



# PORT OF TACOMA

## HYUNDAI MERCHANT MARINE TERMINAL

### CONTRACT NO. 978038

#### PORT COMMISSION:

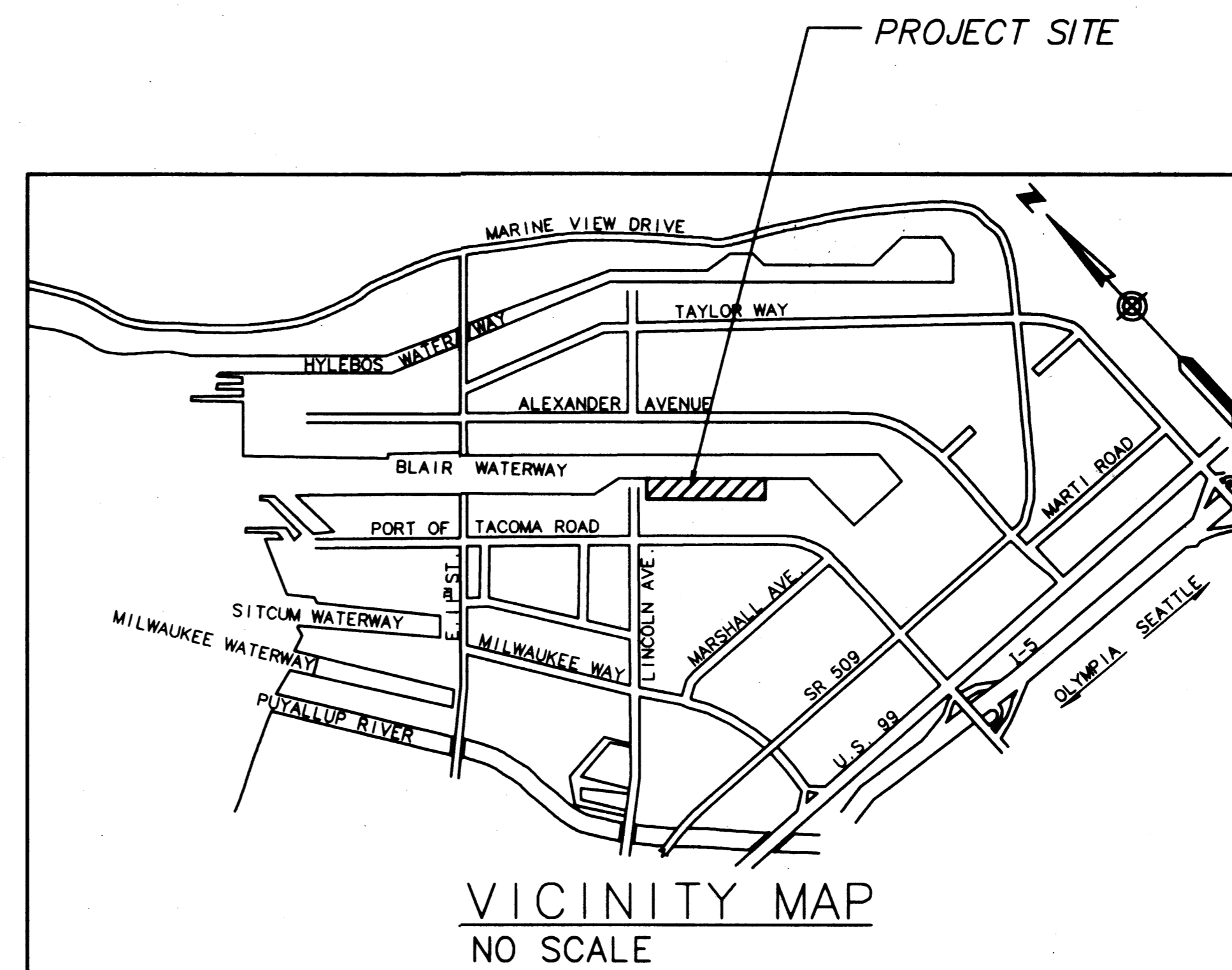
R. TED BOTTIGER  
 JACK A. FABULICH  
 RICHARD P. MARZANO  
 CLARE PETRICH  
 JERRY M. THORPE

#### PORT STAFF:

ANDREA RINIKER  
 EXECUTIVE DIRECTOR  
 CURTIS L. RATCLIFFE, P.E.  
 CHIEF ENGINEER

#### CONSULTANT:

BERGER/ABAM ENGINEERS  
 33301 9th AVENUE SOUTH  
 FEDERAL WAY, WA 98003



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*Curtis L. Ratcliffe, P.E.*

APPROVED  
*Curtis L. Ratcliffe, P.E.*  
 DATE 1/11/99  
 CURTIS L. RATCLIFFE, P.E.  
 CHIEF ENGINEER

MMD 9/97  
 DRAWN BY DATE  
 DESIGNED BY DATE

BCM 9/97  
 CHECKED BY DATE  
 JAS 9/97  
 PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE
AS-BUILT		RDD	JAS	1/4/99

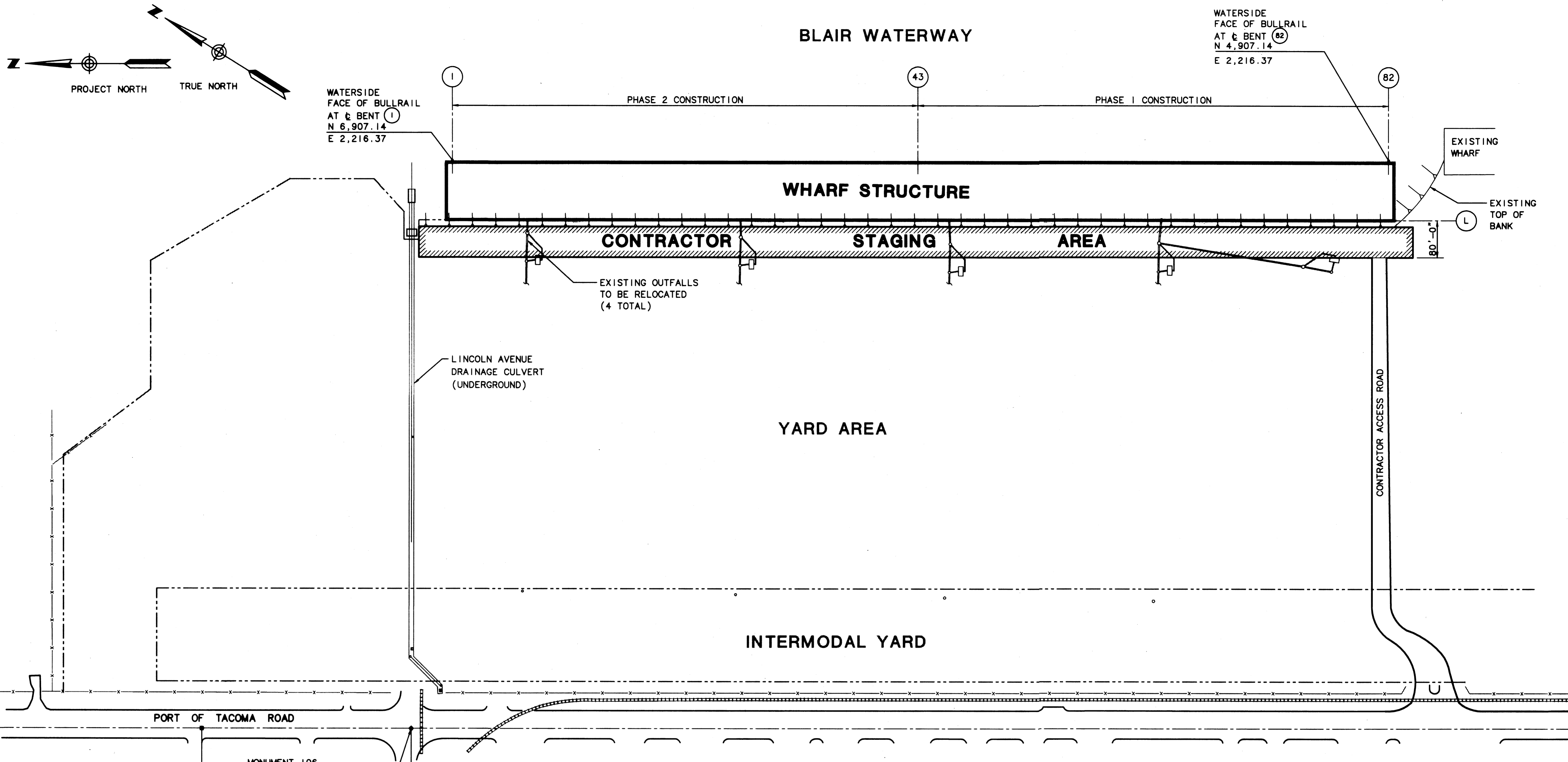
HYUNDAI MERCHANT MARINE TERMINAL  
 WHARF  
 PORT OF TACOMA  
 COVER SHEET

<b>AS-BUILT</b>	
AUTOCAD FILE NO. 501201	G-1
DRAWING NO. EP-5012-26	
CONTRACT NO. 978038	
SHEET NO. 1 OF 58	

**PORT OF TACOMA**  
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1 SITE PLAN  
G-3 SCALE: 1"=100'

NOTES:

1. PROJECT DATUM

- A. PROJECT BASELINE (NORTH-SOUTH LINE) ESTABLISHED AS BETWEEN MONUMENTS 106 & 109 ON PORT OF TACOMA ROAD.
- B. MONUMENT 109 PROJECT COORDINATES: N 3696.82, E 1000.00 (NOT SHOWN)
- C. VERTICAL DATUM: MONUMENT 106 EL. +17.16

2. REQUIRED SEQUENCE OF CONSTRUCTION

- A. PHASE 1 CONSTRUCTION WILL START AT THE SOUTH END (BENT 82) AND PROCEED TO THE NORTH. PILE DRIVING FOR PHASE 1 CONSTRUCTION TO BE COMPLETE BY 15 MARCH 1998 AND ALL PHASE 1 CONSTRUCTION, INCLUDING PAVING AND UTILITIES, TO BE COMPLETED FOR PORT'S OCCUPANCY BY 15 OCTOBER 1998.
- B. PHASE 2 CONSTRUCTION, AT CONTRACTOR'S OPTION, MAY START AT ANY TIME SUBJECT TO AVAILABILITY OF PORT FURNISHED 24" CONCRETE PILES. SEE SPECIFICATIONS FOR PILE DELIVERY SCHEDULE. PHASE 2 CONSTRUCTION AND THE ENTIRE PROJECT TO BE COMPLETED BY 30 NOVEMBER 1998.

3. USE OF STAGING AREA

- A. STAGING AREA AS SHOWN SHALL BE PROGRESSIVELY VACATED FROM SOUTH TO NORTH FOLLOWING COMPLETION OF WHARF CONSTRUCTION.
- B. THERE WILL BE ONGOING WORK BY OTHERS IN THE YARD AREA, INCLUDING THE DESIGNATED STAGING AREA FOR THIS CONTRACTOR. PORT WILL COORDINATE THE ALLOCATION/VACATION OF WORK AREAS FOR THE VARIOUS CONTRACTORS WORKING ON THE SITE & MAY REQUIRE THIS CONTRACTOR TO TEMPORARILY VACATE PORTIONS OF THE STAGING AREA TO ALLOW WORK BY OTHERS IN SUCH AREAS. CONTRACTOR SHALL BE AWARE OF SUCH WORK BY OTHERS AND FULLY COOPERATE WITH THE PORT TO FACILITATE WORK BY OTHERS.

AS-BUILT

AUTOCAD FILE NO. 5012G3	G-3
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APPROVED  
*Curtis L. Ratcliffe* 1/11/99  
DATE  
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CHIEF ENGINEER

MMD 9/91  
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BCM 9/91  
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JAS 9/91  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE

**HYUNDAI MERCHANT MARINE TERMINAL WHARF PORT OF TACOMA SITE PLAN**

DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **3** OF **58**

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**STRUCTURAL NOTES**

**CODES AND STANDARDS**

**1. STRUCTURAL**

- A. ALL METHODS AND MATERIALS SHALL CONFORM TO THE UNIFORM BUILDING CODE, 1994 EDITION, AS AMENDED AND ADOPTED BY THE CITY OF TACOMA.
- B. SEISMIC DESIGN OF THE WHARF STRUCTURE SHALL CONFORM TO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" AS ADOPTED BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS, INC. (AASHTO), 16TH EDITION, 1996.
- C. REINFORCED CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS" (ACI 301) AND "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318), LATEST EDITIONS.
- D. STRUCTURAL AND MISCELLANEOUS STEEL FABRICATION AND ERECTION THEREOF SHALL CONFORM TO THE "AISC MANUAL OF STEEL CONSTRUCTION," LATEST EDITION.
- E. WELDING OF STRUCTURAL AND MISCELLANEOUS STEEL SHALL CONFORM TO THE LATEST EDITION OF "STRUCTURAL WELDING CODE - STEEL" (AWS D1.1).

**2. CIVIL**

- A. ALL METHODS AND MATERIALS SHALL CONFORM TO THE WASHINGTON STATE 1996 STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION AS PREPARED BY THE WASHINGTON STATE DEPARTMENT OF TRANSPORTATION (WSDOT) AND THE AMERICAN PUBLIC WORKS ASSOCIATION (APWA) WASHINGTON STATE CHAPTER.
- B. ALL PIPING ETC. SHALL CONFORM TO AMERICAN WATER WORKS ASSOCIATION (AWWA) GUIDELINES.
- C. ALL TRACKWORK SHALL CONFORM TO THE AMERICAN RAILROAD ENGINEERING ASSOCIATION (AREA), MANUAL FOR RAILWAY ENGINEERING, 1996 EDITION.

**GENERAL**

- 1. THESE NOTES CONTAIN GENERAL INFORMATION AND ARE NOT COMPLETE FOR CONSTRUCTION PURPOSES. CONTRACTOR SHALL VERIFY INFORMATION GIVEN HERE WITH SPECIFICATIONS AND OTHER DOCUMENTS AND BRING ANY CONFLICTS TO THE ATTENTION OF THE PORT BEFORE BEGINNING AFFECTED WORK. THE PORT'S ENGINEER WILL RESOLVE ANY SUCH CONFLICT.
- 2. ALL DIMENSIONS AND DETAILS WILL BE VERIFIED BY THE CONTRACTOR PRIOR TO FABRICATION AND CONSTRUCTION.
- 3. ALL SHOP DRAWINGS FOR PRECAST CONCRETE ELEMENTS, REINFORCING STEEL, MISCELLANEOUS STEEL, AND FENDER SYSTEM SHALL BE SUBMITTED TO AND REVIEWED BY THE PORT PRIOR TO FABRICATION.
- 4. ALL ELEVATIONS REFER TO MEAN LOWER LOW WATER (MLLW) EL 0.00 FT AS DEFINED BY THE U.S. ARMY CORPS OF ENGINEERS.
- 5. BUILDING CLASSIFICATION: IFR

**PILING**

- 1. PILES SHALL BE DRIVEN TO THE MINIMUM TIP ELEVATIONS INDICATED.
- 2. STEEL PILING SHALL CONFORM TO ASTM A 252, GRADE 3.

**REINFORCED CONCRETE**

- 1. REINFORCING STEEL
  - A. PRESTRESSING STEEL SHALL BE UNCOATED LOW-RELAXATION SEVEN-WIRE STRAND CONFORMING TO ASTM A 416, GRADE 270.
  - B. ALL REINFORCING STEEL SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615, GRADE 60.
  - C. ALL REINFORCING STEEL OVER NO. 8 IN SIZE IN PRECAST CONCRETE DECK PANELS SHALL BE OF WELDABLE QUALITY AND SHALL CONFORM TO ASTM A 615, OR A 706 GRADE 60. ADDITIONALLY, THE CARBON EQUIVALENT SHALL NOT EXCEED 0.55%.
  - D. WIRE FOR SPIRAL REINFORCEMENT SHALL CONFORM TO ASTM A 82.

- E. SPLICING OF LONGITUDINAL REINFORCEMENT OVER 40 FT IN LENGTH, EXCEPT AS SPECIFICALLY NOTED ON THE DRAWINGS, SHALL BE PERMITTED. SPLICES SHALL BE CLASS "B" (ACI 318) STAGGERED WITH NO MORE THAN 50% OF THE BARS BEING SPLICED AT ANY ONE LOCATION. SPLICE LENGTH SHALL BE INCREASED FOR TOP BAR CONDITIONS AS PER ACI 318. MINIMUM LENGTH OF LAP SPLICE SHALL BE 50 TIMES THE BAR DIAMETER.
- F. PROVIDE CORNER BARS AT ALL CORNERS. CORNER BARS SHALL MATCH THE NUMBER/SPACING AND DIAMETER OF ALL HORIZONTAL REINFORCEMENT AT THE CORNER. TERMINATED STRAIGHT BARS SHALL EXTEND FULL AVAILABLE LENGTH INTO ADJOINING MEMBERS. SPLICE LENGTH SHALL BE INCREASED FOR TOP BAR CONDITIONS AS PER ACI 318. SPLICE CORNER BAR TO TERMINATED STRAIGHT BAR WITH A MINIMUM SPLICE LENGTH OF 50 BAR DIAMETERS.

- 2. PRECAST CONCRETE
  - A. PRECAST PRESTRESSED CONCRETE PILES 8000 PSI
  - B. PRECAST CONCRETE PANELS 6000 PSI
- 3. CAST-IN-PLACE CONCRETE
  - A. CAST-IN-PLACE CONCRETE PILE CAPS 4000 PSI
  - B. BULLRAILS 4000 PSI
  - C. DECK PANEL SHEAR KEY CONCRETE 4000 PSI
  - D. CAST-IN-PLACE CONCRETE IN PILE BUILDUP 6000 PSI
- 4. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4 IN.
- 5. CONSTRUCTION JOINTS SHALL BE PROVIDED ONLY AS NOTED ON THE DRAWINGS AND AS SPECIFICALLY PERMITTED BY THE PORT ENGINEER.

**STRUCTURAL TIMBER**

- 1. ALL TIMBER SHALL BE PACIFIC COAST DOUGLAS FIR, GRADE NO. 1, AND SHALL CONFORM TO THE LATEST SPECIFICATIONS OF THE WEST COAST LUMBER INSPECTION BUREAU (WCLIB).
- 2. ALL TIMBER SHALL BE SURFACED FOUR SIDES (S4S) UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
- 3. ALL TIMBER SHALL BE PRESSURE TREATED IN ACCORDANCE WITH AMERICAN WOOD PRESERVER ASSOCIATION (AWPA) STANDARDS. REMOVABLE TIMBER BULLRAIL SHALL BE TREATED IN ACCORDANCE WITH AWPA C2-B2 AND P5-B1, ACA OR CCA, WITH A MINIMUM RETENTION OF 0.4 LB WATERBORNE PRESERVATIVE PER CUBIC FOOT. STORAGE, HANDLING, CARE, AND FIELD TREATMENT OF TREATED TIMBER SHALL BE IN ACCORDANCE WITH AWPA STANDARD M4-80.
- 4. FABRICATION: ALL TREATED TIMBER SHALL BE CUT TO LENGTH AND BORED BEFORE TREATMENT. HOLES FOR BOLTS SHALL BE 1/16 INCH LARGER THAN THE BOLT. LEAD HOLES FOR DOWELS AND LAG BOLTS SHALL BE PREBORED TO 65 PERCENT OF SHANK DIAMETER.
- 5. HARDWARE: BOLTS AND MISCELLANEOUS HARDWARE NECESSARY FOR THE COMPLETE INSTALLATION SHALL BE HOT-DIP GALVANIZED. BOLTS SHALL BE TIGHTENED WHEN INSTALLED AND RETIGHTENED BEFORE FINAL ACCEPTANCE OF THE CONTRACT. ALL NAILS AND SPIKES SHALL BE HOT-DIP GALVANIZED.

**GROUT**

- 1. ALL GROUT, EXCEPT AS NOTED IN THE SPECIFICATIONS, SHALL BE NON-SHRINK "MASTER FLOW 928" OR APPROVED EQUAL.

**MISCELLANEOUS STEEL**

- 1. ALL MISCELLANEOUS STEEL SHAPES AND PLATES, EXCEPT AS NOTED BELOW, SHALL CONFORM TO ASTM A 36.
- 2. ALL BOLTS AND NUTS SHALL CONFORM TO ASTM A 307, UNLESS SPECIFICALLY NOTED OTHERWISE ON THE DRAWINGS.
- 3. ALL MISCELLANEOUS STEEL, INCLUDING ALL FASTENERS, SHALL BE HOT-DIP GALVANIZED. GALVANIZE ITEMS AFTER FABRICATION AS FAR AS PRACTICABLE. GALVANIZING DAMAGED ACCIDENTALLY OR DUE TO FIELD WELDING SHALL BE RESTORED WITH FIELD-APPLIED GALVANIZING COMPOUND.

- 4. PROVIDE BLEED HOLES IN EMBEDDED PLATES AND SHAPES AT 24-IN. ON CENTER MAXIMUM.
- 5. ALL MISCELLANEOUS PIPE, INCLUDING BOLLARDS, SHALL CONFORM TO ASTM A 53, GRADE B.

**DESIGN CONCEPT**

- 1. VERTICAL LOADS
  - LOADS ARE DISTRIBUTED THROUGH ASPHALT/CONCRETE PAVING TO DECK PANELS, DECK PANELS TO PILE CAPS, PILE CAPS TO PILES, PILES TO SOIL IN FRICTION AND END BEARING.
- 2. HORIZONTAL LOADS
  - HORIZONTAL LOADS, INCLUDING SEISMIC FORCES, SOIL PRESSURE, SHIP IMPACT, AND MOORING FORCES ARE TRANSMITTED THROUGH THE DECK ACTING AS A DIAPHRAGM TO THE BATTER PILES. HORIZONTAL LOADS PARALLEL TO THE WHARF ARE RESISTED BY SOIL FRICTION AGAINST BULKHEAD AND SHEET PILES.

**SEISMIC DESIGN**

THE SEISMIC DESIGN IS IN BASIC ACCORDANCE WITH THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES (1996 EDITION), DIVISION I-A, SEISMIC DESIGN.

THE SEISMIC LOADING HAS BEEN EXTENDED BEYOND THAT OUTLINED IN THE AASHTO SPECIFICATION TO INCLUDE AN OPERATING LEVEL GROUND MOTION UNDER WHICH THE WHARF IS INTENDED TO REMAIN EFFECTIVELY OPERATIONAL. THE DESIGN APPROACH IS THEREFORE MULTI-LEVEL AS OUTLINED IN SEISMIC GUIDELINES FOR PORTS, DRAFT MONOGRAPH 1997, ASCE.

THE SEISMIC LOADING IS REPRESENTED BY TWO RESPONSE SPECTRA.

- 1. THE DESIGN EARTHQUAKE SPECTRUM REPRESENTS GROUND MOTIONS WITH A 10 PERCENT CHANCE OF EXCEEDENCE IN 50 YEARS. THIS LOADING IS IN DIRECT ACCORDANCE WITH AASHTO. (PER FIGURE 6, GEO ENGINEERS REPORT ADDENDUM, DATED 9/10/97, FILE NO. 0454-042-03)
- 2. THE OPERATING LEVEL EARTHQUAKE SPECTRUM, REPRESENTS GROUND MOTIONS WITH A 50 PERCENT CHANCE OF EXCEEDENCE IN 50 YEARS. (PER FIGURE 5, GEO ENGINEERS REPORT ADDENDUM, DATED 9/10/97, FILE NO. 0454-042-03)

**AASHTO SEISMIC PARAMETERS**

IMPORTANCE CLASSIFICATION	II
ACCELERATION COEFFICIENT	0.33 - DESIGN LEVEL LOADING
	0.15 - OPERATING LEVEL LOADING
SEISMIC PERFORMANCE CATEGORY	C - FOR BOTH LOADINGS
SOIL PROFILE TYPE	III
RESPONSE MODIFICATION FACTORS	R = 1 - FOR BOTH LOADINGS

**DESIGN CRITERIA**

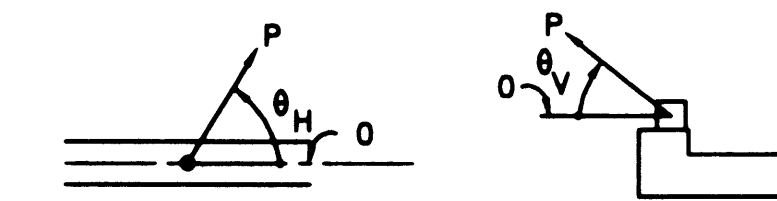
**DESIGN LOADS**

- 1. UNIFORM LIVE LOAD ON PIER: 750 PSF ON ALL/ANY COMBINATION OF SPANS, EXCEPT 2000 PSF IN THE HEAVY LOAD AREA.
- 2. CONCENTRATED LIVE LOAD (WHEELS, OUTRIGGERS, ETC.):
  - P = 100 KIPS, INCLUDING IMPACT
  - WHEEL/OUTRIGGER TRANSVERSE SPACING > 8 FEET
  - WHEEL/OUTRIGGER LONGITUDINAL SPACING > 18 FEET
  - CONTACT PRESSURE: 100 PSI +/-
- 3. BERTHING:
  - A. VESSELS
    - 1. SHIP
      - LENGTH OVERALL (LOA): 902 FEET
      - BEAM: 131 FEET
      - DRAFT: 40 FEET
      - DISPLACEMENT: 89,340 LT
    - 2. BARGE
      - LENGTH OVERALL (LOA): 400 FEET
      - BEAM: 100 FEET
      - DRAFT: 14 FEET
      - DISPLACEMENT: 18,105 LT

**B. BERTHING LOADS**

- 1. SHIP
  - APPROACH VELOCITY: 1 KNOT
  - APPROACH ANGLE: 10 DEGREES
- 2. BARGE
  - APPROACH VELOCITY: 1 KNOT
  - APPROACH ANGLE: 10 DEGREES

**4. LINE PULL ON BOLLARDS AND CLEATS:**



LOCATION	LINE PULL P	RANGE OF HORIZONTAL ANGLE theta H	RANGE OF VERTICAL ANGLE theta V
TYPICAL BOLLARD	125 KIPS	0 TO 180	0 TO 30

**5. CONTAINER CRANE LOADS**

- A. OPERATING WHEEL LOADS: EQUIVALENT UNIFORM LINE LOAD = 40 KIPS PER LINEAR FOOT OF RAIL, INCLUDING IMPACT
- B. LONGITUDINAL LOADS AT PIN SOCKETS: P = 150 KIPS, PER SOCKET.
- C. CRANE STOPS: P = 200 KIPS ACTING HORIZONTALLY 4'-6" ABOVE TOP OF RAIL, PER STOP.

**6. LOAD COMBINATIONS**

- U1 = 1.4D + 1.7L
  - U2 = 1.3D + 1.7L + 1.3E
  - U3 = 1.3D + 0.17L + 1.7B + 1.3E
  - U4 = 1.3D + 1.3E + 1.3EQ (SEISMIC LEVEL 1)
  - U5 = 1.0D + 1.0E + 1.0EQ (SEISMIC LEVEL 2)
- D - DEAD LOAD  
L - LIVE LOAD (UNIFORM AND/OR GANTRY CRANE)  
B - BERTHING LOAD  
E - EARTH PRESSURE LOAD  
EQ - EARTHQUAKE LOAD

**7. SPECIAL INSPECTION:**

THE CRITICAL ELEMENTS REQUIRING SPECIAL INSPECTION PER UBC CHAPTER 17 ARE AS FOLLOWS:

- A. CONCRETE
- B. BOLTS INSTALLED IN CONCRETE
- C. REINFORCING STEEL
- D. STRUCTURAL WELDING
- E. PILING

**AS-BUILT**

AUTOCAD FILE NO. 5012G4	G-4
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APPROVED  
*[Signature]*  
DATE 11/99  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

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AS-BUILT		RDD	JAS	1/4/98

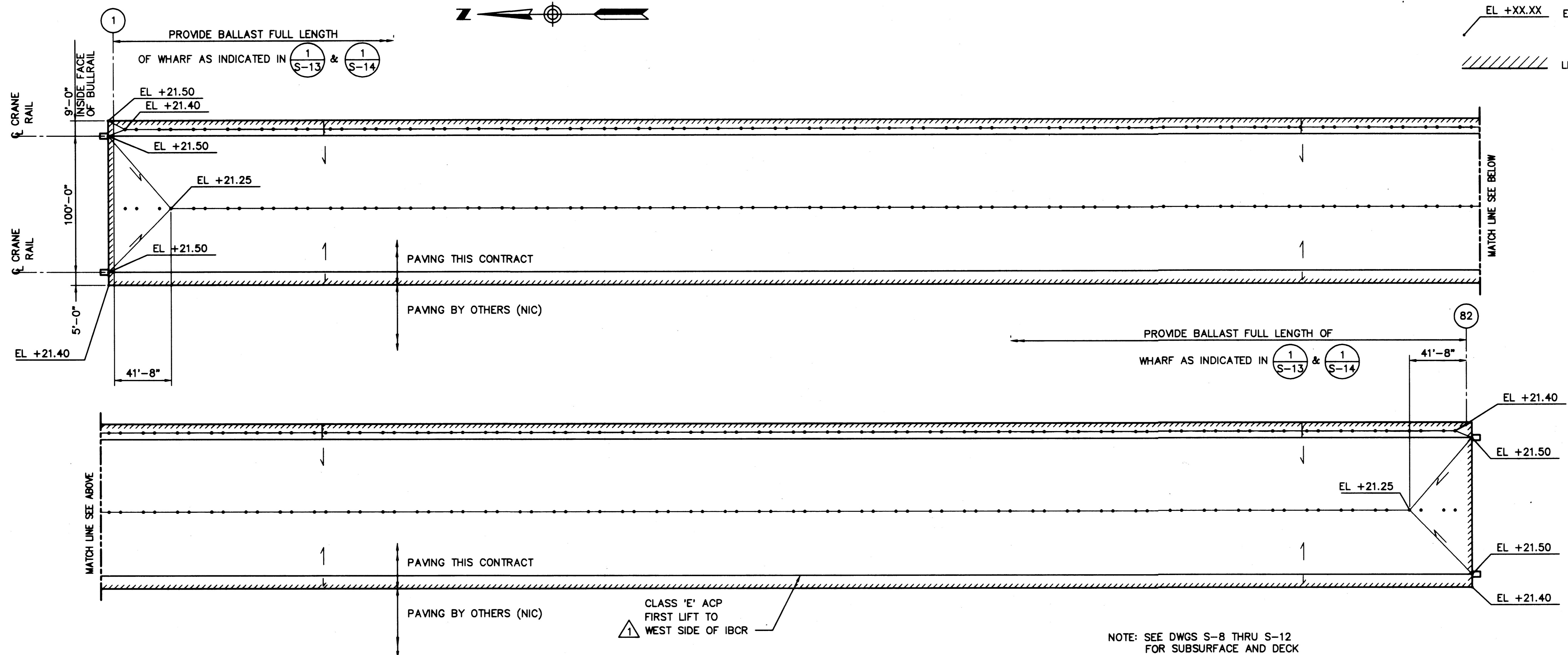
**HYUNDAI MERCHANT MARINE TERMINAL WHARF PORT OF TACOMA GENERAL NOTES**

DRAWING NO. EP-5012-26
CONTRACT NO. 978038
SHEET NO. 4 OF 58

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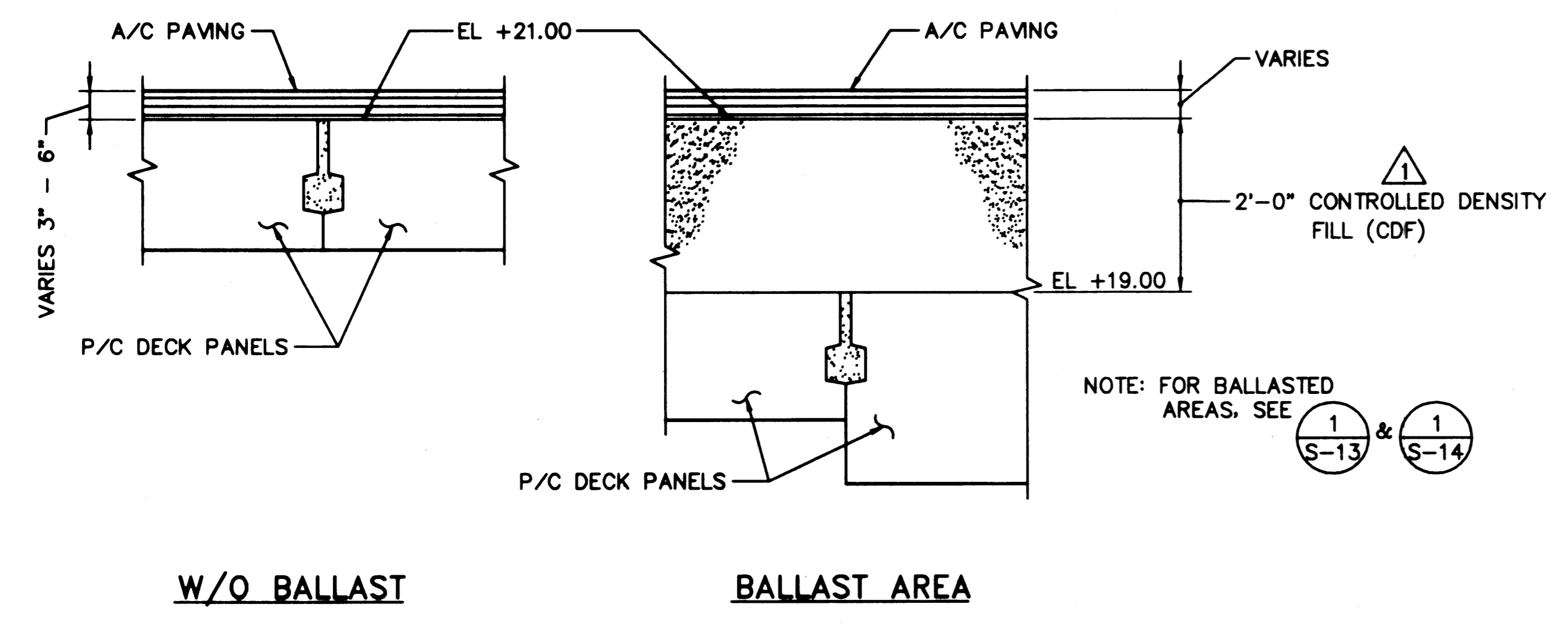
**LEGEND**

EL +XX.XX ELEVATION, TOP OF A/C PAVING  
 // LIMITS OF PAVING THIS CONTRACT

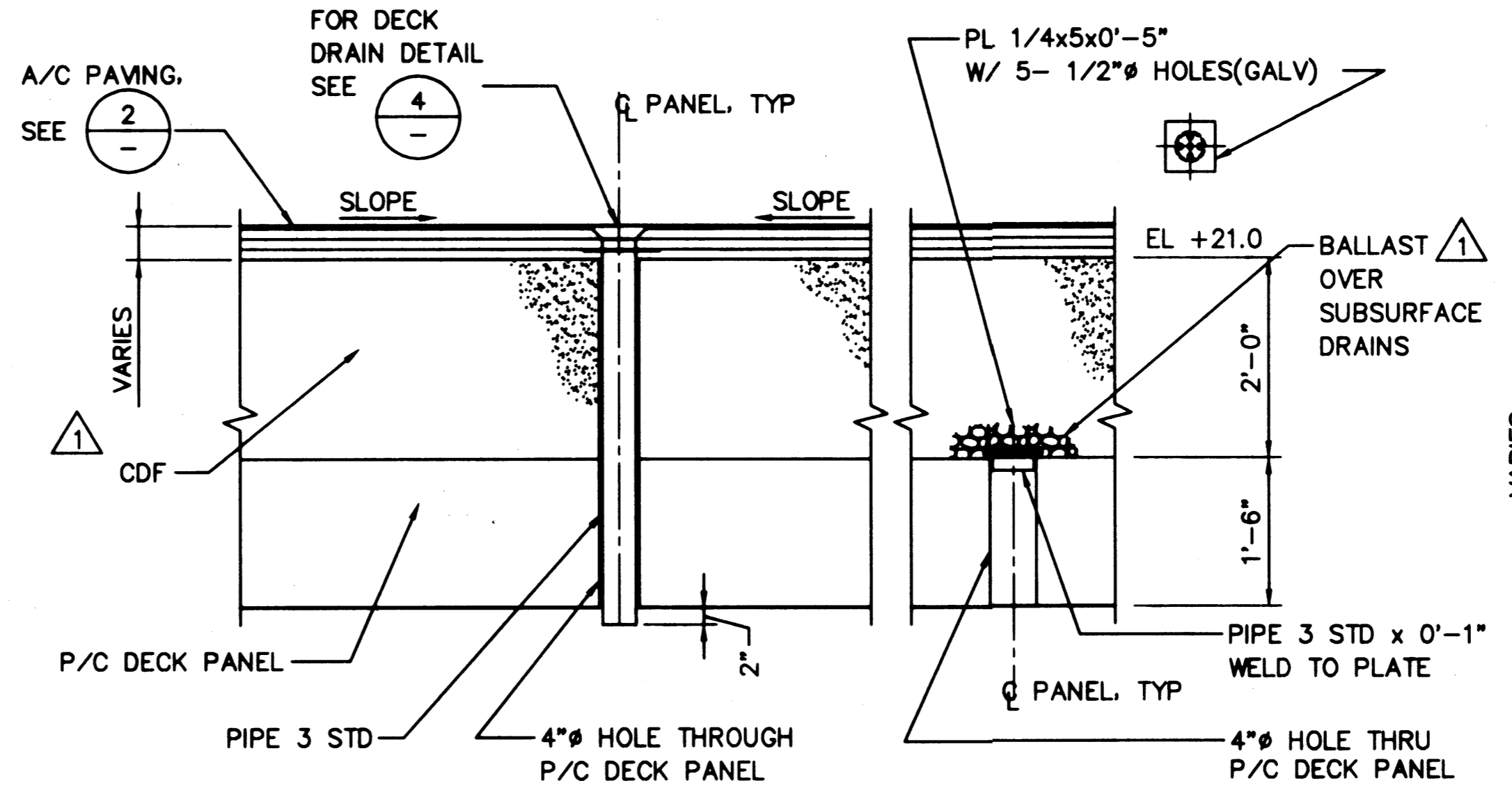


**1 PLAN - WHARF PAVING & DRAINAGE**  
 SCALE: 1"=40'-0"

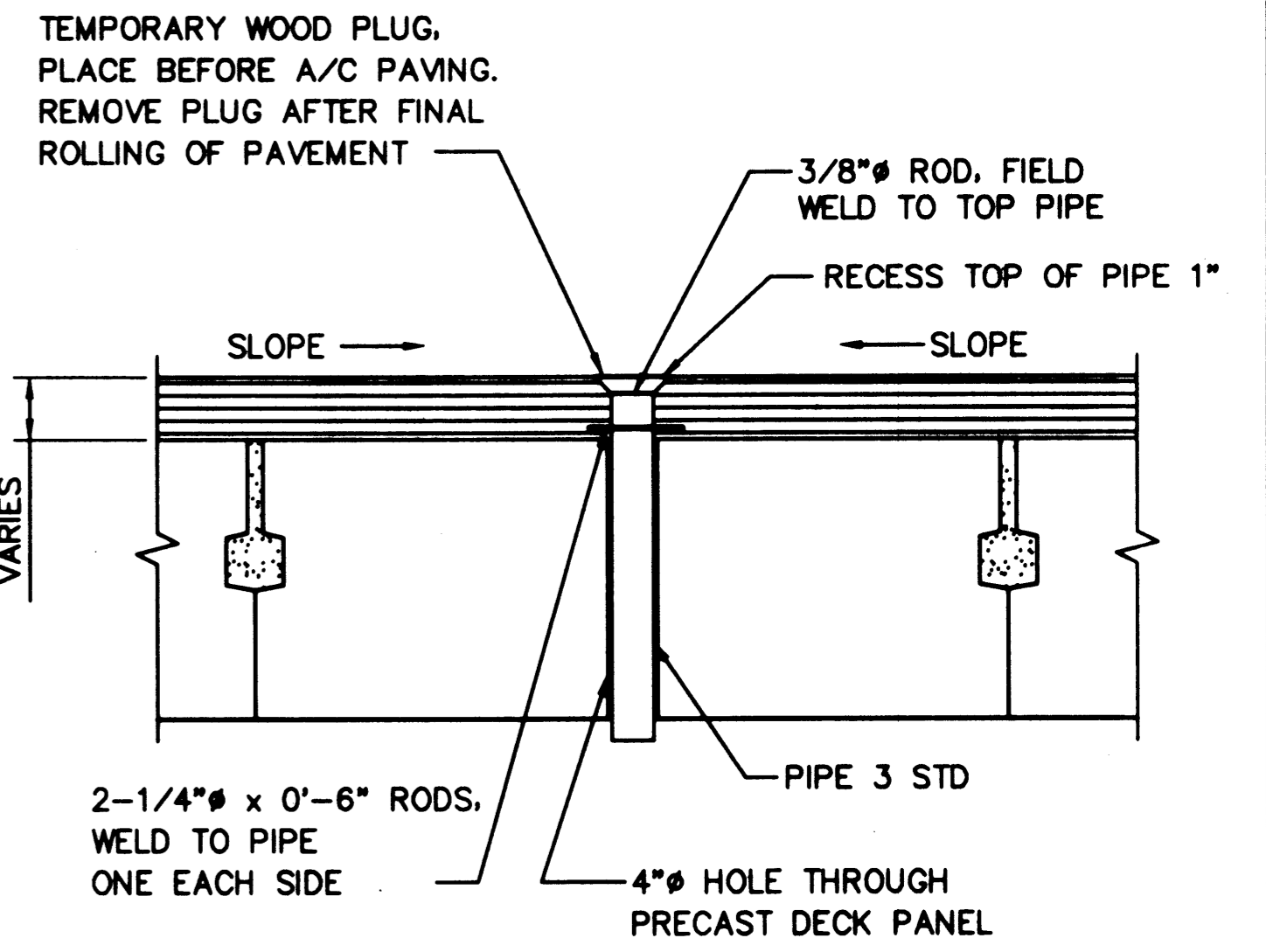
NOTE: SEE DWGS S-8 THRU S-12 FOR SUBSURFACE AND DECK DRAIN LOCATIONS



**2 DETAIL - PAVING & BALLAST**  
 SCALE: 3/4"=1'-0"



**3 DECK DRAIN & SUBSURFACE DRAIN @ BALLASTED AREA**  
 SCALE: 3/4"=1'-0"



**4 DETAIL DECK DRAIN AS-BUILT**  
 SCALE: 3/4"=1'-0"

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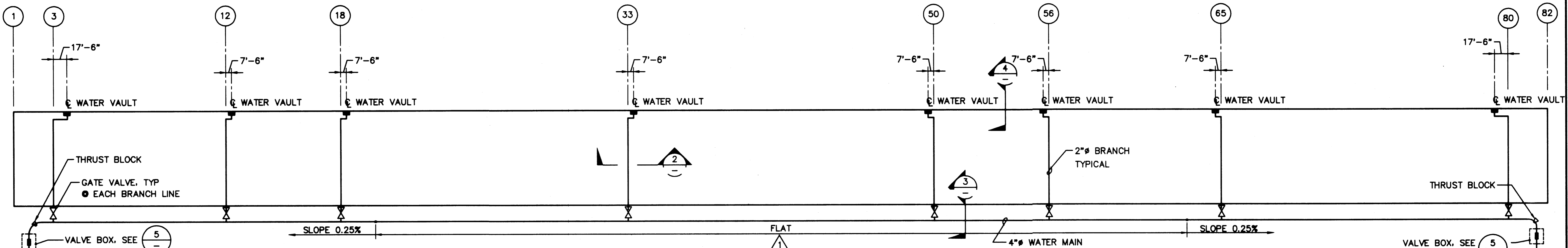
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 CHIEF ENGINEER

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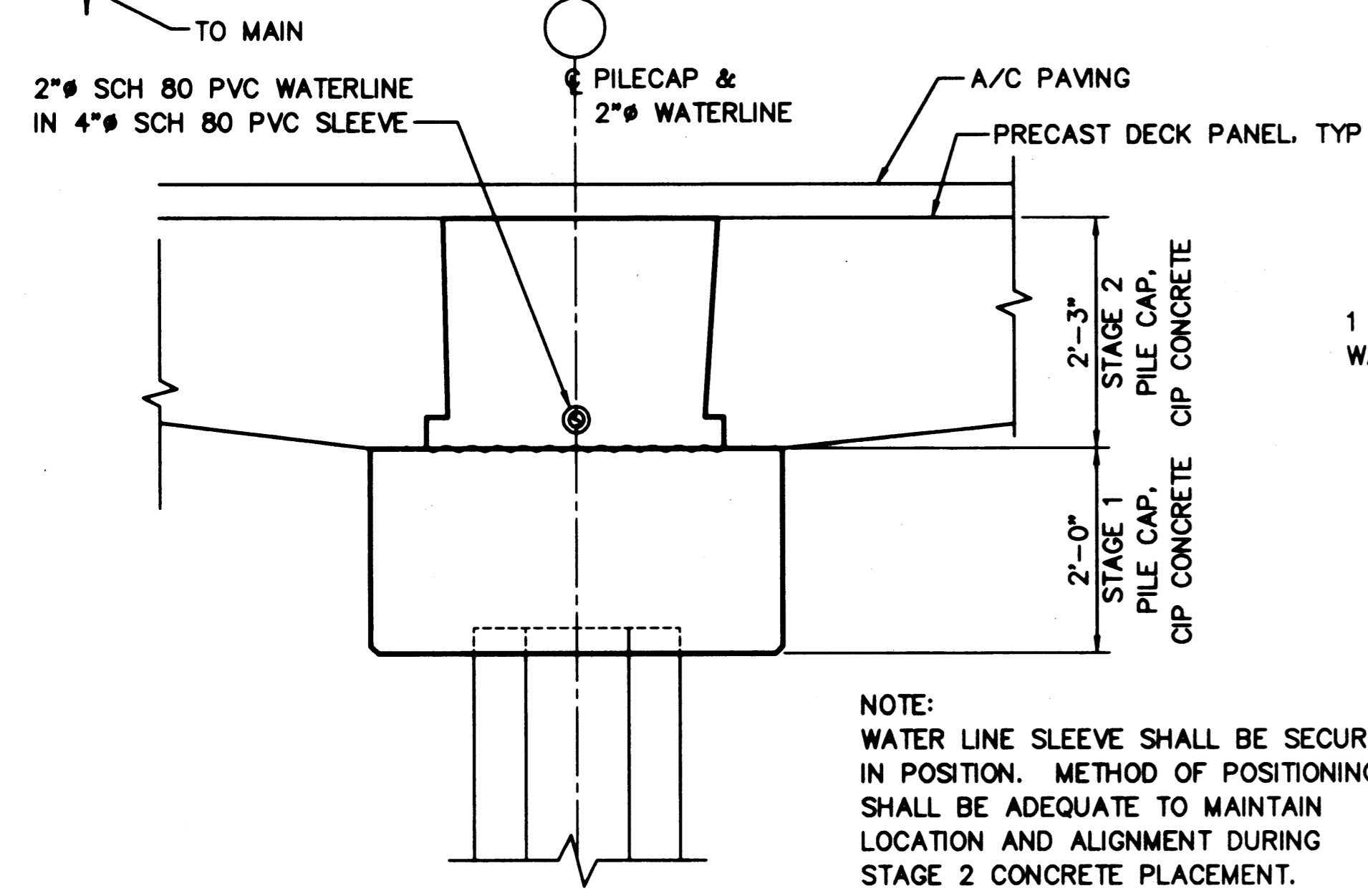
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MARK	REVISION	BY	APP. DATE

**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**WHARF PAVING AND DRAINAGE PLAN**

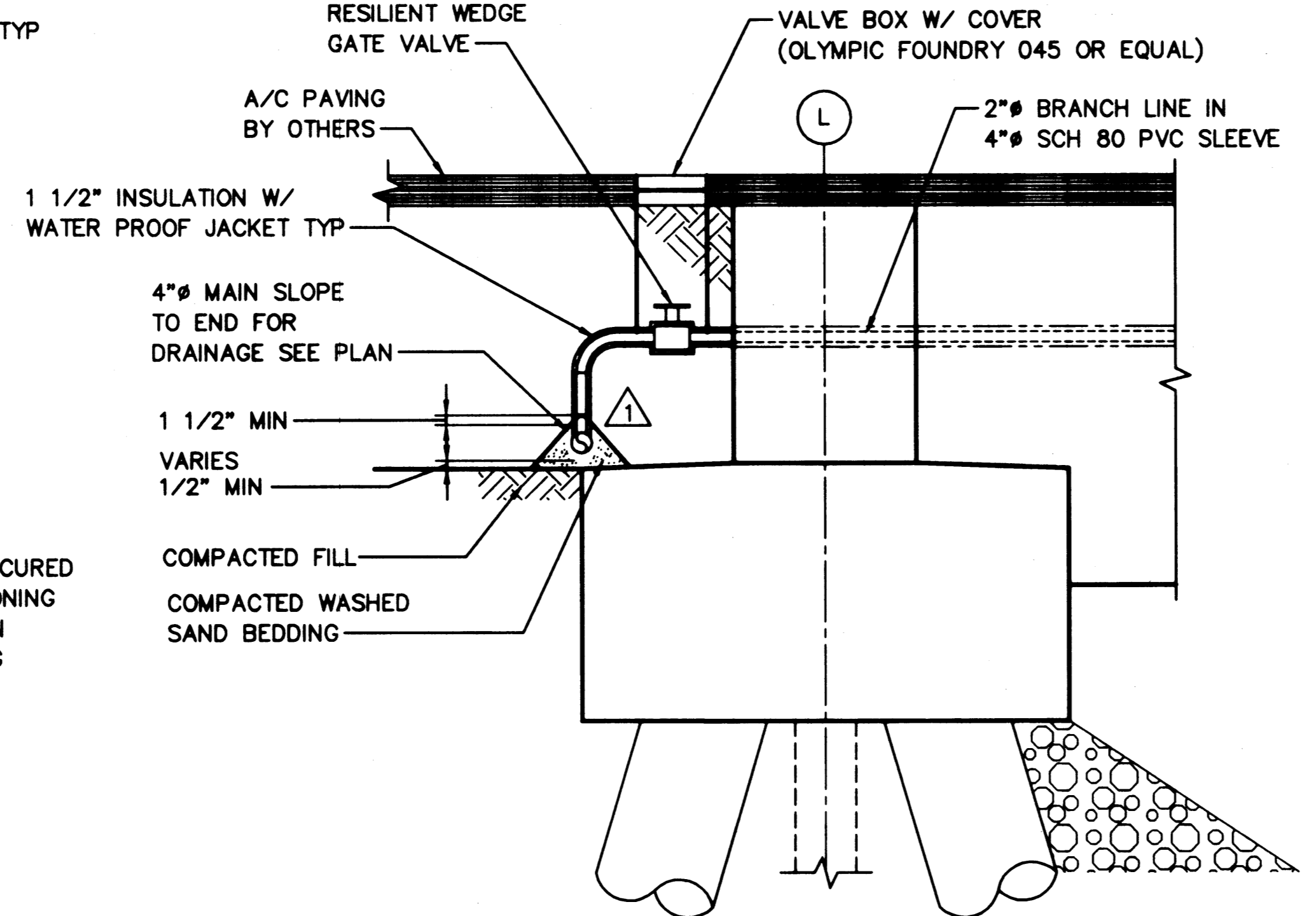
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SHEET NO. <b>5</b> OF <b>58</b>	



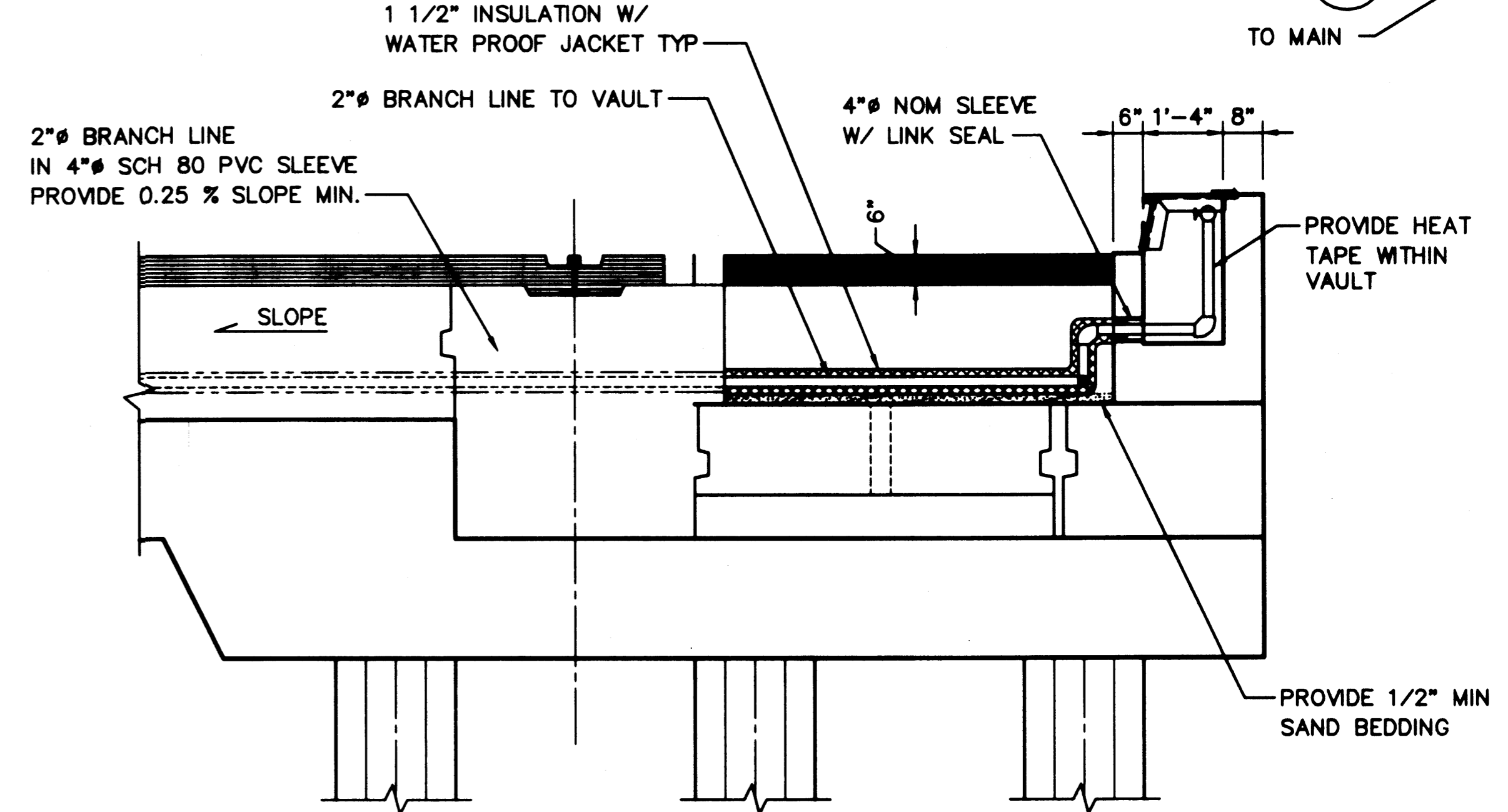
**1 PLAN - WATER SERVICE**  
SCALE: 1"=60'



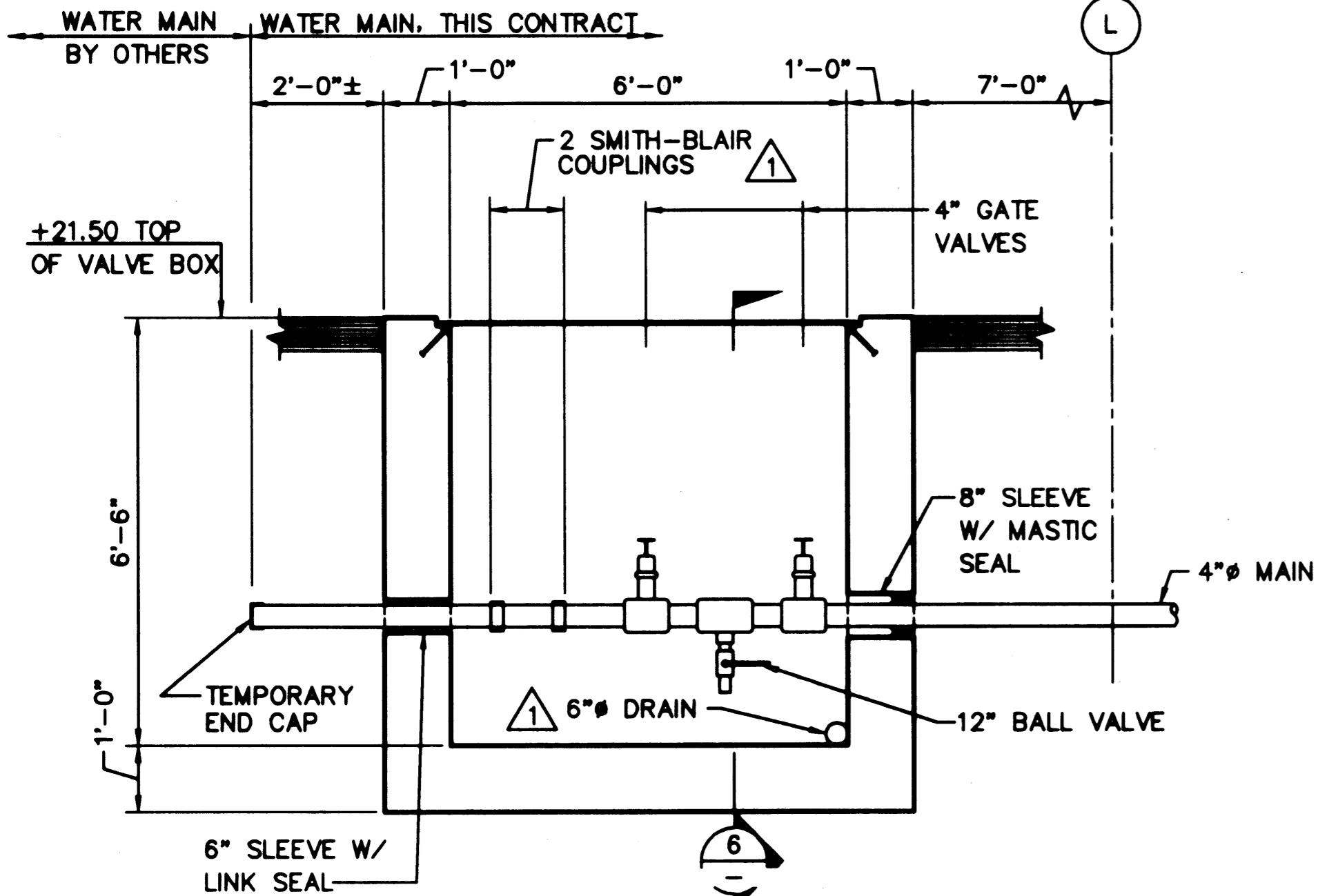
**2 SECTION - BRANCH IN CAP**  
SCALE: 3/4"=1'-0"



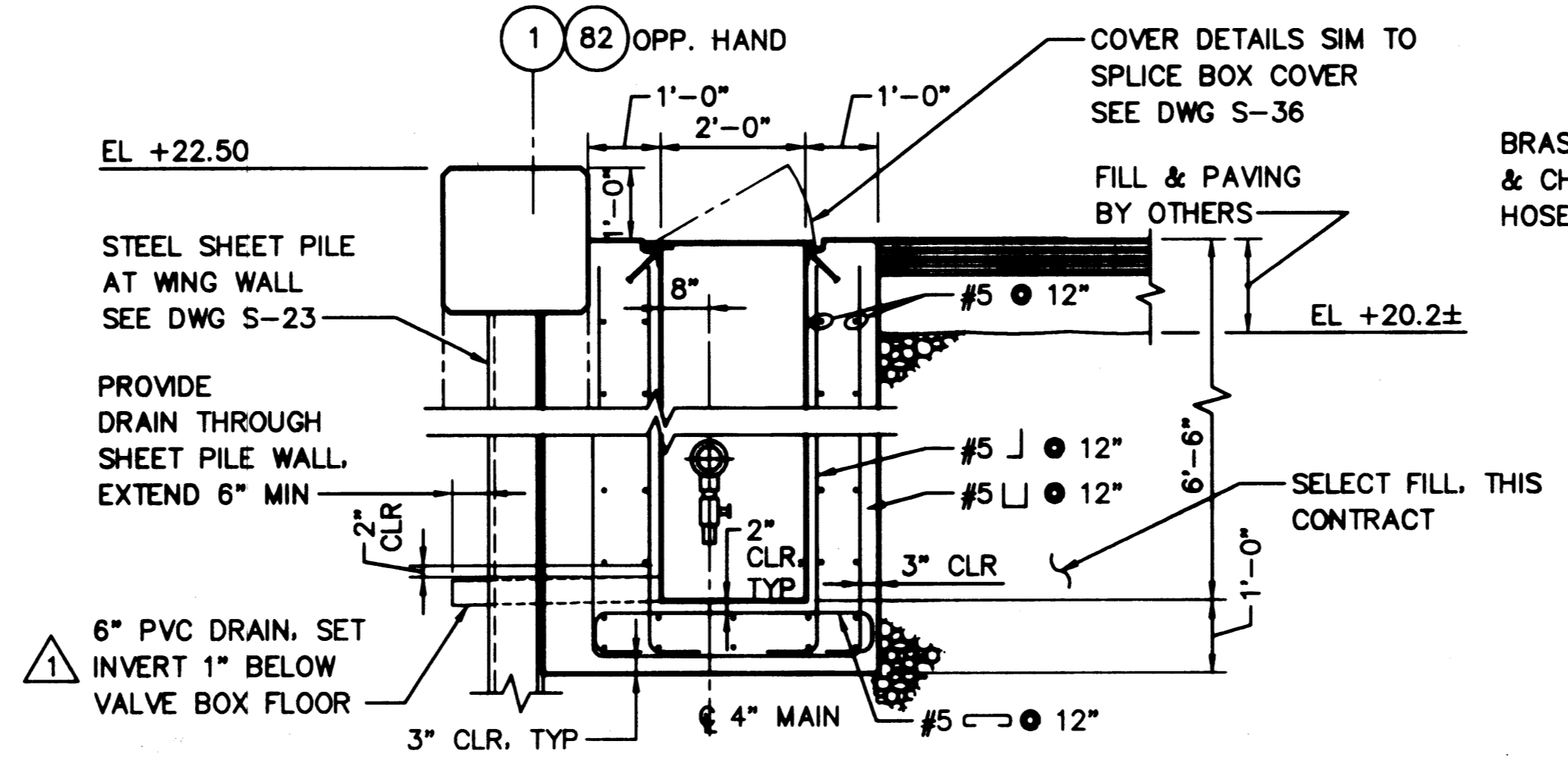
**3 SECTION - 4" WATER MAIN**  
SCALE: 1/2"=1'-0"



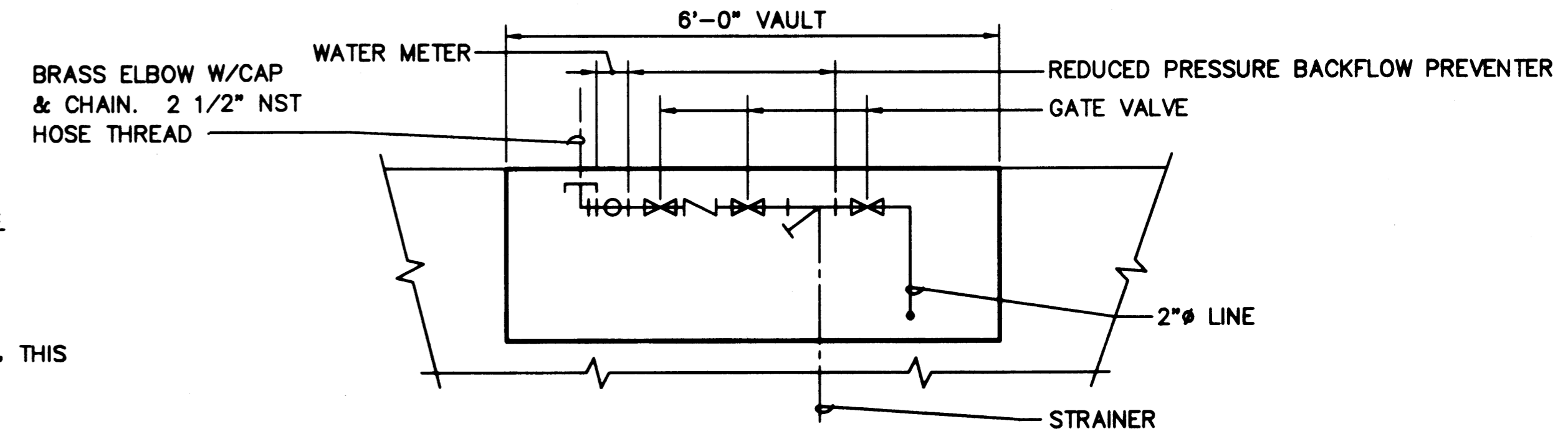
**4 SECTION - BRANCH @ WHARF FACE**  
SCALE: 1/2"=1'-0"



**5 SECTION - VALVE BOX**  
SCALE: 1/2"=1'-0"



**6 SECTION - VALVE BOX**  
SCALE: 1/2"=1'-0"



**7 ELEVATION - WATER VAULT SCHEMATIC**  
SCALE: NONE

**AS-BUILT**  
AUTOCAD FILE NO. **6012G2** **C-2**

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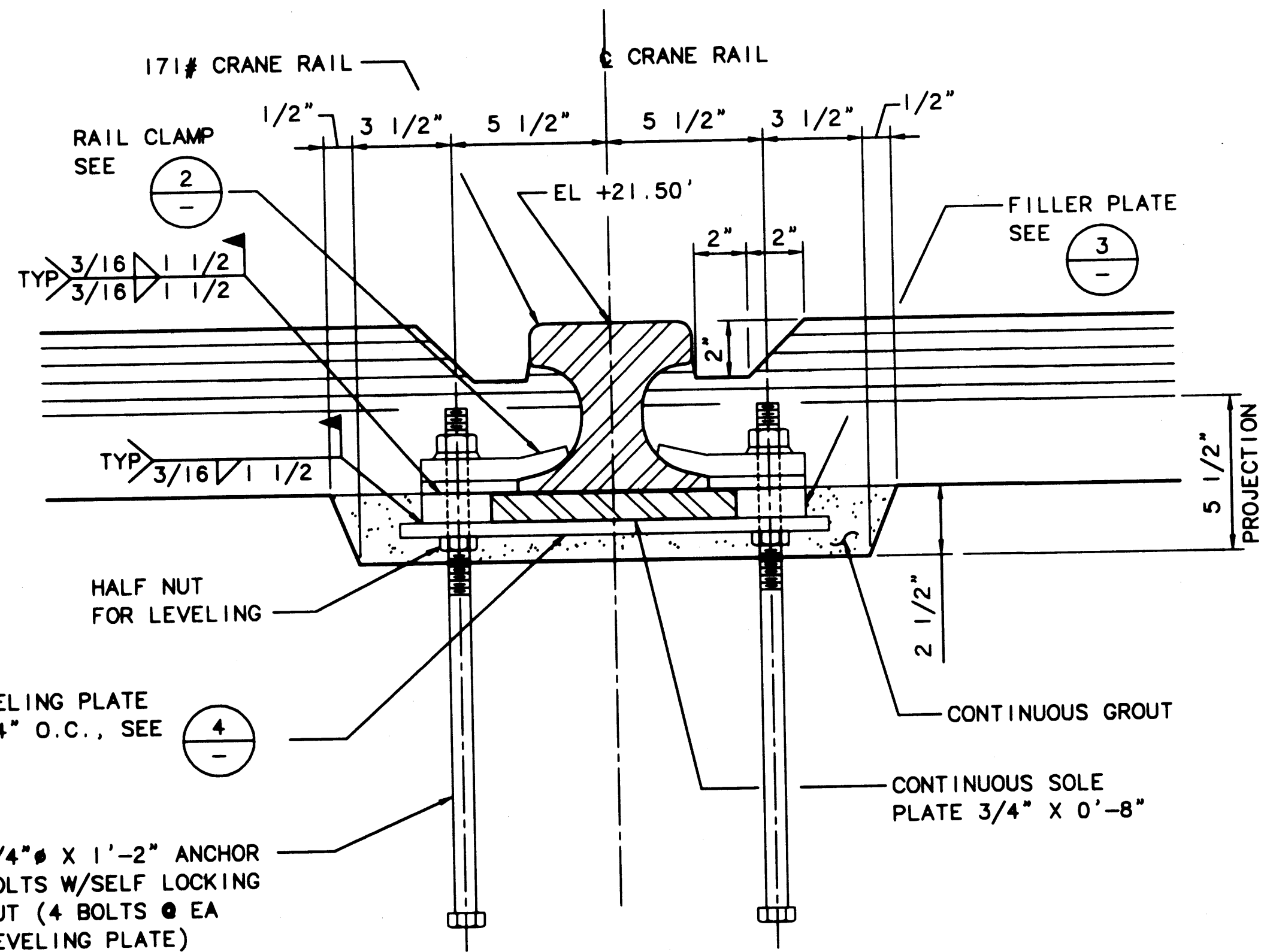
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**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**WHARF WATER SERVICE PLAN & DETAILS**

DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **6** OF **58**

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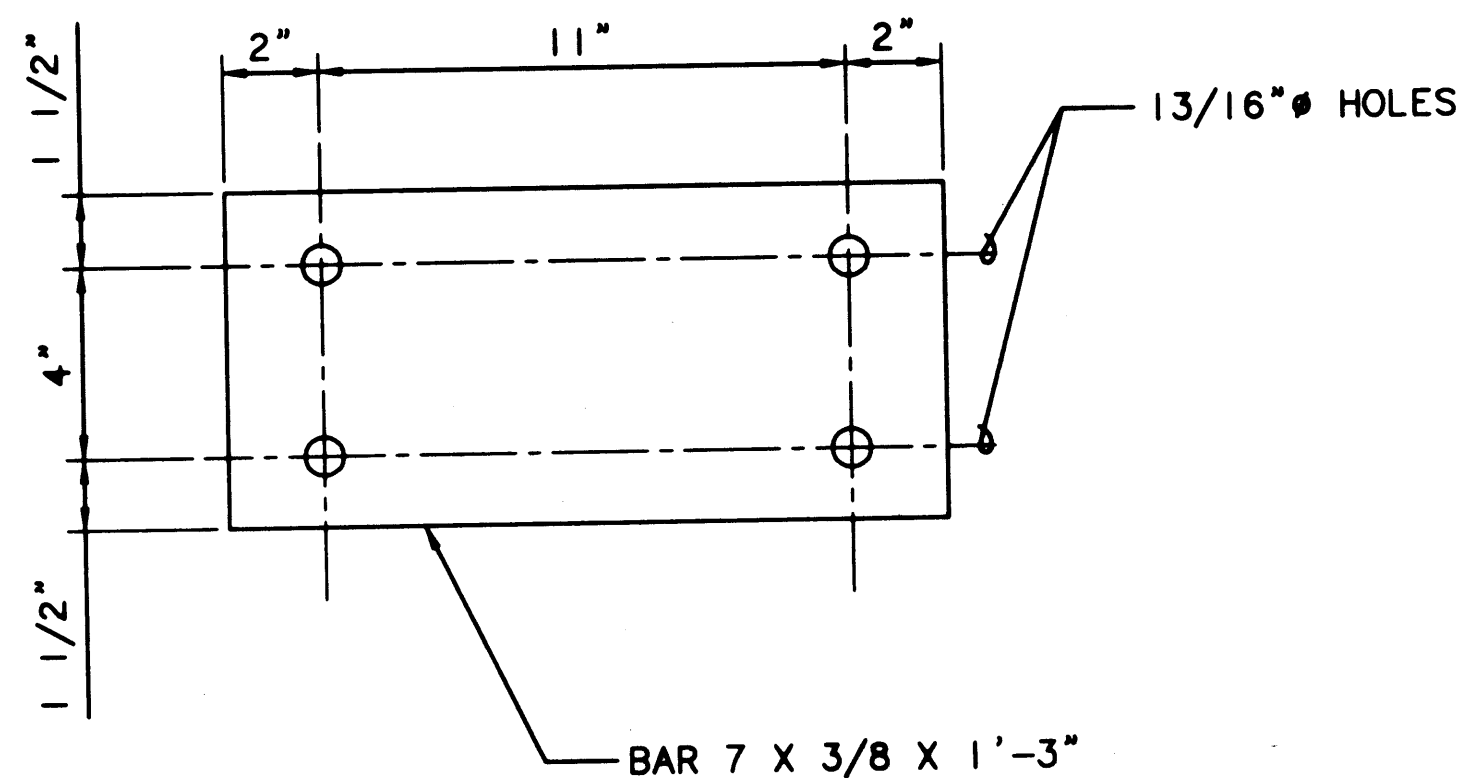
LEVELING PLATE  
@ 24" O.C., SEE 4

3/4" # X 1'-2" ANCHOR  
BOLTS W/SELF LOCKING  
NUT (4 BOLTS @ EA  
LEVELING PLATE)

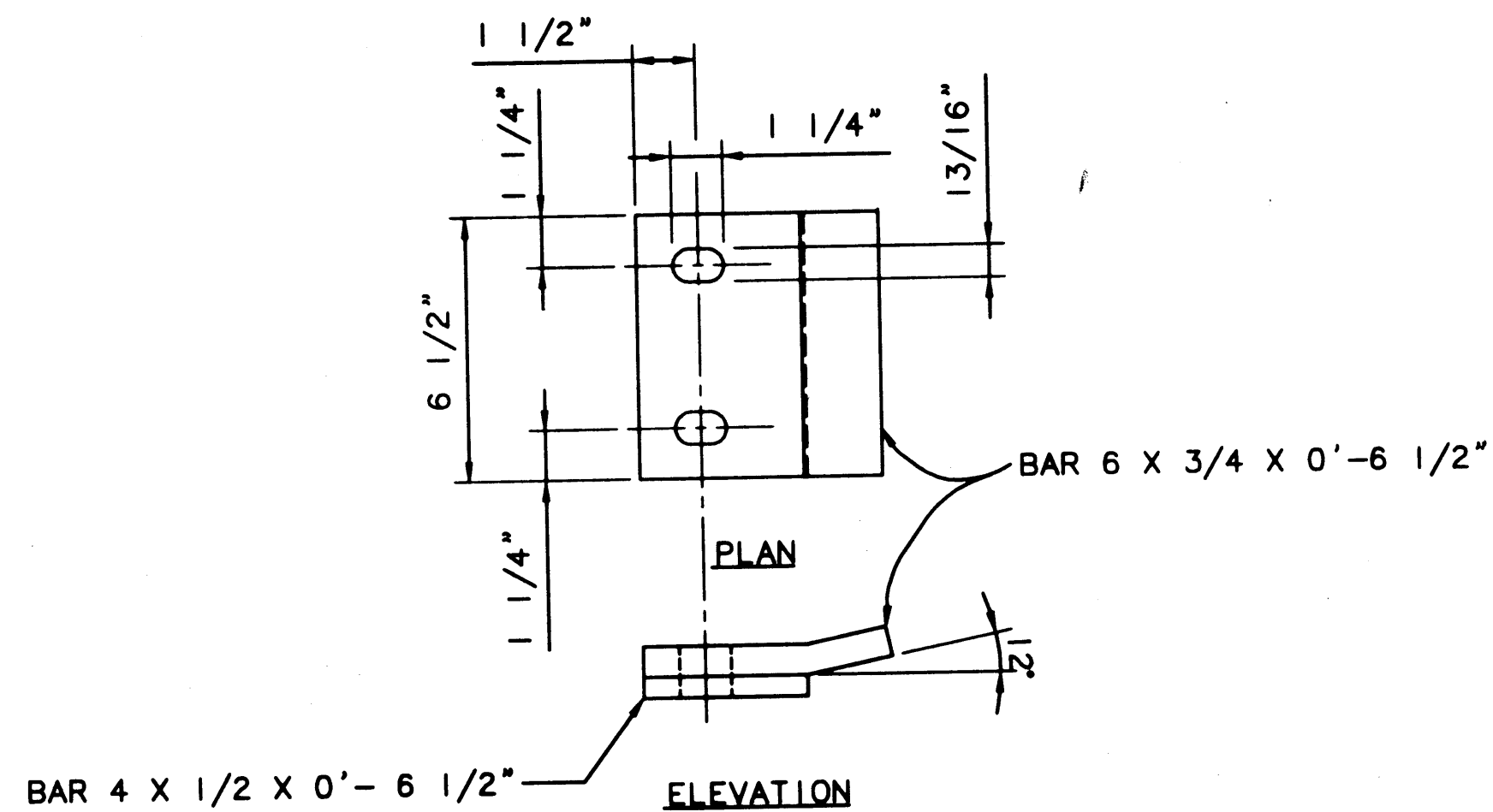
NOTES:

1. LOCATE SOLE PLATE JOINTS OVER LEVELING PLATE. PROVIDE 1/4" GAP BETWEEN PLATES AT JOINT.
2. STAGGER RAIL AND SOLE PLATE JOINTS.
3. SOLE PLATE EDGES UNDER RAIL, AT JOINT LINE, TO BE GROUND SMOOTH.

