

NOVEMBER 4, 2022

CONTRACT NO. 1752

REPAIRS TO FLUID BED INCINERATOR NO. 1

ADDENDUM NO. 1

**Members of the Board**

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Julie Motley-Williams  
*Director  
Administration*

All bidders bidding **Contract No. 1752** shall read and take note of this **Addendum No. 1**. The Contract Documents for **Contract No. 1752 – Repairs to Fluid Bed Incinerator No. 1** are hereby revised and/or clarified as stated below.

**Acknowledgement of Contract No. 1752, Addendum No. 1**

The Acknowledgement attached to **Addendum No. 1** is to be signed and returned immediately via email to **Kathleen P. Uniatowski** at [Kathleen.uniatowski@alcosan.org](mailto:Kathleen.uniatowski@alcosan.org) and acknowledged with Bidder's Proposal.

A handwritten signature in blue ink that reads "Kimberly Kennedy". The signature is written over a horizontal line.

**Kimberly Kennedy, P.E.**  
Director – Engineering and Construction

**ACKNOWLEDGEMENT OF**

**CONTRACT NO. 1752**

**REPAIRS TO FLUID BED INCINERATOR NO. 1**

**ADDENDUM NUMBER 1**

**FIRM NAME:** \_\_\_\_\_

**SIGNATURE:** \_\_\_\_\_

**TITLE:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**NOVEMBER 4, 2022**

**CONTRACT NO. 1752**

**REPAIRS TO FLUID BED INCINERATOR NO. 1**

**ADDENDUM NO. 1**



*Jeffrey S. Mazza*

11/3/2022

**NOVEMBER 4, 2022**

**CONTRACT NO. 1752**

**REPAIRS TO FLUID BED INCINERATOR NO. 1**

**ADDENDUM NO. 1**

**A. Contract Documents**

1. Article 1:
  - a) Replace the existing page 1-3 with the revised version attached to this addendum.
2. Article 4:
  - a) Replace the existing page 4-2 with the revised version attached to this addendum.
3. Article 6:
  - a) Replace *Summary of Work* (Section 01010) with the revised version attached to this addendum.
  - b) Replace *Structural Steel* (Section 05120) with the revised version attached to this addendum.
  - c) Replace *Air Manifold Installation* (Section 15060) with the revised version attached to this addendum.
  - d) Add *First Evaporator Tube Bundle* (Section 15510), attached to this addendum
  - e) Add the attached Form P-3 to the appendix.
4. General: Update any/all tables of contents to reflect these changes.

**B. Contract Drawings**

1. Add the following reference drawings to the existing reference drawings:
  - a. **D-7026-1A** General Arrangement Drawing of Waste Heat Boiler Heat Exchangers, Unit 1
  - b. **D-7026-2** 1<sup>st</sup> Evaporator & Superheater Unit 1 Arrangement Drawing
  - c. **D-7026-2B** Removeable End Door Details 1<sup>st</sup> Evaporator & Superheater Units 1&2 Arrangement Drawing
  - d. **D-7026-5** 1<sup>st</sup> Evaporator & Superheater Unit 1 Bundle Arrangement Drawing
  - e. **D-7026-9** 1<sup>st</sup> Evaporator Tube Support Detail
  - f. **D-7026-3A** 2<sup>nd</sup> Evaporator Front & Rear Panel Details for Units 1&2
2. Update the drawing index to reflect the additions listed above.

**C. Questions**

1. *(No Items)*

**Attachments:**

Specifications:

Article 1, page 1-3

Article 4, page 4-2

Specification Section 01010 - *Summary of Work*

Specification Section 05120 - *Structural Steel*

Specification Section 15060 - *Air Manifold Installation*

Specification Section 15510 - *First Evaporator Tube Bundle*

Drawings:

<b>D-7026-1A</b>	General Arrangement Drawing of Waste Heat Boiler Heat Exchangers, Unit 1
<b>D-7026-2</b>	1 <sup>st</sup> Evaporator & Superheater Unit 1 Arrangement Drawing
<b>D-7026-2B</b>	Removeable End Door Details 1 <sup>st</sup> Evaporator & Superheater Units 1&2 Arrangement Drawing
<b>D-7026-5</b>	1 <sup>st</sup> Evaporator & Superheater Unit 1 Bundle Arrangement Drawing
<b>D-7026-9</b>	1 <sup>st</sup> Evaporator Tube Support Detail
<b>D-7026-3A</b>	2 <sup>nd</sup> Evaporator Front & Rear Panel Details for Units 1&2

Other:

Form P-3

**\* \* \* \* END OF ADDENDUM NO. 1 \* \* \* \***

8.2 Unit Price Work:

Bidder further proposes to accept as full payment for the Unit Price Work proposed herein the amounts computed under the provisions of the Bidding Documents and based on the following unit price amounts, it being expressly understood that the unit prices are independent of the exact quantities involved. Bidder agrees that the unit prices represent a true measure of the labor, materials, and services required to furnish and install the item, including all allowances for overhead and profit for each type and unit of Work called for in these Bidding Documents.

8.2 Unit Price Work:

Item	Description	Quantity	Unit Price	Extended Amount
A	Furnish & deliver manifold # 1, complete, with spool, flange, plows, shield, etc.	1		
B	Furnish & deliver manifold # 2, complete, with spool, flange, plows, shield, etc.	1		
C	Furnish & deliver manifold # 3, complete, with spool, flange, plows, shield, etc.	1		
D	Furnish & deliver manifold # 4, complete, with spool, flange, plows, shield, etc.	1		
E	Furnish & deliver manifold # 5, complete, with spool, flange, plows, shield, etc.	1		
F	Furnish & deliver manifold # 6, complete, with spool, flange, plows, shield, etc.	1		
G	Furnish & deliver manifold # 7, complete, with spool, flange, plows, shield, etc.	1		
H	Furnish & deliver manifold # 8, complete, with spool, flange, plows, shield, etc.	1		
I	Furnish & deliver manifold # 9, complete, with spool, flange, plows, shield, etc.	1		
J	Furnish & deliver manifold # 10, complete, with spool, flange, plows, shield, etc.	1		
k	Remove, machine, reinstall, align one expansion end slider sleeve	3		
L	Remove & Replace (to full depth) one square foot of refractory material on the walls of the first evaporator	80 sq. ft.		
<b>Addendum No. 1-Version 1</b>			<b>Total</b>	

Unit Price Work:

Item	Description	Quantity	Unit Price	Extended Amount
A	Furnish & deliver manifold # 1, complete, with spool, flange, plows, shield, etc.	1		
B	Furnish & deliver manifold # 2, complete, with spool, flange, plows, shield, etc.	1		
C	Furnish & deliver manifold # 3, complete, with spool, flange, plows, shield, etc.	1		
D	Furnish & deliver manifold # 4, complete, with spool, flange, plows, shield, etc.	1		
E	Furnish & deliver manifold # 5, complete, with spool, flange, plows, shield, etc.	1		
F	Furnish & deliver manifold # 6, complete, with spool, flange, plows, shield, etc.	1		
G	Furnish & deliver manifold # 7, complete, with spool, flange, plows, shield, etc.	1		
H	Furnish & deliver manifold # 8, complete, with spool, flange, plows, shield, etc.	1		
I	Furnish & deliver manifold # 9, complete, with spool, flange, plows, shield, etc.	1		
J	Furnish & deliver manifold # 10, complete, with spool, flange, plows, shield, etc.	1		
k	Remove, machine, reinstall, align one expansion end slider sleeve	3		
L	Remove & Replace (to full depth) one square foot of refractory material on the walls of the first evaporator	80 sq. ft.		
			Total	

**Base Bid Summary:**

Item #1: Lump Sum Work \$ \_\_\_\_\_

Item #2: Total of Extended Amount for Unit Price Work \$ \_\_\_\_\_

**TOTAL BASE BID** (Sum of lines Item #1 & Item #2)

\_\_\_\_\_ Dollars

(Words)

and \_\_\_\_\_ Cents. \$ \_\_\_\_\_

(Words)

(Figures)

## PART 1 GENERAL

### 1.1 GENERAL

- A. The work included in this Contract No. 1752 is to provide the Allegheny County Sanitary Authority (ALCOSAN) with various repairs to its #1 Fluidized Bed Incinerator (FBI) system. In addition to other portions of this individual Contract, there will be construction activities for other Contracts included in the overall program underway at the plant site during part or all of the construction period for this Contract.
- B. This Contract 1752 will be constructed by one (1) Prime Contractor to meet the requirements of the Contract Documents. The following organizations may be present at the Job Site and have responsibilities described generally in Article 3, General Contract Conditions:
  - 1. Construction Manager (CM)
  - 2. Engineer
  - 3. Prime Contractor(s)
  - 4. Owner (ALCOSAN)
- C. The Owner is identified as the responsible entity for certain actions in the sections of Divisions 1 through 15. The Owner may elect to delegate certain of these respective duties and responsibilities to the aforementioned organizations.
- D. All contact between the Contractor and remaining aforementioned parties shall be through the Construction Manager
- E. FBI #1 is off line and “cold.” The FBI (aka: unit) will be isolated from the process before the commencement of work, with the sand bed removed, and the upper access doorway (man way) opened. Evaporator panels/doors will not be open – contractor shall remove the end panels, as well as any other doors/openings required,

### 1.2 WORK COVERED BY CONTRACT DOCUMENTS

- A. Work Included in Contract
  - 1. The following are general descriptions of the work to be done under the Contract unless noted otherwise and are in no way meant to limit or restrict the Work that is required. Refer to the Drawings and the remainder of the Specifications for additional detail on the scope of the Work. The completed work will provide the Owner with a repaired & completely functional fluidized bed incinerator and heat recovery evaporator.

**SECTION 01010**  
**SUMMARY OF WORK**

Contract: 1752

2. The broad/general intent of this contract is to replace:
  - A section of the incinerator shell
  - The fluidizing air plenum assembly & appurtenances
  - Ten (10) fluidizing air expansion joints
  - Brick support ring gusset plates
  - Damaged fluidizing air manifold assemblies, if required
  - First evaporator tube assembly, complete.
  
3. The following general scope of work, specification sections, and contract drawings apply to Contract 1752.
  - a. General Scope of Work:
    - 1) Prepare and maintain Contractor's staging areas.
    - 2) Pre-Construction inspection of the work area (external to FBI #1)
    - 3) Pre-Construction inspection of the work area (inside FBI #1 and evaporator) for access points, rigging concerns, and any possible loose refractory (including the "ceiling"). Contractor shall satisfy themselves with respect to the integrity of the existing overhead refractory coating and any other site conditions prior to entering the incinerator.
    - 4) Inspect the interior of the FBI # 1 incinerator unit, complete. Measure & record the alignment, orientation, condition, etc. of each complete manifold assembly prior to any removal activities. Share same with owner. Bring any pertinent observations/comments to the attention of the owner.
    - 5) Remove any and all flanges, hatches, connections, expansion joints, etc. to fully view, inspect, and access the work. This includes, but is not limited to the blind flange covers from the ten (10) external 8" pipe nozzles (west side of FBI) and the ten (10) internal manifold cleanout blind flanges (exposed after the removal of the 8" blinds). Reinstall at the end of the job, with proper new gaskets, specified elsewhere in these documents. (This includes any gasketed connections opened by the owner in preparation for this work.)
    - 6) Prior to any demo, record the measurements between each of the plenum's exit nozzle faces and the incinerator's fixed end nozzle faces.
    - 7) Demo & remove the existing fluidizing air plenum assembly & applicable appurtenances. Remove (and later reinstall) any/all supports, structural steel, stairs, grating, railing, piping, etc. as required to effect the removal of the existing plenum and the reinstallation of the new plenum assembly. Provide temporary replacements of any such items. Owner & inspector access to the work area/s shall be provided and maintained by the contractor for the duration of the contract.
    - 8) Remove existing and later furnish and install ten (**10**) new expansion/flex joints.

**SECTION 01010**  
**SUMMARY OF WORK**

Contract: 1752

- 9) Remove (and later reinstall, if deemed acceptable by the owner) all existing fluidizing air manifold assemblies & other appurtenant structures/materials/components. Sand shields, sand plows, thermoprobe brackets, etc. may also need to be removed.) Support & carefully separate each manifold at the fillet weld that joins the flanged spool piece with the longer piece that bears the nozzle caps. (apply two unique & indelible match marks prior to separation). Remove each manifold assembly from the unit. The short end of each manifold (the “spool” end) should be capable of being removed by pulling it straight out of the incinerator. Ensure that the long portion of each manifold assembly (and the appurtenant parts/pieces) are not damaged during the removal process, which will have to be removed via the hatch/manway.
- 10) Identify (mark), remove & reinstall (reuse existing) the ten (10) cooling air pipes/manifold from the shell & cone section of the FBI to the extent needed to perform all contract work.
- 11) With the ten (10) fluidizing air manifolds removed, conduct another inspection of the interior of the incinerator. Check for shell cracks, bulges, failed welds, (especially at the brick support ring and cone support ring). Make accurate field measurements of all critical dimensions, such as the distance from the outer face (flange) of the fixed end nozzles to the outer face (flange) of the expansion end nozzle, the distance from the outer face (flange) of the expansion end nozzle to the open end of the slider (slip) sleeve, and any other measurements that would affect the required overall length of the fluidizing air manifolds. These same measurements will be taken after the shell repairs are performed. The differences between the “before & after” dimensions must be taken into account when the two pieces of each manifold are reinstalled.
- 12) Devise & install bracing that will allow the entire incinerator to withstand the removal/replacement of the specified portion of its shell (and the performance of the rest of the work) without sustaining any damage whatsoever to the remaining shell or any other aspect/area/component/system of the incinerator. The bracing shall allow for the new shell segment to be installed in one piece. At the discretion of the owner, all of (or a portion of) the bracing shall remain in place upon completion of the work.
- 13) Provide for the manufacturing/fabrication, inspection, delivery, installation, insulation, metallic jacketing and painting of a new fluidizing air plenum - complete, as generally shown/delineated on the drawings. This includes the conical entrance (reducer) assembly and the flexible connection located above it.
- 14) Furnish and ~~install~~ **deliver** new manifold assemblies (complete, with all appurtenances, as shown on the drawings) if the existing ones are deemed to be damaged (as directed by the owner). Otherwise, reinstall previously removed manifold/s in the same location from which they were removed. **It is noted that the contractor owns the installation of**

**SECTION 01010  
SUMMARY OF WORK**

Contract: 1752

ten (10) manifold assemblies under this contract – *whether they are new ones or old (existing) ones*. This is the reason that the unit price work indicated in Article 1 (page 1-3) and Article 4 (page 4-2) states “furnish and deliver” new manifolds. (The installation is included as part of the base bid work.) It is also noted that the replacement of the shell section (and the subsequent reattachment of the existing pipe nozzles) may result in slight dimensional changes, and differences in the relative alignment of the fixed end and expansion end nozzles, as well as other system components. Thus, when re-installing an existing manifold assembly, the flange that is welded to the spool piece of said manifold may need to have that weld ground off & the flange welded back on after insertion and alignment/joining of the spool piece & main manifold assembly. Also, the large weld that joins the spool to the main portion of the manifold assembly may need to be ground off to achieve optimal alignment and insertion (the depth to which the spool is inserted into the main portion of the manifold assembly).

