

ENGINEERING DEPARTMENT
EL PASO

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SECTION 1 - GENERAL REQUIREMENTS

1.1 SCOPE OF WORK

1.11 CONTRACTOR shall perform all labor and furnish all utilities, supplies, tools equipment, temporary facilities and all items of a consumable nature (such as listed in Specifications Nos. EG-1048 and EG-1049) that are required for construction of the Butane Isomerization Plant at El Paso, Texas for Chevron Oil Company, d/b/a Standard Oil Company of Texas as detailed by this Specification, except as otherwise provided in Sections 1.21 below.

a. This plant will be in accordance with Plot Plan PA-20-23313 and Piping and Instrument Diagrams PA-20-23304, 23305 and 23306 as well as other pertinent drawings to be supplied by CONTRACTOR and items shown in Section 1.4 to be supplied by COMPANY.

1.12 In addition, CONTRACTOR shall furnish the following material and equipment to be incorporated in the finished work:

Materials purchased in field, such as insulation, foundations, paving and grouting, miscellaneous supports. Field supplies, such as welding rod, oxygen, acetylene, gasoline, diesel fuel, lumber, tie wire, nails, etc.

1.2 WORK, MATERIAL AND EQUIPMENT, AND UTILITIES BY COMPANY OR OTHERS

1.21 Material and equipment by COMPANY

COMPANY will furnish all items of material and equipment to be incorporated in the finished work except as provided in Section 1.12 above.

1.22 Construction Utilities by COMPANY

1.221 COMPANY will furnish metered electrical energy to CONTRACTOR at no expense 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 furnished and installed by CONTRACTOR.

1.222 COMPANY will provide industrial fresh water in moderate quantities at no expense to CONTRACTOR. Tie-ins, connections and extensions from these points to CONTRACTOR'S work areas shall be furnished and installed by CONTRACTOR.

1.223 COMPANY will provide drinking water at no expense for
CONTRACTOR'S containers.

1.3 LOCATION OF WORK

The work described in this Specification will be performed at COMPANY'S refinery,
El Paso, Texas

1.4 DRAWINGS AND SPECIFICATIONS

1.41 "The construction drawings and specifications listed in the Appendix further
detail the work hereunder and are part of this Specification:"

1.5 INTENT

It is the intent of this Specification that CONTRACTOR shall provide the work defined
herein, complete in every respect, and in accordance with the good practices of the
several trades involved and the detailed requirements of this Specification, ready to
operate in the manner indicated or manifestly implied herein, regardless of whether or
not full details of such completeness, workmanship or practices are contained herein.

1.6 ERRORS AND OMISSIONS

The specifications and drawings are not complete in every detail but show the purpose
and intent only, and the CONTRACTOR shall comply with their true intent and meaning,
taken as a whole, and shall not avail himself of any manifest errors or omissions to the
detriment of the work. Should any error, omission or discrepancy appear in the draw-
ings, specifications, instructions, or in work done by other, CONTRACTOR shall notify
the COMPANY at once, and COMPANY will issue instructions to be followed. If
CONTRACTOR proceeds with any such work prior to receiving such instructions,
necessary corrections shall be at CONTRACTOR'S expense. Any work and material not
indicated on the drawings or called for in the specifications which is manifestly necessary
for full and faithful performance of the work in accordance with the true intent of the
contract shall be provided and incorporated at the expense of the CONTRACTOR to
the same extent as if both indicated and specified. Any work indicated on the drawings
but not specified, or vice versa, shall be furnished as though fully set forth in both.

1.7 COMPANY APPROVAL

COMPANY'S approval of or agreement to the performance of certain items of construction
work or the furnishing of certain materials and equipment by CONTRACTOR as required
in this Specification shall in no way relieve CONTRACTOR from the full responsibility
for the performance of such work, for the adequacy of such material and equipment or
for the sole responsibility for the work performed under this Specification. CONTRACTOR
shall obtain such approval or agreement through COMPANY'S Construction Representa-
tive, or in a manner previously approved in writing by COMPANY'S Construction
Representative.

