

DOCUMENT 00 90 20
ADDENDUM No. 2



PART 1 GENERAL

1.1 DOCUMENT INCLUDES

- A. Changes to the Bid Documents.

1.2 CONSTRUCTION CONTRACT

- A. The Construction Contract is known as Ogden Airport Well House Project.
- B. Date of this Addendum: March 27, 2020

PART 2 CHANGES

2.1 CHANGES TO PRIOR ADDENDA

- A. Addendum No. 1

2.2 CHANGES TO BIDDING REQUIREMENTS

- A. None

2.3 CHANGES TO AGREEMENT AND OTHER CONTRACT FORMS

- A. None

2.4 CHANGES TO CONDITIONS OF THE CONTRACT

- A. None

2.5 CHANGES TO SPECIFICATIONS

- A. Specification 09 90 01, Protective Coatings
 - a. Revised the specification number from 09 90 00 to 09 90 01
- B. Specification 41 22 00, Hoist and Cranes, General
 - a. 1.4.A – Replace with the following: “Inspection and Testing Requirements: After erection, the Contractor shall inspect and test all hoists and crane systems per specification 41 22 13.”
 - b. 1.5.A – Replace with the following: “As per specification 41 22 13.”
 - c. 2.1.B – Replace with the following: “The load capacity of each hoist and trolley shall be permanently marked in a conspicuous manner on the equipment.”
 - d. 2.1.D – Replace with the following: “Motors: Motors shall comply with the requirements of Section 41 22 13.”
 - e. 2.4 – Delete item 2.4 in its entirety.
 - f. 3.3.A – Replace with the following: “After completion of the Work, the Contractor shall test all hoist and crane equipment in accordance with specification 41 22 13.”
 - g. 3.3.B - Delete item B in its entirety.
 - h. 3.3.C - Delete item C in its entirety.

- i. 3.4.A – Replace with the following: “Coat per Section 41 22 13,”
- C. Specification 41 22 13, Bridge Cranes
- a. 1.3 Items A and B – Replace Items A and B to the following:
 - “A. Testing and acceptance criteria shall be required as outlined in this section.”
 - “B. Warranty. The manufacturer shall provide standard one year warranty with each bridge crane supplied to this project.”
 - b. 2.1.A – Revise deflection load to 1/600.
 - c. 2.1.C – Revise deflection load to 1/600.
 - d. 2.2.A – Update Equipment Number to CR-1.
 - e. 2.2.B – Revise the following; Equipment No. to CR-1, Bridge Type to Single Girder, Capacity to 2 Ton, Min Lift to 11’-0”
 - f. 2.2.C – Update Equipment No. to CR-1
 - g. 2.3.F – Delete the last two sentences of the paragraph.
 - h. 2.3.G – Revise the end truck wheel base to 1/8.
 - i. 2.3.H – Replace with the following: “Crane Wheels: Crane wheels shall be box type and have tread surfaces hardened to a minimum of 300 Brinell. Treads shall be tapered to provide suitable running alignment for crane. The wheels shall be lubricated at the factory and provided with a suitable reservoir of lubricant to eliminate the need for field lubrication. Wheel treads shall be smooth, true, and uniform within 0.01-inch tread diameter on all wheels.”
 - j. 2.3.I – Replace with the following: “Crane Drive: The crane drive motor shall be totally enclosed, 30 minute cycle rated. The motor shall be integral with a fully enclosed oil splash lubricated gear reduction. The crane drive shall include integrally-mounted spring set electrically-released dc rectified disc brake.”
 - k. 2.3.J – Delete item J in its entirety.
 - l. 2.3.M.1 – Delete item 1 in its entirety.
 - m. 2.3.N – Revise deflection load to 1/600.
 - n. 2.4.A – Replace with the following: “Electrical controls shall be two-speed or VFD as required for each equipment specified. Bridge control shall include a mainline magnetic contactor, manually-operated fused mainline disconnect with lock-out provisions, branch circuit fuses, reversing bridge control, and transformer with fused secondary. Bridge control shall be as specified.
 - 1. All bridge cranes specified with a pendant controller shall be equipped with an integral strain relief. Each pendant shall be installed to be operated at 4 ft above operating floor.”
 - o. 2.4.B – Replace with the following: “Electrical power and controls shall be in accordance with current NEC standards.”
 - p. 2.4.C – Delete item C in its entirety.
 - q. 2.4.D – Replace with the following: “Controller for the pendant shall be equipped with 2 pushbuttons for each motion, 6 total push buttons.”
 - r. 2.5.A – Replace with the following: “The following shall be provided with each overhead bridge crane:

1. None
- s. 3.2.A – Replace with the following: “After complete installation of the system, the bridge crane equipment shall be tested within a range of 100 percent to 125 percent above the rated capacity. Testing shall be performed in the presence of an authorized representative of the crane system manufacturer, and in the presence the Engineer and Owner.”
- t. 3.2.F – Replace with the following: “No crane equipment shall be used to handle any equipment until the load testing is completed and a certificate has been provided.”
- u. 3.4.A – Replace with the following: “The bridge beam, runway beams, tracks, hoist and trolley system shall be painted with standard industrial enamel as provided by the manufacturer. Do not paint the running surfaces of the track.”
- v. 3.5 – Delete items C & D and replace Items A &B with the following:
 - “A. Inspection, Startup, and Field Adjustment: An approved representative of the manufacturer shall be present at the Site to furnish the services required.”
 - “B. Instruction of Owner’s Personnel: A training representative of the manufacturer shall be present at the Site for a complete start-up and load test of the equipment and a complete Owner/operator training.”

2.6 CHANGE TO DRAWINGS

- A. Drawing No. G-05. Revised note 31, Deleted note 47.
- B. Drawing No. M-03. Revised item Number 20 description and remarks regarding the bridge crane requirements, see attached updated drawing.

2.7 DOCUMENT CLARIFICATIONS

- A. Would it be possible to recess the electrical panels into the block or furr out the wall to locate conduits in the block? No furring out of the walls will be considered. Depending on the size of the panel, there is a potential to recess smaller panels into the block. The block bond beams run vertically every 24 inches which could leave 16” of availability to recess smaller panels. This will only be approved on a case by case basis and is in no way a guarantee that panels can be recessed.
- B. Does the inlet filter and pressure regulator come with the tablet chlorinator skid? To clarify from Addendum No. 1, Yes the inlet filter and pressure regulator will come attached to the tablet chlorinator skid piping. The skid should be mounted approximately 18 inches from the wall to accommodate the inlet filter and the contractor supplied schedule 80 PVC ball valve prior to the filter.
- C. There still seems to be some confusion on what is required for the fabricated steel pipe lining. Shall the steel pipe be lined with cement-mortar lining or epoxy lined? All fabricated steel piping, whether exposed in the pump room or buried shall be lined with shop applied epoxy per specification 09 91 01 System No. 1. Per Addendum No. 1, specification 09 90 00 system No. 4 will be required on all exterior coatings for steel pipe exposed and specification 09 90 00 system No. 2 or system No. 8 shall be used for buried steel pipe coatings depending on if the pipe is concrete encased or not. Color as selected by the Owner.
- D. Are there 28 or 29 bollards for the project? There are a total of 29 bollards.

- E. Can packaged A/C units be mounted on factory curbs as specified in lieu of Detail 1 on H-02? A standard factory roof curb on a concrete pad is sufficient for this project and the ground mounted units. Rubber isolators are sufficient as an alternate to the spring isolators.
- F. Is it the subcontractor's option to select internal or external insulation? Insulation will comply with specified R-values in 230700 either way. Rectangular ductwork shall be lined and the external ductwork shall also have an aluminum jacket to protect from the elements. Meet the 2018 IECC duct insulation requirements for interior and exterior ductwork. The exposed ductwork in the space is not required to be insulated.
- G. Louver schedule calls for motorized dampers to be provided, and wired to fan operation. Associated fans come with gravity back-draft dampers making motorized dampers redundant. Please advise if both dampers are required, or which of the two damper types should be eliminated. The louvers shall have motorized dampers that are wired to the fan to not let in air when the fans are not running. The gravity dampers on the fans are sufficient. Extra motorized dampers on the fans are not required.
- H. Since equipment is mounted on concrete pads on grade, can condensate be trapped at unit and drain to grade? Yes please trap and drain to nearby roof drainage system, see note 15 on drawing M-01.

END OF ADDENDUM

SECTION 09 90 01

ADDENDUM NO. 2 - PROTECTIVE COATINGS

PART 1 GENERAL

1.01 WORK INCLUDED

- A. This section covers surface preparation, furnishing, and application of protective coatings, complete.
- B. It is the intent of this specification that all new or existing expose metal surfaces, shall be coated with a protective coating, unless specifically excluded.
- C. Shop or existing surface preparation methods, cleanliness, and existing paint, rust, and mill scale removal is not known nor documented. Contractor shall be solely responsible for determining work effort, abrasive blast requirements, and any other factors that may affect work productivity as required to provide the specified surface preparation cleanliness; regardless of prior system preparation or coating application.

1.02 RELATED SECTIONS:

- A. The Contract Documents are complementary; what is called for by one is as binding as if called for by all.
- B. It is the CONTRACTOR's responsibility for scheduling and coordinating the Work of subcontractors, suppliers, and other individuals or entities performing or furnishing any of CONTRACTOR's Work.
- C. The following Sections are related to the Work described in this Section. This list of Related Sections is provided for convenience only and is not intended to excuse or otherwise diminish the duty of the CONTRACTOR to see that the completed Work complies accurately with the Contract Documents.
 - 1. Section 01 33 00 - Submittal Procedures.
 - 2. Section 09 97 10 - Pipeline Coating and Lining

1.03 GENERAL:

- A. See section GENERAL CONDITIONS, which contain information and requirements that apply to the work specified and are mandatory for this project.

1.04 ABBREVIATIONS

ANSI	American National Standards Institute
AWWA	American Water Works Association
MDFT	Minimum Dry Film Thickness
MDFTPC	Minimum Dry Film Thickness Per Coat
mil	Thousandths of an Inch
OSHA	Occupational Safety and Health Act
PSDS	Paint System Data Sheet

SFPG	Square Feet Per Gallon
SFPGPC	Square Feet Per Gallon Per Coat
SP	Surface Preparation
SSPC	Steel Structures Painting Council

1.05 REFERENCE STANDARDS

- A. This specification recognizes AWWA, NACE, and SSPC standards as minimum industry standards and they are referenced for purpose of conformance, except where modified in this section. The requirements of this specification section have been written to a higher design standard with the intent of achieving a long-term coating performance of 100 years.

NACE SP0188	Discontinuity (Holiday) Testing of New Protective Coatings on Conductive Substrates.
NACE RP-0274	High Voltage Electrical Inspection of Pipeline Coatings Prior to Installation.
SSPC-SP-1	Solvent Cleaning Surface Preparation
SSPC-SP-2	Hand Tool Cleaning Surface Preparation
SSPC-SP-3	Power Tool Cleaning Surface Preparation
SSPC-SP-5	White metal Abrasive Blast Surface Preparation
SSPC-SP-6	Commercial Abrasive Blast Surface Preparation
SSPC-SP-10	Near White Metal Abrasive Blast Surface Preparation
SSPC-SP-11	Power Tool Cleaning to Bare Metal
SSPC-SP-13	Surface Preparation of Concrete

1.06 SUBMITTAL REQUIREMENTS

- A. Contractor submittals shall be made in accordance with Section 01 33 20 of these Specifications.
- B. Shop Drawings: Catalog cuts and other information for all products proposed. Provide copy of approved coating system submittals to the coating applicator.
- C. Quality Control Submittals: Furnish the following:
1. Applicator's Experience with list of references substantiating compliance.
 2. Coating manufacturer's certification stating the individual coating applicators have met the qualification certification requirements as specified this section.
 3. Coating manufacturer shall provide a copy of the manufacturer's coating application quality assurance manual.
 4. If the manufacturer of field-applied coating differs from that of the shop applied primer, provide written confirmation from both manufacturers' that the two coating materials are compatible.
- D. Product Data: Furnish the following Data Sheets:
1. For each paint system used herein, furnish a Paint System Data Sheet (PSDS), Technical Data Sheets, and paint colors available (where applicable) for each product used in the paint system, except for products applied by equipment manufacturers. A sample PSDS form is appended at the end of this section.
 2. The required information shall be submitted on a system-by-system basis.

3. The Contractor shall also provide copies of the paint system submittals to the coating applicator.
 4. Indiscriminate submittal of manufacturer's literature only is not acceptable.
- E. Where ANSI/NSF Standard 60 and 61 approvals is required, submit ANSI/NSF certification letter for each coating in the system indicating product application limits on size of tank or piping, dry film thickness, number of coats, specific product tested, colors certified, and approved additives.
- F. Provide TCLP test data for lead and other regulated heavy metals in non-recyclable, slag type abrasive blast media to be used on the project. Acceptable abrasive test data shall indicate the abrasive manufacturer, location of manufacture, and media gradation and type. Surface preparation will not be permitted to begin until acceptable test data has been submitted.

1.07 QUALITY ASSURANCE

- A. Coating Applicator's Experience and Certification:
1. Coating Application Company and coating application supervisor (Certified Applicator) shall have a minimum of 5 years' experience applying the specified coating system.
 2. Coating application personnel, whom have direct coating application responsibility, shall have a minimum of 2 years practical experience in application of the indicated coating system.
 3. Coating applicator shall be certified by the coating manufacturer as an approved applicator.
- B. Continuity of Contractor: Contractor's site supervisor shall be coordinated with the Engineer. Any replacement of the supervisor on site will require notification of Engineer 72 hours in advance, and will be subject to approval by the Owner.
- C. Coating and/or lining manufacturer shall provide a technical representative to visit the jobsite at intervals during surface preparation and painting as may be required for product application quality assurance, and to determine compliance with manufacturer's instructions and these Specifications, and as may be necessary to resolve field problems attributable to, or associated with, the manufacturer's products furnished under this Contract.

