

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT			1. CONTRACT ID CODE	PAGE OF PAGES	
			J	1	2
2. AMENDMENT/MODIFICATION NO. 0002	3. EFFECTIVE DATE 10-Sep-2004	4. REQUISITION/PURCHASE REQ. NO. W68SBV-4191-7950		5. PROJECT NO.(If applicable)	
6. ISSUED BY WALLA WALLA DISTRICT, COE - G4P CONTRACTING DIVISION 201 N THIRD AVENUE WALLA WALLA WA 99362-1876	CODE W912EF	7. ADMINISTERED BY (If other than item 6) <b>See Item 6</b>		CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)			X	9A. AMENDMENT OF SOLICITATION NO. W912EF-04-B-0020	
			X	9B. DATED (SEE ITEM 11) 17-Aug-2004	
				10A. MOD. OF CONTRACT/ORDER NO.	
				10B. DATED (SEE ITEM 13)	
CODE	FACILITY CODE		11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS		
<input checked="" type="checkbox"/> The above numbered solicitation is amended as set forth in Item 14. The hour and date specified for receipt of Offer <input type="checkbox"/> is extended, <input checked="" type="checkbox"/> is not extended. Offer must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended by one of the following methods: (a) By completing Items 8 and 15, and returning <u>1</u> copies of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.					
12. ACCOUNTING AND APPROPRIATION DATA (If required)					
13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS. IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.					
A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14 ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.					
B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATIVE CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103(B).					
C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:					
D. OTHER (Specify type of modification and authority)					
E. IMPORTANT: Contractor <input type="checkbox"/> is not, <input type="checkbox"/> is required to sign this document and return _____ copies to the issuing office.					
14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.) Amends the technical specifications. Bid opening remains unchanged at September 20, 2004, 2:00 pm local time.  MCNARY PUMPING PLANT 12-2 and 15-D Modifications, Benton and Franklin Counties, WA					
Except as provided herein, all terms and conditions of the document referenced in Item 9A or 10A, as heretofore changed, remains unchanged and in full force and effect.					
15A. NAME AND TITLE OF SIGNER (Type or print)			16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)		
			TEL: _____ EMAIL: _____		
15B. CONTRACTOR/OFFEROR	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA		16C. DATE SIGNED	
_____ (Signature of person authorized to sign)		BY _____ (Signature of Contracting Officer)		10-Sep-2004	

## SECTION SF 30 BLOCK 14 CONTINUATION PAGE

**The following items are applicable to this modification:**AMENDMENT #0002

W912EF-04-B-0020, Amendment #0002

## A. The solicitation is amended as indicated below.

1. Section 01010 SUPPLEMENTARY REQUIREMENTS, paragraph 1.11.2 - Added a requirement for the Contractor to provide electrical power for performance of the work at pumping plant 15-D during periods when the power to the plant is shut down for worker safety.

2. Section 02140 DIVERSION AND CARE OF WATER, paragraph: 3.4(a) - Changed "Minimum of one 6000 gpm pump with one 6000 gpm backup pump." to "Minimum 6000 gpm pumping capacity with 6000 gpm backup pumping capacity."

3. Section 07720 ROOF HATCH MODIFICATIONS, paragraph 3.1 - Added a requirement to remove existing rocks and debris from the roofs.

4. Section 07720 ROOF HATCH MODIFICATIONS - Added a new paragraph 3.3 ROOF MOUNTED ANTENNAS to specify the requirements for removal and reinstallation of existing roof mounted pump monitoring antennas. All subsequent paragraphs renumbered accordingly.

5. Added 2 photos to the end of Section 07720 ROOF HATCH MODIFICATIONS to show the roof mounted antennas, rocks, and debris.

**B. Bid opening remains unchanged at: September 20, 2004, 2:00 pm local time.**

C. Bidders must acknowledge receipt of this amendment. See Block No. 11 of Standard Form 30 for methods of acknowledging solicitation amendments.

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SECTION 01010

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PART 3 EXECUTION (Not Used)

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SECTION 01010

SUPPLEMENTARY REQUIREMENTS

PART 1 GENERAL

The work covered by this section of the specifications consists of work common to more than one section of these TECHNICAL SPECIFICATIONS.

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

CORPS OF ENGINEERS (COE)

COE EM 385-1-1 (1996) Safety and Health Requirements Manual

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Accident Prevention Plan; G,CD

Equipment List

Safe Clearance (Lockout) Procedures; G,CD.

Contractor's Schedule

SD-11 Closeout Submittals

As-Built Contract Drawings; G,CD

1.3 PUBLIC ACCESS

The existing levee access roads on top of the levees are open to the public. The access road at pumping plant 12-2 is a high public use road for pedestrians, cyclists, and equestrians, and shall be maintained open to the public during the work. The access road at pumping plant 15-D may be closed to the public for performance of the work. Barriers and warning signs shall be placed in approved locations to protect the public during performance of the work. Signs shall be placed to warn the public coming from both directions toward the pumping plants.