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SECTION 2 - GENERAL CONDITIONS

2.01 FIELD REPRESENTATIVES

2.011 COMPANY'S Construction Representative

COMPANY will maintain a Construction Representative in the field who will be the only COMPANY employee in the field authorized to represent COMPANY with respect to contractual matters for work covered in this Specification.

2.0111 Examples of his functions are to:

- a. Establish and maintain field liaison between CONTRACTOR'S Construction Representative and COMPANY.
- b. Furnish materials and equipment to CONTRACTOR per Paragraph 3.03 of this Specification.
- c. Review CONTRACTOR'S construction schedule
- d. Explain drawings and specifications as required.
- e. Review and approve field changes or material substitutions, or any other matter where COMPANY'S approval or agreement is required by this Specification.
- f. Negotiate with CONTRACTOR'S Construction Representative the amount of increase or decrease in compensation due CONTRACTOR arising from any Changes in the Work which COMPANY may authorize.

2.012 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.

2.0121 Examples of his functions are to:

- a. Represent CONTRACTOR in matters pertaining to construction quality, schedule and accounting practice.
- b. Represent CONTRACTOR during acceptance tests.
- c. Receive materials and equipment from COMPANY per Paragraph 3.03 of this Specification.
- d. Negotiate and approve for CONTRACTOR the amount of increase or decrease in compensation due CONTRACTOR arising from COMPANY'S authorized Changes in the Work to be performed by CONTRACTOR.

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2.02 CHANGE IN THE WORK

In the event that a Change in the Work is authorized in writing by COMPANY, as provided in Section 2.1 of the Terms and Conditions and COMPANY and CONTRACTOR fail to agree in writing upon an adjustment or upon a basis for an adjustment in the compensation, then upon written election by COMPANY, such adjustment shall be determined in accordance with the provisions of the Contract facing sheet.

2.03 SCHEDULE AND COST BREAKDOWN

CONTRACTOR shall maintain a detailed construction schedule for all phases of work covered in this Specification.

- 2.031 Construction schedule shall indicate, for each portion of work, the start of construction, job progress and completion date.
- 2.032 CONTRACTOR will be furnished with current information regarding delivery dates as the job progresses. Delivery delays up to 4 weeks will not be considered cause for delays in completing the work hereunder for reimbursement pursuant to Section 3.2 of the Terms and Conditions. Delivery delays of longer than 4 weeks in the delivery of major materials and equipment to be furnished by COMPANY will be considered as causes for delays in completing the work hereunder and as delays caused by COMPANY under Section 3.2 of the Terms and Conditions.
- 2.033 CONTRACTOR will cooperate with COMPANY in obtaining a cost breakdown by equipment categories after the job is completed

2.04 REFINERY REGULATIONS

CONTRACTOR shall comply with El Paso Refinery Instruction No. 1404, "General Instructions to Contractors Working Within the Refinery."

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SECTION 3 - PERFORMANCE OF WORK

3.01 EXCAVATION AND BACKFILL

Earthwork shall be in accordance with applicable paragraphs of Specification EG-581. CONTRACTOR shall haul any excess excavated material to a location designated by COMPANY'S Construction Representative.

3.02 REMOVAL OF EXISTING EQUIPMENT

Existing equipment that is dismantled by CONTRACTOR and not used in the plant shall be removed by CONTRACTOR to a place designated by COMPANY'S Construction Representative.

3.03 MATERIALS HANDLING AND CORRESPONDING PAPER WORK

3.031 CONTRACTOR shall receive from any one of several storage areas located within the refinery the equipment and materials furnished by COMPANY and required for the work described in Section 1.1 of this Specification.

