

JEA - SJRPP

**ST JOHNS RIVER POWER PARK
Intake Structure Isolation
Sheet Piling**

JACKSONVILLE, FLORIDA

GENERAL CONSTRUCTION

198821.70.0100

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01100 – Scope of Work

01100.1 Project Description

The St. Johns River Power Park (SJRPP) Intake Structure is located in Jacksonville, FL on the north bank of the St Johns River near Blount Island adjacent to Northside Generating Station (NGS). The existing Intake Structure consists of a Sheet Pile System with Pile Caps and steel struts. This project will isolate the intake structure from the NGS discharge structure since SJRPP is now closed.

01100.1.2 Technical Scope of Work

The scope of work specified herein includes the erection of approximately 21 linear feet of sheet piling to the depth shown on the design drawings. The Contractor shall provide all materials and services to furnish and erect the sheet pile system specified within the Technical Specifications and on the Design Drawings. The scope of work includes required materials and services, but is not limited to the following:

- Remove the east guardrail from the fish trough platform crossing the canal at the intake inlet.
- Furnish and install Waler and connection brackets to the top of the concrete cap.
- Furnish and install sheet pile connections to tie new sheet pile to the existing sheet pile.
- Furnish and install AZ19-700 Sheet Piling. 60' sections
- Furnish and install new guardrail attached to new sheet pile.

The Contractor shall provide all materials and services to furnish and erect a complete, operational, and water tight system. Omission by Engineer of specific material and services in the above list shall not relieve the Contractor of his responsibility to provide all materials and services to furnish and erect a complete, operational, and water tight system as specified herein.

Where provision of specific equipment, materials and services are specified herein, the Contractor shall provide the equipment, materials and services as specified unless otherwise noted or approved by the Owner.

Where the term "Contractor" is used herein, it shall refer to the Prime Contractor and/or the Prime Contractor's subContractor(s) and/or the Prime Contractor's subcontractor(s). Where the term "Owner" is used herein, it shall refer to the Owner, JEA, and the Owner's representative(s).

01100.1.3 Miscellaneous Materials and Services

Miscellaneous materials and services not otherwise specifically called for shall be furnished by the Contractor in accordance with the following:

- All surveying and layout work for the specified installations utilizing the Owner provided control point monuments.
- All field testing for the specified installations.
- If required to conduct work, dewatering systems, including design, sheeting, pumps, piping, routing to an approved discharge and other materials as required for complete system.
- Disposal of excess waste material in accordance with contract documents.
- Preservation of existing trees, landscape, wetlands, slopes and habitat

01100.2 Drawings and Technical Attachments

This article lists the drawings and other technical attachments that have been prepared for the work under these specifications.

01100.2.1 Engineer's Attachments

The following listed drawings and or drawings referenced by manifest shall be part of the Subcontract Documents.

Drawing No.	Title
198821-CHRC-S3701	Intake Structure Isolation
81113-DM-0660	Coatings System Data Sheet – System 2314

01100.2.2 As-Built Drawings

Contractor shall provide as-built drawing markups of the locations and elevations of equipment, utilities, structures, and fixtures. As-built drawing markups shall be clear and legible and electronically “red-lined” on the most recent drawing revision. Hard copy As-Built drawing markups shall be submitted to the Owner within 14 days of completion of a system or area. As-Built markups requiring clarification shall be resolved within 7 days of the Owner’s request for clarification. As-Built markups shall be certified by the Contractor and the Surveyor on each As-Built drawing.

01100.3 Site Conditions and Environmental Protection

01100.3.1 General

Any costs for soil remediation, soil improvements, removal of unknown abnormal underground obstructions or contaminated soil or structures shall be considered additional work, and shall not be included in the initial Contract Scope of Work or pricing, unless noted otherwise.

01100.3.2 Environmental Protection

The Contractor shall specifically assign a person to watch for manatees and sea turtles when any work is occurring within 25 feet of the mean high water elevation. If a manatee or sea turtle enters the work area, work shall stop and shall not recommence until the manatee or sea turtle leaves the work area, unless otherwise directed by a JEA Environmental representative.

The Contractor shall be responsible to insure that turbidity outside the Discharge Basin is controlled to the Florida Department of Environmental Protection and St. Johns River Water Management District allowable levels throughout the duration of the work.

01100.3.3 Not Used

01100.3.4 Damages

Damage to adjacent facilities caused by Contractor’s activities shall be repaired at no additional cost to JEA. Contractor may have JEA or a JEA contractor perform the work at the Contractor’s cost. JEA may withhold payment(s) from Contractor for damages until corrected.

01100.3.4 Forced Shutdown

JEA reserves the right to shutdown the work at no additional cost to JEA due to one or more of the following conditions:

- Potential safety concerns.
- Risk of interrupting the operation of the units.

- Significant deviation from the design drawings without prior approval.
- Exclusion of a certain condition from the above shall not preclude JEA's right to shutdown the work.

01100.4 Division of Responsibility

The Division of Responsibility Matrix defining the Contractor's scope of supply and the Owner's scope of supply is included at the end of this section and supplements responsibility definition provided throughout the Contract Documents.

Division of Responsibility Matrix			
Engineering, Procurement, and Construction Items	Contractor	Owner	Remarks
Engineering design		X	
Certified As-Built Drawings	X		
Site survey	X		As required for construction only.
Site security	x	X	Owner will provide security for access inside the facility fence line. Contractor is responsible for security within the waterway.
Construction power supply	X		Contractor to provide all required temporary facilities and distribution system(s) from the point of Owner supply.
Construction water supply	X		Potable water is available from onsite service water connections as designated by JEA Site Project Manager
Construction sewage and waste disposal services	X		
Construction telecommunications	X		
All construction craft and supervision	X		

01100.5 Drawings

The following listed attachments accompany these specifications. The information contained in these attachments constitutes requirements under the defined Scope of Work.

Drawing No.	Title
198821-CHRC-S3701	Intake Structure Isolation

01100.6 Schedule of Submittals

Item No.	Submittal Items	Submittal Dates			
		Calendar		Event	Due Date
S01	Material Certifications and Gradations	7 Days	Before	Construction	
S02	Manufacture Cut Sheets	7 Days	Before	Construction	
S02	Field Test Results	2 Days	After	Test	
S03	Certified As-Built	14 days	After	Construction	

01100.7 Scope of Work Area



01400 – Technical Supplemental Specifications

This section contains technical supplemental specifications that provide additional requirements applicable to the work covered under the technical sections which follow this Section 01400.

01400.1 Summary of Applicable Supplementals

The technical supplementals applicable to each technical section are indicated below.

	Technical Section Number	Technical Section Name	Applicable Technical Supplementals
1	02262	Steel Sheet Piling	Q003, Q100, Q500

01400.2 Technical Supplemental Specifications

The technical supplemental specifications follow.

Q003 Quality System Requirements

This Supplemental Specification establishes the quality management system requirements for Contractors of equipment and commodities.

Q003.1 Quality System

It is the Contractor's responsibility to define and implement a detailed and documented quality management system which ensures that all equipment and commodities supplied are in conformance with required drawings and/or specifications. The Contractor shall meet all the guidelines (requirements) set forth in this document. The quality management system shall be capable of providing assurance that design, purchasing, materials, manufacturing, examination and testing of equipment, shipping, storage, and related services comply with the Contract requirements.

The Contractor's quality management system shall include, at a minimum, procedures and/or methods that ensure the following processes are controlled:

- Design documents, drawings, specifications, procedures, inspection and test status and procurement documents are current, accurate, and controlled.
- Materials, equipment, and services conform to the requirements of the Contract.
- Receipt inspection, in-process inspection, examination, testing, checkouts, and final acceptance testing are conducted.
- Shipping, storage, and preservation of equipment and commodities are adequate to prevent damage during delivery and storage of the equipment.
- Quality system requirements are passed on to subtier Contractors for subcontracted work, and the Contractor has adequate oversight of subtier Contractor activities.
- Special processes, such as welding, heat treatment, hot forming, bending and nondestructive examination, are monitored.

