CITY OF TURLOCK
STANISLAUS COUNTY, CALIFORNIA

CONTRACT DOCUMENTS
FOR
CONSTRUCTION OF THE

HARDING DRAIN BYPASS PUMP STATION AND PIPELINE PROJECT

PROJECT NO. WQCF-6859

MAY 2012
CONFORMED

VOLUME 2

Specifications
(Divisions 0 through 9)

Principal-In-Charge: Mike Britten, P.E.
Project Manager: Darren Baune, P.E.

Engineers...Working Wonders With Water™

CITY OF TURLOCK
STANISLAUS COUNTY, CALIFORNIA

HARDING DRAIN BYPASS PUMP STATION AND PIPELINE PROJECT
LICENSEE RESPONSIBLE FOR SPECIFICATIONS

Contract Documents prepared by or under the direction of the following registered persons:

Michael James Britten (Civil)
Carollo Engineers, Inc.
2700 Ygnacio Valley Road, Suite 300
Walnut Creek, CA 94598
(925) 932-1710

Original stamped by Michael James Britten, 12/7/11, PE C27729

Darren G. Baune (Civil)
Carollo Engineers, Inc.
2700 Ygnacio Valley Road, Suite 300
Walnut Creek, CA 94598
(925) 932-1710

Original stamped by Darren G. Baune, 12/7/11, PE C68899

Michael James Hartlaub (Civil)
Carollo Engineers, Inc.
2700 Ygnacio Valley Road, Suite 300
Walnut Creek, CA 94598
(925) 932-1710

Original stamped by Michael James Hartlaub, 12/7/11, PE C74901

Anthony L. Morroni (Electrical)
Carollo Engineers, Inc.
10822 W. Toller Drive, Ste. 200
Littleton, CO 80127-5084
(303) 980-8260

Original stamped by Anthony L. Morroni, 12/7/11, PE L012875

INDEX OF CONTRACT DOCUMENTS

CITY OF TURLOCK

HARDING DRAIN BYPASS PUMP STATION AND PIPELINE PROJECT

PROJECT NO. WQCF-6859

———

Volume	Volume Contents
1	Drawings
2	Specifications (Divisions 0 – 9)
3	Specifications (Divisions 10 – 17)
4	Permits

VOLUME 2
SPECIFICATIONS (DIVISIONS 0 – 9)

DIVISION 0 - BIDDING REQUIREMENTS,
CONTRACT FORMS, AND CONDITIONS OF THE CONTRACT

DOCUMENT NO.	TITLE
00100	INVITATION TO BID
00120	DAVIS BACON ACT REQUIREMENTS
00200	~~INSTRUCTIONS TO BIDDERS~~ **INSTRUCTIONS TO BIDDERS (Addendum 6)**
00400	**BID SUBMITTAL CHECKLIST (Addendum 7)**
00410	~~BID FORM~~ **BID FORM (Addendum 7)**
00432	~~10% BID BOND~~ **10% BID BOND (Addendum 6)**
00434	~~LIST OF SUBCONTRACTORS~~ **LIST OF SUBCONTRACTORS (Addendum 6)**
00436	LIST OF EQUIPMENT AND MATERIAL MANUFACTURERS
00451B	~~CONSTRUCTION CONTRACTOR'S QUALIFICATION STATEMENT FOR ENGINEERED CONSTRUCTION~~ **CONSTRUCTION CONTRACTOR'S QUALIFICATION STATEMENT FOR ENGINEERED CONSTRUCTION (Addendum 6)**
00456	~~NON-COLLUSION AFFIDAVIT~~ **NON-COLLUSION AFFIDAVIT**
00457	**STATE REVOLVING FUNDS FORMS REQUIRED AT BID OPEN" to the TABLE OF CONTENTS (Addendum 7)**
00510	NOTICE OF AWARD
00520	~~AGREEMENT FORM~~ **AGREEMENT FORM (Addendum 4)**
00550	NOTICE TO PROCEED
00602	ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION
00612	CONSTRUCTION PERFORMANCE BOND
00614	LABOR AND MATERIALS BOND
00618	GUARANTY BOND

00650	~~SUPPLEMENTAL BID FORMS REQUIRED FOR SRF FUNDING~~ **SUPPLEMENTAL FORMS AND INFORMATION REQUIRED FOR SRF FUNDING (Addendum 6)**
00700	~~GENERAL CONDITIONS~~ **GENERAL CONDITIONS (Addendum 1)**
00800	SUPPLEMENTARY CONDITIONS
00821	ARBITRATION
00822	~~DISPUTES REVIEW BOARD~~ **DISPUTES REVIEW BOARD (Addendum 1)**
00823	ESCROW BID DOCUMENTS
00899	NOTICE OF SUBSTANTIAL COMPLETION

DIVISION 1 – GENERAL REQUIREMENTS

SECTION NO.	TITLE
01110	SUMMARY OF WORK
01111	**LABOR COMPLIANCE (Addendum 6)**
01116	PROJECT MANUAL LANGUAGE
01140	WORK RESTRICTIONS
01201	PAYMENT PROCEDURES
01210	ALLOWANCES
01270	~~UNIT PRICES~~ **UNIT PRICES (Addendum 6)**
01294	APPLICATIONS FOR PAYMENT
01312	PROJECT MEETINGS
01322	WEB BASED CONSTRUCTION DOCUMENT MANAGEMENT
01324	PROGRESS SCHEDULES AND REPORTS
01329	SAFETY PLAN
01330	SUBMITTAL PROCEDURES
01340	PHOTOGRAPHIC AND VIDEOGRAPHIC DOCUMENTATION
01350	SPECIAL PROCEDURES
01352	ALTERATION PROJECT PROCEDURES
01354	HAZARDOUS MATERIAL PROCEDURES
01355	STORMWATER POLLUTION PREVENTION CONSTRUCTION ACTIVITY – BEST MANAGEMENT PRACTICES

01410	REGULATORY REQUIREMENTS
01424	ABBREVIATIONS
01450	QUALITY CONTROL
01455	SPECIAL TESTS AND INSPECTIONS
01500	TEMPORARY FACILITIES AND CONTROLS
01550	TRAFFIC CONTROL
01600	PRODUCT REQUIREMENTS
01612	~~SEISMIC DESIGN CRITERIA~~ **SEISMIC DESIGN CRITERIA (Addendum 7)**
01614	~~WIND DESIGN CRITERIA~~ **WIND DESIGN CRITERIA (Addendum 7)**
01722	FIELD ENGINEERING
01732	CUTTING AND PATCHING
01734	WORK WITHIN PUBLIC RIGHT-OF-WAY
01756	TESTING, TRAINING, AND FACILITY START-UP
01770	CLOSEOUT PROCEDURES
01782	OPERATION AND MAINTENANCE DATA
01999	REFERENCE FORMS

DIVISION 2 - SITE CONSTRUCTION

SECTION NO.	TITLE
02084	UTILITY STRUCTURES
02200	SITE PREPARATION
02240	DEWATERING
02260	EXCAVATION SUPPORT AND PROTECTION
02300	EARTHWORK
02312	CONTROLLED LOW STRENGTH MATERIAL
02318	TRENCHING
02370	RIPRAP AND GABIONS EROSION AND SEDIMENTATION CONTROL
02441	MICROTUNNELING
02581	ELECTRICAL MANHOLES
02600	REINFORCED CONCRETE PIPE FOR (MICROTUNNELED) SECTIONS
02621	STABILIZATION FABRIC
02722	AGGREGATE BASE COURSE

02738	DECOMPOSED GRANITE
02742A	ASPHALTIC CONCRETE PAVING
02772	CONCRETE CURBS, GUTTERS, AND SIDEWALKS
02820	FENCES AND GATES
02924	HYDROSEEDING
02952	PAVEMENT RESTORATION AND REHABILITATION

DIVISION 3 – CONCRETE

SECTION NO.	**TITLE**
03071	EPOXIES
03072	EPOXY RESIN/PORTLAND CEMENT BONDING AGENT
03102	CONCRETE FORMWORK
03150	CONCRETE ACCESSORIES
03200	CONCRETE REINFORCEMENT
03212	REINFORCING BAR COUPLERS
03300	CAST-IN-PLACE CONCRETE
03360	CONTACT GROUTING
03366	TOOLED CONCRETE FINISHES
03410	STRUCTURAL PRECAST CONCRETE VAULT
03600	GROUTS
03931	EPOXY INJECTION SYSTEM
03936	**WATER LEAKAGE TESTING FOR CONCRETE STRUCTURES (Addendum 4)**

DIVISION 4 - MASONRY

SECTION NO.	**TITLE**
	NOT USED

DIVISION 5 - METALS

SECTION NO.	**TITLE**
05120	STRUCTURAL STEEL
05140	STRUCTURAL ALUMINUM

05500	METAL FABRICATIONS

DIVISION 6 - WOOD AND PLASTICS

SECTION NO.	**TITLE**
	NOT USED

DIVISION 7 - THERMAL AND MOISTURE PROTECTION

SECTION NO.	**TITLE**
07214	**BATT INSULATION (Addendum 4)**
07900	JOINT SEALERS
07916	PRECAST CONCRETE JOINT SEALER

DIVISION 8 - DOORS AND WINDOWS

SECTION NO.	**TITLE**
08110	STEEL DOORS AND FRAMES
08310	FLOOR ACESS DOORS (HATCHES)
08710	DOOR HARDWARE
08952	REMOVABLE TRANSLUSCENT SKYLIGHT SYSTEM

DIVISION 9 - FINISHES

SECTION NO.	**TITLE**
09250	GYPSUM BOARD
09523	ACOUSTICAL PANELS
09910	PAINTS
09960	COATINGS

VOLUME 3
SPECIFICATIONS (DIVISIONS 10 – 17)

DIVISION 10 – SPECIALTIES

SECTION NO.	**TITLE**
10400	IDENTIFICATION DEVICES
10520	FIRE PROTECTION SPECIALTIES

DIVISION 11 – EQUIPMENT

SECTION NO.	TITLE
11200	**BOOSTER PUMP SYSTEM (Addendum 6)**
11211	**PRESSURE WASHING STATION (Addendum 4)**
11292A	FLAP GATES
11294A	CAST-IRON SLIDE GATES
11312D	VERTICAL TURBINE PUMPS
11510	SAFETY EQUIPMENT

DIVISION 12 – FURNISHINGS

SECTION NO.	TITLE
	NOT USED.

DIVISION 13 – SPECIAL CONSTRUCTION

SECTION NO.	TITLE
13112	PIPELINE CORROSION MONITORING FACILITIES
13122	METAL BUILDING SYSTEM
13446	MANUAL ACTUATORS

DIVISION 14 – CONVEYING SYSTEMS

SECTION NO.	TITLE
	NOT USED.

DIVISION 15 – MECHANICAL

SECTION NO.	TITLE
15050	BASIC MECHANICAL MATERIALS AND METHODS
15052	BASIC PIPING MATERIALS AND METHODS
15057	FUSION BONDED EPOXY LINING
15061	PIPE SUPPORTS
15062	PREFORMED CHANNEL PIPE SUPPORT SYSTEM
15075	MECHANICAL IDENTIFICATION
15084	DUCTWORK INSULATION
15110	VALVES

15111	**BALL VALVES (Addendum 4)**
15112	BUTTERFLY VALVES
15114	CHECK VALVES
15115	GATE, GLOBE, AND ANGLE VALVES
15119	AIR AND VACUUM RELIEF VALVES
15120	PIPING SPECIALTIES
15121	PIPE COUPLINGS
15230	**PLASTIC PIPING AND TUBING (Addendum 6)**
15251	DUCTILE IRON AWWA C151 PIPE
15252A	STEEL PIPING
15252C	STEEL TRANSMISSION PIPELINES 24 - 54 INCHES DIAMETER
15254	CAST IRON SOIL PIPING
15255	STAINLESS STEEL PIPING AND TUBING
15256	CORRUGATED METAL PIPING
15261	REINFORCED CONCRETE LOW-HEAD PRESSURE PIPING
15281	**COPPER WATER TUBE-SEAMLESS, ASTM B 88 (Addendum 6)**
15732	AIR CONDITIONING UNITS
15812	METAL DUCTWORK
15820	DUCTWORK ACCESSORIES
15830	FANS
15841	AIR TERMINAL UNITS
15852	LOUVERS
15936	HEATING, VENTILATING, AND AIR CONDITIONING CONTROLS
15954	HVAC SYSTEMS TESTING, ADJUSTING, AND BALANCING
15956	PIPING SYSTEM TESTING
15958	MECHANICAL EQUIPMENT TESTING

DIVISION 16 - ELECTRICAL

SECTION NO.	TITLE
16050	GENERAL REQUIREMENTS FOR ELECTRICAL WORK
16060	GROUNDING AND BONDING
16075	ELECTRICAL IDENTIFICATION
16123	600 VOLT OR LESS WIRES AND CABLES

16130	CONDUITS
16133	DUCT BANKS
16134	BOXES
16135	PRECAST CONCRETE PULL BOXES AND ELECTRICAL MANHOLES
16140	WIRING DEVICES
16150	WIRE CONNECTIONS
16210	UTILITY COORDINATION
16222	LOW VOLTAGE MOTORS UP TO 500 HORSEPOWER
16264	VARIABLE FREQUENCY DRIVES 60-500 HORSEPOWER
16272	DRY TYPE TRANSFORMERS
16285	TRANSIENT VOLTAGE SURGE SUPPRESSORS
16290	POWER MEASUREMENT
16305	ELECTRICAL SYSTEM STUDIES
16411	DISCONNECT SWITCHES
16412	LOW VOLTAGE MOLDED CASE CIRCUIT BREAKERS
16422	MOTOR STARTERS
16441	GROUP-MOUNTED CIRCUIT BREAKER SWITCHBOARDS
16445	BRANCH CIRCUIT PANELBOARDS
16446	DISTRIBUTION PANELBOARDS
16494	LOW VOLTAGE FUSES
16500	LIGHTING
16950	FIELD ELECTRICAL ACCEPTANCE TESTS
16990	SAMPLE TYPICAL DRAWINGS

DIVISION 17 – INSTRUMENTATION

SECTION NO.	**TITLE**
17050	PROCESS CONTROL AND INSTRUMENTATION SYSTEM GENERAL REQUIREMENTS
17100	CONTROL STRATEGIES
17101	SPECIFIC CONTROL STRAGIES
17201	LEVEL MEASUREMENT – SWITCHES
17302	FLOW MEASUREMENT - MAGNETIC FLOWMETERS
17401	**PRESSURE/VACUUM MEASUREMENT - DIAPHRAGM SEALS (Addendum 6)**

17402	PRESSURE/VACUUM MEASUREMENT - INSTRUMENT VALVES
17404	PRESSURE/VACUUM MEASUREMENT - GAUGES
17405	PRESSURE /VACUUM MEASUREMENT - DIRECT
17407	PRESSURE MEASUREMENT - SUBMERSIBLE
17506	DISSOLVED OXYGEN (DO) ANALYZER
17604	TEMPERATURE MEASUREMENT - RTD
17710	CONTROL SYSTEMS – PANELS, ENCLOSURES, AND PANEL COMPONENT
17712	CONTROL SYSTEMS – UNINTERRUPTIBLE POWER SUPPLIES 10 KVA AND BELOW
17720	CONTROL SYSTEMS – PROGRAMMABLE LOGIC CONTROLLERS HARDWARE
17721	CONTROL SYSTEMS – HUMAN MACHINE INTERFACE HARDWARE
17750	WIRELESS COMMUNICATIONS
17761	PLC PROGRAMMING SOFTWARE
17765	HUMAN MACHINE INTERFACE SOFTWARE
17901	SCHEDULES - FIELD INSTRUMENT
17903	I/O LIST
17950	TESTING, CALIBRATION, AND COMMISSIONING

DOCUMENT 00100

INVITATION TO BID

CITY OF TURLOCK

DEVELOPMENT SERVICES/ENGINEERING DIVISION

156 SOUTH BROADWAY, SUITE 150

TURLOCK, CA 95380-5454

For constructing Harding Drain Bypass Pump Station and Pipeline Project - WQCF- 6859

ARTICLE 1 - BID OPENING

1.01 Bids will be received at the office of the City Engineer, Engineering Division, **156 South Broadway, Suite 150, Turlock, CA 95380-5454** and shall be date and time stamped before 2:00 p.m. sharp (as determined by computer clock located at the Engineering Division Front Counter) on ~~January 31 2012~~ **February 23, 2012** local time, at which time they will be opened and read aloud. Bidders are required to complete Document 00451, Construction Contractor's Qualification Statement, attached to the Bid Form.

1.02 Bidders are required to complete Document 00451, Construction Contractor's Qualification Statement, attached to the Bid Form.

~~1.03 The Bid will remain subject to acceptance for 120 days after the Bid opening. The contractor shall guarantee the bid price for up to 120 days after the bid opening.~~

1.03 The Contractor shall guarantee the bid price for up to 90 working days after the bid opening.

ARTICLE 2 - DESCRIPTION OF THE PROJECT

2.01 You are invited to bid on work comprising the construction of The City of Turlock Harding Drain Bypass Pump Station and Outfall Project in Turlock, California for the City of Turlock. The project consists of the following sections:

1) Junction Structure
2) 48” Pump Station Influent Gravity Pipeline
3) Pump Station. (Cast in place wetwell, four vertical turbine pumps, prefabricated metal building, site work, and all other appurtenances).
4) Outfall Pipeline. (Steel Pipe or Ductile Iron Pipe - nominal diameter 36”).
5) Standpipe
6) 48” Gravity Pipeline to Outfall Structure
7) San Joaquin River Outfall Structure

ARTICLE 3 - BIDDING DOCUMENTS

~~3.01 Bidding Documents can only be obtained directly from the City of Turlock, Engineering Division 156 South Broadway Suite 150, Turlock, California 95380-5454. Charges for all documents obtained will be made on the following basis: Check to be made payable to the City of Turlock.~~

	~~Non Refundable Charges~~
~~Full-size drawings with specifications~~	~~$135.00~~
~~Geotechnical Report (per copy) on CD-ROM~~	~~$25.00~~
~~Mailing~~	~~Not Included. Must provide UPS or FEDEX or other overnight mail service account number.~~

~~Half sized drawing sets (11''x17'') will not be made available for this project.~~

3.01 Bidding Documents may be obtained directly from the City Turlock, Engineering Division (156 South Broadway Suite 150, Turlock, California 95380 – 5454); the bidding documents may also be downloaded from the City's website (www.cityofturlock.org/capitalprojects).

3.02 Bidding Documents may also be examined at the following locations:

A full set of Bidding Documents is available for examination at the :

- Office of the City Engineer of the City of Turlock, Engineering Division 156 South Broadway, Suite 150, Turlock, California 95380-5454:
- Carollo Engineers, 2700 Ygnacio Valley Road, Walnut Creek, California 94598
- Carollo Engineers 2500 Venture Oaks Way, Suite 320, Sacramento, California 95833.

List of plan holders can be viewed on the Internet at www.cityofturlock.org then click on City Departments then Engineering Services then Project Out to Bid then Project Plan holders.

Contact City for names and addresses of other locations where bidding documents can be viewed.

For procedural questions contact: Stephen Fremming
City of Turlock, Development Services, Engineering Division
(209) 668-5599 ext. 4417
SFremming@turlock.ca.us

Submit all technical questions during the bid period in writing (via email) to the first and second contacts listed below:

Darren Baune (first contact)
Carollo Engineers, P.C. – Walnut Creek Office
(925) 932-1710, fax (925) 930-0203
dbaune@carollo.com

Michael Hartlaub, (second contact)
Carollo Engineers, P.C. – Walnut Creek Office
(925) 932-1710, fax (925) 930-0203
mhartlaub@carollo.com

Michael Britten (third contact)
Carollo Engineers, P.C. – Walnut Creek Office
(925) 932-1710, fax (925) 930-0203

ARTICLE 4 - BID SECURITY

4.01 Each Bid shall be accompanied by cash, a certified or cashier's check, or Bid Bond in the amount of 10 percent of the total bid price, payable to the City of Turlock.

4.02 The Bidder shall guarantee the Total Bid Price pursuant to Article 8 of Instructions to Bidders.

ARTICLE 5 - OWNER'S RIGHTS

5.01 OWNER reserves the right after opening Bids to reject any or all Bids, to waive any informality (non-responsiveness) in a Bid, or to make award to the lowest responsive, responsible Bidder and reject all other Bids, as it may best serve the interest of the OWNER.

ARTICLE 6 - FUNDING

6.01 This project is funded by the Clean Water State Revolving Fund (CWSRF) Program. Accordingly, the Contractor shall comply with DAVIS BACON REQUIREMENTS in Section 00120 AND DISADVANTAGED BUSINESS ENTERPRISE (DBE) GUIDELINES in Section 00434.

ARTICLE 7 - LAWS AND REGULATIONS

7.01 Prevailing Wage Rates: Pursuant to Section 1770 et seq., California Labor Code, the successful Bidder shall pay not less than the prevailing rate of per diem wages as determined by the Director of California Department of Industrial Relations. A copy of such prevailing rate is on file at the offices of the City Engineer, City of Turlock (OWNER) which copy will be made available for examination during business hours to any party on request.

7.02 Contractor shall meet the wage and labor requirements Davis Bacon Act.

7.03 Contractor's License Classification: In accordance with the provisions of California Business and Professions Code, Section 7028, OWNER has determined that CONTRACTOR shall possess a valid Class A Contractor License at the time of Bid and for the duration of the contract. Failure to

possess the specified license shall render the Bid as non-responsive and shall act as a bar to award of the contract to any Bidder not possessing said license at the time of Bid opening.

7.04 The Contractor's State License Board may be contacted at 9835 Goethe Road, Sacramento, CA 95827; P.O. Box 26000, Sacramento, CA 95826; (800) 321-2752.

7.05 Pursuant to Division 2, Part 5, Section 22300, et. seq., of the Public Contracts Code, the CONTRACTOR may request the right to substitute securities for any monies withheld by the City of Turlock to ensure the performance required of the CONTRACTOR under the contract, or that the City of Turlock make payment of retentions earned directly into an escrow account established at the expense of the CONTRACTOR.

ARTICLE 8 - MANDATORY PRE-BID CONFERENCE

~~8.01 A pre-Bid conference will be held at 10:00 am on January 11, 2011 at Turlock Regional Water Quality Control Facility Administration Building, 901 South Walnut Road, Turlock, CA. Representatives of OWNER and ENGINEER will be present to discuss the Project. Bidders are required to attend in the conference. ENGINEER will transmit to all prospective Bidders of record such Addenda as ENGINEER considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.~~

8.01 A pre-bid conference will be held at 10:00 AM on January 11, 2012 at Turlock Regional Water Quality Control Facility Administration Building, 901 S. Walnut Road, Turlock, CA. Representatives of OWNER and ENGINEER will be present to discuss the Project. Bidders are required to attend the pre-bid conference. ENGINEER will transmit to all prospective Bidders of record such Addenda as ENGINEER considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.

Date _____ 2011

CITY OF TURLOCK

By _____
Michael G. Pitcock, City Engineer

END OF DOCUMENT

SECTION 00120

DAVIS-BACON ACT REQUIREMENTS

Contract and Subcontract Provisions.

(a) The Recipient shall insert in full in any contract in excess of $2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1, the following clauses:

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

The **Recipient** may obtain wage determinations from the U.S. Department of Labor’s web site, www.wdol.gov.

(ii)(A) The **Recipient**, on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The EPA award official shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the **Recipient** agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the **Recipient** to the State Water Board. The State Water Board will transmit the report, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the State Water Board or will notify the State Water Board within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the **Recipient** do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), USEPA will refer the questions, including the views of all interested parties and the recommendation of the State Water Board, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has

found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding.

The **Recipient**, shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the **Recipient**, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State Water Board or EPA. As to each payroll copy received, the **Recipient** shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out

accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the **Recipient** for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the **Recipient**.

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on

the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and Trainees

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor,

Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act Requirements.

The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts.

The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may by appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract Termination: Debarment.

A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act Requirements.

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes Concerning Labor Standards.

The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated

by reference in this contract.

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the R**ecipient**, State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of Eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

4. **Contract Provision for Contracts in Excess of $100,000.**

(a) Contract Work Hours and Safety Standards Act.

The **Recipient** shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements.

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages.

In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or

mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages.

The **Recipient,** upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (a)(2) of this section.

(4) Subcontracts.

The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the **Recipient** shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the **Recipient** shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the USEPA, State Water Resources Control Board, and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

****END OF SECTION****

DOCUMENT 00200

INSTRUCTIONS TO BIDDERS

ARTICLE 1 - DEFINED TERMS

1.01 **Terms used in these Instructions to Bidders will have the meanings indicated in the General Conditions and Supplementary Conditions. Additional terms used in these Instructions to Bidders have the meanings indicated below which are applicable to both the singular and plural thereof:**

A. **Bidder -- Any individual, partnership, corporation, joint venture, or other combination thereof who submits a Bid to OWNER for the Work contemplated, acting directly or through an authorized representative. As used in the Contract Documents, masculine pronouns refer to both masculine and feminine genders.**

B. **Successful Bidder -- The lowest responsible Bidder submitting a responsive Bid to whom OWNER (on the basis of OWNER's evaluation as hereinafter provided) makes an award.**

ARTICLE 2 - COPIES OF BIDDING DOCUMENTS

2.01 **Complete sets of the Bidding Documents in the number and for the deposit sum, if any, stated in the Invitation to Bid may be obtained from City of Turlock pursuant to Article 3 of Document 00100, Invitation to Bid. Deposit is non-refundable.**

2.02 **Complete sets of Bidding Documents must be used in preparing Bids; OWNER does not assume any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.**

2.03 **OWNER, in making copies of Bidding Documents available on the above terms, does so only for the purpose of obtaining Bids for the Work and does not confer a license or grant for any other use.**

ARTICLE 3 - QUALIFICATIONS OF BIDDERS

3.01 **More than one Bid from an individual, firm, partnership, corporation, or association under the same or different names will not be considered. If the OWNER believes that any Bidder submits more than one Bid for the Work contemplated, all Bids in which such Bidder is interested will be rejected. If the OWNER believes that collusion exists among the Bidders, all Bids will be rejected.**

3.02 **Pursuant to Sections 4110 and 4111, California Public Contract Code, Bidder may not circumvent the requirement to list subcontractors by the device of listing one subcontractor, who in turn sublets portions constituting the majority of the work covered by the contract.**

3.03 **No CONTRACTOR or Subcontractor may submit a Bid or perform Work on this Project who is found in violation of Labor Code Division 2, Part 7, Chapter 1 by the Labor**

Commissioner. Subcontractors who have been disbarred may not receive public funds pursuant to Public Contract Code §6109.

3.04 **To demonstrate Bidder's qualifications to perform the Work, Bidder shall submit written evidence such as financial data, previous experience, present commitments, and such other data as called for in OWNER's Construction Contractor's Qualification Statement attached as Document 00451, which must be completed in ink and attached to the Bid.**

3.05 **The criteria which will be used to determine the lowest responsive and responsible Bidder are as follows:**

A. **Responsive Bidder: Means a Bidder who has submitted a Bid which conforms in all material respects to the Bidding Documents.**

B. **Responsible Bidder: Means a Bidder who has the capacity and capability in all respects to perform fully the contract requirements and who has the integrity and reliability to assure good faith performance. Among factors to be considered in determining whether the Bidder meets these standards, are:**

1. **Financial, material, equipment, facility, and personnel resources and expertise necessary to meet contractual requirements;**

2. **A record of integrity;**

3. **A record of Successful Completion defined as: completion of a project within a reasonable time and budget;**

4. **Qualified legally to contract with the OWNER, and;**

5. **Has not failed to supply any necessary information in connection with the inquiry concerning responsibility.**

ARTICLE 4 - EXAMINATION OF BIDDING DOCUMENTS, OTHER RELATED DATA, AND SITE

4.01 **Subsurface and Physical Conditions:**

A. **The Supplementary Conditions identify:**

1. **Those reports of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Bidding Documents.**

2. **Those drawings of physical conditions in or relating to existing surface and subsurface structures at or contiguous to the Site (except Underground Facilities) that ENGINEER has used in preparing the Bidding Documents.**

B. **Copies of reports and drawings of Subsurface and Physical Conditions will be made available by OWNER to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in paragraph 4.02 of the General Conditions has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data,**

interpretations, opinions or information contained in such reports or shown or indicated in such drawings.

C. **Copies of reports and drawings of Subsurface and Physical Conditions will be made available by the City. Contact Steven Fremming, City of Turlock, Municipal Services/Engineering Division at (209) 668-5599 ext. 4417 to request a copy. A non-refundable charge of $25 will be required to obtain a copy of this report. Subsurface and Physical Conditions Geotechnical Study report was prepared by Fugro West Inc. Contact is Ronald Bajuniemi at Fugro West Inc. 1000 Broadway, Suite 200, Oakland, California 94207, (510) 268-0461 for any questions regarding interpretation of the report. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in paragraph 4.02 of the General Conditions has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from an "technical data" or any other data, interpretations, opinions or information contained in such reports or shown or indicated in such drawings.**

4.02 **Underground Facilities:**

A. **Information and data shown or indicated in the Bidding Documents with respect to existing Underground Facilities at or contiguous to the Site is based upon information and data furnished to OWNER and ENGINEER by owners of such Underground Facilities, including OWNER, or others.**

4.03 **Hazardous Environmental Condition:**

A. **The Supplementary Conditions identify those reports and drawings relating to Hazardous Environmental Conditions at the Site, if any, that ENGINEER has used in preparing the Bidding Documents.**

B. **Copies of reports and drawings of Hazardous Environmental Conditions will be made available by OWNER to any Bidder on request. Those reports and drawings are not part of the Contract Documents, but the "technical data" contained therein upon which Bidder is entitled to rely as provided in paragraph 4.06 of the General Conditions has been identified and established in the Supplementary Conditions. Bidder is responsible for any interpretation or conclusion Bidder draws from any "technical data" or any other data, interpretations, opinions, or information contained in such reports or shown or indicated in such drawings.**

4.04 **Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to subsurface conditions, other physical conditions and Underground Facilities, and possible changes in the Bidding Documents due to differing or unanticipated conditions appear in paragraphs 4.02, 4.03, and 4.04 of the General Conditions. Provisions concerning responsibilities for the adequacy of data furnished to prospective Bidders with respect to a Hazardous Environmental Condition at the Site, if any, and possible changes in the Contract Documents due to any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated on the Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work appear in paragraph 4.06 of the General Conditions.**

4.05 **On request, OWNER will provide Bidder access to the Site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary**

for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies.

4.06 **Reference is made to Article 7 of the Supplementary Conditions for the identification of the general nature of other work that is to be performed at the Site by OWNER or others (such as utilities and other prime contractors) that relates to the Work for which a Bid is to be submitted. On request, OWNER will provide to each Bidder for examination access to or copies of contract documents (other than portions thereof related to price) for such other work.**

4.07 **It is the responsibility of each Bidder before submitting a Bid to:**

A. **Examine and carefully study the Bidding Documents, including any Addenda and the other related data identified in the Bidding Documents;**

B. **Visit the Site and become familiar with and satisfy Bidder as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work;**

C. **Become familiar with and satisfy Bidder as to all federal, state, and local Laws and Regulations that may affect cost, progress, or performance of the Work;**

D. **Carefully study all reports of exploration and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions;**

E. **Obtain and carefully study (or assume responsibility for doing so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including any specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents, and safety precautions and programs incident thereto;**

F. **Agree at the time of submitting its Bid that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of its Bid for performance of the Work at the price bid and within the times and in accordance with the other terms and conditions of the Bidding Documents;**

G. **Become aware of the general nature of the work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents;**

H. **Correlate the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents;**

I. **Promptly give ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder discovers in the Bidding Documents and confirm that the written resolution thereof by ENGINEER is acceptable to Bidder; and**

J. **Determine that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work.**

4.08 **The submission of a Bid will constitute an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article 4, that without exception the Bid is premised upon performing and furnishing the Work required by the Bidding Documents and applying any specific means, methods, techniques, sequences, and procedures of construction that may be shown or indicated or expressly required by the Bidding Documents, that Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, and discrepancies that Bidder has discovered in the Bidding Documents and the written resolutions thereof by ENGINEER are acceptable to Bidder, and that the Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performing and furnishing the Work.**

ARTICLE 5 - MANDATORY PRE-BID CONFERENCE

5.01 **A pre-Bid conference will be held at 10:00 am on January 11, 2011 at Turlock Regional Water Quality Control Facility Administration Building, 901 South Walnut Road, Turlock, CA. Representatives of OWNER and ENGINEER will be present to discuss the Project. Bidders are required to attend in the conference. ENGINEER will transmit to all prospective Bidders of record such Addenda as ENGINEER considers necessary in response to questions arising at the conference. Oral statements may not be relied upon and will not be binding or legally effective.**

ARTICLE 6 - SITE AND OTHER AREAS

6.01 **The Site is identified in the Bidding Documents. All additional lands and access thereto required for temporary construction facilities, construction equipment, or storage of materials and equipment to be incorporated in the Work are to be obtained and paid for by CONTRACTOR. Easements for permanent structures or permanent changes in existing facilities are to be obtained and paid for by OWNER unless otherwise provided in the Bidding Documents.**

ARTICLE 7 - INTERPRETATIONS AND ADDENDA

7.01 **All questions about the meaning or intent of the Bidding Documents are to be submitted to ENGINEER in writing. Interpretations or clarifications considered necessary by ENGINEER in response to such questions will be issued by Addenda mailed or delivered to all parties recorded by ENGINEER as having received the Bidding Documents. Questions received less than 10 days prior to the date for opening of Bids may not be answered. Only questions answered by Addenda will be binding. Oral and other interpretations or clarifications will be without legal effect.**

7.02 **Addenda may be issued to clarify, correct, or change the Bidding Documents as deemed advisable by OWNER or ENGINEER.**

ARTICLE 8 - BID SECURITY

8.01 **A Bid must be accompanied by Bid security made payable to OWNER in an amount of ten percent (10%) of Bidder's maximum Bid price and in the form of cash, a certified or bank check, or a Bid Bond on the form attached issued by a surety meeting the requirements of paragraphs 5.01 and 5.02 of the General Conditions.**

8.02 **The Bid security of the Successful Bidder will be retained until such Bidder has executed the Contract Documents, furnished the required contract security and met the other conditions of the Notice of Award, whereupon the Bid security will be returned. If the Successful Bidder fails to execute and deliver the Contract Documents and furnish the required contract security within 10 days after the Notice of Award, OWNER may annul the Notice of Award and the Bid security of that Bidder will be forfeited. The Bid security of other Bidders whom OWNER believes to have a reasonable chance of receiving the award may be retained by OWNER for a reasonable length of time after the Bid opening, whereupon Bid security furnished by such Bidders will be returned.**

8.03 **Bid security of other Bidders will be returned after execution of the Contract with Successful Bidder.**

ARTICLE 9 - CONTRACT TIMES

9.01 **The number of days within which, or the dates by which, the Work is to be (a) Substantially Completed and (b) also completed and ready for final payment are set forth in the Agreement.**

ARTICLE 10 - LIQUIDATED DAMAGES

10.01 **Provisions for liquidated damages, if any, are set forth in the Agreement.**

ARTICLE 11 - SUBSTITUTE AND "OR-EQUAL" ITEMS

11.01 **The Contract, if awarded, will be on the basis of materials and equipment specified or described in the Bidding Documents without consideration of possible substitute or "or-equal" items. Whenever it is specified or described in the Bidding Documents that a substitute or "or-equal" item of material or equipment may be furnished or used by CONTRACTOR if acceptable to ENGINEER, the procedure for submission of any such application by CONTRACTOR and consideration by ENGINEER is set forth in paragraph 6.05 of the General Conditions.**

11.02 **In accordance with Section 3400 of the California Public Contract Code, the successful Bidder is permitted a period of 10 days prior to the award of contract for submission of data substantiating a request for a substitution of an “or equal” item.**

ARTICLE 12 - SUBCONTRACTORS, SUPPLIERS, AND OTHERS

12.01 **Pursuant to California Government Contract Code §4106, Subcontractors who will perform work or labor or render services in an amount in excess of one-half of one percent**

of CONTRACTOR's total bid shall be set forth on Document 00434, List of Subcontractors, and attached to Document 00410, Bid Form. Such list shall be accompanied by an experience statement with pertinent information regarding similar projects and other evidence of qualification for each such Subcontractor, Supplier, individual, or entity if requested by OWNER. If OWNER or ENGINEER, after due investigation, has reasonable objection to any proposed Subcontractor, Supplier, individual, or entity, OWNER may, before the Notice of Award is given, request apparent Successful Bidder to submit a substitute, in which case apparent Successful Bidder shall submit an acceptable substitute, Bidder's Bid price will be increased (or decreased) by the difference in cost occasioned by such substitution, and OWNER may consider such price adjustment in evaluating Bids and making the contract award.

12.02 **If apparent Successful Bidder declines to make any such substitution, OWNER may award the Contract to the next lowest Bidder that proposes to use acceptable Subcontractors, Suppliers, individuals, or entities. Declining to make requested substitutions will not constitute grounds for forfeiture of the Bid security of any Bidder. Any Subcontractor, Supplier, individual, or entity so listed and against which OWNER or ENGINEER makes no written objection prior to the giving of the Notice of Award will be deemed acceptable to OWNER and ENGINEER subject to revocation of such acceptance after the Effective Date of the Agreement as provided in paragraph 6.06 of the General Conditions.**

12.03 **CONTRACTOR shall not be required to employ any Subcontractor, Supplier, individual, or entity against whom CONTRACTOR has reasonable objection.**

12.04 **The quantities of work or material stated in unit price items of the Bid are supplied only to give an indication of the general scope of the Work; the OWNER does not expressly or by implication agree that the actual amount of work or material will correspond therewith.**

ARTICLE 13 - PREPARATION OF BID

13.01 **The Bid Form is included with the Bidding Documents. Additional copies may be obtained as noted in paragraph 3.01 of Document 00100, Invitation to Bid.**

13.02 **All blanks on the Bid Form shall be completed by printing in ink or by typewriter and the Bid signed. A Bid price shall be indicated for each Bid item, alternative, and unit price item listed therein, or the words "No Bid," "No Change," or "Not Applicable" entered.**

13.03 **A Bid by a corporation shall be executed in the corporate name by the president or a vice-president or other corporate officer accompanied by evidence of authority to sign. The corporate seal shall be affixed and attested by the secretary or an assistant secretary. The corporate address and state of incorporation shall be shown below the signature.**

13.04 **A Bid by a partnership shall be executed in the partnership name and signed by a partner (whose title must appear under the signature), accompanied by evidence of authority to sign. The official address of the partnership shall be shown below the signature.**

13.05 **A Bid by a limited liability company shall be executed in the name of the firm by a member and accompanied by evidence of authority to sign. The state of formation of the firm and the official address of the firm must be shown below the signature.**

13.06 **A Bid by an individual shall show the Bidder's name and official address.**

13.07 **A Bid by a joint venture shall be executed by each joint venturer in the manner indicated on the Bid Form. The official address of the joint venture must be shown below the signature.**

13.08 **All names shall be typed or printed in ink below the signatures.**

13.09 **The Bid shall contain an acknowledgment of receipt of all Addenda, the numbers of which shall be filled in on the Bid Form.**

13.10 **The address and telephone number for communications regarding the Bid shall be shown.**

13.11 **The Bid shall contain evidence of Bidder's authority and qualification to do business in California. Bidder's state contractor license number shall also be shown on the Bid Form. Questions concerning a contractor may be referred to the Registrar, Contractors' State License Board, P.O. Box 26000, Sacramento, CA 95826.**

13.12 **Pursuant to the provisions of Section 6707, California Labor Code, Bids shall contain, as a Bid item, the cost for adequate sheeting, shoring and bracing, or equivalent method, for the protection of life and limb in trenches and open excavation, which shall conform to applicable safety orders.**

13.13 **Pursuant to the provisions of Section 7106 of the California Public Contract Code, Bidders shall submit with their Bids, a Non-Collusion Affidavit, Document 00456.**

13.14 **Pursuant to Section 7105, California Public Contract Code, Bidder shall indicate, in the appropriate space provided in the Bid Form, the cost of insurance premiums for earthquake and tidal wave to indemnify OWNER for damage to the Work caused by earthquake or tidal wave in an amount of at least 50 percent of the contract price. The determination of whether to require earthquake and tidal wave insurance will be made by OWNER prior to award of contract.**

ARTICLE 14 - BASIS OF BID; EVALUATION OF BIDS

14.01 **Unit Price:**

A. **Bidders shall submit a Bid on a unit price basis for each item of Work listed in the Bid schedule.**

B. **The total of all estimated prices will be determined as the sum of the products of the estimated quantity of each item and the unit price Bid for the item. The final quantities and Contract Price will be determined in accordance with paragraph 11.03 of the General Conditions.**

C. **Discrepancies between the multiplication of units of Work and unit prices will be resolved in favor of the unit prices. Discrepancies between the indicated sum of any column of figures and the correct sum thereof will be resolved in favor of the correct sum.**

D. **In the evaluation of Bids, the lowest Bid shall be the lowest total of the Bid prices on the base contract and bid alternates A and B will not be considered in determining the lowest bid price.**

1. **Bid Alternate A add: Antenna tower at Water Quality Control Faciltiy. Contractor to install per Typical Detail N200.1 on Drawing TE03.**

2. **Bid Alternate B add: Cost of adding insurance against risk of earthquakes, tidal waves, (i.e. "Act of God").**

3. **Bid Alternate C add: Cost of modifying Bid Item 15 to provide a 2-inch overlay over the Harding Road where required.**

14.02 **The Bid Price shall include such amounts as the Bidder deems proper for overhead and profit on account of cash allowances, if any, named in the Contract Documents as provided in paragraph 11.02 of the General Conditions.**

14.03 **Discrepancies between words and figures will be resolved in favor of the words.**

ARTICLE 15 - SUBMITTAL OF BID

15.01 **Each prospective Bidder is furnished one copy of the Bidding Documents. The Bid Form is to be completed and submitted with the Bid security and the following forms.**

A. **SPECIFICATION SECTION 00400 –BID CHECKLIST**

B. **SPECIFICATION SECTION 00410 – BID FORM**

C. **SPECIFICATION SECTION 00432--10% BID BOND**

D. **SPECIFICATION SECTION 00434- LIST OF SUBCONTRACTORS**

E. **SPECIFICATION SECTION 00436 - LIST OF EQUIPMENT AND MATERIAL MANUFACTURERS**

F. **SPECIFICATION SECTION 00456 –NON-COLLUSION AFFIDAVIT**

G. **SPECIFICATION SECTION 00457 – STATE REVOLVING FUNDS FORMS TO BE SUBMITTED WITH BID**

H. **DBE - GOOD FAITH EFFORT (SEE SPECIFICATION SECTION 00650 FOR REQURIEMENTS)**

15.02 **A Bid shall be submitted no later than the date and time prescribed and at the place indicated in the Invitation to Bid and shall be enclosed in an opaque sealed envelope plainly marked with the Project title (and, if applicable, the designated portion of the Project for which the Bid is submitted), the name and address of Bidder, and shall be accompanied by**

the Bid security and other required documents. If a Bid is sent by mail or other delivery system, the sealed envelope containing the Bid shall be enclosed in a separate envelope plainly marked on the outside with the notation "BID ENCLOSED."

ARTICLE 16 - MODIFICATION AND WITHDRAWAL OF BID

16.01 **A Bid may be modified or withdrawn by an appropriate document duly executed in the manner that a Bid must be executed and delivered to the place where Bids are to be submitted prior to the date and time for the opening of Bids.**

16.02 **Unauthorized conditions, limitations, or modifications attached to the Bid will render it informal and may cause its rejection as being non-responsive. The completed Bid Forms shall be without interlineations, alterations, or erasures. Any changes or corrections shall be initialed by the Bidder. Alternative Bids will not be considered unless expressly called for in Document 00100, Invitation to Bid. Oral, telegraphic, faxed or telephone Bids or modifications will not be considered.**

16.03 **In accordance with Sections 5101 and 5103, California Public Contract Code, withdrawal of Bids may be permitted for mistakes made in filling out the Bid but will not be permitted for mistakes resulting from errors in judgment or carelessness in inspecting the site of the work or in reading the drawings, specifications, and other Contracts Documents.**

16.04 **In the event Bidder alleges that a clerical error has been made in the list of subcontractors, the procedures for substitution shall be provided in accordance with Section 4107.5, California Public Contract Code.**

ARTICLE 17 - OPENING OF BIDS

17.01 **Bids will be opened at the time and place indicated in the advertisement or Invitation to Bid and, unless obviously non-responsive, read aloud publicly. An abstract of the amounts of the base Bids and major alternates, if any, will be made available to Bidders after the opening of Bids.**

17.02 **The three lowest Bidders shall submit within 72 hours of the Bid opening one copy of all documentary information generated in preparation of Bid prices for this Project, pursuant to Document 00823, Escrow Bid Documents.**

ARTICLE 18 - BIDS TO REMAIN SUBJECT TO ACCEPTANCE

18.01 **All Bids will remain subject to acceptance for the period of time stated in paragraph 2.01 of the Bid Form, but OWNER may, in its sole discretion, release any Bid and return the Bid security prior to the end of this period.**

ARTICLE 19 - AWARD OF CONTRACT

19.01 **OWNER reserves the right to reject any or all Bids, including without limitation, nonconforming, nonresponsive, unbalanced, or conditional Bids. OWNER further reserves the right to reject the Bid of any Bidder whom it finds, after reasonable inquiry and evaluation, to be non-responsible. OWNER may also reject the Bid of any Bidder if OWNER believes that it would not be in the best interest of the Project to make an award to that Bidder. OWNER also reserves the right to waive all formalities not involving price, time, or changes in the Work and to negotiate contract terms with the Successful Bidder.**

19.02 **More than one Bid for the same Work from an individual or entity under the same or different names will not be considered. Reasonable grounds for believing that any Bidder has an interest in more than one Bid for the Work may be cause for disqualification of that Bidder and the rejection of all Bids in which that Bidder has an interest.**

19.03 **In evaluating Bids, OWNER will consider whether or not the Bids comply with the prescribed requirements, and such alternates, unit prices and other data, as may be requested in the Bid Form or prior to the Notice of Award.**

19.04 **In evaluating Bidders, OWNER will consider the qualifications of Bidders and may consider the qualifications and experience of Subcontractors, Suppliers, and other individuals or entities proposed for those portions of the Work for which the identity of Subcontractors, Suppliers, and other individuals or entities must be submitted as provided in the Supplementary Conditions.**

19.05 **OWNER may conduct such investigations as OWNER deems necessary to establish the responsibility, qualifications, and financial ability of Bidders, proposed Subcontractors, Suppliers, individuals, or entities to perform the Work in accordance with the Contract Documents.**

19.06 If the Contract is to be awarded, it will be awarded to the most responsive, responsible Bidder. Per Public Contract Code Section 20103.8, item (b), and restated as follows:

"(b) The lowest bid shall be the lowest total of bid prices on the base contract and those additive of deductive items that were specifically identified in the bid solicitation (see Article 2 of Section 00100) as being used to the purpose of determining the lowest bid."

ARTICLE 20 - CONTRACT SECURITY AND INSURANCE

20.01 **Article 5 of the General Conditions, as may be modified by the Supplementary Conditions, sets forth OWNER's requirements as to performance and payment Bonds and insurance. When the Successful Bidder delivers the executed Agreement to OWNER, it must be accompanied by such Bonds and evidence of insurance as required.**

ARTICLE 21 - SIGNING OF AGREEMENT

21.01 **When OWNER gives a Notice of Award to the Successful Bidder, it shall be accompanied by the required number of unsigned counterparts of the Agreement with the other Contract Documents which are identified in the Agreement as attached thereto. Within**

15 days thereafter, Successful Bidder shall sign and deliver the required number of counterparts of the Agreement and attached documents to OWNER. Within 15 days thereafter, OWNER shall deliver one fully signed counterpart to Successful Bidder with a complete set of the Drawings with appropriate identification.

ARTICLE 22 - SALES AND USE TAXES

22.01 **CONTRACTOR shall pay all sales, use and other taxes as specified in paragraph 6.10 of the General Conditions. Cost of sales tax shall be included in the appropriate unit price items.**

22.02 **Contractor shall cooperate with City to the full extent possible to maximize the local allocation of California sales and use tax to the City. Such cooperation shall include but not be limited to:**

A. **Use Tax Direct Payment Permits. Contractor shall apply for, obtain and utilize, to the maximum extent reasonable, a California Use Tax Direct Payment Permit.**

B. **Purchases of $500,000 or More. Contractor shall require vendors and suppliers located outside California from whom Contractor makes purchase of $500,000 or more to allocate the use tax to the City.**

Additional information regarding use tax and the Permit can be found in the State of California Board of Equalization, Sales and Use Tax Regulations, Regulation 1699.6, Use Tax Direct Payment Permits, or on the web site for the Board of Equalization at http://www.boe.ca.gov/sutax/sutprograms.htm

ARTICLE 23 - RETAINAGE

23.01 **Provisions concerning CONTRACTOR's rights to deposit securities in lieu of retainage are set forth in Document 00520, Agreement Form.**

END OF DOCUMENT

SECTION 00400

BID SUBMITTAL CHECKLIST

FAILURE TO PROVIDE ALL THE REQUIRED DOCUMENTS MAY CAUSE THE PROPOSAL TO BE CONSIDERED NON-RESPONSIVE.

Complete Bid Shall include the following documents: SPECIFICAITON SECTION No.

☐	**BID SUBMITTAL CHECKLIST 00400**
☐	**BID FORM 00410**
☐	**10% BID BOND……00432**
☐	**LIST OF SUBCONTRACTORS 00434**
☐	**LIST OF EQUIPMENT AND MATERIAL MANUFACTURERS 00436**
☐	**CONSTRUCTION CONTRACTOR'S QUALIFICATION STATEMENT FOR ENGINEERED CONSTRUCTION…….00451B**
☐	**NON-COLLUSION AFFIDAVIT……00456**
☐	**STATE REVOLVING FUNDS FORMS REQUIRED AT BID OPEN ..... 00457** ***1. DISADVANTAGED BUSINESS ENTERPRISE (DBE) CONTRACTOR SUBCONTRACTOR CERTIFICATION*** ***2 .DISADVANTAGED BUSINESS ENTERPRISE (DBE) SELECTED PRIME CONTRACTOR/RECIPIENT***
☐	**DBE GOOD FAITH EFFORT DOCUMENTATION (SEE SPECIFICATION 00650 FOR REQUIREMENTS).....**

THE GOOD FAITH EFFORT AND ALL SUPPORTING DOCUMENTATION AND FORMS ARE REQUIRED TO BE SUBMITTED WITH THE BID.

1.01 THE APPARENT LOW BIDDER, THE 2ND LOW BIDDER, AND THE 3RD LOW BIDDER MUST COMPLETE AND SUBMIT THE FOLLOWING DOCUMENTS:

A. Escrow Bid Documents to the City of Turlock no later than 4:00 p.m. on the 3rd business day after bid opening.

END OF DOCUMENT

DOCUMENT 00410
BID FORM

PROJECT IDENTIFICATION:

CITY OF TURLOCK
Harding Drain Bypass Pump Station and Pipeline Project

THIS BID IS SUBMITTED BY:

_____

(Bidder)

_____

(Bidder Address)

_____

THIS BID IS SUBMITTED TO:

CITY OF TURLOCK
Engineering Division
156 South Broadway Suite 150
Turlock, California 95380-5454

1.01 **The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an agreement with OWNER in the form included in the Bidding Documents to perform all Work as specified or indicated in the Bidding Documents within the specified time and for the price indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.**

2.01 **Bidder accepts all of the terms and conditions of the Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 90 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.**

3.01 **In submitting this Bid, Bidder represents that:**

A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of which is hereby acknowledged.

ADDENDA

No.	_____	**Dated**	_____
No.	_____	**Dated**	_____
No.	_____	**Dated**	_____
No.	_____	**Dated**	_____
No.	_____	**Dated**	_____
No.	_____	**Dated**	_____
No.	_____	**Dated**	_____

B. **Bidder has visited the site and become familiar with and satisfied itself as to the general, local, and site conditions that may affect cost, progress, and performance of the Work.**

C. **Bidder is familiar with and has satisfied itself as to all Federal, state, and local Laws and Regulations and Permits that may affect cost, progress, and performance of the Work.**

D. **Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions, and (2) reports and drawings of a Hazardous Environmental Condition, if any, which has been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions.**

E. **Bidder has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies and data concerning conditions (surface, subsurface and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder, including applying the specific means, methods, techniques, sequences, and procedures of construction expressly required by the Bidding Documents to be employed by Bidder, and safety precautions and programs incident thereto.**

F. **Bidder does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price(s) bid and within the times and in accordance with the other terms and conditions of the Bidding Documents.**

G. **Bidder is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Bidding Documents.**

H. **Bidder has correlated the information known to Bidder, information and observations obtained from visits to the Site, reports and drawings identified in the Bidding Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Bidding Documents.**

I. **Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by ENGINEER is acceptable to Bidder.**

J. **The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.**

K. **In accordance with Section 1861, California Labor Code, the Bidder states the following as its certification:**

> **"I am aware of the provisions of Section 3700 of the California Labor Code which requires every employer to be insured against liability for workers' compensation or to undertake self insurance in accordance with the provisions of that code, and**

I will comply with such provisions before commencing the performance of the Work."

4.01 **Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.**

5.01 **Bidder will complete the Work in accordance with the Contract Documents for the following unit prices. Quantities indicated are not guaranteed; they are solely for comparing Bids and establishing the initial Contract Price. Final payment will be based on actual quantities.**

BID SCHEDULE
CITY OF TURLOCK
HARDING DRAIN BYPASS
PUMP STATION AND PIPELINE PROJECT

Item No.	Description (As described in Specification Section 01270)	Quantity	Unit	Unit Cost	Extended Cost
1	Junction Structure, including temporary bypass system and manholes	1	Lump Sum	$_____	$ _____
2	48-inch Gravity Pipeline				
	2a. 48-inch Gravity Pipeline, Open Cut portions	120	Linear Foot	$_____	$ _____
	2b. 48-inch Gravity Pipeline Microtunneling portion	163	Linear Foot	$_____	$ _____
3	Outfall Pump Station	1	Lump Sum	$_____	$ _____
4.	Outfall Pipeline System (Bid item does not include sheeting/shoring)				
	Bidder to enter amount for only one of the two outfall pipe material systems (Items 4 a. and 4 b).				
	4 a. 36 – inch Steel Outfall Pipeline, including all appurtenances. Enter $0 if a steel piping system is not proposed in this bid.	29,368	Linear Foot	$_____	$ _____

	OR:				
	4 b. 36 – inch Ductile Iron Pipe Outfall Pipeline, including all appurtenances. Enter $0 if a ductile iron pipe system is not proposed in this bid.	**29,368**	**Linear Foot**	**$_____**	**$ _____**
5	**Stand Pipe Structure**	**1**	**Lump Sum**	**$_____**	**$ _____**
6	**48-inch Gravity Outfall Pipeline (Welded Steel and RCP) (Including Levee Restoration)**				
	6a: 48-inch Gravity Outfall Pipeline Welded Steel Pipe Section	**280**	**Linear Foot**	**$_____**	**$ _____**
	6b: 48-inch Gravity Outfall Pipeline (Reinforced Concrete Pipe section)	**163**	**Linear Foot**	**$_____**	**$ _____**
7	**Outfall Structure**	**1**	**Lump Sum**	**$_____**	**$ _____**
8	**Rip Rap Channel and River Embankment Restoration**	**1**	**Lump Sum**	**$_____**	**$ _____**
9	**Trench Shield and Sheeting/Shoring, in trenches and open excavations**	**1**	**Lump Sum**	**$_____**	**$ _____**
10	**Dewatering for trenches and open excavations**	**1**	**Lump Sum**	**$_____**	**$_____**
11	**Mobilization and Demobilization (Not to be less than 2% and not greater than 4% of contract price)**	**1**	**Lump Sum**	**$_____**	**$ _____**
12	**Traffic Management and Dust Control**	**1**	**Lump Sum**	**$_____**	**$ _____**
13	**Permanent Asphalt Pavement-Harding Road**	**150,000**	**Square Foot**	**$_____**	**$ _____**
14	**Permanent Asphalt Pavement-County Road Crossings**	**4,000**	**Square Foot**	**$_____**	**$ _____**
15	**Asphalt Overlay on Harding Road**	**90,000**	**Square Foot**	**$_____**	**$ _____**
16	**Valve Assemblies**				

	16 a. Air Release Valve Assemblies (TYP P800 & P801)	**24**	**Each**	**$_____**	**$ _____**
	16 b. Slow Closing Air & Vacuum Assemblies (TYP 802)	**2**	**Each**	**$_____**	**$ _____**
17	**Blowoff Valve Assembly (TYP 804)**	**22**	**Each**	**$_____**	**$ _____**
18	**Inspection Outlets (TYP 806)**	**17**	**Each**	**$_____**	**$ _____**
19	**Pipe Trench Cut-off Walls (TYP P005)**	**46**	**Each**	**$_____**	**$ _____**
20	**For the cathodic protection monitoring stations for outfall pipeline (for both ductile or steel), installed and in place.**	**1**	**Lump Sum**	**$_____**	**$ _____**
21	**Contract Allowances (fixed prices)**				
	21 a. Electric Utility Coordination Allowance	**1**	**Lump Sum**	**$ 30,000**	**$ 30,000**
	21 b. Stanislaus County Encroachment Inspection deposit	**1**	**Lump Sum**	**$10,000**	**$10,000**
	21 c. Unknown Utilities Allowance	**1**	**Lump Sum**	**$50,000**	**$50,000**
	21 d. Disputes Review Board Allowance per specification section 00822	**1**	**Lump Sum**	**$15,000**	**$15,000**
	21.e Web-based Construction Document Software (Construction Management Software)	**1**	**Lump Sum**	**$20,000**	**$20,000**
22	**Surveying and Field Engineering per specification section 01722**	**1**	**Lump Sum**	**$_____**	**$ _____**
23	**Miscellaneous Work not included in items 1 to 22.**		**Lump Sum**	**$_____**	**$ _____**
	TOTAL BASE BID PRICE (SUM OF ITEMS 1 TO 23)				**$_____**

TOTAL BASE BID PRICE (Items 1 – 23) in words:

$ _____Dollars

(Price in words)

Unit Prices have been computed in accordance with paragraph 11.03 of the General Conditions and as described in specification section 01270.

Bidder acknowledges that estimated quantities are not guaranteed, and are solely for the purpose of comparison of Bids, and final payment for all Unit Price Bid items will be based on actual quantities provided, determined as provided in the Contract Documents. The contract shall be awarded based upon the lowest base bid price.

6.01 **Bid Alternates: acceptance or rejection of these alternates will be at the option of the OWNER. The final contract price shall be the net amount determined by applying the net addition or net deductions listed below.**

1. **Bid Alternate A (add): Bidder agrees to add the total lump sum base bid price by the amount shown below if the OWNER chooses to add the supply and installation of an Antenna Tower at the Turlock Water Reclamation Facility. Details of Construction are shown on Typical Detail N200.1 on Typical Drawing sheet TE04.**

$_____

(Price in figures)

_____

(Price in words)

2. **Bid Alternate B. (add): As cost control is a major concern, PRIME CONTRACTOR is instructed to bid a price for adding insurance coverage in the amount of 50 percent of the Lump Sum Bid against the risk of tidal wave and earthquake of any magnitude, deemed an act of God under California code. OWNER may, at its sole option, elect to provide its own insurance.**

$ _____

(Price in figures)

_____

(Price in words)

3. **Bid Alternate C. (add): Bidder agrees to modify Bid Item 15 to completely demolish the existing road section and provide a 2-inch pavement section over the Harding Road rather than a 1-inch overlay as described in Bid Item 15. The quantities shall be the same as Bid Item 15. The cost of this bid item shall be additive Bid Item 15.**

Total Price:

$ _____

(Total Price in figures)

_____

(Total Price in words)

Unit Price:

$_____

(Unit Price ($/SF) in figures)

_____

(Unit Price ($/SF) in words)

7.01 **Bidder agrees that the Work will be completed according to the contract time line indicated in Article 4, Document 00520, Agreement.**

8.01 **Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the contract times stated in Article 4, Document 00520, Agreement.**

9.01 **The following documents are attached to and made a condition of this Bid:**

SPECIFICATION SECTION 00400 –BID CHECKLIST,

SPECIFICATION SECTION 00410 – BID FORM

SPECIFICATION SECTION 00432 10% BID BOND; Required Bid security in the form of cash, a certified or bank check, or a Bid Bond issued by a surety meeting the requirements of paragraphs 5.01 and 5.02 of the General Conditions;

SPECIFICATION SECTION 00434 - LIST OF SUBCONTRACTORS, and other individuals and entities required to be identified in this Bid;

SPECIFICATION SECTION 00436 - LIST OF EQUIPMENT AND MATERIAL MANUFACTURERS,

SPECIFICATION SECTION 00451B – REQUIRED CONSTRUCTION CONTRACTOR'S QUALIFICATION STATEMENT with supporting data; and

SPECIFICATION SECTION 00456 –NON-COLLUSION AFFIDAVIT

SPECIFICATION SECTION 00457 – STATE REVOLVING FUNDS FORMS TO BE SUBMITTED WITH BID

DBE - GOOD FAITH EFFORT (SEE SPECIFICATION SECTION 00650 FOR REQURIEMENTS)

10.01 **The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.**

SUBMITTED on _____, 2012.

State Contractor License Number _____.

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____ **(SEAL)**
(Individual's signature)

Doing business as: _____

Business address: _____

Phone Number: ( ) _____ **FAX Number: ( )** _____

A Partnership

Partnership Name: _____ **(SEAL)**

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

Phone Number: ( ) _____ **FAX Number: ( )** _____

A Corporation

Corporation Name: _____ **(SEAL)**

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____

(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Attest: _____
(Signature of Corporate Secretary, Acting Secretary or other officer)

Business address: _____

Phone Number: ( ) _____ **FAX Number: ( )** _____

_____

Date of Qualification to do business is _____

_____

A Joint Venture

Joint Venturer Name: _____

_____(SEAL)

By: _____

(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone Number: (___) _____ FAX Number: (___) _____

_____

Joint Venturer Name: _____

_____(SEAL)

By: _____

(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone Number: (___) _____ FAX Number: (___) _____

_____

Phone and FAX Number, and Address for receipt of official communications:

_____

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

END OF DOCUMENT

DOCUMENT 00432

10 % BID BOND

PENAL SUM FORM

BIDDER *(Name and Address)*:

_____

_____

_____

SURETY *(Name and Address of Principal Place of Business)*:

_____

_____

_____

OWNER *(Name and Address)*:
City of Turlock
Municipal Services/Engineering Division
156 South Broadway, Suite 150
Turlock, California 95380-5454

BID

Bid Due Date: _____, 2012

Project: City of Turlock – Harding Drain Bypass Pump Station and Pipeline

BOND

Bond Number: _____
Date: (Not later than Bid Due Date): _____
Penal Sum: _____

IN WITNESS WHEREOF, Surety and Bidder, intending to be legally bound hereby, subject to the terms printed on the reverse side hereof, do each cause this Bid Bond to be duly executed on its behalf by its authorized officer, agent, or representative.

BIDDER	**SURETY**
_____ **(SEAL)**	_____ **(SEAL)**
(Bidder's Name and Corporate Seal)	**(Surety's Name and Corporate Seal)**
By: _____	**By:** _____
(Signature and Title)	**(Signature and Title)** **(Attach Power of Attorney)**
Attest: _____	**Attest:** _____

Note: (1) Above addresses are to be used for giving required notice.

(2) Any singular reference to Bidder, Surety, OWNER or other party shall be considered plural where applicable.

1. **Bidder and Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to pay to OWNER upon default of Bidder the penal sum set forth on the face of this Bond.**

2. **Default of Bidder shall occur upon the failure of Bidder to deliver within the time required by the Bidding Documents the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents.**

3. **This obligation shall be null and void if:**

   a. **OWNER accepts Bidder's Bid and Bidder delivers within the time required by the Bidding Documents (or any extension thereof agreed to in writing by OWNER) the executed Agreement required by the Bidding Documents and any performance and payment bonds required by the Bidding Documents and Contract Documents, or**

   b. **All Bids are rejected by OWNER, or**

   c. **OWNER fails to issue a Notice of Award to Bidder within the time specified in the Bidding Documents (or any extension thereof agreed to in writing by Bidder and, if applicable, consented to by Surety when required by paragraph 5 hereof).**

4. **Payment under this Bond will be due and payable upon default of Bidder and within 30 calendar days after receipt by Bidder and Surety of written notice of default from OWNER, which notice will be given with reasonable promptness, identifying this Bond and the Project and including a statement of the amount due.**

5. **Surety waives notice of and any and all defenses based on or arising out of any time extension to issue Notice of Award agreed to in writing by OWNER and Bidder, provided that the time for issuing Notice of Award including extensions shall not in the aggregate exceed 120 days from Bid due date without Surety's written consent.**

6. **No suit or action shall be commenced under this Bond prior to 30 calendar days after the notice of default required in paragraph 4 above is received by Bidder and Surety, and in no case later than one year after the Bid due date.**

7. **Any suit or action under this Bond shall be commenced in a court of competent jurisdiction located in the state in which the Project is located.**

8. **Notice required hereunder shall be in writing and sent to Bidder and Surety at their respective addresses shown on the face of this Bond. Such notices may be sent by personal delivery, commercial courier or by United States Registered or Certified Mail, return receipt requested, postage pre-paid, and shall be deemed to be effective upon receipt by the party concerned.**

9. **Surety shall cause to be attached to this Bond a current and effective Power of Attorney evidencing the authority of the officer, agent or representative who executed this Bond on behalf of Surety to execute, seal and deliver such Bond and bind the Surety thereby.**

10. This Bond is intended to conform to all applicable statutory requirements. Any applicable requirement of any applicable statute that has been omitted from this Bond shall be deemed to be included herein as if set forth at length. If any provision of the Bond conflicts with any applicable provision of any applicable statute, then the provision of said statute shall govern and the remainder of this Bond that is not in conflict therewith shall continue in full force and effect.

11. The term "Bid" as used herein includes a bid, offer or proposal as applicable.

END OF DOCUMENT

DOCUMENT 00434

CITY PROJECT No. 6859

LIST OF SUBCONTRACTORS

Pursuant to California Public Contract Code §4100 et seq., the Bidder shall list below the names and work to be performed for each subcontractor who will perform Work or labor or who will render service to the prime Contractor in or about the construction of the Work or improvement, or a subcontractor duly licensed who, under subcontract to the prime Contractor, specially fabricates and installs a portion of the Work or improvement according to detailed Drawings contained in the Contract Documents, in an amount in excess of one-half of one percent of the prime Contractor's total Bid. After the opening of Bids, no changes or substitutions will be allowed except as otherwise provided by law. The listing of more than one subcontractor for each item of Work to be performed with the words "and/or" will not be permitted. The Bidder's attention is directed to the provisions of paragraph 6.06.B of Document 00800, Supplementary Conditions, which stipulates the percent of the Work to be performed with the Bidder's own forces.

Failure to comply with this requirement may render the Bid as non-responsive and may cause its rejection.

Work to be Performed	Subcontractor Name
1.	
2.	
3.	
4.	
5.	
6.	
7.	
8.	
9.	

Work to be Performed	Subcontractor Name
10.	
11.	
12.	
13.	
14.	

Add additional sheets, if necessary.

BIDDER

_____

(Signature)

_____

(Date)

DOCUMENT 00436

LIST OF EQUIPMENT AND MATERIAL MANUFACTURERS

Bidder shall list the manufacturer or supplier that will furnish the respective item of equipment for the Work. Bidder shall list only one manufacturer or supplier for each piece of equipment identified.

In the event any listed manufacturer or supplier differs from those manufacturers or suppliers specifically named in the specifications, Bidder shall submit complete information demonstrating that such manufacturer or supplier is capable of providing equipment that meets the requirements of the Contract Documents.

1. **Information shall be submitted with the bid.**

2. **Information shall include data and documentation pursuant to paragraph 6.05 of Document 00700, General Conditions, and Section 01330, Submittal Procedures, Division 1, General Provisions.**

3. **Acceptance of a manufacturer or supplier listed by the Bidder shall not constitute a waiver of any provision of the Contract Documents.**

Where manufacturer's or supplier's names are listed by the Bidder next to the specific item of equipment listed, this shall be interpreted to mean that such manufacturers and suppliers shall not be changed by the Bidder after the Bid opening, except as follows:

1. **The manufacturer or supplier cannot provide equipment that meets the requirements of the Contract Documents, or**

2. **The manufacturer or supplier is unable to meet the delivery requirements necessary to maintain progress of the Project based upon the accepted construction schedule.**

In the event Bidder changes the listed manufacturer or supplier due to reasons outlined above, Bidder shall propose an alternate manufacturer or supplier and submit complete information to demonstrate the alternative equipment meets the requirements of the Contract Documents.

Failure by Bidder to list names of manufacturers or suppliers for every item of equipment in the space provided may be cause for rejection of the Bid.

Detailed shop drawings will be required for all items of equipment identified in the Contract Documents.

Equipment or Materials	Manufacturer, Model (if applicable)
1. Butterfly Valves	
2. Vertical Turbine Pumps	
3. Electrical Motor Control Centers	
4. Variable Frequency Drives	
5. Pump Soft Starter Control	
6. Welded Steel Pipe	
7. Ductile Iron Pipe	
8. Dissolved Oxygen probe for Standpipe Structure	
9. Level Indicators	
10. Check Valves (Swing Type)	
11. Gate Valve	
12. Prefabricated building supplier	
13. Programmable Logic Hardware	
14. Air Release Valve	
15. Vacuum Release Valve	
16. Slide Gate	

BIDDER

_____

(Signature)

_____

(Date)

END OF DOCUMENT

DOCUMENT 00451B

CONSTRUCTION CONTRACTOR'S QUALIFICATION STATEMENTS

THE ASSOCIATED GENERAL CONTRACTORS OF AMERICA

CONSTRUCTION CONTRACTOR'S QUALIFICATION STATEMENT FOR ENGINEERED CONSTRUCTION

This qualification statement was developed by AGC of America in cooperation with the Engineers Joint Contract Documents Committee (EJCDC) which recommend its use as a suggested generic prequalification statement or a contract-specific qualification statement. In the latter case, the owner or engineer may wish to make appropriate supplemental inquiries.

The Engineers Joint Contract Documents Committee consists of representatives of the following organizations:

National Society of Professional Engineers
American Consulting Engineers Council
American Society of Civil Engineers
Construction Specifications Institute

The contents of this statement are CONFIDENTIAL.

Submitted by:

Name of Organization:

Name of Individual: _____

Title: _____

Address: _____

_____

_____

_____

Telephone: (_____)_____

Submitted to: _____

Name: **Michael G Pitcock, PE**

Address: **156 S. Broadway Suite 150, Turlock CA 95380**

_____

_____

Telephone: **(209) 668-5520**

Project Name and Description (if applicable) Harding Drain Bypass Pump Station and Pipeline

Project

_____

_____

CONTRACTOR's General Business Information

Check if:

[ ] Corporation [ ] Partnership [ ] Joint Venture [ ] Sole Proprietorship

If Corporation:

a. Date and State of Incorporation:

_____

_____

b. List of Executive Officers:

Name	Title

If Partnership:

a. Date and State of Organization:

b. List of Current General Partners:

c. Type of Partnership:

[ ] General **[ ] Publicly Traded**

[ ] Limited **[ ] Other (describe):**_____

If Joint Venture:

a. Date and State of Organization:

b. Name, Address and Form of Organization of Joint Venture Partners: (Indicate managing partner by an asterisk *)

If Sole Proprietorship:

a. Date and State of Organization:

b. Name and Address of Owner or Owners:

1. On Schedule A, attached, list major engineered construction projects completed by this organization in the past five (5) years. (If joint venture, list each participant's projects separately.)

2. On Schedule B, attached, list current projects under construction by this organization. (If joint venture, list each participant's projects separately.)

3. Name of surety company and name, address, and phone number of agent:

4. Is your organization a member of a controlled group of corporations as defined in Internal Revenue Code Sec. 1563?

[ ] Yes [ ] No

If yes, show names and addresses of affiliated companies.

5. Furnish on Schedule C, attached, details of the construction experience of the principal individuals of your organization directly involved in construction operations.

6. Has your organization ever failed to complete any construction contract awarded to it?

[ ] Yes [ ] No

If yes, describe circumstances on attachment.

7. Has any Corporate officer, partner, joint venture participant or proprietor ever failed to complete a construction contract awarded to him or her in their own name or when acting as a principal of another organization?

[ ] Yes [ ] No

If yes, describe circumstances on attachment.

8. In the last five years, has your organization ever failed to substantially complete a project in a timely manner?

[ ] Yes [ ] No

If yes, describe circumstances on attachment.

9. Indicate general types of work performed with your own work force.

_____

_____

10. If required, can your organization provide a bid bond for this project?

[ ] Yes [ ] No

11. What is your approximate total bonding capacity?

[ ] $500,000 to $2,000,000 **[ ] $5,000,000 to $10,000,000**

[ ] $2,000,000 to $5,000,000 **[ ] $10,000,000 or more**

12. Describe the permanent safety program you maintain within your organization. Use attachment if necessary.

_____

_____

_____

_____

13. If required by OWNER during Bid evaluation, Bidder agrees to provide balance sheet for two or more years audited by a registered CPA.

14. Furnish the following information with respect to an accredited banking institution familiar with your organization.

Name of Bank: _____

Address: _____

_____

_____

_____

Account Manager:

Telephone: **(_____)**_____

I hereby certify that the information submitted herewith, including any attachment is true to the best of my knowledge and belief.

_____

By: _____

Title: _____

Dated: _____

SCHEDULE A

MAJOR ENGINEERED CONSTRUCTION PROJECTS COMPLETED IN PAST 5 YEARS

Name, Location and Description of Project	Owner	Design Engineer	Dated Completed	Contract Price	Reference/Contact Include Address and Phone

SCHEDULE B

CURRENT PROJECTS UNDER CONSTRUCTION

Name, Location and Description of Project	Owner	Design Engineer	Contract Price	Amount Completed	Date of Scheduled Completion	Reference/Contact Include Address and Phone

SCHEDULE C PERSONNEL				
Name	**Position**	**Date started with this organization**	**Date started in construction**	**Prior positions and experience in construction**

END OF DOCUMENT

DOCUMENT 00456

NON-COLLUSION AFFIDAVIT

The undersigned states that this Bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the Bid is genuine and not collusive or sham; that the Bidder has not directly or indirectly induced or solicited any other Bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any Bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the Bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the Bidder or any other Bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other Bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the Bid are true; and, further, that the Bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

BIDDER

_____

(Signature)

_____

(Date)

State of _____)
ss.
County of _____)

On _____ before me, _____
Notary Public, personally appeared _____

Q personally known to me OR Q proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

WITNESS my hand and official seal.

_____ **(seal)**
(Signature of Notary Public)

END OF DOCUMENT

DOCUMENT 00457

STATE REVOLVING FUNDS FORMS REQUIRED TO BE SUBMITTED WITH BID

TABLE OF CONTENTS

1. **DISADVANTAGED BUSINESS ENTERPRISE (DBE) CONTRACTOR SUBCONTRACTOR CERTIFICATION**
2. **DISADVANTAGED BUSINESS ENTERPRISE (DBE) SELECTED PRIME CONTRACTOR/RECIPIENT**

NOTE: Contractors can no longer self-certify. They must be certified by EPA, Small Business Administration (SBA), Department of Transportation (DOT) or by State, Local, Tribal or private entities whose certification criteria match EPA's. Proof of Certification must be provided. A copy of the contractor certification must be submitted with this form.

END OF DOCUMENT

DISADVANTAGED BUSINESS ENTERPRISE (DBE)
CONTRACTOR SUBCONTRACTOR CERTIFICATION

Firm Name:	Phone:
Address:	
Principal Service or Product:	Bid Amount $

PLEASE INDICATE PERCENTAGE OF OWNERSHIP BELOW

☐ DBE _____% Ownership	
☐ Prime Contractor	☐ Supplier of Material/Service
☐ Subcontractor	
☐ Sole Ownership	☐ Corporation
☐ Partnership	☐ Joint Venture
Certified by:	Title:

(Original signature and date required)

Name:	Date:

NOTE: Contractors can no longer self-certify. They must be certified by EPA, Small Business Administration (SBA), Department of Transportation (DOT) or by State, Local, Tribal or private entities whose certification criteria match EPA's. Proof of Certification must be provided. A copy of the contractor certification must be submitted with this form.

This form must be submitted at Bid Opening.

Revised October, 2011

DISADVANTAGED BUSINESS ENTERPRISE (DBE)
SELECTED PRIME CONTRACTOR/RECIPIENT

CONTRACT RECIPIENTS NAME	CONTRACT NO. OR SPECIFICATION NO.
PROJECT DESCRIPTION	PROJECT LOCATION
PRIME CONTRACTOR INFORMATION	
NAME AND ADDRESS (Include ZIP Code, Federal Employer Tax ID #) PHONE	☐ MBE ☐ WBE AMOUNT OF CONTRACT$
DBE INFORMATION	
☐ NONE*	
☐ DBE	NAME AND ADDRESS (Include ZIP Code,)
☐ SUBCONTRACTOR ☐ JOINT VENTURE / ☐ SUPPLIER/SERVICE	
AMOUNT OF CONTRACT $	PHONE
WORK TO BE PERFORMED	
☐ DBE	NAME AND ADDRESS (Include ZIP Code)
☐ SUBCONTRACTOR ☐ JOINT VENTURE / ☐ SUPPLIER/SERVICE	
AMOUNT OF CONTRACT $	PHONE
WORK TO BE PERFORMED	
☐ DBE	NAME AND ADDRESS (Include ZIP Code,)
☐ SUBCONTRACTOR ☐ JOINT VENTURE / ☐ SUPPLIER/SERVICE	
AMOUNT OF CONTRACT $	PHONE
WORK TO BE PERFORMED	
TOTAL DBE AMOUNT: $	TOTAL WBE AMOUNT: $
SIGNATURE OF PERSON COMPLETING FORM:	
TITLE: ————————————	PHONE:_____ DATE: _____

NOTE: Negative reports are required. Original signature and date are required. Failure to complete and submit this form with the bid will cause the bid to be rejected as non-responsive.

Revised October 2011

DOCUMENT 00510

NOTICE OF AWARD

Date _____, 2012.

To: _____
(Bidder)

Address: _____

_____

Project: City of Turlock – Harding Drain Bypass Pump Station and Pipeline.

OWNER Project Number: WQCF - 6859

Contract for Construction of: Harding Drain Bypass Pump Station and Pipeline.

You are hereby notified that your Bid dated _____, 2012, for the above Contract has been considered. You are the apparent successful Bidder and are being considered for the award of a contract for the above-named Project.

The Bid Price of your contract is $_____

_____ Dollars

Two copies of the Agreement Form accompany this Notice of Award.

Unless otherwise indicated, you must respond within 14 days of the date of this Notice of Award; that is, by _____, 2012. We plan to award this Project at the OWNER's meeting _____, 2012.

1. You must deliver to the OWNER two fully executed Agreement forms.

2. You must deliver with the executed Agreement such Bonds and certificates of insurance as specified in paragraphs 2.01 and 5.03 of the General Conditions.

3. To comply with the insurance requirements to endorse the OWNER, the ENGINEER, and the OWNER's Consultant as additional insureds, the following statement must appear on each of the insurance certificates:

   "The OWNER, its officials, employees, agents, ENGINEER and Consultant, County of Stanislaus, and Turlock Irrigation District are named as additional insureds as regards OWNER Project Number 6859."

4. You must also deliver with the executed Agreement, copies of all current Business Licenses for you as General Contractor and for all Subcontractors working on the Project.

Failure to comply with these conditions within the time specified will entitle the OWNER to consider your Bid abandoned, to annul this Notice of Award, and to declare your Bid security forfeited.

After award of contract by the City Council, the OWNER will return to you one fully signed Agreement Form.

OWNER

_____

(Signature)

_____

(Date)

CITY OF TURLOCK
Engineering Division
156 South Broadway, Suite 150
Turlock, California 95380-5454
(209) 668-5520

END OF DOCUMENT

DOCUMENT 00520

AGREEMENT FORM

THIS AGREEMENT is by and between the City of Turlock

(hereinafter called OWNER) and_____

(hereinafter called CONTRACTOR).

OWNER and CONTRACTOR, in consideration of the mutual covenants hereinafter set forth, agree as follows:

ARTICLE 1 - THE PROJECT

1.01 **The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:**

1) Junction Structure

2) 48" Pump Station Influent Gravity Pipeline

3) Pump Station

4) 36" (Nominal Diameter) Outfall Pipeline

5) Standpipe Structure

6) 48" Gravity Pipeline to Outfall Structure

7) Outfall Structure

ARTICLE 2 - WORK

2.01 **CONTRACTOR shall complete all Work as specified or indicated in the Contract Documents for completion of the Project.**

ARTICLE 3 - ENGINEER

3.01 **The ENGINEER, Carollo Engineers, P.C., is to act as OWNER's representative, assume all duties and responsibilities, and have the rights and authority assigned to ENGINEER in the Contract Documents in connection with the completion of the Work in accordance with the Contract Documents, unless otherwise modified in the Supplementary Conditions.**

ARTICLE 4 - CONTRACT TIMES

4.01 **Time of the Essence:**

A. **All time limits for Milestones, if any, Substantial Completion, and completion and readiness for final payment as stated in the Contract Documents are of the essence of the Contract.**

4.02 **Days to Achieve Milestone 1:**

A. **Milestone 1: Completion of Item Number 2.b (defined in 00410 and 01270 as 48-inch Gravity Pipeline Microtunneling portion).**

1. **The work for Milestone 1 shall be completed by March 1, 2013.**

Under no circumstance will the CONTRACTOR be allowed to install the 48-inch microtunnel crossing of TID Lateral No. 5 during the Irrigation Season from March 15 to October 15 (i.e. spring, summer, early fall).

4.03 **Days to Achieve Substantial Completion and Final Payment:**

A. **Substantial Completion: Substantially completed within 500 calendar days after the date when the Contract Times commence (as defined by paragraph 2.03 of the General Conditions). Substantial Completion is defined in paragraph 14.04 of the General Conditions.**

B. **Final Completion: The CONTRACTOR shall complete the Project and be ready for final payment in accordance with paragraph 14.07 of the General Conditions within 530 calendar days after the date when the Contract Times commence.**

4.04 **Dates for Milestone 1, Substantial Completion and Final Payment:**

A. **The Work for Milestone 1 shall be completed on or before March 1, 2013.**

B. **The Work for Substantially Completion shall be on or before _____,_____, 2013, in accordance with paragraph 14.04 of the General Conditions (Date to be filled in after Notice to Proceed is signed).**

C. **The work for Final Completion shall be on or before _____, _____ 2013 in accordance with paragraph 14.07 of the General Conditions (Date to be filled in after Notice to Proceed is signed).**

4.05 **Liquidated Damages:**

A. **CONTRACTOR and OWNER recognize that time is of the essence of this Agreement and that OWNER will suffer financial loss if the Work is not completed within the dates specified in paragraph 4.04, plus any extensions thereof allowed in accordance with Article 12 of the General Conditions. The parties also recognize that it will be impracticable to determine actual damages which OWNER will sustain in the event of or by reason of the delay. Accordingly, instead of requiring any such proof, OWNER and CONTRACTOR agree that as liquidated damages for delay (but not as a penalty) CONTRACTOR shall pay OWNER the following damages for each day that expires after the specified dates in paragraph 4.04:**

1. **Milestone 1: $500/working day.**
2. **Substantial Completion: $5,000 per working day.**
3. **Final Completion: $3,500 per working day.**

B. **It is further agreed that the amount stipulated for liquidated damages per day of delay is a reasonable estimate of the damages that would be sustained by OWNER, and CONTRACTOR agrees to pay such liquidated damages as herein provided. In case the liquidated damages are not paid, CONTRACTOR agrees that OWNER may deduct the amount thereof from any money due or that may become due to CONTRACTOR by progress payments or otherwise under the Agreement, or if said amount is not sufficient, recover the total amount.**

ARTICLE 5 - CONTRACT PRICE

5.01 **OWNER shall pay CONTRACTOR for completion of the Work in accordance with the Contract Documents an amount in current funds equal to the sum of the amounts determined pursuant to paragraphs 5.01.A below:**

A. **For all Unit Price Work, an amount equal to the sum of the established unit price for each separately identified item of Unit Price Work times the estimated quantity of that item as indicated in this paragraph 5.01.B:**

TOTAL OF ALL UNIT PRICES _____ **(use words)** **$** _____ **(figure)**

As provided in paragraph 11.03 of the General Conditions, estimated quantities are not guaranteed, and determinations of actual quantities and classifications are to be made by ENGINEER as provided in paragraph 9.08 of the General Conditions. Unit prices have been computed as provided in paragraph 11.03 of the General Conditions.

B. **For all Work, at the prices stated by CONTRACTOR, the Bid Form is attached hereto as an exhibit.**

ARTICLE 6 - PAYMENT PROCEDURES

6.01 **Submittal and Processing of Payments:**

A. **CONTRACTOR shall submit Applications for Payment in accordance with Article 14 of the General Conditions. Applications for Payment will be processed by ENGINEER as provided in the General Conditions.**

6.02 **Progress Payments; Retainage:**

A. **Pursuant to Section 20104.50 of California Public Contract Code, OWNER shall make progress payments within 30 days after receipt of CONTRACTOR's undisputed and properly submitted Application for Payment less amounts which are authorized to be reserved or retained by state law and in accordance with paragraphs 6.02.A.1 and 6.02.A.2 below and paragraph 14.02.D of the General Conditions. All such payments will be measured by the schedule of values established in paragraph 2.07.A of the General Conditions (and in**

the case of Unit Price Work based on the number of units completed) or, in the event there is no schedule of values, as provided in the General Requirements:

1. **Prior to Substantial Completion, progress payments will be made in an amount equal to the percentage indicated below but, in each case, less the aggregate of payments previously made and less such amounts as ENGINEER may determine or OWNER may withhold, in accordance with paragraph 14.02 of the General Conditions:**

95 percent of Work completed (with the balance being retainage). If the Work has been 50 percent completed as determined by ENGINEER, and if the character and progress of the Work have been satisfactory to OWNER and ENGINEER, OWNER, on recommendation of ENGINEER, may determine that as long as the character and progress of the Work remain satisfactory to them, there will be no retainage on account of Work subsequently completed, in which case the remaining progress payments prior to Substantial Completion will be in an amount equal to 100 percent of the Work completed less the aggregate of payments previously made; and

90 percent of cost of materials and equipment not incorporated in the Work (with the balance being retainage).

2. **Upon Substantial Completion, OWNER may pay an amount sufficient to increase total payments to CONTRACTOR to 95 percent of the Work completed, less such amounts as ENGINEER shall determine in accordance with paragraph 14.02.B.5 of the General Conditions.**

3. **Upon final completion, OWNER may pay an amount sufficient to increase total payments to CONTRACTOR to 100 percent of the Work completed, less such amounts as ENGINEER shall determine in accordance with paragraph 14.02.B.5 of the General Conditions and less up to 125 percent of ENGINEER's estimate of the value of Work to be completed or corrected as shown on the tentative list of items to be completed or corrected attached to the certificate of completion or alternatively, in dispute.**

B. **Pursuant to Section 10263 of California Public Contract Code, CONTRACTOR has the option to deposit securities with an Escrow Agent as a substitute for retention of earnings required to be withheld by OWNER. For Escrow Agreement see Document 00602.**

6.03 **Final Payment:**

A. **Upon final completion and acceptance of the Work, OWNER shall pay the remainder of the Contract Price as recommended by ENGINEER in accordance with paragraph 14.07 of the General Conditions.**

ARTICLE 7 - INTEREST

7.01 **All moneys not paid when due as provided in Article 14 of the General Conditions shall bear interest at the legal rate unless otherwise specified according to California law.**

ARTICLE 8 - CONTRACTOR'S REPRESENTATIONS

8.01 **In order to induce OWNER to enter into this Agreement CONTRACTOR makes the following representations:**

A. **CONTRACTOR has examined and carefully studied the Contract Documents and the other related data identified in the Bidding Documents.**

B. **CONTRACTOR has visited the Site and become familiar with and is satisfied as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.**

C. **CONTRACTOR is familiar with and is satisfied as to all federal, state, and local Laws and Regulations that may affect cost, progress, and performance of the Work.**

D. **CONTRACTOR has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or contiguous to the Site and all drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) which have been identified in the Supplementary Conditions as provided in paragraph 4.02 of the General Conditions and (2) reports and drawings of a Hazardous Environmental Condition, if any, at the Site which has been identified in the Supplementary Conditions as provided in paragraph 4.06 of the General Conditions.**

E. **CONTRACTOR has obtained and carefully studied (or assumes responsibility for having done so) all additional or supplementary examinations, investigations, explorations, tests, studies, and data concerning conditions (surface, subsurface, and Underground Facilities) at or contiguous to the Site which may affect cost, progress, or performance of the Work or which relate to any aspect of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, including applying the specific means, methods, techniques, sequences, and procedures of construction, if any, expressly required by the Contract Documents to be employed by CONTRACTOR, and safety precautions and programs incident thereto.**

F. **CONTRACTOR does not consider that any further examinations, investigations, explorations, tests, studies, or data are necessary for the performance of the Work at the Contract Price, within the Contract Times, and in accordance with the other terms and conditions of the Contract Documents.**

G. **CONTRACTOR is aware of the general nature of work to be performed by OWNER and others at the Site that relates to the Work as indicated in the Contract Documents.**

H. **CONTRACTOR has correlated the information known to CONTRACTOR, information and observations obtained from visits to the Site, reports and drawings identified in the Contract Documents, and all additional examinations, investigations, explorations, tests, studies, and data with the Contract Documents.**

I. **CONTRACTOR has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that CONTRACTOR has discovered in the Contract Documents, and the written resolution thereof by ENGINEER is acceptable to CONTRACTOR.**

J. **The Contract Documents are generally sufficient to indicate and convey understanding of all terms and conditions for performance and furnishing of the Work.**

ARTICLE 9 - CONTRACT DOCUMENTS

9.01 **Contents:**

A. **The Contract Documents consist of the following:**

1. **This Agreement, Document 00520;**

2. **Performance Bond, Document 00612;**

3. **Labor and Materials Bond, Document 00614;**

4. **Guaranty Bond, Document 00618;**

5. **General Conditions, Document 00700;**

6. **Supplementary Conditions, Document 00800;**

7. **Specifications;**

8. **Drawings;**

9. **Addenda (numbers _____to _____, inclusive);**

10. **Exhibits to this Agreement (enumerated as follows):**

CONTRACTOR's Bid Form, Document 00410;

Escrow Agreement for Security Deposits in Lieu of Retention, Document 00602;

Construction Contractor's Qualification Statement, Document 00451;

Escrow Bid Documents, Document 00823;

11. **The following which may be delivered or issued on or after the Effective Date of the Agreement and are not attached hereto:**

Notice to Proceed, Document 00550;

Written Amendments;

Work Change Directives;

Field Order(s).

B. **There are no Contract Documents other than those listed above in this Article 9.**

C. **The Contract Documents may only be amended, modified, or supplemented as provided in paragraph 3.04 of the General Conditions.**

ARTICLE 10 - MISCELLANEOUS

10.01 **Terms:**

A. **Terms used in this Agreement will have the meanings indicated in the General Conditions.**

10.02 **Assignment of Contract:**

A. **No assignment by a party hereto of any rights under or interests in the Contract will be binding on another party hereto without the written consent of the party sought to be bound; and, specifically but without limitation, moneys that may become due and moneys that are due may not be assigned without such consent (except to the extent that the effect of this restriction may be limited by law), and unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assignor from any duty or responsibility under the Contract Documents.**

10.03 **Successors and Assigns:**

A. **OWNER and CONTRACTOR each binds itself, its partners, successors, assigns, and legal representatives to the other party hereto, its partners, successors, assigns, and legal representatives in respect to all covenants, agreements, and obligations contained in the Contract Documents.**

10.04 **Severability:**

A. **Any provision or part of the Contract Documents held to be void or unenforceable under any Law or Regulation shall be deemed stricken, and all remaining provisions shall continue to be valid and binding upon OWNER and CONTRACTOR, who agree that the Contract Documents shall be reformed to replace such stricken provision or part thereof with a valid and enforceable provision that comes as close as possible to expressing the intention of the stricken provision.**

10.05 **In accordance with Section 1775, California Labor Code, CONTRACTOR shall forfeit to OWNER, as a penalty, not more than $50 for each day, or portion thereof, for each worker paid, either by CONTRACTOR or any subcontractor, less than the prevailing rates as determined by the Director of California Department of Industrial Relations for the Work.**

10.06 **In the performance of the Work, a day's work shall be eight (8) hours of labor in any workday and forty (40) hours in any work week and any other work as required by Section 510, California Labor Code, and CONTRACTOR shall further conform to the requirements of Section 1813, California Labor Code, or forfeit to OWNER, as a penalty, the sum of $25 for each worker employed in the execution of the Work by CONTRACTOR or any subcontractor, for each day during which any worker is required or permitted to labor more than eight (8) hours in any workday or more than forty (40) hours in any one calendar week in violation of Section 510.**

10.07 **CONTRACTOR shall carry workers' compensation insurance and require subcontractors to carry workers' compensation insurance as required by Section 3700, California Labor Code.**

10.08 **Excavation of any trench or trenches 5 feet or more in depth, involving estimated expenditures in excess of $25,000 shall require, in advance of excavation, a detailed plan showing the design of shoring, bracing, sloping or other provisions to be made for worker protection prepared by a registered civil or structural engineer.**

ARTICLE 11 - TAXES

11.01 **Contractor shall cooperate with City to the full extent possible to maximize the local allocation of California sales and use tax to the City. Such cooperation shall include but not be limited to:**

A. **Use Tax Direct Payment Permits. Contractor shall apply for, obtain and utilize, to the maximum extent reasonable, a California Use Tax Direct Payment Permit.**

B. **Purchases of $500,000 or More. CONTRACTOR shall require vendors and suppliers located outside California from whom Contractor makes purchase of $500,000 or more to allocate the use tax to the City.**

Additional information regarding use tax and the Permit can be found in the State of California Board of Equalization, Sales and Use Tax Regulations, Regulation 1699.6, Use Tax Direct Payment Permits, or on the web site for the Board of Equalization at http://www.boe.ca.gov/sutax/sutprograms.htm

REST OF PAGE INTENTIONALLY LEFT BLANK

IN WITNESS WHEREOF, OWNER and CONTRACTOR have signed this Agreement in duplicate. One counterpart each has been delivered to OWNER and CONTRACTOR. All portions of the Contract Documents have been signed or identified by OWNER and CONTRACTOR or on their behalf.

This Agreement will be effective on _____, 2012 (which is the Effective Date of the Agreement).

OWNER: CITY OF TURLOCK	**CONTRACTOR:**
By:	**By:**
Attest:	**Attest:**
Address for giving notices:	**Address for giving notices:**
	License No. _____ **(Where applicable)**
	Agent for service of process:
Designated Representative:	**Designated Representative:**
Name:	**Name:**
Title:	**Title:**
Address:	**Address:**
Phone:	**Phone:**
Facsimile:	**Facsimile:**

END OF DOCUMENT

DOCUMENT 00550

NOTICE TO PROCEED

To: _____

Project: _____

Construction Contract Number: _____

Amount of Contract: _____

You are hereby notified to commence work on the referenced Contract on or before _____, 2012, and shall complete all of the work of said Contract within _____ consecutive calendar days thereafter. Your final completion date is therefore _____, 2013.

Paragraph 4.03 of Document 00520, Agreement, provides for an assessment of liquidated damages for each consecutive calendar day after the date for Substantial Completion and Final Completion as calculated in the Contract Documents that the work remains incomplete.

A preconstruction conference will be held at **[**_____**] [a.m.] [p.m.]** on **[**_____**]** at **[**_____**]**. Representatives of OWNER and ENGINEER will be present to discuss the project. CONTRACTOR is required to attend and participate in the conference.

OWNER

_____
(Signature)

_____
(Date)

ACCEPTANCE OF NOTICE

Receipt of the foregoing Notice to Proceed is hereby acknowledged by _____ this _____ day of _____, 2012.

CONTRACTOR

_____
(Signature)

_____
(Date)

END OF DOCUMENT

DOCUMENT 00602

ESCROW AGREEMENT FOR
SECURITY DEPOSITS IN LIEU OF RETENTION

This escrow agreement is made and entered into by and between City of Turlock whose address is Municipal Services/Engineering Division, 156 South Broadway, Turlock, CA 95380-5454 hereinafter called "OWNER," _____ whose address is _____ hereinafter called "CONTRACTOR," and _____ whose address is _____ hereinafter called "Escrow Agent."

For the consideration hereinafter set forth, the OWNER, CONTRACTOR, and Escrow Agent agree as follows:

(1) Pursuant to Section 10263 of the Public Contract Code of the State of California, the CONTRACTOR has the option to deposit securities with the Escrow Agent as a substitute for retention earnings required to be withheld by the OWNER pursuant to the construction contract entered into between the OWNER and CONTRACTOR for _____ in the amount of _____ dated _____, 2011 (hereafter referred to as the "contract"). Alternatively, on written request of the CONTRACTOR, the OWNER shall make payments of the retention earnings directly to the Escrow Agent. When the CONTRACTOR deposits the securities as a substitute for the contract earnings, the Escrow Agent shall notify the OWNER within ten days of the deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as retention under the terms of the contract between the OWNER and CONTRACTOR. Securities shall be held in the name of the _____ and shall designate the CONTRACTOR as the beneficial owner.

(2) The OWNER shall make progress payments to the CONTRACTOR for those funds which otherwise would be withheld from progress payments pursuant to the contract provision, provided that the Escrow Agent holds securities in the form and amount specified above.

(3) When the OWNER makes payment of retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the CONTRACTOR until such time as the escrow created under this contract is terminated. The CONTRACTOR may direct the investment of the payments into securities. All terms and conditions of this Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the OWNER pays the Escrow Agent directly.

(4) The CONTRACTOR shall be responsible for paying all fees for the expenses incurred by the Escrow Agent in administering the escrow account. These expenses and payment terms shall be determined by the CONTRACTOR and Escrow Agent.

(5) The interest earned on the securities or the money market accounts held in escrow and all interest earned on the interest shall be for the sole account of CONTRACTOR and shall be subject to withdrawal by CONTRACTOR at any time and from time to time without notice to the OWNER.

(6) The CONTRACTOR shall have the right to withdraw all or any part of the principal in the escrow account only by written notice to the Escrow Agent accompanied by written authorization from the OWNER to the Escrow Agent that the OWNER consents to the withdrawal of the amount sought to be withdrawn by CONTRACTOR.

(7) The OWNER shall have a right to draw upon the securities in the event of default by the CONTRACTOR. Upon seven days' written notice to the Escrow Agent from the OWNER of the default, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the OWNER.

(8) Upon receipt of written notification from the OWNER certifying that the contract is final and complete, and that the CONTRACTOR has complied with all requirements and procedures applicable to the contract, the Escrow Agent shall release to the CONTRACTOR all securities and interest on deposit less escrow fees and charges of the escrow account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payments of fees and charges.

(9) The Escrow Agent shall rely on the written notifications from the OWNER and the CONTRACTOR pursuant to Sections (1) to (8), inclusive, of this Agreement and the OWNER and CONTRACTOR shall hold the Escrow Agent harmless from the Escrow Agent's release, conversion, and disbursement of the securities and interest as set forth above.

(10) The names of the persons who are authorized to give written notice or to receive written notice on behalf of the OWNER and on behalf of the CONTRACTOR in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of the OWNER:	On behalf of the CONTRACTOR:
Title	Title
Name	Name
Signature	Signature
Address	Address

On behalf of the Escrow Agent:

Title

Name

Signature

Address

At the time the escrow account is opened, the OWNER and CONTRACTOR shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date first set forth above.

OWNER	CONTRACTOR
Title	Title
Name	Name
Signature	Signature

END OF DOCUMENT

DOCUMENT 00612

CONSTRUCTION PERFORMANCE BOND

Any singular reference to CONTRACTOR, Surety, OWNER or other party shall be considered plural where applicable.

CONTRACTOR *(Name and Address)*:

SURETY *(Name and Address of Principal Place of Business)*:

OWNER *(Name and Address)*:

CONSTRUCTION CONTRACT

Date:
Amount:
Project *(Name and Location):*

BOND

Date: *(Not earlier than Construction Contract Date)*:
Amount:
Modifications to this Bond Form:

CONTRACTOR AS PRINCIPAL	SURETY
Company: (Corp. Seal)	Company: (Corp. Seal)
Signature:	Signature:
Name and Title:	Name and Title:

CONTRACTOR AS PRINCIPAL	SURETY

EJCDC NO. 1910-28A B1984 Edition)
Prepared through the joint efforts of The Surety Association of America, Engineers= Joint Contract Documents Committee, The Associated General Contractors of America, and the American Institute of Architects.

Company: _____ (Corp. Seal)	Company: _____ (Corp. Seal)
Signature: _____	Signature: _____
Name and Title:	Name and Title:

1. The CONTRACTOR and the Surety, jointly and severally, bind themselves, their heirs, executors, administrators, successors and assigns to the OWNER for the performance of the Construction Contract, which is incorporated herein by reference.

2. If the CONTRACTOR performs the Construction Contract, the Surety and the CONTRACTOR shall have no obligation under this Bond, except to participate in conferences as provided in Subparagraph 3.a.

3. If there is no OWNER Default, the Surety's obligation under this Bond shall arise after:

    a. The OWNER has notified the CONTRACTOR and the Surety at its address described in Paragraph 10 below, that the OWNER is considering declaring a CONTRACTOR Default and has requested and attempted to arrange a conference with the CONTRACTOR and the Surety to be held not later than fifteen days after receipt of such notice to discuss methods of performing the Construction Contract. If the OWNER, the CONTRACTOR and the Surety agree, the CONTRACTOR shall be allowed a reasonable time to perform the Construction Contract, but such an agreement shall not waive the OWNER's right, if any, subsequently to declare a CONTRACTOR Default; and

    b. The OWNER has declared a CONTRACTOR Default and formally terminated the CONTRACTOR's right to complete the contract. Such CONTRACTOR Default shall not be declared earlier than twenty days after the CONTRACTOR and the Surety have received notice as provided in Subparagraph 3.a; and

    c. The OWNER has agreed to pay the Balance of the Contract Price to the Surety in accordance with the terms of the Construction Contract or to a contractor selected to perform the Construction Contract in accordance with the terms of the contract with the OWNER.

4. When the OWNER has satisfied the conditions of Paragraph 3, the Surety shall promptly and at the Surety's expense take one of the following actions:

    a. Arrange for the CONTRACTOR, with consent of the OWNER, to perform and complete the Construction Contract; or

    b. Undertake to perform and complete the Construction Contract itself, through its agents or through independent contractors; or

    c. Obtain bids or negotiated proposals from qualified contractors acceptable to the OWNER for a contract for performance and completion of the Construction Contract, arrange for a contract to be prepared for execution by the OWNER and the contractor selected with the OWNER's concurrence, to be secured with performance and payment bonds executed by a qualified surety equivalent to the bonds issued on the Construction Contract, and pay to the OWNER the amount of damages as described in Paragraph 6 in excess of the Balance of the Contract Price incurred by the OWNER resulting from the CONTRACTOR's Default; or

    d. Waive its right to perform and complete, arrange for completion, or obtain a new contractor and with reasonable promptness under the circumstances:

        (1) After investigation, determine the amount for which it may be liable to the OWNER and, as soon as practicable after the amount is determined, tender payment

therefor to the OWNER; or

(2) Deny liability in whole or in part and notify the OWNER citing reasons therefor.

5. If the Surety does not proceed as provided in Paragraph 4 with reasonable promptness, the Surety shall be deemed to be in default on this Bond fifteen days after receipt of an additional written notice from the OWNER to the Surety demanding that the Surety perform its obligations under this Bond, and the OWNER shall be entitled to enforce any remedy available to the OWNER. If the Surety proceeds as provided in Subparagraph 4.d, and the OWNER refuses the payment tendered or the Surety has denied liability, in whole or in part, without further notice the OWNER shall be entitled to enforce any remedy available to the OWNER.

6. After the OWNER has terminated the CONTRACTOR's right to complete the Construction Contract, and if the Surety elects to act under Subparagraph 4.a, 4.b, or 4.c above, then the responsibilities of the Surety to the OWNER shall not be greater than those of the CONTRACTOR under the Construction Contract, and the responsibilities of the OWNER to the Surety shall not be greater than those of the OWNER under the Construction Contract. To the limit of the amount of this Bond, but subject to commitment by the OWNER of the Balance of the Contract Price to mitigation of costs and damages on the Construction Contract, the Surety is obligated without duplication for:

   a. The responsibilities of the CONTRACTOR for correction of defective work and completion of the Construction Contract;

   b. Additional legal, design professional and delay costs resulting from the CONTRACTOR's Default, and resulting from the actions or failure to act of the Surety under Paragraph 4; and

   c. Liquidated damages, or if no liquidated damages are specified in the Construction Contract, actual damages caused by delayed performance or non-performance of the CONTRACTOR.

7. The Surety shall not be liable to the OWNER or others for obligations of the CONTRACTOR that are unrelated to the Construction Contract, and the Balance of the Contract Price shall not be reduced or set off on account of any such unrelated obligations. No right of action shall accrue on this Bond to any person or entity other than the OWNER or its heirs, executors, administrators, or successors.

8. The Surety hereby waives notice of any change, including changes of time, to the Construction Contract or to related subcontracts, purchase orders and other obligations.

9. Any proceeding, legal or equitable, under this Bond may be instituted in any court of competent jurisdiction in the location in which the work or part of the work is located and shall be instituted within two years after CONTRACTOR Default or within two years after the CONTRACTOR ceased working or within two years after the Surety refuses or fails to perform its obligations under this Bond, whichever occurs first. If the provisions of this Paragraph are void or prohibited by law, the minimum period of limitation available to sureties as a defense in the jurisdiction of the suit shall be applicable.

10. Notice to the Surety, the OWNER or the CONTRACTOR shall be mailed or delivered to the address shown on the signature page.

11. When this Bond has been furnished to comply with a statutory or other legal requirement in the location where the construction was to be performed, any provision in this Bond conflicting with said statutory or legal requirement shall be deemed deleted herefrom and provisions conforming to such statutory or other legal requirement shall be deemed incorporated herein. The intent is that this Bond shall be construed as a statutory bond and not as a common law bond.

12. Definitions.

    a. Balance of the Contract Price: The total amount payable by the OWNER to the CONTRACTOR under the Construction Contract after all proper adjustments have been made, including allowance to the CONTRACTOR of any amounts received or to be received by the OWNER in settlement of insurance or other claims for damages to which the CONTRACTOR is entitled, reduced by all valid and proper payments made to or on behalf of the CONTRACTOR under the Construction Contract.

    b. Construction Contract: The agreement between the OWNER and the CONTRACTOR identified on the signature page, including all the Contract Documents and changes thereto.

    c. CONTRACTOR Default: Failure of the CONTRACTOR, which has neither been remedied nor waived, to perform or otherwise to comply with the terms of the Construction Contract.

    d. OWNER Default: Failure of the OWNER, which has neither been remedied nor waived, to pay the CONTRACTOR as required by the Construction Contract or to perform and complete or comply with the other terms thereof.

(FOR INFORMATION ONLY C Name, Address and Telephone)

AGENT OR BROKER:	OWNER'S REPRESENTATIVE:

END OF DOCUMENT

DOCUMENT 00614
(on Surety Letterhead)
LABOR AND MATERIALS BOND
(CONSTRUCTION)

KNOW ALL PERSONS BY THESE PRESENTS, that City of Turlock ("OWNER") a municipal corporation located in the County of Stanislaus, State of California, by Resolution No. _____, has awarded a contract to and has entered into an agreement with _____, hereinafter designated as "CONTRACTOR" whereby CONTRACTOR agrees to complete the improvements more particularly described in all documents forming the complete contract entitled **"[**_____**]"**, which said agreement is hereby referred to and made a part hereof; and

WHEREAS, said CONTRACTOR is required to furnish a bond in connection and with said contract, provided that if said CONTRACTOR, or any of his/her/its contractors, shall fail to pay for any materials, provisions, provender or other supplies or teams used in, upon, for or about the performance of the work contracted to be done, or for any work or labor done thereon of any kind, the Surety of this bond will pay the same to the extent hereinafter set forth.

NOW, THEREFORE, we the CONTRACTOR and _____, as surety, are held and firmly bound unto the OWNER in the penal sum of $_____, lawful money of the United States, being not less than one hundred percent (100%) of the estimated contract cost of the work, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said CONTRACTOR, his/her/its heirs, executors, administrators, successors or assigns, or its subcontractors, shall fail to pay any of the persons named in Section 3181 of the Civil Code, or to pay for any materials, provisions, provender, or other supplies or teams used in, upon, for or about the performance of the work contracted to be done, or for any work or labor thereon of any kind or for amounts due under the Unemployment Insurance Code with respect to such work or labor, then said Surety will pay the same in or to an amount not exceeding the amount hereinabove set forth, and also will pay in case suit is brought upon this bond a reasonable attorney's fee in such suit, which fee shall be fixed by the Court.

AS FURTHER TERMS OF THIS BOND, IT IS UNDERSTOOD AS FOLLOWS:

1. This bond and all its provisions shall inure to the benefit of and all persons named in Section 3181 of the Civil Code so as to give a right of action to such persons or their assigns in any suit brought upon this bond.

2. This bond is given to comply with the provisions of Chapter 7, Part 4, Division 3, of the Civil Code. The liability of the CONTRACTOR and Surety hereunder is governed by the provisions of said Chapter, all acts amendatory thereof, and all other statutes referred to therein.

And the said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any wise affect its

obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of this contract or to the work or to the specifications.

IN WITNESS WHEREOF, the above bounden parties have executed this instrument under their seals this _____ day of _____, 2011, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

NOTE: To be signed by CONTRACTOR and Surety and acknowledgment and notarial seal attached.

(SEAL)

_____
CONTRACTOR AS PRINCIPAL

By: _____

Title: _____

_____
SURETY COMPANY

By: _____

Title: _____

The above bond accepted and approved this _____ day of _____, 2011

_____
CITY ATTORNEY

END OF DOCUMENT

DOCUMENT 00618

GUARANTY BOND

Any singular reference to CONTRACTOR, Surety, OWNER or other party shall be considered plural where applicable.

GUARANTEE for _____

CONTRACTOR (Name and Address):

_____

_____

_____

SURETY (Name and Principal Place of Business):

_____

_____

_____

OWNER (Name and Address):

_____

_____

_____

CONSTRUCTION CONTRACT

Date: _____
Amount: _____
Description (Name and Location): _____

_____

(SEAL AND NOTARIAL ACKNOWLEDGMENT OF SURETY)

CONTRACTOR AS PRINCIPAL	SURETY
Company: _____ (Corp. Seal)	Company: _____ (Corp. Seal)
Signature: _____	Signature: _____
Name and Title:	Name and Title:

CONTRACTOR AS PRINCIPAL	SURETY
Company: _____ (Corp. Seal)	Company: _____ (Corp. Seal)
Signature: _____	Signature: _____
Name and Title:	Name and Title:

We hereby guarantee that all Work performed for the Contract Documents entitled:

The Project for which the Work under the Contract Documents may be the whole or only a part is generally described as follows:

1. Junction Structure
2. 48” Pump Station Influent Gravity Pipeline
3. Pump Station
4. 36” (Nominal Diameter) Outfall Pipeline
5. Standpipe Structure
6. 48” Gravity Pipeline RCP to Outfall Structure
7. Outfall Structure

which we have constructed, have been done in accordance with the Contract Documents, and that the work as constructed will fulfill the requirements of CONTRACTOR’s general warranty and guaranties included in the Contract Documents. We agree to perform all work necessary to correct deficiencies, errors or omissions in the workmanship or materials within a period of one (1) year from the date of final acceptance of the above-named work by the OWNER, pursuant to paragraph 13.07.A of Document 00700, General Conditions, without any expense whatsoever to said OWNER, ordinary wear and unusual abuse excepted.

As part of the obligation secured hereby and in addition to the face amount specified therefor, there shall be included costs and reasonable expenses and fees, including reasonable attorney's fees, incurred by OWNER.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the agreement or to the work to be performed thereunder or the specifications accompanying the same shall in anywise affect its obligations on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the agreement or to the work or to the specifications.

In the event of our failure to comply with the above-mentioned conditions within ten (10) calendar days after being notified in writing by the OWNER, we collectively or separately, do hereby authorize the OWNER to proceed to have said defects repaired and made good at our expense and we will honor and pay the costs and charges therefore upon demand. When correction work is started, it shall be carried through to completion.

DATED:_____

END OF DOCUMENT

DOCUMENT 00650

SUPPLEMENTAL FORMS AND INFORMATION REQUIRED FOR SRF FUNDING

TABLE OF CONTENTS

A. **DAVIS BACON ACT REQUIREMENTS**
B. **Compliance Guidelines for Clean Water State Revolving Fund (CWSRF) Program for Disadvantaged Business Enterprise (DBE) and Approval of Award (AOA)**
C. **DAVIS BACON ACT PREVAILING WAGE RATES**

END OF DOCUMENT

Contract and Subcontract Provisions.

(a) The Recipient shall insert in full in any contract in excess of $2,000 which is entered into for the actual construction, alteration and/or repair, including painting and decorating, of a public building or public work, or building or work financed in whole or in part from Federal funds or in accordance with guarantees of a Federal agency or financed from funds obtained by pledge of any contract of a Federal agency to make a loan, grant or annual contribution (except where a different meaning is expressly indicated), and which is subject to the labor standards provisions of any of the acts listed in § 5.1, the following clauses:

(1) Minimum wages.

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

The **Recipient** may obtain wage determinations from the U.S. Department of Labor’s web site, www.wdol.gov.

(ii)(A) The **Recipient**, on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The EPA award official shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the **Recipient** agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the **Recipient** to the State Water Board. The State Water Board will transmit the report, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the State Water Board or will notify the State Water Board within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the **Recipient** do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), USEPA will refer the questions, including the views of all interested parties and the recommendation of the State Water Board, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, provided, that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding.

The R**ecipient**, shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to

cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the **Recipient**, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State Water Board or EPA. As to each payroll copy received, the **Recipient** shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/esa/whd/forms/wh347instr.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the **Recipient** for transmission to the State or EPA if requested by EPA , the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the **Recipient**.

(B) Each payroll submitted shall be accompanied by a “Statement of Compliance,” signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and Trainees

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage

determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act Requirements.

The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts.

The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may by appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract Termination: Debarment.

A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act Requirements.

All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes Concerning Labor Standards.

Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and the R**ecipient**, State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of Eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

4. **Contract Provision for Contracts in Excess of $100,000.**

(a) Contract Work Hours and Safety Standards Act.

The **Recipient** shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements.

No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages.

In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages.

The **Recipient,** upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (a)(2) of this section.

(4) Subcontracts.

The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the **Recipient** shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the **Recipient** shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the USEPA, State Water Resources Control Board, and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

State Water Resources Control Board
Division of Financial Assistance (Division)
1001 I Street • Sacramento, California 95814 • (916) 341-5700 FAX (916) 341-5707
Mailing Address: P. O. Box 944212 • Sacramento, California • 94244-2120
Internet Address: http://www.waterboards.ca.gov

Guidelines for Clean Water State Revolving Fund (CWSRF) Program Disadvantaged Business Enterprise (DBE) and Approval of Award (AOA)

DBE REQUIREMENTS

The DBE Program is an outreach, education, and goaling program designed to increase the participation of DBEs. The DBE Program encompasses many of the components of the former Minority/Women Owned Business Enterprise (MBE/WBE) Program and includes many new features.

Financial Assistance recipients should award a "fair share" of sub-agreements to small, MBE/WBE businesses. Since each is a separate entity, the objective is to assure that each of these business entities is given the opportunity to participate in sub-agreement financial assistance agreements. This applies to all sub-agreements for equipment, supplies, construction and services.

How to Achieve the Purpose of the Program

Recipients of financial agreements are required to seek, and are encouraged to utilize, MBE/WBE businesses for their procurement needs under the financial agreement. The key functional components of the DBE Program are as follows.

- Fair Share Objectives
- Six Good Faith Efforts
- Contract Administration Requirements
- MBE/WBE Reporting
- MBE/WBE Certification

DBEs, MBEs and WBEs

DBEs are:

- entities owned and/or controlled by socially and economically disadvantaged individuals as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note) (10% statute), and Public Law 102-389 (42 U.S.C. 4370d) (8% statute), respectively;
- a Small Business Enterprise (SBE);
- a Small Business in a Rural Area (SBRA);
- a Labor Surplus Area Firm (LSAF); or
- an Historically Underutilized Business (HUB) Zone Small Business Concern or a concern under a successor program.

MBEs are:

- entities that are at least 51% owned and/or controlled by a socially and economically disadvantaged individual as described by Title X of the Clean Air Act Amendments of 1990 (42 U.S.C. 7601 note), and Public Law 102-389 (42 U.S.C. 4370d), respectively.

WBEs are:

- entities that are at least 51% owned and/or controlled by women.

Certifying MBE and WBE firms

Under the DBE Program, entities can no longer self-certify. Certifications will be accepted from:

- The Small Business Administration(SBA) (both SBA 8(a) program certifications and SBA Small Disadvantaged Business (SDB) Program self-certifications);
- The Department of Transportation's state implemented DBE Certification Program (with U.S. citizenship);
- Tribal, State and Local governments; and
- Independent private organization certifications.

If an entity holds one of these certifications, it is considered acceptable for establishing MBE or WBE status under the DBE Program.

GOOD FAITH EFFORT (GFE)

The GFE is required for all financial agreement recipients to ensure that all DBEs have the opportunity to compete for procurements funded by financial assistance dollars.

Six Good Faith Efforts

- Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. For Tribal, State and Local Government recipients, this will include placing DBEs on solicitation lists and soliciting them whenever they are potential sources.
- Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. Posting solicitations for bids or proposals for a minimum of 15 calendar days before the bid.
- Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. For Tribal, State and Local Government recipients, this will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
- Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
- Use the services and assistance of the SBA and Minority Business Development Agency of the Department of Commerce.
- If the prime contractor awards subcontracts, require the subcontractor to take the above steps.

ADMINISTRATION REQUIREMENTS

- A recipient must require its prime contractor to pay its subcontractor for satisfactory performance no more than 30 days from the prime contractor's receipt of payment from the recipient;
- A recipient must be notified in writing by its prime contractor prior to any termination of a DBE subcontractor for convenience by the prime contractor;
- If a DBE subcontractor fails to complete work under the subcontract for any reason, the recipient must require the prime contractor to employ the six GFEs if soliciting a replacement subcontractor; and
- A recipient must require its prime contractor to employ the six GFEs even if the prime contractor has achieved its fair share objectives.

Forms to be submitted with the GFE:

- DBE Contractor/Subcontractor Certification
- DBE Selected Prime Contractor/Recipient
- DBE Good Faith Effort Certification By Recipient
- DBE Bidders List – Contractor/Subcontractor

FORM	REQUIREMENT	PROVIDED BY	COMPLETED BY	SUBMITTED TO
DBE Contractor/Subcontractor Certification	**Subcontractor required to provide proof of DBE certification**	**Prime Contractor**	**Subcontractor**	**Prime Contractor**
DBE Selected Prime Contractor/Recipient	**Prime Contractor/Recipient list selected DBEs**	**Recipient**	**Recipient**	**SWRCB**
DBE Good Faith Effort Certification By Recipient	**Recipient certifies that Prime Contractor meets DBE requirements**	**Recipient**	**Recipient**	**SWRCB**
DBE Bidders List – Contractor/Subcontractor	**Provides Recipients with a database of DBE Prime Contractors and Subcontractors**	**Recipient**	**Recipient**	**SWRCB**

BIDDERS LIST REQUIREMENTS

The Bidders List is to provide the recipient receiving financing agreements, who conduct competitive bidding with as accurate of a database as possible, about the universe of MBE/WBE and non-MBE/WBE prime contractors and subcontractors.

- A recipient of a financial agreement to capitalize CWSRF funds also must require entities receiving funds to create and maintain a Bidders List if the recipient of the financing agreement is subject to, or chooses to follow, competitive bidding requirements;
- The list must include all firms that bid or quote on prime contracts, or bid or quote subcontracts including both MBE/WBEs and non-MBE/WBEs; and
- The Bidders List must be kept until the recipient is no longer receiving funding under the agreement.

Information Retained on the Bidders List

1. Entity's name with point of contact;
2. Entity's mailing address and telephone number;
3. The project description on which the entity bid or quoted and when;
4. Amount of bid/quote; and
5. Entity's status as a MBE/WBE or non-MBE/WBE.

AOA REQUIREMENTS

The DBE GFE is one element of the AOA process summarized below. The AOA request package submitted to the Division for approval is the final step and must contain the following:

1. A completed AOA form (original must be signed by the recipient's authorized representative or designee); and
2. All of the AOA attachments in accordance with the AOA instructions, if not previously submitted.

Once a bidder is selected, the prime contractor should compile the information required by the GFE process. **All information supporting the GFE must be submitted at bid opening**. Recipient shall review the successful bidder's records closely to be sure that the GFE was made. Failure of either the bidder or prime contractor/subcontractor to follow the GFE and provide the necessary information could jeopardize funding of the project. The following situations and circumstances require action as indicated:

1. If the apparent successful low bidder was rejected, a complete explanation must be provided;
2. Contractors must provide written evidence that they are certified. Self certification is not acceptable. Contractors must be certified at bid opening; and
3. Failure of the apparent low bidder to perform the GFE *prior* to bid opening will result in its bid being declared non-responsive. The construction contract may then be awarded to the next low, responsive, and responsible bidder that meets the requirements or the recipient may re-advertise the project.

Each procurement contract signed by the Recipient must include the following term and condition:

"The contractor shall not discriminate on the basis of race, color, national origin or sex in their performance of this contract. The contractor shall carry out applicable requirements of 40 CFR Part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract which may result in the termination of this contract."

Reporting Requirements

For the duration of the construction contract, all prime contractors and subcontractors will be required to submit to SWRCB reports of progress made in fulfilling the GFE in the Semi-Annual Report submitted by April 10 and October 10 of each fiscal year on a Utilization Report form (UR-334). Failure to provide this information as stipulated in the financial agreement language will be cause for withholding disbursements.

CONTACT FOR MORE INFORMATION

SWRCB – CWSRF Barbara August 916-341-6952 baugust@waterboards.ca.gov
SWRCB – CWSRF Susan Damian 916-341-5494 sdamian@waterboards.ca.gov.
EPA Region 9 - Joe Ochab 415-972-3761 ochab.joe@epa.
EPA Headquarters - Veronica Squirrell 202-564-5347 squirrell.veronica@epa.gov.
EPA OSBP Headquarters Indirect Procurement Team:
Kimberly Patrick, Team Leader: 202-566-2605 patrick.kimberly@epa.gov.
Samuel Peterson, Program Analyst: 202-566-1510 peterson.samuel@epa.gov.

Revised October, 2011

DISADVANTAGED BUSINESS ENTERPRISE (DBE)
CONTRACTOR SUBCONTRACTOR CERTIFICATION

Firm Name:	Phone:
Address:	
Principal Service or Product:	Bid Amount $

PLEASE INDICATE PERCENTAGE OF OWNERSHIP BELOW

☐ DBE _____% Ownership	
☐ Prime Contractor	☐ Supplier of Material/Service
☐ Subcontractor	
☐ Sole Ownership	☐ Corporation
☐ Partnership	☐ Joint Venture
Certified by:	Title:

(Original signature and date required)

Name:	Date:

NOTE: Contractors can no longer self-certify. They must be certified by EPA, Small Business Administration (SBA), Department of Transportation (DOT) or by State, Local, Tribal or private entities whose certification criteria match EPA's. Proof of Certification must be provided. A copy of the contractor certification must be submitted with this form.

This form must be submitted at Bid Opening.

Revised October, 2011

DISADVANTAGED BUSINESS ENTERPRISE (DBE)
SELECTED PRIME CONTRACTOR/RECIPIENT

CONTRACT RECIPIENTS NAME	CONTRACT NO. OR SPECIFICATION NO.
PROJECT DESCRIPTION	PROJECT LOCATION
PRIME CONTRACTOR INFORMATION	
NAME AND ADDRESS (Include ZIP Code, Federal Employer Tax ID #) PHONE	☐ MBE ☐ WBE AMOUNT OF CONTRACT$
DBE INFORMATION	
☐ NONE*	
☐ DBE	NAME AND ADDRESS (Include ZIP Code,)
☐ SUBCONTRACTOR ☐ JOINT VENTURE / ☐ SUPPLIER/SERVICE	
AMOUNT OF CONTRACT $	PHONE
WORK TO BE PERFORMED	
☐ DBE	NAME AND ADDRESS (Include ZIP Code)
☐ SUBCONTRACTOR ☐ JOINT VENTURE / ☐ SUPPLIER/SERVICE	
AMOUNT OF CONTRACT $	PHONE
WORK TO BE PERFORMED	
☐ DBE	NAME AND ADDRESS (Include ZIP Code,)
☐ SUBCONTRACTOR ☐ JOINT VENTURE / ☐ SUPPLIER/SERVICE	
AMOUNT OF CONTRACT $	PHONE
WORK TO BE PERFORMED	
TOTAL DBE AMOUNT: $	TOTAL WBE AMOUNT: $
SIGNATURE OF PERSON COMPLETING FORM:	
TITLE: ————————————	PHONE:_____ DATE: _____

NOTE: Negative reports are required. Original signature and date are required. Failure to complete and submit this form with the bid will cause the bid to be rejected as non-responsive.

Revised October 2011

DISADVANTAGED BUSINESS ENTERPRISE (DBE)
GOOD FAITH EFFORT CERTIFICATION BY RECIPIENT

1. The apparent successful low bidder on Clean Water State Revolving Fund Program funded project number
   C-06-_____ is _____
   (Name of Bidder)

2. Before the State Water Resources Control Board can consider requests for an Approval Of Award (AOA) to any bidder, the applicant/recipient must certify to the following:

   DISADVANTAGED BUSINESS ENTERPRISE (DBE)

   The bidder has obtained _____% of DBE participation for this contract.

   Also submitted are the Contractor/Subcontractor Certification and Selected Prime Contractor/Recipient DBE forms that contain a complete list of those DBE firms subcontracted with or with whom other types of agreements were made. The list includes the names of the firm, address, phone number and dollar amount involved.

   The following affirmative steps as required by 40 CFR 35.3150 (d) have been taken:

   1. The contractor divided total requirements when economically feasible, into small tasks or quantities to permit maximum participation of DBE businesses.

   2. The contractor established delivery schedules, where the requirements of the work permitted, which encouraged participation by DBE businesses.

   3. The contractor included qualified DBE businesses on solicitation lists.

   4. The contractor assures that DBE businesses were solicited, whenever they were potential sources.

   5. The contractor used the services and assistance of the Small Business Administration and the Office of Minority Business Development Agency of the U.S. Department of Commerce.

It must be understood that the applicant/recipient in its role as a public trustee assumes primary responsibility to achieve an acceptable level of DBE utilization. This primary responsibility is a basic condition of the award of any Clean Water State Revolving Fund financial agreement. Where an application/recipient fails to meet its obligations under these requirements the applicant/recipient may be declared non-responsive and may have funding either annulled, suspended or terminated.

In accepting these responsibilities, I hereby certify to the above.

_____
Name of Applicant/Recipient

_____ _____
Signature of Authorized Representative Date

_____
Name and Title of Authorized Representative

NOTE: This form must be submitted with the AOA package.

Revised October 2011

Disadvantaged Business Enterprise (DBE)
Bidders List
Contractor/Subcontractor

Contractor/ Subcontractor	Address	Contact Name	Phone Number	Project Description	Bid/ Quote	Selected	MBE/WBE Certification

Revised October, 2011

STATE WATER RESOURCES CONTROL BOARD – DIVISION OF FINANCIAL ASSISTANCE
DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION
CLEAN WATER STATE REVOLVING FUND FINANCING AGREEMENT

1. Grant/Finance Agreement Number: C-06-	**2. Semi-Annual Reporting Period**: **04/01/11_ through 09/30/11_** 10/01/____ through 03/31/____	**3. Purchase Period of Financing Agreement:** Start Date:_____ Ending Date:_____

4. Total Payments Paid to Prime Contractor or Sub-Contractors This Period: $

5. Recipient's Name and Address:	**6. Recipient's Contact Person and Phone Number:**

7. List All DBE Payments Paid by Prime Contractor or Recipient During Reporting Period:

Payment or Purchase Paid by Recipient or Contractor?	Amount Paid to Any DBE Contractor/Sub-Contractor For Service Provided to Recipient MBE - WBE		Date of Payment (M/D/Y)	Product Type Code ** (see below)	Name and Address of DBE Contractor or Sub-contractor or Vendor

8. Initial here if no DBE Contractors/Sub-Contractors paid during this reporting period. (_____)

9. Initial here if all purchases for this contract are completed. (_____)

10. Comments:

11. Signature and Title of Recipient's Authorized Representative	**12. Date:**

Return to:
Susan Damian
State Water Resources Control Board
Division of Financial Assistance
PO Box 944212
Services, Repair Services
Sacramento, CA 94244-2120
sdamian@waterboards.ca.gov

Phone: (916) 341-5494
Fax: (916) 327-7469

Product Type:
1: Construction
2. Supplies
3. Services
(Includes: Business Services, Professional and Personnel Services)
4. Equipment

STATE WATER RESOURCES CONTROL BOARD - DIVISION OF FINANCIAL ASSISTANCE
DISADVANTAGED BUSINESS ENTERPRISE (DBE) UTILIZATION
CLEAN WATER STATE REVOLVING FUND FINANCING AGREEMENT
INSTRUCTIONS FOR COMPLETING THE UR 334

Box 1 Grant or Financing Agreement Number.

Box 2 Semi-annual reporting period. Choose one semi-annual period and enter the correct years.

Box 3 Enter the dates between which you plan to make procurements under this financing agreement or grant.

Box 4 Enter the total amount of payments paid to the contractor or sub-contractors during this reporting period.

Box 5 Enter Recipient's Name and Address.

Box 6 Enter Recipient's Contact Name and Phone Number.

Box 7 Enter details for the **DBE purchases only** and be sure to limit them to the current period. 1) Use either an "R" or a "C" to represent "Recipient" or "Contractor." 2) Enter a dollar total for DBE and total the two columns at the bottom of the section. 3) Provide the payment date. 4) Enter a product type choice from those at the bottom of the page. 5) List the vendor name and address in the right-hand column

Box 8 Initial here if no DBE contractors or sub-contractors were paid during this reporting period.

Box 9 Initial this box only if all purchases under this financing agreement or grant have been completed during this reporting period or a previous period. If you initial this box, we will no longer send you a survey.

Box 10 This box is for explanatory information or questions.

Box 11 Provide an authorized representative signature.

Box 12 Enter the date form completed.

General Decision Number: CA120029 01/27/2012 CA29

Superseded General Decision Number: CA20100029

State: California

Construction Types: Building, Heavy (Heavy and Dredging) and Highway

Counties: Alameda, Calaveras, Contra Costa, Fresno, Kings, Madera, Mariposa, Merced, Monterey, San Benito, San Francisco, San Joaquin, San Mateo, Santa Clara, Santa Cruz, Stanislaus and Tuolumne Counties in California.

BUILDING CONSTRUCTION PROJECTS; DREDGING PROJECTS (does not include hopper dredge work); HEAVY CONSTRUCTION PROJECTS (does not include water well drilling); HIGHWAY CONSTRUCTION PROJECTS

Modification Number	Publication Date
0	01/06/2012
1	01/20/2012
2	01/27/2012

ASBE0016-001 08/01/2011

AREA 1: ALAMEDA, CONTRA COSTA, LAKE, MARIN, MENDOCINO, MONTEREY, NAPA, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, & SONOMA COUNTIES

AREA 2: ALPINE, AMADOR, BUTTE, CALAVERAS, COLUSA, DEL NORTE, EL DORADO, FRESNO, GLENN, HUMBOLDT, KINGS, LASSEN, MADERA, MARIPOSA, MERCED, MODOC, MONO, NEVADA, PLACER, PLUMAS, SACRAMENTO, SAN JOAQUIN, SHASTA, SIERRA, SISKIYOU, STANISLAU, SUTTER, TEHEMA, TRINITY, TULARE, TUOLUMNE, YOLO, & YUBA COUNTIES

	Rates	Fringes
Asbestos Workers/Insulator (Includes the application of all insulating materials, Protective Coverings, Coatings, and Finishes to all types of mechanical systems)		
Area 1	$ 53.05	17.25
Area 2	$ 41.40	17.25

ASBE0016-004 01/01/2010

	Rates	Fringes
Asbestos Removal worker/hazardous material handler (Includes preparation, wetting, stripping, removal, scrapping, vacuuming, bagging		

and disposing of all
insulation materials from
mechanical systems, whether
they contain asbestos or not)....$ 15.18 2.80

BOIL0549-001 01/01/2009

AREA 1: ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO & SANTA CLARA COUNTIES

AREA 2: REMAINING COUNTIES

	Rates	Fringes
BOILERMAKER		
Area 1	$ 40.17	22.32
Area 2	$ 37.01	22.25

BRCA0003-001 06/01/2011

	Rates	Fringes
MARBLE FINISHER	$ 28.02	12.22

BRCA0003-003 06/01/2011

	Rates	Fringes
MARBLE MASON	$ 39.22	18.68

BRCA0003-005 05/01/2011

	Rates	Fringes
BRICKLAYER		
(1) Fresno, Kings, Madera, Mariposa, Merced	$ 34.11	19.34
(7) San Francisco, San Mateo	$ 39.85	22.00
(8) Alameda, Contra Costa, San Benito, Santa Clara	$ 39.63	19.92
(9) Calaveras, San Joaquin, Stanislaus, Toulumne	$ 35.11	18.99
(16) Monterey, Santa Cruz	$ 35.91	22.42

BRCA0003-008 06/01/2011

	Rates	Fringes
TERRAZZO FINISHER	$ 30.30	13.77
TERRAZZO WORKER/SETTER	$ 39.30	21.20

BRCA0003-011 01/01/2011

AREA 1: Alameda, Contra Costa, Monterey, San Benito, San Francisco, San Mateo, Santa Clara, Santa Cruz

AREA 2: Calaveras, San Joaquin, Stanislaus, Tuolumne

AREA 3: Fresno, Kings, Madera, Mariposa, Merced

	Rates	Fringes
TILE FINISHER		
Area 1	$ 21.44	12.31
Area 2	$ 21.26	12.44
Area 3	$ 21.01	11.58
Tile Layer		
Area 1	$ 38.61	13.73
Area 2	$ 34.41	13.68
Area 3	$ 29.78	13.10

CARP0022-001 07/01/2011

San Francisco County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 37.65	24.84
Journeyman Carpenter	$ 37.50	24.84
Millwright	$ 37.60	26.43

CARP0034-001 07/01/2011

	Rates	Fringes
Diver		
Assistant Tender, ROV Tender/Technician	$ 36.75	28.04
Diver standby	$ 41.43	28.04
Diver Tender	$ 40.43	28.04
Diver wet	$ 82.86	28.04
Manifold Operator (mixed gas)	$ 45.43	28.04
Manifold Operator (Standby)	$ 40.43	28.04

DEPTH PAY (Surface Diving):
050 to 100 ft $2.00 per foot
101 to 150 ft $3.00 per foot
151 to 220 ft $4.00 per foot

SATURATION DIVING:
The standby rate shall apply until saturation starts. The saturation diving rate applies when divers are under pressure continuously until work task and decompression are complete. The diver rate shall be paid for all saturation hours.

DIVING IN ENCLOSURES:

Where it is necessary for Divers to enter pipes or tunnels, or other enclosures where there is no vertical ascent, the following premium shall be paid: Distance traveled from entrance 26 feet to 300 feet: $1.00 per foot. When it is necessary for a diver to enter any pipe, tunnel or other enclosure less than 48" in height, the premium will be $1.00 per foot.

WORK IN COMBINATION OF CLASSIFICATIONS:
Employees working in any combination of classifications within the diving crew (except dive supervisor) in a shift are paid in the classification with the highest rate for that shift.

CARP0034-003 07/01/2011

	Rates	Fringes
Piledriver	$ 36.75	28.04

CARP0035-007 07/01/2010

AREA 1: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara counties

AREA 2: Monterey, San Benito, Santa Cruz Counties

AREA 3: Calaveras, Fresno, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tuolumne Counties

	Rates	Fringes
Modular Furniture Installer		
Area 1		
Installer I	$ 22.11	14.98
Installer II	$ 18.68	14.98
Lead Installer	$ 25.56	15.48
Master Installer	$ 29.78	15.48
Area 2		
Installer I	$ 19.46	14.98
Installer II	$ 16.51	14.89
Lead Installer	$ 22.43	15.48
Master Installer	$ 26.06	15.48
Area 3		
Installer I	$ 18.51	14.98
Installer II	$ 15.74	14.98
Lead Installer	$ 21.31	15.48
Master Installer	$ 24.73	15.48

CARP0035-008 08/01/2011

AREA 1: Alameda, Contra Costa, San Francisco, San Mateo, Santa Clara counties

AREA 2: Monterey, San Benito, Santa Cruz Counties

AREA 4: Calaveras, Fresno, Kings, Madera, Mariposa, Merced, San Joaquin, Stanislaus, Tuolumne Counties

	Rates	Fringes
Drywall Installers/Lathers:		
Area 1	$ 37.50	25.28
Area 2	$ 31.62	25.28
Area 4	$ 30.77	25.28
Drywall Stocker/Scrapper		
Area 1	$ 18.75	14.44
Area 2	$ 15.81	14.44
Area 4	$ 15.39	14.44

CARP0152-001 07/01/2011

Contra Costa County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 37.65	24.84
Journeyman Carpenter	$ 37.50	24.84
Millwright	$ 37.60	26.43

CARP0152-002 07/01/2011

San Joaquin County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 31.77	24.84
Journeyman Carpenter	$ 31.62	24.84
Millwright	$ 33.67	26.43

CARP0152-004 07/01/2011

Calaveras, Mariposa, Merced, Stanislaus and Tuolumne Counties

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 30.42	24.84

Journeyman Carpenter	$ 30.27	24.84
Millwright	$ 32.77	26.43

CARP0217-001 07/01/2011

San Mateo County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 37.65	24.84
Journeyman Carpenter	$ 37.50	24.84
Millwright	$ 37.60	26.43

CARP0405-001 07/01/2011

Santa Clara County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 37.65	24.84
Journeyman Carpenter	$ 37.50	24.84
Millwright	$ 37.60	26.43

CARP0405-002 07/01/2011

San Benito County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 31.77	24.84
Journeyman Carpenter	$ 31.62	24.84
Millwright	$ 34.12	26.43

CARP0505-001 07/01/2011

Santa Cruz County

	Rates	Fringes

Carpenters
Bridge Builder/Highway
Carpenter.....$ 37.50 24.84
Hardwood Floorlayer,
Shingler, Power Saw
Operator, Steel Scaffold &
Steel Shoring Erector, Saw
Filer.....$ 31.77 24.84
Journeyman Carpenter.....$ 31.62 24.84
Millwright.....$ 34.12 26.43

CARP0605-001 07/01/2011

Monterey County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway		
Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw		
Filer	$ 31.77	24.84
Journeyman Carpenter	$ 31.62	24.84
Millwright	$ 34.12	26.43

CARP0701-001 07/01/2011

Fresno and Madera Counties

	Rates	Fringes
Carpenters		
Bridge Builder/Highway		
Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw		
Filer	$ 30.42	24.84
Journeyman Carpenter	$ 30.27	24.84
Millwright	$ 32.77	26.43

CARP0713-001 07/01/2011

Alameda County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway		
Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw		
Filer	$ 37.65	24.84
Journeyman Carpenter	$ 37.50	24.84

Millwright.....$ 37.60 26.43

CARP1109-001 07/01/2011

Kings County

	Rates	Fringes
Carpenters		
Bridge Builder/Highway Carpenter	$ 37.50	24.84
Hardwood Floorlayer, Shingler, Power Saw Operator, Steel Scaffold & Steel Shoring Erector, Saw Filer	$ 30.42	24.84
Journeyman Carpenter	$ 30.27	24.84
Millwright	$ 32.77	26.43

ELEC0006-001 12/01/2010

ALAMEDA, CONTRA COSTA, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA, AND SANTA CRUZ COUNTIES

	Rates	Fringes
Sound & Communications		
Installer	$ 29.87	3%+12.95
Technician	$ 34.01	3%+12.95

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0006-007 12/01/2010

SAN FRANCISCO COUNTY

	Rates	Fringes
ELECTRICIAN	$ 53.05	22.69

ELEC0006-008 12/01/2006

CALAVERAS, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS AND TUOLUMNE COUNTIES

	Rates	Fringes
Communications System		
Installer	$ 23.47	3%+10.65
Technician	$ 26.72	3%+10.65

SCOPE OF WORK: Including any data system whose only function is to transmit or receive information; excluding all other data systems or multiple systems which include control function or power supply; inclusion or exclusion of terminations and testings of conductors determined by their function; excluding fire alarm work when installed in raceways (including wire and cable pulling) and when performed on new or major remodel building projects or jobs for which the conductors for the fire alarm system are installed in conduit; excluding installation of raceway systems, line voltage work, industrial work, life-safety systems (all buildings having floors located more than 75' above the lowest floor level having building access); excluding energy management systems.

FOOTNOTE: Fire alarm work when installed in raceways (including wire and cable pulling), on projects which involve new or major remodel building construction, for which the conductors for the fire alarm system are installed in the conduit, shall be performed by the inside electrician.

ELEC0100-002 06/01/2011

FRESNO, KINGS, AND MADERA COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 32.85	3%+16.30

ELEC0100-005 07/01/2011

FRESNO, KINGS, MADERA

	Rates	Fringes
Communications System		
Installer	$ 26.29	13.74
Technician	$ 29.93	13.85

SCOPE OF WORK

Includes the installation testing, service and maintenance, of the following systems which utilize the transmission and/or transference of voice, sound, vision and digital for commercial, education, security and entertainment purposes for the following: TV monitoring and surveillance, background-foreground music, intercom and telephone

interconnect, inventory control systems, microwave transmission, multi-media, multiplex, nurse call system, radio page, school intercom and sound, burglar alarms, and low voltage master clock systems.

A. SOUND AND VOICE TRANSMISSION/TRANSFERENCE SYSTEMS Background foreground music, Intercom and telephone interconnect systems, Telephone systems Nurse call systems, Radio page systems, School intercom and sound systems, Burglar alarm systems, Low voltage, master clock systems, Multi-media/multiplex systems, Sound and musical entertainment systems, RF systems, Antennas and Wave Guide,

B. FIRE ALARM SYSTEMS Installation, wire pulling and testing

C. TELEVISION AND VIDEO SYSTEMS Television monitoring and surveillance systems Video security systems, Video entertainment systems, Video educational systems, Microwave transmission systems, CATV and CCTV

D. SECURITY SYSTEMS Perimeter security systems Vibration sensor systems Card access systems Access control systems, Sonar/infrared monitoring equipment

E. COMMUNICATIONS SYSTEMS THAT TRANSMIT OR RECEIVE INFORMATION AND/OR CONTROL SYSTEMS THAT ARE INTRINSIC TO THE ABOVE LISTED SYSTEMS SCADA (Supervisory Control and Data Acquisition) PCM (Pulse Code Modulation) Inventory Control Systems, Digital Data Systems Broadband and Baseband and Carriers Point of Sale Systems, VSAT Data Systems Data Communication Systems RF and Remote Control Systems, Fiber Optic Data Systems

WORK EXCLUDED Raceway systems are not covered (excluding Ladder-Rack for the purpose of the above listed systems). Chases and/or nipples (not to exceed 10 feet) may be installed on open wiring systems. Energy management systems. SCADA (Supervisory Control and Data Acquisition) when not intrinsic to the above listed systems (in the scope). Fire alarm systems when installed in raceways (including wire and cable pulling) shall be performed at the electrician wage rate, when either of the following two (2) conditions apply:
1. The project involves new or major remodel building trades construction.
2. The conductors for the fire alarm system are installed in conduit.

ELEC0234-001 05/31/2011

MONTEREY, SAN BENITO AND SANTA CRUZ COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 41.20	21.50

ELEC0302-001 06/01/2011

CONTRA COSTA COUNTY

	Rates	Fringes
CABLE SPLICER	$ 52.49	3%+20.95
ELECTRICIAN	$ 46.21	3%+20.95

ELEC0332-001 11/28/2011

SANTA CLARA COUNTY

	Rates	Fringes
CABLE SPLICER	$ 57.01	29.165
ELECTRICIAN	$ 49.57	28.14

FOOTNOTES: Work under compressed air or where gas masks are required, orwork on ladders, scaffolds, stacks, "Bosun's chairs," or other structures and where the workers are not protected by permanent guard rails at a distance of 40 to 60 ft. from the ground or supporting structures: to be paid one and one-half times the straight-time rate of pay. Work on structures of 60 ft. or over (as described above): to be paid twice the straight-time rate of pay.

ELEC0595-001 06/01/2011

ALAMEDA COUNTY

	Rates	Fringes
CABLE SPLICER	$ 50.63	3%+25.43
ELECTRICIAN	$ 45.00	3%+25.43

ELEC0595-002 12/01/2011

CALAVERAS AND SAN JOAQUIN COUNTIES

	Rates	Fringes
CABLE SPLICER	$ 37.13	9.025%+21.74
ELECTRICIAN		
(1) Tunnel work	$ 34.65	9.025%+21.74
(2) All other work	$ 33.00	9.025%+21.74

ELEC0617-001 06/01/2011

SAN MATEO COUNTY

	Rates	Fringes
ELECTRICIAN	$ 50.00	23.14

ELEC0684-001 07/01/2010

MARIPOSA, MERCED, STANISLAUS AND TUOLUMNE COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 34.60	3%+16.90

CABLE SPLICER = 110% of Journeyman Electrician

ELEC1245-001 06/01/2011

	Rates	Fringes
LINE CONSTRUCTION		
(1) Lineman; Cable splicer	$ 47.87	13.87
(2) Equipment specialist (operates crawler tractors, commercial motor vehicles, backhoes, trenchers, cranes (50 tons and below), overhead & underground distribution line equipment)	$ 38.23	12.80
(3) Groundman	$ 29.25	12.53
(4) Powderman	$ 42.75	12.97

HOLIDAYS: New Year's Day, M.L. King Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day and day after Thanksgiving, Christmas Day

---

ELEV0008-001 01/01/2011

	Rates	Fringes
ELEVATOR MECHANIC	$ 56.14	21.785

FOOTNOTE:
PAID VACATION: Employer contributes 8% of regular hourly rate as vacation pay credit for employees with more than 5 years of service, and 6% for 6 months to 5 years of service.
PAID HOLIDAYS: New Years Day, Memorial Day, Independence Day, Labor Day, Veterans Day, Thanksgiving Day, Friday after Thanksgiving, and Christmas Day.