- 15) Test the fit of the manifolds & their respective spool assemblies prior to placing them inside of the incinerator. Remove all weld slag, debris, etc. from within the manifold pieces prior to installation/assembly. Ensure that all manifold assemblies, expansion/fixed end nozzles, and appurtenant components are level/plumb, align/oriented with respect to each other and any mating surface or concentric fitting; as prescribed or required by the manufacturer {Outotec (USA) Inc, formerly known as Energy Products of Idaho} or Owner.
- 16) Ensure that all manifolds (new or old) are properly centered within the incinerator (with respect to an east-west centerline). Ensure that all manifold assemblies are properly aligned within the nozzles/slider sleeves, proper spool insertion is achieved, and that shims are placed between the small end of the manifold & the slider sleeve (to center it while performing the final welding to the new flange ring (that gets welded to the opposite end of each spool piece). Remove shims afterwards.
- 17) Plug weld any holes (in nozzle caps) that will direct fluidizing air against a thermoprobe, sand plow, other nozzle cap, etc., at the direction of the owner (not to exceed 20 holes).
- 18) Measure the concentricity of the inside diameter of the expansion end slider sleeves. Share results with owner, who will decide if any remedial action is warranted. Note: Minor field-dressing (with grinders, etc.) of areas of the inside diameter of each 10” I.D. slip sleeve shall be considered incidental, and thus part of the bid price. Additionally, the owner may decide to have the contractor bevel the inside edge of expansion slider sleeve. This, too shall be considered incidental, and part of the base bid price.
- 19) It is noted that, while the manifolds are being fabricated, the contractor shall perform all other field measurements, inspections, tests, repairs, prep work, etc., to the extent practical, so as to be ready to install the

**SECTION 01010  
SUMMARY OF WORK**

Contract: 1752

manifold assemblies as soon as they are delivered to the job site. Additionally, if any of these measurements, tests, inspections, etc. reveal any information pertinent to the manifold fabrication, said information can be applied to/incorporated into the fabrication of the new manifolds.

- 20) Remove & replace (with new materials) a portion of the incinerator shell, as described in the contract documents. Retain nozzles for reuse/reinstallation. If required for access, remove & reinstall any grating, structural steel supports, etc.
- 21) Remove and replace (with new gussets) all internal reinforcing gussets on the fixed side of the incinerator. (These gussets will be exposed with the removal of the shell section.) Note that the innermost leg of each new gusset (the leg farthest from the incinerator shell) may need to be shortened by approx. 1/8" (exact amount TBD based on field measurements) in order to allow for downward expansion at high temperatures. This reduction may occur using a grinder at the time of installation (as warpage of both the brick support and cone support rings may require a custom "fit.").
- 22) After the new shell section is installed, and the gusset plates, etc. have all been installed, check/measure the alignment of each fixed end pipe nozzle and expansion end slider sleeve (prior to welding the fixed end nozzle pipe). Use piano wire or laser. Each such pair shall be checked for coincident center lines, as well as angular misalignment (relative to the common centerline). If a slider sleeve is misaligned, remove, align & reattach the sleeve. (Up to three sleeves, per the unit price work allowance.) Also check/measure the flanged face of each fixed end nozzle to be sure that the planar face of said flange is perpendicular to the piano wire. Adjust & optimize the orientation of the fixed end nozzle pipe prior to final welding.
- 23) Install all new components as well as any existing components designated for reuse.
- 24) Any/all components/pieces that were removed shall be either replaced (with new) or reinstalled (with existing), as described in the contract documents or as directed by the owner.
- 25) Furnish and install new gaskets/gasket rope, to all assemblies/systems/openings whose gasketed connections were opened during the preparation, inspection, installation/assembly of the work/components. (This includes openings/connections disassembled by the owner prior to the contractor's work)
- 26) Reception, unloading, storage, and transportation to the project site of any equipment or items under this Contract.
- 27) Installation of all lighting, ventilation, air quality monitors, and any/all aspects of PPE, means of access, equipment/materials required for confined space work, etc.
- 28) Supply, install, and remove all necessary scaffolding, flooring, rigging, shoring, jacks, bracing, tie-offs, supports, etc.

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- 29) Repair or replace any refractory or refracting component damaged or otherwise affected by this work (as directed by the engineer).
- 30) Patch, prep, prime, paint, coat, repair any existing structures, equipment, surfaces, or site conditions as required by the owner following the demolition or installation under this contract.
- 31) Prep, prime and paint/coat all surfaces of all new carbon steel components installed during this job. Any bracing left in place shall also be prepped, primed & painted.
- 32) All field painting and identifying device work as required by the Contract Documents.
- 33) All shop prime coats and factory finishes compatible with Section 09900.
- 34) All welding shall conform to the notes, symbols, and recommendations of the manufacturer {Outotec (USA) Inc, formerly known as Energy Products of Idaho} or Owner. (Refer to the documents for more information.) All shop and field weld inspection shall be performed by a third party, provided/coordinated by the contractor.
- 35) All materials, installation, alignments, tolerances, welding, etc. shall conform to the notes, symbols, and recommendations of the manufacturer {Outotec (USA) Inc., formerly known as Energy Products of Idaho} and/or Owner. (Refer to the contract documents/drawings for more information.)
- 36) Apply specified anti-seize product to all bolts and tighten with the proper torque value. Note that required bolt torques are lessened when the bolt threads are thusly lubricated.
- 37) Clean-up & proper disposal of any/all construction/demolition debris, materials, extra materials, etc.
- 38) Remove any temporary work/structures/supports, scaffolds, falsework, etc.
- 39) Submission of all close-out documents, including detailed as-builts.
- 40) Other work as described in more detail later in this section or elsewhere in the contract documents.
- 41) The order of these and any other work tasks shall be up to the contractor.
- 42) Open/remove (and later reinstall) side access panels (and any other panels, hatches, braces, structural steel, etc. as required to be able to effectively & fully access & perform the inspection and all other facets of the evaporator work). Replace any damaged or missing exterior board insulation (located under the aluminum jacketing) in each panel and wall section. Repair (affix a patch of the same material/product) to any damaged sections of the exterior aluminum jacketing. When reinstalling the access panels, etc., replace any missing or damaged "Kaowool" fiber ceramic blanket gasketing materials.
- 43) Remove and later reattach all steam piping and any other equipment, appurtenances, devices, etc. as required for full access to the work.

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- 44) Protect the lower sections of the evaporator (superheater, second evaporator, etc.) from any accumulated debris and any/all debris that may be created during the execution of the work. Remove and properly dispose of any/all ash, debris, tramp material, insulation, refractory, etc. – whether existing or created during the execution of the work.
- 45) Remove and replace (the entire thickness of refractory, complete, with all required prep, anchors, accessories, ancillary materials, etc.) damaged wall refractory (front & rear panels and side access panels). Up to 80 square feet shall be considered contract work, in accordance with the unit price allowance in the bid.
- 46) The contractor shall be responsible for coordination of any/all activities related to this work.
- 47) Furnish and install the new tube arrays for the first evaporator section, complete with all support pipes, scallop bars, flat bars, etc. (See reference drawing D-7026-9 for the required tube support details.)
- 48) All welding, fabrication/construction shall be performed in accordance with provisions of the ASME boiler code, et al, as well as the notations on the Cannon Boiler reference drawings.
- 49) Contractor shall provide for the proper inspection, hydrostatic testing, certifications, paperwork, stamping, etc. required for the work and in accordance with provisions of the ASME boiler code, et al, as well as the notations on the Cannon Boiler reference drawings.
- 50) The contractor shall be responsible for filling & draining the evaporator system required for testing. Any requisite flushing and cleaning of the new tubes – inside and out - (removal of weld scale/debris, metal shavings, detritus, chemical cleaning, neutralization, etc.) shall also be the responsibility of the contractor. (Owner shall furnish the water.)

b. Specification Sections as follows are included in this Contract:

- 1) Contract 1752, Contract Documents
  - (a) Article 1 – Bidding Documents
  - (b) Article 2 – Information for Bidders
  - (c) Article 3 – General Contract Conditions
  - (d) Article 4 – Contract Agreement
  - (e) Article 5 – Bonds, Certificates and Statements
  - (f) Article 6 - Technical Specifications
    - Division 1 – General Requirements
    - Division 2 – Site Work
    - Division 5 – Metals
    - Division 9 – Finishes
    - Division 15 – Mechanical

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- c. The following Contract Drawings depict the majority of work to be performed by this Contract 1752

<b>CONTRACT 1752</b>		
<b>SHEET NUMBER</b>	<b>DRAWING TITLE</b>	<b>DRAWINGS NO.</b>
01	SITE UTILIZATION PLAN	1752-SU-01
02	ENERGY RECOVERY FACILITY 2 <sup>ND</sup> FLOOR PLAN AND SECTION	410-M-01
03	INSTALLATION & DETAILS SINGLE MANIFOLD	410-M-02
04	F.B.I. #1 MANIFOLD ASSEMBLY	410-M-03
05	F.B.I. #1 MANIFOLD SPOOL, FLANGE & SAND SHIELD DETAILS	410-M-04
06	F.B.I. #1 MANIFOLD SPOOL ASSEMBLY	410-M-05
07	F.B.I. #1 MANIFOLD DETAILS & BILL OF MATERIALS	410-M-06
08	F.B.I. #1 MANIFOLD DETAILS	410-M-07
09	F.B.I. #1 MANIFOLD NO. 5 & 6 ASSEMBLY	410-M-08
10	F.B.I. #1 MANIFOLD NO. 3 & 8 ASSEMBLY	410-M-09
11	F.B.I. #1 MANIFOLD NO. 1 & 10 ASSEMBLY	410-M-10
12	F.B.I. #1 MANIFOLD NO. 4 & 7 ASSEMBLY	410-M-11
13	F.B.I. #1 MANIFOLD NO. 2 & 9 ASSEMBLY	410-M-12
14	LOCATION OF SECTION OF SHELL TO BE REPLACED	410-M-13

<b>SHEET NUMBER</b>	<b>REFERENCE DRAWINGS</b>	<b>DRAWING NO.</b>
15	PLENUM SECTION PLENUM ASSEMBLY	1020-10
16	PLENUM SECTION PLENUM & COOLING AIR DETAILS	1020-11
17	PLENUM SECTION COOLING AIR & HEADER ASSEMBLIES	1020-12
18	INCINERATOR & AFTERBURNER INSTALLATION PLAN VIEW	1001-1
19	INCINERATOR INSTALLATION ELEVATION	1001-2
20	PLENUM & AFTERBURNER DETAILS INSTALLATION	1001-3
21	PLENUM SECTION PLAN VIEW	1020-1
22	PLENUM SECTION ELEVATION VIEW	1020-2
23	PLENUM SECTION OUTER SKIN SECTIONS & DETAILS	1020-9

**SECTION 01010  
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24	INCINERATOR DETAILS	1085-3
25	INCINERATOR #1 ASSEMBLY DETAILS	1085-1
26	PLENUM SECTION VESSEL SKIN ASSEMBLY	1020-8
27	General Arrangement Drawing of Waste Heat Boiler Heat Exchangers, Unit 1 Heat General Arrangement Drawing of Waste Heat Boiler Heat Exchangers, Unit 1	D-7026-1A
28	1 <sup>st</sup> Evaporator & Superheater Unit 1 Arrangement Drawing	D-7026-2
29	Removeable End Door Details 1 <sup>st</sup> Evaporator & Superheater Units 1&2 Arrangement Drawing	D-7026-2B
30	1st Evaporator & Superheater Unit 1 Bundle Arrangement Drawing	D-7026-5
31	1st Evaporator Tube Support Detail	D-7026-9
32	2nd Evaporator Front & Rear Panel Details for Units 1&2	D-7026-3A

- d. The Contractor is responsible for coordinating his work with the work of all other Contractors/Entities.
4. Terminology Clarification: “Fixed End” refers to the side of the incinerator vessel/manifold adjacent to the fluidizing air plenum (also called the East end or plenum end/side). The “Expansion End” (also called the West end or slider end/side) refers to the side opposite of the fixed end. The manifolds, upon heating, experience thermal growth/expansion. One end remains “fixed” (hence, fixed end) while the other end moves (hence, expansion end).  
On the fixed end of the incinerator, there are ten (10) external 16” flanged pipe “nozzles” that protrude outward from the shell. These are commonly referred to as fixed end nozzles or penetration pipes.  
On the expansion end of the incinerator, there are ten (10) external 8” flanged pipe “nozzles” that protrude outward from the shell. These are commonly referred to as expansion end nozzles. Additionally (on the expansion end of the incinerator), there are ten (10) pipe sections that protrude *inward* from the shell. These are commonly referred to as expansion end sleeves, slip sleeves, or slider sleeves. *If there is any uncertainty about the terminology, the contractor shall seek clarification during the bidding process.*

1.3 ALTERNATIVES

- A. Alternates, if specified, can be found listed on the Bid Forms for each Prime Contractor

#### 1.4 REPORTS AND STUDIES

- A. In preparation of the Contract Documents, Engineering has utilized the following, which are available for review:
1. Reference documents such as the following can be reviewed at the ALCOSAN Engineering Building during regular business hours. Contact Mr. Steve Miller in advance if these drawings need to be referenced.
    - a. Construction Drawings, Contracts 34, 35, 36, 40, 41, Allegheny County Sanitary Authority, Pittsburgh, Pennsylvania, Pittsburgh Sewage Treatment Plant, Metcalf & Eddy, Inc., Engineers, 1955.
    - b. Construction Drawings, Contracts 301, 302, 303, 305, 306 through 310, Allegheny County Sanitary Authority, Pittsburgh, Pennsylvania, Waster-Water Treatment Plant, Metcalf & Eddy, Inc., Engineers, 1969.
    - c. Construction Drawings, Contract 916 – Construction of Fluidized Bed Incinerator – Energy Products of Idaho (EPI)
    - d. Contract 916 series – S.E. Technologies.
    - e. Contracts 1302, 1381, 1420, 1669, 1697, and 1720.