1.08 WARRANTY

- A. The Contractor and coating manufacturer shall jointly and severally warrant to the Owner and guarantee the work under this section against defective workmanship and materials for a period of 2 year(s) commencing on the date of final acceptance of the work.

1.09 ENGINEER OBSERVATIONS

- A. The Contractor shall give the Owner Representative notice a minimum of 14 days prior to start of work for scheduling shop or field observation.

- B. Provide Owner Representative a minimum 3 days' notice for actual start of surface preparation and coating application work.
- C. Provisions shall be made to allow Owner's representative full access to facilities and appropriate documentation regarding coating application.
- D. Observation by the Owner's representative or the waiver of observation of any portion of the work shall not be construed to relieve the Contractor of his responsibility to perform the work in accordance with these Specifications.
- E. Materials shall be subject to testing for conformance with this specification as the Owner's representative may elect, prior to or during incorporation into the work.
- F. Perform work in the presence of ENGINEER, unless Engineer grants prior approval to perform such work in Engineer's absence. Approval to perform work in the Engineer's absence is limited to the current day unless specifically noted to extend beyond the completion of the workday.

PART 2 PRODUCTS

2.01 GENERAL

- A. Coatings and linings will be stored and handled per manufacturer's written directions.
- B. All metallic surfaces shall be prepared and coated in accordance with referenced standards, written instructions of the coating or lining manufacturer, and these specifications, whichever is more stringent, unless specified otherwise.
- C. Coatings shall be the product of a single manufacturer. Product substitutions during the project will not be permitted, without ENGINEER approval.

2.02 PAINT DELIVERY, STORAGE, AND HANDLING

- A. Delivered paint to the project site in unopened containers that plainly show, at the time of use, the designated name, date of manufacture, color, and name of manufacturer.
- B. Stored paints in a suitable protected area that is heated or cooled as required to maintain temperatures within the range recommended by the paint manufacturer.
- C. Shipping:
 - 1. Where shop finish coated or primed items are to be shipped to the jobsite, protect coating from damage. Batten coated items to prevent abrasion.
 - 2. Use nonmetallic or padded slings and straps in handling.
 - 3. Items will be rejected for excessive damage.

2.03 PAINT AND COATINGS MANUFACTURERS

- A. A manufacturer letter code as follows will be found following the generic descriptions of materials outlined in the Specifications. Address is that of the general offices.

Contact these offices for information regarding the location of representative nearest the project site.

- B. MANUFACTURER CODE A - COATINGS MANUFACTURERS (Able to supply most heavy-duty industrial coatings and architectural paints):
1. Carboline Coatings Company, St. Louis, MO.
 2. ICI Devoe Coatings Company, Louisville, KY.
 3. International Coatings,
 4. Pittsburgh Paints (PPG), Pittsburgh, PA.
 5. Sherwin Williams, Cleveland, OH
 6. Tnemec Coatings, Kansas City, MO

2.04 PAINT MATERIALS

- A. Products shall meet federal, state, and local requirements limiting the emission of volatile organic compounds. Specific information may be secured through the local office of the Air Pollution Control Officer.
- B. Materials Including Primer and Finish Coats: Produced by same paint manufacturer.
- C. Thinners, Cleaners, Driers, and Other Additives: As recommended by paint manufacturer of the particular coating. Where coatings are required to meet ANSI/NSF Standard 60 and 61, addition of thinners, driers, and other paint additives not approved under the ANSI/NSF certification letter will not be permitted without written approval from the Engineer.
- D. Paint products are listed according to their approximate order of appearance in the paint systems. The letter designating the manufacturer code refers to Article PAINT AND COATING MANUFACTURERS.

Products	Description
Epoxy, NSF	Amine or polyamine epoxy coating, two parts, suitable for immersion service, 75% volume solids minimum, capable of 4 to 8 MDFT per coat, approved for potable water contact in conformance to ANSI/NSF Standard 60 and 61, and suitable for the application temperatures and conditions. MANUFACTURER CODE: A
Epoxy	Polyamine or polyamide epoxy, two parts, suitable for immersion service, 75% volume solids minimum, capable of 4 to 8 MDFT per coat, and suitable for the application temperatures and conditions. MANUFACTURER CODE: A
Polysiloxane	Acrylic polysiloxane hybrid coating, single component, suitable for shop or field application at 32 degrees F, minimum, recoat window of not less than 12 months with preference for products with unlimited overcoat capability, solids content of

85% minimum, high gloss, and tintable colors. Tinted colors shall be capable of storage for 30 days or longer prior to application. Coating shall be capable of spray, roller, or brush application on all metal substrates and specified prime and intermediate coats. MANUFACTURER CODE: A

Inorganic Zinc Primer	Solvent or water based, 14 lbs. metallic zinc content per gallon minimum; unlimited recoat window, conform to manufacturer's recommended top coats as specified herein. MANUFACTURER CODE: A
Wash Primer	Vinyl butyral acid or equivalent coating for enhancing finish coat adhesion to galvanized steel surfaces. MANUFACTURER CODE: A
Polyurethane Enamel	Two-component, aliphatic or acrylic based polyurethane; high gloss finish, suitable for continuous dry service at 200 degrees F without discoloration or peeling. MANUFACTURER CODE: A

2.05 COLORS

- A. Provide as selected by the Owner.
- B. Formulated with colorants free of lead, lead compounds, or other materials which might be affected by the presence of hydrogen sulfide or other gas likely to be present at the project.
- C. Proprietary identification of colors is for identification only. Any authorized manufacturer may supply matches.
- D. Equipment Colors:
 - 1. Equipment shall be meant to include the machinery or vessel itself plus the structural supports and fasteners and attached electrical conduits.
 - 2. Paint non-submerged portions of equipment in the same color as the process piping it serves, except as itemized below:
 - a. Dangerous parts of equipment and machinery: OSHA Orange
 - b. Fire protection equipment and Apparatus: OSHA Red
 - c. Radiation hazards: OSHA Purple
 - d. Physical hazards in normal operating area: OSHA Yellow
 - 3. Fiberglass reinforced plastic (FRP) equipment with an integral colored gel coat does not require painting, provided the color is as specified.
- E. Pipe Identification Painting:
 - 1. Color code non-submerged metal piping except electrical conduit. Paint fittings and valves the same color as the pipe.
 - 2. Piping color coding: In accordance with the Piping Schedule as shown.
 - 3. On exposed stainless steel piping, apply color 24 inches in length along pipe axis at all connections to equipment, valves, or branch fittings, at wall boundaries, and at intervals along the piping not greater than 9 feet on center, with identification labels applied to each exposed run of pipe as specified herein.
 - 4. Pipe supports: Mild steel, painted No. 70 light gray as specified in ANSI Z35.1.

5. Fiberglass reinforced plastic (FRP) pipe and polyvinyl chloride (PVC) pipe located outside of buildings and enclosed structures will not require painting, except as noted.
- F. Labels for Piping:
1. Identification labels shall bear the full piping system name as specified in the Piping Schedule shown.
 2. Install separate flow directional arrows with each label.
 3. Include black lettering on OSHA safety yellow self-adhesive vinyl or vinyl cloth.
 4. Lettering height: Meet ANSI A13.1.
 5. Label and Adhesive: Long lasting, resistant to moisture, oils, solvents, and weathering, meeting OSHA requirements.
 6. Locate labels at all connections to equipment, valves, or branch fittings, at wall boundaries, and at intervals along the piping not greater than 18 feet on center, with at least one label applied to each exposed run of pipe.
 7. Manufacturers:
 - a. W. H. Brady Co., Milwaukee, WI
 - b. Seton Nameplate Corp., New Haven, CT
 - c. or Equal.

2.06 QA/QC TESTING AND INSPECTION

- A. General
1. Applicator shall inspect and test the coating system in accordance with referenced standards and these specifications, whichever is more stringent.
 2. Quality control testing as specified in AWWA standards are minimum industry standards and it is the intent of this specification to provide a higher level of quality control for the objective of achieving maximum coating performance.
 3. If any conflict between this specification and referenced standards occurs, the more stringent requirement shall apply and any interpretation of this requirement or results shall be with the objective of achieving maximum coating performance.
 4. The frequency of the testing shall be determined by the applicator, but shall not be less than the requirements of this specification.
- B. Surface Profile Testing
1. Surface profile of abrasive blasted surfaces to be tested with "Press-O-Film" tester tape or equivalent in accordance with NACE RP287.
 2. Tester tape shall be suitable for the intended profile height.
 3. Profile shall be measured to a minimum tolerance of 0.1 mils, maximum.
 4. Electronic surface profilometer shall be used, where deemed necessary, to verify tester tape measurements.
- C. Adhesion testing: As specified in Section 09910, where directed by the Engineer for assessing coating application problems.
- D. Holiday Testing
1. Holiday tests on polyurethane coatings or linings will be conducted on the completed coating or lining after cure or 24-hours, whichever is less, using a high voltage spark test in accordance with NACE SP-0188 and these specifications.

2. Coating thickness used for high voltage holiday testing setting shall be the average dry coating thickness.
- E. Dry Film Thickness Testing
1. Coatings shall be tested for dry film thickness using a properly calibrated magnetic pull off, eddy current, or ultrasonic equipment.
 2. Coating thickness measurements shall be conducted as necessary and without limitation. Testing conformance to the requirements of SSPC PA-2 is specifically excluded from this specification.

PART 3 EXECUTION

3.01 GENERAL

- A. The intention of this specification is for all existing and new, interior and exterior surfaces are painted, whether specifically mentioned or not, except as modified herein. Concealed structural steel surfaces shall receive prime coat only unless modified herein. Exterior concrete surfaces will not be painted unless specifically indicated hereinafter.
- B. Surface preparation and coating application shall be in conformance with these specifications and the coating manufacturer's written product data sheets and written recommendations of the manufacturer's technical representative. Where conflicts occur between the manufacturer's recommendations and these specifications, the more stringent of the two shall apply unless otherwise approved by the Engineer.
- C. For coatings subject to immersion, obtain full cure for completed system. Consult coatings manufacturer's written instructions for these requirements. Do not immerse coating for any purpose until completion of curing cycle.

3.02 REGULATORY REQUIREMENTS

- A. Meet federal, state, and local requirements limiting the emission of volatile organic compounds and worker exposures.
- B. Protect workers and comply with applicable federal, state, and local air pollution and environmental regulations for surface preparation, blast cleaning, disposition of spent aggregate and debris, coating application and dust prevention including, but not limited to the following Acts, Regulations, Standards, and Guidelines:
1. Clean Air Act
 2. National Ambient Air Quality Standard
 3. Resource Conservation and Recovery Act (RCRA)
- C. Comply with applicable federal, state, and local regulations for confined space entry.
- D. Provide and operate equipment that meets explosion proof requirements.

3.03 ENVIRONMENTAL CONDITIONS

- A. Do not perform abrasive blast cleaning whenever the relative humidity exceeds 85 percent, whenever surface temperature is less than 5 degrees F above the dew point of the ambient air.
- B. Surface preparation power tools and blast equipment shall contain dust collection equipment that will prevent discharge of dust particles into the atmosphere.
- C. Do not apply paint when:
 - 1. Surface temperatures exceeds the maximum or minimum temperature recommended by the paint manufacturer,
 - 2. In dust, smoke-laden atmosphere, damp or humid weather, or under conditions which could cause icing on the metal surface.
 - 3. When it is expected that surface temperatures will drop below 5 degrees above dew point within 8 hours after application of coating.

3.04 DEHUMIDIFICATION

- A. Where environmental conditions cannot be met or controlled, Contractor shall provide and operate desiccant dehumidification equipment to maintain environmental conditions for 24 hours a day during abrasive blasting and coating application and cure. Liquid, granular, or loose lithium chloride drying systems will not be acceptable.
- B. Contractor shall provide dehumidification equipment sized to maintain dew point temperature 17 degrees or more below surface temperature of metal surfaces to be cleaned and coated. System shall provide ventilation within the environmentally controlled areas as required for the following requirements:
 - 1. One air exchange per hour, minimum,
 - 2. Maintenance of personnel exposures limits (PEL) at 50 percent of OSHA PEL limits for all chemicals used in the performance of the work, and
 - 3. Maintenance of lower explosive limits (LEL) to less than 50 percent of the most volatile solvent used in the performance of the work.
- C. Dehumidification equipment type, size, air flow, and power requirements shall be designed by a qualified company knowledgeable in dehumidification equipment, and its operation based on project requirements and anticipated seasonal weather conditions for the project schedule. Design to include evaluation of existing conditions, humidity, and temperature, proper air exchange requirements, ventilation requirements, ducting requirements for adequate air flow, and any other issues necessary to achieve the specified performance and environmental conditions throughout the duration of the project.
- D. Contractor to submit written recommendations from dehumidification subcontractor for bulkhead locations, bulkhead venting, duct work for each bulkhead section, any secondary ventilation requirements for coating cure, dust collection equipment CFM requirements, and drying requirements for blast hose compressed air necessary to maintain environmental control as specified herein.
- E. Dehumidification subcontractor shall either operate the equipment or provide training to Contractor on the proper operation and setup of dehumidification equipment. Dehumidification subcontractor shall provide a technical representative on site for a minimum of two 8-hour days to ensure proper operation of the equipment,

achievement of desired environmental control, and to insure Contractor can properly setup, operate, monitor, and maintain the equipment.

