

**THE CITY AND BOROUGH OF JUNEAU**

CBJ  
Engineering Department - Contracts Division  
155 South Seward Street  
Juneau, Alaska 99801

Telephone: (907) 586-0490 Facsimile: (907) 586-4530

**REQUEST FOR QUOTE**

Number: **RFQ E11-179**

This number must appear on all related  
correspondence

Date: 03-Dec-10

**Quotes Are Due No Later Than:**

**2:00 pm 10-Dec-10**

Department

Engineering

Division

Contracts

Project Name **Juneau Douglas Wastewater Treatment Plant Heat Exchanger Repair**

**1. BIDDER NAME AND MAILING ADDRESS:**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**2. BIDDER CONTACT INFORMATION:**

**Fax No:** \_\_\_\_\_

**Telephone No:** \_\_\_\_\_

**Contact Name:** \_\_\_\_\_

**3.**

The Contractor shall provide all labor, equipment, materials and perform all Work for weld and related repairs to the heat exchanger unit on the City & Borough of Juneau's (CBJ's) fluidized bed bio-solids incinerator located at the Juneau-Douglas Wastewater Treatment Plant in Juneau, Alaska. The heat exchanger unit is approximately 6 years old and repairs are needed at the upper and lower tube sheet connections of 48 heat exchange tubes.

LUMP SUM \$ \_\_\_\_\_

**4. Addenda Received**

***Bidder has examined the bid documents, including the following addenda (receipt of all of which is hereby acknowledged by the undersigned). Give number and date of each addenda. Failure to acknowledge receipt of all addenda may cause the quote to be non-responsive and may cause its rejection. If there are no addenda, "none" or "0" must be filled out.***

Addenda No.

Date Issued


**5.**

\_\_\_\_\_  
Bidder's Signature

\_\_\_\_\_  
Please Print Name

**6. Title**

**7. Alaska Contractor's and  
Business License No.'s**

**8. Date**

**NOTE: Bidder must complete Items 1 through 8.**

Return this form and all required data via fax or deliver to the CBJ  
Engineering Department, Contracts Division - 3rd Floor Marine View  
Center



**CITY AND BOROUGH OF JUNEAU (CBJ)  
REQUEST for QUOTES (RFQ)**

**Juneau Douglas Wastewater Treatment Plant (JDWWTP)  
Heat Exchanger Repair  
RFQ No. E11-179**

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**QUOTES ARE DUE PRIOR TO 2:00 p.m., December 10, 2010**

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**RESPONDING TO THIS REQUEST FOR QUOTES.** Quotes may be hand-delivered, or faxed, to the attention of Janet Sanbei, CBJ Engineering, Contracts Office, 3rd Floor, Marine View Center at 230 South Franklin Street. The Engineering Department Contracts Division fax number is 907-586-4530. Emailed quotes will be accepted if they are emailed to [eng\\_contracts@ci.juneau.ak.us](mailto:eng_contracts@ci.juneau.ak.us), received and printed prior to the deadline stated above. It is strongly recommended that Bidders call (907) 586-0490 to confirm receipt of faxed or emailed quotes.

**SCOPE OF WORK.** The Contractor shall provide all labor, equipment, materials and perform all Work for weld and related repairs to the heat exchanger unit on the City & Borough of Juneau's (CBJ's) fluidized bed bio-solids incinerator located at the JDWWTP in Juneau, Alaska. The heat exchanger unit is approximately six years old and repairs are needed at the upper and lower tube sheet connections of 48 heat exchange tubes.

The existing heat exchanger unit was manufactured by Hamon USA and installed in 2004. See Attachment "A" Design Drawings and Attachment "B" Project Photos. The vertical heat exchange tubes are 2" NPS Sch#10 SB-729S, Alloy 20 steel, 22'-0" overall length. The upper end of each tube is seal welded to the upper 1 1/4" thick alloy tube sheet. The lower end of each tube is welded to a tube expansion joint which is welded to the lower tube sheet. The tubes are leaking at their top and bottom connections and require the following repairs:

Upper End Tube Repairs: Repairs to the upper tube joints will include re-welding of the tube seal joints connecting each tube to the upper tube sheet. Some of the existing tubes have dropped out of location and will need to be jacked back into position prior to re-welding. These repairs will require utilizing TIG welding equipment and ERNiCr-3 TIG welding rod. See Attachment "C" Welding Specification.

Lower End Tube Repairs: Repairs to the lower tube joints will require the installation of an approximately 3/16" SS ring welded to the bottom end of each tube and to the bottom end of each existing tube bellows. These repairs will require overhead welding using TIG welding equipment and ERNiCr-3 TIG welding rod. See Attachment "C" Welding Specification.

All welding will require careful application by professional welders certified for TIG welding in accordance with the welding specification. Welding Process (Type's) can be either (1) GTAW - TIG/ Manual or (2) GMAW – MIG/Semiautomatic. The Contractor will use dye penetrant testing all the weld joints to locate cracks and verify weld integrity both before and after repair work.

The welding repairs will require confined space entry and the Contractor price for the work shall

include confined space entry procedures in accordance with local, state, and federal laws.

**LOCATION OF THE PROJECT.** The Project is located at the Juneau Douglas Wastewater Treatment Plant on Thane Road in Juneau, Alaska.

**COMPLETION TIME FOR THE WORK.** The Contractor shall have until January 17, 2011, to complete all Work as described.

**SITE INSPECTION.** Bidders are encouraged to visit the Project site prior to submitting a bid for this Work. Failure to visit the site shall in no way relieve the Contractor of its responsibility to perform the Work in compliance with the terms and specifications of this Contract.

**QUALITY OF WORK.** The Contractor shall employ workers and craftspeople qualified in the necessary trades. All Work shall conform to the drawings and specifications, industry standards and practices, and the manufacturer's requirements. The Contractor shall be responsible for the supervision and control of all Work; the safety of the workers; and assurance that the quality of Work and character of workers conform to all applicable laws and regulations.

**QUALIFICATIONS.** By submitting a quote the Contractor warrants that it is qualified to perform the Work described in accordance with all applicable codes, standards, and regulations. The Contractor shall, upon request by the CBJ, provide all documentation showing the Contractor's qualifications and/or registrations necessary for completion of the Project.