- Personnel performing special processes, such as welding, nondestructive examinations, coatings, heat treatment, etc., are qualified.
- Inspection, measuring, and test equipment is appropriately maintained.
- Processes exist for the verification, storage, use, and maintenance of client supplied product.

Applicable industry standards (such as ANSI, AGMA, API, ASME, IEEE, AISC, etc.) shall be incorporated into the quality management system. The quality management system shall be made available to the Engineer's Quality Management Services (QMS) Department for review, inspection, and/or audit upon request.

Q003.2 Verification

The Owner shall have access to perform assessments, quality audits, or witness test activities during the manufacturing process and to review applicable records. Owner may designate an authorized agent to perform these activities. The authorized agent may be an employee of the Owner or an outside agency. When an outside agency is designated as an authorized agent for the Owner, such designation shall be in writing with a copy provided to the Contractor. Hereinafter, when the term "Owner's representative" is used, it may also mean the Engineer or the authorized agent.

Q003.2.1 Access

The Owner shall have the right to access the Contractor's and sub-tier Contractor's work and related documents at any time during the manufacturing process without delaying the schedule. The Contractor shall provide, without cost, reasonable facilities including tools, personnel, and instruments for demonstrating acceptability of the work.

Q003.2.2 Control of Special Processes

The Contractor shall ensure that personnel are qualified in accordance with industry standards to perform special processes such as welding, nondestructive examination (NDE), coating, painting, etc. If special processes were conducted by unqualified employees, the Engineer has the option to validate and test the product at the Contractor's expense and/or reject the product.

Q003.2.3 Corrective Action

Upon identification of a noncompliance with the requirements of the Contract, the Contractor shall document the noncompliance issue. For noncompliance issues where the nonconforming characteristic can be restored to a condition such that the capability of an item to function reliably and safely is unimpaired, even though that item still does not conform to the original requirement, the Contractor shall submit the noncompliance to the Engineer for approval.

During witness and hold point activities, if the Owner's representative identifies a noncompliance issue, the Contractor shall document the noncompliance issue and provide a copy of the report to the Owner's representative. If the Contractor disagrees and does not document the noncompliance, the Owner's representative shall issue a corrective action report to the Contractor for disposition and action. The Contractor shall correct, in a timely manner, all deficiencies identified.

Q003.2.4 Rejection

If any items or articles are identified as not meeting the requirements of the specifications, the lot, or any faulty portion thereof, may be rejected. Before offering specified material or equipment for shipment, the Contractor shall inspect the material and equipment and eliminate any items that are defective or do not meet the requirements of the Contract. The fact that equipment or materials have been previously

inspected, tested, and accepted does not relieve the Contractor of responsibility in the case of later discovery of flaws or defects.

Q100 General Welding Requirements

Unless otherwise specified, the applicable governing edition and addenda to be used for all references to codes or standards specified herein shall be interpreted to be the jurisdictionally approved edition and addenda. If a code or standard is not jurisdictionally mandated, then the current edition and addenda in effect at the time of (contract or specification) approval shall govern.

Q100.1 General

Section Q100 shall be used in conjunction with the other Welding Technical Supplemental Specification sections.

Any conflict identified between the requirements of this Welding Technical Supplemental Specification and the provisions of any applicable industry standard, code, regulation, or any specification, standard, or purchasing document contractually required for a given application shall be referred to Owner for resolution prior to the start of welding.

Where requirements of a referenced code or standard differ from the Welding Technical Supplemental Specification sections, the more stringent or restrictive requirements shall apply.

Any request for deviation from specified requirements shall be submitted in writing and shall include the proposed deviation, rationale for the deviation, any technical data supporting the deviation, and historical experience supporting the deviation.

Q100.2 Welding Processes

Unless otherwise specified, only shielded metal arc welding (SMAW), gas metal arc welding (GMAW), flux cored arc welding (FCAW), submerged arc welding (SAW), plasma arc welding (PAW), stud welding, and gas tungsten arc welding (GTAW) processes shall be permitted within the restrictions or limitations specified in the applicable Welding Technical Supplemental Specification section. Other welding processes may be used, provided the governing code or standard permits it and written approval has been granted by Owner.

Any limitation or restriction specified for GMAW short-circuit arc transfer or a variation of controlled wave-form GMAW short-circuit arc transfer marketed by welding equipment manufacturers such as Miller Electric's RMD and Lincoln Electric's STT process shall be applied the same, whether a constant voltage (CV) power supply or other power supply developed by a welding equipment manufacturer is used.

Q100.3 Welding Procedure Qualification

Welding procedures shall be prepared and qualified in accordance with the referenced code. Unless otherwise specified, each manufacturer or contractor is responsible for conducting the tests required by the referenced code to qualify the Welding Procedure Specification (WPS).

Because of the number of different filler metal types and alloys within various alloy P-number groups, WPSs for welding P-Nos. 8, 10H, and 41 - 49 shall identify the required filler metal classification (s) vs the actual base material type(s) to be welded in production to ensure appropriate filler metal selection, e.g., E/ER316 for P-Nos. 8 (Type 316); E/ER308L for P-Nos. 8 Type 304L, etc. Alternatively, filler metal and base metal types may be cross-referenced to the WPS by other means, e.g., a weld map (or a separate listing of WPS and filler metal and base material grades, addendum to the WPS, etc.

Standard Welding Procedure Specifications (SWPSs) produced by the American Welding Society (AWS) may be used when permitted by the jurisdictional code. Any supplemental requirements mandated by the jurisdictional code shall be met.

Q100.3.1 Welding Procedure Submittals

WPSs and applicable Procedure Qualification Records (PQRs) shall be submitted for review by Owner prior to start of fabrication. Submittal of welding procedures and applicable PQRs shall apply to all Contractors and subContractors. Contractors shall review the documents in accordance with the applicable code and specification requirements and shall accept all of their subContractors' welding procedures and applicable PQRs prior to submitting accepted documents to Owner.

The submittal shall also include a weld map or tabulated listing of WPSs to be used. The applicable code(s) of construction and production base material types and grades shall be listed on the weld map or listing.

Q100.4 Welder/Welding Operator Performance Qualification

Welders and welding operators shall be qualified in accordance with the referenced code. The welder and welding operator qualification records shall be available at the shop facility or construction site and shall be made available for review when requested.

Field personnel not qualified and certified as welders or welding operators are prohibited from performing any welding activities such as tack welds, temporary welds, permanent welds, manufacturing aids, tools, fixtures, or other welded items. The only field personnel not qualified or certified as welders or welding operators who are permitted to perform welding are personnel completing welding training or performing welding performance qualification testing required by the applicable referenced code or specification.

Shop personnel not qualified and certified as welders or welding operators are prohibited from performing any welding activity on materials designated for permanent or temporary installation by the contract, such as tack welds or temporary welds.

Each manufacturer or contractor is responsible for the qualification of welders or welding operators. Welder or welding operator performance qualification testing shall be performed under the full supervision and control of the manufacturer or contractor.

Q100.5 Filler Materials

Welding filler metal shall comply with the requirements of the referenced code and any modified requirements specified herein. The filler metal shall be as specified in the applicable WPS.

Unless otherwise specified, the welding filler metal for welding similar base metal types shall have a chemical composition as similar as possible to the base materials to be welded. The finished weld as deposited, or after postweld heat treatment (PWHT) when required, shall be at least equal to the base metal's minimum specified properties or characteristics as they pertain to strength, ductility, notch toughness, corrosion-erosion resistance, or other physical or thermal properties.

Unless otherwise approved in writing, the GTAW or PAW process shall require the addition of filler metal.

