SHIPREPAIR YARD

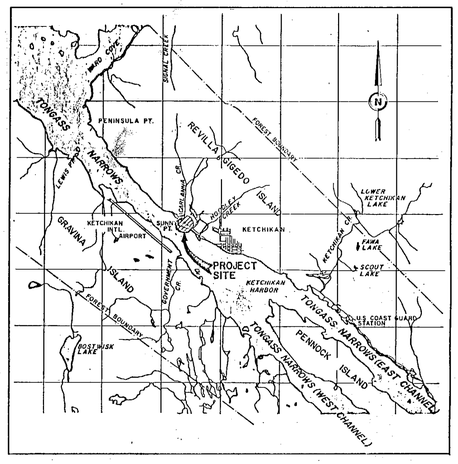
KETCHIKAN ~~VESSEL MAINTENANCE FACILITY~~

PIER

NORTH ~~WHARF~~

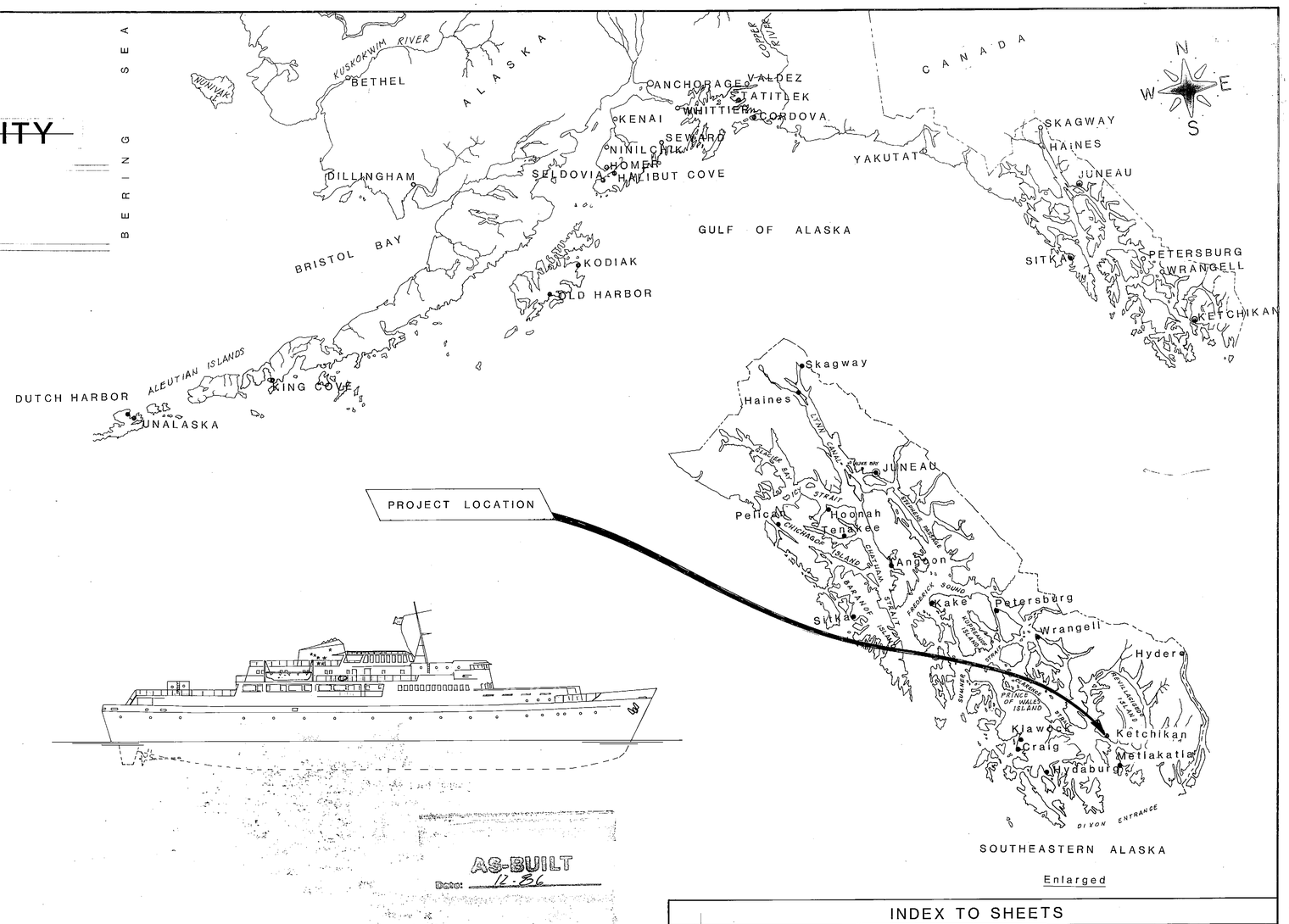
PROJECT NO. X70025 ~~X 70010~~

AS-BUILT
DECEMBER 1986



VICINITY MAP

0 4 8 16 MILES



PROJECT LOCATION

AS-BUILT
Date: 12-86

INDEX TO SHEETS

STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION & PUBLIC FACILITIES

MARINE FACILITIES

APPROVED

FOR HRM
DIRECTOR

Recommend For Approval Group Design Chief

Sheet 1 of 24

ESTIMATE OF QUANTITIES

Item No.	Item	Pay Unit	Est. Quan.	Unit	Total	
201(1)	Removal of Test Pile	L.S.	All Reqd	L.S.	All Reqd.	
" (2)	Relocate and Lengthen Waterline	L.S.	"	L.S.	"	
" (3)	Relocate Fuel Dock	L.S.	"	L.S.	"	
" (4)	Relocate CP System Components	L.S.	"	L.S.	"	
" (5)	Removal of Portion of Existing Wharf	L.S.	"	L.S.	"	
202	Excavation	L.S.	15,000	C.Y.	~~15,000~~	10,000± (APPROX.)
301(1)	24" x ½" Wall Steel Pipe Piles, Furnished ⑥	L.F.	9902	L.F.	~~9902~~	7315
" (2)	30" x 3/8" " " " " " ⑫	L.F.	9341	L.F.	~~9341~~	4348 S
" (3)	42" x ½" " " " " "	L.F.	2116	L.F.	~~2116~~	1050 S
" (4)	24" x ½" " " " " , Driven ①	Ea.	53	Ea.	53	
" (5)	30" x 3/8" " " " " , " ②	Ea.	48	Ea.	48	
" (6)	42" x ½" " " " " , "	Ea.	10	Ea.	10	
" (7)	24" x ½" Wall Pipe Transfer Bridge Piles ③	L.S.	All Reqd.	L.S.	All Reqd	
" (8)	Timber Piles, Furnished	L.F.	11,400	L.F.	~~11,400~~	11,477 ±
" (9)	Timber Piles, Driven	Ea.	138	Ea.	138	
302(1)	Pier End Dolphin and Fender System	L.S.	All Reqd	L.S.	All Reqd	
" (2)	Drydock Dolphins	L.S.	"	L.S.	"	
" (3)	Utility Tunnel	L.S.	"	L.S.	"	
" (4)	Wharf Fender System and Hawse Rail	L.S.	"	L.S.	"	
~~302(5)~~	~~Steel Superstructure (Alternate "B")~~	L.S.	"	L.S.	"	NOT USED
304(1)	Wharf Pier Caps and Weldments	L.S.	All Reqd	L.S.	All Reqd	
(2)	Utility Channel	L.S.	"	L.S.	"	
(3)	Transfer Bridge Abut., Apron and Pier Cap ④	L.S.	"	L.S.	"	
305	Double Tees (Alternate "A")	L.S.	All Reqd	L.S.	All Reqd	
~~306~~	~~Glu-Lam Deck (Alternate "B")~~	"	"	"	"	NOT USED △
109	DBE / WBE Adjustment	C.S.	"	C.S.	-0-	

① Includes sand fill* and approx. 196 C.Y. of Class A-A concrete fill
② Includes " " * " 602 634 C.Y. " " " " " " , also includes exc. of piles within cells.
③ See Tech. Spec's. Section 301. Contractor to furnish and drive, 8 piles of 200 ft. max. length each
④ See Tech. Spec's. Section 304. Contractor to cast 50 C.Y. max class A-A concrete, includes reinforcement sheet pile arc removal, excavation and backfill.
* Sand fill to come from excavation ie; no screening or crushing reqd.

Location / Orientation	Dia. (in.)	Capacity (tons) Bearing	Capacity (tons) Uplift	Tip Elevations Min.	Tip Elevations Est.	Cutoff Elev.	
Dolphin / Vertical	24	100	67	-67	-175	+29.00	⑦ ①
" / Batter	24	50	50	-67	-175	+30.00	⑦ ①
" / Fender	24	—	—	-52	-52	+29.00	⑦ ①
Dry dock Dolphin / Vert.	42	100	100	-67	-175	+18.00	②
/ Batter	42	220	50	-67	-175	+18.00	②
Wharf / Vertical (Rear)	30	120	—	-67	-175	+19.60	③
" / " (Center)	30	160	—	-67	-175	+19.60	③
" / " (Front)	24	120	120	-67	-175	+12.50	① ④
" / Batter (")	24	100	80	-67	-175	+18.93	②
Wharf Fender / Vertical	⑤	—	—	-55	-55	⑥	

① Drive closed ended NOTE: ALL CLOSED ENDED PILES CLOSED WITH 3/4" PLATE
② Drive open ended w/ APF 0-14001 reinforcement on tips
③ Drive closed ended and sand fill to elev. -57, reinforced concrete fill above elev. -57. Except piles within sheet pile cells, drive open ended and clean out to elev. -10 and reinforced concrete fill.
④ Sandfill to elev. -57, reinforced concrete fill above elev. -57.
⑤ 18" ø min. butt.
⑥ El. +30.00 or El. +25.00, See Sheets 4 and 8
⑦ DRIVE OPEN ENDED WITH REINFORCED TIPS PER PLAN SHEET 14 DETAIL

GENERAL NOTES

Specifications:

Construction: Per Contract Documents for KVMF North Wharf, Project No. X70010.

Design: Wharf and Dolphin Fender Systems per Marine Facilities Design Standards.

Drydock Dolphins per Project No. X70024 Drwg. No. S 2120-3. Mooring spud design loads.

Transfer Bridge Abutment and Pier per Marine Facilities Design Standards.

Design Loads:

Wharf: DL + 600 psf LL or + Design Vehicle
Design Vehicle moving: Max GVW = 250,000#, Max. load on Tridem = 220,000#, min. axle spacing = 4' - 6", max. tire pressure = 75 psi.
Design Vehicle Lifting: Outriggers within 2 ft. either side of centerline of pier caps on 3 ft. square dunnage pad = 170,000# maximum, Max. Live Load per one pier cap = 220,000#. Berthing energy from Fender System Bollard - 50 kip Line Load.

Utility Channel Section: DL Util. + 60 psf or walkway.
Utility Ped. Walkway (Planks): 60 psf

Wharf Fender System: 20 ft. - kips Service
40 ft. - kips Overload

Pier End Dolphin and Fender System:
30 ft. - kips Service
70 ft. - kips Overload

Drydock Dolphins: Per Project No. X70024 Drwg. No. S 2120-3, Crandall Drydock Engineers Mooring Loads.

Transfer Bridge Abutment and Pier: DL (per Drydock manufacturers supplied structure) LL - AASHTO HS-20 (Max. DL or DL + LL for Pier and Abutment = 400 Tons) (See Tech. Spec's Section 301 and 304).

Design Unit Stresses:

Steel: A36 F_s = 20 Ksi
A252 Gr. 2 F_s = 19.25 Ksi
A500 Gr. B F_s = 25 Ksi
A572 F_s = 27 Ksi

Concrete:

Class A-A f'c @ 28 days = 5.0 Ksi
Prestressed f'c @ 28 days = 6.0 Ksi

Reinforcing Steel: F_y = 60 Ksi
Glu-Lam Timber: Comb 2 Web Use F_b = 1.4 Ksi
Sawn Timber: Wet Use F_b = 0.8 Ksi
Ekki Timber: F_b = 3.6 Ksi
F_u = 0.3 Ksi

Materials:

Steel: Tube Sections A500 Gr. B
Pile A252 Gr. 2, A501 or A53, br. B, type E or S
Pipe A53, Gr. B, type E or S
All other shall be A36 or A572 as noted.

Concrete: Class A-A except prestressed concrete per Tech. Spec. Section 305.
Reinforcing Steel: A615 Gr. 60
Timber: Glu-Lam: Douglas Fir/Larch Comb 2 Wet Adhesives
Sawn: No. 1 Douglas Fir/Larch
Fender Faces on Pier End Dolphin: Ekki

Protective Coatings/Treatments:

Pipe Piles and Structural steel and Hardware:
Galvanize after fabrication.
Pier End Fender Timbers: Untreated Ekki
Wharf Fender Timbers: Creo. 12 PCF retention
Wharf Fender Piles: Creo. 17 PCF retention
Utility Ped. Timbers: Penta (in light oil) 0.6 pcf retention.
Glu-Lam Decking: Penta (in light oil) 0.6 pcf retention
Reinforcing Steel: Galvanize after fabrication or epoxy coated.
Hardware: Galvanize unless otherwise noted.

Piling:

Size: 24" Ø x 1/2" Wall Steel Pipe and
30" Ø x 3/8" Wall Steel Pipe and
42" Ø x 1/2" Wall Steel Pipe and
18" min. Ø butt timber piles.

For Filling and Excavation and Filling, Driving Requirements, tip reinforcement and Elevations, See Pile Table this sheet.

Contractor note that during driving piles inside existing cells, movement of the cells can be expected.

½" typ.
1" typ to lettering
¼" wide border

LOAD LIMITS
NORTH WHARF

Moving Vehicle: Max. triple tandem axle load = 220,000 lbs
Max. GVW = 250,000 lbs
Min. tandem axle spacing = 4'6"
Max. Tire press. @ Max. load = 75psi
Lifting Vehicle: Min. dunnage pad 3 ft. square
Max. outrigger load = 170,000 lbs.
Max. Live load on one pier cap = 220,000 lbs.
Centerline of outriggers and dunnage to be within 2 ft. of centerline pier cap.
Uniform Load: In lieu of Design Vehicles above Wharf may be loaded uniformly to 600 psf, except Walkway planks max. load of 60 psf.

Loads or positions of loads not within above parameters will require approval, prior to use of Wharf by Alaska Marine Highway System at (907) - 465 - 2740.

Contractor shall provide and install above signage. Engraved Laminate Red foreground, White 80 PT letters. Provide 6 each signs bonded to 10 ga. Stainless Steel sheet metal plates same size as sign. Bolt signs @ 80' centers to Wharf deck next to Utility Walkway.
Drill-in bolts acceptable if Alt. "A" awarded. 3/8" Ø x 4" min.
Lag bolts acceptable if Alt. "B" awarded. 3/8" Ø x 4" min.

AS-BUILT
Date: 12-2-86

△ Rev. 11-26-85

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49TH
James A. Lowell
#CE-5597
PROFESSIONAL ENGINEER
11/25/85

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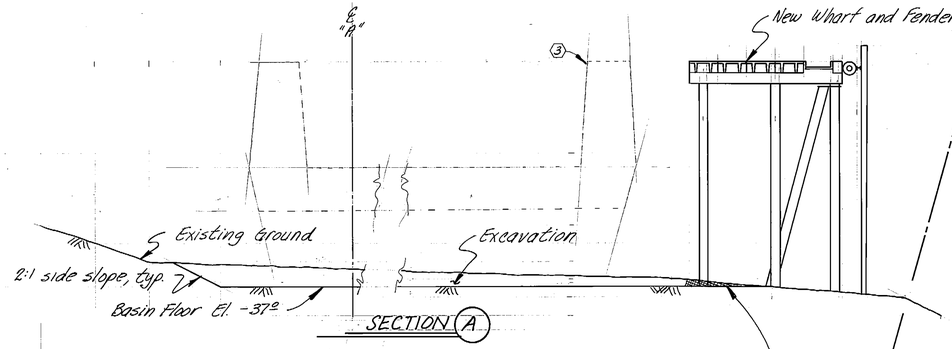
Ketchikan Alaska

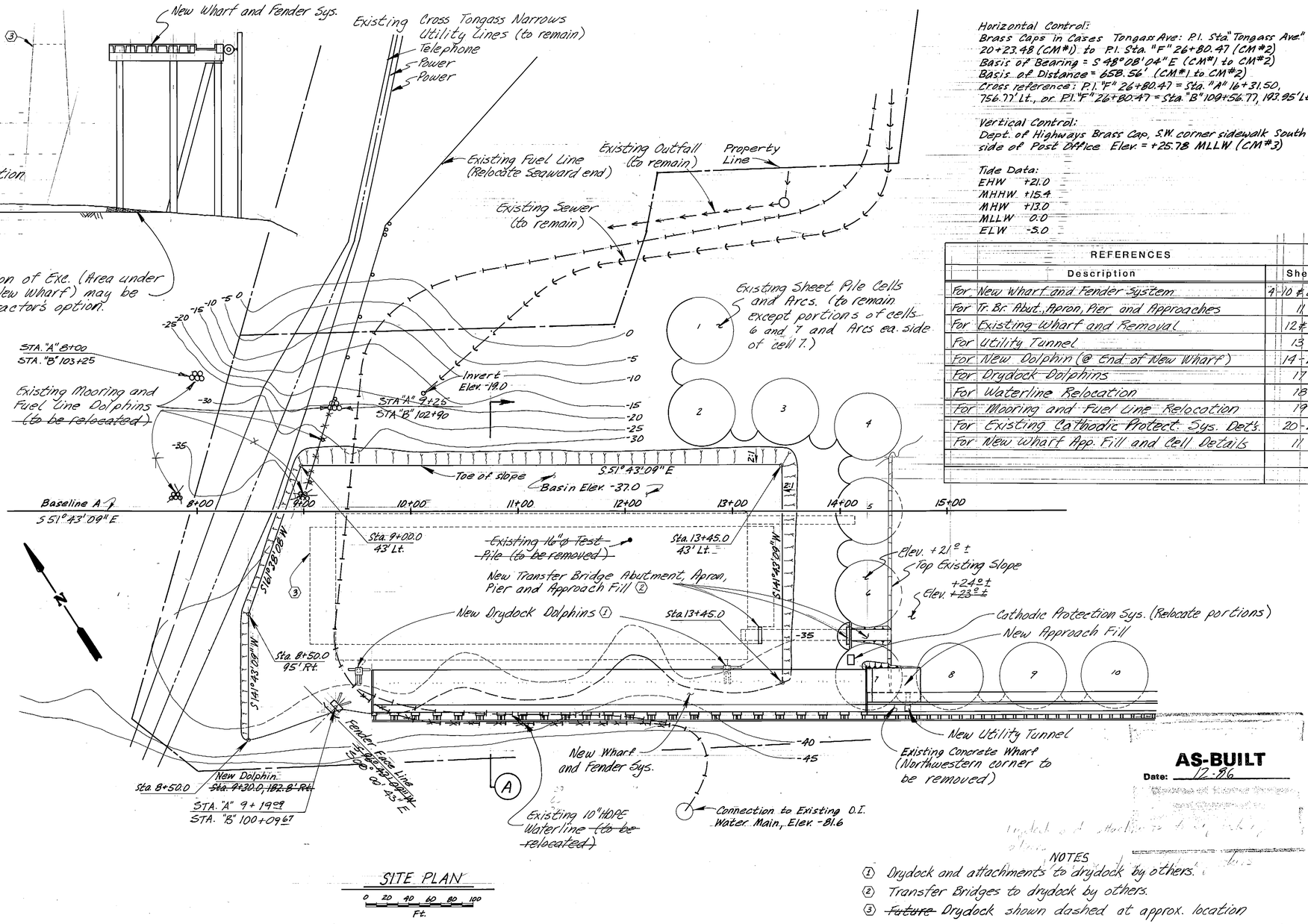
QUANTITIES
AND GENERAL NOTES

DESIGNED	CHECKED	DRAWN	DATE
JS	BAS	JS	11-85

PROJECT NUMBER X70010 SHEET 2 OF 24



Note: Shaded Portion of Exc. (Area under Plan outline of New Wharf) may be omitted at Contractor's option.



Horizontal Control:
Brass Caps in Cases Tongass Ave: P.I. Sta "Tongass Ave." 20+23.48 (CM#1) to P.I. Sta. "F" 26+80.47 (CM#2)
Basis of Bearing = S 48°08'04" E (CM#1 to CM#2)
Basis of Distance = 658.56' (CM#1 to CM#2)
Cross reference: P.I. "F" 26+80.47 = Sta. "A" 16+31.50, 756.77' Lt., or P.I. "F" 26+80.47 = Sta. "B" 109+56.77, 193.95' Lt.

Vertical Control:
Dept. of Highways Brass Cap, S.W. corner sidewalk South side of Post Office Elev. = +25.78 MLLW (CM#3)

Tide Data:
EHW +21.0
MHHW +15.4
MHW +13.0
MLLW 0.0
ELW -5.0

REFERENCES

Description	Sheets
For New Wharf and Fender System	4-10 & 23-24
For Tr. Br. Abut., Apron, Pier and Approaches	11
For Existing Wharf and Removal	12 & 13
For Utility Tunnel	13
For New Dolphin (@ End of New Wharf)	14-16
For Drydock Dolphins	17
For Waterline Relocation	18
For Mooring and Fuel Line Relocation	19
For Existing Cathodic Protect. Sys. Det's.	20-22
For New Wharf App. Fill and Cell Details	11

AS-BUILT
Date: 12-86

NOTES
1. Drydock and attachments to drydock by others.
2. Transfer Bridges to drydock by others.
3. ~~Future~~ Drydock shown dashed at approx. location

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ACE-5597
REGISTERED PROFESSIONAL ENGINEER
11/28/85

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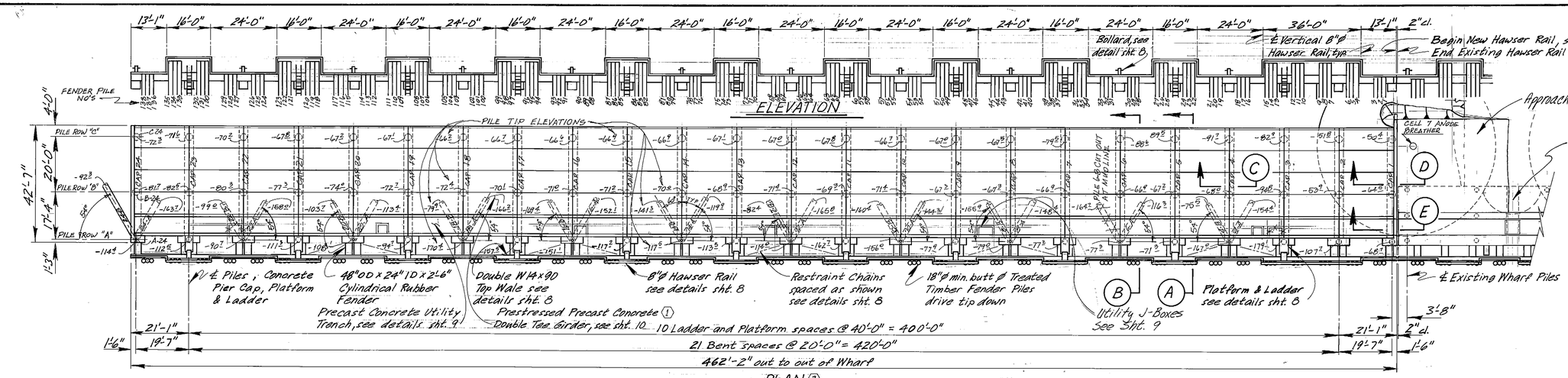
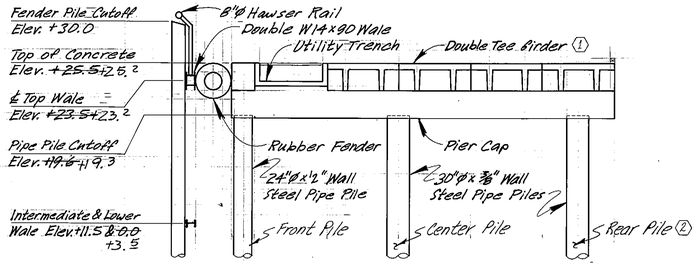
GENERAL LAYOUT

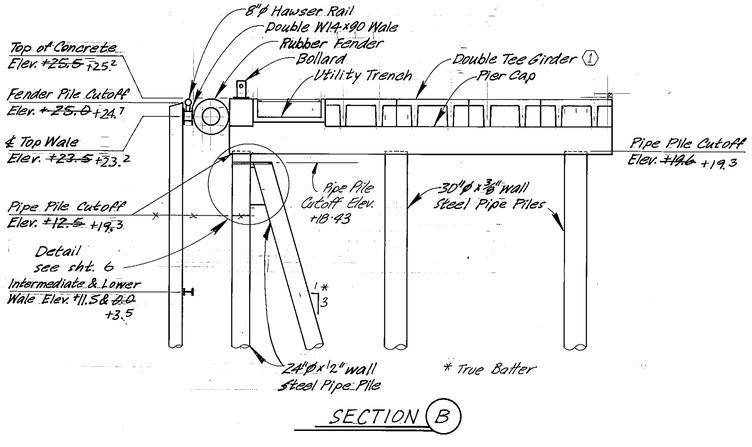
DESIGNED Staff	CHECKED JS	DRAWN LVB	DATE 11/85
PROJECT NUMBER X 70010		SHEET 3 OF 24	