- F. Dehumidification shall be operated in a manner that prevents all condensation or icing throughout surface preparation and coating application and cure.
- G. Reblasting of flash rusted metal surfaces or removal of damaged coatings, as a result of equipment malfunction, shutdown, or other events that result in the loss of environmental control, will be at the sole expense of the Contractor. Cleaned metal surfaces subject to flash rusting shall be cleaned to the same cleanliness as prior to the flash rust formation and shall be approved by the Engineer.
- H. Contractor shall monitor ambient temperature, humidity, dew point temperature, and pipe surface temperature both outdoors and within the work area at the start, midpoint, and end of each work shift, minimum, but not greater than 5 hours between measurements.
- I. Daily environmental condition monitoring and maintenance of the equipment shall be documented in writing and posted near the equipment for review by the Engineer.

3.05 VENTILATION AND ILLUMINATION

- A. Adequate illumination shall be provided while work is in progress. Whenever required by the inspector, the Contractor shall provide additional illumination and necessary supports to cover all areas to be inspected. The level of illumination for inspection purposes shall be determined by the inspector.
- B. Ventilation shall be used to control potential dust and hazardous conditions within the tank. Ventilation flow rates shall be in accordance with OSHA regulations and as required to reduce air contamination to nonhazardous conditions.

3.06 SURFACES NOT REQUIRING PAINTING

- A. Unless otherwise stated herein or shown, the following areas or items will not require painting:
 - 1. Concrete and masonry surfaces
 - 2. Nonferrous and corrosion-resistant ferrous alloys such as copper, bronze, monel, aluminum, chromium plate, atmospherically exposed weathering steel, and stainless steel, except where:
 - a. Required for electrical insulation between dissimilar metals.
 - b. Aluminum and stainless steel are embedded in concrete or masonry, or aluminum is in contact with concrete or masonry.
 - c. Color coding of equipment and piping is required.
 - 3. Nonmetallic materials such as glass, PVC, wood, porcelain, and plastic (FRP) except as required for architectural painting or color coding.
 - 4. Prefinished electrical and architectural items such as motor control centers, switchboards, switchgear, panel boards, transformers, disconnect switches, acoustical tile, cabinets, elevators, building louvers, wall panels, etc.; color coding of equipment is required.
 - 5. Non-submerged electrical conduits attached to unpainted concrete surfaces.
 - 6. Cathodic protection anodes.

7. Items specified to be galvanized after fabrication unless specifically required elsewhere or subject to immersion.
8. Insulated piping and/or insulated piping with jacket will not require exterior coating, except as required for architectural painting or color coding.

3.07 PREPARATION OF SURFACES

A. Surface Preparation Inspection:

1. Inspect and provide substrate surfaces prepared in accordance with these Specifications and the printed directions and recommendations of paint manufacturer whose product is to be applied.
2. Provide Engineer minimum 3 days' notice prior to start of surface preparation work or coating application work.
3. Perform such work only in the presence of Engineer, unless Engineer grants prior approval to perform such work in Engineer's absence.

B. Metal Surface Preparation:

1. General:

- a. Do not perform a surface preparation blast prior to submission of samples. Workmanship for metal surface preparation as specified shall meet current Steel Structures Painting Council (SSPC) Specifications as follows:
 - (1) Solvent Cleaning: SP 1
 - (2) Hand Tool Cleaning: SP 2
 - (3) Power Tool Cleaning: SP 3
 - (4) White Metal Blast Cleaning: SP 5
 - (5) Commercial Blast Cleaning: SP 6
 - (6) Brush-Off Blast Cleaning: SP 7
 - (7) Pickling: SP 8
 - (8) Near-White Blast Cleaning: SP 10
 - (9) Bare Metal Power Tool Cleaning: SP 11
- b. All surface preparation shall be assumed to be on a SSPC Grade A steel surface condition, unless specifically noted otherwise.
- c. Wherever the words "solvent cleaning", "hand tool cleaning", "wire brushing", or "blast cleaning", or similar words of equal intent are used in these Specifications or in paint manufacturer's specifications, they shall be understood to refer to the applicable SSPC Specifications listed above.
- d. Where OSHA or EPA regulations preclude standard abrasive blast cleaning, wet or vacu-blast methods may be required. Coating manufacturers' recommendations for wet blast additives and first coat application shall apply. Wet blasting methods shall be approved by the Engineer.
- e. Hand tool clean areas that cannot be cleaned by power tool cleaning.

2. Welds and adjacent areas:

- a. Prepared such that there is:
 - (1) No undercutting or reverse ridges on the weld bead.
 - (2) No weld spatter on or adjacent to the weld or any other area to be painted.
 - (3) No sharp peaks or ridges along the weld bead.
- b. Grind embedded pieces of electrode or wire flush with the adjacent surface of the weld bead.

3. Preblast Cleaning Requirements:

- a. Remove oil, grease, welding fluxes, and other surface contaminants prior to blast cleaning.
 - b. Cleaning methods: Steam, open flame, hot water, or cold water with appropriate detergent additives followed with clean water rinsing.
 - c. Clean small isolated areas as above or solvent cleaned with suitable solvents and clean cloths.
 - d. Round or chamfered all sharp edges and grind smooth burrs, jagged edges, and surface defects.
4. Blast Cleaning Requirements:
- a. General:
 - (1) Type of Equipment and Speed of Travel: Designed to obtain specified degree of cleanliness.
 - (2) Select type and size of abrasive to produce a surface profile that meets the coating manufacturer's recommendations for the particular coating to be applied or not less than 20 percent of the specified coating thickness, whichever is more stringent.
 - (3) Meet applicable federal, state, and local air pollution control regulations for blast cleaning and disposition of spent aggregate and debris.
 - (4) Do not reuse abrasive, unless abrasive is recyclable steel grit or shot abrasive.
 - b. Shop Blasting
 - (1) Notify Engineer at least 7 days prior to start of shop blast cleaning to allow for inspection of the work during surface preparation and shop application of paints. Work shall be subject to the Engineer's approval before shipment to the jobsite.
 - (2) Items such as structural steel, metal doors and frames, metal louvers, and similar items as reviewed by the Engineer may be shop prepared and primed. Centrifugal wheel blast cleaning is an acceptable alternate to shop blast cleaning. Blast clean and prime in accordance with these Specifications.
 - c. Field Blasting
 - (1) Perform sandblasting for items and equipment where specified and as required to restore damaged surfaces previously shop or field blasted and primed. Materials, equipment, procedures, shall meet requirements of Steel Structures Painting Council.
 - (2) Field blasting in areas with electrical or mechanical equipment, within buildings, or on coated surfaces with lead paint greater than 2,000 mg/L total lead shall be performed with dustless abrasive systems such as "Sponge-Jet", dry ice abrasive blasting.
5. Post-Blast Cleaning and Other Cleaning Requirements:
- a. Clean surfaces of dust and residual particles from cleaning operations by dry (no oil or water vapor) air blast cleaning or other method prior to painting. Vacuum clean enclosed areas and other areas where dust settling is a problem and wiped with a tack cloth.
 - b. Paint surfaces the same day they are sandblasted. Reblast surfaces that have started to rust before they are painted.
- C. Concrete Surface Preparation:
- 1. Do not begin until 30 days after the concrete has been placed.
 - 2. Remove grease, oil, dirt, salts or other chemicals, loose materials or other foreign matter by solvent, detergent, or other suitable cleaning methods.

3. Clean concrete using mechanical or chemical methods for the degree of cleaning specified for the coating system in accordance with SSPC SP-13, Surface preparation of Concrete.
 4. Unless otherwise required for proper adhesion, ensure surfaces are dry prior to coating.
 5. Bug holes, air pockets, and other voids in the concrete will be filled or patched in chemical exposure areas, secondary containment, and where specifically required.
 6. Concrete Surface Preparation Inspection:
 - a. Adhesion Testing:
 - (1) Tensile testing of the surface preparation shall be performed by the Engineer as necessary using Type 4 or Type 5 pneumatic adhesion testing equipment in accordance with ASTM D4541 using 2-inch diameter dollies for concrete surface adhesion testing.
 - (2) Applied coating greater than 20 mils in thickness or with a tensile strength greater than 2,500 psi shall be scored for concrete adhesion testing.
 - (3) Adhesive failure greater than 50 percent of the dolly surface area shall indicate inadequate surface preparation.
 - (4) Cohesive failures which results in loss of sound concrete will be acceptable provided the loss is greater than 50 percent of the dolly surface area.
 - (5) Low adhesion cohesive failures with a thin layer of concrete due to weak concrete or laitance over 50 percent of the dolly surface will be rejected.
 - b. Concrete Soundness:
 - (1) Concrete soundness shall be determined using the scratching or hammer impact methods as defined in SSPC SP-13.
 - c. Moisture Content:
 - (1) Moisture shall be tested as Specified in SSPC SP-13 and shall not exceed the moisture content recommended by the coating manufacturer.
- D. Brush-off Blast Cleaning:
1. Equipment, procedure, and degree of cleaning shall meet SSPC-SP 7, Brush-off Blast Cleaning and shall achieve a profile on the coating equivalent to 80 grit sandpaper with no exposed metal. Profile shall be uniform over the surface with no glossy areas visible.
 2. Where metal substrate is exposed, Contractor shall apply full coating system as specified for new metal surfaces.
 3. Repair or replace surfaces damaged by blast cleaning, where damage is defined as visible metal substrate. If less than 5 percent of prepared surface has the metal substrate visible, the coating shall be repaired by application of a brush applied intermediate coat. If greater than 5 percent the coating shall be fully removed to meet the specified surface cleanliness and recoated with the specified coating system.
 4. Abrasive: Either conventional abrasive blasting with sand, grit, or nut shells or specialized abrasive blasting. Abrasives shall be 60 mesh grit, maximum.
 5. Select various surface preparation parameters such as size and hardness of the abrasive, nozzle size, air pressure, and nozzle distance from the surface such that the surface is cleaned without pitting, chipping, or other damage.
 6. Verify parameter selection by blast cleaning a trial area that will not be exposed to view.

7. The Engineer shall approve trial blast cleaned area and shall use area as a representative sample of surface preparation.
- E. Solvent Cleaning:
1. Consists of removal of foreign matter such as oil, grease, soil, drawing and cutting compounds, and any other surface contaminants by the use of solvents, emulsions, cleaning compounds, steam cleaning, or similar materials and methods which involve a solvent or cleaning action.
 2. Method meets SSPC-SP 1.

3.08 PROTECTION OF MATERIALS NOT TO BE PAINTED

- A. Remove, mask, or otherwise protect hardware, lighting fixtures, switch plates, aluminum surfaces, machined surfaces, couplings, shafts, bearings, nameplates on machinery, and other surfaces not intended to be painted.
- B. Provide drop cloths to prevent paint materials from falling on or marring adjacent surfaces.
- C. Protect working parts of mechanical and electrical equipment from damage during surface preparation and painting process.
- D. Mask openings in motors to prevent paint and other materials from entering the motors.

3.09 PAINT MIXING

- A. Multiple-component coatings:
 1. Prepare using all of the contents of the container for each component as packaged by the paint manufacturer.
 2. No partial batches will be permitted.
 3. Do not use multiple-component coatings that have been mixed shall not be used beyond their pot life.
 4. Provide small quantity kits for touchup painting and for painting other small areas.
 5. Mix only components specified and furnished by the paint manufacturer.
 6. Do not intermix additional components for reasons of color or otherwise, even within the same generic type of coating.
 7. Fast set or plural component products shall be applied using an appropriate multipart pump that properly mixes both components at the recommended ratio using equipment recommended by the coating manufacturer. Hot mixing of fast set or plural component products will not be permitted.
- B. Keep paint materials sealed when not in use and provide nitrogen blanket on fast set, plural, or moisture cured coatings on opened product containers when stored or not in use more than 8 hours.
- C. Where more than one coat of a material is applied within a given system, alternate color to provide a visual reference that the required number of coats have been applied.

3.10 APPLICATION OF PAINT

A. General:

1. Inspection: Schedule with Engineer in advance for cleaned surfaces and all coats prior to the succeeding coat.
2. Apply coatings in accordance with the paint manufacturer's recommendations. Allow sufficient time between coats to assure thorough drying of previously applied paint.
3. Fusion Bonded Coatings Method Application: Electrostatic, fluidized bed, or flocking.
4. Paint units to be bolted together and to structures prior to assembly or installation.
5. Shop Primed or Factory Finished Surfaces:
 - a. Inspection: Schedule with Engineer in advance for shop primed or factory-finished items delivered to jobsite for compliance with these Specifications.
 - b. Hand or power sand areas of chipped, peeled, or abraded coating, feathering the edges. Follow with a spot primer using specified primer.
 - c. For two-package or converted coatings, consult the coatings manufacturer for specific procedures as relates to top coating of these products.
 - d. Prior to application of finish coats, clean shop primed surfaces of dirt, oil, and grease, and apply a mist coat of specified primer, 1.0 mil dry film thickness.
 - e. After welding, prepare and prime holdback areas as required for the specified paint system. Apply primer in accordance with manufacturer's instructions.
6. Manufacturer Applied Paint Systems:
 - a. Repair abraded areas on factory-finished items in accordance with the equipment manufacturer's directions.
 - b. Carefully blend repaired areas into the original finish.

