CENTRAL ENGINEERING DEPT.
DESIGN SECTION

Salt Lake City, Utah
November 17, 1971

Mr. J. W. English
El Paso Plant

EA-14-EP, N.Y. 2240, JOB NO. 550
CE-71-EP-28 - SOUTHWESTERN
CONTRACTORS AND RIGGERS, INC.

We have enclosed seven (7) sets of Construction Specifications for Steam Auxiliary Equipment and Piping for your use with Southwestern in supplying proper valves, fittings, insulation, etc., for the steam, condensate and water systems outlined on the drawings. Code designations on the drawings refer to these specifications.

Concerning instrumentation we will hopefully place an order with Foxboro next week for all required components which were reviewed with Wellman-PG on Thursday, November 11th, in this office. Drawings are being prepared to interface this information with them and will be forwarded upon completion.

AOM:jj
encls.
cc:EHHaug
WRKelly
WRMahoney-w/epecs.
LCBurt-w/specs.
WRNasmyth-w/specs.

A. O. MARSH, Jr.

PLAINTIFF'S EXHIBIT

ASA-1052

CONSTRUCTION SPECIFICATIONS

FOR

STEAM AUXILIARY EQUIPMENT AND PIPING

FOR

CONVERTER GAS ACID PLANT

EL PASO, TEXAS

Prepared by
Central Engineering Department
Design Section

Date November 17, 1971

By A. O. Marsh, Jr.
A. O. MARSH, Jr.
Chief Design Engineer

CONVERTER GAS ACID PLANT
CONSTRUCTION SPECIFICATIONS

Section on Steam Auxiliary Equipment and Piping

Scope

This section covers the installation of the following:

1. Steam auxiliary equipment.
2. All piping except in the Acid Plant proper.
3. Site clearance required for installing the above. Electrical and instrumentation work related to the above equipment will be covered under separate specifications.

Drawings

The following drawings delineating the construction shall be a part of these specifications.

EP-17785 Power House-Boiler & Compressor Room-Arrgt.

EP-17787 Site Clearance

EP-17789 General Arrgt. Deaerator Installation

EP-17790 Pipe Rack Plan-Area A

EP-17791 Pipe Rack Sections-Area A

EP-17792 Oily Condensate Filters-Area B-Plans

EP-17793 Oily Condensate Filters-Area B-Sections

EP-17794 Deaerator Plan Above Grade-Area C

EP-17795 Deaerator Plan Above Elev. 3792'-4 -Area C

EP-17796 Deaerator Sections-Area C

EP-17797 Air Compressor Plan Above Elev. 3792'-4 -Area D

EP-17798 Dump Condenser-Plan Above Elev. 3773'-0 -Area E

EP-17799 Power House-Schematic-Modifications

EP-17802 Dump Condenser Plan Above Elev. 3798' 7-1/4 -Area E

EP-17803 Dump Condenser Piping-Area E-Section A

EP-17804 Dump Condenser Piping-Area E-Sections B & C

EP-17811 Steam Drums-Plan-Area F

EP-17812 Steam Drums-Section-Area F

EP-17813 Converter Hood Piping-Area F

EP-17814 Boiler Plans-Above 3773'-0

EP-17815 Boiler Sections-Area G

EP-17816 Boiler Sections-Area G

EP-17817 Boiler Sections-Area G

EP-17818 Spray Chamber-Sections-Area H

EP-17819 Pipe Support Details

EP-17820 Pipe Support Details

EP-17821 Key Plan and General Notes

EP-17822 Air Compressor Plan Above Elev. 3773'-6 - Area D

EP-17823 Air Compressor Sections-Area D

EP-17824 Spray Chamber Piping Plans-Area H

EP-17882 Converter Hood Piping Details-Area F

EP-17883 Spray Chamber Air Piping & Misc. Details

EP-17884 Spray Chamber Water Spray & Piping Arrgt.