PLAN (3)



SECTION (A)



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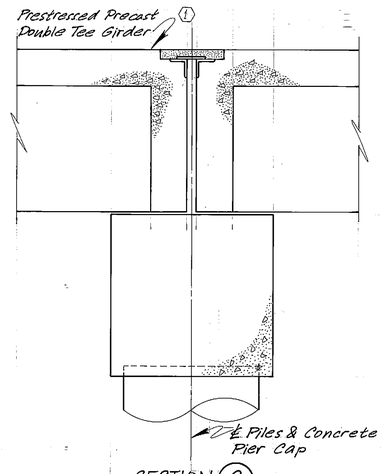

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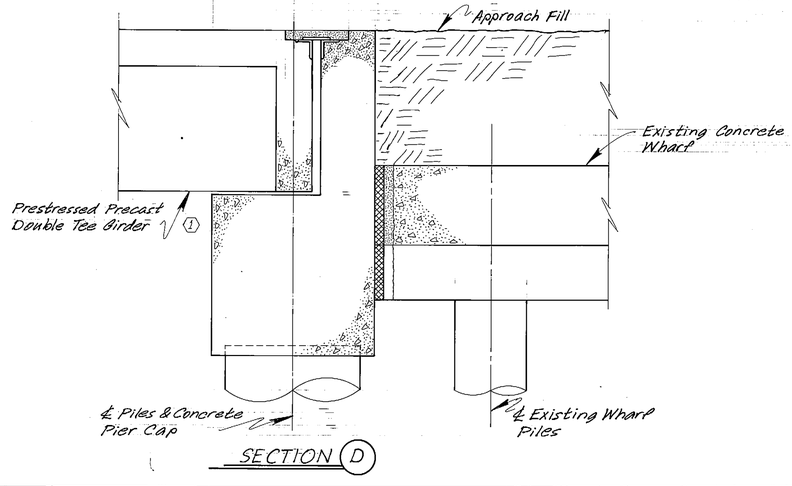

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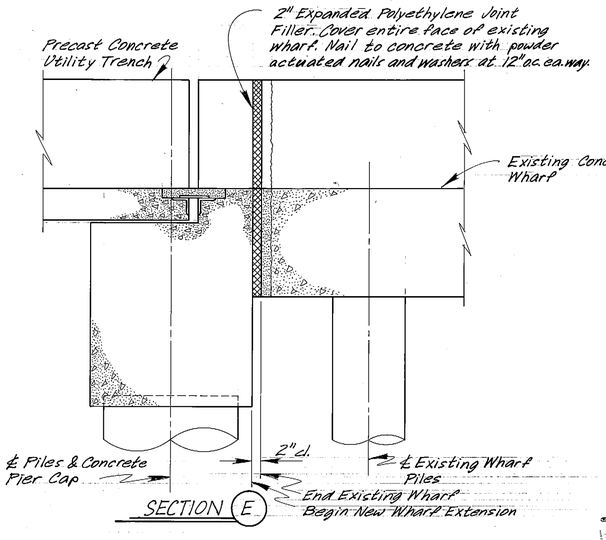

SECTION (E)

AS-BUILT
Date: 12-86

Notes:

(1) Alternate "A" shown, ~~for Alt. "B" see sheets 23 & 24~~
(2) See Pile Table Sheet 2
(3) For Removal a. of N.W. corner of Existing Wharf See Shts. 12 & 13
b. and Relocation of C.P. components See Shts. 11 & 20-22

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John T. Scott, II CE 4755
REGISTERED PROFESSIONAL ENGINEER
11-22-85

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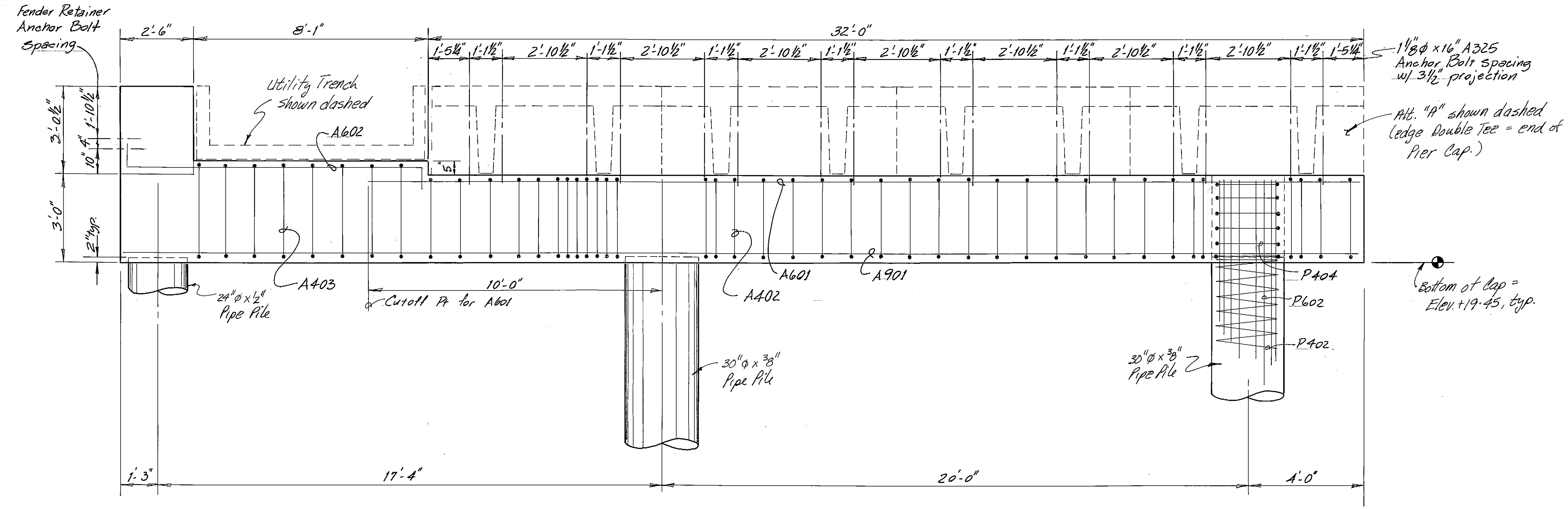
Ketchikan — Alaska

WHARF LAYOUT AND TYPICAL SECTIONS

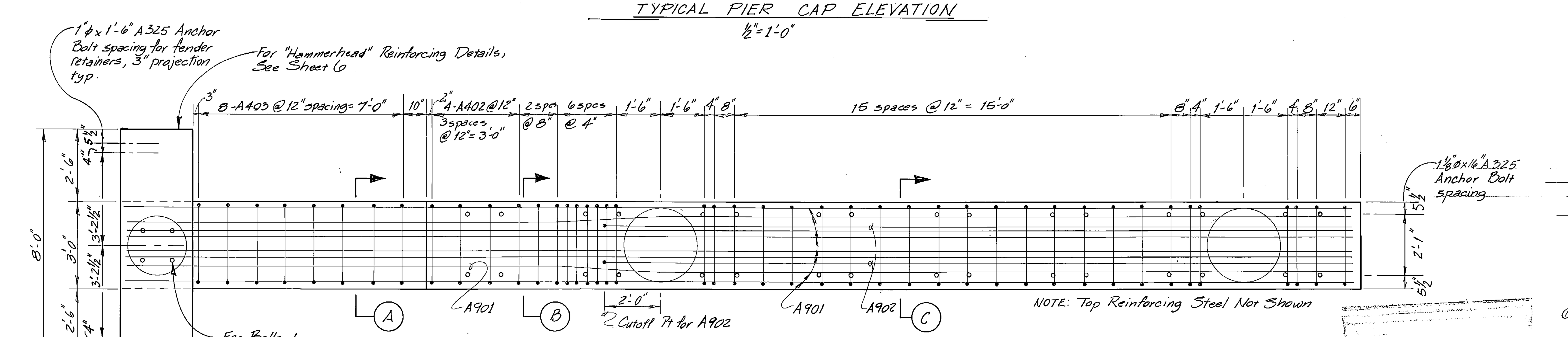
DESIGNED	CHECKED	DRAWN	DATE
BS	~~45~~	LVB	10/85

PROJECT NUMBER X70010 — SHEET 4 OF 24



TYPICAL PIER CAP ELEVATION

½" = 1'-0"

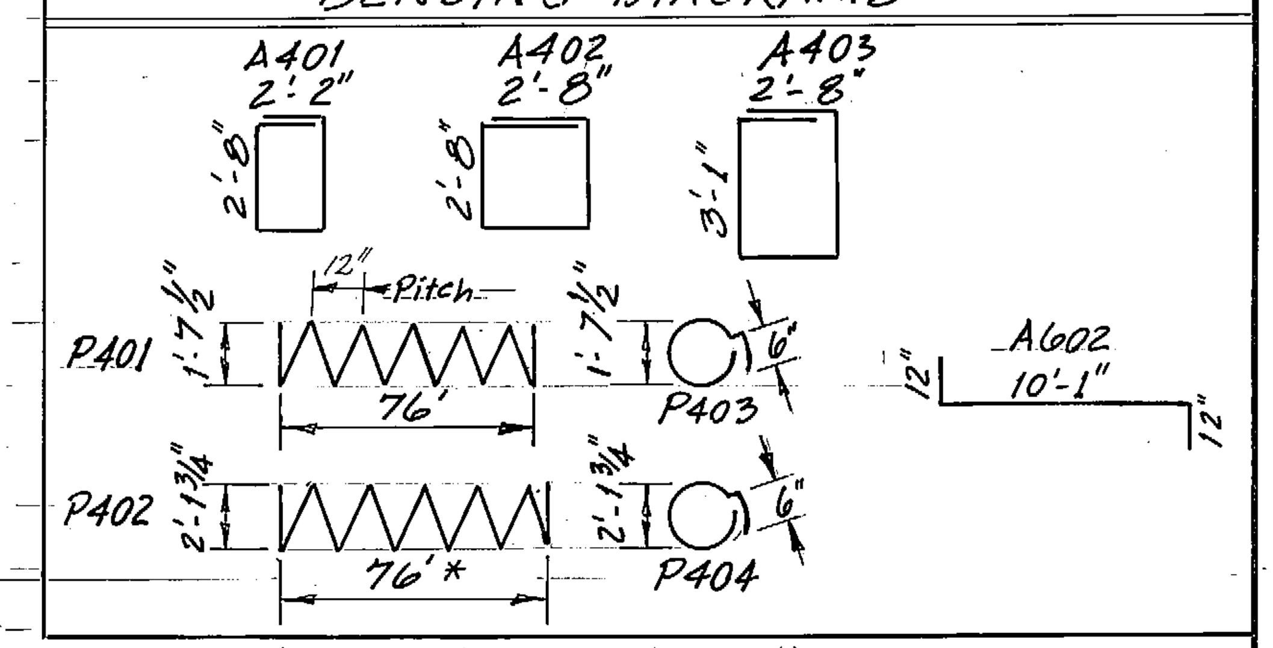


TYPICAL PIER CAP PLAN

½" = 1'-0"

PILE CAP REINFORCING STEEL (EA. CAP)				
MARK	SIZE	NO.	LENGTH	TYPE
A401	4	18	11'-10'	Bent
A402	4	36	13'-4"	Bent
A403	4	8	14'-2"	Bent
A404	4	12	7'-8"	–
A405	4	4	42'-3"	–
A501	5	12	5'-8"	–
A601	6	9	33'-10"	–
A602	6	7	12'-1"	Bent
A901	9	8	42'-3"	–
A902	9	2	25'-10"	–
P401	4	1	410'-0"	Spiral
P402	4	2	530'-0"	Spiral
P403	4	12	5'-8"	Bent
P404	4	12	7'-3"	Bent
P601	6	12	81'-9"	–
P602	6	32	79'-0" **	–

BENDING DIAGRAMS



* 29' for piles inside cells

** 32' " " " "

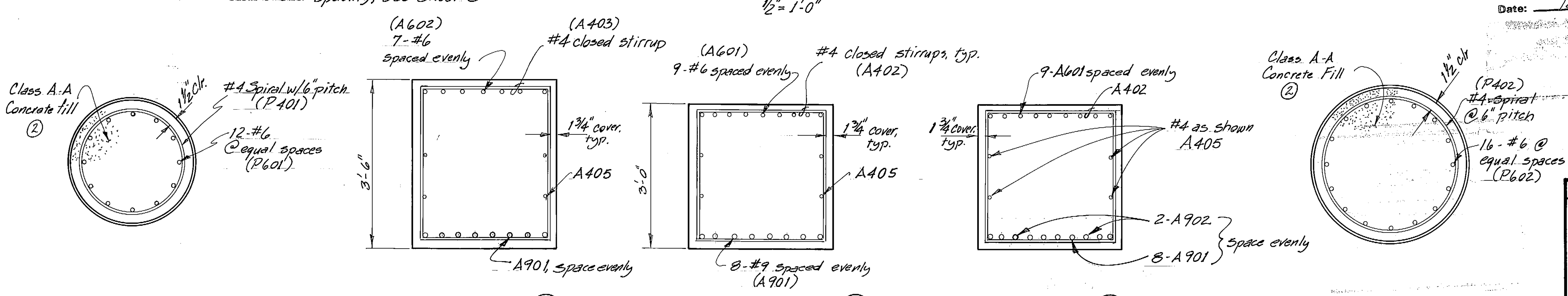
NOTE:

① ~~Details shown are for cast-in-place construction~~ Contractor may propose precast. Submit details for approval. PRECAST USED

② Concrete Pile fill to extend to El. -57 for piles outside of cells and to El. -10 for those within cells. Tremie plug may be req'd. for open-ended piles.

AS-BUILT

Date: 12-86



24"φ x ½" WALL PILE SECTION
NTS

SECTION (A)
¾" = 1'-0"

SECTION (B)
¾" = 1'-0"

SECTION (C)
¾" = 1'-0"

30"φ x ⅜" WALL PILE SECTION
NTS

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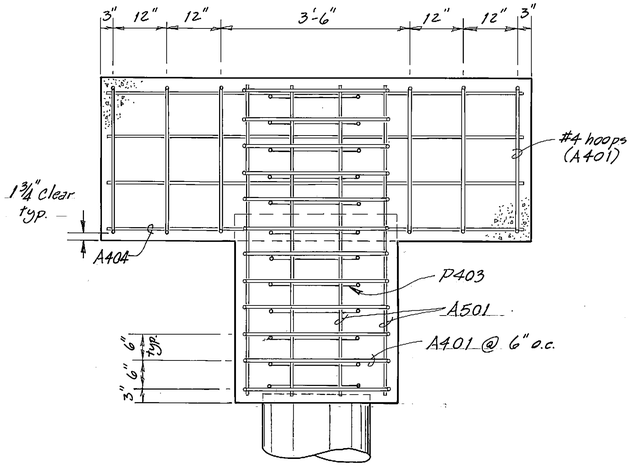
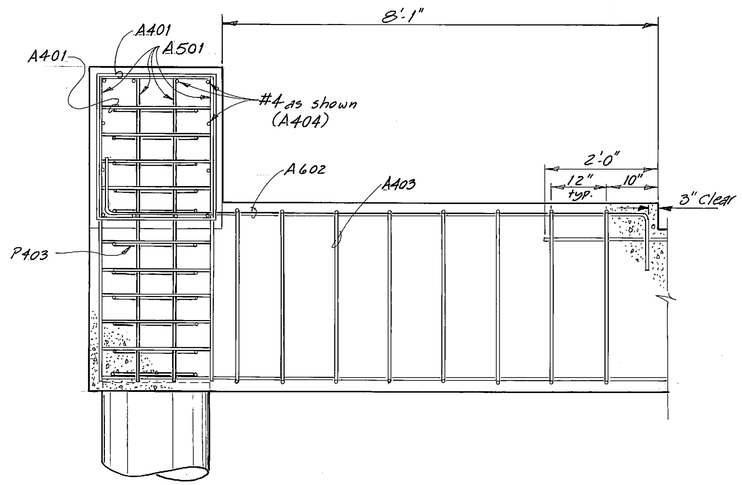
PIER CAP

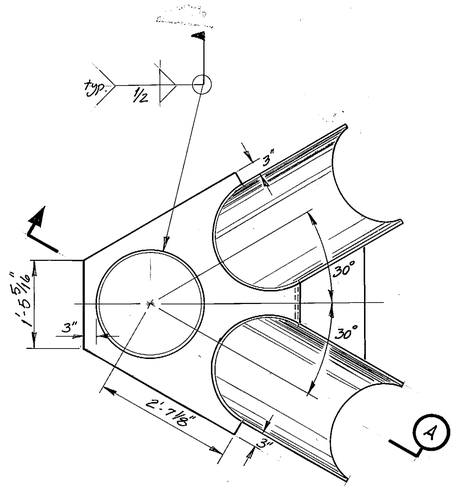
DESIGNED BAS	CHECKED JS	DRAWN DB	DATE 11-85
PROJECT NUMBER X 70010		SHEET 5	OF 24



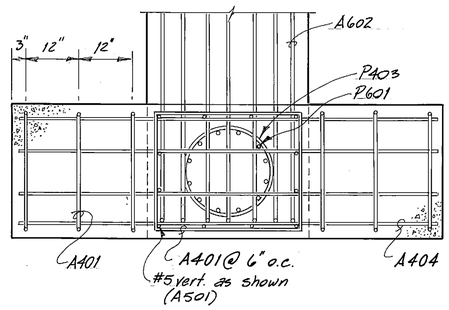
FRONT ELEVATION
¾" = 1'-0"



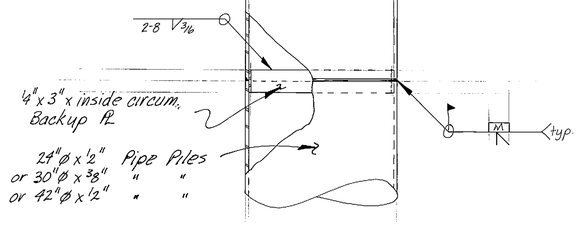
SIDE ELEVATION
¾" = 1'-0"



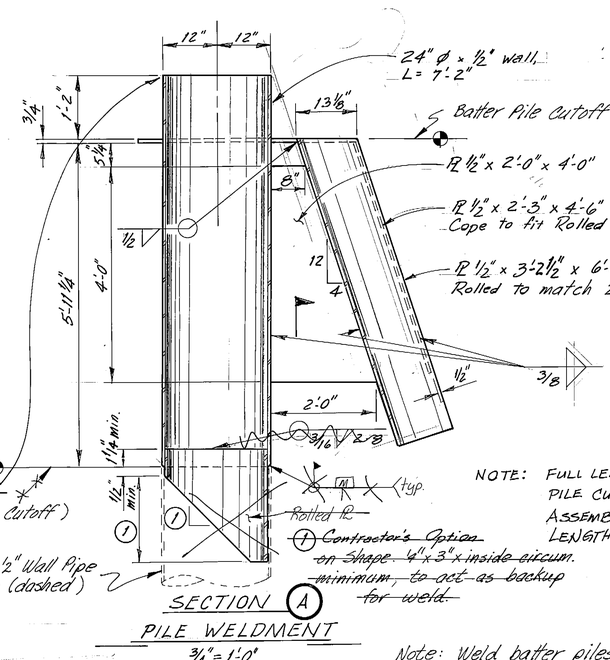
PLAN VIEW
¾" = 1'-0"



PLAN VIEW
PILE CAP
¾" = 1'-0"



PILE SPLICE DETAILS
N.T.S.



NOTE: FULL LENGTH PILES USED PILE CUTOFF ELEV. 19.3. ASSEMBLIES WELDED TO FULL LENGTH PILES AFTER DRIVING.

SECTION (A)
PILE WELDMENT
¾" = 1'-0"

Note: Weld batter piles with ⅜" fillet all around to Weldment, typ.

NOTE: See Sheet 5 for Reinforcing Schedule

AS-BUILT
Date: 12 86

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49TH
John T. Scott, II
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11-22-85

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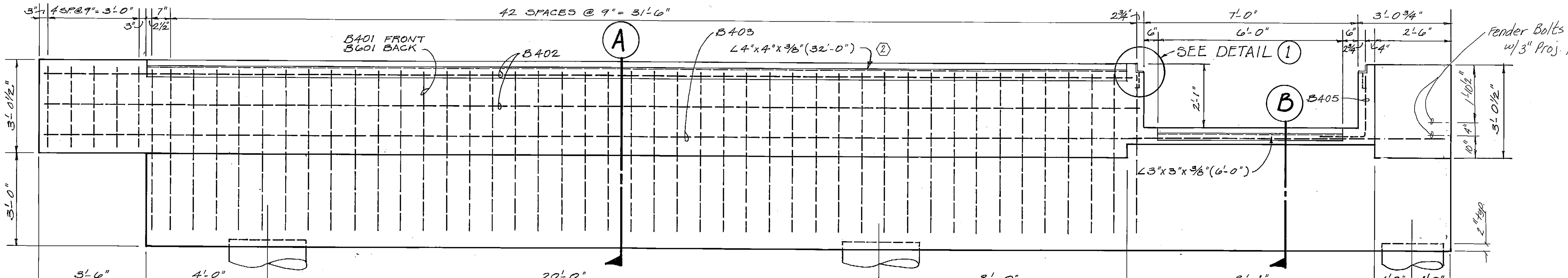
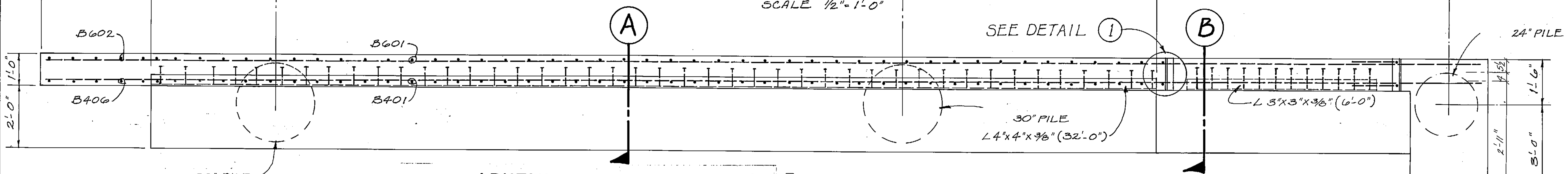
PIER CAP DETAILS

DESIGNED BAS	CHECKED JS	DRAWN DB	DATE 11-85
PROJECT NUMBER X 70010		SHEET 6	OF 24



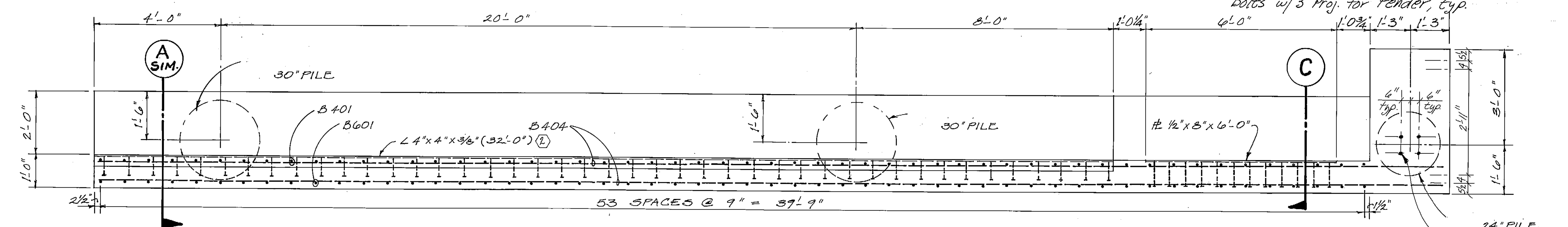
ABUTMENT - ELEVATION ①

SCALE 1/2" = 1'-0"



ABUTMENT - SECTION ①

SCALE 1/2" = 1'-0"



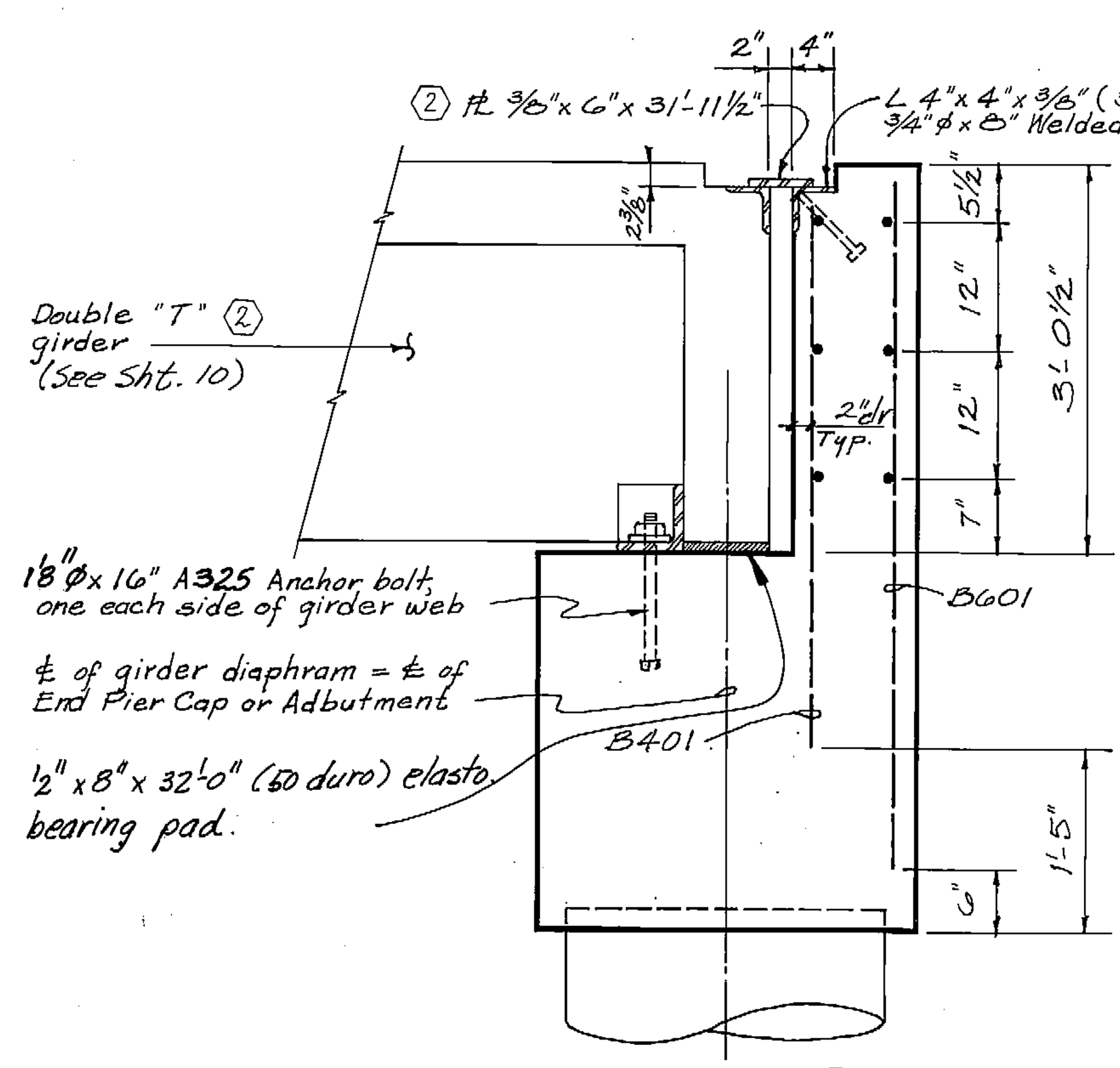
WHARF END PIER - SECTION ①

SCALE 1/2" = 1'-0"

NOTE:
Only end wall reinforcement shown. For beam and hammerhead reinforcement see sheets 5 and 6.

