



**OFFICIAL DATE OF ADDENDUM: November 22, 2016**

## **ADDENDUM NO. 1**

**Issued by the Texas Department of Transportation**

**For the**

**GALVESTON-BOLIVAR FERRY BULKHEAD REDESIGN PROJECT**

**GALVESTON COUNTY, HOUSTON DISTRICT**

**GALVESTON FERRY LANDING**

**PROJECT NO. FT 912-73-205**

**CSJ 0912-73-205**

**ESTIMATED CONSTRUCTION COST: \$25,000,000.00**

**BID GUARANTY or BID BOND: \$100,000.00**

**PRE-BID CONFERENCE: NOVEMBER 17, 2016 – 1:00 P.M.**

**at 1000 Ferry Road North, Galveston, TX 78373**

**BID DATE: DECEMBER 1, 2016 - 1P.M. IN AUSTIN**

**BIDS DUE: 1:00 p.m., local time, December 1, 2016**

**AT 200 EAST RIVERSIDE DRIVE, AUSTIN, TEXAS, ROOM 1A.2**

- **ADDENDUM NO. 1 IS ATTACHED WITH THIS FAX NOTIFICATION.** E-MAIL Request to: Tim West at [Timothy.West@txdot.gov](mailto:Timothy.West@txdot.gov) for a pdf file of the entire addendum.
- **Available to print from TxDOT Plans Online.**  
[www.txdot.gov](http://www.txdot.gov) (Business, Letting & Bids, Plans Online, Building Facility Projects from View or FTP).  
<http://www.dot.state.tx.us/business/plansonline/plansonline.htm>
- Addendum is also available at <http://esbd.cpa.state.tx.us> - Electronic State Business Daily (ESBD) Use Agency 601 for Requisition Number [FT 912-73-205](http://esbd.cpa.state.tx.us).

**NOTE: THIS ADDENDUM SHALL BECOME AN OFFICIAL PART OF THE PLANS AND SPECIFICATIONS AND BIDDERS SHALL ACKNOWLEDGE RECEIPT OF THIS ADDENDUM ON THE "ADDENDUM ACKNOWLEDGMENT" SHEET PROVIDED IN THE PROPOSAL/SPECIFICATION BOOK.**

**FAILURE TO ACKNOWLEDGE RECEIPT OF AN ADDENDUM WILL RESULT IN THE BID NOT BEING READ.**

**ADDENDUM NO. 1 DATED November 22, 2016**

**Cover page: 1**

**Project: GALVESTON-BOLIVAR FERRY BULKHEAD REDESIGN PROJECT**

**CSJ 0912-73-205**

**NOTICE TO BIDDERS:**

This Addendum shall be considered as part of the Contract Documents for the above mentioned project as though it had been issued at the same time and incorporated therewith. Where provisions of the following supplementary data differ from those of the original Contract Documents, this Addendum shall govern and take precedence. Work not specifically deleted, modified, changed or altered by this Addendum shall remain in effect as a part of the Contract Documents.

Bidders are hereby notified that they shall make any necessary adjustment(s) in their estimates based on this Addendum. It will be construed that each bidder's proposal is submitted with full knowledge of all modifications and supplemental data specified herein.

**ADDENDUM NO. 1**

- 1) Working Days are increased to 450 Working Days
- 2) A Force Account is being added for Testing
- 3) There will be no HUB requirements on this project
- 4) Pre-bid meeting notes and questions

See attached documents

**THE ENTIRE BOUND PROPOSAL DOCUMENT RECEIVED FROM TxDOT MUST BE TURNED IN AS THE BID PROPOSAL.**

**USE THE BID BOND FORM BOUND IN THE PROPOSAL. NO OTHER BID FORM IS ACCEPTABLE. THE BID BOND CAN BE REMOVED FROM THE PROPOSAL FOR SIGNATURES, SEALS AND THE POWER OF ATTORNEY. THIS FORM MUST BE SIGNED BY THE CONTRACTOR AND SURETY – WITH AN IMPRESSED SEAL. AFTER SIGNATURES – INCLUDE THE COMPLETED BOND IN THE PROPOSAL.**

**Total pages to this Addendum including cover pages: 146**

**ADDENDUM NO. 1 DATED November 22, 2016**

**Cover page: 2**

**Project: GALVESTON-BOLIVAR FERRY BULKHEAD REDESIGN PROJECT**

CSJ 0912-73-205

# NOTIFICATION OF ADDENDUM

## ADDENDUM NO. 1

**DATED 11/22/2016**

<b>Control</b>	<b>0912-73-205</b>
<b>Project</b>	<b>FT 912-73-205</b>
<b>Highway</b>	<b>VA</b>
<b>County</b>	<b>GALVESTON</b>

Ladies/Gentlemen:

Attached please find an addendum on the above captioned project. Included in the attachment is an addendum notification which details the changes and the respective proposal pages which were added and/or changed.

Except for new bid insert pages, it is unnecessary to return any of the pages attached.

Bid insert pages must be returned with the bid proposal submitted to the Department, unless your firm is submitting a bid using a computer print out. The computer print out must be changed to reflect the new bid item information.

Contractors and material suppliers, etc. who have previously been furnished informational proposals are not being furnished a copy of the addendum. If you have a subcontractor on the above project, please advise them of this addendum. Acknowledgment of this addendum is not requested if your company has been issued a proposal stamped "This Proposal Issued for Informational Purposes."

You are required to acknowledge receipt of this addendum on the Addendum Acknowledgement form contained in your bid proposal by placing a mark in the box next to the respective addendum.

Failure to Acknowledge receipt of this addendum in your bid proposal will result in your bid not being read.

SUBJECT: PLANS AND PROPOSAL ADDENDUMS

PROJECT: FT 912-73-205

CONTROL: 0912-73-205

COUNTY: GALVESTON

LETTING: 12/01/2016

REFERENCE NO: 1122

**PROPOSAL ADDENDUMS**

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- X PROPOSAL COVER
- \_ BID INSERTS (SH. NO.: )
- \_ GENERAL NOTES (SH. NO.: )
  
- \_ SPEC LIST (SH. NO.: )
- \_ SPECIAL PROVISIONS: )
- \_ ADDED:
  
- DELETED:
  
- \_ SPECIAL SPECIFICATIONS:
- \_ ADDED:
  
- DELETED:
  
- \_ OTHER:

DESCRIPTION OF ABOVE CHANGES  
(INCLUDING PLANS SHEET CHANGES)

PROPOSAL COVER: NUMBER OF WORKING DAYS CHANGED.

ALSO ATTACHED TO THIS ADDENDUM IS A LIST OF PRE-BID MEETING CLARIFICATIONS

Control	0912-73-205
Project	FT 912-73-205
Highway	VA
County	GALVESTON

# PROPOSAL TO THE TEXAS TRANSPORTATION COMMISSION

## 2014 SPECIFICATIONS

### WORK CONSISTING OF RECON OF FERRY BULKHEAD & WORK DOCK GALVESTON COUNTY, TEXAS

The quantities in the proposal are approximate. The quantities of work and materials may be increased or decreased as considered necessary to complete the work as planned and contemplated.

This project is to be completed in 450 working days and will be accepted when fully completed and finished to the satisfaction of the Executive Director or designee.

Provide a proposal guaranty in the form of a Cashier's Check, Teller's Check (including an Official Check) or Bank Money Order on a State or National Bank or Savings and Loan Association, or State or Federally chartered Credit Union made payable to the Texas Transportation Commission in the following amount:

ONE HUNDRED THOUSAND (Dollars) ( \$100,000 )

A bid bond may be used as the required proposal guaranty. The bond form may be detached from the proposal for completion. The proposal may not be disassembled to remove the bond form. The bond must be in accordance with Item 2 of the specifications.

Any addenda issued amending this proposal and/or the plans that have been acknowledged by the bidder, become part of this proposal.

By signing the proposal the bidder certifies:

1. the only persons or parties interested in this proposal are those named and the bidder has not directly or indirectly participated in collusion, entered into an agreement or otherwise taken any action in restraint of free competitive bidding in connection with the above captioned project.
2. in the event of the award of a contract, the organization represented will secure bonds for the full amount of the contract.
3. the signatory represents and warrants that they are an authorized signatory for the organization for which the bid is submitted and they have full and complete authority to submit this bid on behalf of their firm.
4. that the certifications and representations contained in the proposal are true and accurate and the bidder intends the proposal to be taken as a genuine government record.

• **Signed:** \*\*

(1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

**Print Name:**

(1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

**Title:**

(1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

**Company:**

(1) \_\_\_\_\_ (2) \_\_\_\_\_ (3) \_\_\_\_\_

- Signatures to comply with Item 2 of the specifications.

\*\*Note: Complete (1) for single venture, through (2) for joint venture and through (3) for triple venture.

\* **When the working days field contains an asterisk (\*) refer to the Special Provisions and General Notes.**

## **NOTICE TO CONTRACTORS**

**ANY CONTRACTORS INTENDING TO BID ON ANY WORK TO BE AWARDED BY THIS DEPARTMENT MUST SUBMIT A SATISFACTORY “AUDITED FINANCIAL STATEMENT” AND “EXPERIENCE QUESTIONNAIRE” AT LEAST TEN DAYS PRIOR TO THE LETTING DATE.**

**UNIT PRICES MUST BE SUBMITTED IN ACCORDANCE WITH ITEM 2 OF THE STANDARD SPECIFICATIONS OR SPECIAL PROVISION TO ITEM 2 FOR EACH ITEM LISTED IN THIS PROPOSAL.**

A. Questions and Answers:

1. **Question:** What is the coating length on the sheet pile, combi wall, monopile, and H-pile?

**Answer: Steel sheet, H and Pipe pilings shall be coated with the approved coating system and in the prescribed manner to the full height of pile and to a minimum embedment depth of 8 ft. below the mud-line.**

2. **Question:** What is the top elevation or overall length of the H-piles detailed on sheet S-503?

**Answer: Top of H-piles: EL. +8'-6" +/-**

3. **Question:** Are the gangplanks to be TSA coated or HDG? Sheet S-002 appears to indicate both.

**Answer: Gangplanks shall be TSA coated. Please refer to S-002, "Marine Coatings" and "Structural Steel Notes", Note 13 in particular that states "All exposed structural steel, not otherwise coated shall be hot dipped galvanized after fabrication".**

4. **Question:** Sheet S-002 indicates that steel pipe piles, H-piles, and hot-rolled steel sheets are to be Grade 50, but spec 31 62 16.00 section 2.1 indicates Grade 65. What grade is required?

**Answer: All structural steel shall be Grade 50, with the exception of the stand-alone monopiles, which shall be Grade 65 steel.**

5. **Question:** Drawing S-501 calls out AZ19-700 sheet piling for the intermediate sheets between the pipe. AZ-19-700 is manufactured in Europe (Arcelor Mittal) and will not comply with Buy America.

A possible solution, which doesn't change the layout, is NZ-19 or NZ-26 which is made by Nucor in Blytheville, Arkansas. NZ-19 and NZ-26 are melted and manufactured in the USA. Note however that the maximum steel grade produced is ASTM A572 Grade 60. NZ-26 in Grade 50 will meet the bending moment of AZ19-700 Grade 65.

**Answer: All high strength rolled steel sheet piling shall conform to ASTM A572, Grade 50. Therefore, in keeping with the requirements of Buy America program, NZ 19 can be used in lieu of AZ 19-700. As a result, no changes in layout will be necessary.**

6. **Question:** Section 31 62 16.00 of the specifications call for steel sheet piling to meet ASTM A572 Grade 65. Nucor, which is the only producer in the world of PZ-35 and "NZ" sections, can only produce to ASTM A572 Grade 60...not Grade 65. A possible solution is to accept PZ-40 in Grade 60 to meet the required bending moment. Note however that PZ-40 will change the layout of the wall as it is not the same width as the PZ-35. This change will impact corner configurations, tie-rod spacing, and possibly the concrete cap.

**Answer: All high strength rolled steel sheet piling shall conform to ASTM A572, Grade 50, including the PZ 35 profile.**

7. **Question:** The same issue exists with the E22 Connectors. (E22 connectors are attached to the combiwall pipe and allow threading of the intermediate sheet pile). The maximum steel grade manufactured is ASTM A572 Grade 60...not Grade 65. Please advise/confirm that E22 connectors per Grade 60 are acceptable.

**Answer: E22 connectors shall conform to ASTM A572 Grade 50 (min.). To facilitate domestic procurement of connectors, we suggest that the connectors be cut from NZ 19 sheets to match the profile of the specified E22 connectors, if the E22 cannot be produced domestically.**

8. **Question:** The 48"OD x .875" combiwall pipe can be made with A572 Grade 65 coil. However, please note that ASTM A572 Grade 65 is not a pipe piling specification. It is a structural steel/plate specification. Pipe piling is made to a pipe specification; ASTM A252. Please advise/confirm that pipe piling manufactured and certified to ASTM A252 with coil meeting ASTM A572 Grade 65 is acceptable.

**Answer: While ASTM A252 addresses only welded and seamless steel pipe piles, both ASTM A572 and ASTM A252 products are presented as suitable for the project's combi-wall pile requirements (See Skyline Steel 2014/2015 Technical product Manual, p.19 for available steel grades). Our intent is to provide a combi-wall system (both pipe and sheet) having the same chemical and physical properties. Furthermore, it is not our desire to recommend spiralweld piles without the client's consent since one of the major concerns with spiralweld steel piles over the years has been the large variation in the quality of the welds that may be subjected to large stress concentrations. We therefore recommend ASTM A572 Grade 50 rolled and welded pipe and sheets for the combi-wall and ASTM A252 Grade 3 (mod) with yield strength of 65 ksi for the stand-alone monopiles. Specification 31 62 16.00 will be modified accordingly and issued as an Addendum.**

9. **Question:** TSA spec 09 96 26 does not address field touch-up. Will you supply a spec for approved TSA field touch-up/ repair while in the field?

**Answer: Please refer to Specification 09 96 26, Section 3.8 for instructions to repair film discontinuities and damage to the coating system after erection.**

10. **Question:** Buried obstructions/ granite rock clearly exist as it is mentioned in both the drawings and geotechnical report, but the exact area or extent is not defined. Will the encounter of granite rock and other buried obstructions be considered Differing Site Conditions as per TXDOT's definition (Item 4, Section 5).

**Answer: LAN has approximated the extent and area of the buried obstructions/granite rock. Please refer to the S-series set of Drawings.**

11. **Question:** If granite rock/ buried obstructions are encountered during the grouted tiebacks install, will that be considered a Differing Site Condition as per TXDOT definition (Item 4, Section 5)? In that scenario the obstruction will likely be unable to be removed due to the location of the existing bilge water system/ containment.

**Answer: LAN has approximated the extent and area of the buried obstructions/granite rock. Please refer to the S-series set of Drawings.**

12. **Question:** Will jetting/ hydraulic probing be permitted to help identify any buried obstructions prior to setting the piles?

**Answer: Per Specification 31 62 16.00, no jetting shall be allowed.**

13. **Question:** If unforeseen buried obstructions are encountered during the piling installation, will it be considered a Differing Site Condition as per TXDOT's definition (Item 4, Section 5).

**Answer: No**

14. **Question:** The specs state that "No special payment shall be made for removal of artificial obstructions or down time" during the dredging operations. Will TXDOT quantify the amount of debris/ obstructions anticipated?

**Answer: Debris is expected along newly installed wall on Corp of Engineers side of property. No other debris is expected.**

15. **Question:** TXDOT states that the dredge quantities are estimates only, and no payments will be made for actual quantity dredged. What level of accuracy does TXDOT feel they have supplied contractors with in regards to dredge quantities? Industry standard is to pay for the actual quantity dredged.

**Answer: Bidders are advised that the dredge quantities are based on a dredge depth of EL. -20 ft. MSL. Be further advised that the permit request that has been submitted to the USACE reflect those quantities. No allowance shall be made for over-dredging beyond a vertical dredge tolerance of 1 ft. Please refer to Specification 35 20 23.15 –Dredging and Disposal for further information.**

16. **Question:** Will TXDOT provide a contact for the disposal areas that have been approved for this project?

**Answer: Refer to drawings-no contact**

17. **Question:** Are independent testing labs required? If so, will TxDOT be paying for all testing? Typically the owner handles all testing.

**Answer: Lab testing and any inspection order than special inspection shall be borne by the Contractor. However, TxDOT shall engage all Special Inspectors directly.**

18. **Question:** Once one phase of work is complete, will we immediately be able to start the next phase of work? If not, what is the estimated downtime between phases? Will additional contract time be granted for downtime between phases? Will standby be paid for downtime between phases?

**Answer: No downtime, no standby time move directly to next phase**

19. **Question:** There appears to be a total of (9) ea grouted tiebacks. (1) Grouted tieback is in Phase 3 and the other (8) grouted tiebacks are in Phase 4. Will all grouted tieback work be able to be performed in (1) mobilization? It does not appear to be shown that way currently.

**Answer: Ideally, all grouted tieback work will be performed under one mobilization. This is LAN's preferred option. However, a firm decision on this issue will be made upon further discussion with the selected bidder and TxDOT.**

20. **Question:** In the Contract Description under Division 1 of the General Conditions, it indicates that the work may be phased over multiple funding years and may be delayed if funding is not available. Please provide us with the number of funding years anticipated and the estimated amount of funding in each year.

**Answer: Phases will proceed upon completion of each phase**

21. **Question:** In the Contract Description under Division 1 of the General Conditions, it indicates that the work is to proceed continuously until all work is complete and operational. Under the same section it also indicates that the work may be delayed if funding is not available. This is in contradiction to the previous statement. Please clarify.

**Answer: see 20**

22. **Question:** Article 9.9 of the TxDOT Building Uniform General Conditions indicates a No Damages for Delay clause, yet TxDOT is indicating in the Contract Description under Division 1 of the General Requirements that there is the potential for a delay due to funding. How is the contractor to be compensated for these delays?

**Answer: see 20**

23. **Question:** If the work that takes place in a particular phase is substantially more than the funded amount, at what point will the project be placed on hold (at the end of the phase or at the end of the funded amount). If it is at the end of the phase will TxDOT seek additional funding to bridge the gap, or will the Contractor be financing it until the next funding cycle is approved?

**Answer: see 20**

24. **Question:** Has a time determination schedule been developed? If so, can it be provided to the bidders?

**Answer:**  
**(Phase 1) 120 working days**  
**(Phase 2) 99 working days**  
**(Phase 3) 95 working days**  
**(Phase 4) 136 working days**  
**450 total working days**

25. **Question:** Are there any work restrictions at the facility, such as not being able to work during summer months if the ferries are busy? If so, please provide anticipated work stoppages.

**Answer: 0720-1550 mon/ fri normal working schedule. Additional working will be allowed as agreed to with Txdot with proper security measures in place, such as escorting.**

26. **Question:** Does the contractor have to build any levees at the dredge disposal areas?

**Answer: The dredge disposal placement area will be determined during the development of the USACE Section 404 Permit Application. Any restrictions will be provided as the USACE permit plans develop. TxDOT assumes that dredged material will be placed at an existing DMPA.**

27. **Question:** Are there any tipping fees for the dredge material at the placement area that the contractor is responsible for?

**Answer: The exact details of the USACE Section 404 Permit will be provided as the permit application continues to be developed and coordinated with the USACE. According to the Pre-Bid Documents 35 20 23.15 Section 1.09 A. The dredge contractor would be responsible for any tipping fees.**

28. **Question:** Has environmental testing been performed on the dredged material?

**Answer: Environmental testing has been performed for previous dredge events and per scheduled testing. Environmental testing of the dredged material would be required. The number of samples and analysis performed would be determined during the permit process and dependent on which DMPA is used for the material.**

29. **Question:** At the pre-bid meeting it was indicated that dredging may need to be done mechanically, yet the plans indicate hydraulic placement areas for disposal. Please clarify if dredging is to be done through mechanical or hydraulic means.

**Answer: Based on the pre-bid information, plans indicate hydraulic placement for dredge material. Bid packages should be based on provided pre-bid materials.**

30. **Question:** Please provide the dates when the Army Corps permits are expected for the bulkhead construction and for the dredging.

**Answer: TxDOT is working with the USACE to prepare a NWP application for the bulkhead construction. TxDOT understands the anticipated start date of February 2017 and is working toward that date for the NWP. As the permit process develops, updates to the permitting schedule will be provided to the contractor. Additionally, TxDOT understands the anticipated start date of October 2017 for the dredging event and is working toward that date for Section 404 issuance. As the permit process develops, updates to the permitting schedule will be provided to the contractor.**

31. **Question:** Is filling required in areas where the existing surface is lower than the dredged surface?

**Answer: No filling is required where the existing surface is lower than the dredged surface.**

32. **Question:** Is there a Buy America clause on this project?

**Answer: Yes Buy America clause does apply.**

33. **Question:** Dwg. S-103, Note states 60"  $\emptyset$  typ. 19 locations. Should this read 20?

**Answer: 60" Dia. Piles is correct. However there are 20 piles.**

34. **Question:** Dwg. G-004 states "Remove Existing Fenders & H-Pile & Salvage for Owner". Dwg. S-201 states "Rem. Existing Fender System & Dispose". Please clarify.

**Answer: The Contractor shall dispose of all existing fenders that are removed. Note: The bid price shall account for the value of salvage material related to all the existing piles that are removed.**

35. **Question:** Dwg. G-010 states "Remove Existing Fenders & Store for re-use". All other three demo phases show removal of H-Piles as well. Please advise if H-Piles at Phase 4 are to be removed or not.

**Answer: H-piles at Phase 4 are to be removed. Note: The bid price shall account for the value of salvage material related to all the existing piles that are removed.**

36. **Question:** Dwg. S-401, Sections 4 & 5 show top of sheet @ fenders & gangplank to be +2.0'. Everywhere else it's +2.5'.

**Answer: Dwg. S-401 is specific to retrofit of existing Dock 1 (Phase 1). "Everywhere else" is representative of Docks 2-5.**

37. **Question:** Please provide weld detail for waler to sheetpile.

**Answer: Walers shall be field welded to the sheetpile with ¼" fillet weld, 2" long at the top and bottom of the C12 at 55.12" c. to c.**

38. **Question:** Please provide waler splice detail.

**Answer: See attached detail (Exhibit: Question 38).**

39. **Question:** What are the coating limits for sheetpile, pipe piles & H-piles?

**Answer: Steel sheet, H and Pipe pilings shall be coated with the approved coating system and in the prescribed manner to the full height of pile and to a minimum embedment depth of 8 ft. below the mud-line.**

40. **Question:** Can Waler's be bare?

**Answer: All walers that are fully encased shall in concrete shall be bare.**

41. **Question:** Is any wrap required around the tie-rods or are they bare? Are any sleeves required for the tierods?

**Answer: Wraps and sleeves are not required. Note that trenches that are cut to accommodate the installation of the anchor rods shall be backfilled with cement stabilized material.**

42. **Question:** What is the distance between the new sheetpile wall and the deadman? ON Dwg. S-103, while distance is provided from WP, it's not clear where the WP falls on the existing sheetpile.

**Answer: The distance between the waterside face of the waler to the landside face of the deadman is approximately 55 ft.**

43. **Question:** Upon installation of the contractor designed sacrificial anode system to the piles, if this area has TSA on it, can the weld joints be coated w/Splash Zone?

**Answer: Refer to the instructions for repair of coating discontinuities and damage to the coating system after erection/installation.**

44. **Question:** Would you consider moving the start of Phase 4 to the South so that all grouted tie-backs are part of the same phase?

**Answer: LAN will consider all grouted tiebacks installation under one (1) mobilization.**

45. **Question:** What is the length of the new return wall at the South end of the project?

**Answer: 57' +/-**

46. **Question:** What is the top of sheetpile elevation for the return walls? Can we assume it's +2.50'?

**Answer: Top of return wall sheetpile elevation varies with slope of c.i.p concrete pavement and shall terminate 6" below top of pavement.**

47. **Question:** Dimensions are provided from WP to WP on existing sheetpile bulkhead wall. Can we assume that for the new sheetpile wall, the WP shown falls along the C/L of the 1st & last sheetpile pairs?

**Answer: Both workpoints have been established at the corners of the existing bulkhead and existing return walls.**

48. **Question:** Dwg. S-510, Detail 1 states "See 1/S-571 For Info". Please provide Dwg. S-571.

**Answer: This is a graphical error. Please ignore the Note in its entirety.**

49. **Question:** Spec 31 62 16.00, Item 1.9A, Page 4 states production piles. Are there any test piles on this job? If yes, where and how many and what type of test?

**Answer: Load testing is not required.**

50. **Question:** Spec 31 62 16.00, Item 3.7B States Encase concrete for bulkhead is 5,000 psi. But Section 2.1, Materials calls for 4,000 psi. Please advise.

**Answer: All concrete shall be a minimum 5000 psi at 28 days.**

51. **Question:** Can TxDOT postpone receipt of the bid proposals until the January 2017 letting?

**Answer: No**

52. **Question:** Will addenda be posted under State Let Construction, State Let Maintenance or Local Let Maintenance section within the Addenda section of the website?

**Answer: Addendum will be posted on Plans Online under Building Facilities.**

**53. Question:** The drawings show a corner called PZ90. PZ90 is no longer available from USA sources. A possible solution is SKP90 corners which are melted and manufactured in the USA. Please advise if SKP90 corners are acceptable.

**Answer: SKP90 can be used in lieu of PZ90.**

**54. Question:** Specs show HUB goal requirement of 21.1%. Typically marine projects for TXDOT waive any type of HUB goals or requirements. Please reply with any requirements for HUB.

**Answer: HUB goal does not apply**

**55. Question:** General conditions Article 5.2.5 shows builders risk insurance to be provided. Is TXDOT requiring successful contractor to provide builders risk insurance policy for this project?

**Answer: Yes Builders Risk will be required**

**56. Question:** What area is TXDOT going to provide to contractor for use as laydown area? We would need location for placement of field office trailer, adequate employee parking for approximately 25 vehicles and approximately 1 acre for storage of construction materials (preferable adjacent to waterfront).

**Answer: Trailer ok, lay down ok, parking ok may include short walk, public parking must remain for public**

**57. Question:** Please clarify the location of dredge spoil placement that the contractor is to bid for this project? Who will pay disposal fees? If yardage varies from that shown on the plans and documentation is provided to TXDOT upon completion of each dredging phase, will TXDOT pay based on the actual yardage dredged and issue change order for any variances?

**Answer: Please refer to answers on questions 15-30**

**58. Question:** Please provide drawings for details of existing conditions including existing sheet pile wall, shoreside details and floating docks and piles.

**Answer: See attached drawings; (Exhibit: Question 58).**

**59. Question:** Sheet S-103 shows 60" pipe pile dolphins typical at 19 locations. All the drawings seem to detail 20 dolphins. Please clarify

**Answer: There are 20 60" diam. monopiles.**

60. **Question:** Does this contract require all materials to be furnished from domestic sources, i.e. "Buy America".

**Answer: Buy America clause does apply per UGC (16.6)**

61. **Question:** Dwg. S-403, Detail 4, shows a Spacer plate - 1/2" x 3-1/4" x 10". Please advise the quantity of these spacer plates. Are there two of these plates at every grouted tie-rod? Also no such detail is shown for the waler that goes to the concrete deadman? Should these plates be used at those tie-rod locations as well?

**Answer: Yes spacer plates are provided at locations of all sheetpile/anchor locations only.**

62. **Question:** What is the projected time between Phases of work, specifically Phase 3 & Phase 4?

**Answer: Completion of phase will release next phase**

63. **Question:** Will there be an available source of potable water for grout mixing on site? If so, what is the source and what are the details on flow (gpm) and pressure (psi)?

**Answer: Yes-City of Galveston flow and pressure as provided**

64. **Question:** Must all spoil material during grouted tieback installation (e.g. drill cuttings, cement grout) be collected and hauled off site?

**Answer: Yes all spoils generated from the grouted tie-back installation shall be collected and hauled off the site.**

65. **Question:** Will there be on-site parking available for construction crew throughout the duration of the project?

**Answer: Answer: Yes as needed**

66. **Question:** Have all below grade utilities been accounted for during the design of the grouted tiebacks?

**Answer: Below grade utilities within the limits of the grouted tiebacks are not anticipated.**

67. **Question:** Is there any specific safety training required in order to work on site?

**Answer: No-all PPEs will be required**

68. **Question:** What is the specific type and quantity of testing for only the grouted tiebacks? Do the same types of testing & frequency as the typical anchor rods apply?

**Answer: Please refer to Specification 31 51 00 for the grouted tie-backs testing requirements.**

69. **Question:** What is the typical water level elevation & tidal fluctuations at the site?

**Answer: Please refer to Drawing Sheet S-002, General Requirements and Design Criteria for water level and tidal data.**

70. **Question:** Note 7 on C3 states existing underground piping to emergency generator to be removed and replaced with double wall stainless steel piping. Does this mean they want us to bury double wall stainless steel piping? I am unfamiliar with where to obtain double wall stainless steel piping. Please provide a preferred manufacturer.

**Answer: Alternative corrosion resistant double walled piping will be acceptable.**

71. **Question:** Per spec section 23 11 13 paragraph 2.01.C they mention utility boom piping. I could not find any details on the drawings.

**Answer: Refer to Detail 1, Sheet M-502, Volume 1. Boom piping configuration matches existing. Piping materials on the utility boom match piping materials in the Pipe Material List on M-601. Flexible connections between fixed piping and the boom, as well as connections for the boat, are defined in 23 11 13-2.01.C**

72. **Question:** Is Modern welding an acceptable tank manufacturer?

**Answer: Envirosafe Aboveground Fuel Systems is the acceptable tank manufacturer. If proposed by the successful bidder/contractor, the engineer and TxDOT may consider comparable alternatives if offered.**

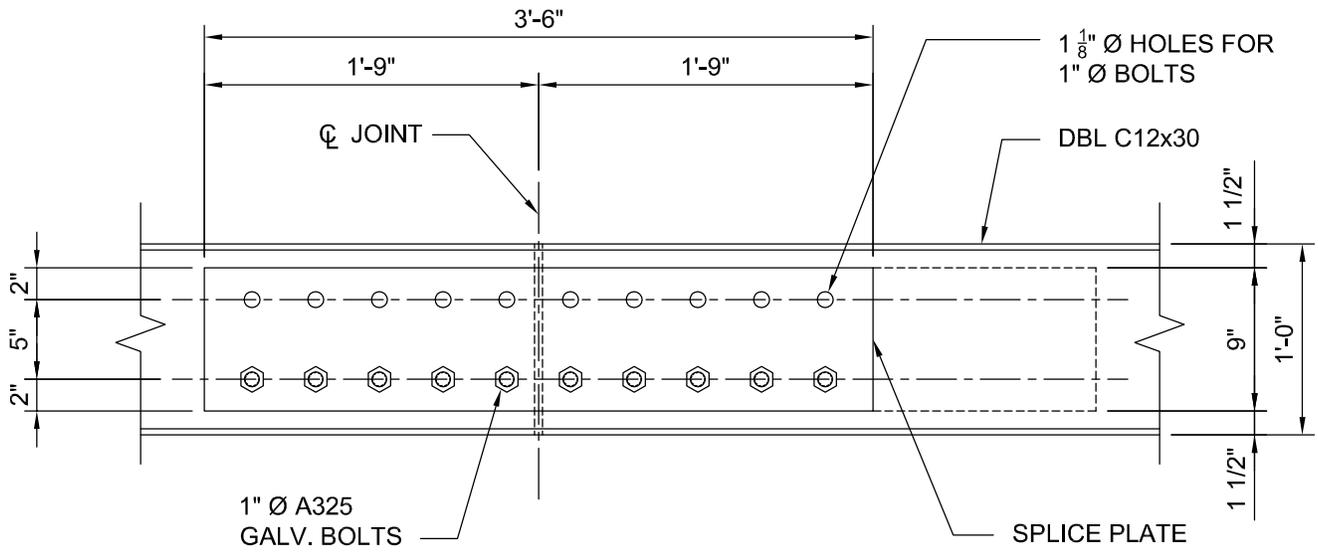
73. **Question:** The specs mention hydrostatic testing. This is not recommended due to the possibility of water contamination of fuel. Please confirm hydrostatic testing required.

**Answer: Hydrostatic testing is required on all piping systems prior to being put in service. All piping should be cleaned after testing, but prior to service.**

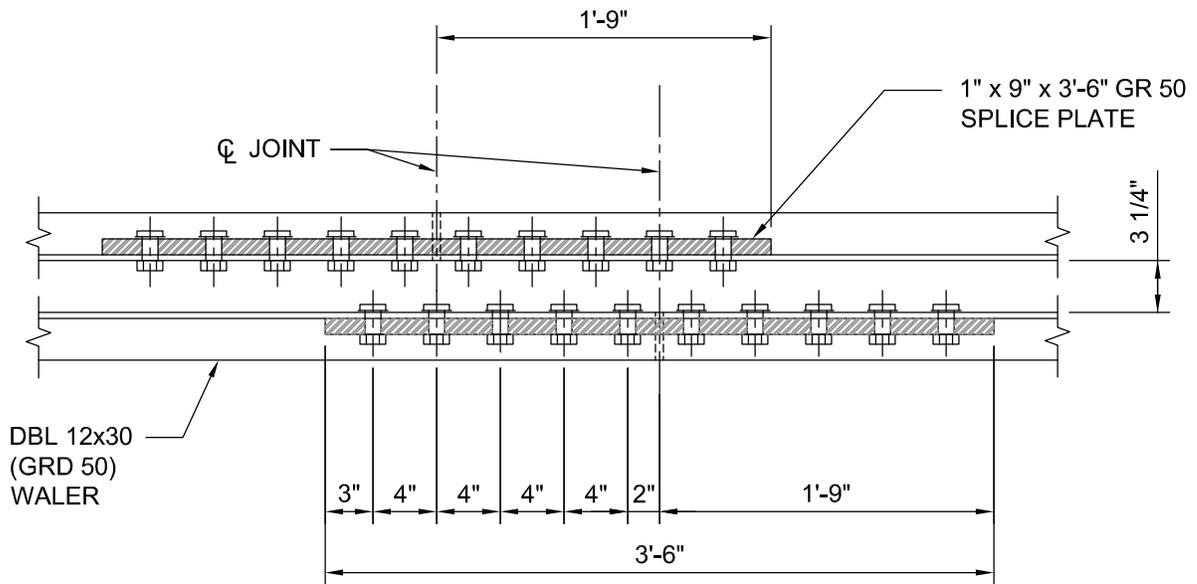
74. **Question:** The fueling specs reference spec section 23 05 13 for motors. I could not find this spec section.

**Answer: This reference occurs in Section 22 14 29 Sump Pumps. Delete the reference to 23 05 13 and provide the motor defined by the Liberty Pump model number in the Pump Schedule on Sheet M-601.**

**NOTE: This addendum # 1 includes the following attachments; Exhibit for question 38, Exhibit for question 58 and Substitution Request # 1**



PLAN



SECTION

1

## WALER SPLICE DETAIL

SCALE: 1"=1'-0"

# TxDOT Galveston-Bolivar Ferry Bulkhead Redesign

Texas Department of Transportation  
Galveston-Bolivar Ferry  
1000 Ferry Road North  
Galveston, TX 77550

**LAN** Lockwood, Andrews & Newnam, Inc.  
A LEO A DALY COMPANY  
2925 Briarpark Drive  
Suite 400  
Houston, TX 77042  
Tel 713-266-6900 www.lan-inc.com

Job No. 170-10729-008  
Date 11/21/2016

Exhibit: Addendum 1, Qu. 38

STATE OF TEXAS  
DEPARTMENT OF TRANSPORTATION

FED. AID DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	FBD 001 (002)	1	
STATE	DIST. NO.	COUNTY	
TEXAS	12	GALVESTON	
CONT.	SECT.	JOB	HIGHWAY NO.
0367	06	050	SH 87

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SUMMARY OF QUANTITIES
3-3A	GENERAL NOTES & SPECIFICATION DATA
4	ESTIMATE & QUANTITY SHEETS
5	DREDGE SPOIL DISPOSAL AREAS
6-8	PROJECT PLAN LAYOUTS
9	CONCRETE PAVEMENT DETAILS
10	STORM WATER POLLUTION PREVENTION PLAN
11	FLOATING MOORING DOCK LAYOUT
12-15	FLOATING MOORING DOCK DETAILS
16	PROTECTIVE FENDER BAR AND RUB STRIP PANEL DETAILS
17	STEEL CYLINDER PILE DETAILS
18	GANG PLANK LAYOUT
19	GANG PLANK DETAILS
20-21	GANG PLANK FOUNDATION DETAILS
22-24	GANG PLANK STANCHION DETAILS
<b>STANDARD SHEETS BELOW</b>	
25-26	SEWER MANHOLES (DIST 12) omitted CONTINUOUSLY REINFORCED CONCRETE PAVEMENT DETAILS (DIST 12)
27-29	RID (1-3)-93
30-33	ED (1-4)-93
34-42	BC (1) THRU (9) - 94

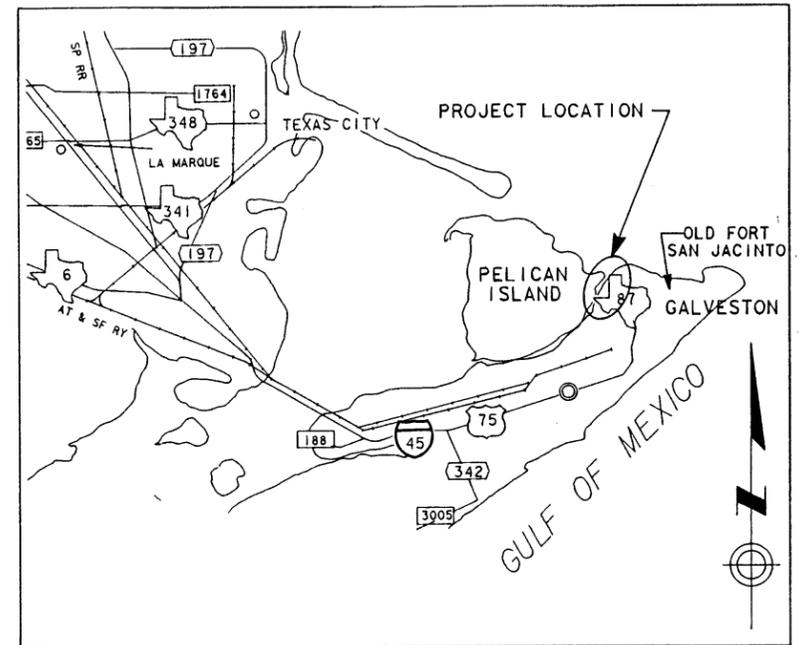
~~PROPOSED~~  
FINAL PLANS OF  
STATE HIGHWAY IMPROVEMENT

FEDERAL-AID PROJECT  
FBD 001 (002)

GALVESTON COUNTY  
GALVESTON FERRY LANDING

LIMITS: AT GALVESTON FERRY LANDING  
NO PROJECT LENGTH

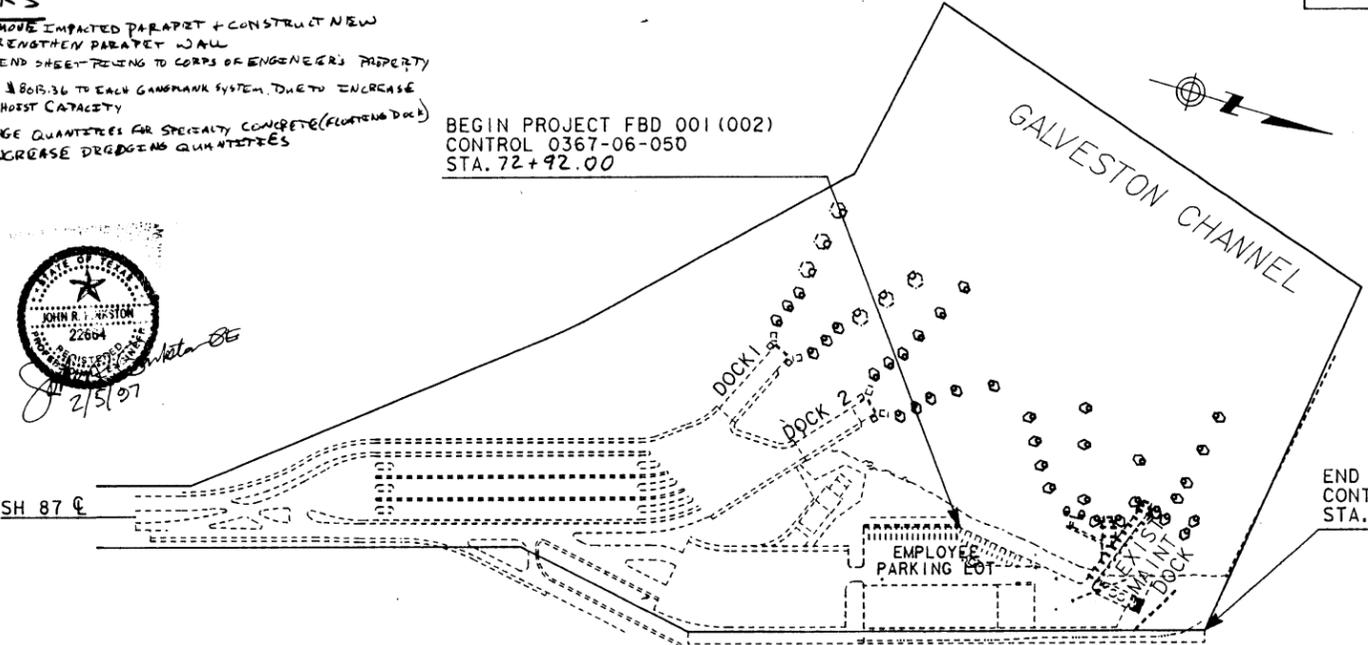
FOR THE CONSTRUCTION OF A NEW MAINTENANCE FERRY DOCK SYSTEM  
CONSISTING OF SHEET PILING, FLOATING DOCK SYSTEM, FIXED DOCK,  
DREDGING, BACKFILL, REMOVE EXIST MAINTENANCE DOCK  
AND REMOVE EXIST PILE CLUSTERS



VICINITY MAP  
SCALE: 1 IN = 4.0 MI.

- CHANGE ORDERS**
- ADD \$0.10 PER CUBIC YARD FOR LEVEE USE FEE
  - ADD SPECIAL PROVISION 007-065
  - ADD LABOR, MATERIALS, & EQUIPMENT TO INSTALL 50 PAIR TELEPHONE CABLE. INSTALL RAIL (TYPED) ON SHEET PILING. DECREASE DREDGING.
  - EXTEND & RELOCATE 12" X-STRONG PIPE
  - INSTALL TWO 150 AMP BREAKER BOXES
  - REMOVE STEEL BULKHEAD & ROCK JETTY
  - ADD LABOR, WAGE, & EQUIPMENT RATES TO INSTALL UTILITY LINES. INSTALL 3" DIESEL LINE
  - APPLY ASPHALTIC COATING TO OUTSIDE WALLS OF FLOATING DOCKS
  - ADD LABOR, WAGE & EQUIPMENT FOR REMOVING & DISPOSAL OF STABILIZED MATERIAL OVER UTILITY LINES
  - COMPENSATE CONTRACTOR FOR WORK DELAY COSTS
  - MODIFY HEDGE SYSTEM FOR UTILITY BOOM
  - REMOVE IMPACTED PARAPET & CONSTRUCT NEW STRENGTHEN PARAPET WALL
  - EXTEND SHEET PILING TO CORPS OF ENGINEERS PROPERTY
  - ADD \$808.36 TO EACH GANGPLANK SYSTEM DUE TO INCREASE IN HOIST CAPACITY
  - CHANGE QUANTITIES FOR SPECIALTY CONCRETE (FLOATING DOCK)
  - INCREASE DREDGING QUANTITIES

BEGIN PROJECT FBD 001 (002)  
CONTROL 0367-06-050  
STA. 72+92.00



END PROJECT FBD 001 (002)  
CONTROL 0367-06-050  
STA. 77+17.98

SCALE: 1 IN = 150 FT

NO EQUATIONS  
NO RAILROAD CROSSINGS  
NO EXCEPTIONS

CORRECT: *July 13 1994*  
*John R. Pimston* PE  
AREA ENGINEER

APPROVED FOR LETTING: \_\_\_\_\_  
DIRECTOR, TRAFFIC OPERATIONS DIVISION

U. S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION

RECOMMENDED FOR LETTING: *7-15 1994*  
*John R. Pimston* PE  
DISTRICT ENGINEER

APPROVED FOR LETTING: *8-26-94*  
*William J. Maulwus* PE  
DIRECTOR, DESIGN DIVISION

APPROVED: \_\_\_\_\_  
DIVISION ADMINISTRATOR DATE

THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE  
HAVE BEEN SELECTED BY ME OR UNDER MY  
RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO  
THIS PROJECT.

*John R. Pimston* PE

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION,  
MARCH 1, 1993 AND SPECIFICATION ITEMS LISTED AND  
DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED  
CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION  
CONTRACTS (FORM FHWA 1273, DECEMBER 1993).

COUNTY GALVESTON PROJ. NO. FBD 001 (002)  
 HWY. NO. SH 87 LETTING DATE 10-94  
 DATE ACCEPTED 11-21-94  
 DATE WORK BEGAN 1-1-95  
 CONTRACTOR AUSTIN BREEDEE & ROAD INC. DATE COMPLETED 10-25-96

FBD 001(002) GALVESTON

## SUMMARY OF MAINTENANCE DOCK SYSTEM QUANTITIES

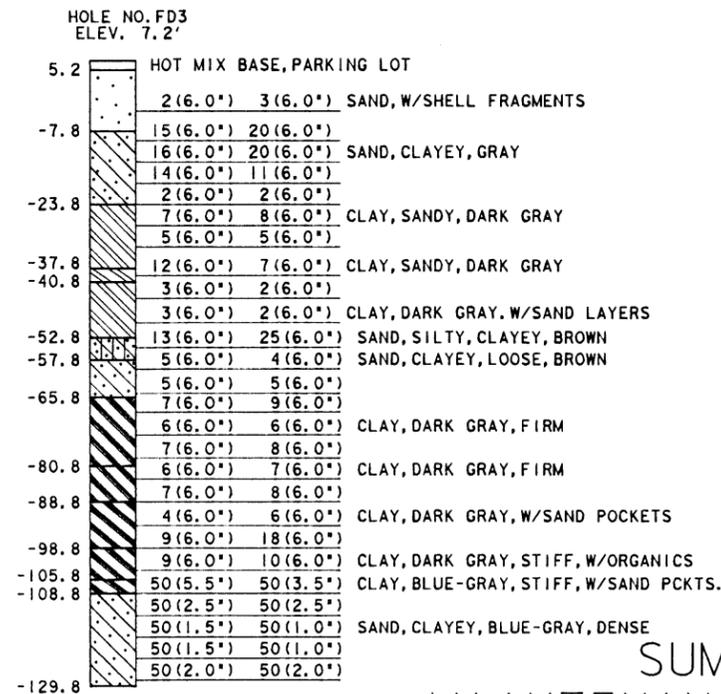
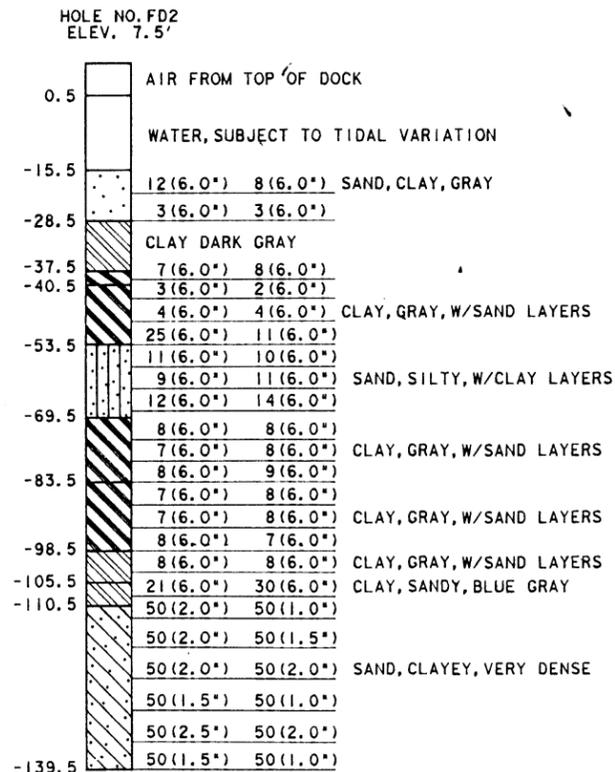
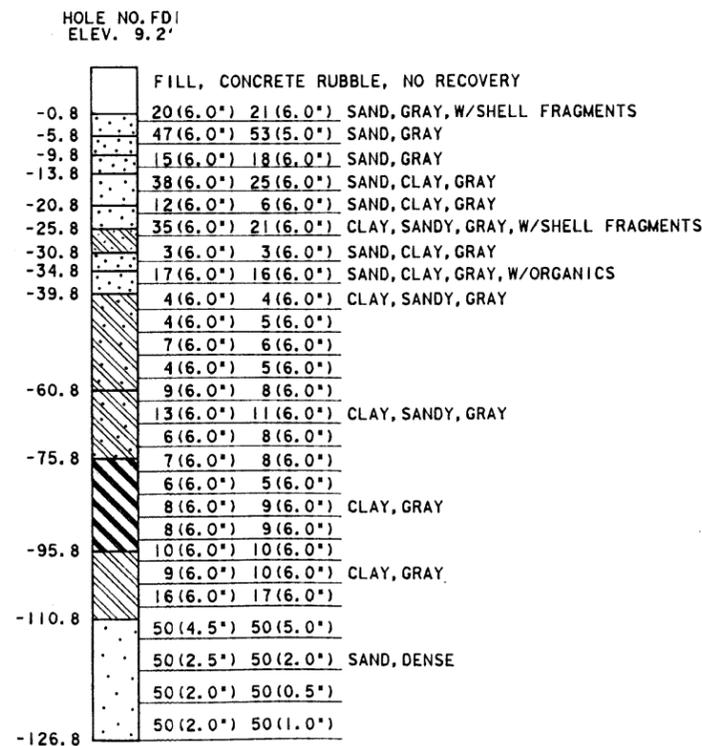
ITEM NO.	104	360	368	400			407	464		481	496		
	REMOV CONC (CURB)	CONC PAV (CONT REINF HY STL) (9")	TERMINAL ANCHORAGE LUGS	CEM STABIL BKFL	CUT & RESTORING PAV	LIMESTONE BKFL (1/2" USUAL) (0% CEM)	SHEET PILE (PZ-35)	RC PIPE (CL 111) (12")	RC PIPE (CL 111) (24")	PVC PIPE (SCH 40) (3 IN)	REMOV OLD STR (LARGE)	REMOV OLD STR (SMALL)	REMOV OLD STR (PIPE)
	LF	SY	CY	CY	SY	CY	SF	LF	LF	LF	EA	EA	LF
<b>TOTAL (0367-06-050)</b>	250	2302	76	1946	195	113	25988	25	8	37	1	21	4
<b>GRAND TOTAL</b>	250	2302	76	1946	195	113	25988	25	8	37	1	21	4

610	618		620				656	4081	4083	4080		XXXX	4084	4085	4086	4082
RDWY ILL ASSEM (TY SA 40S-8) (.25 KW)S	CONDUIT (PVC) (SCHD 80) (1 1/4")	CONDUIT (PVC) (SCHD 80) (2")	ELEC CONDUCTOR (NO. 12) BARE	ELEC CONDUCTOR (NO. 12) INSULATED	ELEC CONDUCTOR (NO. 6) INSULATED	ELEC CONDUCTOR (NO. 1/0) INSULATED	FND FOR RDWY ILL ASM (TY C) (30IN DR SH)	STEEL CYLINDER PILING	MOORING POST	CONSTRUCT GANGPLANK SYSTEM	DREDGING	MOBILIZATION FOR DREDGING	FENDER SYSTEM END BERTHING	FENDER SYSTEM BAR FENDER	FENDER SYSTEM LOW FRICTION PANEL	SPECIALTY CONC (FLOATING DOCK)
EA	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	CY	EA	EA	EA	SF	CY
4	425	600	425	850	800	2400	40	3640	58	4	41500	1	8	420	3307	1830
4	425	600	425	850	800	2400	40	3640	58	4	41500	1	8	420	3307	1830

▲ FOR CONTRACTOR'S INFORMATION ONLY

**NOTE:**

1. ALL PILE TIMBER CLUSTERS TO BE REMOVED UNDER ITEM 496 REMOVE OLD STR (SMALL).
2. EXISTING MAINTANACE DOCK SYSTEM TO BE REMOVED UNDER ITEM 496 REMOVE OLD STR (LARGE).



*Revised 9-26-94*  
*Revised 9-12-94*

## SUMMARY OF MAINTENANCE DOCK SYSTEM QUANTITIES AND BORING LOG

SHEET 1 OF 1 SHEET		
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	FBD 001(002)	2
STATE	STATE DIST. NO.	COUNTY
TEXAS	12	GALVESTON
CONTRACT NO.	SECT.	JOB
0367	06	050 SH 87

F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

GENERAL NOTES:

IN THOSE INSTANCES WHERE FIXED FEATURES REQUIRE, THE GOVERNING SLOPES INDICATED HEREIN MAY BE VARIED BETWEEN THE LIMITS SHOWN AND TO THE EXTENT DETERMINED BY THE ENGINEER.

FOR THIS PROJECT THE CONTRACTOR WILL BE EXPECTED TO SCHEDULE THIS WORK SO THAT THE CONCRETE PAVEMENT PLACEMENT OPERATIONS WILL FOLLOW THE SHEET PILING WORK AS CLOSELY AS PRACTICAL IN ORDER TO PREVENT UNDUE DELAY AND POSSIBLE PROJECT DELAYS.

THE ATTENTION OF PROSPECTIVE BIDDERS IS DIRECTED TO ORDINANCES AND REGULATIONS OF LOCAL MUNICIPAL AND COUNTY GOVERNMENTS AND THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION WHICH MAY BE APPLICABLE ON THIS PROJECT.

THE CONTRACTOR SHALL PROCURE ALL PERMITS AND LICENSES, WHICH ARE TO BE ISSUED TO THE CONTRACTOR BY THE CITY.

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MARKING STATIONS EVERY 100 FEET AND SHALL MAINTAIN THE MARKINGS FOR THE DURATION OF THE PROJECT.

MIXING OF MATERIALS, STORING OF MATERIALS, STORING OF EQUIPMENT, OR REPAIRING OF EQUIPMENT ON TOP OF MOORING DOCK DECKS WILL NOT BE PERMITTED UNLESS SPECIFICALLY AUTHORIZED BY THE ENGINEER. PERMISSION WILL BE GRANTED TO STORE MATERIALS ON SURFACES IF, IN THE OPINION OF THE ENGINEER, NO DAMAGE OR DISCOLORATION WILL RESULT.

REFERENCES TO MANUFACTURER'S TRADE NAME OR CATALOG NUMBERS ARE FOR THE PURPOSE OF IDENTIFICATION ONLY, AND THE CONTRACTOR WILL BE PERMITTED TO FURNISH LIKE MATERIALS OF OTHER MANUFACTURERS PROVIDED THEY ARE OF EQUAL QUALITY AND COMPLY WITH SPECIFICATIONS

PERSONAL VEHICLES OF THE CONTRACTOR'S EMPLOYEES SHALL NOT BE PARKED WITHIN THE RIGHT-OF-WAY AT ANY TIME, INCLUDING ANY SECTION CLOSED TO PUBLIC TRAFFIC. HOWEVER, THE CONTRACTOR'S EMPLOYEES MAY PARK ON THE RIGHT-OF-WAY AT THE SITES OF THE CONTRACTOR'S OFFICE, EQUIPMENT, AND MATERIALS STORAGE YARD.

ALL CONTRACTORS WHO WISH TO BID ON THE PROJECT ARE REQUIRED TO ATTEND A PRE-BID CONFERENCE SEPTEMBER 21, 1994, OR SEPTEMBER 23, 1994 AT THE TEXAS DEPARTMENT OF TRANSPORTATION OFFICE, 5407 GULF FREEWAY LAMARQUE, TX, 77568 (713) 337-3344. CONTRACTORS WHO FAIL TO ATTEND ONE OF THESE CONFERENCES SHALL NOT BE CONSIDERED FOR BIDDING. BOTH CONFERENCES

SPECIFICATION DATA  
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08/26 SHEET A  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

BEGIN AT 10:00 AM.

THE APPROXIMATE LOCATIONS OF KNOWN UNDERGROUND UTILITIES HAVE BEEN SHOWN ON THE PLAN SHEETS. PRIOR TO BEGINNING ANY EXCAVATION WORK IN THE AREA OF EXISTING UTILITIES, THE CONTRACTOR SHALL CONTACT THE UTILITY COMPANIES OR THE UTILITY COORDINATING COMMITTEE FOR EXACT LOCATIONS TO PREVENT ANY DAMAGE OR INTERFERENCE WITH PRESENT FACILITIES. THE UTILITY COORDINATING COMMITTEE AND THE TEXAS ONE CALL SYSTEM SHALL BE NOTIFIED.

THIS ACTION, HOWEVER, SHALL IN NO WAY BE INTERPRETED AS RELIEVING THE CONTRACTOR OF HIS/HER RESPONSIBILITIES UNDER THE TERMS OF THE CONTRACT AS SET OUT IN THE PLANS AND SPECIFICATIONS. THE CONTRACTOR SHALL REPAIR ANY DAMAGE CAUSED BY HIS/HER OPERATIONS AT THE CONTRACTOR'S EXPENSE AND SHALL RESTORE FACILITIES TO SERVICE IN A TIMELY MANNER.

THE DEPARTMENT MAY TEST BY ULTRASONIC METHODS THE ANCHOR BOLTS FOR LIGHT POLES AFTER THEY HAVE BEEN ERECTED. FAULTY ANCHOR BOLTS SHALL BE REPLACED AS DIRECTED BY THE ENGINEER.

DREDGING NEAR SHEET PILING WILL BE INITIATED AFTER SHEET PILING IS IN PLACE AND THE CONCRETE SLAB IS IN PLACE.

IF ANY OVERHEAD OR UNDERGROUND POWER LINES NEED TO BE DE-ENERGIZED, THE CONTRACTOR SHALL CALL THE POWER COMPANY TO DO THIS WORK. ANY COST ASSOCIATED WITH DE-ENERGIZING THE POWER LINE AND/OR ANY OTHER PROTECTIVE MEASURES REQUIRED SHALL BE AT THE CONTRACTOR'S EXPENSE.

BEFORE USE ON THIS PROJECT, SEVEN PRINTS OF EACH SHOP DRAWING SHALL BE PROVIDED FOR THE APPROVAL OF THE ENGINEER.

ALL ELECTRICAL WORK DONE SHALL BE IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE (N.E.C.).

ERECTION AND/OR REMOVAL OF POLES AND LUMINAIRES LOCATED NEAR ANY OVERHEAD OR UNDERGROUND ELECTRICAL LINES SHALL BE ACCOMPLISHED USING ESTABLISHED INDUSTRY AND UTILITY SAFETY PRACTICES.

AT THE CONTRACTOR'S OPTION, ELECTRICAL GROUNDING CONNECTIONS AND PERMISSIBLE SPLICES MAY BE MADE BY THE THERMAL FUSION PROCESS, CALDWELD, THERMAWELD OR EQUAL, IN LIEU OF BOLTED CONNECTIONS AND SPLICES.

THE AREA ENGINEER WILL ARRANGE, WITH THE CONTRACTOR, AN INSPECTION OF THE COMPLETED ELECTRICAL SYSTEMS FOR LIGHTING ON THIS PROJECT PRIOR TO

SPECIFICATION DATA  
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08/26 SHEET B  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

FINAL ACCEPTANCE FOR COMPLIANCE WITH PLANS AND SPECIFICATIONS. THE INSPECTION WILL BE MADE WITH PERSONNEL FROM THE ELECTRICAL SECTION OF TRAFFIC ENGINEERING. ANY DEFICIENCIES FOUND DURING THIS INSPECTION SHALL BE CORRECTED PRIOR TO ACCEPTANCE OF THAT PORTION OF THE WORK.

UTILITY WORK DONE ON PLANS SHALL BE IN ACCORDANCE WITH THE SPECIAL SPECIFICATION, "UTILITY SYSTEMS AND PAYMENT SHALL BE UNDER PERTINENT CONTRACTOR FORCE ACCOUNT."

FERRY MAINTENANCE DOCK OPERATIONS WILL BE MAINTAINED THROUGHOUT THE DURATION OF THE PROJECT. ACCESS TO TWO DOCKS SHALL BE MAINTAINED AT ALL TIMES.

FOR THIS PROJECT THE CONTRACTOR WILL FURNISH AND MAINTAIN ALL BARRICADES AND WARNING SIGNS.

ALL HARDWARE, INCLUDING STRUCTURAL STEEL, BOLTS, AND WASHERS SHALL BE HOT DIP GALVANIZED, UNLESS SHOWN ON PLANS TO BE PAINTED.

ITEM 7: LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC

MAINTENANCE OF SLOPE STABILITY IS THE RESPONSIBILITY OF THE CONTRACTOR. TEMPORARY RETAINING STRUCTURES OR SHORING PROPOSED BY THE CONTRACTOR MUST BE APPROVED IN WRITING BY THE ENGINEER PRIOR TO ERECTION. TEMPORARY RETAINING STRUCTURES OR SHORING MAY BE REQUIRED AT THE DISCRETION OF THE ENGINEER. THE CONTRACTOR MUST SUBMIT DESIGN CALCULATIONS, WORKING DRAWINGS AND PLAN OF OPERATIONS INCLUDING SEQUENCING FOR APPROVAL BY THE ENGINEER.

NO DIRECT PAYMENT WILL BE MADE FOR MAINTENANCE OF SLOPE STABILITY BUT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.

ITEM 104: REMOVING CONCRETE

REMOVING CONCRETE (CURB) WILL BE PAID FOR AS A SEPARATE BID ITEM WHERE EXISTING PAVEMENT ON WHICH IT RESTS IS NOT TO BE REMOVED AT THE SAME TIME.

SAW CUTS, WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE ITEM, "REMOVING CONCRETE (PAVEMENT)".

SPECIFICATION DATA  
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08/26 SHEET C  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 360: CONCRETE PAVEMENT

WHEN CONVENTIONAL PAVING METHODS ARE USED (FORMS), A LONGITUDINAL FINISHING MACHINE WILL BE REQUIRED. THE LONGITUDINAL FINISHING MACHINE SHALL BE PROVIDED WITH A LONGITUDINAL FLOAT NOT LESS THAN TEN FEET IN LENGTH, ADJUSTED TO A TRUE PLANE, SHALL BE POWER DRIVEN AND MOUNTED IN A SUBSTANTIAL FRAME EQUIPPED TO RIDE ON FORMS, AND SHALL BE SO DESIGNED AND OPERATED AS TO FINISH THE REQUIRED GRADE. IN LIEU OF THE LONGITUDINAL FINISHING MACHINE THE CONTRACTOR MAY USE A LONGITUDINAL TRANSANGULAR FLOAT (ALSO KNOWN BY VARIOUS TRADE NAMES SUCH AS V FINISHER, LEWIS TRANSANGULAR FINISHER, C.M.I. TUBE FLOAT, ETC.) ADJUSTABLE TO CROWN AND GRADE. THE OPERATION OF THE LONGITUDINAL TRANSANGULAR FLOAT SHALL BE AS APPROVED BY THE ENGINEER.

WHERE PAVEMENT CURB IS LEFT OFF FOR A TIE AT A LATER DATE, DOWELS AND/OR TIE BARS SHALL BE PROVIDED AS INDICATED ON APPLICABLE PAVING DETAIL SHEETS AND AS DIRECTED BY THE ENGINEER. DOWEL BARS PROVIDED SHALL NOT BE MEASURED OR PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS ITEMS OF WORK.

THE CONTRACTOR SHALL HAVE ON THE JOB SITE SUFFICIENT POLYETHYLENE FABRIC, AS DIRECTED BY THE ENGINEER, TO COVER A SECTION OF CONCRETE PAVEMENT 600 FEET LONG AND 50 FEET WIDE.

CONCRETE PLACEMENT WILL NOT BE PERMITTED WHEN IMPENDING WEATHER CONDITIONS, IN THE OPINION OF THE ENGINEER, MAY RESULT IN RAINFALL OR LOW TEMPERATURES WHICH WILL IMPAIR THE QUALITY OF THE FINISHED WORK.

IF CONCRETE PAVEMENT SURFACES ARE DAMAGED WHILE IN A PLASTIC STATE BY ACTION OF RAIN, TIRE TRAFFIC, OR FOOT TRAFFIC, THOSE DAMAGED PORTIONS SHALL BE REPAIRED BEFORE THAT AREA RECEIVES PERMANENT PAVEMENT MARKINGS AND IS OPENED TO TRAFFIC. REPAIRS SHALL BE STRUCTURALLY EQUIVALENT TO AND COSMETICALLY UNIFORM WITH THE ADJACENT UNDAAGED AREAS. "GROUTING" ONTO THE SURFACE OVER TIRE-IMPRINTED DEPRESSIONS WITHOUT REMOVAL OF CURING COMPOUNDS OR WITHOUT FULL BONDING TO UNDERLYING CONCRETE AGGREGATE IS NOT AN ACCEPTABLE REPAIR PROCEDURE.

THE USE OF READY MIX CONCRETE WILL BE PERMITTED. EQUIPMENT AND CONSTRUCTION METHODS, SATISFACTORY TO THE ENGINEER, WHICH WILL PRODUCE THE DESIRED RESULTS MAY BE USED IN LIEU OF THOSE SPECIFIED. HAND FINISHING WILL BE PERMITTED.

CONCRETE SHALL CONTAIN NOT LESS THAN SIX SACKS OF CEMENT PER CUBIC YARD OF CONCRETE.

SPECIFICATION DATA  
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08/26 SHEET D  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 360: CONCRETE PAVEMENT, CONT'D

UNLESS OTHERWISE SHOWN ON THE PLANS, THE ACID INSOLUBLE RESIDUE OF THE FINE AGGREGATE SHALL NOT BE LESS THAN 85% BY HEIGHT WHEN TESTED IN ACCORDANCE WITH TEST METHOD TEX-612-J. WHEN NATURAL SAND IS USED AS FINE AGGREGATE, THIS REQUIREMENT WILL BE WAIVED.

ITEMS 360, 420 AND 421: ALL CONCRETE ITEMS

THE ENGINEER WILL SAMPLE ALL CONCRETE AND MAKE AND TEST ALL TEST BEAMS AND CYLINDERS IN ACCORDANCE WITH TEST METHODS TEX-418-A AND TEX-420-A.

FOR ALL CONCRETE, THE HAULING, REMOVING FROM FORMS AND CURING OF TEST BEAMS AND ALL HANDLING UNTIL FINAL DISPOSITION SHALL BE DONE BY A RESPONSIBLE PERSON FURNISHED BY THE CONTRACTOR AND IN ACCORDANCE WITH BULLETIN C-11 AND AS DIRECTED BY THE ENGINEER. THE ABOVE WORK SHALL NOT BE PAID FOR SEPARATELY BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS OTHER BID ITEMS. ACTUAL TESTING SHALL BE PERFORMED BY THE ENGINEER. FOR THIS PROJECT, THE CONTRACTOR SHALL FURNISH AND MAINTAIN TEST BEAMS AND/OR CYLINDER TEST MOLDS. THESE MOLDS MUST MEET THE REQUIREMENTS OF TEST METHOD TEX-447-A. THE CONTRACTOR SHALL PROVIDE WHEELBARROWS FOR THE INSPECTOR'S USE IN TAKING CONCRETE SAMPLES.

ALL LABOR AND EQUIPMENT FURNISHED BY THE CONTRACTOR FOR CONCRETE SAMPLING AND TESTING SHALL BE CONSIDERED SUBSIDIARY TO THE VARIOUS ITEMS AND WILL NOT BE PAID FOR DIRECTLY.

ITEM 368: TERMINAL ANCHORAGE LUGS

THE REINFORCING STEEL SHALL BE PLACED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH ITEM 440, "REINFORCING STEEL". EQUIPMENT AND CONSTRUCTION METHODS SHALL BE APPROVED BY THE ENGINEER. ALL MATERIAL SHALL CONFORM TO THE PERTINENT REQUIREMENTS OF THE FOLLOWING ITEMS: ITEM 421, "PORTLAND CEMENT CONCRETE" ITEM 440, "REINFORCING STEEL"

THE SPECIFIED CLASS OF CONCRETE SHALL BE MIXED, PLACED, CONSOLIDATED, FINISHED AND CURED AS SPECIFIED IN ITEM 420, "CONCRETE STRUCTURES".

ITEM 400: EXCAVATION AND BACKFILL FOR STRUCTURES

ALL EXCAVATION AND DISPOSAL OF SURPLUS MATERIALS REQUIRED FOR STRUCTURES AND LIGHTING STANDARD FOUNDATIONS SHALL BE INCLUDED IN THE UNIT PRICES BID FOR THE VARIOUS ITEMS WHERE EXCAVATION IS REQUIRED.

SPECIFICATION DATA  
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08/26 SHEET E  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 400: EXCAVATION AND BACKFILL FOR STRUCTURES, CONT'D

WHEN BACKFILLING PILING WITH STABILIZED MATERIAL, THE MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED 24 INCHES IN DEPTH (LOOSE MEASUREMENT), AND SHALL BE COMPACTED USING MECHANICAL MEANS.

AGGREGATE FOR CEMENT STABILIZED BACKFILL SHALL BE CRUSHED CONCRETE, FREE FROM DELETERIOUS MATTER AND SUBJECT TO APPROVAL OF THE ENGINEER.

CEMENT STABILIZED BACKFILL SHALL CONTAIN A MINIMUM OF 7% OF PORTLAND CEMENT BASED ON THE DRY WEIGHT OF COMBINED AGGREGATE AND CEMENT.

THE FOLLOWING ADDITIONAL REQUIREMENTS WILL BE APPLICABLE WHEN ITEM 276, TYPE "D2" BASE, IS INCLUDED IN THE PLANS:

1. AGGREGATE FOR CEMENT STABILIZED BACKFILL SHALL BE SAND, CRUSHED CONCRETE OR SALVAGED BASE, FREE FROM DELETERIOUS MATTER AND SUBJECT TO APPROVAL OF THE ENGINEER.
2. CRUSHED CONCRETE BACKFILL MATERIAL SHALL CONFORM TO ITEM 276, TYPE "D2" (BASE) OR (CRUSHED CONCRETE) BUT WITH THE STIPULATION THAT THE TYPE "D2" MATERIAL SHALL NOT CONTAIN ANY RAP (RECLAIMED ASPHALT PAVEMENT).
3. THE STABILIZED BACKFILL MATERIAL SHALL BE OF A GRADATION THAT CAN BE SATISFACTORILY PLACED AND COMPACTED TO PROVIDE A VERY DENSE MASS WITHOUT SEGREGATION.

ITEM 407: STEEL PILING

USED STEEL SHEET PILING MAY BE FURNISHED UPON THE APPROVAL OF THE ENGINEER.

SHEET PILING SHALL RECEIVE PROTECTION SYSTEM III FOR THE TOP 40 FEET AND SHALL BE APPLIED AS STATED IN ITEM 446.

ITEM 420: CONCRETE STRUCTURES

TEXTURING EQUIPMENT OTHER THAN THAT SPECIFIED IN STANDARD SPECIFICATION ITEM "CONCRETE STRUCTURES" MAY BE APPROVED BY THE ENGINEER, PROVIDED AN EQUIVALENT TEXTURE IS OBTAINED. THE CONTRACTOR SHALL HAVE HAND RAKES WITH TINES AVAILABLE AT ALL TIMES FOR THE PURPOSE OF PROVIDING TEXTURE IN THE EVENT OF EQUIPMENT BREAKDOWN.

SPECIFICATION DATA  
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08/26 SHEET F  
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*Revised 8-26-94*

F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3A
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 420: CONCRETE STRUCTURES, CONT'D  
EXCEPT WHERE DIRECTED OTHERWISE BY THE ENGINEER, NO CONCRETE MAY BE PLACED IN AN EXPOSED POSITION WHEN THE OFFICIAL WEATHER FORECAST FOR THE FOLLOWING 24 HOUR PERIOD IMMEDIATELY AFTER START OF PLACEMENT PREDICTS A TEMPERATURE OF 32 DEGREES FAHRENHEIT OR LOWER.

ITEM 446: CLEANING, PAINT AND PAINTING  
ALL PAINTS PURCHASED FROM THE TEXAS DEPARTMENT OF TRANSPORTATION WILL BE CHARGED AS FOLLOWS:  
GRAY APPEARANCE COAT (PROTECTION SYSTEM III) \*64.40/5 GAL.  
*IF THE COATS ARE DAMAGED BEFORE DRIVING OR ERECTION, THEY SHALL BE REPAIRED IN A MANNER ACCEPTABLE TO THE ENGINEER.*  
FOR THE SHEET PILING AND STEEL CYLINDER PILING, THE CONTRACTOR SHALL HAVE ALL THREE PAINTS OF PROTECTION SYSTEM III APPLIED IN THE SHOP. FOR STRUCTURAL STEEL, THE CONTRACTOR SHALL HAVE THE OPTION OF EITHER HAVING ALL THREE PAINTS APPLIED IN THE SHOP OR HAVING THE PRIME COAT APPLIED IN THE SHOP AND THE OTHER TWO PAINTS APPLIED IN THE FIELD.  
ALL CUT EDGES MUST BE GROUND TO 1/8 " RADIUS BEFORE PAINTING.

ITEM 464: REINFORCED CONCRETE PIPE  
CONCRETE COLLARS WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS BID ITEMS.  
RUBBER GASKETS WILL BE REQUIRED FOR JOINTS ON THIS PROJECT.  
AN EFFORT HAS BEEN MADE TO LOCATE THE EXISTING STUBOUTS, AS SHOWN ON THE PLANS, BUT THERE IS A POSSIBILITY THAT THESE STUBOUTS WILL BE IN A DIFFERENT POSITION OR CONDITION. ANY DELAY, INCONVENIENCE OR ADDITIONAL WORK REQUIRED WILL NOT BE A BASIS FOR ADDITIONAL COMPENSATION.

ITEMS 481: PVC PIPE FOR BRIDGE DRAINS  
THIS ITEM SHALL BE FOR FURNISHING AND INSTALLING OF (PVC) PIPE, OF VARIOUS SIZES AND TYPES AS SHOWN ON PLANS.

SPECIFICATION DATA  
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08/26 SHEET G  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3A
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

ITEMS 481: PVC PIPE FOR BRIDGE DRAINS, CONT'D  
PVC PIPE AND FITTINGS WHICH ARE TO BE CAST IN CONCRETE OR BURIED SHALL MEET THE REQUIREMENTS OF ASTM D3034 TYPE SDR-35 OF THE NOMINAL SIZE SHOWN ON THE PLANS.  
THE CONTRACTOR SHALL FURNISH THE ENGINEER A MANUFACTURER'S CERTIFICATION THAT THE MATERIAL HAS MANUFACTURED AND INSPECTED IN ACCORDANCE WITH AND MEETS THE REQUIREMENTS OF THE PERTINENT ASTM SPECIFICATION.

ITEMS 496: REMOVING OLD STRUCTURES  
UNLESS OTHERWISE SPECIFIED ON THE PLANS, TIMBER PILES SHALL BE REMOVED COMPLETELY.  
SALVAGED ITEMS FROM THE EXISTING MAINTENANCE DOCK TO BE REMOVED SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE PROJECT SITE.  
THE REMOVAL OF UTILITIES AND VARIOUS INDIVIDUAL STRUCTURES (LIGHT POLES, RAILING, FOUNDATIONS, ETC.) ON THE EXISTING MAINTENANCE DOCK SHALL BE INCLUDED IN THE LUMP SUM PAYMENT FOR "REMOVE OLD STRUCTURES (LARGE)."

ITEMS 610 AND 616: ROADWAY ILLUMINATION ASSEMBLIES AND PERFORMANCE TESTING OF LIGHTING SYSTEMS  
IT IS THE INTENT OF THE ILLUMINATION PORTION OF THESE PLANS TO PROVIDE FOR A COMPLETE ILLUMINATION SYSTEM INSTALLED, CONNECTED, TESTED AND READY FOR OPERATION.  
THE CONTRACTOR SHALL PERMIT THE ELECTRICAL WORK TO BE INSPECTED BY THE STATE AND CITY BUT WILL NOT BE REQUIRED TO COMPLY WITH THE PROVISIONS AND REQUIREMENTS OF THE CITY ELECTRICAL ORDINANCE. SUCH INSPECTION WILL IN NO SENSE MAKE THE CITY A PARTY TO THIS CONTRACT.  
ANY WIRE USED IN POLE FOUNDATION OR POLE BASE TO MAKE CONNECTIONS SHALL BE CONSIDERED INCIDENTAL TO ROADWAY ILLUMINATION ASSEMBLY. LINEAR FEET FOR PAYMENT SHALL BE SURFACE DISTANCE BETWEEN LOCATIONS.  
AFTER SATISFACTORY COMPLETION OF ALL TESTS, ALL NEW LIGHTING FIXTURES SHALL BE PLACED IN OPERATION. FINAL ACCEPTANCE WILL NOT BE MADE UNTIL THE FIXTURES HAVE OPERATED SATISFACTORILY FOR A PERIOD OF NOT LESS THAN 14 DAYS. THE 14 DAY TEST PERIOD WILL BE INCLUDED IN THE WORKING DAYS

SPECIFICATION DATA  
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08/26 SHEET H  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3A
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

ITEMS 610 AND 616: ROADWAY ILLUMINATION ASSEMBLIES AND, CONT'D ALLOWED FOR THE PROJECT.  
THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE NEW LIGHTING FIXTURES DURING THE TEST PERIOD, SHALL MAKE ANY ADJUSTMENTS OR REPAIRS WHICH MAY BE REQUIRED, AND SHALL REMEDY ANY DEFECTS OR DAMAGES WHICH MAY OCCUR AT THE CONTRACTOR'S EXPENSE.  
THE CONTRACTOR SHALL PAY FOR INSTALLATION CHARGE FROM HOUSTON LIGHTING AND POWER COMPANY, BUT THE CONTRACTOR SHALL NOT BE REQUIRED TO PAY FOR ELECTRICAL ENERGY CONSUMED BY THE FIXTURES DURING THE PERIOD OF TRIAL OPERATION. AFTER SUCCESSFUL COMPLETION OF THE TESTING PERIOD, THE CONTRACTOR SHALL THEREAFTER BE RELIEVED OF THE MAINTENANCE OF THE LIGHTING FIXTURES IN ACCORDANCE WITH THE PROVISIONS OF ITEM 7.  
THE GALVANIZING PROCESS FOR TUBULAR TYPE LIGHT STANDARDS SHALL INCLUDE A PREFLUX BATH. THE PREFLUX BATH SHALL BE IN AN INDIVIDUAL TANK AND SHALL BE HYDROCHLORIC ACID, ZINC AMMONIA CHLORIDE, OR ANOTHER APPROVED SOLUTION. THE PREFLUX BATH SHALL PRECEDE THE GALVANIZING TANK IMMERSION IN THE GALVANIZING PROCESS.

ITEM 618: CONDUIT  
WHEN BACKFILLING BORE PITS, THE CONTRACTOR MUST ENSURE THAT THE CONDUIT DOES NOT BECOME DAMAGED DURING INSTALLATION OR DUE TO ANY SETTling OF THE BACKFILL MATERIAL. THE CONTRACTOR MUST COMPACT SELECT BACKFILL IN THREE EQUAL LIFTS TO THE BOTTOM OF THE CONDUIT; OR IF SAND IS USED, IT MUST BE PLACED TO A POINT TWO INCHES ABOVE THE CONDUIT. BACKFILL DENSITY SHALL BE EQUAL TO THE EXISTING SOIL. DUE CARE SHOULD BE EXERCISED TO PREVENT ANY MATERIAL FROM ENTERING THE CONDUIT.  
IF IT IS NECESSARY TO PLACE CONDUIT UNDER EXISTING PAVEMENT IN ORDER TO REACH SERVICE POLES, THE CONDUIT SHALL BE BORED IN PLACE AND EXTENDED A MINIMUM DISTANCE OF 2.5 FEET BEYOND THE EDGE OF SHOULDER OR BACK OF CURB.  
IF CASING IS REQUIRED TO PLACE BORED CONDUIT, CASING SHALL BE INCIDENTAL TO CONDUIT.  
BORE PITS SHALL BE NO CLOSER THAN 2.5 FEET FROM EDGE OF THE BASE OR PAVEMENT.  
ALL EXPOSED CONDUIT SHALL BE RIGID METAL CONDUIT (RMC).

SPECIFICATION DATA  
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08/26 SHEET I  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3A
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 618: CONDUIT, CONT'D  
PULLING CONDUCTORS IN PVC CONDUIT SHALL BE ACCOMPLISHED WITH NONMETALLIC PULL ROPE.  
ALL CONDUCTOR AND CONDUIT TO BE ABANDONED SHALL BE REMOVED TO ONE FOOT BELOW GROUND LEVEL. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO THE VARIOUS BID ITEMS AND WILL NOT BE PAID FOR DIRECTLY.

ITEM 620: ELECTRICAL CONDUCTOR  
EACH WIRE OF EACH CABLE OR CONDUCTOR SHALL BE TESTED AFTER INSTALLATION BY THE CONTRACTOR. ANY INCOMPLETE CIRCUIT OR ANY DAMAGE TO ANY WIRE OR ANY CABLE WILL RESULT IN THE IMMEDIATE REJECTION OF THE ENTIRE CABLE BEING TESTED. THE CONTRACTOR SHALL REMOVE AND REPLACE THE ENTIRE CABLE AT HIS/HER EXPENSE, AND THE REPLACEMENT CABLE SHALL ALSO BE TESTED AFTER INSTALLATION.  
ALL INSULATED CONDUCTORS SHALL BE COLOR CODED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. THE NEUTRAL CONDUCTOR SHALL BE WHITE OR MARKED WITH WHITE TAPE. WHITE SHALL NOT BE USED FOR ANY OTHER CONDUCTOR. THE GROUNDING CONDUCTOR SHALL BE BARE OR GREEN. GREEN SHALL NOT BE USED FOR ANY OTHER CONDUCTOR.  
WHEN PULLING CABLES OR CONDUCTORS THROUGH CONDUIT, MANUFACTURER'S RECOMMENDED PULLING TENSIONS SHALL NOT BE EXCEEDED AND THE CABLES OR CONDUCTORS SHALL BE LUBRICATED WITH A LUBRICANT RECOMMENDED BY THE CABLE MANUFACTURER.  
ALL CIRCUITS SHALL TEST CLEAR OF FAULTS, GROUNDS AND OPEN CIRCUITS TO THE SATISFACTION OF THE ENGINEER.

ITEM 624: GROUND BOXES  
GROUND BOX LOCATIONS SHOWN ON THE PLANS ARE APPROXIMATE LOCATIONS. THE GROUND BOXES SHALL NOT BE PLACED IN SIDEWALKS OR DRIVEWAYS. ALTERNATE GROUND BOX LOCATIONS SHALL BE AS DIRECTED BY THE ENGINEER.  
METAL GROUND BOX COVERS SHALL BE GROUND BY A GROUND ROD IN THE GROUND BOX.

SPECIFICATION DATA  
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08/26 SHEET J  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3A
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 628: ELECTRICAL SERVICES  
SEVEN PRINTS OF EACH SHOP DRAWING FOR ALL ELECTRICAL COMPONENTS SHALL BE PROVIDED TO THE ENGINEER FOR APPROVAL BEFORE USE ON THIS PROJECT.  
SERVICE POLES SHALL BE GROUNDED IN ACCORDANCE WITH THE NATIONAL ELECTRIC CODE. THE COST OF SUCH GROUNDING SHALL BE INCLUDED IN THE UNIT PRICE FOR THIS ITEM.  
THE CONTRACTOR SHALL VERIFY AND COORDINATE SERVICE POLE LOCATION WITH THE ENGINEERING SECTION OF THE APPROPRIATE UTILITY DISTRICT.  
ANY AND ALL COST ASSOCIATED WITH THE INSTALLATION AND CONNECTION OF SERVICE POLE TO THE ELECTRICAL UTILITY COMPANY WILL BE CONSIDERED INCIDENTAL TO THE SERVICE POLE. THIS INCLUDES CONDUIT, CONDUIT FITTINGS AND ELECTRICAL CONDUCTORS.  
SERVICE POLE ADDRESS NUMBERS AND LETTERS SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR. TYPE AND SIZE OF LETTERS AND NUMBERS SHALL BE APPROVED BY THE ENGINEER.  
A CONTROL TRANSFORMER SHALL BE PROVIDED WHEN NECESSARY TO OPERATE THE PHOTOCELL AT 120 VOLTS. THIS TRANSFORMER SHALL BE RATED AT 115 DEGREES (CENTIGRADE) TEMPERATURE RISE.  
THE EXTERNAL DISCONNECT HANDLE WILL BE FLANGE MOUNTED ON THE COMBINATION LIGHTING CONTACTOR ENCLOSURE AND WILL LATCH THE DOOR. IT SHALL BE LOCKABLE IN EITHER POSITION.  
THE LIGHTNING ARRESTOR SHALL BE MOUNTED IN A NEMA 1 ENCLOSURE TO CONTAIN FRAGMENTS IN THE EVENT OF A LIGHTNING STRIKE.  
CIRCUIT BREAKERS SHALL BE RATED AT 250 VOLTS FOR THE 120/240 VOLT CIRCUITS AND AT 600 VOLTS FOR THE 240/480 VOLT CIRCUITS.  
FIXTURE MOUNTING CHANNELS SHALL BE INCLUDED FOR PAYMENT WITH THE SIGN LIGHTING FIXTURES.

ITEM 656: FOUNDATIONS FOR SIGNS, TRAFFIC SIGNALS AND ROADWAY ILLUMINATION ASSEMBLIES  
ALL EXCAVATION AND DISPOSAL OF SURPLUS MATERIALS REQUIRED FOR LIGHTING STANDARD FOUNDATIONS WILL BE CONSIDERED INCIDENTAL TO ROADWAY ILLUMINATION ASSEMBLY FOUNDATION. ALL SURPLUS EXCAVATED MATERIAL SHALL BE DISPOSED OF AS DIRECTED BY THE ENGINEER.

SPECIFICATION DATA  
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08/26 SHEET K  
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F.R. DIV.6	TEXAS	FBD 001(002)	SHEET 3A
GALVESTON	COUNTY	HWY SH87	CONT 0367-6-50

GENERAL NOTES AND SPECIFICATION DATA--

ITEM 656: FOUNDATIONS FOR SIGNS, TRAFFIC SIGNALS AND ROADWAY, CONT'D  
ALL STUB-OUTS IN FOUNDATION AND CONCRETE STRUCTURES ARE TO BE RIGID METAL CONDUIT (RMC) AND SHALL BE CONSIDERED INCIDENTAL TO DRILLED SHAFT FOUNDATIONS.  
READY MIX CONCRETE MAY BE USED FOR SIGN FOUNDATIONS.  
PAYMENT FOR FURNISHING AND INSTALLING ANCHOR BOLTS MOUNTED IN DRILLED SHAFTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR THE VARIOUS DRILLED SHAFTS.

ITEM 5004: TEMPORARY EROSION, SEDIMENTATION AND WATER POLLUTION PREVENTION AND CONTROL  
THE "STORM WATER POLLUTION PREVENTION PLAN" (SW3P) FOR THIS PROJECT SHALL CONSIST OF USE OF ANY TEMPORARY EROSION CONTROL MEASURES DEEMED NECESSARY BY THE ENGINEER AND AS PROVIDED UNDER THIS ITEM.  
FOR THIS PROJECT, A "STORM WATER POLLUTION PREVENTION PLAN" (SW3P) IS REQUIRED. SINCE THE DISTURBED AREA IS LESS THAN FIVE ACRES ON THIS PROJECT, A "NOTICE OF INTENT" (NOI) IS NOT REQUIRED.  
THE CONTRACTOR WILL TAKE APPROPRIATE MEASURES TO PREVENT, MINIMIZE AND CONTROL THE SPILL OF HAZARDOUS MATERIALS IN THE CONSTRUCTION STAGING AREA. ALL MATERIALS BEING REMOVED AND/OR DISPOSED OF BY THE CONTRACTOR WILL BE DONE SO IN ACCORDANCE WITH STATE AND FEDERAL LAWS AND WITH THE APPROVAL OF THE PROJECT ENGINEER.  
PRIOR TO STARTING CONSTRUCTION, THE ENGINEER WILL REVIEW WITH THE CONTRACTOR THE SW3P TO BE USED FOR TEMPORARY EROSION CONTROL AS OUTLINED IN THE PLANS. AS REQUIRED ON THE SW3P OR AS DIRECTED BY THE ENGINEER, THE TEMPORARY EROSION AND SEDIMENTATION CONTROL FEATURES SHALL BE IN PLACE PRIOR TO CONSTRUCTION.

SPECIFICATION DATA  
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08/26 SHEET L  
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*REVISED 9-26-94*

# ESTIMATE SUMMARY

PROJECT FBD 001 (002)												A L T	ITEM- CODE	DESCRIPTION	U N I T	TOTAL				
CSJ-0367-06-050 - SH 87																ITEM NO	DESC CODE	SP NO	EST.	FINAL
GALVESTON COUNTY ROADWAY																				
EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL	EST.	FINAL					
								250.000	250.000	104	514		REMOV CONC (CURB)	LF	250.000	250.000				
								2302.000	2287.300	360	504		CONC PAV (CONT REINF HY STL)(9 ")	SY	2302.000	2287.300				
								76.000	76.000	368	501		TERMINAL ANCHORAGE LUGS	CY	76.000	76.000				
								1946.000	2201.230	400	507	001	CEM STABIL BKFL	CY	1946.000	2201.230				
								195.000	323.000	400	508		CUT & RESTORING PAV	SY	195.000	323.000				
								25988.000	28488.000	407	507		SHEET PILING (PZ-3S)	SF	25988.000	28488.000				
								25.000	25.000	464	501		RC PIPE (CL III)(12 ")	LF	25.000	25.000				
								8.000	0.000	464	505		RC PIPE (CL III)(24 ")	LF	8.000	0.000				
								37.000	37.000	481	511		PVC PIPE (SCH 40)(3 IN)	LF	37.000	37.000				
								1.000	1.000	496	501		REMOV OLD STR (LARGE)	EA	1.000	1.000				
								21.000	21.000	496	502		REMOV OLD STR (SMALL)	EA	21.000	21.000				
								4.000	4.000	496	504		REMOV OLD STR (PIPE)	LF	4.000	4.000				
								1.000	1.000	500	501		MOBILIZATION	LS	1.000	1.000				
								9.000	9.000	502	501	003	BARRICADES, SIGNS AND TRAF HANDLE	MO	9.000	9.000				
								4.000	4.000	610	509		RDWY ILL ASSEM (TY SA 40S-8)(.25 KW)S	EA	4.000	4.000				
								425.000	425.000	618	516		CONDUIT (PVC)(SCHD 80)(1 1/4")	LF	425.000	425.000				
								600.000	2250.000	618	518		CONDUIT (PVC)(SCHD 80)(2 ")	LF	600.000	2250.000				
								425.000	425.000	620	501		ELEC CONDUCTOR (NO. 12) BARE	LF	425.000	425.000				
								850.000	850.000	620	507		ELEC CONDUCTOR (NO. 12) INSULATED	LF	850.000	850.000				
								800.000	1277.000	620	510		ELEC CONDUCTOR (NO. 6) INSULATED	LF	800.000	1277.000				
								2400.000	3740.000	620	514		ELEC CONDUCTOR (NO. 1/0) INSULATED	LF	2400.000	3740.000				
								40.000	40.000	656	517		FND FOR RDWY ILL ASM (TY C)(30IN DR SH)	LF	40.000	40.000				
								4.000	0.000	4080	501		GANGPLANK SYSTEM	EA	4.000	0.000				
								3640.000	3640.000	4081	501		STEEL CYLINDER PILING	LF	3640.000	3640.000				
								1830.000	1098.000	4082	501		SPECIALTY CONCRETE (FLOATING DOCK)	CY	1830.000	1098.000				
								58.000	58.000	4083	501		MOORING POST	EA	58.000	58.000				
								8.000	8.000	4084	501		FENDER SYSTEM (END BERTHING)	EA	8.000	8.000				
								420.000	420.000	4085	501		FENDER SYSTEM (BAR FENDER)	EA	420.000	420.000				
								3307.000	3312.000	4086	501		FENDER SYSTEM (LOW FRICTION PANEL)	SF	3307.000	3312.000				
								1.000	1.000	5103	501		MOBILIZATION FOR DREDGING	EA	1.000	1.000				
								41500.000	0.000	5104	501		DREDGING	CY	41500.000	0.000				
								365.000	391.000	0450	559		RAIL(TY 50)(RDWY-94) W/DRAIN SLOTS	LF	365.000	391.000				
								1830.000	732.000	4082	501	900	SPECIALTY CONCRETE (FLOATING DOCK)	CY	1830.000	732.000				
								95.540	95.540	9082	502		SPLGNG (PARAPET WALL REPAIR) ED. 1+2	LF	95.540	95.540				
													CONTRACTOR FORCE ACT OR AGR UNIT PRICE							
													TEMP. EROSION, SEDT & WTR-POL CONTROL	LS	1.000					
													UTILITY SYSTEMS	LS	1.000					
								41500.000	59808.000	5104	501	900	DREDGING	CY	41500.000	59808.000				
								1040.000	236.500	9003	001		O.S.T. PROGRAM (THOMAS SWANFORD)(905)	HR	1040.000	236.500				
								1040.000	1040.000	9002	001		O.S.T. PROGRAM (JUAN REYES)(905)	HR	1040.000	1040.000				
								1040.000	1040.000	9001	001		O.S.T. PROGRAM (CHARLES BROWN)(903)	HR	1040.000	1040.000				
								4995.000	4995.000	9001	001		CHANGE ORDER NO. 3	EA	4995.000	4995.000				
								4995.000	4995.000	9005	001		CHANGE ORDER NO. 5	EA	4995.000	4995.000				
								2528.250	2528.250	9006	001		CHANGE ORDER NO. 6	EA	2528.250	2528.250				
								75123.410	17351.870	9007	001		CHANGE ORDER NO. 7	EA	75123.410	17351.870				
								5651.970	4965.000	9008	001		CHANGE ORDER NO. 9	EA	5651.970	4965.000				
								4723.050	4723.050	9009	001		CHANGE ORDER NO. 4	EA	4723.050	4723.050				
								2766.780	2766.780	9010	001		CHANGE ORDER NO. 11	EA	2766.780	2766.780				
								1.000	1.000	9082	501		DELAY COSTS (INITIAL 2 FLOAT DOCKS)	LS	1.000	1.000				
								4.000	4.000	4080	501	900	GANG PLANK SYSTEM	EA	4.000	4.000				

REVISED 9-26-94  
REVISED 9-12-94

## ESTIMATE & QUANTITY SHEET

STATE DIST. NO.	COUNTY	PROJECT NO.	SHEET NO.
12	GALVESTON	FBD 001 (002)	4

# GALVESTON COUNTY APPROVED DREDGE SPOIL DISPOSAL AREAS

- 1- DREDGE DISPOSAL OPERATIONS SHALL BE CONDUCTED BY UNIFORM PLACEMENT TO AVOID THE DEPOSIT OF ANY MOUND IN EXCESS OF THE HEIGHT OF THE EXISTING LEVEES.
- 2- PRECAUTIONS SHALL BE TAKEN TO PREVENT THE IMPOUNDMENT OF DREDGE EFFLUENT WATER. ALL PONDED EFFLUENT SHALL BE DRAINED PRIOR TO FINAL ACCEPTANCE OF THE WORK.
- 3- USE OF EITHER SPOILS SITE IS TO BE DETERMINED BY THE CORPS OF ENGINEER LICENSE.



SCALE: 1" = 2113'

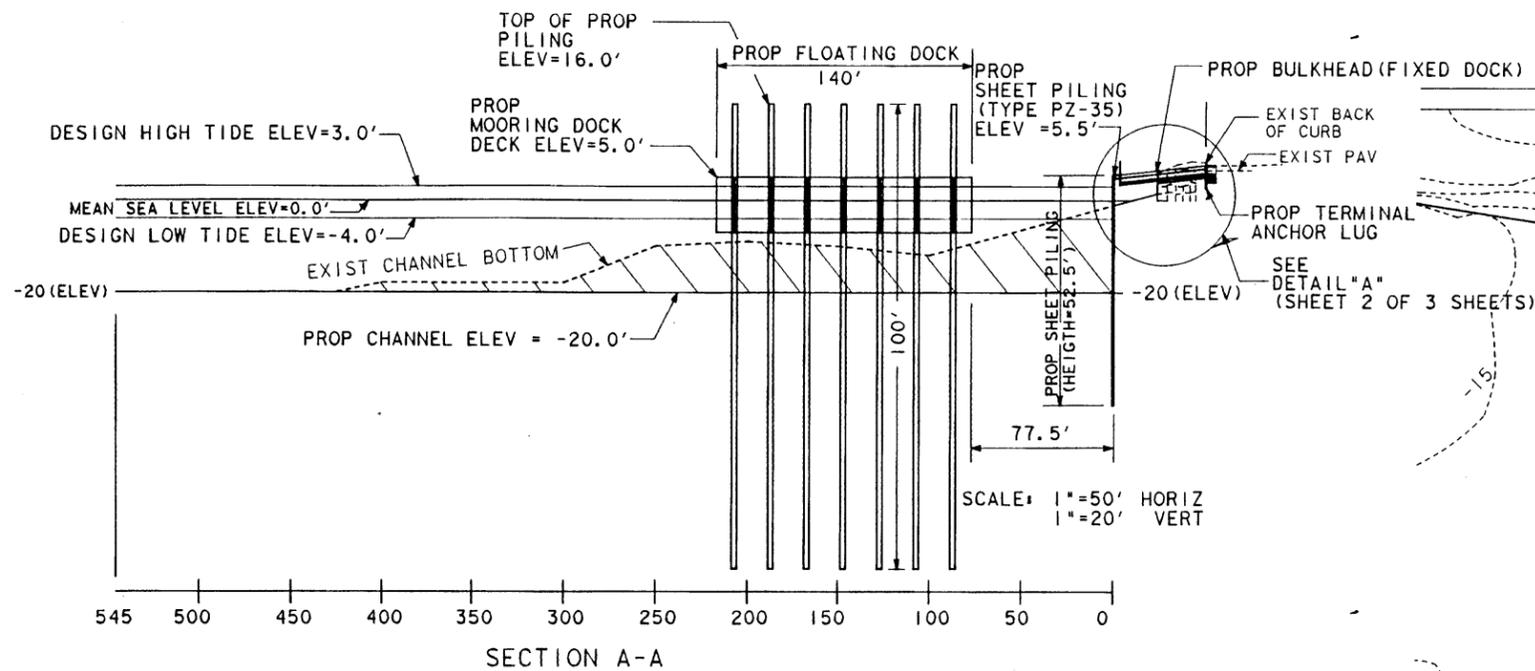


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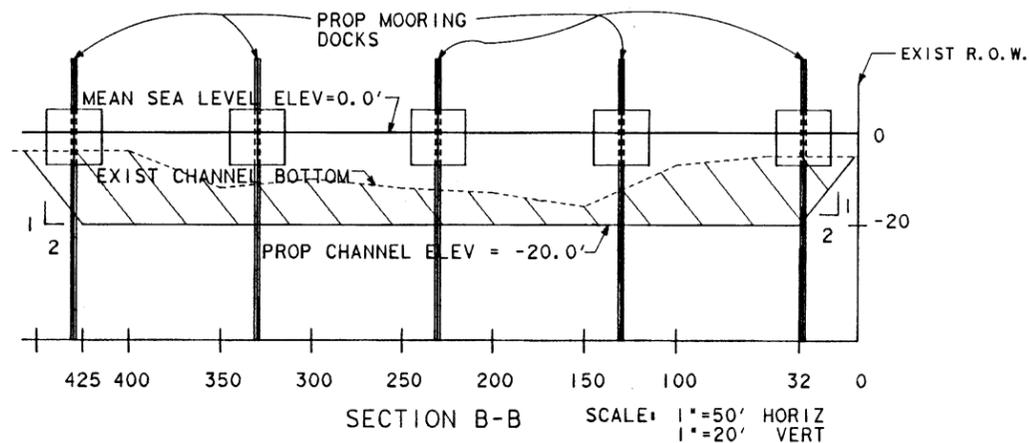
*Joseph A. Waring, P.E.*

## DREDGE SPOIL DISPOSAL AREAS

SHEET 1 OF 1 SHEET			
FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	FBD 001 (002)	5	
STATE	STATE DIST.	COUNTY	
TEXAS	12	GALVESTON	
CONT.	SECT.	JOB	HIGHWAY NO.
0367	06	050	SH 87
/USR/D12LAM/SH87 > SH87DA.DGN			

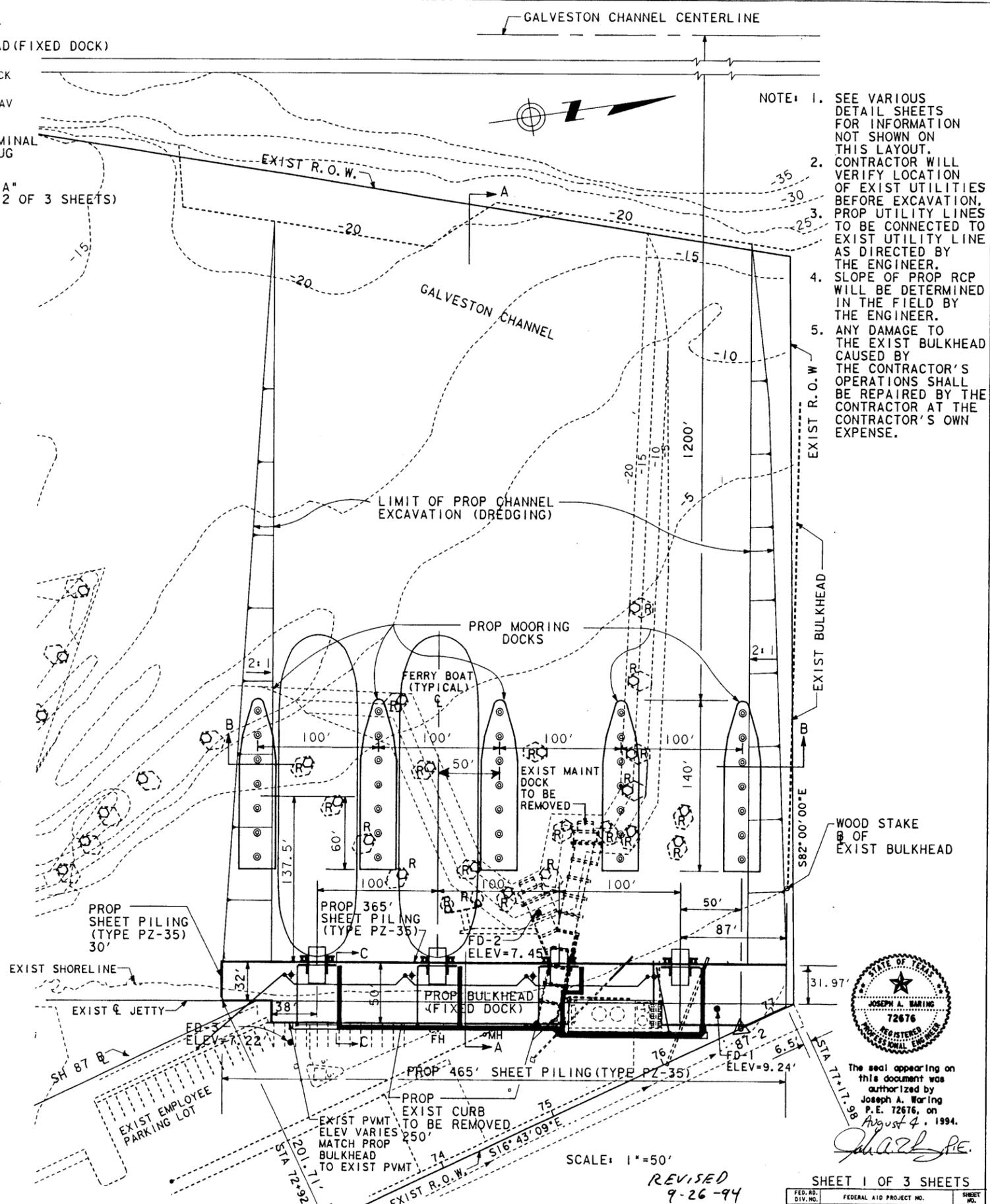


SECTION A-A



SECTION B-B

- LEGEND**
- PROPOSED VARIABLE DEPTH LIMESTONE FILL (1 1/2" USUAL SIZE)
  - PROPOSED CHANNEL EXCAVATION (DREDGING)
  - EXISTING PILING CLUSTER TO BE REMOVED
  - PROPOSED END BERTHING FENDER & PROPOSED GANGPLANK
  - SOIL BORING
  - EXISTING FIRE HYDRANT
  - EXISTING MANHOLE
  - PROPOSED 250 WATT HPS 40' MOUNTED HEIGHT



- NOTE:**
1. SEE VARIOUS DETAIL SHEETS FOR INFORMATION NOT SHOWN ON THIS LAYOUT.
  2. CONTRACTOR WILL VERIFY LOCATION OF EXIST UTILITIES BEFORE EXCAVATION, PROPOSED UTILITY LINES TO BE CONNECTED TO EXIST UTILITY LINE AS DIRECTED BY THE ENGINEER.
  3. SLOPE OF PROPOSED RCP WILL BE DETERMINED IN THE FIELD BY THE ENGINEER.
  4. ANY DAMAGE TO THE EXIST BULKHEAD CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S OWN EXPENSE.



