JEA-Northside Generating Station

INLET FAN SILENCER REPLACEMENT

JACKSONVILLE, FLORIDA

Issued For Bid

401685.65.1000

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Revision 0

BLACK & VEATCH
JACKSONVILLE, FLORIDA

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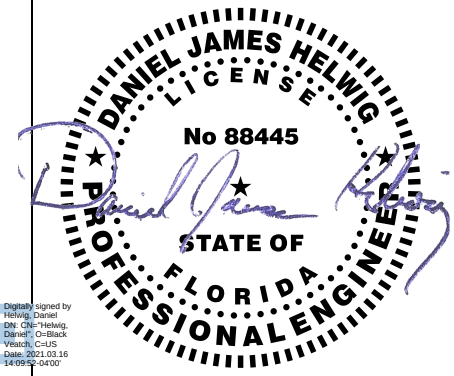
Project Identification	
Title:	**JEA Northside Inlet Fan Silencer Replacement**
Address:	4377 Heckscher Dr, Jacksonville, FL 32226
Specification:	Inlet Fan Silencer Replacement
Issue Status:	Issued for Bid
Certification(s)	

I hereby certify that this specification was prepared by me or under my direct supervision and that I am a duly registered professional engineer under the laws of the state of Florida:

THIS ITEM HAS BEEN ELECTRONICALLY SIGNED AND SEALED BY DANIEL J HELWIG, PE, ON THE TIME & DATE STAMP SHOWN USING A DIGITAL SIGNATURE. PRINTED COPIES OF THIS DOCUMENT ARE NOT CONSIDERED SIGNED AND THE SIGNATURE MUST BE VERIFIED ON ANY ELECTRONIC COPIES.



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01100 - Scope of Work

01100.1 Technical Scope of Work

The design and supply described herein for replacement fan silencers for Units 1&2 secondary air (SA) and primary air (PA) fans shall be included. The draft fans shall not impose any restrictions on the normal operation of the unit and shall be designed to operate safely, reliably, continuously, and without undue maintenance over the entire operating load range. The design shall consider steady-state and normal transient conditions.

Technical supplemental specifications that are applicable to the work covered under these technical specification articles are identified and included in Section 21000.

Scope of supply shall include the fan silencers and all parts required for their function as specified herein. Fan silencers procured through this data package shall be ready for installation, and shall be shop assembled to the maximum extent practical.

The work under these specifications shall include furnishing a fully assembled silencer box that is designed to:

- Match the existing outline dimensions;
- Match the existing bolting pattern and mating flanges;
- Include all bolting hardware for installation by Others;
- Match the existing silencer sound attenuation requirements listed in section 15533.1.1;
- Maintain the total pressure drop at or below specified limits; and
- Maintain the weight at or below the existing silencer weight.
- Carbon steel casing shall be shop prime painted.
- Acoustic perforated metal liner shall be stainless steel or galvanized.
- Drawings and design documentation for the equipment as defined herein.
- Installation, Operating, and Maintenance Manuals.
- Silencer must be rated for 130 mph.

All Work shall be produced in accordance with the current laws, ordinances, regulations, codes, standards, and rules applicable to Professional Engineers practicing in the state of Florida. If required by the applicable current laws, ordinances, regulations, codes, standards and rules; the Supplier design documents (calculations, drawings, specifications, statements of special inspections, certificates of compliance, etc.) shall be certified and sealed by an engineer licensed to practice in the state of Florida and shall be submitted to the Purchaser.