3.032 CONTRACTOR will be required to complete and submit a COMPANY materials requisition, Form GO-111, to the COMPANY'S field construction office for withdrawal of COMPANY furnished material and equipment for performance of the work. Requests for material shall be based on quantities shown on drawings of Lists of Materials furnished by COMPANY. CONTRACTOR must obtain approval from COMPANY'S Construction Representative before materials in excess of the quantities shown on the Lists of Materials can be issued.

3.033 Subject to Section 5.3 of the Terms and Conditions CONTRACTOR shall:
(a) be responsible for keeping all materials and equipment in good condition until the completed facility is accepted by COMPANY: (1) take any necessary steps such as painting, greasing, installation of rust preventive oil, or covering, etc., to protect all equipment externally and internally from mechanical damage or damage from the elements, and (2) protect all instruments and control panels from corrosion, etc., due to humidity, precipitation, temperature and atmospheric conditions or environment; (b) be held accountable for surplus materials furnished by COMPANY, items received from COMPANY and to be returned, and for shortages or damages to equipment and materials furnished by COMPANY. Where necessary CONTRACTOR shall apply code colors for the identification of special alloy materials when they are received, to insure that these alloy materials are properly installed and that correct weld rod is used.

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- 3.034 Upon completion of the job, CONTRACTOR shall furnish COMPANY an inventory of all remaining equipment and materials which were furnished by COMPANY including the quantity, description, and the item number for each item. When directed by COMPANY, CONTRACTOR shall transport the remaining equipment and materials to such locations within the refinery as designated by COMPANY.

3.04 INSPECTION AND TESTING

3.041 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 not relieve CONTRACTOR of full responsibility for the work hereunder.

3.042 Welding Inspection

- 3.0421 CONTRACTOR shall arrange for welding qualification tests at his expense in accordance with Engineering Instruction EP-310, "Qualification of Welders." Welders shall be required to pass qualification tests before performing any operation during construction of the project. 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.

3.043 Hydrostatic Testing

CONTRACTOR shall perform hydrostatic tests on all equipment and lines after erection, but before insulation or backfill. Before performing any hydrostatic test, CONTRACTOR shall notify COMPANY'S Construction Representative sufficiently in advance so that all hydrostatic tests may be witnessed by COMPANY inspector. CONTRACTOR shall furnish all equipment needed for use in hydrostatic testing.

Tests shall be accomplished in accordance with Engineering Instruction EP-300. Tests shall be performed with all welded, screwed, or flanged joints exposed.

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3.044 Electrical Inspection and Testing

CONTRACTOR shall inspect wiring, cables, motors, controllers, and lighting and test grounding, all in accordance with Specification Nos. EG-894 and EG-1675.

3.045 Instrument Testing

CONTRACTOR shall inspect and make all necessary tests and such additional tests as COMPANY may request to insure that instruments are installed correctly in accordance with Specification No. EG-1586.

3.046 Columns and Vessels

CONTRACTOR shall prepare all pressure vessels and columns for final inspection, including opening of all internal and external manways and handholes, providing proper gaskets for all openings and removal of debris. When CONTRACTOR has proceeded with his work to the point where a column or vessel is ready for a COMPANY check, he shall advise COMPANY. When COMPANY has had reasonable opportunity to complete its inspection and COMPANY'S Construction Representative is satisfied that no further action is required before final heading up of the column or vessel, he will give CONTRACTOR written notice releasing it for final heading up.

3.047 Mechanical Equipment

3.0471 CONTRACTOR shall align the shafts of all drivers and connected driven equipment such as motors or turbines driving equipment such as pumps and compressors. CONTRACTOR shall notify COMPANY'S Construction Representative sufficiently in advance prior to bolting up couplings so that COMPANY may inspect and approve alignments. CONTRACTOR shall be responsible for equipment alignment until correct alignment has been demonstrated at operating temperature. Pumps, drivers, gears, etc., mounted on baseplates or soleplates shall be doweled to preserve alignment while operating and to restore alignment when equipment is removed for maintenance.