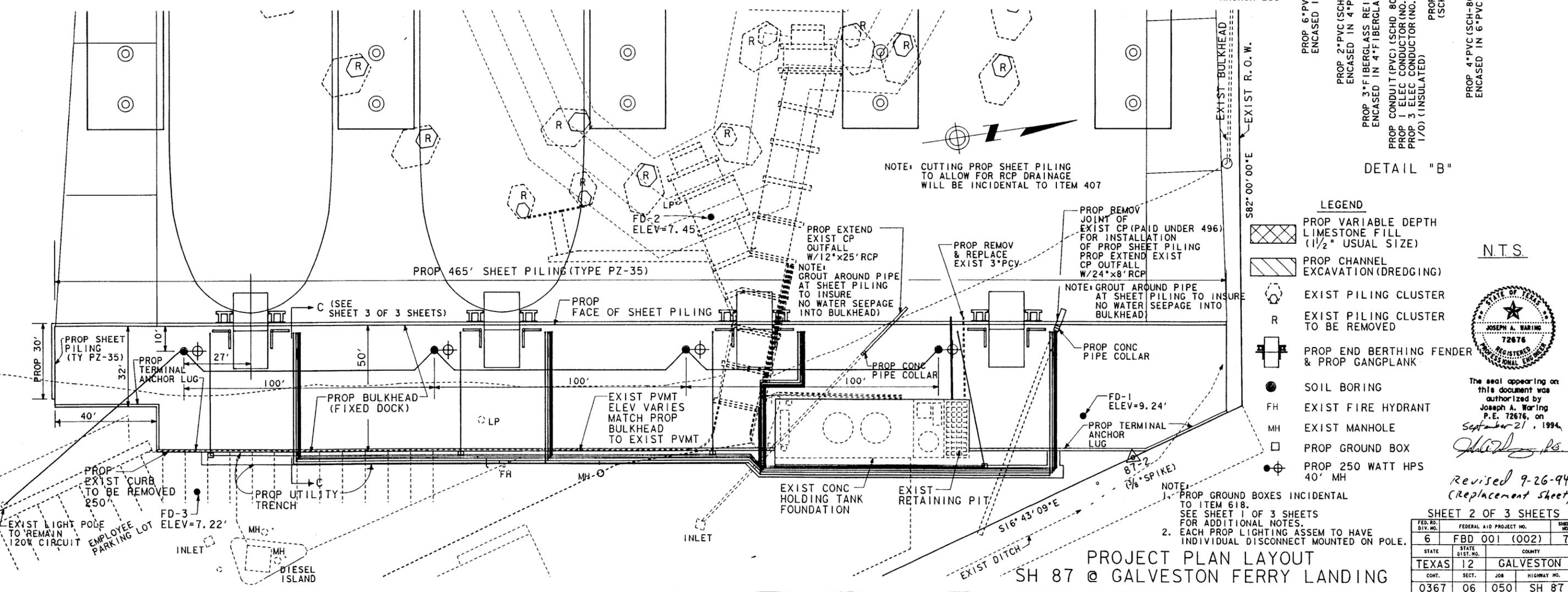
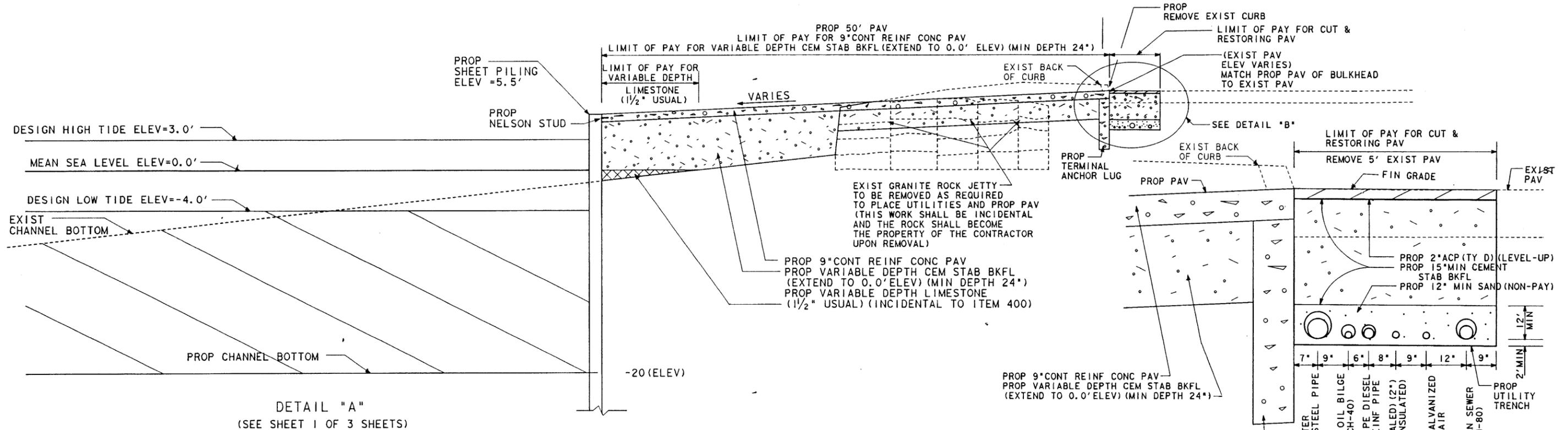
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**PROJECT PLAN LAYOUT  
SH 87 @ GALVESTON FERRY LANDING**

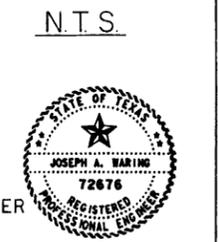
REVISED  
9-26-94

SHEET 1 OF 3 SHEETS

FED. AID DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	FBD 001 (002)	6
STATE	STATE DIST. NO.	COUNTY
TEXAS	12	GALVESTON
CONT.	SECT.	JOB HIGHWAY NO.
0367	06	050 SH 87



- LEGEND**
- PROP VARIABLE DEPTH LIMESTONE FILL (1 1/2" USUAL SIZE)
  - PROP CHANNEL EXCAVATION (DREDGING)
  - EXIST PILING CLUSTER TO BE REMOVED
  - EXIST PILING CLUSTER
  - PROP END BERTHING FENDER & PROP GANGPLANK
  - SOIL BORING
  - EXIST FIRE HYDRANT
  - EXIST MANHOLE
  - PROP GROUND BOX
  - PROP 250 WATT HPS 40" MH



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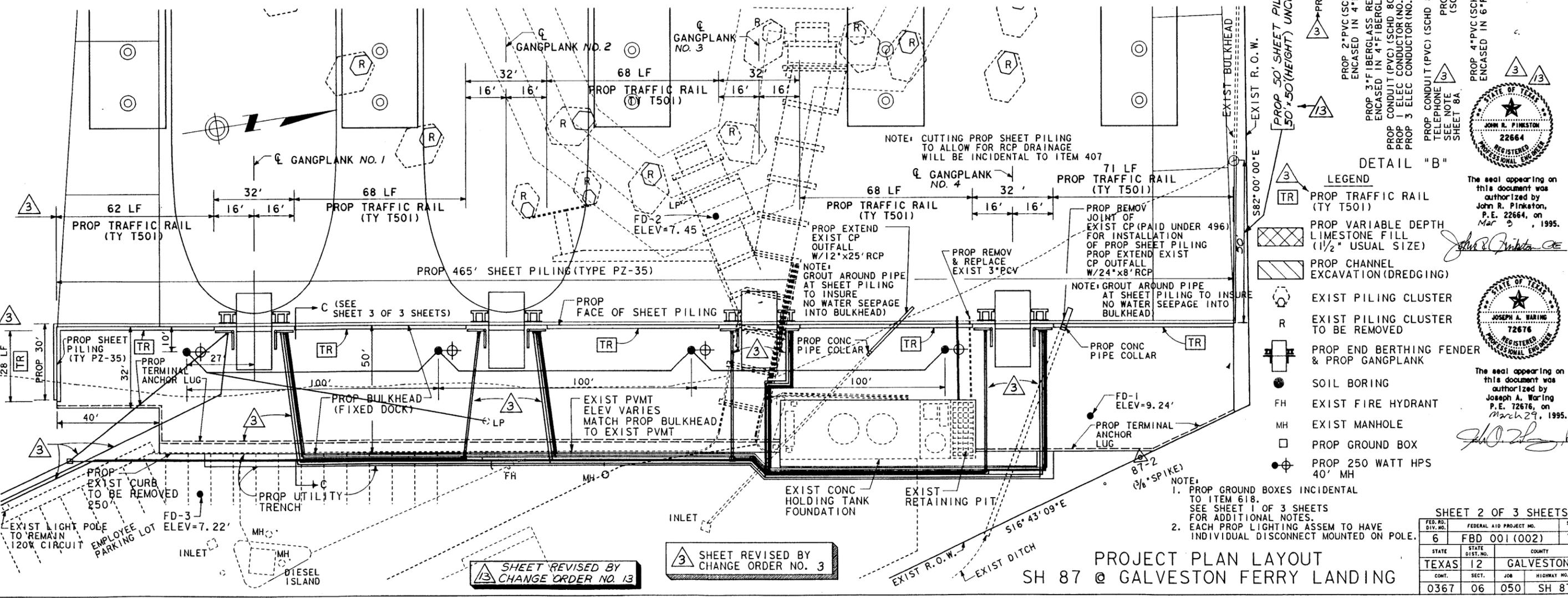
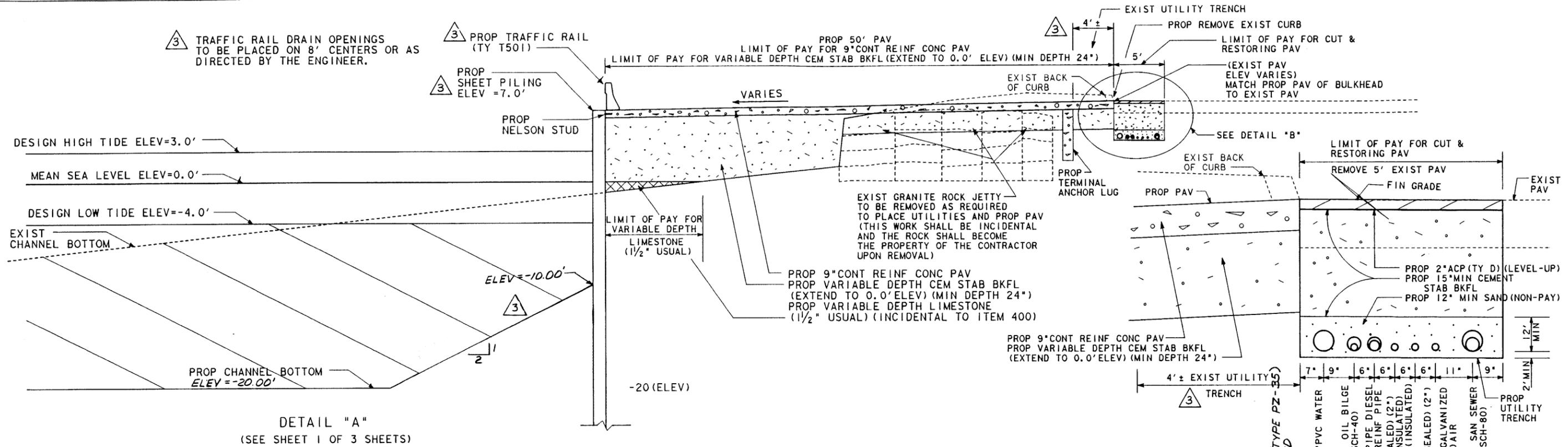
*John D. [Signature]*

Revised 9-26-94  
(Replacement sheet)

SHEET 2 OF 3 SHEETS

FED. AID DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	FBD 001 (002)	7
STATE	STATE DIST. NO.	COUNTY
TEXAS	12	GALVESTON
CONT.	SECT.	JOB HIGHWAY NO.
0367	06	050 SH 87

**PROJECT PLAN LAYOUT**  
**SH 87 @ GALVESTON FERRY LANDING**



**DETAIL "B"**

**LEGEND**

- TR PROP TRAFFIC RAIL (TY T501)
- PROP VARIABLE DEPTH LIMESTONE FILL (1/2" USUAL SIZE)
- PROP CHANNEL EXCAVATION (DREDGING)
- R EXIST PILING CLUSTER TO BE REMOVED
- PROP END BERTHING FENDER & PROP GANGPLANK
- SOIL BORING
- FH EXIST FIRE HYDRANT
- MH EXIST MANHOLE
- PROP GROUND BOX
- PROP 250 WATT HPS 40' MH

NOTE: 1. PROP GROUND BOXES INCIDENTAL TO ITEM 618. SEE SHEET 1 OF 3 SHEETS FOR ADDITIONAL NOTES.  
2. EACH PROP LIGHTING ASSEM TO HAVE INDIVIDUAL DISCONNECT MOUNTED ON POLE.



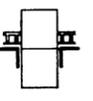
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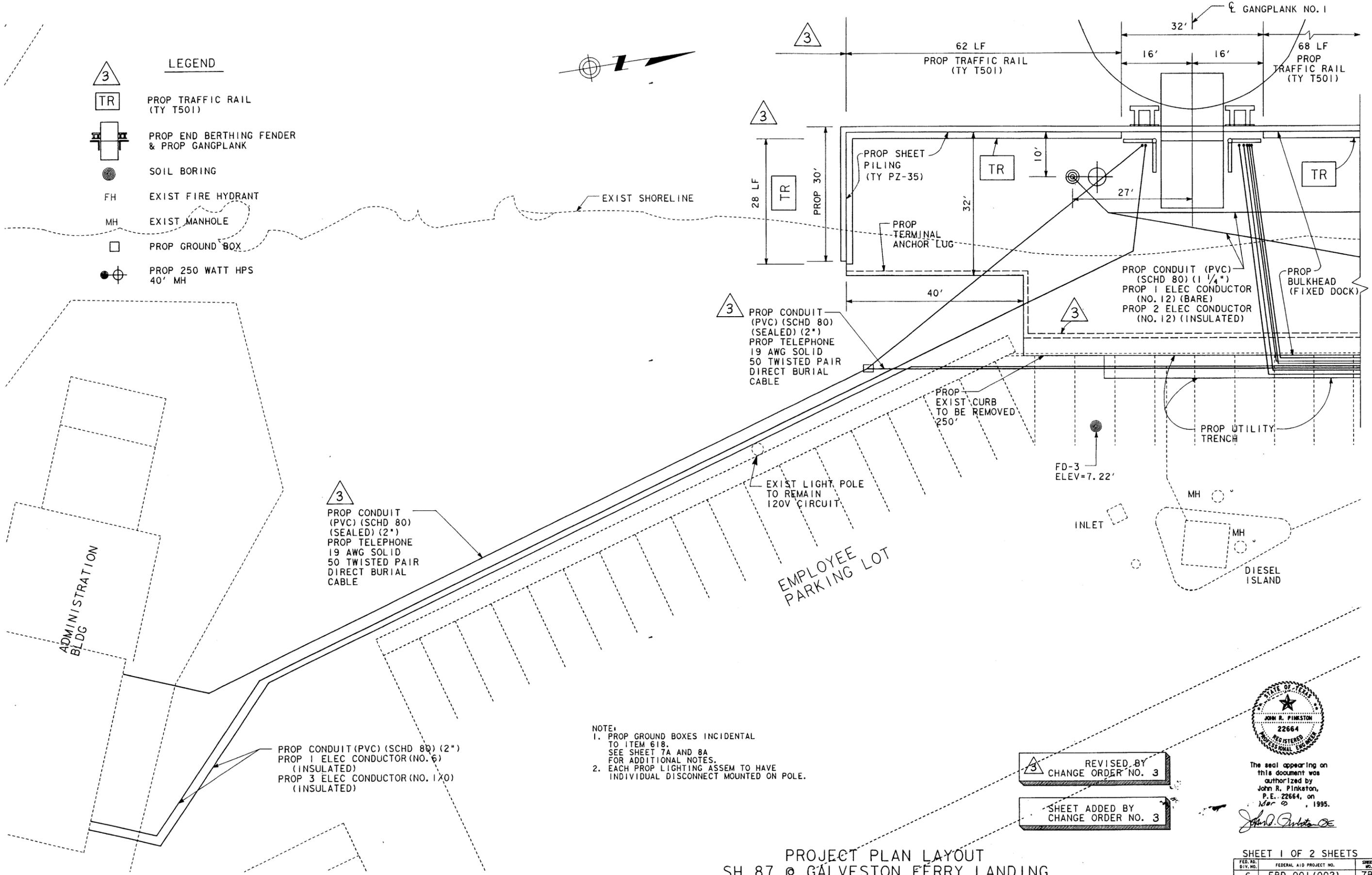
3 SHEET REVISED BY CHANGE ORDER NO. 3

**PROJECT PLAN LAYOUT  
SH 87 @ GALVESTON FERRY LANDING**

SHEET 2 OF 3 SHEETS

FED. NO. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	FBD 001 (002)	7A
STATE	DIST. NO.	COUNTY
TEXAS	12	GALVESTON
CONT.	SECT.	JOB HIGHWAY NO.
0367	06	050 SH 87

- LEGEND**
-  3
  -  TR PROP TRAFFIC RAIL (TY T501)
  -  PROP END BERTHING FENDER & PROP GANGPLANK
  -  SOIL BORING
  -  FH EXIST FIRE HYDRANT
  -  MH EXIST MANHOLE
  -  PROP GROUND BOX
  -  PROP 250 WATT HPS 40' MH



3  
 PROP CONDUIT (PVC) (SCHD 80) (SEALED) (2")  
 PROP TELEPHONE 19 AWG SOLID 50 TWISTED PAIR DIRECT BURIAL CABLE

PROP CONDUIT (PVC) (SCHD 80) (2")  
 PROP 1 ELEC CONDUCTOR (NO. 6) (INSULATED)  
 PROP 3 ELEC CONDUCTOR (NO. 1X0) (INSULATED)

- NOTE:**
1. PROP GROUND BOXES INCIDENTAL TO ITEM 618. SEE SHEET 7A AND 8A FOR ADDITIONAL NOTES.
  2. EACH PROP LIGHTING ASSEM TO HAVE INDIVIDUAL DISCONNECT MOUNTED ON POLE.

3 REVISED BY CHANGE ORDER NO. 3

SHEET ADDED BY CHANGE ORDER NO. 3



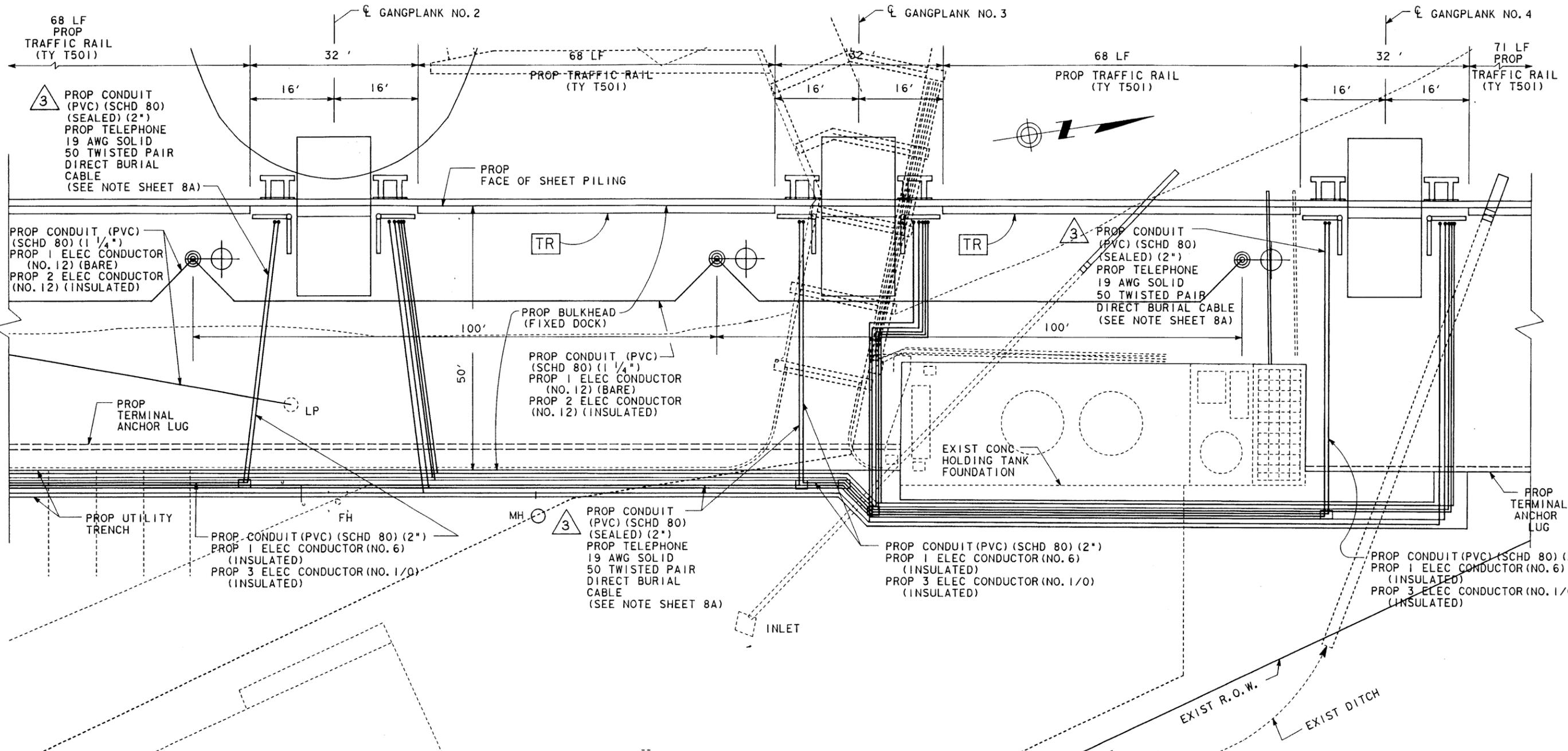
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**PROJECT PLAN LAYOUT  
 SH 87 @ GALVESTON FERRY LANDING**

SCALE: 1" = 10'

SHEET 1 OF 2 SHEETS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	FBD 001 (002)	7B
STATE	STATE DIST. NO.	COUNTY
TEXAS	12	GALVESTON
CONT.	SECT.	JOB HIGHWAY NO.
0367	06	050 SH 87



- LEGEND**
- PROP TRAFFIC RAIL (TY T501)
  - PROP END BERTHING FENDER & PROP GANGPLANK
  - SOIL BORING
  - EXIST FIRE HYDRANT
  - EXIST MANHOLE
  - PROP GROUND BOX
  - PROP 250 WATT HPS 40' MH

**NOTE:**  
 1. PROP GROUND BOXES INCIDENTAL TO ITEM 618. SEE SHEET 7A AND 8A FOR ADDITIONAL NOTES.  
 2. EACH PROP LIGHTING ASSEM TO HAVE INDIVIDUAL DISCONNECT MOUNTED ON POLE.

REVISED BY CHANGE ORDER NO. 3

SHEET ADDED BY CHANGE ORDER NO. 3



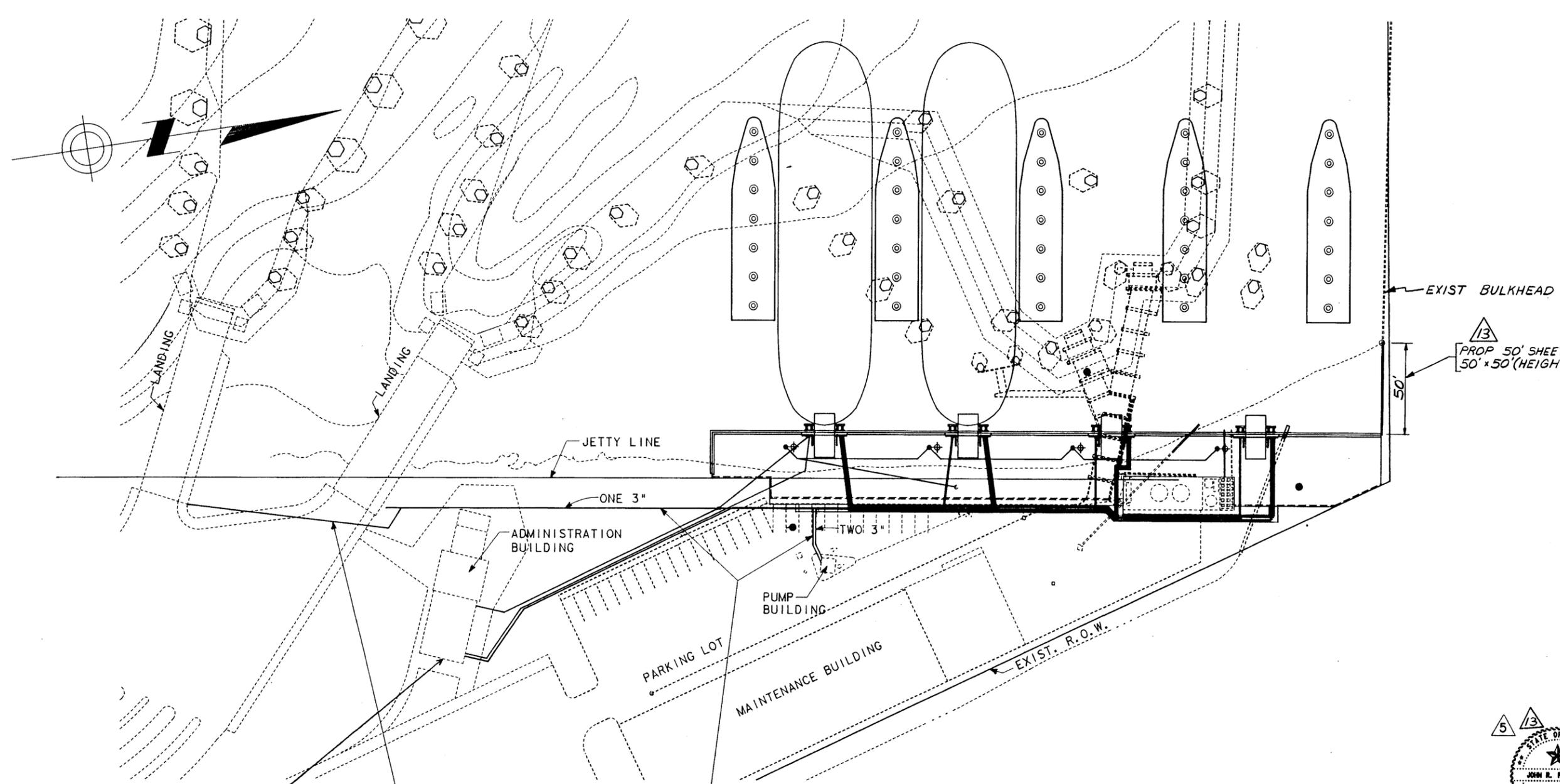
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*John R. Pinkston*

**PROJECT PLAN LAYOUT  
 SH 87 @ GALVESTON FERRY LANDING**  
 SCALE: 1" = 10'

SHEET 2 OF 2 SHEETS

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	FBD 001 (002)	7C
STATE	STATE DIST. NO.	COUNTY
TEXAS	12	GALVESTON
CONT.	SECT.	JOB HIGHWAY NO.
0367	06	050 SH 87



5  
 EXISTING PANEL  
 INSTALL (2) 150 AMP BREAKER BOXES  
 NOTE: BREAKERS TO BE INSTALLED  
 AT NIGHT WHEN FERRY CAN  
 BE SHUT DOWN

7  
 EXISTING 2 1/2" DIESEL FUEL LINE  
 TO BE REMOVED (APPROX. LOCATIONS)  
 AND REPLACED WITH 3" FIBERGLASS  
 REINFORCED PIPE

13  
 PROP 50' SHEET PILING (PZ-35)  
 50' x 50' (HEIGHT) UNCOATED

PLAN LAYOUT  
 SH 87 @ GALVESTON FERRY LANDING  
 SCALE: 1" = 40'

13 SHEET REVISED BY  
 CHANGE ORDER NO. 13

5 SHEET REVISED BY  
 CHANGE ORDER NO. 5

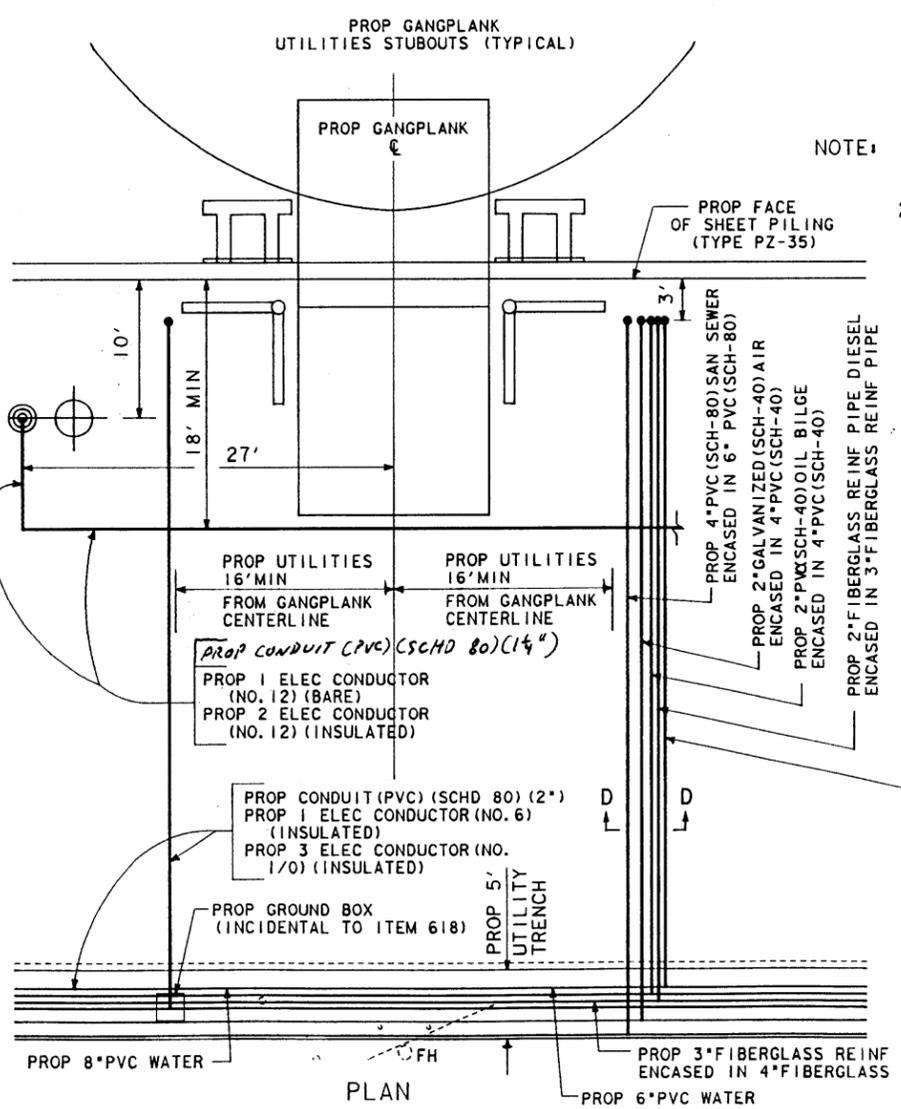
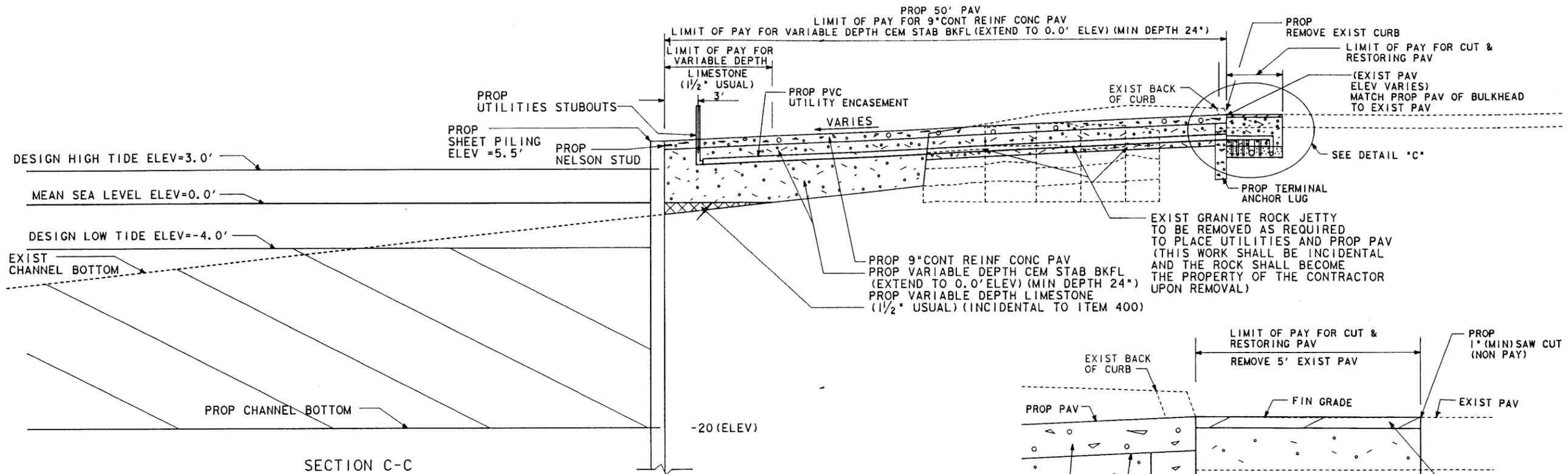
7 SHEET ADDED BY  
 CHANGE ORDER NO. 7



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 John R. Pinkston,  
 P.E. 22664, on  
 July 20, 1995.  
*John R. Pinkston*

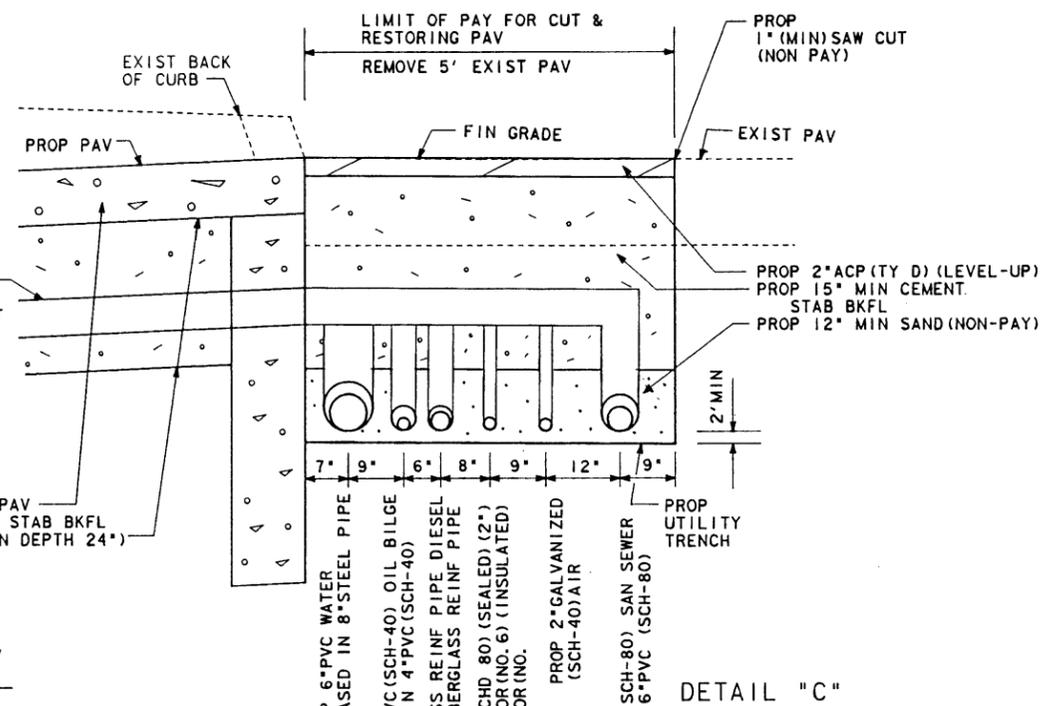
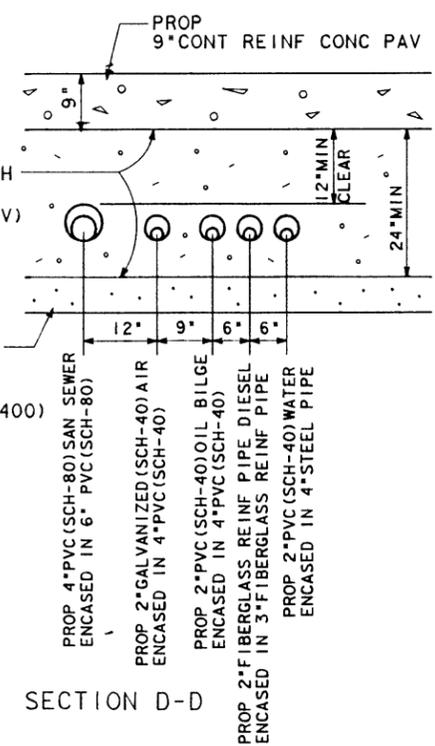
SHEET 1 OF 1 SHEET

FED. RD. DIST. NO.	FEDERAL AID PROJECT NO.	7D
6	FBD 001 (002)	
STATE	STATE	COUNTY
TEXAS	12	GALVESTON
CONT.	SECT.	JOB
0367	06	050
		SH 87



NOTE: 1. PROP CONC SURROUNDING ELECTRIC UTILITY LINE SHALL BE YELLOW OR RED  
 2. PROP UTILITIES STUBOUTS SHALL HAVE A MINIMUM 21" CLEARANCE FROM TOP OF PROP 9" CONT REINF CONC PAV

SEE SHEET 1 OF 3 SHEETS FOR ADDITIONAL NOTES  
 SEE SHEET 2 OF 3 SHEETS FOR ADDITIONAL NOTES



- LEGEND**
- PROP VARIABLE DEPTH LIMESTONE FILL (1 1/2" USUAL SIZE)
  - PROP CHANNEL EXCAVATION (DREDGING)
  - PROP END BERTHING FENDER & PROP GANGPLANK
  - PROP 250 WATT HPS 40' MOUNTED HEIGHT

N.T.S

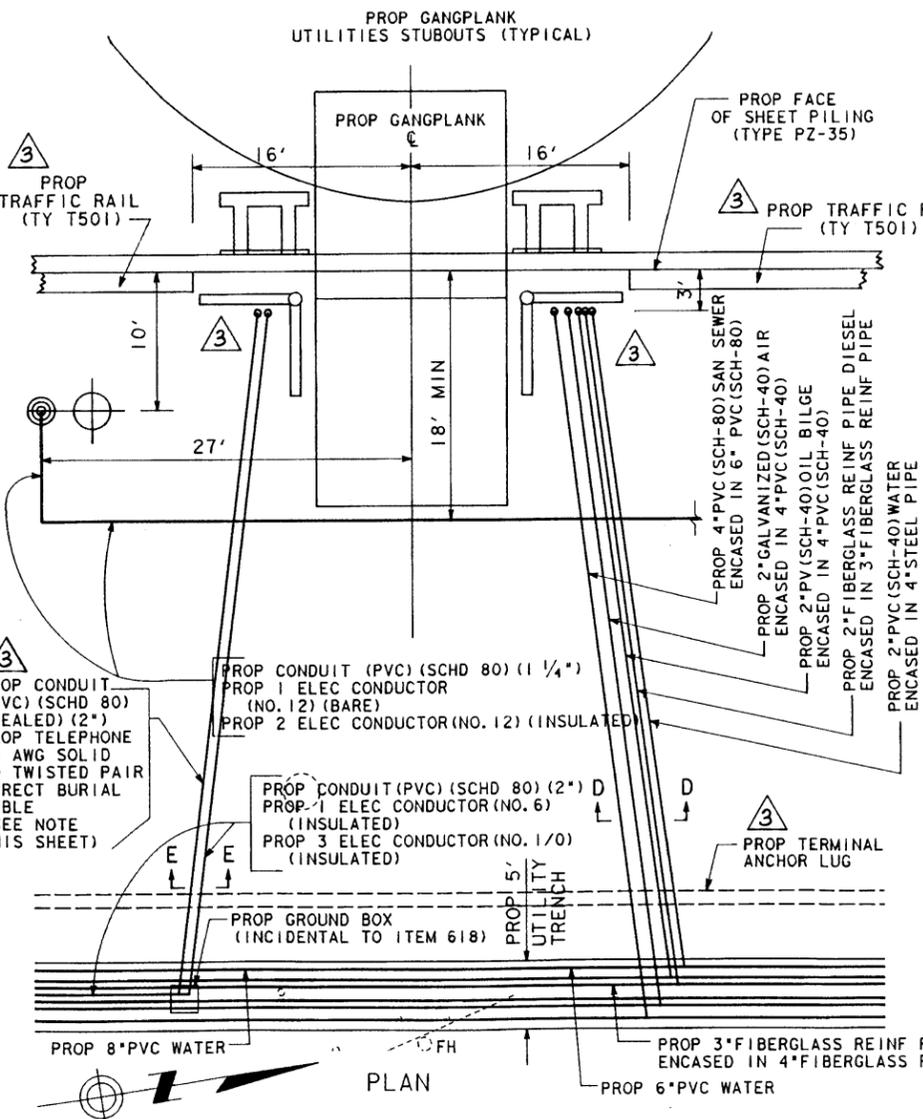
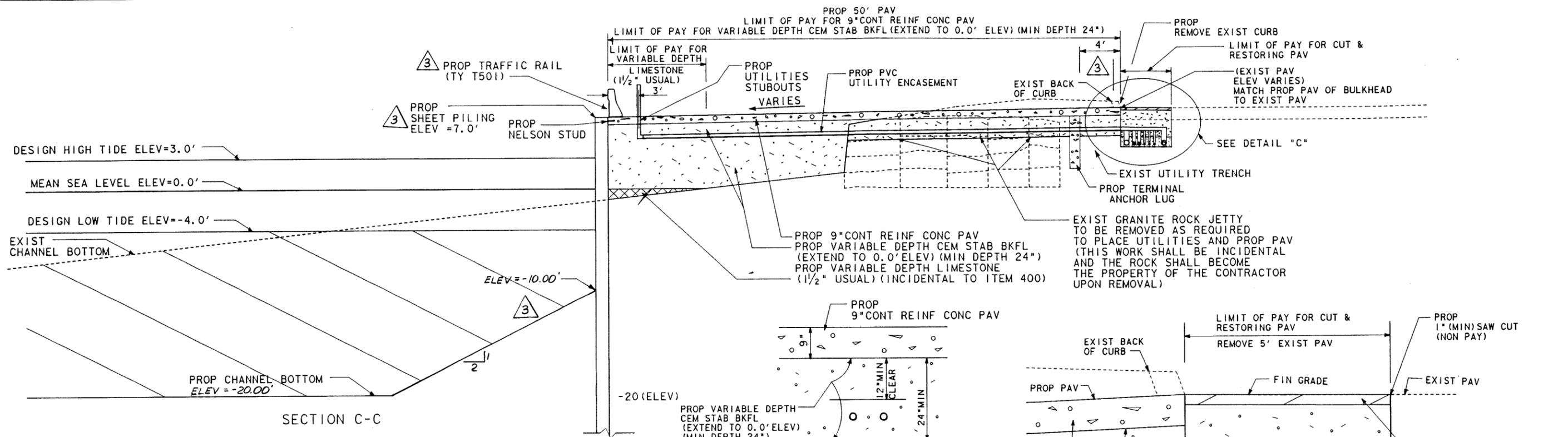


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*John P. King*  
 Revised 9-26-94  
 (Replacement Sheet)  
 SHEET 3 OF 3 SHEETS

PROJECT PLAN LAYOUT  
 SH 87 @ GALVESTON FERRY LANDING

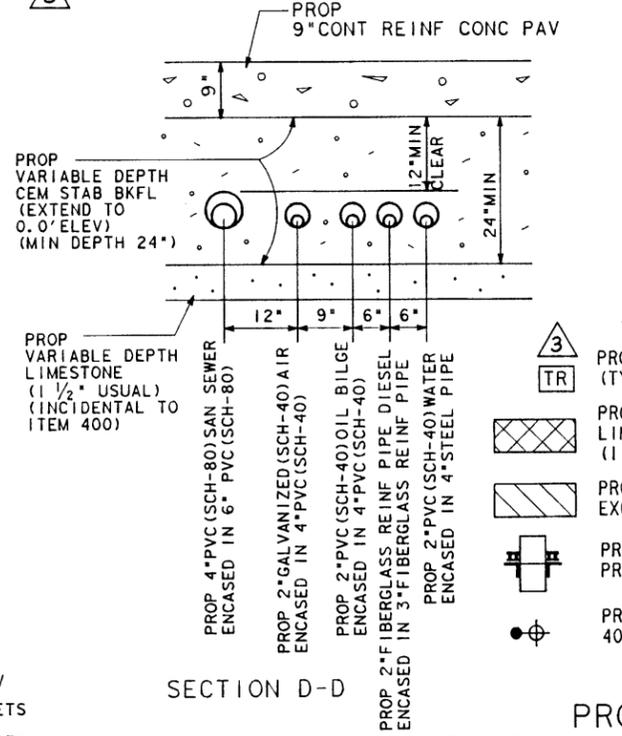
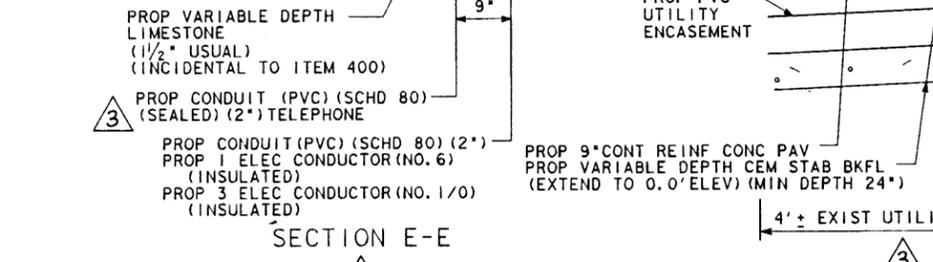
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	FBD 001 (002)	8
STATE	STATE DIST. NO.	COUNTY
TEXAS	12	GALVESTON
CONT.	SECT.	JOB HIGHWAY NO.
0367	06 050	SH 87



**3 PROP TELEPHONE CABLE NOTE:**

THE PROP TELEPHONE CABLE SHALL BE SUITABLE FOR DIRECT BURIAL APPLICATIONS, SHALL RESIST ACIDS, ALKALIS, MOISTURE AND FUNGUS, AND SHALL WITHSTAND TEMPERATURE RANGE OF -60°C TO +80°C. SUGGESTED CABLE IS THE ALPHA WIRE CORP. DIRECT BURIAL PE-39 NO. 4050 OR EQUAL (ALPHA WIRE CORP. PHONE (201) 925-8000). PROP TELEPHONE CABLE SHALL MEET THE FOLLOWING REQUIREMENTS: CONDUCTOR SHALL BE SOLID BARE COPPER, INSULATION SHALL BE COLOR CODED HIGH DENSITY POLYETHYLENE TWISTED INTO 50 PAIRS WITH STAGGERED PAIR LAY, CORE SPACES SHALL BE FILLED WITH PE/PJ COMPOUND TO RETARD WATER FLOW, CORE WRAP SHALL BE NON-HYGROSCOPIC DIELECTRIC TAPE, SHIELD SHALL BE 0.008" (0.20 mm) CORRUGATED ALUMINUM, JACKET SHALL BE A BLACK, WEATHER RESISTANT, LOW DENSITY, HIGH MOLECULAR WEIGHT POLYETHYLENE JACKET.

NOTE: 1. PROP CONC SURROUNDING ELECTRIC UTILITY LINE SHALL BE YELLOW OR RED  
2. PROP UTILITIES STUBOUTS SHALL HAVE A MINIMUM 21" CLEARANCE FROM TOP OF PROP 9" CONT REINF CONC PAV



**LEGEND**

- 3 PROP TRAFFIC RAIL (TY T501)
- TR PROP VARIABLE DEPTH LIMESTONE FILL (1 1/2" USUAL SIZE)
- X PROP CHANNEL EXCAVATION (DREDGING)
- + PROP END BERTHING FENDER & PROP GANGPLANK
- ⊙ PROP 250 WATT HPS 40' MOUNTED HEIGHT
- 3 SHEET REVISED BY CHANGE ORDER NO. 3

STATE OF TEXAS  
 JOHN R. PINKSTON  
 22664  
 REGISTERED PROFESSIONAL ENGINEER

The seal appearing on this document was authorized by John R. Pinkston, P.E. 22664, on Mar 5, 1995.

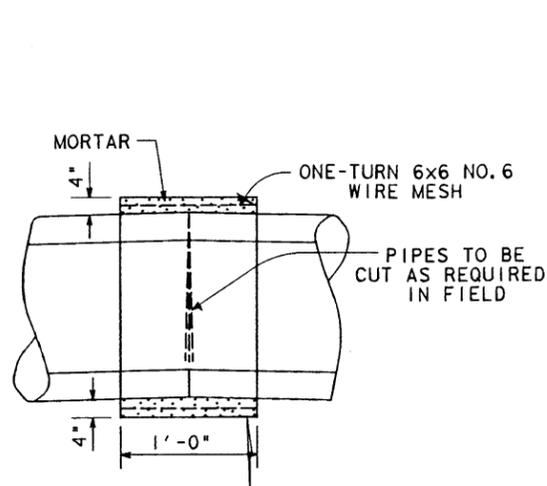
STATE OF TEXAS  
 JOSEPH A. WARING  
 72676  
 REGISTERED PROFESSIONAL ENGINEER

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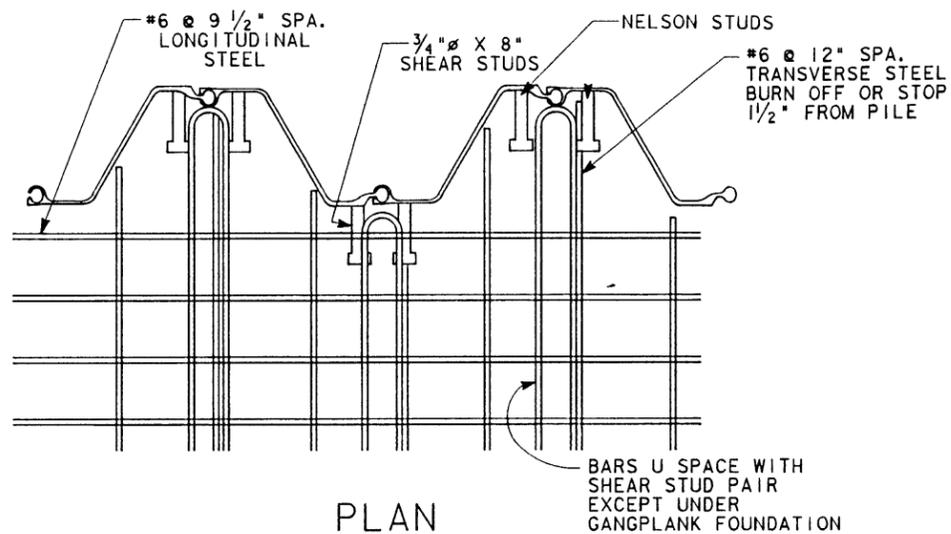
PROJECT PLAN LAYOUT  
 SH 87 @ GALVESTON FERRY LANDING

SHEET 3 OF 3 SHEETS

FED. PROJ. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	FB0 001 (002)	8A
STATE	DIST. NO.	COUNTY
TEXAS	12	GALVESTON
CONT.	SECT.	JOB
0367	06	050
		SH 87

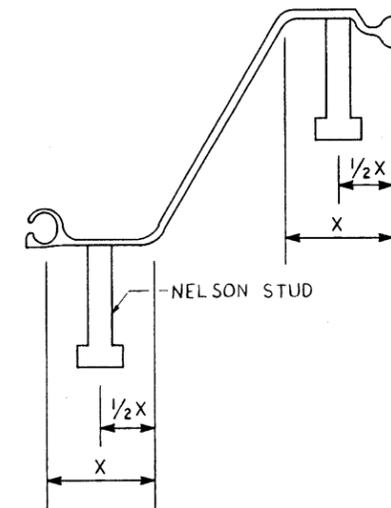


PIPE COLLAR DETAIL

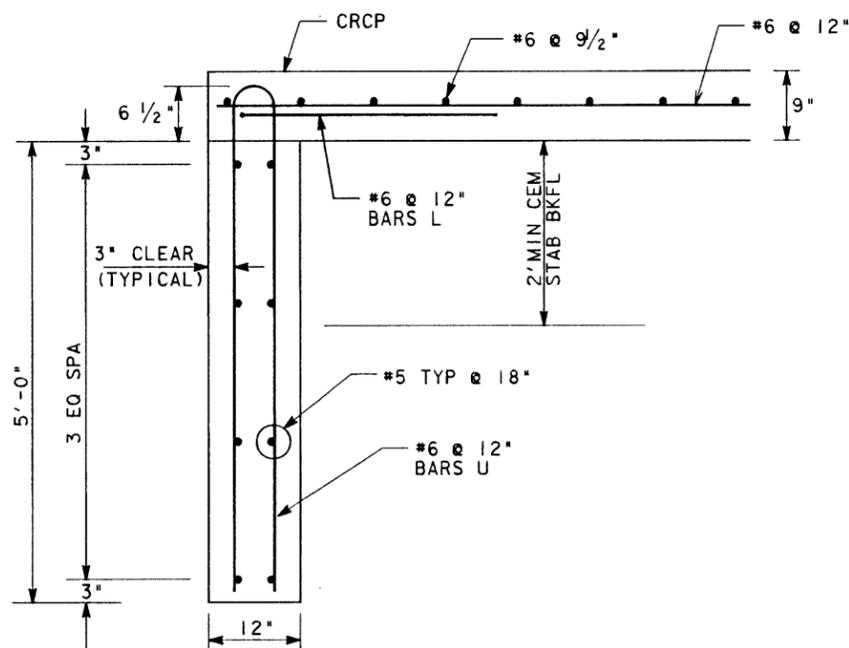


PLAN

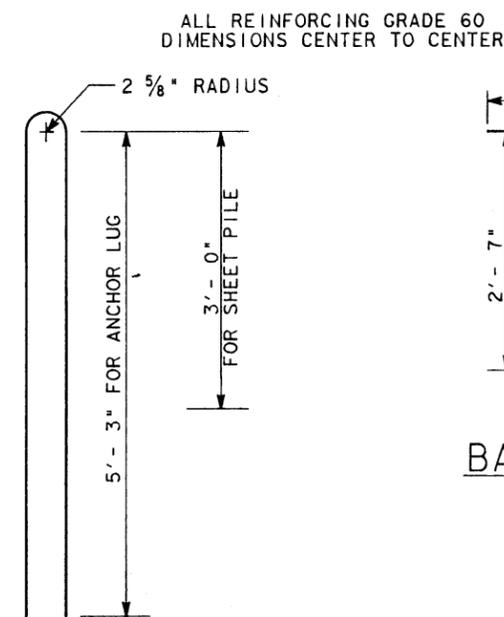
NOTE: STUDS SHALL BE ELECTRIC ARC END-WELDED TO THE SHEET PILE WITH COMPLETE FUSION. PLACE STUDS AT MID DEPTH OF CONC PAVEMENT.



STUD CONNECTOR DETAIL

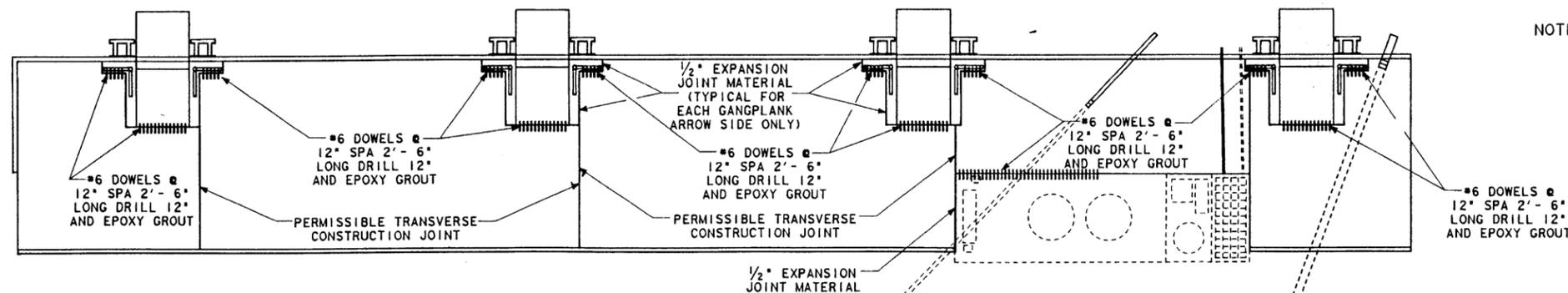


ANCHOR LUG DETAIL



BARS L

BARS U



NOTE: NELSON STUDS ARE REQUIRED FOR STABILITY OF BULKHEAD. ALL MAINTENANCE ACTIVITIES ON THE CONCRETE PAVEMENT MUST MAKE PROVISIONS FOR MAINTAINING THE INTEGRITY OF THE NELSON STUD PAVEMENT CONNECTION.



The seal appearing on this document was authorized by Joseph A. Waring P.E. 72676, on August 4, 1994.

*Joseph A. Waring*

CONT REINF CONC PAV DETAILS  
SH 87 @ GALVESTON FERRY LANDING

SHEET 1 OF 1 SHEET			
FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.	
6	FBD 001 (002)	9	
STATE	STATE DIST. NO.	COUNTY	
TEXAS	12	GALVESTON	
CONF.	SECT.	JOB	HIGHWAY NO.
0367	06	050	SH 87

SITE DESCRIPTION

PROJECT LIMITS: AT GALVESTON FERRY LANDING

PROJECT DESCRIPTION: FOR THE CONSTRUCTION OF NEW MAINTENANCE FERRY DOCK SYSTEM FACILITY, CONSISTING OF SHEET PILING, FLOATING DOCK SYSTEM, FIXED DOCK, DREDGING BACKFILL, REMOVE EXIST MAINTENANCE DOCK AND REMOVE EXIST PILE CLUSTERS.

MAJOR SOIL DISTURBING ACTIVITIES: DREDGING, REMOVING EXISTING PILE CLUSTERS AND EXISTING MAINTENANCE DOCK, AND EXCAVATION FOR FIXED DOCK.

TOTAL PROJECT AREA: 0.075 MI.

TOTAL AREA TO BE DISTURBED: \_\_\_\_\_

WEIGHTED RUNOFF COEFFICIENT (AFTER CONSTRUCTION): N/A

EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: THE EXISTING SOIL IS MOSTLY SABINE GALVESTON. THE VEGETATIVE COVERAGE IS VARIOUS TYPES OF GRASSES WHICH COVER 5%-10% AND ARE IN POOR CONDITION. THE TERRAIN IS BASICALLY FLAT, VERY LITTLE SLOPE.

NAME OF RECEIVING WATERS: GALVESTON BAY

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

- TEMPORARY SEEDING
- PERMANENT PLANTING, SODDING, OR SEEDING
- MULCHING
- SOIL RETENTION BLANKET
- BUFFER ZONES
- PRESERVATION OF NATURAL RESOURCES

OTHER: DISTURBED AREAS ON WHICH CONSTRUCTION ACTIVITIES HAVE CEASED (TEMPORARILY OR PERMANENTLY) SHALL BE STABILIZED WITHIN 14 DAYS UNLESS ACTIVITIES ARE SCHEDULED TO RESUME WITHIN 21 DAYS.

STRUCTURAL PRACTICES:

- SILT FENCES
- HAY BALES
- ROCK BERMS
- DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- DIVERSION DIKE AND SWALE COMBINATIONS
- PIPE SLOPE DRAINS
- PAVED FLUMES
- ROCK BEDDING AT CONSTRUCTION EXIT
- TIMBER MATTING AT CONSTRUCTION EXIT
- CHANNEL LINERS
- SEDIMENT TRAPS
- SEDIMENT BASINS
- STORM INLET SEDIMENT TRAP
- STONE OUTLET STRUCTURES
- CURBS AND GUTTERS
- STORM SEWERS
- VELOCITY CONTROL DEVICES

OTHER: SILT CURTAIN OR CONTAINMENT BOOM (TO BE PLACED IN THE BAY) THE TYPES CHOSEN BY THE CONTRACTOR SHALL BE SUBJECT TO APPROVAL BY THE ENGINEER.

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

- I. INSTALL SILT FENCES AT OUTFALLS, AND SILT CURTAINS OR CONTAINMENT BOOMS, AS DIRECTED BY THE ENGINEER, PRIOR TO CONSTRUCTION.
- II. REMOVE ALL STORM WATER MANAGEMENT STRUCTURAL DEVICES WHEN CONSTRUCTION ACTIVITY IS COMPLETE AND ALL AREAS HAVE BEEN STABILIZED AND APPROVED BY THE ENGINEER.

STORM WATER MANAGEMENT: STORM WATER DRAINAGE WILL BE PROVIDED BY EXISTING STORM SEWER SYSTEM, STORM WATER DRAINAGE WILL BE GRATE INLETS AND RC PIPE.

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: ALL EROSION AND SEDIMENT CONTROLS WILL BE MAINTAINED IN GOOD WORKING ORDER. IF A REPAIR IS NECESSARY, IT WILL BE DONE AT THE EARLIEST DATE POSSIBLE, BUT NO LATER THAN 7 CALENDAR DAYS AFTER.

INSPECTION: AN INSPECTION WILL BE PERFORMED BY A TxDOT INSPECTOR EVERY WEEK, AN INSPECTION AND MAINTENANCE REPORT WILL BE MADE PER EACH INSPECTION. BASED ON THE INSPECTION RESULTS, THE CONTROLS SHALL BE REVISED PER THE INSPECTION REPORT.

WASTE MATERIALS: ALL WASTE MATERIALS WILL BE COLLECTED AND STORED IN A SECURELY LIDDED METAL DUMPSTER. THE DUMPSTER WILL MEET ALL STATE AND LOCAL CITY SOLID OR WATER WASTE MANAGEMENT REGULATIONS. ALL TRASH AND CONSTRUCTION DEBRIS FROM THE SITE WILL BE DEPOSITED IN THE DUMPSTER. THE DUMPSTER WILL BE EMPTIED AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION, AND THE TRASH WILL BE HAULED TO A LOCAL DUMP. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, DIESEL FUEL, OIL BILGE, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ALPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR SHOULD BE CONTACTED IMMEDIATELY.

SANITARY WASTE: ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

OFFSITE VEHICLE TRACKING:

- HAUL ROADS DAMPENED FOR DUST CONTROL
- LOADED HAUL TRUCKS TO BE COVERED WITH TARPULIN
- EXCESS DIRT ON ROAD REMOVED DAILY
- STABILIZED CONSTRUCTION ENTRANCE

OTHER: \_\_\_\_\_

REMARKS: DISPOSAL AREAS, AND STOCKPILES, SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL THE AMOUNT OF SEDIMENT THAT MAY ENTER RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WETLAND, WATERBODY OR STREAMBED. CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED BY THE CONTRACTOR IN A MANNER TO MINIMIZE THE RUNOFF OF POLLUTANTS. ALL WATERWAYS SHALL BE CLEARED AS SOON AS PRACTICABLE OF TEMPORARY MATTING, PILING, DEBRIS OR OTHER OBSTRUCTIONS PLACED DURING CONSTRUCTION OPERATIONS THAT ARE NOT A PART OF THE FINISHED WORK.

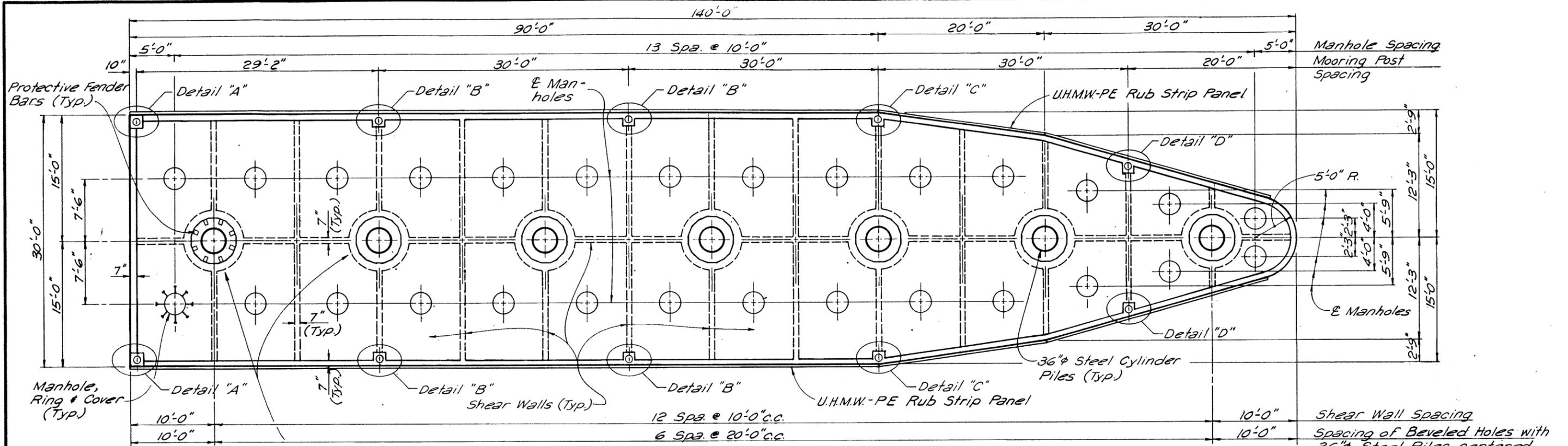


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*Joseph A. Waring*

TxDOT STORM WATER POLLUTION PREVENTION PLAN (SW3P)

FED. NO. DIV. NO.	FEDERAL AID PROJECT NO.	SHEET NO.
6	FBD 001(002)	10
STATE	STATE DIST. NO.	COUNTY
TEXAS	12	GASVERTON
CONT.	SECT.	JOB HIGHWAY NO.
0367	06	050 SH 87



PLAN

Note: See sheet 4 of 4 "Floating Mooring Dock Details" for Detail A, B, C and D.

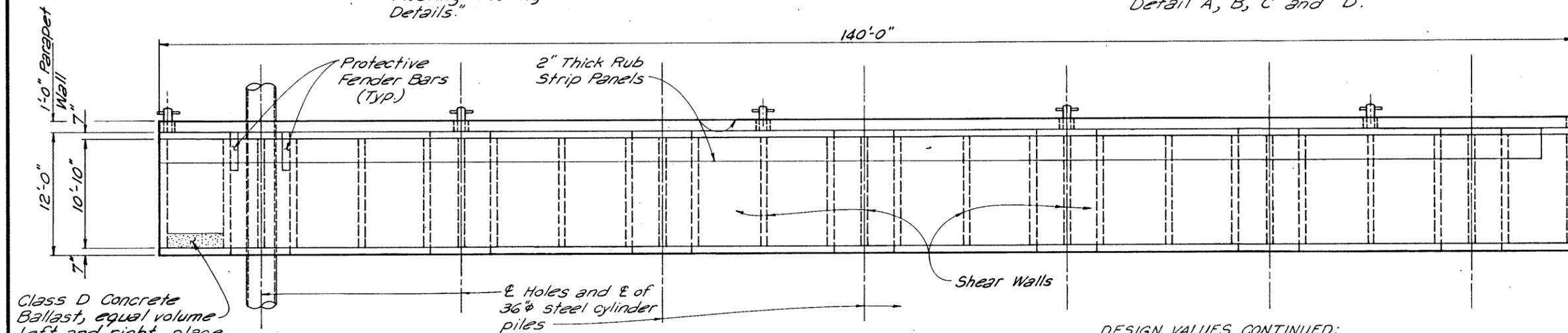
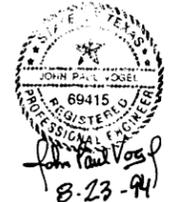
For shape and dimensions of holes, see sht. 4 of 4 "Floating Mooring Dock Details."

**DESIGN VALUES:**  
**Vessel**  
 Vessel Type: Ferry Beam = 66.00 Ft., Length = 265.00 Ft.  
 Displacement = 1675 long tons.  
 Freeboard = 5.5 to 6.0 Ft.  
**Berthing**  
 Angle of attack = 15°  
 Velocity = 4.4 Ft/sec. for side berthing, 0.75 Ft/sec. for end berthing.  
**Tide**  
 Mean high high water = +3.0 Ft.  
 Mean low low water = -4.0 Ft.  
 High tide for end berthing = 1.50 Ft. and hurricane storm surge = +10.00 Ft.  
**Navigation Conditions**  
 Sheltered berthing  
**Mooring Line**  
 Breaking strength = 50,000 Lbs.

**DESIGN VALUES CONTINUED:**  
**Mooring Dock**  
 Displacement = 1,532,440 Lbs.  
 Draft = 6.73 Ft.  
 Freeboard = 6.27 Ft. (Including Parapet)  
 Center of Mass = 62.54 Ft. from stern  
 Center of Buoyancy = 62.54 Ft. from stern.

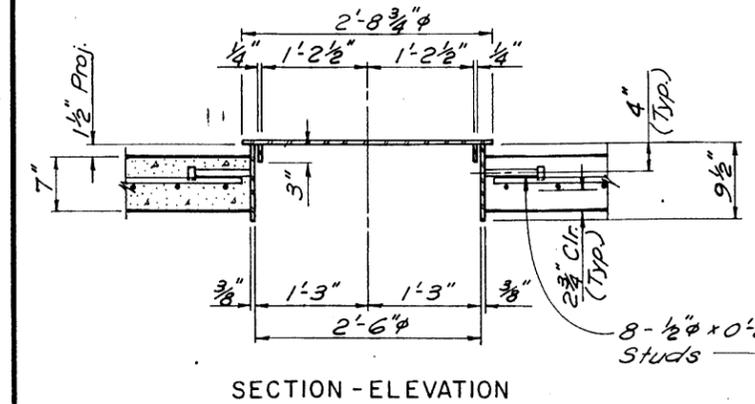
Note: Studs shall be electric-arc end welded to plate with complete fusion. Any studs that are dislodged during shipping or handling shall be replaced before concrete is poured.

See Sheet 15 For Details "A" - "D"

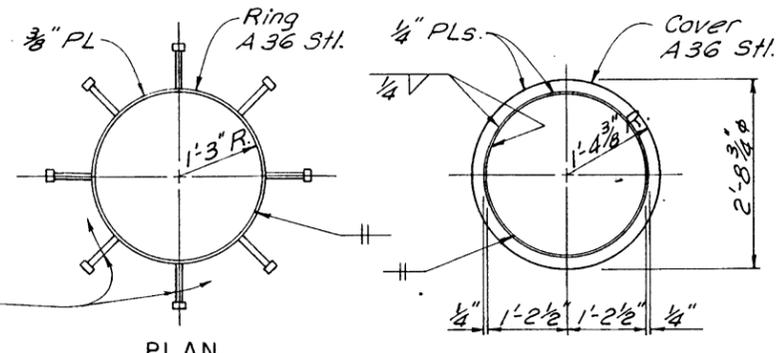


ELEVATION

Class D Concrete Ballast, equal volume left and right, place after dock is floated to level dock.



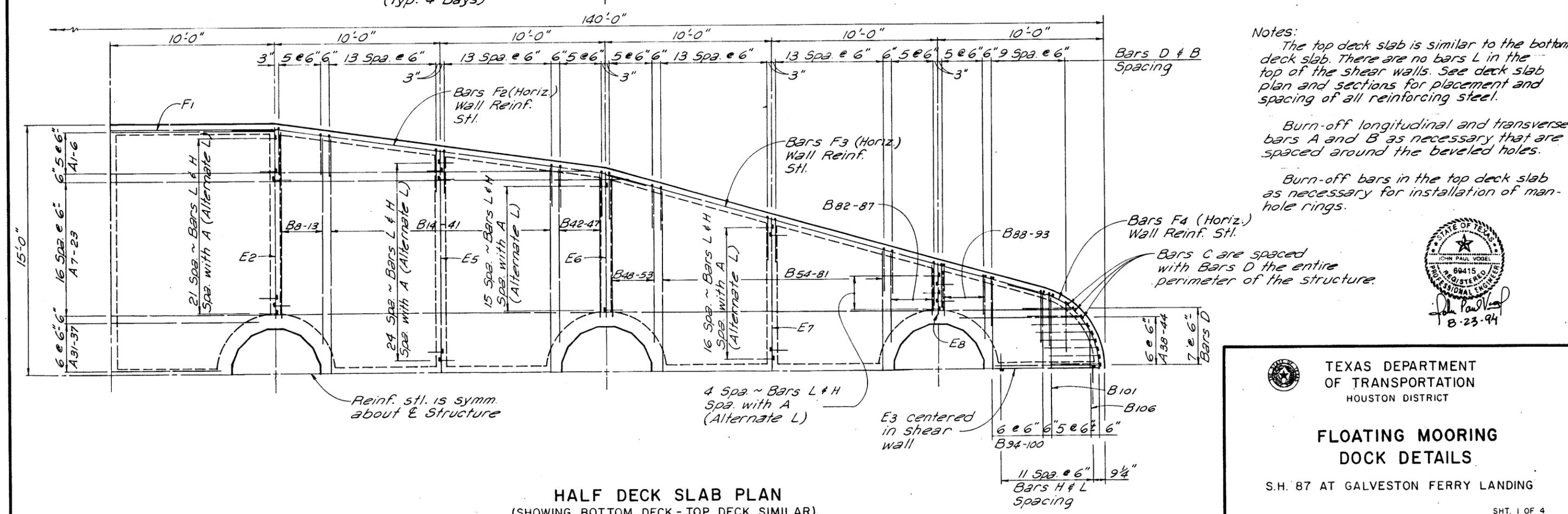
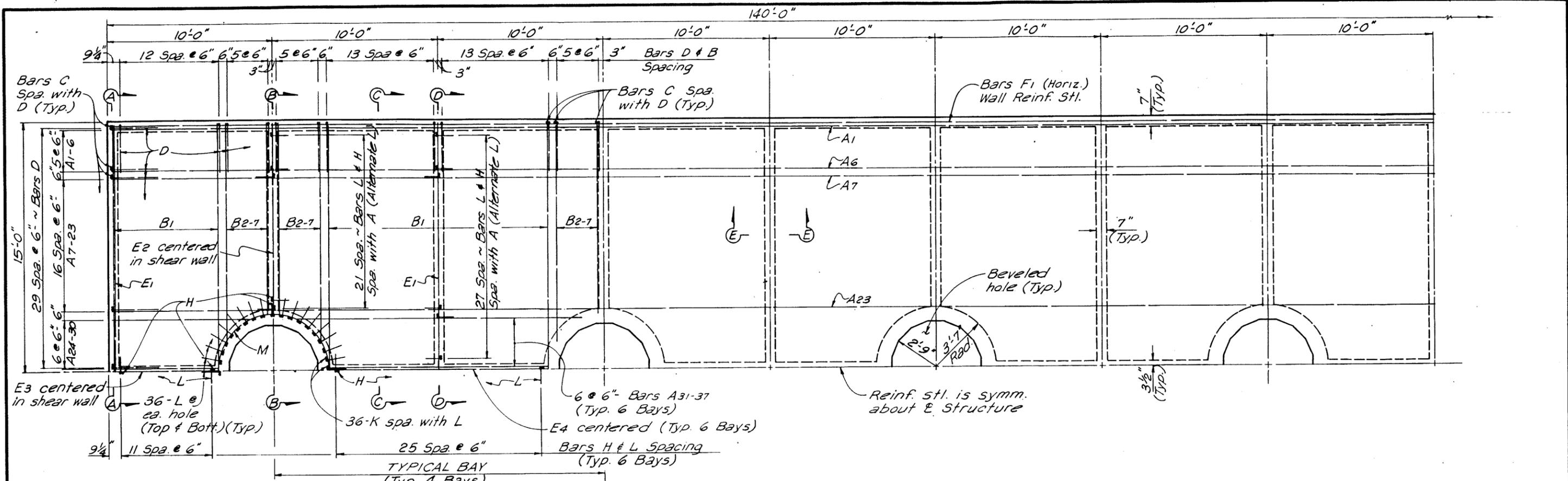
SECTION - ELEVATION



RING AND COVER DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION HOUSTON DISTRICT		<b>FLOATING MOORING DOCK LAYOUT</b> S.H. 87 AT GALVESTON FERRY LANDING	
ORIGINAL DRAWING DATE: JUNE 1994 REVISIONS	STATE DISTRICT: 12 FEDERAL PROJECT: 6 FEDERAL AID PROJECT: PBD col (002)	COUNTY: GALVESTON CONTROL SECTION: 0367.06 JOB: 050.SH.87	SHEET: 11

FILM DWT 13439



Notes:  
 The top deck slab is similar to the bottom deck slab. There are no bars L in the top of the shear walls. See deck slab plan and sections for placement and spacing of all reinforcing steel.  
 Burn-off longitudinal and transverse bars A and B as necessary that are spaced around the beveled holes.  
 Burn-off bars in the top deck slab as necessary for installation of man-hole rings.



**HALF DECK SLAB PLAN**  
 (SHOWING BOTTOM DECK - TOP DECK SIMILAR)

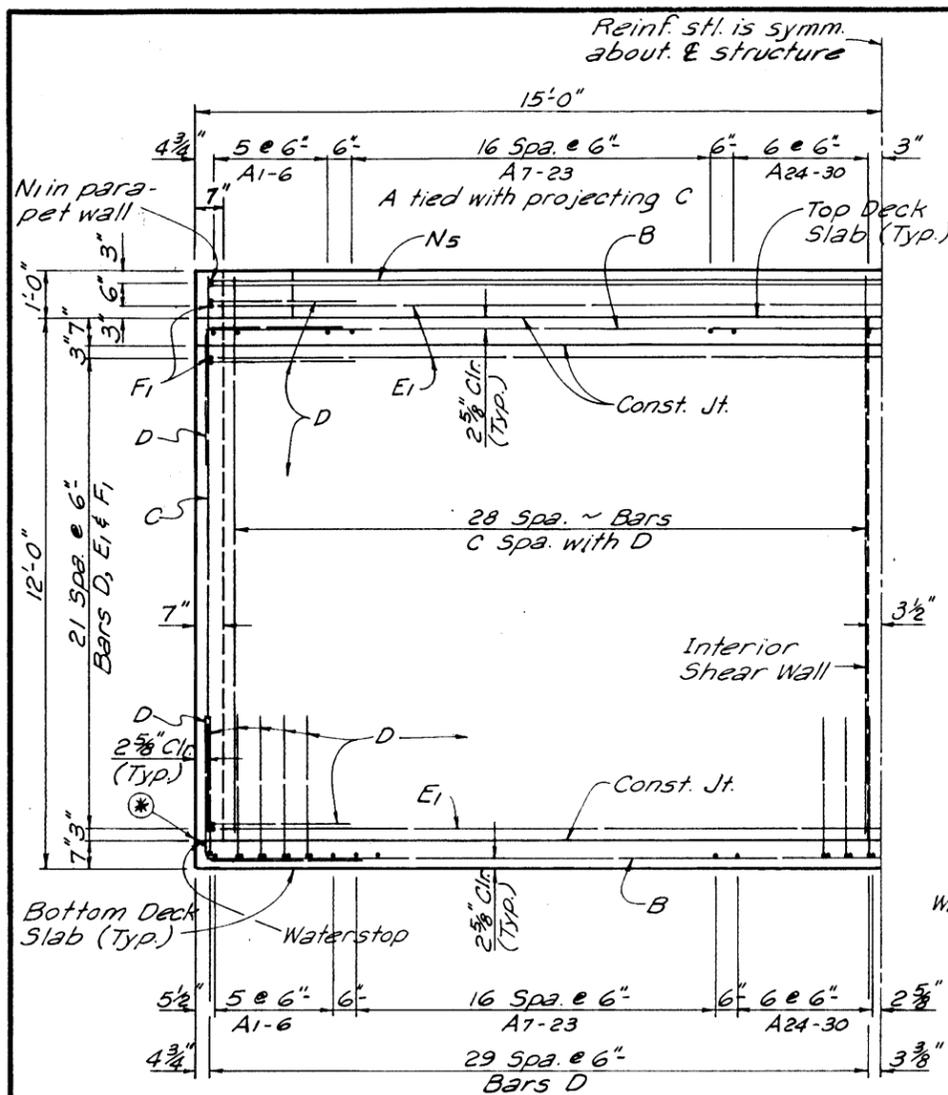
TEXAS DEPARTMENT OF TRANSPORTATION  
 HOUSTON DISTRICT

**FLOATING MOORING DOCK DETAILS**

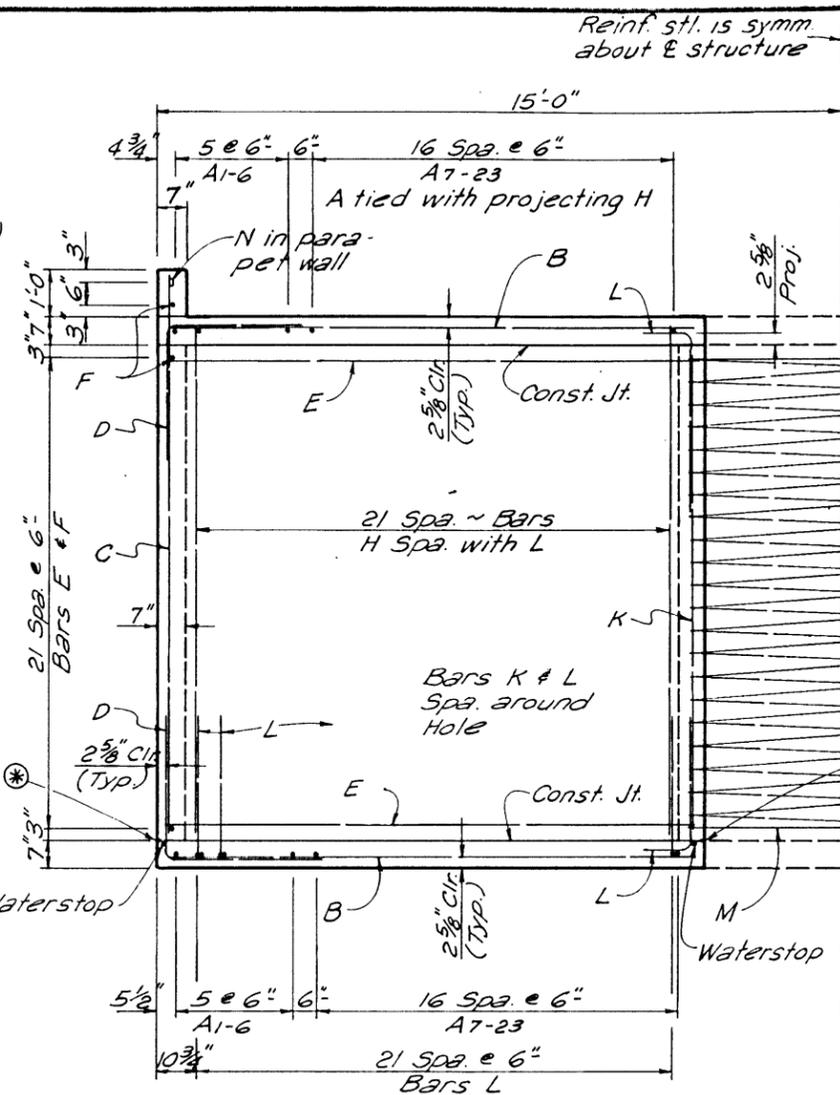
S.H. 87 AT GALVESTON FERRY LANDING

SHT. 1 OF 4

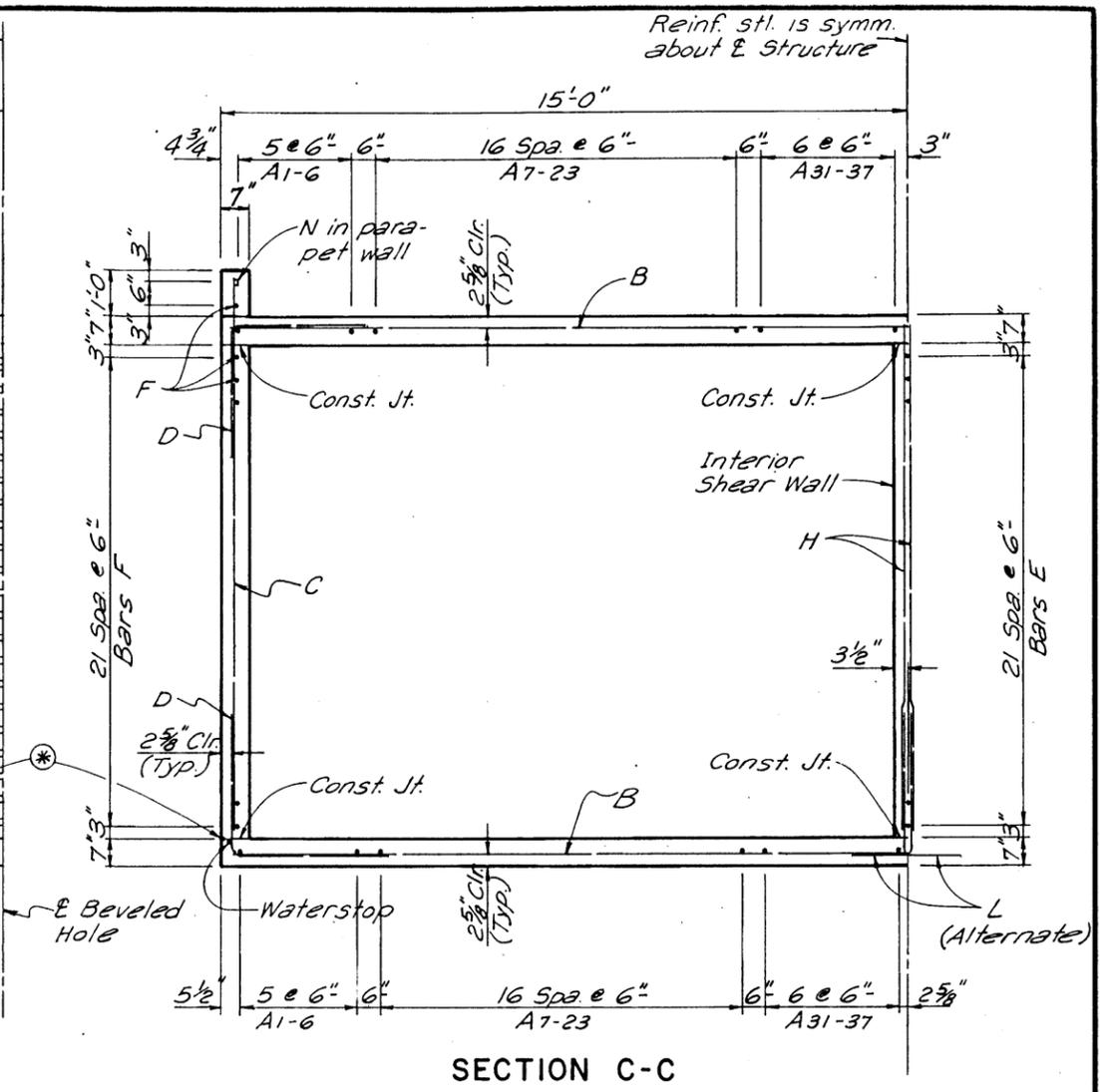
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DR. JPV	REVISIONS:	COUNTY: GALVESTON	CONTROL SECTION: 0367 06 050	JOB: SH 87
DR. CJM				
DR. JPV				



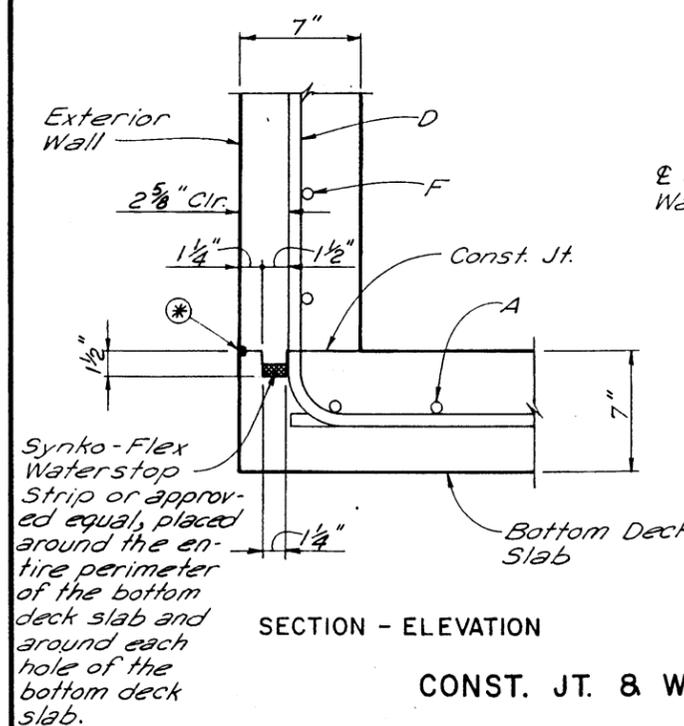
SECTION A-A



SECTION B-B

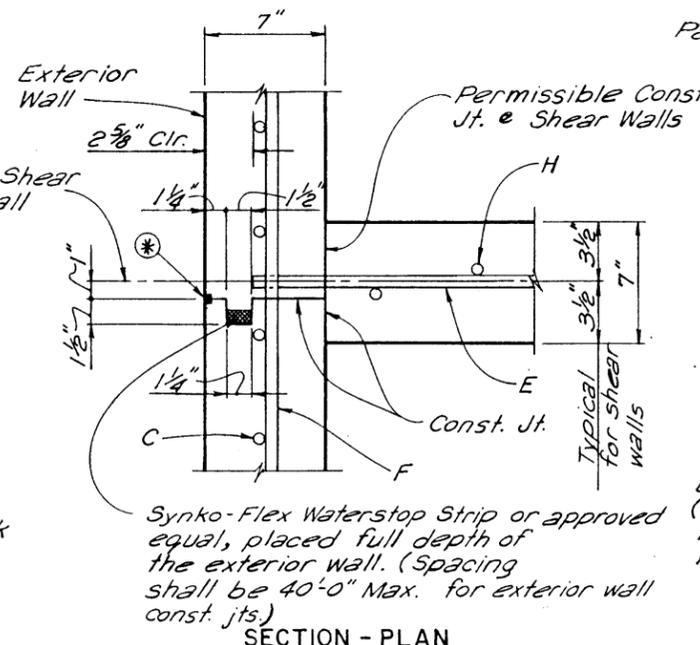


SECTION C-C

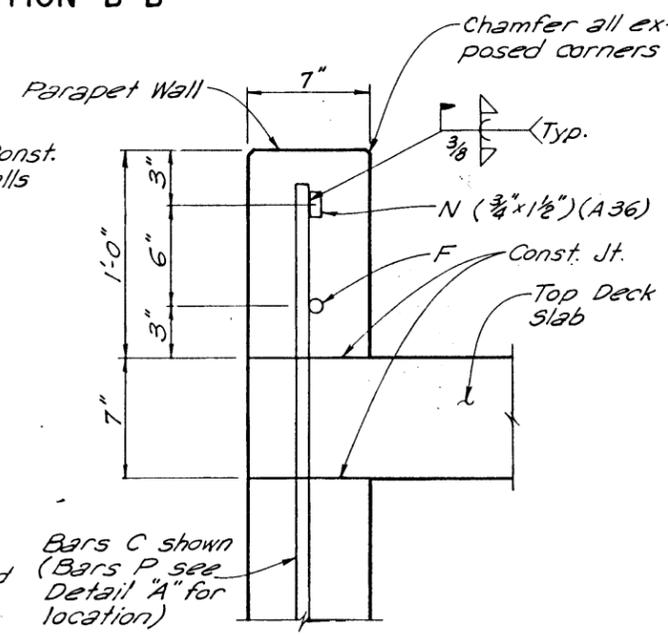


SECTION - ELEVATION

CONST. JT. & WATERSTOP DETAILS



SECTION - PLAN

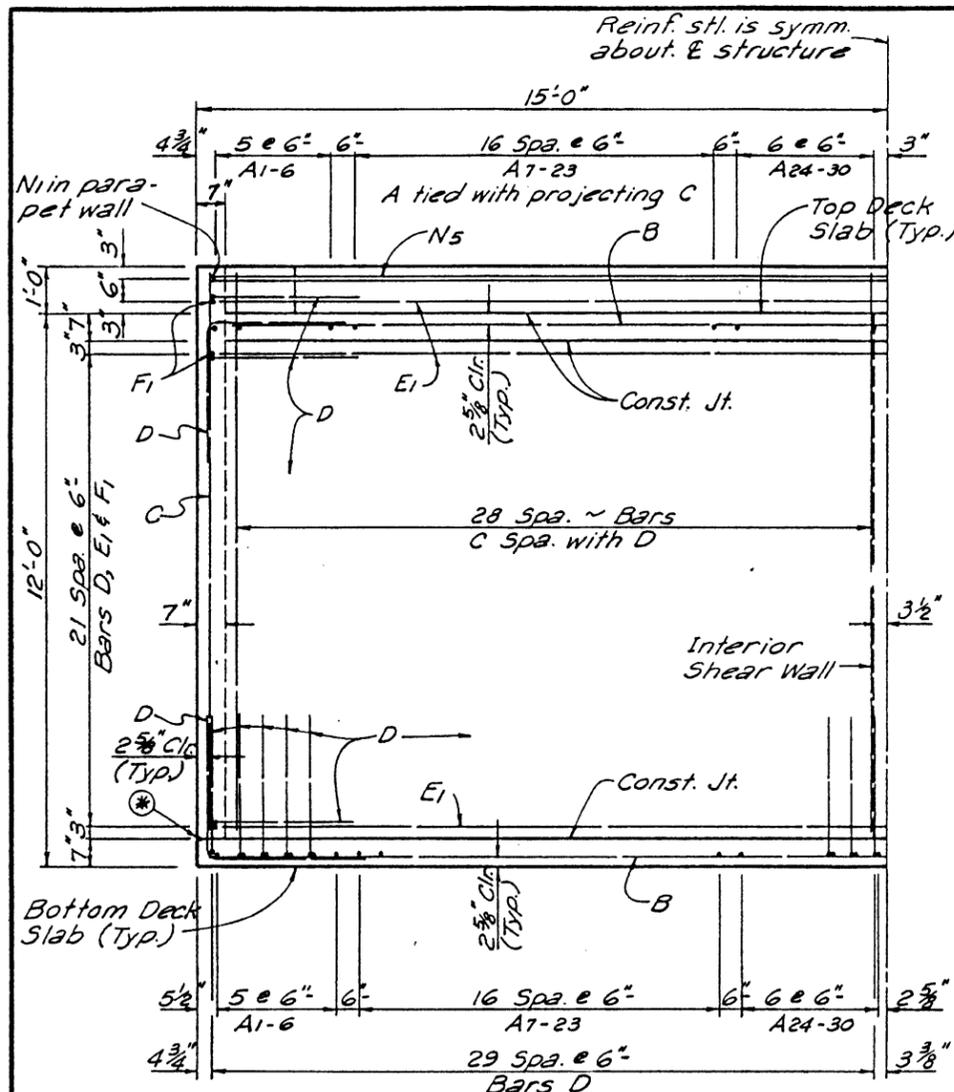


BAR WELDING DETAIL

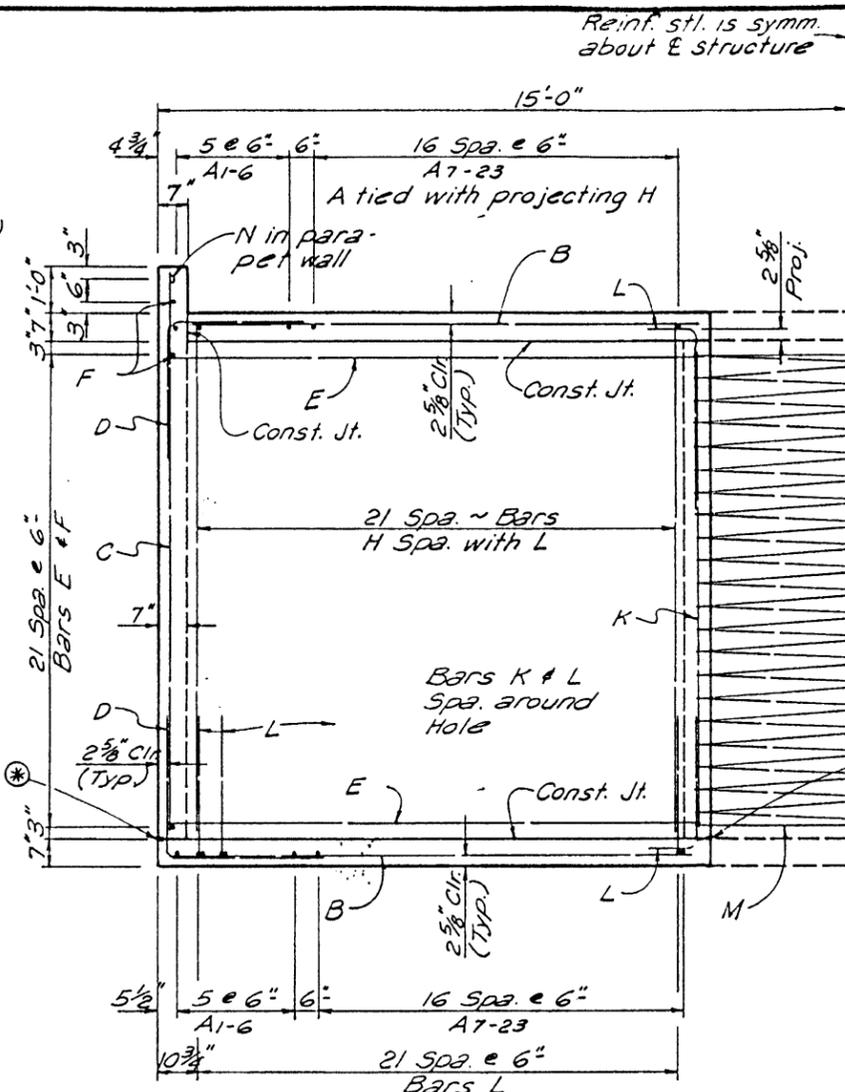
\* Groove exterior side of all wall construction joints one-quarter of an inch in width and depth and seal with a Type VII epoxy, meeting the requirements of Item 575, "Epoxy". Fill the groove and extend epoxy over an area not less than one (1) inch on each side of the joint.

8.23.94

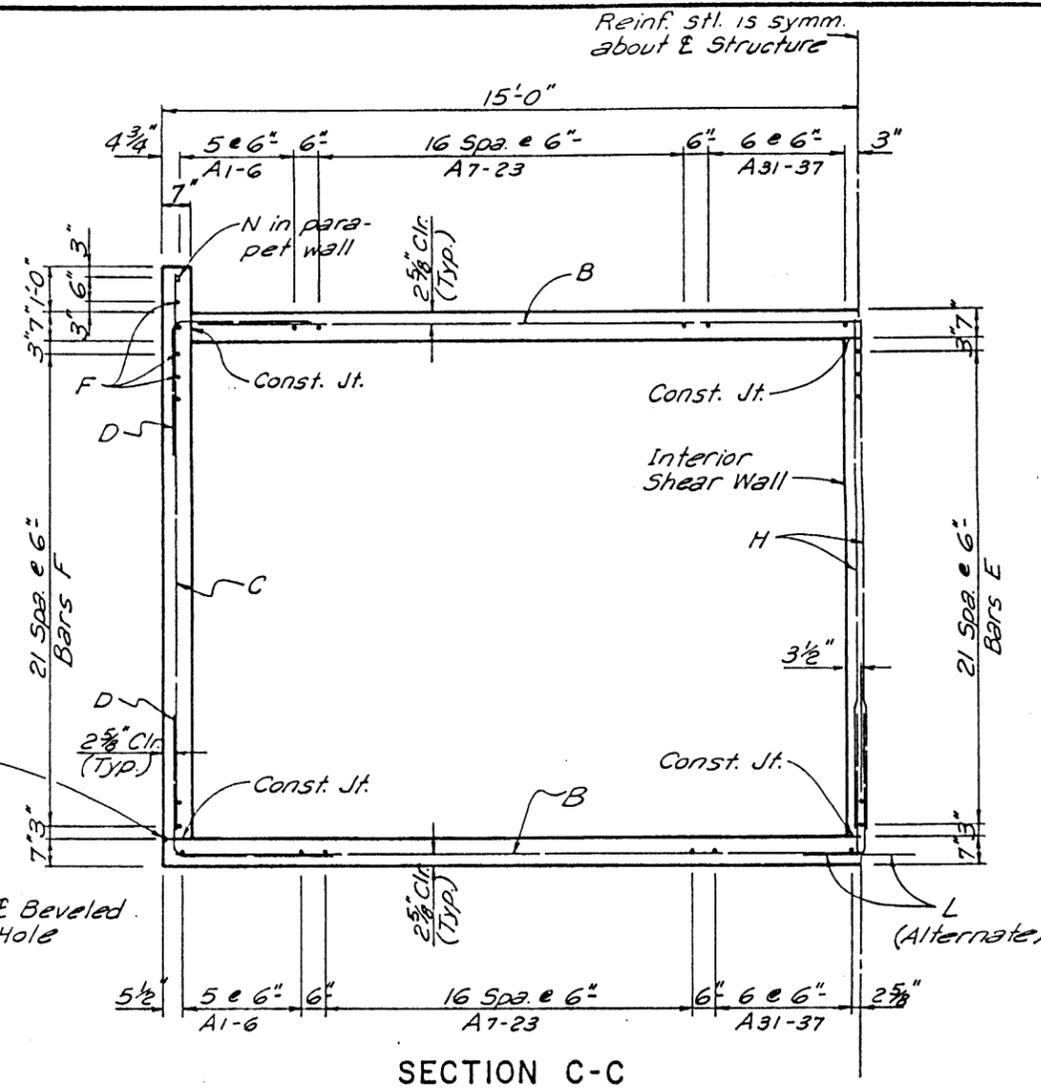
		TEXAS DEPARTMENT OF TRANSPORTATION HOUSTON DISTRICT	
<b>FLOATING MOORING DOCK DETAILS</b>			
S.H. 87 AT GALVESTON FERRY LANDING			
SHT. 2 OF 4			
ORIGINAL DRAWING DATE: JUNE 1994 DR. 1 - JPV DR. 1 - CJM DR. 1 - JPV	REVISIONS 12 6 COUNTY: GALVESTON	FEDERAL AID PROJECT FEDERAL REGION: 6 FEDERAL AID PROJECT: FBD 001 (002) CONTROL SECTION: 0367 JOB: 06 HIGHWAY: 0505H 87	SHEET: 13



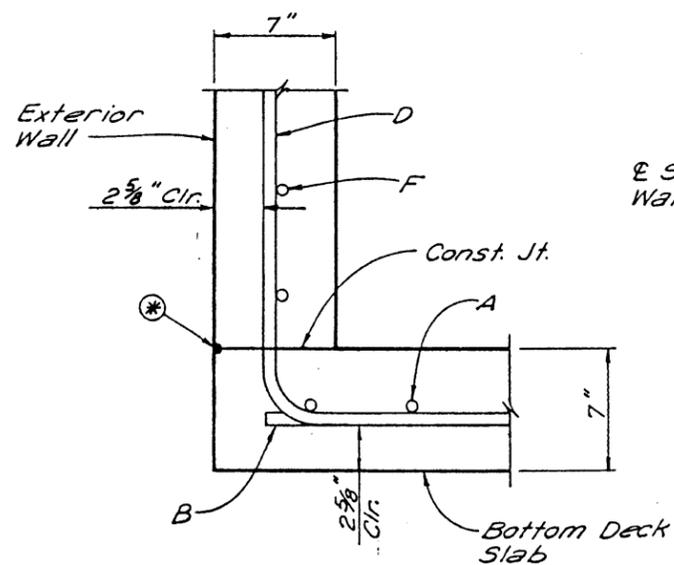
SECTION A-A



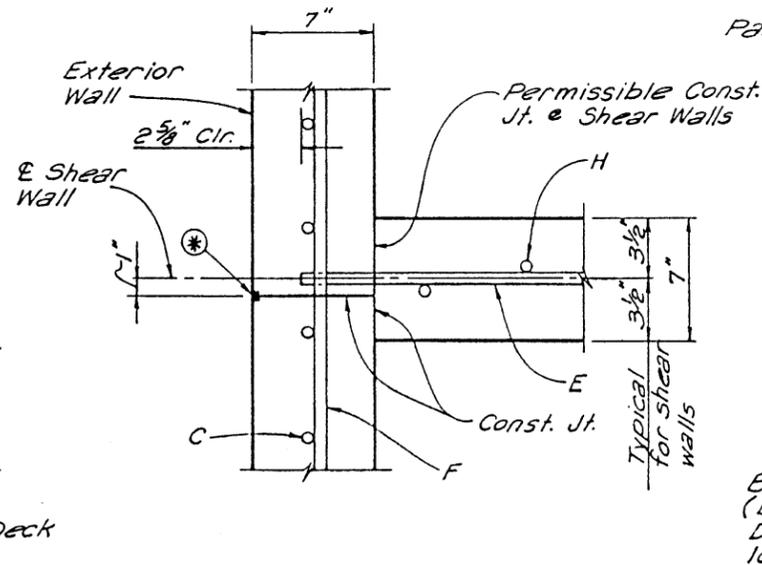
SECTION B-B



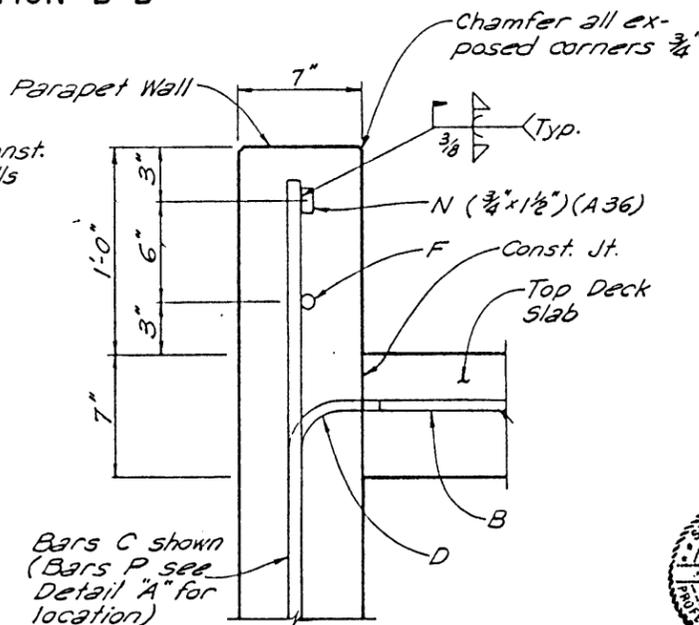
SECTION C-C



SECTION - ELEVATION



SECTION - PLAN



BAR WELDING DETAIL

⊗ Groove exterior side of all wall construction joints one-quarter of an inch in width and depth and seal with a Type VIII epoxy, meeting the requirements of Item 575, "Epoxy". Fill the groove and extend epoxy over an area not less than one (1) inch on each side of the joint.

Revised 8-29-95  
Eliminated water stop, revised roof const. jt.



TEXAS DEPARTMENT OF TRANSPORTATION  
HOUSTON DISTRICT

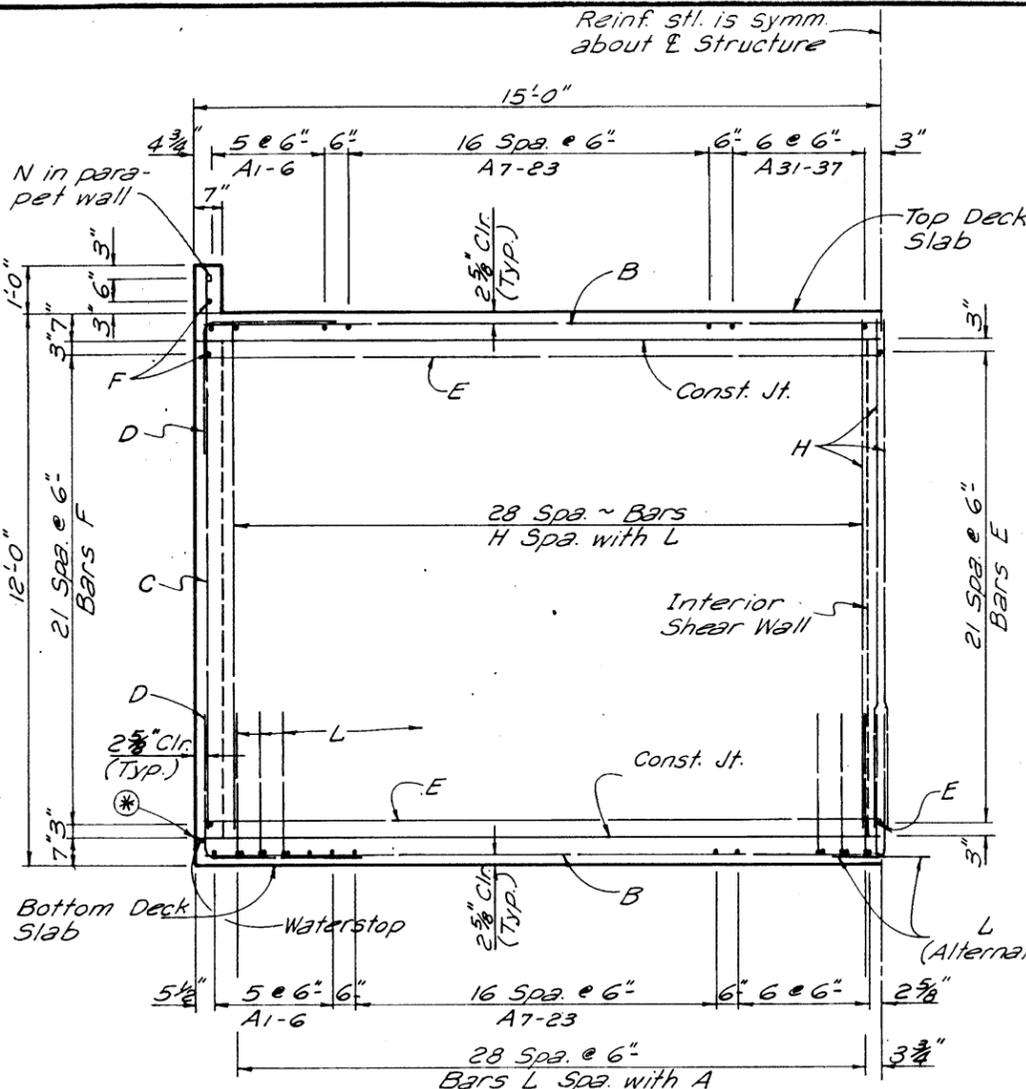
**FLOATING MOORING DOCK DETAILS**  
FOR PROPOSED DOCKS 3, 4 & 5

S.H. 87 AT GALVESTON FERRY LANDING

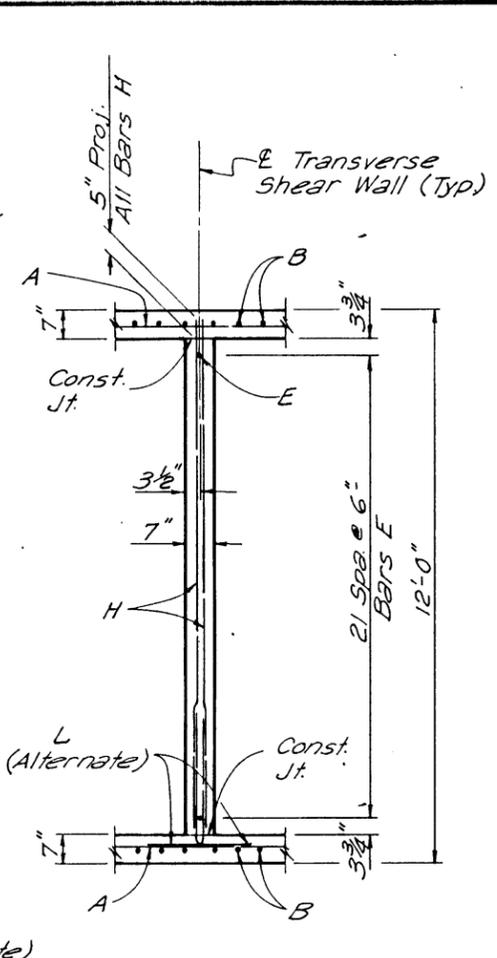
SHT. 2 OF 4

DATE: JUNE 1994	SCALE: 1/2" = 1'-0"	FEDERAL AID PROJECT NO.:	SHEET NO. 13A
DESIGNER: JPV	REVISIONS:	COUNTY:	
CHECKER: GJM		GALVESTON	0367.06 0505H 87

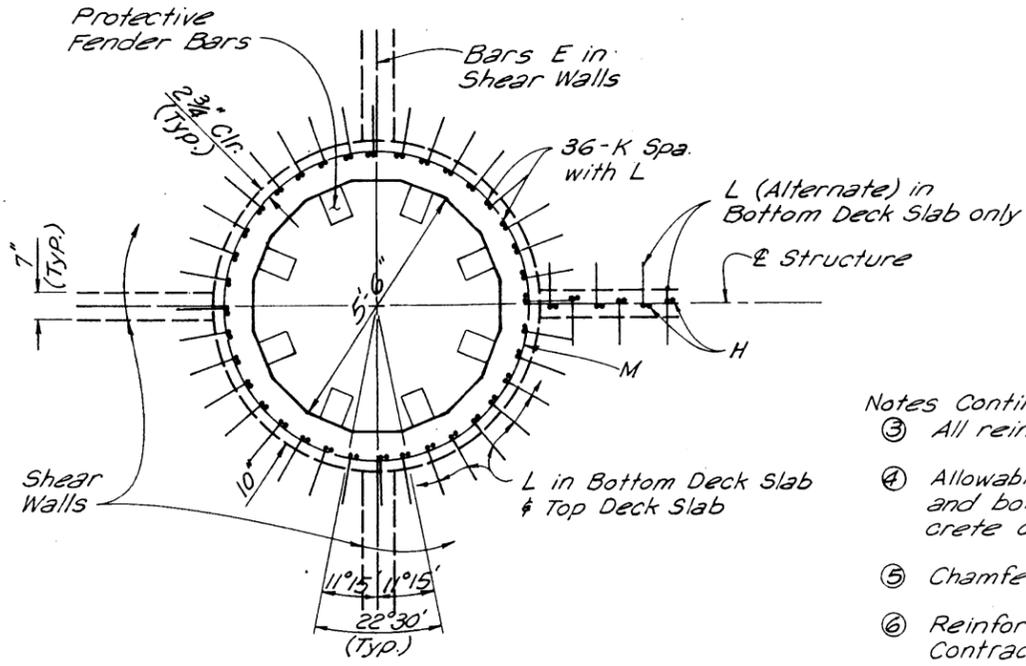
CONST. JT. & WATERSTOP DETAILS



SECTION D-D



SECTION E-E  
(All Shear Walls Similar)



PLAN  
(Showing Reinf. Stl. around beveled hole (Typ.))