Unless otherwise specified or permitted by an approved deviation request, the use of the nonstandard international classifications or nonstandard AWS-G electrode/wire classification is prohibited (comment: welding consumables produced under standard compositions and the requirements specified by national or international filler metal standards are considered acceptable). When permitted, welding procedures specifying nonstandard classifications or AWS-G classification consumables shall be restricted to the same manufacturer and brand-name consumable used to weld the procedure qualification test coupon. The manufacturer and brand name shall be listed on the WPS and PQR. The manufacturer's standard,

including the mechanical properties and chemical analysis, along with the request for using nonstandard classifications (e.g., "G" classification consumables) shall be submitted to Owner prior to fabrication.

SAW multipass weld deposits shall use an essentially neutral flux for welding carbon steels. Alloy, semiactive, or active fluxes shall not be used except as specified otherwise. Fluxes that compensate for losses of alloying elements are permitted. Active flux may be used for single pass welding of carbon steels, provided the weld deposit thickness is approximately 1/4 inch (6 mm) maximum each side for a double-V-groove joint design or approximately 1/4 inch (6 mm) one side for a single-V-groove joint design. The joint thickness shall not exceed 1/2 inch (13 mm) nominal.

When using the SAW process, the flux listed in the WPS is restricted to the specific brand-name flux used in the welding procedure qualification test. Any change in the flux brand name or designation shall require a new welding procedure qualification. For SAW welding of stainless or nickel-base alloy materials, only those fluxes specified by the flux manufacturer as suitable for the particular type of high alloy electrode to be used are permitted.

The SAW process shall not use recrushed slag.

SMAW low-hydrogen type electrodes, including stainless steel and nickel and nickel alloy electrodes, shall be purchased in hermetically sealed or vacuum packed containers only.

Q100.5.1 Filler Material Selection

Unless otherwise specified, filler material selection shall be in accordance with the following requirements.

Q100.5.1.1 Filler Materials for Steels and Low Alloy Steels. For the SMAW process, all filler metal shall be of the low-hydrogen type when welding on either carbon steel or low alloy steel materials. Nonlow-hydrogen type electrodes (E6010/E6011 or E7010-A1 only) may be used only for root pass welding on carbon steel piping, unless otherwise specified by other Welding Technical Supplemental Specification sections. SMAW low-hydrogen type ferrous electrodes for all fill passes shall have a minimum tensile strength of 70,000 psi (495 MPa) as defined by the applicable SFA or AWS specification.

For the FCAW process when welding carbon steel materials, only AWS filler metal Classifications E7XT-1, -5, -9, -12 with shielding gas shall be used (current AWS classifications also utilize either an "M" or "C" after the final digit).

Low alloy FCAW electrodes of nominal composition 2-1/4 Cr - 1 Mo and higher for use on pressure-retaining components shall be purchased with a diffusible hydrogen designation of H4 maximum (SFA-5.29) unless otherwise specified.

The low carbon (-B2L, -B3L, -B6L, and -B8L), low alloy filler metal classifications are prohibited for welding 1-1/4 Cr - 1/2 Mo, 2-1/4 Cr - 1 Mo, 5 Cr-Mo, and 9 Cr-Mo alloy materials. The filler metal for welding these materials shall have a carbon content greater than 0.05 percent. Previously classified low alloy filler metal Classifications ER502, E502-XX, ER505, and E505-XX are not permitted for welding low alloy base materials.

Q100.5.1.2 Filler Material Requirements vs Base Material Types(s).

Carbon Steel or Low Alloy Steel-to-Austenitic Stainless Steels			
Service $\leq 500^{\circ}$ F (260° C)		Service $> 500^{\circ}$ F (260° C)	
ASME	AWS Classification	ASME	AWS Classification
SFA 5.9 or SFA 5.14	ER309 or ER309L ERNiCr-3	SFA 5.14	ERNiCr-3
SFA 5.4 or SFA 5.11	E309 or E309L ENiCrFe-3 or ENiCrFe-2	SFA 5.11	ENiCrFe-3 or ENiCrFe-2
SFA 5.22	E309TX-X or E309LTX-X	N/A	N/A

Where carbon steel or low alloy steel piping is to be welded to austenitic stainless steel components, and the carbon or low alloy steel piping is of such a thickness as to require PWHT, the end of the carbon or low alloy steel pipe shall be buttered with Type 309L, ERNiCr-3, or ENiCrFe-3 filler metal for system service $< 500^{\circ}$ F (260° C) and shall be buttered with Type ERNiCr-3 or ENiCrFe-3 filler metal for system service $> 500^{\circ}$ F (260° C); the buttered end shall be postweld heat treated. The buttering thickness shall be 3/16 inch (5 mm) minimum after final surface preparation. The weld joint shall then be made between the austenitic stainless steel and the buttering on the carbon or low alloy steel as applicable. This joining method is applicable only to groove welds unless written approval has been granted by Owner/Owner.

Alloy AL6XN, UNS N08367-to-Carbon Steel	
ASME Specification	AWS Classification
SFA 5.14	ERNiCrMo-3 or ERNiCr-3
SFA 5.11	ENiCrMo-3 or ENiCrFe-3

Carbon Steel-to-Nickel-Base Alloys	
ASME Specification	AWS Classification
SFA 5.14	ERNiCr-3
SFA 5.11	ENiCrFe-3

Alloy AL6XN, UNS N08367	
ASME Specification	AWS Classification
SFA 5.14	ERNiCrMo-3
SFA 5.11	ENiCrMo-3

Alloy 20, UNS N08020	
ASME Specification	AWS Classification
SFA 5.9	ER320LR
SFA 5.4	E320LR

Q100.5.1.3 Filler Material for Welding 300 Series Stainless Steels.

ASME P-No. 8 Base Material Type	Filler*
304	308
304L	308L
316	316
316L	316L
321, 347	347
Austenitic H-grade (0.040 wt. percent min. carbon)	0.040 wt. percent min. carbon

*This selection requirement may not necessarily apply to cryogenic applications.

Q100.5.1.4 Filler Material Requirements for 300 Series SSs for High Temp Service. When using Type 308, 316, 317, 321, and 347 filler metals for design temperature applications above 1000° F (538° C), the deposited carbon content shall be 0.040 percent minimum.

For base metal grades 304H, 316H, 321H, 347H, filler metal classification E/ER 16-8-2 may be used for all system design temperatures and base material thicknesses. E/ER 16-8-2 should be used when the system design temperature exceeds 1,000° F (538° C) when base material thickness exceeds 1/2 inch (12 mm).

When FCAW austenitic stainless steel weld deposits require PWHT or are used at service temperatures >1,000° F (538° C), the electrodes shall have a formulation that does not intentionally add bismuth, and bismuth in the deposited weld metal shall not exceed 0.002 weight percent.

Filler metals for austenitic 300 series weld deposits for service temperatures >1000° F (538° C) shall not exceed 10 FN (ferrite number).

Q100.5.2 Filler Material Control

Storage, handling, and drying of SMAW electrodes and SAW flux shall, as a minimum, be in accordance with the manufacturers' recommendations. In addition, SMAW low-hydrogen type carbon and low alloy steel electrodes shall be stored in ovens at 250° F (120° C) minimum after the hermetically sealed or vacuum packed container is opened. Bare rod in straight lengths shall be individually flag tagged, stamped, or otherwise identified with the AWS classification or product classification. Each spool of solid or cored rod shall be tagged, labeled, or otherwise identified with the AWS classification or product classification. SMAW low-hydrogen type covered electrodes shall only be reconditioned one time. Any SMAW electrodes that have been wet or have damaged coatings shall not be used. Any welding filler metals or fluxes not readily identifiable shall not be used.

SAW fluxes for welding low alloy chromium-molybdenum steels (2-1/4 Cr - 1 Mo) and higher nominal weld deposit composition shall be baked prior to use. This requirement does not apply for fluxes used within

the same work shift after removal from a hermetically sealed package or container. Flux that is exposed to an atmospheric exposure limit exceeding one work shift shall be baked prior to use, unless the flux is placed in a heated container within 10 hours of issuance. After baking, fluxes should be stored in hermetically sealed containers or (preferably) stored in a heated container until issuance. Storage in a heated container or baking shall be in accordance with the flux manufacturer's directions.

