

CHEVRON U.S.A. INC.
ENGINEERING DEPARTMENT - EL PASO, TEXAS

SPECIFICATION NO. EP-388-L
April 11, 1980
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SPECIFICATION NO. 388-L
FABRICATION AND INSTALLATION OF A
STEAM SEPARATOR SYSTEM IN THE
SULFUR RECOVERY UNIT
EL PASO REFINERY

SECTION 1 - GENERAL REQUIREMENTS

1.0 SCOPE OF WORK

1.1 CONTRACTOR shall provide all utilities, tools, construction equipment, labor, including supervision and inspection, and all items of a consumable nature that are required for construction of a steam separator system in the 110# steam system of the Sulfur Recovery Unit at the Chevron U.S.A. Inc., El Paso Refinery as detailed by this Specification, including the drawings and other attachments listed in the Appendix, except as otherwise provided in Section 1.2 below.

This work includes but is not limited to:

1.11 Setting, leveling and grouting 110# Steam Separator, D-5911.

1.12 Fabrication and installation of:

- (a) 8" 110# steam piping per Drawing PD-59-29897, Sheet 3.
- (b) 1" steam trap manifold and 2" condensate return piping per Drawing PD-59-29897, Sheet 4.
- (c) 3/4" screwed and seal welded piping for LAH-59-554, LAH-59-555, LG-743 and LG-744, and yard water supply per Drawing PD-59-29897, Sheet 5.
- (d) Foundations for D-5911 per Drawing PB-59-29951-0 and for the pipe support shown on PD-59-29897-0, Sheet 3.

1.13 Hydrostatic testing of piping, Items 1.12 (a), (b) and (c).
(a) Flanged spools shall be tested before installation.

1.14 Installation of level gages, pressure gages and level alarm float chambers detailed on Drawing PD-59-29897, Sheet 5.

1.15 Fabrication and installation of all necessary supports.

1.2 In addition, CONTRACTOR shall provide the following material to be incorporated into the Facility:

1.21 Materials for grouting D-5911.

2.0 WORK, MATERIAL AND UTILITIES BY COMPANY OR OTHERS

2.1 Work by Others

The following items of work related to the Facility will be performed for COMPANY by others:

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- 2.11 Fabrication of Steam Separator Drum, D-5911.
- 2.12 Installation of flanged gate valves and hot tapping as shown on Drawing PD-59-29897, Sheet 4.
- 2.13 Insulation of steam and condensate lines.
- 2.14 All instrument electrical and pneumatic connections.

2.2 Material by COMPANY

COMPANY will provide all items of material to be incorporated in the facility except as provided in Section 1.2 above.

2.3 Construction Utilities by COMPANY

- 2.31 COMPANY will provide electrical energy to CONTRACTOR at either 480 volts, 3 phase, or 120/240 volts, single-phase suitable disconnect switches and all materials for extension of service to CONTRACTOR'S work areas shall be provided and installed by CONTRACTOR. Each job requirement should be reviewed to determine if adequate power is available.
- 2.32 COMPANY will provide drinking water for CONTRACTOR'S containers at a location designated by COMPANY'S Representative.

3.0 SEQUENCE OF WORK

The sequence of work shall be as mutually agreed between the COMPANY and CONTRACTOR and shall be consistent with the facing sheet of the agreement.

4.0 INTENT

The facility shall be complete in every respect, constructed in accordance with generally accepted, current good practices of the several trades involved and the detailed requirements of this specification and ready to operate in the manner expressed or implied herein, regardless of whether of not full details of such completeness or practices are contained herein.

5.0 COMPANY REVIEW AND APPROVAL

COMPANY'S review of, approval of, or agreement to the performance of certain items of work or the provisions of certain material shall in no way relieve CONTRACTOR of full responsibility for the performance of such work, or for the adequacy of such material. All such reviews, approvals or agreements shall be obtained through COMPANY'S Construction Representative, or in a manner previously approved in writing by COMPANY'S Construction Representative.