---

* ENGI0003-008 07/01/2011

	Rates	Fringes
Dredging: (DREDGING: CLAMSHELL & DIPPER DREDGING; HYDRAULIC SUCTION DREDGING:)		
AREA 1:		
(1) Leverman	$ 38.94	24.43
(2) Dredge Dozer; Heavy duty repairman	$ 33.98	24.43
(3) Booster Pump Operator; Deck Engineer; Deck mate; Dredge Tender; Winch Operator	$ 32.86	24.43
(4) Bargeman; Deckhand; Fireman; Leveehand; Oiler	$ 29.56	24.43
AREA 2:		
(1) Leverman	$ 40.94	24.43
(2) Dredge Dozer; Heavy duty repairman	$ 35.98	24.43
(3) Booster Pump Operator; Deck		

Engineer; Deck mate;
Dredge Tender; Winch
Operator.....$ 34.86 24.43
(4) Bargeman; Deckhand;
Fireman; Leveehand; Oiler..$ 31.56 24.43

AREA DESCRIPTIONS

AREA 1: ALAMEDA,BUTTE, CONTRA COSTA, KINGS, MARIN, MERCED, NAPA, SACRAMENTO, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, STANISLAUS, SUTTER, YOLO, AND YUBA COUNTIES

AREA 2: MODOC COUNTY

THE REMAINGING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW:

ALPINE COUNTY:
Area 1: Northernmost part
Area 2: Remainder

CALAVERAS COUNTY:
Area 1: Remainder
Area 2: Eastern part

COLUSA COUNTY:
Area 1: Eastern part
Area 2: Remainder

ELDORADO COUNTY:
Area 1: North Central part
Area 2: Remainder

FRESNO COUNTY:
Area 1: Remainder
Area 2: Eastern part

GLENN COUNTY:
Area 1: Eastern part
Area 2: Remainder

LASSEN COUNTY:
Area 1: Western part along the Southern portion of border with Shasta County
Area 2: Remainder

MADERA COUNTY:
Area 1: Except Eastern part
Area 2: Eastern part

MARIPOSA COUNTY
Area 1: Except Eastern part
Area 2: Eastern part

MONTERREY COUNTY
Area 1: Except Southwestern part
Area 2: Southwestern part

NEVADA COUNTY:

Area 1: All but the Northern portion along the border of Sierra County
Area 2: Remainder

PLACER COUNTY:
Area 1: Al but the Central portion
Area 2: Remainder

PLUMAS COUNTY:
Area 1: Western portion
Area 2: Remainder

SHASTA COUNTY:
Area 1: All but the Northeastern corner
Area 2: Remainder

SIERRA COUNTY:
Area 1: Western part
Area 2: Remainder

SISKIYOU COUNTY:
Area 1: Central part
Area 2: Remainder

SONOMA COUNTY:
Area 1: All but the Northwestern corner
Area 2: Remainder

TEHAMA COUNTY:
Area 1: All but the Western border with Mendocino & Trinity Counties
Area 2: Remainder

TRINITY COUNTY:
Area 1: East Central part and the Northeastern border with Shasta County
Area 2: Remainder

TUOLUMNE COUNTY:
Area 1: Except Eastern part
Area 2: Eastern part

ENGI0003-018 06/27/2011

"AREA 1" WAGE RATES ARE LISTED BELOW

"AREA 2" RECEIVES AN ADDITIONAL $2.00 PER HOUR ABOVE AREA 1 RATES.

SEE AREA DEFINITIONS BELOW

	Rates	Fringes
OPERATOR: Power Equipment (AREA 1:)		
GROUP 1	$ 37.77	27.52
GROUP 2	$ 36.24	27.52
GROUP 3	$ 34.76	27.52
GROUP 4	$ 33.38	27.52

```
     GROUP 5.....................$ 32.11           27.52
     GROUP 6.....................$ 30.79           27.52
     GROUP 7.....................$ 29.65           27.52
     GROUP 8.....................$ 28.51           27.52
     GROUP 8-A...................$ 28.30           27.52
OPERATOR:   Power Equipment
(Cranes and Attachments -
AREA 1:)
     GROUP 1
      Cranes.....................$ 38.65           27.52
      Oiler......................$ 29.39           27.52
      Truck crane oiler..........$ 31.68           27.52
     GROUP 2
      Cranes.....................$ 36.89           27.52
      Oiler......................$ 29.18           27.52
      Truck crane oiler..........$ 31.42           27.52
     GROUP 3
      Cranes.....................$ 35.14           27.52
      Hydraulic..................$ 30.79           27.52
      Oiler......................$ 28.90           27.52
      Truck Crane Oiler..........$ 31.18           27.52
OPERATOR:   Power Equipment
(Piledriving - AREA 1:)
     GROUP 1
      Lifting devices............$ 38.99           27.52
      Oiler......................$ 29.73           27.52
      Truck crane oiler..........$ 32.01           27.52
     GROUP 2
      Lifting devices............$ 37.17           27.52
      Oiler......................$ 29.46           27.52
      Truck Crane Oiler..........$ 31.76           27.52
     GROUP 3
      Lifting devices............$ 35.49           27.52
      Oiler......................$ 29.24           27.52
      Truck Crane Oiler..........$ 31.47           27.52
     GROUP 4.....................$ 33.72           27.52
     GROUP 5.....................$ 31.08           27.52
     GROUP 6.....................$ 28.85           27.52
OPERATOR:   Power Equipment
(Steel Erection - AREA 1:)
     GROUP 1
      Cranes.....................$ 39.62           27.52
      Oiler......................$ 30.07           27.52
      Truck Crane Oiler..........$ 32.30           27.52
     GROUP 2
      Cranes.....................$ 37.85           27.52
      Oiler......................$ 29.80           27.52
      Truck Crane Oiler..........$ 32.08           27.52
     GROUP 3
      Cranes.....................$ 36.37           27.52
      Hydraulic..................$ 31.42           27.52
      Oiler......................$ 29.58           27.52
      Truck Crane Oiler..........$ 31.81           27.52
     GROUP 4.....................$ 34.35           27.52
     GROUP 5.....................$ 33.05           27.52
OPERATOR:   Power Equipment
(Tunnel and Underground Work
- AREA 1:)
     SHAFTS, STOPES, RAISES:
      GROUP 1....................$ 33.87           27.52
```

GROUP 1-A	$ 36.34	27.52
GROUP 2	$ 32.61	27.52
GROUP 3	$ 31.28	27.52
GROUP 4	$ 30.14	27.52
GROUP 5	$ 29.00	27.52
UNDERGROUND:		
GROUP 1	$ 33.77	27.52
GROUP 1-A	$ 36.34	27.52
GROUP 2	$ 32.51	27.52
GROUP 3	$ 31.18	27.52
GROUP 4	$ 30.04	27.52
GROUP 5	$ 28.90	27.52

FOOTNOTE: Work suspended by ropes or cables, or work on a Yo-Yo Cat: $.60 per hour additional.

POWER EQUIPMENT OPERATOR CLASSIFICATIONS

GROUP 1: Operator of helicopter (when used in erection work); Hydraulic excavator, 7 cu. yds. and over; Power shovels, over 7 cu. yds.

GROUP 2: Highline cableway; Hydraulic excavator, 3-1/2 cu. yds. up to 7 cu. yds.; Licensed construction work boat operator, on site; Power blade operator (finish); Power shovels, over 1 cu. yd. up to and including 7 cu. yds. m.r.c.

GROUP 3: Asphalt milling machine; Cable backhoe; Combination backhoe and loader over 3/4 cu. yds.; Continuous flight tie back machine assistant to engineer or mechanic; Crane mounted continuous flight tie back machine, tonnage to apply; Crane mounted drill attachment, tonnage to apply; Dozer, slope brd; Gradall; Hydraulic excavator, up to 3 1/2 cu. yds.; Loader 4 cu. yds. and over; Long reach excavator; Multiple engine scraper (when used as push pull); Power shovels, up to and including 1 cu. yd.; Pre-stress wire wrapping machine; Side boom cat, 572 or larger; Track loader 4 cu. yds. and over; Wheel excavator (up to and including 750 cu. yds. per hour)

GROUP 4: Asphalt plant engineer/box person; Chicago boom; Combination backhoe and loader up to and including 3/4 cu. yd.; Concrete batch plant (wet or dry); Dozer and/or push cat; Pull- type elevating loader; Gradesetter, grade checker (GPS, mechanical or otherwise); Grooving and grinding machine; Heading shield operator; Heavy-duty drilling equipment, Hughes, LDH, Watson 3000 or similar; Heavy-duty repairperson and/or welder; Lime spreader; Loader under 4 cu. yds.; Lubrication and service engineer (mobile and grease rack); Mechanical finishers or spreader machine (asphalt, Barber-Greene and similar); Miller Formless M-9000 slope paver or similar; Portable crushing and screening plants; Power blade support; Roller operator, asphalt; Rubber-tired scraper, self-loading (paddle-wheels, etc.); Rubber- tired earthmoving equipment (scrapers); Slip form paver (concrete); Small tractor with drag; Soil stabilizer (P & H or equal); Spider plow and spider puller; Tubex pile rig; Unlicensed constuction work boat operator,

on site; Timber skidder; Track loader up to 4 yds.; Tractor-drawn scraper; Tractor, compressor drill combination; Welder; Woods-Mixer (and other similar Pugmill equipment)

GROUP 5: Cast-in-place pipe laying machine; Combination slusher and motor operator; Concrete conveyor or concrete pump, truck or equipment mounted; Concrete conveyor, building site; Concrete pump or pumpcrete gun; Drilling equipment, Watson 2000, Texoma 700 or similar; Drilling and boring machinery, horizontal (not to apply to waterliners, wagon drills or jackhammers); Concrete mixer/all; Person and/or material hoist; Mechanical finishers (concrete) (Clary, Johnson, Bidwell Bridge Deck or similar types); Mechanical burm, curb and/or curb and gutter machine, concrete or asphalt); Mine or shaft hoist; Portable crusher; Power jumbo operator (setting slip-forms, etc., in tunnels); Screed (automatic or manual); Self-propelled compactor with dozer; Tractor with boom D6 or smaller; Trenching machine, maximum digging capacity over 5 ft. depth; Vermeer T-600B rock cutter or similar

GROUP 6: Armor-Coater (or similar); Ballast jack tamper; Boom- type backfilling machine; Assistant plant engineer; Bridge and/or gantry crane; Chemical grouting machine, truck-mounted; Chip spreading machine operator; Concrete saw (self-propelled unit on streets, highways, airports and canals); Deck engineer; Drilling equipment Texoma 600, Hughes 200 Series or similar up to and including 30 ft. m.r.c.; Drill doctor; Helicopter radio operator; Hydro-hammer or similar; Line master; Skidsteer loader, Bobcat larger than 743 series or similar (with attachments); Locomotive; Lull hi-lift or similar; Oiler, truck mounted equipment; Pavement breaker, truck-mounted, with compressor combination; Paving fabric installation and/or laying machine; Pipe bending machine (pipelines only); Pipe wrapping machine (tractor propelled and supported); Screed (except asphaltic concrete paving); Self- propelled pipeline wrapping machine; Soils & materials tester; Tractor; Self-loading chipper; Concrete barrier moving machine

GROUP 7: Ballast regulator; Boom truck or dual-purpose A-frame truck, non-rotating - under 15 tons; Truck-mounted rotating telescopic boom type lifting device, Manitex or similar (boom truck) - under 15 tons; Cary lift or similar; Combination slurry mixer and/or cleaner; Drilling equipment, 20 ft. and under m.r.c.; Firetender (hot plant); Grouting machine operator; Highline cableway signalperson; Stationary belt loader (Kolman or similar); Lift slab machine (Vagtborg and similar types); Maginnes internal full slab vibrator; Material hoist (1 drum); Mechanical trench shield; Pavement breaker with or without compressor combination); Pipe cleaning machine (tractor propelled and supported); Post driver; Roller (except asphalt); Chip Seal; Self-propelled automatically applied concrete curing mahcine (on streets, highways, airports and canals); Self-propelled compactor (without dozer); Signalperson; Slip-form pumps (lifting device for concrete forms); Tie spacer; Tower mobile; Trenching machine, maximum digging

capacity up to and including 5 ft. depth; Truck- type loader

GROUP 8: Bit sharpener; Boiler tender; Box operator; Brakeperson; Combination mixer and compressor (shotcrete/gunite); Compressor operator; Deckhand; Fire tender; Forklift (under 20 ft.); Generator; Gunite/shotcrete equipment operator; Hydraulic monitor; Ken seal machine (or similar); Mixermobile; Oiler; Pump operator; Refrigeration plant; Reservoir-debris tug (self-propelled floating); Ross Carrier (construction site); Rotomist operator; Self-propelled tape machine; Shuttlecar; Self-propelled power sweeper operator (includes vacuum sweeper); Slusher operator; Surface heater; Switchperson; Tar pot firetender; Tugger hoist, single drum; Vacuum cooling plant; Welding machine (powered other than by electricity)

GROUP 8-A: Elevator operator; Skidsteer loader-Bobcat 743 series or smaller, and similar (without attachments); Mini excavator under 25 H.P. (backhoe-trencher); Tub grinder wood chipper

---

ALL CRANES AND ATTACHMENTS

GROUP 1: Clamshell and dragline over 7 cu. yds.; Crane, over 100 tons; Derrick, over 100 tons; Derrick barge pedestal-mounted, over 100 tons; Self-propelled boom-type lifting device, over 100 tons

GROUP 2: Clamshell and dragline over 1 cu. yd. up to and including 7 cu. yds.; Crane, over 45 tons up to and including 100 tons; Derrick barge, 100 tons and under; Self-propelled boom-type lifting device, over 45 tons; Tower crane

GROUP 3: Clamshell and dragline up to and including 1 cu. yd.; Cranes 45 tons and under; Self-propelled boom-type lifting device 45 tons and under; Boom Truck or dual purpose A-frame truck, non-rotating over 15 tons; Truck-mounted rotating telescopic boom type lifting device, Manitex or similar (boom truck) over 15 tons;

PILEDRIVERS

GROUP 1: Derrick barge pedestal mounted over 100 tons; Clamshell over 7 cu. yds.; Self-propelled boom-type lifting device over 100 tons; Truck crane or crawler, land or barge mounted over 100 tons

GROUP 2: Derrick barge pedestal mounted 45 tons to and including 100 tons; Clamshell up to and including 7 cu. yds.; Self-propelled boom-type lifting device over 45 tons; Truck crane or crawler, land or barge mounted, over 45 tons up to and including 100 tons; Fundex F-12 hydraulic pile rig

GROUP 3: Derrick barge pedestal mounted under 45 tons; Self-

propelled boom-type lifting device 45 tons and under; Skid/scow piledriver, any tonnage; Truck crane or crawler, land or barge mounted 45 tons and under

GROUP 4: Assistant operator in lieu of assistant to engineer; Forklift, 10 tons and over; Heavy-duty repairperson/welder

GROUP 5: Deck engineer

GROUP 6: Deckhand; Fire tender

STEEL ERECTORS

GROUP 1: Crane over 100 tons; Derrick over 100 tons; Self-propelled boom-type lifting device over 100 tons

GROUP 2: Crane over 45 tons to 100 tons; Derrick under 100 tons; Self-propelled boom-type lifting device over 45 tons to 100 tons; Tower crane

GROUP 3: Crane, 45 tons and under; Self-propelled boom-type lifting device, 45 tons and under

GROUP 4: Chicago boom; Forklift, 10 tons and over; Heavy-duty repair person/welder

GROUP 5: Boom cat

TUNNEL AND UNDERGROUND WORK

GROUP 1-A: Tunnel bore machine operator, 20' diameter or more

GROUP 1: Heading shield operator; Heavy-duty repairperson; Mucking machine (rubber tired, rail or track type); Raised bore operator (tunnels); Tunnel mole bore operator

GROUP 2: Combination slusher and motor operator; Concrete pump or pumpcrete gun; Power jumbo operator

GROUP 3: Drill doctor; Mine or shaft hoist

GROUP 4: Combination slurry mixer cleaner; Grouting Machine operator; Motorman

GROUP 5: Bit Sharpener; Brakeman; Combination mixer and compressor (gunite); Compressor operator; Oiler; Pump operator; Slusher operator

---

AREA DESCRIPTIONS:

POWER EQUIPMENT OPERATORS, CRANES AND ATTACHMENTS,TUNNEL AND UNDERGROUND [These areas do not apply to Piledrivers and Steel Erectors]

AREA 1: ALAMEDA, BUTTE, CONTRA COSTA, KINGS, MARIN, MERCED, NAPA, SACRAMENTO, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, STANISLAUS, SUTTER, YOLO, AND YUBA COUNTIES

AREA 2 - MODOC COUNTY

THE REMAINING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW:

ALPINE COUNTY:
Area 1: Northernmost part
Area 2: Remainder

CALAVERAS COUNTY:
Area 1: Except Eastern part
Area 2: Eastern part

COLUSA COUNTY:
Area 1: Eastern part
Area 2: Remainder

DEL NORTE COUNTY:
Area 1: Extreme Southwestern corner
Area 2: Remainder

ELDORADO COUNTY:
Area 1: North Central part
Area 2: Remainder

FRESNO COUNTY
Area 1: Except Eastern part
Area 2: Eastern part

GLENN COUNTY:
Area 1: Eastern part
Area 2: Remainder

HUMBOLDT COUNTY:
Area 1: Except Eastern and Southwestern parts
Area 2: Remainder

LAKE COUNTY:
Area 1: Southern part
Area 2: Remainder

LASSEN COUNTY:
Area 1: Western part along the Southern portion of border with Shasta County
Area 2: Remainder

MADERA COUNTY
Area 1: Remainder
Area 2: Eastern part

MARIPOSA COUNTY
Area 1: Remainder
Area 2: Eastern part

MENDOCINO COUNTY:
Area 1: Central and Southeastern parts
Area 2: Remainder

MONTEREY COUNTY
Area 1: Remainder
Area 2: Southwestern part

NEVADA COUNTY:
Area 1: All but the Northern portion along the border of Sierra County
Area 2: Remainder

PLACER COUNTY:
Area 1: All but the Central portion
Area 2: Remainder

PLUMAS COUNTY:
Area 1: Western portion
Area 2: Remainder

SHASTA COUNTY:
Area 1: All but the Northeastern corner
Area 2: Remainder

SIERRA COUNTY:
Area 1: Western part
Area 2: Remainder

SISKIYOU COUNTY:
Area 1: Central part
Area 2: Remainder

SONOMA COUNTY:
Area 1: All but the Northwestern corner
Area 2: Reaminder

TEHAMA COUNTY:
Area 1: All but the Western border with mendocino & Trinity Counties
Area 2: Remainder

TRINITY COUNTY:
Area 1: East Central part and the Northeaster border with Shasta County
Area 2: Remainder

TULARE COUNTY;
Area 1: Remainder
Area 2: Eastern part

TUOLUMNE COUNTY:
Area 1: Remainder
Area 2: Eastern Part

ENGI0003-019 06/27/2011

SEE AREA DESCRIPTIONS BELOW

	Rates	Fringes

OPERATOR: Power Equipment
(LANDSCAPE WORK ONLY)

GROUP 1		
AREA 1	$ 28.64	19.96
AREA 2	$ 30.64	19.96
GROUP 2		
AREA 1	$ 25.04	19.96
AREA 2	$ 27.04	19.96
GROUP 3		
AREA 1	$ 20.43	19.96
AREA 2	$ 22.43	19.96

GROUP DESCRIPTIONS:

GROUP 1: Landscape Finish Grade Operator: All finish grade work regardless of equipment used, and all equipment with a rating more than 65 HP.

GROUP 2: Landscape Operator up to 65 HP: All equipment with a manufacturer's rating of 65 HP or less except equipment covered by Group 1 or Group 3. The following equipment shall be included except when used for finish work as long as manufacturer's rating is 65 HP or less: A-Frame and Winch Truck, Backhoe, Forklift, Hydragraphic Seeder Machine, Roller, Rubber-Tired and Track Earthmoving Equipment, Skiploader, Straw Blowers, and Trencher 31 HP up to 65 HP.

GROUP 3: Landscae Utility Operator: Small Rubber-Tired Tractor, Trencher Under 31 HP.

AREA DESCRIPTIONS:

AREA 1: ALAMEDA, BUTTE, CONTRA COSTA, KINGS, MARIN, MERCED, NAPA, SACRAMENTO, SAN BENITO, SAN FRANCISCO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, SOLANO, STANISLAUS, SUTTER, YOLO, AND YUBA COUNTIES

AREA 2 - MODOC COUNTY

THE REMAINING COUNTIES ARE SPLIT BETWEEN AREA 1 AND AREA 2 AS NOTED BELOW:

ALPINE COUNTY:
Area 1: Northernmost part
Area 2: Remainder

CALAVERAS COUNTY:
Area 1: Except Eastern part
Area 2: Eastern part

COLUSA COUNTY:
Area 1: Eastern part
Area 2: Remainder

DEL NORTE COUNTY:
Area 1: Extreme Southwestern corner
Area 2: Remainder

ELDORADO COUNTY:
Area 1: North Central part
Area 2: Remainder

FRESNO COUNTY
Area 1: Except Eastern part
Area 2: Eastern part

GLENN COUNTY:
Area 1: Eastern part
Area 2: Remainder

HUMBOLDT COUNTY:
Area 1: Except Eastern and Southwestern parts
Area 2: Remainder

LAKE COUNTY:
Area 1: Southern part
Area 2: Remainder

LASSEN COUNTY:
Area 1: Western part along the Southern portion of border with Shasta County
Area 2: Remainder

MADERA COUNTY
Area 1: Remainder
Area 2: Eastern part

MARIPOSA COUNTY
Area 1: Remainder
Area 2: Eastern part

MENDOCINO COUNTY:
Area 1: Central and Southeastern parts
Area 2: Remainder

MONTEREY COUNTY
Area 1: Remainder
Area 2: Southwestern part

NEVADA COUNTY:
Area 1: All but the Northern portion along the border of Sierra County
Area 2: Remainder

PLACER COUNTY:
Area 1: All but the Central portion
Area 2: Remainder

PLUMAS COUNTY:
Area 1: Western portion
Area 2: Remainder

SHASTA COUNTY:
Area 1: All but the Northeastern corner
Area 2: Remainder

SIERRA COUNTY:
Area 1: Western part

Area 2: Remainder

SISKIYOU COUNTY:
Area 1: Central part
Area 2: Remainder

SONOMA COUNTY:
Area 1: All but the Northwestern corner
Area 2: Reaminder

TEHAMA COUNTY:
Area 1: All but the Western border with mendocino & Trinity Counties
Area 2: Remainder

TRINITY COUNTY:
Area 1: East Central part and the Northeaster border with Shasta County
Area 2: Remainder

TULARE COUNTY;
Area 1: Remainder
Area 2: Eastern part

TUOLUMNE COUNTY:
Area 1: Remainder
Area 2: Eastern Part

IRON0002-004 07/01/2010

	Rates	Fringes
Ironworkers:		
Fence Erector	$ 26.58	15.26
Ornamental, Reinforcing and Structural	$ 33.00	23.73

PREMIUM PAY:

$6.00 additional per hour at the following locations:

China Lake Naval Test Station, Chocolate Mountains Naval Reserve-Niland,
Edwards AFB, Fort Irwin Military Station, Fort Irwin Training Center-Goldstone, San Clemente Island, San Nicholas Island, Susanville Federal Prison, 29 Palms - Marine Corps, U.S. Marine Base - Barstow, U.S. Naval Air Facility - Sealey, Vandenberg AFB

$4.00 additional per hour at the following locations:

Army Defense Language Institute - Monterey, Fallon Air Base, Naval Post Graduate School - Monterey, Yermo Marine Corps Logistics Center

$2.00 additional per hour at the following locations:

Port Hueneme, Port Mugu, U.S. Coast Guard Station - Two Rock

LABO0036-001 07/01/2007

SAN FRANCISCO AND SAN MATEO COUNTIES:

	Rates	Fringes
MASON TENDER, BRICK	$ 26.93	16.50

FOOTNOTES: Underground work such as sewers, manholes, catch basins, sewer pipes, telephone conduits, tunnels and cut trenches: $5.00 per day additional. Work in live sewage: $2.50 per day additional.

LABO0036-002 07/01/2007

SAN FRANCISCO AND SAN MATEO COUNTIES:

	Rates	Fringes
PLASTER TENDER	$ 26.48	16.23

FOOTNOTES: Work on a suspended scaffold: $5.00 per day additional. Work operating a plaster mixer pump gun: $1.00 per hour additional.

LABO0067-002 04/01/2010

AREA "A" - ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO AND SANTA CLARA COUNTIES

AREA "B" - ALPINE, AMADOR, BUTTE, CALAVERAS, COLUSA, DEL NORTE, EL DORADO, FRESNO, GLENN, HUMBOLDT, KINGS, LAKE, LASSEN, MADERA, MARIPOSA, MENDOCINO, MERCED, MODOC, MONTEREY, NAPA, NEVADA, PLACER, PLUMAS, SACRAMENTO, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, SHASTA, SIERRA, SISKIYOU, SOLANO, SONOMA, STANISLAUS, SUTTER, TEHAMA, TRINITY, TULARE, TUOLUMNE, YOLO AND YUBA COUNTIES

	Rates	Fringes
Asbestos Removal Laborer		
Areas A & B	$ 18.68	5.88
LABORER (Lead Removal)		
Area A	$ 36.25	5.94
Area B	$ 35.25	5.94

ASBESTOS REMOVAL-SCOPE OF WORK: Site mobilization; initial site clean-up; site preparation; removal of asbestos-containing materials from walls and ceilings; or from pipes, boilers and mechanical systems only if they are being scrapped; encapsulation, enclosure and disposal of asbestos-containing materials by hand or with equipment or machinery; scaffolding; fabrication of temporary wooden barriers; and assembly of decontamination stations.

LABO0067-003 07/01/2009

AREA A: ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO & SANTA CLARA

AREA B: ALPINE, AMADOR, BUTTE, CALAVERAS, COLUSA, DEL NORTE, EL DORADO, FRESNO, GLENN, HUMBOLDT, KINGS, LAKE, LASSEN, MADERA, MARIPOSA, MENOCINO, MERCED, MODOC, MONTEREY, NAPA, NEVADA, PLACER, PLUMAS, SANCRMENTO, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, SIERRA, SHASTA, SISKIYOU, SOLANO, SONOMA, STANISLAUS,TEHAMA,TRINITY, TULARE, TUOLUMNE, YOLO & YUBA COUNTIES

	Rates	Fringes
LABORER (TRAFFIC CONTROL/LANE CLOSURE)		
Escort Driver, Flag Person		
Area A	$ 26.89	14.93
Area B	$ 25.89	14.93
Traffic Control Person I		
Area A	$ 27.19	14.93
Area B	$ 26.19	14.93
Traffic Control Person II		
Area A	$ 24.69	14.93
Area B	$ 23.69	14.93

TRAFFIC CONTROL PERSON I: Layout of traffic control, crash cushions, construction area and roadside signage.

TRAFFIC CONTROL PERSON II: Installation and removal of temporary/permanent signs, markers, delineators and crash cushions.

LABO0067-006 06/28/2010

AREA "A" - ALAMEDA, CONTRA COSTA, MARIN, SAN FRANCISCO, SAN MATEO AND SANTA CLARA COUNTIES

AREA "B" - ALPINE, AMADOR, BUTTE, CALAVERAS, COLUSA, EL DORADO, FRESNO, GLENN, KINGS, LASSEN, MADERA, MARIPOSA, MERCED, MODOC, MONTEREY, NAPA, NEVADA, PLACER, PLUMAS, SACRAMENTO, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, SHASTA, SIERRA, SISKIYOU, SOLANO, SONOMA, STANISLAUS, SUTTER, TEHAMA, TRINITY, TULARE, TUOLUMNE, YOLO AND YUBA COUNTIES

	Rates	Fringes
Laborers: (CONSTRUCTION CRAFT LABORERS - AREA A:)		
Construction Specialist Group	$ 27.84	15.82
GROUP 1	$ 27.14	15.82
GROUP 1-a	$ 27.36	15.82
GROUP 1-c	$ 27.19	15.82
GROUP 1-e	$ 27.69	15.82
GROUP 1-f	$ 27.72	15.82
GROUP 1-g (Contra Costa County)	$ 27.34	15.82
GROUP 2	$ 26.99	15.82
GROUP 3	$ 26.89	15.82
GROUP 4	$ 20.58	15.82

See groups 1-b and 1-d under laborer classifications.

Laborers: (CONSTRUCTION CRAFT
LABORERS - AREA B:)
Construction Specialist
Group.....$ 26.84 15.82
GROUP 1.....$ 26.14 15.82
GROUP 1-a.....$ 26.36 15.82
GROUP 1-c.....$ 26.19 15.82
GROUP 1-e.....$ 26.69 15.82
GROUP 1-f.....$ 26.72 15.82
GROUP 2.....$ 25.99 15.82
GROUP 3.....$ 25.89 15.82
GROUP 4.....$ 19.58 15.82
See groups 1-b and 1-d under laborer classifications.
Laborers: (GUNITE - AREA A:)
GROUP 1.....$ 28.10 15.82
GROUP 2.....$ 27.60 15.82
GROUP 3.....$ 27.60 15.82
GROUP 4.....$ 27.60 15.82
Laborers: (GUNITE - AREA B:)
GROUP 1.....$ 27.10 15.82
GROUP 2.....$ 26.60 15.82
GROUP 3.....$ 26.01 15.82
GROUP 4.....$ 25.89 15.82
Laborers: (WRECKING - AREA A:)
GROUP 1.....$ 27.14 15.82
GROUP 2.....$ 26.99 15.82
Laborers: (WRECKING - AREA B:)
GROUP 1.....$ 26.14 15.82
GROUP 2.....$ 25.99 15.82
Landscape Laborer (GARDENERS,
HORTICULTURAL & LANDSCAPE
LABORERS - AREA A:)
(1) New Construction.....$ 26.89 15.82
(2) Establishment Warranty
Period.....$ 20.58 15.82
Landscape Laborer (GARDENERS,
HORTICULURAL & LANDSCAPE
LABORERS - AREA B:)
(1) New Construction.....$ 25.89 15.82
(2) Establishment Warranty
Period.....$ 19.58 15.82

FOOTNOTES:
Laborers working off or with or from bos'n chairs, swinging scaffolds, belts shall receive $0.25 per hour above the applicable wage rate. This shall not apply to workers entitled to receive the wage rate set forth in Group 1-a below.

LABORER CLASSIFICATIONS

CONSTRUCTION SPECIALIST GROUP: Asphalt ironer and raker; Chainsaw; Laser beam in connection with laborers' work; Cast-in- place manhole form setter; Pressure pipelayer; Davis trencher - 300 or similar type (and all small trenchers); Blaster; Diamond driller; Multiple unit drill; Hydraulic drill

GROUP 1: Asphalt spreader boxes (all types); Barko, Wacker and similar type tampers; Buggymobile; Caulker, bander, pipewrapper, conduit layer, plastic pipelayer; Certified hazardous waste worker including Leade Abatement; Compactors of all types; Concrete and magnesite mixer, 1/2 yd. and under; Concrete pan work; Concrete sander; Concrete saw; Cribber and/or shoring; Cut granite curb setter; Dri-pak-it machine; Faller, logloader and bucker; Form raiser, slip forms; Green cutter; Headerboard, Hubsetter, aligner, by any method; High pressure blow pipe (1-1/2" or over, 100 lbs. pressure/over); Hydro seeder and similar type; Jackhammer operator; Jacking of pipe over 12 inches; Jackson and similar type compactor; Kettle tender, pot and worker applying asphalt, lay-kold, creosote, lime, caustic and similar type materials (applying means applying, dipping or handling of such materials); Lagging, sheeting, whaling, bracing, trenchjacking, lagging hammer; Magnesite, epoxyresin, fiberglass, mastic worker (wet or dry); No joint pipe and stripping of same, including repair of voids; Pavement breaker and spader, including tool grinder; Perma curb; Pipelayer (including grade checking in connection with pipelaying); Precast-manhole setter; Pressure pipe tester; Post hole digger, air, gas and electric; Power broom sweeper; Power tampers of all types (except as shown in Group 2); Ram set gun and stud gun; Riprap stonepaver and rock-slinger, including placing of sacked concrete and/or sand (wet or dry) and gabions and similar type; Rotary scarifier or multiple head concrete chipping scarifier; Roto and Ditch Witch; Rototiller; Sandblaster, pot, gun, nozzle operators; Signalling and rigging; Tank cleaner; Tree climber; Turbo blaster; Vibrascreed, bull float in connection with laborers' work; Vibrator; Hazardous waste worker (lead removal); Asbestos and mold removal worker

GROUP 1-a: Joy drill model TWM-2A; Gardner-Denver model DH143 and similar type drills; Track driller; Jack leg driller; Wagon driller; Mechanical drillers, all types regardless of type or method of power; Mechanical pipe layers, all types regardless of type or method of power; Blaster and powder; All work of loading, placing and blasting of all powder and explosives of whatever type regardless of method used for such loading and placing; High scalers (including drilling of same); Tree topper; Bit grinder

GROUP 1-b: Sewer cleaners shall receive $4.00 per day above Group 1 wage rates. "Sewer cleaner" means any worker who handles or comes in contact with raw sewage in small diameter sewers. Those who work inside recently active, large diameter sewers, and all recently active sewer manholes shal receive $5.00 per day above Group 1 wage rates.

GROUP 1-c: Burning and welding in connection with laborers' work; Synthetic thermoplastics and similar type welding

GROUP 1-d: Maintenance and repair track and road beds. All employees performing work covered herein shall receive $ .25 per hour above their regular rate for all work

performed on underground structures not specifically covered herein. This paragraph shall not be construed to apply to work below ground level in open cut. It shall apply to cut and cover work of subway construction after the temporary cover has been placed.

GROUP 1-e: Work on and/or in bell hole footings and shafts thereof, and work on and in deep footings. (A deep footing is a hole 15 feet or more in depth.) In the event the depth of the footing is unknown at the commencement of excavation, and the final depth exceeds 15 feet, the deep footing wage rate would apply to all employees for each and every day worked on or in the excavation of the footing from the date of inception.

GROUP 1-f: Wire winding machine in connection with guniting or shot crete

GROUP 1-g, CONTRA COSTA COUNTY: Pipelayer (including grade checking in connection with pipelaying); Caulker; Bander; Pipewrapper; Conduit layer; Plastic pipe layer; Pressure pipe tester; No joint pipe and stripping of same, including repair of voids; Precast manhole setters, cast in place manhole form setters

GROUP 2: Asphalt shoveler; Cement dumper and handling dry cement or gypsum; Choke-setter and rigger (clearing work); Concrete bucket dumper and chute; Concrete chipping and grinding; Concrete laborer (wet or dry); Driller tender, chuck tender, nipper; Guinea chaser (stake), grout crew; High pressure nozzle, adductor; Hydraulic monitor (over 100 lbs. pressure); Loading and unloading, carrying and hauling of all rods and materials for use in reinforcing concrete construction; Pittsburgh chipper and similar type brush shredders; Sloper; Single foot, hand-held, pneumatic tamper; All pneumatic, air, gas and electric tools not listed in Groups 1 through 1-f; Jacking of pipe - under 12 inches

GROUP 3: Construction laborers, including bridge and general laborer; Dump, load spotter; Flag person; Fire watcher; Fence erector; Guardrail erector; Gardener, horticultural and landscape laborer; Jetting; Limber, brush loader and piler; Pavement marker (button setter); Maintenance, repair track and road beds; Streetcar and railroad construction track laborer; Temporary air and water lines, Victaulic or similar; Tool room attendant (jobsite only)

GROUP 4: Final clean-up work of debris, grounds and building including but not limited to: street cleaner; cleaning and washing windows; brick cleaner (jobsite only); material cleaner (jobsite only). The classification "material cleaner" is to be utilized under the following conditions:
A: at demolition site for the salvage of the material.
B: at the conclusion of a job where the material is to be salvaged and stocked to be reused on another job.
C: for the cleaning of salvage material at the jobsite or temporary jobsite yard.

The material cleaner classification should not be used in

the performance of "form stripping, cleaning and oiling and moving to the next point of erection".

GUNITE LABORER CLASSIFICATIONS

GROUP 1: Structural Nozzleman

GROUP 2: Nozzleman, Gunman, Potman, Groundman

GROUP 3: Reboundman

GROUP 4: Gunite laborer

WRECKING WORK LABORER CLASSIFICATIONS

GROUP 1: Skilled wrecker (removing and salvaging of sash, windows and materials)

GROUP 2: Semi-skilled wrecker (salvaging of other building materials)

LABO0067-010 07/01/2010

	Rates	Fringes
Tunnel and Shaft Laborers:		
GROUP 1	$ 33.35	16.08
GROUP 2	$ 33.12	16.08
GROUP 3	$ 32.87	16.08
GROUP 4	$ 32.42	16.08
GROUP 5	$ 31.88	16.08
Shotcrete Specialist	$ 33.87	16.08

TUNNEL AND SHAFT CLASSIFICATIONS

GROUP 1: Diamond driller; Groundmen; Gunite and shotcrete nozzlemen

GROUP 2: Rodmen; Shaft work & raise (below actual or excavated ground level)

GROUP 3: Bit grinder; Blaster, driller, powdermen, heading; Cherry pickermen - where car is lifted; Concrete finisher in tunnel; Concrete screedman; Grout pumpman and potman; Gunite & shotcrete gunman & potman; Headermen; High pressure nozzleman; Miner - tunnel, including top and bottom man on shaft and raise work; Nipper; Nozzleman on slick line; Sandblaster - potman, Robotic Shotcrete Placer, Segment Erector, Tunnel Muck Hauler, Steel Form raiser and setter; Timberman, retimberman (wood or steel or substitute materials therefore); Tugger (for tunnel laborer work); Cable tender; Chuck tender; Powderman - primer house

GROUP 4: Vibrator operator, pavement breaker; Bull gang - muckers, trackmen; Concrete crew - includes rodding and spreading, Dumpmen (any method)

GROUP 5: Grout crew; Reboundman; Swamper/ Brakeman

LABO0073-003 07/01/2009

CALAVERAS, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
LABORER		
Mason Tender-Brick	$ 27.03	14.93

LABO0073-005 07/01/2009

CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS & TUOLUMNE

	Rates	Fringes
Plasterer tender	$ 28.37	14.14

LABO0166-001 07/01/2006

ALAMEDA AND CONTRA COSTA COUNTIES:

	Rates	Fringes
Brick Tender	$ 25.91	14.65

FOOTNOTES: Work on jobs where heat-protective clothing is required: $2.00 per hour additional. Work at grinders: $.25 per hour additional. Manhole work: $2.00 per day additional.

LABO0166-002 07/01/2006

ALAMEDA AND CONTRA COSTA COUNTIES:

	Rates	Fringes
Plasterer tender	$ 30.15	15.90

Gun Man $0.75 per hour additional

LABO0270-001 07/01/2008

SANTA CLARA & SANTA CRUZ COUNTIES

	Rates	Fringes
MASON TENDER, BRICK		
Santa Clara	$ 27.93	13.48
Santa Cruz	$ 26.93	13.48

FOOTNOTE: $2.00 per hour for refactory work where heat-protective clothing is required.

LABO0270-005 07/01/2007

SANTA CLARA AND SANTA CRUZ COUNTIES

	Rates	Fringes
PLASTER TENDER		
4 Stories and under	$ 27.62	13.73
5 Stories and above	$ 29.54	13.73

LABO0294-001 07/01/2009

FRESNO, KINGS AND MADERA COUNTIES

	Rates	Fringes
LABORER (Brick)		
Mason Tender-Brick	$ 27.03	14.93

LABO0297-001 08/01/2007

MONTEREY AND SAN BENITO COUNTIES

	Rates	Fringes
Plasterer tender	$ 23.70	11.50

FOOTNOTE: Mixer person: $4.00 per day additional.

PAIN0016-001 06/01/2011

ALAMEDA, CONTRA COSTA, MONTEREY, SAN BENITO, SAN MATEO, SANTA CLARA, AND SANTA CRUZ COUNTIES

	Rates	Fringes
Painters:	$ 32.71	19.16

PREMIUMS:

EXOTIC MATERIALS - $0.75 additional per hour.
SPRAY WORK: - $0.50 additional per hour.
INDUSTRIAL PAINTING - $0.25 additional per hour
  [Work on industrial buildings used for the manufacture and processing of goods for sale or service; steel construction (bridges), stacks, towers, tanks, and similar structures]

HIGH WORK:
over 50 feet - $2.00 per hour additional
100 to 180 feet - $4.00 per hour additional
Over 180 feet - $6.00 per houir additional

PAIN0016-003 07/01/2011

AREA 1: ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO & SANTA CLARA COUNTIES

AREA 2: CALAVERAS, MARIPOA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SANTA CRUZ, STANISLAUS & TUOLUMNE COUNTIES

	Rates	Fringes
Drywall Finisher/Taper		
AREA 1	$ 40.37	19.47
AREA 2	$ 36.24	18.07

PAIN0016-012 07/01/2011

ALAMEDA, CONTRA COSTA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA AND SANTA CRUZ COUNTIES

	Rates	Fringes
SOFT FLOOR LAYER	$ 44.87	17.11

PAIN0016-015 01/01/2011

CALAVERAS, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS & TUOLUMNE COUNTIES

	Rates	Fringes
PAINTER	$ 27.78	15.27
Brush	$ 29.82	12.72

FOOTNOTES:
SPRAY/SANDBLAST: $0.50 additional per hour.
EXOTIC MATERIALS: $1.00 additional per hour.
HIGH TIME: Over 50 ft above ground or water level $2.00 additional per hour. 100 to 180 ft above ground or water level $4.00 additional per hour. Over 180 ft above ground or water level $6.00 additional per hour.

PAIN0016-022 06/01/2011

SAN FRANCISCO COUNTY

	Rates	Fringes
PAINTER	$ 36.33	19.16

PAIN0169-001 07/01/2011

FRESNO, KINGS, MADERA, MARIPOSA AND MERCED COUNTIES:

	Rates	Fringes
GLAZIER	$ 27.07	9.98

PAIN0169-005 07/01/2011

ALAMEDA CONTRA COSTA, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA & SANTA CRUZ COUNTIES

	Rates	Fringes

GLAZIER.....$ 41.88 18.49

PAIN0294-004 07/01/2011

FRESNO, KINGS AND MADERA COUNTIES

	Rates	Fringes
PAINTER		
Brush, Roller	$ 25.67	14.57
Drywall Finisher/Taper	$ 30.47	15.57

FOOTNOTE:
Spray Painters & Paperhangers recive $1.00 additional per hour. Painters doing Drywall Patching receive $1.25 additional per hour. Lead Abaters & Sandblasters receive $1.50 additional per hour. High Time - over 30 feet (does not include work from a lift) $0.75 per hour additional.

PAIN0294-005 01/01/2011

FRESNO, KINGS & MADERA

	Rates	Fringes
SOFT FLOOR LAYER	$ 27.83	14.33

PAIN0767-001 07/01/2011

CALAVERAS, SAN JOAQUIN, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
GLAZIER	$ 32.24	20.79

PAID HOLIDAYS: New Year's Day, Martin Luther King, Jr. Day, President's Day, Memorial Day, Independence Day, Labor Day, Veteran's Day, Thanksgiving Day, and Christmas Day.

Employee rquired to wear a body harness shall receive $1.50 per hour above the basic hourly rate at any elevation.

PAIN1176-001 07/01/2011

HIGHWAY IMPR0VEMENT

	Rates	Fringes
Parking Lot Striping/Highway Marking:		
GROUP 1	$ 31.35	11.65
GROUP 2	$ 26.65	11.65
GROUP 3	$ 26.96	11.65

CLASSIFICATIONS

GROUP 1: Striper: Layout and application of painted traffic stripes and marking; hot thermo plastic; tape, traffic stripes and markings

GROUP 2: Gamecourt & Playground Installer

GROUP 3: Protective Coating, Pavement Sealing

PAIN1237-003 07/01/2011

CALAVERAS; SAN JOAQUIN COUNTIES; STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
SOFT FLOOR LAYER	$ 28.25	16.42

PLAS0066-002 08/01/2011

ALAMEDA, CONTRA COSTA, SAN MATEO AND SAN FRANCISCO COUNTIES:

	Rates	Fringes
PLASTERER	$ 33.13	24.64

PLAS0300-001 07/01/2009

	Rates	Fringes
PLASTERER		
AREA 188: Fresno	$ 29.72	14.21
AREA 224: San Benito, Santa Clara, Santa Cruz	$ 34.22	14.08
AREA 295: Calaveras & San Joaquin Couonties	$ 32.82	15.10
AREA 337: Monterey County	$ 31.01	13.93
AREA 429: Mariposa, Merced, Stanislaus, Tuolumne Counties	$ 32.82	15.30

PLAS0300-005 06/28/2010

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 28.65	18.56

PLUM0038-001 07/01/2011

SAN FRANCISCO COUNTY

	Rates	Fringes
PLUMBER (Plumber, Steamfitter, Refrigeration Fitter)	$ 57.75	39.74

PLUM0038-005 07/01/2011

SAN FRANCISCO COUNTY

	Rates	Fringes
Landscape/Irrigation Fitter		

(Underground/Utility Fitter).....$ 46.96 28.85

PLUM0062-001 01/01/2012

MONTEREY AND SANTA CRUZ COUNTIES

	Rates	Fringes
PLUMBER & STEAMFITTER.....	$ 40.55	23.07

PLUM0159-001 01/01/2012

CONTRA COSTA COUNTY

	Rates	Fringes
Plumber and steamfitter		
(1) Refrigeration.....	$ 49.33	27.94
(2) All other work.....	$ 28.14	27.64

PLUM0246-001 01/01/2012

FRESNO, KINGS & MADERA COUNTIES

	Rates	Fringes
PLUMBER & STEAMFITTER.....	$ 35.45	23.32

PLUM0246-004 01/01/2012

FRESNO, MERCED & SAN JOAQUIN COUNIES

	Rates	Fringes
PLUMBER (PIPE TRADESMAN).....	$ 13.00	9.23

PIPE TRADESMAN SCOPE OF WORK:
Installation of corrugated metal piping for drainage, as well as installation of corrugated metal piping for culverts in connection with storm sewers and drains; Grouting, dry packing and diapering of joints, holes or chases including paving over joints, in piping; Temporary piping for dirt work for building site preparation; Operating jack hammers, pavement breakers, chipping guns, concrete saws and spades to cut holes, chases and channels for piping systems; Digging, grading, backfilling and ground preparation for all types of pipe to all points of the jobsite; Ground preparation including ground leveling, layout and planting of shrubbery, trees and ground cover, including watering, mowing, edging, pruning and fertilizing, the breaking of concrete, digging, backfilling and tamping for the preparation and completion of all work in connection with lawn sprinkler and landscaping; Loading, unloading and distributing materials at jobsite; Putting away materials in storage bins in jobsite secure storage area; Demolition of piping and fixtures for remodeling and additions; Setting up and tearing down work benches, ladders and job shacks; Clean-up and sweeping of jobsite; Pipe wrapping and waterproofing where tar or similar material is applied for protection of buried piping; Flagman

---

PLUM0342-001 07/01/2011

ALAMEDA & CONTRA COSTA COUNTIES

	Rates	Fringes
PIPEFITTER		
CONTRA COSTA COUNTY	$ 51.21	29.79
PLUMBER, PIPEFITTER, STEAMFITTER		
ALAMEDA COUNTY	$ 51.21	29.79

PLUM0355-004 07/01/2011

ALAMEDA, CALAVERAS, CONTRA COSTA, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY, SAN BENITO, SAN JOAQUIN, SAN MATEO, SANTA CLARA, SANTA CRUZ, STANISLAUS, AND TUOLUMNE COUNTIES:

	Rates	Fringes
Underground Utility Worker /Landscape Fitter	$ 28.20	7.65

PLUM0393-001 07/01/2011

SAN BENITO AND SANTA CLARA COUNTIES

	Rates	Fringes
PLUMBER/PIPEFITTER	$ 53.66	25.83

PLUM0442-001 01/01/2012

CALAVERAS, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS & TUOLUMNE COUNTIES

	Rates	Fringes
PLUMBER & STEAMFITTER	$ 35.95	23.17

PLUM0467-001 01/01/2012

SAN MATEO COUNTY

	Rates	Fringes
Plumber/Pipefitter/Steamfitter...	$ 53.90	27.31

ROOF0027-002 09/01/2010

FRESNO, KINGS, AND MADERA COUNTIES

	Rates	Fringes
ROOFER	$ 27.65	8.07

FOOTNOTE: Work with pitch, pitch base of pitch impregnated

products or any material containing coal tar pitch, on any building old or new, where both asphalt and pitchers are used in the application of a built-up roof or tear off: $2.00 per hour additional.

ROOF0040-002 08/01/2010

SAN FRANCISCO & SAN MATEO COUNTIES:

	Rates	Fringes
ROOFER	$ 33.33	11.04

ROOF0081-001 08/01/2010

ALAMEDA AND CONTRA COSTA COUNTIES:

	Rates	Fringes
Roofer	$ 34.06	9.54

ROOF0081-004 08/01/2011

CALAVERAS, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
ROOFER	$ 28.49	10.75

ROOF0095-002 08/01/2011

MONTEREY, SAN BENITO, SANTA CLARA, AND SANTA CRUZ COUNTIES:

	Rates	Fringes
ROOFER		
Journeyman	$ 35.58	10.90
Kettle person (2 kettles); Bitumastic, Enameler, Coal Tar, Pitch and Mastic worker	$ 35.58	10.90
Kettleman (2 kettles), Bitumastic Enameler, Coal Tar, Pitch & Mastic	$ 33.73	9.89

SFCA0483-001 08/01/2011

ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO AND SANTA CLARA COUNTIES:

	Rates	Fringes
SPRINKLER FITTER (FIRE)	$ 50.59	23.70

SFCA0669-011 04/01/2011

CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, MONTEREY,

SAN BENITO, SAN JOAQUIN, SANTA CRUZ, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
SPRINKLER FITTER	$ 33.35	17.75

SHEE0104-001 01/01/2012

AREA 1: ALAMEDA, CONTRA COSTA, SAN FRANCISCO, SAN MATEO, SANTA CLARA

AREA 2: MONTEREY & SAN BENITO

AREA 3: SANTA CRUZ

	Rates	Fringes
SHEET METAL WORKER		
AREA 1:		
Mechanical Contracts under $200,000	$ 44.47	31.25
All Other Work	$ 48.85	31.55
AREA 2	$ 38.00	28.21
AREA 3	$ 40.15	26.06

SHEE0104-015 07/01/2011

ALAMEDA, CONTRA COSTA, MONTEREY, SAN BENITO, SAN FRANCISCO, SAN MATEO, SANTA CLARA AND SANTA CRUZ COUNTIES:

	Rates	Fringes
SHEET METAL WORKER (Metal Decking and Siding only)	$ 32.43	28.66

SHEE0162-001 07/01/2011

CALAVERAS AND SAN JOAQUIN COUNTIES:

	Rates	Fringes
SHEET METAL WORKER	$ 33.71	22.79

SHEE0162-003 07/01/2011

MARIPOSA, MERCED, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
SHEET METAL WORKER (Excluding metal deck and siding)	$ 34.64	24.91

SHEE0162-004 07/01/2011

FRESNO, KINGS, AND MADERA COUNTIES:

	Rates	Fringes
SHEET METAL WORKER	$ 34.32	25.50

SHEE0162-013 07/01/2011

CALAVERAS, FRESNO, KINGS, MADERA, MARIPOSA, MERCED, SAN JOAQUIN, STANISLAUS AND TUOLUMNE COUNTIES:

	Rates	Fringes
Sheet metal worker (Metal decking and siding only)	$ 34.31	26.78

TEAM0094-001 07/01/2009

	Rates	Fringes
Truck drivers:		
GROUP 1	$ 27.13	18.99
GROUP 2	$ 27.43	18.99
GROUP 3	$ 27.73	18.99
GROUP 4	$ 28.08	18.99
GROUP 5	$ 28.43	18.99

FOOTNOTES:

Articulated dump truck; Bulk cement spreader (with or without auger); Dumpcrete truck; Skid truck (debris box); Dry pre-batch concrete mix trucks; Dumpster or similar type; Slurry truck: Use dump truck yardage rate.

Heater planer; Asphalt burner; Scarifier burner; Industrial lift truck (mechanical tailgate); Utility and clean-up truck: Use appropriate rate for the power unit or the equipment utilized.

TRUCK DRIVER CLASSIFICATIONS

GROUP 1: Dump trucks, under 6 yds.; Single unit flat rack (2-axle unit); Nipper truck (when flat rack truck is used appropriate flat rack shall apply); Concrete pump truck (when flat rack truck is used appropriate flat rack shall apply); Concrete pump machine; Fork lift and lift jitneys; Fuel and/or grease truck driver or fuel person; Snow buggy; Steam cleaning; Bus or personhaul driver; Escort or pilot car driver; Pickup truck; Teamster oiler/greaser and/or serviceperson; Hook tender (including loading and unloading); Team driver; Tool room attendant (refineries)

GROUP 2: Dump trucks, 6 yds. and under 8 yds.; Transit mixers, through 10 yds.; Water trucks, under 7,000 gals.; Jetting trucks, under 7,000 gals.; Single-unit flat rack (3-axle unit); Highbed heavy duty transport; Scissor truck; Rubber-tired muck car (not self-loaded); Rubber-tired truck jumbo; Winch truck and "A" frame drivers; Combination winch truck with hoist; Road oil truck or bootperson; Buggymobile; Ross, Hyster and similar straddle carriers; Small rubber-tired tractor

GROUP 3: Dump trucks, 8 yds. and including 24 yds.; Transit mixers, over 10 yds.; Water trucks, 7,000 gals. and over; Jetting trucks, 7,000 gals. and over; Vacuum trucks under 7500 gals. Trucks towing tilt bed or flat bed pull trailers; Lowbed heavy duty transport; Heavy duty transport tiller person; Self- propelled street sweeper with self-contained refuse bin; Boom truck - hydro-lift or Swedish type extension or retracting crane; P.B. or similar type self-loading truck; Tire repairperson; Combination bootperson and road oiler; Dry distribution truck (A bootperson when employed on such equipment, shall receive the rate specified for the classification of road oil trucks or bootperson); Ammonia nitrate distributor, driver and mixer; Snow Go and/or plow

GROUP 4: Dump trucks, over 25 yds. and under 65 yds.; Water pulls - DW 10's, 20's, 21's and other similar equipment when pulling Aqua/pak or water tank trailers; Helicopter pilots (when transporting men and materials); Lowbedk Heavy Duty Transport up to including 7 axles; DW10's, 20's, 21's and other similar Cat type, Terra Cobra, LeTourneau Pulls, Tournorocker, Euclid and similar type equipment when pulling fuel and/or grease tank trailers or other miscellaneous trailers; Vacuum Trucks 7500 gals and over and truck repairman

GROUP 5: Dump trucks, 65 yds. and over; Holland hauler; Low bed Heavy Duty Transport over 7 axles

---

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

==========

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (ii)).

The body of each wage determination lists the classification and wage rates that have been found to be prevailing for the cited type(s) of construction in the area covered by the wage determination. The classifications are listed in alphabetical order of "identifiers" that indicate whether the particular rate is union or non-union.

Union Identifiers

An identifier enclosed in dotted lines beginning with characters other than "SU" denotes that the union classification and rate have found to be prevailing for that classification. Example: PLUM0198-005 07/01/2011. The first four letters , PLUM, indicate the international union and the four-digit number, 0198, that follows indicates the local

union number or district council number where applicable , i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2011, following these characters is the effective date of the most current negotiated rate/collective bargaining agreement which would be July 1, 2011 in the above example.

Union prevailing wage rates will be updated to reflect any changes in the collective bargaining agreements governing the rate.

Non-Union Identifiers

Classifications listed under an "SU" identifier were derived from survey data by computing average rates and are not union rates; however, the data used in computing these rates may include both union and non-union data. Example: SULA2004-007 5/13/2010. SU indicates the rates are not union rates, LA indicates the State of Louisiana; 2004 is the year of the survey; and 007 is an internal number used in producing the wage determination. A 1993 or later date, 5/13/2010, indicates the classifications and rates under that identifier were issued as a General Wage Determination on that date.

Survey wage rates will remain in effect and will not change until a new survey is conducted.

WAGE DETERMINATION APPEALS PROCESS

1.) Has there been an initial decision in the matter? This can be:

* an existing published wage determination
* a survey underlying a wage determination
* a Wage and Hour Division letter setting forth a position on a wage determination matter
* a conformance (additional classification and rate) ruling

On survey related matters, initial contact, including requests for summaries of surveys, should be with the Wage and Hour Regional Office for the area in which the survey was conducted because those Regional Offices have responsibility for the Davis-Bacon survey program. If the response from this initial contact is not satisfactory, then the process described in 2.) and 3.) should be followed.

With regard to any other matter not yet ripe for the formal process described here, initial contact should be with the Branch of Construction Wage Determinations. Write to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2.) If the answer to the question in 1.) is yes, then an interested party (those affected by the action) can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Write to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and by any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3.) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

4.) All decisions by the Administrative Review Board are final.

==========

END OF GENERAL DECISION

TABLE OF CONTENTS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY 00700-4
- **1.01 *Defined Terms* 00700-4**
- **1.02 *Terminology* 00700-6**

ARTICLE 2 - PRELIMINARY MATTERS 00700-6
- **2.01 *Delivery of Bonds* 00700-6**
- **2.02 *Copies of Documents* 00700-6**
- **2.03 *Commencement of Contract Times; Notice to Proceed* 00700-6**
- **2.04 *Starting the Work* 00700-6**
- **2.05 *Before Starting Construction* 00700-6**
- **2.06 *Preconstruction Conference* 00700-7**
- **2.07 *Initial Acceptance of Schedules* 00700-7**

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE 00700-7
- **3.01 *Intent* 00700-7**
- **3.02 *Reference Standards* 00700-7**
- **3.03 *Reporting and Resolving Discrepancies* 00700-7**
- **3.04 *Amending and Supplementing Contract Documents* 00700-8**
- **3.05 *Reuse of Documents* 00700-8**

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS 00700-8
- **4.01 *Availability of Lands* 00700-8**
- **4.02 *Subsurface and Physical Conditions* 00700-8**
- **4.03 *Differing Subsurface or Physical Conditions* 00700-8**
- **4.04 *Underground Facilities* 00700-9**
- **4.05 *Reference Points* 00700-10**
- **4.06 *Hazardous Environmental Condition at Site* 00700-10**

ARTICLE 5 - BONDS AND INSURANCE 00700-11
- **5.01 *Performance, Payment, and Other Bonds* 00700-11**
- **5.02 *Licensed Sureties and Insurers* 00700-11**
- **5.03 *Certificates of Insurance* 00700-11**
- **5.04 *CONTRACTOR's Liability Insurance* 00700-11**
- **5.05 *OWNER's Liability Insurance* 00700-12**
- **5.06 *Property Insurance* 00700-12**
- **5.07 *Waiver of Rights* 00700-12**
- **5.08 *Receipt and Application of Insurance Proceeds* 00700-13**
- **5.09 *Acceptance of Bonds and Insurance; Option to Replace* 00700-13**
- **5.10 *Partial Utilization, Acknowledgment of Property Insurer* 00700-13**

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES 00700-13
- **6.01 *Supervision and Superintendence* 00700-13**
- **6.02 *Labor, Working Hours* 00700-14**
- **6.03 *Services, Materials, and Equipment* 00700-14**
- **6.04 *Progress Schedule* 00700-14**
- **6.05 *Substitutes and "Or-Equals"* 00700-14**
- **6.06 *Concerning Subcontractors, Suppliers, and Others* 00700-15**
- **6.07 *Patent Fees and Royalties* 00700-16**
- **6.08 *Permits* 00700-16**
- **6.09 *Laws and Regulations* 00700-16**
- **6.10 *Taxes* 00700-16**
- **6.11 *Use of Site and Other Areas* 00700-16**
- **6.12 *Record Documents* 00700-17**
- **6.13 *Safety and Protection* 00700-17**
- **6.14 *Safety Representative* 00700-17**
- **6.15 *Hazard Communication Programs* 00700-17**
- **6.16 *Emergencies* 00700-17**
- **6.17 *Shop Drawings and Samples* 00700-17**
- **6.18 *Continuing the Work* 00700-18**
- **6.19 *CONTRACTOR's General Warranty and Guarantee* 00700-18**
- **6.20 *Indemnification* 00700-18**

ARTICLE 7 - OTHER WORK 00700-19
- **7.01 *Related Work at Site* 00700-19**
- **7.02 *Coordination* 00700-19**

ARTICLE 8 - OWNER'S RESPONSIBILITIES 00700-19
8.01 *Communications to Contractor* 00700-19
8.02 *Replacement of ENGINEER* 00700-19
8.03 *Furnish Data* 00700-20
8.04 *Pay Promptly When Due* 00700-20
8.05 *Lands and Easements; Reports and Tests* 00700-20
8.06 *Insurance* 00700-20
8.07 *Change Orders* 00700-20
8.08 *Inspections, Tests, and Approvals* 00700-20
8.09 *Limitations on OWNER's Responsibilities* 00700-20
8.10 *Undisclosed Hazardous Environmental Condition* 00700-20
8.11 *Evidence of Financial Arrangements* 00700-20

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION 00700-20
9.01 *OWNER'S Representative* 00700-20
9.02 *Visits to Site* 00700-20
9.03 *Project Representative* 00700-20
9.04 *Clarifications and Interpretations* 00700-20
9.05 *Authorized Variations in Work* 00700-20
9.06 *Rejecting Defective Work* 00700-21
9.07 *Shop Drawings, Change Orders and Payments* 00700-21
9.08 *Determinations for Unit Price Work* 00700-21
9.09 *Decisions on Requirements of Contract Documents and Acceptability of Work* 00700-21
9.10 *Limitations on ENGINEER's Authority and Responsibilities* 00700-21

ARTICLE 10 - CHANGES IN THE WORK; CLAIMS 00700-21
10.01 *Authorized Changes in the Work* 00700-21
10.02 *Unauthorized Changes in the Work* 00700-21
10.03 *Execution of Change Orders* 00700-22
10.04 *Notification to Surety* 00700-22
10.05 *Claims and Disputes* 00700-22

ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK 00700-22
11.01 *Cost of the Work* 00700-22
11.02 *Cash Allowances* 00700-24
11.03 *Unit Price Work* 00700-24

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES 00700-24
12.01 *Change of Contract Price* 00700-24
12.02 *Change of Contract Times* 00700-25
12.03 *Delays Beyond CONTRACTOR's Control* 00700-25
12.04 *Delays Within CONTRACTOR's Control* 00700-25
12.05 *Delays Beyond OWNER's and CONTRACTOR's Control* 00700-25
12.06 *Delay Damages* 00700-25

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK 00700-25
13.01 *Notice of Defects* 00700-25
13.02 *Access to Work* 00700-25
13.03 *Tests and Inspections* 00700-25
13.04 *Uncovering Work* 00700-26
13.05 *OWNER May Stop the Work* 00700-26
13.06 *Correction or Removal of Defective Work* 00700-26
13.07 *Correction Period* 00700-26
13.08 *Acceptance of Defective Work* 00700-26
13.09 *OWNER May Correct Defective Work* 00700-27

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION 00700-27
14.01 *Schedule of Values* 00700-27
14.02 *Progress Payments* 00700-27
14.03 *CONTRACTOR's Warranty of Title* 00700-28
14.04 *Substantial Completion* 00700-28
14.05 *Partial Utilization* 00700-29
14.06 *Final Inspection* 00700-29
14.07 *Final Payment* 00700-29
14.08 *Final Completion Delayed* 00700-30
14.09 *Waiver of Claims* 00700-30

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION 00700-30
15.01 *OWNER May Suspend Work* 00700-30
15.02 *OWNER May Terminate for Cause* 00700-30
15.03 *OWNER May Terminate For Convenience* 00700-30
15.04 *CONTRACTOR May Stop Work or Terminate* 00700-31

ARTICLE 16 - DISPUTE RESOLUTION 00700-31
16.01 *Methods and Procedures* 00700-31

ARTICLE 17 - MISCELLANEOUS 00700-31
17.01 *Giving Notice* 00700-31
17.02 *Computation of Times* 00700-31
17.03 *Cumulative Remedies* 00700-31
17.04 *Survival of Obligations* 00700-31
17.05 *Controlling Law* 00700-31

GENERAL CONDITIONS

ARTICLE 1 - DEFINITIONS AND TERMINOLOGY

1.01 ***Defined Terms***

A. **Wherever used in the Contract Documents and printed with initial or all capital letters, the terms listed below will have the meanings indicated which are applicable to both the singular and plural thereof.**

1. ***Addenda*--Written or graphic instruments issued prior to the opening of Bids which clarify, correct, or change the Bidding Requirements or the Contract Documents.**

2. ***Agreement*--The written instrument which is evidence of the agreement between OWNER and CONTRACTOR covering the Work.**

3. ***Application for Payment*--The form acceptable to ENGINEER which is to be used by CONTRACTOR during the course of the Work in requesting progress or final payments and which is to be accompanied by such supporting documentation as is required by the Contract Documents.**

4. ***Asbestos*--Any material that contains more than one percent asbestos and is friable or is releasing asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.**

5. ***Bid*--The offer or proposal of a bidder submitted on the prescribed form setting forth the prices for the Work to be performed.**

6. ***Bidding Documents*--The Bidding Requirements and the proposed Contract Documents (including all Addenda issued prior to receipt of Bids).**

7. ***Bidding Requirements*--The Advertisement or Invitation to Bid, Instructions to Bidders, Bid security form, if any, and the Bid form with any supplements.**

8. ***Bonds*--Performance and payment bonds and other instruments of security.**

9. ***Change Order*--A document recommended by ENGINEER which is signed by CONTRACTOR and OWNER and authorizes an addition, deletion, or revision in the Work or an adjustment in the Contract Price or the Contract Times, issued on or after the Effective Date of the Agreement.**

10. ***Claim*--A demand or assertion by OWNER or CONTRACTOR seeking an adjustment of Contract Price or Contract Times, or both, or other relief with respect to the terms of the Contract. A demand for money or services by a third party is not a Claim.**

11. ***Contract*--The entire and integrated written agreement between the OWNER and CONTRACTOR concerning the Work. The Contract supersedes prior negotiations, representations, or agreements, whether written or oral.**

12. ***Contract Documents*--The Contract Documents establish the rights and obligations of the parties and include the Agreement, Addenda (which pertain to the Contract Documents), CONTRACTOR's Bid (including documentation accompanying the Bid and any post Bid documentation submitted prior to the Notice of Award) when attached as an exhibit to the Agreement, the Notice to Proceed, the Bonds, these General Conditions, the Supplementary Conditions, the Specifications and the Drawings as the same are more specifically identified in the Agreement, together with all Written Amendments, Change Orders, Work Change Directives, Field Orders, and ENGINEER's written interpretations and clarifications issued on or after the Effective Date of the Agreement. Approved Shop Drawings and the reports and drawings of subsurface and physical conditions are not Contract Documents. Only printed or hard copies of the items listed in this paragraph are Contract Documents. Files in electronic media format of text, data, graphics, and the like that may be furnished by OWNER to CONTRACTOR are not Contract Documents.**

13. ***Contract Price*--The moneys payable by OWNER to CONTRACTOR for completion of the Work in accordance with the Contract Documents as stated in the Agreement (subject to the provisions of paragraph 11.03 in the case of Unit Price Work).**

14. ***Contract Times*--The number of days or the dates stated in the Agreement to: (i) achieve Substantial Completion; and (ii) complete the Work so that it is ready for final payment as evidenced by ENGINEER's written recommendation of final payment.**

15. ***CONTRACTOR*--The individual or entity with whom OWNER has entered into the Agreement.**

16. ***Cost of the Work*--See paragraph 11.01.A for definition.**

17. ***Drawings*--That part of the Contract Documents prepared or approved by ENGINEER which graphically shows the scope, extent, and character of the Work to be performed by CONTRACTOR. Shop Drawings and other CONTRACTOR submittals are not Drawings as so defined.**

18. ***Effective Date of the Agreement*--The date indicated in the Agreement on which it becomes effective, but if no such date is indicated, it means the date on which the Agreement is signed and delivered by the last of the two parties to sign and deliver.**

19. ***ENGINEER*--The individual or entity named as such in the Agreement.**

20. ***ENGINEER's Consultant*--An individual or entity having a contract with ENGINEER to furnish services as ENGINEER's independent professional associate or consultant with respect to the Project**

and who is identified as such in the Supplementary Conditions.

21. ***Field Order*--A written order issued by ENGINEER which requires minor changes in the Work but which does not involve a change in the Contract Price or the Contract Times.**

22. ***General Requirements*--Sections of Division 1 of the Specifications. The General Requirements pertain to all sections of the Specifications.**

23. ***Hazardous Environmental Condition*--The presence at the Site of Asbestos, PCBs, Petroleum, Hazardous Waste, or Radioactive Material in such quantities or circumstances that may present a substantial danger to persons or property exposed thereto in connection with the Work.**

24. ***Hazardous Waste*--The term Hazardous Waste shall have the meaning provided in Section 1004 of the Solid Waste Disposal Act (42 USC Section 6903) as amended from time to time.**

25. ***Laws and Regulations; Laws or Regulations*--Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.**

26. ***Liens*--Charges, security interests, or encumbrances upon Project funds, real property, or personal property.**

27. ***Milestone*--A principal event specified in the Contract Documents relating to an intermediate completion date or time prior to Substantial Completion of all the Work.**

28. ***Notice of Award*--The written notice by OWNER to the apparent successful bidder stating that upon timely compliance by the apparent successful bidder with the conditions precedent listed therein, OWNER will sign and deliver the Agreement.**

29. ***Notice to Proceed*--A written notice given by OWNER to CONTRACTOR fixing the date on which the Contract Times will commence to run and on which CONTRACTOR shall start to perform the Work under the Contract Documents.**

30. ***OWNER*--The individual, entity, public body, or authority with whom CONTRACTOR has entered into the Agreement and for whom the Work is to be performed.**

31. ***Partial Utilization*--Use by OWNER of a substantially completed part of the Work for the purpose for which it is intended (or a related purpose) prior to Substantial Completion of all the Work.**

32. ***PCBs*--Polychlorinated biphenyls.**

33. ***Petroleum*--Petroleum, including crude oil or any fraction thereof which is liquid at standard conditions of temperature and pressure (60 degrees Fahrenheit and 14.7 pounds per square inch absolute), such as oil, petroleum, fuel oil, oil sludge, oil refuse, gasoline, kerosene, and oil mixed with other non-Hazardous Waste and crude oils.**

34. ***Project*--The total construction of which the Work to be performed under the Contract Documents may be the whole, or a part as may be indicated elsewhere in the Contract Documents.**

35. ***Project Manual*--The bound documentary information prepared for bidding and constructing the Work. A listing of the contents of the Project Manual, which may be bound in one or more volumes, is contained in the table(s) of contents.**

36. ***Radioactive Material*--Source, special nuclear, or byproduct material as defined by the Atomic Energy Act of 1954 (42 USC Section 2011 et seq.) as amended from time to time.**

37. ***Resident Project Representative*--The authorized representative of ENGINEER who may be assigned to the Site or any part thereof.**

38. ***Samples*--Physical examples of materials, equipment, or workmanship that are representative of some portion of the Work and which establish the standards by which such portion of the Work will be judged.**

39. ***Shop Drawings*--All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared or assembled by or for CONTRACTOR and submitted by CONTRACTOR to illustrate some portion of the Work.**

40. ***Site*--Lands or areas indicated in the Contract Documents as being furnished by OWNER upon which the Work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by OWNER which are designated for the use of CONTRACTOR.**

41. ***Specifications*--That part of the Contract Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the Work and certain administrative details applicable thereto.**

42. ***Subcontractor*--An individual or entity having a direct contract with CONTRACTOR or with any other Subcontractor for the performance of a part of the Work at the Site.**

43. ***Substantial Completion*--The time at which the Work (or a specified part thereof) has progressed to the point where, in the opinion of ENGINEER, the Work (or a specified part thereof) is sufficiently complete, in accordance with the Contract Documents, so that the Work (or a specified part thereof) can be utilized for the purposes for which it is intended. The terms "substantially complete" and "substantially completed" as applied to all or part of the Work refer to Substantial Completion thereof.**

44. ***Supplementary Conditions*--That part of the Contract Documents which amends or supplements these General Conditions.**

45. ***Supplier*--A manufacturer, fabricator, supplier, distributor, materialman, or vendor**

having a direct contract with CONTRACTOR or with any Subcontractor to furnish materials or equipment to be incorporated in the Work by CONTRACTOR or any Subcontractor.

46. ***Underground Facilities*--All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.**

47. ***Unit Price Work*--Work to be paid for on the basis of unit prices.**

48. ***Work*--The entire completed construction or the various separately identifiable parts thereof required to be provided under the Contract Documents. Work includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into such construction, all as required by the Contract Documents.**

49. ***Work Change Directive*--A written statement to CONTRACTOR issued on or after the Effective Date of the Agreement and signed by OWNER and recommended by ENGINEER ordering an addition, deletion, or revision in the Work, or responding to differing or unforeseen subsurface or physical conditions under which the Work is to be performed or to emergencies. A Work Change Directive will not change the Contract Price or the Contract Times but is evidence that the parties expect that the change ordered or documented by a Work Change Directive will be incorporated in a subsequently issued Change Order following negotiations by the parties as to its effect, if any, on the Contract Price or Contract Times.**

50. ***Written Amendment*--A written statement modifying the Contract Documents, signed by OWNER and CONTRACTOR on or after the Effective Date of the Agreement and normally dealing with the nonengineering or nontechnical rather than strictly construction-related aspects of the Contract Documents.**

1.02 ***Terminology***

A. ***Intent of Certain Terms or Adjectives***

1. **Whenever in the Contract Documents the terms "as allowed," "as approved," or terms of like effect or import are used, or the adjectives "reasonable," "suitable," "acceptable," "proper," "satisfactory," or adjectives of like effect or import are used to describe an action or determination of ENGINEER as to the Work, it is intended that such action or determination will be solely to evaluate, in general, the completed Work for compliance with the requirements of and information in the Contract Documents and conformance with the design concept of the completed Project as a functioning whole as shown or indicated in the Contract Documents (unless there is a specific statement indicating otherwise). The use of any such term or adjective shall not be effective to assign to ENGINEER any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility contrary to the provisions of paragraph 9.10 or any other provision of the Contract Documents.**

B. ***Day***

1. **The word "day" shall constitute a calendar day of 24 hours measured from midnight to the next midnight.**

C. ***Defective***

1. **The word "defective," when modifying the word "Work," refers to Work that is unsatisfactory, faulty, or deficient in that it does not conform to the Contract Documents or does not meet the requirements of any inspection, reference standard, test, or approval referred to in the Contract Documents, or has been damaged prior to ENGINEER's recommendation of final payment (unless responsibility for the protection thereof has been assumed by OWNER at Substantial Completion in accordance with paragraph 14.04 or 14.05).**

D. ***Furnish, Install, Perform, Provide***

1. **The word "furnish," when used in connection with services, materials, or equipment, shall mean to supply and deliver said services, materials, or equipment to the Site (or some other specified location) ready for use or installation and in usable or operable condition.**

2. **The word "install," when used in connection with services, materials, or equipment, shall mean to put into use or place in final position said services, materials, or equipment complete and ready for intended use.**

3. **The words "perform" or "provide," when used in connection with services, materials, or equipment, shall mean to furnish and install said services, materials, or equipment complete and ready for intended use.**

4. **When "furnish," "install," "perform," or "provide" is not used in connection with services, materials, or equipment in a context clearly requiring an obligation of CONTRACTOR, "provide" is implied.**

E. **Unless stated otherwise in the Contract Documents, words or phrases which have a well-known technical or construction industry or trade meaning are used in the Contract Documents in accordance with such recognized meaning.**

ARTICLE 2 - PRELIMINARY MATTERS

2.01 ***Delivery of Bonds***

A. **When CONTRACTOR delivers the executed Agreements to OWNER, CONTRACTOR shall also deliver to OWNER such Bonds as CONTRACTOR may be required to furnish.**

2.02 ***Copies of Documents***

A. **OWNER shall furnish to CONTRACTOR up to ten copies of the Contract Documents. Additional copies will be furnished upon request at the cost of reproduction.**

2.03 ***Commencement of Contract Times; Notice to Proceed***

A. **The Contract Times will commence to run on the thirtieth day after the Effective Date of the Agreement or, if a Notice to Proceed is given, on the day indicated in the Notice to Proceed. A Notice to Proceed may be given at any time within 30 days after the Effective Date of the Agreement. In no event will the Contract Times commence to run later than the sixtieth day after the day of Bid opening or the thirtieth day after the Effective Date of the Agreement, whichever date is earlier.**

2.04 ***Starting the Work***

A. **CONTRACTOR shall start to perform the Work on the date when the Contract Times commence to run. No Work shall be done at the Site prior to the date on which the Contract Times commence to run.**

2.05 ***Before Starting Construction***

A. ***CONTRACTOR's Review of Contract Documents:*** **Before undertaking each part of the Work, CONTRACTOR shall carefully study and compare the Contract Documents and check and verify pertinent figures therein and all applicable field measurements. CONTRACTOR shall promptly report in writing to ENGINEER any conflict, error, ambiguity, or discrepancy which CONTRACTOR may discover and shall obtain a written interpretation or clarification from ENGINEER before proceeding with any Work affected thereby; however, CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any conflict, error, ambiguity, or discrepancy in the Contract Documents unless CONTRACTOR knew or reasonably should have known thereof.**

B. ***Preliminary Schedules*****: Within ten days after the Effective Date of the Agreement (unless otherwise specified in the General Requirements), CONTRACTOR shall submit to ENGINEER for its timely review:**

1. **a preliminary progress schedule indicating the times (numbers of days or dates) for starting and completing the various stages of the Work, including any Milestones specified in the Contract Documents;**

2. **a preliminary schedule of Shop Drawing and Sample submittals which will list each required submittal and the times for submitting, reviewing, and processing such submittal; and**

3. **a preliminary schedule of values for all of the Work which includes quantities and prices of items which when added together equal the Contract Price and subdivides the Work into component parts in sufficient detail to serve as the basis for progress payments during performance of the Work. Such prices will include an appropriate amount of overhead and profit applicable to each item of Work.**

C. ***Evidence of Insurance*****: Before any Work at the Site is started, CONTRACTOR and OWNER shall each deliver to the other, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance which either of them or any additional insured may reasonably request) which CONTRACTOR and OWNER respectively are required to purchase and maintain in accordance with Article 5.**

2.06 ***Preconstruction Conference***

A. **Within 20 days after the Contract Times start to run, but before any Work at the Site is started, a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.05.B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.**

2.07 ***Initial Acceptance of Schedules***

A. **Unless otherwise provided in the Contract Documents, at least ten days before submission of the first Application for Payment a conference attended by CONTRACTOR, ENGINEER, and others as appropriate will be held to review for acceptability to ENGINEER as provided below the schedules submitted in accordance with paragraph 2.05.B. CONTRACTOR shall have an additional ten days to make corrections and adjustments and to complete and resubmit the schedules. No progress payment shall be made to CONTRACTOR until acceptable schedules are submitted to ENGINEER.**

1. **The progress schedule will be acceptable to ENGINEER if it provides an orderly progression of the Work to completion within any specified Milestones and the Contract Times. Such acceptance will not impose on ENGINEER responsibility for the progress schedule, for sequencing, scheduling, or progress of the Work nor interfere with or relieve CONTRACTOR from CONTRACTOR's full responsibility therefor.**

2. **CONTRACTOR's schedule of Shop Drawing and Sample submittals will be acceptable to ENGINEER if it provides a workable arrangement for reviewing and processing the required submittals.**

3. **CONTRACTOR's schedule of values will be acceptable to ENGINEER as to form and substance if it provides a reasonable allocation of the Contract Price to component parts of the Work.**

ARTICLE 3 - **CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE**

3.01 ***Intent***

A. **The Contract Documents are complementary; what is called for by one is as binding as if called for by all.**

B. **It is the intent of the Contract Documents to describe a functionally complete Project (or part thereof) to be constructed in accordance with the Contract Documents. Any labor, documentation, services, materials, or equipment that may reasonably be inferred from the Contract Documents or from prevailing custom or trade usage as being required to produce the intended result will be provided whether or not specifically called for at no additional cost to OWNER.**

C. **Clarifications and interpretations of the Contract Documents shall be issued by ENGINEER as provided in Article 9.**

3.02 ***Reference Standards***

A. ***Standards, Specifications, Codes, Laws, and Regulations***

1. **Reference to standards, specifications, manuals, or codes of any technical society, organization, or association, or to Laws or Regulations, whether such reference be specific or by implication, shall mean the standard, specification, manual, code, or Laws or Regulations in effect at the time of opening of Bids (or on the Effective Date of the Agreement if there were no Bids), except as may be otherwise specifically stated in the Contract Documents.**

2. **No provision of any such standard, specification, manual or code, or any instruction of a Supplier shall be effective to change the duties or responsibilities of OWNER, CONTRACTOR, or ENGINEER, or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract Documents, nor shall any such provision or instruction be effective to assign to OWNER, ENGINEER, or any of ENGINEER's Consultants, agents, or employees any duty or authority to supervise or direct the performance of the Work or any duty or authority to undertake responsibility inconsistent with the provisions of the Contract Documents.**

3.03 ***Reporting and Resolving Discrepancies***

A. ***Reporting Discrepancies***

1. **If, during the performance of the Work, CONTRACTOR discovers any conflict, error, ambiguity, or discrepancy within the Contract Documents or between the Contract Documents and any provision of any Law or Regulation applicable to the performance of the Work or of any standard, specification, manual or code, or of any instruction of any Supplier, CONTRACTOR shall report it to ENGINEER in writing at once. CONTRACTOR shall not proceed with the Work affected thereby (except in an emergency as required by paragraph 6.16.A) until an amendment or supplement to the Contract Documents has been issued by one of the methods indicated in paragraph 3.04; provided, however, that CONTRACTOR shall not be liable to OWNER or ENGINEER for failure to report any such conflict, error, ambiguity, or discrepancy unless CONTRACTOR knew or reasonably should have known thereof.**

B. ***Resolving Discrepancies***

1. **Except as may be otherwise specifically stated in the Contract Documents, the provisions of the Contract Documents shall take precedence in resolving any conflict, error, ambiguity, or discrepancy between the provisions of the Contract Documents and:**

a. **the provisions of any standard, specification, manual, code, or instruction (whether or not specifically incorporated by reference in the Contract Documents); or**

b. **the provisions of any Laws or Regulations applicable to the performance of the Work (unless such an interpretation of the provisions of the Contract Documents would result in violation of such Law or Regulation).**

3.04 ***Amending and Supplementing Contract Documents***

A. **The Contract Documents may be amended to provide for additions, deletions, and revisions in the Work or to modify the terms and conditions thereof in one or more of the following ways: (i) a Written Amendment; (ii) a Change Order; or (iii) a Work Change Directive.**

B. **The requirements of the Contract Documents may be supplemented, and minor variations and deviations in the Work may be authorized, by one or more of the following ways: (i) a Field Order; (ii) ENGINEER's approval of a Shop Drawing or Sample; or (iii) ENGINEER's written interpretation or clarification.**

3.05 ***Reuse of Documents***

A. **CONTRACTOR and any Subcontractor or Supplier or other individual or entity performing or furnishing any of the Work under a direct or indirect contract with OWNER: (i) shall not have or acquire any title to or ownership rights in any of the Drawings, Specifications, or other documents (or copies of any thereof) prepared by or bearing the seal of ENGINEER or ENGINEER's Consultant, including electronic media editions; and (ii) shall not reuse any of such Drawings, Specifications, other documents, or copies thereof on extensions of the Project or any other project without written consent of OWNER and ENGINEER and specific written verification or adaption by ENGINEER. This prohibition will survive final payment, completion, and acceptance of the Work, or termination or completion of the Contract. Nothing herein shall preclude CONTRACTOR from retaining copies of the Contract Documents for record purposes.**

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

4.01 ***Availability of Lands***

A. **OWNER shall furnish the Site. OWNER shall notify CONTRACTOR of any encumbrances or restrictions not of general application but specifically related to use of the Site with which CONTRACTOR must comply in performing the Work. OWNER will obtain in a timely manner and pay for easements for permanent structures or permanent changes in existing facilities. If CONTRACTOR and OWNER are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of any delay in OWNER's furnishing the Site, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.**

B. **Upon reasonable written request, OWNER shall furnish CONTRACTOR with a current statement of record legal title and legal description of the lands upon which the Work is to be performed and OWNER's interest therein as necessary for giving notice of or filing a mechanic's or construction lien against such lands in accordance with applicable Laws and Regulations.**

C. **CONTRACTOR shall provide for all additional lands and access thereto that may be required for temporary construction facilities or storage of materials and equipment.**

4.02 ***Subsurface and Physical Conditions***

A. ***Reports and Drawings*: The Supplementary Conditions identify:**

1. **those reports of explorations and tests of subsurface conditions at or contiguous to the Site that ENGINEER has used in preparing the Contract Documents; and**

2. **those drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site (except Underground Facilities) that ENGINEER has used in preparing the Contract Documents.**

B. ***Limited Reliance by CONTRACTOR on Technical Data Authorized*: CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER, or any of ENGINEER's Consultants with respect to:**

1. **the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by CONTRACTOR, and safety precautions and programs incident thereto; or**

2. **other data, interpretations, opinions, and information contained in such reports or shown or indicated in such drawings; or**

3. **any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions, or information.**

4.03 ***Differing Subsurface or Physical Conditions***

A. ***Notice*: If CONTRACTOR believes that any subsurface or physical condition at or contiguous to the Site that is uncovered or revealed either:**

1. **is of such a nature as to establish that any "technical data" on which CONTRACTOR is entitled to rely as provided in paragraph 4.02 is materially inaccurate; or**

2. **is of such a nature as to require a change in the Contract Documents; or**

3. **differs materially from that shown or indicated in the Contract Documents; or**

4. **is of an unusual nature, and differs materially from conditions ordinarily encountered and generally recognized as inherent in work of the character provided for in the Contract Documents;**

then CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing the subsurface or physical conditions or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), notify OWNER and ENGINEER in writing about such condition. CONTRACTOR shall not further disturb such condition or perform any Work in connection therewith (except as aforesaid) until receipt of written order to do so.

B. ***ENGINEER's Review*: After receipt of written notice as required by paragraph 4.03.A, ENGINEER will promptly review the pertinent condition, determine the necessity of OWNER's obtaining additional exploration or tests with respect thereto, and advise OWNER in writing (with a copy to CONTRACTOR) of ENGINEER's findings and conclusions.**

C. **Possible Price and Times Adjustments**

1. **The Contract Price or the Contract Times, or both, will be equitably adjusted to the extent that the existence of such differing subsurface or physical condition causes an increase or decrease in CONTRACTOR's cost of, or time required for, performance of the Work; subject, however, to the following:**

a. **such condition must meet any one or more of the categories described in paragraph 4.03.A; and**

b. **with respect to Work that is paid for on a Unit Price Basis, any adjustment in Contract Price will be subject to the provisions of paragraphs 9.08 and 11.03.**

2. **CONTRACTOR shall not be entitled to any adjustment in the Contract Price or Contract Times if:**

a. **CONTRACTOR knew of the existence of such conditions at the time CONTRACTOR made a final commitment to OWNER in respect of Contract Price and Contract Times by the submission of a Bid or becoming bound under a negotiated contract; or**

b. **the existence of such condition could reasonably have been discovered or revealed as a result of any examination, investigation, exploration, test, or study of the Site and contiguous areas required by the Bidding Requirements or Contract Documents to be conducted by or for CONTRACTOR prior to CONTRACTOR's making such final commitment; or**

c. **CONTRACTOR failed to give the written notice within the time and as required by paragraph 4.03.A.**

3. **If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, a Claim may be made therefor as provided in paragraph 10.05. However, OWNER, ENGINEER, and ENGINEER's Consultants shall not be liable to CONTRACTOR for any claims, costs, losses, or damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by CONTRACTOR on or in connection with any other project or anticipated project.**

4.04 ***Underground Facilities***

A. ***Shown or Indicated*: The information and data shown or indicated in the Contract Documents with respect to existing Underground Facilities at or contiguous to the Site is based on information and data furnished to OWNER or ENGINEER by the owners of such Underground Facilities, including OWNER, or by others.**

Unless it is otherwise expressly provided in the Supplementary Conditions:

1. **OWNER and ENGINEER shall not be responsible for the accuracy or completeness of any such information or data; and**

2. **the cost of all of the following will be included in the Contract Price, and CONTRACTOR shall have full responsibility for:**

a. **reviewing and checking all such information and data,**

b. **locating all Underground Facilities shown or indicated in the Contract Documents,**

c. **coordination of the Work with the owners of such Underground Facilities, including OWNER, during construction, and**

d. **the safety and protection of all such Underground Facilities and repairing any damage thereto resulting from the Work.**

B. **Not Shown or Indicated**

1. **If an Underground Facility is uncovered or revealed at or contiguous to the Site which was not shown or indicated, or not shown or indicated with reasonable accuracy in the Contract Documents, CONTRACTOR shall, promptly after becoming aware thereof and before further disturbing conditions affected thereby or performing any Work in connection therewith (except in an emergency as required by paragraph 6.16.A), identify the owner of such Underground Facility and give written notice to that owner and to OWNER and ENGINEER. ENGINEER will promptly review the Underground Facility and determine the extent, if any, to which a change is required in the Contract Documents to reflect and document the consequences of the existence or location of the Underground Facility. During such time, CONTRACTOR shall be responsible for the safety and protection of such Underground Facility.**

2. **If ENGINEER concludes that a change in the Contract Documents is required, a Work Change Directive or a Change Order will be issued to reflect and document such consequences. An equitable adjustment shall be made in the Contract Price or Contract Times, or both, to the extent that they are attributable to the existence or location of any Underground Facility that was not shown or indicated or not shown or indicated with reasonable accuracy in the Contract Documents and that CONTRACTOR did not know of and could not reasonably have been expected to be aware of or to have anticipated. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment in Contract Price or Contract Times, OWNER or CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.**

4.05 ***Reference Points***

A. **OWNER shall provide engineering surveys to establish reference points for construction which in ENGINEER's judgment are necessary to enable CONTRACTOR to proceed with the Work. CONTRACTOR shall be responsible for laying out the Work, shall protect and preserve the established reference points and property monuments, and shall make no changes or relocations without the prior written approval of OWNER. CONTRACTOR shall report to ENGINEER whenever any reference point or property monument is lost or destroyed or requires relocation because of necessary changes in grades or locations, and shall be responsible for the accurate replacement or relocation of such reference points or property monuments by professionally qualified personnel.**

4.06 ***Hazardous Environmental Condition at Site***

A. ***Reports and Drawings*: Reference is made to the Supplementary Conditions for the identification of those reports and drawings relating to a Hazardous Environmental Condition identified at the Site, if any, that have been utilized by the ENGINEER in the preparation of the Contract Documents.**

B. ***Limited Reliance by CONTRACTOR on Technical Data Authorized*: CONTRACTOR may rely upon the general accuracy of the "technical data" contained in such reports and drawings, but such reports and drawings are not Contract Documents. Such "technical data" is identified in the Supplementary Conditions. Except for such reliance on such "technical data," CONTRACTOR may not rely upon or make any Claim against OWNER, ENGINEER or any of ENGINEER's Consultants with respect to:**

1. **the completeness of such reports and drawings for CONTRACTOR's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences and procedures of construction to be employed by CONTRACTOR and safety precautions and programs incident thereto; or**

2. **other data, interpretations, opinions and information contained in such reports or shown or indicated in such drawings; or**

3. **any CONTRACTOR interpretation of or conclusion drawn from any "technical data" or any such other data, interpretations, opinions or information.**

C. **CONTRACTOR shall not be responsible for any Hazardous Environmental Condition uncovered or revealed at the Site which was not shown or indicated in Drawings or Specifications or identified in the Contract Documents to be within the scope of the Work. CONTRACTOR shall be responsible for a Hazardous Environmental Condition created with any materials brought to the Site by CONTRACTOR, Subcontractors, Suppliers, or anyone else for whom CONTRACTOR is responsible.**

D. **If CONTRACTOR encounters a Hazardous Environmental Condition or if CONTRACTOR or anyone for whom CONTRACTOR is responsible creates a Hazardous Environmental Condition, CONTRACTOR shall immediately: (i) secure or otherwise isolate such condition; (ii) stop all Work in connection with such condition and in any area affected thereby (except in an emergency as required by paragraph 6.16); and (iii) notify OWNER and ENGINEER (and promptly thereafter confirm such notice in writing). OWNER shall promptly consult with ENGINEER concerning the necessity for OWNER to retain a qualified expert to evaluate such condition or take corrective action, if any.**

E. **CONTRACTOR shall not be required to resume Work in connection with such condition or in any affected area until after OWNER has obtained any required permits related thereto and delivered to CONTRACTOR written notice: (i) specifying that such condition and any affected area is or has been rendered safe for the resumption of Work; or (ii) specifying any special conditions under which such Work may be resumed safely. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of any adjustment in Contract Price or Contract Times, or both, as a result of such Work stoppage or such special conditions under which Work is agreed to be resumed by CONTRACTOR, either party may make a Claim therefor as provided in paragraph 10.05.**

F. **If after receipt of such written notice CONTRACTOR does not agree to resume such Work based on a reasonable belief it is unsafe, or does not agree to resume such Work under such special conditions, then OWNER may order the portion of the Work that is in the area affected by such condition to be deleted from the Work. If OWNER and CONTRACTOR cannot agree as to entitlement to or on the amount or extent, if any, of an adjustment in Contract Price or Contract Times as a result of deleting such portion of the Work, then either party may make a Claim therefor as provided in paragraph 10.05. OWNER may have such deleted portion of the Work performed by OWNER's own forces or others in accordance with Article 7.**

G. **To the fullest extent permitted by Laws and Regulations, OWNER shall indemnify and hold harmless CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition, provided that such Hazardous Environmental Condition: (i) was not shown or indicated in the Drawings or Specifications or identified in the Contract Documents to be included within the scope of the Work, and (ii) was not created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph 4.06.E shall obligate OWNER to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.**

H. **To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, other consultants, and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to a Hazardous Environmental Condition created by CONTRACTOR or by anyone for whom CONTRACTOR is responsible. Nothing in this paragraph 4.06.F shall obligate CONTRACTOR to indemnify any individual or entity from and against the consequences of that individual's or entity's own negligence.**

I. **The provisions of paragraphs 4.02, 4.03, and 4.04 are not intended to apply to a Hazardous Environmental Condition uncovered or revealed at the Site.**

ARTICLE 5 - BONDS AND INSURANCE

5.01 *Performance, Payment, and Other Bonds*

A. **CONTRACTOR shall furnish performance and payment Bonds, each in an amount at least equal to the Contract Price as security for the faithful performance and payment of all CONTRACTOR's obligations under the Contract Documents. These Bonds shall remain in effect at least until one year after the date when final payment becomes due, except as provided otherwise by Laws or Regulations or by the Contract Documents. CONTRACTOR shall also furnish such other Bonds as are required by the Contract Documents.**

B. **All Bonds shall be in the form prescribed by the Contract Documents except as provided otherwise by Laws or Regulations, and shall be executed by such sureties as are named in the current list of "Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies" as published in Circular 570 (amended) by the Financial Management Service, Surety Bond Branch, U.S. Department of the Treasury. All Bonds signed by an agent must be accompanied by a certified copy of such agent's authority to act.**

C. **If the surety on any Bond furnished by CONTRACTOR is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of paragraph 5.01.B, CONTRACTOR shall within 20 days thereafter substitute another Bond and surety, both of which shall comply with the requirements of paragraphs 5.01.B and 5.02.**

5.02 *Licensed Sureties and Insurers*

A. **All Bonds and insurance required by the Contract Documents to be purchased and maintained by OWNER or CONTRACTOR shall be obtained from surety or insurance companies that are duly licensed or authorized in the jurisdiction in which the Project is located to issue Bonds or insurance policies for the limits and coverages so required. Such surety and insurance companies shall also meet such additional requirements and qualifications as may be provided in the Supplementary Conditions.**

5.03 *Certificates of Insurance*

A. **CONTRACTOR shall deliver to OWNER, with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by OWNER or any other additional insured) which CONTRACTOR is required to purchase and maintain. OWNER shall deliver to CONTRACTOR with copies to each additional insured identified in the Supplementary Conditions, certificates of insurance (and other evidence of insurance requested by CONTRACTOR or any other additional insured) which OWNER is required to purchase and maintain.**

5.04 *CONTRACTOR's Liability Insurance*

A. **CONTRACTOR shall purchase and maintain such liability and other insurance as is appropriate for the Work being performed and as will provide protection from claims set forth below which may arise out of or result from CONTRACTOR's performance of the Work and**

CONTRACTOR's other obligations under the Contract Documents, whether it is to be performed by CONTRACTOR, any Subcontractor or Supplier, or by anyone directly or indirectly employed by any of them to perform any of the Work, or by anyone for whose acts any of them may be liable:

1. **claims under workers' compensation, disability benefits, and other similar employee benefit acts;**

2. **claims for damages because of bodily injury, occupational sickness or disease, or death of CONTRACTOR's employees;**

3. **claims for damages because of bodily injury, sickness or disease, or death of any person other than CONTRACTOR's employees;**

4. **claims for damages insured by reasonably available personal injury liability coverage which are sustained: (i) by any person as a result of an offense directly or indirectly related to the employment of such person by CONTRACTOR, or (ii) by any other person for any other reason;**

5. **claims for damages, other than to the Work itself, because of injury to or destruction of tangible property wherever located, including loss of use resulting therefrom; and**

6. **claims for damages because of bodily injury or death of any person or property damage arising out of the ownership, maintenance or use of any motor vehicle.**

B. **The policies of insurance so required by this paragraph 5.04 to be purchased and maintained shall:**

1. **with respect to insurance required by paragraphs 5.04.A.3 through 5.04.A.6 inclusive, include as additional insureds (subject to any customary exclusion in respect of professional liability) OWNER, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, all of whom shall be listed as additional insureds, and include coverage for the respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of all such additional insureds, and the insurance afforded to these additional insureds shall provide primary coverage for all claims covered thereby;**

2. **include at least the specific coverages and be written for not less than the limits of liability provided in the Supplementary Conditions or required by Laws or Regulations, whichever is greater;**

3. **include completed operations insurance;**

4. **include contractual liability insurance covering CONTRACTOR's indemnity obligations under paragraphs 6.07, 6.11, and 6.20;**

5. **contain a provision or endorsement that the coverage afforded will not be canceled, materially changed or renewal refused until at least thirty days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured identified in the Supplementary Conditions to whom a certificate of insurance has been issued (and the certificates of insurance furnished by the CONTRACTOR pursuant to paragraph 5.03 will so provide);**

6. **remain in effect at least until final payment and at all times thereafter when CONTRACTOR may be correcting, removing, or replacing defective Work in accordance with paragraph 13.07; and**

7. **with respect to completed operations insurance, and any insurance coverage written on a claims-made basis, remain in effect for at least two years after final payment (and CONTRACTOR shall furnish OWNER and each other additional insured identified in the Supplementary Conditions, to whom a certificate of insurance has been issued, evidence satisfactory to OWNER and any such additional insured of continuation of such insurance at final payment and one year thereafter).**

5.05 ***OWNER's Liability Insurance***

A. **In addition to the insurance required to be provided by CONTRACTOR under paragraph 5.04, OWNER, at OWNER's option, may purchase and maintain at OWNER's expense OWNER's own liability insurance as will protect OWNER against claims which may arise from operations under the Contract Documents.**

5.06 ***Property Insurance***

A. **Unless otherwise provided in the Supplementary Conditions, OWNER shall purchase and maintain property insurance upon the Work at the Site in the amount of the full replacement cost thereof (subject to such deductible amounts as may be provided in the Supplementary Conditions or required by Laws and Regulations). This insurance shall:**

1. **include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them, each of whom is deemed to have an insurable interest and shall be listed as an additional insured;**

2. **be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, false work, and materials and equipment in transit, and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and such other perils or causes of loss as may be specifically required by the Supplementary Conditions;**

3. **include expenses incurred in the repair or replacement of any insured property (including but not limited to fees and charges of engineers and architects);**

4. **cover materials and equipment stored at the Site or at another location that was agreed to**

in writing by OWNER prior to being incorporated in the Work, provided that such materials and equipment have been included in an Application for Payment recommended by ENGINEER;

5. **allow for partial utilization of the Work by OWNER;**

6. **include testing and startup; and**

7. **be maintained in effect until final payment is made unless otherwise agreed to in writing by OWNER, CONTRACTOR, and ENGINEER with 30 days written notice to each other additional insured to whom a certificate of insurance has been issued.**

B. **OWNER shall purchase and maintain such boiler and machinery insurance or additional property insurance as may be required by the Supplementary Conditions or Laws and Regulations which will include the interests of OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and any other individuals or entities identified in the Supplementary Conditions, each of whom is deemed to have an insurable interest and shall be listed as an insured or additional insured.**

C. **All the policies of insurance (and the certificates or other evidence thereof) required to be purchased and maintained in accordance with paragraph 5.06 will contain a provision or endorsement that the coverage afforded will not be canceled or materially changed or renewal refused until at least 30 days prior written notice has been given to OWNER and CONTRACTOR and to each other additional insured to whom a certificate of insurance has been issued and will contain waiver provisions in accordance with paragraph 5.07.**

D. **OWNER shall not be responsible for purchasing and maintaining any property insurance specified in this paragraph 5.06 to protect the interests of CONTRACTOR, Subcontractors, or others in the Work to the extent of any deductible amounts that are identified in the Supplementary Conditions. The risk of loss within such identified deductible amount will be borne by CONTRACTOR, Subcontractors, or others suffering any such loss, and if any of them wishes property insurance coverage within the limits of such amounts, each may purchase and maintain it at the purchaser's own expense.**

E. **If CONTRACTOR requests in writing that other special insurance be included in the property insurance policies provided under paragraph 5.06, OWNER shall, if possible, include such insurance, and the cost thereof will be charged to CONTRACTOR by appropriate Change Order or Written Amendment. Prior to commencement of the Work at the Site, OWNER shall in writing advise CONTRACTOR whether or not such other insurance has been procured by OWNER.**

5.07 ***Waiver of Rights***

A. **OWNER and CONTRACTOR intend that all policies purchased in accordance with paragraph 5.06 will protect OWNER, CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) in such policies and will provide primary coverage for all losses and damages caused by the perils or causes of loss covered thereby. All such policies shall contain provisions to the effect that in the event of payment of any loss or damage the insurers will have no rights of recovery against any of the insureds or additional insureds thereunder. OWNER and CONTRACTOR waive all rights against each other and their respective officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for all losses and damages caused by, arising out of or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work; and, in addition, waive all such rights against Subcontractors, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) under such policies for losses and damages so caused. None of the above waivers shall extend to the rights that any party making such waiver may have to the proceeds of insurance held by OWNER as trustee or otherwise payable under any policy so issued.**

B. **OWNER waives all rights against CONTRACTOR, Subcontractors, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them for:**

1. **loss due to business interruption, loss of use, or other consequential loss extending beyond direct physical loss or damage to OWNER's property or the Work caused by, arising out of, or resulting from fire or other peril whether or not insured by OWNER; and**

2. **loss or damage to the completed Project or part thereof caused by, arising out of, or resulting from fire or other insured peril or cause of loss covered by any property insurance maintained on the completed Project or part thereof by OWNER during partial utilization pursuant to paragraph 14.05, after Substantial Completion pursuant to paragraph 14.04, or after final payment pursuant to paragraph 14.07.**

C. **Any insurance policy maintained by OWNER covering any loss, damage or consequential loss referred to in paragraph 5.07.B shall contain provisions to the effect that in the event of payment of any such loss, damage, or consequential loss, the insurers will have no rights of recovery against CONTRACTOR, Subcontractors, ENGINEER, or ENGINEER's Consultants and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them.**

5.08 ***Receipt and Application of Insurance Proceeds***

A. **Any insured loss under the policies of insurance required by paragraph 5.06 will be adjusted with OWNER and made payable to OWNER as fiduciary for the insureds, as their interests may appear, subject to the requirements of any applicable mortgage clause and of paragraph 5.08.B. OWNER shall deposit in a separate account any money so received and shall distribute it in accordance with such agreement as the parties in interest may reach. If no other special agreement is reached, the damaged Work shall be repaired or replaced, the moneys so received applied on account thereof, and the Work and**

the cost thereof covered by an appropriate Change Order or Written Amendment.

B. **OWNER as fiduciary shall have power to adjust and settle any loss with the insurers unless one of the parties in interest shall object in writing within 15 days after the occurrence of loss to OWNER's exercise of this power. If such objection be made, OWNER as fiduciary shall make settlement with the insurers in accordance with such agreement as the parties in interest may reach. If no such agreement among the parties in interest is reached, OWNER as fiduciary shall adjust and settle the loss with the insurers and, if required in writing by any party in interest, OWNER as fiduciary shall give bond for the proper performance of such duties.**

5.09 ***Acceptance of Bonds and Insurance; Option to Replace***

A. **If either OWNER or CONTRACTOR has any objection to the coverage afforded by or other provisions of the Bonds or insurance required to be purchased and maintained by the other party in accordance with Article 5 on the basis of non-conformance with the Contract Documents, the objecting party shall so notify the other party in writing within 10 days after receipt of the certificates (or other evidence requested) required by paragraph 2.05.C. OWNER and CONTRACTOR shall each provide to the other such additional information in respect of insurance provided as the other may reasonably request. If either party does not purchase or maintain all of the Bonds and insurance required of such party by the Contract Documents, such party shall notify the other party in writing of such failure to purchase prior to the start of the Work, or of such failure to maintain prior to any change in the required coverage. Without prejudice to any other right or remedy, the other party may elect to obtain equivalent Bonds or insurance to protect such other party's interests at the expense of the party who was required to provide such coverage, and a Change Order shall be issued to adjust the Contract Price accordingly.**

5.10 ***Partial Utilization, Acknowledgment of Property Insurer***

A. **If OWNER finds it necessary to occupy or use a portion or portions of the Work prior to Substantial Completion of all the Work as provided in paragraph 14.05, no such use or occupancy shall commence before the insurers providing the property insurance pursuant to paragraph 5.06 have acknowledged notice thereof and in writing effected any changes in coverage necessitated thereby. The insurers providing the property insurance shall consent by endorsement on the policy or policies, but the property insurance shall not be canceled or permitted to lapse on account of any such partial use or occupancy.**

ARTICLE 6 - **CONTRACTOR'S RESPONSIBILITIES**

6.01 ***Supervision and Superintendence***

A. **CONTRACTOR shall supervise, inspect, and direct the Work competently and efficiently, devoting such attention thereto and applying such skills and expertise as may be necessary to perform the Work in accordance with the Contract Documents. CONTRACTOR shall be solely responsible for the means, methods, techniques, sequences, and procedures of construction, but CONTRACTOR shall not be responsible for the negligence of OWNER or ENGINEER in the design or specification of a specific means, method, technique, sequence, or procedure of construction which is shown or indicated in and expressly required by the Contract Documents. CONTRACTOR shall be responsible to see that the completed Work complies accurately with the Contract Documents.**

B. **At all times during the progress of the Work, CONTRACTOR shall assign a competent resident superintendent thereto who shall not be replaced without written notice to OWNER and ENGINEER except under extraordinary circumstances. The superintendent will be CONTRACTOR's representative at the Site and shall have authority to act on behalf of CONTRACTOR. All communications given to or received from the superintendent shall be binding on CONTRACTOR.**

6.02 ***Labor, Working Hours***

A. **CONTRACTOR shall provide competent, suitably qualified personnel to survey, lay out, and construct the Work as required by the Contract Documents. CONTRACTOR shall at all times maintain good discipline and order at the Site.**

B. **Except as otherwise required for the safety or protection of persons or the Work or property at the Site or adjacent thereto, and except as otherwise stated in the Contract Documents, all Work at the Site shall be performed during regular working hours, and CONTRACTOR will not permit overtime work or the performance of Work on Saturday, Sunday, or any legal holiday without OWNER's written consent (which will not be unreasonably withheld) given after prior written notice to ENGINEER.**

6.03 ***Services, Materials, and Equipment***

A. **Unless otherwise specified in the General Requirements, CONTRACTOR shall provide and assume full responsibility for all services, materials, equipment, labor, transportation, construction equipment and machinery, tools, appliances, fuel, power, light, heat, telephone, water, sanitary facilities, temporary facilities, and all other facilities and incidentals necessary for the performance, testing, start-up, and completion of the Work.**

B. **All materials and equipment incorporated into the Work shall be as specified or, if not specified, shall be of good quality and new, except as otherwise provided in the Contract Documents. All warranties and guarantees specifically called for by the Specifications shall expressly run to the benefit of OWNER. If required by ENGINEER, CONTRACTOR shall furnish satisfactory evidence (including reports of required tests) as to the source, kind, and quality of materials and equipment. All materials and equipment shall be stored, applied, installed, connected, erected, protected, used, cleaned, and conditioned in accordance with instructions of the applicable Supplier, except as otherwise may be provided in the Contract Documents.**

6.04 ***Progress Schedule***

A. **CONTRACTOR shall adhere to the progress schedule established in accordance with paragraph 2.07 as it may be adjusted from time to time as provided below.**

1. **CONTRACTOR shall submit to ENGINEER for acceptance (to the extent indicated in paragraph 2.07) proposed adjustments in the progress schedule that will not result in changing the Contract Times (or Milestones). Such**

adjustments will conform generally to the progress schedule then in effect and additionally will comply with any provisions of the General Requirements applicable thereto.

2. **Proposed adjustments in the progress schedule that will change the Contract Times (or Milestones) shall be submitted in accordance with the requirements of Article 12. Such adjustments may only be made by a Change Order or Written Amendment in accordance with Article 12.**

6.05 ***Substitutes and "Or-Equals"***

A. **Whenever an item of material or equipment is specified or described in the Contract Documents by using the name of a proprietary item or the name of a particular Supplier, the specification or description is intended to establish the type, function, appearance, and quality required. Unless the specification or description contains or is followed by words reading that no like, equivalent, or "or-equal" item or no substitution is permitted, other items of material or equipment or material or equipment of other Suppliers may be submitted to ENGINEER for review under the circumstances described below.**

1. ***"Or-Equal" Items*: If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR is functionally equal to that named and sufficiently similar so that no change in related Work will be required, it may be considered by ENGINEER as an "or-equal" item, in which case review and approval of the proposed item may, in ENGINEER's sole discretion, be accomplished without compliance with some or all of the requirements for approval of proposed substitute items. For the purposes of this paragraph 6.05.A.1, a proposed item of material or equipment will be considered functionally equal to an item so named if:**

a. **in the exercise of reasonable judgment ENGINEER determines that: (i) it is at least equal in quality, durability, appearance, strength, and design characteristics; (ii) it will reliably perform at least equally well the function imposed by the design concept of the completed Project as a functioning whole, and;**

b. **CONTRACTOR certifies that: (i) there is no increase in cost to the OWNER; and (ii) it will conform substantially, even with deviations, to the detailed requirements of the item named in the Contract Documents.**

2. ***Substitute Items***

a. **If in ENGINEER's sole discretion an item of material or equipment proposed by CONTRACTOR does not qualify as an "or-equal" item under paragraph 6.05.A.1, it will be considered a proposed substitute item.**

b. **CONTRACTOR shall submit sufficient information as provided below to allow ENGINEER to determine that the item of material or equipment proposed is essentially equivalent to that named and an acceptable substitute therefor. Requests for review of proposed substitute items of material or equipment will not be accepted by ENGINEER from anyone other than CONTRACTOR.**

c. **The procedure for review by ENGINEER will be as set forth in paragraph 6.05.A.2.d, as supplemented in the General Requirements and as ENGINEER may decide is appropriate under the circumstances.**

d. **CONTRACTOR shall first make written application to ENGINEER for review of a proposed substitute item of material or equipment that CONTRACTOR seeks to furnish or use. The application shall certify that the proposed substitute item will perform adequately the functions and achieve the results called for by the general design, be similar in substance to that specified, and be suited to the same use as that specified. The application will state the extent, if any, to which the use of the proposed substitute item will prejudice CONTRACTOR's achievement of Substantial Completion on time, whether or not use of the proposed substitute item in the Work will require a change in any of the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) to adapt the design to the proposed substitute item and whether or not incorporation or use of the proposed substitute item in connection with the Work is subject to payment of any license fee or royalty. All variations of the proposed substitute item from that specified will be identified in the application, and available engineering, sales, maintenance, repair, and replacement services will be indicated. The application will also contain an itemized estimate of all costs or credits that will result directly or indirectly from use of such substitute item, including costs of redesign and claims of other contractors affected by any resulting change, all of which will be considered by ENGINEER in evaluating the proposed substitute item. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute item.**

B. ***Substitute Construction Methods or Procedures*: If a specific means, method, technique, sequence, or procedure of construction is shown or indicated in and expressly required by the Contract Documents, CONTRACTOR may furnish or utilize a substitute means, method, technique, sequence, or procedure of construction approved by ENGINEER. CONTRACTOR shall submit sufficient information to allow ENGINEER, in ENGINEER's sole discretion, to determine that the substitute proposed is equivalent to that expressly called for by the Contract Documents. The procedure for review by ENGINEER will be similar to that provided in subparagraph 6.05.A.2.**

C. ***Engineer's Evaluation*: ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to paragraphs 6.05.A and 6.05.B. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute will be ordered, installed or utilized until ENGINEER's review is complete, which will be evidenced by either a Change Order for a substitute or an approved Shop Drawing for an "or equal."**

ENGINEER will advise CONTRACTOR in writing of any negative determination.

D. ***Special Guarantee*: OWNER may require CONTRACTOR to furnish at CONTRACTOR's expense a special performance guarantee or other surety with respect to any substitute.**

E. ***ENGINEER's Cost Reimbursement*: ENGINEER will record time required by ENGINEER and ENGINEER's Consultants in evaluating substitute proposed or submitted by CONTRACTOR pursuant to paragraphs 6.05.A.2 and 6.05.B and in making changes in the Contract Documents (or in the provisions of any other direct contract with OWNER for work on the Project) occasioned thereby. Whether or not ENGINEER approves a substitute item so proposed or submitted by CONTRACTOR, CONTRACTOR shall reimburse OWNER for the charges of ENGINEER and ENGINEER's Consultants for evaluating each such proposed substitute.**

F. ***CONTRACTOR's Expense*: CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" at CONTRACTOR's expense.**

6.06 ***Concerning Subcontractors, Suppliers, and Others***

A. **CONTRACTOR shall not employ any Subcontractor, Supplier, or other individual or entity (including those acceptable to OWNER as indicated in paragraph 6.06.B), whether initially or as a replacement, against whom OWNER may have reasonable objection. CONTRACTOR shall not be required to employ any Subcontractor, Supplier, or other individual or entity to furnish or perform any of the Work against whom CONTRACTOR has reasonable objection.**

B. **If the Supplementary Conditions require the identity of certain Subcontractors, Suppliers, or other individuals or entities to be submitted to OWNER in advance for acceptance by OWNER by a specified date prior to the Effective Date of the Agreement, and if CONTRACTOR has submitted a list thereof in accordance with the Supplementary Conditions, OWNER's acceptance (either in writing or by failing to make written objection thereto by the date indicated for acceptance or objection in the Bidding Documents or the Contract Documents) of any such Subcontractor, Supplier, or other individual or entity so identified may be revoked on the basis of reasonable objection after due investigation. CONTRACTOR shall submit an acceptable replacement for the rejected Subcontractor, Supplier, or other individual or entity, and the Contract Price will be adjusted by the difference in the cost occasioned by such replacement, and an appropriate Change Order will be issued or Written Amendment signed. No acceptance by OWNER of any such Subcontractor, Supplier, or other individual or entity, whether initially or as a replacement, shall constitute a waiver of any right of OWNER or ENGINEER to reject defective Work.**

C. **CONTRACTOR shall be fully responsible to OWNER and ENGINEER for all acts and omissions of the Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work just as CONTRACTOR is responsible for CONTRACTOR's own acts and omissions. Nothing in the Contract Documents shall create for the benefit of any such Subcontractor, Supplier, or other individual or entity any contractual relationship between OWNER or ENGINEER and any such Subcontractor, Supplier or other individual or entity, nor shall it create any obligation on the part of OWNER or ENGINEER to pay or to see to the payment of any moneys due any such Subcontractor, Supplier, or other individual or entity except as may otherwise be required by Laws and Regulations.**

D. **CONTRACTOR shall be solely responsible for scheduling and coordinating the Work of Subcontractors, Suppliers, and other individuals or entities performing or furnishing any of the Work under a direct or indirect contract with CONTRACTOR.**

E. **CONTRACTOR shall require all Subcontractors, Suppliers, and such other individuals or entities performing or furnishing any of the Work to communicate with ENGINEER through CONTRACTOR.**

F. **The divisions and sections of the Specifications and the identifications of any Drawings shall not control CONTRACTOR in dividing the Work among Subcontractors or Suppliers or delineating the Work to be performed by any specific trade.**

G. **All Work performed for CONTRACTOR by a Subcontractor or Supplier will be pursuant to an appropriate agreement between CONTRACTOR and the Subcontractor or Supplier which specifically binds the Subcontractor or Supplier to the applicable terms and conditions of the Contract Documents for the benefit of OWNER and ENGINEER. Whenever any such agreement is with a Subcontractor or Supplier who is listed as an additional insured on the property insurance provided in paragraph 5.06, the agreement between the CONTRACTOR and the Subcontractor or Supplier will contain provisions whereby the Subcontractor or Supplier waives all rights against OWNER, CONTRACTOR, ENGINEER, ENGINEER's Consultants, and all other individuals or entities identified in the Supplementary Conditions to be listed as insureds or additional insureds (and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them) for all losses and damages caused by, arising out of, relating to, or resulting from any of the perils or causes of loss covered by such policies and any other property insurance applicable to the Work. If the insurers on any such policies require separate waiver forms to be signed by any Subcontractor or Supplier, CONTRACTOR will obtain the same.**

6.07 ***Patent Fees and Royalties***

A. **CONTRACTOR shall pay all license fees and royalties and assume all costs incident to the use in the performance of the Work or the incorporation in the Work of any invention, design, process, product, or device which is the subject of patent rights or copyrights held by others. If a particular invention, design, process, product, or device is specified in the Contract Documents for use in the performance of the Work and if to the actual knowledge of OWNER or ENGINEER its use is subject to patent rights or copyrights calling for the payment of any license fee or royalty to others, the existence of such rights shall be disclosed by OWNER in the Contract Documents. To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees or agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out**

of or relating to any infringement of patent rights or copyrights incident to the use in the performance of the Work or resulting from the incorporation in the Work of any invention, design, process, product, or device not specified in the Contract Documents.

6.08 ***Permits***

A. **Unless otherwise provided in the Supplementary Conditions, CONTRACTOR shall obtain and pay for all construction permits and licenses. OWNER shall assist CONTRACTOR, when necessary, in obtaining such permits and licenses. CONTRACTOR shall pay all governmental charges and inspection fees necessary for the prosecution of the Work which are applicable at the time of opening of Bids, or, if there are no Bids, on the Effective Date of the Agreement. CONTRACTOR shall pay all charges of utility owners for connections to the Work, and OWNER shall pay all charges of such utility owners for capital costs related thereto, such as plant investment fees.**

6.09 ***Laws and Regulations***

A. **CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to the performance of the Work. Except where otherwise expressly required by applicable Laws and Regulations, neither OWNER nor ENGINEER shall be responsible for monitoring CONTRACTOR's compliance with any Laws or Regulations.**

B. **If CONTRACTOR performs any Work knowing or having reason to know that it is contrary to Laws or Regulations, CONTRACTOR shall bear all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such Work; however, it shall not be CONTRACTOR's primary responsibility to make certain that the Specifications and Drawings are in accordance with Laws and Regulations, but this shall not relieve CONTRACTOR of CONTRACTOR's obligations under paragraph 3.03.**

C. **Changes in Laws or Regulations not known at the time of opening of Bids (or, on the Effective Date of the Agreement if there were no Bids) having an effect on the cost or time of performance of the Work may be the subject of an adjustment in Contract Price or Contract Times. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any such adjustment, a Claim may be made therefor as provided in paragraph 10.05.**

6.10 ***Taxes***

A. **CONTRACTOR shall pay all sales, consumer, use, and other similar taxes required to be paid by CONTRACTOR in accordance with the Laws and Regulations of the place of the Project which are applicable during the performance of the Work.**

6.11 ***Use of Site and Other Areas***

A. **Limitation on Use of Site and Other Areas**

1. **CONTRACTOR shall confine construction equipment, the storage of materials and equipment, and the operations of workers to the Site and other areas permitted by Laws and Regulations, and shall not unreasonably encumber the Site and other areas with construction equipment or other materials or equipment. CONTRACTOR shall assume full responsibility for any damage to any such land or area, or to the owner or occupant thereof, or of any adjacent land or areas resulting from the performance of the Work.**

2. **Should any claim be made by any such owner or occupant because of the performance of the Work, CONTRACTOR shall promptly settle with such other party by negotiation or otherwise resolve the claim by arbitration or other dispute resolution proceeding or at law.**

3. **To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultant, and the officers, directors, partners, employees, agents, and other consultants of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to any claim or action, legal or equitable, brought by any such owner or occupant against OWNER, ENGINEER, or any other party indemnified hereunder to the extent caused by or based upon CONTRACTOR's performance of the Work.**

B. ***Removal of Debris During Performance of the Work:*** **During the progress of the Work CONTRACTOR shall keep the Site and other areas free from accumulations of waste materials, rubbish, and other debris. Removal and disposal of such waste materials, rubbish, and other debris shall conform to applicable Laws and Regulations.**

C. ***Cleaning*****: Prior to Substantial Completion of the Work CONTRACTOR shall clean the Site and make it ready for utilization by OWNER. At the completion of the Work CONTRACTOR shall remove from the Site all tools, appliances, construction equipment and machinery, and surplus materials and shall restore to original condition all property not designated for alteration by the Contract Documents.**

D. ***Loading Structures*****: CONTRACTOR shall not load nor permit any part of any structure to be loaded in any manner that will endanger the structure, nor shall CONTRACTOR subject any part of the Work or adjacent property to stresses or pressures that will endanger it.**

6.12 ***Record Documents***

A. **CONTRACTOR shall maintain in a safe place at the Site one record copy of all Drawings, Specifications, Addenda, Written Amendments, Change Orders, Work Change Directives, Field Orders, and written interpretations and clarifications in good order and annotated to show changes made during construction. These record documents together with all approved Samples and a counterpart of all approved Shop Drawings will be available to ENGINEER for reference. Upon completion of the Work, these record documents, Samples, and Shop Drawings will be delivered to ENGINEER for OWNER.**

6.13 ***Safety and Protection***

A. **CONTRACTOR shall be solely responsible for initiating, maintaining and supervising all safety precautions and programs in connection with the Work.**

CONTRACTOR shall take all necessary precautions for the safety of, and shall provide the necessary protection to prevent damage, injury or loss to:

1. **all persons on the Site or who may be affected by the Work;**

2. **all the Work and materials and equipment to be incorporated therein, whether in storage on or off the Site; and**

3. **other property at the Site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and Underground Facilities not designated for removal, relocation, or replacement in the course of construction.**

B. **CONTRACTOR shall comply with all applicable Laws and Regulations relating to the safety of persons or property, or to the protection of persons or property from damage, injury, or loss; and shall erect and maintain all necessary safeguards for such safety and protection. CONTRACTOR shall notify owners of adjacent property and of Underground Facilities and other utility owners when prosecution of the Work may affect them, and shall cooperate with them in the protection, removal, relocation, and replacement of their property. All damage, injury, or loss to any property referred to in paragraph 6.13.A.2 or 6.13.A.3 caused, directly or indirectly, in whole or in part, by CONTRACTOR, any Subcontractor, Supplier, or any other individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, shall be remedied by CONTRACTOR (except damage or loss attributable to the fault of Drawings or Specifications or to the acts or omissions of OWNER or ENGINEER or ENGINEER's Consultant, or anyone employed by any of them, or anyone for whose acts any of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of CONTRACTOR or any Subcontractor, Supplier, or other individual or entity directly or indirectly employed by any of them). CONTRACTOR's duties and responsibilities for safety and for protection of the Work shall continue until such time as all the Work is completed and ENGINEER has issued a notice to OWNER and CONTRACTOR in accordance with paragraph 14.07.B that the Work is acceptable (except as otherwise expressly provided in connection with Substantial Completion).**

6.14 ***Safety Representative***

A. **CONTRACTOR shall designate a qualified and experienced safety representative at the Site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs.**

6.15 ***Hazard Communication Programs***

A. **CONTRACTOR shall be responsible for coordinating any exchange of material safety data sheets or other hazard communication information required to be made available to or exchanged between or among employers at the Site in accordance with Laws or Regulations.**

6.16 ***Emergencies***

A. **In emergencies affecting the safety or protection of persons or the Work or property at the Site or adjacent thereto, CONTRACTOR is obligated to act to prevent threatened damage, injury, or loss. CONTRACTOR shall give ENGINEER prompt written notice if CONTRACTOR believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby or are required as a result thereof. If ENGINEER determines that a change in the Contract Documents is required because of the action taken by CONTRACTOR in response to such an emergency, a Work Change Directive or Change Order will be issued.**

6.17 ***Shop Drawings and Samples***

A. **CONTRACTOR shall submit Shop Drawings to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. All submittals will be identified as ENGINEER may require and in the number of copies specified in the General Requirements. The data shown on the Shop Drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to show ENGINEER the services, materials, and equipment CONTRACTOR proposes to provide and to enable ENGINEER to review the information for the limited purposes required by paragraph 6.17.E.**

B. **CONTRACTOR shall also submit Samples to ENGINEER for review and approval in accordance with the acceptable schedule of Shop Drawings and Sample submittals. Each Sample will be identified clearly as to material, Supplier, pertinent data such as catalog numbers, and the use for which intended and otherwise as ENGINEER may require to enable ENGINEER to review the submittal for the limited purposes required by paragraph 6.17.E. The numbers of each Sample to be submitted will be as specified in the Specifications.**

C. **Where a Shop Drawing or Sample is required by the Contract Documents or the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER as required by paragraph 2.07, any related Work performed prior to ENGINEER's review and approval of the pertinent submittal will be at the sole expense and responsibility of CONTRACTOR.**

D. **Submittal Procedures**

1. **Before submitting each Shop Drawing or Sample, CONTRACTOR shall have determined and verified:**

a. **all field measurements, quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers, and similar information with respect thereto;**

b. **all materials with respect to intended use, fabrication, shipping, handling, storage, assembly, and installation pertaining to the performance of the Work;**

c. **all information relative to means, methods, techniques, sequences, and procedures of construction and safety precautions and programs incident thereto; and**

d. **CONTRACTOR shall also have reviewed and coordinated each Shop Drawing or Sample with other Shop Drawings and Samples and with the requirements of the Work and the Contract Documents.**

2. **Each submittal shall bear a stamp or specific written indication that CONTRACTOR has satisfied CONTRACTOR's obligations under the Contract Documents with respect to CONTRACTOR's review and approval of that submittal.**

3. **At the time of each submittal, CONTRACTOR shall give ENGINEER specific written notice of such variations, if any, that the Shop Drawing or Sample submitted may have from the requirements of the Contract Documents, such notice to be in a written communication separate from the submittal; and, in addition, shall cause a specific notation to be made on each Shop Drawing and Sample submitted to ENGINEER for review and approval of each such variation.**

E. **ENGINEER's Review**

1. **ENGINEER will timely review and approve Shop Drawings and Samples in accordance with the schedule of Shop Drawings and Sample submittals acceptable to ENGINEER. ENGINEER's review and approval will be only to determine if the items covered by the submittals will, after installation or incorporation in the Work, conform to the information given in the Contract Documents and be compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents.**

2. **ENGINEER's review and approval will not extend to means, methods, techniques, sequences, or procedures of construction (except where a particular means, method, technique, sequence, or procedure of construction is specifically and expressly called for by the Contract Documents) or to safety precautions or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.**

3. **ENGINEER's review and approval of Shop Drawings or Samples shall not relieve CONTRACTOR from responsibility for any variation from the requirements of the Contract Documents unless CONTRACTOR has in writing called ENGINEER's attention to each such variation at the time of each submittal as required by paragraph 6.17.D.3 and ENGINEER has given written approval of each such variation by specific written notation thereof incorporated in or accompanying the Shop Drawing or Sample approval; nor will any approval by ENGINEER relieve CONTRACTOR from responsibility for complying with the requirements of paragraph 6.17.D.1.**

F. **Resubmittal Procedures**

1. **CONTRACTOR shall make corrections required by ENGINEER and shall return the required number of corrected copies of Shop Drawings and submit as required new Samples for review and approval. CONTRACTOR shall direct specific attention in writing to revisions other than the corrections called for by ENGINEER on previous submittals.**

6.18 ***Continuing the Work***

A. **CONTRACTOR shall carry on the Work and adhere to the progress schedule during all disputes or disagreements with OWNER. No Work shall be delayed or postponed pending resolution of any disputes or disagreements, except as permitted by paragraph 15.04 or as OWNER and CONTRACTOR may otherwise agree in writing.**

6.19 ***CONTRACTOR's General Warranty and Guarantee***

A. **CONTRACTOR warrants and guarantees to OWNER, ENGINEER, and ENGINEER's Consultants that all Work will be in accordance with the Contract Documents and will not be defective. CONTRACTOR's warranty and guarantee hereunder excludes defects or damage caused by:**

1. **abuse, modification, or improper maintenance or operation by persons other than CONTRACTOR, Subcontractors, Suppliers, or any other individual or entity for whom CONTRACTOR is responsible; or**

2. **normal wear and tear under normal usage.**

B. **CONTRACTOR's obligation to perform and complete the Work in accordance with the Contract Documents shall be absolute. None of the following will constitute an acceptance of Work that is not in accordance with the Contract Documents or a release of CONTRACTOR's obligation to perform the Work in accordance with the Contract Documents:**

1. **observations by ENGINEER;**

2. **recommendation by ENGINEER or payment by OWNER of any progress or final payment;**

3. **the issuance of a certificate of Substantial Completion by ENGINEER or any payment related thereto by OWNER;**

4. **use or occupancy of the Work or any part thereof by OWNER;**

5. **any acceptance by OWNER or any failure to do so;**

6. **any review and approval of a Shop Drawing or Sample submittal or the issuance of a notice of acceptability by ENGINEER;**

7. **any inspection, test, or approval by others; or**

8. **any correction of defective Work by OWNER.**

6.20 ***Indemnification***

A. **To the fullest extent permitted by Laws and Regulations, CONTRACTOR shall indemnify and hold harmless OWNER, ENGINEER, ENGINEER's Consultants, and the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them from and against all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to the performance of the Work, provided that any such claim, cost, loss, or damage:**

1. **is attributable to bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property (other than the Work itself), including the loss of use resulting therefrom; and**

2. **is caused in whole or in part by any negligent act or omission of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work or anyone for whose acts any of them may be liable, regardless of whether or not caused in part by any negligence or omission of an individual or entity indemnified hereunder or whether liability is imposed upon such indemnified party by Laws and Regulations regardless of the negligence of any such individual or entity.**

B. **In any and all claims against OWNER or ENGINEER or any of their respective consultants, agents, officers, directors, partners, or employees by any employee (or the survivor or personal representative of such employee) of CONTRACTOR, any Subcontractor, any Supplier, or any individual or entity directly or indirectly employed by any of them to perform any of the Work, or anyone for whose acts any of them may be liable, the indemnification obligation under paragraph 6.20.A shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for CONTRACTOR or any such Subcontractor, Supplier, or other individual or entity under workers' compensation acts, disability benefit acts, or other employee benefit acts.**

C. **The indemnification obligations of CONTRACTOR under paragraph 6.20.A shall not extend to the liability of ENGINEER and ENGINEER's Consultants or to the officers, directors, partners, employees, agents, and other consultants and subcontractors of each and any of them arising out of:**

1. **the preparation or approval of, or the failure to prepare or approve, maps, Drawings, opinions, reports, surveys, Change Orders, designs, or Specifications; or**

2. **giving directions or instructions, or failing to give them, if that is the primary cause of the injury or damage.**

ARTICLE 7 - **OTHER WORK**

7.01 ***Related Work at Site***

A. **OWNER may perform other work related to the Project at the Site by OWNER's employees, or let other direct contracts therefor, or have other work performed by utility owners. If such other work is not noted in the Contract Documents, then:**

1. **written notice thereof will be given to CONTRACTOR prior to starting any such other work; and**

2. **if OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times that should be allowed as a result of such other work, a Claim may be made therefor as provided in paragraph 10.05.**

B. **CONTRACTOR shall afford each other contractor who is a party to such a direct contract and each utility owner (and OWNER, if OWNER is performing the other work with OWNER's employees) proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of such other work and shall properly coordinate the Work with theirs. Unless otherwise provided in the Contract Documents, CONTRACTOR shall do all cutting, fitting, and patching of the Work that may be required to properly connect or otherwise make its several parts come together and properly integrate with such other work. CONTRACTOR shall not endanger any work of others by cutting, excavating, or otherwise altering their work and will only cut or alter their work with the written consent of ENGINEER and the others whose work will be affected. The duties and responsibilities of CONTRACTOR under this paragraph are for the benefit of such utility owners and other contractors to the extent that there are comparable provisions for the benefit of CONTRACTOR in said direct contracts between OWNER and such utility owners and other contractors.**

C. **If the proper execution or results of any part of CONTRACTOR's Work depends upon work performed by others under this Article 7, CONTRACTOR shall inspect such other work and promptly report to ENGINEER in writing any delays, defects, or deficiencies in such other work that render it unavailable or unsuitable for the proper execution and results of CONTRACTOR's Work. CONTRACTOR's failure to so report will constitute an acceptance of such other work as fit and proper for integration with CONTRACTOR's Work except for latent defects and deficiencies in such other work.**

7.02 ***Coordination***

A. **If OWNER intends to contract with others for the performance of other work on the Project at the Site, the following will be set forth in Supplementary Conditions:**

1. **the individual or entity who will have authority and responsibility for coordination of the activities among the various contractors will be identified;**

2. **the specific matters to be covered by such authority and responsibility will be itemized; and**

3. **the extent of such authority and responsibilities will be provided.**

B. **Unless otherwise provided in the Supplementary Conditions, OWNER shall have sole authority and responsibility for such coordination.**

ARTICLE 8 - **OWNER'S RESPONSIBILITIES**

8.01 ***Communications to CONTRACTOR***

A. **Except as otherwise provided in these General Conditions, OWNER shall issue all communications to CONTRACTOR through ENGINEER.**

8.02 ***Replacement of ENGINEER***

A. **In case of termination of the employment of ENGINEER, OWNER shall appoint an engineer to whom CONTRACTOR makes no reasonable objection, whose status under the Contract Documents shall be that of the former ENGINEER.**

8.03 ***Furnish Data***

A. **OWNER shall promptly furnish the data required of OWNER under the Contract Documents.**

8.04 ***Pay Promptly When Due***

A. **OWNER shall make payments to CONTRACTOR promptly when they are due as provided in paragraphs 14.02.C and 14.07.C.**

8.05 ***Lands and Easements; Reports and Tests***

A. **OWNER's duties in respect of providing lands and easements and providing engineering surveys to establish reference points are set forth in paragraphs 4.01 and 4.05. Paragraph 4.02 refers to OWNER's identifying and making available to CONTRACTOR copies of reports of explorations and tests of subsurface conditions and drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the Site that have been utilized by ENGINEER in preparing the Contract Documents.**

8.06 ***Insurance***

A. **OWNER's responsibilities, if any, in respect to purchasing and maintaining liability and property insurance are set forth in Article 5.**

8.07 ***Change Orders***

A. **OWNER is obligated to execute Change Orders as indicated in paragraph 10.03.**

8.08 ***Inspections, Tests, and Approvals***

A. **OWNER's responsibility in respect to certain inspections, tests, and approvals is set forth in paragraph 13.03.B.**

8.09 ***Limitations on OWNER's Responsibilities***

A. **The OWNER shall not supervise, direct, or have control or authority over, nor be responsible for, CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. OWNER will not be responsible for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.**

8.10 ***Undisclosed Hazardous Environmental Condition***

A. **OWNER's responsibility in respect to an undisclosed Hazardous Environmental Condition is set forth in paragraph 4.06.**

8.11 ***Evidence of Financial Arrangements***

A. **If and to the extent OWNER has agreed to furnish CONTRACTOR reasonable evidence that financial arrangements have been made to satisfy OWNER's obligations under the Contract Documents, OWNER's responsibility in respect thereof will be as set forth in the Supplementary Conditions.**

ARTICLE 9 - ENGINEER'S STATUS DURING CONSTRUCTION

9.01 ***OWNER'S Representative***

A. **ENGINEER will be OWNER's representative during the construction period. The duties and responsibilities and the limitations of authority of ENGINEER as OWNER's representative during construction are set forth in the Contract Documents and will not be changed without written consent of OWNER and ENGINEER.**

9.02 ***Visits to Site***

A. **ENGINEER will make visits to the Site at intervals appropriate to the various stages of construction as ENGINEER deems necessary in order to observe as an experienced and qualified design professional the progress that has been made and the quality of the various aspects of CONTRACTOR's executed Work. Based on information obtained during such visits and observations, ENGINEER, for the benefit of OWNER, will determine, in general, if the Work is proceeding in accordance with the Contract Documents. ENGINEER will not be required to make exhaustive or continuous inspections on the Site to check the quality or quantity of the Work. ENGINEER's efforts will be directed toward providing for OWNER a greater degree of confidence that the completed Work will conform generally to the Contract Documents. On the basis of such visits and observations, ENGINEER will keep OWNER informed of the progress of the Work and will endeavor to guard OWNER against defective Work.**

B. **ENGINEER's visits and observations are subject to all the limitations on ENGINEER's authority and responsibility set forth in paragraph 9.10, and particularly, but without limitation, during or as a result of ENGINEER's visits or observations of CONTRACTOR's Work ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work.**

9.03 ***Project Representative***

A. **If OWNER and ENGINEER agree, ENGINEER will furnish a Resident Project Representative to assist ENGINEER in providing more extensive observation of the Work. The responsibilities and authority and limitations thereon of any such Resident Project Representative and assistants will be as provided in paragraph 9.10 and in the Supplementary Conditions. If OWNER designates another representative or agent to represent OWNER at the Site who is not ENGINEER's Consultant, agent or employee, the responsibilities and authority and limitations thereon of such other individual or entity will be as provided in the Supplementary Conditions.**

9.04 ***Clarifications and Interpretations***

A. **ENGINEER will issue with reasonable promptness such written clarifications or interpretations of the requirements of the Contract Documents as ENGINEER may determine necessary, which shall be consistent with the intent of and reasonably inferable from the Contract Documents. Such written clarifications and interpretations will be binding on OWNER and CONTRACTOR. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a written clarification or interpretation, a Claim may be made therefor as provided in paragraph 10.05.**

9.05 ***Authorized Variations in Work***

A. **ENGINEER may authorize minor variations in the Work from the requirements of the Contract Documents which do not involve an adjustment in the Contract Price or the Contract Times and are compatible with the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. These may be accomplished by a Field Order and will be binding on OWNER and also on CONTRACTOR, who shall perform the Work involved promptly. If OWNER and CONTRACTOR are unable to agree on entitlement to or on the amount or extent, if any, of any adjustment in the Contract Price or Contract Times, or both, as a result of a Field Order, a Claim may be made therefor as provided in paragraph 10.05.**

9.06 ***Rejecting Defective Work***

A. **ENGINEER will have authority to disapprove or reject Work which ENGINEER believes to be defective, or that ENGINEER believes will not produce a completed Project that conforms to the Contract Documents or that will prejudice the integrity of the design concept of the completed Project as a functioning whole as indicated by the Contract Documents. ENGINEER will also have authority to require special inspection or testing of the Work as provided in paragraph 13.04, whether or not the Work is fabricated, installed, or completed.**

9.07 ***Shop Drawings, Change Orders and Payments***

A. **In connection with ENGINEER's authority as to Shop Drawings and Samples, see paragraph 6.17.**

B. **In connection with ENGINEER's authority as to Change Orders, see Articles 10, 11, and 12.**

C. **In connection with ENGINEER's authority as to Applications for Payment, see Article 14.**

9.08 ***Determinations for Unit Price Work***

A. **ENGINEER will determine the actual quantities and classifications of Unit Price Work performed by CONTRACTOR. ENGINEER will review with CONTRACTOR the ENGINEER's preliminary determinations on such matters before rendering a written decision thereon (by recommendation of an Application for Payment or otherwise). ENGINEER's written decision thereon will be final and binding (except as modified by ENGINEER to reflect changed factual conditions or more accurate data) upon OWNER and CONTRACTOR, subject to the provisions of paragraph 10.05.**

9.09 ***Decisions on Requirements of Contract Documents and Acceptability of Work***

A. **ENGINEER will be the initial interpreter of the requirements of the Contract Documents and judge of the acceptability of the Work thereunder. Claims, disputes and other matters relating to the acceptability of the Work, the quantities and classifications of Unit Price Work, the interpretation of the requirements of the Contract Documents pertaining to the performance of the Work, and Claims seeking changes in the Contract Price or Contract Times will be referred initially to ENGINEER in writing, in accordance with the provisions of paragraph 10.05, with a request for a formal decision.**

B. **When functioning as interpreter and judge under this paragraph 9.09, ENGINEER will not show partiality to OWNER or CONTRACTOR and will not be liable in connection with any interpretation or decision rendered in good faith in such capacity. The rendering of a decision by ENGINEER pursuant to this paragraph 9.09 with respect to any such Claim, dispute, or other matter (except any which have been waived by the making or acceptance of final payment as provided in paragraph 14.07) will be a condition precedent to any exercise by OWNER or CONTRACTOR of such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any such Claim, dispute, or other matter.**

9.10 ***Limitations on ENGINEER's Authority and Responsibilities***

A. **Neither ENGINEER's authority or responsibility under this Article 9 or under any other provision of the Contract Documents nor any decision made by ENGINEER in good faith either to exercise or not exercise such authority or responsibility or the undertaking, exercise, or performance of any authority or responsibility by ENGINEER shall create, impose, or give rise to any duty in contract, tort, or otherwise owed by ENGINEER to CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or to any surety for or employee or agent of any of them.**

B. **ENGINEER will not supervise, direct, control, or have authority over or be responsible for CONTRACTOR's means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for any failure of CONTRACTOR to comply with Laws and Regulations applicable to the performance of the Work. ENGINEER will not be responsible for CONTRACTOR's failure to perform the Work in accordance with the Contract Documents.**

C. **ENGINEER will not be responsible for the acts or omissions of CONTRACTOR or of any Subcontractor, any Supplier, or of any other individual or entity performing any of the Work.**

D. **ENGINEER's review of the final Application for Payment and accompanying documentation and all maintenance and operating instructions, schedules, guarantees, Bonds, certificates of inspection, tests and approvals, and other documentation required to be delivered by paragraph 14.07.A will only be to determine generally that their content complies with the requirements of, and in the case of certificates of inspections, tests, and approvals that the results certified indicate compliance with, the Contract Documents.**

E. **The limitations upon authority and responsibility set forth in this paragraph 9.10 shall also apply to ENGINEER's Consultants, Resident Project Representative, and assistants.**

ARTICLE 10 - **CHANGES IN THE WORK; CLAIMS**

10.01 ***Authorized Changes in the Work***

A. **Without invalidating the Agreement and without notice to any surety, OWNER may, at any time or from time to time, order additions, deletions, or revisions in the Work by a Written Amendment, a Change Order, or a Work Change Directive. Upon receipt of any such document, CONTRACTOR shall promptly proceed with the Work involved which will be performed under the applicable conditions of the Contract Documents (except as otherwise specifically provided).**

B. **If OWNER and CONTRACTOR are unable to agree on entitlement to, or on the amount or extent, if any, of an adjustment in the Contract Price or Contract Times, or both, that should be allowed as a result of a Work Change Directive, a Claim may be made therefor as provided in paragraph 10.05.**

10.02 ***Unauthorized Changes in the Work***

A. **CONTRACTOR shall not be entitled to an increase in the Contract Price or an extension of the Contract Times with respect to any work performed that is not required by the Contract Documents as amended, modified, or supplemented as provided in paragraph 3.04, except in the case of an emergency as provided in paragraph 6.16 or in the case of uncovering Work as provided in paragraph 13.04.B.**

10.03 ***Execution of Change Orders***

A. **OWNER and CONTRACTOR shall execute appropriate Change Orders recommended by ENGINEER (or Written Amendments) covering:**

1. **changes in the Work which are: (i) ordered by OWNER pursuant to paragraph 10.01.A, (ii) required because of acceptance of defective Work under paragraph 13.08.A or OWNER's correction of defective Work under paragraph 13.09, or (iii) agreed to by the parties;**

2. **changes in the Contract Price or Contract Times which are agreed to by the parties, including any undisputed sum or amount of time for Work actually performed in accordance with a Work Change Directive; and**

3. **changes in the Contract Price or Contract Times which embody the substance of any written decision rendered by ENGINEER pursuant to paragraph 10.05; provided that, in lieu of executing any such Change Order, an appeal may be taken from any such decision in accordance with the provisions of the Contract Documents and applicable Laws and Regulations, but during any such appeal, CONTRACTOR shall carry on the Work and adhere to the progress schedule as provided in paragraph 6.18.A.**

10.04 ***Notification to Surety***

A. **If notice of any change affecting the general scope of the Work or the provisions of the Contract Documents (including, but not limited to, Contract Price or Contract Times) is required by the provisions of any Bond to be given to a surety, the giving of any such notice will be CONTRACTOR's responsibility. The amount of each applicable Bond will be adjusted to reflect the effect of any such change.**

10.05 ***Claims and Disputes***

A. ***Notice*: Written notice stating the general nature of each Claim, dispute, or other matter shall be delivered by the claimant to ENGINEER and the other party to the Contract promptly (but in no event later than 30 days) after the start of the event giving rise thereto. Notice of the amount or extent of the Claim, dispute, or other matter with supporting data shall be delivered to the ENGINEER and the other party to the Contract within 60 days after the start of such event (unless ENGINEER allows additional time for claimant to submit additional or more accurate data in support of such Claim, dispute, or other matter). A Claim for an adjustment in Contract Price shall be prepared in accordance with the provisions of paragraph 12.01.B. A Claim for an adjustment in Contract Time shall be prepared in accordance with the provisions of paragraph 12.02.B. Each Claim shall be accompanied by claimant's written statement that the adjustment claimed is the entire adjustment to which the claimant believes it is entitled as a result of said event. The opposing party shall submit any response to ENGINEER and the claimant within 30 days after receipt of the claimant's last submittal (unless ENGINEER allows additional time).**

B. ***ENGINEER's Decision*: ENGINEER will render a formal decision in writing within 30 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any. ENGINEER's written decision on such Claim, dispute, or other matter will be final and binding upon OWNER and CONTRACTOR unless:**

1. **an appeal from ENGINEER's decision is taken within the time limits and in accordance with the dispute resolution procedures set forth in Article 16; or**

2. **if no such dispute resolution procedures have been set forth in Article 16, a written notice of intention to appeal from ENGINEER's written decision is delivered by OWNER or CONTRACTOR to the other and to ENGINEER within 30 days after the date of such decision, and a formal proceeding is instituted by the appealing party in a forum of competent jurisdiction within 60 days after the date of such decision or within 60 days after Substantial Completion, whichever is later (unless otherwise agreed in writing by OWNER and CONTRACTOR), to exercise such rights or remedies as the appealing party may have with respect to such Claim, dispute, or other matter in accordance with applicable Laws and Regulations.**

C. **If ENGINEER does not render a formal decision in writing within the time stated in paragraph 10.05.B, a decision denying the Claim in its entirety shall be deemed to have been issued 31 days after receipt of the last submittal of the claimant or the last submittal of the opposing party, if any.**

D. **No Claim for an adjustment in Contract Price or Contract Times (or Milestones) will be valid if not submitted in accordance with this paragraph 10.05.**

ARTICLE 11 - COST OF THE WORK; CASH ALLOWANCES; UNIT PRICE WORK

11.01 ***Cost of the Work***

A. ***Costs Included*: The term Cost of the Work means the sum of all costs necessarily incurred and paid by CONTRACTOR in the proper performance of the Work. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, the costs to be reimbursed to CONTRACTOR will be only those additional or incremental costs required because of the change in the Work or because of the event giving rise to the Claim. Except as otherwise may be agreed to in writing by OWNER, such costs shall be in amounts no higher than those prevailing in the locality of the Project, shall include only the following items, and shall not include any of the costs itemized in paragraph 11.01.B.**

1. **Payroll costs for employees in the direct employ of CONTRACTOR in the performance of**

the Work under schedules of job classifications agreed upon by OWNER and CONTRACTOR. Such employees shall include without limitation superintendents, foremen, and other personnel employed full time at the Site. Payroll costs for employees not employed full time on the Work shall be apportioned on the basis of their time spent on the Work. Payroll costs shall include, but not be limited to, salaries and wages plus the cost of fringe benefits, which shall include social security contributions, unemployment, excise, and payroll taxes, workers' compensation, health and retirement benefits, bonuses, sick leave, vacation and holiday pay applicable thereto. The expenses of performing Work outside of regular working hours, on Saturday, Sunday, or legal holidays, shall be included in the above to the extent authorized by OWNER.