1.4 CONTRACTOR ACCESS

Access to the Government disposal area and the pumping plants requires

opening of locked gates and pumping plant doors. Contractor access to the work areas will be arranged at the pre-work meeting.

## 1.5 SAFETY

### 1.5.1 Accident Prevention

In accordance with Contract Clause ACCIDENT PREVENTION the Contractor shall provide and maintain work environments and procedures which will safeguard the public, Government personnel, Contractor personnel, property, materials, supplies, and equipment exposed to Contractor operations and activities.

#### 1.5.1.1 Safety Requirements

The Contractor shall comply with the requirements of COE EM 385-1-1.

#### 1.5.1.2 Corrective Action by the Contractor

Whenever the Contracting Officer detects any noncompliance with these requirements or any condition that poses a serious or imminent danger to the health or safety of any personnel, the Contracting Officer will notify the Contractor and request immediate initiation of corrective action. Lack of notice from the Contracting Officer does not relieve the Contractor from compliance requirements and responsibility. After receipt of notice from the Contracting Officer, the Contractor shall immediately take corrective action. Such notice, when delivered to the Contractor at the site of the work, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for additional costs or damages by the Contractor.

### 1.5.2 Accident Prevention Plan

Before commencing any work on site, the Contractor shall submit an Accident Prevention Plan for the Contracting Officer's review and acceptance. Paragraph 01.A.07 and Appendix A of COE EM 385-1-1 reflect requirements and guidelines for preparing accident prevention plans.

### 1.5.3 Hazard Analysis

Prior to beginning each major phase of work, an activity Hazard Analysis shall be prepared by the Contractor in accordance with paragraph 01.A.09 and Figure 1-1 of COE EM 385-1-1 and provided to the Government Inspector.

### 1.5.4 Subcontractors

Compliance with the accident prevention and safety requirements by subcontractors will be the responsibility of the Contractor.

## 1.6 SAFE CLEARANCE (LOCKOUT) PROCEDURES

A safe clearance procedure (hazardous energy control plan) is used by project personnel to ensure continuity of service and safety to personnel and equipment. The projects require that the contractor shall provide the names of two individuals who shall have the authority to request clearances and release clearances. These individuals will receive training at the

projects. An allowance for three hours is required to review the project procedures and have the instruction. Any work performed by the Contractor which requires taking project operating equipment out of service will be done only after a formal clearance is obtained through the Contracting Officer's Representative. Only the Government's designated individual, as arranged by the Contracting Officer's Representative, will issue clearances. Contractor personnel shall not violate the clearance procedure. A copy of the Projects Safe Clearance Procedure will be provided to the Contractor. As required in paragraph 12.A.02 in COE EM 385-1-1, the Contractor shall submit its hazardous energy control plan to the Corps for approval prior to initiation of any activities requiring the removal of any project operating equipment from service. Prior to the removal of any project operating equipment from service a meeting and preparatory inspection will be held between the Contractor and project personnel to ensure that all affected personnel understand and comply with the restrictions of each others energy control procedures.

#### 1.7 EQUIPMENT LIST

The Contractor shall furnish a complete list of all equipment to be used on the project, in duplicate, within 15 days after date of receipt of notice to proceed. The Contractor shall submit a revised list in the event of change of equipment. Lists shall include rented equipment as well as lease-purchase or sale-leaseback equipment. The initial list and the revised lists shall indicate dates equipment is assigned to or removed from the project and adequate identification or description of each item of equipment including manufacturer's name (abbreviated), model number, manufacturer's serial number, year of manufacture, and Contractor's assigned serial or record number.

#### 1.8 CONTRACTOR'S CRANES

Contractor's cranes and equipment furnished for this work shall conform to all applicable OSHA Requirements and COE EM 385-1-1.

#### 1.9 TESTING OF EQUIPMENT

Before any machinery or mechanized equipment is put to use on the job, it shall be inspected and tested by a qualified person and determined to be in safe operating condition in the presence of the representative of the Contracting Officer. Cranes or derricks shall be tested by the Contractor or a qualified testing agency in accordance with COE EM 385-1-1. Equipment shall be large enough to safely handle proposed picks or tasks without exceeding the crane rating established by these tests.

#### 1.10 CONTRACTOR'S STORAGE AND STAGING AREA

The Contractor may use the areas adjacent to the pumping plants along the toe of the levee for staging of equipment and materials. The areas are open to the public and are subject to occasional vandalism. The Contractor shall be responsible for security of all materials and equipment located at the project sites for the duration of the work.

#### 1.11 UTILITIES

##### 1.11.1 Water

The Contractor shall furnish all water required for performance of the work.