**QUOTES.** A Quote for the Work will not be accepted from a Contractor who does not hold a valid Alaska Business License and a valid Contractor's license in Alaska (applicable to the type of Work bid upon) at the time of opening Bids. **The CBJ's procurement code requires that Request for Quotes be used for projects estimated to not exceed \$50,000.00 in total cost.** If a quote is submitted for an amount exceeding \$50,000.00, it shall be considered non-responsive.

**CONTRACTOR'S RESPONSIBILITIES.** The Contractor shall designate a Construction Superintendent, or designee, who shall serve as the Contractor's point of contact and be in full charge of the Work, ensuring that construction is performed in a safe and professional manner. Unless otherwise approved in writing by the Owner's Project Representative, the Construction Superintendent shall acknowledge and accept, on behalf of the Contractor, all written change orders, directives, approval, or rejection notices.

The Contractor shall have sole responsibility for the means, methods, sequences, or procedures of construction and safety precautions related thereto. The Contractor shall conduct all Work in such a manner as to protect CBJ resources.

The Contractor shall comply with all applicable laws, regulations, codes, and ordinances. In addition, the Contractor shall obtain applicable licenses and permits, unless directed otherwise; provide supervision, labor, tools and new materials, unless directed otherwise.

**SUBCONTRACTING.** If this project will have subcontractors, the Contractor shall submit a list of Subcontractors who will be working on the project (form attached to the end of this RFQ), and to comply with Alaska Department of Labor Wage and Hour requirements and the Alaska Employment Security Act. The Employment Security Tax Clearance form will be issued with the Notice to Proceed.

**CANCELLATION.** The CBJ, as Owner, reserves the sole right to cancel this Contract, in whole or in part, immediately, in the event of the Contractor's failure to perform the Work in conformance with these Contract Documents.

**CONTRACT ADMINISTRATION AND ACCEPTANCE.** The CBJ, through its authorized representative, will perform the Contract Administration and Inspection for this Work. The CBJ reserves the right to determine the acceptability of the finished Project. Should the Contractor fail to meet the required specifications, the Contractor shall immediately complete the Project as specified, at no additional cost to the CBJ.

**COMPENSATION.** The Contractor shall be paid on a lump sum basis, upon satisfactory completion and acceptance of the Work by the CBJ and notification by the State Department of Labor that the Contractor has complied with its requirements.

### **LIABILITY AND INSURANCE REQUIREMENTS.**

**Liability.** The Contractor shall hold and save the CBJ, its officers, agents, and employees harmless from liability of any nature. This includes any costs, expenses, suits or damages of any kind sustained by any person(s) or property by any virtue of performance resulting from the Project, unless arising from carelessness or negligence by the CBJ, which will be apportioned on a comparative fault basis.

**Insurance Requirements.** The Contractor shall provide evidence of insurance with a carrier or carriers satisfactory to the CBJ, covering injury to persons and/or property suffered by the CBJ or a third party, as a result of operations under this contract by the Contractor or by any Subcontractor. This coverage will also provide protection against injuries to all employees of the Contractor and the employees of any Subcontractor engaged in Work under this contract. The delivery to the CBJ of a written 30-day notice is required before cancellation of any coverage or reduction in any limits of liability. Insurance carriers providing coverage shall have an A.M. Best rating of at least A-VII. The Contractor shall maintain in force at all time, during the performance of Work under this contract, the following policies of insurance. **"The CBJ shall be named as additional insured for any and all work performed for the CBJ."** (Additional insured requirements not required for Worker's Compensation coverage.) Proof of this insurance is required before the final bid award.

1. **Commercial General Liability Insurance.** Such insurance shall cover all operations by, or on behalf of, the Contractor providing insurance for bodily injury and property damage liability including coverage for premises and operations, products and completed operations, contractual liability, broad form property damage, and personal injury liability.  
The minimum limits of liability shall be:  
  
\$1,000,000 each occurrence for General Liability and Products/Completed Operations;  
\$1,000,000 for Personal Injury Liability;  
\$2,000,000 Aggregate for Products-Completed Operations;  
\$2,000,000 General Aggregate.
2. **Business Automobile Insurance.**  
\$1,000,000 per accident, combined single limit, covering owned, non-owned and hired automobiles.

**The City and Borough of Juneau shall be named as an "Additional Insured" under all liability coverages listed above.**

3. Workers' Compensation Insurance. The Contractor, if subject to the provisions of the Alaska Workers' Compensation Act (AS 23.30), will provide the CBJ and the State of Alaska with proof, furnished by the insurance carrier, of current coverage for workers compensation with an insurance company or association authorized to transact such business in the State of Alaska, or an approved current certification of self-insurance by the Alaska Workers' Compensation Board. The Contractor further acknowledges and agrees that in the event it fails to maintain proper Workers' Compensation coverage, the State will implement the provisions of AS 23.30.045 8 and CBJ, at its option, may terminate this agreement for cause without liability.
  - a. Employers Liability

Bodily Injury by Accident:	\$100,000.00 Each Accident
Bodily Injury by Disease:	\$100,000.00 Each Employee
Bodily Injury by Disease:	\$500,000.00 Policy Limit
  - b. The Contractor agrees to waive all rights of subrogation against the Owner for Work performed under the contract.
  - c. If the Contractor directly utilizes labor outside of the State of Alaska in the prosecution of the Work, "Other States" endorsement shall be required as a condition of the contract.

**TITLE 36 (Little Davis-Bacon) REQUIREMENTS.** If your quote exceeds \$2,000.00 and you subcontract or employ anyone to perform any of the Work, the following will apply:

**Title 36 AS (Little Davis-Bacon)** requires that prevailing rates of pay be paid for Work performed on any public works Project which exceeds \$2,000.00 (contained in pamphlet number 600 and 400, copies available from the State of Alaska Department of Labor and Workforce Development, Labor Standards and Safety Division, Wage and Hour Administration, P.O. Box 11149, Juneau, Alaska 99811-1149, or call 465-4842.

**AS 36.05.035** requires that the contracting agencies notify ADOL of the award of public contracts, as well as the name of the Contractors and Subcontractors.

**AS 36.05.040** requires the filing of certified payrolls directly with the Wage and Hour Administration every two weeks. It also requires any other information which ADOL may request. One specific requirement is that all Contractors and Subcontractors notify ADOL as to the identity of all Subcontractors they may have.

Contractors and contracting agencies are required to keep the ADOL notified of all Subcontractors. This requirement is two-fold; one is to ensure proper Contractor licensing of all Subcontractors and two, to enable the ADOL to notify Subcontractors of their legal obligations under Title 36. If a Subcontractor fails to respond to its legal requirements, ADOL may hold the prime Contractor responsible.