2. **Cost of all materials and equipment furnished and incorporated in the Work, including costs of transportation and storage thereof, and Suppliers' field services required in connection therewith. All cash discounts shall accrue to CONTRACTOR unless OWNER deposits funds with CONTRACTOR with which to make payments, in which case the cash discounts shall accrue to OWNER. All trade discounts, rebates and refunds and returns from sale of surplus materials and equipment shall accrue to OWNER, and CONTRACTOR shall make provisions so that they may be obtained.**

3. **Payments made by CONTRACTOR to Subcontractors for Work performed by Subcontractors. If required by OWNER, CONTRACTOR shall obtain competitive bids from subcontractors acceptable to OWNER and CONTRACTOR and shall deliver such bids to OWNER, who will then determine, with the advice of ENGINEER, which bids, if any, will be acceptable. If any subcontract provides that the Subcontractor is to be paid on the basis of Cost of the Work plus a fee, the Subcontractor's Cost of the Work and fee shall be determined in the same manner as CONTRACTOR's Cost of the Work and fee as provided in this paragraph 11.01.**

4. **Costs of special consultants (including but not limited to engineers, architects, testing laboratories, surveyors, attorneys, and accountants) employed for services specifically related to the Work.**

5. **Supplemental costs including the following:**

a. **The proportion of necessary transportation, travel, and subsistence expenses of CONTRACTOR's employees incurred in discharge of duties connected with the Work.**

b. **Cost, including transportation and maintenance, of all materials, supplies, equipment, machinery, appliances, office, and temporary facilities at the Site, and hand tools not owned by the workers, which are consumed in the performance of the Work, and cost, less market value, of such items used but not consumed which remain the property of CONTRACTOR.**

c. **Rentals of all construction equipment and machinery, and the parts thereof whether rented from CONTRACTOR or others in accordance with rental agreements approved by OWNER with the advice of ENGINEER, and the costs of transportation, loading, unloading, assembly, dismantling, and removal thereof. All such costs shall be in accordance with the terms of said rental agreements. The rental of any such equipment, machinery, or parts shall cease when the use thereof is no longer necessary for the Work.**

d. **Sales, consumer, use, and other similar taxes related to the Work, and for which CONTRACTOR is liable, imposed by Laws and Regulations.**

e. **Deposits lost for causes other than negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, and royalty payments and fees for permits and licenses.**

f. **Losses and damages (and related expenses) caused by damage to the Work, not compensated by insurance or otherwise, sustained by CONTRACTOR in connection with the performance of the Work (except losses and damages within the deductible amounts of property insurance established in accordance with paragraph 5.06.D), provided such losses and damages have resulted from causes other than the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable. Such losses shall include settlements made with the written consent and approval of OWNER. No such losses, damages, and expenses shall be included in the Cost of the Work for the purpose of determining CONTRACTOR's fee.**

g. **The cost of utilities, fuel, and sanitary facilities at the Site.**

h. **Minor expenses such as telegrams, long distance telephone calls, telephone service at the Site, expressage, and similar petty cash items in connection with the Work.**

i. **When the Cost of the Work is used to determine the value of a Change Order or of a Claim, the cost of premiums for additional Bonds and insurance required because of the changes in the Work or caused by the event giving rise to the Claim.**

j. **When all the Work is performed on the basis of cost-plus, the costs of premiums for all Bonds and insurance CONTRACTOR is required by the Contract Documents to purchase and maintain.**

B. ***Costs Excluded*: The term Cost of the Work shall not include any of the following items:**

1. **Payroll costs and other compensation of CONTRACTOR's officers, executives, principals (of partnerships and sole proprietorships), general**

managers, engineers, architects, estimators, attorneys, auditors, accountants, purchasing and contracting agents, expediters, timekeepers, clerks, and other personnel employed by CONTRACTOR, whether at the Site or in CONTRACTOR's principal or branch office for general administration of the Work and not specifically included in the agreed upon schedule of job classifications referred to in paragraph 11.01.A.1 or specifically covered by paragraph 11.01.A.4, all of which are to be considered administrative costs covered by the CONTRACTOR's fee.

2. **Expenses of CONTRACTOR's principal and branch offices other than CONTRACTOR's office at the Site.**

3. **Any part of CONTRACTOR's capital expenses, including interest on CONTRACTOR's capital employed for the Work and charges against CONTRACTOR for delinquent payments.**

4. **Costs due to the negligence of CONTRACTOR, any Subcontractor, or anyone directly or indirectly employed by any of them or for whose acts any of them may be liable, including but not limited to, the correction of defective Work, disposal of materials or equipment wrongly supplied, and making good any damage to property.**

5. **Other overhead or general expense costs of any kind and the costs of any item not specifically and expressly included in paragraphs 11.01.A and 11.01.B.**

C. ***CONTRACTOR's Fee*: When all the Work is performed on the basis of cost-plus, CONTRACTOR's fee shall be determined as set forth in the Agreement. When the value of any Work covered by a Change Order or when a Claim for an adjustment in Contract Price is determined on the basis of Cost of the Work, CONTRACTOR's fee shall be determined as set forth in paragraph 12.01.C.**

D. ***Documentation*: Whenever the Cost of the Work for any purpose is to be determined pursuant to paragraphs 11.01.A and 11.01.B, CONTRACTOR will establish and maintain records thereof in accordance with generally accepted accounting practices and submit in a form acceptable to ENGINEER an itemized cost breakdown together with supporting data.**

11.02 ***Cash Allowances***

A. **It is understood that CONTRACTOR has included in the Contract Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums as may be acceptable to OWNER and ENGINEER. CONTRACTOR agrees that:**

1. **the allowances include the cost to CONTRACTOR (less any applicable trade discounts) of materials and equipment required by the allowances to be delivered at the Site, and all applicable taxes; and**

2. **CONTRACTOR's costs for unloading and handling on the Site, labor, installation costs, overhead, profit, and other expenses contemplated for the allowances have been included in the Contract Price and not in the allowances, and no demand for additional payment on account of any of the foregoing will be valid.**

B. **Prior to final payment, an appropriate Change Order will be issued as recommended by ENGINEER to reflect actual amounts due CONTRACTOR on account of Work covered by allowances, and the Contract Price shall be correspondingly adjusted.**

11.03 ***Unit Price Work***

A. **Where the Contract Documents provide that all or part of the Work is to be Unit Price Work, initially the Contract Price will be deemed to include for all Unit Price Work an amount equal to the sum of the unit price for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Agreement. The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Price. Determinations of the actual quantities and classifications of Unit Price Work performed by CONTRACTOR will be made by ENGINEER subject to the provisions of paragraph 9.08.**

B. **Each unit price will be deemed to include an amount considered by CONTRACTOR to be adequate to cover CONTRACTOR's overhead and profit for each separately identified item.**

C. **OWNER or CONTRACTOR may make a Claim for an adjustment in the Contract Price in accordance with paragraph 10.05 if:**

1. **the quantity of any item of Unit Price Work performed by CONTRACTOR differs materially and significantly from the estimated quantity of such item indicated in the Agreement; and**

2. **there is no corresponding adjustment with respect to any other item of Work; and**

3. **if CONTRACTOR believes that CONTRACTOR is entitled to an increase in Contract Price as a result of having incurred additional expense or OWNER believes that OWNER is entitled to a decrease in Contract Price and the parties are unable to agree as to the amount of any such increase or decrease.**

ARTICLE 12 - **CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES**

12.01 ***Change of Contract Price***

A. **The Contract Price may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Price shall be based on written notice submitted by the party making the Claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.**

B. **The value of any Work covered by a Change Order or of any Claim for an adjustment in the Contract Price will be determined as follows:**

1. **where the Work involved is covered by unit prices contained in the Contract Documents, by application of such unit prices to the quantities of the items involved (subject to the provisions of paragraph 11.03); or**

2. **where the Work involved is not covered by unit prices contained in the Contract**

Documents, by a mutually agreed lump sum (which may include an allowance for overhead and profit not necessarily in accordance with paragraph 12.01.C.2); or

3. **where the Work involved is not covered by unit prices contained in the Contract Documents and agreement to a lump sum is not reached under paragraph 12.01.B.2, on the basis of the Cost of the Work (determined as provided in paragraph 11.01) plus a CONTRACTOR's fee for overhead and profit (determined as provided in paragraph 12.01.C).**

C. ***CONTRACTOR's Fee*: The CONTRACTOR's fee for overhead and profit shall be determined as follows:**

1. **a mutually acceptable fixed fee; or**

2. **if a fixed fee is not agreed upon, then a fee based on the following percentages of the various portions of the Cost of the Work:**

a. **for costs incurred under paragraphs 11.01.A.1 and 11.01.A.2, the CONTRACTOR's fee shall be 15 percent;**

b. **for costs incurred under paragraph 11.01.A.3, the CONTRACTOR's fee shall be five percent;**

c. **where one or more tiers of subcontracts are on the basis of Cost of the Work plus a fee and no fixed fee is agreed upon, the intent of paragraph 12.01.C.2.a is that the Subcontractor who actually performs the Work, at whatever tier, will be paid a fee of 15 percent of the costs incurred by such Subcontractor under paragraphs 11.01.A.1 and 11.01.A.2 and that any higher tier Subcontractor and CONTRACTOR will each be paid a fee of five percent of the amount paid to the next lower tier Subcontractor;**

d. **no fee shall be payable on the basis of costs itemized under paragraphs 11.01.A.4, 11.01.A.5, and 11.01.B;**

e. **the amount of credit to be allowed by CONTRACTOR to OWNER for any change which results in a net decrease in cost will be the amount of the actual net decrease in cost plus a deduction in CONTRACTOR's fee by an amount equal to five percent of such net decrease; and**

f. **when both additions and credits are involved in any one change, the adjustment in CONTRACTOR's fee shall be computed on the basis of the net change in accordance with paragraphs 12.01.C.2.a through 12.01.C.2.e, inclusive.**

12.02 ***Change of Contract Times***

A. **The Contract Times (or Milestones) may only be changed by a Change Order or by a Written Amendment. Any Claim for an adjustment in the Contract Times (or Milestones) shall be based on written notice submitted by the party making the claim to the ENGINEER and the other party to the Contract in accordance with the provisions of paragraph 10.05.**

B. **Any adjustment of the Contract Times (or Milestones) covered by a Change Order or of any Claim for an adjustment in the Contract Times (or Milestones) will be determined in accordance with the provisions of this Article 12.**

12.03 ***Delays Beyond CONTRACTOR's Control***

A. **Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of CONTRACTOR, the Contract Times (or Milestones) will be extended in an amount equal to the time lost due to such delay if a Claim is made therefor as provided in paragraph 12.02.A. Delays beyond the control of CONTRACTOR shall include, but not be limited to, acts or neglect by OWNER, acts or neglect of utility owners or other contractors performing other work as contemplated by Article 7, fires, floods, epidemics, abnormal weather conditions, or acts of God.**

12.04 ***Delays Within CONTRACTOR's Control***

A. **The Contract Times (or Milestones) will not be extended due to delays within the control of CONTRACTOR. Delays attributable to and within the control of a Subcontractor or Supplier shall be deemed to be delays within the control of CONTRACTOR.**

12.05 ***Delays Beyond OWNER's and CONTRACTOR's Control***

A. **Where CONTRACTOR is prevented from completing any part of the Work within the Contract Times (or Milestones) due to delay beyond the control of both OWNER and CONTRACTOR, an extension of the Contract Times (or Milestones) in an amount equal to the time lost due to such delay shall be CONTRACTOR's sole and exclusive remedy for such delay.**

12.06 ***Delay Damages***

A. **In no event shall OWNER or ENGINEER be liable to CONTRACTOR, any Subcontractor, any Supplier, or any other person or organization, or to any surety for or employee or agent of any of them, for damages arising out of or resulting from:**

1. **delays caused by or within the control of CONTRACTOR; or**

2. **delays beyond the control of both OWNER and CONTRACTOR including but not limited to fires, floods, epidemics, abnormal weather conditions, acts of God, or acts or neglect by utility owners or other contractors performing other work as contemplated by Article 7.**

B. **Nothing in this paragraph 12.06 bars a change in Contract Price pursuant to this Article 12 to compensate CONTRACTOR due to delay, interference, or disruption directly attributable to actions or inactions of OWNER or anyone for whom OWNER is responsible.**

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL OR ACCEPTANCE OF DEFECTIVE WORK

13.01 ***Notice of Defects***

A. **Prompt notice of all defective Work of which OWNER or ENGINEER has actual knowledge will be given to CONTRACTOR. All defective Work may be rejected, corrected, or accepted as provided in this Article 13.**

13.02 ***Access to Work***

A. **OWNER, ENGINEER, ENGINEER's Consultants, other representatives and personnel of OWNER, independent testing laboratories, and governmental agencies with jurisdictional interests will have access to the Site and the Work at reasonable times for their observation, inspecting, and testing. CONTRACTOR shall provide them proper and safe conditions for such access and advise them of CONTRACTOR's Site safety procedures and programs so that they may comply therewith as applicable.**

13.03 ***Tests and Inspections***

A. **CONTRACTOR shall give ENGINEER timely notice of readiness of the Work for all required inspections, tests, or approvals and shall cooperate with inspection and testing personnel to facilitate required inspections or tests.**

B. **OWNER shall employ and pay for the services of an independent testing laboratory to perform all inspections, tests, or approvals required by the Contract Documents except:**

1. **for inspections, tests, or approvals covered by paragraphs 13.03.C and 13.03.D below;**

2. **that costs incurred in connection with tests or inspections conducted pursuant to paragraph 13.04.B shall be paid as provided in said paragraph 13.04.B; and**

3. **as otherwise specifically provided in the Contract Documents.**

C. **If Laws or Regulations of any public body having jurisdiction require any Work (or part thereof) specifically to be inspected, tested, or approved by an employee or other representative of such public body, CONTRACTOR shall assume full responsibility for arranging and obtaining such inspections, tests, or approvals, pay all costs in connection therewith, and furnish ENGINEER the required certificates of inspection or approval.**

D. **CONTRACTOR shall be responsible for arranging and obtaining and shall pay all costs in connection with any inspections, tests, or approvals required for OWNER's and ENGINEER's acceptance of materials or equipment to be incorporated in the Work; or acceptance of materials, mix designs, or equipment submitted for approval prior to CONTRACTOR's purchase thereof for incorporation in the Work. Such inspections, tests, or approvals shall be performed by organizations acceptable to OWNER and ENGINEER.**

E. **If any Work (or the work of others) that is to be inspected, tested, or approved is covered by CONTRACTOR without written concurrence of ENGINEER, it must, if requested by ENGINEER, be uncovered for observation.**

F. **Uncovering Work as provided in paragraph 13.03.E shall be at CONTRACTOR's expense unless CONTRACTOR has given ENGINEER timely notice of CONTRACTOR's intention to cover the same and ENGINEER has not acted with reasonable promptness in response to such notice.**

13.04 ***Uncovering Work***

A. **If any Work is covered contrary to the written request of ENGINEER, it must, if requested by ENGINEER, be uncovered for ENGINEER's observation and replaced at CONTRACTOR's expense.**

B. **If ENGINEER considers it necessary or advisable that covered Work be observed by ENGINEER or inspected or tested by others, CONTRACTOR, at ENGINEER's request, shall uncover, expose, or otherwise make available for observation, inspection, or testing as ENGINEER may require, that portion of the Work in question, furnishing all necessary labor, material, and equipment. If it is found that such Work is defective, CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such uncovering, exposure, observation, inspection, and testing, and of satisfactory replacement or reconstruction (including but not limited to all costs of repair or replacement of work of others); and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If, however, such Work is not found to be defective, CONTRACTOR shall be allowed an increase in the Contract Price or an extension of the Contract Times (or Milestones), or both, directly attributable to such uncovering, exposure, observation, inspection, testing, replacement, and reconstruction. If the parties are unable to agree as to the amount or extent thereof, CONTRACTOR may make a Claim therefor as provided in paragraph 10.05.**

13.05 ***OWNER May Stop the Work***

A. **If the Work is defective, or CONTRACTOR fails to supply sufficient skilled workers or suitable materials or equipment, or fails to perform the Work in such a way that the completed Work will conform to the Contract Documents, OWNER may order CONTRACTOR to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, this right of OWNER to stop the Work shall not give rise to any duty on the part of OWNER to exercise this right for the benefit of CONTRACTOR, any Subcontractor, any Supplier, any other individual or entity, or any surety for, or employee or agent of any of them.**

13.06 ***Correction or Removal of Defective Work***

A. **CONTRACTOR shall correct all defective Work, whether or not fabricated, installed, or completed, or, if the Work has been rejected by ENGINEER, remove it from the Project and replace it with Work that is not defective. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or removal (including but not limited to all costs of repair or replacement of work of others).**

13.07 ***Correction Period***

A. **If within one year after the date of Substantial Completion or such longer period of time as may be prescribed by Laws or Regulations or by the terms of any applicable special guarantee required by the Contract Documents or by any specific provision of the Contract**

Documents, any Work is found to be defective, or if the repair of any damages to the land or areas made available for CONTRACTOR's use by OWNER or permitted by Laws and Regulations as contemplated in paragraph 6.11.A is found to be defective, CONTRACTOR shall promptly, without cost to OWNER and in accordance with OWNER's written instructions: (i) repair such defective land or areas, or (ii) correct such defective Work or, if the defective Work has been rejected by OWNER, remove it from the Project and replace it with Work that is not defective, and (iii) satisfactorily correct or repair or remove and replace any damage to other Work, to the work of others or other land or areas resulting therefrom. If CONTRACTOR does not promptly comply with the terms of such instructions, or in an emergency where delay would cause serious risk of loss or damage, OWNER may have the defective Work corrected or repaired or may have the rejected Work removed and replaced, and all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) arising out of or relating to such correction or repair or such removal and replacement (including but not limited to all costs of repair or replacement of work of others) will be paid by CONTRACTOR.

B. **In special circumstances where a particular item of equipment is placed in continuous service before Substantial Completion of all the Work, the correction period for that item may start to run from an earlier date if so provided in the Specifications or by Written Amendment.**

C. **Where defective Work (and damage to other Work resulting therefrom) has been corrected or removed and replaced under this paragraph 13.07, the correction period hereunder with respect to such Work will be extended for an additional period of one year after such correction or removal and replacement has been satisfactorily completed.**

D. **CONTRACTOR's obligations under this paragraph 13.07 are in addition to any other obligation or warranty. The provisions of this paragraph 13.07 shall not be construed as a substitute for or a waiver of the provisions of any applicable statute of limitation or repose.**

13.08 ***Acceptance of Defective Work***

A. **If, instead of requiring correction or removal and replacement of defective Work, OWNER (and, prior to ENGINEER's recommendation of final payment, ENGINEER) prefers to accept it, OWNER may do so. CONTRACTOR shall pay all Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) attributable to OWNER's evaluation of and determination to accept such defective Work (such costs to be approved by ENGINEER as to reasonableness) and the diminished value of the Work to the extent not otherwise paid by CONTRACTOR pursuant to this sentence. If any such acceptance occurs prior to ENGINEER's recommendation of final payment, a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work, and OWNER shall be entitled to an appropriate decrease in the Contract Price, reflecting the diminished value of Work so accepted. If the parties are unable to agree as to the amount thereof, OWNER may make a Claim therefor as provided in paragraph 10.05. If the acceptance occurs after such recommendation, an appropriate amount will be paid by CONTRACTOR to OWNER.**

13.09 ***OWNER May Correct Defective Work***

A. **If CONTRACTOR fails within a reasonable time after written notice from ENGINEER to correct defective Work or to remove and replace rejected Work as required by ENGINEER in accordance with paragraph 13.06.A, or if CONTRACTOR fails to perform the Work in accordance with the Contract Documents, or if CONTRACTOR fails to comply with any other provision of the Contract Documents, OWNER may, after seven days written notice to CONTRACTOR, correct and remedy any such deficiency.**

B. **In exercising the rights and remedies under this paragraph, OWNER shall proceed expeditiously. In connection with such corrective and remedial action, OWNER may exclude CONTRACTOR from all or part of the Site, take possession of all or part of the Work and suspend CONTRACTOR's services related thereto, take possession of CONTRACTOR's tools, appliances, construction equipment and machinery at the Site, and incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere. CONTRACTOR shall allow OWNER, OWNER's representatives, agents and employees, OWNER's other contractors, and ENGINEER and ENGINEER's Consultants access to the Site to enable OWNER to exercise the rights and remedies under this paragraph.**

C. **All Claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred or sustained by OWNER in exercising the rights and remedies under this paragraph 13.09 will be charged against CONTRACTOR, and a Change Order will be issued incorporating the necessary revisions in the Contract Documents with respect to the Work; and OWNER shall be entitled to an appropriate decrease in the Contract Price. If the parties are unable to agree as to the amount of the adjustment, OWNER may make a Claim therefor as provided in paragraph 10.05. Such claims, costs, losses and damages will include but not be limited to all costs of repair, or replacement of work of others destroyed or damaged by correction, removal, or replacement of CONTRACTOR's defective Work.**

D. **CONTRACTOR shall not be allowed an extension of the Contract Times (or Milestones) because of any delay in the performance of the Work attributable to the exercise by OWNER of OWNER's rights and remedies under this paragraph 13.09.**

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

14.01 ***Schedule of Values***

A. **The schedule of values established as provided in paragraph 2.07.A will serve as the basis for progress payments and will be incorporated into a form of Application for Payment acceptable to ENGINEER. Progress payments on account of Unit Price Work will be based on the number of units completed.**

14.02 ***Progress Payments***

A. ***Applications for Payments***

1. **At least 20 days before the date established for each progress payment (but not more often than once a month), CONTRACTOR shall submit to ENGINEER for review an Application for Payment filled out and signed by CONTRACTOR covering the Work completed as of the date of the Application and accompanied by such supporting documentation as is required by the Contract Documents. If payment is requested on the basis of materials and equipment not incorporated in the Work but delivered and suitably stored at the Site or at another location agreed to in writing, the Application for Payment shall also be accompanied by a bill of sale, invoice, or other documentation warranting that OWNER has received the materials and equipment free and clear of all Liens and evidence that the materials and equipment are covered by appropriate property insurance or other arrangements to protect OWNER's interest therein, all of which must be satisfactory to OWNER.**

2. **Beginning with the second Application for Payment, each Application shall include an affidavit of CONTRACTOR stating that all previous progress payments received on account of the Work have been applied on account to discharge CONTRACTOR's legitimate obligations associated with prior Applications for Payment.**

3. **The amount of retainage with respect to progress payments will be as stipulated in the Agreement.**

B. **Review of Applications**

1. **ENGINEER will, within 10 days after receipt of each Application for Payment, either indicate in writing a recommendation of payment and present the Application to OWNER or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment. In the latter case, CONTRACTOR may make the necessary corrections and resubmit the Application.**

2. **ENGINEER's recommendation of any payment requested in an Application for Payment will constitute a representation by ENGINEER to OWNER, based on ENGINEER's observations on the Site of the executed Work as an experienced and qualified design professional and on ENGINEER's review of the Application for Payment and the accompanying data and schedules, that to the best of ENGINEER's knowledge, information and belief:**

a. **the Work has progressed to the point indicated;**

b. **the quality of the Work is generally in accordance with the Contract Documents (subject to an evaluation of the Work as a functioning whole prior to or upon Substantial Completion, to the results of any subsequent tests called for in the Contract Documents, to a final determination of quantities and classifications for Unit Price Work under paragraph 9.08, and to any other qualifications stated in the recommendation); and**

c. **the conditions precedent to CONTRACTOR's being entitled to such payment appear to have been fulfilled in so far as it is ENGINEER's responsibility to observe the Work.**

3. **By recommending any such payment ENGINEER will not thereby be deemed to have represented that: (i) inspections made to check the quality or the quantity of the Work as it has been performed have been exhaustive, extended to every aspect of the Work in progress, or involved detailed inspections of the Work beyond the responsibilities specifically assigned to ENGINEER in the Contract Documents; or (ii) that there may not be other matters or issues between the parties that might entitle CONTRACTOR to be paid additionally by OWNER or entitle OWNER to withhold payment to CONTRACTOR.**

4. **Neither ENGINEER's review of CONTRACTOR's Work for the purposes of recommending payments nor ENGINEER's recommendation of any payment, including final payment, will impose responsibility on ENGINEER to supervise, direct, or control the Work or for the means, methods, techniques, sequences, or procedures of construction, or the safety precautions and programs incident thereto, or for CONTRACTOR's failure to comply with Laws and Regulations applicable to CONTRACTOR's performance of the Work. Additionally, said review or recommendation will not impose responsibility on ENGINEER to make any examination to ascertain how or for what purposes CONTRACTOR has used the moneys paid on account of the Contract Price, or to determine that title to any of the Work, materials, or equipment has passed to OWNER free and clear of any Liens.**

5. **ENGINEER may refuse to recommend the whole or any part of any payment if, in ENGINEER's opinion, it would be incorrect to make the representations to OWNER referred to in paragraph 14.02.B.2. ENGINEER may also refuse to recommend any such payment or, because of subsequently discovered evidence or the results of subsequent inspections or tests, revise or revoke any such payment recommendation previously made, to such extent as may be necessary in ENGINEER's opinion to protect OWNER from loss because:**

a. **the Work is defective, or completed Work has been damaged, requiring correction or replacement;**

b. **the Contract Price has been reduced by Written Amendment or Change Orders;**

c. **OWNER has been required to correct defective Work or complete Work in accordance with paragraph 13.09; or**

d. **ENGINEER has actual knowledge of the occurrence of any of the events enumerated in paragraph 15.02.A.**

C. **Payment Becomes Due**

1. **Ten days after presentation of the Application for Payment to OWNER with ENGINEER's recommendation, the amount recommended will (subject to the provisions of**

paragraph 14.02.D) become due, and when due will be paid by OWNER to CONTRACTOR.

D. **Reduction in Payment**

1. **OWNER may refuse to make payment of the full amount recommended by ENGINEER because:**

a. **claims have been made against OWNER on account of CONTRACTOR's performance or furnishing of the Work;**

b. **Liens have been filed in connection with the Work, except where CONTRACTOR has delivered a specific Bond satisfactory to OWNER to secure the satisfaction and discharge of such Liens;**

c. **there are other items entitling OWNER to a set-off against the amount recommended; or**

d. **OWNER has actual knowledge of the occurrence of any of the events enumerated in paragraphs 14.02.B.5.a through 14.02.B.5.c or paragraph 15.02.A.**

2. **If OWNER refuses to make payment of the full amount recommended by ENGINEER, OWNER must give CONTRACTOR immediate written notice (with a copy to ENGINEER) stating the reasons for such action and promptly pay CONTRACTOR any amount remaining after deduction of the amount so withheld. OWNER shall promptly pay CONTRACTOR the amount so withheld, or any adjustment thereto agreed to by OWNER and CONTRACTOR, when CONTRACTOR corrects to OWNER's satisfaction the reasons for such action.**

3. **If it is subsequently determined that OWNER's refusal of payment was not justified, the amount wrongfully withheld shall be treated as an amount due as determined by paragraph 14.02.C.1.**

14.03 ***CONTRACTOR's Warranty of Title***

A. **CONTRACTOR warrants and guarantees that title to all Work, materials, and equipment covered by any Application for Payment, whether incorporated in the Project or not, will pass to OWNER no later than the time of payment free and clear of all Liens.**

14.04 ***Substantial Completion***

A. **When CONTRACTOR considers the entire Work ready for its intended use CONTRACTOR shall notify OWNER and ENGINEER in writing that the entire Work is substantially complete (except for items specifically listed by CONTRACTOR as incomplete) and request that ENGINEER issue a certificate of Substantial Completion. Promptly thereafter, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of the Work to determine the status of completion. If ENGINEER does not consider the Work substantially complete, ENGINEER will notify CONTRACTOR in writing giving the reasons therefor. If ENGINEER considers the Work substantially complete, ENGINEER will prepare and deliver to OWNER a tentative certificate of Substantial Completion which shall fix the date of Substantial Completion. There shall be attached to the certificate a tentative list of items to be completed or corrected before final payment. OWNER shall have seven days after receipt of the tentative certificate during which to make written objection to ENGINEER as to any provisions of the certificate or attached list. If, after considering such objections, ENGINEER concludes that the Work is not substantially complete, ENGINEER will within 14 days after submission of the tentative certificate to OWNER notify CONTRACTOR in writing, stating the reasons therefor. If, after consideration of OWNER's objections, ENGINEER considers the Work substantially complete, ENGINEER will within said 14 days execute and deliver to OWNER and CONTRACTOR a definitive certificate of Substantial Completion (with a revised tentative list of items to be completed or corrected) reflecting such changes from the tentative certificate as ENGINEER believes justified after consideration of any objections from OWNER. At the time of delivery of the tentative certificate of Substantial Completion ENGINEER will deliver to OWNER and CONTRACTOR a written recommendation as to division of responsibilities pending final payment between OWNER and CONTRACTOR with respect to security, operation, safety, and protection of the Work, maintenance, heat, utilities, insurance, and warranties and guarantees. Unless OWNER and CONTRACTOR agree otherwise in writing and so inform ENGINEER in writing prior to ENGINEER's issuing the definitive certificate of Substantial Completion, ENGINEER's aforesaid recommendation will be binding on OWNER and CONTRACTOR until final payment.**

B. **OWNER shall have the right to exclude CONTRACTOR from the Site after the date of Substantial Completion, but OWNER shall allow CONTRACTOR reasonable access to complete or correct items on the tentative list.**

14.05 ***Partial Utilization***

A. **Use by OWNER at OWNER's option of any substantially completed part of the Work which has specifically been identified in the Contract Documents, or which OWNER, ENGINEER, and CONTRACTOR agree constitutes a separately functioning and usable part of the Work that can be used by OWNER for its intended purpose without significant interference with CONTRACTOR's performance of the remainder of the Work, may be accomplished prior to Substantial Completion of all the Work subject to the following conditions.**

1. **OWNER at any time may request CONTRACTOR in writing to permit OWNER to use any such part of the Work which OWNER believes to be ready for its intended use and substantially complete. If CONTRACTOR agrees that such part of the Work is substantially complete, CONTRACTOR will certify to OWNER and ENGINEER that such part of the Work is substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. CONTRACTOR at any time may notify OWNER and ENGINEER in writing that CONTRACTOR considers any such part of the Work ready for its intended use and substantially complete and request ENGINEER to issue a certificate of Substantial Completion for that part of the Work. Within a reasonable time after either such request, OWNER, CONTRACTOR, and ENGINEER shall make an inspection of that part of the Work to determine its status of completion. If ENGINEER does not consider that part of the Work to be substantially complete, ENGINEER will notify OWNER and CONTRACTOR in writing giving the**

reasons therefor. If ENGINEER considers that part of the Work to be substantially complete, the provisions of paragraph 14.04 will apply with respect to certification of Substantial Completion of that part of the Work and the division of responsibility in respect thereof and access thereto.

2. **No occupancy or separate operation of part of the Work may occur prior to compliance with the requirements of paragraph 5.10 regarding property insurance.**

14.06 ***Final Inspection***

A. **Upon written notice from CONTRACTOR that the entire Work or an agreed portion thereof is complete, ENGINEER will promptly make a final inspection with OWNER and CONTRACTOR and will notify CONTRACTOR in writing of all particulars in which this inspection reveals that the Work is incomplete or defective. CONTRACTOR shall immediately take such measures as are necessary to complete such Work or remedy such deficiencies.**

14.07 ***Final Payment***

A. ***Application for Payment***

1. **After CONTRACTOR has, in the opinion of ENGINEER, satisfactorily completed all corrections identified during the final inspection and has delivered, in accordance with the Contract Documents, all maintenance and operating instructions, schedules, guarantees, Bonds, certificates or other evidence of insurance, certificates of inspection, marked-up record documents (as provided in paragraph 6.12), and other documents, CONTRACTOR may make application for final payment following the procedure for progress payments.**

2. **The final Application for Payment shall be accompanied (except as previously delivered) by: (i) all documentation called for in the Contract Documents, including but not limited to the evidence of insurance required by subparagraph 5.04.B.7; (ii) consent of the surety, if any, to final payment; and (iii) complete and legally effective releases or waivers (satisfactory to OWNER) of all Lien rights arising out of or Liens filed in connection with the Work.**

3. **In lieu of the releases or waivers of Liens specified in paragraph 14.07.A.2 and as approved by OWNER, CONTRACTOR may furnish receipts or releases in full and an affidavit of CONTRACTOR that: (i) the releases and receipts include all labor, services, material, and equipment for which a Lien could be filed; and (ii) all payrolls, material and equipment bills, and other indebtedness connected with the Work for which OWNER or OWNER's property might in any way be responsible have been paid or otherwise satisfied. If any Subcontractor or Supplier fails to furnish such a release or receipt in full, CONTRACTOR may furnish a Bond or other collateral satisfactory to OWNER to indemnify OWNER against any Lien.**

B. **Review of Application and Acceptance**

1. **If, on the basis of ENGINEER's observation of the Work during construction and final inspection, and ENGINEER's review of the final Application for Payment and accompanying documentation as required by the Contract Documents, ENGINEER is satisfied that the Work has been completed and CONTRACTOR's other obligations under the Contract Documents have been fulfilled, ENGINEER will, within ten days after receipt of the final Application for Payment, indicate in writing ENGINEER's recommendation of payment and present the Application for Payment to OWNER for payment. At the same time ENGINEER will also give written notice to OWNER and CONTRACTOR that the Work is acceptable subject to the provisions of paragraph 14.09. Otherwise, ENGINEER will return the Application for Payment to CONTRACTOR, indicating in writing the reasons for refusing to recommend final payment, in which case CONTRACTOR shall make the necessary corrections and resubmit the Application for Payment.**

C. **Payment Becomes Due**

1. **Thirty days after the presentation to OWNER of the Application for Payment and accompanying documentation, the amount recommended by ENGINEER will become due and, when due, will be paid by OWNER to CONTRACTOR.**

14.08 ***Final Completion Delayed***

A. **If, through no fault of CONTRACTOR, final completion of the Work is significantly delayed, and if ENGINEER so confirms, OWNER shall, upon receipt of CONTRACTOR's final Application for Payment and recommendation of ENGINEER, and without terminating the Agreement, make payment of the balance due for that portion of the Work fully completed and accepted. If the remaining balance to be held by OWNER for Work not fully completed or corrected is less than the retainage stipulated in the Agreement, and if Bonds have been furnished as required in paragraph 5.01, the written consent of the surety to the payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by CONTRACTOR to ENGINEER with the Application for such payment. Such payment shall be made under the terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.**

14.09 ***Waiver of Claims***

A. **The making and acceptance of final payment will constitute:**

1. **a waiver of all Claims by OWNER against CONTRACTOR, except Claims arising from unsettled Liens, from defective Work appearing after final inspection pursuant to paragraph 14.06, from failure to comply with the Contract Documents or the terms of any special guarantees specified therein, or from CONTRACTOR's continuing obligations under the Contract Documents; and**

2. **a waiver of all Claims by CONTRACTOR against OWNER other than those previously made in writing which are still unsettled.**

ARTICLE 15 - **SUSPENSION OF WORK AND TERMINATION**

15.01 ***OWNER May Suspend Work***

A. **At any time and without cause, OWNER may suspend the Work or any portion thereof for a period of not more than 90 consecutive days by notice in writing to CONTRACTOR and ENGINEER which will fix the date on which Work will be resumed. CONTRACTOR shall resume the Work on the date so fixed. CONTRACTOR shall be allowed an adjustment in the Contract Price or an extension of the Contract Times, or both, directly attributable to any such suspension if CONTRACTOR makes a Claim therefor as provided in paragraph 10.05.**

15.02 ***OWNER May Terminate for Cause***

A. **The occurrence of any one or more of the following events will justify termination for cause:**

1. **CONTRACTOR's persistent failure to perform the Work in accordance with the Contract Documents (including, but not limited to, failure to supply sufficient skilled workers or suitable materials or equipment or failure to adhere to the progress schedule established under paragraph 2.07 as adjusted from time to time pursuant to paragraph 6.04);**

2. **CONTRACTOR's disregard of Laws or Regulations of any public body having jurisdiction;**

3. **CONTRACTOR's disregard of the authority of ENGINEER; or**

4. **CONTRACTOR's violation in any substantial way of any provisions of the Contract Documents.**

B. **If one or more of the events identified in paragraph 15.02.A occur, OWNER may, after giving CONTRACTOR (and the surety, if any) seven days written notice, terminate the services of CONTRACTOR, exclude CONTRACTOR from the Site, and take possession of the Work and of all CONTRACTOR's tools, appliances, construction equipment, and machinery at the Site, and use the same to the full extent they could be used by CONTRACTOR (without liability to CONTRACTOR for trespass or conversion), incorporate in the Work all materials and equipment stored at the Site or for which OWNER has paid CONTRACTOR but which are stored elsewhere, and finish the Work as OWNER may deem expedient. In such case, CONTRACTOR shall not be entitled to receive any further payment until the Work is finished. If the unpaid balance of the Contract Price exceeds all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) sustained by OWNER arising out of or relating to completing the Work, such excess will be paid to CONTRACTOR. If such claims, costs, losses, and damages exceed such unpaid balance, CONTRACTOR shall pay the difference to OWNER. Such claims, costs, losses, and damages incurred by OWNER will be reviewed by ENGINEER as to their reasonableness and, when so approved by ENGINEER, incorporated in a Change Order. When exercising any rights or remedies under this paragraph OWNER shall not be required to obtain the lowest price for the Work performed.**

C. **Where CONTRACTOR's services have been so terminated by OWNER, the termination will not affect any rights or remedies of OWNER against CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of moneys due CONTRACTOR by OWNER will not release CONTRACTOR from liability.**

15.03 ***OWNER May Terminate For Convenience***

A. **Upon seven days written notice to CONTRACTOR and ENGINEER, OWNER may, without cause and without prejudice to any other right or remedy of OWNER, elect to terminate the Contract. In such case, CONTRACTOR shall be paid (without duplication of any items):**

1. **for completed and acceptable Work executed in accordance with the Contract Documents prior to the effective date of termination, including fair and reasonable sums for overhead and profit on such Work;**

2. **for expenses sustained prior to the effective date of termination in performing services and furnishing labor, materials, or equipment as required by the Contract Documents in connection with uncompleted Work, plus fair and reasonable sums for overhead and profit on such expenses;**

3. **for all claims, costs, losses, and damages (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or arbitration or other dispute resolution costs) incurred in settlement of terminated contracts with Subcontractors, Suppliers, and others; and**

4. **for reasonable expenses directly attributable to termination.**

B. **CONTRACTOR shall not be paid on account of loss of anticipated profits or revenue or other economic loss arising out of or resulting from such termination.**

15.04 ***CONTRACTOR May Stop Work or Terminate***

A. **If, through no act or fault of CONTRACTOR, the Work is suspended for more than 90 consecutive days by OWNER or under an order of court or other public authority, or ENGINEER fails to act on any Application for Payment within 30 days after it is submitted, or OWNER fails for 30 days to pay CONTRACTOR any sum finally determined to be due, then CONTRACTOR may, upon seven days written notice to OWNER and ENGINEER, and provided OWNER or ENGINEER do not remedy such suspension or failure within that time, terminate the Contract and recover from OWNER payment on the same terms as provided in paragraph 15.03. In lieu of terminating the Contract and without prejudice to any other right or remedy, if ENGINEER has failed to act on an Application for Payment within 30 days after it is submitted, or OWNER has failed for 30 days to pay CONTRACTOR any sum finally determined to be due, CONTRACTOR may, seven days after written notice to OWNER and ENGINEER, stop the Work until payment is made of all such amounts due CONTRACTOR, including interest thereon. The provisions of this paragraph 15.04 are not intended to preclude CONTRACTOR from making a Claim under paragraph 10.05 for an adjustment in Contract Price or Contract Times or otherwise for expenses or damage directly attributable to CONTRACTOR's stopping the Work as permitted by this paragraph.**

ARTICLE 16 - **DISPUTE RESOLUTION**

16.01 ***Methods and Procedures***

A. **Dispute resolution methods and procedures, if any, shall be as set forth in the Supplementary Conditions. If no method and procedure has been set forth, and subject to the provisions of paragraphs 9.09 and 10.05, OWNER and CONTRACTOR may exercise such rights or remedies as either may otherwise have under the Contract Documents or by Laws or Regulations in respect of any dispute.**

ARTICLE 17 - **MISCELLANEOUS**

17.01 ***Giving Notice***

A. **Whenever any provision of the Contract Documents requires the giving of written notice, it will be deemed to have been validly given if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered at or sent by registered or certified mail, postage prepaid, to the last business address known to the giver of the notice.**

17.02 ***Computation of Times***

A. **When any period of time is referred to in the Contract Documents by days, it will be computed to exclude the first and include the last day of such period. If the last day of any such period falls on a Saturday or Sunday or on a day made a legal holiday by the law of the applicable jurisdiction, such day will be omitted from the computation.**

17.03 ***Cumulative Remedies***

A. **The duties and obligations imposed by these General Conditions and the rights and remedies available hereunder to the parties hereto are in addition to, and are not to be construed in any way as a limitation of, any rights and remedies available to any or all of them which are otherwise imposed or available by Laws or Regulations, by special warranty or guarantee, or by other provisions of the Contract Documents, and the provisions of this paragraph will be as effective as if repeated specifically in the Contract Documents in connection with each particular duty, obligation, right, and remedy to which they apply.**

17.04 ***Survival of Obligations***

A. **All representations, indemnifications, warranties, and guarantees made in, required by, or given in accordance with the Contract Documents, as well as all continuing obligations indicated in the Contract Documents, will survive final payment, completion, and acceptance of the Work or termination or completion of the Agreement.**

17.05 ***Controlling Law***

A. **This Contract is to be governed by the law of the state in which the Project is located.**

DOCUMENT 00800

SUPPLEMENTARY CONDITIONS

These Supplementary Conditions amend or supplement the General Conditions, Document 00700. All provisions which are not so amended or supplemented remain in full force and effect.

The terms used in these Supplementary Conditions will have the meanings indicated in the General Conditions. Additional terms used in these Supplementary Conditions have the meanings indicated below, which are applicable to both the singular and plural thereof.

ARTICLE 1 - DEFINITIONS

SC-1.01.A.15 Delete paragraph 1.01.A.15 and insert the following in lieu thereof:

15. CONTRACTOR--Person or entity identified as such in the Agreement and the CONTRACTOR's authorized representatives who are referred to throughout the Contract Documents as if singular in number.

SC-1.01.A.19 Delete paragraph 1.01.A.19 and insert the following in lieu thereof:

19. ENGINEER--Person or entity identified as such in the Agreement and the ENGINEER's authorized representatives who are referred to throughout the Contract Documents as if singular in number.

SC-1.01.A.26 Add the following sentence to paragraph 1.01.A.26:

Also referred to as Stop Notices.

SC-1.01.A.30 Delete paragraph 1.01.A.30 and insert the following in lieu thereof:

30. OWNER--The individual, entity, public body or authority identified as such in the Agreement and the OWNER's authorized representatives who are referred to throughout the Contract Documents as if singular in number.

SC-1.01.A.37 Delete paragraph 1.01.A.37.

SC-101.A.43 Delete paragraph 1.01.A.43 and insert:

Substantial completion shall be as defined in SC -14.04.A.

To 1.01 A, add the following defined terms:

SC-1.01.A.51 Award--The formal acceptance of the Bid by OWNER.

SC-1.01.A.52 Bidder--Any individual, partnership, corporation, joint venture, or other combination thereof who submits a Bid to OWNER for the Work contemplated, acting directly or through an authorized representative. As used in the Contract Documents, masculine pronouns refer to both masculine and feminine genders.

SC-1.01.A.53 Bid Guarantee (Bid Bond)--The security furnished with a Bid to guarantee that the Bidder will enter into the Contract if Bidder's Bid is accepted by OWNER.

SC-1.01.A.54 Construction Manager--Person or entity designated by the OWNER to provide construction management services for the Project with duties, responsibilities, and limitations of the ENGINEER, unless stipulated otherwise.

SC-1.01.A.55 Design Engineer - Carollo Engineers, A Professional Corporation.

SC-1.01.A.56 Disputes Review Board -- Panel of individuals chose to help resolve disputes in accordance with Document 00822.

SC-1.01.A.57 Equipment--(Construction)--All machinery and equipment, together with the necessary supplies for upkeep and maintenance, including tools and apparatus necessary for the proper construction and acceptable completion of the Work contemplated. (Installation) C All material or articles used in equipping a facility or apparatus required to fulfill a functional design.

SC-1.01.A.58 Execution--Field or site performance, workmanship, installation, erection, application, field fabrication, quality control, and protection of installed products on the site.

SC-1.01.A.59 Materials--All materials incorporated into the Project, including equipment and all other materials consumed or to be consumed in the performance of the Work contemplated.

SC-1.01.A.61 Product Data--Type of Shop Drawing comprised of standard illustrations, schedules, performance charts, instructions, brochures, diagrams, catalog cuts, and other information assembled by or for the CONTRACTOR and submitted by the CONTRACTOR to illustrate materials or equipment for some portion of the Work.

SC-1.01.A.62 Products--Materials, equipment, systems, shop fabrications, mixtures, and source controls.

SC-1.01.A.63 Utility--Any public or private fixed works for the transportation of fluids, gases, electricity, signals, or communications.

ARTICLE 2 - PRELIMINARY MATTERS

SC-2.02.A Copies of Documents: Delete the first sentence of paragraph 2.02.A and insert the following in lieu thereof:

OWNER shall furnish CONTRACTOR up to 10 copies of the Contract Documents.

SC-2.05.B Before Starting Construction: Add the following to paragraph 2.05.B:

4. A preliminary schedule of payments showing projected cash flow.

SC-2.06.A Preconstruction Conference: Delete paragraph 2.06.A and insert the following in lieu thereof:

A. Before the Contract Times start to run, but after Notice to Proceed is given, a conference attended by CONTRACTOR, ENGINEER, CONSTRUCTION MANAGER and others as appropriate will be held to establish a working understanding among the parties as to the Work and to discuss the schedules referred to in paragraph 2.05.B, procedures for handling Shop Drawings and other submittals, processing Applications for Payment, and maintaining required records.

SC-2.07.A Initial Acceptance of Schedules: Add the following to paragraph 2.07.A:

4. CONTRACTOR's schedule of payments will be acceptable if it provides a reasonable projection of payments in relationship to the progress schedule and schedule of values.

ARTICLE 3 - CONTRACT DOCUMENTS: INTENT, AMENDING, REUSE

SC-3.01.A Add the following sentence and subparagraphs to paragraph 3.01.A:

The Contract Document higher in precedence shall control and supersede the Contract Documents lower in precedence in accordance with the following listing arranged from the highest to the lowest in precedence:

1. Addenda, if any; Supplemental Agreements; and Change Orders; the one dated later having precedence over another dated earlier.

2. Agreement.

3. General Requirements (DIVISION 1).

4. Other Specifications (DIVISION 2 and other DIVISIONS following it).

5. Drawings.

6. Supplementary Conditions, if any (00800).

7. General Conditions (00700).

ARTICLE 4 - AVAILABILITY OF LANDS; SUBSURFACE AND PHYSICAL CONDITIONS; REFERENCE POINTS

SC-4.01.D Availability of Lands: Add the following paragraph 4.01.D:

D. Any Work performed in public rights-of-way, in addition to conforming to the Contract Documents, shall be done in accordance with the requirements of the permit issued by the public agency in whose right-of-way the Work is located.

SC-4.02.A.1 Subsurface Conditions: Delete paragraph 4.02.A.1 and insert the following in lieu thereof:

1. The following reports of exploration and tests of subsurface conditions at or contiguous to the site have been used by Design Engineer in preparing the Contract Documents. Test holes made on the site are located where indicated on the Drawings.

a. Report dated December 2004, by Fugro West, Inc., entitled "Geotechnical Study", City of Turlock Outfall Pipeline, Pump Station, and River Discharge Facilities, Stanislaus County, California.

2. The following drawings of physical conditions in or relating to existing surface or subsurface structures at or contiguous to the site (except Underground Facilities) have been used by Design Engineer in preparing the Contract Documents. Drawings of physical conditions in or

relating to existing surface and subsurface structures (except Underground Facilities) are available for review at the City Engineer’s office, upon 48 hours' notice to OWNER.

a. Drawings dated December 1979, prepared by CH2MHILL and entitled “City of Turlock Wastewater Treatment Plant - Schedule O Outfalls.”

SC-4.02.B Limited Reliance by CONTRACTOR on Technical Data Authorized: Delete "Such 'technical data' is identified in the Supplementary Conditions" and insert "Technical data is limited to data provided in the reports and drawings listed in paragraph SC-4.02.A" in lieu thereof, and add the following subparagraph:

4. CONTRACTOR's interpretation of the character and condition of the materials between test hole locations.

SC-4.04.B Underground Facilities, Not Shown or Indicated: Add the following subparagraphs to paragraph 4.04.B:

3. Generally, service connections are not indicated on the Drawings. CONTRACTOR shall be responsible for discovery of existing underground installations, in advance of excavating or trenching, by contacting all local utilities and by prospecting.

4. All information relative to Underground Facilities shall be recorded and incorporated into the record documents required by paragraph 6.12.

5. CONTRACTOR will be held responsible for any unauthorized interruption in the operation of Underground Facilities as a result of CONTRACTOR's operations. Unless the owner of the damaged facility elects to perform the repair and restoration work, CONTRACTOR shall repair and fully restore any damaged Underground Facility to a condition at least equal to that which existed just prior to the time of damage. All repair and restoration work shall be done to the satisfaction of the facility owner and ENGINEER.

6. CONTRACTOR shall arrange for any inspection of repaired or reconditioned Utility facilities required by authorities having jurisdiction. All inspection fees shall be paid by CONTRACTOR. If the facility owner elects to perform the repair and restoration work, CONTRACTOR shall render all assistance required. CONTRACTOR shall be responsible for all just and reasonable expenses incurred by the facility owners for such work.

SC-4.06.A Hazardous Environmental Conditions at Site: Delete paragraph 4.06.A and insert the following in lieu thereof:

4.06.A Reports and Drawings:

4.06.A.1 No reports of exploration and tests of hazardous environmental conditions at or contiguous to the site have been used by Design Engineer in preparing the Contract Documents.

4.06.A.2 No drawings of hazardous environmental conditions at or contiguous to the site have been used by Design Engineer in preparing the Contract Documents.

SC-4.06.B. Limited Reliance by CONTRACTOR on Technical Data Authorized: Delete "Such 'technical data' is identified in the Supplementary Conditions" and insert "Technical data is limited to data provided in the reports listed in paragraph SC-4.06.A.1.@

ARTICLE 5 - BONDS AND INSURANCE

~~SC-5.02 Licensed Sureties and Insurers: Add the following paragraph after 5.02A:~~

~~Contractor shall not commence work under this Agreement until Contractor has obtained City's approval regarding all insurance requirements, forms, endorsements, amounts, and carrier ratings, nor shall Contractor allow any subcontractor to commence work on a subcontract until all similar insurance required of the subcontractor shall have been so obtained and approved. Contractor shall procure and maintain for the duration of this Agreement insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees or subcontractors. Failure to maintain or renew coverage or to provide evidence of renewal may constitute a material breach of contract.~~

~~(a) Minimum Scope of Insurance: Coverage shall be at least as broad as:~~

~~(1) Insurance Services Office Commercial General Liability coverage (occurrence Form CG 00 01) with an additional insured endorsement (form CG 20 10 11 85 or its equivalent), to be approved by the City of Turlock.~~

~~(2) Insurance Services Office Form CA 00 01 covering Automobile Liability, Code 1 (any auto).~~

~~(3) Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.~~

~~(4) Insurance Service Office Form CP 00 20 with Causes of Loss – Special Form CP 10 30 covering Builder's Risk (Course of Construction) insurance covering all risks of loss less policy exclusions.~~

~~(5) Surety bonds as described below.~~

SC-5.02 Licensed Sureties and Insurers: Add the following paragraph after 5.02A:

Contractor shall not commence work under this Agreement until Contractor has obtained City's approval regarding all insurance requirements, forms, endorsements, amounts, and carrier ratings, nor shall Contractor allow any subcontractor to commence work on a subcontract until all similar insurance required of the subcontractor shall have been so obtained and approved. Contractor shall procure and maintain for the duration of this Agreement insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the work hereunder by Contractor, its agents, representatives, employees or subcontractors. Failure to maintain or renew coverage or to provide evidence of renewal may constitute a material breach of contract.

~~SC-5.04 CONTRACTOR'S Liability Insurance: Delete paragraph 5.04 in its entirety and insert the following in lieu thereof:~~

~~Contractor shall not commence work under this Agreement until Contractor has obtained City's approval regarding all insurance requirements, forms, endorsements, amounts, and carrier ratings, nor shall Contractor allow any subcontractor to commence work on a subcontract until all similar insurance required of the subcontractor shall have been so obtained and approved. Contractor shall procure and maintain for the duration of this Agreement insurance against claims for injuries to persons or damages to property which may arise from or in connection with the performance of the~~

work hereunder by Contractor, its agents, representatives, employees or subcontractors. Failure to maintain or renew coverage or to provide evidence of renewal may constitute a material breach of contract.

(a) Minimum Scope of Insurance: Coverage shall be at least as broad as:

(1) Insurance Services Office Commercial General Liability coverage (occurrence Form CG 00 01) with an additional insured endorsement (form CG 20 10 11 85 or its equivalent), to be approved by the City of Turlock.

(2) Insurance Services Office Form CA 00 01 covering Automobile Liability, Code 1 (any auto).

(3) Workers' Compensation insurance as required by the State of California and Employer's Liability Insurance.

(4) Insurance Service Office Form CP 00 20 with Causes of Loss – Special Form CP 10 30 covering Builder's Risk (Course of Construction) insurance covering all risks of loss less policy exclusions.

(5) Surety bonds as described below.

(6) Errors and Omissions/Professional Liability Insurance.

(b) Minimum Limits of Insurance: Contractor shall maintain limits no less than:

(1) General Liability (including operations, products and completed operations): $1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit.

(2) Automobile Liability: $1,000,000 per occurrence for bodily injury and property damage.

(3) Workers' Compensation: As statutorily required by the State of California.

(4) Employer's Liability: $1,000,000 per accident for bodily injury or disease.

(5) Builder's Risk: Completed value of the project with no coinsurance penalty provisions.

(6) Errors and Omissions/Professional Liability: $1,000,000 per claim as needed for design/build.

(c) Deductibles and Self-Insured Retentions: Any deductibles or self-insured retentions must be declared to and approved by City. At the option of City, either: (a) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects City, its elective and appointive boards, officers, agents, employees, and volunteers; or (b) Contractor shall provide a financial guarantee satisfactory to City guaranteeing payment of losses and related investigations, claim administration and defense expenses.

(d) Other Insurance Provisions: The commercial general and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

(1) City, its elective and appointive boards, officers, agents, employees, and volunteers are to be covered as additional insureds with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of Contractor; and with respect to liability arising out of work or

operations performed by or on behalf of Contractor, including materials, parts or equipment furnished in connection with such work or operations, which coverage shall be maintained in effect for at least three (3) years following the completion of the work specified in the contract. General liability coverage can be provided in the form of an endorsement to Contractor's insurance (CG 20 10 for ongoing operations and CG 20 37 for products/completed operations, or their equivalent), or as a separate owner's policy that is at least as broad as the ISO Form CG 00 09 11 88 Owners and Contractors Protective Liability Coverage Form – Coverage for Operations of Designated Contractor.

(2) For any claims related to this project, Contractor's insurance coverage shall be primary insurance as respects City and any insurance or self-insurance maintained by City shall be excess of Contractor's insurance and shall not contribute with it.

(3) In the event of cancellation, non-renewal, or material change that reduces or restricts the insurance coverage afforded to City under any of the required insurance coverages, the insurer, broker/producer, or Contractor shall provide City with thirty (30) days' prior written notice of such action.

(4) Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

(e) Builder's Risk (Course of Construction) Insurance: City shall be named as loss payee.

(f) Acceptability of Insurers: Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII or with an insurer to which the City has provided prior approval.

(g) Verification of Coverage: Contractor shall furnish City with original certificates and endorsements, including amendatory endorsements, effecting coverage required by this Agreement. All certificates and endorsements are to be received and approved by City before work commences. City reserves the right to require complete, certified copies of all required insurance policies, including endorsements effecting the coverage required by these specifications at any time.

(h) Waiver of Subrogation: With the exception of professional liability, Contractor hereby agrees to waive subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. The commercial general liability policy and workers' compensation policy shall be endorsed to contain a waiver of subrogation in favor of City for all work performed by Contractor, its agents, employees, independent contractors and subcontractors. Contractor agrees to obtain any endorsement that may be necessary to effect this waiver of subrogation.

(i) Subcontractors: Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

(j) Surety Bonds: Contractor shall provide a Performance Bond, and a Payment Bond.

SC-5.06 Property Insurance: Delete paragraph 5.06 in its entirety and insert the following in lieu thereof:

Minimum Limits of Insurance: Contractor shall maintain limits no less than:

(1) General Liability (including operations, products and completed operations): $1,000,000 per occurrence for bodily injury, personal injury and property damage. If Commercial General Liability

Insurance or other form with a general aggregate limit is used, either the general aggregate limit shall apply separately to this project/location or the general aggregate limit shall be twice the required occurrence limit. This insurance shall be occurrence type written in comprehensive form and shall protect CONTRACTOR, OWNER, Construction Manager, DESIGN ENGINEER, and ENGINEER's Consultants, Turlock Irrigation District, Stanislaus County, and any other persons or entities identified by OWNER and ENGINEER as additional insured's, against claims arising from injuries, sickness, disease, or death of any person or damage to property arising out of performance of the Work. The policy shall also include personal injury liability coverage, contractual liability coverage, completed operations and products liability coverage, and coverage for blasting, explosion, collapse of buildings, and damage to underground property. The liability limits for bodily injury and property damage shall be not less than:

~~1. Combined Single Limit for each occurrence: $1,000,000~~

~~2. General aggregate: $2,000,000~~

1. Combined Single Limit for each occurrence: $5,000,000

2. General aggregate: $5,000,000

Unless specifically required by the technical specification, for Subcontractors that complete less than 2% of the total bid, the limits shall be:

1. Combined Single Limit for each occurrence: $1,000,000

2. General aggregate: $1,000,000

(2) Automobile Liability: Comprehensive Automobile Liability Insurance: This insurance shall be occurrence type written in comprehensive form and shall protect CONTRACTOR, OWNER, CONSTRUCTION MANAGER, DESIGN ENGINEER, and ENGINEER's Consultants, Turlock Irrigation District, Stanislaus County, and any other persons or entities identified by OWNER and ENGINEER as additional insureds, against all claims for injuries to members of the public and damage to property of others arising from the use of motor vehicles, either on or off the project site whether they are owned, non-owned, or hired. The liability limits for bodily injury and property damage shall be not less than: Combined Single Limit for each occurrence:$1,000,000

(3) Workers' Compensation: As. Workers' Compensation and Employer's Liability Insurance: This insurance shall protect CONTRACTOR against all claims under applicable state workers' compensation laws, including coverage as necessary for the benefits provided under the United States Longshoremen's and Harbor Workers' Act and the Jones Act. CONTRACTOR shall also be protected against claims for injury, disease, or death of employees which, for any reason, may not fall within the provisions of a workers' compensation law. This policy shall include an "all states" or "other states" and waiver of subrogation endorsements. The liability limits, as required by state law shall be not less than:

1. Workers' compensation: Statutorily required by the State of California.

2. Employer's liability: $1,000,000 each occurrence.

(4) Employer's Liability: $1,000,000 per accident for bodily injury or disease.

(5) Builder's Risk: Completed value of the project with no coinsurance penalty provisions.

(6) Umbrella Liability Insurance: This insurance shall protect CONTRACTOR, OWNER, DESIGN ENGINEER, ENGINEER's Consultants, Construction Manager, Turlock Irrigation District, Stanislaus County, and any other persons or entities identified by OWNER and ENGINEER as additional insureds, against claims in excess of the limits provided under workers' compensation and employer's liability, comprehensive automobile liability, and commercial general liability policies. The umbrella policy shall follow the form of the primary insurance, including the application of the primary limits. The liability limits for bodily injury and property damage shall be not less than:

~~1. Combined Single Limit for each occurrence: $2,000,000~~

~~2. General aggregate: $2,000,000~~

1. Combined Single Limit for each occurrence: $5,000,000

2. General aggregate: $10,000,000

Unless specifically required by the technical specification, for Subcontractors that complete less than 2% of the total bid, the limits shall be:

1. Combined Single Limit for each occurrence: $2,000,000

2. General aggregate: $2,000,000

Property Insurance: CONTRACTOR shall purchase and maintain property insurance coverage for the Work at the site in the amount of the full replacement cost thereof. This insurance shall:

1. include the interests of OWNER, CONTRACTOR, Subcontractors, CONSTRUCTION MANAGER, DESIGN ENGINEER, ENGINEER's Consultants, Turlock Irrigation District, Stanislaus County, and any other persons or entities identified by OWNER and ENGINEER, each of whom is deemed to have an insurable interest and shall be listed as a named insured;

2. be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss or damage to the Work, temporary buildings, falsework, Work in transit including ocean transit, and Work in storage at the project site or at another location acceptable to OWNER, and shall insure against at least the following perils: fire, lightning, extended coverage, theft, vandalism and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, water damage, and damage caused by frost and freezing;

F. All policies required must be maintained until final payment is made unless agreed to in writing by OWNER, CONTRACTOR, and ENGINEER with 30 days written notice to each additional inserted to whom a certificate of insurance has been issued.

(c) Deductibles and Self-Insured Retentions: Any deductibles or self-insured retentions must be declared to and approved by City. At the option of City, either: (a) the insurer shall reduce or eliminate such deductibles or self-insured retentions as respects City, its elective and appointive boards, officers, agents, employees, and volunteers; or (b) Contractor shall provide a financial

guarantee satisfactory to City guaranteeing payment of losses and related investigations, claim administration and defense expenses.

(d) Other Insurance Provisions: The commercial general and automobile liability policies are to contain, or be endorsed to contain, the following provisions:

(1) City, its elective and appointive boards, officers, agents, employees, and volunteers are to be covered as additional insureds with respect to liability arising out of automobiles owned, leased, hired or borrowed by or on behalf of Contractor; and with respect to liability arising out of work or operations performed by or on behalf of Contractor, including materials, parts or equipment furnished in connection with such work or operations, which coverage shall be maintained in effect for at least three (3) years following the completion of the work specified in the contract. General liability coverage can be provided in the form of an endorsement to Contractor's insurance (CG 20 10 for ongoing operations and CG 20 37 for products/completed operations, or their equivalent), or as a separate owner's policy that is at least as broad as the ISO Form CG 00 09 11 88 Owners and Contractors Protective Liability Coverage Form – Coverage for Operations of Designated Contractor.

(2) For any claims related to this project, Contractor's insurance coverage shall be primary insurance as respects City and any insurance or self-insurance maintained by City shall be excess of Contractor's insurance and shall not contribute with it.

(3) In the event of cancellation, non-renewal, or material change that reduces or restricts the insurance coverage afforded to City under any of the required insurance coverages, the insurer, broker/producer, or Contractor shall provide City with thirty (30) days' prior written notice of such action.

(4) Coverage shall not extend to any indemnity coverage for the active negligence of the additional insured in any case where an agreement to indemnify the additional insured would be invalid under Subdivision (b) of Section 2782 of the Civil Code.

(e) Builder's Risk (Course of Construction) Insurance: City shall be named as loss payee.

(f) Acceptability of Insurers: Insurance is to be placed with insurers with a current A.M. Best's rating of no less than A:VII or with an insurer to which the City has provided prior approval.

(g) Verification of Coverage: Contractor shall furnish City with original certificates and endorsements, including amendatory endorsements, effecting coverage required by this Agreement. All certificates and endorsements are to be received and approved by City before work commences. City reserves the right to require complete, certified copies of all required insurance policies, including endorsements effecting the coverage required by these specifications at any time.

(h) Waiver of Subrogation: With the exception of professional liability, Contractor hereby agrees to waive subrogation which any insurer of Contractor may acquire from Contractor by virtue of the payment of any loss. The commercial general liability policy and workers' compensation policy shall be endorsed to contain a waiver of subrogation in favor of City for all work performed by Contractor, its agents, employees, independent contractors and subcontractors. Contractor agrees to obtain any endorsement that may be necessary to effect this waiver of subrogation.

(i) Subcontractors: Contractor shall include all subcontractors as insureds under its policies or shall furnish separate certificates and endorsements for each subcontractor. All coverages for subcontractors shall be subject to all of the requirements stated herein.

(j) Surety Bonds: Contractor shall provide a Performance Bond, and a Payment Bond.

ARTICLE 6 - CONTRACTOR'S RESPONSIBILITIES

SC-6.02.B Labor; Working Hours: Add the following subparagraphs immediately after paragraph 6.02.B:

1. No Work shall be done between 5:00 p.m. and 7:00 a.m. without permission of OWNER. However, emergency work may be done without prior permission.

2. Night Work may be undertaken as a regular procedure with the permission of OWNER; such permission, however, may be revoked at any time by OWNER if CONTRACTOR fails to maintain adequate equipment and supervision for the proper prosecution and control of the Work at night.

SC-6.03 Services, Materials, and Equipment: Add the following paragraphs immediately after paragraph 6.03.B:

C. Until Substantial Completion of the Work is acknowledged by OWNER, CONTRACTOR shall have the responsible charge and care of the Work and of materials to be used herein, including materials for which CONTRACTOR has received partial payment or materials which have been furnished by OWNER, and shall bear the risk of injury, loss, or damage to any part thereof by the action of the elements or from any other cause, whether arising from the execution or from the non-execution of the Work.

D. CONTRACTOR shall rebuild, repair, restore, and make good all injuries, losses, or damages to any portion of the Work or the materials occasioned by any cause before the Work's completion and acceptance and shall bear the expense thereof. Where necessary to protect the Work or materials from damage, CONTRACTOR shall, at CONTRACTOR's own expense, provide suitable drainage and erect such temporary structures or rent such structures as are necessary to protect the Work or materials from damage. The suspension of the Work or the granting of an extension of time from any cause whatever shall not relieve CONTRACTOR of CONTRACTOR's responsibility for the Work and materials as specified herein.

E. When the quality of a material, process, or article is not specifically set forth in the Contract Documents, the best available quality of the material, process, or article shall be provided.

SC-6.04.A Progress Schedule: Add the following subparagraph to paragraph 6.04.A:

3. If, in the opinion of ENGINEER, CONTRACTOR falls behind the accepted Construction Schedule due to actions or neglect of CONTRACTOR or CONTRACTOR's agents, servants, employees, officers, subcontractors, directors, or any party contracting to perform part or all of the Work or to supply any equipment or materials, CONTRACTOR shall take steps, including, but not limited to, increasing the number of personnel, shifts, and/or overtime operations, days of work, and/or amount of construction equipment until such time as the Work is back on schedule. CONTRACTOR shall also submit for review not later than the time of submittal of the next request for partial payment, such supplementary schedule or schedules as may be necessary to demonstrate the manner in which the acceptable rate of progress will be regained, all without additional cost to OWNER.

SC-6.06.B Concerning Subcontractors, Suppliers, and Others: Delete the first sentence of the paragraph 6.06.B and insert the following in lieu thereof, and add subparagraph 6.06.B.1:

B. CONTRACTOR shall submit to the OWNER a list of Subcontractors, Suppliers, or other individuals or entities who perform work, labor or render services to the CONTRACTOR in excess of

one-half of one percent of the CONTRACTOR's total Bid together with the portion of the work or services provided which will be done by each such Subcontractor, Supplier or other individual or entity.

1. Subcontracting: CONTRACTOR shall perform with CONTRACTOR's own organization work amounting to not less than 35 percent of the combined value of all items of the Work covered by the Contract.

SC-6.09 Laws and Regulations: Delete the first sentence of paragraph 6.09.A and insert the following in lieu thereof. Add paragraphs 6.09.D, 6.09.E and 6.09.F.

A. CONTRACTOR shall give all notices and comply with all Laws and Regulations applicable to furnishing and performance of the Work and shall cause all CONTRACTOR's agents, employees, Subcontractors, and Suppliers to observe and comply with all such laws, ordinances, and regulations.

D. Employment Requirements: CONTRACTOR shall comply with employment requirements stipulated in the specifications.

E. Pursuant to Section 1776, California Labor Code, CONTRACTOR shall keep an accurate payroll record showing the name, address, work classification, straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker, or other employee employed by CONTRACTOR for the performance of the work.

1. A certified copy of payroll records shall be submitted to OWNER and shall be made available for inspection or furnished upon request to a representative of the California Division of Labor Standards Enforcement and Division of Apprenticeship Standards.

2. In case of non-compliance with Section 1776, and after a 10-day period following receipt of a written notice, CONTRACTOR shall forfeit $25 for each calendar day, or portion thereof, for each worker in non-compliance, until compliance is effectuated.

F. Section 7104, California Public Contract Code includes procedures when the Work involves excavation that extends deeper than four feet below the surface.

SC-6.13 Safety and Protection: Add the following paragraphs immediately after paragraph 6.13.B:

C. CONTRACTOR shall prepare, implement, and maintain a safety and health program or plan in accordance with Section 01329 of the General Requirements.

D. CONTRACTOR shall make reasonable efforts to detect and abate any violations of safety standards of which CONTRACTOR is aware and to which CONTRACTOR's employees are exposed, despite the fact that CONTRACTOR did not commit the violation.

ARTICLE 7- OTHER WORK

SC-7.01.A Related Work at Site: Delete the first sentence of paragraph 7.01.A and insert the following in lieu thereof:

A. OWNER, Turlock Irrigation District or Stanislaus County may have other work related to the Project at the Site performed by OWNER's employees and separate contractors or utility owners.

ARTICLE 8 – OWNER' RESPONSIBILITIES

SC-8.02.A Replacement of ENGINEER: Delete the following text: "to whom CONTRACTOR makes no reasonable objection."

ARTICLE 9 – ENGINEER' STATUS DURING CONSTRUCTION

SC-9.03 Resident Project Representative:

Add the following paragraphs below 9.03 A.

The duties and responsibilities of the resident project representative include the following:

1. Review schedules as required in paragraph 2.05.B of the General Conditions and amendment thereto.

2. Attend conferences and meeting with CONTRACTOR.

3. Serve as liaison between ENGINEER and CONTRACTOR and help ENGINEER serve as liaison between OWNER and CONTRACTOR.

4. Conduct on-site observation of the work.

5. Observe tests, equipment and system start-ups.

6. Report to the ENGINEER when clarifications and interpretations of the Contract Documents are needed. Consider, evaluate and report to the ENGINEER, CONTRACTOR's requests for modifications.

7. Maintain orderly records, keep a daily log (when on a part time basis, keep log for days visiting site) and furnish periodic reports tot the ENGINEER of the progress of the work.

8. Before project completion, prepare final list of items to be completed for corrected and make recommendations to the ENGINEER concerning acceptance of the work.

The resident project representative shall not:

1. Authorize any deviation from the Contract Documents or substitutions of materials or equipment.

2. Exceed limitations of ENGINEER's authority as set forth in the Contract Documents.

3. Undertake any of the responsibilities of CONTRACTOR, subcontractor or CONTRACTOR's superintendent.

4. Advise on, issue direction relative to or assume control over any aspect of the

means, methods, techniques, sequences or procedures of construction.

5. Advise on, issue directs regarding or assume control over safety precautions and programs in connection with the work.

6. Accept shop drawing or sample submittals from anyone other than CONTRACTOR.

7. Authorize OWNER to occupy the project in whole or in part.

8. Participate in specialized field or laboratory tests or inspections conducted by others except as specifically authorized by ENGINEER.

ARTICLE 10 - CHANGES IN THE WORK

No Modifications.

ARTICLE 11 - COST OF THE WORK

SC-11.01.A Cost of the Work: Insert the following after paragraph 11.01.A.5.c:

1) Rental rates will be determined as follows:

a) The base rates shall be those established in the cost guide, entitled "Caltrans Labor Surcharge and Equipment Rental Rates," and revisions thereto. The hourly rate to be paid shall be the sum of the weekly rate divided by 40 plus the estimated operator's cost per hour shown therein, except as modified by article 12.01.

b) Attachments (e.g., tractor with ripper and dozer or tractor with loader and backhoe) will be included in the hourly rental rate only when deemed essential to the Work as determined by ENGINEER.

c) The total established rental rate per hour shall be rounded to the nearest $0.10.

d) Rental rates shall not be adjusted for regional differences.

e) No compensation shall be allowed for shop tools having a daily rental rate less than $10.00 as set forth in the cost guide.

2) If deemed necessary by ENGINEER to use equipment not listed in the aforementioned publications, a suitable rental rate for such equipment will be mutually established by CONTRACTOR and ENGINEER. CONTRACTOR may furnish any cost data that might establish a suitable rental rate for such equipment. Rental payment will be made for the actual time that such equipment is in operation on the Work and for 20 percent of the actual standby time on the Work.

SC-11.03.C Unit Price Work: Delete paragraph 11.03.C.1 and insert the following in lieu thereof:

1. the quantity of any item of Unit Price Work performed by CONTRACTOR differs by more than 25 percent from the estimated quantity of such item indicated in the Agreement; and

ARTICLE 12 - CHANGE OF CONTRACT PRICE; CHANGE OF CONTRACT TIMES

SC-12.01 Change of Contract Price

A. The contract price may only be changed by a contract change order. The value of any work covered by a contract change order for an adjustment in the contract price will be determined in the City's sole discretion as follows:

1. If the work performed is on the basis of unit prices contained in the contract documents, the change order will be determined in accordance with the provisions in paragraph 11.03, or

2. If the work performed is not included on the engineers estimate associated with a unit price, the change order will be by a mutually agreed lump sum; or

3. If the change order is not determined as described in either 12.01.A.1 or 12.01.A.2, the change order will be determined on the basis of Force Account in accordance with the provisions in Section 12.01, "Force Account Payment", of the Caltrans Standard Specifications, plus a contractor's fee for overhead and profit as determined by 1.24.B.

B. The Contractor will be paid the direct costs for labor, materials and equipment used in performing the force account work in accordance with Article 11 "Work Performed by Contractor" of the Caltrans Standard Specifications as modified below.

To the total of the direct costs computed as provided in 12.01 there will be added a markup of 5 percent to the cost of labor, 5 percent to the cost of materials and 5 percent to the equipment rental.

The above markups shall constitute full compensation for all delay costs, overhead costs and profit which shall be deemed to include all items of expense not specifically designated as cost or equipment rental in 11.01 The total payment made as provided above shall be deemed to be the actual cost of the work and shall constitute full compensation therefor.

When extra work to be paid for on a force account basis is performed by a subcontractor, approved in conformance with the provisions in Article 11.01, an additional markup of 2 percent will be added to the total cost of that extra work including all markups specified in this 12.01. The additional 2 percent markup shall reimburse the Contractor for additional administrative costs, and no other additional payment will be made by reason of performance of the extra work by a subcontractor.

SC-12.02 Change of Contract Times: Add the following paragraphs 12.02.C and 12.02.D:

C. Use of Float:

1. A claim for an adjustment of Contract Times (or Milestones), otherwise allowable under the Contract Documents, shall be granted only when the time lost or gained exceeds the float for the activity at the time of the event giving rise to the claim. Float, the amount of time between the early start date and the late start date, or the early finish date and the late finish date, is jointly owned by both OWNER and CONTRACTOR whether expressly disclosed or implied in any manner.

2. CONTRACTOR shall not use float suppression techniques (including, but not limited to, preferential sequencing caused by late starts of follow-up trades, unreasonably small crews, extended durations, or imposed dates) in information provided to ENGINEER.

D. The contract time includes a weather day allowance of 30 working days. No extension in Contract Time will be allowed for the first 30 working days lost due to weather conditions.

ARTICLE 13 - TESTS AND INSPECTIONS; CORRECTION, REMOVAL, OR ACCEPTANCE OF DEFECTIVE WORK

No modifications.

ARTICLE 14 - PAYMENTS TO CONTRACTOR AND COMPLETION

SC-14.02.A Application for Progress Payments: Delete "At least twenty days before the date established for each progress payment (but not more than once a month)" in paragraph 14.02.A.1 and insert "On the last day of each calendar month" in lieu thereof and add the following subparagraphs at the end of 14.02.A.1:

a. Stored Materials and Equipment: Payments for stored materials and equipment shall be based only upon the actual cost of the materials and equipment to CONTRACTOR and shall not include any overhead or profit to CONTRACTOR. Partial payments will not be made for undelivered materials or equipment, except for payments associated with procurement contracts initiated by OWNER and assigned to CONTRACTOR.

b. Schedules and Data: During the progress of the Work, each Application for Payment shall be accompanied by CONTRACTOR's updated schedule of operations, or progress report, with such shop drawings schedules, procurement schedules, value of material on hand included in application, and other data specified in Section 01330 or reasonably required by ENGINEER.

c. Payment for material delivered to the work site or stored under OWNER's control will be based on the vendors' paid invoices or the bill of lading showing date of delivery and the work site where the delivery took place, a copy of which shall be furnished by CONTRACTOR to ENGINEER with each request for progress payment. Only those materials which have been incorporated into the Project or are stored under OWNER's control may be included in the progress payment as material stored.

d. In addition to the amounts which OWNER may retain as provided elsewhere in the Contract Documents, OWNER may withhold a sufficient amount or amounts from any payment otherwise due CONTRACTOR as in OWNER's judgment may be necessary to cover:

1) Payments which may be due and payable for properly filed claims against CONTRACTOR or any Subcontractor for labor or materials furnished in or about the performance of the Contract.

2) Estimated or actual costs for correcting defective work not remedied.

3) Amounts claimed by OWNER as forfeiture due to delays or other offsets. OWNER may apply such withheld amount or amounts to the payment of such claim at OWNER's discretion. In doing so, OWNER shall be deemed the agent of CONTRACTOR and any payments so made by OWNER shall be considered as a payment made under the Contract

by OWNER to CONTRACTOR, and OWNER shall not be liable to CONTRACTOR for such payment made in good faith. Such payments may be made without prior judicial determination of the claim or claims. OWNER shall render to CONTRACTOR a proper account of any such funds disbursed in or on behalf of CONTRACTOR.

e. CONTRACTOR shall disburse money paid to him, including any interest CONTRACTOR receives, to Subcontractors and Suppliers within 15 days after CONTRACTOR receives the money, in direct proportion to the Subcontractors' and Suppliers' basis in the total Contract between CONTRACTOR and OWNER. Any money which is payable to a Subcontractor pursuant to this section accrues interest at the legal rate. CONTRACTOR may withhold 10 percent from the amount of any partial payment under a subcontract with is made before 50 percent of the Work has been completed under the subcontract. Thereafter CONTRACTOR shall pay any additional funds if, in the opinion of the CONTRACTOR, satisfactory progress is being made in the work under the subcontract, and the payment must be equal to that paid by OWNER to CONTRACTOR for the Work performed by the Subcontractor.

1) The CONTRACTOR may retain the amount withheld under the subcontract until the subcontract is satisfactorily completed.

2) The amount withheld under the subcontract is due within 15 days after the acceptance of the subcontract work by CONTRACTOR.

3) Whenever CONTRACTOR receives a payment of interest earned on the amount withheld from the Contract, CONTRACTOR shall within 15 days pay to each Subcontractor that portion of the interest received from the state which is attributable to the amount of money withheld from the Subcontractor.

SC-1402.B Review of Application: Delete the first sentence of 14.02.B.1 and inset in lieu thereof the following sentence:

1. ENGINEER will, within 7 days after receipt of each Application for Payment, either indicate in writing a recommendation for payment and present the Application to OWNER or return the Application to CONTRACTOR indicating in writing ENGINEER's reasons for refusing to recommend payment, in accordance with Section 20104.50, California Public Contract Code.

SC-14.02.C Payment Becomes Due: Delete paragraph 14.02.C.1 and insert the following text in lieu thereof:

1. Thirty days after presentation of the Application for Payment to OWNER with ENGINEER's recommendation, the amount recommended less amounts due to OWNER and other amounts which are authorized to be reserved or retained by state law will (subject to the provisions of paragraph 14.02.D) become due and when due will be paid by OWNER to CONTRACTOR.

SC-14.04.A Substantial Completion: Add the following subparagraphs immediately after paragraph 14.04.A:

1. The Work shall be Substantially Complete when:
   a. Outfall Pump Station can deliver all of Turlock's Effluent to the San Joaquin River.

ARTICLE 15 - SUSPENSION OF WORK AND TERMINATION

SC-15.02 OWNER May Terminate for Cause: Delete paragraphs 15.02.A through 15.02.C and insert the following in lieu thereof:

A. If CONTRACTOR refuses or fails to prosecute the Work or any separable part thereof with such diligence as will ensure the completion of the Work within the Contract Times, or any extension thereof, or fails or refuses to complete such Work within such extension, or if CONTRACTOR should be adjudged bankrupt, or if CONTRACTOR should make assignment for the benefit of CONTRACTOR's creditors, or if CONTRACTOR files a petition to take advantage of any debtor's act, or if a receiver should be appointed on account of CONTRACTOR's insolvency, or if CONTRACTOR or any Subcontractor should violate any provision of the Contract, or if CONTRACTOR should persistently refuse or should fail to supply enough properly skilled workmen or proper materials to complete the Work in the time specified, or if CONTRACTOR should fail to make prompt payment to Subcontractors or for materials or labor, or if CONTRACTOR should disregard laws, ordinances, or instructions given by OWNER, ENGINEER, or OWNER's Operating Agent or disregard in any substantial way any provisions of the Contract Documents; OWNER may without prejudice to any other right or remedy, serve written notice upon CONTRACTOR and CONTRACTOR's surety of OWNER's intention to terminate the Contract. Such notice will contain the reasons for OWNER's intention to terminate the Contract and unless such violations shall cease and satisfactory arrangements for the corrections thereof have been accepted by OWNER in writing within 10 days after the service of such notice, the Contract shall upon the expiration of said 10 days cease and terminate. In the event of such termination, the OWNER shall immediately serve written notice upon the Surety and CONTRACTOR, and CONTRACTOR shall be liable for all costs necessary to complete the Work.

B. The Surety shall, after receipt of notification from OWNER of termination of the Contract, take over and perform the Work, utilizing a contractor which is acceptable to ENGINEER. The Surety shall, within 10 days after receipt of the notice of termination, provide OWNER with written notice of Surety's intent to take over and complete the Work in accordance with the Contract Documents, and shall commence the Work within 10 days thereafter.

C. If the Surety does not reply to the notice of termination, or fails to perform the Work in compliance with the Contract Documents, or provides the OWNER with written notice that Surety does not intend to take over and perform the work to completion, OWNER may without prejudice on the part of the Surety, take over the Work and prosecute the same to completion by any method OWNER may deem advisable for the account at the expense of CONTRACTOR, and the Surety shall be liable to OWNER for any excess cost or other damage occasioned OWNER thereby. In such event OWNER may, without liability for so doing, take possession of and utilize in completing the Work such materials, appliances, plant, and other property belonging to CONTRACTOR that may be on the work sites and be necessary therefor. CONTRACTOR shall turn over to OWNER's Operating Agent all materials and equipment in CONTRACTOR's possession that is to be incorporated into the Project, and shall make arrangements with OWNER to turn over any materials or equipment in which OWNER has made payment or partial payment but is not in OWNER's possession.

D. Upon completion of the Work, if the unpaid balance of the Contract Price exceeds the direct and indirect cost of completing the Work, including, but not limited to, all costs incurred by OWNER from professional services and attorneys' fees and all costs generated to insure or bond the Work of substituted contractors or subcontractors used to complete the Work, such excess shall be paid to CONTRACTOR. If such costs exceed the unpaid balance, CONTRACTOR shall pay the difference to OWNER within 30 days upon demand; on failure of CONTRACTOR to pay, the Surety shall promptly pay the difference to OWNER upon written notice of CONTRACTOR's failure of payment. Such difference or any portion thereof not paid by the CONTRACTOR or the Surety within the 30 days following the date of mailing of the demand for payment, shall earn interest at the rate of 10 percent per annum or the maximum rate authorized by state law, whichever is lower.

SC-15.04 CONTRACTOR May Stop Work or Terminate: Delete paragraph 15.04 in its entirety.

ARTICLE 16 - DISPUTE RESOLUTION

SC-16. DISPUTE RESOLUTION. Delete paragraph 16.01 and insert the following in lieu thereof:

16.01 As a condition precedent to the commencement of judicial action for resolution of claims and disputes, arising out of, or relating to, the Agreement, including any disagreement with ENGINEER's decisions, either OWNER or CONTRACTOR shall file a written demand for Disputes Review Board, pursuant to Document 00822 of the dispute with the other party.

16.02 No demand for Disputes Review Board or of any claim, dispute or other matter in question arising out of or relating to the Agreement shall be made until the earlier of (a) the date on which ENGINEER has rendered a written decision or (b) 30 days after the parties have presented their evidence to the ENGINEER, including additional evidence required by the ENGINEER. No demand for Disputes Review Board or of any claim, dispute or other matter shall be made later than 60 days after the date the parties have presented their evidence to the ENGINEER in respect thereof pursuant to Article 9 of the General Conditions. Failure to demand Disputes Review Board or within said period shall result in ENGINEER's decision being final and binding upon the OWNER and CONTRACTOR. If ENGINEER renders a decision after a demand for Disputes Review Board or such decision may be entered as evidence at Disputes Review Board or judicial proceedings but will not supersede such proceedings except where the decision is acceptable to the parties concerned.

16.03 If the party upon whom the demand for arbitration is made rejects arbitration by failing to give written response within 30 days after receiving the demand, the other party may commence judicial action on the merits of the dispute. If the party upon whom the demand for arbitration is made accepts arbitration and provides a written response within 30 days, the parties shall commence arbitration in accordance with Document 00821. The arbitrator's award shall be final and judgment may be entered upon it in any court having jurisdiction.

16.04 If a claim, dispute, or other matter in question between OWNER and CONTRACTOR involves the work of a Subcontractor, either OWNER or CONTRACTOR may join such Subcontractor as a party to the Disputes Review Board or between OWNER and CONTRACTOR. CONTRACTOR shall include in all subcontracts the provisions of Article 16 of the General Conditions including the specific provision whereby the Subcontractor consents to being joined in a Disputes Review Board between OWNER and CONTRACTOR involving the Work of such Subcontractor. Nothing in this paragraph nor in the provisions of such subcontract consenting to joinder shall create any claim, right or cause of action in favor of Subcontractor and against OWNER or ENGINEER that does not otherwise exist.

ARTICLE 17 - MISCELLANEOUS

No Modifications.

END OF DOCUMENT

DOCUMENT 00821

ARBITRATION

1.01 Procedures:

A. All claims, disputes and other matters in question between OWNER and CONTRACTOR arising out of or relating to the Contract Documents or the breach thereof (except for claims which have been waived by the making or acceptance of final payment in accordance with Document 00700, General Conditions) will be decided by arbitration in accordance with this Document 00821. This agreement to arbitrate and any other agreement or consent to arbitrate entered into in accordance herewith will be specifically enforceable under the prevailing law of any court having jurisdiction.

B. Notice of the demand for arbitration will be filed in writing with the other party to the Agreement, and a copy will be sent to ENGINEER for information. The demand for arbitration will be made within the period specified in paragraph 16.02 of the Supplementary Conditions, and in all other cases within a reasonable time after the claim, dispute or other matter in question has arisen, and in no event shall any such demand be made after the date when institution of legal or equitable proceedings based on such claim, dispute or other matter in question would be barred by the applicable statute of limitations.

C. Except as provided in paragraph 1.01.D below, no arbitration arising out of or relating to the Contract Documents shall include by consolidation, joinder or in any other manner any other person or entity who is not a party to this dispute unless:

1. the inclusion of such other person or entity is necessary if complete relief is to be afforded among those who are already parties to the arbitration, and

2. such other person or entity is substantially involved in a question of law or fact which is common to those who are already parties to the arbitration and which will arise in such proceedings, and

3. the written consent of the other person or entity sought to be included and of OWNER and CONTRACTOR has been obtained for such inclusion, which consent shall make specific reference to this paragraph; but no such consent shall constitute consent to arbitration of any dispute not specifically described in such consent or to arbitration with any party not specifically identified in such consent.

D. Notwithstanding paragraph 1.01.C if a claim, dispute or other matter in question between OWNER and CONTRACTOR involves the Work of a Subcontractor, either OWNER or CONTRACTOR may join such Subcontractor as a party to the arbitration between OWNER and CONTRACTOR hereunder. CONTRACTOR shall include in all subcontracts a specific provision whereby the Subcontractor consents to being joined in an arbitration between OWNER and CONTRACTOR involving the Work of such Subcontractor. Nothing in this paragraph 1.01.D nor in the provision of such subcontract consenting to joinder shall create any claim, right or cause of action in favor of Subcontractor and against OWNER, ENGINEER or ENGINEER's Consultants that does not otherwise exist.

E. The demand for arbitration shall specify with particularity the nature of the dispute. The dispute shall be decided by a panel of three arbiters. Each party shall select one arbiter, and within 60 days, the two arbiters will select a third arbiter. The dispute shall be resolved pursuant to agreed upon procedures, by majority decision of the arbiters which shall be binding on all parties.

F. The parties all share equally the arbiters' collective fees plus any out of pocket expenses of the arbiters.

G. The parties shall furnish all relevant information, documents and arguments to the arbiters within 30 calendar days of the date arbiter selection is completed. Unless agreed to by all parties to the dispute, the arbiters shall issue their written binding decision together with a reasonable discussion for the basis of decision within 120 calendar days of the written request for arbitration.

H. Qualified arbiters must be experienced with the type of construction involved in this project and interpretation of Contract Documents.

Qualified arbiters shall show no partiality to either the OWNER or CONTRACTOR or other parties included by consolidation. The criteria and limitations for arbiter appointment are as follows:

1. No arbiter shall have an ownership interest, professional or personal relationship to any party or a financial interest in the outcome of the arbitration.

2. Except for fee-based consulting services on other projects, no arbiter shall have been previously employed by, or have any financial ties to any party to the dispute.

3. During the tenure of an arbiter, no arbiter shall be employed by any party to the dispute nor enter into an agreement with any party regarding future employment.

I. The parties shall offer such evidence to the arbiters as they desire and shall produce such additional evidence or testimony as the arbiters may deem necessary. The arbiters shall be the judge of admissibility of the evidence offered. Conformity to legal rules of evidence shall not be necessary. The arbiters shall endeavor to facilitate the presentation of evidence in a manner that is fair to all parties in order to arrive at an expeditious resolution. The arbiters may require production of any evidence necessary to resolve the dispute.

J. Arbiters shall not undertake any discussion of the dispute with one party without the presence of all interested parties or their agents, unless those parties fail or refuse to be present after due notification by the arbiters.

K. All arbitration hereunder shall be conducted in the county and state selected by the arbiters.

ARBITRATION THREE PARTY AGREEMENT

THIS THREE PARTY AGREEMENT, made and entered into this _____ day of _____, 2011, between the _____ hereinafter called "OWNER," and _____, hereinafter called "CONTRACTOR," and the Arbitrators, hereinafter called the "Panel," and consisting of three members _____, _____, and _____.

WITNESSETH, that

WHEREAS, OWNER is now engaged in the construction _____; and

WHEREAS, the Contract Documents for this project provide for resolution of disputes by appointment of an Arbitration Panel to assist in resolving disputes and claims; and

WHEREAS, the Panel is composed of three members, one selected by OWNER, one selected by CONTRACTOR, and the third member selected by the first two;

NOW THEREFORE, in consideration of the terms, conditions, covenants, and agreements contained herein, or attached and incorporated and made a part hereof, the parties hereto agree as follows:

I. DESCRIPTION OF THE WORK

In order to resolve disputes and claims between OWNER and CONTRACTOR, the Contract Documents prepared for the project provide for an Arbitration Panel to provide written determinations for each dispute. The members of this Panel shall perform the services necessary to participate in the Panel's actions in accordance with the scope of work.

II. SCOPE OF WORK

The scope of work of the Panel includes:

A. Establish Procedures:

During its first meeting at the job site, the Panel shall, with the agreement of all parties, establish procedures for the conduct of its hearings for consideration of disputes and claims.

B. Determination of Disputes:

Upon receipt by the Panel of a written demand to arbitrate a dispute, either from OWNER or CONTRACTOR, the Panel shall convene a hearing to review and consider the dispute. Both OWNER and CONTRACTOR shall be given a full and adequate opportunity to present evidence, with respect to each issue in dispute, at these hearings. Both OWNER and CONTRACTOR are encouraged to provide exhibits, calculations, and any other pertinent material to the Panel prior to the hearing, for review. All such material shall be given in the same form and content to all parties to this Agreement.

It is expressly understood that all Panel members shall act impartially and independently in the consideration of facts and conditions surrounding any dispute presented by OWNER or CONTRACTOR, and that the determinations concerning any such dispute are binding on all parties.

Panel determinations shall be based upon the pertinent contract provisions, and the documents, testimony and evidence involved in the dispute. The determinations shall be furnished in writing to OWNER and CONTRACTOR.

C. Member Replacement:

Should the need arise to appoint a replacement Panel member, the replacement member shall be appointed in the same manner as the original member was appointed. The selection of a replacement Panel member shall begin promptly upon notification of the necessity for a replacement and shall be completed within four weeks. This Agreement shall be amended to indicate change in Panel membership.

D. Consultation:

OWNER and CONTRACTOR shall refrain from soliciting, and the Panel shall refrain from giving, consulting advice on conduct of the work or resolution of problems other than disputes referred to the Panel as herein provided.

III. PANEL RESPONSIBILITIES

The Panel is organized for the purpose of making determinations of disputes, claims, and controversies which may arise or exist between OWNER and CONTRACTOR. Primarily, the Panel shall consider such matters as interpretation of the Contract Documents, delays, acceleration of the work, scheduling, extra work, differing site conditions, and design changes.

The Panel shall encourage the settlement of differences at the job level.

IV. CONTRACTOR RESPONSIBILITY

CONTRACTOR shall furnish each Panel member one copy of all documents it might have, other than those furnished by OWNER, which are pertinent to the performance of the Panel.

V. OWNER RESPONSIBILITIES

OWNER shall furnish the following:

A. Contract Related Documents:

OWNER shall furnish each Panel member one copy of all Contract Documents, including but not limited to the specifications, drawings, all addenda to the specifications and drawings, Geotechnical Data and Interpretative Reports, progress schedule and updates, progress reports, and other documents pertinent to the performance of the Contract, relative to a specific dispute.

B. Coordination:

OWNER shall, in cooperation with CONTRACTOR, provide agreed upon conference facilities at or near the site, and shall provide secretarial and copying services.

VI. PAYMENT

The Panel members shall be paid one-half by CONTRACTOR and one-half by OWNER. Payments shall be full compensation for work performed and services rendered, and for all materials, supplies, travel, subsistence, and incidentals necessary to serve on the Panel.

A. Payment for Services and Expenses:

Payment for services shall be at the rates agreed to between OWNER and CONTRACTOR. Changes in the billing rates are subject to agreement between OWNER and CONTRACTOR.

Direct, non-salary expenses shall be reimbursed at the actual cost to the Panel member. These expenses may include, but are not limited to, automobile mileage (at the IRS rate in effect at the time the trip is taken), parking, travel expenses from the Panel member's point of origin to the initial point of arrival, automobile rental, food and lodging, printing, long distance telephone, postage, and courier delivery. Billing for these expenses shall include an itemized listing supported by copies of the original bills, invoices, expense accounts, and miscellaneous supporting data.

B. Payments:

Each Panel member shall submit invoices to CONTRACTOR and OWNER for payment for work completed for each month during the progress of the work, along with documentation for services rendered and expenses. Such invoices shall be in a format approved by OWNER and CONTRACTOR, and accompanied by a general description of activities performed during that period. The value of work accomplished for payment shall be established from the billing rate and hours expended by the Panel member together with direct, non-salary expenses.

Satisfactorily submitted invoices shall be paid within 30 days.

C. Inspection of Cost Records:

Panel members shall keep available, for inspection by representatives of OWNER and CONTRACTOR for a period of three years after final payment, the cost records and accounts pertaining to this Agreement.

VII. ASSIGNMENT

Panel members shall not assign any of the work of this Agreement.

VIII. TERMINATION OF PANEL MEMBERS

Panel members may withdraw from the Panel by providing four weeks written notice to the other Panel members, OWNER, and CONTRACTOR. In the event that the OWNER-Appointed member withdraws, the OWNER shall nominate a replacement member using the procedures set forth herein. If the CONTRACTOR-appointed member withdraws, the CONTRACTOR will

nominate a replacement member using the same procedures. If the Panel terminates one of its members, the two remaining Panel members will mutually nominate a replacement member using the procedures set forth herein.

IX. LEGAL RELATIONS

The parties mutually understand and agree that the Panel member, in the performance of his duties, is acting in the capacity of an independent agent and not as an employee of either OWNER or CONTRACTOR.

X. DISPUTES REGARDING THIS THREE PARTY AGREEMENT

Any dispute among the parties hereto, arising out of the Work or other items of this Agreement, which cannot be resolved by negotiation and mutual concurrence between parties, shall be referred to court of competent jurisdiction.

XI. VENUE, APPLICABLE LAW, AND PERSONAL JURISDICTION

In the event that any party institutes legal action or proceedings to enforce the Panel's decisions, the parties hereunto agree that any such action shall be initiated in a Court of the county in which the project is located. The parties hereby agree that all questions shall be resolved by application of state law and that the parties to such action shall file appeals from decisions in accordance with the laws of the State. Panel members shall not be called to testify as fact or expert witnesses in any subsequent litigation or serve as a consultant in any such litigation concerning any work or the parties hereunder. However, Panel members may be called as necessary to admit Panel's determinations into evidence.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date and year first above written.

(PANEL MEMBER)

(Signature)

(PANEL MEMBER)

(Signature)

(PANEL MEMBER)

(Signature)

(CONTRACTOR)

(Signature)

(OWNER)

(Signature)

END OF DOCUMENT

DOCUMENT 00822

DISPUTES REVIEW BOARD

1. INTRODUCTION

A Disputes Review Board shall be established to assist in the resolution of disputes and claims arising from the Work under this project. This Document 00822 specifies the purpose, procedure, function, and key features of the Disputes Review Board. Attached to this Document 00822 is the agreement which will be used to create the Board. The Board is organized for the purpose of making determinations of disputes, claims, and controversies which may arise or exist between OWNER and CONTRACTOR and to develop settlement recommendations for consideration by OWNER and CONTRACTOR, relating to disputes, claims, or controversies in an effort to prevent construction delay and litigation.

It is not intended that OWNER or CONTRACTOR shall default on their normal responsibility to amicably and fairly settle their differences by indiscriminately assigning them to the Board. The mere existence of the Board should encourage OWNER and CONTRACTOR to resolve potential disputes without resorting to the formal Disputes Review Board procedure. The Board shall be utilized when normal OWNER-CONTRACTOR dispute resolution is unsuccessful, and is a prerequisite to the filing of litigation by either party. Either OWNER or CONTRACTOR may refer a dispute to the Board. Arbitration followed by litigation may be commenced by either party, subsequent to the Disputes Review Board process on only those issues, disputes, and controversies brought before the Board. Specifically, the Disputes Review Board procedure must be utilized with regard to each claim, issue, controversy, or dispute prior to the commencement of arbitration followed by litigation.

The determinations of the Disputes Review Board shall not be binding on either OWNER or CONTRACTOR. The Board shall fairly and impartially consider all disputes and shall provide, for each issue before the Board, written determinations to OWNER and CONTRACTOR.

2. CONTINUANCE OF WORK DURING DISPUTE

At all times during the course of the Disputes Review Board process, CONTRACTOR shall continue with the Work as directed, in a diligent and reasonable manner and without delay, and conform to OWNER's decision or order, and shall be governed by all applicable provisions of the Contract Documents. Records of the Work shall be kept in sufficient detail to enable payment in accordance with the General Conditions and Supplementary Conditions if necessary. Failure of CONTRACTOR to continue with the work as directed by OWNER will result in a presumption of OWNER's right to terminate the contract for cause pursuant to Paragraph 15.02 of the General Conditions.

3. MEMBERSHIP

The Disputes Review Board shall consist of one member selected by OWNER and approved by CONTRACTOR, and one member selected by CONTRACTOR and approved by OWNER. The first two members shall nominate the third member. OWNER and

CONTRACTOR shall approve the third member. Normally, the third member shall act as Chairman for all activities.

Each Disputes Review Board member shall be experienced with the type of construction involved on this project, interpretation of contract documents, and resolution of construction disputes. The goal in selecting the third member is to complement the experience of the first two members, and to provide leadership for the Board's operations.

Board members shall not show partiality to either CONTRACTOR or OWNER, nor shall they have any conflicts of interest. A "member" also includes the member's current primary employer.

The criteria and limitations for membership on the Board shall be as follows:

a. Members shall not have an ownership interest in any party to the contract, nor a financial interest in the contract, except for payment for services on the Disputes Review Board.

b. Except for fee-based consulting services on other projects, members shall not have ever been a full-time employee of either party.

c. Members shall not have had substantial prior involvement in the project of a nature which compromises their ability to impartially interpret disputes.

d. Members shall not be employed by any party to the Contract or the sponsoring member of the CONTRACTOR's joint venture during the life of this Contract, except as a member of this Disputes Review Board.

e. During the life of this Contract no discussions shall be conducted or agreements made between any Disputes Review Board member and any party to this Contract for employment after this Contract is complete.

f. Members shall generally be available to visit the job site and attend DRB meetings on two weeks' notice.

Before appointments are approved, the first two prospective members shall submit complete disclosure statements for the approval of both OWNER and CONTRACTOR. Each statement shall include a resume of experience and a declaration describing all past, present, and anticipated or planned future relationships with the project and with all parties involved in this Contract. Disclosure of close, professional or personal, relationships with all key parties to the Contract shall be included. The third Board member shall supply such a statement to the first two Board members and to OWNER and CONTRACTOR before his appointment is approved. Either party may request a personal interview with prospective Board members at a mutually agreeable location before final selection of the Board.

OWNER and CONTRACTOR shall select and negotiate an agreement with their candidates for the Board within one month after award of the Contract. OWNER and CONTRACTOR shall immediately notify their members to begin selection of the third member. The first two members shall ensure that the third member meets all the criteria

listed above. The third member shall be selected within one month after the first two members are notified to proceed with the selection of the third member.

In the event of an impasse in the selection of a third member, that third member shall be selected by mutual agreement of OWNER and CONTRACTOR.

OWNER, CONTRACTOR, and all three members of the Disputes Review Board shall execute the Disputes Review Board Three Party Agreement within two weeks after the selection of the third member.

4. OPERATION

The Disputes Review Board shall formulate its own rules of operation. Strict rules for the functioning of the Board are not required. The entire procedure shall be kept flexible to adapt to changing situations. The Board shall initiate, with OWNER's and CONTRACTOR's concurrence, new rules, or modifications to old ones, whenever this is deemed necessary.

Neither party shall solicit any Board member's advice or consultation on matters concerning the conduct of the work.

In order to keep abreast of construction developments and progress, the members shall be promptly informed of construction activities through written weekly progress reports and other relevant data prepared by ENGINEER and distributed to the Board, OWNER, and CONTRACTOR. The Board shall visit the project at regular intervals and at critical construction events and shall meet with representatives of OWNER, ENGINEER, and CONTRACTOR. The frequency of these visits shall be determined by mutual agreement of OWNER, CONTRACTOR, and Board, depending upon the progress of the work.

Regular meetings shall be held at the job site. Each meeting shall consist of an informal discussion and a field inspection of the work being performed on the Contract. The meeting shall be attended by representatives of OWNER, ENGINEER, and CONTRACTOR.

Agenda for regular meetings of the Disputes Review Board shall generally include the following:

a. Meeting opened by the Chairman of the Disputes Review Board.

b. Opening remarks by OWNER's and ENGINEER's representatives.

c. A presentation by CONTRACTOR's representatives of:

- **work accomplished since the last meeting**
- **current status of the work schedule**
- **future schedule changes**
- **potential problems**
- **proposed solutions for these problems**
- **tentative date for next meeting**

- **field inspection**

d. Discussion by OWNER's and ENGINEER's representatives of:

- **work schedule**
- **potential disputes or claims**
- **status of past disputes and claims**
- **tentative date for next meeting**

ENGINEER shall make arrangements for the preparation of minutes of all regular meetings and shall distribute them for comments and revisions and for approval of all concerned parties.

The field inspection will cover all active segments of the work. The Board shall be accompanied by representatives of OWNER, ENGINEER, and CONTRACTOR.

5. PROCEDURE AND SCHEDULE FOR DISPUTES RESOLUTION

Disputes shall be considered as expeditiously as possible, taking into consideration the particular circumstances and the time reasonably required by OWNER and CONTRACTOR to prepare their respective documentation concerning the dispute. The procedure and time periods outlined below may be amended as agreed upon by both OWNER and CONTRACTOR in order to expedite a determination by the Board for resolution of the dispute.

a. If CONTRACTOR objects to any decision, or order of OWNER or determination of ENGINEER, and wants to pursue the matter further, CONTRACTOR shall file a written objection with OWNER, stating clearly and in detail the basis of his objection, within seven days after receipt of the decision or order of OWNER or determination of ENGINEER. Failure to provide such notice shall constitute acceptance of OWNER's decision, or order or determination of ENGINEER, and shall be final and conclusive on the matter.

b. OWNER shall consider the written objection and make a decision on the basis of the pertinent contract provisions, together with the facts and circumstances involved in the dispute. The decision shall be furnished in writing to CONTRACTOR within seven days after receipt of CONTRACTOR's written objection.

c. OWNER's decision, provided to CONTRACTOR as required in Paragraph 5.b above, shall be final and conclusive on the dispute, unless a written appeal to the Disputes Review Board is filed by CONTRACTOR within seven days of receiving OWNER's decision pursuant to 5.b above. A copy of the appeal shall be provided to OWNER and ENGINEER at the same time that it is delivered to the Board.

d. Upon receiving an appeal, the Board shall first decide the time and place for conducting the hearing. If the matter is not urgent, the hearing may be scheduled for the next regular Board meeting. For an urgent matter, the Board shall meet at its earliest convenience.

e. CONTRACTOR and OWNER shall each be offered an opportunity to be heard by the Board and to offer evidence, relating to each issue or controversy in dispute, in accordance with the procedure set forth in the Conduct of Hearing paragraph.

f. Within ten days of receiving the Board's written report containing its determinations with regard to each matter or issue presented, both OWNER and CONTRACTOR shall respond to the other and to the Board in writing, signifying either acceptance or rejection of the Board's determinations. The failure of either party to respond within 10 days shall be deemed an acceptance of the Board's determinations, although neither party shall be bound by the determinations. If OWNER and CONTRACTOR are able to resolve their dispute with the aid of the Board's determinations, ENGINEER shall promptly prepare any required contract change orders for execution by both parties.

g. Should the dispute remain unresolved, OWNER or CONTRACTOR may, but not later than fifteen days after receipt of the Board's determinations, request the Board to reconsider its determination.

h. OWNER and CONTRACTOR should strongly consider the determinations of the Disputes Review Board; however, the determinations are not binding on either party. If the Board's determinations do not resolve the dispute, the Board's written determinations concerning each issue presented, including any minority determination, shall be admissible as evidence in subsequent arbitration and/or litigation.

i. Notwithstanding the above procedures, OWNER may appeal ENGINEER's decision or convene the Disputes Review Board at any time during the project and present issues to the Board for its determination. Notice of OWNER's action in convening the Board shall be provided to CONTRACTOR. The Notice shall state clearly in detail the specific issues which OWNER desires the Board to consider for determination.

j. OWNER and CONTRACTOR each have a duty to participate in the Disputes Review Board process and procedure and shall be presumed to have participated fully in such process. If CONTRACTOR fails to participate in the Disputes Review Board procedure, the decisions or orders of OWNER or the determinations of ENGINEER shall be binding, final, and conclusive with regard to the issues presented to the Board for determination.

6. CONDUCT OF HEARING

The Board may request that written documentation and arguments from both parties be sent to each member for study before the hearing begins. The Board may also request a presentation of factual documentation, prepared jointly by the parties.

Normally the hearing will be conducted at the job site. However, any location that would be more convenient and still provide all required facilities and access to necessary documentation is satisfactory. Private deliberations of the Board may be held at a location other than the job site.

The third member of the Board shall act as Chairman of the hearing, or he may appoint one of the other members. The Chairman will keep minutes of the hearing. Although a formal transcript of the proceeding is not required, such a transcript will be maintained if

either OWNER or CONTRACTOR so requests. OWNER and CONTRACTOR should attempt to conduct the hearings informally if possible. Audio or video recordings will not be permitted.

Attendance by, or participation of, lawyers will be at the discretion of the Board.

OWNER and CONTRACTOR shall have representatives at all hearings. CONTRACTOR will discuss the dispute, followed by OWNER. Each party shall then be allowed one or more rebuttals until all aspects are fully covered. Each time a person testifies, the Board members may ask questions, request clarification, or ask for additional data. In large or complex cases, additional hearings may be necessary in order to consider and fully understand all the evidence presented by both parties. Both OWNER and CONTRACTOR shall be provided a full and adequate opportunity to present evidence, documentation, and testimony with regard to each issue before the Board for determination.

During the hearings, no Board member shall express any opinion concerning the merit of any fact or issue of the case.

The parties shall avoid ex parte communication with the Board.

After the hearings are concluded and each party has been afforded a full and adequate opportunity to present evidence, testimony, and documentation with regard to each specific issue before the Board, the Board shall meet in private to formulate its formal determinations for each issue presented. The determinations shall be supported by two or more members. All Board deliberations shall be conducted in private, with all individual views kept strictly confidential. The Board's determinations, together with discussion of the factual basis for its determinations, shall be submitted as a written report to both parties. The determinations shall be based upon the pertinent contract provisions and the facts and circumstances involved in the dispute. It is important for the Board to clearly and completely express the logic and reasoning leading to the determinations so that both parties fully understand them. In addition, the Board shall issue written recommendations for settlement of the dispute, together with a discussion of its reasons for such recommendations.

However, such written recommendations for settlement of the dispute shall be provided to CONTRACTOR and OWNER as a document separate and apart from the written report containing the Board's determinations of disputes, claims, and controversies. Recommendations for settlement issued by the Board shall not be admissible as evidence in subsequent arbitration and/or litigation.

The Board shall make every effort to reach a unanimous decision with regard to its determinations. If this proves impossible, the dissenting member may prepare a minority written report containing the dissenting member's determinations.

7. COMPENSATION

Any costs related to an interview with a prospective Board member shall be borne by the party requesting the interview.

Fees and expenses of all three members of the Board shall be paid by the CONTRACTOR. OWNER will reimburse CONTRACTOR for the Board's fees and expenses

as provided for in the Bid Form. OWNER will provide administrative services, such as conference facilities and secretarial services, and will bear the cost of these services. If the Board desires special services, such as legal or other consultation, accounting, data research, etc., both parties must agree.

CONTRACTOR shall pay the invoices of all Board members after approval by both parties.

DISPUTES REVIEW BOARD THREE PARTY AGREEMENT

_____

_____

THIS THREE PARTY AGREEMENT, made and entered into this _____ day of _____, 2011, between the _____ hereinafter called "OWNER," and _____, hereinafter called "CONTRACTOR," and the Disputes Review Board, hereinafter called the "Board," and consisting of three members _____, _____, and _____.

WITNESSETH, that

WHEREAS, OWNER is now engaged in the construction _____; and

WHEREAS, the Contract Documents for this project provide for the establishment and operation of a Board to assist in resolving disputes and claims; and

WHEREAS, the Board is composed of three members, one selected by OWNER, one selected by CONTRACTOR, and the third member selected by the first two;

NOW THEREFORE, in consideration of the terms, conditions, covenants, and agreements contained herein, or attached and incorporated and made a part hereof, the parties hereto agree as follows:

I. DESCRIPTION OF THE WORK

In order to assist in the resolution of disputes and claims between OWNER and CONTRACTOR, the Contract Documents prepared for the project provide for the establishment of a Disputes Review Board. The intent of the Board is to fairly and impartially consider the disputes placed before it and to provide written determinations to both OWNER and CONTRACTOR for each issue in dispute. The members of this Board shall perform the services necessary to participate in the Board's actions in accordance with the scope of work.

II. SCOPE OF WORK

The scope of work of the Board includes, but is not limited to, the following:

A. Familiarization with the Project:

Board members shall review plans and specifications, geotechnical data and interpretive reports, and relevant material provided by OWNER and CONTRACTOR in order to become familiar with the project. In addition, the Board shall review progress reports and other correspondence directed to them by OWNER and CONTRACTOR to keep current with the progress of the project.

B. Construction Site Visits:

Board members shall visit the project site to keep abreast of construction activities and to develop a familiarity with the work in progress. The frequency, exact time, and duration of these visits shall be as mutually agreed upon among the Board, OWNER, and CONTRACTOR.

In the case of an alleged changed condition or a construction problem, it will be advantageous, but not absolutely necessary, for the Board to personally view such conditions. Photographs and descriptions of these conditions, by both parties, may suffice, if viewing by the Board would cause delay to the project.

C. Establish Procedures:

During its first meeting at the job site, the Board shall, with the agreement of all parties, establish procedures for the conduct of its routine site visits and its hearings for consideration of disputes and claims. The conduct of its business shall, in general, be based upon the contract document provisions.

D. Determination of Disputes:

Upon receipt by the Board of a written appeal of a dispute or a notice from OWNER to present an issue to the Board, either from OWNER or CONTRACTOR, the Board shall convene a hearing to review and consider the dispute. Both OWNER and CONTRACTOR shall be given a full and adequate opportunity to present evidence, with respect to each issue in dispute, at these hearings. Both OWNER and CONTRACTOR are encouraged to provide exhibits, calculations, and any other pertinent material to the Board prior to the hearing, for review. All such material shall be given in the same form and content to all parties to this Agreement.

It is expressly understood that all Board members shall act impartially and independently in the consideration of facts and conditions surrounding any dispute presented by OWNER or CONTRACTOR, and that the determinations concerning any such dispute are advisory.

Board determinations shall be based upon the pertinent contract provisions, and the facts and circumstances involved in the dispute. The determinations shall be furnished in writing to OWNER and CONTRACTOR.

E. Member Replacement:

Should the need arise to appoint a replacement Board member, the replacement member shall be appointed in the same manner as the original member was appointed. The selection of a replacement Board member shall begin promptly upon notification of the necessity for a replacement and shall be completed within four weeks. This Agreement shall be amended to indicate change in Board membership.

F. Consultation:

OWNER and CONTRACTOR shall refrain from soliciting, and the Board shall refrain from giving, consulting advice on conduct of the work or resolution of problems other than disputes referred to the Board as herein provided.

III. BOARD RESPONSIBILITIES

The Board is organized for the purpose of making determinations of disputes, claims, and controversies which may arise or exist between OWNER and CONTRACTOR and to develop settlement recommendations, for consideration by OWNER and CONTRACTOR, relating to the disputes, claims, or controversies at issue in an effort to prevent construction delay and litigation. Primarily, the Board shall consider such matters as interpretation of the Contract Documents, delays, acceleration of the work, scheduling, extra work, differing site conditions, and design changes.

The Board shall encourage the settlement of differences at the job level.

The Board and its individual members shall refrain from giving any advice to either party on conduct of the work or resolution of problems other than disputes referred to the Board as provided herein.

IV. CONTRACTOR RESPONSIBILITY

CONTRACTOR shall furnish each Board member one copy of all documents it might have, other than those furnished by OWNER, which are pertinent to the performance of the Board.

V. OWNER RESPONSIBILITIES

OWNER shall furnish the following:

A. Contract Related Documents:

OWNER shall furnish each Board member one copy of all Contract Documents, including but not limited to the specifications, drawings, all addenda to the specifications and drawings, Geotechnical Data and Interpretative Reports, progress schedule and updates, progress reports, and other documents pertinent to the performance of the Contract, and necessary to the Board's work.

B. Coordination:

OWNER shall, in cooperation with CONTRACTOR, coordinate the operations of the Board.

C. Services:

OWNER shall provide conference facilities at or near the site, and shall provide secretarial and copying services.

VI. TIME FOR BEGINNING AND COMPLETION

The Board shall operate throughout the duration of the construction contract. It shall begin operation upon written authorization of OWNER following execution of this Agreement, and shall terminate upon completion of the construction contract, after final payment has been made.

With the exception of choosing a third member by the first two members, the Board members shall not begin any work under the terms of this Agreement until authorized in writing by OWNER.

VII. PAYMENT

The Board members shall be paid by CONTRACTOR. Payments shall be full compensation for work performed and services rendered, and for all materials, supplies, travel, subsistence, and incidentals necessary to serve on the Board.

A. Payment for Services and Expenses:

Payment for services of OWNER-appointed and CONTRACTOR-appointed members of the Board shall be at the rates agreed to between OWNER and CONTRACTOR and their respective appointed Board members. Changes in the billing rates are subject to agreement between OWNER and CONTRACTOR and their respective appointed members.

Payment for services rendered by the third member of the Board shall be paid at the rate agreed to between OWNER, CONTRACTOR, and the third member. Changes in the billing rate are subject to agreement between OWNER, CONTRACTOR, and the third member.

The first two members shall be reimbursed for the time and expenses of choosing the third member.

Direct, non-salary expenses shall be reimbursed at the actual cost to the Board member. These expenses may include, but are not limited to, automobile mileage (at the IRS rate in effect at the time the trip is taken), parking, travel expenses from the Board member's point of origin to the initial point of arrival, automobile rental, food and lodging, printing, long distance telephone, postage, and courier delivery. Billing for these expenses shall include an itemized listing supported by copies of the original bills, invoices, expense accounts, and miscellaneous supporting data.

B. Payments:

Each Board member shall submit invoices to CONTRACTOR for payment for work completed for each month during the progress of the work, along with documentation for services rendered and expenses. Such invoices shall be in a format approved by OWNER and CONTRACTOR, and accompanied by a general description of activities performed during that period. The value of work accomplished for payment shall be established from the billing rate and hours expended by the Board member together with direct, non-salary expenses.

Satisfactorily submitted invoices shall be paid within 30 days.

After indicating approval thereon, CONTRACTOR shall submit invoices of the Board members to OWNER. After approval by OWNER, CONTRACTOR shall pay the invoices in accordance with the provisions of Section VII above; Section 01201, Measurement and Payment; and the allowance set forth in Document 00410, Bid Form, as such allowance may be modified by Change Order.

C. Inspection of Cost Records:

Board members shall keep available, for inspection by representatives of OWNER and CONTRACTOR for a period of three years after final payment, the cost records and accounts pertaining to this Agreement.

VIII. ASSIGNMENT

Board members shall not assign any of the work of this Agreement.

IX. TERMINATION OF BOARD MEMBERS

Board members may withdraw from the Board by providing four weeks written notice to the other Board members, OWNER, and CONTRACTOR. Board members may be terminated for cause: (1) by their original appointers; OWNER may only terminate the OWNER-appointed member, CONTRACTOR may only terminate the CONTRACTOR-appointed member; or (2) the Board may terminate its own member if a majority of the Board agree to terminate the third member. In the event that the OWNER-appointed member withdraws or is terminated, the OWNER shall nominate a replacement member using the procedures set forth in Section II above. If the CONTRACTOR-appointed member withdraws or is terminated, the CONTRACTOR will nominate a replacement member using the procedures set forth in Section II above. If the Board terminates one of its members, the two remaining Board members will mutually nominate a replacement member using the procedures set forth in Section II above.

X. LEGAL RELATIONS

The parties mutually understand and agree that the Board member, in the performance of his duties on the Board, is acting in the capacity of an independent agent and not as an employee of either OWNER or CONTRACTOR.

No party to this Agreement shall bear a greater responsibility for damages or personal injury than is normally provided by Federal and/or State of _____ law.

Board members are absolved of any personal or professional liability arising from the activities and recommendations of the Board.

XI. DISPUTES REGARDING THIS THREE PARTY AGREEMENT

Any dispute among the parties hereto, arising out of the Work or other items of this Agreement, which cannot be resolved by negotiation and mutual concurrence between parties, shall be referred to the Circuit Court of the County of _____ and the State of _____, as provided in Section XII following.

XII. VENUE, APPLICABLE LAW, AND PERSONAL JURISDICTION

In the event that any party deems it necessary to institute legal action or proceedings to enforce any right or obligation under this Agreement, the parties hereunto agree that any such action shall be initiated in a Circuit Court of the county in which the project is located. The parties hereby agree that all questions shall be resolved by application of state law and that the parties to such action shall have the right to appeal from decisions in accordance with the laws of the State. Board members shall not be called to testify as fact or expert witnesses in any subsequent litigation or serve as a consultant in any such litigation concerning any work or the parties hereunder. However, Board members may be called as necessary to admit Board's determinations into evidence.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date and year first above written.

(BOARD MEMBER)

(Signature)

(BOARD MEMBER)

(Signature)

(BOARD MEMBER)

(Signature)

(CONTRACTOR)

(Signature)

(OWNER)

(Signature)

END OF DOCUMENT

DOCUMENT 00823

ESCROW BID DOCUMENTS

1. SCOPE

The three lowest Bidders shall submit, within the specified time after receipt of Bids, one copy of all documentary information generated in preparation of Bid prices for this Project. This material is hereinafter referred to as "Escrow Bid Documents." The Escrow Bid Documents of the Successful Bidder will be held in escrow for the duration of the contract.

The Successful Bidder agrees, as a condition of award of the contract, that the Escrow Bid Documents constitute the complete, only, and all documentary information used in preparation of his Bid. No other Bid preparation information shall be considered in resolving disputes.

Nothing in the Escrow Bid Documents shall change or modify the terms or conditions of the Contract Documents.

2. OWNERSHIP

The Escrow Bid Documents are, and shall always remain, the property of CONTRACTOR, subject only to joint review by OWNER and CONTRACTOR, as provided herein.

OWNER stipulates and expressly acknowledges that the Escrow Bid Documents, as defined herein, constitute trade secrets. This acknowledgment is based on OWNER's express understanding that the information contained in the Escrow Bid Documents is not known outside the Bidder's business, is known only to a limited extent and only by a limited number of employees of the Bidder, is safeguarded while in Bidder's possession, is extremely valuable to Bidder, and could be extremely valuable to Bidder's competitors by virtue of it reflecting Bidder's contemplated techniques of construction. OWNER acknowledges that the Bidder expended substantial sums of money in developing the information included in the Escrow Bid Documents and further acknowledges that it would be difficult for a competitor to replicate the information contained therein. OWNER further acknowledges that the Escrow Bid Documents and the information contained therein are made available to OWNER only because such action is an express prerequisite to award of the contract. OWNER further acknowledges that the Escrow Bid Documents include a compilation of information used in the Bidder's business, intended to give the Bidder an opportunity to obtain an advantage over competitors who do not know of or use the contents of the documentation. OWNER agrees to safeguard the Escrow Bid Documents, and all information contained therein, against disclosure to the fullest extent permitted by law.

3. PROGRAM

Escrow Bid Documents will be used to assist in the negotiation of price adjustments and Change Orders and in the settlement of disputes, claims, and other controversies. They will not be used for pre-award evaluation of CONTRACTOR's anticipated methods of construction or to assess CONTRACTOR's qualifications for performing the Work.

4. FORMAT AND CONTENTS

Bidders may submit Escrow Bid Documents in their usual cost estimating format. It is not the intention of this section to cause the Bidder extra work during the preparation of the Bid, but to ensure that the Escrow Bid Documents will be adequate to enable complete understanding and proper interpretation for their intended use. The Escrow Bid Documents shall be in the language of the Specifications.

It is required that the Escrow Bid Documents clearly itemize the estimated costs of performing the work of each Bid item contained in the Bid schedule. Bid items should be separated into subitems as required to present a complete and detailed cost estimate and allow a detailed cost review. The Escrow Bid Documents shall include all quantity takeoffs; crew; equipment; calculations of rates of production and progress; copies of quotations from equipment manufacturers, Subcontractors, and Suppliers; and memoranda, narratives, consultants' reports, add/deduct sheets, and all other information used by the Bidder to arrive at the prices contained in the Bid Form. Estimated costs should be broken down into the Bidder's usual estimate categories, such as direct labor, repair labor, equipment operation, equipment ownership, expendable materials, permanent materials, and subcontract costs as appropriate. Plant and equipment and indirect costs should be detailed in the Bidder's usual format. CONTRACTOR's allocation of plant and equipment, indirect costs, contingencies, markup, and other items to each Bid item shall be included.

All costs shall be identified. For Bid items amounting to less than $10,000, estimated unit costs are acceptable without a detailed cost estimate, provided that labor, equipment, materials, and subcontracts, as applicable, are included, and provided that indirect costs, contingencies, and markup, as applicable, are allocated.

Bidding Documents provided by the OWNER should not be included in the Escrow Bid Documents unless needed to comply with the requirements of this section.

5. SUBMITTAL

The Escrow Bid Documents shall be submitted in a sealed container within 72 hours after the time of receipt of Bids. The container shall be clearly marked on the outside with the Bidder's name, date of submittal, project name, and the words "Escrow Bid Documents."

The Escrow Bid Documents shall be accompanied with the Bid Documentation Certification, signed by an individual authorized by the Bidder to execute the Bid Form, stating that the material in the Escrow Documentation constitutes the complete, only, and all documentary information used in preparation of the Bid and that he has personally examined the contents of the Escrow Bid Documents container and has found that the documents in the container are complete.

Prior to award, Escrow Bid Documents of the apparent Successful Bidder will be unsealed, examined, organized, and inventoried by representatives of OWNER, together with members of CONTRACTOR's staff who are knowledgeable in how the Bid was prepared.

This examination is to ensure that the Escrow Bid Documents are authentic, legible, and complete. It will not include review of, and will not constitute approval of, proposed construction methods, estimating assumptions, or interpretations of Contract Documents. This examination is subject to the condition that, as trade secrets, the Escrow Bid Documents are proprietary and

confidential as described in Paragraph 2. Examination will not alter any condition(s) or term(s) of the contract.

If all the documentation required in Paragraph 4, "Format and Contents," has not been included in the original submittal, additional documentation shall be submitted, at OWNER's discretion, prior to award of the contract. The detailed breakdown of estimated costs shall be reconciled and revised, if appropriate, by agreement between CONTRACTOR and OWNER before making the award.

If the contract is not awarded to the apparent Successful Bidder, the Escrow Bid Documents of the Bidder next to be considered for award shall be processed as described above.

Timely submission of complete Escrow Bid Documents is an essential element of the Bidder's responsibility and a prerequisite to contract award. Failure to provide the necessary Escrow Bid Documents will be sufficient cause for OWNER to reject the Bid.

If the Bidder's proposal is based on subcontracting any part of the Work, each Subcontractor whose total subcontract price exceeds 5 percent of the total Contract Price proposed by the Bidder shall provide separate Escrow Bid Documents to be included with those of the Bidder. These documents will be opened and examined in the same manner and at the same time as the examination described above for the apparent Successful Bidder.

If CONTRACTOR subcontracts any portion of the Work after award, OWNER retains the right to require CONTRACTOR to submit Escrow Bid Documents from the Subcontractor before the subcontract is approved.

Escrow Bid Documents submitted by unsuccessful Bidders will be returned unopened, unless opened as provided above, as soon as they are no longer needed by OWNER and no later than immediately following award of the contract.

6. STORAGE

The Escrow Bid Documents of the Successful Bidder will be placed in escrow prior to award of the contract, for the life of the contract, in a mutually agreeable institution. The cost of storage will be paid by OWNER.

7. EXAMINATION AFTER AWARD OF CONTRACT

The Escrow Bid Documents shall be examined by both OWNER and CONTRACTOR, at any time deemed necessary after award of the contract by either OWNER or CONTRACTOR, to assist in the negotiation of price adjustments and Change Orders, or the settlement of disputes.

Examination of the Escrow Bid Documents after award of the contract is subject to the following conditions:

a. As trade secrets, the Escrow Bid Documents are proprietary and confidential as described in Paragraph 2.

b. OWNER and CONTRACTOR shall each designate, in writing to the other party and a minimum of 10 days prior to examination, representatives who are authorized to examine the Escrow Bid Documents. With the consent of both OWNER and CONTRACTOR, members of the Disputes Review Board may examine the Escrow Bid Documents if required to assist in the settlement of a dispute. No other person shall have access to the Escrow Bid Documents.

c. Access to the Escrow Bid Documents will take place only in the presence of duly designated representatives of both OWNER and CONTRACTOR.

8. FINAL DISPOSITION

The Escrow Bid Documents will be returned to CONTRACTOR at such time as the contract has been completed and final settlement has been achieved.

END OF DOCUMENT

DOCUMENT 00899

NOTICE OF SUBSTANTIAL COMPLETION

OWNER's Project Number: WQCF-6859.

Project: City of Turlock, Harding Drain Bypass Pump Station and Pipeline Project:

CONTRACTOR: _____

Contract For Construction of: _____

_____

_____

Project or Specified Part Shall Include: _____

_____

Contract Date: _____, 2011

The Work performed under this Contract has been inspected by authorized representatives of the OWNER, CONTRACTOR, and ENGINEER, and the Project (or specified part of the Project, as indicated above) is hereby accepted by the OWNER and declared to be substantially completed on the above date.

1) Final completion of the Work shall be the date of such acceptance of the Work by the OWNER.

2) Final completion shall mean full performance of the Contract requirements.

A list of all items remaining to be completed or corrected has been sent to the CONTRACTOR in the OWNER's letter dated _____, _____. All such work shall be completed or corrected to the satisfaction of the OWNER prior to the release of the CONTRACTOR's retention and within 30 calendar days following the date of the Notice of Substantial Completion.

ENGINEER

_____
(Signature)

_____
(Date)

The CONTRACTOR hereby accepts the above Notice of Substantial Completion and agrees to complete and correct all of the items as outlined in the OWNER's letter to the CONTRACTOR dated _____, _____.

CONTRACTOR

_____
(Signature)

_____
(Date)

The OWNER accepts the project or specified area of the project as substantially completed and will assume full possession of the Project or specified area of the Project at **[time]**, on **[date]**. The responsibility for heat, utilities, security, and insurance under the Contract Documents will be assumed by the OWNER after that date.

OWNER

_____
(Signature)

_____
(Date)

END OF DOCUMENT

SECTION 01110

SUMMARY OF WORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Identification and summary description of the Project, the Work, location, OWNER furnished products, activities by others, coordination, and early occupancy by OWNER.

1.02 THE WORK

A. The Work consists of construction of the Outfall and River Discharge Facilities for the City of Turlock Water Quality Control Facility.
   1. Junction Structure.
   2. 48-inch Pump Station Influent Gravity Pipeline.
   3. Pump Station. (Cast in place wetwell, four vertical turbine pumps, prefabricated metal building, and site work and appurtenances).
   4. Outfall Pipeline (steel or ductile per specifications with nominal diameter of 36”).
   5. Standpipe Structure.
   6. 48-inch Gravity Pipeline to Outfall Structure.
   7. Outfall Structure.

B. Except as specifically noted otherwise, provide and pay for:
   1. Insurance and bonds.
   2. Labor, materials, and equipment.
   3. Tools, equipment, and machinery required for construction.
   4. Utilities required for construction.
   5. Temporary facilities including sheeting and shoring.
   6. Traffic control and dust control measures.
   7. Other facilities and services necessary for proper execution and completion of the Work.

C. Secure and pay for all permits including OSHA excavation permits, Surface Water Pollution Prevention permits, County of Stanislaus encroachment permits, government fees and licenses.

D. Comply with codes, ordinances, regulations, orders, and other legal requirements of public authorities having bearing on the performance of the Work.

1.03 LOCATION OF PROJECT

A. The Work is located along Harding Road from Prairie Flower Road to the San Joaquin River, in Stanislaus County, California.

1.04 ACTIVITIES BY OTHERS

A. OWNER, utilities (i.e. TID), and others may perform activities within Project area while the Work is in progress.
   1. Schedule the Work with OWNER, utilities, and others to minimize mutual interference.

B. The work area is adjacent to farms. Any damage to crops or farm operation shall be repaired. All costs of repair shall be borne by the CONTRACTOR.

C. Cooperate with others to minimize interference and delays.
   1. When cooperation fails, submit recommendations and perform Work in coordination with work of others as directed.

D. When the Work depends for proper execution or results upon work performed by others, inspect and promptly report apparent discrepancies or defects in work performed by others.
   ~~1. Assume responsibility for work performed by others, except for defects reported as specified in this paragraph and defects, which may become apparent in work performed by others after execution of the Work.~~

E. **Underwater post construction survey required by the California State Lands Commission Section 2 Special Provisions will be performed by others.**

1.05 COORDINATION OF WORK

A. Maintain overall coordination of the Work.

B. Obtain construction schedules from each subcontractor, and require each subcontractor to maintain schedules and coordinate modifications.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

DOCUMENT 01111

LABOR COMPLIANCE

ARTICLE 1 - DEFINITIONS

1.01 **Definitions:**

A. **Division of Labor Standards Enforcement (DLSE) -- The DLSE is a division within the California Department of Industrial Relations (DIR) that enforces minimum labor standards, such as wage and hour laws in order to protect employers who comply with the law from those who attempt to gain competitive advantage at the expense of their workers by failing to comply with minimum labor standards.**

B. **Compliance Monitoring Unit (CMU) – The CMU is a new component within the DLSE that was created to monitor and enforce prevailing wage requirements on public works projects that receive state bond funding. The CMU will ensure that public works construction workers are promptly paid the proper prevailing wage rates. Contracts using state bond funds that are awarded after January 1, 2012 are subject to the new CMU requirements. The CMU replaces third-party and self-administered Labor Compliance Programs.**

C. **Awarding Body -- An awarding body or body awarding the contract means department, board, authority, officer or agent awarding a contract for public work. In most cases the awarding body is a unit of state or local government, such as a city, county, school district, water district, special district, or a state agency.**

D. **Certified Payroll Reports (CPRs) – CPRs are weekly payroll reports prepared by the Contractor and subcontractors with signed statements of compliance that certifies that the information on the payroll report is correct, complete, and that each employee has been paid no less than the prevailing wage rate for the work performed, as determined by the Department of Labor.**

ARTICLE 2 - OTHER LABOR COMPLIANCE PROVISIONS

2.01 **Contractor shall abide by the labor compliance provisions found in this section, the requirements directed toward the Contractor in State Bill X 2-9 and Assembly Bill 436, and other project documents and specification sections dealing with the Davis Bacon Act and labor compliance. Where conflicts exist in other locations within the project documents and specifications with regards to labor compliance notification, reporting, and/or enforcement, this section and the new Compliance Monitoring Unit requirements shall take precedence.**

ARTICLE 3 - NOTIFICATION

3.01 **This project is subject to monitoring and enforcement of labor compliance by the Department of Industrial Relations' Compliance Monitoring Unit (CMU). Contractor must comply with the requirements directed toward the Contractor in State Bill X 2-9 and Assembly Bill 436. More information, including frequently asked questions and webinar**

training recordings for Contractors' benefit, can be viewed on the CMU website at http://www.dir.ca.gov/dlse/cmu/CMU.html.

3.02 **The Awarding Body will notify the Division of Apprenticeship Standards and the CMU that this project must comply with CMU requirements for labor compliance.**

ARTICLE 4 - POSTING

4.01 **Contractor shall post the notice required by 8 Cal. Code Reg. section 16451(d) at the job site. Posters are available for download on the CMU website, at the Division of Labor Standards Enforcement District Offices, or by emailing a request to CMU@dir.ca.gov.**

ARTICLE 5 - REPORTING

5.01 **The Contractor, including subcontractors, shall submit certified payroll reports to the CMU at least monthly using the CMU's eCPR system. Go to https://app.mylcm.com and follow the instructions to enroll in this system. Note that the awarding body will have direct and immediate access to the certified payroll reports (CPRs) for their projects that are submitted through the eCPR system.**

5.02 **The Contractor must provide prompt notification to the CMU if a subcontractor or lower tiered subcontractors is approved by the Awarding Body as a substitute.**

5.03 **The Contractor must provide prompt notification to the CMU if a subcontractor or lower tiered subcontractors is approved by the Awarding Body as a substitute.**

ARTICLE 6 - FEES AND WITHHOLDING CONTRACT PAYMENTS

6.01 **The City shall receive monthly invoices from the Department of Industrial Relations and pay these fees directly to the CMU for their monitoring and enforcement services.**

6.02 **When the City receives a notice from the CMU that a contractor has failed to submit proper CPRs, or if the wages or hours listed in a CPR are suspected violations, the City will withhold a portion of the contract payment as allowed by applicable laws.**

END OF DOCUMENT

SECTION 01116

PROJECT MANUAL LANGUAGE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Explanation of arrangement, language, reference standards, and method of resolving conflicts between Contract Documents.

B. Related Documents and Sections:
   1. Document 00700 - General Conditions.
   2. Document 00800 - Supplementary Conditions.
   3. Section 01600 - Product Requirements.

1.02 REFERENCES

A. Construction Specifications Institute (CSI):
   1. Manual of Practice - Document MP-2-1, MasterFormat™.
   2. Manual of Practice - Document MP-2-2, SectionFormat™.
   3. Manual of Practice - Document MP-2-3, PageFormat™.

1.03 PROJECT MANUAL ARRANGEMENT

A. Document and Section numbers used in Project Manual, and Project Manual arrangement are in accordance with CSI Document MP-2-1, MasterFormat™, except where departures have been deemed necessary.

B. Sections are written in CSI SectionFormat™ in accordance with CSI Document MP-2-2, Three-Part Section Format, except where departures have been deemed necessary.

C. Page format for Sections in the Project Manual is in accordance with CSI Document MP-2-3, Page Format, except where departures have been deemed necessary.

1.04 PROJECT MANUAL LANGUAGE

A. Specification Section Paragraphs entitled "Section Includes" summarizes briefly what is generally included in the section. Requirements of Contract Documents are not limited by "Section Includes" paragraphs. Specifications have been partially streamlined by intentionally omitting words and phrases, such as "the CONTRACTOR shall," "in conformity therewith," "shall be" following "as indicated," "a," "an," "the" and "all". Assume missing portions by inference.

B. Phrase "by ENGINEER" modifies words such as "accepted," "directed," "selected," "inspected," and "permitted," when they are unmodified.

C. Phrase "to ENGINEER" modifies words such as "submit," "report," and "satisfactory," when they are unmodified.

D. Colons (:) are used to introduce a list of particulars, an appositive, an amplification, or an illustrative quotation.
   1. When used as an appositive after designation of product, colons are used in place of words "shall be."

E. Word "provide" means to manufacture, fabricate, deliver, furnish, install, complete, assemble, erect in place, test, render ready for use or operation, including necessary related material, labor, appurtenances, services, and incidentals.

F. Words "CONTRACTOR shall" are implied when direction is stated in imperative mood.

G. Term "products" includes materials and equipment as specified in Section 01600.

1.05 REFERENCE STANDARDS

A. Use edition or amendment of referenced standards in effect on date stipulated in Document 00700. Use only applicable portions of referenced standards, ignoring payment stipulations and other provisions which change the duties of the ENGINEER or OWNER as described in Document 00700.

B. Equate terms relating to designer to "ENGINEER."

C. Notify ENGINEER when referenced standard, code, or specification conflicts with Contract Documents.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01140

WORK RESTRICTIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for sequencing and scheduling the Work affected by existing site and facility, work restrictions and coordination between construction operations and plant operations.

B. Related Sections:
   1. Section 01110 - Summary of Work.
   2. Section 01324 - Progress Schedules and Reports.
   3. Section 01352 - Alteration Project Procedures.
   4. Section 01355 - Stormwater Pollution Prevention Construction Activity, and Best Management Practices.
   5. Section 01500 - Temporary Facilities and Controls.

1.02 GENERAL CONSTRAINTS ON SEQUENCE AND SCHEDULING OF WORK

A. The City of Turlock Water Quality Control Facility (WQCF) is the City of Turlock's only means of treating domestic and industrial wastewater prior to discharging to the San Joaquin River. Impairing the operational capabilities including effluent disposal of this treatment plant will result in serious environmental damage and monetary fines to be paid by the CONTRACTOR.

B. Conduct work in a manner that does not impair the disposal ability of the Turlock WQCF; the WQCF must be "operational" The status of the WCQF shall be defined as "operational" as the following:
   1. The WCQF is capable of treating and disposing of the entire quantity of wastewater received to the water quality limits specified in the discharge permit at all times.
   2. The WCQF maintains the ability to discharge through the existing twin 36 and the 24-inch outfall pipelines to the Turlock Irrigation District (T.I.D) Harding Drain.

C. Work sequence and constraints presented do not include all items affecting completion of the Work, but are intended to describe critical events necessary to minimize disruption of the existing facilities and to ensure compliance with National Pollutant Discharge Elimination System permit requirements.

D. Include costs in bid price for compliance with the specific sequencing limitations and constraints and the related general factors pertaining to maintaining the operational capacity effluent disposal of the treatment facility.

1.03 INTERRUPTION OF TREATMENT PROCESSES

A. Execute the Work while the existing WQCF and existing outfall pipeline is in operation as specified in Section 01352.

B. Indicate required shutdowns of existing facilities or interruptions of existing operations on Progress Schedule.

C. Submit notification of required shutdowns of existing facilities at least 7 days prior to the planned date of shutdown.

D. The ENGINEER and the CITY will evaluate the request based on the plant's ability to reliably meet capacity demands.

E. Do not begin alterations until ENGINEER's written permission has been received.

F. Minimize shutdown times by thorough advanced planning. Have required equipment, materials, and labor on hand at time of shutdown.

G. Where required to minimize treatment process interruptions while complying with specified sequencing constraints, provide temporary pumping, power, lighting, controls, instrumentation, and safety devices.

1.04 COMPLIANCE WITH NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM PERMIT

A. The WQCF and outfall pipeline are operating under the terms of a National Pollutant Discharge Elimination System (NPDES) Water permit issued by the State of California. This permit specifies the water quality limits that the plant must meet prior to discharge of effluent. A copy of the existing permit is on file for review at the City of Turlock Water Quality Control Facility.

B. Perform work in a manner that will not prevent the existing WQCF from achieving the finished water quality requirements established by regulations.

C. The City is required to comply with the NPDES for discharging treated effluent. Impairing the operational capabilities of the Turlock WQCF or the existing outfalls will result in serious environmental damage and monetary fines of at least $3,000 per day of violation of discharge standards. Per state law, fines for discharge violations are automatic and cannot be waived. CONTRACTOR shall bear the cost of penalties imposed on the OWNER for discharge violations caused by actions of the CONTRACTOR.

1.05 REQUIREMENTS FOR OPERATION OF TURLOCK WATER QUALITY CONTROL FACILITY (WQCF or PLANT) AND MAINTAINING CONTINUOUS OPERATION OF EXISTING OUTFALL FACILITIES

A. Conduct the Work and provide temporary facilities required to keep the existing plant and piping for conveyance of effluent to the Harding Drain, T.I.D No. 5 continuously operational.

B. Do not remove or demolish existing facilities required to keep the existing plant operational at the capacities specified until the existing facilities are replaced by temporary, new or upgraded facilities or equipment. The replacement facilities shall have been tested and demonstrated to be operational prior to removing or demolishing existing facilities.

1.06 OPERATIONS AND MAINTENANCE ACCESS

A. Provide safe, continuous access to process control equipment for plant operations personnel.

1.07 SHUTDOWN CONSTRAINTS

A. Shutdown constraints, in general terms, are as follows. Additional shutdown constraints are in Part 1.10 herein.
   1. Existing Outfall Pipelines: Shutdowns of the two 36-inch outfall pipelines from the WQCF to the existing point of discharge at Harding Drain will be required to construct the Junction Structure, Harding Drain crossings, and for other activities. During a shutdown of the outfall pipelines, the City will divert effluent into holding ponds at the WQCF. Shutdowns of the existing two 36-inch outfalls are restricted to Tuesdays, Wednesdays, or Thursdays.
   2. During the dry season, defined herein as May 1 through October 1, shutdowns may occur without any further restrictions except for the above specified three-day window. However, during the wet season (the remaining months), there is an additional restriction that shutdowns of the WQCF cannot occur within 3 days of a forecast of rainfall exceeding 0.1 inches.

1.08 UTILITIES

A. Maintain electrical, telephone, water, gas, sanitary facilities, and other utilities within existing facilities in service. Provide temporary utilities when necessary.

B. Provide advance notice to and utilize services of Underground Services Alert (U.S.A) for location and marking of underground utilities operated by utility agencies other than the OWNER.

