

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT				1. CONTRACT ID CODE		PAGE OF PAGES 1 2	
2. AMENDMENT/MODIFICATION NO. 0003		3. EFFECTIVE DATE 30-Sep-2022		4. REQUISITION/PURCHASE REQ. NO.		5. PROJECT NO.(If applicable)	
6. ISSUED BY USAED, WALLA WALLA - CONTRACTING DIV. HILLARY A. MORGAN 201 N. THIRD AVENUE WALLA WALLA WA 99362		CODE W912EF		7. ADMINISTERED BY (If other than item 6) See Item 6		CODE	
8. NAME AND ADDRESS OF CONTRACTOR (No., Street, County, State and Zip Code)				X		9A. AMENDMENT OF SOLICITATION NO. W912EF22R0015	
				X		9B. DATED (SEE ITEM 11) 18-Aug-2022	
						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 _____ 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.) The purpose of this amendment is to incorporate the changes outlined below .							
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)		30-Sep-2022	

SECTION SF 30 BLOCK 14 CONTINUATION PAGE

SUMMARY OF CHANGES

Summary of changes for Amend - 0003
McNary Powerhouse Drainage, Unwatering, and Equalization System Rehabilitation
W912EF22R0015

1. Revised the following Specifications (See revised specification for details):
 - a. SECTION 01 14 00.20 28 WORK AND OPERATIONAL RESTRICTIONS
 - Revised Paragraph 1.2.1 "Coordination for Adult Fish Passage Impacts"
 - b. SECTION 01 55 10.00 28 CONTRACTOR WORK, ACCESS AND STORAGE AREAS
 - Revised Paragraph 1.4.1 "Work and Storage Areas"
 - c. SECTION 03 30 70.00 28 CONCRETE DEMOLITION, REPAIR OF CONCRETE SURFACES, AND EQUIPMENT FOUNDATIONS
 - Revised Paragraph 3.4.10 "Finished Surface Tolerance"
 - d. SECTION 22 11 00.01 28 PIPING AND VALVES
 - Revised Paragraph 1.2 REFERENCES
 - Revised Paragraph 2.1.1 "Galvanized Steel Piping"
 - Revised Paragraph 2.2.5 "Unwatering Discharge Plug"
 - Revised Paragraph 2.3.1 "Flanges and Gaskets"
 - Revised Paragraph 2.3.10 "Custom Suction Bell"
 - Added Paragraph 2.3.11 "Drainage Header Clean Out"
2. Revised the following Drawings (See clouded areas for revisions).
 - a. SHEET SD101
 - b. SHEET M-101
 - c. SHEET M-201
 - d. SHEET M-202

(End of Summary of Changes)

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 14 00.20 28

WORK AND OPERATIONAL RESTRICTIONS

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 - 1.1.1 Remaining Contract Work
- 1.2 GENERAL REQUIREMENTS
 - 1.2.1 Coordination for Adult Fish Passage Impacts
- 1.3 PHASE 1 - DRAINAGE SYSTEM AND MAIN TURBINE UNIT VALVE UPGRADES
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PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

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SECTION 01 14 00.20 28

WORK AND OPERATIONAL RESTRICTIONS

PART 1 GENERAL

This SECTION contains Work Restriction requirements and information. If conflicts are found between this SECTION and other areas of the Plans and Specifications, notify the Contracting Officer (KO).

NOTE:

- a. Due to blockage in the Drainage header (between Main Units 7 and 8), Draft Tube Drain Valve pits for Main Turbine Units (Main Units) 7-14 are currently flooded and not available for Contractor access. Blockage in the Drainage Header must be removed prior to access to these areas. See SECTION 33 01 30.16 28 DRAINAGE HEADER DEBRIS REMOVAL for additional information.
- b. A maximum of two (2) Main Units will be removed from service for Main Unit Drainage and Equalizer Valve upgrades, prior to Drainage Header blockage removal. Blockage must be completely removed before additional Main Units will be removed from service, for work on this contract.
- c. See Sheet M-901 for Unwatering Pump Isometric. Includes overall configuration of Unwatering and Drainage System piping and pumps.
- d. See Sheet M-601 for Powerhouse Valve Schedule.

1.1 WORK PHASE REQUIREMENTS

Work on this Contract shall be complete, as specified and required, in the identified Phases. See Contracting Clause 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK, for additional information.

- a. Phase 1 - Drainage System and Main Turbine Unit Valve Upgrades.
- b. Phase 2 - Unwatering System Upgrades.
- c. Phase 3 - Station Service Turbine Unit Valve Upgrades.

1.1.1 Remaining Contract Work

All work not associated with a specific time period or work phase, shall be scheduled by the Contractor and included in the accepted Project Schedule. See SECTION 01 32 01.00 28 PROJECT SCHEDULE for additional information.

1.2 GENERAL REQUIREMENTS

The following requirements apply to all work on this Contract:

- a. Prior to removing any of the following from service, all valves, parts, equipment, etc. required to upgrade and return each component to service, must be on-site and accepted for installation by the

Contracting Officer (KO):

1. Main Turbine Units (Phase 1).
 2. Station Service Turbine Units (Phase 3).
 3. All or part of the Drainage pump system, including intake and discharge piping, and valves (Phase 1).
 4. All or part of the Unwatering pump system, including intake and discharge piping, and valves (Phases 1 and 2).
- b. The following restrictions apply to work on, and/or use of, upgraded Fishway Drain Flush Line Piping:
1. Required piping upgrades shall occur outside of the Adult Fish Passage Work Window (Phase 1).
 2. Fishway Drain Flush Line Piping upgrades must be complete prior to use for routing of Unwatering and/or Drainage Sump discharge flows.
 3. Restrictions apply to routing of Unwatering and/or Drainage Sump discharge flows through upgraded Fishway Drain Flush Line Piping. See paragraph "Phase 2 Work Restrictions" for additional information.
- c. Contractor access to and/or work in the Drainage Sump is restricted to the Phase 1 timeframe. Contractor access to and/or work in the Unwatering Sump is restricted to the Phase 2 timeframe.
- d. Temporary pumping, and temporary power are responsibilities of the Contractor and will not be provided by the Government. See SECTION 02 24 10.02 28 DEWATERING, paragraph DEWATERING OF WORK AREAS for additional information.
- e. Contractor shall **NOT** remove Government equipment from service, and/or adjust Government equipment or valves, unless approved, in writing, by the KO.

1.2.1 Coordination for Adult Fish Passage Impacts

- a. See Contracting Clause 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK for Adult Fish Passage Work Window information. Restrictions apply to non-routine maintenance activities and construction work when fishladders are operational. Restrictions do NOT apply during fishladder outages.
- b. When fishladders are operational, non-routine maintenance and construction activities meeting the following conditions require coordination via a Memorandum of Coordination (MOC) a minimum of 3 weeks prior to impacts to operations. Coordinate anticipated impacts with the KO.
 1. Deviations to powerhouse unit priority or any work that affects operation of fish pumps.
 2. Work within 100 feet of any fishway entrance or exit.

~~3. Work within 50 feet of any other part of the adult fishway. The adult fish passage season occurs from 1 March through 31 December, annually. Deviations to powerhouse unit priority or any work that affects operation of fish pumps, or creates noise within 100 feet of a fish ladder requires coordination via a Memorandum of Coordination (MOC) a minimum of 3 weeks prior to impacts to operations. Coordinate anticipated impacts with the KO.~~

1.3 PHASE 1 - DRAINAGE SYSTEM AND MAIN TURBINE UNIT VALVE UPGRADES

Complete the following required work during Phase 1 - Drainage System and Main Turbine Unit Valve Upgrades:

- a. All work related to Drainage System upgrades, including, but not limited to the following:
 1. Drainage pump, and related piping and valve upgrades.
 2. Drainage sump work.
 3. All Drainage header upgrades, repairs, and related work. Includes Drainage header blockage removal, and Drainage header point repair, if needed.
 4. All Cleanout Sump upgrades, including concrete removal, pump replacement, and cleanout and valve upgrades.
- b. Fishway Drain Flush Line piping upgrades.
- c. Upgrades/replacements of all Unwatering Pumps, as shown and specified.
- d. Replacement of Unwatering Pump #3 **motor**. Temporary power required. See SECTION 02 24 10.02 28 DEWATERING, paragraph DEWATERING OF WORK AREAS, for Temporary Power information.
- e. Unwatering Pump Inlet Valves and Piping Upgrades. See Sheet M-401 for reference. Includes 14" Isolation Gate Valves and related piping on the inlet side of the Unwatering Pumps.
 1. **NOTE:** Does NOT include suction pipes inside Unwatering Sump.
- f. **ALL** Main Unit Draft Tube Drain Valves, Draft Tube Drain Valve Tees, Scroll Case Drain Valves, and Equalizer Valves replacements and refurbishments.
 1. **NOTE:** See paragraph MAIN UNIT OUTAGE REQUIREMENTS for additional information.

1.3.1 Phase 1 Work Sequencing Requirements

The following tasks have sequencing requirements and must be completed in the order as specified. List may not be all inclusive:

- a. **Cleanout Sump concrete removal** must be completed prior to Drainage Header Blockage Removal.
- b. **Drainage Header Blockage Removal** must be completed prior to the following:
 1. Access to Draft Tube Drain Valve Pits for Main Units 7-14.
 2. Removal of additional Main Units as specified in paragraph GENERAL.

3. Removal of 8" PVC Drainage Header and reconnection of 6" Drain Pipes to original Header in EL. 207 Gallery. **See also item "Drainage Header Pipe Point Repair" below.**

- c. **Drainage Header Pipe Point Repair** (if needed) must be completed prior to removal of 8" PVC Drainage Header and reconnection of 6" Drain Pipes to original Header in EL. 207 Gallery.
- d. **Draft Tube Drain Valve, and Draft Tube Drain Valve Tee replacement** must be completed prior to replacement of Scroll Case Drain Valve and Equalization Valve upgrades, for each Main Unit.

1.3.2 Phase 1 Work Restrictions

The table below lists Phase 1 Work items with specific restrictions. List is not necessarily in sequence (unless identified as such), is not inclusive of all required work, and may not reflect all restrictions found in the Plans and Specifications. Refer to the plans and specifications for additional information. Plan sheet references are for information only and do not include all related Plan sheets.