Remember:

- 1) The contracting agency and the Contractors must notify the ADOL of all Contractors and Subcontractors on the Project on a continuing basis.

- 2) Certified payrolls must be sent every two weeks before the second Friday to the addresses below by each Contractor and Subcontractor on the Project.
- 3) Failure to comply may result in the ADOL withholding progress payments to obtain compliance and/or debarment of the Contractor or Subcontractor found to be in non-compliance.

Certified payrolls must be sent to the following:

STATE OF ALASKA  
Department of Labor  
and Workforce Development  
Labor Standards and Safety Division  
Wage and Hour Administration  
P.O. Box 11149  
Juneau, Alaska 99811-1149

Jennifer Mannix  
City and Borough of Juneau  
Engineering Department  
155 S. Seward Street  
Juneau, Alaska 99801  
907-586-0873

If you need additional information, contact the State of Alaska, Department of Labor at 465-4842.

**QUESTIONS CONCERNING THE WORK.** Contact Jennifer Mannix, Contract Administrator at 907-586-0873, or email: [jennifer\\_mannix@ci.juneau.ak.us](mailto:jennifer_mannix@ci.juneau.ak.us).

**FINAL PAYMENT.** Prior to final payment of the final 5% of this contract, the Contractor must submit the following documents:

1. Employment Security Tax Clearance for the Contractor and each Subcontractor from Alaska Department of Labor, Juneau Field Tax Office – (form to be provided with Notice to Proceed)
2. Compliance Certificate and Release Form – (form to be provided with Notice to Proceed)
3. Approved Notice of Completion of Public Works (from DOL)

**AS-BUILT PLANS.** This request for bids may include a portion of an as-built plan. As-built plans are prepared from the best available information; however, the plans may not reflect actual utility locations. The CBJ is not responsible for costs incurred by the Contractor due to any discrepancy in the as-built plans.

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## TECHNICAL SPECIFICATIONS/DRAWING INDEX

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Attachment A – Design Drawings  
Attachment B – Project Photos  
Attachment C – Weld Procedures

# Standard Terms and Conditions

**Examination of Quote Documents:** Each bidder shall thoroughly examine and be familiar with all the documents and any addenda to those documents. The submission of an Quote shall constitute an acknowledgment that the bidder has thoroughly examined and is familiar with the Request For Quote (RFQ) documents. The failure or neglect of a bidder to receive or examine any of the Quote documents shall in no way relieve that bidder from any obligations with respect to that bidder's proposal, or to the contract. Misinterpretation or a claimed lack of knowledge concerning the Quote will not serve as a basis for a claim for additional compensation.

**Interpretation of Quote Documents:** Comments concerning defects, questionable or objectionable material and requests for interpretation must be made in writing and received by the CBJ Engineering Department, Contracts Office. If required, amendments to the Quote documents will be in the form of an addenda and, when issued, will be sent as promptly as is practical to all parties to whom the RFQ documents have been issued. All such addenda shall become part of the contract. Request must be sent to the CBJ Engineering Department, Contracts Office, 155 South Seward Street, Juneau, Alaska 99801.

**Preparation of Quote:** Quote must be submitted on the RFQ forms provided, or copies thereof, and be completed in all respects as required by the RFQ documents. Each Quote shall include all information requested, and be manually signed in ink.

**Addenda:** Each Quote shall include acknowledgment in the space provided (Item 2), in the RFQ form, receipt of all addenda issued during the bidding period. Failure to acknowledge all addenda may result in the proposal being rejected as not responsive. It shall be the bidder's responsibility to inquire about addenda issued.

**Qualification of Bidders:** Each bidder shall be skilled and regularly engaged in the general class or type of work called for under the contract. If requested by the CBJ Engineering Department, the **low bidder** shall submit resumes, documentation or information explaining, illustrating, or demonstrating the experience of the firm, and its key personnel who will be assigned to this contract.

**Specifications:** Unless otherwise specified in the RFQ, product brand names or model numbers specified in this RFQ are examples of the type and quality of product required, and are not statements of preference. If the specifications describing an item conflict with a brand name or model number describing the item, the specifications govern. Reference to brand name or number does not preclude an offer of a comparable or better product, if full specifications and descriptive literature is provided for the product. Failure to provide such specifications and descriptive literature may be cause for rejection of the offer.

**Quote Prices:** The bid prices shall include everything necessary for the fulfillment of the contract, including, but not limited to, furnishing all materials, equipment and labor, except as may be provided otherwise in the contract documents. Price bid must be in U.S. Funds.

**Additional Units on RFQ Award:** The CBJ may from time to time request additional units above the amount stated in the RFQ, realizing that additional orders constituting more than 25% of the amount stated in the RFQ would be with the concurrence of the Contractor.

**Extension of Prices:** In case of error in the extension of prices in the Quote, the unit prices will govern; in a lot bid, the lot prices will govern.

**Firm Offer:** For the purpose of award, offers made in accordance with this RFQ must be held firm for a period of ninety (90) days from the date of RFQ opening.

**Contract Extensions:** Unless otherwise provided in the RFQ, the CBJ and successful bidder/Contractor agrees: (1) that any holding over of the contract excluding any exercised renewal options, will be considered as a month-to-month extension, and all other terms and conditions shall remain in full force and effect, and (2) to provide written notice to the other party of the intent to cancel such month-to-month extension.

**Default:** In case of default by the Contractor, for any reason whatsoever, the CBJ may procure the goods or services from another source and hold the Contractor responsible for any resulting excess cost and may seek other remedies under law or equity.

**Billing Instructions:** Except as specifically allowed under the RFQ, invoices must be billed to the Engineering Department, as noted on the purchase order. The ordering agency will approve for payment after it receives the merchandise or service and all conditions of the RFQ have been met.

**Equal Employment Opportunity:** The CBJ is an affirmative action purchaser and encourages small and disadvantaged businesses to submit bids.

**Rejection of Quotes:** The CBJ reserves the right to reject any or all bids and to determine which bid, if any, should be accepted in the best interest of the CBJ. The CBJ reserves the right to waive any informality in a quote.

**Fax Disclaimer:** It is the responsibility of the bidder to respond in a timely manner. Bidders' use of a facsimile machine shall be at bidders' sole risk. The CBJ will attempt to keep the facsimile machine in good working order but will not be responsible for bids that are late due to mechanical failure, a busy facsimile machine, or any other cause arising from bidders' use of a facsimile machine even if bidder submits a transmission report or provides other confirmation indicating that the bidder transmitted a bid before the submittal deadline. Bidders are therefore strongly encouraged to confirm receipt of their bid with the CBJ prior to submittal deadline.