1.09 WORK BY OTHERS

A. Where proper execution of the Work depends upon work by others, inspect and promptly report discrepancies and defects.

1.10 WORK CONSTRAINTS

A. Trench shoring of the 36 inch FE pipeline is required along the entire Harding Drain Road Alignment from STATION 10+50 through 305+00. The CONTRACTOR shall is responsible for the installation and design of the trench shoring. The shoring shall meet all requirements of the specifications.

B. CONTRACTOR shall backfill the pipeline trench after completion of work each day. It is not acceptable to leave the trench open (i.e. not backfilled) at the end of the working day.

C. CONTRACTOR shall pressure test the 36-inch FE pipeline in a maximum of 5,000-foot sections, see specification 15956 for additional requirements. Contractor is responsible for providing all equipment and thrust restraint required for testing.

D. CONTRACTOR is responsible for maintaining access though the Harding Road (Either Private or Public) and County Right of Way after working hours.

E. CONTRACTOR shall contact TID prior to working near the powerlines along the pipeline alignment. CONTRACTOR shall perform work in accordance with TID's and California OSHA safety requirements. All costs associated with working near the powelines or support of the powerpoles shall be born by the CONTRACTOR.

F. CONTRACTOR shall contact ATT prior to construction parallel or crossing underground or belowground ATT telephone lines. CONTRACTOR shall meet all the requirements of the utility when working near or within the utilities easement. all costs associated with working near or in utility easements shall be born by the contractor.

G. CONTRACTOR shall contact PG&E for location of high pressure gas line shown on the drawing. The installation of the pipeline was in construction during the design of the pipeline and locations shown on the drawings are based on design drawings and not record drawings. CONTRACTOR to confirm with PG&E the location and elevation of all gas lines crossing or parallel to the pipeline.

H. CONTRACTOR may propose alternate sequence or modifications to this work sequence. OWNER will review the proposed modifications and determine if such proposed modifications of the work sequence interferes with the activities associated with proper operation of the wastewater treatment. Any modifications shall be submitted by the CONTRACTOR in writing and shall be approved by OWNER in writing prior to their implementation.

I. Before proceeding with any excavation or ordering of fabrication shop drawings for piping, CONTRACTOR shall perform field verification of the location of existing utilities.
    1. Information shown on the drawings is based on the best available information at the time these drawings were prepared. However, the drawings should not be construed as portraying an accurate and complete representation of actual delineation of underground facilities. Locations, depth of bury, sizes, and types of existing underground piping shown are approximate.
    2. Prior to commencement of any work, CONTRACTOR shall perform potholing exploration to field verify both vertical and horizontal alignment and locations of existing piping and underground utilities. See Section 01210 "Allowances" for Existing Underground Utilities and Piping Location Allowance. CONTRACTOR shall notify owner in advance of intent and schedule time and location for each potholing exploration.
    3. Once the exact location of existing piping and utilities have been determined by CONTRACTOR, the CONTRACTOR shall determine if any modifications are required to the drawings. CONTRACTOR shall notify OWNER and ENGINEER of potential conflicts between existing piping as field located and new piping shown on the drawings as soon as they are uncovered so they can be remedied in a timely manner. ENGINEER will review each conflict on a case by case basis and propose modifications to the piping to meeting field conditions, as required. If required, ENGINEER will provide revised drawings based on these field conditions within 30 days after receiving field data from the CONTRACTOR. Once the CONTRACTOR receives the revised drawings, CONTRACTOR will then have 15 days to review the revised piping drawings and determine if a change in contract price is required to complete the work based on the revised drawings. No time extension to the Contract time shall be

granted unless ENGINEER cannot provide revised drawings within the time allotted and stated above.

J. Effluent flow diversion from the existing 36 inch outfall pipelines will be required to construct piping connections at the Junction Structure. Request approval from OWNER for each shutdown in writing, a minimum of 7 days in advance of anticipated shutdown. Only two shutdowns will be allowed for the piping tie-ins and each shutdown shall not last more than 16 hours each. A WQCF shutdown will not be allowed if the Holding Ponds are more than 25% full. A minimum of one week shall be assumed between each shutdown event to allow drainage of the Holding Ponds by OWNER. The shutdown of the effluent pipeline can only be performed during the months of May through September and will be delayed if rain is forcasted within 3 days of the proposed shutdown.

K. Effluent flow diversion and WQCF shutdown will be required to perform open cut excavation of T.I.D Harding Drain crossing in the vicinity of Crows Landing Road and Central Avenue. Request approval from OWNER for each shutdown in writing, a minimum of two weeks in advance of anticipated shutdown. A maximum of two shutdowns will be allowed, one per crossing. A shutdown of the WQCF will not be allowed if the Holding Ponds are more than 25% full. A minimum of one week shall be assumed between each shutdown event to allow drainage of the Holding Ponds by OWNER. **Shutdowns shall last no more that 16 hours each.**

L. CONTRACTOR shall install the 36" FE pipeline across the T.I.D Harding Drain in vicinity of Crows Landing Road and Central Avenue as noted below:
   1. The T.I.D Harding Drain conveys water from several sources, including City of Turlock effluent, T.I.D operational canal spills, irrigation tailwater, farmland dewatering and drainage, and storm runoff.
   2. Flow in the Harding Drain shall not be interrupted during construction of the Drain crossings.
   3. Lowest flows in the Harding Drain historically occur in early November, after the irrigation season ends. CONTRACTOR shall install the crossings in early November.
   4. T.I.D can divert some of the Harding Drain flows to other drains. But, operational canal spills cannot be controlled or diverted during the irrigation season, which typically occurs from March 15th through October 30th. CONTRACTOR shall provide T.I.D seven (7) days notice for reducing flows in the Harding Drain.
   5. Stormwater flows cannot be redirected in their entirety, and CONTRACTOR shall schedule open cut of the ditch only where favorable weather is forecasted.
   6. CONTRACTOR shall install a cofferdam upstream and downstream of the crossing locations. CONTRACTOR shall prepare the cofferdam design, bypass flow system (gravity or pumped), and excavation dewatering design for review by the Engineer. Slope protection shall be provided to prevent erosion of the Harding Drain bottom and side slopes, and the cofferdam.
   7. CONTRACTOR shall install trench shoring at each crossing locations as shown on the drawings. The trench shoring shall meet all requirements of specification 02260 section 1.04.B.4.

M. Construction activities shall be limited to the hours of 7:00 AM to 6:00 PM, Monday through Friday unless superseded by the county.

N. Construction activities along the banks of the San Joaquin River, including the outfall structures, gravity pipeline, levee penetration, and gravity pipeline shall be constructed between June 1 and August 31.

O. Microtunneling under the TID Ceres Main Drain between the junction structure and the pump station shall be performed between October 30 and March 15, CONTRACTOR is to obtain written permission from TID prior to construction and shall confirm with TID before starting work. CONTRACTOR cannot perform installation of piping under the canal during irrigation season.

P. Groundwater levels vary throughout the year, groundwater levels can increase during the irrigation season. Contractor to provide adequate dewatering for installation of all of the pipeline, pump station, junction structure, and the standpipe. Contractor is responsible for all permits or treatment required for disposal of dewatering discharge. Refer to specification section 02240 for requirements.

Q. Water levels in the Harding Drain may increase significantly during wet weather. Under these conditions, water may migrate from the Harding Drain to the 36-inch FE pipeline trench during construction. CONTRACTOR shall suspend pipeline installation (i.e. trenching) during periods of high flow in the Harding Drain.

R. **The San Joaquin River water elevation will vary during the year. The Contractor shall design the outfall structure temporary cofferdam and construct the San Joaquin River Levee modifications for actual water surface elevation. The elevation of the San Joaquin River may range from 35 to 50 feet during the summer.**

1.11 WORK WITHIN STANISLAUS COUNTY (COUNTY) RIGHT-OF-WAY

A. Trench shoring is required along the entire Harding Drain Road Alignment from STATION 10+50.56 through 305+00; the shoring system shall meet all requirements of specification 02260.

B. Comply with requirements of County encroachment permit.

C. Work within Cross Landing Road and Carpenter Road shall be performed at During Nighttime hours. All work shall be performed in accordance with Stanislaus County Country Traffic Division Requirements. During crossing of the street the contractor will be required to maintain one working lane at all times during the crossing of the road.

D. In the following description, a segment of Harding Road is describing that portion of the road between two adjacent north-south oriented cross streets. The CONTRACTOR will be allowed to close one segment of Harding Road at a time to thru traffic. CONTRACTOR shall maintain ingress and egress access to all local residences and agricultural activities (local as in those within that specific segment) from one of the two cross roads. CONTRACTOR shall notify local residences of the construction schedule of these detours and the method provided for access. Prior to proceeding onto an adjacent segment of Harding Road, the previous segments shall be reconstructed, including the asphalt surfacing.

E. Specific routes and schedules for road closures and detours must be approved by the Stanislaus County Traffic Division prior to construction.

F. Warning signs and flagmen are to be placed in advance of construction and maintained in place during the hours of operation per the State of California Traffic Manual and Standard Specifications.

G. Traffic control shall be provided in conformance with Section 1-1.08, “Public Convenience”, of the State Standard Specifications.

H. CONTRACTOR shall conform to the requirements of Section 81, “Monuments”, of the State Standard Specifications. When an existing monument is disturbed or damaged by the CONTRACTOR, the exact location of the existing monument point shall be referenced and established of not less that four (4) reference points, any two of which shall be adequate to locate the monument point. Reference points shall be set in locations that will not be disturbed by the CONTRACTOR’s work and shall be protected from damage.

I. Sections of asphalt outside the lines and limits of removal shown in the Plans, which are broken or damaged by the CONTRACTOR’s operations, shall be replaced to the satisfaction of Stanislaus County by the CONTRACTOR at no additional cost to the Project.

J. CONTRACTOR shall submit two copies of videotape of the 36 inch FE pipeline alignment. Video shall be continuous footage of the entire alignment. Video content shall be thorough and clear enough to depict the location and condition of facilities that will be impacted by construction of this Project. CONTRACTOR shall inspect, record and submit the condition of existing irrigation pipelines crossing the alignment. Following construction, the condition of these facilities the CONTRACTOR shall again inspect, record, and submit the respective condition of these facilities. CONTRACTOR shall repair as required such that the post-construction condition is equal to existing condition, unless other more stringent repair methods are shown in the Drawings.

K. CONTRACTOR to coordinate the installation of the 36-inch outfall pipeline at the southwest corner of Harding and Prairie Flower Roads with the T.I.D to avoid disruption of water deliveries through the numerous irrigation conduits at this location. Installation of the 36-inch outfall pipeline is secondary to irrigation deliveries.

L. CONTRACTOR shall submit two copies of “marked up” as-built drawings for review.

1.12 ENVIRONMENTAL MITIGATION REQUIREMENTS

A. The CONTRACTOR shall comply with all mitigation measures described in the Environmental Impact Report (EIR) for this Project including, but not limited to, the following items:
   1. The OWNER is required to hire a qualified wildlife biologist or botanist to perform a number of surveys described below. If the surveys identify a species described in the Environmental Impact Report (EIR), the CONTRACTOR must comply with the applicable mitigation measures in the EIR. Table 2.1 and 6.1 from the EIR is included at the end of this section. A complete EIR is available for review at the office of the OWNER.
      a. General Pre-Construction Surveys:
         1) Swainson’s Hawk: if construction occurs during April 1 to August 31.
         2) Raptor: if construction occurs during March 15 to September 15.

3) Burrowing Owls.
4) Special Status Plants west of Carpenter Road (survey must occur between May to July).

b. Surveys Within 24 Hours of Construction:
1) Giant Garter Snake (GGS).
2) San Joaquin Whipsnakes.
3) Northwestern and Southwestern Pond Turtles.

2. Prior to construction, the CONTRACTOR shall make sure that all construction workers take part in a Service-approved worker environmental awareness program given by a Service-approved biologist.
3. Prior to construction, the CONTRACTOR shall provide a copy of the Traffic Control Plan to the Sheriff's Department, County Fire Department, and any private ambulance service providers for information and coordination purposes.
4. Prior to construction of individual pipeline segments, the CONTRACTOR shall provide 72-hour notice to the local utility service providers.
5. The CONTRACTOR shall provide a minimum 2-week advance notice of the construction activities schedule to the affected community members adjacent to construction areas (e.g., residences, property owners, business owners, and public facilities), including the posting of signs.
6. Construction activities shall be limited to the hours between 7:00 a.m. to 6:00 p.m., Monday through Friday, or other hours and days as established by the County for encroachment permits.
7. Construction activities along the banks of and within the San Joaquin River (within levee and west of the eastern levee) will be limited to the period between June 1 and August 31.
8. The CONTRACTOR shall provide a temporary fence along the construction easement for the proposed T.I.D Lateral No. 5 crossings in order to reduce the possibility of incidentally impacting the giant garter snake, whipsnake, or pond turtle habitat outside the construction area.
9. The CONTRACTOR shall provide temporary construction fencing around the project site to reduce the potential of incidental fill of the area on the inboard side of the eastern levee of the San Joaquin River.
10. The CONTRACTOR shall implement San Joaquin Valley Air Pollution Control District required fugitive dust control measures.
11. The CONTRACTOR shall locate staging areas where there is no interference with residents or businesses.
12. Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturers' specifications) and by shrouding or shielding impact tools. All equipment shall have sound-control devices no less effective than those provided by the manufacturer.
13. The CONTRACTOR shall place all stationary noise generating construction equipment as far away as feasibly possible from sensitive receptors or in an orientation minimizing noise impacts.
14. If any historic or prehistoric find is discovered during construction, the CONTRACTOR shall cease construction until a qualified archaeologist determines whether the find is significant and determines the appropriate course of action.
15. In the event human remains are discovered, the CONTRACTOR shall cease excavation or disturbance of the site and follow CEQA Guidelines 15064.5 (e)(1).

16. If contaminated soil and/or groundwater or suspected contamination is encountered during project construction, work shall be halted in the area, and the type and extent of the contamination shall be identified and reported to the appropriate regulatory agency for consultation.
17. The CONTRACTOR shall, identify all mailboxes, walls, fences, driveways, potable water wells and landscaping located in the alignment and prepare a relocation and replacement plan for each to address impacts resulting from displacement of existing improvements in the pipeline alignment.
18. The CONTRACTOR shall restore wetland/stream crossings to pre-construction contours and re-vegetate using a mix of native vegetation per the specifications.
19. The CONTRACTOR shall restore affected lands to pre-project conditions.
20. The CONTRACTOR shall establish grass or other vegetative cover by no later than September 15.

B. Prior to construction, CONTRACTOR shall submit a detailed traffic control plan that complies with the requirements of the EIR listed in Table 2.1 at the end of this section and City and County standard specifications.

1.13 PERMITTING REQUIREMENTS

A. The OWNER has procured certain permits, licenses, and easement agreements as required for the prosecution of the Work. Copies of these permits, licenses, and easements agreements are included in Volume 4 of the Contract Documents. CONTRACTOR shall comply with all the requirements of these permits, licenses, and easement agreements. Some of these permits require CONTRACTOR to sign documents and pay for application fees as noted.

B. CONTRACTOR to obtain and pay for the fugitive dust control permit from the Air Pollution Control District.

C. A minimum of 48 hours before start of work within the County Right-of-way, CONTRACTOR to obtain and pay for encroachment permit(s) from the County of Stanislaus. Draft permit requirements are included at the end of this section.

D. CONTRACTOR to pay a $10,000 inspector deposit to Stanislaus County to obtain the encroachment permit.

E. CONTRACTOR shall comply with requirements of the permits and agreements obtained by OWNER. These permits have been included in Volume 4 of the Contract Documents.

F. Storm Water Pollution Preventive Plan, see 01355 for requirements.

1.14 TEMPORARY SERVICES, MATERIALS, AND EQUIPMENT

A. Locate temporary facilities in a manner that minimizes interference to OWNER's operation and maintenance personnel.

B. Unless otherwise specified, install temporary pipelines of the same size as its connection to the existing facility at the downstream end of the pipeline.

C. Provide piping of suitable material for the material being conveyed.

D. Dimensions for all existing structures, piping, paving, and other nonstructural items are approximate. The CONTRACTOR shall field verify all dimensions and conditions and report any discrepancies to the ENGINEER a minimum of 14 days in advance of any construction in the area.

E. Discrepancies between coordinates, bearings and lengths, and stationing shall be resolved in the following order of precedence:
   1. Coordinates.
   2. Bearings and lengths.
   3. Stationing.

END OF SECTION

Table 2.1

SUMMARY OF IMPACTS AND MITIGATION MEASURES

TABLE 2-1
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.1 WATER RESOURCES				
3.1.1	Water Quality – Construction of the Proposed Project could result in increased erosion and sedimentation, with subsequent impacts to water quality and/or storm drain capacity during construction. Additionally, release of fuels or other hazardous materials associated with construction equipment could impact local surface and groundwater quality. (Potentially Significant)	3.1.1a	To minimize the exposure of sediments to runoff, the City would implement measures contained in the Construction Contractor's Guide and Specification of the Caltrans Storm Water Quality Handbook (The Handbook; April 1997) and the SWRCB Water Quality Order 99-08-DWQ, NPDES, General Permit for Stormwater Discharge Associated with Construction Activity.	LS
		3.1.1b	All construction plans and activities shall implement multiple BMPs to provide effective erosion and sediment control. These BMPs shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. BMPs to be implemented as part of this mitigation measure shall include, but are not limited to, the following measures: • Temporary erosion control measures (such as silt fences, staked straw bales/ wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) will be employed for disturbed areas. • Dirt and debris shall be swept from paved streets in the construction zone on a regular basis, particularly before predicted rainfall events.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• Grass or other vegetative cover will be established on the construction site as soon as possible after disturbance. At minimum, vegetative application shall be done by September 15th to allow for plant establishment. No disturbed surfaces will be left without erosion control measures in place during the period of October 15th to April 15th. • Silt fences and catch basins will be placed below all construction activities at the edge of the river to intercept sediment before it reaches the river. These structures will be installed prior to any clearing or grading activities. • Spoil sites will be located such that they do not drain directly into the San Joaquin River or TID Laterals, if possible. If a spoil site drains into the river or local drains, catch basins will be constructed to intercept sediment before it reaches the river. Spoil sites will be graded to reduce the potential for erosion. While data is scarce regarding the effectiveness of BMPs as erosion and sediment controls, the expected pollutant removal efficiencies given in Table 3.1-2 suggest that multiple BMPs used in combination, properly installed and maintained, can achieve significant sediment removal. Therefore the final selection and design of erosion and sediment controls should include the use of multiple BMPs to protect water quality.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	BMPs proposed by the City's contractor shall be subject to approval by the City, and the City shall require that all parties performing construction under the Proposed Project incorporate into contract specifications the requirement that the contractor(s) comply with and implement these provisions. The contractor shall also include provisions for monitoring during and after construction activities to verify that these standards are met.	
	3.1.1c Implement Mitigation Measure 3.10.2.	
3.1.2 Hydrology – Removal of treated-wastewater from the Harding Drain will not reduce existing flows in the San Joaquin River, but would lead to reduced flows in the Harding Drain. (Less-than-Significant)	No mitigation is required.	
3.1.3 Water Quality – The elimination of the WQCF discharges to the Harding Drain would not result in adverse effects to water quality and beneficial uses (Less-than-Significant)	No mitigation is required.	
3.1.4 Water Quality – Project-related facilities are expected to result in a minimal increase in drainage flows as a result of runoff from increased amounts of impervious surfaces. The additional impervious surfaces would not represent significant sources of non-point source pollution, nor are they expected to contribute substantial additional sources of polluted runoff. (Less-than-Significant)	No mitigation is required.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.1.5	Water Quality – The discharge of tertiary treated wastewater to the San Joaquin River under the Proposed Project would not result in adverse changes to the volume and quality of discharge to the San Joaquin River. (Less-than-Significant)	No mitigation is required.	
3.1.6	Water Quality – The pipeline and flows associated with the Proposed Project would introduce the potential for leaks and sewer overflows, with impacts to surface and/or groundwater. (Less-than-Significant)	No mitigation is required.	
3.1.7	Groundwater Quantity – Implementation of the Proposed Project would not deplete local groundwater supplies or interfere substantially with groundwater recharge. (Less-than-Significant)	No mitigation is required.	
3.1.8	Drainage – The Proposed Project would not result in any significant adverse effects to the existing drainage pattern of the project area. (Less-than-Significant)	No mitigation is required.	
3.1.9	Flooding – The Proposed Project would involve the placement of an outfall structure within a 100-year flood hazard area for the San Joaquin River. However, this structure would not increase risks associated with flooding in the project area, including flooding as a result of the failure of a levee or dam. (Less-than-Significant)	No mitigation is required.	
3.1.10	Seiche, Tsunami, or Mudflow – The proposed Project would not result in the increased exposure of people or structures risks associated with inundation by seiche, tsunami, or mudflow. (Less-than-Significant)	No mitigation is required.	

Less-than-Significant = LS | Beneficial = B | Significant = S | Cumulative Significant = CS | Significant and Unavoidable = SU | Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT		MITIGATION MEASURES		LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.2 BIOLOGICAL RESOURCES				
3.2.1	The Proposed Project may have significant adverse impacts, either directly or through habitat modifications, to terrestrial and aquatic endangered, rare, or threatened species, as listed in Title 14 of the California Code of Regulations (Sections 670.2 or 670.5) or in Title 50, Code of Federal Regulations (Sections 17.11 or 17.12). (Potentially Significant)	3.2.1a	As noted above, the project area appears to provide only marginal habitat for GGS. Nonetheless, a survey for GGS will be conducted by a qualified biologist within 24 hours prior to the start of construction, and if GGS are present and there is a reasonable likelihood that construction will adversely impact GGS, the City and its construction contractor will adhere to the appropriate terms and conditions of the Programmatic Biological Opinion issued to the ACOE by the USFWS for giant garter snake (dated Nov. 13, 1997).	LS
		3.2.1b	Prior to construction, all construction workers shall take part in a Service-approved worker environmental awareness program given by a Service-approved biologist.	
		3.2.1c	The construction easement for the proposed crossings shall be fenced using temporary fencing to reduce the possibility of incidentally impacting giant garter snake habitat outside of the construction area.	
		3.2.1d	If construction activities occur between April 1st and August 31st, a survey for active Swainson's hawk nests shall be conducted along the proposed alignment according to the CDFG's Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California by a qualified wildlife biologist. The survey shall be limited to trees within 500 feet of the proposed alignment.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
		3.2.1e	If active nests are detected and potential impacts are identified, measures that will avoid or mitigate impacts will be implemented. Avoidance measures may include, but are not limited to, establishing buffer zones around nests and retaining a qualified wildlife biologist to monitor active nests during construction.	
3.2.2	Construction of the outfall along the eastern bank of the San Joaquin River could result in potentially significant adverse impacts to native fisheries. (Potentially Significant).	3.2.2a	Construction activities along the banks of and within the San Joaquin River will, to the extent feasible, shall be limited to the period between June 1st and August 31st, the period during which impacts to native fisheries are not likely to occur.	LS
		3.2.2b	Implement Mitigation Measure 3.1.1.	
3.2.3	Based on the habitats present in the Project area, several special-status species may be impacted by the Proposed Project. (Potentially Significant).	3.2.3a	Prior to construction, the proposed alignment (San Joaquin River levee, Harding Drain banks, and grassland habitat areas) shall be surveyed by a qualified biologist for burrowing owls using established CDFG protocols (Appendix F).	LS
		3.2.3b	If burrowing owls are detected within the construction zone, mitigation that will avoid active nest sites or compensate for the loss of nest sites shall be developed in coordination with CDFG.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT		MITIGATION MEASURES		LEVEL OF SIGNIFICANCE AFTER MITIGATION
		3.2.3c	A qualified biologist shall survey the proposed pipeline trenching and aeration facility construction site within the annual/alkali grassland habitat for the presence of San Joaquin whipsnakes. The survey shall take place no more than 24 hours prior to construction. If a snake is detected by the survey, no construction shall take place until the snake has left the construction area and CDFG shall be notified for proper guidance. The performance standard for this action is that no snake shall be harassed or taken.	
		3.2.3d	Implement all mitigation measures listed for giant garter snakes. Biological monitors present during canal/ditch crossing construction shall also monitor for northwestern and southwestern pond turtles on the site, and pre-construction surveys shall also target northwestern and southwestern pond turtles.	
3.2.4	Based on the habitats present in the project area, several special-status plant species may be impacted by the Proposed Project. (Potentially Significant).	3.2.4a	Prior to construction of the Proposed Project, the proposed alignment and aeration facility location west of Carpenter Road, shall be surveyed by a qualified botanist for special-status plants at the appropriate flowering period (May–July) using established CNPS protocols.	LS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
		3.2.4b	If special-status plants are detected within the construction zone or the immediate vicinity, mitigation that will avoid impacts within 50' of these plants or compensate for unavoidable impacts to habitat shall be developed in coordination with CDFG. Mitigation may include protection of existing rare plant occurrences and habitats by rerouting the alignment or protecting other alkaline wetland habitats in the area where they may occur at a 2:1 ratio using existing Mitigation Banks.	
3.2.5	The Proposed Project may result in the temporary fill of "other" waters of the U.S. Potential wetland areas located along the proposed alignment and aeration facility include areas on the inboard-side of the eastern levee of the San Joaquin River. (Potentially Significant).	3.2.5a	Fill of wetland areas will be minimized wherever possible. Temporary construction fencing will be erected around the Project site to reduce the potential of incidental fill.	LS
		3.2.5b	Following pipeline construction, wetland/stream crossings shall be restored to pre-construction contours. Areas exposed due to construction shall be re-vegetated using a mix of native vegetation.	
3.2.6	Removal of nesting raptors or their nests, or causing the abandonment of nests for these species due to construction activities would be considered a potentially significant impact. (Potentially Significant).	3.2.6a	If construction activities occur between March 15th and September 15th (the raptor breeding season), a survey for active nests of raptors shall be conducted by a qualified wildlife biologist at the project site and within a 500 foot buffer surrounding the site. These surveys should be integrated with pre-construction surveys conducted for Swainson's Hawk.	
		3.2.6b	Implement Mitigation Measure 3.2.1e.	

Less-than-Significant = LS | Beneficial = B | Significant = S | Cumulative Significant = CS | Significant and Unavoidable = SU | Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT		MITIGATION MEASURES		LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.3 LAND USE AND AGRICULTURE				
3.3.1	The Proposed Project would generally be consistent with applicable land use goals, policies, and objectives of the City's General Plan. Additionally, the Proposed Project would generally conform to land use polices and zoning designations established for the project area by Stanislaus County. (Less-than-Significant).		No mitigation is required.	
3.3.2	Implementation of the Proposed Project would result in short-term construction impacts in the form of dust, noise, and traffic and access disruption to local residents located in close proximity to the proposed alignment. (Potentially Significant).	3.3.2a	The City of Turlock shall require its construction contractor to provide a minimum 2-week advance notice of the construction activities schedule to the affected community members adjacent to construction areas (e.g., residences, property owners, business owners, and public facility operators), including the posting of signs.	LS
		3.3.2b	The City of Turlock, in cooperation with its contractor(s), shall provide a phone number and community contact for inquiries about the project's schedule throughout the construction period. This information will be posted in a local newspaper and at City Hall and will be updated on a weekly basis.	
		3.3.2c	The City and its contractor(s) shall coordinate with local jurisdictions and obtain all necessary permits (e.g., encroachment permit, utility excavation permit), comply with permit conditions established to minimize construction impacts, and coordinate inspections with Stanislaus County to oversee construction activities.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
		3.3.2d	Implement San Joaquin Valley Air Pollution Control District required fugitive dust control measures, Mitigation Measure 3.7.1a through d, and Mitigation Measure 3.8.1a through e.	
3.3.3	Implementation of the Proposed Project could result in the displacement of existing improvements during construction-related activities. (Potentially Significant).	3.3.3	The City's contractor shall, as part of the right-of-way surveys and final design work, identify all mailboxes, walls, fences, driveways, potable water wells and landscaping located in the alignment and prepare a relocation and replacement plan for each to address impacts resulting from displacement of existing improvements in the pipeline alignment.	LS
3.3.4	Construction of the Proposed Project could impact farmland and/or adjacent agricultural operations. Additionally routine maintenance over the long-term could further impact these operations. (Potentially Significant).	3.3.4	Restore affected lands to pre-project conditions.	LS
3.3.5	The Proposed Project would result in minimal conversion of Important Farmlands, as identified by the Department of Conservation, to non-agricultural use. (Potentially Significant).	3.3.5	Implement Mitigation Measure 3.3.4.	LS
3.3.6	Implementation of the Proposed Project would conflict with an existing Williamson Act contract. (Less-than-Significant).	3.3.6	No mitigation is required.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT		MITIGATION MEASURES		LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.4 PUBLIC SERVICES AND UTILITIES				
3.4.1	Construction of the Proposed Project could result in substantial adverse impacts to the provision of governmental services, thereby adversely affecting current service ratios, response times, or other performance objectives for local public service providers. (Potentially Significant).	3.4.1a	The City's construction contractor(s) shall provide a copy of the Traffic Control Plan to the Sheriff's Department, County Fire Department, and any private ambulance service providers for informational and coordination purposes prior to construction.	LS
		3.4.1b	The City's construction contractor(s) shall provide 72-hour notice to the local service providers prior to construction of individual pipeline segments. Discussion on the Traffic Control Plan is provided in Section 3.8, Transportation, and Traffic Circulation, under Measure 3.8.1a.	
3.4.2	Construction of the Proposed Project is not expected to require or result in the construction of new storm drain water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects. (Less-than-Significant).		No mitigation required.	
3.4.3	The Proposed Project would not increase water demand or change water supply availability. (Less-than-significant).		No mitigation required.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.4.4	Materials that would need disposal as part of construction of the Proposed Project would be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs. After construction, the project is not anticipated to generate significant amounts of solid waste beyond the current baseline condition. (Less-than-Significant).		No mitigation required.	
3.4.5	Construction of the Proposed Project would comply with federal, state, and local statutes and regulations related to solid waste. (Less-than-Significant).		No mitigation required.	
3.4.6	Construction of the Proposed Project could encounter or affect under- and above-ground utilities and result in temporary interruptions in utility service. (Potentially Significant).	3.4.6	Underground utilities and service connections shall be identified by the City's construction contractor(s) prior to commencing any excavation work through the implementation of an underground services alert (USA). The exact utility locations will be determined by hand-excavated test pits dug at locations determined and approved by the construction manager (also referred to as "pot-holing"). Temporary disruption of service may be necessary to allow for construction. No service on such lines would be disrupted until prior approval is received from the construction manager and the service provider.	LS

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT		MITIGATION MEASURES		LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.5 CULTURAL RESOURCES				
3.5.1	Implementation of the proposed pipeline may affect unknown, potentially significant prehistoric and historic resources. (Potentially Significant).	3.5.1	If any historic or prehistoric find is determined to be significant by a qualified archaeologist, representatives of the City and the archaeologist and/or paleontologist would meet to determine an appropriate course of action. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards in accordance with CEQA Guidelines Section 15064.5 (f).	LS
3.5.2	The implementation of the proposed project may adversely affect previously undocumented paleontological resources. (Potentially Significant).	3.5.2	Implement Mitigation Measure 3.5.1.	LS
3.5.3	The implementation of the proposed project may adversely impact human burials or osteological remains. (Potentially Significant).	3.5.3	In the event of the discovery of human remains, CEQA Guidelines 15064.5 (e)(1) shall be followed, which is as follows: (1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until: (A) The Coroner of the county in which the remains are discovered must be contacted to verify that the remains are human, that no investigation of the cause of death is required, and	LS

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	(B) If the coroner determines the remains to be Native American: 1. The coroner shall contact the Native American Heritage Commission within 24 hours. 2. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. 3. The most likely descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.6 AIR QUALITY		
3.6.1 Fugitive dust generated during future project construction activities could be substantial and would contribute to intermittent ambient respirable particulate matter concentrations that could contribute to the continued violation of State PM10 standards. The SJVAPCD requires that all construction activities implement fugitive dust control measure in accordance with Regulation VIII. With the implementation of these measures for project-specific activities, a less than significant impact is expected. (Less-than-Significant).	No mitigation is required beyond the implementation of measure identified in Regulation VIII, Rule 8010.	
3.6.2 The long-term operation of the Proposed Project would not result in a substantial increase in criteria air pollutants and/or TACs. (Less-than-Significant).	No mitigation is required.	
3.6.3 The Proposed Project would not create objectionable odors affecting a substantial number of people. (Less-than-Significant)	No mitigation is required.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.7 NOISE		
3.7.1 Construction associated with the implementation of the Proposed Project would temporarily and intermittently increase noise levels along the proposed pipeline alignment. The temporary increase in noise could adversely affect nearby sensitive receptor locations along the proposed alignment. Construction noise resulting from the use of heavy equipment along the proposed route is considered a potentially significant impact of the Proposed Project. (Potentially Significant).	3.7.1a Construction activities within rural residential areas shall be limited to the hours and days specified by the County as follows: 1. Construction activity is limited to hours and days when noise standard exemptions apply, per encroachment permit. 2. If construction outside those exempt time periods is proposed, the City shall obtain a variance from the County. 3. Where no construction exemption is granted, construction shall be scheduled between 7:00 a.m. to 7:00 p.m., Monday to Friday, or other hours and days as established by the County in applicable encroachment permits. 3.7.1b The City shall require in construction specifications that the contractor select staging areas as far as feasibly possible from existing residences. Activities within these staging areas shall conform to the time limitations established in Mitigation Measure 3.7.1a.	LS

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT		MITIGATION MEASURES		LEVEL OF SIGNIFICANCE AFTER MITIGATION
		3.7.1c	Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturers' specifications) and by shrouding or shielding impact tools. All equipment shall have sound-control devices no less effective than those provided by the manufacturer.	
		3.7.1d	The City shall require in construction specifications that the contractor place all stationary noise generating construction equipment as far away as feasibly possible from sensitive receptors or in an orientation minimizing noise impacts (i.e., behind existing barriers or storage piles, etc.).	
3.7.2	The Proposed Project could result in a substantial permanent increase in ambient noise levels in the project vicinity. (Less-than-Significant).		No mitigation is necessary.	
3.8 TRANSPORTATION AND TRAFFIC CIRCULATION				
3.8.1	Construction of the proposed pipeline would reduce the available width of or in some instances the entire roadway, thereby resulting in short-term yet significant traffic delays for vehicles traveling past the construction zone on the affected roadways. (Potentially Significant).		Prior to the onset of construction of the project, a Traffic Control Plan will be prepared for all project-affected roadways and intersections. The Traffic Control Plan shall comply with requirements in all relevant encroachment permits issued by Stanislaus County. The Traffic Control Plan to be prepared by the construction contractor(s) may include the following measures:	LS

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT	MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
	• Maintain the maximum amount of travel lane capacity during non-construction periods, with all trenches covered with steel plates or backfilled and roadways open for use. • Use detour signing on alternate access streets when temporary full street closure is required. Alternatively, limit the construction work zone in each block to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone where feasible. • Restrict construction to non-peak traffic periods as required for specific work sites in encroachment permits. Weekend and night work shifts may be considered in non residential areas only. • Coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to agricultural areas and dairies. • Post advanced warning of construction activities (e.g., signs, articles in newspapers, notices on radio/TV, etc.) to allow motorists to select alternative routes in advance. • Specifications that allow for direct passage for bicyclists and pedestrians in all areas potentially affected by project construction. If direct passage is not feasible, the detour routes shall be provided.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
			• Warning signs and speed control (including signs informing drivers of State-legislated double fines for speed infractions in a construction zone) shall be provided, where necessary, to achieve required speed reductions for safe traffic flow through the work zone.	
		3.8.1b	Prior to onset of construction, and in consultation with Stanislaus County, the City's construction contractor(s) shall identify areas where night construction may be appropriate. Night construction shall be performed in all areas identified, but not within 1,000 feet on an existing residence.	
		3.8.1c	Expedite construction by using multiple work crews so that disturbances are kept as short in duration as possible.	
		3.8.1d	Arrange for a 24-hour telephone hotline to address public questions and complaints during project construction, and to offer information about detours, etc.	
3.8.2	Construction of the Proposed Project would generate short-term increases in vehicle trips by construction workers and construction vehicles. (Potentially Significant).	3.8.2a	As part of the Traffic Control Plan for roadway segments and intersections (see Measure 3.9.1a), designated haul routes will be specified for the project after consultation with relevant agencies (e.g., Caltrans and County Public Works).	LS

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
		3.8.2b	To the extent possible, daily work sites will be scheduled such that their relative locations shall disperse truck trips over a number of different haul routes, thereby lessening the number of truck trips on any one road. In addition, construction worker and truck trips during peak traffic periods shall be avoided, to the extent possible.	
3.8.3	Construction of the Proposed Project would affect access to adjacent land uses and streets for both general and emergency traffic and for bicycle/pedestrian access. (Potentially Significant).	3.8.1a	As part of the Traffic Control Plan for roadway segments and intersections (Measure 3.9.1a), comprehensive strategies for maintaining emergency access shall be developed for sensitive land uses such as residential and agricultural areas in consultation with the facility owner or administrator. Strategies shall include, but not be limited to, maintaining steel trench plates at the construction sites to restore access across open trenches, and identification of alternate routing around construction zones. Also, police, fire, and other emergency service providers shall be notified of the timing, location, and duration of construction activities and the location of detours and lane closures.	LS
		3.8.3b	Implement Mitigation Measure 3.8.1b.	
		3.8.3c	Use detour signing on alternate access streets established when temporary full street closure is required.	
		3.8.3d	The City shall provide a minimum 72 hour advance notice of access restrictions for residents and businesses.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.8.4	Construction of the Proposed Project would not result in any significant disruptions to transit service. (Less-than-Significant).		No further mitigation required.	
3.8.5	Construction of the Proposed Project would generate a demand for parking spaces for construction worker vehicles. In addition, pipeline construction could temporarily displace on-street parking along the proposed alignment. (Potentially Significant).	3.8.5	Construction contracts shall require the contractor(s) to provide off-street parking for construction worker's vehicles in the vicinity of the work zone, or, workers may be shuttled to the work site from an off-site location.	LS
3.8.6	Construction of the Proposed Project would increase potential traffic safety hazards for vehicles, bicyclists, and pedestrians on public roadways. (Potentially Significant).	3.8.6a	Implement Mitigation Measure 3.8.1a.	LS
		3.8.6b	The City in coordination with Stanislaus County Department of Public Works will ensure the integration of clear zone concepts into the final design of proposed above-ground structures. Final design will also account for the ultimate rights-of-way for affected roadways.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT		MITIGATION MEASURES		LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.8.7	Construction of the Proposed Project would increase wear and tear on the designated haul routes used by construction vehicles to access the project work site(s). (Potentially Significant).	3.8.7a	Prior to construction, the City, a County representative, and the City's construction contractor(s) will be responsible for assessing current road conditions for all project routes once final design plans are complete in efforts to develop post-construction road restoration requirements. An agreement shall be entered into by the City and County prior to construction that details post-construction road restoration requirements. Staff of the Stanislaus County Public Works Department shall review the post-construction restoration plans for each of the affected haul routes to ensure compliance with County standards. The City shall perform roadway repairs or rehabilitation as necessary such that post-construction requirements are met.	LS
		3.8.7b	The City shall obtain encroachment permits from Stanislaus County prior to construction of the project, and comply with haul route designations, and roadway wear monitoring and repairs conditions.	
3.9 GEOLOGY, SOILS, AND SEISMICITY				
3.9.1	In the event of a major earthquake in the region, seismic groundshaking could cause collapse or structural damage to the proposed pipeline and associated facilities. Structural damage to project components resulting from substantial displacement along various fault sources could indirectly result in significant injury to people and disruption of major services (e.g., sanitary sewer). (Less-than-Significant).		No mitigation is required.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.9.2	The presence of expansive and corrosive soils could result in structural damage to the proposed pipeline and associated facilities. (Less-than-Significant).		No mitigation is required.	
3.9.3	The project area could be subjected to geologic hazards, including liquefaction, differential settlement, total settlement, and minor slumping along the Harding Drain. (Less-than-Significant).		No mitigation is required.	
3.9.4	Implementation of the Proposed Project could result in increased surface soil erosion thereby lending to increased siltation of local waterways. (Potentially Significant).		Implement Mitigation Measures 3.1.1a, 3.1.1b, and 3.1.1c.	LS
3.10 HAZARDS AND HAZARDOUS MATERIALS				
3.10.1	Construction of the Proposed Project may expose construction workers, the general public, and the environment to pre-existing hazardous materials contamination. (Potentially Significant).	3.10.1a	If contaminated soil and/or groundwater or suspected contamination were encountered during project construction, work shall be halted in the area, and the type and extent of the contamination shall be identified. The depth of trenches would be approximately eight to nine feet. A contingency plan to dispose of any contaminated soil or groundwater should be developed through consultation with the appropriate regulatory agencies. If dewatering were to occur during project construction, the RWQCB should be consulted for any special requirements such as containing the water until it can be sampled and analyzed to ensure that no contaminants are in the groundwater that could be released into the TID drainage system.	LS

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

ENVIRONMENTAL IMPACT		MITIGATION MEASURES		LEVEL OF SIGNIFICANCE AFTER MITIGATION
		3.10.1b	Implement Mitigation Measure 3.1.1b.	
3.10.2	During construction, there lies a risk of exposure to hazardous materials such as fuel and other chemicals used for pipeline excavation and construction activities. (Potentially Significant).	3.10.2	The City shall ensure, through the enforcement of contractual obligations, that all contractors transport, store and handle construction-related hazardous materials in a manner consistent with relevant regulations and guidelines, including those recommended and enforced by the Department of Transportation, California RWQCB, the local fire departments, and the local environmental health department. Recommendations shall include as appropriate transporting and storing materials in appropriate and approved containers, maintaining required clearances, and handling materials using applicable federal, state, and/or local regulatory agency protocols. In addition, all precautions required by the RWQCB issued NPDES construction activity stormwater permits would be taken to ensure that no hazardous materials enter any nearby waterways. In the event of a spill, the City shall ensure, through the enforcement of contractual obligations, that all contractors immediately control the source of any leak and immediately contain any spill utilizing appropriate spill containment and countermeasures. If required by the local fire departments, the local environmental health department, or any other regulatory agency, contaminated media shall be collected and disposed of at an off-site facility approved to accept such media.	LS

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

TABLE 2-1 (Continued)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

	ENVIRONMENTAL IMPACT		MITIGATION MEASURES	LEVEL OF SIGNIFICANCE AFTER MITIGATION
3.10.3	The Proposed Project could interfere with an emergency response or evacuation plan. (Potentially Significant)	3.10.3	Implement Mitigation Measure 3.8.3a.	LS
3.11	**AESTHETICS AND RECREATION**			
3.11.1	The Proposed Project would modify the existing visual character of the project area. (Less-than-Significant).		No mitigation is required.	
3.11.2	The Proposed Project would involve the construction of structures that would result in the creation of new sources of daytime glare and/or nighttime illumination. (Potentially Significant).	3.11.2	The City will install security lighting with directional shields to concentrate lighting toward the site. The night time security and associated parking lighting fixtures will be equipped with directional shields that aim light downward and away from adjacent residential properties. In addition, the placement of lighting fixtures would be selected to concentrate light on-site to avoid spillover onto adjacent residential properties.	LS
3.11.3	Impacts to scenic corridors and officially designated routes. (No Impact).		No mitigation is required.	
3.11.4	The Proposed Project would not result in an indirect increase in visitor use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated. (No Impact).		No mitigation is required.	
3.11.5	The Proposed Project would not substantially disrupt or conflict with the use of existing recreational facilities to the extent that it would affect the recreational value of such facilities. (This impact is considered less-than-significant.		No mitigation is required.	

Less-than-Significant = LS Beneficial = B Significant = S Cumulative Significant = CS Significant and Unavoidable = SU Potentially Significant = PS

Table 6.1

MITIGATING MONITORING SYSTEM

TABLE 6-1
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.1	**WATER RESOURCES**					
3.1.1a	To minimize the exposure of sediments to runoff, the City would implement measures contained in the Construction Contractor's Guide and Specification of the Caltrans Storm Water Quality Handbook (The Handbook; April 1997) and the SWRCB Water Quality Order 99-08-DWQ, NPDES, General Permit for Stormwater Discharge Associated with Construction Activity.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the RWQCB	Completion of SWPPP. Verification by the RWQCB of inclusion of mitigation measures within the SWPPP. Site inspection by the City of Turlock and RWQCB to ensure proper implementation.	Throughout construction activities	
3.1.1b	All construction plans and activities shall implement multiple BMPs to provide effective erosion and sediment control. These BMPs shall be selected to achieve maximum sediment removal and represent the best available technology that is economically achievable. BMPs to be implemented as part of this mitigation measure shall include, but are not limited to, the following measures: • Temporary erosion control measures (such as silt fences, staked straw bales/ wattles, silt/sediment basins and traps, check dams, geofabric, sandbag dikes, and temporary revegetation or other ground cover) will be employed for disturbed areas. • Dirt and debris shall be swept from paved streets in the construction zone on a regular basis, particularly before predicted rainfall events.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the RWQCB	Completion of SWPPP. Verification by the RWQCB of inclusion of mitigation measures within the SWPPP. Site inspection by the City of Turlock and RWQCB to ensure proper implementation.	Throughout construction activities	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
• Grass or other vegetative cover will be established on the construction site as soon as possible after disturbance. At minimum, vegetative application shall be done by September 15th to allow for plant establishment. No disturbed surfaces will be left without erosion control measures in place during the period of October 15th to April 15th.					
• Silt fences and catch basins will be placed below all construction activities at the edge of the river to intercept sediment before it reaches the river. These structures will be installed prior to any clearing or grading activities.					
• Spoil sites will be located such that they do not drain directly into the San Joaquin River or TID Laterals, if possible. If a spoil site drains into the river or local drains, catch basins will be constructed to intercept sediment before it reaches the river. Spoil sites will be graded to reduce the potential for erosion.					
While data is scarce regarding the effectiveness of BMPs as erosion and sediment controls, the expected pollutant removal efficiencies given in Table 3.1-2 suggest that multiple BMPs used in combination, properly installed and maintained, can achieve significant sediment removal. Therefore the final selection and design of erosion and sediment controls should include the use of multiple BMPs to protect water quality.					
BMPs proposed by the City's contractor shall be subject to approval by the City, and the City shall require that all parties performing construction under the Proposed Project incorporate into contract specifications the requirement that the contractor(s) comply with and implement these provisions. The contractor shall also include provisions for monitoring during and after construction activities to verify that these standards are met.					

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.1.1c	Implement Mitigation Measure 3.10.2.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the County of Stanislaus, RWQCB, DOT, and TID	Verification of inclusion within contract wording	Throughout construction	
3.2	**BIOLOGICAL RESOURCES**					
3.2.1a	As noted above, the project area appears to provide only marginal habitat for GGS. Nonetheless, a survey for Giant Garter Snake (GGS) will be conducted by a qualified biologist within 24 hours prior to the start of construction, and if GGS are present and there is a reasonable likelihood that construction will adversely impact GGS, the City and its construction contractor will adhere to the appropriate terms and conditions of the Programmatic Biological Opinion issued to the ACOE by the USFWS for giant garter snake (dated Nov. 13, 1997).	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to construction	
3.2.1b	Prior to construction, all construction workers shall take part in a Service-approved worker environmental awareness program given by a Service-approved biologist.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to construction	
3.2.1c	The construction easement for the proposed crossings shall be fenced using temporary fencing to reduce the possibility of incidentally impacting giant garter snake habitat outside of the construction area.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to and throughout construction	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.2.1d	If construction activities occur between April 1st and August 31st, a survey for active Swainson's hawk nests shall be conducted along the proposed alignment according to the CDFG's Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (*Buteo swainsoni*) in the Central Valley of California by a qualified wildlife biologist. The survey shall be limited to trees within 500 feet of the proposed alignment.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to construction	
3.2.1e	If active nests are detected and potential impacts are identified, measures that will avoid or mitigate impacts will be implemented. Avoidance measures may include, but are not limited to, establishing buffer zones around nests and retaining a qualified wildlife biologist to monitor active nests during construction.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to and throughout construction	
3.2.2a	Construction activities along the banks of and within the San Joaquin River will, to the extent feasible, shall be limited to the period between June 1st and August 31st, the period during which impacts to native fisheries are not likely to occur.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Throughout construction	
3.2.2b	Implement Mitigation Measure 3.1.1.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the RWQCB	Verification of compliance by RWQCB	Throughout construction	
3.2.3a	Prior to construction, the proposed alignment (San Joaquin River levee, Harding Drain banks, and grassland habitat areas) shall be surveyed by a qualified biologist for burrowing owls using established CDFG protocols (Appendix F).	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to construction	
3.2.3b	If burrowing owls are detected within the construction zone, mitigation that will avoid active nest sites or compensate for the loss of nest sites shall be developed in coordination with CDFG.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to and throughout construction	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.2.3c A qualified biologist shall survey the proposed pipeline trenching and aeration facility construction site within the annual/alkali grassland habitat for the presence of San Joaquin whipsnakes. The survey shall take place no more than 24 hours prior to construction. If a snake is detected by the survey, no construction shall take place until the snake has left the construction area and CDFG shall be notified for proper guidance. The performance standard for this action is that no snake shall be harassed or taken.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to construction	
3.2.3d Implement all mitigation measures listed for giant garter snakes. Biological monitors present during canal/ditch crossing construction shall also monitor for northwestern and southwestern pond turtles on the site, and pre-construction surveys shall also target northwestern and southwestern pond turtles.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to construction	
3.2.4a Prior to construction of the Proposed Project, the proposed alignment and aeration facility location west of Carpenter Road, shall be surveyed by a qualified botanist for special-status plants at the appropriate flowering period (May–July) using established CNPS protocols.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to construction	
3.2.4b If special-status plants are detected within the construction zone or the immediate vicinity, mitigation that will avoid impacts within 50' of these plants or compensate for unavoidable impacts to habitat shall be developed in coordination with CDFG. Mitigation may include protection of existing rare plant occurrences and habitats by rerouting the alignment or protecting other alkaline wetland habitats in the area where they may occur at a 2:1 ratio using existing Mitigation Banks.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to and throughout construction	
3.2.5a Fill of wetland areas will be minimized wherever possible. Temporary construction fencing will be erected around the Project site to reduce the potential of incidental fill.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to and throughout construction	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.2.5b Following pipeline construction, wetland/stream crossings shall be restored to pre-construction contours. Areas exposed due to construction shall be re-vegetated using a mix of native vegetation.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Upon completion of construction	
3.2.6a If construction activities occur between March 15th and September 15th (the raptor breeding season), a survey for active nests of raptors shall be conducted by a qualified wildlife biologist at the project site and within a 500 foot buffer surrounding the site. These surveys should be integrated with pre-construction surveys conducted for Swainson's Hawk.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to construction	
3.2.6b Implement Mitigation Measure 3.2.1e.	City of Turlock Public Works Director or designee	City of Turlock in coordination with CDFG	Verification of compliance by CDFG	Prior to and throughout construction	
3.3 LAND USE AND AGRICULTURE					
3.3.2a The City of Turlock shall require its construction contractor to provide a minimum 2-week advance notice of the construction activities schedule to the affected community members adjacent to construction areas (e.g., residences, property owners, business owners, and public facility operators), including the posting of signs.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the County of Stanislaus, and TID	Verification of compliance by the County of Stanislaus, and TID	Prior to construction within each respective jurisdiction	
3.3.2b The City of Turlock, in cooperation with its contractor(s), shall provide a phone number and community contact for inquiries about the project's schedule throughout the construction period. This information will be posted in a local newspaper and at City Hall and will be updated on a weekly basis.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the County of Stanislaus, and TID	Verification of compliance by the County of Stanislaus, and TID	Prior to construction within each respective jurisdiction	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.3.2c	The City and its contractor(s) shall coordinate with local jurisdictions and obtain all necessary permits (e.g., encroachment permit, utility excavation permit), comply with permit conditions established to minimize construction impacts, and coordinate inspections with Stanislaus County to oversee construction activities.	City of Turlock Public Works Director or designee	City of Turlock in consultation with the County of Stanislaus, and TID	Acquisition and compliance with encroachment permits from the County of Stanislaus, and TID	Prior to construction	
3.3.2d	Implement San Joaquin Valley Air Pollution Control District (SJVAPCD) required fugitive dust control measures, Mitigation Measure 3.7.1a through d, and Mitigation Measure 3.8.1a through e.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the SJVAPCD.	Verification of compliance from the SJVAPCD	Prior to and throughout construction	
3.3.3	The City's contractor shall, as part of the right-of-way surveys and final design work, identify all mailboxes, walls, fences, driveways, potable water wells and landscaping located in the alignment and prepare a relocation and replacement plan for each to address impacts resulting from displacement of existing improvements in the pipeline alignment.	City of Turlock Public Works Director or designee	City of Turlock	Verification of compliance prior to the commencement of construction	Prior to construction	
3.3.4	Restore affected lands to pre-project conditions.	City of Turlock Public Works Director or designee	City of Turlock	Verification of Compliance from the Department of Conservation	Upon completion of construction	
3.3.5	Implement Mitigation Measure 3.3.4.	City of Turlock Public Works Director or designee	City of Turlock	Verification of Compliance from the Department of Conservation	Upon completion of construction	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.4	**PUBLIC SERVICES AND UTILITIES**					
3.4.1a	The City's construction contractor(s) shall provide a copy of the Traffic Control Plan to the Sheriff's Department, County Fire Department, and any private ambulance service providers for informational and coordination purposes prior to construction.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the County of Stanislaus	Completion of Traffic Control Plan	Prior to construction	
3.4.1b	The City's construction contractor(s) shall provide 72-hour notice to the local service providers prior to construction of individual pipeline segments. Discussion on the Traffic Control Plan is provided in Section 3.8, Transportation, and Traffic Circulation, under Measure 3.8.1a.	City of Turlock Public Works Director or designee	City of Turlock	Verification of noticing	Prior to and throughout construction	
3.4.6	Underground utilities and service connections shall be identified by the City's construction contractor(s) prior to commencing any excavation work through the implementation of an underground services alert (USA). The exact utility locations will be determined by hand-excavated test pits dug at locations determined and approved by the construction manager (also referred to as "pot-holing"). Temporary disruption of service may be necessary to allow for construction. No service on such lines would be disrupted until prior approval is received from the construction manager and the service provider.	City of Turlock Public Works Director or designee	City of Turlock	Verification of USA compliance	Prior to and throughout construction	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.5	**CULTURAL RESOURCES**					
3.5.1	If any historic or prehistoric find is determined to be significant by a qualified archaeologist, representatives of the City and the archaeologist and/or paleontologist would meet to determine an appropriate course of action. All significant cultural materials recovered shall be subject to scientific analysis, professional museum curation, and a report prepared by the qualified archaeologist according to current professional standards in accordance with CEQA Guidelines Section 15064.5 (f).	City of Turlock Public Works Director or designee	City of Turlock in coordination with the Native American Heritage Commission	Verification of compliance from the Native American Heritage Commission	Instructions included in grading and construction plans	
3.5.2	Implement Mitigation Measure 3.5.1.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the Native American Heritage Commission	Verification of compliance from the Native American Heritage Commission	Instructions included in grading and construction plans	
3.5.3	In the event of the discovery of human remains, CEQA Guidelines 15064.5 (e)(1) shall be followed, which is as follows:	City of Turlock Public Works Director or designee	City of Turlock in coordination with the Stanislaus County Coroner and Native American Heritage Commission	Verification of compliance from the Stanislaus County Coroner and Native American Heritage Commission	Instructions included in grading and construction plans	
	(1) There shall be no further excavation or disturbance of the site or any nearby area reasonably suspected to overlie adjacent human remains until:					
	(A) The coroner of the county in which the remains are discovered must be contacted to verify that the remains are human, that no investigation of the cause of death is required, and					

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
(B) If the coroner determines the remains to be Native American: 1. The coroner shall contact the Native American Heritage Commission within 24 hours. 2. The Native American Heritage Commission shall identify the person or persons it believes to be the most likely descended from the deceased Native American. 3. The Most Likely Descendent may make recommendations to the landowner or the person responsible for the excavation work, for means of treating or disposing of, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.					
3.6 AIR QUALITY					
No mitigation is required beyond the implementation of measures identified in Regulation VIII, Rule 8010.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the SJVAPCD	Verification of compliance from the SJVAPCD	Throughout construction activities	
3.7 NOISE					
3.7.1a Construction activities within rural and urban residential areas shall be limited to the hours and days specified by each jurisdiction as follows: 1. Construction activity is limited to hours and days when noise standard exemptions apply, per encroachment permit.	City of Turlock Public Works Director or designee	City of Turlock	Verification of compliance with applicable noise regulations.	Throughout construction activities	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
	2. If construction outside those exempt time periods is proposed, the City shall obtain a variance from the appropriate jurisdiction. 3. Where no construction exemption is granted, construction shall be scheduled between 7:00 a.m. to 7:00 p.m., Monday to Friday, or other hours and days as established by the appropriate local jurisdiction in applicable encroachment permits.					
3.7.1b	The City shall require in construction specifications that the contractor select staging areas as far as feasibly possible from existing residences. Activities within these staging areas shall conform to the time limitations established in Mitigation Measure 3.7.1a.	City of Turlock Public Works Director or designee	City of Turlock	Verification of final staging area locations.	Final construction plans	
3.7.1c	Construction equipment noise shall be minimized during project construction by muffling and shielding intakes and exhaust on construction equipment (per the manufacturers' specifications) and by shrouding or shielding impact tools. All equipment shall have sound-control devices no less effective than those provided by the manufacturer.	City of Turlock Public Works Director or designee	City of Turlock	Inclusion of manufactures specifications within contract wording	Final construction plans	
3.7.1d	The City shall require in construction specifications that the contractor place all stationary noise generating construction equipment as far away as feasibly possible from sensitive receptors or in an orientation minimizing noise impacts (i.e., behind existing barriers or storage piles, etc.).	City of Turlock Public Works Director or designee	City of Turlock	Inclusion of manufactures specifications within contract wording	Final construction plans	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.8 TRANSPORTATION AND CIRCULATION					
3.8.1a Prior to the onset of construction of the project, a Traffic Control Plan will be prepared for all project-affected roadways and intersections. The Traffic Control Plan shall comply with requirements in all relevant encroachment permits issued by Stanislaus County. The Traffic Control Plan to be prepared by the construction contractor(s) may include the following measures: • Maintain the maximum amount of travel lane capacity during non-construction periods, with all trenches covered with steel plates or backfilled and roadways open for use. • Use detour signing on alternate access streets when temporary full street closure is required. Alternatively, limit the construction work zone in each block to a width that, at a minimum, maintains alternate one-way traffic flow past the construction zone where feasible. • Restrict construction to non-peak traffic periods as required for specific work sites in encroachment permits. Weekend and night work shifts may be considered in non residential areas only. • Coordinate construction activities (time of year and duration) to minimize traffic disturbances adjacent to agricultural areas and dairies. • Post advanced warning of construction activities (e.g., signs, articles in newspapers, notices on radio/TV, etc.) to allow motorists to select alternative routes in advance.	City of Turlock Public Works Director or designee	City of Turlock	Completion of the Traffic Control Plan and verification of its inclusion in contract wording on construction plans	Final construction plans	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
	• Specifications that allow for direct passage for bicyclists and pedestrians in all areas potentially affected by project construction. If direct passage is not feasible, the detour routes shall be provided. • Warning signs and speed control (including signs informing drivers of State-legislated double fines for speed infractions in a construction zone) shall be provided, where necessary, to achieve required speed reductions for safe traffic flow through the work zone.					
3.8.1b	Prior to onset of construction, and in consultation with Stanislaus County, the City's construction contractor(s) shall identify areas where night construction may be appropriate. Night construction shall be performed in all areas identified, but not within 1,000 feet on an existing residence.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the County of Stanislaus	Verification of contract wording.	Construction Plans	
3.8.1c	Expedite construction by using multiple work crews so that disturbances are kept as short in duration as possible.	City of Turlock Public Works Director or designee	City of Turlock	Verification of contract wording	Construction Plans	
3.8.1d	Arrange for a 24-hour telephone hotline to address public questions and complaints during project construction, and to offer information about detours, etc.	City of Turlock Public Works Director or designee	City of Turlock	Confirmation of 24-hour hotline	Throughout construction	
3.8.2a	As part of the Traffic Control Plan for roadway segments and intersections (see Measure 3.9.1a), designated haul routes will be specified for the project after consultation with relevant agencies (e.g., Caltrans and County Public Works).	City of Turlock Public Works Director or designee	City of Turlock	Verification of inclusion within contract wording	Construction plans	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.8.2b	To the extent possible, daily work sites will be scheduled such that their relative locations shall disperse truck trips over a number of different haul routes, thereby lessening the number of truck trips on any one road. In addition, construction worker and truck trips during peak traffic periods shall be avoided, to the extent possible.	City of Turlock Public Works Director or designee	City of Turlock	Verification of inclusion within contract wording	Construction plans	
3.8.3a	As part of the Traffic Control Plan for roadway segments and intersections (Measure 3.9.1a), comprehensive strategies for maintaining emergency access shall be developed for sensitive land uses such as residential and agricultural areas in consultation with the facility owner or administrator. Strategies shall include, but not be limited to, maintaining steel trench plates at the construction sites to restore access across open trenches, and identification of alternate routing around construction zones. Also, police, fire, and other emergency service providers shall be notified of the timing, location, and duration of construction activities and the location of detours and lane closures.	City of Turlock Public Works Director or designee	City of Turlock	Verification of inclusion within contract wording	Construction plans	
3.8.3b	Implement Mitigation Measure 3.8.1b.	City of Turlock Public Works Director or designee	City of Turlock	Verification of inclusion within contract wording		
3.8.3c	Use detour signing on alternate access streets established when temporary full street closure is required.	City of Turlock Public Works Director or designee	City of Turlock	Verification of inclusion within contract wording	Construction plans	
3.8.3d	The City shall provide a minimum 72 hour advance notice of access restrictions for residents and businesses.	City of Turlock Public Works Director or designee	City of Turlock	Verification of inclusion within contract wording	Prior to construction	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.8.5	Construction contracts shall require the contractor(s) to provide off-street parking for construction worker's vehicles in the vicinity of the work zone, or, workers may be shuttled to the work site from an off-site location.	City of Turlock Public Works Director or designee	City of Turlock	Verification of inclusion within contract wording	Construction plans	
3.8.6a	Implement Mitigation Measure 3.8.1a.	City of Turlock Public Works Director or designee	City of Turlock	Completion of the Traffic Control Plan and verification of its inclusion in contract wording on construction plans		
3.8.6b	The City in coordination with Stanislaus County Department of Public Works will ensure the integration of clear zone concepts into the final design of proposed above-ground structures. Final design will also account for the ultimate rights-of-way for affected roadways.					
3.8.7a	Prior to construction, the City, a County representative, and the City's construction contractor(s) will be responsible for assessing current road conditions for all project routes once final design plans are complete in efforts to develop post-construction road restoration requirements. An agreement shall be entered into by the City and County prior to construction that details post-construction road restoration requirements. Staff of the Stanislaus County Public Works Department shall review the post-construction restoration plans for each of the affected haul routes to ensure compliance with County standards. The City shall perform roadway repairs or rehabilitation as necessary such that post-construction requirements are met.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the County of Stanislaus	Verification of inclusion within contract wording	Construction plans	
3.8.7b	The City shall obtain encroachment permits from Stanislaus County prior to construction of the project, and comply with haul route designations, and roadway wear monitoring and repairs conditions.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the County of Stanislaus	Verification of issuance of encroachment permits	Prior to construction	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.9	**GEOLOGY, SOILS, AND SEISMICITY**					
3.9.4	Implement Mitigation Measures 3.1.1a, 3.1.1b, and 3.1.1c.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the RWQCB	Completion of SWPPP. Verification by the RWQCB of inclusion of mitigation measures within the SWPPP. Site inspection by the City of Turlock and RWQCB to ensure proper implementation.	Throughout construction activities	
3.10	**HAZARDS AND HAZARDOUS MATERIALS**					
3.10.1a	If contaminated soil and/or groundwater or suspected contamination were encountered during project construction, work shall be halted in the area, and the type and extent of the contamination shall be identified. The depth of trenches would be approximately eight to nine feet. A contingency plan to dispose of any contaminated soil or groundwater should be developed through consultation with the appropriate regulatory agencies. If dewatering were to occur during project construction, the RWQCB should be consulted for any special requirements such as containing the water until it can be sampled and analyzed to ensure that no contaminants are in the groundwater that could be released into the TID drainage system.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the County of Stanislaus, RWQCB, and TID	Verification of inclusion within contract wording	Throughout construction activities	
3.10.1b	Implement Mitigation Measure 3.1.1b.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the RWQCB	Completion of SWPPP. Verification by the RWQCB of inclusion of mitigation measures within the SWPPP. Site inspection by the City of Turlock and RWQCB to ensure proper implementation.	Throughout construction activities	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

	Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.10.2	The City shall ensure, through the enforcement of contractual obligations, that all contractors transport, store and handle construction-related hazardous materials in a manner consistent with relevant regulations and guidelines, including those recommended and enforced by the Department of Transportation, California RWQCB, the local fire departments, and the local environmental health department. Recommendations shall include as appropriate transporting and storing materials in appropriate and approved containers, maintaining required clearances, and handling materials using applicable federal, state, and/or local regulatory agency protocols. In addition, all precautions required by the RWQCB issued NPDES construction activity stormwater permits would be taken to ensure that no hazardous materials enter any nearby waterways. In the event of a spill, the City shall ensure, through the enforcement of contractual obligations, that all contractors immediately control the source of any leak and immediately contain any spill utilizing appropriate spill containment and countermeasures. If required by the local fire departments, the local environmental health department, or any other regulatory agency, contaminated media shall be collected and disposed of at an off-site facility approved to accept such media.	City of Turlock Public Works Director or designee	City of Turlock in coordination with the County of Stanislaus, RWQCB, DOT, and TID	Verification of inclusion within contract wording	Construction plans	
3.10.3	Implement Mitigation Measure 3.8.3a.	City of Turlock Public Works Director or designee	City of Turlock	Verification of inclusion within contract wording	Construction plans	

TABLE 6-1 (Continued)
MITIGATION MONITORING PROGRAM

Mitigation Measure	Implementing Responsibility	Monitoring Responsibility	Compliance Standards	Timing	Verification of Compliance (Initials and Date)
3.11 AESTHETICS AND RECREATION					
3.11.2 The City will install security lighting with directional shields to concentrate lighting toward the site. The night time security and associated parking lighting fixtures will be equipped with directional shields that aim light downward and away from adjacent residential properties. In addition, the placement of lighting fixtures would be selected to concentrate light on-site to avoid spillover onto adjacent residential properties.	City of Turlock Public Works Director or designee	City of Turlock	Verification of inclusion within contract wording	Construction plans	

Acronyms:

CDFG	California Department of Fish and Game
DOT	California Department of Transportation
DTSC	California Department of Toxic Substance Control
RWQCB	Regional Water Quality Control Board (Region 5)
SWPPP	Stormwater Pollution Prevention Plan
TID	Turlock Irrigation District

SECTION 01201

PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Procedures for submitting applications for payment and means used as a basis for Progress Payments, including:
   1. Cost Summaries.
   2. Payment for Mobilization.
   3. Start-up.
   4. Demobilization.

1.02 BASIS FOR PROGRESS PAYMENTS

A. Base Application for Payment on the breakdown of costs for each scheduled activity in the Progress Schedule and the Percentage of Completion for each activity. Generate Application for Payment by downloading cost data from the Progress Schedule to a spreadsheet type format. Identify each activity on the Progress Schedule that has a cost associated with it, the cost of each activity, the estimated Percent Complete for each activity, and the Value of Work Completed for both the payment period and job to date.

1.03 COST SUMMARIES

A. Prepare Summary of Cost Information for each Major Item of Work listed in the Schedule of Values. Identify the Value of Work Completed for both the payment period and job to date.

B. Cash Flow Summary: Prepare cash flow summary, indicating total dollar amount of work planned for each month of the project. Equate sum of monthly amounts to the Contract Price.

1.04 PAYMENT FOR MOBILIZATION

A. Limit amounts included under Mobilization to the following items:
   1. Moving on the site any equipment required for first month operations.
   2. Installing temporary construction power and wiring.
   3. Developing construction water supply.
   4. Providing field office trailers for the CONTRACTOR, complete with all specified furnishings and utility services including telephones.
   5. Providing on-site sanitary facilities and potable water facilities as specified.
   6. Arranging for and erection of CONTRACTOR's work and storage yard.
   7. Subcontractor insurance and bonds.
   8. Obtaining all required permits, licenses, and fees.
   9. Developing construction schedule.
   10. CONTRACTOR bonds and insurance.

B. Furnish data and documentation to substantiate the amounts claimed under mobilization.

C. Limit price for mobilization to no more than 2 percent of Contract Price.

1.05 PAYMENT FOR START-UP AND DEMOBILIZATION

A. Total Price for start-up and demobilization shall not be less than 2 percent of Contract Price.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01210

ALLOWANCES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:

B. Listing of allowance items.
   1. Related responsibilities of ENGINEER and CONTRACTOR, and procedures.

C. Related Documents:
   1. Document 00410 - Bid Form.

1.02 ALLOWANCE AMOUNTS

A. The following cost allowances shall be included in the Total Lump Sum Bid Price as part of this Contract.
   1. Electric Utility Coordination Allowance: CONTRACTOR shall include an allowance of $30,000 in the Bid Schedule to cover the cost of the electric primary service and utility service coordination that will be required by the Turlock Irrigation District (T.I.D) Electric Utility Department. The actual amount of the permit fee will be adjusted by change order (add or deduct) based on the actual connection fee.
   2. Include allowance of $10,000 to pay Stanislaus County Inspection deposit.
   ~~3. Unknown Utilities Allowance: CONTRACTOR shall include an allowance of $30,000 in the Bid Schedule for working around unknown utilities which are not shown on drawings.~~
   3. **Unknown Utilities Allowance: CONTRACTOR shall include an allowance of $50,000 in the Bid Schedule for working around unknown utilities which are not shown on drawings.**
   4. **Dispute resolution board allowance: CONTRACTOR shall include an allowance of $15,000 in the bid schedule for the dispute resolution board per specification section 00822.**
   5. **Web-based Construction Document Software (Construction Management Software): CONTRACTOR shall include an allowance of $20,000 in the bid schedule for the Construction Management Software specified in section 01322.**

1.03 COSTS INCLUDED AND EXCLUDED IN ALLOWANCES

A. Refer to General Conditions, Paragraph 11.02, Cash Allowances.

1.04 ADJUSTMENT OF COSTS

~~A. When actual cost is more or less than amount of allowance, Contract Price will be adjusted by Change Order.~~

A. **When actual cost is more or less than amount of allowance, Contract Price will be adjusted by Change Order in accordance with Article 12, Paragraph 12.01.B of Document 00700, without application of Paragraph 12.01.C.**

1. **For Bid Item 21C (Unknown Utilities Allowance) only, when actual cost is more or less than amount of allowance, Contract Price will be adjusted by Change Order in accordance with Article 12, Paragraphs 12.01.B and 12.01.C of Document 00700.**

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01270

UNIT PRICES

PART 1 GENERAL

1.01 SUMMARY

A. **Section Includes: Procedures for measurement and payment of Work performed on a unit price basis.**

B. **Related Documents:**
   1. **Document 00410 - BID FORMS.**

1.02 MEASUREMENT OF QUANTITIES

A. **Work paid at a unit price times number of units measured will be measured by ENGINEER in accordance with United States Standard Measures.**

1.03 PAY ITEMS

A. **General: Pay items following are included in Document 00410, Bid Form.**

B. **Schedule of Price Bid Items:**
   1. **Junction Structure (Item 1):**
      a. **Shall include all work and materials necessary to construct new junction structure as shown on the Plans. Also included is clearing and grubbing easement, saw cutting and removal of existing pavement, asphalt surfacing, excavation, dewatering, furnishings, bedding, backfill, aggregate base course material, compaction, paving, and connections to existing and new pipelines. Payment for trench shields, sheeting, shoring, and bracing is included in Item 9.**
      b. **Measurement for payment shall be in lump sum, paid as a percent complete of the structure completed. Payment includes as-built submittals to OWNER.**
   2. **48-Inch Gravity Pipeline (Item 2a For Open Cut, Item 2b for Microtunneling):**
      a. **Shall include excavation for open cut, excavation of access pits for microtunneling, microtunneling, and ancillary operations, including but not limited to setting up jacking shaft, tunneling with tunneling machine, head recovery, groundwater dewatering, excavation material processing, and disposal of tunnel grouting, saw cutting of existing surfacing, disposal of debris, hand excavation, potholing to determine the location of adjacent utilities before trenching, correction of conflict between new pipeline and main utilities, restoration of existing improvements such as landscaping, lawn, irrigation pipe lines and facilities, pipe provision and installation, bedding, backfill, disposal of excess soil, temporary asphalt resurfacing within trench, compaction, specified testing procedures, and all other work (excluding manholes) necessary to install the pipe**

complete and in place. Payment item 2a shall include costs for microtunneling of 48-inch RCP under TID Harding Drain. Payment for trench shields, sheeting, shoring, and bracing is included in Item 9. Measurement for payment for open cut shall be in "Linear Foot" (LF), measured along the centerline of the pipe from outside face of junction structure to center of Manhole No. 2 Measurement for payment of Microtunneling shall be in linear foot measured from center of Manhole No. 2 to outside face of pump station wetwell structure. Payment includes as-built submittals to the OWNER.

3. **Outfall Pump Station (Item 4):**
   a. **Complete installation of all items required to make pump station complete and operational including: excavation, dewatering, removal and disposal of spoils, connection to new 48-inch RCP, bedding, backfill, aggregate base course material, compaction, concrete, pumps, electrical work, controls, instrumentation, antennae, paving, fencing and all other work required to make pump station operational, complete, and ready for use as indicated in these contract documents. Payment for sheeting, shoring, and bracing is included in Item 9.**
   b. **Measurement for payment shall be in lump sum paid as a percent complete of the pump station completed. Payment includes as-built submittals to OWNER.**
4. **Outfall Pipeline: 36-inch diameter (Nominal) from Station 11+32.95 – 305+00; Cement Mortar Lined and Coated Steel Pipe system or ductile iron pipe system) (Item 4):**
   a. **Item 4a: (cement mortar lined and coated steel Pipe)Shall include excavation, saw cutting of existing surfacing, disposal of debris, hand excavation, potholing to determine the location of adjacent utilities before trenching, correction of conflict between new pipeline and utilities, restoration of existing improvements such as irrigation pipe lines and facilities, dewatering, furnishing and installing piping, bedding, backfill, disposal of excess soil, temporary asphalt resurfacing within trench, compaction, specified testing procedures, and all other work (excluding items included in other bid items) necessary to install the pipe complete and in place. Payment for trench shields, sheeting, shoring, and bracing is included in Item 9. Measurement for payment for both restrained and unrestrained shall be in linear foot, measured along the centerline of the pipe from outside face of pump station wet well to outside face of standpipe structure. Payment includes as-built submittals to the OWNER.**
   b. **Item 4b: (Ductile iron pipe system)Shall include excavation, saw cutting of existing surfacing, disposal of debris, hand excavation, potholing to determine the location of adjacent utilities before trenching, correction of conflict between new pipeline and utilities, restoration of existing improvements such as irrigation pipe lines and facilities, dewatering, furnishing and installing piping, bedding, backfill, disposal of excess soil, temporary asphalt resurfacing within trench, compaction, specified testing procedures, and all other work (excluding items included in other bid items) necessary to install the pipe complete and in place. Payment for trench shields, sheeting, shoring, and bracing is included in Item 9. Measurement for payment for both restrained and unrestrained shall be in linear**

foot, measured along the centerline of the pipe from outside face of pump station wet well to outside face of standpipe structure. Payment includes as-built submittals to the OWNER.

5. **Standpipe Structure (Item 5):**
   a. **Complete installation of all items required to make standpipe structure complete and operational including: excavation, dewatering, removal and disposal of spoils, all yard piping not included in other bid items, connection to outfall pipeline and 48-inch cement mortar lined and coated welded steel pipe gravity pipeline, bedding, backfill, aggregate base course material, compaction, concrete, electrical work, controls, instrumentation, antennae, fencing, paving, and all other work required to make the standpipe structure operational, complete, and ready for use as indicated in these contract documents. Payment for sheeting, shoring, and bracing is included in Item 9.**
   b. **Measurement for payment shall be in lump sum, paid as a percent complete of the pump station completed. Payment includes as-built submittals to OWNER.**
6. **48-Inch Gravity Outfall Pipeline (cement mortar lined and coated steel pipe and RCP) (Item 6):**
   a. **48-inch Gravity Outfall Pipeline Welded Steel Section Shall include excavation, clearing and grubbing of existing surfacing, disposal of debris (including removal of concrete demolition materials placed on work area by others), hand excavation, potholing to determine the location of adjacent utilities before trenching, correction of conflict between new pipelines and utilities, restoration of existing improvements such as irrigation pipe lines and facilities, dewatering, furnishing and installing pipe, bedding, backfill, disposal of excess soil and construction debris, temporary asphalt resurfacing within trench, compaction, specified testing procedures, thrust blocks, and all other work (excluding items included in other bid items) necessary to install the pipe complete and in place. Payment for trench shields, sheeting, shoring, and bracing shall be included in Item 9. Measurement for payment for the gravity pipeline shall be in linear foot, measured along the centerline of the pipe from outside face of the standpipe structure STA 13+50. Payment includes as-built submittals to the OWNER.**
   b. **48-inch Gravity Outfall Pipeline (RCP section): Shall include excavation, clearing and grubbing of existing surfacing, disposal of debris (including removal of concrete demolition materials placed on work area by others), hand excavation, potholing to determine the location of adjacent utilities before trenching, correction of conflict between new pipelines and utilities, restoration of existing improvements such as irrigation pipe lines and facilities, dewatering, furnishing and installing pipe, bedding, backfill, disposal of excess soil and construction debris, temporary asphalt resurfacing within trench, compaction, specified testing procedures, thrust blocks, and all other work (excluding items included in other bid items) necessary to install the pipe complete and in place. Item 6b shall also include concrete encasement and restoration of levee as shown on the drawings. Payment for trench shields, sheeting, shoring, and bracing shall be included in Item 9. Measurement for payment for the**

gravity pipeline shall be in linear foot, measured along the centerline of the pipe from STA13+50 to the outside face of the outfall structure. Payment includes as-built submittals to the OWNER.

7. **Outfall Structure (Item 7):**
   a. **Complete installation of all items required to make outfall structure complete and operational including: excavation, dewatering, removal and disposal of spoils, connection to new 48-inch RCP Gravity Pipeline, bedding, backfill, aggregate base course material, compaction, concrete, and all other work required to make outfall structure operational, complete, and ready for use as indicated in these contract documents. This item includes the gate structure in the Levee. Payment for sheeting, shoring, and bracing is included in Item 9.**
   b. **Measurement for payment shall be in lump sum, paid as a percent complete of the outfall structure completed. Payment includes as-built submittals to OWNER.**
8. **Riprap Channel and River Embankment Restoration (Item 8):**
   a. **Complete installation of all items required to make riprap channel from outfall structure to San Joaquin River complete and operational including; removal and disposal of concrete construction debris, excavation, river cofferdam, dewatering within cofferdam, dewatering, backfill, compaction, riprap, hydroseeding and all other work required to make riprap channel and river embankment restoration complete and ready for use as indicated in the contract documents. Payment for sheeting, shoring, and bracing shall be included in Item 9. Sheeting for the cofferdam shall be included in this Item 9.**
   b. **Measurement for payment shall be in lump sum paid as a percentage of work completed. 20 percent of this pay item will be withheld until permitting agencies review and approve the post construction ground and Bathymetric surveys. Payment includes as-built submittals to OWNER.**
9. **Trench Shield, Sheeting, Shoring, and Bracing (Item 9):**
   a. **Measurement for payment for temporary trench box, sheeting, shoring, and bracing, or equivalent method will be based upon the completion of all planning, design, engineering fees, furnishing and constructing, and removal and disposal of such temporary sheeting shoring, and bracing as a lump sum item, complete, as required under the provisions of any permits, and in accordance with the requirements of OSHA and the Construction Safety Orders of the State of California, pursuant to the provision of Section 6707 of the California Labor Code. Payment for temporary sheeting, shoring, and bracing or equivalent method will be as lump sum and after completion of all work requiring excavation.**
10. **Dewatering for trenches and open excavation (Item 10):**
    a. **Shall include all necessary pumps, piping, permitting, and engineering services required to keep the pipeline and other open excavations dewatered during construction of the pipeline. This pay item shall include all permitting, all treatment and disposal costs, installation of dewatering equipment and cost of pumping water**

from excavations. Payment of will be as a percentage of completion of excavation work.

11. **Mobilization and Demobilization (Item 11):**
    a. **Shall include insurance and bonds, moving onto the site of all plant and equipment, furnishing temporary construction utilities, temporary buildings, obtaining required permits, performing pre-construction audio/video, and other construction facilities all as required for the proper performance and completion of the work.**
    b. **Demobilization shall include final cleaning and restoration of job site, removal of all temporary facilities and equipment from the work area, disconnection of the temporary construction utilities and turnover of project to the Owner. Payment shall be as "LS."**
    c. **Pre-Construction audio video of pipeline alignment shall include inspection manpower equipment, recording tapes to perform a video inspection of the surface features before construction. This video is to record pre-construction surface conditions for work areas to facilitate restoration to existing conditions. The CONTRACTOR shall provide OWNER with two copies of the video prior to beginning any construction work.**
12. **Traffic Management and Dust Control (Item 12):**
    a. **Shall include all work required for management including but not limited to temporary striping, signage, delineators, K-rails, cones, labor, flagmen, temporary fence, and equipment necessary for traffic control and dust control during the course of the work. Payment shall be "LS."**
13. **Permanent Asphalt Pavement for Harding Road to be installed over pipe trench (Item 13):**
    a. **Measurement for payment of permanent 2 inch asphalt pavement over pipe trench as shown on drawings, shall be measured by square foot (SF). Payment shall include full compensation for all materials, labor, and equipment necessary to saw cut existing asphalt and existing asphalt cuttings, placement of permanent asphalt pavement in conformance with the plans including, but not limited to compaction, grading, saw cutting as required, asphalt binder pavement materials, and clean up. This item will only be paid when temporary pavement is removed and replaced with permanent pavement.**
14. **Permanent Asphalt Pavement for County Road Crossings (Item 14):**
    a. **Measurement for payment of permanent asphalt pavement shall be by SF. Payment shall include full compensation for all materials, labor, and equipment necessary to saw cut existing asphalt and existing asphalt cuttings, placement of permanent asphalt pavement in conformance with the plans including, but not limited to compaction, grading, saw cutting as required, asphalt binder pavement materials, and clean up. This item will only be paid when temporary pavement is removed and replaced with permanent pavement.**
15. **Overlay of Asphalt Pavement For Harding Road (Item 15):**
    a. **Measurement for payment of one-inch overlay of permanent asphalt pavement shall be by square foot (SF). Payment shall include full compensation for all materials, labor, and equipment necessary to overlay those portions of the existing asphalt surface of Harding**

Road along the pipeline alignment which are not reconstructed per Item No. 13.

16. **Valve Assemblies (Item 16a and 16b):**
    a. **Measurement for payment of air release valve assemblies shall be by each (EA) air release assembly installed and complete with operating valves, manholes, structures, all pipes, fittings, marker posts, and appurtenances as shown on the Plans.**
    b. **Measurement for payment of air release and vacuum valve assemblies shall be each (EA) air release/vacuum assembly installed and complete with valves, manholes, structures, all pipes, fittings, marker posts, and appurtenances as shown on the plans.**
17. **Blowoff Valve Assemblies (Item 17):**
    a. **Measurement for payment of blowoff valve assemblies shall be by each (EA) blowoff valve assembly installed and complete with manhole, operating valves, all pipes, fittings, and appurtenances as shown on the Plans.**
18. **Inspection Outlets (Item 18):**
    a. **Measurement for payment of inspection outlets shall be by EA inspection outlet installed and complete with all pipes, fittings, and appurtenances as shown on the Plans.**
19. **Pipe Trench Cut-off Walls (Item 19)**
    a. **Measurement for payment of pipe trench cut-off walls shall be by EA pipe trench cut-off wall and complete as shown on the Plans.**
20. **Cathodic protection of outfall pipeline (Item 20)**
    a. **Measurement for payment of cathodic protection of outfall pipeline shall be based on the complete installation of the cathodic protection monitoring and bonding system in place as specified in the Bid Form and as detailed on the Plans. This system applies to both the ductile iron or steel piping system.**
21. **Contract Allowances (Items 21a - d):**
    a. **Measurement for Item 21a Utility Coordination Allowance shall be paid for as described in Section 01210 – Allowances and upon receipt of payment to TID.**
    b. **Measurement for Item 21b Stanislaus County Inspection shall be paid for upon receipt of payment to the County in accordance with section 01210.**
    c. **Measurement for payment 21c for Disputes review board shall be paid for as described in section 01210 – Allowances and 00822 – Disputes resolution board. If disputes review board is not utilized as part of this project, this amount will not be paid to the CONTRACTOR.**
    d. **Measurement for payment for Construction Software Item 21d shall be based on a 18 month software subscription. Payment shall to the contractor after the installation and required training required in the specification is complete.**
22. **Field Engineering and Surveying (Item 22):**
    a. **Field Engineering and Surveying stamped by a registered Land Surveyor or Civil Engineer as required by specification section 01722. Payment of the this work will be after staking is complete.**
    b. **Under this item, CONTRACTOR shall perform a post construction ground survey of all disturbed areas from the east toe of slope of the**

levee to the river and a Bathymetric survey of disturbed areas within the San Joaquin River from east to west river banks.

23. **Miscellaneous Work not included in Items 1 to 22:**
    a. **Measurement for payment for miscellaneous work shall be made by a determination of a percentage of the project completion and shall include any additional work needed to complete the project which is not specifically included for payment in other items.**
    b. **Payment for all miscellaneous work shall be made as a percentage of project completion and shall be compensation in full for furnishing all labor, materials, and all other work and equipment as required to render the miscellaneous work complete.**

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01294

APPLICATIONS FOR PAYMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Procedures for preparation and submittal of Applications for Payment.

B. Related Sections:
   1. Section 01292 - Schedule of Values.

1.02 FORMAT

A. Develop satisfactory spreadsheet-type form generated by downloading cost data from the Progress Schedule Spreadsheet shall have the following columns:
   1. Itemized list of project element based on approved schedule of values
   2. Value in dollars of each project element based on approved schedule of values
   3. Value of each project element as a percent of total value of project
   4. Value of each project element in dollars of work completed this pay application
   5. Value of each project element in dollars of work completed prior to this pay application
   6. Value in dollars of work completed to date of each project element
   7. Percent complete to date as of this pay application
   8. Percent remaining to complete project element
   9. Remaining value on contract to complete work for each element of project

B. Fill in information required on form. A copy of the application for Payment Form will be provided by ENGINEER at the Pre-Construction Meeting.

C. When Change Orders are executed, add Change Orders at end of listing of scheduled activities.
   1. Identify change order by number and description.
   2. Provide cost of change order in appropriate column.

D. After completing, submit Application for Payment complete with application form and attached spreadsheet. Provide copies of invoice for material stored on site for which payment is requested.

E. ENGINEER will review application for accuracy. When accurate, ENGINEER will transmit application to OWNER for processing of payment.

F. Execute application with signature of responsible officer of CONTRACTOR.

1.03 SUBSTANTIATING DATA

A. Provide Substantiating Data with cover letter identifying:
   1. Project.

2. Application number and date.
3. Detailed list of enclosures.
4. For stored products with item number and identification on application, description of specific material, and proof of insurance coverage for offsite stored products.
5. Submit “certified” payroll.

1.04 SUBMITTALS

A. Submit 5 copies of Application for Payment and Substantiating Data with cover letter.

B. Coordinate requirements with Document 00700, General Conditions, Article 14 - Payments to Contractor and Completion.

1.05 PAYMENT REQUESTS

A. Prepare progress payment requests on a monthly basis. Base requests on the breakdowns of costs for each scheduled activity and the percentage of completion for each activity.

B. Indicate total dollar amount of work planned for every month of the project. Equate sum of monthly amounts to Contract Price.

C. Generate Progress Payment request forms by downloading cost data from the schedule information to a spreadsheet type format. Identify each activity on the Progress Schedule that has a cost associated with it, the cost for each activity, the estimated percent complete for each activity, and the value of work completed for both the payment period and job to date.

D. Prepare summary of cost information for each Major Item of Work listed in the Schedule of Values. Identify the value of work completed for both the payment period and job to date.

E. Submit progress payment requests at progress meetings.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01312

PROJECT MEETINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for conducting conferences and meetings for the purposes of addressing issues related to the Work, reviewing and coordinating progress of the Work and other matters of common interest, and includes the following:
   1. Qualifications of Meeting Participants.
   2. Preconstruction Conference Progress Meetings.
   3. Pre-installation Meetings.
   4. Post Construction Meeting.

1.02 QUALIFICATIONS OF MEETING PARTICIPANTS

A. Representatives of entities participating in meetings shall be qualified and authorized to act on behalf of entity each represents.

1.03 PRECONSTRUCTION CONFERENCE

A. Upon issuance of Notice to Proceed, or earlier when mutually agreeable, ENGINEER will arrange preconstruction conference in convenient place for most persons invited, in accordance with the General Conditions.

B. Attending Preconstruction Conference: CONTRACTOR's superintendent, OWNER, ENGINEER, representatives of utilities, major subcontractors and others involved in performance of the Work, and others necessary to agenda.

C. ENGINEER will preside at conference.

D. Purpose of Conference: To establish working understanding between parties and to discuss Construction Schedule, shop drawing and other submittals, cost breakdown of major lump sum items, processing of submittals and applications for payment, and other subjects pertinent to execution of the Work.

E. Agenda Will Include:
   1. Adequacy of distribution of Contract Documents.
   2. Distribution and discussion of list of major subcontractors and suppliers.
   3. Proposed progress schedules and critical construction sequencing.
   4. Major equipment deliveries and priorities.
   5. Project coordination.
   6. Designation of responsible personnel.
   7. Procedures and Processing of:
      a. Field decisions.
      b. Proposal requests.
      c. Submittals.
      d. Change Orders.

e. Applications for Payment.
f. Record Documents.

8. Use of Premises:
   a. Office, construction, and storage areas.
   b. OWNER's requirements.
9. Construction facilities, controls, and construction aids.
10. Shoring requirements and submittal of Contractor’s geotechnical report.
11. Temporary utilities.
12. Safety and first aid procedures.
13. Security procedures.
14. Housekeeping procedures.

F. ENGINEER will record minutes of meeting and distribute copies of minutes within 7 days of meeting to participants and interested parties.

1.04 PROGRESS MEETINGS

A. Conduct progress meetings at least once every week in CONTRACTOR's field office, ENGINEER's field office or other mutually agreed upon place.

B. Distribute to each anticipated participant written notice and agenda of each meeting at least 4 days before meeting.

C. Require attendance of CONTRACTOR's superintendent and subcontractors who are or are proximate to be actively involved in the Work, or who are necessary to agenda.

D. Invite OWNER, ENGINEER, utility Companies when the Work affects their interests, and others necessary to agenda.

E. Complete and bring Application for Payment and Progress Schedule to progress meeting.

F. Prepare and distribute agenda.

G. Preside at meetings.

H. Purpose of Progress Meetings: To expedite work of subcontractors or other organizations that are not meeting scheduled progress, resolve conflicts, and coordinate and expedite execution of the Work.

I. Review progress of the Work, Progress Schedule, narrative report, Application for Payment, record documents, and additional items of current interest that are pertinent to execution of the Work.

J. Verify:
   1. Actual start and finish dates of completed activities since last progress meeting.
   2. Durations and progress of activities not completed.
   3. Reason, time, and cost data for Change Order Work that will be incorporated into Progress Schedule and application for payment.
   4. Percentage completion of items on Application for Payment.

5. Reasons for required revisions to Progress Schedule and their effect on Contract Time and Contract Price.

K. Discuss potential problems which may impede scheduled progress and corrective measures.

L. ENGINEER will record minutes of meeting and distribute copies of minutes within 7 days of meeting to participants and interested parties.

1.05 POST CONSTRUCTION MEETING

A. Meet with and inspect the Work 11 months after date of Substantial Completion with OWNER and ENGINEER.

B. Arrange meeting at least 7 days before meeting.

C. Meet in OWNER's office or other mutually agreed upon place.

D. Inspect the Work and draft list of items to be completed or corrected.

E. Review service and maintenance contracts, and take appropriate corrective action when necessary.

F. Complete or correct defective work and extend correction period accordingly.

G. Require attendance of Superintendent, appropriate manufacturers and installers of major units of constructions, and affected subcontractors.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01322

WEB BASED CONSTRUCTION DOCUMENT MANAGEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Requirements for web-based construction document management.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
      a. Section 01330 - Submittal Procedures.

1.02 REQUIREMENTS

A. The OWNER and CONTRACTOR shall utilize EADOC (EADOC is a registered trademark of EADOC LLC.) for submission of all data and documents (unless specified otherwise in this Section) throughout the duration of the Contract.
   1. EADOC is a web-based electronic media site hosted by EADOC LLC.
   2. EADOC is paid for by the CONTRACTOR.
   3. EADOC will be made available to all CONTRACTOR's personnel, subcontractor personnel, City Staff, suppliers, consultants, and ENGINEER.
   4. The joint use of this system is to facilitate electronic exchange of information, automation of key processes, and overall management of Contract Documentation.
   5. EADOC shall be the primary means of project information submission and management.

B. User access limitations:
   1. The ENGINEER will control the CONTRACTOR's access to EADOC by allowing access and assigning user profiles to accepted CONTRACTOR personnel. User profiles will define levels of access into the system; determine assigned function based authorizations and user privileges. Subcontractors and suppliers will be given access to EADOC by and through the CONTRACTOR. Entry of information exchanged and transferred between the CONTRACTOR and its subcontractors and suppliers on EADOC shall be the responsibility of the CONTRACTOR.

C. Joint ownership of data:
   1. Data entered in a collaborative mode (entered with the intent to share as determined by permissions and workflows within the EADOC system) by the ENGINEER and the CONTRACTOR will be jointly owned.

D. Automated system notification and audit log tracking:
   1. Review comments made (or lack thereof) by the OWNER on CONTRACTOR submitted documentation shall not relieve the CONTRACTOR from compliance with requirements of the Contract Documents. The CONTRACTOR is responsible for managing, tracking, and documenting the Work to comply with the requirements of the Contract Documents. OWNER's acceptance via automated system notifications or audit logs extends only to the face value of the submitted documentation and does not constitute validation of the CONTRACTOR 's submitted information.

E. Computer Requirements:
   1. The CONTRACTOR shall use computer hardware and software that meets the requirements of the EADOC system as recommended by EADOC LLC to access and utilize EADOC. As recommendations are modified by EADOC, the CONTRACTOR will upgrade their system(s) to meet or exceed the recommendations. Upgrading of the CONTRACTOR's computer systems will not be justification for a cost or time modification to the Contract.
   2. The CONTRACTOR shall ensure that connectivity to the EADOC system is accomplished through DSL, cable, T-1 or wireless communications systems. The minimum bandwidth requirements for using the system is 128kb/s. It is recommended a faster connection be used when uploading pictures and files into the system.
   3. EADOC currently supports Mozilla's Firefox v1.4, Apple's Safari v1.2, and Microsoft's Internet Explorer v6.0 web browsers for accessing the application.

F. CONTRACTOR responsibility:
   1. The CONTRACTOR shall be responsible for the validity of their information placed in EADOC and for the abilities of their personnel.
   2. Accepted users shall be knowledgeable in the use of computers, including Internet Browsers, email programs, cad drawing applications, and Adobe Portable Document Format (PDF) document distribution program.
   3. The CONTRACTOR shall utilize the existing forms in EADOC to the maximum extent possible. If a form does not exist in EADOC the CONTRACTOR must include a form of their own or provided by the ENGINEER as an attachment to a submittal.
   4. Adobe PDF documents will be created through electronic conversion rather than optically scanned whenever possible. The CONTRACTOR is responsible for the training of their personnel in the use of EADOC (outside what is provided by the OWNER) and the other programs indicated above as needed.

G. Connectivity problems:
   1. Provide a list of CONTRACTOR 's key EADOC personnel for the ENGINEER's acceptance. CONTRACTOR is responsible for adding and removing users from the system. The ENGINEER reserves the right to perform a security check on all potential users. The CONTRACTOR will be allowed to add additional personnel and subcontractors to EADOC.

1.03 SUBMITTALS

A. Preconstruction Submittals List of CONTRACTOR 's key EADOC personnel. Include descriptions of key personnel's roles and responsibilities for this project. CONTRACTOR should also identify their organizations administrator on the list.

PART 2 PRODUCTS

2.01 DESCRIPTION

A. EADOC project management application (no equal) Provided by EADOC LLC www.EADOCsoftware.com.

PART 3 EXECUTION

3.01 EADOC UTILIZATION

A. EADOC shall be utilized in connection with all document and information management required by these Contract Documents.

3.02 SUBMITTALS

A. Shop drawings:
   1. Shop drawing and design data documents shall be submitted PDF attachments to the EADOC submittal work flow process and form. Examples of shop drawings include, but are not limited to:
      a. Standard manufacturer installation drawings.
      b. Drawings prepared to illustrate portions of the work designed or developed by the CONTRACTOR.
      c. Steel fabrication, piece, and erection drawings.

3.03 PRODUCT DATA

A. Product catalog data and manufacturers instructions shall be submitted as PDF attachments to the EADOC submittal work flow process and form. Examples of product data include, but are not limited to:
   1. Manufacturer's printed literature.
   2. Preprinted product specification data and installation instructions.

3.04 SAMPLES

A. Sample submittals shall be physically submitted as specified in Section 01330. CONTRACTOR shall enter submittal data information into EADOC with a copy of the submittal form(s) attached to the sample. Examples of samples include, but are not limited to:
   1. Product finishes and color selection samples.
   2. Product finishes and color verification samples.
   3. Finish/color boards.
   4. Physical samples of materials.

3.05 ADMINISTRATIVE SUBMITTALS

A. All correspondence and pre-construction submittals shall be submitted using EADOC. Examples of administrative submittals include, but are not limited to:
   1. Permits.
   2. Requests for substitutions (RFS).
   3. List of contact personnel.
   4. Requests for Information (RFI).

B. Network Analysis Schedules and associated reports and updates. Each schedule submittal specified in these Contract Documents shall be submitted as a native backed-up file (.PRX or .STX) of the scheduling program being used. The schedule shall also be posted as a PDF file in the format specified in these Contract Documents.

C. Plans for safety, demolition, environmental protection, and similar activities.

D. Quality Control Plan(s), Testing Plan and Log, Quality Control Reports, Production Reports, Quality Control Specialist Reports, Preparatory Phase Checklist, Initial Phase Checklist, Field Test reports, Summary reports, Rework Items List, etc.

E. Meeting minutes for quality control meetings, progress meetings, pre-installation meetings, etc.

F. Any general correspondence submitted.

3.06 COMPLIANCE SUBMITTALS

A. Test reports, certificates, and manufacture field report submittals shall be submitted on EADOC as PDF attachments. Examples of compliance submittals include, but are not limited to:
   1. Field test reports.
   2. Quality Control certifications.
   3. Manufacturers documentation and certifications for quality of products and materials provided.

3.07 RECORD AND CLOSEOUT SUBMITTALS

A. Operation and maintenance data and closeout submittals shall be submitted on EADOC as PDF documents during the approval and review stage as specified, with actual set of documents submitted for final. Examples of record submittals include, but are not limited to:
   1. Operation and Maintenance Manuals: final documents shall be submitted as specified.
   2. Extra materials, spare stock, etc.: submittal forms shall indicate when actual materials are submitted.

3.08 CLOSEOUT ACTIVITIES

A. Training:
   1. Training to be arranged and paid for by the CONTRACTOR.
   2. Training consists of web-based seminars in conjunction with a conference call.

B. CONTRACTOR shall arrange and pay for the facilities and hardware/software required to facilitate his own training.

3.09 FINANCIAL SUBMITTALS

A. Schedule of Value, Pay Estimates, and Change Request Proposals shall be submitted on EADOC. Supporting material for Pay Estimates and Change Requests shall be submitted on EADOC as PDF attachments. Examples of compliance submittals include, but are not limited to:
   1. CONTRACTOR's Schedule of Values.
   2. CONTRACTOR's Monthly Progress Payment Requests.
   3. Contract Change proposals requested by the OWNER.

END OF SECTION

SECTION 01324

PROGRESS SCHEDULES AND REPORTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Preparation, submittal, and maintenance of computerized progress schedule and reports, contract time adjustments, and payment requests.

B. Related Sections:
   1. Section 01294 - Applications for Payment.
   2. Section 01312 - Project Meetings.
   3. Section 01770 - Close Out Procedures.

1.02 RESPONSIBLE PERSON

A. Designate, in writing and within 5 calendar days after Notice of Award, person responsible for preparation, maintenance, updating and revision of all schedules.

B. Qualifications of Responsible Person:
   1. Authority to act on behalf of CONTRACTOR.
   2. Experience in preparation of complex construction schedules for projects of similar value, size and complexity.
   3. Knowledge of CPM scheduling utilizing Primavera software.

1.03 SCHEDULING FORMAT AND SOFTWARE

A. Schedule Format: Utilize critical path method (CPM) format.

B. Prepare computerized schedule utilizing “Primavera Project Planner” or equivalent scheduling software. The CONTRACTOR shall provide one licensed copy of the scheduling software to the ENGINEER if Primavera software is not utilized.

1.04 PREPARATION

A. Preparation and submittal of Progress Schedule represents CONTRACTOR's intention to execute the Work within specified time and constraints.

B. CONTRACTOR's bid covers all costs associated with the execution of the Work in accordance with the Progress Schedule.

C. During preparation of the preliminary Progress Schedule, ENGINEER will facilitate CONTRACTOR's efforts by being available to answer questions regarding sequencing issues, scheduling constraints, interface points, and dependency relationships.

D. Prepare schedule utilizing Precedence Diagramming Method (PDM).

E. Prepare schedule utilizing activity durations in terms of working days. Do not exceed 15 working day duration on activities except concrete curing, submittal review and equipment fabrication and deliveries. Where duration of continuous work exceeds 15 working days, subdivide activities by location, stationing, or other sub-element of the Work.

F. Failure to include an activity required for execution of the Work does not excuse CONTRACTOR from completing the Work and portions thereof within specified times and at price specified in Agreement.

G. Reference schedule to working days with beginning of Contract Time as Day "1."

1.05 SUBMITTAL OF PROGRESS SCHEDULES

A. Submit preliminary and complete Progress Schedule pursuant to Section 00700, General Conditions.

B. Submit the Following Items:
   1. One reproducible sepia copy of each sheet.
   2. Three prints of each sheet.
   3. Three Computer Printouts as Follows:
      a. List of activity descriptions and numbers.
      b. List of all activities sorted numerically identifying predecessor/successor information.
      c. List of all activities sorted numerically identifying duration, early start, late start, early finish, late finish, and total float.
      d. List of all activities sorted by total float identifying duration, early start, late start, early finish, and late finish.
      e. CD-ROM containing the computerized CPM Schedule data.
      f. Three prints of Summary Schedule.

1.06 NETWORK DETAILS AND GRAPHICAL OUTPUT

A. Produce a clear, legible, and accurate calendar based, time scaled, and graphical network diagram. Group activities related to the same physical areas of the Work. Produce the network diagram based upon the early start of all activities.

B. Include for each activity, the description, activity number, estimated duration in working days, total float and all activity relationship lines.

C. Illustrate order and interdependence of activities and sequence in which Work is planned to be accomplished. Incorporate the basic concept of the precedence diagram network method to show how the start of one activity is dependent upon the start or completion of preceding activities and its completion restricts the start of following activities.

D. Indicate the critical path for the project.

E. Delineate the specified contract duration and identify the planned completion of the work as a milestone. The time-period between these two dates, if any, shall be considered contract float. Contract float is for the mutual benefit of both the OWNER and the CONTRACTOR. Changes to the project that can be accomplished within this available period of float may be made by the OWNER without extending the

contract time, by utilizing the float. Likewise, the CONTRACTOR may utilize the float to offset delays other than delays caused by the OWNER. The mutual use of this float shall continue until all available float shown by the Progress Schedule has been utilized by either the OWNER or the CONTRACTOR, or both. At that time, extensions of the contract time will be granted by the OWNER for valid OWNER-caused delays which affect the planned completion date and which have been properly documented and demonstrated by the CONTRACTOR.

F. Identify system shutdown dates, system tie-in dates, specified interim completion or milestone dates and contract completion date as milestones. Include, in addition to Construction Activities:
   1. Submission dates and review periods for major equipment submittals, and shoring submittals.
      a. Shoring Reviews: Allow 4-week review period for each shoring submittal.
   2. Any activity by the OWNER or the ENGINEER that may affect progress or required completion dates.
   3. Equipment deliveries.
   4. Approvals required by regulatory agencies or other third parties.
   5. Monitoring periods for endangered species.
   6. Work restrictions for work in the San Joaquin River.
   7. Irrigation season.

G. Produce network diagram on 22 inch by 34 inch sheets with grid coordinate system on the border of all sheets utilizing alpha and numeric designations.

H. Identify the Execution of the following, omitting items not applicable to the Work:
   1. Mobilization.
   2. Submittal review.
   3. Equipment and materials procurement.
   4. Excavation.
   5. Shoring design and submission of detailed shoring submittals. Identify submission as a milestone.
   6. Shoring review, shoring materials procurement, shoring installation and shoring removal.
   7. Backfill and compaction.
   8. Dewatering.
   9. Grading, subbase, base, and paving.
   10. Fencing and landscaping.
   11. Concrete, including installation of forms and reinforcement, placement of concrete, curing, stripping, finishing and patching.
   12. Tests for leakage of concrete structures intended to hold water.
   13. Metal fastenings, framing, structures, and fabrications.
   14. Waterproofing and dampproofing, insulation, roofing and flashing, and sealants.
   15. Doors and windows, including hardware and glazing.
   16. Finishes including coating and painting, flooring, ceiling, and wall covering.
   17. Building specialties.
   18. Process equipment, including identification of ordering lead-time, factory testing and installation.
   19. Pumps and drives, including identification of ordering lead time, factory testing and installation.

20. Other mechanical equipment including fans and heating, ventilating, and air conditioning equipment.
21. Trenching, pipe laying, and trench backfill and compaction.
22. Piping, fittings and appurtenances, including identification of ordering and fabrication lead time, layout, installation and testing.
23. Valves, gates and operators, including identification of order lead-time, installation and testing.
24. Plumbing specialties.
25. Electric transmission, service, and distribution equipment, including identification of ordering lead-time, and factory testing.
26. Other electrical work including lighting, heating and cooling, and special systems, including identification of ordering lead-time.
27. Instrumentation and controls, including identification of ordering lead-time.
28. Preliminary testing of equipment, instrumentation and controls.
29. Final testing, including preparation time.
30. Operational testing period.
31. Punch list work.
32. Operation and maintenance training.
33. Demobilization.

1.07 SUMMARY SCHEDULE

A. Provide Summary Schedule, which consolidates groups of activities associated with Major Items of Work listed in Unit Prices. Summary Schedule is intended to give an overall indication of the project schedule without a large amount of detail.

1.08 WEATHER DAY ALLOWANCE

A. Include as a separate identifiable activity on the critical path, an activity labeled "Weather Days Allowance." Insert this activity at the end of the schedule.

B. Duration of Weather Days Allowance is specified in Conditions of the Contract.

C. Insert an activity in critical path to reflect weather day occurrences when weather days are experienced and accepted by ENGINEER. Identify this activity as a weather delay.

D. Reduce duration of Weather Days Allowance activity as weather delays are experienced and inserted into the Schedule. Remaining weather days in Weather Day Allowance at completion of project is considered float.

1.09 REVIEW AND ACCEPTANCE OF SCHEDULES

A. ENGINEER will review schedule to ascertain compliance with specified project constraints, compliance with milestone dates, reasonableness of durations and sequence, accurate inter-relationships and completeness.

B. ENGINEER and OWNER will issue written comments following completion of preliminary review.

C. Revise and resubmit schedule in accordance with ENGINEER’s comments, or request joint meeting to resolve objections.

D. When schedule reflects OWNER's and CONTRACTOR's agreement of project approach and sequence, schedule will be accepted by OWNER as the base schedule. Use accepted schedule for planning, organizing and directing the work and for reporting progress. Provide all items specified in Article, "Submittal of Project Schedules."

1.10 UPDATING THE SCHEDULE

A. Update the schedule prior to progress meetings. Report significant changes in Progress Meeting.

B. Submit updated schedule and materials specified under Article "Submittal of Progress Schedules", 5 days before the progress meeting.

C. Progress payment requests may not be processed by ENGINEER if updated schedule has not been submitted or if the updated schedule is found to be unacceptable.

D. Prepare update using most recent accepted version of schedule. Include:
   1. Actual start dates of activities that have been started.
   2. Actual finish dates of activities that have been completed.
   3. Percentage of completion of activities that have been started but not finished.
   4. Actual dates on which milestones were achieved.
   5. Activities shall not be updated by inputting percent complete figures only without also inputting actual dates.

E. Submit written narrative report in conjunction with each updated schedule. Describe:
   1. Activities added to or deleted from schedule. Identify added activities in manner distinctly different from original activity designations.
   2. Changes in sequence or estimated duration of activities.
   3. Current or anticipated problems and delays affecting progress, impact of these problems and delays and measures taken to mitigate impact.
   4. Assumptions made and activities affected by incorporating change order work into the schedule.

F. Identify overall progress of each Major Item of Work in the Summary Schedule.

1.11 REVISIONS TO SCHEDULE

A. Submit revised schedule within 5 days:
   1. When delay in completion of any activity or group of activities indicates an overrun of the contract time or milestone dates by 20 working days or 5 percent of the remaining duration, whichever is less.
   2. When delays in submittals, deliveries, or work stoppages are encountered making necessary the replanning or rescheduling of activities.
   3. When the schedule does not represent the actual progress of activities.
   4. When any change to the sequence of activities, the completion date for major portions of the work, or when changes occur which affect the critical path.
   5. When Contract modification necessitates schedule revision, submit schedule analysis of change order work with cost proposal.

B. Submit revised schedule and materials as specified under Article "Submittals of Progress Schedules."

C. Make revisions on most recently accepted version of schedule.

1.12 WEEKLY SCHEDULE

A. Submit to ENGINEER, on the last working day of every week, the CONTRACTOR's Plan of Activities for the following 2 weeks.

B. The format of the Weekly Schedule shall be as agreed upon between the CONTRACTOR and the ENGINEER.

1.13 SCHEDULE OF VALUES

A. Submit, in conjunction with the Progress Schedule, a Schedule of Values identifying costs of Major Items of Work as generated by the cost loaded schedule. Equate the aggregate of these costs to the Lump Sum Contract Price.

1.14 ADJUSTMENT OF CONTRACT TIMES

A. Contract time will be adjusted only for causes specified in Contract Documents.

B. Submit justification, construction schedule data, and supporting evidence with each request for contract time adjustment.

C. Submit Proof That the Contract Completion Date Has Been Affected By:
   1. Inserting new activities associated with change orders or OWNER - caused delays into the schedule,
   2. Revising activity logic, or
   3. Revising activity durations.

D. When a delay to the project as a whole can be avoided by revising preferential sequencing or logic, and the CONTRACTOR chooses not to implement the revisions, the CONTRACTOR will be entitled to a time extension and no compensation for extended overhead.

E. Indicate clearly that the CONTRACTOR has used, in full, all Contract Float available for the work involved in the request, including any float that may exist between the CONTRACTOR's planned completion date and the Contract completion date. Utilize the latest version of the Progress Schedule accepted at the time of the alleged delay, and all other relevant information, to determine the adjustment of the contract time.

F. Contract Float shall be for the mutual benefit of the OWNER and the CONTRACTOR. Adjustment of the Contract Times will be granted only when the Contract Float has been fully utilized and only when the revised date of completion of the Work has been pushed beyond the contract completion date. Adjustment of the Contract Times will be made only for the number of days that the planned completion of the work has been extended.

G. Actual delays in activities which do not affect the critical path work or which do not move the CONTRACTOR's planned completion date beyond the Contract completion date will not be the basis for an adjustment to the contract time.

H. The CONTRACTOR shall not be entitled to job-site or home office overhead beyond the CONTRACTOR's originally planned occupancy of the site if completion of the project occurs within the specified contract time.

I. When an adjustment of the Contract Time is requested due to OWNER-requested changes to the Project, include, as part of each change order proposal, that portion of the latest version of the accepted Progress Schedule which illustrates logic revisions, duration changes, and other impacts to the Progress Schedule due to the proposed Change Order work in question.

J. Notify ENGINEER of a request for contract time adjustment. Submit request in accordance with ARTICLE 10 - CHANGES IN THE WORK; CLAIMS, of the General Conditions, claims and Disputes. In cases where the CONTRACTOR does not submit a request for contract time adjustment for a specific change order, delay, or CONTRACTOR request within the specified period of time, then it is mutually agreed that the particular change order, delay, or CONTRACTOR request has no time impact on the Contract completion date and no time extension is required.

K. The ENGINEER will, within 30 days after receipt of a contract time adjustment, request any supporting evidence, review the facts and advise the CONTRACTOR in writing.

L. The new Progress Schedule data, if accepted by the OWNER, shall be included in the next monthly updating of the schedule.

M. When the OWNER has not yet made a final determination as to the adjustment of the contract time, and the parties are unable to agree as to the amount of the adjustment to be reflected in the Progress Schedule, reflect that amount of time adjustment in the Progress Schedule as the ENGINEER may accept as appropriate for such interim purpose. It is understood and agreed that any such interim acceptance by the ENGINEER shall not be binding and shall be made only for the purpose of continuing to schedule the Work, until such time as a final determination as to any adjustment of the contract time acceptable to the ENGINEER has been made. Revise the Progress Schedule prepared thereafter in accordance with the final decision.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01329

SAFETY PLAN

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Development and maintenance of a Construction Safety Plan.

1.02 CONSTRUCTION SAFETY PLAN

A. Detail the Methods and Procedures to comply with California Labor Code Section 6401.7, Federal, and Local Health and Safety Laws, Rules and Requirements for the duration of the Contract Times. Include the following:
   1. Identification of the Certified or Licensed Safety Consultant who will prepare, initiate, maintain and supervise safety programs, and procedures.
   2. Procedures for providing workers with an awareness of safety and health hazards expected to be encountered in the course of construction.
   3. Safety equipment appropriate to the safety and health hazards expected to be encountered during construction. Include warning devices, barricades, safety equipment in public right-of-way and protected areas, and safety equipment used in multi-level structures.
   4. Methods for minimizing employees' exposure to safety and health hazards expected during construction.
   5. Procedures for reporting safety or health hazards.
   6. Procedures to follow to correct a recognized safety and health hazard.
   7. Procedures for investigation of accidents, injuries, illnesses and unusual events that have occurred at the construction site.
   8. Periodic and scheduled inspections of general work areas and specific workstations.
   9. Training for employees and workers at the jobsite.
   10. Methods of communication of safe working conditions, work practices and required personal protection equipment.

B. Assume responsibility for every aspect of Health and Safety on the jobsite, including the health and safety of Subcontractors, suppliers, and other persons on the jobsite.
   1. Forward available information and reports to the Safety Consultant who shall make the necessary recommendations concerning worker health and safety at the jobsite.
   2. Employ additional health and safety measures specified by the Safety Consultant, as necessary, for workers in accordance with OSHA guidelines.

C. Transmit to OWNER and ENGINEER copies of reports and other documents related to accidents or injuries encountered during construction.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01330

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements and procedures for submitting Shop Drawings, Product Data, Samples, other submittals relating to products, and as specified in individual sections.

1.02 DEFINITIONS

A. Manufacturer's Instructions: Instructions, stipulations, directions, and recommendations issued in printed form by the manufacturer of a product addressing handling, installation, erection, and application of the product; Manufacturers Instructions are not prepared especially for the Work.

B. Shop Drawings: Drawings, diagrams, schedules, and other data specially prepared for the Work to illustrate some portion of the Work.

C. Product Data: Illustrations, standard schedules, performance charts, brochures, diagrams and other information to illustrate materials or equipment for some portion of the Work.

D. Samples: Physical examples which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.

E. Special Samples: Physical examples which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged, and will be incorporated in the Work.

1.03 PROCEDURES

A. Deliver submittals to ENGINEER at address listed on cover of Project Manual, unless another mutually agreeable place is designated.

B. Submit submittals in ample time for each to serve submittals' intended purpose.

C. Submit submittals via electronic based document management system per specification Section 01322.

D. Provide or furnish products and execute the Work in accordance with accepted submittals, unless in conflict with Contract Documents.

E. When minor deviations from Contract Documents are accepted, modify Contract Documents in accordance with the Conditions of the Contract.

1.04 SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

A. Submit Shop Drawings, Product Data, Samples, and other pertinent information in sufficient detail to show compliance with specified requirements. Submittals shall list any deviations from the Contract Documents.

B. Check, verify, and revise submittals as necessary to bring them into conformance with Contract Documents and actual field conditions.
   1. Determine and verify quantities, dimensions, specified design and performance criteria, materials, catalog numbers, and similar data.
   2. Coordinate submittal with other submittals and with the requirements of the Contract Documents.

C. Shop Drawings: Submit 5 copies when electronic submission is not possible (i.e. O&M manuals over 200 pages). One will be returned with reviewer's comments and stamp.

D. Product Data and Manufacturer's Instructions: Excise or cross out non-applicable information and clearly mark applicable information with citations to and terminology consistent with Contract Documents.

E. Samples: Submit 2 samples labeled with reference to applicable Contract Documents. Label will be returned with reviewer's selection when appropriate, comments and stamp. Samples will not be returned unless return is requested in writing and additional sample is submitted.

F. Special Samples: Submit 1 sample labeled with reference to applicable Contract Documents. Sample and 1 label will be returned for installation in the Work.

G. Assume risk of expense and delays when proceeding with work related to required submittals without review and acceptance.

H. Resubmittals shall include a cover letter to explain how the Engineer’s comments from the previous submittal were addressed. The cover letter shall address each comment in detail. Resubmittals that do not include the cover letter will not be reviewed.

1.05 MANUFACTURER'S INSTRUCTIONS

A. Submit manufacturer's instructions whenever made available by manufacturers and when installation, erection, or application in accordance with manufacturer's instructions are required by the Specifications.

B. Submit manufacturer's instructions prior to installation, erection, or application of equipment and other project components. Submit manufacturer's instructions in accordance with requirements for Product Data.

1.06 ENGINEER'S REVIEW

A. ENGINEER's review of submittals shall not release CONTRACTOR from CONTRACTOR's responsibility for performance of requirements of Contract Documents. Neither shall ENGINEER's review release CONTRACTOR from

fulfilling purpose of installation nor from CONTRACTOR's liability to replace defective work.

B. Do not consider submittals as Contract Documents. Purpose of submittals is to demonstrate how CONTRACTOR intends to conform with the design concepts.

C. ENGINEER's review of shop drawings, samples, or test procedures will be only for conformance with design concepts and for compliance with information given in Contract Documents.
   1. ENGINEER's review does not extend to:
      a. Accuracy of dimensions, quantities, or performance of equipment and systems designed by CONTRACTOR.
      b. CONTRACTOR's means, methods, techniques, sequences, or procedures except when specified, indicated on the Drawings, or required by Contract Documents.
      c. Safety precautions or programs related to safety which shall remain the sole responsibility of the CONTRACTOR.

D. Except as may be provided in subsequent specifications, a submittal will be returned within 30 days. When a submittal cannot be returned within that period, ENGINEER will, within a reasonable time after receipt of the submittal, give notice of the date by which that submittal will be returned.

E. For submittals returned Resubmittal Not Required - Make Corrections Noted / See all Comments, Contractor shall incorporate all review comments into the work, but resubmittal of an amended submittal package is not required.

F. For submittals returned Correct and Resubmit – Make Corrections Noted / See All Comments, Contractor shall incorporate the review comments into a complete revised package, and resubmit it for review.

G. For submittals returned Rejected- See All Comments, Contractor shall develop a new submittal package with materials, equipment, methods, etc. that meet the requirements of the Contract Documents.

H. For submittals returned Submittal Not Reviewed, Filed for Record, no further action is required by the Contractor for this submittal.

I. ENGINEER will be entitled to rely upon the accuracy or completeness of designs, calculations, or certifications made by licensed professionals accompanying a particular submittal whether or not a stamp or seal is required by Contract Documents or Laws and Regulations.

J. Costs incurred by OWNER as a result of additional reviews of a particular submittal after the second time it has been reviewed shall be borne by CONTRACTOR. Reimbursement to OWNER will be made by deducting such costs from CONTRACTOR's subsequent partial payments.

1.07 MINOR OR INCIDENTAL PRODUCTS AND EQUIPMENT SCHEDULES

A. Shop Drawings of minor or incidental fabricated products will not be required, unless requested.

B. Submit tabulated lists of minor or incidental products showing the names of the manufacturers and catalog numbers, with Product Data and Samples as required to determine acceptability.

1.08 SUBMITTALS FOR INFORMATION OR RECORD ONLY

A. Mill Test Reports:
   1. Submit certified copies of factory and mill test reports for record only. No copies will be returned.
   2. Do not incorporate Products in the Work which have not passed testing and inspection satisfactorily.
   3. Pay for mill and factory tests.

B. Reinforcing Steel:
   1. Submit reinforcing steel fabrication and setting drawings for information or record only. No copies will be returned.
   2. Note deviations and variations as specified for Shop Drawings.

C. Tunnels, Jacking, and Boring
   1. Submit detailed description of tunneling or jacking operations as Shop Drawings.
   2. Include indications of:
      a. Equipment to be used.
      b. Detailed schedule for performing the Work.
      c. Safety precautions to be taken.
      d. Compliance with applicable Laws and Regulations.
      e. Monitoring roadway movement.
      f. Contingency plan for correcting movement.
      g. Other pertinent information on items required to perform the Work.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01340

PHOTOGRAPHIC AND VIDEOGRAPHIC DOCUMENTATION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes requirements for:
   1. Pre-construction photographs.
   2. Pre-construction videos.
   3. Post-construction photographs.
   4. Post-construction videos.

B. The purpose of the photographs and videos is to document the condition of the facilities prior to the CONTRACTOR beginning work at the Project site and after Substantial Completion of the Work.

C. Areas to be photographed and videoed shall include the site of the Work and all existing facilities either on or adjoining the Project site, including the interior of existing structures, that could be damaged as a result of the CONTRACTOR's Work.

D. The scope of the photographic and videographic documentation shall be the sole responsibility of the CONTRACTOR, but shall be acceptable to the ENGINEER.

E. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
      a. Section 01312 - Project Meetings.
      b. Section 01770 - Closeout Procedures.

1.02 SUBMITTALS

A. Key plan: Submit key plan of Project site with notation of vantage points marked for location and direction of each photograph. Include the same label information as the corresponding set of photographs.

B. Photographs:
   1. Paper media:
      a. Submit 4 prints of each photographic view within 7 days of taking photographs.
      b. Format:
         1) 4- by 6-inch photos.

2) Photographs shall be enclosed in clear plastic sleeves that are punched for standard 3-ring binders.

c. Identification: On back or below each print, provide the following information:
1) Name of project.
2) Date photograph was taken.
3) Description of vantage point, indicating location and direction by compass point.

2. Digital media:
a. Provide photos as individual, indexed JPG files with the following characteristics:
1) Compression shall be set to preserve quality over file size.
2) Highest resolution JPG images shall be submitted. Resizing to a smaller size when high resolution JPGs are available shall not be permitted.
3) JPG image resolution shall be 800 by 600 or higher.
4) Images shall have rectangular clean images. Artistic borders, beveling, drop shadows, etc., are not permitted.

C. Videos:
1. Submit 4 copies of each video within 7 days of recording.
2. Videos shall be submitted in a digital color video format on a DVD suitable for playback on a standard DVD player.
3. Identification: On each copy provide a label with the following information:
a. Name of project.
b. Date video was recorded.

D. Pre-construction photographs and videos: Submit prior to beginning work at the Project site or prior to the Preconstruction Conference specified in Section 01312, whichever occurs earlier.

E. Post-construction photographs and videos: Submit with project closeout documents as specified in Section 01770.

PART 2 PRODUCTS

2.01 MEDIA

A. Paper media:
1. Commercial grade, glossy surface, acid-free photographic paper.

B. Digital media:
1. 120 millimeters, 700-MB, 80-minute CD compatible with Microsoft Windows XP.

C. Videos:
1. 120 millimeters, DVD compatible with standard DVD players.

PART 3 EXECUTION

3.01 GENERAL

A. Photographs (paper and digital media):
   1. Date stamp: Unless otherwise indicated, date and time stamp each photograph as it is being taken so stamp is integral to photograph.

B. Videos:
   1. Display continuous running time.
   2. At start of each video recording, record weather conditions from local newspaper or television and the actual temperature reading at Project site.

END OF SECTION

SECTION 01350

SPECIAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Special procedures for locating and verifying concealed existing facilities.

1.02 CONCEALED EXISTING FACILITIES

A. Verify locations of utilities and facilities, which may exist by consulting with the OWNER, utility companies, and Underground Services Alert (USA) or other service available in area of Project.
   1. Abide by easement and right-of-way restrictions.

B. Notify the OWNER, owners of facilities when the Work will be in progress. Make arrangements for potential emergency repairs in accordance with requirements of owners of utility facilities, including individual or residential facilities.

C. Assume responsibility for repair of facilities damaged by performance of the Work.

D. Expose sanitary and storm sewers, water, gas, electric, telephone utility lines, and other underground facilities indicated to permit survey location prior to commencement of Work in affected area.
   1. Expose in ample time to permit relocation of interfering utilities with minimum delaying effect on contract time.

E. Work required for raising, lowering, or relocating utilities not indicated will be performed by affected utility owners or as part of the Work at option of affected owners of utilities.
   1. When part of the Work, perform work in accordance with standards of affected utility owner, and adjustment to Contract Price and Contract Times will be made as stipulated in conditions of contract.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01352

ALTERATION PROJECT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements and procedures for performing alterations to existing facilities.

B. Related Sections:
   1. Section 01140 - Work Restrictions.
   2. Section 01500 - Temporary Facilities and Controls.
   3. Section 01732 - Cutting and Patching.
   4. Section 01770 - Closeout Procedures.
   5. Section 02222 - Building Demolition.

1.02 SUBMITTALS

A. Alterations Schedule: Submit in accordance with requirements for Progress Schedules.

1.03 SEQUENCE AND SCHEDULES

A. Perform Work in sequences and within times specified in Section 01140.

B. Submit separate detailed sub-schedule for alterations, coordinated with construction schedules. Indicate:
   1. Each stage of Work and dates of occupancy of areas.
   2. Date of Substantial Completion for each area of alterations as appropriate.
   3. Trades and Subcontractors employed in each stage.

1.04 WORK INVOLVED WITH EXISTING OPERATING FACILITIES

A. Perform the Work while Outfall Pipeline remains in service.

B. Do not jeopardize operation or materially reduce efficiency of existing facility.

C. Coordinate the Work with operation of the facility.
   1. Do not begin alterations of designated portions of the Work until specific permission has been granted in writing by OWNER in each case.
   2. ENGINEER will coordinate the planned procedure with facility manager.
   3. Complete as quickly as possible and with as little delay as possible, connections to existing equipment and utilities, and other operations that interfere with the operation of existing facility.

D. Operational functions of the facility that are required to be performed to facilitate the Work will be performed by facility personnel only.

E. When necessary for the proper operation or maintenance of portions of the facility, reschedule Work operations so that the Work will not conflict with necessary operations or maintenance of the facility.

1.05 ALTERATIONS, CUTTING, AND PROTECTION

A. Assign relocation, removal, cutting, and patching to trades qualified to perform in manner, which causes least damage, and provide means of returning surfaces to appearance of new construction.

B. Provide weather protection, waterproofing, heat and humidity control as needed to prevent damage to remaining existing and new construction.

1.06 SALVAGE MATERIALS

A. Owner does not wish to salvage any equipment or materials.

1.07 PREPARATION

A. Identify existing materials, which shall be patched, extended, or matched.

B. In addition to demolition specified in Section 02222, and Construction specifically indicated on the Drawings, cut, move or remove items as necessary to provide access or to allow alteration and new construction to proceed, including:
   1. Repair or removal of hazardous or unsanitary conditions.
   2. Removal of abandoned items and items serving no useful purpose, such as abandoned piping, conduit and wiring.
   3. Removal of unsuitable or extraneous materials not marked for salvage, such as abandoned furnishings and equipment, and debris such as rotted wood, rusted metals, and deteriorated concrete.
   4. Cleaning of surfaces and removal of surface finishes needed to install new construction and finishes.
   5. Disposal of items removed and not salvaged.

C. Cut and remove minimum amount of existing construction in manner, which avoids damage to adjacent work.

D. Cut finish surfaces such as masonry, tile, plaster, and metals by methods which terminate surfaces in straight line at natural points of division.

E. Perform cutting and patching as specified in Section 01732.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01354

HAZARDOUS MATERIAL PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Procedures required when encountering hazardous materials at the Work site.

1.02 REFERENCES

A. California Health and Safety Code, Section 25117.

B. State of California Code of Regulations (CCR).
   1. Title 8. Industrial Relations.
      a. Division 1. Department of Industrial Relations.
   2. Title 22. Social Security
      a. Division 4. Environmental Health.
      b. Division 4.5. Environmental Health Standards for the Management of Hazardous Waste.

C. United States Code of Federal Regulation (CFR), Title 29 and Title 40.
   1. 29 CFR 1910.1000.
   2. 29 CFR 1910.134.

D. Steel Structure Painting Council:
   1. Guide 61 - Guide for Containing Debris Generated During Paint Removal Operations.
   2. Guide 61 - Description of Methods and Systems.
   3. Guide 71 - Guide for the Disposal of Lead-Contamination Surface Preparation Debris.
   4. PA Guide 3.

1.03 SUBMITTALS

A. Submit laboratory reports, hazardous material removal plans, and certifications.

1.04 HAZARDOUS MATERIALS PROCEDURES

A. Hazardous materials are those defined by California Health and Safety Code, Section 25117.

B. When Hazardous Materials Have Been Found:
   1. Prepare and initiate implementation of plan of action.
   2. Notify immediately OWNER, ENGINEER, and other affected persons.
   3. Notify such agencies as are required to be notified by Laws and Regulations with the times stipulated by such Laws and Regulations.

4. Designate a Certified Industrial Hygienist to issue pertinent instructions and recommendations for protection of workers and other affected persons' health and safety.
5. Identify and contact subcontractors and licensed personnel qualified to undertake storage, removal, transportation, disposal, and other remedial work required by, and in accordance with laws and regulations.

C. Forward to ENGINEER, copies of reports, permits, receipts, and other documentation related to remedial work.

D. Assume responsibility for worker health and safety, including health and safety of Subcontractors and their workers.
1. Instruct workers on recognition and reporting of materials that may be hazardous.

E. File requests for adjustments to Contract Times and Contract Price due to the finding of Hazardous Materials in the Work site in accordance with paragraph 4.06, General Conditions.
1. Minimize delays by continuing performance of the Work in areas not affected by hazardous materials operations.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01355

STORMWATER POLLUTION PREVENTION
CONSTRUCTION ACTIVITIES - BEST MANAGEMENT PRACTICES

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Requirements for preparation and implementation of the Stormwater Pollution Prevention Plan for the CONTRACTOR's construction activities for the purposes of applying and obtaining a State of California General Construction Activity Stormwater Permit. The permit authorizes the discharge of stormwater associated with construction activities from construction site.

1.02 REFERENCES

A. National Pollutant Discharge Elimination System (NPDES).

B. State of California, State Water Resources Control Board, Regional Water Quality Control Board (SWRCB).
   1. Links for Permit Requirements for Linear projects: http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml
   2. Construction Permits Requirements can be found: http://www.swrcb.ca.gov/water_issues/programs/stormwater/constpermits.shtml

C. United States Code of Federal Regulation (CFR):
   1. 40 - Protection of Environmental :
      a. 117 - Determination of reportable quantities for hazardous substance.
      b. 302 - Designation, reportable quantities, and notification.

1.03 SUBMITTALS

A. For the purposes of bidding, it is assumed that this project is a: Risk Level 2 as defined under the SWRCB permit conditions.
   1. The contractor is to pay for all requirements, fees, engineering, and other fees related to SWPPP permits.
   2. Contractor is to confirm the risk level for the project.

B. Construction General Permit:
   1. The CONTRACTOR shall prepare and submit all Permit Registration Documents (PRD's) to the State of California Water Resources Control Board to obtain approval of the Construction General Permit (CGP).
   2. The PRD's shall include but are not limited to the Notice of Intent (NOI), Risk Determination Worksheet, Site Maps, Stormwater Pollution Prevention Plan (SWPPP), Annual Fee's and Owner Certification. It shall also include all other reports, calculations, studies, exhibits, and documentation required to obtain the CGP.

3. The PRD's and Annual Reports shall be electronically submitted into the Stormwater Multiple Application and Report Tracking System (SMARTS).
4. The CONTRACTOR shall also be responsible for maintaining the existing CGP active throughout the duration of the project. This shall include preparation of:
    a. Rain Event Action Plans (REAPs),
    b. Testing reports,
    c. Water quality testing reports,
    d. NAL reporting,
    e. Inspections reports required by the permit,
    f. Monitoring and all other items as required by the CGP.
5. All CGP documents shall be submitted to the OWNER for reference and a copy shall be located on site at all times.

C. Pollution Prevention Plan:
1. Prepare and submit a Stormwater Pollution Prevention Plan (SWPPP) in accordance with Section A of the General Construction Activity Stormwater Permit to the OWNER for reference.
2. Prepare and submit a monitoring program and reporting plan in accordance with Section B of the General Construction Activity Stormwater Permit to the OWNER for reference.
3. Submit to the OWNER for reference a Stormwater Pollution Prevention Plan detailing the placement of physical Best Management Practices (BMPs) required for installation and the methods used to comply with those BMPs directed at operational procedures, Monitoring Program, and Reporting Plan.
4. The plan shall specifically address and detail changes from the alternatives called out in this Section. The CONTRACTOR's preferred techniques shall show how it will comply with the stated objectives of the program.

D. The CONTRACTOR shall submit a copy of the BMP Handbook with each BMP to be utilized check marked to show compliance or marked to show deviation.

E. The entire plan shall be kept and maintained by the CONTRACTOR on the construction site during the duration of the project.

F. The CONTRACTOR shall be responsible for taking the proper actions to prevent contaminants and sediments from entering the storm sewer drainage system should any unforeseen circumstance occur. The CONTRACTOR shall take immediate action if directed by the ENGINEER, or if the CONTRACTOR observes contaminants and/or sediments entering the storm drainage system, to prevent further stormwater from entering the system.

1.04 REGULATORY REQUIREMENTS

A. The CONTRACTOR shall comply with the State Water Resources Control Board, Regional Water Quality Control Board, county, city, and other local agency requirements regarding stormwater discharges and management.

B. The CONTRACTOR shall not begin any construction work until the OWNER receives the State of California General Construction Activity Stormwater Permit. The CONTRACTOR shall allow the OWNER 30 days to obtain this permit after receipt of the information listed below.

C. The CONTRACTOR shall comply with the following prohibitions and limitations, which are contained in the Stormwater Permit:
   1. Discharge prohibitions:
      a. Discharges of materials other than stormwater, which are not otherwise regulated by a NPDES permit, to a separate stormwater sewer system or water of the nation are prohibited.
      b. Stormwater discharges shall not cause or threaten to cause pollution, contamination (including sediment), or nuisance.
      c. Stormwater discharges regulated by this general permit shall not contain a hazardous substance equal to or in excess of a reportable quantity listed in 40 CFR 117 and 40 CFR 302.
   2. Receiving water limitations:
      a. Stormwater discharges to any surface or groundwater shall not adversely impact human health or the environment.
      b. Stormwater discharge shall not cause or contribute to a violation of any applicable water quality standards contained in the California Ocean Plan, Inland Surface Waters and Enclosed Bays and Estuaries Plan, or the applicable Regional Water Board's Basin Plan.

D. Requirements:
   1. In order to comply with the permit mandates the Stanislaus County has developed a County-Wide Stormwater Pollution Prevention Program and summary of Best Management Practices (BMPs) that are suggested to be utilized by the CONTRACTOR. BMPs are measures or practices used to reduce the amount of pollution entering surface water. BMPs may take the form of a process, activity, or physical structure. Some BMPs are simple and can be put into place immediately, while others are more complicated and require extensive planning or space. They may be inexpensive or costly to implement. No additional compensation shall be made for implementation of BMPs.

1.05 STORMWATER POLLUTION PREVENTION PLAN IMPLEMENTATION

A. The CONTRACTOR shall implement all activities required by the General Permit and as detailed in the Stormwater Pollution Prevention Plan, Monitoring Program, and Reporting Plan.

1.06 NON-STORMWATER MANAGEMENT

A. The Stormwater Pollution Prevention Plan shall discuss any non-stormwater sources (i.e., landscaping irrigation, pipe flushing, street washing, and dewatering). In addition, the Plan shall include standard observation measures and best management practices, including best available technologies economically achievable and best conventional pollutant control technologies that are to be implemented in order to reduce the pollutant loading to the waters.

1.07 AMENDMENTS

A. The CONTRACTOR shall amend the Stormwater Pollution Prevention Plan, Monitoring Program, and Reporting Plan whenever there is a change in construction or operations which may affect the discharge of pollutants to stormwater.

B. The Stormwater Pollution Prevention Plan shall also be amended if it is in violation of any conditions of the general permit or has not achieved the general objective of reducing pollutants in stormwater discharges.

C. All amendments shall be completed at no additional cost to the OWNER.

1.08 ANNUAL SUMMARY

A. The CONTRACTOR shall submit to the Regional Water Quality Control Board an annual summary report including but not limited to: construction activities; project status; and documentation of non-stormwater discharge. The report shall be in accordance with all Regional Water Quality Control Board requirements.

1.09 NOTICE OF TERMINATION

A. The CONTRACTOR shall submit to the State Water Resources Control Board, a Notice of Termination upon completion of all construction activities, in accordance with Section C of the General Construction Activity Stormwater Permit.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Nonhazardous material/waste management:
   1. Designated area: The CONTRACTOR shall propose designated areas of the project site, for approval by the ENGINEER, suitable for material delivery, storage, and waste collection that, to the maximum extent practicable, are near construction entrances and away from catch basins, gutters, drainage courses, and creeks.
   2. Granular material:
      a. The CONTRACTOR shall store granular material at least 10 feet away from catch basin and curb returns.
      b. The CONTRACTOR shall not allow granular material to enter storm drains, creeks, or rivers.
      c. When rain is forecast within 24 hours or during wet weather, the ENGINEER may require the CONTRACTOR to cover granular material with a tarpaulin and to surround the material with sand bags.
   3. Dust control: The CONTRACTOR shall use reclaimed water to control dust on a daily basis or as directed by the CONSTRUCTION MANAGER.
   4. Street sweeping: At the end of each working day or as directed by the ENGINEER, the CONTRACTOR shall clean and sweep roadways and on-site paved areas of all materials attributed to or involved in the work. The CONTRACTOR shall not use water to flush down streets in place of street sweeping.

B. Spill prevention and control:

1. The CONTRACTOR shall keep a stockpile of spill cleanup materials, such as rags or absorbents, readily accessible on-site.
2. The CONTRACTOR shall immediately contain and prevent leaks and spills from entering storm drains, and properly clean up and dispose of the waste and cleanup materials. If the waste is hazardous, the CONTRACTOR shall dispose of hazardous waste only at authorized and permitted treatment, storage, and disposal facilities, and use only licensed hazardous waste haulers to remove the waste off-site, unless quantities to be transported are below applicable threshold limits for transportation specified in State and Federal regulations.
3. The CONTRACTOR shall not wash any spilled material into streets, gutters, storm drains, creeks, or rivers and shall not bury spilled hazardous materials.
4. The CONTRACTOR shall report any hazardous materials spill to the OWNER and ENGINEER and to all applicable regulatory agencies.

C. Vehicle/equipment cleaning:
1. The CONTRACTOR shall not perform vehicle or equipment cleaning on-site or in the street using soaps, solvents, degreasers, steam cleaning equipment, or equivalent methods.
2. The CONTRACTOR shall perform vehicle or equipment cleaning, with water only, in a designated, bermed area that will not allow rinse water to run off-site or into streets, gutters, storm drains, creeks or rivers.

D. Vehicle/equipment maintenance and fueling:
1. The CONTRACTOR shall perform maintenance and fueling of vehicles or equipment in designated, bermed area(s) or over a drip pan that will not allow run-on of stormwater or runoff of spills.
2. The CONTRACTOR shall use secondary containment, such as a drip pan, to catch leaks or spills any time that vehicle or equipment fluids are dispensed, changed, or poured.
3. The CONTRACTOR shall keep a stockpile of spill cleanup materials, such as rags or absorbents, readily accessible on-site.
4. The CONTRACTOR shall clean up leaks and spills of vehicle or equipment fluids immediately and dispose of the waste and cleanup materials as hazardous waste, as described in section" Spill prevention and control" above.
5. The CONTRACTOR shall not wash any spilled material into streets, gutters, storm drains, creeks, or rivers and shall not bury spilled hazardous materials.
6. The CONTRACTOR shall report any hazardous materials spill to the OWNER and ENGINEER and all applicable regulatory agencies.
7. The CONTRACTOR shall inspect vehicles and equipment arriving on-site for leaking fluids and shall promptly repair leaking vehicles and equipment. Drip pans shall be used to catch leaks until repairs are made.
8. The CONTRACTOR shall recycle waste oil and antifreeze, to the maximum extent practicable.
9. The CONTRACTOR shall comply with Federal, State, and City requirements for aboveground storage tanks.

E. CONTRACTOR training and awareness:
1. CONTRACTOR shall train all employees/subcontractors on the stormwater pollution prevention requirements contained in these specifications.

2. CONTRACTOR shall inform subcontractors of the stormwater pollution prevention contract requirements and include appropriate subcontract provisions to ensure that these requirements are met.
3. CONTRACTOR shall post warning signs in areas treated with chemicals.
4. CONTRACTOR shall paint new, reset or raised catch basins, constructed as part of the project, with a “No Dumping” stencil.

3.02 SPECIFIC REQUIREMENTS

A. Paving operations:
   1. Project site management:
      a. When rain is forecast within 24 hours or during wet weather, the CONSTRUCTION MANAGER may prevent the CONTRACTOR from paving.
      b. The ENGINEER may direct the CONTRACTOR to protect drainage courses by using control measures, such as earth dike, straw bale, and sand bag, to divert runoff or trap and filter sediment in addition to those already shown on the construction plan sheets.
      c. The CONTRACTOR shall place drip pans or absorbent material under paving equipment when not in use.
      d. The CONTRACTOR shall cover catch basins and manholes when paving or applying seal coat, tack coat, slurry seal, or fog seal.
      e. If the paving operation includes an on-site mixing plant, the CONTRACTOR shall comply with applicable Federal, State, and local General Industrial Activities Stormwater Permit requirements.
   2. Paving waste management: The CONTRACTOR shall not sweep or wash down excess sand (placed as part of a sand seal or to absorb excess oil) into gutters, storm drains, or creeks. Instead, the CONTRACTOR shall either collect the sand and return it to the stockpile, or dispose of it in a trash container. The CONTRACTOR shall not use water to wash down fresh asphalt concrete pavement.

B. Saw cutting:
   1. During saw cutting, the CONTRACTOR shall cover or barricade catch basins using control measures, such as filter fabric, straw bales, sand bags, and fine gravel dams, to keep slurry out of the storm drain system. When protecting a catch basin, the CONTRACTOR shall ensure that the entire opening is covered.
   2. The CONTRACTOR shall vacuum saw cut slurry and pick up the waste prior to moving to the next location or at the end of each working day, whichever is sooner.
   3. If saw cut slurry enters catch basins, the CONTRACTOR shall remove the slurry from the storm drain system immediately.

C. Concrete, grout, and mortar waste management:
   1. Material management: The CONTRACTOR shall store concrete, grout, and mortar away from drainage areas and ensure that these materials do not enter the storm drain system.
   2. Concrete truck/equipment washout:
      a. The CONTRACTOR shall not washout concrete trucks or equipment into streets, gutters, storm drains, creeks, or rivers.

b. The CONTRACTOR shall perform washout of concrete trucks or equipment off-site or in a designated area on-site where the water will flow onto dirt or into a temporary pit in a dirt area. The CONTRACTOR shall let the water percolate into the soil and dispose of the hardened concrete in a trash container. If a suitable dirt area is not available, then the CONTRACTOR shall collect the wash water and remove it off-site.

3. Exposed aggregate concrete wash water:
   a. The CONTRACTOR shall avoid creating runoff by draining water from washing of exposed aggregate concrete to a dirt area. If a suitable dirt area is not available, then the CONTRACTOR shall filter the wash water through straw bales or equivalent material.
   b. The CONTRACTOR shall collect and return sweepings from exposed aggregate concrete to a stockpile or dispose of the waste in a trash container.

END OF SECTION

SECTION 01410

REGULATORY REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Regulatory requirements:
   1. Building code.
   2. Electrical code.
   3. Energy code.
   4. Fire code.
   5. Mechanical code.
   6. Plumbing code.

1.02 REFERENCES

A. National Fire Protection Association (NFPA):
   1. NFPA 70: National Electrical Code, 2011.

B. State or Local Building Codes and Amendments.
   1. California Code of Regulations (CCR),
      a. Title 24:- California Building Standards Code.
         1) California Building Code -2010 (CBC). (Title 24, Part 2.)
         2) California Electrical Code -2010 (CEC). (Title 24, Part 3.)
         3) California Mechanical Code -2010 (CMC). (Title 24, Part 4.)
         4) California Plumbing Code -2010 (CPC). (Title 24, Part 5.)
         5) California Energy Code -2010 (CEC). (Title 24, Part 6.)
         6) California Historical Building Code -2010 (CHBC). (Title 24, Part 8.)
         7) California Fire Code -2010 (CFC). (Title 24, Part 9.)
         8) California Existing Building Code - 2010 (CEBC). (Title 24, Part 10,)
         9) California Green Building Standards Code -2010 (Cal Green). (Title 24, Part 11.)]
      b. Title 8: Industrial Relations. Division 1: Department of Industrial Relations. Chapter 4: Division of Industrial Safety
         1) California Elevator Safety Construction Code - 2007.

1.03 SYSTEM DESCRIPTION

A. Building code:
   a. California Building Code.
   b. California Existing Building Code
   c.
   2. Electrical code:
      a. California Electrical Code
   3. Energy conservation code:
      a. California Energy Code.