WORK ITEM	MAX. DRAINAGE SUMP WSE	MAX. UNWATERING SUMP WSE	OTHER RESTRICTIONS
Cleanout Sump concrete removal, EL 176 fmsl. See sheets SD101 and S-101.	N/A	N/A	Sequence requirements. See paragraph "Phase 1 Work Sequencing Requirements".
Remove Drainage Header Check valve in Cleanout Sump. See Sheet MD402, Section A2.	EL 172 fmsl	N/A	
Drainage Header Blockage Removal	EL 172 fmsl	N/A	Sequence requirements. See paragraph "Phase 1 Work Sequencing Requirements", and paragraph GENERAL.

WORK ITEM	MAX. DRAINAGE SUMP WSE	MAX. UNWATERING SUMP WSE	OTHER RESTRICTIONS
Install New Drainage Header Clean out in Cleanout Sump. See Sheets M-202, M-401.	EL 172 fmsl	N/A	
Drainage Header Pipe Point Repair.	EL 172 fmsl Verify required elevation.	N/A	Sequence requirements. See paragraph "Phase 1 Work Sequencing Requirements". Option Work. See SECTION 33 01 30.72 28 DRAINAGE HEADER POINT REPAIR for additional information. Required Drainage Sump WSE dependent on elevation of damaged pipe.
Remove 8" PVC Drainage Header; Reconnect 6" Drain Pipes to original Header in EL. 207 Gallery. See Sheets MD203, M-402 detail A1.	N/A	N/A	Sequence requirements. See paragraph "Phase 1 Work Sequencing Requirements".
Drainage Pump and Upper Discharge Piping replacement. Install drainage sump baffle box, and seismic bracing on Drainage Pump intake pipe. See Sheets S-201, MD101, MD201, M-101, M-201.	Empty Drainage Sump	N/A	Requires temporary pumping of Drainage Sump inflows into Unwatering Sump.

WORK ITEM	MAX. DRAINAGE SUMP WSE	MAX. UNWATERING SUMP WSE	OTHER RESTRICTIONS
<p>Fishway Drain Flush Line Piping upgrades.</p> <p>See Sheets MD202, M-202</p>	N/A	N/A	<p>Required piping upgrades shall occur outside of the Adult Fish Passage Work Window.</p> <p>See paragraph GENERAL REQUIREMENTS for additional restrictions.</p>
<p>Unwatering Pumps Inlet Valves and Piping upgrades.</p> <p>Sheets MD402, M-401.</p> <p>See paragraph PHASE 1 - DRAINAGE SYSTEM AND MAIN TURBINE UNIT VALVE UPGRADES for additional information.</p>	EL 176 fmsl	EL 177 fmsl*	<p>No additional Main Units unwatered during this work.</p> <p>Does not include piping in Unwatering Sump.</p>
<p>Unwatering Pump and Motor Upgrades.</p> <p>See Sheets MD202, M-201, M-202.</p>	N/A	N/A	<p>Minimum of two (2) Unwatering Pumps must be operational at all times.</p> <p>Replacement of Unwatering Pump #3 motor. Temporary power required.</p> <p>See SECTION 43 23 31.13 28 POWERHOUSE UNWATERING PUMPS for additional information.</p>

WORK ITEM	MAX. DRAINAGE SUMP WSE	MAX. UNWATERING SUMP WSE	OTHER RESTRICTIONS
Main Turbine Unit Draft Tube Drain Valve, and Draft Tube Drain Valve Tee Replacement See Sheets MD203, MD401, M-402.	N/A	EL 177 fmsl*	Sequence requirements. See paragraph "Phase 1 Work Sequencing Requirements". Unwatering Sump WSE restriction applies to Draft Tube Drain Valve and Draft Tube Drain Valve Tee replacement, only. No additional Main Units unwatered during Draft Tube Drain Valve, or Draft Tube Drain Valve Tee replacement.
Main Turbine Unit Scroll Case Drain Valve Replacement, and Equalizer Valve Upgrades. See Sheets MD203, MD401, M-102, M-402.	N/A	N/A	Sequence requirements. See paragraph "Phase 1 Work Sequencing Requirements".

NOTES:

* Unwatering Sump WSE requirements limit Main Unit unwatering.

TABLE DEFINITIONS:

1. WSE: Water Surface Elevation.
2. fmsl: Feet Mean Sea Level.
3. N/A: Not Applicable.

1.4 PHASE 2 - UNWATERING SYSTEM UPGRADES

Complete all remaining Unwatering System work during Phase 2 - Unwatering System Upgrades. Required work includes, but is not limited to the following:

- a. All work related to the Unwatering System Isolation Valve replacement, the 90 degree bend immediately downstream of the valve, and installation and removal of Unwatering Discharge Plug in the tailrace. See Contracting Clause 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK for coordination requirements.
- b. All Unwatering System discharge piping and valve replacement and upgrades.

- c. All Unwatering suction piping upgrades, Unwatering sump concrete removal, and related sump work.
- d. Replacement of remaining Unwatering Pump motors.
- e. All Electrical Upgrades impacting the Unwatering System, including upgrades to the Motor Control Center (MCC).

1.4.1 Phase 2 Work Sequencing Requirements

The following sequencing requirements must be completed as specified. See Contracting Clause 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK, for additional information. List may not be all inclusive:

- a. **Unwatering System Isolation Valve Replacement, and 90 degree bend immediately downstream,** must be completed prior to the following:
 - 1. Replacement of Unwatering Pump Discharge Piping.
 - 2. Replacement of Unwatering Pump inlet suction pipes in Unwatering Sump.

1.4.2 Phase 2 Work Restrictions

- a. The table below lists Phase 2 work items with specific restrictions. List is not necessarily in sequence (unless identified as such), is not inclusive of all required work, and may not reflect all restrictions found in the Plans and Specifications. Refer to the plans and specifications for additional information. Plan sheet references are for information only and do not include all related Plan sheets.

- b. **NOTES:**

- 1. Unwatering Pump #3 must be operational at all times during the Phase 2 timeframe. Temporary power may be required.

- 2. Use of upgraded Fishway Drain Flush Line Piping to reroute Unwatering and/or Drainage Sump discharge flows, shall NOT occur during the Oregon Fish Ladder outage, with one exception.

- i. Rerouting of sump flows during the Oregon Fish Ladder outage will be required for replacement of the Unwatering System Isolation Valve, and adjacent 90 degree bend downstream of the valve. Dates for this work must be coordinated with the KO. See Contracting Clause 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK for additional information.

WORK ITEM	MAX. UNWATERING SUMP WSE	OTHER RESTRICTIONS
<p>Unwatering System Isolation Valve Replacement.</p> <p>Includes replacement of 90 degree bend immediately downstream of Valve.</p> <p>See Sheets MD202, M-202.</p>	N/A	<p>Sequence requirements. See paragraph "Phase 2 Work Sequencing Requirements".</p> <p>All work must be completed as identified in Contracting Clause 52.211-10 COMMENCEMENT, PROSECUTION, AND COMPLETION OF WORK. Includes installation and removal of Unwatering Discharge Plug in the tailrace.</p> <p>Requires Unwatering Sump discharge flows to be routed through upgraded Fishway Drain Flush Line Piping.</p>
<p>Unwatering Pump Discharge Piping replacement/upgrades.</p> <p>See Sheets MD202, M-202.</p>	N/A	<p>Sequence requirements. See paragraph "Phase 2 Work Sequencing Requirements".</p> <p>Requires Unwatering Sump discharge flows to be routed through upgraded Fishway Drain Flush Line Piping.</p> <p>Temporary Pumping may be required.</p>
<p>Unwatering Pump inlet suction pipes replacement (in Unwatering Sump). Includes required concrete modifications.</p> <p>See Sheets MD202, MD402, M-202, M-401</p>	Empty	<p>Sequence requirements. See paragraph "Phase 2 Work Sequencing Requirements".</p> <p>Requires the following:</p> <ol style="list-style-type: none"> 1. Temporary pumping of Unwatering Sump in-flows to Drainage Sump. 2. Reconfiguration of Unwatering Pumps to pull from Drainage Sump and discharge through upgraded Fishway Drain Flush Line Piping.

WORK ITEM	MAX. UNWATERING SUMP WSE	OTHER RESTRICTIONS
Remove existing, and install new Unwatering System MCC (SQ02), Controls cabinet (SQ02C), and all related electrical work. See Sheets ED101, ED201, E-101, E-201, E-501.	N/A	Requires Temporary power to new Unwatering Pump Motors prior to removing MCC from service.

TABLE DEFINITIONS:

1. WSE: Water Surface Elevation.
2. N/A: Not Applicable.

1.5 PHASE 3 - STATION SERVICE TURBINE UNIT VALVE UPGRADES

Complete all work related to Station Service Turbine Unit drain valve upgrades, including, but not limited to the following. Plan sheet references are for information only and do not include all related Plan sheets.

- a. Replacement of Draft Tube Drain Valves, and Draft Tube Drain Valve Tee. See Sheets MD403, M-403.
- b. Replacement of Penstock Drain Valves, and rerouting of Penstock Drain piping. See Sheets MD204, M-203.

1.6 MAIN UNIT OUTAGE REQUIREMENTS

Main Unit outages are required for Main Turbine Unit Valve Upgrades (Phase 1 work). The following requirements apply to Main Unit Outages for work on this contract:

- a. Main Units will be unwatered, prepared for Contractor work, rewatered, and returned to service by the Government.
- b. Each Main Unit will be Out of Service one time only for work on this contract. All required work for the Out of Service Main Unit must be completed, commissioned, and accepted by the Government during this time.
- c. A maximum of 2 (two) Main Units will be Out of Service at any time for work on this contract. Out of Service includes all of the following:
 1. Government Unwatering and preparation of Main Unit for Contractor work (anticipate 4 Government work days duration per Main Unit). See SECTION 01 14 00.10 28 PROJECT SITE RESTRICTIONS, paragraph "Government's Work Schedule" for Government Work Days

information.

2. Contractor removal, installation, upgrade, and commissioning of all Draft Tube Drain valves, Draft Tube Drain valve tees, Scroll Case Drain valves, and Equalizer valves for the Out of Service Main Unit.