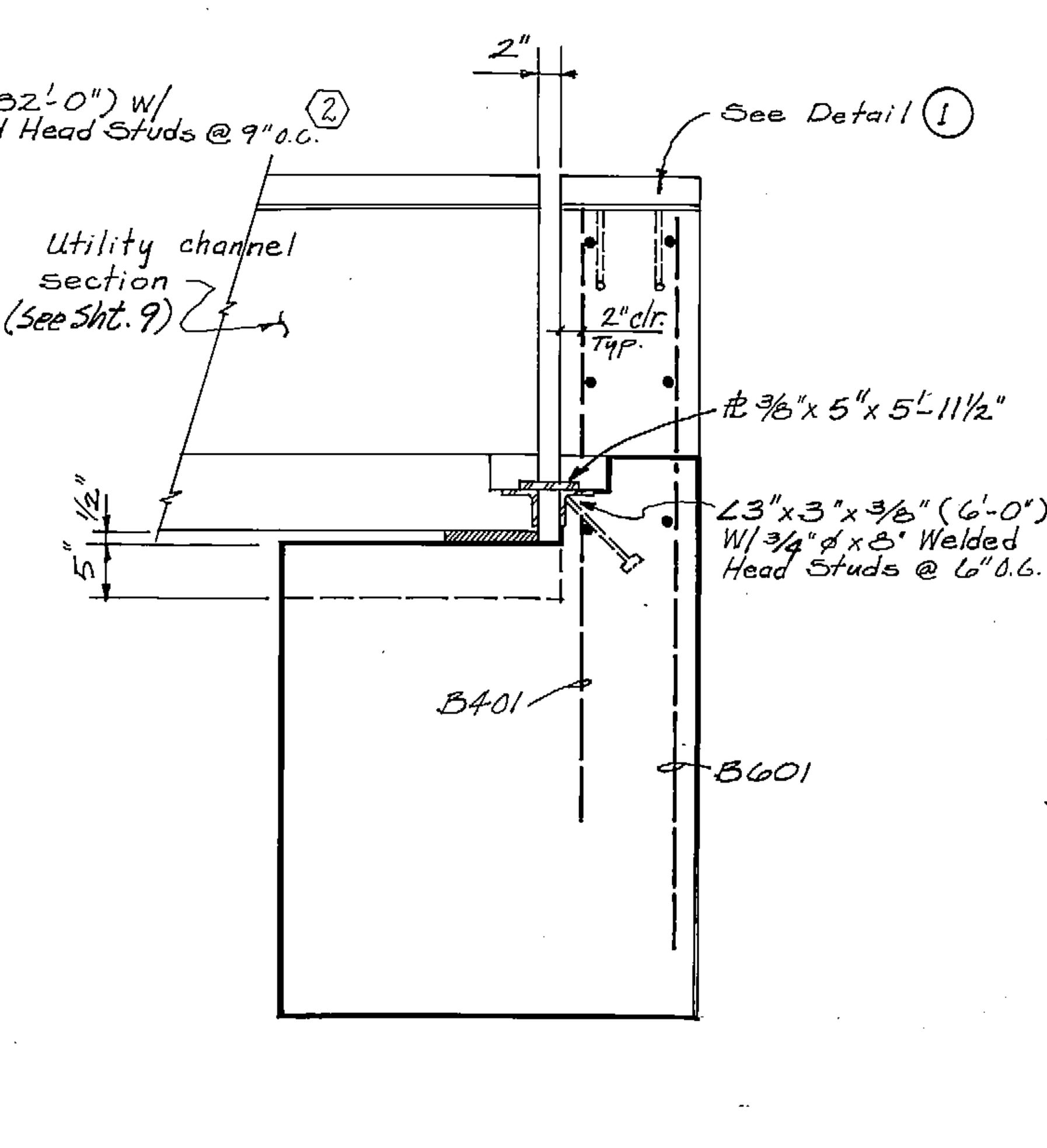
ABUTMENT ③					
MARK	SIZE	NO.	LENGTH	TYPE	BEND
A401	4	18	11'-10"		
A402	4	36	13'-4"	BENT	
A403	4	8	14'-2"	BENT	
A404	4	12	7'-8"	—	
A405	4	4	42'-3"	—	
A501	5	12	5'-8"	—	
A601	6	9	33'-10"	—	
A602	6	7	12'-1"	BENT	
A901	9	8	42'-3"	—	
A902	9	2	25'-10"	—	
B401	4	44	4'-3"	—	B405: 1'-6", 2'-1"
B402	4	4	35'-8"	—	
B403	4	2	45'-8"	—	
B405	4	2	3'-7"	BENT	
B406	4	5	2'-8"	—	
B601	6	44	5'-4"	—	
B602	6	5	2'-8"	—	
P401	4	1	155'-0"	SPIRAL	
P402	4	2	215'-0"	SPIRAL	
P403	4	12	5'-8"	BENT	
P404	4	12	7'-3"	BENT	
P601	6	12	32'-0"	—	
P602	6	32	29'-0"	—	

WHARF END PIER ③					
MARK	SIZE	NO.	LENGTH	TYPE	BEND
A401	4	18	11'-10"	—	
A402	4	36	13'-4"	BENT	
A403	4	8	14'-2"	BENT	
A404	4	12	7'-8"	—	
A405	4	4	42'-3"	—	
A501	5	12	5'-8"	—	
				—	
A601	6	9	33'-10"		
A602	6	7	12'-1"	BENT	
A901	9	8	42'-3"	—	
A902	9	2	25'-10"	—	
B401	4	54	4'-3"	—	
B402	4	6	42'-3"	—	
B601	6	54	5'-4"	—	
P401	4	1	410'-0"	Spiral	
P402	4	2	530'-0"	Spiral	
P403	4	12	5'-8"	Bent	
P404	4	12	7'-3"	Bent	
P601	6	12	81'-9"	—	
P602	6	32	79'-0"	—	



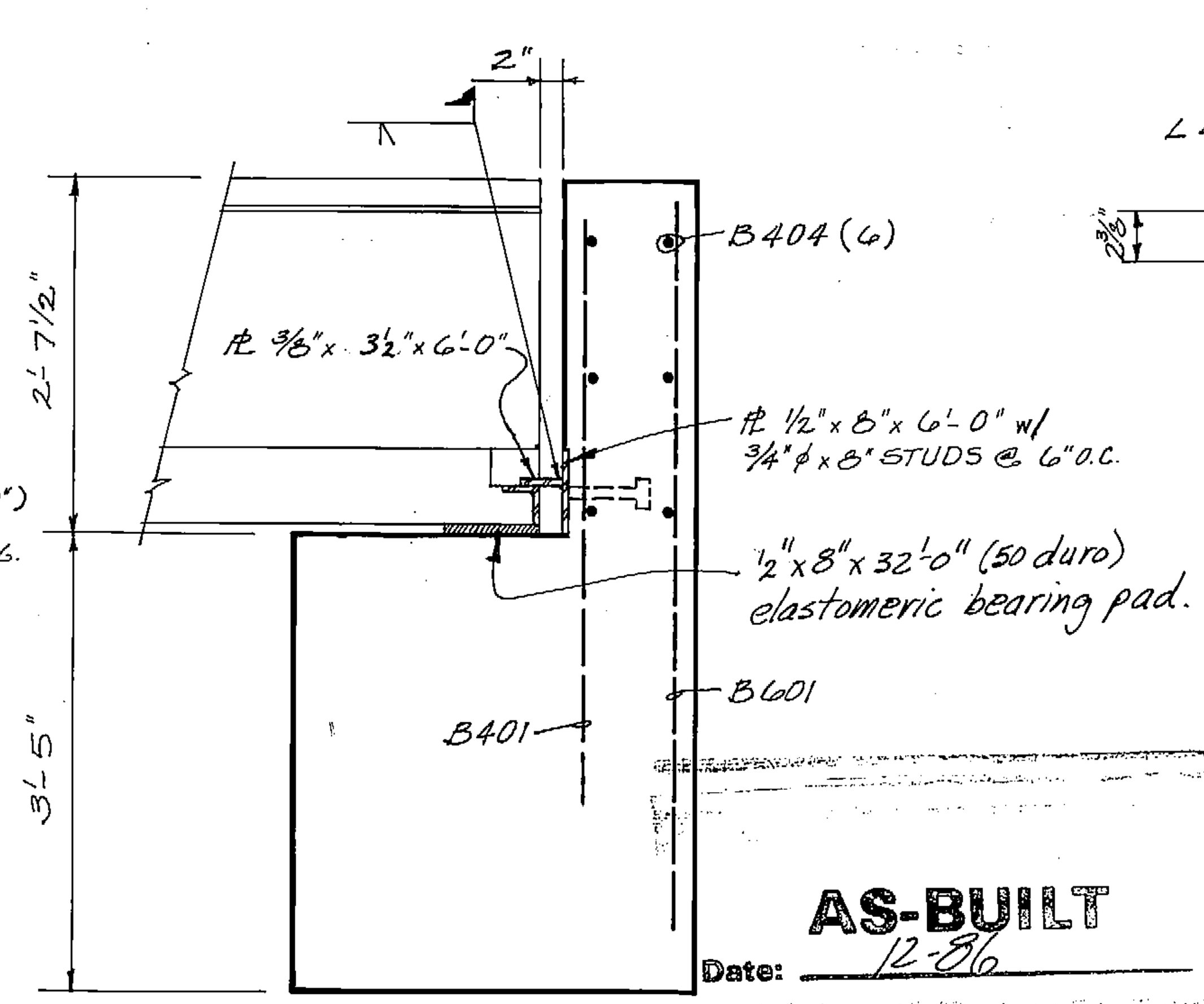
SECTION (A)

3/4" = 1'-0"



SECTION (B)

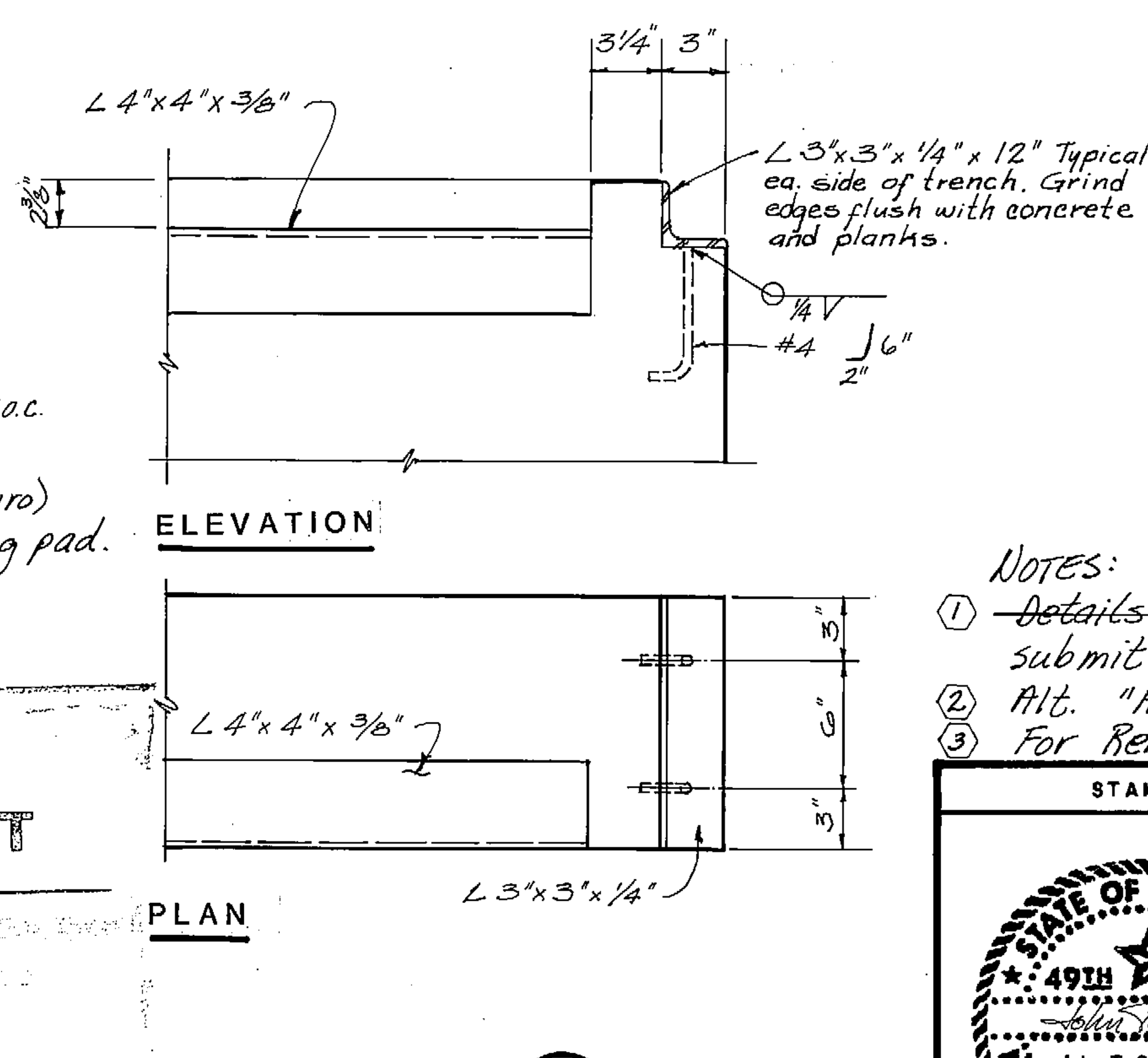
3/4" = 1'-0"



SECTION (C)

3/4" = 1'-0"

AS-BUILT
Date: 12-86



DETAIL ①

1 1/2" = 1'-0"

NOTES:
1. ~~Details shown for Cast-in-Place const.~~ ~~Contractor may propose pre-cast, submit details for approval.~~
2. Alt. "A" shown. ~~For Alt. "B", see Sheets 23 & 24~~
3. For Rein. and Bend details and Pier Cap Details see Sheets 5&6

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STATE OF ALASKA 49TH REGISTERED PROFESSIONAL ENGINEER John T. Scott, II CE 4755
11-22-85