Floating Mooring Dock Notes:

- Ballast concrete shall be class "D" with no maximum slump requirement. The ballast concrete shall be self leveling with only enough finishing required to achieve a uniform plan depth in the ballast cells. See sheet 11 for location and placement.
- Floating Mooring Dock Concrete shall be class "F" with a minimum 28 day compressive strength (f'c) of 5000 psi.

Concrete shall be cast with Type II cement. Only sulfate resistant fly ash may be used. Maximum water-cement ratio shall be 0.45. Entrained air will be required. Concrete shall contain 1.0 gal/cy of Master Builders Rheocrete 222 corrosion inhibitor admixture or approved equal. Concrete shall contain high-range water-reducing admixture meeting the requirements of ASTM C 494 type F or G. Water-reducing admixture shall be added at the batch plant. No water shall be added after admixture is added. Redose at the job site if required. Concrete shall contain 1.5 lb/cy of Fibermesh MD graded fibers or approved equal. Use of fibermesh shall be in accordance with manufacturers recommendations.

Notes Continued

- All reinforcing steel shall be grade 60.
- Allowable tolerance for top deck, wall and bottom deck thickness and concrete cover shall be  $\pm 1/4"$ .
- Chamfer all exposed corners  $3/4"$ .
- Reinforcing steel quantity is for Contractor's information only.

ESTIMATED QUANTITIES (ONE DOCK)		
Item	Unit	Quantity
CI D Conc Ballast	CY	13.42
Waterstop	LF	540
Stl Pipe (ASTM A53)(Gr B)	LB	1430
Str Stl (HYC)	LB	571
Penetrating Conc Surf Treat (CI) SY		1030
Specialty Conc (Floating Dock)	CY	366

\* For Contractor's information.  
 Δ Specialty Conc (Floating Dock) is a pay item quantity.

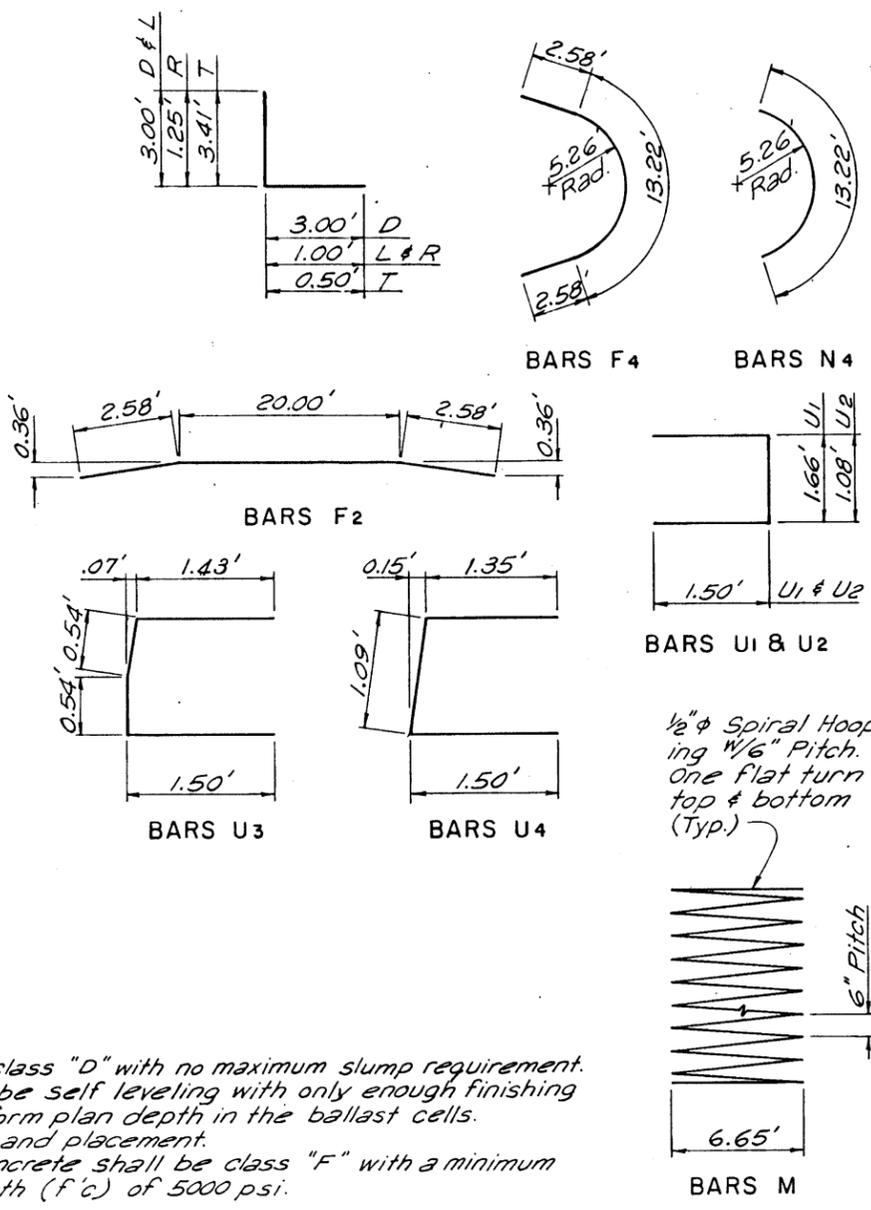


TABLE OF REINFORCING STEEL				
Bar	No.	Size	Length	Weight
A1-6	4 Ea	#6	92.58'-111.67'	2578
A7-23	4 Ea	#6	116.67'-143.41'	9303
A24-30	4 Ea	#6	8.83'-6.58'	227
A31-37	24 Ea	#6	17.67'-13.67'	2769
A38-44	4 Ea	#6	7.67'-6.67'	211
B1	252	#6	29.67'	7866
B2-7	36 Ea	#6	13.42'-11.67'	2851
B8-13	4 Ea	#6	11.67'-13.08'	312
B14-41	2 Ea	#6	28.83'-25.17'	1591
B42-47	4 Ea	#6	10.83'-8.92'	249
B48-53	4 Ea	#6	8.83'-9.83'	236
B54-81	2 Ea	#6	22.12'-14.61'	1082
B82-87	4 Ea	#6	5.83'-3.45'	117
B88-93	4 Ea	#6	3.29'-4.12'	94
B94-100	2 Ea	#6	11.00'-9.33'	150
B101	2	#6	8.92'	19
B102	2	#6	8.16'	17
B103	2	#6	7.40'	16
B104	2	#6	6.64'	14
B105	2	#6	5.88'	12
B106	2	#6	5.12'	11
C	626	#6	12.17'	8015
D	626	#6	6.00'	3951
E1	111	#6	29.67'	3465
E2	220	#6	11.67'	2701
E3	44	#6	6.67'	309
E4	132	#6	13.67'	1898
E5	22	#6	26.92'	623
E6	44	#6	8.92'	413
E7	22	#6	18.67'	432
E8	44	#6	3.37'	156
F1	46	#6	92.41'	4471
F2	46	#6	25.16'	1218
F3	46	#6	27.50'	1331
F4	23	#6	18.38'	445
H	750	#6	11.17'	8813
K	252	#6	10.67'	2829
L	1254	#6	4.00'	5277
M	7	1/2" φ	445.00'	2081
N1	2	3/4" x 1/2"	89.67'	687
N2	2	3/4" x 1/2"	20.09'	154
N3	2	3/4" x 1/2"	27.44'	210
N4	1	3/4" x 1/2"	13.22'	51
N5	1	3/4" x 1/2"	29.29'	112
P	8	#6	3.50'	29
R	40	#5	2.25'	94
S	16	#4	0.75'	8
T	32	#6	3.91'	132
U1	8	#4	4.66'	25
U2	24	#4	4.08'	65
U3	4	#4	4.01'	11
U4	4	#4	3.94'	11
V	8	#6	4.25'	36
Total Lbs. (One Dock)				79,779

\* Includes one - 2.58' Lap.  
 † Includes Two - 2.58' Laps.



TEXAS DEPARTMENT OF TRANSPORTATION  
 HOUSTON DISTRICT

**FLOATING MOORING DOCK DETAILS**

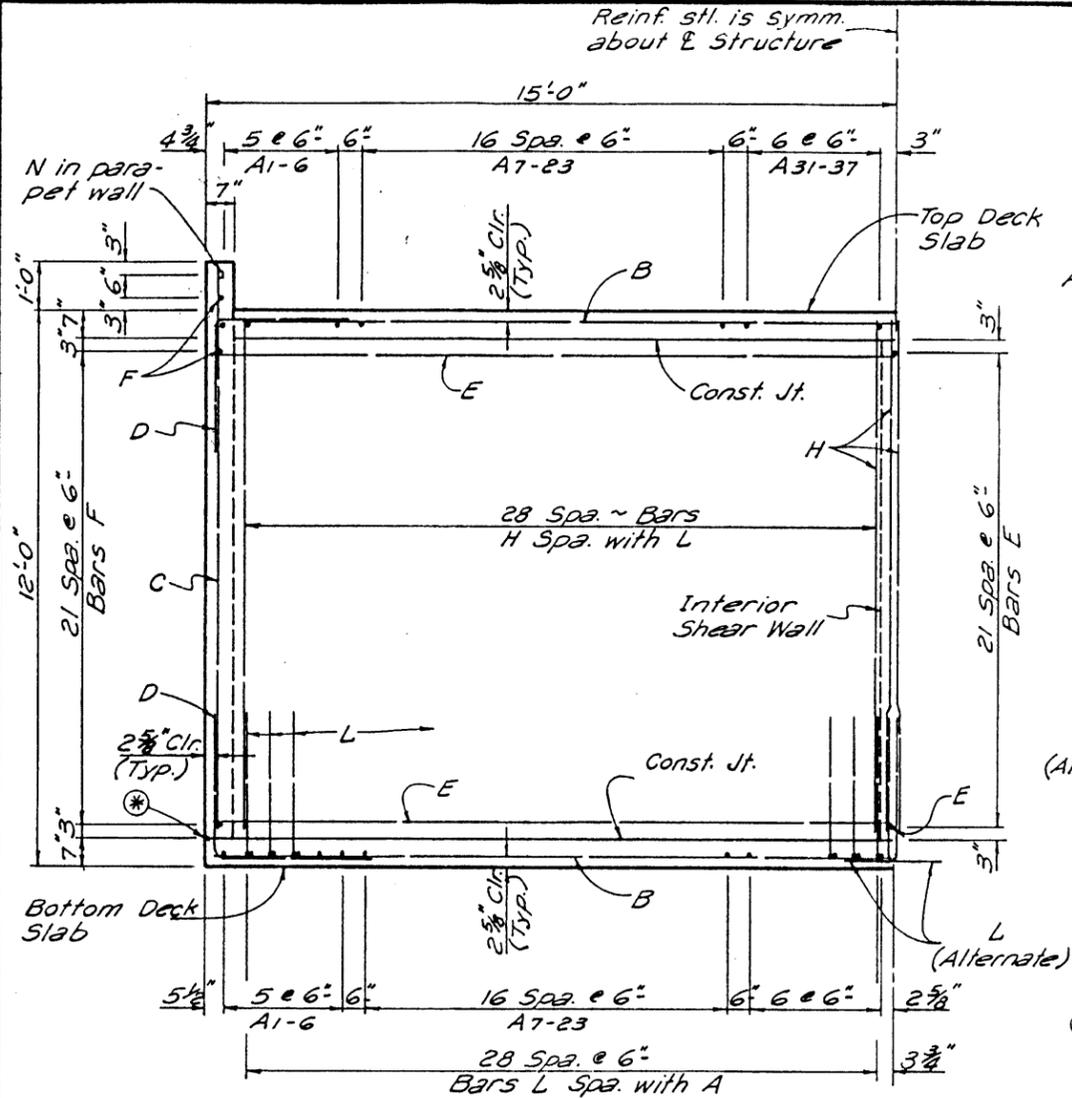
S.H. 87 AT GALVESTON FERRY LANDING

SHT. 3 OF 4

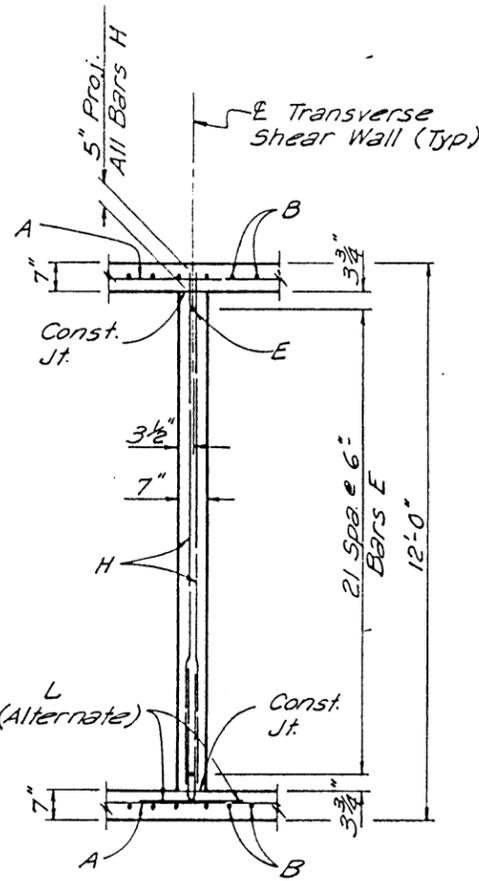
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 REVISIONS: 01

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
12	6	FBD (001)(002)	14
COUNTY	CONTROL	SECTION	JOB
GALVESTON	0367	06050	SH 87

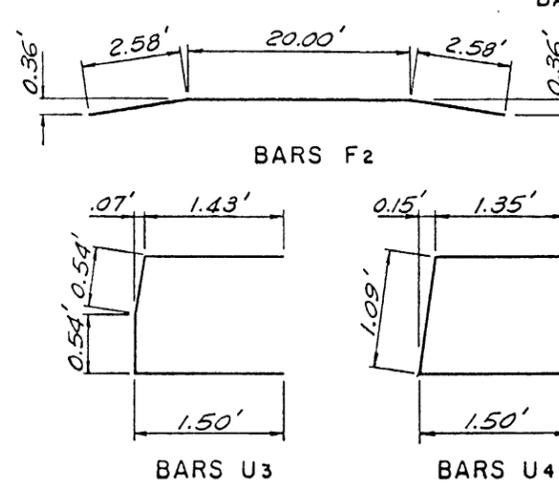
Reinf. stl. is symm. about E Structure



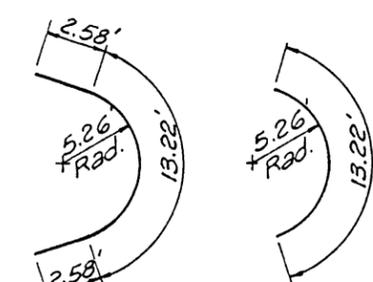
SECTION D-D



SECTION E-E  
(All Shear Walls Similar)



Revisions 8-29-95  
Revised to eliminate water stop. Revised roof const. Jt. & reinf. stl. accordingly.



1/2" Spiral Hooping W/6" Pitch. One flat turn top & bottom (Typ.)

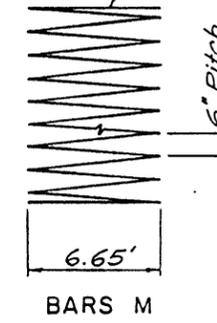
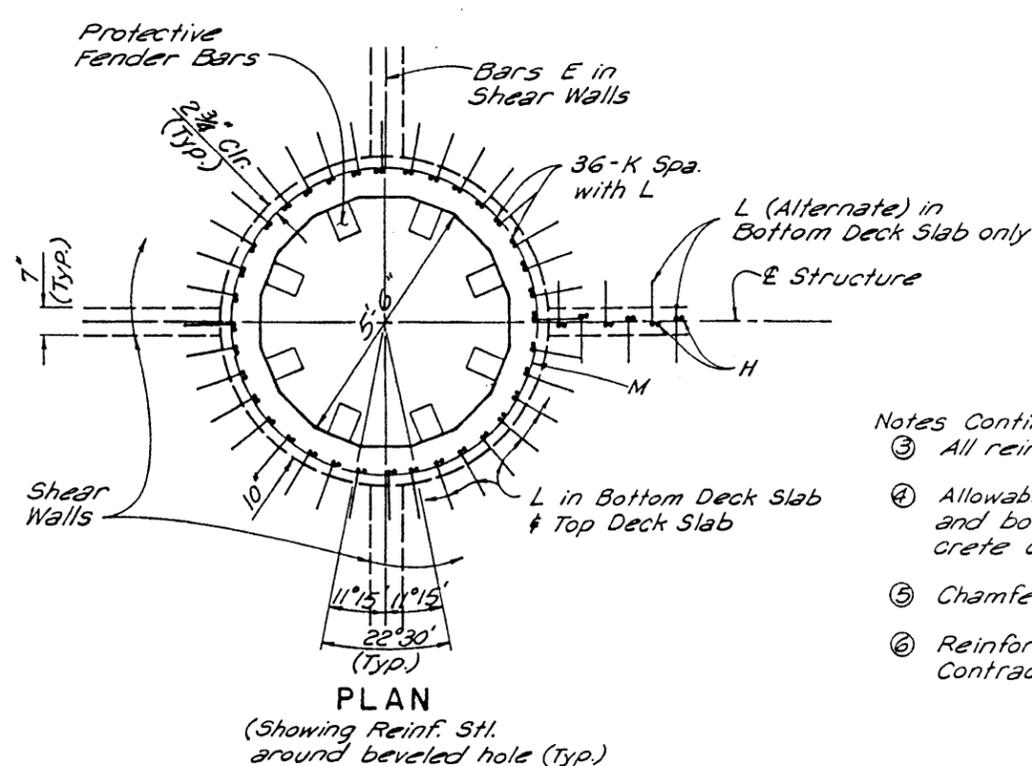


TABLE OF REINFORCING STEEL				
Bar No.	Size	Length	Weight	
* A1-6	4 Ea #6	92.58'-111.67'	2578	
† A7-23	4 Ea #6	116.67'-143.41'	9305	
A24-30	4 Ea #6	8.83'-6.58'	227	
A31-37	24 Ea #6	17.67'-13.67'	2769	
A38-44	4 Ea #6	7.67'-6.67'	211	
B1	252 #6	29.67'	7866	
B2-7	36 Ea #6	13.42'-11.67'	2851	
B8-13	4 Ea #6	11.67'-13.08'	312	
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B48-53	4 Ea #6	8.83'-9.83'	236	
B54-81	2 Ea #6	22.12'-14.61'	1082	
B82-87	4 Ea #6	5.83'-3.45'	117	
B88-93	4 Ea #6	3.29'-4.12'	94	
B94-100	2 Ea #6	11.00'-9.33'	150	
B101	2 #6	8.92'	19	
B102	2 #6	8.16'	17	
B103	2 #6	7.40'	16	
B104	2 #6	6.64'	14	
B105	2 #6	5.88'	12	
B106	2 #6	5.12'	11	
C	626 #6	12.17'	8015	
D	626 #6	6.00'	3951	
E1	111 #6	29.67'	3465	
E2	220 #6	11.67'	2701	
E3	44 #6	6.67'	309	
E4	132 #6	13.67'	1898	
E5	22 #6	26.92'	623	
E6	44 #6	8.92'	413	
E7	22 #6	18.67'	432	
E8	44 #6	3.37'	156	
F1	46 #6	92.41'	4471	
F2	46 #6	25.16'	1218	
F3	46 #6	27.50'	1331	
F4	23 #6	18.38'	445	
H	750 #6	11.17'	8813	
K	252 #6	10.67'	2829	
L	1254 #6	4.00'	5277	
M	7 #6	445.00'	2081	
N1	2 #6	89.67'	687	
N2	2 #6	20.09'	154	
N3	2 #6	27.44'	210	
N4	1 #6	13.22'	51	
N5	1 #6	29.29'	112	
P	8 #6	3.50'	29	
R	68 #5	2.25'	160	
S	16 #4	0.75'	8	
T	16 #6	3.91'	94	
U1	12 #4	4.66'	37	
U2	36 #4	4.08'	98	
U3	6 #4	4.01'	16	
U4	6 #4	3.94'	16	
V	8 #6	4.25'	36	
Total Lbs. (One Dock)			79861	

\* Includes one - 2.58' Lap.  
† Includes Two - 2.58' Laps.



PLAN  
(Showing Reinf. Stl. around beveled hole (Typ.))

Floating Mooring Dock Notes:

- Ballast concrete shall be class "D" with no maximum slump requirement. The ballast concrete shall be self leveling with only enough finishing required to achieve a uniform plan depth in the ballast cells. See sheet 11 for location and placement.
- Floating Mooring Dock Concrete shall be class "F" with a minimum 28 day compressive strength (f'c) of 5000 psi.

Concrete shall be cast with Type II cement. Only sulfate resistant fly ash may be used. Maximum water-cement ratio shall be 0.45. Entrained air will be required. Concrete shall contain 1.0 gal/cy of Master Builders Rheocrete 222 corrosion inhibitor admixture or approved equal. Concrete shall contain high-range water-reducing admixture meeting the requirements of ASTM C 494 type F or G. Water-reducing admixture shall be added at the batch plant. No water shall be added after admixture is added. Redose at the job site if required. Concrete shall contain 1.5 lb/cy of Fibermesh MD graded fibers or approved equal. Use of fibermesh shall be in accordance with manufacturers recommendations.

- Notes Continued
- All reinforcing steel shall be grade 60.
  - Allowable tolerance for top deck, wall and bottom deck thickness and concrete cover shall be 1/4".
  - Chamfer all exposed corners 3/4"
  - Reinforcing steel quantity is for Contractor's information only.

ESTIMATED QUANTITIES (ONE DOCK)		
Item	Unit	Quantity
† Cl D Conc Ballast	CY	13.42
† Waterstop	LF	540
† Stl Pipe (ASTM A53)(Gr B)	LB	1430
† Str Stl (HYC)	LB	571
† Penetrating Conc Surf Treat (Cl) SY	SY	1030
Δ Specialty Conc (Floating Dock)	CY	366

† For Contractor's information.  
Δ Specialty Conc (Floating Dock) is a pay item quantity.

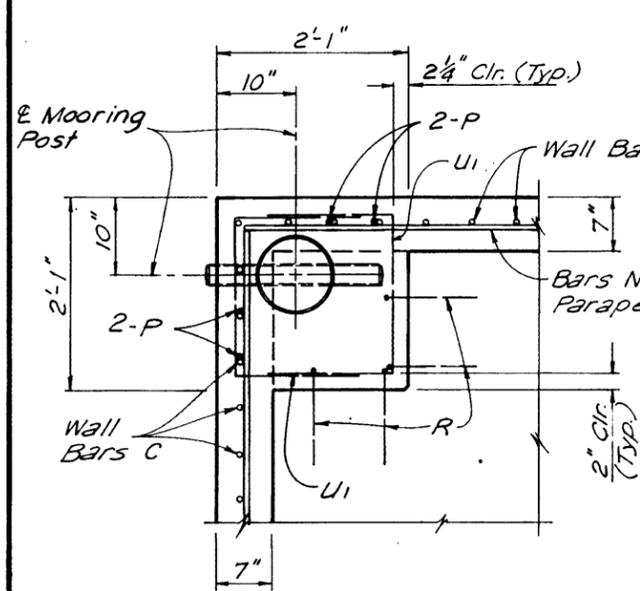
TEXAS DEPARTMENT OF TRANSPORTATION  
HOUSTON DISTRICT

**FLOATING MOORING DOCK DETAILS**  
FOR PROPOSED DOCKS 3, 4 & 5

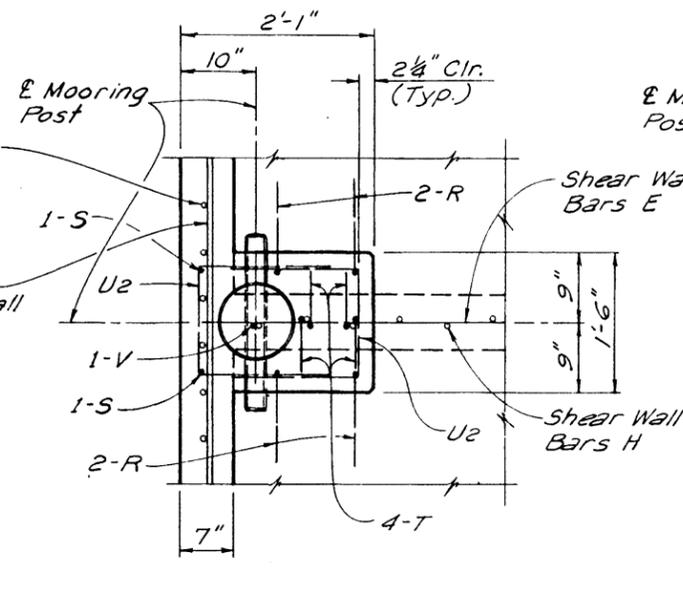
S.H. 87 AT GALVESTON FERRY LANDING

SHT. 3 OF 4

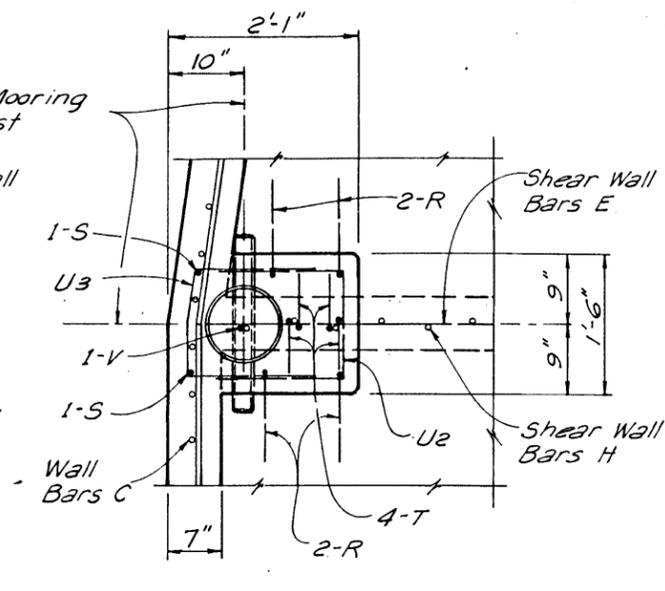
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DATE: 12 6  
COUNTY: GALVESTON  
PROJECT NO: 0367.06.0505H.87



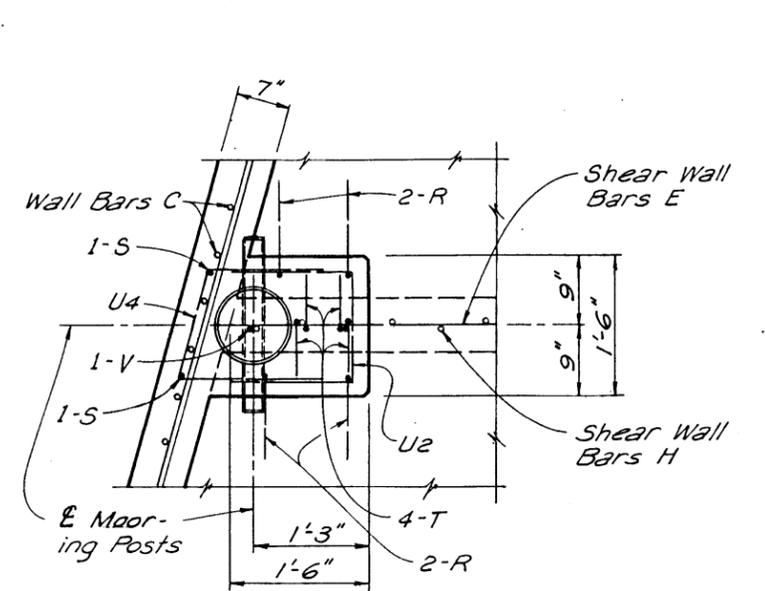
PLAN



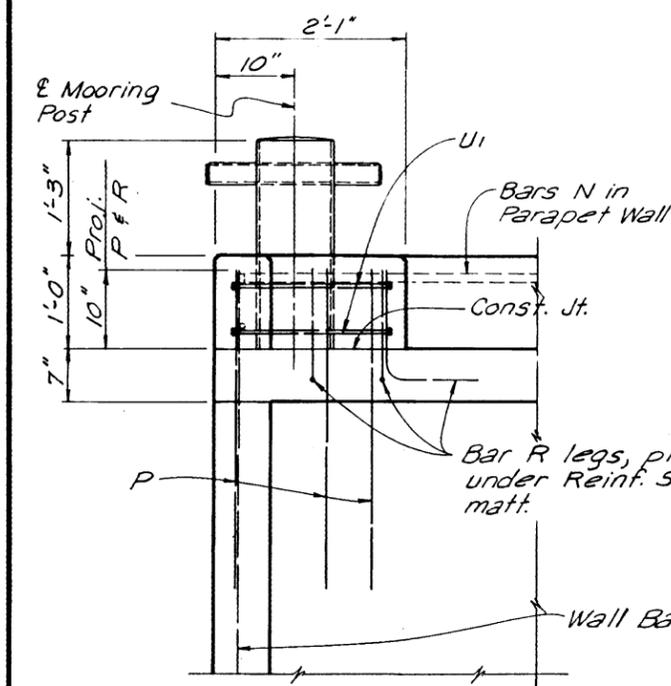
PLAN



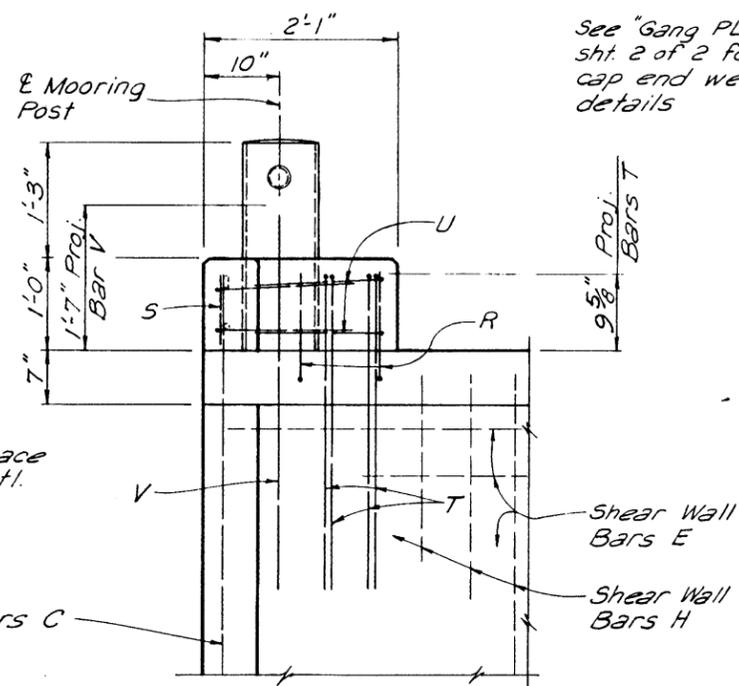
PLAN  
DETAIL "C"



PLAN  
DETAIL "D"



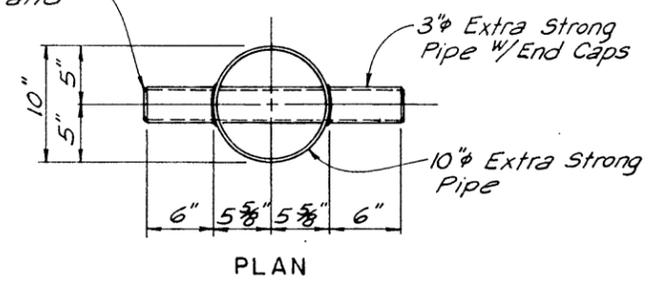
ELEVATION  
DETAIL "A"



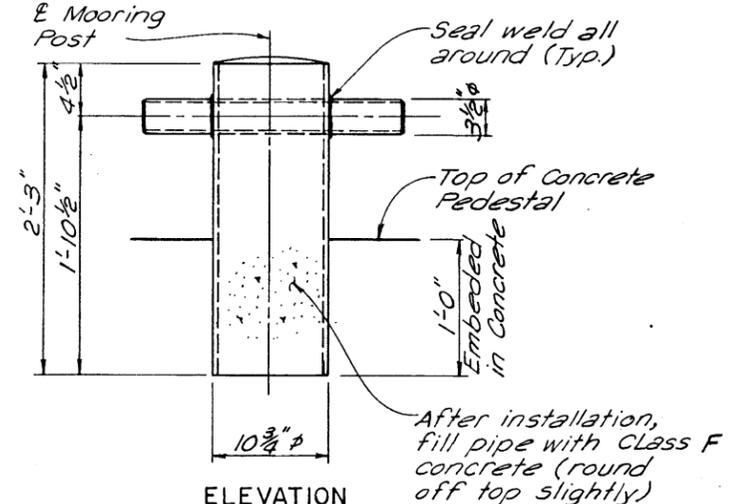
ELEVATION  
DETAIL "B"

Note: The elevation view for Detail "C" & Detail "D" is similar.

See "Gang Plank Details" sht. 2 of 2 for pipe cap end weld and details



PLAN



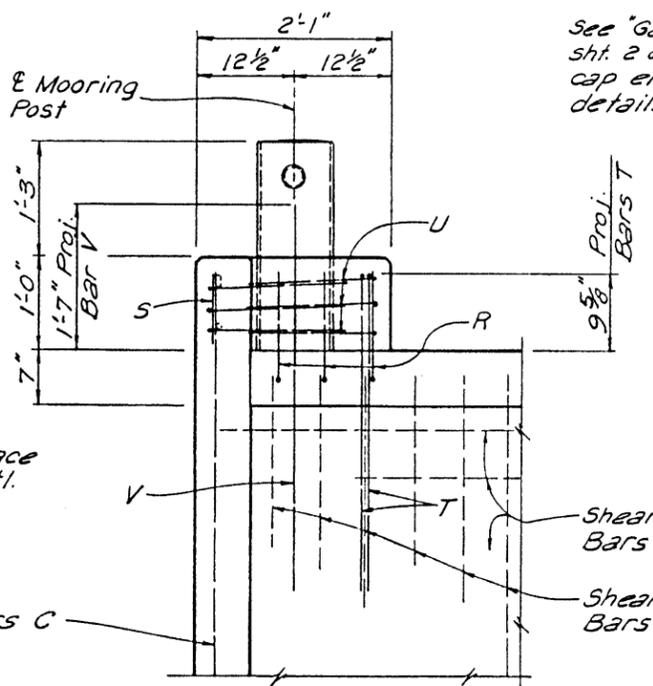
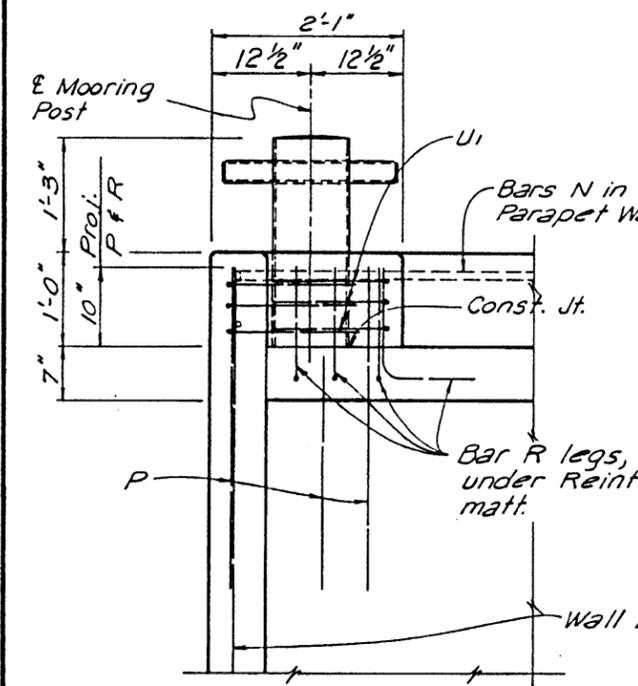
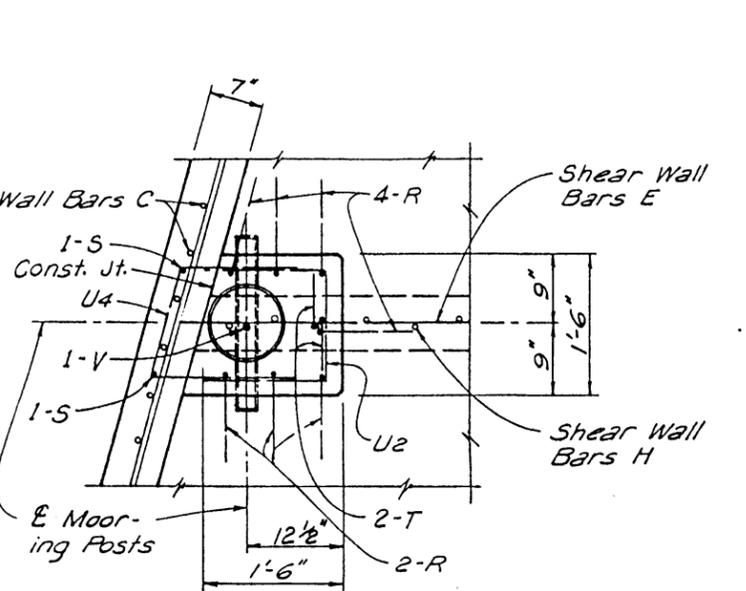
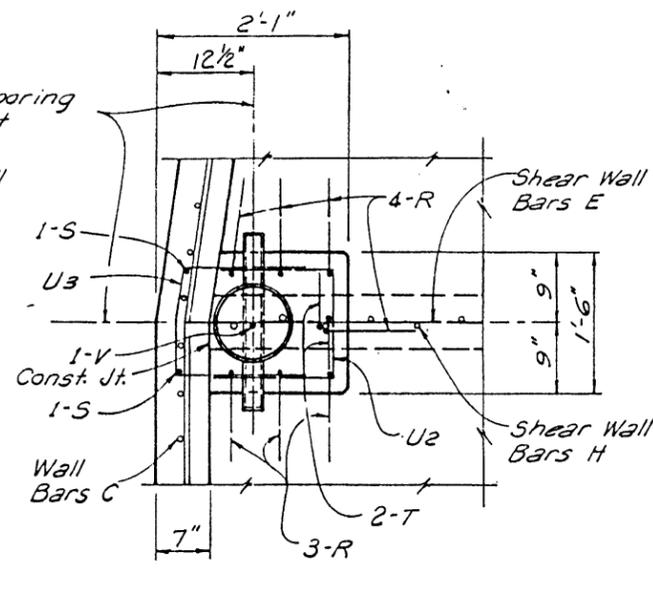
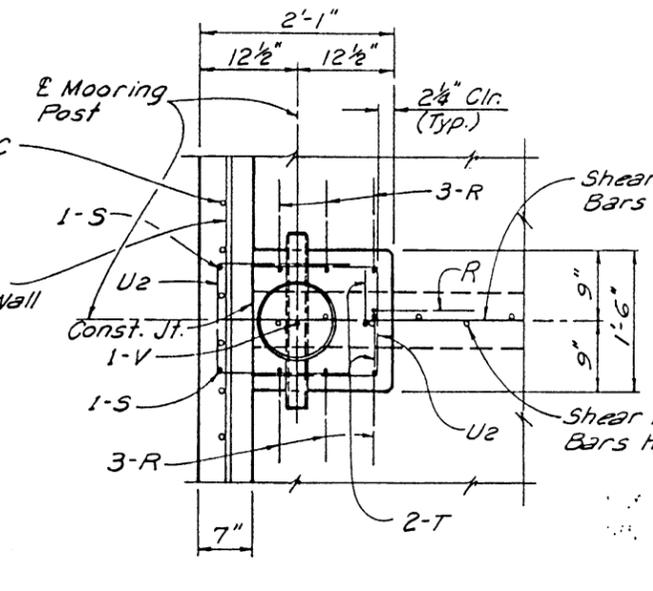
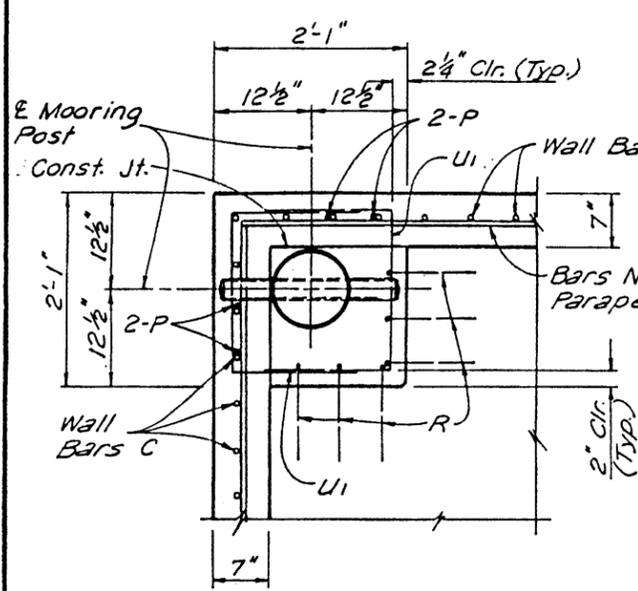
ELEVATION

MOORING POST  
DETAILS

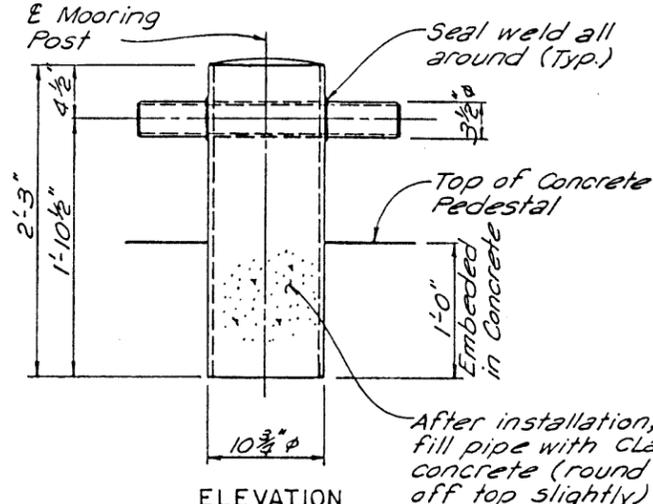
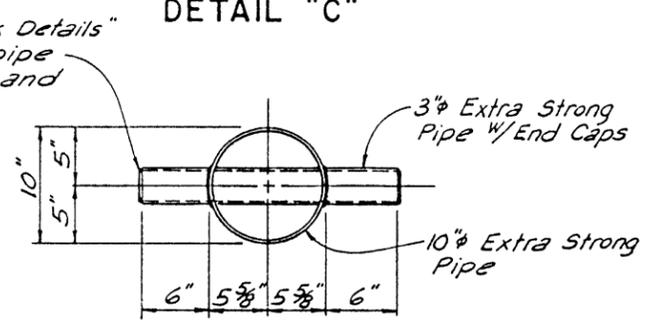
Note: Paint mooring post with Protection System III.



		TEXAS DEPARTMENT OF TRANSPORTATION HOUSTON DISTRICT	
<b>FLOATING MOORING DOCK DETAILS</b>			
S.H. 87 AT GALVESTON FERRY LANDING			
SHT. 4 OF 4			
ORIGINAL DRAWING DATE: JUNE 1994	STATE DISTRICT: 12	FEDERAL REGION: 6	FEDERAL AID PROJECT: F8D 001 (002)
DR. 1: JPY	CONTROL SECTION: 0367 06		SHEET: 15
DR. 2: CJM	COUNTY: GALVESTON	JOB: 0505H 87	HIGHWAY:



See "Gang Plank Details" sht. 2 of 2 for pipe cap end weld and details



MOORING POST DETAILS

Note: The elevation view for Detail "C" & Detail "D" is similar.

Note: Paint mooring post with Protection System III.

Revised 8-29-95  
Moved mooring post, added reinforcing bars.



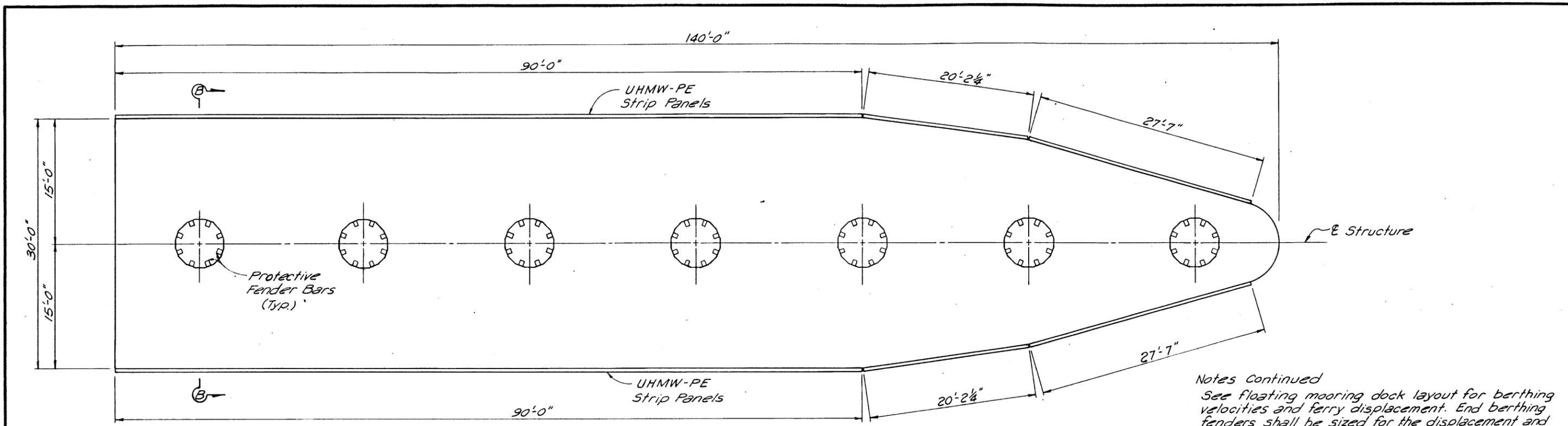
TEXAS DEPARTMENT OF TRANSPORTATION  
HOUSTON DISTRICT

FLOATING MOORING DOCK DETAILS  
FOR PROPOSED DOCKS 3, 4 & 5

S.H. 87 AT GALVESTON FERRY LANDING

SHT. 4 OF 4

ORIGINAL DRAWING DATE: JUNE 1994	STATE: TEXAS	FEDERAL AID PROJECT: 15A
DESIGNER: JPV	DATE: 12 6	PROJECT: 15A
CHECKER: CJM	COUNTY: GALVESTON	CONTRACT NO.: 0367.06.0505H.87
DATE: 8-29-95		



**PLAN**

**FENDER SYSTEM**

General:  
Fender system end berthing, bar fender, low friction panel to be provided by Trellex Morse of Keokuk, Iowa or approved equal.

Each fender system shall have ultra-high molecular weight polyethylene facing containing a minimum of 2.5% by weight UV-stabilization compound with UV-stabilized dyes.

UHMW-PE shall conform to the following:

Property	Test Method	Acceptance Requit.
Molecular Weight		3.0 million, Min.
Ultimate Tensile Strength	ASTM D638	4000 psi, Min.
Izod Impact, dbl. notch	ASTM D256A	18 Ft.-Lbs/in, Min.
Abrasion Wear (Carbon stl=100)	Sand Slurry	18 Maximum
Water Absorption	ASTM D570	Nil
Coefficient of Friction	ASTM D1894	0.20 Maximum

Bar Fenders:  
The design lateral pile load is 70 kips for the lead pile. The piles are designed to absorb all of the berthing energy. The bar fenders are intended to prevent damage to the pile from impact of the mooring dock and shall be sized for 12 kip ft. of energy absorbed.

The pile well in the mooring dock may be modified by the Engineer to accommodate the fenders provided.

End Berthing Fenders:  
See gangplank foundation details for profile of ferry rub rail.

**ESTIMATED QUANTITIES**

Item	Unit	Quantity
* Fender System (End Berthing)	EA	8
* Fender System (Bar Fender)	EA	420
* Fender System (Low Friction Panel)	SF	3307

\* Total all Docks  
in 12' dock zone only

Notes Continued  
See floating mooring dock layout for berthing velocities and ferry displacement. End berthing fenders shall be sized for the displacement and minimum velocities given and the resulting berthing energies.

Minimum fully-deflected standoff 0.50 ft.

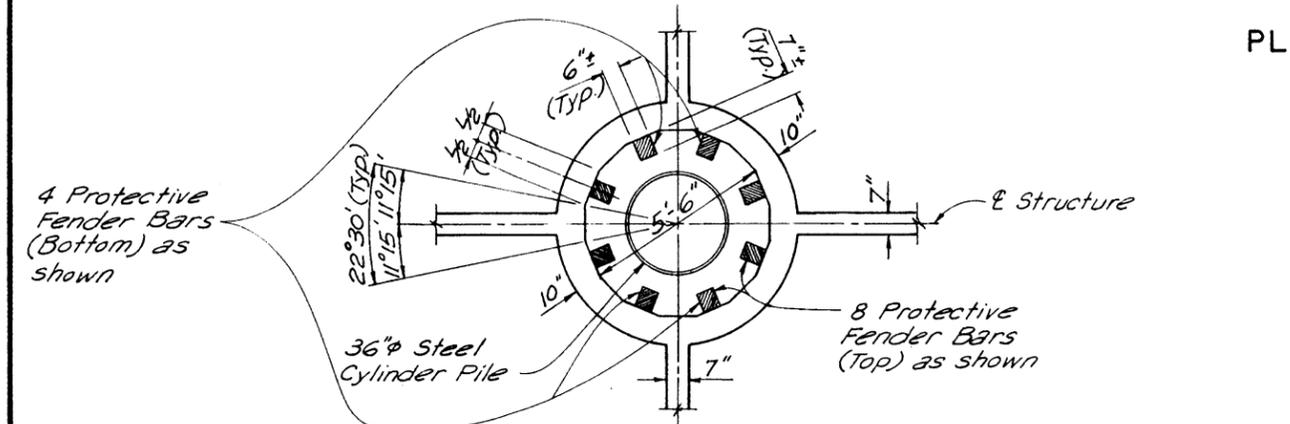
Maximum reaction for end berthing is 200 kips.

Minimum top of fender elevation for end berthing is 7.50.

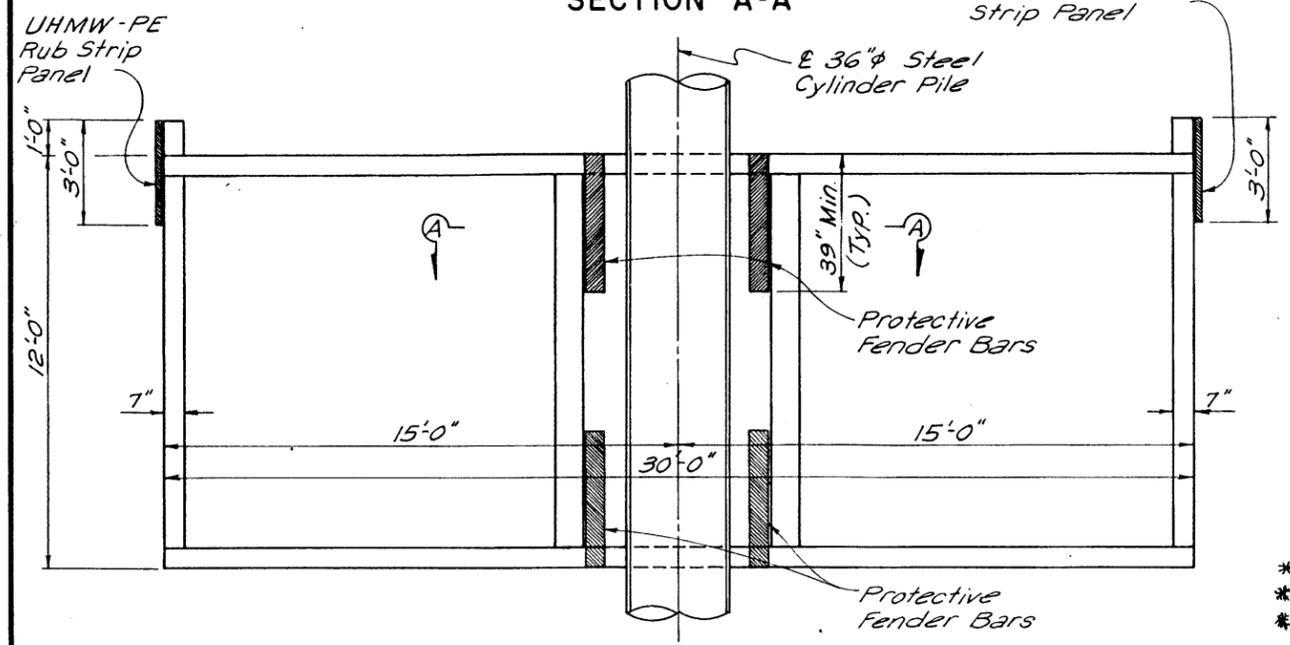
Maximum bottom of fender elevation for end berthing is 0.50

End berthing fenders may be attached to concrete gangplank foundation with anchor bolts. Elevation of top of gangplank foundation is 5.50

Low Friction Panels:  
Low friction panel fenders are required on berthing side only of first and last mooring dock and on both sides of the remaining docks. Panel fenders are intended to eliminate abrasion between the ferry and the dock and to reduce the amount of energy imparted to the dock. The panels shall be sized for a 70 kip force applied over the 18 inch rub rail height.



**SECTION A-A**



**SECTION B-B**

Revised 9-12-94

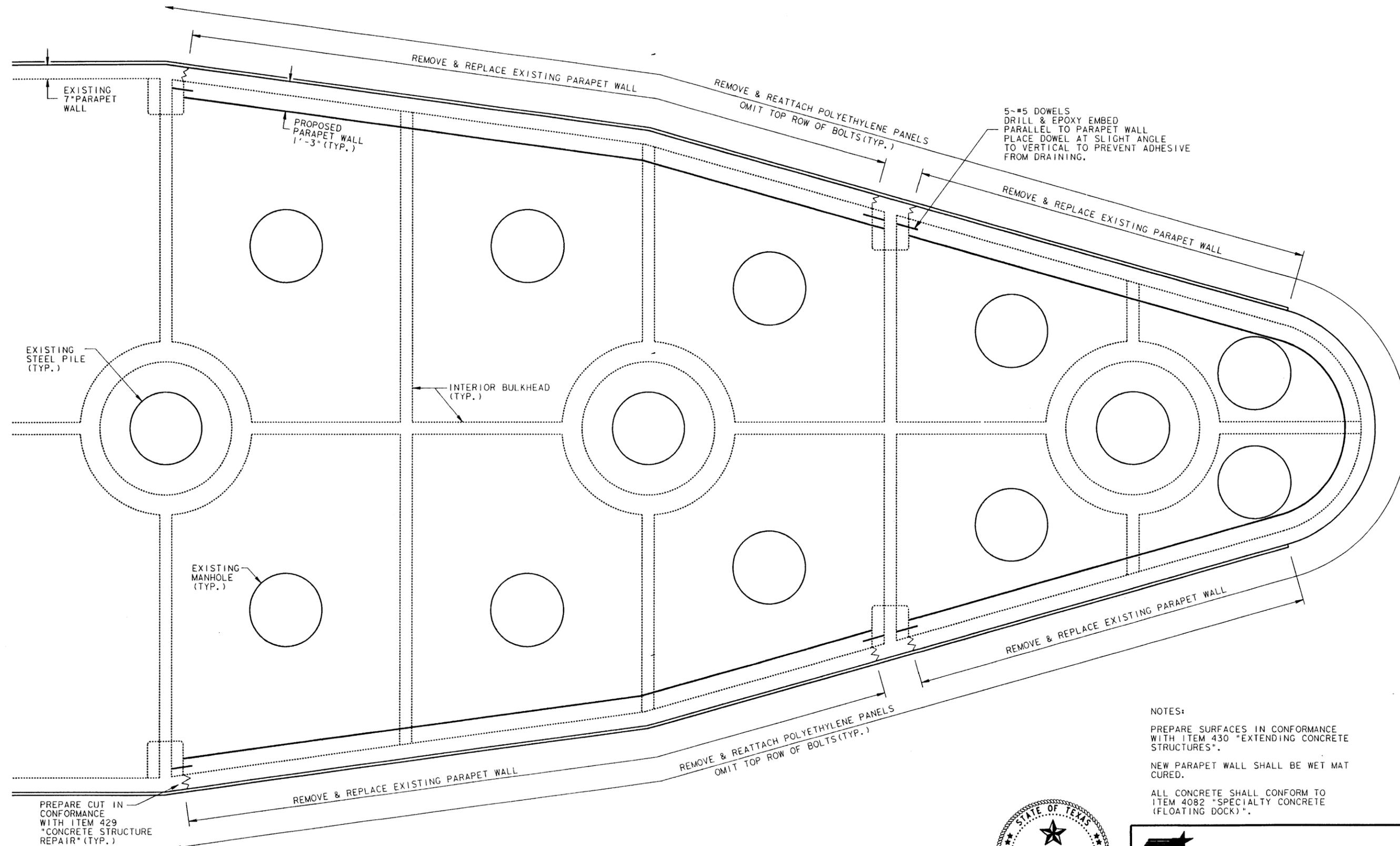
TEXAS DEPARTMENT OF TRANSPORTATION  
HOUSTON DISTRICT

**PROTECTIVE FENDER BAR AND RUB STRIP PANEL DETAILS**

S.H. 87 AT GALVESTON FERRY LANDING

DATE: JULY 1994	STATE: 12	FEDERAL REGION: 6	FEDERAL AID PROJECT: F8D 001(002)	SHEET: 16
DR: JPV	COUNTY: GALVESTON	CONTROL SECTION: 036706	JOB: D50	HIGHWAY: SH 87

Stamp: OFFICE OF THE ENGINEER, GALVESTON DISTRICT, TEXAS DEPARTMENT OF TRANSPORTATION, 8-15-94



STATE OF TEXAS  
 JOHN PAUL VOGEL  
 69415  
 REGISTERED PROFESSIONAL ENGINEER  
*John Paul Vogel*  
 4-4-96

NOTES:  
 PREPARE SURFACES IN CONFORMANCE WITH ITEM 430 "EXTENDING CONCRETE STRUCTURES".  
 NEW PARAPET WALL SHALL BE WET MAT CURED.  
 ALL CONCRETE SHALL CONFORM TO ITEM 4082 "SPECIALTY CONCRETE (FLOATING DOCK)".

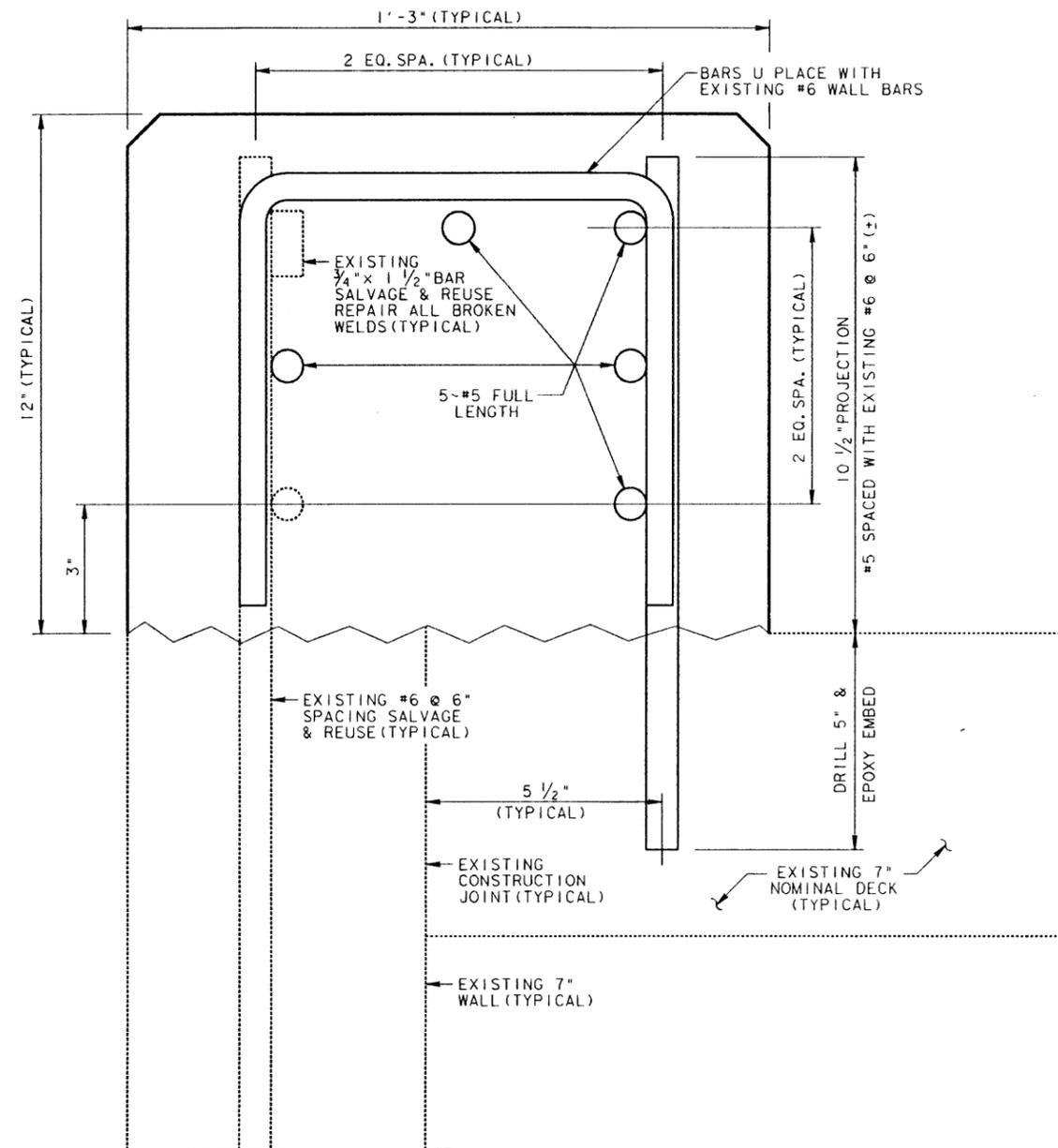
SHEET ADDED BY  
 CHANGE ORDER No. 12

**TEXAS DEPARTMENT OF TRANSPORTATION**  
**FLOATING MOORING DOCKS 1 & 2**  
**PARAPET WALL REPAIR**  
**SH 87 AT GALVESTON FERRY LANDING**

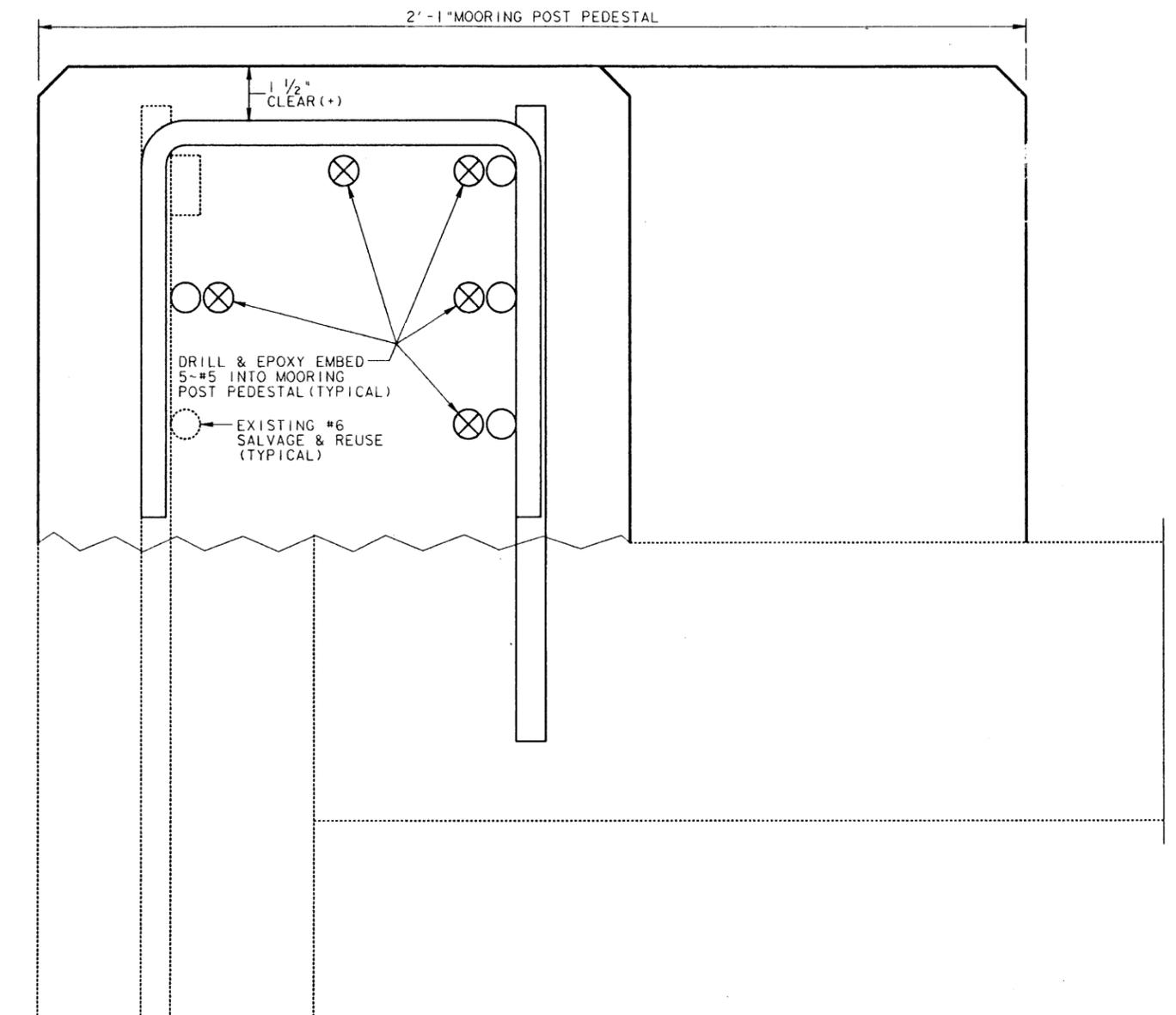
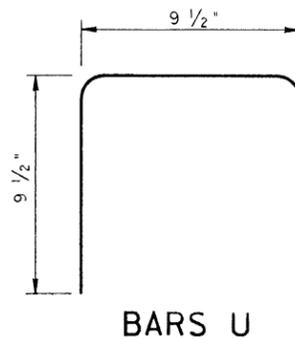
SHEET 1 OF 2 SHEETS

DW:	JPV	ORIGINAL DATE OF DRAWING:	APRIL 1996	FED. DIST. NO.:	6	STATE:	TEXAS	FEDERAL AID PROJECT NO.:	PBD 001 (002)	WIDENING NO.:	SH 87
CK DW:	BJJ	REVISIONS:		STATE DIST.:		COUNTY:		CONTROL NO.:		JOB NO.:	
CK DW:	JPV			TR:				SECTION NO.:		JOB NO.:	
CK TR:				HOUSTON:		GALVESTON:	0367	06	050	16A	

galvlp1an.dgn



TYPICAL SECTION



SECTION AT MOORING POST PEDESTAL

NOTES:  
 DAMAGED REBAR TO BE REPLACED BY BUTT WELDING IN ACCORDANCE WITH ITEM 448 "STRUCTURAL FIELD WELDING".

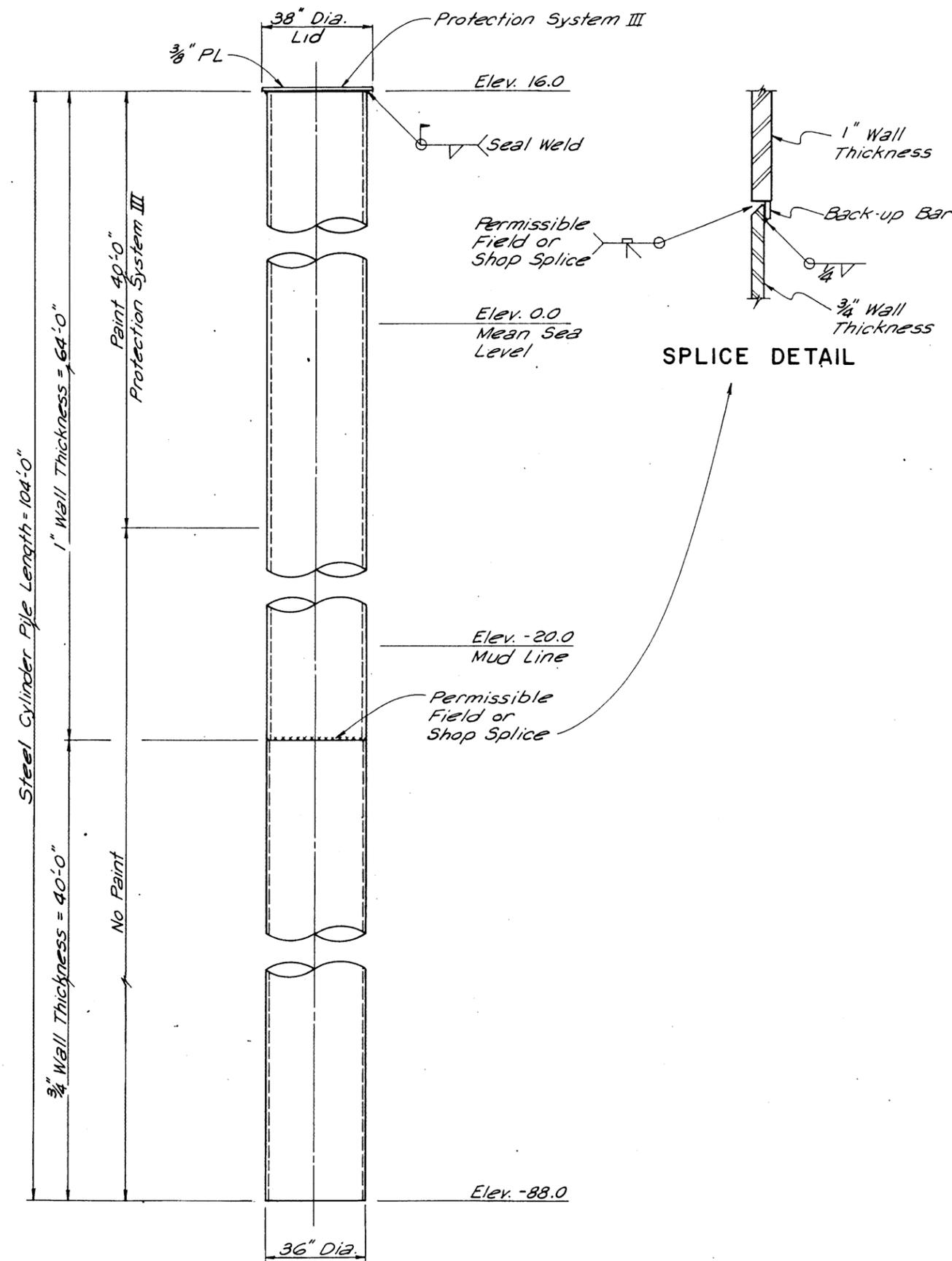


SHEET ADDED BY  
 CHANGE ORDER No. 12

**TEXAS DEPARTMENT OF TRANSPORTATION**  
**FLOATING MOORING DOCKS 1 & 2**  
**PARAPET WALL REPAIR**  
**SH 87 AT GALVESTON FERRY LANDING**

SH 87 AT GALVESTON FERRY LANDING SHEET 2 OF 2 SHEETS

DN:	ORIGINAL DATE OF DRAWING: APRIL 1996	STATE:	FEDERAL AID PROJECT NO.:
CK DN:	REVISIONS:	6 TEXAS	PBD 001 (002) SH 87
CK DW:	TR:	STATE DIST.:	COUNTY:
CK TR:		HOUSTON	GALVESTON 0367 06 050 16B



**ELEVATION**  
(35 Piles Required)

- Notes:
1. Str stl (HYC) may be substituted for str stl (HS) for the lid.
  2. The Contractor shall have the option of either having all three paints applied in the shop or having the prime coat applied in the shop and the other two paints applied in the field before driving piling. If the paint coats are damaged before driving or erection the coats shall be repaired in a manner acceptable to the Engineer.
  3. All cut edges must be ground to  $\frac{1}{8}$ " radius before painting
  4. Pile alignment shall be within a tolerance of three (3) inches from the horizontal position shown on the plans.

str stl (HS) quantity is for one pile.

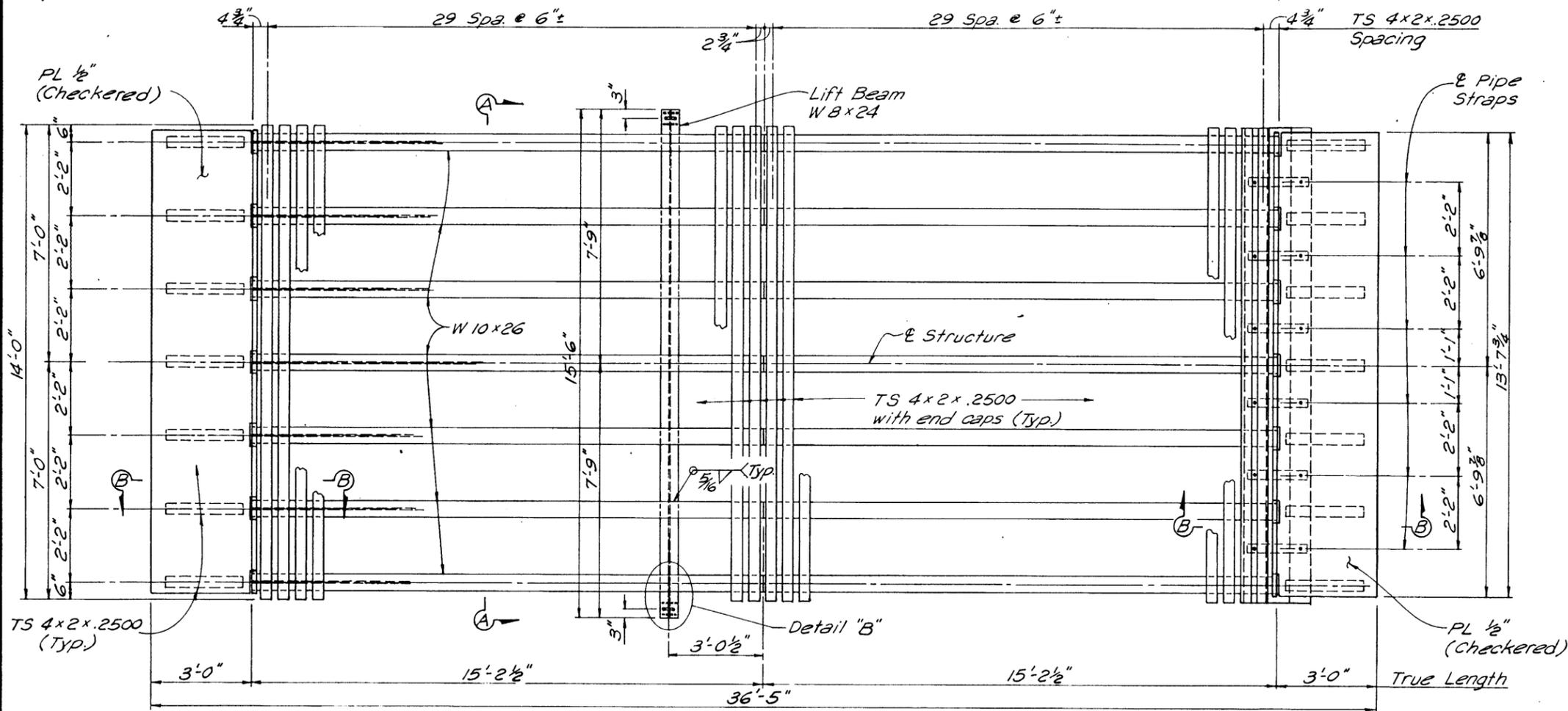
ESTIMATED QUANTITIES		
Item	Unit	Quantity
Str Stl (HS)	LB	35,371


**TEXAS DEPARTMENT OF TRANSPORTATION**  
 HOUSTON DISTRICT

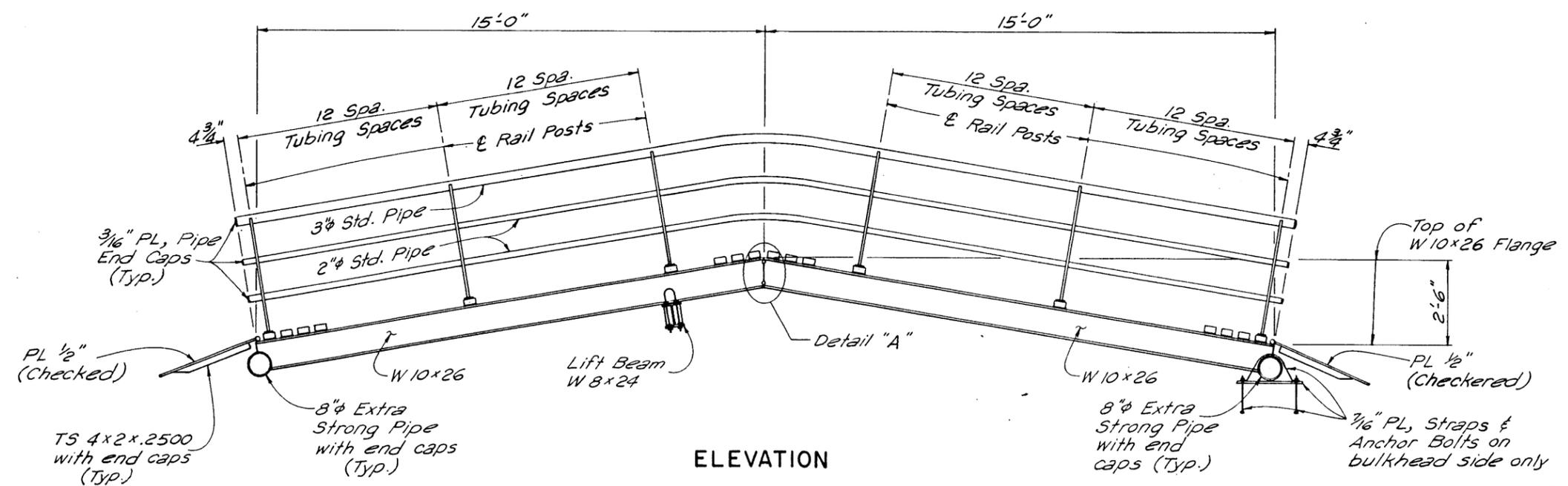
**STEEL CYLINDER PILE DETAILS**  
 S.H. 87 AT GALVESTON FERRY LANDING

ORIGINAL DRAWING DATE: JULY 1994	STATE DISTRICT: 12	FEDERAL REGION: 6	FEDERAL AID PROJECT: F&D 001 (002)	SHEET: 17
DR. JPV	COUNTY: GALVESTON			CONTROL SECTION: 036706050
DR. CJM	JOB: SH 87			HIGHWAY: SH 87
DR. JPV				

  
 8-26-94



DEVELOPED PLAN



ELEVATION

NOTES:

- Designed for HS 20 loading.
- Paint with protection system III.
- Paint top of deck with selba skid anti skid paint or approved equal.
- Lubricate pipe straps with grease before bolting gangplank to foundation.
- Estimated quantities are for one gangplank system and are for contractors information only.
- Wide flange parts shall be structural steel HS.
- Parts made from plate shall be structural steel HS or structural steel HYC.
- Bolts shall be ASTM A 307.
- Threaded rods shall be ASTM A 36.
- Nuts shall be ASTM A 573.

ESTIMATED QUANTITIES		
Item	Unit	Quantity
Stl Pipe (ASTM A 53)(Gr B)	LB	1378
Str Tubing (Gr B)	LB	7079
Checked Plate (Gr 36)	LB	1654
Str Stl (HS)	LB	3193
Str Stl (HYC)	LB	200

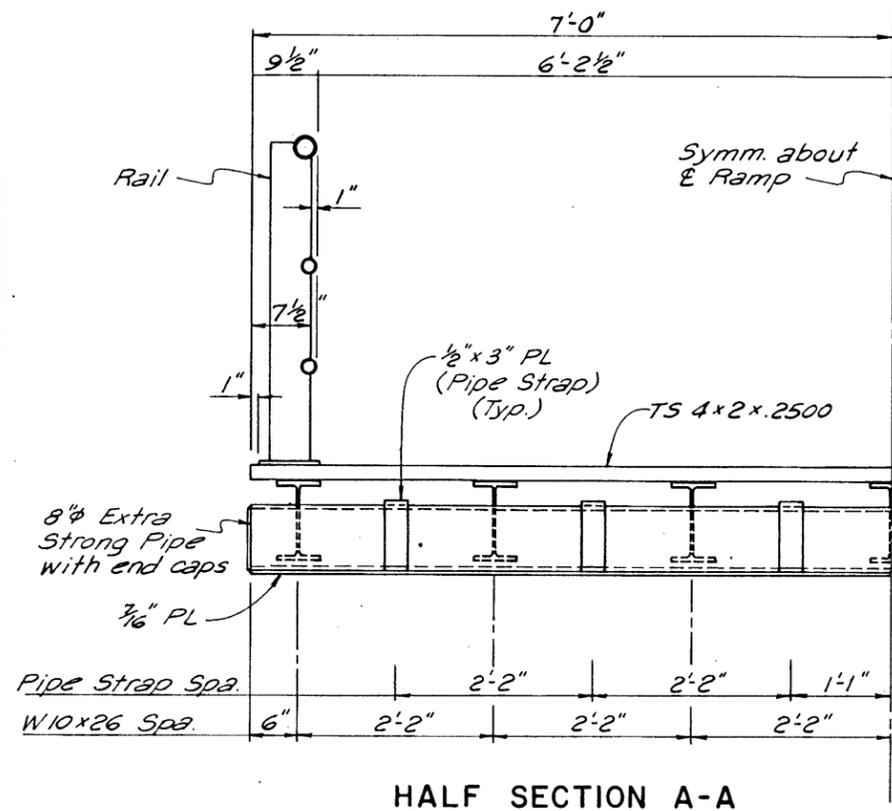

**TEXAS DEPARTMENT OF TRANSPORTATION**  
 HOUSTON DISTRICT

**GANGPLANK LAYOUT**  
 S.H. 87 AT GALVESTON FERRY LANDING

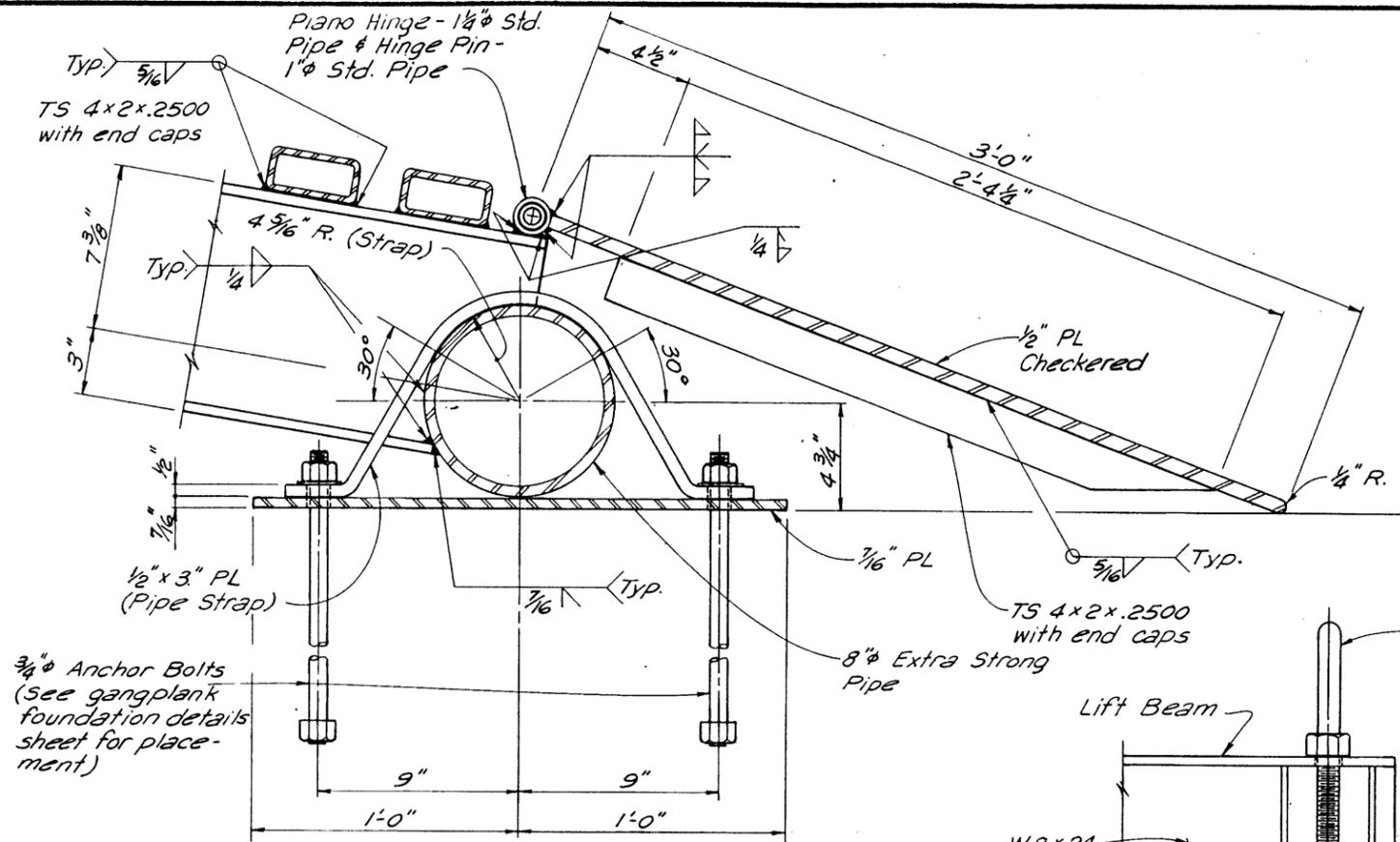
  
 John Paul Vogel  
 8-25-94

ORIGINAL DRAWING DATE: JULY 1994	STATE DISTRICT: 12	FEDERAL REGION: 6	FEDERAL AID PROJECT: FBD 001(002)	SHEET: 18
DR. 1: JPY	COUNTY: GALVESTON		CONTROL SECTION: 0361060505H 87	

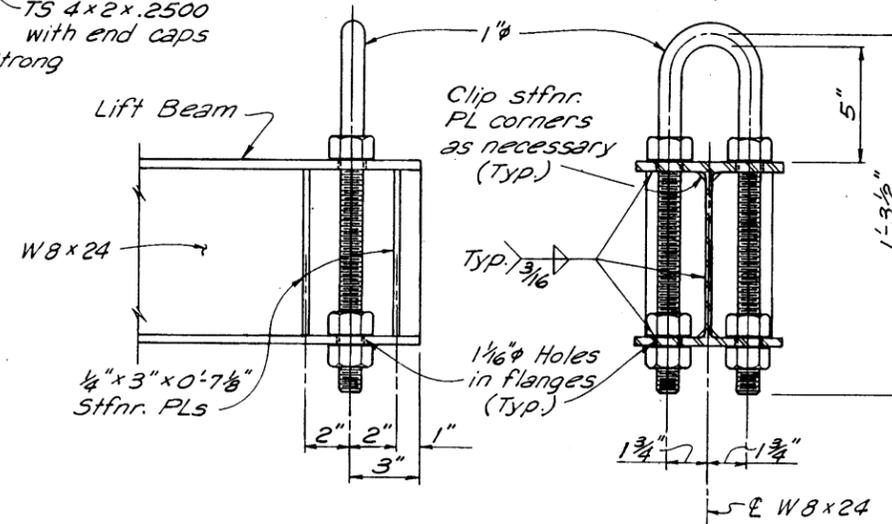
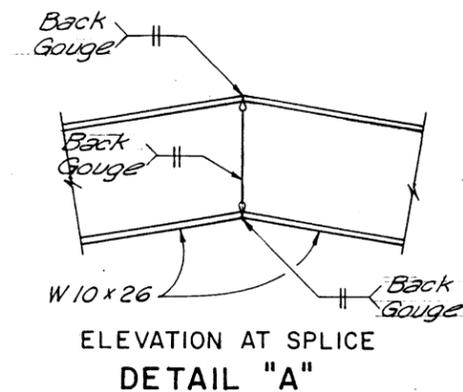
FILM DWT 134430



HALF SECTION A-A

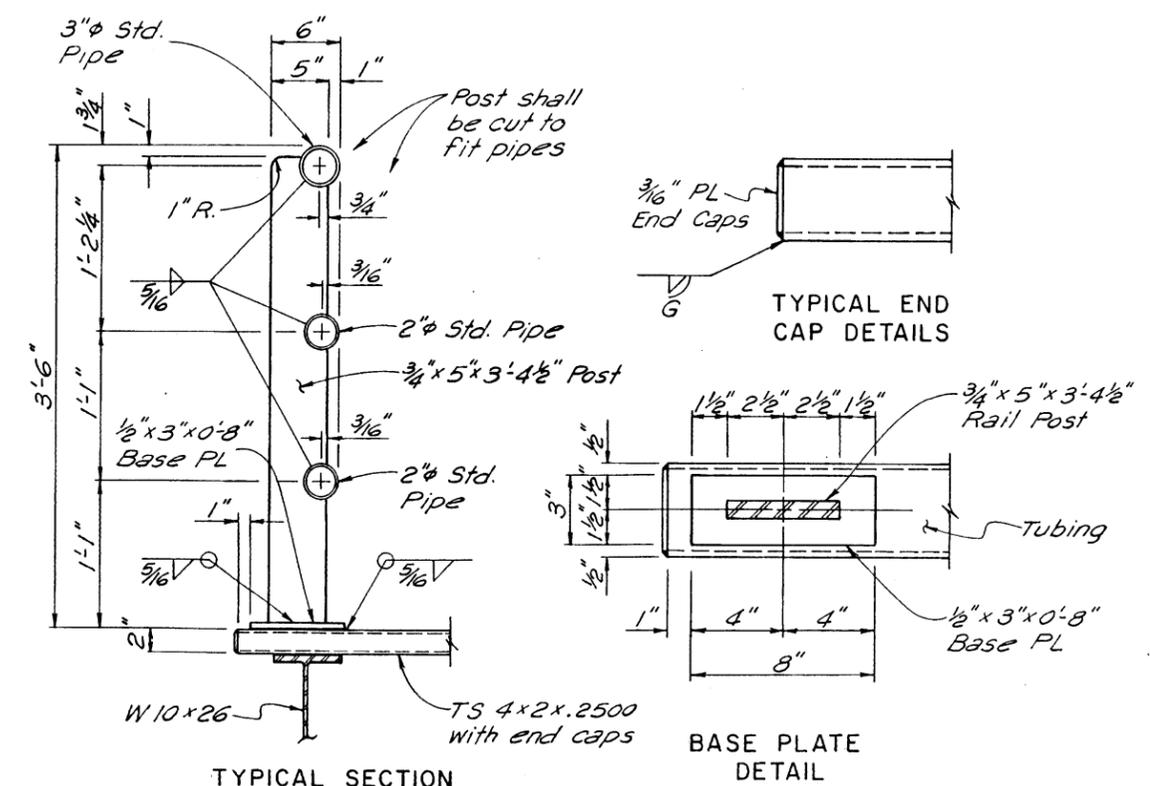


SECTION B-B



ELEVATION

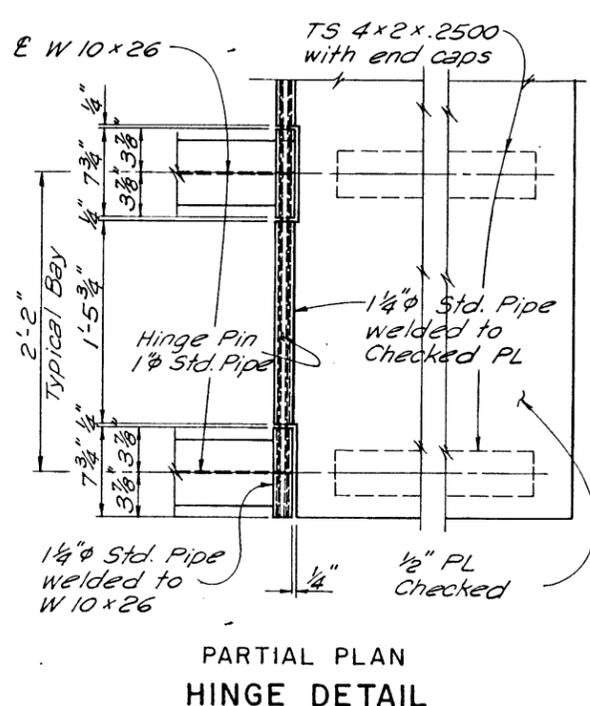
SECTION



TYPICAL SECTION

BASE PLATE DETAIL

RAIL DETAILS



PARTIAL PLAN HINGE DETAIL

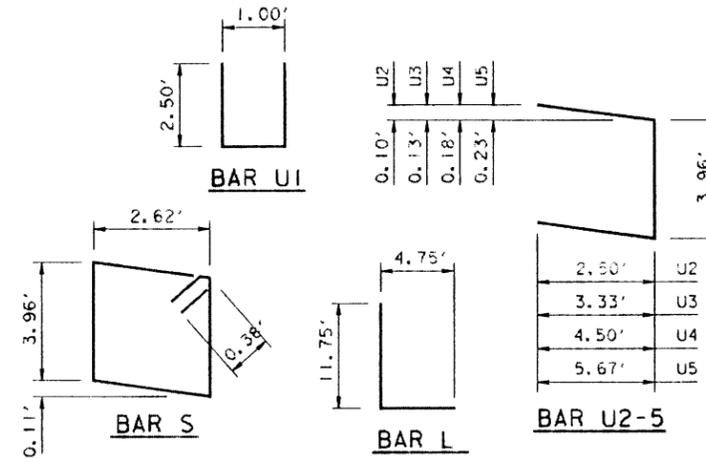


TEXAS DEPARTMENT OF TRANSPORTATION HOUSTON DISTRICT	
<b>GANGPLANK DETAILS</b> S.H. 87 AT GALVESTON FERRY LANDING	
ORIGINAL DRAWING DATE: JULY 1994 CR. 1 JPV CR. 2 CJM CR. 3 JPV	REVISIONS STATE DISTRICT: 12 FEDERAL REGION: 6 COUNTY: GALVESTON FEDERAL AID PROJECT: FBD 001(002) CONTROL SECTION: 036706 JOB HIGHWAY: 0505H 87 SHEET: 19



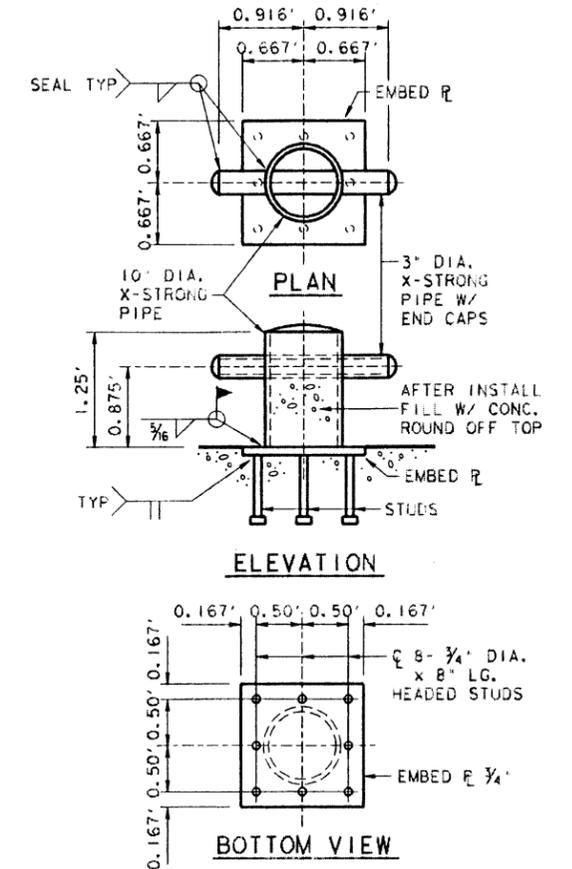
**NOTES:**

PAINT WITH PROTECTION SYSTEM III WITH A GREY APPEARANCE COAT.  
 ESTIMATED QUANTITIES ARE FOR ONE GANGPLANK SYSTEM AND ARE FOR CONTRACTORS INFORMATION ONLY.

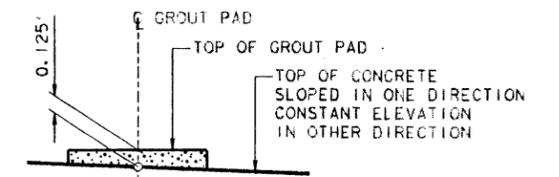


BILL OF REINFORCING STEEL				
BARS	NO.	SIZE	LENGTH / FT	WEIGHT
A	14	#10	31.66	1907
B1	4	#6	1.42	9
B2	4	#6	4.08	25
B3	4	#6	6.67	40
B4	4	#6	9.25	56
C	30	#7	19.00	1165
D	40	#7	16.00	1308
L	10	#6	16.50	248
S	33	#4	13.92	307
U1	25	#5	6.00	156
U2	20	#5	8.96	185
U3	10	#5	10.62	110
U4	10	#5	12.96	134
U5	10	#5	15.30	158
REINF. STEEL (LBS) CONTRACT. INFO. ONLY				5808

ESTIMATED QUANTITIES		
ITEM	UNIT	QUANTITY
<input checked="" type="checkbox"/> CLASS "C" CONC.	CY	46.6
<input checked="" type="checkbox"/> REINF. STEEL	LB	5808
<input checked="" type="checkbox"/> PEN. CONC. SURF. TREATMT.	SY	69.4
<input checked="" type="checkbox"/> STEEL PIPE ASTM A-53 GR.B	LB	174
<input checked="" type="checkbox"/> STRUCTURAL STEEL - HYC	LB	256
<input checked="" type="checkbox"/> FOR CONTRACTORS INFO ONLY, NO DIRECT PAYMENT		



**MOORING POST DETAIL**



**GROUT PAD DETAIL**



This seal appearing on this document was authorized by MICHAEL O. BRAUN P.E. 66521 on 8/28/94

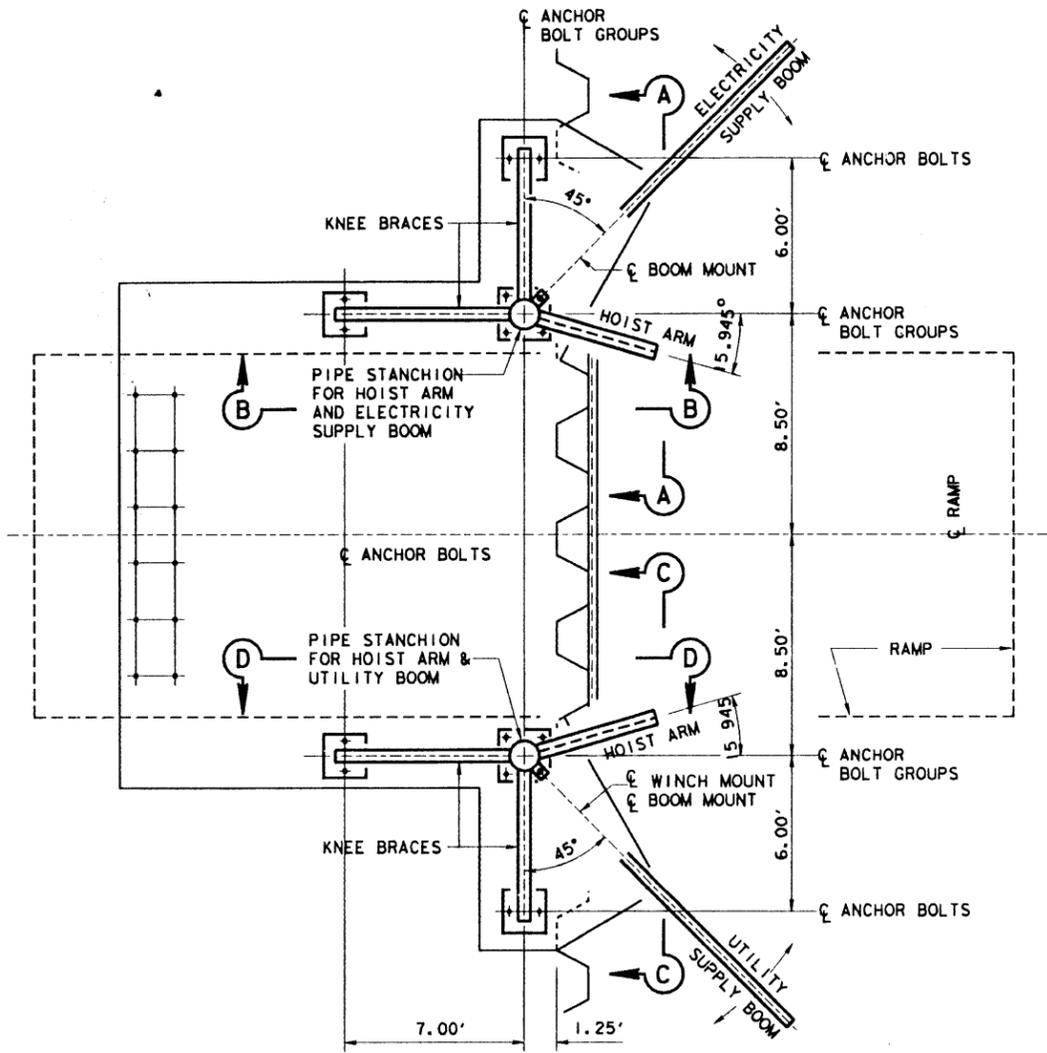
Michael O. Braun, P.E.