A written procedure for storing, handling, issuing, and reconditioning electrodes, wires, and fluxes shall be available for review by Owner's inspector if requested.

Q100.6 Fabrication Controls

Q100.6.1 Welding Preheat and Interpass Temperature

The preheat and interpass temperature requirements are mandatory values and shall be in accordance with the referenced code and as specified herein. The WPS for the material being welded shall specify the minimum preheat and maximum interpass temperature requirements. The thickness used to determine preheat requirements shall be the thickness of the thickest part at the point of welding.

The minimum preheat temperature shall be obtained prior to any welding. This shall include tack welding or temporary tack welding.

Preheating shall provide uniform heating over the complete weld or thermal removal process area.

Preheat and interpass temperatures shall be monitored and checked by temperature indicating crayons, thermocouples (TCs), surface contact pyrometers or thermometers, or other suitable methods.

When electric resistance heating pads are used for preheating, a thermocouple is required underneath the pads for each control zone in the region of the highest expected temperature to ensure the base material is not overheated.

Preheat of pressure retaining components for carbon steel P-No. 1 materials shall be 175° F (80° C) when the material specified carbon content is in excess of 0.30 percent and the nominal thickness at the joint is in excess of 1 inch (25 mm). In addition, 200° F (95° C) minimum preheat is required for nominal thickness over 1.25 inches (32 mm), regardless of carbon content. A minimum preheat temperature of 50° F (10° C) is required for all other carbon steel P-No. 1 materials.

The maximum interpass temperature for welding carbon steel and low alloy steel materials shall be 600° F (315° C). The maximum interpass temperature for welding carbon steel when impact testing is required shall be 500° F (260° C).

The maximum preheat and interpass temperature for stainless steel, nickel alloy, copper alloy, and titanium alloy materials shall be 350° F (175° C). The minimum preheat temperature shall be sufficient to ensure that moisture is removed from the material to be welded.

Q100.6.2 Postweld Heat Treatment (PWHT)

PWHT shall be performed in accordance with the referenced code and any modified requirements specified herein.

Postweld heat treating may be accomplished by the electric resistance heating or furnace heating method. Other methods of PWHT shall require review and approval of Owner. Heating in a furnace should be used when practical. Whether furnace heating or local electric resistance heating is performed, the heating method shall provide the desired heating and cooling rates, the required metal temperature, temperature uniformity, and temperature control. Flame impingement during furnace PWHT is prohibited. Direct flame heating shall not be used for PWHT.

When PWHT is performed in a furnace, sufficient TCs shall be properly attached directly to the materials in various representative locations, such as the expected region and material thickness for the highest temperature and the expected region and material thickness for the coolest temperature, to accurately indicate the metal temperature uniformity throughout the heat treating cycle.

For ASME P-Nos. 1, 3, 4, 5A, and 5B, the controlling setpoint temperature shall be set at 50° F (25° C) above the minimum specified by the code of reference, except when Charpy impacts are applicable.

When PWHT is required for parts of two different materials or different ASME P-numbers, special precautions shall be considered to ensure that the temperature does not exceed the lower critical temperature of either of the materials being postweld heat treated. Depending on the materials, this range may be substantially restricted. Review of the applicable construction code or design specification requirements must be performed.

PWHT temperature recording devices shall be calibrated in accordance with the manufacturer's standard or other suitable standard to ensure the accuracy of the recorded temperatures.

TCs and TC wire shall be Type K chromel/alumel.

TC wire shall be temporarily attached directly to materials by using the capacitor discharge method of welding. The capacitor discharge method of welding shall be performed in accordance with the referenced code, as applicable.

The time at PWHT holding temperature shall be measured from the time the last control TC reading the lowest temperature reaches the minimum designated holding temperature setpoint within the specified tolerance.

A time-temperature recording chart/record traceable to the item being postweld heat treated shall be made for all PWHTs and shall be made available to Owner when requested.

Detailed PWHT procedures shall be submitted for review by Owner. The PWHT procedure shall address the specific PWHT requirements specified herein and any other Welding Technical Supplemental Specification requirements and provide details to accomplish the code required PWHT, including PWHT operator qualification, weld joint preparation, weld joint documentation, heating and cooling rates, holding times, holding temperatures, minimum size of heated zones, precautions to preclude damage, attachment of TCs, welding specifications for attaching welding TC wire using the capacitor discharge method (when used), weld joint insulation, defined nominal thickness, and recorder calibration.

Q100.6.2.1 Local PWHT Requirements. TCs shall be properly attached directly to the weld and/or adjacent material to record the required weld and soak band (SB) temperature. For complete penetration welds, the TCs should be located on the weld at the approximate weld center line.

The width of the band required by code to be heat treated to the PWHT temperature includes the weld and adjacent base material regions and is identified herein as the SB. The minimum SB dimension is specified in the applicable code of construction (e.g., ASME B31.1, Clause 132.7; B31.3 Clause 331.2.6, ASME Section I, PW-39.3, etc.).

The SB consists of the through thickness volume of metal, which is heated to the minimum but does not exceed the maximum required PWHT temperature. As a minimum, it consists of the weld metal, heat affected zone (HAZ), and a portion of the base metal adjacent to the weld being heated. The dimensions of the SB shall be as required by the applicable construction code.

Guidance for the placement of TCs on circumferential butt welds and other type welds is provided in AWS D10.10, "Recommended Practices for Local Heating of Welds in Piping and Tubing," Sections 5, 6, and 8. Special consideration shall be given to the placement of TCs when heating welds adjacent to large heat sinks such as valves, flanges, special fittings, or when joining parts of differing thicknesses, to ensure that no part of the materials subject to the heat source exceeds the lower critical temperature of the material.

Q100.6.2.1.1 Minimum heated band width requirements. Since the construction code does not define the terms "control zone," "heated band," and "gradient control band," the latest edition of AWS D10.10 and the requirements specified herein shall be used to determine the minimum heated band (HB) width and the gradient control (insulation) band (GCB) width critical for achieving the required temperature through the weld SB thickness within the SB region. When the dimensions for the AWS D10.10 HB or GCB cannot be achieved because of configuration, space limitations, component manufacturer restrictions, field conditions, or other valid limitations, the documentation package shall provide an explanation for the deviation.

Q100.6.2.1.2 Thermocouple placement requirements. For each local PWHT weld joint, a sketch that shows the TC attachment location(s), SB width, HB width, GCB width, and heating pad sizes and locations, and a heat treatment time-temperature record or chart recording all TC data is required in the documentation package and shall be provided to Owner when requested. The local PWHT equipment shall be capable of providing temperature data log sheets denoting the time and temperature of all TCs at any given time during the PWHT and shall be provided when requested by Owner. All the required information shall be traceable to the PWHT weld joint.

The minimum number of control zones and control thermocouples (CTCs) required for performing a local PWHT shall be in accordance with the following table. A control zone consists of a grouping of one or more heating pads that are controlled (turned off and on) based upon input from a single CTC. One or more control zones may be present in the circumferential and/or axial directions. Monitoring TCs should also be used as required to confirm temperature uniformity throughout the heat treating cycle as follows:

Pipe Size NPS (DN)	Minimum Number of Thermocouples and Control Zones (Note 1)		
	Control Zones and CTCs On-Weld (Notes1 and 2)	Additional TCs for Each Control	Additional TC Locations
≤6 (150)	One (1) CTC at 12:00	One (1) at 180° opposite the CTC	Note 3
8 - 12 (200 - 300)	Two (2) CTCs at 12:00 and 6:00	None required	
14 -18 (350 - 450)	Three (3) CTCs at 11:00, 1:00, and 6:00	None required	
20 - 30 (500 - 750)	Four (4) CTCs at 12:00, 3:00, 6:00, and 9:00	None required	
>30 (750)	Number of control zones and CTCs as required by the size and spacing of heaters. A minimum of five control zones and five CTCs shall be used.		