B. Application Safety

1. Performed painting in accordance with recommendations of the following:
 - a. Paint manufacturer's instructions.
 - b. NACE contained in the publication, Manual for Painter Safety.
 - c. Federal, state, and local agencies having jurisdiction.
2. Contractor will be solely and completely responsible for condition of the project site, including safety of all persons (including employees) and property during performance of the work. This requirement will apply continuously and not be limited to normal working hours. Safety provisions will conform to U.S. Department of Labor, Occupational Safety and Health Act, any equivalent state law, and all other applicable federal, state, county, and local laws, ordinances, and codes.
3. Contractor will comply with all safety-training requirements promulgated or required for this project.

C. Film Thickness:

1. Coverage is listed as either total minimum dry film thickness in mils (MDFT) or the spreading rate in square feet per gallon (SFPG). Per coat determinations are listed as MDFTPC or SFPGPC.
2. Applied coating system film thickness per coat shall be applied at the specified coating thickness or the manufacturer's recommended minimum thickness, whichever is greater. Where the manufacturer has not specified a minimum

coating thickness on the product data sheets, the minimum recommended coating application thickness shall apply.

3. Maximum film build per coat shall not exceed the coating manufacturer's recommendations.

D. Stripe Coats:

1. Surfaces that are subject to immersion, condensing environments, or where specifically specified shall be stripe coated on all angles, edges, corners, threads, welds, and similar type surfaces.
2. Stripe coat shall be an extra coat of the intermediate coating material and shall be applied between the prime and intermediate coats.
3. The stripe coat shall be a separate coat from coats specified under the coating system.
4. Stripe coats shall be alternated in color like a full coat.

E. Number of coats:

1. Apply specified number of coats, minimum, irrespective of the coating thickness.
2. Additional coats may be required to obtain the minimum required paint thickness, depending on method of application, differences in manufacturers' products, and atmospheric conditions.

F. Porous Surfaces, Such as Concrete, Masonry:

1. Prime Coat:
 - a. May be thinned to provide maximum penetration and adhesion.
 - b. Type and Amount of Thinning: Determined by the paint manufacturer and is dependent on surface density and type of coating.
 - c. Surfaces Specified to Receive Water Base Coating: Damp, but free of running water, just prior to application of the coating.

G. Existing Coated Surfaces:

1. General:
 - a. Equipment or components with shop primer or shop finish coated surfaces shall be reviewed with the Engineer to determine coating damage, repair methods, surface preparation requirements, and conformance with color uniformity, where required.
 - b. All shop primed or finished coated surfaces shall be verified to be chemically compatible with field applied finish coats.
 - c. If a cured epoxy, polyurethane, or plural-component material is to be top coated, contact the coating manufacturer for additional surface preparation requirements. Existing coated surfaces shall be prepared as follows"
 - (1) Existing coated surfaces shall be brush-off blasted as specified herein to remove all gloss and provide a uniform profile on existing coating for adhesion of subsequent coats.
 - (2) Power or hand sanding will not be allowed as a surface preparation procedure for existing coatings, unless reviewed and approved by the Engineer.
 - (3) Where coating manufacturer surface preparation recommendations conflict with this section, the more stringent requirements shall apply.
 - (4) Profile shall be as specified for by the manufacturer or equivalent of 80 grit sandpaper; whichever is more stringent. Profile shall be visible and uniform over existing coated surfaces.

- d. All existing coated surfaces, where demolition of equipment was specified or required, shall be surface prepared, touch-up coating repairs completed, and a cosmetic overcoat applied using the specified coating system on all existing coated surfaces associated with the demolition work, unless otherwise specified.
 - e. Existing coatings on immersed equipment shall be removed to bare metal and recoated with the specified coating system where demolition work was specified.
 - f. Apply sealer/primer where recommended by coating manufacturer for coating compatibility.
2. To be Recoated or Final Coated:
 - a. Detergent wash and freshwater rinse.
 - b. Perform touch-up repairs of existing coating.
 - c. Asphaltic varnish coated ductile iron pipe will require an application of a seal coat prior to the application of a cosmetic finish coat.
 3. Touch-up Repairs:
 - a. Clean loose, abraded, or damaged coatings to substrate by Power Tool (SP 3).
 - b. Feather surrounding intact coating.
 - c. Apply one spot coat of the specified primer to bare areas overlapping the prepared existing coating.
 - d. Apply one full finish coat of the specified primer or finish coat(s) overall.
 4. Application of a Cosmetic Coat:
 - a. The exact nature of shop-applied coatings is not known in all cases.
 - b. Check compatibility by application to a small area prior to starting the coating.
 - c. If lifting or other problems occur, request disposition from the Engineer.
 - d. Cured epoxy, polyurethane, plural component materials or any other coating system that has exceeded its maximum recoat window shall be prepared as specified this section.
- H. Damaged Coatings, Pinholes, and Holidays:
1. Feather edges and repaired in accordance with the recommendations of the paint manufacturer.
 2. Repair fusion bonded coatings to be as recommended by the original applicator. Applicator shall provide liquid repair kits for this purpose as recommended by the coating manufacturer.
 3. Apply finish coats, including touchup and damage-repair coats in a manner that will present a uniform texture and color-matched appearance.
- I. Unsatisfactory Application:
1. If the item has an improper finish color, or insufficient film thickness, clean and topcoat surface with specified paint material to obtain the specified color and coverage. Obtain specific surface preparation information from the coating manufacturer.
 2. Hand or power sand visible areas of chipped, peeled, or abraded paint and feather the edges. Follow with primer and finish coat in accordance with the Specifications. Depending on the extent of repair and its appearance, a finish sanding and topcoat may be required.
 3. Evidence of runs, bridges, shiners, laps, or other imperfections shall be cause for rejection.

4. Repair defects in coating system per written recommendations of coating manufacturer.
5. Leave all staging up until the Engineer has inspected the surface or coating. Replace staging removed prior to approval by Engineer.

3.11 COATING INSPECTION

A. General

1. Film thickness measurements and electrical inspection of the coated surfaces:
2. Perform with properly calibrated instruments.
3. Recoat and repair as necessary for compliance with the Specifications.
4. All coats will be subject to inspection by the Engineer and the coating manufacturer's representative.
5. Visually inspect concrete, nonferrous metal, plastic, and wood surfaces to ensure proper and complete coverage has been attained.
6. Give particular attention to edges, angles, flanges, and other areas where insufficient film thicknesses are likely to be present and ensure proper milage in these areas.

B. Coating Thickness Testing:

1. Engineer shall conduct coating thickness testing as necessary and without limitation. Testing conformance to the requirements of SSPC PA-2 is specifically excluded from this specification.
2. Measure coating thickness specified in mils with a magnetic type dry film thickness gauge as specified.
3. Check each coat for the correct milage. Do not make measurement before a minimum of 8 hours after application of the coating.
4. Tests for concrete coating thickness shall be with a Tooke Gauge, a destructive test. Contractor shall repair coating after thickness testing.

C. Coating Continuity Testing

1. Holiday detect coatings with high voltage units in accordance with NACE RP0188. High voltage detector shall have adjustable voltages in 100-volt increments and shall be operated in accordance with the manufacturer's instructions and the specified standard.
2. Use of an electrical holiday detector, low voltage, wet sponge type holiday detector will be permitted for coating systems less than 20 mils total dry film thickness and are not for immersion or condensing environments.
3. Holiday detect coatings on pipe for buried application with high voltage spark tester in accordance with NACE RP0274.

3.12 CLEANUP

- A. Place cloths and waste that might constitute a fire hazard in closed metal containers or destroyed at the end of each day.
- B. Upon completion of the work, remove staging, scaffolding, and containers from the site or destroyed in a legal manner.
- C. Completely remove paint spots, oil, or stains upon adjacent surfaces and floors and leave entire job clean.

- D. Damages due to over spray on buildings, vehicles, trees, or other surfaces not specified to be painted would be the responsibility of the Contractor.

3.13 MANUFACTURER' SERVICES

- A. Furnish paint manufacturer's representative to visit jobsite at intervals during surface preparation and painting as may be required for product application quality assurance, and to determine compliance with manufacturer's instructions and these specifications, and as may be necessary to resolve field problems attributable to, or associated with, manufacturer's products furnished under this Contract.

3.14 PROTECTIVE COATING SYSTEMS AND APPLICATION SCHEDULE:

- A. Unless otherwise shown or specified in these Specifications painted or coated the work in accordance with the following application schedule.
- B. In the event of discrepancies or omissions in the following, request clarification from the Engineer before starting the work in question.

System No.	Title
1	SUBMERGED METAL - IMMERSION
4	EXPOSED METAL – HIGHLY CORROSIVE
5	EXPOSED METAL – ATMOSPHERIC
8	BURIED METAL - MISCELLANEOUS
10	GALVANIZED METAL
21	EPOXY FLOOR, CONCRETE
27	ALUMINUM AND DISSIMILAR METAL INSULATION
29	FUSION BONDED COATING

- C. System No. 1 - Submerge Metal, Immersion

1. Surface Preparation and Coating System

Surface Prep.	Coating Material	Min. Coats, Cover
Abrasive Blast, or Centrifugal Wheel Blast (SP 5) Cement Mortar Prep: see Interior Linings, this section	Epoxy, NSF	3 coats, 16 MDFT

- 2. Application:
 - a. All metal surfaces subject to immersion or contact with potable water.
 - b. Use on the following areas:
- 3. Material Requirements:

- a. Polyamide Epoxy: Amine or polyamine epoxy coating, two parts, suitable for immersion, application temperatures, and environmental exposures and conditions, 75% volume solids minimum, capable of 4 to 8 MDFT per coat.
 - b. Epoxy coating shall be NSF certified for potable water contact in conformance to ANSI/NSF Standard 60 and 61.
4. Special Requirements:
- a. Epoxy coating applied to immersed surfaces that contact potable water shall be NSF certified for potable water contact.
 - b. NSF certified fusion bonded epoxy linings will be permitted as alternative lining for small diameter pipes, valves, and couplings. FBE coating to be applied as specified for FBE coatings this section and in accordance with the manufacturers recommendations.
 - c. All welds, angles, edges, and bolted connections shall be stripe coated as specified this section.

D. System No. 4 - Exposed Metal, Highly Corrosive

1. Surface Preparation and Coating System

Surface Prep.	Coating Material	Min. Coats, Cover
Abrasive Blast, or Centrifugal Wheel Blast (SP 10)	Inorganic Zinc Rich Primer	1 coat, 3.0 to 4.0 DFT
	Epoxy	1 coat, 4 MDFT
	Polyurethane Enamel	2 coats, 6 to 8 DFT
	Or Polysiloxane	2 coats, 4 to 6 DFT

2. Application:
- a. All exposed metal surfaces, new and existing, located inside of vaults or structures.
 - b. Contractor choice of topcoat material shall not be changed. Only one topcoat materials will be permitted on the project.
3. Special Requirements:
- a. Surface preparation and primer shall be shop applied to all surfaces prior to installation.
 - b. DFT thicknesses greater than manufacturer's recommendations shall be subject to rejection and removal.
 - c. Intermediate and topcoats shall be field applied after installation.
 - d. All shop primed or finish coated surfaces shall be prepared as an existing coated surface as specified herein and shall be top coated with intermediate and/or finish coats as required to provide color uniformity throughout the vault or structure.
 - e. Color uniformity requirements shall apply to all components installed within the vault and visibly part of completed installation regardless of shop applied coating system.

B. System No. 5 - Exposed Metal, Atmospheric:

1. Surface Preparation and Coating System

Surface Prep.	Paint Material	Min. Coats, Cover
Abrasive Blast, or Centrifugal Wheel Blast (SP 10)	Inorganic Zinc Rich Primer	1 coat, 2.5 MDFT
	Polysiloxane	2 coats, 6 MDFT

2. Application:
 - a. Exposed metal surfaces, new and existing, located outside of structures and exposed to weather and the following specific surfaces unless otherwise specified.
 - b. Use on the following items or surfaces:
 - (1) Exposed surfaces of blowoff piping, unless hot dipped galvanized
 - (2) Exposed surfaces of air vent piping, unless hot dipped galvanized.
 - (3) Hollow metal doors per architectural drawings.
3. Special Requirements:
 - a. All shop primed or finish coated surfaces shall be prepared as an existing coated surface as specified herein and shall be top coated with intermediate and/or finish coats as required to provide color uniformity.
 - b. Color uniformity requirements shall apply to all components visibly part of the completed installation regardless of shop applied coating system.
 - c. Galvanized steel surfaces shall be coated per the coating manufacturer's requirements.
 - d. Polysiloxane coating to overlap buried pipe coating a minimum of 4 inches below top of concrete.
 - e. Aliphatic polyurethane will not be allowed as a substitute for polysiloxane due to restrictive overcoat requirements.
 - f. Dry film coating thickness of polysiloxane, including touch up repairs, shall not exceed the manufacturer's recommended maximum film thickness.

C. System No. 8 - Buried Metal, General:

1. Surface Preparation and Coating System

Surface Prep.	Paint Material	Min. Coats, Cover
Abrasive Blast or Centrifugal Wheel Blast (SP 10)	Wax Tape Coating	Wax tape as specified in Section 09 90 10, Pipeline Coating and Lining

2. Application:
 - a. All buried miscellaneous pipe, joints, fittings, and other pipe appurtenances shall be coated as specified under Section 09 97 10, Pipeline Coatings and Linings.
 - b. All buried, below grade portions of steel items, except buried stainless steel or ductile iron, unless otherwise specified.
3. Special Requirements:
 - a. Metallic air vent pipe, buried, may be coated with System No. 1 at Contractor's option.