**TEXAS DEPARTMENT OF TRANSPORTATION**  
**GANGPLANK FOUNDATION DETAILS**  
 S.H. 87 AT GALVESTON FERRY LANDING

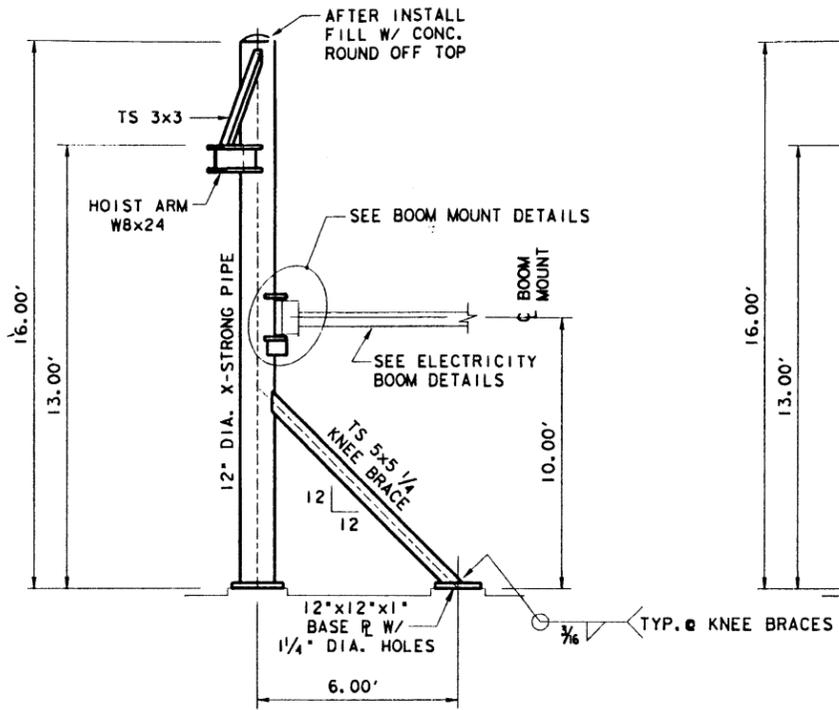
SHEET 2 OF 2 SHEETS

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CK DN# D.BELL					
CK DN# 0					
TR#					
CK TR#					

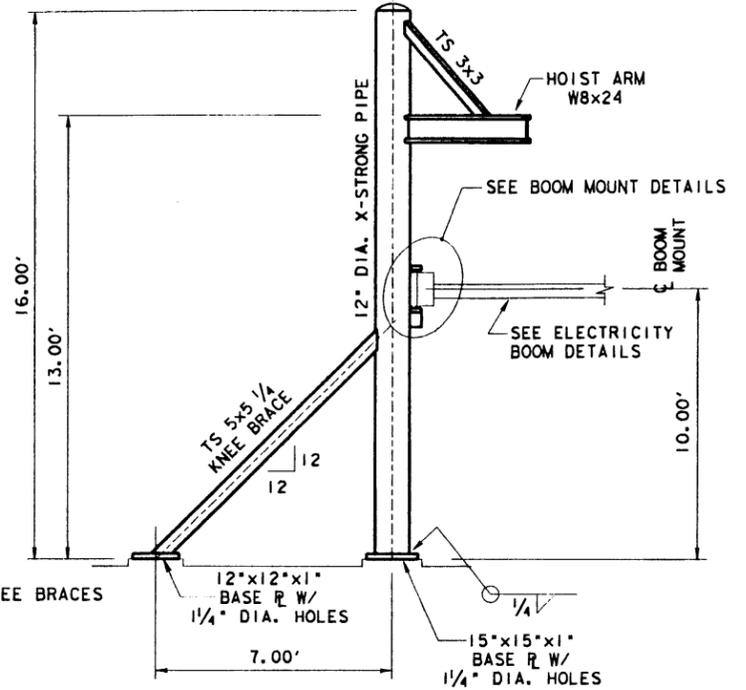
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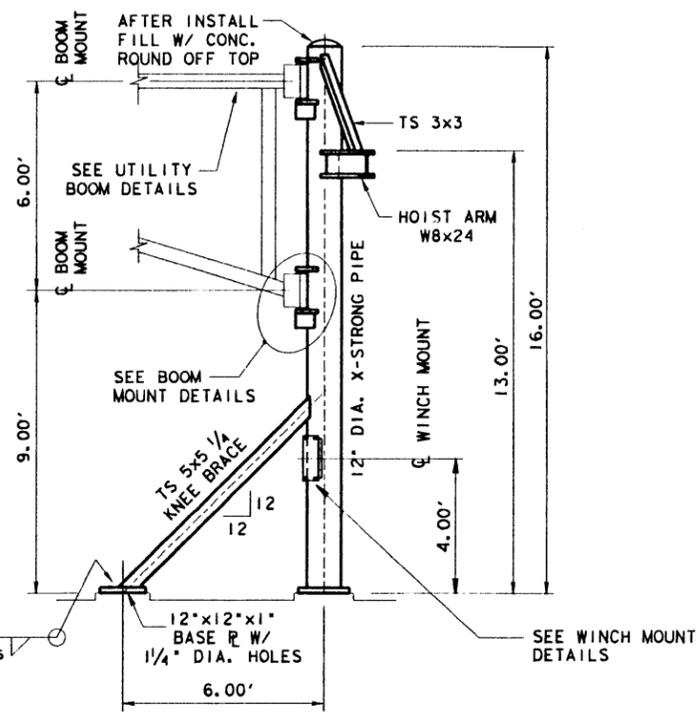
**RAMP HOIST KEY PLAN**



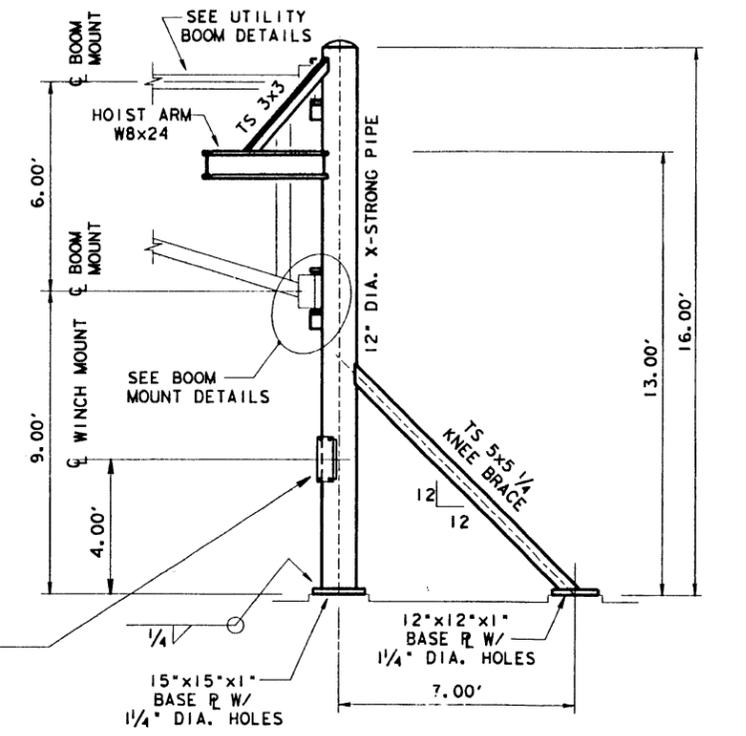
**ELEVATION "A-A"**



**ELEVATION "B-B"**



**ELEVATION "C-C"**



**ELEVATION "D-D"**



This seal appearing on this document was authorized by MICHAEL O. BRAUN P.E. 66521 on 9/23/94  
*Michael O. Braun P.E.*

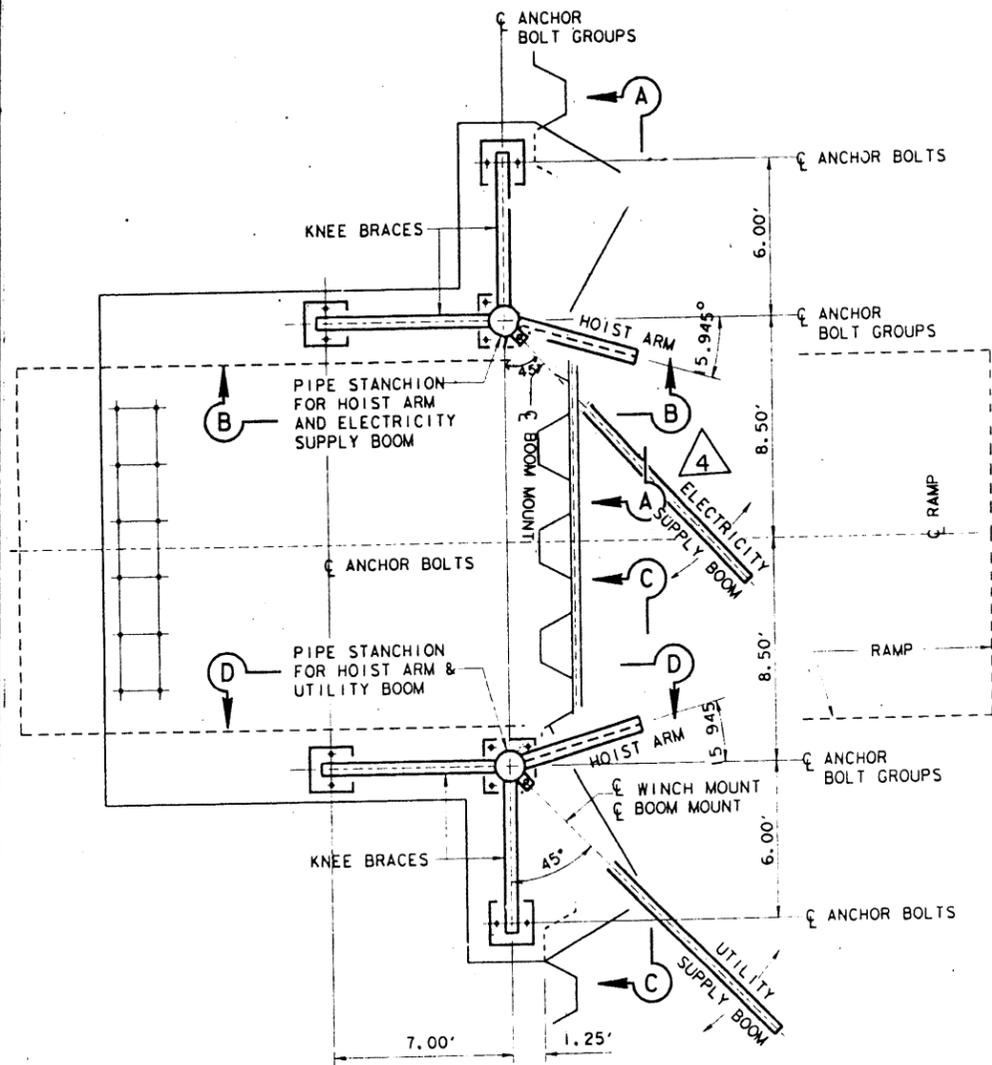
**TEXAS DEPARTMENT OF TRANSPORTATION**  
**GANGLANK STANCHION DETAILS**  
**S.H. 87 AT GALVESTON FERRY LANDING**

STATE OF TEXAS  
 MICHAEL O. BRAUN  
 66521  
 REGISTERED PROFESSIONAL ENGINEER

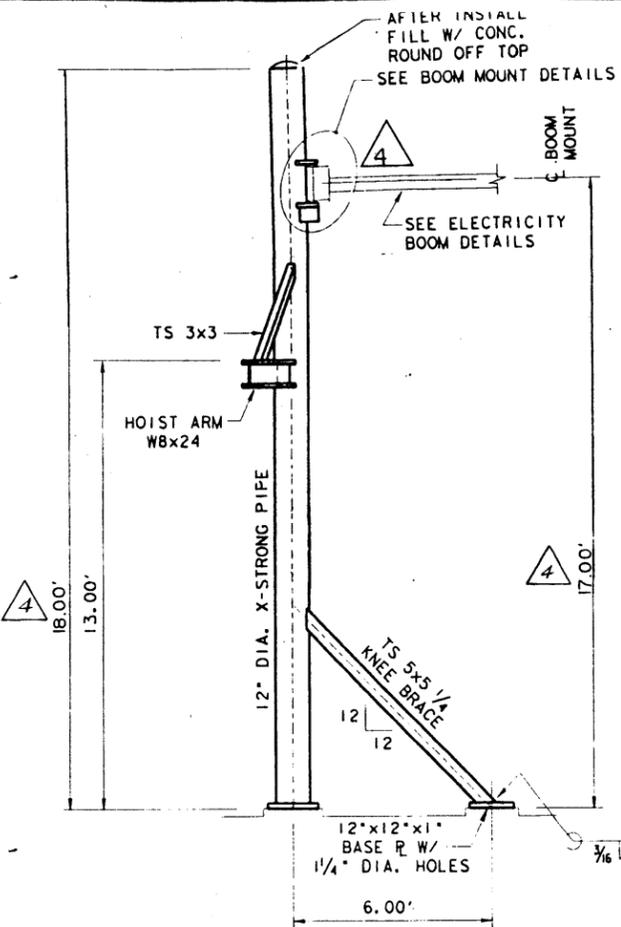
This seal appearing on this document was authorized by MICHAEL O. BRAUN P.E. 66521 on 9/23/94  
*Michael O. Braun P.E.*

DW: MOB	ORIGINAL DATE OF DRAWING: JULY, 1994	STATE: TEXAS	FEDERAL AID PROJECT NO.: FBD 001 (002)	SHEET NO.: 22
CK: DNI: O	REVISIONS:	DIST. NO.: 12	COUNTY: GALVESTON	SECTION NO.: D36706
DW: D. BELL				
CK: DNI: O				
TR:				
CK TR:				

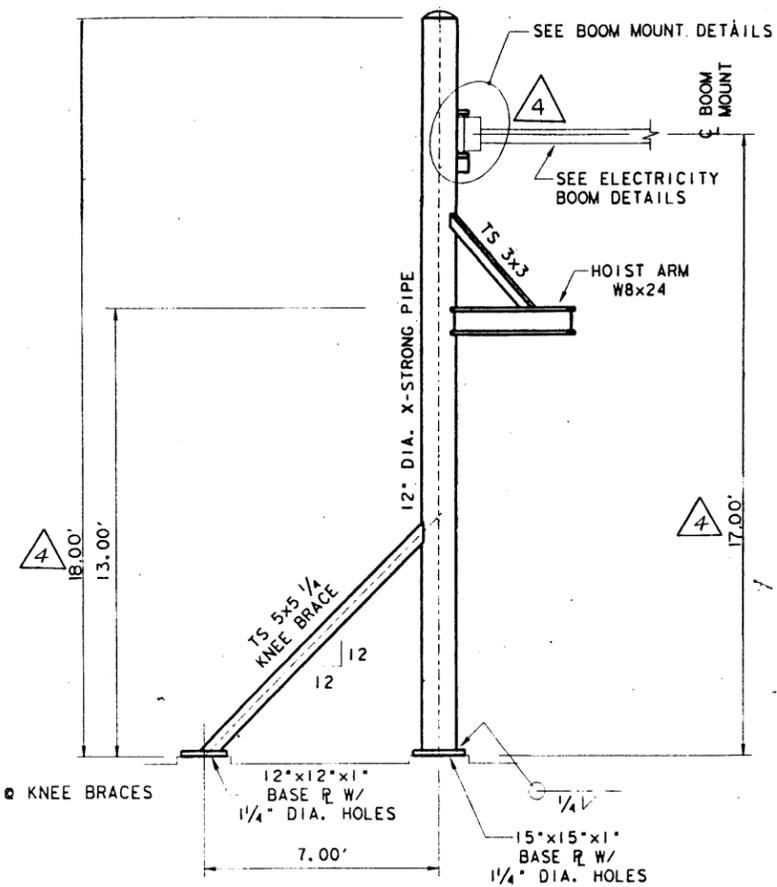
SHEET 1 OF 3 SHEETS



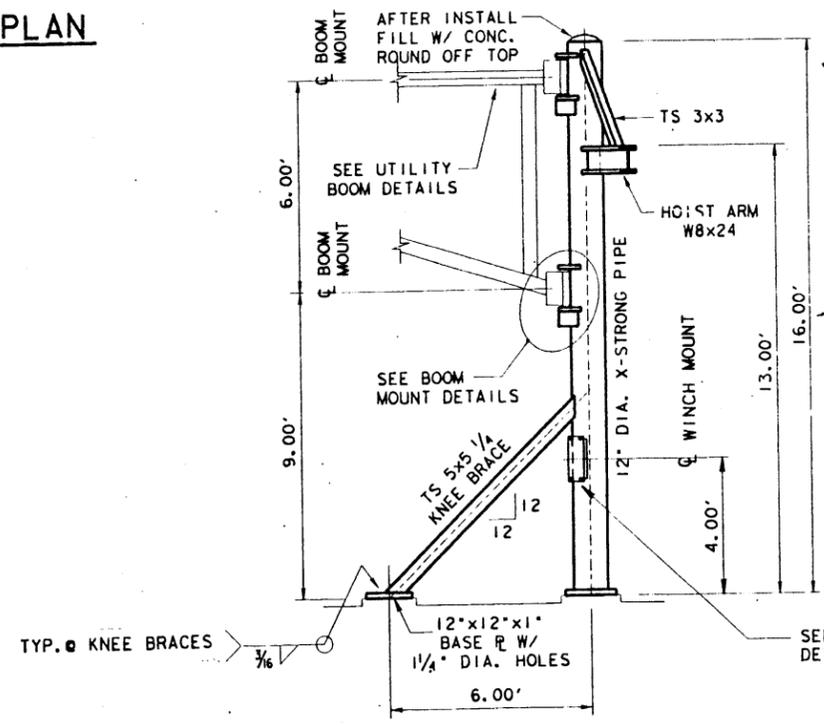
**RAMP HOIST KEY PLAN**



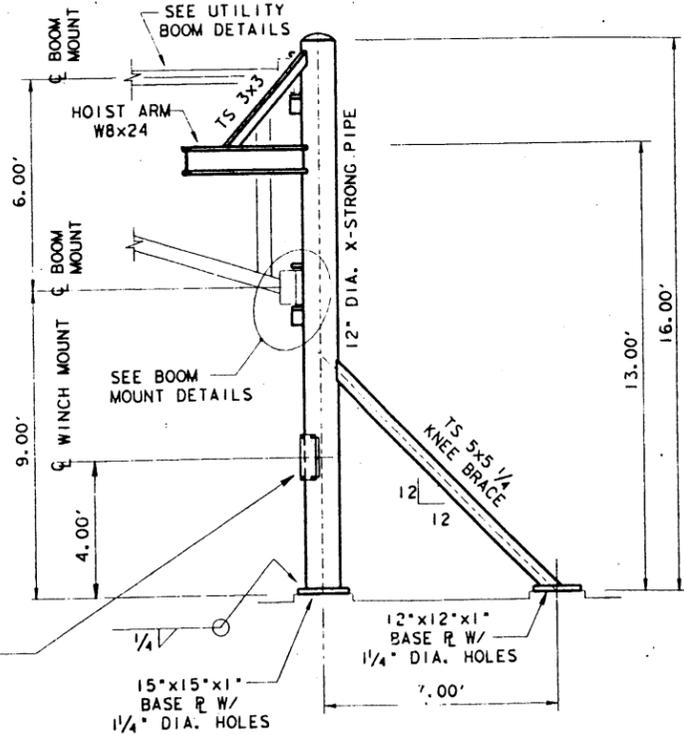
**ELEVATION "A-A"**



**ELEVATION "B-B"**



**ELEVATION "C-C"**



**ELEVATION "D-D"**



*John R. Pinkston*  
7/18/95

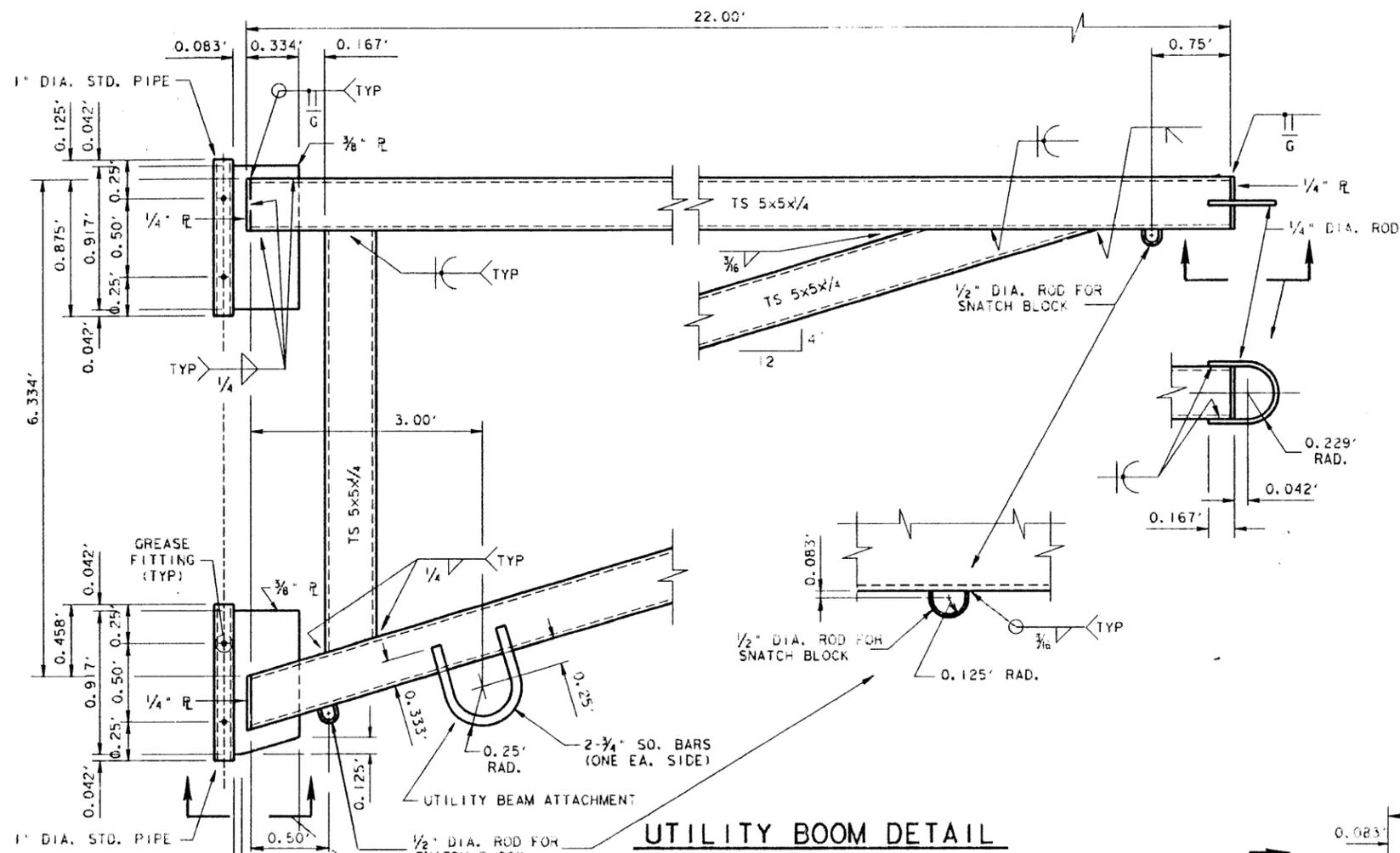
4 SHEET REVISED BY CHANGE ORDER NO. 4

**TEXAS DEPARTMENT OF TRANSPORTATION**  
**GANGPLANK STANCHION DETAILS**  
**S.H. 87 AT GALVESTON FERRY LANDING**

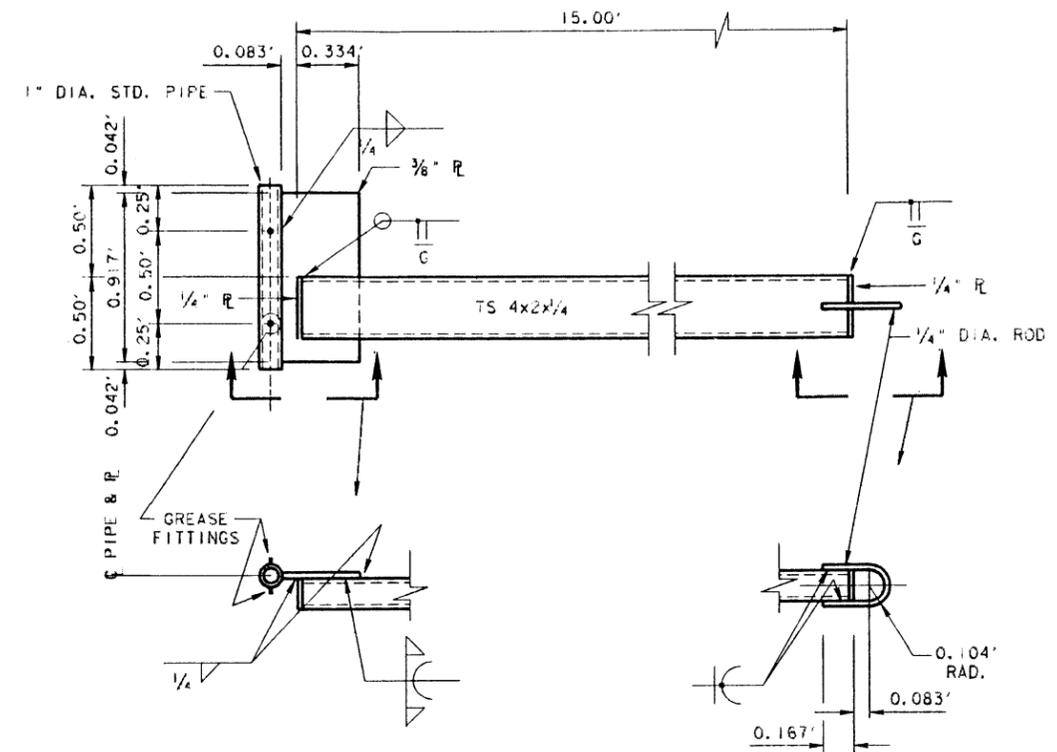
SHEET 1 OF 3 SHEETS

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CK: DW: O	REVISIONS:	6	TEXAS	FBD 001 (002)	SH 87
TR:					
CK TR:		12	GALVESTON	036706	050 22A

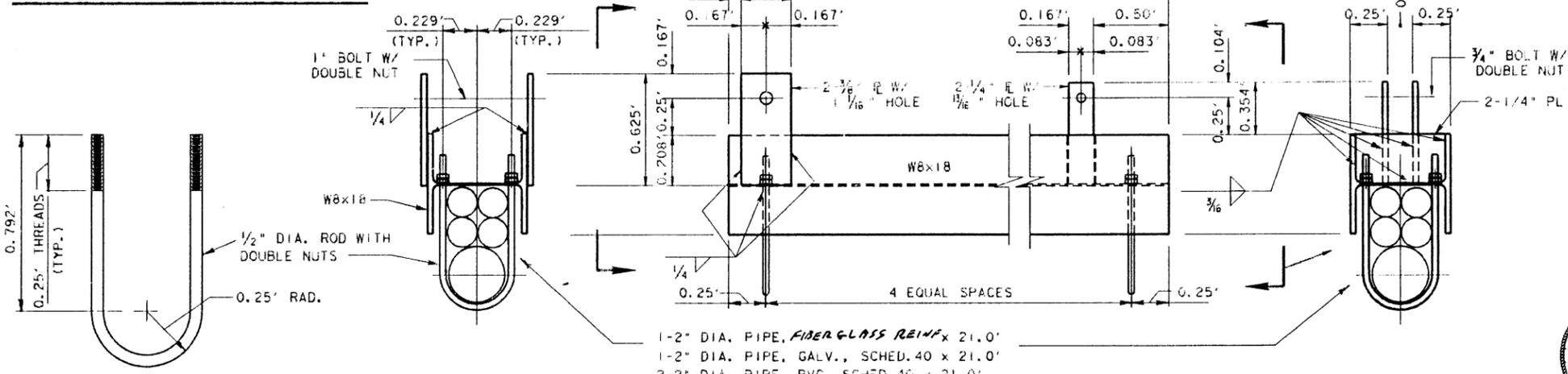
FILM DWT 134435 PAPER DWT 134435



**UTILITY BOOM DETAIL**



**ELECTRICAL BOOM DETAIL**



**UTILITY BEAM DETAIL**

- 1-2" DIA. PIPE, FIBER GLASS REINF x 21.0'
- 1-2" DIA. PIPE, GALV., SCHED. 40 x 21.0'
- 2-2" DIA. PIPE, PVC, SCHED. 40 x 21.0'
- 1-4" DIA. PIPE, PVC, SCHED. 80 x 21.0'

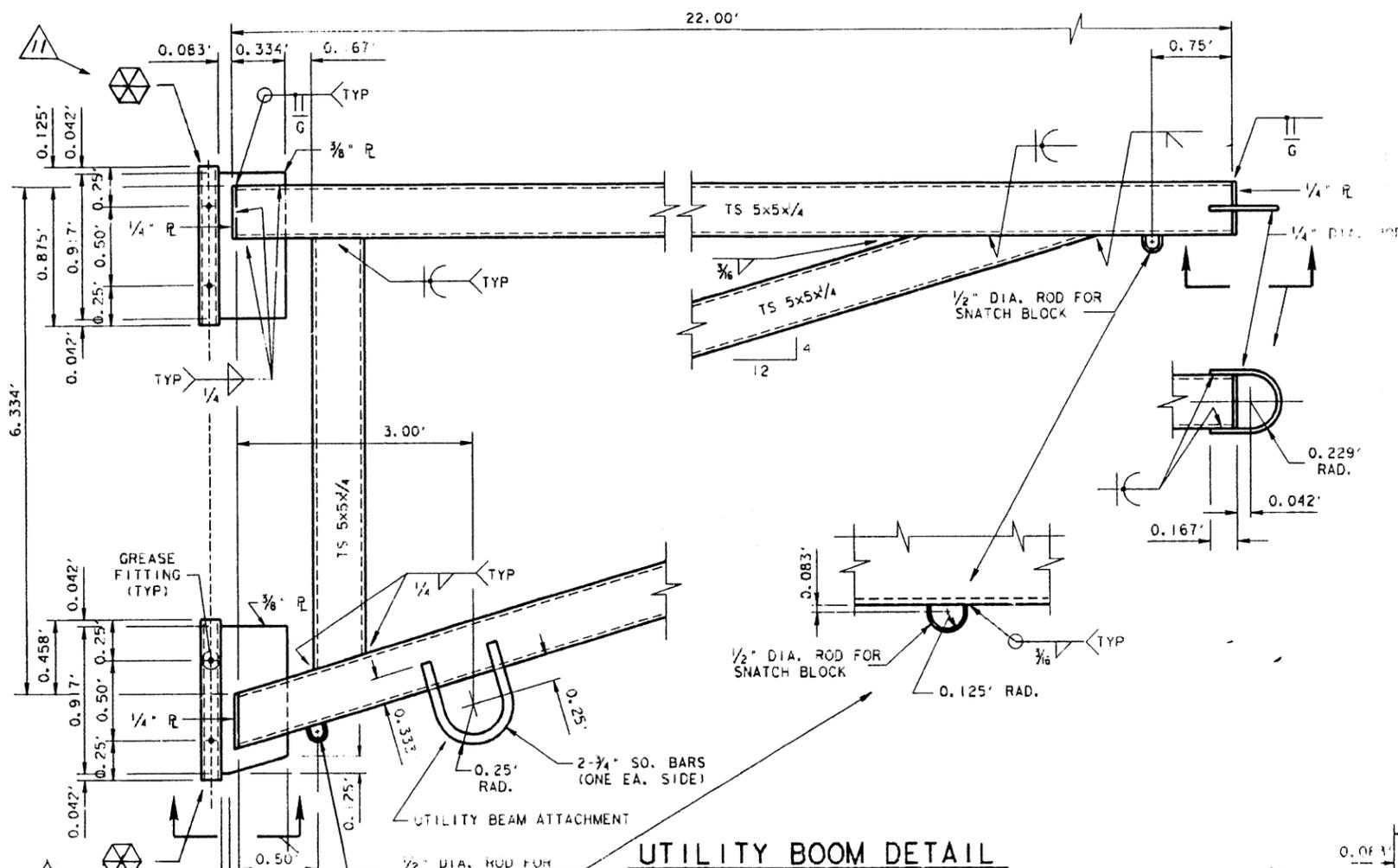


Revised  
9-26-94  
Michael O. Braun, P.E.

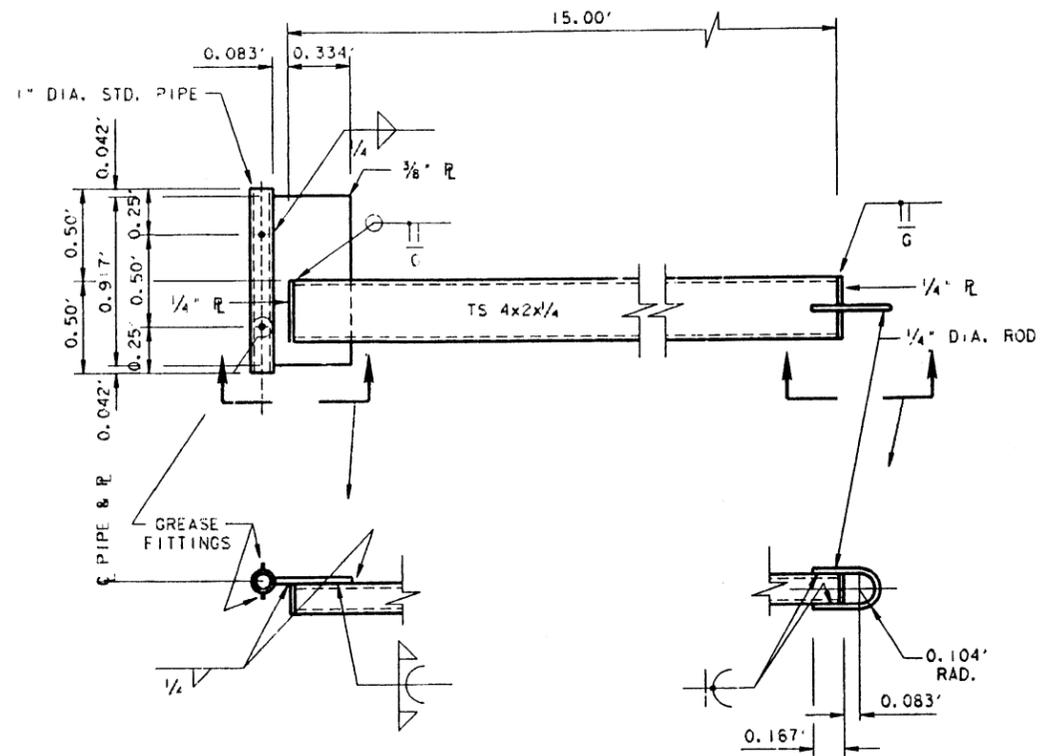
**TEXAS DEPARTMENT OF TRANSPORTATION**  
**GANGPLANK STANCHION DETAILS**  
 S. H. 87 AT GALVESTON FERRY LANDING

SHEET 2 OF 3 SHEETS

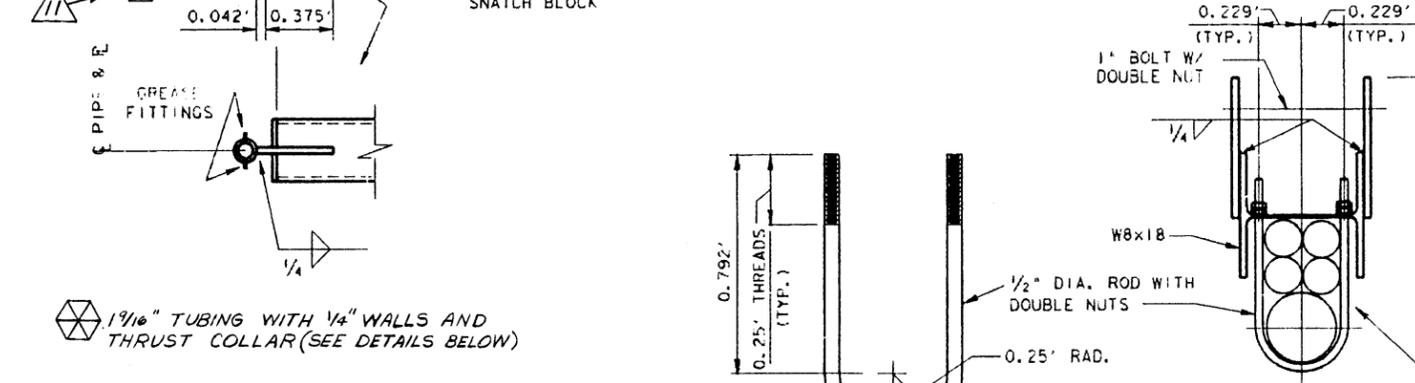
DIST. NO.	MOB.	ORIGINAL DATE OF DRAWING	JULY, 1994	NO. 6	STATE	TEXAS	FEDERAL AID PROJECT NO.	EBD 001 (002)	STATION NO.	SH 87
CK. DW. O.	D. BELL	REVISIONS:								
TR.				12	GALVESTON	0367	06	050		23



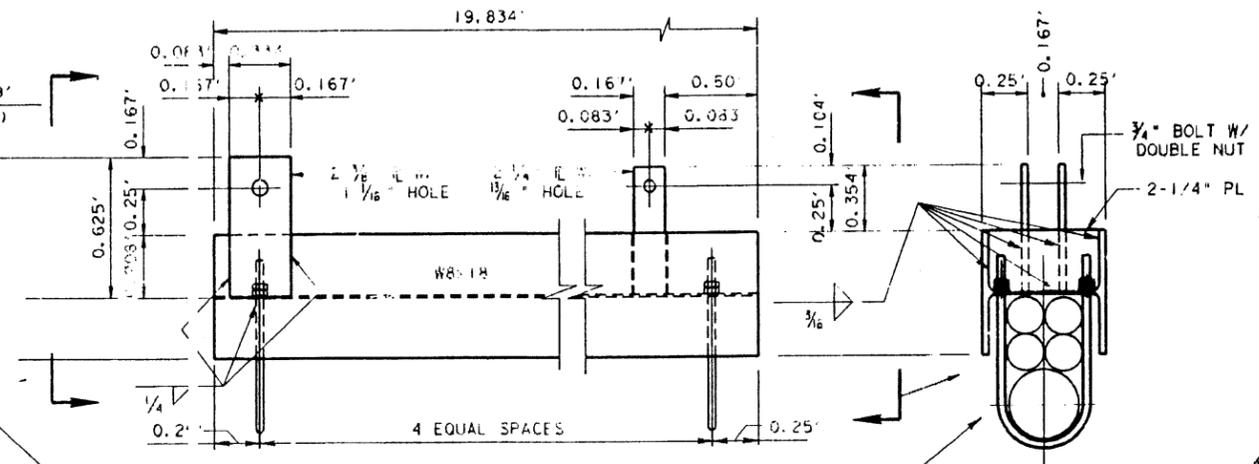
**UTILITY BOOM DETAIL**



**ELECTRICAL BOOM DETAIL**



**TUBING DETAIL**



**UTILITY BEAM DETAIL**

- 1-2" D A. PIPE, FIBERGLASS REINF. x 21.0'
- 1-2" D A. PIPE, GALV., SCHED. 40 x 21.0'
- 2-2" D A. PIPE, PVC, SCHED. 40 x 21.0'
- 1-4" D A. PIPE, PVC, SCHED. 80 x 21.0'



Revised  
9-26-94

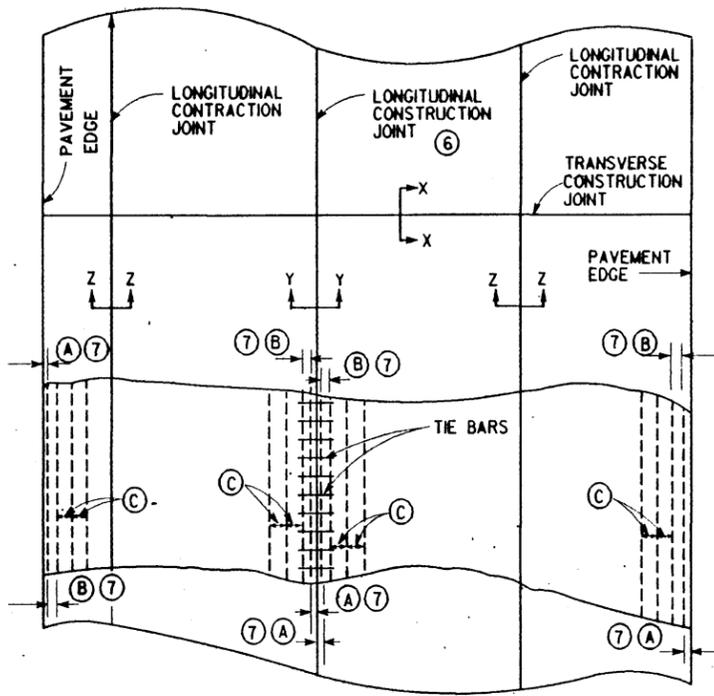
Michael O. Blaur, P.E.

**SHEET REVISED BY  
CHANGE ORDER NO. 11**

**TEXAS DEPARTMENT OF TRANSPORTATION  
GANGLANK  
STANCHION DETAILS  
S. H. 87 AT GALVESTON FERRY LANDING**

DN: MOB	ORIGINAL DATE OF DRAWING	STATE	FEDERAL AID PROJECT NO.	SHEET NO.
CK DN: O	REVISED: JULY, 1994	6 TEXAS	FBD 001 (002)	SH 87
CK DN: O	REVISIONS:	STATE DIST. NO.	COUNTY	CONTRACT NO.
TR:		12	GALVESTON	0367 06 050
CK TR:				23A

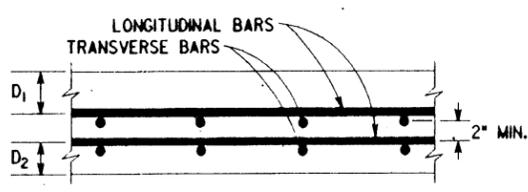




TWO LANE PAVEMENT PLAN  
(38' PLACEMENT OR 16' & 22' PLACEMENT)

OPTIONAL STEEL PLACEMENT

SPACING C (IN.)	NUMBER OF BARS REQUIRED FOR VARIOUS TYPICAL PLACEMENT WIDTHS (FT.)						
	12'	16'	22'	24'	27'	34'	38'
6"	24	32	44	48	54	68	76
6.5"	23	30	41	45	50	63	70
7"	21	27	37	41	46	58	65
8"	18	24	33	36	41	51	57
8.5"	17	23	31	34	38	48	54
9"	16	22	30	32	36	46	51
9.5"	16	21	28	31	34	43	48

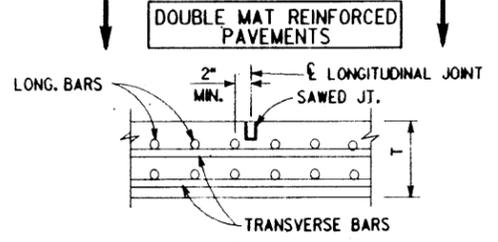
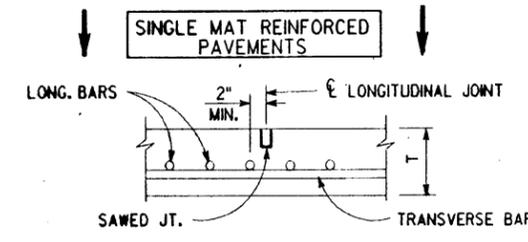


SLAB THK. "I" (IN.)	LONG. REINFORCING		TRANSVERSE REINFORCING				
	BAR SIZE	SPACING C (IN.)	BAR SIZE	MAXIMUM ALLOWABLE PAVEMENT WIDTH (W) (FT.) FOR GIVEN TRANSVERSE STEEL SPACING (B <sub>S</sub> ) (FT.)		B <sub>S</sub> W (FT. <sup>2</sup> )	
SINGLE MAT REINFORCING	8"	9"	*5	186'	93'	62'	186.0
			*6	264'	132'	88'	264.0
	9"	9.5"	*5	165'	82'	55'	165.3
			*6	234'	117'	78'	234.7
	10"	8.5"	*5	148'	74'	49'	148.8
			*6	211'	105'	70'	211.2
12"	6"	*5	124'	62'	41'	124.0	
		*6	176'	88'	58'	176.0	
DOUBLE MAT REINFORCING	11"	7"	*5	270'	135'	90'	270.6
			*6	384'	192'	128'	384.0
	12"	9"	*5	248'	124'	82'	248.0
			*6	352'	176'	117'	352.0
	13"	8"	*5	229'	114'	76'	229.0
			*6	324'	162'	108'	325.0
14"	7"	*5	212'	106'	70'	212.6	
		*6	300'	150'	100'	301.8	
15"	6.5"	*5	198'	99'	66'	198.4	
		*6	280'	140'	93'	281.6	

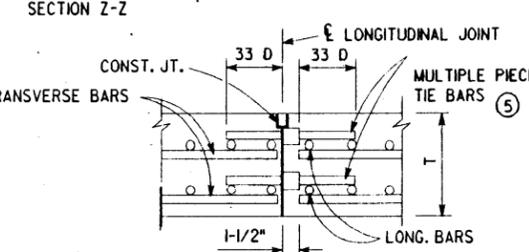
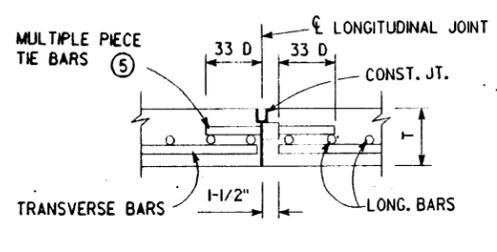
LENGTH	D <sub>1</sub>	D <sub>2</sub>
11"	4 3/4"	3"
12"	5"	4"
13"	5 1/2"	4"
14"	6"	4"
15"	6"	5"

MULTIPLE PIECE TIE BAR - PULL TEST LOAD	
*5	11,160 LBS.
*6	15,840 LBS.

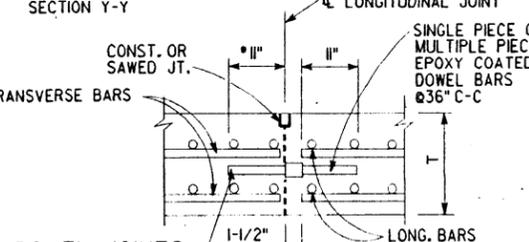
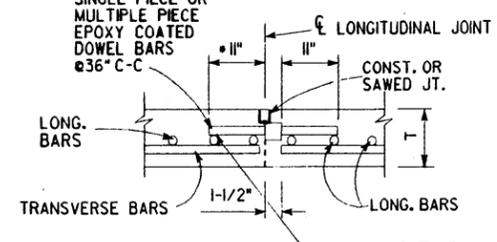
- GENERAL NOTES
- NO EXPANSION JOINTS WILL BE USED EXCEPT AT STRUCTURE ENDS OR FIXED OBJECTS AS SHOWN ELSEWHERE IN THE PLANS.
  - DETAILS AS TO PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS SLOPE SHALL BE AS SHOWN ELSEWHERE IN THE PLANS. GENERALLY, PAVEMENT THICKNESS FOR CONNECTIONS AND RAMP SHALL BE THE SAME AS THE FREEWAY, EXCEPT THAT A TRANSITION IN THICKNESS SHALL BE MADE TO MEET THE FRONTAGE STREET AS DIRECTED BY THE ENGINEER. REINFORCING STEEL THRU THE TRANSITION IN THICKNESS SHALL BE THE SAME AS IN THE THICKER SLAB.
  - WITH THE APPROVAL OF THE ENGINEER, THE CONTRACTOR MAY PLACE THE LONGITUDINAL CONSTRUCTION JOINT AT ANY OF THE LANE LINES TO GIVE A WIDER (MAXIMUM 3 LANES) OR DIFFERENT PLACEMENT. SAWED JOINTS SHALL BE USED AT ALL INTERMEDIATE LANE LINES. IN WIDENED AREAS SAWED JOINTS SHALL BE PLACED AS DIRECTED BY THE ENGINEER. LONGITUDINAL CONSTRUCTION AND/OR SAWED JOINTS SHALL NOT BE MORE THAN 17 FEET APART ON FREEWAY PAVEMENT AND FRONTAGE STREET PAVEMENT AS MEASURED TRANSVERSELY UNLESS DIRECTED BY THE ENGINEER.
  - LONGITUDINAL JOINTS SHALL BE SAWED AS SOON AS SAWING CAN BE ACCOMPLISHED WITHOUT DAMAGE TO THE PAVEMENT AND BEFORE 24 HOURS AFTER THE CONCRETE HAS BEEN PLACED. THE EXACT TIME TO BE APPROVED BY THE ENGINEER.
  - WITHIN ANY AREA BOUNDED BY TWO FEET OF PAVEMENT LENGTH MEASURED PARALLEL TO THE CENTERLINE AND TWELVE FEET OF PAVEMENT WIDTH MEASURED PERPENDICULAR TO THE PAVEMENT CENTERLINE, NOT OVER 33% OF THE REGULAR LONGITUDINAL STEEL SHALL BE SPLICED.
  - THE LONGITUDINAL BARS IN SINGLE MAT PLACEMENT SHALL BE PLACED AT THE VERTICAL SLAB CENTER WITH A TOLERANCE OF 1/2 INCH. TRANSVERSE STEEL SHALL BE PLACED DIRECTLY ABOVE OR BELOW THE LONGITUDINAL STEEL. LONGITUDINAL AND TRANSVERSE STEEL SPACING SHALL NOT VARY MORE THAN ONE TWELFTH OF THE SPACING SHOWN HEREON.
  - THE LONGITUDINAL BARS IN DOUBLE MAT PLACEMENT SHALL BE PLACED WITH A TOLERANCE OF 1/2 INCH.
  - SPLICES SHALL BE A MINIMUM OF 33 TIMES THE NOMINAL STEEL DIAMETER ("D").
  - THE CHAIRS USED TO SUPPORT THE BAR MAT SHALL BE OF SUFFICIENT STRUCTURAL QUALITY AND NUMBER TO HOLD THE MAT WITHIN THE PLACEMENT HEIGHT TOLERANCES, AND SHALL BE OF A TYPE APPROVED BY THE ENGINEER. GALVANIZING OF CHAIRS WILL NOT BE REQUIRED. CHAIR SPACING SHALL NOT EXCEED 30" IN THE TRANSVERSE AND 48" IN THE LONGITUDINAL DIRECTION. PLACEMENT MAY BE STAGGERED SO THAT CHAIRS IN ALTERNATE ROWS ARE CENTERED BETWEEN THE CHAIRS IN ADJACENT ROWS WHEN MACHINE PLACING OF STEEL REINFORCEMENT IS USED. BAR CHAIRS WILL NOT BE REQUIRED, AND THE TRANSVERSE STEEL MAY BE PLACED EITHER ABOVE OR BELOW THE LONGITUDINAL STEEL. VIBRATION OF THE STEEL INTO POSITION SHALL NOT BE PERMITTED. WHEN THE "DOUBLE STRIKE-OFF" PROCEDURE IS USED FOR DOUBLE MAT REINFORCING, CHAIRS WILL NOT BE REQUIRED.
  - AT TRANSVERSE CONSTRUCTION JOINTS THE REGULAR LONGITUDINAL STEEL SHALL EXTEND A MINIMUM OF FOUR FEET ON EITHER SIDE OF THE JOINT, EXCEPT AS SHOWN ON SHEET 1 OF 2.
  - VIBRATION OF CONCRETE WITH HAND-MANIPULATED MECHANICAL VIBRATORS WILL BE REQUIRED ADJACENT TO ALL TRANSVERSE CONSTRUCTION JOINTS.
  - IF WIDTHS OCCUR, OTHER THAN THE TYPICAL WIDTHS SHOWN, INDIVIDUAL BARS OF THE SIZE SPECIFIED HEREON MAY BE ADDED OR REMOVED TO OBTAIN THE APPROPRIATE WIDTH. SPACING REQUIREMENTS SHALL NOT BE EXCEEDED HOWEVER.
  - MULTIPLE PIECE TIE BARS, OR MULTIPLE PIECE DOWEL BARS SHALL BE REQUIRED AT THE LONGITUDINAL CONSTRUCTION JOINTS. THE MULTIPLE PIECE TIE BAR/DOWEL BAR ASSEMBLIES SHALL HAVE STOP TYPE COUPLINGS AND SHALL HAVE THREADS ON THE BARS. THE MULTIPLE PIECE TIE BAR ASSEMBLIES SHALL DEVELOP A MINIMUM ULTIMATE TENSILE STRENGTH EQUAL TO 1-1/4 TIMES THE MINIMUM YIELD STRENGTH OF THE TRANSVERSE BARS BEING JOINED. THE MULTIPLE PIECE DOWEL BAR ASSEMBLIES SHALL HAVE A MINIMUM ULTIMATE TENSILE STRENGTH OF 50.0 KIPS. TIE BARS SHALL BE DEFORMED REINFORCING BARS AND DOWEL BARS SHALL BE SMOOTH, EPOXY COATED BARS. TIE BAR ASSEMBLIES MADE FROM STEELS OTHER THAN ASTM A 615 GRADE 60 AND WITH DEFORMATIONS OTHER THAN ASTM STD. MAY BE USED PROVIDED IT CAN BE PROVEN TO THE SATISFACTION OF THE ENGINEER THAT THEY ARE IN EVERY RESPECT THE EQUAL OF THE ASSEMBLIES SPECIFIED. LABORATORY TESTING OF THESE PROPOSED ASSEMBLIES, AT THE CONTRACTOR'S EXPENSE, MAY BE REQUIRED. SHOULD THE CONTRACTOR ELECT TO USE THE SAW CUT METHOD TO FORM LONGITUDINAL DOWEL JOINTS THEN HE SHALL USE SINGLE PIECE OR MULTIPLE PIECE DOWELS.
  - TIE BARS AND DOWEL BARS OMITTED, LOST OR DAMAGED SHALL BE REPLACED BY DRILLING AND EPOXY GROUTING AT THE CONTRACTOR'S EXPENSE.
  - MULTIPLE PIECE TIE BARS MAY BE PLACED BY ATTACHING TO THE REINFORCING STEEL MAT PRIOR TO PLACING CONCRETE, OR THEY MAY BE INSERTED INTO THE CONCRETE BY VIBRATING THEM INTO PLACE. IF THIS METHOD OF PLACING IS APPROVED BY THE ENGINEER, IF THE BARS ARE VIBRATED INTO PLACE, THEY SHALL BE PULL TESTED AFTER THE CONCRETE HAS CURED AND SHALL WITHSTAND TENSILE LOADING EQUAL TO 1-1/2 TIMES THE DESIGN STRESS FOR NOT LESS ONE MINUTE. (DESIGN STRESS = 24,000 PSI FOR GRADE 60 STEEL.) SEE "MULTIPLE PIECE TIE BAR PULL TEST LOAD" CHART FOR REQUIREMENTS. PULL TESTS SHALL CONSIST OF NOT LESS THAN TWO TESTS OF FIVE BARS EACH FOR EACH DAYS POUR.



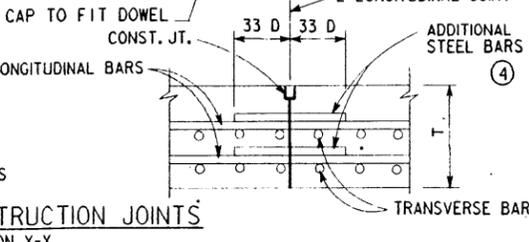
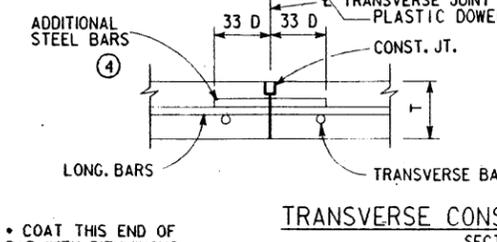
LONGITUDINAL CONTRACTION JOINTS



LONGITUDINAL CONSTRUCTION JOINTS



LONGITUDINAL DOWEL JOINTS



TRANSVERSE CONSTRUCTION JOINTS



NOTES:

- LONGITUDINAL AND TRANSVERSE BARS SHALL BE DEFORMED STEEL CONFORMING TO ASTM A 615 OR ASTM A 616 (GRADE 60) AS NOTED IN THE STANDARD SPECIFICATIONS.
- PAVEMENT WIDTH SHALL BE MEASURED AT RIGHT ANGLES TO THE CENTERLINE AND SHALL INCLUDE ALL MAINLANES, CONNECTORS, RAMPS AND CONCRETE SHOULDERS THAT ARE TIED TOGETHER. TRANSVERSE STEEL REQUIREMENTS AND THE MAXIMUM ALLOWABLE PAVEMENT WIDTH WERE DETERMINED USING SUBGRADE DRAG THEORY (SEE APPENDIX F, SECTION 109 OF THE HIGHWAY DESIGN DIVISION OPERATIONS AND PROCEDURES MANUAL) WITH A COEFFICIENT OF SLIDING RESISTANCE IF OF 1.5, AND AN ALLOWABLE STEEL STRESS (F<sub>s</sub>) OF 45.0 KSI.
- TO DETERMINE THE MAXIMUM ALLOWABLE PAVEMENT WIDTH (W) FOR SPACING OTHER THAN THOSE GIVEN, DIVIDE "BSW" (FOR THE GIVEN BAR SIZE) BY THE DESIRED TRANSVERSE BAR SPACING (B<sub>S</sub>). TRANSVERSE BAR SPACING SHALL NOT BE LESS THAN 12" NOR GREATER THAN 36".
- ADDITIONAL STEEL AT THE TRANSVERSE CONSTRUCTION JOINTS SHALL BE BARS OF EQUAL DIAMETER, AND A SPACING OF DOUBLE THAT SPECIFIED FOR THE LONGITUDINAL STEEL OF THE GIVEN THICKNESS. THE LENGTH OF THE BARS SHALL BE 66 TIMES THE BAR DIAMETER ("D").
- MULTIPLE PIECE TIE BARS SPACING SHALL BE EQUAL TO OR LESS THAN THAT OF THE TRANSVERSE BARS.
- THE LONGITUDINAL CONSTRUCTION JOINT CAN BE RELOCATED OR MAY BE REPLACED BY A LONGITUDINAL CONTRACTION JOINT DEPENDING ON THE PLACEMENT WIDTH AND PLACED 4" MIN. FROM THE LANE LINE OR AS DIRECTED BY THE ENGINEER.
- THE NUMBER OF BARS REQUIRED FOR THE VARIOUS PLACEMENT WIDTHS (INDICATED IN THE TABLE) INCLUDES 2 BARS AT "B" SPACING ON BOTH SIDES WITH AN OVERHANG "A". "A" SPACING SHALL BE BETWEEN 3" AND 4". "B" SPACING SHALL BE BETWEEN 3" AND 9". THE TWO SPACINGS COMBINED ("A" AND "B"), LOCATED AT BOTH LONGITUDINAL EDGES OF THE POUR, SHALL PROVIDE FOR THE REMAINING SPACE AND STEEL LOCATION TO ROUND OUT THE PLACEMENT WIDTH.

GENERAL NOTES

- WHEN THE ENGINEER HAD DETERMINED THAT THIS METHOD IS SATISFACTORY, THE TESTING MAY BE DISCONTINUED. WHEN TIE BARS ARE VIBRATED INTO PLACE, MEASURES SHALL BE TAKEN TO PREVENT THE PAVEMENT EDGE FROM SAGGING OR SLUMPING. THE TIE BARS SHALL BE ACCURATELY POSITIONED PARALLEL TO THE SURFACE AND PERPENDICULAR TO THE PAVEMENT EDGE.
- FOR LEAVE-OUT REQUIREMENTS SEE SHEET 1 OF 2 CRCP-89 DIST12.
- DOWEL BAR JOINT SHALL BE INSTALLED ONLY WHERE CALLED FOR IN THE PLANS. DOWEL BAR EPOXY COATING SHALL CONFORM TO THE COATING FOR REINFORCING STEEL AS SPECIFIED IN ARTICLE 440.9. "EPOXY COATING OF REINFORCING STEEL".
- CONCRETE SHALL BE 6 SACKS OF CEMENT PER CU. YD.
- ANY LONG. REINF. WHICH IS OR HAS BEEN BENT SHALL BE REPLACED. IF THERE IS NOT SUFFICIENT EXPOSED REINFORCING TO PROVIDE A MINIMUM OF A 33 BAR DIAMETER LAP THEN THE EXISTING PAVEMENT SHALL BE REMOVED AND THE EXISTING REINFORCING SUFFICIENTLY EXPOSED TO PROVIDE A 33 BAR DIAMETER LAP. ANY SHEAR BARS THAT ARE DISTURBED SHALL BE REPLACED BY DRILLING AND GROUTING AS REQUIRED BY NOTE 2 ON SHEET 1 OF 2. THE CONTRACTOR SHALL BEAR THE ENTIRE EXPENSE FOR THIS CORRECTIVE ACTION.
- SHEAR CUTTING OF DOWEL BARS IS PROHIBITED.

\* COAT THIS END OF BAR WITH BITUMINOUS MASTIC TO PREVENT BOND.

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION DISTRICT 12

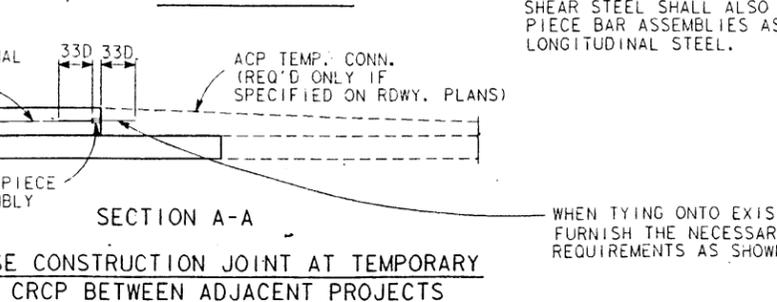
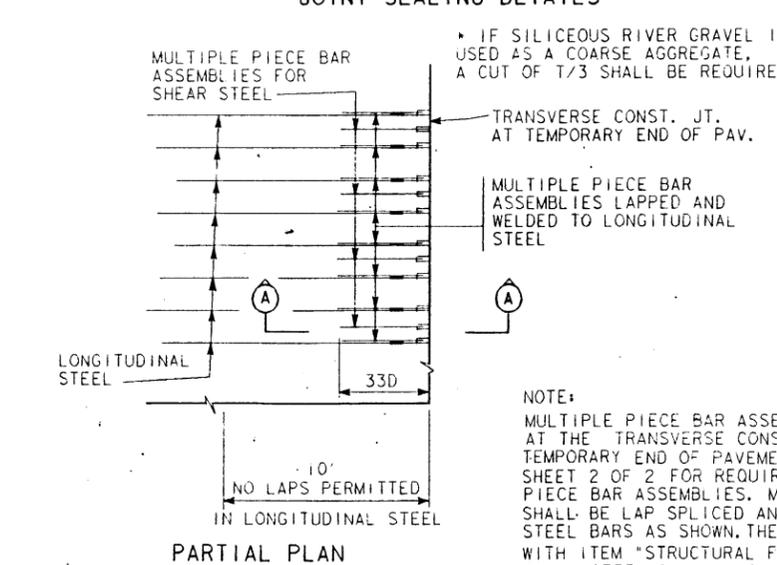
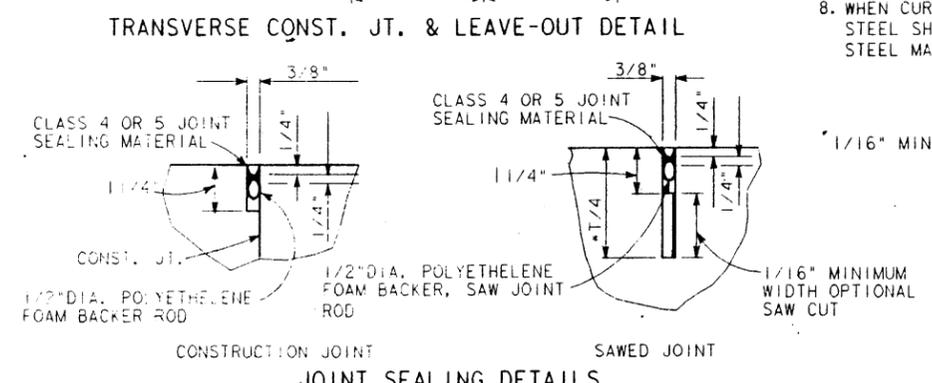
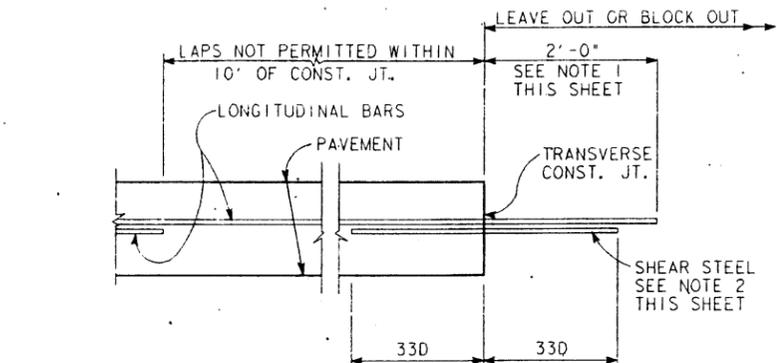
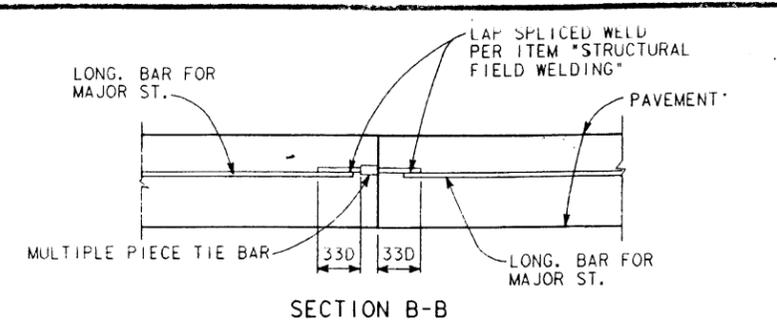
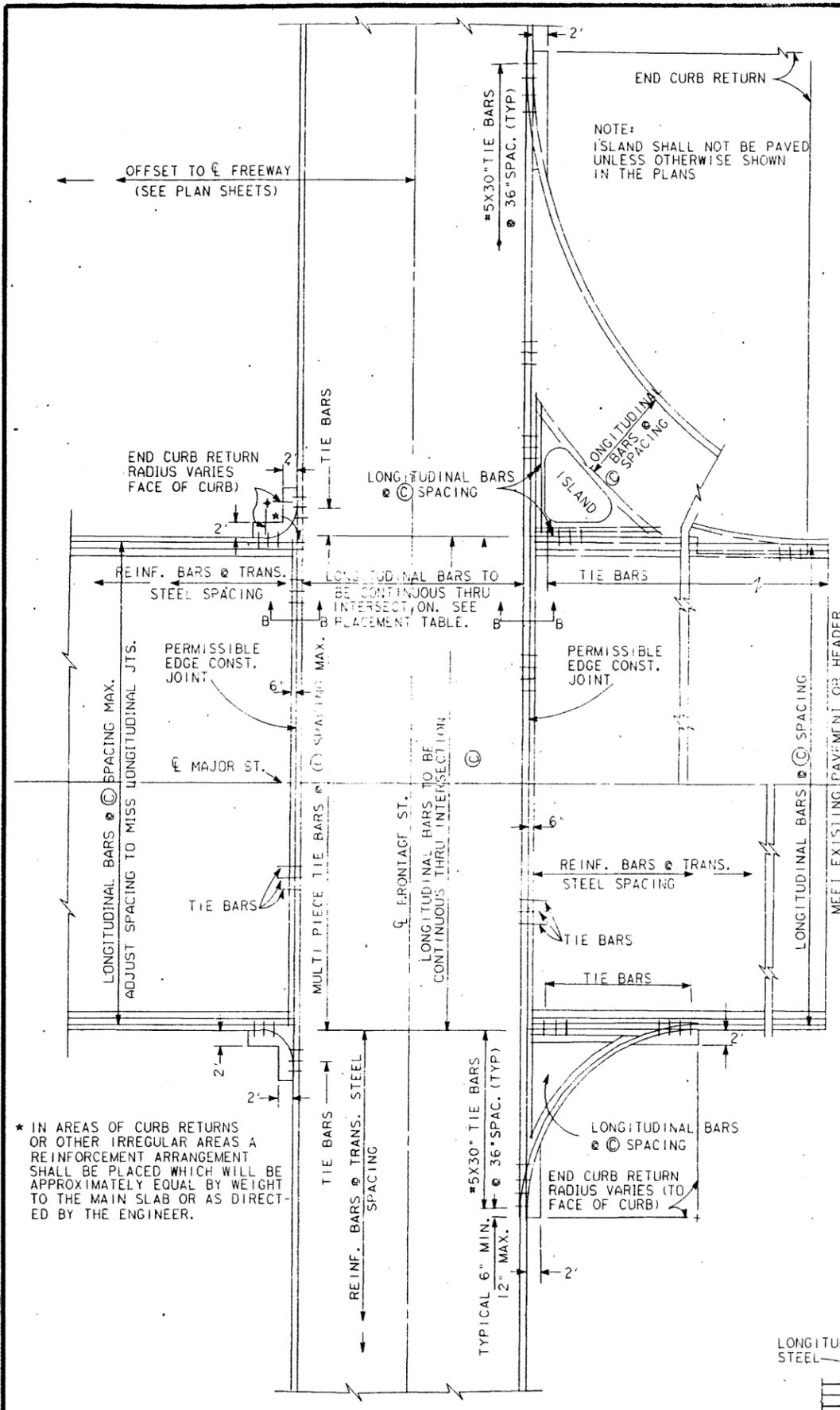
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT DETAILS

CRCP - 89 DIST. 12 ( 2 )

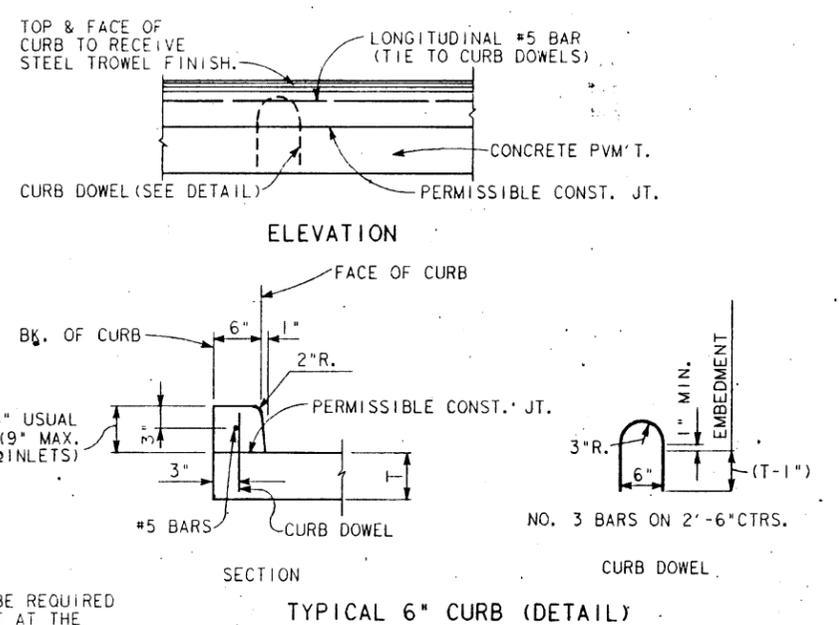
SHEET 2 OF 2

REV. GEN. NOTES 12 & 14 10-31-89  
REV. GEN. NOTES 6A & 15 AND LONGITUDINAL BARS 01-18-90  
REV. GEN. NOTES 16 AND TRANS. REINF. -DMAT REINF. 08-20-90  
REV. ADDED NOTE 19. 06/91  
REV. ITEM NO. 11/92  
REV. ADDED DOWEL BAR CAP 11/92  
REV. UPDATED TO NEW SPECS. 11/93

DRAWN	DRAWING	DATE	FED. RD. DIST.	STATE	FEDERAL AID PROJECT NO.	HIGHWAY NO.
CHECKED	ORIGINAL	MAY, 1989	6	TEXAS	F80 001 (002)	
TRACED	REVISED	FEB., 1991			COUNTY	
CHECKED			12			25



- NOTES:
- WHERE TRAFFIC MUST BE CARRIED ON THE MAJOR STREET DURING CONSTRUCTION, "LEAVE OUTS" WILL BE PERMITTED TO FACILITATE TRAFFIC CONTROL, IF DIRECTED BY THE ENGINEER. LONGITUDINAL STEEL FOR THE FRONTAGE STREET OR MAJOR STREET MAY EXTEND PAST THE TRANSVERSE CONSTRUCTION JOINT INTO THE BLOCKED OUT AREA A DISTANCE OF 2 FEET. WHEN THE BLOCKED OUT AREA IS TO BE COMPLETED, THE LONGITUDINAL STEEL FOR THE FRONTAGE STREET WILL BE LAP SPliced AND WELDED IN ACCORDANCE WITH ITEM "STRUCTURAL FIELD WELDING." THE BARS TO BE SPliced MUST BE PLACED IN A VERTICAL MANNER, ONE ABOVE THE OTHER, TO FACILITATE WELDING. THE WELDING MUST OCCUR ON EACH SIDE OF THE SPlice. LAPS IN THE LONGITUDINAL STEEL WILL NOT BE PERMITTED WITHIN TEN (10) FEET OF THE TRANSVERSE CONSTRUCTION JOINT FORMED BY THE LEAVE OUT.
  - ADDITIONAL SHEAR BARS (DIAMETER "D") SHALL BE THE SAME SIZE AS LONGITUDINAL BARS AND SHALL BE SPaced MIDWAY BETWEEN ALTERNATE LONGITUDINAL BARS ALONG THE TRANSVERSE CONSTRUCTION JOINT FORMED AT THE LEAVE OUT.
  - TRANSVERSE BARS FOR THE FRONTAGE STREET WILL NOT BE REQUIRED WHERE LONGITUDINAL BARS FOR THE MAJOR STREET ARE PRESENT. SIMILARLY, TRANSVERSE BARS FOR THE MAJOR STREET WILL NOT BE REQUIRED WHERE LONGITUDINAL BARS FOR THE FRONTAGE STREET ARE PRESENT.
  - SEE SHEET 2 OF 2 FOR © SPACING.
  - LONGITUDINAL STEEL FOR THE FRONTAGE STREET SHALL BE CONTINUOUS THROUGH THE INTERSECTION REGARDLESS OF WHICH STREET IS PLACED FIRST.
  - IF AN EXISTING STREET IS TO REMAIN, THIS PLAN DOES NOT APPLY. INSTEAD ANCHOR LUGS SHALL BE CONSTRUCTED ON THE FRONTAGE STREET APPROACHES AS DETAILED ELSEWHERE.
  - WITHIN FIVE (5) MINUTES OF SAWING, THE RESULTING SLURRY SHALL BE COMPLETELY REMOVED FROM THE JOINT BY FLUSHING WITH HIGH-PRESSURE WATER. THE JOINT SHALL THEN BE ALLOWED TO DRY FOR A MINIMUM OF 48 HOURS BEFORE SANDBLASTING THE JOINT.
  - WHEN CURB IS PLACED SEPARATELY FROM THE CONCRETE PAVEMENT, THE REINFORCING STEEL SHALL BE PROVIDED AS SHOWN IN THE CURB DETAIL. THE CURB REINFORCING STEEL MAY BE OMITTED WHEN THE CURB IS PLACED MONOLITHICALLY.



REV: 10/93 UPDATE TO NEW SPECS.  
 REV: 7/92 ADD CL. 6 JT. SEAL  
 REV: 12/91 ADD NOTE 8

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION - DISTRICT 12

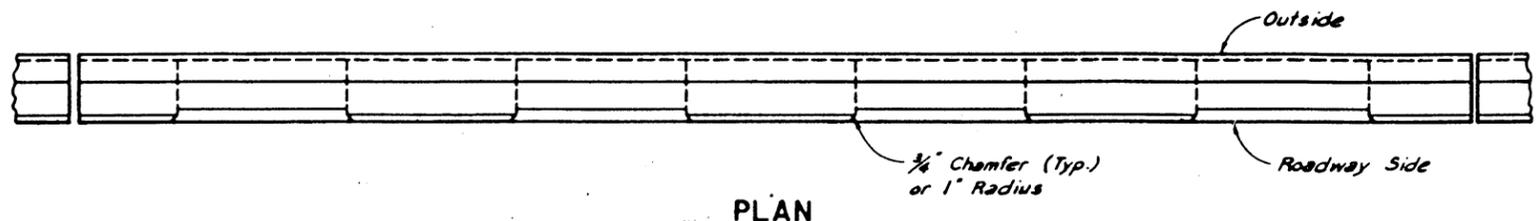
**CONTINUOUSLY REINFORCED CONCRETE PAVEMENT DETAILS**

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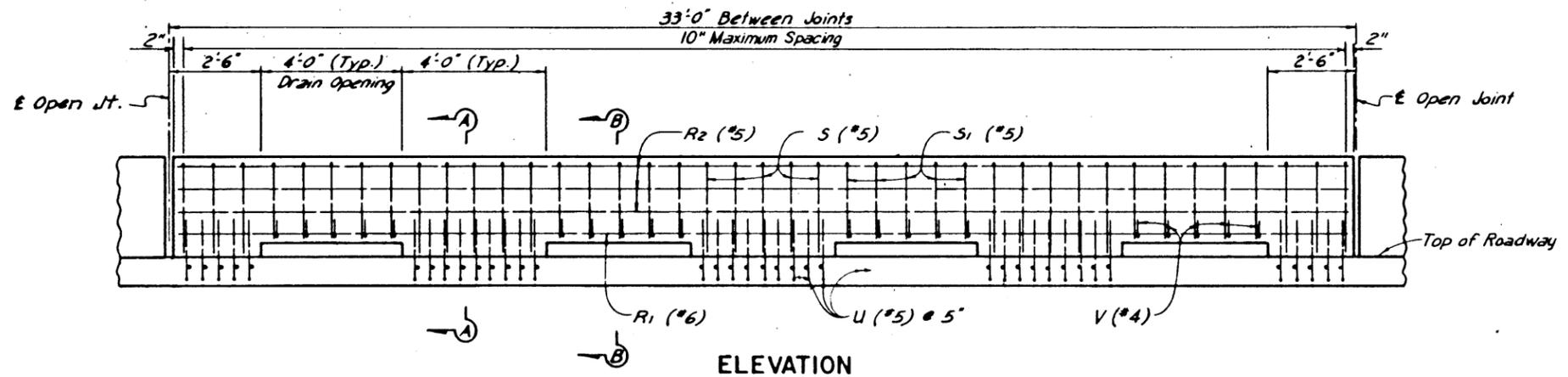
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CHECKED	ORIGINAL	MAY 1989	6	TEXAS	FBD 001 (002)	
TRACED						
CHECKED						

SHEET 1 OF 2

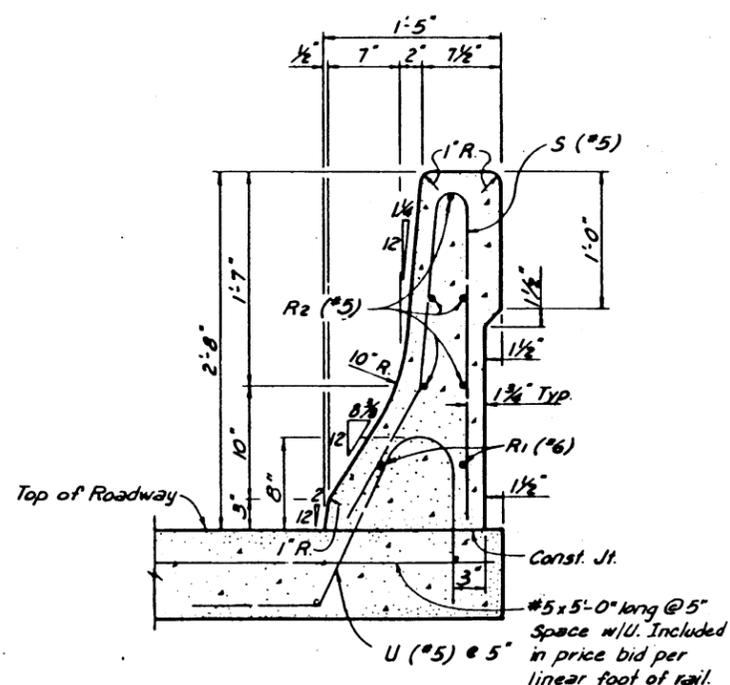




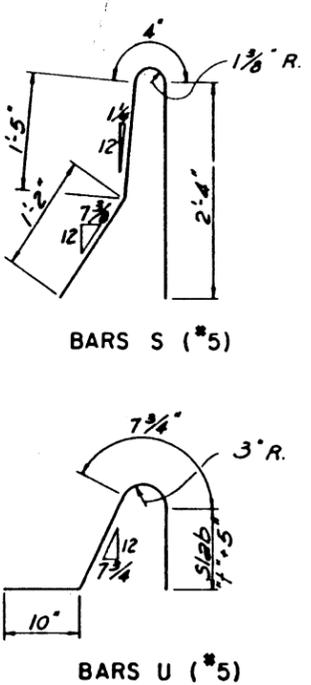
PLAN



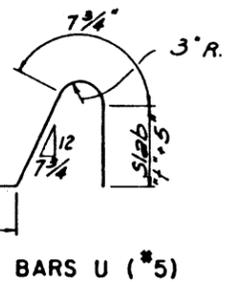
ELEVATION



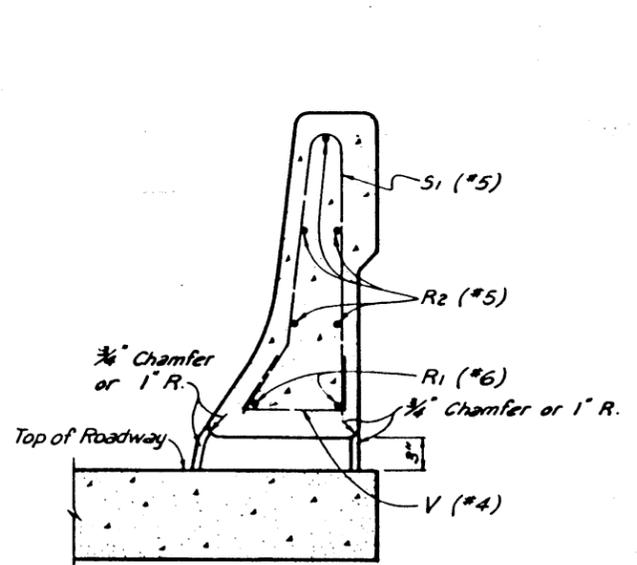
SECTION A-A



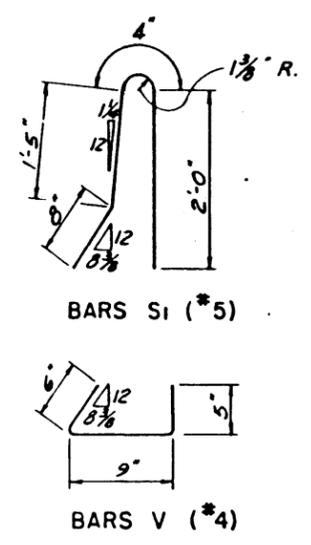
BARS S (#5)



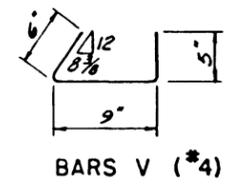
BARS U (#5)



SECTION B-B



BARS S1 (#5)



BARS V (#4)

Notes:  
 Drain slots required only when indicated elsewhere in the plans.  
 For other details and General Notes pertaining to T501 Rail see "Traffic Rail Type T501 (Roadway)".

SHEET ADDED BY  
 CHANGE ORDER NO. 3

STATE DEPARTMENT OF HIGHWAYS AND PUBLIC TRANSPORTATION  
 DISTRICT 12  
 TRAFFIC RAIL WITH DRAIN SLOTS  
 TYPE T 501 (ROADWAY)-94

Des.	Drawn	Checked	File	Scale	Project	Sheet
Ca. Des.	ORIGINAL	OCT 1986	SH 87	1/2"	FBD 00N0021	SH 87
Des.	REV. 4/94	REMOVE 86				
Ca. Des.						
Ca. No.						
Ca. No.						

# GENERAL :

## I. SCOPE

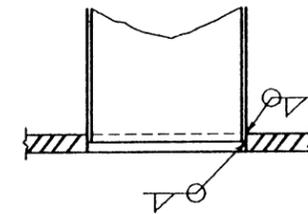
Details herein apply to roadway lighting installations bid under the following Specification Items: Roadway Illumination Assemblies, Relocate Roadway Illumination Assemblies, Foundations for Signs, Traffic Signals and Roadway Illumination Assemblies, and Special Specifications relating to roadway lighting. All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Materials and installation shall comply with the applicable provisions of the National Electrical Code and National Electrical Manufacturers Association standards. Where manufacturer's provide warranties or guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees.

The location of poles and fixtures are diagrammatic only and may be shifted by the Engineer to accommodate local conditions. Erection and/or removal of poles and luminaires located near any overhead electrical lines shall be accomplished using established industry and utility safety practices and in accordance with laws governing such work. The Contractor shall consult with the appropriate utility company prior to beginning such work.

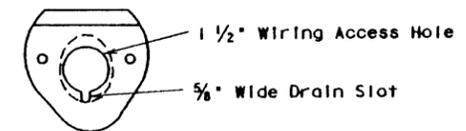
## II. ROADWAY ILLUMINATION ASSEMBLIES

### A. General

1. **Structural Support Design for Luminaires.** Lighting standards shall be designed in accordance with the latest issue of the AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals." All poles shall be designed for 80 mph wind loads. An additional 1.3 gust factor shall be applied to the wind loads. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. Manufacturer's shop drawings shall include the ASTM designations for all material to be used. See paragraph II.b. for additional requirements for the transformer base.
2. **Slip Joint Poles.** Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint. The longitudinal seam weld on the outer shaft at the slip joint end shall be a full penetration weld for a minimum of the slip joint length plus 6 inches.
3. **Mast Arm Attachments.** All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 55-pound luminaire having an effective projected area of 1.4 square feet.
4. **Minor Damage Repair.** The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, or damaged areas on galvanized poles and mast arms shall be thoroughly cleaned by wire brushing. The cleaned area shall be painted with two coats of zinc rich paint containing a minimum of 84% metallic zinc.
5. **Pole Bonding Means.** All shoe base poles, including poles on concrete traffic barriers, shall have a grounding lug with 1/2-13 NC female threads inside the pole near the hand hole, minimum of 3 full threads.
6. **Hand Holes.** All shoe base poles shall have hand holes with reinforcing frames and covers. The openings on all poles shall be approximately 4 inches x 10 inches, located approximately 10 inches from the bottom of the pole and, except for poles mounted on concrete traffic barrier, shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on concrete median barrier, all hand holes shall be on the same side of the median.
7. **CTB Poles.** Poles installed on concrete traffic barrier shall also meet the requirements of CTB details.
8. **J-Hooks.** All poles shall be equipped with a J-hook inside the pole, near the top for supporting vertical conductors.
9. **Base Plate Bolt Circle.** For bolt circles for poles mounted on CTB, see CTB1 (4). For poles placed on existing bridge brackets or existing foundations, bolt circle shall be coordinated with anchor bolts in place. For other bolt circles, see RID (3).
10. **Steel Poles.**
  - a. Steel poles shall be fabricated in accordance with the item "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration, except that weld shall be full penetration within 6 inches of circumferential base plate welds. All welding shall be in accordance with the ANSI AWS Structural Code D1.1. Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Unless otherwise shown on the plans, poles and hardware shall be galvanized in accordance with item 445. "Galvanizing".
  - b. Pole components shall be constructed using the following materials:
    - Shaft: ASTM A-572 Grade 50 or ASTM A-595 Grade A (50 KSI min. yield) or ASTM A-36M50.
    - Base Plate: ASTM A-27 Grade 65-35 or ASTM A-36.
    - Mast Arm Connector: ASTM A-27 Grade 65-35.
    - Mast Arms: Steel Pipe ASTM A-53 Grade A or B or ASTM A-501 or A-513 TY 1 with minimum 30 KSI yield and 20% elongation in 2 inches.
    - Pole Cap: Pole cap shall be zinc die-cast, aluminum, or galvanized metal, secured by three stainless steel or galvanized screws.
    - Pole Hardware: All bolts except mast arm connection bolts shall be stainless steel or standard steel galvanized ASTM A-153 Class C or D, or B-695 Class 50. Mast arm connection bolts shall be ASTM A-325, ASTM A-321 or ASTM A-193 Grade B-7, galvanized as above. Nuts and washers shall be compatible with the bolts and shall be stainless steel or steel, galvanized as above. Lock washers shall be provided on all bolted connections.
11. **Aluminum Poles.**
  - a. Aluminum poles shall be fabricated in accordance with "Structural Welding, Aluminum" ANSI/AWS D1.2.
  - b. Pole components shall be constructed using the following material:
    - Shaft: ASTM B-221 or B-241 Alloy 6063-T6, ASTM B-209 Alloy 5086-H34, ASTM B-221 Alloy 6005-T5
    - Base Flange: ASTM B-26 Alloy 356.0-T6 or ATSM B-108 Alloy A356.0-T6 (Structural strength test required).
    - Mast Arm Fitting: ASTM B-209 Alloy 6061-T6 or ASTM B-221 Alloy 6005-T5.
    - Mast Arms: ASTM B-241 Alloy 6061-T6 or Alloy 6063-T6
    - Pole Cap: ASTM B-209 Alloy 5086-H32 or ASTM B-108 or B-26 Alloy 356.0-T6
    - Bolts: Stainless Steel AISI 300. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.

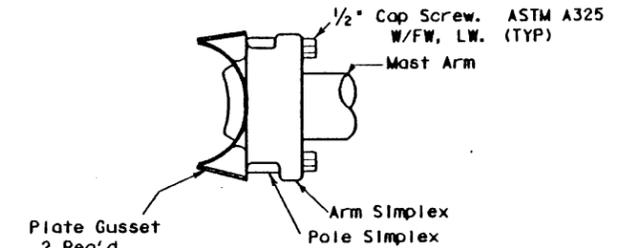


SECTION POLE SHAFT TO BASE PLATE



MAST ARM CONNECTOR

Steel Poles Only  
Aluminum Pole Connector  
Shall Be Clamp-on Type



MAST ARM TO POLE SHAFT CONNECTION

## EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - B - B ) (4KW) S

SA: Pole and mast arm may be steel or aluminum.  
ST: Pole and mast arm must be steel.  
AL: Pole and mast arm must be aluminum.  
SP: Special (ovalized) steel pole for installing on CTB. See standard sheet CTB1 (4).

Two numerical digits denote mounting height in feet.

Next letter denotes type of base, (S- Shoe Base, T-Transformer Base or X-Base, B-Shoe Base Bridge Mount)

First number denotes length of mast arm in feet.

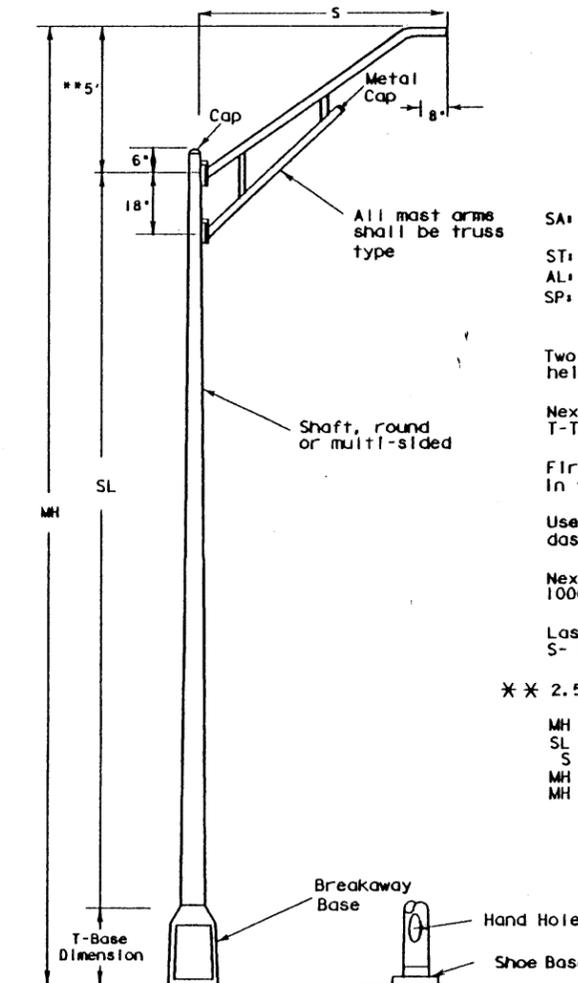
Use of second mast arm is indicated by second dashed number which denotes length in feet.

Next three figures indicate luminaire rating (1 KW= 1000 watts, .4 KW= 400 watts, etc.)

Last letter indicates the type of lamp (M- Mercury, S- High Pressure Sodium, L- Low Pressure Sodium).

\* \* 2.5' for poles with 4' mast arms.

MH = Mounting Height  
SL = Shaft Length  
S = Spread (Mast arm length)  
MH = SL + 5' (T-Base dimension)  
MH = SL + 5' (Shoe Base)



ROADWAY ILLUMINATION ASSEMBLY

		STANDARD PLANS			
		TEXAS DEPARTMENT OF TRANSPORTATION			
ROADWAY ILLUMINATION DETAILS					
RID (1) - 93					
ORIGINAL DRAWING DATE: 01-92	STATE DISTRICT:	FEDERAL REGION:	PERSONAL AND PROJECT:		SHEET:
REVISED BY: K.A.B.	REVISED BY: Hou	REVISED BY: 6	FBD 001(002)		27
REVISED BY: T.B.	DATE: 5-93	DATE: K.A.B.	QUANTITY:	CONTROL SECTION:	JOB HIGHWAY:
REVISED BY: R.E.S.	DATE: 10-93	DATE: K.A.B.	QUANTITY:	CONTROL SECTION:	JOB HIGHWAY:
REVISED BY: T.B.			GALVESTON	0367 06 050	5H 87

11. A.12. Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
13. Installation of high Strength Bolts. The tightening of nuts on high strength bolts shall be in accordance with the item "Structural Bolting."
14. Roadway Illumination Assembly poles shall be erected plumb and true. Top of foundation shall be struck level and shims used to plumb pole, except that for shoe base poles leveling nuts may be used. Leveling nuts shall not be used under transformer bases. Grout shall not be placed between base plate or flange and the foundation.
15. In each pole, continuous color-coded stranded No. 12 AWG copper Type XHHW or other approved XLP conductors shall be connected to the line side of each ballast.
16. Acorn nuts will not be allowed for attaching pole to transformer base or foundation. Nut covers will not be allowed.
17. Fabrication tolerances shall be as shown on Fabrication Tolerances Table.

**B. Transformer Base**

1. Transformer base shall be cast from aluminum, ASTM B-108 or B-26 Alloy 356.0-T6, or other material approved by the Engineer, and shall be furnished or with four washers or lugs as recommended by the manufacturer. Transformer base bolt circles (Top and Bottom) shall match bolt circles for poles and foundations shown on RID(3).
2. Transformer base shall be approximately 15-20 inches high and shall have a door approximately 13 inches x 8 inches x 9 1/4 inches or as otherwise approved by the Engineer. Screw or bolts for attachment of door to base shall be stainless steel. Four machine bolts with four nuts, eight flat washers and four lock washers, galvanized ASTM A-153 Class C or D, or B-695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A-563 grade DH galvanized. A 1/2-13 NC female threaded grounding lug shall be provided inside the transformer base near the bottom.
3. The X-base shall be made from extruded aluminum channel and aluminum plate. The base breakaway features shall rely on bolt shear and not on bolt torque. Bolt shall have torque controlled break-off hex-head. Bolt shall be Aluminum Association type 2024-T4 aluminum. X-base channel shall be connected with aluminum bolts. Bolt shall be left hand thread and shall not be interchangeable with any other bolt not designed specifically for use with the X-base.
4. All breakaway bases shall meet the breakaway requirements of the AASTHO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 1985 edition, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to meet or exceed the full designed plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with shop drawings. Shop drawings shall show breakaway base model number and manufacturer's name or logo.
5. Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
6. Doors for transformer bases shall be made of plastic, fiberglass or other non-aluminum material approved by the Engineer. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

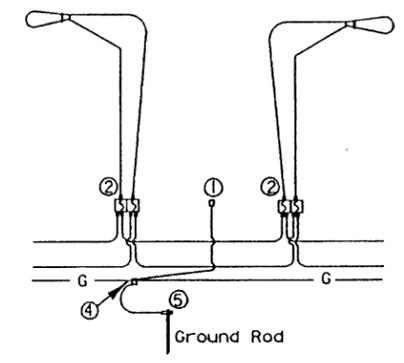
**C. All Luminaires**

1. The luminaire housing shall be cast or drawn from a non-ferrous alloy and shall be free of cracks and excessive porosity. All nuts, screws, clips, washers and attaching hardware shall be made of stainless steel, steel electro-zinc-plated, minimum thickness 0.0002 inch with olive green drab or yellow chromate conversion coating, steel coated with an acidic chromate-phosphate-binder system primer, top coated with a polytetrafluoroethylene modified silicon primer, bright metallic in color, meeting the requirements of General Motors automotive specification GM 164M, or other approved conversion coatings except that brackets may be made from pre-galvanized steel. All threaded surfaces used in the housing shall be lubricated with a silicone grease.
2. The slipfitter shall securely clamp the luminaire to the mast arm. A positive means of vertical adjustments shall be provided. The refractor or lens shall be clear glass. The optic assembly shall be provided with resilient gaskets and so constructed that a positive seal against weather and other contaminants will be maintained. The luminaire shall be designed to permit easy removal of the refractor from the luminaire but shall provide a positive means of preventing an unintentional separation. The latch shall provide a positive means of maintaining closure of the luminaire. The socket shell shall be nickel plated and shall be rigidly attached to a high grade porcelain mogul base which shall extend and enclose the metal shell. A locking means shall be incorporated in the shell of the socket to positively resist the removal of the lamp. Reflectors shall be polished aluminum with Alzak or equal coating and shall not be painted.
3. Mast-arm mounted luminaires shall be provided with a leveling indicator which is clearly visible from the ground. Leveling indicator shall be sensitive to one (1) degree (maximum) changes in position at any point within five (5) degrees (minimum) of the level position. Leveling indicator shall have one or more concentric circular marks, the center of which is the level position. Unless otherwise directed by the Engineer, mast-arm mounted luminaires will be installed in the level position.
4. Underpass luminaires shall be fused internally. Fuses shall be 10 amp time-delay type.

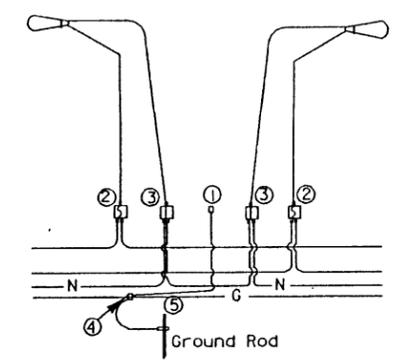
**D. High Pressure Sodium Vapor Luminaires**

1. Photometrics
- a. The U/P (SPL-CO) (.15KW)S (TY 1) and (TY 2) underpass luminaires shall be 150 watt high pressure sodium, IES TYPE M-C with flat tempered glass lens. The fixtures shall provide a minimum measured intensity of .2 footcandle in a rectangular area measuring 80 feet X 30 feet, when mounted 20 feet above the midpoint of either long side of the surface area.
- b. The 250-watt mast arm mounted luminaire shall be IES Type semi-cutoff or cutoff and, when mounted 40 feet above the midpoint of either long side of a rectangular area 200 feet by 50 feet, shall provide a measured minimum intensity of 0.2 footcandle at any point on the surface of this area. Light intensities measured in footcandle along a line parallel to and 20 feet in from the long side of the previously defined rectangular area above which the luminaire is mounted shall decrease at a rate not to exceed 0.8 footcandle in any ten-foot interval along the aforementioned line from 10 to 70 feet on both sides of the luminaire and shall not be less than 0.6 footcandle at any point along such line.
- The maximum to minimum footcandle uniformity ratio shall not exceed 20:1 within the above mentioned rectangular area.
- c. The 400-watt mast arm mounted luminaire shall be IES Type semi-cutoff or cutoff and, when mounted 50 feet above the midpoint of either long side of a rectangular area 240 feet by 70 feet, shall provide a measured minimum intensity of 0.2 footcandle at any point on the surface of this area. Light intensities measured in footcandle along a line parallel to and 30 feet in from the long side of the previously defined rectangular area above which the luminaire is mounted shall decrease at a rate not to exceed 0.8 footcandle in any ten-foot interval along the aforementioned line from 10 to 90 feet on both sides of the luminaire and shall not be less than 0.6 footcandle at any point along such line.
- The maximum to minimum footcandle uniformity ratio shall not exceed 20:1 within the above mentioned rectangular area.
- d. The luminaires shall meet the photometric requirements shown above, when energized at 100 percent of rated line voltage. Test will be run with the fixture in the level position as indicated on leveling indicator.

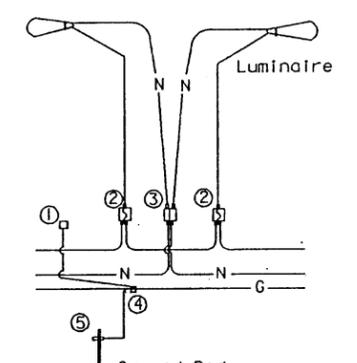
Fabrication Tolerances Table		
Part	Dimension	Tolerance
Pole Assembly	Shaft length	± 1 in.
	I.D. of outside piece of slip fitting pieces	+1/8 in., -1/16 in.
	O.D. of inside piece of slip fitting pieces	+1/32 in., -1/8 in.
	Shaft diameter, other	+ 3/16 in.
	Out of "round"	1/4 in.
	Straightness of shaft	± 1/4 in. in 10 ft.
	Twist in shaft	4° in 50 ft.
	Perpendicular to baseplate	1/8 in. in 24 in.
Arm Assembly	Pole centered on baseplate	± 1/4 in.
	Location of Attachments	± 1/4 in.
	Arm Length	± 3 in.
	Arm Rise	± 1 3/4 in. in 10 ft.
	Arm Diameter	± 3/16 in.
	Overall length or width	± 1/4 in.
	Thickness	+1/4 in., -1/16 in.
	Deviation from flat	1/8 in. in 12 in.
Anchor Bolt	Spacing between holes	± 3/32 in.
	Anchor bolt hole size	± 1/16 in.
	Length	+ 1 in., -1/4 in.
	Threaded length	+ 1 1/2 in., -1/8 in.
Miscellaneous	Galvanized length (if required)	+ 8 in., -1/4 in.
	Bolt hole spacing	± 1/16 in.
	Strut location in truss arms	± 1 1/2 in.



**FOR THREE-WIRE CIRCUIT-CENTER GROUNDED**  
LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.



**FOUR-WIRE CIRCUIT-CENTER GROUNDED**  
LUMINAIRES SERVED AT 240V (240/480 VOLT SERVICE)



**THREE WIRE CIRCUIT-OUTSIDE GROUNDED**  
LUMINAIRES SERVED AT 480V ON 480 VOLT 2 WIRE SERVICE OR LUMINAIRES SERVED AT 240V ON 240 VOLT 2 WIRE SERVICE.

**NOTES:**

- ① Pole Bonding Connector Blackburn TTC3 or Weaver TCC3 or equal.
- ② Fused Connector- Homac Flood Seal Series, Bussman HEB Series, Gould GEB Series, or equal. All fuses shall be time-delay types, 10 Amp (Littlefuse FLO, Bussman FNQ or equal).
- ③ Un-fused Connector- Homac Flood Seal Series, Bussman HEB Series, Gould GEB Series, or equal. Dummy/Neutral fuse shall be Bussman NTS-R-30 or equal.
- ④ Split Bolt or other connector.
- ⑤ Ground Rod Clamp - Blackburn GG58H, Burndy GKP635, or equal.

\*For Transformer Base Poles. On Shoe Base Poles omit un-fused connector for neutral conductor.

**STANDARD PLANS**  
TEXAS DEPARTMENT OF TRANSPORTATION

**ROADWAY ILLUMINATION DETAILS**  
RID (2) - 93

ORIGINAL DRAWING DATE: 1-92	STATE DISTRICT: HOUSTON	FEDERAL REGION: 6	FEDERAL AID PROJECT: FB 001(002)
REVISIONS:	CR. K.A.B.	5-93	K.A.B.
	DR. R.E.S.	10-93	K.A.B.
	CR. T.B.		
GALVESTON		0367 06 050 SH 07	

2. Ballasts

- a. All ballasts shall be isolated-winding lag-type magnetic regulators designed to operate high pressure sodium lamps unless otherwise shown on the plans.
- b. When the circuit voltage indicated on the plans is applied, the ballast input wattage during fluctuations of the test voltage of +10 and -10 percent shall not exceed the following:
 

Nominal Lamp Rating, Watts	Maximum Wattage Input
150	220
250	400
400	552
- c. During fluctuation of the test voltage of +10 and -10 percent, the lamp wattage fluctuation shall not exceed a total of 20 percent and ballast shall maintain lamp wattage within the following limits:
 

Nominal Lamp Watts	Minimum Lamp Watts	Maximum Lamp Watts
150	110	180
250	175	370
400	280	475
- d. The power factor of any ballast when tested at the circuit voltage indicated in the plans shall be not less than 90 percent.
- e. The electronic starting aid shall provide a starting pulse with an amplitude of 2500 volts minimum, 4000 volts maximum. The pulse width shall be a minimum of 0.8 microseconds at 2250 volts. The pulse shall occur when the open-circuit voltage is equal to or greater than 90 percent of peak open-circuit voltage. Pulse repetition rate shall be a minimum of one per cycle and pulse current shall be a minimum of 0.18 amperes. Electronic starting aids for mast-arm mounted poles shall be replaceable without the use of tools. The starting aid shall discontinue to pulse when the lamp starts.
- f. Luminaires will be tested for satisfactory operation of the starter board under open-circuit (lamp-out) condition for a minimum of 72 hours. Any failures of starter boards will be considered grounds for rejection of the model starter board being supplied.
- g. Ballasts shall permanently and clearly indicate the following: lamp type, catalog number, voltage rating, connection diagram, and manufacturer. Capacitors in all luminaires shall be non-PCB type.

3. Lamps

- a. All lamps shall be new and shall be of recent manufacture.
- b. High pressure sodium vapor lamps in the wattage range of 200 to 400 watts inclusive shall have a lamp voltage not greater than 108 volts when tested after thirty minutes burn-in. 150 watt lamps shall be rated for 55 volts.
- c. All lamps shall have nickel plated mogul bases.

4. Testing

- a. Ballasts and luminaires will be tested using a lamp furnished for the same project.
- b. Luminaires, ballasts, and lamps will be sampled and tested in accordance with the TXDOT Materials and Test Division's Manual of Testing Procedures.

III. ROADWAY ILLUMINATION ASSEMBLY FOUNDATIONS.

- A. Foundations will be paid for under the item "Foundations for Signs, Traffic Signals and Roadway Illumination Assemblies", unless otherwise shown on the plans. Top 6 inches of foundation shall be formed and struck level.
- B. Anchor bolts for all poles, except CTB-mounted poles, shall be A-36M55 Anchor Bolts. Anchor bolts for CTB-mounted poles shall be steel, ASTM A-325 or A-321 threaded rod. Nuts for CTB anchor bolts shall be ASTM A-563 Grade D heavy hex, galvanized. The top 8 inches of all anchor bolts shall be galvanized per ASTM A-153. Anchor bolts in foundations shall be 1 1/4 inches x 30 inches for mounting heights 40 feet and greater, 1 inch x 30 inches for mounting heights less than 40 feet. Anchor bolts shall have top end threaded not less than 5 inches and furnished with galvanized hex nuts, flat and lock washers and template. The lower end of the bolt shall be threaded and furnished with nut and template. When bolts with rolled threads are furnished, bolt body need not be full size. See CTB details for anchor bolts in CTB. Anchor bolts and nuts shall have Class 2A and 2B fit. Nuts shall be tapped or chased after galvanizing.
- C. Concrete shall be Class A or C.
- D. A minimum of two conduits shall be installed in each foundation. See lighting layout sheets for locations of foundations with more than two conduits. Any unused conduits in foundations shall be capped on both ends.
- E. Unless otherwise dimensioned on the plans, breakaway roadway illumination assemblies should be located as shown in the placement table. Non-breakaway illumination assemblies should be protected from vehicular impact (i.e. 2 ft. behind guard rail or mounted atop traffic barrier) or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less, see design guidelines for further information.

\* Except that anchor bolts shall be 1 inch x 30 inches for all X-base poles.

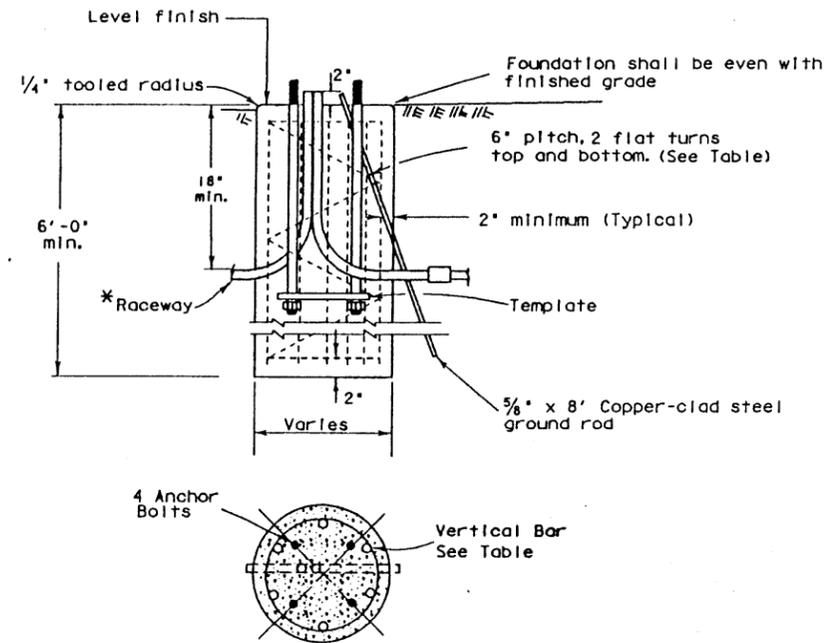
Breakaway Pole Placement, see Para. III. E.	
Roadway Functional Classification	**Pole Offset (distance to transformer base, tolerance + 6 in.)
Freeway mainlanes (roadways with full control of access)	15 ft. (minimum and typical from lane edge)
All curbed, 45 MPH or less design speed	2.5 ft., minimum (15 ft. desirable) from curb face
All others	10 ft., minimum* (15 ft. desirable) from lane edge

\*or as close to ROW line as is practical  
 \*\*all breakaway poles should have 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on other travel lanes. See design guidelines.

BOLT CIRCLES AND ANCHOR BOLTS				
MOUNTING HEIGHT	POLE BASE PLATE	BOLT CIRCLE		BOLT SIZE
		SHOE BASE	*T-BASE	
LESS THAN 40 FEET	13 IN.	13 IN.	14 IN.	1 IN. X 30 IN.
40 FEET OR GREATER	15 IN.	15 IN.	17 1/4 IN.	** 1 1/4 IN. X 30 IN.

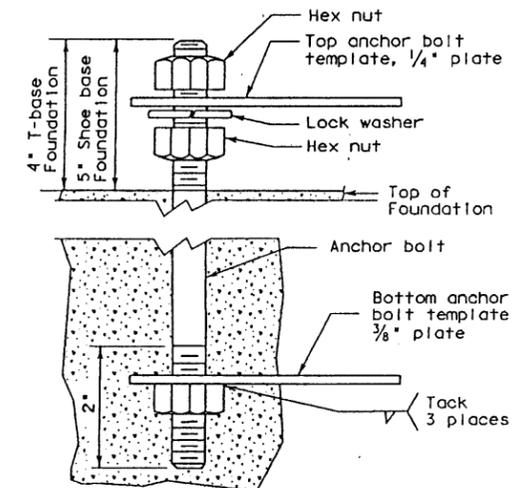
\* AND X-BASE  
 \*\* 1" FOR X-BASE

FOUNDATIONS				
FND. TYPE	DRILL DIA.	SHAFT LENGTH	REINFORCING BAR	REINFORCING SPIRAL
A	30 IN.	6 FT.	6-#4	#2
B	30 IN.	8 FT.	6-#5	#2
C	30 IN.	10 FT.	6-#6	#3



FOUNDATION DETAIL

\* Min. 2" Dia. for duct cable, 18" radius bends. For conductor in conduit system, same size as system conduit with standard radius bends.



ANCHOR BOLT DETAIL

STANDARD PLANS  
 TEXAS DEPARTMENT OF TRANSPORTATION  
 ROADWAY ILLUMINATION DETAILS  
 RID (3) - 93

ORIGINAL DRAWING DATE: 01-92	DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
DR. - K. A. B.	REVISED	Holl	6 FBD 001 (002)	29
DR. - T. B.	5-93 K.A.B.	COUNTY	CONTROL SECTION JOB	
DR. - R. E. S.	10-93 K.A.B.	GALVESTON	0367 06 050	SH 87
DR. - T. B.	2-94 K.A.B.			

## I. GENERAL REQUIREMENTS FOR ALL ELECTRICAL WORK

Faulty fabrication or poor workmanship in any material, equipment, or installation will be considered justification for rejection. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Where manufacturers provide warranties or guarantees as a customary trade practice Contractor shall furnish to the State such warranties or guarantees. The location of conductors, conduit, junction boxes, duct cable, ground boxes, transformer stations, and service poles are diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

Grounding shall be as shown on the plans and in accordance with the NEC. Metallic conduit, lighting poles, and luminaires on bridge structures shall be grounded by connection to the grounding conductor and by installing a ground rod in each ground box or junction box, as shown on the plans, at bridge ends and in each ground box installed for underpass lighting. The bonding jumper shall be bare or, if insulated, shall be green. Ground rods, connectors, and bonding jumpers will not be paid for separately, but will be subsidiary to the various bid items.