For all dissimilar thickness weld joints (Note 4) and all similar thickness weld joints exceeding 2 inches		One monitoring TC for each control heating zone at each outer edge of SB.	
Notes: 1. The control zone references refer to the circumferential direction for any pipe orientation. The indicated CTC clock positions are for pipe oriented in the horizontal position. Additionally, multiple control zones in the pipe's axial direction may be needed, especially for PWHT of joints with thick and thin sections and with increasing pipe diameters. 2. One CTC is required for each control zone. The CTCs designated for "On-Weld" are primarily for complete penetration welds such as butt joints and branch connections. TCs shall be attached at the approximate weld center line for all complete penetration welds. TCs shall be attached adjacent to the weld toe for welds other than complete penetration welds. 3. At least one TC per band of heating pads shall be attached under the anticipated highest temperature location of each band of heating pads. These requirements may require additional TCs than are required by Note 2 to ensure that the materials are not overheated. 4. Dissimilar thickness is defined as when the base material thickness varies by more than 3/8 inch (10 mm) or more than 30 percent** across the SB width. Refer to the following: $**\text{Thickness variation} = [(T_{tk} - T_{tn}) / (T_{tn})] \times 100$ where T_{tk} = Base material thickness on the thick side of the weld joint at the outer edges of the SB. T_{tn} = Base material thickness on the thin side of the weld joint at the outer edges of the SB.			

Overlap of electrical resistance heating pads is prohibited. Overlap of heaters controlled by separate TCs is prohibited.

For local PWHT, when the internal surface is accessible for monitoring temperature, the minimum PWHT temperature required is the minimum required by Code.

For local PWHT for ASME P-Nos. 1, 3, 4, 5A, and 5B, for weld joint thickness exceeding 3 inches (75 mm), the minimum controlling setpoint temperature shall be at least 75° F (40° C) above the code minimum temperature.

Q100.6.3 Not Used.

Q100.6.4 Miscellaneous Fabrication Control Requirements

Welding shall not be performed when surfaces of the parts to be welded are wet. The parts to be welded shall be protected from deleterious contamination and from rain, snow, and excessive wind during welding.

Prior to welding, the weld preparation and adjacent base material surfaces shall be cleaned and kept free from paint, oil, grease, dirt, scale, rust, and other foreign materials.

The weld end preparation on carbon and low alloy steel materials that will be stored for extended periods of time may consist of coating with deoxaluminum or an equivalent protective material. This coating may be welded through if applied within the manufacturer's maximum weldable limit of 1.25 mils. Complete removal of the coating is neither required nor prohibited, unless signs of rust or other foreign materials such as oil, grease, dirt, or excessive coating are apparent, in which case these areas shall be cleaned.

Acceptable cleaning solvents include new or redistilled acetone (acetone reclaimed by other methods shall not be used), alcohol (ethyl, methanol, or isopropanol), methyl ethyl ketone, or toluene (toluol). Halogenated cleaning solvents shall not be used for cleaning or degreasing.

All groove butt joints shall be complete joint penetration unless specified otherwise by design documents or the applicable code. Partial penetration weld joints not specified by design shall require written approval by Engineer.

Tack welds that are to remain in the completed weld shall have their stopping and starting ends prepared by grinding or other suitable means for satisfactory incorporation into the completed weld. Tack welds that are to become part of the completed weld shall be visually examined; defective tack welds, including cracked tack welds, shall be removed.

When runoff plates are used, they shall be of the same nominal alloy composition as either of the base metals being joined. If runoff plates are used, they shall be properly removed after completion of welding. The method of removal shall not damage the remaining weld or base metal. Runoff plates shall not be knocked off.

Complete penetration joints welded from both sides shall have the root of the first layer or pass chipped, gouged, ground, or machined to sound metal prior to welding from the second side. This requirement is not intended to apply to automated line processes, where the welding from the second side is controlled to provide adequate penetration and ensure full fusion without back gouging.

Welded joints shall be made by completing each weld layer before succeeding weld layers are deposited. Partial fill passes are permitted to correct localized underfill conditions and for the purpose of maintaining alignment. Block welding is prohibited.

As-welded surfaces are permitted; however, the surfaces of welds shall be uniform in width and size throughout their full length. The cover pass shall be free from coarse ripples, grooves, overlaps, abrupt ridges, and valleys. The surface condition of the finished welds shall be suitable for the proper interpretation of nondestructive examination. If the surface of the weld requires grinding to meet the above criteria, care shall be taken to avoid reducing the weld or base material below the minimum required thickness.

All pressure retaining fillet weld joints other than socket welded joints that require a fillet weld size greater than 5/16 inch (8 mm) shall require a minimum of two weld layers, except for those fillet weld joints welded with a mechanized or automatic welding process.

Socket welds shall meet the following requirements within the welding process restrictions and limitations specified in the applicable Welding Technical Supplemental Specification section:

A minimum of two weld layers is required for pipe or tube over 0.200 inch (5 mm) nominal wall thickness.

For pipe or tube 1/2 inch (13 mm) or less in nominal pipe size, the GTAW process shall be used.

One of the specific criteria for exemption from PWHT under ASME B31.1 and B31.3, 2014 edition and later for ASME P-Nos. 1, 3, 4, and 5A is that multiple weld layers are required for nominal material thickness > 3/16 inch (5 mm).

Welding slag and spatter shall be removed from all welds.

The purity and maximum dew point of a gas or gas mixture used for shielding shall meet latest edition of AWS A5.32M/A5.32, Welding Consumables -Gases and Gas Mixtures for Fusion Welding and Allied Processes.

Shop fabricators and Contractors shall check for residual magnetism at each end of the machined field pipe weld bevels. Weld bevels containing residual magnetism greater than 5 gauss shall be demagnetized.

Arc strikes outside of the area of permanent welds should be avoided on any base metal. Cracks or blemishes caused by arc strikes shall be ground to a smooth contour and checked to ensure soundness.

Peening is prohibited. The use of power tools for slag removal is not considered peening.

The application of heat to correct weld distortion and dimensional deviation without prior written approval from Owner is prohibited.

Complete joint penetration welds welded from one side without backing, weld repairs welded from one side without backing, or weld repairs in which the base metal remaining after excavation is less than 0.1875 inch (5 mm) from being through wall, which are fabricated from materials with an ASME P-No. of 5B or higher or unassigned metals with similar chemical compositions, shall have the root side of the weld purged with an argon backing gas prior to welding. Unless otherwise specified, backing gas (purge) shall only be argon. The argon backing gas shall be classified as welding grade argon or shall meet Specification SFA-5.32, AWS Classification SG-A. The backing gas (purge) shall be maintained until a minimum of two layers of weld metal have been deposited and as necessary to minimize the development of bluish internal heat tint colors.

Temporary attachments to pressure boundary components outside the weld bevel groove area should be avoided and only used when absolutely necessary. When required, clamps, welded clips, tack welds, or other appropriate means shall be used to properly align the joint for welding. Welded attachments used for fit-up shall be compatible with the base material and shall be welded with a qualified welding procedure. Attachments shall not be knocked off base material. The attachments shall be removed by suitable methods, such as grinding, machining, or sawing, followed by grinding flush with the base material. When thermal cutting is used to remove attachments, approximately 3/16 inch (5 mm) of material shall be left for final removal by grinding. The ground area shall then be visually examined for defects. The area from which attachments have been removed shall be examined as required by the governing code or specification. Any defects found shall be repaired.

Welding across the flanges of Owner's structural steel members (welds that are transverse to the beam or column center line) shall not be an acceptable practice, and Contractor shall design all welded interfaces to Owner's steel structure to specifically avoid this condition. Contractor's design of such interfaces shall achieve full required design strength and stability by means other than welds applied across flanges.