EP-17885 Spray Chamber-Acid Spray Piping

EP-17886 Spray Chamber-Spray Piping & Controls-Schematic

EP-17944 Boiler Plan Above Elev. 3803'-0

EP-17945 Steam Trap Details-Sheet #1

EP-17946 Tagged Item List & Steam Trap Details-Sheet #2

Manufacturer drawings of equipment furnished by Asarco.

Drawings of existing installations pertinent to the work.

Work Conditions

The Contractor shall do the work herein described furnishing all labor, supervision, tools, equipment and personnel facilities. The Contractor shall furnish all materials except as hereinafter described.

The Contractor shall remove all demolished materials, equipment and debris to disposal areas designed by the Plant Engineer.

Equipment Furnished by Asarco

Asarco will furnish the following equipment as specified in the listed Asarco requisitions.

Air Compressor	Req. No. CE-71-EP-3
Dump Condenser	Req. No. CE-71-EP-4
Feedwater Pumps	Req. No. CE-71-EP-5
Deaerator	Req. No. CE-71-EP-6
Valves, Hoses & Nozzles for Spray Chamber	Req. No. CE-71-EP-9
Orifice Flanges	Req. No. CE-71-EP-22
Condensate Storage Pumps	Req. No. CE-71-EP-23
Boiler Check Valves	Req. No. CE-71-EP-24
Spray Chamber Pumps	On hand at Plant.
Motors and Motor Starters	Requisitions pending.

Exceptions and Changes

All exceptions or changes in these specifications or drawings shall be approved by the Asarco Project Engineer, and a written record maintained of all such exceptions and changes for submission to Asarco on completion of the project.

Site Clearance

The Contractor shall clear the site as shown on the drawings for the installation of equipment and piping. This will include the removal of abandoned equipment and piping, the relocation and repiping of existing equipment, and the relocation of piping.

Equipment

The Contractor shall install all equipment shown on the drawings furnishing all except as listed above, and shall furnish and install all supports, structures and foundations required for the satisfactory installation and operation of the equipment. Manufacturer's installation instructions shall be followed in detail.

Piping

The Contractor shall furnish all material and equipment, including valves, hangers, supports and insulation; and shall fabricate and install all piping, fittings, appurtenances and devices necessary for complete piping system ready for operation.

APPLICABLE PUBLICATIONS

All piping shall conform to local codes if they are governing, and to the NBFU fire prevention code, as it applies, and Factory Mutual Engineering Corporation Standards.

All welding shall conform to the requirements of the latest editions of the "American Standard Code for Pressure Piping" ANSI B 31.1a. Backup rings need not be used.

All material furnished and procedures followed in the fabrication and erection of the pipe, valves and associated equipment shall

conform to the latest edition of "American Standard Code for Pressure Piping" ANSI B 31.1 and B 31.1a.

MATERIALS AND WORKMANSHIP

General: Materials of construction, valving and specialties shall be as hereinafter described.

Piping Layout: Major piping shall be installed as shown on the drawings. Minor piping not shown on layout drawings shall be laid out in an orderly manner, grouping lines whenever possible and shall follow the diagrammatic layout shown on the drawings. Relocation in the field may be done only with the written consent of the Engineer. The installation shall be neat in appearance, and adequately supported. Every effort shall be made to locate piping and equipment which must be regularly serviced, inspected or tested so that this work may be done as easily as feasible. Lines shall slope in the direction of flow, a minimum of 1/8 inch per foot whenever possible, or as shown on the drawings. Pump piping arrangements shall be in accordance with the standard details shown on the drawings. Piping running through roofs, floors and walls shall pass through sleeves as follows:

Floor: Sleeves shall be of standard weight pipe, anchored in floor, flush at bottom and projecting one inch above finished floor, sized to allow 1/2 inch minimum clearance from pipe and insulation, if required.

Roof: Sleeves are to be made of galvanized sheet iron fastened to roof, and flashed with galvanized sheet metal.