3. Government acceptance of Contractor work and Government verification Main Unit is ready to return to service.

4. Government Rewatering of Main Unit and return to service (anticipate 4 Government work days duration per Main Unit).

d. Main Units will be taken out of service in non sequential, adjacent pairs that share Draft Tube Drain valve pits (Main Units 1 & 2; Main Units 3 & 4; Main Units 5 & 6; Main Units 7 & 8; Main Units 9 & 10; Main Units 11 & 12; Main Units 13 & 14). The Government will determine the order Main Unit pairs are removed from service, and will notify the Contractor a minimum of 14 calendar days prior to the next scheduled Main Unit outage.

e. Up to 2 Main Units may be unwatered prior to start of the following activities, but Main Unit unwatering will **not** be allowed **during** any of the following:

1. Draft Tube Drain Valve, and/or Draft Tube Drain Valve tee replacement.

2. Unwatering Pumps Inlet Valves and Piping replacement.

3. When a controlled WSE is required in the Unwatering Sump.

4. When Contractor personnel are in the Unwatering Sump.

f. The Government will unwater and prepare one Main Unit for Contractor work at a time. Two Main Units will **not** be prepared simultaneously.

g. Unwatering of one Main Unit and rewatering of another may occur simultaneously.

h. Main Units are critical to Project operation. Once a Main Unit is removed from service, the Contractor must work expeditiously on valve replacements and upgrades in order to return the Main Unit to service with minimal delay.

1.6.1 Main Unit Outage Scheduling

a. Coordinate Main Unit Outage dates a minimum of 21 calendar days prior to anticipated start of the Out of Service period, for each Main Unit. Conduct this coordination during Government's typical scheduled work days.

b. The Government will start to unwater the Main Unit pairs contingent upon the following:

1. Outage dates have been coordinated as required.

2. All parts and equipment required to be replaced or upgraded

during the coordinated outage (of the applicable pair of Main Units), is on-site, and accepted for installation by the KO.

3. No more than one Main Unit is currently Out of Service for work on this contract. See paragraph MAIN UNIT OUTAGE REQUIREMENTS, subparagraph c. At no time will more than 2 Main Units be Out of Service for work on this contract.

1.7 STATION SERVICE UNIT OUTAGE REQUIREMENTS

Station Service Turbine Unit (Station Service Unit) outages are required for Station Service Turbine Unit Valve Upgrades (Phase 3 work). The following requirements apply to Station Service Unit Outages for work on this contract:

a. Station Service Units will be unwatered, prepared for Contractor work, rewatered, and returned to service by the Government.

b. A maximum of 1 (one) Station Service Unit will be Out of Service at any time for work on this contract. Out of Service includes all of the following phases:

1. Government Unwatering and preparation of Station Service Unit for Contractor work (anticipate 4 Government work days duration per Station Service Unit).

2. Contractor removal, installation, upgrade, and commissioning of all Penstock Drain Valves and piping, Draft Tube Drain Valves, and the Draft Tube Drain Valve Tee for Out of Service, Station Service Unit.

3. Government acceptance of Contractor work and Government verification Station Service Unit is ready to return to service.

4. Government Rewatering of Station Service Unit and return to service (anticipate 4 Government work days duration per Station Service Unit).

c. Each Station Service Unit will be Out of Service one time, only, for work on this contract. All required Station Service Unit work must be completed, commissioned, and accepted by the Government during this time.

d. The Government will determine the order Station Service Units are removed from service, and will notify the Contractor a minimum of 14 calendar days prior to Station Service Unit availability for Contractor work.

e. Station Service Units are critical to the Project operation. Once a Unit is removed from service, the Contractor must work expeditiously on valve replacements and upgrades in order to return the Station Service Unit to service with minimal delay.

1.7.1 Station Service Unit Outage Scheduling

a. Coordinate Station Service Unit Outage dates a minimum of 21 calendar days prior to anticipated start of each Station Service Unit Out of Service period. Conduct this coordination during Government's typical scheduled work days.

b. The Government will start to unwater the Station Service Unit contingent upon the following:

1. Outage dates have been coordinated as required.
2. All parts and equipment required to be replaced or upgraded during the coordinated outage (of the applicable Station Service Unit), is on-site, and accepted for installation by the KO.
3. No Station Service Units are Out of Service for work on this contract. See paragraph STATION SERVICE UNIT OUTAGE REQUIREMENTS, subparagraph b. At no time will more than 1 Station Service Unit be Out of Service for work on this contract.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

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DIVISION 01 - GENERAL REQUIREMENTS

SECTION 01 55 10.00 28

CONTRACTOR WORK, ACCESS AND STORAGE AREAS

PART 1 GENERAL

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- 1.4 CONTRACTOR WORK AREA AND ACCESS TO WORK AREA
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PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

ATTACHMENTS:

Boat Restricted Zone (BRZ) Policy

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SECTION 01 55 10.00 28

CONTRACTOR WORK, ACCESS AND STORAGE AREAS

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 within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS
(AASHTO)

AASHTO LRFD (8th Edition; 2017) Bridge Design
Specifications

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1 Safety and Health Requirements Manual

Responsible for complying with the current edition and all changes posted on the web as of the effective date of this solicitation.

1.2 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "I" designation are for information only. A designation following the "G" or "I" designation identifies the office that will review the submittal for the Government. Submit the following in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Transport Loading Diagrams; G ST

Dust Control Plan; I C

1.3 CONTRACTOR'S STORAGE AND STAGING AREA

Storage and staging areas shall be at locations indicated or as otherwise approved by the Contracting Officer. The storage and staging areas may be used for activities such as setup of an office trailer, parking of private vehicles, storage of materials and equipment, and for work activities. Security at the storage and staging site will be the Contractor's responsibility. Install temporary security fencing in a manner approved by the Contracting Officer. Security fencing shall not be installed in a manner that damages existing facilities, such as punching post holes in existing pavement.

1.4 CONTRACTOR WORK AREA AND ACCESS TO WORK AREA

1.4.1 Work and Storage Areas

- a. Limited work, storage, and staging areas will be available within the Powerhouse. Temporary staging prior to lowering items through floor hatches will be available on the Generator floor area El. 287, on a case by case basis. Limited storage area is available on El. 235.5.
- b. See drawings for additional information. Areas are subject to change. Coordinate additional work and storage area requirements with the Contracting Officer (KO). All other stairways, doorways, and floor drainage gutters shall remain open and accessible.
- c. Temporary storage of equipment and materials in the Powerhouse shall be limited to those items required for performance of the work. The Government will not be responsible for providing security for stored equipment, supplies, and materials either inside or outside the powerhouse. Provide all necessary security.
- d. Assume maximum load rating on concrete floors inside the Powerhouse structure is 400 lbs/sf (pounds per square foot), unless otherwise posted or noted. Avoid loading of gratings, drains, hatches, and related areas.

1.4.2 Access to Work Area

- a. Access to work area for personnel will be from the lower parking lot on the Oregon side of the dam, through the personnel door on El. 287 to the Powerhouse interior.
- b. Access for supplies and equipment needing to be moved through the different elevations of the Powerhouse will be through hatches located in floors El. 287.
- c. Contractor may use the Government's powerhouse bridge crane to unload trucks, lower equipment through floor hatches, and to remove and install hatch covers. See SECTION 01 14 00.10 28 PROJECT SITE RESTRICTIONS, paragraph USE OF POWERHOUSE BRIDGE CRANE.
- d. Whenever hatch covers are removed, install temporary guard railing around open hatches. Guard railing shall be in place around open hatches at all times. All guard railing shall conform to EM 385-1-1.
- e. Powerhouse deliveries will be on the South side of the Powerhouse, unless approved otherwise by the Contracting Officer. See Sheet G-103 for route and notes.
- f. See SECTION 01 14 00.10 28 PROJECT SITE RESTRICTIONS for additional access information.

1.4.3 Use or Blockage of Powerhouse Main Door.

Coordinate all use and/or blockage of the Powerhouse Main Door with the KO, a minimum of 7 calendar days prior anticipated use/blockage.

1.5 GOVERNMENT ROADWAYS AND DECK ACCESS RESTRICTIONS

- a. The roadway across McNary dam is not available for use by the

public or the Contractor, to include vehicle turnarounds. Access across the Columbia River is over the interstate highway bridge located two miles downstream from the dam. Project access is only available from the Oregon (South) side tailrace deck.

b. Hauling of materials and equipment will be permitted on Project's roadways, bridges and decks. Submit [transport loading diagrams](#) indicating wheel loads and axle configurations for transport vehicles to haul loads exceeding HS-20, in accordance with [AASHTO LRFD Bridge Design Specifications](#). ([AASHTO LRFD Bridge Design Specifications](#) defines HS-20 vehicles as having a gross vehicle weight of 72,000 lbs. and a maximum axle load of 32,000 lbs).

c. Approximate maximum load capacity on roadways on the dam structure is 1.2 times higher than HS-20 load. All transport vehicles exceeding HS-20 loads must have approved transport loading diagrams before accessing roadways over the dam. Protect the various portions of the Project's structures from damage by traffic, prevent material from falling through the deck openings, and also keep the areas in use cleaned up and orderly at all times during use. Vehicle speeds, special precautions, and safety measures shall be as directed by the Contracting Officer.

d. Maintain at least one way traffic at all times on the tailrace deck, except if temporary blockage of the tailrace deck is allowed by the Contracting Officer (KO) for short durations of time in order to load and unload materials and equipment. Coordinate complete blockages with the KO a minimum of 2 Government workdays in advance of anticipated blockage. See [SECTION 01 14 00.10 28 PROJECT SITE RESTRICTIONS](#), paragraph "Government's Work Schedule" for additional information.

1.6 TRAFFIC CONTROL AND PUBLIC ACCESS

Existing public roads and access roads shall be kept open to vehicle traffic at all times. Conduct this work in such a manner as will obstruct and inconvenience traffic as little as possible. When necessary to operate on or cross existing highways or roads, furnish signs, lights, and/or other necessary safeguards to safely control and direct the flow of traffic. Obtain any and all required permits for such operations from the appropriate private or public authority at no additional cost to the Government.

1.6.1 Public Access Barriers

In areas where the public has access to the job site, construct temporary barriers around ongoing work with bright orange plastic fencing. The barrier shall be maintained until completion of the individual piece of work.