3.0472 CONTRACTOR shall check rotation of motors, set turbine overspeed trips, turn over compressor, etc., in the presence of COMPANY inspector.

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3.048 Equipment Lubrication

COMPANY will furnish all lubricants, and CONTRACTOR shall lubricate all equipment including couplings in accordance with the lubrication schedule, Drawing PC-20-20742

3.049 Bolting-Up Practice

The bolting-up of spiral-wound gasketed, flanged joints shall be as follows:

- (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.
- (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.

3.05 CORRECTION OF DEFECTS

CONTRACTOR shall correct all defects revealed by any test or inspection. When a defect is due to the faulty workmanship of CONTRACTOR, or to defective or unsatisfactory material furnished by CONTRACTOR, the cost of correction shall be borne by CONTRACTOR, in the manner provided in Section 4.2 of the Terms and Conditions for work and materials condemned by COMPANY. Where a defect is due to defective material furnished by COMPANY, the correction of the defect and any damage caused thereby shall be performed by CONTRACTOR and the contract price shall be adjusted in accordance with the "Exhibit - Change in the Work" for such correction work.

3.06 COMPLETION

The work will be considered "complete" when CONTRACTOR has performed all work specifically stated or manifestly implied in this Specification. The following illustrate the type of work items which must have been satisfactorily accomplished before the work will be considered complete:

3.061 Completion of all required tests.

3.062 Completion of all required inspections including P&ID check.

3.063 Pumps, machinery and drivers checked for alignment after final tightening of connecting piping, bearings flushed and lubricated.

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- 3.064 Instruments, alarms, and controls cleaned, lubricated, and checked insofar as practicable.
- 3.065 Piping washed or blown clean with air. All strainers in place and cleaned.
- 3.066 Electrical circuits tested for grounds or shorts, motors checked for rotation and run a minimum of two hours. All lights cleaned and operating, and all control circuits checked.
- 3.067 All nameplates, identification stencils, etc., installed.

3.07 ACCEPTANCE

3.071 Custody of Plant for Initial Operation

When the Plant is tested and completed in accordance with the requirements of this Specification (except for finishing work not essential for the operation of such Plant which COMPANY and CONTRACTOR agree can be completed while the Plant is in the custody of COMPANY, such as painting,) CONTRACTOR shall so notify COMPANY in writing. After receipt of such notice, COMPANY may then take custody of such Plant to begin initial operation to verify that the Plant conforms with requirements of this Specification. Such custody of such Plant shall not be construed as Acceptance pursuant to Paragraph 3.072 below. Any additional work required to be performed by CONTRACTOR in such Plant after COMPANY has taken custody shall be performed on a work permit basis.

3.072 Acceptance

CONTRACTOR'S work hereunder shall be considered accepted on the date COMPANY gives written notice to CONTRACTOR that it is satisfied all work has been completed in accordance with the requirements of this Specification. Acceptance by COMPANY shall in no way relieve CONTRACTOR of his obligation or liabilities under the Contract.

3.08 MECHANICAL GUARANTEE

CONTRACTOR guarantees the Plant to be free of defects in design, materials, equipment and workmanship (insofar as design, materials, equipment and workmanship are furnished by CONTRACTOR) for a period up to one year after the date COMPANY starts-up the Plant but no to exceed 15 months after delivery to COMPANY. Any such equipment, materials, workmanship or designs found to be defective within said one-year period shall be replaced by CONTRACTOR at his sole expense with designs, materials, equipment and workmanship that are satisfactory for a like period of time; provided, however, that said

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3.08 MECHANICAL GUARANTEE (continued)

design, equipment, materials and workmanship are not subjected to conditions more severe than described or implied in this Specification. CONTRACTOR shall be notified of such defects in writing and given reasonable opportunity, if in the opinion of COMPANY the nature of the defect and COMPANY'S operating schedule permit, to inspect and correct such defective designs, materials, equipment or workmanship. Otherwise, after such written notification, COMPANY may make requisite corrections and bill CONTRACTOR for the portion of the costs incurred which are to be borne by CONTRACTOR, as provided herein.