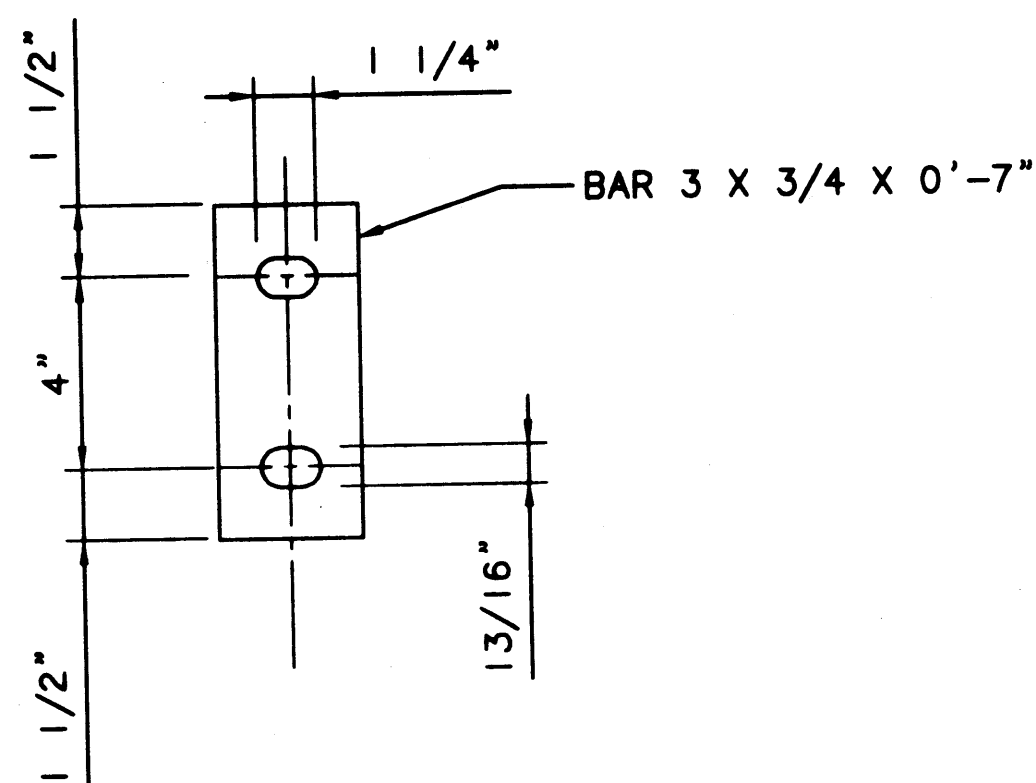
1  
C-3  
DETAIL - TYPICAL CRANE RAIL  
SCALE: 3"=1'-0"



4  
C-3  
LEVELING PLATE  
SCALE: 3"=1'-0"



2  
C-3  
CLAMP PLATE  
SCALE: 3"=1'-0"



3  
C-3  
FILLER PLATE  
SCALE: 3"=1'-0"

PLOTTED: Thu Jan 07 1999 2:22pm FILENAME: V:\1997\497093\CAD\C-3.dwg SCALE: 4



**PORT OF TACOMA**  
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**BERGER/ABAM**  
ENGINEERS INC.  
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FEDERAL WAY, WASHINGTON 98003-6395  
(206) 431-2300 FAX: (206) 431-2250

APPROVED  
*Curtis L. Ratcliffe*  
DATE 1/11/99  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

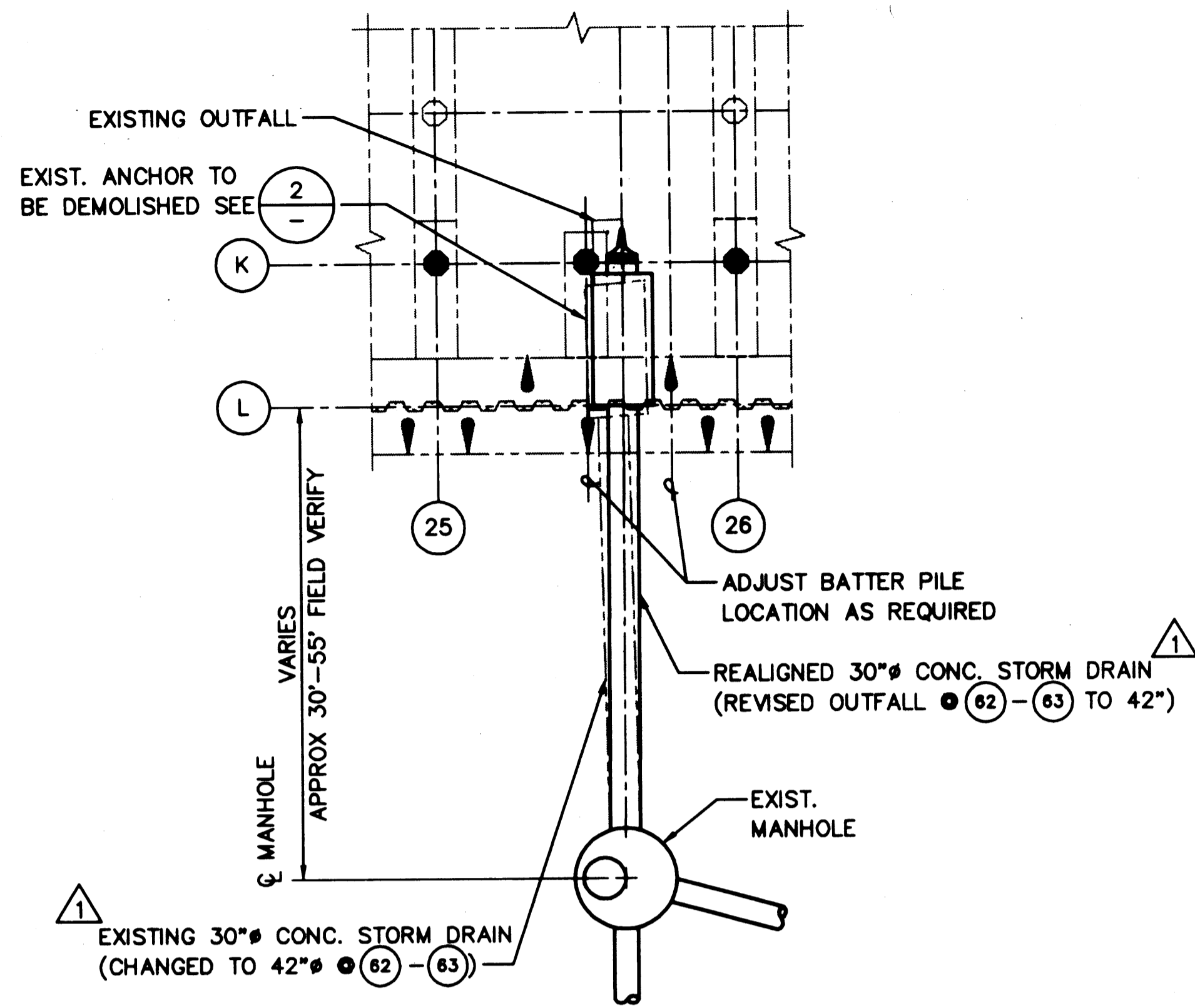
MMD 9/91  
DRAWN BY DATE  
DESIGNED BY DATE

BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE
AS-BUILT		RDD	JAS	1/4/99

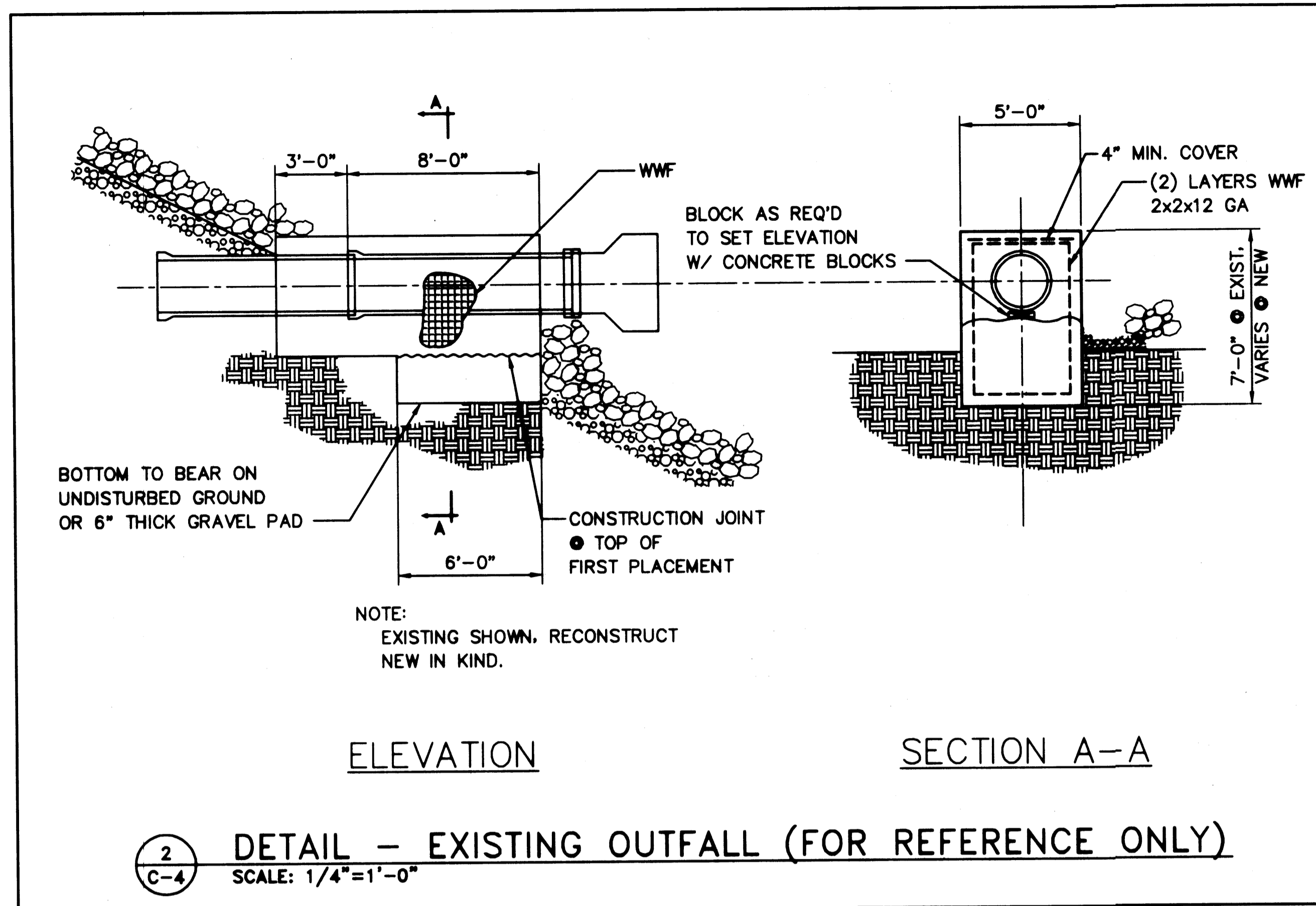
**HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
WHARF TRACKWORK DETAILS**

**AS-BUILT**  
AUTOCAD FILE NO. **5012C3** **C-3**  
DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **7** OF **58**



1 PLAN - OUTFALL  
SCALE: 1"=10'

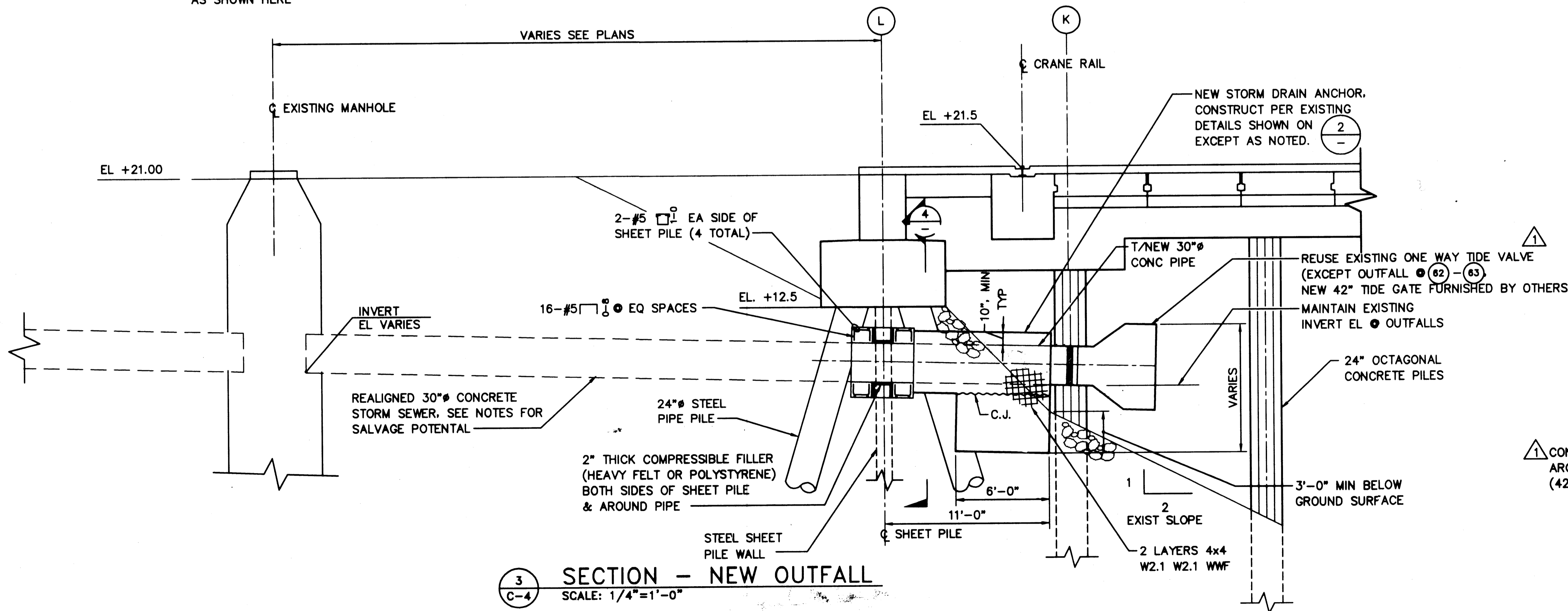
NOTE: CONDITION AT OUTFALL BETWEEN BENTS 25 & 26 SHOWN  
CONDITION AT OUTFALL BETWEEN BENTS 7 & 8; 43 & 44; 62 & 63 IS SIMILAR, AND REQUIRES RELOCATION AS SHOWN HERE



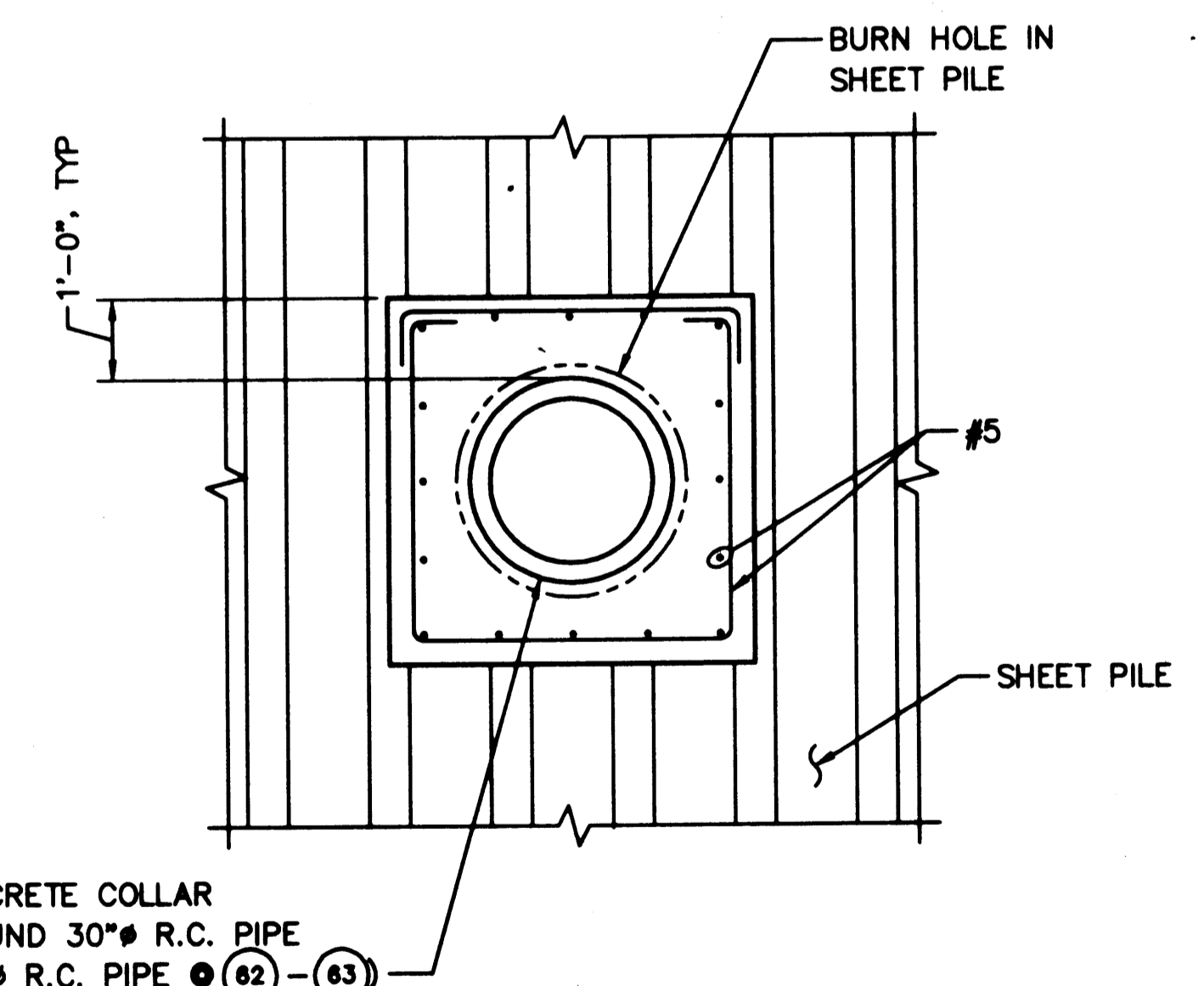
2 DETAIL - EXISTING OUTFALL (FOR REFERENCE ONLY)  
SCALE: 1/4"=1'-0"

NOTES:

- A TOTAL OF (4) OUTFALLS ARE TO BE RELOCATED IN THE PROJECT. THE INTENT OF THE OUTFALL RELOCATION IS TO PROVIDE PASSAGE THROUGH SHEET PILE WALL AND AVOID CONFLICT BETWEEN THE OUTFALLS AND THE PILES IN ROW K.
- THE CONTRACTOR SHALL SURVEY THE EXISTING STORM DRAINS BETWEEN THE MANHOLES AT THE TOP OF BANK AND THE OUTFALL TO ESTABLISH THE EXISTING ALIGNMENT AND INVERT ELEVATIONS. THE CONTRACTOR SHALL THEN PLAN THE NEW ALIGNMENT REQUIRED AT EACH OF THE FOUR OUTFALLS TO MISS THE PILES IN ROW K. STEEL BATTER PILES IN ROW L MAY BE MOVED TO A MAXIMUM EIGHT FOOT SPACING ALONG GRID L TO AID IN THE REALIGNMENT OF THESE STORM DRAINS. SUBMIT SURVEY FINDINGS AND THE PLANS FOR REALIGNMENT, INCLUDING PROPOSED BATTER PILE LOCATION ADJUSTMENTS, TO THE PORT FOR REVIEW AND APPROVAL PRIOR TO STARTING THIS WORK
- AT THE CONTRACTOR'S OPTION, THE EXISTING 30" CONCRETE PIPING MAY BE USED IF UNDAMAGED. ASSUME USE OF NEW PIPES AND FITTINGS AT NO EXTRA COST TO THE PORT IF THE CONTRACTOR DETERMINES THAT FULL/PARTIAL SALVAGE IS NOT FEASIBLE
- SUGGESTED CONSTRUCTION SEQUENCE:
  - REMOVE EXISTING TIDE VALVE AND SALVAGE FOR REUSE
  - DEMOLISH EXISTING ANCHOR BLOCK AND EXCAVATE TO REMOVE STORM DRAIN PIPING BACK TO NEAREST MANHOLE, SALVAGING PIPE WHERE POSSIBLE
  - INSTALL SHEET PILE WALL
  - INSTALL STEEL BATTER PILES
  - COMPLETE RELOCATION AS INDICATED IN 3
- CONTRACTOR SHALL PROVIDE PUMPS AND PIPING OR OTHER TEMPORARY MEANS OF MAINTAINING STORMWATER FLOW TO THE WATERWAY DURING RELOCATION OF THE EXISTING STORM DRAINS AND OUTFALLS.



3 SECTION - NEW OUTFALL  
SCALE: 1/4"=1'-0"



4 SECTION  
SCALE: 1/2"=1'-0"

AS-BUILT

AUTOCAD FILE NO. 5012C4 C-4

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APPROVED: *Curtis L. Ratcliffe, P.E.* 1/11/99  
DATE  
DRAWN BY: MMD 9/91  
CHECKED BY: BCM 9/91  
DESIGNED BY: JAS 9/91  
PROJ ENGR: JAS 9/91  
DATE: 9/91

CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER

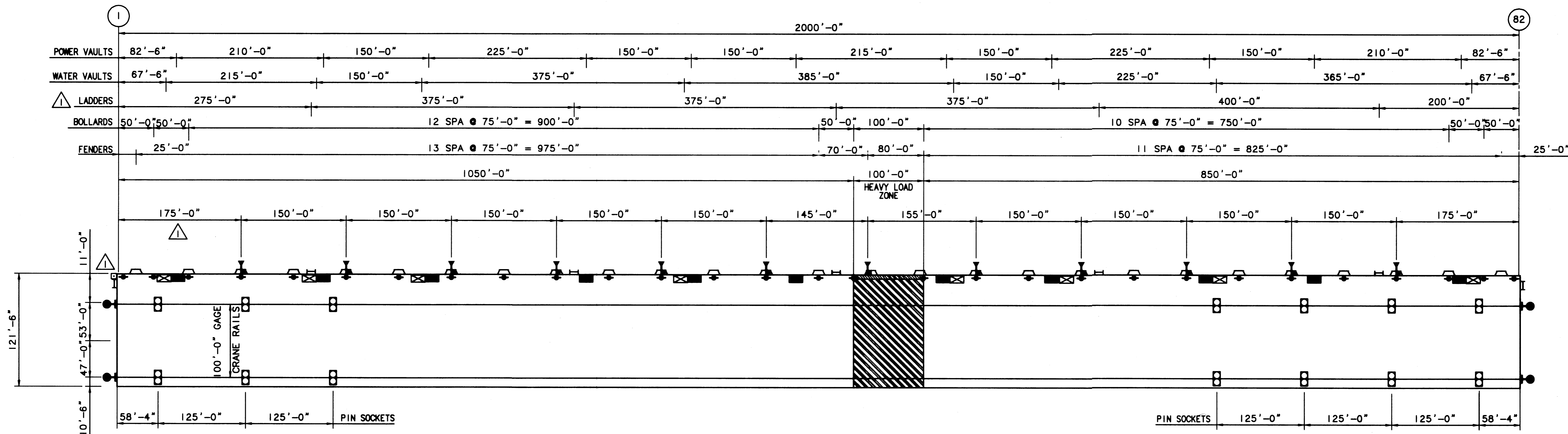
MARK	REVISION	BY	APP.	DATE
	AS-BUILT			

**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**OUTFALL DETAILS**

DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 8 OF 58

PLOTTED: Thu Jan 07 1999 2:22pm FILENAME: V:\1997\497093\CAD\C-4.dwg SCALE: 48





1  
S-1 WHARF SURFACE FEATURES PLAN  
SCALE: NONE

- LEGEND**
- POWER VAULTS
  - ▣ WATER VAULTS
  - ◆ BOLLARDS
  - △ FENDER UNITS
  - ┆ LADDER
  - ┆ LIFE RINGS
  - CRANE STOPS
  - NAVIGATION LIGHT
  - CRANE PIN SOCKETS
  - ▨ REMOVABLE BULLRAIL SECTIONS
  - ▩ HEAVY LOAD ZONE

**AS-BUILT**  
AUTOCAD FILE NO. 5012S1 S-1

**PORT OF TACOMA**  
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APPROVED  
*Curtis L. Ratcliffe*  
DATE 1/11/99  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

MMD  
DRAWN BY DATE  
DESIGNED BY DATE

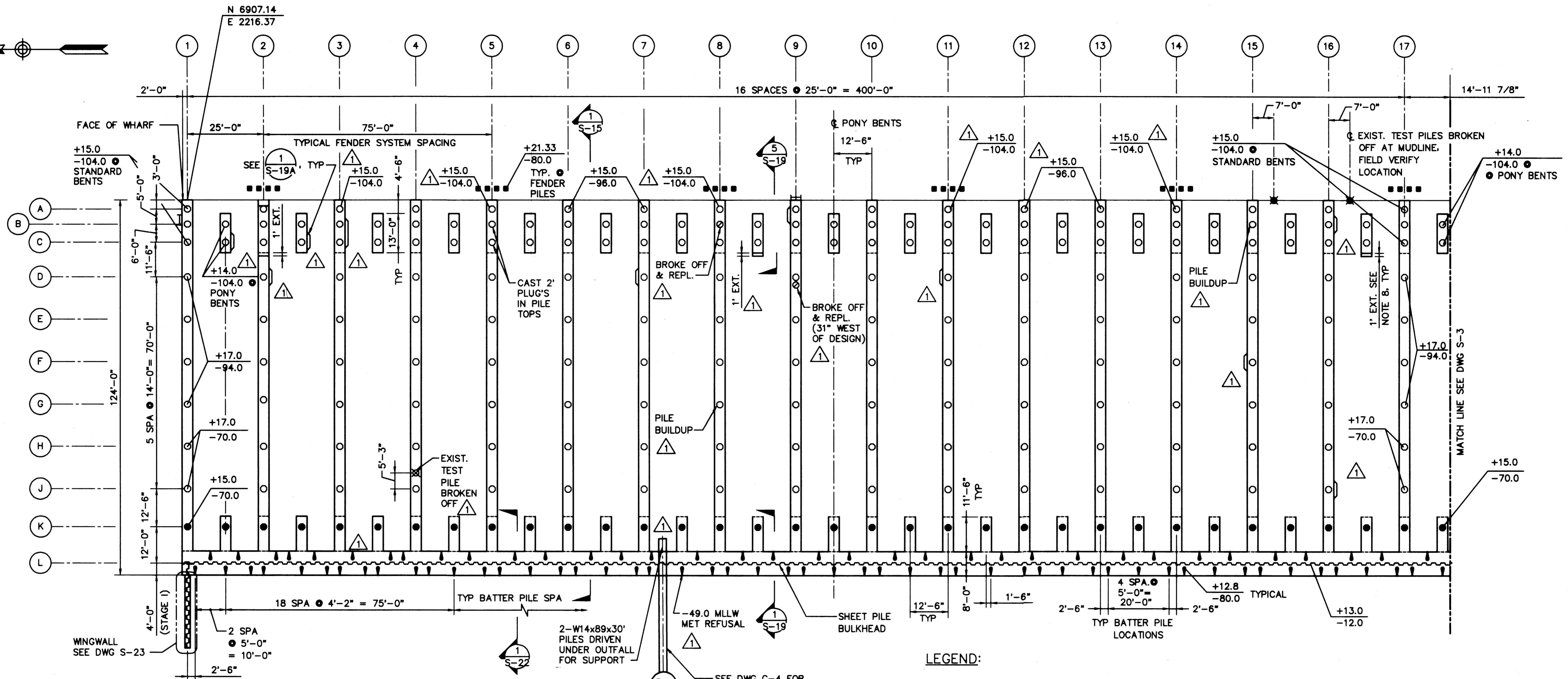
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CHECKED BY DATE  
JAS  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE
	AS-BUILT	RDD	JAS	1/4/99

**HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
SURFACE FEATURES PLAN**

DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 10 OF 58

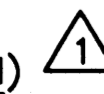
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**1**  
**S-2** PILE AND PILE CAP PLAN  
SCALE: 1/16"=1'-0"

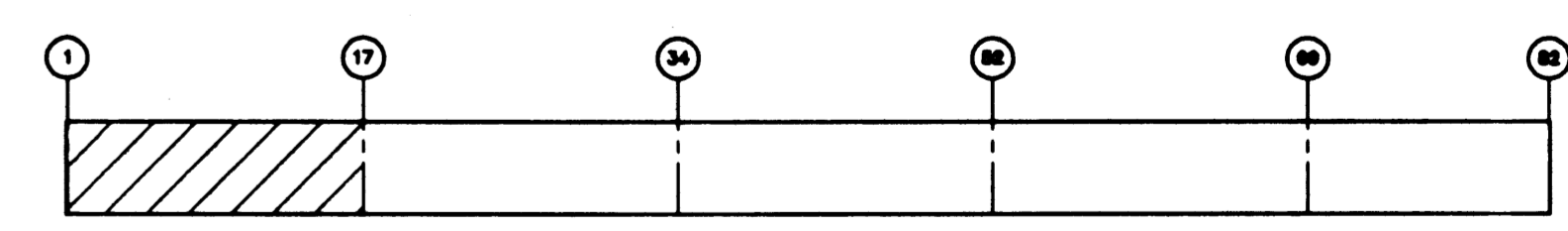
**NOTES:**

- FOR DETAILS OF PRECAST PRESTRESSED CONCRETE PILES, SEE DWGS S-31 & S-32.
- FOR CONCRETE PILE CUT-OFF DETAILS SEE DWG S-7. PILES SHALL NOT BE DRIVEN BELOW THE DESIGN TIP ELEVATION UNLESS OTHERWISE DIRECTED BY THE PORT.
- FOR BULKHEAD STEEL PIPE PILE AND SHEET PILE CUT-OFF DETAILS, SEE DWGS S-22 & S-23.
- FOR FENDER SYSTEM DETAILS, SEE DWGS S-33 & S-34.
- BULKHEAD AND PILE CAPS STAGE 1, SHALL BE PLACED MONOLITHIC WITHOUT ANY CONSTRUCTION JOINTS.
- CONSTRUCTION JOINTS IN BULKHEAD SHALL BE PERMITTED BETWEEN PILE CAPS AND AWAY FROM PILE LOCATIONS.
- CUTOFF AND INCORPORATE TEST PILE INTO PILE CAP. (PILES BROKEN OFF



**LEGEND:**

- 24"  $\phi$  X 3/8" WALL STEEL PIPE PILE - 4:12 BATTER
- 24" HOLLOW OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- 24" SOLID OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- SHEET PILE BULKHEAD
- 16" SQUARE PRESTRESSED CONCRETE FENDER PILE
- PILE CUT-OFF ELEVATION
- PILE TIP ELEVATION
- SHEET PILE CUT-OFF ELEVATION
- SHEET PILE TIP ELEVATION
- EXISTING TEST PILE - BROKEN OFF AT MUDLINE
- TEST PILE - 24"  $\phi$  HOLLOW OCTAGONAL PLUMB CONCRETE; INCORPORATE INTO PILE CAP
- PILE CAP TAB-OUT



KEY PLAN

**AS-BUILT**

AUTOCAD FILE NO. **501282** **S-2**



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APPROVED 1/11/99  
DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

MFD 9/91  
DRAWN BY DATE  
FLY/FDP 9/91  
DESIGNED BY DATE

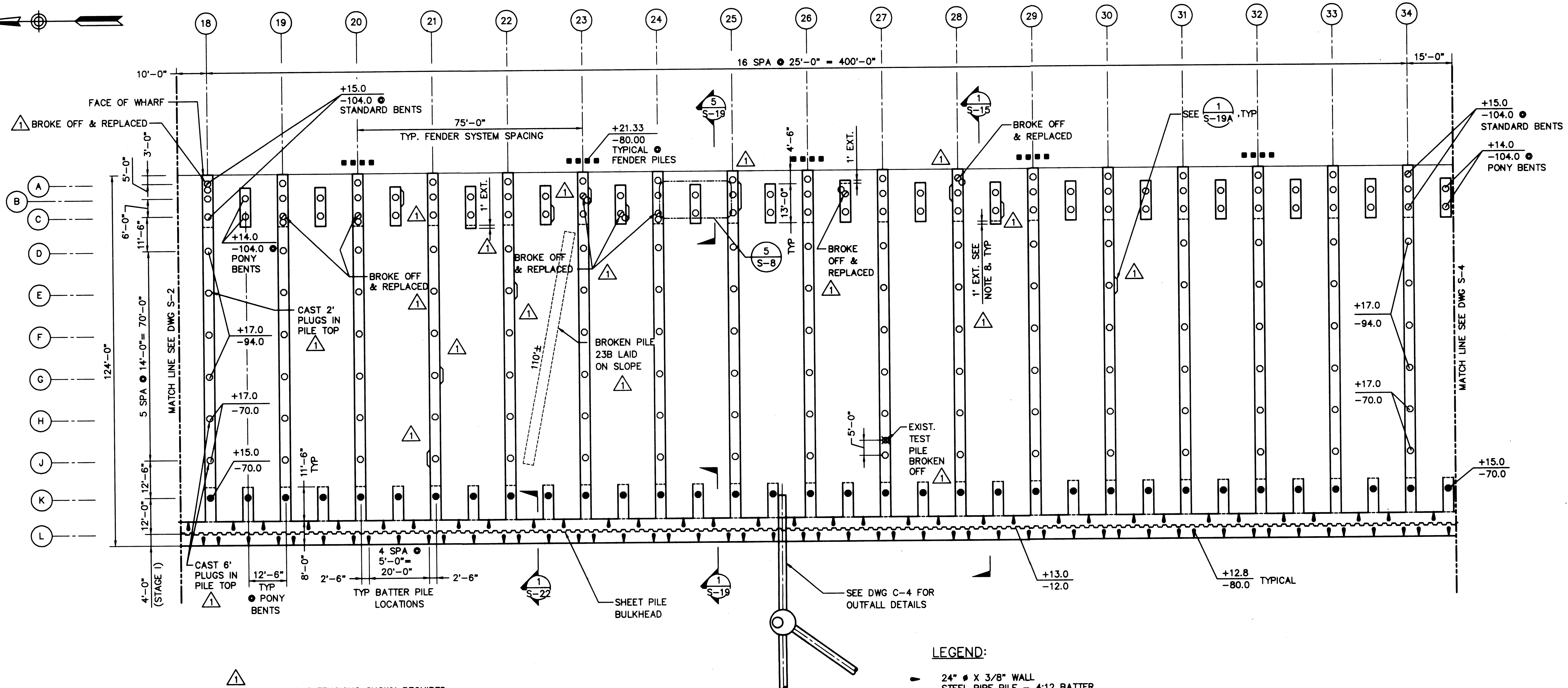
BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE

**HYUNDAI MERCHANT MARINE TERMINAL**  
**WHARF**  
**PORT OF TACOMA**  
**PILE & PILE CAP PLAN - SHEET 1**

DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **11** OF **58**

PLOTTED: Thu Jan 07 1999 2:23pm FILENAME: V:\1997\487093\CAD\AS-02.dwg SCALE: 1/2



**NOTES:**

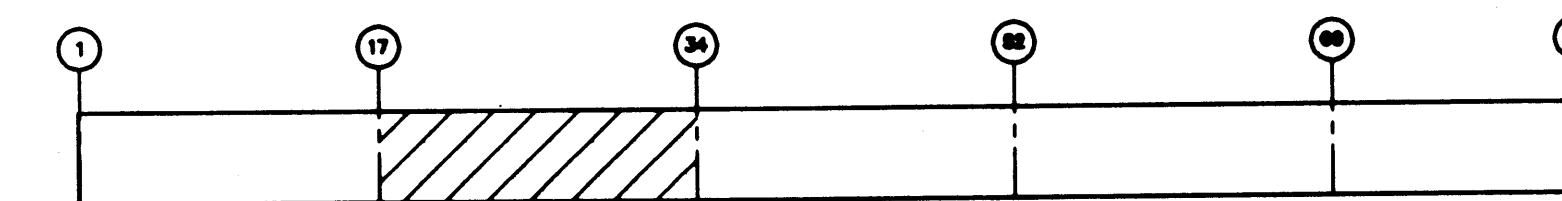
- FOR DETAILS OF PRECAST PRESTRESSED CONCRETE PILES, SEE DWGS S-31 & S-32.
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- FOR FENDER SYSTEM DETAILS, SEE DWGS S-33 & S-34.
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- CONSTRUCTION JOINTS IN BULKHEAD SHALL BE PERMITTED BETWEEN PILE CAPS AND AWAY FROM PILE LOCATIONS.
- CUTOFF AND INCORPORATE TEST PILE INTO PILE CAP. (PILES BROKEN OFF ● M) △

- PILE CAP EXTENSIONS SHOWN REQUIRED DUE TO MISALIGNED PILE. REINFORCING AS SHOWN DWG'S S-15 THROUGH S-19 TO BE EXTENDED TO ACCOMMODATE EXTENSIONS SHOWN.

**PILE AND PILE CAP PLAN**  
SCALE: 1/16"=1'-0"

**LEGEND:**

- 24" # X 3/8" WALL STEEL PIPE PILE - 4:12 BATTER
- 24" HOLLOW OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- 24" SOLID OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- ~~~~ SHEET PILE BULKHEAD
- 16" SQUARE PRESTRESSED CONCRETE FENDER PILE
- +XX.XX / -XX.XX PILE CUT-OFF ELEVATION / PILE TIP ELEVATION
- +XX.XX / -XX.XX SHEET PILE CUT-OFF ELEVATION / SHEET PILE TIP ELEVATION
- ⊗ TEST PILE - 24" # HOLLOW OCTAGONAL PLUMB CONCRETE; INCORPORATE INTO PILE CAP
- △ PILE CAP TAB-OUT



**KEY PLAN**

**AS-BUILT**

AUTOCAD FILE NO. **501283** **S-3**



**PORT OF TACOMA**  
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ENGINEERS INC.  
33301 9TH AVENUE SOUTH  
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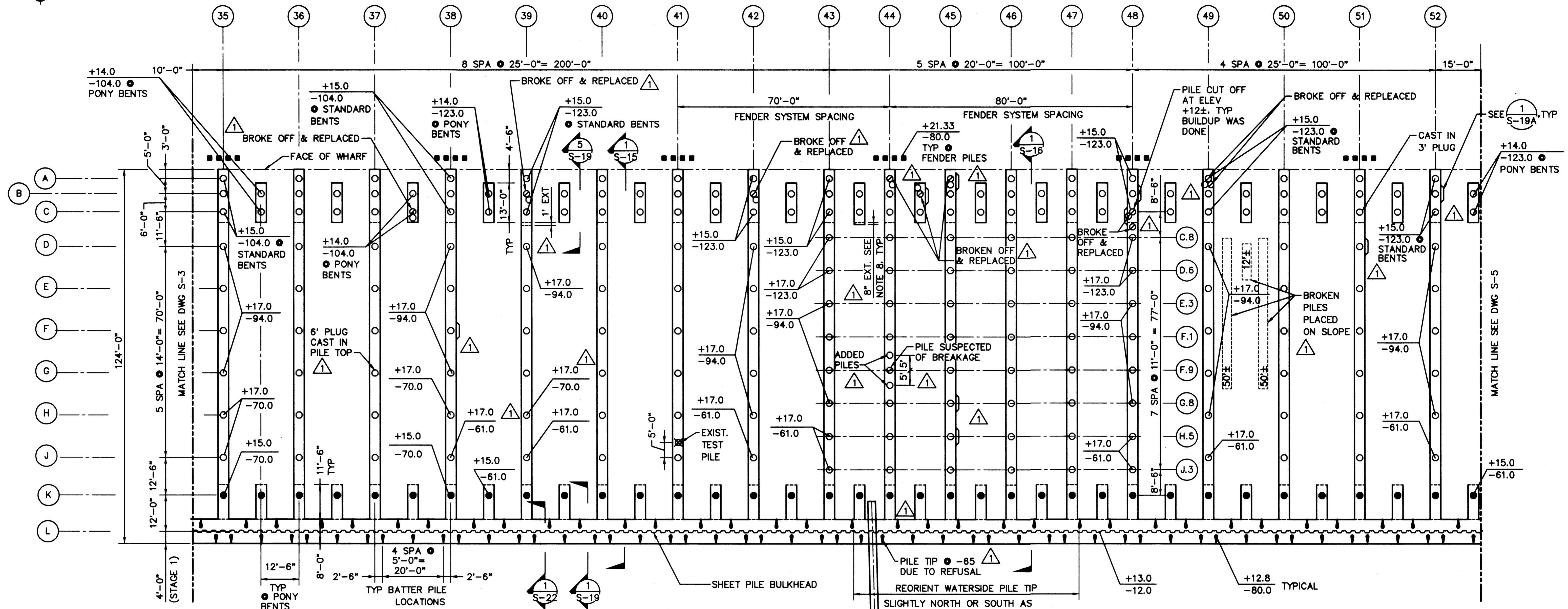
APPROVED: *[Signature]* 1/11/99  
DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

MMD 9/91  
DRAWN BY DATE  
BCM 9/91  
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JAS 9/91  
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AS-BUILT		REDD	JAG 1/4/99

**HYUNDAI MERCHANT MARINE TERMINAL**  
**WHARF**  
**PORT OF TACOMA**  
**PILE & PILE CAP PLAN - SHEET 2**

DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **12** OF **58**



**NOTES:**

- FOR DETAILS OF PRECAST PRESTRESSED CONCRETE PILES, SEE DWGS S-31 & S-32.
- FOR CONCRETE PILE CUT-OFF DETAILS SEE DWG S-7. PILES SHALL NOT BE DRIVEN BELOW THE DESIGN TIP ELEVATION UNLESS OTHERWISE DIRECTED BY THE PORT.
- FOR BULKHEAD STEEL PIPE PILE AND SHEET PILE CUT-OFF DETAILS, SEE DWGS S-22 & S-23.
- FOR FENDER SYSTEM DETAILS, SEE DWGS S-33 & S-34.
- BULKHEAD AND PILE CAPS STAGE 1, SHALL BE PLACED MONOLITHIC WITHOUT ANY CONSTRUCTION JOINTS.
- CONSTRUCTION JOINTS IN BULKHEAD SHALL BE PERMITTED BETWEEN PILE CAPS AND AWAY FROM PILE LOCATIONS.
- CUTOFF AND INCORPORATE TEST PILE INTO PILE CAP. (PILE BROKEN OFF @ M)

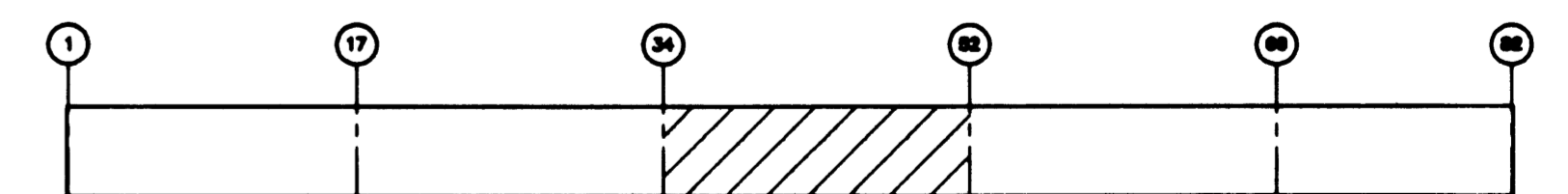


- PILE CAP EXTENSIONS SHOWN REQUIRED DUE TO MISALIGNED PILE. REINFORCING AS SHOWN DWG'S S-15 THROUGH S-19 TO BE EXTENDED TO ACCOMMODATE EXTENSIONS SHOWN.

**LEGEND:**

- 24"  $\phi$  X 3/8" WALL STEEL PIPE PILE - 4:12 BATTER
- 24" HOLLOW OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- 24" SOLID OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- SHEET PILE BULKHEAD
- 16" SQUARE PRESTRESSED CONCRETE FENDER PILE
- +XX.XX PILE CUT-OFF ELEVATION  
-XX.XX PILE TIP ELEVATION
- +XX.XX SHEET PILE CUT-OFF ELEVATION  
-XX.XX SHEET PILE TIP ELEVATION
- TEST PILE - 24"  $\phi$  HOLLOW OCTAGONAL PLUMB CONCRETE; INCORPORATE INTO PILE CAP
- PILE CAP TAB-OUT

**1**  
S-4 **PILE AND PILE CAP PLAN**  
SCALE: 1/16"=1'-0"



**KEY PLAN**

**AS-BUILT**

AUTOCAD FILE NO. **501284** **S-4**

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APPROVED  
*[Signature]* 1/11/99  
DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

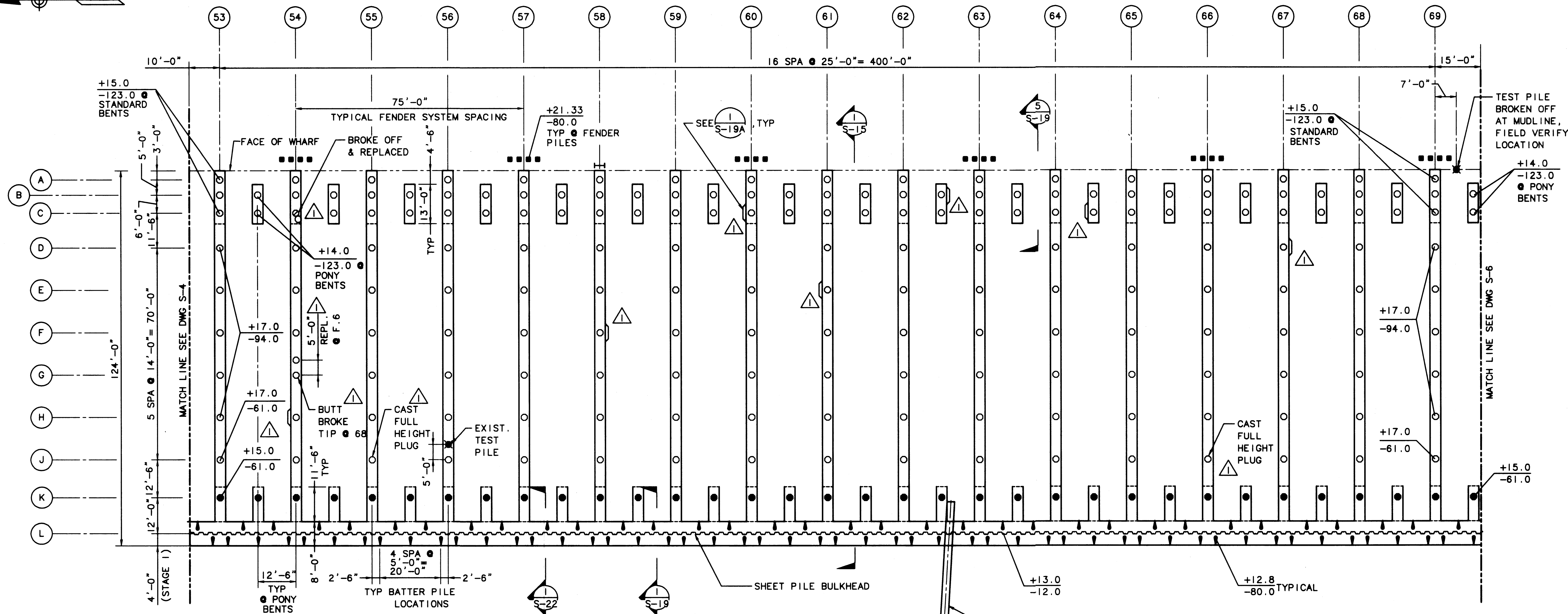
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DESIGNED BY DATE

BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

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**HYUNDAI MERCHANT MARINE TERMINAL**  
**WHARF**  
**PORT OF TACOMA**  
**PILE & PILE CAP PLAN - SHEET 3**

DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **13** OF **58**



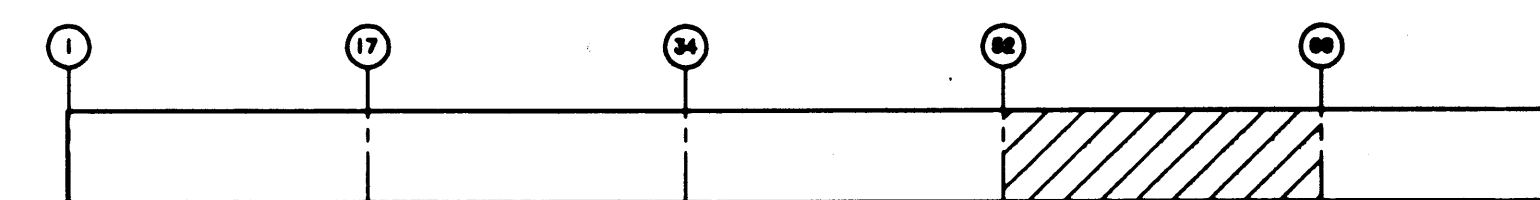
**NOTES:**

- FOR DETAILS OF PRECAST PRESTRESSED CONCRETE PILES, SEE DWGS S-31 & S-32.
- FOR CONCRETE PILE CUT-OFF DETAILS SEE DWG S-7. PILES SHALL NOT BE DRIVEN BELOW THE DESIGN TIP ELEVATION UNLESS OTHERWISE DIRECTED BY THE PORT.
- FOR BULKHEAD STEEL PIPE PILE AND SHEET PILE CUT-OFF DETAILS, SEE DWGS S-22 & S-23.
- FOR FENDER SYSTEM DETAILS, SEE DWGS S-33 & S-34.
- BULKHEAD AND PILE CAPS STAGE I, SHALL BE PLACED MONOLITHIC WITHOUT ANY CONSTRUCTION JOINTS.
- CONSTRUCTION JOINTS IN BULKHEAD SHALL BE PERMITTED BETWEEN PILE CAPS AND AWAY FROM PILE LOCATIONS.
- CUTOFF AND INCORPORATE TEST PILE INTO PILE CAP.

**LEGEND:**

- 24" X 3/8" WALL STEEL PIPE PILE - 4:12 BATTER
- 24" HOLLOW OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- 24" SOLID OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- SHEET PILE BULKHEAD
- 16" SQUARE PRESTRESSED CONCRETE FENDER PILE
- +XX.XX PILE CUT-OFF ELEVATION
- XX.XX PILE TIP ELEVATION
- +XX.XX SHEET PILE CUT-OFF ELEVATION
- XX.XX SHEET PILE TIP ELEVATION
- EXISTING TEST PILE - BROKEN OFF AT MUDLINE
- TEST PILE - 24" HOLLOW OCTAGONAL PLUMB CONCRETE; INCORPORATE INTO PILE CAP
- PILE CAP TAB-OUT

**1**  
S-5 **PILE AND PILE CAP PLAN**  
SCALE: 1/16"=1'-0"



**KEY PLAN**

**AS-BUILT**

AUTOCAD FILE NO. <b>601285</b>	<b>S-5</b>
DRAWING NO. <b>EP-5012-26</b>	
CONTRACT NO. <b>978038</b>	
SHEET NO. <b>14</b> OF <b>57</b>	



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APPROVED  
*Curtis L. Ratcliffe*  
DATE: 1/11/99  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

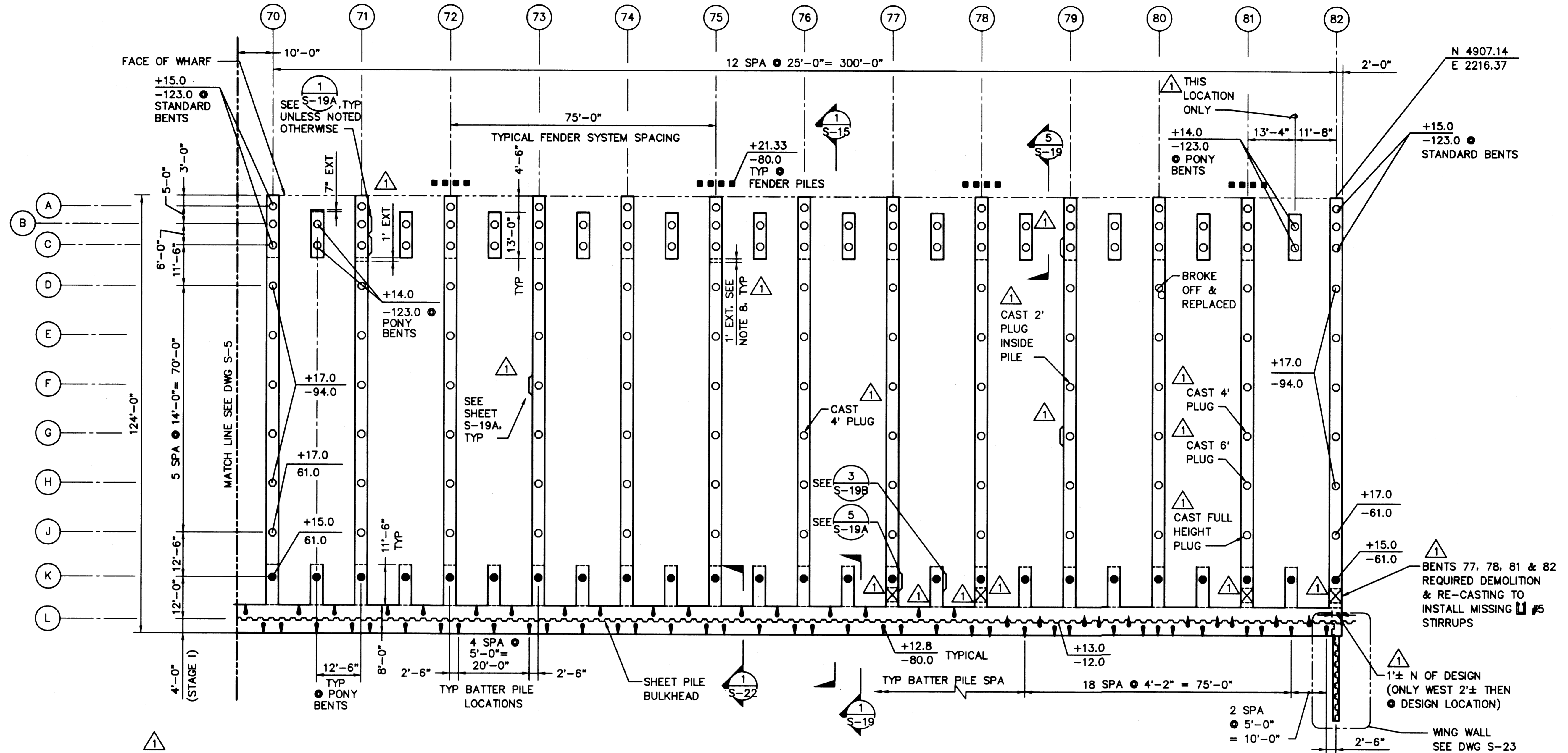
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BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE
	AS-BUILT	RDD	JAS	1/4/99

**HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
PILE & PILE CAP PLAN - SHEET 4**

PLOTTED: Thu Jan 07 1999 2:24pm FILENAME: V:\1997\487083\CAD\S-05.dwg SCALE: 1/16"



**NOTES:**

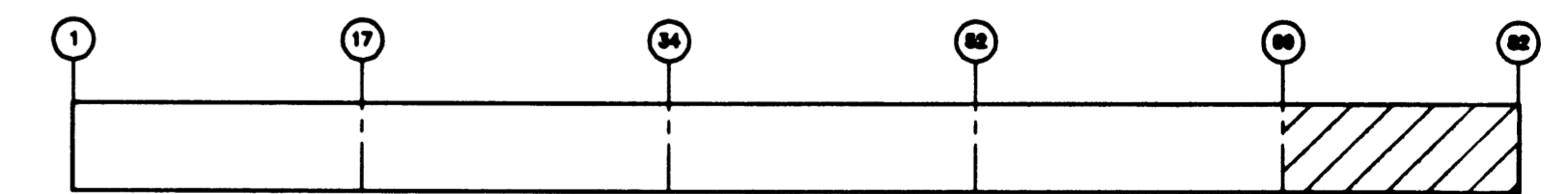
- FOR DETAILS OF PRECAST PRESTRESSED CONCRETE PILES, SEE DWGS S-31 & S-32.
- FOR CONCRETE PILE CUT-OFF DETAILS SEE DWG S-7. PILES SHALL NOT BE DRIVEN BELOW THE DESIGN TIP ELEVATION UNLESS OTHERWISE DIRECTED BY THE PORT.
- FOR BULKHEAD STEEL PIPE PILE AND SHEET PILE CUT-OFF DETAILS, SEE DWGS S-22 & S-23.
- FOR FENDER SYSTEM DETAILS, SEE DWGS S-33 & S-34.
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- CONSTRUCTION JOINTS IN BULKHEAD SHALL BE PERMITTED BETWEEN PILE CAPS AND AWAY FROM PILE LOCATIONS.

- PILE CAP EXTENSIONS SHOWN REQUIRED DUE TO MISALIGNED PILE. REINFORCING AS SHOWN DWG'S S-15 THROUGH S-19 TO BE EXTENDED TO ACCOMMODATE EXTENSIONS SHOWN.

**PILE AND PILE CAP PLAN**  
SCALE: 1/16"=1'-0"

**LEGEND:**

- 24" Ø X 3/8" WALL STEEL PIPE PILE - 4:12 BATTER
- 24" HOLLOW OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- 24" SOLID OCTAGONAL PRECAST CONCRETE PILE - PLUMB
- SHEET PILE BULKHEAD
- 16" SQUARE PRESTRESSED CONCRETE FENDER PILE
- +XX.XX PILE CUT-OFF ELEVATION
- XX.XX PILE TIP ELEVATION
- +XX.XX SHEET PILE CUT-OFF ELEVATION
- XX.XX SHEET PILE TIP ELEVATION
- PILE CAP TAB-OUT



**KEY PLAN**

**AS-BUILT**

AUTOCAD FILE NO. 501286 **S-6**

**PORT OF TACOMA**  
P.O. BOX 1837 TACOMA, WASHINGTON 98401  
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**BERGER/ABAM**  
ENGINEERS INC.  
33301 9TH AVENUE SOUTH  
FEDERAL WAY, WASHINGTON 98003-6395  
(206)431-2300 FAX:(206)431-2250

APPROVED: *Curtis L. Ratcliffe* 1/11/99  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

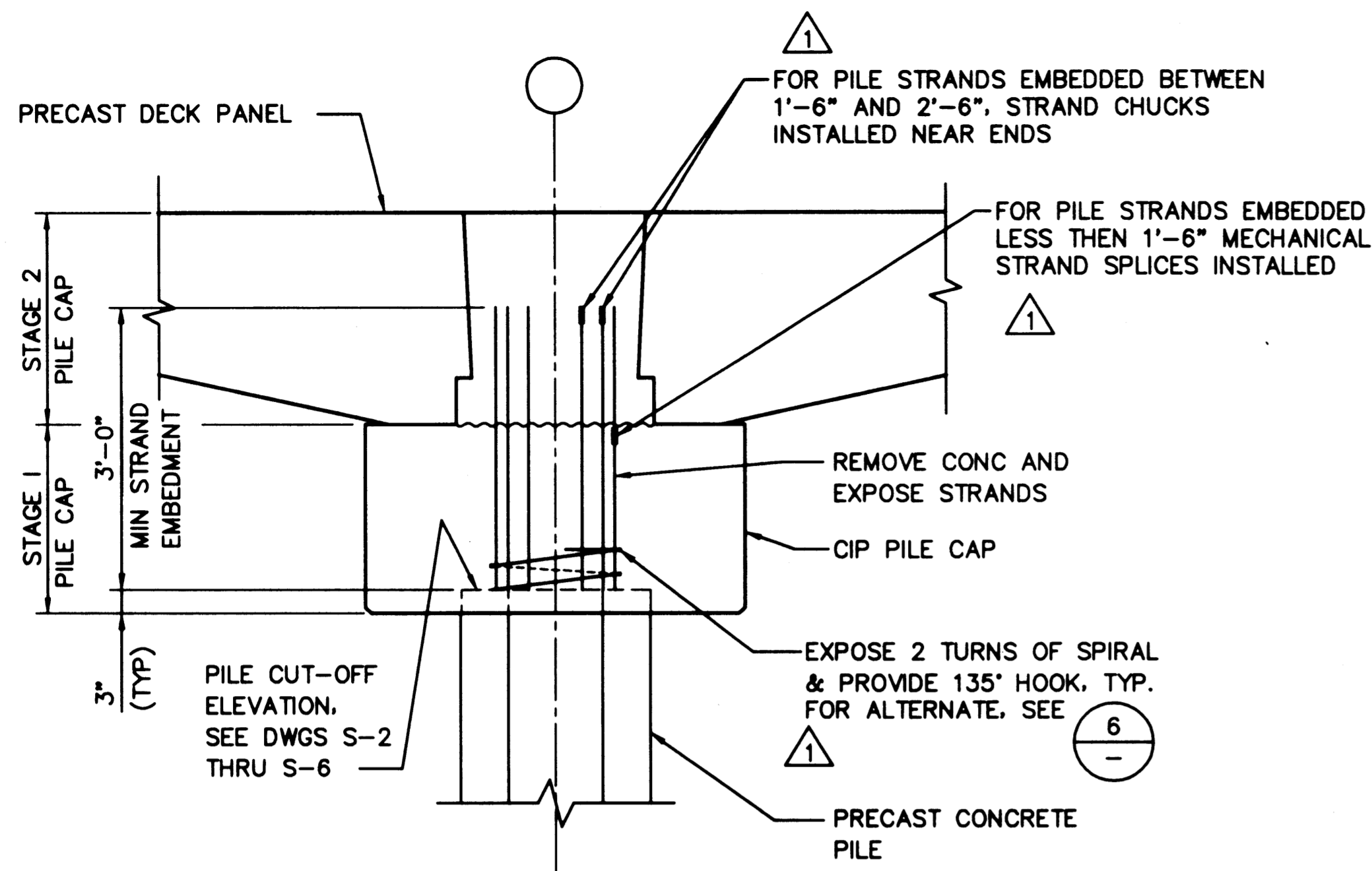
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DESIGNED BY	DATE	PROJ ENGR	DATE

AS-BUILT	RDD	JAS	1/4/99
MARK	REVISION	BY	APP. DATE

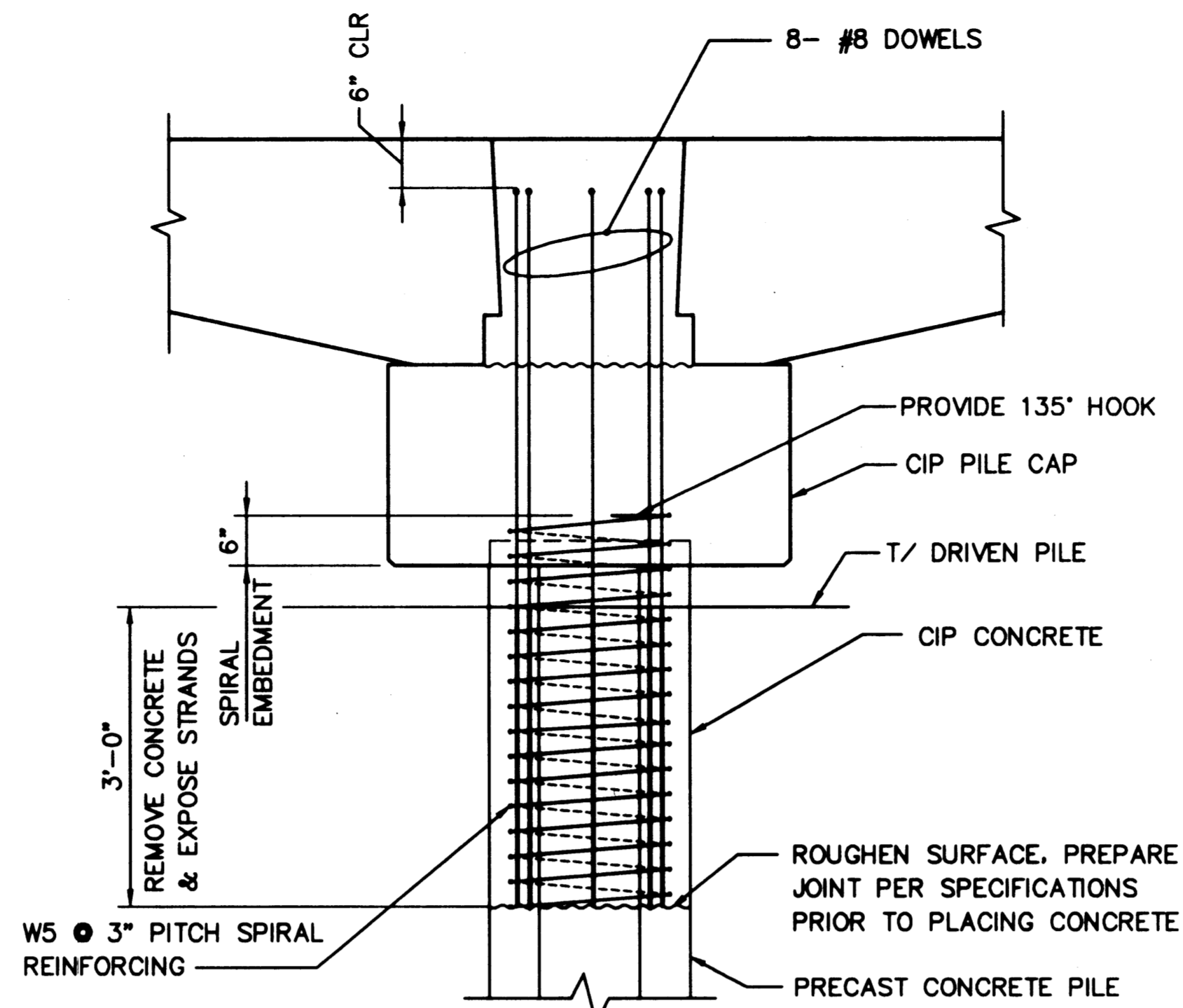
**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**PILE & PILE CAP PLAN - SHEET 5**

DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **15** OF **58**

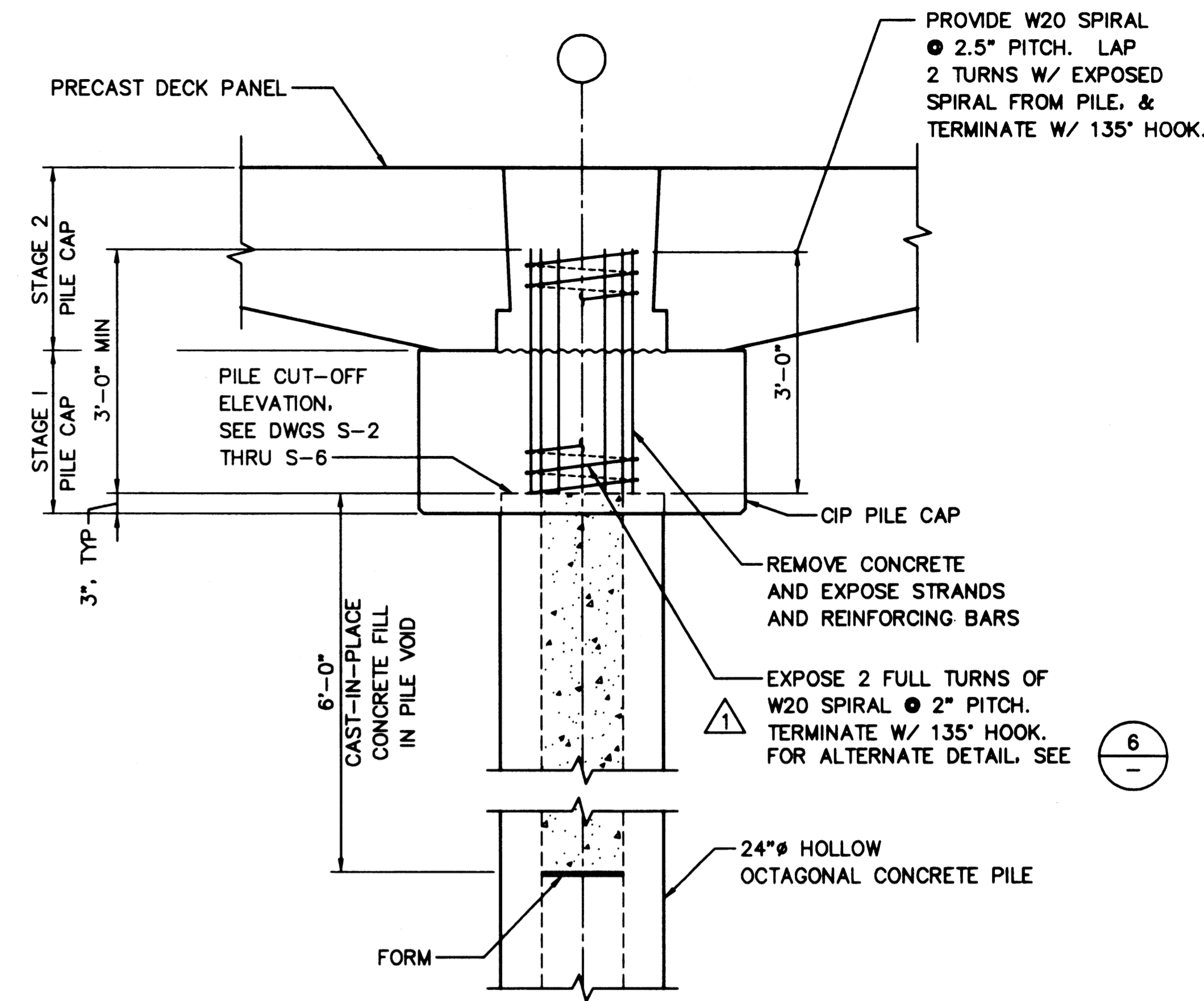
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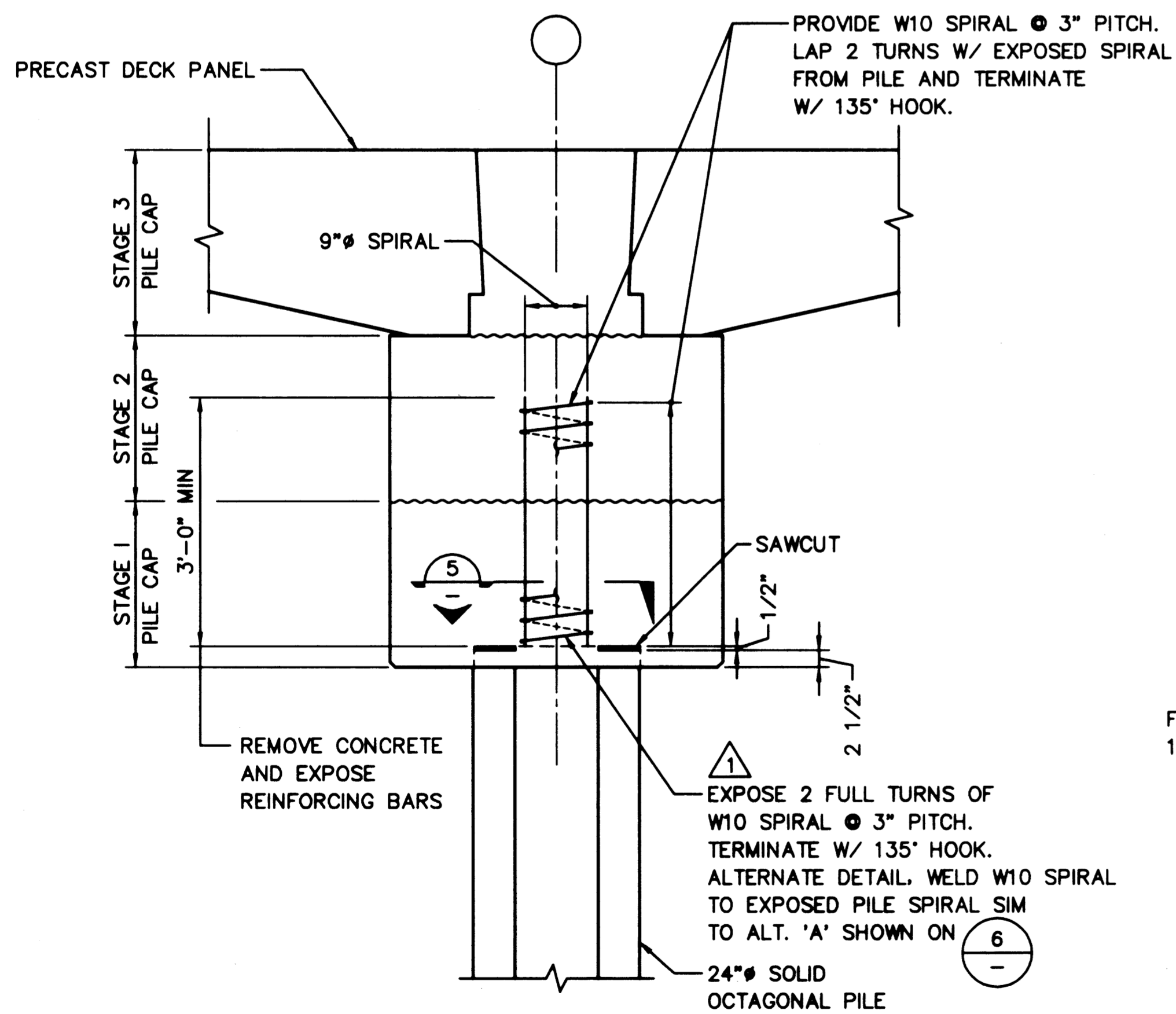
1 DETAIL - PILE CUT-OFF  
SCALE: 3/4"=1'-0"



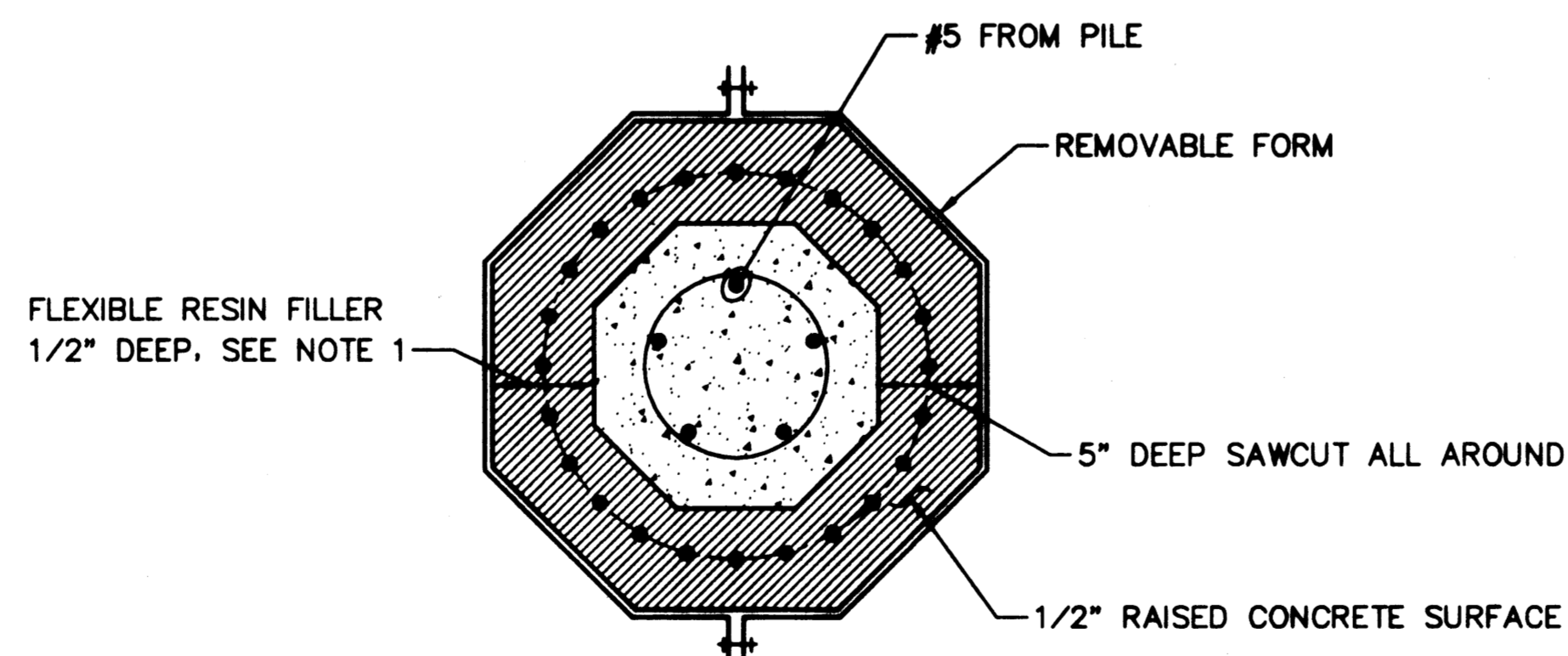
2 DETAIL - PILE BUILD-UP  
SCALE: 3/4"=1'-0"  
(PILE TOP BELOW CUTOFF)



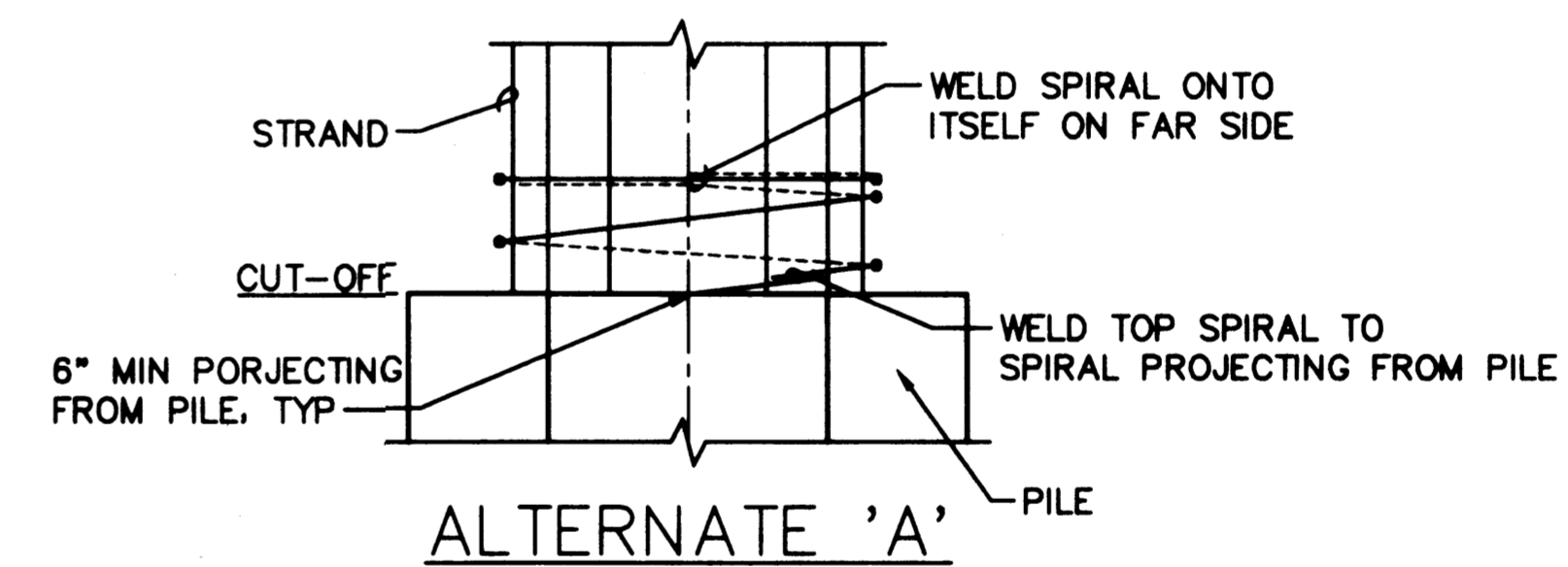
3 DETAIL - PILE CUT-OFF @ ROWS  
SCALE: 3/4"=1'-0"  
H, J, G.8, H.5 & J.3



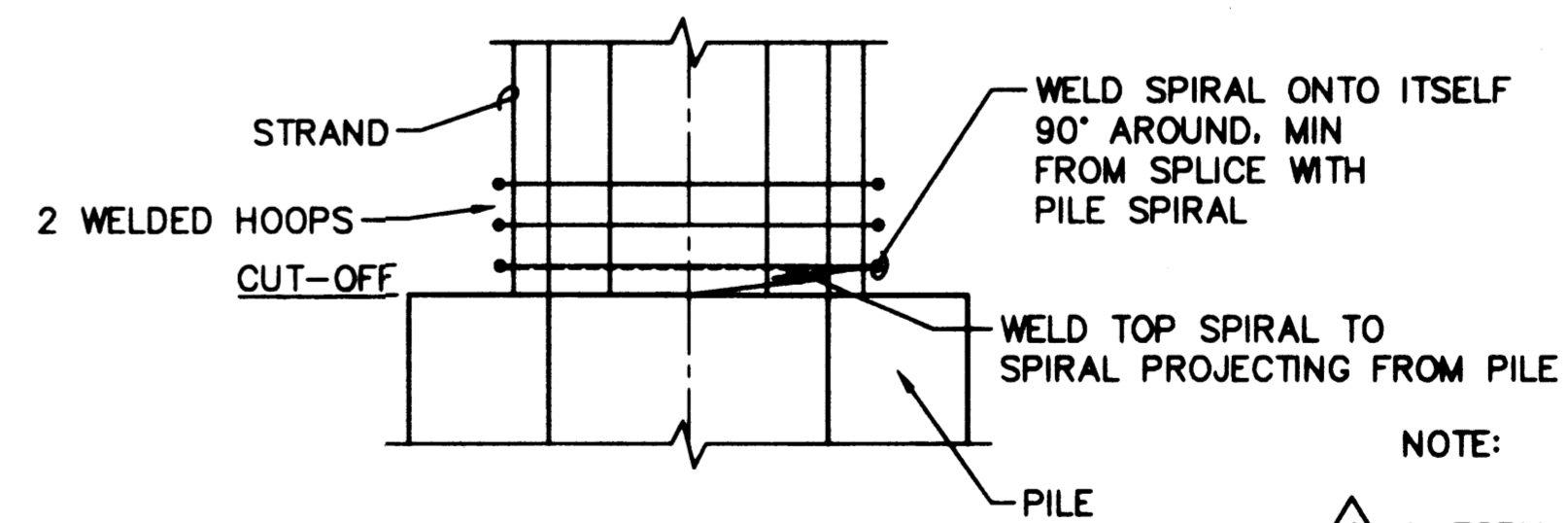
4 DETAIL - PILE CUT-OFF @ ROW  
SCALE: 3/4"=1'-0"



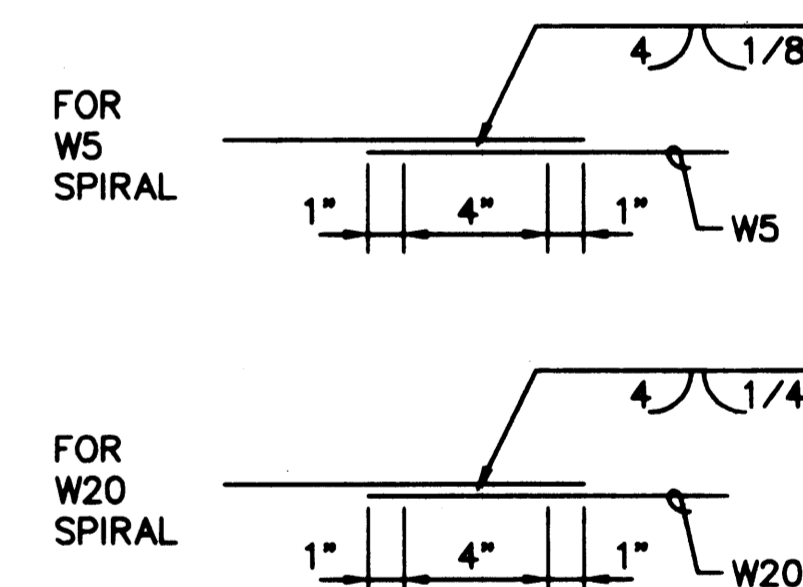
5 SECTION  
SCALE: 1 1/2"=1'-0"



ALTERNATE 'A'



ALTERNATE 'B'



WELD DETAIL

6 ALTERNATE SPIRAL DETAILS  
SCALE: 1 1/2"=1'-0"

- NOTE:
- FORM AND POUR SIKADUR 22 LOW MOD EPOXY RESIN AS SHOWN, AROUND FULL PERIMETER OF PILE. POUR AND CURE PER MANUFACTURERS SPECIFICATIONS FOR A TACK FREE SURFACE.
  - FOR STEEL PIPE PILES & SHEET PILE CUT-OFF DETAILS, SEE DWG S-22.