1.7 OVERHEAD BIRD EXCLUSION WIRES

a. Bird Exclusion Wires span from the Oregon fish pump entrance and Fish Ladder Entrance to the Navigation Lock, downstream guide wall. Exclusion wires run north-south, and are spaced approximately 25-35 feet apart.

b. Wire elevations vary, but are at approximately EL 287 feet mean sea level (fmsl) at McNary. Wires may need to be removed to allow

Contractor access through the BRZ to the work area. Contractor shall remove and dispose of all wires required, in order to perform work on this Contract. Wires shall be replaced by others.

c. Wires are 1x7 stainless steel cable, 3/64" in diameter, with a breaking strength of 300 lbs.

d. Wires are in tension. Contractor shall take care in removal. Contractor shall be responsible for all safety considerations and any damage caused during removal of Bird Exclusion Wires.

1.8 BOAT RESTRICTED ZONE POLICY (BRZ)

The Boat Restricted Zone (BRZ) Policy is attached at the end of this SECTION. Check with the Contracting Officer for BRZ policy updates prior to the Pre-Construction Meeting.

1.9 RADIO AND TELEPHONE COMMUNICATION

Furnish a radio on all Contractor watercraft, capable of transmitting and receiving on all frequencies, including 156.700 MHz (marine band channel 14 - primary channel) and 156.800 MHz (marine band channel 16 - backup channel). When needed, the McNary Project Powerhouse operator will communicate with the Contractor by radio on the marine band channels mentioned above. Furnish a list of supervisory personnel and their telephone numbers to be notified during non-working hours.

1.10 PERMITS AND RESPONSIBILITIES

Contractor shall be responsible for complying with all Federal, State, and municipal laws, codes, and regulations applicable to work on this contract. This includes obtaining all necessary licenses and permits related to transportation of equipment and/or contract items, and other areas of work on this contract, as applicable. Licenses and permits shall be obtained without additional expense to the Government.

1.11 DUST CONTROL PLAN

Dust control during dust generating activities is the responsibility of the Contractor. Submit a written Dust Control Plan detailing what will be done to prevent dust. Related information is located in the following specs. List may not be inclusive. The Dust Control plan shall reflect all requirements in these specifications:

a. SECTION 01 11 01.00 28 SUPPLEMENTARY REQUIREMENTS, paragraph AIR PURITY CONTROL IN THE POWERHOUSE.

b. SECTION 03 30 70.00 28 CONCRETE DEMOLITION, REPAIR OF CONCRETE SURFACES, AND EQUIPMENT FOUNDATIONS, paragraph TEMPORARY BARRIER.

c. SECTION 05 05 20.00 28 POST-INSTALLED ANCHORS IN CONCRETE, paragraph DUST CONTROL.

1.12 HAULING MATERIAL

No material shall be allowed to drop off vehicles while in transit. The Contractor shall take all necessary precautions to prevent any material from dropping off the vehicle onto local roads.

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 National Fire Protection Association (NFPA) recommendations as appropriate. The minimum approved rating of extinguishers shall not be less than 5-B:C.

1.13.1 Fire Hazards

The Contractor shall eliminate all potential fire hazards that may result from their operations. This includes work on or near buildings, grounds, use of equipment, and the storage of supplies, fuels, or cleaning agents. This also includes the removal of any accumulation of burnable or flammable materials or debris around chain-linked fences, signs, and other fixtures on the Project site.

PART 2 PRODUCTS (Not Used)

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SECTION 03 30 70.00 28

CONCRETE DEMOLITION, REPAIR OF CONCRETE SURFACES, AND EQUIPMENT FOUNDATIONS

PART 1 GENERAL

1.1 GENERAL INFORMATION

The work covered by this section consists of furnishing all material, labor, and equipment, and performing all work required for the removal of concrete, core drilling, the restoration of the concrete surfaces to the required lines and grades, and placement of equipment foundations in required locations. The Contractor shall provide protection from concrete dust and water damage to existing and new equipment. The Contractor shall take effective measures to control gas, vapor, fumes, dust, slurry and mist during concrete removal operations.

1.2 REFERENCES

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

AMERICAN CONCRETE INSTITUTE (ACI)

ACI 318 (2014; Errata 1-2 2014; Errata 3-5 2015; Errata 6 2016; Errata 7-9 2017) Building Code Requirements for Structural Concrete (ACI 318-14) and Commentary (ACI 318R-14)

ASTM INTERNATIONAL (ASTM)

ASTM A185/A185M (2007) Standard Specification for Steel Welded Wire Reinforcement, Plain, for Concrete

ASTM A615/A615M (2016) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement

ASTM C387/C387M (2017) Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar

ASTM C881/C881M (2015) Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete

ASTM C1107/C1107M (2017) Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

ASTM C309 (2011) Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete

ASTM C928/C928M (2013) Packaged, Dry, Rapid-Hardening

Cementitious Materials for Concrete Repairs

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1

Safety and Health Requirements Manual

The Contractor shall be responsible for complying with the current edition and all changes posted on the web as of the effective date of this solicitation.

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910

Occupational Safety and Health Standards

29 CFR 1910.1000

Air Contaminants

29 CFR 1910.94

Ventilation

29 CFR 1926

Safety and Health Regulations for Construction

29 CFR 1926.55

Gases, Vapors, Fumes, Dusts, and Mists

29 CFR 1926.57

Ventilation

29 CFR 1926.58

Safety and Health Regulations for Construction

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "I" designation are for information only. When used, a designation following the "G" or "I" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Concrete Removal and Disposal Plan; I, ST

Core Drilling Procedure; I, ST

Concrete Imaging Report; I, ST

Grout Pads; I, ST

SD-03 Product Data

Non-shrink grout; I, ST

Epoxy Adhesive Grout; I, ST

Dry Packaged Concrete; I, ST

Mortar; G, ST

Reinforcing Steel Bar; I, ST

Skim Coat; G, ST

SD-06 Test Reports

Sump Investigation; I, ST

1.4 CONCRETE REMOVAL LOCATIONS

Remove concrete as required in the contract. .

PART 2 PRODUCTS

2.1 NON-SHRINK GROUT

Non-shrink grout shall be inorganic, non-metallic, non-gas-liberating cement-based grout meeting all requirements of ASTM C1107/C1107M; shall have a minimum 28-day compressive strength of 5000 psi; and shall have no shrinkage (0.0 percent) and a maximum 2.0 percent expansion in the hardened state. Manufacturer's data shall be submitted for review 30 days before anticipated use. When submitting the product data, indicate what application it will be used for and anticipated thickness.

2.2 EPOXY ADHESIVE GROUT

Epoxy Adhesive Grout shall be two part epoxy adhesive meeting all requirements of ASTM C881/C881M. Manufacturer's data shall be submitted for review 30 days before anticipated use. When submitting the product data, indicate what application it will be used for and anticipated thickness.

2.3 DRY PACKAGED CONCRETE

Dry Packaged Concrete shall conform to ASTM C387/C387M, normal weight, normal strength. Minimum compressive strength f'c shall be 3000 psi at 28 days. Each bag of concrete shall have factory printing indicating the ASTM designation, weight, and strength. Bags shall be stored off the ground and covered to protect from getting wet. Concrete shall be mixed with electric motor operated portable mixer. Potable water shall be used for mixing the concrete. When submitting the product data, indicate what application it will be used for and anticipated thickness.

2.4 REINFORCING STEEL BAR

Reinforcing Steel Bar shall conform to the requirements of ASTM A615/A615M, Grade 60. Welded steel wire fabric shall conform to the requirements of ASTM A185/A185M. Details of reinforcement not shown shall be in accordance with ACI 318, Chapters 7 and 12.

2.5 MORTAR FOR UNCONFINED CONCRETE REPAIR

Mortar shall be a commercially available prepackaged material consisting of a formulation suitable for the application proposed and meeting the requirements for ASTM C928/C928M. The use of metallic iron in the mortar will not be acceptable. Mortar shall have a minimum 7-day compressive strength of 5000 psi. When submitting the product data, indicate what application it will be used for and anticipated thickness.

PART 3 EXECUTION

3.1 GENERAL SAFETY

3.1.1 General

All site work shall be accomplished in compliance with EM 385-1-1, 29 CFR 1910 and 29 CFR 1926 as applicable.

3.1.2 Electrical Hazards

The work areas may be in proximity of energized electrical equipment. Contractor is required to formally train and document safety training for all workers required to work in this area. Spray over onto live equipment is hazardous to workers and equipment and shall not be permitted. Signed safety training sheets will be required to be turned into Contracting Officer to document worker safety training.

3.2 GAS, VAPOR, FUME, DUST, SLURRY AND MIST CONTROL

All necessary measures shall be taken to effect maximum control of all gases, vapors, fumes, dust, slurry and mists created by Contractor operations under this contract. To the maximum extent possible, all dust and dirt shall be removed by vacuum cleaning and mopping, unless otherwise directed by the Contracting Officer. The required concrete removal and disposal plan shall include the following:

a. Provision of exhaust ducts which shall discharge outside the structure where mechanical ventilation is used. Ventilation systems shall comply with requirements of 29 CFR 1910.94 and 29 CFR 1926.57.

b. Controlled operation of power-driven tools.

c. Furnishing and removing of approved dust preventatives in areas which cannot be properly rendered free from excessive dusting by vacuum cleaning and mopping or other methods.

d. Vacuum cleaning and mopping (or other acceptable method) of spaces inside the structure where dust accumulates.

e. Only air, electrical, propane, or battery-driven equipment may be used inside the structure.

f. The powerhouse is pressurized to prevent dust infiltration from the outside. All doors shall be kept closed when not being used.

g. Blocking doors for extended periods shall not be permitted unless agreed upon in writing by the Contracting Officer (C.O.).

h. Methods to prevent exposure of employees to inhalation, ingestion, skin absorption, or contact with any material or substance at concentrations above those specified in 29 CFR 1910.1000, 29 CFR 1926.55 and 29 CFR 1926.58.

3.3 TEMPORARY BARRIER

Temporary barriers for the control of dust and debris shall be constructed as required to control dust and debris and meeting criteria outlined in EM 385-1-1. The design of the barriers shall be submitted for approval,

as part of the Concrete Removal and Disposal Plan.