#### 1.5 CONFINED SPACES

- A. All work involving confined space entry will be in accordance with 29 CFR 1910.146. The Owner has adopted a Permit Required Confined Space Entry Program for its employees in accordance with OSHA requirements found at 29 CFR 1910.146. This permit Required Confined Space Entry Program must be adopted by the Contractor if its employees will be working in confined spaces. No Contractor employee shall be permitted to enter a “Permit Required Confined Space” as defined in 29 CFR 1910.146 without having complied with all of the requirements of said regulations, including the sign off on the “ALCOSAN On-Site Confined Space Entry Permit” adopted by the Contractor. The Contractor shall have gas detection equipment which is capable of detecting combustibles, oxygen, hydrogen sulfide, and carbon monoxide.
- B. The following EXISTING On-Site spaces have been identified as being a permit required confined spaces. Contractor is cautioned that there may be other work areas encountered and not listed herein that may be considered as a permit required confined spaces:
1. Multiple Hearth Incinerator.
  2. 2- Fluidized Bed Incinerators.
  3. 3- Lime Silos.
  4. 1- New Lime Silo (Bldg. #404)

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5. 3- Lime Day Bins (Bldg. #404)
6. 6- Sludge Product Storage Bins (Bldg. #404)
7. 3- Sludge Surge Bins (Bldg. #404)
8. 2- Potassium Permanganate Silos
9. 4- Polymer Tanks
10. 1- Defoamer Tank
11. 2- Firetube Boilers
12. 3- Caustic Scrubbers (includes all foul AH ductwork).
13. 3- Venturi Incinerator Scrubbers.
14. 2- Impingement Incinerator Scrubbers.
15. 2- Sludge Blending Tanks (Old Lightning Mixing Tanks)
16. 2- Dewatering Feed Tanks (before cleaning)
17. 4- Grit Collecting Tanks (before cleaning)
18. All Manholes and Access Shafts.
19. 2- Ash Silos
20. 2- KMNO<sub>4</sub> Transfer Tanks
21. 2- KMNO<sub>4</sub> Feed Tanks
22. 4- Scum Concentrators (3<sup>rd</sup> floor, ERF)
23. 1- Scum Storage Tank (1<sup>st</sup> floor, ERF)
24. 2- Scum Collection Tanks (N-S walkway between sedimentation tanks)
25. Odor Control Facilities (402, 420, 720 & All Foul Air Handling Ductwork)
26. Lab Building Utility Tunnel
27. Maintenance Cofferdam
28. 1- Fuel Oil Storage Tank, Low Sulfur (250,000 Gallons)
29. 1- Diesel Fuel Tank (12,000 Gallons)
30. 1- Sand Silo
31. 8- Ash Hoppers
32. 2- Tray Towers (5 entries on each)
33. 7- Sludge Bins (To be eliminated)
34. 2- Economizers and 2 Evaporators
35. 3- After Burners
36. 3- Steam Drums
37. 4- Rack Channels
38. 4- Return Sludge Wet Wells
39. 4- Return Sludge Sump Pits
40. 4- Secondary Air Intake Pipe to Compressors
41. 1- Entrance to Wet Well
42. 5- Sodium Hypochlorite Tanks (Temp.)
43. All Underground Steam and Electrical Pits/Vaults
44. 3- Main Pump Station Sump Pits (1- Sump Pit, 2- Drainage Pits)
45. 1- Deaerator
46. 1- Access to Grit Channels
47. 1- Neutralization Tank
48. 1- Sulfuric Acid Tank (Power Gen Bldg)
49. 1- Caustic Soda Tank (power Gen Bldg)
50. 3- Demineralization Tanks

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SUMMARY OF WORK**

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- 51. 2- Bucket Elevators
- 52. All Covered Sedimentation Tanks before cleaning
- 53. Covered Aeration Tanks before cleaning
- 54. 1- Sump Pit, 402 Solids Handling Odor Control System
- 55. 1- Sump Pit, 420 Headworks Odor Control System
- 56. 3- Sludge Cake Storage Bins, Bldg. 405

- C. No Contractor personnel shall enter any of these or any other areas indentified by ALCOSAN as a permit required confined spaces without first receiving written approval from the Owner.
- D. The Contractor shall identify to the Construction Manager any new confined or enclosed space that is created as a result of the performance of the Contract Work. The Contractor shall comply with the requirements of the applicable permit-required confined space entry program whenever the potential exists that work in such spaces could be hazardous.

**1.6 DESCRIPTION OF RESPONSIBILITIES**

- A. **CONTRACTOR:** As described in these Contract Documents and as follows:
  - 1. **Project Manager/Site Superintendent:** On site at all times when Work in individual Contract is proceeding. The Owner reserves the right to approve the Contractors proposed Project Manager and Site Superintendent. If at any time during the execution of the Contract the Owner determines that the Contractors Project Manager and/or Site Superintendent are not executing the Work in conformance with the Contract Documents, the Owner may request in writing that they be replaced. Contractor Project Manager/Site Superintendent shall not be replaced by the Contractor without written notice to Construction Manager except under extraordinary circumstances. The Superintendent will be Contractor's representative at the site and shall have authority to act on behalf of Contractor. All communications to the Superintendent shall be binding upon the Contractor. If at any time during the Project the Superintendent leaves the Project site while Work is in progress, Construction Manager shall be notified and provided with the name of the Contractor's representative having responsible charge.
  - 2. **Quality Control Representative:** Responsible for Contractor's quality control program while Work is in progress. Notify Construction Manager of any change in quality control assignment. Contractor shall be responsible for all weld inspections.
  - 3. **Safety and Protection:**
    - a. Initiate, maintain, and supervise all safety precautions and programs in connection with the Work. Take all necessary precautions for the safety of, and provide the necessary protection to prevent damage, injury, or loss to:
      - 1) All persons on the work site or who may be affected by the Work;
      - 2) All the Work and materials and equipment to be incorporated therein, whether in storage on or off the site; and

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- 3) Other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways, structures, utilities, and underground facilities not designated for removal, relocation, or replacement in the course of construction.
- b. Comply with all applicable Laws and Regulations of any public body having jurisdiction for safety of persons or property or to protect them from damage, injury, or loss.
- c. Before any work at the site is started, General Contractor shall submit a written Safety Plan for Project-specific safety precautions and programs and submit to the Construction Manager for record.
- d. Each Contractor shall revise Contractor's Safety Plan for safety precautions and programs at appropriate times to reflect changes in construction conditions, the Work, Contractor's means, methods, techniques, and sequences and procedures of construction. All revised Safety Plans will be submitted to the Construction Manager for record.
- e. Safety Representative: Each Contractor shall designate a qualified and experienced safety representative at the site whose duties and responsibilities shall be the prevention of accidents and the maintaining and supervising of safety precautions and programs. The Safety representative shall be trained in First Aid and CPR. These qualifications shall be submitted to the Construction Manager prior to beginning work on site.
- f. Emergencies: In emergencies affecting the safety or protection of persons or the work or property at the site or adjacent thereto, each Contractor, without special instruction or authorization from Owner or Construction Manager, is obligated to act to prevent threatened damage, injury or loss. Each Contractor shall give Construction Manager prompt written notice if Contractor believes that any significant changes in the Work or variations from the Contract Documents have been caused thereby. If Construction Manager determines that a change in the Contract Documents is required because of the action taken by Contractor in response to such an emergency, Construction Manager will proceed in accordance with Article 3, General Contract Conditions.

**B. Owner (ALCOSAN):**

1. Enter into legal contract with each Contractor for completion of the Work.
2. Approve contract amendments, progress payments, and make final acceptance of the Work.
3. Participate in coordination of site construction activity.
4. Participate in training, testing and startup activity.

**C. Construction Manager (CM):**

1. Coordinate on-site construction activity.
2. Pre-purchase and Construction Contract Administration.
3. Fabrication and construction inspection services.

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4. Coordinate training, testing and startup activity.
- D. Engineer:
1. Provide engineering support services.
  2. Performs weekly site inspections.
  3. Technical and shop drawing reviews.
  4. Prepare drawing revisions and cost estimates.
  5. Assist in training, testing and startup activity.
- E. Supplier (Owner-Furnished Material & Equipment)
1. Provide manufacturer services in installation, training, testing, start-up and close-out
  2. Coordinate support of each Contractor through the Construction Manager.

**PART 2      PRODUCTS (Not Used)**

**PART 3      EXECUTION (Not Used)**

**{See attached: Appendix A - Site Specific Safety Plan Template}**

**END OF SECTION**

# SITE SPECIFIC SAFETY PLAN (SSSP) TEMPLATE

## Cover Page

- Company Name
- Address or coordinates
- Site Specific Safety Plan
- Project Name/Number
- Date

## Table of Contents

1. Purpose
2. Scope of Work
  - a. Identify steps of the work
  - b. Hours of Operation Project
3. Site Specific Safety Plan
  - a. Spill Leak Prevention and Response
    - i. Identify location of Chemical Inventory (SDSs) – ex: Tool Trailer, Job Office, Foreman Truck
  - b. Hazard Recognition and Mitigation (Define **all project** hazards and steps to mitigate)
    - i. Examples:
      1. Hot Work
      2. Confined Space Entry
      3. Fall Hazard Control and Protection
      4. Arc Flash Protection (70E) using correct PPE
  - c. Minimum Required PPE
  - d. Fire Control
  - e. Dust Control
  - f. Housekeeping Program
  - g. Evacuation Plan
  - h. Rescue Plan (if applicable)
  - i. Traffic Control – School Bus Curfews, Speed Limits, etc.
  - j. Utility Locate Verification (if applicable)
  - k. COVID-19 Plan (consistent with ALCOSAN protocols)
4. Contact information – Names / Contact Info.
  - a. Contractor
    - i. Operations Manager
    - ii. Project Supervisor
    - iii. Safety Manager
    - iv. Foreman

## SITE SPECIFIC SAFETY PLAN (SSSP) TEMPLATE

- b. Subcontractor(s)
    - i. List Company Name and Contact Person
  - c. Alcosan
    - i. Engineers
    - ii. Construction Manager
    - iii. Loss Control Manager
    - iv. Safety Specialist
    - v. Security
- 5. Injury and Incident Response Plan**
- a. Owner Emergency Procedures/Notification
    - i. All cases
    - ii. First aid cases
    - iii. Severed of life-threatening injuries
  - b. Important information
    - i. GPS Coordinates
    - ii. Emergency Contact Information
      - 1. Hospital(s) Contact Information
        - a. Map – Route to Hospital
- 6. Training – What types of work should include specific regulatory training**
- a. Examples:
    - i. Hot work
    - ii. Confined Space
    - iii. Fall Protection
    - iv. Hazard Communication
    - v. LOTO
    - vi. Housekeeping
    - vii. Equipment
- 7. Acknowledgment Form**
- a. “I acknowledge the SSSP for \_\_\_\_\_ has been reviewed and explained to me”  
*Note: Plan to be reviewed with General Contractor and Subcontractors*
    - i. Print name
    - ii. Signatures
    - iii. Date
- 8. Attachments**
- a. Training Documents for specific work listed
  - b. Safety Data Sheets (SDS) for all chemicals brought onto site
  - c. Proof of CCO certification for all crane operators
  - d. Required blank (contractor owned) forms to be completed

## SITE SPECIFIC SAFETY PLAN (SSSP) TEMPLATE

i. Examples:

1. Hot Work
2. Tailgate Safety Meeting (TSM) / Job Safety Analysis (JSA)
3. Confined Space Entry
4. Excavation Daily Inspection
5. LOTO

**9. Additional Comments/Notes**

**PART 1      GENERAL**

**1.1      REFERENCES**

- A.      American Institute of Steel Construction (AISC):
  - 1.      Specifications and Code of Standard Practice.
  - 2.      Specifications for Structural Joints.
  - 3.      Standard Connections.
  
- B.      American Society for Testing and Materials (ASTM):
  - 1.      ASTM A992, Standard Specification of Structural Steel Shapes.
  - 2.      ASTM A36, Standard Specification for Carbon Structural Steel.
  - 3.      ASTM A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.
  - 4.      ASTM A325, Standard Specification for High-Strength Bolts for Structural Steel Joints.
  - 5.      ASTM A490, Standard Specification for Heat-Treated Steel Structural Bolts, 150 ksi Minimum Tensile Strength.
  - 6.      ASTM A500, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
  - 7.      ASTM A501, Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
  - 8.      ASTM F436, Standard Specification for Hardened Steel Washers.
  - 9.      ASTM A759, Standard Specification for Carbon Steel Crane Rails.
  - 10.     ASTM B695, Standard Specification for Coatings of Zinc Mechanically Deposited on Iron and Steel.
  - 11.     ASTM F959, Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners.
  - 12.     ASTM F1554, Standard Specification for Anchor Bolts, Steel, 36, 55 and 105 Yield Strength.
  
- C.      American Welding Society (AWS): ANSI/AWS D1.1, Structural Welding Code Steel.
  - 1.      AWS A3.4, Standard Symbols for Welding, Bracing, and Non-Destructive Examination.
  - 2.      AWS A5.1, Specification for Carbon Steel Electrodes for Shielded Metal Arc Welding.
  - 3.      ANSI/AWS D1.1, Structural Welding Code-Steel.
  
- D.      Crane Manufacturers Association of American (CMAA)

**SECTION 05120  
STRUCTURAL STEEL**

Contract: 1752

1. CMMA 74, Specification for Top Running and Under Running single Girder Electric Overhead Traveling Cranes.
- E. When reference is made to one of the above standards, the revision in effect at the time of bid opening shall apply.

1.2 SUBMITTALS

A. Shop Drawings:

1. Meet requirements of AISC.
2. Provide details showing members and connections
3. Name and address of manufacturer(s).
4. Product specifications.
5. Manufacturer's testing procedures and standards.

B. Quality Control Submittals:

1. Welder Certifications:
  - a. Submit for shop and field welders.
  - b. Issued by recognized testing laboratory.
2. Weld Inspection Test Reports: Submit for review prior to completion of Work.
3. High-Strength Connection Bolts (Galvanized and Non-galvanized):
  - a. Certificates of Compliance that products meet chemical and mechanical requirements of standards specified.
  - b. Manufacturer's inspection test report results for production lot(s) furnished, to include:
    - 1) Tensile strength.
    - 2) Yield strength.
    - 3) Reduction of area.
    - 4) Elongation and hardness.
  - c. Certified Mill Test Reports for Bolts and Nuts:
    - 1) Name and address of manufacturer.
    - 2) Bolts correctly marked.
    - 3) Marked bolts and nuts used in required mill tests and manufacturer's inspection tests.
4. Mill Certificates for the structural steel.
5. Direct Tension Indicators: Furnish manufacturer's test report meeting requirements of ASTM F959.
6. Methods proposed to resolve misalignment between anchor bolts and bolt holes in steel members.

### 1.3 QUALITY ASSURANCE

- A. Qualifications:
  - 1. Welders: Meet requirements of ANSI/AWS D1.1 for procedures and qualifications of welders.
  - 2. Steel Fabricator: Certified under AISC Quality Certification Program.
- B. Regulatory Requirements: Comply with current provisions, except as otherwise indicated:
  - 1. AISC "Code of Standard Practice for Steel Buildings and Bridges."
  - 2. AISC "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" and including "Commentary of the AISC Specification."
  - 3. AISC "Specifications for Structural Joints Using ASTM A325 or ASTM A490 Bolts" approved by Research Council on Structural Connections of the Engineering Foundation; endorsed by American Institute of Steel Construction and Industrial Fasteners Institute.
  - 4. AWS Structural Welding Code ANSI/AWS D1.1 and "Standard Qualification Procedure."
  - 5. Manual of Steel Construction, American Institute of Steel Construction, Inc.

### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Load structural members in such a manner that they will be transported and unloaded without damage to coatings and without being excessively stressed, deformed, or otherwise damaged.
- B. Storage:
  - 1. Protect structural steel members and packaged materials from corrosion and deterioration.
  - 2. Store in dry area and not in direct contact with ground.
  - 3. Avoid any carbon steel contamination at all times.
- C. Handle materials to avoid distortion or damage to members or supporting structures.

## **PART 2 PRODUCTS**

### 2.1 MATERIALS

- A. Rolled Plates, Shapes (other than wide flange), and Bars: ASTM A36 unless otherwise shown.

## 2.2 ANCILLARY MATERIALS

- A. Surface Preparation and Primer: As specified in Section 09900, PAINTING.
- B. Welding Electrodes:
  - 1. For RA 253 MA (manifold pieces and all items welded to any surface of the manifold assembly): Use RA 253 MA in accordance with attached information in Appendix (back of this specification document). Full penetration welds
  - 2. For incinerator shell (shell to shell): Use E70XX in accordance with AWS D1.1; full penetration welds.
  - 3. For shell to brick support ring, use E 308, full penetration welds.
  - 3. Use E309, full penetration welds, for the following welds:
    - Fixed-end nozzles to the new shell section
    - Gusset plate to shell
    - Slip sleeve to shell
    - Gusset plate to cone support ring
  - 4. For dissimilar metals: RA 253 MA to carbon steel: Use RA 253 MA electrode or E309 electrode, as specified. Full penetration welds
  - 5. For gusset plate to brick support ring, use RA 253MA, full penetration welds.

## 2.3 FABRICATION

- A. General:
  - 1. Fabricate in accordance with AISC Specifications, Contractor's erection requirements, and approved Shop Drawings.
  - 2. Mark and match mark materials for field assembly.
  - 3. Complete assembly, including bolting and welding of units, before start of finishing operations.
  - 4. Fabricate to agree with field measurements.
- B. Welded Construction: Comply with ANSI/AWS D1.1 for procedures, appearance, and quality of welds, and methods used in correcting welding Work.
  - 1. Butt Welds: Complete penetration unless otherwise specified.
- C. Surface Preparation and Shop Coatings:
  - 1. Surface Preparation: Clean and remove slag from welds before painting.
  - 2. Coat members with primer except at future field welds, bolt-ups, and concrete embedment.

3. Apply primer in accordance with Section 09900, PAINTING, within 8 hours after surface preparation.

### PART 3 EXECUTION

3.1 N/A

3.2 N/A

#### 3.3 SLIDER SLEEVE/NOZZLE REALIGNMENT & MACHINING

Coordinate the text below with all other spec sections/drawings.

- A. Once manifolds are removed and shell/gusset replacement work is complete, the alignment of the fixed end nozzles and expansion end slider sleeves is to be coordinated/checked. To determine alignment, the centerline of both elements (nozzle and slider sleeve) must be coincident (less than 1/16" apart) with each other, and the axes are to be no more than ½ a degree from the line that connects these two centerlines. [All fixed end nozzles & slider sleeves shall be measured/adjusted for optimal alignment with each other (and adjacent nozzles/sleeves), prior to welding the nozzle in place.] In addition to alignment, each expansion end slider (10" pipe) must be measured for eccentricity & inside diameter. Any slider that measures less than 10" I.D. (or, if eccentric – if the minor axis is less than 10") may need to be removed & machined offsite. The Owner will make this determination. If needed, machine the I.D. so the finished inside diameter is 10.125 " (+0.031" / - 0.000"). Note that these slider sleeves are made of **RA 85 H** alloy, and the sleeves have seen high temperatures and many thermal cycles since being installed in the mid-1990's.
- B. Fixed End Nozzle Reattachment
  1. Measure the flange face of the fixed-end nozzle to verify that it is perpendicular (normal, to within ½ of a degree) to the centerline of the pipe to which it is attached. Align the nozzle such that its centerline axis is both level and its flange face is plumb (all to within ½ of a degree). Additionally, this centerline axis must be parallel to the two adjacent manifolds (+/- 1/16"). Weld (in accordance with the weld procedure, using 309 electrodes) in such a

manner that the nozzle maintains the proper alignment. Verify alignment when welding is complete. (Coordinate this effort with the alignment of the slip sleeves.) Contractor shall provide/coordinate third party to conduct NDT of welds.

- C. Meet requirements of AISC Specifications and Code of Standard Practice.

### 3.4 FIELD ASSEMBLY

- A. Set structural members accurately to lines and elevations shown.
- B. Align and adjust various members forming a part of a complete frame or structure before permanently fastening.
- C. Clean bearing surfaces and other surfaces that will be in permanent contact before assembly.
- D. Perform necessary adjustments to compensate for minor discrepancies in elevations and alignment.
- E. Level and plumb individual members of structure within AISC tolerances or to the tolerances noted on drawings & specs (contract documents), whichever is more stringent.

### 3.5 PAINTING

- A. After erection and field testing of connections, prime paint abrasions, field welds, and unprimed surfaces using shop primer, except surfaces designated to be unpainted or surfaces in contact with concrete.
- B. After erection and field testing of connections, repair damaged galvanizing and prime paint abrasions and field welds at galvanized surfaces with surface primer containing zinc dust in accordance with ASTM A780. Provide a dry film thickness not less than 6 mils.
- C. Shop and field painting shall be as specified in Section 09900 (and elsewhere in the contract documents). All areas that are to be welded shall be masked to 3-inches on all sides of welds. All slip critical connections which must be fully torqued shall have contact surfaces of connection masked prior to painting.

**3.6 FIELD QUALITY CONTROL**

- A. Weld Testing Requirements: All welded connections for structural steel will be subject to inspection and nondestructive testing by the third party inspector (provided/coordinated by the contractor) in accordance with the ANSI/AWS D1.1 Structural Welding Code-Steel as follows:
1. Qualification records for welding procedures and welding operators.
  2. Visual inspection of all welds.
  3. Random ultrasonic or radiographic testing for groove welds
  4. Random inspection of fillet welds using either dye penetrant or magnetic particle method.
- B. Provide unlimited access to the Work. The number and frequency of visual inspections and tests will be at the discretion of the Owner. Notify the Engineer in writing 4 working days in advance of high strength bolting and field welding operations, including pre-installation verification of high strength bolt assemblies.
- C. The fact that steel work has been accepted at the shop and mill will not prevent its final rejection at the site, before or after erection, if it is found to be defective.
- D. Repair of Defective Connections:
1. All defective welds shall be repaired and retested in accordance with ANSI/AWS D1.1.

**END OF SECTION**

**PART 1      GENERAL**

**1.1      SECTION INCLUDES**

- A.      All work necessary to install, complete, the incinerator fluidizing air manifold piping assemblies & appurtenances, as described herein or in any other specification section, appendix or drawing within this set of contract documents.    Coordinate the text below with all other spec sections/drawings.
  
- B.      All work shall be completed as required by applicable codes and good practice. Reference Welding RA 253 MA supplement at end of section.

**1.2      REFERENCES**

- A.      American National Standards Institute (ANSI):
  - 1.    A21.52, Ductile Iron Pipe, Centrifugally Cast, for Gas.
  - 2.    B1.20.1, Pipe Threads, General Purpose (Inch).
  - 3.    B16.1, Cast Iron Pipe Flanges and Flanged Fittings.
  - 4.    B16.3, Malleable Iron Threaded Fittings.
  - 5.    B16.5, Pipe Flanges and Flanged Fittings.
  - 6.    B16.9, Factory-Made Wrought Steel Buttwelding Fittings.
  - 7.    B16.11, Forged Fittings, Socket-Welding and Threaded.
  - 8.    B16.15, Cast Bronze Threaded Fittings, Classes 125 and 250.
  - 9.    B16.21, Nonmetallic Flat Gaskets for Pipe Flanges.
  - 10. B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
  - 11. B16.24, Cast Copper Alloy Pipe Flanges and Flanged Fittings Class 150, 300, 400, 600, 900, 1500, and 2500.
  - 12. B16.25, Butt Welding Ends.
  - 13. B16.42, Ductile Iron Pipe Flanges and Flanged Fittings, Classes 150 and 300.
  
- B.      American Petroleum Institute (API): 5L-92, Specification for Line Pipe.
  
- C.      American Society of Mechanical Engineers (ASME):
  - 1.    Boiler and Pressure Vessel Code, Section VIII, Division 1, Pressure Vessels.
  - 2.    Boiler and Pressure Vessel Code, Section IX, Welding and Brazing Qualifications.
  - 3.    B31.1, Power Piping.
  - 4.    B31.3, Chemical Plant and Petroleum Refinery Piping.
  - 5.    B31.9, Building Services Piping.
  - 6.    B36.10M, Welded and Seamless Wrought Steel Pipe.
  
- D.      American Society for Nondestructive Testing (ASNT): SNT-TC-1A, Recommended Practice for Nondestructive Testing Personnel Qualifications.

**SECTION 15060**  
**AIR MANIFOLD INSTALLATION**

Contract: 1752

- E. American Society for Testing and Materials (ASTM):
1. A47, Standard Specification for Ferritic Malleable Iron Castings.
  2. A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  3. A105/A105M, Standard Specification for Forgings, Carbon Steel, for Piping Components.
  - A106, Standard Specification for Seamless Carbon Steel Pipe for High Temperature Service.
  4. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
  5. A135, Standard Specification for Electric-Resistance-Welded Steel Pipe.
  6. A139, Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over).
  7. A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
  8. A181/181M, Standard Specification for Forgings, Carbon Steel, for General-Purpose Piping.
  9. A182/182M, Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
  10. A183, Standard Specification for Carbon Steel Track Bolts and Nuts.
  11. A193/A193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
  12. A194/A194M, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
  13. A197, Standard Specification for Cupola Malleable Iron.
  14. A216/A216M, Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High Temperature Service.
  15. A234/A234M, Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
  16. A240, Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels.
  17. A276, Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
  18. A283/A283M, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
  19. A285/A285M, Standard Specification for Pressure Vessel Plates, Carbon Steel, Low and Intermediate Tensile Strength.
  20. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
  21. A312/A312M, Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipes.
  22. A320/A320M, Standard Specification for Alloy Steel Bolting Materials for Low-Temperature Service.

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23. A395, Standard Specification for Ferritic Ductile Iron Pressure-Retaining Castings for Use at Elevated Temperatures.
24. A403/A403M, Standard Specification for Wrought Austenitic Stainless Steel Piping Fittings.
25. A409/A409M, Standard Specification for Welded Large Diameter Austenitic Steel Pipe for Corrosive or High-Temperature Service.
26. A536, Standard Specification for Ductile Iron Castings.
27. A563, Standard Specification for Carbon and Alloy Steel Nuts.
28. A587, Standard Specification for Electric-Resistance-Welded Low-Carbon Steel Pipe for the Chemical Industry.
29. A774/A774M, Standard Specification for As-Welded Wrought Austenitic Stainless Steel Fittings for General Corrosive Service at Low and Moderate Temperatures.
30. A778, Standard Specification for Welded, Unannealed Austenitic Stainless Steel Tubular Products.
31. B32, Standard Specification for Solder Metal.
32. B43, Standard Specification for Seamless Red Brass Pipe, Standard Sizes.
33. B61, Standard Specification for Steam or Valve Bronze Castings.
34. B62, Standard Specification for Composition Bronze or Ounce Metal Castings.
35. B75, Standard Specification for Seamless Copper Tube.
36. B88, Standard Specification for Seamless Copper Water Tube.
37. B98, Standard Specification for Copper-Silicone Alloy Rod, Bar, and Shapes.
38. C582, Standard Specification for Contact-Molded Reinforced Thermosetting Plastic (RTP) Laminates for Corrosion Resistant Equipment.
39. D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.
40. D413, Standard Test Methods for Rubber Property-Adhesion to Flexible Substrate.
41. D1248, Standard Specification for Polyethylene Plastics Molding and Extrusion Materials.
42. D1784, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
43. D1785, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
44. D2000, Standard Classification System for Rubber Products in Automotive Applications.
45. D2310, Standard Classification for Machine-Made "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
46. D2464, Standard Specification for Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
47. D2466, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40.
48. D2467, Standard Specification for Socket-Type Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80.
49. D2564, Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.

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50. D2996, Standard Specification for Filament-Wound "Fiberglass" (Glass-Fiber-Reinforced Thermosetting-Resin) Pipe.
  51. D3222, Standard Specification for Unmodified Poly(Vinylidene Fluoride) (PVDF) Molding Extrusion and Coating Materials.
  52. D3350, Standard Specification for Polyethylene Plastics Pipe and Fittings Materials.
  53. D4101, Standard Specification for Propylene Plastic Injection and Extrusion Materials.
  54. F437, Standard Specification for Threaded Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
  55. F439, Standard Specification for Socket-Type Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
  56. F441, Standard Specification for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80.
  57. F491, Standard Specification for Poly(Vinylidene Fluoride) (PVDF) Plastic Lined Ferrous Metal Pipe and Fittings.
  58. F493, Standard Specification for Solvent Cements for Chlorinated Poly(Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.
  59. F714, Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.
- F. American Welding Society (AWS):
1. A5.8, Specification for Filler Metals for Brazing and Braze Welding.
  2. Q1, Standard for AWS Certification of Welding Inspectors.
- G. American Water Works Association (AWWA):
1. C104/A21.4, Cement-Mortar Lining for Ductile-Iron Pipe and Fittings for Water.
  2. C110/A21.10, Ductile-Iron and Gray-Iron Fittings, 3 Inches Through 48 Inches for Water and Other Liquids.
  3. C111/A21.11, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.
  4. C115/A21.15, Flanged Ductile-Iron Pipe with Threaded Flanges.
  5. C151/A21.51, Ductile-Iron Pipe, Centrifugally Cast, for Water or Other Liquids.
  6. C153/A21.53, Ductile-Iron Compact Fittings 3 Inches Through 16 Inches, for Water and Other Liquids.
  7. C200, Steel Water Pipe – 6 Inches and Larger.
  8. C205, Cement-Mortar Protective Lining and Coating for Steel Water Pipe—4 Inches and Larger—Shop Applied.
  9. C207, Steel Pipe Flanges for Water Works Service, Sizes 4 Inches Through 144 Inches.
  10. C208, Dimensions for Fabricated Steel Water Pipe Fittings.
  11. C210, Liquid-Epoxy Coating Systems for the Interior and Exterior of Steel Water Pipelines.
  12. C214, Fusion Bonded Epoxy Coating for the Interior and Exterior of Steel Water Pipelines.

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13. C606, Grooved and Shouldered Type Joints.
14. M11, Steel Pipe - A Guide for Design and Installation.

- H. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS):
1. SP43, Wrought Stainless Steel Butt-Welding Fittings Including Reference to Other Corrosion Resistant Materials.
- I. National Fire Protection Association (NFPA):
1. 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances.