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STATE OF ALASKA

DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

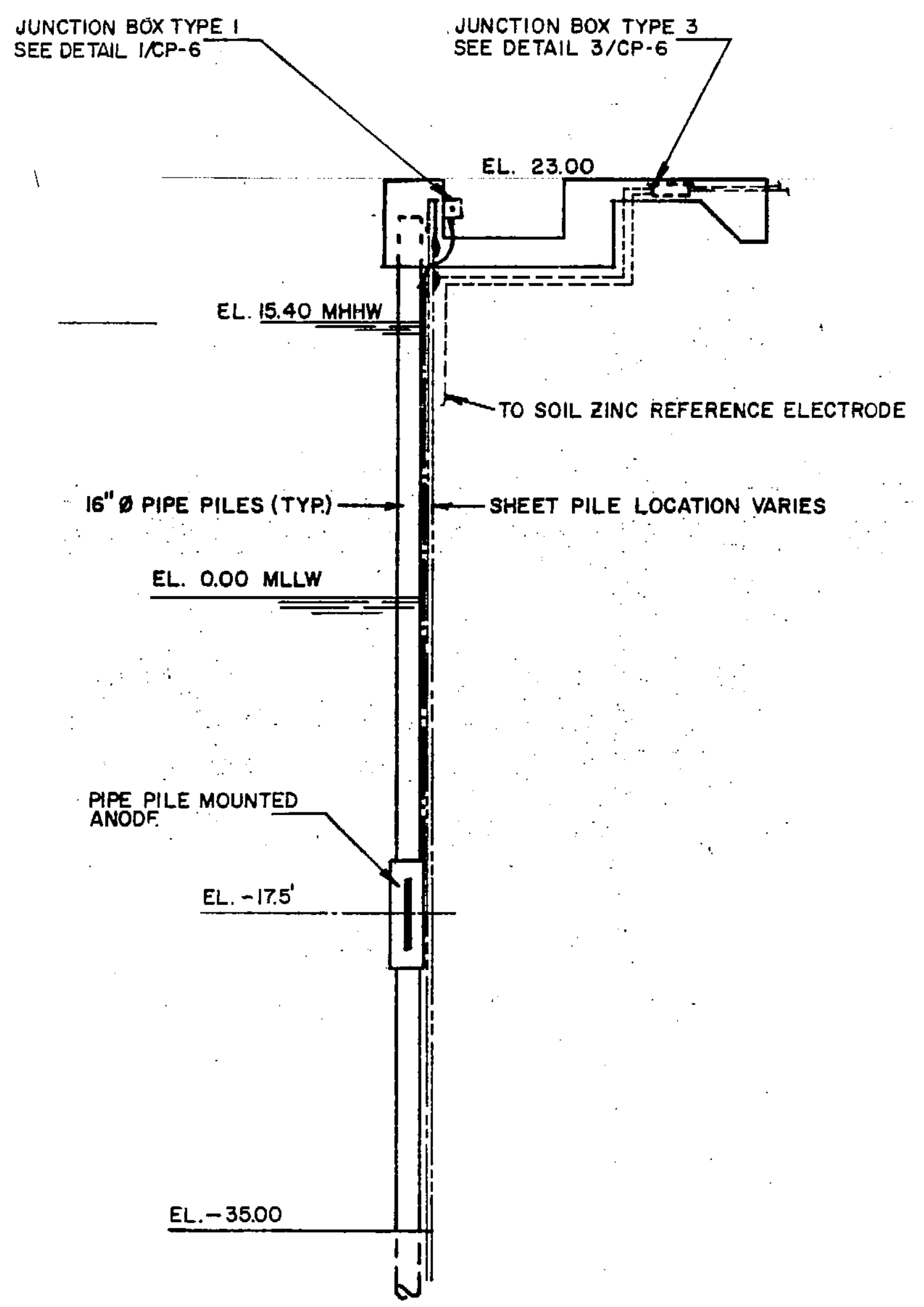
Ketchikan — Alaska

WHARF

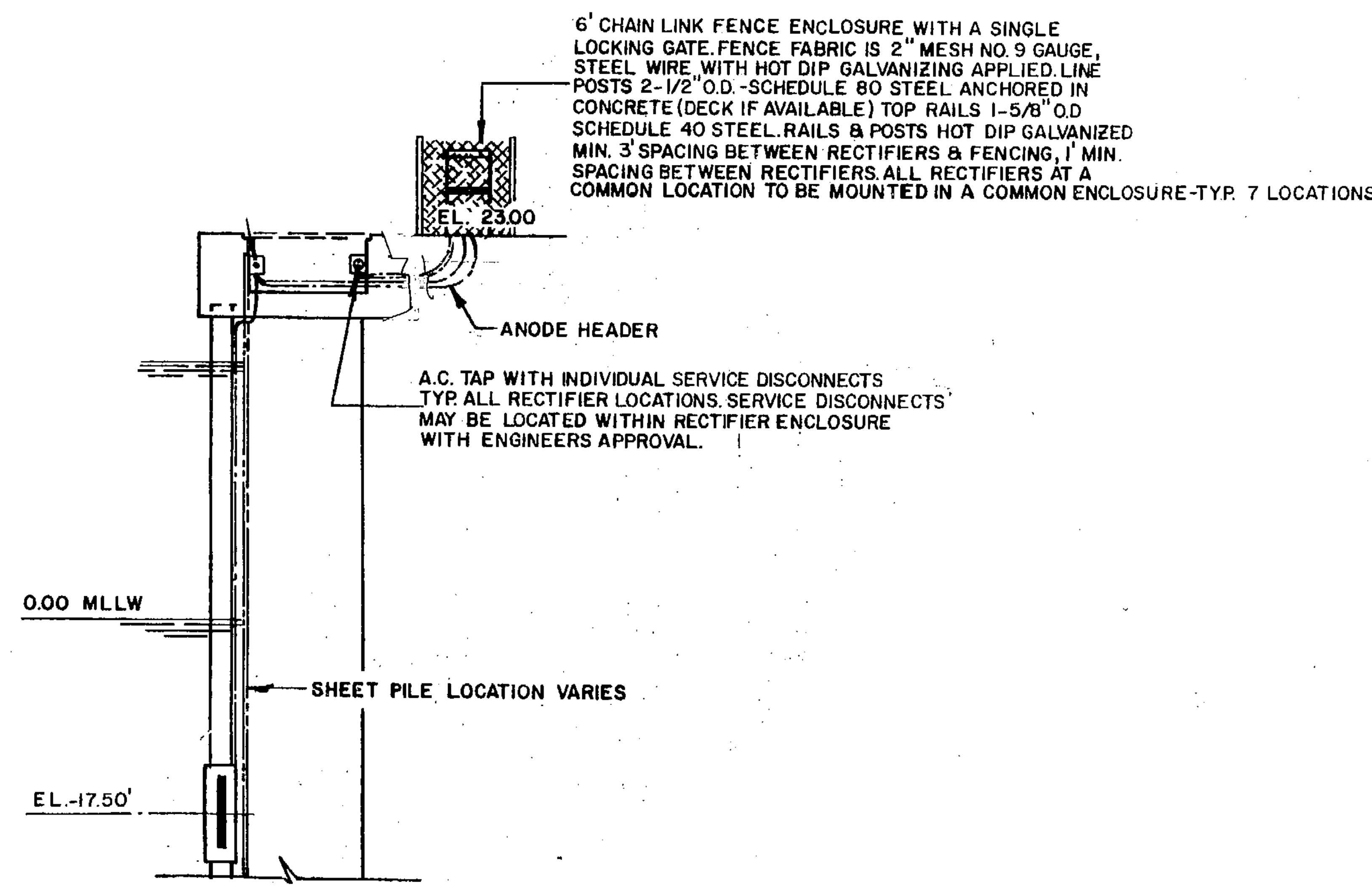
END PIER CAPS AND DETAILS

DESIGNED BAS | CHECKED [illegible] | DRAWN Goodal | DATE Nov 85

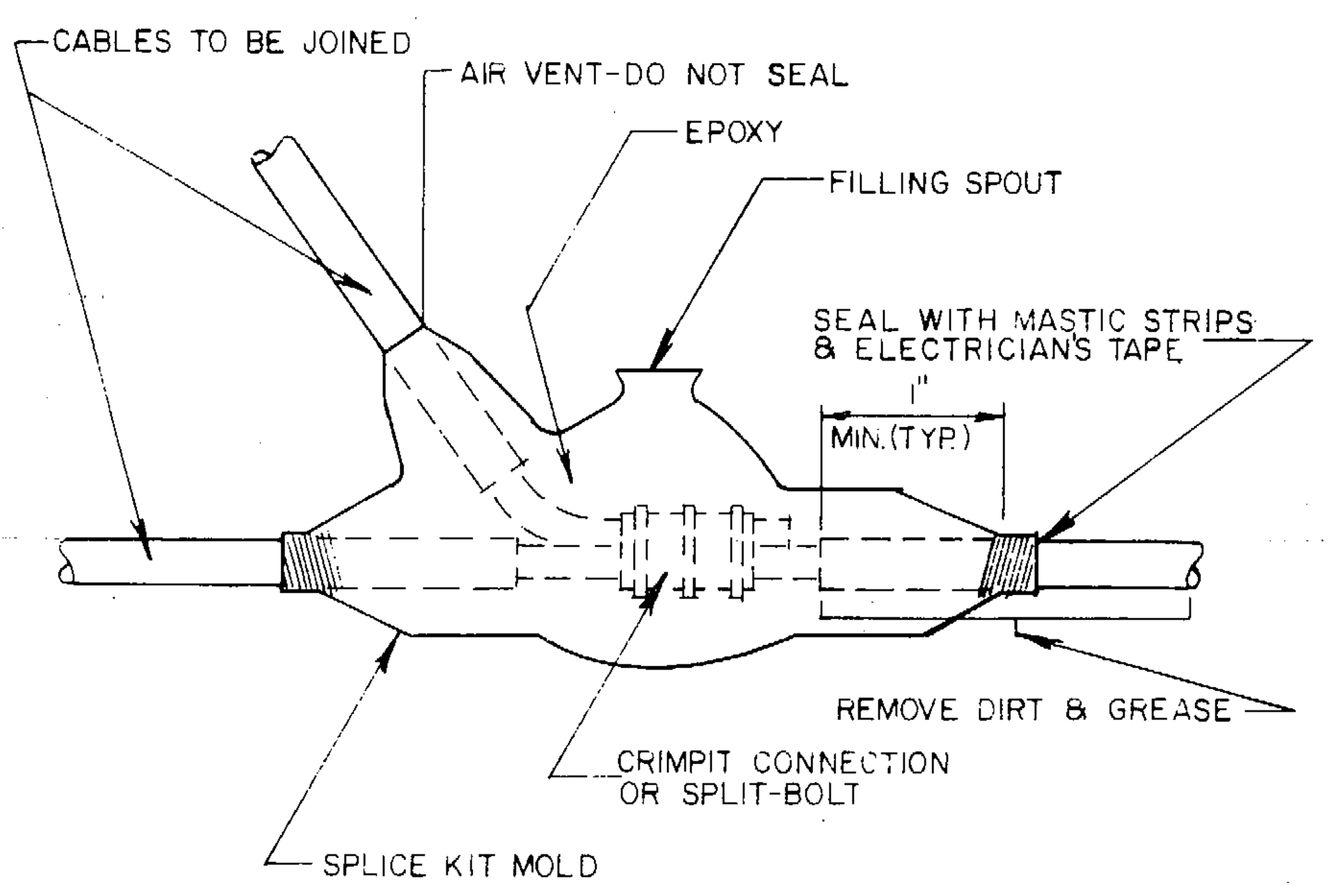
PROJECT NUMBER X70010 | SHEET 7 OF 24



SECTION E



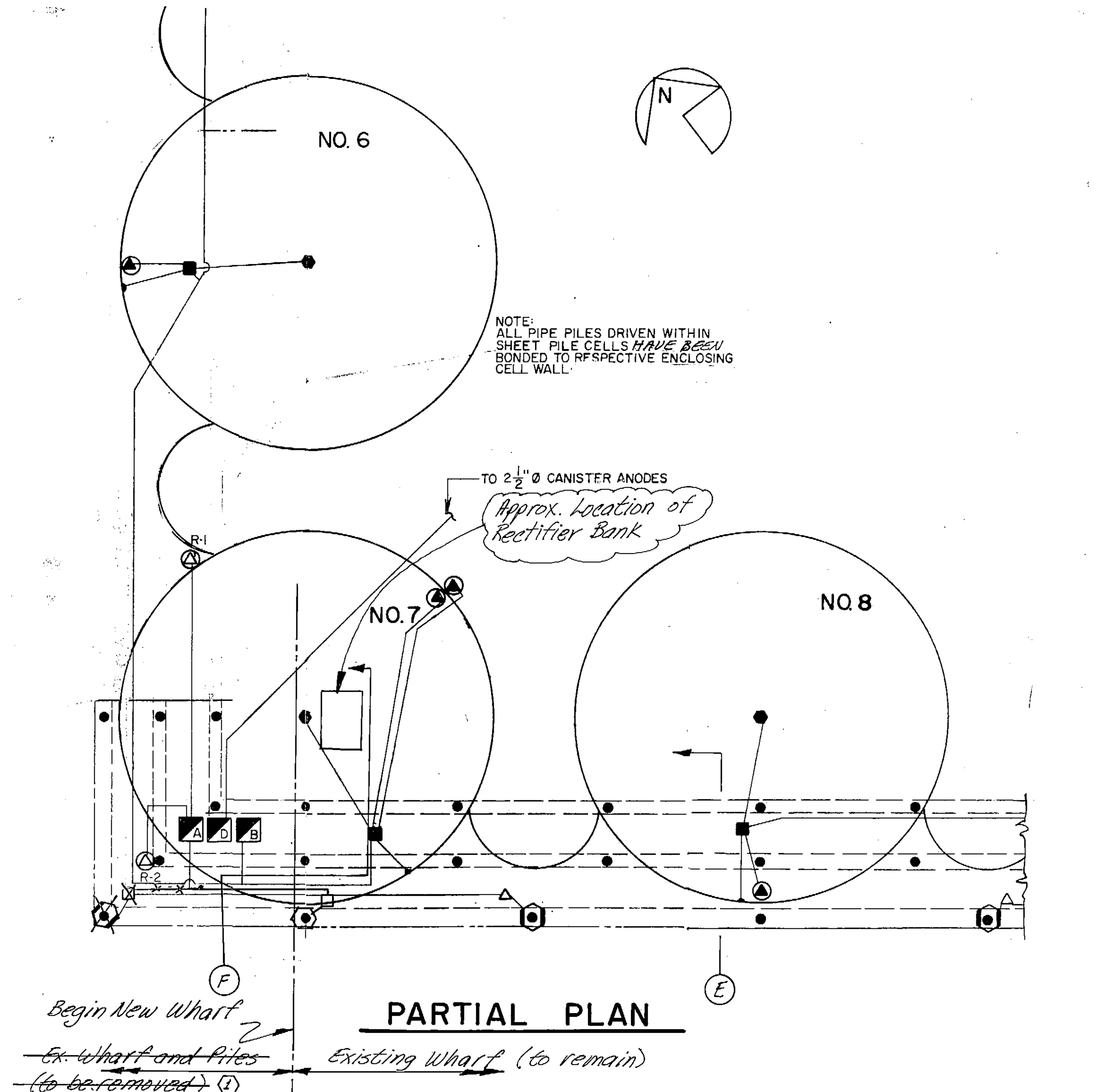
SECTION F



TYPICAL SPLICE

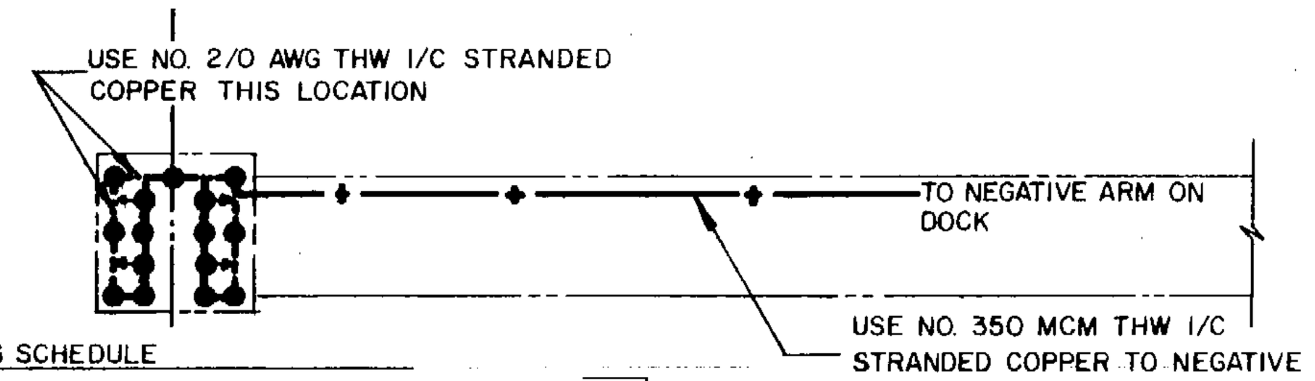
LEGEND

- ⊙ ANODE HEADER SPLICE
- ● INDICATES PIPE PILE.
- ●→ INDICATES BATTERED PIPE PILE AND DIRECTION OF BATTER.
- ■ ANODE JUNCTION BOX
- ZINC REFERENCE ELECTRODE - SOIL
- CANISTER ANODE (3" Ø)
- PILE MOUNTED ANODE - PAIR
- PILE MOUNTED ANODE - SINGLE
  (BOLD FACE INDICATES ANODE ELEMENT LOCATION)
- □ ANODE JUNCTION BOX
- △ ANODE JUNCTION BOX
- ZINC REFERENCE ELECTRODE - MARINE
- RECTIFIER, SIZE INDICATED IN LOWER RIGHT
- ☒ ANODE SLED
- ⊗ CANISTER ANODE (2 1/2" Ø)



PARTIAL PLAN

NOTES



NEGATIVE BONDING WIRING SCHEDULE

NO. 4/0 AWG THW, 1/C STRANDED COPPER OR TWO EACH NO. 6 DEFORMED BILLET STEEL BARS WITH WELDED SPLICES EPOXY COATED - NO WIRE TIES ALLOWED

NO. 2/0 AWG THW, 1/C STRANDED COPPER OR TWO EACH NO. 4 DEFORMED BILLET STEEL BARS WITH WELDED SPLICES EPOXY COATED - NO WIRE TIES ALLOWED

NO. 6 AWG HMW/PE 1/C STRANDED COPPER OR ONE NO. 4 EPOXY COATED DEFORMED BILLET STEEL BARS WITH WELDED SPLICES EPOXY COATED - NO WIRE TIES ALLOWED

NOTE: ALL BONDING WIRES NOT IMBEDDED IN CONCRETE OR DIRECT BURIED TO BE RUN IN VINYL COATED, MILD STEEL RIGID CONDUIT. THOSE WIRES IMBEDDED IN CONCRETE TO HAVE A MINIMUM OF 2" COVER. THOSE WIRES DIRECT BURIED IN BACKFILL TO HAVE A MINIMUM OF 24" COVER. ALL CONDUIT (POSITIVE OR NEGATIVE ARM OR A.C.) IN DIRECT CONTACT WITH SOIL SHALL BE BONDED TO THE CLOSEST SHEET PILE WALL. A SEPERATE NEGATIVE LEAD (STRUCTURE) IS REQUIRED FOR EACH RECTIFIER TO NEAREST PILING OR NEGATIVE STRUCTURAL BONDING.

ANODE WIRING SCHEDULE

SEE ANODE/JUNCTION BOX DETAILS & SCHEMATIC

NOTES:

1. Existing CP System is at present un-powered. North Wharf Contractor to relocate and re-connect existing items as required to make way for new work.

AS-BUILT
Date: 12-86

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STATE OF ALASKA			
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Ketchikan — Alaska			
EXISTING CATHODIC PROTECTION SYSTEM / DETAILS			
DESIGNED Staff	CHECKED [illegible]	DRAWN [illegible]	DATE VIII/85
PROJECT NUMBER X70010		SHEET S-2022	OF 24

5½

wharf

Seaward

Fender Retainer see detail this sht.

± Bollard

1" Chain, galvanized w/ chain shackle each end. Install tight to nearest link. For locations see sht. 4

48"OD x 24"ID x 2'-6" Cylindrical Rubber Fender, typ.

½"ø Weep holes @ 5'-0" ctrs ±

Steel Grating, galvanized, ¼"x⅛"x3'-0" serrated bearing bar @ 1 3/16" o.c. cross bars @ 4" o.c. Weld every fourth bearing bar to L

± 5/8"ø x 1'-0" Anchor Bolts, 2" projection, typ. w/ beveled washers

± 1"ø H.S. Bolts

± 4"ø Upper Hawser Rail support & stiffner

Double W14x99 Wale

8"ø std. Pipe Hawser Rail

± Pier, Ladder & Platform (Ladder & Platform not shown)

± 4"ø Lower Hawser Rail support & stiffner, typ.

11½"x11½" Treated Timber Chock cut for tight fit between piles

± Pier w/ Batter Piles

± 1"ø H.S. Bolts

11½"x11½" Treated Timber Chock as shown fit tight to piles

1"ø H.S. Bolts

± Pier, Ladder & Platform for locations see sht. 4 see details this sheet

Provide ⅜"ø Drain Holes, top & bottom, spaced @ 4'-0" ± o.c.

PLAN

± 8"ø std Pipe Hawser Rail

Pile Cutoff El. +30°

Typ.

12-1¼"x3"x5" each side of pipe

± 1"ø HS Bolt

6"ø std Pipe & short R. Elbows, typ.

TS 3"x5"x⅜"x2'-0"

¼"R Rolled Steere sliding fit

± 8"ø std Pipe Hawser Rail

Pile Cutoff El. +25°

12½" Stiffner

± 1"ø HS Bolts w/ 4"ø x ⅛" R Washer. Counter bore 4½"ø x 2" deep at Fender Piles and Chocks.

11½"x11½" Treated Timber Chock

Double W14x99 Upper Wale

Treated Timber Fender Piles

Single W14x99 Intermediate and Lower Wale

48"OD x 24"ID x 2'-6" Cylindrical Rubber Fender

Fender Retainer see details this sheet

Concrete Pier Cap see details sht. 5 & 6

SECTION (A)

W14x99

TOP WALE SPLICE

N.T.S.

PLAN

12⅜" Transition Plate

½"x½"x1'-11 Tread Bar, typ.

12¾"x16"x1'-4"

12"ø x ⅜" wall pipe

4"ø x 2'-0" std. pipe

⅛" R and seal weld

¼"ø x 1'-3" std. Pipe Hinge

1"ø x 1'-5" Ladder Rung, typ.

12½"x 3"x 4", typ.

See Detail ¾" below

± Top Double Wale shown, lower wales similar

12½"x 3", typ ea. side

± Top Wale

12½"x 3"

12½"x 3"x¼"

DETAIL "A"

N.T.S.

LADDER DETAIL

28 spaces @ 1'-0" = 28'-0"

3'-7½"

PLAN

± holes for 1"ø H.S. Bolts, typ.

ELEV

Symm about ℄

Fender to Concrete Fender to Wale

FENDER RETAINER

* Double Fender model shown. 3'-3" @ Single Fender also Omit Center bracket

L 4x4x½x6'-0"

Steel Grating

± ¾" H.S. Bolt w/ double nuts

12⅜"x4"x7"

⅝"ø Anchor Bolts

MC 8x18.7x2'-5" clip corner as shown

PLATFORM DETAIL

CP

W14x99 Wale

INTERMEDIATE & LOWER WALE SPLICE

N.T.S.

(New to New or Existing to New)

AS-BUILT

Date: 12-86

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STATE OF ALASKA 49TH

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REGISTERED PROFESSIONAL ENGINEER

11-22-85

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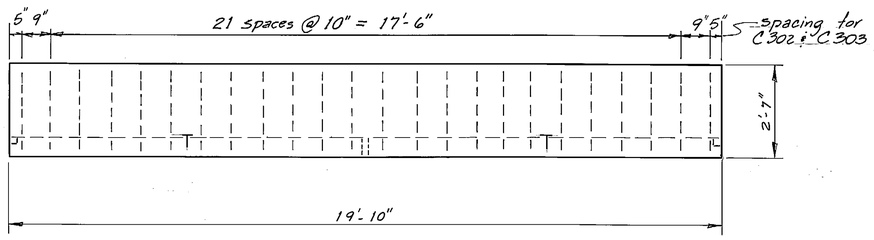
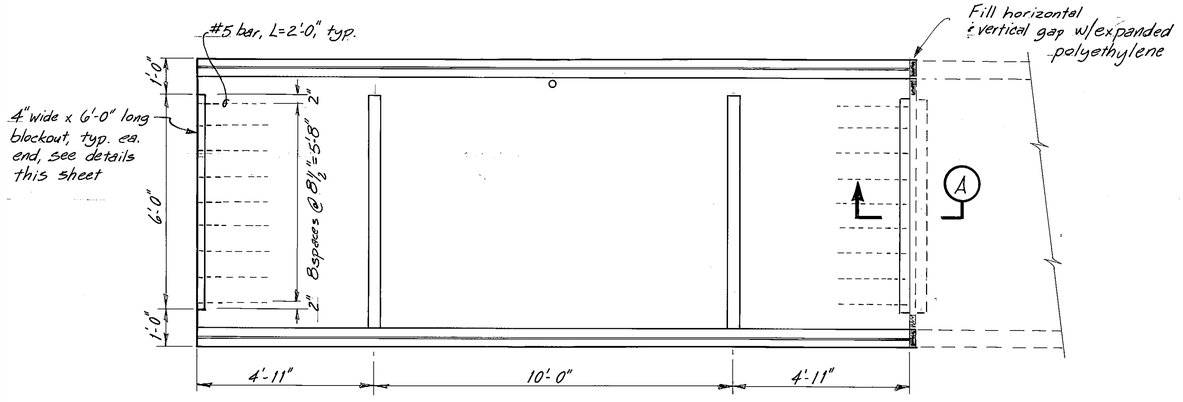
WHARF

FENDER SYSTEM and HAWSE RAIL

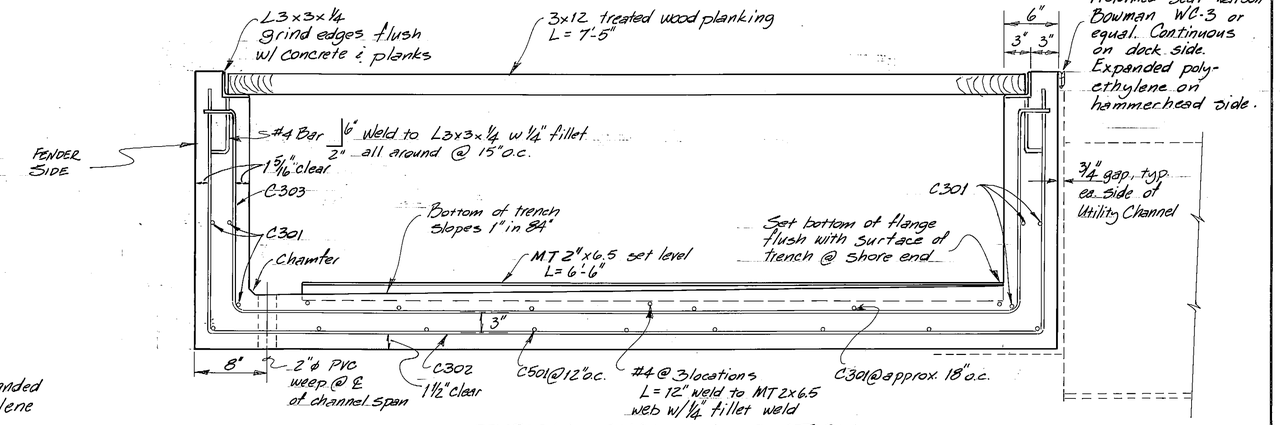
DESIGNED LJB	CHECKED	DRAWN LJB	DATE 11/85
PROJECT NUMBER X70010		SHEET 8	OF 24



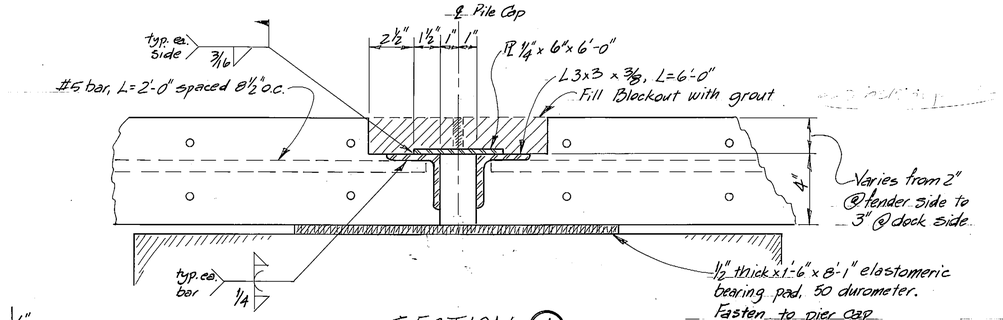
ELEVATION
1/2" = 1'-0"



PLAN
1/2" = 1'-0"

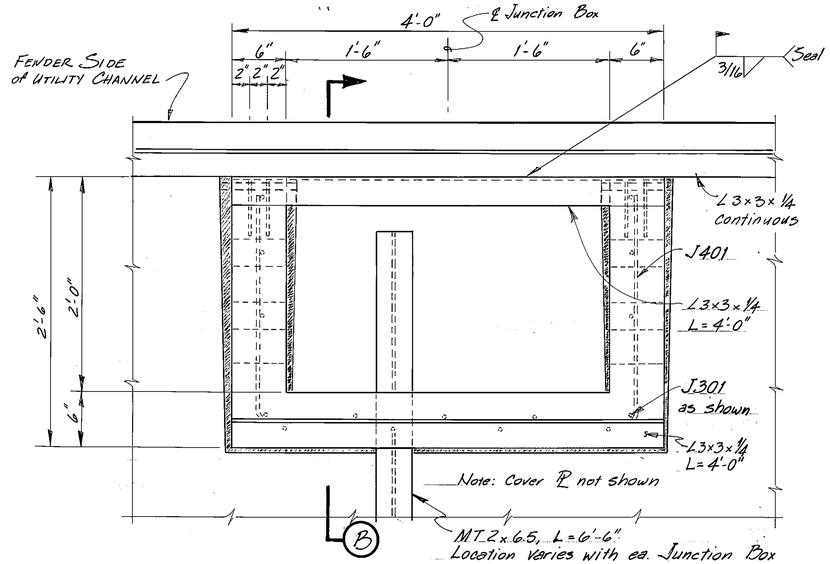


TYPICAL CHANNEL SECTION
1 1/2" = 1'-0"

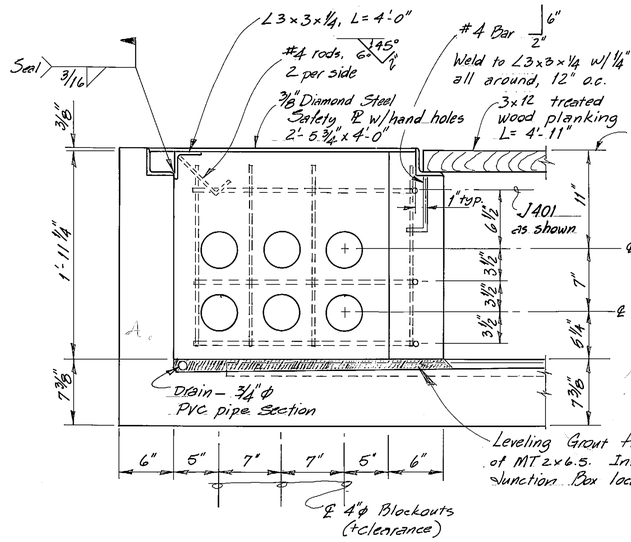


SECTION (A)
3" = 1'-0"

CHANNEL CONNECTION DETAIL



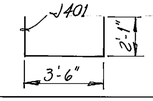
JUNCTION BOX PLAN
1 1/2" = 1'-0"



JUNCTION BOX SECTION (B)

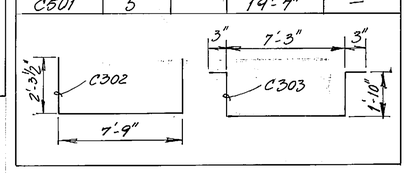
JUNCTION BOX REINFORCEMENT

MARK	SIZE	NO.	LENGTH	TYPE
J301	3	11	1'-9"	—
J401	4	3	7'-8"	Bent



UTILITY CHANNEL REINFORCEMENT

MARK	SIZE	NO.	LENGTH	TYPE
C301	3	14	19'-11"	—
C302	3	24	12'-4"	Bent
C303	3	24	11'-5"	Bent
C501	5		19'-7"	—



JUNCTION BOX LOCATIONS*

STATION	
"A"	~~10+00~~ 10+50
"A"	11+25
"A"	~~12+00~~ 11+96
"A"	12+75
"A"	~~13+00~~ 13+74

*Approximate locations only. Actual locations to be adjusted to fit field conditions.