3.4 REMOVAL METHOD

3.4.1 General

Concrete shall be removed in a manner that will not fracture the surrounding concrete. Maintain a safety ground from the ground system to the frame of the concrete cutting tool during cutting operations to avoid electrical shock hazards. Reinforced concrete removal shall result in flush, level smooth surface at the lines shown on the drawings. Care shall be taken not to damage existing reinforcing bar. Explosive or chemical demolition will not be allowed. Adequate equipment shall be provided to remove the pieces of concrete safely and without damage to the surrounding structure. Slurry or tailings generated from sawing or drilling operations shall be confined to the immediate area, and disposed of by vacuuming and mopping. If during any cutting or core drilling activity copper tailings are produced, the Contractor shall report such findings in writing to the C.O. Additional dust control measures shall be implemented per paragraph "GAS, VAPOR, FUME, DUST, SLURRY AND MIST CONTROL". A written [concrete removal and disposal plan](#) shall be submitted 60 days prior to commencement of concrete work, showing equipment to be used, include a waste water collection plan as specified in [01 57 20.00 28 ENVIRONMENTAL PROTECTION](#), expected noise levels and duration. All concrete removed shall become the property of the Contractor and shall be disposed of in accordance with applicable regulations.

3.4.2 Recommended Procedure

Saw cutting, core-drilling, wire cutting or any combination thereof is the recommended method for the concrete removal to be done as part of this contract. In addition to cutting, chipping or grinding may be used to bring the concrete profile to the final finished grade. When the portion of concrete to be removed is of such a magnitude that it cannot be extracted in a single piece, additional cutting shall be performed to allow the concrete to be removed in several convenient sized sections.

3.4.3 Saw Cutting

Saw cutting shall be performed at the locations shown on the contract drawings. The saw cuts shall be done using a diamond-bladed saw. Saw cuts shall be straight and uniform. Scan concrete for embedded items before cutting. If electrical items are found contact the KO.

3.4.4 Core Drilling

Prior to core drilling the Contractor shall research the area to avoid and identify existing embedded ground wires, conduit, piping and raceways. Contractor shall refer to reference drawings to assure drill patterns are likely to miss existing reinforcing, ground wires and conduit. Research of the area shall include concrete imaging techniques such as radiographic imaging, ground penetrating radar, or electromagnetic field detection. Contractor shall submit a [Concrete Imaging Report](#) describing the findings and locating the embedded items on a concrete outline drawing of the area. Drill pattern shall be adjusted to miss embedded obstructions. All core drilling equipment shall be securely grounded during cutting operations to avoid electrical shock hazards. For core holes, if possible shift core holes to avoid rebar or cut as little rebar as possible. Submit photo of the rebar layout and draw a circle of the area that will be drilled over

the rebar.

Submit Core drilling procedure for approval 60 days prior to commencement of core drilling work, no core drilling shall commence without Contracting Officer approval; submit together with Concrete Imaging Report.

3.4.5 Chipping

When required, concrete removed by saw cutting, core drilling, or stitch drilling shall be brought to the final required lines and grades by using lightweight chipping hammers, bush hammers grinding or other approved means. Chipping operations shall be such that the over breakage does not exceed 2 inches or extend below the existing grade.

3.4.6 Exposed Reinforcement

In all areas where concrete removal will leave exposed reinforcing bars except for the interiors of cored penetrations, the local area around the bar or conduit shall be chipped back to a depth necessary to allow the bar to be burned off 1 1/2 inches back from the final finished concrete surface shown on the drawings, the conduit or bar shall be burned off 1 1/2 inches from the final finished concrete surface shown on the drawings, and the area shall be patched with an approved non-shrink grout bringing it to required final lines and grades as shown on the drawings.

3.4.7 Existing Concrete Strength

The existing concrete to be removed may be expected to range in strength from about 3000 to over 6000 psi. The nominal aggregate size of the concrete is unknown. Zones of honeycomb concrete may also be encountered during the drilling process.

3.4.8 Existing Embedded Items

Embedded items in the path of the concrete cutting or drilling operations include, but are not limited to:

- a. Reinforcing steel as well as minor embedded steel at various distances from the concrete faces.
- b. Steel anchors and form tie backs used in placement of the existing concrete. The number and kind are unknown.
- c. Electrical Conduit.

3.4.9 Concrete Cutting Tolerances

- a. The concrete cut through the existing concrete shall be accurately located. Wire or saw cuts shall be within 1/8 inch of plan dimensions.
- b. The core drill holes through existing concrete shall be accurately located and drilled. During the drilling operation, the drill wobble should be minimized to assure a true and straight hole to meet the specified tolerances.

3.4.10 Finished Surface Tolerance

Finish Smoothness of exposed concrete for ~~the sump pump access as all~~ concrete cutting shown on drawing ~~S-101~~ SD101 to broom finish smoothness.

It can be achieved by one of two means. By cutting and sanding the concrete surface smooth. The cut surface shall be equivalent to broom finish smoothness or smoother or apply a skim coat. The skim coat product shall meet the criteria as specified for tolerances and smoothness. Submit for approval the [skim coat](#) product that will work for this application.

3.4.11 Quality Control

A quality control system for the concrete cutting operation shall be established and maintained. The system shall be sufficient to maintain tolerances such that the final concrete cutting conforms to the tolerances outlined in this section of the specifications. The Government reserves the right to inspect this control system to determine if the tolerances are being adhered to, and direct the Contractor to correct and repair any deviations from these tolerances.

3.4.12 Disposal Of Waste Water And Concrete Debris

The method used in disposing of waste water employed in cutting, washing, and rinsing of concrete surfaces shall be such that it does not stain, discolor, or affect exposed surfaces of the structure and is not allowed to enter the river or reservoir. As some Project drains lead to the river, waste water shall not be disposed of in Government drains. The method for disposing of wastewater shall be as per the written concrete removal plan and as per requirements of [SECTION 01 57 20.00 28 ENVIRONMENTAL PROTECTION](#). The method for disposing of concrete debris shall be in accordance with state's disposal requirements and such that it is not allowed to enter the river or reservoir and shall be included in the written concrete removal plan.

3.4.13 Repair Of Concrete Surfaces

Contractor shall restore all concrete surfaces where equipment is removed and the location is not to be reused for equipment placement. Restoration of the concrete surfaces shall be to the required lines and grades shown using a government approved method. The completed surface shall be level, smooth, and even with the adjacent concrete. Deformations in the surface and protrusions of aggregate will not be acceptable. Grinding will be permitted to achieve an acceptable finish surface. Repair Procedure of Concrete Surfaces shall be submitted for approval 30 calendar days prior to performing repair. Repair work shall not proceed without an approved procedure. The repair procedure shall include detailed information on all materials and methods used. If piping, conduit or ground wires are damaged during core drilling or concrete excavation, a sufficient area of the concrete to allow the ground wire, conduit, or piping to be repaired shall be excavated by saw cutting the perimeter of the area to a depth of 1 1/2 to 2 inches and then completing the remaining excavation needed using a bush hammer taking care to preserve embedded reinforcing steel intact.

3.5 EQUIPMENT FOUNDATIONS

Equipment foundations complying with this specification shall be provided for new equipment where shown on the drawings.

3.5.1 Housekeeping Pad for Equipment Foundation

Equipment foundations shall consist of a new 4-inch thick concrete housekeeping pad reinforced with a 6 by 6 -W2.9 wire mesh, placed uniformly 3 inches from the top of the slab. Edges above existing slab

elevation shall have 1/2-inch chamfer. Slab shall be of adequate size to project at least 1 inch beyond the equipment or to match similar dimensions for nearby existing equipment installations. Concrete shall be consolidated by a combination of rodding, spading, and internal vibrating.

Existing concrete surface shall be free of all dust, dirt, oil, and laitance and be saturated to SSD prior to concrete placement. One of the following methods shall be performed prior to placing the concrete pad:

1. Roughened existing concrete surface to 1/4-inch amplitude prior to concrete placement.
2. Install four 1/2 inch DIA epoxy anchor with a minimum of 4" of embedment into the existing concrete. The anchors shall be located 6 to 8 inches from each corner of the concrete pad. The anchors shall be cast with a minimum of 3 inches of embedment in the new concrete pad. The anchors shall be a minimum of 36 ksi yield strength. The anchor may be an all thread rod or a number 4 bar.

3.5.2 Concrete Placement

Concrete shall be placed within 1-1/2 hours after mixing. Surfaces against which concrete is to be placed shall be clean and damp. Immediately after placing, concrete shall be consolidated by a combination of rodding, spading, and internal vibrating.

3.5.3 Concrete Slabs

Surfaces shall be screeded and darried or bull-floated to bring the surface to the required finish level with no coarse aggregate visible. Tolerance for a floated finish shall be true plane within 0.25 inches in 10 feet. For permanently exposed edges where the concrete is bounded by the forms, the Contractor shall chamfer the edge of the concrete to match with the existing slab's edge.

3.5.4 Concrete Curing

All concrete shall be moist or membrane cured for a minimum of 7 days. Membrane curing compound shall conform to [ASTM C309](#) and shall be applied in accordance with the manufacturer's recommendations. All concrete shall be adequately protected from damage. The air and forms in contact with concrete shall be maintained at a temperature above 40 degrees F. for a minimum of 72 hours after placement and at a temperature above 32 degrees F. for the remainder of the specified curing period.

3.5.5 Grout Pads

Grout shall be packed or poured to develop full contact under the base/sole plate or equipment base. The grout pad shall be sloped at a 45deg angle from the base of the base plate or equipment base to the concrete. It is not acceptable to have a horizontal ledger made of grout penetrating beyond the base plate or equipment base. Grout under baseplate shall be uniformly placed in contact with all surfaces. Any base plate with a grout pad larger than 18 shall have a submittal documenting the method at which the grout shall be placed. Bleed holes, method of installation, and material product data shall be included in the submittals. For pumps all leveling screws to be backed off after grouting such that they will not support any of the load.