SECTION 4 - CONSTRUCTION

4.01 GENERAL

4.011 Nameplates and Tags

A nameplate or tag shall be installed on each pump, driver, vessel, exchanger, instrument, items of electrical equipment, and each mechanical equipment item. Electrical conduit markers and instrument tubing tags shall also be installed.

4.012 Equipment Setting

All equipment shall be set, leveled, and grouted in accordance with Specification EG-985, and aligned, and/or doweled in accordance with manufacturer's instructions. Non-shrinking grout, such as Embeco, shall be used for all machinery bases and under bearing plates for structural columns.

4.02 VESSELS

4.021 The following vessels will be shop stress-relieved. No welding shall be done on them in the field: D-2010 D-2016

4.0211 Welding for any minor modification or repair required on other columns and vessels shall be in accordance with the latest edition of the ASME Code for Unfired Pressure Vessels.

4.03 HEAT EXCHANGERS

4.031 Fire proofing shall be installed on all heat exchanger supports.

4.04 PUMPS AND DRIVERS

4.041 Coupling guards shall be installed on all pumps.

4.042 Auxiliary piping shall be installed on all pumps.

4.043 Pumps not equipped with mechanical seals shall be repacked. COMPANY will furnish packing.

4.044 Motor drivers will be shipped installed on pump baseplates.

4.045 Protective coatings shall be removed prior to the installation of lubricants.

4.05 INSTRUMENTS

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4.051 Instrument Work by Suppliers

Instruments furnished and installed by major equipment suppliers are identified on the instrument schedules. All instruments including those installed by equipment suppliers, shall be cleaned, tested, and inspected by CONTRACTOR in accordance with Specification EG-1586.

4.052 Location

Location of all field instruments are shown on the instrument location plans, electrical layout drawings and piping plan drawings.

4.053 Mounting

All instruments shall be mounted and connected in accordance with the special or standard installation drawings referred to on the instrument schedules. No installation drawings are included for bracket mounting instruments such as pressure and temperature transmitters. Minimum requirements for these items are that they be free from vibration and located for ease of maintaining and adjusting the instrument. Wherever practical, the brackets should locate the instrument counterline 4 ft. above grade or operating platform.

4.054 Control Valves

Control valves will be furnished with packing and lubricators. Lubricator and lubricant will be furnished separately and shall be installed by CONTRACTOR. Type of packing shall be checked for conformance with specified type on control valve schedule and repacked, if not packed or incorrectly packed.

4.055 Orifice Plates

Orifice plates shall be left uninstalled, wired to their respective flanges until lines are flushed.

4.056 Pressure Gages

Any pressure gages obviously out of calibration shall be returned by CONTRACTOR to COMPANY at its instrument shop. COMPANY will test and adjust such pressure gages and release them to CONTRACTOR with a tag attached identifying the gage and indicating that the gage is satisfactory for installation. COMPANY will not test new undamaged pressure gages.

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4.057 Relief Valves

All relief valves shall be returned by CONTRACTOR to COMPANY at its shop for COMPANY to check and adjust, if necessary, relief valve settings. COMPANY will attach a tag to each relief valve showing that it is in satisfactory condition, identifying it, and noting the set pressure. COMPANY will then release valves to CONTRACTOR for installation.

4.06 PIPING

4.061 General

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

4.0611 Fabrication and installation shall be in accordance with

- (a) This Specification EP-207A
- (b) ASA B31.3, Petroleum Refinery Piping Code.
- (c) Piping Standards, Drawing GC-135169
- (d) Specification EG-2505, Fabrication of Steel Piping.