AS-BUILT

AUTOCAD FILE NO. 501287 S-7



PORT OF TACOMA  
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APPROVED  
CURTIS L. RATCLIFFE P.E.  
DATE 1/11/99  
CHIEF ENGINEER

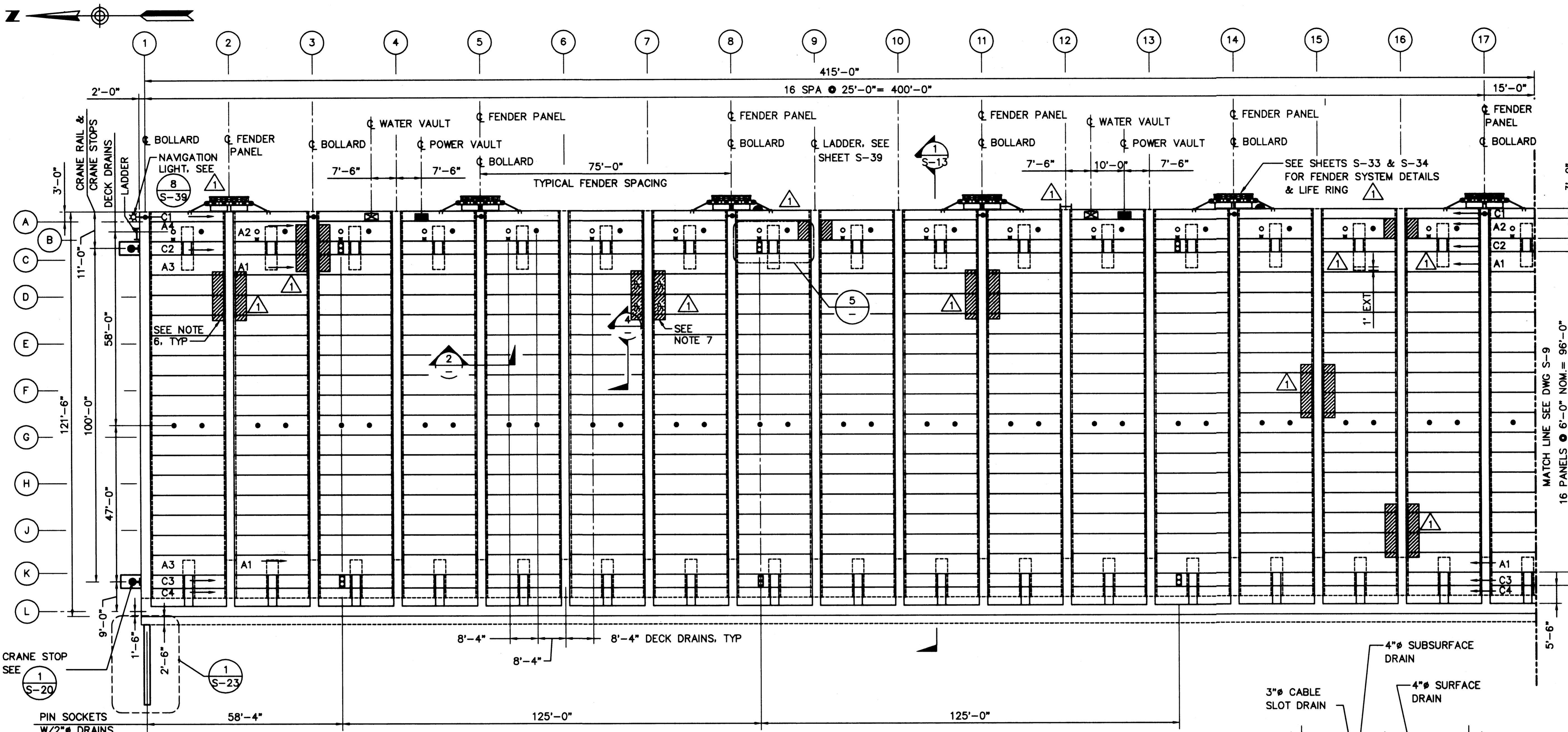
MMD 9/91  
DRAWN BY DATE  
DESIGNED BY DATE

BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE

HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
PILE TO PILE CAP CONNECTION DETAILS

DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 16 OF 58

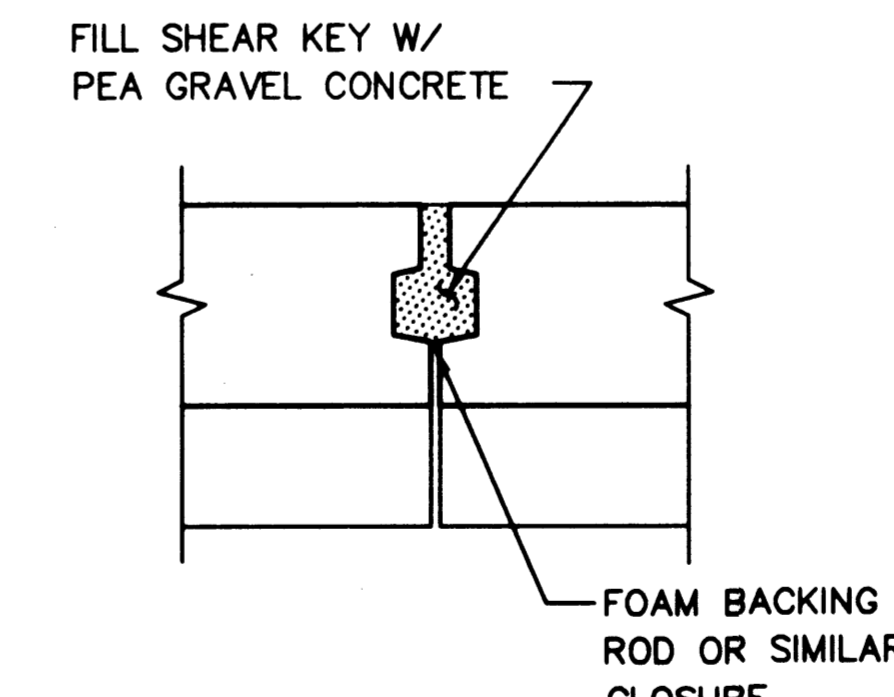
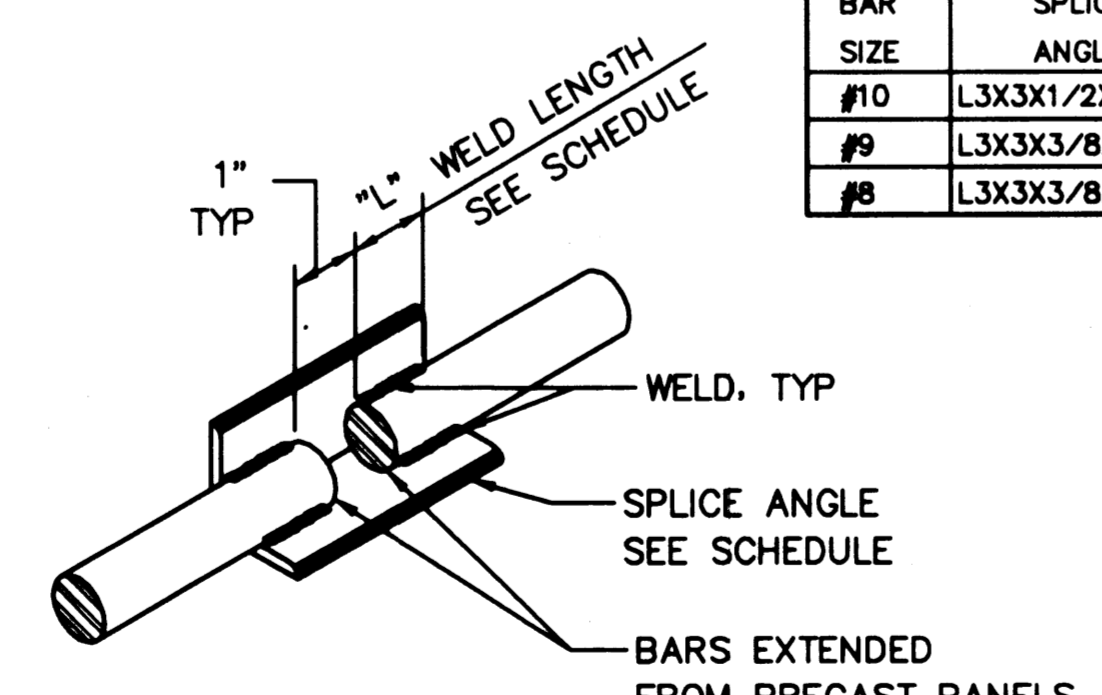


- NOTES:**
- FOR DECK PANEL DETAILS, SEE DWGS S-26 THROUGH S-30
  - FOR SURFACE AND SUBSURFACE DRAIN DETAILS, SEE DWG C-1
  - FOR CABLE SLOT DRAIN DETAILS, SEE DWG S-35
  - FOR UTILITY VAULT DETAILS, SEE DWG S-38
  - FOR BOLLARD DETAILS, SEE DWG S-25
  - DECK PANELS NOTED: HAVE STRAND CHUCKS INSTALLED AT ENDS OF 1'-2" PROJECTING STRANDS FOR ADDED DEVELOPMENT DUE TO PILE TAB-OUTS BELOW.
  - DECK PANELS NOTED: HAVE #6 DOWELS INSTALLED TO MAKE UP FOR MISSING STRANDS WHEN PILE TAB-OUT WAS BELOW.

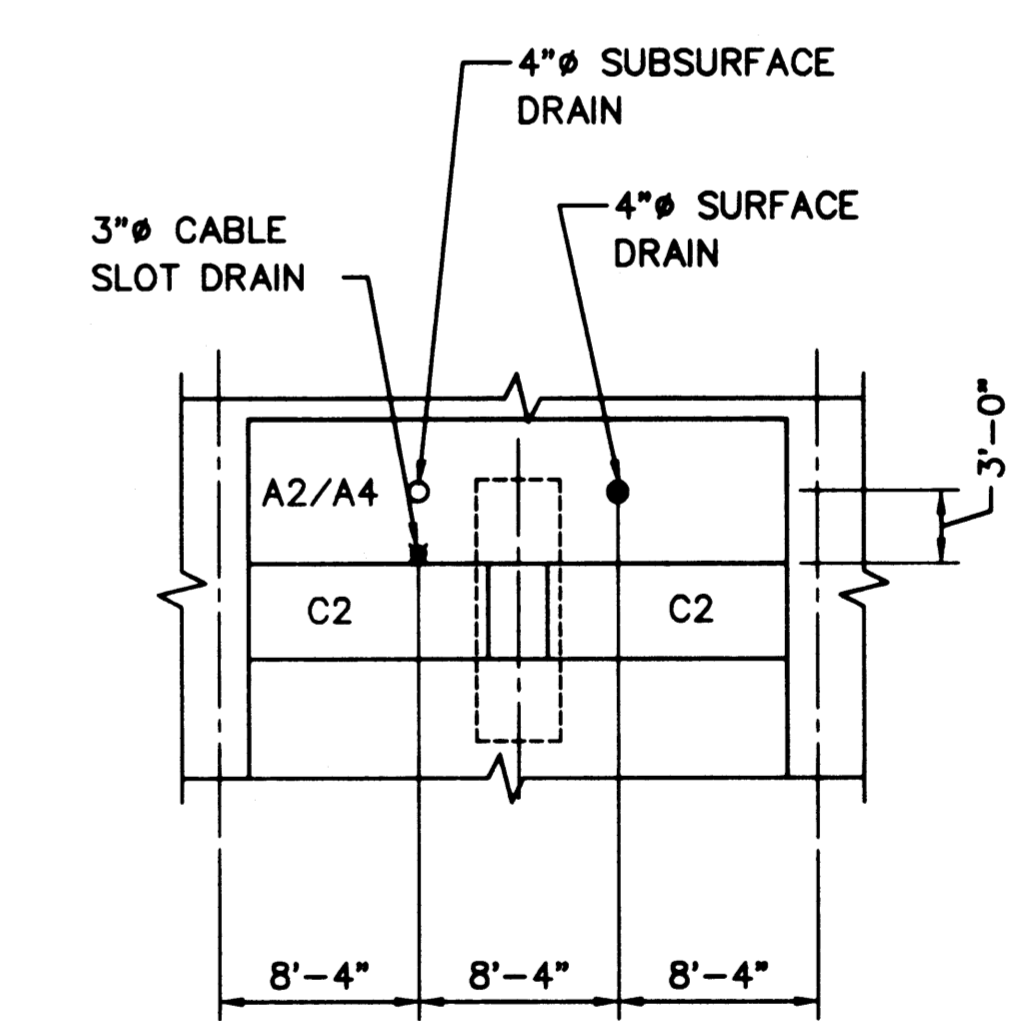
**1 DECK PLAN**  
SCALE: 1/16"=1'-0"

BAR SIZE	SPLICE ANGLE	WELD SIZE THROAT "T"	REIN "R"	WELD LENGTH "L"
#10	L3X3X1/2X1'-5"	1/4" MIN	1/8" MAX	7"
#9	L3X3X3/8X1'-2"	1/4" MIN	1/8" MAX	6"
#8	L3X3X3/8X1'-2"	1/4" MIN	1/8" MAX	5 1/2"

**3 REBAR SPLICE**  
SCALE: NONE



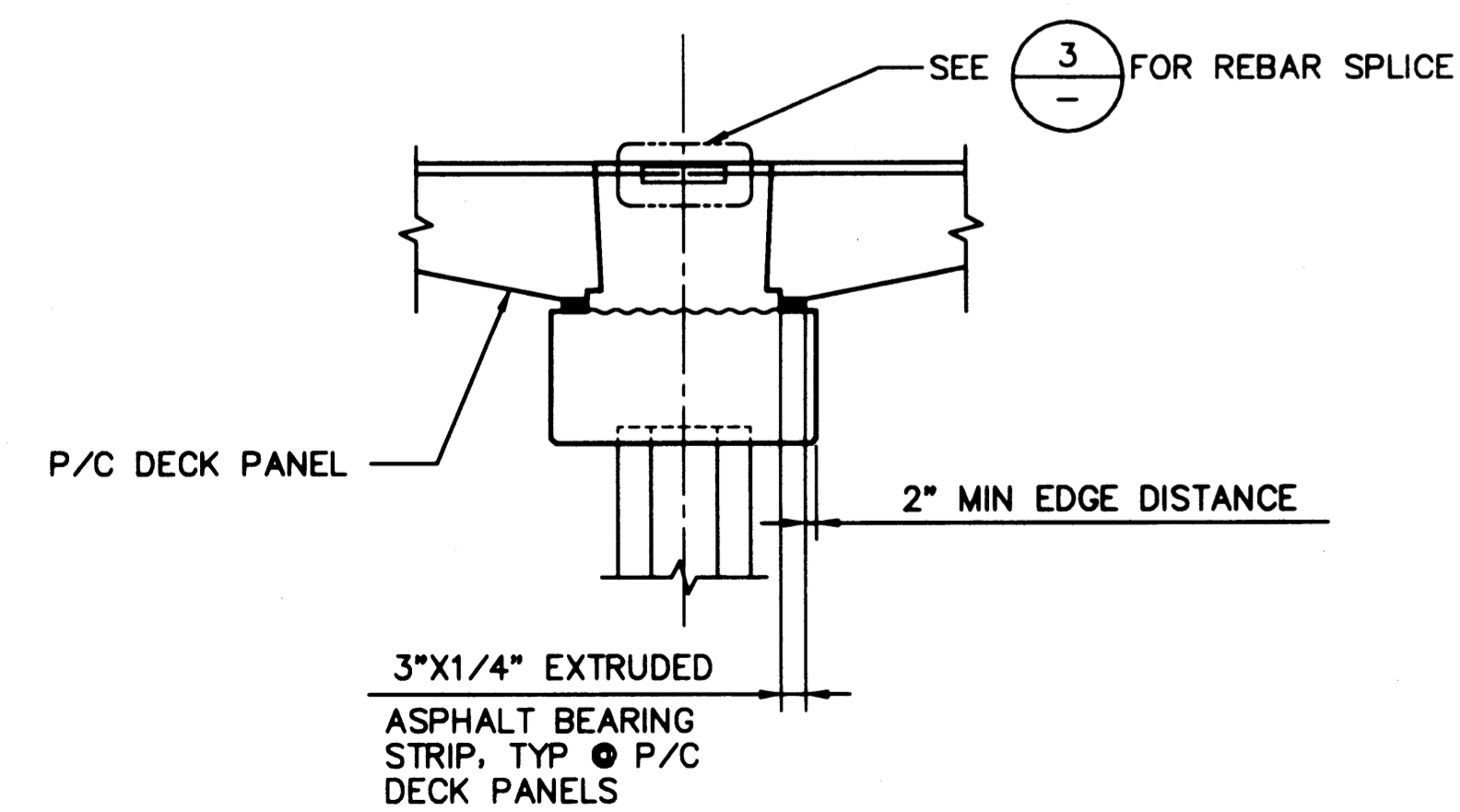
**4 SHEAR KEY**  
SCALE: NONE



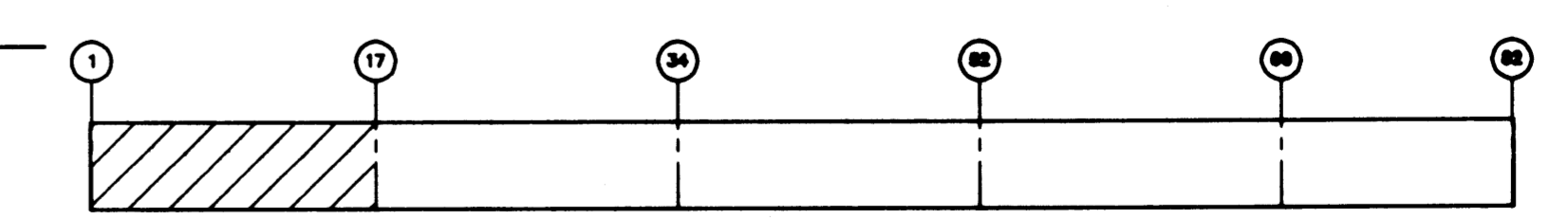
**5 TYPICAL DRAIN LAYOUT-A2 & A4 PANELS**  
SCALE: NONE

**LEGEND**

A/B/C	DECK PANEL DESIGNATION
	BOLLARD
	CRANE STOP
	SUBSURFACE DRAIN
	DECK DRAIN
	CABLE SLOT DRAIN
	LADDER
	PIN SOCKET W/2" DRAIN
	LIFE RING
	POWER VAULT
	WATER VAULT



**2 SECTION - PILE CAP**  
SCALE: 3/8"=1'-0"



**KEY PLAN**

**AS-BUILT**

AUTOCAD FILE NO.	<b>S-8</b>
<b>601288</b>	

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APPROVED  
*Curtis L. Ratcliffe*  
DATE 1/16/99  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

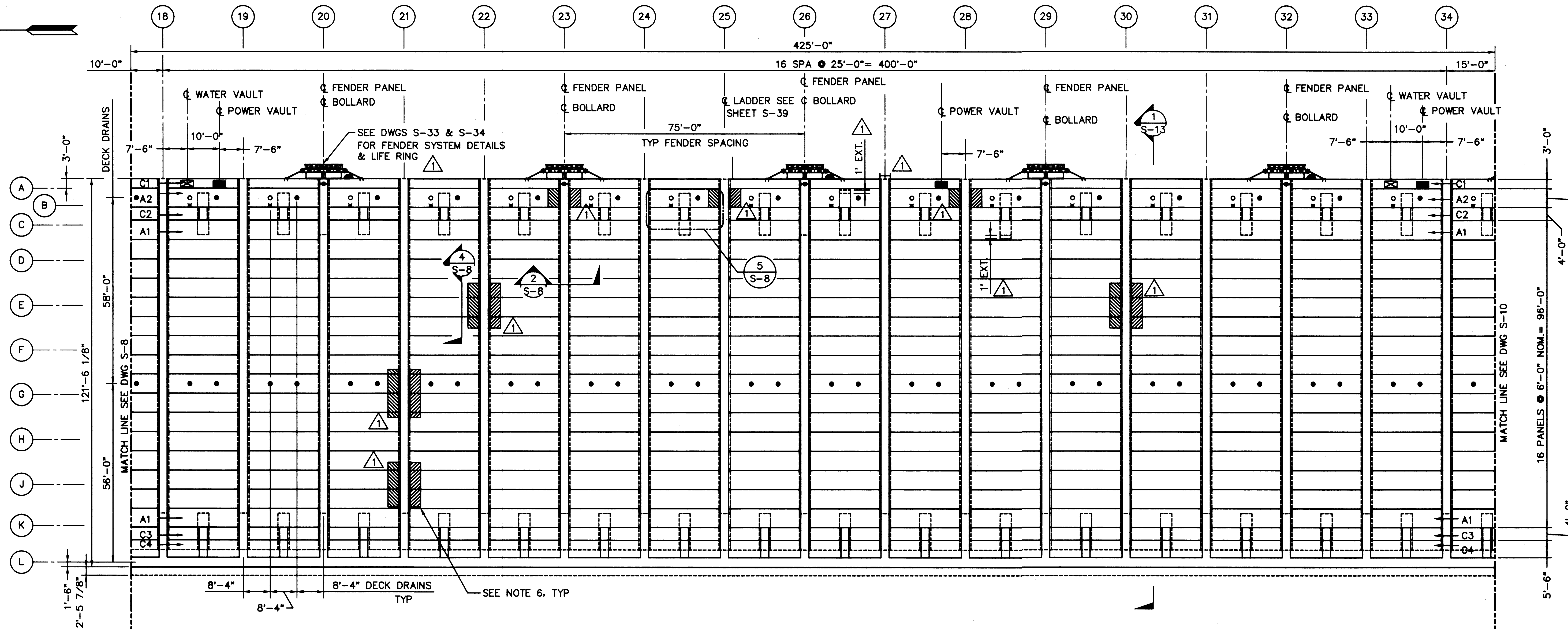
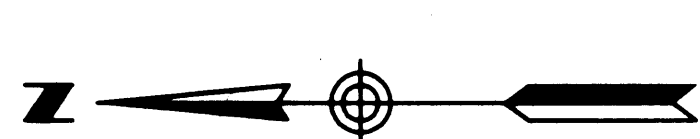
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DRAWN BY	DATE	CHECKED BY	DATE
DESIGNED BY	DATE	PROJ ENGR	DATE
	9/91	JAS	9/91

AS-BUILT	RDD	JAS	1/4/99
MARK	REVISION	BY	APP. DATE

**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**DECK PLAN - SHEET 1**

DRAWING NO.	<b>EP-5012-26</b>
CONTRACT NO.	<b>978038</b>
SHEET NO.	<b>17 OF 58</b>

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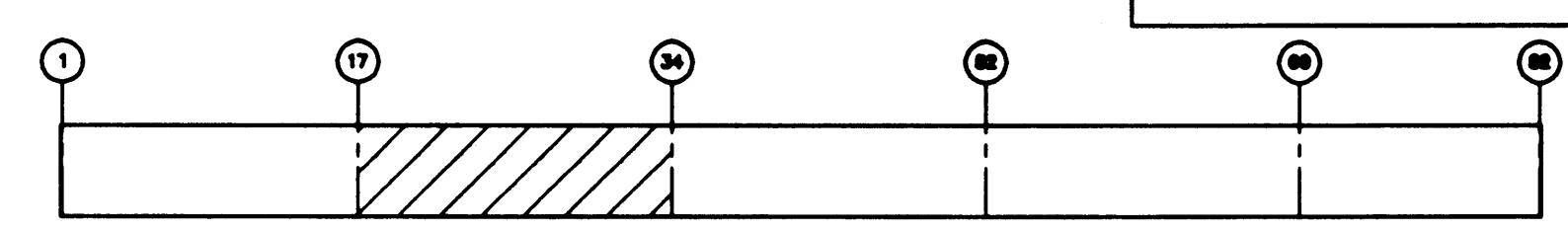


1 DECK PLAN  
S-9 SCALE: 1/16"=1'-0"

NOTES:

- FOR DECK PANEL DETAILS, SEE DWGS S-26 THROUGH S-30
- FOR SURFACE AND SUBSURFACE DRAIN DETAILS, SEE DWG C-1
- FOR CABLE SLOT DRAIN DETAILS, SEE DWG S-35
- FOR UTILITY VAULT DETAILS, SEE DWG S-38
- FOR BOLLARD DETAILS, SEE DWG S-25
- DECK PANELS NOTED: HAVE STRAND CHUCKS INSTALLED AT ENDS OF 1'-2" PROJECTING STRANDS FOR ADDED DEVELOPMENT DUE TO PILE TAB-OUTS BELOW.

LEGEND	
A/B/C	DECK PANEL DESIGNATION
	BOLLARD
	CRANE STOP
	SUBSURFACE DRAIN
	DECK DRAIN
	CABLE SLOT DRAIN
	LADDER
	PIN SOCKET W/2" DRAIN
	LIFE RING
	POWER VAULT
	WATER VAULT



KEY PLAN

AS-BUILT

AUTOCAD FILE NO. <b>501289</b>	<b>S-9</b>
DRAWING NO. <b>EP-5012-26</b>	
CONTRACT NO. <b>978038</b>	
SHEET NO. <b>18</b> OF <b>58</b>	

PLOTTED: Thu Jan 07 1999 2:00pm FILENAME: V:\1997\497083\CAD\AS-09.dwg SCALE: 1/16"

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33301 9TH AVENUE SOUTH  
FEDERAL WAY, WASHINGTON 98003-8385  
(206)431-2300 FAX(206)431-2250

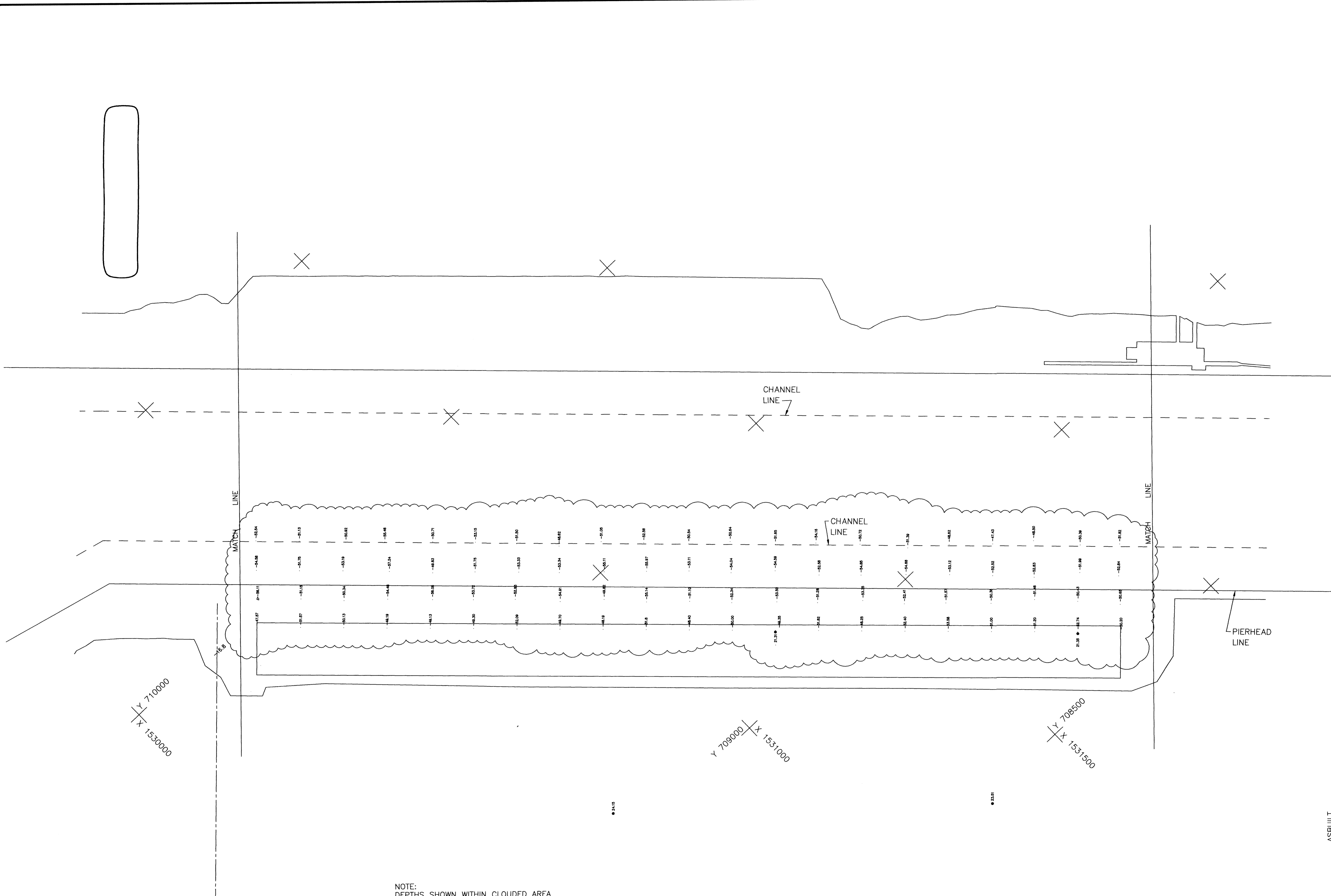
APPROVED:   
DATE: 1/11/99  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

MM/D  
DRAWN BY DATE  
DESIGNED BY DATE

BCM  
CHECKED BY DATE  
JAS  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE
	AS-BUILT	RDD	JAS	1/4/99

**HYUNDAI MERCHANT MARINE TERMINAL**  
WHARF  
PORT OF TACOMA  
DECK PLAN - SHEET 2



NOTE:  
 DEPTHS SHOWN WITHIN CLOUDED AREA  
 WERE OBTAINED 11/11/98 & 11/12/98  
 BY APEX ENGINEERING.

DESIGN	Steve W. Wilson
DRAWN	
CHECKED	
SEC	T R
DISC NO	
DATE	11/13/99
SCALE	1"=100'

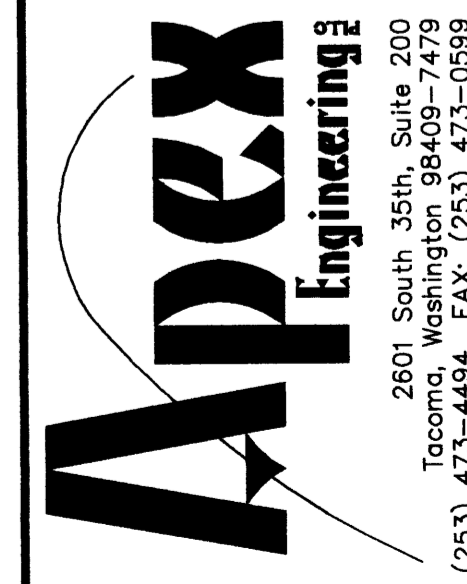
PROJECT MANAGER:	MEI Garland	SIGNATURE:	DATE	BY
REVISION DESCRIPTION				
REV NO				

DATE SEALED

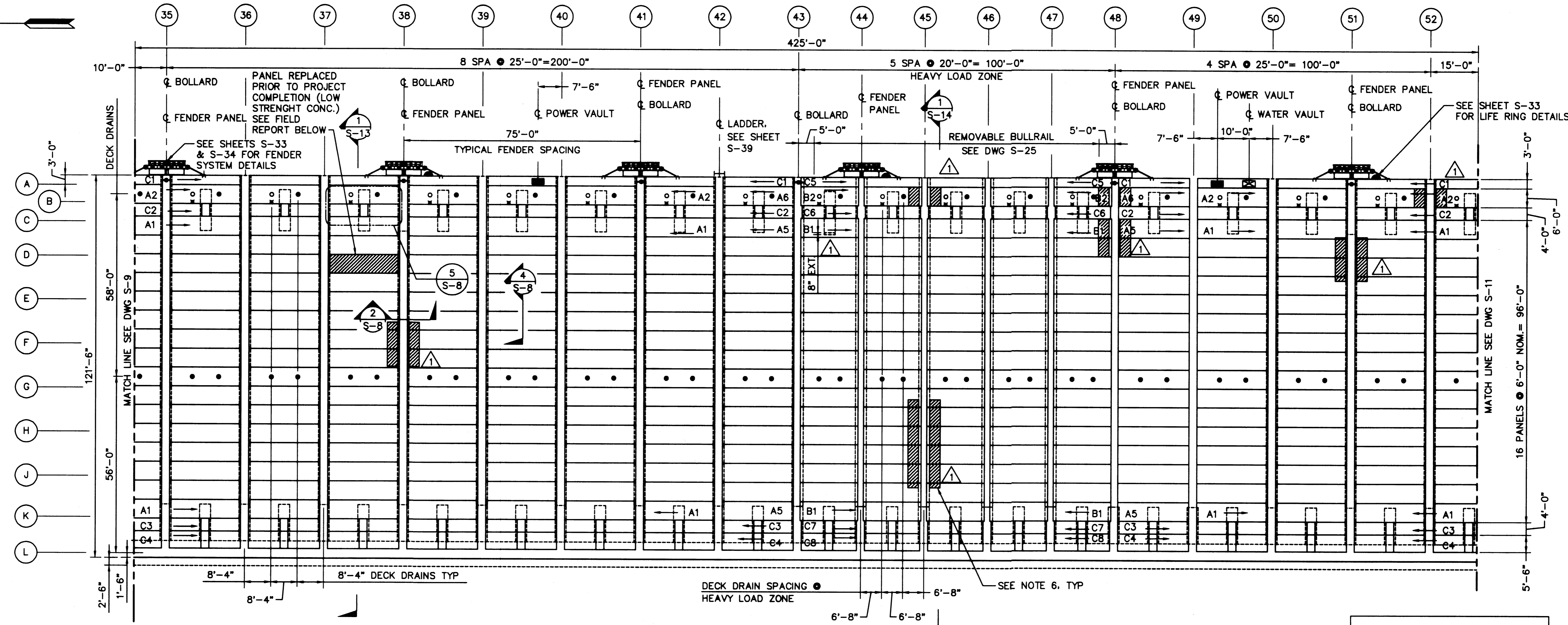
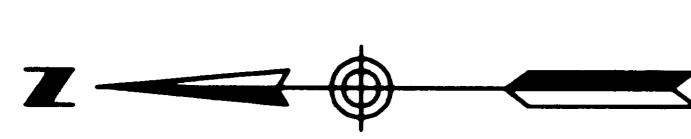


TITLE  
**Hyundai Merchant Marine Terminal Wharf**  
 Dredge Topog

CLIENT  
**PORT OF TACOMA**



ASBUILT



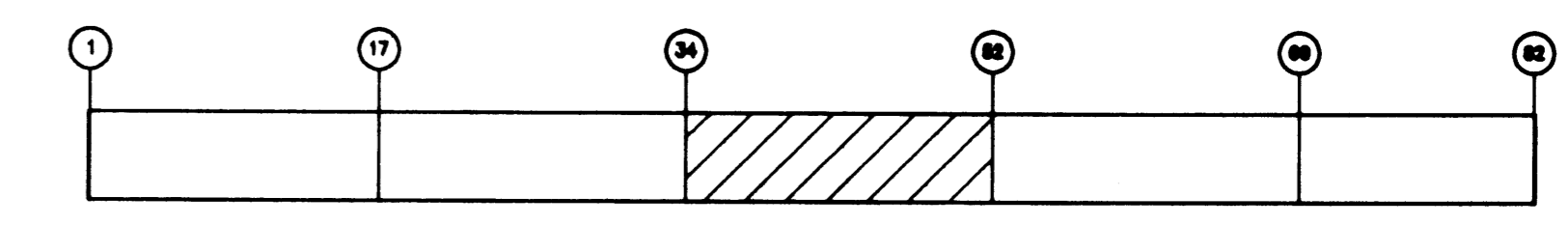
**DECK PLAN**  
SCALE: 1/16"=1'-0"

**NOTES:**

- FOR DECK PANEL DETAILS, SEE DWGS S-26 THROUGH S-30
- FOR SURFACE AND SUBSURFACE DRAIN DETAILS, SEE DWG C-1
- FOR CABLE SLOT DRAIN DETAILS, SEE DWG S-35
- FOR UTILITY VAULT DETAILS, SEE DWG S-38
- FOR BOLLARD DETAILS, SEE DWG S-25
- DECK PANELS NOTED: HAVE STRAND CHUCKS INSTALLED AT ENDS OF 1'-2" PROJECTING STRANDS FOR ADDED DEVELOPMENT DUE TO PILE TAB-OUTS BELOW.

**LEGEND**

- A/B/C DECK PANEL DESIGNATION
- BOLLARD
- CRANE STOP
- SUBSURFACE DRAIN
- DECK DRAIN
- CABLE SLOT DRAIN
- LADDER
- PIN SOCKET W/2"Ø DRAIN
- LIFE RING
- POWER VAULT
- WATER VAULT



**KEY PLAN**

**CONCRETE TECHNOLOGY CORPORATION**  
FIELD REPORT  
DATE: OCTOBER 12, 1998  
TO: AMERICAN CONSTRUCTION  
FROM: LIZ JOHNSON, PROJECT MANAGER  
SUBJECT: HYUNDAI MARINE TERMINAL

CTC JOB NO. 97153

CTC PERFORMED SCHMIDT-HAMMER TESTING ON THE TOP SURFACE OF THE DECK PANELS BETWEEN BENTS 36 AND 39. THE TROWELED SURFACE PRODUCES A WIDER RANGE OF RESULTS THAN HAMMER READINGS ON A FORMED SURFACE. TYPICAL READINGS WERE FROM 34 TO 49 WITH MOST READINGS BETWEEN 36-42.

THE DECK THAT WAS REMOVED (BETWEEN BENTS 37 & 38, AT D2) HAD HAMMER READINGS THAT VARIED FROM 17 TO 44. THE END AT BENT 37 WAS HARDEST, WITH HAMMER READINGS THAT WERE COMPARABLE TO SURROUNDING PANELS. THE OTHER END WAS SOFTER, WITH READINGS IN THE 22-30 RANGE. THE MIDDLE SECTION OF THIS PANEL HAD THE SOFTEST HAMMER READINGS RANGING FROM 17-24. THERE WAS CLEARLY A DIFFERENCE IN THE HAMMER READINGS ON THIS DECK PANEL.

BASED ON THESE RESULT, WE ARE CONFIDENT THAT THE DEFECTIVE BATCH OF CONCRETE WAS PLACED ENTIRELY IN THE DECK PANEL THAT WE REMOVED.

**AS-BUILT**

AUTOCAD FILE NO. <b>5012810</b>	<b>S-10</b>
DRAWING NO. <b>EP-5012-26</b>	
CONTRACT NO. <b>978038</b>	
SHEET NO. <b>19</b> OF <b>58</b>	

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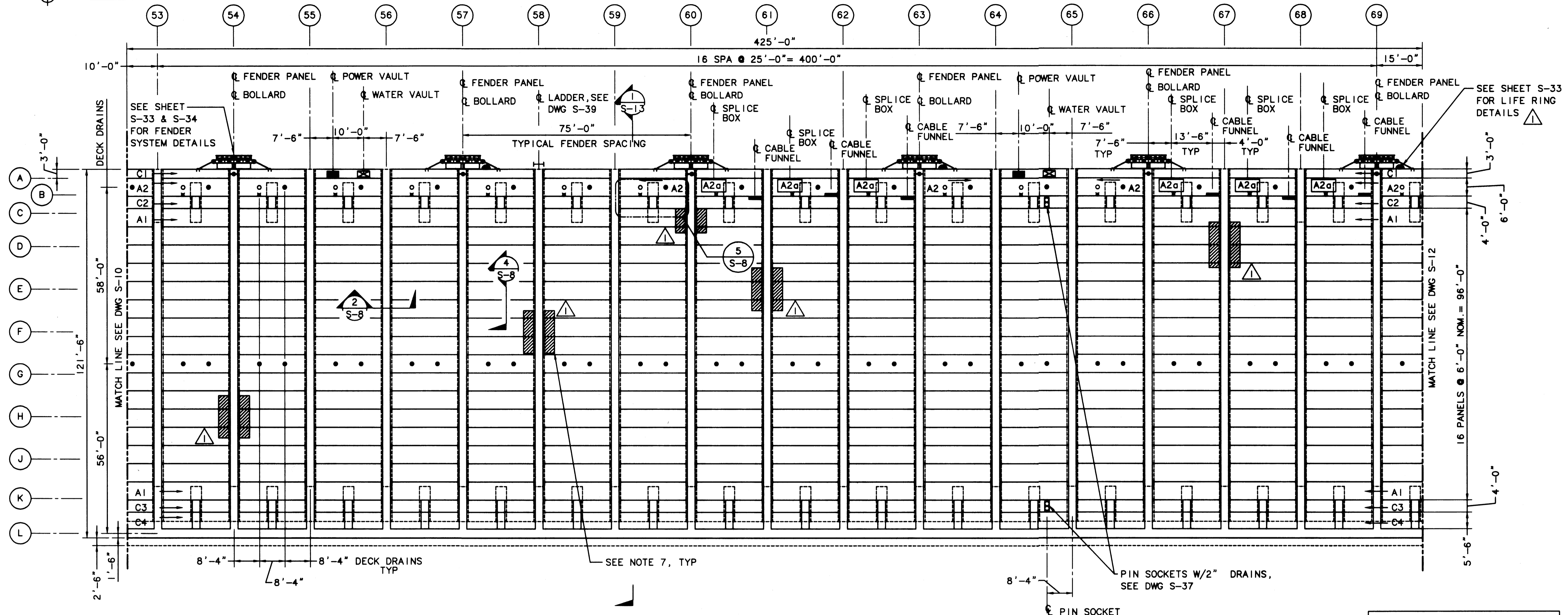
APPROVED 1/11/99  
DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

MMD	9/91	BCM	9/91
DRAWN BY	DATE	CHECKED BY	DATE
		JAS	9/91
DESIGNED BY	DATE	PROJ ENGR	DATE

AS-BUILT	RCD	JAS	1/4/98
MARK	REVISION	BY	APP. DATE

**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**DECK PLAN - SHEET 3**

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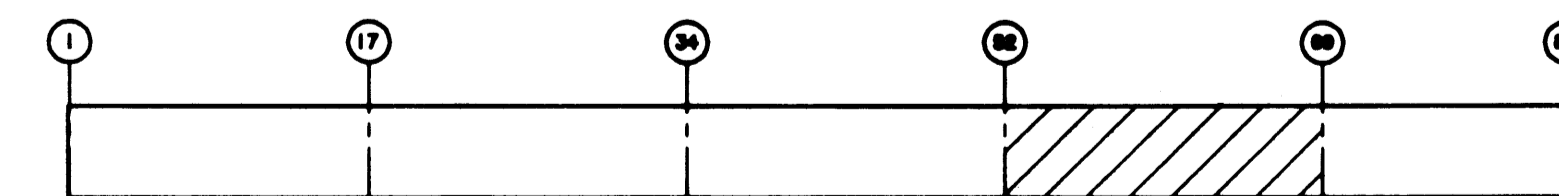


1 DECK PLAN  
S-11 SCALE: 1/16"=1'-0"

NOTES:

1. FOR DECK PANEL DETAILS, SEE DWGS S-26 THROUGH S-30
2. FOR SURFACE AND SUBSURFACE DRAIN DETAILS, SEE DWG C-1
3. FOR CABLE SLOT DRAIN DETAILS, SEE DWG S-35
4. FOR UTILITY VAULT DETAILS, SEE DWG S-38
5. FOR BOLLARD DETAILS, SEE DWG S-2
6. FOR CRANE POWER SPLICE BOX AND CABLE FUNNEL DETAILS, SEE DWG S-36. FOR PANELS TYPE 2a DETAILS, SEE DWG S-30
7. DECK PANELS NOTED: HAVE STRAND CHUCKS INSTALLED AT ENDS OF 1'-2" PROJECTING STRANDS FOR ADDED DEVELOPMENT DUE TO PILE TAB-OUTS BELOW.

LEGEND	
A/B/C	DECK PANEL DESIGNATION
	BOLLARD
	CRANE STOP
	SUBSURFACE DRAIN
	DECK DRAIN
	CABLE SLOT DRAIN
	LADDER
	PIN SOCKET W/2" DRAIN
	LIFE RING
	POWER VAULT
	WATER VAULT



KEY PLAN

AS-BUILT

AUTOCAD FILE NO. 6012811 S-11

**PORT OF TACOMA**  
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33301 9TH AVENUE SOUTH  
FEDERAL WAY, WASHINGTON 98003-6395  
(206) 431-2300 FAX: (206) 431-2250

APPROVED:   
DATE: 1/11/99  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER

MMD 9/51  
DRAWN BY DATE  
DESIGNED BY DATE

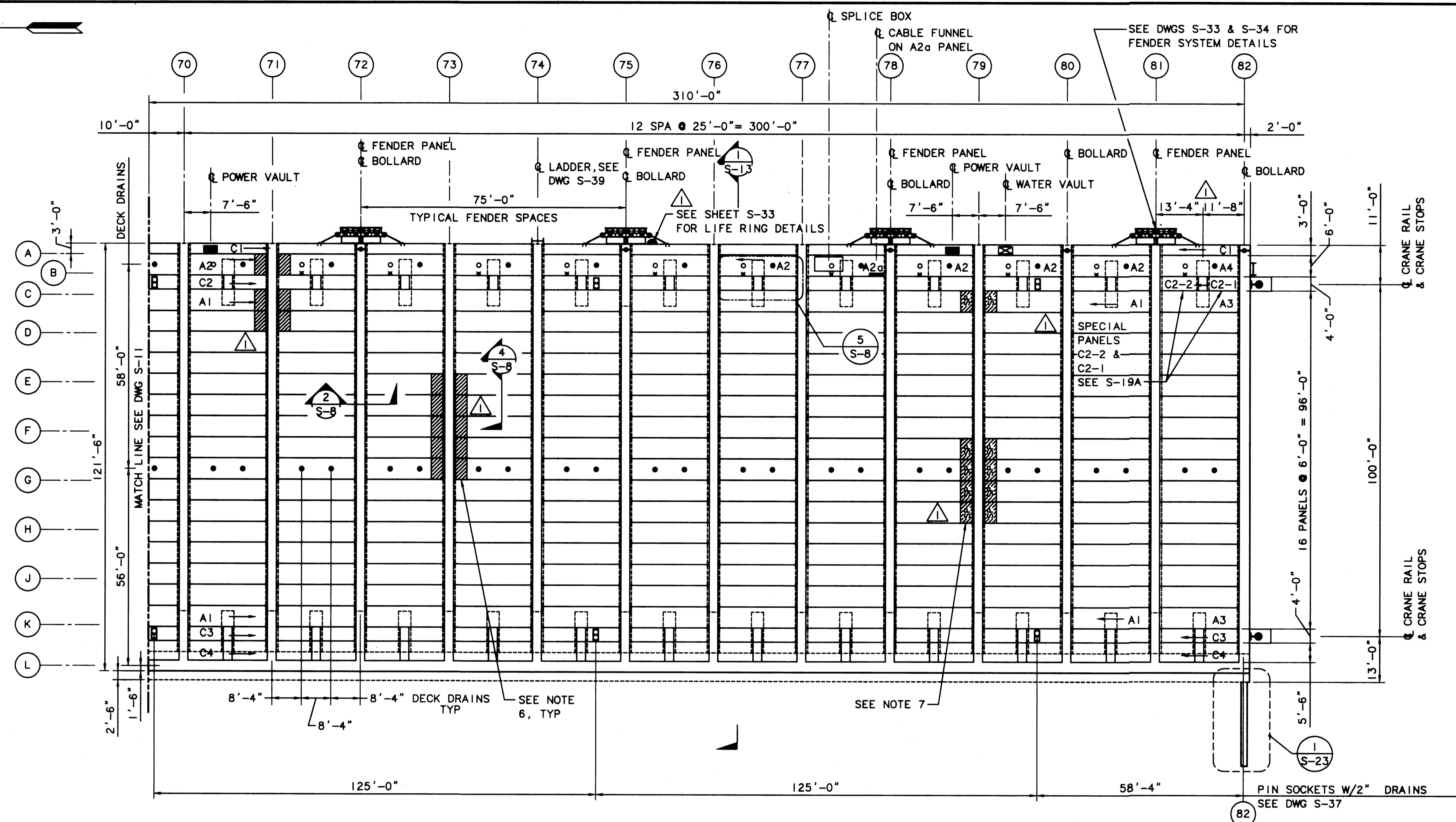
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JAS 9/51  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE
AS-BUILT		RDD	JAS	1/4/99

**HYUNDAI MERCHANT MARINE TERMINAL**  
WHARF  
PORT OF TACOMA  
DECK PLAN - SHEET 4

DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 20 OF 58

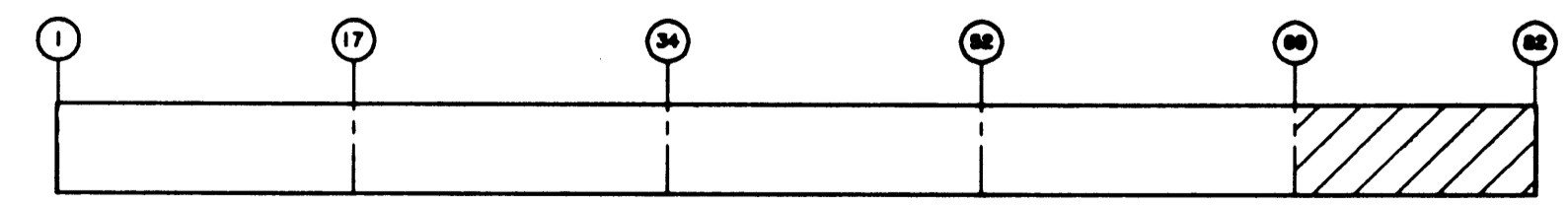
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- NOTES:**
- FOR DECK PANEL DETAILS, SEE DWGS S- 26 THROUGH S-30.
  - FOR SURFACE AND SUBSURFACE DRAIN DETAILS, SEE DWG C-1.
  - FOR CABLE SLOT DRAIN DETAILS, SEE DWG S-35.
  - FOR UTILITY VAULT DETAILS, SEE DWG S-38.
  - FOR BOLLARD DETAILS, SEE DWG S-25
  - DECK PANELS NOTED: HAVE STRAND CHUCKS INSTALLED AT ENDS OF 1'-2" PROJECTING STRANDS FOR ADDED DEVELOPMENT DUE TO PILE TAB-OUTS BELOW.
  - DECK PANELS NOTED: HAVE #6 DOWELS INSTALLED TO MAKE UP FOR MISSING STRANDS WHEN PILE TAB-OUT WAS BELOW.

**1**  
S-12 **DECK PLAN**  
SCALE: 1/16"=1'-0"

LEGEND	
A/B/C	DECK PANEL DESIGNATION
	BOLLARD
	CRANE STOP
	SUBSURFACE DRAIN
	DECK DRAIN
	CABLE SLOT DRAIN
	LADDER
	PIN SOCKET W/2" DRAIN
	LIFE RING
	POWER VAULT
	WATER VAULT



**KEY PLAN**

**AS-BUILT**

AUTOCAD FILE NO. **6012812**

**S-12**



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APPROVED  
*Curtis L. Ratcliffe* 1/11/99  
DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

MMD 9/91  
DRAWN BY DATE  
9/91

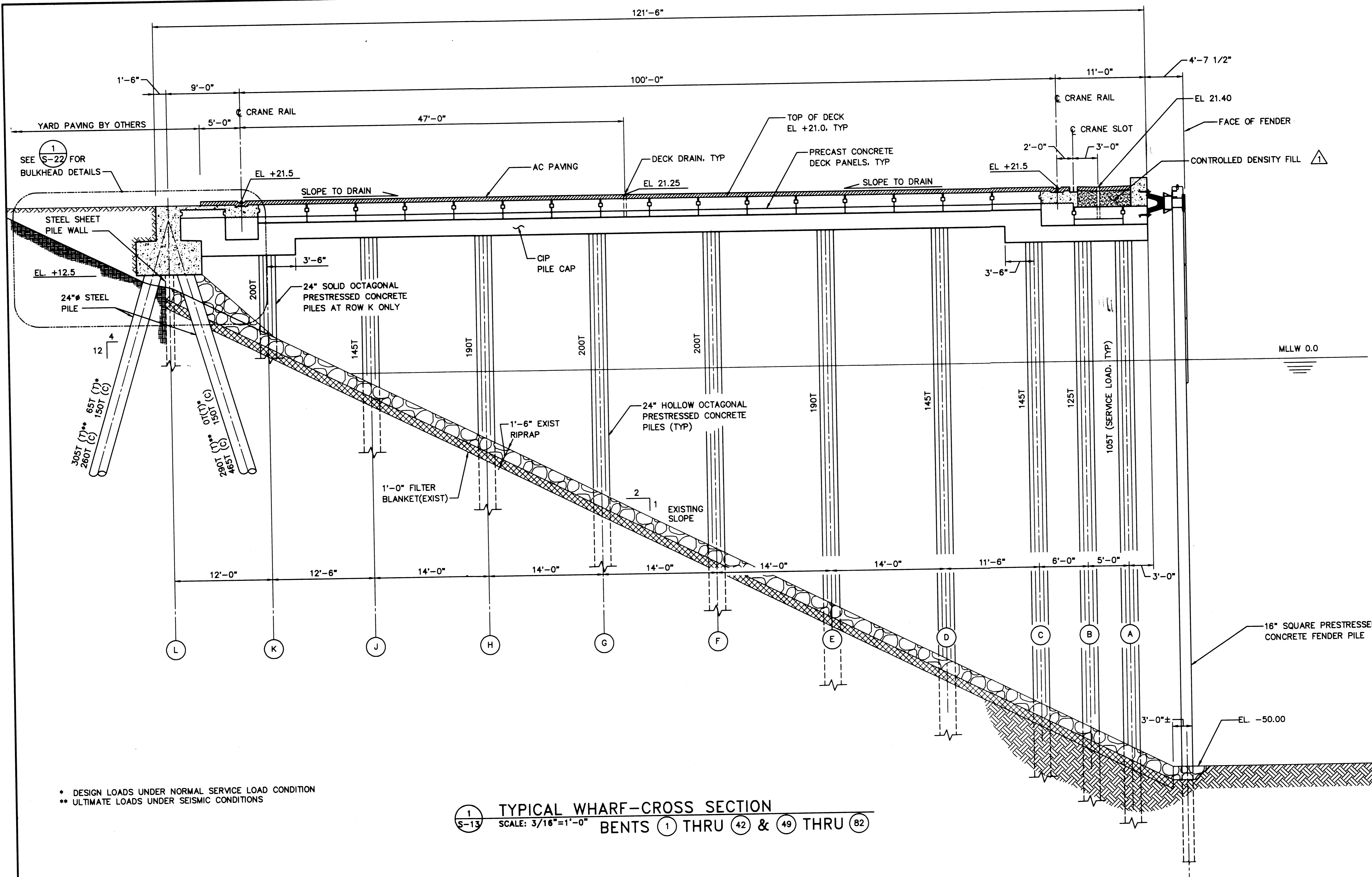
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MARK	REVISION	BY	APP.	DATE
	AS-BUILT	RDD	JAS	1/4/99

**HYUNDAI MERCHANT MARINE TERMINAL**  
**WHARF**  
**PORT OF TACOMA**  
**DECK PLAN - SHEET 5**

DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **21** OF **58**

PLOTTED: Thu Jan 07 1999 2:00pm FILENAME: V:\1987\A97093\CAD\S-12.dwg SCALE: 192



1 TYPICAL WHARF-CROSS SECTION  
 S-13 SCALE: 3/16"=1'-0" BENTS 1 THRU 42 & 49 THRU 82

PLOTTED: Thu Jan 07 1999 2:00pm FILENAME: V:\1997\497093\CAD\S-13.dwg SCALE: 64

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 ENGINEERS INC.  
 33301 9TH AVENUE SOUTH  
 FEDERAL WAY, WASHINGTON 98003-6385  
 (206) 431-2300 FAX: (206) 431-2250

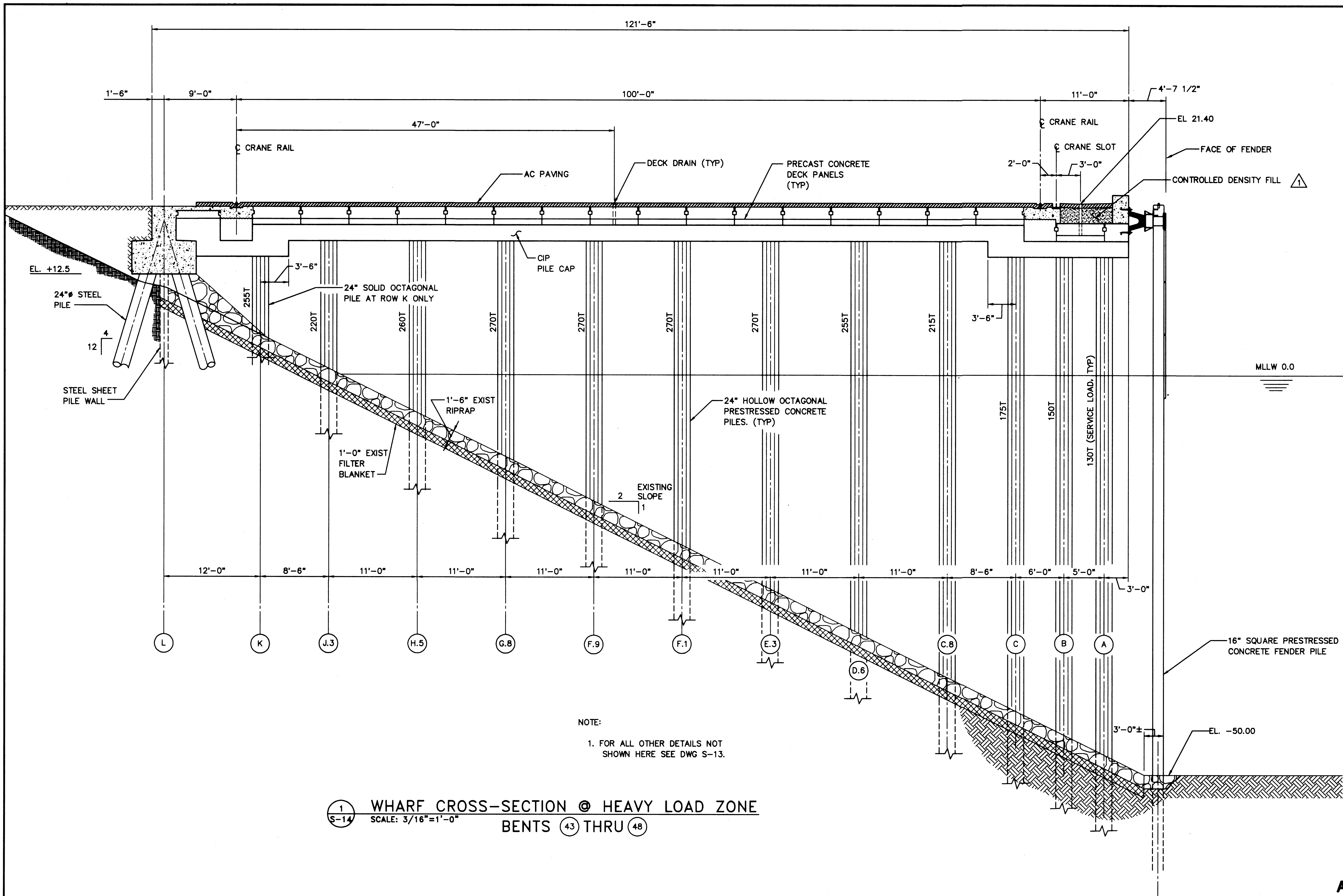
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 DATE 1/11/99  
**CURTIS L. RATCLIFFE P.E.**  
 CHIEF ENGINEER

MMD	9/91	BCM	9/91
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		JAS	9/91
DESIGNED BY	DATE	PROJ ENGR	DATE

AS-BUILT	RDD	JAS	1/4/99
MARK	REVISION	BY	APP. DATE

**HYUNDAI MERCHANT MARINE TERMINAL**  
**WHARF**  
**PORT OF TACOMA**  
**WHARF CROSS-SECTION - TYPICAL**

**AS-BUILT**  
 AUTOCAD FILE NO. **5012813** **S-13**  
 DRAWING NO. **EP-5012-26**  
 CONTRACT NO. **978038**  
 SHEET NO. **22** OF **58**



NOTE:  
 1. FOR ALL OTHER DETAILS NOT SHOWN HERE SEE DWG S-13.

1 WHARF CROSS-SECTION @ HEAVY LOAD ZONE  
 S-14 SCALE: 3/16"=1'-0"  
 BENTS 43 THRU 48

PLOTTED: Thu Jan 07 1999 2:01pm FILENAME: V:\1997\A97093\CAD\S-14.dwg SCALE: 64

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 FEDERAL WAY, WASHINGTON 98003-8395  
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APPROVED  
*Curtis L. Ratcliffe* 1/11/99  
 DATE  
**CURTIS L. RATCLIFFE P.E.**  
 CHIEF ENGINEER

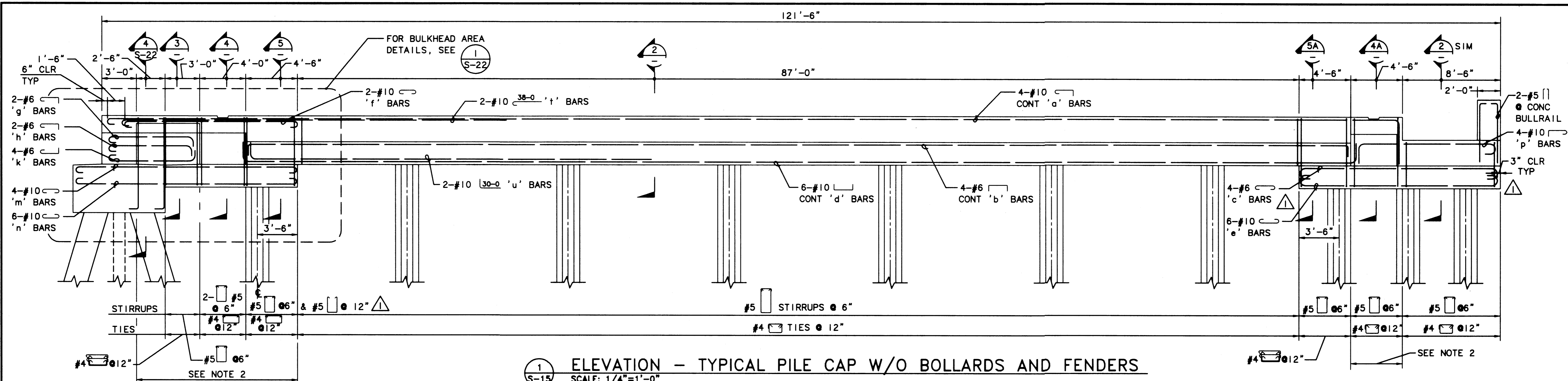
MMD 9/91  
 DRAWN BY DATE  
 9/91

BCM 9/91  
 CHECKED BY DATE  
 JAS 9/91  
 PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE

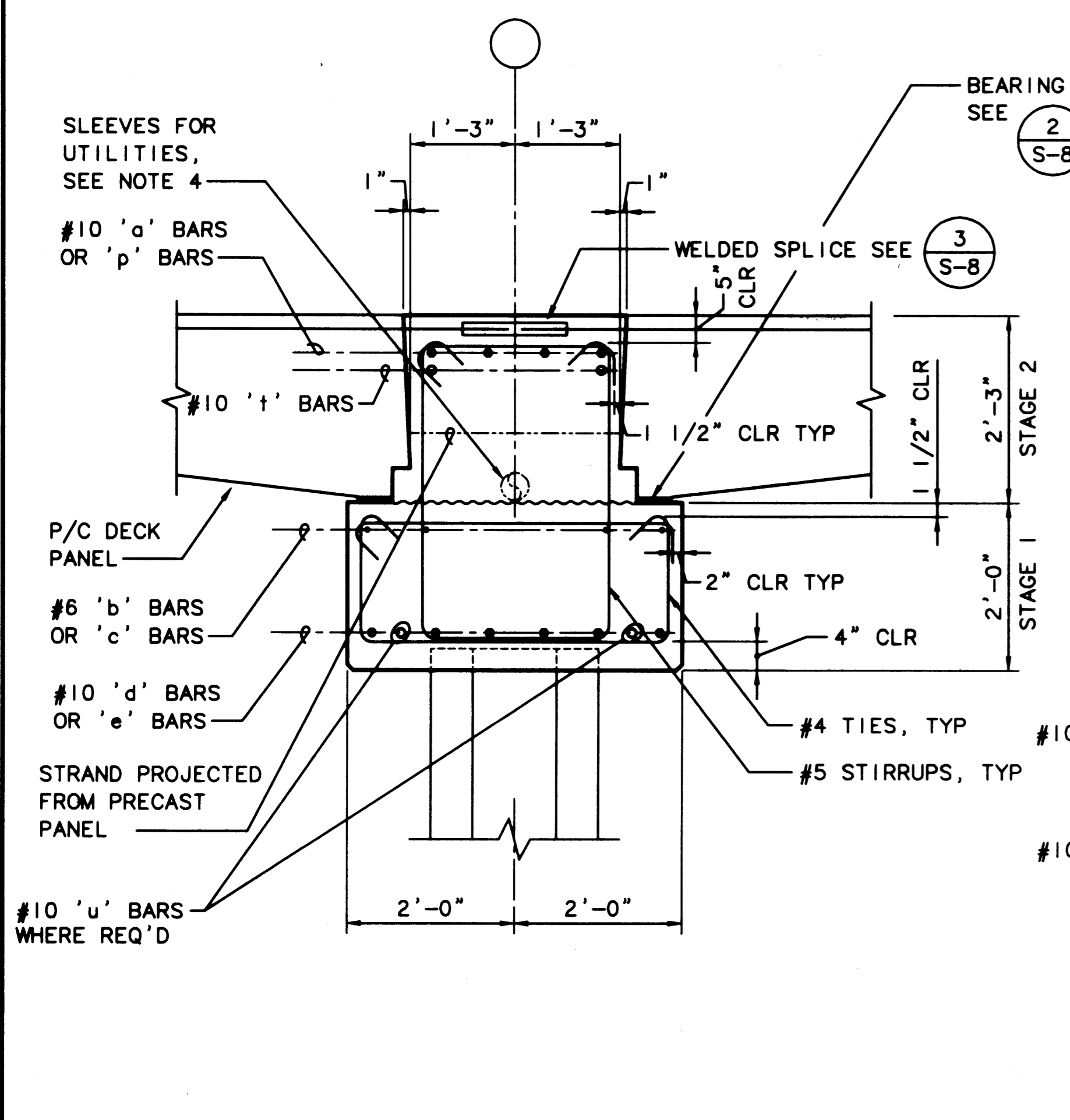
**HYUNDAI MERCHANT MARINE TERMINAL**  
**WHARF**  
**PORT OF TACOMA**  
**WHARF CROSS-SECTION - HEAVY LOAD ZONE**

**AS-BUILT**  
 AUTOCAD FILE NO. 5012814 S-14  
 DRAWING NO. EP-5012-26  
 CONTRACT NO. 978038  
 SHEET NO. 23 OF 58

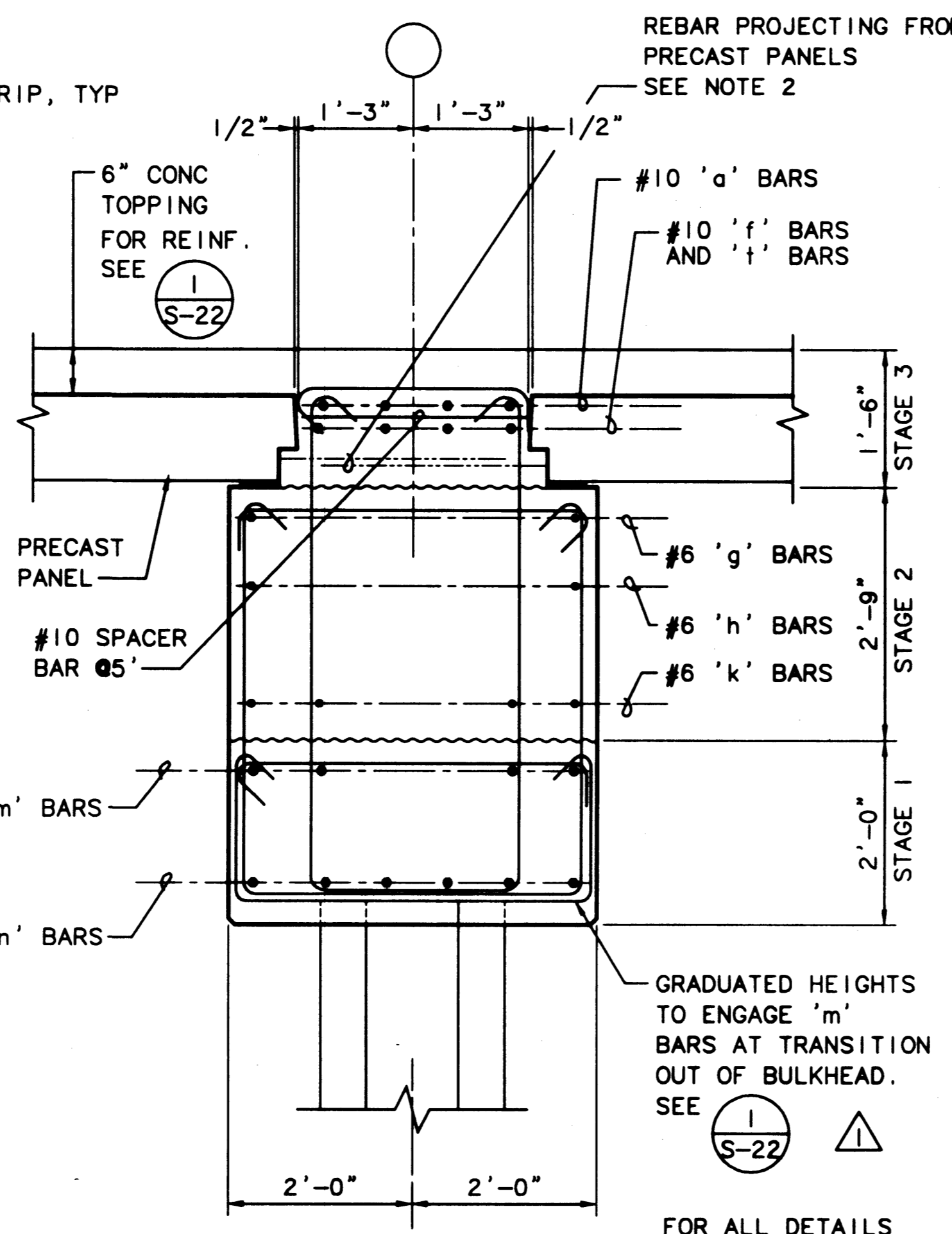


(1) ELEVATION - TYPICAL PILE CAP W/O BOLLARDS AND FENDERS  
 S-15 SCALE: 1/4"=1'-0"

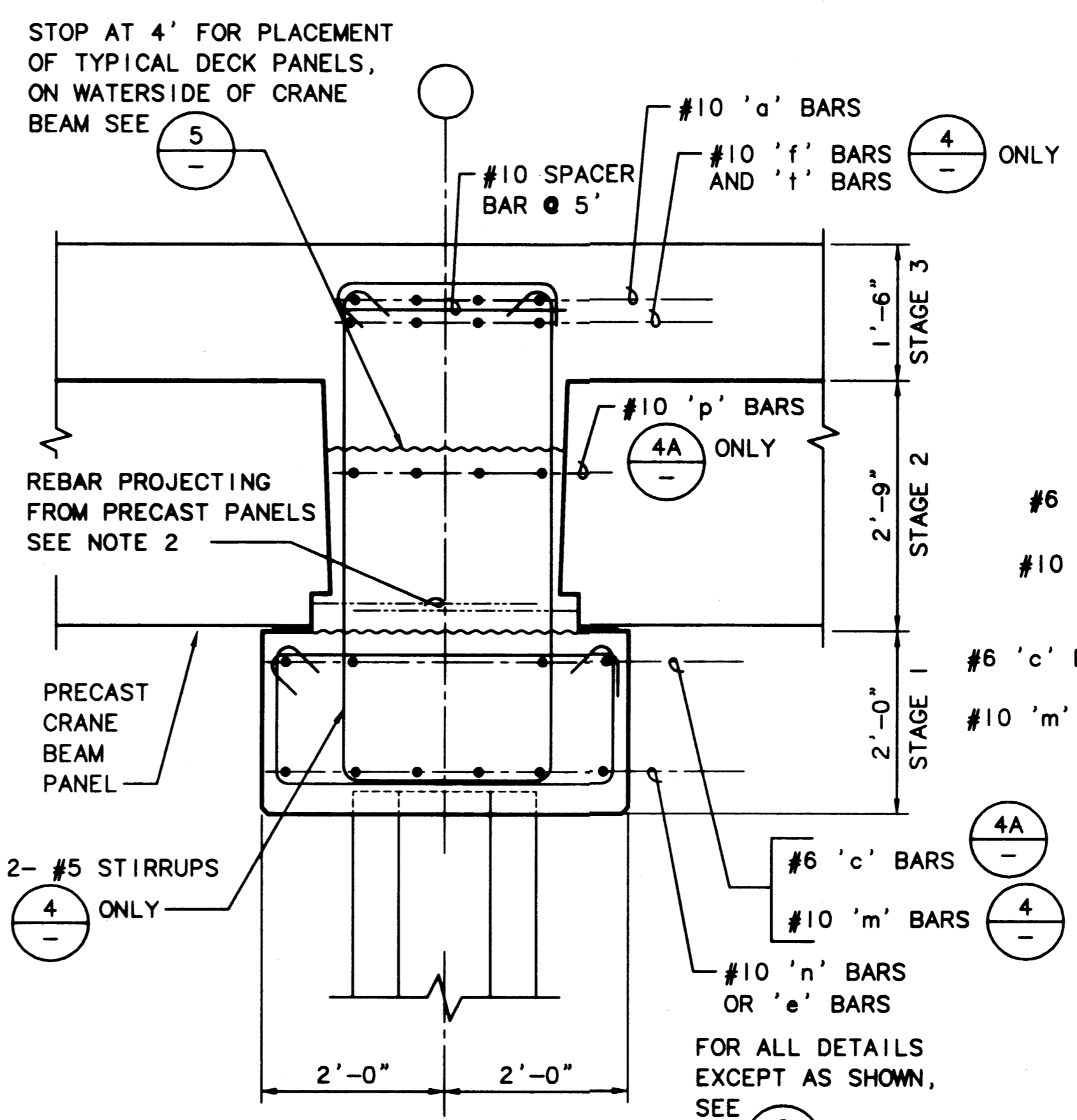
- NOTES:
- SEE DWGS S-8 THRU S-12 FOR LOCATIONS OF TYPICAL CAPS WITHOUT BOLLARDS OR FENDERS AT THE BULLRAIL
  - COORDINATE STIRRUP PLACEMENT IN PILE CAP TO MISS BARS PROJECTING FROM CRANE BEAM PANELS AND PANELS ADJACENT TO BULKHEAD.
  - CONSECUTIVE STIRRUP CAP BARS SHALL HAVE THEIR 90° HOOKS ON OPPOSITE SIDES.
  - FOR SLEEVES AT WATER LINES, SEE DWG C-2, FOR SLEEVES AT POWER AND GROUND WIRE LOCATIONS, SEE ELECTRICAL DRAWINGS.