**INDEMNIFICATION:** Contractor agrees to defend, indemnify, and hold harmless CBJ, its employees, volunteers, consultants, and insurers, with respect to any action, claim, or lawsuit arising out of the Contractor's performance of this contract, without limitation as to the amount of fees, and without limitation as to any damages resulting from settlement, judgment, or verdict, and includes the award of any attorneys fees even if in excess of Alaska Civil Rule 82. This indemnification agreement applies to the fullest extent permitted by law and is in full force and effect whenever and wherever any action, claim, or lawsuit is initiated, filed, or otherwise brought against CBJ relating to this contract. The obligations of Contractor arise immediately upon actual or constructive notice of any action, claim, or lawsuit. CBJ shall notify Contractor in a timely manner of the need for indemnification, but such notice is not a condition precedent to Contractor's obligations and may be waived where the Contractor has actual notice.

**JUNEAU BUSINESS SALES AND PERSONAL PROPERTY TAX:** Vendors/merchants conducting business within the City are required by law to register with, and periodically report to, the City for sales and property taxes. Vendors/merchants must be in good standing with the City prior to award, and prior to any contract renewal and in any event no later than five business days following notification by the City of intent to award or renew. **Good standing** means: all amounts owed to the City are paid in full, including Confession of Judgments; and vendor/merchant is current in reporting (sales tax filings, business personal property declarations). Failure to meet these requirements, if so subject, shall be cause for rejection of your proposal and/or contract renewal. To determine if your business is in good standing, or for further information, contact the City Finance Department's Sales Tax Division, at (907) 586-5265, concerning sales tax and/or Treasury Division, at (907) 586-5268, concerning business personal property and real property tax.

### LIST OF SUBCONTRACTORS (AS 36.30.115)

#### RFQ E11-179 – Juneau Douglas Heat Treatment Plant Exchanger Repair

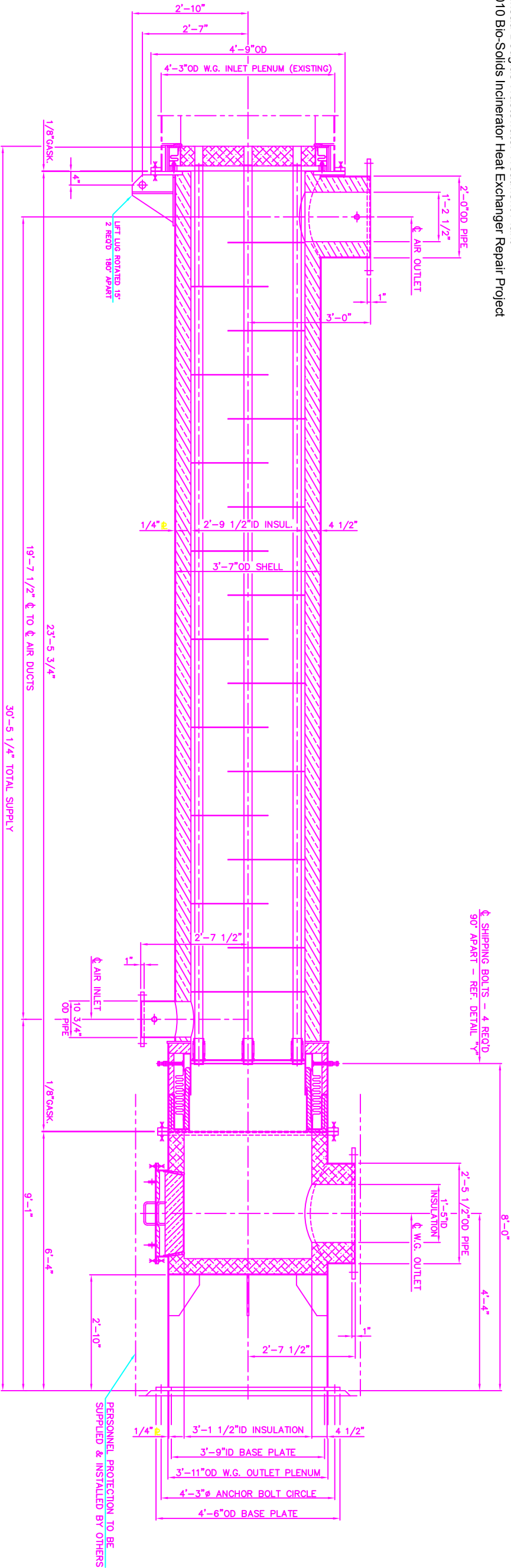
SUBCONTRACTOR ADDRESS	<sup>1</sup> AK Contractor License No. <sup>2</sup> AK Business	<sup>1</sup> Contact Name <sup>2</sup> Phone Number	Type of Work	Contract Amount	DBE?
1. _____ _____ _____	<sup>1</sup> _____ <sup>2</sup> _____	_____ _____	_____ _____	\$ _____	<input type="checkbox"/>
2. _____ _____ _____	<sup>1</sup> _____ <sup>2</sup> _____	_____ _____	_____ _____	\$ _____	<input type="checkbox"/>
3. _____ _____ _____	<sup>1</sup> _____ <sup>2</sup> _____	_____ _____	_____ _____	\$ _____	<input type="checkbox"/>
4. _____ _____ _____	<sup>1</sup> _____ <sup>2</sup> _____	_____ _____	_____ _____	\$ _____	<input type="checkbox"/>

I certify that the above listed Alaska Business License(s) and CONTRACTOR Registration(s), if applicable, were valid at the time Bids were opened for this Project.