4.0612 Screwed connections shall be seal welded to the extent shown in Piping Standards.

Where seal welding is not required screwed pipe fittings shall be sealed with 1/2-inch teflon thread sealant tape, such as Scotch Brand No. 48, or John Crane Thred-Tape.

4.0613 Clear headway of not less than 6-ft 6-inches shall be provided over all platforms, walkways, passageways and working areas.

4.0614 The area adjacent to pumps, turbines, and other mechanical equipment that is used for maintenance access to this equipment shall have not less than 11-ft. 6-inch clear head room.

4.0615 The minimum permissible width of clear passageway on platforms, walkways, etc. shall be 2-ft. 6-inches. Bottom of lines shall be a minimum of 10-inches above the high point of paving.

4.0616 No valves shall be installed with stems pointed down unless COMPANY specifically agrees to same in writing.

4.062 Routing of Small Lines

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4.0621 Open-ended "dummy" extension shall be used for supports where required. Dead-ends of piping shall not be used.

4.0622 Piping shall not be installed above the stanchion lines of the main pipeways where space for future double-decking has been provided.

4.063 Vents and Drains on Piping

All vents and drains shall be installed as shown on the piping and instrument diagrams. However, additional vents and drains at all high and low points in the piping which are required for complete venting or draining for hydrostatic test may not be shown on these drawings. These shall be installed at no extra cost to COMPANY. Vents and drains installed for hydrotesting shall be plugged and seal welded upon completion of testing.

4.064 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.

4.065 Pump Suction Screens

Temporary suction screens for initial operation of pumps shall be furnished and installed by CONTRACTOR. Suction screens shall be cleaned after cleaning lines. COMPANY will remove screens after plant startup. Typical screens are shown on Standard Drawing GC-L88612.

4.066 Pipe Plugs

All square-head plugs furnished on equipment shall be replaced by round-head barstock steel plugs.

4.067 Valve Packing

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

4.068 Valve, Flange, and Stem Safety Covers

Valve stem safety covers shall be installed on all valves 2 inches and larger which have horizontal stems extending into operating areas and which can be considered safety hazards. Milsheff valve covers shall be installed on all valves in caustic services.

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4.069 Valve Extension Handles and Chain Operators

Valve extension handles or chain operators are required for all valves not accessible from grade, platforms or walks unless company agrees to delete. CONTRACTOR shall fabricate and install valve extension handles similar to those shown on Standard Drawing GB-L-13963.

CONTRACTOR shall install chain operators. CONTRACTOR shall fabricate and install brackets to hold chains out of operating areas and accessways when not in use.

4.0610 Buried Lines

4.06101 Protective coatings shall be as follows:

4.061011 COMPANY will furnish coated pipe for lines under concrete paving, structures, buildings, water, or otherwise equally inaccessible. CONTRACTOR shall make field joints and shall repair any damage in the coating, using field joint forms, heating and mixing kettles, and other equipment recommended by the coating applicator.

4.061012 All other underground lines shall be P2A wrapped by CONTRACTOR (including those under asphalt paving) per Drawing GB-L-69318.

4.07 STRUCTURES

4.071 Steel Erection

All work shall comply with latest editions of the AISC Code of Standard Practice for steel building and bridges, AISC Specifications for design, fabrication, and erection of structural steel for buildings and AWS Standard Code for arc and gas welding in building construction.

Loading racks, platforms, stiles, stairs and ladders will be delivered to the job site fabricated per Specification EG-398 as complete as possible, consistent with the economy of handling and shipping the assembled units, in order to minimize field connections.

4.072 Fabrication

All structural steel fabricated by the CONTRACTOR shall conform to Specification EG-398.

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4.073 Pipe Shoes

Pipe shoes for insulated hot piping shall be fabricated by CONTRACTOR from stock material and installed in accordance with Detail E of Drawing GA-N-99783 with shoe details per Type 1 of Drawing GD-N-99653 on all insulated lines 2" in diameter and larger at all supports. Shoes shall be 3" in height. Insulated piping 1-1/2" and smaller shall have insulation notched per left hand sketch of Detail E of Drawing GA-N-99783.