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SECTION 2 - GENERAL CONDITIONS AND PERFORMANCE OF WORK

6.0 PRECEDENCE

- 6.1 As used in the standard specifications attached hereto:
(a) "Purchaser" shall mean COMPANY; (b) "Supplier" or "Vendor" shall mean CONTRACTOR; and (c) "Purchaser's Inspector" shall mean COMPANY Construction Representative.
- 6.2 Unless otherwise expressly provided in this Specification,
(a) any data, specifications, material, and work or any other matter which is covered by this Agreement which the standard specifications require to be provided by COMPANY shall instead be provided by CONTRACTOR; (b) any provisions of the standard specifications requiring COMPANY to inspect certain material or work shall mean that COMPANY has an option, rather than the obligation, to so inspect such material or work; (c) any warranty or guarantee provisions contained in the standard specifications shall be of no effect and the warranty and guarantee provisions of this Specification, if any, shall apply; and (d) any item of material, work, inspection or testing to be furnished at extra expense to COMPANY pursuant to the standard specifications shall be furnished under this Specification at no increase in CONTRACTOR's compensation.

All provisions in the standard specifications concerning compensation or payment to CONTRACTOR in case of delay shall be of no effect, and the provisions of the Terms and Conditions and of this Specification shall apply.

In the engineering instructions, reference to COMPANY's personnel shall be of no effect, and CONTRACTOR's personnel shall perform all activities which are to be performed under the engineering instructions, except as otherwise provided elsewhere in this Specification.

Where standard specifications on materials contain sections covering COMPANY's normal requirement for purchasing and field erection, these sections shall be of no effect except as otherwise expressly stated in this Specification.

7.0 FIELD REPRESENTATIVES

7.1 COMPANY's Representative

COMPANY will maintain a Representative in the field pursuant to Section 3.0 of Refinery Instruction No. 1404, General Instructions to Contractors Working Within the Refinery, attached.

7.2 CONTRACTOR's Construction Representative

CONTRACTOR shall maintain a Construction Representative in the field at all times who shall act in full charge of CONTRACTOR's work and maintain field liaison between CONTRACTOR and COMPANY's Construction Representative.

- 7.3 CONTRACTOR required to meet with the COMPANY Representative at least two days prior to drawing on materials and also at start of work for purpose of reviewing work schedule.

8.0 OTHER CONTRACTS

COMPANY reserves the right to let other contracts or perform other services in connection with CONTRACTOR's work hereunder. CONTRACTOR shall afford others equitable opportunities for the introduction and storage of their materials and the execution of their work and shall properly coordinate its work with theirs.

9.0 SCHEDULE

CONTRACTOR shall maintain a detailed construction schedule for all phases of the work.

- 9.1 The construction schedule shall indicate, for each portion of the Facility, the date of the start of the work thereon, job progress and completion date. Completion dates on such construction schedule shall agree with any dates set forth in Section 4.0 of this Specification, if any, and on the Facing Sheet of this Agreement.

- 9.2 COMPANY's Construction Representative will review the schedule with CONTRACTOR's Construction Representative at periodic intervals to verify that the Facility is progressing as scheduled. Modifications to the schedule which affect the completion dates established in the schedule must be approved in writing by both CONTRACTOR and COMPANY.

10.0 WORK WEEK AND OVERTIME

CONTRACTOR shall pursue to field construction work on a 40-hour per week work schedule in accordance with Section 5.0 of Refinery Instruction No. 1404, General Instruction to Contractors Working Within the Refinery, attached.

11.0 PLANT REGULATIONS

Prior to the commencement of work, CONTRACTOR shall become familiar with the plant regulations specified in the attached Refinery Instruction No. 1404, General Instructions to Contractors Working Within the Refinery; Refinery Instruction No. 1150, Entry into Sulfur Recovery Area; and the following regulations. CONTRACTOR shall be responsible for compliance with these regulations during the execution of his work.

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11.1 Entry into Sulfur Recovery Area

The Sulfur Recovery Area ~~is~~ bound by a yellow and blue line. All work performed by CONTRACTOR will be performed adjacent to the Sulfur Recovery Area. Entry permits will be required if CONTRACTOR personnel must enter the Sulfur Recovery Area. Contact COMPANY Representative before entering the restricted area.