### 1.3 SUBMITTALS

- A. Quality Control Submittals: Furnish the following:
1. Welders and Welding:
    - a. Inspection and Testing Laboratory Qualifications: Submit background information including experience, years in business, and five references for proposed independent testing laboratory.
    - b. Performance Qualifications: Prior to start of work, submit list of welders and welding operators, and types of welding for which each has been qualified, for both shop and field welding. Welder qualifications shall be reviewed and approved by the Engineer prior to any shop or field welding being performed.

### 1.4 QUALITY ASSURANCE

- A. Weld Inspection and Testing Laboratory Qualifications:
1. Contractor shall be responsible for inspection on both shop welding and field welding.
  2. Retain approved independent testing laboratory that will provide the services of an AWS certified welding inspector qualified in accordance with AWS QC1 with prior inspection experience of welds specified herein.
  3. Perform weld examinations with qualified testing personnel who will carry out radiography, ultrasonic, magnetic particle, and other nondestructive testing methods as specified herein.
  4. Welding Inspector:
    - a. Be present when shop or field welding is performed to certify that welding is in accordance with specified standards and requirements.
    - b. Duties include, but are not limited to, the following:
      - (1) Job material verification and storage.
      - (2) Qualification of welders.

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- (3) Certify conformance with approved welding procedure specifications.
- (4) Maintain records and prepare reports in a timely manner.
- (5) Notify OWNER within 1 hour of discovery of unsatisfactory weld performance and within 24 hours of weld test failure.
- (6) Supervision of testing personnel.

**B. Welder and Welding Operator Performance:**

1. Qualify welders and welding operators by approved testing laboratory before performing any welding under this section.
2. Perform welder qualification tests in accordance with Section IX, Article III of the ASME Boiler and Pressure Vessel Code.
3. Qualification tests may be waived if evidence of prior qualification is deemed suitable by the OWNER.
4. Qualify welders and operators in the performance of making groove welds in each different pipe material, including carbon steel pipe, in Positions 2G and 5G for each welding process to be used.
5. Qualify welders and welding operators for stainless steel as stated herein on the type of stainless steel being welded with the welding process used.
6. Retest any welders at any time OWNER considers the quality of the welder's work substandard.
  - a. When the OWNER requests a retest of a previously qualified welder, the labor costs for the retest will be at OWNER's expense if the welder successfully passes the test.
  - b. If the welder fails the retest, all costs shall be at the CONTRACTOR's expense.

**C. Certifications:**

1. Weld Testing Agency: Certified in accordance with current American Society for Nondestructive Testing (4153 Arlingate Plaza, Columbus, OH 43228) recommended practice SNT-TC-1A, NDT Level II.

**1.5 DELIVERY, STORAGE AND HANDLING**

**A. General:**

1. Items delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, or other contaminants.
2. RA 253 MA electrodes must be properly stored to assure freedom from contamination and moisture absorption. After opening from sealed containers electrodes must be stored at 150-250 degrees F.

## **PART 2 PRODUCTS**

### **2.1 GENERAL**

- A. Pipe Materials:
  - 1. General materials to be used for the piping systems are listed by service in the Piping Schedule. Manifolds are fabricated of RA 253 MA.
  - 2. Nozzles are A-36 carbon steel (external to vessel) and RA 85 H (slider sleeve inside vessel).
  - 3. Like Items of Materials: Use products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.
    - a. Furnish grooved-end pipe fittings and couplings from the same manufacturer.
- B. Components: Furnish new products of equal material and rating as connecting pipe.
- C. Pipe Diameters:
  - 1. The long portion of each fluidizing air manifold is 14 inches in outside diameter, and the short (spool) portion is 13 inches in outside diameter (nominal dimensions).
- D. Expansion Joint:
  - 1. Ten (10) new expansion joints are to be furnished and installed under this contract. The joints shall be Hyspan, 10" nominal I.D., 316 stainless steel construction with a 16" O.D. flanged inlet and a 21" O.D. flanged outlet, as described in the appendices.

## **PART 3 EXECUTION**

### **3.1 EXAMINATION**

- A. Verification of Existing Pipe and Penetrations:
  - 1. Measure all critical dimensions prior to start of manifold fabrication. (Consult with owner) Verify that the manifold dimensions shown on the drawings will result in a workable assembly/system.
  - 2. Verify that nozzle alignment/repairs have been completed, and proper nozzle & slider sleeve alignment still exists prior to commencing the manifold reinstallation. (See section 05120, 01010, etc. for more details).

### 3.2 FIELD WELDING

- A. General:
1. Perform in accordance with latest editions of Section IX, ASME Boiler and Pressure Vessel Code and ANSI Code for Pressure Piping, as follows:
    - a. All Piping: ASME Section IX.
    - b. Manifold assembly & accessories: In accordance the specifications and the latest Structural Welding code.
- B. Identification of Welds: Mark each weld with a symbol which identifies the person who made the weld.
- C. Pipe End Preparation:
1. Preferably by machine shaping.
  2. Oxygen or arc cutting are acceptable only if the cut is reasonably smooth and true and all slag is removed either by chipping or grinding.
  3. Beveled Ends for Butt Welding: Meet requirements of ANSI B16.25.
- D. Surfaces: Clean and free of paint, oil, rust, scale, slag, or other material detrimental to welding.
- E. Procedure:
1. Shielded Metal-Arc Process: Use for all field welding, unless otherwise approved or specified herein or in the Detail Piping Specifications.
  2. Welding on RA 253 MA: Use direct current, reverse polarity, gas metal-arc process or direct current, straight polarity, gas tungsten-arc unless otherwise approved. Use appropriate shielding gas. Do not use any gas mixture that will reduce cerium transfer across the arc.
  3. Welding shall be performed on manifold pipes in a manner to prevent warping. Welds should be spaced around the neutral axis.
  4. Tack Welds: Remove completely prior to proceeding with welding if all following requirements are not met.
    - a. Tack welds performed by qualified welder using the same procedure as for the completed weld.
    - b. Tack welds made with an electrode similar or equivalent to electrode to be used for first weld pass.
    - c. Not cracked or otherwise inconsistent.
  5. Thoroughly clean each layer of deposited weld metal, including the final pass, prior to deposition of each additional layer of weld metal with a power-driven wire brush.
  6. Surface Defects: Chip or grind out those that will affect the soundness of weld.

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7. Welds: Free of cracks, incomplete penetration, weld undercutting, excessive weld reinforcement, porosity slag inclusions, and other defects in excess of the limits prescribed in Chapter V of the specified ANSI Codes.

3.3 SLIDER/SLIP SLEEVE REALIGNMENT/MACHINING

- A. Align/repair (machine I.D. if required by owner) as described in section 05120, 01010 & elsewhere in the contract documents. **If machining is required, the I.D. shall be machined (turned) to 10.125" (+0.031/-0.000)**  
Perform **all** other repair work prior to manifold installation (including installation/alignment of the fixed end nozzles).

3.4 MANIFOLD INSTALLATION

- A. Follow Installation procedures and details in specifications and drawing.
  1. Once inside of the incinerator vessel, weld the two manifold sections together, using full penetration welds. Ensure that both sections have coincident centerlines (centerlines shall be within 1/16 of an inch of each other, and shall be parallel to each other, within ½ of a degree). Contractor shall provide/coordinate third party to perform NDT test on welds. Remove alignment guides.
  2. Align (rotate) the manifold such that the tops of the nozzle caps are all parallel to a horizontal plane (within ½ of a degree). Bolt the ring flange to the flange to which it mates. Reconfirm that the manifold is aligned & level. (Use feeler gauges at expansion end). Shim to maintain alignment/concentricity with the expansion end nozzle. Weld on the ring flange supplied with the new manifold. Be sure to allow the proper recess (setback) mentioned on the drawings (consult with owner). Remove bolts (installed above). Install expansion joint & new gaskets. (Gasket underneath expansion joint and gasket material underneath ring flange). NO existing gaskets will be re-used. Contractor shall furnish & install NEW gaskets in all gasketed connections. Ensure manifold remains level & aligned while tightening the bolted connections. Torque nuts carefully and evenly so the ring flange is, at all times, equidistant from the fixed end nozzle's flange. Upon fully tightening these bolts, the ring flange shall be in full, planar contact with its mating flange face (on the fixed end nozzle). Weld at least two 309 stainless steel clips across these two flanges, to keep the flange faces in contact. Grind a unique match mark on or near the 12 O'clock position of these two flanges (spanning both flanges). [If requested by the owner, remove existing match marks by grinding/defacing so the new one will be evident.]
  3. Re-attach clips (that support the thermoprobes) to the proper manifold/location. Use RA 253-MA rod.

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4. Weld nozzle cap holes that are too close to a thermoprobe, plow, etc., (at the direction of the owner).
5. If directed by the owner, trim sand plows. If required, remove plows & reweld (using RA 253 MA rod).
6. Affix (weld) sand shields to each manifold, as directed by the owner.

**END OF SECTION**

**SECTION 15510  
FIRST EVAPORATOR TUBE BUNDLE**

**PART 1      GENERAL**

1.1      SECTION INCLUDES

- A.      Work necessary to fabricate and install, complete, the first evaporator tube bundle, supporting pipes & appurtenances.
- B.      All work shall be completed as required by applicable codes, standards, reference drawings and good practice.

1.2      REFERENCES

- A.      American Society of Mechanical Engineers (ASME):
  - 1.      Boiler and Pressure Vessel Code, Section VIII, Division 1, Pressure Vessels.
  - 2.      Boiler and Pressure Vessel Code, Section IX, Welding and Brazing Qualifications.
  - 3.      B31.1, Power Piping.
  - 4.      B31.3, Chemical Plant and Petroleum Refinery Piping.
  - 5.      B31.9, Building Services Piping.
  - 6.      B36.10M, Welded and Seamless Wrought Steel Pipe.
- B.      American Society for Nondestructive Testing (ASNT): SNT-TC-1A, Recommended Practice for Nondestructive Testing Personnel Qualifications.
- C.      American Society for Testing and Materials (ASTM):
  - 1.      A47, Standard Specification for Ferritic Malleable Iron Castings.
  - 2.      A53, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
  - 3.      A105/A105M, Standard Specification for Forgings, Carbon Steel, for Piping Components.
  - 4.      A106, Standard Specification for Seamless Carbon Steel Pipe for High Temperature Service.
  - 5.      A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
  - 6.      A135, Standard Specification for Electric-Resistance-Welded Steel Pipe.
  - 7.      A139, Standard Specification for Electric-Fusion (Arc)-Welded Steel Pipe (NPS 4 and Over).
  - 8.      A153, Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

9. A181/181M, Standard Specification for Forgings, Carbon Steel, for General-Purpose Piping.
10. A182/182M, Standard Specification for Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service.
11. A183, Standard Specification for Carbon Steel Track Bolts and Nuts.
12. A193/A193M, Standard Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service.
13. A194/A194M, Standard Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and High-Temperature Service.
14. A197, Standard Specification for Cupola Malleable Iron.
15. A216/A216M, Standard Specification for Steel Castings, Carbon, Suitable for Fusion Welding, for High Temperature Service.
16. A234/A234M, Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
17. A240, Standard Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels.
18. A276, Standard Specification for Stainless and Heat-Resisting Steel Bars and Shapes.
19. A283/A283M, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
20. A285/A285M, Standard Specification for Pressure Vessel Plates, Carbon Steel, Low and Intermediate Tensile Strength.
21. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.

D. American Welding Society (AWS):

1. A5.8, Specification for Filler Metals for Brazing and Braze Welding.
2. Q1, Standard for AWS Certification of Welding Inspectors.

### 1.3 SUBMITTALS

A. Quality Control Submittals: Furnish the following:

1. Welders and Welding:
  - a. Inspection and Testing Laboratory Qualifications: Submit background information including experience, years in business, and five references for proposed independent testing laboratory.
  - b. Performance Qualifications: Prior to start of work, submit list of welders and welding operators, and types of welding for which each has been qualified, for both shop and field welding. Welder qualifications shall be reviewed and approved by the Engineer prior to any shop or field welding being performed.

- B. Submit any/all forms and inspections required by ASME code, insurance requirements, etc. for the Upper Evaporator section (or any other aspect of the repairs).
- C. Other materials required to replace existing including but not limited to refractory, insulating fiber boards, insulating batts, metal plates/sheets, pipes and supports.

#### 1.4 QUALITY ASSURANCE

- A. Weld Inspection and Testing Laboratory Qualifications:
- B. Contractor shall be responsible for inspection of all welding, both shop and field. Any inspections (of welds or other items) – in the shop or in the field - required by ASME code, insurance requirements, etc. along with any required certifications/paperwork shall be provided by the contractor.
  - 1. Retain approved independent testing laboratory that will provide the services of an AWS certified welding inspector qualified in accordance with AWS QC1 with prior inspection experience of welds specified herein.
  - 2. Perform weld examinations with qualified testing personnel who will carry out radiography, ultrasonic, magnetic particle, and other nondestructive testing methods as specified herein.
  - 3. Welding Inspector:
    - a. Be present when shop or field welding is performed to certify that welding is in accordance with specified standards and requirements.
    - b. Duties include, but are not limited to, the following:
      - (1) Job material verification and storage.
      - (2) Qualification of welders.
      - (3) Certify conformance with approved welding procedure specifications.
      - (4) Maintain records and prepare reports in a timely manner.
      - (5) Notify OWNER within 1 hour of discovery of unsatisfactory weld performance and within 24 hours of weld test failure.
      - (6) Supervision of testing personnel.
- C. Welder and Welding Operator Performance:
  - 1. Qualify welders and welding operators by approved testing laboratory before performing any welding under this section.
  - 2. Perform welder qualification tests in accordance with Section IX, Article III of the ASME Boiler and Pressure Vessel Code.
  - 3. Qualification tests may be waived if evidence of prior qualification is deemed suitable by the OWNER.
  - 4. Qualify welders and operators in the performance of making groove welds in each different pipe material, including carbon steel pipe, in Positions 2G and 5G for each welding process to be used.
  - 5. Qualify welders and welding operators for stainless steel as stated herein on the type of stainless steel being welded with the welding process used.

6. Retest any welders at any time OWNER considers the quality of the welder's work substandard.
  - a. When the OWNER requests a retest of a previously qualified welder, the labor costs for the retest will be at OWNER's expense if the welder successfully passes the test.
  - b. If the welder fails the retest, all costs shall be at the CONTRACTOR's expense.

D. Certifications:

1. Weld Testing Agency: Certified in accordance with current American Society for Nondestructive Testing (4153 Arlingate Plaza, Columbus, OH 43228) recommended practice SNT-TC-1A, NDT Level II.

## 1.5 DELIVERY, STORAGE AND HANDLING

A. General:

1. Items delivered and placed in storage shall be stored with protection from the weather, humidity and temperature variations, dirt and dust, or other contaminants.