Walls: Sleeves shall be of standard weight pipe, anchored in the wall and flush on each side of the wall. Sleeve shall provide 1/2 inch minimum clearance from pipe and insulation if required. Sleeves in exterior walls shall be filled with oakum and caulked after pipe is placed in sleeve.

Vertical pipelines, passing through concrete, shall be provided with adequate protection to prevent corrosion at point of contact of pipe with concrete. Headroom clearance of 7 ft. 0 in. shall generally be provided below all piping, insulation and appurtenances.

Supports, hangers, guides and anchors: The selection of support points shall be made to utilize existing structural steel where feasible. The Contractor shall furnish and erect all hangers, brackets, rods, clips, clamps, plates, channels and other parts required for a complete installation as well as all necessary miscellaneous iron which may be required to transfer hanger reactions to building steel. All rigid hangers shall be fitted with means of vertical adjustments and suitable locking means shall be provided. All tie rods shall be fitted with adjustment and locknuts. All welded hangers, supports, guide or other attachments shall be of material similar to the pipe, and shall be subject to the same welding procedure as the pipe. Welded attachments to structural steel shall be such as to allow welding along the flange. Welding across the flange will not be allowed. Precautions shall be taken in piping installation to prevent stresses in piping and overstressing of flange

bolting at valves and equipment. Cold springing shall be used in pipe fabrication as shown on the drawings.

Underground Piping: All pipe and fittings shall be carefully handled to avoid damage and shall be inspected for defects before being lowered into the trench. Special care shall be given to handling coated and/or lined pipe to avoid damage. Any damage to pipe, coating, or lining shall be repaired to the satisfaction of the Engineer before installation.

Trenching and Backfilling: The pipe trench shall be excavated along the alignment shown on the plans. Trenches shall be kept to a minimum workable width with trench walls vertical from the bottom of the trench to the top of the pipe. Suitable shoring timbering or sheeting shall be provided where necessary to support the sides of the trench prior to and during installation of the pipe. All shoring, timbering and sheeting shall be removed before backfilling. The open ends of the pipe shall be closed at the end of each day's work, and shall not be opened until work is resumed. After the pipe is laid on suitable fill in the trench, the line shall be backfilled, leaving only the field joints exposed so that the pipe will be protected until tested and accepted by the Engineer. In backfilling the trench around the lines, special care must be taken so as not to injure coatings or displace the pipe and to give it a solid bearing throughout its entire length. The remainder of the backfill above the pipe shall be sufficiently packed to prevent serious settlement. Open trenches across roadways or other areas to be paved shall be backfilled and compacted to a density at least equal to that of the surrounding earth. Sleeves made of steel

pipe shall be used for lines 12 inches and smaller crossing under truck roads and areas where concentrated loads may occur. In all cases, the sleeves shall be two nominal pipe sizes larger than the protected line except that minimum clearance between pipe and sleeve shall be 1-1/2 inches.

CLEANING AND TESTING

Testing and field inspection shall conform to USASI B 31.1 - 1955 and B 31.1a - 1965. All lines shall be thoroughly cleaned while disconnected from all equipment. All piping, except low pressure air, gas and vent lines, shall be tested at 1-1/2 times working pressure of line service. Low pressure air and gas lines shall be tested at 50 psi air and soapy water test.

Underground Pipe Covering

Underground pipe shall have a protective covering except as hereinafter specified, shall be mechanically applied in a factory or field plant especially equipped for the purpose. Specials and fittings that cannot be coated and wrapped mechanically shall have the protective coating applied by hand, preferably at the plant that applies the covering to the pipe. Joints shall be coated and wrapped by hand. Hand-coating and wrapping shall be done in a manner and with materials that will produce a covering equal in effectiveness to that of the mechanically applied covering. The coating work shall be thoroughly inspected, and any flaws or holidays found shall be repaired by the Contractor at no extra cost. The pipe covering shall consist of one of the following:

