

**PLAINTIFF'S
EXHIBIT**

CHV-16

SPECIFICATION NO. E-1040

OCTANE TESTING LABORATORY
EL PASO REFINERY

FOR

STANDARD OIL COMPANY OF TEXAS
EL PASO, TEXAS

October 15, 1951

CHEV BB
0000542

1.0 GENERAL CONLTIONS

1.01 Scope: This specification covers the work of several trades in construction of an Octane Testing Laboratory building and includes all work required to complete the building ready for occupancy by COMPANY except for work to be performed by "others."

1.02 Definitions:

1.021 Contract documents consist of the Contract, these general conditions, the drawings and specifications including all modifications thereof incorporated in the documents before their execution.

1.022 Terms "approved," "as directed," "proper," "suitable," "satisfactory," "equal," and other words of similar meaning and intent, implying exercise of judgment, discretion, or decision to be made, shall refer to the judgment, discretion and decision of the COMPANY. The term equal shall mean "equal" in the opinion of the COMPANY. The term CONTRACTOR shall mean General Contractor.

1.03 Contract Drawings: The following drawings are a part of and complementary to this specification:

<u>Drawing Number</u>	<u>Title</u>
GA-8546-0	Plans and Elevations
GA-8547-0	Mechanical Plan and Miscellaneous Details
GA-8603-0	Lighting Layout
GA-8606-0	440-Volt Layout
GB-169318-14	Wrapped Coatings for Underground Pipe Lines
GB-14368-0	Standard Shop Wall Bench - Type 3
GC-8604-0	Lighting Schedule
GB-8605-0	List of Electrical Material

1.04 Execution, Correlation and Intent of Drawings and Specifications

- 1.041 These specifications and the accompanying drawings are the property of the COMPANY, and shall be returned to the COMPANY at the completion of the contract. It is the intention of these documents to require the completion of the work in a thorough and workmanlike manner, acceptable to COMPANY in every respect.
- 1.042 In general, the drawings indicate dimensions, positions and details of construction; the specifications, qualities of materials and methods of workmanship. Any work indicated on the drawings and not mentioned in the specifications, or vice versa, shall be furnished as though fully set forth in both. Work not particularly detailed, marked or specified shall be the same as similar parts that are detailed, marked or specified.
- 1.043 The CONTRACTOR shall comply with the true intent and meaning of the drawings and specifications taken as a whole and shall not avail himself of any manifest errors or omissions to the detriment of the work. Should any error appear in the drawings or specifications, or in the work done by others affecting the work of the contract, the CONTRACTOR shall notify the COMPANY at once, and the COMPANY will issue appropriate corrections. If the CONTRACTOR proceeds with any such work without such corrections from the COMPANY the CONTRACTOR shall make good all resulting damage and defects.
- 1.044 Figured dimensions take precedence over scale measurements, detailed drawings over general drawings, and drawings of later date over those of earlier date. In like manner, addenda to specifications take precedence over original specifications and earlier addenda thereto.

1.05 Extra Work

- 1.051 Should extra work be authorized, CONTRACTOR shall normally submit a fixed price bid therefor, mutually acceptable to both the COMPANY and the CONTRACTOR, prior to starting of the extra work. However, at COMPANY'S option, extra work may be performed on a force account basis.
- 1.052 Under force account, time slips accounting for time of men spent on each extra work authorization, showing their craft classification and hourly rate, together with a summary of material used, including equipment rental, must be submitted daily to the COMPANY for approval. Payment for extra work under force account will be made only on the basis of such approved time and material slips.

1.053 The charge for the above items shall be invoiced on the following basis:

- (1) Actual net labor cost plus insurance and taxes thereon.
- (2) Equipment cost for time actually used on the extra work authorization, computed at rates not in excess of current Associated Equipment Distributors' "Computation of Rental Rates."
- (3) Materials and supplies actually consumed in the extra work at net cost to the CONTRACTOR plus taxes.
- (4) A percentage of Items 1, 2, and 3 as stipulated in the Contract, to cover the cost of supervision, including foreman, small tools, overhead and profit, and any other charges not specifically mentioned in Items 1, 2 and 3.

1.06 Shop Drawings as required by the specification shall be submitted to COMPANY for approval, and no shop work shall be started until this approval is received. COMPANY'S approval shall not relieve the CONTRACTOR from responsibility for deviations from design drawings or specifications unless he has called COMPANY'S attention to such deviations at the time of submission.

1.061 Two (2) copies of each drawing shall be submitted for preliminary checking purposes. If corrections are unnecessary, five (5) additional copies shall be submitted for final distribution. Where corrections are necessary, they will be noted on one (1) copy which will be returned to the CONTRACTOR who shall revise such drawings accordingly, and resubmit five (5) copies of the corrected drawings.

1.07 Materials: Unless specified or shown on drawings as material furnished by COMPANY, all materials that form a part of the completed job shall be new and of a brand acceptable to COMPANY. Packaged materials shall be delivered in their original containers with unbroken seals.

1.071 Variations from Specified Materials: The materials or products specified shall be the basis of the bids and shall be furnished unless changed by mutual agreement. Where two or more brands are named, the choice of these shall be optional with the CONTRACTOR. Should the CONTRACTOR wish to use any materials or products other than those specified, he must so state in writing, naming the proposed substitutions clearly and stating what difference, if any, will be made in the amount of his bid for each substitution should it be accepted. If any change is made without the COMPANY'S written approval, such material shall be removed from the premises at the expense of the CONTRACTOR.

1.072 Materials Furnished by COMPANY: The following material will be furnished by COMPANY at the job site and installed by CONTRACTOR:

- a. Best lock cylinders
- b. Electric drinking fountain
- c. Electric clocks
- d. Toilet paper, towel, and soap dispensers
- e. Test Engines
- f. Fume Hood

1.073 Ordering material: The CONTRACTOR shall place orders for all materials and equipment to be employed in the work as soon as possible after the award of the contract. It shall be the duty of the CONTRACTOR to keep the COMPANY informed as to the availability of specified materials and equipment, and to advise them promptly, in writing, of all orders placed, and of such materials and equipment as may not be obtainable for purposes of the contract, either due to conditions of the market or other limiting and governing factors.

1.074 Testing Materials: All materials to be incorporated in the work of the contract shall be subject to testing for compliance with the requirements of the specifications. Materials or work required to be tested shall be tested under supervision of, as directed by, and at such points as may be convenient to the COMPANY. All tests shall be made by an approved testing laboratory, and at the expense of the COMPANY unless otherwise hereinafter specified. Tests shall be of number and nature as specified or as considered necessary by the COMPANY, and will be made in accordance with the applicable standard methods of the ASTM, or other procedures designated herein.

1.03 Services and Facilities to be Furnished by COMPANY

1.081 COMPANY will provide access to the job site for CONTRACTOR and his equipment, and will provide CONTRACTOR with necessary uncovered storage space within a reasonable distance of the job site.

1.082 COMPANY will furnish fresh water for personnel and equipment at the job site at no cost to CONTRACTOR.

1.083 COMPANY will furnish within 100 feet of building site electric power required for construction.

1.084 COMPANY will install all utility lines from two feet outside building line to refinery mains and make connections at the building.

1.09 Separate Contracts: The COMPANY reserves the right to let other contracts or do other work in connection with this work. The CONTRACTOR shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

1.10 Utilities

1.101 CONTRACTOR shall furnish and install all temporary lines required for construction and shall remove them upon completion of the work.

1.102 CONTRACTOR shall provide and mount at point designated by COMPANY a disconnecting switch for his electric power during construction and COMPANY will connect service drops to this switch from the pole. CONTRACTOR'S switch shall be fused adequately to protect the service drops.

1.11 Sanitary Facilities: CONTRACTOR shall provide temporary chemical toilet facilities for construction force located as directed, shall maintain them in a sanitary condition, remove upon completion of the work, and disinfect the premises.

1.12 Supervision and Conduct of Work

1.121 The CONTRACTOR shall be responsible for all work done under the contract, including faulty and improper work done by others under him by contract or otherwise. The CONTRACTOR shall be responsible for the conduct of his agents and employees on the premises, and shall maintain good order in all parts of the building and premises where work under the contract is being carried out.

1.122 Throughout the performance of the contract, the CONTRACTOR shall maintain a weathertight office with telephone at the site of the work.