## PART 2 PRODUCTS

### 2.1 GENERAL

A. Tube Materials:

1. The first evaporator tubes shall be SA-178, grade A steel fabricated to the diameter and thicknesses as shown on the Form P-3 Data report and the reference drawings, included in addendum # 1. Note: Reference drawings suggest either thirty-six (36) or thirty-eight (38) rows (arrays) of tubes in the first evaporator. Field-verify all dimensions and quantity.

B. Components: Furnish new products of equal material and rating as connecting pipe.

C. Tube support pipes, saddles, bars and rods shall be type 304 stainless steel.

D. Insulation: re-use existing insulation and panels. If insulation or outer metallic cladding is damaged or unusable, replace in kind. Refer to the reference drawings for more details on insulation products.

E. Refractory materials: If damaged or if removal is required, replaced with AP Green KS castable. Refer to the reference drawings for more details on refractory products. (Note the bid allowance for "wall" refractory repairs – for existing refractory damage only.)

## PART 3 EXECUTION

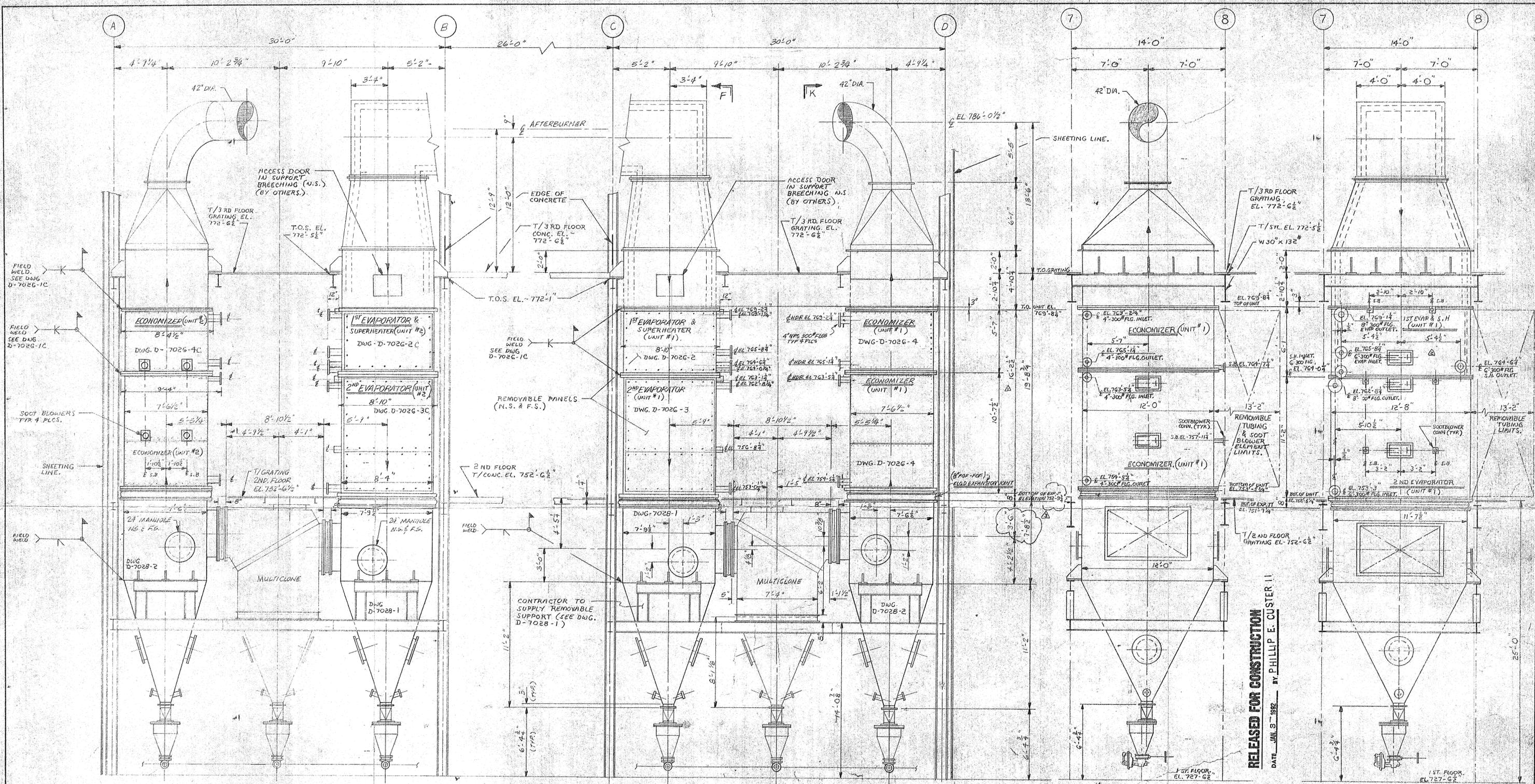
### 3.1 DEMOLITION

- A. Disconnect, demolish and remove Unit 1 first evaporator tube section, supporting pipes and appurtenances. Remove and later replace header refractory material to allow complete removal of existing tubes all the way back to the headers. Protect lower sections of the evaporator assembly from any debris associated with the inspection, demo and installation of the work under this contract. Remove and properly dispose of any/all ash, tramp materials, debris, spalled/broken refractory and insulation pieces from the first evaporator and superheater – whether existing or released/caused by the work to be performed under this contract.

### 3.2 INSTALLATION REQUIREMENTS.

- A. General:
  - 1. Perform in accordance with latest editions of Section IX, ASME Boiler and Pressure Vessel Code and ANSI Code for Pressure Piping, as follows:
    - a. All Piping: ASME Section IX.
    - b. Support Steel welding in accordance with AWS and reference drawing details.
- B. Reference Drawings indicate general location, arrangement and conditions that existed at the time of the original installation. Work has occurred subsequent to that time, thus - Contractor shall field verify all quantities, dimensions/arrangement/conditions, etc. of the existing tube sections (and the evaporator assembly in general) prior to fabrication.
- C. Contractor to remove existing tube bundles back to the headers. Grind smooth and connect in accordance with ASME code and the detail in reference drawings.
- D. Hydrostatic test to be performed on each installed tube section. Test pressure to be 750 psi.

END OF SECTION



- NOTES:**
1. HEADERS ARE NOT DESIGNED FOR EXTERNAL PIPE LOADING.
  2. ALL COMPONENTS TO BE MATCH MARKED FOR FIELD ERECTION
  3. SUPERHEATER DESIGNED TO RUN DRY WITHOUT DAMAGE.
  4. CASINGS TO BE DESIGNED FOR  $\pm 30^{\circ}$  W.C.
  5. ALL MATERIALS BY DOMESTIC MANUFACTURE.
  6. ALL PAINTED SURFACES TO BE SANDELASTED TO S5FC-1-SP-6, THEN PRIME COATED TO DRY FILM THICKNESS OF 1-2 MILS USING "DEGRACO 9211"
  7. CBW TO SUPPLY (6) THERMOWELLS FOR  $\frac{3}{4}$ " NPS TEMPERATURE CONNECTIONS (2) @ ECONOMIZER (6) @ EVAPORATOR.
  8. ALL UNITS MAY BE DRAINED BY GRAVITY.
  9. EXPANSION JOINTS TO BE FABRIC TYPE AS MFG BY PRICO PRODUCTS INC., AND PROVIDED BOLTED TO THE NON-CONNECTIVE DUCT SECTION, COMPRESSED.
  10. UNITS BUILT TO A.S.M.E. CODE SECTION I, 1989 ED., 12-31-90 ADDENDA, AND STAMPED "S".

REFERENCE DWGS.

D-7026-18- PLAN VIEW OF W.H.B. HT X-CHANGERS.
D-7026-2 - 1ST EVAPORATOR & SUPERHEATER ARRGT. DWG.
D-7026-3 - 2ND EVAPORATOR ARRANGEMENT DWG.
D-7028-1 - EVAPORATOR HOPPER ARRANGEMENT DWG.
D-7026-4 - ECONOMIZER ARRANGEMENT DWG.
D-7028-2 - ECONOMIZER HOPPER GEN. ARRGT. DWG.
D-7026-1D - GEN. ARRGT. DWG. OF W.H.B. HT EXCHANGERS UNIT # 2

**FOR REFERENCE ONLY**

\*REQUIRED FOR ONE BOILER

WEIGHT CHART	WT. DRY	WT. WET
ECONOMIZER (TOP SECTION)	13,400#	
ECONOMIZER (BOTTOM SECTION)	25,600#	
ECONOMIZER TOTAL	39,000#	44,900#
EVAPORATOR/SUPERHEATER (TOP SECT)	30,000#	
EVAPORATOR (BOTTOM SECTION)	33,000#	
EVAPORATOR TOTAL	63,000#	93,500#
(2) HOPPERS & (2) EXPANSION JOINTS	30,000#	
TOTAL WEIGHT	132,000#	138,400#

REF: 52 TECHNOLOGY, INC. DWG. # 916-M-007E

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AC.S.A. FILE COPY  
DO NOT REMOVE

**CANNON TECHNOLOGY, INC.**  
NEW KENSINGTON, PA. 15068

ALCOSAN  
GENERAL ARRANGEMENT  
DRAWING OF WASTE HEAT BOILER  
HT. EXCHANGERS (UNIT #1)

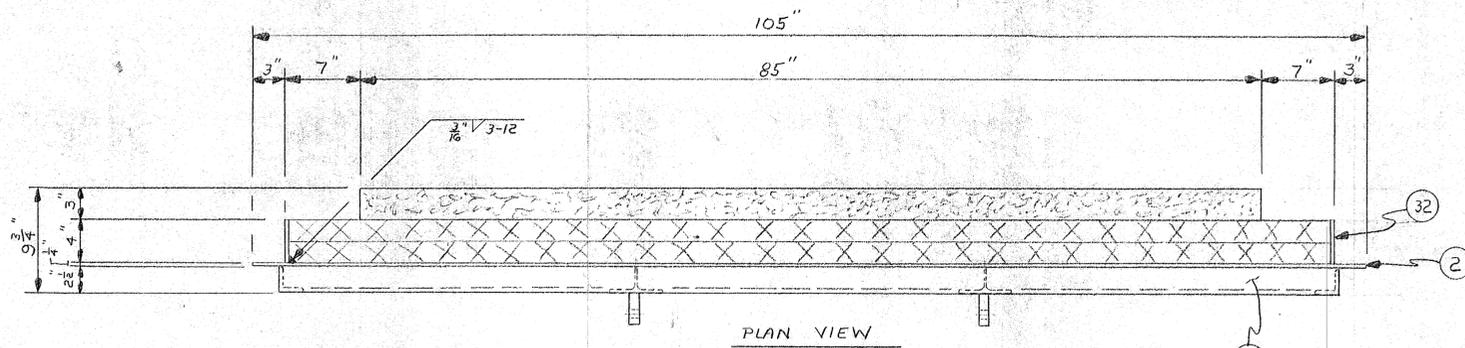
No.	REVISION	DATE

DRAWN BY: DFM DATE: 9/19/82 CHK: PECT DATE: 10/1/82 SCALE: 1"=1'-0" JOB NO: 7026 DWG NO: D-7026-1A REV NO: 1

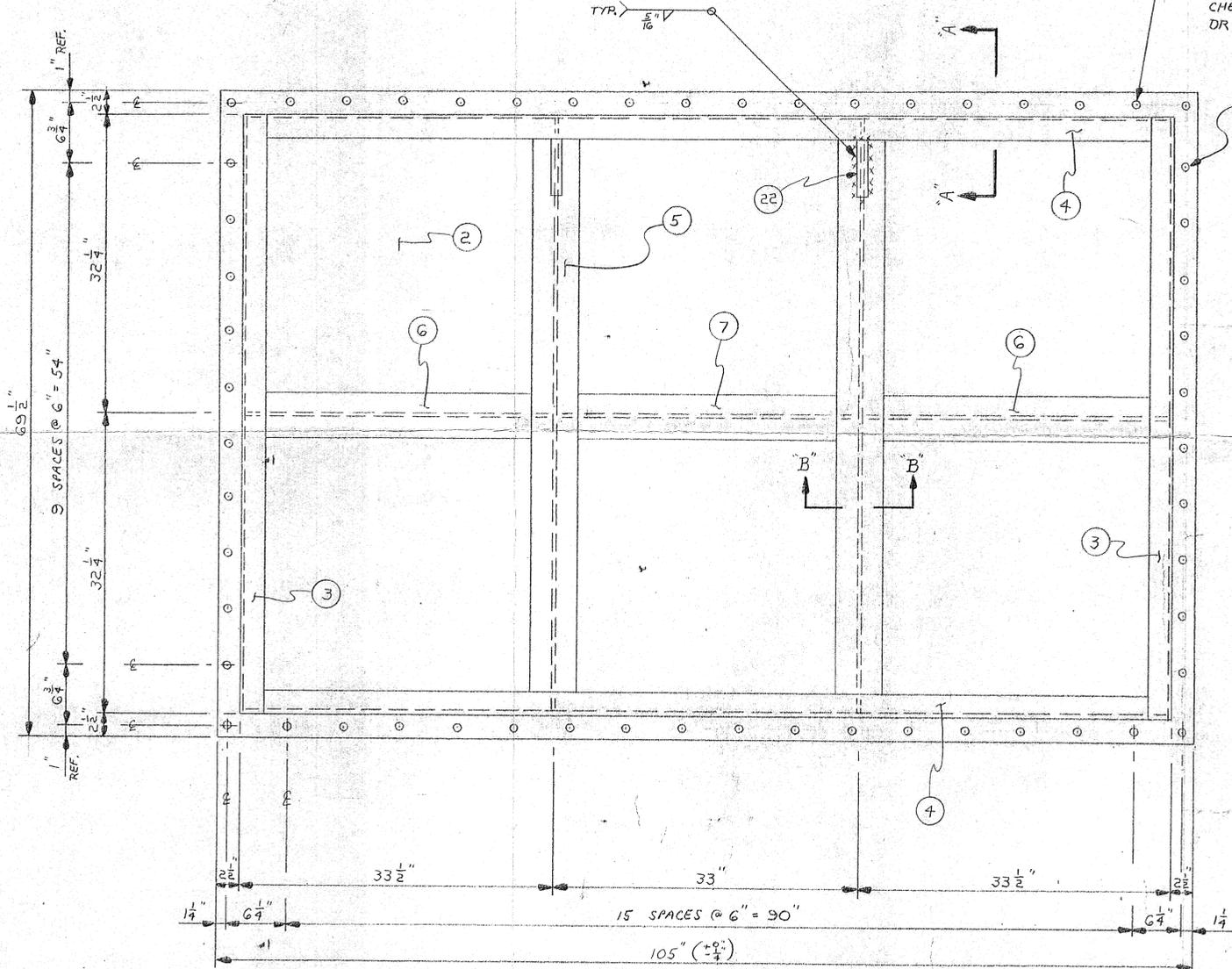
\* GASKETS SUPPLIED BETWEEN BOLTED CONNECTIONS. (BY C.T.I.)