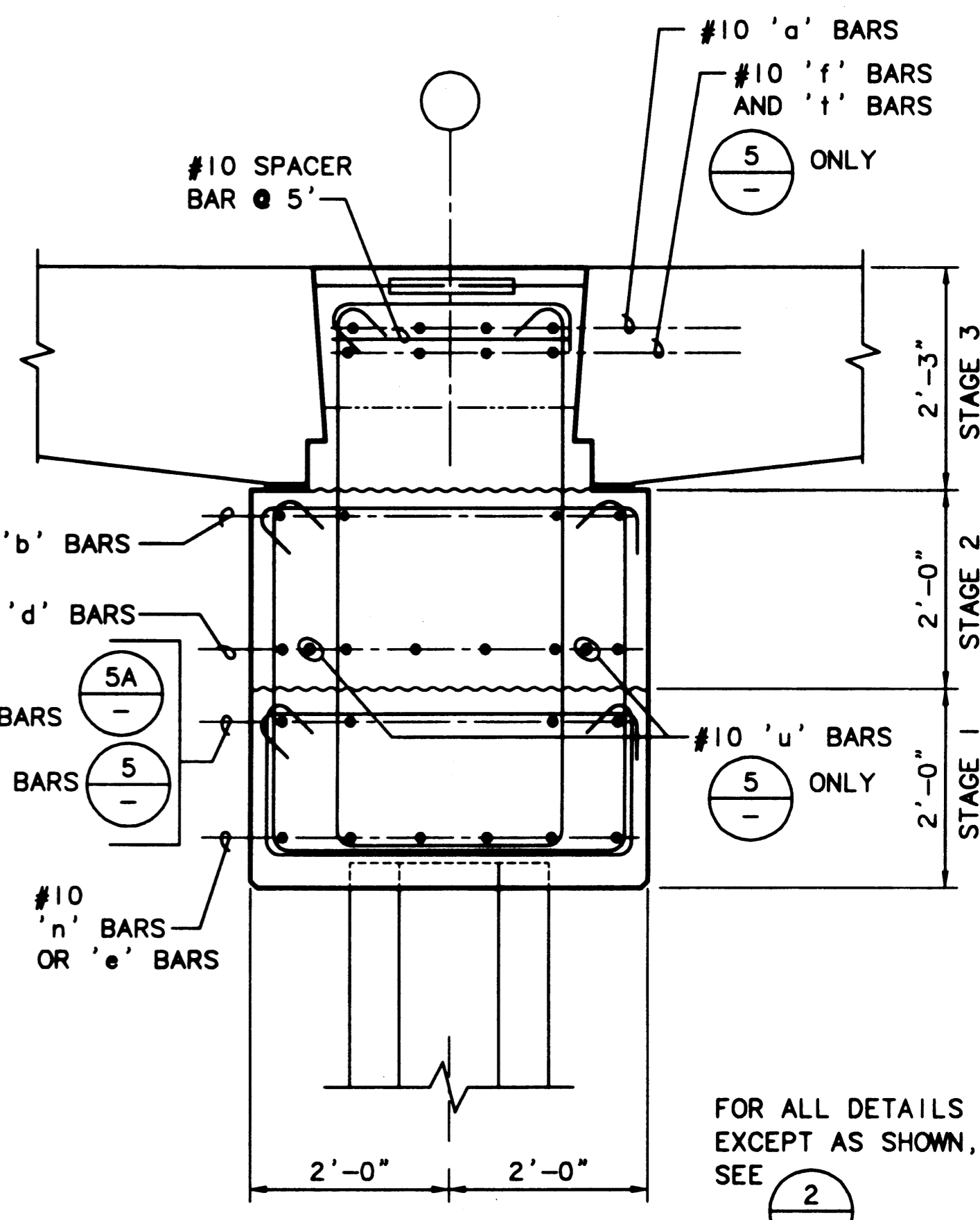
(2) SECTION - TYPICAL PILE CAP  
 S-15 SCALE: 3/4"=1'-0"



(3) SECTION  
 S-15 SCALE: 3/4"=1'-0"



(4, 4A) SECTION  
 S-15 SCALE: 3/4"=1'-0"



(5, 5A) SECTION  
 S-15 SCALE: 3/4"=1'-0"

PLOTTED: Thu Jan 07 1999 2:01pm FILENAME: V:\1997\497083\CAD\S-15.dwg SCALE: 48

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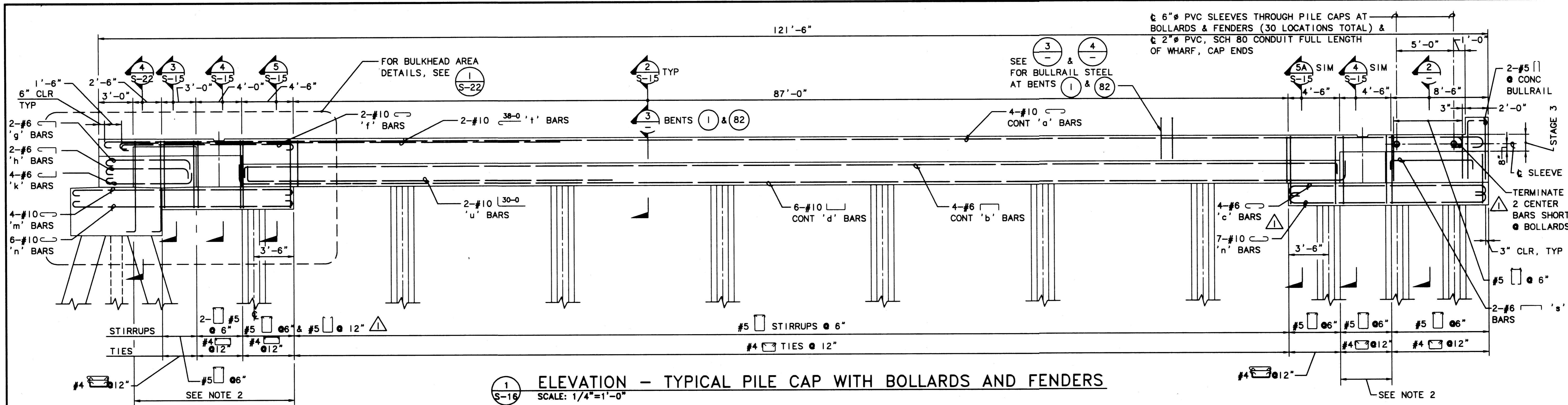
MMD 9/91  
 DRAWN BY DATE  
 DESIGNED BY DATE

BCM 9/91  
 CHECKED BY DATE  
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 PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE
AS-BUILT		RDD	JAS	1/4/99

**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**PILE CAP DETAILS - SHEET 1**

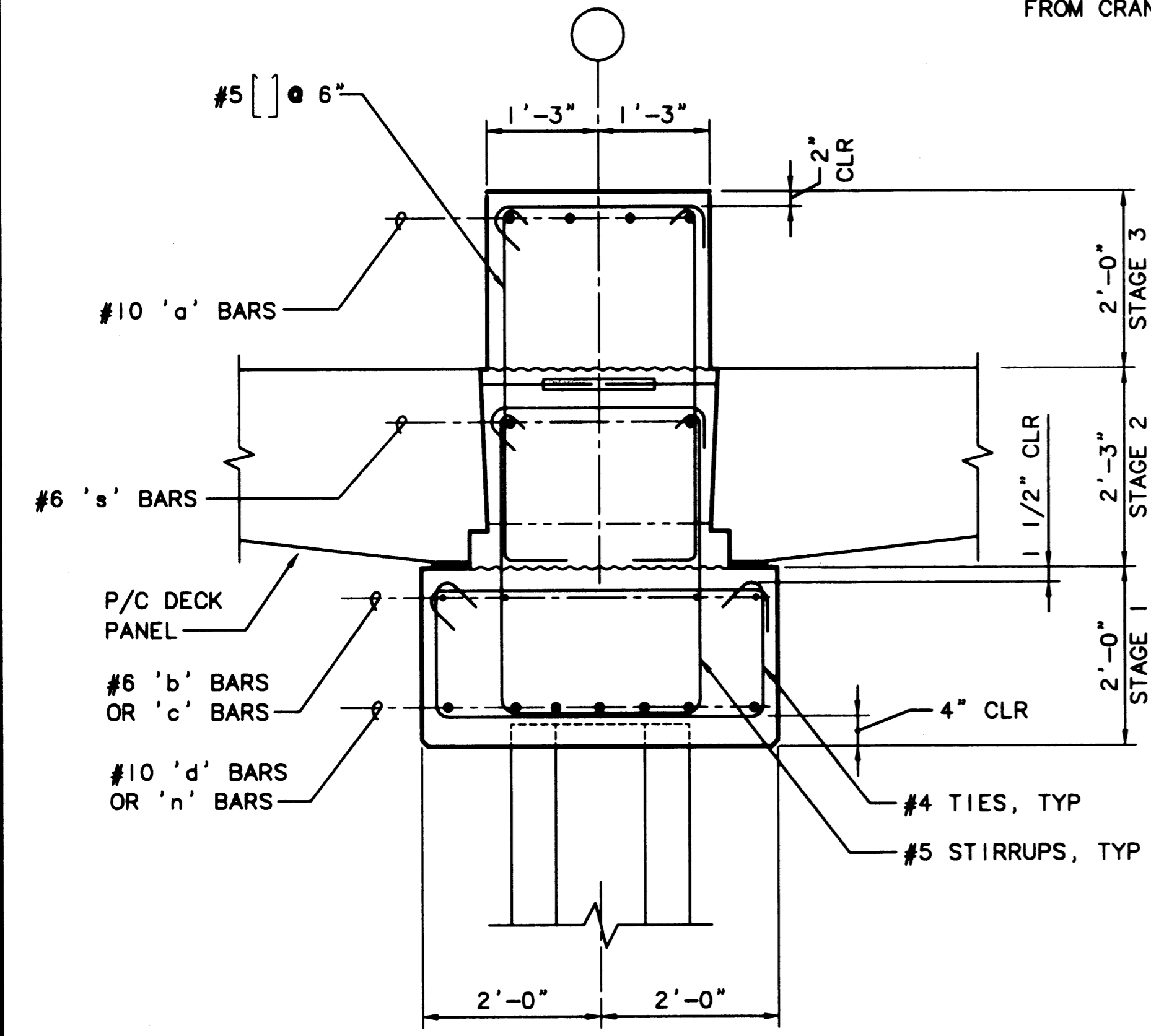
**AS-BUILT**  
 AUTOCAD FILE NO. 5012815  
**S-15**  
 DRAWING NO. EP-5012-26  
 CONTRACT NO. 978038  
 SHEET NO. 24 OF 58



**1 ELEVATION - TYPICAL PILE CAP WITH BOLLARDS AND FENDERS**  
 SCALE: 1/4"=1'-0"

**NOTES:**

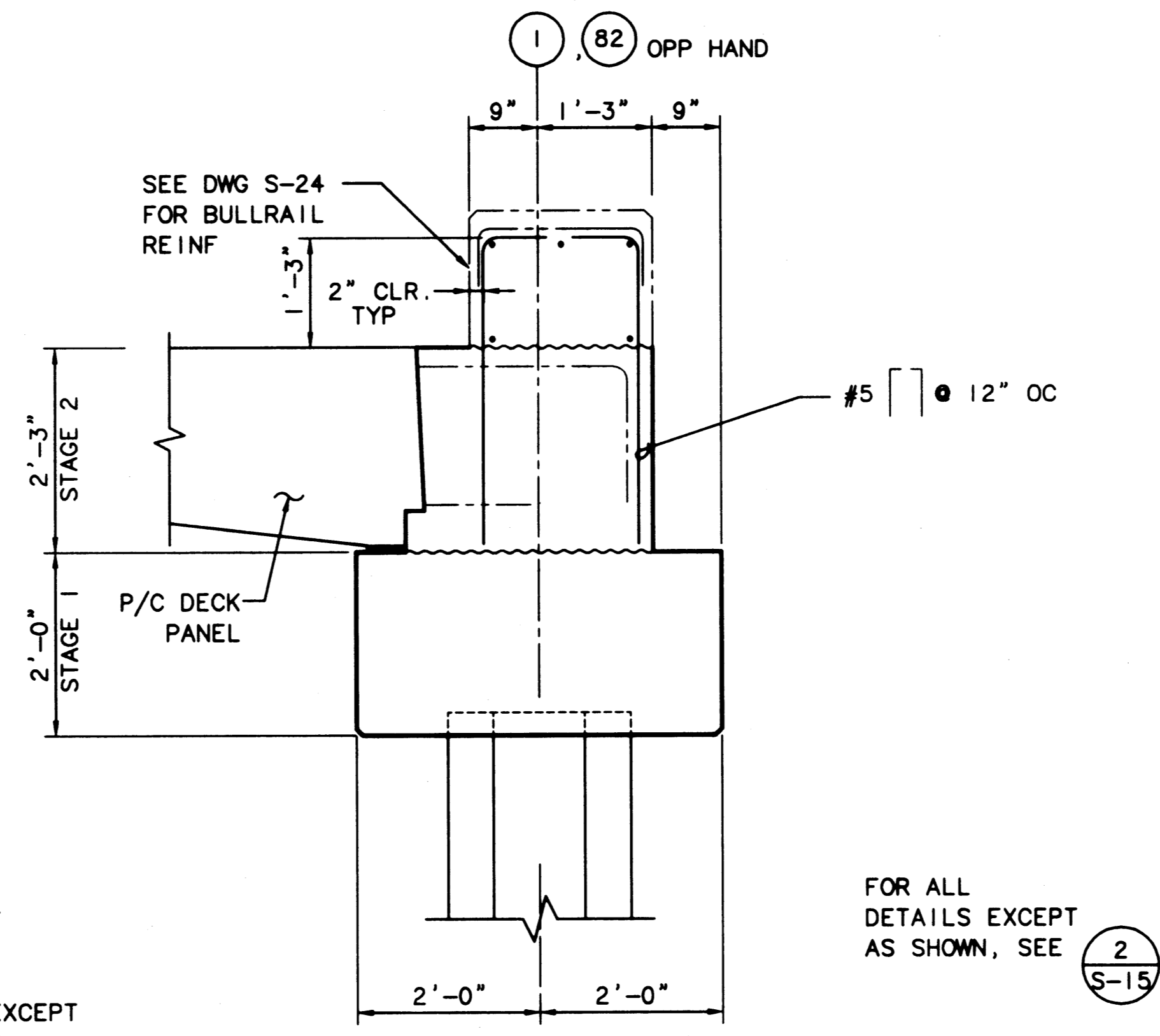
- SEE DWGS S-8 THRU S-12 FOR LOCATIONS OF TYPICAL CAPS WITH BOLLARDS OR FENDERS AT THE BULLRAIL
- COORDINATE STIRRUP PLACEMENT IN PILE CAP TO MISS BARS PROJECTING FROM CRANE BEAM PANELS AND PANELS ADJACENT TO BULKHEAD.
- CONSECUTIVE STIRRUP CAP BARS SHALL HAVE THEIR 90° HOOKS ON OPPOSITE SIDES.
- FOR SLEEVES AT WATER LINES, SEE DWG C-2, FOR SLEEVES AT POWER AND GROUND WIRE LOCATIONS, SEE ELECTRICAL DRAWINGS.



**2 SECTION - TYPICAL PILE CAPS @ BOLLARDS & FENDERS, BALLAST AREA**  
 SCALE: 3/4"=1'-0"

**NOTES:**

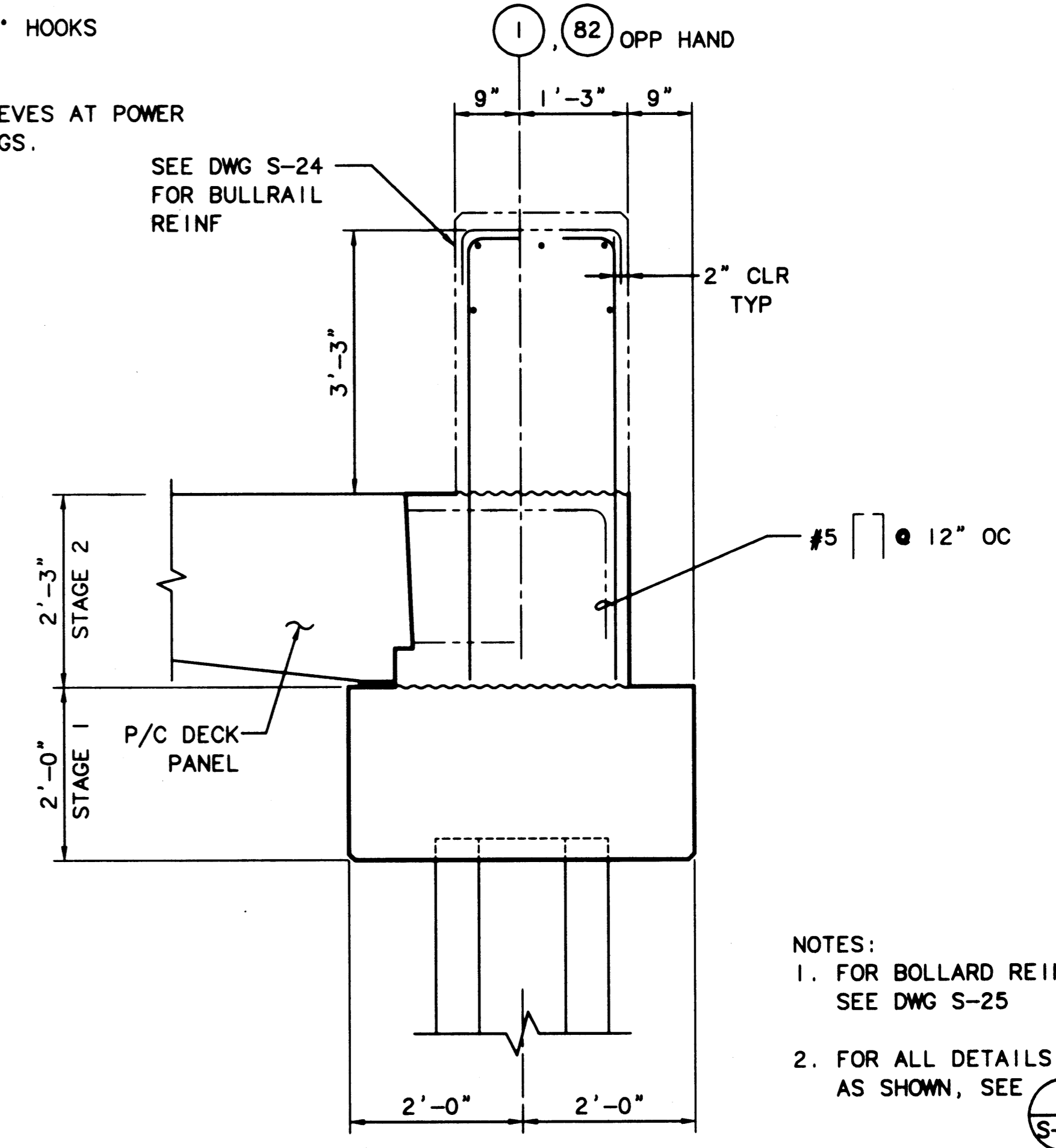
- FOR BOLLARD REINF SEE DWG S-25
- FOR ALL DETAILS EXCEPT AS SHOWN, SEE **2 S-15**



**3 SECTION - PILE CAP @ BENT 1 (BENT 82 OPP HAND)**  
 SCALE: 3/4"=1'-0"

**FOR ALL DETAILS EXCEPT AS SHOWN, SEE**

**2 S-15**



**4 SECTION - PILE CAP @ BENT 1 BALLAST AREA (BENT 82 OPP HAND)**  
 SCALE: 3/4"=1'-0"

**NOTES:**

- FOR BOLLARD REINF SEE DWG S-25
- FOR ALL DETAILS EXCEPT AS SHOWN, SEE **2 S-15**

PLOTTED: Thu Jan 07 1999 2:01pm FILENAME: V:\1997\497093\CAD\S-16.dwg SCALE: 48

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**CURTIS L. RATCLIFFE P.E.**  
 CHIEF ENGINEER

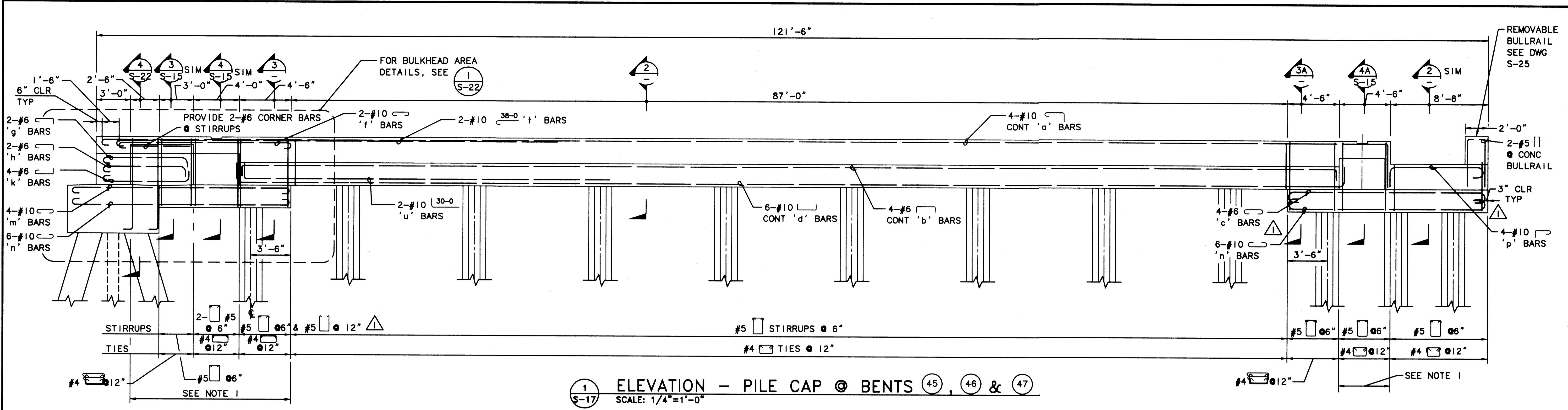
MMB 3/91  
 DRAWN BY DATE  
 3/91  
 DESIGNED BY DATE

ECM 3/91  
 CHECKED BY DATE  
 JAS 3/91  
 PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE

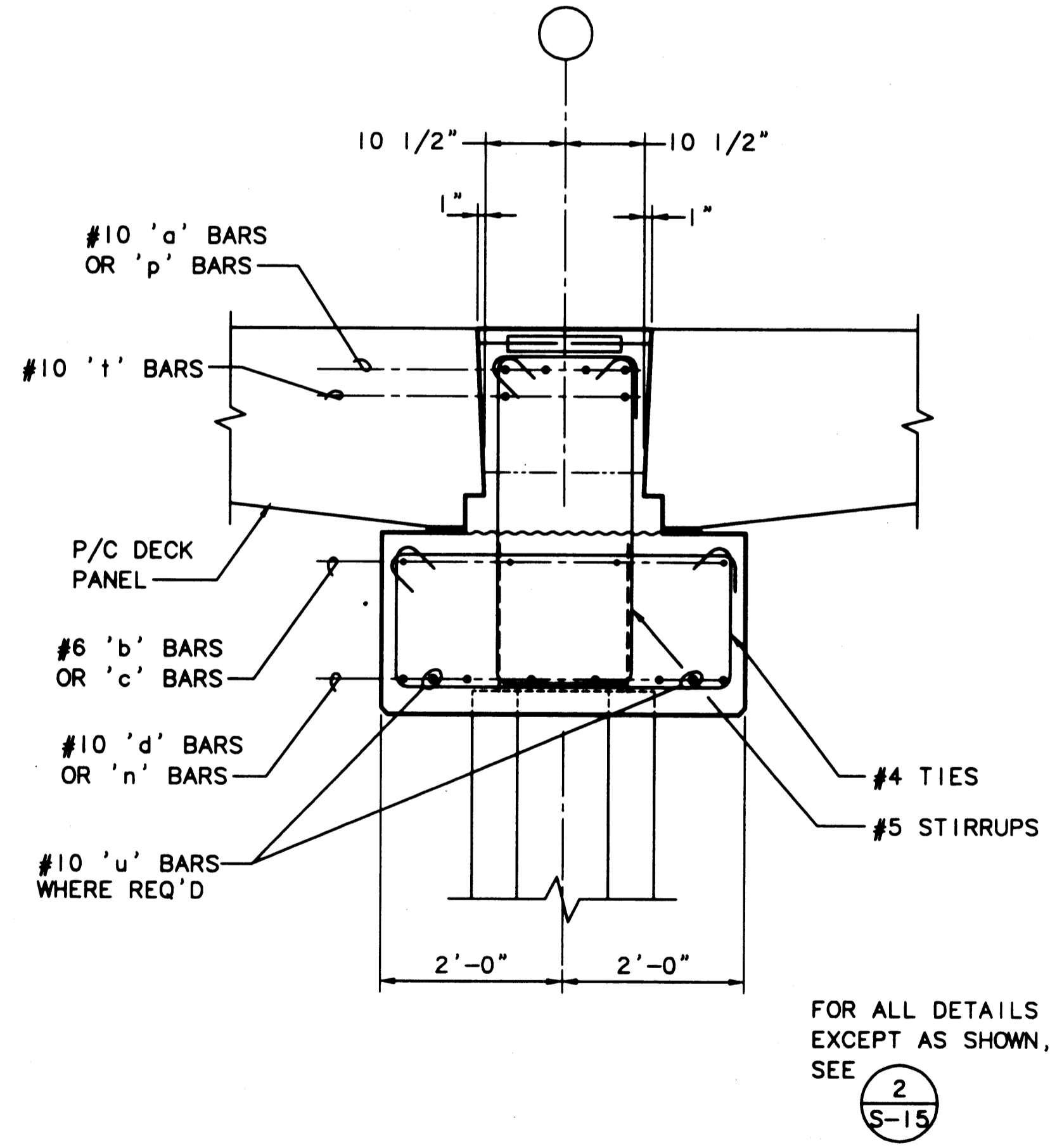
**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
 PORT OF TACOMA  
 PILE CAP DETAILS - SHEET 2

**AS-BUILT**  
 AUTOCAD FILE NO. 5012816  
 S-16  
 DRAWING NO. EP-5012-26  
 CONTRACT NO. 978038  
 SHEET NO. 25 OF 58

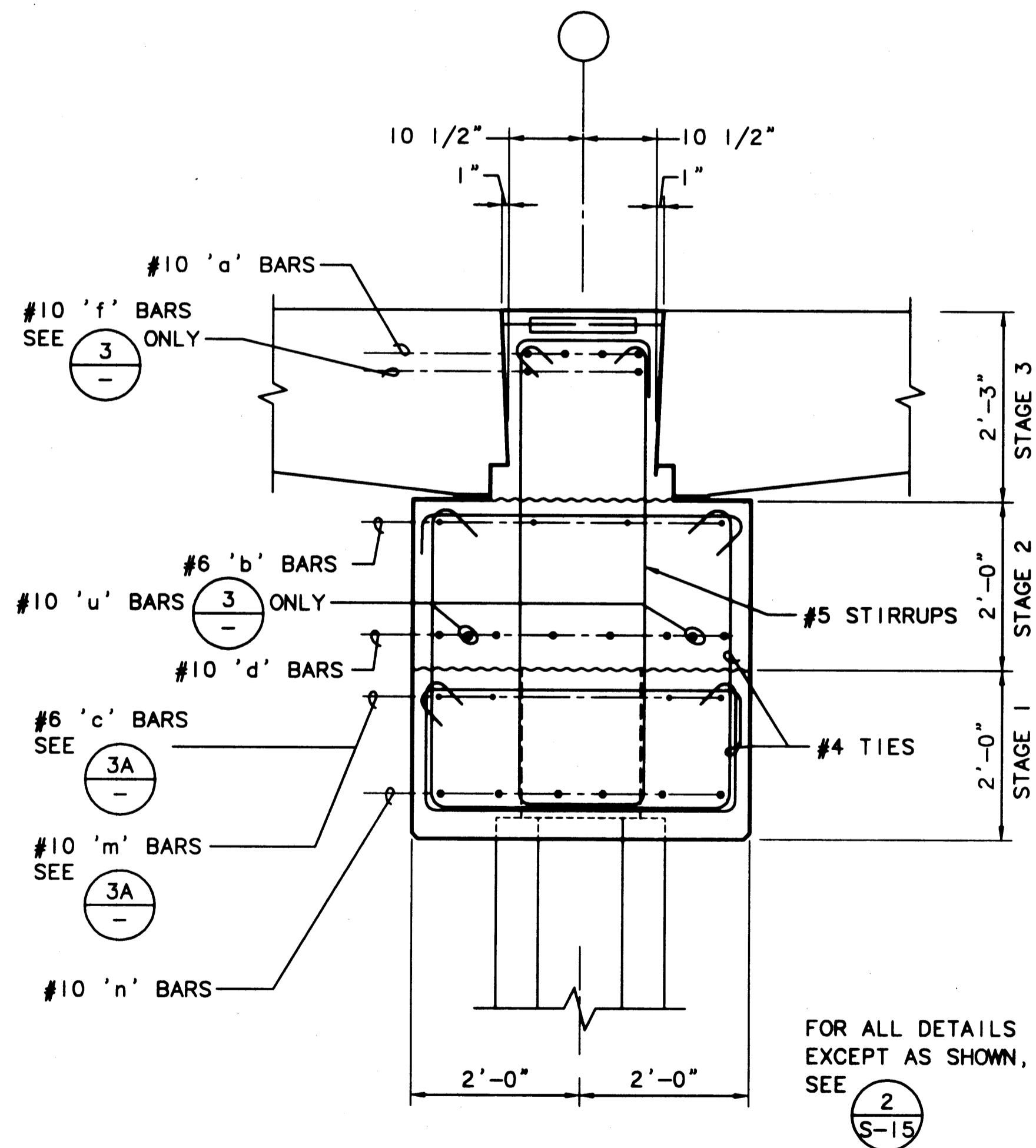


(1) ELEVATION - PILE CAP @ BENTS (45), (46) & (47)  
 SCALE: 1/4"=1'-0"

- NOTES:
- COORDINATE STIRRUP PLACEMENT IN PILE CAP TO MISS BARS PROJECTING FROM CRANE BEAM PANELS AND PANELS ADJACENT TO BULKHEAD.
  - CONSECUTIVE STIRRUP CAP BARS SHALL HAVE THEIR 90° HOOKS ON OPPOSITE SIDES.
  - FOR SLEEVES AT WATER LINES, SEE DWG C-2, FOR SLEEVES AT POWER AND GROUND WIRE LOCATIONS, SEE ELECTRICAL DRAWINGS.



(2) SECTION - HEAVY LOAD PILE CAP  
 SCALE: 3/4"=1'-0"



(3.3A) SECTION  
 SCALE: 3/4"=1'-0"

FOR ALL DETAILS EXCEPT AS SHOWN, SEE (2) S-15

FOR ALL DETAILS EXCEPT AS SHOWN, SEE (2) S-15

PLOTTED: Thu Jan 07 1999 2:01pm FILENAME: \\1997\497083\CAD\AS-17.dwg SCALE: 48

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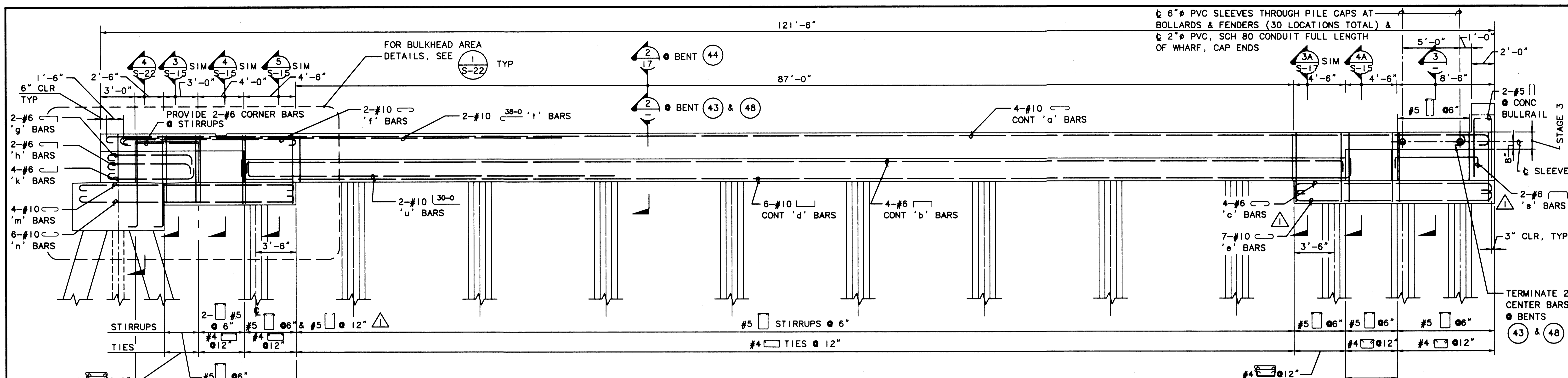
APPROVED  
  
 DATE 1/11/99  
**CURTIS L. RATCLIFFE P.E.**  
 CHIEF ENGINEER

MMD 9/91  
 DRAWN BY DATE  
 BOM 9/91  
 CHECKED BY DATE  
 JAS 9/91  
 PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE
AS-BUILT		JAS		1/4/99

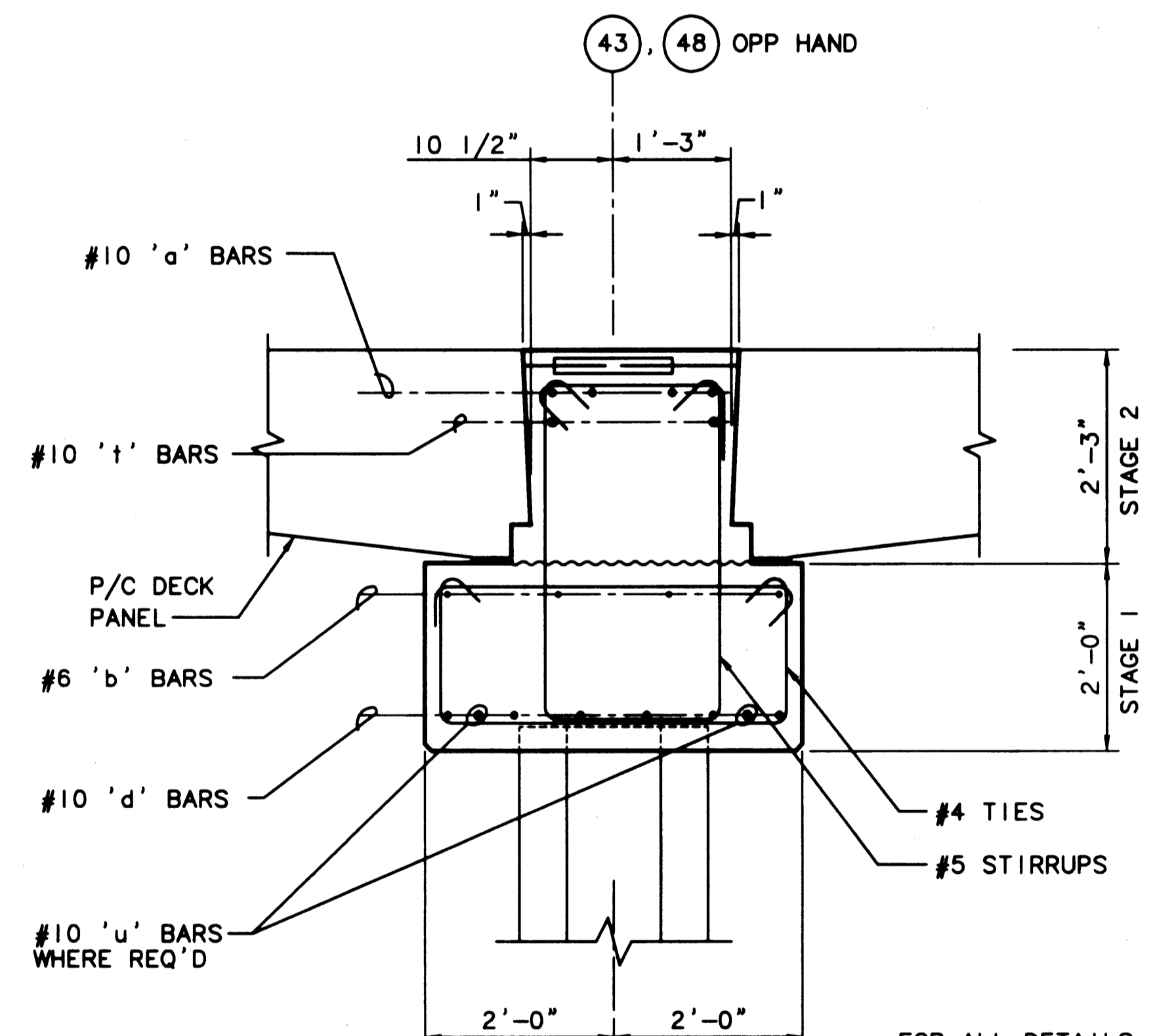
**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
 PORT OF TACOMA  
 PILE CAP DETAILS - SHEET 3

**AS-BUILT**  
 AUTOCAD FILE NO. 5012817  
 S-17  
 DRAWING NO. EP-5012-26  
 CONTRACT NO. 978038  
 SHEET NO. 26 OF 58

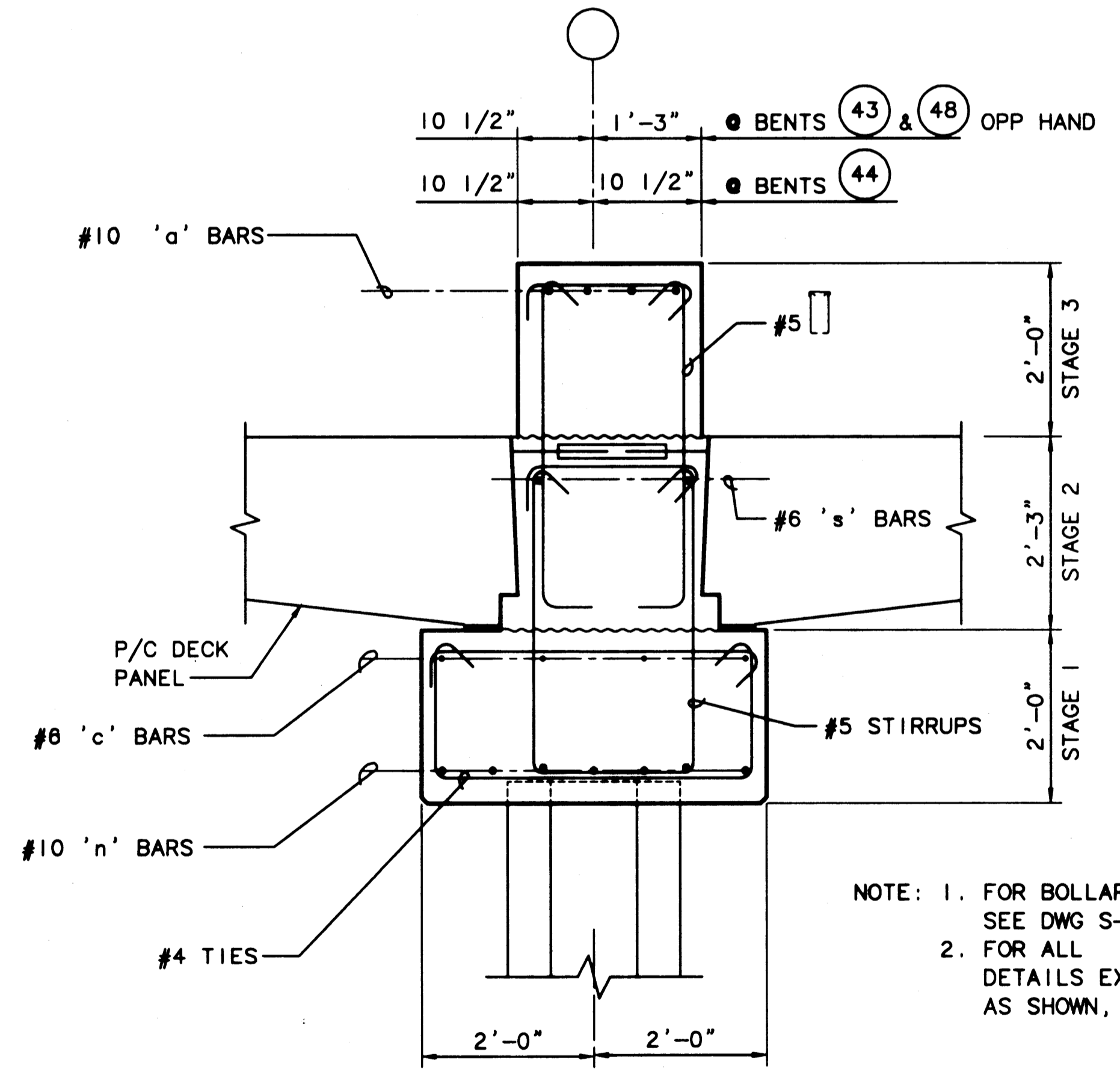


1 ELEVATION - PILE CAP @ BENTS 43, 44 & 48  
 SCALE: 1/4"=1'-0"

- NOTES:
- COORDINATE STIRRUP PLACEMENT IN PILE CAP TO MISS BARS PROJECTING FROM CRANE BEAM PANELS AND PANELS ADJACENT TO BULKHEAD.
  - CONSECUTIVE STIRRUP CAP BARS SHALL HAVE THEIR 90° HOOKS ON OPPOSITE SIDES.
  - FOR SLEEVES AT WATER LINES, SEE DWG C-2, FOR SLEEVES AT POWER AND GROUND WIRE LOCATIONS, SEE ELECTRICAL DRAWINGS.



2 SECTION - PILE CAP @ BENTS 43 & 48  
 SCALE: 3/4"=1'-0"



3 SECTION - PILE CAP @ BENTS 43, 44 & 48  
 BALLAST AREA  
 SCALE: 3/4"=1'-0"

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 DATE  
**CURTIS L. RATCLIFFE P.E.**  
 CHIEF ENGINEER

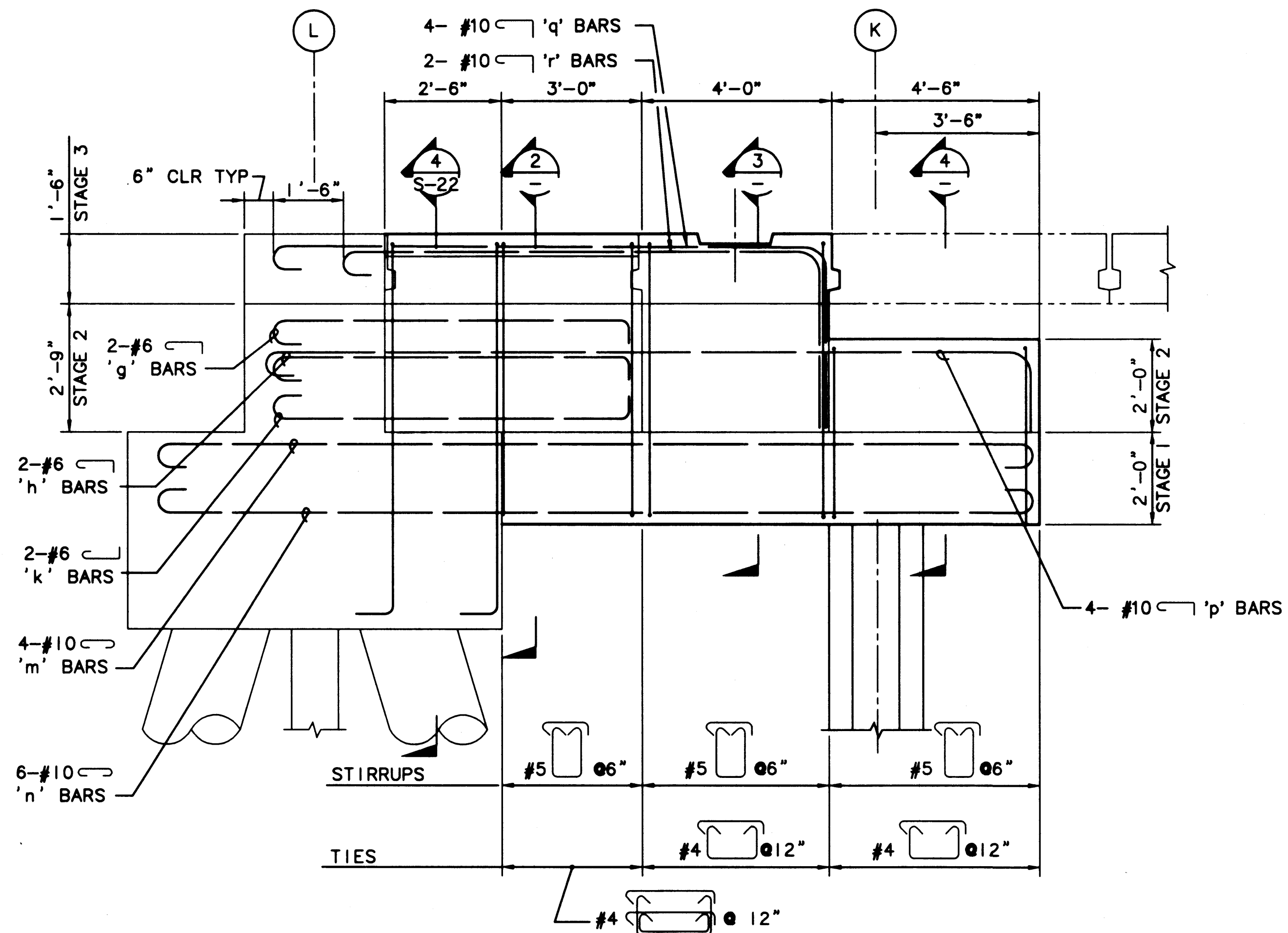
MMD 9/91  
 DRAWN BY DATE  
 9/91

BCM 9/91  
 CHECKED BY DATE  
 JAS 9/91  
 PROJ ENGR DATE

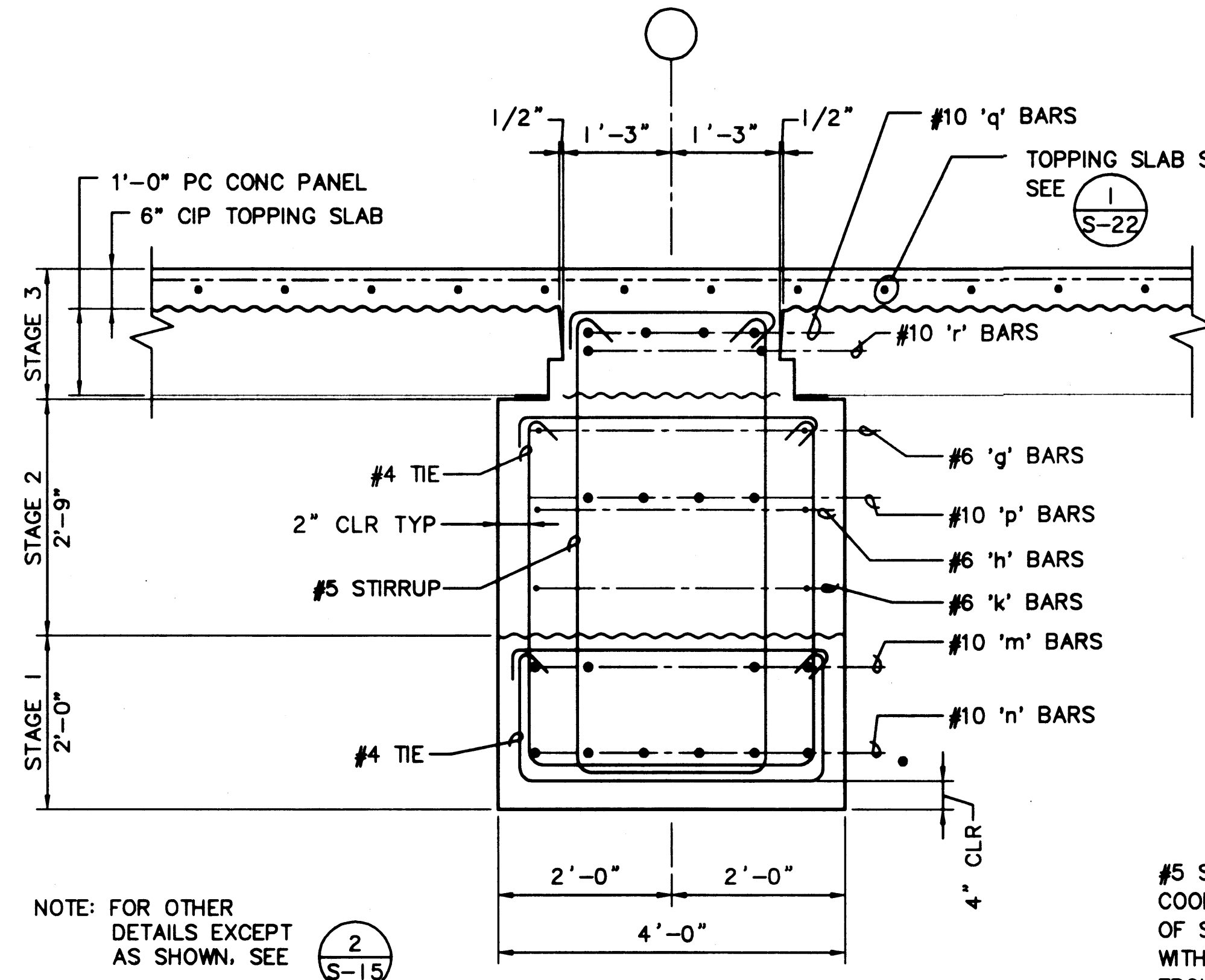
MARK	REVISION	BY	APP.	DATE
	AS-BUILT	RDD	JAS	1/4/99

**HYUNDAI MERCHANT MARINE TERMINAL  
 WHARF  
 PORT OF TACOMA  
 PILE CAP DETAILS - SHEET 4**

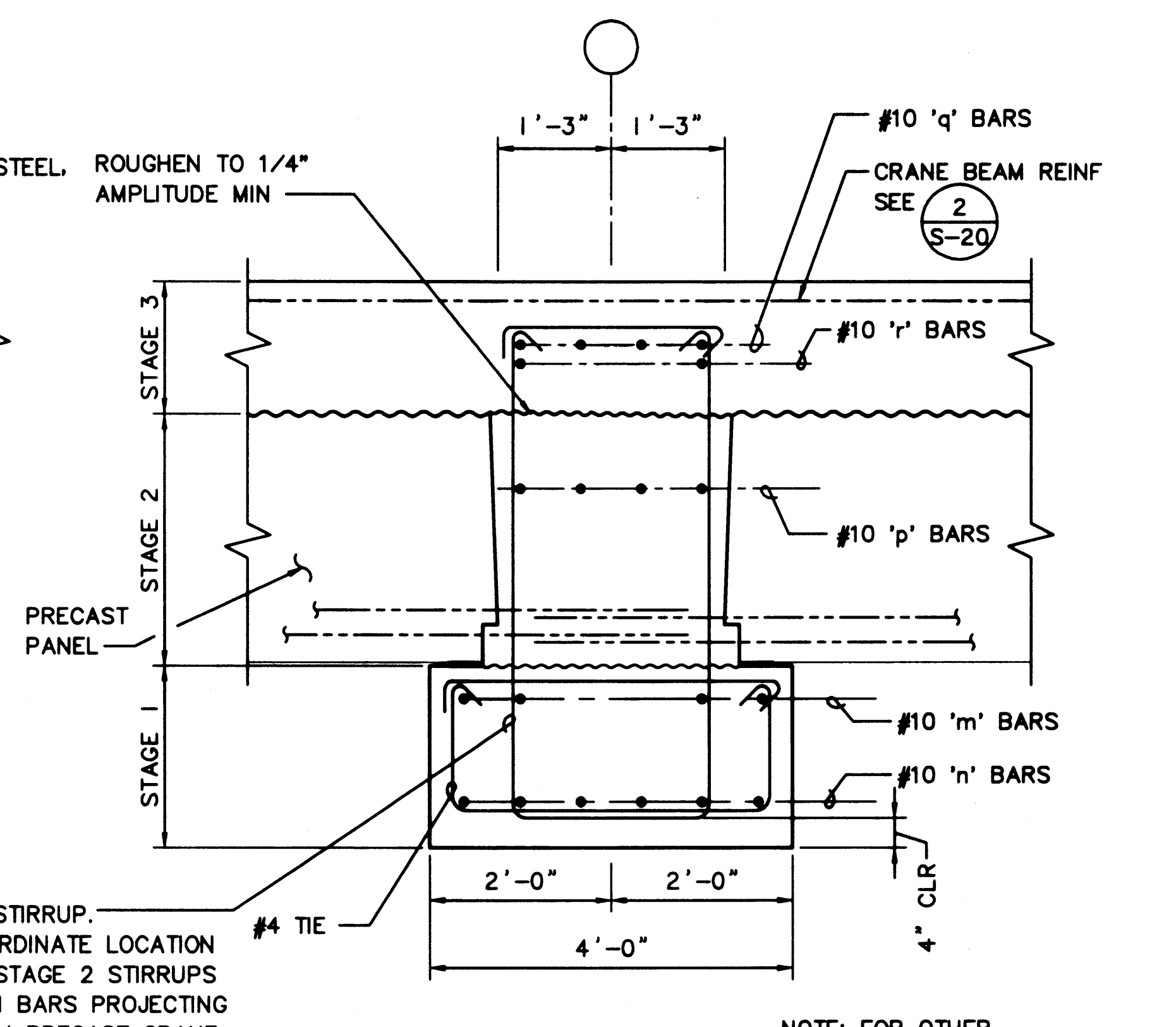
**AS-BUILT**  
 AUTOCAD FILE NO. **6012818** **S-18**  
 DRAWING NO. **EP-5012-26**  
 CONTRACT NO. **978038**  
 SHEET NO. **27** OF **58**



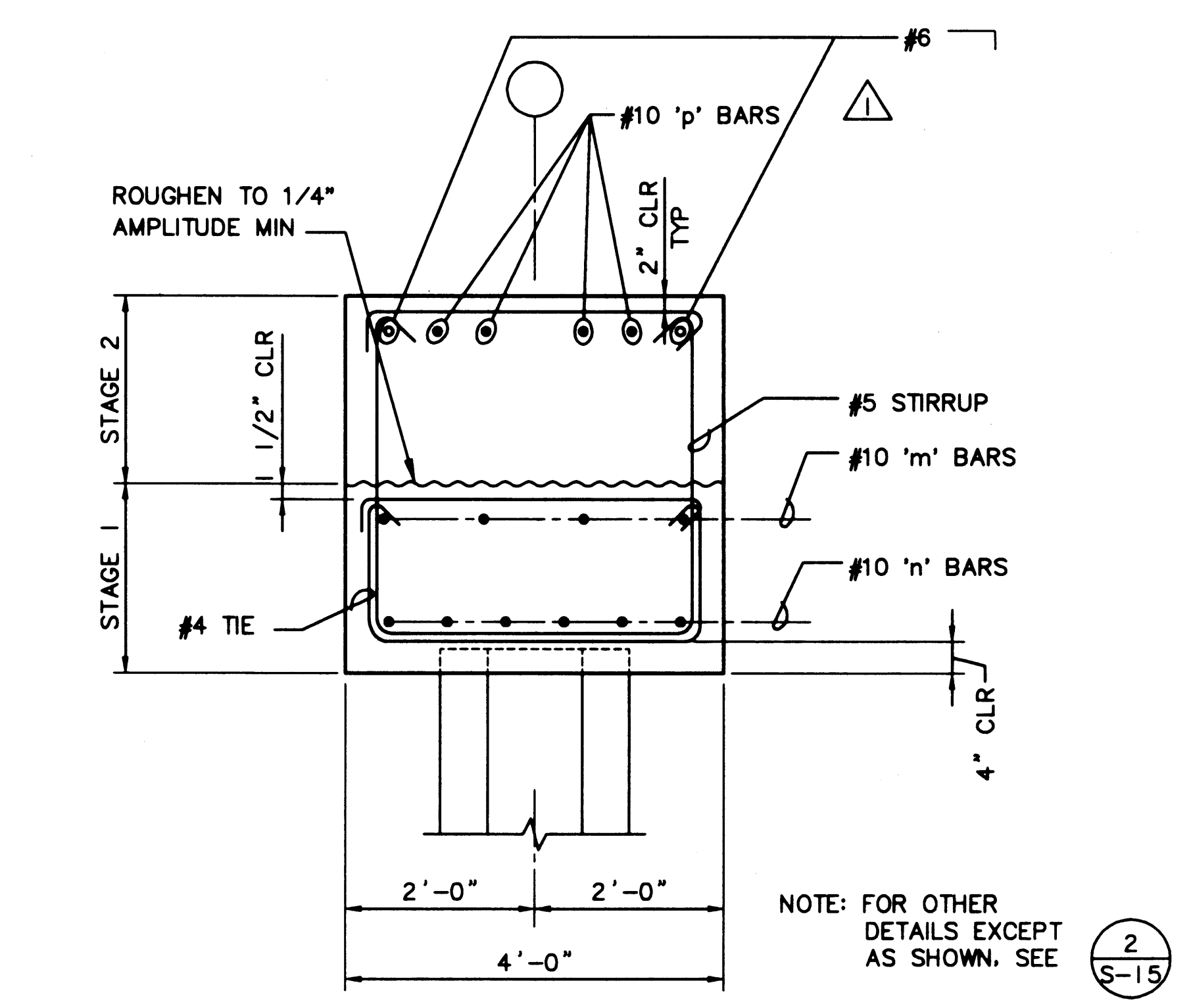
1 ELEVATION - PONY BENT PILE CAP, LANDSIDE  
 S-19 SCALE: 1/2"=1'-0"



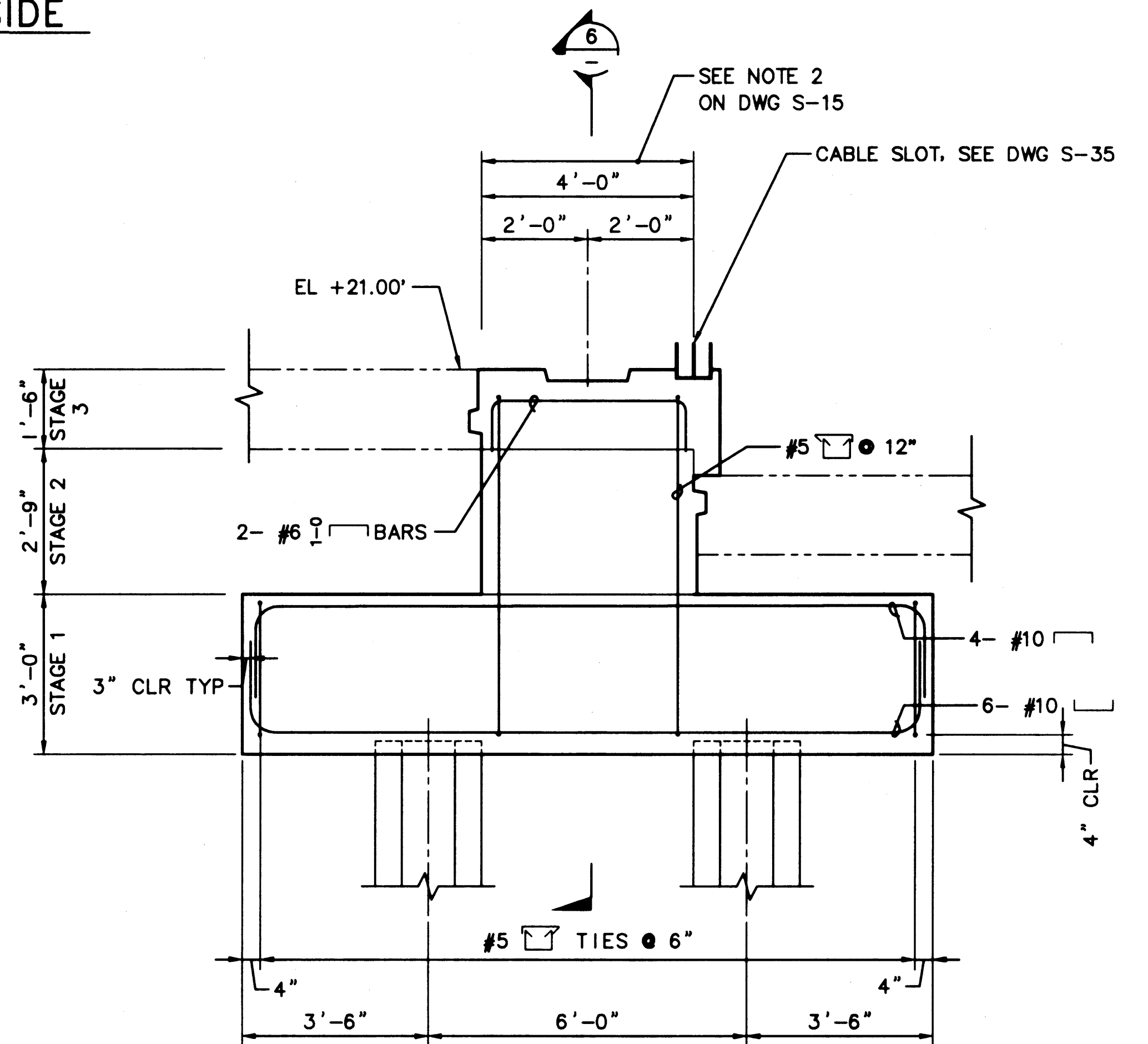
2 SECTION  
 S-19 SCALE: 3/4"=1'-0"



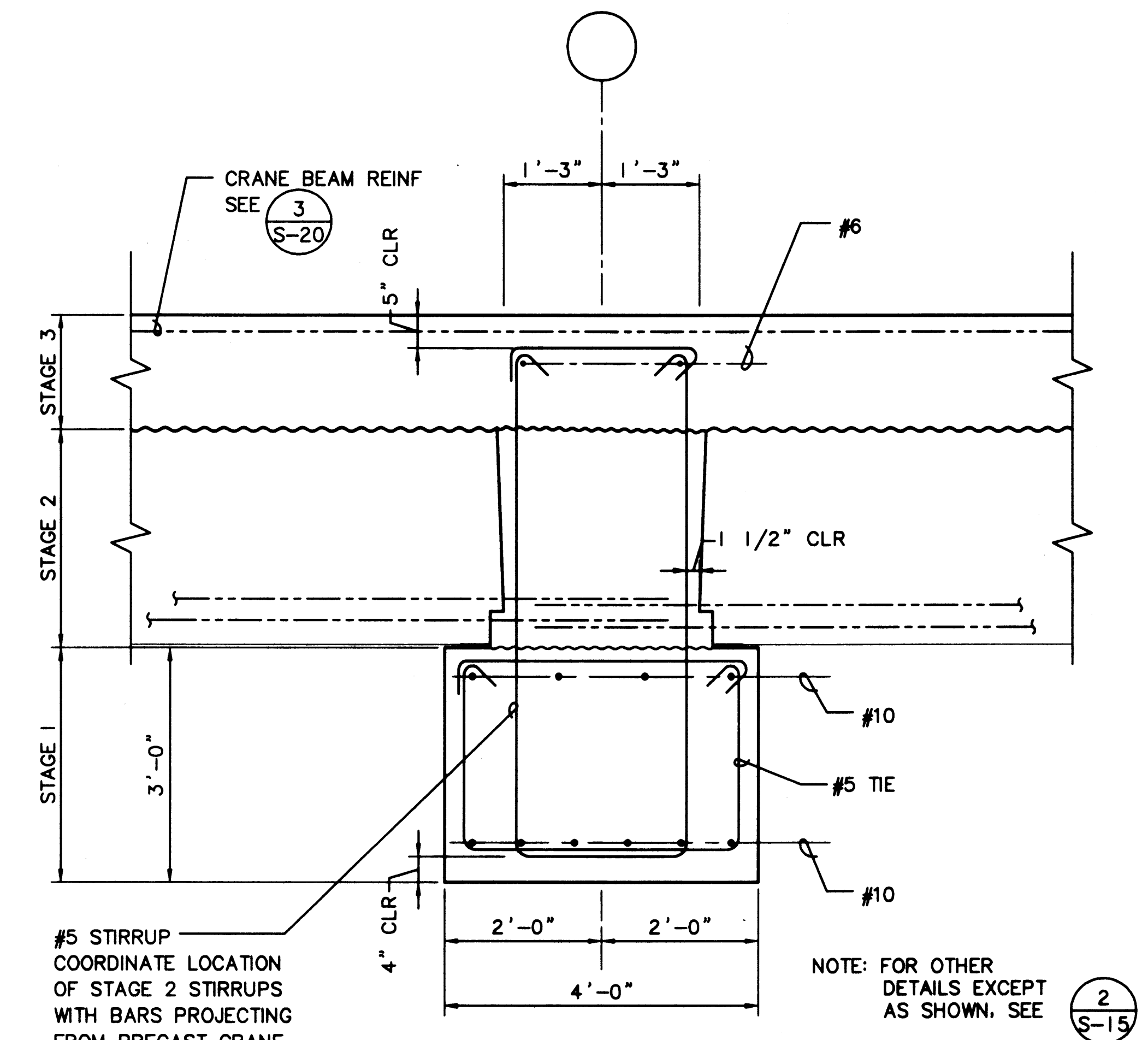
3 SECTION  
 S-19 SCALE: 3/4"=1'-0"



4 SECTION  
 S-19 SCALE: 3/4"=1'-0"



5 ELEVATION - PONY BENT PILE CAP, WATERSIDE  
 S-19 SCALE: 1/2"=1'-0"



6 SECTION  
 S-19 SCALE: 3/4"=1'-0"

AS-BUILT  
 AUTOCAD FILE NO. 5012S19 S-19

PLOTTED: Thu Jan 07 1999 2:01pm FILENAME: V:\1997\497093\CAD\S-19.dwg SCALE: 24



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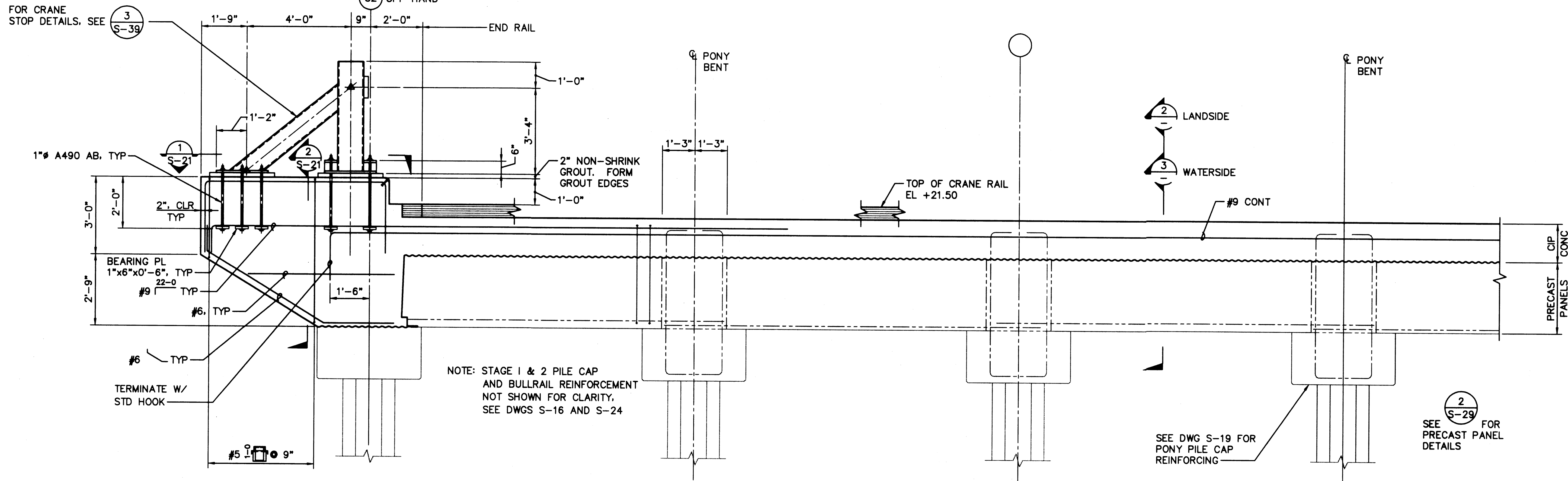
APPROVED  
  
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 DATE  
**CURTIS L. RATCLIFFE P.E.**  
 CHIEF ENGINEER

BTH	9/91	BCM	9/91
DRAWN BY	DATE	CHECKED BY	DATE
DESIGNED BY	DATE	PROJ ENGR	DATE
JAS	9/91	JAS	9/91

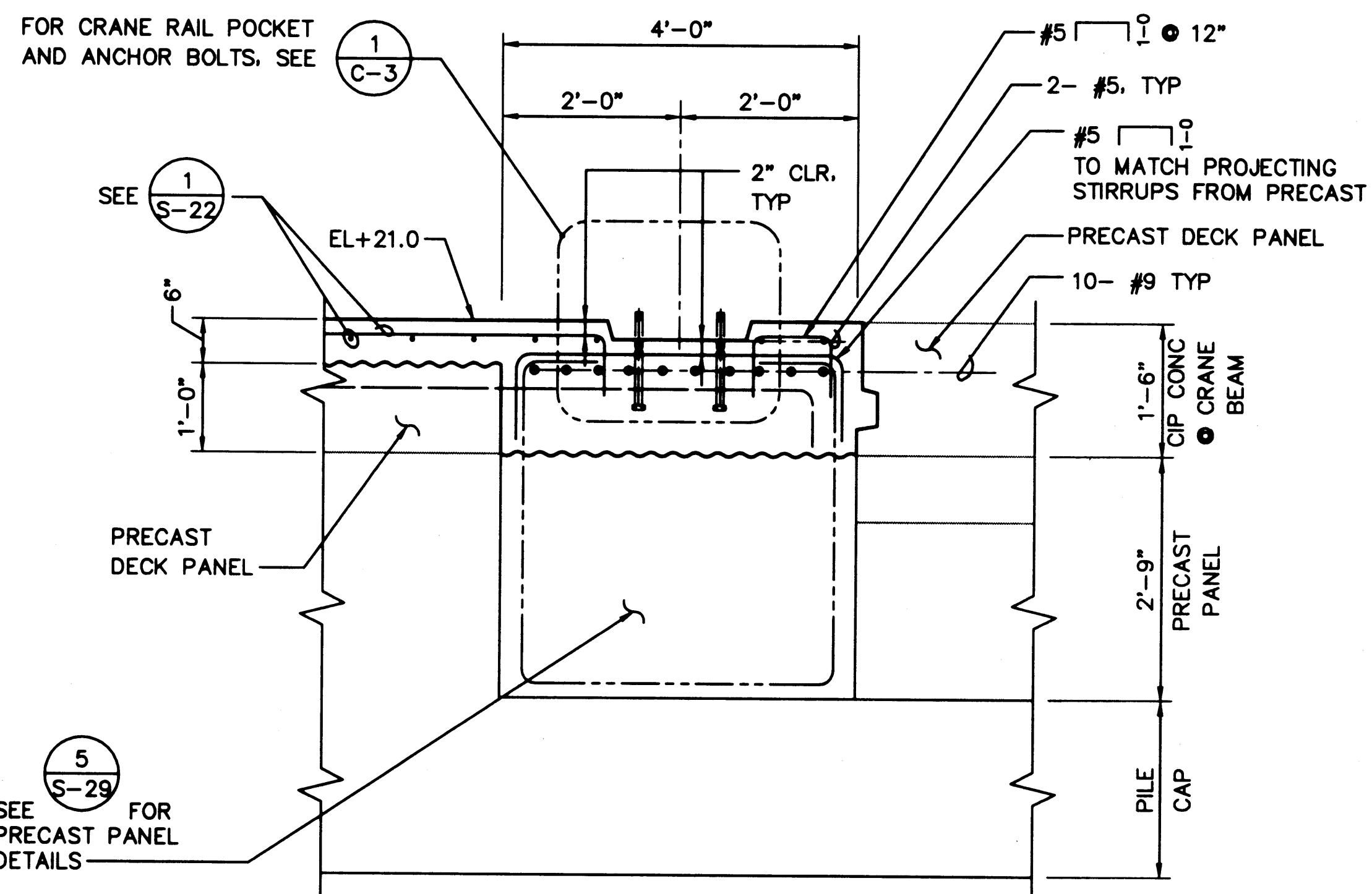
MARK	REVISION	BY	APP.	DATE

**HYUNDAI MERCHANT MARINE TERMINAL**  
**WHARF**  
**PORT OF TACOMA**  
**PILE CAP DETAILS - SHEET 5**

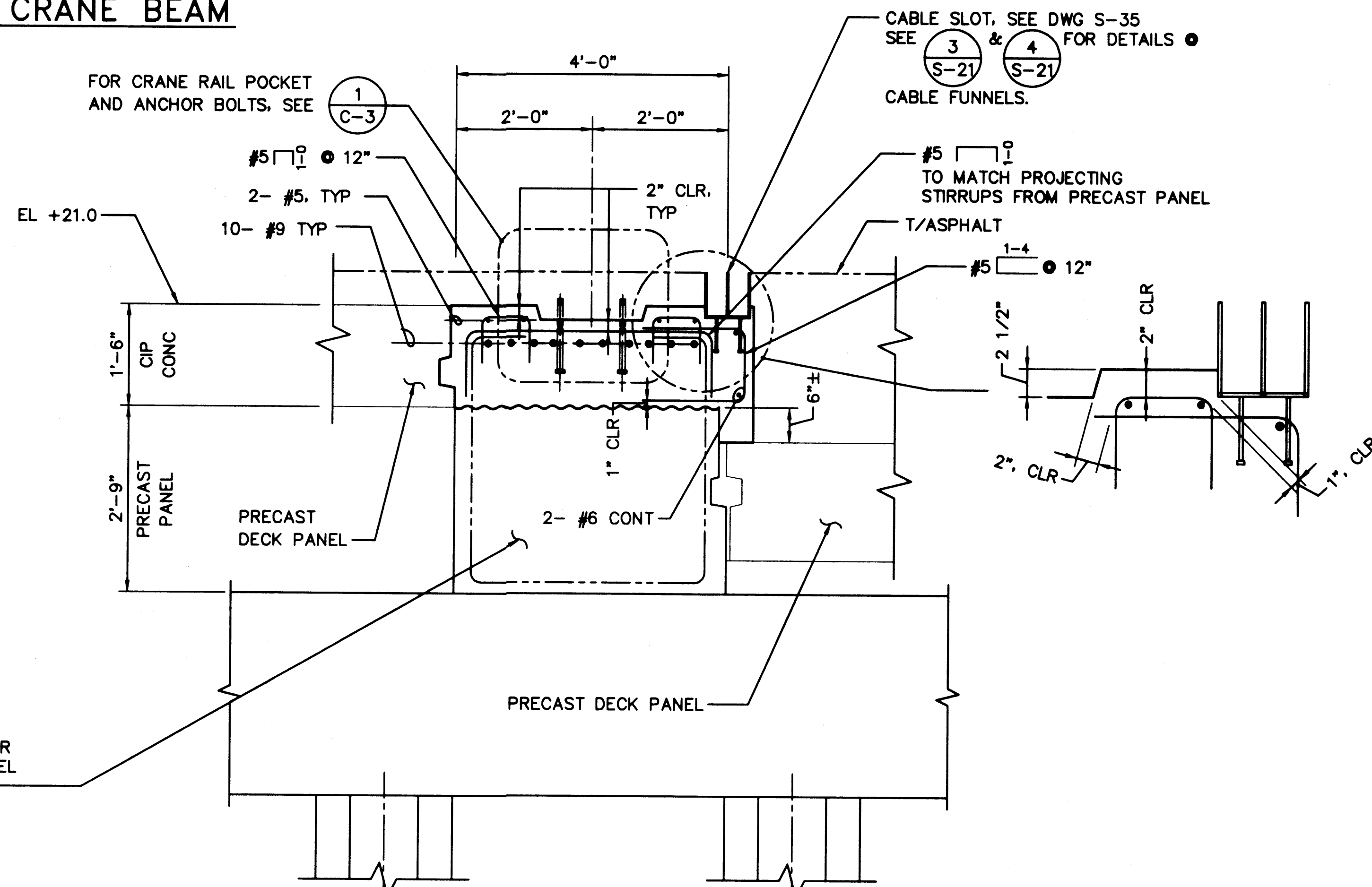
DRAWING NO. EP-5012-26  
 CONTRACT NO. 978038  
 SHEET NO. 28 OF 58



(1) ELEVATION - CRANE BEAM  
SCALE: 1/2" = 1'-0"



(2) SECTION - LANDSIDE CRANE BEAM  
SCALE: 3/4" = 1'-0"



(3) SECTION - WATERSIDE CRANE BEAM  
SCALE: 3/4" = 1'-0"



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*[Signature]* 1/11/99  
DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

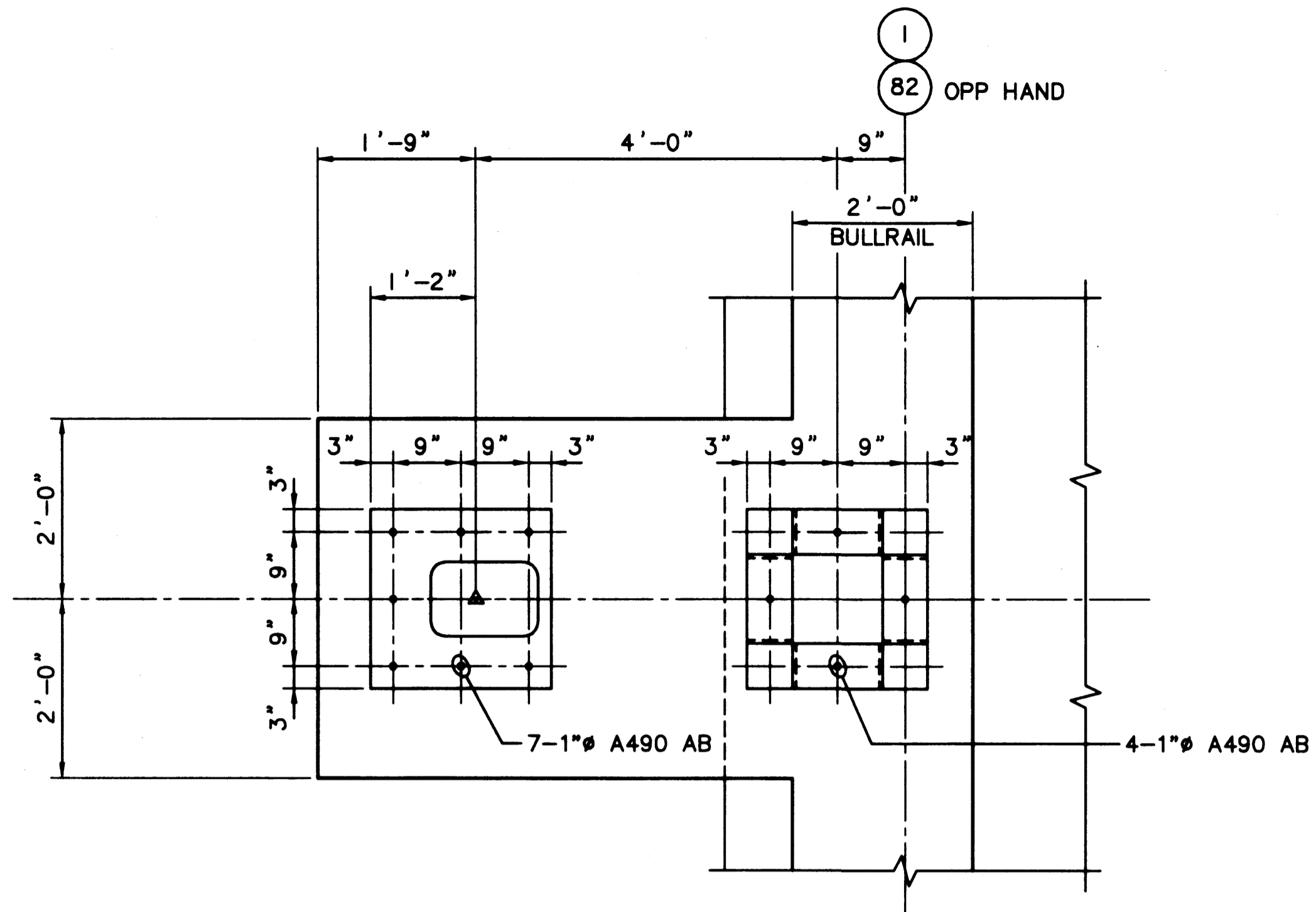
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DESIGNED BY	9/91	JAS	9/91
DATE	DATE	PROJ ENGR	DATE

MARK	REVISION	BY	APP.	DATE

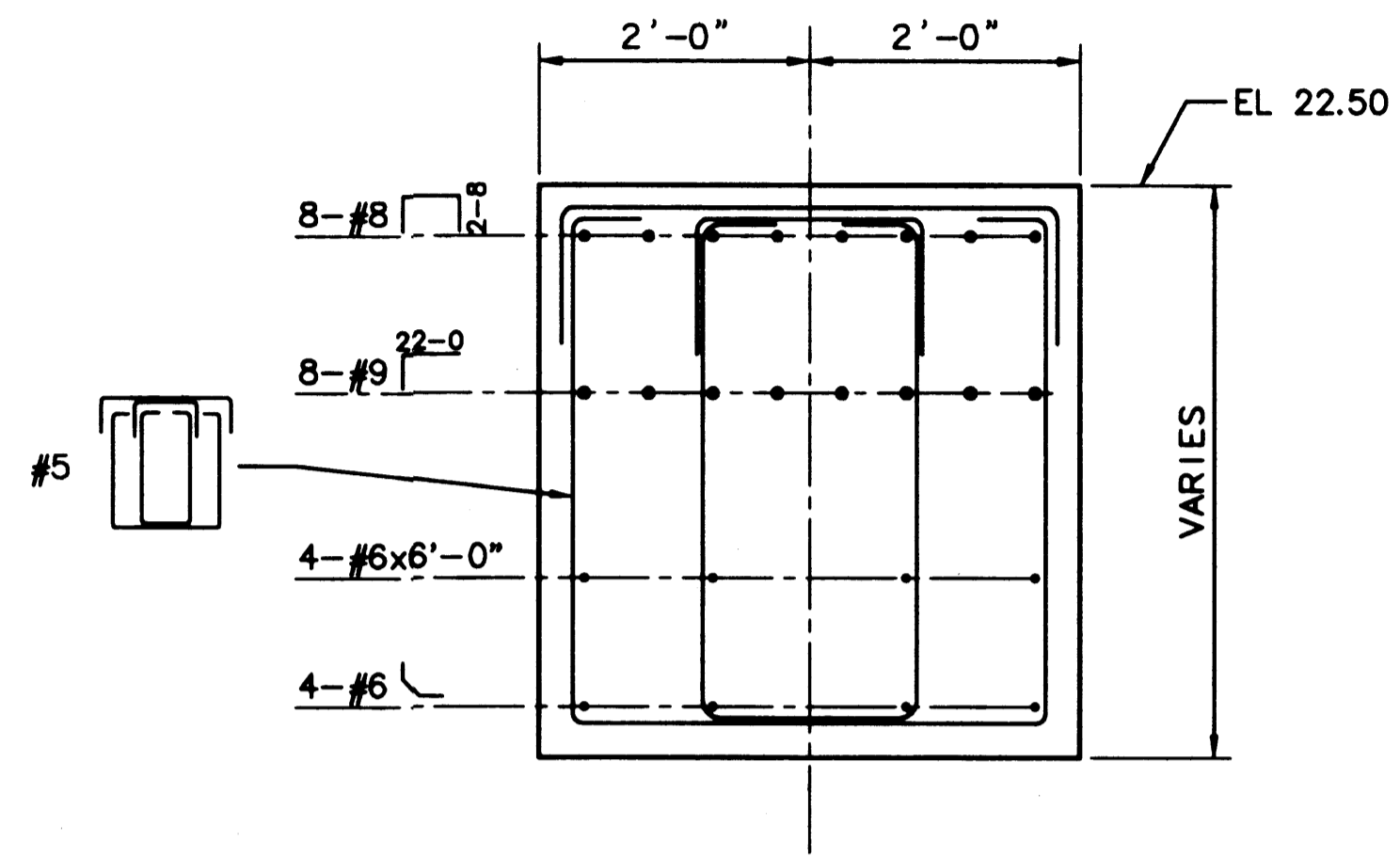
**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
PORT OF TACOMA  
CRANE BEAM DETAILS - SHEET 1