Coal-tar Coating and Wrapping: A coat of coal-tar primer, a coat of coal-tar enamel, a wrapper of coal-tar-saturated asbestos felt,

a second coat of coal-tar enamel, a second wrapper of coal-tar-saturated asbestos felt, where indicated, and a wrapper of kraft paper or a coat of water-resistant whitewash, applied in the order named and conforming to the requirements of AWWA Standard C203 in all respects as to materials, thickness, methods of application, tests, and handling, except that interior lining will not be required. Joints and fittings shall be coated and wrapped either in conformity with AWWA Standard C203 or with the materials specified in Federal Specification HH-T-30, applied in accordance with the manufacturer's recommendation.

Alternate No. 1:

Asphalt Coating and Wrapping: A coat of asphalt primer, a coat of hot asphalt enamel, an asphalt-saturated-felt or asphalt-saturated-glass wrapper completely bonded to the enamel applied in the order named and conforming to the requirements of the Asphalt Institute Specification M-1 in all respects as to materials, thickness, methods of application, tests and handling.

Alternate No. 2:

Extruded polyethylene sheath conforming to Federal Specification L-C-530 and of thicknesses not less than 54 mils. Fittings and joints shall be covered in the manner and with the materials recommended by the applier of the sheath.

Pipe Insulation

All pipes carrying liquids or gases in excess of 150° F. shall be insulated with a metal reinforced fiberglass blanket, Johns-Manville Thermobestos or equal covering all pipes, fittings and valves except as noted on drawings. Insulation shall be applied

in accordance with manufacturer's instructions. The insulation shall have a protective covering of 0.010" thickness stainless steel #304 sheet. Alternate insulation of equal or better insulating value may be used if approved by Owner's representative. Insulation thickness shall be as follows:

400# steam lines	2-1/2"
400" condensate lines	2"
150" condensate lines	1-1/2"
5# steam lines (6" dia. and larger)	1-1/2"
(5" dia. and smaller)	1"
low pressure condensate lines	1"
feed water lines (5" and larger)	1-1/2"
(4" and smaller)	1"

Pipe Painting and Coding

Interior pipe shall not be painted. Exterior non-insulated pipe exposed to the weather shall be given a primer and finish coat in accordance with the general specifications for painting exterior metal surfaces.

Content of piping systems shall be identified according to the Texas State color classification by a colored band completely encircling pipe, at least 8 inches in length (longer where necessary to accommodate full identification labels), painted on pipe or pipe covering in every location where identification labels are required.

Pipes which are concealed or in covered pipe trenches need not be identified.

Identification labels: Identification shall be accomplished by use of Brady "Quik-Labels" (mastic book) as manufactured by the

W. H. Brady Company, Seton Nameplate Corporation, or equal (stenciling is acceptable). Straight lines of pipe shall be identified at intervals of 20 feet and at least once in each room. Piping shall also be identified at a point approximately two feet from all turns, valves and upstream side of distributional fittings or branches. The lettered label, besides identifying the material, shall indicate unusual qualities of the pipe contents, i.e., hot, cold, pressure in pounds/square inch. On service piping, either liquid or air, apply black arrows of same height and with same background color as adjacent to identification labels to indicate direction of flow.

Application: Labels shall be applied to the pipe so that the lettering is in the most legible position. Lettering size shall be in accordance with standards specified in USASI A 13; however, the nearest manufacturer shall be acceptable. Pipes to be marked shall first be wiped clean of dirt, dust, grease and moisture. Apply label over color band, using pressure, so that it lies smooth and flat. Apply a brush coat of clear lacquer, after label has been applied to pipe, making sure edges of label are well covered.

Insulation of Equipment

The deaerator shall be insulated with 1-1/2" thick Johns-Manville Thermobestos block insulation and covered with 0.010 thick 304 stainless steel sheet all applied in accordance with manufacturer's instructions. Alternate insulation if of equal or better insulating value may be used if approved by Owner's representative.