3.6 SUMP INVESTIGATION

Reference Drawings SD101. Prior to removing the concrete around the sump, Perform a GPR scan that can read up to 7 feet deep. The intent of the scan is to validate the as-built condition of the drawings and to validate the concrete depth prior to concrete removal. Scan a minimum of 2 feet beyond the area of the concrete removal. If the GPR is unable to read the depth of the concrete, core drill a 1" DIA hole that is 7 feet deep. If rock or water is hit notify the KO. The core hole shall be located at the south west corner of the concrete excavation (furthest from the existing sump, towards the center of the room within the concrete removal area). Grout in the bottom of the core hole after the concrete is removed. Submit the finding of the GPR results and if coring is done, submit the finding of the coring.

-- End of Section --

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 - 3.1.2.1 Threaded
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- 3.2 FIELD QUALITY CONTROL
 - 3.2.1 Inspections
 - 3.2.2 Field Testing
 - 3.2.2.1 Water Piping Test Plan
- 3.3 WELD TESTING
- 3.4 IDENTIFICATION SYSTEMS
 - 3.4.1 Identification Tags
 - 3.4.2 Pipe Labels

ATTACHMENTS:

McNary Piping Color Marker Identification and Label Scheme

-- End of Section Table of Contents --

SECTION 22 11 00.01 28

PIPING AND VALVES

PART 1 GENERAL

1.1 SCOPE

This section specifies the materials and workmanship standards applicable to the fabrication, assembly, installation, and testing of the various items of piping work. These requirements are in addition to those contained in other sections or indicated on the drawings.

1.2 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.

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M (2020; Errata 1 2021) Structural Welding
Code - Steel

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME B1.20.1 (2013; R 2018) Pipe Threads, General
Purpose (Inch)

ASME B16.3 (2016) Malleable Iron Threaded Fittings,
Classes 150 and 300

ASME B16.42 (2016) Ductile Iron Pipe Flanges and
Flanged Fittings, Classes 150 and 300

ASME B16.5 (2020) Pipe Flanges and Flanged Fittings
NPS 1/2 Through NPS 24 Metric/Inch Standard

ASME B16.21 (2016) Nonmetallic Flat Gaskets for Pipe
Flanges

ASME B16.34 (2017) Valves - Flanged, Threaded and
Welding End

ASME B31.3 (2016) Process Piping

ASME B31.9 (2017) Building Services Piping

ASME B40.100 (2013) Pressure Gauges and Gauge
Attachments

ASTM INTERNATIONAL (ASTM)

ASTM A 53 (1997) Pipe, Steel, Black and Hot-Dipped,
Zinc-Coated Welded and Seamless

ASTM A 105/A 105M	(2005) Carbon Steel Forgings for Piping Applications
ASTM A 516/A 516M	(2004) Pressure Vessel Plates, Carbon Steel, for Moderate- and Lower-Temperature Service
ASTM A536	(1984; R 2014) Standard Specification for Ductile Iron Castings
ASTM A123/A123M	(2017) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A320/A320M	(2015) Standard Specification for Alloy/Steel and Stainless Steel Bolting Materials for Low-Temperature Service

AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME)

ASME A13.1	(2020) Scheme for the Identification of Piping Systems
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AMERICAN WATER WORKS ASSOCIATION (AWWA)

AWWA C110/A21.10	(2012) Ductile-Iron and Gray-Iron Fittings for Water
AWWA C116/A21.16	(2015) Protective Fusion-Bonded Coatings for the Interior and Exterior Surfaces of Ductile-Iron and Gray Iron Fittings
<u>AWWA C213</u>	<u>(2015) Fusion-Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines</u>
AWWA C515	(2009) Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service
AWWA C606	(2015) Grooved and Shouldered Joints

ASTM INTERNATIONAL (ASTM)

ASTM A312/A312M	(2019) Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes
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INTERNATIONAL CODE COUNCIL (ICC)

ICC Plumbing Code	(2012) International Plumbing Code
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MANUFACTURERS STANDARDIZATION SOCIETY OF THE VALVE AND FITTINGS INDUSTRY (MSS)

MSS SP-25	(1998) Standard Marking System for Valves, Fittings, Flanges and Unions
MSS SP-110	(2010) Ball Valves Threaded, Socket-Welding, Solder Joint, Grooved and

Flared Ends

1.3 SUBMITTALS

Government approval is required for submittals with a "G" designation; submittals having an "I" designation are for information only. When used, a designation following the "G" or "I" designation identifies the office that will review the submittal for the Government. The following shall be submitted in accordance with SECTION 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

Identification Tags; G, C

Valve Operator Color Schedule; G, ME

SD-02 Shop Drawings

Piping Drawings; G, ME

SD-03 Product Data

Resilient Seat Wedge Gate Isolation Valves; G, ME

Silent Check Valves; G, ME

Double Wafer Check Valve; G, ME

Unwatering Discharge Plug; G, ME

Ball Valves; I, ME

Equalizer Valve Packing; I, ME

Spare Equalizer Valves; I, ME

Miscellaneous Piping Materials; I, ME

SD-06 Test Reports

Water Piping Test Plan; G, ME

Discharge Piping Weld Test; I, ME

1.4 QUALITY ASSURANCE

Plumbing systems including fixtures, equipment, materials, installation, and workmanship shall be in accordance with the ICC Plumbing Code (referred to herein as Plumbing Code) except as modified herein. In the Plumbing Code the advisory provisions shall be considered to be mandatory, as though the word "shall" had been substituted for the word "should" wherever it appears; reference to the "authority having jurisdiction," the Administrative Authority, the Plumbing Official, and the Design Engineer shall be interpreted to mean the Contracting Officer.

1.5 PIPING DRAWINGS

The Contractor shall submit Piping Drawings for the pump discharge and inlet pipes, pump columns as well as all replaced drainage piping.

Drawings shall consist of plans drawn to scale, with elevations, sections and details to show clearly the location (by dimension to pertinent building features) of all piping. This includes but is not limited to, details of connections and size and type of piping and valves, all support types and locations, pipe thrust restraints, sway braces, and appurtenances.

PART 2 PRODUCTS

2.1 WATER PIPING

2.1.1 Galvanized Steel Piping

Steel pipe, ~~unless otherwise specified, for the pump shaft columns and pump discharge pipes~~ shall be galvanized steel pipe conforming to ASTM A 53, Type S, Grade B, seamless pipe. For all nominal pipe sizes flanged connection and fittings shall be used according to ASME B16.5 and ASME B16.42 class 150 as applicable, unless noted otherwise. For nominal pipe sizes less than 4 inches in diameter that cannot be flanged due to existing conditions threaded connections and fittings shall be used according to ASME B16.3 class 150, unless noted otherwise. Fabricated piping shall be "hot-dip" galvanized in accordance with ASTM A123/A123M after all welding is complete. All welding and repairs to galvanizing shall be done according to 05 50 14.00 28 METALWORK AND METAL FABRICATION.

2.1.2 Stainless Steel Piping

Stainless steel pipe shall meet the requirements of ASTM A312/A312M, seamless, Grade TP304, TP304L, TP316, or TP316L, Schedule 10S with dimensions conforming to ASME B31.9.

2.2 VALVES

Generally, valves shall conform to ASME B16.34 as applicable or unless specified otherwise. Valves of nominal sizes equal to or greater than 4 inches in diameter shall have flanged end connections conforming to ASME B16.42 class 150. Valves of nominal sizes less than 4 inches in diameter shall have threaded end connections according to ASME B16.3 class 150 with a union on all but one side of the valve, or solder end connections for connections between bronze valves and copper tubing. All new valves shall be provided with means to lock them in both the open and closed positions. Contractor shall verify the existing dimension of all valves over 6 inches in diameter to confirm new replacement valves will fit within the existing space per SECTION 01 11 01.00 28 SUPPLEMENTARY REQUIREMENTS, paragraph FIELD VERIFICATION OF SITE CONDITIONS.

2.2.1 Resilient Seat Wedge Gate Isolation Valves

Resilient Seat Wedge Gate valves shall conform to AWWA C515. Valves shall have a ductile iron body, stainless steel stem, bronze mounted trim, bolted bonnet and EPDM rubber encapsulated ductile iron wedge. Each valve shall be provided with a non-rising stem and a geared handwheel operator with chain for valves located more than 6 feet above the floor. For valves located at EL 176 and 207 provide the necessary shaft extensions and operator base as shown on plans. Shaft segments, couplings, bushings and operator base shall be provided per manufacturers recommendation. Shaft supports for draft tube valves shall be supplied per valve manufacturer's specifications to maintain shaft alignment and be anchored to wall per SECTION 05 05 20.00 28 POST-INSTALLED ANCHORS IN CONCRETE. Valves shall

open when turned counter-clockwise. Valves operators shall be color code as follows, normally open green, normally closed red and anything else yellow. The Contractor shall submit the following product data:

Resilient Seat Wedge Gate Isolation Valves

Valve Operator Color Schedule

NOTE: Penstock Drain valves shall be Resilient Seat Wedge Gate Isolation Valves.

2.2.2 Equalizer Valves

Supply two spare equalizer valves for direct replacement of existing 24 inch 100s Stockholm 150 OWG valves. Spare valves must be resilient seat wedge gate valves. Spare equalizer valves shall be on-site prior to start of construction work.

Spare Equalizer Valves

2.2.2.1 Equalizer Valve Packing

Supply and install new stem packing for all existing equalizer valves. Equalizer valves are vintage 1952, 24 inch 100s Stockholm 150 OWG. Submit product data from packing manufacturer showing the design of the new custom packing will work with existing valves.