01100.1.1 Miscellaneous Materials Scope

The following miscellaneous materials shall be included in the Supplier's scope of work if indicated in the Supplier column:

Miscellaneous Materials Scope			
Item	**Description**	**Supplier**	**Purchaser**
1.	All nuts, bolts, gaskets, special fasteners, backing rings, sole plates, shims, leveling blocks, etc., between components and equipment furnished under these specifications.	X	

Miscellaneous Materials Scope			
Item	**Description**	**Supplier**	**Purchaser**
2.	Erection drawings, prints, information, instructions, and other data for use by the erection contractor. Drawing and instructions shall be project specific for equipment and material provided for this project	X	
3.	Detailed storage requirements for use by the erection contractor.	X	
4.	Manufacturer's standard finish coat shall be applied.	X	
5.	All crating/packaging and freight of any equipment furnished under these specifications.	X	
6.	Drawings and performance data sheets for all equipment supplied by Contractor.	X	

01100.2 Precedence

In the event of technical conflicts, errors, or discrepancies, the detailed technical specifications, including this Section 01100 and all higher numbered sections, take precedence over Section 21000.

01100.3 Drawings and Technical Attachments

The following lists the drawings and other technical attachments that have been prepared for the work under these specifications. These attachments shall be part of the Purchase Order.

Reference Drawing No.	Rev.	Title
401685-SM-0001		PA Fan Inlet Silencer - Details
401685-SM-0002		SA Fan Inlet Silencer – Details

15533 – Fan Silencers

15533.1 General Description

Fan silencers shall be designed to comply with the specified sound abatement requirements stated herein for the Primary Air (PA) and Secondary Air (SA) fans. The silencers will be installed in the upstream of the existing PA and SA fans and shall be designed to be a drop in replacement, which matches the overall outline dimensions, flange details, weight, and sound attenuation characteristics. The equipment shall be suitable for outdoor use in a coastal environment. The perforated metal liner shall be stainless steel or galvanized, and carbon steel with zinc primer coating, or equivalent, for the casing. The media shall be fiberglass with a fiberglass cloth media protection.

15533.1.1 Noise Level

The overall sound power insertion loss at each fan inlet shall be reduced, as close as possible, by the levels shown in the following tables during normal operation of the fan unit, including all operating points between 30 percent load and full load.

Primary Air Fan

Octave Band	63	125	250	500	1K	2K	4K	8K
Total Fan LW (dB)	142	139	136	125	125	125	118	110
Silencer Net IL (dB)	11	15	22	32	37	28	21	18

Secondary Air Fan

Octave Band	63	125	250	500	1K	2K	4K	8K
Total Fan LW (dB)	132	132	130	124	123	112	107	97
Silencer Net IL (dB)	10	11	15	19	19	14	10	9

The Supplier shall submit certified data verifying compliance with the specified sound level limits. The data, at a minimum, shall include the overall A-weighted sound level as well as the octave band sound levels.

15533.1.2 Performance

The silencers shall be of the -absorptive type and shall be suitable for use with an ambient air.

The performance requirements for each silencer is shown below:

Service	Quantity Required	Fan Rating (ACFM)	Rating per Silencer (ACFM)	Air Density (lb/ft3)	Pressure Drop per Silencer (Inches WG)	Not to Exceed Weight per Silencer box* (lb)
PA Fan Inlet Silencer	8	224,800	112,400	0.068	1.0	4,850
SA Fan Inlet Silencer	4	96,000	96,000	0.068	0.75	4,220

Silencer specification, design criteria, and calculations shall be submitted for approval.

Silencers performance shall be guaranteed for one year. The silencers shall have drainage provisions to prevent water damage in the bottom of the fan inlet casing.

15533.2 Silencer Frames

Silencer Frames shall be fabricated of rolled structural shapes or formed plate. The SA fan frames shall be self-supporting structural members that do not require any external bracing or support. The PA fan frames shall have cross-bracing on external side of silencer

Frames shall be completely welded assemblies except as noted. The internal welds can be stitched welded if doing so will prolong performance.

Frames shall be rigid and capable of operating under the design conditions without distortion which could affect the operation or sealing characteristics. If required, adjustable alignment bars shall be provided to remove misalignment occurring during shipping and handling.

Damper frame section and thickness shall be determined on the basis of stresses resulting from transit and handling abuse; any combination of pressure, temperature, wind, or seismic loads; effects of corrosion and erosion; and the physical size and weight of the damper. Stress at the weakest section of the frame shall not exceed the levels specified in the AISC manual for complete structural members.