D. System No. 10 - Galvanized Metal Conditioning:

1. Surface Preparation and Coating System

Surface Prep.	Paint Material	Min. Coats, Cover
Solvent Clean (SP 1) Followed by Hand Tool (SP 2) or Power Tool (SP 3)	Wash Primer Finish Coats to Match Existing Paint	1 Coat, 0.4 MDFT As Required to Match Surrounding Area

2. Application:

- a. All galvanized surfaces requiring painting and the following specific surfaces unless otherwise specified.

3. Special Requirements:

- a. Sweep blast as specified this section, may be used in lieu of hand or power tool cleaning of galvanized surfaces provided Contractor can demonstrate that damage to the zinc coating will not result. Engineer approval of sweep blasting locations, methods, and surface cleanliness and profile results is required.
- b. See applicable coating systems for finish coating system and coating requirements based on area and/or surface to be coated.

E. System No. 21 Epoxy Floor, Concrete:

1. Surface Preparation and Coating System

Surface Prep.	Paint Materials	Min. Coats, Cover
Concrete	Epoxy	1 st coat (thinned) 2 coats (unthinned) Total system 80 SFPG

2. Application:

- a. Use on the following areas:
 - (1) All areas as shown on the Drawings or specified to receive, epoxy floor coating, concrete.

3. Special Requirements:

- a. Epoxy coating to be applied a minimum of 6-inches onto walls, pipe supports, and any other metallic component attached to the floor or wall within the 6-inch limit.
- b. All areas above the 6-inch limit shall be masked, provide a straight-line demarking coated versus uncoated areas.
- c. Abrasively blast miscellaneous metal surfaces to an SSPC SP-10, near white blast, as specified this section.
- d. Prime coat of epoxy shall be a thinned coat of the epoxy coating to fill and seal the concrete before the final coats applied, per the coating manufacturer's requirements.
- e. Apply non-skid aggregate between coats where specified or shown.

A. System No. 27 Aluminum and Dissimilar Metal Insulation:

1. Surface Preparation and Coating System

Surface Prep.	Paint Material	Min. Coats, Cover
Solvent Clean (SP 1)	Wash Primer	1 coat, 0.4 MDFT
	Epoxy	1 coat, 8 MDFT

2. Application:

- a. Use on all non-submerged concrete embedded aluminum surfaces, and the following specific surfaces unless otherwise specified.
- b. Use on the following surfaces:
 - (1) All concrete embedded components of vault hatches
 - (2) All concrete embedded surfaces where electrical isolation from concrete reinforcement is required.

B. System No. 29 Fusion Bonded Coating:

1. Surface Preparation and Coating System

Surface Prep.	Paint Material	Min. Coats, Cover
Abrasive Blast, or Centrifugal Wheel Blast (SP 10) or Acid Pickling (SP 8)	Fusion Bonded 100% solids Epoxy or Polyurethane	1 or 2 coats, 10 MDFT

2. Application:

- a. Use where specified.
- b. Use on the following items or surfaces:
 - (1) Concrete embedded anchor bolts, except threads.
 - (2) Removable handrail sleeves.

3. Special Requirements:

- a. System 1 may be used as alternative coating system at Contractor's option

(See PSDS form following this section)

PAINT SYSTEM DATA SHEET

Attached products' Technical Data Sheet (if applicable) to this sheet for each paint system submittal.

Paint System Number (from spec.):		
Paint System Title (from spec.):		
Coatings Manufacturer:		
Representative:		
Surface Preparation:		
Paint Material (Generic)	Product Name/Number Proprietary)	Min. Coats, Coverage

Additional Information Required (check applicable items):

- ANSI/NSF Certification letter for each paint material listed above requiring ANSI/NSF Standard 60 and 61 approvals.
- Manufacturer's minimum and maximum recommended coating thickness per coat and for total coating system.
- Immersion coating cure requirements from minimum coating application temperature to 100 degrees in 15-degree temperature increments.

SECTION 41 22 00
ADDENDUM NO. 2 - HOIST AND CRANES, GENERAL

PART 1 - GENERAL

1.1 THE REQUIREMENT

- A. The Contractor shall provide the hoisting equipment, ancillary steel, and appurtenances, complete and operable, in accordance with the Contract Documents.
- B. The requirements of this Section apply to all hoists and cranes unless indicated otherwise.

1.2 REFERENCE STANDARDS

A. Commercial Standards

AISC	Specifications for the Design, Fabrication, and Erection of Structural Steel for Building
AGMA	American Gear Manufacturer's Association
ANSI B30.11	Overhead and Gantry Cranes
ANSI MH 27.1	Underhung Crane and Monorail Systems
ASTM A 36	Carbon Structural Steel
CMA	Crane Manufacturer's Association of America
NEMA	National Electrical Manufacturer's Association

1.3 CONTRACTOR SUBMITTALS

- A. Furnish submittals in accordance with Section 01 33 00 – Contractor Submittals.
- B. Shop Drawings shall include all electrical requirements, weights, wheel loads, dimensions, and clearances required.
- C. Technical Manuals: Include complete operating and maintenance instructions of the hoist and crane systems.

1.4 QUALITY ASSURANCE

- A. **Inspection and Testing Requirements: After erection, the Contractor shall inspect and test all hoists and crane systems per specification 41 22 13.**
- B. Acceptance Criteria and Tolerances: The Engineer reserves the right to reject any equipment not conforming to the tolerances, deflections, and lateral stiffness indicated.

1.5 MANUFACTURER'S SERVICES

A. As per specification 41 22 13.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Equipment of similar design shall be from the same manufacturer.
- B. The load capacity of each hoist and trolley shall be permanently marked in a conspicuous manner on the equipment.
- C. All hooks shall be safety type with latch.
- D. Motors: Motors shall comply with the requirements of Section 41 22 13.
- E. The Contractor shall verify all dimensions and clearances in the field prior to erection and shall be responsible for the proper fitting and operation of the equipment.

2.2 BASIC MATERIALS

- A. Materials used must be new and of the best commercial grade. Where materials are not indicated, the Contractor shall have the manufacturer use the most suitable selection for the given application and environment.

2.3 PLANT FABRICATED ITEMS

- A. Fabrication, assembly, and welding shall be carried out by factory-trained specialists and certified welders.

~~2.4 TOOLS AND SPARE PARTS~~

- ~~A. Tools: The Contractor shall supply one complete set of special wrenches or other special tools necessary for the assembly, adjustment, and dismantling of the equipment. All tools shall be of best quality and furnished in labeled tool boxes of suitable design.~~
- ~~B. Spare Parts: Furnish spare parts as required by the hoist or crane section. Parts shall be properly labeled and identified with the name and number of the equipment to which they belong.~~

PART 3 - - EXECUTION

3.1 INSTALLATION

- A. Hoist and crane equipment shall be installed in strict accordance with the manufacturer's printed instructions.

- B. Workmanship shall be in accordance with the referenced standards and codes.
- C. Care shall be taken that the structural integrity of beams, columns, walls, floors, and roofs will be maintained at all times.

3.2 USE OF HOISTS AND CRANES BY CONTRACTOR

- A. Hoists and cranes shall only be used in construction work if specifically allowed throughout written request of the Owner. If such use is permitted, the Contractor shall be responsible for obtaining any and all permits or certifications for hoist and crane operation. The Contractor shall also be responsible for maintaining hoist and crane equipment in new conditions, and shall promptly repair any damage or wear to the Owner's satisfaction.

3.3 FIELD TESTING

- A. After completion of the Work, the Contractor shall test all hoist and crane equipment in accordance with specification 41 22 13.
- ~~B. The Contractor shall have the hoist or crane manufacturer furnish the services of a trained, qualified representative for at least one day after the units are installed, for the purpose of inspecting the installation and instructing the Owner's operating personnel.~~
- ~~C. Testing shall be in accordance with CMAA and OSHA requirements.~~

3.4 PROTECTIVE COATINGS

- A. Coat per Section 41 22 13.

END OF SECTION

THIS PAGE INTENTIONALLY BLANK

SECTION 41 22 13
ADDENDUM NO. 2 - BRIDGE CRANES

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor shall provide electrically-operated bridge crane system(s) complete and operable, in accordance with the Contract Documents.
- B. The requirements of Section 11 00 00 - Equipment General and Section 41 22 00 – Hoists and Cranes, General provisions apply to the WORK of this Section.
- C. Contractor shall field verify all dimensions in the field prior to fabrication of the bridge crane or any components.

1.2 CONTRACTOR SUBMITTALS

- A. Furnish shop drawings and technical manuals per Section 01 33 00 – Contractor Submittals and Section 41 22 00 – Cranes & Hoists, General.
- B. Design Calculations: The Contractor shall submit complete design calculations for the crane, runway beams, rails, end stops and other appurtenances that conform to this specification and to the following:
 - 1. Appropriate portions of the IBC and the AISC Manual of Steel Construction.
 - 2. Paragraph “Design Criteria” of this Specification.
 - 3. Design: Cranes including runway beams, rails and end stops shall be designed to meet the design as specified in Section 11 00 00 – Equipment General Provisions and the IBC-2006 Standards when the crane is fully loaded.
 - 4. Design calculations shall be stamped by a licensed professional engineer in the state of Utah. Design calculations shall show sufficient information to allow the Engineer to review conformance with the Specifications.

1.3 QUALITY ASSURANCE

- A. Testing and acceptance criteria shall be required as outlined in this section.
- B. Warranty. The manufacturer shall provide standard one year warranty with each bridge crane supplied to this project.

PART 2 - PRODUCTS

2.1 GENERAL

- A. The bridge crane system(s) shall be of low headroom type, equipped for electronic lift and travel in both directions and shall be mounted on either standard hot rolled shapes or specially fabricated steel sections per AISC standards. The bridge deflection shall be not exceed **1/600** of the bridge span or no greater than 1 ¼”, whichever is less.

- B. Overhead bridge cranes shall be the product of a sole manufacturer and shall comply with all Crane Manufacturer's Association of America (CMAA) standards.
- C. The runway rails shall be a standard hot rolled shape as per AISC standards, or specially fabricated steel sections, firmly anchored to the structure in accordance with AISC design manual recommendations. The maximum deflection shall not exceed 1/600 of the span, or 1-1/4 inches, whichever is less. The completed crane system(s) shall be the product of one crane manufacturer regularly engaged in the manufacture of such equipment.

2.2 DESIGN CRITERIA

A. Site Conditions

Equipment Number	Location	Atmosphere
CR-1	Well House	Indoors

B. The bridge crane system shall have the following capacities and dimensions:

Equipment No.	Crane Type	Bridge Type	Capacity, Ton	Min Lift, ft	Controller Type
CR-1	top running	Single Girder	2	11'-0"	Pendent

Equipment No.	Max Hoist Speed, fpm	Max Trolley Speed, fpm	Max Bridge Speed, fpm	Max Trolley Motor, hp	Max Bridge Motor, hp(Qty)
CR-1	20	50	100	3	1(2)

2.3 FABRICATION

- A. Power: Bridge Crane shall be designed to accommodate a 208V-3ph-60Hz power supply. The power supply shall be from enclosed, UL-approved conductor bar systems.
- B. Hook and Wire Rope: The lifting hook shall be of drop-forged, heat-treated steel with a 360 degree swivel on a shielded roller thrust bearing with safety spring latch. The wire ropes shall be improved plow steel with steel center complete with swaged fittings.
- C. Hoist and Drive: The hoisting drum shall be a large diameter, deep-grooved and flanged drum with at least 2 full turns of rope to remain on the drum at the lowest hook position, with heavy-duty, pre-lubricated sealed bearings. The hoisting controls shall be 2-speed magnetic type. The drum shall be driven by a helical gear reducer with external spur drum gear enclosed in an oil-tight housing. The housing motor shall be a standard, 30 minute duty-motor, 1750 rpm, with suitable NEMA type shaft extension. The hoisting mechanism shall be provided with dc magnet-actuated disc motor brake with hook drift. The motor shall be rated with minimum of 150 percent of full load torque, with gravity type upper and lower hook limit switch and an overload cut off switch to interrupt the raising circuit.
- D. Trolley Assembly: The trolley assembly shall be situated to avoid conflicts with head room and hook heights as shown in the drawings and framed by a structural shape welded into a stable assembly for proper wheel and bearing alignment. The trolley assembly shall be supported by trolley wheels of tread surfaces hardened to a minimum of 300 Brinell. The tread shall be tapered to provide suitable running alignment for trolley. Each wheel shall be

supported on tapered roller bearings suitable to take radial and thrust loads. The wheel mounting shall be designed so that axles and wheels can be removed without disturbing other truck elements of their alignment. The wheel tread shall be smooth, true, and uniform within 0.010-inch tread diameter on all wheels.