1.123 The CONTRACTOR shall at all times during his absence be represented on the work by a superintendent or foreman authorized and competent to receive and act upon oral or written communications from the COMPANY. The CONTRACTOR shall be liable for faithful observance of any instructions delivered to him or his authorized representative on the work.

- 1.124 The work will be let as a general contract covering all classes of work, even though Specifications are divided into Divisions corresponding to the usual trades, in order to facilitate the taking of bids.
- 1.125 The CONTRACTOR shall, as soon as practicable after the execution of the CONTRACT, submit in writing the name of each and every subcontractor to whom he proposes to make awards.
- 1.13 Scaffolding: CONTRACTOR shall furnish, erect and maintain all scaffolding required for the prosecution of the work. Scaffolding shall be erected, equipped and maintained in accordance with all statutes, laws, ordinances and regulations of State, County and municipal authorities or Insurance Companies having jurisdiction.
- 1.14 Cleanup: The CONTRACTOR shall keep the building and premises free from accumulations of waste materials or rubbish. At the completion of the work he shall remove all his rubbish from and about the building and all his tools, scaffolding, surplus materials, spoil from excavation, etc., and clean the site to the satisfaction of the COMPANY. All windows and fixtures shall be washed and polished.
- 1.15 Examination of Site: The CONTRACTOR shall be held to have examined site, compared it with drawings and specifications, and satisfied himself as to conditions under which work is to be performed. No allowance shall be subsequently made in behalf of the CONTRACTOR for any extra expense to which he may be put due to failure or neglect on his part to acquaint himself with conditions of the site and building and any other work thereon, their approaches and possibilities.
- 1.16 Laying Out Work: The location and elevation of all work shall be established by the CONTRACTOR from permanent bench marks established by COMPANY.
- 1.17 Time Schedule: The CONTRACTOR shall prepare and submit to the COMPANY for approval, and in form as directed, a time schedule showing the time necessary to complete the entire work of the contract and each salient portion thereof.

2.0 CONCRETE

- 2.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.
- 2.02 Strength: Concrete shall be proportioned for a minimum compressive strength of 2500 lb per sq inch at 28 days.
- 2.03 Reinforcing Steel: All reinforcing steel shall be structural grade, deformed bars conforming to ASTM Specification A-15, latest revision, and Specification E-516 attached except paragraphs 1.2, and 8.0 shall not apply.
- 2.04 Mixing: Ready-mixed concrete shall be furnished in accordance with ASTM Specification C-94, latest revision, Alternate 2, Job-mixed concrete shall be furnished in accordance with Specification E-351, attached.
- 2.05 Placing and Curing shall be in accordance with Specification E-350, attached, and as specified below.
- 2.06 Forms shall be in accordance with Specification E-350.
- 2.07 Slabs: Lay all slabs with drains, piping and openings, accurately set.
- 2.071 All concrete slabs shall be finished monolithically, colored, except in Barrel Storage Room, using A. C. Horn Company or equal pigment applied in accordance with manufacturer's directions. Approximately one hour after slab is poured, apply a topping of 2 parts pea gravel, 1 part topping sand, 1 sack of cement and coloring pigment to every 200 square feet. Work topping with Kelley Power Floats until a minimum of fines are drawn to the surface. After topping has been floated, trowel to hard dense surface true to line and grade, and matching texture of existing floor.
- 2.08 Vapor Barrier: One layer of "Sisalkraft" over gravel fill with edges lapped 4 inches and sealed with asphalt cement.

3.0 MASONRY

3.01 General Conditions: Section 1, "GENERAL CONDITIONS," found here- with is a part of this specification and all work hereinafter specified is subject thereto.

3.02 Concrete Block Masonry shall conform to Specification E-943 attached except that concrete shall be proportioned for a minimum compressive strength of 2500 lb at 28 days.

3.03 Brickwork

3.031 Materials: All materials used in brickwork shall be as follows:

Portland Cement - standard domestic brand conforming to ASTM Specification C-150.

Water - clean, free from deleterious amounts of acids, alkalis or organic materials.

Mortar Coloring - unfading mineral pigment as manufactured by A. C. Horn Company or approved equal.

Brick shall be approximately 2 $\frac{1}{2}$ " by 3- $\frac{3}{4}$ " by 8" face brick of color and texture as selected.

Mortar for brick shall be as specified for Concrete Block. Add sufficient color pigment to obtain color selected.

3.032 Brick Laying: Wet down all brick before laying. Lay brick in bond and pattern shown on drawings. Joints shall be approximately 1/4 inch thick, flush cut slightly concave and finished with a jointing tool. Lay each brick with a shoved joint in a full bed of mortar with all vertical joints buttered the full depth of the brick. Lay all brick true to dimensions, plumb and square, with all courses level and joints of uniform width.

3.033 Cleaning: Upon completion clean all exposed brick surfaces with fiber brushes and a solution of 1-1/2 pints of muriatic acid to one gallon of water. Rinse off with fresh, clean water.

3.034 Anchorage: Brick veneer shall be tied to masonry backing with #6 gauge corrosion resistant wire ties embedded in joints at 24-inch centers horizontally and 8-inch centers vertically. Attach ties to a #3 gauge continuous horizontal wire embedded in horizontal joints of brick.

1.0 STRUCTURAL STEEL AND STEEL SASH

1.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.

1.02 Structural Steel

1.021 Fabrication shall be in accordance with Specification No. E-395 attached hereto. Submission of shop and erection drawings is not required.

1.022 Erection shall conform to the latest AISC Specification for Design, Fabrication and Erection of Structural Steel for Buildings. Welding shall conform to the latest edition of AWS Standard Code for Arc and Gas Welding in Building Construction.

1.03 Steel Sash shall be "Fenestra" utility sash, bonderized and shop primed, complete with standard hardware and bronze fly screen.

1.031 Sash shall be installed with all edges caulked using an elastic, non-hardening, non-staining caulking compound of color to match adjoining walls. They shall be set plumb and true, securely anchored to walls without distortion of frame and adjusted for smooth operation to satisfaction of COMPANY.

5.0 CARPENTRY AND MILLWORK

5.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.

5.02 Materials:

5.021 Lumber shall be Douglas Fir or Southern Pine, seasoned and air dried S&S unless otherwise noted, and as follows:

- a. Framing lumber - 1450f stress grade
- b. Exposed finished millwork and shelving - VG - B and better, kiln dried.
- c. Plywood - Douglas Fir Interior Grade A for millwork

5.022 Wood Preservative shall be Standard Oil Company's Standard Wood preservative.

5.03 Framing shall be as detailed on drawings, securely nailed.

5.031 Sills, Ledgers and Plates on or against concrete or masonry shall be treated on 4 sides and ends with wood preservative and bolted at 4 foot maximum centers and at ends with bolts of size shown on drawings, or may instead be anchored down with Powder-Power Tool Corporation equipment using MS36 studs on 32 inch centers and at ends.

5.04 Millwork

5.041 General - Millwork shall be fabricated by skilled mechanics. Wherever practicable, means of fastening shall be concealed, joints shall be housed, mortised and tenoned, doweled blocked and glued together with minimum use of nails.

5.042 Wood Finish shall be smooth, belt sanded at mill and hand sanded on the job. Corners and edges shall be sanded off to prevent damage.

5.043 Frames and Trim for doors shall be of material as specified for exposed millwork, with joints housed together, set plumb and square with double wedge blocking placed back of nailing points, hinges and lock strikes. Mouldings shall be cleanly cut with mitered corners accurately made and blind nailed where possible. Visible nailing shall be set and puttied. Backprime all millwork with lead and oil paint before installing.

5.044 Doors not shown as metal covered, shall be "langel" solid core or equal with plywood faces suitable for paint finish. Main entrance door shall be a solid wood store door.

5.045 Shop Drawings shall be submitted for all millwork.

5.05 Cement Asbestos: Where cement asbestos is called for by drawings
Johns Manville 3/16" thick natural finish Flexboard shall be installed.

5.051 Flexboard shall be nailed to framing with nail heads countersunk and holes puttied. All exposed edges shall be beveled 1/16".

6.0 ROOF DECKING

- 6.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.
- 6.02 Material for decking shall be "Insulrock" structural insulating roof deck 32 inch by 96 inch by 3 inch thick as manufactured by SK Insulrock Corporation.
- 6.03 Application shall be as follows:
- a. Lay Insulrock in place between steel sub-purlins with ends of slabs butted tightly.
 - b. Fill longitudinal joints along sub-purlins flush with top of Insulrock slabs with grout mixed with 1 cu ft Portland cement, 4 cu ft stabilized vermiculite, and 4 cu ft water (approx.).
 - c. Apply built-up roofing as specified under "Roofing".