Piping Schedule

Code	Service	Pressure psig	Temperature °F	Material Specification
	Water			
WFH	Feedwater, high press.	760	230	M
WFL	Feedwater, low press.	25 or less	230	N
WCH	Condensate 400#	400	450	M
CH	Chemical Treatment, high pressure	760	amb.	M
WP	Plant Service	90	amb.	N
WM	Softener Makeup Water	90	amb.	N
WT	Cooling Tower	60	amb.	N
WCI	Condensate 150#	150	370	N
WCL	Condensate low press.	50	200	N
CH	Chemical Treatment, low pressure	90	amb.	N
WCO	Oily Condensate	25 or less	110	N
	Steam			
SH	Steam 400#	425	680	M
SL	Steam 5#	5	240	N
	Air			
AH	Soot Blower Air	500	amb.	M
AP	Plant Compressed Air	90	amb.	N
AI	Instrument Air	90	amb.	N
	Natural Gas			
GH	High Pressure	100	amb.	N
GI	Intermediate Pressure	35	amb.	N
GL	Low Pressure 5# & less	5	amb.	N
	Acid			
A	Concentrated Acid	90	amb.	N

Piping Material Specifications

Specification M

Nominal Rating

800 psig @ 300° F.

600 psig @ 700° F.

Pipe

Black, ASTM A-106 Grade B seamless, plain ends

2" and larger - schedule 40 except feedwater lines

schedule 80 feedwater lines

1-1/2" and smaller - schedule 80 all lines

Joints

2" and larger - butt weld

1-1/2" and smaller - socket weld

weld neck flanges next to flanged equipment

Flanges

600# pressure class, USASI B 16.5, ASTM A105 Grade II

1/4" raised face, weld neck

Bolting

Stud bolts USASI B 16.5, ASTM A193 and hex nuts ASTM A194

Gaskets

Spiral wound 304 stainless steel and asbestos for raised face flanges, Flexitallic Style CG.

Fittings

2" and larger, schedule 40 and 80 to match pipe, butt welding, USASI B 16.9, ASTM A234 WPB.

1-1/2" and smaller, 3000# socket weld

USASI B 16.11, ASTM A105, Grade II

Valves (Specification M - high pressure)
mfgr. listed or approved equal

Dwg. Code	Type	Description
V-36	Check	600#, steel, buttweld, piston lift, Edwards 690 Y
V-37	Check	600#, steel, flanged, piston lift, Edwards 690
V-42	Gate	2" and smaller, 800#, steel, flanged, Crane 3611XU
V-43	Gate	2" and smaller, 600#, steel, flanged, Crane 3615XU
V-46	Gate	2-1/2" and larger, 600#, steel, butt weld 8" and above integral bypass, Crane 76-1/2XU
V-47	Gate	2-1/2 and larger, 600#, steel, flanged, 8" and above integral bypass, Crane 76XU
V-51	Globe	2" and smaller, 800#, steel, socketweld Crane 3652XW
V-56	Globe	2-1/2" and larger, 600#, steel, buttweld, 8" and larger integral bypass, Edwards 616Y,618Y
V-57	Globe	2-1/2" and larger, 600#, steel, flanged, 8" and larger integral bypass, Edwards 616, 618
V-58	Globe	2" and smaller, 600#, steel, flanged, Crane 3656XW
V-59	Globe	2-1/2" and larger, 600#, steel, buttweld, angle stop check, Edwards 605 Y

Specification N

Nominal Rating

150 psi @ 400° F. and lower

Pipe

14" and larger, schedule 10, black ASTM A53 seamless, Grade A or B

8" through 12", schedule 20, black ASTM A53 seamless, Grade A or B

6" and smaller, schedule 40, black ASTM A53 seamless, Grade A or B

Pipe for underground service shall be coated and wrapped in accordance with previous specifications.