**AS-BUILT**  
AUTOCAD FILE NO. 5012820  
**S-20**  
DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 31 OF 58

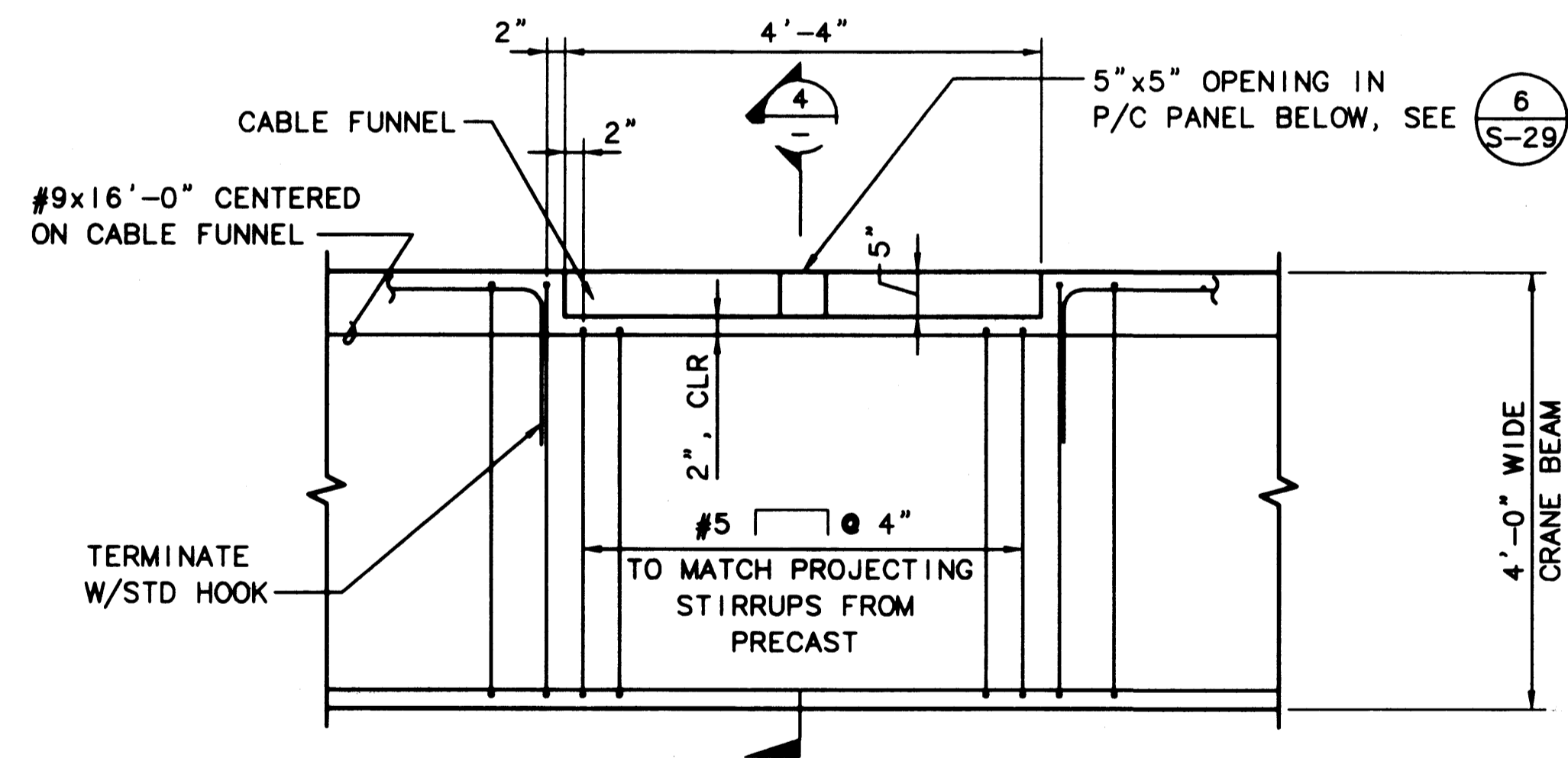
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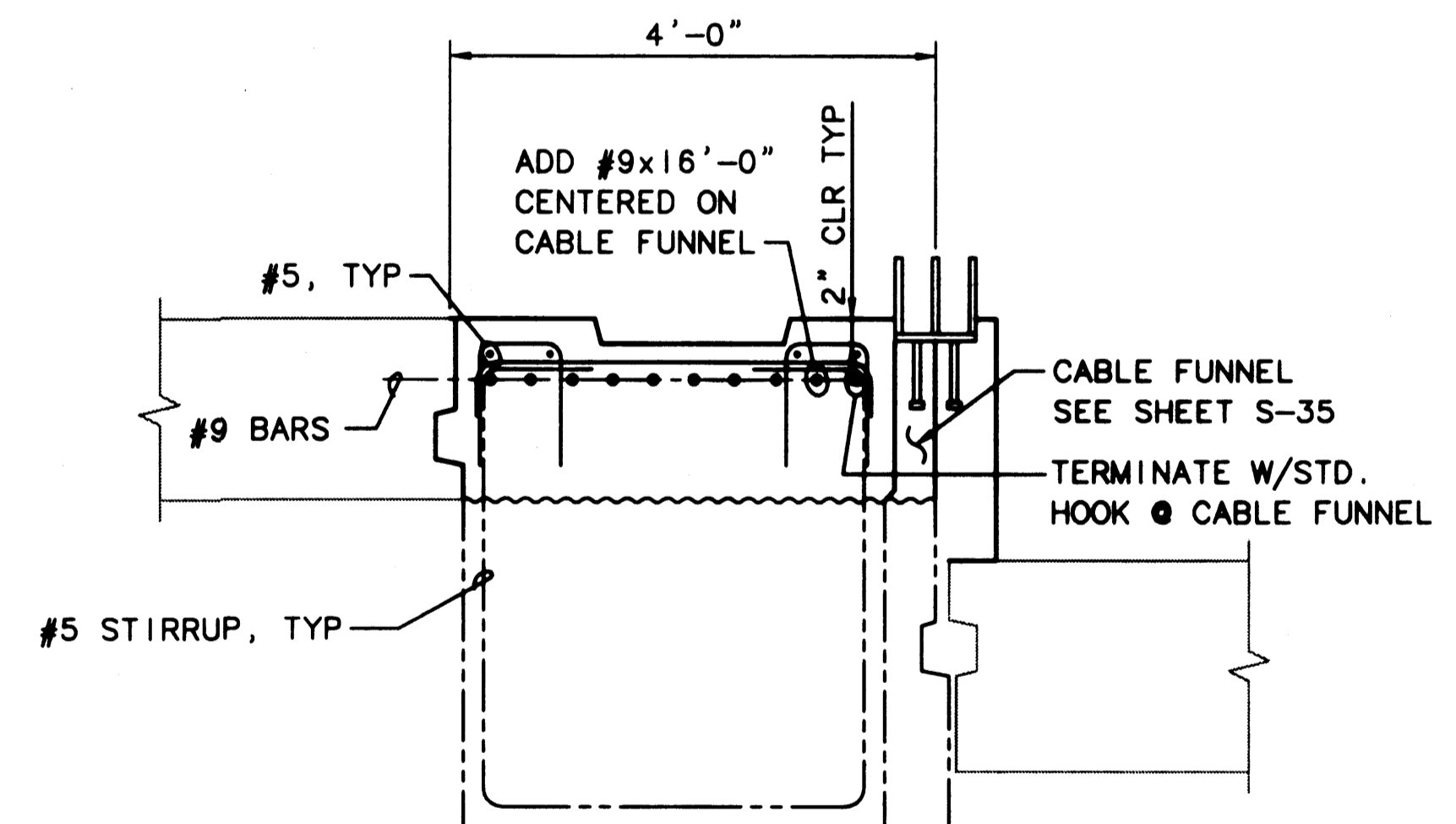
1 SECTION - CRANE STOP  
SCALE: 3/4"=1'-0"



2 SECTION - CRANE STOP  
SCALE: 3/4"=1'-0"



3 PLAN - WATERSIDE CRANE BEAM @ CABLE FUNNEL  
SCALE: 3/4"=1'-0"



4 SECTION - CRANE BEAM @ CABLE FUNNEL  
SCALE: 3/4"=1'-0"

FOR ALL DETAILS EXCEPT AS NOTED, SEE 3/S-20

AS-BUILT

AUTOCAD FILE NO. 5012821

S-21



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APPROVED  
*Curtis L. Ratcliffe*  
DATE 1/1/99  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER

BTH 9/91  
DRAWN BY DATE  
9/91

BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE
AS-BUILT		RDD	JAS	1/4/99

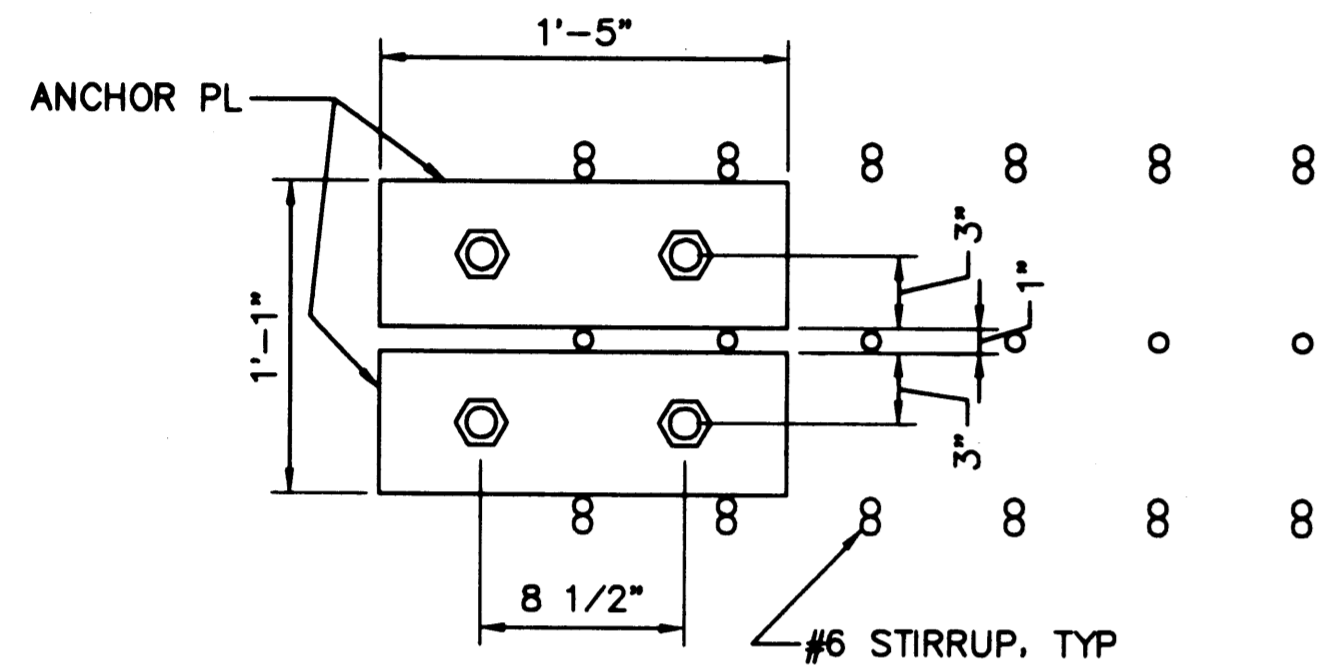
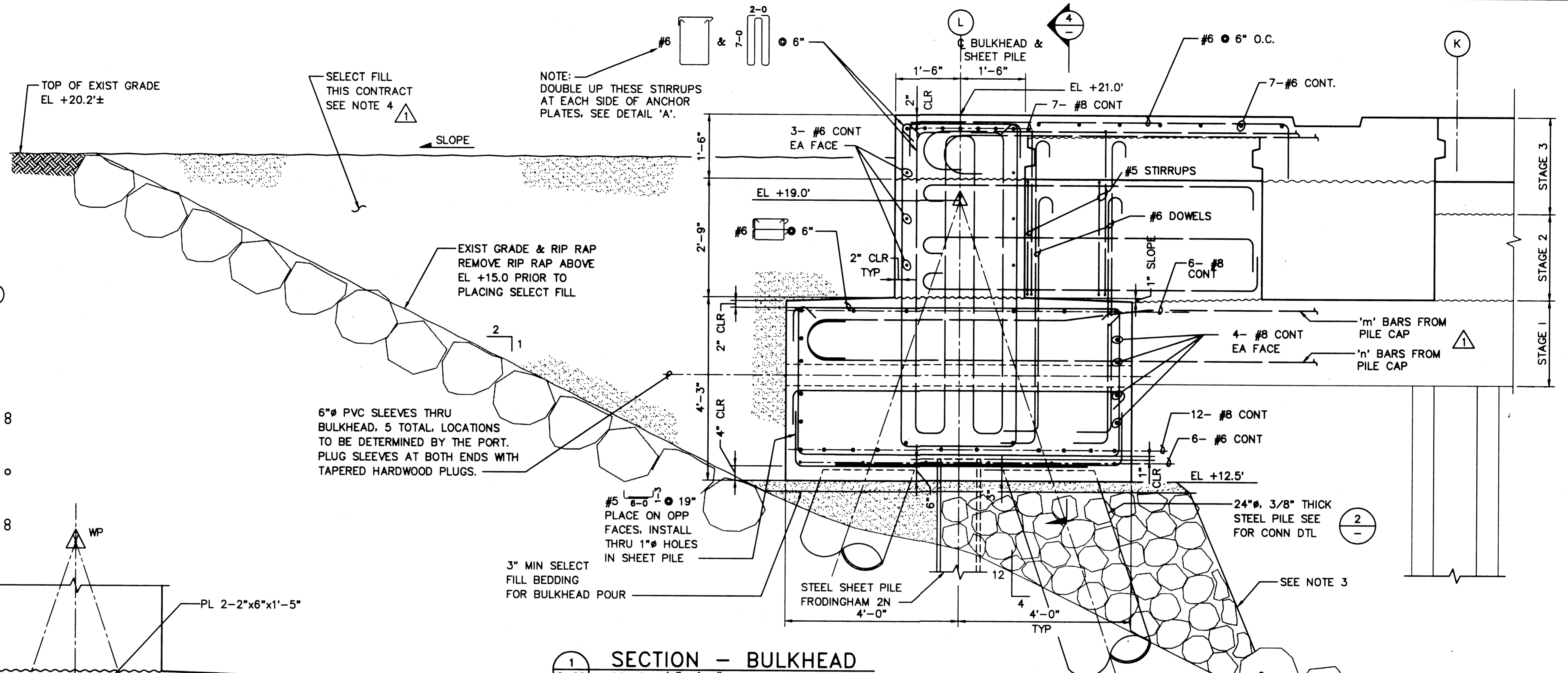
**HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
CRANE BEAM DETAILS - SHEET 2**

DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 32 OF 58

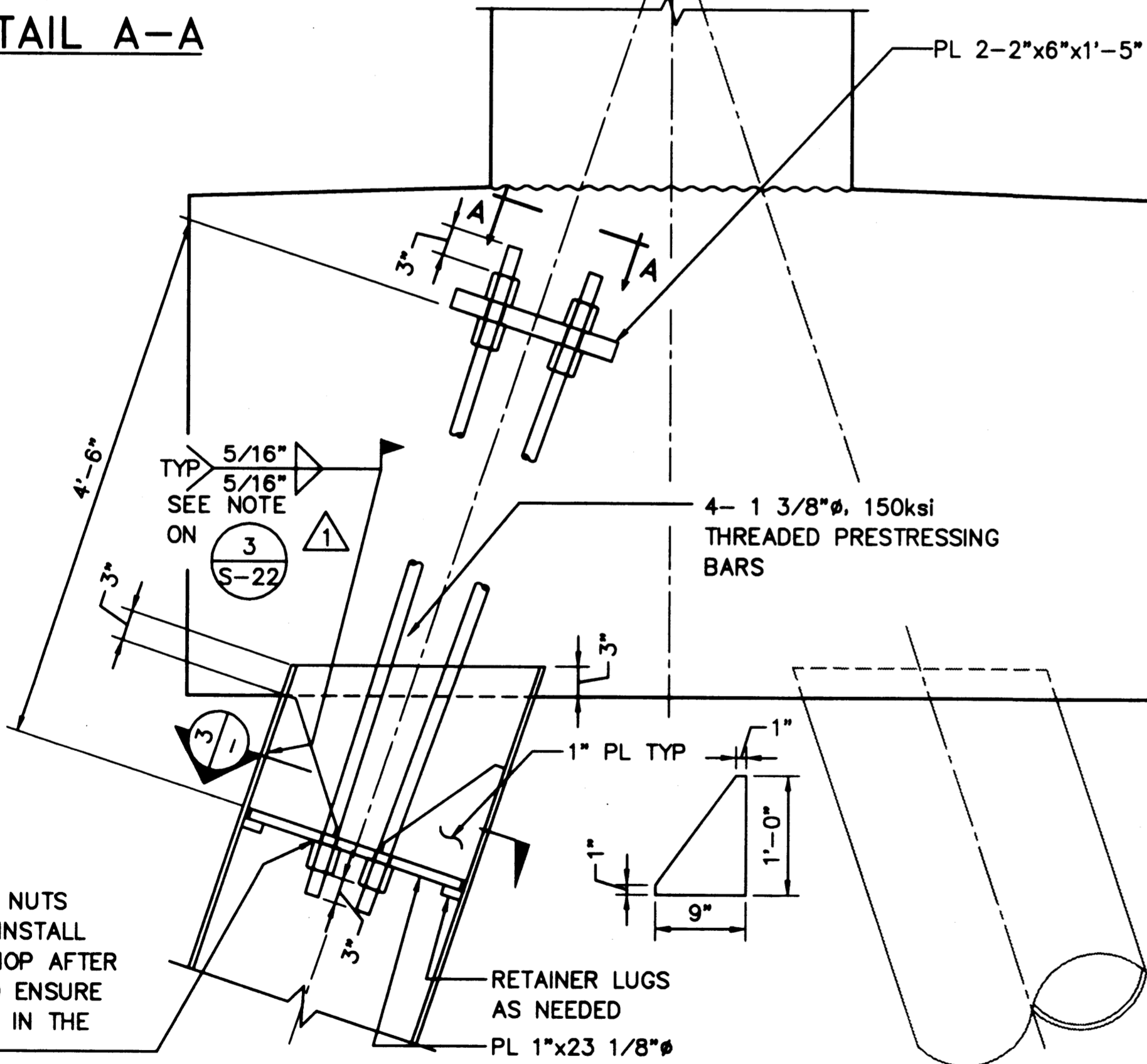
PLOTTED: Thu Jan 07 1999 2:02pm FILENAME: K:\1997\487093\CAD\S-21.dwg SCALE: 16

**NOTES:**

1. WATERSIDE STEEL PIPE PILES & WATERSIDE FACE OF SHEET PILES TO BE PAINTED. SEE SPECIFICATIONS.
2. SHEET PILE DESIGNATION IS SHOWN FOR INDICATION OF SIZE AND SECTION PROPERTIES. PRODUCT OF OTHER MANUFACTURERS MEETING THE SPECIFICATION, SIZE AND SECTION PROPERTY REQUIREMENTS WILL BE ACCEPTABLE.
3. CAP SOFFIT OUTBOARD OF SHEET MAY BE FORMED OR POURED ON TEMPORARY BERM AT CONTRACTOR'S OPTION. FORMS, IF USED, MUST BE REMOVED.
4. BACKFILL NORTH OF BENT (22.3) WAS DONE WITH SITE EXCAVATED CONTAMINATED MATERIAL. FROM BENT (22.3) TO BENT (49) SITE EXCAVATED MATERIAL WAS PLACED ONLY ABOVE ELECTRICAL DUCT BANK ELEVATION. YARD PAVING SECTION FROM BENT (14) TO BENT (22.3) HAS GRAVEL BASE CUT BACK TO AN 8" DEPTH. FROM BENT (14) TO BENT (1) THE YARD PAVING SECTION HAD THE GRAVEL BASE CUT BACK TO A 6" DEPTH.

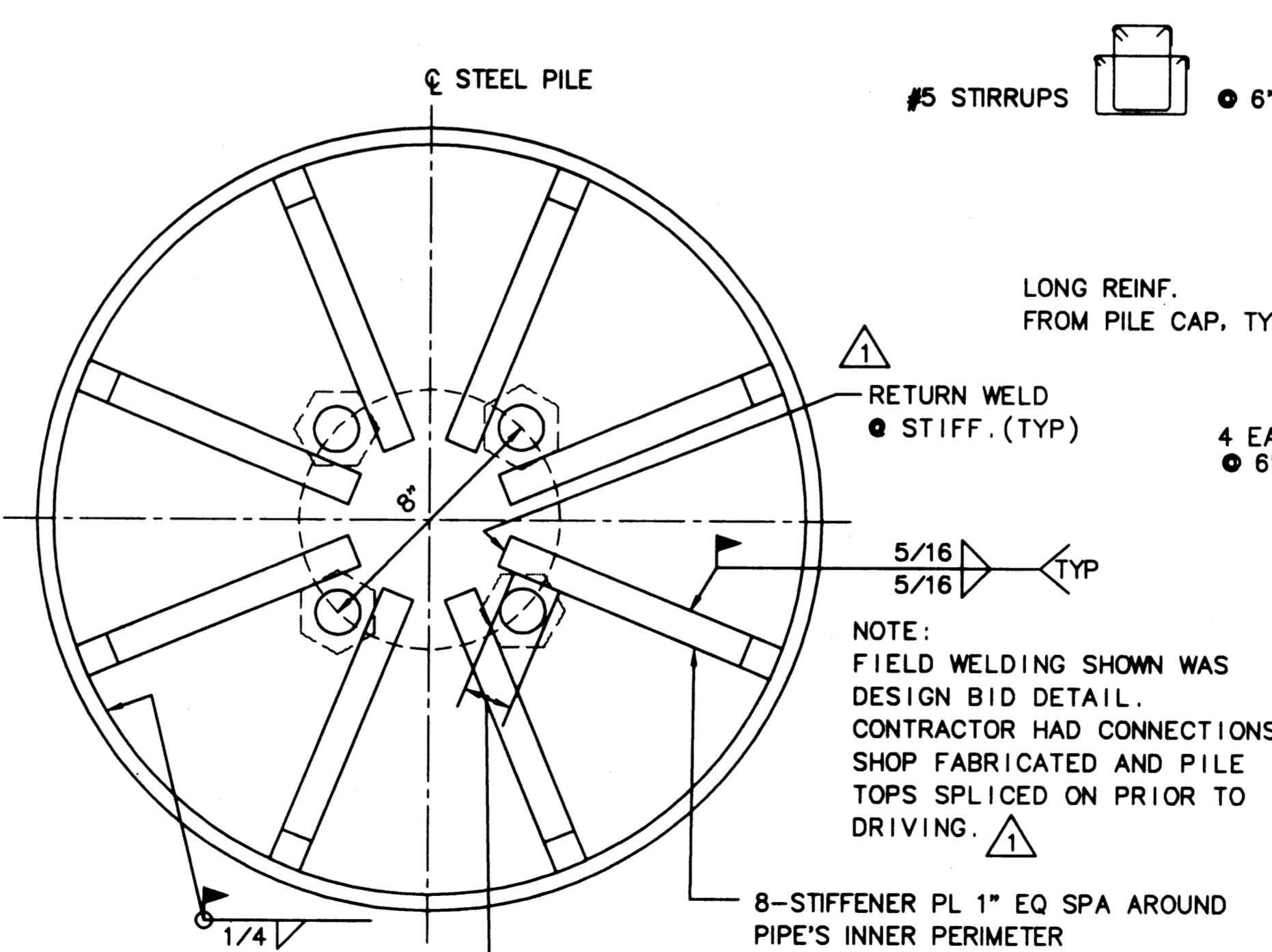


**DETAIL A-A**

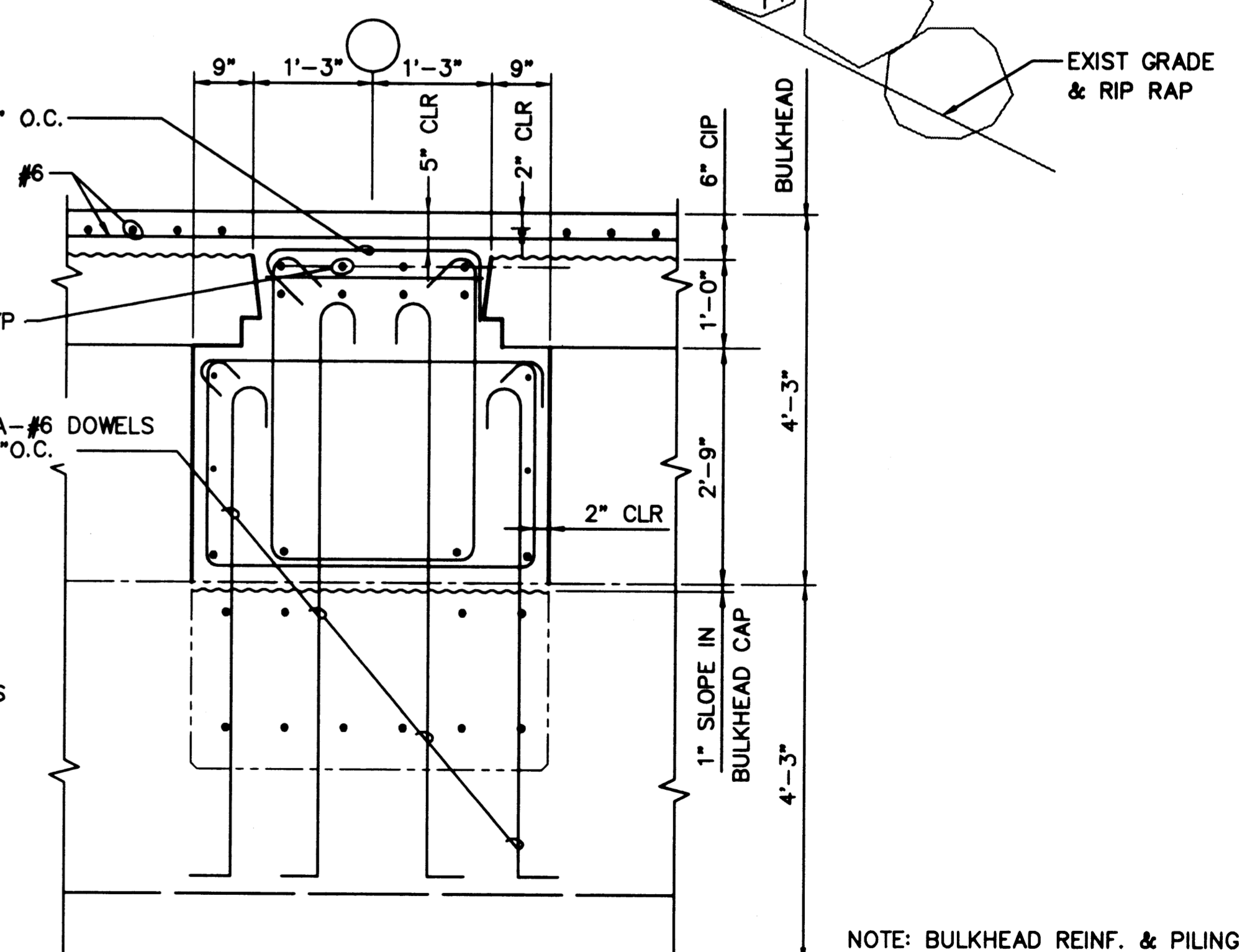


**DETAIL - STEEL PIPE CONNECTION**

NOTE: MISCELLANEOUS STEEL FABRICATIONS SHOWN ON THIS DETAIL NEED NOT BE GALVANIZED



**SECTION - STEEL PIPE CONNECTION**



**SECTION**

NOTE: BULKHEAD REINF. & PILING NOT SHOWN FOR CLARITY

**AS-BUILT**

AUTOCAD FILE NO. 6015822

**S-22**



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APPROVED  
*Curtis L. Ratcliffe*  
DATE 1/10/99  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

MMD 9/91  
DRAWN BY DATE  
DESIGNED BY DATE

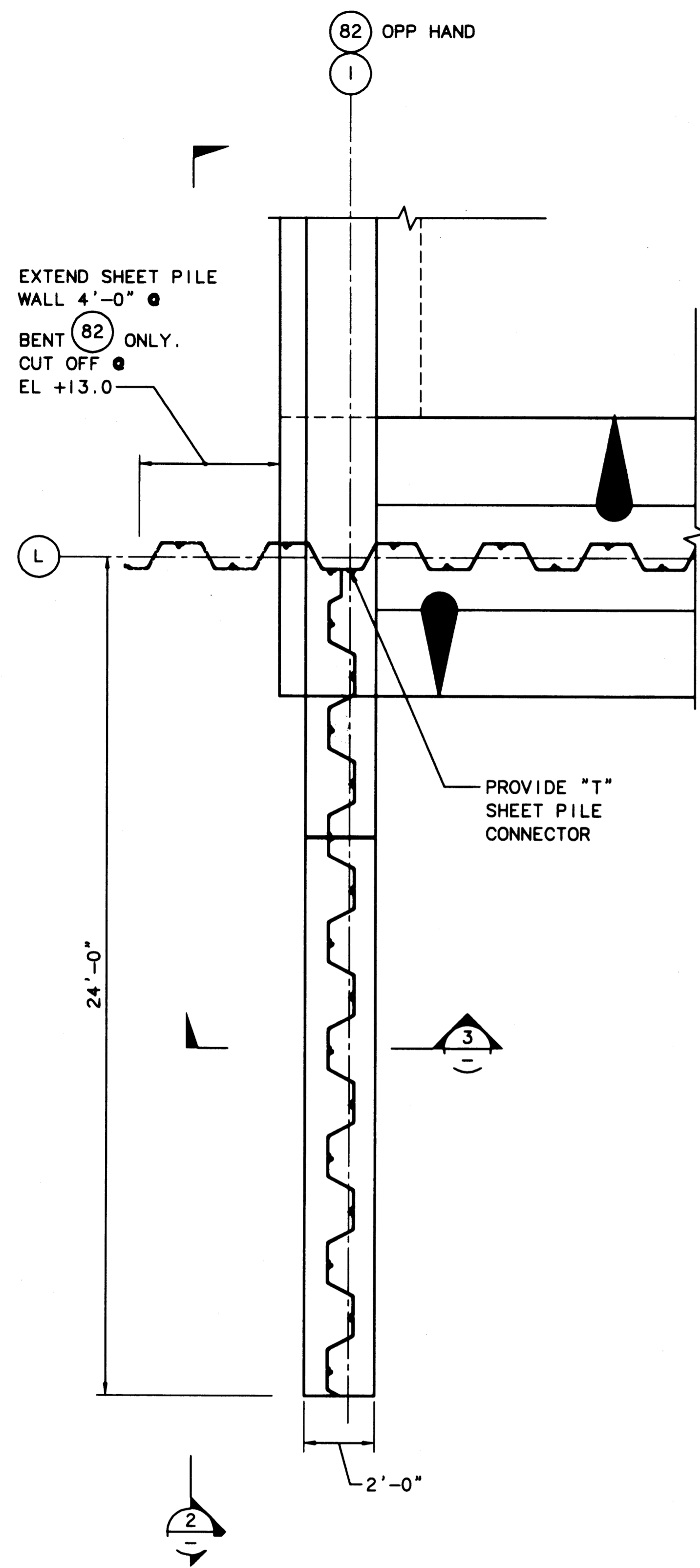
BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

AS-BUILT  
RCD JAS 1/4/99

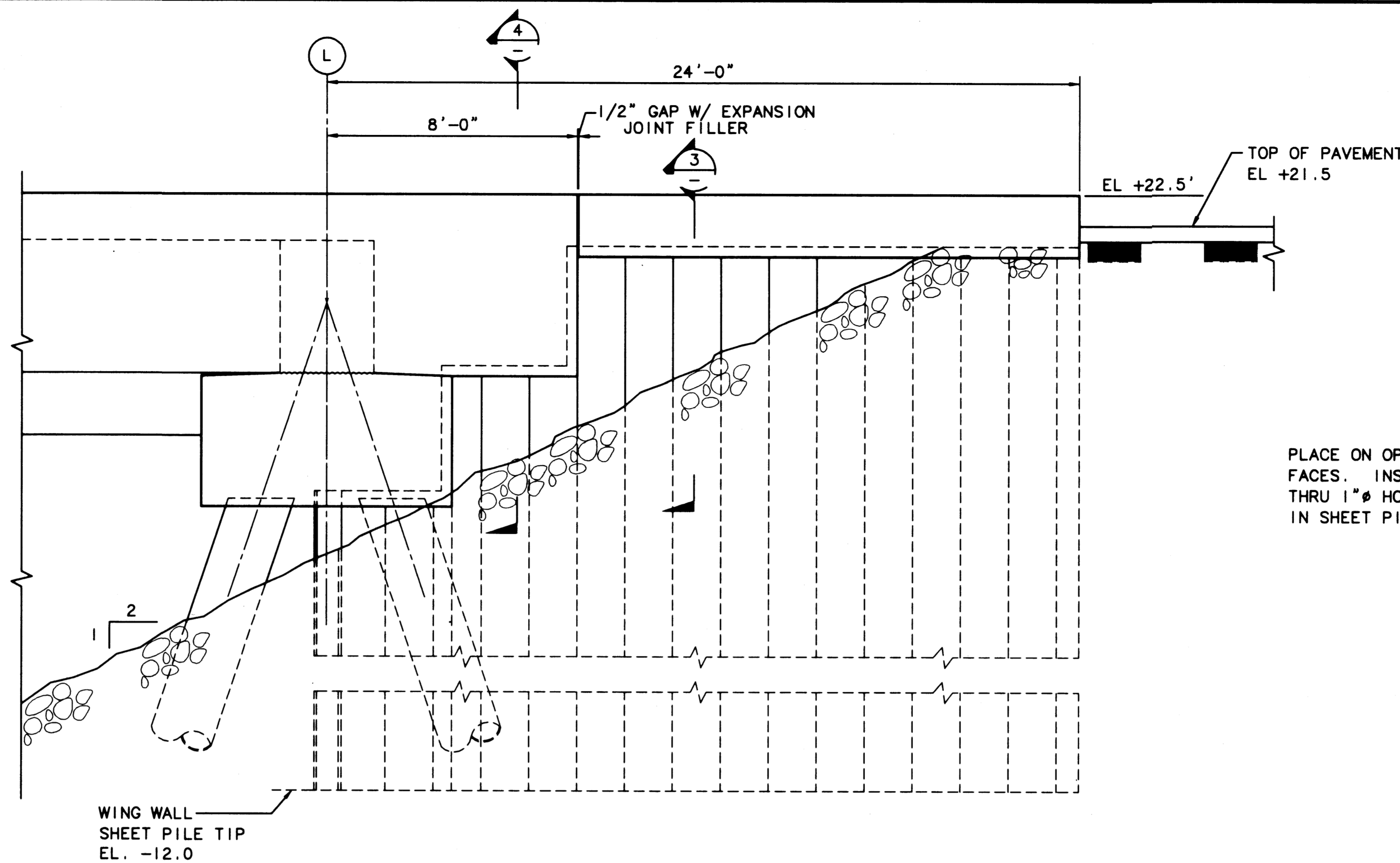
**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**BULKHEAD DETAILS - SHEET 1**

DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **33** OF **58**

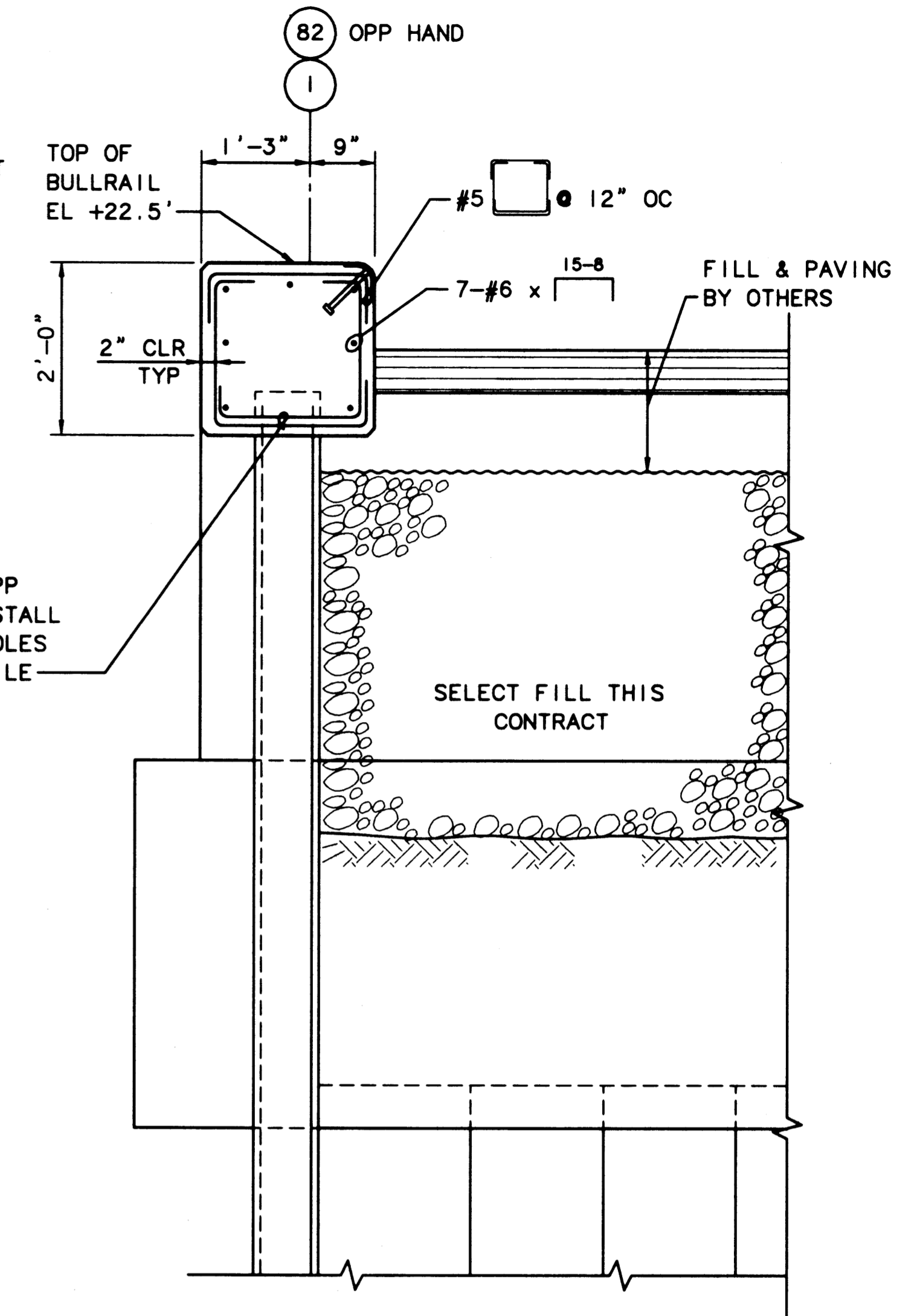
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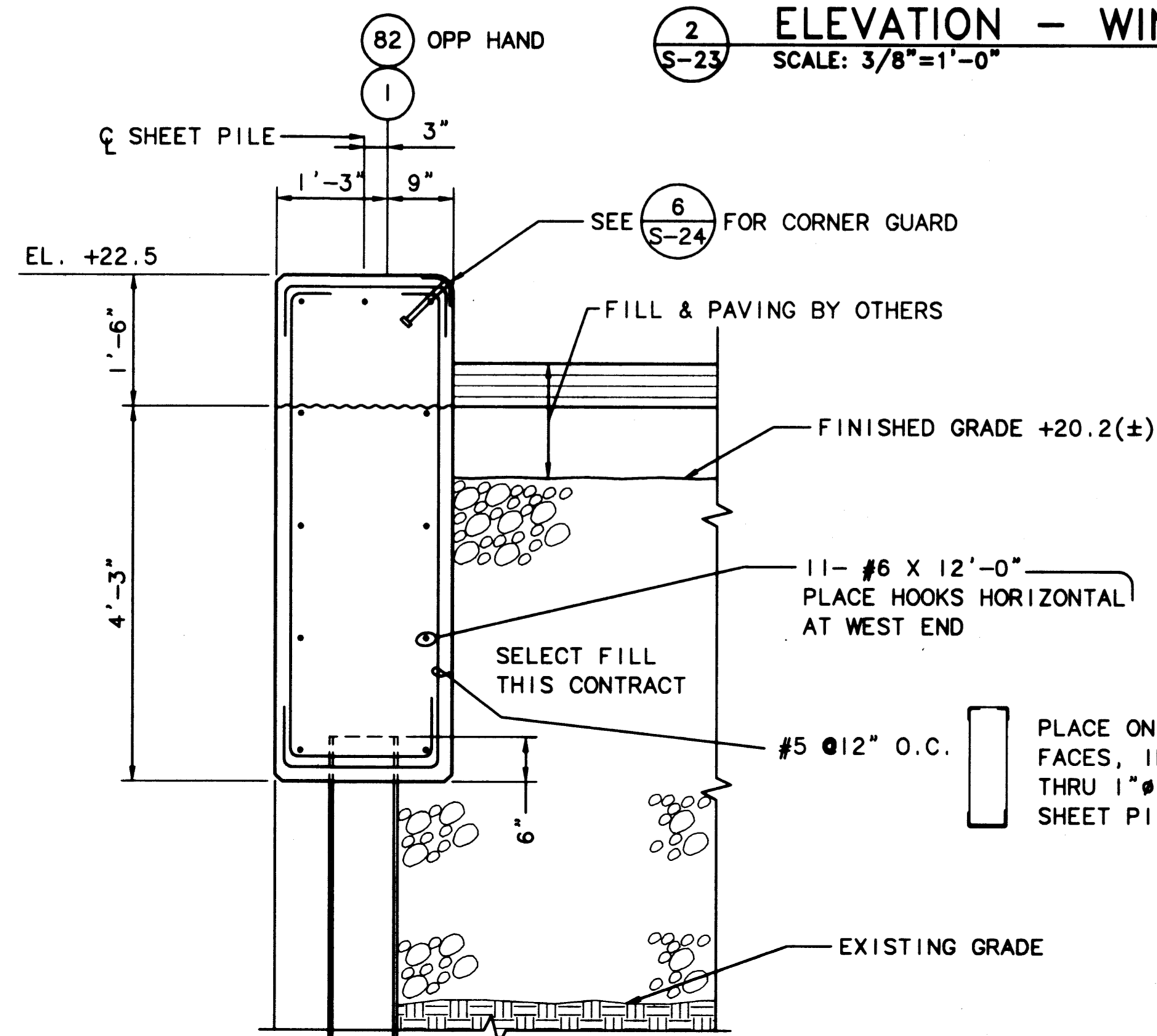
1 PLAN - WING WALL AT BENT 1 & 82  
S-23 SCALE: 3/8"=1'-0"



2 ELEVATION - WING WALL  
S-23 SCALE: 3/8"=1'-0"



3 SECTION - WING WALL  
S-23 SCALE: 3/4"=1'-0"



4 SECTION  
S-23 SCALE: 3/4"=1'-0"

AS-BUILT

AUTOCAD FILE NO. 5012823

S-23



PORT OF TACOMA  
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(206) 431-2300 FAX: (206) 431-2290

APPROVED  
Curtis L. Ratcliffe P.E.  
DATE 1/10/99  
DESIGNED BY DATE  
CHIEF ENGINEER

SK 9/91  
DRAWN BY DATE  
DESIGNED BY DATE

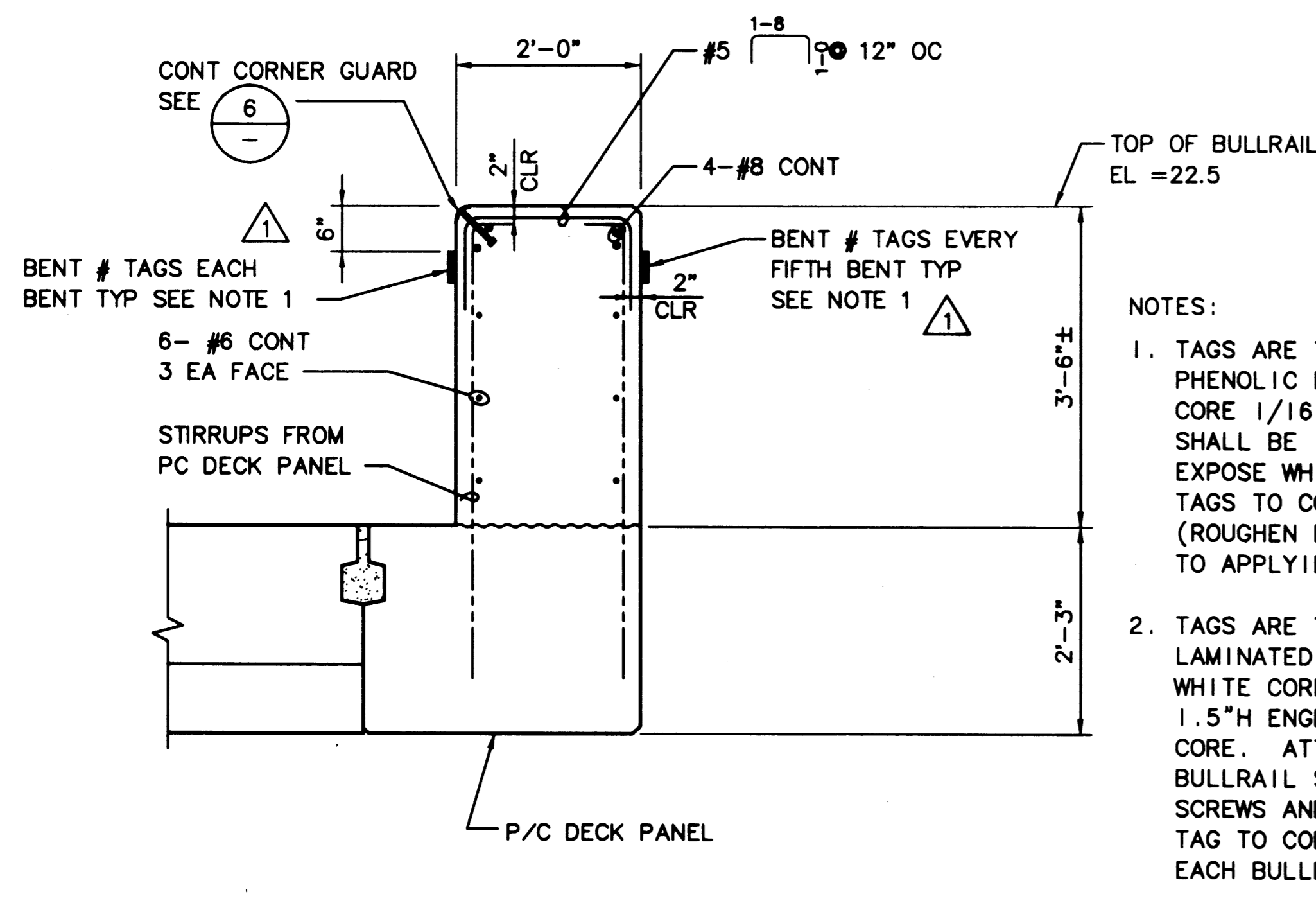
BCM 9/91  
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JAS 9/91  
PROJ ENGR DATE

MARK	REVISION	BY	APP.	DATE

HYUNDAI MERCHANT MARINE TERMINAL WHARF  
PORT OF TACOMA  
BULKHEAD DETAILS - SHEET 2

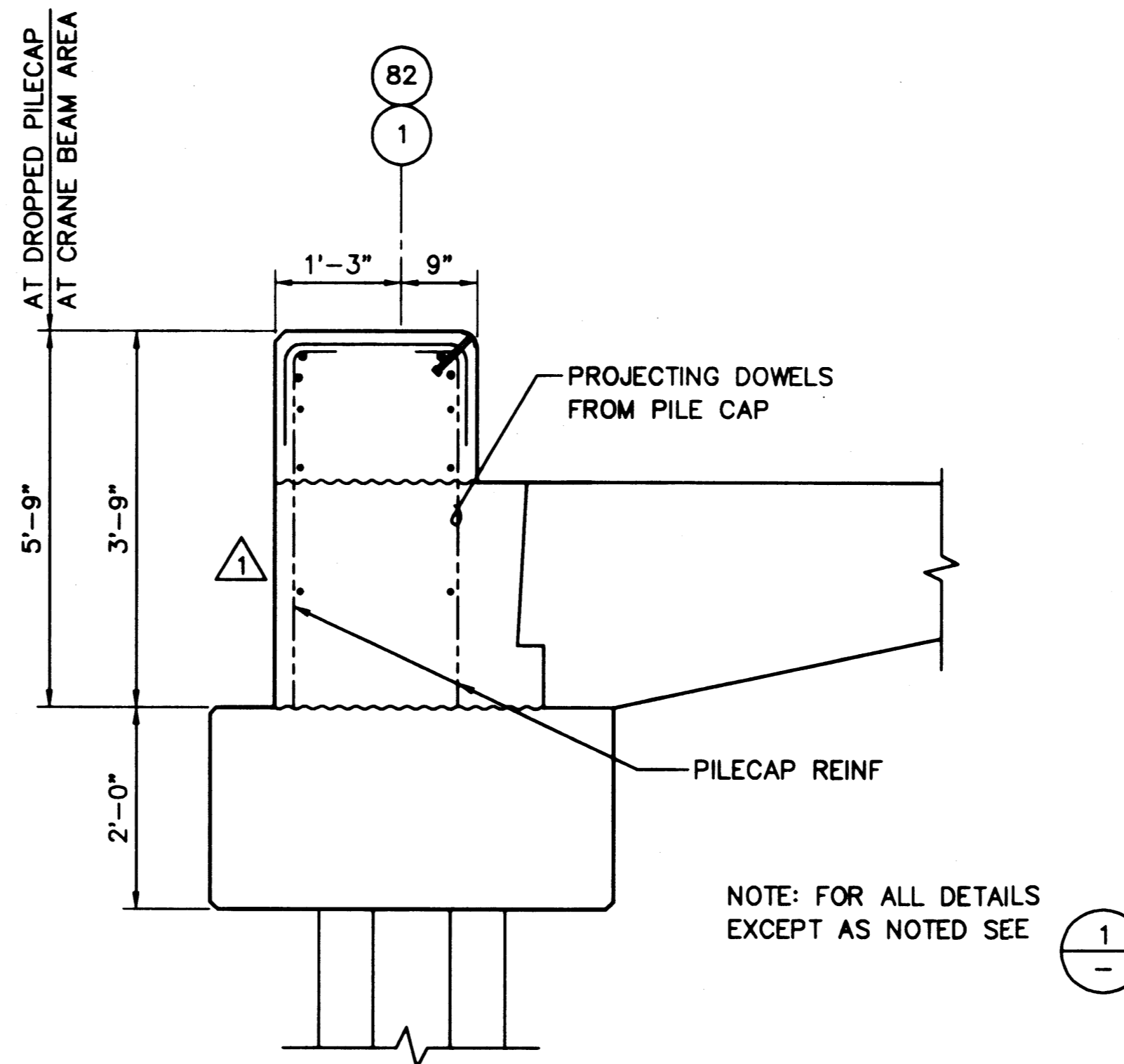
DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 34 OF 58

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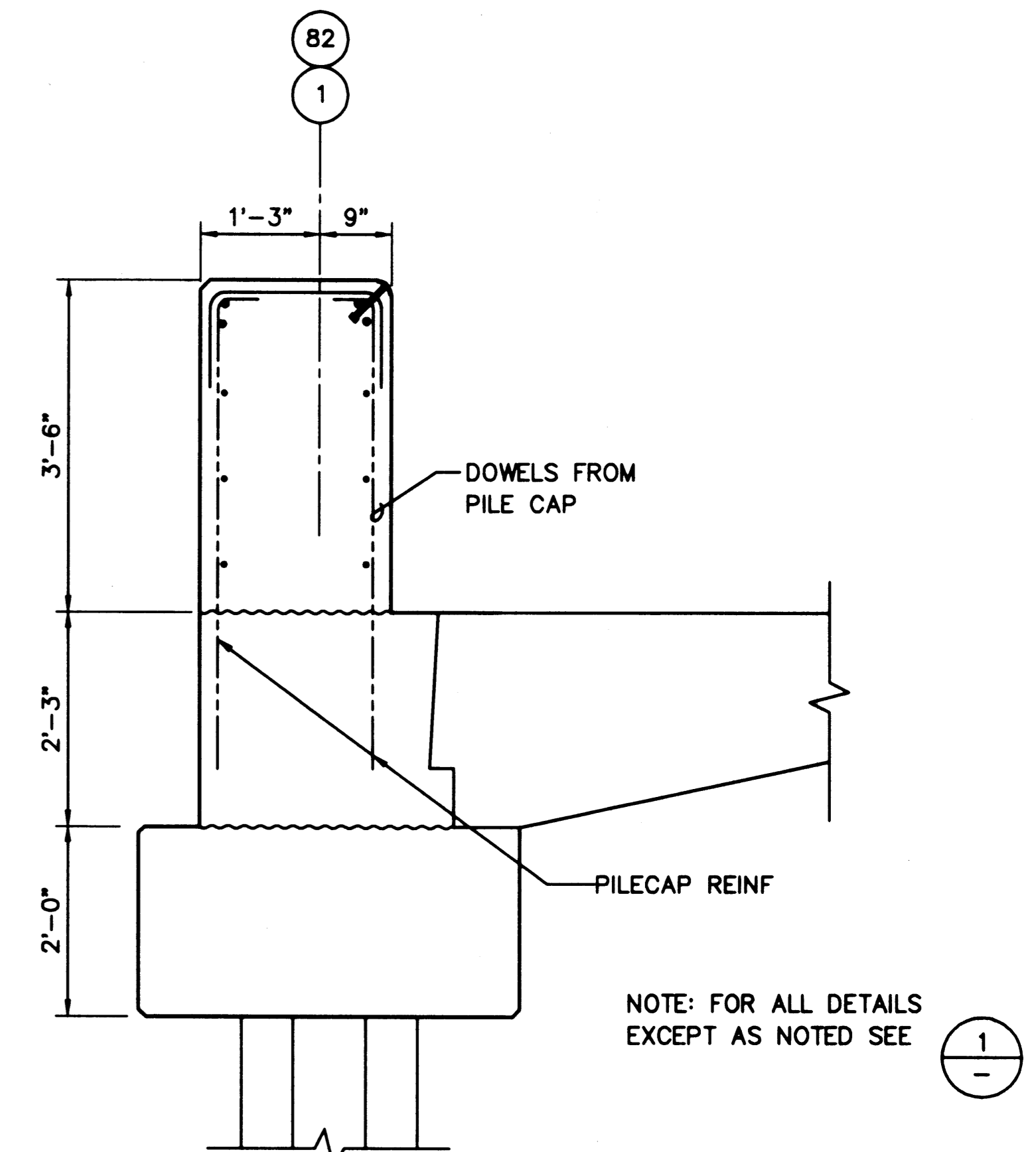


1 SECTION - BULLRAIL, TYP  
S-24 SCALE: 3/4"=1'-0"

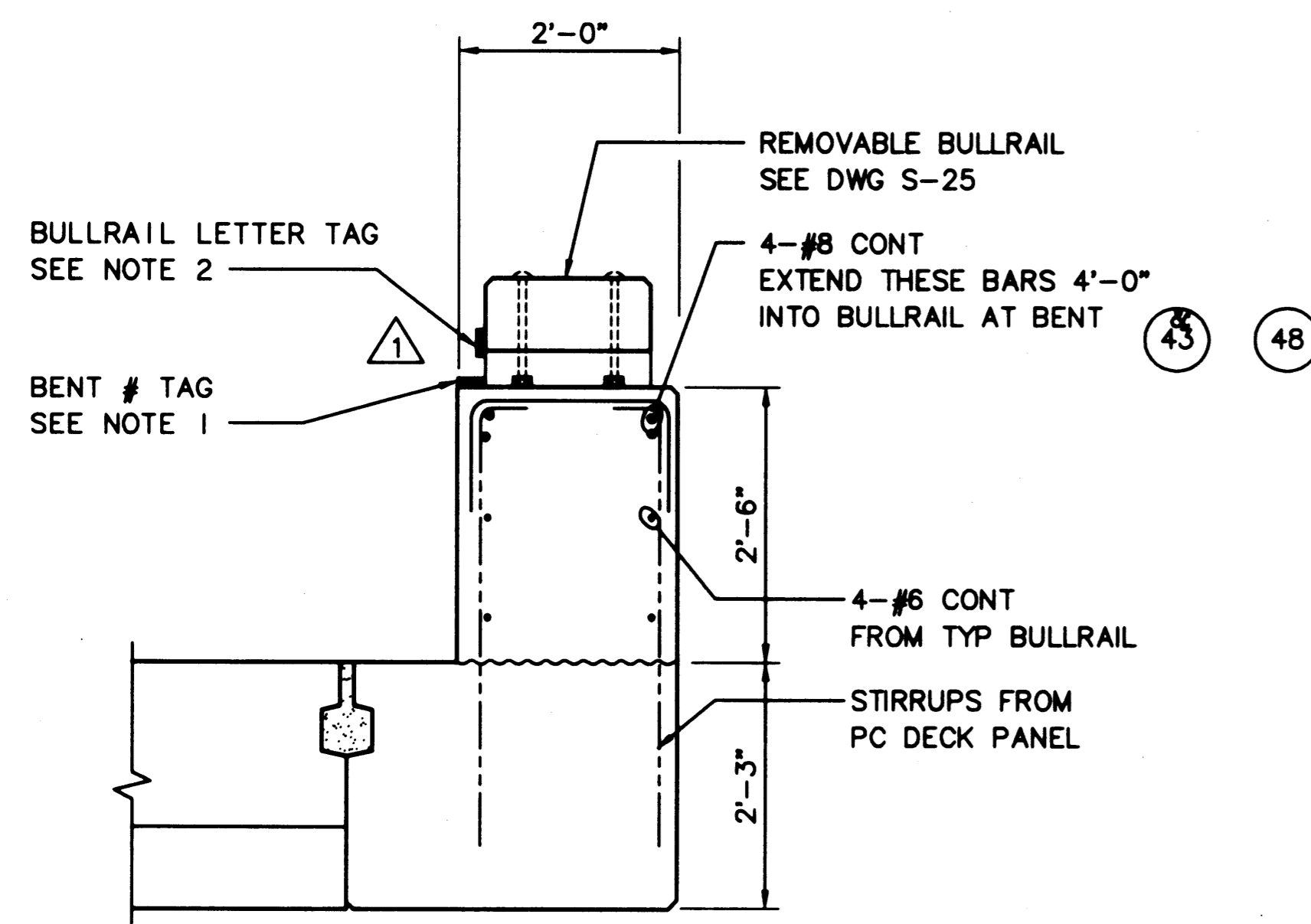
NOTES:  
 1. TAGS ARE TO BE LAMINATED PHENOLIC BLACK WITH WHITE CORE 1/16"x3"Wx4"L. NUMBERS SHALL BE 1.50"H ENGRAVED TO EXPOSE WHITE CORE. EPOXY TAGS TO CONCRETE SURFACE (ROUGHEN BACK OF TAGS PRIOR TO APPLYING EPOXY).  
 2. TAGS ARE TO BE 1/16"x3"Wx3"L LAMINATED PHENOLIC RED WITH WHITE CORE. LETTERS SHALL BE 1.5"H ENGRAVED TO EXPOSE WHITE CORE. ATTACH TO TIMBER BULLRAIL SECTIONS WITH BRASS SCREWS AND EPOXY CORRESPONDING TAG TO CONCRETE SURFACE (2 TAGS EACH BULLRAIL SECTION).



2 SECTION - BULLRAIL AT BENT 1 & 82  
S-24 SCALE: 3/4"=1'-0" AT UNBALLASTED AREA

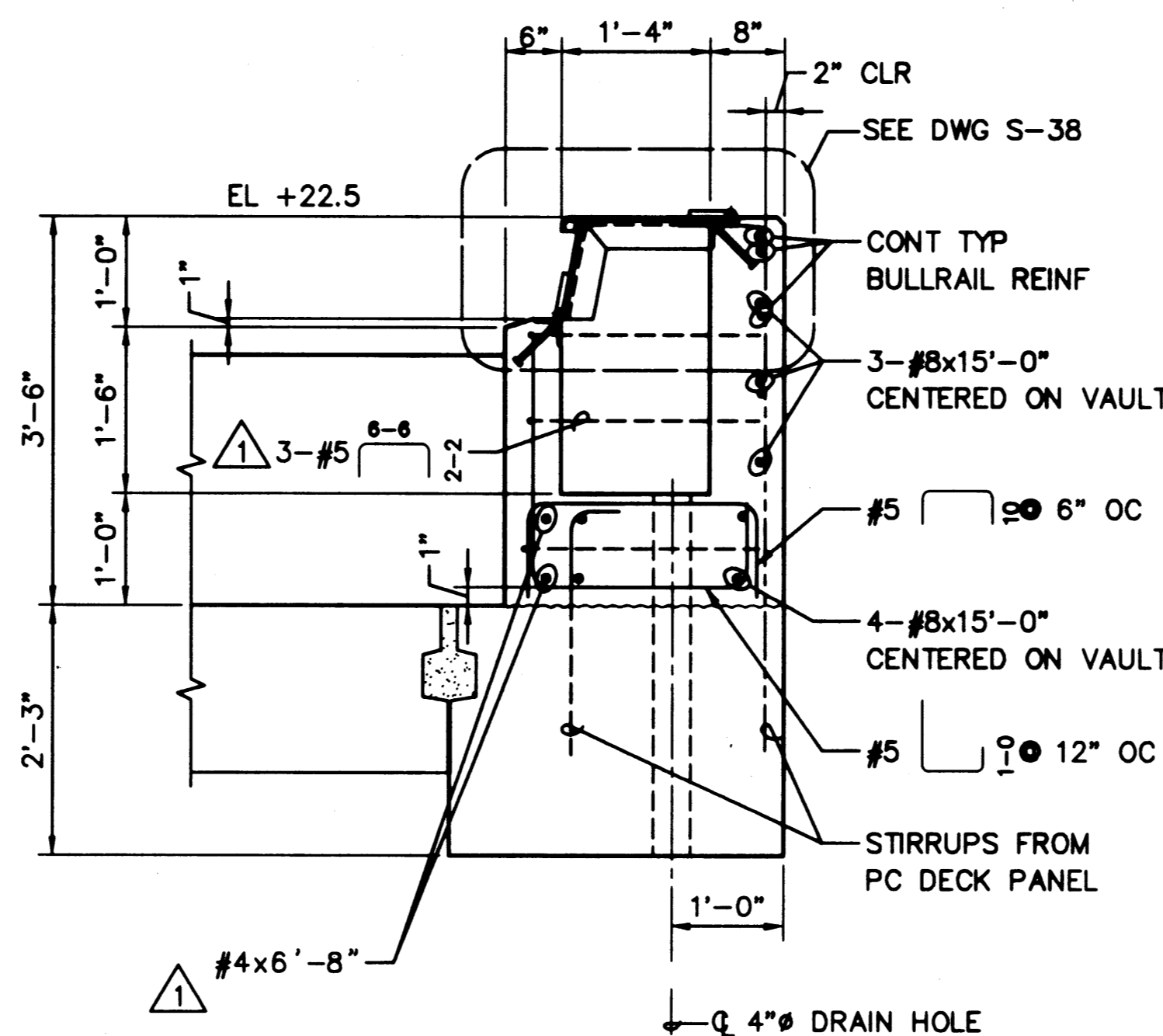


3 SECTION - BULLRAIL AT BENT 1 & 82  
S-24 SCALE: 3/4"=1'-0" AT BALLASTED AREA

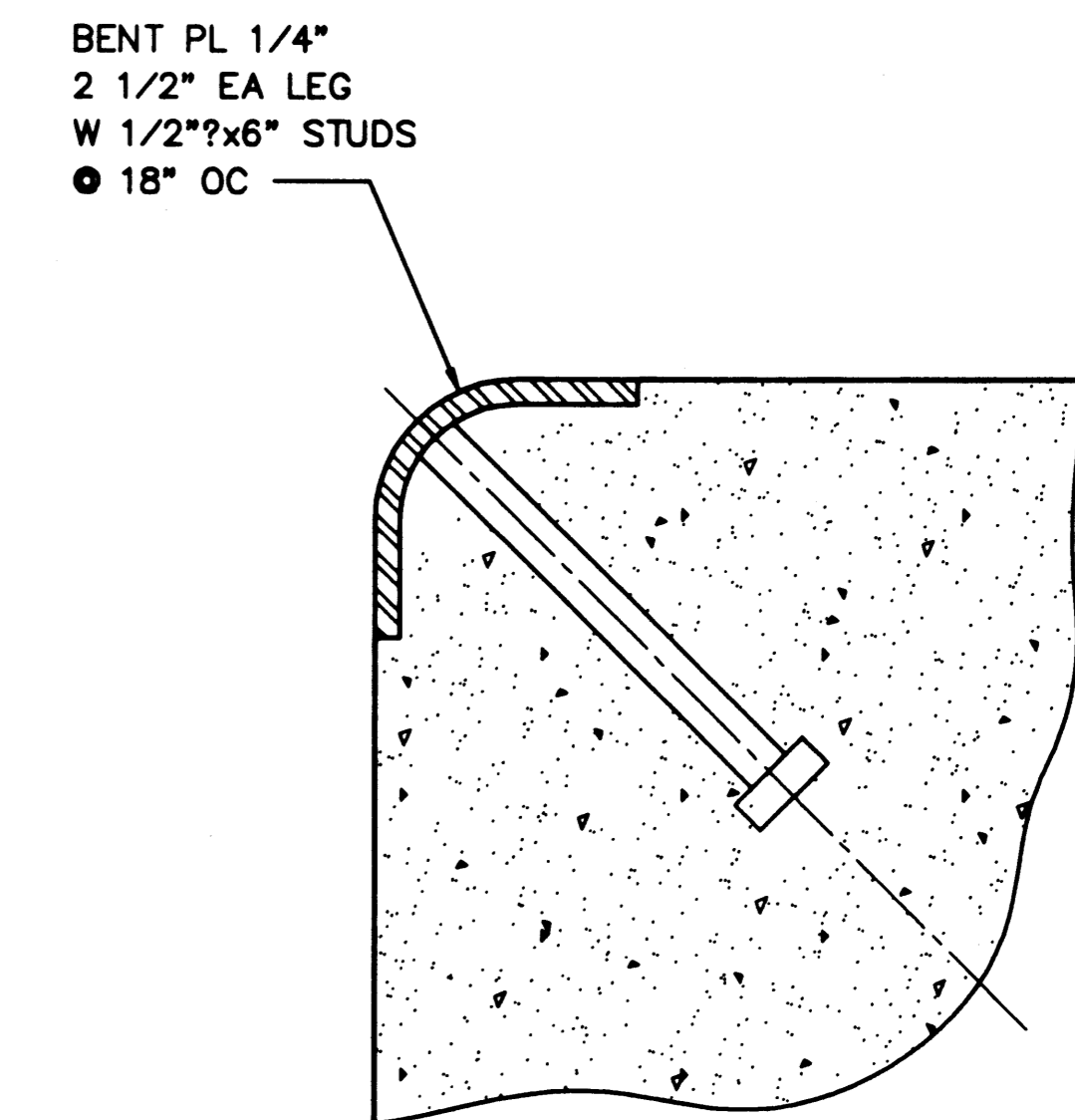


4 SECTION - CURB AT REMOVABLE BULLRAIL  
S-24 SCALE: 3/4"=1'-0"

NOTE: FOR ALL DETAILS EXCEPT AS NOTED SEE 1



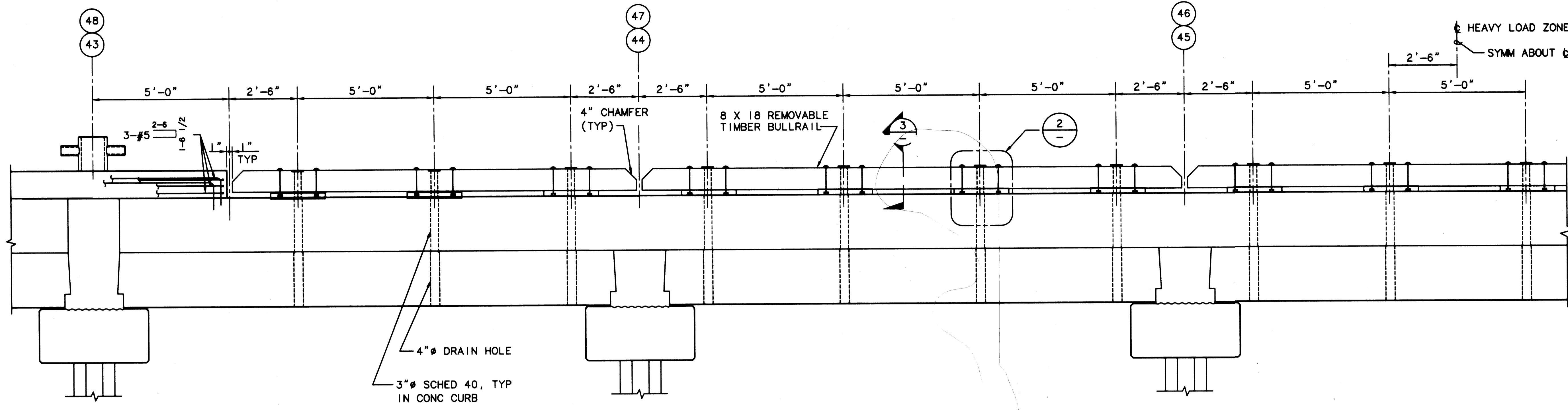
5 SECTION - BULLRAIL AT UTILITY VAULT  
S-24 SCALE: 3/4"=1'-0"



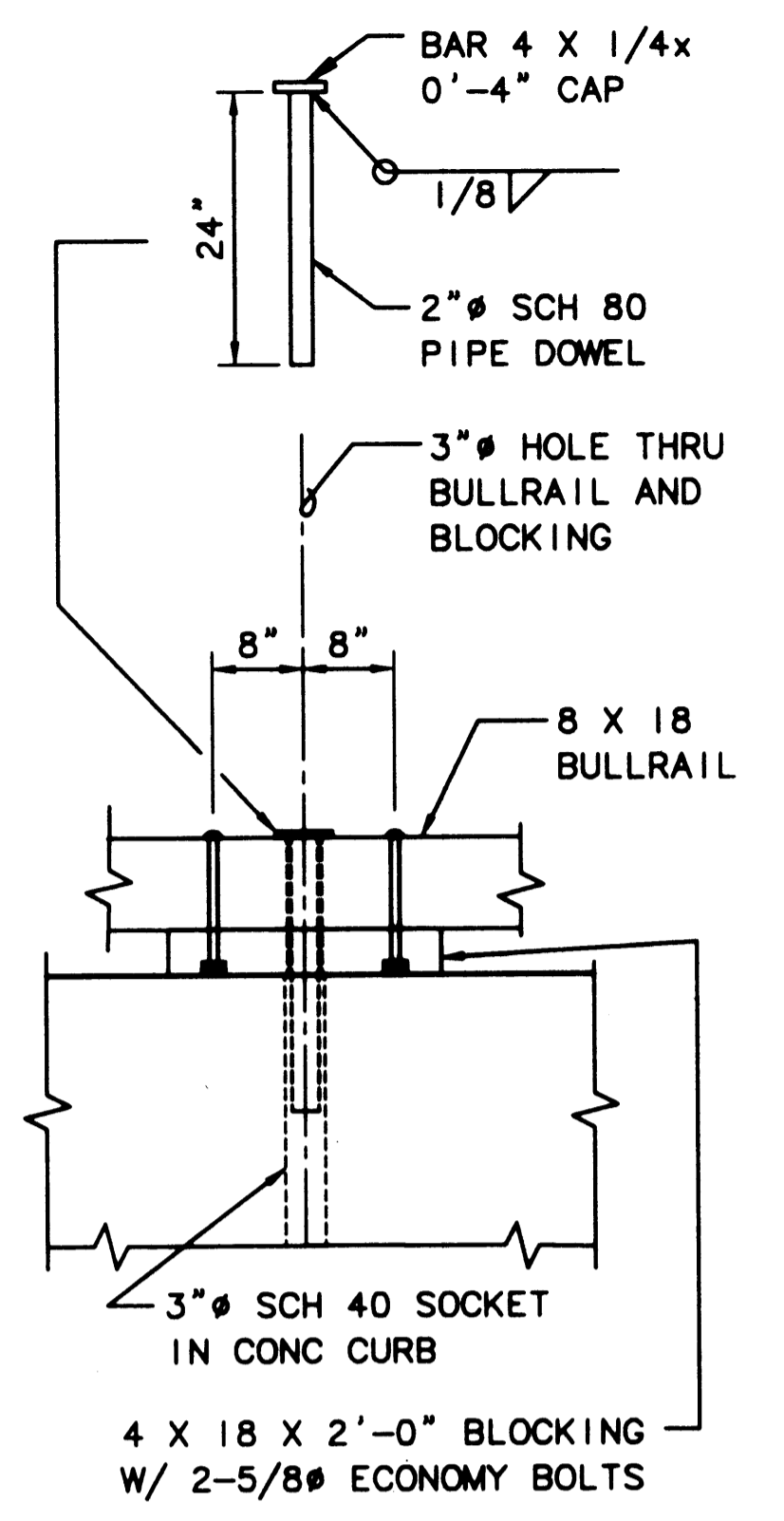
6 DETAIL - BULLRAIL CORNER GUARD  
S-24 SCALE: 6"=1'-0"

NOTES:  
 1. CONTINUOUS BULLRAIL REINFORCEMENT INTERRUPTED AT VAULTS SHALL BE TERMINATED WITH STANDARD HOOKS.  
 2. FOR ADDITIONAL REINFORCING AT BOLLARDS, SEE DRAWING S-25.  
 3. SEE ELECTRICAL AND WATER SYSTEM DRAWINGS FOR UTILITY PENETRATIONS.