7.0 • ROOFING, DAMP-PROOFING, AND SHEET MET.

7.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.

7.02 Work Excluded: The following work is not included in this section:

- a. Metal covered doors
- b. Ventilating ducts

7.03 Roofing shall be 4 ply smooth top asphalt and asbestos felt applied in accordance with Specification 57, (for wood decks) attached, except that final coating shall be asphalt base aluminum paint in lieu of asbestos roof coating.

7.04 Damp-Proofing: A water-proof membrane shall be applied to the decks of evaporative cooler supports as shown on drawings, and as follows:

7.041 Apply 25 pound rosin sized building paper over wood deck with seams lapped 2 inches and nailed sufficiently to hold in place. Over this sheet apply two plys of 15 pound asphalt saturated rag felt mopped solid between plys and over top surface with hot asphalt. Turn all sheets up walls 4 inches.

7.05 Sheet Metal

7.051 Details of sheet metal work not shown on drawings or specified shall comply with "Standard Practice in Sheet Metal Work" published by the National Association of Sheet Metal Contractors.

7.052 Louvers shall be 24 gauge galvanized iron, fabricated as detailed on drawings and installed in a completely weather-tight manner.

7.053 Roof safes for flashing pipes extending through roof shall be 3-pound sheet lead and have a minimum base projection of 12 inches outside wall of pipe. Tops of flashing shall be turned into top of pipes.

7.054 Sink shall be constructed of 18 gauge stainless steel type 304, 2B finish, and as follows:

- a. Seams - butted, welded and ground smooth.
- b. Field joints - butt spliced screwed, soldered and ground smooth.
- c. Top turned down over front of counter and secured with screws.
- d. Sink and adjacent counter sloped 1/2 inch to drain.
- e. Holes for water pipe and drain cut in field.

8.0 FINISH HARDWARE AND METAL COVERED DOORS

8.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.

8.02 Work Excluded: The following work is not included in this section:

- a. Rough hardware.
- b. "Best" lock cylinders which are to be furnished by COMPANY but installed by CONTRACTOR.
- c. Hardware for steel sash.

8.03 Finish Hardware

8.031 Materials: All finish hardware shall be as shown on schedule, new, in perfect working condition and free from all defects of workmanship and finish. The schedule is intended to cover the principal items of hardware, and does not include each and every item required, nor is it a complete schedule.

The CONTRACTOR shall carefully examine the plans in conjunction with the general drawings to fully ascertain the extent of the hardware required, and shall submit a final schedule for approval by COMPANY before installing any hardware.

8.0311 Hardware shall be manufactured by the following firms whose catalog numbers are listed in the schedule unless noted otherwise:

McKinney Manufacturing Company	- Butts
Richards Wilcox Company	- Sliding Door Hardware
Russell and Ervin Division of American Hardware Corporation	- All Other Hardware

8.0312 Finish shall be dull chrome except sliding door hardware and butts.

8.0313 Butts shall be button tipped and prime coated.

8.032 Installation: Hardware shall be installed securely and neatly using fastenings finished to correspond with the hardware. Install hardware before painting, remove and re-install at the completion of the job.

8.033 Schedule

Door 1 - 2 $\frac{1}{4}$ inch thick

Butts - 1 $\frac{1}{2}$ pr. SA 714 $\frac{1}{2}$ - 5" x 5"
Lockset - A2056 - B 3K-S Bristol A16.
Push Bars - 529
Kick Plate - 8" x 1" less than door width
Stainless Steel
Door Closer - D-PC - Automatic Holder arm

Door 2 - 1-3/4 inch thick

Butts - 1 $\frac{1}{2}$ pr. SA 714 $\frac{1}{2}$ - 4 $\frac{1}{2}$ " x 4 $\frac{1}{2}$ "
Latchset - 2039 - Bristol
Stop - AR1 $\frac{1}{2}$

Door 3 - 1-11/16 inch thick

Butts - 1 $\frac{1}{2}$ pr SA 714 $\frac{1}{2}$ - 4 $\frac{1}{2}$ " x 4 $\frac{1}{2}$ "
Lockset - 1024 Bristol
Closer - C-PC - Automatic holder arm

Door 4 - 1-11/16 inch thick

Hangers - 20 $\frac{1}{4}$
Track - 31 with 2 end and 3 center brackets
Stay Rollers - 68
Binder and Stop - 89
Hasp - 182

Cabinet Hardware

Door Hinges - Stanley 1532
Door and Drawer Pulls - Stanley 4450
Shelf Supports - Knappe and Vogt 233 standards and
239 supports
Door Catches - Spring friction

Coat Hooks - 037 - 6 hooks, located as directed in field

8.04 Metal Covered Doors shall be Richards-Wilcox No. 479 galvanized steel flat surfaced doors reinforced for hardware specified above for doors 3 and 4.

9.0 GLASS AND GLAZING

9.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.

9.02 Materials shall be as follows:

9.021 Glass - Libby Owens, Mississippi or Pittsburg free from imperfections and delivered to job bearing manufacturer's label clearly marked as to grade and quality. Labels shall remain on glass until final approval.

- a. Window - 1/8" thick "smooth rough"
- b. Door - 3/16 inch thick heavy sheet "B" grade, clear

9.022 Putty shall be as follows:

- a. For wood glazing - Whiting, white lead, and pure boiled linseed oil.
- b. For steel sash - "Pecora," or equal, steel sash.

9.023 Glazing Clips - Copper clad steel spring wire as recommended by sash manufacturer.

9.03 Glazing

9.031 Setting Glass - Glass, except that secured by glazing angles or stops, shall be secured with clips, set in putty, backputtied and faceputtied. Glass, secured by glazing angles or stops shall be set in full bed of putty, glazing angle or stop then forced into putty bed and screwed into place, putty on both sides struck off flush.

10.0 PAINTING

10.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.

10.02 Work Included in this section is as follows:

Preparation of surfaces to receive paint finish
Priming and back painting of wood finish
Painting of exposed concrete block, woodwork, and metal work on exterior of building
Painting of exposed woodwork, piping, conduit, other metal surfaces and concrete block walls, on interior of building

Protection of floors, fixtures, and equipment against any spattering or dropping of paint, and removing all paint from such surfaces
Sanding, puttying, and other work incidental to or necessary for performance and completion of painting as specified.

10.03 Work Excluded from this section is as follows:

Prime coating of metal work for which shop coating is specified in other sections of these specifications
Painting of brass, white metal, porcelain enamel, or valves and polished metal parts
Factory painted work
Mechanical equipment

10.04 Materials shall be first quality General Paint Company products, or approved equal, compounded especially for the type of surface upon which it is to be applied. Materials shall be delivered to the job in the original unopened container. The reduction of paint materials shall be performed only as specified on paint package by manufacturer. Markers and trade names hereinafter listed are General Paint Company's, unless shown otherwise.

10.041 Colors shall be as selected by COMPANY from samples prepared by painter on various surface materials.

10.042 Paint Thinner - Standard Oil Company mineral spirits (no substitutions will be allowed).

10.043 Linseed Oil - Complying with Federal Specification JJJ-O-331 with Amendment 2, for boiled linseed oil.

10.044 Putty - Composed of equal parts pure white lead and whiting, mixed with linseed oil to proper consistency and colored to match finish.

10.045 All other materials shall be similar and equal to the brands and types hereinafter listed.

10.05 Preparation

10.051 Woodwork shall be hand-sandpapered and dusted clean.

10.052 Metal Surfaces - Pipe, and conduit shall be cleaned of oil and grease.

10.053 Concrete and Concrete Block Surfaces to be painted shall be wire brushed clean. Surfaces which are highly glazed, or where any trace of oil is present shall be treated with dilute solution of muriatic acid, and acid then removed with water.

10.06 Painting Requirements

10.061 General - Paint finishes herein are in addition to shop coats of primers specified in other sections of this specification.

10.062 Workmanship - Each coat of paint shall be applied at proper consistency and brushed out evenly free of brush marks, sags, or runs. Care shall be exercised to avoid lapping of paint onto glass or hardware. Second and third coats, on interior concrete block and all coats on ceilings may be sprayed.