### 1.11.2 Electricity

Electric power will be made available to the Contractor from the existing electrical system at the pumping plants. Electric power will be supplied at no cost to the Contractor. Power is available from existing 120 volt, single phase receptacles, and 480 volt, three phase power distribution panel. The three-phase power, at each plant, is adequate for operating the 3 existing 6,000 GPM pumps. The Contractor shall furnish all temporary wiring, connectors, and devices for connecting to the power supply. The location of all temporary power lines and connections will be subject to COR's approval. All temporary circuits, wire, extension cords, and devices shall be furnished, installed, connected, maintained, and removed by the Contractor in a workmanlike manner, prior to acceptance by the Government. A Government electrician will make the connection of the Contractor's temporary wiring to the power supply panel and disconnect the wiring following completion of the work. The Contractor shall notify the Government a minimum of two days prior to the need to allow for scheduling of the electrician.

Electrical power to pumping plant 15-D runs through overhead conductors to the pump building through a masthead mounted on the building wall and down into the building. The power will be shut down during all work on the roof for worker safety. The Contractor shall provide all electrical power for performance of the work during periods when the power to the pump station is shut down.

### 1.11.3 Compressed Air

The Contractor shall furnish all compressed air required for performance of the work.

## 1.12 SANITATION FACILITIES

The Contractor shall furnish sanitation facilities at the work site in accordance with COE EM 385-1-1.

### 1.13 FIRE CONTROL

Each piece of internal combustion engine driven equipment used at the work site shall be equipped with a fire extinguisher in accordance with recommendation NFPA as appropriate. The minimum approved rating of extinguishers shall not be less than 5-B:C.

## 1.14 WORK SCHEDULES

### 1.14.1 Contractor's Schedule

The Contractor shall furnish a schedule of working hours and days of the week for contract work. The Contractor shall furnish notification of any change of schedule of regular work hours, overtime work hours, and shifts of work crews and personnel at the site. This notification shall be provided a minimum of 48 hours prior to any schedule change to allow suitable scheduling of Government personnel and inspection. Exception to this requirement may be allowed in case of schedule change due to emergency conditions.

### 1.14.2 Government's Work Schedule

The maintenance crews at the Pasco maintenance shop work from 6:30 a.m. to

5:00 p.m., Monday through Thursday. Crews and staff do not work on Fridays, weekends and Federal holidays.

1.15 NOISE RESTRICTION

Due to the proximity of adjacent residences to pumping plant 12-2, construction activities generating 70 db or more, measured at 100 feet away, shall be restricted to the hours allowed by the local noise ordinance.

1.16 FINAL CLEANUP

After installation of the slide gates and roof hatches and following removal of sediment of the pump intake chambers, the Contractor shall do a thorough cleaning of each pump house interiors, including wiping down all equipment, and sweeping and swabbing the floors. The work sites shall be cleaned of all trash and debris and left in a neat and orderly condition. The recreation trail at pumping plant 12-2 shall be cleaned and the surrounding area groomed and left in a neat, orderly condition.

1.17 PROTECTION AND RESTORATION OF EXISTING FACILITIES.

The Contractor shall take precautions to prevent damage to existing facilities while performing work under this contract. Upon completion of the work, all the existing facilities not included as a portion of the work shall be left in a condition better than or equal to the condition existing at time of contract award. Costs for maintenance, repair and restoration of any facilities shall be considered as incidental to and included in the bidding schedule prices.

1.18 MAINTAIN WORKING As-Built Contract Drawings

The Contractor shall maintain a current and accurate record of the work as actually constructed in the form of working "as-built" drawings by marking "as-built" conditions on the contract drawings. Blue pencil shall be used to mark information added to the drawings and red pencil shall be used to mark information deleted from the drawings. Contract drawings shall be maintained on-site during construction. The completeness and accuracy of the marked "as-built" drawings must be verified by Government Quality Assurance personnel prior to submission of progress payment requests. The working "as-built" drawings shall be submitted to the Contracting Officer after all "as-built" conditions have been marked on the working "as-built" contract drawings.

PART 2 PRODUCTS (Not Used)

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SECTION 02140

DIVERSION AND CARE OF WATER

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

This section specifies the requirements for diverting water from the pumping plants 12-2 and 15-D to facilitate installation of slide gates at the pump intakes and for furnishing, installing, and operating temporary pumping plant during the diversion period.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Water Control Plan

1.2.1 Water Control Plan

Prior to start of work, the Contractor shall furnish a plan detailing its proposed method for dewatering the pumping plant intake area and for furnishing temporary pumping plant. The plan shall include details for the following:

- (a) Method for dewatering the intake area
- (b) Materials and equipment to be used in the dewatering
- (c) Location of temporary pumping plant
- (d) Temporary electrical power wiring
- (e) Water level controls (in the toe ditch)
- (f) Intake screen details
- (g) Outlet pipe size(s), number of lines, vertical and horizontal alignment, joint location, vacuum breaker details
- (h) Erosion protection of the existing riprap slope

PART 2 PRODUCTS (not used)

PART 3 EXECUTION

3.1 DESCRIPTION OF EXISTING PUMPING PLANT AND OPERATIONS

Pumping plant 12-2 and 15-D each has three 6,000 GPM pumps, which pump groundwater and surface runoff from the toe ditch behind the levee. Typically, one or two pumps are used to control the water level in the ditch. Prior to the irrigation season, one pump, running for a total of approximately 10 hours a day, maintains the water level in the ditch within operating parameters. During the irrigation season, which typically begins in the May/June timeframe, one pump running approximately 20 hours a day is

required to maintain the water within operating parameters.