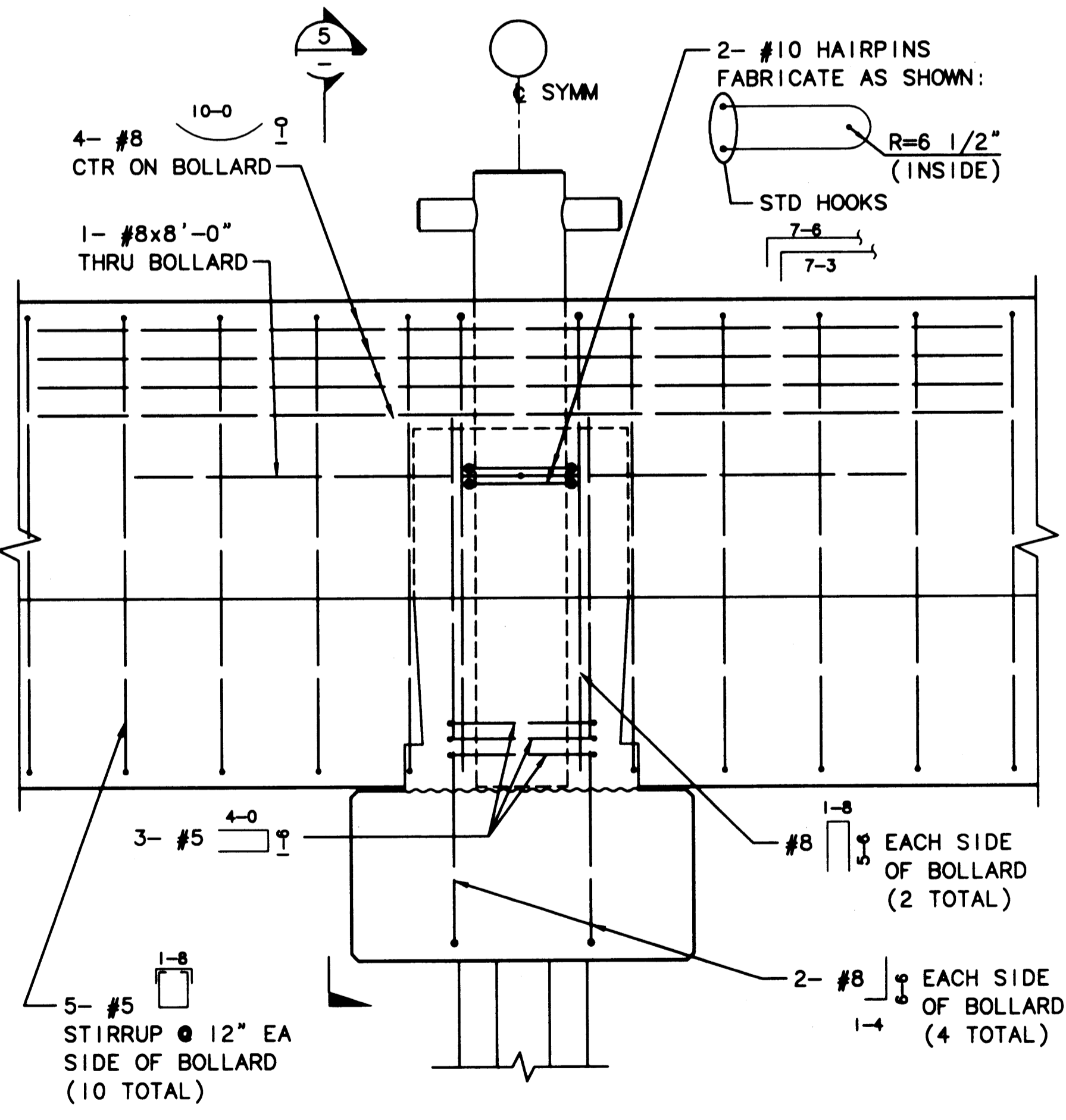
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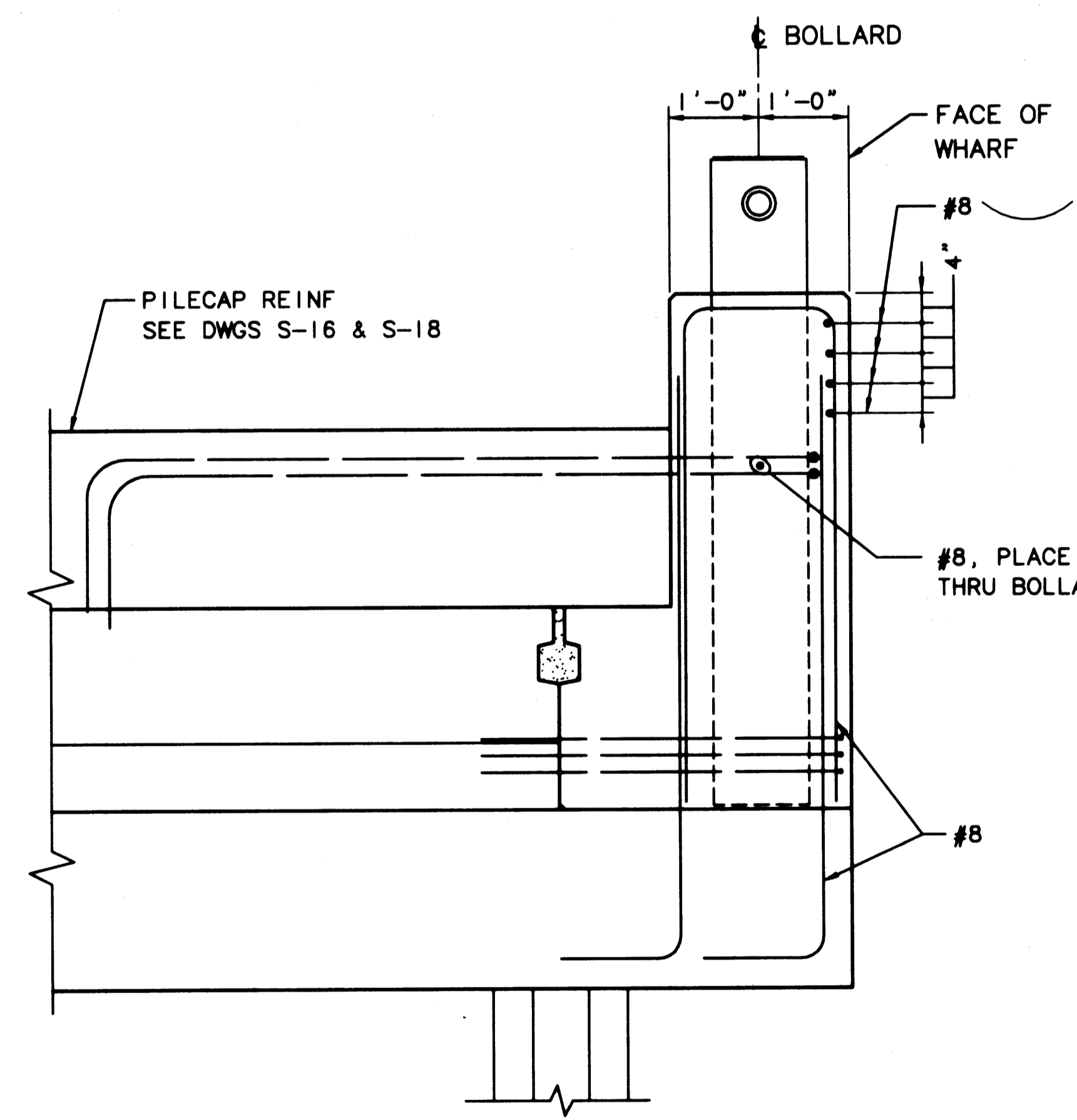
1 ELEV - REMOVABLE BULLRAIL AT HEAVY LOAD ZONE  
S-25 SCALE: 1/2"=1'-0"



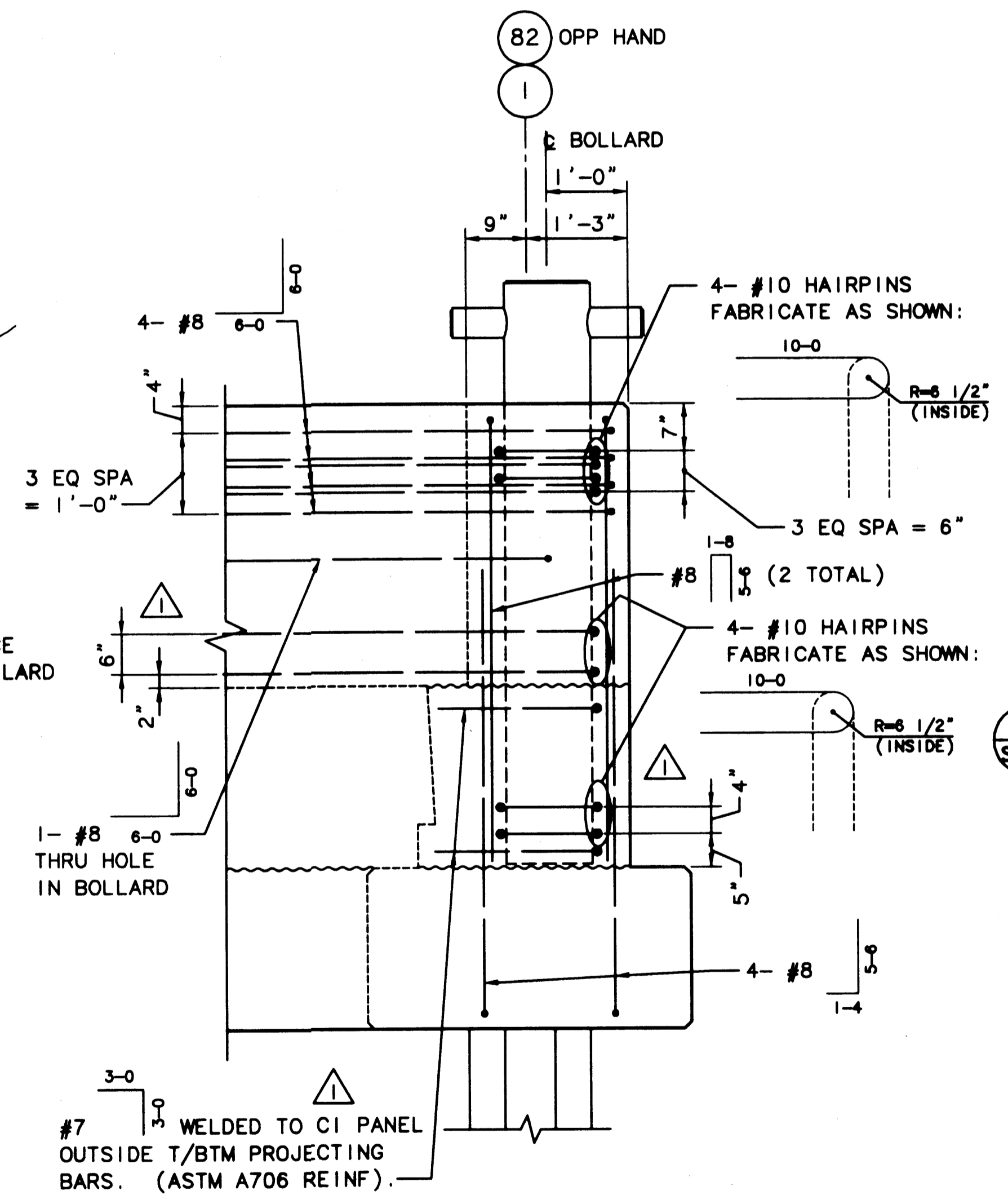
2 DETAIL  
S-25 SCALE: 3/4"=1'-0"



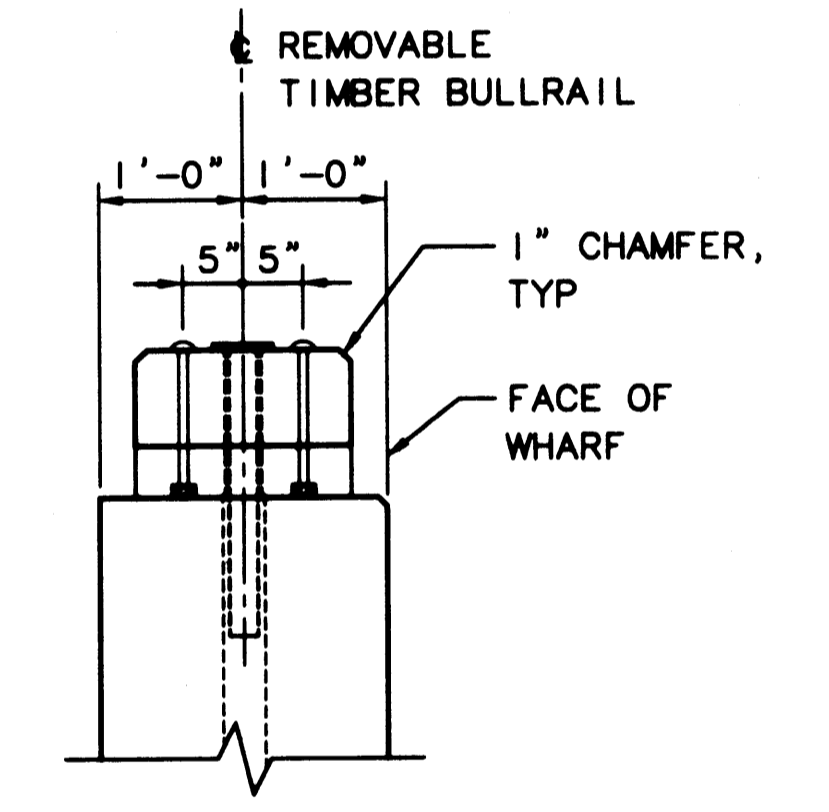
4 ELEV - REINFORCEMENT DETAIL @ TYPICAL BOLLARDS  
S-25 SCALE: 3/4"=1'-0"



5 SECTION @ TYPICAL BOLLARDS  
S-25 SCALE: 3/4"=1'-0"



6 ELEV - CORNER BOLLARD @ 1 & 82 (LOOKING WEST)  
S-25 SCALE: 3/4"=1'-0"



3 SECTION - TIMBER  
S-25 SCALE: 3/4"=1'-0"

- NOTES:
1. REINF SHOWN ON THIS SHEET IS TYP @ BOLLARDS AND IS ADDITIONAL TO THE BULLRAIL, PILE CAP & P/C PANEL REINF SHOWN ELSEWHERE.
  2. FOR BOLLARD DETAILS, SEE DWG S-39.

AS-BUILT  
AUTOCAD FILE NO. 5012825 S-25

PORT OF TACOMA  
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APPROVED  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER  
1/11/99  
DATE

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BCM 9/91  
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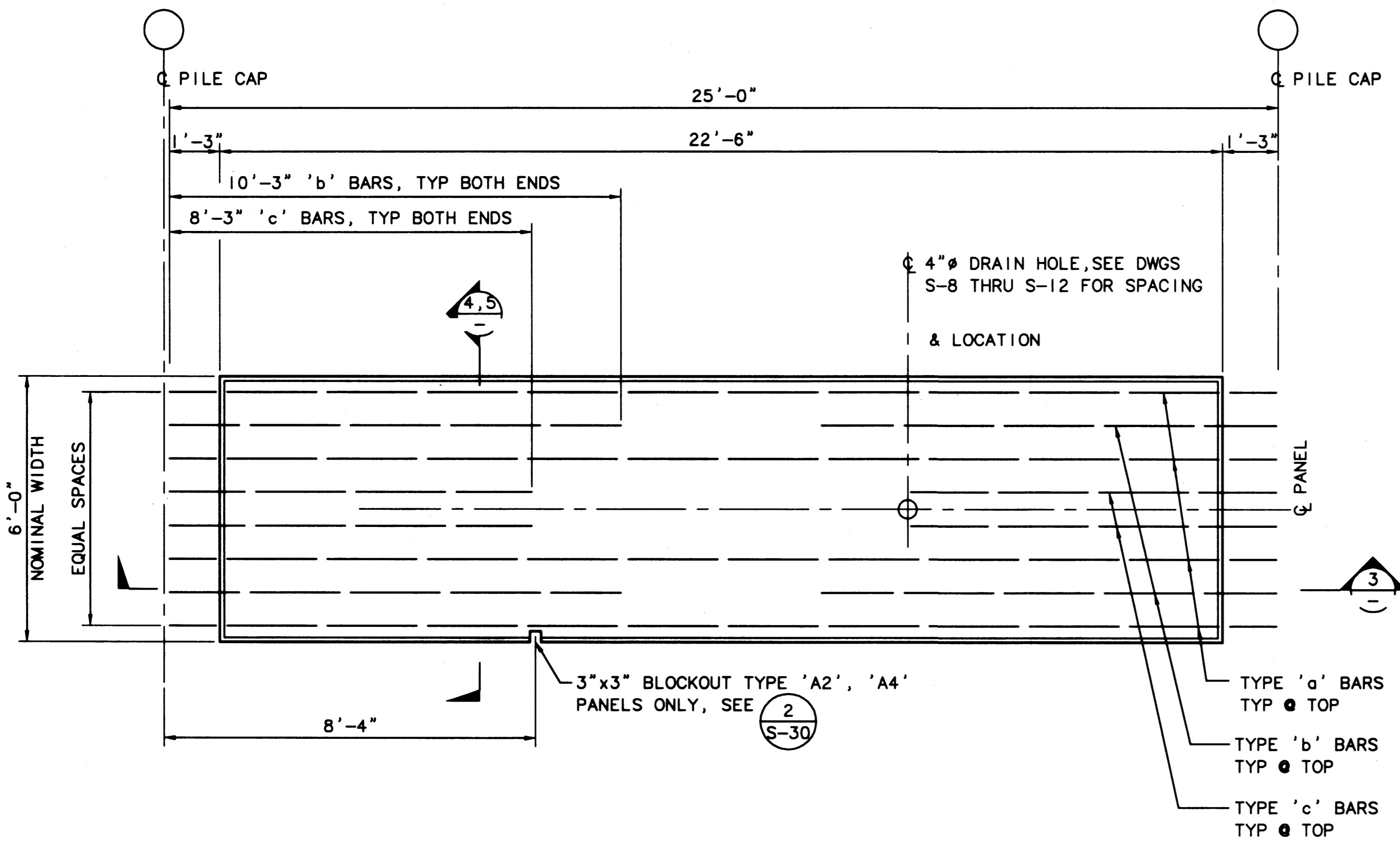
JAS 9/91  
PROJ ENGR DATE

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AS-BUILT		RDD	JAS 1/4/99

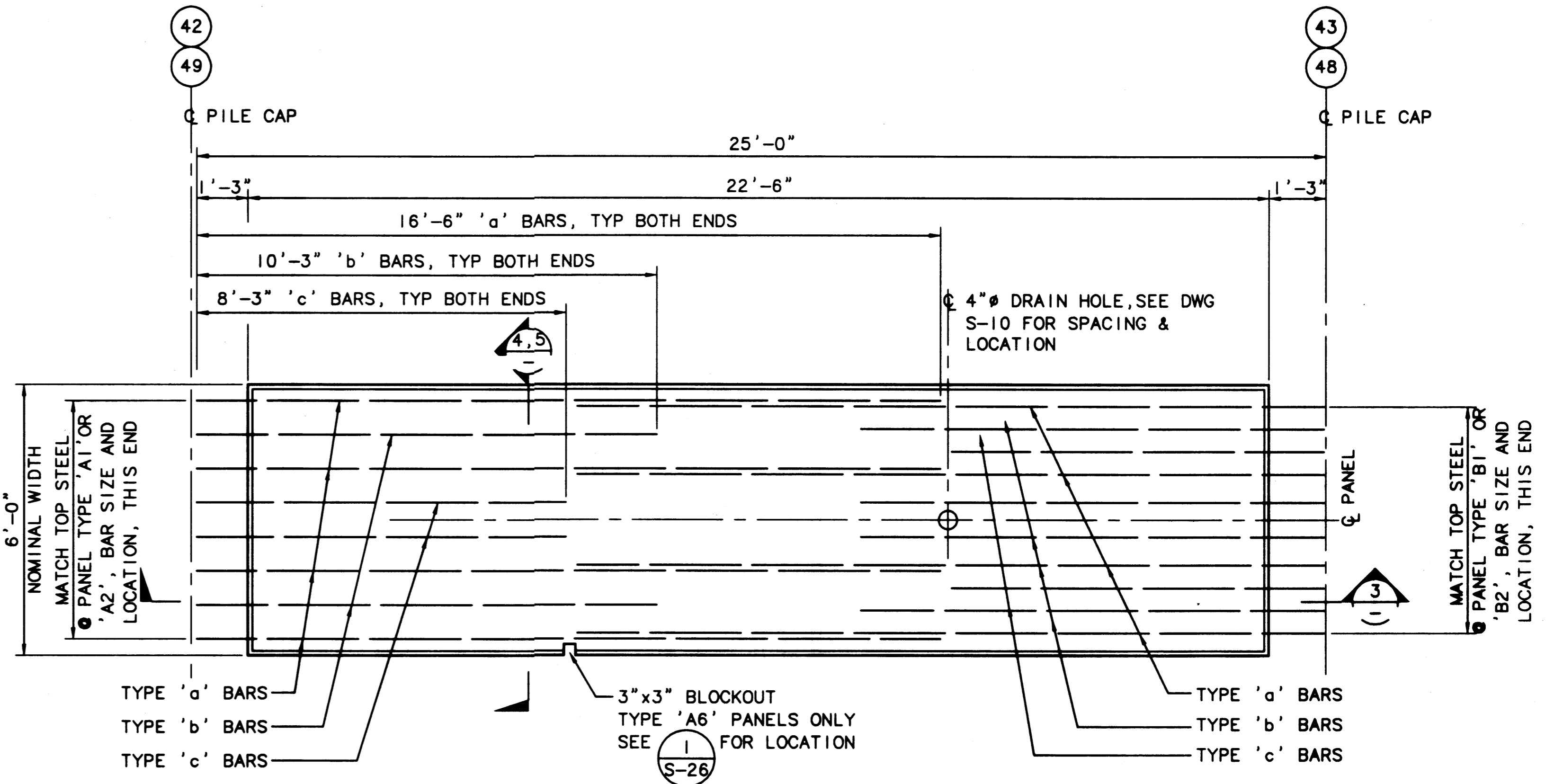
HYUNDAI MERCHNT MARINE TER MINAL  
WHARF  
PORT OF TACOMA  
BULLRAIL DETAILS - SHEET 2

DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 36 OF 58

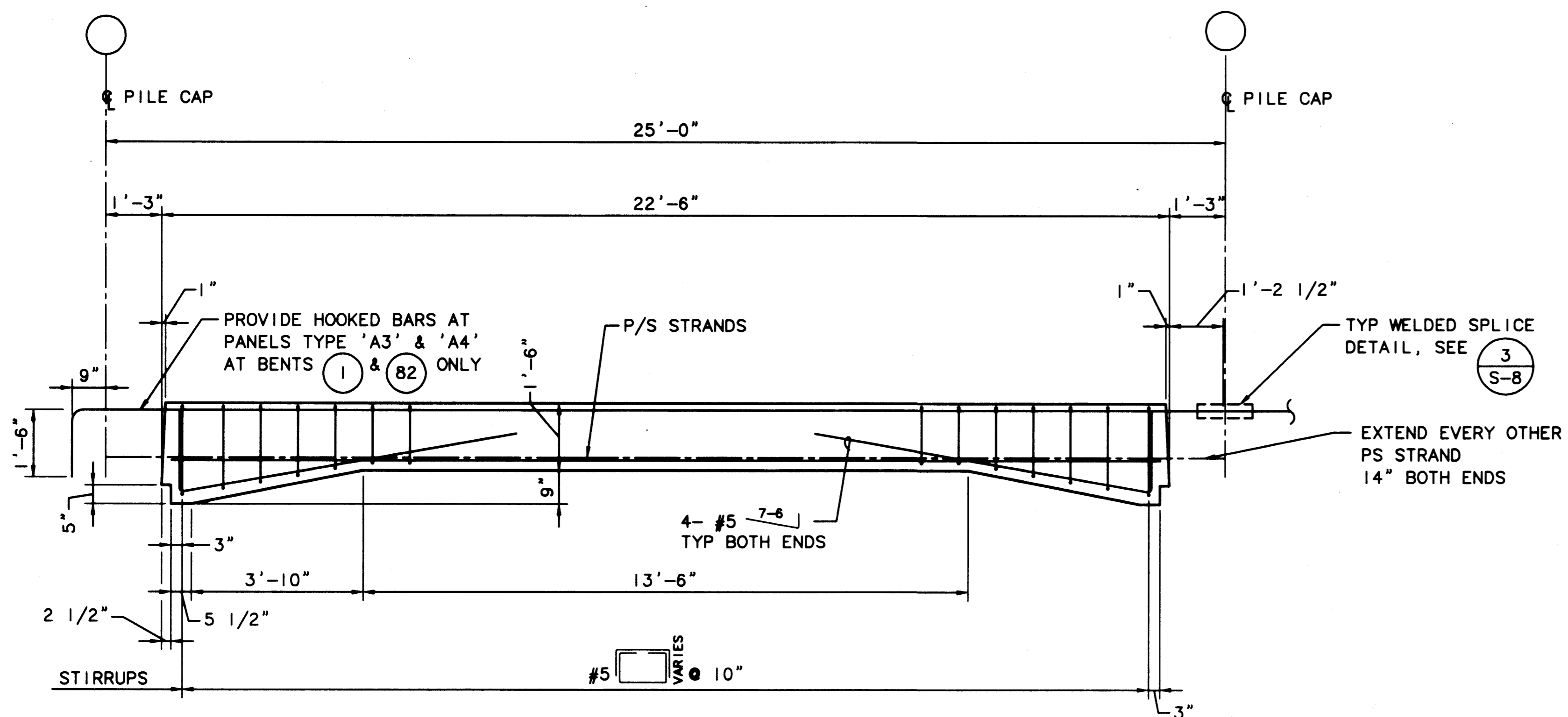
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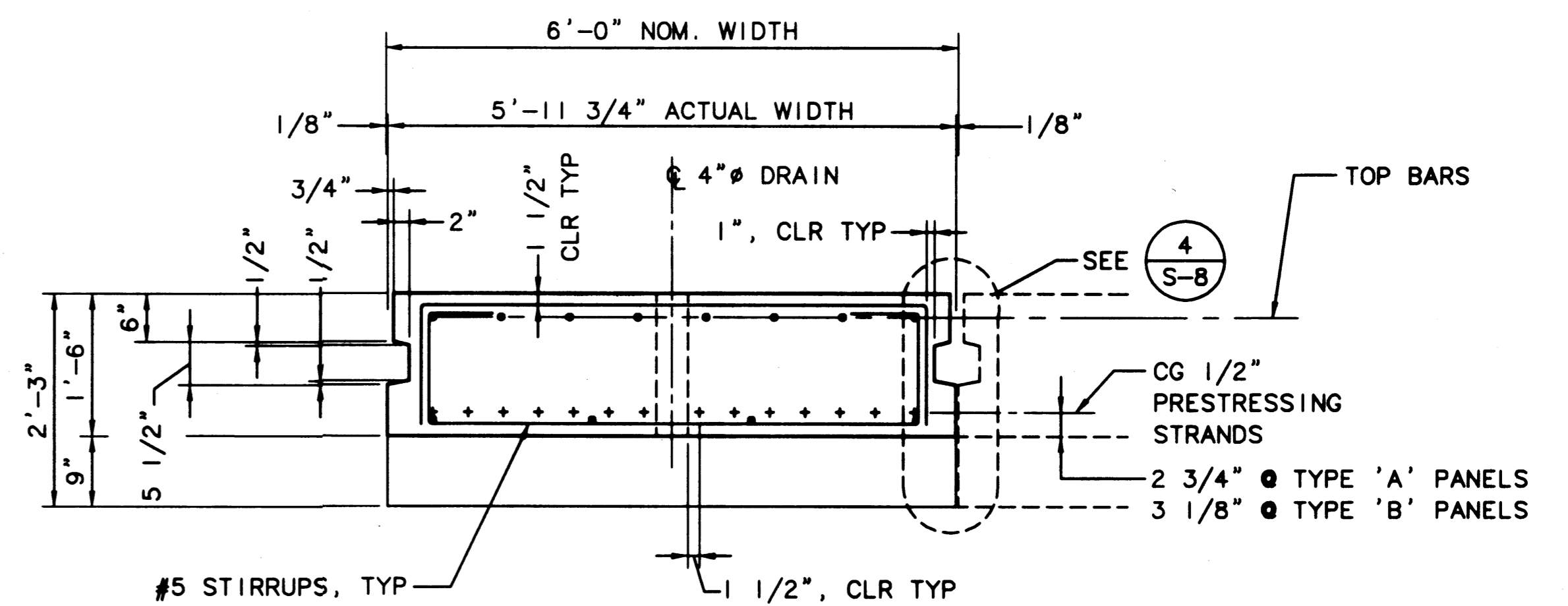
1 PLAN - TYPE 'A1' THRU 'A4' PANELS (SEE SCHEDULE DWG S-27) SCALE: 1/2"=1'-0"



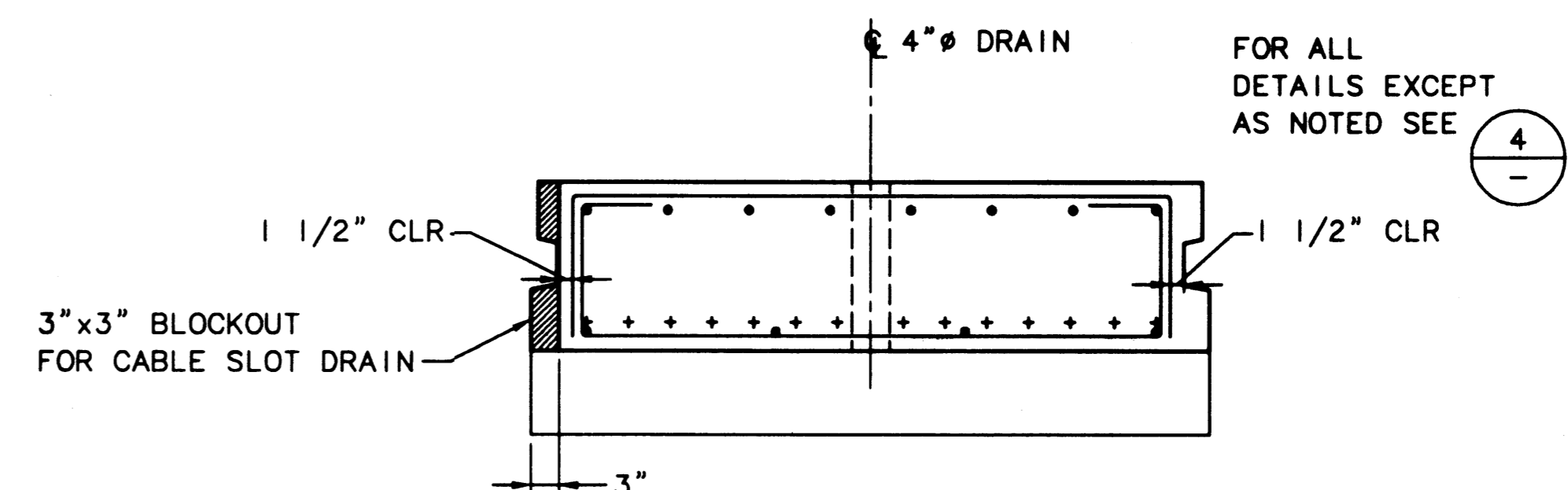
2 PLAN - TYPE 'A5' & 'A6' PANELS (SEE SCHEDULE DWG S-27) SCALE: 1/2"=1'-0"



3 ELEVATION - TYPE 'A' PANELS SCALE: 1/2"=1'-0"



4 SECTION - TYPE 'A1', 'A3', 'A5', & 'B1' PANELS SCALE: 3/4"=1'-0"



5 SECTION - TYPES 'A2', 'A4', 'A6' & 'B2' PANELS SCALE: 3/4"=1'-0"

AS-BUILT

AUTOCAD FILE NO. 5012826 S-26



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APPROVED  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER  
DATE 1/11/99

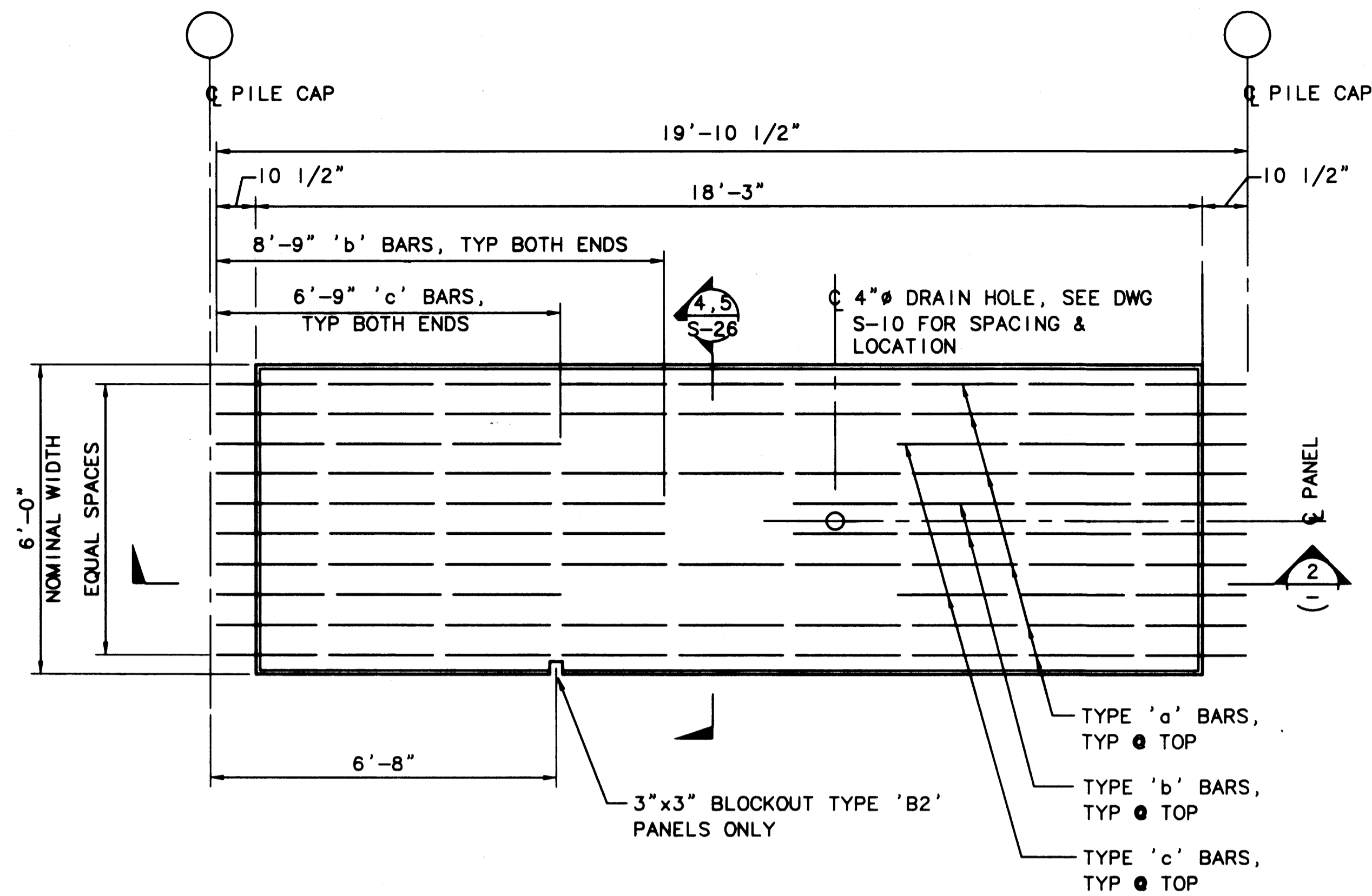
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JAS 9/91  
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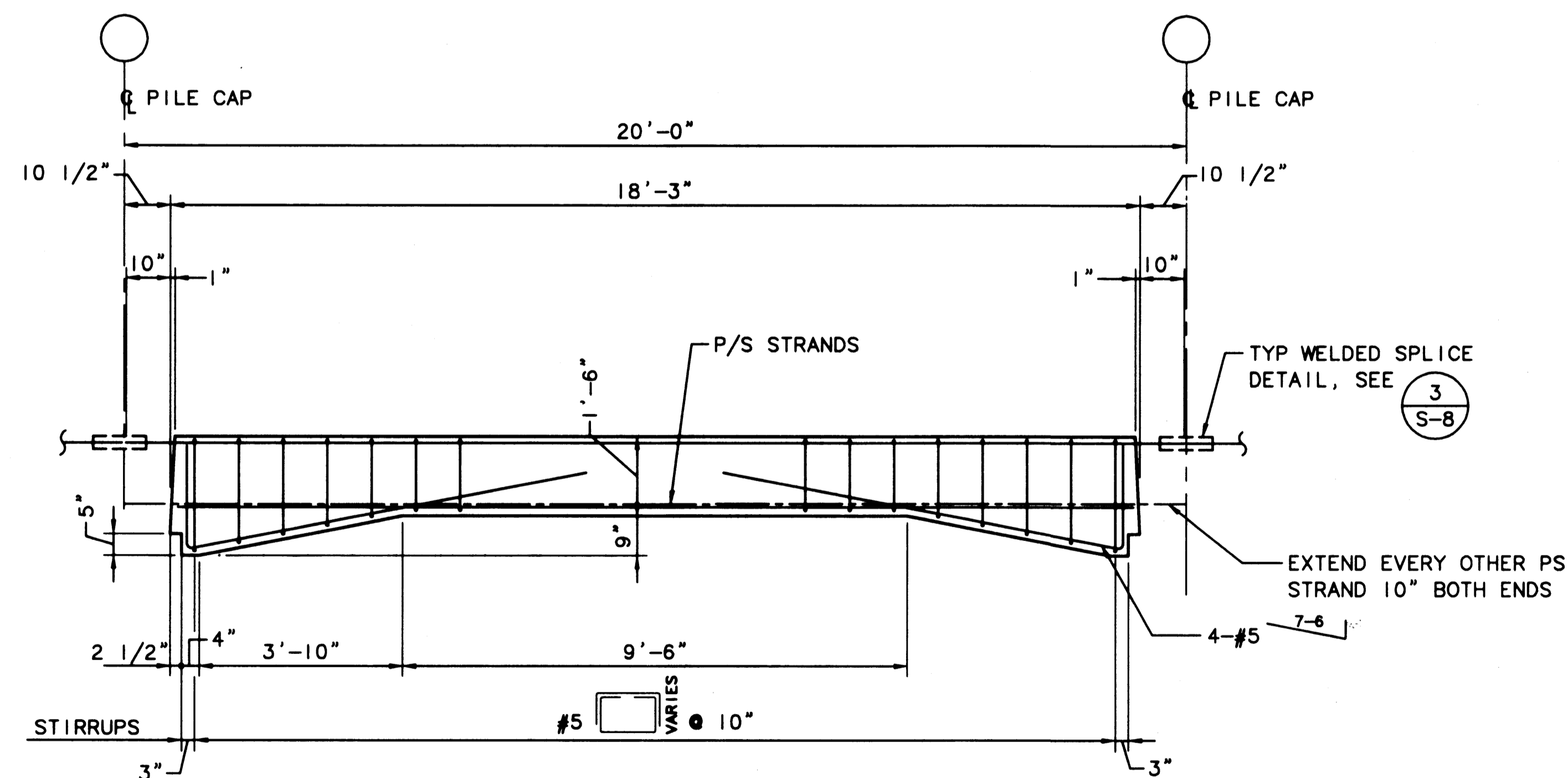
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HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
DECK PANEL DETAILS - SHEET 1

DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 37 OF 58



1 PLAN - TYPE 'B' PANELS (SEE SCHEDULE)  
SCALE: 1/2"=1'-0"



2 ELEVATION - TYPE 'B' PANELS  
SCALE: 1/2"=1'-0"

PRECAST DECK PANEL SCHEDULE  
PANELS 'A1' THRU 'A6', 'B1' & 'B2'

PANEL TYPE	PANEL WIDTH (NOM.)	REF. PLAN	ELEV.	TRANSV. SECTION	CONC STRENGTH	FINAL PRESTRESS (KIPS)	BOTTOM BARS (GR 60)	TOP BARS		
								BARS 'a'	BARS 'b' EA END	BARS 'c' EA END
A1	6'-0"	1/S-26	3/S-26	4/S-26	f'c RELEASE = 4000 PSI MIN f'c @ 28 DAYS = 6000 PSI MIN f'c @ ERECTION = 6000 PSI MIN	294	4- #4	4- #8	2- #8	2- #8
A2	6'-0"	1/S-26	3/S-26	5/S-26		343	4- #4	4- #9	2- #9	2- #9
A2a	6'-0"	1/S-30	3/S-26	2/S-30		343	4- #4	4- #9	2- #9	2- #9
A3	6'-0"	1/S-26	3/S-26	4/S-26		343	4- #4	4- #8	2- #8	2- #8
A4	6'-0"	1/S-26	3/S-26	5/S-26		490	4- #4	4- #9	2- #9	2- #9
A5	6'-0"	2/S-26	3/S-26	4/S-26		294	4- #4	MATCH REINF. FOR PANELS 'A1' & 'B1'		
A6	6'-0"	2/S-26	3/S-26	5/S-26		343	4- #4	MATCH REINF. FOR PANELS 'A2' & 'B2'		
B1	6'-0"	1/S-27	2/S-27	4/S-26		436	4- #4	6- #10	2- #10	2- #10
B2	6'-0"	1/S-27	2/S-27	5/S-26		490	4- #4	6- #10	2- #10	2- #10

PLOTED: Thu Jan 07 1999 2:03pm FILENAME: V:\1997\497093\CAD\S-27.dwg SCALE: 24



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APPROVED: *[Signature]* 1/11/99  
DATE  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER

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JAS 9/91  
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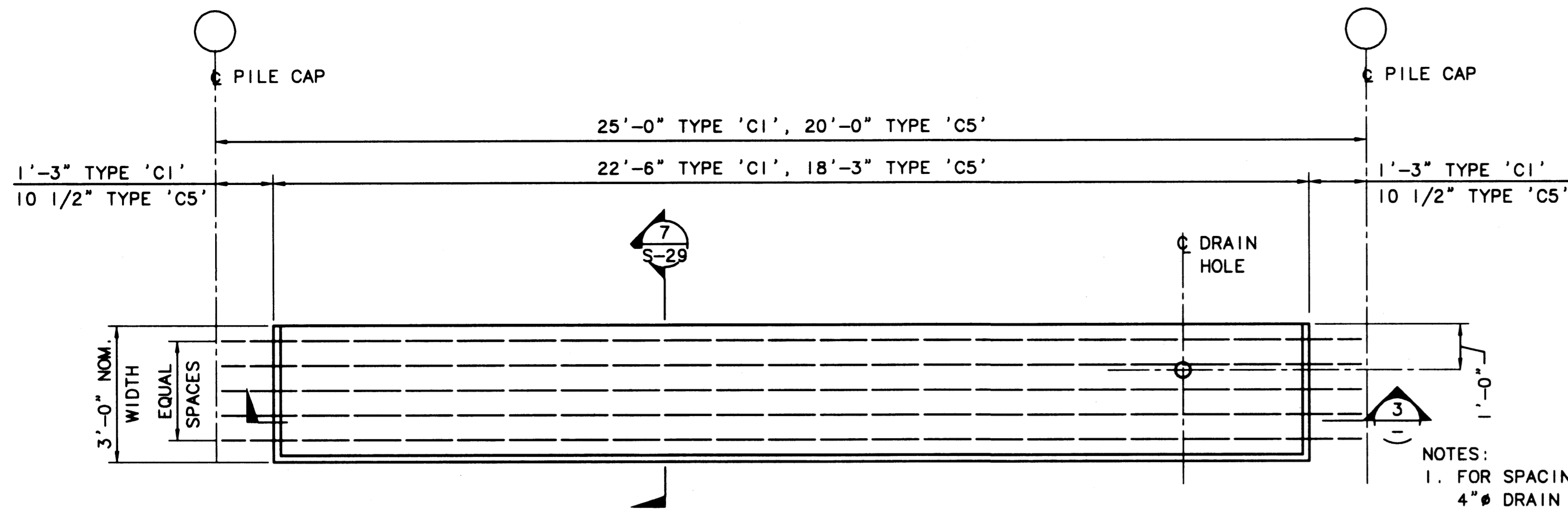
**HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
DECK PANEL DETAILS - SHEET 2**

**AS-BUILT**

AUTOCAD FILE NO.  
**5012827**

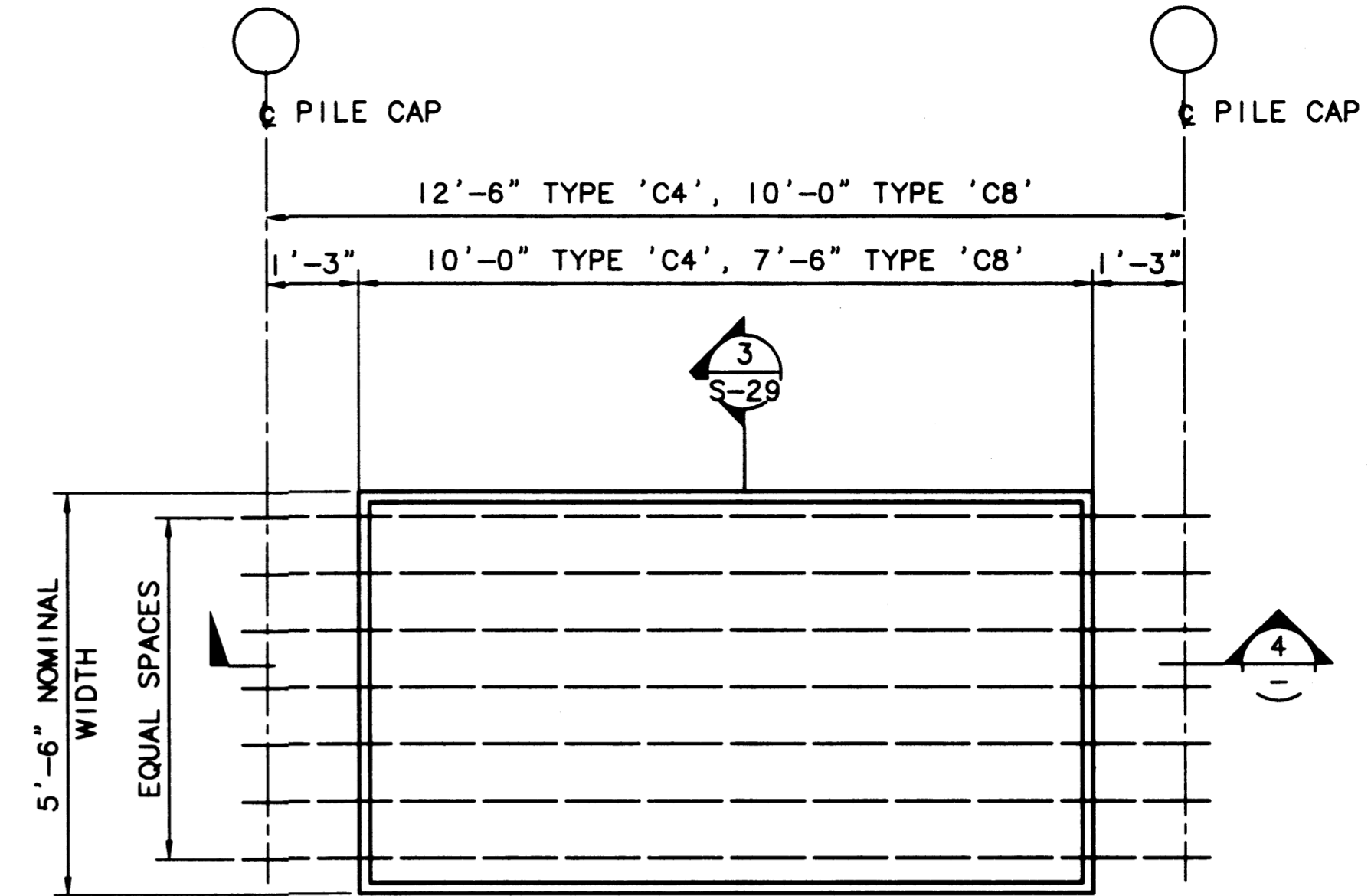
**S-27**

DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **38** OF **58**

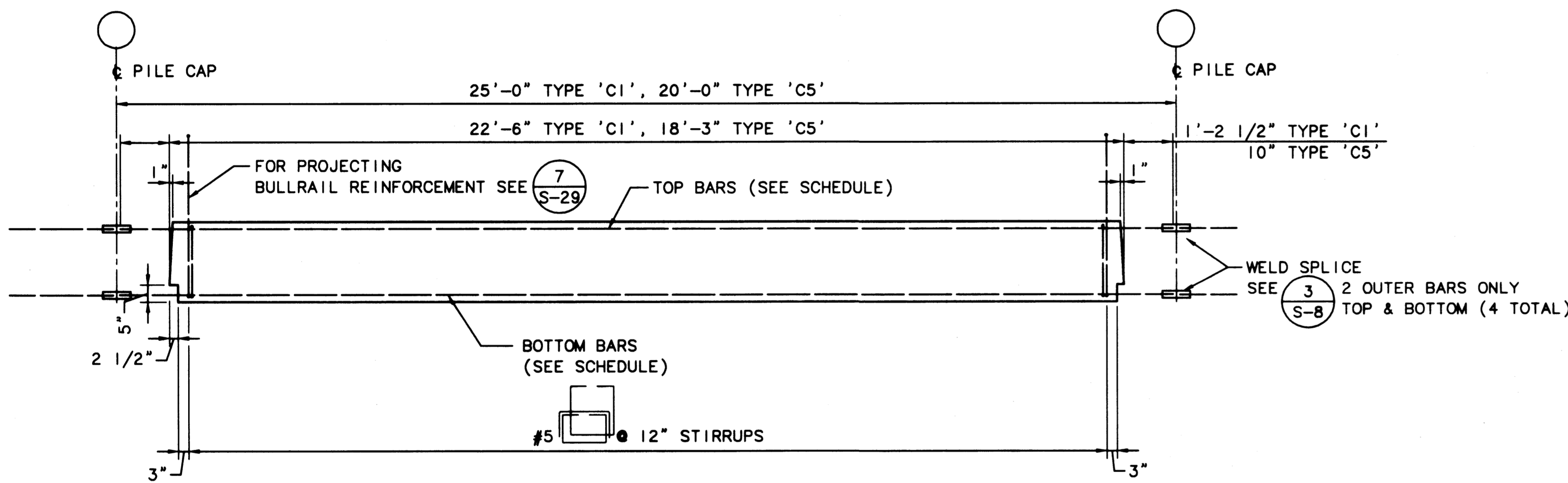


1 PLAN - TYPE 'C1' & 'C5' PANELS (SEE SCHEDULE)  
SCALE: 1/2"=1'-0"

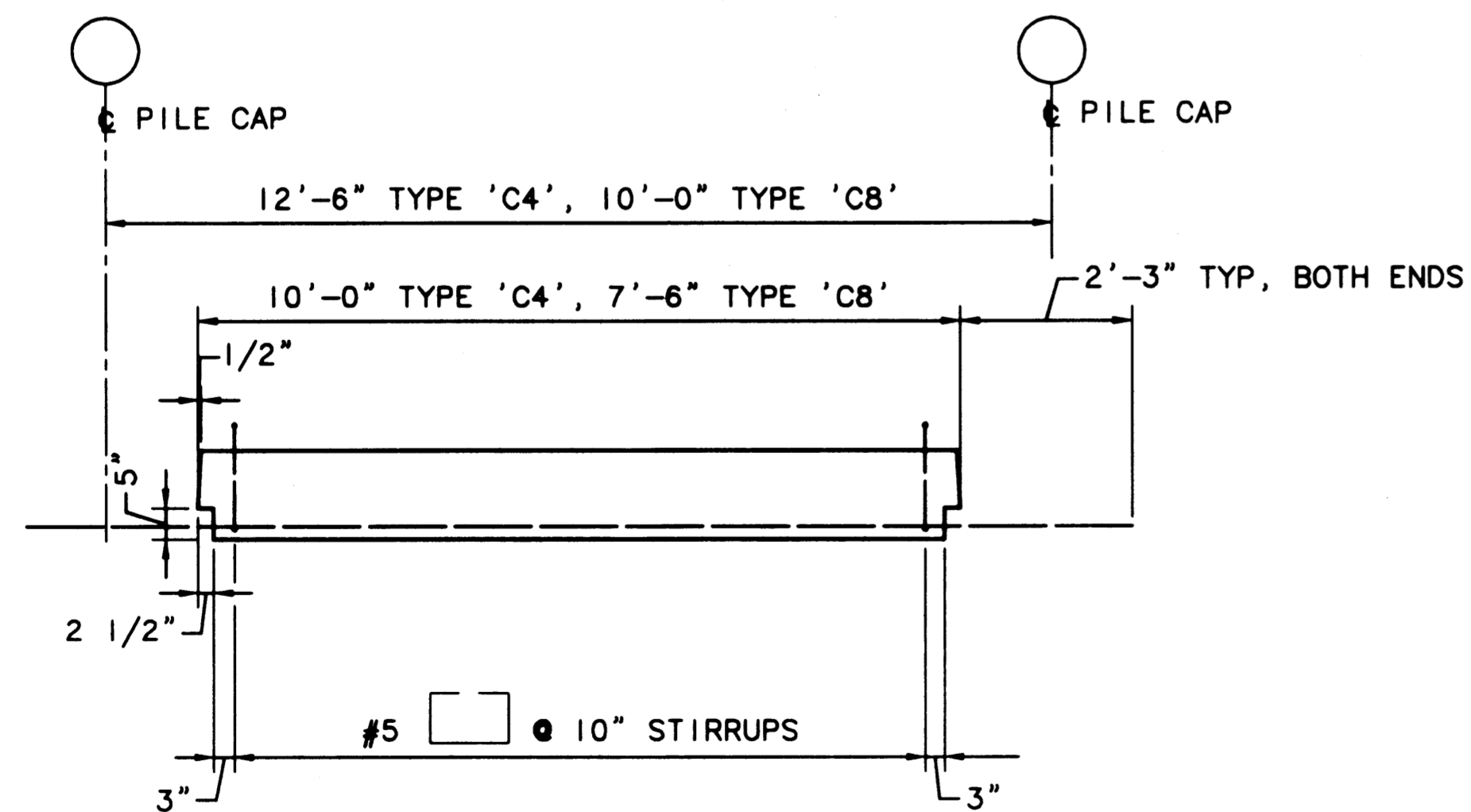
- NOTES:
- FOR SPACING & LOCATION OF 4" DRAIN HOLES ● REMOVABLE TIMBER BULLRAIL, SEE 1 S-25
  - FOR SPACING & LOCATION OF 2" DRAIN HOLES ● UTILITY VAULTS, SEE DWGS S-8 THRU S-12.



2 PLAN - TYPE 'C4' & 'C8' PANELS (SEE SCHEDULE)  
SCALE: 1/2"=1'-0"



3 ELEVATION - TYPE 'C1' & 'C5' PANELS (SEE SCHEDULE)  
SCALE: 1/2"=1'-0"



4 ELEVATION - TYPE 'C4' & 'C8' PANELS (SEE SCHEDULE)  
SCALE: 1/2"=1'-0"

PRECAST DECK PANEL SCHEDULE TYPE 'C' PANELS							
PANEL TYPE	PANEL WIDTH (NOM.)	PLAN REF.	ELEV	TRANSV. SECTION	CONC STRENGTH	BOTTOM BARS (GR 60)	TOP BARS (GR 60)
C1	3'-0"	1 S-28	3 S-28	7 S-29	f'c ● 28 DAYS = 6000 PSI MIN f'c ● ERECTION = 6000 PSI MIN	4- #9	5- #9
C2	4'-0"	1 S-29	4 S-29	2,6 S-29		12- #6	N/A
C3	4'-0"	1 S-29	4 S-29	5 S-29		12- #6	N/A
C4	5'-6"	2 S-28	4 S-28	3 S-29		10- #6	N/A
C5	3'-0"	1 S-28	3 S-28	7 S-29		5- #9	5- #9
C6	4'-0"	1 S-29	4 S-29	2 S-29		12- #6	N/A
C7	4'-0"	1 S-29	4 S-29	5 S-29		12- #6	N/A
C8	5'-6"	2 S-28	4 S-28	3 S-29		10- #6	N/A

AS-BUILT

AUTOCAD FILE NO. 5012828

S-28

**PORT OF TACOMA**  
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**BERGER/ABAM**  
ENGINEERS INC.  
33301 9TH AVENUE SOUTH  
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APPROVED: *Curtis L. Ratcliffe* 1/11/99  
DATE  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER

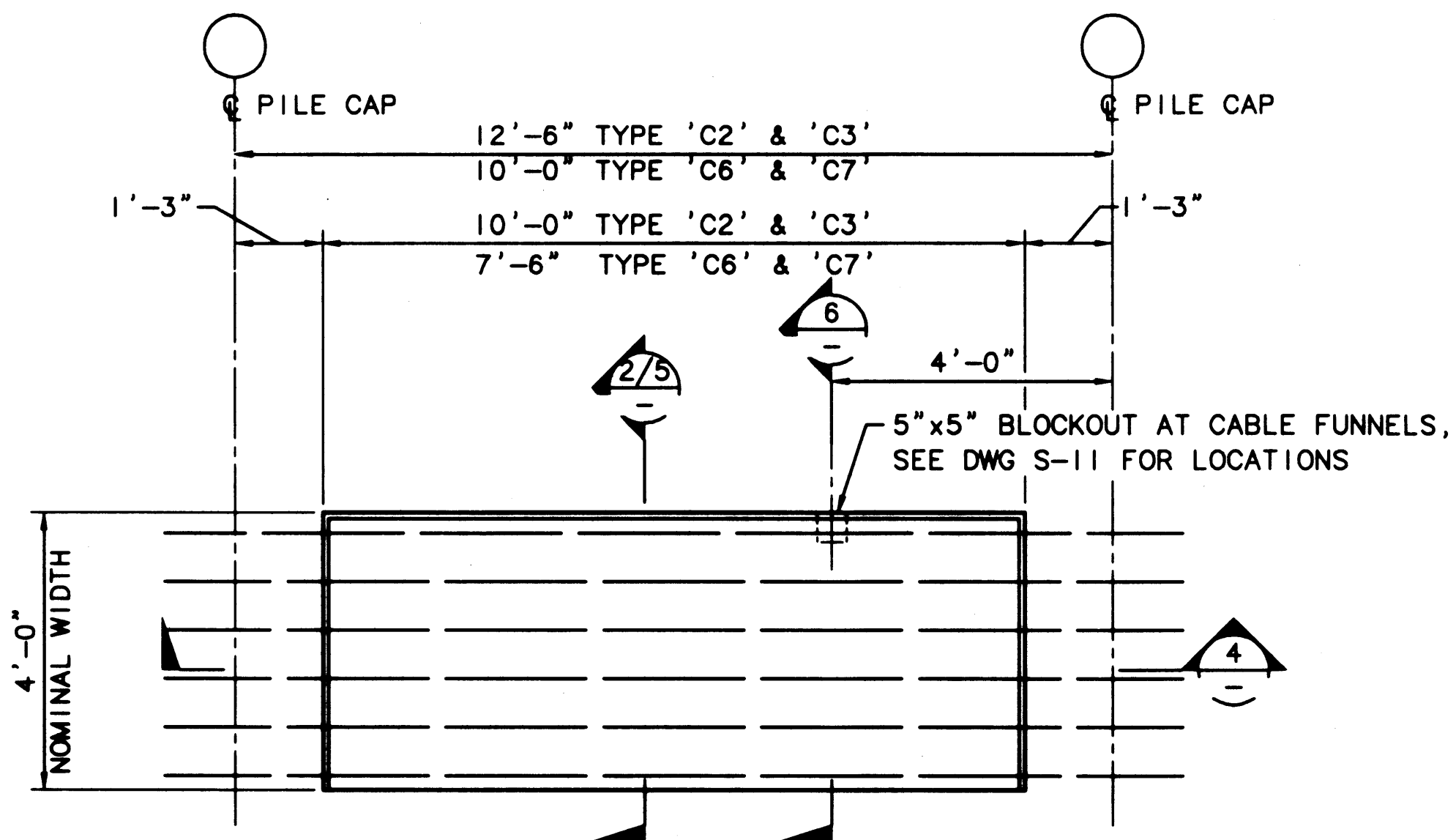
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9/91

BCM 9/91  
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JAS 9/91  
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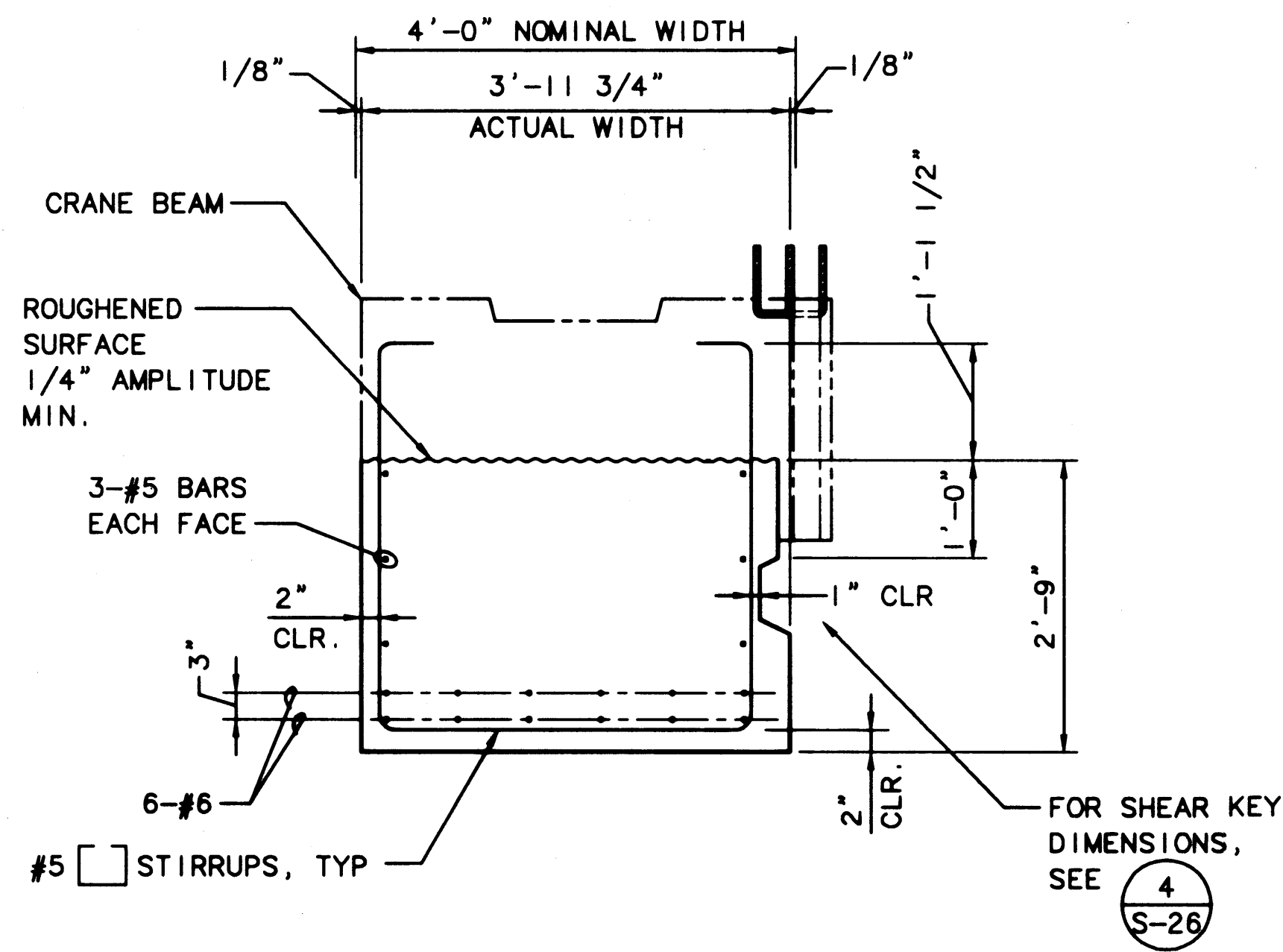
MARK	REVISION	BY	APP. DATE
	AS-BUILT	RDD JAS	1/4/99

**HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
DECK PANEL DETAILS - SHEET 3**

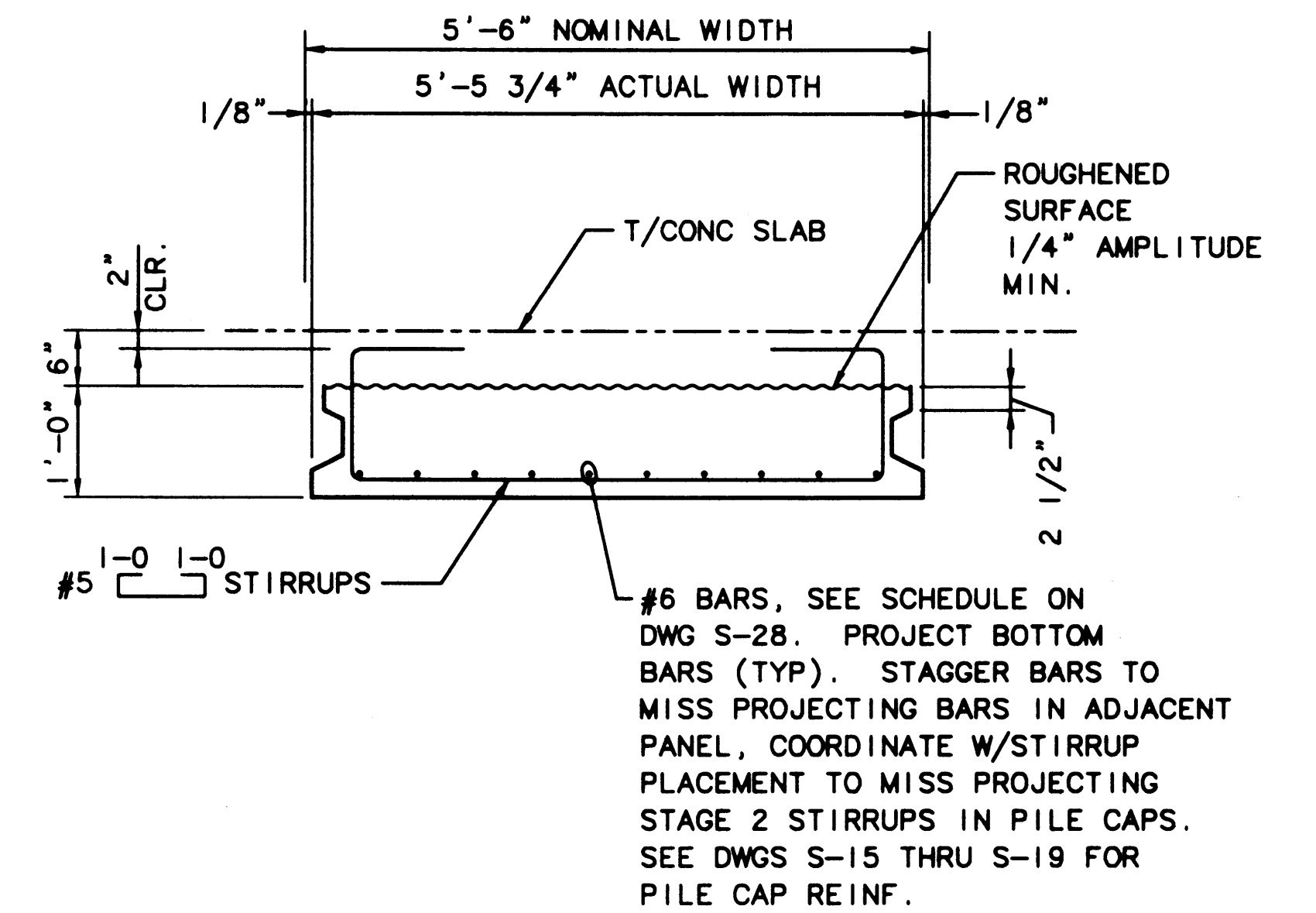
DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 39 OF 58



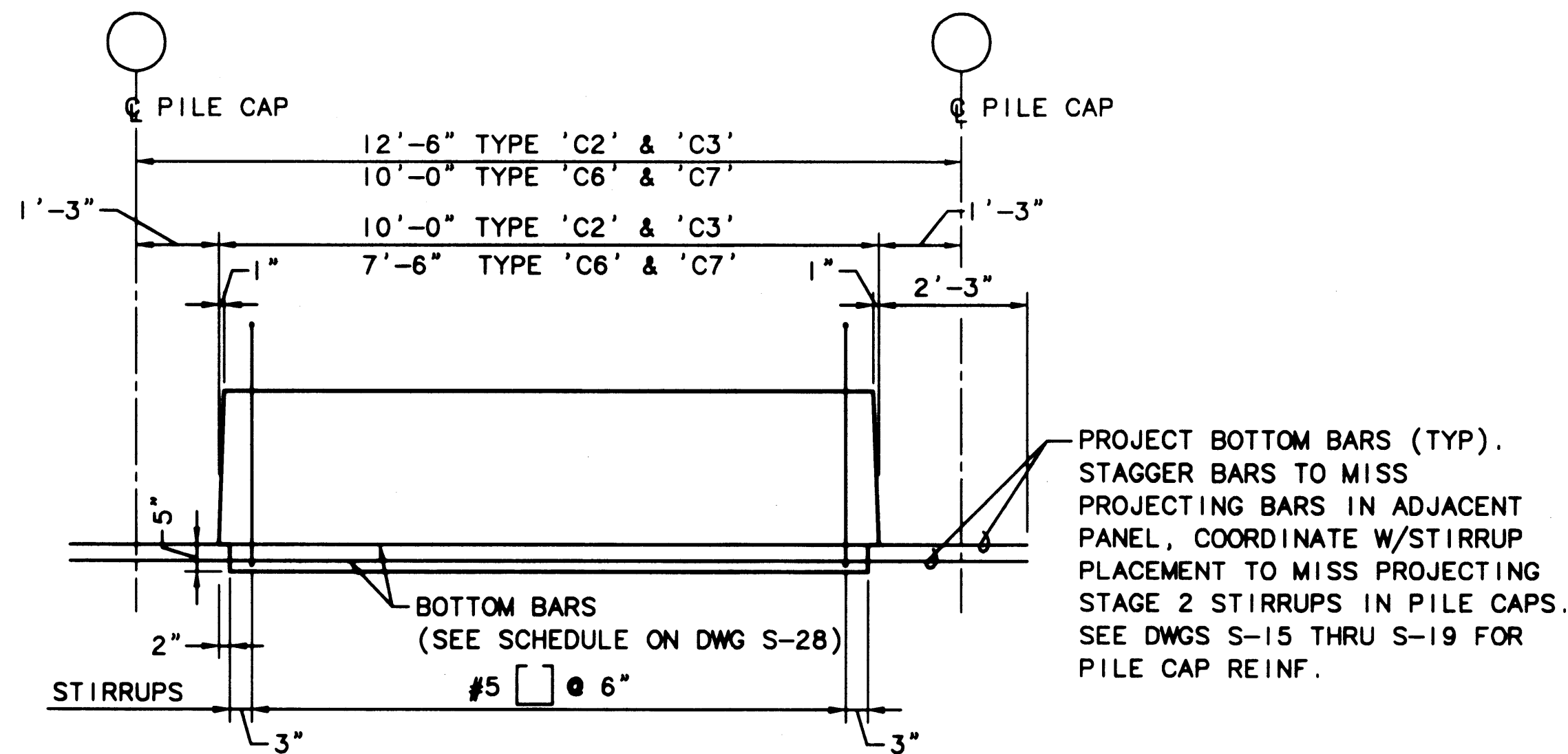
1 PLAN - TYPE 'C2', 'C3', 'C6' & 'C7' PANELS  
SCALE: 1/2"=1'-0"  
(SEE SCHEDULE DWG S-28)



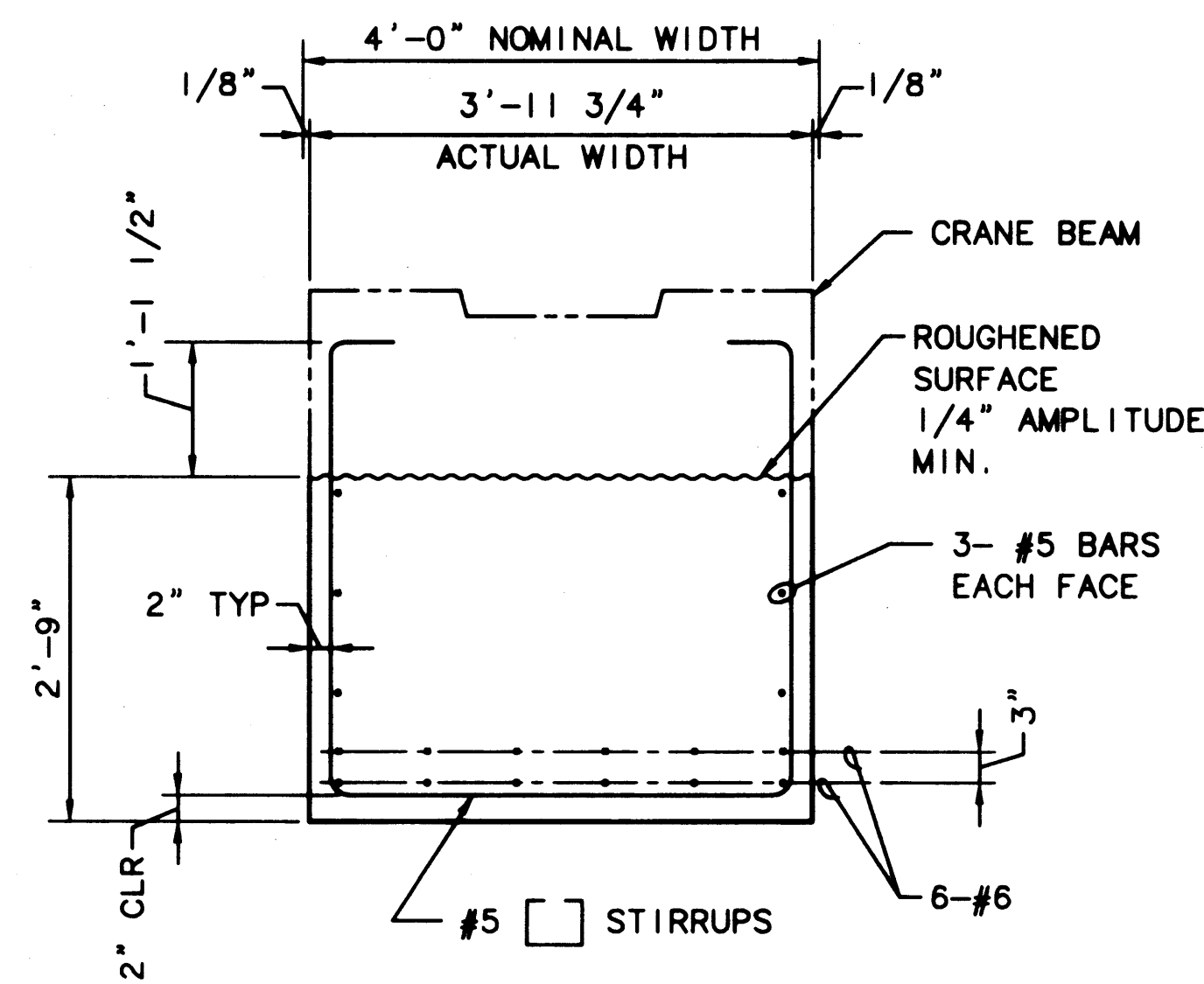
2 SECTION - TYPE 'C2' & 'C6' PANELS  
SCALE: 3/4"=1'-0"



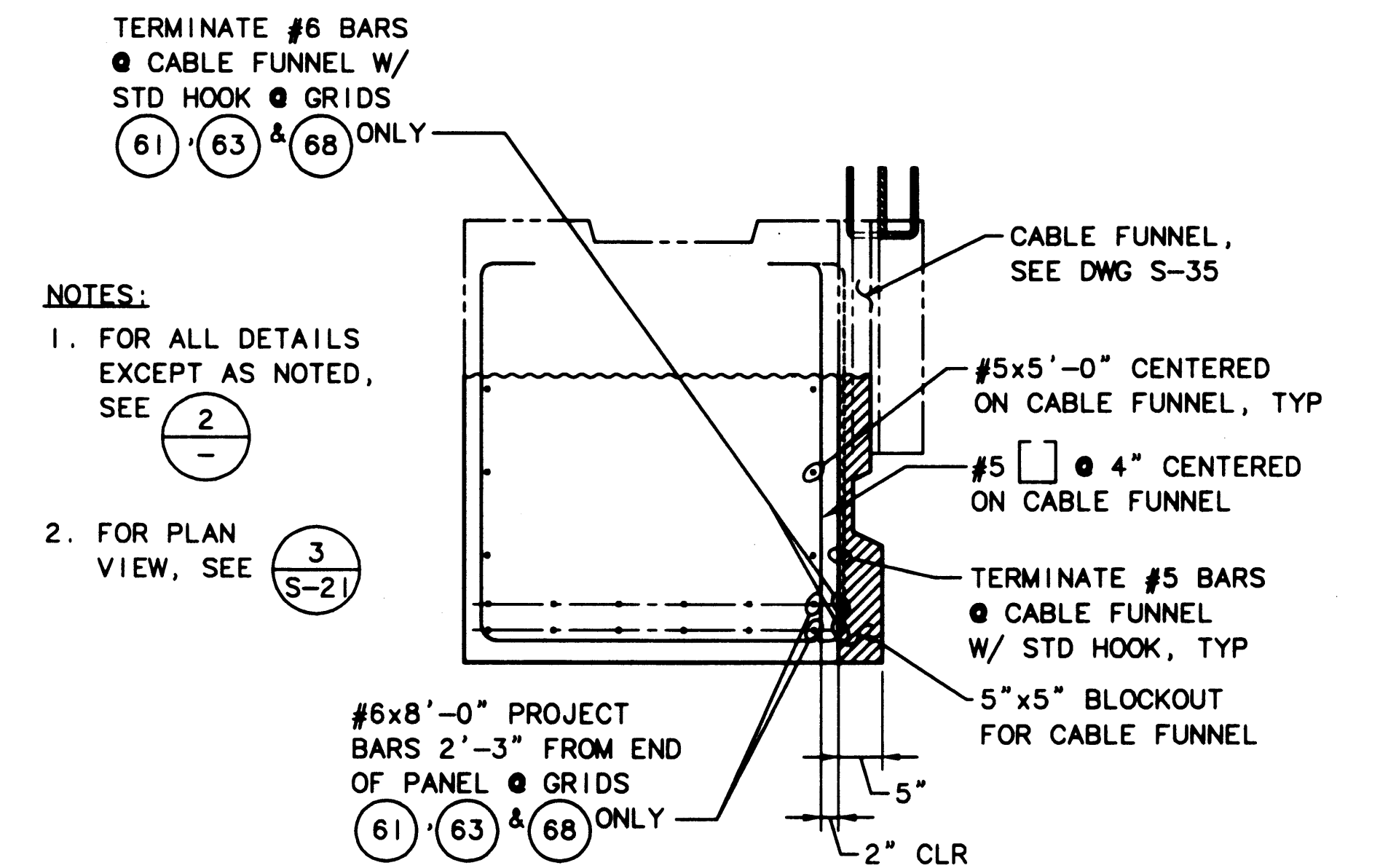
3 SECTION - TYPE 'C4' & 'C8' PANELS  
SCALE: 3/4"=1'-0"



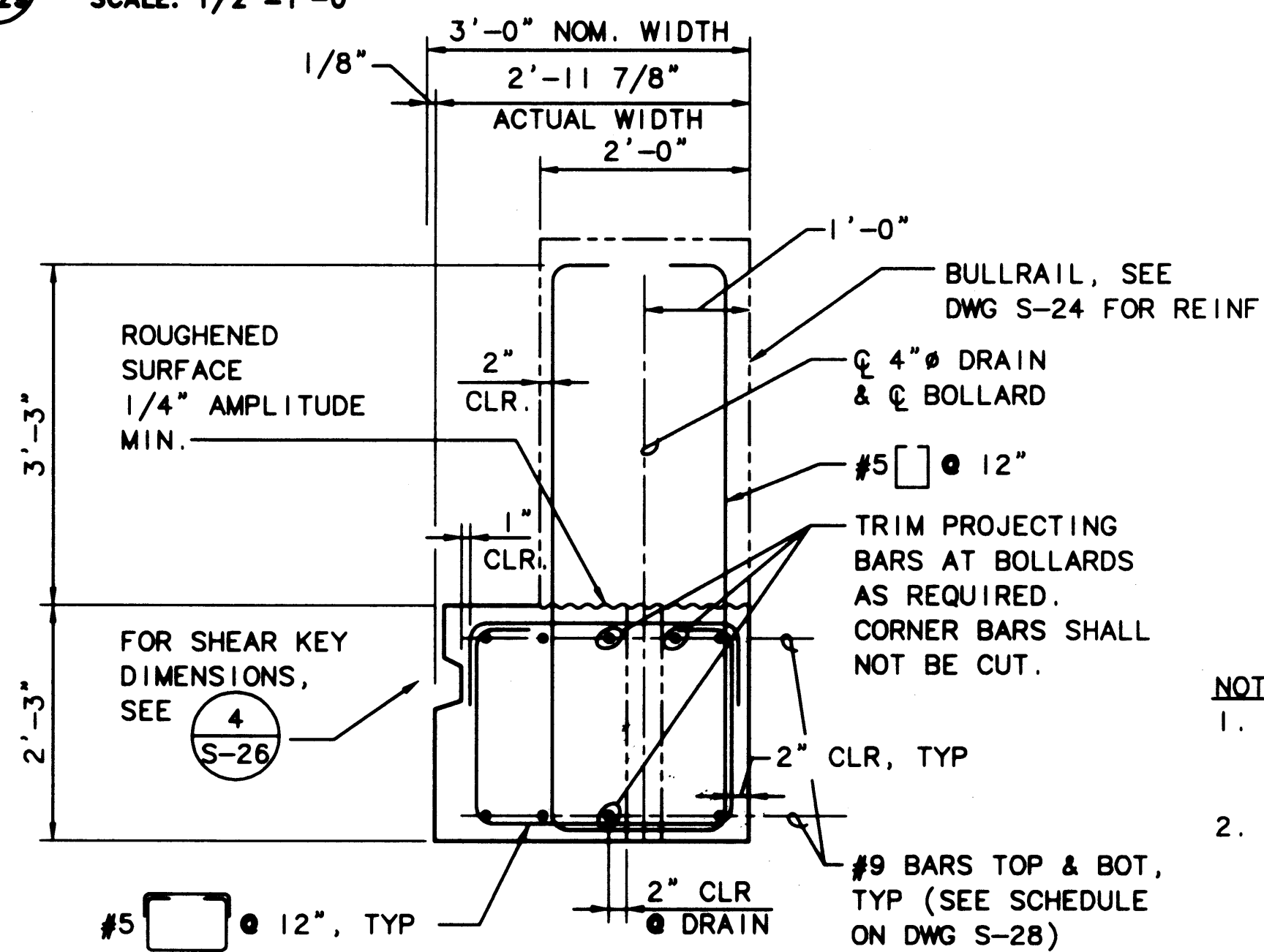
4 ELEVATION - TYPE 'C2', 'C3', 'C6' & 'C7' PANELS  
SCALE: 1/2"=1'-0"



5 SECTION - TYPE 'C3' & 'C7' PANELS  
SCALE: 3/4"=1'-0"



6 SECTION - TYPE 'C2' PANELS @ CABLE FUNNEL  
SCALE: 3/4"=1'-0"



7 SECTION - TYPE 'C1' & 'C5' PANELS  
SCALE: 3/4"=1'-0"

- NOTES:
- FOR FENDER SYSTEM ANCHOR INSERT DETAILS, SEE DWG S-33.
  - COORDINATE WITH BOLLARD PLACEMENT, SEE DWG S-25.