11.2 Electrical Safety Requirements

CONTRACTOR shall provide and use ground fault circuit interrupters for personnel protection at all construction sites (including areas inside existing plants) on all 120 volt single-phase 15 and 20 ampere receptacle outlets. Hubbell type GFP or Porta-Power Pak Inc. Model 72 series are typical of acceptable portable receptacle units. Ground fault circuit interrupters shall not be used in areas where flammable vapors are present. It is essential that the polarity of the conductors in all cords, plugs and receptacles supplying single pole portable ground fault circuit interrupter units be properly maintained to insure proper operation of the units.

11.3 Work Space and Storage Area

COMPANY will assign space in the general vicinity of the CONTRACTOR'S work for CONTRACTOR'S office, work space and storage area.

12.0 TEMPORARY CONSTRUCTION FACILITIES

- 12.1 CONTRACTOR shall provide and install all necessary temporary facilities including, but not limited to, tool rooms, locker rooms, toilets, office and storehouse. All temporary installations shall be subject to approval by COMPANY prior to installation.
- 12.2 In addition, CONTRACTOR shall provide all necessary temporary equipment and material including, but not limited to, shoring, concrete forms, bracing, ladders, scaffolding, staging, drop cloths and tarpaulins.
- 12.3 CONTRACTOR shall maintain all temporary facilities, material and equipment in a safe and adequate manner and remove them immediate upon completion of the work requiring their presence.

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13.0 DELIVERY AND HANDLING OF COMPANY PROVIDED MATERIALS

- 13.1 Materials furnished by COMPANY will be available to CONTRACTOR at the Refinery Storehouse. CONTRACTOR shall provide the necessary labor and equipment for handling and transporting materials.
- (GO-279-GEN) 13.2 CONTRACTOR shall be responsible for keeping all material in good condition until Acceptance of the Facility, subject to Section 5.3 of the Terms and Conditions.
- 13.3 Upon completion of the Facility, CONTRACTOR shall provide COMPANY an inventory of all remaining material which was provided by COMPANY including the quantity, description, and the item number for each item. When directed by COMPANY, CONTRACTOR shall transport the remaining material to the locations on COMPANY's premises designated by COMPANY.

14.0 DRAWINGS AND DIMENSIONS

COMPANY will provide to CONTRACTOR two copies of all pertinent standard drawings, standard specifications, reference drawings, and construction drawings. One copy of Vendor's drawings will be provided for all equipment that COMPANY supplies.

15.0 INSPECTION AND TESTING

15.1 General

CONTRACTOR shall be solely responsible for thorough craft inspection during construction and for the quality of the work. COMPANY will make such inspection as COMPANY may desire in order to check the progress and quality of the work, to see that CONTRACTOR's employees are properly qualified in their respective crafts, that workmanship is of an acceptable grade, and that all requirements of this Specification are being met. Such inspection or any other inspection or testing by COMPANY shall in no way relieve CONTRACTOR of full responsibility for the work hereunder.

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15.2 Welding Inspection and Qualification

- 15.21 CONTRACTOR shall arrange for welding qualification tests at his expense at El Paso Testing Company, Inc., 2315 Myrtle Street, El Paso, Texas 79901, phone 532-3831, or other approved testing firm, in accordance with the appropriate code and the following requirements. Welders shall be required to pass qualification tests before performing any operation. COMPANY reserves the right to require additional qualification tests during construction if it has any doubt about the competence of welders. COMPANY shall be allowed to witness tests and to examine test coupons. If additional tests are required and passed by welders, cost of retesting will be borne by COMPANY; if failed, cost of retesting shall be borne by CONTRACTOR.
- 15.22 The required qualification tests shall be the "Pipe Test for Qualification of Metal Arc Welders" as described in Appendix I of Engineering Instruction No. EP-310. Welds shall be made in seamless pipe conforming to ASTM Specs. A-106 or A-53 or API Spec. 5-L. Weld rods shall be Type E-6010 mild steel electrodes.
- 15.23. The face and root bend specimens shall be tested in the guided bend test jig described in Fig. Q-7 of the ASME Boiler and Pressure Vessel Code, Section IX, Welding Qualifications.
- 15.24 The convex surface of the bend specimens shall be examined for cracks or other open defects. Any specimen in which a crack or open defect is present, after bending, exceeding 1/8" measured in any direction shall be considered as having failed. Cracks which originate along the edges of the specimen during testing and that are minor in extent shall not be considered unless there is definite evidence that they result from slag inclusions or other internal defects.