Joints

2" and larger - butt weld

1-1/2" and smaller - socket weld

weld neck or slip on flanges next to flanged equipment

Flanges

150# pressure class, USASI B16.9, ASTM A234 WPB, weld neck 1/16" raised face, except that flat faced flanges shall be used against flat faced valves or equipment.

Bolting

Stud bolts USASI B16.5, ASTM A193 and hex nuts ASTM A194

Gaskets

Spiral wound 304 stainless steel and asbestos, Flexitallic Style CG

Fittings

2" and larger, schedule 40, butt weld ANSI B16.9, ASTM A234 WPI

1-1/2" and smaller, 2000#, malleable iron screwed fittings, USASI B16.3

Valves (Specification N - intermediate and low pressure)

Mfgr. listed or approved equal

Dwg. Code	Type	Description
V-11	Ball	150# nodular iron, flanged, viton seats and seals, Crane Hiflex No. 81102
V-35	Check	2-1/2" and larger, 150#, steel, flanged, swing, Crane 147X
V-40	Gate	1-1/2" and smaller, 800#, steel, screwed, Crane 3607XU
V-42	Gate	2" and smaller, 800#, steel, socket weld, Crane 3611XU
V-45	Gate	2" and larger, 125#, iron, flanged, Crane 465-1/2
V-50	Globe	1-1/2" and smaller, 800#, steel, screwed Crane 3644 XU
V-51	Globe	2" and smaller, 800#, steel, socket weld, Crane 3652 XW
V-55	Globe	2" and larger, 150#, steel, flanged, Crane 143 XR
V-60	Plug	1-1/2" and smaller, 200#, semisteel, screwed lubricated, Nordstrom 114
V-61	Plug	2" and larger, 200#, semisteel, flanged lubricated, Nordstrom 115

Related Specifications

Construction in this section involving the following is covered by the general specifications:

Concrete
Structural Steel
Painting
Electrical

ASARCO
PD 1 - REVISED 11/62

PURCHASE ORDER

AMERICAN SMELTING AND REFINING COMPANY
PURCHASING DEPARTMENT
120 BROADWAY, NEW YORK, N.Y. 10005

DATE: 10/4/71
ORDER NO. DUMMY ORDER 71 - 1626 - 1
REQUISITION NO. CE-71-EP-28

PLANT JOB NO.
APPROPRIATION NO.

To:
Southwestern Industrial Contractors and Riggers Inc.
(Original not to be mailed out.)

FINAL DESTINATION-PLEASE NOTE CONSIGNMENT BELOW
El Paso, Texas

3021

DATE REQUIRED AT DESTINATION: See below *

CONSIGNMENT-SELLER WILL SHIP TO
American Smelting and Refining Company
El Paso Smelter
El Paso, Texas

SHIPPING INTERVAL PROMISED | SELLER WILL SHIP BEFORE:

POINT OF SHIPMENT | TERMS: As per contract

RENDER BILLS AS PER ATTACHED SHIPPING INSTRUCTIONS -

F.O.B. POINT | SHIP VIA

QUANTITY	UNIT	SPECIFICATIONS	ITEM NO.	UNIT PRICE
		This order is issued to confirm for record purposes the contract dated September 17, 1971 entered into with Southwestern Industrial Contractors and Riggers Inc. covering a converter gas handling system at our El Paso, Texas location. ESTIMATED COST.....$3,311,000.00 LOT PLUS A FIXED FEE OF $100,000.00 LOT * Completed by: 1st converter - 10/1/72 2nd converter - 12/31/72 3rd converter - 3/1/73		

IMPORTANT *This order is not binding on purchaser unless the attached acknowledgment card is signed by an authorized agent of seller and returned promptly to purchaser.*

FOR PURCHASING DEPARTMENT USE ONLY

TVO $3,411,000 URGER CC 601 PC 206

DISTRIBUTION:
1-WRKelly
1-LCTravis
1-AOMarsh,Jr.
1-JWEnglish
1-WRMahoney
3-ROCovington
1-WRNasmyth