All defects in welds or base materials shall be removed and repaired in accordance with the referenced code.

A written procedure for root side purging shall be described in detail and shall be submitted concurrently with the welding procedures for review by Owner.

Welding machine ground leads and clamps shall be located to avoid passing welding current through equipment, snubbers, bearings, or any other items where transfer of electrical current may result in damage to equipment.

A complete repair procedure for repairs that are documented as the basis of a nonconformance report shall be submitted to Owner for review and approval in writing prior to performing the repair. If repair by welding is required, the applicable WPSs and supporting PQRs shall be submitted with the repair procedure. All nonconformance report dispositions shall comply with applicable code requirements.

Q100.7 Nondestructive Examination (NDE)

All NDE shall be performed in accordance with the methods specified in the referenced code and any supplemental NDE specified within the other Welding Technical Supplemental Specification sections.

NDE shall be performed in accordance with written procedures that are prepared in accordance with the referenced code and as specified herein. NDE procedures other than for visual examination shall be approved by a qualified and certified NDE Level III. The NDE Level III approval shall be shown on the NDE procedure. NDE procedures shall be submitted for review by Owner prior to their use.

NDE personnel performing NDE other than visual shall be qualified and certified for the applicable NDE method. Personnel shall meet written practice ASNT SNT-TC-1A, unless permitted otherwise by the referencing code or prior written approval from Owner is obtained. NDE personnel qualification records shall be made available for review when requested.

Personnel performing or supervising the visual examination of welds, including ASME Boiler and Pressure Vessel components, shall be qualified as a Certified Welding Inspector (CWI) in accordance with the American Welding Society AWS QC 1 or previously approved equivalent program as determined by Owner. Visual inspectors' qualifications and certificates shall be submitted for review and verification.

The responsible Contractor's welding inspector shall perform in-process visual inspections at suitable intervals during the fabrication and erection process to ensure the applicable requirements of the referenced code, design specification, and WPS are met. Such inspections, on a sampling basis, shall be performed prior to assembly, during assembly, and during welding.

All welds shall receive 100 percent visual examination. Visual inspection of welds shall be performed prior to any painting, coating, or galvanizing. Visual weld examination acceptance criteria and other NDE acceptance criteria shall be in accordance with applicable referenced codes and design documents. Records of these examinations shall be documented.

The NDE results shall be provided in an NDE Report that is evaluated, interpreted, and accepted by Level II or Level III NDE personnel.

Contractor shall obtain and pay for the services of an independent testing laboratory to provide the required field NDE. Any defective weld shall be removed, repaired, and retested at the Contractor's expense.

Owner may order NDE by an independent laboratory in addition to any examinations specified herein. The NDE type, extent, and method shall be the same as that required for the original weld. If the weld is defective, the laboratory costs shall be paid by the Contractor. If the weld is not defective, the laboratory costs will be paid by Owner. Repair of defective welds and reexamination shall be at the Contractor's expense. Weld acceptance standards shall be in accordance with applicable codes and design

specifications. If an individual interpretation is in question, the final authority shall be the responsibility of Owner.

Q100.8 Records

Records of inspections, NDE, impact testing, hardness testing, PWHT charts or records, base material test reports, filler material test reports, radiographic film with applicable reader sheets, ultrasonic examination records and reports, deviation requests including resolution documentation, nonconformance reports, and other records, as required, shall be retained by the Contractor for 10 years after completion of the work. If the Contractor cannot keep the records for 10 years, the Contractor must submit the records to the Owner prior to contract closeout.

Quality records, including applicable Data Report Forms generated by a manufacturer or assembler in accordance with an approved Quality Control System and applicable Certificates of Authorization from the ASME Boiler & Pressure Vessel Code, shall be provided in accordance with the approved contract or purchase order. Quality records shall be legible, appropriately completed, and sufficiently detailed to permit traceability to the item or activity involved.

Q500 Contractor Drawings

This section, in conjunction with the Schedule of Submittals, stipulates the requirements for engineering data that Contractor shall submit for design information and review. Document submittal procedures shall be in accordance with the requirements of this Contract.

Q500.1 Submittal Requirements

Technical data shall be submitted in electronic format. Hard copy prints of the electronic files shall also be submitted, as specified below.

Electronic technical data submittals shall be made using via email, and shall be limited to 5 MB per email.

Submittals should be sent to the following individuals:

Philip Brulé – BruleP@bv.com
Larry Bradley – BradLF2@jea.com

The following subject line shall be included on all email notifications:

198821.70.0100 YYMMDD SJRPP Intake Structure Isolation - Sheet Piling - Transmittal No. XX

YYMMDD = Date of Transmittal in the listed format
Transmittal No. XX = Unique Sequential Transmittal Number

The following number of prints shall be submitted unless otherwise indicated in the Schedule of Submittals:

Submittal Description	Copies Required	
	Engineer	Owner
Design Data	1 Electronic Copy	1 Electronic Copy and 1 Full Size Print
Test and Inspection Data	1 Electronic Copy	1 Electronic Copy and 1 Full Size Print
Drawings	1 Electronic Copy	1 Electronic Copy, 1 ANSI C Size Print

Q500.2 Not Used

Q500.3 Not Used

Q500.4 Drawings

Drawings shall be in sufficient detail to indicate the kind, size, arrangement, component weight, breakdown for shipment, and operation of component materials and devices; the external connections, anchorages, and supports required; the dimensions needed for installation and correlation with other materials and equipment; and the information specifically requested in the Schedule of Submittals.

Contractor shall fully complete and certify drawings for compliance with the Contract requirements. Drawings shall have title block entries that clearly indicate the drawing is certified.

Each submitted drawing shall be project unique and shall be clearly marked with the name of the project, unit designation, Owner's Contract title, Owner's Contract file number, project equipment or structure nomenclature, component identification numbers, and Owner's name. Equipment, instrumentation, and other components requiring Owner-assigned identification tag numbers shall be clearly identified on the drawings. If standard drawings are submitted, the applicable equipment and devices furnished for the project shall be clearly marked.

Transmittal letters shall identify which Schedule of Submittals item (by item number) is satisfied by each drawing or group of drawings. The transmittal letter shall include the manufacturer's drawing number, revision number, and title for each drawing attached. Each drawing title shall be unique and shall be descriptive of the specific drawing content. Transmittal letters for resubmitted drawings shall include the Engineer's drawing numbers.

Catalog pages are not acceptable, except as drawings for standard non-engineered products and when the catalog pages provide all dimensional data, all external termination data, and mounting data. The catalog page shall be submitted with a typed cover page clearly indicating the name of the project, unit designation, specification title, specification number, component identification numbers, model number, Contractor's drawing number, and Owner's name.

Drawings shall be submitted with all numerical values in English units.

Q500.4.1 Drawing Submittal

A standard drawing submittal template form and transmittal letter are included at the end of this section. Contractor shall use this form for all submittals. (An electronic copy of this form will be made available upon Contract award.)

Drawings shall be submitted electronically in Tagged Image File Format (TIFF) - Group 4 or Adobe Portable Document Format (PDF). AutoCAD or MicroStation format files are not acceptable.

If hard copies are required for submittal, the separately submitted hard copy drawing prints shall be black line on white background. Blue line on white background or color prints are not acceptable. All drawings shall be suitable for electronic imaging and shall have the maximum contrast. Print size shall not exceed 34 inches by 44 inches. Drawings shall be folded to 8-1/2 inches by 11 inches. Drawings shall be collated in sets.

Q500.4.2 Drawing Processing

Contractor's engineering schedule shall allow a minimum of three (3) weeks for mailing, processing, and review of drawings and data by Engineer.