\_\_\_\_\_  
CONTRACTOR, Authorized Signature

\_\_\_\_\_  
CONTRACTOR, Printed Name

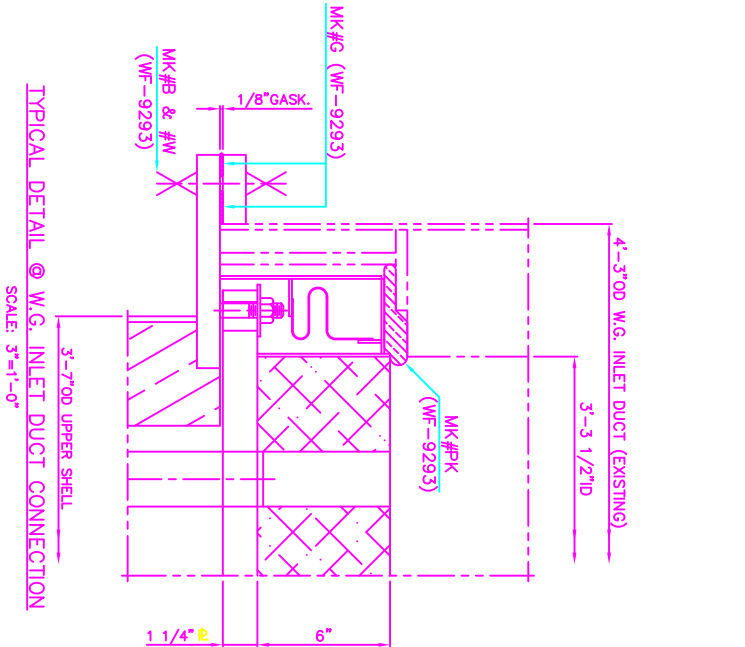




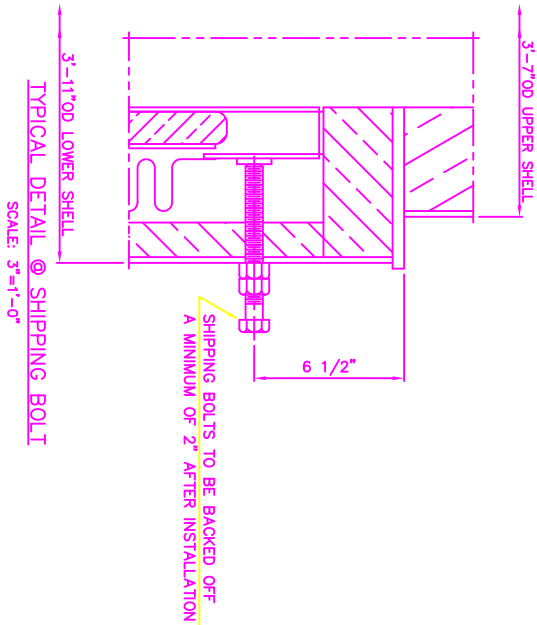
TYPICAL ELEVATION SECTION - 19-PASS HEAT EXCHANGER  
(FOR ACTUAL ORIENTATION OF DUCTS, SHIPPING BOLTS AND LIFT LUGS SEE DRAWING EF-3866)  
SCALE: 3/4"=1'-0"

NOTE:

1. CUSTOMER TO FURNISH NECESSARY FOUNDATION, STRUCTURAL SUPPORTS, AND ALL PIPING TO AND FROM THE HEAT EXCHANGER.
2. ALL PIPING TO AND FROM THE HEAT EXCHANGER TO BE SUPPORTED INDEPENDENT OF THE HEAT EXCHANGER SO THAT NO WEIGHT RESTS ON THE HEAT EXCHANGER OR RESTRICTS EXPANSION.
3. PIPES ARE TO BE 2"NPS Sch#10 SB-729S, ALLOY 20, 22"-0" OVERALL LENGTH.
4. TOP TUBESHEET TO BE 1 1/4"THK. SB-443 GR-2, INCONEL 625 SOLUTION ANNEALED LINED ON WASTE GAS SIDE WITH 6"THK. A.P. GREEN LO-ABRADE CASTABLE.
5. BOTTOM TUBESHEET TO BE 1/4"THK. SB-463, ALLOY 20.
6. AIR PARTITION BAFFLES TO BE #11GA. - TOP 6 TO BE SA-240, 304/304L, REMAINDER TO BE A-569, C.S.
7. TUBE BUNDLE EXPANSION JOINT TO BE SB-443, INCONEL 625 W/SB-409, INCOLOY 800 HT WELD ENDS AND INSULATED LINER.
8. TUBE EXPANSION JOINTS TO BE SB-443, INCONEL 625 W/SB-409, INCOLOY 800HT WELD ENDS AND BLANKET PACKING BETWEEN BOTTOM TUBESHEET AND SB-409, INCOLOY 800HT COVER SHEET.
9. HEAT EXCHANGER SHELL TO BE 1/4"THK. SA-36, CS INTERNALLY INSULATED WITH 4 1/2"THK. FIBERFRAX DURABLANKET STACK-BONDED 8 - 1" LAYERS EQUAL 6". LOWER SECTION OF SHELL (NEAR TUBE BUNDLE EXPANSION JOINT) TO BE SA-240, 316/316L, STALASTIC COATING TO BE APPLIED TO ALL INTERNAL SURFACES OF THE SS-316L SHELL.
10. AIR OUTLET DUCT TO BE 1/4"THK. SA-36, C.S. W/ 1" THK. SA-36, C.S. FLANGE] INTERNALLY INSULATED WITH 4 1/2"THK. FIBERFRAX DURABLANKET STACK-BONDED 8 - 1" LAYERS EQUAL 6".
11. AIR INLET DUCT TO BE 1/4"THK. SA-36, C.S. W/ 1"THK. SA-36, C.S. FLANGE.
12. WASTE GAS OUTLET DUCT TO BE 1/4" THK. SA-240, 316/316L INSULATED INTERNALLY 4 1/2"THK. (6"THK. AT NOZZLE) A.P. GREEN LO-ABRADE CASTABLE. STALASTIC COATING TO BE APPLIED TO ALL INTERNAL SURFACES EXPOSED TO THE WASTE GAS.
13. WASTE GAS INLET DUCT TO BE REUSED.
14. ALL INSULATION TO BE AS NOTED OR EQUAL.
15. MATERIAL CERTS. AND TRACEABILITY REQUIRED.
16. USE THIS DRAWING IN CONJUNCTION WITH DRAWING EF-3866 AND WF-9293.
17. PAINT: ALL EXTERNAL CARBON STEEL SURFACES TO BE SANDBLASTED IN ACCORDANCE WITH SSPC-SP6, AND PAINTED WITH ONE COAT (3 MILS DFT) OF DIMET COTE 12 INORGANIC ZINC PRIMER (GRAY).
18. TTC TO SUPPLY BOLTING HARDWARE, GASKET AND PACKING BLANKET AT W.G. INLET DUCT CONNECTION. 7 SPARE TUBES AND 3 SPARE TUBE EXPANSION JOINT ASSEMBLIES TO BE SUPPLIED.
19. CALCULATED WEIGHT OF UNIT: 15,566 LBS.
20. SHELLSIDE OF UNIT TO BE PRESSURE TESTED AT 5.0 PSI PER TTC STANDARD SPEC. ES-012, TO BE HELD FOR 8 HOURS MIN. WITH NO LEAKAGE.



