

SPECIFICATIONS FOR 195' x 35' x 11' SINGLE TANK CAUSTIC BARGE
PROJECT P-405

DATE: 9/22/60

1. General

These specifications are intended to describe the general arrangement, design and construction of a barge to be used for the transportation of liquid caustic soda on the Mississippi River System and tributaries; the Gulf Intracoastal Waterway, east to Carrabelle, Florida, and west to Brownsville, Texas; and the Atlantic Intracoastal Waterway; including lakes, bays and sounds (excluding the Great Lakes).

The barge shall also be suitable for transportation of Grade "E" combustible liquids in the rake compartment in accordance with the regulations of the United States Coast Guard. The barge shall be classified /A-1 by the American Bureau of Shipping. All materials and workmanship shall be in accordance with the requirements of the United States Coast Guard and the American Bureau of Shipping.

These specifications are intended to cover the design and construction of one 195' x 35' x 11' Liquid Caustic Soda Barge complete, ready for use by the purchaser, including all necessary inspections and approvals by the United States Coast Guard and the American Bureau of Shipping, as required by Section 15, Certification, and any item required to secure these approvals shall be considered as contained herein.

2. General Arrangement

The general arrangement of the barge shall be similar to that shown on Columbia-Southern Chemical Corporation Dwg. Nos. 9E-530-3, 9E-531-3, 9E-532-4, 9E-536-5 and 9E-537-2 with moulded dimensions 195' x 35' x 11'.

The barge shall have one rake end and one square end. It shall have one semi-circular cargo tank and shall be equipped with one Diesel-engine driven cargo pump. No ballast pump will be required.

The barge shall have a minimum side deck width of 4'-0". The barge shall be designed and constructed that it will trim not less than six inches (6") low at the bow at light ship and will have uniform trim when loaded to 8'-6" draft, without using water ballast. If permanent ballast is required to obtain these results it shall be concrete ballast placed above deck in steel enclosures as shown on Dwg. Nos. 9E-558-1 and 9E-568.

3. Hull

The basic hull design shall be all welded dry cargo type barge with one rake and one square end. The square end shall be fitted with suitable towing knees extending above deck to protect equipment. The stern shall be strengthened as shown on Dwg. No. 9E-574. Columbia-Southern Chemical Corporation Dwg. Nos. 9E-530-3, 9E-531-3, 9E-532-4, 9E-536-5, 9E-537-2, 9E-558-1, 9E-568, 9E-572, 9E-573, and 9E-574 are included with these specifications to be used as a guide in design of the barge. All welding of hull plates, all stiffeners, frames,

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3. Hull (Contd.)

trusses, platforms, hangers, supports, etc. shall be continuous so that all metal to metal surfaces are completely sealed.

All transverse frames, longitudinal trusses and stiffeners, and all other structural members shall be constructed of single members.

The thicknesses of the hull plating shall be as required by the American Bureau of Shipping and the United States Coast Guard, but shall not be less than the following:

Deck - 3/8"
Sides - 3/8"
Bottom - 5/16"
Bulkheads - 1/4"
Headlogs - 1/2"
Corners - 3/4"
Deck Insulation Cover - 1/4"
Brackets, Stiffeners, etc. - 1/4"

4. Cargo Tank

The barge shall contain one cargo tank having a net capacity of not less than 1200 short tons of liquid caustic soda at 1.53 specific gravity.

The tank shall be similar in design to that shown on Columbia-Southern Dwg. Nos. 9E-533-4, 9E-534-3, 9E-535-3, 9E-538-2, 9E-541-4, 9E-542-3, 9E-544-2, and 9E-545-3 which are included in these specifications to be used as a guide in design.

The tank shall be double-welded construction. At the "T" joints where the tank shell intersects the tank top and where tank shell intersects the end bulkheads, the shell plate shall be beveled and welded from both sides to give complete penetration. All welds inside of tank shall have smooth, round, continuous reinforcement. All pits and/or projections shall be ground to a smooth radius and all weld spatter shall be removed. All inside finish welds shall be approved by Owner's representative.

The single tank shall be divided by transverse bulkheads into three compartments. The bulkheads shall be of large corrugations. Each bulkhead shall be equipped with a sluice gate and a 3" x 17" air passage. The bulkhead opening for the sluice gate shall be 3'-6" wide by 3'-0" high. The sluice gate shall be designed essentially as shown on Columbia-Southern Dwg. No. 9E-535-3. The sluice gates shall not be installed at this time unless required by the American Bureau of Shipping and/or the United States Coast Guard. However, all openings through the tank top and deck insulation cover, and all guides shall be installed so that the gates can be installed at a later date at a minimum cost.