## II. CONDUIT

### A. Materials.

1. Conduit must be UL-approved for the intended use shown on plan sheets. Aluminum conduit will not be permitted unless shown elsewhere on the plans. EMT and IMC will not be permitted unless shown on the plans.
2. Fittings for steel conduit shall be steel or malleable iron, threaded or compression type threadless and rain-tight. Die cast, set screw, indenter or push-on (socks) fittings will not be permitted.
3. Expansion joints for metallic conduit shall be provided with a grounding strap. Expansion joints for metallic conduit shall be Appleton UNYL 50 Series, OZ AX Series, or equal.
4. Junction boxes in rigid metal conduit systems shall be cast iron, hot-dipped galvanized, or cast aluminum (surface-mounted only) unless otherwise shown on the plans.
5. Surface-mounted junction boxes for rigid metal conduit 1 1/4 inches and larger shall have a minimum wall thickness of 3/8 inch, Crouse Type WAB, 0-Z Type YS, Adalet Type 3R, or approved equal, with mounting lugs, minimum size 6 inches x 6 inches x 4 inches, or as otherwise required by the NEC, or as shown elsewhere on the plans. For conduit one inch or smaller, surface-mounted boxes may be 4 1/2 inches (min.), round, square, or rectangular, and approximately 3 inches deep, Crouse Hinds Type GRFX, Appleton Type JBOX, two-gang FD, or approved equal, unless otherwise required by the NEC or the plans.
6. For rigid metal conduit systems flush-mounted junction boxes installed in concrete structures shall be minimum 6 in. x 6 in. x 4 in., or as required by the NEC, Crouse Hinds Type WGB, 0-Z Type YR, or approved equal.
7. Unless otherwise shown elsewhere on the plans, junction boxes in EMT conduit systems shall be made from galvanized sheeting and shall be UL listed as approved for outdoor use. Sheet metal junction boxes shall be sized in accordance with the NEC.
8. Unless otherwise shown elsewhere on the plans, junction boxes in PVC conduit systems shall be PVC, UL listed for outdoor use, and sized in accordance with the NEC.

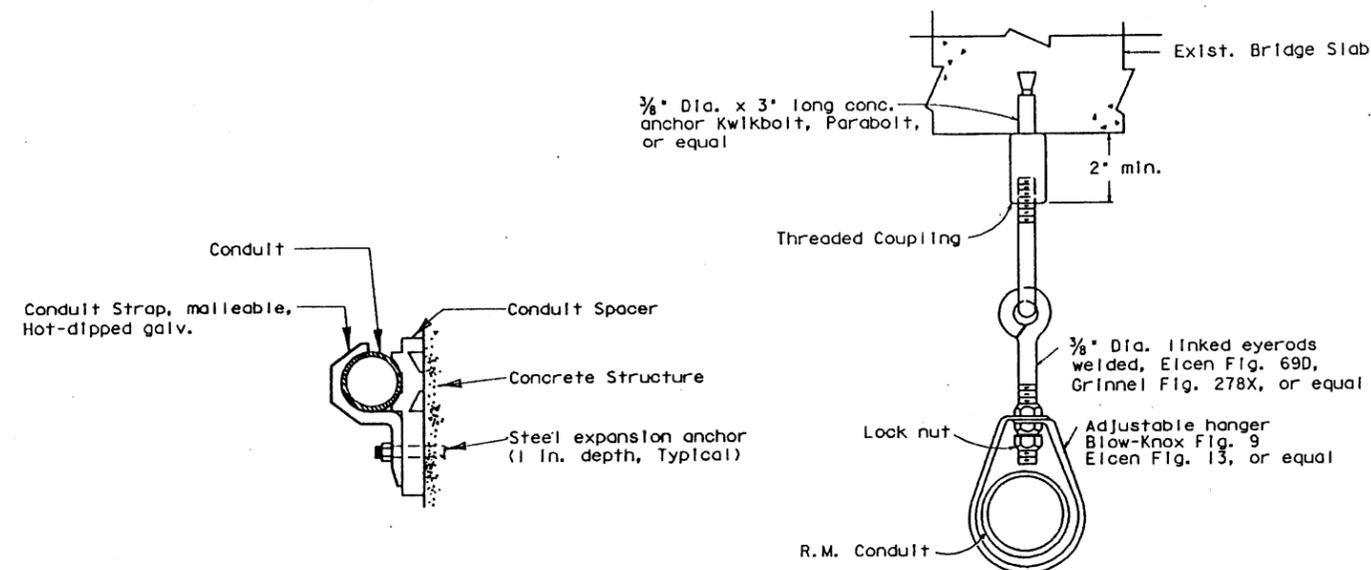
### B. Construction Methods.

1. Continuous runs of conduit in excess of 150 feet attached to structures shall have expansion joints at mid-span or 150-foot intervals. Conduit in structures shall have expansion joints at structure expansion joints or as shown in plans.
2. Conduit hangers or straps shall be spaced at maximum intervals of 5 feet. When shown on the plans, hangers shall be used when hanging conduit from horizontal surfaces (See detail). Conduit spacers shall be used with metal conduit placed on surfaces of concrete structures (See conduit detail).
3. Conduit hangers or straps shall not be attached directly to prestressed concrete beams except as shown in the plans and approved by the Engineer.
4. Conduit placement beneath existing roadways, driveways or sidewalks shall be accomplished by jacking or boring, unless otherwise noted on the plans or directed by the Engineer. The Contractor shall backfill and compact the bore pits to bottom of conduit prior to installing connecting conduit or duct cable, to prevent bending of this connection. Duct cable shall be extended through conduit casings in one continuous length.
5. With approval of the Engineer, conduit placed under new roadways may be trenched in subgrade and backfilled with excavated material. When approved by the Engineer, conduit may be trenched in sub-base but must be backfilled with cement-stabilized base. Conduit placed after base or surfacing operation has begun must be jacked or bored.
6. Open ends of all conduit and raceways shall be fitted with temporary caps or plugs to prevent entry of dirt, debris and rodents during construction.
7. Conduit entry into the top of junction boxes shall be made weathertight using threaded fittings into hubs, or with sealing locknuts inside and out.
8. A bonding jumper shall be installed from grounding bushing to nearest rod, grounding lug, or grounding conductor. At service poles, bonding jumper shall be AWG Size No. 6. All other jumpers shall be minimum size AWG No. 8. Conduit used as casing under roadways for duct cable need not be grounded if duct extends full length through the casing.
9. Conduit ends shall be sealed with heat shrink boots or tubes with sealant, silicone caulking or shall be sealed by other methods approved by the Engineer. Sealing shall be done after completion of any required pull tests.
10. Where called for on the plans, trenched conduit shall be placed on a 2-inch sand cushion and backfilled with a minimum of 6 additional inches of sand fill.
11. Conduits entering ground boxes shall be placed so that the conduit ends shall be not less than 5 inches nor more than 9 inches from the box cover (See ground box detail).
12. Metal junction boxes shall be bonded to the grounding conductor.

## III. ELECTRICAL CONDUCTORS

### A. Materials.

1. Insulated conductors NEC Type XHHW or USE (XLP). Conductors in circuits containing two or more insulated conductors shall be color-coded at each accessible point (i.e., ground boxes, pole bases, junction boxes). Color-coding for No. 10 and smaller shall be by continuous jacket color. Color-coding of electrical conductors No. 8 or larger may be by continuous jacket color or colored tape. Colored tape marker shall consist of a half-lap layer of tape covering a six inch length of conductor.
2. Bonding conductors No. 8 and smaller, tied to ground rods, shall be solid. Connection of bonding conductor to ground rod shall be made using UL listed connectors designed for such purpose.

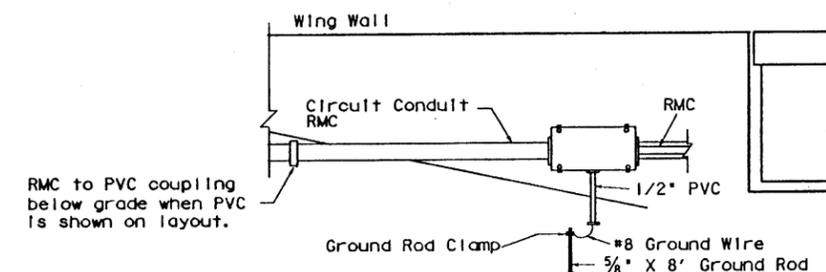


### CONDUIT STRAP DETAIL

(Attachment to concrete surfaces)  
(See para. II.B.2)

### CONDUIT HANGER DETAIL

(Attachment to horizontal surfaces)  
(See II.B.2)



### NOTES

1. Conduit shall be 2" RMC for duct cable entry to junction box.
2. Ground rod clamp to be Blackburn GG 5/8H, Weaver W5/8 or equal.
3. Surface mounting shown, for conduit to be placed in structure use flush-mounted box.
4. Bond junction box to grounding conductor.

### TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

### CONDUIT CONDUCTORS



STANDARD PLANS  
TEXAS DEPARTMENT OF TRANSPORTATION

### ELECTRICAL DETAILS

ED (1) - 93

10-19-93 ZFA2 (122, 101) ED193 STD		STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET
ORIG. DATE	01-92	K.A.B.	6	FBD 001 (002)	30
REV. DATE	5-93	T.B.			
REV. DATE	10-93	R.E.S.			
REV. DATE		T.B.			
COUNTY		CONTROL	SECTION	JOB	HIGHWAY
GALVESTON		0367	06	050	5487

**B. CONSTRUCTION METHODS.**

1. A non-metallic pull rope shall be used in pulling conductor in non-metallic conduit.
2. After conductor is placed in conduit, a pull test will be made on conductors. When any length of conductor cannot be freely pulled the Contractor shall make any needed alterations or repairs at the Contractor's expense.
3. Conductors in illumination poles shall be supported by a J-hook in top of pole.
4. A sufficient length of conductor shall be left in ground boxes (two feet minimum to point of splice, three feet minimum when conductor is pulled through with no splice), enclosures, and pole bases (one foot minimum) for making up connections.
5. Except for overhead wiring, splices shall be made only in junction boxes, ground boxes, pole bases, or electrical enclosures and shall be made with approved compression sleeves or split bolt connectors. Splices shall be insulated with heavy wall heat shrink tubing containing factory applied sealant. Heat shrink sleeves shall lap conductors insulation a minimum of 2 inches on both sides of the splices.
6. When approved by the Engineer, wire nuts may be used for No. 8 and smaller conductors in above-ground junction boxes, but not in pole bases or ground boxes. Wire nuts shall be positioned upright to prevent the accumulation of water.

**IV. DUCT CABLE.**

- A. Duct cable shall be placed by the open trench method, except where otherwise noted, at a minimum depth of 18 inches unless otherwise indicated. Bends in duct cable shall be made in the manner recommended by the manufacturer. Minimum bending radius shall be 15 inches for 1-inch duct and 18 inches for 1-1/4 inch duct. Handling of duct cable reels and installation of duct shall be as recommended by the manufacturer. Duct entering ground boxes shall be placed so that the duct ends are not less than 5 inches or more than 9 inches from the box cover. Duct for duct cable is designed as a conduit system and shall be considered as such in NEC interpretations. Duct shall not be spliced. Ends of duct shall be cut neat and straight and shall be reamed to remove sharp edges.
- B. After duct cable has been installed, a pull test will be made on conductors. If conductors cannot be freely pulled, Contractor shall replace or otherwise adjust installation to free up the conductors. Duct cable ends shall be sealed with approved compound or with heat-shrink material after pull test is completed.
- C. Where noted on plans, duct cable shall be placed on a 2-inch sand cushion and backfilled with a minimum 6 additional inches of sand.
- D. Duct cable shall be encased in conduit when shown on the plans. Duct cable shall be extended through the conduit casing in one continuous length.

**V. GROUND BOX.**

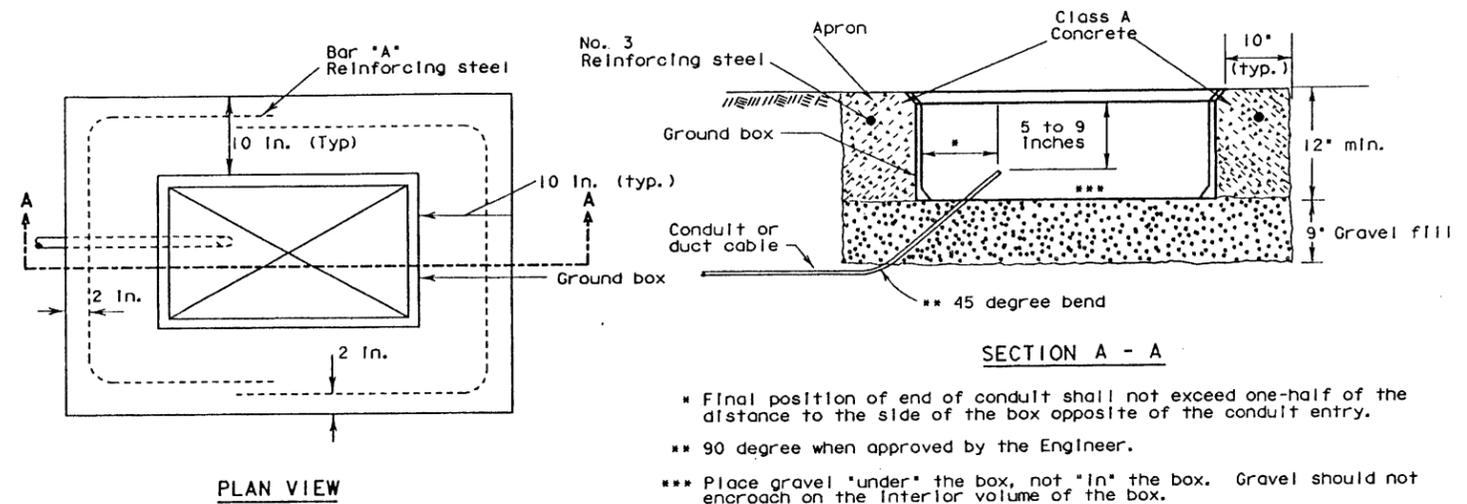
**A. MATERIALS.**

1. Ground boxes shall be concrete or polymer concrete, as required by the descriptive code shown elsewhere.
2. All precast ground boxes and covers shall be permanently marked with manufacturer's name or logo and manufacturer's model number.
3. Covers shall be bolted down. Bolt holes shall be arranged to drain dirt.
4. When steel covers are required, covers shall be provided with a grounding lug with 1/2 - 13 NC female threads on the underside of the cover.
5. Polymer Concrete boxes shall meet the following requirements:
  - a. Boxes shall be manufactured from Reinforced Polymer Concrete (RPM) composed of borosilicate glass fiber, a catalyzed polyester resin and an aggregate. Side walls may be fiber reinforced polymer.
  - b. Minimum inside dimensions shall be as follows (width x length x depth):
 

Type A shall be 11.5 inches x 21 inches x 10 inches	(122311)
Type B shall be 11.5 inches x 21 inches x 20 inches	(122322)
Type C shall be 15.25 inches x 28.25 inches x 10 inches	(162911)
Type D shall be 15.25 inches x 28.25 inches x 20 inches	(162922)
Type E shall be 11.5 inches x 21 inches x 16 inches	(122317)
  - c. Bottom edge of box or extension shall be footed with a minimum 1/4 inch flange.
  - d. Ground boxes shall withstand a test loading of 20,000 lbs. over a 10 in. by 10 in. area centered on the lid and 600 lbs. per sq ft. applied over the entire side wall. The model of ground-box proposed shall have been tested by a laboratory independent of the manufacturer to meet loading requirements. Certification of such tests shall be submitted to the Engineer for approval.
  - e. Covers shall be 2 inch (nominal) thick polymer concrete. Cover shall be secured with two 1/2 inch stainless steel bolts. Bolts shall be captive and shall withstand a minimum of 70 ft-lbs torque and shall have a minimum 750 lbs straight pull out strength. Covers shall be skid resistant, minimum 0.5 coefficient of friction. Covers shall be interchangeable between manufacturers and shall conform to the dimensions shown below. Cover shall be legibly imprinted with the words "Danger, High Voltage," in minimum 2 inch letters. When required, other cover lettering shall be as shown elsewhere on the plans.

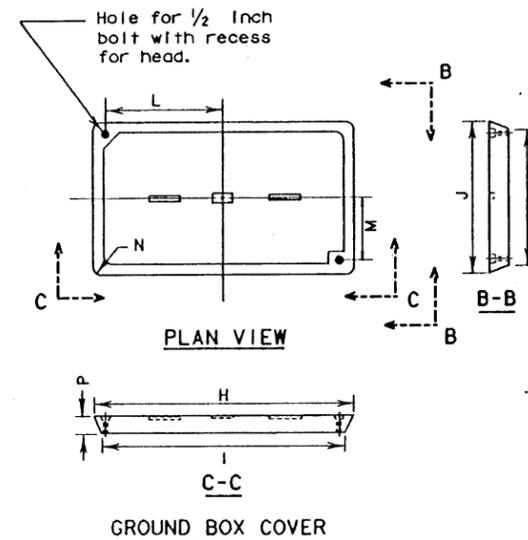
**B. CONSTRUCTION METHODS.**

1. Steel covers shall be bonded to grounding conductor with a 3 foot jumper.
2. Where indicated on the plans, ground box will be encased in concrete apron as detailed below. Construction of apron including concrete and reinforcing steel shall not be paid for directly but shall be subsidiary to the ground box. Field bending of reinforcing steel will be allowed.
3. A minimum gravel fill of 9 inches shall be placed under each ground box. Gravel shall be coarse aggregate grade No. 1 in accordance with Item 421.
4. The Contractor may cut the necessary conduit holes in box extensions only. Holes must be 18 inches or more below the cover.
5. Concrete for aprons shall be considered miscellaneous concrete for testing purposes.

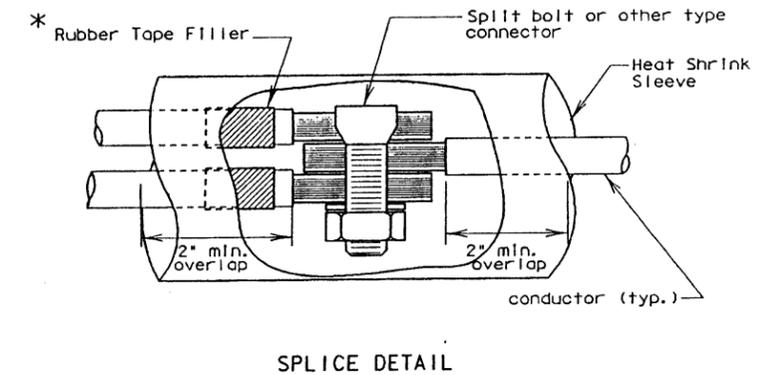


- \* Final position of end of conduit shall not exceed one-half of the distance to the side of the box opposite of the conduit entry.
- \*\* 90 degree when approved by the Engineer.
- \*\*\* Place gravel "under" the box, not "in" the box. Gravel should not encroach on the interior volume of the box.

**APRON FOR GROUND BOXES**  
(Where required)



**GROUND BOX COVER**



- \* Tape filler required where two or more conductors enter one heat shrink tube to ensure watertight splice.

BOX	GROUND BOX COVER DIMENSIONS							
	DIMENSIONS (INCHES)							
SIZE (WXL)	H	I	J	K	L	M	N	P
12 in x 23 in	23/4	23	13 3/4	13 1/2	9 3/8	5 3/8	1 3/8	2
16 in x 29 in	30 1/2	30 3/4	17 1/2	17 3/4	13 3/4	6 3/4	1 3/8	2

**ELECTRICAL CONDUCTORS  
DUCT CABLE  
GROUND BOXES**



STANDARD PLANS  
TEXAS DEPARTMENT OF TRANSPORTATION

**ELECTRICAL DETAILS  
ED (2) - 93**

10-19-93 ZFA2(122,103) ED293.STD			
ORIGINAL DRAWING DATE: 01-92	STATE DISTRICT: 6	FEDERAL REGION: 6	FEDERAL AID PROJECT: FBD 001 (002)
DESIGNED BY: K. A. B.	REVISIONS:	COUNTY: GALVESTON	CONTRACT SECTION JOB NO: 0367 06 050
CHECKED BY: T. B.	DATE: 5-93 K. A. B.		
ENGINEER: R. E. S.			
DATE: T. B.			

# ELECTRICAL SERVICES NOTES

Faulty fabrication or poor workmanship in any material, equipment, or installation will be considered justification for rejection. Materials and installation shall comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Where manufacturers provide warranties or guarantees as a customary trade practice, Contractor shall furnish to the State such warranties or guarantees. The location of conductors, conduit, junction boxes, duct cable, ground boxes, transformer stations, and service poles are diagrammatic only and may be shifted by the Engineer to accommodate local conditions.

All material shall be new and unused. Alternate material equal to or better than those specified may be substituted with the approval of the Engineer. The Contractor shall contact the utility company for metering requirements and any additional requirements and shall comply with all utility company requirements.

All work, materials, services, and incidentals, whether or not specifically shown on the plans, which may be necessary to obtain electrical power and for a complete and proper electrical service installation as shown on the plans, shall be performed, furnished and installed by the Contractor except that the costs involved in extending primary lines to electrical service locations will be paid for under Force Account work. When primary line extensions are required, the Contractor shall consult with the appropriate utility company to determine costs and requirements and shall coordinate the utility company's work as approved by the Engineer.

Lugs on circuit breakers and contactors shall be large enough to accept branch circuit conductors sized as shown on the plans. Where branch circuit conductors are enlarged to reduce voltage drop beyond the capacity of lugs, the lugs shall be changed or distribution blocks shall be installed in the service enclosure to splice branch circuit conductors to the maximum wire size for which the circuit breaker or lighting contactor is rated to accept.

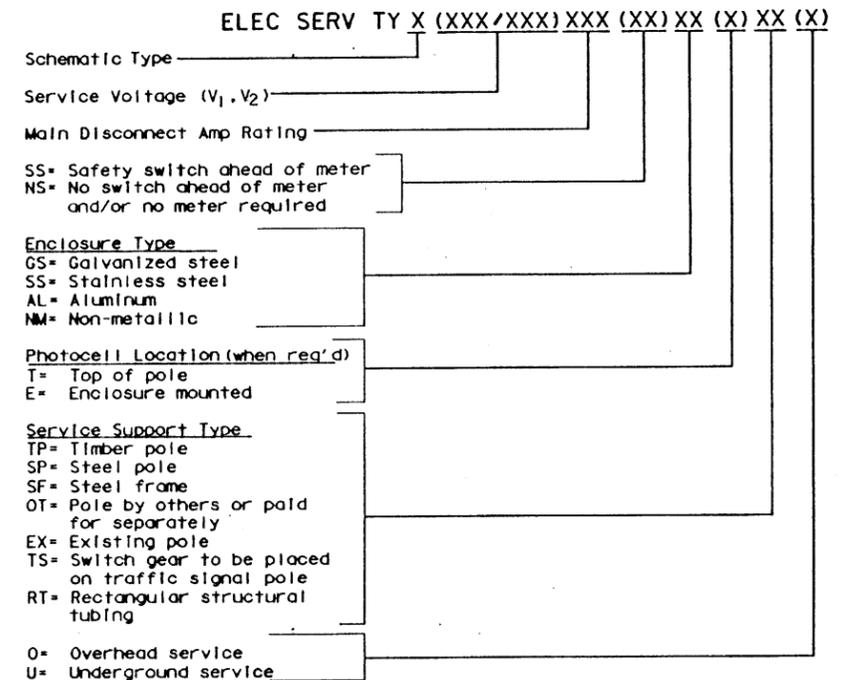
1. **Safety switch.** Shall be placed ahead of meter, when switch is required. The switch shall be of the heavy duty type, unfused, NEMA 3R enclosure and equipped with a solid neutral (s/n) assembly. Switch shall be UL listed. Switches shall be rated 480 VAC (min.) for 240/480V services and rated 240 VAC (min.) for 120/240v services. The Contractor shall modify switch to allow padlocking in the "on" position.
2. **Meter.** Where metering is required, utility company will provide the meter base. The Contractor shall install the meter base.
3. **Service Assembly Enclosure, for Type A, B, and C.** Enclosure shall be sized to provide adequate wiring space in accordance with NEC. All external screws shall be type 302 stainless steel. All enclosures shall be fitted with equipment-mounting panels installed inside enclosure on collar studs or tapped bosses. Panels shall be 12-gauge steel or 0.10"-thick aluminum, primed and painted white. All enclosure doors shall have stainless steel closure clamps and provisions for padlocking. Conduit entries into the top of enclosures shall have threaded hubs. Enclosure disconnect combination shall be UL listed and rated as service entrance equipment. Two 1/8" inch drain holes shall be placed in bottom of enclosure at opposite corners. All enclosures shall be permanently labeled "Danger High Voltage" on the front of the door, minimum one inch letters. The service pole descriptive code specifies that the enclosure shall be one of the following types:
  - a. GS: Galvanized steel enclosures shall be NEMA 3R-rated, constructed of 14-gauge galvanized steel, with piano hinged door, and drip shield.
  - b. SS: Stainless steel enclosure shall be NEMA 3R-rated, with piano hinged door, constructed of 14 gauge Type 304 stainless steel. All hardware including hinge pin shall be stainless steel.
  - c. AL: Aluminum enclosures shall be NEMA 3R-rated, with piano hinged door, constructed from 0.08 inch thick aluminum. All hardware including hinge pin shall be stainless steel.
  - d. NM: Non-metallic enclosures shall conform to NEMA standard for Type 3R enclosures and shall be constructed of molded fiberglass, PVC, or other material approved by the Engineer.

\* A two or three point heavy duty hinge with stainless steel hinge pins may be used for load centers when approved by the Engineer.
4. **Main Disconnect.** Main disconnect device shall be a fusible switch or circuit breaker, as shown on Electrical Service Data Sheet. Switch shall be UL and NEMA-rated Type HD (heavy duty), flange mounted or front mounted in the service assembly enclosure. Switch shall be two pole, rated 240 volts or 480 volts as required. Switch shall have clips for Class R fuses. Circuit breaker shall be UL and NEMA-rated thermal-magnetic circuit breaker, flange-mounted or front mounted in the service assembly enclosure. Breaker shall be two-pole, (one-pole 480V for Ty. B), rated 480 volts or 240 volts as required. Circuit breakers shall have a minimum interrupting rating of 14,000 Amps. Voltage and amperage rating of switches and breakers shall be as shown elsewhere on Electrical Service Data Sheet. Switch and breaker handles shall be capable of padlocking in "On" and in "Off" positions. Main disconnect shall be operable from the outside of the enclosure and shall be interlocked to prevent the service assembly enclosure door from being opened with disconnect in the "On" position. The interlock shall have a manual override such that the main disconnect is capable of being turned "On" with the enclosure door open.
5. **Lightning Arrester.** Arresters shall be MOV-type secondary surge arresters rated 650 volts for 480V services and 175 volts for 120/240V services and shall meet ANSI, IEEE, UL, and NEMA Standards. Mounting brackets shall be provided for mounting the arresters inside the service assembly enclosures. Lightning arrester leads shall be run as straight and short as practical.
6. **Fuse Blocks.** Fuse blocks shall be rated 600 volts (min.) and shall accept a 13/32in. x 1/2in. fuse. Fuse blocks shall be furnished with integral insulated fusepuller and be suitable for mounting to the back panel of the enclosure. Fuse for 120/240 volt service shall be rated 250 volts (min.) and fuses for 480 volt service shall be rated 500 volts (min.). Fuses shall be 3 amp, dual-element (time-delay) fuses.
7. **Control Transformer.** Control transformer shall be rated 250 sealed VA and a minimum inrush rating of 1200 VA at 30 percent power factor. Voltage rating shall be 480-120 volts.
8. **Control Station ("H-O-A" Switch).** Control station shall be a maintained-contact, three position selector switch in a NEMA 1 enclosure. Switch shall be rated 600 volts and shall be fitted with "Hand-Off-Auto" legend.
9. **Photo Electric Control.** shall consist of a photocell, internal lightning arrester and relay mounted inside a weatherproof enclosure with standard 3-prong twist lock photocell plug and receptacle. The enclosure shall be made of poly-acrylic with clear acrylic window. Enclosure chassis shall be molded phenolic plastic. The photocell shall have a polyethylene gasket, and shall have a hermetically sealed cadmium sulfide cell. The arrester shall have an enclosed type expulsion arrester rated 2.0 kV sparkover with 10,000 amps follow-through. Relay shall be time delay type with normally closed contacts. Photo electric control shall be rated 1800 VA, 105-285 volts. Enclosure mounted photocells shall be the same as above except that the photocell shall be mounted inside the enclosure. The enclosure shall have two acrylic windows, or other material approved by the Engineer, one on each side of the enclosure. Each window shall be approximately one inch by two inches or as otherwise approved by the Engineer. The photocell shall be mounted in a position to receive light from one window.
 

The Contractor shall be responsible for proper operation of the photo-electric control. The Contractor shall move and/or adjust or shield the photocell from stray or ambient nighttime light or shall make any other adjustments required for proper operation. The photocell shall face North when practicable. The photocell shall turn on the illumination system at 1.0 +(-) 0.5 footcandle and turn off the illumination system at two (2) footcandles higher than turn on.
10. **Lighting Contactor.** Lighting contactor shall be a NEMA lighting contactor, two-pole, electrically held type designed to control high pressure sodium lighting loads, with silver alloy double break contacts rated at 480 volts or 600 volts.
11. **Power Distribution Terminal Blocks.** Power distribution terminal blocks shall be rated for 600 volts and shall be used for line side connections to branch circuit breakers where more than one circuit breaker is required. Lugs on blocks shall be properly sized for conductors being used. Only one conductor shall be placed under each lug.
12. **Neutral/Ground Bus.** Neutral/ground bus shall be a factory-made insulated, groundable bus with properly sized lugs for grounding and neutral conductors.

13. **Branch Circuit Breakers.** Unless otherwise shown on the plans, circuit breakers shall be the molded case thermal-magnetic type. Circuit breaker voltage shall be compatible with their use. Single pole circuit breakers mounted on high voltage (600V min) insulating fabric shall be used for 480 volt type B service. Circuit breakers shall have a minimum interrupting capacity of 10,000 amps.
14. **Circuit Breaker Panelboard.** Panelboard shall be a commercial/Industrial type with bolt-on branch circuit breakers in a NEMA 3R enclosure. Panelboard for Type C service shall be a MLO (Main Lugs Only) three-wire single phase, S/N panelboard. Panelboards shall be UL-listed and shall meet Federal Specification W-P-115b, Type I, Class 1 requirements and shall have a minimum of 12 one-pole spaces. Tandem and half-width breakers will not be allowed. Conduit entries into the top of enclosure shall have threaded hubs. Panelboards shall have dead front trim.
15. **Load Center.** Load center shall be a circuit breaker panelboard rated 120/240 volts three wire, single phase, S/N in NEMA 3R enclosure with main breaker. Load center shall have a minimum rating of 70 amps and shall have space for a minimum of six full size breakers. Tandem and half-width breakers will not be allowed. Load centers shall be UL listed, and shall meet Federal Specification W-P-115c, Type I, Class 2 requirements. Load center shall have a threaded hub conduit entry for conduit entering the top of the enclosure. Load centers shall have dead front trim and shall be rated as service entrance equipment. Load center enclosures shall meet the requirements of Note 3 paragraph a,b,c, or d above. External operating handle shall not be installed. Closure clamps will not be required.

## EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE



Example: ELEC SERV TYD (120/240)070(NS)GS(T)TP(O)

## ELECTRICAL SERVICES NOTES

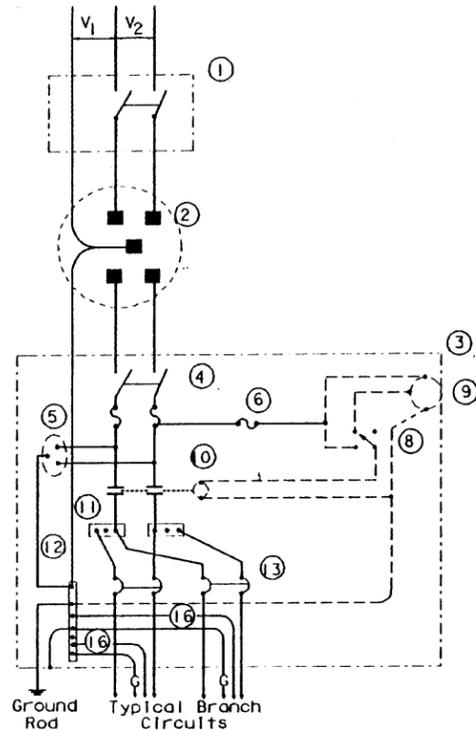


STANDARD PLANS  
TEXAS DEPARTMENT OF TRANSPORTATION

## ELECTRICAL DETAILS ED (3) - 93

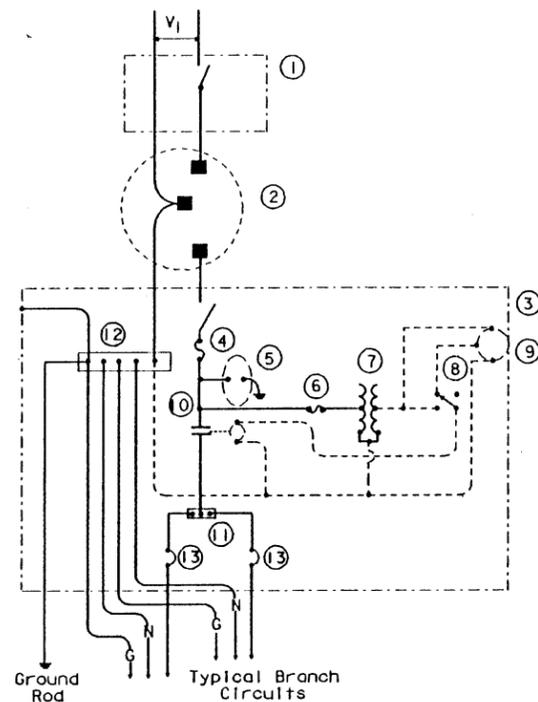
ORIGINAL DRAWING DATE: 01-92	STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT	SHEET NO.
DR.: K. A. B. DC.: T. B. DR.: R. E. S. DC.: T. B.	5-93 K. A. B. 10-93 K. A. B.	6	FBD 001 (002)	32
COUNTY			CONTRACT	SECTION
GALVESTON			036796	050 6187

Traffic Operations Division



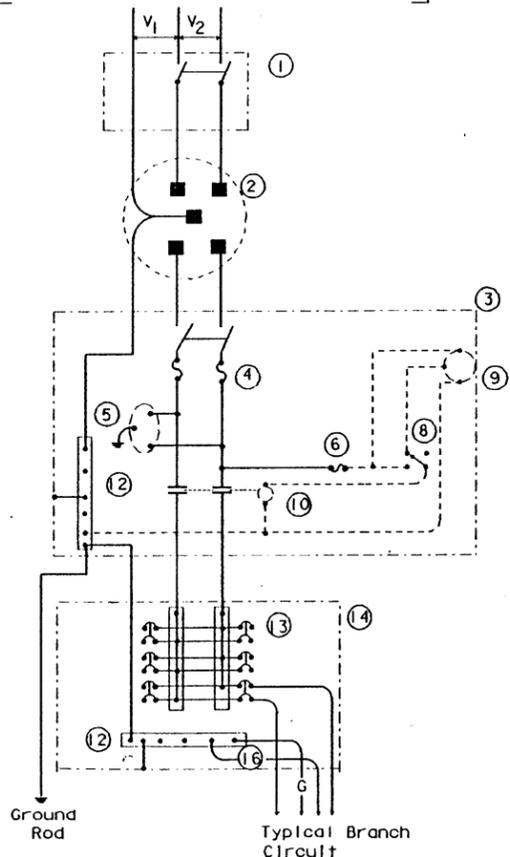
**SCHEMATIC TYPE A**  
THREE WIRE

Maximum branch circuit size: 100 amps for two pole 480V, 125 amps for one or two pole 120V or 240V.



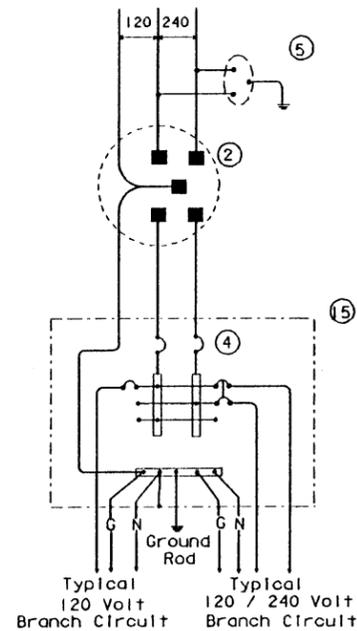
**SCHEMATIC TYPE B**  
TWO WIRE

Maximum branch circuit size: 50 amps for one pole 480V, 125 amps for one pole 120V or 240V.



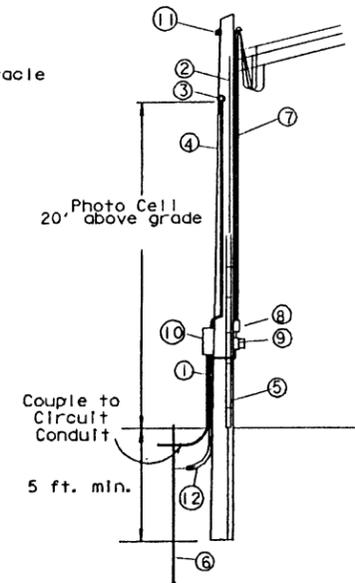
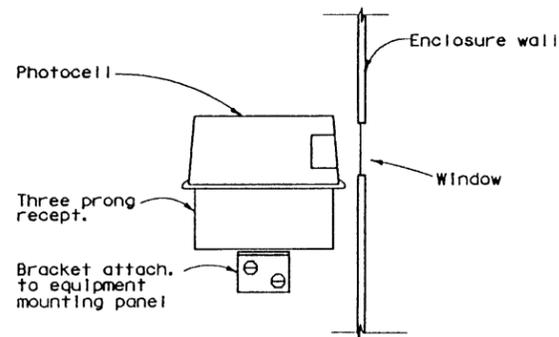
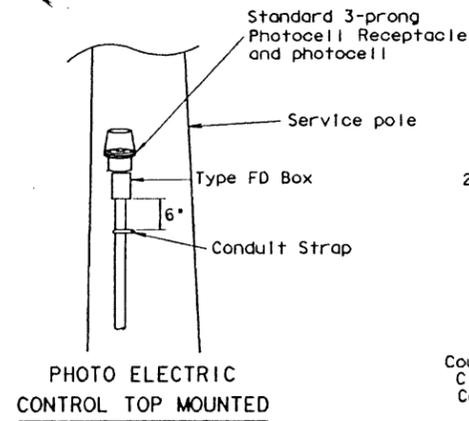
**SCHEMATIC TYPE C**  
THREE WIRE

Maximum branch circuit size: 100 amps for two pole 480V, 125 amps for two pole 120V or 240V.



**SCHEMATIC TYPE D**  
120/240 VOLTS - THREE WIRE

Install photocell and lighting contactor when shown on Electrical Service Data Sheet.



Service Drop from Utility  
Three Wire Service Shown -  
Omit One Conductor for  
Two Wire Service

- 1 - RM conduit - same size as branch circuit conduit
- 2 - No. 6 bare ground wire to butt-wrap ground
- 3 - Photo Electric Control and 1/2" RM conduit - See detail
- 4 - Class 5 pole, 30' minimum or as otherwise required by NESC and utility company
- 5 - Ground wire moulding - 8' min.
- 6 - 5/8" X 8" Copper clad ground rod
- 7 - Service conduit and conductors - See Electrical Service Data Sheet
- 8 - Safety switch (when required)
- 9 - Meter (when required)
- 10 - Service enclosure
- 11 - Lightning arrester (top mounted)
- 12 - No. 6 bare grounding electrode conductor in 1/2" PVC to ground rod

**TIMBER POLE NOTES**

1. Conduit and conductors attached to service pole and underground within 12 inches of service pole shall not be paid for directly but shall be subsidiary to the service pole.
2. Install photo electric control on North side of pole or in service enclosure as required.
3. Attach service enclosure with galvanized channel (Unistrut, Kindorf, or equal). Gain pole two places to provide flat surfaces. Paint ends of channel with zinc rich paint.

**SCHEMATIC LEGEND**

1. Safety Switch (when required)
  2. Meter (when required)
  3. Service Assembly Enclosure
  4. Main Disconnect (Switch or Breaker, See Electrical Service Data Sheet)
  5. Lightning Arrester
  6. Fuse Block
  7. Control Transformer (480-120 Volts) (for Type B only)
  8. Control Station ("H-O-A" Switch)
  9. Photo Electric Control (enclosure-mounted shown)
  10. Lighting Contactor
  11. Power Distribution Terminal Blocks
  12. Neutral/Ground Bus
  13. Branch Circuit Breaker (See Electrical Service Data Sheet)
  14. Circuit Breaker Panelboard (See Electrical Service Data Sheet)
  15. Load Center
  16. Neutral conductor (when required)
- Power Wiring  
- - - - - Control Wiring

**ELECTRICAL SERVICE SCHEMATICS**  
**ELECTRICAL SERVICE SUPPORT**  
**TYPE TP (OVERHEAD)**



STANDARD PLANS  
TEXAS DEPARTMENT OF TRANSPORTATION

**ELECTRICAL DETAILS**  
**ED (4) - 93**

ORIGINAL DRAWING DATE: 01-92	STATE DISTRICT: 6	FEDERAL REGION: 6	FEDERAL AID PROJECT: F.B.D. 001 (002)	5
ENL.- K. A. B.	REVISED: 5-93 K. A. B.	NO. 6	SECTION: 33	
CL.- T. B.	10-93 K. A. B.	COUNTY: GALVESTON	CONTROL SECTION: 0367 06 050	5807
DR.- R. E. S.				
CL.- T. B.				



10/94 7440

# Texas Department of Transportation

P.O. BOX 1386 • HOUSTON, TEXAS 77251-1386 • (713) 869-4571

April 7, 1995

Galveston County  
Project: FBD 001(002)  
Control: 0367-06-050  
Highway: SH 87 - Galveston Ferry Landing

Austin Bridge & Road  
P. O. Box 5445  
Houston, Texas 77262

Gentlemen:

The following North Shore Supply Company (revised) shop drawings for Gangplank has been reviewed and approved with modification:

<u>DRWG. NO.</u>	<u>DESCRIPTION</u>	<u>ACTION</u>
9005-S1	Steel Details	Approved with modification

Sincerely,

J. C. Liu, P.E.  
Director of District Bridge Design  
Houston District

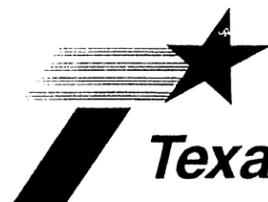
JCL:PIT:ach

cc: North Shore Supply Company  
Design Division - Bridge ✓  
Materials and Tests Division  
District Construction (Letter only)  
Area Engineer - Mr. John Pinkston, P.E.  
File

RECEIVED  
APR 11 1995  
DESIGN DIVISION

RECEIVED  
APR 11 1995  
DESIGN DIVISION





# Texas Department of Transportation

P.O. BOX 1386 • HOUSTON, TEXAS 77251-1386 • (713) 869-4571

February 24, 1995

Galveston County  
Project: FBD 001(002)  
Control: 0367-06-050  
Highway: SH 87

Austin Bridge Company  
P. O. Box 5445  
Houston, Texas 77262

Gentlemen:

The Economy Forms Corporation shop drawing for Floating Mooring Dock Exterior Wall

Forms have been reviewed and approved without modifications.

Should you have any questions or comments, please call Ms. Marietta

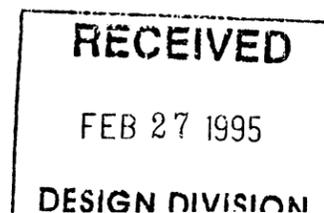
Francisco at (713) 802-5230.

Sincerely,

J. C. Liu, P.E.  
Director of District Bridge Design  
Houston District

JCL:JPV:ach

cc: EFCO  
Design Division - Bridge ✓  
Material & Tests Division  
Resident Engineer J. Pinkston, P.E.  
District Construction (Letter only)  
File



**ENGINEERED  
EFFICIENCY**



DATE: 01/16/94  
PROJECT: SH 87 @ GALVESTON FERRY LANDING  
LOCATION: GALVESTON, TX.  
CONTRACTOR: AUSTIN BRIDGE

CONTENTS	
Dwg. No.	Dwg. Description
DAL-E-001	KEY PLAN - FLOATING MOORING DOCK EXTERIOR WALLS
DAL-E-002	PLAN VIEW - POUR A
DAL-E-003	PLAN VIEW - POURS B & C
DAL-E-004	PLAN VIEW - POUR D
DAL-E-005	PLAN VIEW - POUR E
DAL-E-006	SECTION "A" & DETAILS
DAL-E-006.1	SECTION "C" & DETAILS

CONTINUED ON PAGE 2 OF 2

EFCO AGREEMENT NUMBER: 9450390-01

The EFCO District Office nearest you is:  
Economy Forms Corporation  
1915 WEST COMMERCE STREET  
DALLAS, TEXAS 75208-8104  
FAX: 214/748-7596 PHONE: 214/748-6595

**SAFETY ALERT  
INSPECTION REQUIRED**

All contractor-owned equipment must be inspected by the user before erection. Check all structural elements, such as bolting blocks, flanges, ties, and accessories.

DISCARD STRUCTURALLY DAMAGED EQUIPMENT



**THINK SAFETY - WORK SAFELY**

*steel forms for concrete construction*

TEXAS DEPARTMENT OF TRANSPORTATION **CONTACT:** Sales MIKE BENHAM (713/626-8443)  
Field Service TERRY WUBS  
Engineer FRED POURSHAHIDI

Approved without modification  
 Approved with modification as shown

Date FEB 23 1995 By J. Vogel  
Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

**ENGINEERED  
EFFICIENCY**



DATE: 01/16/95

PROJECT: SH 87 @ GALVESTON FERRY LANDING

LOCATION: GALVESTON, TX.

CONTRACTOR: AUSTIN BRIDGE

EFCO AGREEMENT NUMBER: 9450390-01

The EFCO District Office nearest you is:  
 Economy Forms Corporation  
 1915 WEST COMMERCE STREET  
 DALLAS, TEXAS 75208-8104  
 FAX: 214/748-7596 PHONE: 214/748-6595  
 CONTACT: Sales MIKE BENHAM (713/626-8443)  
 Field Service TERRY WUBS  
 Engineer FRED POURSHAHIDI

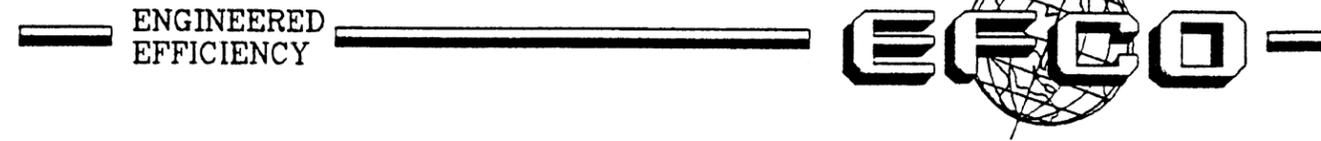
CONTENTS	
Dwg. No.	Dwg. Description
DAL-E-007	KEY PLAN - FLOATING MOORING DOCK INTERIOR WALLS
DAL-E-008	PLAN VIEW - POUR A1
DAL-E-009	PLAN VIEW - POUR B1
DAL-E-010	PLAN VIEW - POUR C1
DAL-E-011	PLAN VIEW - POUR D1
DAL-E-012	PLAN VIEW - POUR E1
DAL-E-013	SECTION "B"
DAL-ED-014	FIELD DRILLING REQUIREMENTS

CONTINUED FROM PAGE 1 OF 2

TEXAS DEPARTMENT TRANSPORTATION	
<input checked="" type="checkbox"/>	Approved without modification
<input type="checkbox"/>	Approved with modification as shown
Date	By <u>J Vogel</u>
FEB 23 1995	
Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.	

*steel forms for concrete construction*

ECONOMY FORMS CORPORATION  
STEEL FORMS FOR CONCRETE CONSTRUCTION



Dear Customer;

In the near future, you are to receive your EFCO forms for your project. Please make an accurate count of incoming shipments of leased equipment. If there is any damage or shortage on incoming shipments, note this on your copy of the freight bill so that you may make a claim against the carrier.

Years of time, study, and experience have gone into developing EFCO equipment into the most efficient forming system available. Although the mechanics are simple, getting your form crew trained to use the equipment properly in the shortest time possible will reflect favorably on your overall forming costs. Toward this end ECONOMY FORMS CORPORATION FIELD SUPERVISOR will be able to visit your job and instruct your crew.

Since the field supervisor's time is limited, we ask your cooperation in helping schedule this visit so that the maximum amount of instruction can be given during his relatively short stay. Proper timing, of course, means that the form crew should be available, footings should be poured, reinforcing steel, necessary tools, and wood material (if required) should be on the job site. In order to provide field service for all our customers, these visits must be planned in advance. Therefore we would appreciate having five working days notice prior to the date you expect to start form work.

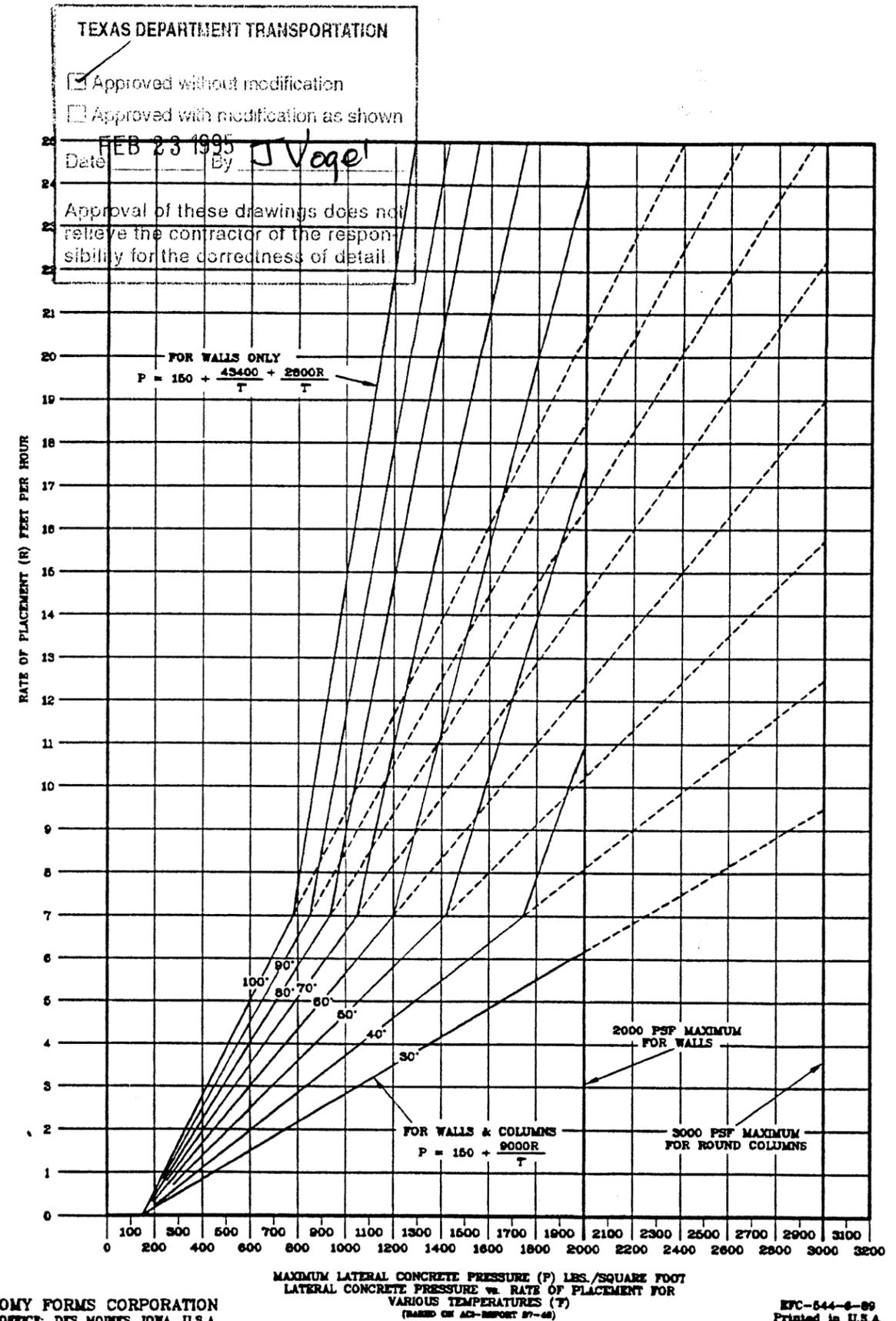
Under your contract, you are expected to clean and repair any equipment which will be returned to EFCO. If EFCO has to provide this service, it is at your expense. **DO NOT SAND BLAST THIS EQUIPMENT.** Sand blasting pits the faces of the forms and makes them unacceptable for redistribution. Return of sand blasted forms results in charges to you for damaged equipment.

Before shipping, the forms have been treated with a protective coating, { EF-GARD }. They do not have any release agent on the face sheet. Therefore, before your first use and after each subsequent use, apply a coat of form release agent. For best results, we recommend EF-COAT.

We look forward to working with you. If you have any questions, please call.

EFCO FIELD SERVICE  
PHONE: 1-(214)-748-6595

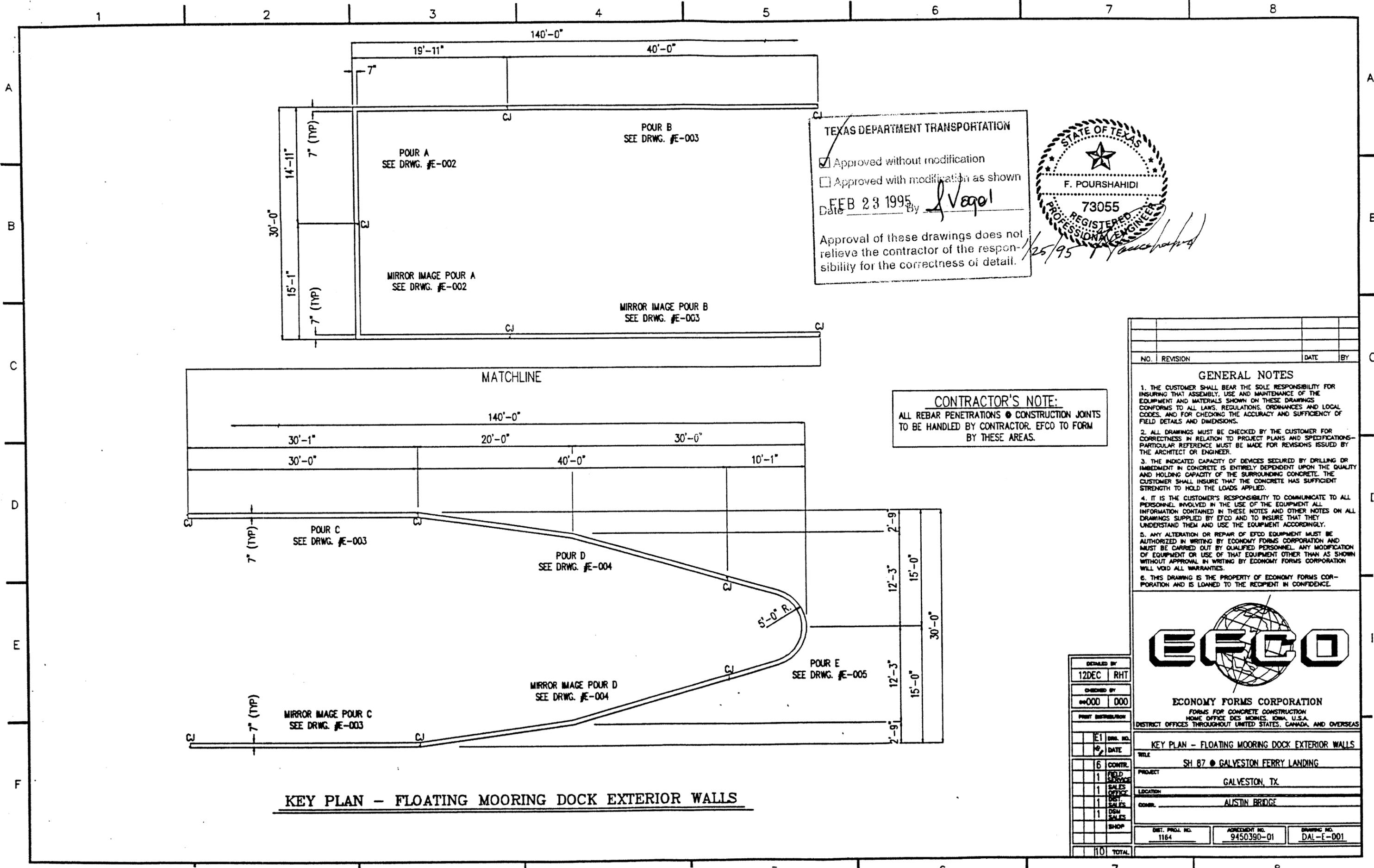
SEE ERECTION DRAWINGS NOTES FOR  
MAXIMUM ALLOWABLE POUR PRESSURES



ECONOMY FORMS CORPORATION  
HOME OFFICE: DES MOINES, IOWA U.S.A.

CAUTION: Mix design and/or additives can directly affect the pour pressures and the results of this report. Confer with your concrete supplier for additional information.

EFC-544-8-89  
Printed in U.S.A.

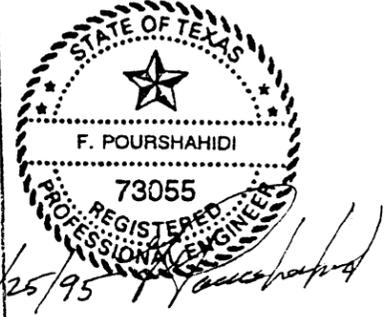


TEXAS DEPARTMENT TRANSPORTATION

Approved without modification  
 Approved with modification as shown

Date FEB 23 1995 By *J. Vega*

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.



**CONTRACTOR'S NOTE:**  
 ALL REBAR PENETRATIONS @ CONSTRUCTION JOINTS TO BE HANDLED BY CONTRACTOR. EFCO TO FORM BY THESE AREAS.

NO.	REVISION	DATE	BY

- GENERAL NOTES**
1. THE CUSTOMER SHALL BEAR THE SOLE RESPONSIBILITY FOR INSURING THAT ASSEMBLY, USE AND MAINTENANCE OF THE EQUIPMENT AND MATERIALS SHOWN ON THESE DRAWINGS CONFORMS TO ALL LAWS, REGULATIONS, ORDINANCES AND LOCAL CODES, AND FOR CHECKING THE ACCURACY AND SUFFICIENCY OF FIELD DETAILS AND DIMENSIONS.
  2. ALL DRAWINGS MUST BE CHECKED BY THE CUSTOMER FOR CORRECTNESS IN RELATION TO PROJECT PLANS AND SPECIFICATIONS - PARTICULAR REFERENCE MUST BE MADE FOR REVISIONS ISSUED BY THE ARCHITECT OR ENGINEER.
  3. THE INDICATED CAPACITY OF DEVICES SECURED BY DRILLING OR IMBEDMENT IN CONCRETE IS ENTIRELY DEPENDENT UPON THE QUALITY AND HOLDING CAPACITY OF THE SURROUNDING CONCRETE. THE CUSTOMER SHALL INSURE THAT THE CONCRETE HAS SUFFICIENT STRENGTH TO HOLD THE LOADS APPLIED.
  4. IT IS THE CUSTOMER'S RESPONSIBILITY TO COMMUNICATE TO ALL PERSONNEL INVOLVED IN THE USE OF THE EQUIPMENT ALL INFORMATION CONTAINED IN THESE NOTES AND OTHER NOTES ON ALL DRAWINGS SUPPLIED BY EFCO AND TO INSURE THAT THEY UNDERSTAND THEM AND USE THE EQUIPMENT ACCORDINGLY.
  5. ANY ALTERATION OR REPAIR OF EFCO EQUIPMENT MUST BE AUTHORIZED IN WRITING BY QUALIFIED PERSONNEL. ANY MODIFICATION OF EQUIPMENT OR USE OF THAT EQUIPMENT OTHER THAN AS SHOWN WITHOUT APPROVAL IN WRITING BY ECONOMY FORMS CORPORATION WILL VOID ALL WARRANTIES.
  6. THIS DRAWING IS THE PROPERTY OF ECONOMY FORMS CORPORATION AND IS LOANED TO THE RECIPIENT IN CONFIDENCE.



**ECONOMY FORMS CORPORATION**  
 FORMS FOR CONCRETE CONSTRUCTION  
 HOME OFFICE DES MOINES, IOWA, U.S.A.  
 DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

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	1	DSM SALES
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**KEY PLAN - FLOATING MOORING DOCK EXTERIOR WALLS**

TITLE: SH 87 @ GALVESTON FERRY LANDING

PROJECT: GALVESTON, TX

LOCATION: AUSTIN BRIDGE

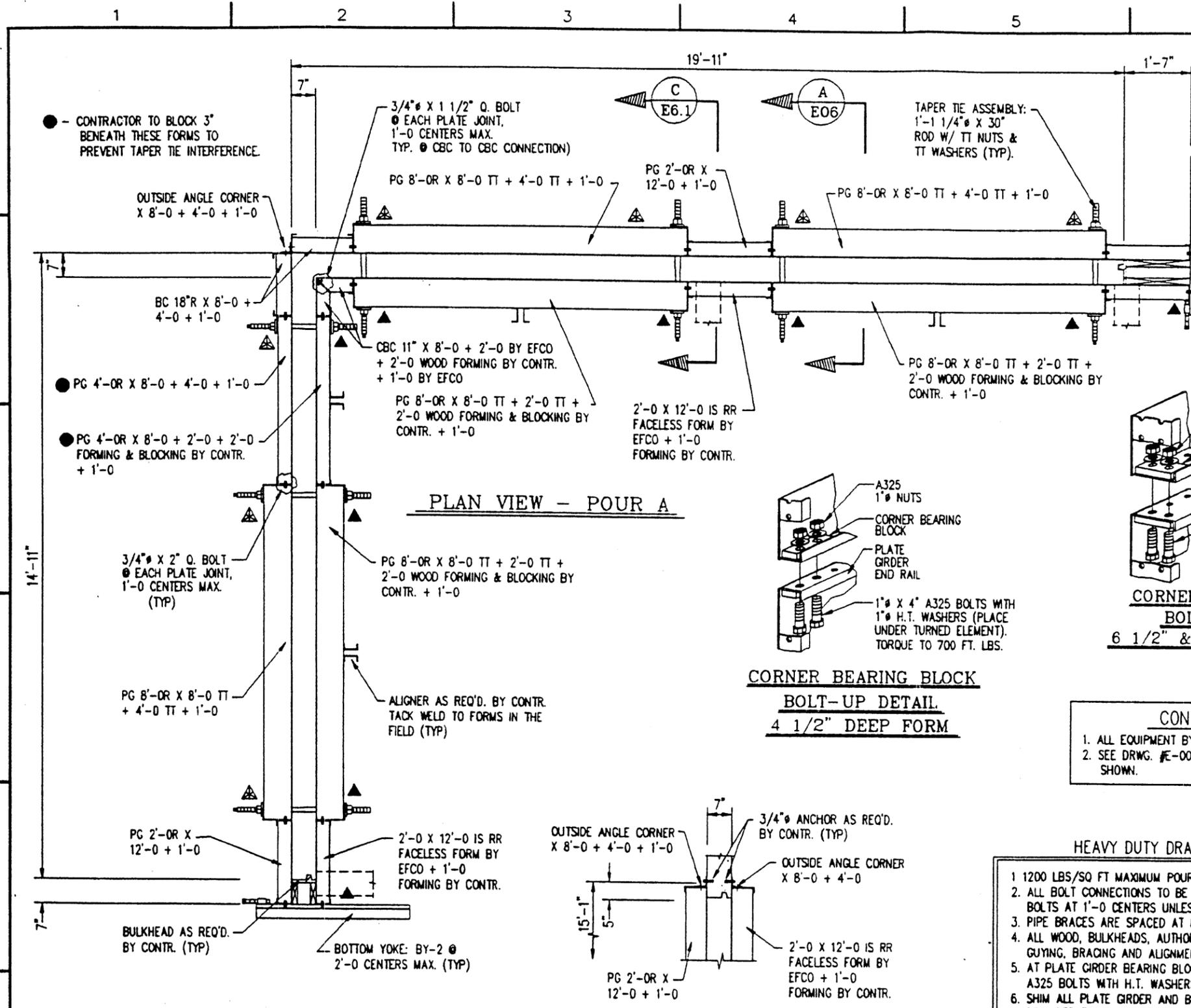
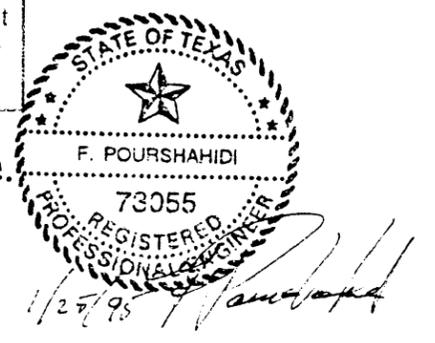
CONTR.: AUSTIN BRIDGE

DIST. PROJ. NO.: 1164      AGREEMENT NO.: 9450390-01      DRAWING NO.: DAL-E-001

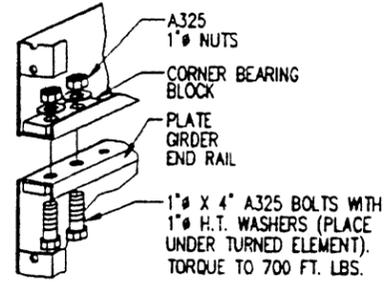
**KEY PLAN - FLOATING MOORING DOCK EXTERIOR WALLS**

Approved without modification  
 Approved with modification as shown  
 Date FEB 23 1995 By J Vogel

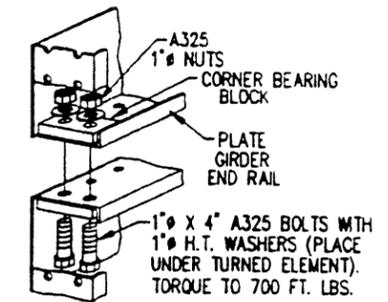
Approval of these drawings does not relieve the contractor of the responsibility for the correct use of the forms. Forms must be oiled before first use and before each reuse. EF-COAT form oil is recommended.



PLAN VIEW - POUR A



CORNER BEARING BLOCK BOLT-UP DETAIL 4 1/2" DEEP FORM

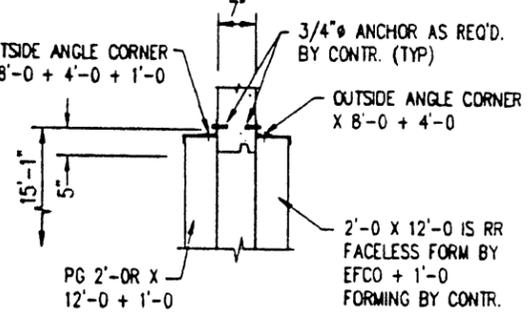


CORNER BEARING BLOCK BOLT-UP DETAIL 6 1/2" & 8 1/2" DEEP FORMS

CONTRACTOR'S NOTES:

- ALL EQUIPMENT BY CONTRACTOR, UNLESS NOTED OTHERWISE.
- SEE DRWG. #E-001 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.

- HEAVY DUTY DRAWING NOTES
- 1200 LBS/SQ FT MAXIMUM POUR PRESSURE, UNLESS NOTED OTHERWISE.
  - ALL BOLT CONNECTIONS TO BE MADE WITH 3/4" x 2" QUICK BOLTS AT 1'-0 CENTERS UNLESS NOTED OTHERWISE.
  - PIPE BRACES ARE SPACED AT 8' TO 12' CENTERS OR AS SHOWN.
  - ALL WOOD, BULKHEADS, AUTHORIZED FIELD DRILLING AND WELDING, GUYING, BRACING AND ALIGNMENT BY CONTRACTOR.
  - AT PLATE GIRDER BEARING BLOCK CONN., USE (2) 1" x 4" A325 BOLTS WITH H.T. WASHERS. TORQUE TO 700 FT. LBS.
  - SHIM ALL PLATE GIRDER AND BUILDING COLUMN JOINTS AS REQUIRED FOR PROPER ALIGNMENT.
  - AT BUILDING COLUMN BEARING BLOCK CONN., USE (1) 3/4" x 3" QUICK BOLT. TORQUE TO 250 FT. LBS.
  - EFCO FORM PANELS HAVE BEEN RUST PROTECTED WITH "EF-GARD" AT THE PLANT. TO SECURE THE MAXIMUM BENEFIT, THE FORMS MUST BE OILED WITH "EF-COAT" FORM RELEASE AGENT PRIOR TO THE FIRST USE AND BEFORE EACH REUSE.
  - DO NOT WELD TIES UNLESS NOTED OTHERWISE.



PARTIAL PLAN VIEW - MIRROR IMAGE POUR A

▲ - TYPICAL LOCATION OF SS-2 & SS-21 (SEE DRWG. #E-006 FOR SCAFFOLD NOTES & DETAIL)  
 ▲ - TYPICAL LOCATION OF PIPE BRACE

NO.	REVISION	DATE	BY

GENERAL NOTES

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 FORMS FOR CONCRETE CONSTRUCTION  
 HOME OFFICE DES MOINES, IOWA, U.S.A.  
 DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

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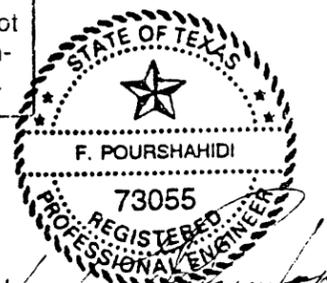
DIST. PROJ. NO. 1164	AGREEMENT NO. 9450390-01	DRAWING NO. DAL-E-002
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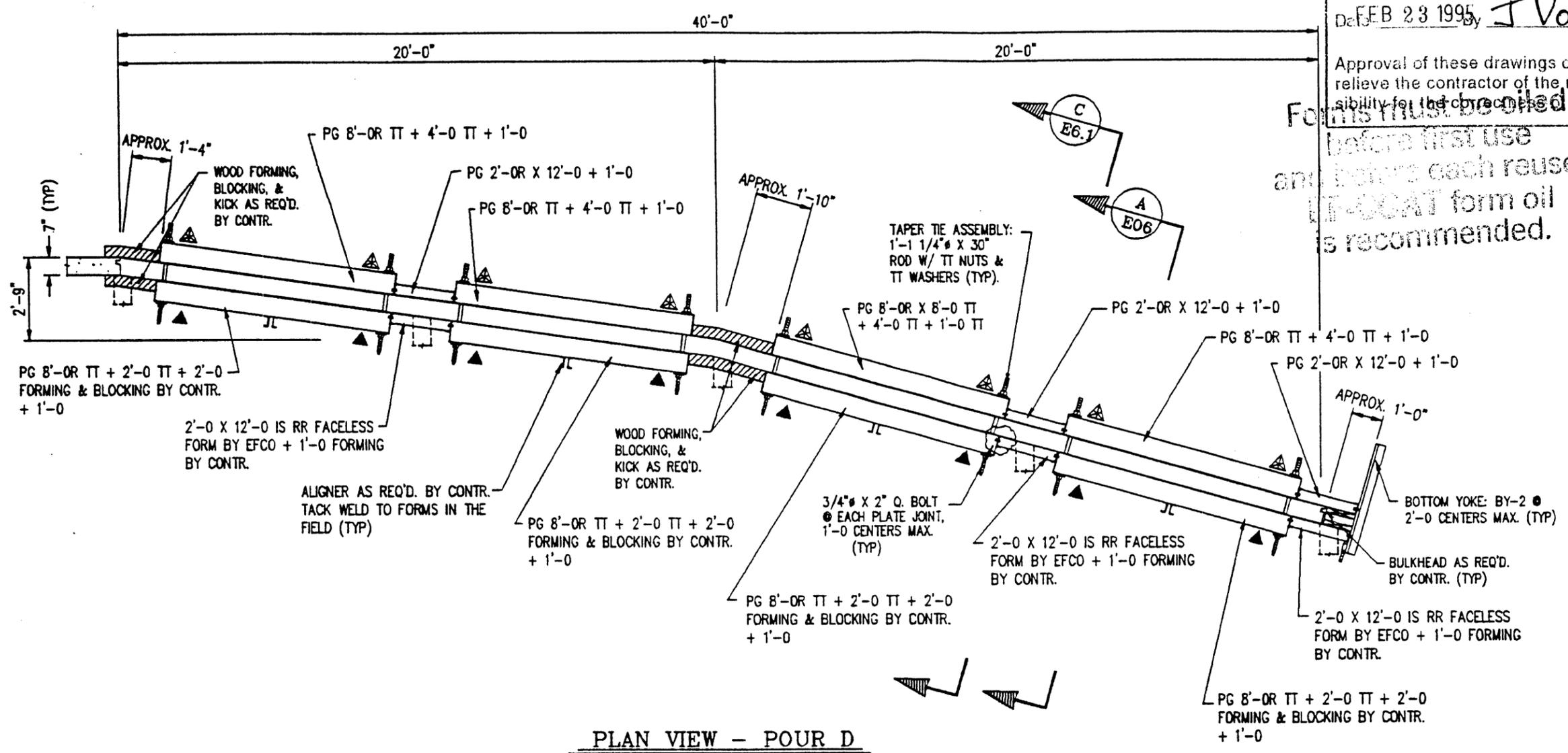
Approved without modification  
 Approved with modification as shown  
 Date FEB 23 1995 by J Vogel

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

Forms must be oiled before first use and before each reuse. EP-COAT form oil is recommended.



1/25/95 [Signature]



PLAN VIEW - POUR D

NO.	REVISION	DATE	BY
GENERAL NOTES			
1. THE CUSTOMER SHALL BEAR THE SOLE RESPONSIBILITY FOR INSURING THAT ASSEMBLY, USE AND MAINTENANCE OF THE EQUIPMENT AND MATERIALS SHOWN ON THESE DRAWINGS CONFORMS TO ALL LAWS, REGULATIONS, ORDINANCES AND LOCAL CODES, AND FOR CHECKING THE ACCURACY AND SUFFICIENCY OF FIELD DETAILS AND DIMENSIONS.			
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6. THIS DRAWING IS THE PROPERTY OF ECONOMY FORMS CORPORATION AND IS LOANED TO THE RECIPIENT IN CONFIDENCE.			

- ▲ - TYPICAL LOCATION OF SS-2 & SS-21 (SEE DRWG. #E-006 FOR SCAFFOLD NOTES & DETAIL)
- ▲ - TYPICAL LOCATION OF PIPE BRACE

**CONTRACTOR'S NOTES:**  
 1. ALL EQUIPMENT BY CONTRACTOR, UNLESS NOTED OTHERWISE.  
 2. SEE DRWG. #E-001 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.

**DRAWING NOTES**  
 1. SEE DRWG. #E-002 FOR DRAWING NOTES.

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 FORMS FOR CONCRETE CONSTRUCTION  
 HOME OFFICE DES MOINES, IOWA, U.S.A.  
 DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

PLAN VIEW POUR D		
FILE	SH 87 @ GALVESTON FERRY LANDING	
PROJECT	GALVESTON, TX.	
LOCATION	AUSTIN BRIDGE	
CONTR.		
DIST. PROJ. NO.	AGREEMENT NO.	DRAWING NO.
1164	9450390-01	DAL-E-004

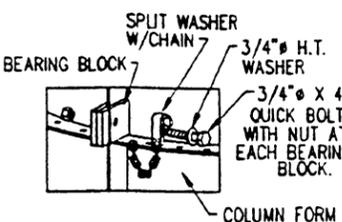
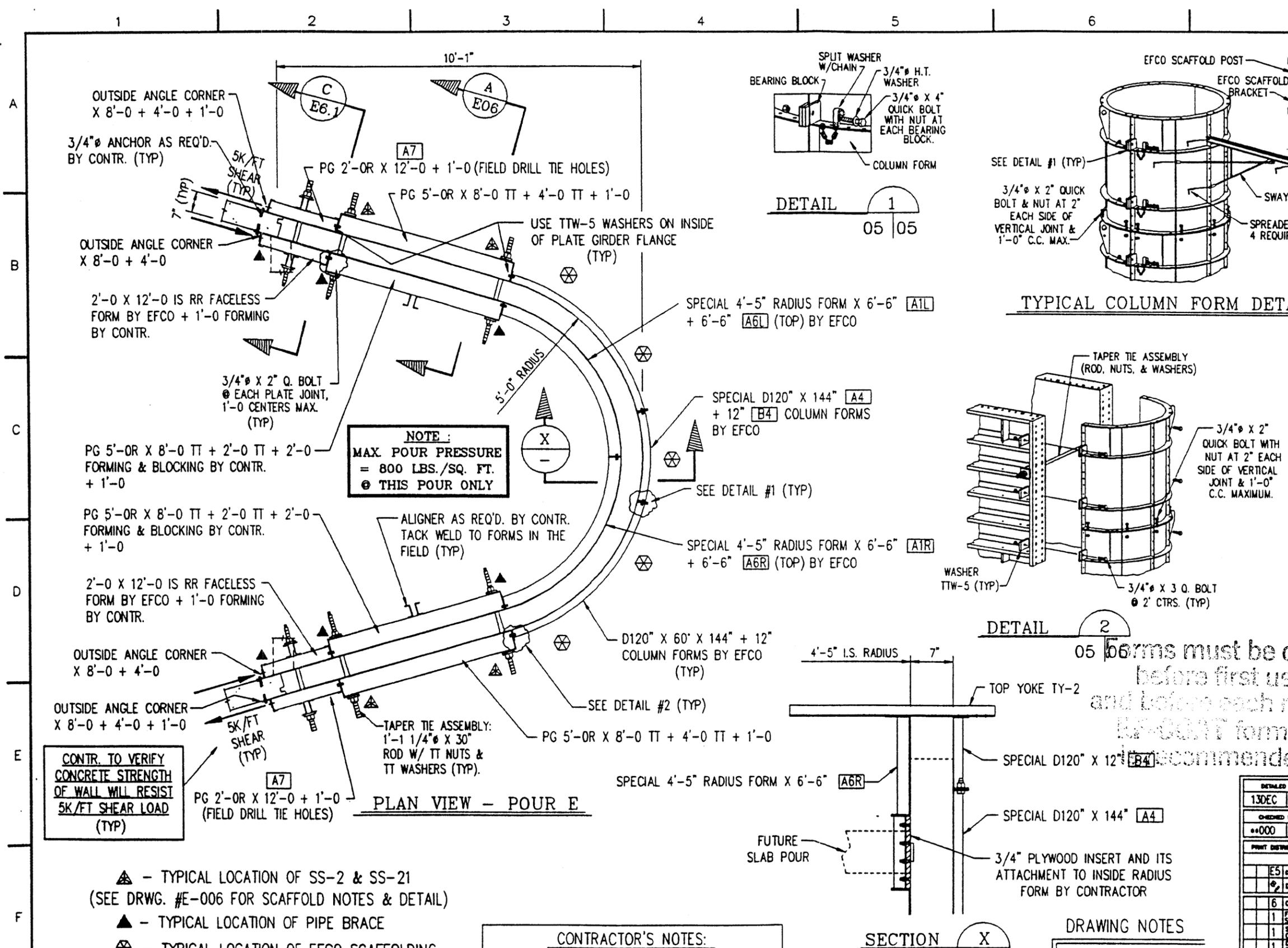
TEXAS DEPARTMENT TRANSPORTATION

Approved without modification  
 Approved with modification as shown

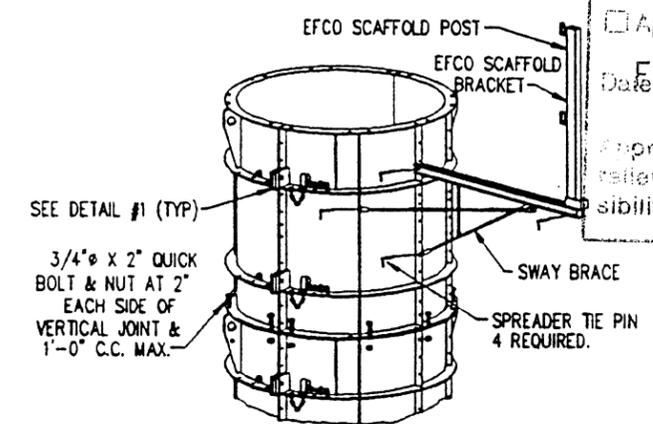
Date FEB 23 1995 By J Vogel

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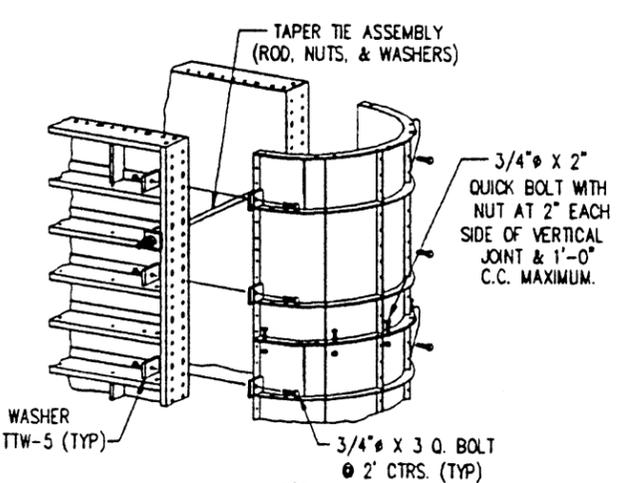
F. POURSHAHIDI  
 73055  
 REGISTERED PROFESSIONAL ENGINEER  
 1/25/95



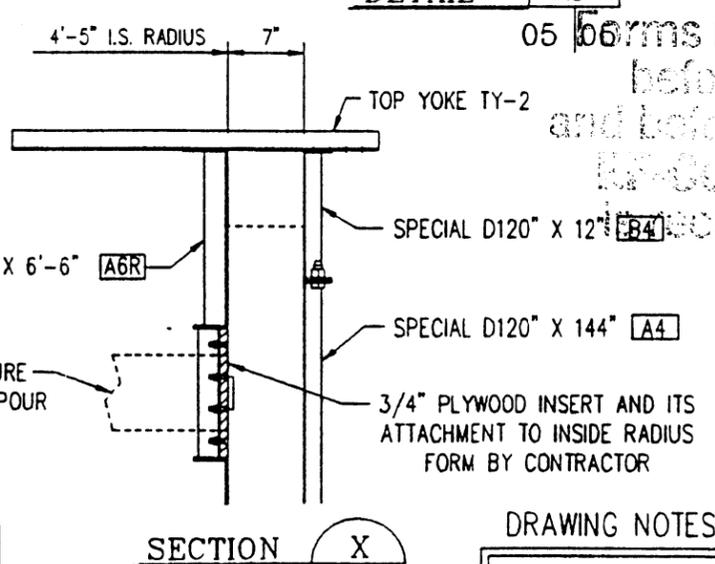
DETAIL 1  
 05 | 05



TYPICAL COLUMN FORM DETAILS



DETAIL 2  
 05 | 05



SECTION X

**NOTE:**  
 MAX. POUR PRESSURE = 800 LBS./SQ. FT.  
 @ THIS POUR ONLY

**CONTR. TO VERIFY CONCRETE STRENGTH OF WALL WILL RESIST 5K/FT SHEAR LOAD (TYP)**

PLAN VIEW - POUR E

- ▲ - TYPICAL LOCATION OF SS-2 & SS-21 (SEE DRWG. #E-006 FOR SCAFFOLD NOTES & DETAIL)
- ▲ - TYPICAL LOCATION OF PIPE BRACE
- ⊗ - TYPICAL LOCATION OF EFCO SCAFFOLDING (SEE DRWG. #E-006 FOR SCAFFOLDING NOTES)

**CONTRACTOR'S NOTES:**

- ALL EQUIPMENT BY CONTRACTOR, UNLESS NOTED OTHERWISE.
- SEE DRWG. #E-001 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.

**DRAWING NOTES**

- SEE DRWG. #E-002 FOR DRAWING NOTES.

- GENERAL NOTES**
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 FORMS FOR CONCRETE CONSTRUCTION  
 HOME OFFICE: DCS, MOBILE, ALABAMA, U.S.A.  
 DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

PLAN VIEW - POUR E

PROJECT: US 87 @ GALVESTON FERRY LANDING

LOCATION: GALVESTON, TX

CONTR.: AUSTIN BRIDGE

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1	FIELD SERVICE
1	SALES OFFICE
1	DIST. SALES
1	SHOP
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DIST. PROJ. NO.	1164	AGREEMENT NO.	9450390-01	DRAWING NO.	DAL-E-005
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TEXAS DEPARTMENT TRANSPORTATION

Approved without modification

Approved with modification as shown

Date FEB 23 1995 by J Vogel

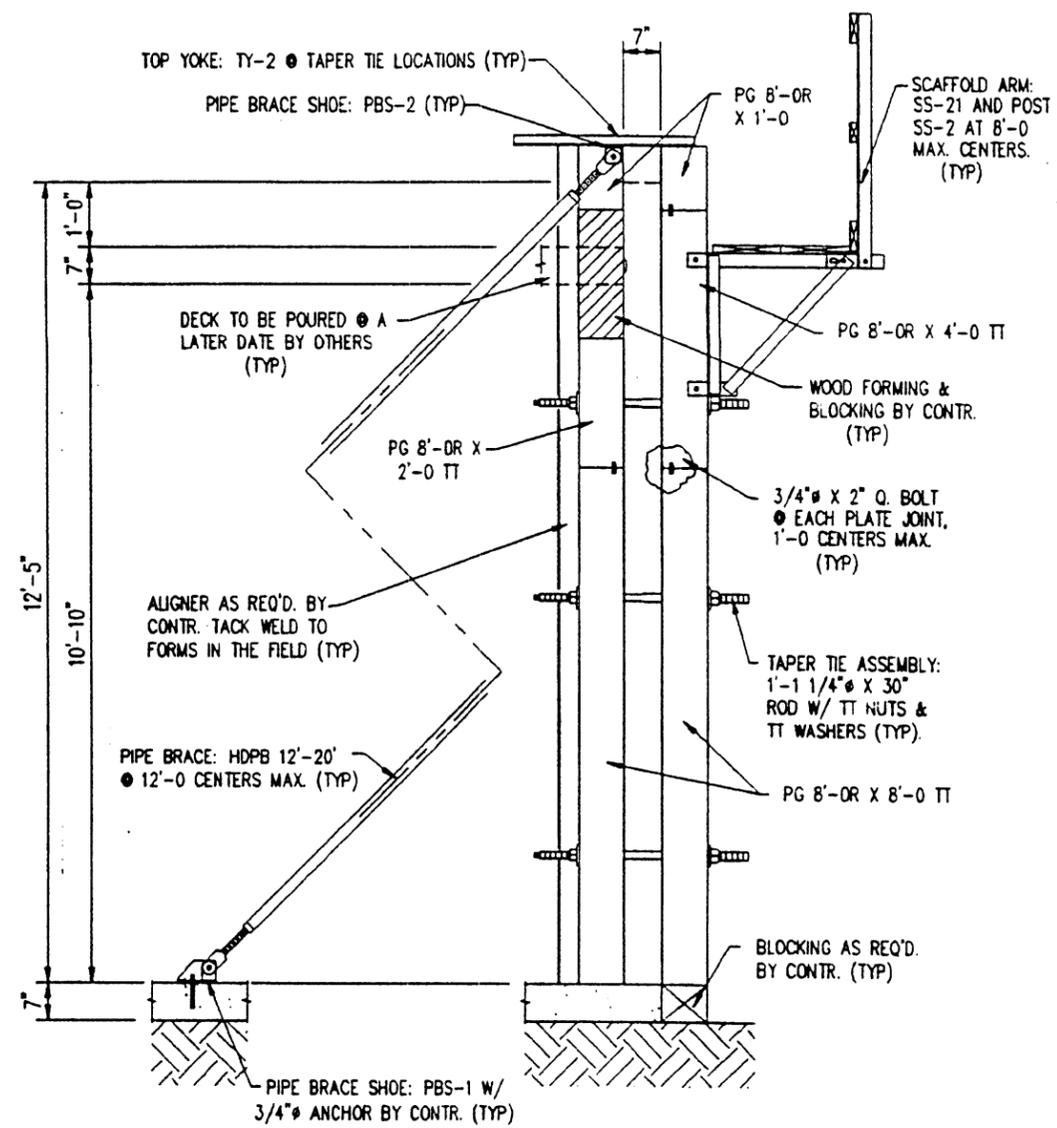
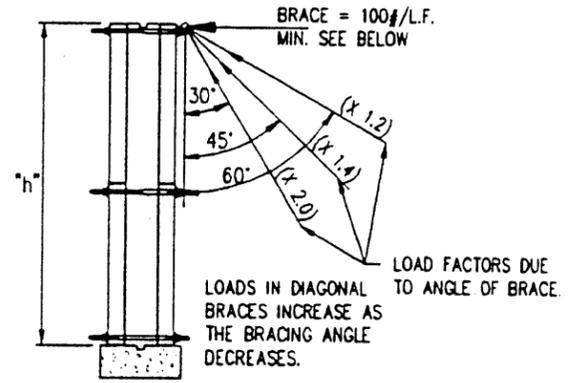
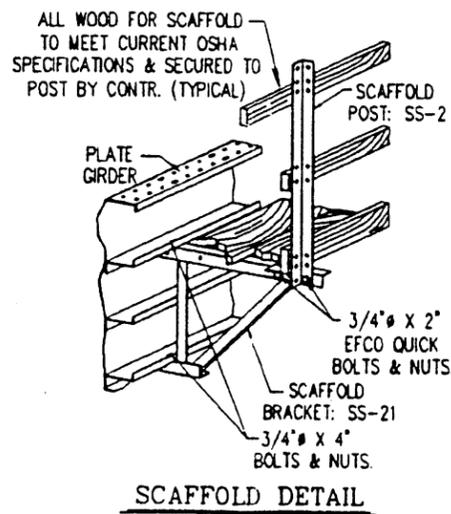
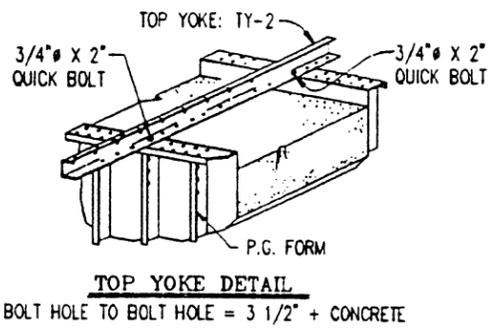
Approval of these drawings does not relieve the contractor of the responsibility for the details.

F. POURSHAHIDI  
73055  
REGISTERED PROFESSIONAL ENGINEER  
2/23/95

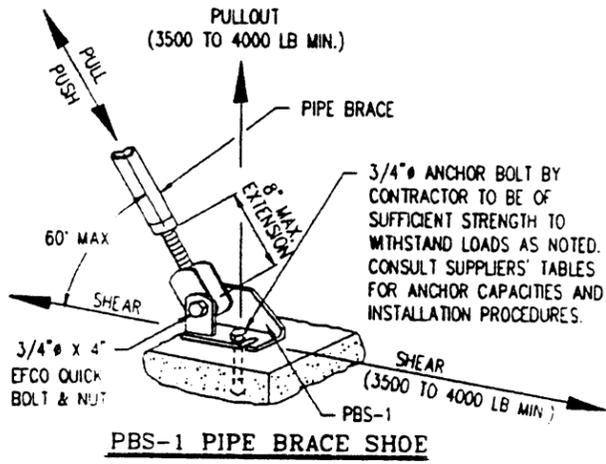
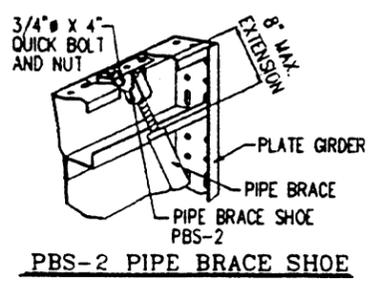
**SAFETY ALERT**  
GENERAL SCAFFOLDING NOTES  
REVIEW WITH USERS AT SAFETY MEETINGS

1. IT IS THE USER'S RESPONSIBILITY TO ENSURE THAT ALL SCAFFOLDING AND ACCESS TO THE FORMS COMPLIES WITH ALL APPLICABLE LAWS REGULATIONS, AND CODES, INCLUDING THE OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).
2. SCAFFOLD LOCATIONS SHOWN ON EFCO DRAWINGS ARE TYPICAL AND ONLY FOR ILLUSTRATION. ACTUAL LOCATIONS WILL VARY WITH JOB CONDITIONS AND ARE THE RESPONSIBILITY OF THE USER.
3. IF, DUE TO JOB OR ANY OTHER CONDITIONS, EFCO SCAFFOLD BRACKETS AND POSTS CANNOT BE USED AS ILLUSTRATED, IT IS THE RESPONSIBILITY OF THE USER TO PROVIDE ADEQUATE ALTERNATIVE SCAFFOLDING AND ACCESS.
4. EFCO SCAFFOLD BRACKETS ARE DESIGNED FOR THE SUPPORT OF PERSONNEL ONLY, NOT FOR THE STORAGE OF MATERIALS SUCH AS REINFORCING ROD, ETC., OR HEAVY EQUIPMENT.
5. EFCO SCAFFOLD BRACKETS ARE DESIGNED TO BE SPACED AT A MAXIMUM OF 8'-0" ON CENTER. IT IS THE USER'S RESPONSIBILITY ENSURE THAT ALL PLANKING AND RAILS ARE ADEQUATE FOR THE SPACING USED AND IN GOOD CONDITION. ALL PLANKING AND RAILS ARE PROVIDED BY USER.
6. USER MUST INSPECT ALL SCAFFOLDING FOR DAMAGE. DAMAGED SCAFFOLDING MUST BE DISCARDED AND NOT USED.

Forms must be oiled before first use and oiled on each reuse. EFCO form oil is recommended.



SECTION A  
02,03,04,05 | 06



**CONTRACTOR'S NOTES:**

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2. SEE DRWG. #E-001 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.

**DRAWING NOTES**

1. SEE DRWG. #E-002 FOR DRAWING NOTES.

**GENERAL NOTES**

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FORMS FOR CONCRETE CONSTRUCTION  
HOME OFFICE DES MOINES, IOWA, U.S.A.  
DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

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EFCO DRG. NO.		
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CONTR.	6	
FIELD SERVICE	1	
SALES OFFICE	1	
DIS. SALES	1	
DSW SALES	1	
SHOP		
TOTAL	10	

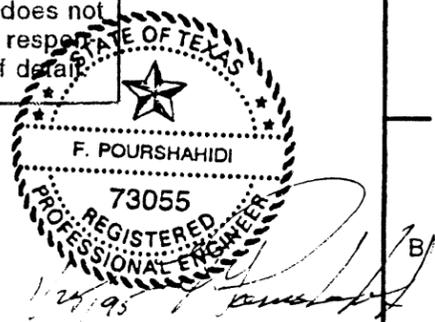
SECTION "A" & DETAILS		
TITLE	SH 87 @ GALVESTON FERRY LANDING	
PROJECT	GALVESTON, TX.	
LOCATION	AUSTIN BRIDGE	
CONTR.		
DIST. PROJ. NO.	1164	AGREEMENT NO. 9450390-01
DRAWING NO.	DAL-E-006	

TEXAS DEPARTMENT TRANSPORTATION

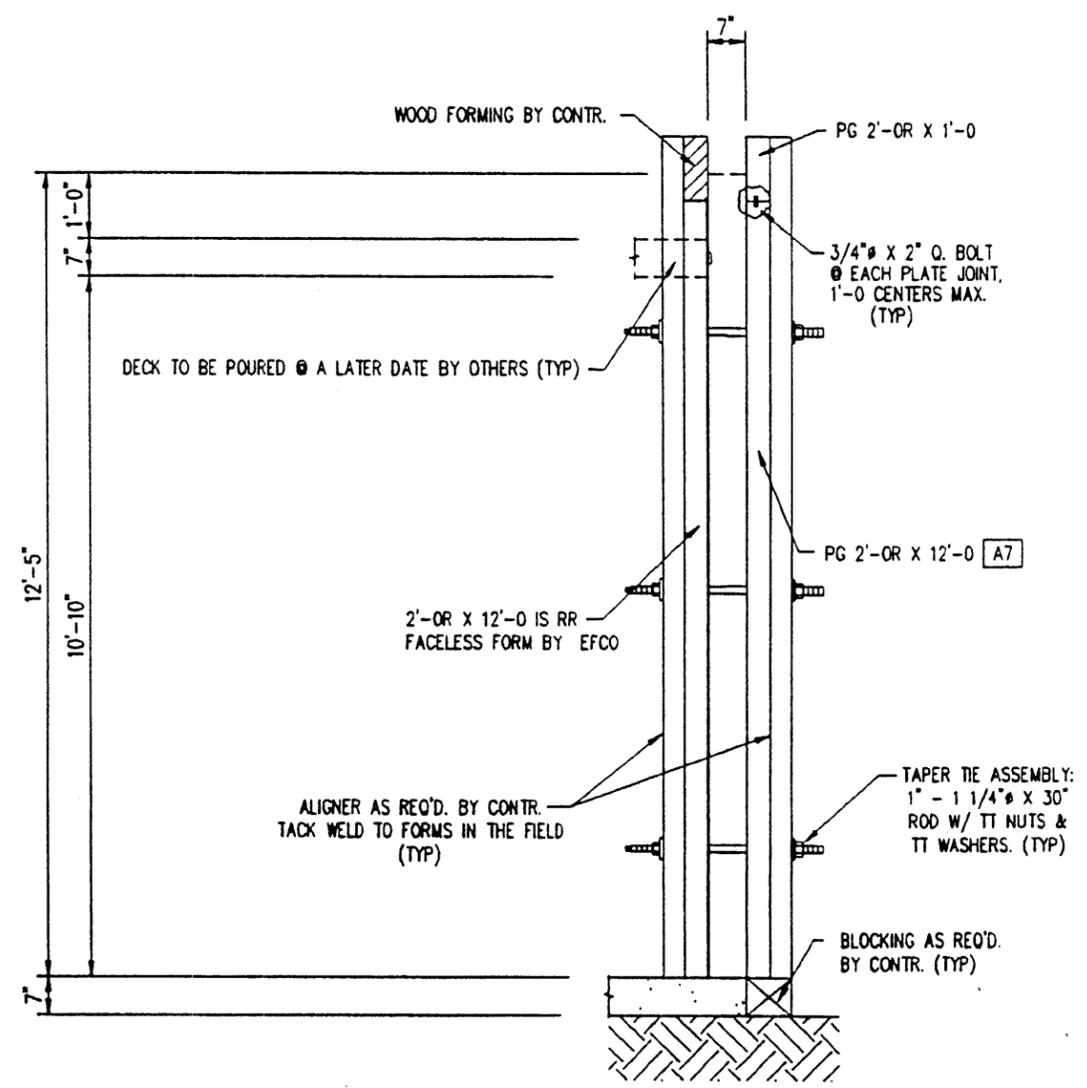
Approved without modification  
 Approved with modification as shown

Date FEB 23 1995 By J Vogel

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

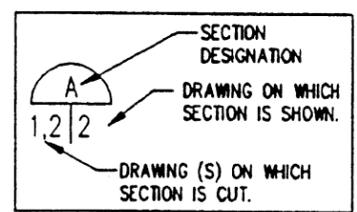


Forms must be oiled before first use and before each reuse. EFCO form oil is recommended.



**CONTRACTOR'S NOTES:**

- ALL EQUIPMENT BY CONTRACTOR, UNLESS NOTED OTHERWISE.
- SEE DRWG. #E-001 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.



NO.	REVISION	DATE	BY
<b>GENERAL NOTES</b>			
1. THE CUSTOMER SHALL BEAR THE SOLE RESPONSIBILITY FOR INSURING THAT ASSEMBLY, USE AND MAINTENANCE OF THE EQUIPMENT AND MATERIALS SHOWN ON THESE DRAWINGS CONFORMS TO ALL LAWS, REGULATIONS, ORDINANCES AND LOCAL CODES, AND FOR CHECKING THE ACCURACY AND SUFFICIENCY OF FIELD DETAILS AND DIMENSIONS.			
2. ALL DRAWINGS MUST BE CHECKED BY THE CUSTOMER FOR CORRECTNESS IN RELATION TO PROJECT PLANS AND SPECIFICATIONS. PARTICULAR REFERENCE MUST BE MADE FOR REVISIONS ISSUED BY THE ARCHITECT OR ENGINEER.			
3. THE INDICATED CAPACITY OF DEVICES SECURED BY DRILLING OR IMBEDMENT IN CONCRETE IS ENTIRELY DEPENDENT UPON THE QUALITY AND HOLDING CAPACITY OF THE SURROUNDING CONCRETE. THE CUSTOMER SHALL INSURE THAT THE CONCRETE HAS SUFFICIENT STRENGTH TO HOLD THE LOADS APPLIED.			
4. IT IS THE CUSTOMER'S RESPONSIBILITY TO COMMUNICATE TO ALL PERSONNEL INVOLVED IN THE USE OF THE EQUIPMENT ALL INFORMATION CONTAINED IN THESE NOTES AND OTHER NOTES ON ALL DRAWINGS SUPPLIED BY EFCO AND TO INSURE THAT THEY UNDERSTAND THEM AND USE THE EQUIPMENT ACCORDINGLY.			
5. ANY ALTERATION OR REPAIR OF EFCO EQUIPMENT MUST BE AUTHORIZED IN WRITING BY ECONOMY FORMS CORPORATION AND MUST BE CARRIED OUT BY QUALIFIED PERSONNEL. ANY MODIFICATION OF EQUIPMENT OR USE OF THAT EQUIPMENT OTHER THAN AS SHOWN WITHOUT APPROVAL IN WRITING BY ECONOMY FORMS CORPORATION WILL VOID ALL WARRANTIES.			
6. THIS DRAWING IS THE PROPERTY OF ECONOMY FORMS CORPORATION AND IS LOANED TO THE RECIPIENT IN CONFIDENCE.			

SECTION C  
02,03,04,05 | 06.1

**DRAWING NOTES**

- SEE DRWG. #E-002 FOR DRAWING NOTES.

DETAILED BY	13JAN RHT
CHECKED BY	#000 000
PRINT DISTRIBUTION	
6.1 DRG. NO.	
DATE	
6 CONTR.	
1 FIELD SERVICE	
1 SALES OFFICE	
1 DIST. SALES	
1 DIST. SALES	
SHOP	
110 TOTAL	

**EFCO**

ECONOMY FORMS CORPORATION  
 FORMS FOR CONCRETE CONSTRUCTION  
 HOME OFFICE DES MOINES, IOWA, U.S.A.  
 DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

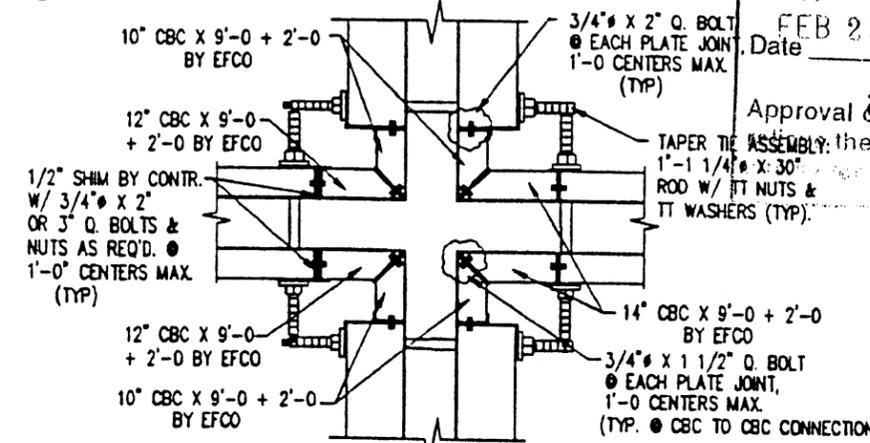
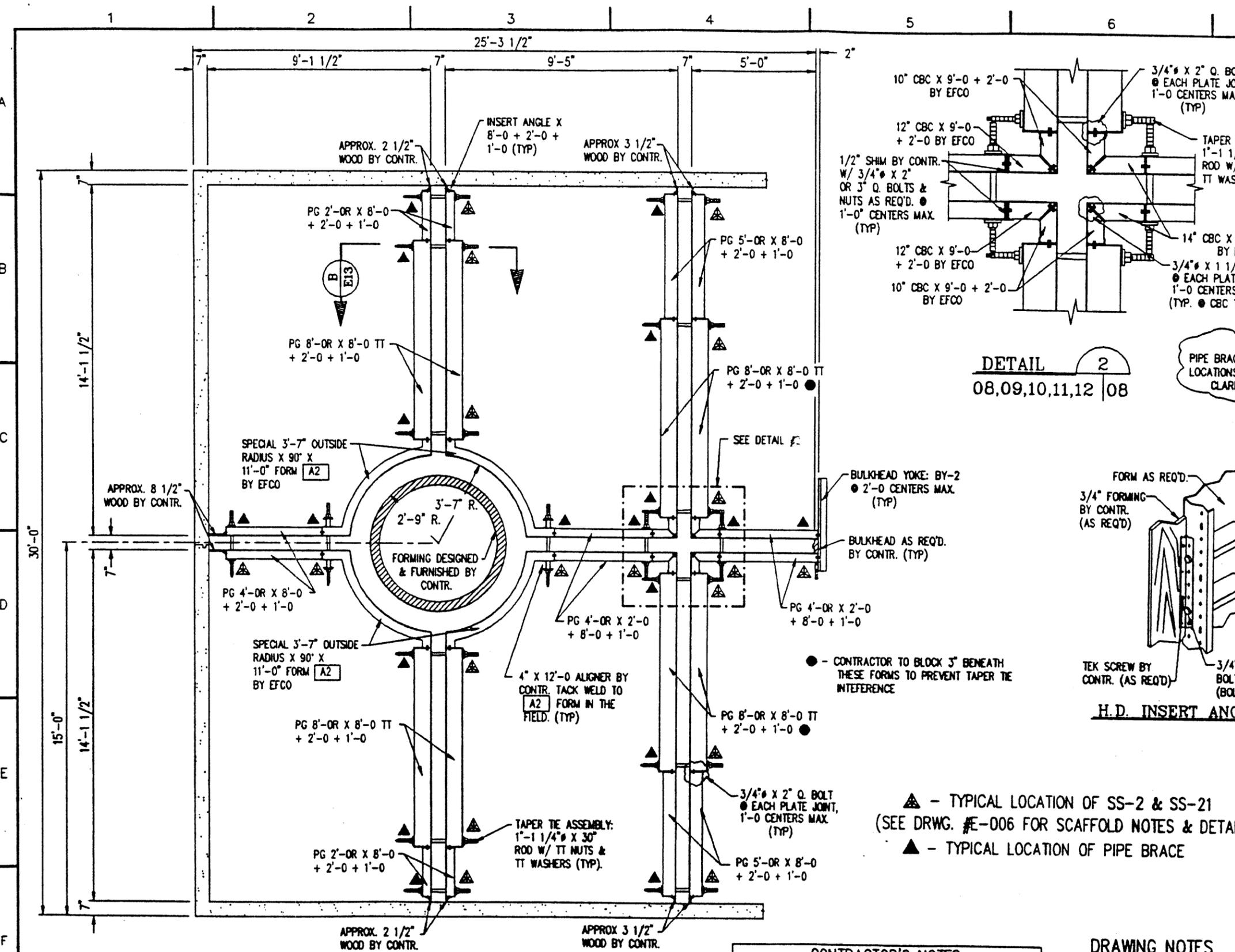
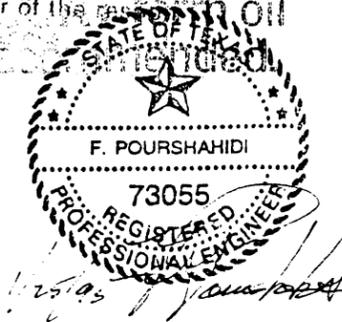
TITLE: SECTION "C" & DETAILS  
 PROJECT: SH 87 @ GALVESTON FERRY LANDING  
 LOCATION: GALVESTON, TX.  
 CONTR.: AUSTIN BRIDGE

DIST. PROJ. NO. 1164  
 AGREEMENT NO. 9450390-01  
 DRAWING NO. DAL-E-006.1



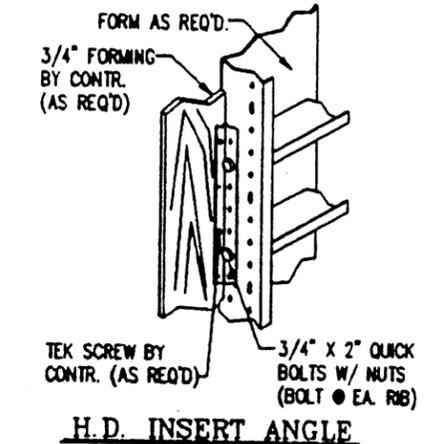
Date FEB 23 1995 By J Vogel Use

Approval of these drawings does not constitute an approval of the contractor of the project. The contractor is responsible for the accuracy of the drawings and the quality of the work.



DETAIL 2  
 08,09,10,11,12 | 08

PIPE BRACE & SCAFFOLDING LOCATIONS NOT SHOWN FOR CLARITY ONLY



**CONTRACTOR'S NOTES:**  
 1. ALL EQUIPMENT BY CONTRACTOR, UNLESS NOTED OTHERWISE.  
 2. SEE DRWG. #E-007 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.  
 3. SEE DRWG. #E-001 FOR EXTERIOR WALL KEY PLAN.