TYPICAL DETAIL @ W.G. INLET DUCT CONNECTION  
SCALE: 3"=1'-0"



TYPICAL DETAIL @ SHIPPING BOLT  
SCALE: 3"=1'-0"

A				REV. PER CHECKING				REVISION			
REV.	DESCRIPTION	DATE	BY	REL	DATE	BY	CHK	REV.	DESCRIPTION	DATE	BY
1-14-04	ELEVATION SECTION										
2-12-04	19-PASS HEAT EXCHANGER										
THERMAL TRANSFER CORP.											
DUQUESNE, PA USA											
A Member of the Worldwide Hamon Group											
SCALE				CUSTOMER NO.				JOB NO.			
AS NOTED				0321-01				H-3112-HEB-02427-3			
				EF-3865				A			

THIS DRAWING IS THE PROPERTY OF THERMAL TRANSFER CORP. IT IS TO BE USED ONLY FOR THE PROJECT AND SITE SPECIFICALLY IDENTIFIED HEREIN. IT IS TO BE RETURNED TO THERMAL TRANSFER CORP. UPON COMPLETION OF THE PROJECT. NO REUSE OR REPRODUCTION IS TO BE MADE WITHOUT THE WRITTEN PERMISSION OF THERMAL TRANSFER CORP.

TOLERANCE UNLESS OTHERWISE SPECIFIED

0" - 18" = ±1/16"

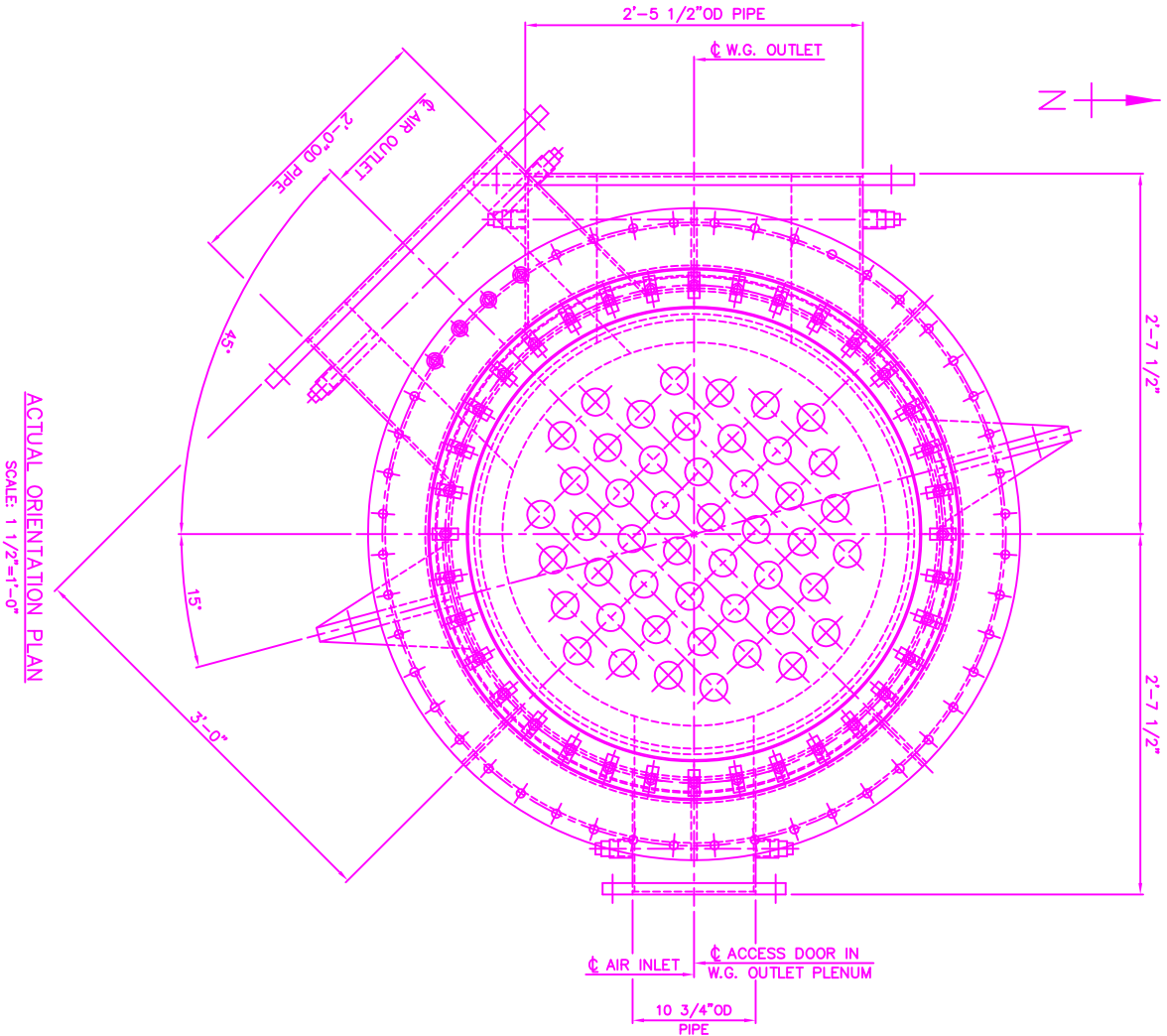
18" - 50" = ±1/8"

50" - 100" = ±3/16"