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Date: 12-86

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John T. Scott, II
CE 4755
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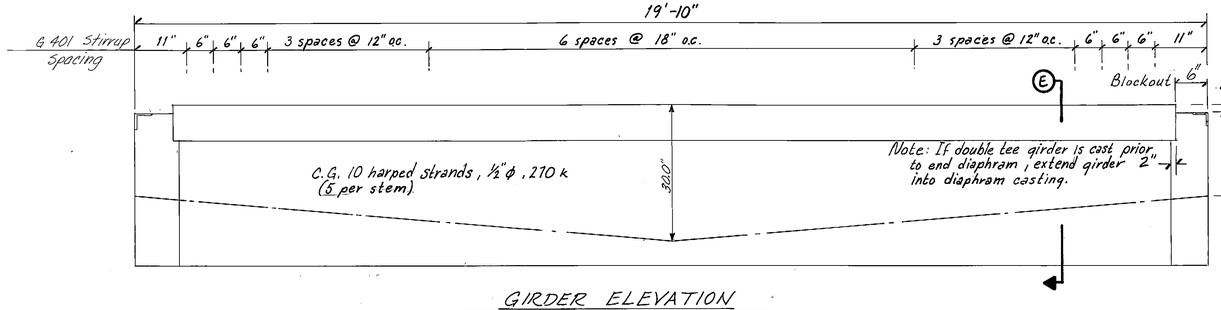
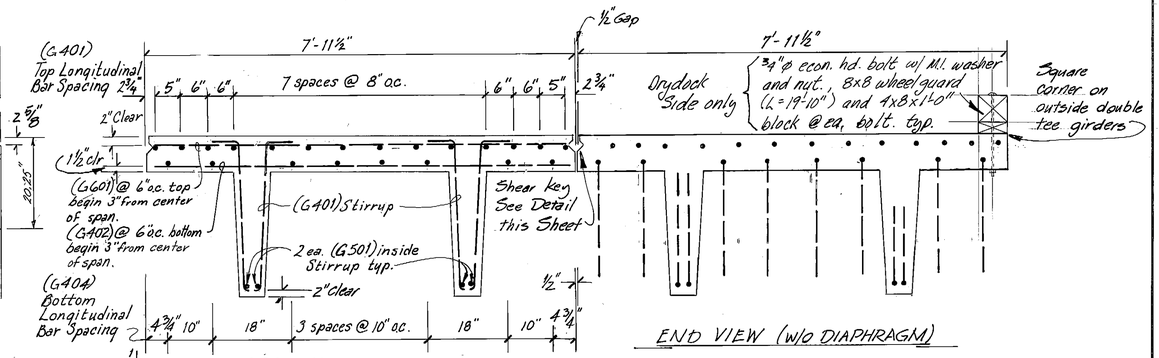
UTILITY CHANNEL SECTION

DESIGNED	BS	CHECKED	[illegible]	DRAWN	DB	DATE	10-85
PROJECT NUMBER	X70010			SHEET	9	OF	24

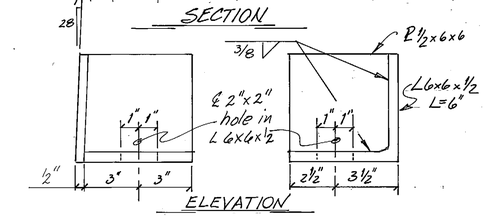


GIRDER ELEVATION

3/4"= 1'-0"

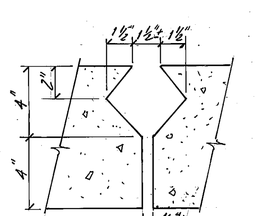


END VIEW (w/o DIAPHRAGM)



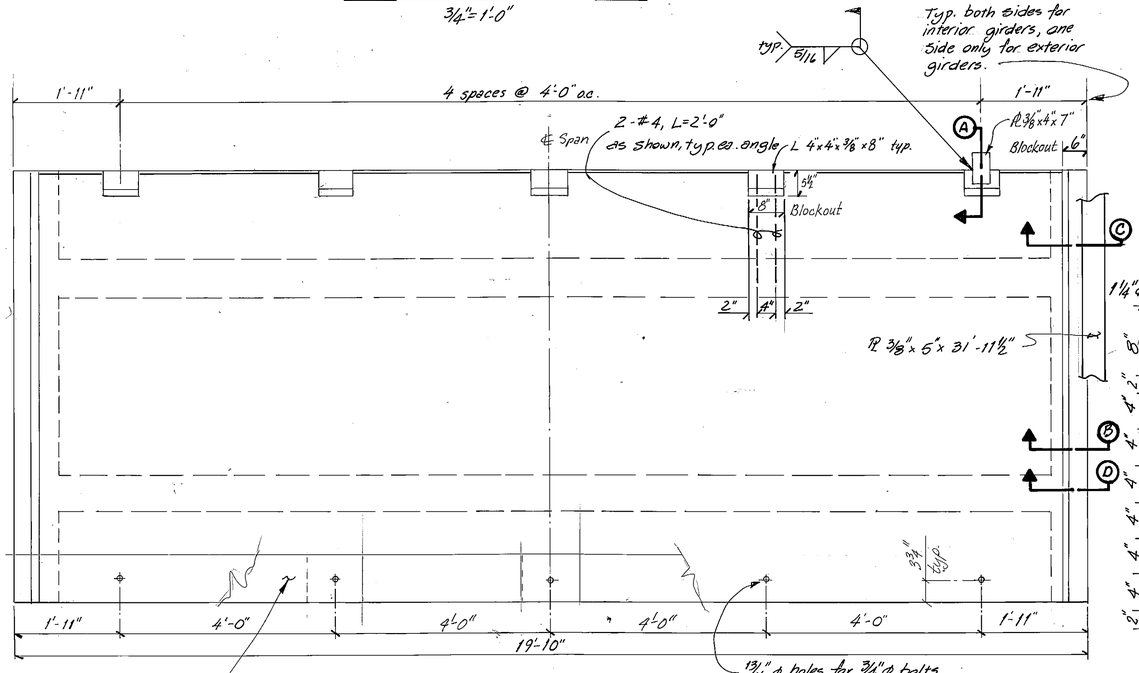
GIRDER BRACKET DETAILS

3"= 1'-0"



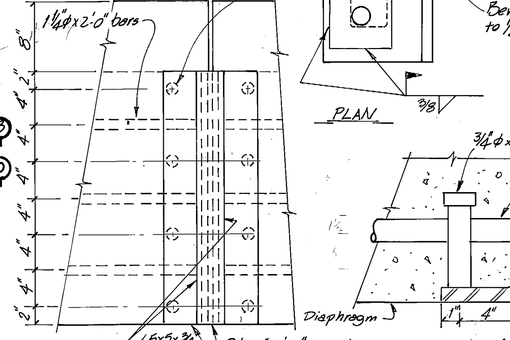
SHEAR KEY DETAIL

3"= 1'-0"



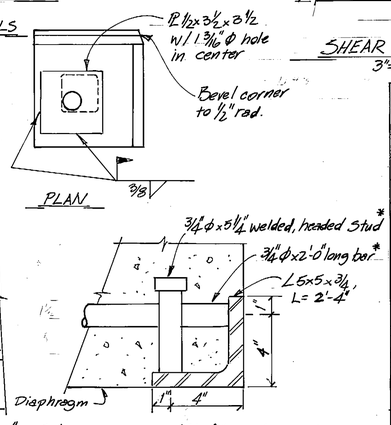
GIRDER PLAN

3/4"= 1'-0"



DIAPHRAGM CONNECTION DETAIL

1½"= 1'-0"

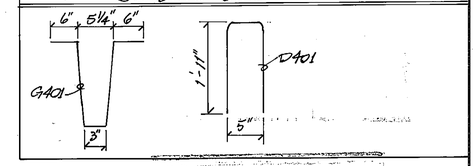


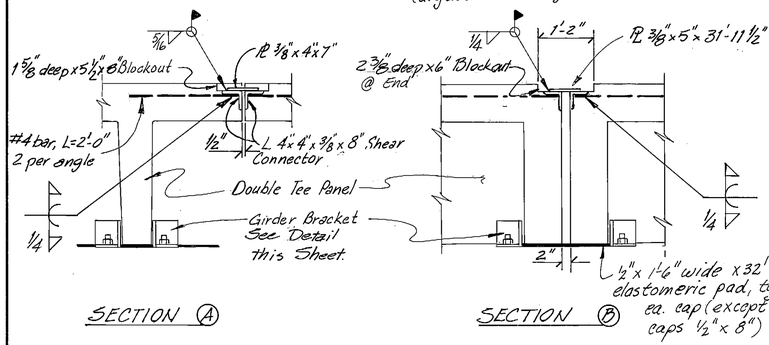
PLAN SECTION

3½"= 1'-0"

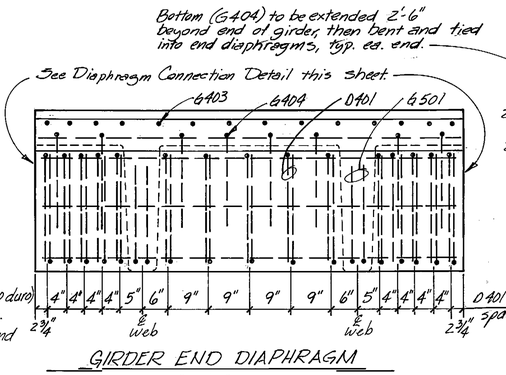
DOUBLE TEE REINFORCEMENT				
MARK	SIZE	NO.	LENGTH	TYPE
G401	4	38	6'-5"	Bent
G402	4	38	7'-7"	—
G403	4	14	19'-8½"	L
G404	4	8	23'-10"	—
G501	5	4	23'-10"	—
G601	6	38	7'-7"	—
D401	4	60	4'-3"	Bent
D402	4	14	7'-7"	—

BENDING DIAGRAMS



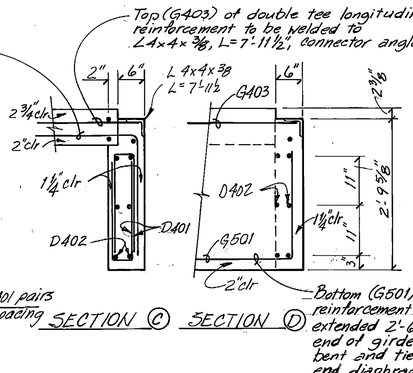


SECTION (A) SECTION (B)



GIRDER END DIAPHRAGM

3/4"= 1'-0"



SECTION (C) SECTION (D)

NOTE: Camber @ Midspan = ½" ±

AS-BUILT

Date: 12-86

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11-22-85

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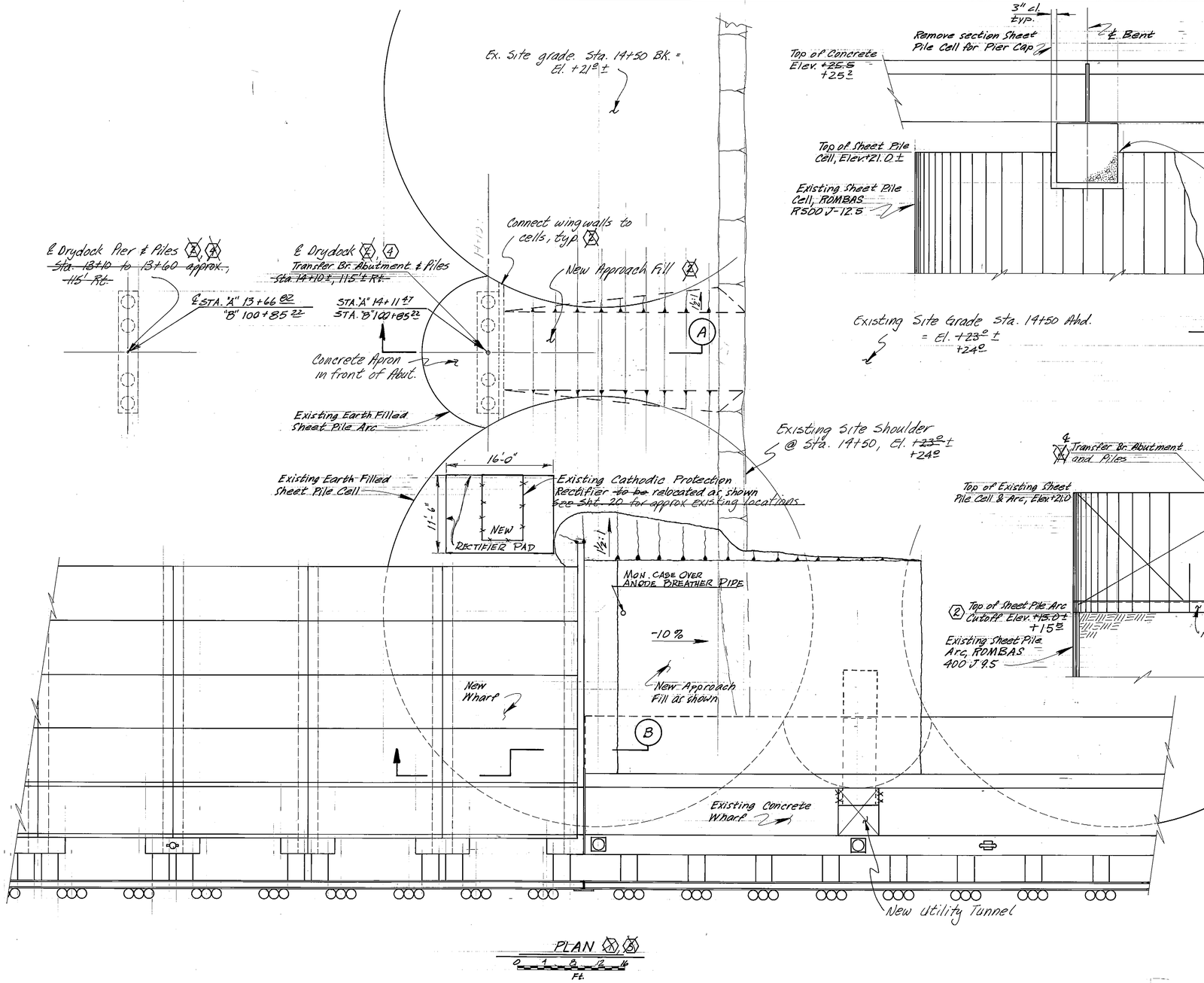
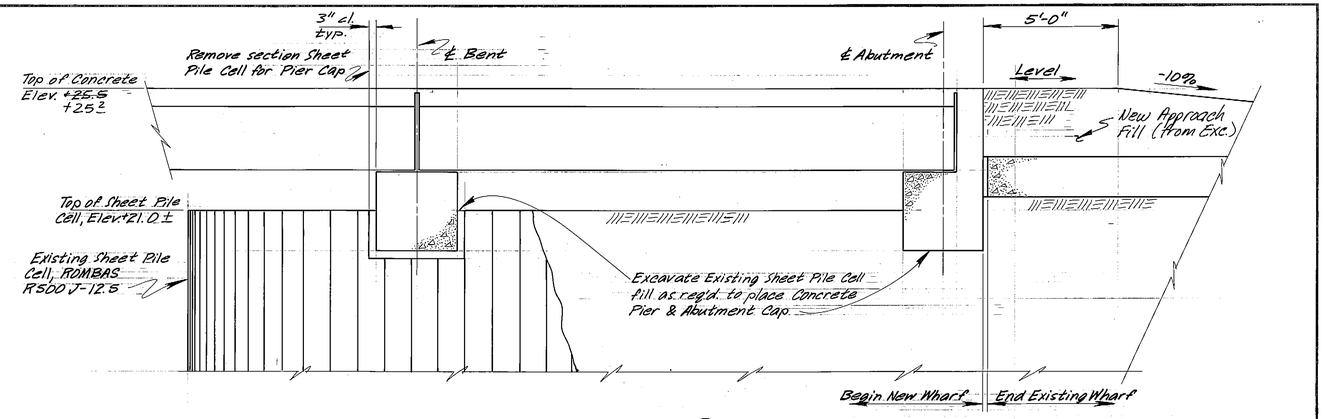
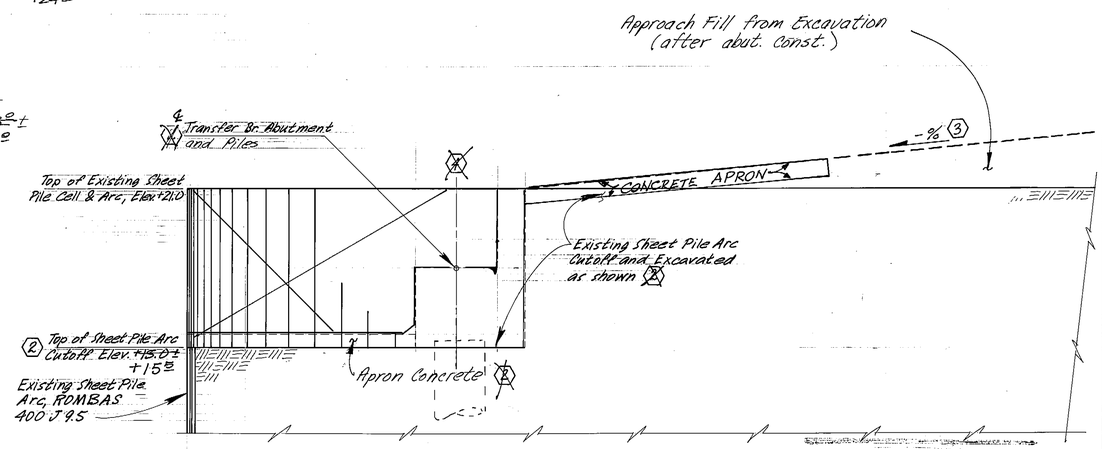
Ketchikan Alaska

DOUBLE TEE DETAILS (ALTERNATE "A")

DESIGNED BAS	CHECKED [illegible]	DRAWN DB	DATE 11-85
PROJECT NUMBER X 70010		SHEET 10	OF 24







AS-BUILT
Date: 12-8-86

NOTES:

1. ~~Existing Wharf Removal, not shown.~~
2. ~~Details, dimensions and elevations to be made available in Spring of 1986 ie; Contingent on Transfer Br. Supplier, See Tech. Spec's. Sections 301-401 and 304-3.12.~~
3. Approach to Tr. Bridge, Slope to meet site shoulder @ El. ~~+23.2±~~ +24.0± @ Sta. "A" 14+50±.
4. ~~Transfer Bridge to be supplied and installed by others.~~
5. Alternate "A" superstructure shown. ~~For Alt. "B" see Sheets 23 & 24~~

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REGISTERED PROFESSIONAL ENGINEER
11-22-85

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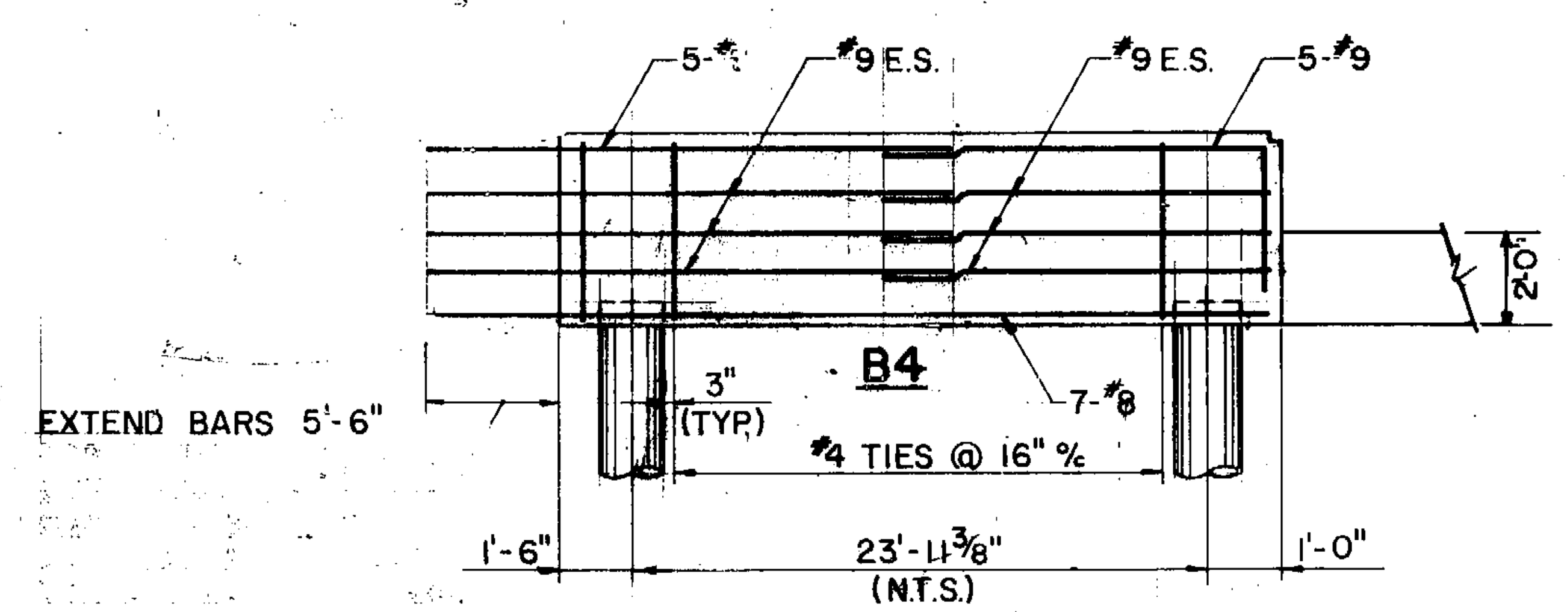
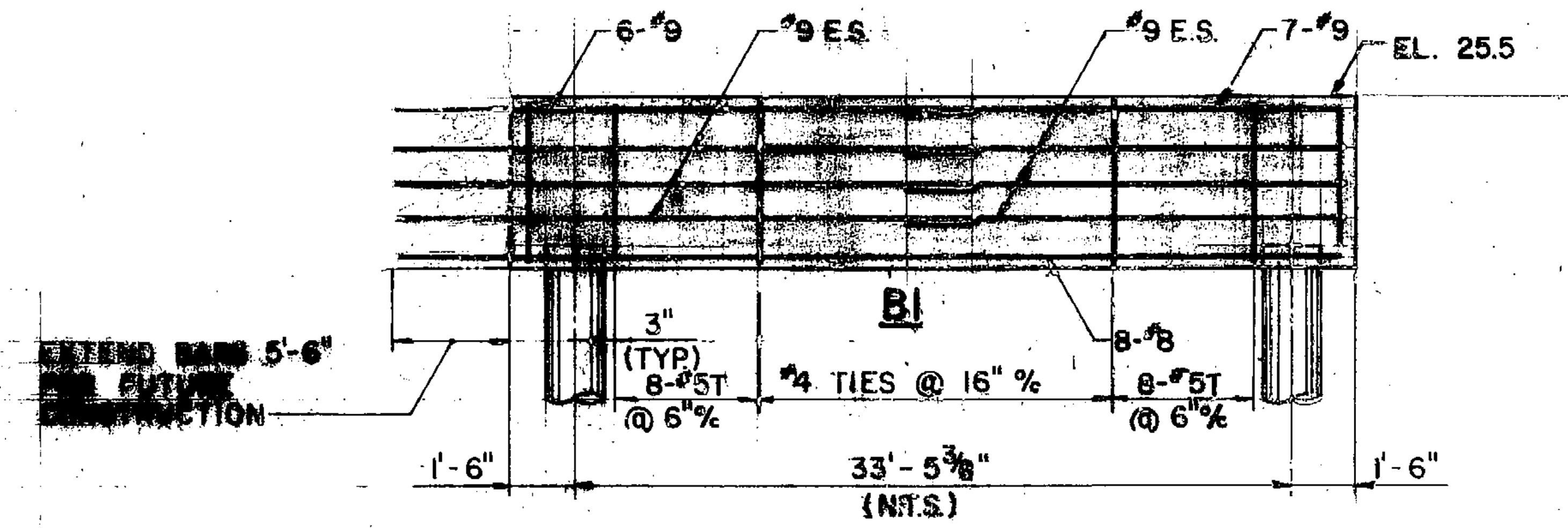
CAP FILL & SHEET Pile REMOVAL DETAILS