### 3.2 CONTRACTOR'S OPERATIONS

The Contractor shall furnish all labor, equipment, and materials required to divert water in the drainage ditch at the toe of the levee away from pumping plants 15D and 12-2, and pump it over the levee for discharge into the Columbia River to facilitate installation of slide gates and cleaning of the pump intake chambers.

### 3.3 Dewatering/Diversion

The Contractor shall design, fabricate and install a dewatering bulkhead, caisson, or other means to divert water away from the pumping plant intake.

The design shall allow dewatering of the intake area while leaving adequate room for removal of the trash rack to facilitate installation of the new slide gate. Pumps used to maintain the dewatered condition shall discharge back into the drainage ditch. Work shall be sequenced so that turbid water pumped back into the drainage ditch is not pumped into the Columbia River by the temporary pumping plant. Stainless steel concrete anchors may be used to connect the dewatering system to the existing structure. All anchors shall be cut off and ground flush after completion of the work. No excavation into the existing levee will be allowed to facilitate installation of the dewatering system. Following installation and testing of the slidegate, the dewatering system shall be removed with all concrete anchors cut off and ground flush with the concrete.

### 3.4 Temporary Pumping Plant

The Contractor shall furnish, install, and maintain adequate pumping capacity to replace the existing pumps while the pumping plant is dewatered for installation of the slide gate and cleaning of the pump intake chamber.

The pumping facilities shall meet the following minimum criteria:

- a. Minimum 6000 gpm pumping capacity with 6000 gpm backup pumping capacity.
- b. Level controls to start pumping at elevation 333.83 and stop pumping at elevation 333.17 at Plant 12-2. Level controls to start pumping at elevation 327.92 and stop pumping at elevation 326.5 at Plant 15-D. Verify level controls on-site with Contracting Officers Representative.
- c. Pumps shall be operational 24 hours a day with personnel on site at all times to monitor and maintain the pumping plant.
- d. Electric power to be Government-furnished from the Motor Control Center in the pump house (see Section 01010).
- e. Water shall be pumped over the levees with temporary piping or hoses. The discharge piping shall include a vacuum breaker, appropriately sized, installed at the highest point, to prevent siphoning and collapse of discharge pipes.
- f. Pump outlet piping will be routed over the existing asphalt recreation trail on top of the levee. Measures shall be taken to prevent damage to the asphalt trail. Following the work, all damage to the trail shall be repaired.
- g. The recreation trail shall be maintained open as specified in Section 01010. Provisions shall be made to allow pedestrian, cyclists, and equestrians to pass safely over the pump outlet piping.
- h. Discharge outlet shall be above Columbia River high water level with provisions to prevent erosion of the levee face.
- i. The Contractor may excavate in the toe ditch for a temporary pump

intake. The Government will direct the intake location. Excavation shall be no more than 24 inches below the pump intake sill elevation. j. Screened intake designed, furnished, installed and maintained by the Contractor. The screen design shall be adequate to screen out plant and other debris which collects in the drainage ditch. Screen openings equal to or smaller than the existing trash rack will suffice. Debris shall be cleaned from the intake screen on a regular basis during the 24 hour a day operation.

### 3.5 REMOVAL OF DEWATERING/DIVERSION

Following completion of the slide gate installation and cleaning of the pumping plant intake chamber, the Contractor shall remove the dewatering structure from the pumping plant and remove the temporary pumping plant facilities.

### 3.6 REPAIR OF DAMAGE TO LEVEES

Following removal of the dewatering and temporary pumping facilities, the Contractor shall repair all damage to the levee including eroded or otherwise disturbed surfaces and displaced riprap. Also, the asphalt pedestrian path at pumping plant 12-2 shall be repaired if damaged. All repairs shall be performed to the satisfaction of the Contracting Officer's Representative. Repair of damage to the levees shall be performed at no additional cost to the Government.