   4. Fire code:
      a. California Fire Code

5. Mechanical codes:
    a. California Mechanical Code.
6. Plumbing code:
    a. California Plumbing Code.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 01424

ABBREVIATIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Abbreviations and meanings.

1.02 INTERPRETATIONS

A. Interpret abbreviations by context in which abbreviations are used.

1.03 ABBREVIATIONS

A. Abbreviations used to identify Reference Standards:

AA	Aluminum Association
AAMA	Architectural Aluminum Manufacturers Association
AAN	American Association of Nurserymen
AASHTO	American Association of State Highway and Transportation Officials
ABC	Associated Air Balance Council
ABPA	Acoustical and Board Products Association
ACI	American Concrete Institute
ACIL	American Council of Independent Laboratories
ADC	Air Diffusion Council
AFBMA	Anti-Friction Bearing Manufacturers' Association
AGA	American Gas Association
AGC	Associated General Contractors
AGMA	American Gear Manufacturers' Association
AI	Asphalt Institute
AIA	American Institute of Architects
AIMA	Acoustical and Insulating Materials Association
AISC	American Institute of Steel Construction
AISI	American Iron and Steel Institute
AITC	American Institute of Timber Construction
AMCA	Air Moving and Conditioning Association
AMG	Arizona Masonry Guild
ANSI	American National Standards Institute
APA	American Plywood Association
API	American Petroleum Institute
ARI	Air Conditioning and Refrigeration Institute
ASAHC	American Society of Architectural Hardware Consultants
ASHRAE	American Society of Heating, Refrigeration and Air Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	ASTM International (Former name American Society for Testing and Materials. Still used in specifications.)

AWI	Architectural Woodwork Institute
AWPA	American Wood Preservers Association
AWPI	American Wood Preservers Institute
AWS	American Welding Society
AWSC	American Welding Society Code
AWWA	American Water Works Association
BHMA	Builders Hardware Manufacturers Association
BIA	Brick Institute of America
BSI	Building Stone Institute
CLFMI	Chain Link Fence Manufacturers Institute
CPSC	U.S. Consumer Product Safety Commission
CRA	California Redwood Association
CRI	Carpet and Rug Institute
CRSI	Concrete Reinforcing Steel Institute
CS	Commercial Standards
CSI	Construction Specifications Institute
CTI	Ceramic Tile Institute
DHI	Door and Hardware Institute
EIFS	Exterior Insulation and Finish System
EJCDC	Engineers Joint Contract Documents Committee
FGMA	Flat Glass Marketing Association
FIA	Factory Insurance Association
FM	Factory Mutual
FS	Federal Specifications
FTI	Facing Tile Institute
GA	Gypsum Association
IAPMO	International Association of Plumbing and Mechanical Officials
ICBO	International Conference of Building Officials
IEEE	Institute of Electrical and Electronics Engineers
MAG	Maricopa Association of Governments
MIA	Marble Institute of America
ML/SFA	Metal Lath/Steel Framing Association
MS	Military Specifications
NAAMM	National Association of Architectural Metal Manufacturers
NAPA	National Asphalt Pavement Association
NBHA	National Builders Hardware Association
NCMA	National Concrete Masonry Association
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NETA	International Electrical Testing Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association
NFPA	National Forest Products Association

NIST	National Institute of Standards and Technology
NMWIA	National Mineral Wood Insulation Association
NPCA	National Paint and Coatings Association
NRCA	National Roofing Contractors Association
NTMA	National Terrazzo and Mosaic Association
NWMA	National Woodwork Manufacturer's Association
PCA	Portland Cement Association
PCI	Prestressed Concrete Institute
PDCA	Paint and Decorating Contractors of America
PDI	Plumbing and Drainage Institute
PEI	Porcelain Enamel Institute
PS	Product Standard
RTI	Resilient Tile Institute
SAE	Society of Automotive Engineers
SCPA	Structural Clay Products Association
SDI	Steel Door Institute
SIGMA	Sealed Insulating Glass Manufacturers Association
SJI	Steel Joist Institute
SMACNA	Sheet Metal and Air Conditioning Contractors National Association
SSPC	Society for Protective Coatings-Steel Structures Painting Council
TCA	Tile Council of America
UBC	Uniform Building Code (ICBO)
UL	Underwriters Laboratories, Inc.
UNS	Unified Numbering System
USDA	United States Department of Agriculture
VA	Vermiculite Association
WCLA	West Coast Lumberman's Association
WCLIB	West Coast Lumber Inspection Bureau
WPA	Western Pine Association
WPOA	Western Plumbing Officials Association
WRC	Welding Research Council
WSCPA	Western States Clay Products Association
WWPA	Western Wood Products Association

B. Abbreviations used in Specifications:

a	year or years (metric unit)
A	ampere or amperes
am	ante meridian (before noon)
ac	alternating current
ac-ft	acre-foot or acre-feet
atm	atmosphere
AWG	American Wire Gauge
bbl	barrel or barrels

bd	board
bhp	brake horsepower
bil gal	billion gallons
BOD	biochemical oxygen demand
Btu	British thermal unit or units
Btuh	British thermal units per hour
bu	bushel or bushels
C	degrees Celsius
cal	calorie or calories
cap	capita
cd	candela or candelas
cfm	cubic feet per minute
Ci	curie or curies
cm	centimeter or centimeters
cmu	concrete masonry unit
CO	carbon monoxide
Co.	Company
CO_2	carbon dioxide
COD	chemical oxygen demand
Corp.	Corporation
counts/min	counts per minute
cu	cubic
cu cm	cubic centimeter or centimeters
cu ft	cubic foot or feet
cu ft/day	cubic feet per day
cu ft/hr	cubic feet per hour
cu ft/min	cubic feet per minute
cu ft/sec	cubic feet per second
cu in	cubic inch or inches
cu m	cubic meter or meters
cu yd	cubic yard or yards
d	day (metric units)
day	day (English units)
db	decibels
DB	dry bulb (temperature)
dc	direct current
diam	diameter
DO	dissolved oxygen
DS	dissolved solids
emf	electromotive force
fpm	feet per minute
F	degrees Fahrenheit
ft	feet or foot
fc	foot-candle or foot candles
ft/day	feet per day
ft/hr	feet per hour
ft/min	feet per minute
ft/sec	feet per second

g	gram or grams
G	gravitational force
gal	gallon or gallons
gal/day	gallons per day
gal/min	gallons per minutes
gal/sec	gallons per second
gfd	gallons per square foot per day
g/L	grams per liter
gpd	gallons per day
gpd/ac	gallons per day per acre
gpd/cap	gallons per day per capita
gpd/sq ft	gallons per day per square foot
gph	gallons per hour
gpm	gallons per minute
gps	gallons per second
h	hour or hours (metric units)
ha	hectare or hectares
hp	high point
hp	horsepower
hp-hr	horsepower-hour or horsepower-hours
hr	hour or hours (English units)
Hz	hertz
ID	inside diameter
ihp	indicated horsepower
Inc.	Incorporated
inch	inch
inches	inches
inches/sec	inches per second
J	joule or joules
JTU	Jackson turbidity unit or units
k	kips
K	kelvin
K	thermal conductivity
kcal	kilocalorie or kilocalories
kcmil	thousand circular mils
kg	kilogram or kilograms
km	kilometer or kilometers
kN	kilonewton or kilonewtons
kPa	kilopascal or kilopascals
ksi	kips per square inch
kV	kilovolt or kilovolts
kVA	kilovolt-ampere or kilovolt-amperes
kW	kilowatt or kilowatts
kWh	kilowatt hour
L	liter or liters
lb/1000 cu ft	pounds per thousand cubic foot

lb/acre-ft	pounds per acre-foot
lb/ac	pounds per acre
lb/cu ft	pounds per cubic foot
lb/day/cu ft	pounds per day per cubic foot
lb/day/acre	pounds per day per acre
lb/sq ft	pounds per square foot
lin	linear, lineal
lin ft	linear foot or feet
lm	lumen or lumens
log	logarithm (common)
ln	logarithm (natural)
lx	lux
m	meter or meters
M	molar (concentration)
mA	milliampere or milliamperes
max	maximum
mCi	millicurie or millicuries
meq	milliequivalent
μF	microfarad or microfarads
MFBM	thousand feet board measure
mfr	manufacturer
mg	milligram or milligrams
mgd/ac	million gallons per day per acre
mgd	million gallons per day
mg/L	milligrams per liter
mg/L	parts per million
μg/L	micrograms per liter
μm	micrometer or micrometers
mile	mile
mil. gal	million gallons
miles	miles
min	minimum
min	minute or minutes
MLSS	mixed liquor suspended solids
MLVSS	mixed liquor volatile suspended solids
mm	millimeter or millimeters
mol wt	molecular weight
mol	mole
Mpa	megapascal or megapascals
mph	miles per hour
MPN	most probable number
mR	milliroentgen or milliroentgens
Mrad	megarad or megarads
mV	millivolt or millivolts
MW	megawatt or megawatts
N	newton or newtons
N	normal (concentration)
No.	number
Nos	numbers
NRC	noise reduction coefficient

NTU or ntu	nephelometric turbidity unit
oc	on center
OD	outside diameter
ORP	oxidation-reduction potential
OT	ortho-tolidine
OTA	ortha-tolidine-arsenite
oz	ounce or ounces
oz/sq ft	ounces per square foot
Pa	pascal or pascals
pl	plate or property line
pm	post meridiem (afternoon)
ppb	parts per billion
ppm	parts per million
ppt	parts per thousand
pr	pair
psf/hr	pounds per square foot per hour
psf	pounds per square foot
psi	pounds per square inch
psia	pounds per square inch absolute
psig	pounds per square inch gauge
PVC	polyvinyl chloride
qt	quart or quarts
R	radius
R	roentgen or roentgens
rad	radiation absorbed dose
RH	relative humidity
rpm	revolutions per minute
rps	revolutions per second
s	second (metric units)
S	Siemens (mho)
SDI	sludge density index or silt density index
sec	second (English units)
SI	International System of Units
sp	static pressure
sp gr	specific gravity
sp ht	specific heat
sq	square
cm^2 or sq cm	square centimeter or centimeters
sq ft	square feet or foot
sq inch	square inch
sq inches	square inches
km^2 or sq km	square kilometer or kilometers
m^2 or sq m	square meter or meters
mm^2 or sq mm	square millimeter or millimeters
sq yd	square yard or yards
SS	suspended solids
STC	Sound Transmission Class

SVI	sludge volume index
TDS	total dissolved solids
TKN	total Kjeldahl nitrogen
TLM	median tolerance limit
TOC	total organic carbon
TOD	total oxygen demand
TOW	top of weir
TS	total solids
TSS	total suspended solids
TVS	total volatile solids
U	U Factor/U Value
U	Coefficient of Heat Transfer
U	heat transfer coefficient
UNS	Uniform Numbering System
US	United States
V	volt or volts
VA	volt-ampere or volt-amperes
W	watt or watts
WB	wet bulb
wg	water gauge
wk	week or weeks
wt	weight
yd	yard or yards
yr	year or years (English unit)

C. Abbreviations used on Drawings: As listed on Drawings or in Specifications.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01450

QUALITY CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Quality control requirements and procedures for products and workmanship and includes the following;
   1. Sampling and testing of materials;
   2. Testing of equipment;
   3. Requirements for testing laboratories;
   4. Procedures and limitations of inspection.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. E 329 - Standard for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction.

1.03 PRODUCTS AND WORKMANSHIP

A. When specified, products will be tested and inspected either at point of origin or at Work site.
   1. Notify ENGINEER in writing well in advance, of when products will be ready for testing and inspection at point of origin.
   2. Do not construe that satisfactory tests and inspections at point of origin is final acceptance of products. Satisfactory tests or inspections at point of origin do not preclude retesting or reinspection at Work site.

B. Do not ship products, which require testing, and inspection at point of origin prior to testing and inspection.

1.04 AUTHORITY AND DUTIES OF OWNER'S REPRESENTATIVE OR INSPECTOR

A. OWNER's Representative or Inspector employed or retained by OWNER or ENGINEER is authorized to inspect the Work.

B. Inspections may extend to entire or part of the Work and to preparation, fabrication, and manufacture of products for the Work.

C. Deficiencies or defects in the Work, which have been observed, will be called to CONTRACTOR's attention.

D. Inspector Will Not:
   1. Alter or waive provisions of Contract Documents.
   2. Inspect CONTRACTOR's means, methods, techniques, sequences, or procedures for construction.
   3. Accept portions of the Work, issue instructions contrary to intent of Contract Documents, or act as foreman for CONTRACTOR. Supervise, control, or

direct CONTRACTOR's safety precautions or programs; or inspect for safety conditions on Work site, or of persons thereon, whether CONTRACTOR's employees or others.

E. Inspector Will:
   1. Conduct on-site observations of the Work in progress to assist ENGINEER in determining when the Work is, in general, proceeding in accordance with Contract Documents.
   2. Report to ENGINEER whenever Inspector believes that Work is faulty, defective, does not conform to Contract Documents, or has been damaged; or whenever there is defective material or equipment; or whenever Inspector believes the Work should be uncovered for observation or requires special testing.

1.05 SAMPLING AND TESTING

A. General:
   1. Prior to delivery and incorporation in the Work, submit listing of sources of materials, when specified in Sections where materials are specified.
   2. When specified in Sections where products are specified,
      a. Submit sufficient quantities of representative samples of character and quality required of materials to be used in the Work for testing or examination.
      b. Test materials in accordance with standards of national technical organizations.

B. Sampling:
   1. Furnish specimens of materials when requested.
   2. Do not use materials, which are required to be tested until testing indicates satisfactory compliance with specified requirements.
   3. Specimens of materials will be taken for testing whenever necessary to determine quality of material.
   4. Assist ENGINEER in preparation of test specimens at site of Work, such as soil samples and concrete test cylinders.

C. Test Standards:
   1. Perform sampling, specimen preparation, and testing of materials in accordance with specified standards, and when no standard is specified, in accordance with standard of nationally recognized technical organization.
   2. Physical characteristics of materials not particularly specified shall conform to standards published by ASTM, where applicable.
   3. Standards and publication references in Contract Documents shall be edition or revision in effect on date stipulated in Document 00700.

1.06 TESTING LABORATORY SERVICES

A. Qualification of Laboratory:
   1. Meets "Recommended Requirements for Independent Laboratory Qualification", published by American Council of Independent Laboratories.
   2. Meets requirements of ASTM E 329.
   3. Has authorization to operate in state in which Project is located.

4. Will submit copy of report of inspection of facilities made by Materials Reference Laboratory of NBS during most recent tour of inspection, with memorandum of remedies of deficiencies reported by inspection.
5. Has testing equipment calibrated at reasonable intervals by devices of accuracy traceable to NBS or accepted values of natural physical constants.

B. Laboratory Duties:
1. Cooperate with ENGINEER and CONTRACTOR.
2. Provide qualified personnel.
3. Notify ENGINEER and CONTRACTOR, in writing, of response time needed to schedule testing or inspections after receipt of notice.
4. Perform specified inspections, sampling and testing of materials and methods of construction in accordance with specified standards to ascertain compliance of materials with requirements of Contract Documents.
5. Promptly notify ENGINEER and CONTRACTOR of observed irregularities or deficiencies of construction.
6. Promptly submit written report of each test and inspection; one copy each to ENGINEER, OWNER, CONTRACTOR, and one copy to file of Project Record Documents. Each report shall include:
   a. Date issued.
   b. Project title and number.
   c. Testing laboratory name, address and telephone number.
   d. Name and signature of laboratory inspector.
   e. Date and time of sampling or inspection.
   f. Record of temperature and weather conditions.
   g. Date of test.
   h. Identification of product and Specification section.
   i. Location of sample or test in Project.
   j. Type of inspection or test.
   k. Results of tests and compliance with Contract Documents.
   l. Interpretation of test results, when requested by ENGINEER.

C. Limitations of Authority of Testing Laboratory: Laboratory is not authorized to:
1. Release, revoke, alter or enlarge on requirements of Contract Documents.
2. Approve or accept portion of Work.
3. Perform duties of CONTRACTOR.

1.07 CONTRACTOR'S RESPONSIBILITIES:

A. Cooperate with laboratory personnel and provide access to construction and manufacturing operations.

B. Secure and deliver to laboratory adequate quantities of representative samples of materials proposed to be used and which require testing.

C. Provide to laboratory preliminary mix design proposed to be used for concrete, and other materials mixes, which require control by testing laboratory.

D. Furnish copies of product test reports.

E. Furnish Incidental Labor and Facilities:
1. To provide access to construction to be tested.

2. To obtain and handle samples at Work site or at source of product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

F. Notify laboratory in advance of when observations, inspections and testing is needed for laboratory to schedule and perform in accordance with their notice of response time.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01455

SPECIAL TESTS AND INSPECTIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: This Section describes the requirements for providing special tests and inspections

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
      a. Section 01450 - Quality Control.

1.02 REFERENCES

A. ASTM International (ASTM):
   1. C 140 -Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units.
   2. C 270 - Standard Specification for Mortar for Unit Masonry.
   3. C 780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry.
   4. C 1019 - Standard Test Method for Sampling and Testing Grout.
   5. C 1314 - Standard Test Method for Compressive Strength of Masonry Prisms.

A. **California Building Code (CBC).**

1.03 DESCRIPTION

A. This Section describes special tests and inspections of structural assemblies and components to be performed in compliance with CBC.

B. These special tests and inspections are in addition to the requirements specified in Section 01450, and by the individual Sections

C. The OWNER will employ 1 or more inspectors who will provide special inspections during construction.

1.04 INSPECTION

A. Duties of Special Inspector:
   1. General: Required duties of the Special Inspector are described in CBC.

1.05 TESTS

A. Selection of the material required to be tested shall be by the OWNER's Testing Laboratory and not the CONTRACTOR.

1.06 SPECIAL TESTING AND INSPECTIONS

A. Testing laboratory: Special tests will be performed by the OWNER's testing laboratory as specified in Section 01450.

B. OWNER reserves the right to positive material identification tests.
   1. Contractor must make materials available for testing.

C. The following types of work require special inspection as described in CBC, Refer to the following verification, testing and inspection schedules.
   1. Appendix A, Cast-In-Place Concrete Special Inspection Schedule.
   2. Appendix B, Essential Architectural, Mechanical And Electrical Inspection Schedule.
   3. Appendix C, Essential Masonry Special Inspection Schedule.
   4. Appendix D, Soils Verification And Inspection Schedule.
   5. Appendix E, Structural Steel Special Inspection Schedule.
   6. Appendix F. Other Special Inspection.
   7. Appendix G, Other Specific Tests Schedule.

1.07 OTHER SPECIFIC TESTS

A. Plastic skylight assemblies and other unusual materials that are expected to support design live loads.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 SCHEDULE

A. The CONTRACTOR shall allow time necessary for Special Inspections as listed above.

B. Sufficient notice shall be given so that the Special Inspections can be performed. This includes time for off-site Special Inspectors to plan the inspection and travel to site.

3.02 PROCEDURE

A. The Special Inspector will immediately notify the ENGINEER of any corrections required and follow notification with appropriate documentation.

B. The CONTRACTOR shall not proceed until the work is satisfactory to the ENGINEER.

END OF SECTION

APPENDIX A
CAST-IN-PLACE CONCRETE SPECIAL INSPECTION SCHEDULE

Verification and Inspection	Reference Standard	Frequency of Inspection	
		Continuous During Task Listed	Continuous During Task Listed
1. Inspection of reinforcing steel, including prestressing tendons, and placement.		–	X
2. Inspection of reinforcing steel welding.	IBC Table 1704.3, Item 5B	–	–
3. Inspect bolts to be installed in concrete prior to and during placement of concrete.		X	–
4. Verifying use of required design mix.		–	X
5. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete.		X	–
6. Inspection of concrete and shotcrete placement for proper application techniques.		X	–
7. Inspection for maintenance of specified curing temperature and techniques.		–	X

APPENDIX B
ESSENTIAL ARCHITECTURAL, MECHANICAL AND ELECTRICAL INSPECTION SCHEDULE

Verification and Inspection	Reference Standard	Frequency of Inspection	
		Continuous During Task Listed	Periodic During Task Listed
1. Suspended ceiling system including anchorage.		–	X
2. Anchorage of electrical equipment for emergency standby power.		–	X
3. Anchorage of other electrical or mechanical equipment over 1,000 lb. on floors or roofs.		–	X
4. Anchorage of ducts greater than 6 sf in cross-section.		–	X
5. Anchorage of pipelines greater than 8 inches in diameter.		–	X
6. Steel storage racks supporting pipelines.		–	X
7. Chlorine cylinders and anchorage in Chemical Building.		X	–
8. Elevator installation.		–	X

APPENDIX C
ESSENTIAL MASONRY SPECIAL INSPECTION SCHEDULE

Verification and Inspection	Reference Standard	Frequency of Inspection	
		Continuous During Task Listed	Periodic During Task Listed
1. From the beginning of masonry construction, the following shall be verified for compliance:			
a. Proportions of site-prepared mortar and grout.		–	X
b. Placement of masonry units and construction of mortar joints.		–	X
c. Placement of reinforcement and connectors.		–	X
d. Grout space prior to grouting.		X	–
e. Placement of grout.		X	–
2. The inspection program shall verify:			
a. Size and location of structural elements.		–	X
b. Type, size and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction.		X	–
c. Specified size, grade and type of reinforcement.			X
d. Welding of reinforcing couplers.		X	–
e. Protection of masonry during cold weather (temperature below 40° F) or hot weather (temperature above 90° F).		–	X
3. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed.		X	–
4. Compliance with required inspection provisions of the construction documents and the approved submittals shall be verified.		–	X

APPENDIX D
SOILS VERIFICATION AND INSPECTION SCHEDULE

Verification and Inspection	Reference Standard	Frequency of Inspection	
		Continuous During Task Listed	Periodic During Task Listed
1. Verify materials below footings are adequate to achieve the design bearing capacity.		–	X
2. Verify excavations are extended to proper depth and have reached proper material.		–	X
3. Perform classification and testing of controlled fill materials.		–	X
4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill.		X	–
5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly.		–	X

APPENDIX E
STRUCTURAL STEEL SPECIAL INSPECTION SCHEDULE

Verification and Inspection	Reference Standard	Frequency of Inspection	
		Continuous During Task Listed	Periodic During Task Listed
1. Material verification of high-strength bolts, nuts and washers:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.		–	X
b. Manufacturer's certificate of compliance required.		–	X
2. Inspection of high-strength bolting:			
a. Bearing-type connections.		–	X
b. Slip-critical connections.		X	X
3. Material verification of structural steel:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.		–	X
b. Manufacturers' certified mill test reports.		X	–
4. Material verification of weld filler materials:			
a. Identification markings to conform to AWS specification in the approved construction documents.		–	X
b. Manufacturer's certificate of compliance required.		–	X
5. Inspection of welding:			
a. Structural steel:		–	–
1) Complete and partial penetration groove welds.		X	–
2) Multi-pass fillet welds.		X	–
3) Single-pass fillet welds > 5/16".		X	–
4) Single-pass fillet welds $\leq$ 5/16".		–	X
5) Floor and deck welds.		–	X
b. Reinforcing steel:		–	–
1) Verification of weldability of reinforcing steel other than ASTM A 706.		–	X
2) Reinforcing steel-resisting flexural and axial forces in boundary elements of special reinforced concrete shear walls and shear reinforcement.		X	–
3) Shear reinforcement.		X	–
4) "Form Saver" (reinforcing couplers).		X	–

Verification and Inspection	Reference Standard	Frequency of Inspection	
		Continuous During Task Listed	Periodic During Task Listed
6. Inspection of steel frame joint details for compliance with approved construction documents:			X
a. Details such as bracing and stiffening.		X	–
b. Member locations.		X	–
c. Application of joint details at each connection.		X	
7. Seismic force resisting systems identified on structural plans.		X	–

SECTION 01500

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Furnishing, maintaining, and removing construction facilities and temporary controls, including temporary utilities, construction aids, barriers and enclosures, security, access roads, temporary controls, project sign, field offices and sheds, and removal after construction.

B. Related Sections:
   1. Section 01140 - Work Restrictions: Utilities.

1.02 TEMPORARY UTILITIES

A. Temporary Electrical Power:
   1. Arrange with local utility to provide adequate temporary electrical service.
   2. Provide and maintain adequate jobsite power distribution facilities conforming to applicable Laws and Regulations.
   3. Provide temporary power to Engineers and contractor trailers.

B. Temporary Electrical Lighting:
   1. In work areas, provide temporary lighting sufficient to maintain lighting levels during working hours not less than lighting levels required by OSHA and state agency which administers OSHA regulations where Project is located.
   2. When available, permanent lighting facilities may be used in lieu of temporary facilities.
      a. Prior to Substantial Completion of the Work, replace bulbs, lamps, or tubes used by CONTRACTOR for lighting.

C. Temporary Heating, Cooling, and Ventilating:
   1. Heat and ventilate work areas to protect the Work from damage by freezing, high temperatures, weather, and to provide safe environment for workers.
   2. Permanent heating system may be utilized when sufficiently completed to allow safe operation.

D. Temporary Water:
   1. Pay for and construct facilities necessary to furnish potable water for human consumption.
   2. Remove temporary piping and connections and restore affected portions of the facility to original condition before Substantial Completion.
   3. Pay for water used for construction prior to Substantial Completion.
   4. Development of Potable Water Supply:
      a. Potable water is not available at construction site.
      b. Provide potable water for human consumption during construction period.
      c. Furnish potable water that meets requirements of Laws and Regulations.

E. Temporary Sanitary Facilities:
   1. Provide suitable and adequate sanitary facilities including toilet paper, paper hand towels, hand soap, and potable wash water that are in compliance with applicable Laws and Regulations.
   2. At completion of the Work, remove sanitary facilities and leave site in neat and sanitary condition.

F. Temporary Fire Protection: Provide sufficient number of fire extinguishers of type and capacity required to protect the Work and ancillary facilities.

G. First Aid: Post first aid facilities and information posters conforming to requirements of OSHA and other applicable Laws and Regulations in readily accessible locations.

H. Utilities in Existing Facilities: See Section 01140 - Work Restrictions.

I. **Water for Compacting Fills: The CONTRACTOR is responsible for attaining water for compacting fills. The CONTRACTOR may use the City of Turlock Water Quality Control Facility effluent; the treatment plant effluent can be taken from the existing manhole nearby the Junction Structure (see drawing PSY-1). The CONTRACT is responsible for all temporary piping, and/or means/methods to convey water to the point of use. The quantity is limited to the amount discharge from the Water Quality Control Facility. It may be possible for the CONTRACTOR to attain permits to pump water from the Harding Drain. If all necessary permits are acquired, the Harding Drain is an acceptable source for construction water.**

J. **CONTRACTOR may use tertiary treated wastewater from the existing manholes shown on drawing PSY-1 for no cost for dust control or any other purposes for construction.**

1.03 CONSTRUCTION AIDS

A. Provide railings, kick plates, enclosures, safety devices, and controls required by Laws and Regulations and as required for adequate protection of life and property.

B. Use construction hoists, elevators, scaffolds, stages, shoring, and similar temporary facilities of ample size and capacity to adequately support and move loads.

C. Design temporary supports with adequate safety factor to assure adequate load bearing capability.
   1. When requested, submit design calculations by professional registered engineer prior to application of loads.
   2. Submitted design calculations are for information and record purposes only.

D. Accident Prevention:
   1. Exercise precautions throughout construction for protection of persons and property.
   2. Observe safety provisions of applicable Laws and Regulations.
   3. Guard machinery and equipment, and eliminate other hazards.
   4. Make reports required by authorities having jurisdiction, and permit safety inspections of the Work.
   5. Before commencing construction Work, take necessary action to comply with provisions for safety and accident prevention.

E. Barricades:
   1. Place barriers at ends of excavations and along excavations to warn pedestrian and vehicular traffic of excavations.
   2. Provide barriers with flashing lights after dark.
   3. Keep barriers in place until excavations are entirely backfilled and compacted.
   4. Barricade excavations to prevent persons from entering excavated areas in streets, roadways, parking lots, treatment plants, or other public or private areas.

F. Warning Devices and Barricades: Adequately identify and guard hazardous areas and conditions by visual warning devices and, where necessary, physical barriers.
   1. Devices shall conform to minimum requirements of OSHA and State agency which administers OSHA regulations where Project is located.

G. Hazards in Public Right-of-Way:
   1. Mark at reasonable intervals, trenches and other continuous excavations in public right-of-way, running parallel to general flow of traffic, with traffic cones, barricades, or other suitable visual markers during daylight hours.
      a. During hours of darkness, provide markers with torches, flashers, or other adequate lights.
   2. At intersections or for pits and similar excavations, where traffic may reasonably be expected to approach head on, protect excavations by continuous barricades.
      a. During hours of darkness, provide warning lights at close intervals.
   3. During road closures k-rails are to be used to protect trenches.

H. Hazards in Protected Areas: Mark or guard excavations in areas from which public is excluded, in manner appropriate for hazard.

I. Above Grade Protection: On multi-level structures, provide safety protection that meets requirements of OSHA and State agency which administers OSHA regulations where Project is located.

J. Protect existing structures, trees, shrubs, and other items to be preserved on Project site from injury, damage or destruction by vehicles, equipment, worker or other agents with substantial barricades or other devices commensurate with hazards.

K. Fences:
   1. Enclose site of the Work with fence adequate to protect the Work against acts of theft, violence, and vandalism.
   2. Enclose temporary offices and storage areas with fence adequate to protect temporary facilities against acts of theft, violence and vandalism.
   3. When entire or part of site is to be permanently fenced, permanent fence may be built to serve for both permanent and temporary protection of the Work site, provided that damaged or defaced fencing is replaced prior to final acceptance.
   4. Protect temporary and permanent openings and close openings in existing fences to prevent intrusion by unauthorized persons. Bear responsibility for protection of plant and material on site of the work when openings in existing fences are not closed.

5. During night hours, weekends, holidays, and other times when no work is performed at site, provide temporary closures or enlist services of security guards to protect all facilities.
6. Fence temporary openings when openings are no longer necessary.

1.04 SECURITY

A. Make adequate provision for protection of the Work area against fire, theft, and vandalism, and for protection of public against exposure to injury.

1.05 ACCESS ROADS

A. Access Roads:
   1. Maintain access roads to storage areas and other areas to which frequent access is required.
   2. Protect buried vulnerable utilities with steel plates, wood planking, or bridges.
   3. Maintain on-site access roads free of mud. Under no circumstances shall vehicles leaving the site track mud off the site onto the public right-of-way.

1.06 TEMPORARY CONTROLS

A. Dust Control:
   1. Prevent dust nuisance caused by operations, unpaved roads, excavation, backfilling, demolition, or other activities.
   2. Control dust by sprinkling with water, use of dust palliatives, modification of operations, or other means acceptable to San Joaquin Valley Air Pollution Control District having jurisdiction.

B. Noise Control:
   1. In inhabited areas, particularly residential, perform operations in manner to minimize noise.
   2. In residential areas, take special measures to suppress noise during night hours.

C. Mud Control:
   1. Prevent mud nuisance caused by construction operations, unpaved roads, excavation, backfilling, demolition, or other activities.

1.07 FIELD OFFICES AND SHEDS

A. CONTRACTOR's Field Office:
   1. Maintain on Project Site weathertight space in which to keep copies of Contract Documents, progress schedule, shop drawings, and other relevant documents.
   2. Provide field office with adequate space to examine documents, and provide lighting and telephone service in that space.
   3. **CONTRACTOR shall provide ENGINEER'S Field Office with the following minimum dimensions: 8-foot x 28-foot.**
   4. **CONTRACTOR to equip the ENGINEER'S Field Office with the furnishings listed within the specification. It is acceptable to provide used or rented furnishing provided the furnishing are fully functional and without major defects. All furnishings will be reviewed by the ENGINEER.**

5. **All temporary equipment is to be returned to the CONTRACTOR at the end of the project. The CITY and the ENGINEER are not responsible for any computer/digital equipment failures that occur due to environmental hazards created by the job site, including: dust, power surges, water damage, job site theft or any other equipment hazards commonly encountered at construction project sites. The computer system memory will be wiped clean at the end of the project. The ENGINEER/CITY is not responsible for replacement costs of computer.**

B. ENGINEER's Field Office:
   1. CONTRACTOR to provide ENGINEER's field office at the pump station site shown on drawing PSC-1. Submit location, trailer layout, and supply list for ENGINEER'S review and approval prior to installation.
   2. Arrange and pay for:
      a. Janitorial service, including weekly dusting, floor cleaning, and trash removal, and monthly comprehensive cleaning, including windows, doors, carpet, and restroom.
      b. A continuous supply of toilet paper, paper hand towels and hand soap for each restroom.
      c. Private telephone line.
      d. Dedicated telephone line for facsimile (fax) machine.
      e. Dedicated telephone line for computer modem.
      f. Bottled drinking water service with dispenser.
      g. Suitable restroom facilities with sinks with hot and cold water.
      h. Suitable electrical power for the trailer and all ancillary facilities. CONTRACTOR is responsible for coordinating with the local utility and installation of electrical service to meet all requirements of the electrical utility.
   3. Provide following furnishings and equipment:
      a. 2 office desks each with 6 drawers (2 with locks) and padded, upholstered swivel chairs.
      b. 1 plan table not less than 36-inches by 96-inches.
      c. 2 metal drafting stools with backs.
      d. 2 straight chairs.
      e. 2 office swivel chairs.
      f. 1 metal filing cabinet, 18-inches by 30-inches by 52-inches, 4 drawers with locks.
      g. 1 folding table not less than 36-inch by 96-inches.
      h. 6 folding chairs.
      i. 1 supply cabinet with not less than 15 square feet of shelves.
      j. 1 metal bookcase with not less than 12 linear feet of shelves for each bookcase.
      k. 3 wastebaskets.
      l. 1 wall mounted dry erase board 96 x 48-inches.
      m. 1 small Refrigerator, 2.5 cubic feet capacity.
      n. 1 Microwave oven, 1.0 cubic feet.
      o. Provide two personal laptop system with the following features minimum:
         1) 2.66 GHz processor.
         2) 46B RAM, 60 ns.
         3) 750 gigabyte, IDE Hard Disk.
         4) Wireless Mouse and mouse pad; Logitech Serial Mouse, or equal.
         5) Sound card and speakers.

6) 48X max CD-RW DVD-R drive.
7) Cables, connectors, and controller cards, as necessary, to provide a functioning system.
8) HP Laser Jet 5200dm or equal.
9) Surge suppressor sized for computer system and with telephone suppressor
10) Personal scanner capable of scanning 11'' x 17'' drawings in color.
    a) connected with a USB drive

p. Provide the following software loaded and set-up for use on the personal computer:
1) Microsoft Windows XP Operating System.
2) Norton Antivirus for Windows XP.
3) Microsoft Office Suite, 2009 Professional.

q. One 2.4 GHz digital spread spectrum cordless telephone set featuring one base with speaker phone, and two handsets with rechargeable bases and intercom capabilities between the sets.

r. One telephone answering machine.

s. One facsimile (Fax) machine capable of unattended receiving operation for plain paper, commercial grade, 250 sheet cassette, programmable memory, and document feeder. Digital modem speed shall be 9,600 bits per second with automatic fallback to 7,200, 4,800, or 2,400 bits per second. The terminal shall have the following features: 196 vertical by 203 horizontal lpi resolution; CCITG3, CCITG2 compatibility; RJ11 series modular jack line connection; solid state flatbed scanner; electrothermal recorder. Obtain and pay for a service contract with a local representative of the facsimile vendor or manufacturer for availability of a service representative to perform on-site service and repair. Provide all necessary paper and other materials required for proper operation of the facsimile.

1.08 REMOVAL

A. Remove temporary buildings and furnishings before inspection for Substantial Completion or when directed.

B. Clean and repair damage caused by installation or use of temporary facilities.

C. Remove underground installations to minimum depth of 24-inches and grade to match surrounding conditions.

D. Restore existing facilities used during construction to specified or original condition.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01550

TRAFFIC CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Providing safe and effective work areas and to warn, control, protect, and expedite vehicular and pedestrian traffic through the construction zone. It shall be the sole responsibility of the CONTRACTOR to provide for the safety of the traveling public within the limits of the project, including work in the public right-of-way and on private property.
   2. Section includes temporary construction, barricades and enclosures, fences, security, temporary controls, and traffic regulation.
   3. In this Section, reference to the "Public" also includes the OWNER's personnel and representatives.
   4. Public Outreach.

1.02 REFERENCES

A. Manual on Uniform Traffic Control Devices, United States Department of Transportation, Federal Highway Administration (latest edition): In this Section it is referred to as MUTCD.

1.03 REQUIREMENTS

A. General:
   1. Traffic control and lane closures must meet the requirements of the Stanislaus County and as specified in this Section.
   2. Construction within Carpenter and Crows Landing Road shall be during night time hours per the requirements a Stanislaus County approved traffic control plan. One lane shall remain open at all times during the road crossing work.
   3. The CONTRACTOR shall maintain all required traffic control devices and trenches within the right-of-way at all times, 24 hours per day, 7 days per week including nights, holidays, and weekends.
   4. Access for emergency vehicles shall be maintained at all times.
   5. All signs and street marking damage caused by or related to the construction of this project shall be replaced in kind by the CONTRACTOR. In the case of partial damage to lane stripes and traffic lettering the whole stripe or marking in its entirety shall be replaced.
   6. CONTRACTOR shall provide access to private resident's households located along the Harding Drain at all times throughout the project.

B. Temporary surfaces:
   1. The CONTRACTOR shall be required to provide temporary surfacing of all excavated areas immediately after completing the backfilling of any section of the Work. If permitted by the government agency with jurisdiction of the right-of-way, the CONTRACTOR may be allowed to leave excavations open

provided that traffic control devices, approved by the governmental agency maintaining the right-of-way, are in place and maintained, and excavations are covered with steel plates (non skid surface type) at the close of each working day. The temporary steel plates shall comply with the requirements of the governmental agency controlling the right-of-way.

2. Temporary gravel surfaces shall not be permitted.
3. All temporary detours and/or bypasses shall be hard surfaced with a minimum of 1-1/2 inches of asphalt-concrete pavement and maintained in a smooth and usable condition at all times for the duration of the detour and/or bypass.

C. Barricades and enclosures:
   1. CONTRACTOR shall effect and maintain at all times during the prosecution of the Work, barriers, and lights necessary for the protection of workmen and the public. CONTRACTOR shall provide suitable barricades, lights, signs, and watchmen at all places where the Work causes obstructions to the normal traffic or constitutes in any way a hazard to the public.
   2. Statutory Requirements: CONTRACTOR shall install and maintain all barricades, signs, lights, and other protective devices within rights-of-way in strict conformity with applicable statutory requirements by the government agency having jurisdiction in accordance with an approved Traffic Control Plan.

D. Temporary bridges:
   1. CONTRACTOR shall design and place suitable temporary bridges where necessary for the maintenance of vehicular and pedestrian traffic and to accommodate the use of temporary sewer bypass pipelines in accordance with the requirements of the encroachment permit issued by the government agency controlling the right-of-way. CONTRACTOR shall assume responsibility for the sufficiency and safety of all such temporary work on bridges and for any damage that may result from their failure or their improper construction, maintenance, or operation.

E. Striping:
   1. Placement of temporary pavement striping shall be by pilot line method and use limited to 14 calendar days and spaced every 40 feet. The double yellow line shall have 2 pieces of tape side by side with a 4-inch space between, and spaced to the above increments.
   2. Painted temporary striping shall be 4 inches wide and shall be in accordance with the Stanislaus County. Painted temporary striping shall not be used on the existing pavement or on final wearing course of pavement.
   3. Existing pavement markings, either painted or raised pavement markers, that are not applicable or are within the transverse limits of the temporary travel lanes shall be removed to the satisfaction of the ENGINEER. Painting over existing markings is not permitted.

F. Traffic control devices:
   1. All traffic control devices not in use, or that will not be used for a period greater than 24 hours, shall be removed by the CONTRACTOR from the work area. The sidewalk area shall not be used at any time to store unused traffic control devices unless the sidewalk is closed and an approved barricade plan is provided for rerouting pedestrians.

2. CONTRACTOR shall maintain all barricades and other traffic control devices in clean and effective condition and replace devices in poor condition immediately.
3. CONTRACTOR shall begin placing barricades in the direction of traffic and remove them in the direction of opposing traffic.
4. Text message boards:
    a. Fixed at each end of the project set and 2 moveable boards within the project setup area.

G. Flaggers:
1. As specified by Stanislaus County.

1.04 SUBMITTALS

A. Project-specific traffic control plan (TCP) shall be prepared by the CONTRACTOR:
1. Plan shall include work hours. Including off peak hour work requirements.
2. Plan shall address pedestrian access.
3. For street closure, provide details related to the notification of all emergency services, such as police and fire. Provide details related to the notification of services, such as mail and garbage collection.

B. For work in the County of Stanislaus rights-of-way, the TCP must be submitted to the respective governmental agency with jurisdiction of the right-of-way for acceptance, as outlined in the County encroachment permits.

C. A TCP shall be required for each phase or segment of the construction meeting the requirements of the Manual on Uniform Traffic Control Devices. Each TCP shall be considered separately.

D. At a minimum, the TCP shall provide, for each phase of the work, the placement and spacing of all traffic control devices (including signs, markings, channelizing devices, lighting devices, flaggers, etc.) and spacing/location of these within the following traffic control areas:
1. Advance Warning Signs.
2. Transition Areas.
3. Buffer Spaces.
4. Work Areas.
5. Termination Areas.

E. Additionally, the TCP must clearly show the following minimum information. Include location, size, height, text height, and color of each sign:
1. Method for protecting excavations, work sites, and school zone crosswalks.
2. Method of barricading at intersections.
3. Driveway access plan.
4. Provisions for emergency vehicle access.
5. All set-up changes to accommodate different phasing of the work.
6. Lane widths and transitions.
7. Twenty-four-hour emergency contact information.
8. Business access signs.
9. Sidewalk “closed/cross here” signs.
10. No parking signs.
11. Project signs.
12. Fresh oil signs.

13. Duration of traffic control and barricade plan.
14. All advance warning signs.
15. Lane closures.
16. Placement of “double penalty in work zones” warning signs.
17. Detour locations.
18. Required signage and barricading associated with bus stop closures.
19. Required signage and barricading associated with school zone/safe route to school.
20. Routing plan and signage for directing pedestrian around work area.

F. Submit 2 copies of the approved TCP to the ENGINEER within 48 hours of approval by government agencies.

G. After Review and comment on the TCP by the government agency with jurisdiction of the right-of-way shall in no way relieve the CONTRACTOR of the responsibility for traffic and safety requirements. Such acceptance shall in no way be construed as confirmation of the technical accuracy or adequacy of the contents of the TCP and shall not relieve the CONTRACTOR of the obligation to institute traffic control measures in full compliance with contract requirements and in conformance with local agency requirements.

H. If, during the execution of the work, the CONTRACTOR determines that the traffic control is not functioning as intended, the CONTRACTOR may make revisions to the TCP as necessary, provided that the local agencies with jurisdiction have accepted the changes. Submit two (6) copies and digital files of the approved revised TCP to the ENGINEER within 48 hours of approval by government agencies.

PART 2 PRODUCTS

2.01 MATERIALS

A. Materials shall conform to the Uniform Standard Specifications, and Uniform Standard Drawings as applicable, and as specified in this Section.

2.02 TEMPORARY STRIPING

A. Temporary traffic striping tape material shall conform to Tape shall be 4 inches wide and 4 feet long. The color of the tape shall match the color of the existing line.

2.03 PERMANENT STRIPING

A. Permanent striping shall conform to the requirements of County of Stanislaus as applicable.

PART 3 EXECUTION

3.01 TRAFFIC CONTROL REQUIREMENTS

A. All traffic control within public rights-of-way shall conform to the requirements of the encroachment permits and traffic control plans approved by the government agency with jurisdiction in the right-of-way.

B. All traffic control on private property shall warn, control, protect, and expedite vehicular and pedestrian traffic through the private property.

END OF SECTION

SECTION 01600

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Product requirements; product selection; products schedule; execution; manufacturer's instructions; and delivery, handling, and storage.

1.02 PRODUCT REQUIREMENTS

A. Comply with Specifications and referenced standards as minimum requirements.

B. Provide products by same manufacturer when products are of similar nature, unless otherwise specified.

C. Provide identical products when products are required in quantity.

D. Provide products with interchangeable parts whenever possible.

E. Require each equipment manufacturer to have maintenance facilities meeting the following requirements:
   1. Minimum 3 years operational experience.
   2. Location in continental United States.
   3. Equipment and tools capable of making repairs.
   4. Staff qualified to make repairs.
   5. Inventory of maintenance spare parts.

1.03 PRODUCT SELECTION

A. When products are specified by standard or specification designations of technical societies, organizations, or associations only, provide products which meet or exceed reference standard and Specifications.

B. When products are specified with names of manufacturers but no model numbers or catalog designations, provide:
   1. Products by one of named manufacturers which meets or exceeds Specifications.
   2. Accepted or-equals.

C. When products are specified with names of manufacturers and model numbers or catalog designations, provide:
   1. Products with model numbers or catalog designations by 1 of named manufacturers.
   2. Accepted or-equals.

D. When products are specified with names of manufacturers, but with brand or trade names, model numbers, or catalog designations by 1 manufacturer only, provide:

1. Products specified by brand or trade name, model number, or catalog designation.
2. Products by 1 of named manufacturers proven in accordance with requirements for or-equals to meet or exceed quality, appearance and performance of specified brand or trade name, model number, or catalog designation.
3. Accepted or-equals.

E. When Products are specified with only 1 manufacturer followed by "or Equal," provide:
1. Products meeting or exceeding Specifications by specified manufacturer.
2. Accepted or-equals.

1.04 PRODUCT OPTIONS AND SUBSTITUTIONS

A. General: Whenever a product is specified using a name of a particular manufacturer or supplier, the specific item cited shall be understood as establishing type, function, dimension, appearance, and quality desired. Other manufacturer's products will be considered for acceptance provided sufficient information is submitted to the ENGINEER for review to determine that the products proposed are equivalent to those named.

1.05 QUALITY ASSURANCE

A. Employ entities, that meet or exceed specified qualifications, to execute the Work.

B. Inspect conditions before executing subsequent portions of the Work. Accept responsibility for correcting unsatisfactory conditions upon executing subsequent portions of the Work.

C. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, and racking.

1.06 DELIVERY, HANDLING, AND STORAGE

A. Prepare Products for Shipment by:
1. Applying grease and lubricating oil to bearings and similar items.
2. Separately packing or otherwise suitably protecting bearings.
3. Tagging or marking products to agree with delivery schedule or Shop Drawings.
4. Including complete packing lists and bills of material with each shipment.
5. Packaging products to facilitate handling and protection against damage during transit, handling and storage.

B. Transport products by methods that avoids product damage. Deliver products in undamaged condition in manufacturer's unopened containers or packaging.

C. Provide equipment and personnel to handle products by methods to prevent soiling or damage.

D. Upon delivery, promptly inspect shipments. Verify compliance with Contract Documents, correct quantities and undamaged condition of products. Immediately store and protect products and materials until installed in Work.

E. Store products with seals and legible labels intact.

F. Store moisture sensitive products in weathertight enclosures.

G. Maintain products within temperature and humidity ranges required or recommended by manufacturer.

H. Connect and operate space heaters during storage when ambient temperatures fall below temperatures recommended by manufacturer.

I. Protect painted surfaces against impact, abrasion, discoloration, and other damage. Repaint damaged painted surfaces.

J. Exterior Storage of Fabricated Products:
   1. Place on above ground supports which allow for drainage.
   2. Cover products subject to deterioration with impervious sheet covering.
   3. Provide ventilation to prevent condensation under covering.

K. Store loose granular materials on solid surfaces in well-drained area. Prevent materials mixing with foreign matter.

L. Provide access for inspection.

M. Maintain equipment per the manufacturer’s recommendation and industry standards, including oil changes, rotation, etc. Provide a log of equipment maintenance to the ENGINEER, on a monthly basis.

1.07 MANUFACTURER'S INSTRUCTIONS

A. Deliver, handle, store, install, erect, or apply products in accordance with manufacturer's instructions, Contract Documents and industry standards.

B. Periodically inspect to assure products are undamaged and maintained under required conditions.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01612

SEISMIC DESIGN CRITERIA

PART 1 GENERAL

1.01 SUMMARY

A. **Section includes: Seismic design criteria for the following:**
   1. **Anchorage of mechanical and electrical equipment.**
   2. **Seismic design and design of anchorage for small tanks fabricated off site and shipped to the Project site.**
   3. **Seismic design of Metal Building System.**
   4. **Other structures or items as specified or indicated on the Drawings.**

B. **Related sections:**
   1. **The Contract Documents are complementary; what is called for by one is as binding as if called for by all.**
   2. **It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.**
   3. **The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.**
      a. **Section 01410 - Regulatory Requirements.**
      b. **Section 13122 – Metal Building System.**

1.02 REFERENCES

A. **American Society of Civil Engineers (ASCE):**
   1. **7-05 - Minimum Design Loads for Buildings and Other Structures,**

1.03 SYSTEM DESCRIPTION

A. **Design requirements:**
   1. **Design in accordance with the requirements of the building code as specified in Section 01410:**
      a. **Occupancy category: III**
      b. **Design spectral acceleration at short period, S_{DS}: 0.76.**
      c. **Design spectral acceleration at 1 sec period, S_{D1}: 0.39.**
      d. **Response modification factor, R: In accordance with ASCE 7-05, Table 12.2-1.**
      e. **Importance factor (seismic), I: 1.25.**
      f. **Component amplification factor, a_p: In accordance with ASCE 7-05, Tables 13.5-1 and 13.6-1.**
      g. **Component response modification factor, R_p: In accordance with ASCE 7-05, Tables 13.5-1 and 13.6-1.**
      h. **Component importance factor, I_p: 1.00.**
   2. **Do not use friction to resist sliding due to seismic forces.**

3. **Do not use more than 60 percent of the weight of the mechanical and electrical equipment for designing anchors for resisting overturning due to seismic forces.**
4. **Do not use more than 60 percent of the weight of the tank for resisting overturning due to seismic forces.**
5. **Use anchor bolts, bolts, or welded studs for anchors for resisting seismic forces. Anchor bolts used to resist seismic forces shall have a standard hex bolt head. Do not use anchor bolts fabricated from rod stock with an L or J-shape.**
6. **Do not use chemical anchors, concrete anchors, flush shells, powder actuated fasteners, sleeve anchors, or other types of anchors unless indicated on the Drawings or accepted in writing by the ENGINEER.**
7. **Seismic forces must be resisted by direct bearing on the fasteners used to resist seismic forces. Do not use connections that use friction to resist seismic forces.**

1.04 SUBMITTALS

A. **Shop drawings and calculations: Complete shop drawings and seismic calculations.**

B. **Calculations shall be signed and stamped by a civil or structural engineer licensed in the state where the Project is located.**

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01614

WIND DESIGN CRITERIA

PART 1 GENERAL

1.01 SUMMARY

A. **Section includes: Wind design criteria.**

B. **Related section:**
   1. **The Contract Documents are complementary; what is called for by one is as binding as if called for by all.**
   2. **It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.**
   3. **The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.**
      a. **Section 01410 - Regulatory Requirements.**

1.02 SYSTEM DESCRIPTION

A. **Design requirements:**
   1. **Building code criteria: Design for wind in accordance with building code as specified in Section 01410:**
      a. **Occupancy category: III.**
      b. **Basic wind speed: 85 miles per hour.**
      c. **Exposure category: C.**
      d. **Topographic factor, K_{zt}: 1.0**
      e. **Wind importance factor, I_w: 1.15.**
   2. **Use anchor bolts, bolts, or welded studs for anchors for resisting wind forces. Anchor bolts used to resist wind forces shall have a standard hex bolt head. Do not use anchor bolts fabricated from rod stock with an L or J shape:**
      a. **Do not use concrete anchors, sleeve anchors, flush shells, chemical anchors, powder actuated fasteners, or other types of anchor unless indicated on the Drawings or accepted in writing by the ENGINEER.**
      b. **Wind forces must be resisted by direct bearing on the anchors used to resist wind forces. Do not use connections which use friction to resist wind forces.**

1.03 SUBMITTALS

A. **Shop drawings and calculations: Complete shop drawings and wind design calculations.**

B. **Calculations shall be signed and stamped by a civil or structural engineer licensed in the state where the Project is located.**

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01722

FIELD ENGINEERING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Field engineering to establish lines and grades for the Work.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
      a. Section 01770 - Closeout Procedures.

1.02 QUALITY ASSURANCE

A. Qualifications of CONTRACTOR's surveyor: Registered civil engineer or land surveyor in state where Project is located.

B. Accuracy of stakes, alignments, and grades may be checked randomly by ENGINEER:
   1. Notice of when checking will be conducted will be given.
   2. When notice of checking is given, postpone parts of the Work affected by stakes, alignments, or grades to be checked until checked.
   3. Do not assume that ENGINEER's check substitutes or complements required field quality control procedures.

1.03 CONSTRUCTION STAKES, LINES, AND GRADES

A. Execute the Work in accordance with the lines and grades indicated.

B. Make distances and measurements on horizontal planes, except elevations and structural dimensions.

1.04 SURVEY REFERENCE POINTS

A. Construction survey control is provided by OWNER as shown in the Drawings.

B. From these reference points, establish other control and reference points as required to properly lay out the Work.

C. Locate and protect control points prior to starting site work, and preserve permanent reference points during construction:
   1. Make no changes or relocations without prior written notice.
   2. Replace Project control point, when lost or destroyed, in accordance with original survey control.

D. Set monuments for principal control points and protect them from being disturbed and displaced;
   1. Re-establish disturbed monuments.
   2. When disturbed, postpone parts of the Work that are governed by disturbed monuments until such monuments are re-established.

1.05 PROJECT SURVEY REQUIREMENTS

A. Establish minimum of 2 permanent benchmarks on the outfall pump station site and 2 permanent benchmarks on the standpipe structure site referenced to data established in the Drawings.
   1. CONTRACTOR shall provide a half-inch rebar with a plastic cap for each permanent benchmark.

B. Record permanent benchmark locations with horizontal and vertical data on Project Record Documents.

C. Assume responsibility for accuracy of stakes, alignments, and grades by performing verifications and checking in accordance with standard surveying practice.

D. **CONTRACTOR shall perform a post-construction ground survey of all disturbed areas from the east toe of slope of the levee to the river and a Bathymetric survey of disturbed areas within the San Joaquin River from east to west river banks. The survey shall be in accordance with the Permit requirements outlined in Permit**

1.06 SURVEY MONUMENT PRESERVATION

A. The CONTRACTOR shall preserve the location of all existing monuments and replace any monuments damaged or required to be relocated, per the requirements of this section.
   ~~1. There are multiple (25±) existing survey monuments located along the 36-inch FE pipeline alignment and in other areas of the work.~~
   1. **There are multiple existing survey monuments located along the 36” FE pipeline alignment and in other areas of the work. CONTRACTOR shall field verify the number of monuments and preserve all monuments according the requirements of this section.**

B. CONTRACTOR shall locate all existing monuments prior to construction and submit locations/information for the ENGINEER’s review.

C. CONTRACTOR shall conform to the requirements of Section 81, "Monuments", of the California State Standard Specifications, Stanislaus County and the following City of Turlock requirements: Prior to an existing monument being disturbed, damaged or destroyed by the CONTRACTOR, the exact location of the existing monument point shall be referenced and established with not less than four (4) durable reference points, any two of which shall be adequate to locate the

monument point. Reference points shall be set in locations that will not be disturbed by the CONTRACTOR'S work and shall be protected from damage. The Reference points shall be physically set and measured in locations within a distance to allow others to relocate the monument point. Monument Ties shall be prepared on a Stanislaus County Corner Record form. Monument Ties shall be stamped and signed by a Licensed Land Surveyor or an Engineer who is authorized to perform Land Surveying. Monument Ties shall be submitted to the City of Turlock Land Surveyor's office for approval prior to construction. The Monument Ties will be filed with the Stanislaus County Surveyor's office upon approval of the City of Turlock Land Surveyor.

1. Prior to final acceptance of the construction all monuments within the limits of the project and other areas affected by the project shall be completely rehabilitated or reset. If determined necessary by the City Land Surveyor and/or the Stanislaus County Surveyor, a Record of Survey may be required in lieu of Corner Records for resetting any destroyed monuments.
2. The existing monuments shall include, but are not limited to Stanislaus County right-of-way monuments, Stanislaus County centerline monuments, Public Lands monuments, private parcel monuments, Stanislaus County vertical control monuments, Turlock Irrigation District vertical control monuments, National Geodetic Survey Control monuments within the bounds of construction.

1.07 RECORD DOCUMENTS

A. Prepare and submit Record Documents as specified in Section 01770.

B. Maintain complete, accurate log of control points and survey.

C. Affix civil engineer's or land surveyor's signature and registration number to record drawing to certify accuracy of information shown.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01732

CUTTING AND PATCHING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Cutting and patching existing and new construction.

B. Related Sections:
   1. Section 01330 - Submittal Procedures.
   2. Section 01600 - Product Requirements.

1.02 SUBMITTALS

A. Submit in accordance with Section 01330.

B. Cutting and Patching Plan:
   1. Submit details of proposed construction before cutting and patching construction commences affecting:
      a. Work of OWNER or of others.
      b. Structural integrity of element of Project.
   2. Cutting and Patching Plan shall include the following:
      a. Identification of Work.
      b. Description of affected construction.
      c. Necessity for cutting, patching, alteration, or excavation.
      d. Description of proposed construction.
      e. Scope of cutting, patching, alteration, or excavation.

PART 2 PRODUCTS

2.01 MATERIALS

A. Comply with specifications and standards for products involved.

PART 3 EXECUTION

3.01 PREPARATION

A. Provide adequate temporary support as necessary to ensure structural integrity of affected portion of Work.

B. Provide devices and methods to protect other portions of Project from damage and persons from injury.

C. Provide protection from elements for that portion of Project which may be exposed by cutting and patching, and maintain excavations free from water.

3.02 CUTTING AND PATCHING

A. Cut, Fit, and Patch when required to:
   1. Make its several parts fit together properly.
   2. Remove and replace construction not conforming to Contract Documents.
   3. Remove samples of installed construction as specified for testing.
   4. Provide routine penetrations of nonstructural surfaces for installation of piping and electrical conduit.

B. Execute cutting and demolition by methods which will prevent damage and will provide proper surfaces to receive installation of repairs.

C. Openings in Existing Concrete:
   1. Create openings by:
      a. Saw cutting completely through concrete, or
      b. Scoring edges of opening with saw to at least 1-inch depth on both surfaces (when accessible) and removing concrete or masonry by chipping.
   2. Do not allow saw cuts to extend beyond limits of opening.
   3. Make corners square and true by combination of core drilling and grinding or chipping.
   4. Prevent debris from falling into adjacent tanks or channels in service or from damaging existing equipment and other facilities.

D. Sizing of Openings in Existing Concrete:
   1. Make openings sufficiently large to permit final alignment of pipe and fittings without deflections.
   2. Allow adequate space for packing around pipes and conduit to ensure watertightness.

E. Grouting Pipes in Place:
   1. Sandblast concrete surfaces and thoroughly clean sand and other foreign material from surfaces prior to placing grout.
   2. Grout pipes, sleeves, castings, and conduits in place by pouring grout under a head of at least 4-inches. Vibrate grout into place. Completely fill the spaces occupied by pipes, sleeves, castings, and conduits.
   3. Water cure the grout.

F. Connections to Existing Pipes:
   1. Cut existing pipe square.
   2. Properly prepare the ends for the connection indicated on the Drawings.
   3. Repair any damage to existing lining and coating.

END OF SECTION

SECTION 01734

WORK WITHIN PUBLIC RIGHT-OF-WAY

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Requirements for maintenance, support, protection, relocation, reconstruction and adjusting-to-grade, restoration, construction of temporary and new facilities, and abandonment of existing utilities affected by construction work within the public right-of-way.

1.02 REFERENCES

A. State of California, Department of Transportation (CALTRANS).
   1. SS - Standard Specifications.

1.03 DEFINITIONS

A. Utility: For purpose of this Section, utility means any public or private service, such as electric light and power systems; gas distribution systems; telephone, telegraph, cable television and other communication services; water distribution; storm drain and sanitary sewer services; police and fire communication systems; street lighting and traffic signs and signals; parking meters; and steam distribution systems.

B. For Trenching:
   1. Open Trench:
      a. General: Includes excavation, pipe laying, backfilling, and pavement replacement.
   2. Any excavated areas shall be considered as "open trench" until all pavement replacement has been made or until all trenches outside of pavement replacement areas have been backfilled and compacted in accordance with these Contract Documents.

1.04 DESIGN REQUIREMENTS

A. General:

B. Trenching:
   ~~1. Except where otherwise specified, indicated on the Drawings, or accepted in writing by the ENGINEER, the maximum length of open trench, where construction is in any stage of completion, shall not exceed the linear footage as set forth below. Descriptions under following area designations are general in nature and may be amended in writing by the ENGINEER due to particular or peculiar field conditions.~~
      ~~a. Residential Areas C 1 Block or 600 linear feet, Whichever is the Least: Single and multi-family residences, apartments, and condominiums.~~
      ~~b. Undeveloped Areas C1,000 Linear Feet: Parks, golf courses, farms, undeveloped subdivided land.~~

1. Completely backfill trenches across streets and install temporary or permanent pavement as soon as possible after pipe laying.

C. Site Conditions:

~~1. Use substantial steel plates with adequate trench bracing to bridge across trenches at street crossings and residential driveways where trench backfill and temporary patch have not been completed during regular working hours.~~

1. **The Contractor shall backfill pipe trenches constructed within the public right-of-way at the end of the workday.**
2. Provide safe and convenient passage for pedestrians.
3. Maintain access to fire stations, fire hydrant, and hospitals at all times.
4. Provide traffic control devices, barricades and signage as required by the regulating agency.

1.05 SUBMITTALS

A. Traffic Control Plan: Submit detailed traffic control plan for acceptance by jurisdictional agency.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01756

TESTING, TRAINING, AND FACILITY START-UP

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Equipment and system testing and startup.
   2. Services of manufacturer's representatives.
   3. Training of OWNER's personnel.
   4. Final testing requirements for the complete facility.

B. Related Sections:
   1. Section 01324 - Progress Schedules.
   2. Section 13410 - Basic Measurement and Control Instrumentation Materials and Methods.
   3. Section 15954 - HVAC Systems Testing, Adjusting and Balancing.
   4. Section 15958 - Mechanical Equipment Testing.
   5. Section 16950 - Electrical Testing.

1.02 GENERAL TESTING, TRAINING, AND START-UP REQUIREMENTS

A. Contract Requirements: Testing, training, and start-up are requisite to the satisfactory completion of the Contract.

B. Complete testing, training, and start-up within the Contract Times.

C. Allow realistic durations in the Progress Schedule for testing, training, and start-up activities.

D. Furnish labor, power, chemicals, tools, equipment, instruments, and services required for and incidental to completing functional testing, performance testing, and operational testing.

E. Provide competent, experienced technical representatives of equipment manufacturers for assembly, installation and testing guidance, and operator training.

1.03 START-UP PLAN

A. Submit start-up plan for each piece of equipment and each system not less than 3 weeks prior to planned initial start-up of equipment or system.

B. Provide detailed sub-network of Progress Schedule with the following activities identified:
   1. Manufacturer's services.
   2. Installation certifications.
   3. Operator training.
   4. Submission of Operation and Maintenance Manual.
   5. Functional testing.

6. Performance testing.
7. Operational testing.

C. Provide testing plan with test logs for each item of equipment and each system when specified. Include testing of alarms, control circuits, capacities, speeds, flows, pressures, vibrations, sound levels, and other parameters.

D. Provide summary of shutdown requirements for existing systems which are necessary to complete start-up of new equipment and systems.

E. Revise and update start-up plan based upon review comments, actual progress, or to accommodate changes in the sequence of activities.

1.04 PERFORMANCE TESTING

A. Test equipment for proper performance at point of manufacture or assembly when specified.

B. When source quality control testing is specified:
1. Demonstrate equipment meets specified performance requirements.
2. Provide certified copies of test results.
3. Do not ship equipment until certified copies have received written acceptance from ENGINEER. Written acceptance does not constitute final acceptance.

C. Include costs associated with witnessing performance tests in the bid price. Include costs for one (1) OWNER's representative and for one (1) ENGINEER’s representative for travel, lodging, transportation to and from, lodging, and 50 dollars meal allowance per person per day.

1.05 GENERAL START-UP AND TESTING PROCEDURES

A. Mechanical Systems: As specified in Section 15958.
1. Remove rust preventatives and oils applied to protect equipment during construction.
2. Flush lubrication systems and dispose of flushing oils. Recharge lubrication system with lubricant recommended by manufacturer.
3. Flush fuel system and provide fuel for testing and start-up.
4. Install and adjust packing, mechanical seals, O-rings, and other seals. Replace defective seals.
5. Remove temporary supports, bracing, or other foreign objects installed to prevent damage during shipment, storage, and erection.
6. Check rotating machinery for correct direction of rotation and for freedom of moving parts before connecting driver.
7. Perform cold alignment and hot alignment to manufacturer's tolerances.
8. Adjust V-belt tension and variable pitch sheaves.
9. Inspect hand and motorized valves for proper adjustment. Tighten packing glands to insure no leakage, but permit valve stems to rotate without galling. Verify valve seats are positioned for proper flow direction.
10. Tighten leaking flanges or replace flange gasket. Inspect screwed joints for leakage.
11. Install gratings, safety chains, handrails, shaft guards, and sidewalks prior to operational testing.

B. Electrical Systems: As specified in Section 16950.
   1. Perform insulation resistance tests on wiring except 120 volt lighting, wiring, and control wiring inside electrical panels.
   2. Perform continuity tests on grounding systems.
   3. Test and set switchgear and circuit breaker relays for proper operation.
   4. Perform direct current high potential tests on all cables that will operate at more than 2,000 volts. Obtain services of independent testing lab to perform tests.
   5. Check motors for actual full load amperage draw. Compare to nameplate value.

C. Instrumentation Systems: As specified in Section 13410.
   1. Bench or field calibrate instruments and make required adjustments and control point settings.
   2. Leak test pneumatic controls and instrument air piping.
   3. Energize transmitting and control signal systems, verify proper operation, ranges and settings.

1.06 FUNCTIONAL TESTING

A. Functionally test mechanical and electrical equipment, and instrumentation and controls systems for proper operation after general start-up and testing tasks have been completed.

B. Demonstrate proper rotation, alignment, speed, flow, pressure, vibration, sound level, adjustments, and calibration. Perform initial checks in the presence of and with the assistance of the manufacturer's representative.

C. Demonstrate proper operation of each instrument loop function including alarms, local and remote controls, instrumentation and other equipment functions. Generate signals with test equipment to simulate operating conditions in each control mode.

D. Conduct continuous 8 hour test under full load conditions. Replace parts which operate improperly.

1.07 OPERATIONAL TESTING

A. After completion of operator training, conduct operational test of the entire facility. Demonstrate satisfactory operation of equipment and systems in actual operation.

B. Conduct operational test for continuous 7 day period.

C. OWNER will provide operations personnel, power, fuel, and other consumables for duration of test.

D. Immediately correct defects in material, workmanship, or equipment which became evident during operational test.

E. Repeat operational test when malfunctions or deficiencies cause shutdown or partial operation of the facility or results in performance that is less than specified.

1.08 CERTIFICATE OF PROPER INSTALLATION

A. At completion of Functional Testing, furnish written report prepared and signed by manufacturer's authorized representative, certifying equipment:
   1. Has been properly installed, adjusted, aligned, and lubricated.
   2. Is free of any stresses imposed by connecting piping or anchor bolts.
   3. Is suitable for satisfactory full-time operation under full load conditions.
   4. Operates within the allowable limits for vibration.
   5. Controls, protective devices, instrumentation, and control panels furnished as part of the equipment package are properly installed, calibrated, and functioning.
   6. Control logic for start-up, shutdown, sequencing, interlocks, and emergency shutdown have been tested and are properly functioning.

B. Furnish written report prepared and signed by the electrical and/or instrumentation Subcontractor certifying:
   1. Motor control logic that resides in motor control centers, control panels, and circuit boards furnished by the electrical and/or instrumentation subcontractor has been calibrated and tested and is properly operating.
   2. Control logic for equipment start-up, shutdown, sequencing, interlocks and emergency shutdown has been tested and is properly operating.

1.09 TRAINING OF OWNER'S PERSONNEL

A. Provide operations and maintenance training for items of mechanical, electrical and instrumentation equipment. Utilize manufacturer's representatives to conduct training sessions.

B. Coordinate training sessions to prevent overlapping sessions. Arrange sessions so that individual operators and maintenance technicians do not attend more than 2 sessions per week.

C. Provide Operation and Maintenance Manual for specific pieces of equipment or systems 1 month prior to training session for that piece of equipment or system.

D. Satisfactorily complete functional testing before beginning operator training.

E. There are three (3) work shifts. Shift 1 is from 10:00 p.m. to 8:00 a.m.; Shift 2 is from 6:00 a.m. to 4:00 p.m. and Shift 3 is from 2:00 p.m. to 12:00 a.m. Training sessions shall be scheduled for Wednesdays at 7:30 a.m. and repeated at 2:00 p.m.

1.10 RECORD KEEPING

A. Maintain and submit following records generated during start-up and testing phase of Project:
   1. Daily logs of equipment testing identifying all tests conducted and outcome.
   2. Logs of time spent by manufacturer's representatives performing services on the job site.
   3. Equipment lubrication records.
   4. Electrical phase, voltage, and amperage measurements.
   5. Insulation resistance measurements.
   6. Data sheets of control loop testing including testing and calibration of instrumentation devices and setpoints.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01770

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Contract closeout requirements including:
   1. Final cleaning,
   2. Preparation and submittal of closeout documents,
   3. Final completion certification.

B. Related Sections:
   1. Section 01722 - Field Engineering.

1.02 FINAL CLEANING

A. Perform final cleaning prior to inspections for Substantial Completion.

B. Employ skilled workers who are experienced in cleaning operations.

C. Use cleaning materials which are recommended by manufacturers of surfaces to be cleaned.

D. Prevent scratching, discoloring, and otherwise damaging surfaces being cleaned.

E. Clean roofs, gutters, downspouts, and drainage systems.

F. Broom clean exterior paved surfaces and rake clean other surfaces of sitework.
   1. Police yards and grounds to keep clean.

G. Remove dust, cobwebs, and traces of insects and dirt.

H. Clean grease, mastic, adhesives, dust, dirt, stains, fingerprints, paint, blemishes, sealants, plaster, concrete, and other foreign materials from sight-exposed surfaces, and fixtures and equipment.

I. Remove non-permanent protection and labels.

J. Polish finish hardware.

K. Clean permanent filters and replace disposable filters when heating, ventilation, and air conditioning units were operated during construction.

L. Clean ducts, blowers and coils when units were operated without filters during construction.

M. Clean light fixtures and replace burned-out or dim lamps.

1.03 WASTE DISPOSAL

A. Arrange for and dispose of surplus materials, waste products, and debris off-site.
   1. Prior to making disposal on private property, obtain written permission from OWNER of such property.

B. Do not fill ditches, washes, or drainage ways which may create drainage problems.

C. Do not create unsightly or unsanitary nuisances during disposal operations.

D. Maintain disposal site in safe condition and good appearance.

E. Complete leveling and cleanup prior to final acceptance of the Work.

1.04 TOUCH-UP AND REPAIR

A. Touch-up or repair finished surfaces on structures, equipment, fixtures, and installations that have been damaged prior to inspection for Substantial Completion.

B. Refinish or replace entire surfaces which cannot be touched-up or repaired satisfactorily.

1.05 CLOSEOUT DOCUMENTS

A. Submit following Closeout Submittals upon Substantial Completion and at least 7 days prior to submitting Application for Final Payment:
   1. Evidence of Compliance with Requirements of Governing Authorities.
   2. Project Record Documents.
   3. Operation and Maintenance Manuals.
   4. Warranties and Bonds.
   5. Keys and Keying Schedule.
   6. Evidence of Payment and Release of Stop Payment Notices as outlined in Conditions of the Contract.
   7. Release of claims as outlined in Conditions of the Contract.
   8. Survey Record Documents as specified in Section 01722.
   9. Certificate of Final Completion.

1.06 EVIDENCE OF COMPLIANCE WITH REQUIREMENTS OF GOVERNING AUTHORITIES

A. Submit the following:
   1. Certificate of Occupancy.
   2. Certificates of Inspection:
      a. Stanislaus County.
      b. End of SWRCB - Storm Water Permit.

1.07 PROJECT RECORD DOCUMENTS

A. Maintain at Project site, available to OWNER and ENGINEER, one copy of the Contract Documents, shop drawings and other submittals, in good order.
   1. Mark and record field changes and detailed information contained in submittals and change orders.

2. Record actual depths, horizontal and vertical location of underground pipes, duct banks and other buried utilities. Reference dimensions to permanent surface features.
3. Identify specific details of pipe connections, location of existing buried features located during excavation, and the final locations of piping, equipment, electrical conduits, manholes, and pull boxes.
4. Identify location of spare conduits including beginning, ending and routing through pull boxes, and manholes. Record spare conductors, including number and size, within spare conduits, and filled conduits.
5. Provide schedules, lists, layout drawings, and wiring diagrams.
6. Make annotations with erasable colored pencil conforming to the following color code:

Additions:	Red
Deletions:	Green
Comments	Blue
Dimensions:	Graphite

B. Maintain documents separate from those used for construction.
1. Label documents "RECORD DOCUMENTS."

C. Keep documents current.
1. Record required information at the time the material and equipment is installed and before permanently concealing.

D. Deliver record documents with transmittal letter containing date, Project title, CONTRACTOR's name and address, list of documents, and signature of CONTRACTOR.

E. During progress meetings, record documents will be reviewed to ascertain that changes have been recorded.

F. Final Schedule Submittal in accordance with Section 01324A, Article "FINAL SCHEDULE SUBMITTAL".

1.08 WARRANTIES AND BONDS

A. Provide executed Warranty or Guaranty Form if required by Contract Documents.

B. Provide specified additional warranties, guarantees, and bonds from manufacturers and suppliers.

1.09 CERTIFICATE OF FINAL COMPLETION

A. When 7 day operational test has been successfully completed, ENGINEER will certify that new facilities are operationally complete. ENGINEER will submit a list of known items (punchlist) still to be completed or corrected prior to contract completion.

B. List of items to be completed or corrected will be amended as items are resolved by CONTRACTOR.

C. When all items have been completed or corrected, submit written certification that the entire work is complete in accordance with the Contract Documents and request final inspection.

D. Upon completion of final inspection, ENGINEER will either prepare a written acceptance of the entire work or advise CONTRACTOR of work not complete. If necessary, inspection procedures will be repeated.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 01782

OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Preparation and submittal of Operation and Maintenance Manuals.

1.02 SUBMITTALS

A. Submit Operation and Maintenance Manuals before field quality control testing and before training of each piece of equipment or system.

B. Submit 5 Manuals for each piece of equipment or system.

C. Make manuals available at project site for use by construction personnel and ENGINEER.

D. Make additions and revisions to the Manuals in accordance with ENGINEER's review comments.

1.03 OPERATION AND MAINTENANCE MANUALS

A. Preparation:
   1. Provide Operations and Maintenance Manuals in 3-ring binders with rigid covers. Utilize tab sheets to organize information.

B. Contents of Operation And Maintenance Manuals:
   1. Cover Page: Equipment name, equipment tag number, project name, OWNER's name, appropriate date.
   2. Table of Contents: General description of information provided within each tab section.
   3. Lubrication Information: Required lubricants and lubrication schedules.
   4. Control Diagrams:
      a. Internal and connection wiring, including logic diagrams, wiring diagrams for control panels, ladder logic for computer based systems, and connections between existing systems and new additions, and adjustments such as calibrations and set points for relays, and control or alarm contact settings.
   5. Start-up Procedures: Recommendations for installation, adjustment, calibration, and troubleshooting.
   6. Operating Procedures:
      a. Step-by-step procedures for starting, operating, and stopping equipment under specified modes of operation.
      b. Include safety precautions and emergency operating shutdown instructions.
   7. Preventative Maintenance Procedures: Recommended steps and schedules for maintaining equipment.

8. Overhaul Instructions: Directions for disassembly, inspection, repair and reassembly of the equipment; safety precautions; and recommended tolerances, critical bolt torques, and special tools that are required.
9. Parts List: Generic title and identification number of each component part of equipment; include bearing manufacturer, model and ball or roller pass frequencies for every bearing.
10. Spare Parts List: Recommended number of parts to be stored at the site and special storage precautions.
11. Drawings: Exploded view or plan and section views with detailed callouts.
12. Provide electrical and instrumentation schematic record drawings.
13. Source (Factory) Quality Control Test Results: Provide copies of factory test reports as specified in Sections 15958 or the equipment section.
14. Field Quality Control Test Results: After field-testing is completed, insert field test reports as specified in Sections 15958 or the equipment section.
15. Equipment Summary Form: Completed form in the format attached at the end of this Section. Insert Equipment Summary Form after the tab sheet of each equipment section. The manufacturer's standard form will not be acceptable.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

EQUIPMENT SUMMARY FORM

1. EQUIPMENT ITEM _____

2. MANUFACTURER _____

3. EQUIPMENT IDENTIFICATION NUMBER(S) _____
(maps equipment number)

4. LOCATION OF EQUIPMENT _____

5. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS) _____

_____

_____

_____

NAMEPLATE DATA -

Horsepower _____
Amperage _____
Voltage _____
Service Factor (S.F.) _____
Speed _____
ENC Type _____
Capacity _____
Other _____

7. MANUFACTURER'S LOCAL REPRESENTATIVE

Name _____

Address _____

Telephone Number _____

8. MAINTENANCE REQUIREMENTS _____

_____

_____

9. LUBRICANT LIST _____

_____

10. SPARE PARTS (recommendations) _____

_____

11. COMMENTS _____

SECTION 01999

REFERENCE FORMS

The forms listed below and included in this Section are to assist in meeting the requirements of the Contract Documents. Contractor may submit equivalent forms for Owner's approval prior to use. If Owner does not approve substitute form, Contractor must use forms found in this Section. Owner will provide Contractor electronic files of prescribed forms upon request.

Form No.	Title of Form
1	CAD WAIVER – **NOT USED**
2	CONTRACTOR'S APPLICATION AND CERTIFICATE FOR PAYMENT
3	SYSTEM OUTAGE REQUEST (SOR)
4	SUBMITTAL TRANSMITTAL
5	PROPOSED "OR EQUAL" SUBSTITUTION TRANSMITTAL
6	DAILY EXTRA WORK REPORT
7	REQUEST FOR INFORMATION (RFI)
8	WARRANTY FORM
9	CERTIFICATE OF SUBSTANTIAL COMPLETION
10	REQUEST FOR PROPOSAL (RFP)
11	FIELD DIRECTIVE
12	CONSTRUCTION CHANGE DIRECTIVE (CCD)
13	FIELD ORDER
14	CONTRACTORS COST BREAKDOWN WORKSHEET
15	CONTRACT CHANGE ORDER
16	EQUIPMENT TEST REPORT
17	OPERATING AND MAINTENANCE INFORMATION TRANSMITTAL
18A	EQUIPMENT RECORD FORM- A
18B	EQUIPMENT RECORD FORM- B
19	MANUFACTURER'S REPRESENTATIVE SERVICE REPORT
20	MANUFACTURER'S INSTALLATION CERTIFICATE FORM
21	MANUFACTURER'S INSTRUCTION CERTIFICATE FORM
22	UNIT RESPONSIBILITY FORM
23	MOTOR DATA FORM
24	PIPE TESTING FORM
25	STARTUP AND PERFORMANCE EVALUATION FORM
26	INSTRUMENTATION DATA SHEET AND CALIBRATION RECORD

CAD WAIVER- Not Used
Form 01999-1

Contractor's Application and Certificate For Payment

		Application Period:		Pay Request No.:	
To (Owner):	City of Turlock, CA Project 0751	From (Contractor):		From:	
Project Name:		Address (Street , P.O. Box)		To:	
Owner's Contract No.:		City, State & Zip		Contract Date:	

Change Order Summary

Approved Change Orders		
Number	Additions	Deductions
TOTALS	$0.00	$0.00

APPLICATION IS MADE FOR PAYMENT AS SHOWN BELOW. THE PRESENT STATUS OF THIS CONTRACT IS AS FOLLOWS:

A. ORIGINAL CONTRACT SUM	$0.00
B. Net change by Change Orders	$0.00
C. CURRENT CONTRACT PRICE	$0.00
D. TOTAL COMPLETED AND STORED TO DATE (Column F Progress Estimate)	$0.00
WITHHELD AMOUNTS	
E. Retainage - __% of Work Completed	$0.00
F. Liquidate Damages	$0.00
G. Other	$0.00
H. SUBTOTAL-WITHHELD	$0.00
I. TOTAL REQUESTED THIS APPLICATION	$0.00
J. BALANCE TO FINISH, PLUS WITHHELDS	$0.00

CONTRACTOR'S CERTIFICATION

The undersigned Contractor certifies that: (1) all previous progress payments received from Owner on account of Work done under Contract have been applied on account to discharge Contractor's legitimate obligations incurred in connection with Work covered by prior Applications for Payment; (2) title of Work, materials and equipment incorporated in said Work of otherwise listed in or covered by this Application for Payment will pass to Owner at time of payment free and clear of all Liens, security interests and encumbrances (except such as are covered by a Bond acceptable to Owner indemnifying Owner against any such Lie Payment of encumbrances); and (3) all Work covered by this Application for Payment is in accordance with the Contract Documents and is not defective.

By: _____

Title: _____ Date: _____

Payment of: $ _____
(Line I or other - attach explanation of other amount)

is recommended by: _____ _____
(Engineer) (Date)

Payment of: $ _____
(Line I or other - attach explanation of other amount)

is approved by: _____ _____
(Owner) (Date)

Progress Estimate

Contractor's Application

Project:	City of Turlock, CA Regional Treatment Project Water Quality Control Facility Headworks and Secondary Treatment Capacity Expansion Project - Phase -1 Project Number 0751				Application Number:				
Contractor:					Application Period:	From:		To:	
A		B	Work Completed		E	F			G
Item			C	D		Total Completed and Stored to Data	%		Balance to
Specification Section No.	Description	Scheduled Value	From Previous Application (C+D)	This Period	Materials Presently Stored (not in C or D)	(C+D+E)	(F) B		Finish (B-F)
						0	#DIV/0!		0
		$0.00	$0.00	$0.00	$0.00	$0.00	#DIV/0!		$0.00

SYSTEM OUTAGE REQUEST FORM
Form No. 01999-3

System to be Shutdown:
_____
_
_____
_
_____

Submittal No.	
( ) 1st Submission	( ) Re-Submittal
Spec Section	
Dwg/Detail No.	

Date of Shutdown: _____ Beginning at _____ a.m. p.m.

Duration of Shutdown: _____ Critical Path Activity? ( ) yes ( ) no

Owner: City of Turlock, CA	**Routing**	**Date Sent**	**Date Received**
Project: Harding Drain Bypass Pump Station and Pipeline	Contractor/CM		
Contractor:	CM/Design Engineer		
	CM/Owner		
Regulatory Agency Notification Required? ( ) yes ( ) no Is a Dry Run Required? ( ) yes ( ) no Confined Space Entry? ( ) yes ( ) no Combustible/Hazardous Gases Present? ( ) yes ( ) no	Design Engineer/CM		
	Owner/CM		
	CM/Design Engineer		
Describe work to be performed including detailed sequence of events, safety plan, protection of existing facilities, equipment to be used and contingency plan. Use additional sheets as necessary.			
Will you require assistance from Owner's Operations? Note that all existing valves and controls shall be operated by City of Modesto Operations staff only.			

SYSTEM OUTAGE REQUEST FORM, (CONT'D)
Form No. 01999-3

Outage Contact Information	Name of Person on Call/Duty	Home Phone	Cell Phone and/or Pager
Contractor			
Construction Mgr.			
Owner's Operations			
Design Engineer			

Additional Contractor Comments: Certified by: _____ (Contractor's Signature)	**CM/Owner /Design Engineer Review Action** ( ) SOR Acceptable with comments noted on attached.) SOR Not Acceptable with reasons noted on attached. Re-Submittal is required. _____ Date: _____ (Engineer's Signature)

SUBMITTAL TRANSMITTAL
Form No. 01999-4

Submittal Description:
_____
_____

Priority Level: ( ) Low ( ) Medium ( ) High **( )**
On Critical Path

Submittal No.	
( ) 1st Submission	( ) Re-Submittal
Spec Section	
Dwg/Detail No.	

Owner:	**Routing**	**Date Sent**	**Date Received**
	Contractor/CM		
Project:	CM/Design Engineer		
	Design Engineer/CM		
Contractor:	CM/Contractor		

We are sending you: ( ) Attached ( ) Under separate cover via _____
( ) Submittals for review and comment

Remarks: _____

( ) Product Data for information only _____

No. Copies	**Description**	**Manufacturer**	**Reviewer Action**	**Reviewer Initials**

SUBMITTAL TRANSMITTAL (CONT'D)
Form No. 01999-4

• The Action Designated above is in accordance with the following legend: A – No Exceptions Taken B – Make Corrections Noted C – Amend and Resubmit D – Rejected E – Design Consultant's review not required	**CONTRACTOR:** Must certify one of the following statements pertaining to the transmittal or submittal sent for review: ( ) As the General Contractor for this project we certify that the material or equipment contained in this submittal meets all the requirements, including coordination with all related work specified (no exceptions) ( ) As the General Contractor for this project we certify that the material or equipment contained in this submittal meets all the requirements specified except for the attached deviations.

Comments:_____

_____

_____

Certified by: _____
(Contractor's Signature)

PROPOSED "OR EQUAL" SUBSTITUTION SUBMITTAL TRANSMITTAL
Form No. 01999-5

Proposed "Or Equal" Substitution Submittal Description:

_____
_____
_____
_____

Submittal No.	
( ) 1st Submission	( ) Re-Submittal
Spec Section	
Dwg/Detail No.	

Priority Level: ( ) Low ( ) Medium ( ) High **( ) On Critical Path**

Owner:	**Routing**	**Date Sent**	**Date Received**
	Contractor/CM		
Project:	CM/Design Engineer		
	Design Engineer/CM		
Contractor:	CM/Contractor		

Proposed "Or Equal" Substitution Item or Service

A. When the first specified item is followed by a second maker's name and "or equal," the Contractor may submit Proposed Equivalent items for the Engineer's review. Proposed "Or Equal" Substitution items that are in the Engineer's judgment equal to the first specified item in quality, utility, and appearance, will be Favorably Reviewed. Where a product description and first maker's name is followed by "or equal" with no second maker's name, it means the Engineer knows of no equivalent product and the Contractor may submit Proposed Equivalent products by other makers for review. Where the term "or equal" is omitted, it means that the named item is required to meet the Owner's needs; no products or makers other than those specified will be considered.

B. This request shall include adequate technical information to fully describe the function and quality of the item. **Submittals of Proposed "Or Equal" Substitution items that are not made within thirty (30) calendar days of the Notice to Proceed date will be rejected unless the Owner has agreed in writing to a later submittal date and the Contractor agrees to comply with all conditions of the Owner for the late submittal.** If the Contractor's second attempt to obtain Favorable Review of a Proposed "Or Equal" Substitution item is unsuccessful, the Contractor shall submit the first specified item.

C. Inclusion of a second maker's name indicates the maker is acceptable but does not necessarily indicate the maker offers a standard product equal to the first specified item. Items by the second named maker are subject to the same conditions of review and compatibility as other Proposed "Or Equal" Substitution items. Inclusion of a maker's name and/or model number after a specification description is not a representation that the maker will furnish an item meeting the Contract requirements at bid time or at time of need. It is the Contractor's sole responsibility to furnish items meeting the Contract requirements.

D. The Engineer's review of Proposed "Or Equal" Substitution items is based solely on information provided by the Contractor and on the Contractor's warranty that the proposed item is equal in quality, utility, function and appearance to the first specified item. Favorable Review of a Proposed "Or Equal" Substitution item has the same meaning and is subject to the same limitations that apply to the Favorable Review of Product Data and Shop Drawings described in the Contract Documents.

E. Submit with proposal:

1. Description of item being proposed including the Manufacturer's model or product number.
2. Manufacturer's representation that the proposed "or equal" substitution item or service is equal to or superior to specified item in all respects.
3. Manufacturer's product data.
4. Information about several recent similar installations, including project name, owner's name, address, telephone number, and name of knowledgeable person to contact for information on performance of the product.
5. Whether a reduction in the Contract Price is being proposed. If so, provide a detailed cost breakdown substantiating the cost reduction. Consideration should be given to all extra costs and expenses necessary to make the proposed "or equal" substitution meet or exceed the all requirements found in the Contract Documents.
6. Whether a reduction in the Contract Time is being proposed. If so, provide schedule analysis substantiating the reduction in contract time and assumptions made in the schedule analysis.
7. Explain all known differences between the product specified and the Proposed "Or Equal" Substitution. Explanation to consider such items as:
    a) Does the substitution affect dimensions shown on Drawings?

PROPOSED "OR EQUAL" SUBSTITUTION SUBMITTAL TRANSMITTAL (CONT'D)
Form No. 01999-5

b) Are the manufacturer's guarantees and warranties on the proposed substitution items identical to those on the specified items? If there are differences, please specify each and every difference in detail.

c) c) Does the proposed "or equal" substitution impact other contractors, trades or suppliers?

d) Is the proposed "or equal" substitution compatible with all other interrelated equipment, materials and products?

e) Any differences in Operations and Maintenance costs?

f) Any differences in available factory authorized repair centers with regards to response times and geographic location?

g) Will use of proposed "or equal" substitution be subject to any license fee or royalty?

h) Are there any color or pattern differences? If so, provide color and pattern samples?

The undersigned hereby:

1. Certifies that he/she has thoroughly investigated the Proposed "Or Equal" Substitution item or service and has determined that the function/utility, appearance and quality of the Proposed "Or Equal" Substitution item or service are equivalent or superior to those of the specified item;
2. Certifies that the Proposed "Or Equal" Substitution item or service is compatible with all interrelated equipment, materials, products and services unless otherwise explained in specific detail in this submittal;
3. Agrees to coordinate installation and make all other changes that may be required for Work to be complete in all respects at no additional cost to the Owner;
4. Waives all claims for additional costs and contract time due to late ordering of the specified products or services caused by requests for "Or Equal" Substitutions that are subsequently rejected by the Engineer;
5. Represents and warrants that the Contractor is solely responsible for any extra cost or expense necessary to make the Proposed "Or Equal" Substitution item or service fully equivalent to and compatible with the Contract Documents and will meet or exceed the Engineer's design intent;
6. Agrees to compensate the Owner for all additional redesign costs associated with the Proposed "Or Equal" Substitution item or service and the cost of the Engineer's review of the Proposed "Or Equal" Substitution item or service;

PROPOSED "OR EQUAL" SUBSTITUTION SUBMITTAL TRANSMITTAL (CONT'D)
Form No. 01999-5

7. Waives all claims for additional costs and contract time which may subsequently become apparent; and

8. Agrees to comply with all additional requirements imposed by the Owner and Engineer should the Proposed "Or Equal" Substitution item or service is approved.

Submitted by:

_____
Contractor

_____
Name

_____
Signature

_____
Title

Date: _____

Daily Extra Work Report

Job Title: Regional WQCF Headworks & Secondary Expansion Project Contract No.:0751	Field Order No.:	Sheet No. ____ of ____
Contractor:	Date Reported:	Date Performed
Description of Work:		

Equipment*			Hours	Hourly Rate	Delay Factor	Extended Amounts
Model	Code	Description				
					1.00	$0.00
					1.00	$0.00
					1.00	$0.00
					1.00	$0.00
					1.00	$0.00
					1.00	$0.00
Total Cost of Equipment - Regular Hours					B.	**$0.00**

Labor*		Hours	Hourly Rate	Extended Amounts
	OT			$0.00
	Reg			$0.00
	OT			$0.00
	Reg			$0.00
	OT			$0.00
	Reg			$0.00
	OT			$0.00
	Reg			$0.00
	OT			$0.00
	Reg			$0.00
	OT			$0.00
	Reg			$0.00
Subtotal - Overtime Hours	OT			**$0.00**
Subtotal - Regular Hours	Reg			**$0.00**

Material and/or Work done by Others**				
Description	No. Units	Unit Cost		Extended Amounts
				$0.00
				$0.00
				$0.00
				$0.00
				$0.00
				$0.00
Total Cost of Materials and Work - Regular Hours			C.	**$0.00**

Description	Ltr.	% Markup	Total Costs
Total Cost of labor (Regular + OT)	A.		$0.00
Total Cost of Equipment	B.		$0.00
Material and/or Work done by Others	C.		$0.00
Markup on Labor (A.)		20%	$0.00
Markup on Equipment (B.)		15%	$0.00
Markup on Materials and Work (C.)		10%	$0.00
Total This Report			**$0.00**

* Includes Equipment and Labor of Subcontractors and Owner-Operators.

** Section is used to report work for which labor rates as described in the specifications are unavailable.

1. List Model, Code & Description of Equipment as it appears in the equipment rental rates booklet published by Caltrans.

2. List labor as it appears in the labor rate breakdown as described in the specifications.

3. Attach photocopies of applicable labor rate breakdown and equipment rental sheets.

4. List operator on same line as equipment.

Contractor's Authorized Field Representative

Owner's Field Representative

Receipt does not constitute acceptability for payment or acceptance of "Extra Work" status for work.

REQUEST FOR INFORMATION
Form No. 01999-7

Area of Work in Question:_____
_____
_____

RFI No.	
( ) 1st Submission	( ) Re-Submittal
Spec Section(s)	
Dwg/Detail No.'s	

RFI Generated by: ( ) Contractor ( ) CM ( ) Other _____

Priority Level: ( ) Low ( ) Medium ( ) High **( ) On Critical Path**

Is their a Cost Impact associated with this RFI? ( ) yes ( ) no ( ) possibly

Is their a Time Impact associated with this RFI? ( ) yes ( ) no ( ) possibly

Owner:	**Routing**	**Date Sent**	**Date Received**
	Contractor/CM		
Project:	CM/Design Engineer		
	Design Engineer/CM		
Contractor:	CM/Contractor		
Question (s): (Attach sketches or additional sheets as needed) Submitted by: _____ Date: _____			
Response: (Attach sketches or additional sheets as needed) Response by: _____ Date: _____			

WARRANTY FORM
Form No. 01999-8

Warranty For:

(Project/Component):

(Location): Turlock, CA

We hereby guarantee the (Total Project or Owner-Occupied Project Component) that we have constructed for a period of one (1) year (unless, pursuant to the Contract Documents, an extended warranty is to be provided in which case the duration of the extended warranty shall apply) from (Date) the date of acceptance of the work/substantial completion by the City of Turlock, CA

We agree that if any of the equipment should fail due to any reason other than improper maintenance or improper operation, if any pipe or appurtenances should develop leakage, or if any settlement of fill or backfill occurs, or should any portion of the work fail to fulfill any of the requirements of the Specifications, we will, within ten days after written notice of such defects, commence to repair or replace the same together with any other work which may be damaged or displaced in so doing.

In the event of our failure to comply with the above with the above mentioned conditions within a reasonable time after being notified, or should the exigencies of the case require repairs or replacements to be made before we can be notified or respond to notification, we do hereby authorize the City of Turlock, CA to proceed to have the defect repaired and made good at our expense, and we will pay the cost therefore upon demand.

The warranty provided herein shall not be in lieu of, but shall be in addition to any warranties or other obligations otherwise imposed by the Contract Documents and by law.

Contractor:_____

CERTIFICATE OF SUBSTANTIAL COMPLETION
Form No. 01999-09

Owner: City of Turlock, CA

Project Name: Regional WQCF Headworks & Secondary Expansion Project

Owner's Contract Number:_____

Contractor:_____

Contract for Construction of: _____

_____

_____

Project or Specified Part Shall Include: _____

_____

Contract Date: _____

The Work performed under this Contract has been inspected by authorized representatives of the Owner, Contractor, Construction Manager and Engineer, and the Project (or specified part of the Project, as indicated above) is hereby accepted by the Owner and declared to be substantially completed on the above date.

1) Final completion of the Work shall be the date of such acceptance of the Work by the Owner.

2) Final completion shall mean full performance of the Contract requirements.

A list of all items remaining to be completed or corrected has been sent to the Contractor in the Owner's letter dated _____. All such work shall be completed or corrected to the satisfaction of the Owner prior to the release of the Contractor's retention and within 30 calendar days following the date of the Notice of Substantial Completion.

RECOMMENDED BY CONSTRUCTION MANAGER

_____
(Signature)

_____
(Date)

CERTIFICATE OF SUBSTANTIAL COMPLETION (CONT'D)
Form No. 01999-09

RECOMMENDED BY ENGINEER

_____
(Signature)

_____
(Date)

The Owner accepts the project or specified area of the project as substantially completed and will assume full possession of the Project or specified area of the Project at (time and date). The responsibility for utilities, fuels and chemicals under the Contract Documents will be assumed by the OWNER after that date.

OWNER

_____
(Signature)

_____
(Date)

The Contractor hereby accepts the above Notice of Substantial Completion and agrees to complete and correct all of the items as outlined in the Owner's letter to the Contractor dated _____.

CONTRACTOR

_____
(Signature)

_____
(Date)

Request For Proposal
Form No. 01999-10

QUOTATION NO: _____

TO: _____ DATE: _____

FROM: _____

PROJECT: Harding Drain Bypass Pump Station and Pipeline Project

KEYWORD DESCRIPTION: _____

DATE PROPOSAL REQUIRED: _____

The following modification to the contract has been identified. Pursuant to Section 01350 – **Modification Procedures,** please provide a proposal for the alteration as described in Item 1. The proposal should include an itemized breakdown of contractor and subcontractor costs, including labor, materials, rentals, approved services, overhead, and profit. This request shall not be considered authorization to proceed with the work herein described. This is not a change order.

To be completed by Initiator

1. Scope of Work: (include list of attachments)

Scope of work has not changed.

2. Reason(s) for Modification:

3. Approval of Request:

Owner: _____ Date: _____

Engineer: _____ Date: _____

To be completed by

4 Total cost of modification (attach $ _____

5 Will a modification to the contract time be required? ☐ Yes ☐ No

If yes, please provide time impact analysis in accordance with Section 01324 – **Progress Schedules and Reports**

_____

6 Proposal is in effect until: (date) _____

Signed:

Contractor's Authorized _____ Date _____

Field Directive No. _____

Form No. 01999-11

Date of Issuance: _____ Effective Date: _____

Project:

Owner:	Owner's Contract No.:
Contractor:	

Attention:
You are hereby directed to promptly execute this Field Directive issued in accordance with Section 01350-1.03 Field Directive, for changes in the Work without changes in Contract Price or Contract Times. If you consider that a change in Contract Price or Contract Times is required, please notify the Engineer immediately and before proceeding with this Work. Any modifications, including a change to the contract price or contract requirements shall be covered by a formal Change Order executed by Owner and Contractor.

Reference: _____ _____
(Specification Section(s))/RFI # (Drawing(s) / Detail(s))

Description:

Refer to Drawing Sheets _____ Section or Detail _____

Refer to Specification Paragraphs _____

Will additional drawings be necessary? ( ) ( )
Yes No

Attachments:

	Issued by:
	Engineer
Receipt Acknowledged by (Contractor):	Date:

Copy to Owner

Construction Change Directive (CCD)
Form No. 01999-12

OWNER:		
PROJECT:		
CHANGE DIRECTIVE NO:		DATE:

When signed by the Owner, this document becomes effective immediately and the Contractor shall proceed with the change(s) described below. The Contractor is hereby directed to make the following change(s) to the Work of the Contract: *(Reference attachments by name and date)*

PROPOSED ADJUSTMENTS

1. The proposed basis of adjustment to the Contract Sum is:
   - ☐ A Lump Sum adjustment of: _____
   - ☐ A Unit Price adjustment of: _____ per _____
   - ☐ Actual costs as documented and approved per the Contract.
   - ☐ Other method as provided below: *(Insert terms of the basis of adjustment or reference attachment by name and date)*
   - ☐ Unilateral determination by Owner.
   - ☐ NO CHANGE
2. The proposed adjustment to the Contract Time is:
   - ☐ NO CHANGE
   - ☐ An increase of _____ calendar days
   - ☐ A decrease of _____ calendar days

PREPARED BY:

(Print or Type Name of Engineer)	*(Signature)*	*(Date)*

WORK AUTHORIZED BY:

(Print or Type Name of Owner)	*(Signature)*	*(Date)*

DIRECTIVE ACCEPTED BY:

Signature by the Contractor indicates the Contractor's full and complete agreement with the proposed basis of adjustment in the Contract Sum and Time set forth in this Construction Change Directive. Change Directives accepted by the Contractor shall be incorporated into a Change Order without further adjustment.

(Print or Type Name of Contractor)	*(Signature)*	*(Date)*

Field Order
Form No. 01999-13

FIELD ORDER NO: _____ Date: _____

To Contractor: _____

Project No.: _____ Contract Days Changed ☐ Yes

Project Name: _____ ☐ No

Location: _____ ☐ To be determined

You are authorized to proceed with the following work:

_____

_____

_____

Justification: _____

_____

Cost Basis: $ _____
Time and Material
Not to Exceed Estimate

Contractor to submit.

_____ DATE: _____
Recommended by Engineer

Approval By: _____ DATE: _____
Owner

Accepted By: _____ DATE: _____
Contractor

Field Order (Cont'd)

Field Work Orders will be converted to a Change Order within thirty (30) days of the Owner's approval. Maximum amount for any one Field Work Order shall conform to the Owner's policy guidelines. All costs incurred by Contractor resulting from this Field Order will be determined in accordance with Section 01350-1.10 **COST DETERMINATION**.

Contractor must submit Daily Extra Work Reports to the Engineer no later than the working day following the performance of said work. See Section 01350-1.05 Field Order-Force Account Work.

CONTRACTOR'S COST BREAKDOWN WORKSHEET
Form No. 01999-14
RFP #____

DESCRIPTION	QTY	UNIT	UNIT MHRS	TOTAL MHRS	COM-POSITE MH RATE	UNIT LABOR COST	TOTAL LABOR COST	UNIT EQUIP. COST	TOTAL EQUIP COST	TOTAL L&E UNIT COST	UNIT EXPEND MATLS COST	TOTAL EXPENDABLES MATERIALS COST	UNIT P. MATL COST	TOTAL PERMANENT MATERIALS COST	UNIT SUBS/ SPECIAL SERVICES COST	SUBS/ SPECIAL SERVICES COST	TOTAL COST
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
				0.0		0.00	$0		$0	$0.00		$0		$0		$0	-
GRAND TOTALS				**-**			**$0**		**$0**			**$0**		**$0**		**$0**	**$0**
																Math Check	***$0***
Direct Field Labor Mark-up @ 20%							$0.00										
Equipment Mark-up @ 15%									$0.00								
Material Mark-up @ 10%												$0.00		$0.00			
Subs/Special Services Mark-up @ 5%																$0.00	
Mark-up Subtotal																	$0.00
Actual Costs plus Mark-up Subtotal																	$0.00
Bonds/ Insurance (not to exceed 21/2%)																	$0.00
TOTAL																	**$0.00**

Contract Change Order
Form No. 01999-15

CHANGE ORDER NO: _____ DATE: _____

CONTRACT FOR: _____ OWNER: _____

TO: _____

You are hereby requested to comply with the following changes from the contract plans and specifications:

Description of Changes (Supplemental Plans and Specifications Attached)	DECREASE in Contract Price	INCREASE in Contract Price
	$	$
TOTALS	$	
NET CHANGE IN CONTRACT PRICE	$	

JUSTIFICATION:

CHANGE TO CONTRACT PRICE	
Original Contract Price:	$
Current Contract Price, as adjusted by previous change orders:	$
The Contract Price due to this Change Order will be increased or (decreased) by	$
The new Contract Price due to this Change Order will be:	$

Contract Change Order
Form No. 01999-15

The Contract Period Provided for Completion will be (Increased) (Decreased) (Unchanged): _____ Days.

APPROVALS REQUIRED: To be effective this order must be approved by the City of Modesto if it changes the scope or objective of the project, or as may otherwise be required by the Contract Documents.

ACCEPTED BY:				RECOMMENDED BY:	
Owner:		Contractor:		Engineer:	
By:		By:		By:	
Title:		Title:		Title:	
Date:		Date:		Date:	

EQUIPMENT TEST REPORT
Form No. 01999-16

NOTE: This example equipment test report is provided for the benefit of the Supplier and is not specific to any piece of equipment to be installed as a part of this project. The example is furnished as a means of illustrating the level of detail required for the preparation of equipment test report forms for this project.

Project: Regional WQCF Headworks & Secondary Treatment Expansion Project
Owner: City of Turlock, CA
Contractor: _____

Supplier: _____

Equipment Name: _____
Equipment Number: _____
Specification Ref: _____

PRE-OPERATIONAL CHECKLIST

	Supplier		Engineer	
	Verified	Date	Verified	Date
Mechanical				
Lubrication				
Alignment				
Anchor bolts				
Pump/mechanical equipment vibration testing				
Seal water system operational				
Equipment rotates freely				
Safety guards				
Valves operational				
O&M manual information complete				
Supplier's installation certificate complete				
Electrical (Circuit ring-out and high-pot tests)				
Circuits: Power to MCC Control to HOA				

EQUIPMENT TEST REPORT (CONT'D)
Form No. 01999-16

	Supplier		Engineer	
	Verified	Date	Verified	Date
Indicators at MCC: Red (running) Green (power) Amber (auto)				
Indicators at local control panel				
Wiring labels complete				
Nameplates: MCC Control station Control panel				
Electrical equipment grounding verification				
Equipment bumped for rotation				
Piping Systems				
Cleaned and flushed: Suction Discharge				
Pressure tests				
Temporary piping screens in place				
Thrust restraint and pipe supports in place				
Instrumentation and Controls				
Flow meter _____ calibration Calibration Report No.				
Flow recorder_____ calibrated against transmitter				
VFD speed indicator calibrated against independent reference				
Discharge overpressure shutdown switch calibration				
Simulate discharge overpressure shutdown				
I/C equipment grounding verification				

EQUIPMENT TEST REPORT (CONT'D)
Form No. 01999-16

FUNCTIONAL TESTS

	Supplier		Engineer	
	Verified	Date	Verified	Date
Mechanical				
Motor operation temperature satisfactory				
Pump operating temperature satisfactory				
Unusual noise, *etc?*				
Pump operation: gpm/ psig				
Pump Measurement: Flow/Pressure Test gage number				
Alignment hot				
Doweled in				
Pump/mechanical equipment vibration testing				
Remarks:				
Electrical				
Local switch function: Runs in *HAND* No control power in *OFF* Timer control in *AUTO*				
Overpressure protection switch PS2502C functional in both *HAND* and *AUTO*				
Overpressure protection switch PS2502C set at 75 psig				
PLC 2500 set at 24 hr cycle, 25 min *ON*				
Motor amperage draw test				

EQUIPMENT TEST REPORT (CONT'D)
Form No. 01999-16

OPERATIONAL TEST

	Supplier		Engineer	
	Verified	Date	Verified	Date
48-hour continuous test: pump cycles as specified indicators functional controls functional pump maintains capacity overpressure protection remains functional hour meter functional				

RECOMMENDED FOR BENEFICIAL OCCUPANCY

Engineer _____ Date _____

ACCEPTED FOR BENEFICIAL OCCUPANCY

Owner's Representative _____ Date _____

OPERATING AND MAINTENANCE INFORMATION TRANSMITTAL
Form No. 01999-17

Submittal Description:

_____

_____

Submittal No.		**# Copies**
( ) 1st Submission		( ) Re-Submittal
Spec Section		

Owner:	**Routing**	**Date Sent**	**Date Received**
	Contractor/CM		
Project:	CM/Design Engineer		
	Design Engineer/CM		
Contractor:	CM/Contractor		

Supplier Name:	**Supplier Review**		**Design Consultant Review**	
Checklist	Satisfactory	N/A	Accept	Deficient
1. Table of Contents				
2. Equipment Record Forms				
3. Supplier/Vendor Contact Information				
4. Safety Precautions				
5. Operator Pre-Start				
6. Start-up, Shutdown/Post-Shutdown Procedures				
7. Normal Operations				
8. Emergency Operations				
9. Operator Service Requirements				
10. Environmental Conditions				
11. Lubrication Data				
12. Preventative Maintenance Plan/Schedule				
13. Troubleshooting Guide/Diagnostic Techniques				
14. Wiring Diagrams and Control Diagrams				
15. Maintenance and Repair Procedures				
16. Removal and Replacement Procedures				

OPERATING AND MAINTENANCE INFORMATION TRANSMITTAL (CONT'D)
Form No. 01999-17

17. Spare Parts and Supply List				
18. Corrective Maintenance Man-hours				
19. Parts Identification				
20. Warranty Information				
21. Personnel Training Requirements				
22. Testing Equipment and Special Tool Information				

Remarks:_____
_____

(Contractor's Signature) Supplier's Signature)

EQUIPMENT RECORD FORM A (Electrical or Motorized Mechanical Equipment):

Form No. 01999-18A

Equip. Description		Equip. Loc. City of Turlock	
Equip. No.	Shop Dwg. No.	Date Inst.	Cost
Mfgr.		Mfgr Contact	
Mfgr. Address			Phone
Vendor		Vendor Contact	
Vendor Address			Phone

MAINTENANCE REQUIREMENTS	D	W	M	Q	S	A	Hours
Lubricants: Recommended							
Alternative:							
Misc. Notes:							

Recommended Spare Parts			
Part No.	Quan	Part Name	Cost

Electrical Nameplate Data			
Equip			
Make			
Serial No.		Id. No.	
Model No.		Frame No.	
HP	V	Amp	Hz
pH	RPM	SF	Duty
Code	Ins. Cl.	DES	Type
NEMA DES	C Amb.	Temp Rise	Rating
Misc.			

EQUIPMENT RECORD FORM A (Electrical or Motorized Mechanical Equipment): (CONT'D)

Form No. 01999-18A

Recommended Spare Parts				Mechanical Nameplate Data			
Part No.	Quan	Part Name	Cost	Equip			
				Make			
				Serial No.		Id. No.	
				Model No.		Frame No.	
				HP	V	Amp	Hz
				pH	RPM	SF	Duty
				Code	Ins. Cl.	DES	Type
				NEMA DES	C Amb.	Temp Rise	Rating
				Misc.			

EQUIPMENT RECORD FORM B (Electrical or Non-Motorized Mechanical Equipment):

Form No. 01999-18B

Equip. Description		Equip. Loc. City of Turlock	
Equip. No.	Shop Dwg. No.	Date Inst.	Cost
Mfgr.		Mfgr Contact	
Mfgr. Address			Phone
Vendor		Vendor Contact	
Vendor Address			Phone

MAINTENANCE REQUIREMENTS	D	W	M	Q	S	A	Hours

MANUFACTURER'S REPRESENTATIVE SERVICE REPORT
Form No. 01999-19

Owner: City of Turlock, CA File No. _____

Project:

Date: _____

Project No. _____

- This form should be completed and returned by the manufacturer's representative prior to leaving the site.
- The representative is expected to follow the instructions to manufacturers' service representatives (Page 2) during the site visit.

Manufacturer: _____ MRSR No. _____

Supplier: _____ Contract/P.O. No. _____

Manufacturer's Representative _____
Company

Equipment/Material: _____

Work performed and tests made on equipment:

Factory errors corrected:

Field errors corrected:

The above equipment ___is ___is not ready to be placed in operation.
Remarks:

Arrival onsite _____ _____ __AM __PM Department from Site _____ _____ __AM __PM
Date Time Date Time

Actual total duration onsite was _____ hours for period covered by this report.

Manufacturer's Representative: _____ _____
Signature Date

Address: _____ _____
Phone No.

Report Received By: _____ _____
Signature Date

Distribution: _____ _____ _____

MANUFACTURER'S INSTALLATION CERTIFICATION FORM
Form 01999-20

Contract No: _____ Specification Section: _____

Equipment name: _____

Contractor: _____

Manufacturer of equipment item:

The undersigned manufacturer of the equipment item described above hereby certifies that he has checked the installation of the equipment and that the equipment, as specified in the project manual, has been provided in accordance with the manufacturer's recommendations and that the trial operation of the equipment item has been satisfactory.

Comments: _____

_____

_____

_____

_____ _____

Date Manufacturer

_____

Signature of
Authorized Representative

_____ _____

Date Contractor

_____

Signature of
Authorized Representative

MANUFACTURER'S INSTRUCTION CERTIFICATION FORM
Form 01999-21

Contract No.:_____ Specification Section: _____

Equipment name: _____

Contractor: _____

Manufacturer of equipment item: _____

The undersigned manufacturer certifies that a service engineer has instructed the wastewater treatment plant operating personnel in the proper maintenance and operation of the equipment designated herein.

Operations Check List (check appropriate spaces)

Start-up procedure reviewed	_____
Shutdown procedure reviewed	_____
Normal operation procedure reviewed	_____
Others: _____	_____
_____	_____
_____	_____

Maintenance Check List (check appropriate spaces)

Described normal oil changes (frequency)	_____
Described special tools required	_____
Described normal items to be reviewed for wear	_____
Described preventive maintenance instructions	_____
Described greasing frequency	_____
Others: _____	_____
_____	_____
_____	_____

_____ _____
Date Manufacturer

_____
Signature of
Authorized Representative

_____ _____
Date Signature of
Owner's Representative

_____ _____
Date Signature of
Contractor's Representative

UNIT RESPONSIBILITY CERTIFICATION, FORM NO 01999-22

City of Turlock, CA

CERTIFICATE OF UNIT RESPONSIBILITY
For Specification Section

(Section title)

In accordance with the contract documents, the undersigned manufacturer accepts unit responsibility for all components of equipment furnished under specification Section We hereby certify that these components are compatible and comprise a functional unit suitable for the specified performance and design requirements.

Notary Public	Name of Corporation
Commission expiration date	Address
Seal:	By: Duly Authorized Official
	Legal Title of Official
	Date:

MOTOR DATA FORM:
Form No. 01999-23

Equipment Name _____ Equipment Number(s) _____

Owner: City of Turlock, CA

Project:

Nameplate Markings

Mfr_____ Mfr Model_____ Frame___ HP_____

Volts ___ Phase _ RPM ___ Service factor _____

FLA ___ LRA ___ Freq ___ Amb temp rating _____ degrees C

Time rating _____ Design letter _____

(NEMA MG1-10.35) (NEMA MG-1.16)

KVA code letter ___ Insulation class _____

The following information is required for explosion proof motors only:

A. Approved by UL for installation in Class ___, Div _____

B. UL frame temperature code ___; Group ___ Atmosphere

(NEC Tables 500-2 and 500-2(b))

The following information is required for high efficiency motors only:

A. Guaranteed minimum efficiency at full load or NEMA efficiency index

(NEMA MG1-12.53b)

B. Nameplate or nominal efficiency _____

Data Not Necessarily Marked on Nameplate

Type of enclosure _____ Enclosure material _____

Temp rise ___ degrees C (NEMA MG1-12.41,42)

Space heater included? _Yes _No; if Yes, _watts __volts

Type of motor winding overtemperature protection, if specified:

_____

Use the space below to provide additional information on other motor modifications, if specified:

_____

Pipe Test Record
Form No. 01999-24

Date: _____

	Project No.:	**Contractor:**
Improvements		
Project - 2009		
Pipeline Size & Name:	**Pipe Type:**	**Pipe Location/Description:**
(SL), SN, IA, etc.)	(DI, PVC, Steel, Copper, etc.)	(Attach sketch if needed)
Section Tested:		
From:_____ **To:** **_____**	**First Test ___** **Or** **Re-Test ___**	**Length of Pipe Tested:** **Ft.**

Test Specifications	**Actual Test Results**
Type of Test: **_____**	
Test Pressure: **_____**	**Start pressure:** **_____** **End Pressure:** **_____**
Duration: **_____**	**Start time:** **____** **Stop time:** **____** **Duration:** **____**
Allowable loss: **_____**	**Actual loss:** **_____**

Comments:

_____

_____

_____

_____

_____

_____

Pipe Test Record (Cont'd)

Form No. 01999-24

Test Passes	
Test Fails	

Tested By: _____
Contractor

Test Witnessed By: _____
Construction Inspector

STARTUP AND PERFORMANCE EVALUATION FORM
Form No. 01999-25

OWNER: _____PROJECT: _____

Plant Unit Process Description: (Include description and equipment number of all equipment and devices):

Startup Procedure: (Describe procedure for sequential startup and evaluation, including valves to be opened/closed, order of equipment startup, etc.):

Startup Requirements (Water, power, chemicals, etc.):

Performance Evaluation Comments:

Contractor Certification that Unit Process is capable of performing its intended function(s), including fully automatic operation:

Firm Name:

Startup Representative: _____ Date: ___ , 20_
(Authorized Signature)

Instrumentation Data Sheet and Calibration Record Test Form
Form No. 1999-26

Component Description	Manufacturer	Location
Component Tag Name	Name_____ Model_____ Serial #_____	Site_____ Equip_____

	Range	Unit
Indicator Range		
Input Range		
Output Range		

General Notes
1.) Attach Calibration Curves for dp Flowmeters
2.) Include mounting elevations for level Instruments
3.) All entries within solid box to be typed in prior to start of test

Designed Calibration			Measured Calibration		
Input Signal	Output	Eng. Value	Input	Output	Comments

Notes_____
_____

_____

_____

_____

_____

Tested by (print name)_____ Witnessed by (print name)_____

Signature _____ Signature _____

Date ___/___/___ Date ___/___/___

****END OF SECTION***

SECTION 02084

UTILITY STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Onsite utility structures.
   1. Precast concrete manholes.
   2. Precast drainage inlets.
   3. Precast ground well boxes.
   4. Precast valve vaults.

B. Related Sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
      a. Section 02318 - Trenching.
      b. Section 03300 - Cast-in-place Concrete.
      c. Section 05500 - Metal Fabrications.

1.02 REFERENCES

A. American Society of Testing and Materials (ASTM):
   1. A 48 - Specification for Gray-Iron Castings.
   2. C 361 - Specification for Reinforced Concrete Low-Head Pressure Pipe.
   3. C 478 - Specification for Precast Reinforced Concrete Manhole Sections.
   4. C 857 - Minimum Structural Design Loading for Underground Precast Concrete Utility Structures.
   5. C 858 - Underground Precast Concrete Utility Structures.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. Manholes and Appurtenances: Manholes and appurtenances shall be watertight and free from infiltration or exfiltration.

1.04 SUBMITTALS

A. Shop Drawings: Submit shop drawings for all proposed precast utility structures.

PART 2 PRODUCTS

2.01 MANUFACTURED UNITS

A. Precast Concrete Manholes:
   1. Construct precast concrete manholes in accordance with design, size, shape, form, details, and at locations indicated on the Drawings and specified.
   2. Construct manholes of precast eccentric or concentric manhole units in accordance with the requirements indicated on the Drawings and specified.
   3. Provide precast, cylinder units, taper sections, and eccentric flat top sections meeting strength requirements for "Precast Reinforced Concrete Manhole Risers and Tops," ASTM C 478.
   4. Base design and manufacture to A-16 (HS 20-44) loading in accordance with ASTM C 857.

B. Precast Ground Well Boxes: 8-inch inside diameter, minimum.
   1. Manufacturers: one of the following or equal:
      a. Brooks Products, Inc., valve boxes.
      b. Christy, valve boxes.

C. Precast Concrete Valve Vaults:
   1. Manufacturer: the following or equal:
      a. Oldcastle Precast Pleasanton:
   2. Construct precast concrete manholes in accordance with design, size, shape, form, details, and at locations indicated on the Drawings and specified.
   3. Base design and manufacture to AAHTO HS 20 loading in accordance with ASTM C 857.
   4. Rebar: ASTM A-615 Grade 60.
   5. Mesh ASTM A-185 Grade 65.
   6. Provide core drilled holes for link seal pipe penetrations.
   7. Provide drawings and calculations verifying H20 loading.
   8. The base slab shall be designed to resist all loads imposed by H20 loading and groundwater uplift forces.
   9. Minimum wall thickness: 10 inches.

2.02 ACCESSORIES

A. Precast Concrete Manholes:
   1. Joint Sealing Compound: Preformed cold-applied ready-to-use plastic joint sealing compound. Manufacturers: One of the following or equal:
      a. Quikset Utility Vaults, Santa Ana, CA, Quik-Seal.
      b. Henry Company, Ram-Neck.
   2. Manhole Frames and Cover Sets: Type, size, and quality as specified in Section 05500 or as indicated on the Drawings.
   3. Drop Manhole Fittings:
      a. Drop Tee and Other Fittings: Vitrified clay pipe or as otherwise specified or indicated on the Drawings.

B. Precast drainage inlets:
   1. Covers: As indicated on the Drawings.

C. Valve Vaults Access Doors:
   1. Manufacturers:

a. BILCO US Foundry, or approved equal.
2. Cover Sets: size as shown on the drawing, shall be a locking double door assembly.
3. Spring Assist Latches.
4. Open 180 Degrees.
5. Material: Galvanized Steel.
6. Lettering: Valve Box – “Butterfly Valve” or “Magnetic Flow Meter Vault” depending on installation.
7. Shall be locking: T-handle style lock.
8. Stainless steel hardware.
9. Flash aluminum drop handles which do not protrude above cover, a recessed padlock box.
10. Galvanized steel ladders.

PART 3 EXECUTION

3.01 INSTALLATION

A. Concrete Manholes:
1. Excavation and Backfill: As specified in Section 02318.
2. Precast Concrete Manholes.
a. Manhole Bases:
1) Form and place concrete on undisturbed soil and/or on aggregate base course compacted to 95 percent of maximum density.
2) Form that portion of base above invert elevation of sewer pipe to provide smooth channel section as indicated on the Drawings.
3) Check forms for accuracy of dimensions and relative smoothness prior to placing concrete for base. Channels shall vary uniformly in size and shape from inlet to outlet if required.
4) Construct of Class A concrete in accordance with Section 03300 to form and dimensions indicated on the Drawings.
5) Place base concrete as monolith.
b. Manhole Sections:
1) Set each manhole section perfectly plumb.
2) Use sections of various heights and adjustment rings in order to bring top of manhole ring and cover to required elevation.
c. Joints:
1) Seal joints with joint sealing compound unless otherwise indicated on the Drawings.
2) Clean joints with brush and prime.
3) Apply sealing compound as follows, except where instructions differ from manufacturer's printed instructions. Where these instructions differ from manufacturer's instructions, install sealing compound in accordance with manufacturer's written instructions.
a) Remove silicon treated protective paper from one side of preformed rope and lay preformed rope, paper side up, on cleaned joint surface. Press surface firmly end-to-end around entire joint, making minimum 1-inch laps where necessary.
b) Remove protective paper from preformed rope and lower next section into place.
4) Seal joints watertight.

d. Manhole Frame and Cover Sets:
    1) Install manhole frames and cover sets at locations indicated.
    2) Setting:
        a) Set manhole covers flush with paving. Where no paving exists, set manhole cover 6 inches above surrounding grade.
        b) Where structure is outside limits of traveled shoulder but not in roadside ditch, place structure 1/10 foot or more above existing ground surface.
        c) Where cover is in existing pavement or in traveled way of existing road shoulder, place cover flush with existing surface.
        d) Where manhole cover falls in existing roadside ditch or right of way, place manhole cover approximately 1-1/2 feet above existing ground surface.
        e) Set manhole frames at required grade and securely attach to top of precast manhole shaft unit or on adjustment rings, using cement mortar.
        f) Setting Covers: After frames are securely set in place in accordance with requirements specified herein, install covers and perform necessary cleaning and scraping of foreign materials from frames and covers as required to accomplish and to assure proper fit. Any frame and cover which creates noise when passed over by traffic shall be replaced.

B. Precast Drainage Inlets:
    1. Excavation and Backfill: As specified in Section 02318.

C. Precast Ground Well Boxes:
    1. As indicated on the Drawings.

D. Concrete Valve Boxes:
    1. Install on 12-inch Aggregate base course.
    2. Contractor may pour concrete base or use precast floor base. Concrete per specification section 03300.
    3. Install vault flush to grade.

END OF SECTION

SECTION 02200

SITE PREPARATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Clearing, grubbing**,** and stripping project site.

B. Related Sections:
   1. Section 01354 - Hazardous Materials Procedures.

1.02 DEFINITIONS

A. Clearing: Consists of removal of natural obstructions and existing foundations, buildings, fences, lumber, walls, stumps, brush, weeds, rubbish, trees, boulders, utility lines, and any other items which shall interfere with construction operations or are designated for removal.

B. Grubbing: Grubbing shall consist of the removal and disposal of wood or root matter below the ground surface remaining after clearing and shall include stumps, trunks, roots, or root systems greater than 1-inch in diameter or thickness to a depth of 6-inches below the ground surface.

C. Stripping: Stripping shall include the removal and disposal of all organic sod, topsoil, grass and grass roots, and other objectionable material remaining after clearing and grubbing from the areas designated to be stripped. The depth of stripping is estimated to be 6-inches, but the required depth of stripping will be determined by the ENGINEER.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements: Verify and comply with applicable regulations regarding those governing noise, dust, nuisance, drainage and runoff, fire protection, and disposal.

B. Pre-construction Conference: Meet with ENGINEER to discuss order and method of work.

1.04 PROJECT CONDITIONS

A. Environmental Requirements:
   1. For suspected hazardous materials found, comply with Section 01354 - Hazardous Materials Procedures.

B. Existing Conditions:
   1. Verify character and amount of clay, sand, gravel, quicksand, water, rock, hardpan, and other material involved and work to be performed.

1.05 SEQUENCING AND SCHEDULING

A. Clearing and Grubbing: Perform clearing and grubbing in advance of grading operations.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine site and verify existing conditions for beginning work.

3.02 PREPARATION

A. Protect existing improvements from damage by site preparation work.

3.03 INSTALLATION

A. Clearing:
   1. Clear areas where construction is to be performed and other areas as indicated on the Drawings or specified in this Section of fences, lumber, walls, stumps, brush, roots, weeds, trees, shrubs, rubbish, and other objectionable material of any kind which, if left in place, would interfere with proper performance or completion of the work, would impair its subsequent use, or form obstructions therein.
   2. Do not incorporate organic material from clearing and grubbing operations in fills and backfills.
   3. Contractor's Construction Facilities: Fill or remove pits, fill, and other earthwork required for erection of facilities, upon completion of the work, and level to meet existing contours of adjacent ground.

B. Grubbing:
   1. From Excavated Areas: Grub stumps, roots, and other obstructions 3-inches or over in diameter to depth of not less than 18-inches below finish grade.
   2. In Embankment Areas or Other Areas to be Cleared Outside Construction Area: Do not leave stumps, roots, and other obstructions higher than the following requirements:

Height of Embankment over Stump	Height of Clearing and Grubbing
0 feet to 2 feet	Grub stumps or roots 3 inches or over in diameter to 18 inches below original grade. Cut others flush with ground.
2 feet to 3 feet	Grub stumps 1 foot and over in diameter to 18 inches below original grade. Cut others flush with ground.
Over 3 feet	Leave no stumps higher than stump top diameter, and in no case more than 18 inches.

3. Backfill and compact cavities left below subgrade elevation by removal of stumps or roots to density of adjacent undisturbed soil.

C. Stripping:
   1. Remove soil material containing sod, grass, or other vegetation to depth of 6 inches from areas to receive fill or pavement and from area within 5 feet outside foundation walls.
   2. Deposit stripped material in accordance with following requirements:
      a. Use accepted material in top 6 inches of areas to be used for future planting.

END OF SECTION

SECTION 02240

DEWATERING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Installation and maintenance of dewatering systems. Disposal of water entering excavation or other parts of the work.

B. Related Sections:
   1. Section 02300 - Earthwork.
   2. Section 02318 - Trenching.
   3. Section 03300 - Cast-in-place Concrete.
   4. Section 03600 - Grouts.

1.02 SUBMITTALS

A. Dewatering Plan: Proposed dewatering plan including arrangement, location, and depths of system components, type, and sizes of filters, and required permits.

B. Dewatering Plan and Dewatering System Analysis:
   1. Submit design and shop drawings prepared by stamped and signed by a Professional Civil Engineer registered in the state of California with at least 8 years of experience in designing similar systems. Qualifications of the dewatering contractor, the CONTRACTOR's Engineer, sampling service and testing laboratory shall be included in the submittal.
   2. The analysis shall include and evaluation of the anticipated subsurface conditions, required well spacing, diameter, depth screen interval, backfill and filter pack, pump size, drawdown duration, drawdown and steady state, flow rates, desilting tank and settlements which support the requirements of Part 3 of this Section.
   3. Dewatering calculations shall include water drawdown curves for the portion of the pipeline where dewatering is required.
   4. Well construction logs which include descriptions of actual materials encountered, construction details, well development procedures and results, and deviations from original design.
   5. Laboratory test results and flow rate information in accordance with Part 3 of this Section.
   6. Dewatering analysis and design shall be fully coordinated with excavation and shoring design. The shoring and excavation desilting shall recognize the changes in groundwater conditions and earth pressures. Chart recorder readings in accordance with Part 3 of this Section.
   7. Dewatering discharge plan as work progresses which identifies the proposed alignment of the discharge line and method of for the conduit to enter the manhole, Provide typical details of the conduit entering the manhole. Open manholes will not be allowed for discharge piping. Approval of each discharge location shall be obtained form the ENGINEER.

1.03 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Assume responsibility for obtaining water discharge permits that are required.

1.04 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Keep excavations reasonably free from water. The static water level shall be drawn down a minimum of 2 feet below the bottom of excavations.
   2. Do not place concrete or masonry footings, foundations, or floors in water, nor allow water to rise over them until concrete or mortar has set at least 24 hours.
   3. Maintain operation of the dewatering system until the complete structure including walls, slabs, beams, struts, and all other structural elements has attained specified strength, and backfill has been completed to 3 feet above the normal static groundwater level.
   4. Provide standby power to ensure continuous dewatering in case of power failure.
   5. Prior to release of groundwater to its static level, all pressure relief devices shall be fully operational.
   6. Release of groundwater to its static level shall be controlled to prevent disturbance of the natural foundation soils or compacted fill and to prevent flotation or movement of structures or pipelines.

1.05 SEQUENCING AND SCHEDULING

A. Within Limits of Structure Foundation: Secure written permission from the ENGINEER before locating wells, well points, or drain lines for purposes of dewatering.

B. Locate dewatering facilities where they will not interfere with utilities and construction work to be performed by others.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 INSTALLATION

A. The CONTRACTOR shall perform work in accordance with all applicable state, county and local regulations.

B. Provide and Maintain During Construction: Ample means and devices with which to promptly remove and properly dispose of water entering excavation or other parts of the work, whether water be surface water or underground water.

C. Install at least one ground water level monitoring well. If more than four dewatering wells or well points are installed, install one additional monitoring well for every four dewatering wells or well points. The monitoring within six feet of the excavation and

located mid way between dewatering wells or well points. Monitoring wells shall have a temporary cap and be not less than two inches in diameter. The contractor shall protect the dewatering wells in place during the excavation.

D. Intercept and divert precipitation and surface water away from excavations through the use of dikes, curb walls, ditches, pipes, sumps, or other means.

E. Disposing of Water:
   1. Dispose of construction dewatering water for pump station and pipelines into TID Harding Drain.
   2. Dispose of water from the work in suitable manner without damage to adjacent property.
   3. Do not drain water into work built or under construction.
   4. Dispose of water in such manner as not to be menace to public health.
   5. Obtain all necessary discharge permits required for dewatering.

F. Wells, Well Points, and Drain Lines for Dewatering:
   1. Locate after receipt of Engineer's written permission.
   2. Fill dewatering wells, lines, and French drains to be left in place within structure foundation limits with Class C concrete as specified in Section 03300 or grout as specified in Section 03600.

END OF SECTION

SECTION 02260

EXCAVATION SUPPORT AND PROTECTION

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Requirements for designing, furnishing and installing, maintaining, and removing excavation support and protection.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
      a. Section 01140 – Work Restrictions
      b. Section 01410 – Regulatory Requirements.
      c. Section 15052 – Basic Piping Materials and Methods.

1.02 REFERENCES

A. American Institute of Steel Construction, Inc. (AISC):
   1. Steel Construction Manual.

B. American Society of Civil Engineers (ASCE):
   1. Guidelines of Engineering Practice for Braced and Tied-Back Excavations.

C. California Code of Regulations (CCR):
   1. Title 8 - Industrial Relations.
      a. Chapter 3.2. California Occupational Safety and Health Regulations (CAL/OSHA).

D. California Labor Code (CLC).

E. Department of the Navy Naval Facilities Engineering Command (NAVFAC):
   1. Design Manual 7.2 - Foundations and Earth Structures.
   2. Design Manual 7.3 - Soil Dynamics and Special Design Aspects

F. State of California Department of Transportation (Caltrans):
   1. Caltrans California Trenching and Shoring Manual.

G. United States Steel Corporation (USS):
   1. Steel Sheet Piling Design Manual.

1.03 DEFINITIONS

A. General Engineering Design Practice: General engineering design practice in area of the Project, performed in accordance with recent engineering literature on subject of shoring and stability of excavations.

B. Shoring: A temporary structural system designed to support vertical faces, or nearly vertical faces, of soil or rock for purposes of excavation. Shoring includes cantilevered sheet piling, internally braced sheet piling, slurry walls, or soldier piles and lagging, and other similar shoring systems. Sloping of the soil is not shoring.

1.04 SYSTEM DESCRIPTION

A. Where General Engineering Design Practice is specified, provide drawings and signed calculations and have design performed by civil or structural engineer registered in State where the Project is located:
   1. Provide design calculations that clearly disclose assumptions made, criteria followed, and stress values used for the materials being used.
   2. Furnish references acceptable to ENGINEER substantiating appropriateness of design assumptions, criteria, and stress values.

B. Design requirements:
   1. General:
      a. Design means for safe and stable excavations in accordance with general engineering design practice:
         1) The preceding requirement shall not apply to trench excavation support conforming to standards set forth in CCR Title 8, Chapter .2.
      b. Design shoring for an excavation depth of at least 3 feet deeper than required for each structure as indicated on the Drawings to allow for possible overexcavation of soils.
      c. Design steel members in accordance with the building code as specified in Section 01410 and the AISC Manual of Steel Design.
      d. Design shoring involving materials other than steel in accordance with building code as specified in Section 01410.
      e. Perform design in accordance with soil characteristics and design recommendations contained in a written geotechnical report issued and signed by a geotechnical engineer hired by the CONTRACTOR. Geotechnical engineer shall be registered in the state where the Project is located:
         1) Make copy of geotechnical report available at project site for ENGINEER's review.
         2) Retain and pay for geotechnical engineer's services.
         3) Obtain report based on soil samples, field and laboratory tests, and borings performed for the geotechnical report for the design of stability of excavations by the geotechnical engineer hired by CONTRACTOR.
      f. When electing to design with material stresses for temporary construction higher than allowable stresses prescribed in the AISC Steel Construction Manual and the building code as specified in Section 01410, increase in such stresses shall not exceed 10 percent of value of prescribed stresses.
      g. Minimum safety factor used for design shall not be less than 1.5.

h. The calculated minimum depth of penetration of shoring below the bottom of the excavation shall be increased not less than 30 percent if the full value of passive pressure is used in the design.
i. The maximum height of cantilever shoring above the bottom of excavation shall not exceed 15 feet.
    1) Use braced shoring when the height of shoring above the bottom of excavation exceeds 15 feet.
j. The location of the point of fixity for shoring shall not be less than half the calculated minimum embedment depth below the bottom of the excavation.
k. Generally acceptable references for the design of shoring and excavations are as follows:
    1) Caltrans California Trenching and Shoring Manual.
    2) NAVFAC Design Manual 7.2.
    3) NAVFAC Design Manual 7.3.
    4) USS Steel Sheet Piling Design Manual.
    5) ASCE Guidelines of Engineering Practice for Braced and Tied-Back Excavations.
l. The shoring design firm shall obtain errors and omissions insurance for the Project for an amount of not less than 5 million dollars.

2. Soldier piles and lagging:
    a. Provide lagging over the full face of the excavation. Joints between pieces of lagging shall be tight to prevent loss of soil.
    b. Provide full face lagging all around penetrations through the lagging.
    c. If the soldier piles are installed in predrilled holes, the predrilled holes shall be filled with control density backfill after the soldiers piles are installed.
    d. The effective width of driven soldier piles for passive soil resistance shall not exceed 2 times the width of the pile.
        1) The effective width of concrete encased soldier piles for passive soil resistance shall not exceed 2 times the width of the concrete encasement.
    e. Fill voids behind lagging with gravel or other material acceptable to the ENGINEER.
    f. Apply loads from tie back soil, rock, or deadman anchors concentrically to soldier piles or wales spanning between soldier piles.
        1) Wales shall be back-to-back double channels or other members acceptable to the ENGINEER.
        2) Eccentrically loaded with section soldier piles or wales are not acceptable.
    g. Design soldier piles for downward loads including vertical loads from tie back anchors.
3. Soil anchors, rock anchors, and deadmen anchors:
    a. Design tie back anchors for a safety factor of not less than 2 times the calculated load from the shoring.
    b. Proof load all production anchors to not less than 150 percent of the calculated load from the shoring.
        1) Lock off anchors at the calculated anchor load.
    c. The length of soil anchors used to calculate resistance to load from the shoring shall not include any length within the potential active pressure soil failure zone behind the face of shoring.

d. Design tie rods for anchors for 130 percent of the calculated load from the shoring.
e. Design tie rods for anchors for 150 percent of the calculated load from the shoring when tie rod couplers are used and for other conditions where stress concentrations can develop.

4. Trench shoring for 36 inch FE Pipeline from Station 10+25 to 305+00:
   a. The requirements in this section are in addition to the requirements of specification 02260. All other requirements of specification 02260 apply.
   b. Submit a shoring design stamped by a professional engineer registered in the state of California.
   c. Trench shoring is required in the locations shown in the drawings. Shoring is shown in the drawings adjacent to the TID power poles, at the T.I.D. Harding Drain crossings, and at other key structures. The CONTRACTOR shall design the shoring system to protect the power poles, the T.I.D. Harding Drain and/or other existing structures; the following requirements apply to these locations:
      1) The shoring system shall be designed for the static, dynamic, seismic, horizontal, vertical, and other loads transferred to the shoring system. Refer to specifications 01612, 01614, and the CONTRACTOR'S geotechnical report for design criteria.
      2) The shoring system shall be designed and installed such that the existing soil does not relax and reduce the passive resistance of the soil. The trench must be continuously shored as the excavation is performed. It is not acceptable to excavate the trench and then install the shoring system.
      3) The shoring system shall be designed by the CONTRACTOR to limit deflection to 0.0035H; where "H" is the restrained soil height.
      4) Vibratory hammer installation methods are not allowed to protect the levee along Harding Drain.
      5) A trench box or speed shore type shoring system is not acceptable at these locations.
   d. Trench shoring or shielding (i.e. trench box or other shielding system) is required for the 36 inch FE pipeline in all other locations from Station 10+25 to 305+00, the following requirements apply:
      1) If a trench shoring system is used, the system shall be designed for the static, dynamic, seismic, horizontal, vertical, and other loads transferred to the shoring system. Refer to specifications 01612, 01614, and the CONTRACTOR'S geotechnical report for design criteria.
      2) If a trench shielding system is used, the system shall be designed as directed by OSHA requirements to provide adequate protection for workers during construction.
      3) Vibratory hammer installation methods are not allowed to protect the levee along Harding Drain.

C. Performance requirements:
   1. General:
      a. Support faces of excavations and protect structures and improvements in vicinity of excavations from damage and loss of function due to settlement or movement of soils, alterations in ground water level caused by such excavations, and related operations.
      b. Specified provisions:

1) Complement, but do not substitute or diminish, obligations of CONTRACTOR for the furnishing of a safe place of work pursuant to provisions of the Occupational Safety and Health Act of 1970 and its subsequent amendments and regulations and for protection of the Work, structures, and other improvements.
2) Represent minimum requirement for:
a) Number and types of means needed to maintain soil stability.
b) Strength of such required means.
c) Methods and frequency of maintenance and observation of means used for maintaining soil stability.

2. Provide safe and stable excavations by means of sheeting, shoring, bracing, sloping, and other means and procedures, such as draining and recharging groundwater and routing and disposing of surface runoff, required to maintain the stability of soils and rock.
3. Provide support for trench excavations for protection of workers from hazard of caving ground.
4. Provide shoring:
a. Where, as result of excavation work and analysis performed pursuant to general engineering design practice, as defined in this Section:
1) Excavated face or surrounding soil mass may be subject to slides, caving, or other types of failures.
2) Stability and integrity of structures and other improvements may be compromised by settlement or movement of soils, or changes in soil load on structures and other improvements.
b. For trenches 5 feet and deeper.
c. For trenches less than 5 feet in depth, when there is a potential for cave-in.
d. Where indicated on the Drawings.
5. For safe and stable excavations, use appropriate design and procedures for construction and maintenance to minimize settlement of supported ground and to prevent damage to structures and other improvements, including:
a. Using stiff support systems.
b. Following appropriate construction sequence.
c. Preventing soil loss through or under support system:
1) Provide support system that is tight enough to prevent loss of soil and extend deep enough to prevent heave or flow of soils from supported soil mass into the excavation.
d. Providing surface runoff routing and discharge away from excavations.
e. Where dewatering is necessary, recharge groundwater as necessary to prevent settlement in area surrounding excavation.
f. Where sheet piling is used, use interlocking type sheets.
1) The sheet piles shall be continuous and driven in interlock.
2) If the bottom of the excavation is located below the water table, use "thumb and finger" type interlock.
g. Not applying shoring loads to existing structures and other improvements.
h. Not changing existing soil loading on existing structures and other improvements.
i. Provide welded steel packing between soil retaining members such as sheet piles and wales and similar members when the gap exceeds 1/4-inch before the wales are loaded.

1.05 SUBMITTALS

A. Shop drawings and calculations:
   1. In accordance with requirements in CLC for trench excavations 5 feet or more in depth and for trenches less than 5 feet in depth when there is potential for cave-in. Submit in advance of excavation work, detailed drawings showing means for safe and stable excavations:
      a. Where such drawings vary from excavation support standards set forth in California Code of Regulations Title 8 - Construction Safety Orders, submit design calculations pursuant to general engineering design practice.
      b. Provide means for safe and stable excavations that are not less effective than required in CCR Title 8 - Construction Safety Orders.
   2. For excavations other than trenches, submit, in advance of excavation work, design calculations as performed pursuant to general engineering design practice, as specified in this Section, and detail drawing showing means for safe and stable excavations. In design calculations and detail drawing, cover, as a minimum:
      a. Excavations adjacent to structures and other improvements, and
      b. Excavations 5 feet or more in depth, or less than 5 feet in depth when there is potential for cave-in, at other locations.
   3. Submit following:
      a. Provide calculations for the different load, support, and other conditions that occur during the sequence of installation of shoring, construction of facilities protected by the shoring, and sequence of removal of shoring.
      b. Provide sketches showing the condition at various stages of installation and removal of shoring.
      c. Show structures, pipelines, and other improvements located near the shoring, and the shoring on a plan.
      d. When utilities penetrate the shoring, submit an elevation of all sides of the shoring showing the locations of the penetrations.
         1) Submit details on ground support and sealing around utility penetrations.

B. Written geotechnical report on soil characteristics and design recommendations, as specified in this Section.

C. Control points and schedule of measurements:
   1. Submit location and details of control points and method and schedule of measurements in accordance with requirements of this Section.
   2. Promptly upon constructing control points and making measurements at such control points, as specified in this Section, submit copy of field notes with such measurements.
      a. The field notes shall show the current measurement and the change in measurement from the first measurement taken.

D. Detailed sequence of installation and removal of shoring:
   1. Consider effects of ground settlement in the sequence of installation and removal of shoring.
   2. Provide sketches showing the conditions at various stages in the sequence of installation and removal of shoring.

E. Submit submittals for stability of excavations as a complete package and include all items required in this Section.
   1. Incomplete submittals will not be reviewed and will be returned for resubmittal as a complete package.

1.06 SEQUENCING AND SCHEDULING

A. Do not begin work on excavations, trenches, and means for providing stability of excavation and trenches until submittals have been accepted by ENGINEER and until materials necessary for installation are on site.

B. Submit submittals a minimum of 60 days prior to the scheduled date to begin excavation work.

C. Do not begin construction of any shoring or excavation operations until:
   1. Control points as specified in this Section and as indicated on the Drawings on existing structures and other improvements have been established and surveyed to document initial elevations and locations.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 INSTALLATION AND REMOVAL

A. Install means for providing safe and stable excavations as indicated in the submittals.

B. Except for concrete encased soldier piles, slurry walls, and similar shoring systems, remove shoring by completion of the Work.
   1. Select shoring system and method of removal, which will minimize soil that sticks to shoring from creating large voids and causing settlement.
   2. To prevent settlement caused by pulling shoring, fill voids with sand, pea gravel, or pressure injected grout.
   3. The methods used shall prevent settlement.
   4. Pressure preservative treated wood lagging may be left in place when acceptable to the ENGINEER.

C. Repair of Harding Drain Slope Repair:
   1. If the Harding drain and slopes are damaged during the construction of the pipeline. Contractor shall repair the drain to existing conditions using select native fill and place in 1 foot lifts compacted at 95 percent relative compaction.

3.02 MAINTENANCE

A. Where loss of soil occurs, plug gap in shoring and replace lost soil with fill material acceptable to ENGINEER.

B. Where measurements and observations indicate possibility of failure or excessive movement of excavation support, determined in accordance with general engineering design practice, take appropriate action immediately.

3.03 CONTROL POINTS

A. Establish control points on shoring and on structures and other improvements in vicinity of excavation for measurement of horizontal and vertical movement. Control points are required at the existing dairy structure shown on Drawing PSY-1:
   1. Set control points on shoring support system:
      a. Set points at distances not exceeding 25 feet at each support level.
      b. Support levels shall be levels of tie-backs, wales, bottom of excavation, and other types of supports.
   2. Set control points in corners of existing structures and on curbs, manholes, and other improvements indicated on the Drawings.

B. Provide plumb bobs with horizontal targets indicating original position of plumb bobs in relation to shoring at control points located on shoring.

C. Perform horizontal and vertical survey and measurement of control points at least once every week.

END OF SECTION

SECTION 02300

EARTHWORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Loosening, excavating, filling, grading, borrow, hauling, preparing subgrade, compacting in final location, wetting and drying, and operations pertaining to site grading for buildings, basins, reservoirs, boxes, roads, and other structures.
   2. Pumping and draining of excavations.
   3. Backfilling and compacting around structures.

B. Related Sections:
   1. Section 01330 - Submittal Procedures.
   2. Section 02240 - Dewatering.
   3. Section 02260 - Excavation Support and Protection.
   4. Section 02312 - Controlled Low Strength Material.
   5. Section 02722 - Aggregate Base Course.
   6. Section 03300 - Cast-In-Place Concrete.