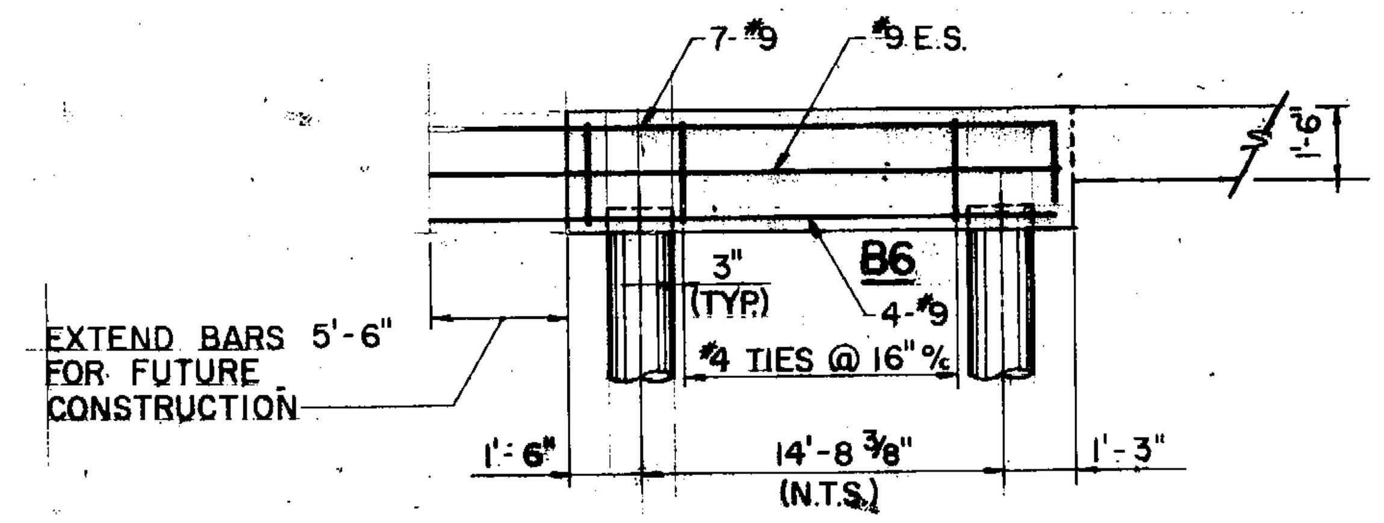
DESIGNED LJB	CHECKED JS	DRAWN LJB	DATE 11/85
PROJECT NUMBER X70010		SHEET 11	OF 24



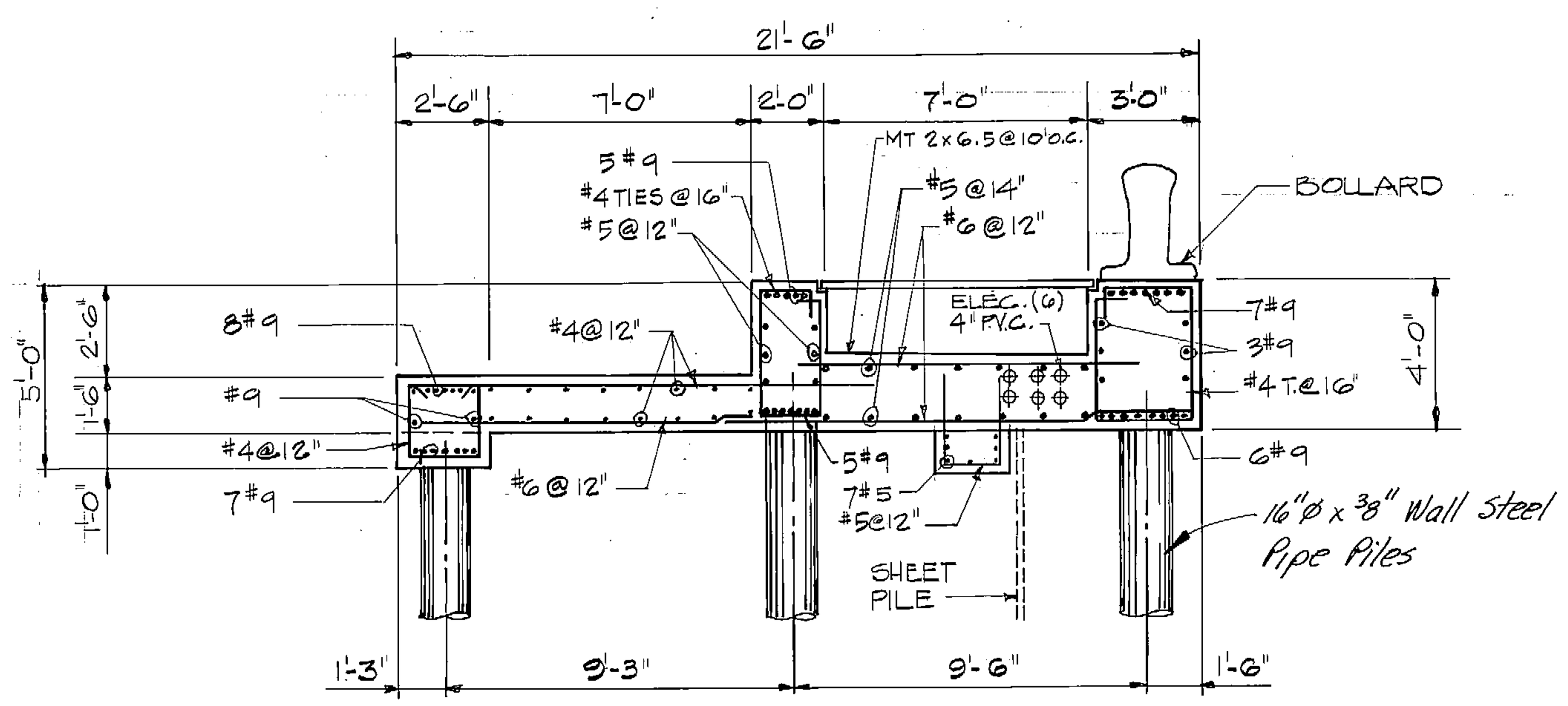
SECTION (A)
SCALE 1" = 4'



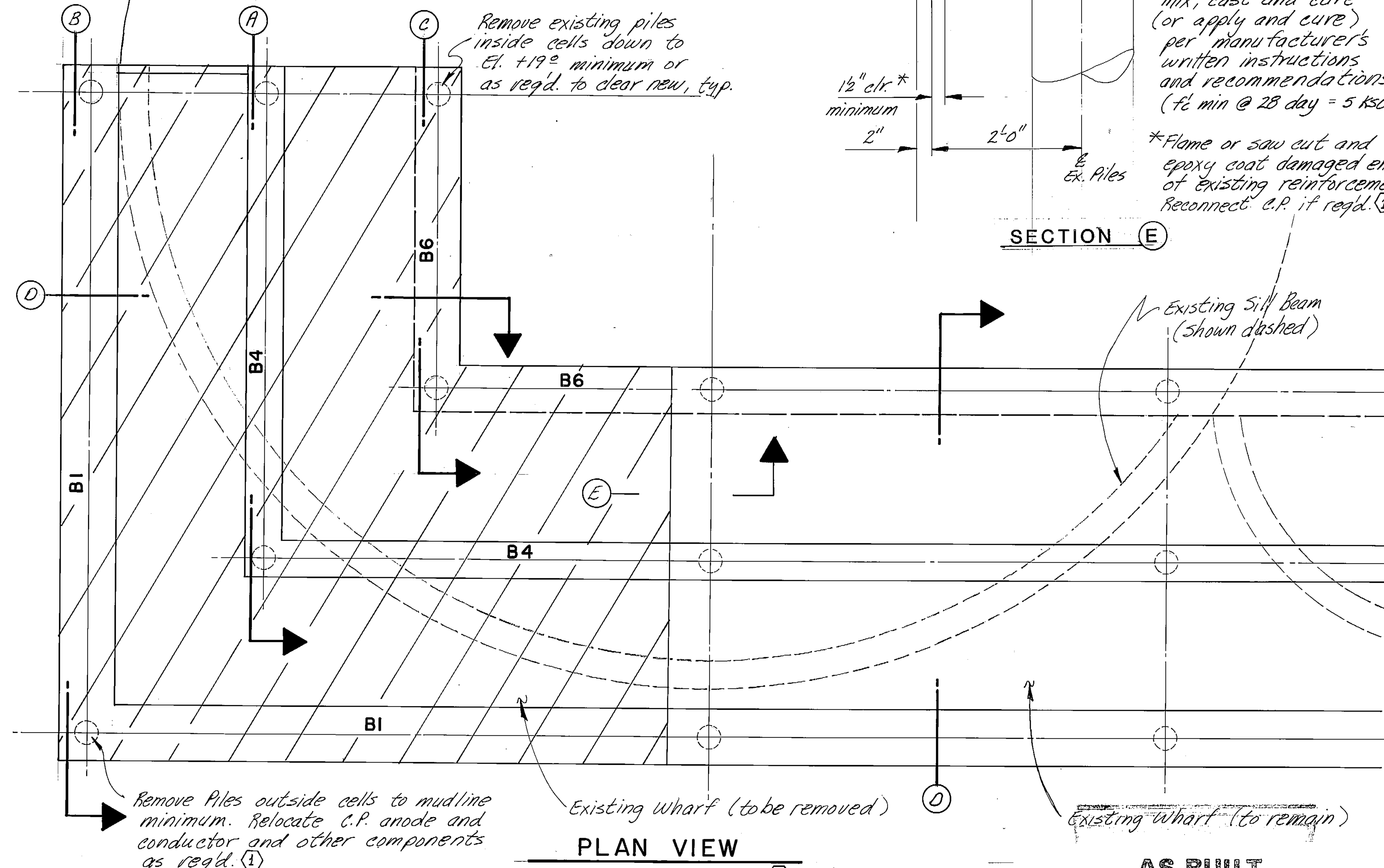
SECTION (B)
SCALE 1" = 4'



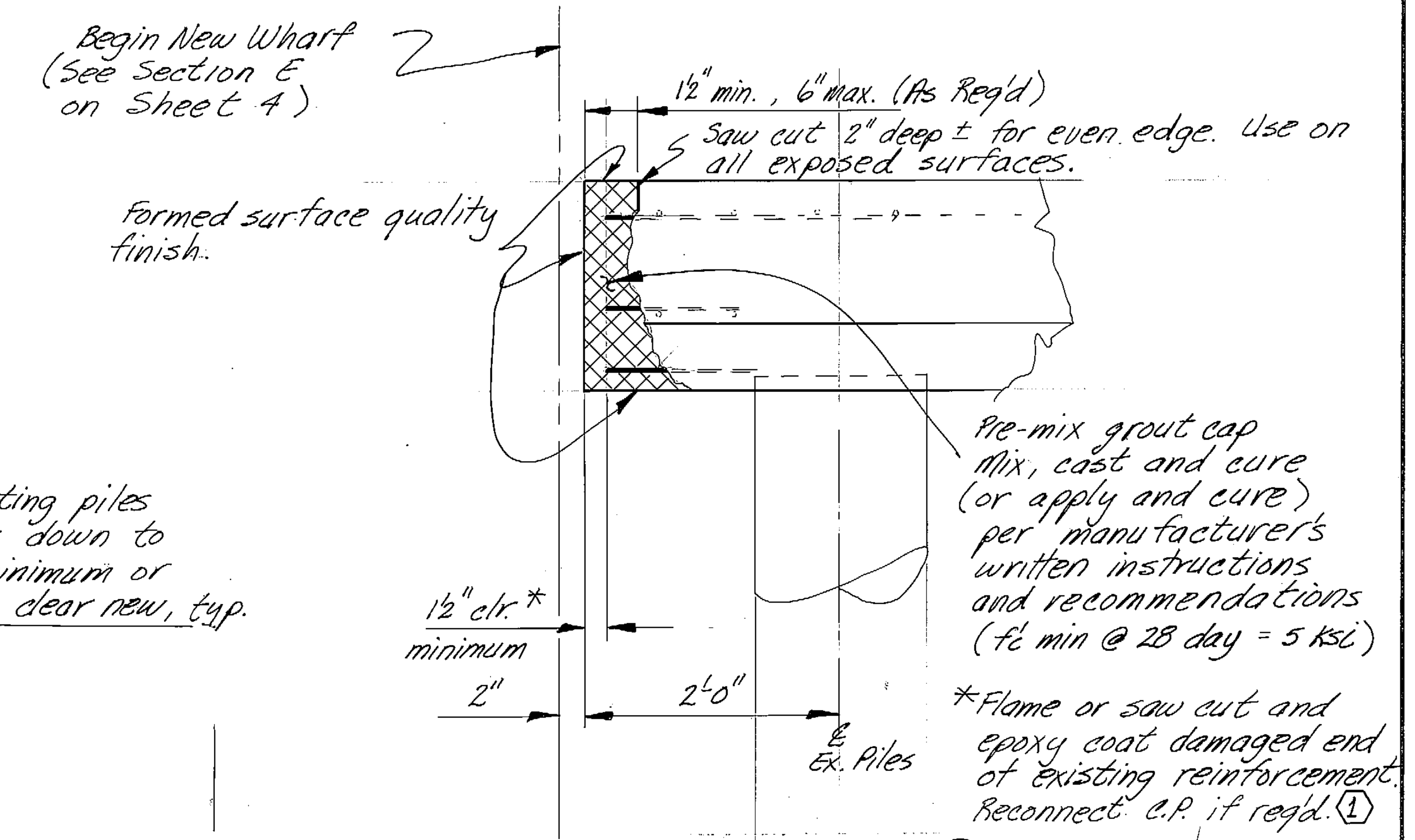
SECTION (C)
SCALE 1" = 4'



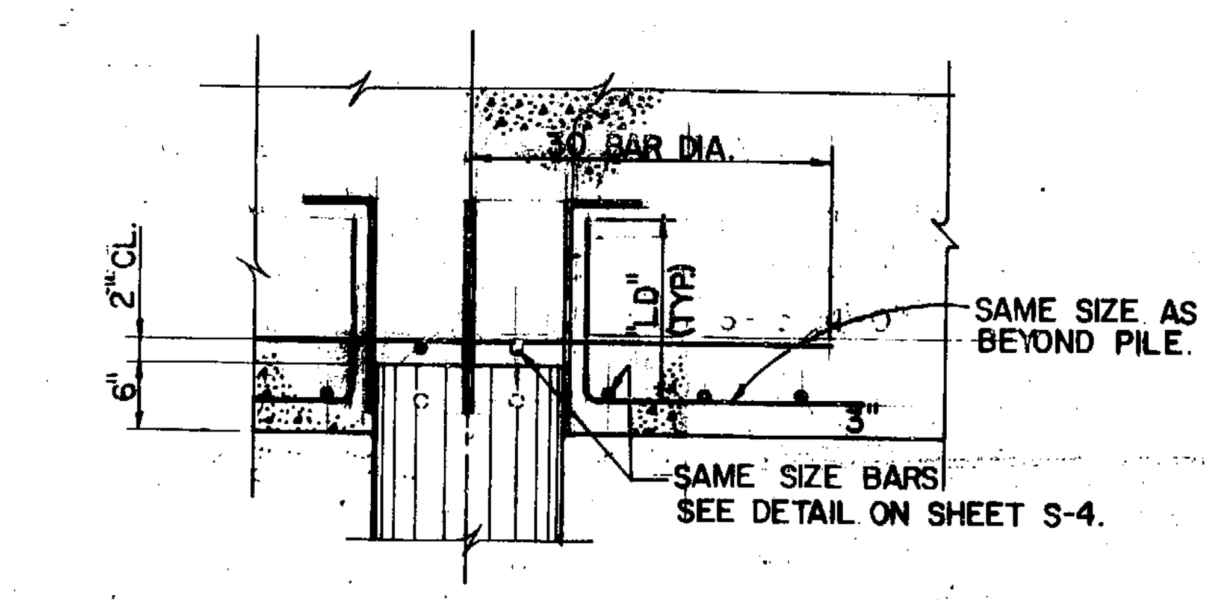
SECTION (D)
SCALE 1" = 4'



PLAN VIEW
EXISTING CONDITIONS (2)



SECTION (E)



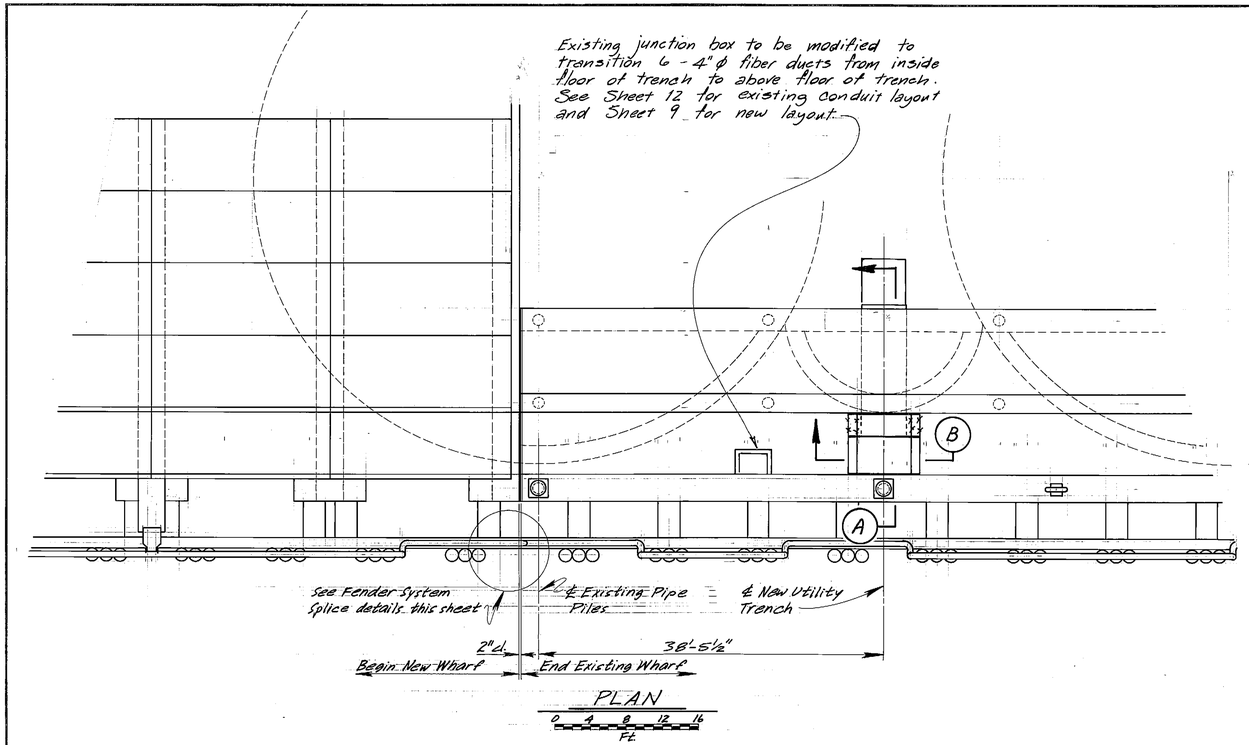
TYPICAL REINFORCING OVER PILES
SCALE: 3/4" = 1'-0"

AS-BUILT
Date: 12-86

NOTES:

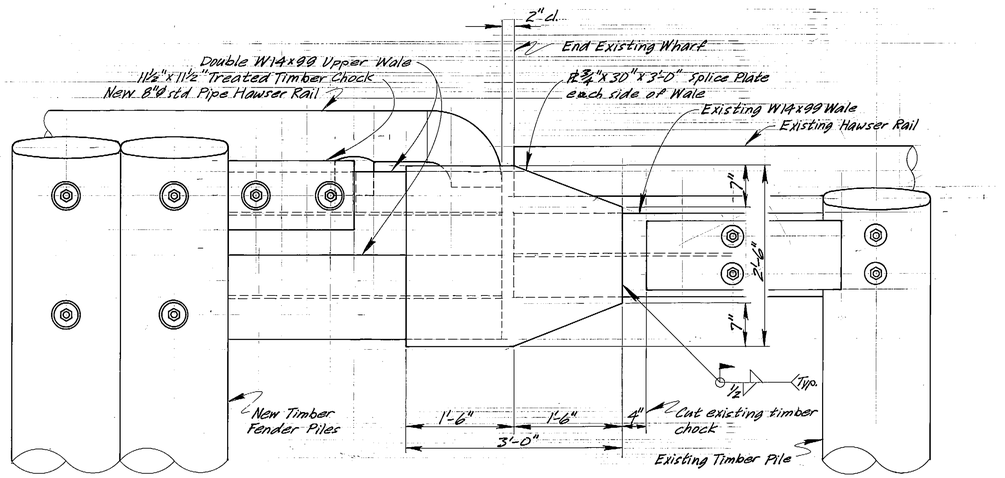
(1) Existing Cathodic Protection Sys. to be relocated as req'd to make way for new. Not shown - See Sheets 20-22
(2) Existing timber pile, steel waled, rubber cushioned fender system, to be removed as required to make way for new. Not shown - See Shts. 4, 8 and 13.

STAMP	DO NOT SCALE THIS DRAWING – USE DIMENSIONS			
STATE OF ALASKA 49TH John T. Scott, II CE 4755 REGISTERED PROFESSIONAL ENGINEER 11-22-85	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES			
	Ketchikan — Alaska EXISTING WHARF REMOVAL AND DETAILS			
	DESIGNED Staff	CHECKED JS	DRAWN Gerald	DATE Nov-85
	PROJECT NUMBER 30-X-700410		SHEET S-12	OF 24



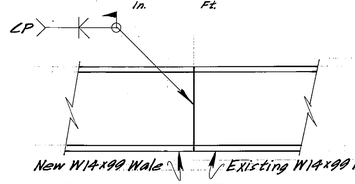
PLAN

0 4 8 12 16 Ft.



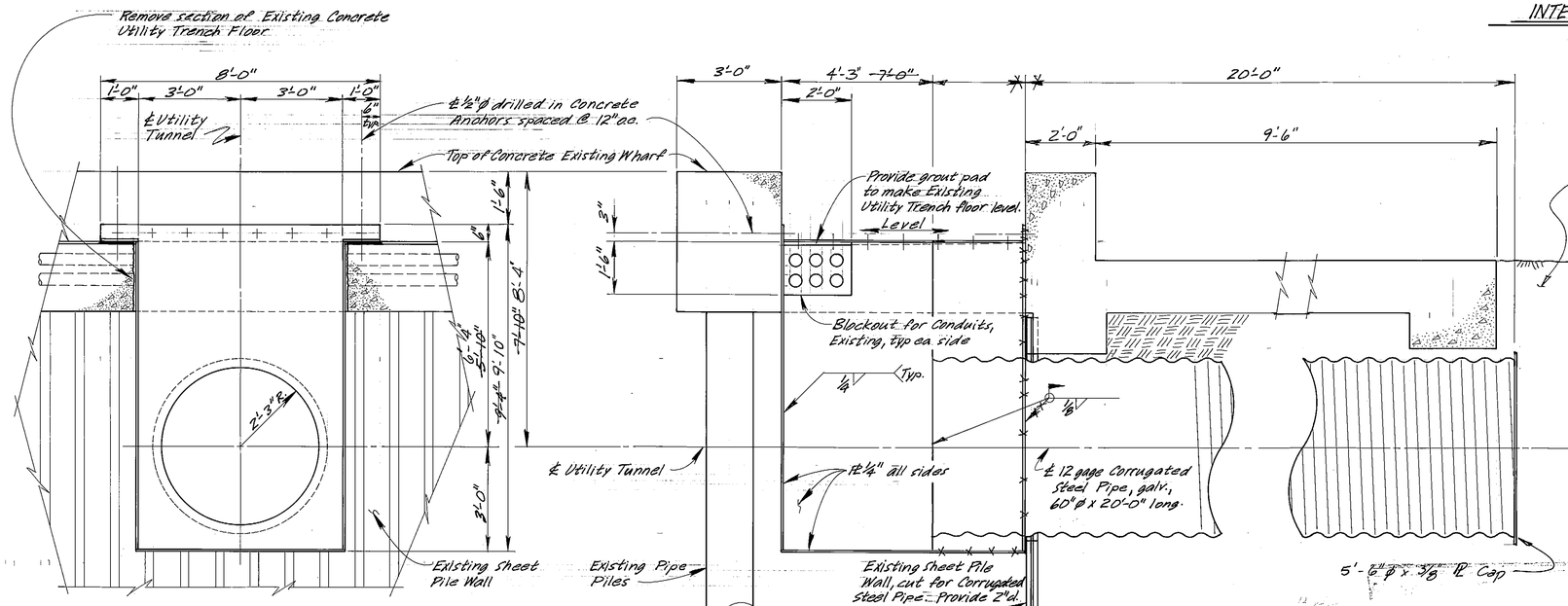
TOP WALE SPLICE

12 6 0 1 In. Ft.