Equalizer Valve Packing

2.2.3 Silent Check Valves

The check valve shall be a silent type check valve and begin to close as forward flow diminishes and be fully closed at zero flow velocity preventing flow reversal and resultant water hammer or shock. The valve body shall be constructed of ductile iron meeting [ASTM A536](#) class 150. The valve shall be provided with flanges according to [ASME B16.42](#) class 150. The Contractor shall submit the following product data:

Silent Check Valves

2.2.4 Double Wafer Check Valve

Double wafer check valve will consist of a double flap springs assisted design, Buna-N O-ring seal, and cracking pressure of not more than 0.3 psi. The valve body shall be constructed to meet ASME Class 150. The valve shall be of lug body design or be provided with flanges according to [ASME B16.42](#) class 150. All internal working components such as pins, hinge and wafer shall be stainless steel. The Contractor shall submit the following product data:

Double Wafer Check Valve

2.2.5 Unwatering Discharge Plug

- a. The Unwatering Discharge Plug shall be installed into the unwatering 18 inch discharge pipe located in the tailrace at elevation 260. Contractor must first remove the broken 18 inch flapper valve. Plug shall be blind flange with 3 inch air snorkel. The snorkel shall

reach a minimum elevation of 275 when installed and terminate in a goose neck configuration. Air snorkel shall be made out of schedule 40 steel pipe. Supply 18 inch gasket to ensure a good seal between blind flange and pipe. Contractor shall verify the condition of the embedded flange prior to plug fabrication during the fish ladder outage of 2023. The contractor shall submit the following shop drawing:

Unwatering Discharge Plug

b. After removal from the Unwatering Discharge pipe, the Unwatering Discharge Plug will become property of the Government. Turn the plug over to the Contracting Officer after removal. Dispose of broken flapper valve.

2.2.6 Ball Valves

Ball valves for pipe sizes less than 2.5 inches shall conform to the requirements of MSS SP-110 full port design, copper alloy. Valves shall have two-position lever handles.

2.3 MISCELLANEOUS PIPING MATERIALS

Supply all needed pipe fitting materials to include, but not limited to: bolts, nuts, gaskets, etc. Re-use of such materials is prohibited. Submit product data for all miscellaneous piping materials.

2.3.1 Flanges and Gaskets

Flanged fittings, including flanges, bolts, nuts, bolt patterns, etc., shall be in accordance with ASME B16.5 Class 150 and shall have the manufacturer's trademark affixed in accordance with MSS SP-25. Flange material shall conform to ASTM A 105/A 105M. Blind flange material shall conform to ASTM A 516/A 516M. Bolts shall conform to ASTM A320/A320M. Flange gaskets shall be full face flat type gaskets conforming to the requirements of ASME B16.21. Flange gaskets for the collection piping in the drainage sump, and EL 207 Gallery piping with flange connection to concrete, shall be Nitrile rubber suited for non-potable water service and resistant to a wide range of oils, greases and other lubricants. Flange gaskets for the pump discharge piping shall be suited to non-potable water service with galvanized piping.

2.3.2 Mechanical Couplings

Mechanical couplings for use with grooved ends are acceptable for piping 8 inch diameter and less. Provide pipe ends grooved by roll grooving or with welded-on adapters and cut grooves in accordance with AWWA C606. Provide grooves as recommended by the coupling manufacturer.

2.3.3 Threaded Fittings

Threaded fittings shall be made of galvanized malleable iron and conform to the requirements of ASME B16.3 class 150. Threaded joints shall have American Standard taper pipe threads conforming to ASME B1.20.1.

2.3.4 Expansion Joints

Expansion joints shall be made of EPDM with galvanized carbon retention rings sized to match piping. Joints shall have a minimum working pressure of 115 psi. Contractor shall verify size of each joint needed.

2.3.5 Flanged Coupling Adapter

Adapter body shall be per ASTM A536 Grade 65-45-12. Flange shall meet AWWA C207 Class D and per ANSI B16.1 Class 125 with O-ring material being NBR (Buna-N). Coupling gasket to meet ASTM D2000.

2.3.6 Welded Outlets

Where indicated branches in pipe spools shall be made using welded branch outlets. Outlets shall be designed for their intended purpose and made of a material compatible with the pipe spool. Outlets shall be formed to allow a full penetration weld between the pipe spool and outlet. Outlets shall be sized to match the branch pipe size.

2.3.7 Pressure Gauges

Pressure gauges shall be installed as indicated. Gauges shall be of the pressure indicating dial type, glycerin filled with an elastic element. Gauges shall conform to the minimum requirements of ASME B40.100. Gauges shall have a minimum 6 inch diameter face and be equipped with an isolation valve.

2.3.8 Offset Pipe Clamps

Offset pipe clamps in the drainage sump shall be stainless steel to match the material of the pipe which they support and be of the size required to fit the pipe supported. Material shall be minimum 1/4" by 1-1/2" for 4" pipe and minimum 1/4" by 2" for 6" pipe.

2.3.9 Draft Tube Drain Tee

Draft tube drain tee's shall be class 150 conforming to AWWA C110/A21.10 and coated per AWWA C116/A21.16.

2.3.10 Custom Suction Bell

The suction bells shall be fabricated according to the plans, meeting ASTM A 53 and ~~be hot dip galvanize in accordance with ASTM A123/A123M, along with its support piping, be coated in accordance with AWWA C213.~~ Flange connection shall be per ASME B16.5. Suction bell shall be fabricated and inspected per SECTION 05 50 14.00.

2.3.11 Drainage Header Clean Out

The drainage header cleanout must be coated in accordance with AWWA C213.

PART 3 EXECUTION

3.1 INSTALLATION

Installation of plumbing systems including piping, equipment, materials, and workmanship shall be in accordance with the ICC Plumbing Code, except as modified herein. Plastic piping shall not be permitted.

3.1.1 Pipe Plug Installation

The unwatering pipe plug shall be installed prior to removal and

replacement of the 18 inch unwatering pump isolation gate valve. Plug to be removed immediately after installation of the isolation valve.

3.1.2 Piping Joints

Installation of pipe and fittings shall be made in accordance with the manufacturer's recommendations. Mitering of joints for elbows and notching of straight runs of pipe for tees will not be permitted. Joints shall be made up with fittings of compatible material and made for the specific purpose intended.

3.1.2.1 Threaded

Only male pipe threads shall be coated with graphite or with an approved graphite compound, or with an inert filler and oil, or shall have a polytetrafluoroethylene (PTFE) tape applied.

3.1.2.2 Unions and Flanges

Unions, flanges and mechanical couplings shall not be concealed in walls, ceilings, or partitions. Unions shall be used on pipe sizes less than 4 inches; flanges shall be used on pipe sizes 4 inches and larger.

3.2 FIELD QUALITY CONTROL

3.2.1 Inspections

Prior to initial operation, inspect piping system for compliance with drawings, specifications, and manufacturer's submittals.

3.2.2 Field Testing

Each system shall be tested as in service in order to demonstrate compliance with the contract requirements before final acceptance of the work. Perform the following tests in addition to the tests specified in the Plumbing Code, except as modified herein. The results of each test shall be submitted in report form. Defects in the work shall be corrected by the Contractor, and tests repeated until work is in compliance with contract requirements. All corrections and subsequent testing shall be done at no additional cost to the Government. The Contractor shall furnish water, electricity, instruments, connecting devices, and personnel for performing tests.

3.2.2.1 Water Piping Test Plan

Hydrostatically test piping systems in accordance with ASME B31.3. Vent or flush air from the piping system. Pressurize system for 10 minutes with water at one and one-half times design working pressure of the pump, then reduce to design working pressure and check for leaks and weeps. Contractor shall submit a test plan for approval. No rupture, cracking or permanent distortion of any part of the pump shall be observed in a test when hydrostatically tested at the required pressure. The Contractor shall submit the following:

Water Piping Test Plan

3.3 WELD TESTING

Test unwatering and drainage pump discharge piping welds in accordance

with the AWS D1.1/D1.1M ultrasonic test (UT) method.