4.074 Bolts and Clips

All bolts and clips required to fasten all pipe supports to structures shall be installed even though the attachments are not shown on the construction drawings.

4.08 INSULATION, STEAM TRACING AND FIREPROOFING

4.081 Insulation

4.0811 Insulation of all lines and vessels will be the responsibility of CONTRACTOR

4.082 Steam Tracing

4.0821 Steam tracing shall be the responsibility of the CONTRACTOR and shall be in accordance with Drawing PB-99-12919

4.083 Fireproofing

4.0831 Fireproofing on major steel supports (skirts and legs) shall be installed to an elevation of 20 ft. above grade. Fireproofing of structural members shall be per Standard Drawing GE-N-33336, and of column and vessel skirts shall be per Standard Drawing GB-N-99994.

4.0832 Fireproofing shall be installed on the saddle supports of all horizontal vessels and exchangers which are 14-inches in diameter or larger.

4.0833 CONTRACTOR shall pressure fill with grout all pipe stanchions fabricated from pipe.

4.09 POWER AND LIGHTING

4.091 Performance of Work

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Specification EG-1675, Installation of Electrical Facilities, describes the general requirements for installation of electrical facilities.

- 4.092 Drawings show location of lights, instruments and equipment, and general routing of conduit. The exact arrangement of conduit shall be established by CONTRACTOR to avoid interferences and to provide maintenance access. Prior to start of conduit installation, CONTRACTOR shall submit proposed routing and arrangement to COMPANY for approval.

4.10 FOUNDATIONS

4.101 Reinforced Concrete

Placing and curing concrete shall be in accordance with Specification EG-850.

Material and fabrication of reinforcing shall conform to Specification EG-516, unless otherwise specified on the drawings.

4.1011 Concrete Properties

Ready Mix concrete shall be furnished 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.

Method of measuring materials shall be such that the proportions can be accurately controlled and easily checked at any time during the work.

4.102 Anchor Bolts

All anchor bolts securing machinery or equipment, shall be provided with sleeves in accordance with drawings. 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.

4.11 MISCELLANEOUS

4.111 Grading

Grading work includes removal of soil or placement and compaction of fill to attain finish grade elevation.

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Finish grading shall be in accordance with applicable provisions of Specification EG-851.

Where fill must be added to bring an area to finish grade, the area shall be scarified and fill placed in layers not exceeding 6" in loose depth, with each layer watered as necessary to obtain optimum moisture content for compaction. All fill material shall be compacted to attain a maximum 95% modified AASHO density.

4.112 Drainage Facilities

4.1121 Septic Tank and Drain Tile

Fabrication and installation of septic tank and drain tile shall be in accordance with Specifications EG-581 and EG-582.

4.113 Paving

4.1131 Asphalt Paving

The design, material and methods of construction of the asphalt paved areas shall be in accordance with the latest, "Specification and Construction Methods for Hot Mix Asphalt Paving," by the Asphalt Institute.

Paving shall be Type IV, dense graded, hot mix asphalt to match what exists in plant.

4.114 Painting

4.1141 General

Surface preparation and painting shall be in accordance with Painting Specification Drawing PB-99-21446. No exceptions shall be made to this drawing without written COMPANY approval.

4.1142 Shop Fabricated Equipment

Shop fabricated equipment and structural steel will be primed by the suppliers. Primers shall be touched up before final painting if the shop prime is damaged.

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I.1143 Manufactured Equipment

Compressors, dryers, motor control centers, transformers, loading pumps and other equipment will be finished painted by the equipment manufacturer. Paint shall be touched up by CONTRACTOR if damaged.

I.1144 Special Surfaces

Aluminum and galvanized surfaces, and insulation weathercoat shall not be painted.

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