- NOTES:
- FOR ALL DETAILS EXCEPT AS NOTED, SEE 2
  - FOR PLAN VIEW, SEE 3

AS-BUILT

AUTOCAD FILE NO. 6012829

S-29



PORT OF TACOMA  
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FEDERAL WAY, WASHINGTON 98003-6395  
(206) 431-2300 FAX: (206) 431-2250

APPROVED  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER  
DATE 1/11/99

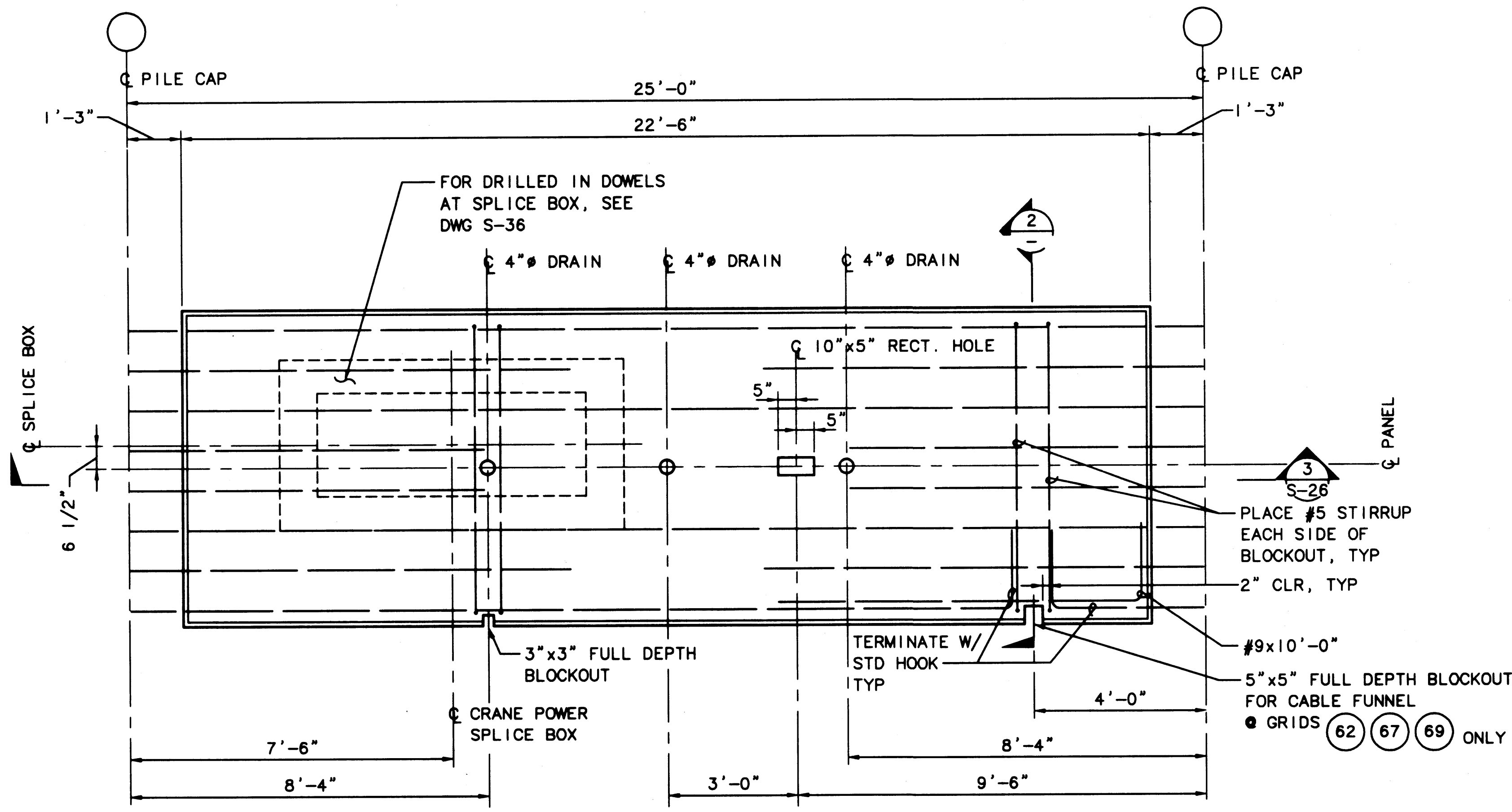
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JAS 9/91  
PROJ ENGR DATE

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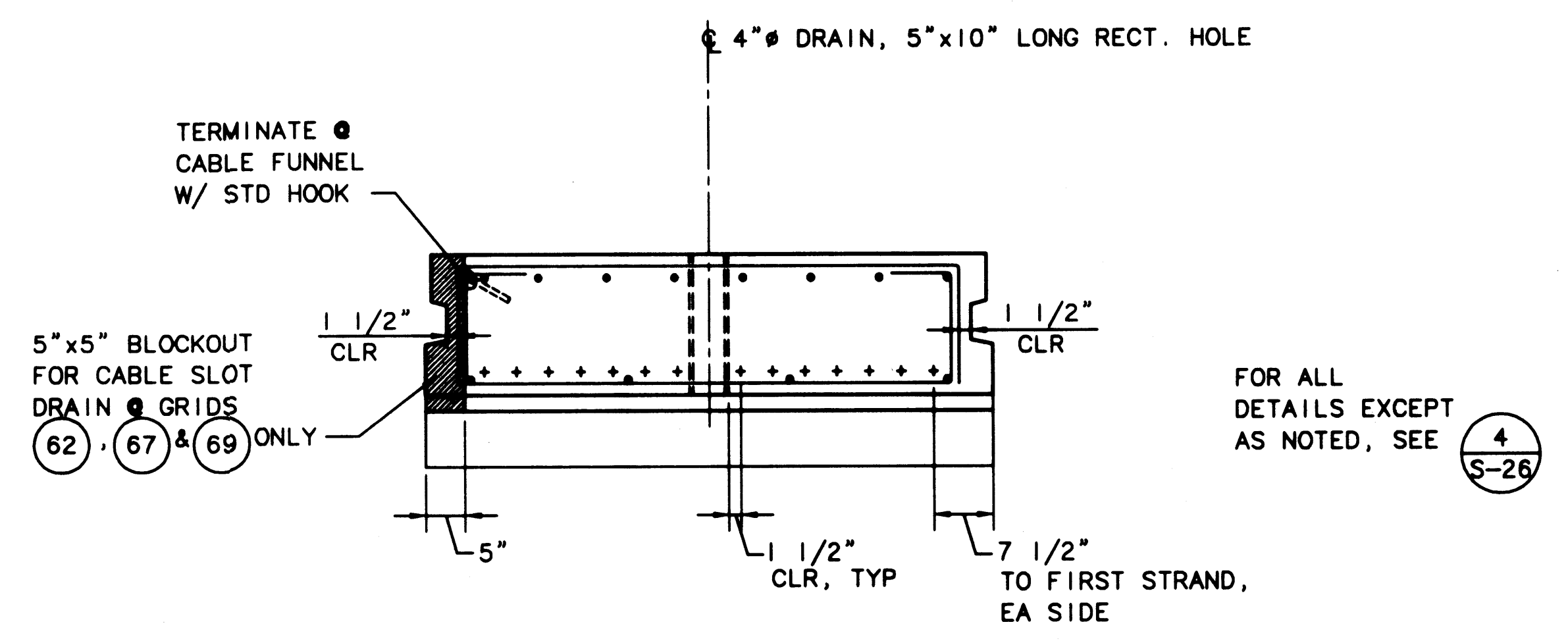
HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
DECK PANEL DETAILS - SHEET 4

DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 40 OF 58



1 PLAN - TYPE 'A2a' PANELS  
S-30 SCALE: 1/2"=1'-0"

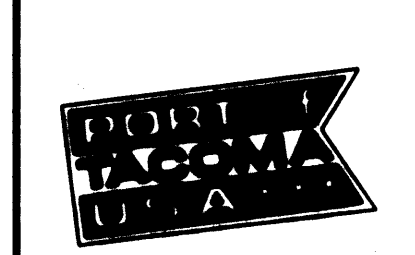
FOR ALL DETAILS EXCEPT AS NOTED, SEE 1 S-26



2 SECTION - TYPE 'A2a' PANELS  
S-30 SCALE: 3/4"=1'-0"

FOR ALL DETAILS EXCEPT AS NOTED, SEE 4 S-26

PLOTTED: Thu Jan 07 1999 2:03pm FILENAME: V:\1997\497093\CAD\S-30.dwg SCALE: 24



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FEDERAL WAY, WASHINGTON 98003-8395  
(206) 431-2300 FAX: (206) 431-2250

APPROVED  
*Curtis L. Ratcliffe* 1/11/99  
DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

MMD 2/91  
DRAWN BY DATE  
DESIGNED BY DATE

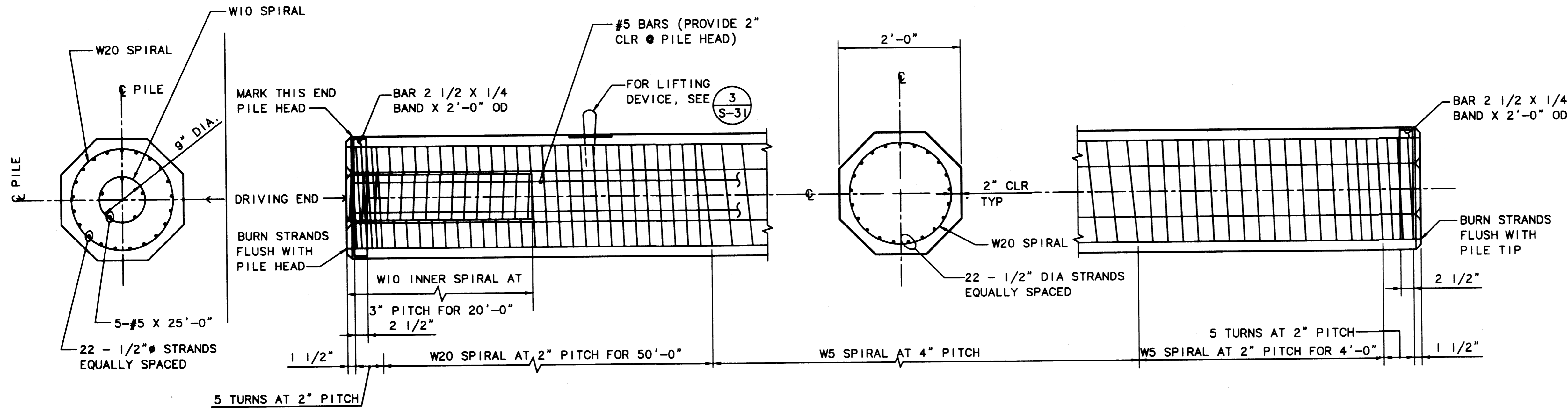
BCM 2/91  
CHECKED BY DATE  
JAS 2/91  
PROJ ENGR DATE

AS-BUILT	RCD	JAS	1/1/99
MARK	REVISION	BY	APP. DATE

**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
PORT OF TACOMA  
DECK PANEL DETAILS - SHEET 5

**AS-BUILT**  
AUTOCAD FILE NO. 5012830 S-30  
DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 41 OF 58





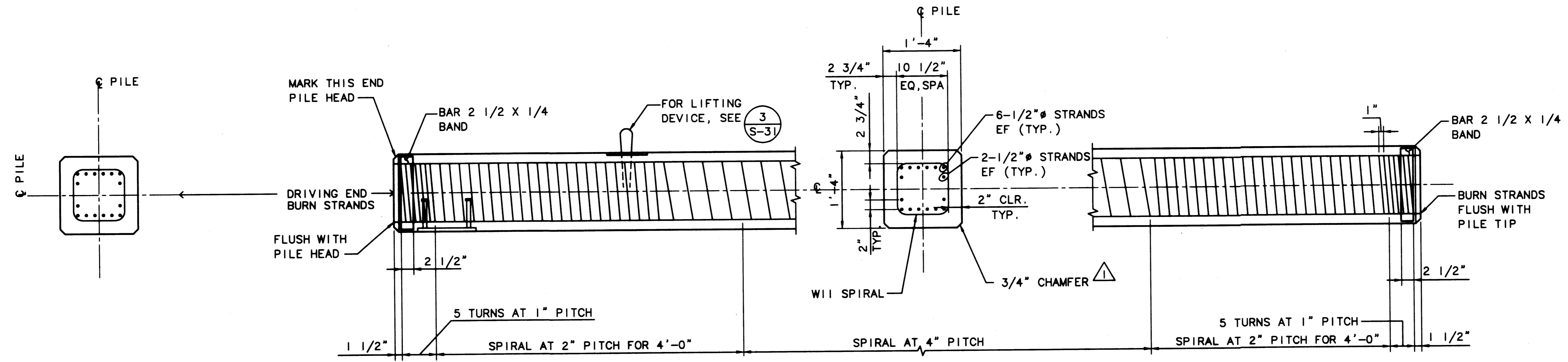
1  
S-32 24" SOLID OCTAGONAL PRECAST PRESTRESSED CONCRETE PILE—ROW K  
SCALE: 1"=1'-0"

NOTE: SEE DWG S-31 FOR SOLID PILE DATA.

NOTE: THESE PILES WILL BE FURNISHED BY THE PORT, SEE SPECIFICATIONS.

PRECAST PRESTRESSED PILE DATA (SQUARE CONCRETE PILES)	
SIZE	16" SOLID
SECTION AREA	256 SQ IN
WEIGHT	276 LBS/FT
SECTION MODULUS	683 CUBIC IN
PRETENSION:	
NUMBER OF STRANDS	16
DESIGN FORCE	154 KIPS
PRESTRESS IN CONCRETE	600 PSI
MIN CONCRETE COMPRESSIVE STRENGTH:	
AT RELEASE	4800 PSI
AT DRIVING	8000 PSI
AT 28 DAYS	8000 PSI
PRESTRESSING STEEL	1/2" DIA 7-WIRE LOW RELAXATION STRAND
SPIRAL	ASTM A82 SPACING/DRAWING

- NOTES:
1. MARK DRIVING END OF ALL PILES CLEARLY IN PRECAST PLANT.
  2. PILES IN ROWS H, J, K, G.8, H.5, & J.3 SHALL HAVE MARKS DESIGNATING THE RESPECTIVE ROW LOCATION PAINTED CLEARLY ON THE PILE.



2  
S-32 16" SOLID SQUARE PRECAST PRESTRESSED CONCRETE FENDER PILE  
SCALE: 1"=1'-0"

NOTE: SEE S-33 & S-34 FOR FENDER ATTACHMENT DETAILS

AS-BUILT  
AUTOCAD FILE NO. 6012832 S-32

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1/1/99  
DATE  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER

MMD 9/91  
DRAWN BY DATE  
JAS 9/91  
DESIGNED BY DATE

BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

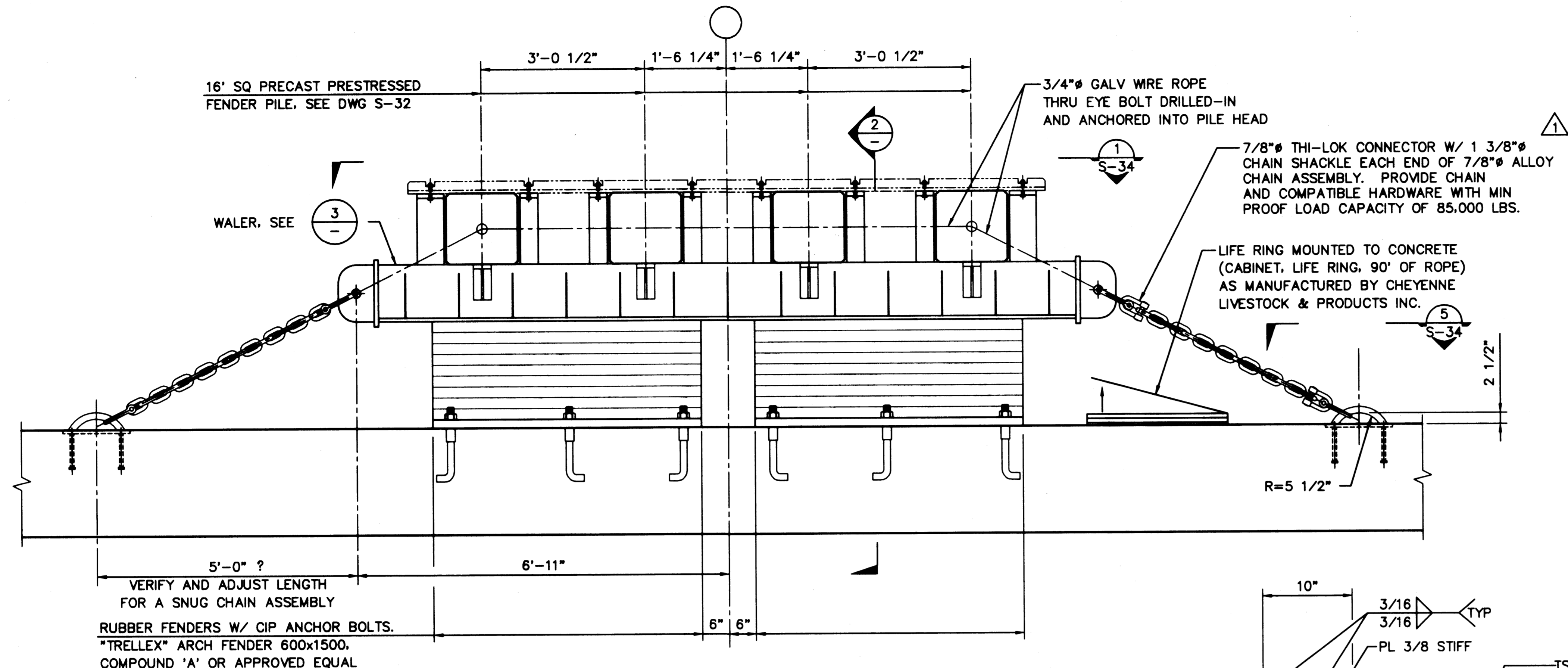
MARK	REVISION	BY	APP.	DATE

HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
PRECAST PILE DETAILS - SHEET 2

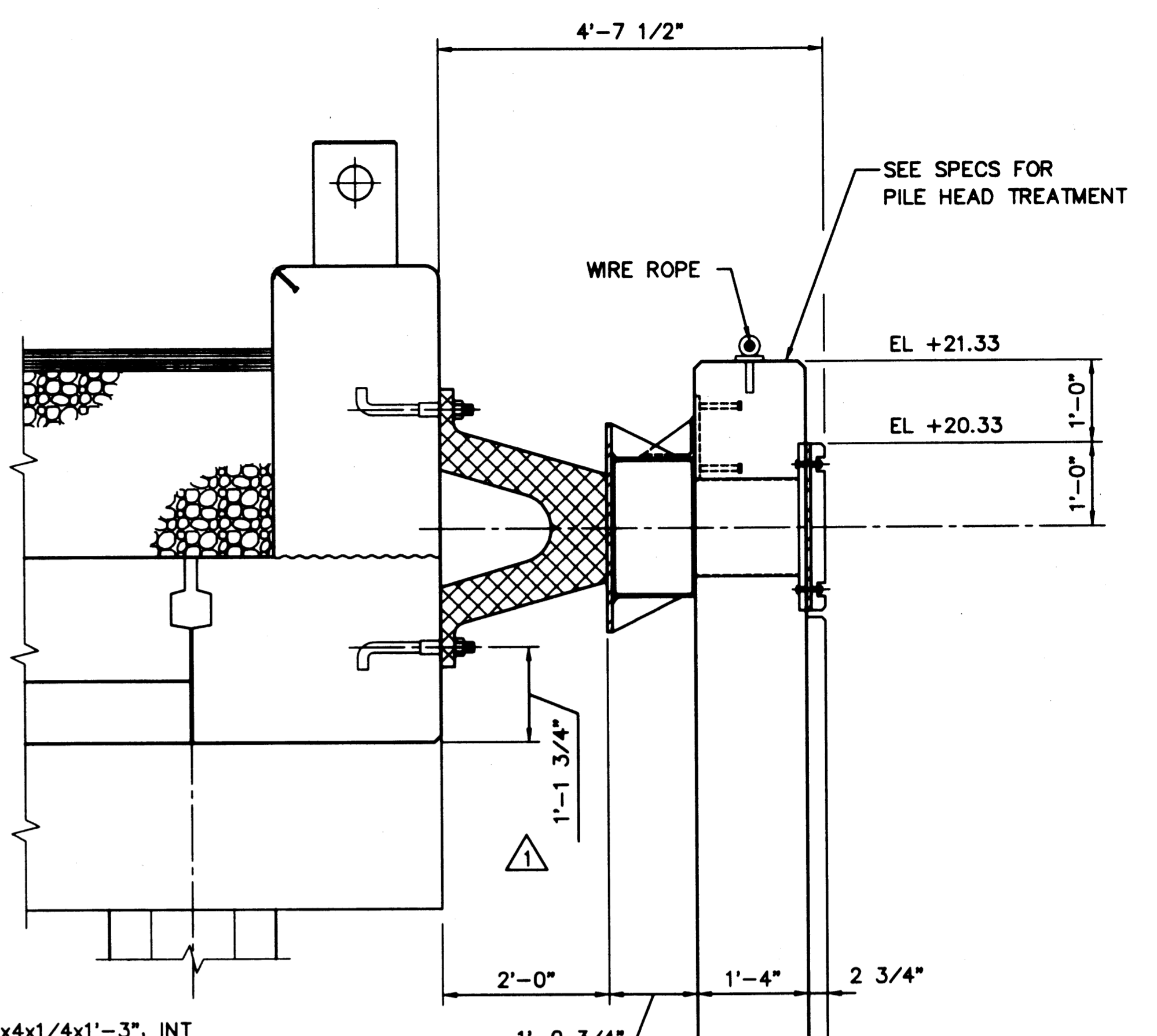
DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 43 OF 58

PLOTTED: Thu Jan 07 1999 2:03pm FILENAME: V:\1997\197093\CAD\S-32.dwg SCALE: 12

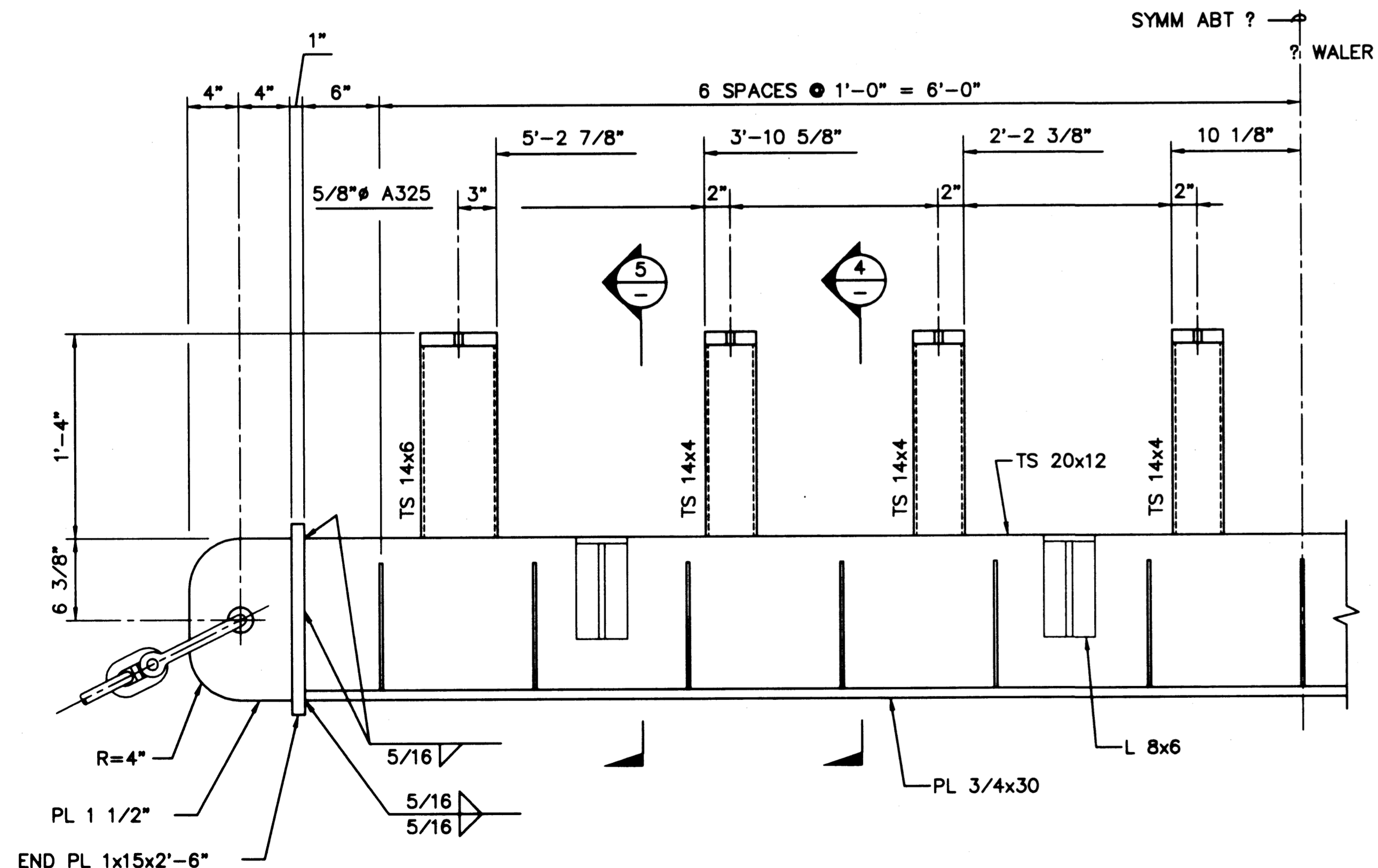
PLOTTED: Thu Jan 07 1999 2:03pm FILENAME: V:\1997\497093\CAD\S-33.dwg SCALE: 16



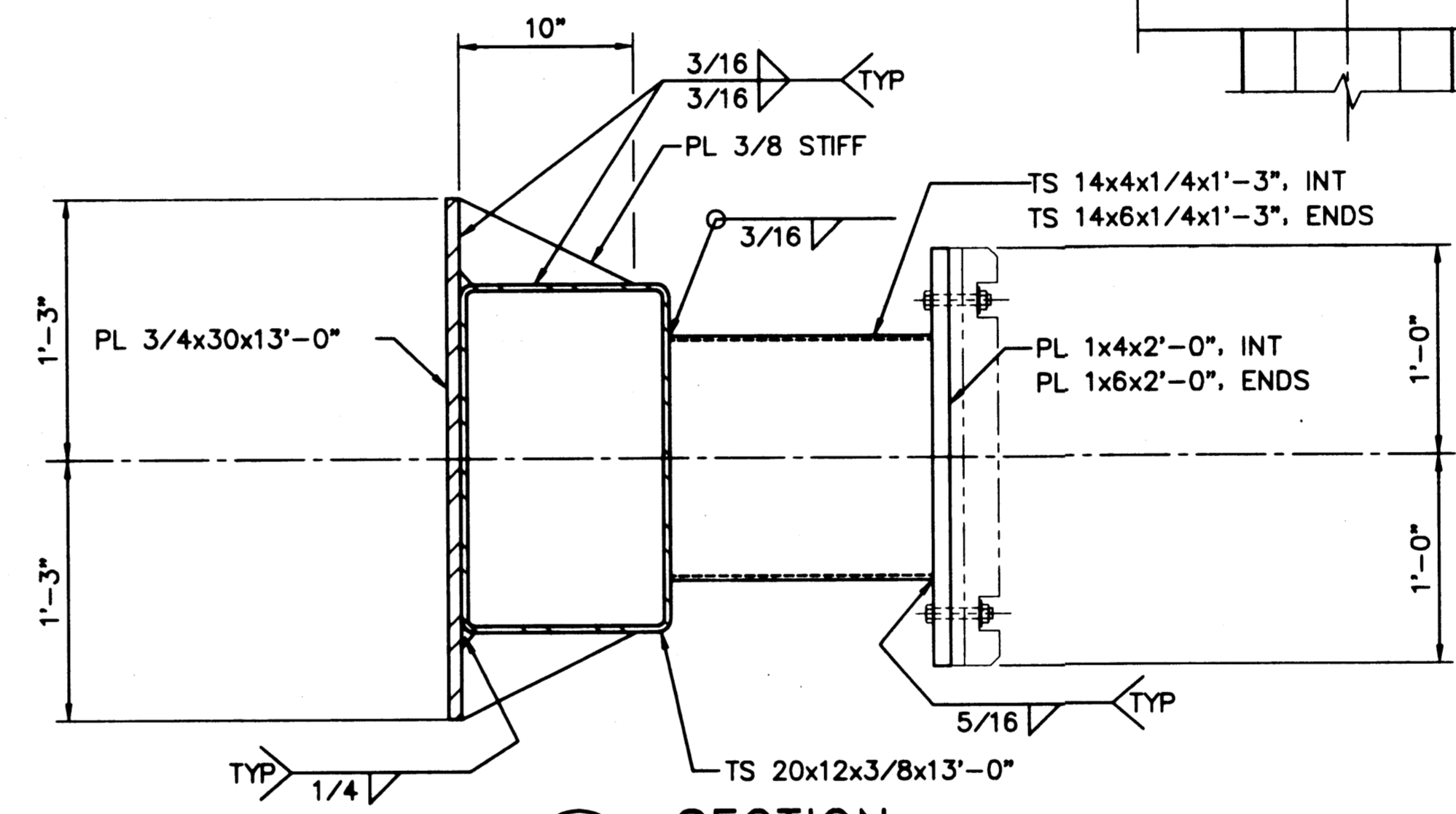
**1 PLAN - FENDER**  
SCALE: 3/4"=1'-0"



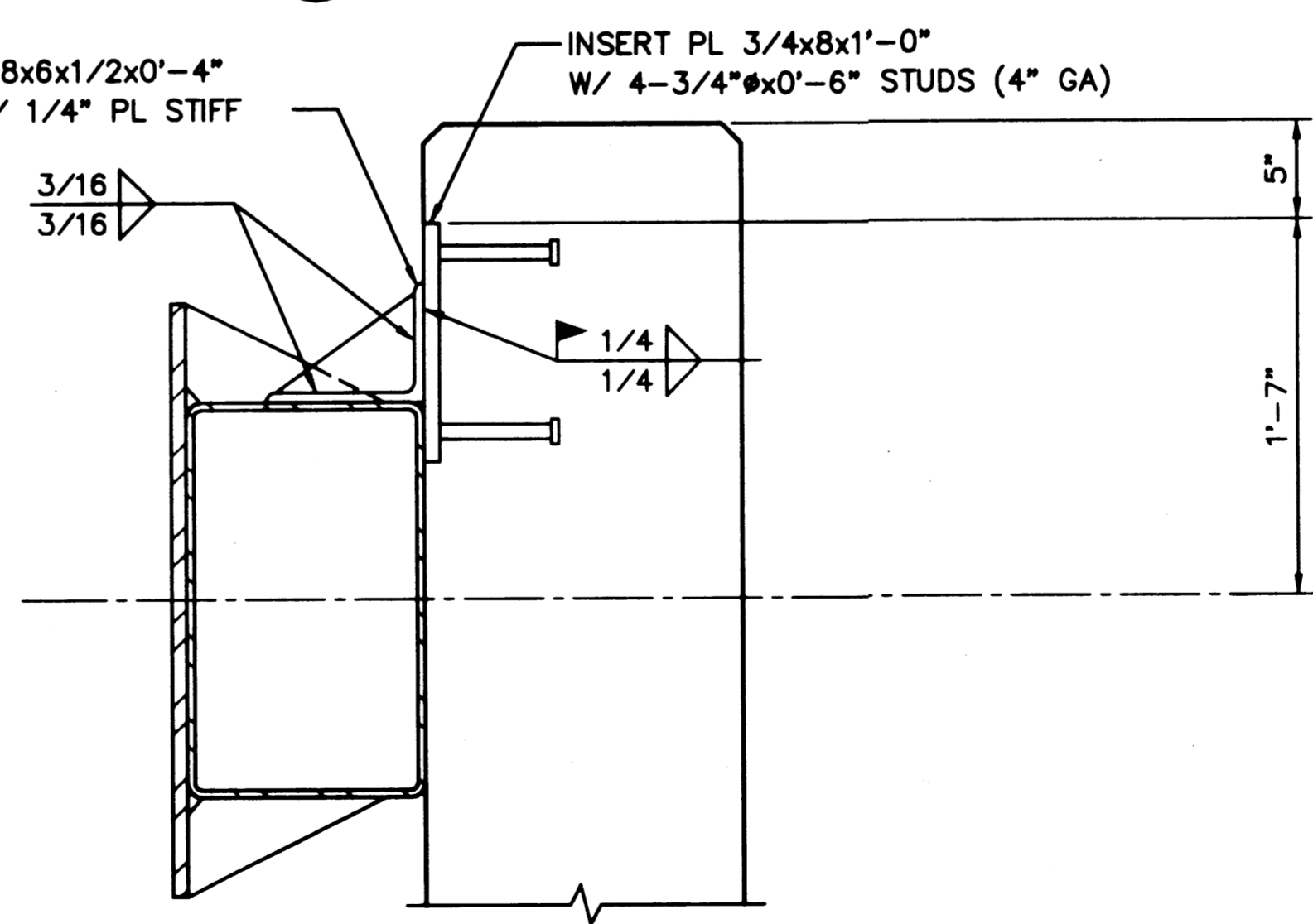
**2 SECTION**  
SCALE: 3/4"=1'-0"



**3 PLAN - WALER**  
SCALE: 1 1/2"=1'-0"



**4 SECTION**  
SCALE: 1 1/2"=1'-0"



**5 SECTION**  
SCALE: 1 1/2"=1'-0"

**AS-BUILT**  
AUTOCAD FILE NO. 5012833 S-33

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(206)431-2300 FAX(206)431-2250

APPROVED: *[Signature]* 1/10/99 DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

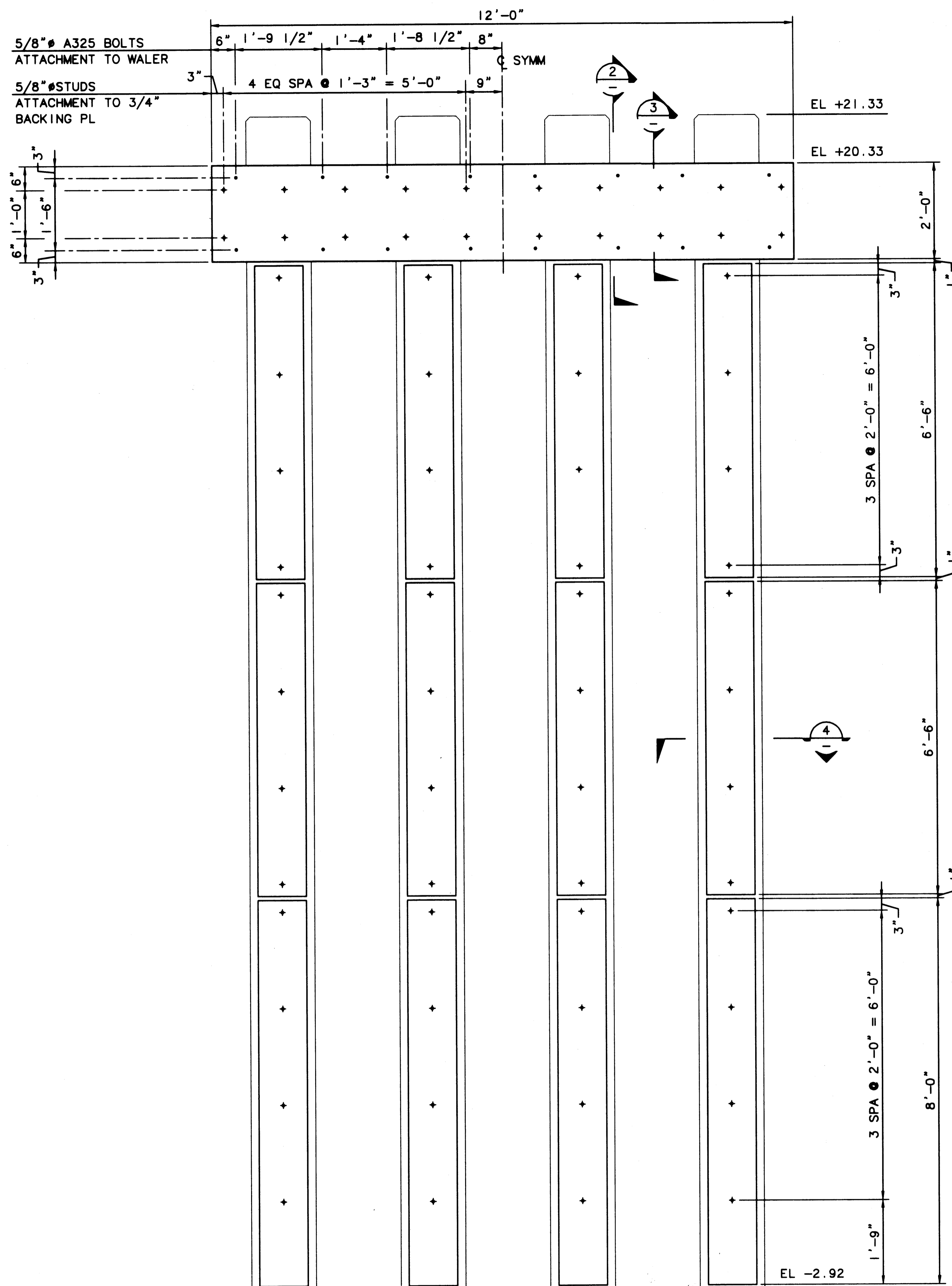
IBTH 9/91 DATE  
DRAWN BY DATE

BCM 9/91 CHECKED BY DATE  
JAS 9/91 PROJ ENGR DATE

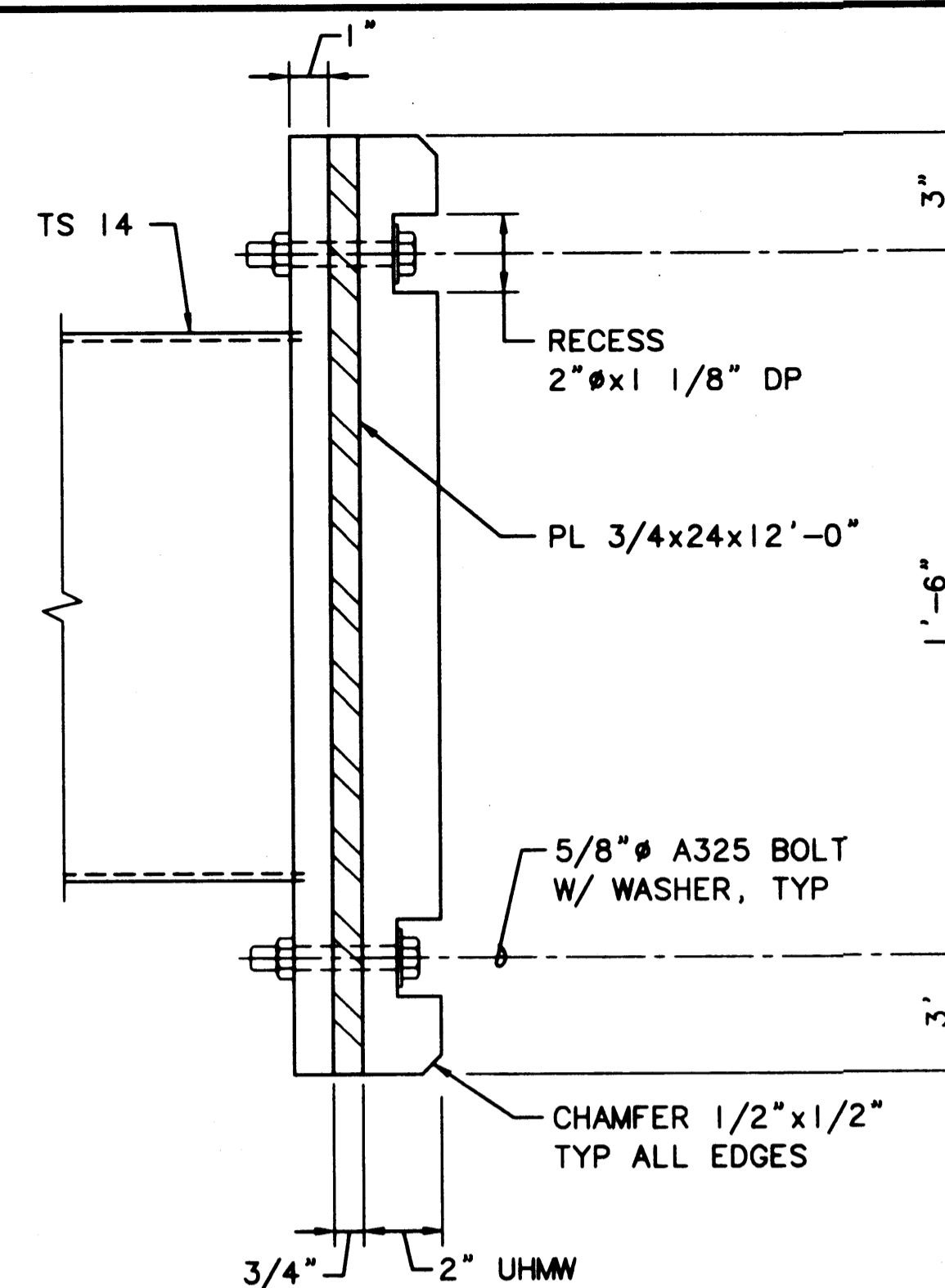
MARK	REVISION	BY	APP.	DATE

**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
PORT OF TACOMA  
FENDER SYSTEM DETAILS - SHEET 1

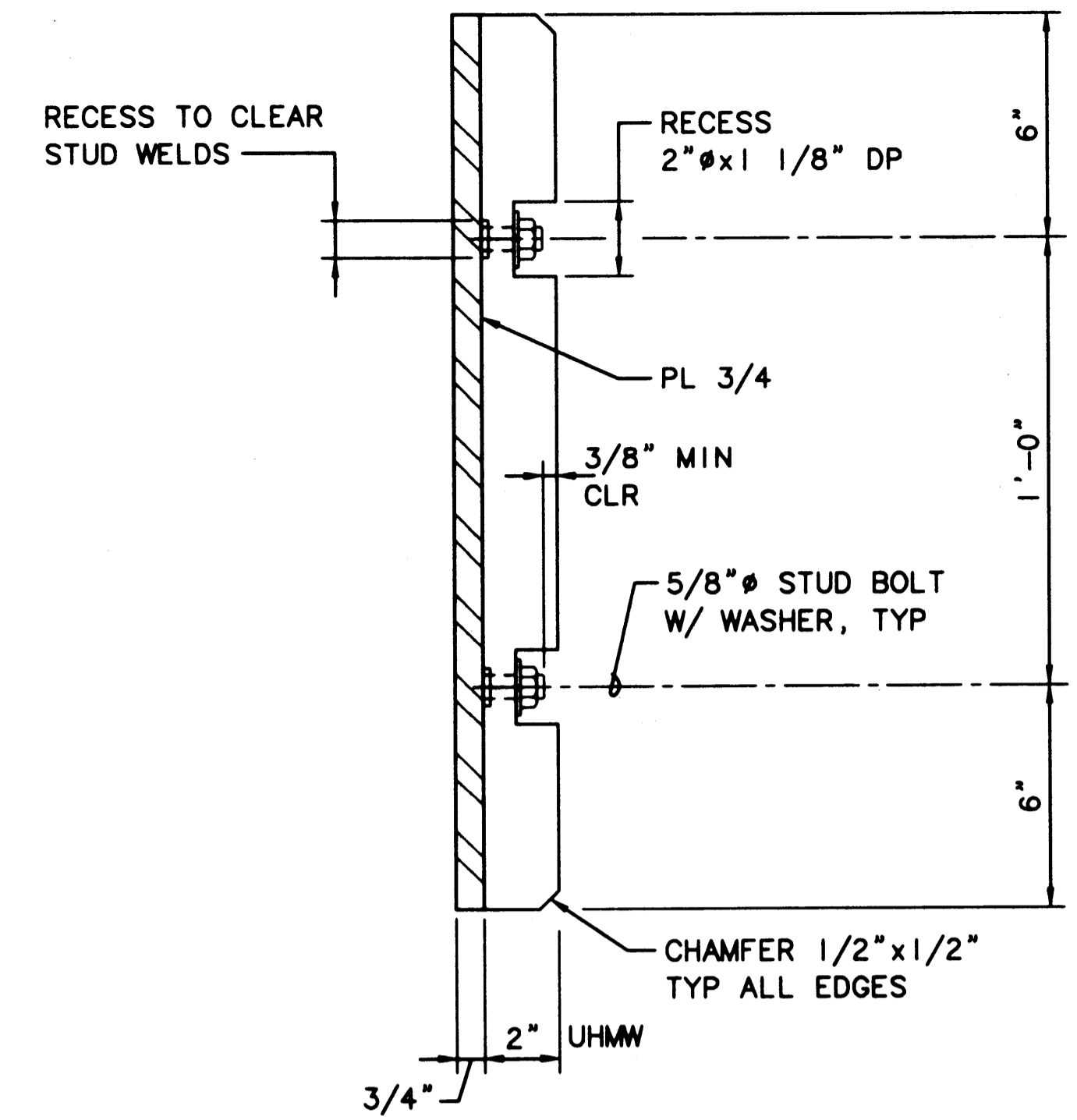
DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **44** OF **58**



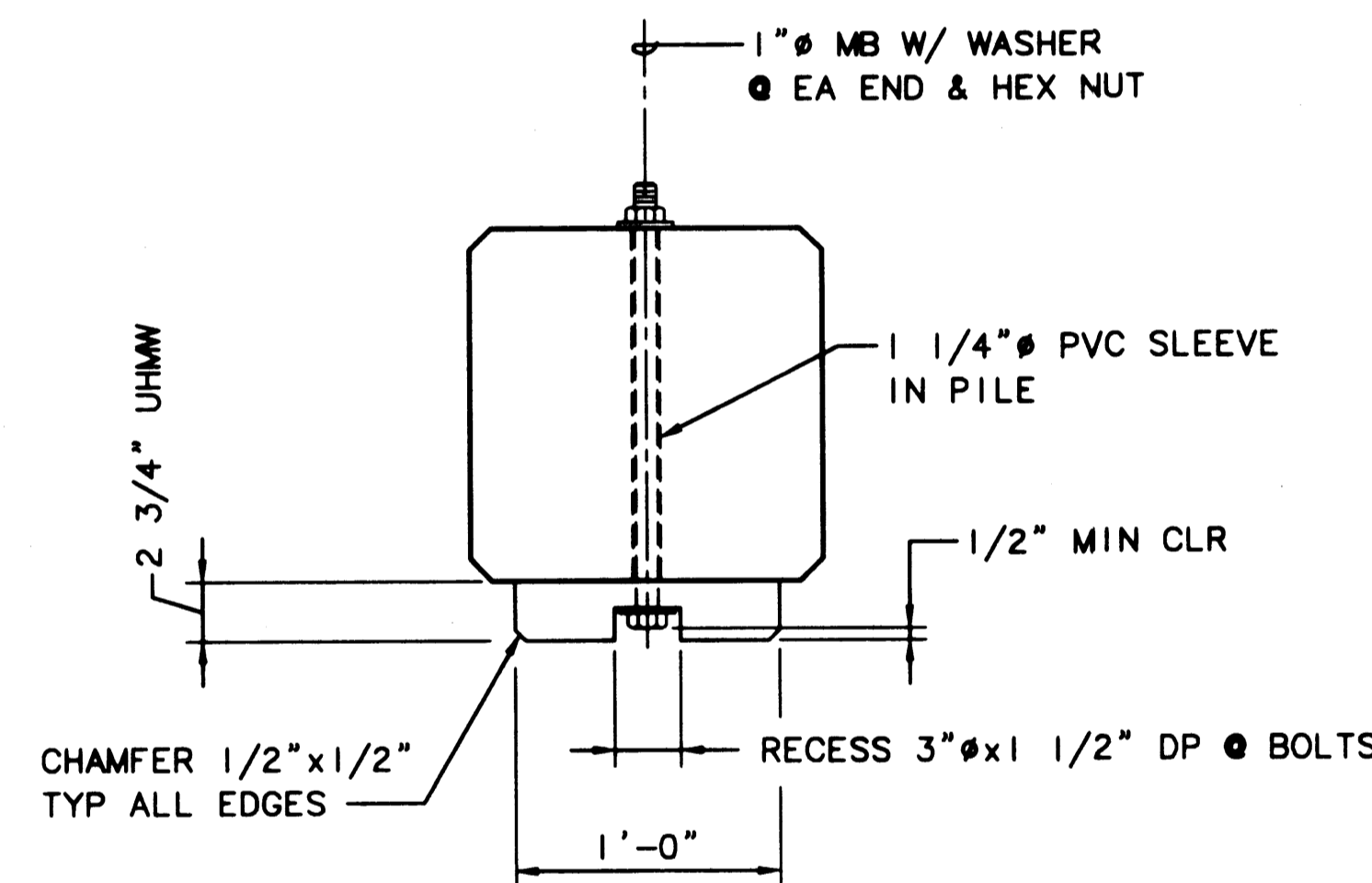
1 ELEVATION - UHMW FACING ON FENDER PANEL & PILES  
SCALE: 3/4"=1'-0"



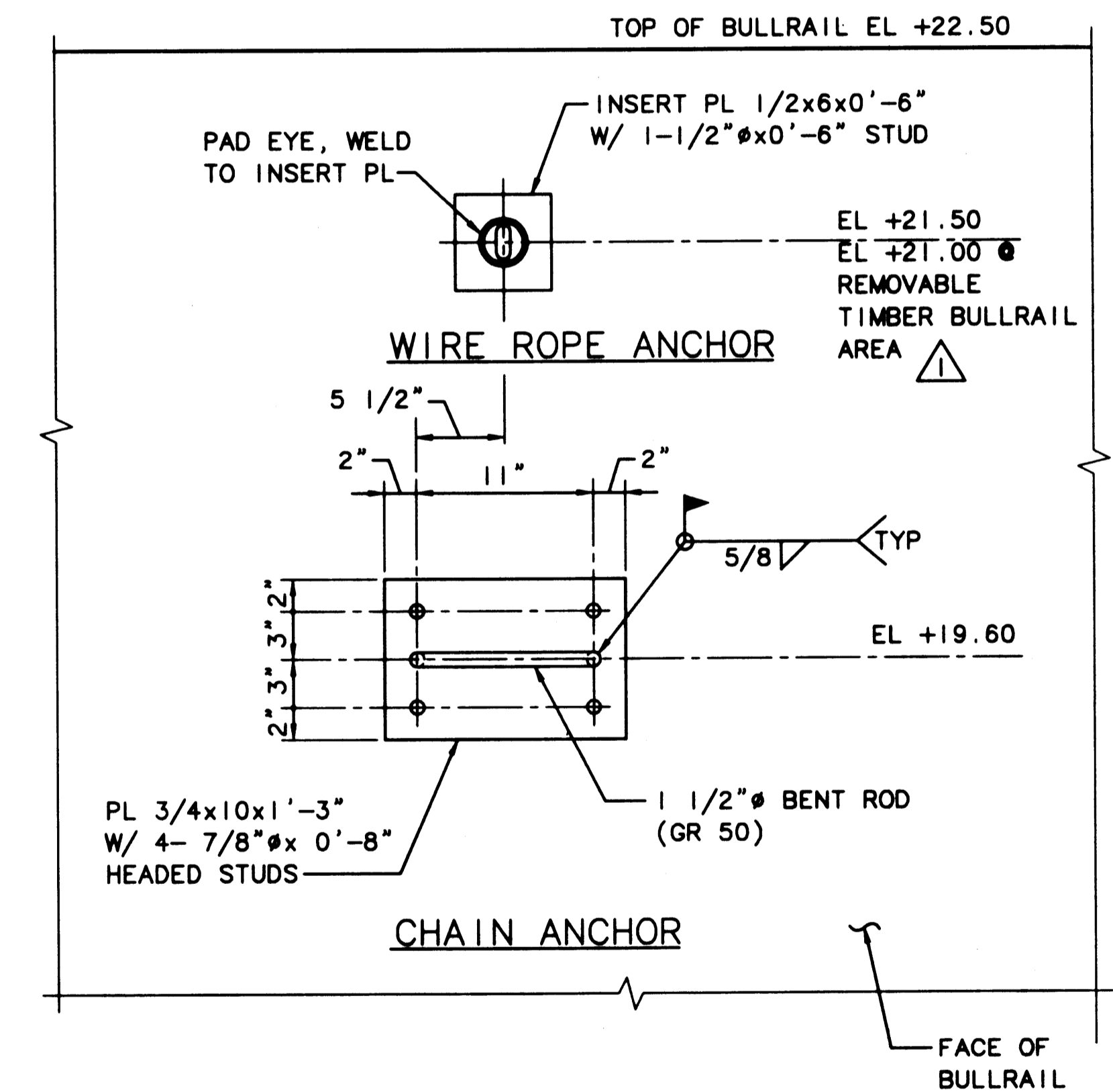
2 SECTION - FENDER PANEL @ TOP  
SCALE: 3"=1'-0"



3 SECTION - FENDER PANEL @ TOP  
SCALE: 3"=1'-0"



4 SECTION - UHMW ATTACHMENT TO FENDER PILE  
SCALE: 1 1/2"=1'-0"



5 ELEVATION - CHAIN AND WIRE ROPE ANCHOR  
SCALE: 1 1/2"=1'-0"

PLOTTED: Thu Jan 07 1999 2:04pm FILENAME: V:\1997\1497093\CAD\S-34.dwg SCALE: 1/8

AS-BUILT

AUTOCAD FILE NO. 5012834

S-34



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APPROVED  
*Curtis L. Ratcliffe* 1/11/99  
DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

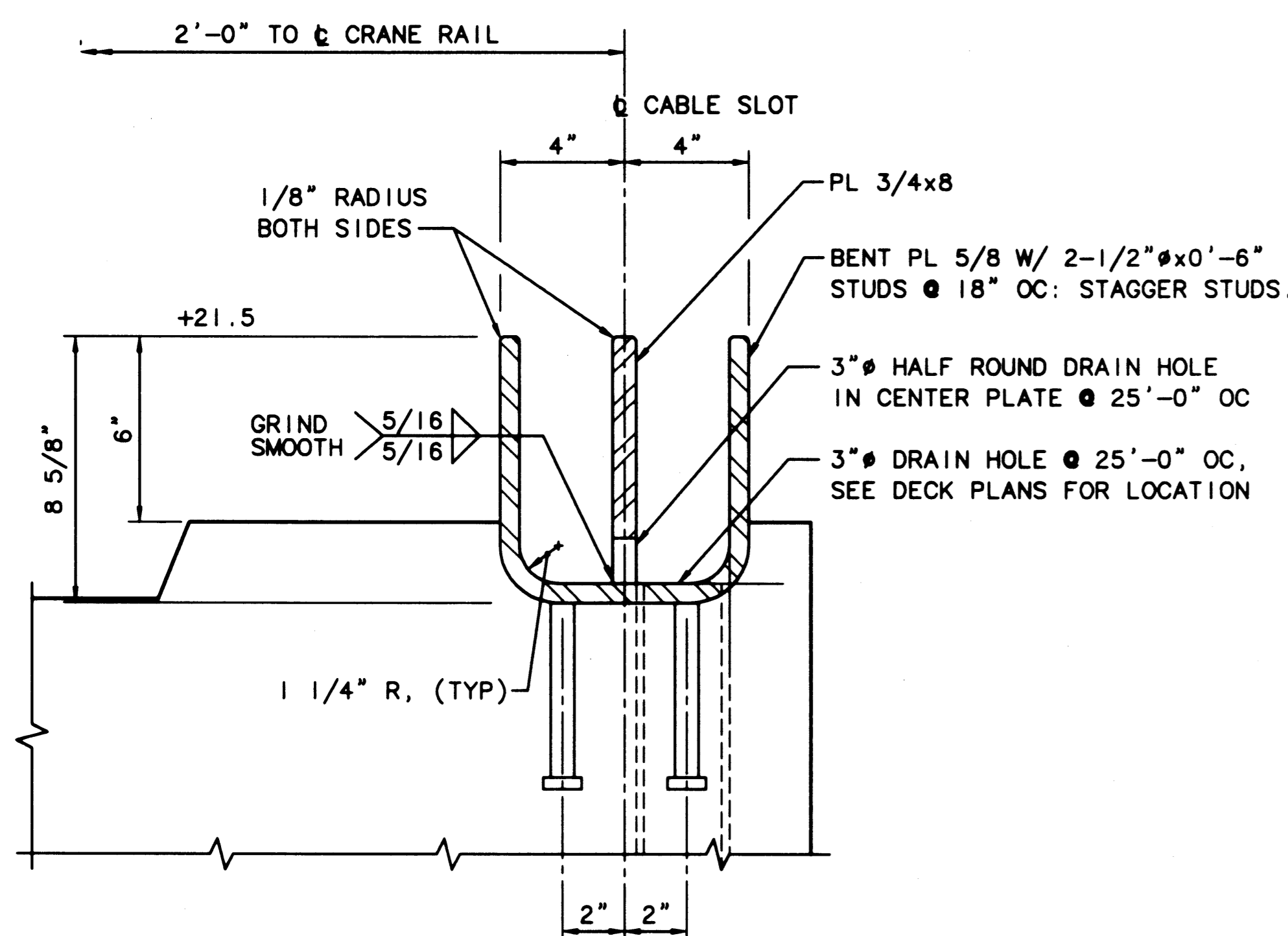
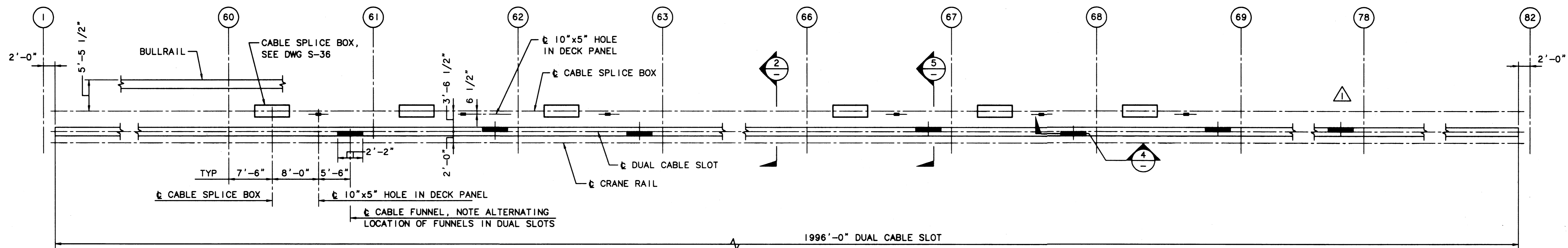
BTH 9/91  
DRAWN BY DATE  
DESIGNED BY DATE

BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

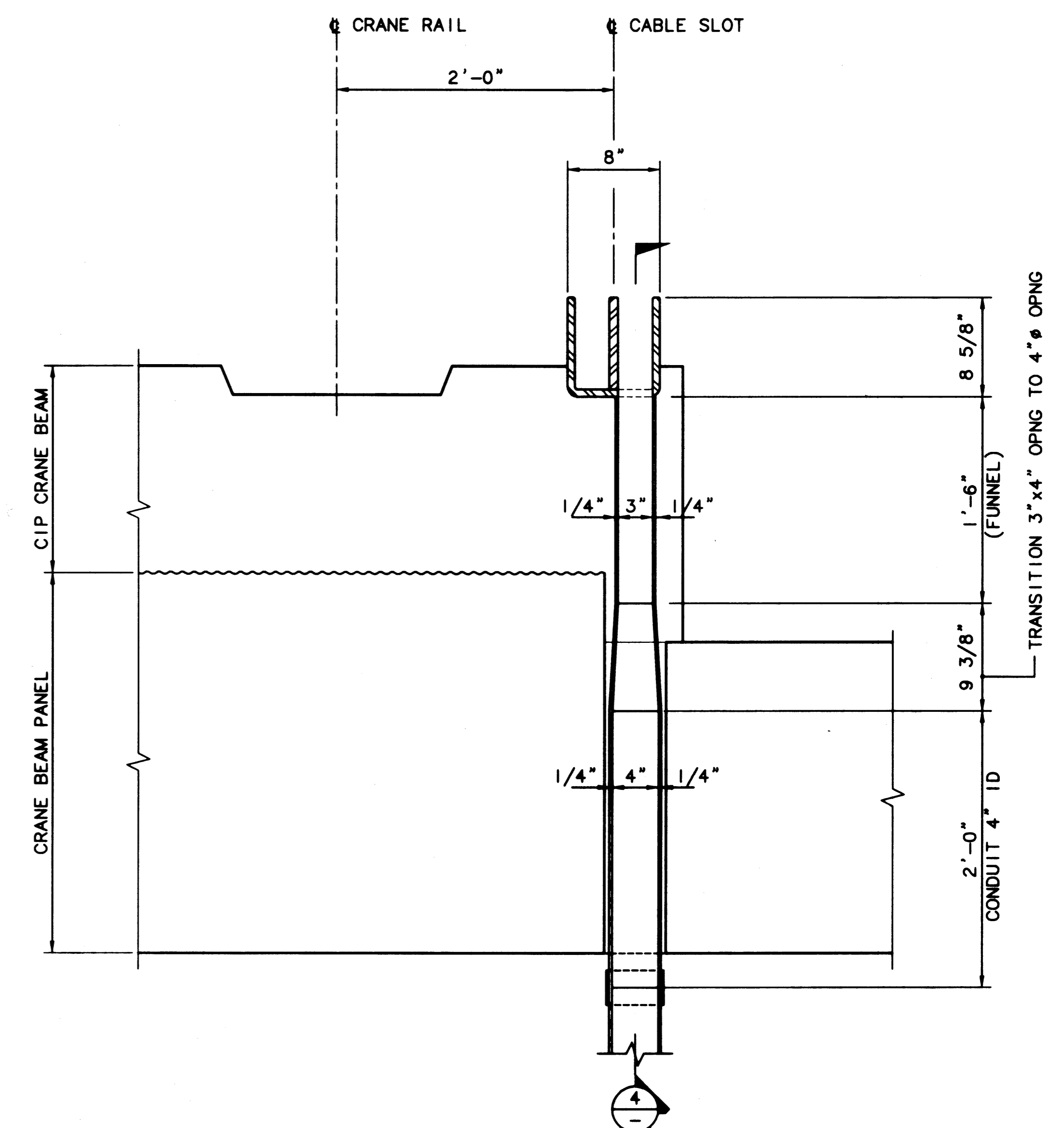
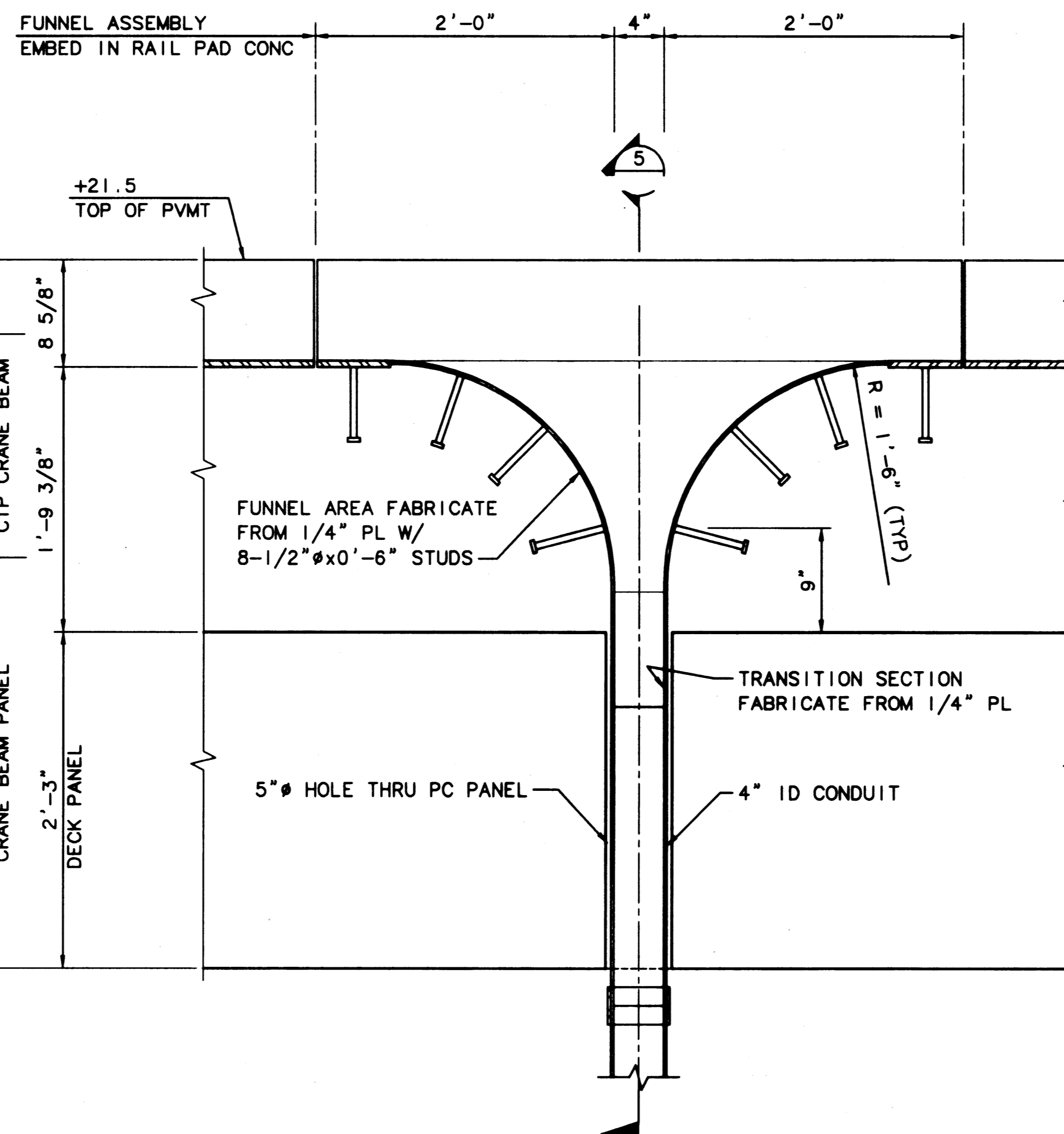
MARK	REVISION	BY	APP.	DATE

HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
FENDER SYSTEM DETAILS - SHEET 2

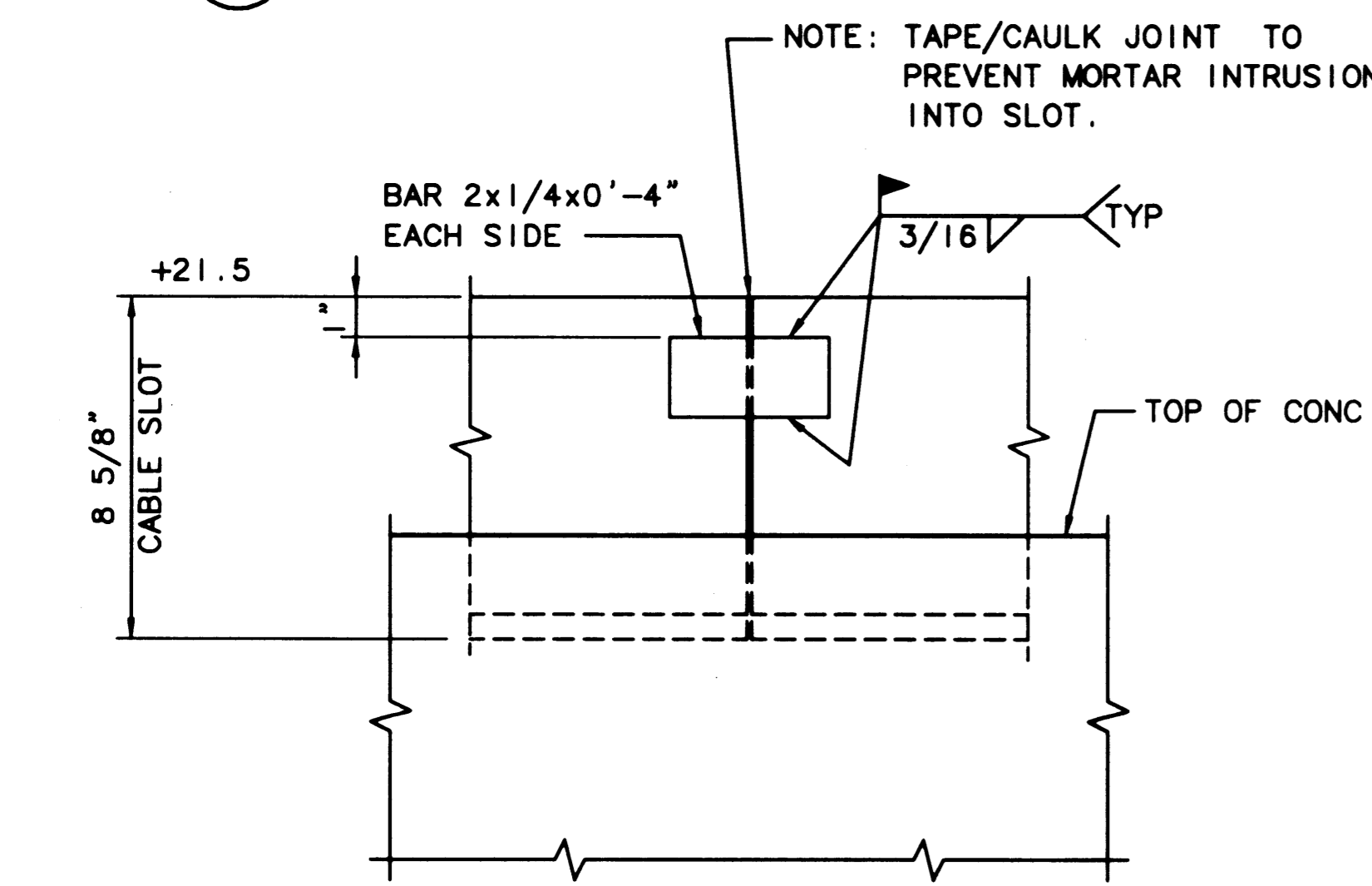
DRAWING NO. EP-6012-26  
CONTRACT NO. 978038  
SHEET NO. 45 OF 68



1  
S-35  
PLAN - CABLE SLOT AND CABLE SPLICE BOXES  
SCALE: 1/8"=1'-0"



2  
S-35  
SECTION - DUAL CABLE SLOT  
SCALE: 3"=1'-0"



4  
S-35  
SECTION - CABLE FUNNEL  
SCALE: 1 1/2"=1'-0"

5  
S-35  
SECTION - CABLE FUNNEL  
SCALE: 1 1/2"=1'-0"

AS-BUILT

AUTOCAD FILE NO. 5012835 S-35

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APPROVED  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER  
DATE 1/11/99

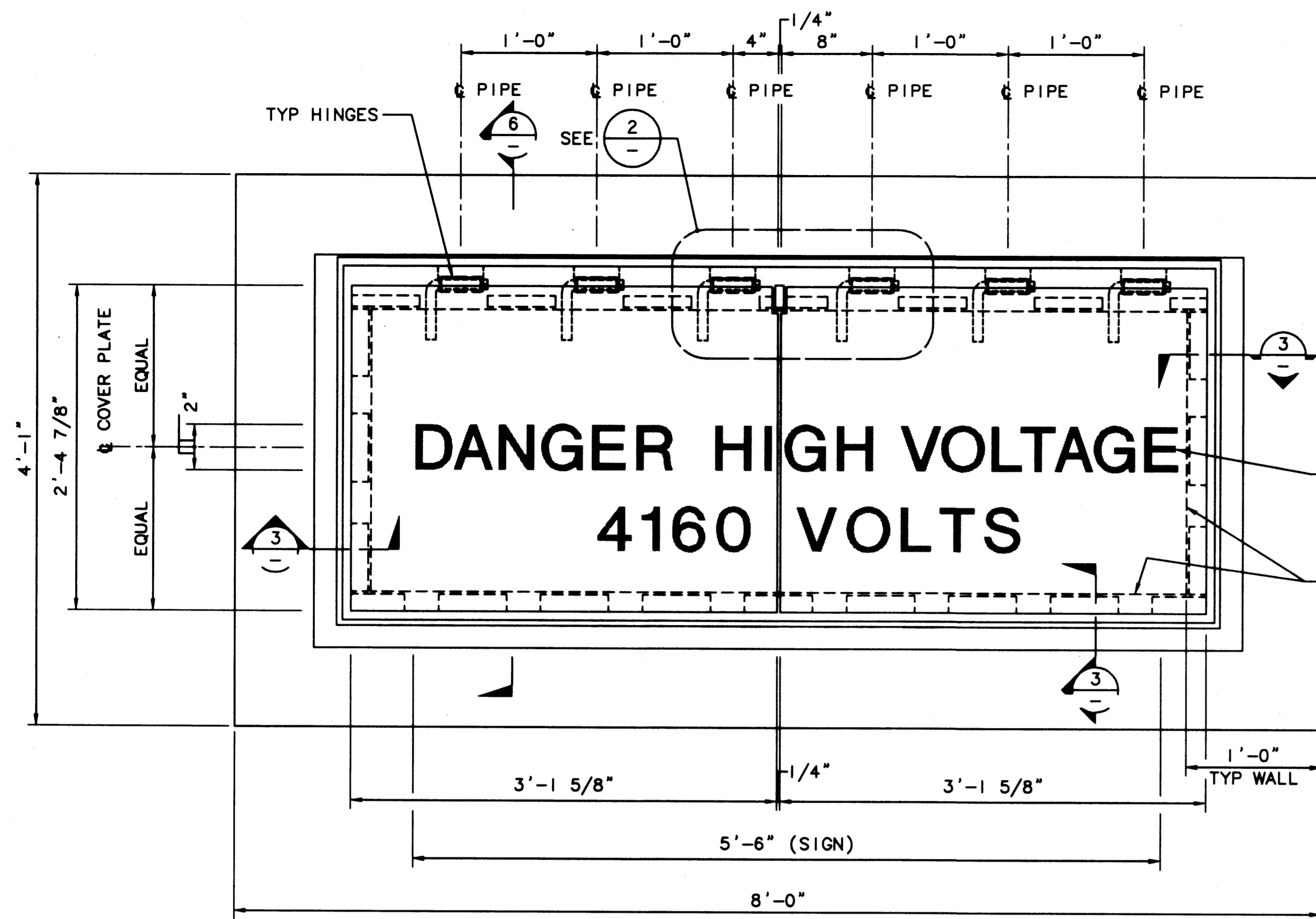
ISTH 9/91  
DRAWN BY DATE  
DESIGNED BY DATE

BCM 9/91  
CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

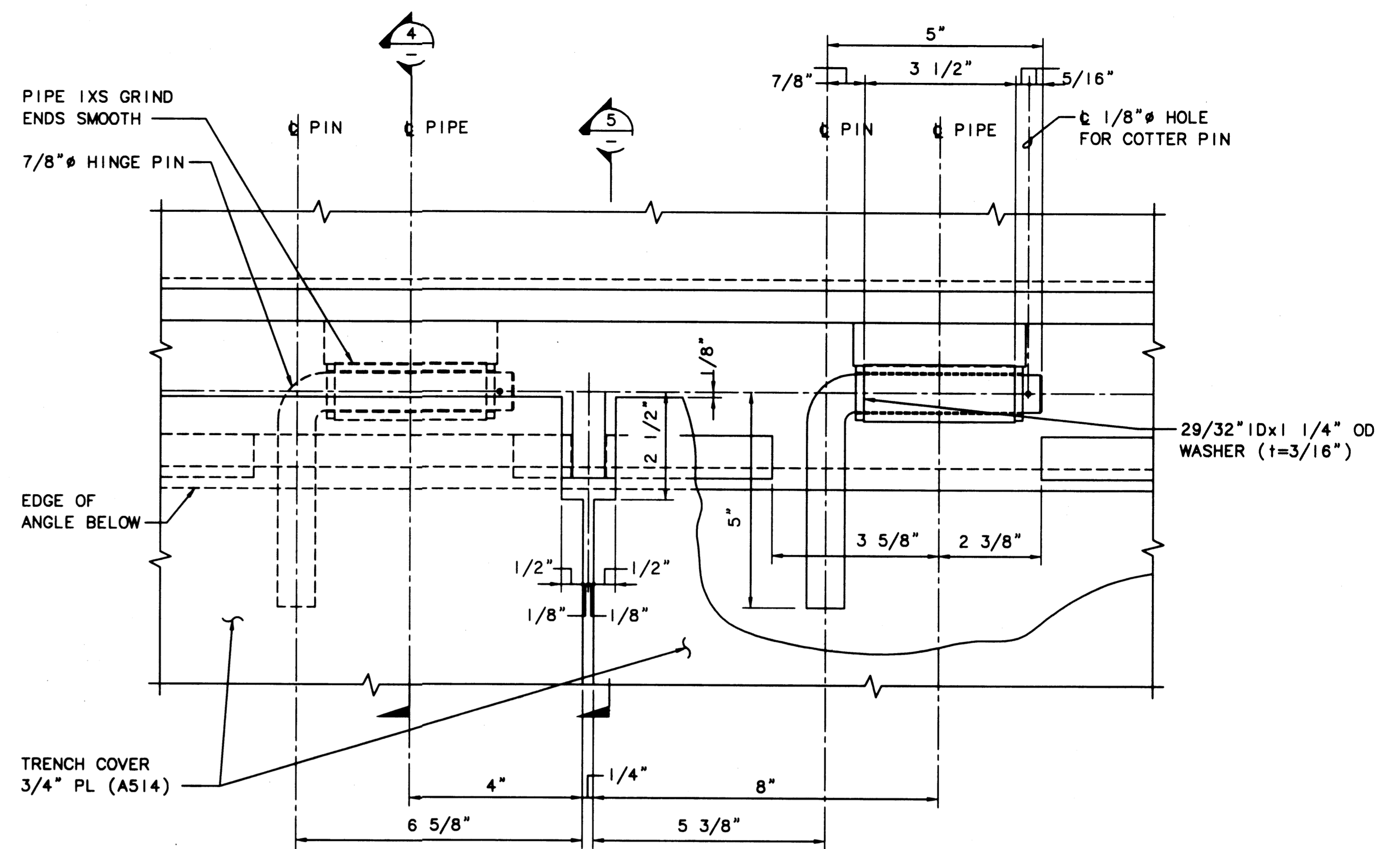
MARK	REVISION	BY	APP.	DATE
AS-BUILT		JAS		1/4/99

HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
CABLE SLOT DETAILS

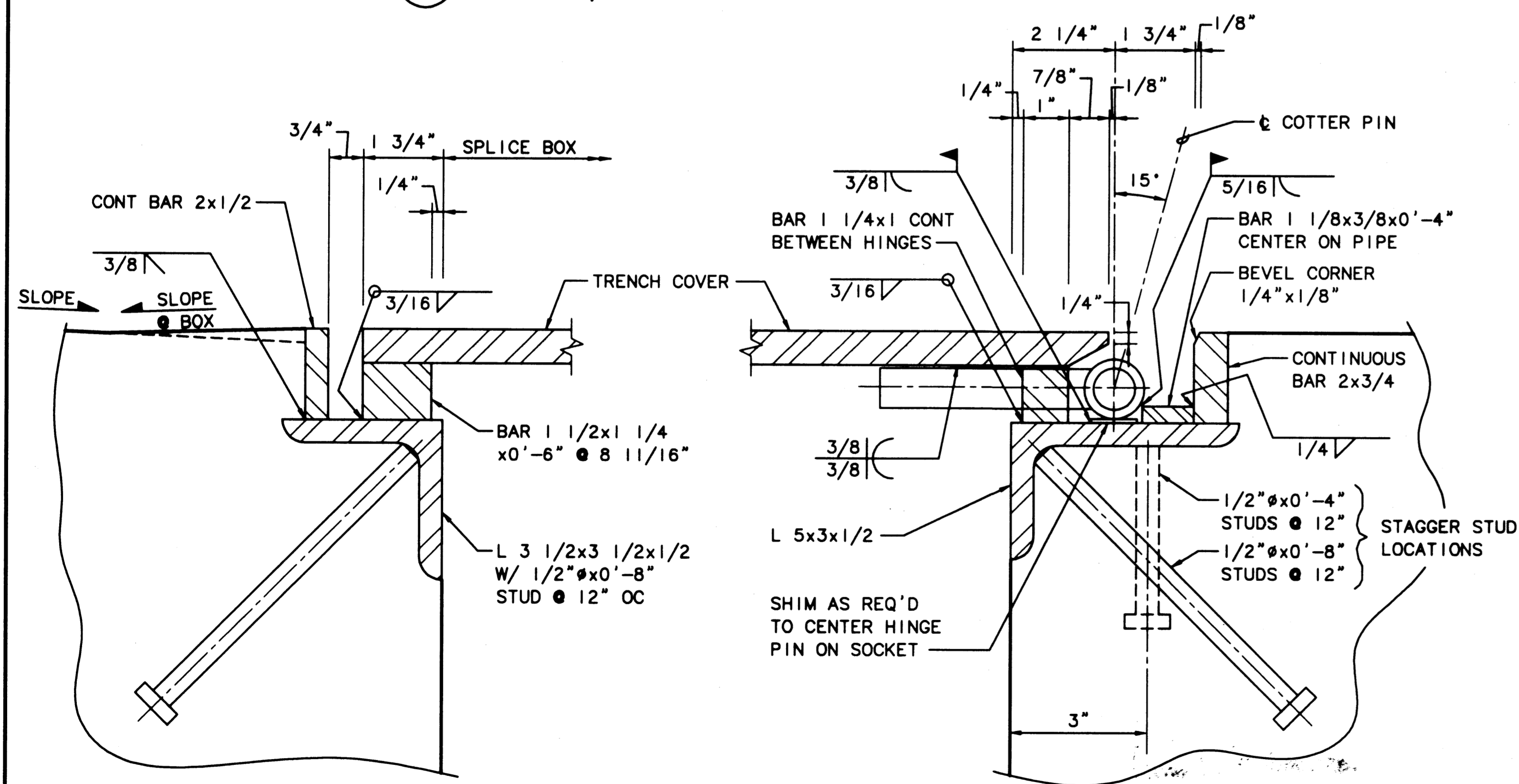
DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 46 OF 58