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SECTION 07720

ROOF HATCH MODIFICATIONS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

This section specifies the requirements for modifying the roof hatches at pumping plants 12-2 and 15-D.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ACI INTERNATIONAL (ACI)

ACI 318/318R (1999) Building Code Requirements for Structural Concrete and Commentary

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM A 325 (2000) High-Strength Bolts for Structural Steel Joints (Metric)

ASTM A 36 (1981) Structural Steel

ASTM A 611 (1997) Structural Steel (SS), Sheet, Carbon, Cold-Rolled

ASTM A 653/A 653M (2002a) Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM C 171 (1997a) Sheet Materials for Curing Concrete

ASTM C 33 (2001a) Concrete Aggregates

ASTM C 494 (1999a) Chemical Admixtures for Concrete

ASTM C 94 (1996) Ready-Mixed Concrete

ASTM D 1117 (1999) Nonwoven Fabrics

ASTM D 1475 (1998) Standard Test Method for Density of Liquid Coatings, Inks, and Related Products

ASTM D 1682 (1964; R 1975) Breaking Load and Elongation of Textile Fabrics

ASTM D 1777 (1996) Measuring Thickness of Textile Materials

ASTM D 2178	(1997; Rev. A) Asphalt Glass Felt Used in Roofing and Waterproofing
ASTM D 2196	(1999) Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield) Viscometer
ASTM D 412	(1998a) Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers - Tension
ASTM D 5	(1997) Penetration of Bituminous Materials
AMERICAN WELDING SOCIETY (AWS)	
AWS D1.3	(1998) Structural Welding Code - Sheet Steel
U.S. GENERAL SERVICES ADMINISTRATION (GSA)	
FF-S-325	Shield, Expansion; Nail, Expansion; and Nail Drive Screw (Devices, Anchoring, Masonry)
MASTER PAINTERS INSTITUTE (MPI)	
MPI 47	(2001) Interior Alkyd, Semi-Gloss
THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)	
SSPC Paint 25	(2000) Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Blast Cleaned Steel Type I and Type II
SSPC SP 10	(2000) Near-White Blast Cleaning

### 1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for information only or as otherwise designated. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES:

#### SD-02 Shop Drawings

Roof hatches; G, EA

#### 1.3.1 Roof Hatch Submittal

Shop drawings for the roof hatches shall be submitted and approved prior to commencement of work on the roof. The shop drawings shall include the following:

- a. Concrete demolition plan, details, equipment and methods
- b. In-fill concrete forming plan and details
- c. Steel decking layout, fabrication and connection details

- d. Product data for roof hatches, curbs, louvers and hatch closure device
- e. Roof hatch installation plan, section and details
- f. ICBO report for steel decking
- g. ICBO report for concrete anchors

## PART 2 PRODUCTS

### 2.1 STRUCTURAL STEEL

Structural steel shall comply with the requirements of ASTM A 36.

### 2.2 STEEL DECKING

Steel decking shall be used as a permanent form for the concrete and shall comply with ASTM A 653/A 653M or ASTM A 611. Decking shall be 1-1/2-inches deep, Type B. Units shall be fabricated of 16-gauge steel and shall be zinc coated in conformance with ASTM A 653/A 653M, G90 coating class. The Contractor shall submit shop drawings and ICBO Report for the steel decking. The shop drawings shall show the layout of steel decking panels and details of supports and welding.

### 2.3 BOLTS

Bolts for structural connections shall comply with the requirements of ASTM A 325.

### 2.4 CONCRETE ANCHORS

#### 2.4.1 Expansion Anchors

Expansion anchors shall conform to Fed. Spec. FF-S-325, Group, Type, and Class appropriate for the intended use. Anchors and bolts shall be 300 series stainless steel. Reinforcing steel and embedded metal may be encountered when drilling holes for expansion anchors. Expansion anchors shall be installed in conformance with the manufacturer's printed installation instructions.

#### 2.4.2 Adhesive Anchors

Anchors shall consist of threaded steel rods grouted into holes drilled in concrete. Grout shall be a two component material consisting of a polyester, vinylester, or epoxy resin and a hardener. Adhesive shall not be water soluble. Threaded rod shall be 300 series stainless steel. Nuts and washers shall be the same as the threaded rods. Installation of the anchors shall be in accordance with the manufacturer's printed installation instructions. Anchor diameters shall be as indicated. Embedment lengths of anchors shall be the larger of the indicated lengths or the manufacturer's standard lengths. Total lengths of anchors shall be as necessary so that at least 1/8 inch of threaded rod extends past the nut when final installation is completed. Reinforcing steel or other embedded metals may be encountered when drilling for installation of the anchors.

### 2.5 CONCRETE

Concrete shall consist of portland cement, aggregates, water, air-entraining admixture, and other optional admixtures, and shall conform to the material requirements of ASTM C 94, Section 4, "Materials." Portland cement shall be Type II, low alkali, meeting the requirements of ASTM

C-150. General requirements for the mix shall be as listed in the following table:

Mix ID	Specified f'c 1	Age	Max W/C Ratio	ASTM C 33 Grading No.	Slump Range	Air Content Range
Mix No.1	3000 psi	28 days	0.50	67	1-4 inch	5-7 %

PART 3 EXECUTION

3.1 REMOVAL OF ROOF VENTS AND ROOFING MATERIALS

Existing roof vents shall be removed and disposed of by the Contractor. Cants and roofing over cants that surround the vent curbs shall also be removed to facilitate cutting the existing concrete curbs that support the vents. Existing roofing adjacent to the vent openings shall be cut back only far enough to facilitate curb removal. Before beginning removal procedures, the Contractor shall cut the existing roof membrane down to the existing concrete deck to ensure that unaffected areas of adjacent roofing are not torn or abraded by the removal process. Both roofs have rocks and other debris that shall be removed and disposed of along with the roofing materials (see photos attached to the end of this Section).