10.063 Protection - Coverings and drop cloths shall be used to protect floors, fixtures and equipment and care exercised to prevent paint being spattered onto surfaces which are not to be painted. Surfaces from which such paint cannot be satisfactorily removed shall be painted or repainted as required to produce finish satisfactory to COMPANY.

10.07 Exterior Painting

10.071 Exposed exterior metal work shall be painted as follows:

- (a) First coat on all unpainted metal work -- one coat of red lead or zinc chromate metal primer, conforming to Standard Oil Company Specification No. 609.

• Revision No. 2
February 11, 1952
Specification 1-1040
Engineering Department
October 15, 1951

<u>Page</u>	<u>Reference</u>	<u>Revision</u>
19	Paragraph 10.073	Add the following: All coats shall be brushed on with a rotary motion using a fairly stiff bristled 6-inch wall brush. Particular care shall be taken to obtain penetration into all pores of the surface.
	Paragraph 10.073 (a)	Add the following: The two thinners shall be thoroughly mixed together before adding to "Aericoat." Apply the diluted material at the rate of one gallon per 500 square ft of wall.

- (b) First coat on all galvanized metal work -- one coat L&S #3801 primer.
- (c) Second coat on all primed metal work including shop and factory painted work -- one coat #2214 "Superbo Undercoater."
- (d) Finish coat -- #31411 enamel, colored as directed.

10.072 Exposed exterior woodwork, including doors, frames and trim, shall be painted as follows:

- (a) First coat on all new work - #1025 "Prime-tite."
- (b) Second coat -- #2214 Superbo Undercoater.
- (c) Finish coat -- #31411 enamel colored as directed.

10.073 Exposed concrete block, concrete above floor line and Insulrock shall be painted as follows:

- (a) First coat mixed two parts "Amercoat" No. 33-XX, one part SoCal No. 1 thinner and one part "Amercoat" No. 10 thinner.
- (b) Second coat -- Pittsburg Plate Glass Company's "Cementhide," tinted.
- (c) Third coat -- same as second.

10.08 Interior Painting

10.081 Exposed metal -- same as for exterior.

10.082 Exposed Woodwork -- same as for exterior.

10.083 Exposed Concrete Block and Durisol ceiling

- (a) First coat "Poly Prime" - #30669.
- (b) Second coat -- #2214 Superbo Undercoater.
- (c) Third coat -- #31411 enamel colored as directed.

10.084 Concrete Floors

- (a) First coat - clear Amercoat 33-XX diluted as specified for concrete block.
- (b) Second coat - same as first.
- (c) Third coat - Amercoat 33-XX undiluted applied 24 hours after second coat.

11.0 PLUMBING, HEATING AND VENTILATING

11.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.

11.02 General: Mechanical layout on drawings is schematic only. All work shall be done in accordance with Local Governing Codes and Ordinances and shall conform to the recommended minimum requirements of the American Standard Plumbing Code published by The American Society of Mechanical Engineers.

Support all lines free from vibration with due allowance for expansion and pitch. All piping shall be supported with 3/8-inch Kindorf or equal pipe hangers spaced not more than 20 feet apart. Hangers shall be secured to the steel or concrete structure.

11.03 Work Included is as follows:

11.031 Complete water, air, steam, condensate, soil and waste systems within the building and extending two feet outside the building line including:

- a. Water, air and drainage lines stubbed up or terminated where shown on drawings for connection to test engines by COMPANY.
- b. Water and drainage lines for sanitary plumbing, including drinking fountain, and evaporative coolers, connected to fixtures specified unless shown otherwise.
- c. Heating system complete including piping, fittings, louvers, fans, registers and convectors.
- d. Cooling system complete including evaporative coolers, ducts, registers, louvers, piping and fittings.
- e. Press shut off valve in each line at entrance to building.

11.04 Work Excluded is as follows:

- a. Utility lines from a point 2 feet outside the building line to the refinery mains.
- b. Test engines and their installation.
- c. Fume hood and installation.

- d. Reference fuel piping and pump.
- e. Stainless steel sink which is specified under sheet metal.
- f. Drinking fountain.

11.05 Soil and Waste Piping shall be as follows:

- a. Below Ground: Extra heavy cast iron with leaded oakum joints under building and 2 ft beyond building.
- b. Above Ground: 2 inch and larger, cast iron with leaded oakum joints. Under 2 inch, galvanized steel, with hot dipped screwed cast iron fittings. Vents likewise.

11.06 Water Piping shall be installed so that there shall be ample and uniform flow to all fixtures entirely free from pipe noises and water hammers.

- 11.061 Use standard weight galvanized seamless steel pipe, with banded malleable iron fittings. Reductions in pipe size shall be made with reducers, not bushings. Clean pipe and fittings of cuttings, etc. before connecting, make up with white leaded joints. Install ground joint unions at each fixture and 12-inch air cushion at faucet outlet.

11.07 Steam and Condensate piping shall be as follows:

- a. Standard weight black steel pipe with malleable iron fittings in sizes 2 inch and smaller, and welded or flanged connections in sizes 3 inch and larger.
- b. Valves in steam line, 150# screwed brass with renewable seats of globe or gate pattern. Strainers, 250# screwed C.I.
- c. Steam lines insulated with standard thickness 35% magnesia insulation and covered with a pasted 3 oz. canvas jacket.

11.08 Air Piping shall be standard weight black steel pipe with malleable iron fittings.

11.09 Pipe Sleeves one size larger than pipe shall be provided where lines pass through concrete or through exterior walls or roofs. Space between pipe and sleeve shall be caulked tight and water-proof.

11.10 Testing: Before covering piping make tight and test in accordance with local regulations or at 150% of line pressures or 50 psi minimum and all leaks made tight.

11.11 Plumbing Fixtures shall be "American Standard," unless shown otherwise, as follows:

a. Water Closet - "Madera" elongated F-2223VS with Sloan Crown 110 FTV flush valve and #9500 black moltex seat.

b. Fittings for Sink:

Faucet - B1095 right hand.

Tail Piece - M. Greenberg & Sons 1½-inch brass tailpiece No. 330 with 9-inch standing overflow.

c. Floor Drains - Zurn #Z-730 - 3 inch with bronze rim and grate less back water valve.

d. Hose Bibs - B-1682 - 3/4 inch

e. Fire Hose - 50 feet of 3/4-inch garden hose with adjustable brass nozzle for solid stream.

12.0 ELECTRICAL WORK

12.01 General Conditions: Section 1, "GENERAL CONDITIONS," bound herewith is a part of this specification and all work hereinafter specified is subject thereto.

12.02 Work Included is the complete power and lighting system except for work or materials specified as furnished or installed by COMPANY.

12.03 Work Excluded is as follows:

- a. The COMPANY will make the necessary arrangements for power service connection to provide a supply of electrical energy at 480 volts, 3 phase, 60 cycles.
- b. The COMPANY will provide underground power service conduit to connect to the underground conduit stub indicated on drawings.
- c. The COMPANY will provide feeder wires to the main circuit breaker in the power panel.
- d. The COMPANY will arrange for detailed wiring of individual Octane Testing Units. The CONTRACTOR shall provide conduit and wiring to the locations at individual Octane Testing Units indicated on drawings.
- e. COMPANY will install wiring for telephones and arrange for installation of service cable.

12.04 General:

12.041 All workmanship, materials and methods shall comply with the National Electric Code and the requirements of local governing codes and ordinances. All materials shall be new and shall have been approved by the Underwriter's Laboratories.

12.042 Drawings shall be followed as closely as actual construction of the building and work of other trades will permit.

12.05 Identification Markings

Each circuit breaker in both the power and the lighting panels shall be identified as indicated on the drawings to show the devices served by the branch circuit.

12.06 Testing and Final Inspection

To obtain acceptance of his work, the CONTRACTOR shall conduct a joint inspection with the OWNER'S representative; such an inspection shall show:

- (1) that the work of installation is complete in accordance with the plans and Specifications.
- (2) that tests indicate satisfactory insulation resistance, freedom from accidental grounds and short circuits on the installation as tested in part and as a whole.
- (3) that all parts of the system have been energized at normal working voltage and that each piece of equipment covered by this Contract has functioned satisfactorily in a test of operation.

SPECIFICATION NO. E-851
CONCRETE PROPORTIONING AND MIXING

1.0 Scope

This specification covers the materials to be used and the procedure to be followed in proportioning and mixing Portland cement concrete in the field.