- E. The trolley shall be driven by a 30 minute-duty cycle rated motor, through an oil-tight gear reducer conforming to NEMA specifications. The motor shall be provided with cushion start and controller for smooth travel and load control. The driver shall provide synchronous drive from gear reducer to both drive wheels. The trolley drive shall be provided with integrally mounted spring set and an electrically-released drag brake.
- F. Crane Bridge Assembly: The crane bridge assembly shall be a single beam top-riding, electrically driven, dual motor type. The bridge beam shall be designed in accordance with the latest specifications of the Crane Manufacturers Association of America. It shall be fabricated of standard structural shape per AISC Specifications. At full load, the beam shall be designed to limit the deflection to 1/600 of the span, but not to exceed 1-1/4-inch maximum deflection. Provision shall be made to prevent creeping of bridge rails by means of positive stops at the ends of the rails. ~~Crane shall be reinforced with outriggers to provide squareness with end trucks, adequate lateral stiffness with a minimum lateral moment of inertia of 1/20 that of the vertical beam moment of inertia. Outriggers shall furnish support for squaring shaft and the crane drive motor and gear reducer assembly.~~
- G. End Trucks: The end trucks shall be traversed by stable assembly of structural shapes welded together to provide proper wheel and bearing alignment. The end truck wheel base shall be a minimum of 1/8 of the crane span. One wheel of each end truck shall be driven with rotating axles. The crane and trucks shall be constructed to maintain alignment and distribute truck loads on inner and outer truck members. Each truck shall be designed such that, in the event of a wheel axle or wheel failure, the drop of the load will be no greater than one-inch. The end trucks shall be fastened to the bridge beams with bolts to ensure proper alignment during assembly.
- H. Crane Wheels: Crane wheels shall be box type and have tread surfaces hardened to a minimum of 300 Brinell. Treads shall be tapered to provide suitable running alignment for crane. The wheels shall be lubricated at the factory and provided with a suitable reservoir of lubricant to eliminate the need for field lubrication. Wheel treads shall be smooth, true, and uniform within 0.01-inch tread diameter on all wheels.
- I. Crane Drive: The crane drive motor shall be totally enclosed, 30 minute cycle rated. The motor shall be integral with a fully enclosed oil splash lubricated gear reduction. The crane drive shall include integrally-mounted spring set electrically-released dc rectified disc brake.
- J. ~~Drive Shaft: The drive shaft of the crane shall be supported on lubricated, precision, ball-bearing pillow blocks based on 10 ft maximum centers. These pillow blocks shall be lubricated through pressure grease fittings. The crane drive shaft shall be steel and designed to limit torsional shaft stress to 6,000 psi. Maximum torsional twist angle in the drive shaft shall not exceed one degree of the wheel rotation under maximum rated load, regardless of load location.~~

- K. Bearing Life: Bearings in the crane wheels, those supporting the drive shafts, and the gear reduction shafts, shall be designed for 5,000 hrs L-10 bearing life minimum.
- L. Gearing: Gears shall be cut from solid blanks with 20-degree pressure angle involute shape for high strength and shall comply with AGMA specifications for load ratings. All gears operating at higher than 20 fpm pitch line speed shall be fully enclosed in oil-tight housings and lubricated by splash principle.
- M. Bridge Stops: Each bridge shall be provided with bumpers capable of stopping the crane (not including the lifted load) at a rate of deceleration not to exceed 3 fps when traveling in either direction at 20 percent of rated speed. The bumpers shall have sufficient energy absorbing capacity to stop the crane when traveling at a speed of at least 40 percent of the rated load speed. Bridge trucks shall be equipped with sweeps which extend below the top of the rail and project in front of the crane wheel.
 - 1. ~~Bridge stops for bridge cranes located in the Membrane Tank Galleries (CR-01-08-70-01 and CR-01-08-70-03) shall be located in the CMU exterior wall to allow full bridge crane travel. Runway beams and rails shall extend into, but not through, exterior CMU walls.~~
- N. Runway Beams and Rails: The runway beams and rails shall be provided as indicated. The rails shall be an ASCE type securely fastened into the runway beams. The runway beams shall be designed from an ASTM A992 structural steel shape and shall have a maximum deflection not to exceed $1/600$ of the span. Necessary column supports or clamps, hanger rods, bolts, and fittings shall be provided as required to meet the requirements of this section and the drawings.

2.4 ELECTRICAL CONTROLS

- A. Electrical controls shall be two-speed or VFD as required for each equipment specified. Bridge control shall include a mainline magnetic contactor, manually-operated fused mainline disconnect with lock-out provisions, branch circuit fuses, reversing bridge control, and transformer with fused secondary. Bridge control shall be as specified.
 - 1. All bridge cranes specified with a pendant controller shall be equipped with an integral strain relief. Each pendant shall be installed to be operated at 4 ft above operating floor.
- B. Electrical power and controls shall be in accordance with current NEC standards.
- C. ~~Conductor and Wiring: The runway shall be provided with enclosed conductor base electrification adequately supported as recommended by the manufacturer. The bridge shall have a rigid truck festoon type electrification. All other wiring of the crane shall be in rigid or flexible conduit and in accordance with National Electrical Code and complying with Fire Underwriters specifications. When a crane is shipped knocked down, the wiring shall terminate in approved terminal boxes and the wire end shall be provided with permanent marking tags.~~
- D. Controller for the pendant shall be equipped with 2 pushbuttons for each motion, 6 total push buttons.

2.5 SPARE PARTS

- A. The following shall be provided with each overhead bridge crane:
1. None

2.6 MANUFACTURERS, OR EQUAL

- A. The following manufacturers, or equal, are acceptable:
1. American Equipment
 2. HOJ Engineering & Sales Co., Inc.
 3. Over Head Crane
 4. R&M Material Handling

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Bridge crane equipment shall be installed in strict conformance with the manufacturer's published or written instructions. Cranes shall be factory assembled and given a no-load test. Major components of the system shall be marked at the factory to assure prompt and correct field identification.

3.2 FIELD TESTING

- A. After complete installation of the system, the bridge crane equipment shall be tested within a range of 100 percent to 125 percent above the rated capacity. Testing shall be performed in the presence of an authorized representative of the crane system manufacturer, and in the presence the Engineer and Owner.
- B. Load and slings shall be provided and removed when the tests are completed.
- C. Furnish the labor required to test the crane system. The equipment system shall be operated through a complete lift and lowering cycle, and through complete travel of the trolley, to determine that the equipment will perform the functions of hoisting, braking, and traveling quietly, smoothly, and safely.
- D. In the event the equipment fails to meet the above test, make necessary changes and retest the equipment. If the equipment remains unable to meet the test requirements, it shall be removed and replaced with satisfactory equipment at the expense of the Contractor.
- E. Correct all defects recorded during the above field tests.
- F. No crane equipment shall be used to handle any equipment until the load testing is completed and a certificate has been provided.

3.3 USE OF CRANE SYSTEM

- A. The contractor may use the overhead bridge cranes only in accordance with requirements of Section 41 22 00 – Hoists & Cranes, General.

3.4 PROTECTIVE COATINGS

- A. The bridge beam, runway beams, tracks, hoist and trolley system shall be painted with standard industrial enamel as provided by the manufacturer. Do not paint the running surfaces of the track.

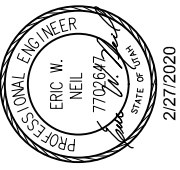
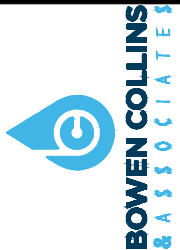
3.5 SERVICES OF MANUFACTURER

- A. Inspection, Startup, and Field Adjustment: An approved representative of the manufacturer shall be present at the Site to furnish the services required.
- B. Instruction of Owner's Personnel: A training representative of the manufacturer shall be present at the Site for a complete start-up and load test of the equipment and a complete Owner/operator training.
- ~~C. For the purposes of this section, a Day is defined as an eight (8) hour period at the Site, excluding travel time. All onsite work hours shall be coordinated with the OWNER and/or Contractor.~~
- ~~D. The Engineer may require that the inspection, startup, owner instruction and field adjustment services above be furnished in two separate trips.~~