3.2 CONCRETE REMOVAL

Openings cut into concrete roof slabs shall be made utilizing a diamond saw or other means suitable for making a clean cut in the concrete. Pieces of the slab that will be removed by cutting shall be secured to prevent them from falling into the building. In addition, the Contractor shall design and install a method for containing concrete chips, spalled pieces, dust and water generated by cutting activities, to prevent them from contaminating inside surfaces and equipment of the pump houses. All concrete rubble shall be taken from the job site and be disposed of by the Contractor and shall not be disposed of at the Toothakre HMU. The Contractor shall also be responsible for cleaning all interior and exterior surfaces of the pump houses and interior pump house equipment contaminated with concrete dust and water containing concrete sediment. At the determination of the COR, any equipment damaged or made inoperable as a result of construction activities shall be repaired or replaced by the Contractor at no additional cost to the government. Steel reinforcements and embedded conduits may be encountered during concrete cutting. Steel reinforcements exposed by demolition shall be coated with one coat of SSPC Paint 25 primer and two coats of semi-gloss alkyd enamel in compliance with MPI 47. Color of finish coat shall be a light gray. Embedded electrical conduits shall be abandoned and de-energized. Exposed embedded conduits shall be plugged with an epoxy resin based or Portland cement based grout and troweled smooth to match the surrounding concrete.

3.3 ROOF MOUNTED ANTENNAS

Each pump house has an antenna mounted on the roof (see Photos attached to the end of this section). The antennas are mounted on a pipe mast cast into the concrete roof deck. The Contractor shall carefully remove the antennas during demolition work. The antennas shall be reinstalled with the new roof hatch system in the same location from which they were removed. The antennas shall have a watertight flashing installed with the roofing system as recommended by the roofing manufacturer.

### 3.4 STRUCTURAL STEEL

Structural steel components shall be fabricated to the sizes and configurations indicated. All structural steel components shall be shop primed with SSPC Paint 25. Threads of stainless steel nuts shall be coated with anti-galling compound prior to installation.

### 3.5 STEEL DECKING

Steel decking shall be installed in accordance with the Steel Deck Institute (SDI) Specification and Commentary for Steel Floor Decking and the approved shop drawings. Decking that is bent or with holes burned through it shall not be installed. Decking units shall be placed on secure supports, properly adjusted, and aligned at right angles to supports before being welded in place. Decking units shall be welded to supports with nominal 5/8-inch diameter puddle welds spaced at a maximum 12-inches on center. Welding of decking shall be in accordance with AWS D1.3 using methods and electrodes as recommended by the decking manufacturer.

### 3.6 CONCRETE

#### 3.6.1 Steel Reinforcements

The Contractor shall furnish, cut, bend, and place all steel reinforcement as indicated. All reinforcement shall be free from loose, flaky rust and scale, and free from oil, grease, or other coating which might destroy or reduce its bond with the concrete. All placing of steel reinforcement shall be in accordance with ACI 318/318R, the contract drawings, and the Contractor's approved shop drawings. The minimum cover for all reinforcement shall be 1-1/2-inches.

#### 3.6.2 Surface Preparation

Steel decking upon which concrete is to be placed shall be clean and free from frost, ice, and water. Before placing concrete, care shall be taken to determine that all embedded items are firmly and securely fastened in place as indicated on the drawings. Decking and embedded items shall be free of oil and other foreign matter such as loose coatings of rust, paint and scale.

#### 3.6.3 Placing

The installation of steel decking and embedded items shall be approved by the COR prior to concrete placement. Concrete placement will not be permitted when, in the opinion of the COR, weather conditions prevent proper placement and consolidation. Concrete shall be deposited as close as possible to its final position. Concrete shall be delivered to the site of work and discharge shall be completed within 1-1/2 hours after introduction of the cement to the aggregates. When the concrete temperature exceeds 85° F, the placement shall be completed within 45 minutes. Concrete shall not be placed when adverse weather conditions exist. These conditions are when ambient air temperatures are below 40° F or above 90 F, or when rain, snow, hail, or wind (in excess of 25 miles per hour) occurs at the placing site. Concrete shall be consolidated around rebar and other embedded items by means of rodding or vibration.

#### 3.6.4 Cold Weather Requirements

Special protection measures, approved by the COR, shall be used if freezing

temperatures are anticipated before the expiration of the specified curing period. The ambient temperature of the air where concrete is to be placed and the temperature of surfaces to receive concrete shall not be less than 40°F. The temperature of the concrete when placed shall not be less than 40°F. Heating of the mixing water or aggregates will be required to regulate the concrete placing temperature. Materials entering the mixer shall be free from ice, snow, or frozen lumps. Salt, chemicals or other materials shall not be incorporated into the concrete to prevent freezing. Upon approval of the Contracting Officer, a chemical admixture conforming to ASTM C 494, Type C or E may be used, however, no admixtures containing more than trace amounts of chloride shall be used.