The tank shall be hydrostatically or air tested for water-tightness. The tank shall be fitted with an external heating jacket for 50 psig steam to provide

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4. Cargo Tank (Contd.)

2000 square feet of heating surface. The steam jacket shall be similar in design to that shown on Columbia-Southern Dwg. No. 9E-573. If ABS and USCG approval cannot be obtained for this design, use design as shown on Dwg. No. 9E-533-4 as an alternate. In the event the new design of steam chest is used, it will be necessary to raise cargo tank at least 2".

Provisions shall be made in the construction and installation of the tank, including tank cover, to allow for expansion longitudinally and transversely and for installation of fiberglass insulation on all sides of the tank, including ends and tank cover. For insulation specifications refer to Section 8 - Insulation, and to Columbia-Southern Dwg. Nos. 9E-544-2 and 9E-545-3.

The tank shall be fitted with four 28" diameter hinged manways, three of which shall have 6" diameter ullage fitting essentially as shown on Columbia-Southern Dwg. No. 9E-541-4, except that the center pivot shall be strengthened by substituting hinge with 3/4" diameter pin. The location of the manways shall be essentially as shown on Columbia-Southern Dwg. No. 9E-545-3.

5. Tank Supports

Steel saddles shall be worked into the hull framing for the reception of the cargo tank. The saddles shall be lined with insulating concrete using Johns-Manville Sil-O-Cel C3 for aggregate. Refer to Columbia-Southern Dwg. 9E-533-4.

6. Fittings

The cargo tank shall be fitted with four 28" diameter hinged manways.
(See Section 4 - Cargo Tank.)

Four 16" x 24" raised coaming hinged manways shall be installed in the deck for access to the hold.

Two 16" x 24" raised coaming hinged manways shall be installed in the rake compartment and two in the ballast compartment.

A vertical steel ladder shall be installed at each manway in the hold, rake compartment and ballast compartment (total of six steel ladders). A vertical nickel ladder shall be installed at each manway in the cargo tank (total of four nickel ladders).

Double bits shall be installed at each corner of the barge. These shall be cast steel bits extending through the deck and secured to under-deck reinforcement.

Twelve (12) 36" cast steel kevels shall be installed on doublers on the deck (five on each side and one on each end).

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6. Fittings (Contd.)

Rubbing plates shall be installed on both sides of the barge at the light load line and near the top. These shall be continuous 1" x 6" bars extending the full length of the barge with continuous seal weld both sides.

Valve and line label plates shall be installed for all piping and sluice gates. These plates shall be made of 1" x 3/16" monel metal, shall have 1/2" letters and shall be welded to the deck with a light continuous monel weld. (Refer to Columbia-Southern Dwg. No. 9E-551-3.)

A Diesel Fuel Tank shall be furnished and installed on deck similar to that shown on Columbia-Southern Dwg. No. 9E-540-3 which is included in these specifications for reference.

A suitable instruction book stand shall be installed on the deck near the loading station. Refer to Dwg. No. 9E-564. (Exact wording of procedures will be furnished by Owner.)

The following fittings shall be installed in accordance with the requirements of the U. S. Coast Guard:

- (a) Running Light Standards
- (b) Loading Light and Warning Flag Standards
- (c) Fire Extinguisher Rack with One Fire Extinguisher
- (d) Certificate Holder
- (e) Vents and Sounds
- (f) Four (4) Standard Interstate Commerce Placard Holders and Frames
- (g) Draft marks on both ends of each side shall be Arabic numerals 6" high formed of steel bar continuously welded to the hull and painted white as specified under Section 10 - Painting.

All light standards and warning flag standards shall be hinged (Refer to Columbia-Southern Dwg. No. 9E-540-3.)

For signs and lettering refer to Section 10 - Painting.

7. Piping

Piping to conform to United States Coast Guard Regulations for Class II Piping.

The following piping shall be installed:

- (a) Sound and vent piping similar to that shown on C-SCC Dwg. No. 9E-550-3 with revisions in size and location as required by USCG.

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7. Piping (Contd.)