END OF SECTION

GENERAL NOTES

- SYMBOLS FOR STRUCTURES, PIPE AND ETC. USED FOR IDENTIFICATION ARE SHOWN IN LEGENDS AND SHALL BE FOLLOWED THROUGHOUT THE PLANS WHENEVER APPLICABLE. NOT ALL OF THE VARIOUS COMPONENTS SHOWN IN THESE LEGENDS ARE NECESSARILY USED IN THE PROJECT.
- SCALE OF THE DRAWINGS OR DETAILS ARE SHOWN IN TITLE BLOCK OR DIRECTLY UNDER THE PLAN OR DETAIL. THE SIZE OF THE ORIGINAL PLOTTED DRAWINGS IS 22"x34". CARE SHOULD BE TAKEN TO VERIFY THE SCALE BAR IN THE TITLE BLOCK AREA TO DETERMINE THE SCALE OF REDUCED REPRODUCTIONS.
- IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO PERFORM CONSTRUCTION ACTIVITIES PER THE CONTRACT DOCUMENTS. ANY ADDITIONS, DELETIONS, OR MODIFICATIONS SHALL FIRST MEET WITH THE WRITTEN APPROVAL OF THE ENGINEER AND THE OWNER.
- CONTRACTOR SHALL OBTAIN ALL NECESSARY PERMIT(S) AND COMPLY WITH ALL REQUIREMENTS OF GOVERNING AGENCIES.
- THE CONTRACTOR SHALL PREPARE AND SUBMIT TRAFFIC CONTROL PLANS FOR REVIEW AND APPROVAL BY OGDEN CITY AND UDOT. WORK WILL NOT BEGIN UNTIL THE PLANS HAVE BEEN APPROVED.
- THE CONTRACTOR SHALL KEEP ALL CONSTRUCTION ACTIVITIES WITHIN THE ESTABLISHED RIGHTS-OF-WAY. THIS SHALL INCLUDE BUT NOT BE LIMITED TO, VEHICLES AND EQUIPMENT, LIMITS OF TRENCH EXCAVATION, AND EXCAVATED MATERIAL AND BACKFILL STORAGE. IF THE CONTRACTOR REQUIRES ADDITIONAL CONSTRUCTION EASEMENTS, IT SHALL BE SOLELY THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN SUCH EASEMENTS FROM INDIVIDUAL PROPERTY OWNERS.
- UTILITY LOCATIONS:
 - CONTRACTOR SHALL CONTACT BLUE STAKES TO LOCATE EXISTING UTILITIES.
 - ALL UTILITY LOCATIONS, SHOWN ON DRAWINGS, ARE APPROXIMATE AND ARE NOT INCLUSIVE OF ALL EXISTING UTILITIES.
 - CONTRACTOR TO VERIFY DEPTHS OF UTILITIES IN THE FIELD BY POT HOLING A MINIMUM OF TWO WEEKS TIME AHEAD OF PIPELINE CONSTRUCTION TO AVOID CONFLICTS WITH DESIGNED PIPELINE GRADE AND ALIGNMENT. IF A CONFLICT ARISES RESULTING FROM THE CONTRACTOR NEGLECTING TO POT HOLE UTILITIES, THE CONTRACTOR TO RESOLVE THE CONFLICT WITHOUT ADDITIONAL COST OR CLAIM TO THE OWNER.
 - CONTRACTOR SHALL POT HOLE CRITICAL LOCATIONS AND OBTAIN ALL EXISTING PIPE O.D. PRIOR TO ORDERING OR OBTAINING MATERIALS REQUIRED FOR CONNECTIONS TO EXISTING PIPING. UTILITY SHUT-DOWNS AND OTHER WORK WILL NOT BE SCHEDULED OR ALLOWED UNTIL THIS IS ACCOMPLISHED AND MATERIALS ARE ON SITE AND APPROVED FOR USE BY OGDEN CITY.
- THE CONTRACTOR SHALL TAKE ALL PRECAUTIONARY MEASURES NECESSARY TO PROTECT EXISTING IMPROVEMENTS FROM DAMAGE WHICH ARE TO REMAIN IN PLACE. ALL SUCH IMPROVEMENTS OR STRUCTURES DAMAGED BY THE CONTRACTORS OPERATIONS SHALL BE REPAIRED OR RECONSTRUCTED TO ORIGINAL OR BETTER CONDITION TO THE SATISFACTION OF THE OWNER AT THE EXPENSE OF THE CONTRACTOR.
- THE CONTRACTOR IS RESPONSIBLE FOR LOCATING SERVICE LINES FOR GAS, SEWER, WATER, AND OTHER UTILITIES AND REPAIRING DAMAGE TO SUCH LINES AS A RESULT OF THE CONTRACTOR'S OPERATIONS. SERVICE CONNECTIONS FOR UTILITIES ARE NOT SHOWN ON THE DRAWINGS.
- CONTRACTOR IS SOLELY RESPONSIBLE FOR CONFORMANCE WITH LOCAL AND FEDERAL CODES GOVERNING SHORING AND BRACING OF EXCAVATIONS AND TRENCHES. CONTRACTOR IS RESPONSIBLE FOR THE SAFETY OF THE PUBLIC AND PROTECTION OF PERSONNEL AND WORKERS.
- IF THE CONTRACTOR CHOOSES TO WORK ON THE PROJECT WHEN HOT MIX ASPHALT IS NOT AVAILABLE, THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE GOVERNING AGENCY PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL FURNISH AND INSTALL TEMPORARY ASPHALT SURFACING MATERIAL. WHEN PERMANENT ASPHALT BECOMES AVAILABLE, THE CONTRACTOR SHALL REMOVE THE TEMPORARY ASPHALT, FURNISH AND INSTALL THE PERMANENT ASPHALT AT NO ADDITIONAL COST TO THE OWNER.
- CONTRACTOR SHALL NOT DESTROY, REMOVE, OR DISTURB ANY EXISTING SURVEY MONUMENTS WITHOUT AUTHORIZATION OF CONTROLLING AGENCY. NO PAVEMENT CUTTING OR REMOVAL SHALL BEGIN UNTIL ALL SURVEY MARKERS OR MONUMENT POINTS THAT HAVE THE POTENTIAL OF BEING DISTURBED BY THE CONSTRUCTION OPERATIONS HAVE BEEN PROPERLY REFERENCED BY A REGISTERED LAND SURVEYOR. ALL SURVEY MONUMENTS OR POINTS DISTURBED BY THE CONTRACTOR SHALL BE ACCURATELY RESET BY A REGISTERED LAND SURVEYOR AFTER ALL RESTORATION AND RESURFACING HAS BEEN COMPLETED.
- TRENCHING OPERATIONS SHALL BE PERFORMED SO AS TO PROTECT THE EXISTING CURB AND GUTTER. DAMAGED CURB AND GUTTER SHALL BE REPLACED TO MATCH EXISTING AT THE CONTRACTOR'S EXPENSE PER APWA STANDARDS FOR OGDEN CITY AND PER UDOT STANDARDS IN UDOT RIGHTS-OF-WAY. TRENCH SUPPORTS AND DEWATERING (NOTE 14) SHALL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR. MAXIMUM OPEN TRENCH DURING WORKING HOURS SHALL BE 300 FEET. ALL TRENCHES SHALL BE BACKFILLED AND/OR PLATED DURING NON-WORKING HOURS, PER EXCAVATION PERMIT REQUIREMENTS.
- DEWATERING: GROUND WATER AND SURFACE WATER CONTROL SHALL BE PERFORMED AND RESPONSIBLY HANDLED BY THE CONTRACTOR ACCORDING TO, AND IN COMPLIANCE WITH, ALL LOCAL GOVERNING AUTHORITIES. HEAVY GROUND WATER AND/OR SURFACE WATER PUMPING MAY BE REQUIRED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE POTENTIAL PUMPING NEEDS. THE CONTRACTOR SHALL NOT RELY ON OWNER SUPPLIED PROCTOR, GROUND WATER AND/OR SURFACE WATER DATA. CONTRACTOR SHALL OBTAIN DEWATERING PERMIT AS NECESSARY.
- AERIAL PHOTOS IN DRAWINGS: THE AERIAL PHOTOS PROVIDED AS BACKGROUND IN THESE DRAWINGS ARE PROVIDED TO HELP CLARIFY THE WORK SITE. HOWEVER, THE PHOTOS DEPICT CONDITIONS AS THEY EXISTED IN 2017. PRESENT DAY CONDITIONS MAY VARY FROM THOSE SHOWN. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS PRIOR TO BIDDING. BID SHALL INCLUDE ALL WORK REQUIRED TO COMPLETE THE PROJECT.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CORRECTING ANY SETTLEMENT OF EXCAVATIONS, AND ANY DAMAGE OF UTILITIES RESULTING FROM SETTLEMENT.
- CONTRACTOR SHALL PREVENT ANY GROUND WATER OR DEBRIS FROM ENTERING NEW PIPES DURING CONSTRUCTION. THE ENDS OF THE PIPES SHALL BE SEALED AT THE END OF EACH WORKDAY.
- PROFILE DRAWINGS ARE HORIZONTAL PROJECTIONS OF THE PIPELINE CENTERLINE, UNLESS OTHERWISE NOTED.
- LAY PIPE TO DEPTH AND ALONG HORIZONTAL ALIGNMENT AS DEFINED IN THESE DRAWINGS. CONTRACTOR SHALL NOT DEVIATE FROM PROPOSED ALIGNMENT OR GRADE WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER. AVOID HIGH AND LOW POINTS EXCEPT WHERE DESIGNED.
- CONTRACTOR SHALL SALVAGE ALL REMOVED COPPER PIPE AND HYDRANTS AND PROVIDE THEM TO OGDEN CITY, UNLESS NOTED OTHERWISE.
- CONTRACTOR SHALL BACKFILL TRENCH AREAS WHERE NEW WATERLINES CROSS UNDER EXISTING BURIED UTILITIES WITH FLOWABLE FILL (SOIL CEMENT BACKFILL) IN ACCORDANCE WITH APWA STANDARDS, IF STANDARD MECHANICAL COMPACTION CANNOT BE OBTAINED USING MECHANICAL METHODS. WATER LINES ARE NOT ALLOWED TO BE BURIED BELOW SEWER LINES UNLESS AN EXCEPTION HAS BEEN GRANTED BY THE DIVISION OF DRINKING WATER PRIOR TO CONSTRUCTION.
- ALL BURIED REBAR, FITTINGS, COUPLINGS, VALVES AND MECHANICAL JOINT NUTS AND BOLTS ARE TO BE COATED WITH NON OXIDE GREASE CHEVRON FM 2 OR APPROVED EQUAL, COVERED WITH 8 MIL POLYETHYLENE SHEETING, AND TAPE WRAPPED.
- CONTRACTOR SHALL MAINTAIN A 10-FOOT HORIZONTAL AND AN 18-INCH VERTICAL SEPARATION (OUTSIDE OF PIPE TO OUTSIDE OF PIPE/MANHOLE) BETWEEN ALL SEWER AND WATER LINES. WATER LINES ARE NOT ALLOWED TO BE BURIED BELOW SEWER LINES UNLESS AN EXCEPTION HAS BEEN GRANTED BY THE DIVISION OF DRINKING WATER PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL RESTORE OR REPLACE ANY SPRINKLING SYSTEMS AND LANDSCAPING DAMAGED DURING CONSTRUCTION TO EQUAL OR BETTER CONDITION THAN WHAT EXISTED PRIOR TO CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
- UNLESS NOTED OTHERWISE, ALL WATER MAIN SHALL BE 14-INCH DUCTILE IRON CLASS 350 PIPE. SIZE OF FITTINGS SHOWN ON THE PLANS SHALL CORRESPOND TO ADJACENT STRAIGHT RUN OF PIPE, AND SHALL BE DUCTILE IRON FITTINGS.
- CONTRACTOR SHALL PROTECT ADJACENT PRESSURE PIPELINES AND PROVIDE TEMPORARY THRUST RESTRAINT AS NECESSARY DURING CONSTRUCTION INCLUDING EXISTING VALVES, TEES, BENDS, ETC.. ALL NEW PRESSURE PIPE AND FITTINGS SHALL HAVE THRUST RESTRAINED JOINTS, THRUST BLOCKS, THRUST TIES OR OTHER APPROVED THRUST RESTRAINT. THRUST PROTECTION SHALL BE ADEQUATE FOR THE TEST PRESSURE SPECIFIED.
- ALL FITTINGS REQUIRED FOR THE COMPLETION OF THE WORK ARE NOT SHOWN IN THE DRAWINGS. MAXIMUM PIPE JOINT DEFLECTION SHALL BE 1-DEGREE. ADDITIONAL FITTINGS REQUIRED TO MAINTAIN THE ALIGNMENT SHOWN IN THE PLANS SHALL BE PROVIDED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
- MINIMUM DEPTH OF NEW PIPE: 4 FEET TO TOP OF PIPE UNLESS OTHERWISE NOTED.
- COORDINATE CONNECTION OF EXISTING WATER MAINS WITH OGDEN CITY.
 - OPERATION OF ALL EXISTING MAIN LINE VALVES TO BE COORDINATED THROUGH OGDEN CITY 48-HOURS IN ADVANCE OF SHUTDOWN. CONNECTIONS TO SOME WATERLINES SERVING COMMERCIAL AREAS MAY REQUIRE NIGHT OR WEEKEND SHUTDOWNS. CONTRACTOR TO PERFORM NIGHT OR WEEKEND WORK IN THESE AREAS AT NO ADDITIONAL COST TO OWNER.
 - OGDEN CITY DOES NOT GUARANTEE WATER SHUT-DOWNS. CONTRACTOR TO DEVISE PLANS TO AVOID WORK STOPPAGES IN THE EVENT A SHUT-DOWN DOES NOT GO AS PLANNED
 - CONTRACTOR SHALL SUBMIT FOR REVIEW A SEQUENTIAL PLAN FOR CONNECTION, TESTING, AND FLUSHING OF ALL NEW WATER MAINS, HYDRANTS, AND SERVICE CONNECTIONS.
- CONTRACTOR SHALL PERFORM CHLORINATION TEST, PRESSURE TEST, AND BACTERIA TEST. ALL WATERLINES INSTALLED SHALL BE DISINFECTED IN ACCORDANCE WITH THE "AMERICAN WATER WORKS ASSOCIATION STANDARD FOR DISINFECTING WATER MAINS" (AWWA C651). ALL CHLORINATED WATER SHALL BE DISPOSED OF IN ACCORDANCE WITH THE REQUIREMENTS FOR SURFACE DISCHARGE AND COORDINATED WITH UTAH DIVISION OF WATER QUALITY AND OGDEN CITY.
- ASPHALT SHALL BE PG 58-28 ASPHALT IN ACCORDANCE WITH OGDEN CITY REQUIREMENTS. CONTRACTOR SHALL OBTAIN PERMITS FROM OGDEN CITY AND COMPLY WITH ALL REQUIREMENTS OF THE PERMITS.
- ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN A WORKMANLIKE AND SAFE MANNER AND IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND JOB-SITE RELATED CONSTRUCTION CONDITIONS AND REQUIREMENTS. OBTAIN PERMITS, INSPECTIONS AND APPROVALS AS REQUIRED BY JURISDICTIONAL AGENCIES AND PAY ALL ASSOCIATED FEES. CONTRACTOR AND INSTALLERS SHALL BE LICENSED AS REQUIRED BY STATE AND LOCAL JURISDICTIONS, AND BONDED AS DETERMINED BY PROJECT REQUIREMENTS.
- PRESSURE TEST ALL PIPELINES TO 180 PSI MINIMUM FOR TWO HOURS WITH ZERO LEAKAGE. IN THE CASE OF PIPELINES THAT FAIL TO PASS THE LEAKAGE TEST, THE CONTRACTOR SHALL DETERMINE THE CAUSE OF THE EXCESSIVE LEAKAGE, SHALL TAKE CORRECTIVE MEASURES NECESSARY TO REPAIR THE LEAKS, AND SHALL AGAIN TEST THE PIPELINES, ALL AT NO COST TO THE OWNER.
- WORKING PRESSURE FOR THE SYSTEM IS 120 PSI WITH TEST PRESSURE OF 180 PSI. ALL FLANGES, VALVES, FITTINGS, THRUST BLOCKS, ETC. SHALL BE RATED APPROPRIATELY.
- ALL PIPE, FITTINGS, AND VALVES SHALL BE NSF 61 COMPLIANT FOR CULINARY WATER USE.
- CONTRACTOR TO PROVIDE AND DISTRIBUTE APPROVED WRITTEN NOTICE OF CONSTRUCTION ACTIVITIES TO ALL RESIDENTS AND BUSINESSES LOCATED IN THE CONSTRUCTION AREA AT LEAST 48 HOURS PRIOR TO CONSTRUCTION. WRITTEN NOTICE SHALL BE APPROVED BY THE ENGINEER PRIOR TO DISTRIBUTION.
- CONTRACTOR SHALL PROVIDE AND UPDATE A CONSTRUCTION SCHEDULE FOR WORKING IN THE PUBLIC RIGHT-OF-WAY PRIOR TO CONSTRUCTION.
- CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING CONTROL OF DRAINAGE AND EROSION DURING CONSTRUCTION AT CONSTRUCTION SITE, STAGING, AND SPOILS AREA. CONTRACTOR SHALL SUBMIT STORM RUNOFF CONTROL PLAN FOR APPROVAL BY ENGINEER AND OBTAIN A SWPPP PERMIT FROM THE UTAH DEPARTMENT OF ENVIRONMENTAL QUALITY.
- ABANDONING EXISTING WATERLINE: REMOVE ABANDONED PIPE WHERE UNCOVERED OR DISTURBED BY CONSTRUCTION. WHERE NOT DISTURBED, CONTRACTOR MAY ABANDON EXISTING WATER MAIN IN PLACE AFTER NEW MAIN IS IN FULL SERVICE. PLUG ENDS OF ABANDONED MAIN WITH CONCRETE. OLD WATER MAINS THAT ARE NO LONGER IN SERVICE ARE TO BE DISCONNECTED COMPLETELY FROM THE WORKING SYSTEM. UNLESS CONTRACTOR IS SPECIFICALLY DIRECTED TO REMOVE EXISTING VALVES, THE CONTRACTOR SHALL ABANDON EXISTING VALVES IN PLACE. OPEN VALVE, REMOVE BOTH THE TOP AND BOTTOM OF VALVE BOX AND FILL RESULTING HOLE WITH SAND. RESTORE SURFACE IN ACCORDANCE WITH SURFACE RESTORATION REQUIREMENTS OF THE GOVERNING AGENCY.
- ALL ASBESTOS CEMENT WATERLINES REQUIRING REMOVAL SHALL BE DISPOSED OF IN ACCORDANCE WITH ALL FEDERAL, STATE, AND LOCAL REQUIREMENTS IN AN APPROVED LOCATION EQUIPPED TO HANDLE SUCH MATERIALS. ANY CUTTING REQUIRED SHALL BE PERFORMED IN ACCORDANCE WITH PROPER REGULATORY PROCEDURES. IN NO CASE SHALL THE PIPE AND FITTINGS BE BROKEN OR CRUSHED.
- CONTRACTOR SHALL SAW CUT ASPHALT, SIDEWALK TO THE NEAREST JOINT, AND WHERE REQUIRED CURB AND GUTTER TO THE NEAREST JOINT AT THE LIMITS OF ALL TRENCH EXCAVATION.
- WORKING HOURS IN OGDEN CITY SHALL BE 7:00 AM TO 7:00 PM. WORKING HOURS IN THE UDOT RIGHT-OF-WAY SHALL BE IN ACCORDANCE WITH THE UDOT PERMIT REQUIREMENTS.
- INSTALL ALL MATERIALS ACCORDING TO MANUFACTURER RECOMMENDATIONS AND STATE AND LOCAL REQUIREMENTS. USE ONLY NEW AND UNUSED MATERIALS. ALL MATERIALS SHALL BE PROVIDED BY MANUFACTURERS REGULARLY ENGAGED IN PRODUCING SAID ITEMS, AND WHICH SHALL BE FIRST QUALITY, HEAVY DUTY, COMMERCIAL/INDUSTRIAL GRADE, SUITABLE FOR THE INTENDED USE.
- CONTRACTOR SHALL RESTORE ALL DAMAGED CURB, GUTTER, SIDEWALK, DRIVEWAY APPROACHES, AND WATERWAYS IN ACCORDANCE WITH APWA MANUAL OF STANDARD PLANS 2017 EDITION, PLAN NO. 205, 211, 221, AND 231 WITHIN OGDEN CITY RIGHT-OF-WAY AND IN ACCORDANCE WITH UDOT STANDARDS IN UDOT RIGHTS-OF-WAY. TO PRESERVE AND PROTECT EXISTING CURB AND GUTTER, CONTRACTOR SHALL FLOWABLE FILL UNDERNEATH CURB AND GUTTER AFTER TUNNELING FOR HYDRANTS OR SERVICE CONNECTIONS.
- ALL GAS LINES SHALL HAVE A MINIMUM VERTICAL CLEARANCE OF 12-INCHES ABOVE OR BELOW THE NEW WATERLINE, AND A MINIMUM HORIZONTAL CLEARANCE OF 3 FEET. ALL GAS LINES RELOCATED OR EXPOSED SHALL BE REBURIED PER DOMINION ENERGY'S REQUIREMENTS
- ABANDON EXISTING WATERLINE IN PLACE AFTER NEW WATERLINE IS IN FULL SERVICE. PLUG ENDS OF ABANDONED WATERLINE WITH CONCRETE. OLD WATERLINES THAT ARE NO LONGER IN SERVICE ARE TO BE DISCONNECTED COMPLETELY FROM THE WORKING SYSTEM. ABANDON EXISTING VALVES IN PLACE. OPEN VALVE REMOVE VALVE BOX AND FILL RESULTING HOLE WITH SAND. RESTORE SURFACE IN ACCORDANCE WITH SURFACE RESTORATION REQUIREMENTS.
- NOT USED.
- PRESERVE AND PROTECT EXISTING TREES. NO TRIMMING OR REMOVAL OF TREES SHALL BE ALLOWED WITHOUT PRIOR APPROVAL OF OGDEN CITY.