Any external frames required shall be fabricated so that water cannot accumulate on surfaces. The top of the frames shall be pitched to allow drainage of rain or other moisture. External frames of the open type are preferred if zero leakage to the atmosphere can be maintained for all damper operating conditions, including blade in transit.

Integral lifting lugs shall be provided on the silencer frame.

15533.3 Silencers

Silencers shall be provided to reduce the noise emissions to meet the specified sound levels. Silencers shall be installed within the silencer frame. Exhaust silencers shall be constructed of sound absorbent material suitably clad between perforated metal sheets. The silencers shall be constructed of stainless steel or galvanized steel material. The design of the attenuators shall be such that components or parts of the attenuators cannot become detached and obstruct or pass through the flow passage.

21000 - Technical Supplemental Specifications

This section contains technical supplemental specifications that provide additional requirements applicable to the work covered under the technical sections.

21000.1 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	15533	Fan Silencers	Q100, Q301, Q500

21000.2 Technical Supplemental Specifications

The technical supplemental specifications follow.

Q100 General Welding Requirements (Revised by Project: 21MAY19)

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 any other Welding Technical Supplemental Specification section(s) when referenced.

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 Purchaser 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 Purchaser.

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 Purchaser prior to start of fabrication. Submittal of welding procedures and applicable PQRs shall apply to all suppliers and subsuppliers. Suppliers shall review the documents in accordance with the applicable code and specification requirements and shall accept all of their subsuppliers' welding procedures and applicable PQRs prior to submitting accepted documents to Purchaser.

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 Purchaser prior to fabrication.

Alloy, semiactive, or active fluxes shall not be used except as specified otherwise. Fluxes that compensate for losses of alloying elements are permitted.

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.

Q100.6 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 Purchaser. 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 Purchaser when requested.

Detailed PWHT procedures shall be submitted for review by Purchaser. 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.

Q100.6.3 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. This shall include any previously applied paints, coatings and galvanized surfaces. Previous coated, painted or galvanized surfaces shall be completely removed down to bare metal prior to welding. Any previous coated, painted and/or galvanizing surface shall be sufficiently removed from either side of the mating members so that no peeling or melting of the coating enters into the weldment.

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 deoxaluminate 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.

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 suppliers 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 Purchaser 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 Purchaser's structural steel members (welds that are transverse to the beam or column center line) shall not be an acceptable practice, and Supplier shall design all welded interfaces to Purchaser's steel structure to specifically avoid this condition. Supplier'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 Purchaser.

A complete repair procedure for repairs that are documented as the basis of a nonconformance report shall be submitted to Purchaser 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 Purchaser 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 Purchaser 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 Purchaser. Visual inspectors' qualifications and certificates shall be submitted for review and verification.

The responsible supplier'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.

Supplier 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 Supplier's expense.

Purchaser 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 Supplier. If the weld is not defective, the laboratory costs will be paid by Purchaser. Repair of defective welds and reexamination shall be at the Supplier'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 Purchaser.

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 Supplier for 10 years after completion of the work. If the Supplier cannot keep the records for 10 years, the Supplier must submit the records to the Purchaser 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.

Q301 Manufacturer's Standard Coating (Revised by Project: 21MAY19)

Unless otherwise specified, the manufacturer's standard coating systems shall be applied in the shop to ferrous metal surfaces of equipment and materials. The coating systems shall provide resistance to corrosion caused by weather and industrial environments. Manufacturer's standard coating systems shall be specified to provide medium (M) durability in accordance with ISO 12944, Paints and Varnishes – Corrosion Protection of Steel Structures by Protective Paint Systems, for the intended service environment. Surfaces that will be inaccessible after assembly shall be protected for the life of the equipment.

Coating material and application shall conform to the regulations of the air quality management agency having jurisdiction. Materials shall be formulated to contain less than 0.06 percent lead or chromium in the dried film.

Surfaces shall be cleaned, prepared, and coated in accordance with the coating manufacturer's instructions and specified codes. Surfaces to be painted shall be prepared, as necessary, to provide a smooth, uniform base for painting.