INTERMEDIATE & LOWER WALE SPLICE

12 6 0 1 In. Ft.



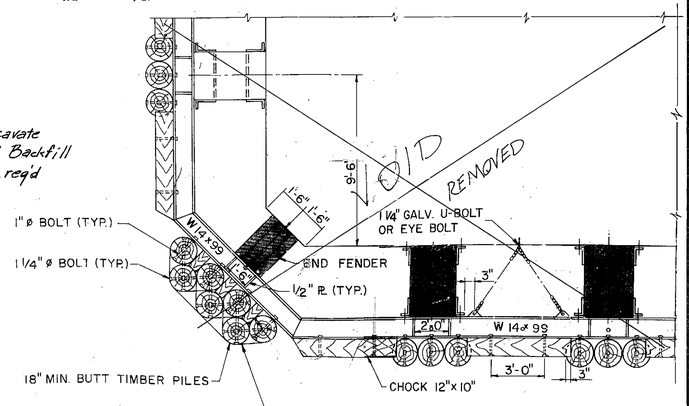
SECTION (B)

12 6 0 1 2 3 In. Ft.

SECTION (A)

12 6 0 1 2 3 In. Ft.

AS-BUILT
Date: 12-86



EXISTING WHARF FENDER DETAIL

1"= 4'-0"

STAMP

STATE OF ALASKA 49TH
John T. Scott, II CE 4755
REGISTERED PROFESSIONAL ENGINEER
11-22-85

DO NOT SCALE THIS DRAWING – USE DIMENSIONS

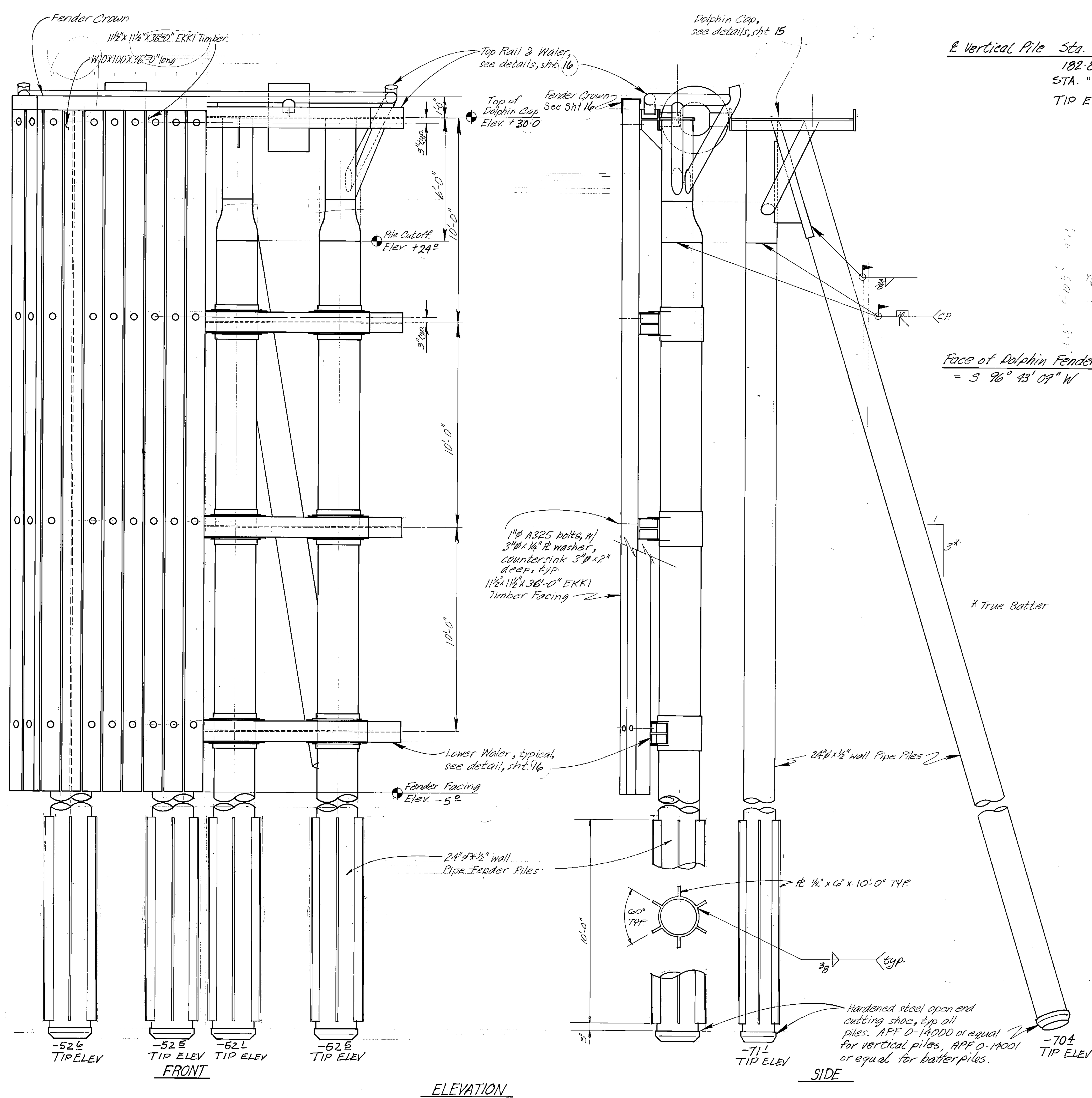
STATE OF ALASKA

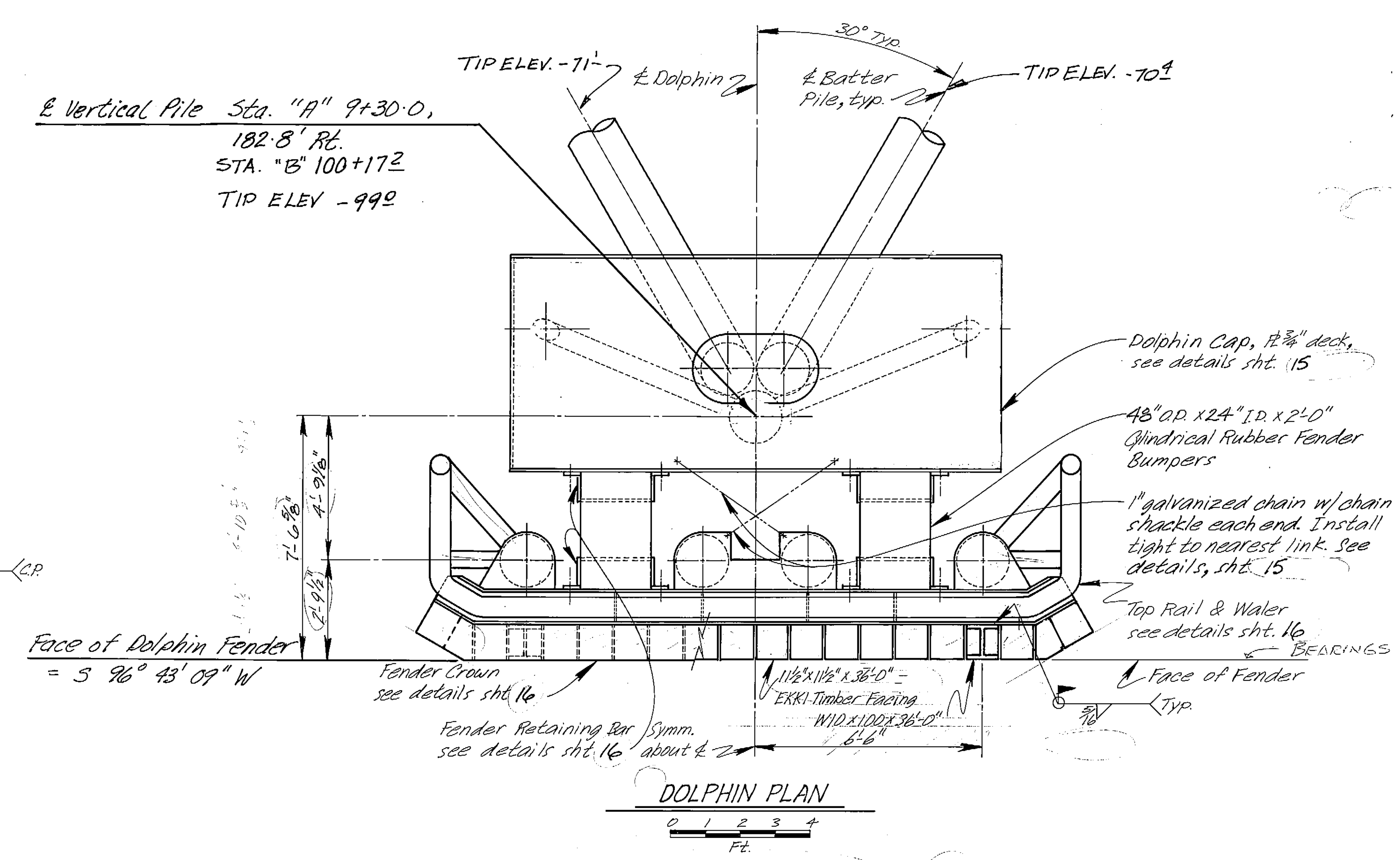
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Ketchikan Alaska

EXISTING WHARF REMOVAL & UTILITY TUNNEL

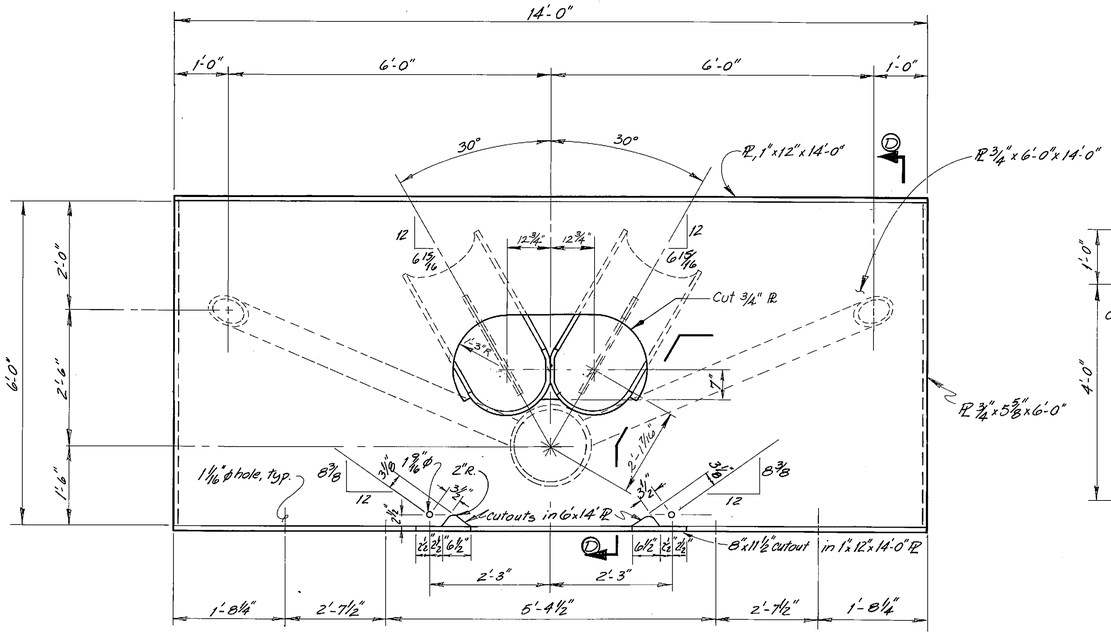
DESIGNED	LVB	CHECKED	JS	DRAWN	LVB	DATE	11/85
PROJECT NUMBER	X 70010			SHEET	13	OF	24


Fender Crown
1½"x 1½"x 36'-0" EKKI Timber
W10x100x36'-0" long
Top Rail & Waler, see details, sht. 16
Top of Dolphin Cap Elev. +30.0
Pile Cutoff Elev. +24.0
Fender Crown See Sht 16
Dolphin Cap, see details, sht 15
1"⌀ A325 bolts, w/ 3"⌀x¼" ℞ washer, countersink 3"⌀x2" deep, typ.
1½"x1½"x36'-0" EKKI Timber Facing
Lower Waler, typical, see detail, sht. 16
Fender Facing Elev. -5.0
24"⌀x½" wall Pipe Fender Piles
24"⌀x½" wall Pipe Piles
℞ ½" x 6" x 10'-0" TYP.
60° TYP.
typ.
C.P.
*True Batter
Hardened steel open end cutting shoe, typ all piles. APF 0-14000 or equal for vertical piles, APF 0-14001 or equal for batter piles.
-52.6 TIP ELEV
-52.5 TIP ELEV
-52.1 TIP ELEV
-52.5 TIP ELEV
-71.1 TIP ELEV
-70.4 TIP ELEV
FRONT
SIDE
ELEVATION
0 1 2 3 4 Ft.

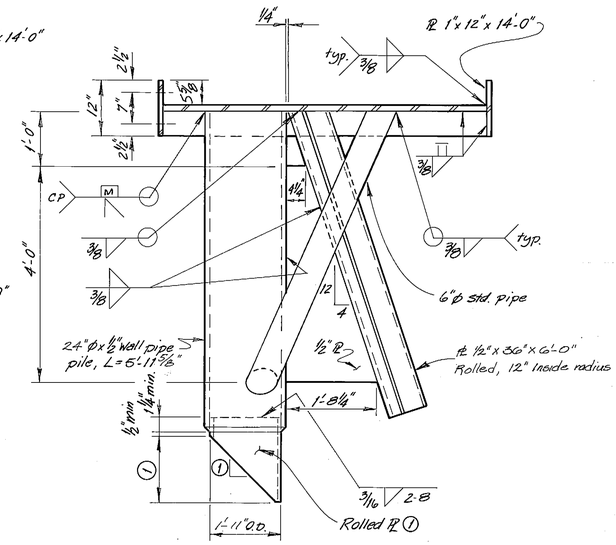

TIP ELEV. -71.1
℄ Dolphin
℄ Batter Pile, typ.
30° Typ.
TIP ELEV. -70.4
℄ Vertical Pile Sta. "A" 9+30.0, 182.8' Rt.
STA. "B" 100+17.2
TIP ELEV -99.0
Dolphin Cap, ℞ ⅜" deck, see details sht. 15
48"O.D. x 24" I.D. x 2'-0" Cylindrical Rubber Fender Bumpers
1" galvanized chain w/ chain shackle each end. Install tight to nearest link. See details, sht. 15
Top Rail & Waler see details sht. 16
BEARINGS
Face of Fender
Typ.
Face of Dolphin Fender = S 96° 43' 09" W
Fender Crown see details sht 16
1½"x1½"x36'-0" EKKI Timber Facing
W10x100x36'-0"
Fender Retaining Bar see details sht 16
Symm. about ℄
DOLPHIN PLAN
0 1 2 3 4 Ft.

AS-BUILT
Date: 12-86

STAMP	DO NOT SCALE THIS DRAWING – USE DIMENSIONS
STATE OF ALASKA · REGISTERED PROFESSIONAL ENGINEER · James A. Lowell #CE-5597 · 49TH	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES Ketchikan — Alaska DOLPHIN PLAN & ELEVATIONS
	DESIGNED LS · CHECKED BAS · DRAWN LJB-G · DATE 6284-11/85
	PROJECT NUMBER X70010 · SHEET 14 OF 24

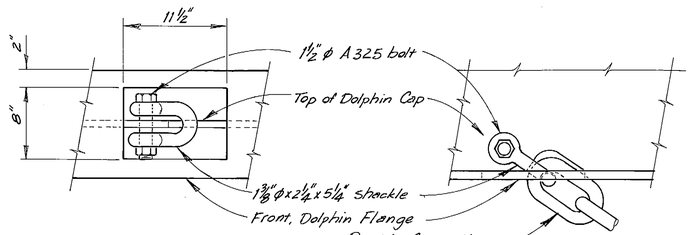


DOLPHIN CAP DETAILS
3/4" = 1'-0"

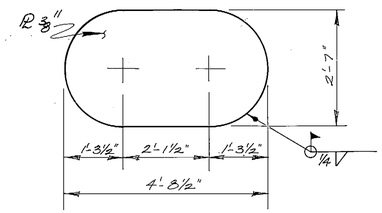


1 Contractor's option (fab. and shape) 1/4" PL min.

SECTION D-D
3/4" = 1'-0"



DOLPHIN CHAIN CONNECTION
N.T.S.



COVER PL DETAIL
3/4" = 1'-0"

AS-BUILT
Date: 12-86

STAMP

STATE OF ALASKA 49TH
James A. Lowell #CE-5597 REGISTERED PROFESSIONAL ENGINEER
11/25/85

DO NOT SCALE THIS DRAWING — USE DIMENSIONS

STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Ketchikan Alaska

DOLPHIN CAP DETAILS

DESIGNED	CHECKED	DRAWN	DATE
JS	BMS	WJB-G	11-85

PROJECT NUMBER X70010 SHEET 15 OF 24

ELEVATION

PLAN

TOP RAIL & WALER

LOWER WALER

FENDER CROWN

END ELEVATION

SECTION A

SECTION B

SECTION C

SECTION D

FENDER RETAINING BAR

CORNER ERKI FACING

W.T.S.

AS-BUILT
Date: 12-86

STAMP	DO NOT SCALE THIS DRAWING – USE DIMENSIONS
STATE OF ALASKA 49TH — James A. Lowell #CE-5597 — REGISTERED PROFESSIONAL ENGINEER — 11/25/85	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES Ketchikan Alaska DOLPHIN FENDER DETAILS
DESIGNED BS CHECKED [illegible] DRAWN LJB G DATE 6/84 11/85	
PROJECT NUMBER X70010 SHEET 16 OF 24	

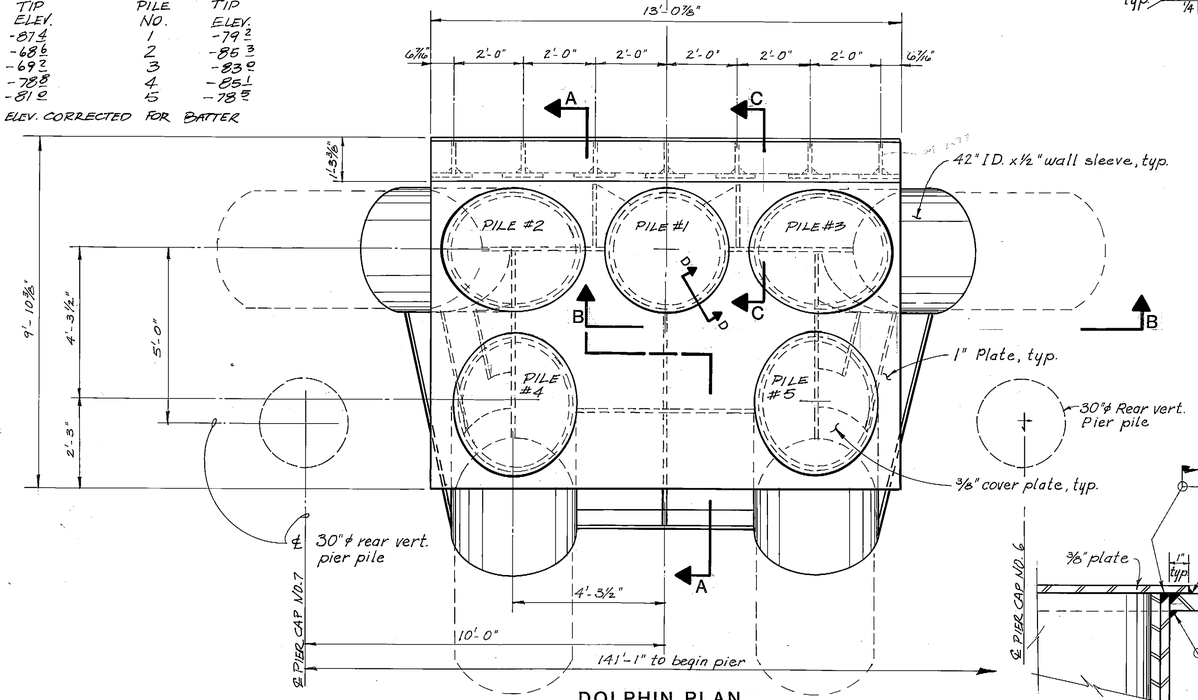
DOLPHIN A

TO DOLPHIN B ← 373'-8¾" (360'± Exact location to be verified by Drydock Mfgr.)

℄ Symetrical about STA. "A" 13+13.84

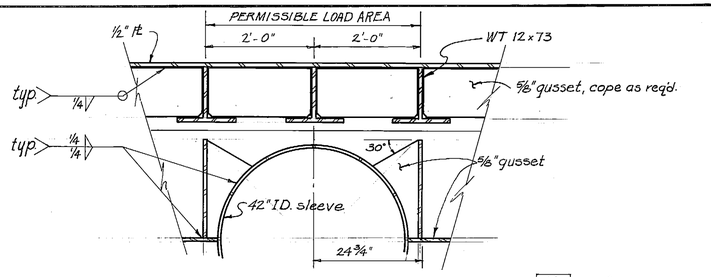
DOLPHIN PILE NO.	A TIP ELEV.	DOLPHIN PILE NO.	B TIP ELEV.
1	-87.4	1	-79.2
2	-68.6	2	-85.3
3	-69.2	3	-83.9
4	-78.8	4	-85.1
5	-81.2	5	-78.3

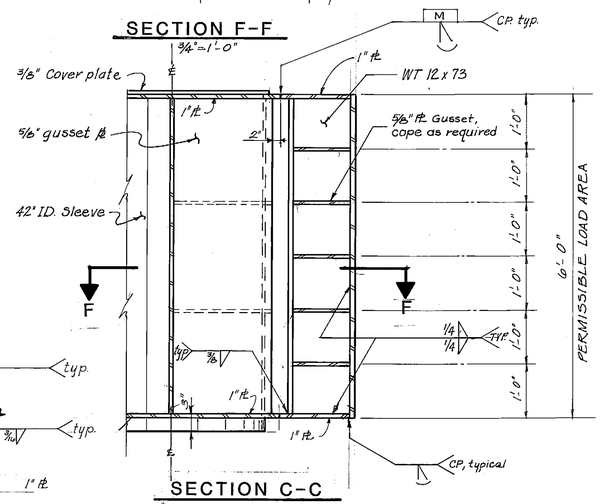
TIP ELEV. CORRECTED FOR BATTER



DOLPHIN PLAN

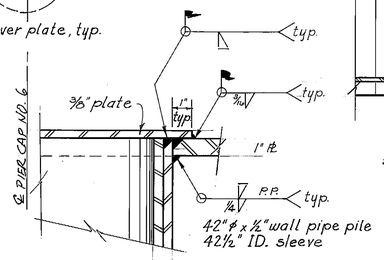
½" = 1'-0"





SECTION C-C

¾" = 1'-0"



SECTION D-D

3" = 1'-0"

NOTES:

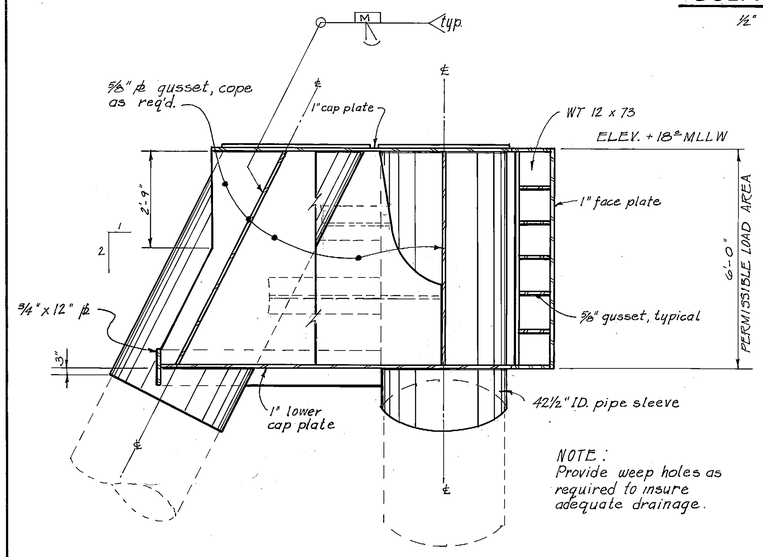
1. Permissable load area refers to allowable area within which to situate connection hardware for drydock. Connection to be made by others.
2. ~~Exact location of drydock restraint dolphin B to be verified by drydock mfgr. Locations shown are preliminary and subject to change.~~

VIEW E-E

Lower Cap Plate

½"=1'-0"

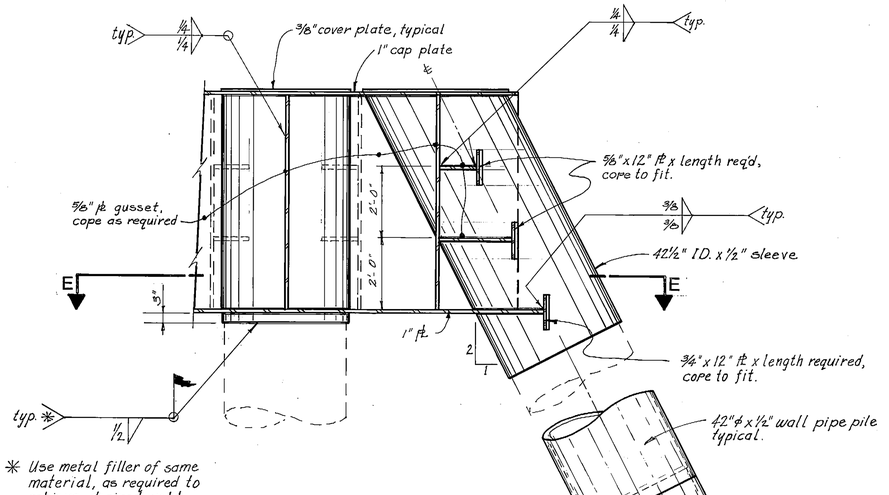
AS-BUILT
Date: 12-86



NOTE:
Provide weep holes as required to insure adequate drainage.