### 3.6.5 Hot Weather Requirements

The temperature of the concrete placed during warm weather shall not exceed 85°F except where an approved retarder is used. The mixing water and/or aggregates shall be cooled, if necessary, to maintain a satisfactory placing temperature. In no case, shall the placing temperature exceed 90°F.

### 3.6.6 Surface Finish

The ambient temperature of spaces adjacent to surfaces being finished shall not be less than 50°F. Surfaces of new slab shall be screeded and floated to bring the surface level with adjacent existing concrete surfaces and to match the slope of existing adjacent concrete surfaces. No coarse aggregate shall be visible. No cement mortar, or water shall be added to the surface during finishing operations. The concrete, while still green, but sufficiently hard to bear a man's weight without deep imprint, shall be floated to a true and even plane. Hand floats shall be made of magnesium or aluminum. Tolerance for a floated finish shall be true plane within 1/8-inch in 5 feet as determined by a straight edge placed anywhere on the slab in any direction. The top surface of new and existing concrete roof decks shall be flush.

### 3.6.7 Curing and Protection

Beginning immediately after placement and continuing for at least 7 days, all concrete shall be cured and protected from premature drying, extremes in temperature, rapid temperature change, freezing, mechanical damage, and exposure to rain or flowing water. All materials and equipment needed for adequate curing and protection shall be available and at the site of the placement prior to the start of concrete placement. Preservation of moisture for concrete surfaces not in contact with forms shall be accomplished by application of impervious sheet material conforming to ASTM C 171.

## 3.7 THERMAL & MOISTURE PROTECTION

### 3.7.1 Protection and Coordination Requirements

Areas of the pump house roofs to be left open during the course of construction shall be covered with tarps or other approved means at the end of each day to protect the pump house interior from inclement weather.

### 3.7.2 Cold-Process Roofing

#### 3.7.2.1 General

Roofing repairs shall be commence as soon as possible following

installation of the roof hatches. New roofing shall be a minimum 3-ply cold applied bituminous system. All roofing materials shall be products manufactured or recommended by one manufacturer. Components of the roofing system not in compliance with this specification and the written application instructions published by the roofing system manufacturer will not be accepted.

3.7.2.2 Cold-Process Ply Sheet

Material to be used as base sheet, interply sheet, and top sheet shall be a coated fiberglass ply that is non-porous, water resistant, and flexible. The sheet shall meet the following performance requirements:

<u>Material Property</u>	<u>Testing Standard</u>	<u>Performance Requirement</u>
Weight	-----	25.5lb/100 sq. ft. min.
Breaking Strength	ASTM D 2178	44 lb./inch min.
Glass Fiber Distribution	ASTM D 2178	Random
Adherent comminuted surfacing	ASTM D 2178	2.5 lb/100 sq. ft.
Asphalt Saturant	-----	190°F - 325°F
Softening Point Penetration	ASTM D 5	
Mineral Filler (Smaller than 70 mesh)	-----	Greater than 30%

3.7.2.3 Cold Process Adhesive

Adhesive used between sheet plies shall meet the following performance requirements:

<u>Material Property</u>	<u>Testing Standard</u>	<u>Performance Requirement</u>
Viscosity	-----	25-50 when contained in a ½-pint can @ 2 RPM on scale 0 to 100 @ 77°F±2°F
Homogeneity	ASTM D 2196	Free from lumps, livering, granulation, and excessive separation; shall not visibly deteriorate or develop excessive body storage while in original containers
Density	ASTM D 1475	7.6-8.6 lb. Per U.S. gal. When tested @ 77°F±2°F

3.7.2.4 Fiberglass Reinforcing Mesh

Reinforcing mesh shall be used to strengthen the outside corners of the roof hatches and to provide a transition between the top of the cant and metal curbs of the roof hatches. Mesh shall meet the following performance requirements:

<u>Material Property</u>	<u>Testing Standard</u>	<u>Performance Requirement</u>
Tensile Strength	ASTM D 1682	55 lb./in @ 77°F MD
Weight	ASTM D 1117	1.2 lb./100 sq. ft.
Ames Thickness	ASTM D 1777	0.018 inches

### 3.7.2.5 Elastomeric Top Coating

Top coating to be used over the 3-ply roofing system shall be a single-component roof elastomer formulated from polymers. Top coating shall meet the following performance requirements :

<u>Material Property</u>	<u>Testing Standard</u>	<u>Performance Requirement</u>
Density	ASTM D 1475	8.1 lb./gal.
Elongation	ASTM D 412	1000% min. @ 77°F 100% min. @ -30°F
Recovery from Elongation	ASTM D 412	90% min.
Tensile Strength	ASTM D 412	40-100 psi @ 100% elongation

### 3.7.2.6 Preparation of Roofing Surfaces

Areas to receive new 3-ply bituminous roofing shall be swept free of gravel and loose debris from demolition operations. Adjacent existing roofing damaged during demolition and new construction activities shall be cut out to receive new roofing. Exposed existing concrete surfaces and new concrete surfaces to receive roofing shall be primed with a quick-drying primer recommended by the roofing manufacturer.