Coating films that show defects such as sags, checks, blisters, teardrops, and fat edges will not be accepted. Any coated surface that contains any of the previously mentioned defects shall be repaired or, if necessary, entirely removed from the member or unit involved and the surface recoated.

Surfaces to be finish painted after installation shall be shop painted with one coat of the manufacturer's standard primer.

Touchup paint shall be provided for repair painting of at least 10 percent of the finish painted equipment surface. The touchup paint shall be the same type and color as the shop applied material. Application instructions shall be provided.

Coating dry film thicknesses shall be measured using a magnetic or electronic thickness detector in accordance with Society for Protective Coatings (SSPC)-PA2. Additional coating shall be applied to all areas that show a deficiency in dry film thickness.

Shop drawings shall identify the shop applied coating systems. Data to be provided shall include the coating system manufacturer's name and product designation, the degree of surface preparation, dry film thickness, finish color, and Safety Data Sheets (SDSs). Final dry film thickness test results shall be submitted to Purchaser for verification.

Q500 Shop Drawings and Instruction Manuals (Revised by Project: 21MAY19)

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

Q500.1 Submittal Requirements

Technical data shall be submitted in electronic format.

Electronic technical data submittals shall be made using the Project Central project collaboration system, a Web-based file transfer service. If Supplier does not already have Project Central transmittal capability, the Purchaser will provide the required credentials for access upon Purchase Order award.

Notification to Purchaser that submittals have been posted to Project Central shall be in accordance with the correspondence requirements of this Purchase Order.

Q500.2 Compliance Reports

Reports shall be submitted that record the tests and/or calculations required in the specification technical sections. Reports shall be submitted for each piece of equipment or each plant system. Specified drawings shall be submitted with the compliance reports.

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, supports, and grouting requirement; the dimensions needed for installation and correlation with other materials and equipment; and the information specifically requested in the Schedule of Submittals.

Drawings for use in installation and erection shall include a Bill of Quantity (BOQ), identifying the unit of measure, quantity, description, part number (or piece mark identifier), location reference on the drawing and any other details required by Purchaser. It may be acceptable to have the BOQ detail in other means or media, if approved in advance by Purchaser.

Supplier shall fully complete, check, and certify drawings, including drawings produced by a subcontractor, for compliance with the Purchase Order requirements prior to submittal. 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, Purchaser's Purchase Order title, Purchaser's Purchase Order file number, project equipment or structure nomenclature, component identification numbers, and Purchaser's name. Equipment, instrumentation, and other components requiring Purchaser-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 as well as all fields listed in the transmittal letter. Each drawing title shall be unique and shall be descriptive of the specific drawing content. Transmittal letters for resubmitted drawings shall include the Purchaser's drawing numbers.

Catalog pages are not acceptable, except as drawings for standard nonengineered 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, Supplier's drawing number, and Purchaser's name.

Drawings shall be submitted with all numerical values in English and/or metric (SI) units.

All multi sheet documents shall be submitted in their entirety for all revisions.

Q500.4.1 Drawing Submittal
A standard drawing submittal template form is included at the end of this section. Supplier shall use this form for all submittals. (An electronic copy of this form will be made available upon Purchase Order award.)

Drawings shall be submitted electronically in Portable Document Format (PDF). AutoCAD or MicroStation format files are not acceptable. If Supplier does not have the capability to provide Portable Document Format (PDF), an alternative submittal format shall be used as mutually agreed between Purchaser and Supplier.

Reproducibles can be plots or photocopies for drawings larger than 34 inches by 44 inches.

Q500.4.2 Drawing Processing
Supplier's engineering schedule shall allow a minimum of three (3) weeks for transmittal, processing, and review of drawings and data by Purchaser.