**DRAWING NOTES**  
 1. SEE DRWG. #E-002 FOR DRAWING NOTES.

**GENERAL NOTES**

- THE CUSTOMER SHALL BEAR THE SOLE RESPONSIBILITY FOR INSURING THAT ASSEMBLY, USE AND MAINTENANCE OF THE EQUIPMENT AND MATERIALS SHOWN ON THESE DRAWINGS CONFORMS TO ALL LAWS, REGULATIONS, ORDINANCES AND LOCAL CODES, AND FOR CHECKING THE ACCURACY AND SUFFICIENCY OF FIELD DETAILS AND DIMENSIONS.
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 HOME OFFICE DES MOINES, IOWA, U.S.A.  
 DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

DESIGNED BY	18DEC RHT
CHECKED BY	000 D00
DATE	
PROJECT	SH 87 @ GALVESTON FERRY LANDING
LOCATION	GALVESTON, TX.
CONTR.	AUSTIN BRIDGE
EST. FILE NO.	1184
ADDRESS NO.	9450390-01
DRAWING NO.	DAL-1-008

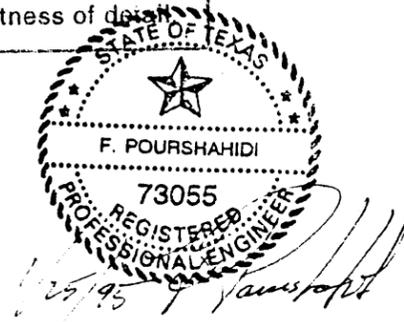
TEXAS DEPARTMENT OF TRANSPORTATION

Approved without modification

Approved with modification as shown

Date FEB 23 1995 By J Vogel

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of data.



▲ - TYPICAL LOCATION OF SS-2 & SS-21 (SEE DRWG. #E-006 FOR SCAFFOLD NOTES & DETAIL)

▲ - TYPICAL LOCATION OF PIPE BRACE

● - CONTRACTOR TO BLOCK 3" BENEATH THESE FORMS TO PREVENT TAPER TIE INTERFERENCE

Forms must be oiled before first use and oiled after each reuse. EFCO form oil is recommended.

**CONTRACTOR'S NOTES:**

- ALL EQUIPMENT BY CONTRACTOR, UNLESS NOTED OTHERWISE.
- SEE DRWG. #E-007 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.
- SEE DRWG. #E-001 FOR EXTERIOR WALL KEY PLAN.

**DRAWING NOTES**

- SEE DRWG. #E-002 FOR DRAWING NOTES.

**GENERAL NOTES**

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**EFCO**

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FORMS FOR CONCRETE CONSTRUCTION  
HOME OFFICE: 625 HENRI, U.S.A.  
DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

PLAN VIEW - POUR B1

PROJECT: SH B7 @ GALVESTON FERRY LANDING

LOCATION: GALVESTON, TX

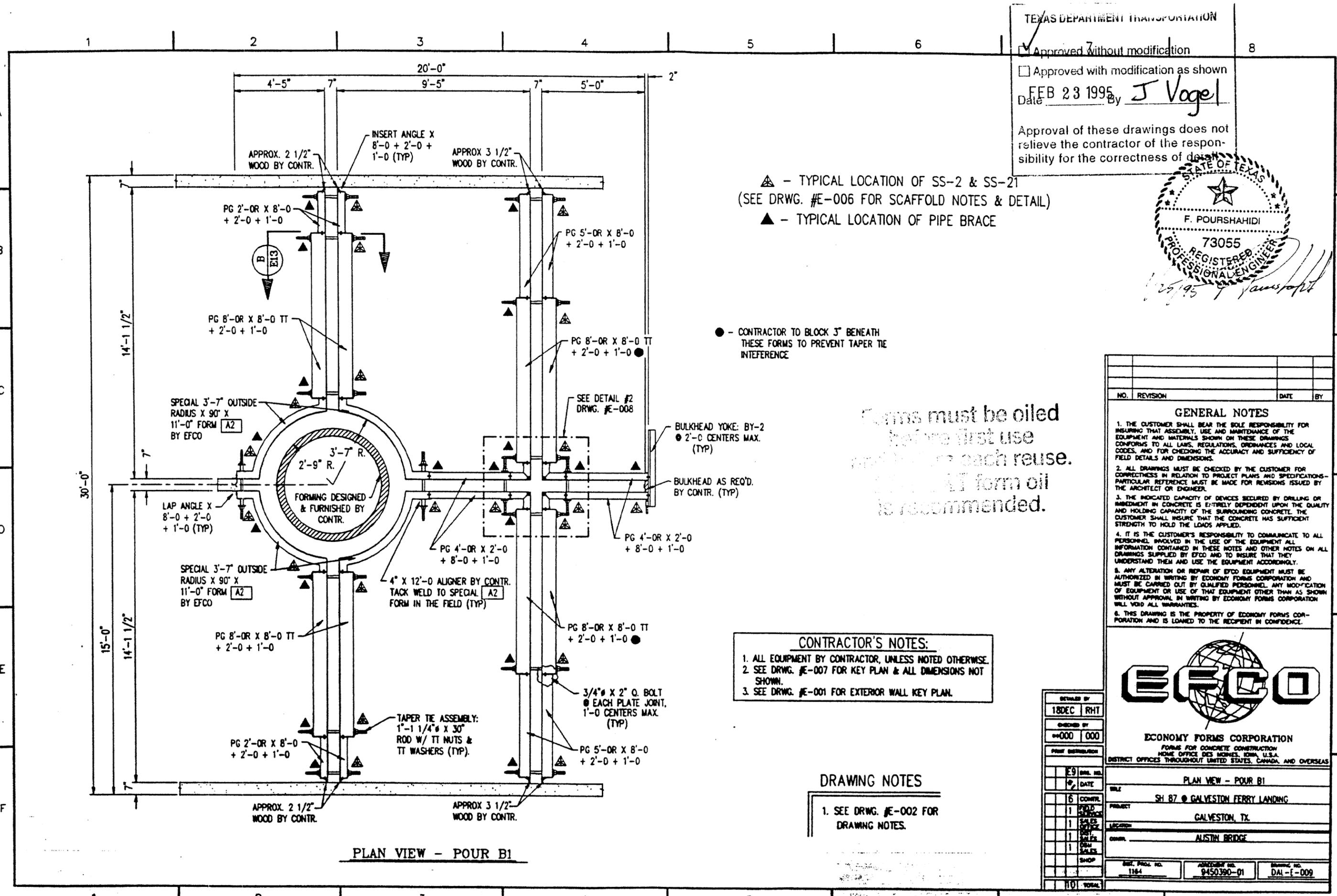
CONTRACT: AUSTIN BRIDGE

DATE: 18DEC 1994

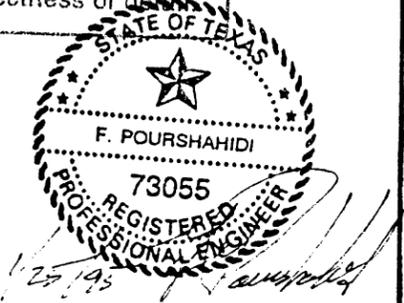
AGREEMENT NO.: 9450390-01

DRAWING NO.: DAL-E-009

DESIGNED BY		18DEC	RHT
CHECKED BY		#000	000
PRINT DISTRIBUTION			
	E9	DATE	
	6	CONTR.	
	1	FIELD SERVICES	
	1	SALES OFFICE	
	1	SALES	
	1	SHOP	
	10	TOTAL	



TEXAS DEPARTMENT TRANSPORTATION  
 Approved without modification  
 Approved with modification as shown  
 Date FEB 23 1995 By J Vogel  
 Approval of these drawings does not relieve the contractor of the responsibility for the correctness of details.



▲ - TYPICAL LOCATION OF SS-2 & SS-21  
 (SEE DRWG. #E-006 FOR SCAFFOLD NOTES & DETAIL)  
 ▲ - TYPICAL LOCATION OF PIPE BRACE

● - CONTRACTOR TO BLOCK 3" BENEATH THESE FORMS TO PREVENT TAPER DUE TO INTERFERENCE

Forms must be oiled before first use and before each reuse. EP-COAT form oil is recommended.

**CONTRACTOR'S NOTES:**  
 1. ALL EQUIPMENT BY CONTRACTOR, UNLESS NOTED OTHERWISE.  
 2. SEE DRWG. #E-007 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.  
 3. SEE DRWG. #E-001 FOR EXTERIOR WALL KEY PLAN.

**DRAWING NOTES**  
 1. SEE DRWG. #E-002 FOR DRAWING NOTES.

**GENERAL NOTES**

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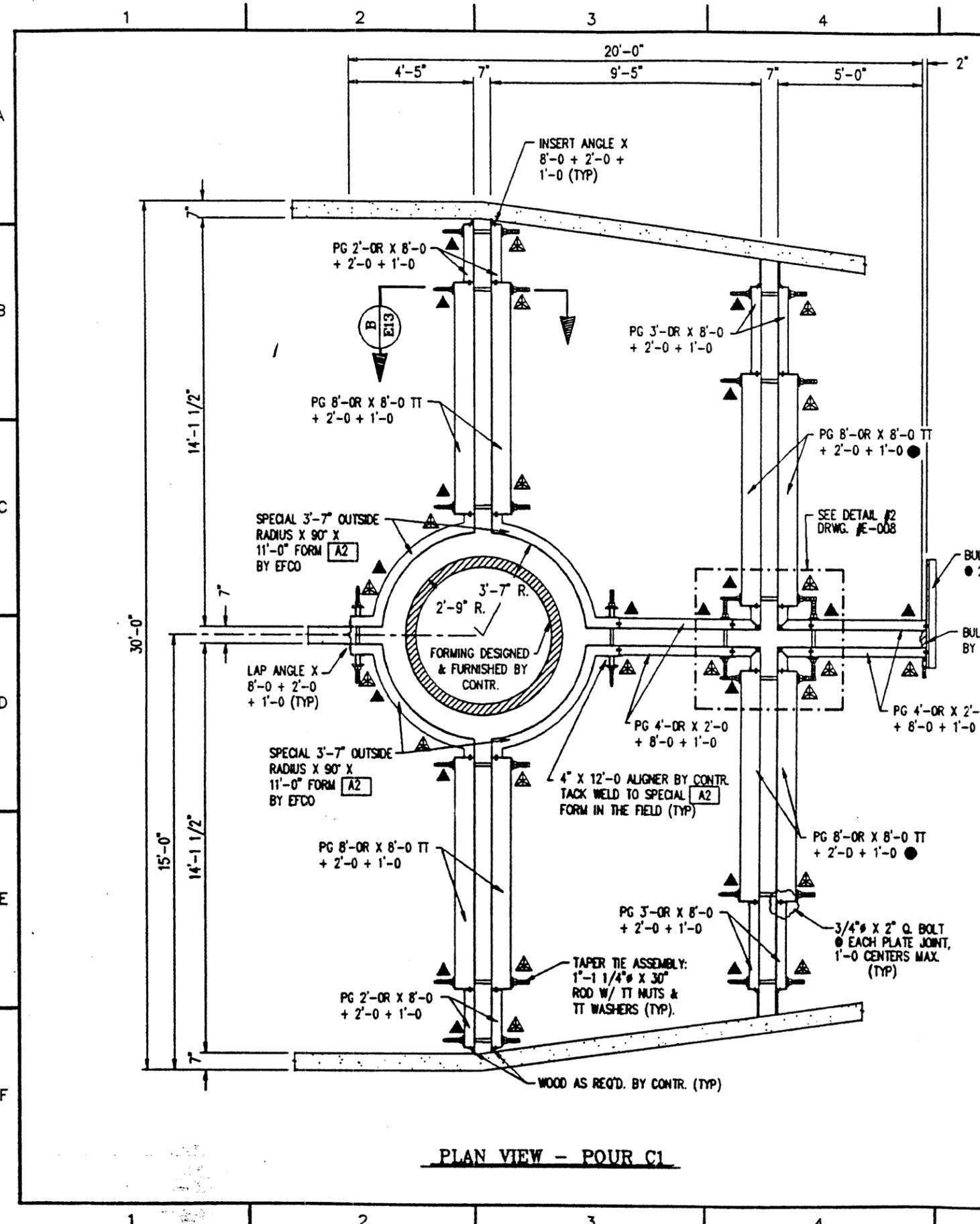


**ECONOMY FORMS CORPORATION**  
 FORMS FOR CONCRETE CONSTRUCTION  
 HOME OFFICE: DES MOINES, IOWA, U.S.A.  
 DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

18DEC RHT		000 000	
10	DATE	6	CONTR.
1		1	FIELD
1		1	SALES
1		1	DESIGN
1		1	SHOP
10	TOTAL		

PROJECT: SH 87 @ GALVESTON FERRY LANDING  
 LOCATION: GALVESTON, TX  
 CONTR.: AUSTIN BRIDGE

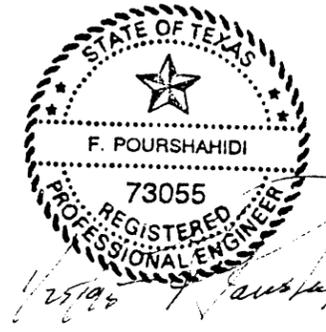
DIST. PROJ. NO. 1184      AGREEMENT NO. 9450390-01      DRAWING NO. DAL-E-010



PLAN VIEW - POUR C1

1 2 3 4 5 6 7 8

Forms must be oiled  
before first use  
and before each reuse.  
EF-COAT form oil  
is recommended.



▲ - TYPICAL LOCATION OF SS-2 & SS-21  
(SEE DRWG. #E-006 FOR SCAFFOLD NOTES & DETAIL)  
▲ - TYPICAL LOCATION OF PIPE BRACE

● - CONTRACTOR TO BLOCK 3" BENEATH  
THESE FORMS TO PREVENT TAPER THE  
INTERFERENCE

TEXAS DEPARTMENT TRANSPORTATION  
 Approved without modification  
 Approved with modification as shown  
FEB 23 1995 by J Vogel  
Approval of these drawings does not  
relieve the contractor of the responsi-  
bility for the correctness of detail.

**CONTRACTOR'S NOTES:**  
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2. SEE DRWG. #E-007 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.  
3. SEE DRWG. #E-001 FOR EXTERIOR WALL KEY PLAN.

NO.	REVISION	DATE	BY

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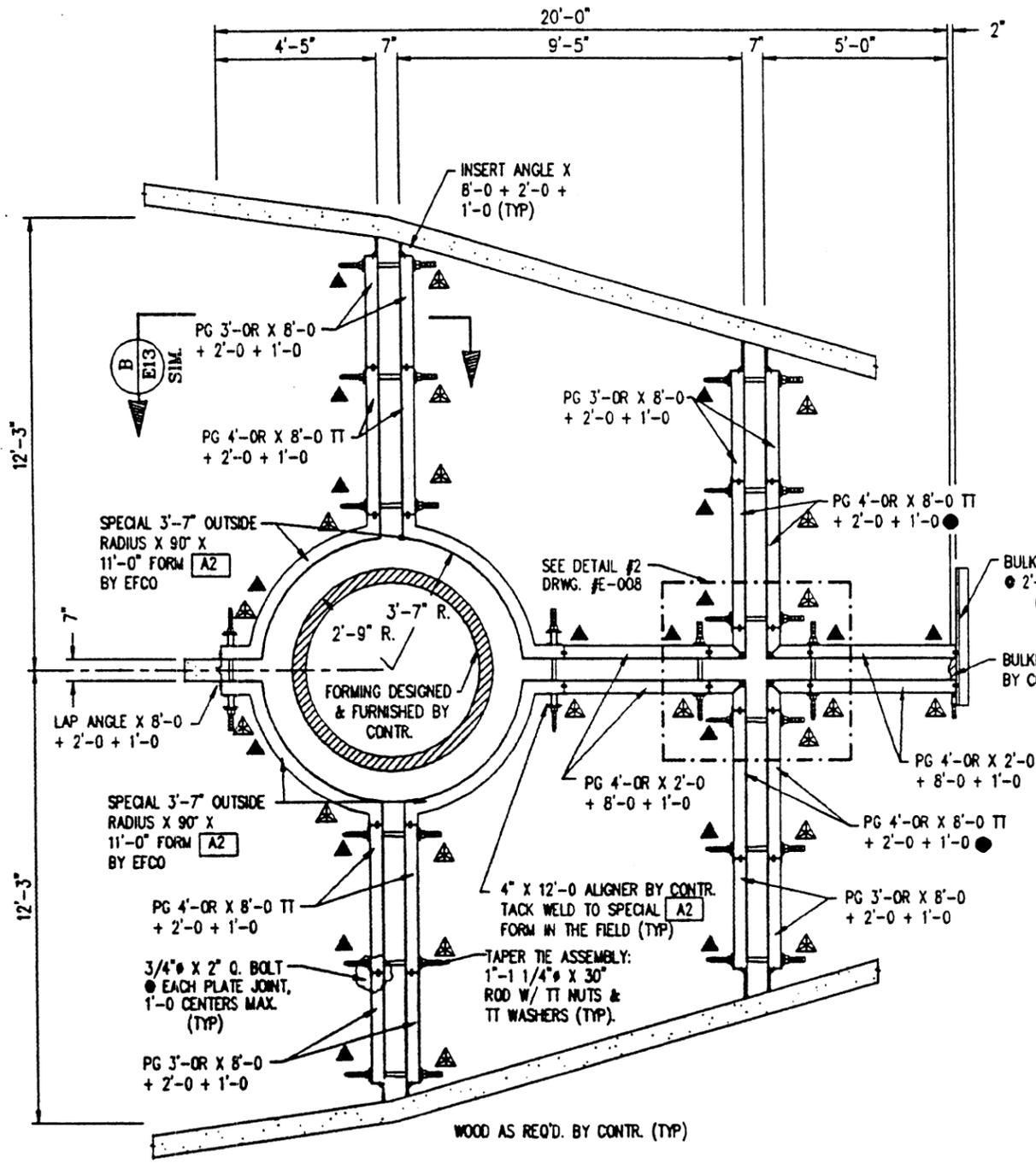
**ECONOMY FORMS CORPORATION**  
FORMS FOR CONCRETE CONSTRUCTION  
HOME OFFICE DES MOINES, IOWA, U.S.A.  
DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

DESIGNED BY	18DEC	RHT
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PRINT DISTRIBUTION		
DATE	11	
CONTR.	6	
FIELD SERVICE	1	
SALES OFFICE	1	
SALES	1	
DEPT. SALES	1	
SHOP		
TOTAL	10	

PLAN VIEW - POUR D1	
PROJECT	SH 87 @ GALVESTON FERRY LANDING
LOCATION	GALVESTON, TX.
CONTR.	AUSTIN BRIDGE
EST. PROJ. NO.	1164
AGREEMENT NO.	9450390-01
SHIPPING NO.	DAL-E-011

**DRAWING NOTES**

- SEE DRWG. #E-002 FOR DRAWING NOTES.



**PLAN VIEW - POUR D1**

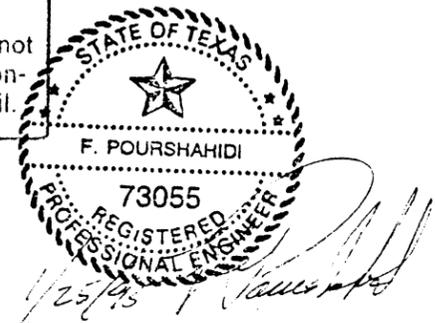
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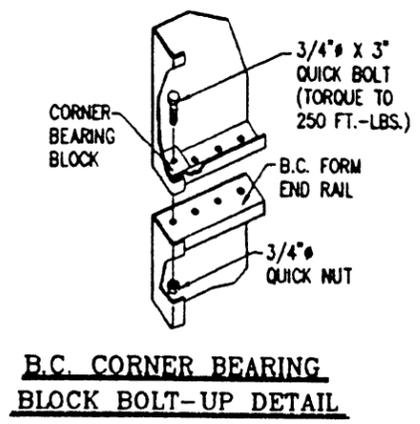
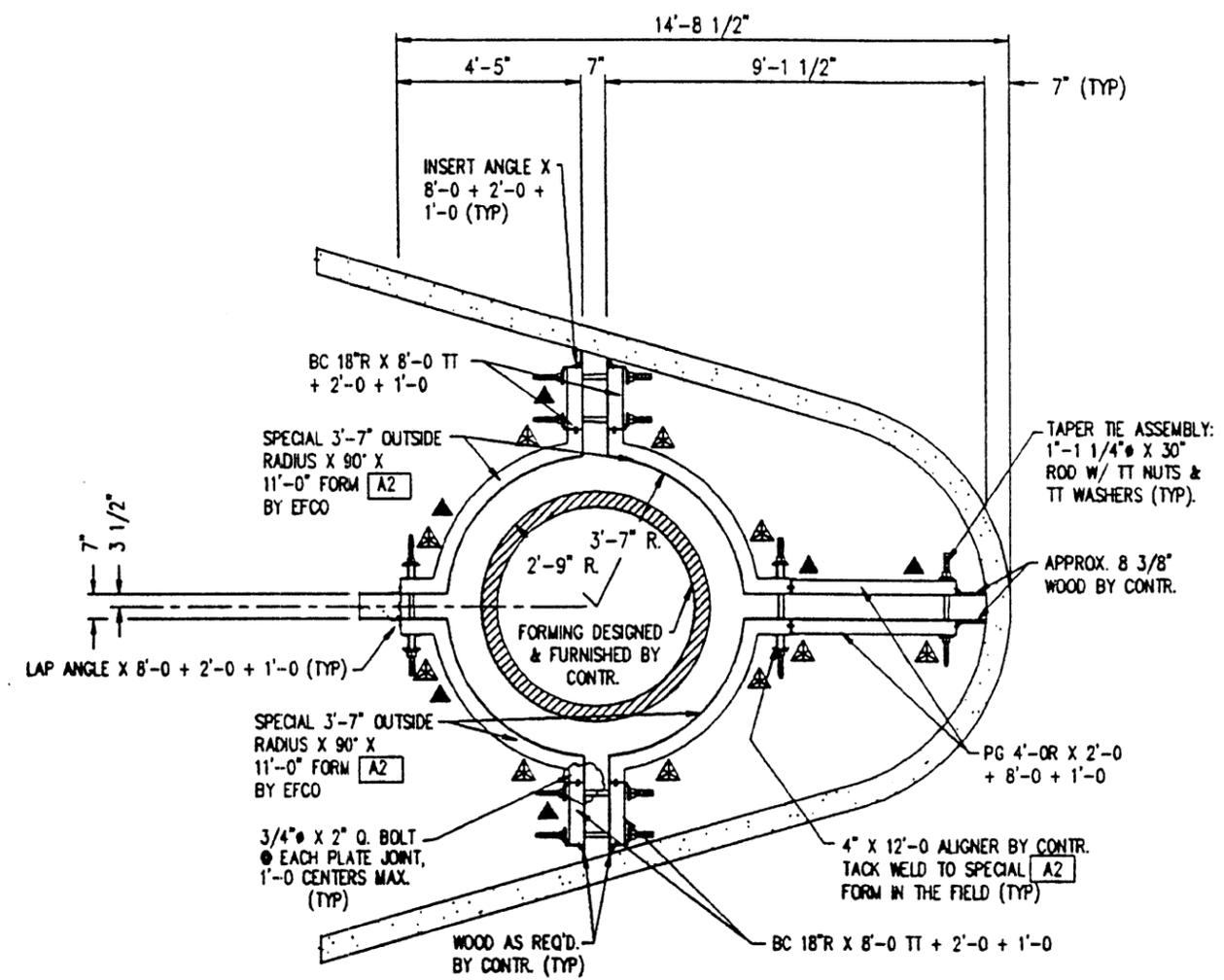
TEXAS DEPARTMENT TRANSPORTATION

Approved without modification  
 Approved with modification as shown

Date FEB 23 1995 J Vogel



Forms must be oiled before use and before each reuse. EFCO form oil is recommended.



**CONTRACTOR'S NOTES:**

- ALL EQUIPMENT BY CONTRACTOR, UNLESS NOTED OTHERWISE.
- SEE DRWG. #E-007 FOR KEY PLAN & ALL DIMENSIONS NOT SHOWN.
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**ECONOMY FORMS CORPORATION**  
 FORMS FOR CONCRETE CONSTRUCTION  
 HOME OFFICE DES MOINES, IOWA, U.S.A.  
 DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

DESIGNED BY	18DEC	RHT
CHECKED BY	000	000
PRINTED BY		
DATE	12	1995
CONTR.	6	
FIELD SERVICE	1	
SALES OFFICE	1	
SALES	1	
SHOP	1	
TOTAL	10	

PLAN VIEW - POUR E1

PROJECT: SH 87 @ GALVESTON FERRY LANDING

LOCATION: GALVESTON, TX

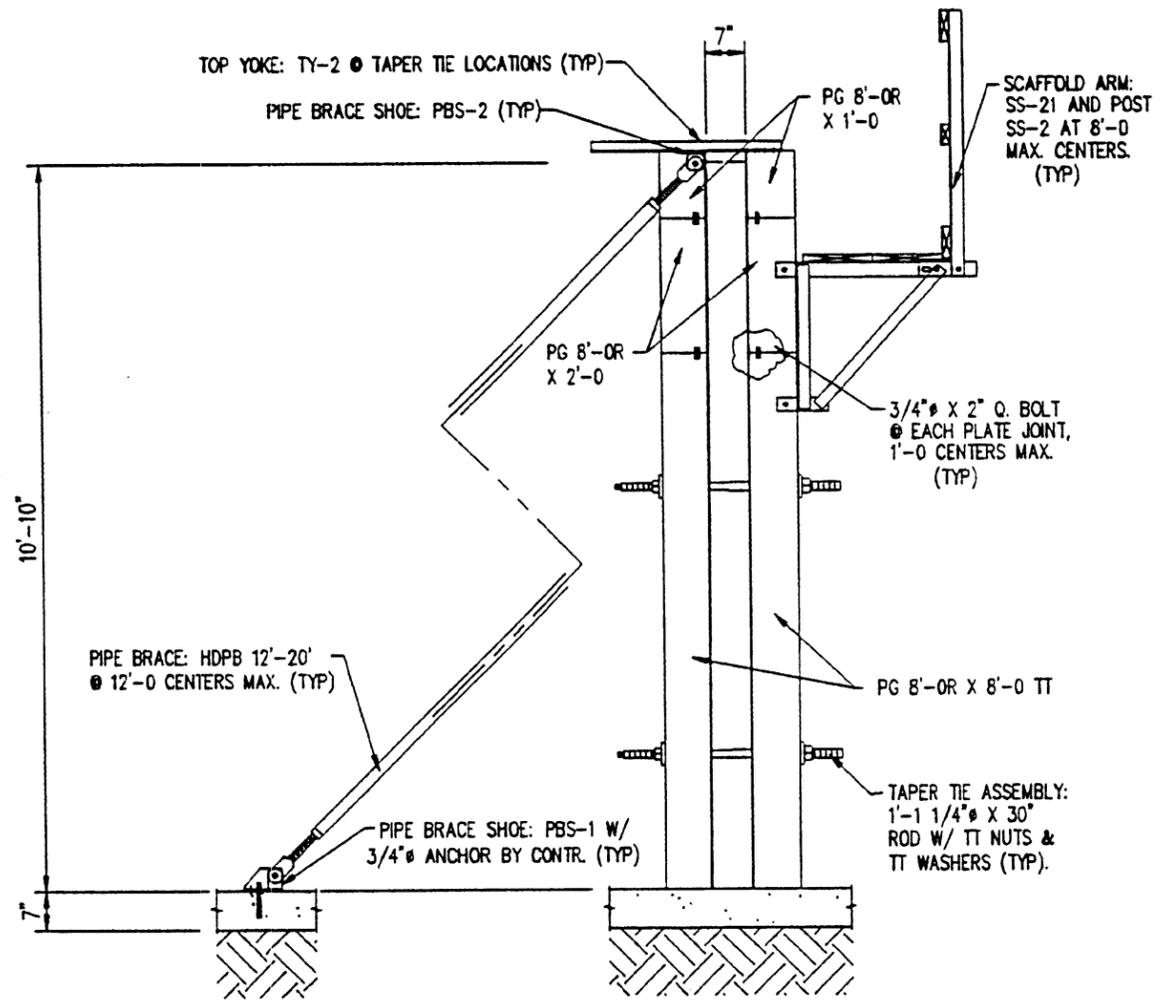
CONTR.: AUSTIN BRIDGE

EST. PROJ. NO. 1164      AGREEMENT NO. 9450390-01      DRAWING NO. DAL-1-012

**DRAWING NOTES**

- SEE DRWG. #E-002 FOR DRAWING NOTES.

▲ - TYPICAL LOCATION OF SS-2 & SS-21  
 (SEE DRWG. #E-006 FOR SCAFFOLD NOTES & DETAIL)  
 ▲ - TYPICAL LOCATION OF PIPE BRACE



SECTION B  
08,09,10,11,12 | 13

TEXAS DEPARTMENT TRANSPORTATION

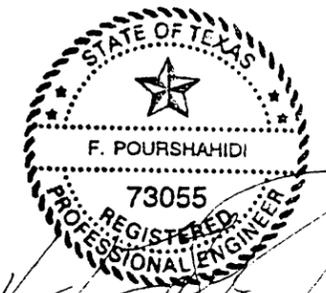
Approved without modification

Approved with modification as shown

Date FEB 23 1995 By J Vogel

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

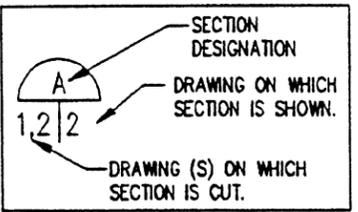
Forms must be oiled before first use and before each reuse. EF-COAT form oil is recommended.



2/25/95 F. Pourshahidi

- CONTRACTOR'S NOTES:
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  3. SEE DRWG. #E-001 FOR EXTERIOR WALL KEY PLAN.

- | NO. | REVISION | DATE | BY |
|-----|----------|------|----|
|     |          |      |    |
- GENERAL NOTES
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  5. ANY ALTERATION OR REPAIR OF EFCO EQUIPMENT MUST BE AUTHORIZED IN WRITING BY ECONOMY FORMS CORPORATION AND MUST BE CARRIED OUT BY QUALIFIED PERSONNEL. ANY MODIFICATION OF EQUIPMENT OR USE OF THAT EQUIPMENT OTHER THAN AS SHOWN WITHOUT APPROVAL IN WRITING BY ECONOMY FORMS CORPORATION WILL VOID ALL WARRANTIES.
  6. THIS DRAWING IS THE PROPERTY OF ECONOMY FORMS CORPORATION AND IS LOANED TO THE RECIPIENT IN CONFIDENCE.



- DRAWING NOTES
1. SEE DRWG. #E-002 FOR DRAWING NOTES.



ECONOMY FORMS CORPORATION  
FORMS FOR CONCRETE CONSTRUCTION  
HOME OFFICE DES MOINES, IOWA, U.S.A.  
DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERS

DETAILED BY	
18DEC	RHT
CHECKED BY	
000	000
PRINT DISTRIBUTION	
13	DRG. NO.
2	DATE
6	CONTR.
1	FIELD SERVICE
1	SALES OFFICE
1	DIST. SALES
1	DSM SALES
1	SHOP
10	TOTAL

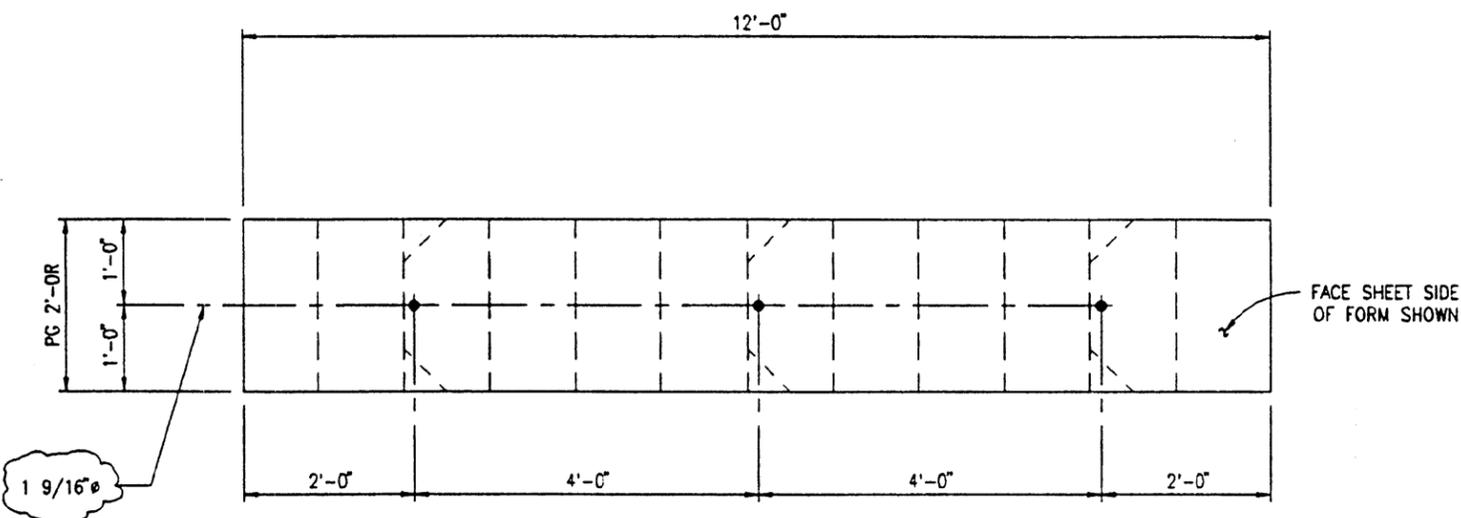
SECTION "B"		
TITLE	SH 87 @ GALVESTON FERRY LANDING	
PROJECT	GALVESTON, TX.	
LOCATION	AUSTIN BRIDGE	
CONTR.	AUSTIN BRIDGE	
DIST. PROJ. NO.	AGREEMENT NO.	DRAWING NO.
1164	9450390-01	DAL-E-013

TEXAS DEPARTMENT TRANSPORTATION

Approved without modification  
 Approved with modification as shown

Date FEB 23 1995 By J Vogel

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.



CONTR. TO TAKE (2) - PG 2'-OR X 12'-0,  
DRILL HOLES AS SHOWN AND MARK FORM : A7

NO.	REVISION	DATE	BY

**GENERAL NOTES**

1. THE CUSTOMER SHALL BEAR THE SOLE RESPONSIBILITY FOR INSURING THAT ASSEMBLY, USE AND MAINTENANCE OF THE EQUIPMENT AND MATERIALS SHOWN ON THESE DRAWINGS CONFORMS TO ALL LAWS, REGULATIONS, ORDINANCES AND LOCAL CODES, AND FOR CHECKING THE ACCURACY AND SUFFICIENCY OF FIELD DETAILS AND DIMENSIONS.
2. ALL DRAWINGS MUST BE CHECKED BY THE CUSTOMER FOR CORRECTNESS IN RELATION TO PROJECT PLANS AND SPECIFICATIONS - PARTICULAR REFERENCE MUST BE MADE FOR REVISIONS ISSUED BY THE ARCHITECT OR ENGINEER.
3. THE INDICATED CAPACITY OF DEVICES SECURED BY DRILLING OR IMBEDMENT IN CONCRETE IS ENTIRELY DEPENDENT UPON THE QUALITY AND HOLDING CAPACITY OF THE SURROUNDING CONCRETE. THE CUSTOMER SHALL INSURE THAT THE CONCRETE HAS SUFFICIENT STRENGTH TO HOLD THE LOADS APPLIED.
4. IT IS THE CUSTOMER'S RESPONSIBILITY TO COMMUNICATE TO ALL PERSONNEL INVOLVED IN THE USE OF THE EQUIPMENT ALL INFORMATION CONTAINED IN THESE NOTES AND OTHER NOTES ON ALL DRAWINGS SUPPLIED BY EFCO AND TO INSURE THAT THEY UNDERSTAND THEM AND USE THE EQUIPMENT ACCORDINGLY.
5. ANY ALTERATION OR REPAIR OF EFCO EQUIPMENT MUST BE AUTHORIZED IN WRITING BY ECONOMY FORMS CORPORATION AND MUST BE CARRIED OUT BY QUALIFIED PERSONNEL. ANY MODIFICATION OF EQUIPMENT OR USE OF THAT EQUIPMENT OTHER THAN AS SHOWN WITHOUT APPROVAL IN WRITING BY ECONOMY FORMS CORPORATION WILL VOID ALL WARRANTIES.
6. THIS DRAWING IS THE PROPERTY OF ECONOMY FORMS CORPORATION AND IS LOANED TO THE RECIPIENT IN CONFIDENCE.



**ECONOMY FORMS CORPORATION**  
 FORMS FOR CONCRETE CONSTRUCTION  
 HOME OFFICE DES MOINES, IOWA, U.S.A.  
 DISTRICT OFFICES THROUGHOUT UNITED STATES, CANADA, AND OVERSEAS

FIELD DRILLED PG 2'-OR X 12'-0 A7

TITLE: SH 87 @ GALVESTON FERRY LANDING

PROJECT: GALVESTON, TEXAS

LOCATION: AUSTIN, BRIDGE

CONTR.:

DIST. PROJ. NO. AGREEMENT NO. 9450390-01 DRAWING NO. DAL-E-014

DETAILED BY	
25JAN95	JRG
CHECKED BY	
PRINT DISTRIBUTION	
ED	DATE
6	CONTR.
1	FIELD SERVICE
1	SALES OFFICE
1	EST. SALES
1	DSM SALES
0	SHOP
8	TOTAL

1450390-D-01 01/25/95 1028



# Texas Department of Transportation

DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

January 24, 1995

County: Galveston  
Control: 1607-02-013  
Project: STP 94(321)R  
Highway: FM 1764  
Structure: Highland Bayou (Str. #18)

Shop Plan File: 7465  
Your Order: 95-018H

Structural Engineering Associates  
3838 N. W. Loop 410, Suite 200  
San Antonio, Texas 78229

Attention: Mr. Charles Garza

Gentlemen:

We have reviewed your shop drawings, sheets E-1, I-1, NP-1, B-1 thru B-8, & S"B", covering B beams and neoprene pads on the above project. The drawings are approved for fabrication and are enclosed.

Any corrections noted in red must be incorporated into the work. Revised prints for these corrections will not be necessary.

One set of any erection drawings, included herein, has been sent to the Contractor.

If you have questions, please call Greg Kindle at 512-416-2221.

Sincerely,

Robert L. Wilson, P.E.  
Director, Design Division

By:

Charles C. Terry, P.E.  
Engineer of Bridge Design

GRK:ew  
Encl.

cc: Houston District  
Materials and Tests Division  
NGB Constructors, Inc.

# I N D E X

STRUCTURE		BEAM		LENGTH			1/2" $\phi$ -270k LO-LAX STRANDS					CONCRETE		ENDS		BEAM DETAIL SHEET NO.	DESIGN REFERENCE NO.	REMARKS
DESIG-NATION	SPAN NO.	TYPE & MARK NO.	QUANTITY	I.D.T.S. ADDED	DESIGN (A)	CAST (B)	TOTAL QUANTITY	"e" AT $\phi$	"e" AT END	DEPRESSED		MINIMUM RELEASE	MIN. COMP. 28 DAY STRENGTH	SKEW (INCHES)	BATTER (INCHES)			
										QUAN.	AT							
HIGHLAND BAYOU DITCH (STRUCTURE NO. 18)	1	B-1	1	None	54.67'	54.72'	18	11.60"	8.26"	6	A-16	4850	5000	1 5/8"	None	B-1	Gp-NS-LR	NONE
	1	B-2	8	None	54.67'	54.72'	18	11.60"	8.26"	6	A-16	4850	5000	1 5/8"	None	B-2	Gp-NS-LR	NONE
	1	B-3	1	None	54.67'	54.72'	18	11.60"	8.26"	6	A-16	4850	5000	1 5/8"	None	B-3	Gp-NS-LR	NONE
	1	B-4	1	None	54.67'	54.72'	18	11.60"	8.26"	6	A-16	4850	5000	1 5/8"	None	B-4	Gp-NS-LR	NONE
	2	B-5	1	None	54.67'	54.72'	18	11.60"	8.26"	6	A-16	4850	5000	1 5/8"	None	B-5	Gp-NS-LR	NONE
	2	B-6	8	None	54.67'	54.72'	18	11.60"	8.26"	6	A-16	4850	5000	1 5/8"	None	B-6	Gp-NS-LR	NONE
	2	B-7	1	None	54.67'	54.72'	18	11.60"	8.26"	6	A-16	4850	5000	1 5/8"	None	B-7	Gp-NS-LR	NONE
	2	B-8	1	None	54.67'	54.72'	18	11.60"	8.26"	6	A-16	4850	5000	1 5/8"	None	B-8	Gp-NS-LR	NONE

**TEXAS DEPARTMENT OF TRANSPORTATION**  
**APPROVED**  
 DIVISION OF BRIDGES AND STRUCTURES  
  
**JAN 24 1995**  
  
 APPROVAL OF THIS DRAWING DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE CORRECTNESS OF DETAIL.

**RECEIVED**  
**JAN 17 1995**  
 DESIGN DIVISION

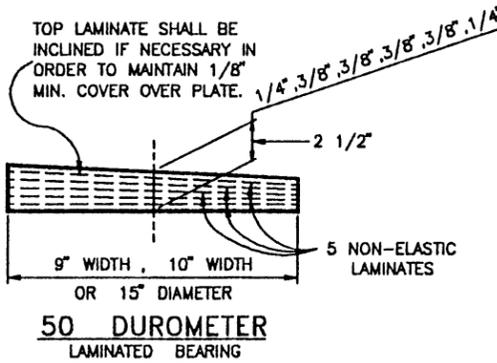
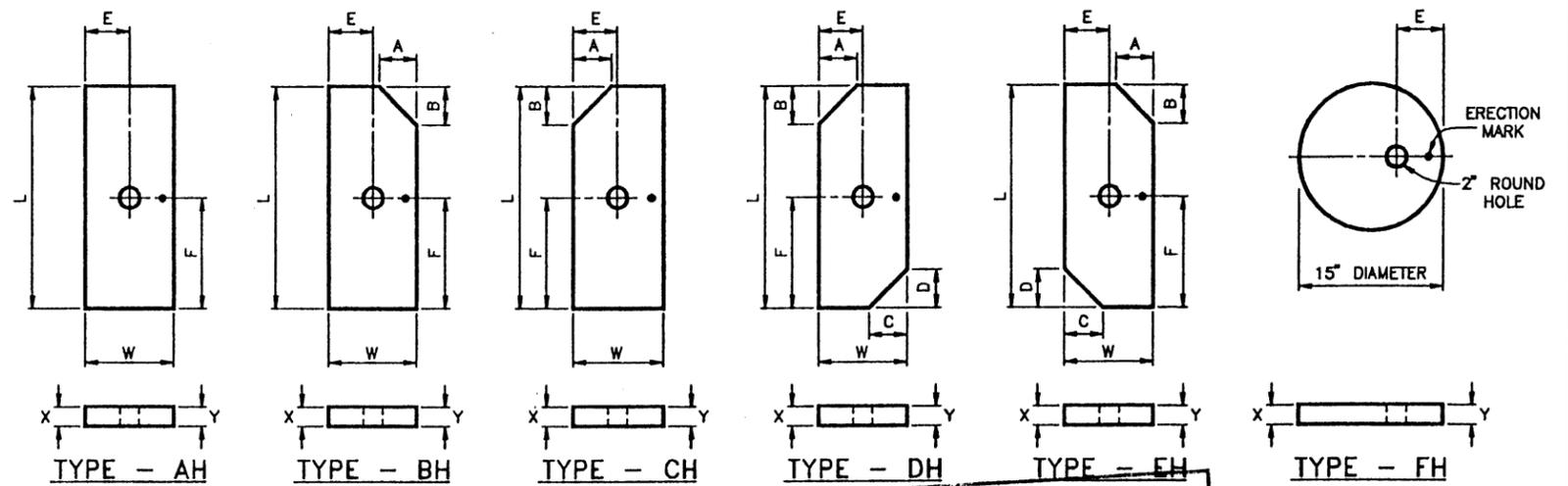
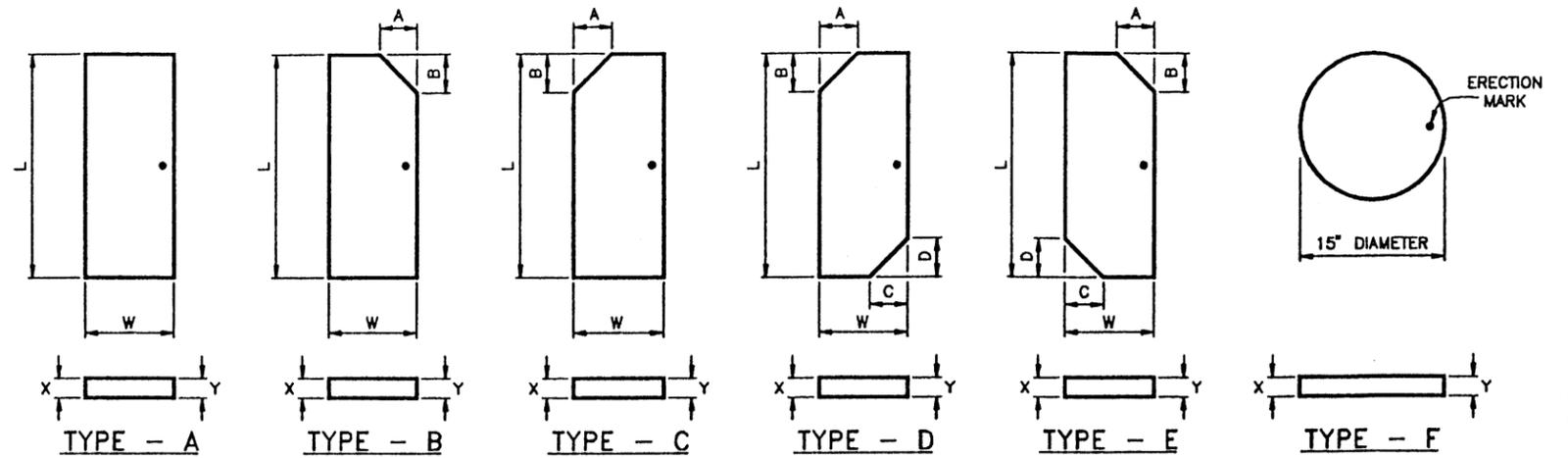
TOTAL HANGERS REQUIRED FOR THIS PROJECT = 114  
 TOTAL LINEAR FEET OF THIS PROJECT : 1202.74'

<b>MANUFACTURED CONCRETE PRODUCTS CO.</b>				
CONTRACTOR : NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013, ETC.
COPYRIGHT 1989 BY <b>SEA</b> STRUCTURAL ENGINEERING ASSOCIATES, INC. CONSULTING ENGINEERS, SAN ANTONIO, TEXAS				
JOB NO.	DRAWN	CHECKED	DATE	SHEET NO.
94-027	M.J.R.	C.F.G.	1/16/1995	I-1
SEA JOB NO.	INDEX SHEET			
95-018H				

**FOR APPROVAL**  
**JAN 16 1995**

# ELASTOMERIC BEARING PADS SCHEDULE

MARK	TYPE	DURO.	QUANT.	X	Y	L	W	A	B	C	D	E	F
P-1	A	50	40	2 1/2"	2 1/2"	16"	8"						
P-2	AH	50	4	2 1/2"	2 1/2"	16"	8"					4"	8"



TEXAS DEPARTMENT OF TRANSPORTATION APPROVED DIVISION OF BRIDGES AND STRUCTURES

JAN 24 1995

APPROVAL OF THIS DRAWING DOES NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY FOR THE CORRECTNESS OF THE MANUFACTURE OF BEARING PADS. SPECIAL NOTES IF PERMITTED.

70 DUROMETER ELASTOMERIC BEARING

PLAIN BEARING

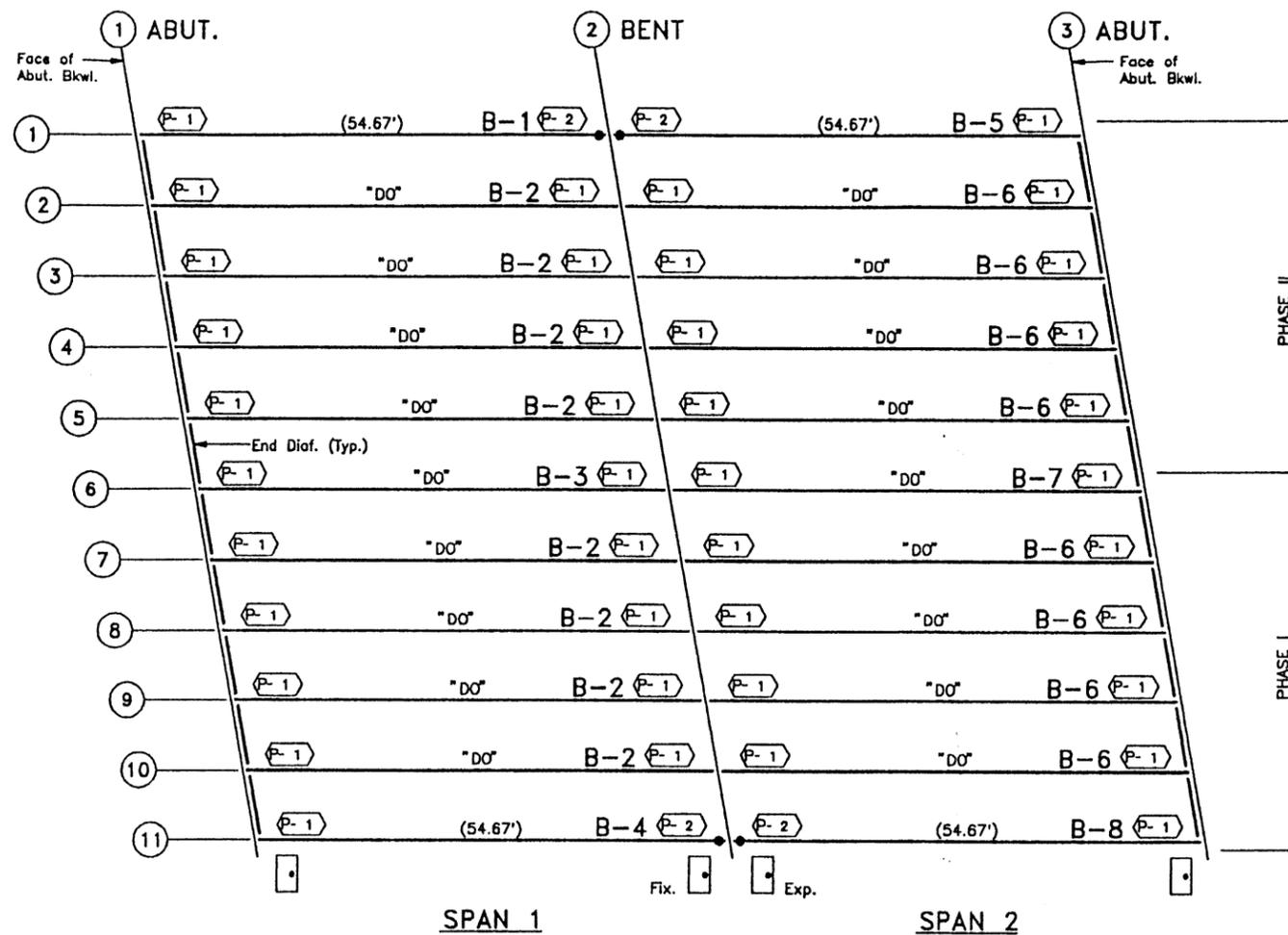
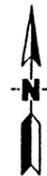
○ DENOTES 2" ROUND HOLE

● DENOTES ERECTION MARK

FOR APPROVAL  
JAN 16 1995

MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR : NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013, ETC.
COPYRIGHT 1989 BY SEA STRUCTURAL ENGINEERING ASSOCIATES, INC. CONSULTING ENGINEERS, SAN ANTONIO, TEXAS				
JOB NO. 94-027	DRAWN M.J.R.	CHECKED C.F.G.	DATE 1/16/1995	SHEET NO. NP-1
SEA JOB NO. 95-018H				NEOPRENE PADS

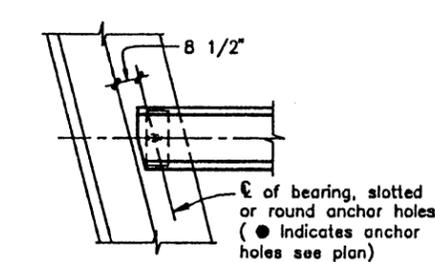
HIGHLAND BAYOU  
DITCH "A"  
(STRUCTURE NO. 18)



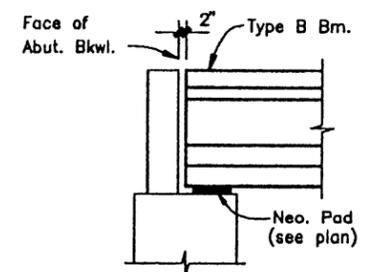
TEXAS DEPARTMENT OF  
TRANSPORTATION  
APPROVED  
DIVISION OF BRIDGES AND STRUCTURES

JAN 24 1995

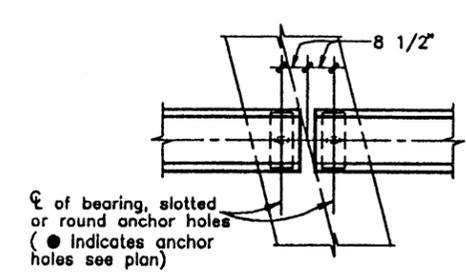
APPROVAL OF THIS DRAWING DOES NOT  
RELIEVE THE CONTRACTOR OF THE  
RESPONSIBILITY FOR THE CORRECTNESS  
OF DETAIL.



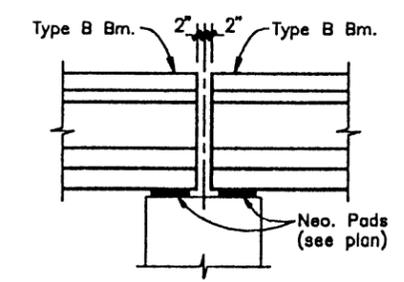
PLAN AT ABUT. 1  
(ABUT. 3 SIM.)



ELEV. AT ABUT. 1  
(ABUT. 3 SIM.)



PLAN AT BENT 2



ELEV. AT BENT 2

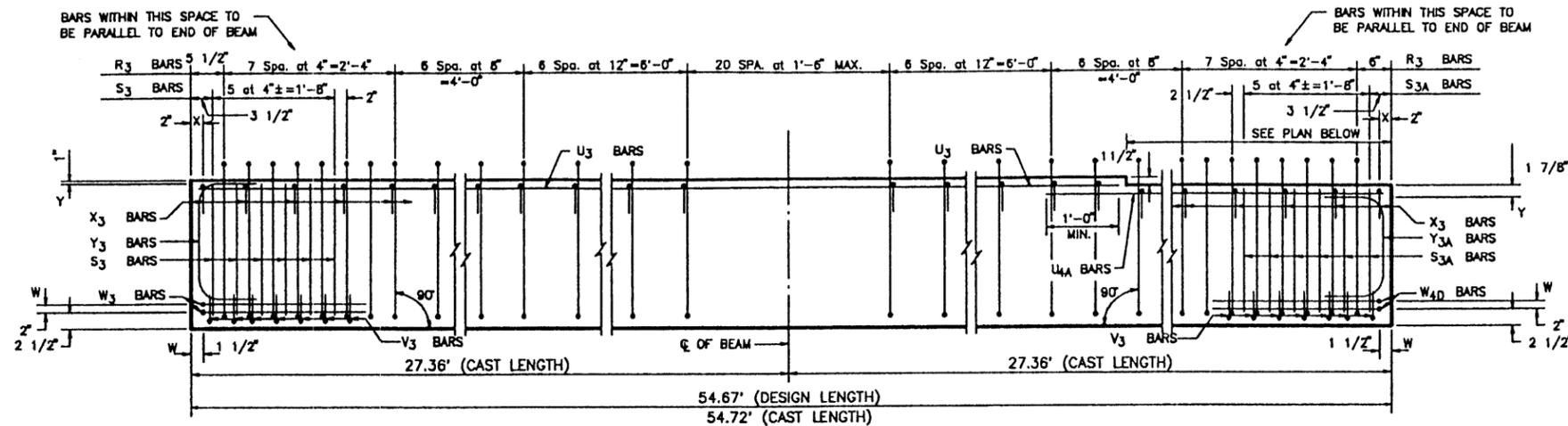
FOR APPROVAL  
JAN 16 1995

( ) INDICATES BEAM LENGTH

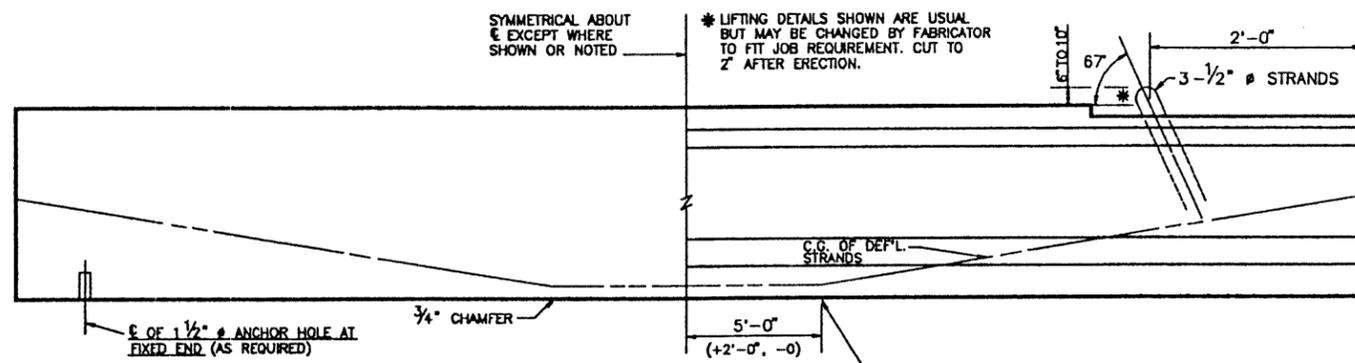
MANUFACTURED CONCRETE PRODUCTS CO.					
CONTRACTOR : NBG CONSTRUCTORS, INC.					
CONTRACTORS OPTIONS		END DIAFRAM : E.D.O. #2		SLAB : PANELS	
INTERIOR DIAFRAM : N/A					
FED. RD. DIV. NO.	STATE	PROJECT NO.		HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.		FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	
12	GALVESTON	1607	02	013, ETC.	
COPYRIGHT 1989 BY SEA STRUCTURAL ENGINEERING ASSOCIATES, INC. CONSULTING ENGINEERS, SAN ANTONIO, TEXAS					
JOB NO. 94-027	DRAWN M.J.R.	CHECKED C.F.G.	DATE 1/16/1995	SHEET NO. E-1	
SEA JOB NO. 95-018H	ERECTION SHEET				

REINFORCING STEEL SCHEDULE

BAR	QUANTITY PER BEAM	TOTAL QUANTITY	SIZE	LENGTH
R3	59	59	#4	standard
X3	53	53	#3	standard
Y3	2	2	#6	standard
S3	12	12	#5	standard
V3	14	14	#3	standard
W3	2	2	#5	standard
U3	2	2	#5	50'-7"
Y3A	2	2	#6	standard
S3A	12	12	#5	standard
W4D	2	2	#5	standard
U4A	2	2	#5	6'-6"

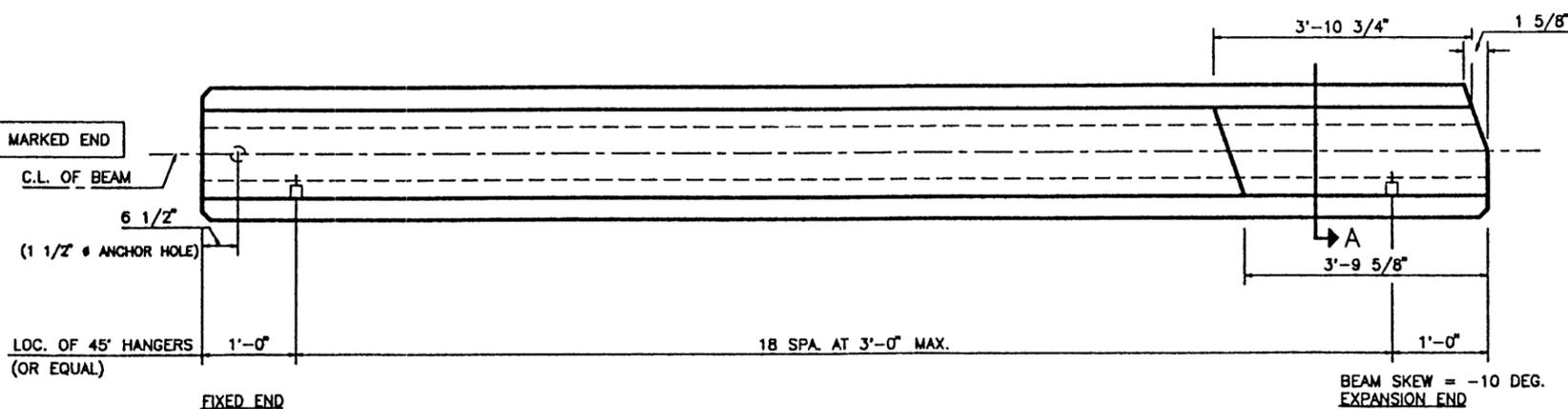


ELEVATION - REINFORCING STEEL



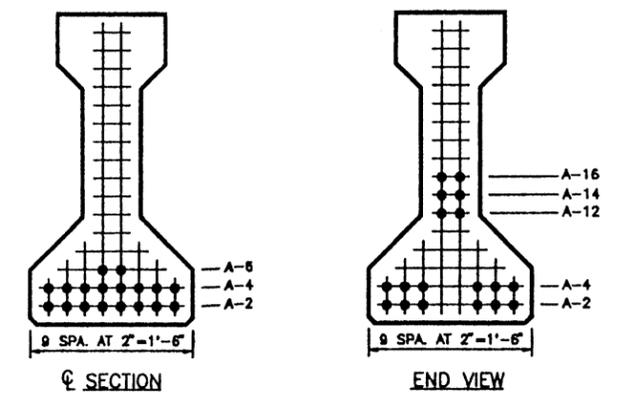
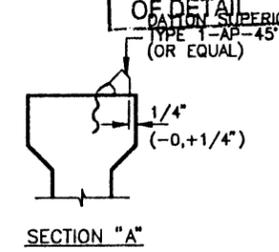
BEAM ELEVATION  
SEE PLAN VIEW FOR HOLE(S) LOCATION

SINGLE LIFTING LOOP DETAIL  
(TYP. FOR BEAMS UNDER 75')



PLAN

TEXAS DEPARTMENT OF TRANSPORTATION  
APPROVED  
DIVISION OF BRIDGES AND STRUCTURES  
JAN 24 1995  
APPROVAL OF THIS DRAWING DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE CORRECTNESS OF DETAIL



TYPE "B" BEAM QUANTITY : 1

LO-LAX STRAND PATTERN	
NUMBER OF STRANDS	: 18 ~1/2" # 270 K @ 31.00 K EACH
NUMBER OF STRAIGHT STRANDS	: 12
NUMBER OF DEFLECTED STRANDS	: 6 @ A - 16
CONCRETE RELEASE STRENGTH	: 4850 PSI
CONCRETE DESIGN STRENGTH	: 5000 PSI
ECCENTRICITY @ C	: 11.60" ECCENTRICITY @ END : 8.26"

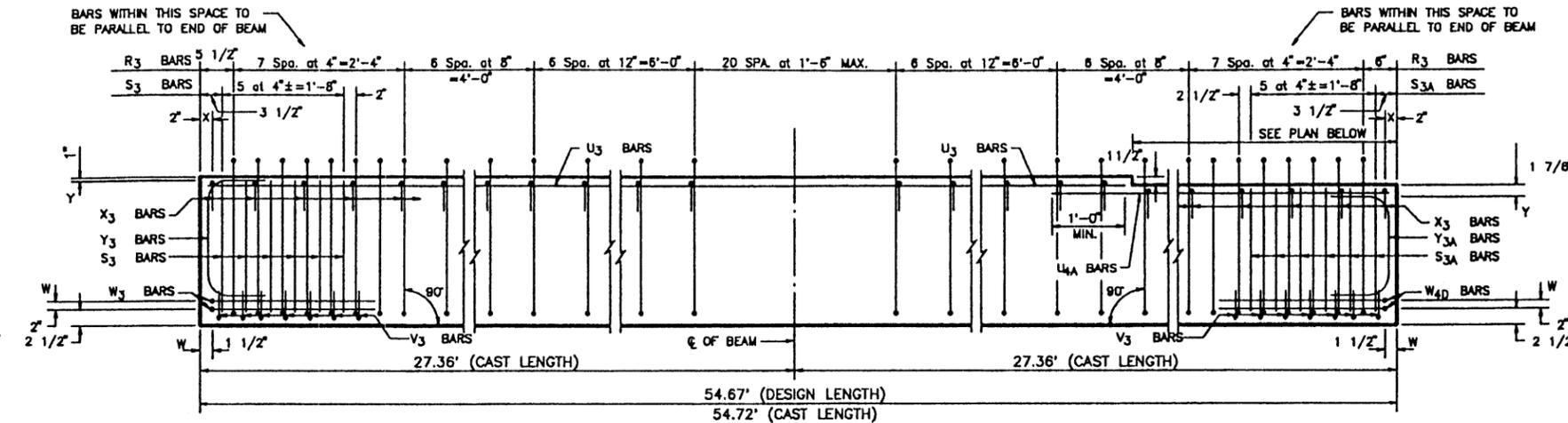
DESIGN NO. : Gp-NS-LR  
TOTAL BEAM LENGTH OF THIS SHEET : 54.67'

MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013, ETC.
COPYRIGHT 1989 BY SEA STRUCTURAL ENGINEERING ASSOCIATES, INC. CONSULTING ENGINEERS, SAN ANTONIO, TEXAS				
JOB NO.	DRAWN	CHECKED	DATE	SHEET/MARK NO.
94-027	M.J.R.	C.F.G.	1/16/1995	B-1
SEA JOB NO.	FABRICATION SHEET			
95-018H				

FOR APPROVAL  
JAN 16 1995

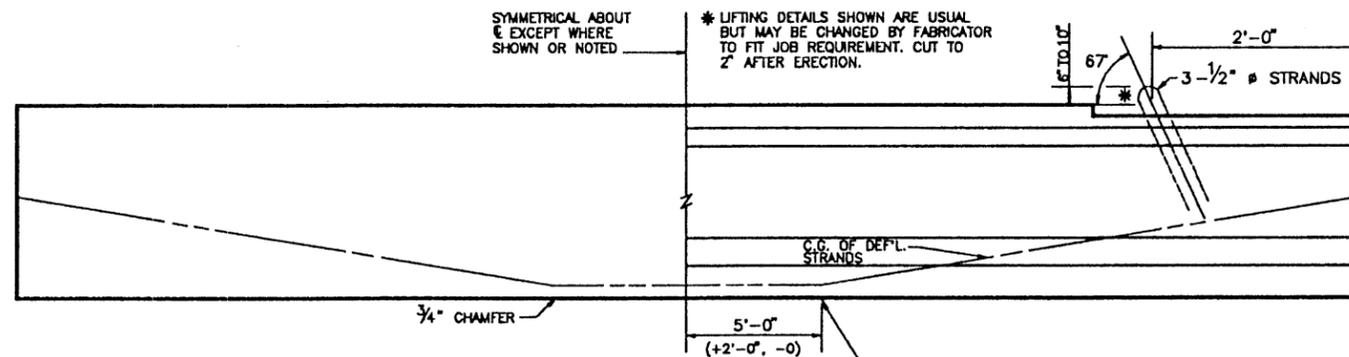
REINFORCING STEEL SCHEDULE

BAR	QUANTITY PER BEAM	TOTAL QUANTITY	SIZE	LENGTH
R3	59	472	#4	standard
X3	53	424	#3	standard
Y3	2	16	#6	standard
S3	12	96	#5	standard
V3	14	112	#3	standard
W3	2	16	#5	standard
U3	2	16	#5	50'-7"
Y3A	2	16	#6	standard
S3A	12	96	#5	standard
W4D	2	16	#5	standard
U4A	2	16	#5	6'-6"



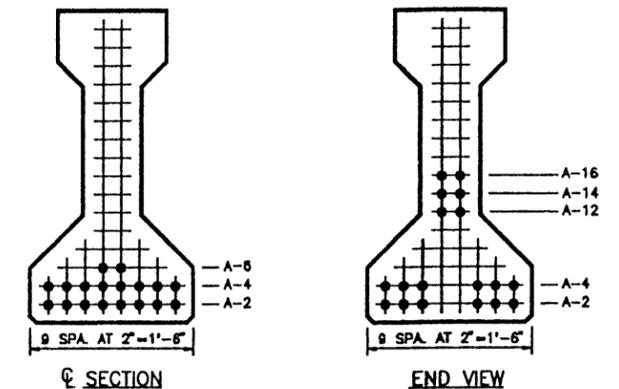
ELEVATION - REINFORCING STEEL

TEXAS DEPARTMENT OF TRANSPORTATION  
 APPROVED  
 DIVISION OF BRIDGES AND STRUCTURES  
  
 JAN 24 1995  
  
 APPROVAL OF THIS DRAWING DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE CORRECTNESS OF DETAIL.



BEAM ELEVATION  
 SEE PLAN VIEW FOR HOLE(S) LOCATION

SINGLE LIFTING LOOP DETAIL  
 (TYP. FOR BEAMS UNDER 75')



TYPE "B" BEAM QUANTITY : 8

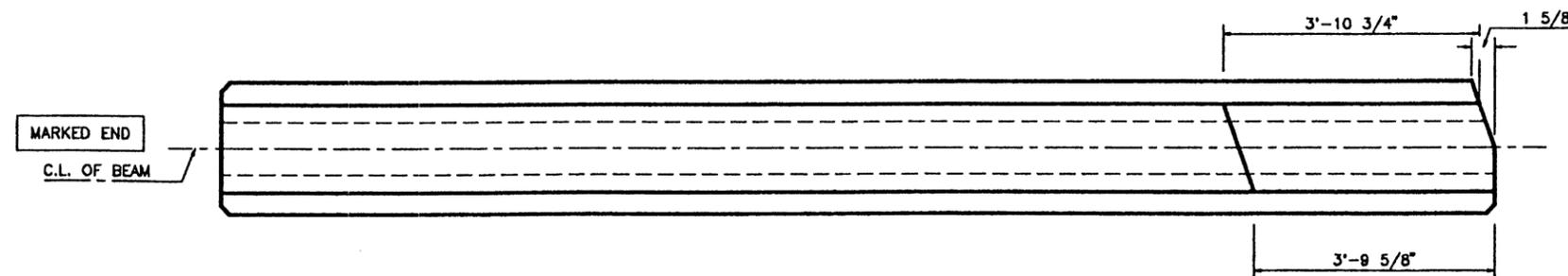
LO-LAX STRAND PATTERN	
NUMBER OF STRANDS	: 18 ~1/2" # 270 K @ 31.00 K EACH
NUMBER OF STRAIGHT STRANDS	: 12
NUMBER OF DEFLECTED STRANDS	: 6 @ A - 16
CONCRETE RELEASE STRENGTH	: 4850 PSI
CONCRETE DESIGN STRENGTH	: 5000 PSI
ECCENTRICITY @ C	: 11.60" ECCENTRICITY @ END : 8.26"

DESIGN NO. : Gp-NS-LR  
 TOTAL BEAM LENGTH OF THIS SHEET : 437.36'

MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013, ETC.

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JOB NO. 94-027	DRAWN M.J.R.	CHECKED C.F.G.	DATE 1/16/1995	SHEET/MARK NO. B-2
SEA JOB NO. 95-018H	FABRICATION SHEET			



FIXED END

BEAM SKEW = -10 DEG.  
 EXPANSION END

PLAN

TOP FINISH PANELS  
 SEE STANDARD SHEET S-"B" FOR TOP FINISH AND OTHER NOTES AND DETAILS.

FOR APPROVAL  
 JAN 16 1995

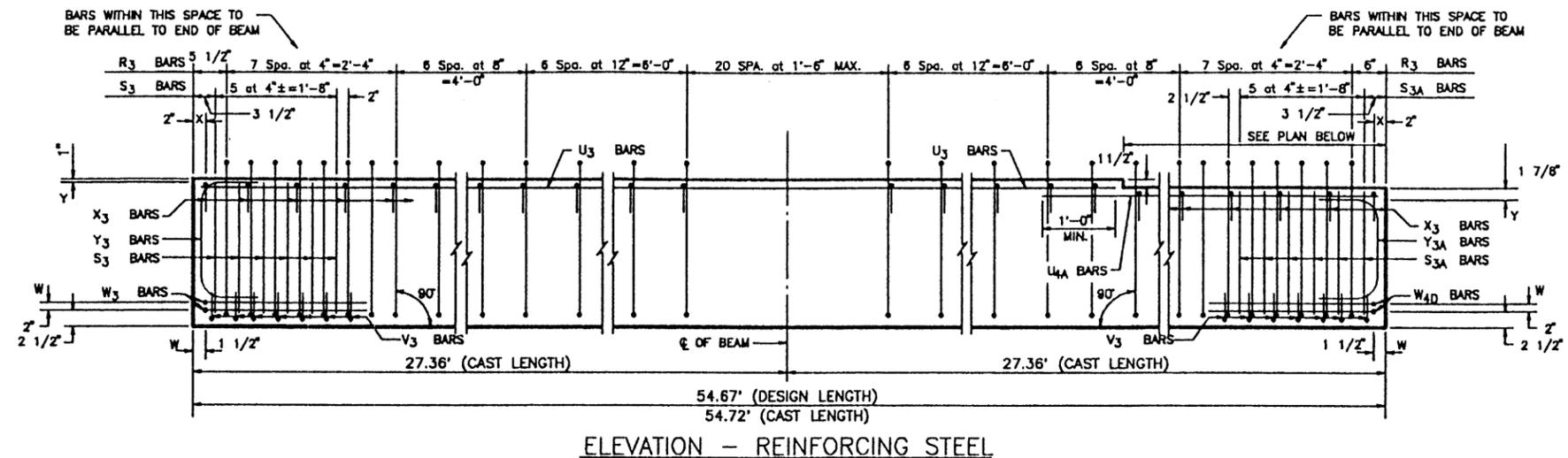
REINFORCING STEEL SCHEDULE

BAR	QUANTITY PER BEAM	TOTAL QUANTITY	SIZE	LENGTH
R3	59	59	#4	standard
X3	53	53	#3	standard
Y3	2	2	#6	standard
S3	12	12	#5	standard
V3	14	14	#3	standard
W3	2	2	#5	standard
U3	2	2	#5	50'-7"
Y3A	2	2	#6	standard
S3A	12	12	#5	standard
W4D	2	2	#5	standard
U4A	2	2	#5	6'-6"

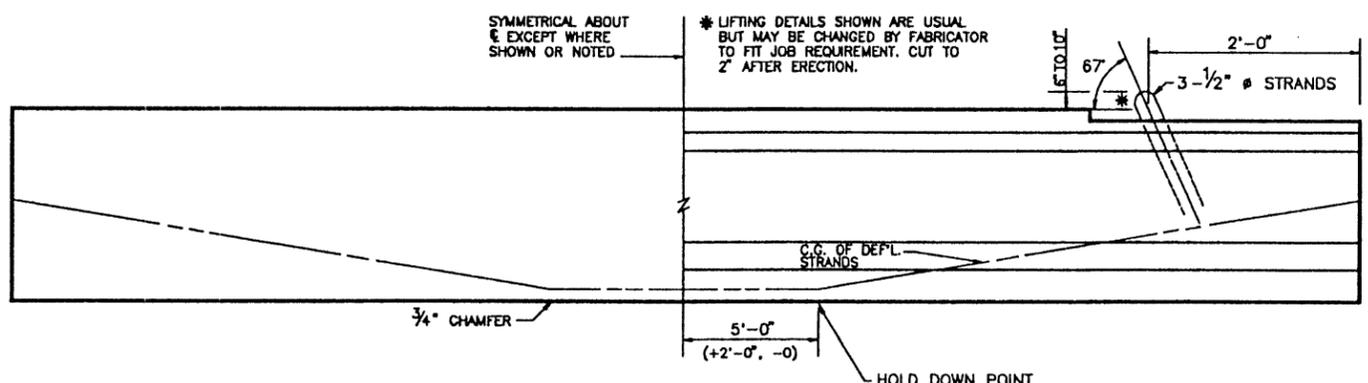
TEXAS DEPARTMENT OF  
TRANSPORTATION  
APPROVED  
DIVISION OF BRIDGES AND STRUCTURES

JAN 24 1995

APPROVAL OF THIS DRAWING DOES NOT  
RELIEVE THE CONTRACTOR OF THE  
RESPONSIBILITY FOR THE CORRECTNESS  
OF DETAIL.

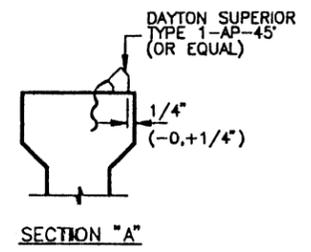


ELEVATION - REINFORCING STEEL

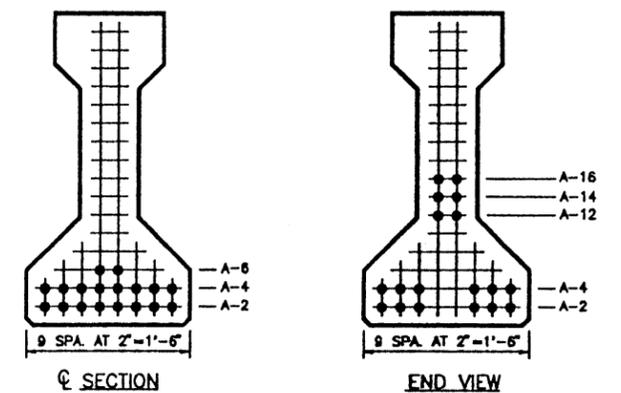


BEAM ELEVATION  
SEE PLAN VIEW FOR HOLE(S) LOCATION

SINGLE LIFTING LOOP DETAIL  
(TYP. FOR BEAMS UNDER 75')



SECTION "A"



SECTION

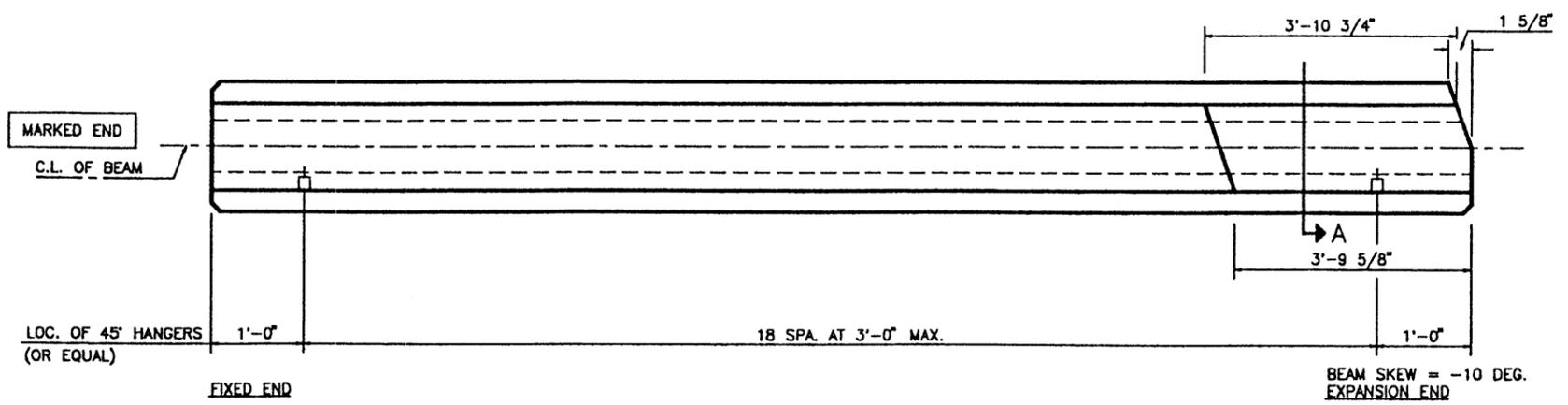
END VIEW

TYPE "B" BEAM QUANTITY : 1

LO-LAX STRAND PATTERN	
NUMBER OF STRANDS	: 18 ~ 1/2" # 270 K @ 31.00 K EACH
NUMBER OF STRAIGHT STRANDS	: 12
NUMBER OF DEFLECTED STRANDS	: 6 @ A - 16
CONCRETE RELEASE STRENGTH	: 4850 PSI
CONCRETE DESIGN STRENGTH	: 5000 PSI
ECCENTRICITY @ C	: 11.60" ECCENTRICITY @ END : 8.26"

DESIGN NO. : Gp-NS-LR  
TOTAL BEAM LENGTH OF THIS SHEET : 54.67'

MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013, ETC.
COPYRIGHT 1989 BY SEA STRUCTURAL ENGINEERING ASSOCIATES, INC. CONSULTING ENGINEERS, SAN ANTONIO, TEXAS				
JOB NO.	DRAWN	CHECKED	DATE	SHEET/MARK NO.
94-027	M.J.R.	C.F.G.	1/16/1995	B-3
SEA JOB NO.	FABRICATION SHEET			
95-018H				



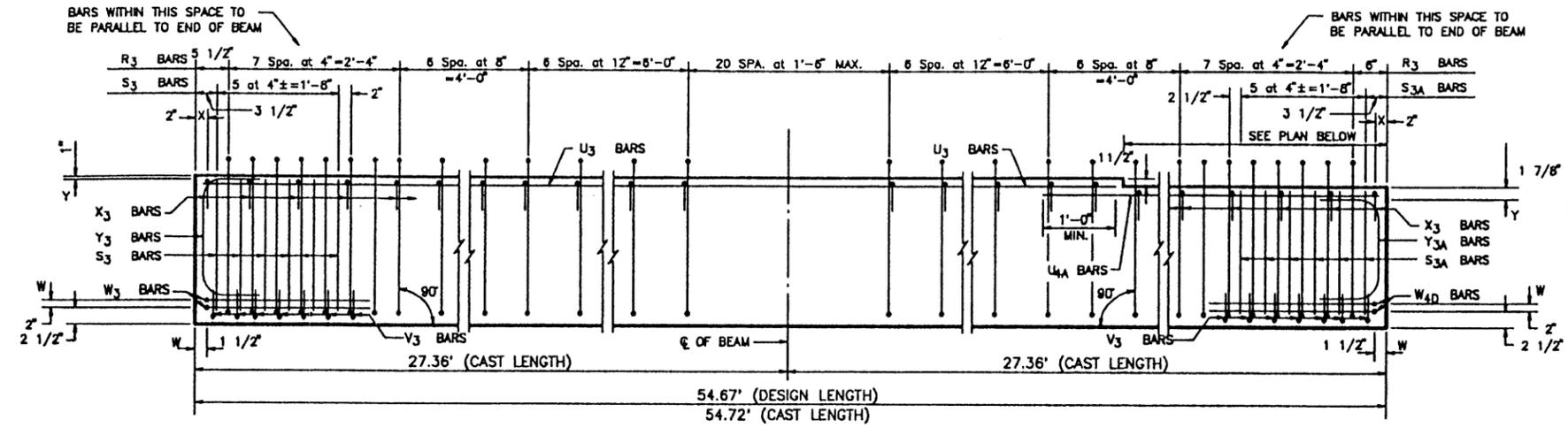
PLAN

TOP FINISH PANELS  
SEE STANDARD SHEET S-"B" FOR TOP  
FINISH AND OTHER NOTES AND DETAILS.

FOR APPROVAL  
JAN 16 1995

REINFORCING STEEL SCHEDULE

BAR	QUANTITY PER BEAM	TOTAL QUANTITY	SIZE	LENGTH
R <sub>3</sub>	59	59	#4	standard
X <sub>3</sub>	53	53	#3	standard
Y <sub>3</sub>	2	2	#6	standard
S <sub>3</sub>	12	12	#5	standard
V <sub>3</sub>	14	14	#3	standard
W <sub>3</sub>	2	2	#5	standard
U <sub>3</sub>	2	2	#5	50'-7"
Y <sub>3A</sub>	2	2	#6	standard
S <sub>3A</sub>	12	12	#5	standard
W <sub>4D</sub>	2	2	#5	standard
U <sub>4A</sub>	2	2	#5	6'-6"

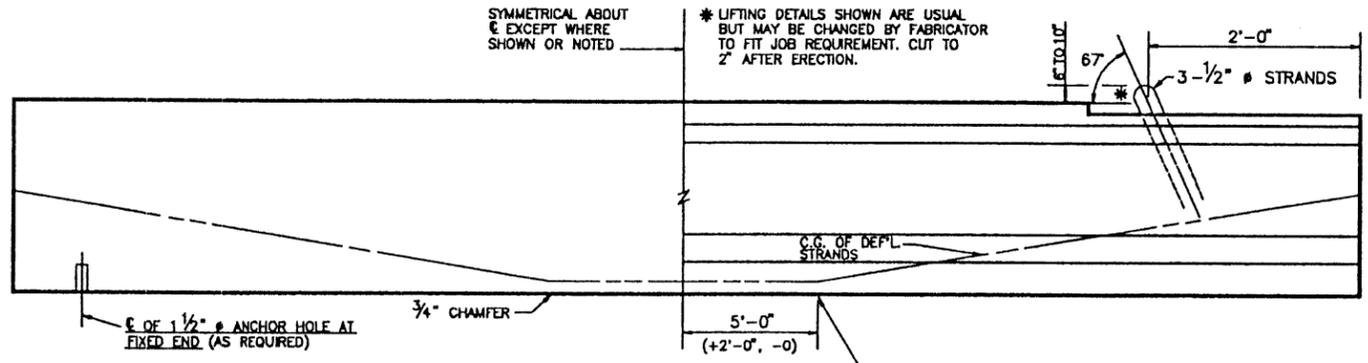


ELEVATION - REINFORCING STEEL

TEXAS DEPARTMENT OF  
TRANSPORTATION  
APPROVED  
DIVISION OF BRIDGES AND STRUCTURES

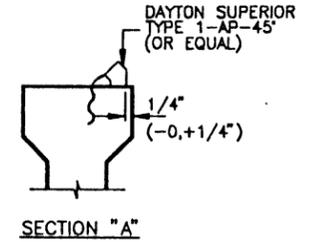
JAN 24 1995

APPROVAL OF THIS DRAWING DOES NOT  
RELIEVE THE CONTRACTOR OF THE  
RESPONSIBILITY FOR THE CORRECTNESS  
OF DETAIL.

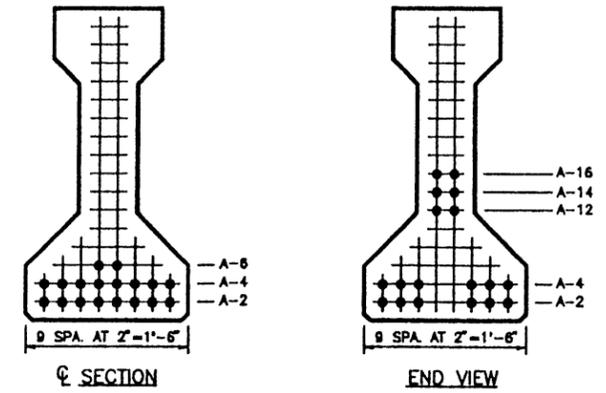


BEAM ELEVATION  
SEE PLAN VIEW FOR HOLE(S) LOCATION

SINGLE LIFTING LOOP DETAIL  
(TYP. FOR BEAMS UNDER 75')



SECTION "A"



C SECTION

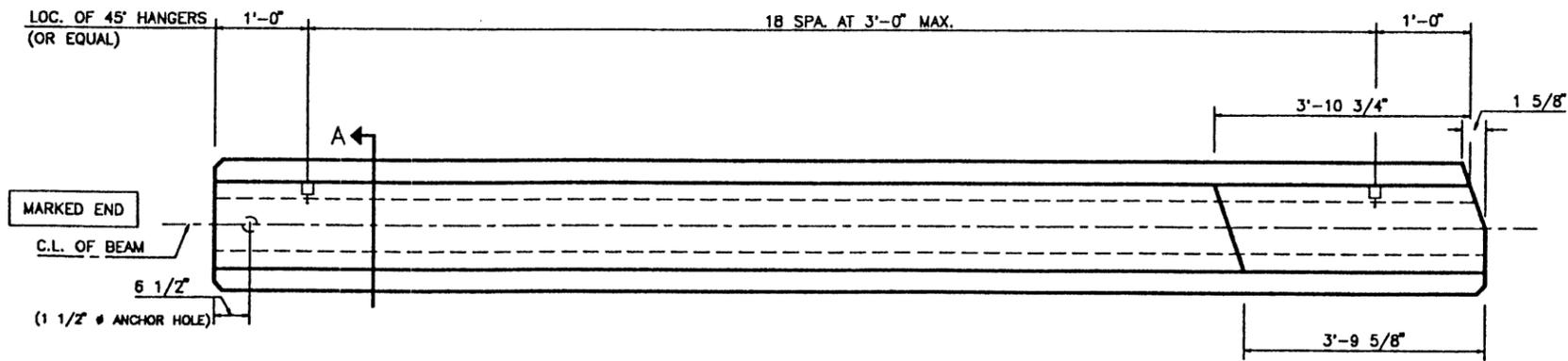
END VIEW

TYPE "B" BEAM QUANTITY : 1

LO-LAX STRAND PATTERN	
NUMBER OF STRANDS	: 18 ~1/2" # 270 K @ 31.00 K EACH
NUMBER OF STRAIGHT STRANDS	: 12
NUMBER OF DEFLECTED STRANDS	: 6 @ A - 16
CONCRETE RELEASE STRENGTH	: 4850 PSI
CONCRETE DESIGN STRENGTH	: 5000 PSI
ECCENTRICITY @ C.E.	: 11.60" ECCENTRICITY @ END : 8.26"

DESIGN NO. : Gp-NS-LR  
TOTAL BEAM LENGTH OF THIS SHEET : 54.67'

MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1807	02	013, ETC.
COPYRIGHT 1989 BY SEA STRUCTURAL ENGINEERING ASSOCIATES, INC. CONSULTING ENGINEERS, SAN ANTONIO, TEXAS				
JOB NO.	DRAWN	CHECKED	DATE	SHEET/MARK NO.
94-027	M.J.R.	C.F.G.	1/16/1995	B-4
SEA JOB NO.	FABRICATION SHEET			
95-018H				



FIXED END

BEAM SKEW = -10 DEG.  
EXPANSION END

PLAN

TOP FINISH PANELS  
SEE STANDARD SHEET S-"B" FOR TOP  
FINISH AND OTHER NOTES AND DETAILS.

FOR APPROVAL  
JAN 16 1995

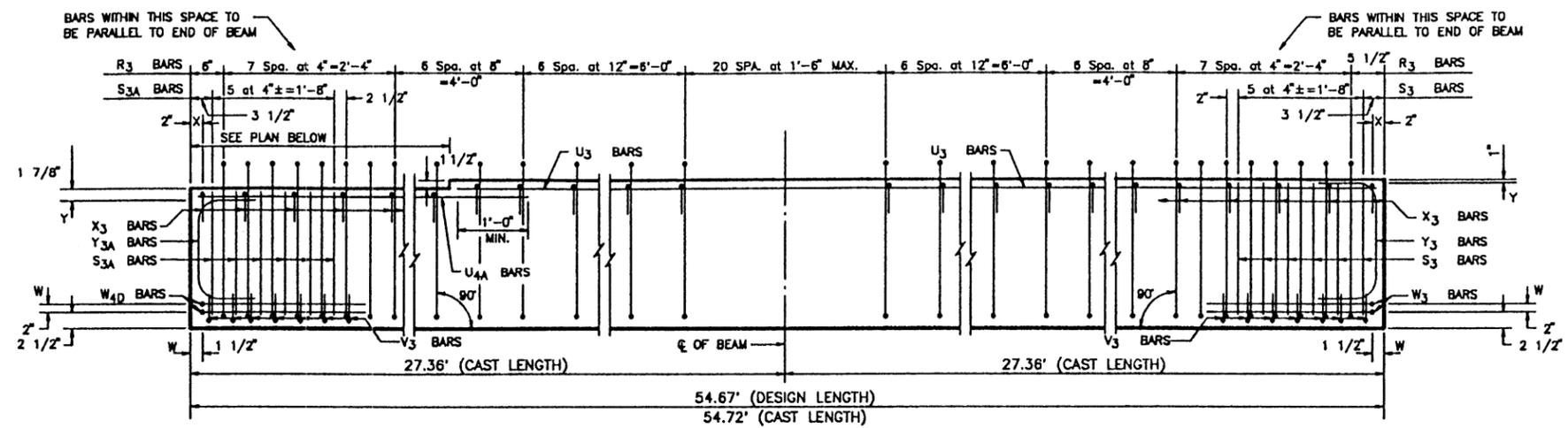
REINFORCING STEEL SCHEDULE

BAR	QUANTITY PER BEAM	TOTAL QUANTITY	SIZE	LENGTH
R <sub>3</sub>	59	59	#4	standard
X <sub>3</sub>	53	53	#3	standard
Y <sub>3</sub>	2	2	#6	standard
S <sub>3</sub>	12	12	#5	standard
V <sub>3</sub>	14	14	#3	standard
W <sub>3</sub>	2	2	#5	standard
U <sub>3</sub>	2	2	#5	50'-7"
Y <sub>3A</sub>	2	2	#6	standard
S <sub>3A</sub>	12	12	#5	standard
W <sub>4D</sub>	2	2	#5	standard
U <sub>4A</sub>	2	2	#5	6'-6"

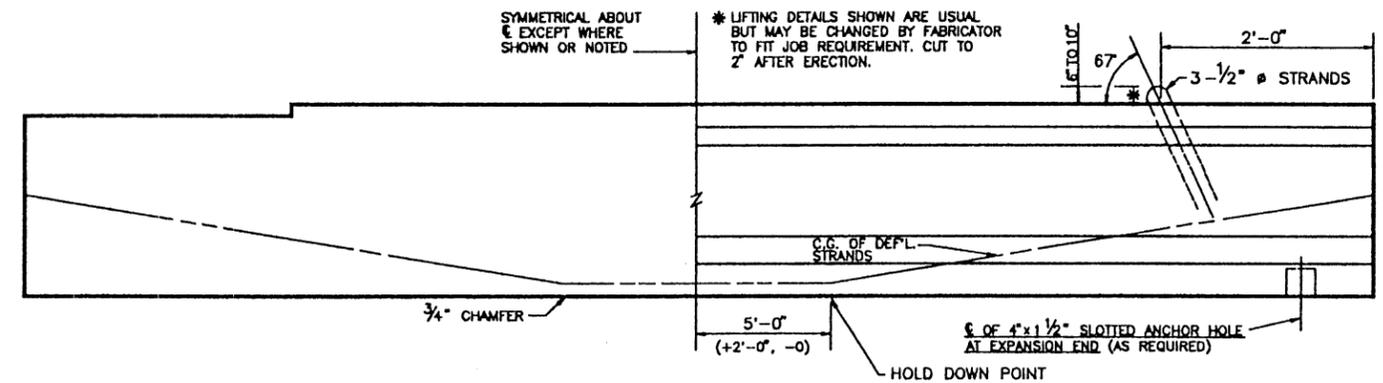
TEXAS DEPARTMENT OF TRANSPORTATION  
 APPROVED  
 DIVISION OF BRIDGES AND STRUCTURES

JAN 24 1995

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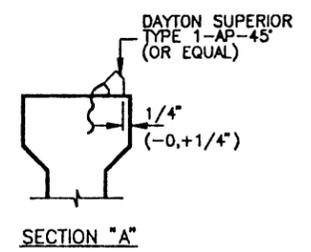


ELEVATION - REINFORCING STEEL

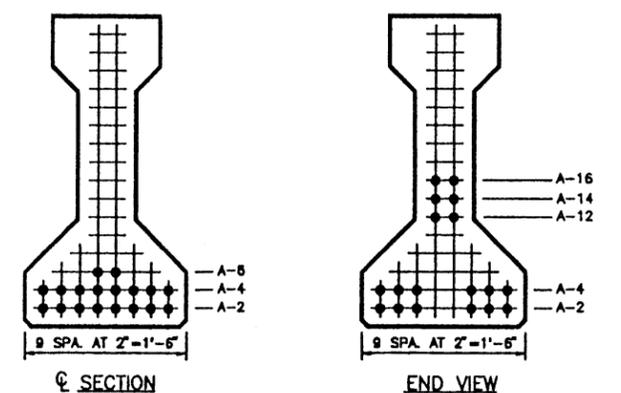


BEAM ELEVATION  
 SEE PLAN VIEW FOR HOLE(S) LOCATION

SINGLE LIFTING LOOP DETAIL  
 (TYP. FOR BEAMS UNDER 75')



SECTION "A"



SECTION  
 END VIEW

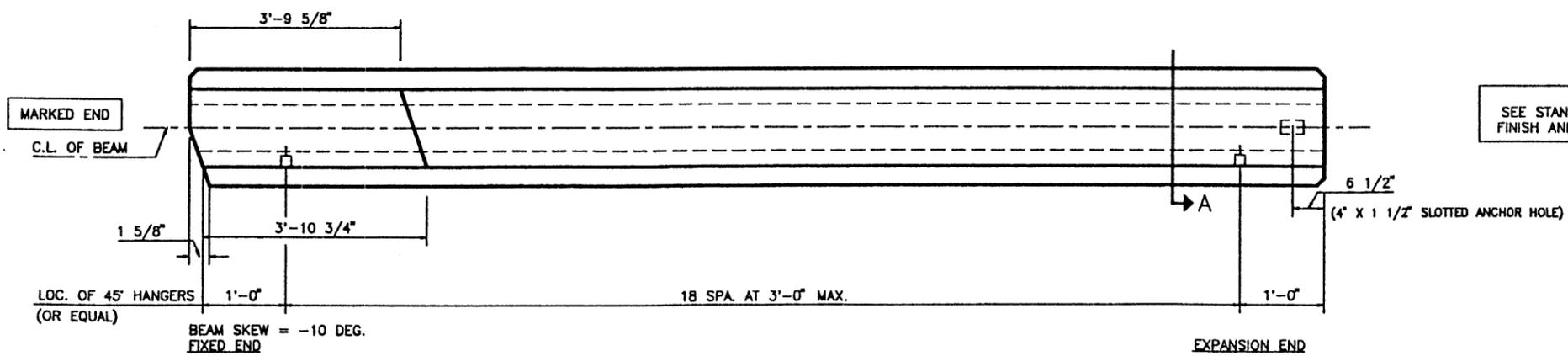
TYPE "B" BEAM QUANTITY : 1

LO-LAX STRAND PATTERN	
NUMBER OF STRANDS :	18 ~ 1/2" # 270 K @ 31.00 K EACH
NUMBER OF STRAIGHT STRANDS :	12
NUMBER OF DEFLECTED STRANDS :	6 @ A - 16
CONCRETE RELEASE STRENGTH :	4850 PSI
CONCRETE DESIGN STRENGTH :	5000 PSI
ECCENTRICITY @ C :	11.60" ECCENTRICITY @ END : 8.26"

DESIGN NO. : Gp-NS-LR  
 TOTAL BEAM LENGTH OF THIS SHEET : 54.67'

MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013, ETC.

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JOB NO. 94-027	DRAWN M.J.R.	CHECKED C.F.G.	DATE 1/16/1995	SHEET/MARK NO. B-5
SEA JOB NO. 95-018H	FABRICATION SHEET			



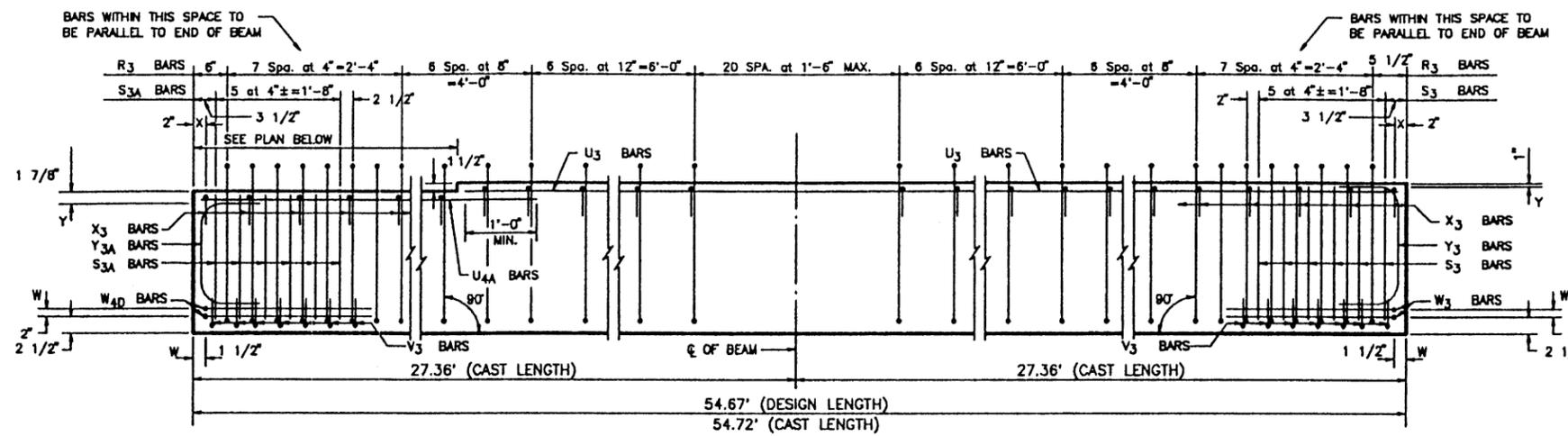
PLAN

FOR APPROVAL  
 JAN 16 1995

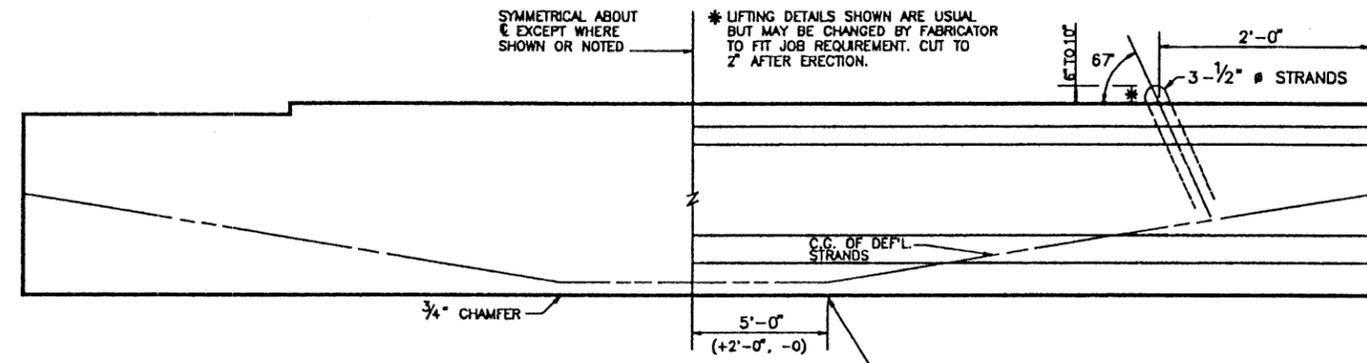
REINFORCING STEEL SCHEDULE

BAR	QUANTITY PER BEAM	TOTAL QUANTITY	SIZE	LENGTH
R <sub>3</sub>	59	472	#4	standard
X <sub>3</sub>	53	424	#3	standard
Y <sub>3</sub>	2	16	#6	standard
S <sub>3</sub>	12	96	#5	standard
V <sub>3</sub>	14	112	#3	standard
W <sub>3</sub>	2	16	#5	standard
U <sub>3</sub>	2	16	#5	50'-7"
Y <sub>3A</sub>	2	16	#6	standard
S <sub>3A</sub>	12	96	#5	standard
W <sub>4D</sub>	2	16	#5	standard
U <sub>4A</sub>	2	16	#5	6'-6"

TEXAS DEPARTMENT OF  
TRANSPORTATION  
APPROVED  
DIVISION OF BRIDGES AND STRUCTURES  
  
JAN 24 1995  
  
APPROVAL OF THIS DRAWING DOES NOT  
RELIEVE THE CONTRACTOR OF THE  
RESPONSIBILITY FOR THE CORRECTNESS  
OF DETAIL.

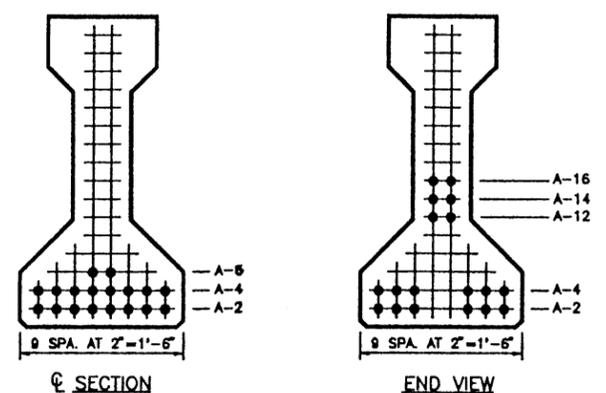


ELEVATION - REINFORCING STEEL



BEAM ELEVATION  
SEE PLAN VIEW FOR HOLE(S) LOCATION

SINGLE LIFTING LOOP DETAIL  
(TYP. FOR BEAMS UNDER 75')



TYPE "B" BEAM QUANTITY : 8

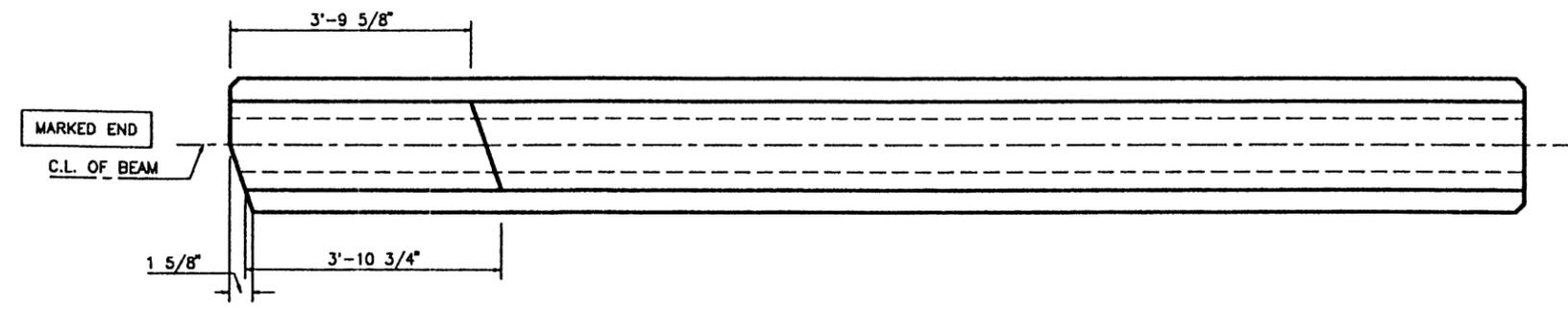
LO-LAX STRAND PATTERN	
NUMBER OF STRANDS :	18 ~ 1/2" Ø 270 K @ 31.00 K EACH
NUMBER OF STRAIGHT STRANDS :	12
NUMBER OF DEFLECTED STRANDS :	6 @ A - 16
CONCRETE RELEASE STRENGTH :	4850 PSI
CONCRETE DESIGN STRENGTH :	5000 PSI
ECCENTRICITY @ C.C. :	11.60" ECCENTRICITY @ END : 8.26"

DESIGN NO. : Gp-NS-LR  
TOTAL BEAM LENGTH OF THIS SHEET : 437.36'

MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013, ETC.

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JOB NO. 94-027	DRAWN M.J.R.	CHECKED C.F.G.	DATE 1/16/1995	SHEET/MARK NO. B-6
SEA JOB NO. 95-018H	FABRICATION SHEET			



BEAM SKEW = -10 DEG.  
FIXED END

EXPANSION END

PLAN

TOP FINISH PANELS  
SEE STANDARD SHEET S-"B" FOR TOP FINISH AND OTHER NOTES AND DETAILS.