2.0 Materials

- 2.1 Portland cement shall conform to the Standard Specifications for Portland cement, ASTM C150.
- 2.2 Water used in mixing concrete shall be clean and free from injurious amounts of oil, acid, alkali, organic matter, or other deleterious substances.
- 2.3 All aggregates shall be composed of inert materials that are durable and strong. The amounts of dust, organic matter, loam, or other deleterious substances in the aggregates shall not exceed the maximum permissible limits specified in the Standard Specification for Concrete Aggregates, ASTM C33.
- 2.4 Recommended maximum sizes of coarse aggregates are as follows:
 - a) Fine gravel between 1/8" and 3/8": Floors with "integral finish" carrying light loads and requiring a smooth surface. Structural floors may have larger aggregate depending upon the spacing of steel reinforcing, followed by a separate pour of a special mix for the finish. For floor finishes the smaller aggregates permit a smooth finish and provide a durable wearing surface.
 - b) 3/4" rock or gravel: Building work such as walls, columns, slabs, etc. Also floors carrying heavy loads.
 - c) 1" to 1-1/2" rock or gravel: Heavy walls, piers, footings.
 - d) 2" rock or gravel: Pavements, depending upon thickness of pavement.
 - e) 2" and larger, up to 8" or 10": Mass concrete construction, foundations with minimum thickness of 48"
- 2.5 The largest pieces of aggregate shall not be more than 1/5 the narrowest dimension between the forms or 2/3 of the clear opening between reinforcing bars.

3.0 Proportioning

- 3.1 General: The proportion of cement, fine and coarse aggregates shall be such that will produce a mixture which will readily work into corners and around reinforcing bars without segregating and honey-combing, or permitting water to collect on the surface.
- 3.2 The methods of measuring concrete materials shall be such that the proportions can be accurately controlled within 1% and easily checked at any time during the work.
- 3.3 The cement content in the concrete mixture shall be in accordance with the following table:

<u>Assumed Compressive Strength at 28 Days</u>	<u>Cement Content in 94 lb Sacks of Cement per Cubic Yard of Concrete</u>
2000 lb/sq. in.	5 sacks
2500 lb/sq. in.	5-3/4 sacks
3000 lb/sq. in.	6-1/2 sacks
3500 lb/sq. in.	7 sacks

In no case shall the cement content be less than 5 - 94 lb sacks per cubic yard of concrete.

- 3.4 The water content in the concrete mixture, including surface moisture of aggregate, shall be in accordance with the following table:

<u>Assumed Compressive Strength at 28 Days</u>	<u>Water Content U.S. Gallons per 94 lb. Sack of Cement</u>
2000 lb/sq. in.	7-1/2 gallons
2500 lb/sq. in.	6-3/4 gallons
3000 lb/sq. in.	6 gallons
3500 lb/sq. in.	5-1/2 gallons

In no case shall the total water content exceed 7-1/2 gallons per sack of cement.

4.0 Consistency and Workability

- 4.1 The consistency of the concrete mix shall be such that it is plastic and workable. The consistency shall be determined in advance of placing concrete by the standard slump test. The following table indicates the concrete consistencies suitable for different types of work:

RECOMMENDED SLUMPS FOR CONCRETE		
Type of Structure	Slump Inches	
	Minimum	Maximum
Massive sections, pavements and floors laid on ground	1	4
Heavy slabs, beams or walls	3	6
Thin walls and columns, ordinary slabs or beams	4	8

More workable concrete mixtures are required for thin walls with reinforcing than for floors, heavier walls or mass footings.

- 4.2 The workability of the concrete shall not be increased by adding water to the mixture. Whenever necessary, the workability shall be varied by changing the mix proportions while maintaining the required water-cement ratio. An increase in workability may be obtained by increasing the ratio of fine to coarse aggregate, or by increasing the cement content, or both.

5.0 Mixing of Concrete

- 5.1 Unless otherwise authorized by COMPANY the mixing of concrete shall be done in a batch mixer approved by COMPANY. The volume of the mixed material for each batch shall not exceed the manufacturer's rated capacity of the mixer. The mixer shall be rotated at the speed recommended by the manufacturer.
- 5.2 The concrete shall be mixed until there is a uniform distribution of the material and shall be discharged completely before the mixer is recharged.
- 5.3 For mixers of a capacity of one cubic yard or less the mixing shall be continued for at least one minute after all materials are in the mixer. For mixers larger than one cubic yard capacity the minimum mixing time shall be increased 15 seconds for each additional half cubic yard or fraction thereof.

- 6.0 Conveying: Concrete shall be conveyed from the mixer to the place of final deposit by methods which will prevent the separation or loss of the materials.

RAS-AMC

February 9, 1949.

CHEV BB
0000570

SPECIFICATION E-516

REINFORCING STEEL FABRICATION

1.0 GENERAL

- 1.1 This specification covers the detailing, furnishing, fabricating, marking and delivery of fabricated reinforcing steel called for on COMPANY drawings and purchase order.
- 1.2 SUPPLIER shall not supply wire mesh, tie wire, chairs, anchor bolts, nor the placement of reinforcing steel furnished under this specification.
- 1.3 Deviations in the scope or details of the work from those herein specified may be stated in the purchase order which shall have precedence over this specification.

2.0 DRAWINGS

- 2.1 SUPPLIER shall prepare complete shop detail and placement drawings and shall furnish three copies of each drawing to COMPANY. COMPANY approval of these drawings will not be required.
- 2.2 SUPPLIER shall furnish in addition to the prints above three complete sets of all shop detail and placement drawings. These prints shall accompany the steel to the job site, and shall be adequately packaged to arrive in good condition.
- 2.3 SUPPLIER shall correct, or shall assume the cost of correcting, any errors in detailing and fabricating work performed by him.

3.0 MATERIAL

- 3.1 All reinforcing steel shall be structural grade bars conforming to ASTM Specification A-15 with deformations in accordance with ASTM A-305. Acid Bessemer steel is not acceptable.
- 3.2 All bars shall be round unless otherwise noted on the drawing.
- 3.3 All bars except 1/4-inch are deformed unless otherwise noted on the drawing.

4.0 DETAILS OF CONSTRUCTION

- 4.1 All general details of construction and workmanship shall be as specified by the latest edition of A.C.I. Code and the A.C.I. Manual for Detailing Reinforced Concrete Structures, unless specifically covered by this specification.

4.2 Where not otherwise shown, concrete coverage over the reinforcement shall be as follows:

4.21 Unformed sections below grade: 3 inch

4.22 Formed sections below grade: 2 inch

4.23 Columns and beams above grade: 1-1/2 inch

4.24 Roof, floor and wall slabs: 1 inch

4.3 Closed type stirrups, 3/8 inch minimum round spaced at 18-inch centers shall be provided for all beams and joists with top steel where no stirrups are called for on the drawing.

4.4 Two longitudinal carrier bars, 3/8 inch round without hooks, shall be provided in the top corners of all concrete beams if there are stirrups and no top steel shown on the drawing.

4.5 Ends of non-continuous bars in beams and slabs are to terminate in standard hooks unless otherwise shown.

4.6 Unless otherwise shown on drawings, all bar splices shall be lapped at least 45-bar diameters.

5.0 MARKING FOR SHIPMENT

5.1 Each bundle shall be tagged to show destination by name, address, and order number as shown on Purchase Order.

5.2 Each bundle of straight bars shall be tagged to show number of pieces, size, and length.

5.3 Each bundle of bent bars shall be tagged to show number of pieces and code number as shown on placement drawing.

5.4 All tagging shall be with cloth tags and waterproof ink or pressed metal.

6.0 INSPECTION

The COMPANY reserves the right to inspect all material before shipment.

7.0 CHANGES

If any changes required by the COMPANY affect the cost of the work, the SUPPLIER shall submit an estimate of the additional cost for COMPANY approval immediately upon receiving change order or revised drawings.