108 916-E-3





PLAN VIEW

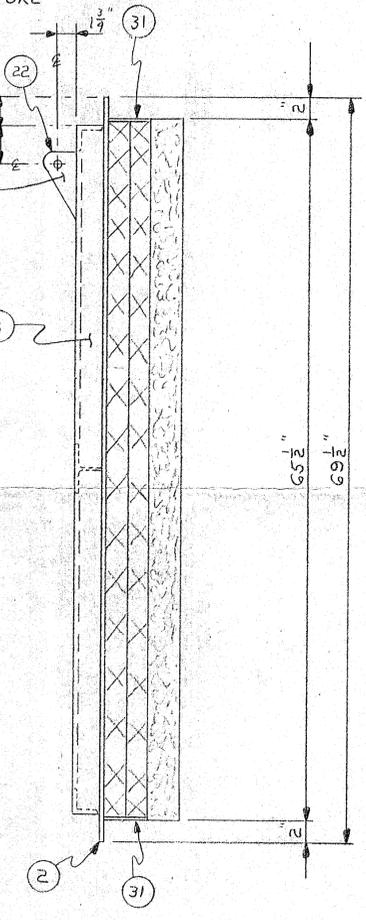


ELEVATION VIEW

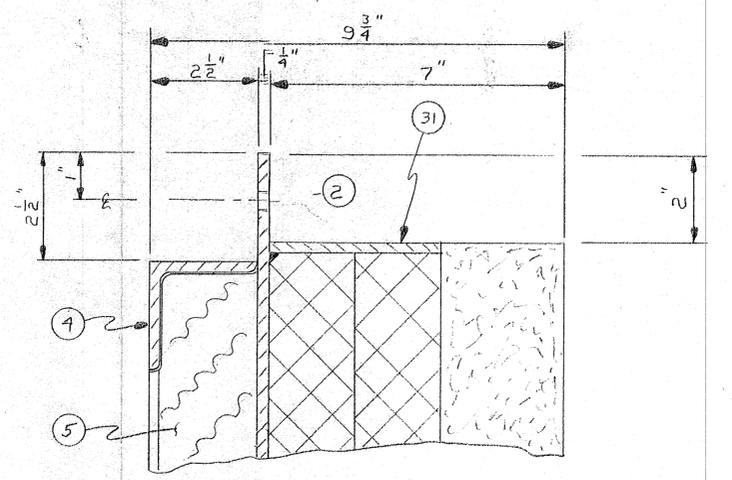
1 3/16" DIA. HOLES FOR 1/2" - 13 NC NELSON STUDS CHECK CERAMIC DIA. BEFORE DRILLING !!!

SEE LUG DETAIL.

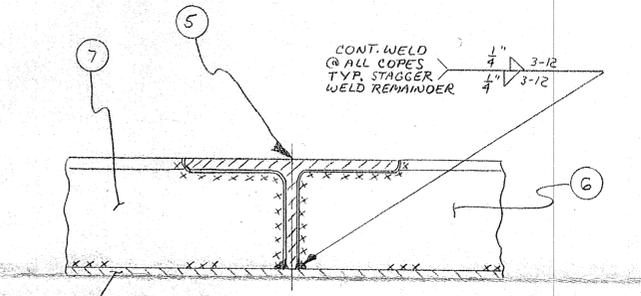
TOTAL WEIGHT PER DOOR - 2500 #



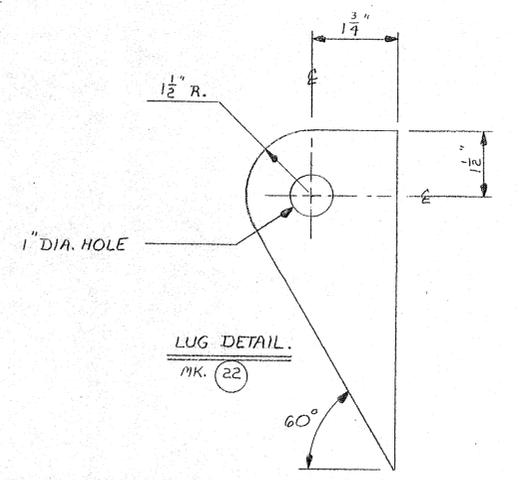
END VIEW.



SECTION "A"- "A" (TYP. TOP & BOTTOM.)



SECTION "B"- "B"



LUG DETAIL. MK. 22

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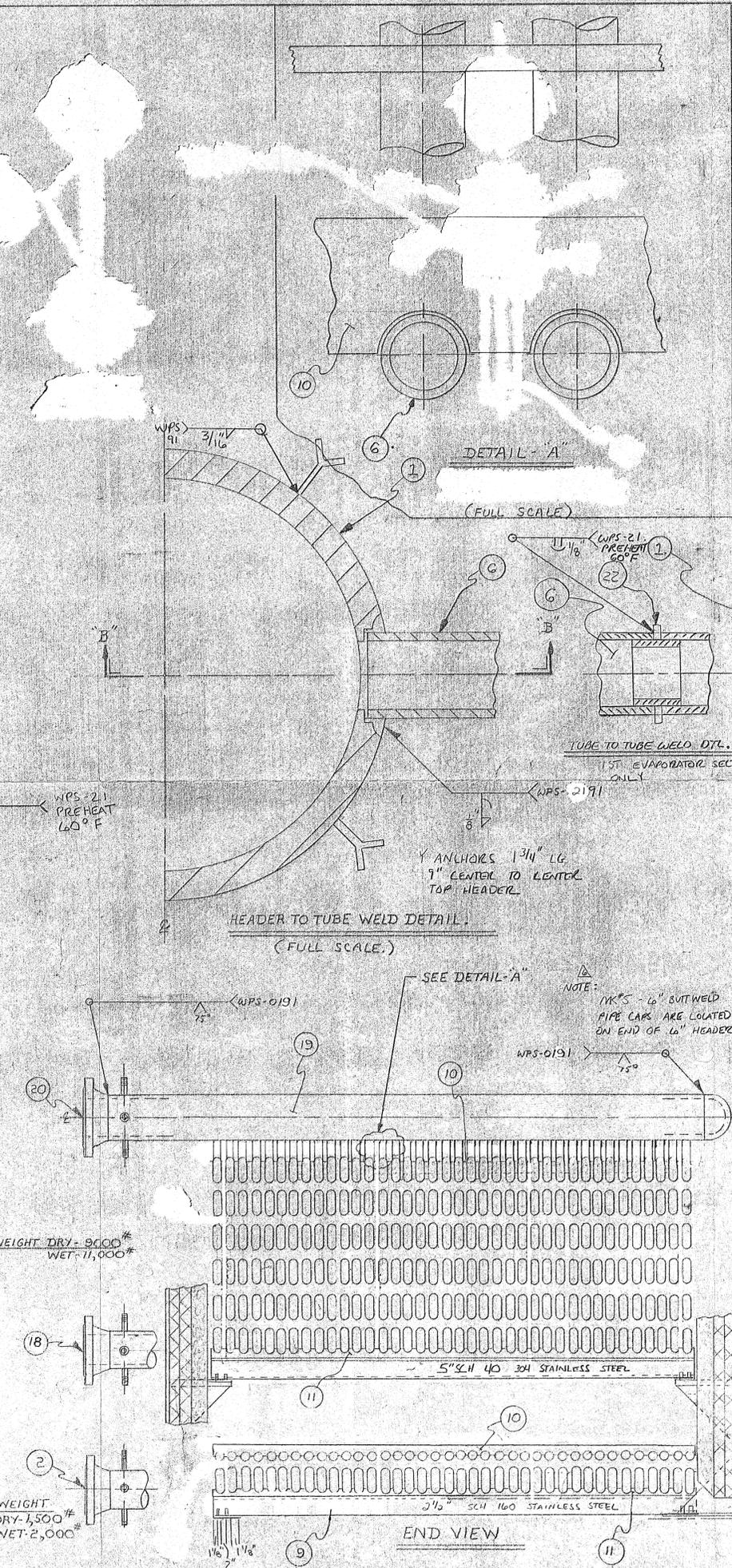
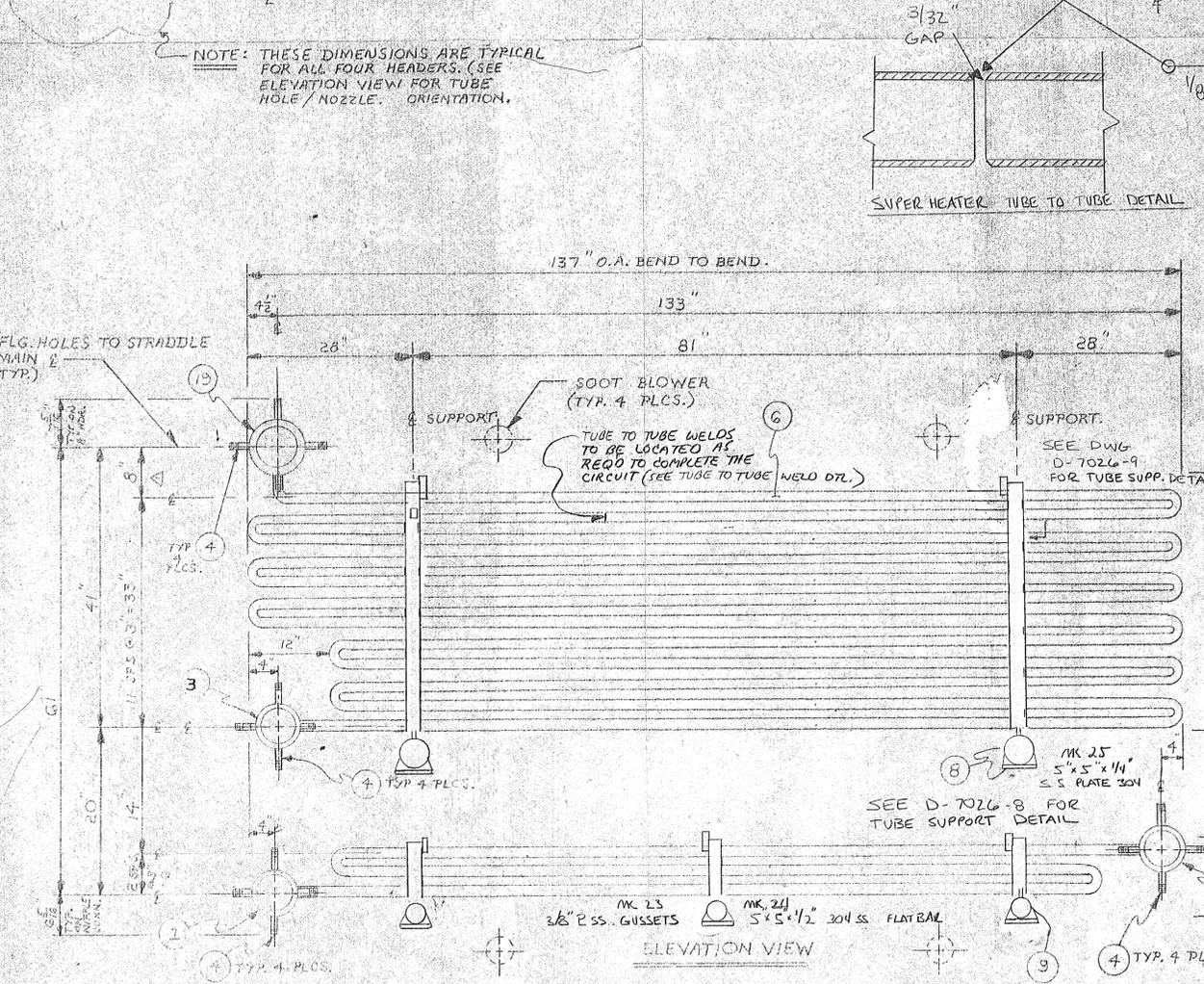
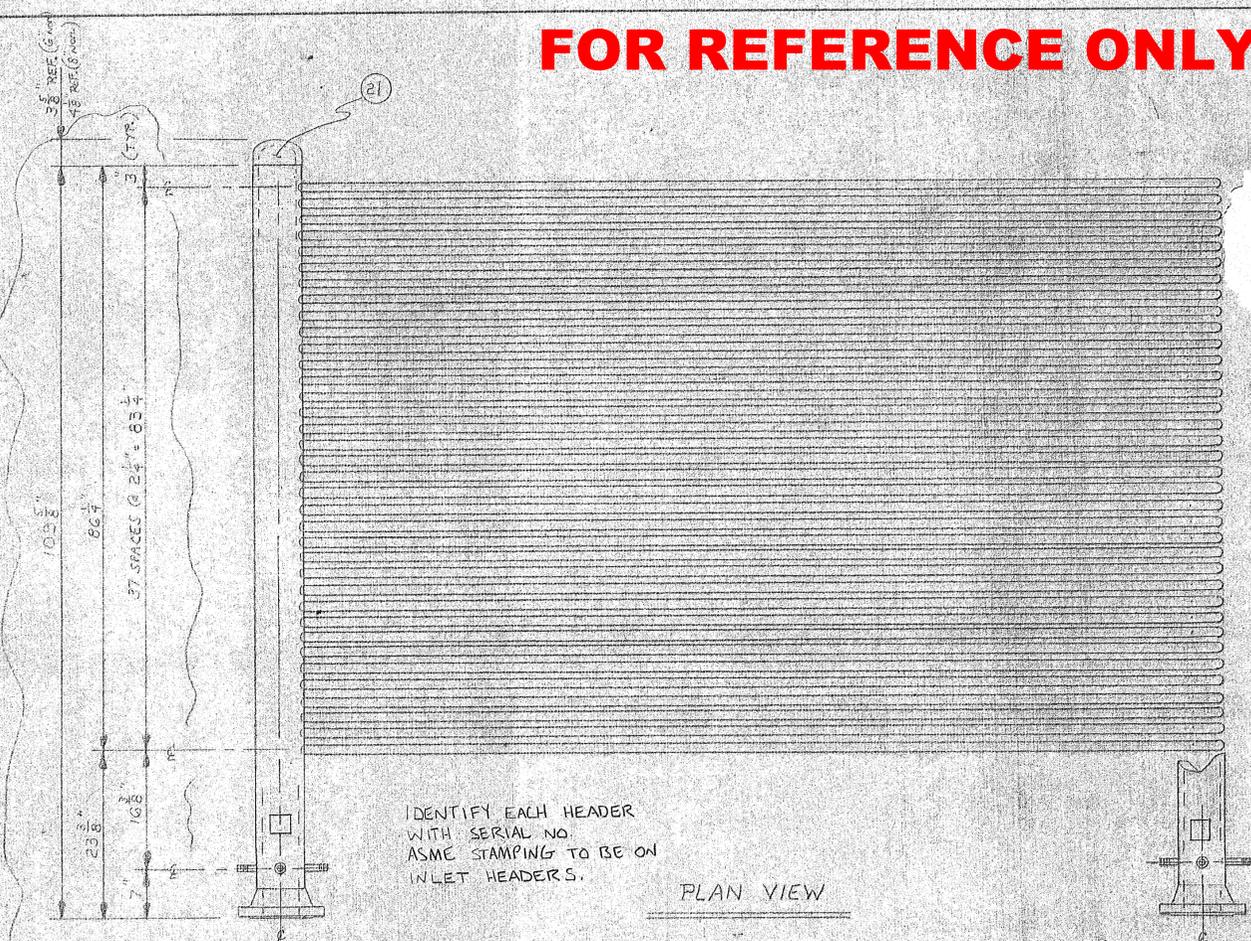
A.C.S.A. FILE COPY  
DO NOT REMOVE

CANNON TECHNOLOGY, INC.		NEW KENSINGTON, PA. 15068	
ALCOSAN		REMOVABLE END DOOR DETAILS	
D-7026-2 & 2C-1 STEAMP & SPRINTR. ARRCT DWG. UNITS 1 & 2.		1ST EVAPORATOR & SUPERHEATER.	
D-7026-2A- FRONT & REAR PANEL DETAIL, UNITS 1 & 2		UNITS 1 & 2	
No.	REVISION	DATE	DATE
1	INDICATED DWG IS FOR UNITS 1 & 2	12/24/11	
DRAWN BY	DATE	CHK.	DATE
GW	11/13/11	W.S.	12/24/11
SCALE	N.T.S.		
JOB No.	7026		
DWG No.	D-7026-2B.		
REV No.			