Discharge Piping Weld Test

3.4 IDENTIFICATION SYSTEMS

3.4.1 Identification Tags

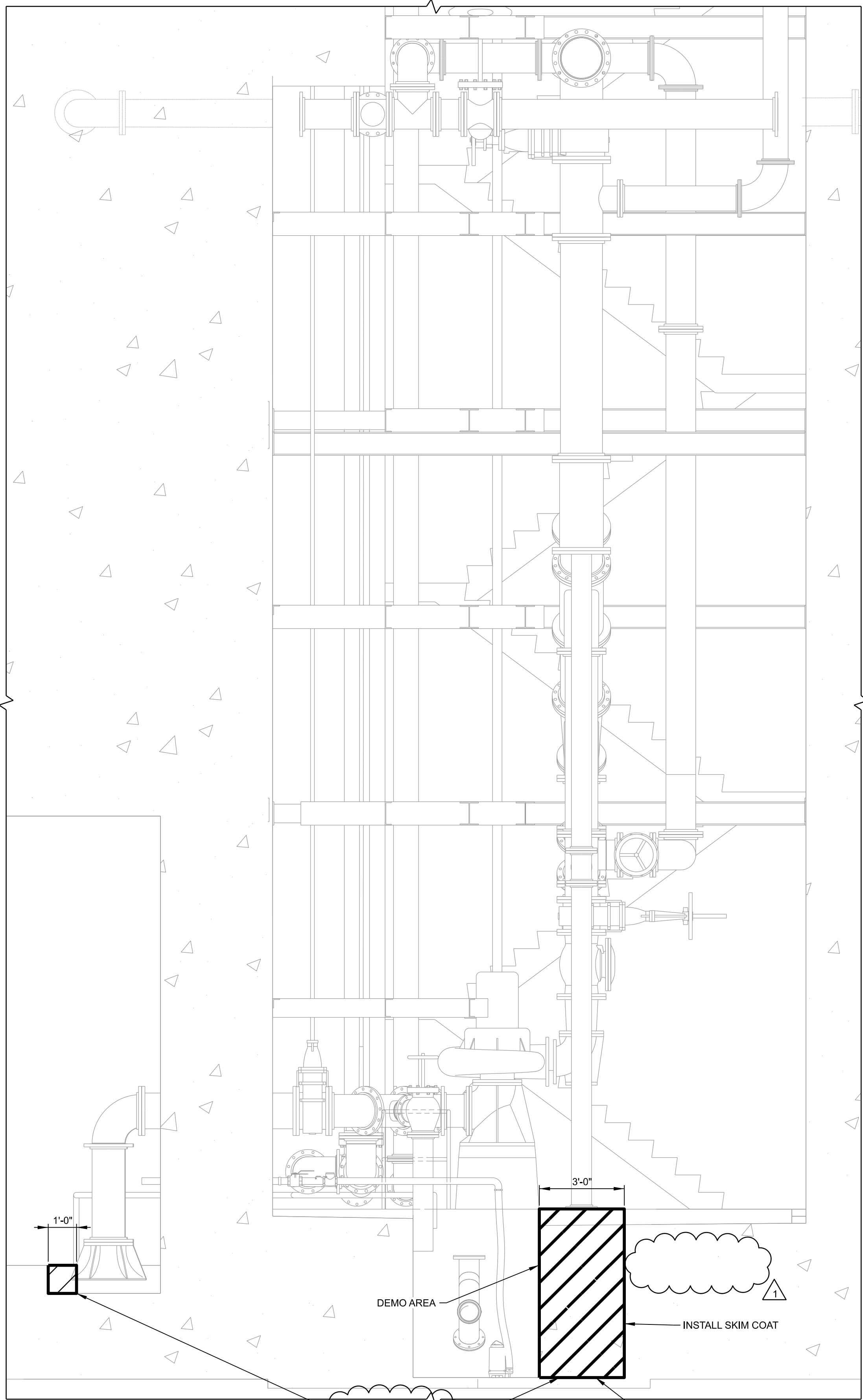
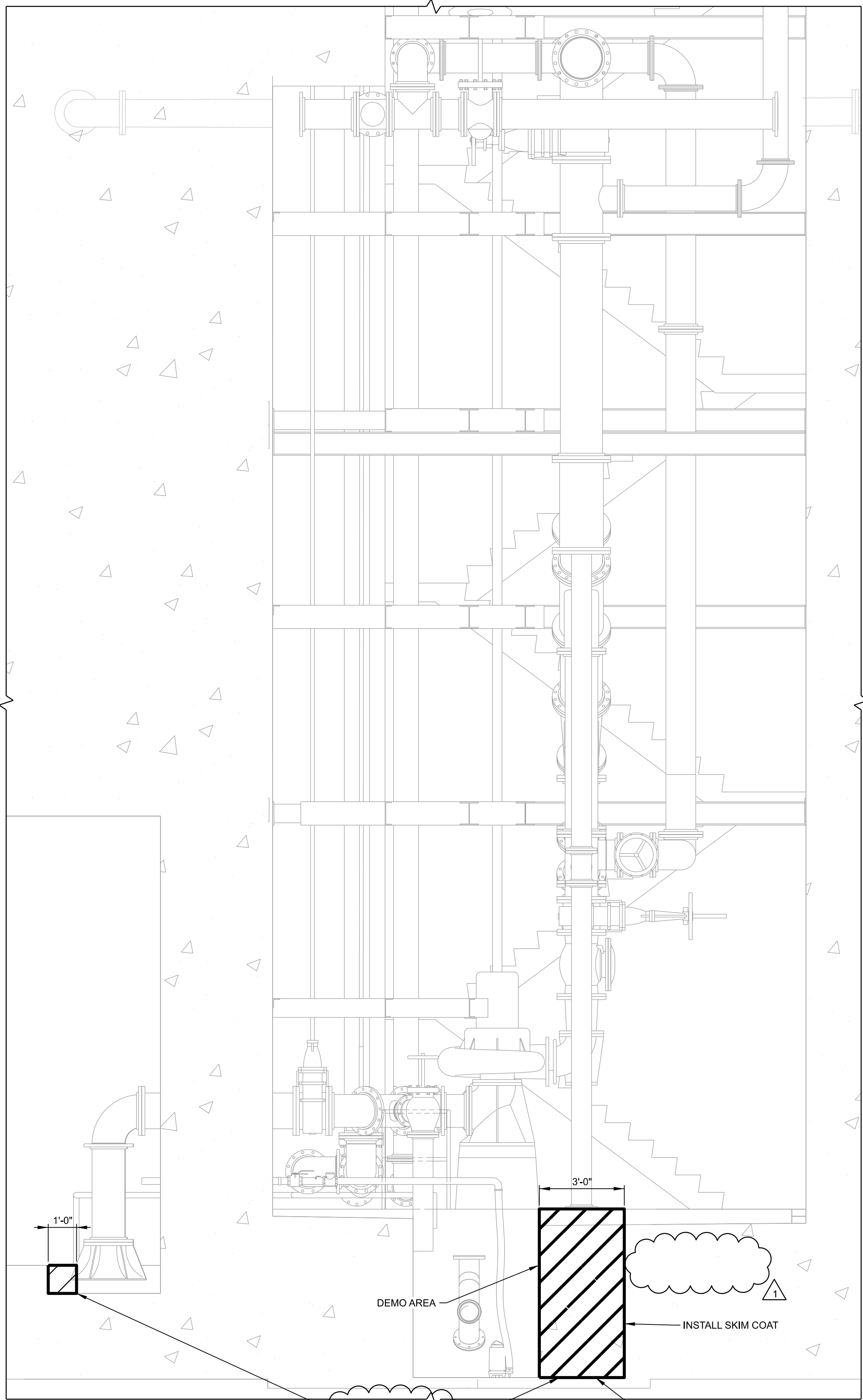
Identification tags made of engraved laminated plastic or engraved anodized aluminum shall be installed on all valves. Tags shall be 4-1/2 inch wide by 3-1/2 inch tall, and marking shall be stamped or engraved. If the tag is indoors and protected from UV light it can be a plastic tag, if the tag is in an exterior or exposed to UV light then the tag shall be engraved anodized aluminum. Indentations for tags should be green on white with white lettering. Information on the tag shall include the valve ID #, description, location, elevation. Tags shall be attached to valves with two corrosion resistant cables or clamp on fasteners. Submit identification tag template and valve list prior to tag fabrication.

3.4.2 Pipe Labels



All piping shall have labels in accordance with ASME A13.1. Drainage and Unwatering Sump discharges are considered drains. See attached McNary Piping Color Marker Identification and Label Scheme.

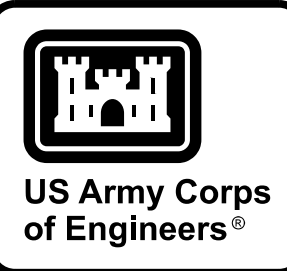
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LEGEND

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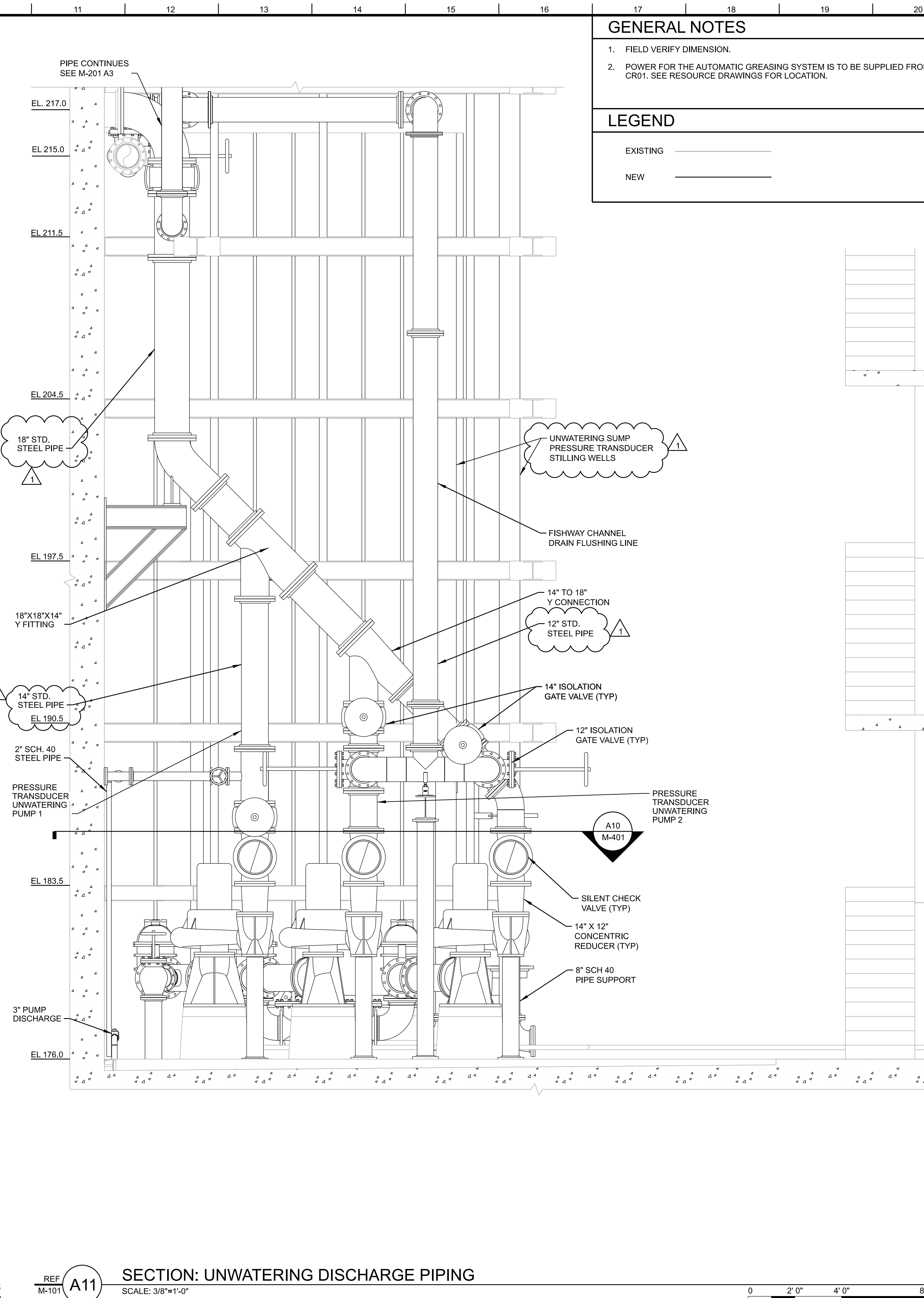
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MCNARY LOCK AND DAM
COLUMBIA RIVER, OREGON AND WASHINGTON
POWERHOUSE DRAINAGE, UNWATERING AND
EQUALIZATION SYSTEM REHABILITATION

CONCRETE DEMOLITION

SHEET ID

SD101



GENERAL NOTES	
1.	FIELD VERIFY DIMENSION.
2.	POWER FOR THE AUTOMATIC GREASING SYSTEM IS TO BE SUPPLIED FROM CR01. SEE RESOURCE DRAWINGS FOR LOCATION.
LEGEND	
EXISTING	_____
NEW	_____