SPECIFICATION NO. E-850

PLACING AND CURING CONCRETE

1.0 Placing

- 1.1 Concrete shall be deposited as nearly as practicable in its final position to avoid segregation due to rehandling or flowing. The concreting shall be carried on at such a rate that the concrete is at all times plastic and flows readily into the spaces between the bars. No concrete that has partially hardened or has been contaminated by foreign material shall be deposited on the work, nor shall retempered concrete be used. Concrete shall not be deposited during rain unless adequately protected, and in any case, shall be protected from rain until it has hardened sufficiently so that it will not be damaged.
- 1.2 Concrete shall be placed with properly constructed aprons or chutes extending down into the forms to control the flow of concrete and prevent segregation. The free fall of the concrete deposited into forms shall be limited to six feet. Regardless of the type of transporting vehicle or placing equipment, concrete shall have the quality required when deposited in the forms.
- 1.3 When concreting is once started, it shall be carried on as a continuous operation until the placing of the panel or section is completed. The top surface shall be generally level. When construction joints are necessary they shall be made in accordance with Section 6.
- 1.4 All concrete shall be thoroughly compacted by suitable means during the operation of placing, and shall be thoroughly worked around the reinforcement and embedded fixtures, and into the corners of the forms. The compacting may be done by spading or rodding the concrete, tapping or hammering the forms when possible, or vibration; however, in no case shall the concrete be rodded or vibrated to such an extent that segregation takes place.

2.0 Curing

Concrete shall be maintained in a moist condition for at least seven days after placement, except that for high-early strength concrete, moist curing shall be provided for at least the first three days.

3.0 Forms

- 3.1 Forms shall conform to the shape, lines, and dimensions of the members as called for on the plans, and shall be substantial, free from surface defects, and sufficiently tight to prevent leakage of mortar. They shall be properly braced or tied together so as to maintain position and shape.

- 3.2 Contact surfaces of forms for exposed concrete shall be made up of surfaced lumber or equivalent and shall be treated with Standard Oil Company of California's "Diamond Form Oil." Soil and forms for unexposed concrete shall be thoroughly soaked with water before placing concrete. Forms shall be clean of any foreign material and excess water before concrete is placed.
- 3.3 All edges and corners of exposed concrete shall have a 1-inch chamfer.
- 3.4 Forms shall be removed in such a manner as to insure the complete safety of the structure. In no case shall the supporting forms or shoring be removed until the members have acquired sufficient strength to support safely their weight and the load thereon. Side forms which do not resist dead load bending may be removed within a period of from two (2) to five (5) days as authorized by COMPANY.

4.0 Reinforcement

- 4.1 Metal reinforcement, at the time concrete is placed, shall be free from rust, scale, or other coatings that will destroy or reduce the bond. Bends for stirrups and ties shall be made around a pin having a diameter not less than two times the minimum thickness of the bar. Bends for other bars shall be made around a pin having a diameter not less than six times the minimum thickness of the bar, except that for bars larger than one inch, the pin shall be not less than eight times the minimum thickness of the bar. All bars shall be bent cold.
- 4.2 Metal reinforcement shall be accurately placed in accordance with the plans and shall be adequately secured in position by concrete or metal chairs and spacers. Ties at intersections shall be made with annealed wire.
- 4.3 In slabs, beams, and girders, splices of reinforcement at points of maximum stress shall be avoided. Bar splices may be welded or must be lapped at least 45 bar diameters.

5.0 Concrete Protection for Reinforcement

The metal reinforcement shall be protected by the thickness of concrete indicated on the plans. Where not otherwise shown the thickness of concrete over the reinforcement shall be as follows:

Where concrete is deposited against the ground without the use of forms, not less than 3".

Where concrete is placed in forms and is to be exposed to weather or to be in contact with the ground, not less than 2".

In beams, girders, and columns not exposed to the ground or to the weather, not less than 1-1/2 inches.

In all cases the thickness of concrete over the reinforcement shall be at least equal to the diameter of round bars and one and one-half times the side dimension of square bars. Exposed reinforcement bars intended for bonding with future extensions shall be protected from corrosion by concrete or other adequate covering.

6.0 Construction Joints

- 6.1 Joints not indicated on the plans shall be so made and located as to least impair the strength of the structure. Where a joint is to be made, the surface of the concrete shall be thoroughly cleaned and all laitance removed. In addition to the foregoing, vertical joints shall be thoroughly wetted but not saturated, and slushed with a coat of neat cement grout immediately before placing of new concrete.
- 6.2 At least two hours must elapse after depositing concrete in the columns or walls before depositing in beams, girders, or slabs supported thereon. Beams, girders, brackets, column capitals, and haunches shall be considered as part of the floor system and shall be placed monolithically therewith.
- 6.3 Construction joints in floors shall be located near the middle of the spans of slabs, beams, or girders, unless a beam intersects a girder at this point, in which case the joints in the girders shall be offset a distance equal to twice the width of the beam. In this last case provision shall be made for shear by use of inclined reinforcement.

SPECIFICATION NO. E-943
CONCRETE BLOCK CONSTRUCTION
(Hollow Unit Masonry)

1.0 SCOPE

- 1.1 This specification covers the materials to be used and the procedure to be followed in building Concrete Block Masonry Walls.
- 1.2 Where other specifications are referred to herein, the latest edition of such specifications is intended.

2.0 GENERAL WORKMANSHIP

- 2.1 The work of the masonry contractor shall be coordinated with that of the other trades. All openings and chases for heating, plumbing and electrical ducts, pipes and conduits shall be built into the masonry walls as shown on the plans. Provision shall be made for installation of bolts, toggles, flashing, beams, anchors, hangers, nailing strips, wall plugs, and frames as required.
- 2.2 At the conclusion of the masonry work, contractor shall clean down all masonry walls and remove all equipment, refuse and surplus material from the site.

3.0 MATERIALS

- 3.1 Hollow Load Bearing Masonry Units shall conform to A.S.T.M. Specification C-90 Grade B blocks except that units shall be made with lightweight aggregates unless otherwise indicated on the drawings.
- 3.2 Hollow Non-Load Bearing Concrete Masonry Units shall conform to A.S.T.M. Specification C-129 except that units shall be made with lightweight aggregates unless otherwise indicated on the drawings.
- 3.3 Mortar
 - 3.31 Materials used as ingredients in the mortar shall conform to the specifications listed below:
 - Portland cement: Type I or III A.S.T.M. Specification C-150
 - Quicklime for Structural Purposes: A.S.T.M. Specification C-5
 - Hydrated Lime for Masonry Purposes: A.S.T.M. Specification C-207
 - Aggregates for Masonry Mortar: A.S.T.M. Specification C-144
 - 3.32 Water shall be clean and free of deleterious amounts of acids, alkalies or organic materials.

- 3.33 No anti-freeze compounds shall be used to lower the freezing point of the mortar. Admixtures shall not be used unless specifically called for by company specification or drawings.

3.4 Concrete

Concrete used for studs, bond beams, lintels, etc. shall be mixed and placed in accordance with Specifications E-850 and E-851. The minimum strength of the mix shall be 2000 p.s.i. at 28 days. The maximum aggregate size for bond beams and studs shall be 1/2-in. Pre-cast units may be used in place of cast in placing concrete for bond beams, lintels, and sills.

4.0 LAYING OF BLOCKS

4.1 Blocks

Concrete masonry units shall be in a dry condition when delivered to the building site and shall be protected against wetting prior to laying in the walls. Special units shall be provided to form bond beams, jambs, recess for joist, etc., so that proper bond will be maintained throughout the length of the wall. All blocks shall be neatly cut as required preferably by power saw equipment. Clean-out holes shall be cut at the bottom of each stud (refer to section 5.1).

4.2 Mixing of Mortar

Unless otherwise noted the mortar mix for above-ground construction shall be type B as specified in Uniform Building Code. This mix consists of 1 part Portland cement, not more than 1/2 part hydrated lime or lime putty, and $4\frac{1}{2}$ parts aggregate, by volume. The mix shall develop a minimum compressive strength of 1800 psi at 28 days.

4.3 Joints

Mortar joints shall be 3/8 inches thick with full mortar coverage on vertical and horizontal face shells. Vertical joints shall be shoved tight. Exposed mortar joints shall be struck off flush with wall surface and when partially set shall be compressed and compacted with a round jointing tool to form a concave surface. Joints to be covered by plaster shall be struck flush with the face of the wall.

4.4 Laying Out

All masonry walls shall be true and plumb and built to dimensions as indicated on the plans. The wall shall be laid in straight uniform courses with each vertical joint aligned over the center of the unit below, giving perfect alignment of vertical cells. A constant check on vertical spacing shall be maintained to assure that each course is level all around the building.

4.5 Intersecting Walls

Intersecting walls, partitions and block columns shall be interlocked with the main wall to form masonry keys or if not interlocked shall be tied with $1/4$ " round bent bars embedded in the mortar joint 16 inches on centers. Ties shall be in the form of a loop projecting at least one block thickness into each intersecting wall.