Unless this Contract indicates that a drawing or engineering data submittal by Contractor is to be for Engineer's information only, Engineer, upon receipt of submittals, shall review and return same to Contractor, marked "No Exceptions Noted," "Exceptions Noted," "Received for Distribution," "Returned for Corrections," "Release for Record," "Void," or "Superseded." The timing of Contractor's submittals and Engineer's review shall be in accordance with the Completion Dates for same as set forth in the Contract. The submittal of any drawing or other submittal document by Contractor to Engineer under this Contract will be certification by Contractor that the information set forth therein is accurate in all material respects.

Q500.4.2.1 No Exceptions Noted (NE) or Received for Distribution (RD). Upon receipt of a submittal marked "No Exceptions Noted" or "Received for Distribution," Contractor may proceed with its Work to the extent of and in accordance with the submittal. Contractor shall not resubmit unless the drawing or document is revised, in which case it shall be resubmitted as a new document revision in accordance with Q500.4.2.7.

Q500.4.2.2 Exceptions Noted (EN). Upon receipt of a submittal marked "Exceptions Noted" and if Contractor concurs with Engineer's comments, Contractor shall incorporate same and may proceed with its Work to the extent of and in accordance with the annotated submittal. Contractor shall submit to Engineer within fourteen calendar days a revision to the original submittal in which Engineer's comments have been incorporated. If Contractor determines that it cannot incorporate Engineer's comments without prejudice to Contractor's warranty or other obligations under this Contract, Contractor shall so advise Engineer in writing within seven calendar days of its receipt of Engineer's comments, stating the reasons therefore. Contractor may proceed with its Work to the extent of and in accordance with the annotated submittal only upon Engineer and Contractor resolving Engineer's comments.

Q500.4.2.3 Returned for Corrections (RC). Upon receipt of a submittal marked "Returned for Corrections," Contractor shall immediately take all necessary action to revise its submittal in accordance with Engineer's comments, the Specification, and the Drawings, and shall resubmit to Engineer for review the corrected original submittal, voiding previous information and adding new documents if required. In no event shall Contractor proceed with the affected Work until its revised submittals have been returned to Contractor marked "No Exceptions Noted" or "Exceptions Noted" by Engineer.

Q500.4.2.4 Release for Record (RR). Receipt of a submittal marked "Release for Record" indicates that there are no specific objections to the document. Work may proceed. Certain project information required by the Engineer's document management system may have been added electronically to the drawing and provided to Contractor for the record. Contractor shall not resubmit the drawing or document unless revisions to the design are required. If revisions are required, Contractor shall incorporate Engineer's information and resubmit as a new revision. Engineer's project-specific information shall be added if future revisions and submittals are made.

Q500.4.2.5 Void (VO) or Superseded (SS). Receipt of a submittal marked "Void" or "Superseded" does not require any action by Contractor. "Void" indicates that the submittal is no longer applicable to the project and is not being replaced by other drawings or data. "Superseded" indicates that different drawings or data have replaced the previously submitted drawings and data; this status does not pertain to revisions of the same drawings and data.

Q500.4.2.6 Hold (HO). A submittal may be given a status of "Hold" by the Engineer, or the Contractor may have "Holds" on the submitted drawing.

For a Hold status designated by the Engineer, the Contractor shall not proceed with the work that is designated on "Hold" except as specifically directed by the Engineer. Additional information required for the Contractor to release the "Hold" will be transmitted from the Engineer later.

The Contractor shall provide information to the Engineer about the cause for any "Holds" designated on the drawing and immediately take all action necessary to resolve the "Holds". The Contractor shall resubmit the drawing for review once the "Holds" are removed from the drawing and should make all efforts to not submit drawings to the Engineer until drawing review comments have been received back from the Engineer.

Q500.4.2.7 Resubmittals. If during or subsequent to the completion of the submittal process, Contractor makes further changes to the equipment and materials shown on submittals that have been reviewed by Engineer, the changes shall be clearly marked on the submittal by Contractor and the submittal process shall be repeated. If changes are made by Contractor after delivery to the Jobsite, as-built drawings indicating the changes shall be prepared by Contractor and submitted to Engineer for review. Any resubmittal of information shall clearly identify the revisions by footnote or by a form of back-circle, with revision block update, as appropriate.

Q500.4.2.8 Engineer's Review. Engineer's review of drawings and other submittals will cover only general conformity of the data to the Specifications and Drawings, external connections, interfaces with equipment and materials furnished under separate specifications, and dimensions that affect plant arrangements. Engineer's review does not include a thorough review of all dimensions, quantities, and details of the equipment, material, device, or item indicated or the accuracy of the information submitted. Review and comment by Engineer of Contractor's Drawings or other submittals shall not relieve Contractor of its sole responsibility to meet the Completion Dates requirement of this Contract and to supply Goods that conform to the requirements of this Contract.

Q500.4.2.9 File Returns to Contractor. The iBackup web service will be used by Engineer to return TIFF files to Contractor.

A copy of the manifest will be returned to Contractor indicating drawing status as NE (No Exceptions Noted).

Each packet of drawings returned to Contractor will include a manifest generated by Engineer. The manifest will include a list of drawings transmitted, manufacturer's drawing numbers, Engineer's assigned drawing numbers, Engineer's drawing titles, and the status of the drawings.

Files returned to Contractor will be in TIFF Group 4 format unless another format is agreed upon by Engineer and Contractor.

02262 - Steel Sheet Piling

02262.1 General

02262.1.1 Scope of Supply

Scope of supply shall include materials and installation of a cantilevered or tied back permanent steel sheet piling bulk head at the locations indicated on the design drawings.

02262.1.2 Items Furnished by Others and Interfaces

Items furnished by others and not in this scope of supply include the following:

None

02262.1.3 Performance and Design Requirements

Performance and design requirements for steel sheet piling are indicated in Article 02262.2.

02262.1.4 Codes and Standards

Work performed under these specifications shall be done in accordance with the following codes and standards. The version that is the latest adopted, published, and effective at the date of this document shall apply unless specifically stated otherwise. These references shall govern the work except where they conflict with the Owner's specifications. In cases of conflict, the latter shall govern to the extent of such difference:

Work	In Accordance With
Sheet Pile Design and Construction	Florida Building Code 2014 and U.S. Army Corps of Engineers EM 1110-2-2504, "Design of Sheet Pile Walls"

02262.1.5 Materials

The following materials shall be used:

General	
Component	Material
Sheet piling	New interlocking piling meeting ASTM A572 / "Standard Specification for Steel Sheet Piling" A572M, coated as specified
Shapes and plates	"Standard Specification for Carbon Structural Steel" ASTM A992 Gr. 50, galvanized or coated as specified.
Wales and bearing plates	"Standard Specification for Carbon Structural Steel" ASTM A992 Gr. 50, galvanized or coated as specified.
Tie rods	"Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement" ASTM A615, coated as specified.

General	
Component	Material
Turnbuckles	"Standard Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use" ASTM A668/A668M, Class D; and "Standard Specification for Turnbuckles, Waged, Welded, Forged" ASTM F1145, Class 2, coated as specified
Rivets	"Standard Specification for Rivets, Steel, Structural" ASTM A502, Grade 1, copper bearing 0.20 percent.
Shop and field bolts	"Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength" ASTM A307 bolts, nuts, and washers; except as otherwise indicated on the drawings.
Welding electrodes	"Structural Welding Code - Steel," AWS D1.1/D1.1M (as specified in Table 4.1 "Matching filler metal requirements"). 70,000 psi minimum tensile strength.
Coatings	Reference Engineers attachment CSDS - System 2314

02262.1.6 Acceptable Manufacturers of Components

For the following components, the manufacturers listed below provide examples of the quality of workmanship required by these specifications. If the Contractor wants to propose a nonlisted manufacturer that is considered to provide an equivalent level of quality, this manufacturer must be identified and supporting testimony provided. Acceptance of the manufacturer as a substitute is at the discretion of the Owner:

Component	Manufacturer
Sheet piling	Skyline Steel Corporation

02262.1.7 Test Requirements

The following testing shall be conducted in accordance with the specified source. This testing is to be considered part of the defined Scope of Work, and all associated costs are the responsibility of the Contractor unless specifically identified as a Bid Option or the Owner-conducted. Tests identified as an option are to be priced separately. If identified as the Owner-conducted, costs for the initial test will be the responsibility of the Owner. However, the Contractor is responsible for all costs associated with correcting deficiencies and retesting in the event of a test failure:

In Accordance With	Conducted By
Code Requirements	Contractor
Provided Coating System Data Sheet	Contractor

02262.1.8 Technical Attachments

Technical attachments relevant to the work under this section are listed in Section 01100.2.