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- 15.25 The fractured surfaces of the nick-break test shall show complete penetration throughout the entire thickness of the weld, absence of oxide or slag inclusions, and a degree of porosity not to exceed six gas pockets per square inch of the total area of the weld surface exposed in the fracture, the maximum dimension of any such pocket not to be in excess of 1/16".
- 15.26 If the welder fails in one of the test positions, he may be allowed to take an immediate retest by making two test pieces in the failed position. Both of the test pieces shall pass the test requirements. If the welder fails in more than one position he shall not be allowed to take a retest.
- 15.27 Upon passing the qualification tests, CONTRACTOR shall assign each welder an identification number. This number shall thereafter be used by the welder to identify his work by stamping it alongside each completed weld with steel stencils.
- 15.28 At the option of the COMPANY's Lead Equipment Inspector, CONTRACTOR's welders need not pass the welding qualification tests if they can present suitable and acceptable evidence of having passed the appropriate ASME Performance Qualification Tests as described in Section IX of the ASME Boiler and Pressure Vessel Code.
- 15.29 COMPANY will perform (random or 100%) radiography of welds in accordance with Section 7.0 of Specification No. EG-2505 to verify that the overall quality of workmanship is in accordance with COMPANY standards as set forth in Specification No. EG-2505. Welds so inspected shall be repaired or replaced by CONTRACTOR at no increase in CONTRACTOR's compensation if the weld fails to meet said standards. All of COMPANY's radiographs will be available to CONTRACTOR for his review and use to the extent he desires to verify that all requirements of Section 15.1 above are met.

15.3 Hydrostatic Testing

Equipment and Piping - CONTRACTOR shall perform hydrostatic tests, in accordance with Refinery Instruction No. 1501, on all equipment and lines after erection, but before any insulation or backfill, and with all welded, screwed or flanged joints exposed. Before performing any hydrostatic test, CONTRACTOR shall notify COMPANY'S Construction Representative sufficiently in advance so that all hydrostatic tests may be witnessed by a representative of COMPANY. CONTRACTOR shall provide all equipment needed for use in hydrostatic testing.

15.4 Valve Packing

All valves will be checked for free operation. During hydrostatic tests, valve packing shall be examined for leakage and corrected, if necessary.

15.5 Concrete Samples

COMPANY may perform compression and slump tests on concrete. CONTRACTOR will furnish samples taken in accordance with ASTM specifications as may be requested for the following tests and inspections:

- A. Compression Tests: 3 cylinders from each 10 cubic yard of structural concrete placed each day.
- B. Slump Tests: Periodic samples daily during pouring of concrete.

16.0 BOLTING-UP PRACTICE

The bolting-up of flanged joints shall be in accordance with Engineering Instruction R-800. In addition, the following procedure shall be used for spiral-wound gasketed flanged joints:

- 16.1 A programmed bolting sequence of uniform loads, i.e., start with the flange bolt in the 12 o'clock position, then transfer successively to the 6 o'clock, 9 o'clock, 3 o'clock, etc., bolt positions, increasing the bolt load uniformly each time the sequence is completed.
- 16.2 Tighten the bolts until the flanges are uniformly seated on the gasket centering ring. Lubrication of the gasketed surface is required only where necessary to obtain tight joints.

17.0 ERECTION AND RIGGING PLANS

CONTRACTOR shall submit Rigging Diagrams for all "Heavy Lifts" to COMPANY'S Construction Representative for review at least one week prior to the scheduled date for implementing the plan. "Heavy Lifts" are defined in Refinery Instruction No. 1407. The Rigging Diagram shall completely define the rigging plan and shall include information on location layout; location of guys and deadmen; details of connections at equipment, poles and deadmen; safe loads

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on and calculations of stresses in cables and all rigging components; and all other matters necessary to enable COMPANY to review the Rigging Diagrams.

CONTRACTOR shall also submit for review by COMPANY plans and/or drawings of any other operation which may jeopardize existing facilities.