RELEASED FOR CONSTRUCTION  
DATE JUN 8 '12 BY PHILLIP E. CUSTER 11

124-916E-2

**FOR REFERENCE ONLY**



**BILL OF MATERIALS**

MK.	QTY.	MAT'L	DESCRIPTION
1	2	SA-106 B	PIPE - 6" NOM. SCH. 80 (.432) (10 1/2 LG) (B.B.E.)
2	2	SA-105	WELD NECK FLGS. - 6" NOM. SCH. 80 BORE
3	ONE	SA-106 B	PIPE - 6" NOM. SCH. 80 (.432) X 105 3/8 LG (B.B.E.)
4	16	SA-106 B	PIPE - 3/4" NOM. SCH. 80 X 3 1/2 LG (T.O.E.)
5	3	SA-234	BUTT WELD PIPE CAP - 6" NOM. SCH. 80
6	ONE LOT	SA-178-01A	TUBES - 1 1/2" DIA. X 0-120" MIN. WALL
7			DELETED
8	6	STAINLESS STEEL 304	5" SCH 40 X 85" LG - PIPE
9	6	STAINLESS STEEL 304	2 1/2" SCH 40 X 85" LG - PIPE
10	5	STAINLESS STEEL 304	FLATBAR - 1/2" X 2" X 85" LG. (SCALLOPED)
11	5	STAINLESS STEEL 304	FLATBAR - 1/2" X 1" X 85" LG. (SCALLOPED)
12			DELETED
13			DELETED
14			DELETED
15			DELETED
16			DELETED
17			DELETED
18	ONE	SA-105	WELD NECK FLG. - 6" NOM. - 300# SCH. 80 BORE
19	ONE	SA-106 B	PIPE - 8" NOM. SCH. 80 X 105 1/2 LG (B.B.E.)
20	ONE	SA-105	WELD NECK FLGS. - 8" NOM. - 300# R.F. SCH. 80 BORE
21	ONE	SA-234	BUTT WELD PIPE CAP - 8" NOM. SCH. 80
22	AS REQ'D	SA-27	BACKING RINGS - 8" SPLIT TYPE (CC FOR 100 X 100 MW TUBES)
23	40	304 STAINLESS STEEL	1 1/2" O.D. TUBES
24	6	5" X 5" X 1/2" PLATE	3/4" NOM. P.I.F.C.
25	4	304 STAINLESS STEEL	5" X 5" X 1/4" FLATBAR

**NOZZLE DIM. TABLE**

	A	B	C
1	1 1/8"	1 1/8"	1 1/8"
2	1 1/8"	1 1/8"	1 1/8"
3	1 1/8"	1 1/8"	1 1/8"
4	1 1/8"	1 1/8"	1 1/8"
5	1 1/8"	1 1/8"	1 1/8"
6	1 1/8"	1 1/8"	1 1/8"
7	1 1/8"	1 1/8"	1 1/8"
8	1 1/8"	1 1/8"	1 1/8"
9	1 1/8"	1 1/8"	1 1/8"
10	1 1/8"	1 1/8"	1 1/8"
11	1 1/8"	1 1/8"	1 1/8"
12	1 1/8"	1 1/8"	1 1/8"
13	1 1/8"	1 1/8"	1 1/8"
14	1 1/8"	1 1/8"	1 1/8"
15	1 1/8"	1 1/8"	1 1/8"
16	1 1/8"	1 1/8"	1 1/8"
17	1 1/8"	1 1/8"	1 1/8"
18	1 1/8"	1 1/8"	1 1/8"
19	1 1/8"	1 1/8"	1 1/8"
20	1 1/8"	1 1/8"	1 1/8"
21	1 1/8"	1 1/8"	1 1/8"
22	1 1/8"	1 1/8"	1 1/8"
23	1 1/8"	1 1/8"	1 1/8"
24	1 1/8"	1 1/8"	1 1/8"
25	1 1/8"	1 1/8"	1 1/8"

**DESIGN DATA**

EVAPORATOR	SUPERHEATER
MODEL NUMBER: EVX-125-0-38-12-11.42	SX-125-0-38-3-11.42
DESIGN PRESSURE: 500 PSIG	500 PSIG
TEST PRESSURE: 750 PSIG	750 PSIG
DESIGN TEMPERATURE: 700°F	700°F
WELD PREHEAT: PER WPS	PER WPS
CORROSION ALLOWANCE: NONE	NONE
RADIOGRAPH: NONE	NONE
STRESS RELIEVE: NONE	NONE
SURFACE AREA: 1,716 SQ. FT.	395 SQ. FT.
B.T.U. RECOVERY: 12,647, 280 BTU/HR	726, 500 BTU/HR
A.S.M.E. CODE SECTION I; 5" STAMP 1989 CODE; 12-31-90 ADDENDA.	

**CERTIFIED DWG.**  
DATE: FEB 9 1994

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**CANNON TECHNOLOGY, INC.**  
NEW KENSINGTON, PA. 15068

ALCOSAN  
1ST EVAPORATOR & SUPERHEATER  
(UNIT #1) BUNDLE DEV. CUC.

No.	REVISION	DATE
1	AS BUILT INFORMATION	1/15/94
2	CHANGED BUNDLE SUPPORTS	3/29/94
3	ADDED TUBE TO TUBE WELD DTL	2/1/92
4	MOVED TUBE TO TUBE WELD DTL & PREHEAT NOTES	2/1/92
5	CHG SPRK HOLES TO 6" COOL FLG	3/1/92
6	INDICATED BUNDLE ARRGT. FOR UNIT # 2 ONLY	11/23/91
7	CHG 1ST EVAP WLET HOLE TO 8" DIA	11/23/91

DRAWN BY	DATE	CHK.	DATE	SCALE	JOB No.	DWG No.	REV No.
G.W.H.	9/14/91	PEC II	3/23/92	1/10	7026	D-7026-5	1

104-916E-4





**FORM P-3 MANUFACTURER'S DATA REPORT FOR WATERTUBE BOILERS, SUPERHEATERS, WATERWALLS, AND ECONOMIZERS**

As Required by the Provisions of the ASME Code Rules

1. Manufactured by CANNON BOILER WORKS, INC., SCHREIBER INDUSTRIAL PARK, 12TH ST., BLDG 9B  
(Name and address of manufacturer) NEW KENSINGTON, PA. 15068
2. Manufactured for ALLEGHENY COUNTY SANITARY AUTHORITY, 3300 PREBLE AVE., PITTSBURGH, PA 15233-1092  
(Name and address of purchaser)
3. Location of installation SAME AS ABOVE  
(Name and address)
4. Unit Identification EVAPORATOR ID Nos, 7026-1-1V --- D-7026-5REV.4 12266 1992  
(Complete boiler, superheater, waterwall, economizer, etc.) (Mfr's serial No.) (CRN) (Drawing) (Nat'l. Bd. N) (Year Built)
5. The chemical and physical properties of all parts meet the requirements of material specifications of the ASME Boiler and Pressure Vessel Code The design, construction and workmanship conform to ASME Rules, Section I, 1989 and Addenda to 12-31-90  
(Year) (Date)
- Remarks: Manufacturer's Partial Data Reports properly identified and signed by Commissioned Inspectors are attached for the following items of this report NO PARTIAL DATA REPORTS.  
(Name of part, item number, mfr's name, and identifying stamp)

6. (a) Dru *N/A*

No.	Inside Diameter, In.	Inside Length		Shell Plates			Tube Sheets		Tube Hole Ligament Efficiency	
				Mat'l. Spec., Grade	Thickness In.	Inside Rad. In.	Thickness In.	Inside Rad. In.	Longitudinal	Circumferential
1	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---

No.	Longitudinal Joints		Circum. Joints		Heads					Hydrostatic test, psi
	No. & Type*	Efficiency	No. & Type	Efficiency	Mat'l. Spec., Grade	Thickness, In.	Type**	Radius of Dish	Manholes No. Size	
1	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---

\*Indicate if (1) seamless; (2) fusion welded

\*\*Indicate if (1) flat; (2) dished; (3) ellipsoidal; (4) hemispherical

6. (b) Boiler tubes: *N/A*

Diameter	Thickness	Mat'l. Spec. No., Grade	No.	How Attached
---	---	---	---	---
---	---	---	---	---
---	---	---	---	---
---	---	---	---	---

6. (c) Headers no: *N/A*

Heads or ends --- (box or sinuous or round; mat'l. spec. no.; thickness) Hydro. test, psi ---  
(shape; mat'l spec. no.; thickness)

6. (d) Staybolts:

Pitch --- in. (mat'l. spec. no; diameter; size telltale; net area) Net area --- sq. in. Design pressure --- psi  
(Supported by one bolt)

6. (e) Mud drum: --- or ---  
(For sect. header boilers state size; shape; mat'l spec. no.; thickness)

Heads or ends --- (shape; mat'l spec. no; thickness) Hydro test, psi ---

7. Waterwall head *N/A*

No.	Size and Shape	Material Spec. No., Gr.	Thickness In.	Heads or Ends		7(b) Waterwall Tubes <i>N/A</i>				
				Shape	Thickness In.	Mat'l. spec. No., Gr.	Hydro Test, psi	Diameter In.	Thickness In.	Material Spec. no.
---	---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---
---	---	---	---	---	---	---	---	---	---	---

8(a) Economizer Headers

1	5.761" I.D.	SA-106B	.432"	2:1	.432"	SA-234	750	1.25	.120MW	SA178A
2	7.625" I.D.	SA-106B	.500"	2:1	.500"	SA-234	750	1.25	.120MW	SA178A

8(b) Economizer Tubes

9 (a) Superheater Headers <i>N/A</i>				Heads or Ends			9 (b) Superheater <i>N/A</i>			
No.	Size and Shape	Material spec. no.	Thickness In.	Shape	Thickness In.	Material spec. no.	Hydro Test, psi	Diameter In.	Thickness In.	Material spec. no.

10(a) Other Part 1 N/A 2    3    10(b) Tubes for Other Parts

1										
2										
3										

11 Openings (1) Steam N/A (2) Safety Valve ONE OUTLET LOCATED ON PIPING  
 (3) Blowoff N/A (4) Feed ONE 8" NPS 300# RF WN FLG  
 (No., size, and type of nozzles or outlets) (No., size, and type of nozzles or outlets)  
 (No., size, and type of nozzles or outlets) (No., size, type, and location of connection)

12	Maximum Allowable Working Pressure	Code Par. and/or Formula on Which MAWP is Based	Shop hydro. test psi	Heating Surface sq. ft.	11. Field hydro, test psi
a Boiler					
b Waterwall					
c Economizer	<u>500 PSI</u>	<u>PG-27.2.2</u>	<u>750PSI</u>	<u>1716</u>	<u>N/A</u>
d Superheater					
e Other parts					

LOCATED AT END OF OF 8" HDR.  
 Heating surface to be stamped on drum heads.  
 This heating surface not to be used for determining minimum safety valve capacity.

**CERTIFICATE OF COMPLIANCE**  
 We certify the statements in this Data Report to be correct.  
 Date 5-4-92 Signed Cannon Boiler Works, Inc. by Charles J. Amprey  
Manufacturer (Authorized Representative)  
 Our Certificate of Authorization No. 14694 to use the (A) or (S) S Symbol expires JULY 11, 1993.

**CERTIFICATE OF SHOP INSPECTION** SCHREIBER INDUSTRIAL PARK, 12TH STREET, BLDG. 9-B, NEW KENSINGTON, PA 15068  
 BOILER MADE BY CANNON BOILER WORKS, INC. at     
 I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the state or province of Pennsylvania and employed by Kemper National Insurance Companies of Long Grove, IL. have inspected parts of this boiler referred to as data items 4, 5, 8a, 8b, 11, 12c. and have examined Manufacturers' Partial Data Reports for Items

and state that, to the best of my knowledge and belief, the manufacturer has constructed this boiler in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE.  
 By signing this certificate neither the inspector nor his employer makes any warranty, expressed or implied, concerning the boiler described in this Manufacturer's Data Report. Furthermore, neither the inspector nor his employer shall be liable in any manner for any personal injury or property damage or loss of any kind arising from or connected with this inspection.  
 Date 5-4-92 Arthur J. Jaworski Commissions NB8153 PA2227  
Inspector (Nat'l. bd. (incl. endorsements) state, prov. and no.)

**CERTIFICATE OF COMPLIANCE**  
 We certify that the field assembly of all parts of this boiler conforms with the requirements of SECTION I of the ASME BOILER AND PRESSURE VESSEL CODE.  
 Date    Signed    By     
(Assembler) (by representative)  
 Our Certificate of Authorization No.    to use the (A) or (S)    Symbol expires   , 19  

**CERTIFICATE OF FIELD ASSEMBLY INSPECTION**  
 I, the undersigned, holding a valid commission issued by the National Board of Boiler and Pressure Vessel Inspectors and/or the state or province of    and employed by    of    have compared the statements in this Manufacturer's Data Report with the described boiler and state that the parts referred to as data items   , not included in the Certificate of Shop Inspection, have been inspected by me and that to the best of my knowledge and belief the Manufacturer and/or the assembler has constructed and assembled this boiler in accordance with the applicable sections of the ASME BOILER AND PRESSURE VESSEL CODE. The described boiler was inspected and subjected to a hydrostatic test of    psi.  
 By signing this certificate neither the inspector nor his employer makes any warranty, expressed or implied, concerning the boiler described in this Manufacturers' Data Report. Furthermore, neither the Inspector nor his employer shall be liable in any manner for any personal injury or property damage or a loss of any kind arising from or connected with this inspection.  
 Date    Commissions     
Inspector Nat'l Board, State, Province and No.