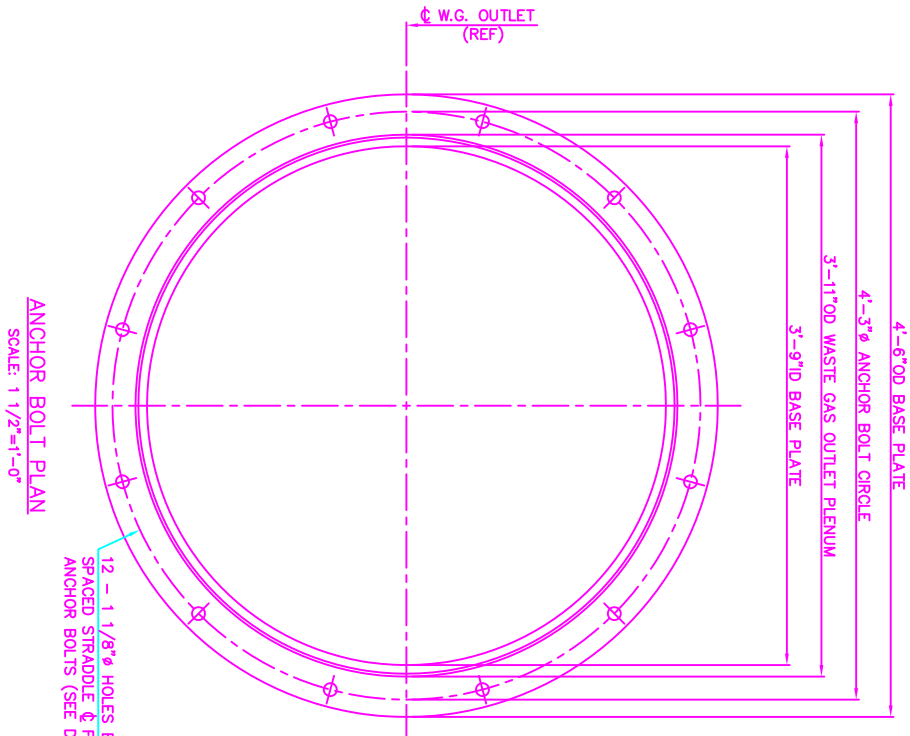
100" & ABOVE = ±1/4"

± 1"

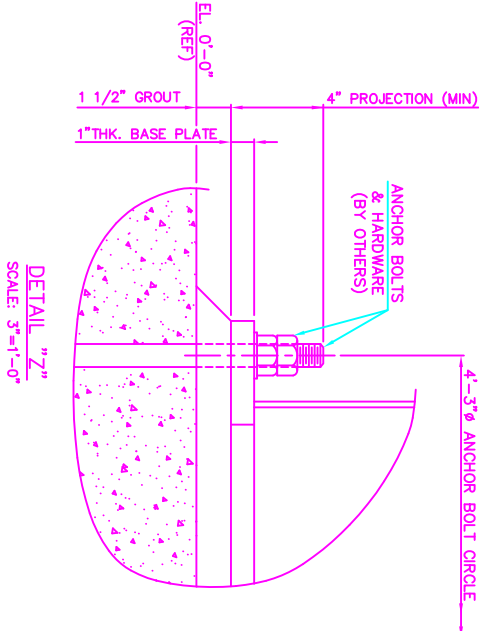
TOLERANCE TO BE NON-ACCUMULATIVE



ACTUAL ORIENTATION PLAN  
SCALE: 1 1/2"=1'-0"



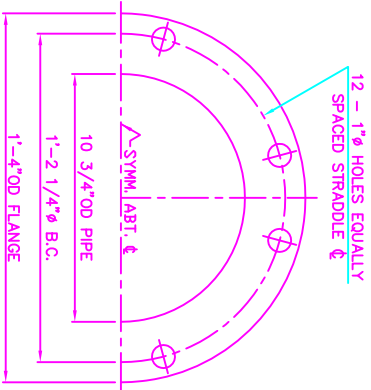
ANCHOR BOLT PLAN  
SCALE: 1 1/2"=1'-0"



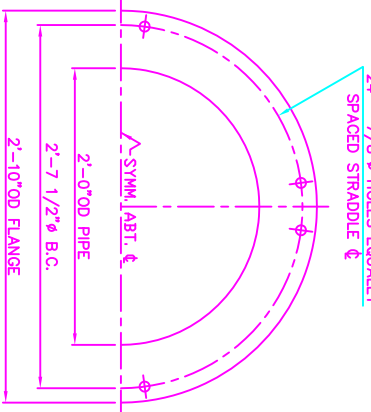
DETAIL "Z"  
SCALE: 3"=1'-0"

NOTE:

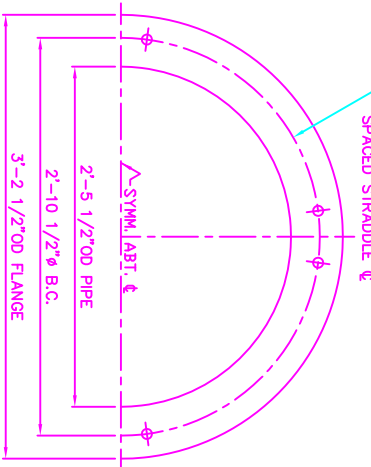
1. CUSTOMER TO FURNISH NECESSARY FOUNDATION AND ANCHOR BOLTS.
2. CUSTOMER TO ALLOW FOR 1 1/2" GROUT BETWEEN CONCRETE PAD AND UNDERSIDE OF BASE PLATE.
3. BOTTOM OF TTC BASE PLATE TO BE EL. + 0'-1 1/2"
4. ALL INSULATION TO BE AS NOTED OR EQUAL.
5. MATERIAL CERTS. AND TRACEABILITY REQUIRED.
6. USE THIS DRAWING IN CONJUNCTION WITH DRAWING EF-3865.
7. PAINT: ALL EXTERNAL CARBON STEEL SURFACES TO BE SANDBLASTED IN ACCORDANCE WITH SSPC-SP6, AND PAINTED WITH ONE COAT (3 MILS DFT) OF DIMET COTE 12 INORGANIC ZINC PRIMER (GRAY).



AIR INLET FLANGE  
SCALE: 3"=1'-0"



AIR OUTLET FLANGE  
SCALE: 1 1/2"=1'-0"



WASTE GAS OUTLET FLANGE  
SCALE: 1 1/2"=1'-0"


FABRICATION TOLERANCE UNLESS OTHERWISE SPECIFIED		MATERIAL LISTED ABOVE FOR ONE ( 1 ) REQUIRED		ORIENTATION PLAN: ANCHOR BOLT PLAN: FLANGES	
0' - 18" = ±1/16"	18" - 50" = ±1/8"	DR.	REL.	1-18-04	THERMAL TRANSFER CORP. DUQUESNB, PA USA
50" - 100" = ±3/16"	100" & ABOVE = ±1/4"	CK.	TSA	2-18-04	
± 1"		APR.			
TOLERANCE TO BE NON-ACCUMULATIVE		THIS DRAWING IS THE PROPERTY OF THERMAL TRANSFER CORP. IT IS TO BE USED ONLY AS A GUIDE FOR FABRICATION. IT IS NOT TO BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, WITHOUT PERMISSION IN WRITING FROM THERMAL TRANSFER CORP.		A Member of the Worldwide Hamon Group	
					