18.0 CLEANING UP

During the performance of the work, CONTRACTOR shall keep a reasonable degree of order by disposing of accumulated rubbish and waste material and, at the completion of the work, the site shall be cleared of all debris, left-over tools, consumable supplies, and material which may have accumulated in the performance of the work. Where the CONTRACTOR, after due notice, fails to keep the area of his work reasonably clean and safe, or fails to clean this area at the completion of the work, COMPANY may perform this work; the cost of such work shall be for CONTRACTOR's account and may be deducted from the sums due or to become due CONTRACTOR.

19.0 COMPLETION

The work will be considered "complete" when CONTRACTOR has performed all work expressly stated or implied in this Specification.

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SECTION 3 - CONSTRUCTION

This Section amplifies the construction details for some portions of CONTRACTOR's work. The provisions are generally applicable to all the facilities covered by this Specification.

20.0 GENERAL

20.1 Piping and Instrument Diagrams

Piping and Instrument Diagrams show all anticipated equipment, instrumentation, lines, line classification and sizes, as well as principal vents, drains, and steamout connections.

20.2 Final Connections

If it is necessary for CONTRACTOR to make connection to any COMPANY facility already in service, CONTRACTOR shall request a date for making such connection in advance so that COMPANY Construction Representative can schedule a shutdown. No work shall be done until a Work Permit has been issued. COMPANY Inspector must be present while work is in progress.

20.3 Equipment Setting

All equipment shall be set, leveled, and grouted in accordance with Specification EG-985, and aligned and/or doweled in accordance with COMPANY Representative's instructions. Nonshrinking grout, such as Embeco, or Ceilcote shall be used in special cases such as when massive equipment is grouted or when the alignment requirements are critical. Construction drawings will specify when non-shrinking grout is required.

21.0 COLUMNS, VESSELS AND REACTORS

21.1 Lifting lugs will be provided by CONTRACTOR to erect vessel.

22.0 INSTRUMENTS

22.1 Scope of Work

CONTRACTOR shall install instruments and instrument materials in accordance with COMPANY's Piping and Instrument Diagrams, Instrument Schedules, and other instrument drawings listed in the Construction Drawing Index.

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23.0 PIPING

23.1 General

All piping, except that marked "by others" as shown on the construction drawings shall be installed by CONTRACTOR.

A. Fabrication and installation shall be in accordance with:

- (1) This specification
- (2) ANSI B31.3, Petroleum Refinery Piping Code
- (3) Piping Standards, Drawing
- (4) Specification EG-2505, Fabrication of Steel Piping
- (5) Section 1, ASME Boiler and Pressure Vessel Code.

23.2 Seal welding and bridge welding requirements are specified in Drawing.

23.3 No valves shall be installed with stems pointed down.

23.4 Isometric Drawings

COMPANY will provide dimensioned isometric drawings for lines for 3/4 inch and larger shown on Piping and Instrument Diagrams. Isometrics for small utility lines may not be fully dimensioned.

23.5 Routing of Small Lines

General routing only will be shown for small lines such as yard water piping. Exact routing for such lines shall be determined in cooperation with COMPANY'S Construction Representative before installation by CONTRACTOR.

23.6 Vents and Drains on Piping

Vents and drains required for operation are shown on the Piping and Instrument Diagrams. COMPANY will furnish detail drawings showing location of these vents and drains. However, vents and drains at all high and low points in the piping which are required for complete venting or draining for hydrostatic may not be shown on these drawings. Any such additional vents and drains shall be installed by CONTRACTOR. All vents and drains shall be installed in accordance with Drawing GB-L31335 and applicable construction drawings. Vents and drains installed for hydrostatic testing shall be plugged and seal welded upon completion of testing.

23.7 Line Cleaning

Piping shall be washed or blown clean with air to remove loose materials. This may be performed in conjunction with the hydrostatic testing.

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23.8 Valve Packing

Refer to Section 15.4 of this specification for details.

23.9 Valve Chain Operators

Valve chain operators are required for all valves not accessible from grade, platforms, or walks. CONTRACTOR shall install chain operators, and fabricate and install brackets to hold chains out of operating areas and accessways when not in use.

24.0 STEEL WORK

24.1 Pipe Supports

CONTRACTOR shall fabricate, locate and install all required pipe supports. Supports for small lines not shown on project drawings shall be field fabricated by CONTRACTOR.