### 3.7.2.7 Membrane Application

Roofing plies shall be allowed to relax 30 minutes before application. New roofing shall start at the low point requiring repairs and be taken up to the top of the cant against the metal roof hatch curb. Felts shall be applied such that there are a minimum 3-plys of roofing anywhere on the new roofing surface. Embed the first roofing ply in cold adhesive applied at the rate of 3 gallons per square. Course in the subsequent 2 plies in a full bed of roofing adhesive applied at the rate of 3 gallons per square. Nowhere shall felt touch felt. Felts shall be broomed to ensure complete contact (wrinkle free), void of fish-mouths and blisters. Stagger end laps on felts a minimum 3-feet. Reinforce outside corners of the roof cants with fiberglass mesh. Mesh shall be embedded in a solid layer of cold adhesive and extend a minimum 12-inches each side of the corner and 12-inches out onto the horizontal roofing surface. In addition, reinforce the junction between roof cants and metal curbs of the hatches with mesh embedded in a solid layer of cold adhesive. Run a single, 8-inch wide layer of mesh 4-inches up the curb and 4-inches over the cant. Embed an additional 4-inch wide layer in cold adhesive over the mesh on the curb. Reinforce the curb corners with 4-inch wide mesh extending a minimum 12-inches each side.

### 3.7.2.8 Roof Surfacing

Elastomeric top-coating shall be applied over the new 3-ply roofing and mesh reinforcements at the rate of 5 gallons/25 sq. ft. Top Coating shall then be seeded with 3M No. 11 white granules (or equal) applied at the rate of 60 lbs. per square. Top coating shall be seeded immediately after it's application. Unadhered and excess granules shall be swept up and removed from the roof.

## 3.8 ROOF HATCHES

### 3.8.1 Description

The Contractor shall furnish and install three complete insulated roof

hatches at each pumping plant, as indicated. Roof hatches shall consist of a vented curb and a hatch cover. The vented curbs shall include two operable louvers on opposing sides. Minimum free area for each operable louver shall be 95 square inches at full open position (with bird screen). The operable louvers shall be a pull chain operated type with a spring return (to fully closed position). The pull chain operator shall be equipped with a means to maintain various opening positions. The normal louver position shall be fully closed. The louvers shall also be equipped with a bird screen, mechanically fastened with sheet metal screws. The minimum clear opening for the vented curb, from inside face to inside face of opposing louvers, shall be at least 50 inches. Pull chains shall be sufficiently long to allow for operation while standing on the pump house floor. Each pull chain operator may extend into the 50"x50" clear opening a maximum of 1". Distance from the bottom of the louver openings to the roof deck shall be a minimum of 6". Distance from the top of the louver openings to the top of the vented curb shall be a minimum of 2". The hatch shall be secured to the vented curb with stainless steel, pad lockable, draw latches. Four draw latches per hatch. Minimum working load for each draw latch shall be 200 pounds. The hatches shall not be hinged. Each hatch shall be furnished with three lifting points. Minimum working load for each lift point shall be 100 pounds. The vented curb shall be flanged for anchoring to the roof using ¼" diameter adhesive concrete anchors. Minimum insulation thickness shall be 1", nominal.

### 3.8.2 Fabrication

The vented curb and hatch cover shall be a Marine & Construction Supplies #2200, Weather Tight Hatch, or equivalent. Hatch covers shall be fabricated from 0.25" thick mild steel, minimum. Coaming (vented curb) shall be fabricated from 3/8" thick mild steel, minimum. All welds shall be ground flush to match adjacent surfaces. Mounting flanges shall be welded to the coaming (vented curb) to facilitate anchoring to the roof. Minimum mounting flange width shall be 3-1/2". The louvers shall be aluminum. All steel surfaces shall be cleaned, prepared in accordance with SSPC SP 10, and primed with two coats of zinc rich primer, followed by three coats of oil based, zinc chromate paint.

### 3.8.3 Installation

The roof hatches shall be centered over the openings and mounted to the roof using ¼" diameter stainless steel adhesive concrete anchor bolts. Anchor bolts shall not protrude above the nut/washer assembly by more than ¼". Once the hatch is anchored in place, apply cant, flashing, and roofing to completely conceal the mounting hardware and form a weather tight seal.

-- End of Section --



Pumping Plant 12-2 showing pump monitoring antenna mounted on pipe mast embedded in concrete roof deck at center of photo between ventilators. Roof surface covered with rocks and other minor debris.



Pumping Plant 15-D showing pump monitoring antenna mounted on pipe mast embedded in concrete roof deck at center of photo between ventilators. Roof surface covered with rocks and other minor debris.