02262.1.9 Supplemental Specifications

Technical supplemental specifications that are applicable to the work covered under this technical specification section are identified and included in Section 01400.

02262.2 Products

02262.2.1 General

This article covers materials and installation of permanent steel sheet piling for cantilevered retaining walls and tied back retaining walls.

02262.2.2 Drawings

Shop fabrication and field installation drawings for the steel sheet piling and fabricated piling accessories shall be prepared, checked, and submitted for review and acceptance as specified in Section Q500 . Certification that the furnished materials meet the specified material and strength requirements shall be submitted.

02262.2.3 Fabrication

Metal materials furnished under this section shall be fabricated in accordance with the Engineer's drawings and applicable requirements of the "Steel Construction Manual, Thirteenth Edition" of the American Institute of Steel Construction Inc.

Steel sheet piles and interlocks shall not have excessive kinks, cambers, or twists that prevent free sliding of the piles in the interlocks.

The following steel sheet piling shall be installed at locations indicated on the drawings. Piling shall meet the corresponding requirements. Steel sheet piling shall be furnished in lengths sufficient to allow trimming of tops after installation. Tops shall be trimmed to produce a neat appearance:

Sheet Pile Properties	
Shape	AZ19-700
Nominal web thickness, inches	0.375 min.
Section modulus, per linear foot of wall	34.80 cu. in/ft min.
Weight, per square foot of wall, pounds	23.41 min.
Weight, per linear foot of pile, pounds	53.76 min.
Pile Length	60 feet
Moment of Inertia	288.40 in ⁴ /ft min.

02262.2.4 Coating

The surfaces of the steel sheet piling and tie rods, except for the interior contacting surfaces of the interlocks, shall be coated with a protective layer of bituminous material as specified in Article 02262.1.5 Materials. Wales and steel attachments shall be hot dip galvanized..

Materials shall be shop coated.

Shop coated surfaces shall be thoroughly prepared and primed for coating application in accordance with coatings system data sheet (CSDS). A field coating may be placed over galvanizing provided the surface is clean of all dirt, rust, and oil. The coating shall be applied by brush or spray using commercially available equipment. Excessive sagging of the coating shall be prevented during application.

Coatings will be applied in accordance with a referenced CSDS unless otherwise approved in writing by the Engineer. Any detail not covered by the referenced CSDS shall be in accordance with the coating manufacturer's recommendations.

Coated surfaces shall not be damaged during handling. Coatings damaged during handling shall be repaired to the satisfaction of the Owner.

02262.3 Execution

02262.3.1 General

A complete description of pile driving equipment, including hammers, extractors, protecting caps, and other pile driving aids shall be submitted to the Engineer for review and acceptance before beginning the work. Steel sheet piling shall be driven at the locations and to the elevations indicated on the drawings. Piling shall be driven plumb and shall not exceed a vertical tolerance of 1/8 inch per foot of length along the interlock. Piles shall be placed as true to line as possible. Each pile shall be installed interlocked with adjoining piles for its entire length. Suitable temporary wales, master piles, templates, or other guide structures shall be provided to drive the piles in the correct location and alignment. Sections that are damaged during handling or driving shall be replaced or repaired to the satisfaction of the Owner.

02262.3.2 Installation of Sheet Piling

Sections of pile shall be interlocked for the full length. Interlocks on sheets, wyes, and corners shall be installed in their normal position.

Piles shall be driven by acceptable methods that prevent damage to the piles. Pile hammers shall be the size and type necessary to install the piling as specified. Alignment shall be maintained during driving operations by using suitable leads or guides attached to the hammer. A protecting cap consisting of steel casting slotted to fit the top of the sheet pile shall be used during driving. If driving tips are required to achieve design tip elevation, they shall be provided by the contractor at no additional cost to the Owner.

A vibratory hammer may be used to drive piles when the vibratory loading does not exceed 1 minute, continuous loading, with a penetration rate of 1.0 foot or less. An impact hammer shall be used to drive sheet pile when vibratory hammer requirements are exceeded. When a vibratory hammer is used, piles shall be driven without heating the interlocks to the point of melting. Water jets and other commonly used pile driving aids shall not be used during installation unless acceptable to the Engineer. Jetting, if permitted, shall be performed on both sides of the sheet pile simultaneously. The pile shall be seated without the use of jetting. Adjacent piles may be pinned together to prevent movement during installation of an adjoining pile. Damaged piles and piles that are not interlocked shall be removed and replaced.

Piles shall not be driven within 100 feet of concrete less than 7 days old.

Welding sheet pile to plates designated to be embedded in concrete shall be performed after the piles are driven. Welding to plates that are embedded in concrete will not be allowed.

All temporary sheet piling shall be completely removed.

Contractor shall hire a Geotechnical Engineering firm to monitor the installation of the sheet piling. The firm shall be approved by the Owner. Submittal of the sheet pile installation log is required.

02262.3.3 Not Used

 BLACK & VEATCH Building a world of difference.	Epoxy Coal Tar (EPT)/Epoxy Coal Tar (EPT)	Coating System 2314
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Project	Coating System and Blast Media Selection Procedure
Description	Epoxy coal tar with epoxy coal tar finish
Surfaces	Carbon steel

Regulatory Compliance	Volatile organic compound (VOC) content of all materials must comply with applicable regulations for the point of application and, as required, the site location.
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Approved Products	Coating manufacturers and products other than those listed herein are subject to Engineer's review/approval.	
Manufacturer	First Coat	Second Coat
Carboline	Bitumastic 300 M	Bitumastic 300 M
PPG	Amercoat 78HB	Amercoat 78HB
Sherwin-Williams	Tar Guard	Tar Guard

Surface Preparation	SSPC-SP 10/NACE No. 2 Near White Blast Cleaning Profile depth 2 to 4 mils (50 µm to 100 µm)
Remarks	Profile to be verified by Contractor using ASTM D4417 Method C. Welds to be prepared in accordance with NACE SP0178, Appendix C, Designation "C." Maintain minimum of 1/8 in. (3.2 mm) radius on all corners and edges. Test in accordance with ISO 8502-3, Assessment of dust on steel surfaces prepared for painting. An acceptable result is a dust quantity of 2 and a dust size class of 2.

Dry Film Thickness (DFT)					
	Generic Coating Type	Minimum DFT	Maximum DFT	Shop (S) or Field (F) Applied	Remarks
First Coat	EPT	8 mils (200 µm)	12 mils (300 µm)	S, F	
Second Coat	EPT	8 mils (200 µm)	12 mils (300 µm)	S, F	
Completed System		16 mils (400 µm)	24 mils (600 µm)		Dry film thickness to be verified in accordance with SSPC-PA 2. Holiday testing required in accordance with NACE SP0188 and coating manufacturer's instructions.

					2	11/05/13	General Revision	GMA	RHW
4	10/28/16	Changed to SSPC-SP 10	RJT	BPL	1	08/31/11	General Revision	GMA	RHW
3	12/31/15	Biennial Review	RJT	BPL	0	06/01/08	Initial Issue	BPL	RHW
REV	DATE	REVISIONS AND RECORD OF ISSUE	BY	APP	REV	DATE	REVISIONS AND RECORD OF ISSUE	BY	APP
BLACK & VEATCH			COATING SYSTEM DATA SHEETS - SYSTEM 2314				Drawing No. 81113-DM-0660	Rev 4	