Unless this Purchase Order indicates that a drawing or engineering data submittal by Supplier is to be for Purchaser's information only, Purchaser, upon receipt of submittals, shall review and return same to Supplier, marked "No Exceptions Noted," "Exceptions Noted," "Received for Distribution," "Returned for Corrections," "Release for Record," "Void," "Superseded" or "Hold" The timing of Supplier's submittals and Purchaser's review shall be in accordance with the Completion Dates for same as set forth in the Purchase Order. The submittal of any drawing or other submittal document by Supplier to Purchaser under this Purchase Order will be certification by Supplier 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," Supplier may proceed with its Work to the extent of and in accordance with the submittal. Supplier 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 Supplier concurs with Purchaser's comments, Supplier shall incorporate same and may proceed with its Work to the extent of and in accordance with the annotated submittal. Supplier shall submit to Purchaser within fourteen calendar days a revision to the original submittal in which Purchaser's comments have been incorporated. If Supplier determines that it cannot incorporate Purchaser's comments without prejudice to Supplier's warranty or other obligations under this Purchase Order, Supplier shall so advise Purchaser in writing within seven calendar days of its receipt of Purchaser's comments, stating the reasons therefore. Supplier may proceed with its Work to the extent of and in accordance with the annotated submittal only upon Purchaser and Supplier resolving Purchaser's comments.

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

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 Purchaser's document management system may have been added electronically to the drawing and provided to Supplier for the record. Supplier shall not resubmit the drawing or document unless revisions to the design are required. If revisions are required, Supplier shall incorporate Purchaser's information and resubmit as a new revision. Purchaser'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 Supplier. "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 Purchaser, or the Supplier may have "Holds" on the submitted drawing.

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

The Supplier shall provide information to the Purchaser about the cause for any "Holds" designated on the drawing and immediately take all action necessary to resolve the "Holds". The Supplier 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 Purchaser until drawing review comments have been received back from the Purchaser.

Q500.4.2.7 Resubmittals. If during or subsequent to the completion of the submittal process, Supplier makes further changes to the equipment and materials shown on submittals that have been reviewed by Purchaser, the changes shall be clearly marked on the submittal by Supplier and the submittal process shall be repeated. If changes are made by Supplier after delivery to the Jobsite, drawings conforming to construction records indicating the changes shall be prepared by Supplier and submitted to Purchaser 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. The Supplier shall put the Black & Veatch drawing number on the transmittal letter and submit a complete document..

Q500.4.2.8 Purchaser's Review. Purchaser'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. Purchaser'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 Purchaser of Supplier's Drawings or other submittals shall not relieve Supplier of its sole responsibility to meet the Completion Dates requirement of this Purchase Order and to supply Goods that conform to the requirements of this Purchase Order.

Q500.4.2.9 File Returns to Supplier. The Project Central will be used by Purchaser to return PDF files to Supplier.

A copy of the manifest will be returned to Supplier indicating drawings statused as NE (No Exceptions Noted).

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

Files returned to Supplier will be in PDF format.

Q500.5 Manufacturer's Data Report Requirements

The Supplier shall submit a Manufacturer's Data Report (MDR) for all furnished equipment and materials within ten (10) working days after the equipment and materials have been released for shipment to site. The MDR shall include the following information as a minimum.

1. Table of contents

2. Procedures
    a. Complete list of all Supplier's Welding, PWHT, NDE and Coating Procedures used to manufacture the equipment and materials.

3. Qualifications
    a. Complete list of all Supplier's Welding and Inspection Personnel used during manufacture of the equipment and materials.

4. Materials
    a. Material List.

    b. Complete list of all Welding Consumable Certificates and Test Reports for all weld materials incorporated into the equipment and materials.

    c. Material Safety Data Sheets (MSDS) for all Coatings included in the equipment and materials at time of release for shipment.

5. Inspection and Test Records required by the Inspection and Test Plan and/or Manufacturer's Standards. Examples of these records include:

    a. Weld Data Records and other NDE records

    b. Dimension Inspection Report

c. Blasting / Coating Inspection Report

d. Release For Shipment Report

6. All associated defect or nonconformance reports with final disposition

Q500.6 Binding

Each copy of the MDR shall be assembled and bound in three-ring or post binders designed for rough usage. Light-duty binders will not be acceptable.