24.2 Welders

Field welding on steel work shall be done by welders who are qualified as specified in Section 15.2 of this specification.

25.0 CONCRETE WORK

25.1 Scope of Work

CONTRACTOR shall provide and be responsible for all concrete work.

25.2 Methods

Placing and curing concrete shall be in accordance with Specification EG-850. Material and fabrication of reinforcing shall conform to Specification EG-516.

25.3 Properties

Ready-Mix concrete shall be in accordance with ASTM Specification C-94. If field mix concrete is used, materials to be used and the procedure to be followed in proportioning and mixing Portland Cement Concrete in the field shall conform with Specification EG-851. Consistency and workability shall be in accordance with Specification EG-851 with a minimum ultimate compressive strength of 3000 psi after 28 days of curing, maximum aggregate size 3/4 inch, slump 3 to 5 inches. Method of measuring materials shall be such that proportions can be accurately controlled and easily checked at any time during the work.

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25.4 Anchor Bolts

All anchor bolts securing machinery or equipment shall be provided with sleeves in accordance with drawing GB-Q68922. After setting equipment, these sleeves shall be filled with grout. Anchor bolts shall be accurately placed and securely tied to avoid movement during concrete placement.

24.5 Special Techniques

CONTRACTOR shall consult COMPANY'S Construction Representative before using such special techniques as, for example, precasting pipeway stanchions, or pumping structural concrete.

26.0 HYDROSTATIC TESTING

26.1 Equipment and Piping

CONTRACTOR shall perform hydrostatic tests in accordance with Instruction No. 1501 on all equipment and lines after erection, but before any insulation or backfill, and with all welded, screwed or flanged joints exposed. All small connections (drains, bleeders, material and sample connections, level and gage glass connections, and thermometer and pyrometer wells) shall be in place during testing and shall be subjected to the test pressure out to the first valve of the connection. Before performing any hydrostatic tests, notification to COMPANY must be given so that tests may be witnessed by COMPANY Inspector. CONTRACTOR shall furnish all equipment needed for use in hydrostatic testing.

26.2 Cold Weather

If the ambient air temperature is less than 40° at the time a hydrotest is to be made, the test media must be heated to the extent necessary to achieve the following tabulated temperatures in the media when filling is complete.

- A. For wall thicknesses 1" and less, 70°F.
- B. For wall thicknesses more than 1", 100°F.

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A.1 CONSTRUCTION DRAWINGS

<u>Drawing Number</u>	<u>Title</u>
PB-59-29951-0	Foundation for Vertical Filter, D-5911
PD-59-29897-0 Sht. 3	110# Steam Vertical Filter, D-5911
PD-59-29897-0 Sht. 4	110# Steam K.O. Drum Steam Trap and Condensate Return
PD-59-29897-0 Sht. 5	Yard Water and Instrumentation for 110# Steam Vertical Filter, D-5911
PF-13-29511-2	Piping Plan - South Main P/W for Sulfur Recovery Unit, Pumping and Storage
PD-13-29590-3	Piping Schematic - Off Plot Tie-ins for Sulfur Recovery Unit, Pumping and Storage
Peerless 6B37307	20" O.D. 110 psig Vertical Filter Separator
PF-59-30055-8	Plot Plan
<u>A.2 STANDARD DRAWINGS</u>	
GB-L-31335-7	Vents and Drains for Lines and Equipment
GB-Q-68922-12	Anchor Bolts

A.3 STANDARD SPECIFICATIONS

<u>Specification Number</u>	<u>Title</u>
EG-985-A	Grouting of Machinery (General)
EG-2505-G	Fabrication of Steel Piping
EG-850-C	Placing and Curing Concrete
EG-851	Concrete Proportioning and Mixing

A.4 REFINERY AND ENGINEERING INSTRUCTIONS

<u>Number</u>	<u>Title</u>
EP-310	Pipe Test for Qualification of Metal Arc Welders
R-800	Bolting-Up Practice
1150	Entry Into Sulfur Recovery Area
1404	Instruction to Contractors Working Within the Refinery
1407	Rigging Practice
1501	Hydrostatic Testing of Equipment