1.02 REFERENCES

A. American Association of State Highway Transportation Officials (AASHTO):
   1. T-27.

B. Associated General Contractors (AGC):
   1. Manual of Accident Prevention in Construction (Section 9).

C. American Society for Testing and Materials (ASTM):
   1. C 131 - Standard Test Method for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
   2. C 136 - Standard Test Method for Sieve Analysis of Fine and Course Aggregates.
   3. D 1556 - Standard Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method.
   4. D 1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 (2,700 kN-m/m).
   5. D 2419 - Standard Test Method for Sand Equivalent Value of Soils and Fine Aggregate.
   6. D 2922 - Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   7. D 3017 - Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth).
   8. D 4318 - Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

D. Division of Industrial Safety (DIS).

E. Occupational Safety and Health Act (OSHA).

F. State of California Department of Transportation (Caltrans Test Method, CTM).
   1. CTM 211: Method of test for abrasion of course aggregate.
   2. CTM 301: Resistance “R” value of treated and untreated bases, subbases, and basement soils (stabilometer).

1.03 DEFINITIONS

A. Excavation: Consists of satisfactory loosening, removing, loading, transporting, depositing, and compacting in final location, wet and dry materials, necessary to be removed for purposes of construction, or as required for ditches, grading, roads, and such other purposes as are indicated on the Drawings.

B. Backfill Adjacent to Structure: Is backfill within volume bounded by the exterior surfaces of structure, the surface of undisturbed soil in the excavation around structure, and finish grade around structure.

C. In-Place Density of Compacted Backfill: Is density determined in accordance with ASTM D 1557, or with ASTM D 2922 and ASTM D 3017.

D. Maximum Density: Is density obtained in laboratory when tested in accordance with ASTM D 1557.

E. Definitions Related to Compaction of Fill:
   1. One Pass: Defined as one movement of roller over area being compacted.
   2. Measurement Of Pass Width: Measure width of pass between centers of outside tires or outside edge of roller wheel.

1.04 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. Where mud or other soft or unstable material is encountered, remove such material and refill space with select material or gravel, which can be compacted with no perceptible movement under roller.
   2. Obtain acceptable material from other sources if surplus or borrow materials obtained within project site do not conform to specified requirements or are not sufficient in quantity for structural backfill.
   3. No extra compensation will be made for hauling of fill materials nor for water required to compact fills.
   4. Structural Backfill:
      a. Material for Backfill:
         1) Unless otherwise specified or indicated on the Drawings, material for backfill, adjacent to structures, slabs, or wall shall consist of native material or of sand, gravel, or other imported materials acceptable to the ENGINEER.
         2) Backfill material under concrete structures, under pavement, or where heavy compaction equipment, such as a pneumatic tired roller, cannot be used satisfactorily shall consist of aggregate base course, except areas indicated on the Drawings as controlled low strength material or concrete encasement.
         3) Backfill in any area under concrete structures, shall extend from undisturbed native soil or rock to the bottom surface of the structure.

5. Embankments and Roadway Fills:
    a. Material for Fills: Unless otherwise specified or indicated on the Drawings, material shall be Caltrans Class 2 aggregate base within roadways and may be surplus material from excavation for structures or other construction for embankments or, if accepted by the OWNER, borrow material excavated from source within Project site may be used for embankments.
    b. Whatever source is used, provide fill material conforming with specified requirements.
    c. Obtain acceptable material from other sources if surplus or borrow materials obtained within Project site do not conform to specified requirements or are not sufficient in quantity for construction of embankments.
6. Compacted Fills:
    a. Provide specified compaction for backfill, fill, and other earthwork.
    b. Perform confirmation tests to verify and confirm that work has complied, and is complying at all times, with requirements specified in this Section concerning initial compaction demonstration, and field quality control testing.
7. Borrow Area:
    ~~a. No borrow area has been indicated on the Drawings.~~
    ~~b. Where borrow material is required, provide such material from source selected by the CONTRACTOR, subject to acceptance by the ENGINEER, but not necessarily from within project site.~~
    c. Use of imported borrow shall not cause additional cost to the Contract.

1.05 SUBMITTALS

A. General: Submit in accordance with Section 01330.

B. Property Owner's Permission Agreements: Submit copy of property owner's agreements to allow placement of surplus material on their property.

C. Product Data: Submit material source, gradation, and testing data for all materials, including imported and on-site materials.

D. Excavation Plan: Submit proposed excavation plan.

E. Test Reports: Submit certified test reports of all tests specified to be performed by the CONTRACTOR. Test reports shall be signed and sealed by a registered geotechnical engineer in the state of California.

F. Samples: 50-lb sample of proposed import fill material when requested by ENGINEER.

1.06 QUALITY ASSURANCE

A. Initial Compaction Demonstration:
    1. Adequacy of Compaction Equipment and Procedures: Demonstrate adequacy of compaction equipment and procedures before exceeding any of following amounts of earthwork quantities:
        a. 200 linear feet of trench backfill.
        b. 50 cubic yards of structural backfill.

c. 100 cubic yards of embankment work.
d. 50 cubic yards of base material.

2. Compaction Sequence Requirements: Until specified degree of compaction on previously specified amounts of earthwork is achieved, do not perform additional earthwork of the same kind.

1.07 SEQUENCING AND SCHEDULING

A. Schedule earthwork operations to meet requirements as provided in this Section for excavation and uses of excavated material.

B. If necessary, stockpile excavated material in order to use it in specified locations.

C. Excavation and Filling: Perform excavation and filling, during construction, in manner and sequence that provides drainage at all times.

PART 2 PRODUCTS

2.01 MATERIALS

~~A. Water for Compacting Fills: Use water from Harding Drain, San Joaquin River or other source acceptable to ENGINEER.~~

A. Fill Materials:
1. General:
   a. Provide sand, aggregate base course, gravel, Class 2 permeable, drain rock, select material, and native material, where required for fill and backfill.
   b. Obtain material for fills from cut sections, excess pipeline trench materials, or borrow from source.
   c. Excavated onsite sandy soils can be re-used as part of the trench and wall backfill, providing the soils having an organic content of less than 3 percent by volume. The fills should not contain rocks or lumps larger than 6 inches in greatest dimension with not more than 15 percent larger than 2.5 inches.
   ~~d. If imported fill will be used, it should be predominantly granular with a Plasticity Index of 12 or less. If jetting will be used to backfill the pipe trench, the fine content (passing 200 sieve) should be less than 20 percent. The fine content of onsite upper silty sand ranged from 20 to 35 percent, and may not be suitable for jetting. If clean import sand is used, these materials can be jetted to achieve the required compaction provided full-time observation and testing is performed.~~
   d. **If imported fill will be used, it should be predominantly granular with a Plasticity Index of 12 or less. Water jetting will not be permitted.**
   e. Provide material having maximum particle size not exceeding 6 inches and that is free of trash, lumber, debris, leaves, grass, roots, stumps, and other vegetable matter.
   f. Materials derived from processing demolished or removed asphalt concrete are not acceptable.
2. Aggregate Base Course: As specified in Section 02722.
3. Class 2 Permeable:
   a. Consist of hard, durable particles of stone or gravel, screened or crushed

to the specified size and gradation.

b. Provide free of organic matter, lumps or balls of clay, and other deleterious matter.
c. Durability Index: Percentage of wear not greater than 40 percent when tested in accordance with ASTM C 131.
d. Sand Equivalent: Not less than 75 when tested in accordance with ASTM D 2419.
e. Conform to size and grade within the limits as follows when tested in accordance with ASTM C 136:

Sieve Size (Square Openings)	Percent by Weight Passing Sieve
1 inch	100
3/4 inch	90-100
3/8 inch	40-100
Number 4	25-40
Number 8	18-33
Number 30	5-15
Number 50	0-7
Number 200	0-3

4. Drain Rock:
   a. Consist of hard, durable particles of stone or gravel, screened or crushed to specified size and gradation.
   b. Free from vegetable matter, lumps or balls of clay, or other deleterious matter.
   c. Crush or waste coarse material and waste fine material as required to meet gradation requirements.
   d. Durability Index: Not greater than 40 percent when tested in accordance with ASTM C 131 and Caltrans Standard Specifications Test 211.
   e. Conform to size and grade within the limits as follows when tested in accordance with AASHTO T-27 or ASTM C 136:

Sieve Size (Square Openings)	Percent By Weight Passing Sieve
2 inch	100
1-1/2 inch	95-100
3/4 inch	50-100
3/8 inch	15-55
Number 4	0-25
Number 8	0-5
Number 200	0-2

5. Gravel:
   a. Consist of hard, durable particles of stone or gravel, screened or crushed to the specified sizes and gradations.
   b. Free of vegetable matter, lumps or balls of clay, and other deleterious

matter.

c. Crush or waste coarse material and add or waste fine material in order to meet the specified gradations.

d. Fraction of Material Passing Number 40 Sieve: Material having plasticity index not greater than five when tested in accordance with ASTM D 4318.

e. Durability Index: Not greater than 40 percent when tested in accordance with ASTM C 131, and Caltrans Standard Specifications.

f. Conform to sizes and grade within the limits as follows when tested in accordance with ASTM C 136.

Sieve Size (Square Openings)	**Percent by Weight Passing Sieve**		
	A	**B**	**C**
3 inch	100	--	--
1-1/2 inch	--	100	--
1 inch	--	--	100
Number 4	30-70	30-70	40-80
Number 200	0-15	0-15	5-20

6. Sand:
   a. Clean, coarse, natural sand.
   b. Nonplastic when tested in accordance with ASTM D 4318.
   c. 100 percent shall pass a 1/2 inch screen.
   d. No more than 20 percent shall pass a Number 200 screen.

~~7. Select Native Material:~~

~~a. Sound, on-site earthen materials free of debris and suitable for reuse. Soils shall have less than 3 percent organics by weight when tested in accordance with ASTM D2974.~~

~~b. Gradation as follows when tested in accordance with ASTM C 136:~~

~~**Sieve Size (Square Openings)**~~	~~**Percent by Weight Passing Sieve**~~
~~6 inch~~	~~100~~
~~2.5 inch~~	~~85~~
~~No. 200~~	~~Less than 20~~

~~c. Verify that native material is capable of compaction to specified density before placing as fill. If material will not compact to specified density, work material in a manner, which will reduce water content to improve compaction or remove the material from the site and replace with Select Imported Material at no additional cost to OWNER.~~

7. **Select Native Material:**
   a. **Sound, on-site earthen materials free of debris and suitable for reuse. Soils shall have less than 3 percent organics by weight when tested in accordance with ASTM D2974.**
   b. **Gradation as follows when tested in accordance with ASTM C 136:**

Sieve Size (Square Openings)	**Percent by Weight Passing Sieve**
1 inch	**100**

   c. **Verify that native material is capable of compaction to specified**

density before placing as fill. If material will not compact to specified density, work material in a manner, which will reduce water content to improve compaction or remove the material from the site and replace with Select Imported Material at no additional cost to OWNER.

8. Select Imported Material.
   a. Granular, non-expansive earthen materials free of debris and having less than 3 percent organics by weight when tested in accordance with ASTM D2974.
   b. Liquid limit less than 30 and Plasticity Index less than 12; when tested in accordance with ASTM D 4318.
   c. Resistance Value greater than 30 when tested in accordance with CTM 301.
   d. Gradation as follows when tested in accordance with ASTM C136:

Sieve Size (Square Openings)	Percent by Weight Passing Sieve
3 inch	100
3/4 inch	80-100
No. 4	60-100
No. 200	Less than 30

   e. The OWNER will allow use of the City's property as a borrow site to obtain select imported material, subject to approval of soil samples from the site. Material obtained from the City's borrow site may be obtained at no cost to the CONTRACTOR. CONTRACTOR shall be responsible for excavation and hauling the select imported material. OWNER makes no representation of the quality of the borrow site materials, and the CONTRACTOR shall determine to his satisfaction that the materials are suitable to be used as select imported material. The OWNER owns the borrow material, including any stockpiled material, until it is actually removed from the borrow site by CONTRACTOR. OWNER, or others under contract with the OWNER, may remove any stockpiled material without notice. CONTRACTOR shall not be compensated for any additional costs if stockpiled material is removed by others. The CONTRACTOR will be provided with an excavation plan by the Owner, which will consist of the following requirements: 6:1 side slopes, a uniform base, and fine grading without compaction when borrowing is complete. Additional borrow material may be available from the Dianne Pond site at the discretion of the Owner.
   f. The City's borrow site is located at Dianne Pond on Dianne Drive approximately 0.5 miles north of West Main St. in the City of Turlock. Observe all requirements of Divisions 0 and 1 when excavating and hauling select imported material from the borrow site.
9. Select Imported Levee Material:
   a. Impervious material with 20 percent or more passing the No. 200 sieve.
   b. Liquid Limit less than 50, and Plasticity Index of 8 or more.
   c. Free of lumps or stones exceeding 3 inches in greatest dimension, vegetative matter, or other unsatisfactory material.
   d. Backfill material shall be compacted in 4-inch to 6-inch layers to a minimum of 90 percent relative compaction as measured by ASTM Method D1557-91.

B. Geotextile:
   1. Geotextile shall have the minimum value of puncture strength of 125 pounds when tested in accordance with the ASTM D4833 and flow rate of 115 gallons per minute/sq ft when tested in accordance with ASTM D4491.
   2. Geotextile shall be Mirafi FW300, or equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:
   1. Character and Quantity of Material:
      a. Verify character and quantity of rock, gravel, sand, silt, water, and other inorganic or organic materials to be encountered in work to be performed.
      b. Determine gradation and shrinkage of excavation and fill material, and suitability of material for use intended in work to be performed.
      c. Determine quantity of material, and cost thereof, required for construction of excavations and fills, whether from on-site excavations, borrow areas, or imported materials. Include in cost of work to be performed.
      d. Include wasting of excess material, if required, in cost of work to be performed.

3.02 PREPARATION

A. Provide excavation support in accordance with Section 02260 where designated on the Drawings or to protect existing structures or utilities.

B. Surface Preparation:
   1. Preparing Ground Surfaces for Fill or Small At-grade Concrete Structures:
      a. After clearing is completed, scarify entire areas which underlie fill sections or structures to a depth of 6 inches and until surface is free of ruts, hummocks, and other features which would prevent uniform compaction by equipment to be used.
      b. Recompact areas to density specified in "Compacted Fills" before placing of fill material or concrete.
      c. Where cemented rock, cobbles, or boulders compose a large portion of foundation material underlying structures, slabs, or paved areas, it may not be advisable to scarify the top 6 inches prior to compaction. If the ENGINEER deems it advisable not to scarify existing natural ground, then moisten the native soil and compact it as specified in "Compaction of Coarse Fill."
   2. Preparing Sloped Surfaces for Fill or Foundations:
      a. Foundations for Fill Having Slopes in Excess of One Vertical to Four Horizontal:
         1) Bench or terrace to adequately key existing ground and fill built thereon.
      b. Slopes of Original Hillsides and Old Fills: Bench minimum of feet as shown on the drawings, horizontally as fill is placed.
      c. Provision of New Benches:
         1) Start new bench wherever vertical cut of next lower bench intersects existing ground.
         2) Recompact material thus cut out along with new embankment material at no additional cost to the Contract.

3. Preparing for Structural Backfill:
    a. After completion of foundation footings and walls and other construction below the elevation of the final grades and prior to backfilling, all forms shall be removed and excavation shall be cleaned of all trash and debris.
    b. Do not place backfill against walls until structures bracing top of wall are in place, complete, and for concrete, have achieved full specified minimum compression strength.
    c. After inspection of foundation, walls, and pipes, backfill shall be placed symmetrically to prevent eccentric loading upon or against structures.
    d. To prevent damage to structures, structural backfill shall be placed with equipment, which does not exceed H-20 loading, within a distance of 1/2 to 1/3 h (h being the vertical distance from the level being compacted down to the surface on the opposite side of the wall). Outside this distance, normal compaction equipment may be used.
    e. All backfill shall be compacted per Compaction of this specification.

3.03 APPLICATION

A. General:
1. Dispose of excavated materials, which are not required or unsuitable for fill and backfill in lawful manner.
2. Dispose of surplus material on private property only when written permission agreement is furnished by owner of property. Submit copies of such agreements.
3. Obtain material required for fills in excess of that produced by excavation from borrow areas subject to the fill material requirements specified herein.
4. Rocks, broken concrete, or other solid materials larger than 6 inches in greatest dimension shall not be placed in fill areas, but removed from project site at no additional cost to the Contract.
5. Stabilization of Subgrade: Provide materials used or perform work to stabilize subgrade so it can withstand loads, which may be placed upon it by CONTRACTOR's equipment.

B. Excavation:
1. Excavations for Buildings and Structures:
    a. Dimensions and Elevations of Excavations: Provide excavations conforming to dimensions and elevations indicated on the Drawings for each building and structure, including trenching for adjacent piping and all work incidental thereto.
    b. After clearing is complete, excavate area of the structure, plus five feet on each side to the elevation indicated on the Drawings, or twelve (12) inches if not indicated, below the elevation of the bottom of the structure. Remove all loose material using hand equipment or a flat edged backhoe bucket. Place geotextile fabric over the area and fill the excavation to the bottom of the structure with Aggregate Base Coarse.
    c. Compact Structural Backfill to densities specified in “Compacted Fills” before placement of concrete.
    d. Soil of Unsuitable Bearing Value: Where soil is encountered having unsuitable bearing value, ENGINEER may direct in writing that excavation be carried below elevations specified.
    e. Unless directed by the ENGINEER, excavations shall not be carried below elevations specified.
    f. Excavation Width: Extend excavations horizontally past walls and footings

the minimum dimension specified to allow for placing and removal of forms, installation of services, and inspection. Undercutting of slopes will not be permitted.

g. Difficulty of Excavation: No extra compensation will be made for removal of rock or any other material due to difficulty of excavation.

2. Excavation of Ditches and Gutters:
   a. Cutting: Cut ditches and gutters accurately to cross sections and grades indicated on the Drawings.
   b. Excavation: Take care not to excavate ditches and gutters below grades indicated on the Drawings.
   c. Over Excavation: Backfill excessive ditch and gutter excavation to grade with suitable thoroughly compacted material to form adequate gutter paving.
   d. Depositing of Material Adjacent to Ditches: Do not deposit any material within three feet of edge of ditch unless otherwise indicated on the Drawings.
3. Necessary Over Excavation:
   a. General:
      1) Where it becomes necessary to excavate beyond normal lines of excavation in order to remove boulders or other interfering objects, backfill voids remaining after removal as specified in Backfilling of Voids, or as acceptable to the ENGINEER.
      2) Perform necessary excavation beyond normal lines as specified above and backfill such voids.
   b. Backfilling of Voids:
      1) Fill voids with suitable material acceptable to the ENGINEER, placed in manner and to same uniform density as surrounding material.
      2) With acceptance of the ENGINEER, concrete of same mix as used in concrete channel may be used.

C. Compaction:
1. Compacted Fills:
   a. Lines and Grades:
      1) Construct fills, embankments, and backfills, designated herein as fills, at locations and to lines and grades indicated on the Drawings.
   b. Compact with mechanical methods. Water settling, ponding or flooding will not be permitted.
      1) Remove and replace any placed material that does not have correct moisture content.
      2) Remove and replace fills with suitable material when any one of the following two conditions exist as they shall serve as sufficient evidence, without further testing, that moisture content is not correct:
         a) Soft, spongy, or springy material causing areas that “pump” when heavy loads pass over them.
         b) Dry material that will not “ball.”
   c. Mechanical Spreading and Rolling Layers of Fills:
      1) Spreading: Spread each layer uniformly by use of road machine or other accepted device.
      2) Rolling: Roll with acceptable tamping roller, heavy pneumatic roller, or power roller until thoroughly compacted to not less than specified density.
      3) Fill required to be compacted that is inaccessible to rollers: Compact with pneumatic vibrating, or other tamping equipment.

4) Use of other equipment: Use of trucks, carryalls, scrapers, tractors, or other heavy hauling equipment is not considered as rolling in lieu of rollers, but distribute traffic of such hauling equipment over fill in such manner as to make use of compaction afforded thereby as addition to compaction by use of rollers.

d. Compacted Fill Shape and Sections: Provide completed fill that corresponds to shape of typical sections indicated on the Drawings or that meets requirements for particular case.

e. Preparation of Areas Designated to Receive Fill Material: Scarify to minimum depth of 6 inches, unless otherwise indicated on the Drawings, and recompact to density of fill material as specified in following Article.

f. Fills and Backfills and Upper 6 Inches in Cuts: Compact to percentage of maximum density as follows:
   1) Backfill adjacent to structures: 95 percent.
   2) Under present structures: 95 percent.
   3) Under roadways, parking and storage areas, curbs, and sidewalks: 95 percent.
   4) Other areas: 90 percent.
   5) Compacted embankments: 95 percent.

g. Placing Compacted Fills:
   1) Placement: Place loose material in successive layers that do not exceed 8 inches in uncompacted thickness.
   2) Moisture Content: Bring each layer to slightly above optimum moisture content for maximum density before compaction.
   3) Defective Compacted Fills: Remove and recompact.

2. Compaction of Embankments and Roadway Fills:
   a. Construction and Compaction of Fills:
      1) Construct in layers of depths specified above.
      2) Compact by rolling with power rollers, tamping rollers, vibrating rollers or pneumatic tire rollers.

3. Moisture Content:
   a. While and as each layer is deposited, apply water in sufficient amount to ensure optimum moisture to secure compaction specified.
   b. Uniformly incorporate water with fill material in amount sufficient to assure required density after rolling.
   c. If excess moisture is encountered in fill, manipulate each layer so as to dry out excess moisture.

4. Borrow sources are not available within project site. Where required, CONTRACTOR shall provide necessary imported fill material from outside sources. Refer to Part 2.01, B.8. of this Section.

3.04 FIELD QUALITY CONTROL

A. Tests:
   1. Soil Compaction Confirmation Tests: Confirmation tests will be conducted by the ENGINEER.
      a. CONTRACTOR's Responsibilities:
         1) Accomplish specified compaction for backfill, fill, and other earthwork.
         2) Control operations by confirmation tests to verify that compaction work complies, and is complying at all times, with requirements specified in this Section concerning compaction, control, and testing.
         3) Cost Of Confirmation Tests: Paid for by the OWNER.
         4) Copies of Confirmation Test Reports: ENGINEER will provide copies

to CONTRACTOR.

b. ENGINEER will perform testing at the following intervals:
   1) Perform testing not less than as follows:
      a) For embankment, or fill: minimum 1 test every 200 cubic yards.
      b) For backfill: minimum 1 test ever 20 cubic yards.
      c) Aggregate base course: minimum 1 test every 50 cubic yards.

c. Coordination with ENGINEERs' Testing: Remove overburden above level at which the ENGINEER wishes to test. Backfill and recompact excavation after testing is completed.

d. If compaction fails to meet specified requirements, perform remedial work by one of the following methods:
   1) Remove and replace backfill at proper density.
   2) Bring density up to specified level by other means acceptable to the ENGINEER.

e. Retesting:
   1) Costs of Retesting: Costs of retesting required to confirm and verify that remedial work has brought compaction within specified requirements shall be borne by the CONTRACTOR.
   2) CONTRACTOR's Confirmation Tests During Performance of Remedial Work:
      a) Performance: ENGINEER will perform.
      b) Frequency: Test at twice the frequency specified for initial confirmation tests.

B. Tolerances:
   1. Finish Grading of Excavations, Backfill and Fills:
      a. Perform fine grading under concrete structures such that finished surfaces are never above established grade or approved cross section and are never more than 0.10 feet below.
      b. Provide finish surface areas outside of structures that are not more than 0.10 feet above or below established grade or accepted cross section.
   2. Excavation of Unlined Channels and Basins:
      a. In Both Cut and Fill, and Levee and Access Road Side Slopes in Cut: Vertical tolerance of none above and 3 inches below specified grade will be allowed on bottom and side slopes.
      b. On Top Surface of Levee and Access Road in Both Cut and Fill, and Levee and Access Road Side Slopes in Fill: Vertical tolerance of none below and 3 inches above specified grade will be allowed.
   3. Areas Which Are Not under Structures, Concrete, Asphalt, Roads, Pavements, Walks, Dikes and Similar Type Items:
      a. Provide finish graded surfaces of either undisturbed natural soil, or cohesive material not less than 6 inches deep.
      b. Intent of preceding is to avoid sandy or gravelly areas.
   4. Finished Grading Surfaces:
      a. Reasonably smooth, compacted, and free from irregular surface changes.
      b. Provide degree of finish that is ordinarily obtainable from blade grader operations, except as otherwise specified.
      c. Uniformly grade areas, which are not under concrete.
      d. Finish gutters and ditches so that they drain readily.

3.05 ADJUSTING

A. Finish Grades of Excavations, Backfilling and Fill:

1. Repair and reestablish grades to required elevations and slopes due to any settlement or washing way that may occur from action of the elements or any other cause prior to final acceptance.

3.06 PROTECTION

A. Finish Grades of Excavations, Backfilling and Fill:
   1. Protect newly graded areas from action of the elements.

B. Ditches and Gutters:
   1. Maintain ditches and gutters excavated free from detrimental quantities of debris that might inhibit drainage until final acceptance.

END OF SECTION

SECTION 02312

CONTROLLED LOW STRENGTH MATERIAL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Controlled Low Strength Material (CLSM).

B. Related Sections:
   1. Section 03300 - Cast-in-place Concrete.

1.02 REFERENCES

A. American Society of Testing and Materials (ASTM):
   1. C 31 - Practice for Making and Curing Concrete Test Specimens in The Field.
   2. C 33 - Specification for Concrete Aggregate.
   3. C 143 - Test Method for Slump of Hydraulic-Cement Concrete.
   4. C 231 - Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
   5. C 260 - Specification for Air-Entraining Admixtures for Concrete.
   6. C 618 - Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete.
   7. D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft^3 [2,700 kN-m/m^3]).

1.03 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. Total Calculated Air Content: Not be less than 8.0 percent nor greater than 12.0 percent.
   2. Minimum Unconfined Compressive Strength: Not less than 50 pounds per square inch.
   3. Maximum Unconfined Compressive Strength: Not greater than 150 pounds per square inch, measured at 28 days.
   4. Wet Density: No greater than 132 pounds per cubic foot.

1.04 SUBMITTALS

A. Shop Drawings:
   1. Submit a mix design which conforms to the density and strength criteria established herein. A suggested mix design is described in Part 2, under Mixes.
   2. Submit mix design which conforms to be specified density and strength performance requirements. Include laboratory test reports of trial strength tests.

B. Submit Mix Design and Trial Batch Test Results for Acceptance:
   1. Prepare the trial batches using the specified cement and aggregates proposed to be used for the work.

2. Prepare sufficient quantity of trial batches to determine slump, workability, consistency, and to provide sufficient test cylinders.

C. Test Cylinders: Prepare test cylinders in accordance with ASTM C 31 with the Following Exception:
   1. Fill the concrete test cylinders to overflowing and tap sides lightly to settle the mix.
   2. Do not rod the concrete mix and strike off the excess material.
   3. Place the cylinders in a safe location away from the construction activities. Keep the cylinders moist by covering with wet burlap, or equivalent. Do not sprinkle water directly on the cylinders.
   4. After 2 days, place the cylinders in a protective container for transport to the laboratory for testing. The concrete test cylinders are fragile and shall be handled carefully. The container may be a box with a styrofoam or similar lining that will limit the jarring and bumping of the cylinders.

D. Submit data for each of the test cylinders.
   1. Identify the data for the mix and slump for each of the test cylinders. Determine slump in accordance with ASTM C 143 with the following exceptions:
      a. Do not rod the concrete material.
   2. Place material in cone in one semi-continuous filling operation, slightly overfill, tap lightly, strike off, and then measure and record slump.
   3. Use a slump of the placed material greater than 9 inches, and sufficient to allow the material to flow freely during placement.
      a. After trial batch testing and acceptance, maintain slump developed during testing during construction at all times within plus or minus 1 inch.

E. Compression test 8 test cylinders.
   1. Test 4 test cylinders at 3 days and 4 at 28 days in accordance with ASTM C 39 with the following exception:
      a. Place test cylinders in a moist curing room prior to compression testing. Exercise caution in moving and transporting the cylinders since they are fragile and will withstand only minimal bumping, banging, or jolting without damage.
      b. Do not remove the test cylinder mold until the cylinder is to be capped and tested.

F. The cylinders may be capped with standard sulfur compound or neoprene pads.
   1. Perform the capping carefully to prevent premature fractures.
   2. Use neoprene pads a minimum of 1/2 inch thick, and 1/2 inch larger in diameter than the test cylinders.
   3. Do not perform initial compression test until the cylinders reach a minimum age of 3 days.

G. The compression strength of the four test cylinders tested at 28 days shall be equal to or greater than the minimum required compression strength but not to exceed maximum compression strength.

H. If the trial batch tests do not meet the Specifications for strength or density, change the mix design proportions, and make additional trial batches and tests until an acceptable trial batch is produced that meets the Specifications.

1. All the test batches and acceptability of materials shall be paid by the CONTRACTOR.
2. After acceptance, do not change the mix design without submitting a new mix design and test information.

I. **The CONTRACTOR shall submit trial batch test information for the CLSM mix proposed for this project. CLSM mix test results and data from other projects will not be accepted.**

PART 2 PRODUCTS

2.01 MATERIALS

A. Controlled Low Strength Material Components:
1. Portland Cement: Type II low alkali Portland Cement as specified herein.
2. Fly Ash: Class F fly ash conforming to ASTM C 618.
3. Water: As specified in Section 03300.
4. Admixture: Air entraining admixture conforming to ASTM C 260.
5. Fine Aggregate: Concrete sand, that does not need to conform to ASTM C 33. No more than 12 percent of fine aggregate shall pass a No. 200 sieve, and no plastic fines shall be present.
6. Coarse Aggregate: Pea gravel no larger than 3/8 inch.

2.02 MIXES

A. Suggested Design Criteria:

Material	**Weight**	**Specific Gravity**	**Absolute Volume Cubic Foot**
Cement	30 pounds	3.15	0.15
Fly Ash	300 pounds	2.30	2.09
Water	283 pounds	1.00	4.54
Coarse Aggregate	1,465 pounds	2.68	8.76
Fine Aggregate	1,465 pounds	2.68	8.76
Admixture	4-6 ounces	–	2.70
TOTAL	**3,543 pounds**	**–**	**27.00**

PART 3 EXECUTION

3.01 INSTALLATION

A. Prior to placement, native soils shall be scarified to a depth of 8 inches, uniform moisture conditioned to or above the optimum moisture content, and compacted to a minimum of 95 percent relative compaction in accordance with ASTM D1557.

B. General:

1. Place controlled low strength material by any method which preserves the quality of the material in terms of compressive strength and density.
    a. The basic requirement for placement equipment and placement methods is the maintenance of its fluid properties.
    b. Transport and place material so that it flows easily around, beneath, or through walls, pipes, or other structures.
    c. Use a slump, consistency, workability, flow characteristics, and pumpability (where required) such that when placed the material is self-compacting, self-densifying, and has sufficient plasticity that compaction or mechanical vibration is not required.

3.02 FIELD QUALITY CONTROL

A. General: Make provisions for and furnish all material for the test specimens, and provide manual assistance to assist the ENGINEER in preparing said specimens. Be responsible for the care of and providing curing condition for the test specimens.

B. Tests by OWNER:
    1. During the progress of construction, the OWNER will have tests made to determine whether the controlled low strength material, as being produced, complies with the requirements specified hereinbefore:
        a. These tests will be made in accordance with ASTM C 31, and ASTM C 39 with exceptions as given herein.
        b. Test cylinders will be made and delivered to the laboratory by the ENGINEER and the testing expense will be borne by the OWNER.
    2. Not less than 3 cylinder specimens will be tested for each 150 cubic yards of controlled low strength material and not less than three specimens for each half day's placement. One cylinder will be tested at 3 days and 2 at 28 days.
    3. The OWNER will test the air content of the controlled low strength material by volume by measurement. Test will be made immediately after discharge from the mixer in accordance with ASTM C 231.

C. Tests by CONTRACTOR:
    1. Test the slump of controlled low strength material using a slump cone in accordance with ASTM C 143 with exceptions as given herein.
        a. Test the slump at the beginning of each placement, as often as necessary to keep the slump within the specified range, and when requested to do so by the ENGINEER.

END OF SECTION

SECTION 02318

TRENCHING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Trench excavation, fine grading, pipe bedding, backfilling, and compaction for the following, including requirements for ditch crossings:
   1. Pipe and electrical conduits.
   2. Manholes, valves, or other accessories.
   3. Potable water pipe appurtenances.

B. Related Sections:
   1. Section 02260 - Excavation Support and Protection.
   2. Section 02312 - Controlled Low Strength Material.
   3. Section 02722 - Aggregate Base Course.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C 131 - Test Method for Resistance to Degradation of Small-Size Course Aggregate by Abrasion and Impact in the Los Angeles Machine.
   2. C 136 - Test Method for Sieve Analysis of Fine and Course Aggregates.
   3. D 1556 - Test Method for Density and Unit Weight of Soil in Place by the Sand Cone Method.
   4. D 1557 - Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft. lbf/f_4^3).
   5. D 2922 - Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   6. D 3017 - Test Method for Moisture Content of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth).
   7. D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.03 DEFINITIONS

A. In-Place Density of Compacted Backfill: Is density determined in accordance with ASTM D 2922 and ASTM D 3017.

B. Maximum Density: Is density obtained in laboratory when tested in accordance with ASTM D 1557.

1.04 SUBMITTALS

A. Products Data: For all proposed bedding and backfill materials.
   1. Material source.
   2. Gradation.
   3. Testing data.

B. Samples: 50-lb sample of import bedding or fill material when requested by ENGINEER.

PART 2 PRODUCTS

2.01 MATERIALS

A. General:
   1. Provide material having maximum particle size not exceeding 3 inches and that is free of leaves, grass, roots, stumps, and other vegetable matter.
   2. Materials derived from processing demolished or removed asphalt concrete are not acceptable.

B. Aggregate Base Course: As specified in Section 02722.

C. Gravel:
   1. Consist of hard, durable particles of stone or gravel, screened or crushed to the specified sizes and gradations.
   2. Free of vegetable matter, lumps or balls of clay, and other deleterious matter.
   3. Crush or waste coarse material and add or waste fine material in order to meet the specified gradations.
   4. Fraction of Material Passing Number 40 Sieve: Material having plasticity index not greater than 5 when tested in accordance with ASTM D 4318.
   5. Resistance to degradation: Percentage of wear not greater than 40 percent when tested in accordance with ASTM C 131.
   6. Conform to sizes and grade within the limits as follows when tested in accordance with ASTM C 136:

Sieve Size (Square Openings)	**Percent by Weight Passing Sieve**		
	A	**B**	**C**
3 inch	100	--	--
1-1/2 inch	95-100	100	--
3/8 inch	15-40	35-65	50-100
Number 4	0-25	20-35	30-45
Number 200	0-5	2-9	2-9

D. Sand:
   1. Clean, coarse, natural sand.
   2. Nonplastic when tested in accordance with ASTM D 4318.
   3. 100 percent shall pass a 1/2 inch screen.
   4. No more than 20 percent shall pass a Number 200 screen.

E. Select Native Material:
   1. Sound, on-site earthen materials free of debris and suitable for reuse. Soils shall have less than 3 percent organics by weight when tested in accordance with ASTM D2974.
   2. Gradation as follows when tested in accordance with ASTM C 136:

Sieve Size (Square Openings)	Percent by Weight Passing Sieve
6 inch	100
2.5 inch	85
No. 200	Less than 30

3. Verify that native material is capable of compaction to specified density before placing as fill. If material will not compact to specified density, work material in a manner which will reduce water content to improve compaction or remove the material from the site and replace with Select Imported Material at no additional cost to OWNER.

F. Select Imported Material.
   1. Granular, non-expansive earthen materials free of debris and having less than 3 percent organics by weight when tested in accordance with ASTM D2974.
   2. Liquid limit less than 30 and Plasticity Index less than 12; when tested in accordance with ASTM D 4318.
   3. Resistance Value greater than 30 when tested in accordance with CTM 301.
   4. Gradation as follows when tested in accordance with ASTM C136:

Sieve Size (Square Openings)	Percent by Weight Passing Sieve
3 inch	100
3/4 inch	80-100
No. 4	60-100
No. 200	Less than 30

   5. The OWNER may allow use of the City's property as a borrow site to obtain select imported material, subject to approval of soil samples from the site. Material obtained from the City's borrow site may be obtained at no cost to the CONTRACTOR. CONTRACTOR shall be responsible for excavation and hauling the select imported material. OWNER makes no representation of the quality of the borrow site materials, and the CONTRACTOR shall determine to his satisfaction that the materials are suitable to be used as select imported material.
      a. The City's borrow site is located at Dianne Pond on Dianne Drive approximately 0.5 miles north of West Main St. in the City of Turlock. Observe all requirements of Divisions 0 and 1 when excavating and hauling select imported material from the borrow site.
      b. The CONTRACTOR will be provided with an excavation plan by the OWNER, which will consist of the following requirements: 6:1 side slopes, a uniform base, and fine grading without compaction when borrowing is complete. Additional borrow material may be available from the Dianne Pond site at the discretion of the OWNER.

G. Controlled Density Fill: As specified in Section 02312.

PART 3 EXECUTION

3.01 PREPARATION

A. General:
   1. Trench Condition:
      a. Install pipe and materials as specified herein.
   2. Embankment Condition:
      a. Exists where width of trench exceeds limits specified herein.
      b. Before laying pipes or electrical conduits in fill, place fill and compact it to not less than 2 feet above top of pipe or conduit.
      c. After placing and compacting fill, excavate through fill and fine grade as required in this Section.

B. Protection: Stabilize excavation as specified in Section 02260.

3.02 INSTALLATION

A. Trench Excavation:
   1. General Requirements:
      a. If, because of soil conditions, safety requirements or other reasons, trench width at top of pipe is increased beyond width specified in this Section, upgrade laying conditions or install stronger pipe designed in conformance with Specifications for increased trench width, without additional cost.
      b. Pipe and Electrical Conduits:
         1) Lay pipe and electrical conduits in open trench.
         2) If bottom of excavation is found to consist of rock or any material that by reason of its hardness cannot be excavated to provide uniform bearing surface, remove such rock or other material to a depth of not less than 4 inches below bottom of pipe and refill to grade with bedding material placed at uniform density, with minimum possible compaction.
         3) If bottom of excavation is found to consist of soft or unstable material which is incapable of properly supporting pipe, remove such material to a depth and for the length required, as determined by the ENGINEER, and then refill trench to grade with bedding material compacted to 95 percent of maximum density.
      c. Trench Widths:
         1) Minimum Clear Width of Trench for Pipe (Measured at Top of Pipe):
            a) For Pipe Sizes 4 Inches to and Including 24 Inches: Not less than outside diameter of pipe plus 18 inches.
            b) For Pipe Sizes Larger Than 24 Inches: Not less than outside diameter of pipe plus 24 inches.
         2) Maximum Clear Width of Trench for Pipe (Measured at Top of Pipe):
            a) For Pipe Sizes 4 Inches to and Including 24 Inches: Not to exceed outside diameter of pipe plus 24 inches.
            b) For Pipe Sizes Larger Than 24 Inches: Not to exceed outside diameter of pipe plus 36 inches.

d. For Manholes, Valves, or Other Accessories:
    1) Provide excavations sufficient to leave at least 12 inches clear between their outer surfaces and embankment or shoring which may be used to hold banks and protect them.
    2) Do not backfill with earth under manholes, vaults, tanks, or valves.
    3) Fill any unauthorized excess excavation below elevation indicated on the Drawings for foundation of any structure with sand, aggregate base material, bedding material, or concrete at no additional cost.
    4) Backfilling of Manhole Excavation: Conform to backfilling requirements as specified for trenches in this Section.
e. At Road Crossings or Existing Driveways:
    1) Make provision for trench crossings at these points, either by means of backfills, or temporary bridges.

B. Trench Fine Grading:
1. For Pipes 16 Inches in Nominal Diameter and Under:
    a. Unless otherwise specified, accurately grade bottom of trench to provide uniform bearing and support for each section of pipe, on undisturbed soil at every point along pipe's entire length, except for portions of pipe where it is necessary to excavate for bells and for proper sealing of pipe joints.
2. For Pipe over 16 Inches in Diameter:
    a. Overexcavate bottom of trench by at least 6 inches.
    b. Fill overcut with bedding material specified herein, and fine graded as specified.
    c. Place bedding material at uniform density, with minimum possible compaction.
    d. Where trench excavation is below grade of bedding material, restore trench bottom to proper grade by backfilling and compacting backfill to 95 percent of maximum density, at no additional cost. Use bedding material as specified in this Section.
3. Bell or Coupling Holes:
    a. Dig holes after trench bottom has been graded.
    b. Provide holes of sufficient width to provide ample room for grouting, banding, or welding.
    c. Excavate holes only as necessary in making joints and to ensure that pipe rests upon prepared trench bottom and not supported by any portion of the joint.
4. Depressions for Joints, Other than Bell-and-spigot:
    a. Make in accordance with recommendations of joint manufacturer for particular joint used.

C. Pipe Bedding:
1. After Pipe Laid:
    a. Place bedding material under and around pipe in maximum 6 inch lifts to level even with spring line of pipe, and compact to 95 percent of maximum density.
    b. Fill section of trench from spring line to 12 inches above top of pipe in maximum 6 inch lifts with bedding material and mechanically compact to 95 percent of maximum density.
    ~~c. Alternatively, place bedding under and around pipes to 12-inches above top of pipe and water settle (jetting) to 95 percent relative density~~.
    c. **Water jetting will not be permitted.**

2. Pipe Displacement:
    a. Take necessary precautions in placement and compaction of bedding material to prevent displacement of piping.
    b. In event there is movement or floating, re-excavate re-lay, and backfill the pipe.

~~3. Consolidation:~~

~~c. When acceptable to the ENGINEER, perform consolidation by flooding and poling, or jetting so as to obtain compaction of backfill material at least equal to that specified.~~

~~d. Do not use water settling methods when backfill material is not sufficiently granular in nature to be self-draining during and after consolidation and when foundation materials may be softened or otherwise damaged by water.~~

~~e. When flooding, poling, or jetting methods are used, place and consolidate material used as backfill in layers not exceeding 4 feet in thickness.~~

~~f. Supplement flooding and poling, or jetting methods by use of vibratory or other compaction equipment when necessary to obtain required compaction.~~

~~g. Flooding and poling, or jetting shall not be permitted within 3 feet of the finished grade.~~

~~h. Full time observation by a Geotechnical Engineer shall be required to observe the jetting process.~~

3. **Consolidation: Water jetting will not be permitted.**

D. Trench Backfill Above Pipe Bedding:
    1. Under and Parallel to Roadways, Paved Areas, or Storage Areas:
        a. Backfill trench up to within 2 feet of finish grade with select native material compacted to 95 percent of maximum density.
        b. Then backfill from 2 feet below finish grade to finish grade, or underside of aggregate base course or pavement as indicated on the Drawings with select native material, aggregate base course material, or select material, compacted to 95 percent of maximum density.
    2. In Areas Outside the Improved Section of Roadways or in Open Country:
        a. Backfill to finish grade with select native material compacted to 95 percent of maximum density.

E. Under Existing Intersecting Pipes or Conduits Larger than 3 Inches in Diameter:
    1. Backfill from bottom of new pipe trench to spring line of intersecting pipe or conduit with aggregate base course material compacted to 95 percent of maximum density when tested in accordance with ASTM D 1566 or ASTM D 2922.
    2. Extend aggregate base course material 2 feet on either side of intersecting pipe or conduit to ensure that material remains in place while other backfill is placed.
    3. Backfill remainder of trench according to Paragraph D, above.

F. Compacting Select Native Material:
    1. Assure that select native material, when used as previously specified, is capable of being compacted to degree specified.
    2. If select native material cannot be compacted to density as previously specified, remove and dispose of material whether it has been placed in trench

as backfill or not, and utilize other backfill material from another source acceptable to the ENGINEER.

3. Consolidate using mechanical methods. Water settling, ponding, and/or flooding will not be permitted.
4. Place material in 8-inch uncompacted lifts prior to compaction operations.

G. Excess Material:
   1. Utilize excess excavated material for fill.
   2. Remove excess excavated material from the project site.
   3. **The City of Turlock has a site (501 S. Walnut Rd Turlock, CA) that the contractor may use to off haul excess material from the project. Material taken to this site must meet the following requirements:**
      a. **Must not contain material greater than 2-inches in diameter.**
      b. **Free of concrete rubble, trash, wood, hazardous material or any other material deemed unsuitable.**
      c. **Containing more than 5% organic material.**
      d. **Contractor is to spread the material evenly across the site and within the limits of the site described by the Resident Engineer.**

3.03 FIELD QUALITY CONTROL

A. Tests:
   1. Soil Compaction Confirmation Tests will be conducted by ENGINEER:
      a. Contractor's Responsibilities:
         1) Accomplish specified compaction of trench backfill.
         2) Control operations by confirmation tests to verify and confirm that compaction work complies, and is complying at all times, with requirements specified in this Section concerning compaction, control, and testing.
         3) Cost of Confirmation Tests: Paid for by the OWNER.
         4) Copies of Confirmation Test Reports: Submit promptly to the CONTRACTOR.
      b. Frequency of Confirmation Testing:
         1) ENGINEER will perform testing not less than as follows:
            a) For Trenches: At each test location include tests for each type or class of backfill from bedding to finish grade.
            b) In Open Fields: 2 every 1,000 linear feet.
            c) Along Dirt or Gravel Road or off Traveled Right-of-way: Two every 500 linear feet.
            d) Crossing Paved Roads: 2 locations along each crossing.
            e) Under Pavement Cuts or Within 2 Feet of Pavement Edges: 1 location every 400 linear feet.
      c. For Tests in Water Settled Backfill: Remove overburden above level at which the ENGINEER wishes to test. ENGINEER may request testing every 200 feet on water settled backfill. Backfill and recompact excavation after testing is completed.
      d. If Compaction Fails to Meet Specified Requirements: Perform remedial work by one of the following methods:
         1) Remove and replace backfill at proper density.
         2) Bring density up to specified level by other means acceptable to the ENGINEER.
      e. Retesting:

1) Costs of Retesting: Costs of retesting required to confirm and verify that remedial work has brought compaction within specified requirements shall be borne by the CONTRACTOR.
2) Contractor's Confirmation Tests During Performance of Remedial Work:
a) Performance: ENGINEER will perform.
b) Frequency: Double amount specified for initial confirmation tests.

2. Water Testing Pipe:
a. After Bedding the Pipe, CONTRACTOR Has the Following Option To:
1) Water-test pipe.
2) Backfill to surface, at his own risk, before water-testing pipe.
b. If pipe does not pass test, uncover pipe, locate leaks, repair and retest, repeating until pipe section under test passes.

3.04 TRENCH MATERIAL SCHEDULE

A. Fine Grading Materials:
1. Fine grading material shall be the same as bedding material.

B. Pipe Bedding Materials:
1. For Pipe less than 16 Inch Nominal Size: Except as otherwise specified, use sand.
2. For Pipe from 16 Inch to 48 Inch Nominal Size: Except as otherwise Specified, use aggregate base course.
a. Sand is not an acceptable backfill material.
3. For Polyvinyl Chloride or Other Plastic Pipe less than 2 Inches in diameter: Use sand.

C. Trench Backfill Materials:
1. Aggregate base course or select native material.

D. Refer to specification 02300 for material specifications.

END OF SECTION

SECTION 02370

RIPRAP AND GABIONS EROSION AND SEDIMENTATION CONTROL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Plain riprap and gabions.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. A 90 - Test Method for Weight of Coating of Zinc-Coated (Galvanized) Articles.

B. California Code of Regulations.
   1. Title 23, Division 1.

1.03 SUBMITTALS

A. Product Data. Installation instructions.

PART 2 PRODUCTS

2.01 PLAIN RIPRAP

A. Material: Quarry Stone.

B. Size:

Quarry Stone	
Stone Size	**Percent Passing**
15”	100
8”	80 to 95
6”	45 to 80
4”	15 to 45
2”	0 to 15

Per Title 23, Division 1, Section 121.

C. Material Shapes:
   1. Capable of forming stable protection structure of required depth.
   2. Angular.
   3. Flat or needle shapes with thickness more than 1/3 length.

2.02 GABIONS

A. Materials:
   1. Wire Mesh and Diaphragms: Minimum U.S. Steel Wire Gauge No. 11, galvanized with minimum zinc coating of 0.80-ounce per square foot of uncoated wire surface as determined by ASTM A 90.
   2. Tie or Connecting Wire: Same as wire mesh wire, except minimum 13 gauge.
      a. Quantity: As required for securely fastening edges of gabions and diaphragms and providing internal connecting as follows:
         1) In Each Cell 1/2 Unit High: 4 internal wires.
         2) In Each Cell 1 Unit High: 8 internal wires.
   3. Rings: Hog rings minimum gauge, galvanized.
   4. Stones: 4 to 8 inches, both measured in greatest dimension.

B. Fabrication of Gabion Wire Baskets:
   1. Fabricate non-raveling mesh with maximum 4-1/2 inch dimension across maximum 8 square inch openings.
   2. Securely selvage mesh perimeter edges so that joints formed by tying selvedges have the same or greater strength as mesh body.
   3. Weave baskets base lid, ends, and sides into single unit, or connect so that strength and flexibility at connections equals or exceeds strength and flexibility of mesh.
   4. Fabricate baskets so that sides, ends, lids, and diaphragms can be assembled at project site into rectangular baskets of specified sizes.
   5. Secure diaphragms in proper position on base so that no additional tying at junctures will be necessary.
   6. Fabricate with uniform minimum 24-inch horizontal widths and height.
   7. Fabricate with lengths of 2, 3, or 4 multiples of horizontal width.
   8. When length exceeds horizontal width, equally divide baskets by diaphragms so cell lengths do not exceed horizontal width.
   9. Height, length, and width tolerance: Within 3 percent of manufacturer's stated dimensions.

PART 3 EXECUTION

3.01 PREPARATION

A. Shape and trim bed for riprap as required to provide even surface which at no point is higher than design surface.

B. Grade slopes on which riprap or gabions are to be placed to tolerance of 0.00 to minus 0.20 foot.

C. Excavate footing trench along toe and cutoff trench at top of slope, as indicated on the Drawings.

3.02 PLACING PLAIN RIPRAP

A. When required riprap is less than 20 inches in depth, place material by hand. When riprap is 20 inches or more in depth, place material by dumping and spreading in layers by bulldozers or other suitable equipment.

B. Place material to provide minimum of voids.

C. Place larger pieces in toe of trench, foundation coarse, and on outer surface of riprap.

D. Place pieces with their longitudinal axis normal to face of embankment and so arranged that each piece above the foundation coarse has minimum 3-point bearing on underlying stones. Bearing on smaller pieces used to fill voids will not be acceptable.

E. Fill interstices between pieces with small pieces and spalls.

3.03 GABIONS

A. Set empty wire basket units to line and grade as indicated on the Drawings.

B. Assemble each wire basket for gabions unit by binding together vertical edges with wire ties at approximately 6 inches on center, or by stitching around vertical edges with continuous connecting wire about every 4 inches.

C. Uniformly space internal tie wires or hog rings at maximum 6 inch intervals in each outside cell of structure and fasten securely.

D. Use standard fence stretcher, chain fall, or iron rod to stretch wire basket units and hold alignment.

E. Fill wire baskets with stone carefully placed by hand or machine. Ensure alignment and avoid bulges and voids.

F. After wire baskets have been filled, bend lid over until it meets sides and edges.

G. Secure lid to sides, ends, and diaphragms with wire continuous ties at 6 inches on center or stitching connecting wire at 4 inches on center.

H. Cut and seal gabions, where gabions abut structures at angle, to meet structures flush.

3.04 TOLERANCES

A. Finished Surfaces of Riprap for Plain Riprap: Within 3 inches per foot of depth.

B. Finished Surfaces of Gabions: Within 3 inches.

END OF SECTION

SECTION 02441

MICROTUNNELING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Requirements for trenchless installation of pipe by microtunneling.

B. Related Sections:
   1. Section 02260 - Excavation Support and Protection.
   2. Section 02240 - Dewatering.
   3. Section 02600 - Reinforced Concrete Pipe for (Microtunneled) Sections.
   4. Section 03360 - Contact Grouting.

1.02 DEFINITIONS

A. Microtunneling. A remotely-controlled, guided, pipe-jacking process that provides continuous support to the excavation face. The guidance system usually consists of a laser, mounted in the jacking pit as a reference, with a target mounted inside the microtunneling machine's articulated steering head. The microtunneling process does not require personnel entry into the tunnel. A key element of microtunneling is the ability to control the stability of the face by applying mechanical or fluid pressure to the face to balance the earth and groundwater pressures.

B. Intermediate Jacking Station (IJS). A fabricated steel cylinder fitted with hydraulic jacks that are incorporated into a pipeline between two interjack pipe sections. The function of an intermediate jacking station is to distribute the jacking load along the pipe string during pipe installation. The hydraulic jacks are removed at the completion of a drive and the gap between adjacent pipe sections is fully closed by pushing the pipes together with the main shaft jacks.

C. Launch Seal. A mechanical seal, usually comprised of a rubber flange attached to a steel housing, that is mounted to the wall of the drive shaft. The microtunneling machine distends the flange seal as it passes through, creating a seal to prevent water, slurry, or lubrication inflows into the shaft during tunneling operations.

D. Surface Settlement Point. A point with elevation and spatial location established by survey prior to construction. The point is re-surveyed periodically to monitor ground movements. The point may be a nail, pin, or other device that can be readily located and surveyed.

E. Lubrication Port. A port located in a jacking pipe segment, fitted with a one-way valve, for injection of lubrication material or grout into the annular space between the pipe and the ground.

F. Jacking Record. A computer-generated report that contains information on all pertinent microtunneling operations, including rate of advance, slurry flow rates and pressures, jacking forces, face pressure, cutter-head torque, steering corrections, machine inclination, roll, machine position, installed tunnel length, intermediate jacking station

pressures, date, time, name of Operator, problems with the tunneling machine and reasons for delays.

G. Obstruction. Objects or portions of objects located wholly or partially within the cross-sectional area excavated by the microtunneling machine that are larger than 30 percent the outer diameter of the shield or cutter-head, and that prevent the forward motion of the microtunneling machine.

1.03 SYSTEM DESCRIPTION

A. Microtunneling shall be used for the installation of 48-inch inner-diameter pipeline for treated wastewater effluent. The location of the pipeline is shown on the Drawings.

B. General:
   1. The work specified in this section includes the construction of all pipelines using microtunneling methods, as indicated in the Contract Documents.
   2. Remote controlled, laser guided, pipe-jacking equipment with a slurry spoil removal system capable of maintaining positive face pressure will be required.
   3. Pipe jacking methods, using microtunneling equipment, shall be employed to directly install microtunneling jacking pipe at each of the locations indicated in the Contract Drawings.
   4. Geotechnical Investigation:
      a. The CONTRACTOR shall conduct a geotechnical investigation to satisfy himself or herself as to the geologic conditions to be encountered on the project. This geotechnical information shall be used to design and/or refine the microtunneling machine and related systems. The results of the geotechnical investigation shall be submitted to the ENGINEER.

C. Design Requirements:
   1. Equipment: ONLY slurry microtunneling equipment will be used for the pipe installation work described in this Section.
      a. Microtunneling Equipment: As manufactured by one of the following or equal:
         1) Akkerman.
         2) Herrenknecht.
         3) Iseki.
         4) Soltau.
         5) Lovat.
   2. The machine shall be equipped with a computerized data acquisition system for collecting information for the jacking record. An on-site printer and disk drive will also be required for production of the printed daily jacking record and diskettes files.
   3. The machine shall be capable of fully supporting the face during both excavation and shutdown periods and shall have the capability of exerting a controllable, measurable, continuous, stabilizing pressure at the face required to prevent loss of ground and groundwater inflows. The machine shall be capable of controlling the volume of excavated material removed at the tunnel face, independent of machine advance.
   4. The machine shall have a slurry chamber capable of being pressurized. A pressure gage shall be provided to monitor the pressure exerted by the slurry at the heading.
   5. The machine shall be remotely operated, laser-guided, and monitored continuously by the operator. A display showing the position of the machine in relation to the design line and grade shall be provided at the operation console to allow the

operator and site inspector to monitor the face pressure, torque, roll, inclination, laser position, steering attitude, rate of advance, installed length, and jacking force.

6. The machine shall have an articulated shield that is steerable in both the vertical and horizontal directions to maintain line and grade within the specified tolerances. The articulation joints between the two segments of the joint shall be water tight. The cutter head shall have a reversible drive system so that it can rotate in either direction to minimize rotation or roll of the machine during installation.
7. The machine shall be capable of advancing through the geologic conditions to be encountered at the site, as described in the Geotechnical Report and as determined by the CONTRACTOR's own investigation. The machine shall be able to excavate or crush boulders or other objects with diameters up to 30 percent of the outer diameter of the shield and with unconfined compressive strengths as high as 30,000 psi.
8. The machine shall be equipped for continuous gas monitoring. The CONTRACTOR shall have a shut-down plan that includes activation of the slurry by-pass in the event that a gassy environment is detected in the heading.
9. A lubrication injection system shall be provided to inject pipe lubricant to decrease required jacking forces. Lubrication materials may include a mixture of bentonite or polymers and water.
10. The maximum radial overcut will be one (1.0) inch. The minimum radial overcut will be one-quarter (0.25) -inch. The radial overcut will be determined as the difference between the maximum diameter created by the cutting teeth or overcut band on the machine and the outer diameter of the pipeline, divided by two.
11. The connection between the tail of the machine and the first pipe section shall be fully gasketed and sealed to prevent material or water from flowing into the machine during tunneling operations.
12. The jacking system shall be capable of continuously monitoring the jacking pressure, rate of advance, and jacking distance. The jacking system shall develop a uniform distribution of jacking forces on the ends of the pipe.
13. The outer shell or "can" of the intermediate jacking station shall be constructed of stainless steel. The intermediate jacking station shell shall be fully gasketed between the interjack shell and each interjack pipe, with 2 gaskets.

D. The slurry separation plant shall be designed to achieve the rates of spoil separation and slurry cleaning required by the CONTRACTOR to achieve planned production rates. The CONTRACTOR is advised that the ground conditions include silt and clay that could present delays if a gravity separation method is used alone. Shaker screens, hydrocyclones, and centrifuges may be required for efficient separation of spoils. The separation plant must fit within the allowable work areas shown on the Drawings. Excavated slurry pits or ponds shall not be allowed. Additionally, all excavated materials and slurry must be discharged into, and completely contained within, tanks, truck, or other containers at all times. On-site stockpiling or disposal shall not be permitted. Accidental spills shall be promptly contained and cleaned up.

E. Design of the jacking pipe and determination of acceptable pipe fabrication tolerances is the responsibility of the CONTRACTOR. Minimum requirements are specified in Section 02600. The pipe shall be designed to withstand all anticipated loads with appropriate safety factors.

F. The thrust block shall be perpendicular to the proposed pipe alignment and shall be designed to withstand the maximum jacking force provided by the jacking frame with an appropriate safety factor. The thrust block shall be designed to transmit the applied jacking forces to the earth behind the shaft wall and to minimize deflection and displacement.

G. Ground surface settlement or heave above the tunnel centerline shall be limited to one inch or less.

H. Tolerances. The following tolerances apply to the pipelines installed by microtunneling:
   1. Line Tolerance: 2 inches.
   2. Grade Tolerance: 2 inches.

I. Water shall be free draining between any two points at the pipe invert. No reverse grades will be allowed.

J. Safety.
   1. The City of Turlock has obtained from the State of California, Industrial Relations Department, Division of Occupational Safety and Health Administration, an underground classification of "Potentially Gassy" for this project. A copy of the classification is included in the Appendix. All work shall be in conformance with procedures appropriate for this classification and all applicable federal, state and local safety requirements.
   2. All work must be performed in accordance with the current applicable regulations of Federal, State, and local agencies.
   3. All applicable provisions of the Tunnel Safety Orders of the State of California and 29 CFR Part 1926, Subpart S, Underground Construction by OSHA must be met. In the event of conflict, the more restrictive applicable requirements must be met.
   4. No gasoline-powered equipment shall be permitted in jacking and receiving shafts.

K. Groundwater:
   1. Groundwater is present at the elevation of the microtunneling. Shaft and pits shall be water tight and designed by the microtunnelling contractor.

1.04 SUBMITTALS

A. Submit the following in accordance with Section 01330, Submittal Procedures: Provide sufficient detail to allow the ENGINEER to judge whether the proposed equipment, materials, and procedures will meet the Contract requirements.
   1. All drawings shall be legible with dimensions accurately shown and clearly marked in English.
   2. Drawings transmitted by a facsimile will not be accepted.
   3. The ENGINEER’s review of submitted details and data will be based on consideration of requirements for the completed work, utilities, and the possibility of unnecessary delays in the execution of the work to be constructed under this Contract.

B. Calculations. Submit all calculations in a legible, comprehensible format.
   1. Submit calculations for anticipated jacking forces for each drive. The anticipated jacking forces shall be based on anticipated face pressures and frictional forces along the pipeline.
   2. Submit calculations demonstrating that the soils behind the thrust block are capable of sustaining the maximum anticipated forces required to complete the drive or the maximum capacity of the jacking frame, whichever is less, with an appropriate safety factor.

C. Shop Drawings/Microtunneling -Excavation Plan:
   1. Equipment Product Data and Details: Submit the following:

a. Provide manufacturer's literature describing the microtunneling equipment in detail, including detailed description of the microtunneling equipment and procedures to be employed.
b. Describe method and capabilities for providing stabilizing pressure at the tunnel heading. Indicate the range of face pressures anticipated to be required to stabilize the heading and the methods and equipment to be used to monitor and control the face pressure. Indicate the torque required to rotate the cutterhead under no face pressure.
c. Alignment Control and Steering System: Description of the alignment control and steering system. Confirm that these systems can achieve the required tolerances for pipeline line and grade. Include a description of the equipment and procedure for checking the position of the laser. Provide documentation that the laser has been calibrated. Submit a description of methods to ensure that thrust block, entry seal, and jacking frame are installed on proper line and grade. Submit name and qualifications of surveyor who shall be responsible for establishing survey control and setting the guidance system for pipe installation.
d. Provide Details for the following:
    1) lubrication injection system used for lubrication of the pipeline during microtunneling operations.
    2) planned lubrication port locations along the pipeline and the injection scheme that will be used. Provide details of the calculated volume of the annular space (the minimum volume that will be continuously pumped throughout installation procedures).
    3) Provide a description of the lubrication materials that will be used.
e. Details on the muck/slurry handling, transport, recovery, and disposal equipment and procedures.
    1) Include details on the slurry separation and recirculation systems. Details shall be provided on the planned slurry composition and any slurry additives that are planned for use during the microtunneling operations.
    2) Include diagrams showing the location of all slurry delivery and return pumps.
    3) Provide written documentation signed by the site OWNER or manager of the disposal site(s) indicating that they will accept the muck or slurry and are in compliance with all applicable local, state, and federal regulations.
    4) Provide detailed description of the slurry separation plant, including dimensions, specifications, noise ratings, and sound-proofing.
f. Provide details on the jacking frame, including a diagram of the main jacks, thrust ring, jacking controls, and pressure gages.
    1) Provide details on the maximum jacking capacity of the jacking frame and the hydraulic pressure required to develop the maximum pressure.
    2) Provide the conversion factor from gage pressure for the hydraulic jacks to thrust, in tons.
g. Provide details on the entry and exit shaft seals and the mounting procedures.
h. Provide details on the generator, including dimensions, noise ratings at 100 feet, and soundproofing.

D. Quality Assurance Submittals:
1. Qualifications. All Microtunneling work shall be completed by an experienced CONTRACTOR with experienced personnel. The Microtunneling project superintendent and Microtunneling operator(s) shall have at least five (5) years of experience on at least three (3) Microtunneling projects of similar size. At least one of the projects shall have been completed in similar soil conditions of dense to very dense silty sands and sands below the water table. Submit written documentation,

including OWNER's representative names, addresses, and telephone numbers, summarizing the experience of the microtunneling project superintendent, the microtunneling operator(s), and the site safety representative. The superintendent and operator(s) must be as listed in the prequalification document. The site personnel shall meet or exceed the minimum qualifications of the personnel submitted in the CONTRACTOR's prequalification. Submit evidence of Cal/OSHA certification for the site safety representative and personnel responsible for gas testing.

E. CONTRACTOR Geotechnical Report.

F. Schedule.
   1. Provide a schedule for all microtunneling work, identifying all major construction activities as independent items.
   2. The schedule shall include, as a minimum, the following activities:
      a. Mobilization, Groundwater Control at Jacking and Receiving Shafts, Shaft Excavation and Support, Thrust Wall Construction, Jacking Equipment Set Up, Ground Stabilization for Launch of Machine, Microtunneling for Each Drive, Moving Equipment Between Drives, Shaft Abandonment, Site Restoration, Cleanup, and Demobilization.
      b. The schedule shall also include the working hours for each activity, and a written description of the construction activities.
      c. The schedule shall be reviewed by the ENGINEER, will be updated, and resubmitted by the CONTRACTOR every two weeks or more frequently if requested by the ENGINEER.
   3. Ground Stabilization During Launch: Submit details on the method of controlling groundwater inflows and loss of ground into the shafts at all times, including the periods during launch and retrieval of the microtunneling machine, i.e. when exiting the launch shaft and entering the reception shaft.

G. Daily Records. The following daily records shall be submitted to the Engineer for review:
   1. Jacking Records: These records shall include, at a minimum, the following information:
      a. The name of the operator.
      b. Tunnel drive identification.
      c. The date.
      d. The installed length of tunnel.
      e. Thrust force.
      f. Slurry flow rates.
      g. Face pressure.
      h. Cutter-head torque.
      i. Progression rate.
      j. Roll.
      k. Inclination.
      l. Steering adjustments.
      m. Laser position.
      n. Line and grade deviations.
      o. Any movement of the laser.
      p. Problems.
      q. Reason for stopping operations.
      r. Duration of any stops.
   2. The operating system shall continuously provide performance data to the operator. Recorded data shall be referenced to the length of installed tunnel and shall be recorded at length intervals of one foot or less. Manually recorded observations

shall be made at intervals of not less than three times per pipe, as conditions change, or as directed by the ENGINEER.

3. Lubrication Records:
    a. These records will include the amount of lubrication pumped throughout a drive, reported as pumped volume per pipe, and total for each shift.
4. Slurry Additives:
    a. These records will include all slurry additives, including any bentonite and polymers and will be submitted with the daily jacking record. The time and volume of the addition to the slurry shall be noted. Measurements of specific gravity and viscosity will be made at the beginning, middle, and end of each shift, and submitted with the daily logs.
5. Survey Measurements:
    a. Survey measurements of settlement points will be submitted to the ENGINEER by the end of the day after the measurements were taken. Measurements will be made at least once per 100 feet of tunneling, or as directed by the ENGINEER.
    b. Settlement points shall be on both sides of the microtunnel run.

H. Safety Plan:
1. Protection of Adjacent Structures. Provide details on measures to be taken to monitor and protect adjacent utilities, structures, roadways, canals, and provide details on monitoring equipment and provisions, including the layout of all surface settlement points and other monitoring points.
2. Safety Plan. Submit a safety plan for personnel conducting the pipe jacking operations, including provisions for lighting, ventilation, and electrical system safeguards. Include in the safety plan a code of safe practices and an emergency plan in accordance with Cal/OSHA requirements.
3. CONTRACTOR IS TO SUBMIT A PLAN TO PROTECT THE EXISTING 24-INCH OUTFALL PIPELINE DURING INSTALLATION OF 48'' FE PIPELINE.

I. Contingency Plans: The following list includes problem scenarios that may be encountered during the microtunneling operations. The CONTRACTOR shall submit contingency plans for dealing with each problem scenario while satisfying the specifications. These plans shall include the observations and measurements required to clearly identify the cause of the problems.
1. Machine Unable to Advance, must be Retrieved
    a. Possible obstructions (including boulders, construction debris, or wood).
    b. Insufficient jacking capacity.
    c. Machine malfunction.
2. Slurry Separation Problems.
    a. Cuttings do not settle out using the CONTRACTOR's on-site slurry separation plant.
    b. Cuttings settle out in the slurry lines before reaching the sedimentation tanks.
3. Strong hydrocarbon smell is detected in the slurry returns or in the shaft.
4. Laser distorted by heat, humidity, or physical disturbance.
5. Jacking forces:
    a. Jacking forces increase dramatically or suddenly.
    b. Jacking forces reach design capacity of pipe, jacking frame, or thrust wall (treat these scenarios as separate incidents).
6. Settlement:
    a. Survey measurements indicate deformations exceed allowable limits.
    b. Excavated volumes exceed pipe volume installed.
    c. Slurry face pressures and/or torque on head decrease suddenly and significantly.

7. Slurry losses from tank or slurry returns to ground surface.
8. Groundwater inflows to shaft transport fines into shaft in measurable quantities.
9. Steering difficulties result in line and grade tolerances being exceeded.
10. Pipe damaged or found to be out of compliance with specifications.
    a. Before installation.
    b. During or after installation.
11. Thrust block deforms excessively under jacking loads, or provides insufficient capacity to advance pipe.
12. Severe storms or flooding predicted; shaft flooding possible.
13. Voids are created that may or may not be visible by ground surface settlements.

J. The CONTRACTOR shall submit shaft layout drawings detailing locations of all equipment, including crane, slurry separation equipment, jacking frame, pumps, control container, generator, lubrication plant, pipe storage area, sound baffles, and staging area. Shaft layout drawings will be required for the launch shaft location and shall be to scale. Product Data:

K. Closeout Submittals:

1.05 PROJECT CONDITIONS

A. Environmental Requirements, refer to Section 01140.

B. Existing Conditions:

1.06 QUALITY ASSURANCE

A. All Microtunneling work shall be performed by an experienced CONTRACTOR with experienced personnel who has been deemed qualified following approval of the qualifications submittal requirements in paragraph 1.04.D.1.
B. The site safety representative and personnel responsible for air quality monitoring shall be experienced in tunnel construction and shall have current certification by Cal OSHA.
C. The surveyor responsible for line-and-grade control shall be a Licensed Surveyor registered in the State of California who has prior experience in similar projects.
D. The CONTRACTOR shall provide at least 72 hours advance written notice to ENGINEER of the planned launch of the MTBM.
E. The CONTRACTOR shall immediately notify the ENGINEER, in writing, when any problems are encountered with equipment or materials, or if the CONTRACTOR believes the conditions encountered are materially and significantly different from those represented within the Contract Documents.
F. All work by the CONTRACTOR shall be done in the presence of the ENGINEER unless the ENGINEER grants prior written approval to perform such work in ENGINEER's absence.
G. The CONTRACTOR shall allow access to the ENGINEER and shall furnish necessary assistance and cooperation to aid the ENGINEER in observations, measurements, data, and sample collection, including, but not limited to the following:
    1. The CITY and ENGINEER shall have full access to the operator control container prior to, during, and following all Microtunneling operations. This shall include but not be limited to, providing visual access to real-time operator controls screens, gauges, and indicators.
    2. The CITY and ENGINEER shall have full aces to the jacking and reception shafts and installed pipe string, prior to, during, and following all jacking operations. This shall include, but not be limited to, visual inspection of installed pipes, launch and retrieval seals, and verification of line and grade. The CONTRACTOR shall

provide safe access in accordance with all safety regulations.

3. The CITY and ENGINEER shall have full access to the slurry separation plant prior to, during, and following all Microtunneling operations. This shall include, but not be limited to, full access to shaker screens, hydrocyclones, conveyor belts, centrifuge equipment, and slurry and spoil holding tanks. The ENGINEER shall be allowed to collect soil samples from the shaker screens and/or spoil holding tanks on the slurry separation plant a minimum of once per installed pipe section, or every ten (10) feet, whichever is more often and at any time when changes in soil conditions or obstructions are apparent or suspected.
4. The CITY and/or ENGINEER shall have full access to the bentonite lubrication plant prior to, during and following all jacking operations. This shall include, but not be limited to, full access to visually inspect storage and mixing tanks, lubricant pressures and pumping rates, and amount and type of lubricants on site.

PART 2 PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. See Section 02600 Reinforced Concrete Pipe (Microtunneling).

PART 3 EXECUTION

3.01 EXAMINATION

A. Site Verification of Conditions: The CONTRACTOR shall not begin microtunneling until the following conditions have been met:
   1. All required submittals have been made and the ENGINEER has reviewed and accepted all submittals.
   2. Required pre-construction surveys have been completed.
   3. Shaft excavation and support has been completed in accordance with Section 02260.
   4. Groundwater control and soil stabilization has been established for launch.
   5. A pre-construction safety conference has been conducted in accordance with Cal/OSHA requirements. This conference must be arranged and the ENGINEER notified of the date at least 7 days in advance of the conference.
   6. A start-up inspection of all mechanical and hydraulic systems associated with the microtunneling operations has been completed. The system shall be tested on the surface to ensure that the microtunneling machine and supporting equipment is functioning properly. The ENGINEER shall be notified at least 72 hours prior to the start-up inspection and a site inspector representing the OWNER will be present during the start-up inspection. Key machine performance data shall be measured and recorded by the CONTRACTOR during this inspection, including cutterhead rotational torque under no load, correct functioning of main jacks and steering jacks, laser and target, and other components. The records of the start-up inspection shall be submitted to the ENGIENER within 24 hours of the completed inspection.

3.02 PREPARATION

A. Protection: CONTRACTOR to pothole to verify location and invert depth of existing 24-inch diameter outfall. Protect this outfall.

B. **The CONTRACTOR shall protect the 24-inch outfall during microtunneling operations. If the pipeline is damaged during construction the CONTRACTOR shall replace the pipeline.**

3.03 INSTALLATION

A. The CONTRACTOR shall furnish all necessary equipment, power, water, and utilities for microtunneling, shoring and shafts, excavation, bentonite mixing and pumping, removal and disposal of spoils, and other associated work consistent with the CONTRACTOR's methods of construction.

B. Preparation:
   1. CONTRACTOR shall pour a concrete working slab inside the jacking shaft to provide a stable platform for setting the guide rails and jacking frame.
   2. The CONTRACTOR shall survey the location and orientation of the pipe guide rails prior to starting jacking operations to ensure they are on the proper line and grade.

C. Tunnel excavation shall be between the limits indicated on the Contract Drawings to the specified line and grade and shall be accomplished using methods which include due regard for safety of workers, adjacent structures and improvements, utilities, and the public. Jacking and receiving pits shall be located as identified on the Contract Drawings, unless otherwise approved in writing by the ENGINEER.

D. The CONTRACTOR shall ensure that the axial forces from the main jacks shall be distributed to the pipe uniformly through cushion materials to prevent damage to the ends of the pipe.

E. The CONTRACTOR shall ensure that each pipe section shall be jacked as the excavation progresses in such a way that no length of tunnel is left exposed at any time.

F. The CONTRACTOR will ensure that steering corrections are gradual, with corrections made at a rate of no more than 1 inch over 25 feet of drive length.

G. The CONTRACTOR shall jack the pipes into place without damaging the pipe. In the event a section of pipe is damaged during the jacking operation, the pipe shall be jacked through to the next shaft and removed.

H. The CONTRACTOR shall control the advance rate of the machine and shall balance the rate of removal of excavated material with the rate of excavation and pipe installation to avoid over excavation that can lead to subsidence and under excavation that can lead to heave.

I. The CONTRACTOR shall mount the laser independently from the thrust block and jacking frame to maintain the alignment of the laser. The CONTRACTOR will stop tunneling operations and reset the laser if the laser alignment shifts or is moved off design alignment and grade for any reason. The CONTRACTOR shall immediately notify the ENGINEER if the laser has been disturbed and must be reset.

J. If the pipe installation does not meet the specified tolerance, the CONTRACTOR will correct the installation including, if necessary, redesign of the pipeline or structures and acquisition of necessary easements. All corrective work shall be performed by the CONTRACTOR at no additional cost to the City and is subject to the approval of the ENGINEER.

K. The CONTRACTOR will maintain and control face pressure exerted at the heading of the tunneling machine to balance soil and groundwater pressures and prevent loss of ground, groundwater inflows, and settlement or heave of the ground surface. Face pressures shall be measured at the face of the machine and slurry flow rates shall be measured at the shaft.

L. The CONTRACTOR's operations shall prevent excessive settlement or heave of the ground. The CONTRACTOR shall repair any damage resulting from surface settlement or heave caused by shaft excavation, shaft dewatering, or tunneling at no additional cost to the City, and will modify any practices that caused or contributed to the ground disturbance to avoid continued or recurring problems.

M. The CONTRACTOR shall take active measures to prevent loss of ground during launch and retrieval of the machine. Groundwater or slurry inflows into the shaft during launch and retrieval will not be permitted. A launch and retrieval seal will be required for each microtunneling drive.

N. The CONTRACTOR shall use an alignment control and steering system capable of maintaining the position of the machine to the specified line and grade. The laser shall be field-calibrated to the longest drive length, to ensure that the position of the laser on the target can be distinguished and that the signal is sufficiently strong to provide accurate steering data to the operator.

O. The CONTRACTOR shall use a lubrication/bentonite injection system to provide continuous lubrication of the pipeline. Lubrication material will be pumped in sufficient volume to completely fill the annular space of the pipeline, or that area between the outer diameter of the pipe and the overcut diameter. Grout pours shall be provided in jacking pipes at intervals not greater than 10 feet. The pipes will be inserted into the string with the bentonite ports alternating between 10-, 12- and 2 o'clock.

P. Slurry Composition. The composition of the slurry will be monitored during the tunneling operations. Specific gravity and viscosity measurements shall be taken at the beginning, middle, and end of each shift and will be included in the daily record. The CONTRACTOR shall keep accurate records of all slurry additives, including volumes added to the slurry tanks.

Q. The CONTRACTOR will install pipe cushion materials between each pipe joint. The cushion materials or "compression rings" will be made of plywood or other materials recommended by the pipe manufacturer and reviewed by the ENGINEER. The compression rings shall not protrude beyond the outer diameter of the pipe. The compression rings shall be of sufficient thickness to distribute the jacking load between successive pipe sections, and minimize eccentric loading.

R. The CONTRACTOR shall conduct all operations such that trucks and other vehicles do not create a dust or mud nuisance or traffic hazard in the streets and adjacent properties. Any muck spillage or slurry breakthroughs will be promptly cleaned up, removed and properly disposed.

S. The CONTRACTOR shall perform all work so as not to disturb roadways, adjacent structures, landscaped areas, or utilities. Any damage shall be immediately repaired by the CONTRACTOR to the satisfaction of the City, at no additional cost to the City.

T. If the microtunneling operations shall encounter an obstruction that prevents the forward progress of the machine, the CONTRACTOR shall notify the ENGINEER immediately. The CONTRACTOR shall remove, clear, or otherwise make it possible for the microtunneling machine and jacked pipe to advance past any and all objects or obstructions that halt forward progress of the machine. Upon written notification of the ENGINEER, the CONTRACTOR shall immediately proceed with removal of the obstruction by means of an obstruction removal shaft or by other approved means, as submitted by the CONTRACTOR in reviewed submittals. An obstruction removal shaft shall consist of a small excavation for the purpose of removing the obstruction. Obstruction removal shafts shall be built in accordance with Section 02260. The CONTRACTOR will receive compensation for removal of obstructions, as defined as metallic debris, reinforced concrete, rocks, whole trees, and other hard objects, partially or wholly within the cross-sectional area of the bore with a maximum dimension 30 percent of the outer diameter of the shield or cutting head, whichever is larger. Payment will be negotiated with the CONTRACTOR by the CITY on a case-by-case basis. However, any removal process that does not allow direct inspection of the nature and position of the obstruction will not be considered for payment. The CONTRACTOR will receive no additional compensation for removing, clearing, or otherwise making it possible for the microtunneling machine to advance past objects consisting of cobbles, boulders, wood, non-reinforced concrete, and other nonmetallic objects or debris with maximum lateral dimensions less than 30 percent the outer diameter of the shield or cutterhead, whichever is larger.

U. In the event that voids are created or encountered around the pipeline, the CONTRACTOR shall grout the voids using materials and procedures that have been submitted in the Contingency Plan and reviewed by the ENGINEER.

END OF SECTION

SECTION 02581

ELECTRICAL MANHOLES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Electrical manholes and electrical manhole accessories.

B. Related Sections:
   1. Section 16075 - Electrical Identification.
   2. Section 16123 - 600 Volt or Less Wires and Cables.
   3. Section 16133 - Conduits.

1.02 REFERENCES

A. The American Association of State Highway and Transportation Officials (AASHTO):
   1. Standard Specifications for Highway Bridges.

B. American National Standards Institute (ANSI):
   1. C2 - National Electrical Safety Code(NESC).

1.03 SUBMITTALS

A. Shop Drawings:
   1. Submit sketch of each manhole with plan and sections showing manhole dimensions and actual installation of cables trained along the side walls of the manhole.
      a. Include a statement of compliance with the requirements of applicable codes on each manhole sketch.
      b. Indicate on sketch those manholes where cable splices will be installed.
      c. Indicate ductbank knock-out sections on each manhole wall.
   2. Submit underground ductbank profile drawings. Include site elevations, grade level, ductbank elevations, and manhole elevations.

1.04 WARRANTY

A. Submit manufacturer's standard warranty.

PART 2 PRODUCTS

2.01 MANHOLES

A. Use precast manholes only when acceptable to the ENGINEER.

B. Size: As indicated on the Drawings and to suit duct banks and cable installation requirements as specified in Section 16123, but not less than:
   1. 6 feet wide by 6 feet long by 7 feet deep for 600 volt system.

C. Comply with ANSI C2 as minimum requirement for manholes and manhole accessories, including grade rings and covers.

D. Pulling Eyes: Secured to reinforcement on interior walls.

E. Cable Racks: Non-corrosive spaced to support each conductor at 2 foot intervals.

F. Manhole Covers: Cast iron; frame and inner pan for traffic loading and for electrical installations; inner pan with caulking joint; radial block tread, lifting ring, and machined to fit; word, ELECTRICAL, engraved on top side; 30 inch clear opening.
   1. Manufacturers: One of the following or equal:
      a. Alhambra Foundry.

PART 3 EXECUTION

3.01 INSTALLATION

A. Route signal cable such as instrumentation and communication cables separately from alternating current power and control cable as specified in Section 16123.

B. Identify cables and conductors routed through manholes as specified in Section 16075.

C. Support medium voltage conductors and low voltage conductors 4/0 American Wire Gauge and larger on industrial grade insulators. Route and tie all conductors in manholes to prevent damage during personnel ingress.

D. Install cover drain pipe to minimum 12 by 12 by 12 inch drain sump filled with ABC per Section 02722 approximately 10 feet from manhole on down slope.

E. Install top of manholes at 4 inches above finish grade or surface. Install surveyor markings to establish finish grade.

3.02 PROTECTION

A. Seal manholes and covers to avoid water leakage within manholes.

END OF SECTION

SECTION 02600

REINFORCED CONCRETE PIPE FOR (MICROTUNNELED) SECTIONS

PART 1 GENERAL

1.01 SUMMARY

A. This section covers manufacturing, furnishing, and installing Reinforced Concrete Pipe (RCP) in microtunneled sections.

B. All RCP sizes refer to the nominal inside diameter of the pipe. All pipe, joints incorporated into the pipe, and manufactured fittings connecting pipe between structures shall be fabricated by one and only one manufacturer and be of the same type, quality, class, and size unless otherwise required. All field-cut pipe shall be accomplished by methods and equipment recommended by the pipe manufacturer. No hammer or chisel cuts will be permitted. The Contractor shall submit for approval, at its own expense, shop and material details of all special pipe before the pipe is manufactured or used on the work. All pipe and fittings delivered to the job site shall be properly marked by the manufacturer with, at a minimum, the manufacturer's name, piece number, pipe diameter, length, class, and date of manufacture.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02441, Microtunneling.

B. Section 03360, Contact Grouting.

C. Section 15261, Reinforced Concrete Lowhead Pressure Piping.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Codes: All work shall comply with all codes, as referenced herein.

B. Commercial Standards: Without limiting the generality of other requirements of these specifications, all work specified herein shall conform to or exceed the applicable requirements of the referenced standards provided that wherever the provisions of said publications are in conflict with the requirements specified herein, the more stringent requirement shall apply.
   1. ASTM C 150 Specification for Portland Cement.
   2. ASTM C 361 Specification for Reinforced Concrete Low-Head Pressure Pipe.
   3. ASTM D 412 Test Methods for Rubber Properties in Tension.
   4. ASTM D 2240 Test Method for Rubber Property - Durometer Hardness.

C. RCP shall comply with Section 15261.

1.04 SUBMITTALS

A. Product Data.

1. The Contractor shall submit product data to the Engineer for review in accordance with Section 01330.
2. The CONTRACTOR shall submit joint and pipe wall construction details which indicate wall thickness, location of grout ports, reinforcing details, steel sleeve and gasket details, and all other pertinent information required for the manufacturers of the pipe.

B. Manufacturer's Procedures.
1. The Contractor shall submit written descriptions of the procedures and specifications used in the manufacture of the RCP.

C. Design Calculations.
1. The Contractor shall submit design calculations for the pipe. The calculations shall be prepared by a licensed professional engineer in the State of California. The RCP shall be designed to safely withstand all loads, including axial jacking loads, earth and groundwater, traffic, and other dead and live or transient loads. Calculations must clearly state the ultimate and design jacking capacity of the pipe and the factor of safety applied to calculate design capacity. The pipe and pipe joints shall withstand the calculated jacking forces with a minimum safety factor of 2.0, or as recommended by the pipe manufacturer.
2. Contractor shall use information from their soils investigation to determine appropriate factors for design.

D. Test Reports.
1. The Contractor shall submit test results with respect to the physical properties of the RCP. These tests shall be at no extra cost to the City and shall be in accordance with appropriate standards cited in Section 1.03, the table included at the end of this specification and any other tests referenced in this specification. The test results shall be submitted prior to shipment of the pipe to the site. The Contractor shall notify the City at least one week in advance of any testing conducted at the plant so that the City may, if it chooses to do so, attend and witness the testing.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packing, Shipping, Storage, and Protection.
1. The Contractor and manufacturer shall exercise extreme care during transportation, handling, storage, and installation of the RCP to ensure that the pipe is not chipped, crushed, gouged or otherwise damaged in any way.

B. Acceptance.
1. If any part of the RCP becomes damaged, it shall be rejected and removed from the site and replaced at no cost to the City.

1.06 WARRANTY

A. The Contractor shall warrant and shall obtain from the manufacturer its warranty that the RCP conforms to these specifications and will be free from defects in materials and workmanship for a period of one (1) year from the date of substantial completion of this Contract. Said manufacturer's warranty shall be in a form acceptable to and for the benefit of the City and shall be submitted by the Contractor as a condition of final payment. The Contractor shall repair or replace, at

the sole option of and at no cost to the City, any work found to be defective within said warranty period. Such repair or replacement shall include the cost of removal and reinstallation.

PART 2 PRODUCTS

2.01 PIPE MATERIALS

A. The Contractor shall furnish and install reinforced concrete pipe (RCP) with double gasketed joints, and stainless steel sleeves, complete, in place.

B. Comply with Section 15261.

C. Sleeves shall be flush fitting and constructed of stainless steel.

2.02 MANUFACTURING TOLERANCES

A. The outside walls of the pipe shall be straight, without bell modification.

B. Tolerances. The following tolerances shall be achieved in pipe fabrication unless the Contractor determines that smaller tolerances are required:
   1. Wall Thickness: The wall thickness shall not vary by more than five percent with a maximum permissible deviation of three-sixteenths (3/16) inches.
   2. Inside Diameter: Maximum permissible internal diameter deviation of plus or minus one-fourth (1/4) inch.
   3. Length of Two Opposite Sides: Variations in the length of two opposite sides of the pipe shall not be more than one-eighth (1/8) inch per foot or one-half (1/2) inch for any individual section of pipe, whichever is less.
   4. End Squareness: Maximum deviation from true perpendicular shall not exceed one-sixteenth (1/16) inch.

C. Grout Ports and Plugs: Grout ports shall be provided in jacking pipes at intervals no greater than 10 feet. During installation, the locations of the ports shall be staggered, beginning at the crown, then 60 degrees left and right of the crown. Each port shall be fitted with a one-way valve for injection of lubrication materials during tunneling operations, and for grouting after microtunneling are completed.

PART 3 EXECUTION

3.01 INSTALLATION OF RCP

A. General.
   1. The Contractor shall carry out operations in strict accordance with all applicable OSHA, local, and state safety standards.

B. Installation by Microtunneling.
   1. Microtunneling operations shall be performed in accordance with Section 02441, “Microtunneling.”
   2. Each RCP section shall be jacked forward as the excavation progresses with the microtunneling machine in such a way as to provide complete and adequate ground support at all times.

3. Protect the driving ends of the carrier pipe.
4. Install a resilient material as recommended by the manufacturer to equalize pressures during jacking and allow sufficient room for finishing the joints with mortar when jacking is completed.
5. Each RCP section shall be jacked forward as the microtunneling machine advances in such a way that the joints maintain their integrity and the continuity of the RCP train is maintained.
6. After completion of the microtunneling operation between jacking and receiving shafts, the annular space between the soil and the pipe shall be grouted. The lubricant material, if used, shall be displaced from between the RCP exterior and surrounding ground. The pressure and amount of grout shall be controlled to avoid pipe damage and displacement of the pipe and soil. After grouting, seal holes in carrier pipe with grout and finish the surface smooth.

C. Post-Installation.
1. Any pipe which has been damaged during installation shall be pushed or pulled out and replaced, or repaired in-place subject to Engineer's written approval, using approved materials and methods. The cost of replacement, repair, or installation of a new pipe shall be at no additional cost to the City.

3.02 FIELD QUALITY CONTROL

A. Per Section 15052.

END OF SECTION

SECTION 02621

STABILIZATION FABRIC

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Woven stabilization fabric used for subgrade enhancement.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D 3786 - Test Method for Hydraulic Bursting Strength of Knitted Goods and Nonwoven Fabrics: Diaphragm Brushing Strength Tester Method.
   2. D 4533 - Test Method for Trapezoid Tearing Strength of Geotextiles.
   3. D 4632 - Test Method for Grab Breaking Load and Elongation of Geotextiles.
   4. D 4833 - Test Method for Index Puncture Resistance of Geotextiles, Geomembranes, and Related Products.

1.03 DEFINITIONS

A. Stabilization Fabric: Woven geotextile fabric manufactured from polypropylene yarns.

1.04 SUBMITTALS

A. Product Data.

B. Samples.

C. Quality Control Submittals:
   1. Certificates of Compliance.
   2. Manufacturer's Installation Instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection:
   1. Furnish stabilization fabric in protective covers capable of protecting the fabric from ultraviolet rays, abrasion, and water.

1.06 PROJECT CONDITIONS

A. Field Measurements:
   1. Take field measurements to determine the exact lengths and dimensions of the surfaces to receive the fabric.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. One of the Following or Equal:
   1. Ten Cate Nicolon, Charlotte, NC, Mirafi 500X.

Property (1)	Test Method	Requirements (1)
Grab Tensile Strength	ASTM D 4632	275 pounds
Mullen Burst Strength	ASTM D 3786	600 pounds per square inch
Trapezoid Tear Strength	ASTM D 4533	120 pounds
Puncture Strength	ASTM D 4833	120 pounds
(1) Minimum average roll values.		

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify that conditions are satisfactory for the installation of stabilization fabric.

3.02 PREPARATION

A. Surface Preparation: During grading operations, take care not to disturb the subgrade. This may require use of lightweight dozers for low strength soils such as saturated, cohesionless, or low cohesion soils.

B. Prior to Placement of Fabric: Prepare surface to smooth condition free of debris, depressions, or obstructions that may damage the fabric.

3.03 INSTALLATION

A. Follow manufacturer's installation instructions and as complimented herein.

B. Place the stabilization fabric smoothly without folds or wrinkles.

C. Use special care when placing the stabilization fabric in contact with the soil so that no void spaces occur between the stabilization fabric and the prepared surface.

D. Overlap the parallel rolls and ends of rolls a minimum of 24 inches and not less than recommended by manufacturer.

E. Do not drag stabilization fabric across subgrade.

F. Make overlaps at ends of rolls in the direction of the aggregate placement with the previous roll on top.

G. Use lightweight dozers if necessary. Do not allow equipment directly on stabilization fabric.

3.04 FIELD QUALITY CONTROL

A. Inspection: Before covering, the condition of the fabric will be observed by the ENGINEER to determine that no holes or rips exist in the fabric. Repair all holes or rips by placing a new layer of fabric extending beyond the defect in all directions a distance equal to the minimum overlap required for adjacent rolls.

END OF SECTION

SECTION 02722

AGGREGATE BASE COURSE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Aggregate base course.

B. Related Sections:
   1. Section 02300 - Earthwork.
   2. Section 02742 - Asphaltic Concrete Paving.

1.02 REFERENCES

A. State of California Department of Transportation:
   1. Caltrans Standard Specifications.

B. American Society of Testing and Materials (ASTM):
   1. C 117 - Test Method for Material Finer than 75 µM (No. 200) Sieve in Mineral Aggregate by Washing.
   2. C 136 - Method for Sieve Analysis of Fine and Coarse Aggregates.
   3. D 4318 - Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

1.03 SUBMITTALS

A. Product Data:
   1. Source, gradation, and testing data for aggregate base course.

B. Quality Control:
   1. Test Reports: Reports for tests required by Sections of Caltrans Standard Specifications.
   2. Certificates of Compliance: Certificates as required by Sections of Caltrans Standard Specifications.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Storage and Protection: Protect from segregation and excessive moisture during delivery, storage, and handling.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aggregate Base Course:
   1. Class 2, 3/4 inch maximum aggregate size free from vegetable matter and other deleterious substances, and of such nature that aggregate can be compacted readily under watering and rolling to form a firm, stable base.

2. E' (modulus of soil reaction) at 95% relative compaction shall be 2,000 psi minimum where aggregate base course is used for pipe bedding material.
3. Materials derived from processing demolished or removed asphalt concrete are not acceptable.
4. Aggregate shall not be treated with lime, cement, or other chemical material before the Durability Index test is performed.
5. Aggregate grading and sand equivalent tests shall be performed to represent not more than 500 cubic yards or one day's production of material, whichever is smaller.
6. Conform to size and grade within the limits as follows when tested in accordance with California Test 202:

Sieve Sizes (Square Openings)	Percent by Weight Passing Sieve
1 inch	100
3/4 inch	90-100
Number 4	35-60
Number 30	10-30
Number 200	2-9

Quality Requirements		
Description	**California Test**	**Minimum Test Result**
Resistance (R Value)	301	78
Sand Equivalent	217	22
Durability Index	229	35

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine conditions upon which the work specified in this Section depends for defects that may influence installation and performance.

B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Subgrade Preparation: Prepare as specified in Section 02300.

3.03 INSTALLATION

A. Furnish, spread, and compact aggregate base course material to the lines, grades, and dimensions indicated on the Drawings and specified in Section 02300 and 02318.
   1. Spreading: Spread in accordance with Caltrans Standard Specifications.
   2. Compacting: Compact in accordance with Caltrans Standard Specifications.

3.04 FIELD QUALITY CONTROL

A. Tests: Perform field tests as required by Caltrans Standard Specifications.

END OF SECTION

SECTION 02738

DECOMPOSED GRANITE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Decomposed granite.

1.02 SUBMITTALS

A. Product Data: Submit for chemical agents. Include material safety data sheets, Environmental Protection Agency registration number, and manufacturer's instructions for handling, storing, mixing, and application.

B. Shop Drawings: Submit gradation analysis from lot.

C. Samples: Provide sample showing color and texture.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Acceptance at Site: Provide load tickets indicating weight and conformance with submittals.

B. Storage and Protection:
   1. Protect delivered material from contamination by, or mixing with, other materials.

C. Handling:
   1. Handle, mix, and apply chemicals in accordance with applicable regulations and manufacturer's instructions. When required, use licensed applicator.
   2. Store chemicals in accordance with hazardous material regulations.

1.04 PROJECT CONDITIONS

A. Existing Conditions:
   1. Verify before beginning work.

PART 2 PRODUCTS

2.01 MATERIALS

A. Decomposed Granite:
   1. Provide granite that is free from lumps or balls of clay and that does not contain calcareous coatings, caliche, organic matter, or deleterious substances, and is "Desert Gold" or Grey in color.
   2. Color and Source of Decomposed Granite: Subject to acceptance by the ENGINEER.

3. Provide materials that present uniform appearance and are from single production source.
4. Grading Requirements: As Follows:

Sieve Size	Percent Passing
3/4 inch	95 - 100
1/2 inch	85 - 95
Number 4	30 - 40
Number 40	0 - 10

5. Reject material containing clumps, which will not disintegrate with shovel blow.

B. Chemical Control Agent: Spectracide (United Industries Corporation), Roundup (Monsanto Company), or equal.

C. Pre-emergence Control Agent: Pre-emergent herbicide. Fatam pre-emergent weed control (Dexol) or equal.

D. Water: Potable and exhibiting no deleterious effects upon decomposed granite.

PART 3 EXECUTION

3.01 PREPARATION

A. Surface Preparation:
1. Prior to Placing Decomposed Granite Perform Following Operations to Areas Designated to Receive Granite:
   a. Apply chemical control agent in manner to ensure areas are totally free of weeds.
   b. Grade to true and even condition.
   c. Apply pre-emergence control agent in accordance with manufacturer's instructions.

3.02 INSTALLATION

A. Installation of Decomposed Granite:
1. Apply evenly distributed granite at designated areas to depth of 6 inches.
2. After placing and grading decomposed granite, lightly water granite to remove fine material from surface.
3. Then apply pre-emergent control agent according to manufacturer's recommendations.
4. Roll and compact to a smooth, even surface with a steel wheeled roller.

B. Tolerances:
1. Thickness shall not be less than specified.
2. Surface to be plus or minus 1 inch along a 10 foot straight edge.

3.03 PROTECTION

A. Protect from damage by elements, erosion, vehicles, and mixing with contaminating substances.

END OF SECTION

SECTION 02742A

ASPHALTIC CONCRETE PAVING

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Asphalt pavement on prepared subgrade or aggregate base course to lines, grades and compacted thickness as indicated on the Drawings.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
      a. Section 02300 - Earthwork.
      b. Section 02722 - Aggregate Base Course.

1.02 REFERENCES

A. ASTM International (ASTM):
   1. D 1557 - Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft. lbf/f_4^3)(2,700 kN-m/m^3).
   2. D 1561 - Standard Practice for Preparation of Bituminous Mixture Test Specimens by Means of California Kneading Compactor.

B. Caltrans Standard Test Methods:
   1. Calif Test 202 - Sieve Analysis of Fine and Coarse Aggregates.
   2. Calif Test 304 - Preparation of Bituminous Mixtures for Testing.
   3. Calif Test 362 - Determining Asphalt Content in Bituminous Mixtures by Vacuum Extraction.
   4. Calif Test 375 - Determining the In-Place Density and Relative Compaction of AC Pavement.
   5. Calif Test 379 - Determining Asphalt Content in Bituminous Mixtures (Troxler Nuclear Gauge Model 3241).

C. State of California Department of Transportation Standard Specifications, latest edition (Caltrans Standard Specifications):
   1. Section 37 - Bituminous Seals.
   2. Section 39 - Asphalt Concrete.
   3. Section 88 - Engineering Fabrics.
   4. Section 92 - Asphalts.
   5. Section 93 - Liquid Asphalts.
   6. Section 94 - Asphaltic Emulsions.

1.03 SYSTEM DESCRIPTION

A. This Work shall consist of furnishing and mixing aggregate and asphalt binder at a central mixing plant, spreading and compaction of the mixture as specified and as indicated on the Drawings.

B. In general, asphalt concrete and asphalt concrete base shall conform to Section 39 “Asphalt Concrete,” and all applicable referenced sections, of the Caltrans Standard Specifications:
   1. Where conflicts exist, this specification shall govern.

1.04 DEFINITIONS

A. “Asphalt Concrete” as used by Caltrans shall be considered the “Surface Course,” or the final lift of the pavement section.

B. “Asphalt Concrete Base” as used by Caltrans shall be the remaining portion of the asphalt pavement section excluding the final lift.

C. “Asphalt Pavement” shall be the total pavement section of asphalt including Asphalt Concrete and Asphalt Concrete Base.

1.05 SUBMITTALS

A. Mix design.

B. Shop drawings.

C. Product Data:
   1. Asphalt.
   2. Asphalt aggregate.
   3. Pavement reinforcing fabric.

D. Quality control submittals:
   1. Test results.
   2. Certificate of Compliance.
   3. Certificate of Competence.

E. Equipment list.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Asphalt pavement delivery:
   1. Transport the mixture from the mixing plant to the point of use in vehicles having tight bodies previously cleaned of all foreign materials.
   2. Treat bodies as necessary to prevent material from sticking to the bodies.
   3. Cover each load with canvas or other suitable material of sufficient size and thickness to protect the asphalt mixture from the weather.

1.07 PROJECT CONDITIONS

A. Environmental requirements:
   1. Asphalt concrete:

a. Place asphalt concrete only when surface is dry, when atmospheric temperature in the shade is 40 degrees Fahrenheit and rising, or above 50 degrees Fahrenheit if falling.
b. Do not place asphalt concrete when weather is foggy or rainy nor when base on which material is to be placed is in wet or frozen conditions or when, in the opinion of the ENGINEER, weather conditions will prevent proper handling, finishing, compaction of the mixtures.

PART 2 PRODUCTS

2.01 ASPHALT PAVEMENT MATERIALS

A. Asphalts:
1. Asphalt binder: Steam-refined paving asphalt, PG 64-10, conforming to Section 92-1.02 “Grades” of the Caltrans Standard Specifications.
2. Tack coat: Grade SC-70, conforming to Section 93-1.01 of the Caltrans Standard Specifications.
3. Fog seal: Asphaltic emulsion, Grade SS-1h conforming to Section 94-1.01 of the Caltrans Standard Specification.

B. Asphalt aggregate:
1. Aggregate for asphalt concrete shall conform to Section 39-2.02 of the Caltrans Standard Specifications for Type B grading, 1/2-inch maximum, medium.
2. Aggregate for asphalt concrete base shall conform to Section 39-2.02 of the Caltrans Standard Specifications for Type B grading.

C. Asphalt pavement shall be produced in a batch mixing plant, a continuous pugmill mixing plant, or drier-drum mixing plant:
1. Storage shall conform to section 39-3.01 and Section 39-3.05 of the Caltrans Standard Specifications.
2. Drying shall conform to Section 39-3.02 of the Caltrans Standard Specifications.
3. Proportioning shall conform to Section 39-3.03 of the Caltrans Standard Specifications.
4. Mixing shall conform to Section 39-3.04 of the Caltrans Standard Specifications.

~~2.02 FOG SEAL~~

~~A. A fog seal shall be applied to all surfaces of Types A and B asphalt concrete in conformance with the provisions in Section 37-1, and all applicable referenced sections of the Caltrans Standard Specifications.~~

2.03 AGGREGATE BASE COURSE

A. Aggregate base course: As specified in Section 02722.

B. Compacted thickness of aggregate base course shall be **[**as indicated on the Drawings**.**

2.04 EQUIPMENT

A. Spreading and compacting equipment:
   1. Spreading equipment shall conform to Section 39-5.01 and all applicable referenced sections, of the Caltrans Standard Specifications:
      a. Only in areas inaccessible to the machine, by approval of the ENGINEER, will hand spreading be permitted.
   2. Compaction equipment shall conform to Section 39-5.02 and all applicable referenced sections, of the Caltrans Standard Specifications.

~~**2.05 SOURCE QUALITY CONTROL**~~

~~A. The ENGINEER will perform sampling and tests of materials in accordance with California Test Method Number 304 and California Test Method Number 362 or 379, as applicable. Samples will be taken from materials as delivered to the site.~~

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of conditions: Verify surfaces and site conditions are ready to receive work. If unsatisfactory conditions exist, do not commence installation until such conditions have been corrected. Beginning application means acceptance of existing conditions.

3.02 PREPARATION

A. Protection:
   1. Protect concrete pavements and walks, curbs and bases, and other improvements adjacent to the operations with suitable materials.
   2. Building and other surfaces shall be covered with paper or other protection, when required.
   3. CONTRACTOR shall be responsible for any damage caused by CONTRACTOR's employees. All damage caused by the CONTRACTOR's operations shall be repaired to the satisfaction of the ENGINEER at no additional cost to OWNER.

B. Subgrade preparation:
   1. Immediately prior to applying tack coat, or immediately prior to placing the asphalt pavement when tack coat is not required, the subgrade to receive asphalt pavement shall conform to the compaction requirement and elevation tolerances specified for the material involved and shall be cleaned to remove any loose or extraneous material.
   2. If the asphalt pavement is to placed on an existing base or pavement which was not constructed as part of the contract, the CONTRACTOR shall clean the surface by sweeping, flushing or other means to remove all loose particles of paving, all dirt and all other extraneous material immediately before applying the tack coat.

3.03 TACK COAT

A. Tack coat:

1. A tack coat of asphaltic emulsion shall be applied to all vertical surfaces of existing pavement, curbs, gutters, and construction joints in the surfacing against which additional material is to be placed, or as otherwise specified in this Section.
2. Tack coat shall be applied in one application at a rate of 0.1 gallons per square yard of surface covered.

3.04 ASPHALT PAVEMENT

A. Placing materials in a windrow, then picking it up and placing it in the asphalt paver with loading equipment will be permitted provided that:
   1. The asphalt paver is of such design that the material will fall into a hopper which has a movable bottom conveyor to feed and screed.
   2. The loader is constructed and operated so that substantially all of the material deposited into windrows is picked up and deposited into the paving machine.
   3. The windrow is deposited only so far in advance of the paver to provide for continuous operation of the paver and not so far as to allow the temperature of the asphalt pavement in the windrow to fall below 260 degrees Fahrenheit.

B. Open graded asphalt concrete shall be spread at a temperature of not less than 205 degrees Fahrenheit, and not more than 250 degrees Fahrenheit, measured in the hopper of the paving machine. Open graded asphalt concrete shall be compacted as soon as possible after spreading.

C. Asphalt pavement shall be spread and compacted in the number of layers and of the thicknesses indicated in the following table:
   1. A thickness tolerance of within 0.1 inches is allowed for asphalt concrete.
   2. A total thickness tolerance of within 0.2 inches is allowed for asphalt concrete base.

Total Thickness Indicated on Drawings[a]	**Number of Lifts**	**Top Layer Thickness**		**Next Lower Layer Thickness**		**All Other Lower Layer Thicknesses**	
		Min	**Max**	**Min**	**Max**	**Min**	**Max**
< 2-3/4”	1	-----	-----	-----	-----	-----	-----
3”	2	1-1/4”	1-1/2”	1-1/4”	1-1/2”	-----	-----
3-1/4” - 4-3/4”	2	1-3/4”	2-1/4”	1-3/4”	3”	-----	-----
> 5”	[b]	1-3/4”	2-1/4”	1-3/4”	3”	1-3/4”	4-3/4”

Notes:

[a] When pavement reinforcing fabric is shown to be placed between layers of asphalt pavement, the thickness of asphalt pavement above the pavement reinforcing fabric shall be considered to be the “Total Thickness Indicated on the Drawings” for the purpose of spreading and compacting the asphalt pavement above the pavement reinforcing fabric.

[b] At least 2 layers shall be placed if the total thickness is less than 5 inches. At least 3 layers shall be placed if the total thickness is more than 5 inches, and less than 10-1/2 inches. At least 4 layers shall be placed if the total thickness is greater than 10-1/2 inches.

D. A layer shall not be placed over another layer which exceeds 3 inches in compacted thickness until the temperature of the layer which exceeds 3 inches in compacted thickness is less than 160 degrees Fahrenheit at mid depth:
   1. If the temperature of any layer drops below 140 degrees Fahrenheit, or if directed by the ENGINEER, apply tack coat before placing next layer.

E. Unless otherwise indicated on the Drawings, asphalt mixtures shall not be handled, spread, or windrowed in a manner that will stain the finished surface of any pavement or other improvements.

F. The completed mixture shall be deposited on the prepared subgrade at a uniform quantity per linear foot, as necessary to provide the required compacted thickness without resorting to spotting, picking-up or otherwise shifting the mixture.

G. Spreading:
   1. All layers of asphalt pavement shall be spread with an asphalt paver and shall conform to Section 39-6.02 and all applicable referenced sections of the Caltrans Standard Specifications.
   2. At locations where the asphalt pavement is to placed over areas inaccessible to spreading and rolling equipment, all layers of asphalt pavement shall be distributed directly out of the back of the dump truck and spread by hand:
      a. Asphalt pavement spread by hand shall be compacted thoroughly to the required lines, grades, and cross-sections by means of pneumatic tampers, or by other methods that will produce the same degree of compaction as pneumatic tampers.

H. Compaction:
   1. Compaction of asphalt pavement shall conform to Section 39-6.03 and all applicable referenced sections of the Caltrans Standard Specifications.
   2. Minimum required density for each layer of asphalt pavement shall be 95 percent of that obtained in the laboratory in accordance with ASTM Test Method D 1561.

I. Segregation shall be avoided and the surfacing shall be free of pockets of coarse or fine material. Asphalt pavement containing hardened lumps shall not be used:
   1. In areas inaccessible to paving and compacting equipment where spreading is done by hand, minimize the amount of segregation.

J. Location of longitudinal joints in the top layer will be determined by the ENGINEER and shall not adversely affect the quality of the finished product.

K. At all locations, or as directed by the ENGINEER, the asphalt concrete shall be square and at least 1 inch thick when conforming to existing surfacing. Tapering or feathering is not allowed.

3.05 FIELD QUALITY CONTROL

~~A. The CONTRACTOR shall control the quality of Work and shall provide adequate testing to assure compliance with these Specifications:~~
   ~~1. The type and size of the samples shall be suitable to determine conformance with stability, density, thickness and other specified requirements. Use an approved power saw or core drill for cutting samples. Furnish all tools, labor, and materials for cutting samples, testing, and replacing the pavement where~~

~~samples were removed. Take a minimum of 1 sample for every 4,000 square feet of asphalt pavement placed.~~

A. All asphalt pavement shall match the grades indicated on the Drawings and shall be completely free from unintended hollows and high spots:
   1. After completion of paving work, all paving shall be flooded with water. Any ponding that results in standing water greater than 3/4 inch in depth shall be ringed with chalk. Such hollows shall be corrected by removing and replacing the asphalt concrete. The asphalt concrete patch shall be square and at least 1 inch thick when conforming to existing surfacing. Tapering or feathering is not allowed.

B. CONTRACTOR shall perform in-place density and compaction tests of the completed pavement in accordance with California Test Method Number 375, to determine compliance with the specified requirements. Submit test results to ENGINEER for approval.

C. Cracks, settling of surface, improper drainage, improper compaction, and sloppy connection to previously laid surfaces will be construed as improper workmanship and will not be accepted.

3.06 MAINTENANCE OF PAVEMENT

A. Upon completion of final rolling, traffic shall not be permitted on the finished pavement for at least 6 hours, or until the asphalt pavement has cooled sufficiently to withstand traffic without being deformed.

3.07 WORKMANSHIP AND WARRANTY

A. CONTRACTOR shall provide written warranty against defects in materials or workmanship for a period of not less than 1 year upon completion of Work.

END OF SECTION

SECTION 02772

CONCRETE CURBS, GUTTERS, AND SIDEWALKS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Concrete curbs, gutters, sidewalks, driveways, access ramps, and alley intersections.

B. Related Sections:
   1. Section 02722 - Aggregate Base Course.
   2. Section 03150 - Concrete Accessories.
   3. Section 03300 - Cast-In-Place Concrete.
   4. Section 03366 - Tooled Concrete Finishes.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements: Construct various types of concrete curb, gutter, sidewalk, and driveways to dimensions and details indicated on the Drawings.

1.03 SUBMITTALS

A. Product Data: Submit data completely describing products.

B. Samples: Submit samples when requested.

1.04 PROJECT CONDITIONS

A. Environmental Requirements.

B. Existing Conditions.

C. Field Measurements.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete: Class A, conforming to the applicable requirements of Section 03300.

B. Curb Finishing Mortar: 1 part portland cement to 2 parts sand.

C. Form Release Material: Light oil or other releasing agent of type which does not discolor concrete or interfere with the application of finishing mortar to curb tops and faces.

D. Joint Materials:
   1. Expansion: Comply with requirements as specified in Section 03150.

2. Construction: Steel dividers or plastic inserts.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:
   1. Verify field conditions, including subgrade condition and interferences, before beginning construction.

3.02 PREPARATION

A. Surface Preparation:
   1. Subgrade:
      a. Construct and compact true to grades and lines indicated on the Drawings.
      b. Remove soft or unsuitable material to depth of not less than 6 inches below subgrade elevation and replace with satisfactory material.
   2. Forms And Subgrade: Water immediately in advance of placing concrete.

3.03 INSTALLATION

A. Special Techniques:
   1. Contractor's Option:
      a. Construct concrete curbs and gutters by conventional use of forms, or by means of curb and gutter machine when acceptable to the ENGINEER.
      b. When use of machines designed specifically for work of this Section are accepted by the ENGINEER, results must be equal to or better than those produced by use of forms.
      c. Applicable requirements of construction that apply to use of forms also apply to use of machines.
      d. Discontinue use of machines when results are not satisfactory to the ENGINEER.

B. Forms:
   1. Carefully set to line and grade and securely stake in position forms conforming to dimensions of items to be constructed.
   2. Thoroughly clean prior to each use and coat with form releasing material.

C. Expansion and Contraction Joints:
   1. Expansion Joints:
      a. Construct vertically, and at right angles to centerline of street and match joints in adjacent pavement or sidewalks.
      b. Constructed at radius points, driveways, alley entrances, and at adjoining structures.
      c. Fill joints with expansion joint filler material.
   2. Contraction Joints:
      a. Constructed not more than 15 feet apart.
      b. Make joints of construction joint material, scoring or saw cutting to depth of not less than 1-1/2 inches and matching joints in adjacent pavement or sidewalk.

D. Concrete:
   1. Placing:
      a. Thoroughly spade concrete away from forms so that no rock pockets exist next to forms and so that no coarse aggregate will show when forms are removed.
   2. Compacting:
      a. Compact by mechanical vibrators accepted by the ENGINEER.
      b. Continue tamping or vibrating until mortar flushes to surface and coarse aggregate is below concrete surface.
   3. Form Removal:
      a. Front Form Faces: Do not remove before concrete has taken initial set and has sufficient strength to carry its own weight.
      b. Gutter and Rear Forms: Do not remove until concrete has hardened sufficiently to prevent damage to edges. Take special care to prevent damage.
   4. Finishing and Curing: Comply with requirements as specified in Section 03366 except as modified here:
      a. As soon as curb face forms are stripped, apply finishing mortar to the top and face of curb and trowel to a smooth, even finish. Finish with fine haired broom in direction of work.
      b. Where curb is installed without integral gutter, extend finish 2 inches below grade.
      c. Edge concrete at expansion joints to 1/4 inch radius.
      d. Flow lines of gutters shall be troweled smooth 4 inches out from curb face for integral curb and gutter and 4 inches on both sides of flowline 4 gutters without curbs.

E. Backfilling:
   1. Unless otherwise specified, backfill behind curbs, gutters, or sidewalks with soil native to area and to lines and grades indicated on the Drawings.

3.04 FIELD QUALITY CONTROL

A. Tests:
   1. Curbs and Gutters:
      a. Test face, top, back, and flow line with 10 foot straightedge or curve template longitudinally along surface.
      b. Correct deviations in excess of 1/4 inch.
   2. Gutters:
      a. Frequency of Testing: When required by the ENGINEER, where gutters have slope of 0.8 foot per hundred feet or less, or where unusual or special conditions cast doubt on capability of gutters to drain.
      b. Test Method: Establish flow in length of gutter to be tested by supplying water from hydrant, tank truck, or other source.
      c. Required Results:
         1) 1 hour after supply of water is shut off, inspect gutter for evidence of ponding or improper shape.
         2) In event water is found ponded in gutter to depth greater than 1/2 inch, or on adjacent asphalt pavement, correct defect or defects in manner acceptable to the ENGINEER without additional cost to the Contract.

3.05 ADJUSTING

A. Repair portions of concrete damaged while stripping forms or, when damage is severe, replace such work at no additional cost to the Contract. Evidence of repairs shall not be noticeable in the finished product.

B. Remove and replace sections of work deficient in depth or not conforming to requirements indicated on the Drawings and specified in the Specifications at no additional cost to the Contract. Removal and replacement shall be the complete section between 2 joints.

END OF SECTION

SECTION 02820

FENCES AND GATES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Metallic fences and gates.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. A 120 - Specification for Pipe, Steel, Black and Hot Dipped Zinc-Coated (Galvanized) Welded and Seamless for Ordinary Uses.
   2. A 121 - Specification for Zinc-Coated (Galvanized) Steel Barbed Wire.
   3. A 123 - Specification for Zinc (Hot Galvanized) Coatings on Products Fabricated from Rolled, Pressed, and Forged Steel Shapes, Plates, Bars and Strip.
   4. A 153 - Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
   5. A 385 - Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
   6. A 392 - Specification for Zinc-Coated Steel Chain-Link Fence Fabric.
   7. A 702 - Specification for Steel Fence Posts and Assemblies, Hot-Wrought.
   8. F 626 - Specification for Fence Fittings.
   9. F 668 - Specification for Polyvinyl Chloride (PVC)-Coated Chain-Link Fence Fabric.

B. State of California Department of Transportation (CALTRANS):
   1. SS - Standard Specifications.
   2. SP - Standard Plans.

1.03 SUBMITTALS

A. Product Data: Submit data completely describing products.

B. Shop Drawings:
   1. Submit drawings showing details indicating methods and means of mounting, attaching and installing locks to gates.

C. Samples: Provide for polyvinyl chloride coated fabric and accessories.

D. Quality Control Submittals:
   1. Certificates of Compliance: Provide certification that materials conform to referenced specifications.

1.04 QUALITY ASSURANCE

A. Qualifications: Provide installer's references and list of local references.

B. Pre-installation Conference: Participate in conference, if required.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Storage and Handling: Unload, store, and protect materials such that they are not damaged.

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify actual field distances so that post spacing can be made uniform.

PART 2 PRODUCTS

2.01 MATERIALS

A. Fabric:
   1. Height:
      a. As shown on the Drawings.
   2. Mesh: 2 inches.
   3. Size Wire: 6 gauge or 9 gauge.
      a. Coating: Zinc coating, ASTM A 392, Class 1.
      b. Tensile Strength: 80,000 pounds per square inch minimum.
      c. Barbed Wire:
         1) Total Number Strands: 6.
         2) Wires Per Strand: 2.
         3) Size Wires: 12-1/2 gauge.
         4) Barbs: 14 gauge, 4-point at 3 inches on center.
         5) Coating: Galvanized, ASTM A 121, Class 3.
         6) Color Coating: PVC, ASTM F 668, Color Selected by ENGINEER.

B. Top Rail:
   1. Size: 1-5/8 inch outside diameter, galvanized.
   2. Weight: 2.27 pounds per linear foot.
   3. Tension Wire: 7 gauge galvanized coil spring wire.

C. Line Posts: 4.10 pounds "H" section outside diameter, 3.65 pounds per linear foot, galvanized.

D. Terminal, Corner, and Pull Posts:
   1. Size: 2-7/8 inch outside diameter round.
   2. Weight: 5.79 pounds per linear foot.

E. Gate Posts and Concrete Foundations for Gate Posts: Except where differently indicated on the Drawings, determine gate posts and concrete foundations for gate posts in accordance with following schedule:

Gate Leaf Widths (Feet)	Posts		Foundations	
	O.D. (Inches)	(Lbs per Lin Ft)	Diameter (Inches)	Depth (Feet)
0 TO 6	2-7/8	5.79	12	4
Over 6 to 13	4	9.11	18	3

Gate Leaf Widths (Feet)	Posts		Foundations	
	O.D. (Inches)	(Lbs per Lin Ft)	Diameter (Inches)	Depth (Feet)
Over 13 to 18	6-5/8	18.97	18	4
Over 18 to 25	8-5/8	24.70	18	4.5

F. Gate Frames: 1.90 inch outside diameter galvanized pipe weighing 2.72 pounds per linear foot.

G. Color: Coat posts, rails, and frame the same color as fabric and per ASTM F 626.

H. Accessories:
   1. Fence Fittings: Conform to ASTM F 626.
   2. Post Top Fittings:
      a. General: Provide post top fitting extension arms designed such that top rail passes through extension arm fitting.
      b. Post Top Fittings: Extension arms, 45-degree angle type, capable of receiving three strands of barbed wire.
      c. Post Top Fittings: Extension arms, "V" shaped 45 degree, double angle arms designed to carry total of 6 strands of barbed wire, 3 strands on each arm.
   3. Fabric Accessories:
      a. Wire Clips: Minimum 6 gauge hot-dip galvanized.
      b. Tension Bars: 1/4 inch by 3/4 inch, galvanized.
      c. Steel Bands: 11 gauge, one inch wide, hot-dip galvanized.
      d. Bolts and Nuts: 3/8 inch diameter.
      e. Hog Rings: 11 gauge.

I. Gate Accessories:
   1. Corner Fittings: Heavy pressed steel or malleable castings.
   2. Gate Tensioning:
      a. Cross Tensioning Rods: 3/8 inch, galvanized.
      b. Turnbuckles: Heavy duty.
   3. Tension Rods for 4 Foot Gates: 3/8 inch, easily adjustable, galvanized.
   4. Gate Frame Corner Fittings: Fitting designed for purpose, manufacturer's standard.
   5. Horizontal Gate Stiffeners: 1-5/8 inch outside diameter galvanized pipe weighing 2.27 pounds per linear foot.
   6. Gate Hardware:
      a. Catch and Locking Attachment: Combination steel or malleable iron catch and locking attachment of acceptable design.
      b. Stops.
      c. Type 1: Capable of holding gates open.
      d. Type 2: Center rest with catch.
      e. Color: Match color of fabric.

J. Barbed Wire Fence and Gates:
   1. Fence:
      a. Line Posts: Standard ASTM A 702, Class B, "T-Section," 7 feet long and weighing not less than 9.3 pounds including anchor plate.

b. Gate and Corner Posts: Unpunched angle posts, 2-1/2 inch by 2-1/2 inch by 1/4 inch with 2 inch by 2 inch by 1/4 inch angle braces.
c. Barbed Wire Strands: Not less than 12-1/2 gauge galvanized wires with 14 gauge, 4 point galvanized barbs (at not more than 5 inches on center spacing).
1) Galvanizing shall be ASTM A 121, Class 2.
d. Stays: Minimum 9-1/2 gauge galvanized twisted wire.
e. Padlocks:
1) Size: Minimum 1-1/2 inch.
2) Keying: Alike.
f. Chain:
1) Links: Hardened steel, minimum 1-3/8 inch long, minimum 3/16-inch diameter links.
2) Length: Sufficient to padlock 2 gates together.

2. Barbed Wire Gates:
a. Frame: 1-3/8 inch outside diameter tubular steel, galvanized.
b. Center Support: 7/8 inch outside diameter tubular steel, galvanized.
c. Filler Wire: 11 gauge.
d. Wire Clamps: Wire T-clamps, galvanized.
e. Hardware: Suitable hinges and latches.

3. Fabric Wire Gates:
a. Framing: Tubular steel frame 1-1/2 inch outside diameter. galvanized.
b. Center Supports:
1) Tubular steel 1-1/2 inch outside diameter, galvanized.
c. Truss Rods: Adjustable, galvanized.
d. Fabric: 9 gauge fabric, 2 inch mesh conforming to ASTM A 392, Class I, with exposed points on fabric at top edge.
e. Hog Rings: 9 gauge galvanized.
f. Gate Posts: Provide posts sized as specified herein for chain link fence gates.
g. Padlocks: Provide 1-1/2 inch minimum galvanized padlock and 1/4 inch diameter galvanized chain for locking gates together. Key padlocks alike.

2.02 MANUFACTURED UNITS

A. Chain Link Fence Gates:
1. Pipe Posts: Provide posts having tops which exclude moisture.
2. Gate Posts: Provide posts having vertical extension arms with 3 strands of barbed wire.
3. Gate Frames: Fabricate of galvanized pipe, to sizes as indicated on the Drawings.

B. Barbed Wire Fence Gates:
1. Barbed Wire Gates:
a. Size:
1) Provide gates that are maximum 12 feet wide and 50 inches high.
2) Provide two 12-foot gates to close 24 foot opening.
b. Provide gates consisting of frame, center support, and filler wire complete with hinges and latches.
c. Where two 12-foot gates swinging together at center of 24 foot opening, provide padlock and chain for locking gates together.

2. Fabric Wire Gates:
    a. Provide gates of width indicated on the Drawings and 54 inches high consisting of complete frame, center support, and adjustable truss rods.
    b. Install fabric with exposed points on fabric at top edge.
    c. Tie fabric at 1 foot 6 inch on center with hog rings.
    d. Provide 2 gates for openings larger than 12 feet.
    e. For pairs of gates provide padlocks.
    f. Gate Posts: Fabricate posts sized as specified herein for chain link fence gates.
3. Swing Gates:
    a. Corners of Gate Frames: Fasten together and reinforce with fitting designed for purpose or by welding. Grind weld smooth.
    b. Gate Stiffeners: Provided as follows:
        1) On Gates 12 Feet and Wider: Vertically on gates at 6 feet on center.
        2) On Gates over 7 Feet in Height: Horizontally.
    c. Gates with Fabric 7 Feet or More in Height:
        1) Install vertical stiffeners at maximum of 8-foot centers.
        2) Install adjustable tension rod on gates over 4 feet in width.
        3) Chain Link Fence Fabric: Attach to gate frame by use of tension bars and tie wires as specified for fence construction, and suitable tension connectors spaced at approximately 16 inch intervals.
    d. Gate Tensioning: Provide gates with cross tensioning rods and turnbuckles rigidly attached to gate frame.
    e. Gate Hardware: Provide each pair gates with following:
        1) Catch and locking attachment.
        2) Two Type 1 stops and one Type 2 stop as indicated on the Drawings.
4. Swing Gates:
    a. Hinges: Provide swing gates with minimum two hinges designed as to securely clamp to gate post and permit gate to be swung open 180 degrees.

2.03 FABRICATION

A. Shop Finishing:
    1. Galvanizing: For items not fabricated of galvanized materials hot-dip galvanize products after fabrication in accordance with following as applicable:
        a. ASTM A 123.
        b. ASTM A 153.
        c. ASTM A 385.
    2. Mark galvanized products with name of galvanize, applicable ASTM designation, and weight of zinc coating.
    3. Galvanize fabricated items complete, or in largest practicable sections.
    4. Provide galvanizing at rate of 2.0 ounces per square foot, minimum.
    5. Hardware:
        a. Padlocks: Cadmium plated.
        b. Chain: Galvanized.

B. Finish Schedule:
    1. Ferrous Metal:
        a. Typical: Clean, then hot-dip galvanize in accordance with galvanizing standards.

C. Field Finish Touch-up Painting:
   1. Galvanized Repair Paint: Apply paint having minimum dry film thickness of 2.0 to 3.5 mils.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Verify field conditions prior to construction.

3.02 PREPARATION

A. Surface Preparation:
   1. Before locating fence posts grade ground to permit grade of fence to remain constant over any local elevations or depressions in groundline.

3.03 INSTALLATION

A. Fences and Gates:
   1. Chain Link Fences and Gates:
      a. General:
         1) Install chain link fence and gates as indicated on the Drawings and specified in this Section.
         2) Provide fence systems that are plumb, taut, true to line and grade, and complete in all details.
         3) Install fencing to generally follow finish grade of ground and provide pull posts at points where required to conform to change in grade.
         4) Install fencing such that space between bottom of fence and finish groundline does not exceed 3 inches.
      b. Concrete Foundation for Fence Posts:
         1) Set fence posts in concrete foundations, that extend at least 3 feet into ground, and space posts not over 10 feet apart.
         2) Provide concrete foundations having minimum of 10 inches in diameter for line posts and 12 inches in diameter for corners and gates.
         3) Provide foundations that extend minimum of 1 inch above finish grade and have tops that are shaped to slope to drain away from posts.
         4) Trowel finish tops of footings, and slope or dome to direct water away from posts. Set keepers, stops, sleeves, tracks, eye bolts, and other accessories into concrete as required. Wheel rolling area for sliding gates shall be steel-trowel smooth finish concrete.
      c. Post Bracing:
         1) End Corner, Pull, and Gate Posts: Brace with same material as top rail and trussed to line posts with 3/8 inch rods and tighteners.
         2) Bracing End, Corner, Slope, and Gate Posts:
            a) Brace to midpoint of nearest line post or posts with horizontal braces used as compression members.
            b) Then from such line posts truss from brace back to bottom of end, corner, slope, or gate post with 3/8 inch steel truss rods with turnbuckles or other suitable tightening devices used as tension members.

d. Top Rail:
    1) Unless otherwise specified or indicated on the Drawings, install fencing with top rail and bottom tension wire.
    2) Where top rail is omitted, use top and bottom tension wire.
e. Fabric:
    1) Place fabric on outward facing side of the posts and install so that top edge projects over top rail of fence.
    2) Stretch fabric taut and securely fasten to posts, top rail and bottom tension wire.
    3) Install tension wire parallel to line of fabric.
    4) Fabric: Connect fabric to:
        a) Line posts with wire clips minimum every 14 inches.
        b) Terminal, corner, and gate posts with tension bars tied to posts minimum 14 inches on center and with steel bands and bolts and nuts.
        c) Tension wires with hog rings minimum 24 inches on center.
f. Post Top Fittings: Provide post tops with extension arms.
g. Swing Gates:
    1) Provide chain link fencing with swing gates, unless otherwise indicated on the Drawings or specified in this Section.
    2) Provide swing chain link gates where indicated on the Drawings.
    3) Provide gates with 2 leafs at each gate location.
    4) Hang gates by at least 2 hinges.

3.04 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Manufacturer shall check and test all powered gates and accessories before acceptance.

3.05 ADJUSTING

A. Adjust gate travel, stops, and operator position to meet field conditions.

3.06 CLEANING

A. Clean up surplus dirt, concrete, and other waste material and dress grade up upon completion of the work.

3.07 PROTECTION

A. Protect installed fences and gates against damage and, if damaged, repair prior to final acceptance.

END OF SECTION

SECTION 02924

HYDROSEEDING

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Hydroseeding, seed bed preparation, and maintenance.

1.02 REFERENCES

A. Association of Official Analytical Chemists (AOAC):
   1. Official Methods of Analysis.

B. U.S. Department of Agriculture (USDA):
   1. FSAR - Federal Seed Act Regulations.

C. Federal Specifications (FS):
   1. O-F-241 - Granular Fertilizer.

1.03 DESCRIPTION

A. Erosion control hydroseeding to be applied to all exterior slopes of levee section. Hydroseed all filled areas and any adjacent areas within the levee construction area existing vegetation is disturbed. Hydroseeding shall be the last activity conducted by CONTRACTOR at the river discharge.

1.04 DELIVERY AND STORAGE

A. Ensure that seed packages are packed to provide adequate protection against injury during transit.

B. Deliver undamaged sealed seed bags with legible labels showing weight, analysis, vendor's name and address, and point of origin. Label seed bags per variety.

C. Deliver dry commercial process or packaging, such as fertilizer, in undisturbed original unopened containers with legible labels showing manufacturer's guaranteed analysis or description.

D. Inspect materials and packages upon delivery. Discard damaged packages or containers immediately.

E. Store materials in protected and covered storage until application or use.

PART 2 PRODUCTS

2.01 HYDROMULCHING EQUIPMENT

A. Manufacturers: One of the following or equal:

1. Bowie Industries, Inc., Bowie, TX.
2. Reinco, Plainfield, NJ.
3. Finn Equipment Co., Cincinnati, OH.

B. With built-in agitation system sufficient to agitate, suspend and homogeneously mix slurry containing fiber, fertilizers, chemicals, and seed mix.

C. Capable of slurry distribution line large enough to prevent stoppage.

D. Equipped with set of hydraulic spray nozzles which provide continuous nonfluctuating discharge of minimum 225 pounds per square inch at end of spray nozzle.

2.02 MATERIALS

A. Seed Mix: Seed mix from latest crop. Minimum pure live seed content to be 80 percent, and tested within the preceding 6 months. Do not use seed mix after expiration date.
1. Bermuda Grass: (Cynodon dactylon “coastal”): 30 lbs per acre.
2. Bermuda Grass: (Cynodon dactylon “Tufcote”): 30 lbs per acre.

B. Fiber Mulch: Wood fiber manufactured for hydroseeding.
1. Manufacturers: One of the following or equal:
   a. Grass Growers, Plainfield, NJ.
   b. Conwed Corp., Fibers Div., St. Paul, MN.
   c. Eva Cell Co., Evadale, TX.

C. Granular Fertilizers: Fertilizer to be 16-20-0, commercial grade, free flowing, uniform in composition, inorganic.
1. Manufacturers: One of the following or equal:
   a. Sierra Chemical Co., Milpitas, CA.
   b. Green Light Co., Wonder Grow Chemicals, San Antonio, TX.
   c. Kay-Fries Chemicals, Montvale, NJ.

D. Water: Use potable water for making up seed mixture. Plant effluent may be used for hydroseed watering, as specified in this section.

PART 3 EXECUTION

3.01 PREPARATION

A. Area to be seeded to be weed free and have a firm seed bed which has previously been roughened by scarifying, discing, harrowing, chiseling, or otherwise worked to a depth of 2 to 4 inches.

B. Do not use any implements that will create an excessive amount of downward movement or clods on sloping areas.

C. Seed bed may be prepared at time of completion of earth-moving work.

3.02 FERTILIZER

A. Distributed uniformly over seed bed and incorporated into the soil. Incorporation may be part of the seed bed preparation or as part of the seeding operation, unless seed is broadcast. If fertilizing is a part of the seed bed preparation, do not fertilize more than 15 days prior to seeding.

B. Apply fertilizer at 250 pounds per acre.

3.03 APPLICATION

A. Mark test plots to calibrate equipment and rate of vehicle. Continue test operations until satisfied with performance of even, smooth application.

B. Apply seed with wood cellulose fiber at 500 pounds per acre. Do not allow seed to stay within slurry longer than 30 minutes.

C. Immediately after seeding, apply wood fiber mulch at 3,000 pounds per acre with a tackifier adhesive at 75 pounds per acre. Mixture to be sufficiently green in color to determine coverage. Use nontoxic dye that is water soluble.

D. Foot traffic on hydroseeded area is not permitted.

3.04 SLURRY PREPARATION

A. Prepare slurry at project site, using potable water.

B. Dispose of any slurry that has not been used within two hours at a location off-site at Contractor's expense.

3.05 HYDROSEED WATERING

A. Provide temporary watering system acceptable to ENGINEER. Plant effluent may be used for hydroseed watering.

B. Germination Stage:
   1. Initiate watering sequence within 24 hours after hydromulching planted areas. Leave water on long enough to moisten soil thoroughly to a depth of the fiber, taking care not to supersaturate or wash fiber or soil particles off the slopes. Observe irrigation system continually while in operation.
   2. CONTRACTOR to repair all seed washing or erosion immediately.
   3. Irrigate fiber and seed lightly and frequently to maintain optimum moisture content for maximum germination. Determine irrigation sequence according to air temperature, prevailing wind velocity, soil texture, orientation and other logistical problems.
   4. Keep soil moist at all times during germination period. Continue irrigation sequence until seedlings have grown beyond the germination stage, approximately 30 to 60 days.

C. Establishment Stage:
   1. Reduce watering frequency while increasing duration of the water sufficiently to allow for maximum water penetration for the expanding root system. Take care not to cause erosion.

2. Precise watering reduction program to be determined by CONTRACTOR.

D. Hardening-off Stage:
   1. Reduce irrigation frequency while increasing the duration of each water cycle.
   2. A specific watering program to be approved by OWNER.

E. CONTRACTOR shall maintain planted area for a minimum of three months prior to acceptance of work.

3.06 GUARANTEE

A. CONTRACTOR to be responsible for the quality of all labor and materials as provided by Subcontractors, and suppliers, including seed mix, hydroslurry ingredients, hydroseed application, and maintenance of areas.

END OF SECTION

SECTION 02952

PAVEMENT RESTORATION AND REHABILITATION

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Resurfacing roads and paved surfaces in which surface is removed or damaged by installation of new work.

B. Related Sections:
   1. Section 02722 - Aggregate Base Course.
   2. Section 02742 - Asphaltic Concrete Paving.

1.02 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. Limiting Dimensions:
      a. Determine the exact lengths and dimensions of such roads, pavements, parking areas, and walks that will require removal and replacement for new work.
      b. Join existing surfaces to terminals of new surfacing in smooth juncture.

1.03 SUBMITTALS

A. Mix Designs:
   1. Prior to placement of asphalt concrete, submit full details, including design and calculations for the asphalt concrete mix proposed.
   2. Submit gradation of aggregate base.
   3. Submit proposed mix design of portland cement concrete.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aggregate Base Course: As specified in Section 02722.

B. Asphalt Pavement: As specified in Section 02742.

C. Portland Cement Concrete Replacement Material: Class A concrete as specified in Section 03300.

2.02 EQUIPMENT

A. Roads, Pavements, Parking Areas, and Walks:
   1. Equipment Requirements: Good condition, capable of performing work intended in satisfactory manner.

2.03 ACCESSORIES

A. Material for Painting Asphalt Concrete Pavement: Tack coat as specified in Section 02742.

PART 3 EXECUTION

3.01 INSTALLATION

A. Aggregate Surface Removal Replacement:
   1. When trench cut is in aggregate surfaced areas, replace aggregate base course material with material matching existing material compacted to 95 percent of its maximum density.

B. Pavement Removal and Temporary Asphalt Replacement:
   1. Install temporary asphalt pavement or first course of permanent pavement replacement immediately following backfilling and compaction of trenches that have been cut through existing pavement.
   2. Except as otherwise provided, maintain this temporary pavement in safe and reasonably smooth condition until required permanent pavement is installed.
   3. Remove and dispose of temporary paving from project site.
   4. Where longitudinal trench is partly in pavement, replace pavement to original pavement edge, on a straight line, parallel to center line of roadway.
   5. Where no part of longitudinal trench is in pavement, surfacing replacement shall only be required where existing surfacing materials have been removed.

C. Asphalt Pavement Replacement:
   1. Replace asphalt pavement to same thickness as adjacent pavement and match as nearly as possible adjacent pavement in texture, unless otherwise specified or indicated on the Drawings.
   2. Cut existing asphalt pavements to be removed for trenches or other underground construction by wheel cutter, clay spade, or other device capable of making neat, reasonably straight and smooth cut without damaging adjacent pavement. Cutting device operation shall be subject to acceptance of ENGINEER.
   3. Cut and trim existing pavement after placement of required aggregate base course and just prior to placement of asphalt concrete for pavement replacement, and paint trimmed edges with material for painting asphalt concrete pavement immediately prior to constructing new abutting asphalt pavements. No extra payment will be made for these items, and all costs incurred in performing this work shall be incidental to pipe laying or pavement replacement.
   4. Conform replacement of asphalt pavement to contour of original pavement.

3.02 FIELD QUALITY CONTROL

A. Tests:
   1. Asphalt concrete as specified in Section 02742.

B. Inspection:
   1. Asphalt Concrete:

a. Lay 10 foot straightedge parallel to center line of trench when the trenches run parallel to street, and across pavement replacement when trench crosses street at angle.
b. Remove and correct any deviation in cut pavement replacement greater than 1/4 inch in 10 feet.

END OF SECTION

SECTION 03071

EPOXIES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Epoxy.
   2. Epoxy gel.
   3. Epoxy bonding agent.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D 638 - Test Method for Tensile Properties of Plastics.
   2. D 695 - Test Method for Compressive Properties of Rigid Plastics.
   3. D 790 - Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. Provide epoxy materials that are new and use them within shelf life limitations set forth by manufacturer.
   2. Perform and conduct work of this Section in neat orderly manner.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's data completely describing epoxy materials.

B. Quality Control Submittals:
   1. Manufacturer's installation instructions.

PART 2 PRODUCTS

2.01 MATERIALS

A. Epoxy: Water-insensitive two-part type low viscosity epoxy adhesive material containing 100 percent solids and meeting or exceeding following characteristics when tested in accordance with standards specified: Manufacturers: One of the following or equal:
   1. Master Builders, Inc., Concressive Standard LVI.
   2. Sika Chemical Corp.'s, Sikadur 35 Hi-Mod LV.

Physical Characteristic	Test Method	Required Results
Tensile Strength	ASTM D 638	8,000 pounds per square inch at 14 days and 77 degrees Fahrenheit cure.
Flexure Strength	ASTM D 790	11,000 pounds per square inch at 14 days and 77 degrees Fahrenheit cure.
Compressive Strength	ASTM D 695	16,000 pounds per square inch at 24 hours and 77 degrees Fahrenheit cure.
Bond Strength	–	Concrete shall fail before failure of epoxy.
Gel Time In 5-Mil Film	–	Four hours maximum at 77 degrees Fahrenheit.
Elongation	ASTM D 638	1 percent minimum at 14 days and 77 degrees Fahrenheit.

B. Epoxy Gel: Manufacturers: One of the following or equal:
   1. Sika Chemical Corp.'s, Sikadur 31, Hi-Mod Gel.

C. Epoxy Bonding Agent: Manufacturers: One of the following or equal:
   1. Master Builders, Inc., Concressive 1001 Liquid LPL.
   2. Sika Chemical Corp.'s, Sikadur 32, Hi-Mod.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install and cure epoxy materials in accordance with manufacturer's installation instructions.

B. Epoxy:
   1. Apply in accordance with manufacturer's installation instructions.

C. Epoxy Gel:
   1. Apply in accordance with manufacturer's installation instructions.
   2. Use for vertical or overhead work, or where high viscosity epoxy is required.
   3. Epoxy gel used for vertical or overhead work may be used for horizontal work.

D. Epoxy Bonding Agent:
   1. Apply in accordance with manufacturer's installation instructions.
   2. Bonding agent will not be required for filling form tie holes or for normal finishing and patching of similar sized small defects.

END OF SECTION

SECTION 03072

EPOXY RESIN/PORTLAND CEMENT BONDING AGENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Epoxy resin/Portland cement bonding agent.

1.02 REFERENCES

A. American Society for Testing of Materials (ASTM):
   1. C 109 - Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2 inch or 50 millimeter Cube Specimens).
   2. C 348 - Test Method for Flexural Strength of Hydraulic Cement Mortars.
   3. C 496 - Test Method for Splitting Tensile Strength of Cylindrical Concrete Specimens.
   4. C 882 - Test Method for Bond Strength of Epoxy-Resin Systems Used with Concrete Slant Shear.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Sika Corporation, Lyndhurst, New Jersey, Sika Armatec 110.

B. Substitutions: The use of other than the specified product will be considered providing the CONTRACTOR requests its use in writing to the ENGINEER. This request shall be accompanied by:
   1. A certificate of compliance from an approved independent testing laboratory that the proposed substitute product meets or exceeds specified performance criteria, tested in accordance with the specified test standards.
   2. Documented proof that the proposed substitute product has a one year proved record of performance of bonding Portland cement mortar/concrete to hardened Portland cement mortar/concrete, confirmed by actual field tests and five successful installations that the ENGINEER can investigate.

2.02 PERFORMANCE CRITERIA

A. Properties of the Mixed Epoxy Resin/Portland Cement Adhesive:
   1. Pot life: 75-105 minutes.
   2. Contact time: 24 hours.
   3. Color: Dark gray.

B. Properties of the Cured Epoxy Resin/Portland Cement Adhesive:
   1. Compressive strength in accordance with ASTM C 109.
      a. 1 day: 810 pounds per square inch minimum.
      b. 7 day: 6,000 pounds per square inch minimum.
      c. 28 day: 8,000 pounds per square inch minimum.

2. Splitting tensile strength in accordance with ASTM C 496.
    a. 28 days: 540 pounds per square inch minimum.
3. Flexural Strength:
    a. 1,100 pounds per square inch minimum in accordance with ASTM C 348.
4. Bond strength in accordance with ASTM C 882 modified at 14 days.
    a. 0 Hours Open Time: 1,900 pounds per square inch minimum.
    b. 24 Hours Open Time: 1,500 pounds per square inch minimum.
5. The epoxy resin/Portland cement adhesive shall not produce a vapor barrier.
6. Material must be proven to prevent corrosion of reinforcing steel when tested under the procedures as set forth by the Federal Highway Administration Program Report Number FHWA/RD86/193. Proof shall be in the form of an independent testing laboratory corrosion report showing prevention of corrosion of the reinforcing steel.

2.03 MATERIALS

A. Epoxy Resin/Portland Cement Adhesive:
    1. Component "A" shall be an epoxy resin/water emulsion containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
    2. Component "B" shall be primarily a water solution of a polyamine.
    3. Component "C" shall be a blend of selected Portland cements and sands.
    4. The material shall not contain asbestos.

PART 3 EXECUTION

3.01 MIXING AND APPLICATION

A. Mixing the Epoxy Resin: Shake contents of Components "A" and Component "B". Empty all of both components into a clean, dry mixing pail. Mix thoroughly for 30 seconds with a jiffy paddle on a low-speed with 400 to 600 revolutions per minute drill. Slowly add the entire contents of Component "C" while continuing to mix for 3 minutes until uniform with no lumps. Mix only that quantity that can be applied within its pot life.

B. Placement Procedure:
    1. Apply to prepared surface with stiff-bristle brush, broom, or "hopper type" spray equipment.
        a. For Hand Applications: Place fresh, plastic concrete/mortar while the bonding bridge adhesive is wet or dry, up to 24 hours.
        b. For Machine Applications: Allow the bonding bridge adhesive to dry for 12 hours minimum.

C. Adhere to all limitations and cautions for the epoxy resin/Portland cement adhesive in the manufacturers current printed literature.

3.02 CLEANING

A. Leave finished work and work area in a neat, clean condition without evidence of spillovers onto adjacent areas.

END OF SECTION

SECTION 03102

CONCRETE FORMWORK

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Concrete formwork.

B. Related Sections:
   1. Section 03300 - Cast-in-Place Concrete.
   2. Section 03600 - Grouts.
   3. Section 07900 - Joint Sealers.

1.02 REFERENCES

A. American Concrete Institute (ACI):
   1. 117 - Standard Specifications for Tolerances for Concrete Construction and Materials.

B. California Building Code (CBC):
   1. Section 1906A - Formwork, Embedded Pipes and Construction Joints.

1.03 SYSTEM DESCRIPTION

A. Design Requirements:
   1. Design of concrete forms, falsework, and shoring in accordance with local, state, and federal regulations.
   2. Design forms and ties to withstand concrete pressures without bulging, spreading, or lifting of forms.