1 PLAN - CABLE SPLICE BOX COVER  
SCALE: 1 1/2"=1'-0"

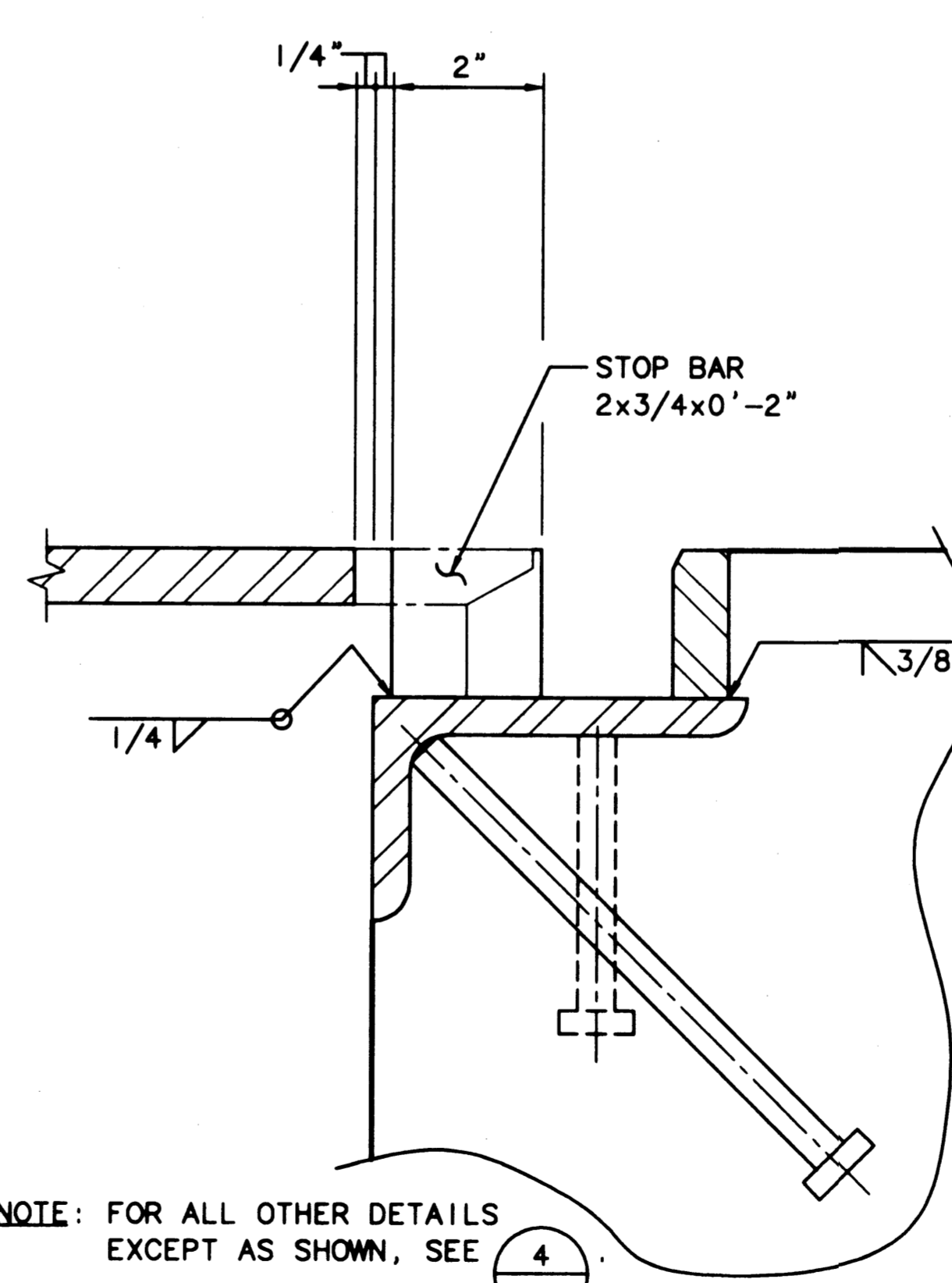


2 DETAIL  
SCALE: 6"=1'-0"



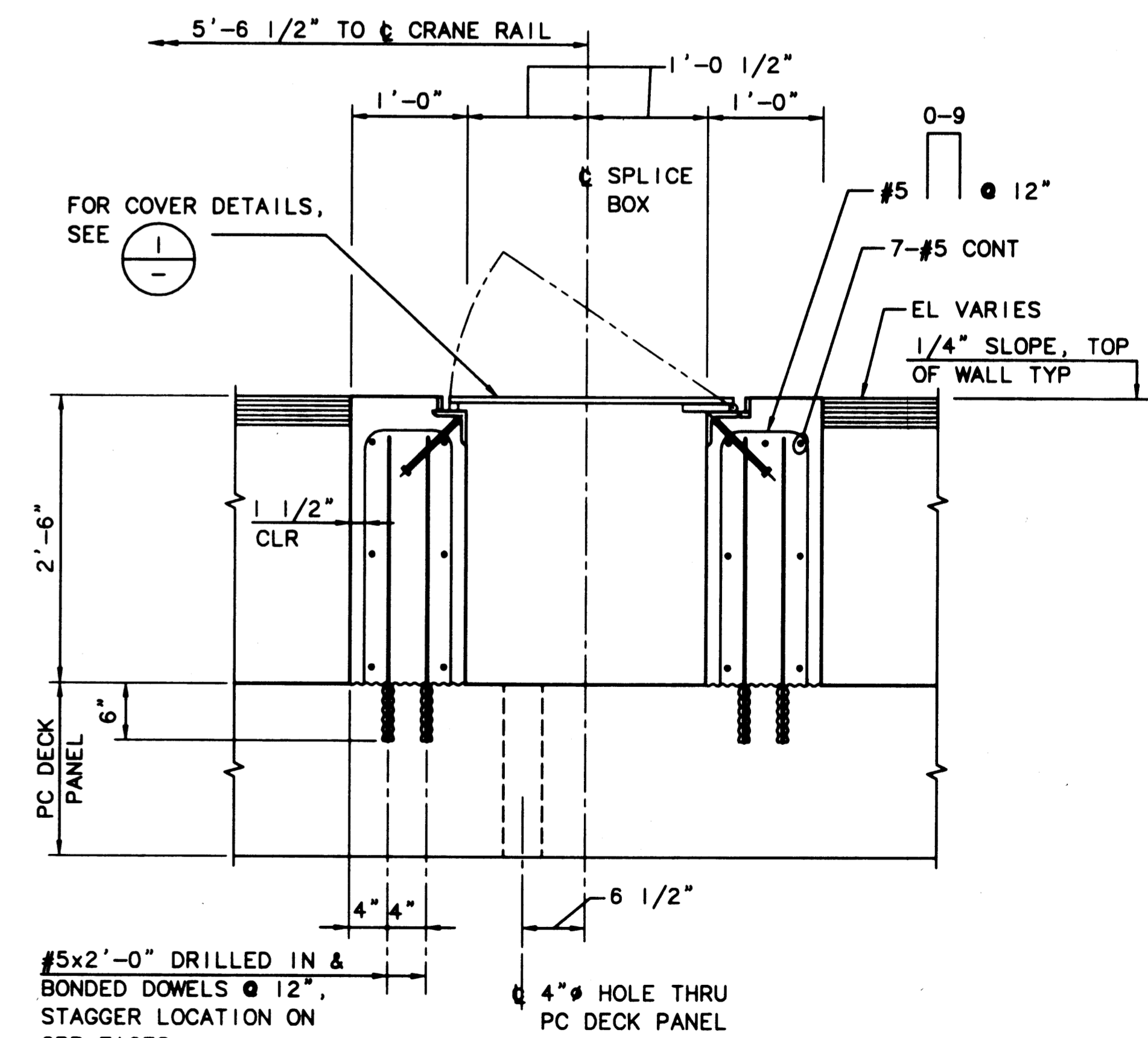
3 SECTION  
SCALE: 3"=1'-0"

4 SECTION  
SCALE: 3"=1'-0"



NOTE: FOR ALL OTHER DETAILS EXCEPT AS SHOWN, SEE 4

5 SECTION  
SCALE: 3"=1'-0"



6 SECTION - CABLE SPLICE BOX AS-BUILT  
SCALE: 1"=1'-0"

PLOTTED: Thu Jan 07 1999 2:04pm FILENAME: W:\1997\497093\CAD\S-36.dwg SCALE: 8



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APPROVED  
*Curtis L. Ratcliffe*  
DATE 1/1/99  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

ISTH 9/91  
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CHECKED BY DATE  
JAS 9/91  
PROJ ENGR DATE

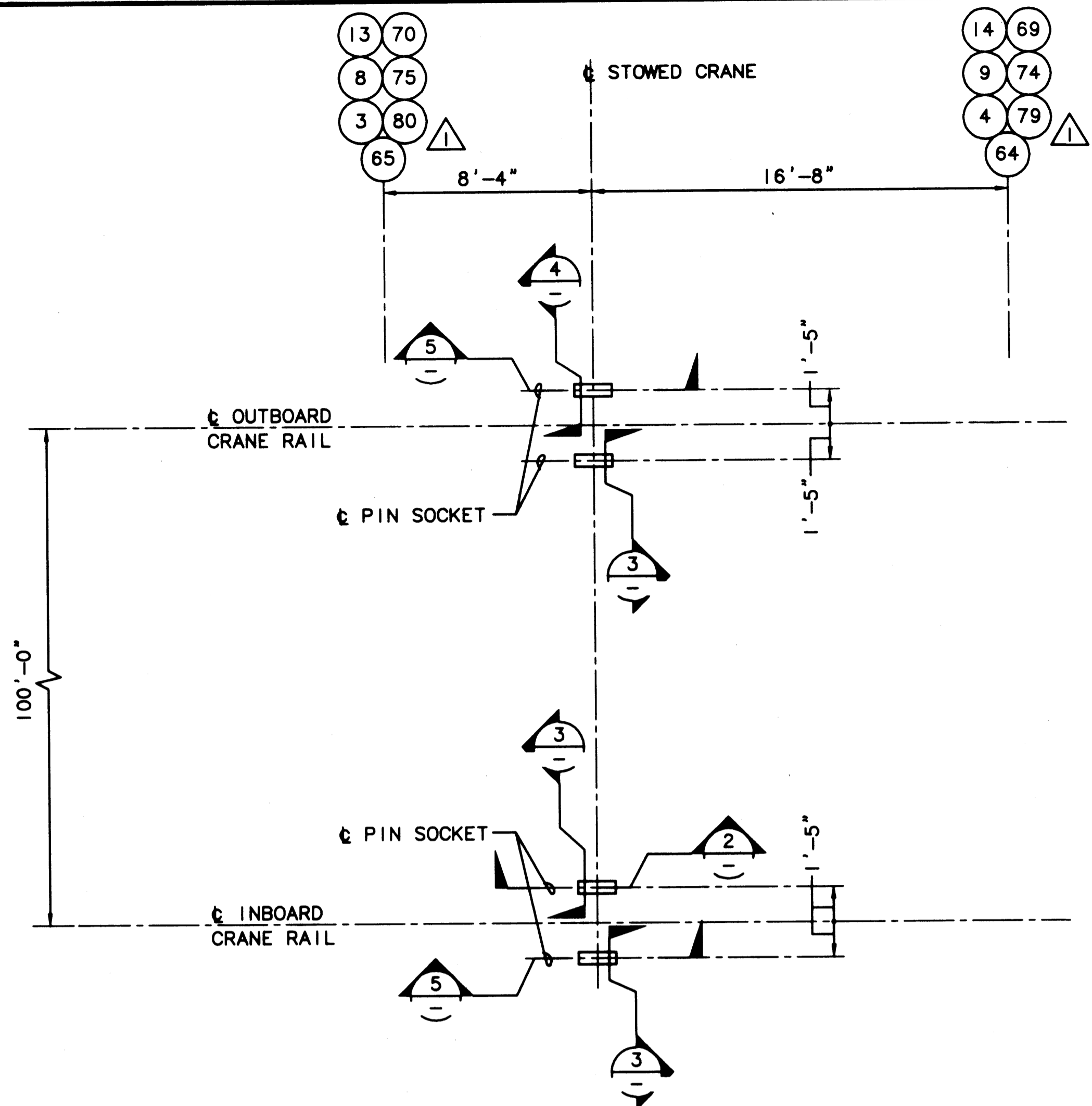
MARK	REVISION	BY	APP.	DATE

**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**SPLICE BOX DETAILS**

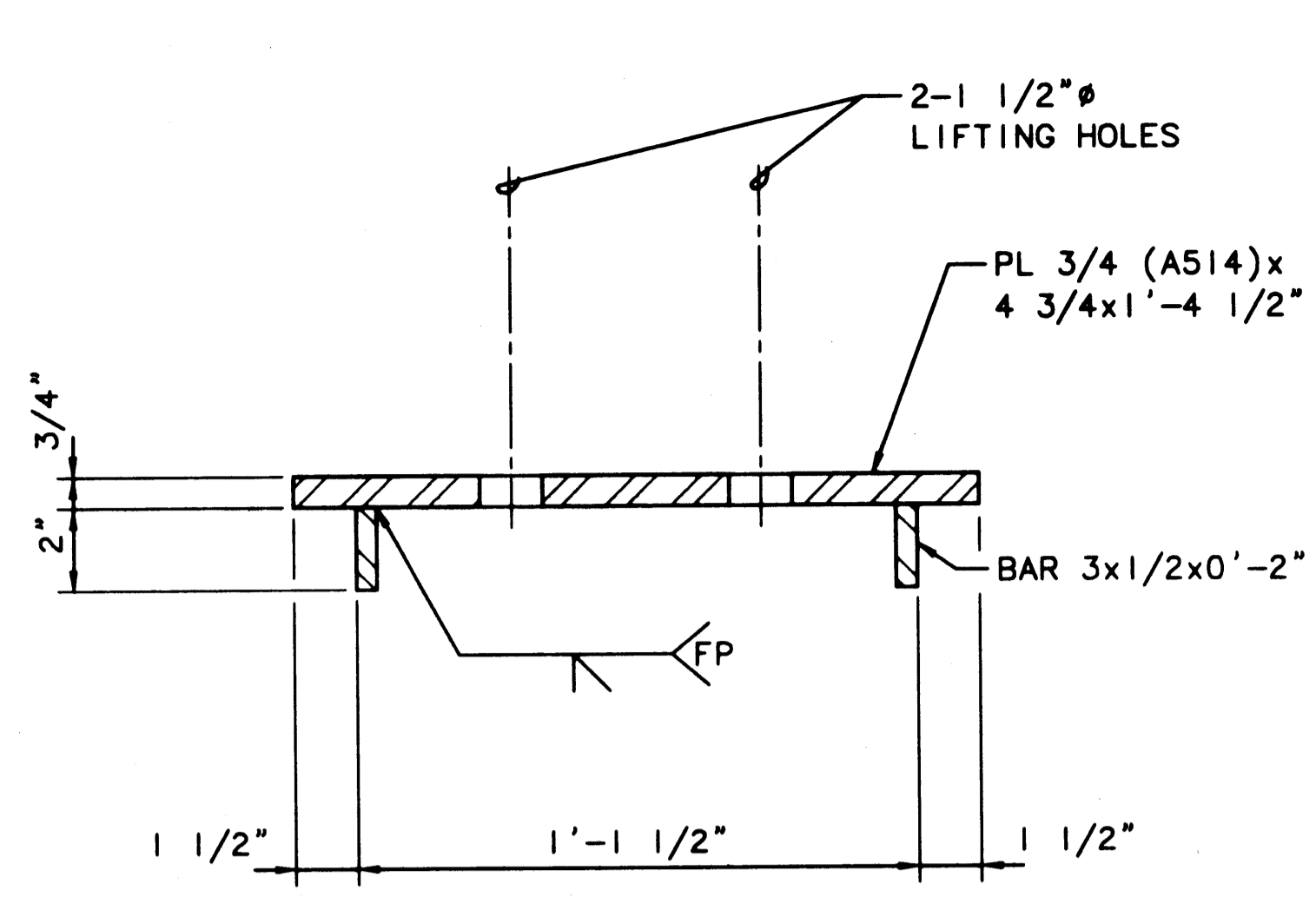
AUTOCAD FILE NO.  
**5012936**

**S-36**

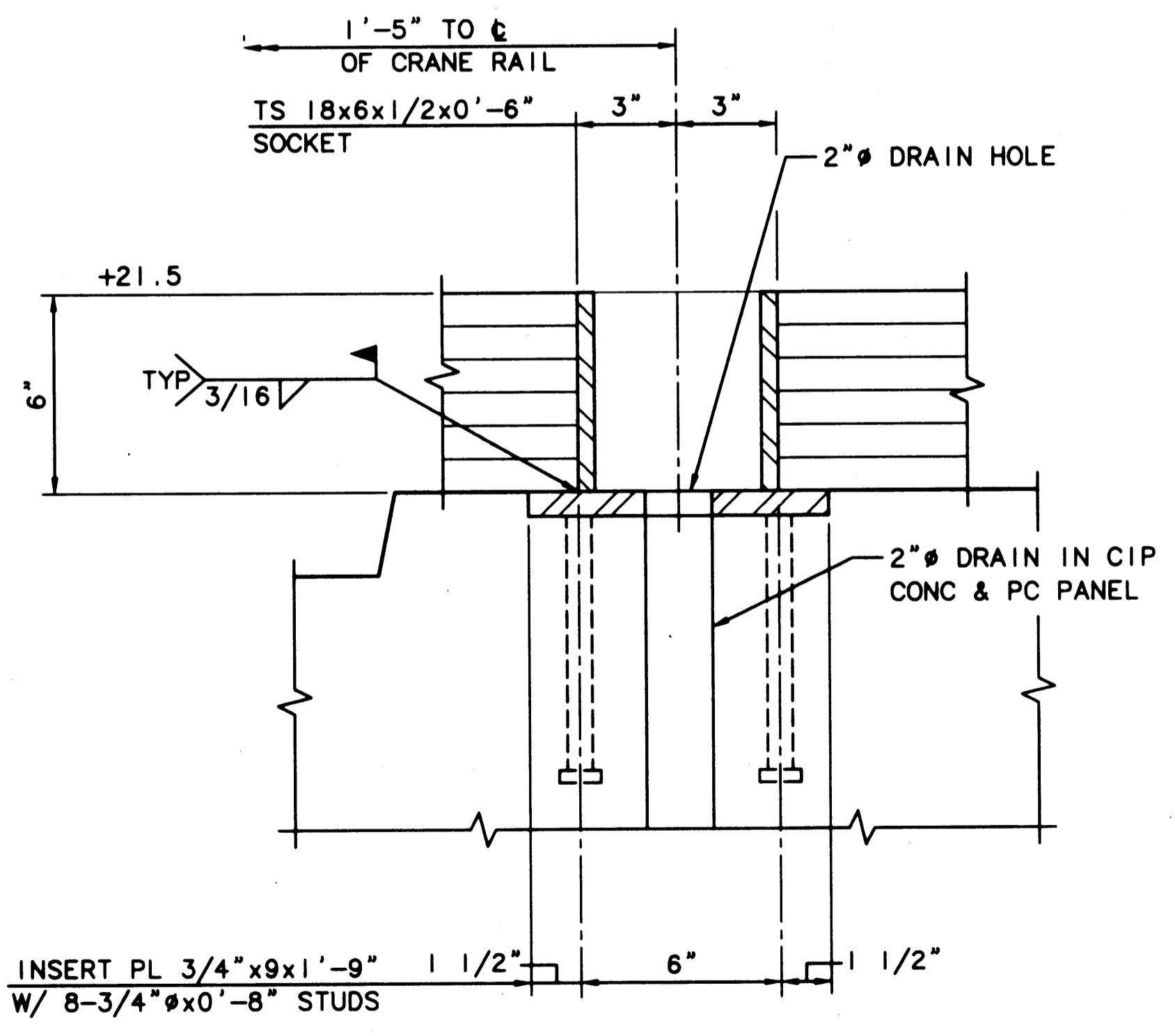
DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **47** OF **58**



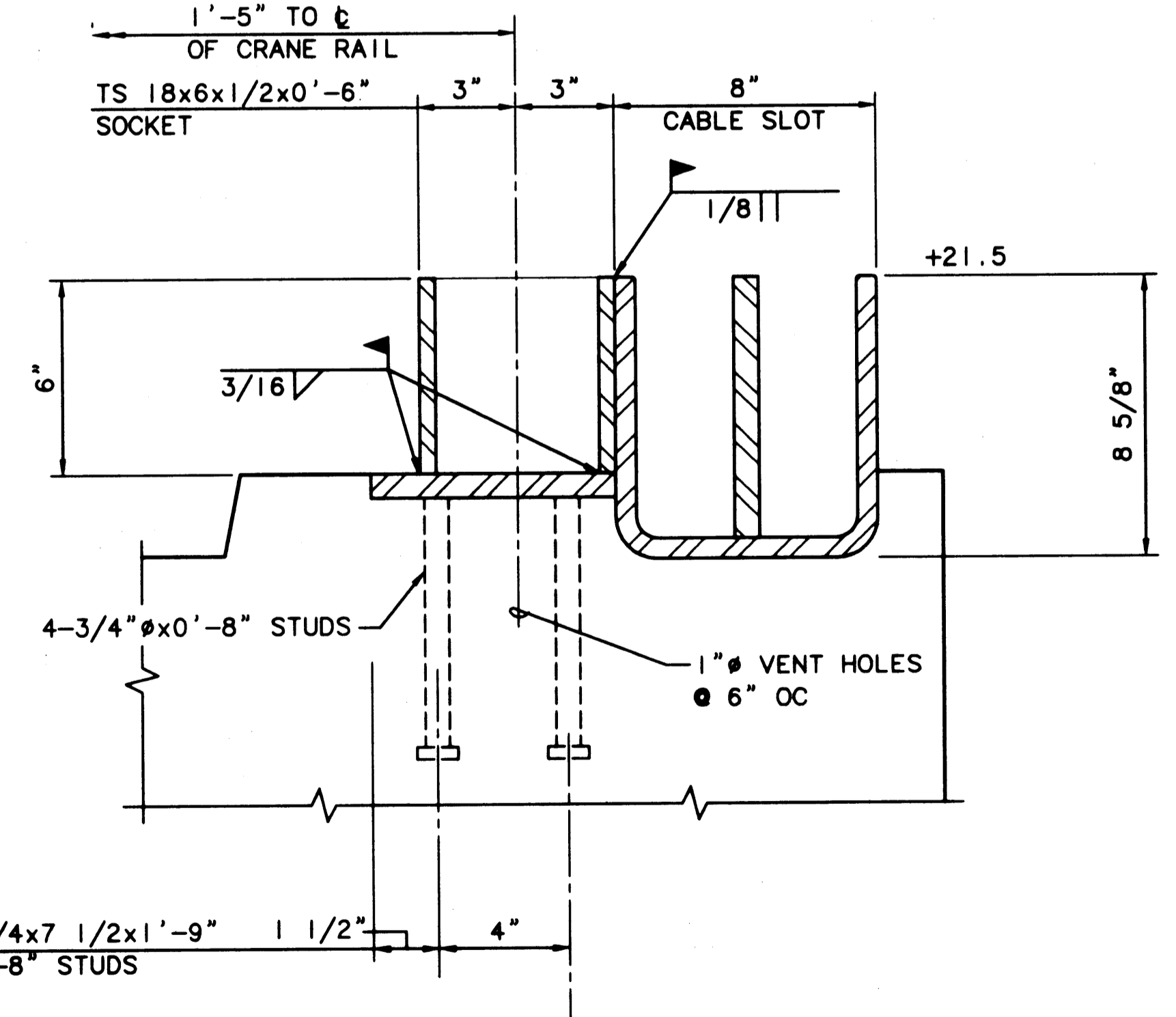
1 PLAN - PIN SOCKET @ STOWED CRANE LOCATIONS  
SCALE: 1/4"=1'-0"



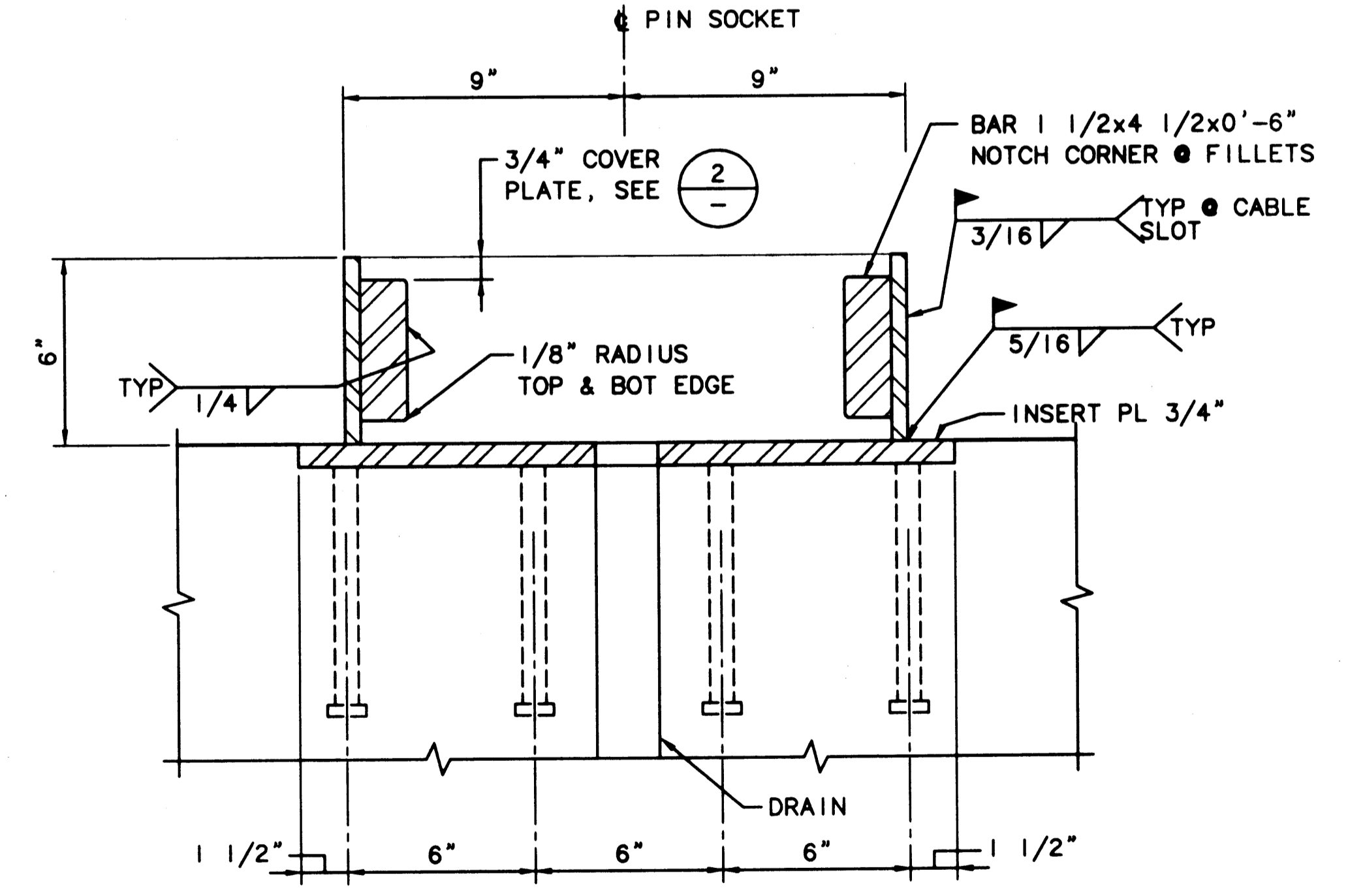
2 DETAIL - PIN SOCKET COVER  
SCALE: 3"=1'-0"



3 SECTION - PIN SOCKETS: INBOARD CRANE RAIL & LANDSIDE OF OUTBOARD CRANE RAIL  
SCALE: 3"=1'-0"



4 SECTION - PIN SOCKETS: WATERSIDE OF OUTBOARD CRANE RAIL  
SCALE: 3"=1'-0"



5 SECTION - TYPICAL PIN SOCKET  
SCALE: 3"=1'-0"

PLOTTED: Thu Jan 07 1999 2:04pm FILENAME: \\1997\497093\CAD\S-37.dwg SCALE: 48

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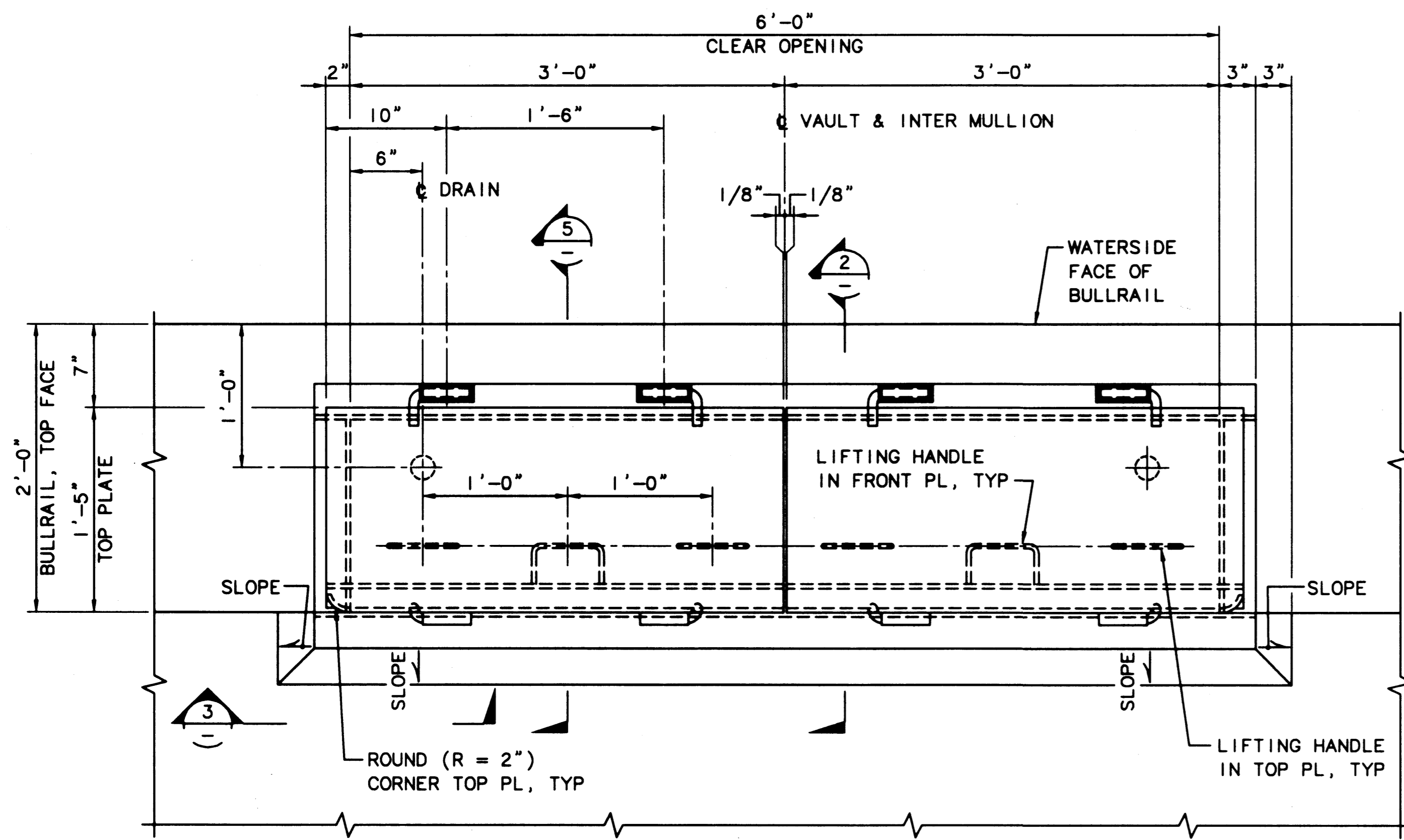
APPROVED: *[Signature]* 1/11/99  
DATE  
**CURTIS L. RATCLIFFE P.E.**  
CHIEF ENGINEER

BTH	9/91	BCM	9/91
DRAWN BY	DATE	CHECKED BY	DATE
		JAS	9/91
DESIGNED BY	DATE	PROJ ENGR	DATE

AS-BUILT	RECD	JAG	1/4/99
MARK	REVISION	BY	APP. DATE

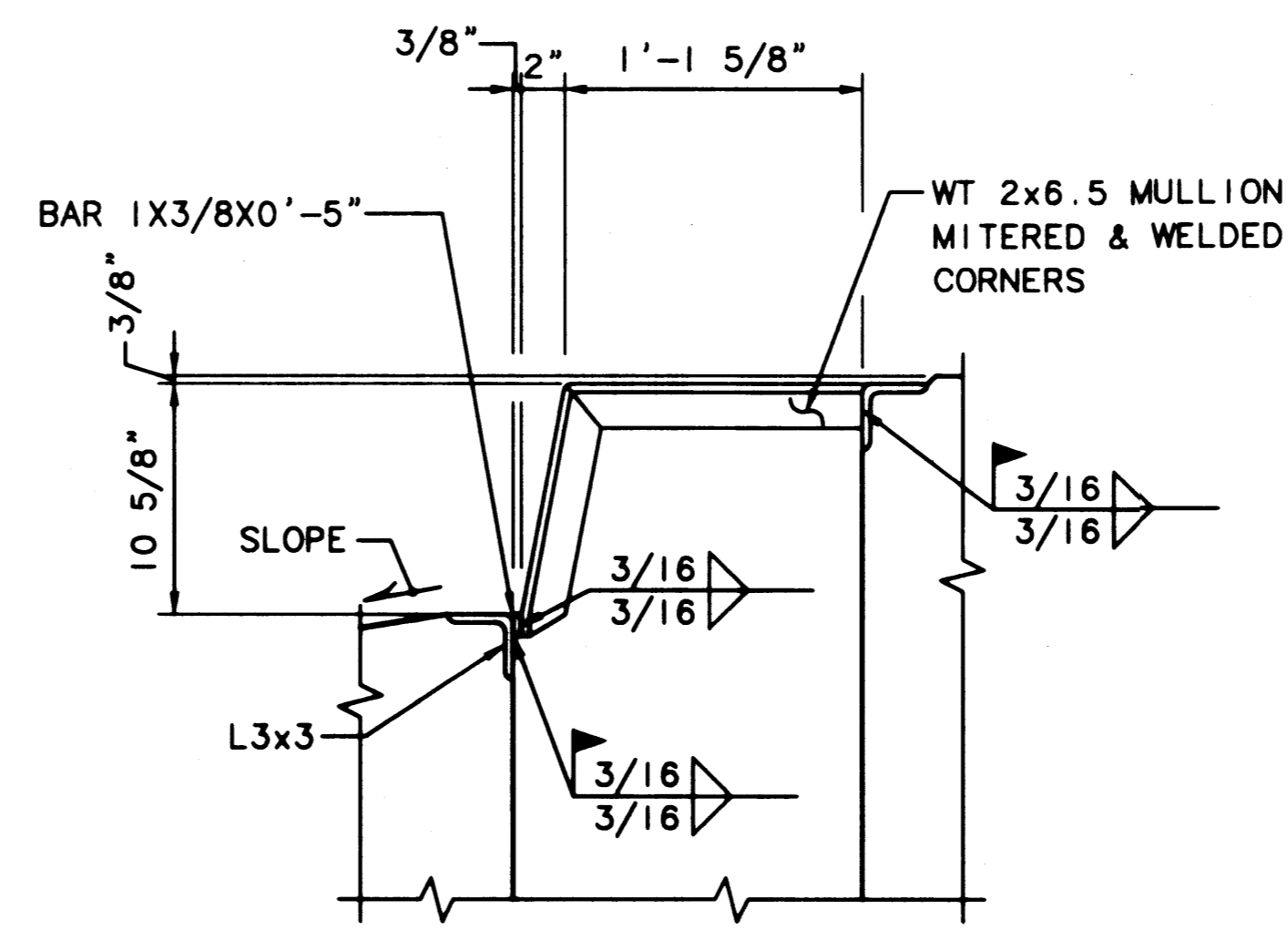
**HYUNDAI MERCHANT MARINE TERMINAL WHARF**  
**PORT OF TACOMA**  
**CRANE PIN SOCKET DETAILS**

**AS-BUILT**  
AUTOCAD FILE NO. **5012837** **S-37**  
DRAWING NO. **EP-5012-26**  
CONTRACT NO. **978038**  
SHEET NO. **48** OF **58**

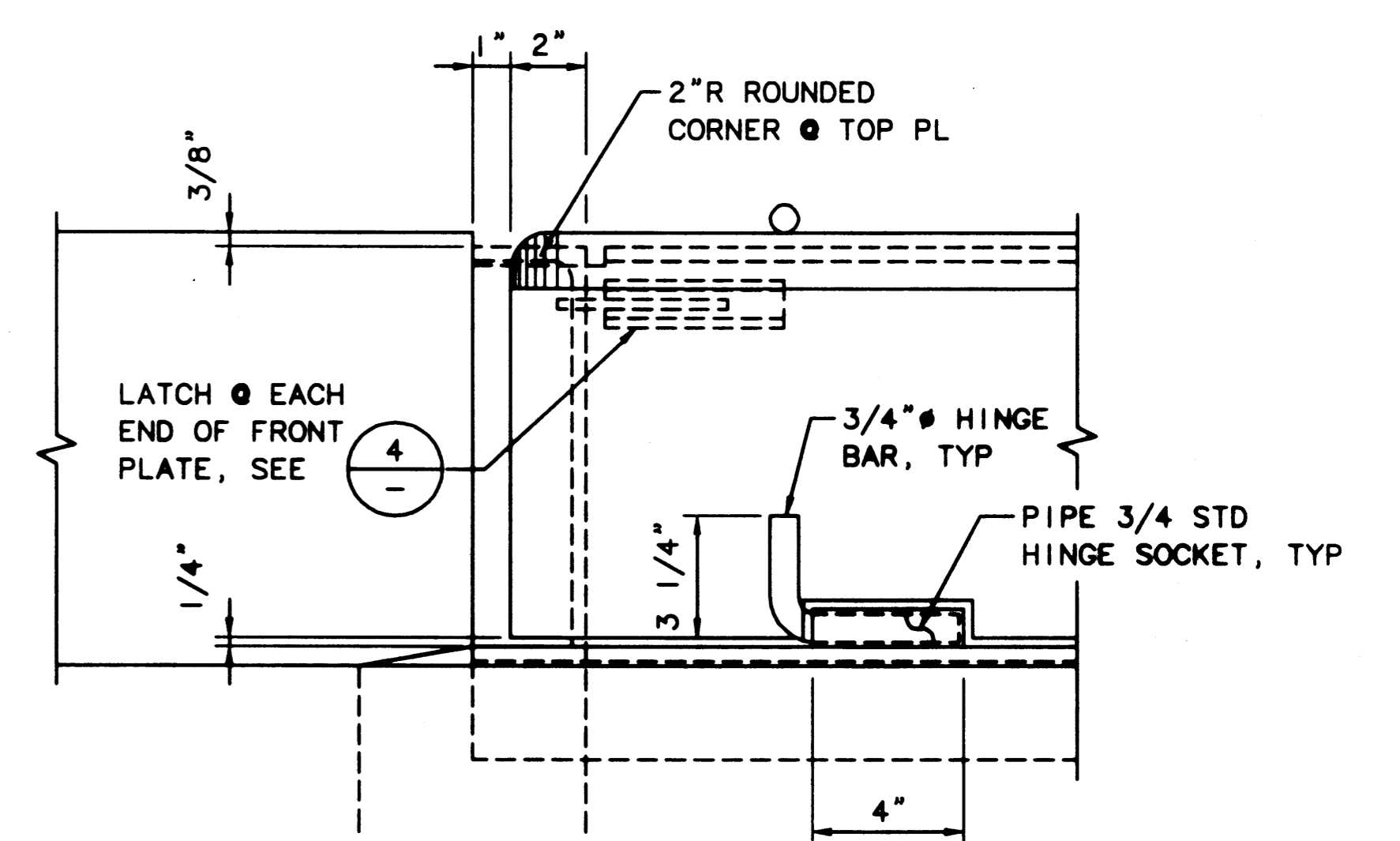


1 PLAN - UTILITY VAULT  
SCALE: 1 1/2"=1'-0"

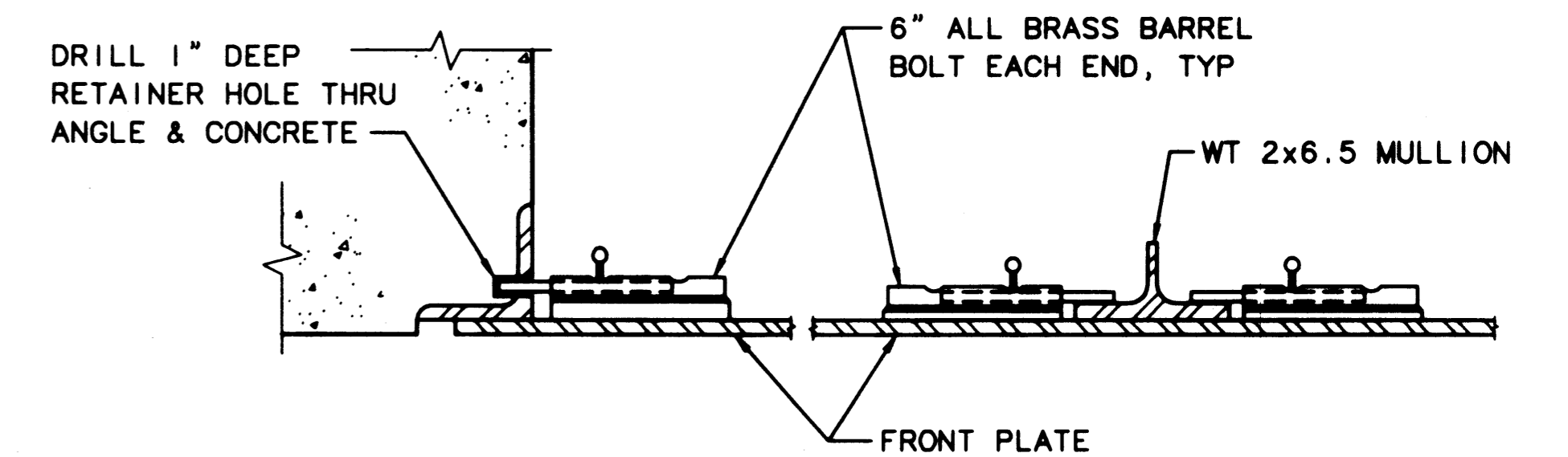
NOTE: PAINT DESIGNATOR SIGNS - "WATER" & "ELECTRICAL" ON TOP OF RESPECTIVE VAULTS. DETAIL AS SHOWN ON 1/S-36



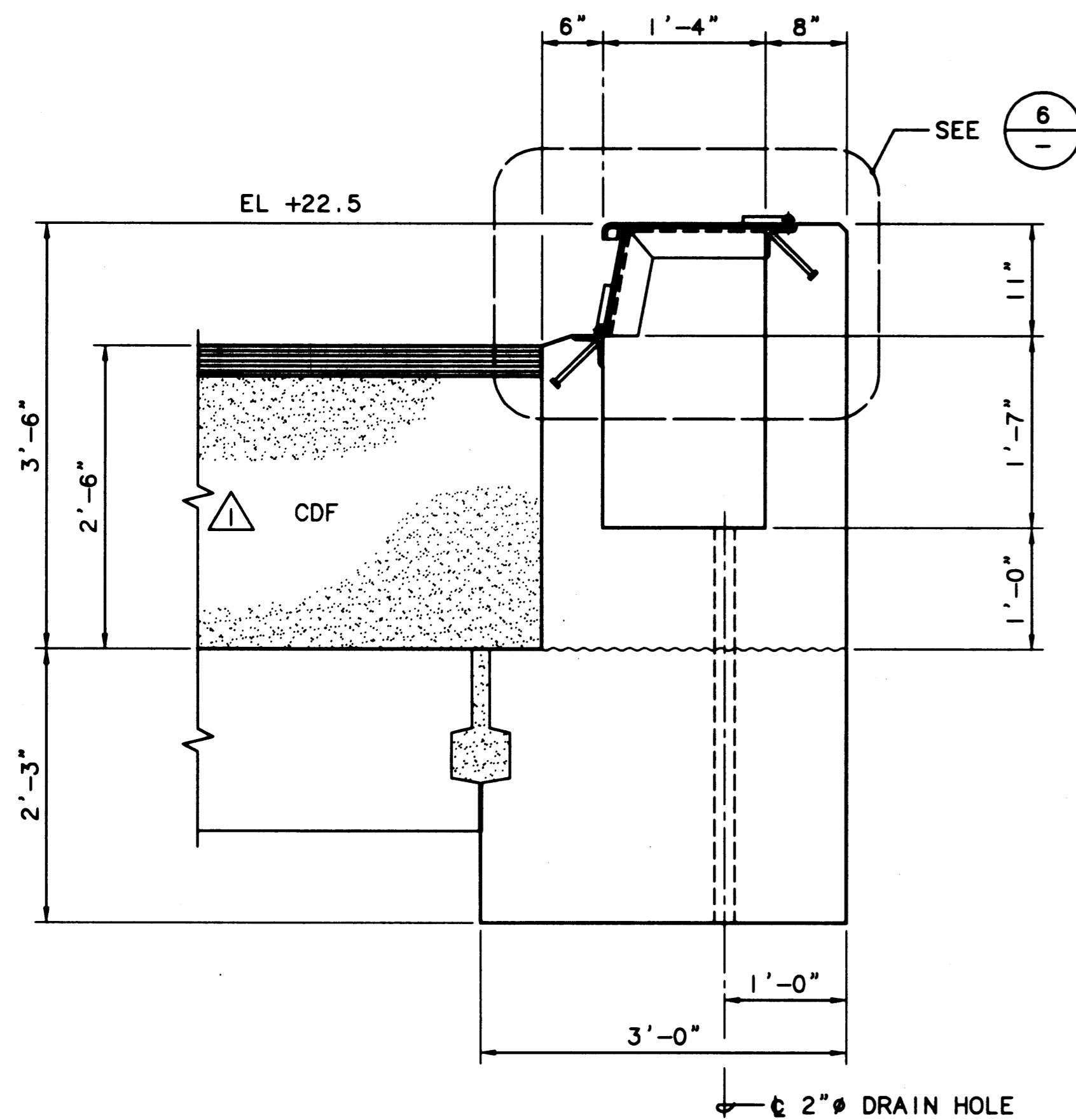
2 DETAIL - INTERMEDIATE MULLION  
SCALE: 1 1/2"=1'-0"



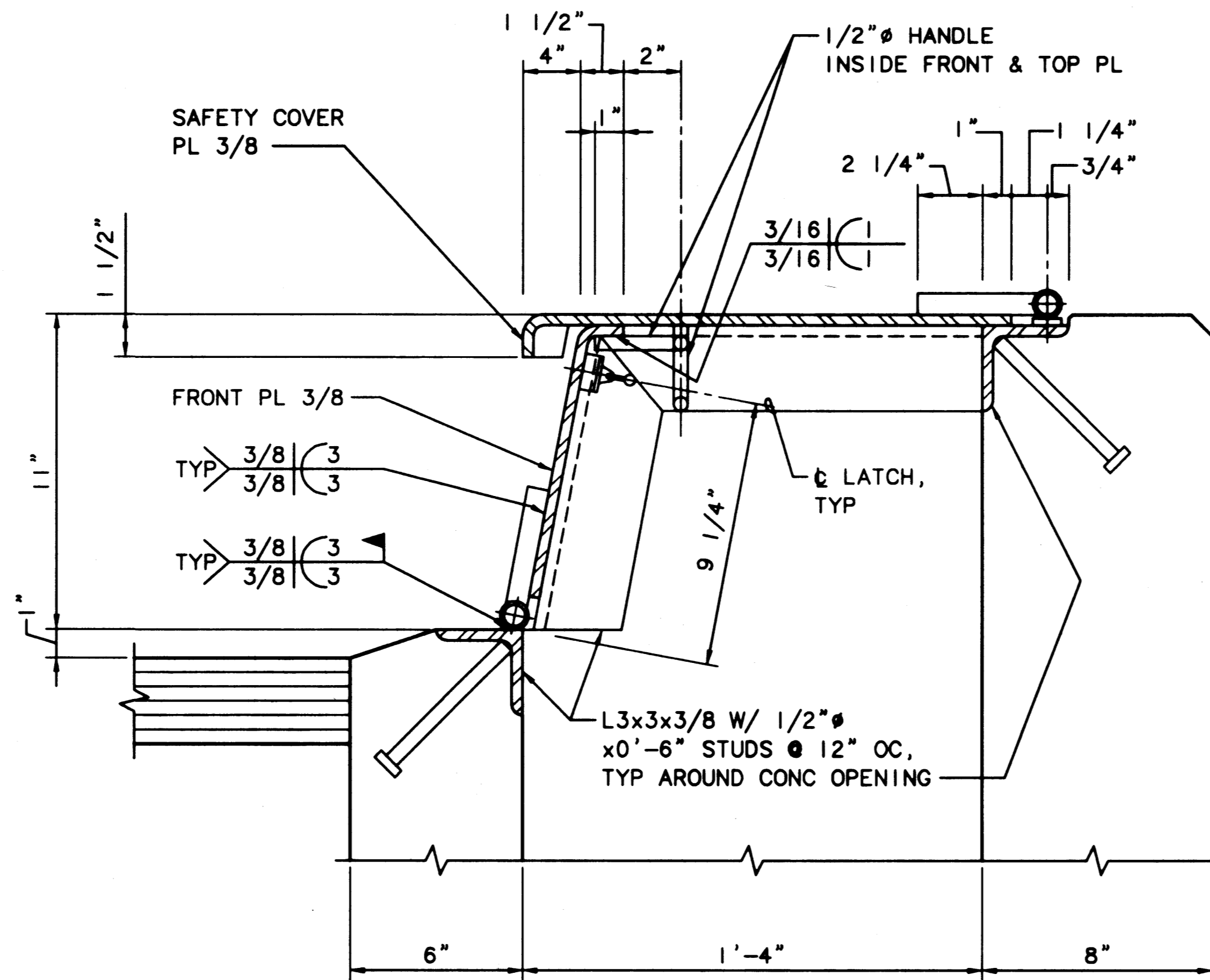
3 ELEVATION - FRONT PLATE  
SCALE: 3"=1'-0"



4 PLAN - LATCH DETAIL  
SCALE: 3"=1'-0"



5 SECTION - UTILITY VAULT  
SCALE: 1"=1'-0"



6 DETAIL - VAULT COVER  
SCALE: 3"=1'-0"

AS-BUILT

AUTOCAD FILE NO. 5012838

S-38



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APPROVED  
CURTIS L. RATCLIFFE P.E.  
CHIEF ENGINEER  
1/11/99  
DATE

BTH 9/91  
DRAWN BY DATE

BCM 9/91  
CHECKED BY DATE

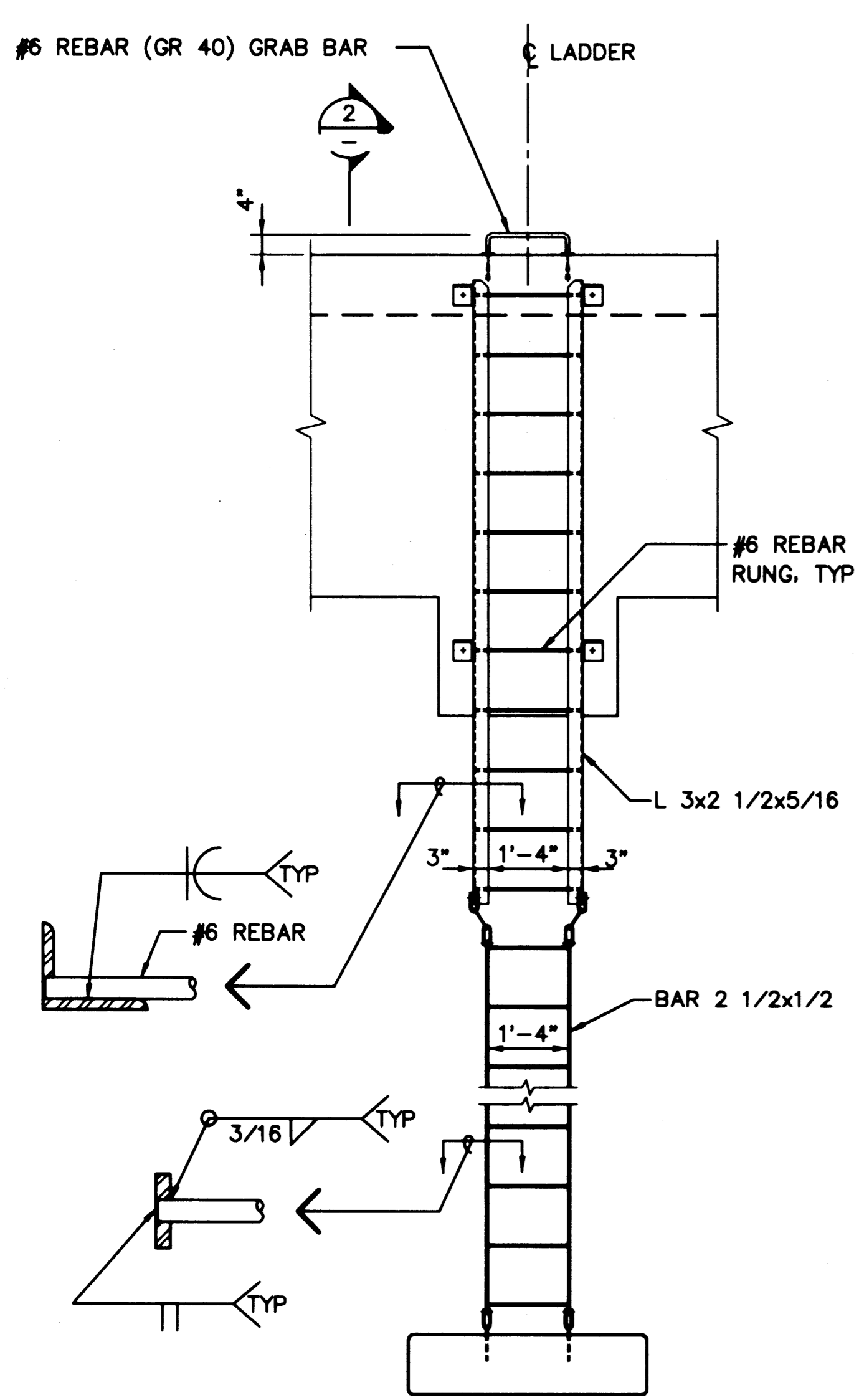
JAS 9/91  
PROJ ENGR DATE

AS-BUILT  
REVISION

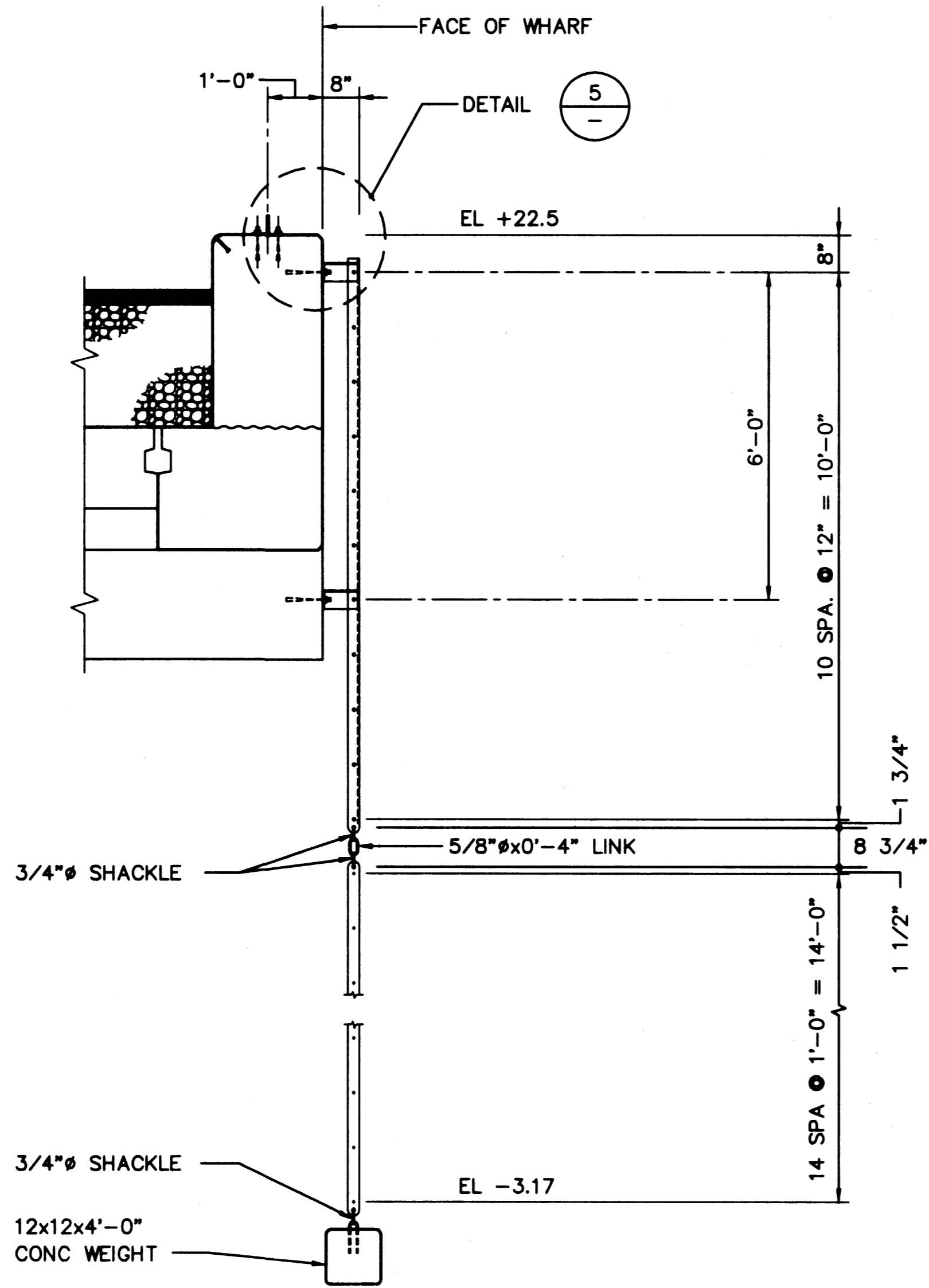
RDD JAS 1/4/99  
BY APP. DATE

HYUNDAI MERCHANT MARINE TERMINAL  
WHARF  
PORT OF TACOMA  
UTILITY VAULT DETAILS

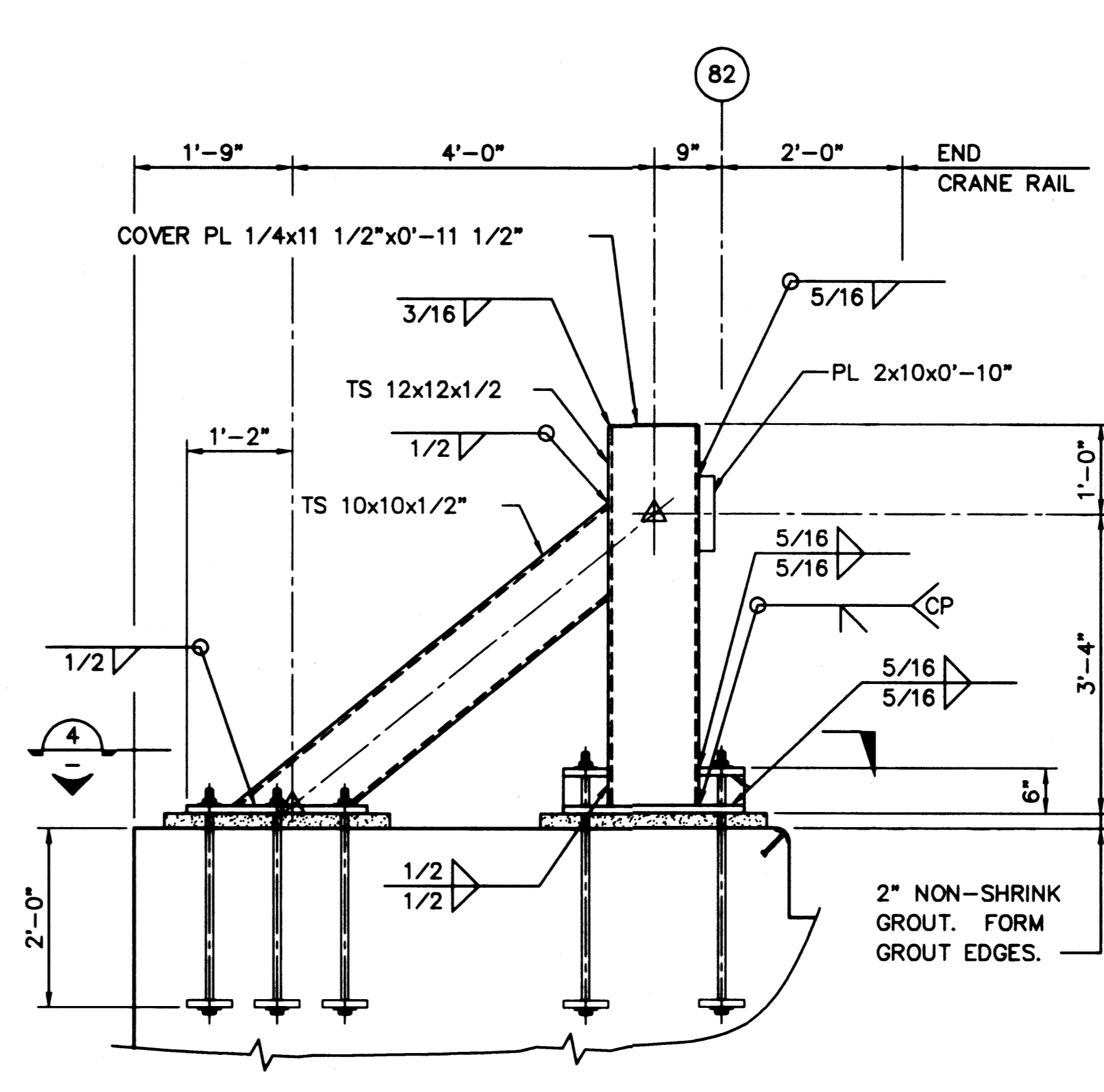
DRAWING NO. EP-5012-26  
CONTRACT NO. 978038  
SHEET NO. 49 OF 58



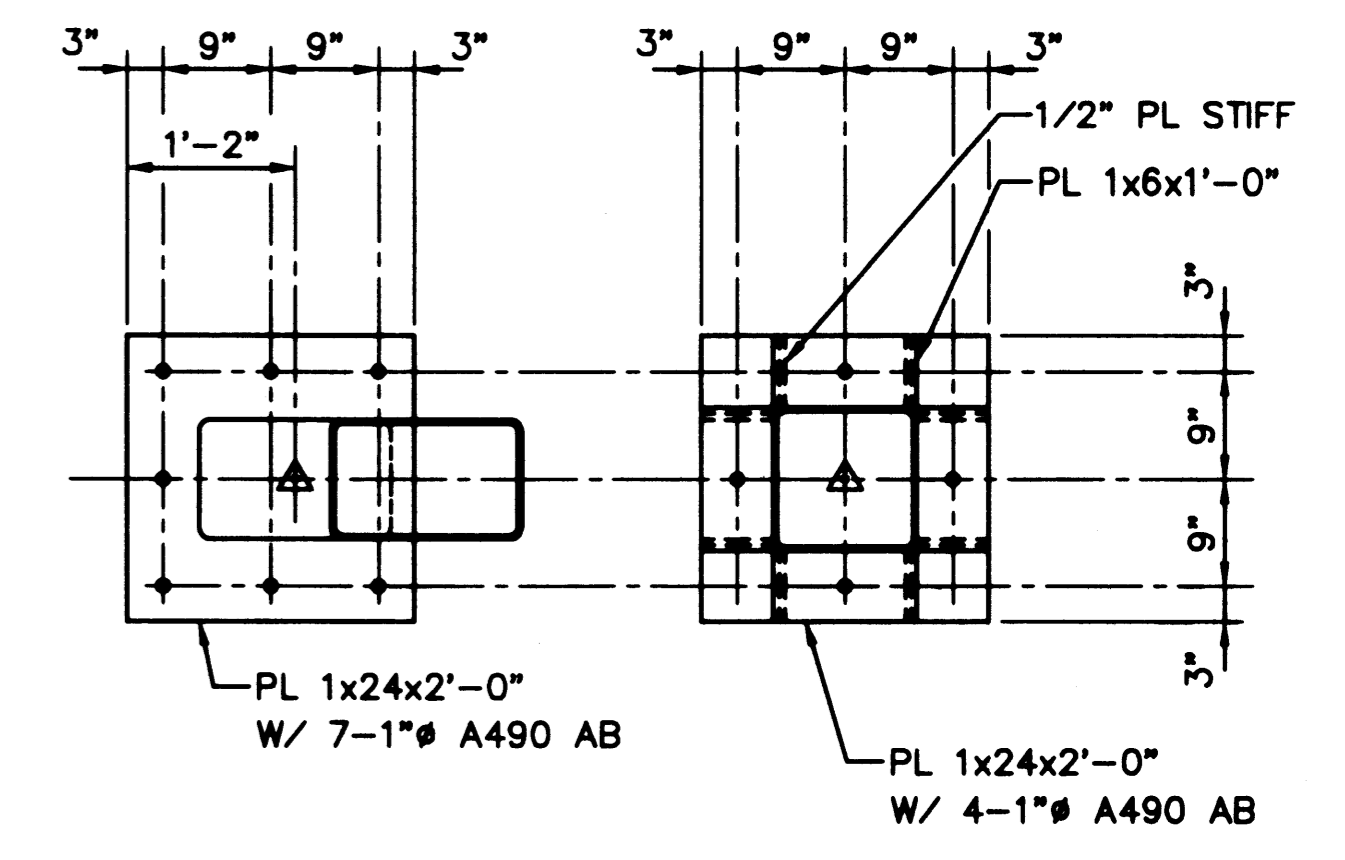
1 ELEVATION - LADDER  
SCALE: 1/2"=1'-0"



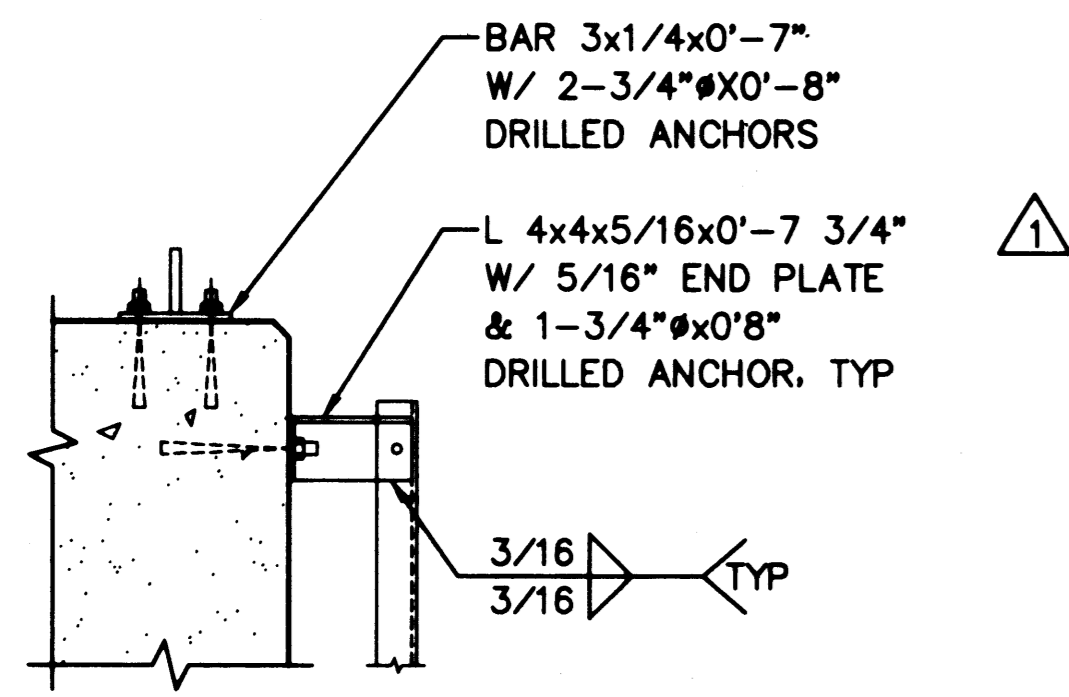
2 SECTION - LADDER  
SCALE: 1/2"=1'-0"



3 ELEVATION - CRANE STOP  
SCALE: 3/4"=1'-0"

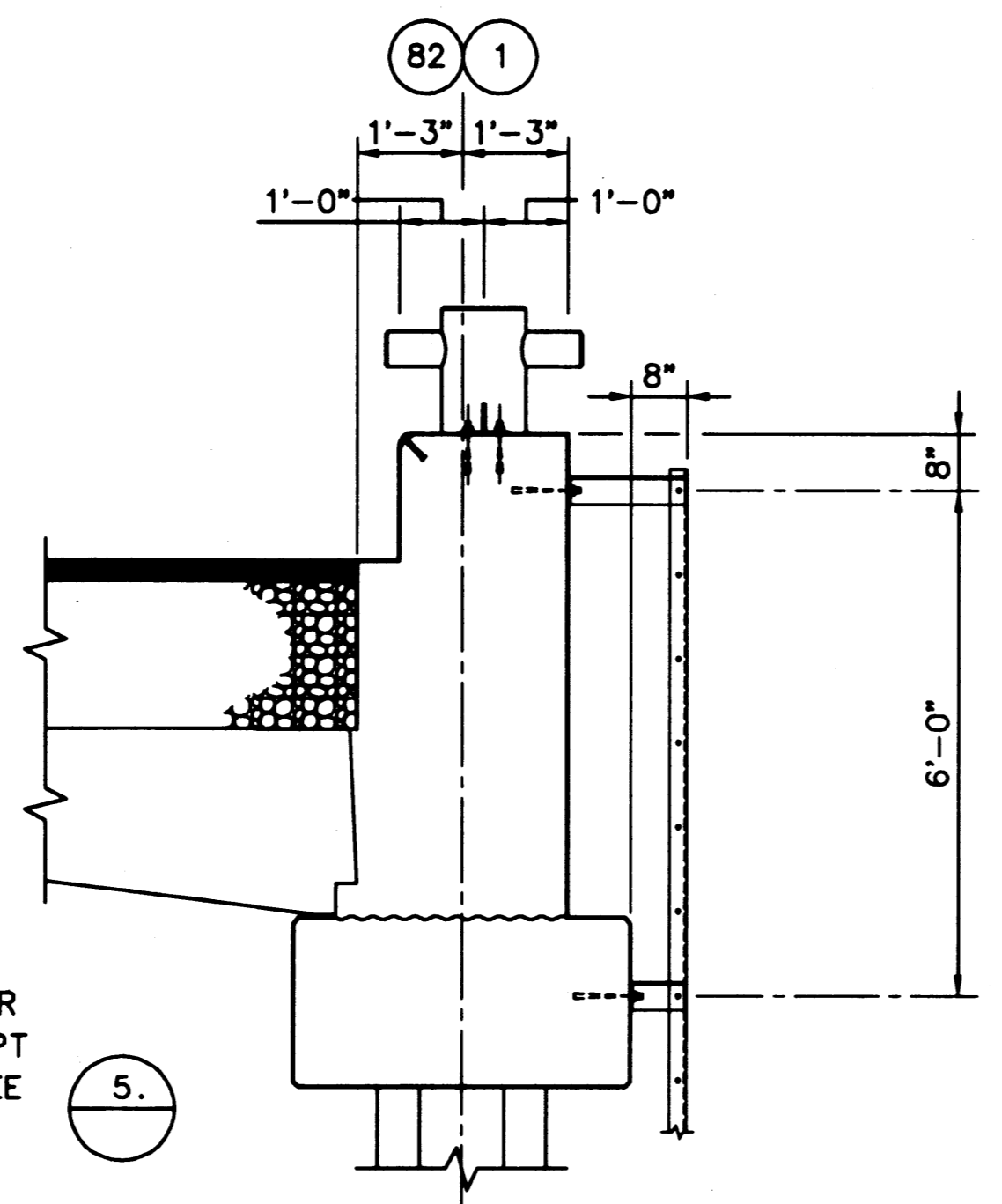


4 SECTION  
SCALE: 3/4"=1'-0"

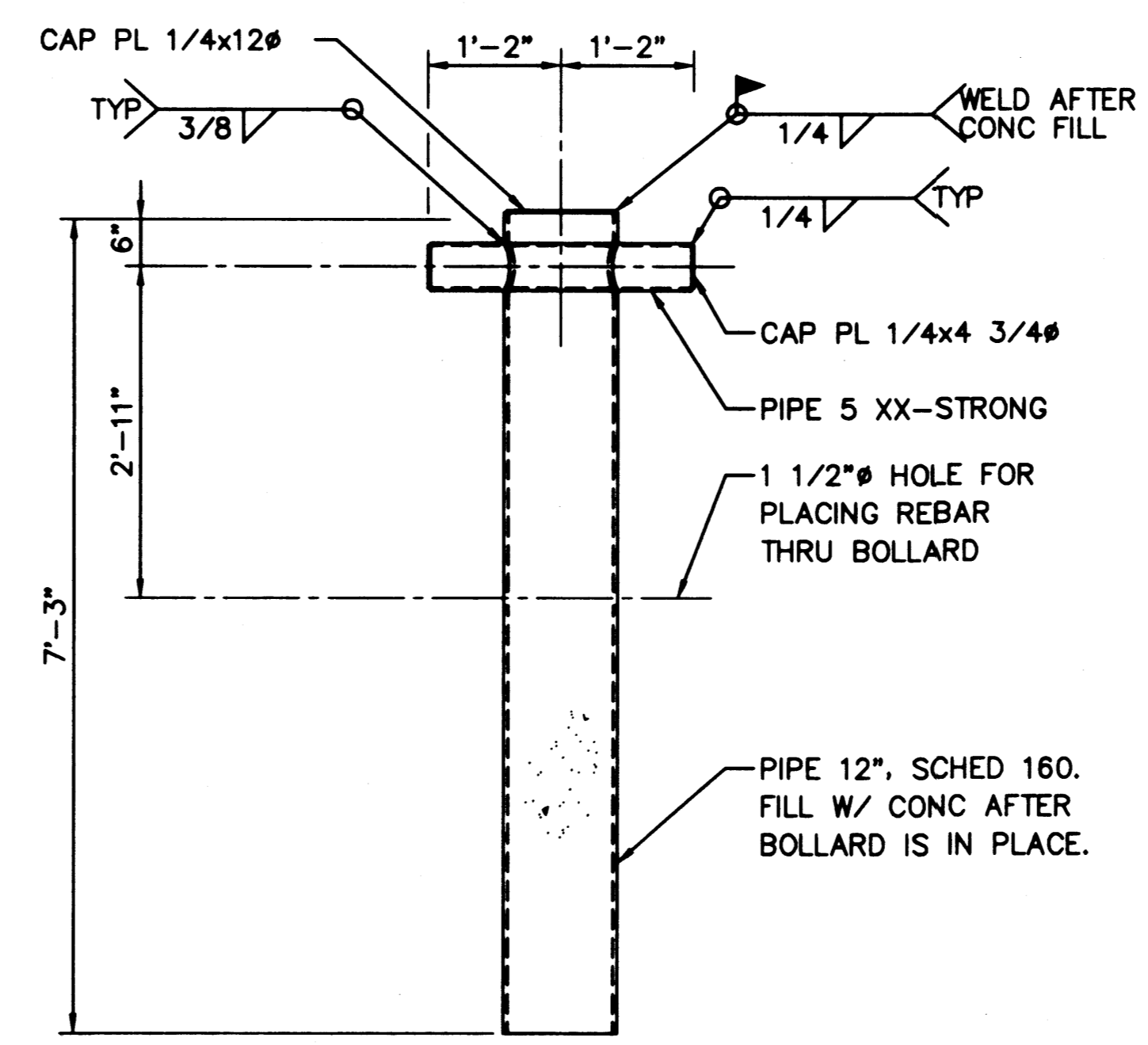


5 DETAIL  
SCALE: 1"=1'-0"

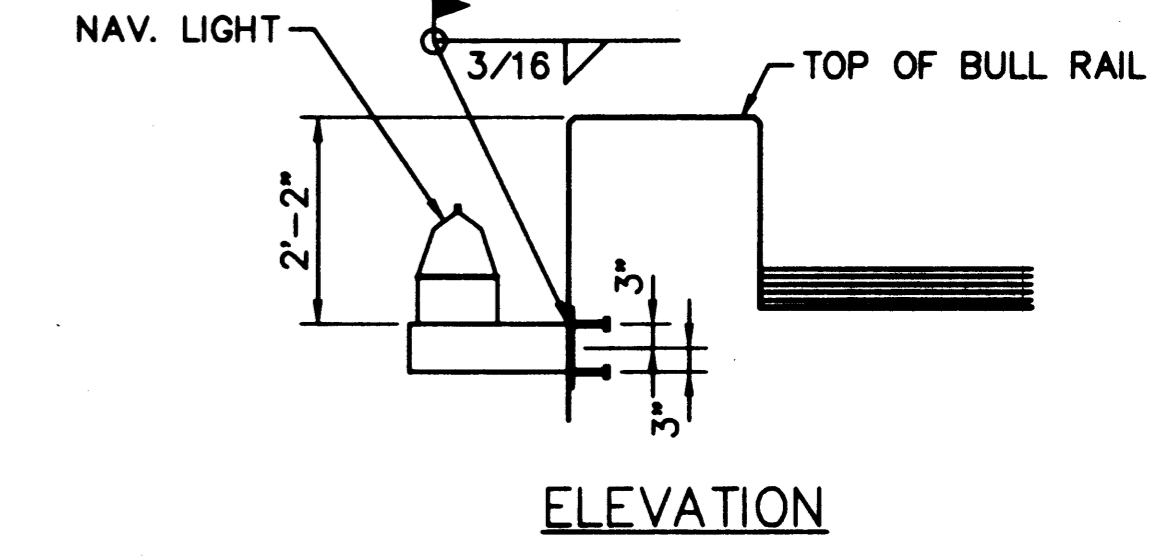
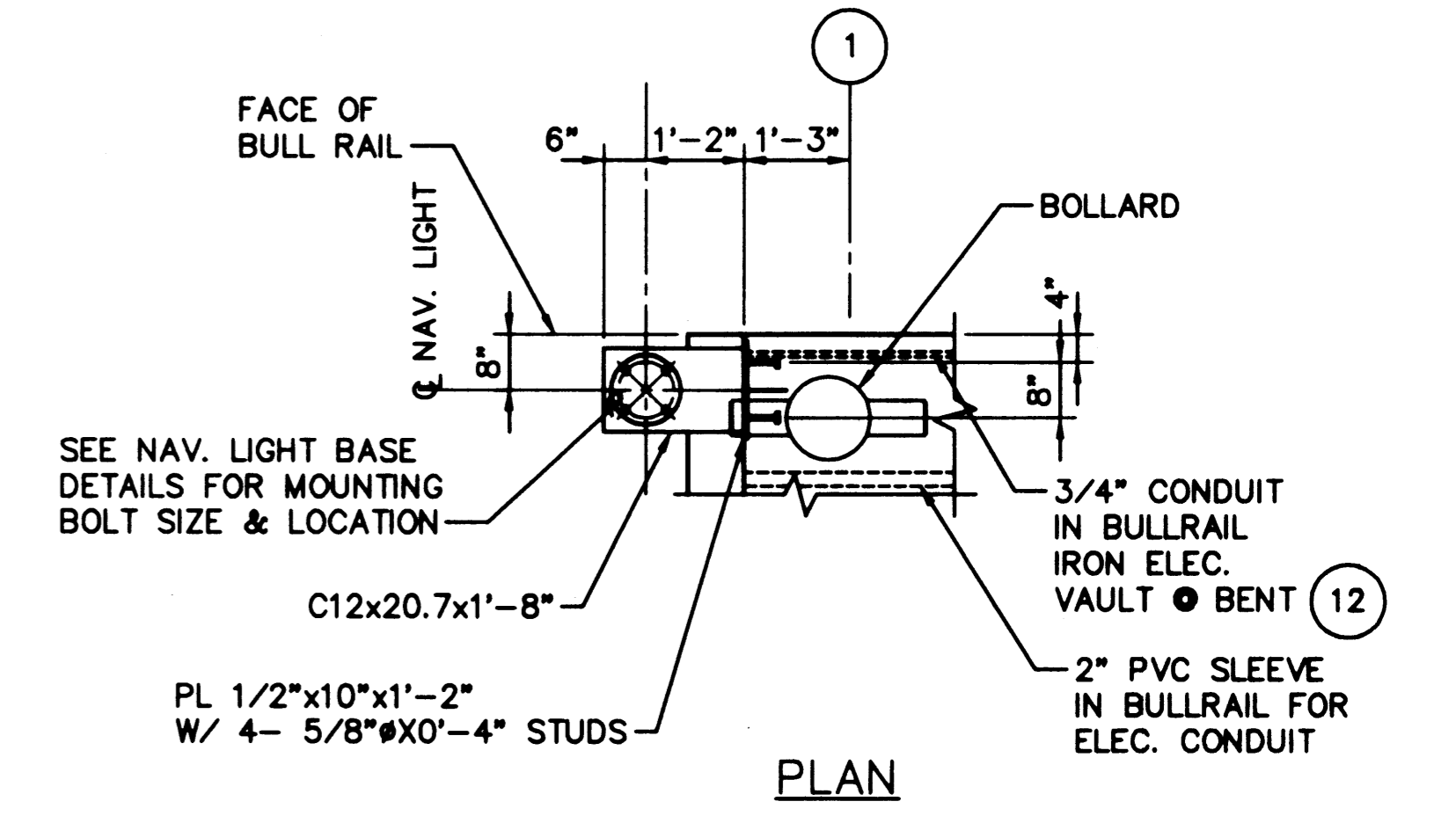
NOTE: FOR ALL OTHER DETAILS EXCEPT AS SHOWN, SEE 5.



6 SECTION - LADDER @ BENTS 1 & 82  
SCALE: 1/2"=1'-0"



7 DETAIL - PERMANENT BOLLARD  
SCALE: 3/4"=1'-0"



8 DETAIL - NAVIGATION LIGHT  
SCALE: 3/4"=1'-0"