FOR APPROVAL  
JAN 16 1995

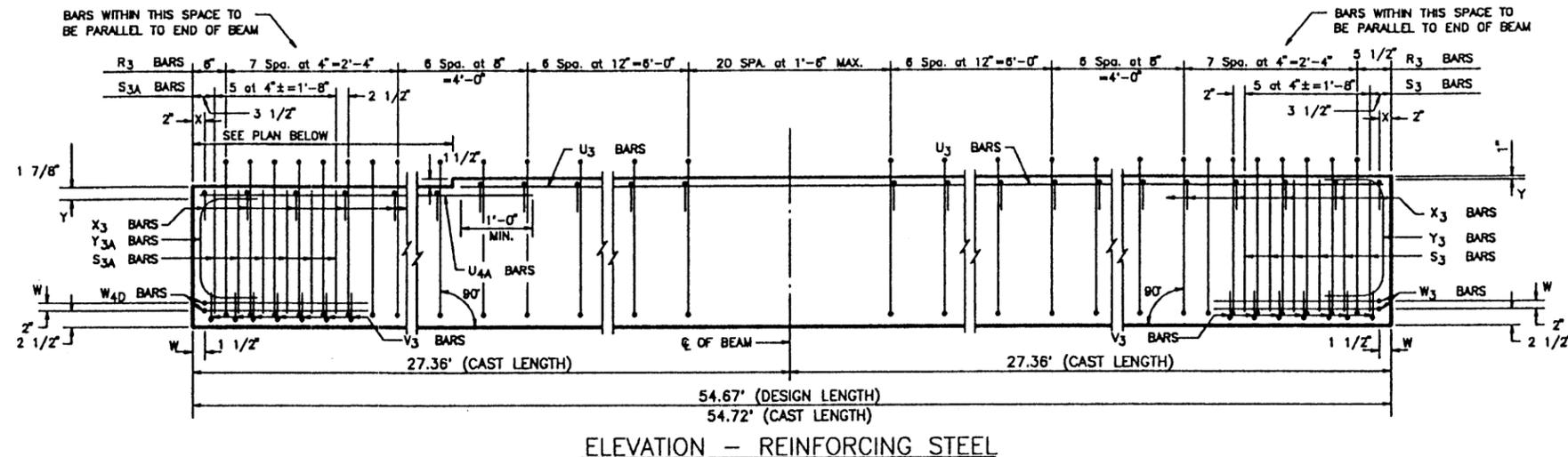
REINFORCING STEEL SCHEDULE

BAR	QUANTITY PER BEAM	TOTAL QUANTITY	SIZE	LENGTH
R <sub>3</sub>	59	59	#4	standard
X <sub>3</sub>	53	53	#3	standard
Y <sub>3</sub>	2	2	#6	standard
S <sub>3</sub>	12	12	#5	standard
V <sub>3</sub>	14	14	#3	standard
W <sub>3</sub>	2	2	#5	standard
U <sub>3</sub>	2	2	#5	50'-7"
Y <sub>3A</sub>	2	2	#6	standard
S <sub>3A</sub>	12	12	#5	standard
W <sub>4D</sub>	2	2	#5	standard
U <sub>4A</sub>	2	2	#5	6'-6"

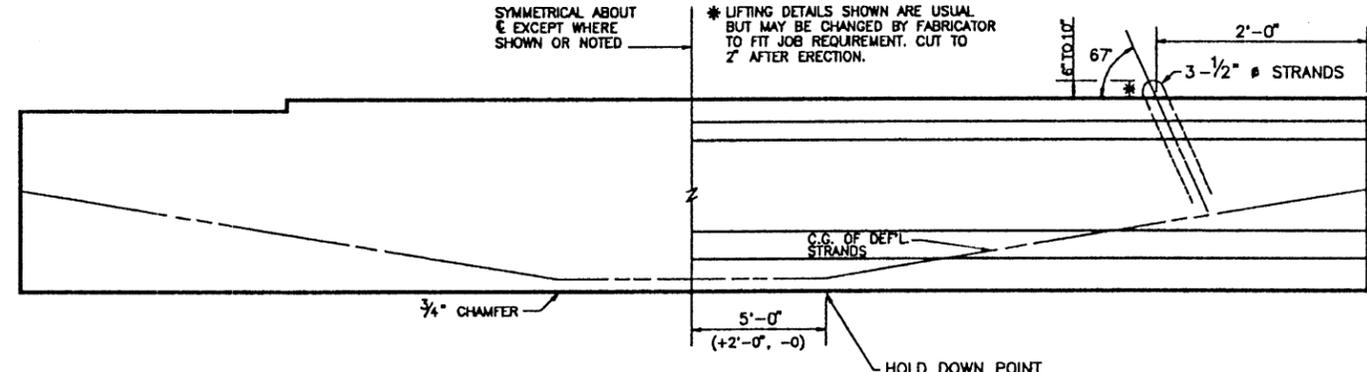
TEXAS DEPARTMENT OF  
TRANSPORTATION  
APPROVED  
DIVISION OF BRIDGES AND STRUCTURES

JAN 24 1995

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RESPONSIBILITY FOR THE CORRECTNESS  
OF DETAIL.

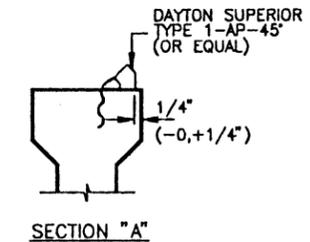


ELEVATION - REINFORCING STEEL

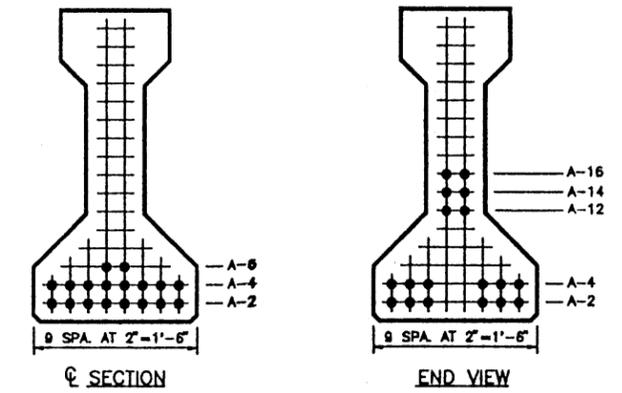


BEAM ELEVATION  
SEE PLAN VIEW FOR HOLE(S) LOCATION

SINGLE LIFTING LOOP DETAIL  
(TYP. FOR BEAMS UNDER 75')

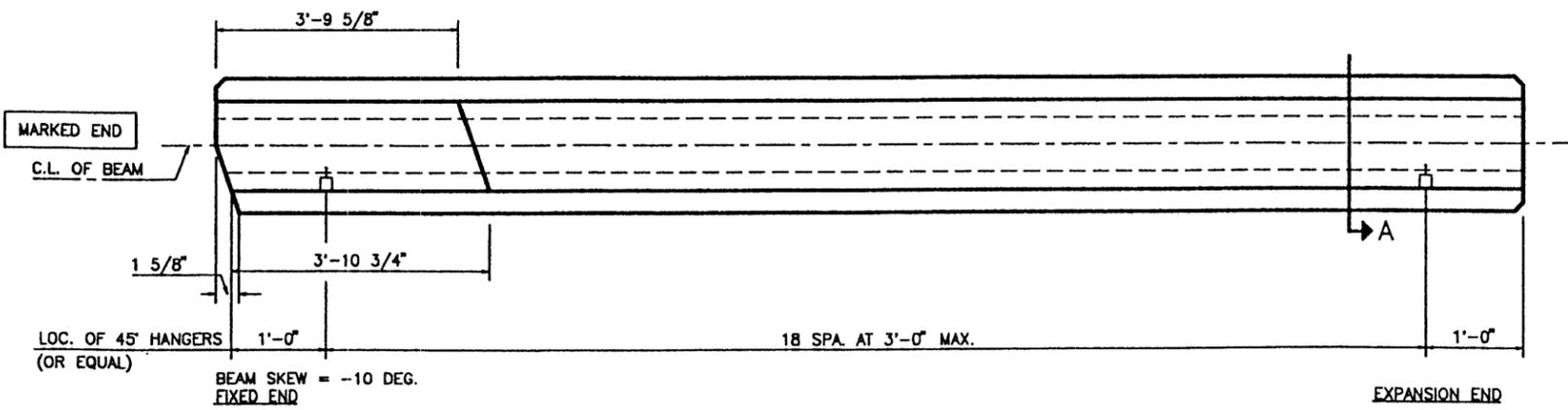


SECTION "A"



TYPE "B" BEAM QUANTITY : 1

LO-LAX STRAND PATTERN	
NUMBER OF STRANDS	: 18 ~ 1/2" # 270 K @ 31.00 K EACH
NUMBER OF STRAIGHT STRANDS	: 12
NUMBER OF DEFLECTED STRANDS	: 6 @ A - 16
CONCRETE RELEASE STRENGTH	: 4850 PSI
CONCRETE DESIGN STRENGTH	: 5000 PSI
ECCENTRICITY @ C	: 11.60" ECCENTRICITY @ END : 8.26"

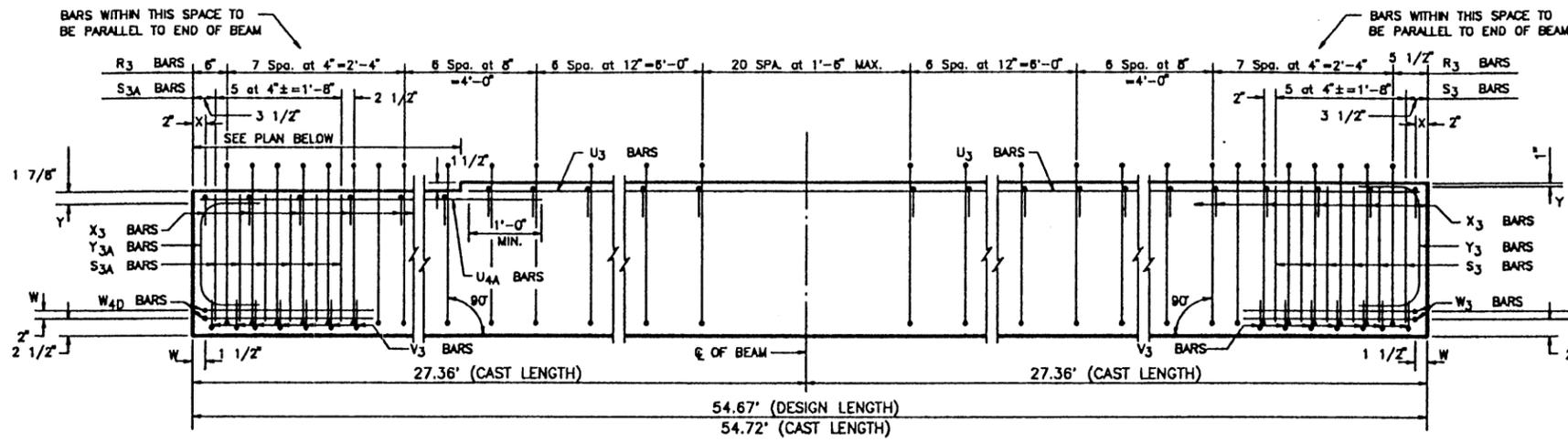


PLAN

TOP FINISH PANELS  
SEE STANDARD SHEET S-"B" FOR TOP  
FINISH AND OTHER NOTES AND DETAILS.

FOR APPROVAL  
JAN 16 1995

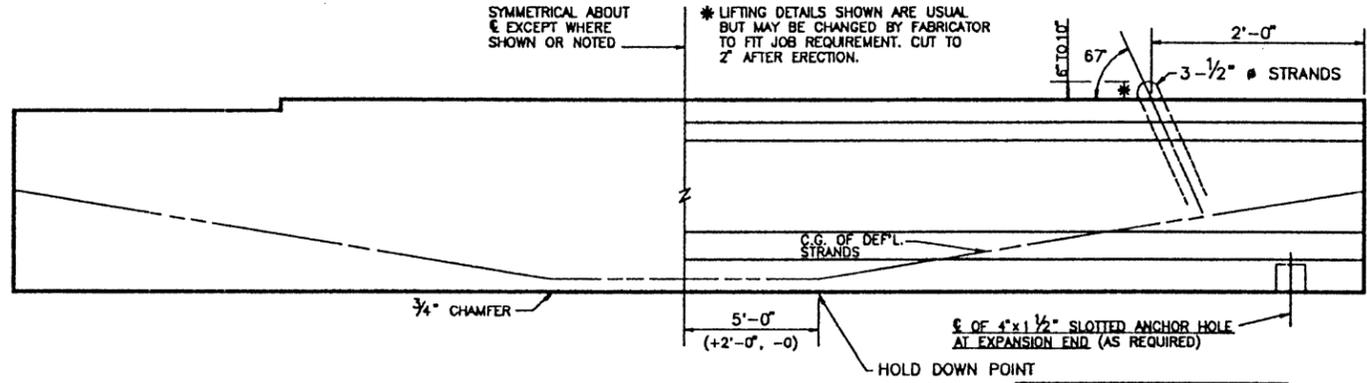
DESIGN NO. : Gp-NS-LR				
TOTAL BEAM LENGTH OF THIS SHEET : 54.67'				
MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1807	02	013, ETC.
COPYRIGHT 1989 BY SEA STRUCTURAL ENGINEERING ASSOCIATES, INC. CONSULTING ENGINEERS, SAN ANTONIO, TEXAS				
JOB NO.	DRAWN	CHECKED	DATE	SHEET/MARK NO.
94-027	M.J.R.	C.F.G.	1/16/1995	B-7
SEA JOB NO.	FABRICATION SHEET			
95-018H				



ELEVATION - REINFORCING STEEL

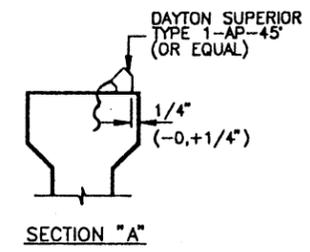
TEXAS DEPARTMENT OF  
TRANSPORTATION  
DIVISION OF BRIDGES AND STRUCTURES  
  
JAN 24 1995  
  
APPROVAL OF THIS DRAWING DOES NOT  
RELIEVE THE CONTRACTOR OF THE  
RESPONSIBILITY FOR THE CORRECTNESS  
OF DETAIL.

REINFORCING STEEL SCHEDULE				
BAR	QUANTITY PER BEAM	TOTAL QUANTITY	SIZE	LENGTH
R3	59	59	#4	standard
X3	53	53	#3	standard
Y3	2	2	#6	standard
S3	12	12	#5	standard
V3	14	14	#3	standard
W3	2	2	#5	standard
U3	2	2	#5	50'-7"
Y3A	2	2	#6	standard
S3A	12	12	#5	standard
W4D	2	2	#5	standard
U4A	2	2	#5	6'-6"

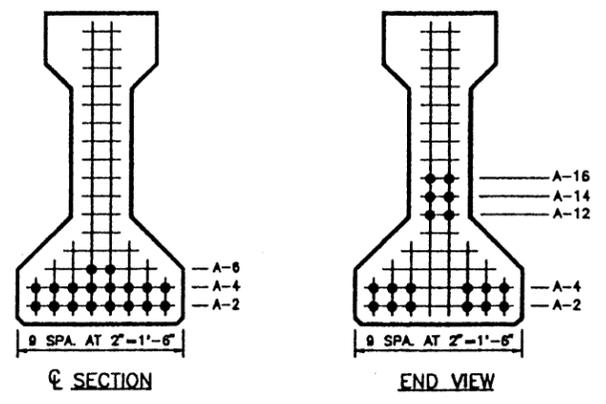


BEAM ELEVATION  
SEE PLAN VIEW FOR HOLE(S) LOCATION

SINGLE LIFTING LOOP DETAIL  
(TYP. FOR BEAMS UNDER 75')



SECTION "A"



TYPE "B" BEAM QUANTITY : 1

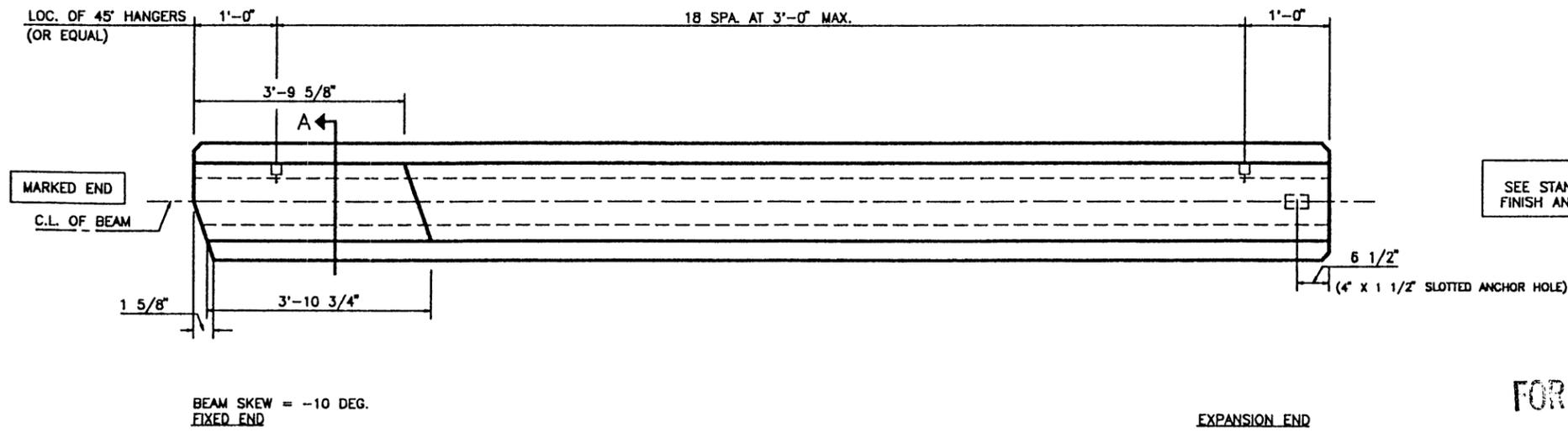
LO-LAX STRAND PATTERN	
NUMBER OF STRANDS	: 18 ~1/2" # 270 K @ 31.00 K EACH
NUMBER OF STRAIGHT STRANDS	: 12
NUMBER OF DEFLECTED STRANDS	: 6 @ A - 16
CONCRETE RELEASE STRENGTH	: 4850 PSI
CONCRETE DESIGN STRENGTH	: 5000 PSI
ECCENTRICITY @ Q	: 11.60" ECCENTRICITY @ END : 8.26"

DESIGN NO. : Gp-NS-LR  
TOTAL BEAM LENGTH OF THIS SHEET : 54.67'

MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013, ETC.

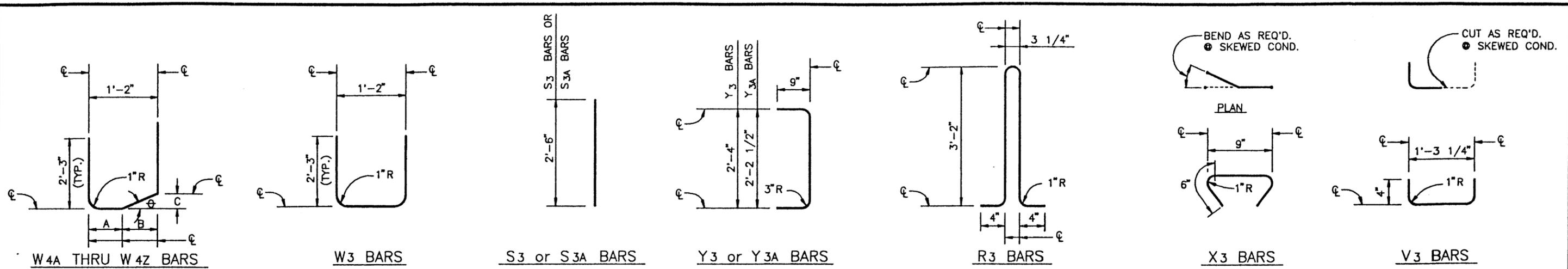
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JOB NO. 94-027	DRAWN M.J.R.	CHECKED C.F.G.	DATE 1/16/1995	SHEET/MARK NO. B-8
SEA JOB NO. 95-018H	FABRICATION SHEET			

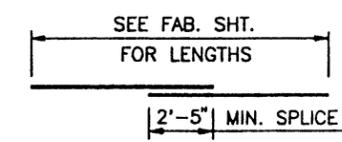


PLAN

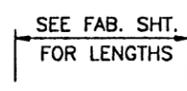
FOR APPROVAL  
JAN 16 1995



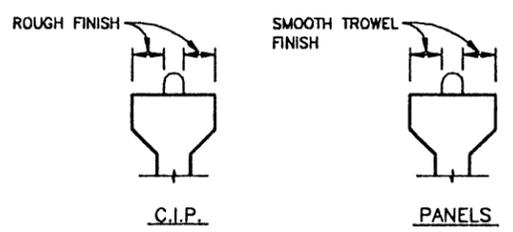
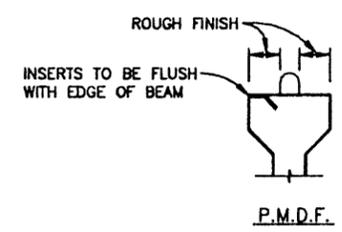
BAR	"A"	"B"	"C"	"D"
W4A	7 1/8"	6 7/8"	3/8"	2 1/2"
W4B	7 1/8"	6 7/8"	5/8"	5"
W4C	7"	7"	7/8"	7 1/2"
W4D	6 7/8"	7 1/8"	1 1/4"	10"
W4E	6 3/4"	7 1/4"	1 5/8"	12 1/2"
W4F	6 3/4"	7 1/4"	2"	15"
W4G	6 3/4"	7 1/4"	2 1/4"	17 1/2"
W4H	6 3/4"	7 1/4"	2 5/8"	20"
W4I	6 5/8"	7 3/8"	3"	22 1/2"
W4J	6 5/8"	7 3/8"	3 1/2"	25"
W4K	6 5/8"	7 3/8"	3 7/8"	27 1/2"
W4L	6 5/8"	7 3/8"	4 1/4"	30"
W4M	6 1/2"	7 1/2"	4 3/4"	32 1/2"
W4N	6 1/2"	7 1/2"	5 1/4"	35"
W4O	6 1/2"	7 1/2"	5 3/4"	37 1/2"
W4P	6 1/2"	7 1/2"	6 1/4"	40"
W4Q	6 3/8"	7 5/8"	7"	42 1/2"
W4R	6 3/8"	7 5/8"	7 5/8"	45"
W4S	6 3/8"	7 5/8"	8 3/8"	47 1/2"
W4T	6 1/4"	7 3/4"	9 1/4"	50"
W4U	6 1/4"	7 3/4"	10 1/8"	52 1/2"
W4V	6 1/4"	7 3/4"	11 1/8"	55"
W4W	6 1/8"	7 7/8"	1'-0 3/8"	57 1/2"
W4X	6 1/8"	7 7/8"	1'-1 5/8"	60"
W4Y	6 1/8"	7 7/8"	1'-3 1/8"	62 1/2"
W4Z	6"	8"	1'-5 1/8"	65"



**U3 BARS**  
 U BAR SPLICES PERMITTED (40'-0" MIN. C-C SPLICES)  
 NO PORTION OF BAR TO BE LESS THAN 10'-0"  
 (LAP 2'-5" MIN.). U BAR LENGTH INDICATED IS  
 OVERALL LENGTH, DOES NOT INCLUDE SPLICE.



**U4A, U4B, U4C, U4D & U4E BARS**

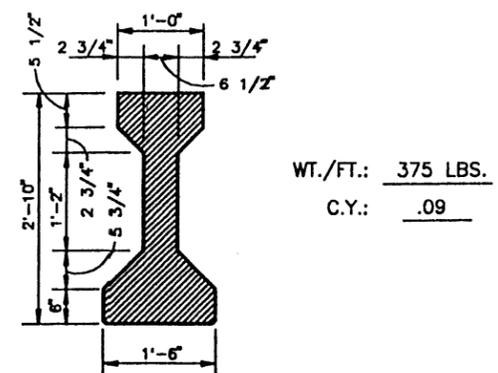


**BEAM TOP FINISH**

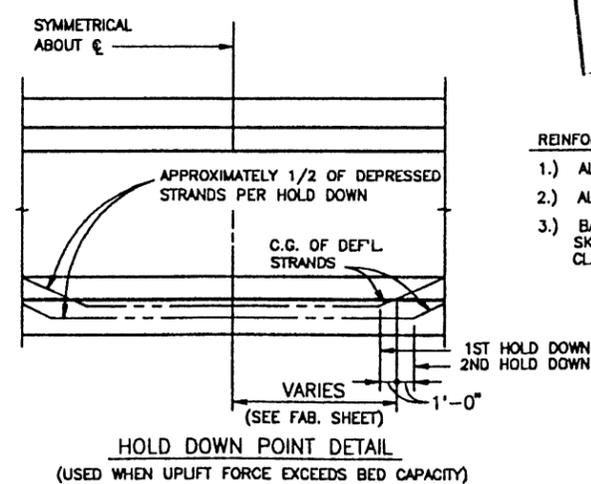
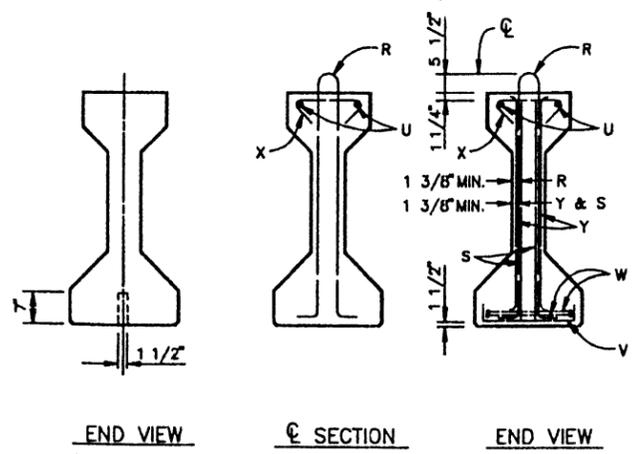
**GENERAL NOTES**

1. SPACING OF BARS R AND S MAY BE VARIED TO AVOID DIAFRAM HOLES.
2. REINFORCING BARS AND/OR STRANDS MAY COME IN CONTACT WITH MATERIALS USED IN FORMING DIAFRAM HOLES.
3. DIMENSIONS RELATING TO BARS OR STRANDS ARE CENTER TO CENTER.
4. BARS V AND X MAY BE TILTED THUS OR SKEWED AS REQUIRED TO MAINTAIN 1" MIN. CONCRETE COVER.
5. STRANDS MAY BE SPREAD TO MISS DIAFRAM HOLES.
6. STRANDS MAY BE RECESSED 1/2" MAX. INTO END OF BEAM.
7. BEAM ENDS MAY BE FORMED WITH WOOD.
8. BOTTOM CORNERS OF ALL BEAM FLANGES AND OUTSIDE CORNERS OF EXTERIOR BEAM ENDS SHALL BE CHAMFERED OR ROUNDED TO A 3/4" RADIUS. AT FABRICATORS OPTION, ALL VERTICAL EDGES ON ALL BEAMS MAY BE CHAMFERED.
9. BEAM MARKS TO BE PLACED ON FIXED END OR AS NOTED.
10. ALL DIMENSIONS MEASURED ALONG BOTTOM OF BEAM AT C UNLESS NOTED OTHERWISE.
11. USE CLASS H OR HH CONCRETE.

TEXAS DEPARTMENT OF TRANSPORTATION  
 DIVISION OF BRIDGES AND STRUCTURES  
 APPROVED  
 JAN 24 1995  
 APPROVAL OF THIS DRAWING DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE CORRECTNESS OF DETAIL.



**TYPE "B" BEAM**



- REINFORCING STEEL NOTES:**
- 1.) ALL DIMENSIONS ARE CENTER TO CENTER
  - 2.) ALL STEEL TO BE A.S.T.M. A-615, GR. 60
  - 3.) BARS R AND S MAY BE ADJUSTED FOR SKEWED END CONDITIONS AND ADJUSTED TO CLEAR DIAFRAM HOLE.

**END VIEW**      **C SECTION**      **END VIEW**

(\* ANCHOR HOLE)

\* NOTE: ANCHOR HOLES MAY BE TAPERED (4 3/4" x 1 5/8" EXP. END) (1 5/8" # FIXED END) AT BASE. IF HOLES ARE FORMED WITH SHEET METAL, FORMS MAY BE LEFT IN PLACE. HOLES AT FIXED END MAY EXTEND FULL DEPTH OF BEAM. PLUG TOP OR FILL WITH ASPHALT MASTIC. AT FABRICATORS OPTION, ALL BEAMS MAY BE FURNISHED WITH ANCHOR HOLES.

**FOR APPROVAL**  
 JAN 16 1995

MANUFACTURED CONCRETE PRODUCTS CO.				
CONTRACTOR NBG CONSTRUCTORS, INC.				
FED. RD. DIV. NO.	STATE	PROJECT NO.	HWY. NO.	
6	TEXAS	STP 94(321)R, ETC.	FM 1764	
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013, ETC.
COPYRIGHT 1989 BY SEA		STRUCTURAL ENGINEERING ASSOCIATES, INC. CONSULTING ENGINEERS, SAN ANTONIO, TEXAS		
JOB NO. 94-027	DRAWN M.J.R.	CHECKED C.F.G.	DATE 1/16/1995	SHEET S- "B"
SEA JOB NO. 85-018H	STANDARD SHEET			



DEWITT C. GREER STATE HIGHWAY BLDG. • 125 E. 11TH STREET • AUSTIN, TEXAS 78701-2483 • (512) 463-8585

February 9, 1995

County: Galveston  
Control: 1607-02-013  
Project: STP 94(321)R  
Highway: FM 1764  
Structure: Highland Bayou Ditch "A"

Shop Plan File: 7465  
Your Order: 95-758

Bexar Concrete Works, Inc.  
P. O. Box 700250  
San Antonio, Texas 78270-0250

Attention: Mr. Jorge D. Hinojosa, P.E.

Gentlemen:

We have reviewed your shop drawings, sheets E-1, P-1, & P-2, covering panels on the above project. The drawings are approved for fabrication and are enclosed.

Any corrections noted in red must be incorporated into the work. Revised prints for these corrections will not be necessary.

One set of any erection drawings, included herein, has been sent to the Contractor.

If you have questions, please call Mark Bewley at 512-416-2207.

Sincerely,

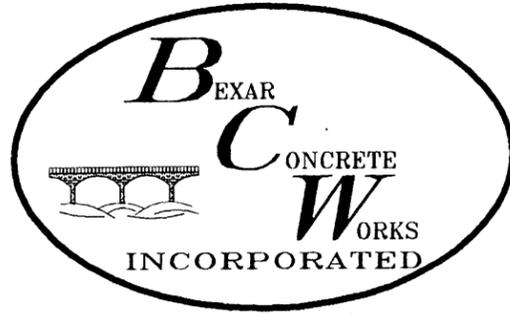
Robert L. Wilson, P.E.  
Director, Design Division

By:

Alan B. Matejowsky, P.E.  
Asst. Engineer of Bridge Design

MAB:ew  
Encl.

cc: Houston District  
Materials and Tests Division  
NBG Constructors, Inc.



7465  
11/94  
P.O. Box 700250, San Antonio, TX 78270-0250  
(210) 497-3773, Fax (210) 497-3810

## LETTER OF TRANSMITTAL

January 17, 1995

Mr. Greg Kindle  
Design Division  
Texas Department of Transportation  
125 E. 11Th. Street  
Austin, Tx. 78701

RECEIVED  
JAN 24 1995  
DESIGN DIVISION

RE: Galveston County <sup>12/85 84</sup>  
Project: STP 94 (321) R  
Control: 1607-02-013

FM 1704

Attached are 7 copies of shop drawing for approval on the above mentioned project.

If you have any questions regarding this matter please feel free to contact me.

Sincerely,  
Bexar Concrete Works Inc.

  
Jorge D. Hinojosa, P.E.

cc: Hans Hofmann  
Freddie Birck  
file

Project Engineer TRANSMITTAL OF APPROVED DESIGN DIVISION  FEB 09 1995  APPROVAL OF THIS DRAWING DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE CORRECTNESS OF DETAIL
---

# SUMMARY

PANEL TABLE FOR SPAN 1		
PANEL	QUANTITY	AREA (sq.ft.)
3.5A-7.58	20	530.60
8.0S-7.58	50	3032.00
TOTAL PANEL AREA = 3,562.60		

PANEL TABLE FOR SPAN 2		
PANEL	QUANTITY	AREA (sq.ft.)
3.5A-7.58	20	530.60
8.0S-7.58	50	3032.00
TOTAL PANEL AREA = 3,562.60		

**TOTAL PANEL AREA FOR THIS PROJECT = 7,125.20**

RECEIVED  
JAN 24 1995

DESIGN DIVISION  
TEXAS DEPARTMENT OF  
TRANSPORTATION  
APPROVED  
DESIGN DIVISION  
FEB 09 1995

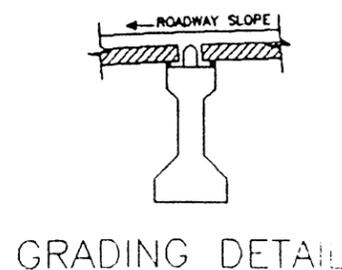
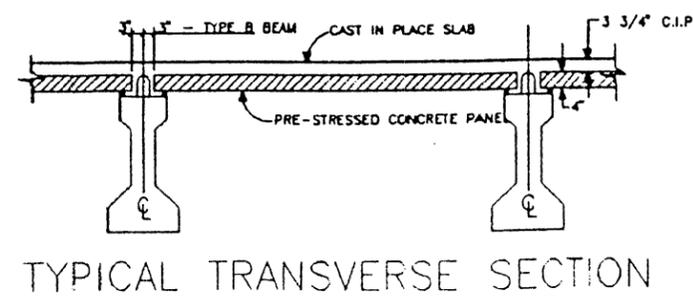
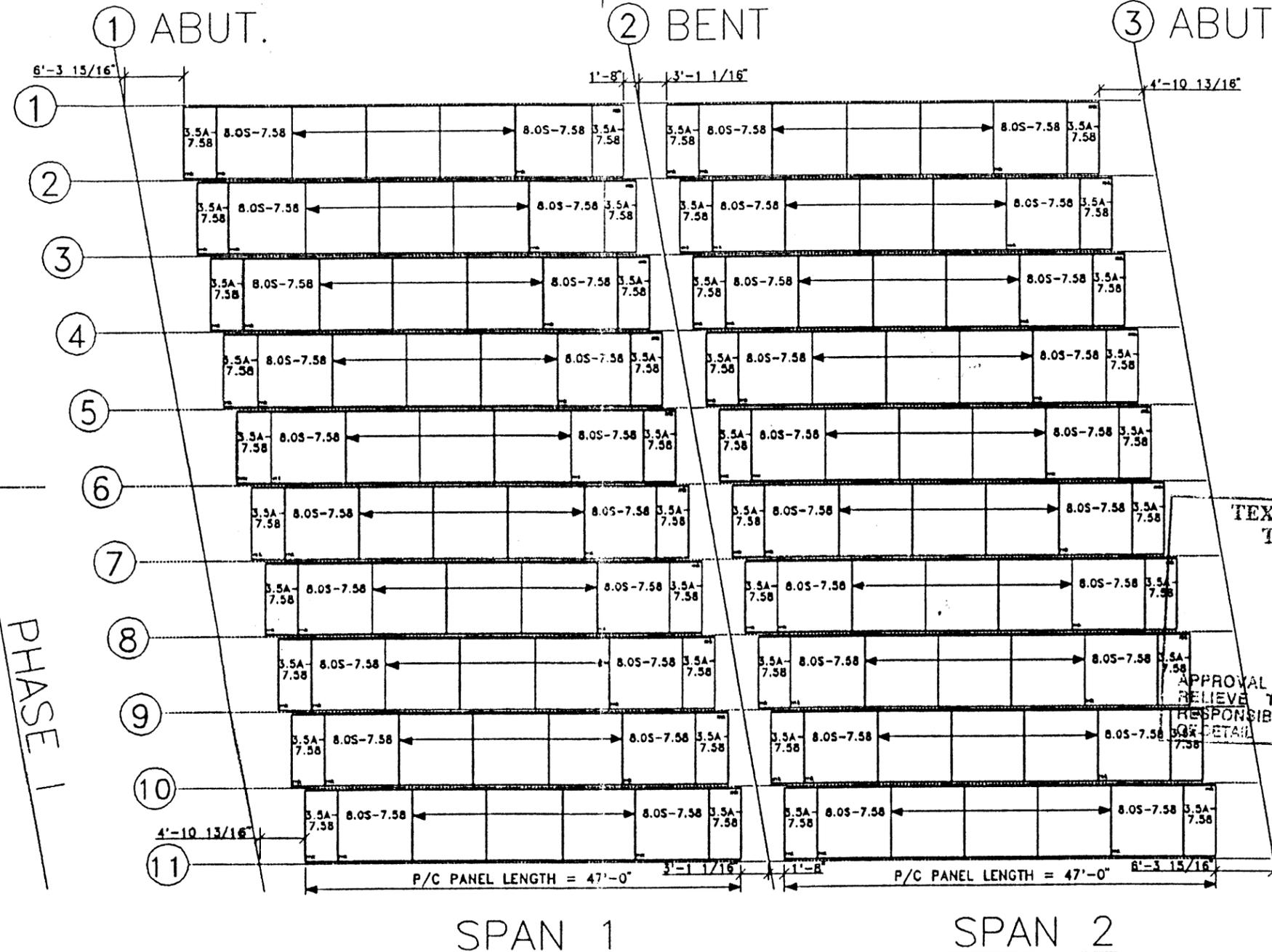
APPROVAL OF THIS DRAWING DOES NOT  
RELIEVE THE CONTRACTOR OF THE  
RESPONSIBILITY FOR THE CORRECTNESS  
OF THE  
DETAIL

NOTES: SHIPPED JAN 17 1995

- 1- ALL DIMENSIONS SHOWN ARE ON A HORIZONTAL PLANE.
- 2- ALL DIMENSIONS SHOWN ARE MEASURED ALONG CENTERLINE OF BEAM FROM CENTERLINE OF BENT, FACE OF ABUTMENT BACKWALL OR FACE OF INVERTED T BENT CAP BACKWALL.
- 3- mk INDICATES PANEL ERECTION MARK

NS 6

CONTRACTOR <del>NS</del> Constructors Inc.				
CONTRACTOR'S END DIAFRAM E. D. D. #2		INTERIOR DIAFRAM N/A		
FED. RD. DIV. #	STATE	PROJECT NO.	HWY. #	
6	TEXAS	STP 94 (321) R	FM 1764	
STATE DIST. #	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013
<b>BEXAR CONCRETE WORKS INCORPORATED</b>				
DRAWN BY J. D. H.	CHECKED F. B.	DATE JAN 16, 1995	SHEET # E-1	
JOB # 95-758	ERECTION SHEET			

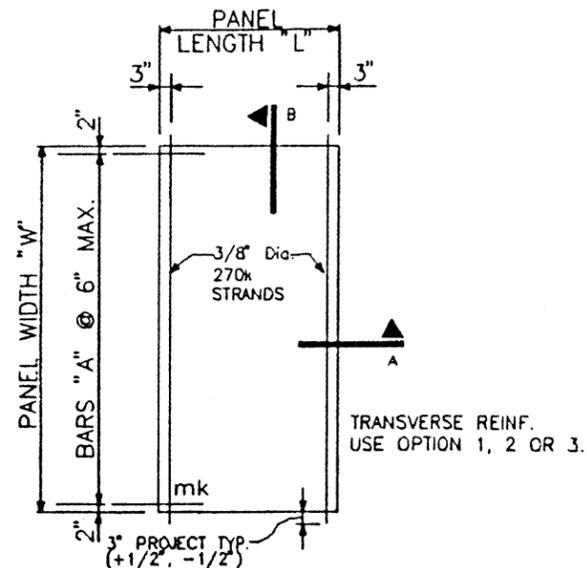


## HIGHLAND BAYOU DITCH "A"

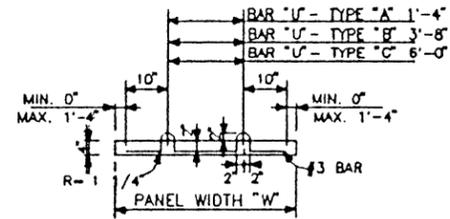
FIBER BOARD DIMENSIONS				BEAM
MAXIMUM ROADWAY SLOPE				
.08 ft/ft	.06 ft/ft	.04 ft/ft	.02 ft/ft	1" X 1/2" B
THICKNESS MAY BE OF 1/2" LAYERS.				

# STANDARD PANEL SCHEDULE

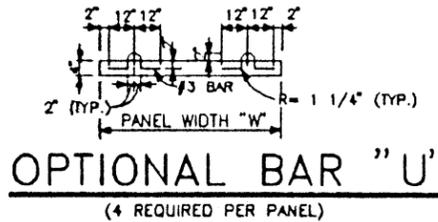
PANEL	QUANTITY	LENGTH "L" (ft)	WIDTH "W" (ft)	"X" NUMBER OF STRANDS	MINIMUM W.W.F. WIDTH (ft)	BAR "U" TYPE	NUMBER OF BARS "A"	AREA PER PANEL sq. ft.	TOTAL AREA sq. ft.
3.5A-7.5B	40	3.5	7.58	7	7.25	C	16	26.53	1,061.20
TOTAL PANEL AREA ON THIS SCHEDULE									1,061.20



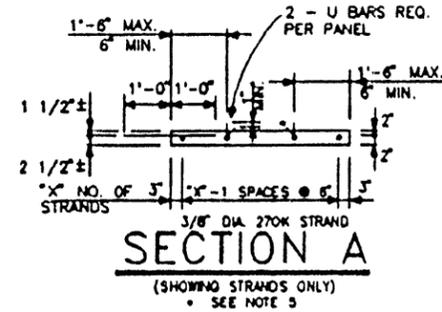
**TYPICAL PLAN**



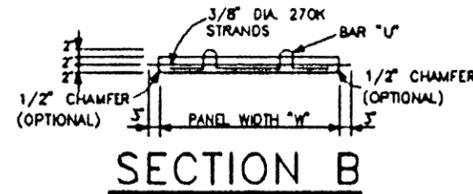
**TYPICAL BAR "U"**



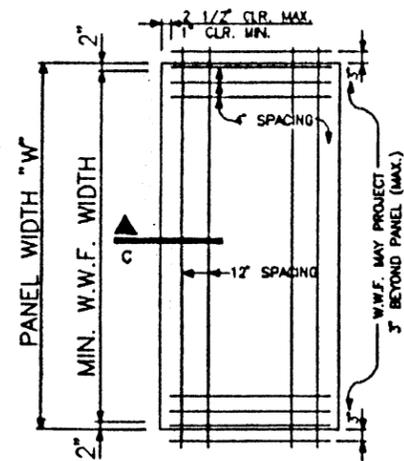
**OPTIONAL BAR "U"**  
(4 REQUIRED PER PANEL)



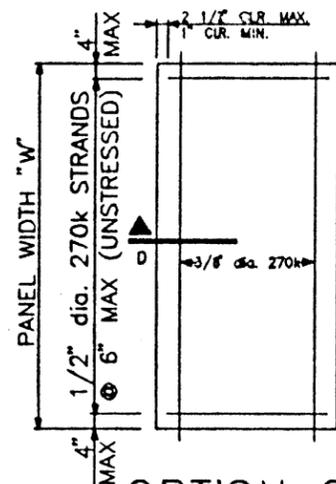
**SECTION A**  
(SHOWING STRANDS ONLY)  
SEE NOTE 3



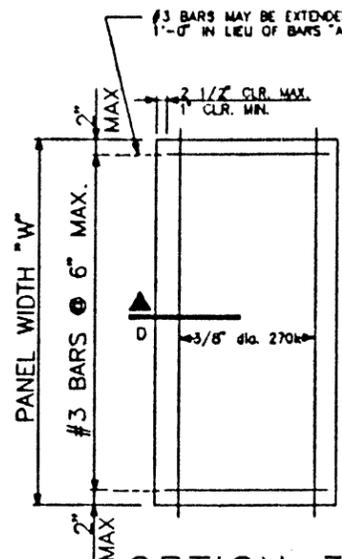
**SECTION B**



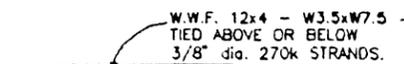
**OPTION 1**  
(TRANSVERSE REINF.)



**OPTION 2**  
(TRANSVERSE REINF.)

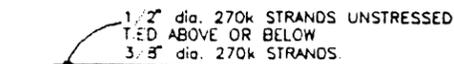


**OPTION 3**  
(TRANSVERSE REINF.)

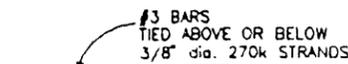


**SECTION C**

NO SIDE LAP SPLICE REQUIRED FOR W.W.F.



**SECTION D**



**SECTION E**

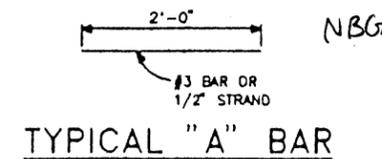
## NOTES:

- 1- 3/8" dia. 270k STRANDS: INITIAL FORCE 2,000 LB PER STRAND, STRESS TO 16,100 LB EACH.
- 2- CONCRETE CLASS: H  
RELEASE STRENGTH: 4000 PSI  
28 DAY COMPRESSIVE STRENGTH: 5000 PSI
- 3- TOP SURFACE OF PANEL SHALL BE BROOM FINISHED.
- 4- mk INDICATES PANEL ERECTION MARK.
- 5- FOR PANELS USED WITH EPOXY COATED SLAB REINFORCING THE LOOPS OF BARS U SHALL BE FIELD BENT AS SHOWN OF DETAIL. BARS U MAY BE FIELD BENT TO CLEAR SLAB REINFORCING.

**TEXAS DEPARTMENT OF TRANSPORTATION**  
APPROVED  
DESIGN DIVISION  
  
FEB 09 1995

APPROVAL OF THIS DRAWING DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR THE CORRECTNESS OF THE DRAWING.

**SHIPPED JAN 17 1995**

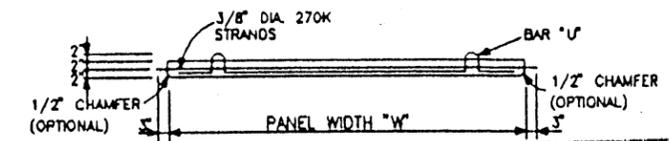
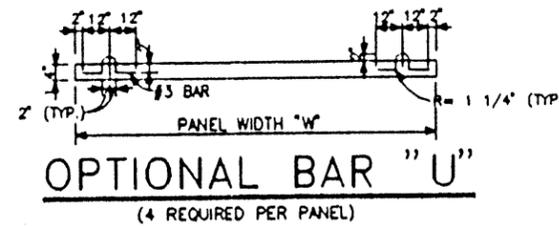
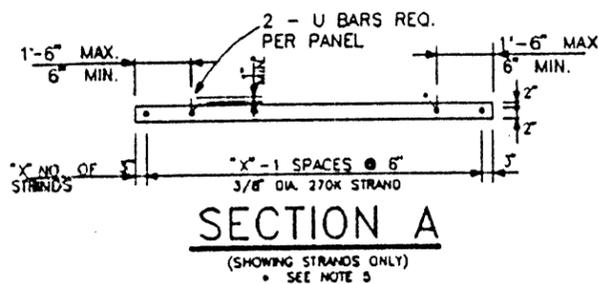
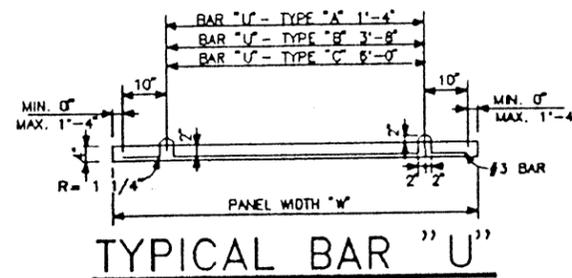
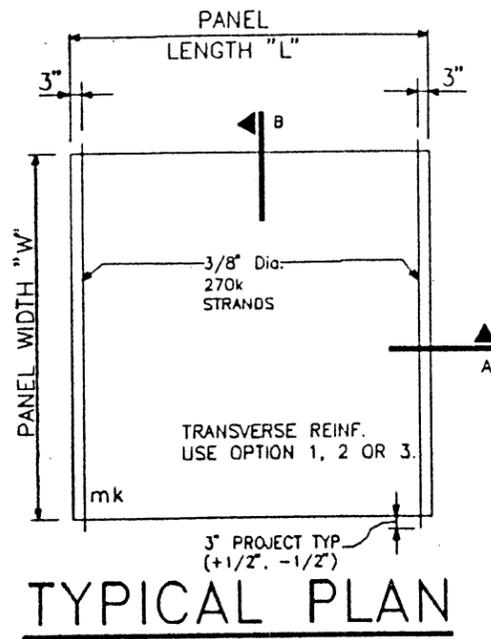


**TYPICAL "A" BAR**

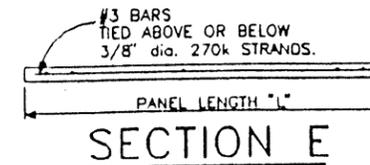
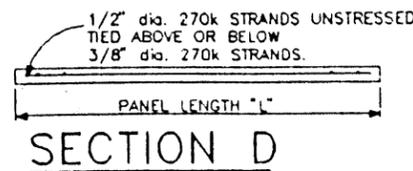
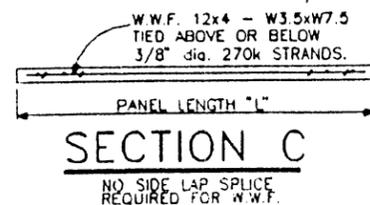
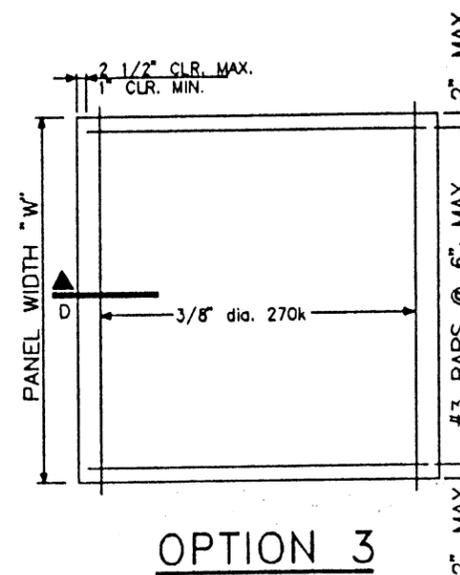
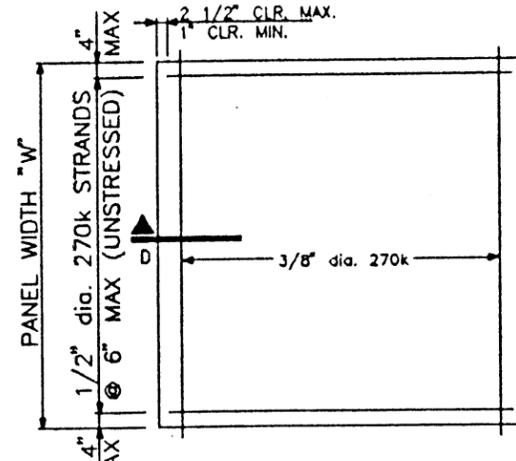
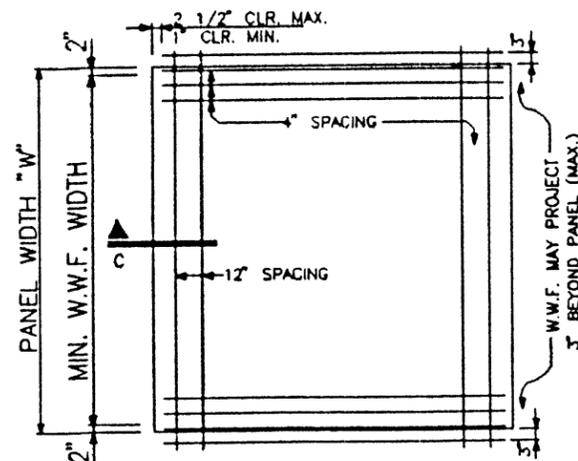
CONTRACTOR: NCB Constructors Inc.				
CONTRACTOR'S END DIAGRAM E.D.O. #2		OPTIONS INTERIOR DIAGRAM N/A		
FED. RD DIV. #	STATE	PROJECT NO.	HWY. #	
6	TEXAS	STP 94 (321) R	FH 1764	
STATE DIST. #	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013
<b>BELAR CONCRETE WORKS INCORPORATED</b>				
DRAWN BY J.D.H.	CHECKED F.B.	DATE JAN 16, 1995	SHEET # P-1	
JCB # 65-758	PANEL FAB. "A"			

# STANDARD PANEL SCHEDULE

PANEL	QUANTITY	LENGTH "L" (ft)	WIDTH "W" (ft)	"X" NUMBER OF STRANDS	MINIMUM W.W.F. WIDTH (ft)	BAR "U" TYPE	AREA PER PANEL sq. ft.	TOTAL AREA sq. ft.
8.0S-7.5B	100	8.0	7.58	16	7.25	C	60.64	6,064.00
TOTAL PANEL AREA ON THIS SCHEDULE								6,064.00



SECTION DEPARTMENT OF  
TRANSPORTATION  
APPROVED  
DESIGN DIVISION  
  
FEB 09 1995  
  
APPROVAL OF THIS DRAWING DOES NOT  
RELIEVE THE CONTRACTOR OF THE  
RESPONSIBILITY FOR THE CORRECTNESS  
OF DETAIL.



## NOTES:

**SHIPPED JAN 17 1995**

- 1- 3/8" dia. 270k STRANDS: INITIAL FORCE 2,000 LB PER STRAND, STRESS TO 16,100 LB EACH.
- 2- CONCRETE CLASS: H  
RELEASE STRENGTH: 4000 PSI  
28 DAY COMPRESSIVE STRENGTH: 5000 PSI
- 3- TOP SURFACE OF PANEL SHALL BE BROOM FINISHED.
- 4- mk INDICATES PANEL ERECTION MARK.
- 5- FOR PANELS USED WITH EPOXY COATED SLAB REINFORCING, THE LOOPS OF BARS U SHALL BE FIELD BENT AS SHOWN. BARS U MAY BE FIELD BENT TO CLEAR SLAB REINFORCING.

CONTRACTOR: NGB Constructors Inc.				
CONTRACTOR: SEND DIAFRAM E.D.O. #2				
OPTIONS: INTERIOR DIAFRAM N/A				
FED. RD. DIV. #	STATE	PROJECT NO.	HWY. #	
6	TEXAS	STP 94 (321) R	FM 1764	
STATE DIST. #	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.
12	GALVESTON	1607	02	013
<b>BIXAR CONCRETE WORKS INCORPORATED</b>				
DRAWN BY J.D.H.	CHECKED F.B.	DATE: JAN 16, 1995	SHEET #	
JOB # 95-758	PANEL FAB. "S"			P-2

NBG



# Texas Department of Transportation

P.O. BOX 1386 • HOUSTON, TEXAS 77251-1386 • (713) 869-4571

February 16, 1995

Galveston County  
Project: STP 94(321)R, etc.  
Control: 1607-02-013  
Highway: FM 1764

NBG Constructors, Inc.  
9702 Synott  
Houston, Texas 77083

Gentlemen:

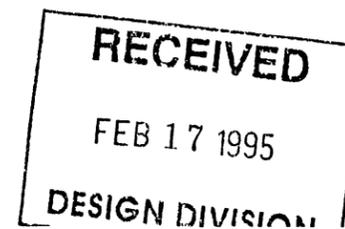
The Premier Fabricators and Supply Company, Inc. shop drawings for Erection Plan and Detail Armor Joint has been reviewed and approved with modification.

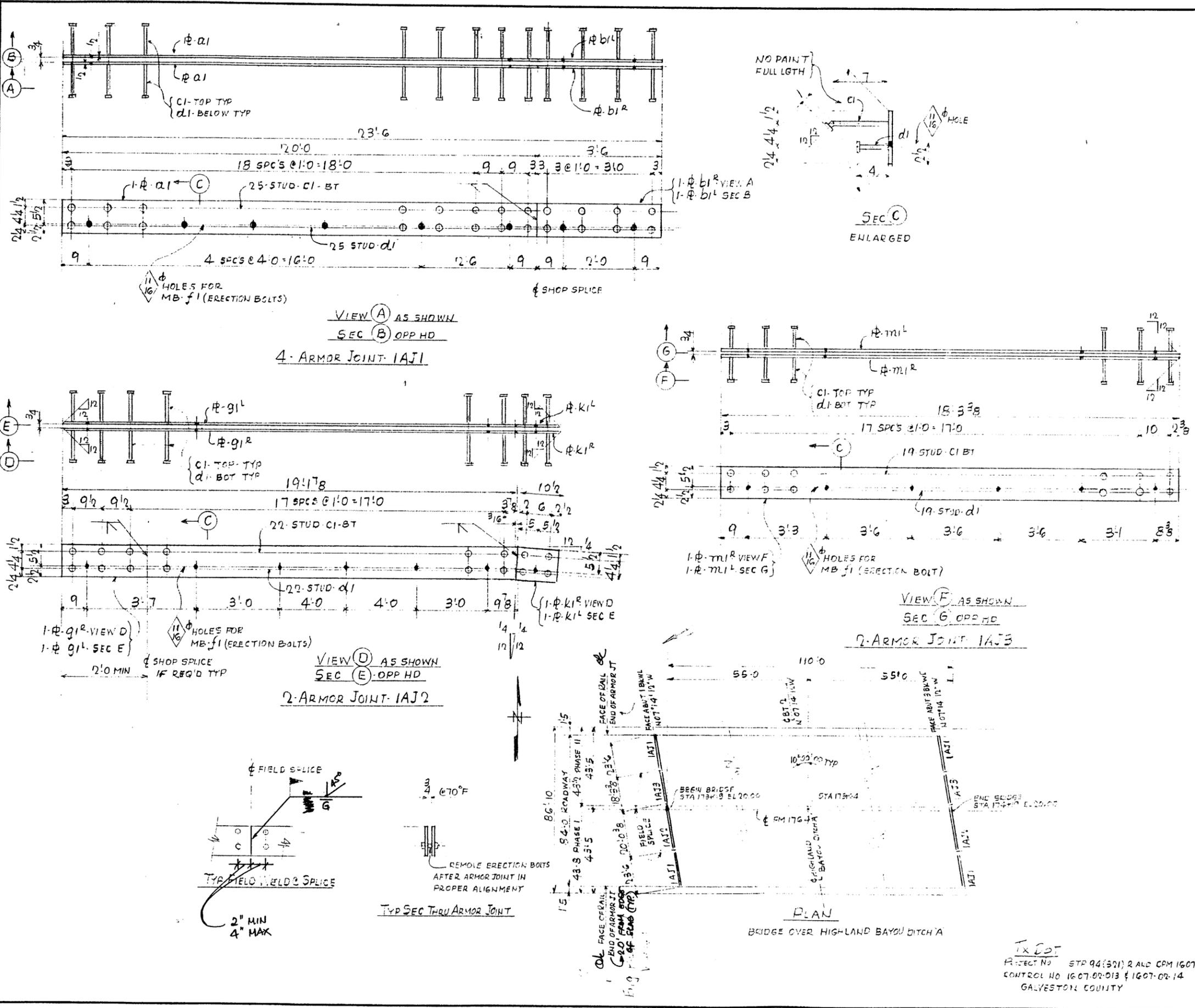
Should you have any questions or comments, please call Ms. Marietta Francisco at (713) 802-5230.

Sincerely,

J. C. Liu, P.E.  
Director of District Bridge Design  
Houston District

JCL:MFF:ach  
cc: Premier Fabricators and Supply Co.  
Design Division - Bridge  
Material & Tests Division  
Resident Engineer J. Pinkston, P.E.  
District Construction (Letter only)  
File





PHASE	LINE NO	DESCRIPTION	LGTH	ASSEMBLY	REMARKS	WT.
	NO		FT	MARK		
1	11					
2	2	ARMOR JOINT- 1AJ1				
	2	8 PL 1/2 X 8	20	0	a1	
	3	4 PL 1/2 X 8	3	6	b1 <sup>R</sup>	BEV 81 END
	4	100 NELSON STUD 5/8 φ	0	8	c1	BT
	5	100 NELSON STUD 5/8 φ	0	4	d1	
	6	16 MACH BOLTS 5/8 φ	0	23/4	f1	HHAN A307
	7					
	8					
2	9	ARMOR JOINT- 1AJ2				
	10	2 PL 1/2 X 8	19	17/8	g1 <sup>R</sup>	BEV 1 END
	11	2 PL 1/2 X 8	0	10 1/2	k1 <sup>R</sup>	BEV 2 ENDS
	12	88 NELSON STUD 5/8 φ	0	8	c1	BEHT
	13	88 NELSON STUD 5/8 φ	0	4	d1	
	14	12 MACH BOLT 5/8 φ	0	23/4	f1	HHAN A307
	15					
	16					
2	17	ARMOR JOINT- 1AJ3				
	18	2 PL 1/2 X 8	18	3 3/8	m1 <sup>L</sup>	BEV 1 END
	19	76 NELSON STUD 5/8 φ	0	8	c1	BEHT
	20	76 NELSON STUD 5/8 φ	0	4	d1	
	21	6 MACH BOLT 5/8 φ	0	23/4	f1	HHAN A307
	22					
	23					
	24					
	25					
	26					
	27					
	28					
	29					
	30					
	31					
	32					
	33					
	34					
	35					

TEXAS DEPARTMENT TRANSPORTATION

Approved without modification

Approved with modification as shown

FEB 16 1995 By MFF

Approval of these drawings does not release the contractor of the responsibility for the correctness of detail.

SHOP NOTES

MATERIAL-ASTM-A36 UN

HOLES-AS NOTED

WELD PER AWS CODE E70X ELECTRODES

STUDS SHALL BE ELECTRIC ARC WELD WITH COMPLETE FUSION

PREMIER FABRICATORS AND SUPPLY INC

PO BOX 2476 SPRING, TEXAS 77383 2476 AC 713-350-6900 FAX 713-350-6065

CUSTOMER NBG CONTRACTORS INC

JOB FM1764 BRIDGE OVER HIGHLAND BAYOU DITCH 'A'

DESCRIPTION ERECTION PLAN & DETAIL ARMOR JOINT

DRAWN BY: PS	CHECKED BY: CWP	DATE: 1/15/95	ORDER NO: 0076
SCALE: —	APPROVED BY:	DATE:	DRAWING NO: 94-26-01

TXDOT

PROJECT NO STP 94(321) 2 AND CPM 1607-02-14

CONTROL NO 1607-02-013 & 1607-02-14

GALVESTON COUNTY



# Texas Department of Transportation

P.O. BOX 1386 • HOUSTON, TEXAS 77251-1386 • (713) 869-4571  
December 9, 1994

Galveston County  
Project: STP94(321)R  
Control: 1607-02-013  
Highway: FM 1764

NBG, Inc.  
9702 Synott  
Houston, Texas 77083

Dear Sir:

The Flexicore of Texas, Inc. shop drawings for Prestressed Concrete Piling have been reviewed and approved without modification.

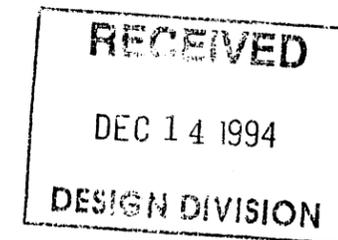
Should you have any questions or comments, please call Ms. Marietta Francisco at (713) 802-5230.

Sincerely,

Michael O. Braun, P.E.  
Acting District Bridge Engineer  
Houston District

GOD:ach

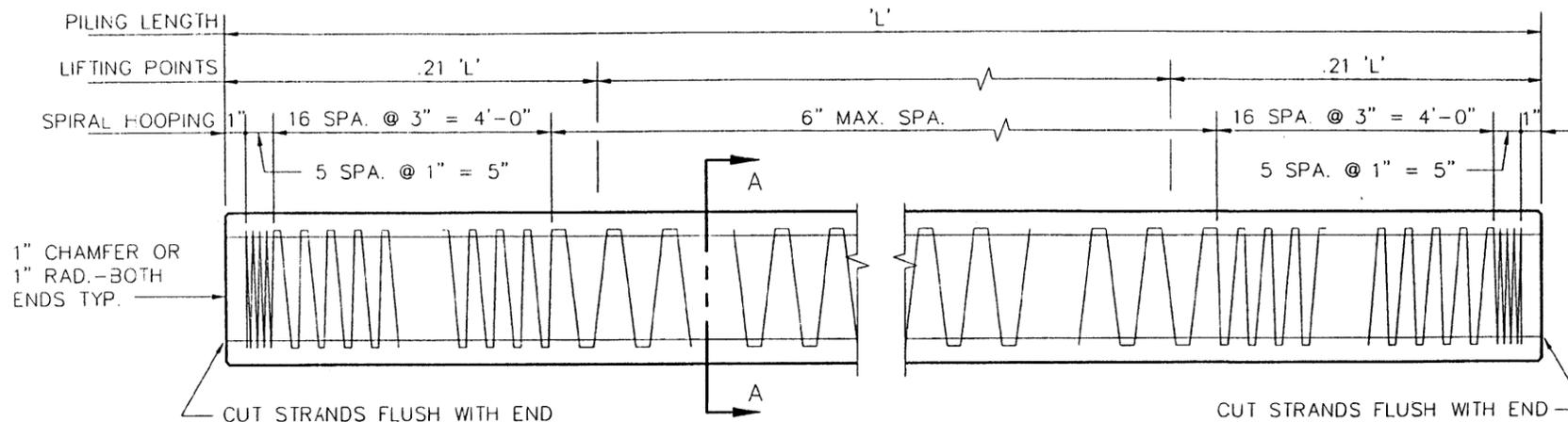
cc: Flexicore of Texas, Inc.  
Design Division - Bridge Design ✓  
Materials & Test Division  
Resident Engineer - J. Pinkston, P.E.  
Construction (Letter Only)  
File



PRESTRESSED CONCRETE PILING SCHEDULE				
PILE MARK	PILE SIZE	QUANTITY	PILE LENGTH	REMARKS
A	16" □	32	43'-0"	
B		11	51'-0"	
TOTALS		43	1937'	

TABLE OF ELEMENTS FOR PRESTRESSED CONCRETE PILING						
PILE SIZE 'D'	AREA OF PILE SECTION SQ. IN.	I IN. <sup>4</sup>	WEIGHT LB./FT.	1/2"φ - 270K STRANDS		
				QUANTITY	INITIAL PRESTRESS FORCE KIPS	FINAL PRESTRESS (20% LOSS) P.S.I.
16" □	254	5,340	265	8	231	728

PILE PLACEMENT SCHEDULE					16" □
STRUCTURE	BENT NO.	PILE MARK	NUMBER PILES	FT.	PCS.
FM 1764	ABUT NO 1	A	/	/	688'
		B	/	/	561'
	ABUT NO 3	A	/	/	688'
TOTALS					1937'
					43



NOTE:  
PILING SHALL BE HELD FIRMLY IN THIS POSITION □ (HORIZ.) THROUGHOUT ALL LIFTING AND HANDLING OPERATIONS.

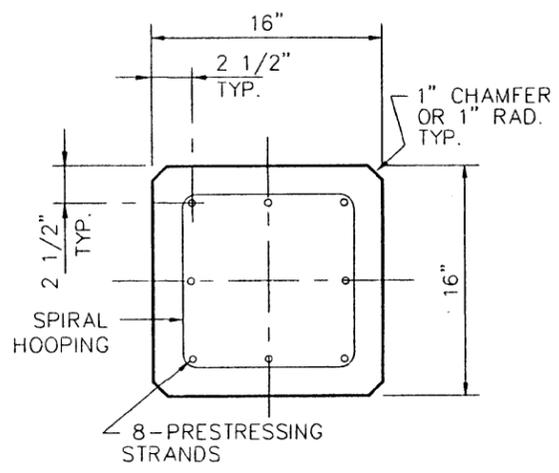
TEXAS DEPARTMENT TRANSPORTATION

Approved without modification

Approved with modification as shown

Date **DEC 09 1994** By **MFF**

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.



16" SECTION A-A

GENERAL NOTES

- CONCRETE FOR PRESTRESSED PILING SHALL BE CLASS H EXCEPT AS NOTED.  
RELEASE STRENGTH FOR CLASS H CONCRETE = 4000 psi.  
MINIMUM COMPRESSIVE STRENGTH 28 DAY (f'c) = 5000 psi.
- ALL CORNERS SHALL BE CHAMFERED AS SHOWN OR NOTED.
- ALL DIMENSIONS RELATING TO REINFORCING OR PRESTRESSING STEEL ARE TO CENTERS OF BARS OR STRANDS.
- SPIRAL HOOPING SHALL BE .207"φ MIN.
- PILE SHOULD BE SUPPORTED AT THE PICKUP POINTS AS SHOWN.
- TOLERANCES PER TxDOT SPEC. MAR 1993.
- ALL PILING TO BE CAST WITH CONCRETE USING TYPE II CEMENT.

REVISIONS		PROJECT	ADDRESS
△		FM 1764	GALVESTON COUNTY
△		C-1607-2-13	PROJECT No. STP94(321)R
△		TxDOT	
△		CONTRACTOR	NBG, INC

*flexicore* of TEXAS, INC.

P.O. BOX 450049, HOUSTON, TEXAS 77245

DRWN BY: G.FISHER  
CHCK BY: J.P.  
DATE: 12/07/94  
DRWG No. 1 OF 1  
JOB No. 94225



# Texas Department of Transportation

7440

P.O. BOX 1386 • HOUSTON, TEXAS 77251-1386 • (713) 869-4571

December 1, 1994

Galveston County  
Project: FBD 001(002)  
Control: 0367-06-050  
Highway: SH 87

Austin Bridge Company  
5200 Mitchelldale St.  
Houston, Texas 77092

Gentlemen:

The following North Shore Supply Company shop drawings for Galveston Ferry Landing Details have been reviewed and approved as follows:

<u>DRWG. NO.</u>	<u>DESCRIPTION</u>	<u>ACTION</u>
9005-S1 thru 9005-S2	Ferry Landing Details	Approved without modification
9005-S3	" " "	Approved with modification
9005-S4	" " "	Approved without modification
9005-E1	Landing Erection & Anchor Bolt Plan	Approved without modification

Should you have any questions or comments, please call Ms. Marietta Francisco at (713) 802-5230.

Sincerely,

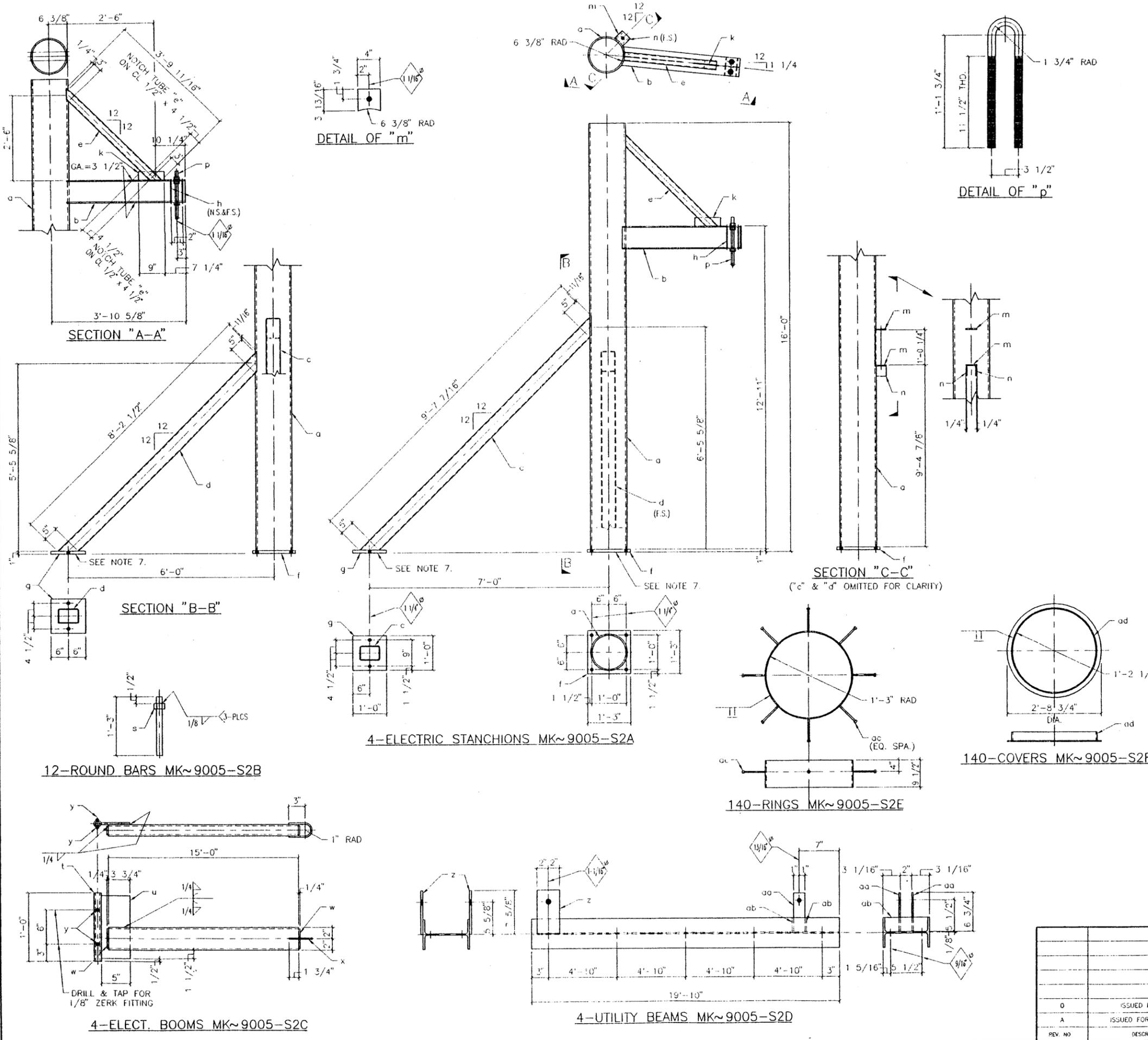
*Michael O. Braun, P.E.*

Michael O. Braun, P.E.  
Acting Bridge Design Engineer

MOB:MFF:ach  
cc: North Shore Supply Company  
Design Division - Bridge Design ✓  
Material and Test Division  
Resident Engineer (Pinkston, P.E.)  
Construction (Letter Only)  
File

RECEIVED  
DEC 05 1994  
DESIGN DIVISION





ITEM NO.	QTY	DESCRIPTION	UNIT	REMARKS	WEIGHT	ITEM CODE		
1	4	ELECT. STANCHIONS				9005-S2A		
2	4	PIPE 12 # XS	15	11	a	AS3-GR B	4165	
3	4	WB24	3	5 1/8	b		333	
4	4	TS5x5x1/4	9	7 7/16	c	A500-GR B	590	
5	4	TS5x5x1/4	8	2 1/2	d	A500-GR B	503	
6	4	TS3x3x3/16	3	9 11/16	e	A500-GR B	104	
7	4	PL 1 x 15	1	3	f		255	
8	8	PL 1 x 12	1	0	g		326	
9	16	PL 1/4 x 3	0	7 1/3	h		24	
10	4	PL 3/8 x 3	0	9	k		11	
11	8	PL 3/8 x 3 13/16	0	4	m		13	
12	8	PL 1/4 x 3 1/2	0	3 1/2	n		7	
13	4	RB 1 #	2	9	p	w/6 H.N. EA. A573	26	
14								
15								
16	12	RB 1 #	1	3			40	9005-S2B
17	12	HEX NUT 1 #			s		3	
18								
19								
20	4	TS4x2x1/4	15	0			528	9005-S2C
21	4	PIPE 1 # SCH 40	1	0	t		7	
22	4	PL 3/8 x 5	0	11	u		23	
23	8	PL 1/4 x 1 5/8	0	3 5/8	w		3	
24	4	RB 1/4 #	0	9 9/16	x		1	
25	16	ZERK FITTING 1/8			y			
26								
27								
28	4	WB18	19	10			1428	9005-S2D
29	8	PL 3/8 x 4	0	7 5/8	z		26	
30	8	PL 3/8 x 2	0	6 3/4	aa		11	
31	8	PL 1/4 x 2 1/2	0	7 1/2	ab		11	
32								
33								
34	140	PL 3/8 x 9 1/2	7	11 7/16			13487	9005-S2E
35	1120	WELD STUD 1/2 #	0	8	ac		498	
36								
37								
38	140	PL 1/4 x 32 3/4 #					10637	9005-S2F
39	140	PL 1/4 x 3	7	7 7/8	ad		2733	
40								
41								
42	4	PL 3/4 x 6	13	8		PLAIN MAT'L	836	9005-S2G
43								
44								
45								

WEIGHT THIS DWG.=36630#

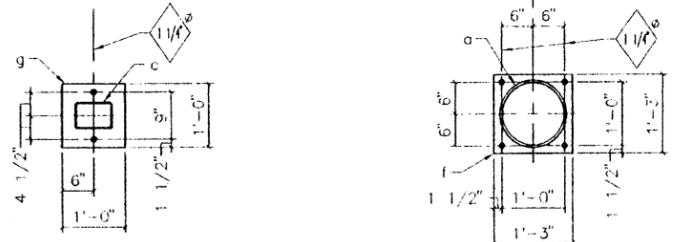
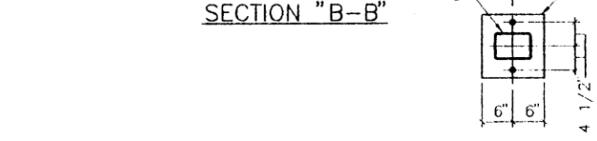
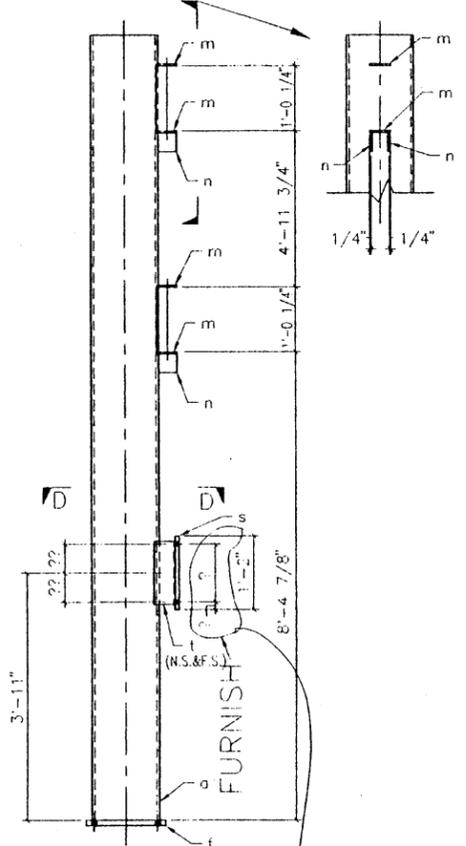
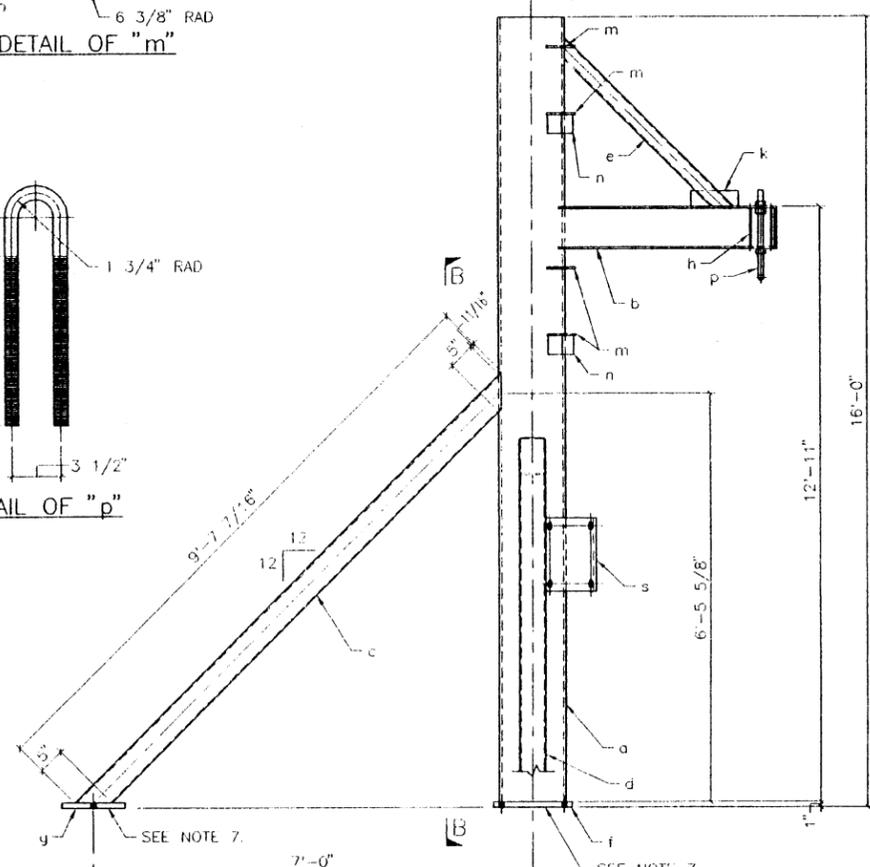
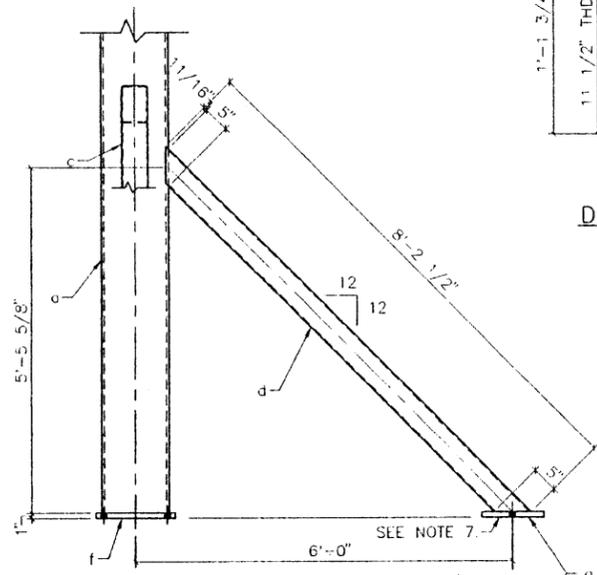
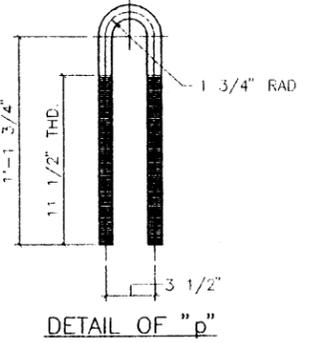
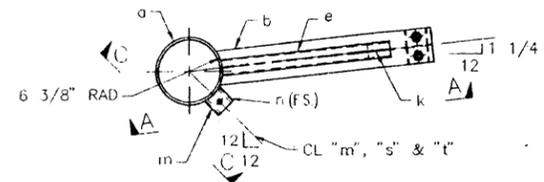
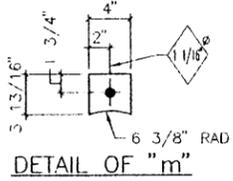
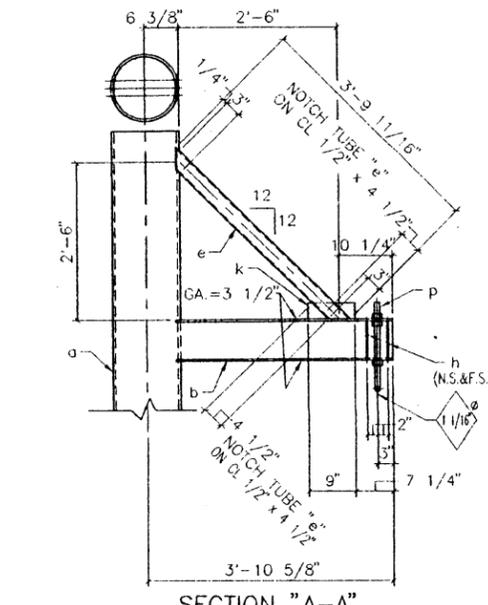
TEXAS DEPARTMENT TRANSPORTATION  
 Approved without modification  
 Approved with modification as shown  
 DEC 01 1994  
 Date By MFF  
 Approval of these drawings does not  
 relieve the contractor of the responsibility  
 for the correctness of detail.

- SHOP NOTES:
1. WELDS TO BE 1/4" FILLET U.N.
  2. ALL MATERIAL TO BE A36, UNL. NTD.
  3. PIECE MARK SUFFIXED BY DWG. NO., I.E. (a) BECOMES (aXX).
  4. SURFACE PREP. SSPC-SP10, NEAR WHITE BLAST CLEANING.
  5. GRIND ALL CUT EDGES TO 1/8" RAD.
  6. PAINT:  
 PRIME: 1-COAT OF INORGANIC ZINC, 3.0 M.D.T.  
 INTER: 1-COAT OF SYSTEM III EPOXY 2.0 M.D.T.  
 FINISH: 1-COAT OF SYSTEM III, URETHANE, 2.0 M.D.T., COLOR- CONCRETE GREY.
  7. APPLY 1-ADDITIONAL PRIMER COAT & 1-ADDITIONAL INTERMEDIATE COAT TO THESE SURFACES.

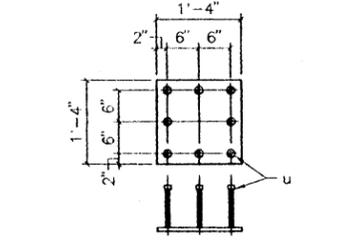
(3/4:12)

NORTH SHORE SUPPLY COMPANY			
P.O. BOX 9940 - HOUSTON, TEXAS 77213 - PHONE 713-453-3533 - TELEFAX 792174530-1641			
SHEET TITLE GALVESTON FERRY LANDING DETAILS			
JOB TITLE GALVESTON FERRY LANDING			
DRAWN BY	CD	DATE	CHECKED BY
		11-2-94	JR
ARCHITECT	TEXAS D.O.T.		
GENERAL CONTRACTOR	AUSTIN BRIDGE CO.		
CONTRACT NO.	SHOP NO.	SHEET NO.	REV.
FED 001 (002)	9005	9005-S2	A
REV. NO.	DESCRIPTION	BY	DATE
0	ISSUED FOR FAB	LT	???
A	ISSUED FOR APPROVAL	LT	11-10-94

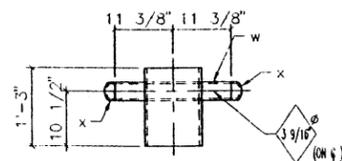
11/10/94 10:52 AM 11/10/94 10:52 AM



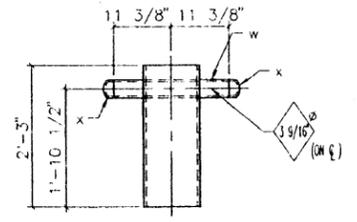
4-UTILITY STANCHIONS MK~9005-S3A



8-PLATES MK~9005-S3E

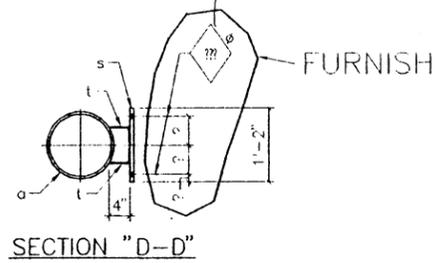


8-POSTS MK~9005-S3F



50-POSTS MK~9005-S3G

COORDINATE WITH CONTRACTOR



SECTION "D-D"

SEQUENCE	LINE	NO. PCS	SECTION	LENGTH FE.	INS.	TEMP. MK	REMARKS	WEIGHT	SHIPPING MK	FAB. CODE
1	4		UTILITY STANCHIONS						9005-S3A	
2	4		PIPE 12 Ø XS	15	11	a	A53-GR. B	4165		
3	4		WBx24	3	5 1/8	b		333		
4	4		TS5x5x1/4	9	7 7/16	c	A500-GR. B	590		
5	4		TS5x5x1/4	8	2 1/2	d	A500-GR. B	503		
6	4		TS3x3x3/16	3	9 11/16	e	A500-GR. B	104		
7	4		PL 1 x 15	1	3	f		255		
8	8		PL 1 x 12	1	0	g		326		
9	16		PL 1/4 x 3	0	7 1/8	h		24		
10	4		PL 3/8 x 3	0	9	k		11		
11	16		PL 3/8 x 3 13/16	0	4	m		26		
12	16		PL 1/4 x 3 1/2	0	3 1/2	n		14		
13	4		RB 1 Ø	2	9	p	w/6 H.N.	26		
14	8		L4x3x1/4	1	0	t		46		
15	4		PL 3/4 x 14	1	2	s		167		
16										
17										
18	64		RB 1 Ø	2	0		w/4 H.N. EA A573	342	9005-S3B	
19							THD 5" E.E.			
20										
21	48		RB 3/4 Ø	1	10		w/4 H.N. EA A573	132	9005-S3C	
22							THD 5" E.E.			
23										
24	35		PL 3/8 x 3'-2 Ø				PLAIN MATL. NO PAINT	5370	9005-S3D	
25										
26										
27	8		PL 3/4 x 16	1	4			435	9005-S3E	
28	64		WELD STUD 3/4 Ø	0	8	u		64		
29										
30										
31	8		PIPE 10 Ø XS	1	3			547	9005-S3F	
32	8		PIPE 3 Ø XS	1	10 3/4	w		150		
33	16		PIPE CAP 3 XS			x		32		
34										
35										
36	50		PIPE 10 Ø XS	2	3			6158	9005-S3G	
37	50		PIPE			w		972		
38	100		PIPE CAP			x		200		

WEIGHT THIS DWG. = 20992#

TEXAS DEPARTMENT TRANSPORTATION  
 Approved without modification  
 Approved with modification as shown  
 DEC 01 1994 By MFE  
 Approval of these drawings does not reduce the contractor of the responsibility for the correctness of detail.

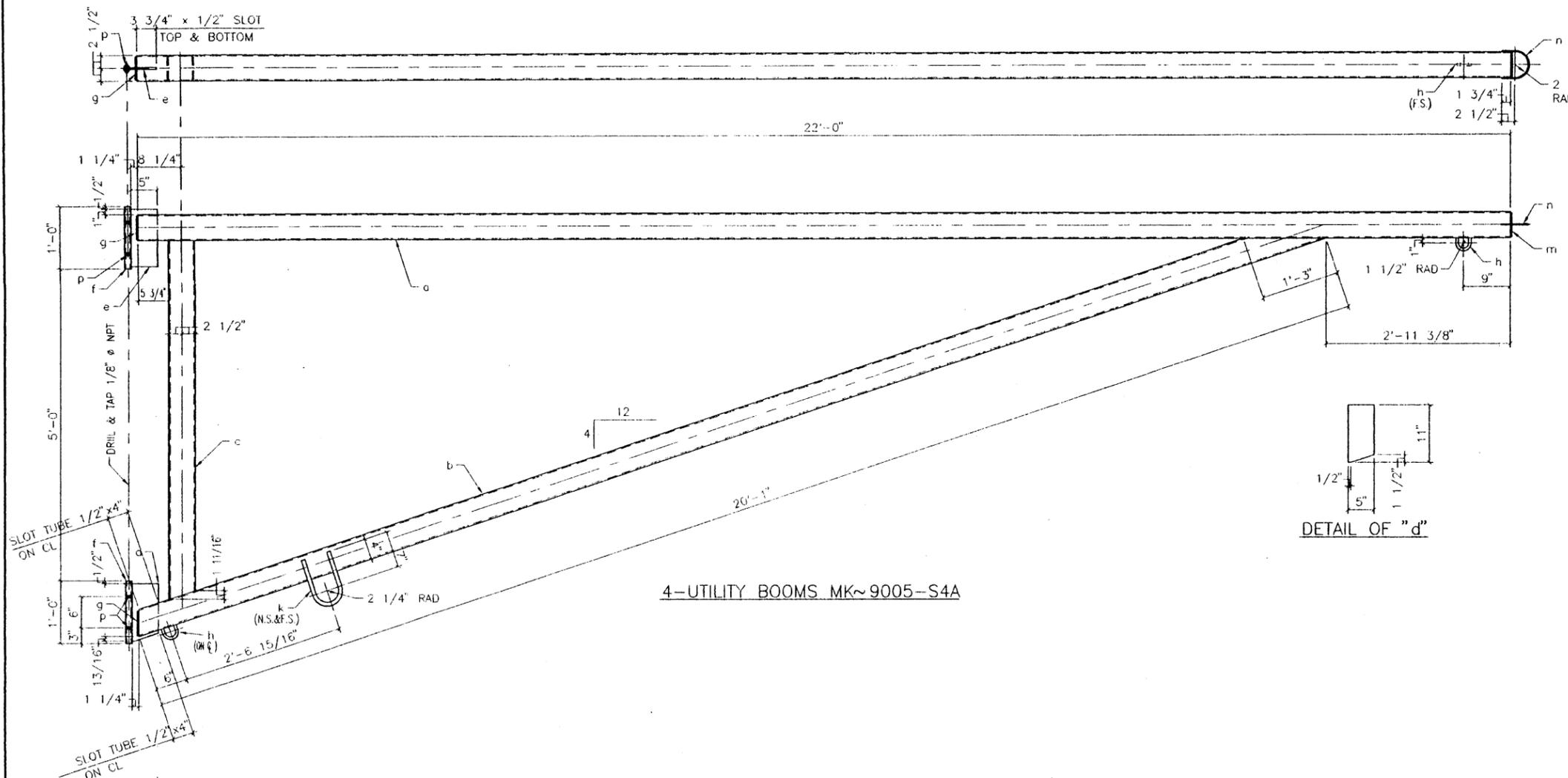
SHOP NOTES:

1. WELDS TO BE 1/4" FILLET U.N.
2. ALL MATERIAL TO BE A36, UNL. NTD.
3. PIECE MARK SUFFIXED BY DWG. NO., I.E. (a) BECOMES (aXX).
4. SURFACE PREP. SSPC-SP10, NEAR WHITE BLAST CLEANING
5. GRIND ALL CUT EDGES TO 1/8" RAD.
6. PAINT:  
 PRIME: 1-COAT OF INORGANIC ZINC, 3.0 M.D.  
 INTER: 1-COAT OF SYSTEM III EPOXY 2.0 M.D.  
 FINISH: 1-COAT OF SYSTEM III, URETHANE, 2.0 M.D.T., COLOR- CONCRETE GREY.
7. APPLY 1-ADDITIONAL PRIMER COAT & 1-ADDITIONAL INTERMEDIATE COAT TO THESE SURFACES.

REV. NO	DESCRIPTION	BY	DATE	CONTRACT NO.	SHOP NO.	SHEET NO.	REV.
0	ISSUED FOR FAB	LT	11-3-94	FBI 001 (002)	9005	9005-S3	A
A	ISSUED FOR APPROVAL	LT	11-10-94				

NORTH SHORE SUPPLY COMPANY

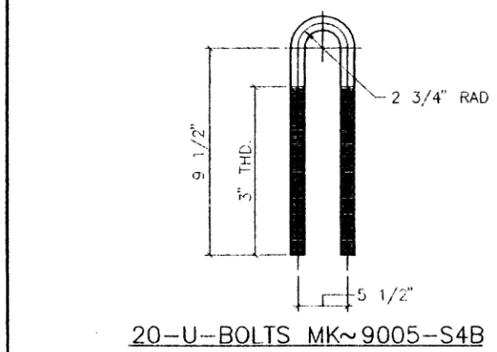
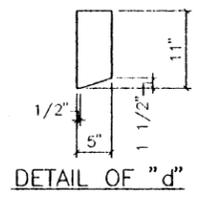
P.O. BOX 6940 - HOUSTON, TEXAS 77213 - PHONE: 713-453-3533 - TELE: 792179632 - FAX  
 SHEET TITLE GALVESTON FERRY LANDING DETAILS  
 JOB TITLE GALVESTON FERRY LANDING  
 DRAWN BY CD DATE 11-3-94 CHECKED BY JR DATE 11-9-94  
 ARCHITECT TEXAS D.O.T.  
 GENERAL CONTRACTOR AUSTIN BRIDGE CO.  
 CONTRACT NO. FBI 001 (002) SHOP NO. 9005 SHEET NO. 9005-S3 REV. A



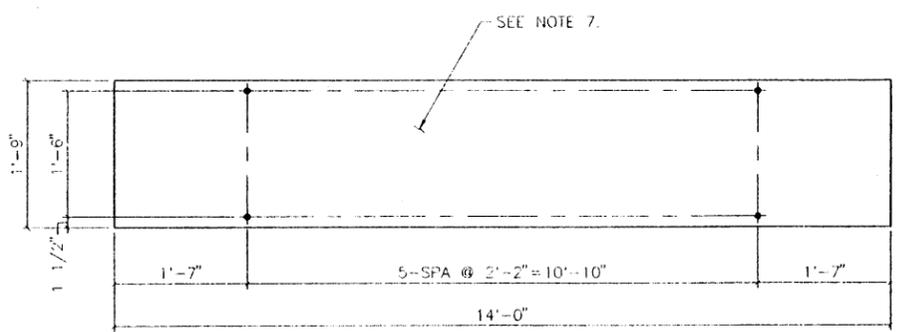
4-UTILITY BOOMS MK~9005-S4A

ITEM NO.	QTY	DESCRIPTION	UNIT	WEIGHT	MARK	REMARKS	WEIGHT	MARK	REMARKS
1	4	UTILITY BOOMS					9005-S4A		
2	4	TS5x5x1/4	22	0	a	A500-GR. B	1357		
3	4	TS5x5x1/4	20	1	b	A500-GR. B	1239		
4	4	TS5x5x1/4	5	9	c	A500-GR. B	355		
5	4	PL 3/8 x 5	0	11	d		23		
6	4	PL 3/8 x 5	0	11	e		23		
7	8	PIPE 1" STD	1	0	f	A53-GR. B	13		
8	16	PL 1/4 x 2 1/8	0	4 5/8	g		11		
9	8	RB 1/2"	0	7 1/2	h		3		
10	8	SQ BAR 3/4	1	10 1/4	k		28		
11	4	PL 1/4 x 4 5/8	0	4 5/8	m		6		
12	4	RB 1/4"	1	1 1/4	n		1		
13	32	ZERK FITTING 1/8			p				
14									
15									
16	20	RB 1/2"	2	3 5/8		w/4-H.N. EA. A573	30	9005-S4B	
17									
18	4	PL 1/2 x 2 1/2	14	0			2000	9005-S4C	

WEIGHT THIS DWG.=5090#



20-U-BOLTS MK~9005-S4B



4-PLATES MK~9005-S4C

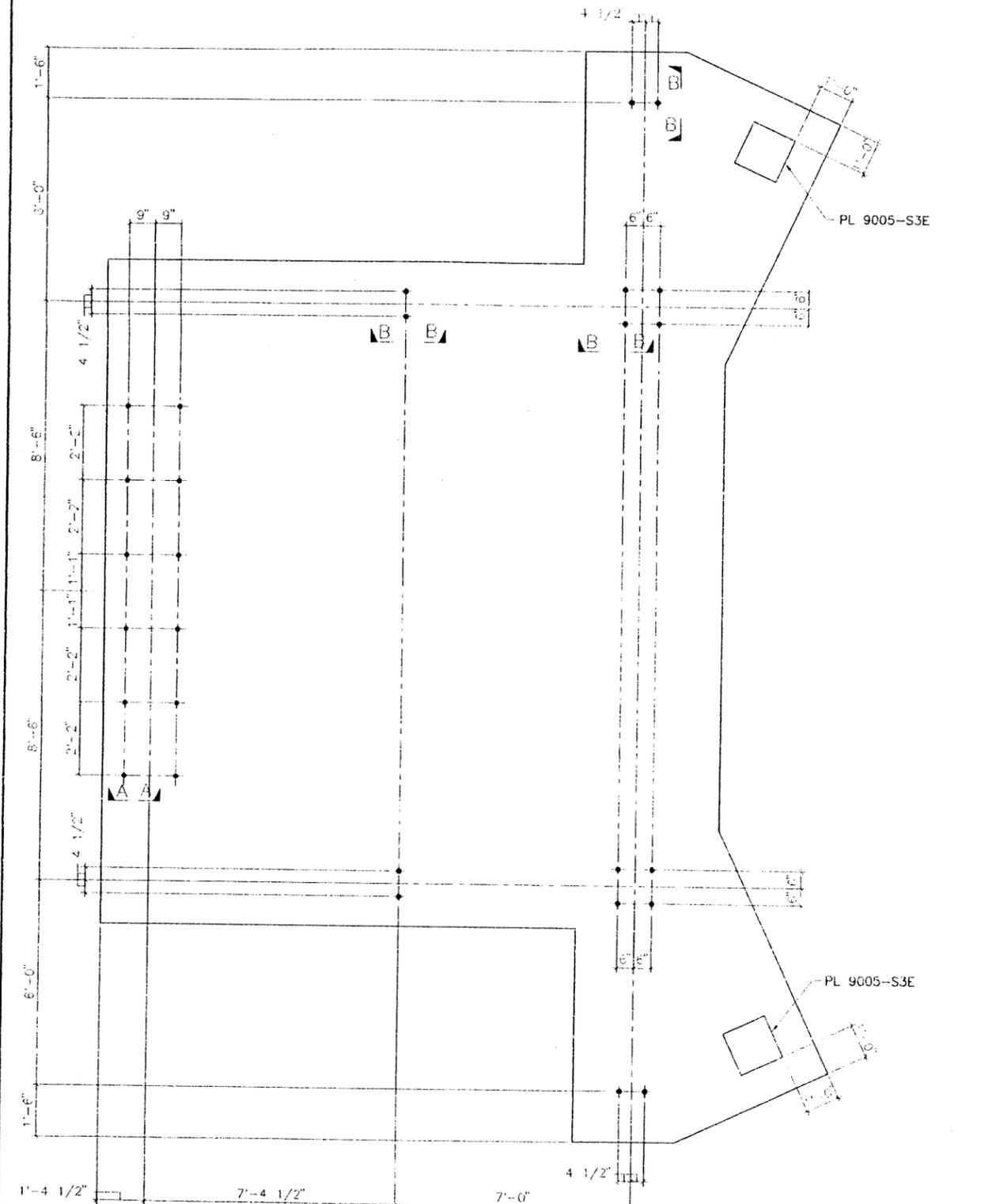
TEXAS DEPARTMENT TRANSPORTATION  
 Approved without modification  
 Approved with modification as shown  
 DEC 01 1994  
 Date by MEF  
 Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

- SHOP NOTES:
1. WELDS TO BE 1/4" FILLET UN.
  2. ALL MATERIAL TO BE A36, UNL. NTD.
  3. PIECE MARK SUFFIXED BY DWG. NO., I.E. (a) BECOMES (aX).
  4. SURFACE PREP. SSPC-SP10, NEAR WHITE BLAST CLEANING.
  5. GRIND ALL CUT EDGES TO 1/8" RAD.
  6. PAINT:  
 PRIME: 1-COAT OF INORGANIC ZINC, 3.0 M.D.T.  
 INTER: 1-COAT OF SYSTEM III EPOXY 2.0 M.D.T.  
 FINISH: 1-COAT OF SYSTEM III, URETHANE, 2.0 M.D.T., COLOR- CONCRETE GREY.
  7. APPLY 1-ADDITIONAL PRIMER COAT & 1-ADDITIONAL INTERMEDIATE COAT TO THESE SURFACES.

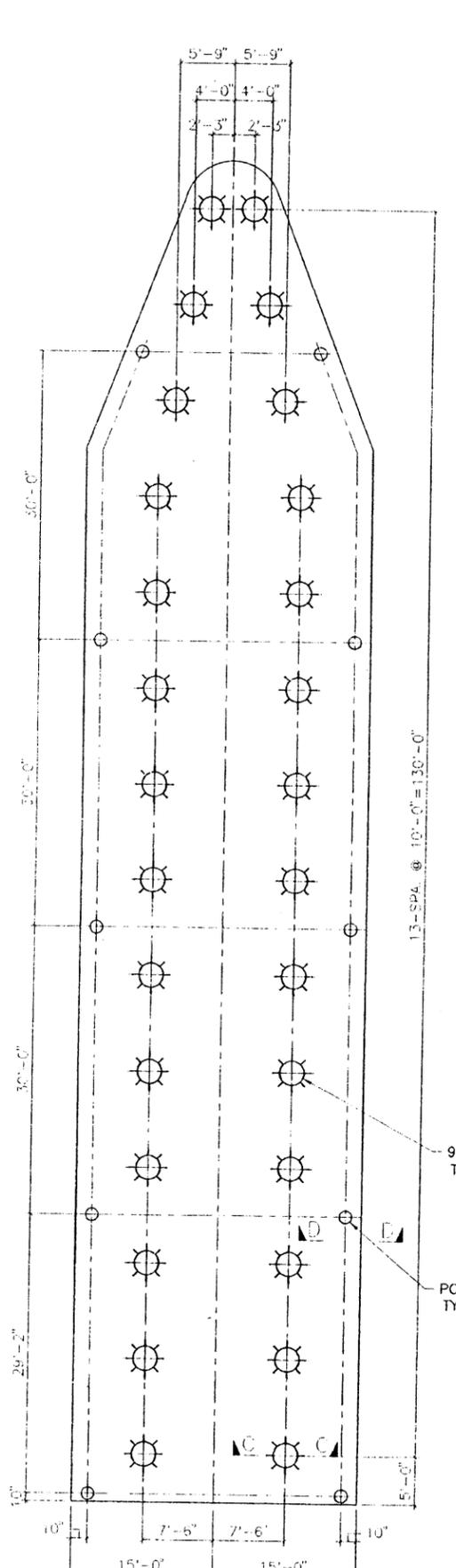
(1-12)

REV. NO.	DESCRIPTION	BY	DATE
0	ISSUED FOR FAB	LT	???
A	ISSUED FOR APPROVAL	LT	11-10-94

<b>NORTH SHORE SUPPLY COMPANY</b>			
<small>P.O. BOX 9940 - HOUSTON, TEXAS 77213 - PHONE 713-453-3533 - TELEFAX 792179550-100</small>			
SHEET TITLE GALVESTON FERRY LANDING DETAILS			
JOB TITLE GALVESTON FERRY LANDING			
DRAWN BY	CD	DATE	CHECKED BY
		11-7-94	JR
ARCHITECT	TEXAS D.O.T.		
GENERAL CONTRACTOR	AUSTIN BRIDGE CO.		
CONTRACT NO.	SHOP NO.	SHEET NO.	REV.
FBO 001 (002)	9005	9005-S4	A

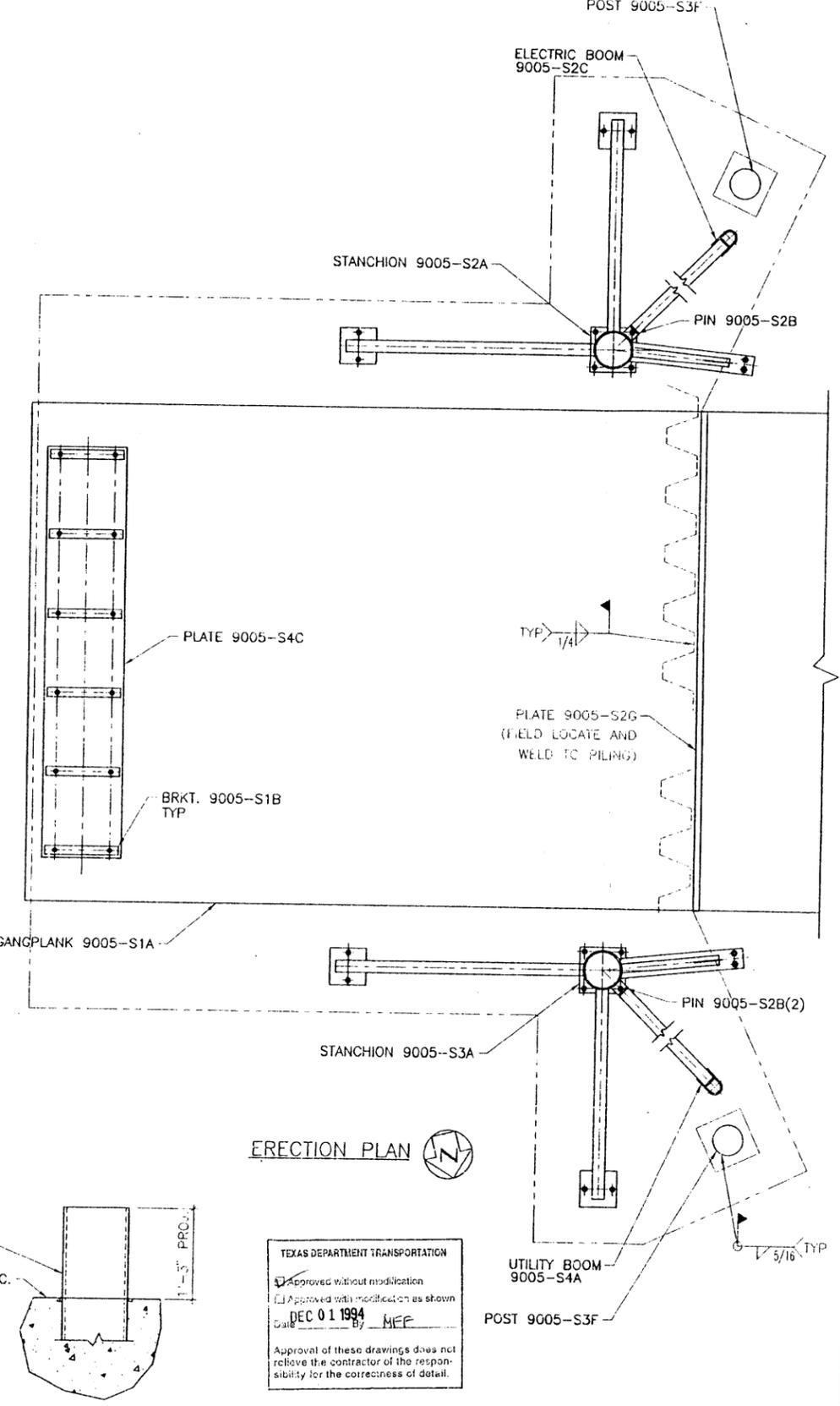


ANCHOR BOLT SETTING PLAN



SETTING PLAN @ MOORING DOCKS

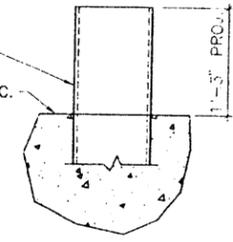
NOTE: FIELD WELD 3/8" Ø LID TO STEEL CYLINDER PILES. (35-101AL REQ'D). MK~9005-S3D



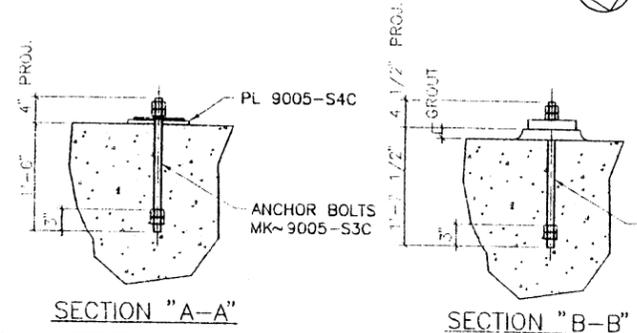
ERECTION PLAN



TEXAS DEPARTMENT TRANSPORTATION  
 Approved without modification  
 Approved with modification as shown  
 Date DEC 01 1994 By MEF  
 Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

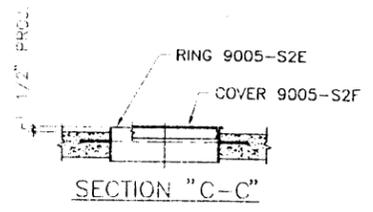


SECTION "D-D"



SECTION "A-A"

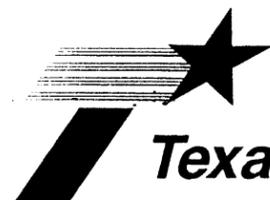
SECTION "B-B"



SECTION "C-C"

NORTH SHORE SUPPLY COMPANY			
P.O. BOX 9440 - HOUSTON, TEXAS 77033 - PHONE 713-453-5533 - TELE 7921981500 (400)			
SHEET TITLE GALVESTON FERRY LANDING ERECTION AND ANCHOR BOLT SETTING PLAN			
JOB TITLE GALVESTON FERRY LANDING			
DRAWN BY CD	DATE 11-7-94	CHECKED BY JR	DATE 11-9-94
ARCHITECT TEXAS D.O.T.			
GENERAL CONTRACTOR AUSTIN BRIDGE CO.			
REV. NO.	DESCRIPTION	BY	DATE
0	ISSUED FOR FAB	LT	???
A	ISSUED FOR APPROVAL	LT	11-10-94
CONTRACT NO. FRD 001 (5000)		SHOP NO. 0004	SHEET NO. 0004

(1/2.12)



# Texas Department of Transportation

7440

P.O. BOX 1386 • HOUSTON, TEXAS 77251-1386 • (713) 869-4571

January 27, 1995

Galveston County  
Project: FBD 001 (002)  
Control: 0367-06-050  
Highway: SH 87 - Galveston Ferry

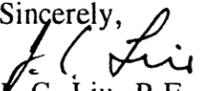
Austin Bridge & Road  
P. O. Box 5445  
Houston, Texas 77262

Gentlemen:

The following Trellex Morse shop drawings for Fender Systems have been reviewed and approved as follows:

<u>DESCRIPTION</u>	<u>ACTION</u>
Bill of Materials	Added Anchors to be Provided by the Contractor
Fender System Specifications	Approved without modification
Handling & Installation Instructions	Approved without modification
Hilti Drop-In Anchor Product Information	Added to Submittal
End Berthing Fenders	Approved without modification
Bar Fenders	Reduced size of threaded Rod - Added Repair Note
Low Friction Panels	Added Hilti Fastener Notes

Should you have any questions or comments, please call Mr. John P. Vogel, P.E. at (713) 802-5235.