NO.	DATE	REV. BY	DESCRIPTION
1	3/20	EN	ADDENDUM NO. 2

OGDEN CITY
OGDEN, UT

VERIFY SCALE
BAR IS ONE INCH ON ORIGINAL DRAWING

DESIGN	REVIEW
DESIGN S. DUCKWORTH DRAWN S. DUCKWORTH	CHECKED E. NEIL APPROVED E. NEIL

GENERAL

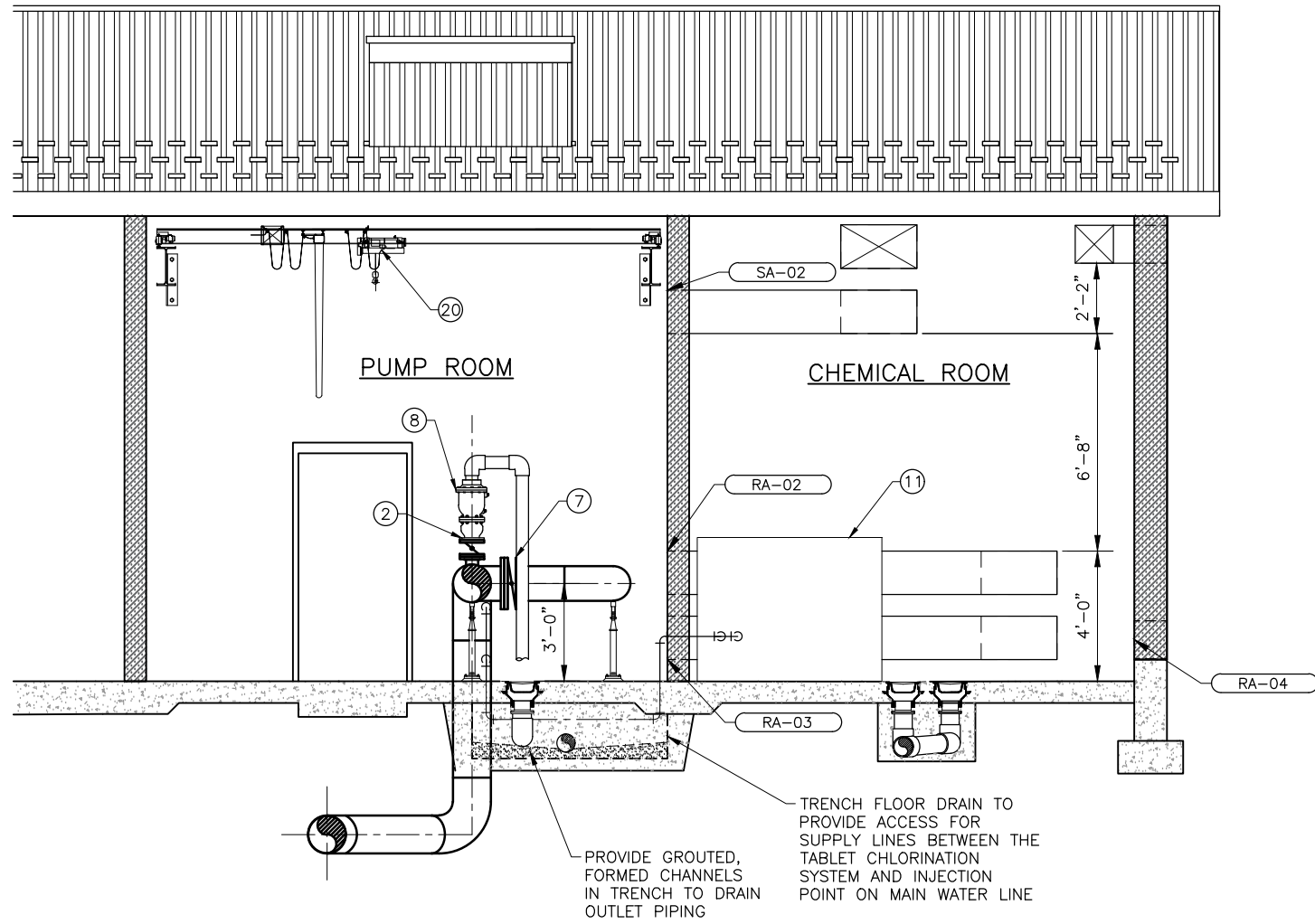
GENERAL NOTES

DATE: FEBRUARY 2020

PROJECT NUMBER: 202-16-01

DRAWING NO.
G-05

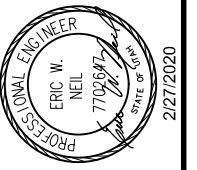
SHEET **05** OF **58**



SECTION **B**
 $\frac{3}{8}'' = 1'-0''$ M-01

VALVE AND EQUIPMENT SCHEDULE

NO.	DESCRIPTION	SIZE	JT TYPE	REMARKS
①	VERTICAL TURBINE PUMP	14-IN DISCHARGE	FL	2,725 GPM @ 690 TDH, MAX @ 60Hz
②	BUTTERFLY VALVE	4-INCH	FL	MANUAL LEVER
③	AIR RELEASE VALVE	1-INCH	NPT	VAL-MATIC MODEL 25.6 OR APPROVED EQUAL
④	CHECK VALVE	14-INCH	FL	SLANTING OR TILTED DISC TYPE, APCO MODEL 800 OR VALMATIC MODEL 9808
⑤	PUMP CONTROL VALVE	10-INCH	FL	GLOBE STYLE DEEP WELL CLA-VAL MODEL 61-02, FUSION BONDED EPOXY LINED AND COATED, SST INTERNAL TRIM, TUBES, AND FITTINGS. EQUIPPED WITH ANTICAVITATION TRIM. CONTROL VALVE SHALL BE SUPPLIED WITH 2 LIMIT SWITCHES.
⑥	MAGNETIC FLOW METER	14-INCH	FL	SIEMENS WITH WALL MOUNTED TRANSMITTER, SEE ELECTRICAL PLANS
⑦	BUTTERFLY VALVE	14-INCH	FL	HANDWHEEL OPERATED
⑧	WELL SERVICE AIR VALVE	4-INCH	FL	AIR VALVE WITH REGULATED-EXHAUST DEVICE, VALMATIC MODEL 104SS OR EQUAL
⑨	EMERGENCY EYE WASH STATION	--	--	WALL MOUNTED EMERGENCY EYEWASH STATION (GUARDIAN OR EQUAL). DRAIN TO FLOOR DRAIN
⑩	PRESSURE INDICATING TRANSMITTER/SWITCH	--	--	PRESSURE TRANSMITTER SHALL HAVE LOCAL READOUT
⑪	TABLET CHLORINATION UNIT	--	--	ACCU-TAB POWERPRO 3150 SERIES OR APPROVED EQUAL; UNIT SHALL HAVE BUILT IN TABLET WEIGHT SCALE, 150 LB TABLET CAPACITY, 30 GALLON SOLUTION TANK, PIPING, PUMP, ELECTRICAL PANELS AND ALL OTHER REQUIRED COMPONENTS FOR A COMPLETE OPERABLE SYSTEM
⑫	ELECTRIC UNIT HEATER	5 KW	--	HEATER TO BE WALL MOUNTED, SEE DRAWING H-01 FOR HVAC EQUIPMENT SCHEDULE
⑬	CHLORINE RESIDUAL ANALYZER	0.1-5.0 MG/L	--	PROVIDE PRESSURE REDUCER, BRASS BALL VALVES, AND SMOOTH NOSE SAMPLING TAP; HACH CL17 OR APPROVED EQUAL; ROUTE DRAIN TO FLOOR DRAIN BENEATH INSTRUMENT
⑭	FLAPGATE VALVE	4-INCH	--	WATERMAN FLAPPER VALVE, MODEL F-10
⑮	BUTTERFLY VALVE	12-INCH	--	HANDWHEEL OPERATED
⑯	TURBIDIMETER	0-10 NTU	--	HIGH TURBIDITY ALARM SET TO 2.5 NTU, HACH TU5300 OR APPROVED EQUAL; ROUTE DRAIN TO FLOOR DRAIN BENEATH INSTRUMENT
⑰	TOTAL MANGANESE ANALYZER	0-1 MG/L	--	HACH EZ2000 COLORIMETRIC ANALYZER FOR TOTAL MANGANESE; ROUTE DRAIN TO FLOOR DRAIN BENEATH INSTRUMENT
⑱	POLYPHOSPHATE DOSING SYSTEM	0-6 GPD	--	POLYPHOSPHATE SYSTEM FOR UP TO 6 GAL/DAY OF 24-30% POLYPHOSPHATE WITH 20:1 TURN DOWN. STORAGE TANK CAPACITY TO BE 250 GALLONS MINIMUM. CONTRACTOR SHALL FURNISH AND INSTALL ALL COMPONENTS, PIPE, FITTINGS, VALVES, ADAPTERS, SUPPORTS, AND BRACKETS TO MAKE A COMPLETE AND FUNCTIONAL SYSTEM. COORDINATE DOSING AT SITE WITH OWNER. SEE DETAIL M/3015.
⑲	PRESSURE INDICATING TRANSMITTER	--	--	PRESSURE TRANSMITTER SHALL HAVE LOCAL READOUT
⑳	BRIDGE CRANE, CR-1	--	--	THE HOIST SHALL BE ABLE TO SUPPORT 4,000 LBS AND BE EQUIPPED WITH MOTORIZED TROLLEY (208 VOLT, 3 PHASE) AND 2-TON MONORAIL BRIDGE. THE WIRE ROPE REEVING SHALL BE 2-PART DOUBLE, CROSS MOUNTED OR SIMILAR TYPE. SEE SPECIFICATIONS FOR DETAILS.
㉑	REDUCED PRESSURE ASSEMBLY	1½-INCH	THRD	FEBCO OR APPROVED EQUAL



NO.	DATE	REV. BY	DESCRIPTION
1	3/20	EN	ADDENDUM NO. 2
1	3/20	EN	ADDENDUM NO. 1

VERIFY SCALE
 THIS IS ONE INCH ON ORIGINAL DRAWING

REVIEW
 CHECKED B. MAYERS
 APPROVED E. NEIL

DESIGN
 DESIGN E. NEIL
 DRAWN J. COLLINS

MECHANICAL
 OGDEN CITY
 OGDEN, UT
OGDEN AIRPORT WELL HOUSE PROJECT
 MECHANICAL SECTION - 2
 DATE: FEBRUARY 2020
 PROJECT NUMBER: 202-18-01

P:\Ogden City\202-18-01 Ogden Airport Well Design Phase\Drawings\Shf\2021801_M-03.dwg Plotted: 3/27/2020 10:49 AM By: Eric Neil