4.6 Protection of Masonry

All masonry shall be protected against freezing for at least 24 hours after laying.

5.0 REINFORCEMENT

5.1 Studs

Reinforced concrete studs shall be located as shown on the layout drawings. Studs shall always be located at each side of all windows and doors and at all corners. A 4-in. x 4-in. cleanout hole shall be cut from the interior side of the block at the foot of each stud, and all loose mortar rodded down and removed. Studs shall be poured in such a manner as to insure a continuous column free from voids. Pieces cut out for these cleanout holes shall be carefully replaced with mortar joints wherever a finished interior wall is to be exposed. Unless shown otherwise on the drawing, reinforcing of studs shall be $1/2$ $\emptyset$ bars lapping foundation dowels 2-ft. and hooked 6-in. into the bond beam at the top. Foundation dowels shall be $1/2$ $\emptyset$ 4-ft. long and shall be placed so that they will align with the center of the poured concrete studs and shall project 2-ft. above foundation.

5.2 Bond Beams

Reinforced concrete bond beams shall be installed as shown on the layout drawings. Cells of courses below concrete bond beam units and cells below those to receive anchor bolts shall be filled with sacking or similar material of sufficient strength to prevent concrete from dropping into cells or wire screen cloth may be placed along top of block before concrete is poured. Unless otherwise noted, reinforcing bars for bond beams shall consist of 2-3/8 bars lapped 45 dia. when a splice is required.

SPECIFICATION NO. E-398

STEEL FABRICATION

1.0 GENERAL

- 1.1 This specification covers the detailing, furnishing of material, fabricating, marking and crating (if necessary) for shipment of fabricated steel and manufactured items called for on COMPANY drawings and purchase order.
- 1.2 Where other specifications are referred to herein, the latest edition of such specifications is intended.
- 1.3 FABRICATOR shall, at the option of COMPANY, correct or assume the cost of correcting, any errors in detailing and fabricating work performed by him, which prevent accurate field fit-up.

2.0 DRAWINGS

- 2.1 FABRICATOR shall prepare complete shop detail and erection drawings and shall furnish three copies of each drawing to COMPANY. Unless otherwise specified on purchase order, approval of these drawings by COMPANY prior to starting fabrication will not be required.
- 2.2 Unless otherwise stated on purchase order, FABRICATOR shall furnish in addition to the prints above, three complete sets of all detail sheets and erection diagrams. These prints shall accompany the steel to the job site, and shall be adequately packaged to arrive in good condition.
- 2.3 COMPANY'S approval of FABRICATOR'S drawings shall be for general arrangement only and shall not relieve the FABRICATOR of entire responsibility for correctness of details and dimensions.

3.0 INSPECTION

- 3.1 The COMPANY reserves the right to inspect all material before shipment. Unless otherwise noted on purchase order, the supplier shall notify the COMPANY at least five days prior to shipping so that arrangement can be made for inspection.

4.0 CHANGES

- 4.1 If any changes required by the COMPANY affect the cost of the work, the FABRICATOR shall submit an estimate of the additional cost for COMPANY approval immediately upon receiving change order or revised drawings. If request for additional compensation is not received by COMPANY within ten (10) days after issuance of a change order or revised drawings, COMPANY shall conclude that no change in the contract price of the work is required by such change.

5.0 MATERIALS

- 5.1 All steel shapes and plate shall conform to ASTM Specification A7 except that no acid-Bessemer steel is acceptable. Sizes and weights of members shall be not less than those shown on drawings and any substitutions shall be approved by COMPANY.
- 5.2 Electrodes for welding shall conform to ASTM Specification A233, Series E60 electrodes, and shall be suitable for the positions and other conditions of intended use.
- 5.3 Rivets shall conform to ASTM Specification A141.

6.0 FABRICATION

- 6.1 Fabrication shall conform to the AISC Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
- 6.2 Welding shall conform to the AWS Standard Code for Arc and Gas Welding in Building Construction, unless otherwise noted.
- 6.3 All shop and field connections shall be as shown on the drawings. If connections are not indicated or detailed on the drawings, shop connections may be welded or riveted unless otherwise noted; field connections shall be bolted unless otherwise noted. All required bolt holes shall be shop punched. Connections which are not shown on the drawings shall be adequate to develop the full strength of the member connected if welded; if the connection is riveted or bolted it shall be designed for a joint efficiency of not less than 65%.
- 6.4 Shop assembly shall be as complete as possible, consistent with the feasibility and economy of handling and shipping the assembled units, in order to reduce field connections to a minimum. If any steel section or assembly is too long for shipment and no field joints are shown, provision shall be made for field joints of adequate strength.
- 6.5 FABRICATOR shall furnish field erection clips and bolts (plus 10 per cent extra) required for field erection. FABRICATOR shall place all angles and clips and provide all holes necessary for bolted field erection or for fit-up prior to welding where welded field connections are called for. In the case of ladders and platforms for columns or other vessels the purchase order or drawing will indicate whether the platform and ladder supporting clips are to be supplied by the vessel supplier or by the platform FABRICATOR. If the latter is specified, these clips shall be fabricated and bolted to the proper members before shipment.

- 6.6 Platforms: Where toeboards are called for on the drawings, they shall extend all around the platform including the edge of platforms adjacent to columns and vessels, and shall be omitted only at passages and ladders.

All platform plating shall be securely welded to frame members except where plating is shown removable, in which case it shall be bolted to frame members with 3/8-in. countersunk flat head bolts. Platform grating, unless otherwise shown on the drawings, shall be anchored by anchor clips furnished by grating supplier.

- 6.7 All hinged drop platforms shall be shop-welded in integral units, and the hinged connection to the corresponding fixed platform section shall be assembled in the shop to obtain accurate fit. Corresponding platforms shall be match-marked, and the marks indicated on the erection drawings. The counterweight mechanism shall likewise be shop assembled and match-marked.
- 6.8 Handrails shall be assembled and attached to platforms if it is possible to make shipment of the assembled section. In any event, all straight handrails shall be shop-assembled and shipped in sections with provision for field joints between sections.
- 6.9 Ladders and hoop guards shall be assembled and shipped as complete units ready to be bolted to the vessels in the field. Any ladders that cannot be shipped in one piece because of excessive length, shall be shipped in sections; each section assembled and so fabricated that it can be bolted to the other sections in the field.
- 6.10 Exposed corners, edges, burrs or rough spots on handrails, guards etc. which might cause injury to personnel using the assembled structure shall be ground or filed smooth.

7.0 WINDOWS AND DOORS

- 7.1 Unless otherwise shown on the drawings, steel sash shall be industrial type of standard sash dimensions as shown; sash shall have steel frame of solid rolled sections, vented as shown on the drawings.
- 7.2 Unless otherwise indicated on the drawings sash shall be provided with standard cam handle and stay bar hardware and shall be furnished complete with copper plated steel spring glazing clips.

Sufficient standard clips, and 3/8-inch bolts shall be provided to clip the sash to the pick-up angles at 18-inch intervals or less.

7.3 All steel doors shall be of the size, type, appearance and swing as indicated on the drawing. Unless otherwise shown, the upper panel of each door shall have a solid rolled steel sash section built as an integral part of the door; the lower panel of each door shall be not less than 18-gauge steel welded to rails and stiles and reinforced where necessary to provide rigid construction.

7.4 Unless otherwise indicated on the drawings, all steel doors shall be provided with the following hardware:

Each swing leaf shall be equipped with heavy steel hinges and one lever latch. Where hung in pairs, the inactive leaf shall be provided with top and bottom bolts.

Sliding doors shall be hung from double trolleys and shall be provided with guides, handles, stops and hasp staples.

Doors shall be adequately reinforced at all points where hardware is attached.

8.0 PAINTING

8.1 All material except grating shall be given one shop coat of zinc chromate paint conforming to Navy Specification 52-P-18. Grating shall be given one coat of black paint unless otherwise noted on the drawings.

8.2 Immediately before painting, all material shall be thoroughly cleaned of rust, grease, scale, and dirt by sandblasting or pickling unless the drawings or purchase order state that wirebrushing is acceptable.

8.3 Parts not in contact but inaccessible after assembling, and surfaces inaccessible for painting after erection shall be given two coats of above paint.