		SCALE	CUSTOMER NO.	ADD NO.	REV.
		AS NOTED	0321-01	H-3112-HE8-02427-3	EF-3866
1/2"=1'-0"					



Photo 1: Access to lower end tube repair area



Photo 2: Looking up at lower end tube repair area



Photo 3: Typical lower end tube repair ring



Photo 4: Access to upper end tube repair area



Photo 5: Upper end tube repair area as seen from above

**Thermal Transfer Corporation**

50 North Linden St.

Duquesne, PA 15110

**Welding Procedure Specification (WPS)**

WPS No.: TM 45 45 -1 Date: 9/5/1991 Rev.: 1 Date: 2/8/2001 Page: 1 of 2

By: \_\_\_\_\_ Date Signed: 2/8/2001

Supporting PQR's: TM 45-45-1

Welding Process(es) / Type(s): (1) GTAW / Manual (2) GMAW / Semiautomatic

**Joints (QW-402)**

Joint Design: Groove and fillet welds

Joint Type	Backing	Root Opening	Groove Angle	Root Face	Groove Radius
Single-V groove	no backing	3/16" max.	50 degree min.	1/8" max.	-
Single-bevel groove	no backing	3/16" max.	45 degree min.	1/8" max.	-
Single-V groove	gouged & back welded	1/4" max.	50 degree min.	3/16" max.	-
Double-bevel groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	-
Double-V groove	gouged & back welded	1/4" max.	45 degree min.	3/16" max.	-
Square groove	T-joint	1/32" max.	-	-	-
Square groove	no backing	3/32" max.	-	-	-

Fillet Welds: All (QW-451.4)

Retainers: None

WELD JOINT DESCRIPTIONS SHOWN ARE NOT INCLUSIVE OF ALL THOSE FOUND ON A JOB. WELD JOINT DESIGN REFERENCE IN AN ENGINEERING SPECIFICATION OR A DESIGN DRAWING SHALL TAKE PRECEDENCE OVER WELD JOINTS SHOWN IN THIS WPS.

**Base Metals (QW-403)**

P-No.: 45 Thickness Range (in.): 0.1875 to 2.0000  
to P-No.: 45

Minimum preheat must be maintained during thermal cutting, tacking, and welding operations.  
Welds shall be cleaned between each pass. When completed, remove all slag and projections.

**Filler Metals (QW-404)**

Spec. No. (SFA): (1 & 2) 5.14

AWS No. (Class): (1 & 2) ERNICKR-3

F No.: (1 & 2) 43 A No.: (1 & 2) 9

Weld Metal Thickness Range: (1) 0.1875 to 0.1880 in. (2) 0.1875 to 2.0000 in. No Pass Greater Than 1/2" Allowed

Flux Type: N/A

Flux Trade Name: N/A

Consumable Insert: (1) None

Other: \_\_\_\_\_

Product Form: (1 & 2) Bare (Solid)

Trade Name: (1 & 2) n/r

Supplemental Filler Metal: (2) None

Welding Procedure Specification (WPS)

WPS No.: TM 45 45 -1 Date: 9/5/1991 Rev.: 1 Date: 2/8/2001 Page: 2 of 2

<b>Positions (QW-405)</b> Position of Joint: <u>(1 &amp; 2) All Positions</u> Weld Progression: <u>(1 &amp; 2) Any</u>	<b>Postweld Heat Treatment (QW-407)</b> Type: <u>No PWHT will be performed</u> Temperature Range: <u>None</u> °F Time Range: <u>None</u>
<b>Preheat (QW-406)</b> Preheat Temp. Min.: <u>55</u> °F Interpass Temp. Max.: <u>300</u> °F Preheat Maintenance: <u>None</u>	<b>Gas (QW-408)</b> Gas Composition / Flow Rate Shielding: <u>(1) 100% Argon / 18-24 CFH</u> <u>(2) 90Ar, 7.5He, 2.5CO2 / 26-33 CFH</u> Trailing: <u>(1 &amp; 2) None</u> Backing: <u>(1) Argon / 5-10 CFH (2) None</u>
<b>Electrical Characteristics (QW-409)</b> Current Type / Polarity: <u>(1) DCEN (straight) (2) DCEP (reverse)</u> Pulsed Current: <u>(1) None</u> Tungsten Electrode Type and Size: <u>(1) EWTh-2 / 1/16" - 3/16" (2) N/A</u> Mode of Metal Transfer for GMAW: <u>(1) N/A (2) Short-circuiting arc</u> Max. Heat Input (J/in): <u>(1 &amp; 2) None</u>	
<b>Technique (QW-410)</b> String or Weave Bead: <u>(1) Stringer bead (2) Weave bead</u> Orifice or Gas Cup Size: <u>(1) # 5 to # 10 (2) 3/8" to 5/8"</u> Initial and Interpass Cleaning: <u>With SS brush clean 2" both sides of weld joint.</u> Method of Back Gouging: <u>When required, grind until all defects are removed.</u> Oscillation: <u>N/A</u> Contact Tube to Work Distance: <u>(2) 1/4" - 1/2"</u> Single or Multiple Passes (per side): <u>Multipass</u> Single or Multiple Electrodes: <u>N/A</u> Peening: <u>(1 &amp; 2) None</u> Electrode Spacing: <u>(2) N/A</u>	
(1) No peening done with this procedure. No pass greater than 1/2" allowed. No supplementary filler metal will be used with this procedure.  (2)	

Process Welding Parameters

Weld Layer(s) and/or Pass(es)	Process	Filler Metal		Current		Voltage Range	Travel Speed Range (in/min)
		Class	Diameter (in.)	Type / Polarity	Amperage Range		
Any	GTAW	ERNICR-3	1/16	DCEN (straight)	70-150	n/r	Var.
Any	GTAW	ERNICR-3	3/32	DCEN (straight)	80-180	n/r	Var.
Any	GTAW	ERNICR-3	1/8	DCEN (straight)	130-275	n/r	Var.
Any	GMAW	ERNICR-3	0.035	DCEP (reverse)	80-145	17-22	Var.
Any	GMAW	ERNICR-3	0.045	DCEP (reverse)	110-175	18-23	Var.
Any	GMAW	ERNICR-3	1/16	DCEP (reverse)	165-300	20-25	Var.