- (b) Cargo piping similar to that shown on C-SCC Dwg. No. 9E-546-2.
- (c) Steam and condensate piping similar to that shown on C-SCC Dwg. No. 9E-548-4 and 9E-549-3.
- (d) Water piping for wash water system, including spray nozzles, similar to that shown on C-SCC Dwg. No. 9E-552-3.
- (e) Water piping for ballast system, including sea chest, similar to that shown on C-SCC Dwg. No. 9E-547-5, except that it shall be revised as shown on C-SCC Dwg. No. 9E-572 to allow for elimination of ballast pump.

The design pressures shall be:

Cargo Piping.....	100 psig
Water Piping.....	100 psig
Steam & Condensate Piping.....	50 psig

Pipe 2" and under shall be Schedule 40 A.S.T.M. A-83 Seamless certified to A.S.T.M. A-106 Grade A or B and shall be gas welded.

Pipe 2½" and over shall be Schedule 40 A.S.T.M. A-53 Grade B Seamless, and shall be electric welded.

Unions 1" & under: 2000# WOG Forged Steel Ground Joint Screwed Union with steel to steel seat.

1½" & over: Flanged Joint.

Flanges 1½" & over: 150# Forged Steel Welding Neck, R.F.

All flange bolts shall have 18-8 stainless steel hexagon acorn or cap nuts packed with a silicon lubricant.

Fittings: All fittings Schedule 40 welded.

Valves: Cargo -- 6" Powell Fig. 1453 all iron
1" Powell Fig. 480 all iron
3" Hamer Model 3EW15, 3 Bolt
Line Blind - Steel Body with Nickel Spectacle Plate.

Water -- 1/4" through 2"
Chapman List 960

3" and up Powell Fig. 1503 with P-140 Stainless Steel Trim

3" Hamer Model 3EW15 3 Bolt
Line Blind - Steel Body with Nickel Spectacle Plate

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7. Piping (Contd.)

Valves: Steam -- 1/4" through 2"
Powell Fig. 190

Exception: Powell Fig. 171 at Cargo Header.

3" and up Powell Fig. 1193.

Safety Valve --

1" U. S. Coast Guard approved safety valve, side outlet
set at 50 psig.

Safety Valve --

3" x K x 4" Crosley Ashton Relief Valve on Steam Chest,
set at 50 psig if approved by USCG.

All valves below deck to have reach rods extended through deck
with wheel mounted above deck. Stems to pass through a packing
gland (Packing to be Palmetto Cutno installed in deck).

All valve wheels above deck shall have 2" extra heavy pipe guards.
All valves to have 3/16" thick monel plate attached to deck stamped
designating the valve.

Steam header shall have monel plate attached designating 50 lb. st am
as maximum pressure allowed.

Install a pressure gauge on the steam header.

Gaskets:

1/16" thick Carlock 901 or 951.

Manway covers to have woven asbestos gaskets cemented to manway
cover.

8. Insulation

Insulation shall be furnished and applied in accordance with "Insulation
Specifications for 195' x 35' x 11' Single Tank Caustic Barge", Specification
No. INS-P405 dated 9/21/60, which are to be considered a part of these speci-
fications.

9. Tank Lining

The entire inside surface of the cargo tank shall be lined with Columbia No. 7
Lining in accordance with Specification No. PC-1, "Application Specifications
for Columbia No. 7 Lining", dated 4/10/56, Revision 3 dated 9/22/60, a copy of
which is included in these specifications.

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9. Tank Lining (Contd.)

The lining application will be done while the barge is in the Builder's yard by a licensed applicator under separate contract with the Owner. Builder shall furnish a suitable site for this operation.

The Builder shall furnish at predetermined rates, the services listed immediately below in connection with the lining application:

- (a) 440 Volt and 110 Volt electric power to operate applicator's equipment and lights.
- (b) Crane and/or winch trucks and labor to unload applicator's equipment and material, move it to site and reload it at the completion of the job.
- (c) Natural gas or steam as required to operate applicator's air dryers.
- (d) Equipment and labor to unload and store applicator's bagged blasting sand, move it to the barge as required, and to dispose of the bulk spent sand.
- (e) Tools and labor to perform preliminary surface preparation (such as chipping and grinding) as requested by the lining applicator and approved by Owner's representative.

The Builder shall submit daily time and equipment sheets to Owner's representative for approval.