B. Performance Requirements:
   1. Construct forms so that finished concrete conforms to shapes, lines, grades, and dimensions indicated on the Drawings.
   2. It is intended that surface of concrete after stripping presents smooth, hard, and dense finish that requires minimum amount of finishing.
   3. Provide sufficient number of forms so that the work may be performed rapidly and present uniform appearance in form patterns and finish.
   4. Use forms that are clean and free from dirt, debris, concrete, and similar type items. Coat with acceptable form release oil if required, prior to use or reuse.

1.04 SUBMITTALS

A. Information on the CONTRACTOR's Proposed Forming System: Submit in such detail as the ENGINEER may require to assure himself that intent of the Specifications can be complied with by use of proposed system.

B. Alternate Combinations of Plywood Thickness and Stud Spacing: May be submitted.

1.05 QUALITY ASSURANCE

A. Qualifications of Formwork Manufacturers: Use only forming systems manufactured by manufacturers having minimum 5 years experience, except as otherwise specified, or accepted in writing by the ENGINEER.

B. Regulatory Requirements: Install work of this Section in accordance with local, state, and federal regulations.

1.06 PROJECT CONDITIONS

A. Requirements Due to Weather Condition:
   1. Removal of Formwork: Do not remove forms from concrete which has been placed when outside ambient air temperature is below 50 degrees Fahrenheit until concrete has attained specified strength as determined by test cylinders stored in field under equivalent conditions as concrete structure.

PART 2 PRODUCTS

2.01 MATERIALS

A. Form Ties:
   1. General:
      a. Provide form ties for forming system selected that are manufactured by recognized manufacturer of concrete forming equipment.
      b. Do not use wire ties or wood spreaders of any form.
      c. Provide ties of type that accurately tie, lock, and spread forms.
      d. Provide form ties of such design that when forms are removed they locate no metal or other material within 1-1/2 inches of the surface of the concrete.
      e. Do not allow holes in forms for ties to allow leakage during placement of concrete.
   2. Cone-snap or Flat Bar Form Ties:
      a. Cone-snap ties shall form a cone shaped depression in the concrete with a minimum diameter of 1 inch at the surface of the concrete and 1-1/2 inches deep.
      b. Provide neoprene waterseal washer which is located near the center of the concrete.
   3. Taper Ties:
      a. Neoprene Plugs for Taper Tie Holes: Size so that after they are driven, plugs are located in center third of wall thickeners.
      b. Drypack Mortar for Filling Taper Tie Holes:
         1) Consist of mix of 1 part of Portland cement to 1 part of plaster sand.
         2) Amount of water to be added to cement-sand mix is to be such that mortar can be driven into holes and be properly compacted.
         3) Admixtures or Additives: Are not to be used in dry-pack mortar.

B. Built-up Plywood Forms:
   1. Built-up plywood forms may be substituted for prefabricated forming system subject to following minimum requirements:

a. Size and Material:
    1) Full size 4 by 8 feet plywood sheets, except where smaller pieces are able to cover entire area.
    2) Sheet Construction: 5-ply plywood sheets, 3/4 inch nominal, made with 100 percent waterproof adhesive, and having finish surface that is coated or overlaid with surface which is impervious to water and alkaline calcium and sodium hydroxide of cement.
b. Wales: Minimum 2 by 4 inch lumber.
c. Studding and Wales: Contain no loose knots and be free of warps, cups, and bows.

C. Steel or Steel Framed Forms:
1. Steel Forms: Provide forms that are:
    a. Rigidly constructed and capable of being braced for minimum deflection of finish surface.
    b. Capable of providing finish surfaces that are flat without bows, cups, or dents.
2. Steel Framed Plywood Forms:
    a. Provide forms that are rigidly constructed and capable of being braced.
    b. Plywood Paneling: 5-ply, 5/8 inch nominal or 3/4 inch nominal, made with 100 percent waterproof adhesive, and having finish surface that is coated or overlaid with surface which is impervious to water and alkaline calcium and sodium hydroxide of cement.

D. Incidentals:
1. External Angles:
    a. Where not otherwise indicated on the Drawings, provide with 3/4 inch bevel, formed by utilizing true dimensioned wood or solid plastic chamfer strip on walkways, slabs, walls, beams, columns, and openings.
    b. Provide 1/4 inch bevel formed by utilizing true dimensioned wood or solid plastic chamfer strip on walkways, walls, and slabs at expansion, contraction, and construction joints.
2. Keyways: Steel, plastic, or lumber treated with form coating, applied according to label directions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:
1. Do not place any concrete until all forms have been thoroughly checked for alignment, level, strength, and to assure accurate location of all mechanical and electrical inserts or other embedded items.

3.02 INSTALLATION

A. Forms and Accessories:
1. Vertical Forms:
    a. Remain in place minimum of 24 hours after concrete is placed.
    b. If, after 24 hours, concrete has sufficient strength and hardness to resist surface or other damage, forms may be removed.

2. Other Forms Supporting Concrete and Shoring: Remain in place as follows:
   a. Sides Of Footings: 24 hours minimum.
   b. Vertical Sides of Beams, Girders, and Similar Members: 48 hours minimum.
   c. Slabs, Beams, and Girders: Until concrete strength reaches specified strength or until shoring is installed.
   d. Shoring for Slabs, Beams, and Girders: Shore until concrete strength reaches specified strength.
   e. Wall Bracing: Until concrete strength of beams and slabs laterally supporting wall reaches specified strength.
3. Green Concrete:
   a. No heavy loading on green concrete will be permitted.
   b. Green concrete is defined as concrete with less than 100 percent of specified strength.
4. Immediately after forms are removed, carefully examine concrete surfaces, and repair any irregularities in surfaces and finishes as specified in Section 03300.

B. Form Ties:
1. Cone-snap Rod and Bar Ties: Tie forms together at not more than 2 foot centers vertically and horizontally. After forms are removed from wall, fill tie holes as follows:
   a. Remove form ties from surfaces.
   b. Roughen cone shaped tie holes by heavy sandblasting before repair.
   c. Dry pack cone shaped tie holes with drypack mortar as specified in Section 03600.
2. Taper Ties:
   a. Neoprene Plug in Taper Tie Holes: After forms and taper ties are removed from wall, plug tie holes with neoprene plug as follows:
      1) Heavy sandblast and then clean tie holes.
      2) After cleaning, drive neoprene plug into each of taper tie holes with steel rod. Final location of neoprene plug shall be in center third of wall thickness. Bond neoprene plug to concrete with epoxy.
      3) Locate steel rod in cylindrical recess, made in plug, during driving.
         a) At no time are plugs to be driven on flat area outside cylindrical recess.
   b. Dry Pack Of Taper Tie Holes: After Installing Plugs in Tie Holes:
      1) Coat tie hole surface with epoxy bonding agent and fill with drypack mortar as specified in Section 03600.
         a) Drypack Mortar: Place in holes in layers with thickness not exceeding tie hole diameter and heavily compact each layer.
         b) Dry pack the outside of the hole no sooner than 7 days after the inside of the hole has been dry packed.
         c) Wall surfaces in area of drypacked tie holes: On the water side of water containing structures and the outside of below grade walls:
            (1) Cover with minimum of 10 mils of epoxy gel.
            (2) Provide epoxy gel coating on wall surfaces that extend minimum of 2 inches past drypack mortar filled tie holes.
            (3) Provide finish surfaces that are free from sand streaks or other voids.

C. Built-up Plywood Forms:
   1. Studding:
      a. Spaced at 16 inches or 24 inches on center.
      b. Closer spacing may be required depending upon strength requirements of the forms, in order to prevent any bulging surfaces on faces of finished concrete work.
      c. Install studs perpendicular to grain of exterior plys of plywood sheets.
   2. Wales: Form wales of double lumber material minimum size as specified in this Section.
   3. Number of Form Reuses: Depends upon durability of surface coating or overlay used, and ability to maintain forms in condition such that they are capable of producing flat, smooth, hard, dense finish on concrete when stripped.

D. Steel or Steel Framed Forms:
   1. Steel Forms:
      a. Adequately brace forms for minimum deflection of finish surface.
   2. Steel Framed Plywood Forms:
      a. Rigidly construct and brace with joints fitting closely and smoothly.
      b. Number of Form Reuses: Depends upon durability of surface coating or overlay used.
   3. Built-up Plywood Forms: As specified in this Section may be used in conjunction with steel forms or steel framed plywood forms for special forming conditions such as corbels and forming around items which will project through forms.

E. Bracing and Alignment of Forms:
   1. Line and Grade: Limit deviations to tolerances which will permit proper installation of structural embedded items or mechanical and electrical equipment and piping.
   2. Formwork:
      a. Securely brace, support, tie down, or otherwise hold in place to prevent any movement.
      b. Make adequate provisions for uplift pressure, lateral pressure on forms, and deflection of forms.
   3. When Second Lift is Placed on Hardened Concrete: Take special precautions in form work at top of old lift and bottom of new lift to prevent:
      a. Spreading and vertical or horizontal displacement of forms.
      b. Grout "bleeding" on finish concrete surfaces.
   4. Pipe Stubs, Anchor Bolts, and Other Embedded Items: Set in forms where required.
   5. Cracks, Openings, or Offsets at Joints in Formwork: Close those that are 1/16 inch or larger by tightening forms or by filling with acceptable crack filler.

F. Incidentals:
   1. Keyways: Construct keyways as indicated on the Drawings.
   2. Reentrant Angles: May be left square.
   3. Level Strips: Install level strips at top of wall concrete placements to maintain true line at horizontal construction joints.
   4. Inserts:
      a. Encase pipes, anchor bolts, steps, reglets, castings, and other inserts, as indicated on the Drawings or as required, in concrete.

b. Use dovetail anchors or ties in conjunction with slots or inserts for various materials as specified under other sections of these Specifications and as may be necessary for required work.

G. Pipe and Conduit:
1. Install pipe and conduit in structures as indicated on the Drawings, and seal with materials as specified in Section 07900.

H. Tolerances:
1. Finish concrete shall conform to shapes, lines, grades, and dimensions indicated on the Drawings.
2. The maximum deviation from true line and grade shall not exceed tolerances listed below at time of acceptance of project.
3. General: Comply with ACI 117, paragraphs 2.0 through 2.2 and paragraphs 4.0 through 4.5, except as modified in following:
   a. Slabs:
      1) Slope: Uniformly sloped to drain when slope is indicated on the Drawings.
      2) Slabs Indicated to Be Level: Have maximum deviation of 1/8 inch in 10 feet without any apparent changes in grade.
   b. On Circular Tank Walls: The CONTRACTOR may deviate from finish line indicated on the Drawings by use of forms with chord lengths not to exceed 2 feet.
   c. Inserts: Set inserts to tolerances required for proper installation and operation of equipment or systems to which insert pertains.
   d. Maximum Tolerances: As follows:

Item	Inches
Sleeves and Inserts	Plus 1/8 Minus 1/8
Projected Ends of Anchor Bolts	Plus 1/4 Minus 0.0
Anchor Bolt Setting	Plus 1/16 Minus 1/16

END OF SECTION

SECTION 03150

CONCRETE ACCESSORIES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Polyvinyl chloride waterstop.
   2. Preformed synthetic sponge rubber expansion joint material.
   3. Preformed bituminous fiber expansion joint material.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D 570 - Standard Test Method for Water Absorption of Plastics.
   2. D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
   3. D 638 - Standard Test Method for Tensile Properties of Plastics.
   4. D 746 - Standard Test Method for Brittleness Temperature of Plastics and Elastomers by Impact.
   5. D 747 - Standard Test Method for Apparent Bending Modulus of Plastics by Means of a Cantilever Beam.
   6. D 792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
   7. D 2240 - Standard Test Method for Rubber Property – Durometer Hardness.

B. U. S. Army Corps of Engineers (USACE):
   1. CRD-C-572, Specification for Polyvinyl Chloride Waterstop.

1.03 SUBMITTALS

A. Product Data:
   1. Polyvinyl Chloride Waterstops: Complete physical characteristics.
   2. Preformed Expansion Joint Material: Sufficient information on each type of material for review to determine conformance of material to requirements specified.

B. Samples:
   1. Polyvinyl chloride waterstop.

C. Laboratory Test Reports: Indicating that average properties of polyvinyl chloride waterstops material and finish conform to requirements specified in this Section.

D. Quality Control Submittals:
   1. Certificates of Compliance:
      a. Written certificates that polyvinyl chloride waterstops supplied on this Project meet or exceed physical property requirements of current USACE CRD-C-572 and the requirements of this Section.

2. Manufacturer's Instructions: For materials specified in this Section that are specified to be installed with such instructions.

1.04 QUALITY ASSURANCE

A. Mock-ups:
   1. Welding Demonstration:
      a. Demonstrate ability to weld acceptable joints in polyvinyl chloride waterstops before installing waterstop in forms.

B. Field Joints:
   1. Polyvinyl Chloride Waterstops Field Joints: Shall be free of misalignment, bubbles, inadequate bond, porosity, cracks, offsets and other defects which would reduce the potential resistance of the material to water pressure at any point. Replace defective joints. Remove faulty material from the site and disposed of by the CONTRACTOR at its own expense.

C. Inspections:
   1. Quality of welded joints will be subject to acceptance of the ENGINEER.
   2. Polyvinyl Chloride Waterstop: The following defects that represent a partial list that will be grounds for rejection.
      a. Offsets at joints greater than 1/16 inch or 15 percent of the material thickness, at any point, whichever is less.
      b. Exterior crack at joint, due to incomplete bond, which is deeper than 1/16 inch or 15 percent of the material thickness, at any point, whichever is less.
      c. Any combination of offset or crack which will result in a net reduction in the cross section of the waterstop in excess of 1/16 inch or 15 percent of the material thickness, at any point, whichever is less.
      d. Misalignment of the joint, which will result in misalignment of the waterstop in excess of 1/2 inch in 10 feet.
      e. Porosity in the welded joint as evidenced by visual inspection.
      f. Bubbles or inadequate bonding.

PART 2 PRODUCTS

2.01 MATERIALS

A. Polyvinyl Chloride Waterstops: Manufactured from prime virgin polyvinyl chloride plastic compound containing the plasticizers, resins, stabilizers, and other materials necessary to meet the requirements of this Specification. No scrap or reclaimed material shall be used.

2.02 MANUFACTURED UNITS

A. Waterstops:
   1. Polyvinyl Chloride Waterstops:
      a. Manufacturers: One of the following or equal:
         1) Vinylex Corporation, Kwik-Tie.
         2) Greenstreak Plastic Products Company, Inc.
      b. Type: Ribbed Waterstop.
         1) Construction Joints: 6 inch wide ribbed type.

2) Expansion Joint for Wall Penetrations for Concrete Encased Electrical Duct Banks: 6 inch ribbed type with hollow center bulb.
3) Expansion Joints: 9 inch wide ribbed type with hollow center bulb.

c. Provide polyvinyl chloride waterstops complying with following requirements:

Physical Characteristics	Test Method	Required Results
Specific Gravity	ASTM D 792	Not less than 1.3.
Hardness	ASTM D 2240	70 to 90 Type A Shore durometer.
Tensile Strength	ASTM D 638	Not less than 2,000 pounds per square inch.
Ultimate Elongation	ASTM D 638	Not less than 350 percent
Alkali Extraction	CRD-C-572	7 day weight change between minus 0.1 percent and plus 0.25 percent.
Low Temperature Brittle Point	ASTM D 746	Not more than minus 35 degrees Fahrenheit.
Water Absorption	ASTM D 570	Not more than 0.15 percent after 24 hours.
Accelerated Extraction Tensile	CRD-C-572	Not less than 2,000 pounds per square inch.
Stiffness in Flexure	ASTM D 747	Not less than 750 pounds per square inch.
Tear Resistance	ASTM D 624	Not less than 300 pounds per inch.
Weight Requirements		
6 inch Waterstops	–	Weigh not less than 130 pounds per 100 linear feet.
9 inch Waterstops	–	Weigh not less than 220 pounds per 100 linear feet.
Thickness	–	3/8 inch
Center Bulb:		
6 inch Waterstops	–	7/8 inch or 1 inch nominal outside diameter.
9 inch Waterstops	–	1 inch nominal outside diameter. For expansion joints 1 inch and narrower and 2 inches for expansion joints wider than 1 inch.
Allowable Tolerances		
Width	–	Plus or minus 3/16 inch.
Thickness	–	Plus or minus 1/32 inch.

d. Dumbbell type waterstop will not be allowed unless otherwise specified or indicated on the Drawings.

B. Preformed Expansion Joint Materials:
   1. Preformed Synthetic Sponge Rubber Expansion Joint Material:
      a. Manufacturers: One of the following or equal:
         1) Tammstech, Inc., Cementone.
         2) Burke Concrete Accessories Inc., Neoprene Sponge Rubber Expansion Joint.
   2. Preformed Bituminous Fiber Expansion Joint Material:
      a. Manufacturers: One of the following or equal:
         1) Tammstech, Inc., Hornboard/fiber.
         2) Burke Concrete Accessories Inc., Fiber Expansion Joint.
   3. Use specific type in applications as indicated on the Drawings.
   4. No scrap or recycled material shall be used.

PART 3 EXECUTION

3.01 INSTALLATION

A. Waterstops - General:
   1. Waterstops shall be stored so as to permit free circulation of air around the waterstop material and to prevent direct exposure to sunlight.
   2. Install waterstops in concrete joints where indicated on the Drawings.
   3. Carry waterstops in walls into lower slabs and join to waterstops in slabs with appropriate types of fittings.
   4. In Waterbearing Structures: Provide all joints with waterstops, whether indicated on the Drawings or not.
   5. Provide waterstops that are continuous.
   6. Set waterstops accurately to position and line as indicated on the Drawings.
   7. Hold and securely fix edges in position at intervals of not more than 24 inches so that they do not move during placing of concrete.
   8. Position the waterstop so that symmetrical halves of the waterstop are equally divided between the concrete pours. The center axis of the waterstop shall be coincident with the centerline of the joint.
   9. Do not drive nails, screws, or other fasteners through waterstops in vicinity of construction joints.
   10. Use wires at not more than 24 inches on centers near outer edge of the waterstop to tie waterstops into position.
   11. Special clips may be used in lieu of wires, at CONTRACTOR's option.
   12. Terminate waterstops 3 inches from top of finish surfaces of walls and slabs unless otherwise specified or indicated on the Drawings.
   13. When any waterstop is installed in the concrete on one side of a joint, while the other half or portion of the waterstop remains exposed to the atmosphere for more than 2 days, suitable precautions shall be taken to shade and protect the exposed waterstop from direct rays of sunlight during the entire exposure and until the exposed portion is embedded in concrete.
   14. When placing concrete at waterstops in slabs, lift the edge of the waterstop while placing concrete below the waterstop. Manually force the waterstop against and into the concrete. Then cover the waterstop with fresh concrete.

B. Polyvinyl Chloride Waterstops:
   1. Install waterstops so that joints are watertight.
   2. Weld joints such as unions, crosses, ells, and tees, with thermostatically controlled equipment recommended by waterstop manufacturer.
      a. The material shall not be damaged by heat sealing.
      b. Make joints by overlapping then simultaneously cut the ends of the sections to be spliced so they will form a smooth even joint. Heat the cut ends with the splicing tool until the plastic melts. Press the 2 ends together until the plastic cools.
      c. The continuity of the waterstop ribs and tubular center axis shall be maintained.
      d. The splices shall have a tensile strength of not less than 60 percent of the unspliced materials tensile strength.
   3. Butt joints of the ends of 2 identical waterstop sections may be made while the material is in the forms.
   4. All joints with waterstops involving more than 2 ends to be joined together, and all joints that involve an angle cut, alignment change, or the joining of 2 dissimilar waterstop sections shall be prefabricated by the CONTRACTOR or the manufacturer prior to placement in the forms, providing not less than 24 inch long strips of waterstop material beyond the joint. Upon being inspected and accepted, install such prefabricated waterstop joint assemblies in the forms and the ends of the 24 inch strips shall be butt welded to the straight run portions of waterstop in place in the forms.
   5. Vertical crosses and tees shall be factory prefabricated by the manufacturer. Horizontal crosses or tees may be field or factory welded.
   6. Split type waterstop will not be permitted except where specifically indicated on the Drawings.

C. Joints:
   1. Construct construction, and expansion joints as indicated on the Drawings.
   2. Preformed Expansion Joint Material: Fasten expansion joint strips to concrete, masonry, or forms with adhesive. No nailing will be permitted, nor shall expansion joint strips be placed without fastening.

END OF SECTION

SECTION 03200

CONCRETE REINFORCEMENT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Concrete reinforcement.

1.02 REFERENCES

A. American Concrete Institute (ACI):
   1. 315 - Detailing Manual: Details and Detailing of Concrete Reinforcement.
   2. 318 - Building Code Requirements for Structural Concrete.
   3. ACI 350.

B. American Society for Testing and Materials (ASTM):
   1. A 143 - Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure, for Detecting Embrittlement.
   2. A 185 - Specification for Steel Welded Wire Fabric, Plain, for Concrete Reinforcement.
   3. A 615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.

C. American Welding Society (AWS):
   1. D1.4 - Structural Welding Code - Reinforcing Steel.

D. California Building Code (CBC):
   1. Section 1907A - Details of Reinforcement.

1.03 SYSTEM DESCRIPTION

A. The Drawings contain general notes concerning amount of reinforcement and placing, details of reinforcement at wall corners and intersections, and details of extra reinforcement around openings in concrete.

1.04 SUBMITTALS

A. Shop Drawings:
   1. Shop Drawings on Reinforcing Steel:
      a. Submit to the ENGINEER copy of reinforcing steel detail drawings in accordance with Contract Documents.
      b. Changes to Reinforcing Steel Contract Drawing Requirements:
         1) Indicate in separate letter submitted with shop drawings any changes of requirements indicated on the Drawings for reinforcing steel.
         2) Such changes will not be acceptable unless the ENGINEER has accepted such changes in writing.
      c. Review of shop drawings by the ENGINEER will be limited to general compliance with the Contract Documents.

B. Samples:
   1. Bar Supports: Submit samples of chairs proposed for use along with letter stating where each type chair will be used.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:
   1. Deliver bars bundled and tagged with identifying tags.

B. Acceptance at Site:
   1. Reinforcing Bars: Deliver reinforcing bars lacking grade identification marks accompanied by manufacturer's guarantee of grade.

1.06 SEQUENCING AND SCHEDULING

A. Bar Supports: Do not place concrete until samples and attached data of bar supports has been accepted by the ENGINEER.

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforcement:
   1. General: Provide reinforcing steel that is new material, of quality specified, free from excessive rust or scale or any defects affecting its usefulness.

B. Reinforcing Bars:
   1. Reinforcing Bars to Be Embedded in Concrete or Masonry: Grade 60 deformed bars conforming to ASTM A 615 except as specified in the next subparagraph.
   2. Reinforcement resisting earthquake-induced flexural and axial forces in concrete frame members and in concrete wall boundary members shall comply with low alloy ASTM A 706. ASTM A 615 Grade 60 reinforcement may be used in these members if the following requirements are met:
      a. The actual yield strength based on mill tests does not exceed the specified yield strength by more than 18,000 pounds per square inch (retests shall not exceed this value by more than an additional 3,000 pounds per square inch).
      b. The ratio of the actual ultimate tensile stress to the actual tensile yield strength is not less than 1.25.
   3. Thread Bars:
      a. Provide thread bars having continuous rolled-in pattern of thread-like deformations along entire length.
      b. Provide hex nuts and couplers for the thread bars that develop 125 percent of yield strength of bar.
      c. Thread Bars:
         1) Conform to ASTM A 615 Grade 60.
         2) Manufacturers: One of the following or equal:
            a) DYWIDAG Systems International, DYWIDAG Threadbar.
      d. Do not substitute cut threads on regular reinforcing bars for thread bars.

C. Bar Supports:
   1. Reinforcement Support Chairs:
      a. Hot-dip galvanized steel. Provide hot-dip galvanized steel with plastic tips at surfaces which will be exposed to view. Use unless otherwise indicated on the Drawings.
      b. Stainless Steel where indicated on the Drawings.

D. Tie Wires: Annealed steel.

E. Welded Wire Fabric Reinforcement:
   1. Welded Wire Fabric: ASTM A 185.
   2. Fabric may be used in place of reinforcing bars if accepted by the ENGINEER.
   3. Provide fabric in flat sheet form.
   4. Provide fabric having cross-sectional area per linear foot of not less than cross-sectional area per linear foot of reinforcing bars indicated on the Drawings.

2.02 FABRICATION

A. Shop Assembly:
   1. Cut and bend bars in accordance with provisions of ACI 315, ACI 318, and ACI 350.
   2. Bend bars cold.
   3. Provide bars free from defects and kinks and from bends not indicated on the Drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions:
   1. Reinforcing Bars:
      a. Verify that bars are new stock free from rust scale, loose mill scale, excessive rust, dirt, oil, and other coatings which adversely affect bonding capacity when placed in the work.

3.02 PREPARATION

A. Surface Preparation:
   1. Reinforcing Bars: Thin coating of red rust resulting from short exposure will not be considered objectionable. Thoroughly clean any bars having rust scale, loose mill scale, or thick rust coat.
   2. Cleaning of Reinforcement Materials: Remove concrete or other deleterious coatings from dowels and other projecting bars by wire brushing or sandblasting before bars are embedded in subsequent concrete placement.

3.03 INSTALLATION

A. Reinforcing Bars:
   1. No field bending of bars will be allowed.

2. Welding:
    a. Weld reinforcing bars where indicated on the Drawings or acceptable to the ENGINEER.
    b. Perform welding in accordance with AWS D1.4.

B. Placing Reinforcing Bars:
1. Accurately place bars and adequately secure them in position.
2. Overlap bars at splices as specified or indicated on the Drawings.
3. Unless specifically otherwise indicated on the Drawings, install bars at lap splices in contact with each other and fasten bars together with tie wire.
4. If lap splice length for bars in concrete is not specified or indicated on the Drawings, bars shall be lap spliced in accordance with ACI 318.
5. If not specified or indicated on the Drawings and not specified in DIVISION 4, lap splice bars in masonry in accordance with the California Building Code and reference ACI standards.
6. Bar Supports:
    a. Provide in sufficient number to prevent sagging and to support loads during construction, but in no case less than quantities and at locations as indicated in ACI 315.
    b. Support reinforcing for concrete placed on ground by standard manufactured chairs, with steel plates for resting on ground.
    c. Do not use brick, broken concrete masonry units, spalls, rocks, or similar material for supporting reinforcing steel.
7. If not indicated on the Drawings, provide protective concrete cover in accordance with ACI 318 and ACI 350.

C. Tying of Bar Reinforcement:
1. Fasten bars securely in place with wire ties.
2. Tie bars sufficiently often to prevent shifting.
3. There shall be at least 3 ties in each bar length (does not apply to dowel lap splices or to bars shorter than 4 feet, unless necessary for rigidity).
4. Tie slab bars at every intersection around periphery of slab.
5. Tie wall bars and slab bar intersections other than around periphery at not less than every fourth intersection, but at not greater than following maximum spacings:

Bar Size	Slab Bars Spacing (Inches)	Wall Bars Spacing (Inches)
Bars Number 5 and Smaller	60	48
Bars Number 6 through Number 9	96	60
Bars Number 10 and Number 11	120	96

6. After tying wire ties, bend ends of wire ties in towards the center of the concrete section. Wire ties shall conform to the cover requirements of the reinforcing bars.
7. Above tying requirements do not apply to reinforcement for masonry. Refer to DIVISION 4 for tying requirements for masonry.

D. Lap Splices of Reinforcing Bars:
1. Where bars are to be lapped spliced at joints in concrete, ensure bars project from concrete first placed, minimum length equal to lap splice length indicated on the Drawings.

2. Where lap splice length is not indicated on the Drawings, then provide lap splice length as specified in ACI 318 and ACI 350 and this Division.

E. Welded Wire Fabric Reinforcement:
   1. Install necessary wiring, spacing chairs, or supports to keep welded wire fabric in place while concrete is being placed.
   2. Bend fabric as indicated on the Drawings or required to fit work.
   3. Unroll or otherwise straighten fabric to make perfectly flat sheet before placing in the Work.
   4. Lap splice welded wire fabric as indicated on the Drawings.
   5. If lap splice length is not indicated on the Drawings, splice fabric in accordance with ACI 318.

END OF SECTION

SECTION 03212

REINFORCING BAR COUPLERS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Reinforcing bar couplers.

1.02 REFERENCES

A. American Society of Testing and Materials (ASTM):
   1. A 615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement.
   2. A 706 - Specification for Low-Alloy Steel Deformed Bars for Concrete Reinforcement.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. Do not exceed the following total slip of the reinforcing bars within the splice sleeve after loading reinforcing bar in tension to 30,000 pounds per square inch and relaxing to 3,000 pounds per square inch, measured between gauge points clear of the splice sleeve:
      a. 0.010 inch for Number 14 reinforcing bars or smaller.
      b. 0.030 inch for Number 18 reinforcing bars.
   2. The splicing system and materials used in accordance with the manufacturer’s procedures shall develop in tension not less than the lesser of the following:
      a. 95 percent of the ultimate tensile strength of the reinforcing bar for ASTM A 615 and ASTM A 706 reinforcing bars.
      b. 160 percent of the specified yield strength of the reinforcing bar for ASTM A 615 and ASTM A 706 reinforcing bars.

1.04 SUBMITTALS

A. Submit the following information for each shipment of splice material:
   1. The type or series identification of the splice material. For sleeve-threaded type, the heat treatment lot number.
   2. The bar grade and size number to be spliced by the material.
   3. A copy of the manufacturer's catalog giving complete data on the splice material and procedures.
   4. A statement that the splicing systems and materials used in accordance with the manufacturer's procedures will develop the strength requirements, the total slip requirements, and other requirements in these specifications.

PART 2 PRODUCTS

2.01 MATERIALS

A. Reinforcing Bar Couplers: Mechanical butt splices of the sleeve-threaded type or the sleeve-swaged type, at the option of the CONTRACTOR.
   1. Sleeve-threaded Type of Reinforcing Bar Coupler:
      a. Steel splice sleeve with tapered interior threads that joins the reinforcing bars with matching tapered threads.
      b. Taper threads to such a degree that cross threading will not occur during assembly.
      c. Mark each splice sleeve with the heat treatment lot number.
      d. After completion of assembly of the splice, tighten splice to a torque value of not less than 200 foot pounds for all bar sizes.
   2. Sleeve-swaged type of reinforcing bar coupler: Seamless steel sleeve applied over the ends of the reinforcing bars and swaged to the bars by means of a hydraulic press.

PART 3 EXECUTION

3.01 INSTALLATION

A. Use reinforcing bar couplers where indicated on the Drawings or accepted by the ENGINEER.

B. Splice in accordance with the manufacturer's recommendations, except as modified in this section. Make splices using manufacturer's standard equipment, jigs, clamps, and other required accessories.

C. Cut ends of reinforcing bars to be spliced nominally square.

D. Provide clear cover over reinforcing bar couplers of not less than indicated on the Drawings or specified for the bars when measured from the surface of the concrete to the outside of the sleeve. Adjust stirrups, ties, and other reinforcement and place additional reinforcement if necessary to provide planned clear cover over reinforcement.

END OF SECTION

SECTION 03300

CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Cast-in-Place concrete.

B. Related Sections:
1. Section 03071 - Epoxies.
2. Section 03150 - Concrete Accessories.
3. Section 03366 - Tooled Concrete Finishes.
4. Section 03931 - Epoxy Injection System.
5. Section 07900 - Joint Sealers.

1.02 REFERENCES

A. American Concrete Institute (ACI):
1. 318 - Building Code Requirements for Structural Concrete.
2. 350 - Building Code Requirements for Structural Concrete.
3. Manual of Concrete Practice.
4. Recommended Practices.

B. American Society for Testing and Materials (ASTM):
1. C 31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field.
2. C 33 - Standard Specification for Concrete Aggregates.
3. C 39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
4. C 40 - Standard Test Method for Organic Impurities in Fine Aggregates for Concrete.
5. C 42 - Standard Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete.
6. C 88 - Standard Test Method of Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate.
7. C 94 - Standard Specification for Ready-Mixed Concrete.
8. C 114 - Standard Test Methods for Chemical Analysis of Hydraulic Cement.
9. C 131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine.
10. C 136 - Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
11. C 143 - Standard Test Method for Slump of Hydraulic Cement Concrete.
12. C 150 - Standard Specification for Portland Cement.
13. C 157 - Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete.
14. C 172 - Standard Practice for Sampling Freshly Mixed Concrete.
15. C 173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method.
16. C 203 - Standard Test Methods for Breaking Load and Flexural Properties of Block-Type Thermal Insulation.

17. C 227 - Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method).
18. C 260 - Standard Specification for Air-Entraining Admixtures for Concrete.
19. C 289 - Standard Test Method for Potential Alkali-Silica Reactivity of Aggregates (Chemical Method).
20. C 309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete.
21. C 311 - Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.
22. C 469 - Standard Test Method for Static Modulus of Elasticity and Poisson's Ratio of Concrete in Compression.
23. C 494 - Standard Specification for Chemical Admixtures for Concrete.
24. C 595 - Standard Specification for Blended Hydraulic Cements.
25. C 618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Portland-Cement Concrete.
26. D 75 - Standard Practices for Sampling Aggregates.

C. California Building Code (CBC):
   1. Chapter 19A - Concrete:
      a. Comply with all requirements, including those that are more stringent than stated herein.

1.03 DEFINITIONS

A. Alkali: Is defined to mean sum of sodium oxide and potassium oxide calculated as sodium oxide.

B. Hairline Crack: Crack with a crack width of less than 4 thousandths of an inch.

1.04 SYSTEM DESCRIPTION

A. Performance Requirements:
   1. General:
      a. Except as otherwise specified, provide concrete composed of portland cement, fine aggregate, coarse aggregate, and water so proportioned and mixed as to produce plastic, workable mixture in accordance with requirements as specified in this Section and suitable to specific conditions of placement.
      b. Proportion materials in manner such as to secure lowest water-cement ratio which is consistent with good workability, plastic, cohesive mixture, and one which is within specified slump range.
      c. Proportion fine and coarse aggregate in manner such as not to produce harshness in placing nor honeycombing in structures.
   2. Watertightness of Concrete Work: It is intent of this Section to secure for every part of the Work concrete and grout of homogeneous structure, which when hardened will have required strength, watertightness, and durability.
      a. It is recognized that some surface hairline cracks and crazing will develop in the concrete surfaces.
      b. Construction, contraction, and expansion joints have been positioned in structures as indicated on the Drawings, and curing methods specified, for purpose of reducing number and size of these expected cracks, due to

normal expansion and contraction expected from specified concrete mixes.

c. Class A, Class B, Class C, Class D and Class CE Concrete: Watertight: Repair cracks which develop in walls or slabs and repair cracks which show any signs of leakage until all leakage is stopped.

d. Pressure inject visible cracks, other than hairline cracks and crazing, in following areas with epoxy as specified in Section 03931.
   1) Floors and walls of water bearing structures.
   2) Walls and overhead slabs of passageways or occupied spaces, outsides of which are exposed to weather or may be washed down and are not specified to receive separate waterproof membrane.
   3) Other Items Not Specified to Receive Separate Waterproof Membrane: Slabs over water channels, wet wells, reservoirs, and other similar surfaces.

e. Walls or slabs, as specified above, that leak or sweat because of porosity or cracks too small for successful pressure grouting: Seal on water or weather side by coatings of surface sealant system, as specified in this Section.

f. Grouting and Sealing: Continue as specified above until structure is watertight and remains watertight for not less than one year after final acceptance or date of final repair, whichever occurs later in time.

3. Workmanship and Methods: Provide concrete work, including detailing of reinforcing, conforming with best standard practices and as set forth in ACI 318 and ACI 350, Manuals, and Recommended Practices.

1.05 SUBMITTALS

A. Product Data: Submit data completely describing products.

B. Information on Heating Equipment to Be Used for Cold Weather Concreting: Submit information on type of equipment to be used for heating materials and/or new concrete in process of curing during excessively cold weather.

C. For conditions that promote rapid drying of freshly placed concrete such as low Humidity, high temperature, and wind: Submit corrective measures proposed for use prior to placing concrete.

D. Copies of Tests of Concrete Aggregates: Submit certified copies in triplicate of commercial laboratory tests not more than 90 days old of all samples of concrete aggregates.
   1. Fine Aggregate:
      a. Clay lumps.
      b. Reactivity.
      c. Shale and chert.
      d. Soundness.
      e. Color.
      f. Decantation.
   2. Coarse Aggregate:
      a. Clay lumps and friable particles.
      b. Reactivity.
      c. Shale and chert.
      d. Soundness.

e. Abrasion loss.
f. Coal and lignite.
g. Materials finer than 200 sieve.

E. Sieve Analysis: Submit sieve analyses of fine and coarse aggregates being used in triplicate at least every 3 weeks and at any time there is significant change in grading of materials.

F. Concrete Mixes: Submit full details, including mix design calculations for concrete mixes proposed for use for each class of concrete.
1. Include information on correction of batching for varying moisture contents of fine aggregate.
2. Submit source quality test records with mix design submittal.
a. Include calculations for f'_{cr} based on source quality test records.

G. If There is Change in Aggregate Source, or Aggregate Quality from Same Source: Submit new set of design mixes covering each class of concrete.

H. Test Batch Test Data:
1. Submit data for each test cylinder.
2. Submit data that identifies mix and slump for each test cylinder.

I. Sequence of Concrete Placing: Submit proposed sequence of placing concrete showing proposed beginning and ending of individual placements.

J. Curing Compound Other than Specified Compound: Submit complete data on proposed compound.

K. Repair of Defective Concrete: Submit mix design for grout.

L. Acceptance of Method of Concrete Repair: Make no repair until the ENGINEER has accepted method of preparing surfaces and proposed method of repair.

M. If Either Fine or Coarse Aggregate Is Batched from More than One Bin: Submit analyses for each bin, and composite analysis made up from these, using proportions of materials to be used in mix.

N. Cement Mill Tests: Include alkali content, representative of each shipment of cement for verification of compliance with specified requirements.

O. Pozzolan Certificate of Compliance: Identify source of pozzolan and certify compliance with requirements of ASTM C 618.

P. Information on mixing equipment.

Q. Drying shrinkage test data.

R. Modulus of elasticity test data.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:

1. Deliver, store, and handle concrete materials in manner as to prevent damage and inclusion of foreign substances.
2. Deliver and store packaged materials in original containers until ready for use.
3. Deliver aggregate to mixing site and handle in such manner that variations in moisture content will not interfere with steady production of concrete of specified degree of uniformity and slump.

B. Acceptance at Site: Reject material containers or materials showing evidence of water or other damage.

1.07 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Hot Weather Concreting:
      a. When Ambient Air Temperature Is above 90 Degrees Fahrenheit: Prior to placing concrete, cool forms and reinforcing steel to by water cooling to below 90 degrees Fahrenheit.
      b. Temperature of Concrete Mix at Time of Placement: Keep temperature below 90 degrees Fahrenheit by methods which do not impair quality of concrete.
   2. Cold Weather Concreting:
      a. Concrete placed below ambient air temperature of 45 degrees Fahrenheit and falling or below 40 degrees Fahrenheit: Make provision for heating water.
      b. If materials have been exposed to freezing temperatures to degree that any material is below 35 degrees Fahrenheit: Heat such materials.
      c. Heating Water, Cement, or Aggregate Materials:
         1) Do not heat in excess of 160 degrees Fahrenheit.
      d. Protection of Concrete in Forms:
         1) Protect by means of covering with tarpaulins, or other acceptable covering.
         2) Provide means for circulating warm moist air around forms in manner to maintain temperature of 50 degrees Fahrenheit for at least 5 days.
   3. For conditions that promote rapid drying of freshly placed concrete such as low humidity, high temperature, and wind: Take corrective measures to minimize rapid water loss from concrete.
      a. Furnish and use sufficient number of maximum and minimum self-recording thermometers to adequately measure temperature around concrete.

1.08 SEQUENCING AND SCHEDULING

A. Schedule placing of concrete in such manner as to complete any single placing operation to construction, contraction, or expansion joint.

PART 2 PRODUCTS

2.01 MATERIALS

A. Aggregate:
   1. General:

a. Provide concrete aggregates that are sound, uniformly graded, and free of deleterious material in excess of allowable amounts specified.
b. Grade aggregate in accordance with ASTM D 75 and C 136.
c. Provide unit weight of fine and coarse aggregate which produces in place concrete with weight of not less than 140 pounds per cubic foot.

B. Fine Aggregate:
1. Provide fine aggregate for concrete or mortar consisting of clean, natural sand or of sand prepared from crushed stone or crushed gravel.
2. Do not provide aggregate having deleterious substances in excess of following percentages by weight of contaminating substances. In no case shall total exceed percent listed.

Item	**Test Method**	**Percent**
Removed by decantation (dirt, silt, etc.)	ASTM C 117	3
Shale or Chert	ASTM C 295	1
Clay Lumps	ASTM C 142	1

3. Except as otherwise specified, grade fine aggregate from coarse to fine in accordance with requirements of ASTM C 33.

C. Coarse Aggregate:
1. General: Provide coarse aggregate consisting of gravel or crushed stone made up of clean, hard, durable particles free from calcareous coatings, organic matter, or other foreign substances.
2. Weight: Not exceeding 15 percent, for thin or elongated pieces having length greater than 5 times average thickness.
3. Deleterious Substances: Not in excess of following percentages by weight, and in no case having total of all deleterious substances exceeding 2 percent.

Item	**Test Method**	**Percent**
Shale or chert	ASTM C 295	1
Coal and lignite	ASTM C 123	1/4
Clay lumps and friable particles	ASTM C 142	1/4
Materials finer than Number 200 sieve	ASTM C 117	1/2*
* Except when material finer than Number 200 sieve consists of crusher dust, maximum amount shall be 1 percent.		

4. Grading:
a. Aggregate: As specified in ASTM C 33, Size Number 57, except as otherwise specified or authorized in writing by the ENGINEER.
b. Aggregate for Class CE Concrete for Encasement of Electrical Conduits:
1) Graded as specified in ASTM C 33, Size Number 8.
2) Provide concrete utilizing this aggregate equal to Class C concrete in all other respects, and is designated as Class CE.

D. Portland Cement:

1. General: Conform to specifications and tests for ASTM C 150, Types II or III, Low Alkali, except as specified otherwise.
2. Low Alkali Portland: Have total alkali containing not more than 0.60 percent.
3. Exposed Concrete in Any Individual Structure: Use only one brand of portland cement.
4. Cement for Finishes: Provide cement from same source and of same type as concrete to be finished.

E. Admixtures:
   1. General:
      a. Do not use admixtures of any type, except as specified, unless written authorization has been obtained from the ENGINEER.
      b. Compatible with concrete and other admixtures.
      c. Do not use admixtures containing chlorides calculated as chloride ion in excess of 0.5 percent by weight.
      d. Use in accordance with manufacturer's recommendations and add each admixture to concrete mix separately.
   2. Air Entraining Admixture:
      a. Provide all concrete with 5 percent, plus or minus 1 percent, entrained air of evenly dispersed air bubbles at time of placement.
      b. Conform to ASTM C 260.
   3. Fly Ash Pozzolan Admixture:
      a. Pozzolan:
         1) Conforming to requirements of ASTM C 618, Class F, may be used as admixture in concrete made with Type II portland cement.
         2) Pozzolan may replace portland cement at ratio of 1.0 pound fly ash for each pound of portland cement replaced.
         3) Maximum of 15 percent by weight of minimum quantities of portland cement listed in Table A under paragraph 2.03E may be replaced with pozzolan.
         4) Do not use pozzolan as an admixture in concrete made with portland-pozzolan cement.
      b. Loss on Ignition for Pozzolan: Not exceed four percent.
   4. Water Reducing Admixture:
      a. May be used at the CONTRACTOR's option.
      b. Conform to ASTM C 494, Type A or Type D.
      c. Not contain air entraining agents.
      d. Liquid form before adding to the concrete mix.
      e. No decrease in cement is permitted as result of use of water reducing admixture.
   5. Superplasticizers: Are not to be used without acceptance by ENGINEER.

F. Water:
   1. Water for Concrete, Washing Aggregate, and Curing Concrete: Clean and free from oil and deleterious amounts of alkali, acid, organic matter, or other substances.
   2. Chlorides and Sulfate Ions:
      a. Water for Conventional Reinforced Concrete: Use water not containing more than 1,000 (mg/L) of chlorides calculated as chloride ion, nor more than 1,000 (mg/L) of sulfates calculated as sulfate ion.
      b. Water for Prestressed or Post-tensioned Concrete: Use water not containing more than 650 (mg/L)milligrams per liter of chlorides calculated

as chloride ion, nor more than 800 (mg/L) of sulfates calculated as sulfate ion.

G. Nonslip Abrasive:
   1. Type: Aluminum oxide abrasive of size 8/16, having structure of hard aggregate, homogenous, nonglazing, rustproof, and unaffected by freezing, moisture, or cleaning compounds.
   2. Manufacturers: One of the following or equal:
      a. Exolon Company, Tonawanda, New York.
      b. Abrasive Materials, Incorporated, Hillsdale, Michigan.

H. Concrete Sealer:
   1. Manufacturers: One of the following or equal:
      a. Hillyard Chemical Company, St. Joseph, Missouri, SEAL 341.
      b. A. C. Horn, Inc., Horn Clear Seal EM-180.

I. Conduit Encasement Coloring Agent:
   1. Color: Red color concrete used for encasement of electrical ducts, conduits, similar type items.
   2. Manufacturers: One of the following or equal.
      a. Frank D. Davis Company, Red Oxide Number 1117.
      b. I. Reiss Company, Inc., equivalent product.
   3. Conduit Encasement Concrete: Mix into each cubic yard of concrete 10 pounds of coloring agent.

J. Keyway Material: Steel, plastic, or lumber.

K. Sprayed Membrane Curing Compound: Clear type with fugitive dye conforming to ASTM C 309, Type 1D.

L. Surface Sealant System: Manufacturers: One of the following or equal:
   1. Radcon Laboratories, Inc., Las Vegas, Nevada, Formula Number 7.
   2. IPA Systems, Philadelphia, Pennsylvania, Duripal.

M. Evaporation Retardant:
   1. Manufacturers: One of the following or equal:
      a. Master Builders Technologies, Cleveland, Ohio, Confilm.
      b. Eucid Chemical Company, Cleveland, Ohio, Eucobar.

N. Plastic Membrane Curing: Use polyethylene film.
   1. Color: White
   2. Thickness: Minimum 6 mils.
   3. Loss of Moisture: Not exceed 0.055 grams per square centimeter of surface when tested in accordance with ASTM C156.

2.02 EQUIPMENT

A. Mixing Concrete:
   1. Mixers may be of stationary plant, paver, or truck mixer type.
   2. Provide adequate equipment and facilities for accurate measurement and control of materials and for readily changing proportions of material.
   3. Mixing Equipment:

a. Capable of combining aggregates, cement, and water within specified time into thoroughly mixed and uniform mass and of discharging mixture without segregation.
b. Maintain concrete mixing plant and equipment in good working order and operated at loads, speeds, and timing recommended by manufacturer or as specified.
c. Proportion cement and aggregate by weight.

B. Machine Mixing:
1. Batch plant shall be capable of controlling delivery of all material to mixer within 1 percent by weight of individual material.
2. If bulk cement is used, weigh it on separate visible scale which will accurately register scale load at any stage of weighing operation from zero to full capacity.
3. Prevent cement from coming into contact with aggregate or with water until materials are in mixer ready for complete mixing with all mixing water.
4. Procedure of mixing cement with sand or with sand and coarse aggregate for delivery to project site, for final mixing and addition of mixing water will not be permitted.
5. Retempering of concrete will not be permitted.
6. Discharge entire batch before recharging.
7. Volume of Mixed Material Per Batch: Not exceed manufacturer's rated capacity of mixer.
8. Mixers:
a. Perform mixing in batch mixers of acceptable type.
b. Equip each mixer with device for accurately measuring and indicating quantity of water entering concrete, and operating mechanism such that leakage will not occur when valves are closed.
c. Equip each mixer with device for automatically measuring, indicating, and controlling time required for mixing.
1) Interlock device to prevent discharge of concrete from mixer before expiration of mixing period.

C. Transit-mixed Concrete:
1. Mix and deliver in accordance with ASTM C 94.
2. Total Elapsed Time Between Addition of Water at Batch Plant and Discharging Completed Mix: Not to exceed 90 minutes or elapsed time at project site shall not exceed 30 minutes.
3. Under conditions contributing to quick setting, total elapsed time permitted may be reduced by the ENGINEER.
4. Equip each truck mixer with device interlocked so as to prevent discharge of concrete from drum before required number of turns and furnish such device that is capable of counting number of revolutions of drum.
5. Continuously revolve drum after it is once started until it has completely discharged its batch.
a. Do not admit water until drum has started revolving.
b. Right is reserved to increase required minimum number of revolutions or to decrease designated maximum number of revolutions allowed, if necessary, to obtain satisfactory mixing. The CONTRACTOR will not be entitled to additional compensation because of such increase or decrease.

D. Other Types of Mixers: In case of other types of mixers, mixing shall be as follows:

1. Mix concrete until there is uniform distribution of materials, and discharge mixer completely before recharging.
2. Neither speed nor volume loading of mixer shall exceed manufacturer's recommendations.
3. Continue mixing for minimum of 1-1/2 minutes after all materials are in drum, and for batches larger than one cubic yard increase minimum mixing time 15 seconds for each additional cubic yard or fraction thereof.

2.03 MIXES

A. Measurements of Materials:
   1. Measure materials by weighing, except as otherwise specified or where other methods are specifically authorized in writing by the ENGINEER.
   2. Furnish apparatus for weighing aggregates and cement that is suitably designed and constructed for this purpose.
   3. Accuracy of Weighing Devices: Furnish devices that have capability of providing successive quantities of individual material that can be measured to within one percent of desired amount of that material.
   4. Measuring or Weighing Devices: Subject to review by the ENGINEER, and bear valid seal of the Sealer of Weights and Measures having jurisdiction.
   5. Weighing Cement:
      a. Weigh cement separately.
      b. Cement in Unbroken Standard Packages (Sacks): Need not be weighed.
      c. Bulk Cement and Fractional Packages: Weigh such cement.
   6. Mixing Water: Measured by volume or by weight.

B. Concrete Proportions and Consistency:
   1. Concrete Consistency and Composition:
      a. Provide concrete that can be worked readily into corners and angles of forms and around reinforcement without excessive vibration and without permitting materials to segregate or free water to collect on surface.
      b. Prevent unnecessary or haphazard changes in consistency of concrete.
   2. Ratio of Coarse Aggregate to Fine Aggregate: Not less than 1.0 nor more than 2.0 for all concrete Classes, with exception of Class CE.
   3. Aggregate:
      a. Obtain aggregate from source which is capable of providing uniform quality, moisture content, and grading during any single day's operation.
   4. Concrete Mix Water to Cement Ratio, Minimum Cement Content, and Slump Range: Conform to values specified in Table A in this Section.
   5. Concrete Batch Weights: Control and adjust so as to secure maximum yield, and at all times maintain proportions of concrete mix within specified limits.
   6. Mixture Modification: If required, by the ENGINEER, modify mixture within limits set forth in this Section.

C. Concrete Mixes:
   1. Proportioning of Concrete Mix: Proportion mixes on required average on compressive strength f'_{cr} as defined in Subparagraph 2.04A2.
   2. Mixes:
      a. Adjusting of Water: After acceptance, do not change mixes without acceptance by ENGINEER, except that at all times adjust batching of water to compensate for free moisture content of fine aggregate.

b. Total Water Content of Each Concrete Class: Not exceed those specified in Table A in this Section.
c. Checking Moisture Content of Fine Aggregate: Furnish satisfactory means at batching plant for checking moisture content of fine aggregate.

3. Change in Mixes: Undertake new trial batch and test program as specified in this Section.

D. Hand Mixed Concrete:
1. Hand mix concrete only when acceptable to the ENGINEER.
2. Prepare hand mixed concrete on watertight, level platform in batches not to exceed 1/3 cubic yard each.
3. Aggregate:
a. First spread required amount of coarse aggregate on platform in an even and uniform layer, and then over such aggregate spread proper proportion of fine aggregate.
b. Combined Depth of Both Such Layers: Not be greater than one foot.
4. Cement:
a. First evenly spread required quantity of cement over fine aggregate.
b. Then turn entire batch with shovels at least twice before adding water.
5. Water:
a. Then uniformly sprinkle or spray proper amount of water over batched materials.
b. Then turn with shovels not less than three times before being removing from platform.

E. Classes of Concrete:
1. Provide concrete consisting of 5 classes, referred herein as Classes A, B, C, D, and CE specified in this Section and use where specified or indicated on the Drawings.
2. Weight of Concrete Classes: Provide classes of concrete having minimum weight of 140 pounds per cubic foot.
3. Class B Concrete: Class B concrete may be substituted for Class A concrete, when high-early strength concrete is needed in areas specifically accepted by the ENGINEER and that do not require sulfate resistant concrete.
4. Class C Concrete: Class C concrete may be used for fill for unauthorized excavation, for thrust blocks and ground anchors for piping, for bedding of pipe, and where indicated on the Drawings.
5. Class D Concrete: Use Class D for precast concrete items.
6. Class CE Concrete: Use Class CE for electrical conduit encasements.
7. All other concrete, unless specified or otherwise indicated on the Drawings: Use Class A concrete.

"TABLE A"
CONCRETE
WITH AIR ENTRAINMENT

Class	Specified Compressive Strength f'_c at 28 Days (Pounds per Square Inch)	Maximum NetWater to Cement Ratio	Minimum Cement per Cubic Yard of Concrete by Weight (Pounds)	Slump Range (Inches)
A	4,000	0.45	564	2 to 4*

B (Type III cement)	4,000	0.45	564	2 to 4*
C	2,500	0.62	423	3 to 6
D	4,500	0.45	658	2 to 4
CE	2,500	0.62	564	3 to 6
* NOTE: Slump for slabs, decks, walks, and beams shall be not more than 3-1/2 inches."				

8. Pumped Concrete: Provide pumped concrete that complies with all requirements of this Section.
9. Do not place concrete with slump outside limits indicated in Table A.
10. Classes:
    a. Classes A, C, D, and CE Concrete: Make with Type II low alkali cement.
    b. Class B Concrete: Make with Type III low alkali cement.
    c. Admixtures: Provide admixtures as specified in this Section.

F. Air Entraining Admixture:
1. Add agent to batch in portion of mixing water.
2. Batch solution by means of mechanical batcher capable of accurate measurement.

2.04 SOURCE QUALITY CONTROL

A. Tests:
1. Concrete Mixes:
    a. After concrete mixes have been accepted by ENGINEER, have trial batches of the accepted Class A, Class B, and Class D concrete mix designs prepared by testing laboratory acceptable to the ENGINEER.
    b. Prepare trial batches by using specified cement and aggregates proposed to be used for the Work.
    c. Trial Batches: Provide batches of sufficient quantity to determine slump, workability, consistency, and finishing characteristics, and to provide sufficient test cylinders.
    d. Test Cylinders: Provide cylinders having six inch diameter by 12 inch length and that are prepared in accordance with ASTM C 31 for tests specified in this Section.
    e. Determine slump in accordance with ASTM C 143.
    f. Test Cylinders from Trial Batch:
        1) Test 8 cylinders for compressive strength in accordance with ASTM C 39.
            a) Test 4 cylinders at 7 days and 4 at 28 days.
            b) Establish ratio between 7 day and 28 day strength for mix. Seven day strength may be taken as satisfactory indication of 28 day strength provided effects on concrete of temperature and humidity between 7 day and 28 day are taken into account.
        2) Average Compressive Strength of 4 Test Cylinders Tested At 28 Days: Equal to or greater than required average compressive strength f'cr on which concrete mix design is based.
    g. Drying Shrinkage:
        1) Prepare 5 drying shrinkage specimens in accordance with ASTM C 157, except as modified herein.

2) Remove drying shrinkage specimens from molds at age of 23 hours plus or minus 1 hour after trial batching, then immediately place them in water at 73 degrees Fahrenheit plus or minus 3 degrees for at least 30 minutes and then measure specimens within 30 minutes thereafter to determine original length. Then submerge specimens in saturated lime water at 73 degrees Fahrenheit plus or minus three degrees for moist curing.
3) Make measurement to determine expansion expressed as percentage of original length at age 7 days. Use length at age 7 days as base length for drying shrinkage calculations.
4) Immediately store specimens in humidity controlled room maintained at 73 degrees Fahrenheit plus or minus 3 degrees and 50 percent plus or minus 4 relative humidity for remainder of test.
5) Make and report measurements to determine shrinkage expressed as percentage of base length separately for 7, 14, 21, and 28 days of drying after 7 days of moist curing.
6) Drying Shrinkage Deformation:
    a) Measure drying shrinkage deformation of each specimen as difference between base length and length after drying at each test age.
    b) Measure average drying shrinkage deformation of specimens to nearest 0.0001 inch at each test age.
    c) If drying shrinkage of any specimen departs from average of test age by more than 0.0004 inch, disregard results obtained from that specimen and test another specimen.
    d) Shrinkage of trial batch concrete at 28 days drying age shall not exceed 0.045 percent maximum.

h. If trial batch tests do not meet specified requirements for slump, strength, workability, consistency, drying shrinkage, and finishing, change concrete mix design proportions and, if necessary, source of aggregate. Make additional trial batches and tests until an acceptable trial batch is produced that meets requirements of this Section.
i. Perform test batches and tests required to establish trial batches and acceptability of materials without change in Contract Price.
j. Do not place concrete until the concrete mix design and trial batch have been accepted by ENGINEER.

2. Required Average Compressive Strength:
    a. Determine required average compressive strength (f'_{cr}) for selection of concrete proportions for mix design, for each class of concrete, using calculated standard deviation and its corresponding specified compressive strength f'c, in accordance with ACI 318, Part 3, Chapter 5.
    b. When test records of at least 30 consecutive tests that span period of not less than 45 calendar days are available, establish standard deviation as described in ACI 318, Part 3, Chapter 5 and as modified as follows herein.
    c. Provide test records from which to calculate standard deviation that represent materials, quality control procedures, and conditions similar to materials, quality control procedures, and conditions expected to apply in preparation of concrete for the Work.
    d. Provide changes in materials and proportions within test records that are more restricted than those for the Work.
    e. Specified Compressive Strength (f'_c) of Concrete Used in Test Records: Within 1,000 pounds per square inch of that specified for the Work.

f. When lacking adequate test records for calculation of standard deviation meeting requirements, determine required average compressive strength f'cr from following Table B.

TABLE B	
Specified Compressive Strength f'_c (pounds per square inch)	Required Average Compressive Strength f'_{cr} (pounds per square inch)
Less than 3,000	f'_c + 1,000
3,000 to 5,000	f'_c + 1,200
Over 5,000	f'_c + 1,400

3. Pozzolan:
   a. Sampling and Testing:
      1) Sample and test pozzolan in accordance with ASTM C 311.
      2) In Computing Water to Cement Ratio And Cement Content Per Cubic Yard Of Concrete: Consider cement weight to be weight of portland cement plus 100 percent of weight of fly ash.
4. Aggregate:
   a. Testing of concrete aggregate is at CONTRACTOR's expense.
   b. Sieves:
      1) Use sieves with square openings for testing grading of aggregates.
      2) Sieve Analyses: If sieve analyses indicate significant change in materials, the ENGINEER may require that new mix design be submitted and accepted before further placing of concrete.
   c. Sample aggregate in accordance with ASTM D 75 and C 136.
   d. Fine Aggregate:
      1) Provide fine aggregate not containing strong alkali nor organic matter which gives color darker than standard color when tested in accordance with ASTM C 40.
      2) Provide aggregate having soundness complying with requirements of ASTM C 33 when tested in accordance with ASTM C 88.
      3) Provide aggregate complying with reactivity requirements of ASTM C 33 when tested in accordance with ASTM C 289.
   e. Coarse Aggregate:
      1) Soundness when tested in accordance with ASTM C 88: Have loss not greater than 10 percent when tested with sodium sulfate.
      2) Abrasion Loss: Not exceed 45 percent after 500 revolutions when tested in accordance with ASTM C 131.
      3) Reactivity: Not exceed limits specified in Appendix of ASTM C 33 when tested in accordance with ASTM C 289.
   f. Portland Cement:
      1) Determination Alkali Content: Determine by method set forth in ASTM C 114.

PART 3 EXECUTION

3.01 INSTALLATION

A. Under conditions which result in rapid evaporation of moisture from the surface of the concrete, immediately after the concrete has been screeded, coat the surface of the concrete with a liquid evaporation retardant. Apply the evaporation retardant again after each work operation as necessary to prevent drying shrinkage cracks. Conditions which result in rapid evaporation of moisture may include one or more of the following:
   1. Low humidity.
   2. Windy conditions.
   3. High temperature.

B. Surface Sealant System: Apply as recommended by manufacturer published instructions. Where concrete continues to sweat or leak, apply additional coats of surface sealant until the sweating or leaks stop.

C. Joints and Bonding:
   1. As far as practicable construct concrete work as monolith.
   2. Locations of contraction, construction, expansion, and other joints are indicated on the Drawings or as specified in this Section.
   3. Construction Joints:
      a. Where construction joints are not indicated on the Drawings, provide slabs and walls with construction joints at intervals not greater than 30 feet.
      b. In order to preserve strength and watertightness of structures, make no other joints, except as authorized the ENGINEER.
      c. At construction joints, thoroughly clean concrete of laitance, grease, oil, mud, dirt, curing compounds, mortar droppings, or other objectionable matter by means of heavy sandblasting, and wash surfaces just prior to succeeding concrete placement.
      d. At Horizontal Joints: Immediately prior to resuming concrete placing operations, thoroughly spread bed of grout not less than 1/2 inch in thickness nor more than 1 inch in thickness over horizontal joint surfaces.
   4. Keyways in Joints:
      a. Provide keyways in joints as indicated on the Drawings.
      b. Treat lumber keyway material with form release coating, applied in accordance with manufacturer's instructions.
   5. Take special care to ensure that concrete is well consolidated around and against waterstops and that waterstops are secured in proper position.
   6. Cleaning of Construction Joints:
      a. Wash construction joints free of sawdust, chips, and other debris after forms are built and immediately before concrete or grout placement.
      b. Should formwork confine sawdust, chips, or other loose matter in such manner that it is impossible to remove them by flushing with water, use vacuum cleaner for their removal, after which flush cleaned surfaces with water.
      c. Provide cleanout hole at base of each wall and column for inspection and cleaning.
   7. Expansion, Contraction, and Construction Joints
      a. Constructed where and as indicated on the Drawings.

b. Waterstops, Expansion Joint Material, Synthetic Rubber Sealing Compound, and Other Similar Materials: As specified in Sections 03150 and 07900.

8. Repair of Concrete: Where it is necessary to repair concrete by bonding mortar or new concrete to concrete which has reached its initial set, first coat surface of set concrete with epoxy bonding agent as specified in Section 03071.

D. Conveying and Placing Concrete:
1. Convey concrete from mixer to place of final deposit by methods which prevent separation or loss of materials.
2. Use equipment for chuting, pumping, and conveying concrete of such size and design as to ensure practically continuous flow of concrete at delivery end without separation of materials.
3. Design and use chutes and devices for conveying and depositing concrete that direct concrete vertically downward when discharged from chute or conveying device.
4. Keep equipment for conveying concrete thoroughly clean by washing and scraping upon completion of any day's placement.

E. Placing Concrete:
1. Place no concrete without prior authorization of the ENGINEER.
2. Do Not Place Concrete Until:
   a. Reinforcement is securely and properly fastened in its correct position and loose form ties at construction joints have been retightened.
   b. Dowels, bucks, sleeves, hangers, pipes, conduits, bolts, and any other fixtures required to be embedded in concrete have been placed and adequately anchored.
   c. Forms have been cleaned and oiled as specified.
3. Placement of concrete in which initial set has occurred, or of retempered concrete, will not be permitted.
4. Place no concrete during rainstorms or high velocity winds.
5. Protect concrete placed immediately before rain to prevent water from coming in contact with such concrete or winds causing excessive drying.
6. Keep sufficient protective covering on hand at all times for protection of concrete.
7. After acceptance, adhere to proposed sequence of placing concrete, except when specific changes are requested and accepted by the ENGINEER.
8. Notify the ENGINEER in writing of readiness, not just intention, to place concrete in any portion of the work.
   a. Provide this notification in such time in advance of operations as the ENGINEER deems necessary to make final inspection of preparations at location of proposed concrete placing.
   b. Place forms, steel, screeds, anchors, ties, and inserts in place before notification of readiness is given to the ENGINEER.
   c. Depositing Concrete:
      1) Deposit concrete at or near its final position to avoid segregation caused by rehandling or flowing.
      2) Do not deposit concrete in large quantities in one place and work along forms with vibrator or by other methods.
      3) Do not drop concrete freely into place from height greater than 5 feet.
      4) Use tremies for placing concrete where drop is over 5 feet.

5) Commence placement of concrete on slopes, at bottom of slope.

9. Place concrete in approximately horizontal layers not to exceed 24 inches in depth and bring up evenly in all parts of forms.
10. Continue concrete placement without avoidable interruption, in continuous operation, until end of placement is reached.
11. If more than 20 minutes lapse prior to placement of new concrete over concrete previously placed, reduce depth of layers being placed at one time, and/or increase placing equipment, until it is possible to return with placing operation to previously placed concrete within 20 minutes.
12. If concrete is to be placed over previously placed concrete and more than 20 minutes have elapsed, then spread layer of grout not less than 1/2 inch in thickness nor more than 1 inch in thickness over surface before placing additional concrete.
13. Placement of Concrete for Slabs, Beams, or Walkways:
    a. If cast monolithically with walls or columns, do not commence until concrete in walls or columns has been allowed to set and shrink.
    b. Allow set time of not less than one hour for shrinkage.

F. Consolidating Concrete:
1. Place concrete with aid of acceptable mechanical vibrators.
2. Thoroughly consolidate concrete around reinforcement, pipes, or other shapes built into the work.
3. Provide sufficiently intense vibration to cause concrete to flow and settle readily into place and to visibly affect concrete over radius of at least 18 inches.
4. Vibrators:
    a. Keep sufficient vibrators on hand at all times to vibrate concrete as placed.
    b. In addition to vibrators in actual use while concrete is being placed, have on hand minimum 1 spare vibrator in serviceable condition.
    c. Place no concrete until it has been ascertained that all vibrating equipment, including spares, are in serviceable condition.
5. Take special care to place concrete solidly against forms so as to leave no voids.
6. Take every precaution to make concrete solid, compact, and smooth, and if for any reason surfaces or interiors have voids or are in any way defective, repair such concrete in manner acceptable to the ENGINEER.

G. Footings and Slabs on Grade:
1. Do not place concrete on ground or compacted fill until subgrade is in moist condition acceptable to the ENGINEER.
2. If necessary, sprinkle subgrade with water not less than 6 nor more than 20 hours in advance of placing concrete.
3. If it becomes dry prior to actual placing of concrete, sprinkle again, without forming pools of water.
4. Place no concrete if subgrade is muddy or soft.

H. Loading Concrete:
1. Green Concrete:
    a. No heavy loading of green concrete will be permitted.
    b. Green concrete is defined as concrete with less than 100 percent of the specified strength.

2. No backfill shall be placed against concrete walls until the concrete has reached the specified strength and the connecting slabs and beams have been cast and have reached the specified strength.
3. Use construction methods, sequencing, and allow time for concrete to reach adequate strength to prevent overstress of the concrete structure during construction.

I. Curing Concrete:
   1. General:
      a. Cure concrete by methods specified in this Section.
      b. Cure concrete minimum of 7 days.
      c. Cure concrete to be painted with water or plastic membrane.
      d. Do not use curing compound on concrete surfaces that are to receive paint or upon which any material is to be bonded.
      e. Water cure or plastic membrane cure concrete slabs which are specified to be sealed by concrete sealer.
      f. Cure other concrete by water curing or sprayed curing membrane at the CONTRACTOR's option.
      g. Floor slabs may be cured using plastic membrane curing.
   2. Water Curing:
      a. Keep surfaces of concrete being water cured constantly and visibly moist day and night for period of not less than 7 days.
      b. Each day forms remain in place may count as 1 day of water curing.
      c. No further curing credit will be allowed for forms in place after contact has once been broken between concrete surface and forms.
      d. Do not loosen form ties during period when concrete is being cured by leaving forms in place.
      e. Flood top of walls with water at least 3 times per day, and keep concrete surfaces moist at all times during 7 day curing period.
   3. Sprayed Membrane Curing:
      a. Apply curing compound to concrete surface after repairing and patching, and within 1 hour after forms are removed.
      b. If more than 1 hour elapses after removal of forms, do not use membrane curing compound, but apply water curing for full curing period.
      c. If surface requires repairing or painting, water cure such concrete surfaces.
      d. Curing Compound:
         1) Do not remove curing compound from concrete in less than 7 days.
         2) Curing compound may be removed only upon written request by the CONTRACTOR and acceptance by the ENGINEER, stating what measures are to be performed to adequately cure structures.
         3) Take care to apply curing compound in area of construction joints to see that curing compound is placed within construction joint silhouette.
         4) Remove curing compound placed within construction joint silhouette by heavy sandblasting prior to placing any new concrete.
         5) CONTRACTOR's Option: Instead of using curing compound for curing of construction joints such joints may be water cured.
         6) Apply curing compound by mechanical, power operated sprayer and mechanical agitator that will uniformly mix all pigment and compound.
         7) Apply compound in at least 2 coats.

8) Apply each coat in direction 90 degrees to preceding coat.
9) Apply compound in sufficient quantity so that concrete has uniform appearance and that natural color is effectively and completely concealed at time of spraying.
10) Continue to coat and recoat surfaces until specified coverage is achieved and until coating film remains on concrete surfaces.
11) Thickness and Coverage of Compound: Provide compound having film thickness that can be scraped from surfaces at any and all points after drying for at least 24 hours.
12) The CONTRACTOR is cautioned that method of applying curing compound specified herein may require more compound than normally suggested by manufacturer of compound and also more than is customary in the trade.
13) Apply amounts specified herein, regardless of manufacturer's recommendations or customary practice, if curing compound is used in place of water curing.
14) If the CONTRACTOR desires to use curing compound other than specified compound, coat sample areas of concrete wall with proposed compound and also similar adjacent area with specified compound in specified manner for comparison.
    a) If proposed sample is not equal or better, in opinion of the ENGINEER, in all features, proposed substitution will not be allowed.
15) Prior to final acceptance of the work, remove, by sandblasting or other acceptable method, any curing compound on surfaces exposed to view, so that only natural color of finished concrete is visible uniformly over entire surface.

4. Plastic Membrane Curing:
   a. Polyethylene film may be used to cure slabs. Seal joints and edges with small sand berm.
   b. Install plastic membrane as soon as concrete is finished and can be walked on without damage.
   c. Keep concrete moist under plastic membrane.

3.02 CONCRETE FINISHING

A. Provide concrete finishes in accordance with Section 03366 and the Concrete Finish Schedule indicated on the Drawings.

B. Edges of Joints:
   1. Provide joints having edges as indicated on the Drawings.
   2. Protect wall and slab surfaces at edges against concrete spatter and thoroughly clean upon completion of each placement.

C. Concrete Sealer:
   1. Floors and Slabs to Receive Sealer: As specified in DIVISION 9 on finish schedule.
   2. Floors and Slabs to Receive Sealer: As specified in DIVISION 9.
   3. Seal Floors and Slabs at CONTRACTOR's Option:
      a. All Floor Slabs Except for the Following:
         1) Those indicated on the Drawings to receive seamless Floor surfacing.

2) Any slabs which receive concrete or grout surfacing, in lieu of water or curing compound.

4. Apply Sealant:
   a. Apply sealant at coverage rate not to exceed 500 square feet per gallon.
   b. Apply as soon as slab or floor will bear weight.
   c. Sealer:
      1) Before applying sealer, sweep entire surface clean with very soft bristled brush which will not mark finish.
      2) Apply sealer with large, clean, mop type applicator.
      3) Paint rollers are not acceptable.
      4) Workmen shall wear flat soled shoes which will not mark or scar surface.
      5) Do not allow traffic on floors and slabs until sealer has dried and hardened.

3.03 FIELD QUALITY CONTROL

A. Testing of Concrete:
   1. During progress of construction, the CONTRACTOR shall will have tests made to determine whether the concrete, as being produced, complies with requirements specified.
   2. Tests will be performed in accordance with ASTM C 31, ASTM C 39, and ASTM C 172.
   3. The CONTRACTOR shall will make and deliver test cylinders to the laboratory and testing expense will be borne by the CONTRACTOR.
   4. Required Number Cylinders:
      a. Not less than 3 cylinder specimens, 6 inch diameter by 12 inch long, will be tested for each 150 cubic yards of each class of concrete with minimum of 3 three specimens for each class of concrete placed and not less than 3 specimens for each half day's placement.
      b. One cylinder will be broken at 7 days and 2 at 28 days.
   5. The CONTRACTOR shall:
      a. Test slump of concrete using slump cone in accordance with requirements of ASTM C 143.
      b. Furnish test equipment.
      c. Do not use concrete that does not meet specification requirements in regards to slump, but remove such concrete from project site.
      d. Test slump at the beginning of each placement, as often as necessary to keep slump within the specified range, and when requested to do so by the ENGINEER.
      e. Make provisions for and furnish concrete for test specimens, and provide manual assistance to the ENGINEER in preparing said specimens.
      f. Assume responsibility for care of and providing of curing conditions for test specimens in accordance with ASTM C 31.

B. Air Entraining Admixture:
   1. Test percent of entrained air in concrete at beginning of each placement, as often as necessary to keep entrained air within specified range, and when requested to do so by the ENGINEER.
   2. Provide test equipment.
   3. Do not use concrete that does not meet Specification requirements as to air entrainment and shall remove such concrete from project site.

4. Test air entrainment in concrete in accordance with ASTM C 173.
5. The ENGINEER may at any time test percent of entrained air in concrete received on project site.

C. Enforcement of Strength Requirement:
   1. Concrete is expected to reach higher compressive strength than that which is indicated in Table A as specified compressive strength f'c.
   2. Strength Level of Concrete: Will be considered acceptable if following conditions are satisfied.
      a. Averages of all sets of 3 consecutive strength test results is greater or equal to specified compressive strength f'c.
      b. No individual strength test (average of 2 cylinders) falls below specified compressive strength f'c by more than 500 pounds per square inch.
      c. Whenever one, or both, of 2 conditions stated above is not satisfied, provide additional curing of affected portion followed by cores taken in accordance with ASTM C 42 and ACI 318 and comply with following requirements:
         1) If additional curing does not bring average of 3 cores taken in affected area to at least specified compressive strength f'c, designate such concrete in affected area as defective.
         2) The ENGINEER may require the CONTRACTOR to strengthen defective concrete by means of additional concrete, additional reinforcing steel, or replacement of defective concrete, all of the CONTRACTOR's expense.

3.04 ADJUSTING

A. Repair of Defective Concrete:
   1. Remove and replace or repair defective work.
   2. Correct defective work as specified in this Article.
   3. Do not patch, repair, or cover defective work without inspection by the ENGINEER.
   4. Provide repairs having strength equal to or greater than specified concrete for areas involved.
      a. Chip out and key imperfections in the work and make them ready for repair.
   5. Dry Pack Method:
      a. Dry Pack Method: Use for holes having depth nearly equal to or greater than least surface dimension of hole, for cone-bolt, and narrow slots cut for repair.
      b. Smooth Holes: Clean and roughen by heavy sandblasting before repair.
   6. Mortar Method of Replacement: Use for following:
      a. Holes too wide to dry pack and too shallow for concrete replacement.
      b. Comparatively shallow depressions, large or small, which extend no deeper than reinforcement nearest surface.
   7. Concrete Replacement:
      a. Use: When holes extend entirely through concrete section or when holes are more than 1 square foot in area and extend halfway or more through the section.
      b. Method of Repair for Surfaces of Set Concrete to Be Repaired: First coat with epoxy bonding agent.
   8. Acceptable Method of Concrete Repair:

a. Make no repair until the ENGINEER has accepted method of preparing surfaces and proposed method of repair.

END OF SECTION

SECTION 03360

CONTACT GROUTING

PART 1 GENERAL

1.01 SUMMARY

A. The Work specified in this Section includes requirements for contact grouting the annular space outside the reinforced concrete pipe after microtunneling installations are complete.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 02441 - Microtunneling.

1.03 REFERENCE SPECIFICATIONS, CODES, AND STANDARDS

A. Commercial Standards:
   1. ASTM C 31 Practice for Making and Curing Concrete Test Specimens in the Field.
   2. ASTM C 39 Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens.
   3. ASTM C 94 Specifications for Ready Mix Concrete.
   4. ASTM C 109 Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (using two-inch or 50-mm cube specimens).
   5. ASTM C 144 Specification for Aggregate for Masonry Mortar.
   6. ASTM C 150 Specification for Portland Cement.
   7. ASTM C 937 Standard Specification for Grout Fluidifier for Preplaced-Aggregate Concrete.

1.04 DESIGN CRITERIA

A. All voids between the outside of the microtunneled pipe and the excavation surface and between the outside of the pipe and the inside of the tunnel lining shall be completely filled with grout.

B. Grout Composition: Grout shall consist of Portland cement, not more than 2 percent bentonite by weight of cement, fluidifier as necessary, and water in the proportions specified herein or as approved by the ENGINEER. Sand may be added to the grout mix in instances of very high grout takes as approved by the ENGINEER, but in no case shall the grout mix contain less than six sacks of cement per cubic yard of grout. The addition of sand may require additional water or fluidifier to be added to the grout mix.
   1. Grout mix (water/cement) ratios shall be expressed in cubic feet of water per cubic foot of cement (94 lb bag). The water-cement ratio by volume shall be varied as needed to fill the voids outside the pipe. The range of water-cement ratios shall be between 1:1 and 2:1 by volume.
   2. Recirculate grout mixes when any new mix is batched or after adding water, fluidifier, or sand to mix. Recirculate mix for at least two minutes prior to pumping grout into grout hole.

1.05 CONTRACTOR SUBMITTALS

A. Submit the following in accordance with the requirements of Section 01300.
   1. Work Plan and Methods:
      a. Work plan including contact grouting methods and details of equipment and grouting procedures and sequences including injection pressures, monitoring and recording equipment, pressure gauge calibration data, methods of controlling grout pressure, method of transporting grouting equipment and materials within the pipe, and provisions to protect pipe lining, for each type of contact grouting required.
      b. Details of grout mix proportions; admixtures, including manufacturers literature, and laboratory test data verifying the strength of the proposed grout mix.
   2. Reports and Records:
      a. Maintain and submit daily logs of grouting operations, including pressures, volumes, and grout mix pumped, and time of pumping.

1.06 QUALITY ASSURANCE

A. Grout Strength Tests. Prepare samples for 24 hour and 28 day compressive strength tests according to ASTM C 31 for cylinders or ASTM C 109 for cubes. Cylinder molds shall be at least two inches in diameter and four inches long. Grout cubes shall be either two inches or 50 millimeters square. Test samples according to ASTM C 39 or C 109 as applicable. Grout for the cylinders or cubes shall be taken from the nozzle of the grout injection line. Provide at least one set of four (4) samples for each 100 cubic feet that grout is injected but not less than one set for each grouting shift, unless directed otherwise by the ENGINEER.

PART 2 PRODUCTS

2.01 MATERIALS

A. Cement. Cement shall be Type II or Type V Portland cement conforming to ASTM C 150. Type II cement shall meet Table 4 false set requirements of ASTM C 150.

B. Bentonite. Bentonite shall be a commercially processed powdered bentonite, Wyoming type, such as Baroid Quick Gel, Imacco-gel, Black Hills, or equal.

C. Sand. Conform to ASTM C 144 except where modified in the following subparagraphs.
   1. Fineness modulus: Between 1.50 and 2.00.
   2. Grading requirements:

Sieve Sizes	Percentage Passing by Weight
No. 8	100
No. 16	95 - 100
No. 30	60 - 85
No. 50	20 - 50
No. 100	10 - 30
No. 200	0 - 5

D. Fluidifier:
   1. Fluidifiers shall hold the solid constituents of the grout in colloidal suspension, be compatible with the cement and water used in the grouting work, contain an expansive shrinkage compensator, and comply with the requirements of ASTM C 937.
   2. Use CELBEX 209X manufactured by CELTITE, Inc., or approved equal.

E. Admixtures: Other admixtures may be used subject to the approval of the ENGINEER to improve the pumpability, to control set time, to hold sand in suspension, and to prevent segregation and bleeding.

F. Compressive Strength: Minimum strength of 10 psi in 24 hours, 50 psi in 28 days.

2.02 EQUIPMENT

A. Equipment for mixing and injecting grout shall be adequate to satisfactorily mix and agitate the grout and force it into the grout holes, in a continuous flow at the desired pressure. Pumps shall be capable of continuously developing a sustained pressure of 15 pounds per square inch in excess of existing earth and groundwater pressures, at the grout hole connection.

B. Two pressure gauges shall be provided, one at the grout pump and one at the collar of each hole being grouted. The accuracy of the gauges shall be periodically checked with an accurately calibrated pressure gauge. An adequate supply of spare pressure gauges shall be available on site at all times.

C. Suitable stop valves shall be provided at the collar of each hole for use in maintaining pressure as required until the grout has set.

D. The grouting equipment shall be provided with a meter to determine the volume of grout injected. The meter shall be calibrated in cubic feet to the nearest one-tenth of a cubic foot.

E. The grouting equipment shall be maintained in satisfactory operating condition throughout the course of the work to ensure continuous and efficient performance during grouting operations.

F. Grout hoses shall have an inside diameter not less than 1-1/2 inches nor greater than 2 inches and capable of withstanding the maximum water and grout pressures to be used.

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Commence contact grouting immediately following completion of microtunneling installations performed in accordance with Section 02441, “Microtunneling.”

B. Grout ports shall be provided in jacking, pipes at intervals no greater than 10 feet. Contact grounding ports shall be installed by the pipe manufacturer in the pipe before the pipe is jacked into place. Drilling grout ports through the pipe shall not be permitted. Grout ports shall be threaded to accept valve fittings and plugs.

C. Contact grout shall be used to fill any voids outside the pipe and between the tunnel initial supports and the ground. Contact grouting shall be performed as shown on the Drawings and as specified herein. An attempt shall be made to pump grout at every grout hole or coupling unless approval is granted by the ENGINEER to skip selected holes.

D. Inject grout through the grout connections in such a manner as to completely fill all voids outside the pipe resulting from microtunneling operations. Grout pressure shall be controlled so as to avoid damaging the pipe, and to avoid movement of the surrounding ground or improvements.

E. Grout Mixes: Develop one or more grout mixes designed to completely fill the voids outside the pipe and to provide acceptable strength. Make four (4) samples of each proposed grout mix and determine 24 hour and 28 day strength in accordance with ASTM C39 or C109. All grout mix proportions shall be subject to review and acceptance by the ENGINEER.

3.02 MIXING AND INJECTION OF GROUT

A. All materials shall be free of lumps when put into the mixer and the grout mix shall be constantly agitated. Grout shall flow unimpeded and shall completely fill all voids. Grout not injected 90 minutes after mixing shall be wasted.

B. The locations of contact grout holes in the pipe are shown on the Drawings. Drilling grout holes through pipe will not be permitted.

C. The grouting process shall be operated and controlled so that the grout will be delivered uniformly and consistently.

D. Grouting shall generally progress sequentially in a constant upgradient direction from one grout hole to the next grout hole in the sequence indicated in the approved submittals.

E. At any time during the grouting operations, sufficient contact grout holes ahead of the hole to be grouted shall be cleaned and valves or other suitable devices attached.

F. In general, grouting will be considered completed when less than one cubic foot of grout of the accepted mix and consistency can be pumped in 15 minutes under the specified maximum pressure. After the grouting is finished, the valve shall be closed before the grout header is removed and until grout has set. For any hole ahead of the grouting operation, with a valve attached, and the valve in the open position; such hole shall be considered grouted if grout issues forth of the same consistency, and at the same rate as that being pumped, and the valve closed. Replace grout plugs in pipe at the completion of grouting.

G. The maximum sustained grouting pressure shall be 15 pounds per square inch (psi) in excess of existing earth and groundwater pressures, at the grout hole collar connection, unless otherwise approved by the ENGINEER.

H. All grouting operations are to be performed in the presence of the ENGINEER. Notify the ENGINEER at least 24 hours in advance of starting contact grouting operations.

I. Pipe grout fittings shall be sealed with screw type plugs upon completion of grouting. Dry pack mortar shall be used to fill any recesses.

3.03 CLEANUP

A. Take all the necessary precautions to protect and preserve the interior surfaces of the pipe from damage. Grout spills shall be minimized and clean-up shall proceed immediately after grouting. Any damage to the pipe caused by or occurring during the grouting operations shall be repaired by a method approved by the ENGINEER at no additional cost to the City.

B. During grouting work, provide for adequate disposal of all waste and wastewater. Remove and properly dispose of all waste grout resulting from grouting operations. Grout spills shall be minimized and all cleanup of grout and waste materials shall be performed immediately to avoid damage to the pipe or lining. The contents of grout lines shall not be discharged into the tunnel.

END OF SECTION

SECTION 03366

TOOLED CONCRETE FINISHES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Tooled concrete finishes.

1.02 QUALITY ASSURANCE

A. Mock-ups:
   1. Test Panels for Concrete Finishes:
      a. Prepare test panels for F4 and F5 finishes and tie-hole repairs for review by ENGINEER.
      b. Accepted panels shall serve as standard of quality and workmanship for project.
   2. Test Panels Showing Horizontal and Vertical Joints: Prepare test panel showing horizontal and vertical joints proposed for project for review by the ENGINEER. Refer to finishes as specified in this Section.
   3. Test Panels Indicating Methods for Making Concrete Repairs: Prepare test panels for proposed repairs at beginning of project for review by ENGINEER.
      a. Panels shall serve as standard for repairs during the project.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping:
   1. Deliver and store packaged materials in original containers until ready for use.

PART 2 PRODUCTS

2.01 MIXES

A. Mortar Mix for F4 Finish: Consist of 1 part cement and 1-1/2 parts of fine sand passing Number 100 screen, mixed with enough water and emulsified bonding agent to have consistency of thick cream.

B. Mortar Mix for F5 Finish: Consist of 1 part cement to 1-1/2 parts of sand which passes Number 16 screen.

PART 3 EXECUTION

3.01 CONCRETE FINISHING

A. Cement for Finishes:
   1. Addition of white cement may be required to produce finish which matches color of concrete to be finished.

B. Vertical Concrete Surfaces: Use Following Finishes for Vertical Concrete Surfaces as indicated on the Drawings:
   1. F1 Finish: No special treatment other than repair defective work and fill depressions 1 inch or deeper and tie holes with mortar after removal of curing membrane.
   2. F2 Finish: No special treatment other than repair defective work, remove fins, fill depressions 1/2 inch or deeper and tie holes with mortar after removal of curing membrane.
   3. F3 Finish: Repair defective work, remove fins, offsets, and curing membrane, and grind projections smooth. Fill depressions 1/4 inch or larger in depth or width and tie holes with mortar after removal of curing membrane.
   4. F4 Finish:
      a. Same as specified for F3 Finish, and, in addition fill depressions and holes 1/16 inch or larger in width with mortar.
      b. "Brush-Off" sandblast surfaces prior to filling holes to expose all holes near surface of the concrete.
      c. Thoroughly wet surfaces and commence filling of pits, holes, and depressions while surfaces are still damp.
      d. Perform filling by rubbing mortar over entire area with clean burlap, sponge rubber floats, or trowels.
      e. Do not let any material remain on surfaces, except that within pits and depressions.
      f. Wipe surfaces clean and moist cure.
   5. F5 Finish: Receive same finish specified for F3 Finish, and, in addition, receive special stoned finish, in accordance with following requirements:
      a. Remove forms and perform required repairs, patching, and pointing as specified in this Section.
      b. Wet surfaces thoroughly with brush and rub with hard wood float dipped in water containing 2 pounds of portland cement per gallon.
      c. Rub surfaces until form marks and projections have been removed.
      d. Spread grindings from rubbing operations uniformly over surface with brush in such manner as to fill pits and small voids.
      e. Moist cure brushed surfaces and allow to harden for 3 days.
         1) After curing, obtain final finish by rubbing with carborundum stone of approximately Number 50 grit until entire surfaces have smooth texture and are uniform in color.
         2) Continue curing for remainder of specified time.
      f. If any concrete surface is allowed to become too hard to finish in above specified manner, sandblast and wash related surfaces exposed to view, whether finished or not.
         1) While still damp, rub over surface, plastic mortar, as specified for brushed surfaces and handstoned with Number 60 grit carborundum stone, using additional mortar for brushed surfaces until surface is evenly filled without an excess of mortar.
         2) Continue stoning until surface is hard.
         3) After moist curing for 3 days, make surface smooth in texture and uniform in color by use of Number 50 or Number 60 grit carborundum stone.
         4) After stoning, continue curing until 7 day curing period is completed.

C. Horizontal Concrete: After proper and adequate vibration and tamping, use following finishes for horizontal concrete surfaces as indicated on the Drawings:

1. S1 Finish: Screeded to grade and leave without special finish.
2. S2 Finish: Smooth steel trowel finish.
3. S3 Finish: Steel trowel finish free from trowel marks. Provide smooth finish free of all irregularities.
4. S4 Finish: Steel trowel finish, without local depressions or high points, followed by light hairbroom finish. Do not use stiff bristle brooms or brushes. Perform brooming parallel to slab-drainage. Provide resulting finish that is rough enough to provide nonskid finish. Finish shall be subject to review and acceptance by the ENGINEER.
5. S5 Finish: Nonslip abrasive: After concrete has been screeded level and hardened enough to support man standing on a board, sprinkle abrasive from shake screen into surface at uniform rate of 25 pounds for each 100 square feet of surface area, wood float into finish, then trowel abrasive into surface with steel trowel properly exposing abrasive in surface as required to provide nonslip surface.

D. Concrete Floor Surfaces to Which Surfacing Material Is Applied: Finish smooth with tolerance within 1/8 inch in 10 feet in any direction from lines indicated on the Drawings.

3.02 CONCRETE FINISHING

A. Finish concrete surfaces as indicated on the Drawings. Where not specified or indicated on the Drawings, finish surfaces as follows:
   1. F4 Finish for Following Vertical Surfaces:
      a. Concrete surfaces specified or indicated to be painted.
      b. Concrete surfaces, interior or exterior, exposed to view.
   2. Surfaces in Open Channels, Basins, and Similar Structures:
      a. F3 Finish for vertical surfaces which are normally below water surface.
      b. F4 Finish for vertical surfaces located above normal water surface and exposed to view.
      c. Remove fins and fill tie holes from concrete surfaces located in closed boxes or channels where there is normally no access or passageway.
   3. S4 Finish for Following Surfaces:
      a. Exterior walkways.
      b. Tops of exterior walls or beams which are to serve as walkways.
      c. Tops of exterior walls or beams which are to support gratings.
   4. S1 Finish for Following Surfaces:
      a. Basin bottoms to which layer of grout is to be applied.
      b. Projecting footings which are to be covered with dirt.
      c. Slab surfaces which are to be covered with concrete fill.
   5. S2 Finish for Following Surfaces:
      a. Tops of corbels.
      b. Tops of walls and beams not covered above in this Section.
      c. Tops of slabs not covered above in this Section.
      d. All other surfaces not specified to be finished otherwise.
   6. S3 Finish for Following Surfaces:
      a. Building and Machine Room Floors Which Are Not Covered with Surfacing Material: Provide floors that are free from trowel marks.

END OF SECTION

SECTION 03410

STRUCTURAL PRECAST CONCRETE VAULT

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Structural pre-cast concrete vaults with access hatches as shown on the drawings and as specified herein.

B. Related Sections:
   1. Section 03300 - Cast-in-Place Concrete.
   2. Section 03600 - Grouts.
   3. Section 08310 - Access Doors and Panels.

1.02 REFERENCES

A. American Concrete Institute (ACI):
   1. 318 - Building Code Requirements for Structural Concrete and Commentary.

B. Precast Concrete Institute (PCI):
   1. Manuals.

1.03 SYSTEM DESCRIPTION

A. Design Requirements:
   1. Precast Concrete Vaults:
      a. Have structural pre-cast vaults designed by civil or structural engineer registered in the State of California.

B. Performance Requirements:
   1. Provide precast concrete items as indicated on the Drawings and specified in this Section.
   2. Check and verify dimensions prior to casting to ensure proper fit.
   3. Bring discrepancies or changes in dimensions to the ENGINEER's attention.

1.04 SUBMITTALS

A. Shop Drawings:
   1. Submit manufacturer’s shop drawings, showing dimensions, openings, reinforcement, waterproofing, etc., for approval prior to fabrication.

B. Calculations:
   1. Submit design calculations signed and stamped by a civil or structural engineer registered in the State of California.

C. Quality Control Submittals:
   1. Certificates of compliance.
   2. Manufacturer's instructions.

PART 2 PRODUCTS

2.01 MATERIALS

A. Minimum concrete strength shall be 7,000 psi at 28 days.

B. Reinforcement:
   1. Steel bar: ASTM A 615 or A 706, Grade 60 (deformed).
   2. Welded wire fabric: ASTM A 185

2.02 DESIGN CRITERIA

A. The pre-cast structures shall be designed for the following geotechnical criteria:

1.	Allowable bearing pressure	No greater than 4.5 ksf including short-term loads.
2.	Friction factor	0.45
3.	Backfill angle of internal friction	34 degrees
4.	Backfill unit weight	125 pcf
5.	Equivalent fluid pressure	90 psf/ft

B. Vaults and lids shall be traffic rated for at least AASHTO H-20 traffic loads.

C. The concrete structure shall be designed in accordance with ACI 318-89, AASHTO fourteenth edition and ASTM C857-87.

D. The design shall include a lateral live load surcharge in accordance with ASTM C857-87 for HS-20 traffic loads.

2.03 WATERPROOF COATING

A. Vault manufacturer shall verify rough diameter for all pipe penetrations to receive modular mechanical seals. Refer to section 15235.

B. Holes for major pipe penetrations shall be cast into the vault.

C. Minor pipe penetrations not shown on the drawings may be core drilled in the field.

2.04 FINISH

A. All exterior concrete edges shall have a 3/4-inch chamfer.

B. Score the roofs by brooming with a steel wire or stiff coarse-fiber broom before the concrete has hardened thoroughly.

2.05 VAULT ACCEPTABLE MANUFACTURERS

A. Utility Vault, Old Castle Precast, Auburn, WA, (800) 872-1538.

B. Or approved equal.

2.06 HATCHES

A. Hatches shall be provided by the vault manufacturer to be cast into the roof of the pre-cast vaults. See Section 08310.

B. Galvanized steel hatch doors as sized shown on Drawings shall be AASH to H2O rated.

C. Doors shall have spring assisted latches and locking mechanisms.

D. Doors shall be stamped and lettered as directed by the ENGINEER.

2.07 VAULT ROOF

A. Vault roof shall be removable.

B. Vault roof shall be stamped with its weight.

C. Roof connection to vault shall be waterproof and sealed with mastic.

2.08 LADDER

A. Shall be installed with galvanized steel ladder.

PART 3 INSTALLATION

3.01 GENERAL

A. Install vault at the location indicated on the Drawings.

B. Follow manufacturer's instructions for installation.

3.02 LEAK REPAIR

A. Groundwater, surface water and rain shall not intrude into the installed vaults. Refer to Section 03300 Articles 2.1J and 3.11 for approved materials and procedures to seal leaks in joints and around pipe penetrations.

END OF SECTION

SECTION 03600

GROUTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Concrete mortar.
   2. Grout.
   3. Drypack mortar.
   4. Nonshrink grout.
   5. Epoxy grout.
   6. Non-shrink epoxy grout.

B. Related Sections:
   1. Section 03071 - Epoxies.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C 109 - Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2 inch or 50 millimeter cube specimens).
   2. C 230 - Standard Specification For Flow Table For Use In Tests Of Hydraulic Cement
   3. C 531 - Test Method for Liner Shrinkage and Coefficient of Thermal Expansion of Chemical-Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes.
   4. C 579 - Test Method for Compressive Strength of Chemical-Resistant Mortars and Monolithic Surfacings.
   5. C 827 - Test Method for Change in Height at Early Ages of Cylindrical Specimens from Cementitious Mixtures.
   6. C 939 - Test Method for Flow of Grout for Preplaced-Aggregate Concrete (Flow Cone Method).
   7. C 1090 - Test Method for Measuring Change in Height of Cylindrical Specimens from Hydraulic-Cement Grout.
   8. C 1107 - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink).
   9. C 1181 - Test Methods for Compressive Creep of Chemical-Resistant Polymer Machinery Grouts.

1.03 SUBMITTALS

A. Nonshrink Grout and Non-shrink Epoxy Grout: Submit manufacturer's literature and certified test data prior to installation.

1.04 DELIVERY, STORAGE, AND HANDLING

A. All materials shall be delivered to the jobsite in their original, unopened packages or containers, clearly labeled with the manufacturer's product identification and printed instructions.

B. All materials shall be stored in a cool dry place and in accordance with the manufacturer's recommendations.

C. All materials shall be handled in accordance with the manufacturer's instructions.

1.05 PROJECT/SITE CONDITIONS

A. Refer to manufacturer's literature or contact the manufacturer for any special physical or environmental limitations that may be required for use of products.

1.06 WARRANTIES

A. Non-shrink Grout: The manufacturer shall warranty that the non-shrink grout will never go below its initial placement volume when tested in accordance with ASTM C 1107.

B. Non-shrink Epoxy Grout: The manufacturer shall warranty that non-shrink epoxy grout will show negligible shrinkage or expansion when tested in accordance with ASTM C 531.

PART 2 PRODUCTS

2.01 MATERIALS

A. Concrete Mortar:
   1. General: Consist of concrete mixture with coarse aggregate removed and water quantity adjusted as required.
   2. At Exposed Concrete Surfaces Not to Be Painted or Submerged in Water: White cement.

B. Grout:
   1. Consist of mixture of Portland cement and sand.

C. Dry-pack Mortar:
   1. Consist of mixture of Portland cement and sand.

D. Non-shrink Grout:
   1. Manufacturers: One of the following or equal:
      a. Five Star Products, Inc., Fairfield, CT, Five Star Grout.
      b. Master Builders, Inc., Cleveland, OH, Masterflow 928.
      c. L&M Construction Chemicals, Inc., Omaha, NE, CRYSTEX.
   2. Non-shrink grout shall be a preportioned and prepackaged cement-based mixture. It shall contain no metallic particles such as aluminum powder and no metallic aggregate such as iron filings. It shall require only the addition of potable water.

3. Potable water for pre-soaking, mixing, and curing shall be clean and free of oils, acids, alkalies, organics, and any other deleterious matter.
4. Bleeding: Non-shrink grout shall be free from the emergence of mixing water from within or the presence of water on its surface.
5. Non-shrink grout shall be in accordance with ASTM C 1107.
6. Consistency: Non-shrink grout shall remain at a minimum flowable consistency for at least 45 minutes after mixing at 45 degrees Fahrenheit to 90 degrees Fahrenheit when tested in accordance with ASTM C 230. If at a fluid consistency, it shall be verified in accordance with ASTM C 939.
7. Dimensional Stability (height change): Non-shrink grout shall be in accordance with ASTM C 1107, volume-adjusting Grade B or C at 45 degrees to 90 degrees. It shall show 90 percent or greater bearing area under bases or baseplates.
8. Compressive Strength: Non-shrink grout shall show minimum compressive strengths at 45 degrees Fahrenheit to 90 degrees Fahrenheit in accordance with ASTM C 1107 for various periods from the time of placement, including 5,000 pounds per square inch at 28 days when tested in accordance with ASTM C 109 as modified by C 1107.

E. Epoxy Grout:
1. Consist of mixture of epoxy and sand.
2. Sand: Clean, bagged, graded, and kiln dried silica sand.

F. Non-shrink Epoxy Grout:
1. Manufacturers: One of the following or equal:
   a. Five Star Products, Inc., Fairfield, CT, Five Star Epoxy Grout.
   b. Master Builders, Inc., Cleveland, OH, Masterflow 648 CP Plus.
   c. L&M Construction Chemicals, Inc., EPOGROUT.
2. Non-shrink epoxy grout shall be a 100 percent solids, premeasured, prepackaged system containing a two-component thermosetting epoxy resin and inert aggregate.
3. Consistency: Non-shrink epoxy grout shall maintain a flowable consistency for at least 45 minutes at 70 degrees Fahrenheit.
4. Dimensional Stability (height change):
   a. Non-shrink epoxy grout shall have negligible shrinkage or expansion (less than 0.0006 in/in) when tested in accordance with ASTM C 531.
5. Compressive Strength: Non-shrink epoxy grout shall show a minimum compressive strength of 10,000 pounds per square inch at 24 hours and 14,000 pounds per square inch at 7 days when tested in accordance with ASTM C 579, Method B.
6. Compressive Creep: The compressive creep for non-shrink epoxy grout shall not exceed 0.0027 in/in when tested under a 400 pounds per square inch constant load at 140 degrees Fahrenheit in accordance with ASTM C 1181.
7. Thermal Capability: The coefficient of thermal expansion for non-shrink epoxy grout shall not exceed 0.000018 inches per inch per degree Fahrenheit when tested under ASTM C 531, Method B.

2.02 MIXES

A. Concrete Mortar Mix:
1. Use water-cement ratio that is no more than that specified for concrete being repaired.

2. At Exposed Concrete Surfaces Not to Be Painted or Submerged in Water: Use sufficient white cement to make color of finished patch match that of surrounding concrete.

B. Grout Mix:
   1. For Concrete Repair: Mix in same proportions used for concrete being repaired, with only sufficient water to give required consistency for spreading.
   2. For Spreading over the Surfaces of Construction or Cold Joints: Mix with no more water used than allowed by water-cement ratio specified for concrete.
   3. For Other Applications: Mix in proportions by weight of one part cement to four parts of concrete sand.

C. Dry-pack Mortar Mix: Use only enough water so that resulting mortar will crumble to touch after being formed into ball by hand.

D. Non-shrink Grout: Mix in accordance with manufacturer's installation instructions such that resulting mix has fluid or flowable consistency and is suitable for placing by pouring.

E. Epoxy Grout:
   1. Mix in accordance with manufacturer's installation instructions for mixing.
   2. Proportioning:
      a. For horizontal work, consist of mixture of one part epoxy as specified in Section 03071 with not more than 2 parts sand.
      b. For vertical or overhead work, consist of 1 part epoxy gel as specified in Section 03071 with not more than 2 parts sand.

F. Non-shrink Epoxy Grout: Mix in accordance with manufacturer's installation instructions.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect concrete surfaces to receive grout or mortar and verify that they are free of ice, frost, dirt, grease, oil, curing compounds, paints, impregnations and all loose material or foreign matter likely to affect the bond or performance of grout or mortar.

B. Inspect baseplate and anchor systems for rust, oil, and other deleterious substances that may affect the bond or performance of grout.

C. Confirm that newly placed concrete has been cured sufficiently to attain its design strength and limit further shrinkage.

D. Verify that temperature of cementitious or epoxy grout does not exceed manufacturer's recommendations.

3.02 PREPARATION

A. Surface Preparation:

1. Roughen all concrete surfaces by heavy sandblasting, chipping, or other mechanical means to assure bond. Loose or broken concrete shall be removed.
2. All grease, oil, dirt, curing compounds, laitance, and other deleterious materials that may affect bond that were identified in the inspection process shall be completely removed from concrete and bottoms of baseplates. All metal surfaces should have a 2 to 3 mil peak-to-valley profile for epoxy grouts.
3. For cementitious mortars and grouts, concrete surfaces shall be saturated surface dry. Any standing water shall be removed prior to placing grouts.
4. For epoxy grouts, do not wet concrete surfaces with water. Instead, where required, wet surfaces with epoxy for horizontal work or epoxy gel for vertical or overhead work prior to placing epoxy grouts.

B. Forms and Headboxes for Grouts (Cementitious or Epoxy):
1. Forms for grouts shall be built of material with adequate strength to withstand the placement of grouts.
2. Forms must be rigid and liquid tight. All cracks and joints shall be caulked with an elastomeric sealant. All forms shall be lined with polyethylene for easy grout release. Forms carefully waxed with two coats of heavy-duty paste wax shall also be acceptable.
3. Forms shall be 4 to 6 inches higher than the baseplate on one side of the baseplate configuration when using head pressure for placement.
4. A sufficient number of headboxes shall be built to facilitate placement of grouts.
5. Air relief holes a minimum 1/8 inch in diameter shall be provided when required by a baseplate configuration to avoid entrapping air underneath.

3.03 APPLICATION

A. Cement Mortar and Grout:
1. For Defective Concrete Repair:
a. Filling: Filling of voids around items through the concrete.
b. Grout Spreading: Spread over construction joints, cold joints, and similar type items.
2. Concrete Surfaces:
a. Apply epoxy bonding agent to clean, roughened, and dry surfaces before placing mortar or grout.
3. Placing:
a. Exercise particular care in placing Portland cement mortar or grout since they are required to furnish structural strength or impermeable water seal or both.
b. Do not use cement mortar or grout that has not been placed within 30 minutes after mixing.

B. Epoxy Grout:
1. Apply in accordance with manufacturer's installation instructions.
2. Use where specified herein or where indicated on the Drawings.

3.04 PLACEMENT

A. The CONTRACTOR shall make arrangements to have a grout manufacturer's representative present for a preconstruction meeting and during initial grout

placement. Grout shall only be installed after the final equipment alignment is correct and accepted by the ENGINEER.

1. Grouts shall be mixed in accordance with the manufacturer's recommendations.
2. A mortar mixer with moving paddles shall be used for mixing grouts. For cementitious grouts, pre-wet the mixer and empty out excess water before beginning mixing.
3. Cementitious Grouts:
    a. Non-shrink cementitious grout shall be added to a premeasured amount of water that does not exceed the manufacturer's maximum recommended water content.
    b. Mix cementitious grouts per manufacturer's instructions for uniform consistency.
    c. Grouts may be drypacked, flowed, or pumped into place. All baseplate grouting shall take place from one side of a baseplate to the other to avoid trapping air. Do not overwork grouts.
    d. Do not retemper grout by adding more water after stiffening.
    e. Hydrostatic head pressure shall be maintained by keeping the level of the grout in the headbox above the bottom of the baseplate. The headbox should be filled to the maximum level and the grout worked down to top of baseplate.
4. Epoxy Grouts:
    a. Epoxy grouts shall be mixed in complete units. Do not vary the ratio of components or add solvent to change the consistency of the mix.
    b. Pour the hardener into the resin and mix for at least one minute and until each mixture is uniform in color. Pour the chemical components into the mortar mixer wheelbarrow and add the aggregate. Mix until aggregate is uniformly wetted. Overmixing will cause air entrapment in the mix.
    c. All epoxy grout shall be flowed into place using a headbox. All grouting shall take place from one side of a baseplate to the other in a continuous flow to avoid trapping air.
    d. Hydrostatic head pressure shall be maintained by keeping the level of grout in headboxes above the bottom of baseplates. Headboxes shall be filled to the maximum level and grout worked down to the bottom of baseplates.
    e. Epoxy grouts shall not be cut back after setting. The final level of grout will be as installed with all chamfer edges built into the formwork.

3.05 CURING

A. Cementitious Grouts:
    1. Grouts must be cut back to the lower edge of baseplates after reaching initial set. Provide a 45 degree angle cut back.
    2. Clean equipment and tools as recommended by the grout manufacturer.
    3. Cure Grouts in accordance with manufacturer's specifications and recommendations. Keep grout moist for a minimum of 3 days. The method needed to protect grouts will depend on temperature, humidity, and wind. Wet burlap, a soaker hose, sun shading, ponding and, in extreme conditions, a combination of methods shall be employed.
    4. Grouts shall be maintained above 40 degrees Fahrenheit until they have attained a compressive strength of 3,000 pounds per square inch or above

70 degrees Fahrenheit for a minimum of 24 hours to avoid damage from subsequent freezing.

B. Epoxy Grouts:
   1. Cure grouts in accordance with manufacturers' specifications and recommendations. Do not wet cure epoxy grouts.
   2. Consult the manufacturer for appropriate cure schedule. In no case should any surface in contact with grout be allowed to fall below 50 degrees Fahrenheit for a minimum of 48 hours after placement.
   3. Equipment and tools shall be cleaned immediately with a strong liquid detergent and water solution before grout hardens.

3.06 FIELD QUALITY CONTROL

A. Non-shrink cementitious grouts shall be tested for 24 hour compressive strength in accordance with ASTM C 109.

B. Non-shrink grouts shall be tested for 24 hour compressive strength in accordance with ASTM C 579 (Method B).

END OF SECTION

SECTION 03931

EPOXY INJECTION SYSTEM

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Epoxy injection system.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D 638 - Text Method for Tensile Properties of Plastics.
   2. D 695 - Test Method for Compressive Properties of Rigid Plastics.
   3. D 790 - Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.

1.03 SUBMITTALS

A. Product Data: Submit manufacturer's data completely describing epoxy injection system materials.

B. Quality Control Submittals:
   1. Certificates of Compliance.
   2. Manufacturer's Instructions.

PART 2 PRODUCTS

2.01 MATERIALS

A. Manufacturers: One of the following or equal:
   1. Master Builders, Inc., Concressive Standard LVI.
   2. Sika Chemical Corp.'s, Sikadur 35, Hi-Mod LV.

B. Epoxy: Provide epoxy materials that are new and use them within shelf life limitations set forth by manufacturer. Water-insensitive 2 part type low viscosity epoxy adhesive material containing 100 percent solids and meeting or exceeding following characteristics when tested in accordance with standards specified:

Physical Characteristic	Test Method	Required Results
Tensile Strength	ASTM D 638	8,000 pounds per square inch at 14 days and 77 degrees Fahrenheit cure.
Flexure Strength	ASTM D 790	11,000 pounds per square inch at 14 days and 77 degrees Fahrenheit cure.
Compressive Strength	ASTM D 695	16,000 pounds per square inch at 24 hours and 77 degrees Fahrenheit cure.

Physical Characteristic	Test Method	Required Results
Bond Strength	--	Concrete shall fail before failure of epoxy.
Gel Time In 5-Mil Film	--	Four hours maximum at 77 degrees Fahrenheit.
Elongation	ASTM D 638	1 percent minimum at 14 days and 77 degrees Fahrenheit.

2.02 EQUIPMENT

A. Pump Unit:
   1. Furnish unit to be used for injection that is positive displacement type with interlock to provide in-line mixing and metering system for 2 component epoxy.
   2. Furnish pressure hoses and injection nozzle of such design as to allow proper mixing of 2 components of epoxy.
   3. Presence of standby injection unit may be required.

2.03 MIXES

A. Epoxy Injection System Materials:
   1. Mix epoxy in accordance with manufacturer's installation instructions.
   2. Do not use solvents to thin epoxy system materials introduced into cracks or joints.

PART 3 EXECUTION

3.01 PREPARATION

A. Surface Preparation:
   1. Epoxy Injection System:
      a. General: Before processing, sweep or clean area in vicinity of crack location to receive epoxy and leave in generally clean condition.
      b. Joints to Receive Epoxy: Clean in manner such that joints are free from dirt, laitance, and other loose matter.

3.02 INSTALLATION

A. Install and cure epoxy materials in accordance with manufacturer's installation instructions.

B. Perform and conduct work of this Section in neat orderly manner.

C. Epoxy Injection System:
   1. Apply adequate surface seal to crack or joint to prevent escape of epoxy.
   2. Establish entry points at distance along seal not less than thickness of cracked member.
   3. Force epoxy into crack at first port with sufficient pressure to advance epoxy to adjacent port.
   4. Seal original port and shift entry to port at which epoxy appears.

5. Continue this manner of port-to-port injection until each joint has been injected for its entire length.
6. For small amounts, or where excessive grout pressure developed by pump unit might further damage structure, premixed material and hand caulking gun may be used if acceptable to the ENGINEER.
7. Seal ports, including adjacent locations where epoxy seepage occurs, as necessary to prevent drips or run out.

END OF SECTION

SECTION 03936

WATER LEAKAGE TEST FOR CONCRETE STRUCTURES

PART 1 GENERAL

1.01 SUMMARY

A. **Section includes: Leakage test for concrete water holding structures.**

B. **Related sections:**
   1. **The Contract Documents are complementary; what is called for by one is as binding as if called for by all.**
   2. **It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.**
   3. **The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.**
      a. **Section 03931 - Epoxy Injection System.**
      b. **Section 07900 - Joint Sealants.**
      c. **Section 09960 - Coatings.**

1.02 SUBMITTALS

A. **Shop drawings: Leak repair methods.**

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 WATER LEAKAGE TEST

A. **Test the following concrete water holding structures for leakage:**
   1. **Pump Station Wet Well.**

B. **Before testing water holding structures for leakage:**
   1. **Backfill excavations to top of structure foundations.**
   2. **Cure concrete and obtain specified concrete compressive strength.**
   3. **Do not apply brick facing or other materials that will cover concrete surfaces until after testing water holding structures for leakage.**

C. **Isolate sections of water holding structures that can be isolated in actual operation. Test sections separately for leakage.**

D. **Close valves and gates to structures.**

E. **Fill water-holding structures with water to maximum liquid level indicated on the Drawings.**

F. **Make other equipment such as stop gates, sluice gates, valves, and temporary bulkheads watertight or measure leakage through other equipment by methods acceptable to ENGINEER. Do not base leakage upon manufacturer's estimates.**

G. **Determine evaporation by floating evaporation pans in structures during testing.**

H. **Examine concrete surfaces for leaks and damp spots during first 24 hours after filling structures.**

I. **When leaks or damp spots appear on exposed surfaces:**
   1. **Mark visible leaks and damp spots.**
   2. **Drain structures of water after minimum 24 hours of being full.**
   3. **Repair defects causing leaks and damp spots by epoxy injection as specified in Section 03931 on both interior and exterior of structures.**
   4. **Refill water-holding structures.**
   5. **Repeat testing and repair process until no leaks or damp spots appear.**

J. **When no leaks or damp spots appear after 24 hours of being full, measure change in water volume during the next 24 hours.**

K. **When water volume loss exceeds 0.10 percent of water volume originally held with allowance for equipment leakage, evaporation, and precipitation:**
   1. **Determine cause of volume loss.**
   2. **Drain structures of water.**
   3. **Repair defects causing loss of water volume.**
   4. **Refill water-holding structures.**
   5. **Repeat testing and repair process until volume loss does not exceed 0.10 percent of water volume originally held in 24 hours.**

END OF SECTION

SECTION 05120

STRUCTURAL STEEL

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Structural steel including:
   1. Structural steel shapes and plate.
   2. Fasteners.
   3. Welding.
   4. Associated accessories.
      a. All thread rods.
      b. Anchor bolts.
      c. Assembly bolts.
      d. Chemical anchors.
      e. Concrete anchors.
      f. Deformed bar anchors.
      g. Eyebolts.
      h. Flush shells.
      i. High strength all thread rods.
      j. High strength bolts.
      k. Powder actuated fasteners.
      l. Studs.
      m. Undercut concrete anchors.

B. Related Sections:
   1. Section 09910 - Paints.
   2. Section 09960 - Coatings.

1.02 REFERENCES

A. American Institute of Steel Construction (AISC):
   1. Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design.

B. American National Standards Institute (ANSI):
   1. B212–15 - Cutting Tools – Carbide-tipped Masonry Drills And Blanks For Carbide-tipped Masonry Drills.

C. American Society for Testing and Materials (ASTM):
   1. A 36/A 36M - Standard Specification for Structural Steel.
   2. A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
   3. A 123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   4. A 240 - Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.

5. A 193 - Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
6. A 276 - Standard Specification for Stainless Steel Bars and Shapes.
7. A 307 - Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
8. A 325 - Standard Specification for High-Strength Bolts for Structural Steel Joints.
9. A 489 - Standard Specification for Carbon Steel Lifting Eyes.
10. A 490 - Standard Specification for Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
11. A 496 - Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement.
12. A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
13. A 501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
14. F 593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs.
15. F 959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use With Structural Fasteners.
16. A 992 - Standard Specification for Steel for Structural Shapes.

D. American Welding Society (AWS):
1. A 5.1 - Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding.
2. A 5.17 - Specification for Carbon Steel Electrodes and Fluxes for Submerged Arc Welding.
3. A 5.20 - Specification for Carbon Steel Electrodes for Flux Cored Arc Welding.
4. D 1.1 - Structural Welding Code - Steel.
5. D 10.4 - Recommended Practices for Welding Austenitic Chromium-Nickel Stainless Steel Piping and Tubing.

E. SSPC - Society for Protective Coatings:
1. SSPC SP3 - Power Tool Cleaning.

F. International Code Council (ICC):
1. California Building Code (CBC) 2007.

1.03 SUBMITTALS

A. Quality Control Submittals:
1. Design Data: Submit design of members to be fabricated before starting their fabrication.

B. Test Reports:
1. Certified copies of mill tests and analyses made in accordance with applicable ASTM standards, or reports from a recognized commercial laboratory, including chemical and tensile properties of each shipment of structural steel or part thereof having common properties.
2. Current International Conference of Building Officials Evaluation Report for chemical anchors.

3. Prior to Installation or Use of Concrete Anchors, Perform the Following Test and Submit Test Results:
    a. Furnish not less than four 5/8 inch diameter Type 304 or Type 316 stainless steel concrete anchors of type proposed for use, and install anchors in a test block of concrete to specified embedment length.
    b. Furnish and install one 5/8 inch nut on each concrete anchor and tighten each with an applied torque of 10 foot-pounds.
    c. Loosen each nut and then retighten with an applied torque load of 10 foot-pounds.
    d. Visible evidence of turning by a concrete anchor will be cause for ENGINEER to reject concrete anchors.

1.04 QUALITY ASSURANCE

A. Qualifications:
1. Perform welding of structural metals with welders who have current American Welding Society certificate for the type of welding to be performed.
2. Notify ENGINEER 24 hours minimum before starting shop or field welding.
3. ENGINEER may check materials, equipment, and qualifications of welders.
4. Remove welders performing unsatisfactory Work, or require to requalify.
5. ENGINEER may use gamma ray, magnetic particle, dye penetrate, trepanning, or other aids to visual inspection to examine any part of welds or all welds.
6. CONTRACTOR shall bear costs of retests on defective welds.
7. CONTRACTOR shall also bear costs in connection with qualifying welders.
8. Provide special inspection for the installation of chemical anchors in accordance with California Building Code, Chapter 17.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Packing and Shipping: Deliver structural steel free from mill scale, rust, and pitting.

B. Storage and Protection: Until erection and painting, protect from weather items not galvanized or protected by a shop coat of paint.

PART 2 PRODUCTS

2.01 MATERIALS

A. Unless otherwise specified or indicated on the drawings, materials shall conform to the following:

Item	ASTM Standard Item	Class, Grade, Type or Alloy Number
Steel		
Plate, bars, rolled shapes (except W-shapes), and miscellaneous items	A 36	--
Wide Flange Shapes	A 992	--

Item	ASTM Standard Item	Class, Grade, Type or Alloy Number
Tubing, cold-formed	A 500	--
Tubing, hot-formed	A 501	--
Steel pipe	A 53	Grade B
Stainless Steel		
Plate, sheet, and strip	A 240	Type 304* or 316*
Bars and shapes	A 276	Type 304* or 316*
* Use Type 304L if material will be welded. ** Use Type 316L if material will be welded.		

B. Stainless steels are designated by type or series defined by ASTM.

C. Where stainless steel is welded, use low-carbon stainless steel.

D. Where anchors, connections or other details of structural steel are not specifically indicated on the Drawings or specified, their material, size, and form shall be equivalent in quality and workmanship to items specified.

2.02 FASTENERS

A. General: Furnish threaded fasteners, except high strength bolts, with flat washers, and self-locking nuts, or lock washers and nuts.
   1. Bolt Heads and Nuts: Hex-type.
   2. Bolts, Nuts, and Washers: Of domestic manufacture.
   3. Where bolts, including anchor bolts, nuts, washers, and similar fasteners are specified to be galvanized, galvanize in accordance with ASTM A 153.

B. All Thread Rods:
   1. Type 316 Stainless Steel for Use in Wet and Moist Locations, Including:
      a. Water-Containing Structures:
         1) Below and at water level.
         2) Above Water Level.
            a) Below top of walls of water-containing structures.
            b) Under the roof, slab, beam, or walkway of enclosed water-containing structures.
         3) Dry side of walls of water-containing structures.
      b. Pump bases.
   2. Type 304 or Type 316 stainless steel for aluminum assemblies.
   3. ASTM A 36 meeting the mechanical requirements of ASTM A 307. Hot-dip galvanize for galvanized assemblies and for applications other than those specified.

C. Anchor Bolts:
   1. Anchor Bolts, Nuts, and Washers: Type 316 stainless steel for use in wet and moist locations, including:
      a. Water-Containing Structures:

1) Below and at water level.
2) Above Water Level:
a) Below top of walls of water-containing structures.
b) Under the roof, slab, beam, or walkway of enclosed water-containing structures.
3) Dry side of walls of water-containing structures.
b. Pump bases.
2. Anchor Bolts, Nuts, and Washers: Type 304 or Type 316 stainless steel for fastening aluminum to concrete or steel.
3. Anchor Bolts, Nuts, and Washers: Hot-dip galvanized ASTM A 307 steel or hot-dip galvanized ASTM A 36 steel, for applications other than those specified.

D. Assembly Bolts:
1. Bolts, nuts, and washers for wood baffles, collectors, and other field-assembled construction:
a. Type 316 Stainless Steel for Use in Wet and Moist Locations, Including:
1) Water-Containing Structures:
a) Below and at water level.
b) Above Water Level.
(1) Below top of walls of water-containing structures.
(2) Under the roof, slab, beam, or walkway of enclosed water-containing structures.
(3) Dry side of walls of water-containing structures.
2) Pump bases.
b. Type 304 or Type 316 stainless steel for aluminum assemblies.
2. Hot-dip galvanized ASTM A 307 steel for galvanized assemblies and for applications other than those specified.

E. Chemical Anchors:
1. Where installed in concrete, chemical anchors shall have vinyl ester resin in the composition of the adhesive.
2. All-thread rods shall be either ASTM A 36 steel or stainless steel.
3. Hot-dip galvanize or zinc plate ASTM A 36 steel all-thread rods.
4. Stainless steel all-thread rod shall conform with ASTM F 593 and shall be used for corrosive conditions where indicated on the Drawings.
5. Use reinforcing bars in lieu of all-thread rods where indicated on the Drawings.
6. All-thread rods and reinforcing bars used with the adhesive capsule shall have chisel points and shall be free of oil or coatings that may reduce bond.
7. Do not use chemical anchors to resist tension in overhead positions.
8. Chemical Anchors:
a. Manufacturers: One of the following or equal:
1) Hilti, Hilti HVA Adhesive Anchor System.

F. Concrete Anchors:
1. Manufacturers: One of the following or equal:
a. ITW Ramset/Redhead, Trubolt Wedge.
b. Wej-It Corporation, Wej-It concrete anchors.
2. Concrete Anchor's Integral Threaded Stud, Wedge, Washer, and Nut: Type 304 or Type 316 Stainless Steel for Use in Wet and Moist Locations, Including:
a. Water-Containing Structures:

1) Below and at water level.
2) Above Water Level:
a) Below top of walls of water-containing structures.
b) Under the roof, slab, beam, or walkway of enclosed water-containing structures.
3) Dry side of walls of water-containing structures.
b. Pump bases.
3. Concrete Anchor's Integral Threaded Stud, Wedge, Washer, and Nut: Type 304 or 316 stainless steel for fastening aluminum to concrete or steel.
4. Concrete Anchor's Integral Threaded Stud, Wedge, Washer, and Nut: Hot-dip galvanized ASTM A 307 steel, or hot-dip galvanized ASTM A 36 steel, for applications other than those specified.
5. Do not use Slug-in, lead cinch, and similar systems relying on deformation of lead alloy or similar materials in order to develop holding power.

G. Deformed Bar Anchors: In accordance with ASTM A 496:
1. Manufacturers: One of the following or equal:
a. Nelson Stud Welding Company, D2L Deformed Bar Anchors.
b. Stud Welding Products, DBA (Deformed Bar) Anchors.

H. Eyebolts:
1. Welded or forged, when manufactured of materials other than carbon steel.
2. Having geometric and strength characteristics of eyebolts specified in ASTM A 489, Type 1. The strength characteristics include proof load requirements, breaking strength requirements, tensile strength requirements, bend test, and impact strength.

I. Flush Shells:
1. Manufacturers: One of the following or equal:
a. ITW Ramset/Redhead, Multi-Set II Drop-In.
b. Hilti Corporation, Hol-Hugger HDI Drop-In.
2. Bolts, Flush Shells, Threaded Rods, Washers, and Nuts: Type 303 stainless steel.

J. High Strength All Thread Rods: In accordance with ASTM A 193, Grade B7. Hot-dip galvanize.

K. High Strength Bolts: High strength bolts, nuts, and hardened flat washers shall be in accordance with ASTM A 325 or ASTM A 490, as indicated on the Drawings.

L. Powder Actuated Fasteners:
1. For Installation in Concrete or Steel: Zinc coated, heat-treated, alloy steel.
2. Fasteners Not Sufficiently Protected Against Corrosion from Exposure to Corrosive Conditions: Coat as necessary to make suitable for such conditions.
3. Pins: Furnish with head or threaded stud capable of transmitting loads to shanks.
4. Pins Connected to Steel: Furnish with longitudinal serrations around circumference of shank.

M. Studs:
1. ASTM A 108 with 50,000 pounds per square inch minimum yield strength, and 60,000 pounds per square inch minimum tensile strength.
2. Headed Studs: Manufacturers: One of the following or equal:

a. Nelson Stud Welding Company, S3L Shear Connectors or H4L Concrete Anchors.
b. Stud Welding Products, Headed Concrete Anchors and Shear Connectors or Concrete Anchors.

N. Undercut Concrete Anchors:
1. Materials: In accordance with ASTM A 193, Grade B7. Hot-dip galvanize.
2. Manufacturers: One of the following or equal:
a. Covert Operations, Long Beach, CA, DUC undercut anchors.
b. Drillco, Long Island City, NY, Maxi-Bolt.

2.03 SUPPLEMENTARY PARTS

A. Furnish as required for complete structural steel erection, whether or not such parts and Work are specified or indicated on the Drawings.

2.04 FABRICATION

A. Shop Assembly:
1. Fabricate structural steel in conformance with AISC "Specification for the Structural Steel Buildings - Allowable Stress Design and Plastic Design," unless otherwise specified or modified by applicable regulatory requirements.
2. Where anchors, connections or other details of structural steel are not specifically indicated on the Drawings or specified, their material, size and form shall be equivalent in quality and workmanship to items specified.
3. For Structural members such as W Shapes, S Shapes, Channels, Angles, and similar members not available in quantity, size, and type of stainless steel specified or indicated on the Drawings.
a. Fabricate by welding together pieces of low carbon stainless steel plate, such as 316L.
b. Make full penetration welds between pieces of plate to attain same or higher section modulus and moment of inertia as members indicated on the Drawings.
4. Where galvanizing is required, hot-dip galvanize structural steel after fabrication in accordance with ASTM A 123.
a. Do not electro-galvanize unless specified or accepted by ENGINEER.
b. Restraighten galvanized items that bend or twist during galvanizing.
5. Round off sharp and hazardous projections and grind smooth.
6. Take measurements necessary to properly fit work in the field. Take responsibility for and be governed by the measurements and proper working out of all the details.
7. Take responsibility for correct fitting of all metal work.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine Work in place to verify that it is satisfactory to receive the Work of this Section. If unsatisfactory conditions exist, do not begin this Work until such conditions have been corrected.

3.02 ERECTION

A. General:
   1. Fabricate structural and foundry items to true dimensions without warp or twist.
   2. Form welded closures neatly, and grind off smooth where weld material interferes with fit or is unsightly.
   3. Install structural items accurately and securely, true to level, plumb, in correct alignment and grade, with all parts bearing or fitting structure or equipment for which intended.
   4. Do not cock out of alignment, redrill, reshape, or force fit fabricated items.
   5. Place anchor bolts or other anchoring devices accurately and make surfaces which bear against structural items smooth and level.
   6. Rigidly support and brace structural items needing special alignment to preserve straight, level, even, and smooth lines. Keep structural items braced until concrete, grout, or dry pack mortar has hardened for 48 hours minimum.
   7. Erect structural steel in conformance with AISC "Specification for Structural Steel Buildings - Allowable Stress Design and Plastic Design," unless otherwise specified or modified by applicable regulatory requirements.
   8. Where anchors, connections, and other details of structural steel erection are not specifically indicated on the Drawings or specified, form, locate, and attach with equivalent in quality and workmanship to items specified.
   9. Round off sharp or hazardous projections and grind smooth.
   10. Paint or coat steel items as specified in Sections 09960 and 09910.

B. Welding - General:
   1. Make welds full penetration type, unless otherwise indicated on the Drawings.
   2. Remove backing bars and weld tabs after completion of weld. Repair defective welds observed after removal of backing bars and weld tabs.

C. Welding Stainless Steel:
   1. General: Comply with AWS D1.1.
      a. Perform with electrodes and techniques in accordance with AWS D10.4.

D. Welding Carbon Steel:
   1. General: Comply with AWS D1.1.
      a. Weld ASTM A 36 and A 992 structural steel, ASTM A 500 and A 501 structural tubing, and ASTM A 53 pipe with electrodes conforming to AWS A5.1, using E70XX electrodes; AWS A5.17, using F7X-EXXX electrodes; or AWS A5.20, using E7XT-X electrodes.
      b. Field repair cut or otherwise damaged galvanized surfaces to equivalent original condition using the following:
         1) Manufacturers: One of the following or equal:
            a) Galvinox.
            b) Galvo-Weld.

E. Interface With Other Products:
   1. Where steel fasteners come in contact with aluminum or other dissimilar metals, bolt with stainless steel bolts and separate or isolate from dissimilar metals with sleeves and washers.
      a. Sleeves: Mylar, 1/32 inch thick, of proper size to fit bolts. One sleeve required for each bolt.
         1) Manufacturers: One of the following or equal:

a) Central Plastics Company, Shawnee, Oklahoma.

b. Washers: 63 glass phenolic, 1/8 inch thick, of proper size to fit bolts. Two washers are required for each bolt.

2. Prior to installing nuts, coat threads of stainless steel fasteners with following to prevent galling of threads.
   a. Manufacturers: One of the following or equal:
      1) Never Seez Compound Corporation, Never-Seez.
      2) Oil Research, Inc., WLR No. 111.

F. Threaded Fasteners:
   1. General:
      a. Install bolts, including anchor bolts and concrete anchors, to project 2 threads minimum, but 1/2-inch maximum beyond nut.
      b. Unless otherwise specified, tighten bolts, including anchor bolts and concrete anchors, to the "snug-tight" condition, defined as tightness attained by a few impacts of an impact wrench or the full effort of a man using an ordinary spud wrench.
   2. Anchor Bolts:
      a. Cast-in-place when concrete is placed, wherever feasible.
      b. Accurately locate anchor bolts embedded in concrete with bolts perpendicular to surface from which they project.
      c. Do not allow anchor bolts to touch reinforcing steel.
      d. Where anchor bolts are within 1/4 inch of reinforcing steel, isolate with a minimum of 4 wraps of 10 mil polyvinyl chloride tape in area adjacent to reinforcing steel.
      e. In anchoring machinery bases subject to heavy vibration, use 2 nuts, with 1 serving as a locknut.
      f. Where bolts are indicated on the Drawings for future use, first coat thoroughly with nonoxidizing wax, then turn nuts down full depth of thread and neatly wrap exposed thread with waterproof polyvinyl tape.
      g. Furnish anchor bolts with standard hex bolt head unless otherwise indicated on the Drawings. Where anchor bolts with 90 degree hooks are indicated on the Drawings, provide anchors with minimum 4 diameter hook length.
      h. Embed anchor bolts 10 diameters minimum.
      i. Where indicated on the Drawings, set anchor bolts in metal sleeves having inside diameter approximately 2 inches greater than bolt diameter and minimum 10 bolt diameters long. Fill sleeves with grout when a machine or other equipment is grouted in place.
      j. Anchor bolts may be cast in concrete in lieu of using concrete anchors.
   3. Chemical Anchors:
      a. Accurately locate concrete anchors and set perpendicular to surfaces from which they project.
      b. Drilling Holes:
         1) Do not damage or cut existing reinforcing bars, electrical conduits, or other items embedded in the existing concrete without acceptance by ENGINEER.
         2) Determine location of reinforcing bars, or other obstructions with a non-destructive indicator device.
      c. Hole Drilling Equipment:
         1) Electric or pneumatic rotary type with medium or light impact.
         2) Drill Bits: Carbide-tipped in accordance with ANSI B212-15.

3) Hollow drills with flushing air systems are preferred. Air shall be free of oil, water, or other contaminants which will reduce bond.
4) Where edge distances are less than 2 inches, use lighter impact equipment to prevent microcracking and concrete spalling during drilling process.

d. Hole Diameter:
1) As recommended by chemical anchor cartridge manufacturer.

e. Install reinforcing bars and all thread rods to depth, spacings, and locations as indicated on the Drawings.

f. Cleaning Holes:
1) Insert long air nozzle into hole and blow out loose dust. Use air which is free of oil, water, or other contaminants which will reduce bond.
2) Use a stiff bristle brush to vigorously brush hole to dislodge compacted drilling dust.
3) Repeat step 1.
4) Repeat steps as required to remove drilling dust or other material which will reduce bond. The hole shall be clean and dry.

g. Cleaning All Thread Rods:
1) Degrease over embedment length. The all thread rods shall be free of oil, grease, paint, dirt, mill scale, rust, or other coatings that will reduce bond.

4. Concrete Anchors:
a. Concrete anchors shall mean drilled in place anchors with integral threaded studs.
b. Do not use concrete anchors in lieu of anchor bolts.
c. Accurately locate concrete anchors and set perpendicular to surfaces from which they project.
d. Minimum Embedment Lengths:

Diameter Inches	Embedment Length Inches
1/4	2
3/8	3
1/2	4-1/8
5/8	5-1/8
3/4	6-5/8

e. Drilling Holes:
1) Do not damage or cut existing reinforcing bars, electrical conduits, or other items embedded in the existing concrete without acceptance by ENGINEER.
2) Determine location of reinforcing bars, or other obstructions with a non-destructive indicator device.

f. Hole Drilling Equipment:
1) Electric or pneumatic rotary type with medium or light impact.
2) Drill Bits: Carbide-tipped in accordance with ANSI B212-15.
3) Hollow drills with flushing air systems are preferred. Air shall be free of oil, water, or other contaminants which will reduce bond.
4) Where edge distances are less than 2 inches, use lighter impact equipment to prevent microcracking and concrete spalling during drilling process.

5. High Strength Bolts:
    a. Consider connections with high strength bolts to be slip critical structural connections, unless otherwise indicated on the Drawings.
    b. Connections with high strength bolts shall conform to AISC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.
    c. Furnish Hardened Flat Washer:
        1) Under element, nut or bolt head, turned in tightening.
        2) On outer plies for short slotted holes.
    d. Notify ENGINEER in advance of method selected for tightening and verification pursuant to the referenced AISC Specification.
6. Deformed Bar Anchors:
    a. Butt weld with automatic stud welding gun as recommended by manufacturer.
    b. Ensure butt weld develops full strength of the anchor.
7. Flush Shells:
    a. Use only where specifically indicated on the Drawings.
    b. Accurately locate and set perpendicular to surfaces from which they project.
    c. Drilling Holes:
        1) Do not damage or cut existing reinforcing bars, electrical conduits, or other items embedded in the existing concrete without acceptance by ENGINEER.
        2) Determine location of reinforcing bars, or other obstructions with a non-destructive indicator device.
    d. Hole Drilling Equipment:
        1) Electric or pneumatic rotary type with medium or light impact.
        2) Drill Bits: Carbide-tipped in accordance with ANSI B212-15.
        3) Hollow drills with flushing air systems are preferred. Air shall be free of oil, water, or other contaminants which will reduce bond.
        4) Where edge distances are less than 2 inches, use lighter impact equipment to prevent microcracking and concrete spalling during drilling process.
8. Powder Actuated Fasteners: Use powder actuated fasteners only for applications indicated on the Drawings or specified.
9. Studs:
    a. Butt weld with automatic stud welding gun as recommended by the manufacturer.
    b. Ensure butt weld develops full strength of the stud.
10. Undercut Anchors:
    a. Accurately locate concrete anchors and set perpendicular to surfaces from which they project.
    b. Drilling Holes:
        1) Do not damage or cut existing reinforcing bars, electrical conduits, or other items embedded in the existing concrete without acceptance by ENGINEER.
        2) Determine location of reinforcing bars, or other obstructions with a non-destructive indicator device.
    c. Hole Drilling Equipment:
        1) Electric or pneumatic rotary type with medium or light impact.
        2) Drill Bits: Carbide-tipped in accordance with ANSI B212-15.
        3) Hollow drills with flushing air systems are preferred. Air shall be free of oil, water, or other contaminants which will reduce bond.

4) Where edge distances are less than 2 inches, use lighter impact equipment to prevent microcracking and concrete spalling during drilling process.
5) Undercut bottom of hole using cutting tools manufactured for this purpose by undercut anchor manufacturer.

END OF SECTION

SECTION 05140

STRUCTURAL ALUMINUM

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Structural aluminum products, including sheet, pipe, extrusions, and associated accessories.

B. Related Sections:
   1. Section 05120 - Structural Steel.
   2. Section 09960 - Coatings.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM B 209 -Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
   2. ASTM B 221 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
   3. ASTM B 308/B 308M -Specification for Aluminum-Alloy 6061-T6 Standard Structural Profiles.

B. American Welding Society (AWS):
   1. AWS A 5.10 - Specification for Bare Aluminum and Aluminum-Alloy Welding Electrodes and Rods.
   2. AWS D 1.2 - Structural Welding Code - Aluminum.

1.03 SUBMITTALS

A. Quality Control Submittals:
   1. Test Reports: Certified copies of mill tests or reports from a recognized commercial laboratory including chemical and tensile properties of each shipment of structural metal or part thereof having common properties. Tests and analyses shall be made in accordance with applicable ASTM Standards.

1.04 QUALITY ASSURANCE

A. Qualifications:
   1. Perform welding of structural metals with welders who have current American Welding Society certificate for the type of welding to be performed.
   2. Notify ENGINEER 24 hours minimum before starting shop or field welding.
   3. ENGINEER may check materials, equipment, and qualifications of welders.
   4. Remove welders performing unsatisfactory work, or require to requalify.
   5. ENGINEER may use gamma ray, magnetic particle dye penetrant, or other aids to visual inspection to examine any part of welds or all welds.
   6. CONTRACTOR shall bear costs of retests on defective welds.
   7. CONTRACTOR shall bear costs in connection with qualifying welders.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural Sheet Aluminum: ASTM B 209, Alloy 6061-T6.

B. Structural Aluminum: ASTM B 308, Alloy 6061-T6.

C. Extruded Aluminum: ASTM B 221, Alloy 6063-T42.

D. Miscellaneous Materials:
   1. Furnish supplementary parts necessary to complete each item even where such work is neither definitely indicated on the Drawings nor specified.
   2. Size, form, attachment, and location shall conform to the best of current practice.
   3. Conform to applicable ASTM Standards for materials not otherwise specified.

2.02 FABRICATION

A. Aluminum Layout:
   1. Center punch hole centers, and punch or scribe cutoff lines, except where marks would remain on fabricated material.
   2. Apply temperature correction where necessary in layout of critical dimensions. Use a coefficient of expansion of 0.000013 per degree of Fahrenheit.

B. Cutting Aluminum:
   1. Material 1/2 Inch Thick or Less: Shear, saw, or cut with a router.
   2. Material More than 1/2 Inch Thick: Saw or rout.
   3. Make cut edges true and smooth, free from excessive burrs or ragged breaks.
   4. Avoid reentrant cuts wherever possible. Where used, fillet by drilling prior to cutting.
   5. Do not flame cut aluminum alloys.
   6. Punch or drill rivet or bolt holes to finished size before assembly.
      a. Make finished diameter of holes for bolts 1/16 inch maximum larger than nominal bolt diameter.
      b. Make holes cylindrical and perpendicular to principal surface.
      c. Do not permit holes to drift in a manner to distort metal.

C. Aluminum Forming and Assembly:
   1. Do Not Heat Structural Aluminum, Except as Follows:
      a. Heat aluminum to 400 degrees Fahrenheit for 30 minutes maximum, to facilitate bending or welding.
      b. Heat only when proper temperature controls and supervision can ensure that limitations on temperature and time are observed.

D. Before assembly, remove chips lodged between contacting surfaces.

E. Welding Aluminum:
   1. Perform welding of aluminum in accordance with AWS D1.2, "Structural Welding Code - Aluminum."
   2. Weld aluminum in accordance with the following:
      a. Preparation:

1) Remove dirt, grease, forming or machining lubricants, and organic materials from areas to be welded by cleaning with a suitable solvent or by vapor degreasing.
2) Additionally, etch or scratch brush to remove oxide coating just prior to welding when inert gas tungsten arc welding method is used.
3) Oxide coating may not need to be removed if welding is performed by automatic or semi-automatic inert gas shielded metal arc.
4) Suitably prepare edges to assure 100 percent penetration in butt welds by sawing, chipping, machining, or shearing. Do not cut with oxygen.

b. Filler Metal: Aluminum alloys conforming to the requirements of AWS A5.10 and AWS classification ER 4043, ER 5654, ER 5554, ER 5183, ER 5356, or ER 556.
c. Perform welding of structures which are to be anodized using filler alloys which will not discolor when anodized, AWS ER 5654, ER 5554, ER 5183, ER 5356, or ER 5556.
d. Perform welding by using a non-consumable tungsten electrode with filler metal in an inert gas atmosphere (TIG) or using a consumable filler metal electrode in an inert gas atmosphere (MIG).
e. Do not use welding process that requires use of a welding flux.
f. Neatly make welded closures.
g. Where weld material interferes with fit or is unsightly in appearance, grind it smooth.
h. Make welds full penetration welds unless otherwise indicated on the Drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine Work in place to verify that it is satisfactory to receive the Work of this Section. If unsatisfactory conditions exist, do not begin this Work until such conditions have been corrected.

3.02 INSTALLATION

A. Install structural aluminum products as indicated on the Drawings and specified.

B. Install structural aluminum products accurately and securely, true to level, plumb, in correct alignment and grade, with all parts bearing or fitting structure or equipment for which intended.

C. Do not cock out of alignment, redrill, reshape, or force fit fabricated items.

D. Place anchor bolts or other anchoring devices accurately and make surfaces which bear against structural items smooth and true to level.

E. Rigidly support and brace structural products needing special alignment to preserve straight, level, even, smooth lines, and keep braced until concrete, grout, or dry pack mortar has hardened for a minimum 48 hour period.

F. Interface with Other Products:
   1. Where aluminum comes in contact with dissimilar metals bolt it with stainless steel bolts and separate or isolate it from dissimilar metals as specified in Section 05120.
   2. Coat those parts of aluminum which will be cast into concrete or which will be in contact with concrete, masonry, or wood, as specified in Section 09960.

END OF SECTION

SECTION 05500

METAL FABRICATIONS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Miscellaneous metal fabrications including:
   1. Ladders.
   2. Stairs.
   3. Handrails and Guardrails.
   4. Metal Gratings.
   5. Metal Tread Plate.
   6. Aluminum Stair Nosing.
   7. Aluminum Stair Tread.
   8. Manhole Frames and Covers.
   9. Cast Iron Stop Plank Grooves.
   10. Concrete Inserts.
   11. Preformed Channel Pipe Supports.
   12. Miscellaneous Metals: Includes aluminum, cast iron, stainless steel, structural steel.
   13. Associated accessories to the above items.

B. Related Sections:
   1. Section 02084 - Utility Structures.
   2. Section 09960 - Coatings.
   3. Section 15061 - Pipe Supports.
   4. Section 15062 - Preformed Channel Pipe Support System.

1.02 REFERENCES

A. Aluminum Association (AA):
   1. Specification M12-C22-A41 - Aluminum Finishes.

B. American Association of State Highway and Transportation Officials (AASHTO):
   1. Standard Specifications for Highway Bridges.

C. American Society for Testing and Materials (ASTM):
   1. A 36/A 36M - Standard Specification for Structural Steel.
   2. A 48 - Standard Specification for Grey Iron Castings.
   3. A 53 - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
   4. A 123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
   5. A 240 - Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels.
   6. A 269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
   7. A 276 - Standard Specification for Stainless Steel Bars and Shapes.

8. A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
9. A 325 - Standard Specification for High-Strength Bolts for Structural Steel Joints.
10. A 489 - Standard Specification for Carbon Steel Lifting Eyes.
11. A 490 - Standard Specification for Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
12. A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
13. A 501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
14. A 569 - Standard Specification for Steel, Carbon (0.15 Maximum, Percent) Hot-Rolled Sheet and Strip Commercial Quality.
15. A 570/A 570M - Standard Specification for Steel, Sheet and Strip, Carbon. Hot-Rolled, Structural Quality.
16. A 635/A 635M - Standard Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Carbon, Hot-Rolled.
17. A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-coated (Galvannealed) by the Hot-Dip Process.
18. B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
19. B 429 - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
20. B 782 - Standard Specification for Iron Graphite Sintered Bearings (Oil-Impregnated).
21. A 992 - Standard Specification for Steel for Structural Shapes.

D. American National Standards Institute (ANSI):
   1. A14.3 - Ladders-Fixed: Safety Requirements.

E. International Code Council (ICC):
   1. California Building Code (CBC) 2007.

F. Occupational Safety and Health Administration (OSHA).

1.03 SUBMITTALS

A. Shop Drawings: Submit for handrails and guardrails, including details on connection attachments, gates, kickplates, ladders, and angles.
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
   2. Include erection drawings, elevations, and details where applicable.
   3. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

B. Quality Control Submittals:
   1. Design Data.
   2. Test Reports:
      a. Guardrails: 3 copies of certified tests performed by an independent testing laboratory certifying that guardrails meet current State and Occupational Safety and Health Administration strength requirements.

b. Gratings:
   1) Grating manufacturers' calculations showing that gratings will meet specified load-bearing and deflection requirements for each size grating for each span.
   2) Reports of tests performed.

PART 2 PRODUCTS

2.01 GENERAL

A. Materials: Unless otherwise specified or indicated on the Drawings, structural and miscellaneous metals shall conform with the standards of the ASTM, including the following:

Item	ASTM Standard No.	Class, Grade Type or Alloy No.
Cast Iron		
Cast Iron	A 48	Class 40B
Steel		
Galvanized sheet iron or steel	A 653	Coating G90
Black steel, sheet or strip	A 569 A 570	--
Coil (plate)	A 635	--
Structural plate, bars, rolled shapes (except W-shapes), and miscellaneous items	A 36	--
Wide flange shapes	A 992	--
Standard bolts, nuts, and washers	A 307	--
High strength bolts, nuts, and hardened flat washers	A 325 A 490	--
Eyebolts	A 489	Type 1
Tubing, cold-formed	A 500	--
Tubing, hot-formed	A 501	--
Steel pipe	A 53	Grade B
Stainless steel		
Plate, sheet and strip	A 240	Type 304 or 316*
Bars and shapes	A 276	Type 304 or 316*
Aluminum		
Sheet aluminum-flashing	B 209	Alloy 5005-H14, 0.032 inches minimum thickness
Sheet aluminum-structural	B 209	Alloy 6061-T6

Item	ASTM Standard No.	Class, Grade Type or Alloy No.
Structural aluminum	B 308 B 209	Alloy 6061-T6
Extruded aluminum	B 221	Alloy 6063-T42
* Use Type 304L or Type 316L if material will be welded.		