8.4 No material shall be shipped until shop coat of paint is thoroughly dry.

9.0 MARKING FOR ERECTION AND ASSEMBLY FOR SHIPPING

9.1 All fabricated steel sections shall be match-marked for field assembly with designating numbers or letters corresponding to the field erection drawings.

9.2 All steel sash, doors, small pieces, bolts, etc., shall be suitably crated or bundled and adequately marked for shipment.

9.3 All marking shall be done with waterproof ink. All tagging shall be with cloth tags and waterproof ink or pressed metal.

2-1-50

BUILT-UP ROOFING SMOOTH TOP ASBESTOS

Page 1 of 4

1.0 SCOPE

This Specification covers the materials to be used and the method in which they shall be applied in the construction of built-up smooth top asbestos roofing. Complete data are given for roofing laid on concrete or gypsum, wood and steel decks. Drawing No. 2 attached is part of, and complementary to, this Specification.

2.0 MATERIALS

Approx. Quantities Required per Square
for Various Types of Roof Decks.

2.1 Roofing	Concrete or		
	Gypsum	Wood	Steel
*Primer, Standard Petrolastic Primer	1 gal.		1 gal.
Asphalt, Petrolastic #165	90#	75#	150#
Felt, 15# Asphalt saturated asbestos	60#	45#	60#
Felt, 45# Asphalt saturated asbestos		45#	
Felt, 15# Asphalt saturated rag			15#
Nails, 7/8" x 11 ga., 5/8" dia. head, galv. barbed.		1 1/2#	
Tinned Caps, 1"-1 1/2" dia.		1-1/3#	
Manufacturers Asbestos Roof Coating Special (S.O. Co.)	2 gal.	2 gal.	2 gal.

*2 coats on gypsum, use 1 1/2 gals. total

2.2 Flashing	Quantity Required per 100 Lineal Feet
Plastic Cement (S.O. Co. or equal)	75#
38# Asbestos Base Felt (15" wide)	47#
15# Asbestos felt (4" wide)	7 1/2#
Asphalt, Petrolastic #165	35#
Nails, 1" roofing, specify for concrete if so used.	1-3/4#
Manufacturers Asbestos Roof Coating Special (S.O. Co.)	1 gal.

3.0 ROOFING APPLICATION

3.1 Preparatory Work. Roof decks shall be clean, smooth and dry; free of unnecessary holes, depressions, projections, and properly graded to gutters and drains. All functions of roof deck and vertical surfaces shall be provided with cant strips, coves or crickets.

3.2 Concrete or Gypsum Deck

3.2.1 Primer. Prime entire concrete deck and extend primer up masonry walls 8" above top edge of cant strip. Allow priming coat to dry thoroughly before laying any roofing.

BUILT-UP ROOFING SMOOTE TOP ASBESTOS

- 3.22 Felts. Lay four plies of 15# asphalt saturated asbestos felts, the first felt to be spot mopped to the deck and the other plies solid mopped to it and each other. The felts shall be laid shingle fashion with a $27\frac{1}{2}$ " lap ($8\frac{1}{2}$ " Exp.) for 36" felts or $24\frac{1}{2}$ " for 32" felts on the sides and 6" on the ends. Break all end joints 3'. If deck permits, blind nail second and third plies $3/4$ " from back edge on 6" centers.

In laying roof, start at low point and lay all plies at right angles to slope of roof providing the slope does not exceed 3" in 12"; should it be in excess to this, lay the felts parallel to the slope.

All nailing is to be done through tinned caps.

Extend all roofing felts 1" to 4" up vertical walls feather fashion and mop solid to wall and each other.

Reinforce all gutters and valleys with an extra ply of 45# asbestos felt laid full width and mopped solid.

Spot mopping shall cover about one-half of deck using 10-15 pounds of asphalt per square. On solid mopping use not less than 25 pounds of asphalt per square. The application temperature of the asphalt shall be between 350° - 400° F and at no time shall the kettle temperature exceed 450° F.

In applying the roofing, all felts shall be rolled into the hot asphalt, brooming shall follow immediately behind the laying. In no case shall the application of the asphalt precede the felt laying by more than 3 to 5 feet. Flopping of felts not permitted.

- 3.23 Roof Coating. Coat the entire surface with Manufacturers Asbestos Roof Coating Special (S.O. Co.) applied at the rate of two gallons per square.

3.3 Wood Decks

- 3.31 Felts. Lay one base ply of 45# asphalt saturated asbestos felt. Lap 2" all around and nail 6" O.C. through laps and 18" O.C. staggered through the center of the sheet. Lay 3 plies of 15# asphalt saturated asbestos felts solid mopped to the base felt and to each other. Blind nail 6" O.C. along back edge. Lap sheets 25" on sides (11" Exp.) for 36" felts or 22" for 32" felts and 6" on ends. Break all end joints 3'.

All nailing shall be through tinned caps.

Application of asphalt and orientation of felts shall be the same as described under concrete decks (part 3.22). This includes reinforcement of gutters and valleys.

3.32 Roof Coating. Same as for concrete decks (part 3.23).

3.4 Steel Decks.

3.41 Primer. Prime steel deck and allow to dry thoroughly before applying roofing.

3.42 Vapor Barrier. Solid mop to deck one ply of 15# asphalt saturated rag felt using 25# of asphalt per square and lapping sheets 6" all around. At vertical walls turn up sheets 6" but do not mop to wall.

3.43 Insulation. Apply () layer of () thick insulation. Mop the insulation solid to the base felt using not less than 25# of asphalt per square. Slip the sheets of insulation into the asphalt so that some of the asphalt is squeezed up between the sheets. Where the insulation joins vertical walls turn down and mop solid to the insulation the up-turned flap of the vapor barrier felt. Seal insulation at ridges, eaves and vertical joints with 12" wide strips of 15# saturated rag felt mopped solid to base felt and bottom of insulation and then turned over edge of insulation and mopped solid to the top of the insulation.

Insulation shall be laid with end joints staggered, and when more than one layer of insulation is laid, break all joints.

3.44 Felts. Lay four plies of 15# asphalt saturated asbestos felts per the procedures described for concrete decks (part 3.22) with the exception that the first ply shall be solid mopped instead of spot mopped to the insulation.

3.45 Roof Coating. Same as for concrete decks (part 3.23).

3.46 Unfinished Roofing. Glaze with hot asphalt all unfinished roofing to be exposed to weather over night.

4.0 FLASHING

4.1 General. The flashing system described below (part 4.2) shall be used on smooth topped asbestos roofs laid on concrete or gypsum, wood, and steel decks.

4.2 Procedure. Solid mop to vertical wall and roof one ply of 38# asbestos base flashing extending beyond edges of cant strip 6" up the vertical wall and 4" on to the roof. Nail top edge to wall using suitable nails 4" O.C. (max.). Lap ends 4", mop solid and nail vertically 4" O.C.

Cover vertical seams with a 1/8" layer of plastic flashing cement 5" wide and embed a 4" wide strip of 15# asbestos felt. Over this apply a second 1/8" x 5" layer of cement and trowel to a feather edge. Similarly treat the horizontal joint on the vertical wall.

Where the base flashing extends onto the roof, cover the edge with a 4" wide strip of asbestos felt solid mopped on with asphalt and then mopped over with asphalt.

Coat all flashing with Manufacturers Asbestos Roof Coating Special (S.O. Co.) at rate of two gallons per square.

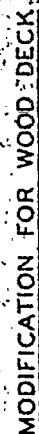
5.0 VENT PIPE FLASHING, GRAVEL STOPS, ETC.

Install all vent pipe flashing, gravel stops, and other roof fixtures over the first ply of roofing felt and mop solid to it. On wood decks also nail around edges 4" O.C.

After attaching fixtures to roof, seal all edges with a 4" wide strip of 15# asbestos felt mopped solid with asphalt. In addition, around vent pipes apply a reinforcing collar of 15# asbestos felt cut to fit pipe smoothly and extending 6" onto the roof beyond the fixture edge. Mop this collar solid to fixture and base felts. On vent pipes, after installing reinforcing collar, build up with plastic roof cement a cant at junction of collar with roof. Lay balance of roofing plies over the reinforcing in the usual manner.

Attach: Drawing No. 2 - Application Details for Smooth Top Asbestos
Built-Up Roofing per Specification 57

DRAWING NO. 2



MODIFICATION FOR STEEL DECK

CHEV BB
0000587