Before work is started a conference shall be held with representatives of the Owner, the Builder and the Lining Applicator present to agree on a work schedule to avoid interference and delays.

10. Painting

The Builder shall furnish all material (except as noted), prepare surfaces and apply paint in accordance with Specification No. PC-P405, "Painting Specifications for Caustic Barges", dated 9/22/60, which are to be considered a part of this specification.

Owner will furnish without cost to builder the necessary amounts of the various paints specified except thinners and cleaners. Thinners and cleaners as specified shall be furnished by Builder. It shall be the Builder's responsibility to store under cover and handle the paint.

11. Operating Procedure Plates

Operating procedure plates for operation of the ballast pump and cargo pump and steaming of cargo tank shall be furnished and installed by the Builder. Plates shall be white on black "Lamitex." Supplemental instructions will be issued by Owner to cover actual wording of procedures.

12. Pumps and Drives

The cargo tank shall be equipped with a Peerless Vertical Turbine Pump with a Peerless Gear Drive, Watson Spicer Flexible Shaft, and General Motors Diesel Engine.

The pump and drive will be furnished by Owner. Builder shall furnish foundations and install.

13. Drawings and Approvals

Drawings covering general arrangement and details of the hull, tank, tank supports, piping and all other drawings necessary to construct the barges shall be prepared by the Builder on Owner's standard 24" x 36" tracing sheets with Owner's title block; these sheets, after final revisions, shall become Owner's property. Three prints of each drawing shall be submitted to Owner for approval before fabrication is started. The Builder shall also secure approval of all drawings by the United States Coast Guard and the American Bureau of Shipping. One complete set of drawings approved and signed by each of the above organizations shall be delivered to the Owner along with two (2) copies each of the signed letters of transmittal from each organization signifying the approval.

The Builder shall prepare a Capacity/Draft Chart on Owner's 24" x 36" tracing sheet. This Capacity/Draft Chart shall be prepared from actual readings taken from light load to full load conditions at the time the barge is first loaded.

The Builder shall furnish seven (7) copies of "Trim and Stability Analysis" of the barge.

Columbia-Southern Chemical Corporation Dwg. Nos. 9E-530 thru 9E-552, 9E-554, 9E-558, 9E-564, 9E-568, 9E-569 and 9E-570 covering arrangement and details of Barges C-SCC-205, 206 & 207 are included in this specification to be used as a guide in preparation of drawings. Also included are C-SCC Dwg. Nos. 9E-572 and 9E-573 which show proposed revisions in piping and steam chest and Dwg. No. 9E-574 which shows strengthening of stern.

14. Inspection

In addition to the inspections outlined in "Marine Engineering Regulations and Material Specifications" of the United States Coast Guard, the workmanship, welding and testing shall be witnessed and approved by an authorized representative of the American Bureau of Shipping and the entire job shall be subject to inspection and approval of the Owner's authorized representative. The Owner will have a full time inspector in the Builder's Yard during construction of the barge. The Builder shall correct such work as is found defective under the specification. If the Builder does not agree with the inspector, the arbitration or settlement procedure specified by the American Arbitration Association shall be used.

Approval by the Owner's inspector shall not relieve the Builder of warranty obligations.

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15. Certification

The barge shall be classified /A-1 by the American Bureau of Shipping for Transportation of Liquid Caustic Soda on Rivers, Lakes, Bays and Sounds.

The barge shall be certified by the United States Coast Guard for transportation of Grade "E" combustible cargoes in the rake compartments on Rivers, Lakes, Bays and Sounds. A load line shall be assigned by the American Bureau of Shipping for service between Carrabelle, Florida and St. Marks, Florida.

The Builder shall furnish the Owner with a Certificate of Classification from the American Bureau of Shipping, a Certificate from the United States Coast Guard and an Assignment of Load Line from the American Bureau of Shipping.

16. Warranty

Notwithstanding the Owner's acceptance of the completed work and final payment therefor, the Builder shall be and remain responsible for faulty materials and/or workmanship which shall appear within a period of one year from the date of substantial completion and the Builder shall, without cost to the Owner, remedy any defects due thereto.

17. Ullage Tables

The Builder shall have the cargo tank strapped by a recognized Inspection Company and shall furnish one reproducible Ullage Table and fourteen (14) bound copies to the Owner. This table shall show the innage of tank in gallons. The top of all ullage fittings shall be installed at the same height above the bottom of the tank.