1. Stainless steels are designated by type or series defined by ASTM.
2. Where stainless steel is welded, use low-carbon stainless steel.

2.02 STAIRS

A. Aluminum:
   1. Stringers: 6061-T6 aluminum alloy.
   2. Stair Treads:
      a. Aluminum of same type specified under Aluminum Grating.
      b. Of sizes indicated on the Drawings, and 1-3/4 inch minimum depth with cast abrasive type safety nosings.
   3. Handrails and Guardrails: Aluminum pipe specified under Aluminum Handrails and Guardrails (Nonwelded Pipe).
   4. Fasteners: Type 304 or Type 316 stainless steel.

2.03 HANDRAILS AND GUARDRAILS

A. General: Design and fabricate assemblies to conform to current local, State, and Occupational Safety and Health Administration standards and requirements.

B. Aluminum Handrails and Guardrails (Nonwelded Pipe):
   1. Rails, Posts, and Fitting-Assembly Spacers:
      a. ASTM B 429, 6063-T5 or T6, minimum Schedule 40, extruded aluminum pipe of minimum 1.89 inch outside diameter and 0.14-inch wall thickness.
      b. Alloy 6063-T6 may be used for pieces requiring bending only.
   2. Kick Plates: 6061-T6 aluminum alloy.
   3. Fastenings and Fasteners: As recommended or furnished by the manufacturer.
   4. Other Parts: 6063 extruded aluminum, or F214 or F514.0 aluminum castings.
      a. Fabrications: ASTM B 209 or ASTM B 221 extruded bars.
         1) Bases: 6061 or 6063 extruded aluminum alloy.
      b. Plug Screws or Blind Rivets: Type 305 stainless steel.
      c. Other Parts: Type 300 series stainless steel.
   5. Finish of Aluminum Components:
      a. Anodized finish, 0.7 mil thick, applied to exposed surfaces after cutting. Aluminum Association Specification M12-C22-A41, mechanical finish-medium satin, chemical finish-medium matte, anodic coating-clear Class I Architectural.
      b. Pretreat aluminum for cleaning and removing markings before anodizing.
   6. Fabrication and Assembly:
      a. Fabricate posts in single, unspliced pipe length.
      b. Perform without welding.
      c. Do not epoxy bond the parts.
      d. Maximum clear opening between assembled railing components as indicated on the Drawings.

7. Manufacturers: One of the following or equal:
    a. Moultrie Manufacturing Company, Wesrail.
    b. Julius Blum and Company, Inc., Connectorail.
    c. Craneveyor Corporation Enerco Metals, C-V Rail.

C. Fastenings and Fasteners: As recommended or furnished by guardrail manufacturer for use with this system.

2.04 METAL GRATINGS

A. General:
1. Fabricate grating to cover areas indicated on the Drawings.
2. Unless otherwise indicated on the Drawings, grating over an opening shall cover entire opening.
3. Make cutouts in grating where required for equipment access or protrusion, including valve operators or stems, and gate frames.
4. Band Ends of Grating and Edges of Cutouts in Grating:
    a. End Banding: 1/4 inch less than height of grating, with top of grating and top edge of banding flush.
    b. Cutout Banding: Full-height of grating.
    c. Use banding of same material as grating.
    d. Panel Layout: Enable installation and subsequent removal of grating around protrusions or piping.
    e. Openings 6 Inches and Larger: Lay out grating panels with edges of 2 adjacent panels located on centerline of opening.
    f. Openings Smaller than 6 Inches: Locate opening at edge of single panel.
    g. Where an area requires more than 1 grating section to cover area, clamp adjacent grating sections together at 1/4 points with fasteners acceptable to ENGINEER.
    h. Fabricate grating in units of maximum 50 pounds each.
5. When requested by ENGINEER, test 1 section of each size grating for each span length involved on the job under full load.
    a. Furnish a suitable dial gauge for measuring deflections.
6. Grating shall be aluminum, unless otherwise specified or indicated on the Drawings.

B. Aluminum Grating:
1. Material for Gratings, Shelf Angles, and Rebates: 6061-T6 or 6063-T6 aluminum alloy, except cross bars may be 6063-T5 aluminum alloy.
2. Shelf Angle Concrete Anchors: Type 304 or Type 316 stainless steel.
3. Grating Rebate Rod Anchors: 6061-T6 or 6063-T6 aluminum alloy.
4. Bar Size and Spacing: As determined by manufacturer to enable grating to support design load.
5. Design Live Load: A minimum of 150 pounds per square foot uniform live load on entire grating area, but not less than the live load indicated on the Drawings for the area where grating is located.
6. Maximum Fiber Stress for Design Load: 12,000 pounds per square inch.
7. Maximum Deflection Due to Design Load: 1/240 of grating clear span.
8. Maximum Spacing of Main Grating Bars: 1-1/8 inches clear between bars.
9. Minimum Grating Height: 1-1/2 inches.
10. Manufacturers: One of the following or equal:
    a. IKG Borden Industries, grooved Galok Aluminum I-Bar.

b. Seidelhuber Metal Products, Inc., grooved I-Bar.

C. Heavy-Duty Grating:
1. Heavy-duty type, fabricated from structural steel and designed in accordance with AASHTO specifications, using H-20 loading.
2. Hot-dip galvanized after fabrication in accordance with ASTM A 123.
3. Manufacturers: One of the following or equal:
a. Reliance Steel Products Company, Heavy-Duty Steel Grating.
b. Seidelhuber Metal Products, Inc., equivalent product.

2.05 MANHOLE FRAMES AND COVERS

A. Material: Gray iron castings, ASTM A 48, Class 30-B.

B. Type: Heavy-duty traffic type, with combined set weight of minimum 265 pounds.

C. Machine horizontal and vertical bearing surfaces to fit neatly, with easily removable cover bearing firmly in frame without rocking.

D. Frame:
1. Bottom flange type.
2. Approximately 4-1/2 inches frame height.
3. 24 inches diameter clear inside dimension, unless otherwise indicated on the Drawings.
4. Approximately 32 inches bottom flange outside diameter.

E. Cover:
1. Skid-resistant grid pattern design stamped with name of utility service provided by manhole, such as "ELECTRICAL," "SEWER," "TELEPHONE," or "WATER."
2. Solid type without ventilation holes.

F. Finish: Unpainted.

2.06 CONCRETE INSERTS

A. Concrete inserts for supporting pipe and other applications are specified in Section 15061, 15062, and elsewhere.

2.07 PREFORMED CHANNEL PIPE SUPPORTS

A. Preformed channel pipe supports for pipe supports and other applications are specified in Section 15062.

2.08 MISCELLANEOUS METAL

A. Miscellaneous Aluminum: Fabricate aluminum products, not covered separately herein, in accordance with the best practices of the trade and field assemble by riveting or bolting. Do not weld or flame cut.

B. Miscellaneous Cast Iron:
1. General:
a. Tough, gray iron, free from cracks, holes, swells, and cold shuts.

b. Quality such that hammer blow will produce indentation on rectangular edge of casting without flaking metal.
c. Before leaving the foundry, clean castings and apply 16 mil dry film thickness coating of coal-tar epoxy, unless otherwise specified or indicated on the Drawings.

C. Miscellaneous Stainless Steel:
1. Provide miscellaneous stainless steel items not specified herein as indicated on the Drawings or specified elsewhere. Fabricate and install in accordance with the best practices of the trade.

D. Miscellaneous Structural Steel:
1. Provide miscellaneous steel items not specified herein as indicated on the Drawings or specified elsewhere. Fabricate and install in accordance with the best practices of the trade.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verification of Conditions: Examine work in place to verify that it is satisfactory to receive the work of this Section. If unsatisfactory conditions exist, do not begin this work until such conditions have been corrected.

3.02 INSTALLATION

A. General: Install products as indicated on the Drawings, and in accordance with shop drawings and manufacturer's printed instructions, as applicable except where specified otherwise.

3.03 STAIRS

A. General: Install guard railings around stair wells as indicated on the Drawings or specified.

3.04 ALUMINUM HANDRAIL AND GUARDRAIL

A. Fasten pipe rails to fittings with Series 300 stainless steel pop rivets or flush set screws.

B. Make pipe cuts clean and straight, free of burrs and nicks, and square and accurate for minimum joint-gap.

C. Drill and countersink holes to proper size, as required for a tight flush fit of screws and other component parts.

D. Space attachment brackets as indicated in the manufacturer's instructions.

3.05 GRATING

A. Steel Grating: Support on hot-dip galvanized structural steel shelf angles.

B. Heavy-Duty Steel Grating:
   1. Support on hot-dip galvanized structural steel shelf angles embedded and anchored in concrete.
   2. Use for roadways, traffic areas, and where indicated on the Drawings.

C. Allow 1/8 inch maximum clearance between ends of grating and inside face of vertical leg of shelf angles.

D. Horizontal bearing leg of shelf angles shall be 2 inches minimum.

E. Install aluminum plate or angles where necessary to fill openings at changes in elevation and at openings between equipment and grating.

F. Install angle stops at ends of grating.

G. Installed grating shall not slide out of rebate or off support.

H. Weld stops in place, unless otherwise specified or indicated on the Drawings.

I. Top surfaces of grating sections adjacent to each other shall lie in same plane.

J. Recess stop plank grooves with cast iron surfaces of groove set flush with concrete surface.

3.06 MANHOLE FRAMES AND COVERS

A. Installation: As specified in Section 02084, Utility Structures.

END OF SECTION

SECTION 07214

BATT INSULATION

PART 1 GENERAL

1.01 SUMMARY

A. **Section includes: Batt or blanket type insulation.**

1.02 REFERENCES

A. **ASTM International (ASTM):**
   1. **C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing.**

1.03 SYSTEM DESCRIPTION

A. **Minimum thermal resistance of ceiling and soffit insulation:**
   1. **R-30 unless otherwise for 9-1/4-inch minimum thickness space.**
   2. **Or as indicated on the Drawings or specifications.**

B. **Minimum thermal resistance of wall insulation:**
   1. **R-3 for 1-3/4-inch spaces.**
   2. **R-11 for 3-1/2-inch spaces.**
   3. **R-19 for 5-1/2-inch spaces.**
   4. **R-30 for 9-1/4-inch spaces.**
   5. **Or as indicated on the Drawings.**

1.04 SUBMITTALS

A. **Product data.**

1.05 DELIVERY, STORAGE, AND HANDLING

A. **Deliver insulation to project site in unopened containers labeled with the manufacturer's name, brand designation, and R-valve rating.**

B. **Store insulation in a dry, well ventilated, and watertight enclosure providing protection from damage.**

1.06 PROJECT/SITE CONDITIONS

A. **Do not install insulation until the building has been made substantially water and weathertight.**

PART 2 PRODUCTS

2.01 BATT INSULATION

A. **Manufacturers: One of the following or equal:**
   1. **Owens-Corning Fiberglas.**
   2. **John Manville, Inc.**
   3. **U. S. Gypsum.**

B. **Foil-faced insulation: ASTM C 665, Type III; fiberglass batts.**
   1. **Thickness: As indicated on the Drawings or as specified, aluminum foil vapor barrier faces and nailing flanges.**
   2. **Flame spread: 25 or less.**

2.02 ACCESSORIES

A. **Welded impaling pins:**
   1. **Manufacturers: The following or equal:**
      a. **Owens-Corning Fiberglas, Pinwelding System.**

B. **Adhesive applied impaling pin system:**
   1. **Manufacturers: The following or equal:**
      a. **Stic-Klips Manufacturing Co., Type B Stic-Klips with locking plates, holding plates, and Type S adhesive.**

C. **Wiring or netting: As recommended by insulation manufacturer.**

PART 3 EXECUTION

3.01 EXAMINATION

A. **Verify that conditions are satisfactory for installation of products.**

B. **Verify that construction required to be in place before application of insulation has been completed, that available space has sufficient depth for required insulation thickness, and that substrate is clean and dry.**

3.02 PREPARATION

A. **Remove cover projections in construction framing that may damage or prevent proper installation of insulation.**

B. **Weld impaling pins to steel in accordance with manufacturer's instructions.**

C. **Apply adhesive-applied impaling pins to concrete.**
   1. **Apply thin coat of adhesive to impaling pin bases with putty knife.**
   2. **Press pin bases on clean surface until adhesive fills holes.**
   3. **Remove excess adhesive.**
   4. **Allow adhesive to cure overnight before proceeding.**

3.03 APPLICATION

A. **Install unfaced insulation wherever insulation will be in direct contact with covering material.**

B. **Install foil-faced insulation wherever insulation will not be in direct contact with covering material.**

3.04 INSTALLATION

A. **Install insulation when construction has progressed to point that inclement weather will not damage or wet insulation material.**

B. **Install Insulation in accordance with manufacturer's recommendations.**

C. **Install insulation to attain minimum R-values.**

D. **Exercise care to maintain vapor barrier integrity.**
   1. **Patch and seal punctures, tears, and voids.**

E. **Install foil-faced insulation with vapor barrier toward warm-in-winter side of assembly.**

F. **Maintain integrity of insulation over entire insulated area, including contiguous breaks, corners, pockets, voids, and offsets.**

G. **Place insulation between exterior wall and pipes and conduit.**

H. **Carefully cut and fit insulation around pipes, conduit, and other obstructions, compressing insulation where necessary.**

I. **Do not block or restrict air ventilation devices.**

J. **Provide 3-inch clearance between insulation and lighting fixtures, fans, and operating equipment.**

K. **Impale insulation over clips.**
   1. **Friction fit insulation between studs.**
   2. **Fill space between studs with as thick as possible insulation.**
   3. **Provide supplementary support where insulation is over 8 feet high to hold insulation in place until interior finish is applied.**

3.05 CLEANING

A. **Remove insulation damaged by construction and replace with new undamaged insulation.**

END OF SECTION

SECTION 07900

JOINT SEALERS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Joint sealers, including sealants, sealant backup, and associated materials.

1.02 REFERENCES

A. American National Standards Institute/National Sanitation Foundation.
   1. ANSI/NSF Standard 61 - Drinking Water System Components - Health Effects.

B. American Society for Testing Materials (ASTM):
   1. D 412 - Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension.
   2. D 624 - Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomer.
   3. C 920 - Specification for Elastomeric Joint Sealants.

C. Federal Specification (FS):
   1. FS TT-S-00227e - Sealing Compound, Elastomeric Type, Multi-Component.

1.03 SUBMITTALS

A. Product Data.

B. Samples, include color selections.

C. Manufacturer's Installation Instructions.

D. Warranty.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer of proposed product for minimum 5 years with satisfactory performance record.

B. Installer Qualifications: Manufacturer approved installer of products similar to specified products on minimum 5 projects of similar scope as Project with satisfactory performance record.

1.05 PROJECT/SITE CONDITIONS

A. Environmental Requirements: Do not apply sealant on wet or frosty surfaces or when surface temperature is higher than 120 degrees Fahrenheit or lower than recommended by the manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products in accordance with manufacturer's recommendations.

B. Code date packages. Do not use material older than 6 months old. Store materials at temperatures lower than 80 degrees Fahrenheit.

1.07 SEQUENCING AND SCHEDULING

A. Caulk joints prior to painting.

1.08 WARRANTY

A. Warrant to correct defective products for minimum 5 years in accordance with manufacturer's standard warranty.

PART 2 PRODUCTS

2.01 SYNTHETIC RUBBER SEALING COMPOUND (POLYURETHANE)

A. Manufacturer: One of the following or equal:
   1. Polymeric Systems, Inc., PSI 270 or PSI 270 SL.
   2. Pacific Polymers, Garden Grove, CA, Elastothane 227R.

B. Material: FS TT-S-00227e, Type I, pourable grade, and Type II, nonsag, Class A; multi-part polyurethane; able to cure at room temperature to firm, highly resilient rubber; able to perform satisfactory when continuously submerged in water or sewage and exposed to direct sunlight in dry condition; with the following properties determined at 75 degrees Fahrenheit and 50 percent relative humidity:
   1. Base: Polyurethane rubber.
   2. Solids: Minimum 97 percent.
   3. Application Time: Minimum 2 hours.
   4. Cure Time: Maximum 3 days.
   5. Tack Free Time: 24 hours.
   6. Ultimate Hardness: 35, within 5 Shore A.
   7. Tensile Strength: Minimum 300 pounds per square inch when tested in accordance with ASTM D 412.
   8. Ultimate Elongation: Minimum 550 percent when tested in accordance with ASTM D 412.
   9. Tear Resistance: Minimum 85 pounds per inch when tested in accordance with ASTM D 624 Die C.
   10. Service Temperature Range: -25 degrees to 158 degrees Fahrenheit.

C. Color: Gray to match concrete, unless indicated on the Drawings.

2.02 SILICONE SEALANT

A. ASTM C 920, Type S, Grade NS, Class 25, single component silicone sealant. Manufacturers: One of the following or equal:
   1. Tremco, Proglaze.
   2. Pecora Corp., Number 864.

3. Dow Corning, Number 795
4. General Electric, Number 1200 Series.

2.03 ACRYLIC-LATEX SEALANT

A. Permanently flexible, nonstaining, and nonbleeding latex modified acrylic sealant compound, colors as selected by ENGINEER from manufacturer's standard options. Manufacturers: One of the following or equal:
   1. Tremco, Mono.
   2. Pecora Corp., Number AC-20.
   3. Sonneborn, Sonolac.

2.04 SYNTHETIC SPONGE RUBBER FILLER

A. Closed-cell expanded sponge rubber manufactured from synthetic polymer neoprene base, or resilient polyethylene foam backer rod. Manufacturers: One of the following or equal:
   1. Presstite, Number 750.3 Ropax Rod Stock.
   2. Rubatex Corp., Rubatex-Cord.

B. Characteristics:
   1. Suitable for application intended.
   2. Strength: As necessary for supporting sealing compound during application.
   3. Resiliency: Sufficient resiliency to prevent significant load transfer across joint.
   4. Resistance to environmental conditions of installation.
   5. Bonding: No bonding to the sealing compound.
   6. Structure: Cellular, prevents wicking or absorption of water.
   7. Compatibility with other materials in joint and acceptance by manufacturer of sealing compound.
   8. Size: Minimum 25 percent greater than nominal joint width.

2.05 RELATED MATERIALS

A. Primer: Nonstaining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Noncorrosive, nonstaining, compatible with joint forming materials and as recommended by sealant manufacturer.

C. Bond Breaker Tape: Pressure-sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify acceptability of joint dimensions, physical, and environmental conditions.

B. Verify that surfaces are dry, clean, and free of dirt, grease, curing compound, and other residue which might interfere with adhesion of sealants.

3.02 PREPARATION

A. Allow concrete to cure thoroughly before caulking.

B. Synthetic Sponge Rubber Filler:
   1. Prepare surfaces designated to receive filler in accordance with manufacturer's installation instructions.
   2. Do not stretch filler beyond its normal length during installation.

C. Caulking:
   1. Verify that surfaces are dry, clean, and free of dirt, grease, curing compounds, and other residue that might interfere with adhesion of caulking compound.
   2. Concrete, Masonry, Wood, And Steel Surfaces: Clean and prime in accordance with manufacturer's instructions prior to caulking.

D. Synthetic Rubber Sealing Compound:
   1. Ensure surfaces to which synthetic rubber must bond are dry and free of dust, dirt, and other foreign residue.
   2. Heavy sandblasted caulking groove to sound surface, and prime with manufacturer's recommended primer for particular surface.

E. For sidewalks, pavements, and similar joints sealed with elastomeric sealants and subject to traffic and other abrasion and indentation exposures, fill joints to depth equal to 75 percent of joint width, but neither more than 5/8 inches deep nor less then 3/8 inches deep.

F. For normal moving building joints sealed with elastomeric sealants not subject to traffic, fill joints to depth equal to 50 percent of joint width, but neither more than 1/2 inch deep nor less than 1/4 inch deep.

G. For joints sealed with acrylic-latex sealants, fill joints to depth in range of 75 percent to 125 percent of joint width.

H. Use joint filler to achieve required joint depths, to allow sealants to perform properly.

I. Prepare surfaces and install synthetic sponge rubber filler in accordance with manufacturer's recommendations.

J. Do not stretch filler beyond normal length during installation.

K. Apply bond breaker when recommended by joint sealer manufacturer.

3.03 INSTALLATION

A. Synthetic Sponge Rubber Filler: Install filler in accordance with manufacturer's installation instructions.

B. Caulking, Joints, and Sealing:
   1. Construct expansion, contraction, and construction joints as indicated on the Drawings.
   2. Install pipe and conduit in structures as indicated on the Drawings.
   3. Caulk doors, windows, louvers, and other items installed in or over concrete openings inside and out.

4. Use synthetic rubber sealing compound for caulking where indicated on the Drawings or as specified, except for masonry construction and where specified otherwise.
5. Complete caulking prior to painting.
6. Verify that concrete is thoroughly cured prior to caulking.
7. When filler compressible material is used, use untreated type.
8. Apply caulking with pneumatic caulking gun.
9. Use nozzles of proper shape and size for application intended.
10. Maintain continuous bond between caulking and sides of joint to eliminate gaps, bubbles, or voids and fill joint in continuous operation without layering of compound.
11. Employ experienced applicators to caulk joints and seams in neat workmanlike manner.
12. To hasten curing of compound when used on wide joints subject to movement, apply heat with infra-red lamps or other convenient means.
13. Apply synthetic rubber sealing compound with pneumatic caulking tool or other acceptable method.

3.04 CLEANING

A. Clean surfaces adjacent to sealant as work progresses.

B. Remove excess uncured sealant by soaking and scrubbing with sealant cleaning solvent.

C. Remove excess cured sealant by sanding with Number 80 grit sandpaper.

D. Leave finished work in neat, clean condition.

3.05 SCHEDULE

A. Synthetic Rubber Sealing Compound (Polyurethane), Non-sag Type II:
1. Use where indicated on the Drawings.
2. Water-bearing and earth-bearing concrete structures.
3. Joints in masonry, concrete vertical surfaces, and metal faced panels in vertical surfaces.
4. Joints between sheet metal flashing and trim.
5. Joints between sheet metal flashing and trim, and vertical wall surfaces.
6. Small voids between materials requiring filling for weathertight performance in vertical surfaces.
7. Surfaces in contact with bituminous materials in vertical surfaces.
8. Perimeters of frames of doors, windows, louvers, and other openings where bonding is critical to airtight performance.
9. Expansion and control joints in masonry vertical surfaces.

B. Synthetic Rubber Sealing Compound (Polyurethane), Self-leveling Type I:
1. Use where indicated on the Drawings.
2. Expansion and control joints in masonry, concrete horizontal surfaces, and metal panels in horizontal surfaces.
3. Small voids between materials requiring filling for weathertight performance in horizontal surfaces.
4. Surfaces in contact with bituminous materials.
5. Pavement joints.

6. Perimeters of frames of doors, windows, louvers, and other openings in horizontal surfaces where bonding is critical to airtight performance.

C. Silicone:
   1. Use where indicated on the Drawings.
   2. Joints and recesses formed where window, door, louver and vent frames, and sill adjoin masonry, concrete, stucco, or metal surfaces.
   3. Door threshold bedding.
   4. Moist or wet locations, including joints around plumbing fixtures.
   5. Stainless steel doors and frames, including joints between applied stops and frames, and around anchor bolts.
   6. Plenum joints.

D. Acrylic Latex:
   1. Use where indicated on the Drawings.
   2. Interior joints with movement less than 7.5 percent and not subject to wet conditions.

END OF SECTION

SECTION 07916

PRECAST CONCRETE JOINT SEALER

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Precast concrete joint sealer such as for manholes.

1.02 REFERENCES

A. American Association of State Highway and Transportation Officials (AASHTO):
   1. M-198.

1.03 SUBMITTALS

A. Product Data.

B. Manufacturer's Installation Instructions.

PART 2 PRODUCTS

2.01 PRECAST CONCRETE JOINT SEALER

A. In accordance with AASHTO M-198; as manufactured by one of the following or equal:
   1. Associated Concrete Products Company, Quik-Seal.
   2. Henry Company, Ram-Nek.
   3. J-K Polysource, Inc., Polyseal.

B. Physical Properties: As follows:
   1. Hydrocarbon Content: 50 to 70 percent.
   2. Inert Mineral Filler: 30 to 50 percent by weight.
   3. Volatile Matter: 2.0 to 3.0 percent by weight lost when heated for 5 hours at 325 degrees fahrenheit.
   4. Specific Gravity: 1.20 to 1.35 at 77 degrees fahrenheit.
   5. Ductility: 5.0 at 77 degrees Fahrenheit.
   6. Softening Point: 320 degrees Fahrenheit.
   7. Sag or Flow: None.
   8. Chemical Resistance: No reaction when exposed for 30 days by 5 percent sulfuric acid, potassium hydroxide, caustic potash, and hydrochloric acid; and saturated hydrogen sulfide solution.

2.02 RELATED MATERIALS

A. Precast Concrete Joint Sealer Primer: As recommended by precast concrete joint sealer manufacturer.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean surface of dust, dirt, and other foreign matter including frost, snow, and ice. Proceed when surfaces are clean and dry.

B. Apply primer on joints of horizontally placed concrete pipe and precast box sections.

3.02 INSTALLATION

A. Place single coils of sealant on shoulder of grooves or recesses.

B. Press against joint surface and remove plastic separator.

END OF SECTION

SECTION 08110

STEEL DOORS AND FRAMES

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Steel Fire Resistive Rated and Non-fire Resistive Rated:
   1. Doors.
   2. Door frames.
   3. Window frames.
   4. Combination door frames and window frames with mullions, muntins, and transom bars.

B. Related Sections:
   1. Section 08710 - Door Hardware.
   2. Section 09960 - Coatings.
   3. Section 09910 - Paints.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. ASTM A 366 - Standard Specification for Steel, Sheet, Carbon, Cold-Rolled Commercial Quality.
   2. ASTM A 569 Standard Specification for Steel, Carbon (0.5 Maximum Percent), Hot-Rolled Sheet and Strip, Commercial Quality.
   3. ASTM A 653/A653M - Specification for Sheet Steel, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
   4. ASTM A 924/A924M - Specification for General Requirements for Steel Sheet, Metallic- Coated by the Hot-Dip Process.
   5. ASTM E 90 - Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.
   6. ASTM E 152 - Standard Methods of Fire Tests of Door Assemblies.
   7. ASTM E 413 - Classification for Rating Sound Insulation.

B. International Conference of Building Officials (ICBO):
   1. Uniform Building Code (UBC) Standards:
      a. UBC Standard 7-2 - Fire Tests of Door Assemblies.

C. National Association of Architectural Metal Manufacturers (NAAMM)/Hollow Metal Manufacturers Association (HMMA):
   1. HMMA 810 - Hollow Metal Doors.
   2. HMMA 861 - Guide Specifications For Commercial Hollow Metal Doors and Frames.

D. National Fire Protection Association (NFPA):
   1. NFPA 80 - Fire Doors and Windows.

E. Steel Door Institute (SDI):
   1. SDI-100 - Standard Steel Doors and Frames.

2. SDI-117 - Manufacturing Tolerances Standard Steel Doors and Frames.

F. Underwriters Laboratories Inc. (UL):
1. UL 10B - Fire Tests of Door Assemblies.

1.03 SUBMITTALS

A. Product Data.

B. Shop Drawings: Show the following with references to the ENGINEER's door marks and hardware groups:
1. Location of door and frame types.
2. Details of fabrication, including core construction, glass lights, louvers, weatherstripping, and factory finish for each door.
3. Cut-outs and reinforcements for hardware.
4. Methods of installation and anchorage to adjacent construction.

C. Certificates of Compliance: Submit certificates certifying compliance with designated standards, governing codes, and applicable labeling agencies.

D. Manufacturer's Instructions: Submit manufacturer's installation instructions.

E. Certifications: Manufacturer's certification that oversize fire-resistive doors conform to Specifications.

1.04 QUALITY ASSURANCE

A. Testing Agency Qualifications: Approved by ultimate enforcing authority for the Project; regularly engaged in inspection of materials and workmanship at factory.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Before delivery, identify type and size of each door and frame in such a way that markings will not damage finish.

B. Preassemble door frames in shop and deliver to Project site with spreader bar at sill or tie them in pairs to form box.

C. Protect doors and frames with resilient packaging sealed with heat shrunk plastic. Break seal on-site to permit ventilation.

D. Protect doors and frames during shipment and storage to prevent warping, bending, and corrosion.

1.06 SEQUENCING AND SCHEDULING

A. Ensure timely delivery of reviewed hardware schedule and hardware templates such that no delay occurs in the work of the Contract.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sheet Steel: ASTM A 366, commercial quality, level, cold rolled steel, or ASTM A 569, hot rolled, pickled and oil rolled steel. Galvanize by hot-dip process with zinc-coating conforming to ASTM A 653 and A 924 with a coating weight of not less than 0.60 ounces per square foot (0.30 ounces per square foot per side).Clips, Bolts, Screws, and Rivets: Sized as recommended by manufacturer.

B. Primer: Rust- inhibitive metal primer capable of being baked and compatible with finish painting system specified in Section 09910.

C. Touch-up Materials: Primer as recommended by manufacturer.

D. Door Hardware: As specified in Section 08710.

2.02 DOOR AND FRAME TYPES

A. Interior Doors: SDI-100, Grade III, Model 3 or NAAMM HMMA 810 Type A and NAAMM HMMA 861, flush steel rib-stiffened, minimum 18 gauge face sheets.

B. Exterior Doors: SDI-100, Grade III, Model 3, or NAAMM HMMA 810 Type A and NAAMM HMMA 861, flush steel rib-stiffened, minimum 16 gauge face sheets.

C. Interior Frames: SDI-100 or NAAMM HMMA 861, fully welded frames, minimum 16 gauge, sizes and shapes as indicated on the Drawings.

D. Exterior Frames: SDI-100 or NAAMM HMMA 861, fully welded frames HMMA 861, except minimum 14 gauge sizes and shapes as indicated on the Drawings.

2.03 COMPONENTS

A. Door Cores:
   1. Stiffeners: Vertical steel ribs formed from minimum 22-gauge plain sheet steel, spaced at maximum 6 inches apart and securely attached to face sheets by spot welds at maximum 5 inches on center.
   2. Core Fillers: Insulation, minimum 0.60 pound density noncombustible type, installed in spaces between stiffeners for full height of door; labeled door core material shall conform to requirements of labeling authority.

B. Glazing Stops: Minimum 18 gauge sheet steel, mitered, square or rectangular.
   1. Outside of Exterior Doors: Fixed, integral to doors and frames.
   2. Secure Side of Interior Doors: Removable.

C. Removable Stop Fasteners: Flat head, countersunk, tamperproof, self-tapping sheet metal screws.

D. Louvers:
   1. Type: Flush with face, inverted Y blades, with UL approved fusible link type louvers at fire rated doors.
   2. Material: Steel sheet, same type sheet as door material.
   3. Blade Gauge: Minimum 24.

4. Frame Gauge: Minimum 20.
5. Construction: Provide louvers that are welded to frame (except at fusible link type).
6. Moldings: Secure and detachable type. Locate detachable moldings on room or non-security side of doors.

E. Louver Screens:
1. Use: At exterior door louvers.
2. Location: Locate screens on interior face of louver, and secured to louvers in rigid manner, that permits easy removal.
3. Screens: Stainless steel insect screen mesh.
4. Frames: Stainless steel manufacturer's standard type and gauge.

2.04 FABRICATION OF FRAMES

A. Galvanize all frames installed in exterior openings.

B. Frames: Sheet steel, integral type, welded continuous to full depth of frames with minimum 5/8 inch deep stops, unless otherwise indicated on the Drawings.

C. Hardware Reinforcement: Minimum 7 gauge at hinges; 12 gauge at strikes, bolts, closers, and other applied hardware.

D. Jamb Anchors: As required for adjacent wall construction, minimum 3 per jamb, unless otherwise indicated on the Drawings;

E. Floor Anchors: Fixed type, except where adjustable anchors are indicated on the Drawings, 1 per jamb, with minimum 2 holes for anchorage. Where floor fill occurs, terminate bottom of frames at indicated finished floor level and support by adjustable extension clips resting on and anchored to structural slabs.

F. Anchors at Masonry: Adjustable strap and stirrup, minimum 16 gauge corrugated or perforated steel at maximum of 30 inches on center and extending minimum 8 inches into masonry.

G. Anchors at Previously Placed Concrete: Countersink machine screws through the frame into expansion devices spaced at maximum 30 inches on center.

H. Anchors at Structural Steel Framing: Welded or otherwise securely fastened with stainless steel screws.

I. Anchors for Fire Resistive Frames: Conform to requirements of labeling authority having jurisdiction.

J. Masonry Angle Stiffeners: Factory welded into heads of frames for installation in openings more than 48 inches wide.

K. Mullions, Muntins, and Transom Bars: Minimum 18 gauge, tubular sheet steel matching, and butt-welded to, head and jamb members.

L. Removable Stops: Fasten at approximately 12 to 16 inches on center.

2.05 FABRICATION OF DOORS

A. Galvanize all doors installed in exterior openings.

B. Reinforce face sheets with steel rib stiffeners, spaced at maximum 6 inches apart, and securely attached to face sheets by spot welds at maximum 5 inches on center.

C. Fill voids between face sheets and stiffeners with fiberglass insulation having a minimum density of 0.8 pounds per cubic foot.

D. Edges: Full weld without visible joints. Bevel striking edge 1/8 inch in 2 inches.

E. Tops and Bottoms of Doors: Close with continuous recess steel channel of minimum 16 gauge, extending full width of door and spot welded to both faces.

F. Tops and Bottoms of Exterior Doors: Flush closing channels welded to make tops and bottoms waterproof with weep holes for escape of moisture.

G. Hinge Reinforcement: 7 gauge.

H. Lock, Closer, and Flush Bolt Reinforcement: 12 gauge.

I. Astragals:
   1. Install on active leaf of double doors in accordance with UL listing requirements for fire resistive ratings as indicated on the Drawings, and for exterior pairs of doors.
   2. Do not install on doors swinging in pairs with rating of 90 minutes or less in means of egress where both leaves are required to provide Uniform Building Code exiting widths.
   3. Do not provide astragal cutouts for hardware operations.

J. Astragal Clearances for Fire Resistive Rated Doors:
   1. Door bottoms at doors designated to receive non-combustible threshold: Not to exceed 3/8 inch between threshold and door bottom.
   2. Door bottoms where there is no threshold: Maximum clearance between door and floor not to exceed 1/2 inch.
   3. Door bottoms at doors designated to receive combustible floor coverings: Not to exceed 1/2 inch between floor covering and door bottom.
   4. Clearance between door and frame and between meeting edges of pairs of doors: Not to exceed 1/8 inch.

K. Astragal Clearances for Non-Fire Resistive Rated Doors: Same as fire resistive rated doors, unless otherwise indicated on the Drawings.

L. Glazing: In accordance with fire labeling.

2.06 FABRICATION OF FIRE RATED DOORS AND FRAMES

A. Fabricate to meet requirements of Uniform Building Code Standard 7-2, UL 10B, and ASTM E 152, except hose stream test shall not be required for opposite swing double egress exit doors and for doors of fire endurance rating of less than 45 minutes with or without approved glass lights.

B. Temperature Rise Requirements of Doors at Exit Enclosures: Maximum transmitted temperature end point of less than 450 degrees Fahrenheit above ambient at end of 30 seconds when tested in accordance with Uniform Building Code Standard 7-2.

C. Apply approved testing agency labels on fire rated doors and frames.

D. Fabricate oversized fire rated doors in accordance with requirements for ratings indicated on the Drawings.

2.07 HARDWARE PREPARATION

A. Cut-out, drill, and reinforce frames and doors for hardware in accordance with hardware templates.

B. Install plaster guards or mortar boxes in back of hardware cut-outs in and welded to frames.

C. Prepare fire resistive rated doors for hardware in accordance with requirements of labeling authority.

D. Do not weld hinges to door frames.

E. Silencers:
   1. Drill single leaf door frame jamb stops for minimum 3 silencers.
   2. Drill double-leaf door frame Head stops for minimum 2 silencers.
   3. Do not drill door frames for silencers when weatherstripping is to be installed.

2.08 FINISHING

A. Thoroughly clean surfaces of oil, grease, and other impurities; touch-up abraded galvanizing; and chemically etch.

B. Fill irregularities and sand smooth finish surface. Apply 1 coat of manufacturer's standard rust inhibitive baked-on primer.

C. Finish Painting: As specified in Section 09960.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine reviewed hardware schedules and verify proper coordination of hardware and doors and frames.

B. Examine Opening Locations and Verify the Following:
   1. Correctness of dimensions, backing or support conditions.
   2. Absence of defects that would adversely affect frame or door installation.

3.02 INSTALLATION

A. Install doors and frames in accordance with approved shop drawings and manufacturer's instructions.

B. Frames:
   1. Set accurately in position, plumb, align, and attach securely to structure.
   2. Set in place before construction of adjacent masonry or framed walls.
   3. Anchor frames to previously placed concrete.
   4. Set frames before removing spreader bars.
   5. Fully grout frames in masonry as the Work progresses.
   6. Grout frames at concrete through keyways provided at head and jambs.

C. Doors: Install at correct openings, ensure smooth swing and proper closure with frame.

D. Fire Resistive Frames and Doors: Install to conform to NFPA 80 for fire resistive rated class as indicated on the Drawings.

E. Door Hardware: Install in accordance with Section 08710.

F. Separate or isolate dissimilar metals with neoprene gaskets, sleeves, and washers, or with coatings acceptable to the ENGINEER.

3.03 TOLERANCES

A. Manufacturing and Installation Tolerances: As indicated on the Drawings or in conformance to SDI 117 as minimum.

3.04 ADJUSTING AND CLEANING

A. Prime Coat Touch-up: Immediately after installation, sand smooth and touch-up rust areas and other areas where primer has been damaged, with prime touch-up paint.

B. Make adjustments as required for correct, proper, and free function and smooth operation without binding of hardware or doors and frames.

C. Protect doors and frames from damage to surface or profile.

END OF SECTION

SECTION 08310

FLOOR ACCESS DOORS (HATCHES)

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Non-rated floor access doors.

1.02 SUBMITTALS

A. Product Data.

B. Shop Drawings: Show the following:
   1. Access door installation recommendations.
   2. Locations of access doors.
   3. Door size and configuration.
   4. Liveload capacity.
   5. Materials of construction and finishes provided.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Identify type and size of each floor door in way not to damage finish prior to delivery.

B. Deliver products only after proper facilities are available.

C. Deliver and store packaged products in original containers with seals unbroken and labels intact until time of use.

D. Handle carefully to prevent damage and store on clean concrete surface or raised platform in safe, dry area. Do not dump onto ground.

E. Protect floor access doors during shipment and storage to prevent warping, bending, and corrosion.

1.04 WARRANTY

A. Provide manufacturer's warranty against defects in material and workmanship for a period of five years.

1.05 MAINTENANCE

A. Deliver 2 keys for each cylinder lock to OWNER.

PART 2 PRODUCTS

2.01 MEDIUM DUTY FLOOR ACCESS DOORS

A. Manufacturers: One of the following or equal:
   1. The Bilco Co., Model J or JD (double leaf).
   2. Babcock-Davis Associates, Inc., Model B-FG.

B. Style: Single or double leaf as indicated on the Drawings, aluminum, capable of withstanding minimum live load of 300 pounds per square foot, channel frame, with drainage couplings.

C. Door Leaf: Minimum 1/4 inch, diamond pattern plate reinforced with stiffeners as required to meet specified live load.

D. Frame: 1/4 inch channel with anchor flange around perimeter.

E. Hardware:
   1. Hinges: Each leaf equipped with a minimum of 2 heavy forged brass hinges with stainless steel pins.
   2. Lock: Snap lock with removable handle mounted on door leaf.
   3. Grip Handle: Provide vinyl grip handle designed to release cover for closing.
   4. Operating Mechanism: Spring operators designed for ease of operation and automatic hold-open arm with release handle.
   5. Drainage Assembly: Provide 1-1/2 inch drainage coupling located in front right corner of channel frame.

2.02 HEAVY DUTY FLOOR ACCESS DOORS

A. Manufacturers: One of the following or equal:
   1. The Bilco Co., Model JH-20 or JDH-20 (double leaf).
   2. Babcock-Davis Associates, Inc., Model B-FG (H-20 leading).

B. Style: Single or double leaf as indicated on the Drawings, aluminum, capable of withstanding minimum AASHTO H-20 wheel load with a maximum deflection of 1/150 of the span, live load channel frame, with drainage couplings.

C. Door Leaf: Minimum 1/4 inch, diamond pattern plate reinforced with stiffeners as required to meet specified live load.

D. Frame: 1/4 inch channel with anchor flange around perimeter.

E. Hardware:
   1. Hinges: Each leaf equipped with a minimum of two heavy forged brass hinges with stainless steel pins.
   2. Lock: Snap lock with removable handle mounted on door leaf.
   3. Grip Handle: Provide vinyl grip handle designed to release cover for closing.
   4. Operating Mechanism: Spring operators designed for ease of operation and automatic hold-open arm with release handle.
   5. Drainage Assembly: Provide 1-1/2 inch drainage coupling located in front right corner of channel frame.

2.03 FINISHES

A. Floor Access Door Finishes:
   1. Aluminum: Manufacturer's standard mill finish.
   2. Aluminum In Contact With Dissimilar Metals and Concrete: Manufacturer's standard bituminous coating.
   3. Steel: Manufacturer's standard red oxide primer.

B. Hardware Finishes:
   1. Provide optional Type 316 stainless steel hardware throughout, including parts of the latch and lifting mechanism assemblies, hold open arms and all brackets, hinges, pins, and fasteners.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine construction to receive floor access door and verify correctness of dimensions and other supporting or adjoining conditions.

3.02 PREPARATION

A. Coordinate details with other work supporting, adjoining, or requiring access doors.

B. Verify dimensions and profiles for each opening.

C. Verify that location will serve portion of work to which access is required. Where proposed functional location conflicts with other work, notify the ENGINEER before installation.

D. Apply coating to aluminum surfaces that will be in contact with dissimilar metals or concrete when there is none.

3.03 INSTALLATION

A. Install access doors in accordance with manufacturer's instructions.

B. Ensure correct types and adequate sizes at proper locations.

C. Securely attach frames to supporting work and ensure doors, frames, and hardware operate smoothly and are free from warp, twist and distortion.

D. Attach drain pipe to coupling provided. Drainage shall be routed as indicated on the Drawings.

3.04 ADJUSTING

A. Adjust doors, frames and hardware to operate smoothly, freely, and properly, without binding.

3.05 CLEANING

A. Thoroughly clean surfaces of grease, oil, or other impurities, touch-up abraded prime coat where applicable.

END OF SECTION

SECTION 08710

DOOR HARDWARE

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Door hardware.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. E 90 - Test Method for Laboratory Measurement of Airborne-Sound Transmission Loss of Building Partitions.
   2. E 283 - Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

B. Builders Hardware Manufacturers Association (BHMA):
   1. A 156.7 - Template Hinge Dimensions.
   2. A 156.18 - Hardware - Materials and Finishes.

1.03 SUBMITTALS

A. Product Data.

B. Hardware Schedule: Include references to ENGINEER's hardware group number, door type designations, locations, other pertinent data, and manufacturer names or suitable abbreviation opposite items scheduled.

C. Samples: Include for each different type and manufacturer for review of finish.

D. Construction Key Distribution List: Submit upon OWNER's request.

E. Templates: Furnish hardware templates to fabricators of doors, frames and other work to be factory-prepared for hardware. Check shop drawings of other work, to confirm that adequate hardware backing is available.

F. Project Record Documents: Include corrected hardware schedule.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver hardware where directed in unopened packages with items packed separately, complete and ready for installation with necessary fittings, trim, fasteners, and accessories.

B. Provide packages bearing the manufacturers' labels, with each item or group of items identified according to the accepted hardware schedule.

1.05 SCHEDULING AND SEQUENCING

A. Upon receipt of accepted hardware schedule, coordinate accepted hardware schedule, templates, reinforcing units, and template instructions to door and frame sections.

B. Restrict distribution of construction keys to superintendents and foremen. Maintain record of persons who have received keys on construction distribution list.

1.06 KEYING

A. Keying of all doors shall match existing City keys. Coordinate with OWNER for a copy of City keys.

PART 2 PRODUCTS

2.01 FASTENERS

A. Types:
   1. To Concrete, Marble, or Masonry: Machine screws and flush shells.
   2. To Wood: Wood screws.
   3. On Gypsum Board or Plaster: Screws of sufficient length to provide solid connection to framing or backing behind gypsum board or plaster.
   4. To Mineral and Hollow Core Doors: Sex bolts.
   5. Of Exit Devices to Doors: Thru-bolts, unless otherwise specified.

B. Screws, Exposed: Phillips head type, full-threaded screws, not combination type.

C. Sizes: Suitable for heavy use.

D. Finish: Stainless steel, unless otherwise required to match material and hardware finish.

2.02 HINGES

A. Manufacturers: One of the following or equal:
   1. Stanley.
   2. Hager.
   3. McKinney.
   4. Lawrence Brothers.
   5. Soss.

B. Material:
   1. Interior Doors: Stainless steel.
   2. Interior Office Doors: Brass.
   3. Exterior Doors: Stainless steel.

C. Knuckles, Number of: Minimum 5.

D. Ball Bearings: Concealed with interior self-lubricating bushings.

E. Type for Doors with Closers: Ball bearing.

F. Material for Fire Resistive Rated Doors: Steel.

G. Pins for Interior Doors: Non-rising.

H. Pins for Exterior Doors: Non-removable.

I. Template Hinges: BHMA A 156.7.

J. Tips: Flat button.

K. Height: As follows, unless otherwise specified:
   1. Doors 1-3/8 inch Thick: 3-1/2 inches.
   2. Doors 1-3/4 inch Thick and Up to 41 inches Wide: 4-1/2 inches.
   3. Doors 1-3/4 inch Thick and From 41 to 48 inches Wide: 4-1/2 inches, extra heavy.
   4. Doors 2 inches Thick or Over 48 inches Wide: 5 inches, extra heavy.

L. Widths: Sufficient to clear trim projection when door swings 180 degrees, unless otherwise specified.

M. Number per Door Leaf: As follows, unless otherwise specified:
   1. Doors to 60 inches high: 2.
   2. Doors to 90 inches High: 3.
   3. Doors to 190 inches High: 4.
   4. Doors over 190 inches High: 4 plus 1 per every additional 30 inches.

2.03 LOCKSETS

A. Manufacturer: Sargent, as scheduled.

B. Permanent Cylinders: Cylinders as manufactured by Sargent, minimum 6 pins.

C. Strikes:
   1. Material: Same as lock trim.
   2. Lock and Latch Boxes: Wrought.
   3. Lips: Extended, able to protect trim from marring by latch bolt.
   4. Cutouts at Metal Frames: In accordance with ANSI, unless otherwise specified.

D. Levers: Type that returns to within 1/2 inch of door.

E. Backset: 2-3/4 inches.

F. Trim Materials: As follows, unless otherwise specified:
   1. Typical: Stainless steel.

2.04 CONSTRUCTION KEYING

A. Type: Removable core system.

B. Contractor’s temporary cores shall be removed by the Contractor. Contractor shall give core removal key to City.

2.05 PERMANENT KEYING AND KEYS

A. Contractor will install permanent cores.

B. Contractor will provide 10 keys. All doors shall be keyed alike.

2.06 CLOSERS

A. Manufacturers: Heavy duty, non-handed and non-sized, adjustable spring power from size 1 through 4, hold open feature where specified, manufacturer's special rust inhibitive epoxy primer on every part. One of the following or equal:
   1. Dorma, 7801 Series.
   2. Sargent EN-351 PH9.

B. Type: Full rack and pinion type with steel spring and non-gumming, non-freezing hydraulic fluid.

C. Controls: Separate set for regulating sweep speed, latch speed, backcheck and backcheck positioning, or where schedules, spring power.

D. Sizes: As recommended by accepted manufacturer.

E. Covers: Plastic, capable of being spray painted to match adjacent hardware finishes, unless otherwise specified.

F. Narrow Frame Provisions: Drop plates.

G. Effort to Operate: As follows:
   1. Exterior: Maximum 8-1/2 pounds.
   2. Interior: Maximum 5 pounds.
   3. Fire Resistive Rated Doors: Maximum 15 pounds.

H. Adjust closers in accordance with manufacturers directions for size of door.

2.07 EXIT DEVICES

A. Lever Design: Manufacturers: One of the following or equal:
   1. Von Duprin, Lever Model 06.

B. Rim Device, Non-fire Resistive Rated: Manufacturers: One of the following or equal:
   1. Von Duprin Inc., Model Series 98.
   2. Sargent Essex Industries, Model Series 8800.

C. Rim Device, Fire Resistive Rated: Manufacturers: One of the following or equal:
   1. Von Duprin Inc., Model Series 98-F.
   2. Sargent Essex Industries, Model Series 12-8800.

D. Concealed Vertical Rod Device, Non-fire Resistive Rated: Manufacturers: One of the following or equal:
   1. Von Duprin Inc., Model Series 9847.
   2. Sargent Essex Industries, Model Series 8600.

E. Concealed Vertical Rod Device, Fire Resistive Rated: Manufacturers: One of the following or equal:
   1. Von Duprin Inc., Model Series 9847-F.
   2. Sargent Essex Industries, Model Series 12-8600.

F. Surface Mounted Vertical Rod Device, Fire Resistive Rated: Manufacturers: One of the following or equal:
   1. Von Duprin Inc., Model Series 9827-F.
   2. Sargent Essex Industries, Model Series 12-8700.

G. Material: As scheduled.

H. Corrosive Environment Provisions: Zinc dichromate coated internal parts.

2.08 MISCELLANEOUS DOOR HARDWARE

A. Wall Stops: As scheduled: Manufacturers: One of the following or equal:
   1. Glynn-Johnson.
   2. H.B. Ives Division of Harrow Co.

B. Floor Stops: As scheduled with strike of suitable height to compensate for clearance between door and floor. Manufacturers: One of the following or equal:
   1. Glynn-Johnson.
   2. H.B. Ives Division of Harrow Co.

C. Flush Bolts: Materials as schedule. Manufacturers: One of the following or equal:
   1. Glynn-Johnson.
   2. H.B. Ives Division of Harrow Co.

D. Kick Plates: As scheduled, 0.050 inch thick, beveled edges, 10 inches high, 1-1/2 inches narrower than single doors, 1 inch narrower than leaf of door pairs. Manufacturers: One of the following or equal:
   1. Ives.
   2. Builders Brass Works.

E. Gasketing Systems: As scheduled, self-adhesive silicone seal, continuous at head and jambs, rated for fire and smoke in accordance with ASTM E 283, sound rated in accordance with ASTM E 90. Manufacturers: One of the following or equal:
   1. Pemko Mfg. Co.
   2. National Guard Products Inc.

F. Weatherstripping for Exterior Doors and Smoke, Light, and Sound Seals for Interior Doors. Manufacturers: One of the following or equal:
   1. Pemko Mfg., Co.
   2. National Guard Products, Inc.

G. Thresholds: As scheduled, extruded aluminum, maximum 1/2 inch high, maximum slope of 1 foot in 2 feet. Manufacturers: One of the following or equal:
   1. National Guard Products Inc.
   2. Pemko Mfg. Co.

H. Dustproof Strike: As Scheduled. Manufacturers: One of the following or equal:
   1. Glynn-Johnson.

2. Builders Brass.

I. Coordinator: As scheduled. Manufacturers: One of the following or equal:
   1. Glynn-Johnson Coordinators, Model COR Series.
   2. Ives, Door Co-Coordinator, Model 469 Series.

J. Door Bottoms: As scheduled, extruded aluminum with vinyl insert, surface mounted, length equal to door width minus 2 inches. Manufacturers: One of the following or equal:
   1. Pemko.
   2. National Guard.

K. Astragals: As specified in Sections 08110.

L. Silencers: As scheduled, pneumatic gray rubber. Manufacturers: One of the following or equal:
   1. Ives.
   2. Glynn-Johnson.

2.09 FINISHES

A. Brass and Bronze: BHMA A 156.18 626 (US26D), satin chrome.

B. Steel: BHMA A156.18 652 (US26D), satin chrome.

C. Stainless Steel: BHMA A156.18 630 (US32D), satin stainless steel.

D. Aluminum: BHMA A156.18 628 (US28).

E. Plastic Closer Covers: Spray paint to match typical door hardware finish.

2.10 ELECTRONIC LOCKING SYSTEM

A. Card Reader: Provide an electronic card reader. Manufacturers:
   1. HID Model No.: ProxPoint Plus Reader 6005B.

B. Cards: Provide 10 cards to the City of Turlock.

C. Controller: Provide two controllers for the card reader and electronic door strike: Manufactures:
   1. HID Model No: EdgePlus Solo ES400.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect doors and door frames for damage or defects and examine hardware for compatibility with receiving conditions and suitable to intended use.

B. Verify that required wall backing has been installed.

3.02 INSTALLATION

A. Install finish hardware in accordance with manufacturer's templates and instructions.

B. Accurately and properly fit hardware.

C. Securely fasten fixed parts for smooth, trouble-free, non-binding operation.

D. Fit faces of mortise parts snug and flush.

E. Ensure that operating parts move freely and smoothly without binding, sticking, or excessive clearance.

F. Protection:
   1. Protect door hardware from damage or marring of finish during construction, use strippable coatings, removable tapes, or other acceptable means.
   2. Ensure door hardware displays no evidence of finish paint after final building clean-up with exception of prime-coated door hardware installed for finish painting.

G. Latch Guard and Dead Bolts: Install so that bolts automatically engage in keeper, whether activated by closer or by manual pressure.

H. Closers:
   1. Mount on opposite sides of corridors or vestibules, except at exterior doors.
   2. Mount for 180-degree swing wherever possible.
   3. Mount with drop plates at narrow top rail doors.
   4. Adjust to operate noiselessly and evenly.
   5. Have closer manufacturer regulate closers prior to final acceptance of project.

I. Gasketing: Mount to provide complete contact between door and frame, finished floor, or both; and soundproof enclosure.

J. Thresholds:
   1. Install immediately before inspection for Substantial Completion or protect from heavy traffic damage during construction.
   2. Cope to fit doorframe profile and drill to suit required flush bolts and panic bolts.
   3. Unless indicated on the Drawings to be set in grout, set in double bead of sealant, tightly fit at jambs, and make waterproof.
   4. Fasten to concrete slab with 5/16 inch stainless steel flat head countersunk machine screws and concrete anchors at 8 inch centers.

K. Silencers: Insert into predrilled holes in frames.

L. Install Card reader and controller to automatically open door when coded card is swiped in front of the card reader. Coordinate with the City of Turlock for coding of the Card key.

3.03 CONSTRUCTION KEYING

A. Insert construction cores in cylinders of exterior doors, and doors requiring security and access for workman, unless otherwise directed by the ENGINEER.

3.04 ADJUSTING

A. Examine hardware in place for complete and proper installation. Lubricate bearing surfaces for proper function.

B. Replace, rework or otherwise correct defective door hardware, including incorrect hand or function.

3.05 CLEANING

A. Remove protective materials and devices and thoroughly clean exposed surfaces of hardware. Check for surface damage prior to final cleaning for acceptance of project.

3.06 HARDWARE SCHEDULE

HARDWARE GROUP HW-1 - STEEL SINGLE DOOR

Hinges	3	Stanley, FBB 191, NRP, US32D
Closer	1	Sargent EN-351 PH9
Threshold	1	Pemko, 170 A
Weatherstrip	1 Set	Pemko, 303 AS
Stop	1	Stanley, SP57-5405
Door Bottom	1	Pemko, 222 AV
Mortise Lockset	1	Sargent, 8255-LNL, IS32D

HARDWARE GROUP HW-2 - STEEL DOUBLE DOOR

Hinges	6	Stanley, FBB 191, NRP, US32D
Closer	2	Sargent EN-351 PH9
Threshold	1	Pemko, 170 A
Weatherstrip	1 Set	Pemko, 303 AS
Stop	2	Stanley, SP57-5405
Door Bottom	2	Pemko, 222 AV
Kick Plate	1	Trimco, K0050 (size per manufacturer's recommendation)
Flush Bolts	Pair	Trimco, 3917-12, inactive leaf
Mortise Lockset	1	Glynn-Johnson, DP1, US26D, inactive leaf
Lockset	1	Sargent, 8255-LNL, US32D

HARDWARE GROUP HW-3 - ELECTRIFIED LOCK

Hinges	2	Stanley, FBB 191, NRP, US32D
Hinges	1	Stanley, CEFBB 191-54, NRP, US32D
Mortise Lockset	1	Sargent, RX-8271-12V, LNJ, US32D
Closer	1	Sargent, EN-351, PH9
Threshold	1	Pemko 170A
Weatherstrip	1	Pemko 303AS
Door Bottom	1	Pemko 222AV

END OF SECTION

SECTION 08952

REMOVABLE TRANSLUCENT SKYLIGHT SYSTEM

PART 1 GENERAL

1.01 SUMMARY

A. Section includes:
   1. Prefabricated insulated translucent removable skylight sandwich panel system.
   2. Battens and perimeter closure system.
   3. System accessories and flashing.

B. Related section:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
      a. Section 01410 - Regulatory Requirements.

1.02 REFERENCES

A. American Architectural Manufacturers Association (AAMA):
   1. 2604 - Voluntary Specification Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.

B. ASTM International (ASTM):
   1. C 297 - Standard Test Method for Flatwise Tensile Strength of Sandwich Construction.
   2. D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position.
   3. D 1002 - Standard Test Method for Apparent Shear Strength of Single-Lap-Joints Adhesively Bonded Metal Specimens by Tension Loading (Metal to Metal).
   4. D 1037 - Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
   5. D 1183 – Standard Practices for Resistance of Adhesives to Cyclic Laboratory Aging Conditions.
   6. D 2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.
   7. E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   8. E 108 - Standard Test Methods for Fire Tests of Roof Coverings.

C. National Fenestration Rating Council (NFRC):
   1. 100 – Procedure for Determining Fenestration Product U-Factors.

D. Underwriters' Laboratory, Inc. (UL):
   1. 790 – Standard Tests Methods for Fire Tests of Roof Covering.

1.03 SUBMITTALS

A. Shop drawings: Indicate at appropriate scale to clearly delineate materials and details of fabrication and installation.

B. Product data: Manufacturer's standard technical specifications and product literature describing materials, special handling instructions, and installation instruction.

C. Samples: Include metal finishes, colors of metal framed skylights, and face sheet types and colors.

D. Manufacturer's installation instructions.

E. Warranty.

F. Manufacturer's certificates: Certifications that materials meet specified requirements:
   1. Certifications: Test reports to be furnished by skylight system manufacturer. The manufacturer shall submit certified test reports made by an independent testing organization for each type and class of panel system.
   2. Reports shall verify that the material will meet all performance requirements of this specification.
      a. Previously completed test reports will be acceptable if current and indicative of products used on this project.
   3. Test reports:
      a. Flame Spread and Smoke Development: ASTM E 84.
      b. Burn Extent: D 635.
      c. Color Difference: ASTM D 2244.
      d. Impact Strength: Free Falling Ball Method.
      e. Bond Strength: ASTM C 297 and ASTM D 1002.
      f. Accelerated Aging: ASTM D 1037.
      g. Insulation U-Value: NFRC 100.
      h. Class A Roof Covering Burning Brand: ASTM E 108.
      i. Class A Roof System UL Listed: UL 790.
      j. Design Loads: In accordance with building code as specified in Section 01410.

G. Proof of regular, independent quality control monitoring under a building code review and listing program shall be submitted.

1.04 PERFORMANCE REQUIREMENTS

A. The manufacturer shall be responsible for the configuration and fabrication of the complete skylight panel system.

1.05 QUALITY ASSURANCE

A. Manufacturer qualifications:
   1. Skylight system manufacturer shall be listed by a recognized building code authority, including the International Conference of Building Officials which requires quality control inspections by an approved agency for sandwich panel construction.
      a. Submit ICBO report indicating UL Class “A” rating.
   2. Quality control inspections and testing conducted at least once each year shall include manufacturing facilities, sandwich panel components, and production sandwich panels for conformance with Acceptance Criteria for Sandwich Panels in accordance with building code as specified in Section 01410.
   3. Materials and products shall be manufactured by a company continuously and regularly engaged in the manufacture of specified materials for a period of not less than 10 consecutive years; and can show evidence of these materials being satisfactorily used on at least 6 projects of similar size, scope, and type within such a period.
      a. At least 3 of the projects shall have been in successful use for 10 years or longer.

B. Installer’s qualifications: Installer shall have been in the business of erecting specified materials for at least 5 consecutive years and can show evidence of satisfactory completion of projects of similar size, scope, and type.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products in accordance with manufacturer's recommendations.

B. Store panels on the long edge, several inches above the ground, blocked, and under cover to prevent warping.

1.07 WARRANTY

A. Provide manufacturer's standard warranty to correct defective products for minimum 5 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. One of the following or equal:
   1. Kalwall.

2.02 COMPONENTS

A. Translucent facing:
   1. Translucent fiberglass faces shall be manufactured from glass fiber reinforced thermoset resins by insulated skylight system fabricator specially for architectural use.

2. Flame spread:
    a. The interior face sheet shall be UL listed and have a flame spread of Class I in accordance with ASTM E 84.
    b. Faces shall not deform, deflect, or drip when subjected to fire or flame, or become detached when subjected to 300 degrees Fahrenheit for 1 hour.
3. Weatherability:
    a. The full thickness of the exterior face shall not change color more than 3.0 Hunter or CIE Units (DELTA E by ASTM D 2244) after 5 years outdoor South Florida weathering at 7 degrees facing south, determined by the average of at least 3 white samples without a protective film or coating to insure maximum, long term color stability.
    b. The exterior face shall have a permanent glass veil erosion barrier to provide maximum long-term resistance to reinforcing fiber exposure and shall be warranted against same for 25 years.
        1) Plastic film overlays are not acceptable.
4. Appearance:
    a. The face sheets shall be uniform in color to prevent splotchy appearance.
        1) Faces shall be completely free of ridges and wrinkles which prevent proper surface contact in bolding to the aluminum grid core.
        2) Clusters of air bubbles/pinholes which collect moisture and dirt are not acceptable.
    b. Exterior face sheets shall be smooth .070-inch thick and white in color.
    c. Interior face sheets shall be 0.45-inch thick and white in color.
    d. Faces shall not vary more than plus/minus 10 percent in thickness.
5. Strength: The exterior face sheet shall be uniform in strength and repel an impact equal to 60 foot pounds without fracture or tear when impacted by a 3-1/2-inch diameter, 6.37 pounds free falling ball.

B. Non-combustible grid core:
1. Panel framing: 6063-T6 or 6005-T5 aluminum I-beams with mechanical interlocking muntin-mullions and perimeter framing to prevent high and low intersections which do not allow full bonding surface to contact with face material.
2. Width of I-beam shall be no less than 7/16 inch.
3. Aluminum I-beam grid shall be machined to tolerances of not greater than plus/minus .002 inch.
4. Panels shall withstand 1,200 degrees Fahrenheit fire for minimum 1 hour without collapse or exterior flaming.

C. Adhesive:
1. Laminate adhesive: Heat and pressure resin-type engineered for structural sandwich panel use.
2. Adhesive shall pass testing requirements specified by the International Conference of Building Officials “Acceptance Criteria for Sandwich Panel Adhesive.” Minimum strength shall be:
    a. A 750 pounds per square inch tensile strength in accordance with ASTM C 297 after 2 exposures to 6 cycles each of the aging conditions in accordance with ASTM D 1037.
3. Shear strength: Average of 5 exposures in accordance with ASTM D 1002:
    a. At 50 percent relative humidity at 73 degrees Fahrenheit: 540 pounds per square inch.
    b. At 182 degrees Fahrenheit: 60 pounds per square inch.

c. Accelerated aging: 700 pounds per square inch. in accordance with ASTM D 1183
d. Full cycle soak: 715 pounds per square inch.
e. 500-hour oxygen bomb: 1,400 pounds per square inch.

2.03 PANEL FABRICATION

A. Translucent panels:
1. Panel thickness: 2-3/4 inches.
~~2. Thermal value: U-value of 0.29, thermally broken, flat only:~~
2. **Thermal value: U-value of 0.21, thermally broken, flat only:**
3. Light transmission:
a. 15 percent and shading coefficient of 0.18.
b. Skylight panels shall be a true sandwich panel of flat fiberglass sheets bonded to a grid core of mechanically interlocking aluminum I-beams and shall be laminated under a controlled process of heat and pressure.
4. Maximum Deflection allowable: L/60.

B. Panel core grid: Grid pattern shall be nominal 8 inch by 20 inch and symmetrical about the horizontal centerline of each panel, for flat panel.

C. Bonding:
1. The adhesive bonding line shall be straight, cover the entire width of the I-beam and have a neat, sharp edge.
2. In order to ensure bonding strength, white spots at intersections of muntins and mullions shall not exceed 4 for each 40 square feet of panel, nor shall they be more than 3/64 inch in width.

D. Skylight panels and aluminum perimeter frame shall be pre-assembled where practical and sealed at the factory.
1. Panels should be shipped to the job site in rugged shipping units and shall be ready for erection.

E. Panels shall be removable, by either a latch system or by a bolt-nut-washer system with no more than 8 bolts.

2.04 BATTENS AND PERIMETER CLOSURE SYSTEM

A. Material: Extruded 6063-T6 and 6063-T5 aluminum screw clamp-tight type closure system.

B. Aluminum closures to be supplied with 300 series stainless steel screws excluding final fasteners to the building and shall be factory sealed to the panels.
1. Aluminum battens and cap plates shall be field installed.

C. All exposed aluminum to be architectural corrosion-resistant finish which meets the performance requirements in accordance to AAMA 2604, color to be selected from manufacturer’s standards.

2.05 FLEXIBLE SEALING TAPE

A. Sealing tape shall be manufacturer’s standard pre-applied to closure system at the factory under controlled conditions.

PART 3 EXECUTION

3.01 EXAMINATION

A. General: Surfaces or openings to receive translucent skylight system shall be inspected by the system supplier or installer for acceptance

3.02 PREPARATION

A. CONTRACTOR shall prepare openings including isolating dissimilar materials from aluminum system which may cause damage by electrolysis and shall provide temporary enclosures if required.

3.03 ERECTION

A. The erector shall erect translucent skylight system in strict accordance with approved shop drawings as supplied by manufacturer.

B. Fastening and sealing shall be in strict accordance with manufacturer's shop drawings.
   1. All aluminum shall be cleaned before sealants are applied.

3.04 CLEANING AND PROTECTION

A. After other trades have completed work on adjacent material, carefully inspect translucent panel installation and make adjustments necessary to ensure proper installation and weather-tight conditions.

END OF SECTION

SECTION 09250

GYPSUM BOARD

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Gypsum board and associated accessories.

B. Related Sections:
   1. Section 09251 - Glass-Fiber Reinforced Cementitious Board.
   2. Section 09910 - Paints: Preparation of gypsum board for texturing.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C 36 - Standard Specification for Gypsum Wallboard.
   2. C 475 - Standard Specification for Joint compounds and Joint Tape for Finishing Gypsum Board.
   3. C 514 - Standard Specification for Nails for the Application of Gypsum Wallboard.
   4. C 557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard in Wood Framing.
   5. C 630 - Standard Specification for Water-Resistant Gypsum Backing Board.
   6. C 840 - Standard Specification for Application and Finishing of Gypsum Board.
   7. C 919 - Standard Practice for Use of Sealants in Acoustical Applications.
   8. C 931 - Standard Specification for Exterior Gypsum Soffit Board.
   9. C 1002 - Steel Drill Screws for the Application of Gypsum Board.

B. Gypsum Association:
   1. GA 216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

1.03 SUBMITTALS

A. Product Data: Include manufacturer's instructions for sealing openings, penetrations, and cut edges of water-resistant gypsum board.

B. Samples: Include texture samples on minimum 6 inch square specified materials.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Provide gypsum board products from single manufacturer or from manufacturers recommended by manufacturer of gypsum board.

B. Regulatory Requirements: When indicated, provide UL listed and labeled fire-rated components or by other recognized rating service.

C. Pre-Installation Conference: Convene with affected entities to review coordination and sequencing of construction to ensure that everything that will be concealed by gypsum board has been installed, and that chases, openings, supplementary framing and blocking have been completed.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store gypsum board under cover, stacked flat, off floor.

B. Store adhesives in dry place, protected against freezing.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform room temperature between 55 and 70 degrees Fahrenheit in cold weather during application of wallboard and joint treatment until joint treatment is completely dry or building is occupied.

B. Provide adequate ventilation.

PART 2 PRODUCTS

2.01 GYPSUM BOARD

A. Regular Board: ASTM C 36; 5/8 inches thick; tapered edge; Type X where required for fire rating.

B. Moisture Resistant Board: ASTM C 630; 5/8 inches thick; tapered edge; Type X where required for fire rating.

C. Insulating Gypsum Board: Gypsum board as specified with aluminum foil on back surface; ends square cut; tapered edges.

D. Exterior Ceiling Board:
   1. ASTM C 931; 5/8 inch thick; weather and sag resistant type with water-repellent face paper; eased tapered edge.
   2. Flame Spread: Maximum 20 flame spread.
   3. Smoke Developed: Maximum 0 smoke developed.

2.02 ACCESSORIES

A. Square Corner Bead Reinforcement: One of the following or equal:
   1. Dur-A-Bead as manufactured by USG or equal.
   2. Wall board corner bead with 1-1/4 inch flanges by manufactured Gold Bond National Gypsum Company.

B. Metal Casing Bead: One of the following or equal:
   1. No. 200A Metal Trim manufactured by USG or equal.
   2. No. 100 wall board casing manufactured by Gold Bond National Gypsum Company.

C. Control Joints: One of the following or equal:
   1. No. 093; as manufactured by USG or equal.

2. 0.093 zinc control joint, manufactured by Gold Bond National Gypsum Company.

2.03 FASTENERS

A. Screws for Metal Studs: ASTM C 1002, Type S; self-drilling, self-tapping, bugle head, for use with power driven tool, minimum 1-1/4 inches long or length to suit application.

B. Screws for Wood Framing: ASTM C 1002, Type W, minimum 1-1/4 inches.

C. Nails: ASTM C 514; minimum 1-1/4 inch long, 12-1/2 gauge, 1/4 inch diameter head.

D. Staples: Type G; 1/2 inch; manufactured by Bostitch or equal.

2.04 LAMINATING ADHESIVES

A. Gypsum Board to Metal Framing: One of the following or equal:
   1. Durabond 200 or 300; manufactured by USG.

B. Gypsum Board to Wood Framing: ASTM C 557.

C. Gypsum Board to Gypsum Board: One of the following or equal:
   1. Durabond 600; manufactured by USG.
   2. Gypsum board laminating adhesive, manufactured by Gold Bond National Gypsum Company.

D. Gypsum Board to Concrete or Masonry: Durabond 500; manufactured by USG or equal.

2.05 ACOUSTICAL SEALANT

A. Type: ASTM C 919; Architecture Sealant, manufactured by USG or equal.

2.06 FINISHING MATERIALS

A. Moisture or Water Resistant Sealant:
   1. Manufacturers: One of the following or equal:
      a. USG, Sheetrock W/R Sealant.
      b. Gold Bond National Gypsum Company.

B. Joint Compound and Tape: ASTM C 475:
   1. Manufacturers: One of the following or equal:
      a. USG, Perf-A-Tape joint system consisting of Perf-A-Tape Reinforcement Tape and Perf-A-Tape All Purpose Ready Mixed Compound for embedding, fill, and finishing.
      b. Sta-Smooth HS tape and Sta-Smooth joint compound by Gold Bond National Gypsum Company.

C. Texturing Compound for Walls:
   1. Manufacturers: One of the following or equal:
      a. USG , Spray Texture Finish.
      b. Perfect Spray EM, orange peel finish, by Gold Bond National Gypsum Company.

D. Texturing Compound for Exterior Ceilings:
   1. Manufacturers: One of the following or equal.
      a. USG, Duracal Exterior Spray Texture Finish.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install gypsum board systems in accordance with ASTM C 840 and GA 216.

3.02 GYPSUM BOARD INSTALLATION ON WALLS

A. Cut gypsum wallboard by scoring and breaking or by sawing, working from face side.

B. Use boards of maximum practical length to minimize end joints.

C. Apply board with long dimension at right angles to framing or furring members with ends on studs. Attach upper boards first.

D. Bring boards into contact with each other but do not force into place.

E. Do not place butt ends against tapered edges.

F. Stagger end joints. Locate joint on opposite sides of partition on different studs.

G. Do not align joints with edges of openings, except for control joints. Cut board neatly to fit around openings. Locate joints at least 8 inches from openings. Center vertical end joints above openings.

H. Extend board to within 1/4 inch of floor.

I. Install fasteners proceeding from center portion of gypsum board toward edges and ends.

J. On non-fire rated walls, screw board to framing at maximum 12 inches on center in field of board at bearings and along abutting edges. Nail board to framing at maximum 8 inches on center in field at bearings and along edges.

K. On fire rated walls, nail or screw board to framing at maximum 8 inches on center in field of board at bearings and along edges, unless indicated otherwise by UL assembly requirements.

L. Drive fasteners home with maximum 1/32 inch dimple in wall surface. Avoid breaking face paper of wallboard. Remove improperly driven nails.

M. Thoroughly seal openings, penetrations and cut edges of water-resistant wallboard in accordance with manufacturer's recommendations.

N. Double Stud Partitions:
   1. Install strips of gypsum board 12 inches wide and of length to span partition depth by screwing to webs of opposing studs.
   2. Space strips approximately 42 inches on center.

O. Double Layer Partitions:
   1. Install first layer vertically then second layer horizontally.
   2. Stagger joints between layers and on opposite sides as far as is practical.

P. Sound Control Partitions:
   1. Apply full running beads of acoustical sealant at perimeter of sound control partitions.
   2. Apply acoustical sealant with air operated equipment.
   3. Inspect joints to receive sealant to be sure they are clean, dry and free of dust, dirt and other foreign matter.
   4. Seal around light boxes, outlets, and switches, with continuous bead of sealant.
   5. Remove excess of sealant or smears as construction progresses.

Q. Perimeter relief where non-load bearing gypsum board partitions abut structural decks or ceilings or vertical structural elements:
   1. Allow not less than 1/4 inch, nor more than 1/2 inch gap between gypsum board and structure.
   2. Finish edges of board face layer with metal casing bead and caulk space between casing bead and structure with continuous sealant bead.
   3. Attach board to studs not less than 1/2 inch below bottom edge of ceiling track flanges and to first stud adjacent to vertical tracks. Do not attach boards directly to tracks.

3.03 ADHERING GYPSUM BOARD TO MASONRY

A. Apply 1-1/2 inch diameter by 1 inch high daubs of adhesive at 6 inch on center along edges and at 12 inch on center each way on field of gypsum board.

B. Position boards vertically and 1/4 inch above floor.

C. Press boards on masonry walls within 10 minutes after applying adhesive. Apply firm hand pressure over entire board to flatten daubs of adhesive to level board.

D. Drive masonry nails through wood blocks at top and bottom of each panel to temporarily secure gypsum board. Remove nails and wood blocks when adhesive has set.

3.04 GYPSUM BOARD INSTALLATION ON SUSPENDED CEILINGS

A. Attach board to suspension system in accordance with manufacturer's instructions with:
   1. Screws at 8 inches on center to furring runners, furring ties, cross ties and wall track.
   2. Long dimension paralleling furring runners.

3. Joints staggered.

B. Loading of suspension component may not cause deflection of more than 1/360 of span.

3.05 GYPSUM BOARD INSTALLATION ON FRAMED OR FURRED CEILINGS

A. Apply board with long dimension at right angles to framing or furring members with abutting ends and edges occurring over flanges.

B. Use board to maximum practical length to minimize end joints.

C. Cut gypsum board neatly to fit around openings.

D. Neatly fit an stagger end joints.

E. Nail field of boards at bearing, and along abutting edges at maximum 7 inches on center. Drive nails up to form slight dimple in board.

F. Screw field of boards, at bearings, and along abutting edges at maximum

3.06 EXTERIOR SOFFIT

A. Install exterior board at right angles to supports, with end joint staggered over supports.

B. Install exterior board with 1/4 inch open space where boards abut other construction.

C. Install exterior board with 1/16 to 1/8 inch space between butt ends of boards.

D. Fasten to supports screws at 12 inches on center or nails at 8 inches on center.

3.07 INSTALLATION OF CASING AND CORNER BEADS

A. Install casing beads wherever board terminates against dissimilar materials or where edges of board are exposed. Provide:
   1. Type with face flange to receive joint compound except where semi-finishing is indicated.
   2. L-type trim where gypsum board is tightly abutted to other construction.
   3. Special kerf-type where other construction is kerfed to receive long leg of L-type trim.
   4. U-type trim where edge is exposed, revealed, gasketed, or sealant filled, including expansion joints.

B. Install metal corner bead reinforcement at outside corners.

C. Where Board Partitions Intersect Masonry Walls:
   1. Provide control joints no less than 1/4 inch nor more than 3/8 inch wide between board and masonry.
   2. Finish exposed edges of board with square-nose metal casing bead and caulk space between casing bead and masonry with continuous sealant.

D. Secure corner beads with same fasteners used for applying wallboard, spaced 8 inches maximum apart on each flange of bead with nails opposite.

3.08 INSTALLATION OF CONTROL JOINTS

A. Discontinue gypsum board at control joints.

B. In ceiling construction, discontinue gypsum board and framing at control joints.

C. In partitions, discontinue gypsum board and install framing studs on each side of control joints.

D. Position control joints to intersect light fixtures, air diffusers, door openings and other areas of stress concentration.

E. Isolate Gypsum Board Construction at Following Locations:
   1. Where partitions or ceilings of dissimilar construction meet and remain in same plane.
   2. Where wings of "L," "U," and "T" shaped ceiling areas are joined.
   3. When expansion or control joints occur in base building construction.

F. Space Control Joints at Following Maximum Distances:
   1. Partitions: 30 feet in either direction.
   2. Interior Ceilings with Perimeter Relief: 50 feet in either direction.
   3. Interior Ceilings without Perimeter Relief: 30 feet in either direction.
   4. Exterior Ceilings: 30 feet in either direction.

G. Extend control joints to ceiling from both corners of door frames where control joints are required.

H. Cut end joints square, align to provide neat fit.

I. Staple control joint to board at maximum 6 inches on center in each flange.

3.09 JOINT COMPOUND

A. Mix joint and topping compound in accordance with instructions on package.

B. Apply thin layer of joint compound uniformly approximately 4 inches wide over each joint.

C. Center tape over joint and embed into compound, leaving sufficient joint compound under tape to provide proper bond.

D. Reinforce wall angles and inside corner angles with tape folded to conform to angle and embedded into compound.

E. Apply skim coat of compound immediately after embedding tape.

F. After compound is thoroughly dry, cover tape with coat of joint compound or topping compound. Spread over tape and approximately 3 inches beyond edges of tape. Feathered out edge.

G. After compound is thoroughly dry, cover tape with coat of joint compound or topping compound. Spread over tape and approximately 3 inches beyond edges of previous coat. Feathered out edge.

H. Coat inside corners with minimum of one coat of joint compound or topping compound with edges feathered out.

I. Apply 3 coats of compound to nail and screw head dimples.

J. Conceal flanges of wallboard corner beads with minimum of 2 coats of compound. Apply joint compound for first coat. Apply joint compound or topping compound for second coat. Feathered out second coat approximately 9 inches on both sides of exposed metal nose of corner bead.

K. Clean excess compound from board surface.

L. Sand coats as necessary after each application of compound has dried. Leave board uniformly smooth ready to receive texturing, to extent that after painting, board shows no distinguishable difference in appearance between taped and untaped surfaces.

M. Apply joint compound over entire board surface with smooth finish.

3.10 TEXTURING

A. Verify that gypsum board surfaces have been primed in accordance with Section 09910.

B. Clean surfaces of dust, dirt, and oil before application.

C. Mix and apply specified materials in accordance with manufacturer's recommendation to produce texture similar to accepted sample.

D. Apply **[orange peel], [sprayed knockdown]**, texture to interior walls.

E. Remove texture droppings or overspray from adjacent completed construction.

3.11 TOLERANCES

A. Offsets between Planes of Board Faces: Maximum 1/16 inch.

B. Flatness: Maximum 1/8 inch in 96 inches.

C. Variation from Plumb: Maximum 1/8 inch in 96 inches.

END OF SECTION

SECTION 09523

ACOUSTICAL PANELS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Acoustical panels and accessories.
   1. Acoustical wall panels.

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. C 514 - Nails for the Application of Gypsum Wallboard.
   2. C 645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.
   3. C 1002 - Steel Drill Screws for the Application of Gypsum Board.
   4. E 84 - Test Method for Surface Burning Characteristics of Building Materials.

B. Federal Specifications (FS):
   1. SS-S-118 - Sound Controlling Blocks and Board.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements: Noise Reduction Coefficient (NRC) of minimum 85, minimum sound absorption coefficient of 2 by 8 foot panels mounted on 1-1/2 inch furring with insulation at following octave band center frequencies:
   1. 125 hertz: 0.24.
   2. 250 hertz: 0.57.
   3. 500 hertz: 1.17.
   4. 1000 hertz: 0.87.
   5. 2000 hertz: 0.93.
   6. 4000 hertz: 0.87.

1.04 SUBMITTALS

A. Product Data: Include sound absorption data, cutting and fabrication, and installation details for panel systems.

B. Shop Drawings: Include panel layout and mounting details.
   1. Indicate panel layout; show locations of mechanical grills, lighting, access panels, sprinkler heads, and other items affecting ceiling installation.

C. Test Reports: Results of sound absorption coefficient testing by independent acoustical laboratory.

D. Manufacturer's Installation Instructions: Including installation instructions for suspended grid system and adhesives.

E. Samples:
   1. Submit full range of manufacturer's standard colors for color selection.
   2. Submit 12 inches square samples for each type and size acoustical unit required.
   3. Submit sample of suspension system; 12 inches long.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store wood fiber panels in dry place. Wrap panels with moisture proof material. Lay flat on pallets. Allow for air circulation under cover. Store within areas in which panels will be applied for minimum 24 hours prior to installation.

1.06 SITE CONDITIONS

A. Deliver panels when building is closed in and in cold seasons, heated.

PART 2 PRODUCTS

2.01 ACOUSTICAL WALL PANELS

A. Manufacturer: One of the following or equal:
   1. ASound Sorb@ by Acoustic Systems, Austin, Texas.
   2. AEckoustic Functional Panels@ by Eckel Industries, Inc. Cambridge, MA.

B. Metal Facing: 0.032 inches minimum; coated aluminum, ribbed to provide impact resistance.

C. Perforation Ratio: not less than 23 percent.

D. Panel Size: 30 x 96 inches.

E. Absorber:
   1. Fiberglass or polyethylene sheet for indoor applications.
   2. Polyethylene thickness 1.5 mils.
   3. Perforation ratio 10% ∀ 2% both sides.
   4. Blanket; semi rigid, not less than 2 inch, density of approximately 1.5 pounds per cubic foot.

F. Perforated metal facing shall be furred out on metals channels by 2 inches.

G. Mounting brackets: Minimum 4; Type 316 stainless steel.

H. Adsorption Factors:

Frequency Band	125	250	500	1000	2000	4000	NRC
Wall Panel	0.34	1.11	1.48	1.15	0.74	0.56	1.10

PART 3 EXECUTION

3.01 INSTALLATION

A. Install acoustical wall panels on pump room as indicated on plans and in accordance with manufacturer's instructions.

B. Anchor furring to stud walls securely. Anchor horizontally at 12 inches above floor, at 24 inches on center, and vertically at ends.

C. Install insulation between furring. Hold in place until installation of panels.

D. Place panels vertically on walls, perpendicular to direction of furring, with maximum 1/16 inch space between panels.

E. Paint nail or screw head white. Nail or screw panels to furring in manufacturer's recommended pattern. Countersink nails or screws 1/16 inch.

F. Do not cover columns and beams with panels. Hold panels back 2 inches from columns.

G. When panels require field cutting, make sharp and perpendicular cuts using jigs.

H. Make neat cutouts for pipes, supports, and other projections from wall. Install metal trim around perimeter of panels. Fasten trim to edge furring with aluminum nails. Miter corners.

END OF SECTION

SECTION 09910

PAINTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
   1. Field applied paints and coatings for normal exposures
   2. Painting Accessories.

B. Related Sections:
   1. Section 01330 - Submittal Procedures.
   2. Section 01600 - Product Requirements.
   3. Section 01770 - Closeout Procedures.

1.02 DEFINITIONS

A. Paints: Manufacturer's best ready-mixed coatings, except when field catalyzed, with fully ground pigments having soft paste consistency and capable of being readily and uniformly dispersed to complete homogeneous mixture, having good flowing and brushing properties, and capable of drying or curing free of streaks or sags.

B. Volatile Organic Compound (VOC): Content of air polluting hydrocarbons in uncured coating product measured in units of grams per liter or pounds per gallon.

1.03 REFERENCES

A. American Society for Testing and Materials (ASTM):
   1. D 16 - Terminology Relating to Paint, Varnish, Lacquer, and Related Products.

B. National Sanitary Foundation (NSF):
   1. NSF 61 - Drinking Water System Components - Health Effects.

C. Society for Protective Coatings (SSPC):
   1. SSPC SP1 - Solvent Cleaning.
   2. SSPC SP2 - Hand Tool Cleaning.
   3. SSPC SP3 - Power Tool Cleaning.
   4. SSPC SP5 - White Metal Blast Cleaning.
   5. SSPC SP6 - Commercial Blast Cleaning.
   6. SSPC SP7 - Brush-Off Blast Cleaning.
   7. SSPC SP10 - Near-White Blast Cleaning.
   8. SSPC SP 11 - Power Tool Cleaning to Bare Metal.
   9. SSPC-SP 12 - High- and Ultrahigh-Pressure Water Jetting.

1.04 SUBMITTALS

A. General: Submit in accordance with Section 01330.

B. Shop Drawings: Include schedule of where and for what use coating materials are proposed in accordance with requirements for Product Data.

C. Product Data: Include description of physical properties of coatings including solids content and ingredient analysis, VOC content, temperature resistance, typical exposures and limitations, and manufacturer's standard color chips.

D. Samples: Include 8 inch square draw-downs or brush-outs of topcoat finish when requested. Identify each sample as to finish, formula, color name and number and sheen name and gloss units.

E. Manufacturer's Instructions: Submit in accordance with requirements for Product Data. Include:
   1. Special requirements for transportation and storage.
   2. Mixing instructions.
   3. Shelf Life.
   4. Pot life of material.
   5. Precautions for applications free of defects.
   6. Surface preparation.
   7. Method of application.
   8. Recommended number of coats.
   9. Recommended thickness of each coat.
   10. Recommended total thickness.
   11. Drying time of each coat, including prime coat.
   12. Required prime coat.
   13. Compatible and non-compatible prime coats.
   14. Recommended thinners, when recommended.
   15. Limits of ambient conditions during and after application.
   16. Time allowed between coats.
   17. Required protection from sun, wind and other conditions.
   18. Touch-up requirements and limitations.

F. Submit Notarized Certificate that:
   1. All paints and coatings to be used on this project comply with the State of California Air Resources Board Rule 1113 VOC Regulations effective as of January 1, 2004; and that
   2. All paints and coatings to be used on this project comply with the VOC regulations of the State of California Air Management District in which the coatings will be used, effective January 1, 2004.

1.05 QUALITY ASSURANCE

A. Products: First line or best grade.

B. Materials for Each Paint System: By single manufacturer.

C. Applicator Qualifications: Applicator of products similar to specified products with minimum 3 years experience.

D. Regulatory Requirements: Comply with by using paints that do not exceed governing agency's VOC limits or do not contain lead.

E. Field Samples: Paint one complete surface of each color scheme to show colors, finish texture, materials and workmanship. Obtain approval before painting other surfaces.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products in accordance with Section 01600.

B. Remove unspecified and unapproved paints from Project site immediately.

C. Deliver containers with labels identifying the manufacturer's name, brand name, product type, batch number, date of manufacturer, expiration date or shelf life, color, and mixing and reducing instructions.

D. Store coatings in well ventilated facility that provides protection form the sun weather, and fire hazards. Maintain ambient storage temperature between 45 and 90 degrees Fahrenheit, unless otherwise recommended by the manufacturer.

E. Take precautions to prevent fire and spontaneous combustion.

1.07 ENVIRONMENTAL CONDITIONS

A. Surface Moisture Contents: Do not paint surfaces that exceed manufacturer specified moisture contents, or when not specified by the manufacturer, the following moisture contents:
   1. Plaster and Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete and Concrete Block: 12 percent.
   3. Interior Located Wood: 15 percent.
   4. Concrete Floors: 7 percent.

B. Do Not Paint or Coat:
   1. Under dusty conditions.
   2. When light on surfaces measures less than 15 foot-candles.
   3. When ambient or surface temperature is less than 50 degrees Fahrenheit or unless manufacturer allow a lower temperature.
   4. When relative humidity is higher than 85 percent.
   5. When surface temperature is less than 5 degrees Fahrenheit above dew point.
   6. When surface temperature exceeds the manufacturer's recommendation.
   7. When ambient temperature exceeds 90 degrees Fahrenheit, unless manufacturer allows a higher temperature.
   8. Apply clear finishes at minimum 65 degrees Fahrenheit.

C. Provide fans, heating devices, or other means recommended by coating manufacturer to prevent formation of condensate or dew on surface of substrate, coating between coats and within curing time following application of last coat.

D. Provide adequate continuous ventilation and sufficient heating facilities to maintain minimum 50 degrees Fahrenheit for 24 hours before, during and 48 hours after application of finishes.

1.08 PROTECTION

A. Protect adjacent surfaces from paint and damage. Repair damage resulting from inadequate or unsuitable protection.

B. Furnish sufficient drop cloths, shields and protective equipment to prevent spray or droppings from fouling surfaces not being painted and in particular, surfaces within storage and preparation area.

C. Place cotton waste, cloths, and material that may constitute fire hazard in closed metal containers and remove daily from site.

D. Remove electrical plates, surface hardware, fittings and fastenings, prior to painting operations. Carefully store, clean and replace on completion of painting in each area. Do not use solvent or degreasers to clean hardware that may remove permanent lacquer finish.

1.09 EXTRA MATERIALS

A. Extra Materials: Deliver in accordance with Section 01770. Include minimum 1 gallon of each type and color of coating applied.
   1. When manufacturer packages material in gallon cans, deliver unopened labeled cans as comes from factory.
   2. When manufacturer does not package material in gallon cans, deliver material in new gallon containers, properly sealed and identified with typed labels indicating brand, type and color.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Paints: One of the following or equal:
   1. Carboline: Carboline, St. Louis, MO.
   2. Devoe: Devoe Coatings, Louisville, KY.
   3. Dunn Edwards: Dunn Edwards Paints, Los Angeles, CA.
   4. Frazee: Frazee/Deer-O Paints, City of Commerce, CA.
   5. Fuller: Fuller O'Brien Paints, San Francisco, CA.
   6. Pittsburgh: Pittsburgh Paints.
   7. P & L: Pratt & Lambert.
   8. S-W: Sherwin-Williams Co., Cleveland, OH.
   9. Sinclair: Sinclair Paints.
   10. Tnemec: Tnemec Co., Kansas City, MO.

B. Submit requests for substitutions in accordance with Section 01600.
   1. Include certified ingredient analyses.
   2. Provide colors that match specified colors.

2.02 PRETREATMENT, PRIMERS, PRIMER-SEALERS, AND WOOD STAIN

A. Aluminum Primer: One of following or equal:
   1. Carboline: 1037 WP.

2. S/W: B50Y1, Zinc Chromate Primer for alkyd systems. None required for latex systems.

B. Concrete Masonry Filler/primer: One of following or equal:
1. S/W: B42W25, Block Filler Interior/Exterior.
2. Tnemec: 130-6601, Envirofill.

C. Concrete, Porous, Filler/primer: One of following or equal:
1. S/W: B42W25, Block Filler Interior/Exterior.
2. Tnemec: 130-6601, Envirofill.

D. Concrete, Smooth, Filler/primer: One of following or equal:
1. S/W: B61W2, Epoxy Ester Masonry Filler/Sealer.
2. Tnemec: W55 WB, Tneme-Crete.

E. Ferrous Metal Primer: One of following or equal:
1. S/W: B50WZ1, Kem Kromik Universal Metal Primer.
2. Tnemec: Series 135 Chembuild.

F. Galvanized Metal Surface Pretreatment Materials: One of following or equal:
1. Amercoat: 59.
2. S/W: P60G2, Wash Primer.
3. Tnemec: 32-1210, Tneme-Grip.

G. Galvanized Metal Surface Primer: One of following or equal:
1. S/W: B66W1 for alkyd. None for latex systems.
2. Tnemec: Series 135 Chembuild.

H. Plaster Sealer: One of following or equal:
1. S/W: Promar 200 Primer.
2. Tnemec: 51-792, PVA Sealer.

I. Plywood, Latex Finishes: One of following or equal:
1. S/W: B42W41, A100 Latex Primer.
2. Tnemec: Series 151, Elasto-Grip.

J. Wood Primer for Opaque Finish Paint, Interior Exposure: One of following or equal:
1. S/W: B49WZ2, Wall and Wood Primer.

K. Wood Primer for Opaque Finish Paint, Exterior Exposure: One of following or equal:
1. S/W: Y24W20, A-100 Primer.
2. Wood Stain: One of following or equal:
a. S/W: A40, Oil Stain.

2.03 PAINTS, INTERIOR EXPOSURE

A. Latex, Flat: One of following or equal:
1. S/W: Promar 200, Latex Flat Wall Paint.
2. Tnemec: Series 6, Tneme Cryl.

B. Latex, Semi-gloss: One of following or equal:
1. S/W: Promar 200, Latex Semi-Gloss Wall Paint.
2. Tnemec: Series 7, Tneme Cryl.

C. Alkyd, Gloss: One of following or equal:
   1. S/W: B54Z, Industrial Enamel, VOC Complying.

D. Acrylic, Semi-gloss: One of following or equal:
   1. S/W: B31W200, ProMar 200 Interior Latex, Semi Gloss Enamel.

E. Urethane Varnish, Clear: One of following or equal:
   1. Flecto: Varathane Exterior Liquid Plastic.
   2. S/W: A67V4, Exterior Varnish.

F. Oil: One of the following or equal:
   1. Watco Danish Oil.

2.04 PAINTS, EXTERIOR EXPOSURE

A. Latex, Flat: One of following or equal:
   1. S/W: A-100, Flat Exterior Latex.
   2. Tnemec: W55 WB, Tneme-Crete.

B. Alkyd, Gloss: One of following or equal:
   1. S/W: B54Z, Industrial Enamel, VOC Complying.

C. Acrylic Latex, Semi-gloss: One of following or equal:
   1. S/W: A100, Latex House and Trim Paint.

D. Urethane Varnish, Clear: One of following or equal:
   1. Flecto: Varathane Exterior Liquid Plastic.
   2. S/W: A67V4, Exterior Varnish.

PART 3 EXECUTION

3.01 INSPECTION

A. Thoroughly examine surfaces scheduled to be painted before starting work.

B. Start painting when unsatisfactory conditions have been corrected.

3.02 SURFACE PREPARATION

A. Prepare surfaces in accordance with paint manufacturer's instructions or when none, the following:
   1. Aluminum: Remove surface contamination by steam, high pressure water or degreasers. Abrade surface by abrasive blasting, power tool cleaning or hand tool cleaning. Apply etching primer.
   2. Reinforced Concrete Panels: Remove dirt, powdery residue and foreign matter. Paint immediately; both sides when applicable.
   3. Canvas and Cotton Insulation Coverings: Remove dirt, grease and oil.
   4. Concrete Floors: Remove contamination, abrasive blast or acid etch and rinse with clear water. Ensure required acid-alkali balance is achieved. Allow to dry thoroughly.

5. Copper for Paint Finish: Remove contamination by steam, high pressure water or degreasers. Abrade surface by abrasive blasting, power tool cleaning or hand tool cleaning. Apply vinyl etch primer.
6. Copper for Oxidized Finish: Remove contamination. Apply oxidizing solution of copper acetate and ammonium chloride in acetic acid. Rub on repeatedly for correct effect. Once attained rinse surfaces well with clear water and allow to dry.
7. Gypsum Wallboard: Remove contamination and prime to show defects. Repair and prime defects.
8. Galvanized Surfaces: Remove surface contamination and oils and wash with degreasers. Apply coat of etching type primer.
9. Zinc Coated Surfaces: Remove surface contamination and oils and prepare for priming in accordance with metal manufacturer's recommendations.
10. Concrete and Concrete Masonry: Remove dirt, loose mortar, scale, powder and other foreign matter. Remove oil and grease with solution of tri-sodium phosphate. Remove stains caused by weathering of corroding metals with solution of sodium metasilicate. Rinse well and allow to thoroughly dry. Spot prime exposed metal with alkyd primer.
11. Plaster: Fill hairline cracks, small holes and imperfections with patching plaster. Smooth off to match adjacent surfaces. Wash and neutralize high alkali surfaces where they occur.
12. Unprimed Steel and Iron: Remove grease, rust, scale, dirt and dust by wire brushing, sandblasting or other necessary method.
13. Shop Primed Steel: Sand and scrape to remove loose primer and rust. Feather out edges to make touch-up patches inconspicuous. Clean surfaces. Prime bare steel surfaces.
14. Wood and Millwork: Sandpaper to smooth even surface. Wipe off dust and grit prior to priming. Spot coat knots, pitch streaks and sappy sections with sealer. Fill nail holes and cracks after primer has dried and sand between coats.
15. Exterior Wood Siding: Remove dust, grit and foreign matter. Seal knots, pitch streak and sappy sections. Fill nail holes with exterior caulking compound after prime coat has been applied.
16. Mildew: Remove by scrubbing with solution of tri-sodium phosphate and chlorine bleach. Rinse with clean water and allow surface to dry completely.
17. Glue Laminated Woods: Remove grease and dirt. Wash down surfaces with degreasers.

3.03 APPLICATION

A. Apply each coat at proper consistency.

B. Tint each coat of paint slightly darker than preceding coat.

C. Sand lightly between coats to achieve required finish.

D. Do not apply finishes on surfaces that are not sufficiently dry.

E. Allow each coat of finish to dry before following coat is applied, unless directed otherwise by manufacturer.

F. Where clear finishes are required ensure tint fillers match wood. Work fillers well into grain before set. Wipe excess from surface.

G. Backprime exterior woodwork, which is to receive paint finish, with exterior primer paint.

H. Backprime interior woodwork, which is to receive paint or enamel finish, with enamel undercoat paint.

I. Backprime interior and exterior woodwork, which is to receive stain or varnish finish, with gloss varnish reduced 25 percent with mineral spirits.

J. Prime top and bottom edges of wood and metal doors with enamel undercoat when they are to be painted.

K. Prime top and bottom edges of wood doors with gloss varnish when they are to receive stain or clear finish.

3.04 MECHANICAL AND ELECTRICAL EQUIPMENT

A. Identify equipment, ducting, piping, and conduit in accordance with Related Sections.

B. Remove grilles, covers and access panels for mechanical and electrical system from location and paint separately.

C. Finish paint primed equipment with color selected by the ENGINEER.

D. Prime and paint insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars and supports, except where items are plated or covered with prefinished coating.

E. Replace identification markings on mechanical or electrical equipment when painted over or spattered.

F. Paint interior surfaces of air ducts, convector and baseboard heating cabinets that are visible through grilles and louvers with 1 coat of flat black paint, to limit of sight line.

G. Paint dampers exposed immediately behind louvers, grilles, convector and baseboard cabinets to match face panels.

H. Paint exposed conduit and electrical equipment occurring in finished areas with color and texture to match adjacent surfaces.

I. Paint both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.

J. Color code equipment, piping, conduit and exposed ductwork and apply color banding and identification, such as flow arrows, naming and numbering, in accordance with DIVISIONS 15 and 16.

3.05 SURFACES NOT REQUIRING FINISHING

A. Stainless Steel, Brass, Bronze, Copper, Monel, Chromium, Anodized Aluminum: Specially finished articles such as porcelain enamel, plastic coated fabrics, and baked enamel.

B. Finished products such as ceramic tile, windows, glass, brick, resilient flooring, acoustical tiles, board and metal tees; other architectural features, such as finish hardware, furnished in aluminum, bronze or plated ferrous metal, prefinished panels, or other items that are installed prefinished.

C. Items completely finished at factory, such as preformed metal roof and wall panels, aluminum frames, toilet compartments, sound control panels, acoustical tiles, shower compartments, folding partition, flagpole.

3.06 CLEANING

A. As work proceeds and upon completion, promptly remove paint where spilled, splashed, or spattered.

B. During progress of work, keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris.

C. Upon completion of work, leave premises neat and clean.

3.07 INTERIOR PAINT SCHEDULE

A. Metal, Galvanized: 2 coats of following finish paints over specified primer.
   1. Acrylic, Semi-Gloss:
      a. Surfaces not scheduled otherwise.
      b. All exposed conduit.
      c. Miscellaneous architectural metals and flashings not color anodized.

B. Metal, Interior Doors and Frames, Galvanized: 2 coats of following finish paints over specified primer.
   1. Acrylic, Semi-Gloss:
      a. Surfaces not scheduled otherwise.
      b. All exposed conduit.
      c. Miscellaneous architectural metals and flashings not color anodized.

C. Metal, Non-Galvanized Ferrous: 2 coats of following finish paints over specified primer.
   1. Acrylic, Semi-Gloss:
      a. Surfaces not scheduled otherwise.
      b. All exposed conduit.
      c. Miscellaneous architectural metals and flashing not color anodized.

D. Metal, Interior Doors and Frames, Non-Galvanized Ferrous: 2 coats of following finish paints over specified primer.
   1. Acrylic, Semi-Gloss:
      a. Surfaces not scheduled otherwise.
      b. All exposed conduit.
      c. Miscellaneous architectural metals and flashings not color anodized.

3.08 EXTERIOR PAINT SCHEDULE

A. Aluminum: 2 Coats of following finish paints over specified primer:
   1. Acrylic, Semi-Gloss:
      a. Surfaces not scheduled otherwise.
      b. Miscellaneous architectural metals and flashings not color anodized.

B. Metal, Ferrous: Following finish coat over specified primer:
   1. Acrylic, Semi-Gloss:
      a. Surface not scheduled otherwise.
      b. All piping exposed to view.
      c. Air Intake Louvers.

C. Metal, and metal Building System as Specified in Section 13122 Galvanized:
   2 Coats of following finish paints over pretreatment and specified primer:
   1. Acrylic, Semi-Gloss:
      a. Surface not scheduled otherwise.
      b. All exposed conduit.
      c. Miscellaneous architectural metals and flashings not color anodized.

END OF SECTION

SECTION 09960

COATINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Field applied coatings.

B. Related sections:
   1. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
   2. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
   3. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
      a. Section 01140 - Work Restrictions.
      b. Section 01312 - Project Meetings.
      c. Section 01330 - Submittal Procedures.
      d. Section 01352 - Alteration Project Procedures.
      e. Section 01600 - Product Requirements.
      f. Section 01770 - Closeout Procedures.
      g. Section 15075 - Mechanical Identification.
      h. Section 16075 - Electrical Identification.

1.02 REFERENCES

A. ASTM International (ASTM):
   1. D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications.
   2. D 4541 - Standard Test Method for Pull-off Strength of Coatings Using Portable Adhesion Testers.

B. NACE International (NACE):
   1. SP0178 - Design, Fabrication, and Surface Finish Practices for Tanks and Vessels to Be Lined for Immersion Service.
   2. SP0188-06 - Discontinuity (Holiday) Testing of Protective Coatings.

C. National Association of Pipe Fabricators (NAPF):
   1. 500-03 - Surface Preparation Standard for Ductile Iron Pipe and Fittings Receiving Special External Coatings and/or Special Internal Linings.

D. NSF International (NSF):
   1. 61 - Drinking Water System Components - Health Effects.

E. Society for Protective Coatings (SSPC):
   1. SP COM - Surface Preparation Commentary for Steel and Concrete Substrates.
   2. SP-1 - Solvent Cleaning.
   3. SP-2 - Hand Tool Cleaning.
   4. SP-3 - Power Tool Cleaning.
   5. SP-5 - White Metal Blast Cleaning.
   6. SP-6 - Commercial Blast Cleaning.
   7. SP-7 - Brush-Off Blast Cleaning.
   8. SP-10 - Near-White Blast Cleaning.

F. U.S. Environment Protection Agency (EPA):
   1. Method 24 - Surface Coatings.

1.03 DEFINITIONS

A. Submerged metal: Steel or iron surfaces below tops of channel or structure walls which will contain water even when above expected water level.

B. Submerged concrete and masonry surfaces: Surfaces which are or will be:
   1. Underwater.
   2. In structures which normally contain water.
   3. Below tops of walls of water containing structures.

C. Exposed surface: Any metal or concrete surface, indoors or outdoors that is exposed to view.

D. Dry film thickness (DFT): Thickness of fully cured coating, measured in mils.

E. Volatile organic compound (VOC): Content of air polluting hydrocarbons in uncured coating product measured in units of grams per liter or pounds per gallon, as determined by EPA Method 24.

F. Ferrous: Cast iron, ductile iron, wrought iron, and all steel alloys except stainless steel.

G. Where SSPC surface preparation standards are specified or implied for ductile iron pipe or fittings, the equivalent NAPF surface preparation standard shall be substituted for the SSPC standard.

1.04 PERFORMANCE REQUIREMENTS

A. Coating materials shall be especially adapted for use in wastewater treatment plants.

B. Coating materials used in contact with potable water supply systems shall be certified to NSF 61.

1.05 SUBMITTALS

A. General: Submit in accordance with Section 01330.

B. Shop drawings:
   1. Schedule of proposed coating materials.
   2. Schedule of surfaces to be coated with each coating material.

C. Product Data: Include description of physical properties of coatings including solids content and ingredient analysis, VOC content, temperature resistance, typical exposures and limitations, and manufacturer's standard color chips:
   1. Regulatory requirements: Submit data concerning the following:
      a. Volatile organic compound limitations.
      b. Coatings containing lead compounds and PCBs.
      c. Abrasives and abrasive blast cleaning techniques, and disposal.
      d. NSF certification of coatings for use in potable water supply systems.

D. Samples: Include 8-inch square drawdowns or brush-outs of topcoat finish when requested. Identify each sample as to finish, formula, color name and number and sheen name and gloss units.

E. Certificates: Submit in accordance with requirements for Product Data.

F. Manufacturer's Instructions: Include the following:
   1. Special requirements for transportation and storage.
   2. Mixing instructions.
   3. Shelf life.
   4. Pot life of material.
   5. Precautions for applications free of defects.
   6. Surface preparation.
   7. Method of application.
   8. Recommended number of coats.
   9. Recommended dry film thickness (DFT) of each coat.
   10. Recommended total dry film thickness (DFT).
   11. Drying time of each coat, including prime coat.
   12. Required prime coat.
   13. Compatible and non-compatible prime coats.
   14. Recommended thinners, when recommended.
   15. Limits of ambient conditions during and after application.
   16. Time allowed between coats (minimum and maximum).
   17. Required protection from sun, wind, and other conditions.
   18. Touch-up requirements and limitations.
   19. Minimum adhesion of each system submitted in accordance with ASTM D 4541.

G. Manufacturer's Representative’s Field Reports.

H. Operations and Maintenance Data: Submit as specified in Section 01770.
   1. Reports on visits to project site to view and approve surface preparation of structures to be coated.
   2. Reports on visits to project site to observe and approve coating application procedures.
   3. Reports on visits to coating plants to observe and approve surface preparation and coating application on items that are “shop coated.”

I. Quality Assurance Submittals:
   1. Quality Assurance plan.
   2. Qualifications of coating applicator including List of Similar Projects.

J. California certifications:
   1. Submit notarized certificate that:
      a. All paints and coatings to be used on this project comply with the State of California Air Resources Board Rule 1113 VOC Regulations effective as of January 1, 2004; and that
      b. All paints and coatings to be used on this project comply with the VOC regulations of the State of California Air Management District in which the coatings will be used, effective January 1, 2004.

1.06 QUALITY ASSURANCE

A. Applicator qualifications:
   1. Minimum of 5 years experience applying specified type or types of coatings under conditions similar to those of the Work:
      a. Provide qualifications of applicator and references listing 5 similar projects completed in the past 2 years.
   2. Manufacturer approved applicator when manufacturer has approved applicator program.
   3. Approved and licensed by polymorphic polyester resin manufacturer to apply polymorphic polyester resin coating system.
   4. Approved and licensed by elastomeric polyurethane (100 percent solids) manufacturer to apply 100 percent solids elastomeric polyurethane system.
   5. Applicator of off-site application of coal tar epoxy shall have successfully applied coal tar epoxy on similar surfaces in material, size, and complexity as on the Project.

B. Regulatory requirements: Comply with governing agencies regulations by using coatings that do not exceed permissible volatile organic compound limits and do not contain lead:
   1. Do not use coal tar epoxy in contact with drinking water or exposed to ultraviolet radiation.

C. Certification: Certify that applicable pigments are resistant to discoloration or deterioration when exposed to hydrogen sulfide and other sewage gases and product data fails to designate coating as "fume resistant."

D. Field samples: Prepare and coat a minimum 100 square foot area between corners or limits such as control or construction joints of each system. Approved field sample may be part of Work.

E. Pre-installation conference: Conduct as specified in Section 01312.

F. Compatibility of coatings: Use products by same manufacturer for prime coats, intermediate coats, and finish coats on same surface, unless specified otherwise.

G. Services of coating manufacturers representative: Arrange for coating manufacturers representative to attend pre-installation conferences. Make periodic visits to the project site to provide consultation and inspection services during surface preparation and application of coatings, and to make visits to coating plants

to observe and approve surface preparation procedures and coating application of items to be “shop primed and coated”.

1.07 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, and handle products as specified in Section 01600.

B. Remove unspecified and unapproved paints from Project site immediately.

C. Deliver new unopened containers with labels identifying the manufacturer's name, brand name, product type, batch number, date of manufacturer, expiration date or shelf life, color, and mixing and reducing instructions.
   1. Do not deliver materials aged more than 12 months from manufacturing date.

D. Store coatings in well-ventilated facility that provides protection form the sun weather, and fire hazards. Maintain ambient storage temperature between 45 and 90 degrees Fahrenheit, unless otherwise recommended by the manufacturer.

E. Take precautions to prevent fire and spontaneous combustion.

1.08 PROJECT CONDITIONS

A. Surface moisture contents: Do not coat surfaces that exceed manufacturer specified moisture contents, or when not specified by the manufacturer, the following moisture contents:
   1. Plaster and gypsum wallboard: 12 percent.
   2. Masonry, concrete, and concrete block: 12 percent.
   3. Interior located wood: 15 percent.
   4. Concrete floors: 7 percent.

B. Do not apply coatings:
   1. Under dusty conditions or adverse environmental conditions, unless tenting, covers, or other such protection is provided for structures to be coated.
   2. When light on surfaces measures less than 15 foot-candles.
   3. When ambient or surface temperature is less than 55 degrees Fahrenheit unless manufacturer allows a lower temperature.
   4. When relative humidity is higher than 85 percent.
   5. When surface temperature is less than 5 degrees Fahrenheit above dew point.
   6. When surface temperature exceeds the manufacturer's recommendation.
   7. When ambient temperature exceeds 90 degrees Fahrenheit, unless manufacturer allows a higher temperature.
   8. Apply clear finishes at minimum 65 degrees Fahrenheit.

C. Provide fans, heating devices, dehumidifiers, or other means recommended by coating manufacturer to prevent formation of condensate or dew on surface of substrate, coating between coats and within curing time following application of last coat.

D. Provide adequate continuous ventilation and sufficient heating facilities to maintain minimum 55 degrees Fahrenheit for 24 hours before, during and 48 hours after application of finishes.

E. Dehumidification and heating for coating of digester interiors, wet wells, and high-humidity enclosed spaces:
   1. Provide dehumidification and heating of digester interior spaces in which surface preparation, coating application, or curing is in progress according to the following schedule:
      a. October 1 to April 30: Provide continuous dehumidification and heating as required to maintain the tanks within environmental ranges as specified in this Section and as recommended by the coating material manufacturer. For the purposes of this Section, “continuous” is defined as 24 hours per day and 7 days per week.
      b. May 1 to September 30: Provide temporary dehumidification and heating as may be required to maintain the tanks within the specified environmental ranges in the event of adverse weather or other temporary condition. At CONTRACTOR’s option and at his sole expense, CONTRACTOR may suspend work until such time as acceptable environmental conditions are restored, in lieu of temporary dehumidification and heating. Repair or replace any coating or surface preparation damaged by suspension of work, at CONTRACTOR’s sole expense.
   2. Equipment requirements:
      a. Capacity: Provide dehumidification, heating, and air circulation equipment with minimum capacity to perform the following:
         1) Maintain the dew point of the air in the tanks at a temperature at least 5 degrees Fahrenheit less than the temperature of the coldest part of the structure where work is underway.
         2) Reduce dew point temperature of the air in the tanks by at least 10 degrees Fahrenheit in 20 minutes.
         3) Maintain air temperature in the tanks at 60 degrees minimum.
      b. Systems:
         1) Site electrical power: Not available for CONTRACTOR’s use.
         2) Internal combustion engine generators: May be used; CONTRACTOR shall obtain all required permits and provide air pollution and noise control devices on equipment as required by permitting agencies.
         3) Dehumidification: Provide desiccant or refrigeration drying. Desiccant types shall have a rotary desiccant wheel capable of continuous operation. No Liquid, granular, or loose lithium chloride drying systems will be allowed.
         4) Heating: Electric, indirect combustion, or steam coil methods may be used. Direct fired combustion heaters will not be allowed during abrasive blasting, coating application, or coating cure time.
   3. Design and submittals:
      a. CONTRACTOR shall prepare dehumidification and heating plan for this project, including all equipment and operating procedures.
      b. Suppliers of services and equipment shall have not less than 3 years experience in similar applications; Cargocaire Corporation (Munters) or equal.
      c. Submit dehumidification and heating plan for ENGINEER’s review.
   4. Monitoring and performance:
      a. Measure and record relative humidity and temperature of air, and structure temperature twice daily (beginning and end of work shifts) to verify that proper humidity and temperature levels are achieved inside the

reservoir after the dehumidification equipment is installed and operational. Test results shall be made available to the ENGINEER upon request.

b. Interior space of the tank(s) shall be sealed and a slight positive pressure maintained as recommended by the supplier of the dehumidification equipment.

c. The filtration system used to remove dust from the air shall be designed so that it does not interfere with the dehumidification equipment's ability to control the dew point and relative humidity inside the reservoir.

1) The air from the tank or dust filtration equipment shall not be recirculated through the dehumidifier during coating application or when solvent vapors are present.

1.09 SEQUENCING AND SCHEDULING

A. Sequence and Schedule: As specified in Section 01352.

1.10 MAINTENANCE

A. Extra materials: Deliver as specified in Section 01770. Include minimum 1 gallon of each type and color of coating applied:

1. When manufacturer packages material in gallon cans, deliver unopened labeled cans as comes from factory.
2. When manufacturer does not package material in gallon cans, deliver material in new gallon containers, properly sealed and identified with typed labels indicating brand, type, and color.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Special coatings: One of the following or equal:

1. Carboline: Carboline, St. Louis, MO.
2. Ceilcote: Ceilcote Corrosion Control, Berea, OH.
3. Dampney: The Dampney Company, Everett, MA.
4. Devoe: ICI Devoe Coatings, Louisville, KY.
5. Dudick: Dudick, Inc., Streetsboro, OH.
6. GET: Global Eco Technologies, Pittsburg, CA.
7. Henkel: Henkel North America, Madison Heights MI.
8. IET: Integrated Environmental Technologies, Santa Barbara, CA.
9. PPC: Polymorphic Polymers Corp., N. Miami, FL.
10. PPG Amercoat: PPG Protective & Marine Coatings, Brea, CA.
11. Sanchem: Sanchem, Chicago, IL.
12. Superior: Superior Environmental Products, Inc., Addison, TX.
13. S-W: Sherwin-Williams Co., Cleveland, OH.
14. Tnemec: Tnemec Co., Kansas City, MO.
15. Wasser: Wasser High Tech Coatings, Kent, WA.

2.02 PREPARATION AND PRETREATMENT MATERIALS

A. Metal pretreatment: As manufactured by one of the following or equal:

1. Henkel: Galvaprep 5.
2. International: AWLGrip Alumiprep 33.

3. S-W: Macropoxy 646 Fast Cure.
4. Tnemec: Series N69 Hi-Build Epoxoline.

B. Surface cleaner and degreaser: As manufactured by one of the following or equal:
1. Carboline Surface Cleaner No. 3.
2. Devoe: Devprep 88.
3. S-W: Clean and Etch.

2.03 COATING MATERIALS

A. Alkali resistant bitumastic: As manufactured by one of the following or equal:
1. Carboline: Bitumastic No. 50.
2. S-W: Targuard.
3. Wasser: MC-Tar.]
4. As specified for Coal Tar Epoxy Substitute.

B. Wax coating: As manufactured by the following or equal:
1. Sanchem: No-Ox-Id A special.

C. High solids epoxy (self priming) not less than 72 percent solids by volume: As manufactured by one of the following or equal:
1. Carboline: Carboguard 891.
2. Devoe: Bar Rust 233H.
3. PPG Amercoat: Amerlock 2.
4. S-W: Macropoxy 646.
5. Tnemec: HS Epoxy Series 104.

D. Aliphatic or aliphatic-acrylic polyurethane: As manufactured by one of the following or equal:
1. Carboline: Carbothane 134 VOC.
2. Devoe: Devthane 379.
3. PPG Amercoat: Amershield VOC.
4. S-W: High Solids Polyurethane CA.
5. Tnemec: Endura-Shield II Series 1075 (U).

E. Polymorphic polyester resin coating system: 2 component, modified styrene based thermoset resin, EPA approved for potable water, with 100 percent solids and maximum 10 grams per liter volatile organic compounds. As manufactured by one of the following or equal:
1. IET: IET Prime Coat DS-101, Intermediate Coat DS-301, and Finish Coat DS-401.
2. PPC: PPC Prime Coat, IC-Filler Coat, and FC-Final Coat.

F. High temperature coating 150 to 350 degrees Fahrenheit: As manufactured by one of the following or equal:
1. Carboline: Thermaline 4900.
2. Dampney: Thermalox 245 Silicone - Zinc Dust.
3. PPG Amercoat: Amerlock 2/400 GFK.

G. High temperature coating 400 to 1,000 degrees Fahrenheit (dry): As manufactured by one of the following or equal:
1. Carboline: Thermaline 4700.
2. Dampney: Thermolox 230C Series Silicone.

3. Devoe: HT-12, High Heat Silicone.

H. High temperature coating up to 1,400 degrees Fahrenheit: As manufactured by the following or equal:
   1. Dampney: Thermalox 240 Silicone Ceramix.

I. Asphalt varnish: AWWA C 500.

J. Protective coal tar: As manufactured by one of the following or equal:
   1. Carboline: Bitumastic No. 50.
   2. PPG Amercoat: 78HB

K. Coal tar epoxy: As manufactured by one of the following or equal:
   1. Carboline: 300-M, Bitumastic.
   2. PPG Amercoat: 78HB.
   3. S-W: Tar Guard 100.
   4. Tnemec: Series 46H-413.

L. Coal tar: Where coal tar, coal tar epoxy, or coal tar mastic are specified or indicated on the Drawings, use coal tar epoxy substitute in their place. Coal tar shall not be allowed.

M. Coal tar epoxy substitute: As manufactured by one of the following or equal:
   1. Devoe: Devtar 5A HS.
   2. S-W : Macropoxy 646 Black.

N. Vinyl ester: Glass mat reinforced, total system 125 mils DFT. As manufactured by one of the following or equal:
   1. Carboline: Semstone 870.
   2. Dudick: Protecto-Flex 800.

O. Elastomeric polyurethane, 100 percent solids, ASTM D 16, Type V, (Urethane P): As manufactured by the following or equal:
   1. GET: Endura-Flex EF-1988.

P. Concrete floor coatings: As manufactured by one of the following or equal:
   1. Carboline: Semstone 140SL.
   2. Devoe: Devran 124.
   3. Dudick: Polymer Alloy 1000.
   4. Tnemec: Tneme-Glaze Series 282.

Q. Waterborne acrylic emulsion: As manufactured by one of the following or equal:
   1. S-W: DTM Acrylic B66W1.
   2. Tnemec: Tneme-Cryl Series 6.

2.04 MIXES

A. Mix epoxy parts in accordance with manufacturer's instructions.

B. Mix coal tar epoxy in containers furnished by manufacturer for mixing purposes. Mix unit quantities only. Use power mixer for minimum time recommended by manufacturer. Do not include time during pouring or stirring in mixing time.

PART 3 EXECUTION

3.01 GENERAL PROTECTION

A. Protect adjacent surfaces from coatings and damage. Repair damage resulting from inadequate or unsuitable protection:

B. Protect adjacent surfaces not to be coated from spatter and droppings with drop cloths and other coverings:
   1. Mask off surfaces of items not to be coated or remove items from area.

C. Furnish sufficient drop cloths, shields and protective equipment to prevent spray or droppings from fouling surfaces not being coated and in particular, surfaces within storage and preparation area.

D. Place cotton waste, cloths and material which may constitute fire hazard in closed metal containers and remove daily from site.

E. Remove electrical plates, surface hardware, fittings, and fastenings, prior to application of coating operations. Carefully store, clean, and replace on completion of coating in each area. Do not use solvent or degreasers to clean hardware that may remove permanent lacquer finish.

3.02 GENERAL PREPARATION

A. Prepare surfaces in accordance with coating manufacturer's instructions, unless more stringent requirements are specified in this Section.

B. Protect following surfaces from abrasive blasting by masking, or other means:
   1. Threaded portions of valve and gate stems, grease fittings, and identification plates.
   2. Machined surfaces for sliding contact.
   3. Surfaces to be assembled against gaskets.
   4. Surfaces of shafting on which sprockets are to fit.
   5. Surfaces of shafting on which bearings are to fit.
   6. Machined surfaces of bronze trim, including those slide gates.
   7. Cadmium-plated items except cadmium-plated, zinc-plated, or sherardized fasteners used in assembly of equipment requiring abrasive blasting.
   8. Galvanized items, unless scheduled to be coated.

C. Protect installed equipment, mechanical drives, and adjacent coated equipment from abrasive blasting to prevent damage caused by entering sand or dust.

D. Concrete:
   1. Allow new concrete to cure for minimum of 28 days before coating.
   2. Clean concrete surfaces of dust, mortar, fins, loose concrete particles, form release materials, oil, and grease. Fill voids so that surface is smooth. Etch or brush off-blast clean in accordance with SSPC SP-7 to provide surface profile equal to 40 to 60 grit sandpaper, or as recommended by coating manufacturer. All concrete surfaces shall be vacuumed clean prior to coating application.

E. Ferrous metal surfaces:
   1. Remove grease and oil in accordance with SSPC SP-1.

2. Remove rust, scale, and welding slag and spatter, and prepare surfaces in accordance with appropriate SSPC standard as specified.
3. Abrasive blast surfaces prior to coating.
4. When abrasive blasted surfaces rust or discolor before coating, abrasive blast surfaces again to remove rust and discoloration.
5. When metal surfaces are exposed because of coating damage, abrasive blast surfaces and feather in to a smooth transition before touching-up.
6. All abrasive blast cleaned surfaces shall be blown down with clean dry air and or vacuumed.

F. Ferrous metal surfaces not to be submerged: Abrasive blast in accordance with SSPC SP-10, unless blasting may damage adjacent surfaces, prohibited or specified otherwise. Where not possible to abrasive blast, power tool clean surfaces in accordance with SSPC SP-3.

G. Ferrous metal surfaces to be submerged: Unless specified otherwise, abrasive blast in accordance with SSPC SP-5 to clean and provide roughened surface profile of not less than 2 mils and not more than 4 mils in depth when measured with Elcometer 123, or as recommended by the coating manufacturer.

H. Ductile iron pipe and fittings to be lined or coated: Abrasive blast clean in accordance with NAPF 500-03.

I. Sherardized, aluminum, copper, and bronze surfaces: Prepare in accordance with coating manufacturer's instructions.

J. Galvanized surface:
1. Degrease or solvent clean (SSPC SP-1) to remove oily residue.
2. Power tool or hand tool clean or whip abrasive blast.
3. Test surface for contaminants using copper sulfate solution.
4. Apply metal pretreatment within 24 hours before coating galvanized surfaces that cannot be thoroughly abraded physically, such as bolts, nuts, or preformed channels.

K. Shop primed metal:
1. Certify that primers applied to metal surfaces in the shop are compatible with coatings to be applied over such primers in the field.
2. Remove shop primer from metal to be submerged by abrasive blasting in accordance with SSPC SP-10, unless greater degree of surface preparation is required by coating manufacturer’s representative.
3. Correct abraded, scratched or otherwise damaged areas of prime coat by sanding or abrasive blasting to bare metal in accordance with SSPC SP-2, SP-3, or SP-6, as directed by the ENGINEER.
4. When entire shop priming fails or has weathered excessively (more than 25 percent of the item), or when recommended by coating manufacturer’s representative, abrasive blast shop prime coat to remove entire coat and prepare surface in accordance with SSPC SP-10.
5. When incorrect prime coat is applied, remove incorrect prime coat by abrasive blasting in accordance with SSPC SP-10.
6. When prime coat not authorized by ENGINEER is applied, remove unauthorized prime coat by abrasive blasting in accordance with SSPC SP-10.

7. Shop applied bituminous paint or asphalt varnish: Abrasive blast clean shop applied bituminous paint or asphalt varnish from surfaces scheduled to receive non-bituminous coatings.

L. Abrasive blast cadmium-plated, zinc-plated, or sherardized fasteners in same manner as unprotected metal when used in assembly of equipment designated for abrasive blasting .

M. Abrasive blast components to be attached to surfaces which cannot be abrasive blasted before components are attached.

N. Grind sharp edges to approximately 1/16-inch radius before abrasive blast cleaning.

O. Remove and grind smooth all excessive weld material and weld spatter before blast cleaning in accordance with NACE SP0178.

P. PVC and FRP Surfaces:
1. Prepare surfaces to be coated by light sanding (de-gloss) and wipe-down with clean cloths, or by solvent cleaning in strict accordance with coating manufacturer's instructions.

Q. Cleaning of previously coated surfaces:
1. Utilize cleaning agent to remove soluble salts such as chlorides and sulfates from concrete and metal surfaces:
   a. Cleaning agent: Biodegradable non-flammable and containing no volatile organic compounds.
   b. Manufacturer: The following or equal:
      1) Chlor-Rid International, Inc.
2. Steam clean and degrease surfaces to be coated to remove oils and grease.
3. Cleaning of surfaces utilizing the decontamination cleaning agent may be accomplished in conjunction with abrasive blast cleaning, steam cleaning, high pressure washing, or hand washing as approved by the coating manufacturer's representative and the ENGINEER.
4. Test cleaned surfaces in accordance with the cleaning agent manufacturer's instructions to ensure all soluble salts have been removed. Additional cleaning shall be carried out as necessary.
5. Final surface preparation prior to application of new coating system shall be made in strict accordance with coating manufacturer's printed instructions.

3.03 MECHANICAL AND ELECTRICAL EQUIPMENT PREPARATION

A. Identify equipment, ducting, piping, and conduit as specified in Section 15075 and Section 16075.

B. Remove grilles, covers, and access panels for mechanical and electrical system from location and coat separately.

C. Prepare and finish coat-primed equipment with color selected by the ENGINEER.

D. Prepare and prime and coat insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars and supports, except where items are covered with prefinished coating.

E. Replace identification markings on mechanical or electrical equipment when coated over or spattered.

F. Prepare and coat interior surfaces of air ducts, convector and baseboard heating cabinets that are visible through grilles and louvers with 1 coat of flat black paint, to limit of sight line.

G. Prepare and coat dampers exposed immediately behind louvers, grilles, convector and baseboard cabinets to match face panels.

H. Prepare and coat exposed conduit and electrical equipment occurring in finished areas with color and texture to match adjacent surfaces.

I. Prepare and coat both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.

J. Color code equipment, piping, conduit, and exposed ductwork and apply color banding and identification, such as flow arrows, naming and numbering, in accordance with Contract Documents.

3.04 GENERAL APPLICATION REQUIREMENTS

A. Apply coatings in accordance with manufacturer's instructions.

B. Coat metal unless specified otherwise:
   1. Aboveground piping to be coated shall be empty of contents during application of coatings.

C. Verify metal surface preparation immediately before applying coating in accordance with SSPC SP COM.

D. Allow surfaces to dry, except where coating manufacturer requires surface wetting before coating.

E. Wash coat and prime sherardized, aluminum, copper, and bronze surfaces, or prime with manufacturer's recommended special primer.

F. Prime shop primed metal surfaces. Spot prime exposed metal of shop primed surfaces before applying primer over entire surface.

G. Apply minimum number of specified coats.

H. Apply coats to thicknesses specified, especially at edges and corners.

I. Apply additional coats when necessary to achieve specified thicknesses.

J. Coat surfaces without drops, overspray, dry spray, runs, ridges, waves, holidays, laps, or brush marks.

K. Remove spatter and droppings after completion of coating.

L. When multiple coats of same material are specified, tint prime coat and intermediate coats with suitable pigment to distinguish each coat.

M. Dust coatings between coats. Lightly sand and dust surfaces to receive high gloss finishes, unless instructed otherwise by coating manufacturer.

N. Apply coating by brush, roller, trowel, or spray, unless particular method of application is required by coating manufacturer's instructions or these Specifications.

O. Plural component application: Drums shall be premixed each day. All gauges shall be working order prior to the start of application. Ratio checks shall be completed prior to each application. A spray sample shall be sprayed on plastic sheeting to insure set time is complete prior to each application. Hardness testing shall be preformed after each application.

P. Spray application:
   1. Stripe coat edges, welds, nuts, bolts, difficult to reach areas by brush before beginning spray application, as necessary, to ensure specified coating thickness along edges.
   2. When using spray application, apply coating to thickness not greater than that recommended in coating manufacturer's instructions for spray application.
   3. Use airless spray method, unless air spray method is required by coating manufacturer's instruction or these Specifications.
   4. Conduct spray coating under controlled conditions. Protect adjacent construction and property from coating mist, fumes, or overspray.

Q. Drying and recoating:
   1. Provide fans, heating devices, or other means recommended by coating manufacturer to prevent formation of condensate or dew on surface of substrate, coating between coats and within curing time following application of last coat.
   2. For submerged service the CONTRACTOR shall provide a letter to the ENGINEER that the lining system is fully cured and ready to be placed into service.
   3. Limit drying time to that required by these Specifications or coating manufacturer's instructions.
   4. Do not allow excessive drying time or exposure which may impair bond between coats.
   5. Recoat epoxies within time limits recommended by coating manufacturer.
   6. When time limits are exceeded, abrasive blast clean and de-gloss clean prior to applying another coat.
   7. When limitation on time between abrasive blasting and coating cannot be met before attachment of components to surfaces which cannot be abrasive blasted, coat components before attachment.
   8. Ensure primer and intermediate coats of coating are unscarred and completely integral at time of application of each succeeding coat.
   9. Touch up suction spots between coats and apply additional coats where required to produce finished surface of solid, even color, free of defects.
   10. Leave no holidays.
   11. Sand and feather in to a smooth transition and recoat and recoat scratched, contaminated, or otherwise damaged coating surfaces so damages are invisible to naked eye.

R. Concrete:
1. Apply first coat (primer) only when surface temperature of concrete is decreasing in order to eliminate effects of off-gassing on coating.

3.05 ALKALI RESISTANT BITUMASTIC

A. Preparation:
1. Prepare surfaces in accordance with general preparation requirements.

B. Application:
1. Apply in accordance with general application requirements and as follows:
a. Apply at least 2 coats, 8 to 14 mils dry film thickness each.

3.06 WAX COATING

A. Preparation:
1. Prepare surfaces in accordance with general preparation requirements.

B. Application:
1. Apply in accordance with general application requirements and as follows:
a. Apply at least 1/32-inch thick coat with 2-inch or shorter bristle brush.
b. Thoroughly rub coating into metal surface with canvas covered wood block or canvas glove.

3.07 HIGH SOLIDS EPOXY SYSTEM

A. Preparation:
1. Prepare surfaces in accordance with general preparation requirements and as follows:
a. Abrasive blast ferrous metal surfaces to be submerged at jobsite in accordance with SSPC SP-5 prior to coating. When cleaned surfaces rust or discolor, abrasive blast surfaces in accordance with SSPC SP-10.
b. Abrasive blast non-submerged ferrous metal surfaces at jobsite in accordance with SSPC SP-10, prior to coating. When cleaned surfaces rust or discolor, abrasive blast surfaces in accordance with SSPC SP-6.
c. Abrasive blast clean ductile iron surfaces at jobsite in accordance with SSPC SP-7.

B. Application:
1. Apply coatings in accordance with general application requirements and as follows:
a. Apply minimum 2-coat system with minimum total dry film thickness (DFT) of 12 mils.
b. Recoat or apply succeeding epoxy coats within time limits recommended by manufacturer. Prepare surfaces for recoating in accordance with manufacturer's instructions.
c. Coat metal to be submerged before installation when necessary, to obtain acceptable finish and to prevent damage to other surfaces.
d. Coat entire surface of support brackets, stem guides, pipe clips, fasteners, and other metal devices bolted to concrete.
e. Coat surface of items to be exposed and adjacent 1 inch to be concealed when embedded in concrete or masonry.

3.08 HIGH SOLIDS EPOXY AND POLYURETHANE COATING SYSTEM

A. Preparation:
   1. Prepare surfaces in accordance with general preparation requirements and as follows:
      a. Prepare concrete surfaces in accordance with general preparation requirements.
      b. Touch up shop primed steel and miscellaneous iron.
      c. Abrasive blast ferrous metal surfaces at jobsite in accordance with SSPC SP-6, prior to coating. When cleaned surfaces rust or discolor, abrasive blast surfaces in accordance with SSPC SP-6.
      d. Degrease or solvent clean, whip abrasive blast, power tool, or hand tool clean galvanized metal surfaces.
      e. Lightly sand (de-gloss) fiberglass and poly vinyl chloride (PVC) pipe to be coated and wipe clean with dry cloths, or solvent clean in accordance with coating manufacturer's instructions.
      f. Abrasive blast clean ductile iron surfaces.

B. Application:
   1. Apply coatings in accordance with general application requirements and as follows:
      a. Apply 3 coat system consisting of:
         1) Primer: 4 to 5 mils dry film thickness high solids epoxy.
         2) Intermediate coat: 4 to 5 mils dry film thickness high solids epoxy.
         3) Topcoat: 2.5 to 3.5 mils dry film thickness aliphatic or aliphatic-acrylic polyurethane topcoat.
   2. Recoat or apply succeeding epoxy coats within 30 days or within time limits recommended by manufacturer, whichever is shorter. Prepare surfaces for recoating in accordance with manufacturer's instructions.

3.09 POLYMORPHIC POLYESTER RESIN SYSTEM

A. Preparation:
   1. Prepare surfaces in accordance with general preparation requirements and as follows:
   2. Prepare concrete to obtain clean, open pore with exposed aggregate in accordance with manufacturer's instructions.
   3. Prepare ferrous metal surfaces in accordance with SSPC SP-5, with coating manufacturer's recommended anchor pattern.
   4. Complete abrasive blast cleaning within 6 hours of applying prime coat. Dew point shall remain 5 degrees above dew point 8 hours after application of coating. When cleaned surfaces rust or discolor, abrasive blast surfaces in accordance with SSPC SP-5.
   5. When handling steel, wear gloves to prevent hand printing.
   6. Adjust pH of concrete to within 5.5 to 8.0 before applying prime coat.

B. Application:
   1. Apply coatings in accordance with general application requirements and as follows:
   2. Apply minimum dry film thickness system consisting of primer, tie coat and top coat in accordance with manufacturer's instructions as follows:
      a. Steel: 35 mils.

b. Concrete: 45 mils.

3.10 HIGH TEMPERATURE COATING

A. Preparation:
   1. Prepare surfaces in accordance with general preparation requirements and as follows:
      a. Abrasive blast surface in accordance with SSPC SP-10.

B. Application:
   1. Apply coatings in accordance with general application requirements and as follows:
      a. Apply number of coats in accordance with manufacturer's instructions.

3.11 ASPHALT VARNISH

A. Preparation:
   1. Prepare surfaces in accordance with general preparation requirements.

B. Application:
   1. Apply coatings in accordance with general application requirements and as follows:
      a. Apply minimum 2 coats.

3.12 PROTECTIVE COAL TAR

A. Preparation:
   1. Prepare surfaces in accordance with general preparation coal tar requirements.

B. Application:
   1. Apply coatings in accordance with general application requirements and as follows:
      a. Apply minimum 20 mils dry film thickness coating.

3.13 COAL TAR EPOXY

A. Preparation:
   1. Prepare surfaces in accordance with general preparation requirements and as follows:
      a. Abrasive blast iron or steel surfaces to be coated as submerged metal in accordance with SSPC SP-5. Prepare other metal surfaces to be coated with coal tar epoxy in accordance with epoxy manufacturer's instructions.

B. Application:
   1. Apply coatings in accordance with general application requirements and as follows:
      a. [Waterproofing outside surfaces of concrete structures: Apply minimum 2 coats with total dry film thickness of 40 mils.]
      b. Apply 2 coats of [8 mils] each for a total [16 mils] dry film thickness.
      c. Apply coal tar epoxy on blasted steel on same day that steel is blasted.

d. Apply succeeding coats over previous coat as soon as application does not cause sagging, within the following times, or as recommended by the coating manufacturer, whichever is sooner.

Average Temperature Degrees (Fahrenheit)	Maximum Time Between Coats (Hours)
50 to 60	36
60 to 70	24
70 to 80	12
80 to 120	4

e. Apply additional coats required to obtain specified thickness.
f. When previous coat has cured or set or Maximum Time Between Coats has lapsed, abrasive blast previous coat until surface film is removed. Wash and clean surface with cleaning solvent. Apply succeeding coat within Maximum Time Between Coats or as recommended by coating manufacturer, whichever is sooner.
g. When succeeding coat is applied over previous coat which has cured or set or Maximum Time Between Coats has lapsed, and surface has not been abrasive blasted, remove entire coating system to substrate, and apply new coating system.
h. Where coating system is applied to exterior concrete surfaces below grade, extend system at least 3 inches above finish grade in straight level. Step extended system down 3 inches when extended system reaches 6 inches above finish grade.

3.14 COAL TAR EPOXY SUBSTITUTE

A. Preparation:
1. Prepare surfaces in accordance with general preparation requirements and in accordance with the coating manufacturer's printed instructions.

B. Application:
1. Apply 2 coats at 6 mils to 8 mils each, for a minimum total DFT of 12 mils.

3.15 VINYL ESTER

A. Preparation:
1. Prepare surfaces in accordance with coating manufacturer's recommendations and as directed and approved by coating manufacturer's representative.

B. Application:
1. Apply prime coat, as required by coating manufacturer, base coat, glass mat, and topcoat to total dry film thickness of 125 mils minimum:
   a. Final topcoat on floors shall include non-skid surface, applied in accordance with manufacturer's instructions.
2. Perform high voltage holiday detection test in accordance with SP0188-06, over 100 percent of coated surface areas to ensure pinhole free finished coating system.
3. All work shall be accomplished in strict accordance with coating manufacturer's instructions and under direction of coating manufacturer's representative.

3.16 ELASTOMERIC POLYURETHANE (100 PERCENT SOLIDS)

A. Preparation:
   1. Prepare surfaces in strict accordance with coating manufacturer's instructions and as directed and approved by coating manufacturer's representative.

B. Application:
   1. Apply epoxy primer at DFT of 1 to 2 mils, in strict accordance with manufacturer's instructions.
   2. Apply polyurethane coating at minimum total DFT as follows:
      a. Steel: 60 mils DFT.
      b. Ductile iron and ductile iron pipe coating and lining: 30 mils DFT.
      c. Concrete: 120 mils DFT.
      d. Or as recommended by the coating manufacturer and accepted by the ENGINEER.
   3. For concrete application, provide saw cutting for coating terminations in strict accordance with manufacturer's instructions:
      a. For application to damaged concrete, refer to Section 03925.

3.17 CONCRETE FLOOR COATINGS

A. Preparation:
   1. Prepare surfaces in accordance with general application requirements and in strict a accordance with coating manufacturer’s instructions.

B. Application:
   1. Apply primer if required by coating manufacturer.
   2. Apply 1 or more coats as recommended by coating manufacturer to receive a minimum total dry film thickness of 25 mils, color as selected by OWNER.

C. Final topcoat shall include non-skid surface, applied in strict accordance with coating manufacturer's instructions.

3.18 WATERBORNE ACRYLIC EMULSION

A. Preparation:
   1. Remove all oil, grease, dirt, and other foreign material by Solvent Cleaning in accordance with SSPC SP-1.
   2. Lightly sand all surfaces and wipe thoroughly with clean cotton cloths before applying coating.

B. Application:
   1. Apply 2 or more coats to obtain a minimum dry film thickness (DFT) of 5.0 mils.

3.19 FIELD QUALITY CONTROL

A. Each coat will be inspected. Strip and remove defective coats, prepare surfaces and recoat. When approved, apply next coat.

B. Control and check dry film thicknesses and integrity of coatings.

C. Measure dry film thickness with calibrated thickness gauge.

D. Dry film thicknesses on ferrous-based substrates may be checked with Elcometer Type 1 Magnetic Pull-Off Gage or Positector 6000.

E. Verify coat integrity with low-voltage holiday detector, in accordance with SP0188 06. Allow ENGINEER to use detector for additional checking.

F. Check wet film thickness before coal tar epoxy coating cures on concrete or non-ferrous metal substrates.

G. Arrange for services of coating manufacturer's field representative to provide periodic field consultation and inspection services to ensure proper surface preparation of facilities and items to be coated, and to ensure proper application and curing:
   1. Notify ENGINEER 24 hours in advance of each visit by coating manufacturer's representative.
   2. Provide ENGINEER with a written report by coating manufacturer's representative within 48 hours following each visit.

3.20 SCHEDULE OF ITEMS NOT REQUIRING COATING

A. General: Unless specified otherwise, the following items do not require coating:
   1. Items that have received final coat at factory and not listed to receive coating in field.
   2. Aluminum, brass, bronze, copper, plastic (except PVC pipe), rubber, stainless steel, chrome, Everdur, or lead.
   3. Buried or encased piping or conduit.
   4. Exterior concrete.
   5. Galvanized steel wall framing, galvanized roof decking, galvanized electrical conduits, galvanized pipe trays, galvanized cable trays, and other galvanized items:
      a. Areas on galvanized items or parts where galvanizing has been damaged during handling or construction shall be repaired as follows:
         1) Clean damaged areas by SSPC SP-1, SP-2, SP-3, or SP-7 as required.
         2) Apply 2 coats of a cold galvanizing zinc compound such as ZRC World Wide Inovatie Zinc Technologies of Mansfield, MA or accepted equal, in strict accordance with manufacturer’s instructions.
   6. Grease fittings.
   7. Fiberglass ducting or tanks in concealed locations.
   8. Steel to be encased in concrete or masonry.

3.21 SCHEDULE OF SURFACES TO BE COATED IN THE FIELD

A. In general, apply coatings to steel, iron, galvanized surfaces, and wood surfaces unless specified or otherwise indicated on the Drawings. Coat concrete surfaces and anodized aluminum only when specified or indicated on the Drawings. Color coat all piping as specified in Section 15075.

B. Following schedule is incomplete. Coat unlisted surfaces with same coating system as similar listed surfaces. Verify questionable surfaces.

C. Concrete:
   1. High solids epoxy:

a. Safety markings.

2. Coal tar epoxy:
   a. Underground bolts used for Flanges, Mechanical Joints, or Mechanical Fitting.
3. Concrete floor coating:
   a. Pump station floor.

D. Metals:
1. Alkali resistant bitumastic:
   a. Aluminum surfaces to be placed in contact with wood, concrete, or masonry.
2. Wax coating:
   a. Sliding faces of sluice and slide gates and threaded portions of gate stems.
3. High solids epoxy and polyurethane system: Interior and exterior non-immersed ferrous metal surfaces including:
   a. Doors, doorframes, ventilators, louvers, grilles, exposed sheet metal, and flashing.
   b. Pipe, valves, pipe hangers, supports and saddles, conduit, cable tray hangers, and supports.
   c. Motors and motor accessory equipment.
   d. Drive gear, drive housing, coupling housings, and miscellaneous gear drive equipment.
   e. Valve and gate operators and stands.
   ~~f. Structural steel including galvanized structural steel.~~
      ~~1) Exposed metal decking.~~
   g. Crane and hoist rails.
   h. Exterior of tanks and other containment vessels.
   i. Mechanical equipment supports, drive units, and accessories.
   j. Pumps not submerged.
   k. Degritters, grit classifiers, frames, supports, and associated equipment.
   l. Other miscellaneous metals.
4. High solids epoxy system:
   a. Field priming of ferrous metal surfaces with defective shop prime coat where no other prime coat is specified; for non-submerged service.
   b. Bell rings, underside of manhole covers and frames.
   c. Sump pumps and grit pumps, including underside of base plates and submerged suction and discharge piping.
   d. Exterior of submerged piping and valves other than stainless steel or PVC piping.
   e. Submerged pipe supports and hangers.
   f. Stem guides.
   g. Other submerged iron and steel metal unless specified otherwise.
   h. Interior surface of suction inlet and volute of submersible influent pumps. Apply coating prior to pump testing.
   i. Submerged piping.
   j. Exterior of influent pumps and influent pump submerged discharge piping.
5. Polymorphic polyester resin system:
   a. Surfaces where indicated on the Drawings following a short cure time.
6. Asphalt varnish:
   a. Underground valves and valve boxes.

7. Protective coal tar:
    a. Underground pipe flanges, excluding pipe, corrugated metal pipe couplings, flexible pipe couplings and miscellaneous underground metals not otherwise specified to receive another protective coating.
8. Coal tar epoxy.

K. Fiberglass and PVC pipe surfaces:
1. Waterborne acrylic emulsion.
    a. Exterior of fiberglass ducting and fan housings.
    b. Fiberglass expose to sunlight.
    c. PVC piping exposed to view.
    d. ABS piping as determined by ENGINEER.

END OF SECTION