Sincerely,  
  
J. C. Liu, P.E.  
Director of District Bridge Design  
Houston District

JCL:JPV:ach  
cc: Trellex Morse  
Design Division - Bridge  
Materials & Tests Division  
Construction - Letter Only  
Resident Engineer - J. Pinkston, P. E.  
File

# Trellex Morse

LETTER OF TRANSMITTAL

TO: Dave Thelen

DATE: 12/02/94

Austin Bridge & Road Inc.

TXM # 2064

8201 Laporte Freeway

Houston, TX 77012

6 Copies are attached for your X Approval    Information

<u>ITEM</u>	<u>REV</u>	<u>DESCRIPTION</u>
S94-215	0	SHIPPING BILL OF MATERIALS
FSPEC.1	0	FENDER SYSTEM SPECIFICATION
UHMW	0	UHMW-PE SPECIFICATIONS
<u>FENDER SYSTEM</u>		
MV04010A	0	PERFORMANCE CURVES, MV400 X 1000A FENDER ELEMENT
B18190	0	MV400 X 1000A FENDER SYSTEM, GALVESTON FERRY LANDING, GALVESTON, TX
T0410A-C	A	FENDER ELEMENT, MV400 X 1000A (CATALOG DIMENSIONS)
P10222	0	FRONTAL PANEL, 7-3/4" X 48"W X 84"H
B18191	0	ANCHOR LOCATIONS FOR MV400 X 1000A, GALVESTON FERRY LANDING, GALVESTON, TX
<u>FENDER BARS</u>		
MF1598-C	0	FENDER BAR ELEMENT, MF150 X 980 (CATALOG DIMENSIONS)
B18189	0	TRELLEX MFB 150/40 MODULAR FENDER BAR
MF1598	A	FENDER BAR ELEMENT, MF150 X 980
HA32891B	0	UHMW-PE PROTECTOR PANEL, (72), 1-9/16" X 5-7/8" X 38-9/16"
HA2695	A	THREADED ROD, 1" X 12" LG., UNC, #304 S.S.
B18213	0	ANCHOR LOCATIONS FOR MFB 150/40

FLOATING DOCKS

B18195	0	PLAN VIEW FOR UHMW-PE SECTIONS, GALVESTON FERRY LANDING, GALVESTON, TX
HA34401B	0	UHMW-PE PROTECTOR PANEL, (72), 2" X 36" X 110"
HA34391B	0	UHMW-PE PROTECTOR PANEL, (72), 2" X 36" X 120-3/4"
HA34381B	0	UHMW-PE PROTECTOR PANEL, (72), 2" X 36" X 119-1/2"
FI-9-92	0	HANDLING & INSTALLATION INSTRUCTIONS

---

Ray Estrada, Project Coordinator

SHIPPING BILL OF MATERIAL  
FOR  
AUSTIN BRIDGE

DATE: 12/02/94  
PAGE #: 1  
SHIP #: S94-215  
JOB #: 2064  
REV: 0

BY: *J. White*

APPROVED: *R. Estrada*

PAGE #: 1  
JOB #: 2064  
REV #: 0

PART #	DESCRIPTION	#REQD	NOTES
HA5746	ANCHOR SHACKLE, 3/4", ALLOY, GALV.	32	0
HA3413	ANCHOR SLEEVE, L-TYPE, 7/8" X 10-3/4" LG., A36 STL., GALV., REF. DWG B18055	32	0
HA6414	BOLT, 7/8" X 2-1/2" LG., UNC, A307, GALV.	64	0
HA2694	CAPSULE, 1" GLASS RESIN, FOR 1" THREADED ROD	840	0
HA8795	CHAIN ANCHOR BRACKET, 3/4" LONG-LINK DOCK CHAIN, NEW CONCRETE, GALV.	16	0
HA3436	CHAIN, 3/4" LONG-LINK DOCK X 11-1/4" (3 LINKS), GALV	16	0
T0410A	FENDER ELEMENT, MV400 X 1000A	16	0
P10222	FRONTAL PANEL, 7-3/4" X 48"W X 84"H	8	0
P90223	MODULE FENDER BAR ASS'Y	420	0
HA7105	NUT, 1", UNC, HEAVY HEX, #304 S.S.	840	0
RK0005	REPAIR KIT, 69, HI-BUILD EPOXOLINE II	4	0
HA2695	THREADED ROD, 1" X 12" LG., UNC, #304 S.S.	840	0
HZ1138	THREADLOCKER 262, 1.69 OZS.	2	0
HA3440	UHMW-PE PROTECTOR PANEL, (72), 2" X 36" X 110"	24	0

TEXAS DEPARTMENT TRANSPORTATION

Approved without modification  
 Approved with modification as shown

Date 1-26-95 By John Vogel P.E.

Approval of these drawings does not  
relieve the contractor of the respon-  
sibility for the correctness of detail.

PAGE #: 2  
 JOB #: 2064  
 REV #: 0

PART #	DESCRIPTION	#REQD	NOTES
HA3438	UHMW-PE PROTECTOR PANEL, (72), 2" X 36" X 119-1/2"	72	0
HA3439	UHMW-PE PROTECTOR PANEL, (72), 2" X 36" X 120-3/4"	16	0
HA2494	WASHER, 1", USS, #304 S.S.	840	0
HA3055	WASHER, MV400, 1/4" X 1-3/4" X 1-3/4", W/1" DIA. HOLE IN CENTER, CHAMFERED, A36 STL., GALV. (SEE REF. #B17991)	64	0

NOTES:

TO BE FURNISHED BY THE CONTRACTOR:

HILTI HDI ANCHORS HDI (SS303) 5/8"	3360
BOLT, 5/8" X 1 1/4" LONG, S.S.	3360
WASHER, 5/8" S.S.	3360

TEXAS DEPARTMENT TRANSPORTATION

- Approved without modification  
 Approved with modification as shown

Date 1-26-95 By Joan Vogel P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.



# Trellex Morse

TEXAS DEPARTMENT TRANSPORTATION

 Approved without modification

 Approved with modification as shown

 Date 1-29-95 By JOHN VOGEL P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

## FENDER SYSTEM SPECIFICATION

### RUBBER:

ASTM Classification:

 Exceeds requirements of D2000 3BA720 A<sub>14</sub>, B<sub>12</sub>, C<sub>12</sub>, EA<sub>14</sub>, F<sub>17</sub>

Minimum Thickness:

1/16" (over integrally-bonded steel plates).

### STEEL:

ASTM A36 (or stronger)

### FASTENERS:

A307 (or stronger) bolts with washers and A563 heavy hex nuts, all galvanized per A153.

### PANEL:

Design:

Closed box for optimum strength and corrosion resistance; max. design stress level = 0.6 Fy;

Material Thickness:

3/8" min. when one side is exposed

1/2" min. when both sides are exposed

Facing Material:

UHMW polyethylene, ultraviolet stabilized, minimum 1/2" wear thickness, .20 maximum coefficient of friction (per ASTM D1894), 26ft.-lbs./in. minimum Izod impact (notch) resistance (per ASTM D256A ) and 18 maximum Taber weight loss (carbon steel=100) abrasion resistance.

### FABRICATION:

 Per latest edition of AISC Manual of Steel Construction and AWS Structural Welding Code D-1.1---all exposed, external welds continuous and watertight and all panel bolt holes sealed with polysulfide sealant.

### PAINT SYSTEM:

Preparation:

All surfaces free from grease, oil, dust, and other foreign materials and blast cleaned to an SSPC-SP10 near-white finish.

Primer:

One coat of Tnemec 90-97 Tnemec-Zinc epoxy zinc-rich primer, 2.5 mils thick.

Finish:

Two coats of Tnemec Series 69 HI-BUILD EPOXOLINE II per manufacturer's specifications to 10 mils minimum thickness.

**ANCHOR BOLT DESIGN CRITERIA:**

Embedment lengths are based on developing 125% of the anchor's minimum ultimate tensile strengths. Where capacities are limited by concrete tensile strength, a working load safety factor of at least four is used.

**EPOXY-BONDED ANCHORS:**

**System Description:**

Two-part, 100% solids, epoxy adhesive paste; mixed inside dispensing nozzle; applied by special, pneumatic "caulk gun"; usable water and overhead as well as horizontal.

**Application Method:**

Drill hole(s) at least 1/8" oversize, inject adhesive into hole(s) until approximately 1/3 full using the "caulk gun", insert anchor to be bonded and strike off adhesive level with concrete. If insufficient adhesive is displaced to reach concrete surface remove anchor and add more adhesive. Save unused adhesive by closing valve on adhesive tube. (General guidance only--Follow manufacturer's instructions supplied with adhesive.)

**CHAIN ASSEMBLIES:**

**Design Safety Factor:**

3:1 based on minimum breaking strength

**Chain:**

Long-Link, alloy dock chain, galvanized per ASTM A153, strength as listed below

**Shackles:**

Alloy-steel, galvanized per ASTM A153, strength as listed below:

ITEM	SIZE	PROOF LOAD	ULTIMATE LOAD
Chain	1/2"	15.0 KIPS	35.0 KIPS
	5/8"	35.0 KIPS	58.0 KIPS
	3/4"	55.0 KIPS	105.0 KIPS
	1"	100.0 KIPS	160.0 KIPS
Shackles	1/2"	16.25 KIPS	32.5 KIPS
	5/8"	25.0 KIPS	50.0 KIPS
	3/4"	35.0 KIPS	70.0 KIPS
	7/8"	47.5 KIPS	95.0 KIPS
	1 1/8"	62.5 KIPS	125.0 KIPS
	1 3/8"	74.8 KIPS	170.0 KIPS
		105.6 KIPS	240.0 KIPS

TEXAS DEPARTMENT OF TRANSPORTATION

Approved without modification

Approved with modification as shown

Date 1-26-95 By John Vogel P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

# Trellex Morse

3588 MAIN STREET  
319/524-8430

KEOKUK, IOWA 52632  
FAX: 319/524-7290

## Trellex Morse Marine UHMW-PE Standard Grade

Cross-linked, mechanical blend of virgin ultrahigh molecular weight polyethylene resin and ground ultrahigh molecular weight polyethylene chips in full compliance with ASTM 4020-81 standards.

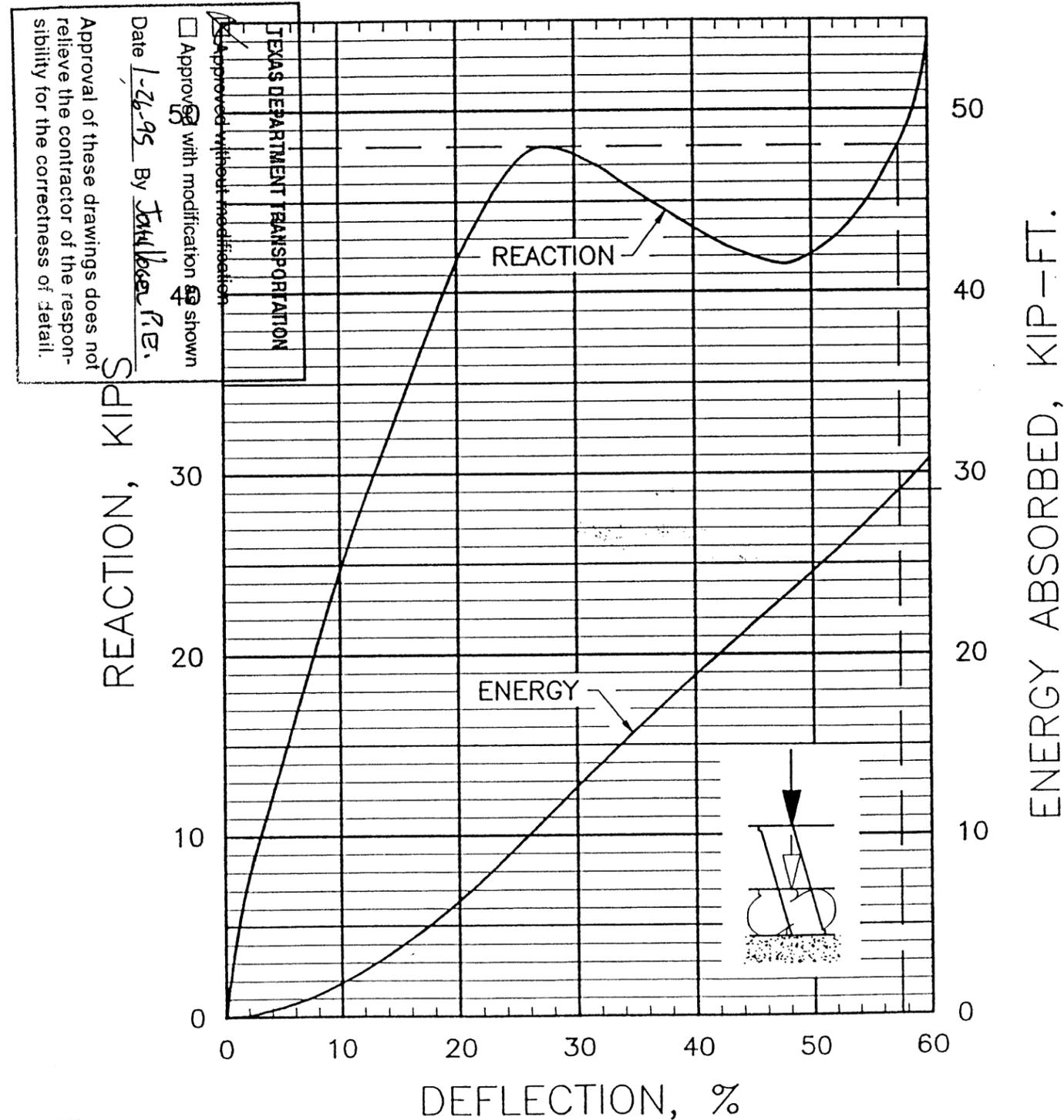
Property	Test Method	Value <sup>1</sup>
Color		Black <sup>2</sup>
Molecular weight		3.1-6.0 million
UV stabilization		2.5% carbon black & stabilizer <sup>3</sup>
Specific gravity	ASTM D792	.926-.945
Tensile strength, ultimate	ASTM D638	4100-5100 psi
Elongation at break	ASTM D638	320-420%
Thermal expansion	ASTM D648	90 x 10 <sup>-4</sup> in./°F
Water absorption	ASTM D570	Nil
Hardness	ASTM D2240	63-67 Shore D
Coefficient of friction, static/kinetic	ASTM D1894	.1-.2
Abrasion wear (virgin UHMW = 100)	Sand slurry	60-80 <sup>4</sup>
Izod impact, double notch	ASTM D256	26-30 ft.-lbs./in. notch

1. Range of values based on tests of multiple samples
2. Other colors available upon request.
3. For colors other than black, carbon black is replaced with added stabilizer.
4. Values are percentage of wear compared to sample used as 100% for comparison. For reference, virgin UHMW has an abrasion wear rating of 15 compared to carbon steel. If carbon steel were rated 100, Trellex Morse Standard Grade Marine UHMW-PE would have a rating of 9-12.

Rev. 5/28/93  
/ck

TEXAS DEPARTMENT TRANSPORTATION	
<input checked="" type="checkbox"/>	Approved without modification
<input type="checkbox"/>	Approved with modification as shown
Date	1-26-95 By John Vogel P.E.
Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.	

## MV400 X 1000A FENDER ELEMENT

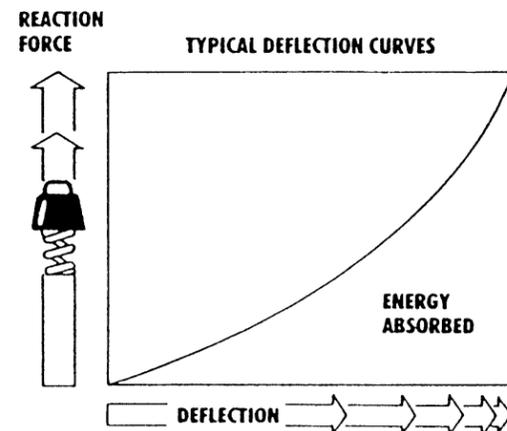
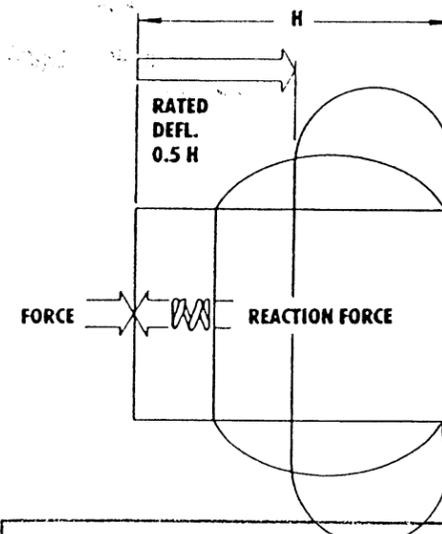
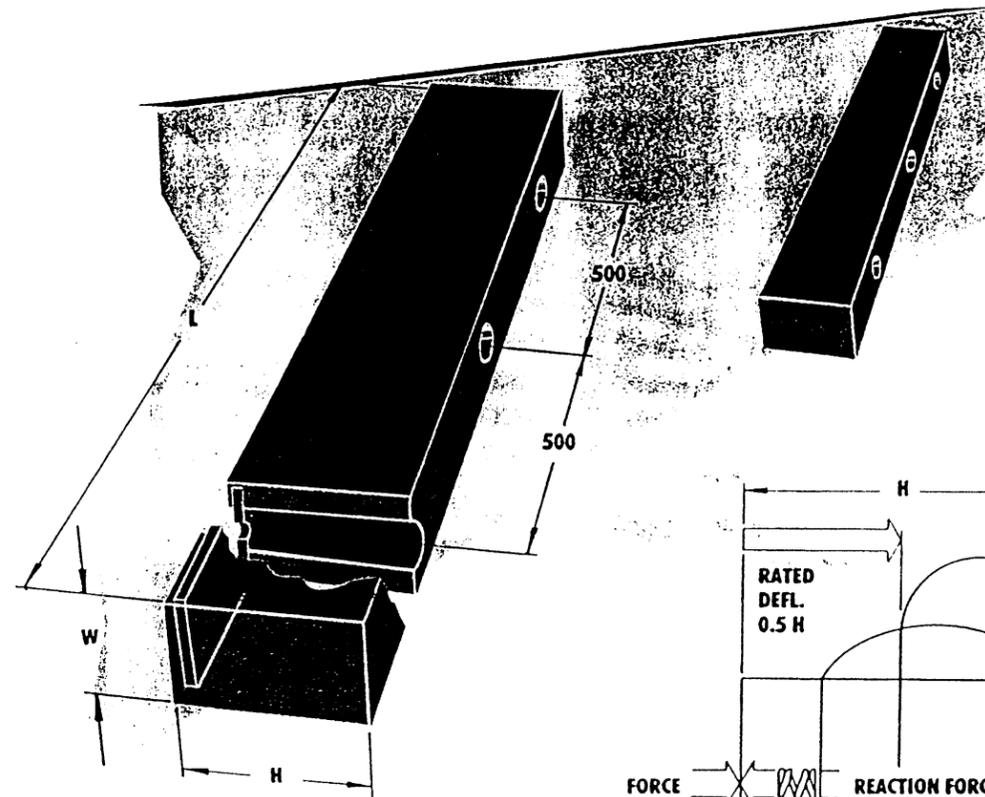


NOTE:  
 ELEMENTS MAY VARY UP TO  
 ±10% FROM CURVES.

MV04010A

### FENDER BAR SELECTION

RATED PROPERTIES				DIMENSIONS IN MM		
ENERGY ABSORBED		REACTION FORCE		FENDER TYPE ML W×H×L	ANCHOR	QTY
TONNE M	FT-KIPS	TONNES	KIPS			
1.7	12.3	65	143	150×150×1000	M 24	2
2.5	18.4	98	216	150×150×1500		3
1.7	12.3	45	99	150×200×1000	M 24	2
2.5	18.4	68	150	150×200×1500		3
2.7	19.5	84	185	200×200×1000	M 30	2
4.1	29.7	126	278	200×200×1500		3
2.7	19.5	67	148	200×250×1000	M 30	2
4.1	29.7	101	223	200×250×1500		3
2.7	19.5	54	119	200×300×1000	M 30	2
4.1	29.7	81	179	200×300×1500		3



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Date 1-26-95 By JOHN VEGEL P. E.

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## HANDLING & INSTALLATION INSTRUCTIONS

### Trellex Molded Fenders

FI-9-92

#### ANCHORS

##### EMBEDDED ANCHOR BOLTS OR SLEEVES - NEW CONCRETE

1. Exercise care to position bolts or sleeves accurately. They must be held within tolerance and must be kept perpendicular to dock face to assure assembly of fenders to the dock face without damaging rubber bonded in mounting holes.
2. If anchor bolts (instead of sleeves) are used, check them with a template and straighten as required to fit template before installation. All projections must be perpendicular to dock face.

##### ADHESIVE ANCHOR BOLTS OR SLEEVES - EXISTING CONCRETE

1. Using template, drill holes for anchors at least 1/8" oversize. Blow all dust out of holes after drilling.
2. FOLLOWING INSTRUCTIONS SUPPLIED WITH THE TUBES OF ADHESIVE inject adhesive into a hole, approx. 25-35% full depending on the size of the embedment, and immediately insert the embedment.
3. Rotate bolts or embedment sleeves or move U-bolts in and out slightly to distribute adhesive and eliminate voids, and strike off excess adhesive.
4. If quantity of adhesive is insufficient to fill hole, remove embedment, add adhesive, reinsert embedment and repeat step 3.
5. As each embedment is set, make sure it is in the correct location and it is perpendicular with the surface of the concrete.
6. Adhesive sets relatively quickly. Therefore, complete installation and alignment of each embedment before proceeding to the next.

## HANDLING

1. Keep all packaging intact until units are being assembled.
2. Use the lifting lugs provided when handling the panel. If lifting lugs are not used, use canvas or nylon slings. NEVER use chain or wire rope.
3. Use EXTREME CARE where sling contacts epoxy-covered steel. Rubbing against these surfaces may chip epoxy.
4. Control all movements, so fenders and panel do not strike hard objects or protrusions (including mounting bolts).

## STORAGE

1. Select a storage location away from all activity and any chemicals that may harm the epoxy coating or rubber.
2. If fenders are stacked, care should be exercised to assure that there are no sharp objects (nails, stone, sand, glass, etc.) on the ground where the first layer is to be placed. Under load, sharp objects may penetrate the rubber bonded to the steel insert and create a potential rust problem. It is recommended that fenders be stored in a neat stack with clean timbers under the first layer to keep fenders off ground.
3. Store steel panels with the plastic protector face down.

## INSTALLATION

1. Position embedments; using a template, so that they are within tolerances shown on anchor location drawing and perpendicular to dock face.
2. Position and mount rubber elements to the steel panel per Trellex Morse drawing.

NOTE: IN ALL CASES, BEFORE ASSEMBLY, APPLY A BEAD OF LOCTITE 262 TO THREADS OF BOLTS ATTACHING FENDERS/ELEMENTS TO DOCK AND PANELS BEFORE MOUNTING THE RUBBER ELEMENTS.

TEXAS DEPARTMENT TRANSPORTATION
<input checked="" type="checkbox"/> Approved without modification
<input type="checkbox"/> Approved with modification as shown
Date: 1-26-95 By: JOHN VOGEL P.E.
Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

3. Using the lifting brackets provided on the panel top, position and mount the assembled fender on the dock using hardware provided.
4. Tighten all bolts until fenders are seated against dock face, and the galvanized washers are seated. When tightening bolts to seat the fender elements, do not allow the washer under the nut or bolt head to be embedded more than 1/32". (Finger tight plus one flat maximum tightening).

**CAUTION: DO NOT OVER-TIGHTEN.**

5. While using the lifting lugs to support the weight of the panel, install any suspension, restraint, and shear chains as shown on the Trellex Morse drawing.
6. Repair all damage to rubber bonded to steel inserts and to epoxy protective coating by following instructions on the repair materials in the Installation/Touch-up Kit supplied by Trellex Morse.

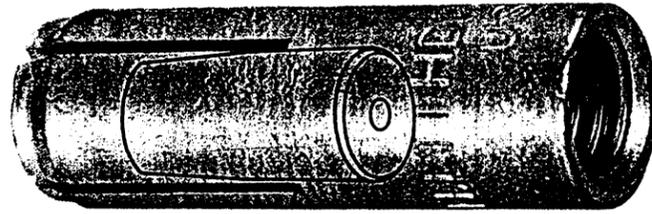
**CAUTION**

**EXPOSED STEEL WILL START CORRODING IMMEDIATELY!**

<p>TEXAS DEPARTMENT TRANSPORTATION</p> <p><input checked="" type="checkbox"/> Approved without modification <input type="checkbox"/> Approved with modification as shown</p> <p>Date <u>1-26-95</u> By <u>John Vogel P.E.</u></p> <p>Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.</p>
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HANDLE 9/92

# Flush-Mount Internal Thread Anchor Meets Wide Range Of Fastener Requirements



### Listings/Approvals

- UL (Underwriter Laboratories) Control No. 767G
  - FM (Factory Mutual) serial No. 22765
  - ICBO (International Conference of Building Officials) Report No. 2895
  - SBCCI (Southern Building Code Congress International) Report No. 8913
  - COLA (City of Los Angeles) Report No. 23709
- Meets the description in Federal Specification FF-S-325, Group VIII, Type 1

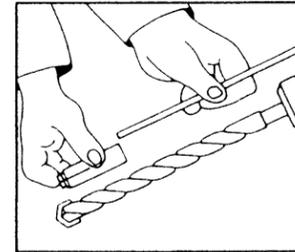
### Advantages

- Installs flush with base material
- Shallow embedment depth for high performance
- Internal thread
- Anchor is preassembled for fast, easy installation

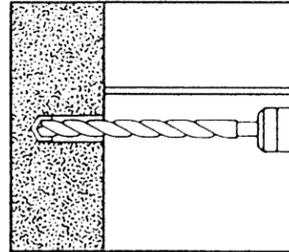
### Materials

- Anchor material is either SAE 1110M or 1010 for ¼", ⅜" & ½" carbon steel HDI's
- Anchor material is AISI 12L14 steel, meeting ASTM specification A 108 for ⅝" & ¾" carbon steel HDI's
- Carbon steel anchor plating is dull zinc, in accordance with ASTM B633, Sc. 1, Type III
- Stainless steel HDI anchor material is AISI 303

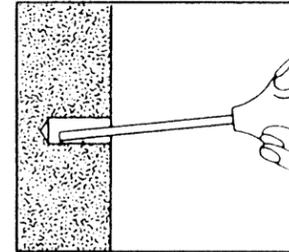
### Installation Instructions



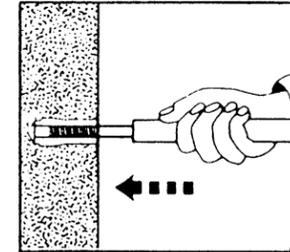
1. Adjust Depth Gauge so anchor will be flush with the base material surface



2. Hammer Drill The Hole



3. Clean Hole



4. Install Anchor Using proper setting tool. Setting tool to be driven into anchor until setting tool shoulder meets top of anchor.

### Anchor Program

#### HDI Sizes: Carbon Steel

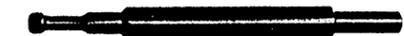
Item Number	Description	Anchor Size	Embedment & Anchor Length	Hilti Drill Bit Diameter	Allowable Working Loads 4000 psi Concrete*		Average Ultimate Loads 4000 psi Concrete*		Usable Thread Length	Quantity per box
					Tension (lbs)	Shear (lbs) <sup>1</sup>	Tension (lbs)	Shear (lbs) <sup>1</sup>		
000457523	HDI ¼"	¼"	1"	⅜"	560	450	2251	1781	7/16"	100
000457531	HDI ⅜"	⅜"	1 1/16"	½"	1240	1060	4942	4225	⅝"	50
000457549	HDI ½"	½"	2"	⅝"	1690	1560	6751	6224	1 1/16"	50
000457556	HDI ⅝"	⅝"	2 9/16"	27/32"	2420	3050	9696	12205	7/8"	25
000457564	HDI ¾"	¾"	3 1/16"	1"	4010	4400	16034	17609	1 3/8"	25

#### HDI Sizes: Stainless Steel

Item Number	Description	Anchor Size	Embedment & Anchor Length	Hilti Drill Bit Diameter	Allowable Working Loads 4000 psi Concrete*		Average Ultimate Loads 4000 psi Concrete*		Usable Thread Length	Quantity per box
					Tension (lbs)	Shear (lbs) <sup>2</sup>	Tension (lbs)	Shear (lbs) <sup>2</sup>		
000457879	HDI(SS303) ¼"	¼"	1"	⅜"	480	600	1930	2400	7/16"	100
000457887	HDI(SS303) ⅜"	⅜"	1 1/16"	½"	1040	1230	4170	4920	⅝"	50
000457895	HDI(SS303) ½"	½"	2"	⅝"	1840	2760	7350	11040	1 1/16"	50
000457903	HDI(SS303) ⅝"	⅝"	2 9/16"	27/32"	2630	4510	10540	18040	7/8"	25
000457911	HDI(SS303) ¾"	¾"	3 1/16"	1"	3830	5580	15340	22320	1 3/8"	25

\*See Product Technical Guide for complete performance data.

1. Shear values based on the use of SAE Grade 5 bolts.
2. Shear values based on the use of Type 18-8 bolts.



### Automatic Setting Devices for HDI Anchors

Use with TE-12S, TE-14, TE-15, TE-18, TE-22 & TE-24 Rotary Hammer Drills.

000302075	Setting Tool TE-C-SD 10	⅜" HDI
000302083	Setting Tool TE-C-SD 12	½" HDI

### Hand Setting Tools for HDI Anchors

Item Number	Description	Sets Anchors Size
000329789	HST ¼" Setting Tool	¼" HDI
000329797	HST ⅜" Setting Tool	⅜" HDI
000329805	HST ½" Setting Tool	½" HDI
000329813	HST ⅝" Setting Tool	⅝" HDI
000329821	HST ¾" Setting Tool	¾" HDI





ENERGY/FENDER ELEMENT: 29 FT.-KIP  
 REACTION/FENDER ELEMENT: 48 KIPS  
 ANCHOR HARDWARE: 7/8", UNC  
 ATTACHING BOLT GRIP: 3/4 INCHES  
 FENDER ELEMENT WT.: 158 LBS.  
 MATERIAL:  
 STEEL: A36  
 RUBBER: ASTM D2000 3BA720  
 A<sub>14</sub> B<sub>13</sub> C<sub>12</sub> EA<sub>14</sub> F<sub>17</sub>

TEXAS DEPARTMENT TRANSPORTATION

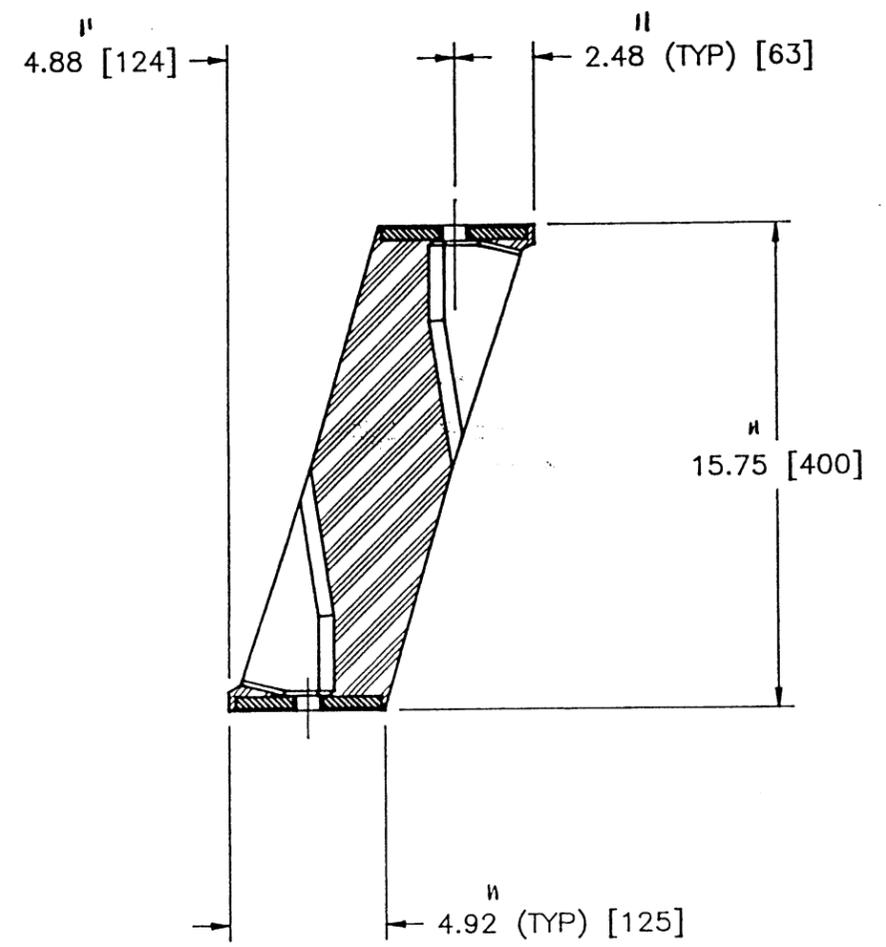
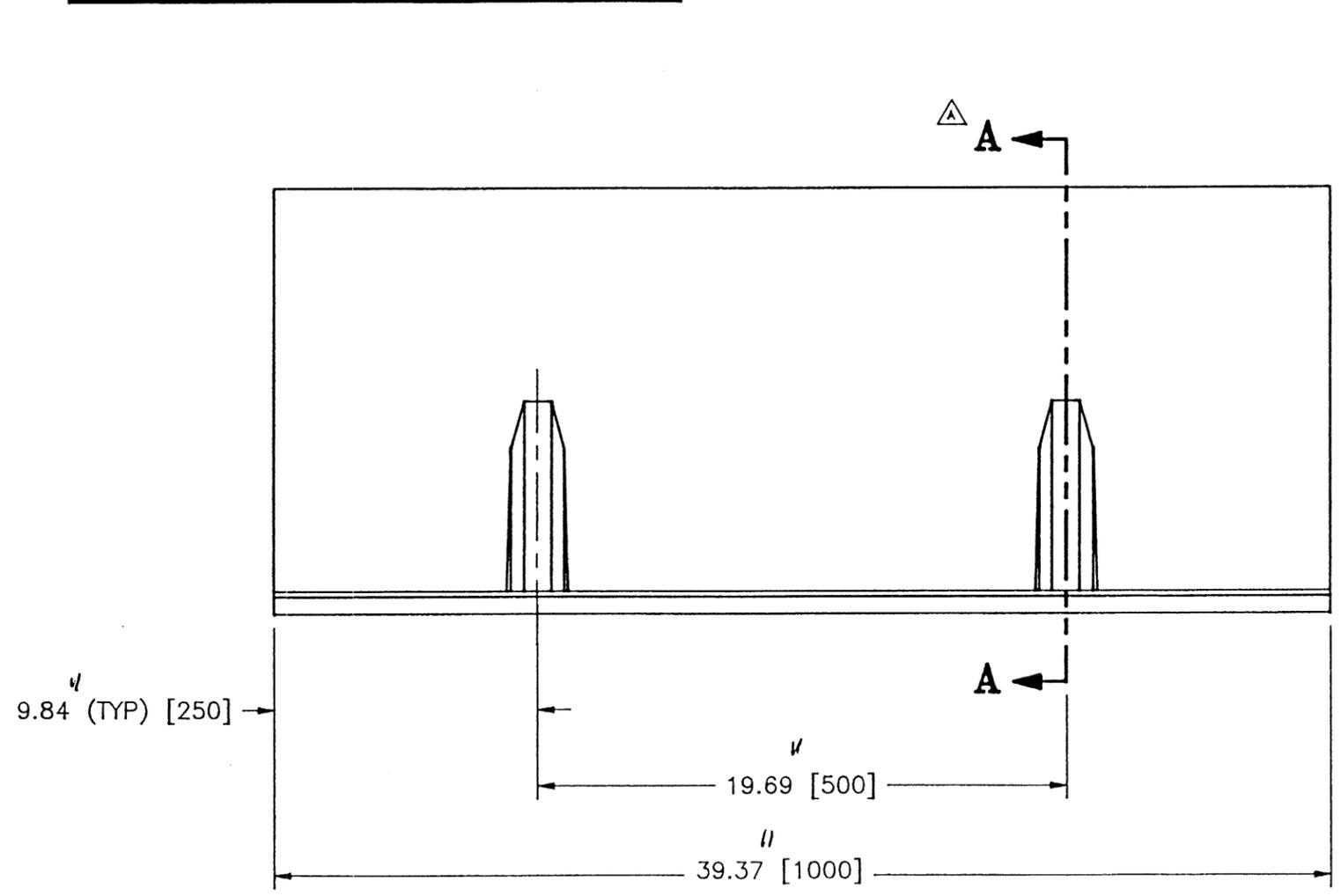
- Approved without modification
- Approved with modification as shown

Date 1-26-95 By John Vega P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.



NOTE:  
DIMENSIONS IN BRACKETS [ ] ARE IN MM.



**A-A**

NOTES:

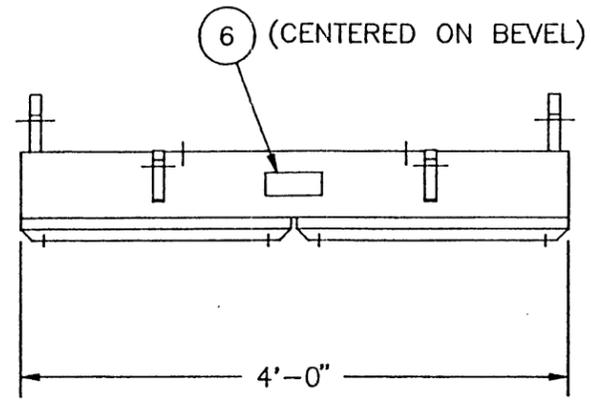

A	070594	REVISED CHART, ADDED NOTE & "TYP" TO DIMS IN SECTION VIEW	TM		

**Trellex Morse**  
 KEOKUK, IOWA 52632

DRAWN BY:	J. McMurren
CHECKED BY:	R. Estrada
APPROVED BY:	
ASSEMBLY DRAWING NUMBER:	

REFERENCE:

FENDER ELEMENT, MV400 X 1000A (CATALOG DIMENSIONS)				
DATE	PART NO.	JOB	DRAWING NUMBER	REV.
071591	STD		T0410A-C	A

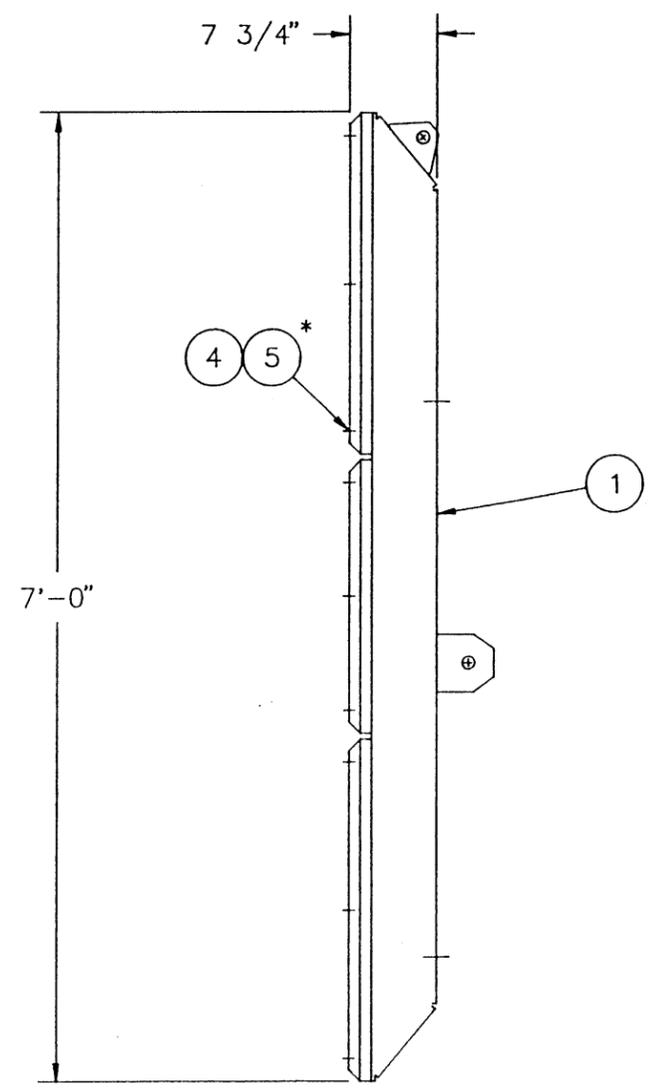
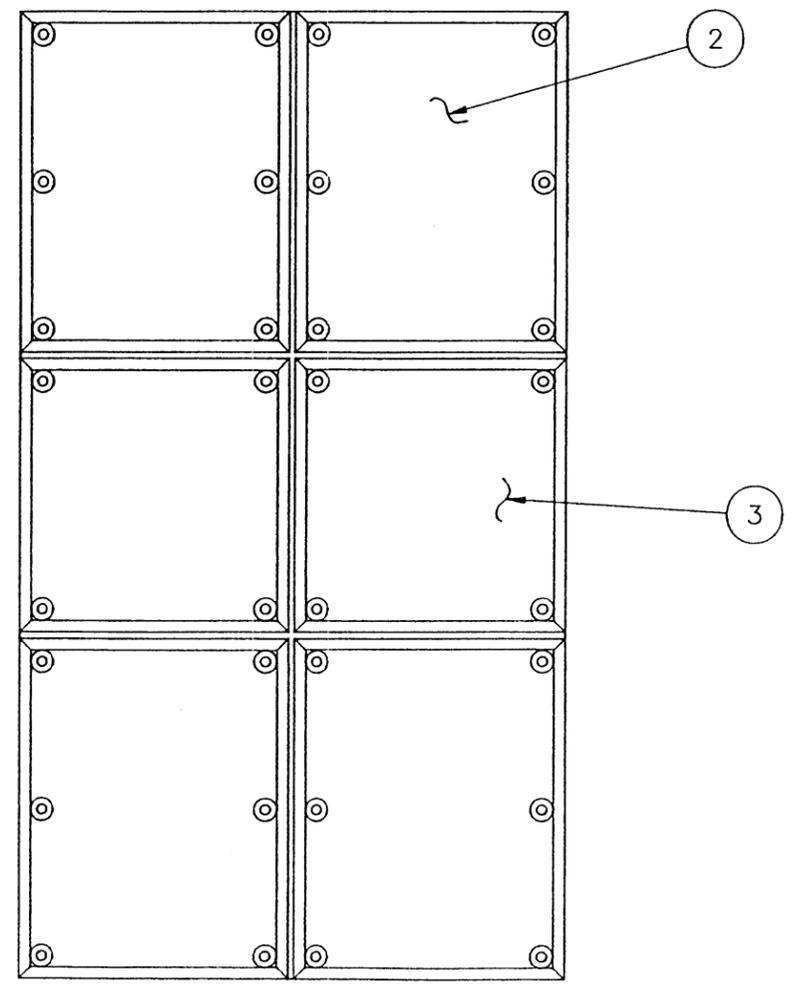


- NOTES:
- DO NOT OVER TIGHTEN NUTS. MAX TORQUE = 30 FT-LBS.
  - ALL DIMENSIONS ARE  $\pm 1/4$ " UNLESS OTHERWISE NOTED.

BILL OF MATERIAL

ITEM	COMPONENT	DESCRIPTION	QTY/ASS'Y
1	B18192	PANEL ASS'Y, 5 3/4" X 48"W X 84"H	1
2	HA9979	UHMW-PE PROTECTOR PANEL, (72), 2" X 23 3/4" X 29 5/8"	4
3	HA3441	UHMW-PE PROTECTOR PANEL, (71), 2" X 23 3/4" X 23 3/4"	2
4	HA6476	NUT, 5/8", UNC, UHMW SPECIAL, GALV.	32
5	HZ1138	THREADLOCKER 262, 1.69 OZS.	
6*	HA8554	TRELLEX FENDER NAME TAG	1

\* APPLY THREADLOCKER TO THREADS OF NUT



**TEXAS DEPARTMENT TRANSPORTATION**

Approved without modification  
 Approved with modification as shown

Date 1-26-95 By John Vogel P.E.

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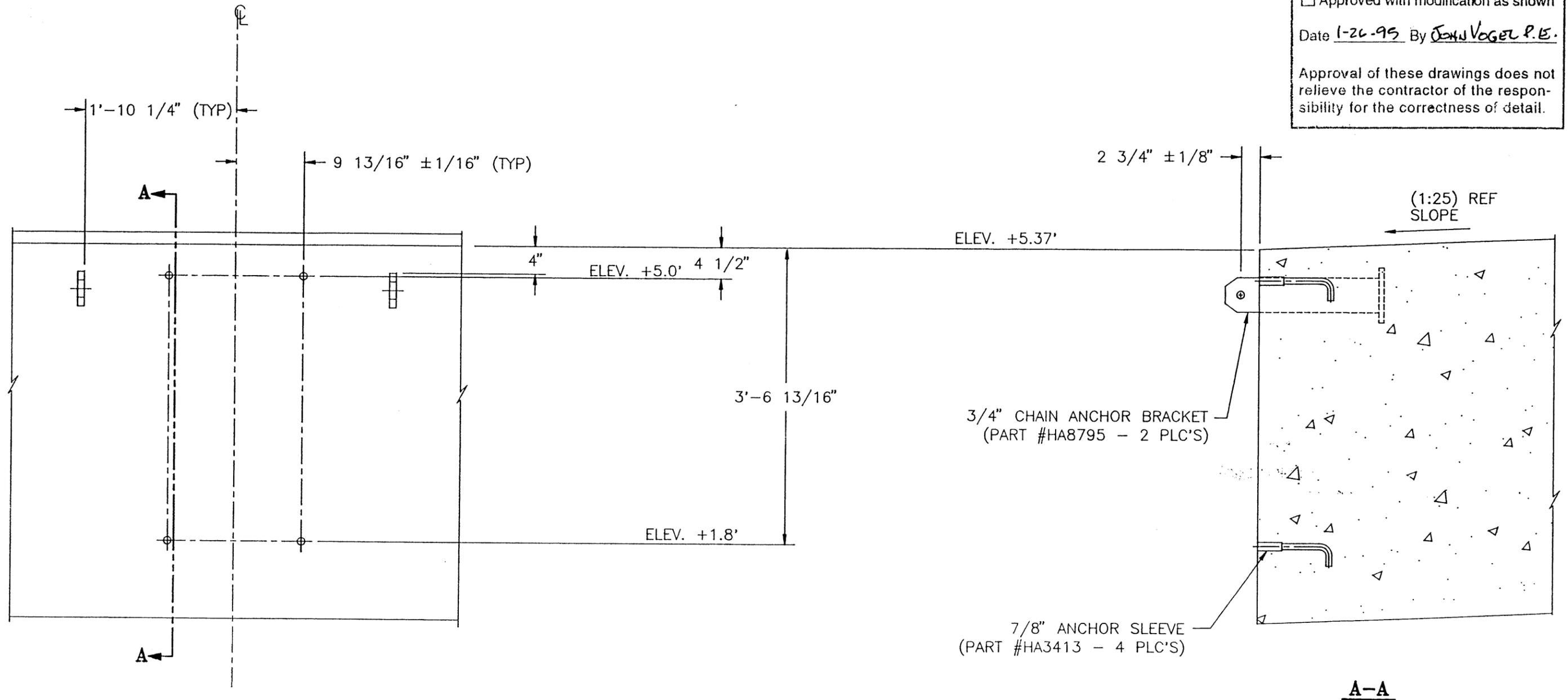
NOTES:				DRAWN BY: <u>J. McMurren</u> CHECKED BY: <u>R. Estrada</u> APPROVED BY:	REFERENCE:	FRONTAL PANEL			
	REV. DATE DESCRIPTION BY APPR	ASSEMBLY DRAWING NUMBER: <u>B18190</u>	DATE: <u>111694</u>	PART NO.: <u>2</u>		JOB: <u>2064</u>	DRAWING NUMBER: <u>P10222</u>	REV: <u>0</u>	

TEXAS DEPARTMENT TRANSPORTATION

- Approved without modification
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Date 1-26-95 By JOHN VOGEL P.E.

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NOTE:  
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UNLESS OTHERWISE NOTED.

NOTES

REV.	DATE	DESCRIPTION	BY	APPR.

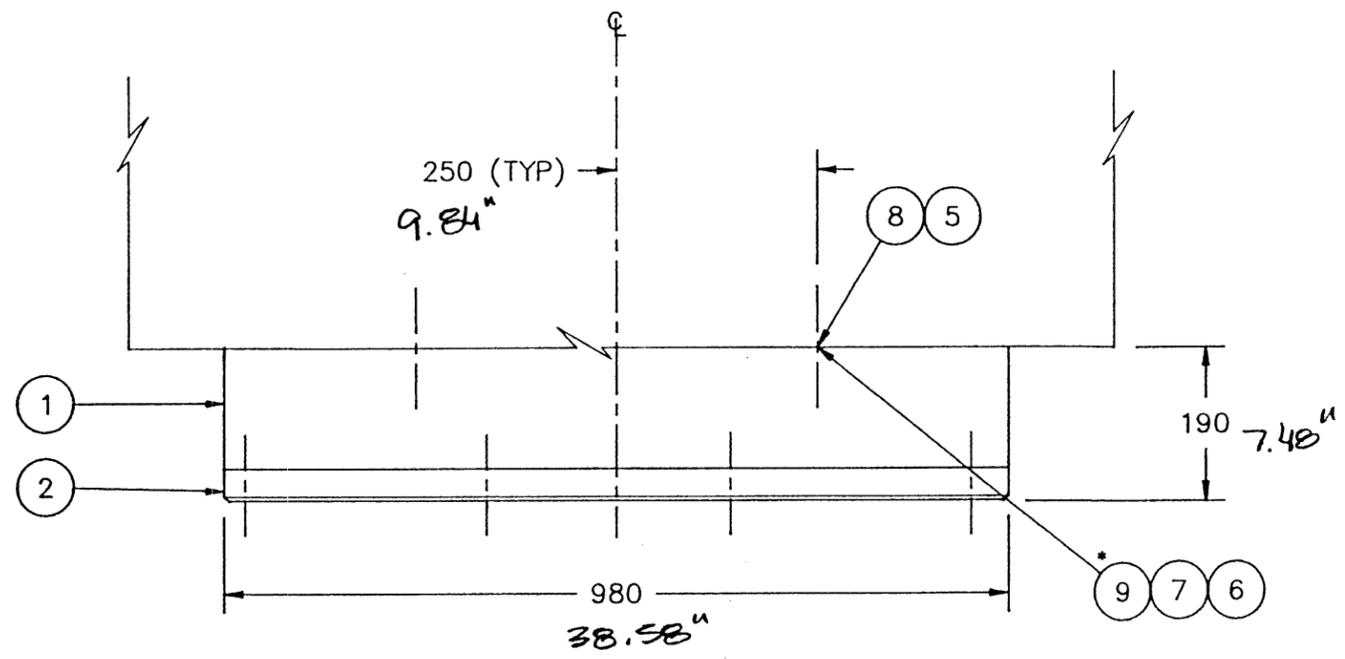
**Trellex Morse**  
KEOKUK, IOWA 52632

DRAWN BY: *J. McMurren*  
CHECKED BY: *R. Bohada*  
APPROVED BY:   
ASSEMBLY DRAWING NUMBER:

REFERENCE:

ANCHOR LOCATIONS FOR MV400 X 1000A  
GALVESTON FERRY LANDING  
GALVESTON, TX

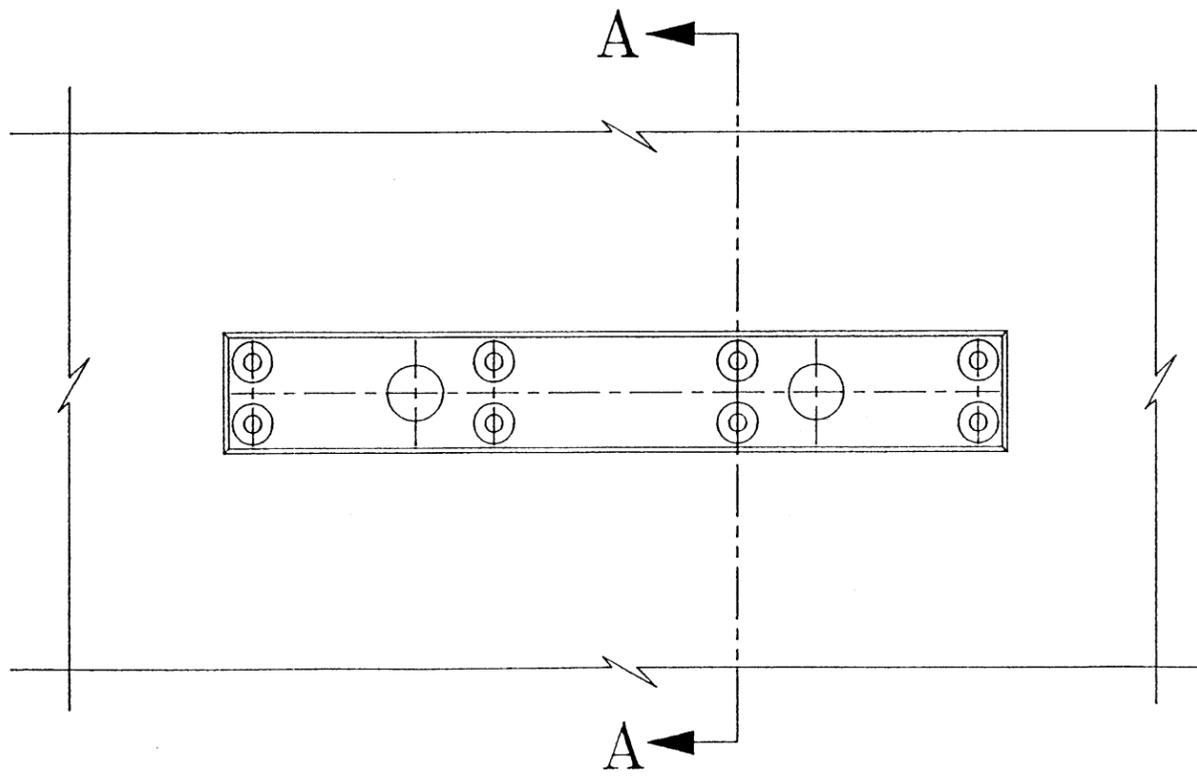
DATE: 111694	PART NO.: 2064	JOB: 2064	DRAWING NUMBER: B18191	REV: 0
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BILL OF MATERIAL

ITEM	COMPONENT	DESCRIPTION	QTY/ASS'Y
1	MF1598	FENDER BAR ELEMENT, MF150 X 980	1
2	HA32891B	UHMW-PE PROTECTOR PANEL, (72) 1 9/16" X 5 7/8" X 38 9/16"	1
3	HA3450	NUT, 5/8", UNC, HEX FLAT JAM, #304 S.S.	8
4	HA2693	WASHER, 5/8", USS, #304 S.S.	8
5	HA2695	THREADED ROD, 1" X 12 LG., UNC, #304 S.S.	2
6	HA7105	NUT, 1", UNC, HEAVY HEX, #304 S.S.	2
7	HA2494	WASHER, 1", USS, #304 S.S.	2
8	HA2694	CAPSULE, 1" GLASS RESIN, FOR 1" THREADED ROD	2
9*	HZ1138	THREADLOCKER 262, 1.69 OZS.	----

\* APPLY THREADLOCKER TO THREADS OF STUDS



APPROXIMATE WEIGHTS	
PLASTIC	6 Kg
FENDER ELEMENT	38 Kg
ASS'Y (TOTAL)	44 Kg

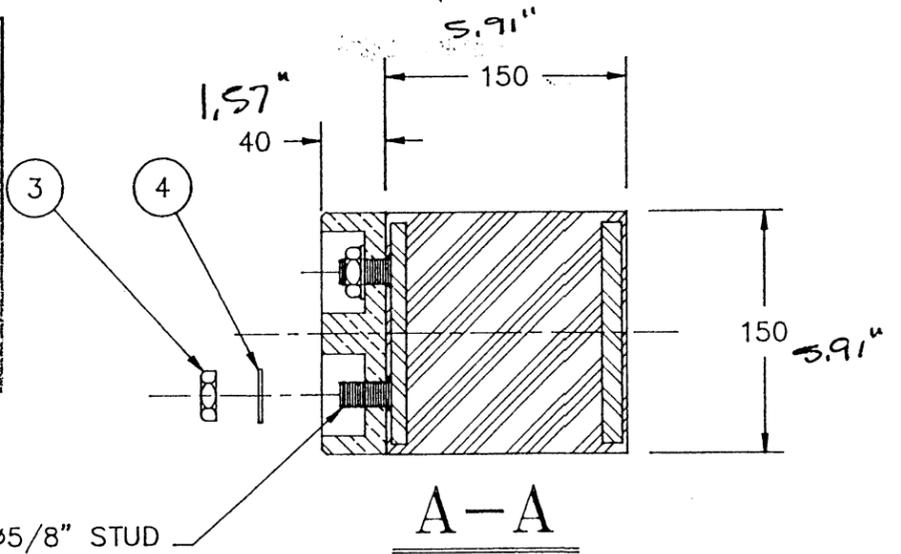
TEXAS DEPARTMENT TRANSPORTATION

Approved without modification

Approved with modification as shown

Date 1-26-95 By John V. Venter P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.



NOTE:  
ALL DIMENSIONS SHOWN ARE NOMINAL.  
REFER TO ACCOMPANYING DRAWINGS  
FOR TOLERANCES.

TYPICAL UHMW-PE  
FIXING DETAIL  
DOUBLE SCALE

REV.	DATE	DESCRIPTION	BY	APPR

**Trellex Morse**

KEOKUK, IOWA 52632

DRAWN BY: Rodney Yates

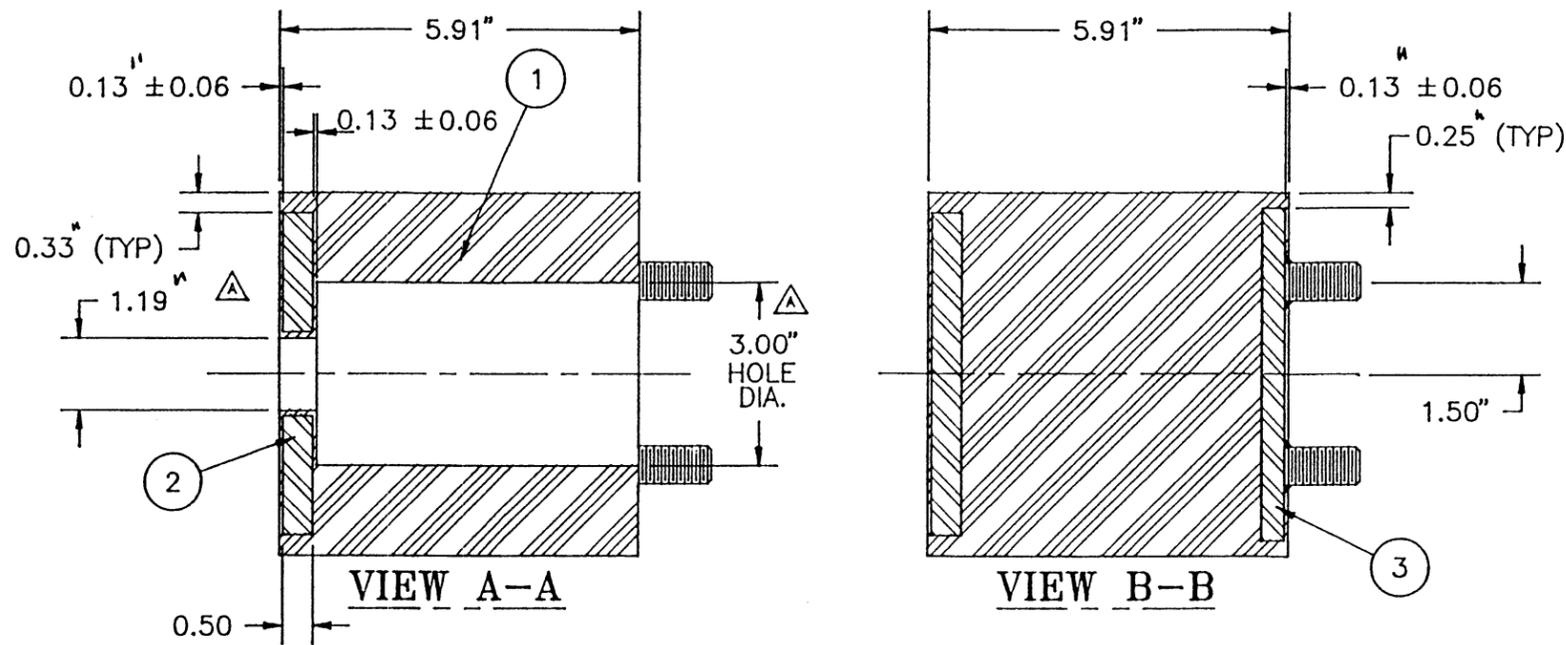
CHECKED BY: R. Estrada

APPROVED BY:

ASSEMBLY DRAWING NUMBER:

REFERENCE:

TRELLEX MFB 150/40 MODULAR FENDER BAR				
DATE	PART NO.	JOB	DRAWING NUMBER	REV.
111494	STD		B18189	0



BILL OF MATERIAL			
ITEM	COMPONENT	DESCRIPTION	QTY/ASS'Y
1	HC9598	RUBBER: BLACK SBR	1
2	HA3471	FENDER BAR INSERT, MF150, 1/2" X 5 1/4" X 37 1/2"	1
3	B17834	FENDER BAR INSERT, MF150, UHMW SIDE	4

TEXAS DEPARTMENT TRANSPORTATION

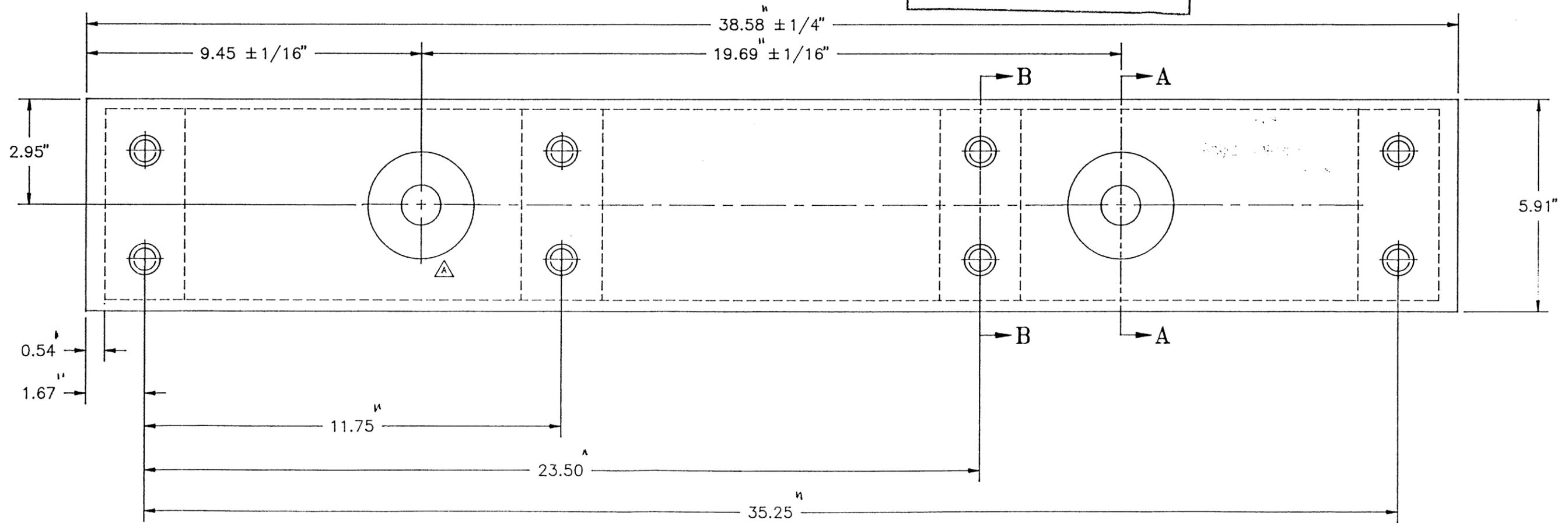
Approved without modification  
 Approved with modification as shown

Date 1-26-95 By John Vonn P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

NOTES:

- ALL DIMENSIONS ARE ±0.06 UNLESS OTHERWISE NOTED.
- STUD LOCATIONS ARE ±0.03



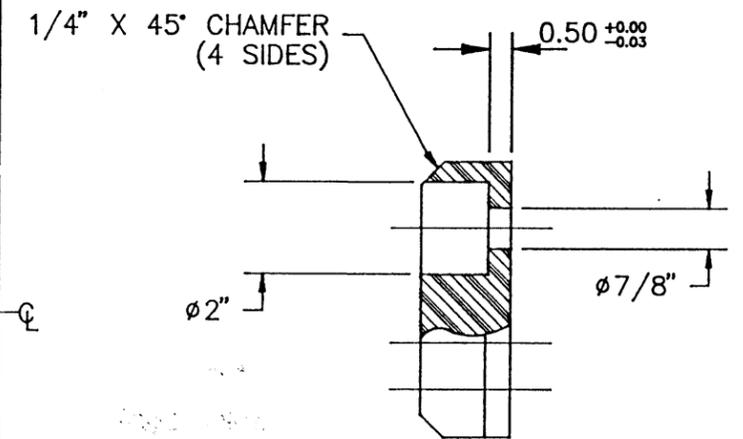
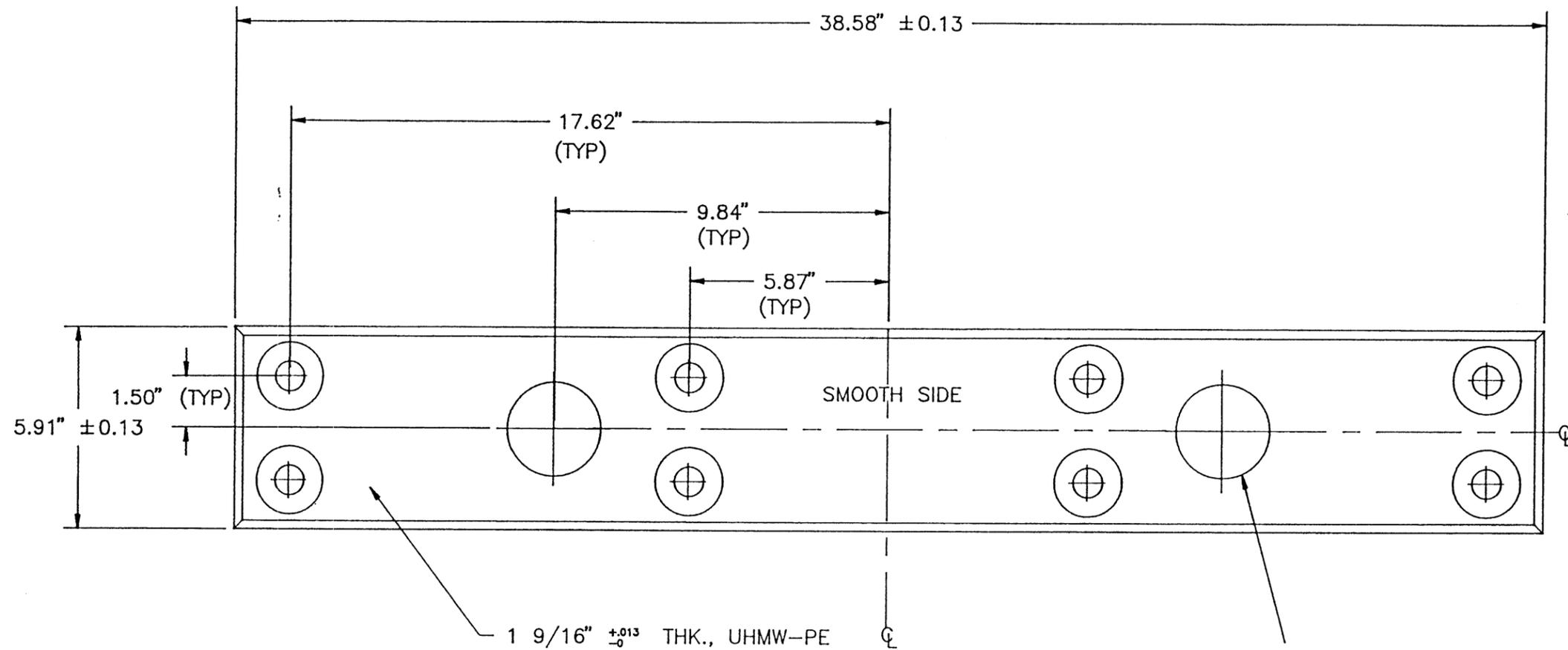
REV.	DATE	DESCRIPTION	BY	APPR
A	120194	CHANGED WIDTH OF INSERT & SLOTS INTO CIRCLES & INCREASED DIA'S	RY	RE

**Trellex Morse**

KEOKUK, IOWA 52632

DRAWN BY: Rodney Yates  
 CHECKED BY: R. Esthada  
 APPROVED BY:  
 ASSEMBLY DRAWING NUMBER:

REFERENCE:					FENDER BAR ELEMENT, MF150 X 980				
DATE:	PART NO.:	JOB:	DRAWING NUMBER:	REV:	DATE:	PART NO.:	JOB:	DRAWING NUMBER:	REV:
101194	STD		MF1598	A					



**TEXAS DEPARTMENT TRANSPORTATION**

Approved without modification  
 Approved with modification as shown

Date 1-26-95 By John Vogel P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

Ø 2 3/4" HOLE  
(2 PLC'S)

- NOTES:
1. ALL DIMENSIONS ARE ± 0.03 UNLESS OTHERWISE NOTED.
  2. DIMENSIONS ARE GIVEN BASED ON MATERIAL TEMPERATURE OF 65°F.

NOTES:

REV.	DATE	DESCRIPTION	BY	APPR

**Trellex Morse**

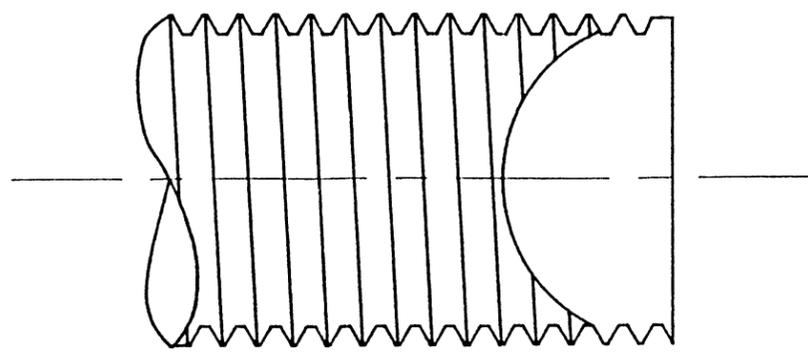
KEOKUK, IOWA 52632

DRAWN BY: Rodney Yates  
 CHECKED BY: MM  
 APPROVED BY: R. Estrada  
 ASSEMBLY DRAWING NUMBER:

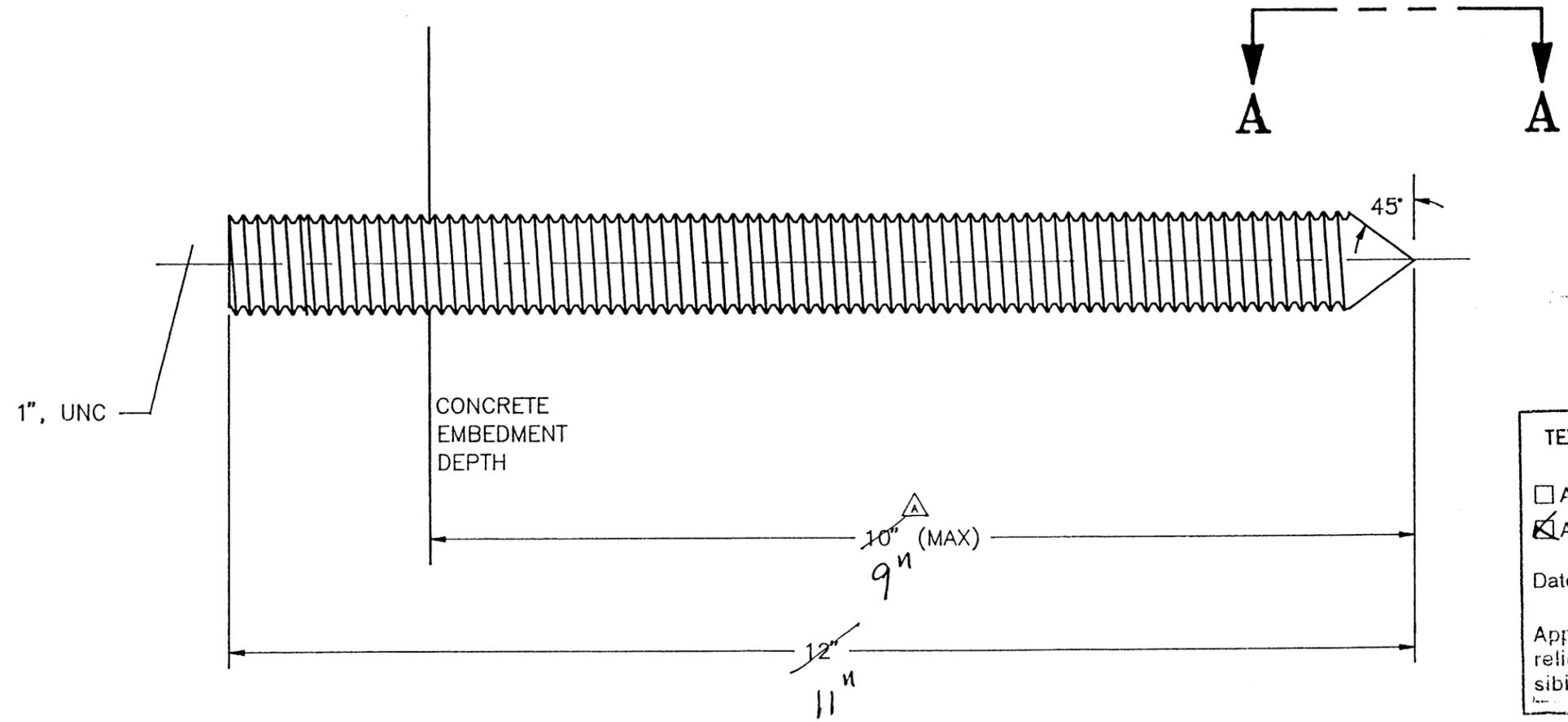
REFERENCE:

UHMW-PE PROTECTOR PANEL, (72)  
 1 9/16" X 5 7/8" X 38 9/16"

DATE: 101294	PART NO.:	JOB:	DRAWING NUMBER: HA3289	REV: 0
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A-A



TEXAS DEPARTMENT TRANSPORTATION

Approved without modification

Approved with modification as shown

Date 1-26-95 By Joan Vogel P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

NOTES:


REV	DATE	DESCRIPTION	BY	APPR
A	120194	ADDED (MAX) TO DIMENSION	RY	RE



DRAWN BY: Rodney Yates

CHECKED BY: J. Estrada

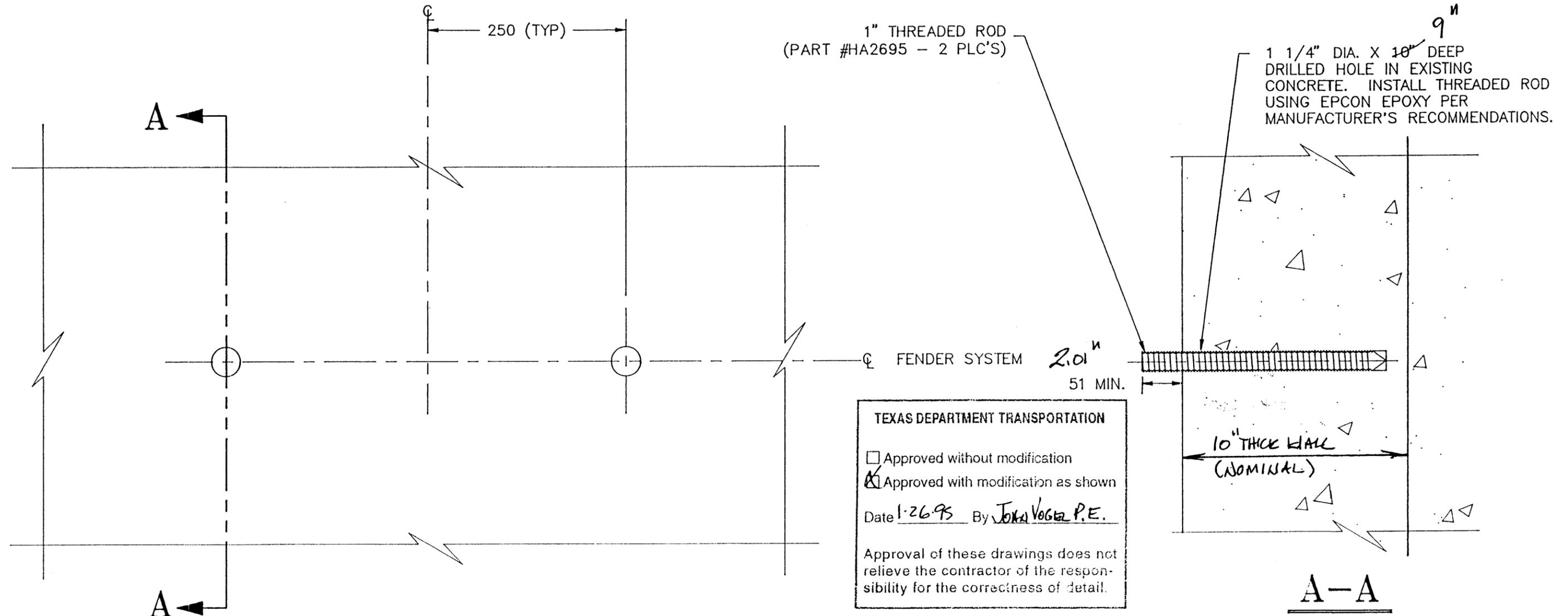
APPROVED BY:

ASSEMBLY DRAWING NUMBER:

REFERENCE:

THREADED ROD, 1" X 12" LG. UNC, #304 S.S.			
DATE: 101294	PART NO: STD	JOB:	REV: A
DRAWING NUMBER: HA2695			

HOLE SHALL NOT EXTEND MORE THAN 9" INTO WALL IF THE HOLE PUNCTURES THE WALL, A REPAIR PROCEDURE SHALL BE PROVIDED BY THE ENGINEER. Rearrange Wall Steel To Miss Hole.



TEXAS DEPARTMENT TRANSPORTATION

Approved without modification

Approved with modification as shown

Date 1-26-95 By JOHN VOGEL P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

- NOTES:
1. ALL DIMENSIONS ARE ±6 UNLESS OTHERWISE NOTED.
  2. DIMENSIONS ARE IN MM.

REV	DATE	DESCRIPTION	BY	APPR

**Trellex Morse**

KEOKUK, IOWA 52632

DRAWN BY: Rodney Yates

CHECKED BY: S. Estada

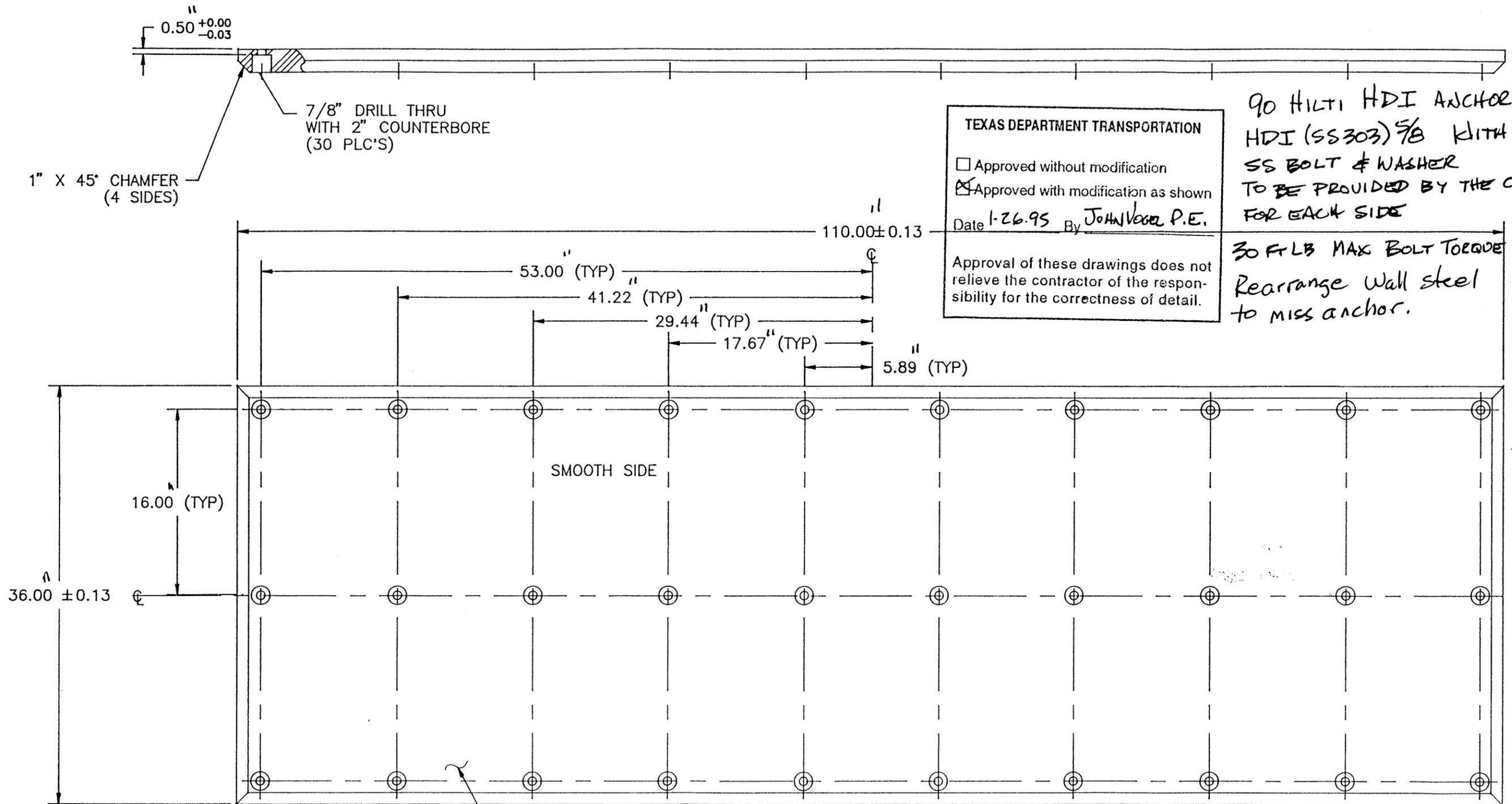
APPROVED BY:

ASSEMBLY DRAWING NUMBER:

REFERENCE:

ANCHOR LOCATIONS FOR MFB 150/40				
DATE	PART NO.	JOB	DRAWING NUMBER	REV
101394	STD		B18213	0





1" X 45° CHAMFER  
(4 SIDES)

7/8" DRILL THRU  
WITH 2" COUNTERBORE  
(30 PLC'S)

TEXAS DEPARTMENT TRANSPORTATION

Approved without modification  
 Approved with modification as shown

Date 1-26-95 By JOHN VOGEL P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

90 HILTI HDI ANCHORS  
HDI (SS303) 5/8" WITH  
SS BOLT & WASHER  
TO BE PROVIDED BY THE CONTRACTOR  
FOR EACH SIDE

30 FT LB MAX BOLT TORQUE  
Rearrange wall steel  
to miss anchor.

- NOTES:
1. ALL DIMENSIONS ARE  $\pm 0.03$  UNLESS OTHERWISE NOTED.
  2. DIMENSIONS ARE GIVEN BASED ON MATERIAL TEMPERATURE OF 65°F.

2.00  $\pm 0.13$  THK. UHMW-PE

NOTES:


REV.	DATE	DESCRIPTION	BY	APPR.

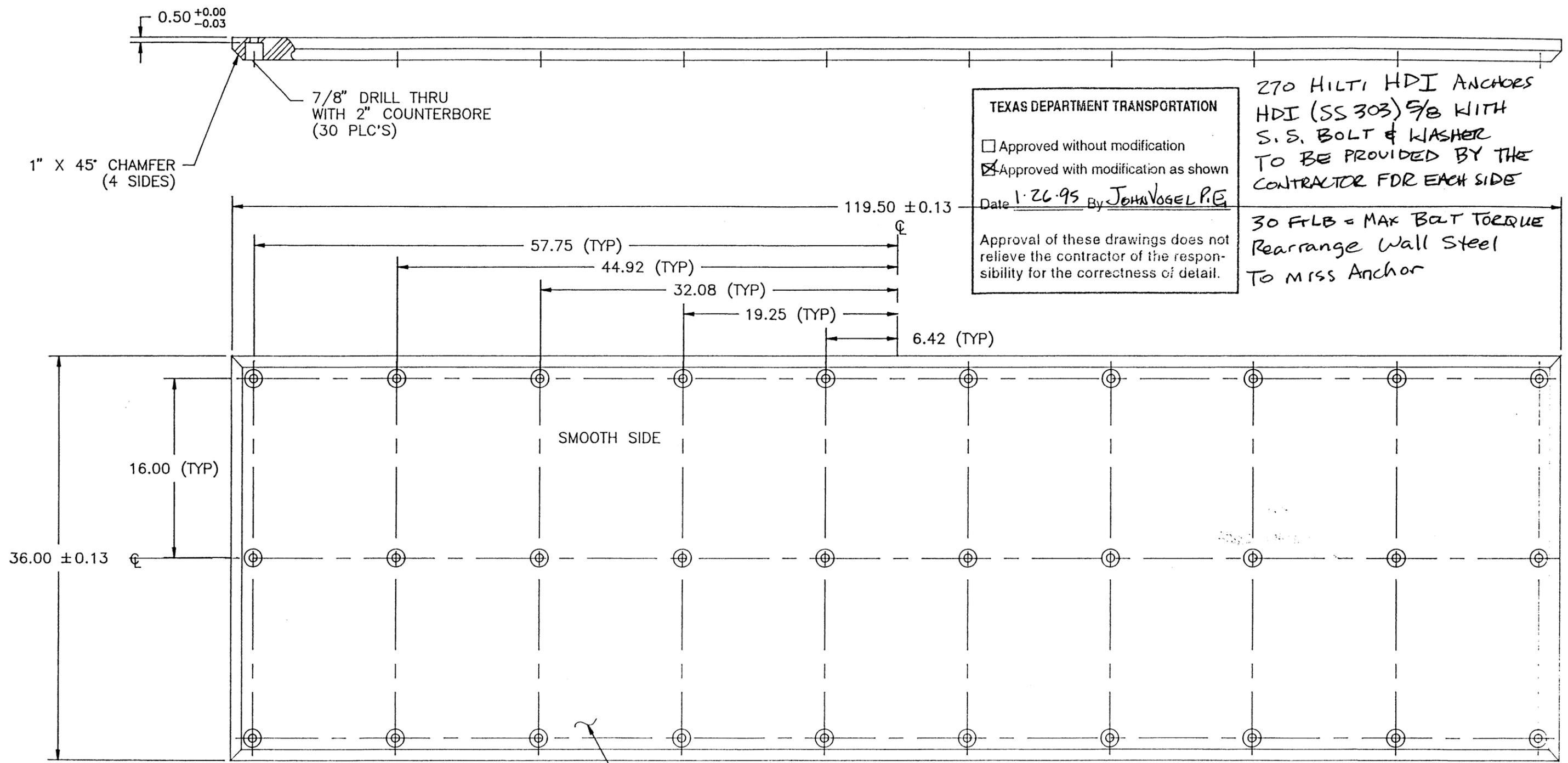
**Trellex Morse**

KEOKUK, IOWA 52632

DRAWN BY: Rodney Yates  
 CHECKED BY: R. Estrada  
 APPROVED BY:  
 ASSEMBLY DRAWING NUMBER:

REFERENCE:

UHMW-PE PROTECTOR PANEL, (72)			
2" X 36" X 110"			
DATE: 1/5/94	PART NO.:	JOB:	DRAWING NUMBER: HA3440
REV: 0			



TEXAS DEPARTMENT TRANSPORTATION

Approved without modification  
 Approved with modification as shown

Date 1-26-95 By JOHN VOGEL P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

270 HILTI HDI ANCHORS  
 HDI (SS 303) 5/8 WITH  
 S.S. BOLT & WASHER  
 TO BE PROVIDED BY THE  
 CONTRACTOR FOR EACH SIDE

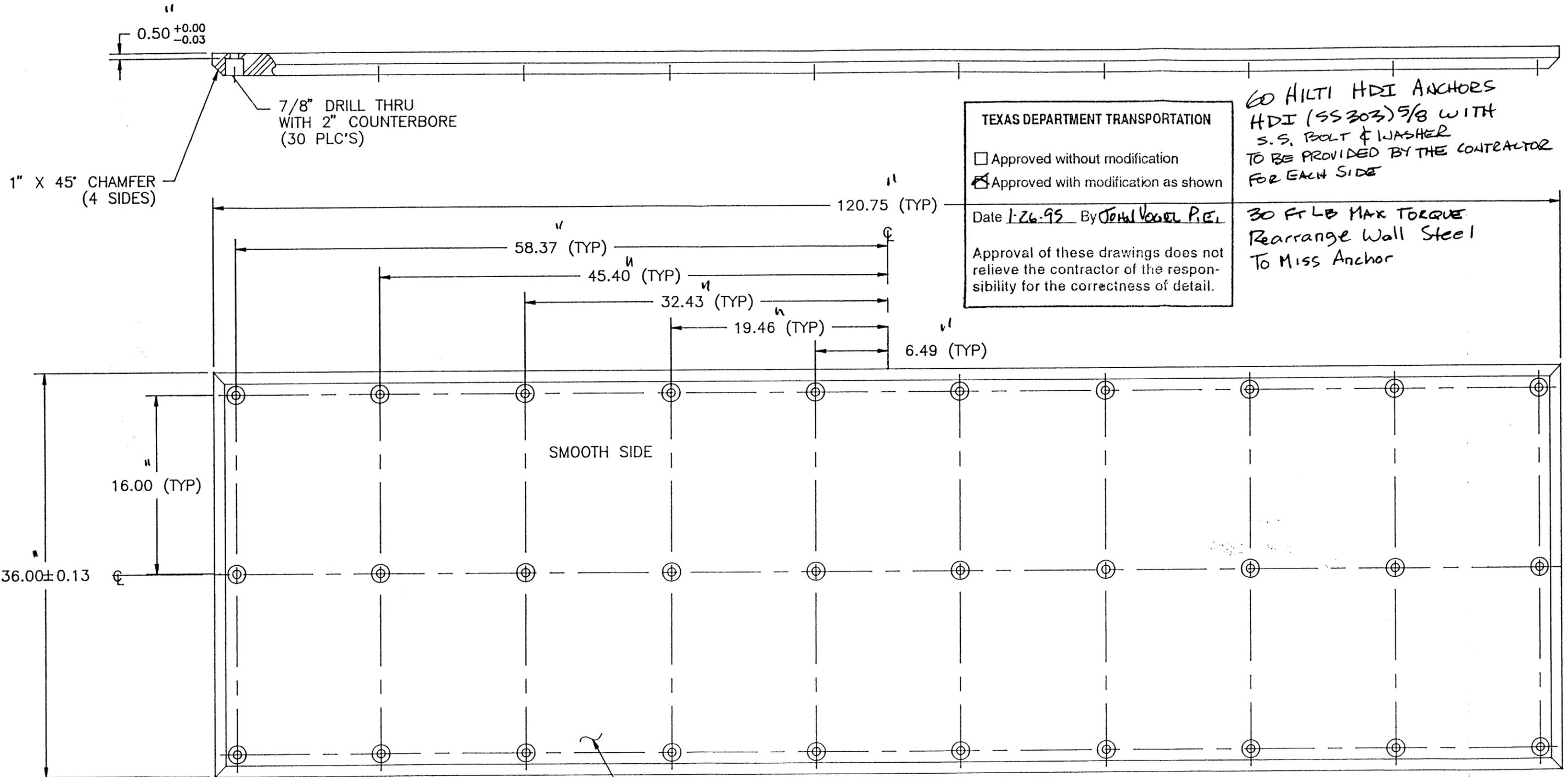
30 FTLB = MAX BOLT TORQUE  
 Rearrange Wall Steel  
 To Miss Anchor

- NOTES:
1. ALL DIMENSIONS ARE  $\pm 0.03$  UNLESS OTHERWISE NOTED.
  2. DIMENSIONS ARE GIVEN BASED ON MATERIAL TEMPERATURE OF 65°F.

2.00  $\pm 0.13$  THK. UHMW-PE

NOTES:			DRAWN BY: <u>Rodney Yates</u> CHECKED BY: <u>R. Estrada</u> APPROVED BY: ASSEMBLY DRAWING NUMBER:	REFERENCE:	UHMW-PE PROTECTOR PANEL, (72) 2' X 36" X 119 1/2"		
REV. DATE	DESCRIPTION	BY APPR	DATE	PART NO.	JOB	DRAWING NUMBER	REV
			11/594			HA3438	0

KEOKUK, IOWA 52632



TEXAS DEPARTMENT TRANSPORTATION

Approved without modification  
 Approved with modification as shown

Date 1-26-95 By John Vogel P.E.

Approval of these drawings does not relieve the contractor of the responsibility for the correctness of detail.

60 HILTI HDI ANCHORS  
 HDI (SS303) 5/8 WITH  
 S.S. BOLT & WASHER  
 TO BE PROVIDED BY THE CONTRACTOR  
 FOR EACH SIDE

30 FT LB MAX TORQUE  
 Rearrange Wall Steel  
 To Miss Anchor

- NOTES:
1. ALL DIMENSIONS ARE  $\pm 0.03$  UNLESS OTHERWISE NOTED.
  2. DIMENSIONS ARE GIVEN BASED ON MATERIAL TEMPERATURE OF 65°F.

2.00  $\pm 0.13$  THK. UHMW-PE

NOTES:						DRAWN BY: <u>Rodney Yates</u> CHECKED BY: <u>R. Estrada</u> APPROVED BY: ASSEMBLY DRAWING NUMBER:		REFERENCE:		UHMW-PE PROTECTOR PANEL, (72) 2" X 36" X 120 3/4"	
REV	DATE	DESCRIPTION	BY			APPR	DATE	PART NO.	JOB	DRAWING NUMBER	REV
					1/15/94			HA3439	0		

TxDOT Galveston – Bolivar Ferry Bulkhead Redesign  
 Galveston-Bolivar Ferry, Houston District  
 Galveston, Galveston County, Texas

SUBSTITUTION REQUEST

PROJECT: TxDOT GALVESTON - BOLIVAR  
FERRY BULKHEAD REDESIGN

APW PROJECT NO.: C912-73-205

TO: Alfredo Cobos  
 TxDOT, MNT Division  
 150 E. Riverside Dr.  
 Austin, TX 78704

FROM (CONTRACTOR/BIDDER):  
 \_\_\_\_\_  
 \_\_\_\_\_

CONTRACTOR (BIDDER) HEREBY REQUESTS ACCEPTANCE OF THE FOLLOWING PRODUCT OR SYSTEMS AS A SUBSTITUTION IN ACCORD WITH PROVISIONS OF DIVISION ONE OF THE SPECIFICATIONS:

1. SPECIFIED PRODUCT OR SYSTEM:

Substitution request for (Generic Description): P2 35 STEEL SHEET PILE

Specification Section No.: 31 62 (6.06-1) Article(s) PART 2.2 Paragraph (s) C

2. SUPPORTING DATA:

Product data for proposed substitution is attached (description of product, reference standards, performance and test data).

Sample is attached

Sample will be sent if requested

3. QUALITY COMPARISON:

	SPECIFIED PRODUCT	SUBSTITUTION
Name brand:	<u>P2 35 STEEL SHEET PILE</u>	<u>P2C 26 STEEL SHEET PILE</u>
Catalog No.	_____	_____
Manufacturer:	<u>NUCOR-YAMOTO</u>	<u>GERDAU</u>
Vendor:	<u>SKYLINE STEEL</u>	<u>L.B. FOSTER</u>
Significant Variations:	_____	<u>WIDER (INCREASE WIDTH)</u>
	_____	<u>TALLER (INCREASED HEIGHT)</u>

Maintenance Service Available:  Yes  No

Spare Part Source: L.B. FOSTER COMPANY INVENTORY (GR. 50)

TxDOT Galveston – Bolivar Ferry Bulkhead Redesign  
Galveston-Bolivar Ferry, Houston District  
Galveston, Galveston County, Texas

4. PREVIOUS INSTALLATIONS:

Identification of similar projects on which proposed substitution was used:

Project: -10" STREET RECONSTRUCTION  
-12 STREET RECONSTRUCTION Engineer: RAJAPPAN + MEYER  
CONSULTING ENGINEERS, INC.

Address: CITY OF State: CALIFORNIA  
OAKLAND, CA. Date Installed: 10/2011 - 12/2011

5. REASON FOR NOT GIVING PRIORITY TO SPECIFIED ITEMS:

ALLOWING ADDITIONAL SHEET PILE SECTIONS, THAT WILL MEET OR  
EXCEED THE SPECIFIED PRODUCTS' REQUIREMENT WILL ELIMINATE SINGLE SOURCING.

6. EFFECT OF SUBSTITUTION:

Proposed substitution affects other parts of Work:  No  Yes (If yes, explain)

Substitution changes Contract Time:  No  Yes  
Add/Deduct \_\_\_\_\_ days.

Substitution requires dimensional revision or redesign of structure or M & E Work:

No  Yes (If yes, attach complete data)

Saving or credit to State, if any, for accepting substitution: \$ \_\_\_\_\_.

Extra cost to State, if any, for accepting substitution: \$ \_\_\_\_\_.

7. CONTRACTOR'S (BIDDER'S) STATEMENT OF CONFORMANCE OF PROPOSED SUBSTITUTION TO CONTRACT REQUIREMENT:

I/we have investigated the proposed substitution. I/we:

- believe that it is equal or superior in all respects to specified product, except as stated above.
- will provide the same warranty as specified for specified product.
- have included complete cost data and implications of the substitution.
- will pay redesign and special inspection costs caused by the use of this product.
- will pay additional costs to other contractors caused by the substitution.
- will coordinate the incorporation of the proposed substitution in the Work.
- will modify other parts of the work as may be needed, to make all parts of the work complete and functioning.
- waive future claims for added cost to Contract caused by the substitution.

Contractor (Bidder): \_\_\_\_\_ Date: \_\_\_\_\_

By: \_\_\_\_\_

Answer all questions and complete all blanks - use "N/A" if not applicable.

ENGINEER REVIEW AND ACTION

Resubmit substitution request:

Provide more information in following categories.

**LAN WILL CONSIDER REQUESTS FOR SUBSTITUTION SHEET PILE  
THAT MEET STRENGTH AND GEOMETRY REQUIREMENTS.**

\_\_\_\_ Sign Contractor's (Bidder's) Statement of Conformance.

\_\_\_\_ Substitution accepted.

\_\_\_\_ Substitution is accepted with the following comments.

\_\_\_\_ Substitution not accepted.

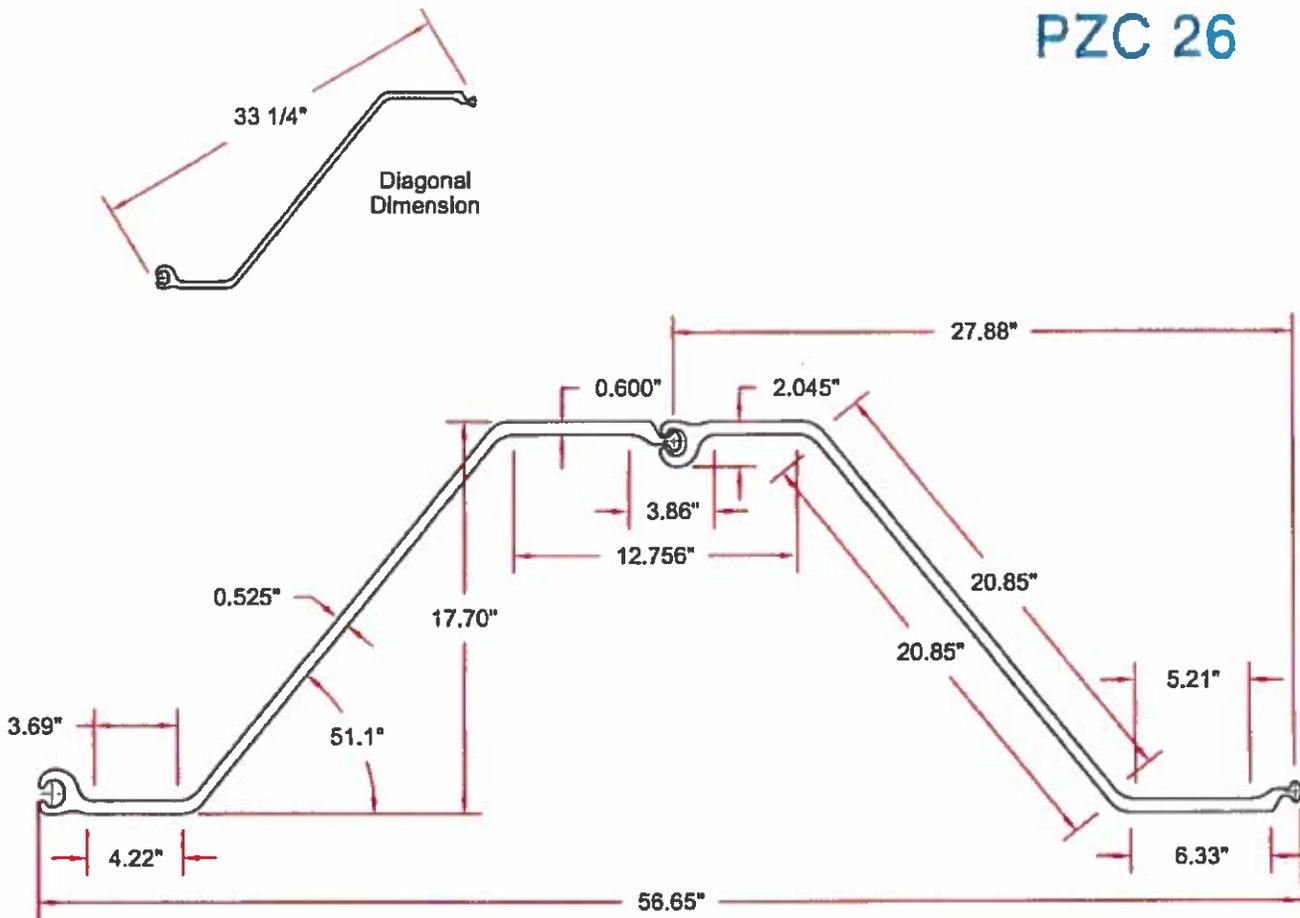
\_\_\_\_ Substitution Request received too late.

  
\_\_\_\_\_  
Alfredo Cabos  
TxDOT

**11-23-16**  
\_\_\_\_\_  
Date

END OF SECTION

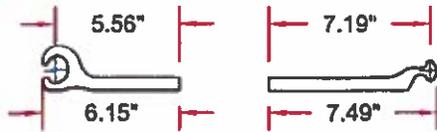
# PZC 26



Sheet Pile Section Properties										
Nominal Width (in)	Area (in <sup>2</sup> )		Weight (lbs)		Moment of Inertia (in <sup>4</sup> )		Section Modulus (in <sup>3</sup> )		Surface Area (ft <sup>2</sup> /ft)	
	Single Section	Per Linear Foot of Wall	Per Foot of Sheet	Per Square Foot	Single Section	Per Linear Foot of Wall	Single Section	Per Linear Foot of Wall	Total Area	Nominal Coating Area *
27.88	21.72	9.35	73.9	31.8	994.3	428.1	112.4	48.4	6.65	6.15

\* Excludes socket interior & ball of interlock.

Available Material Grades: ASTM A572 Grade 50 and 60, Also A588 and A690.



Flange Dimensions

## LB Foster

PILING DIVISION  
L.B. FOSTER COMPANY  
SUWANEE, GA 30024

TITLE SHEET PILING DIMENSIONS & PROPERTIES

PROJECT PZC26 STEEL SHEET PILE

CUSTOMER N/A

FILE #VLE/Shop/Shop Setup/Sheet/Sheet Rev

PROJ # 11-052

SO# N/A

DRAWN TWI

DATE 07/29/11

CHK'D

SCALE 1-1/2"=1'0"

SP-DC26

0

RD	DATE	DESCRIPTION
	08/01/11	Issued for Review and Comment.

Issued for Review and Comment.

DESCRIPTION

DWG #

SHT 1 of 1

REVISION