SECTION A-A

½" = 1'-0"



* Use metal filler of same material, as required to achieve desired weld.

SECTION B-B

½" = 1'-0"

STAMP

STATE OF ALASKA 49TH
(James A. Lowell #CE-5597)
REGISTERED PROFESSIONAL ENGINEER
11/25/85

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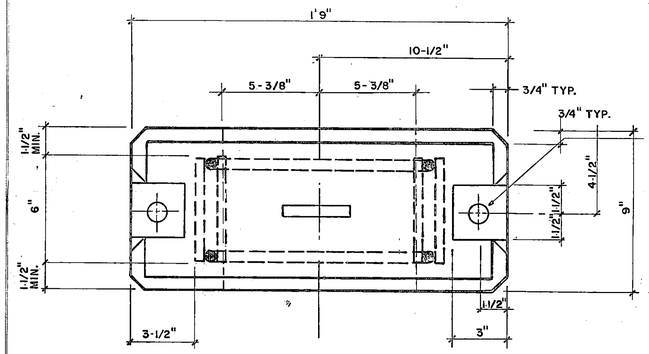
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Ketchikan Alaska

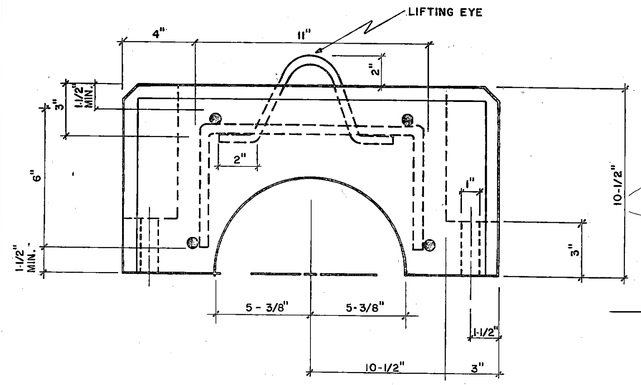
DRYDOCK DOLPHIN

DESIGNED JAL	CHECKED JAL/B	DRAWN JAL & G	DATE 11-85		
PROJECT NUMBER X70010		SHEET 17	OF 24		



TOP

SIDE



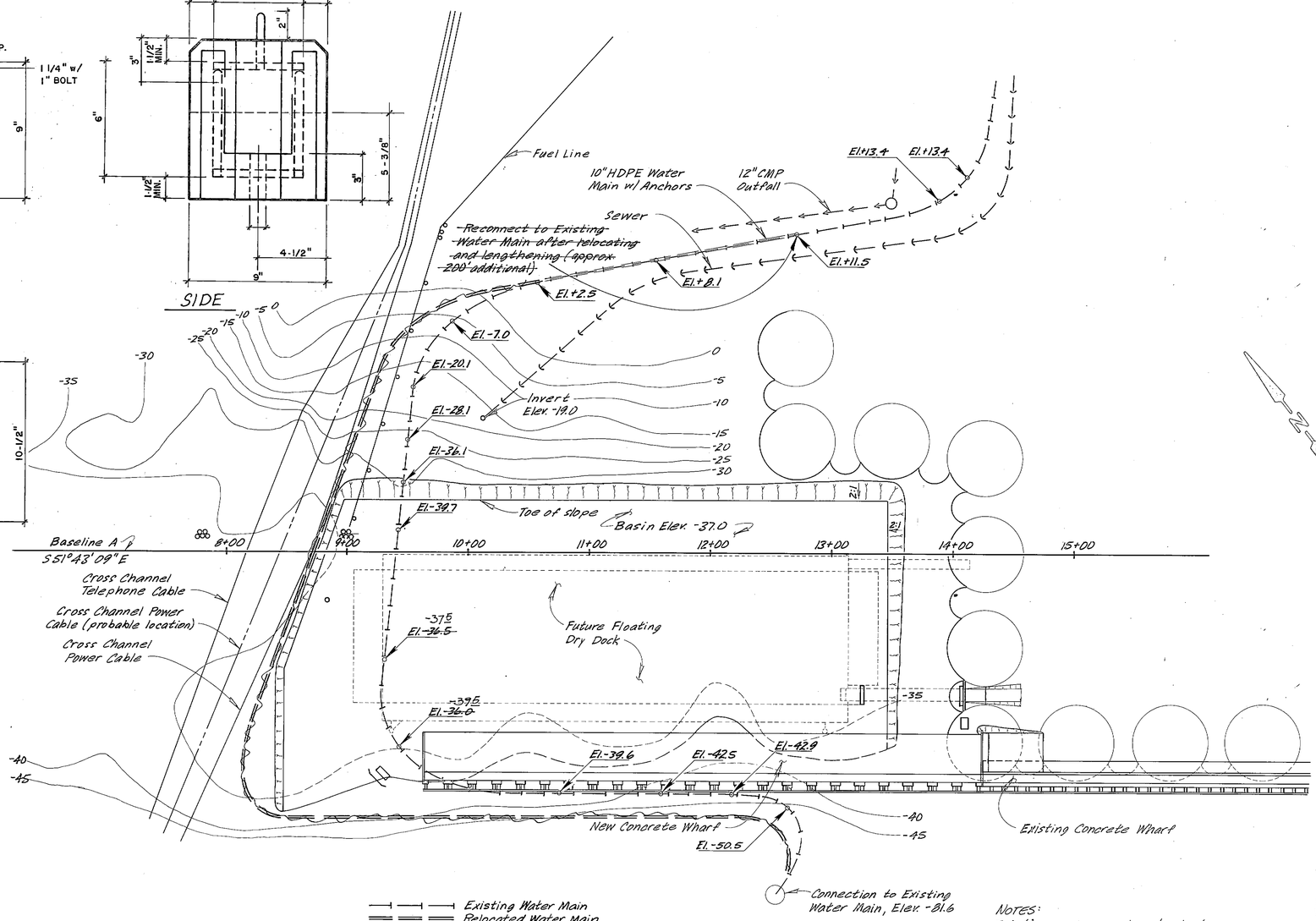
FRONT

CONCRETE PIPE ANCHOR

N.T.S.

CONCRETE ANCHOR NOTES:

1. REINFORCING STEEL SHALL BE #6 DEFORMED BARS.
2. EXPOSED EDGES SHALL HAVE A 3/4" CHAMFER AS SHOWN.
3. ANCHORS ARE SYMMETRICAL ABOUT CENTERLINES.
4. EACH ANCHOR CONSISTS OF A TOP AND BOTTOM HALF. THE HALVES SHALL BE BOLTED TOGETHER WITH 1" DIA. X 8" LONG STAINLESS STEEL BOLT WITH STAINLESS STEEL WASHER UNDER THE BOLT HEAD AND NUT.
5. PRIOR TO BOLTING THE ANCHOR ON TO THE PIPE, THE PIPE SHALL BE WRAPPED IN A 1/8" THICK RUBBER GASKETING MATERIAL AT EACH ANCHOR LOCATION TO PROTECT THE PIPE.
6. THE LIFTING EYE SHALL BE #6 REINFORCING BAR.



Existing Water Main
Relocated Water Main

SITE PLAN

0 20 40 60 80 100
Ft.

EXISTING WATERLINE NOT DISTURBED

AS-BUILT
Date: 12-86

NOTES:
1. Existing main maybe buried.
2. Elev. shown along existing are approximate.
3. Relocation alignment is approximate.
4. Contractor shall burry new pipe above elev. -5. Below Elev. -10 pipe may be laid on the bottom, except in curves where pipe shall be buried 2' minimum.

STAMP

STATE OF ALASKA
49TH
John T. Scott, II
CE 4755
REGISTERED PROFESSIONAL ENGINEER
11-25-85

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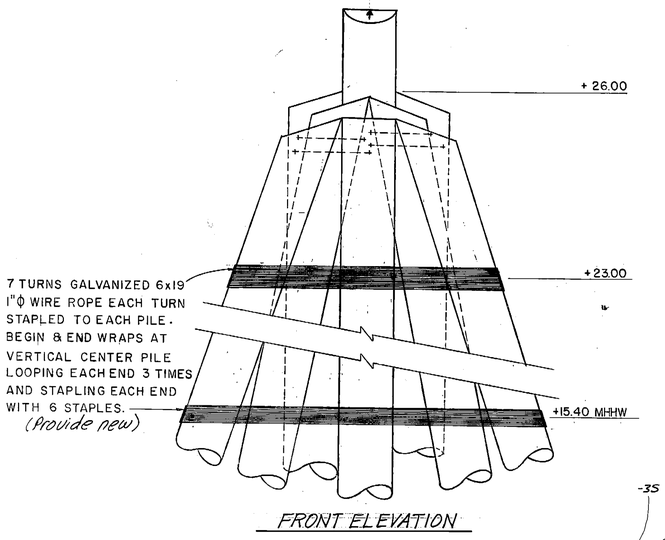
STATE OF ALASKA
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

Ketchikan Alaska

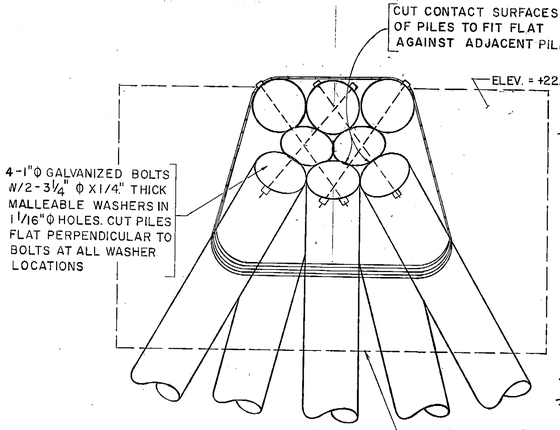
WATER LINE RELOCATION

DESIGNED	CHECKED	DRAWN	DATE
-B	BAS	LVB	11/85

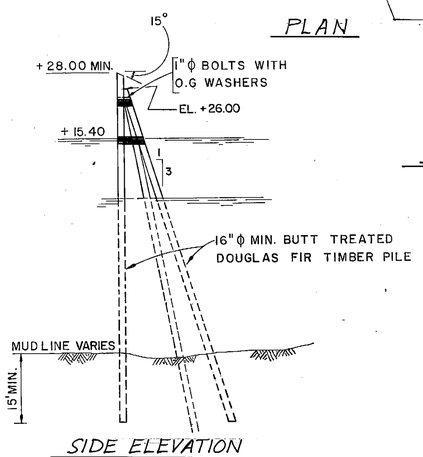
PROJECT NUMBER X70010 SHEET 18 OF 24



FRONT ELEVATION

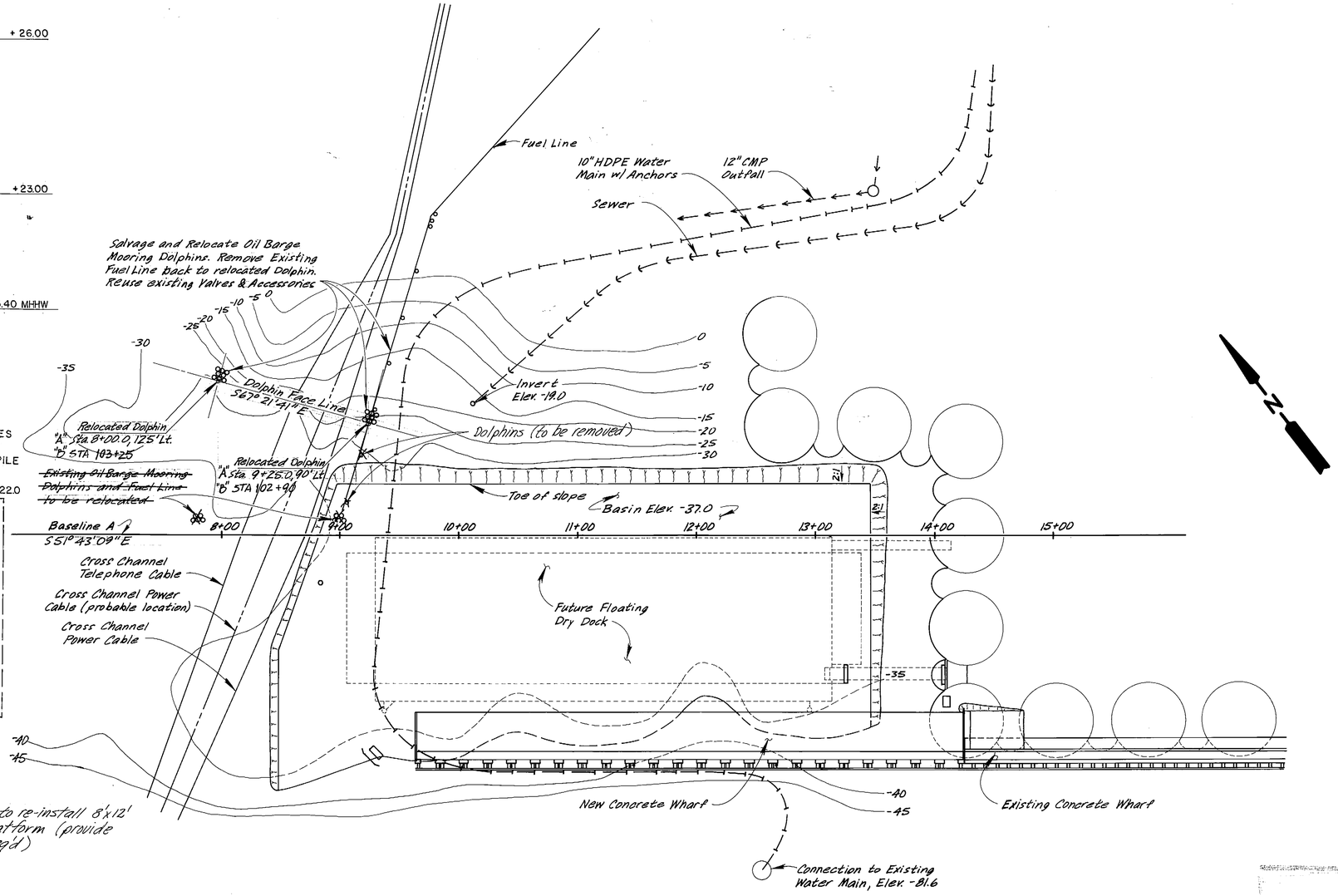


PLAN



SIDE ELEVATION

OIL BARGE MOORING DOLPHIN
N.T.S.

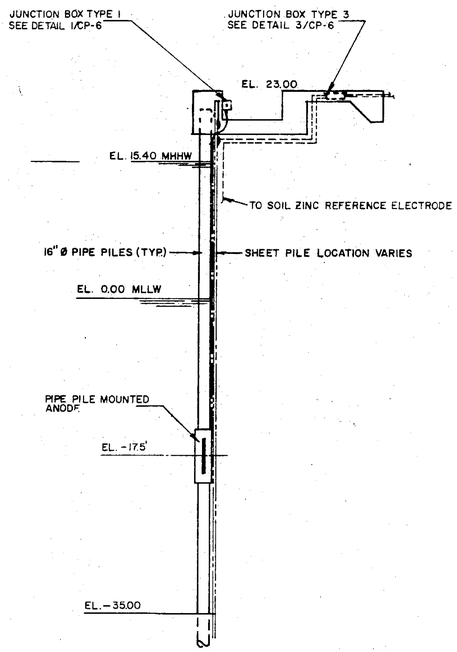


SITE PLAN

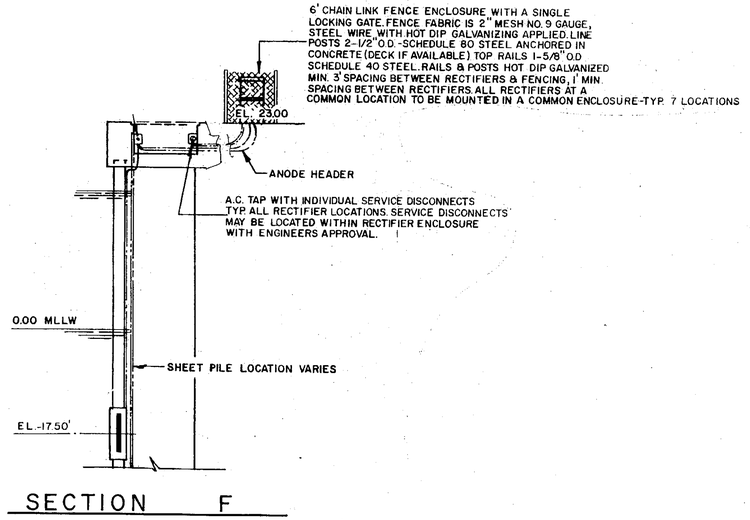
0 20 40 60 80 100
Ft.

AS-BUILT
Date: 12-86

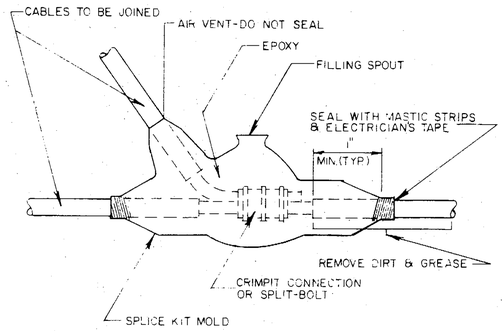
STAMP	DO NOT SCALE THIS DRAWING – USE DIMENSIONS
STATE OF ALASKA 49TH John T. Scott, II No. 3 REGISTERED PROFESSIONAL ENGINEER 11-25-85	STATE OF ALASKA DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES Ketchikan Alaska MOORING DOLPHIN & FUEL LINE RELOCATION
DESIGNED LJB CHECKED JS DRAWN LJB DATE 11/85 PROJECT NUMBER X70010 SHEET 19 OF 24	



SECTION E



SECTION F



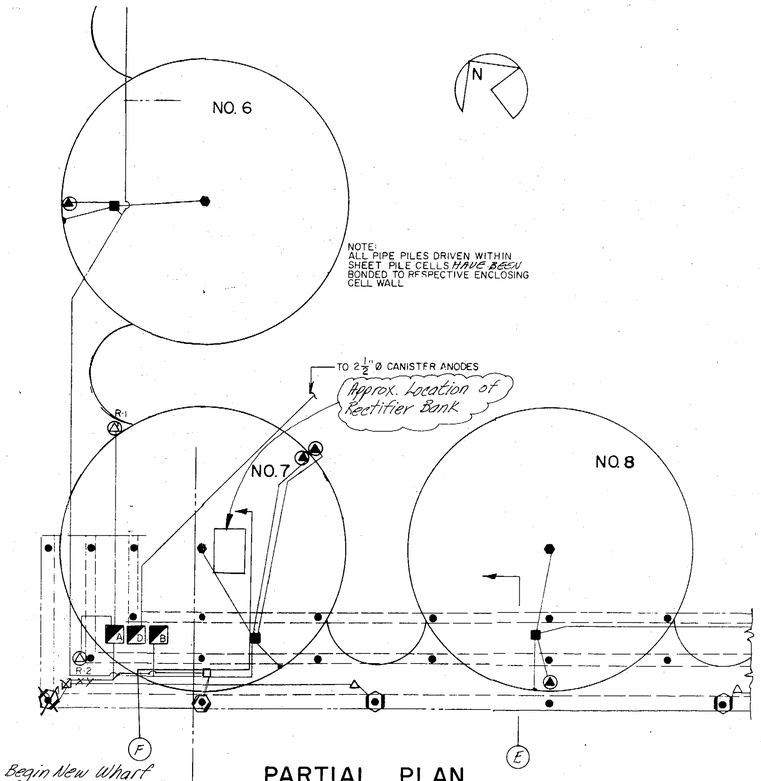
TYPICAL SPLICE

LEGEND

- ANODE HEADER SPLICE
- INDICATES PIPE PILE
- INDICATES BATTERED PIPE PILE AND DIRECTION OF BATTER
- ANODE JUNCTION BOX
- ZINC REFERENCE ELECTRODE - SOIL
- CANISTER ANODE (3" Ø)
- PILE MOUNTED ANODE - PAIR
- PILE MOUNTED ANODE - SINGLE

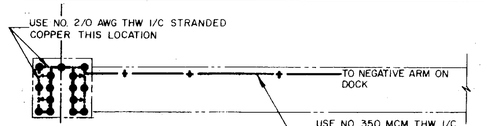
(BOLD FACE INDICATES ANODE ELEMENT LOCATION)

- ANODE JUNCTION BOX
- ANODE JUNCTION BOX
- ZINC REFERENCE ELECTRODE - MARINE
- RECTIFIER, SIZE INDICATED IN LOWER RIGHT
- ANODE SLED
- CANISTER ANODE (2 1/2" Ø)



PARTIAL PLAN

NOTES



NEGATIVE BONDING WIRING SCHEDULE

NO. 4/0 AWG THW, I/C STRANDED COPPER OR TWO EACH NO. 6 DEFORMED BILLET STEEL BARS WITH WELDED SPLICES EPOXY COATED-NO WIRE TIES ALLOWED

NO. 2/0 AWG THW, I/C STRANDED COPPER OR TWO EACH NO. 4 DEFORMED BILLET STEEL BARS WITH WELDED SPLICES EPOXY COATED-NO WIRE TIES ALLOWED

NO. 6 AWG HMW/PE I/C STRANDED COPPER OR ONE NO. 4 EPOXY COATED DEFORMED BILLET STEEL BARS WITH WELDED SPLICES EPOXY COATED-NO WIRE TIES ALLOWED

ANODE WIRING SCHEDULE

SEE ANODE/JUNCTION BOX DETAILS & SCHEMATIC

NOTE: ALL BONDING WIRES NOT IMBEDDED IN CONCRETE OR DIRECT BURIED TO BE RUN IN VINYL COATED MILD STEEL RIGID CONDUIT. THOSE WIRES IMBEDDED IN CONCRETE TO HAVE A MINIMUM OF 2" COVER. THOSE WIRES DIRECT BURIED IN BACKFILL TO HAVE A MINIMUM OF 24" COVER. ALL CONDUIT (POSITIVE OR NEGATIVE ARM OR A.C.) IN DIRECT CONTACT WITH SOIL SHALL BE BONDED TO THE CLOSEST SHEET PILE WALL. A SEPERATE NEGATIVE LEAD (STRUCTURE) IS REQUIRED FOR EACH RECTIFIER TO NEAREST PILING OR NEGATIVE STRUCTURAL BONDING.

NOTES:

(1.) Existing CP System is at present un-powered. North Wharf Contractor to relocate and re-connect existing items as required to make way for new work.

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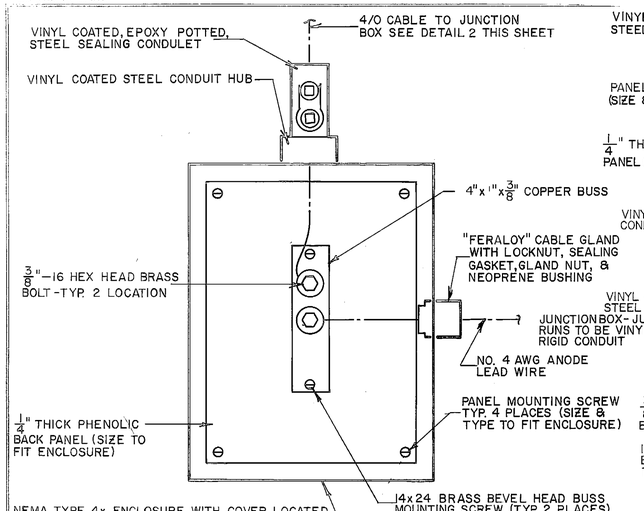
DEPARTMENT OF TRANSPORTATION AND PUBLIC FACILITIES

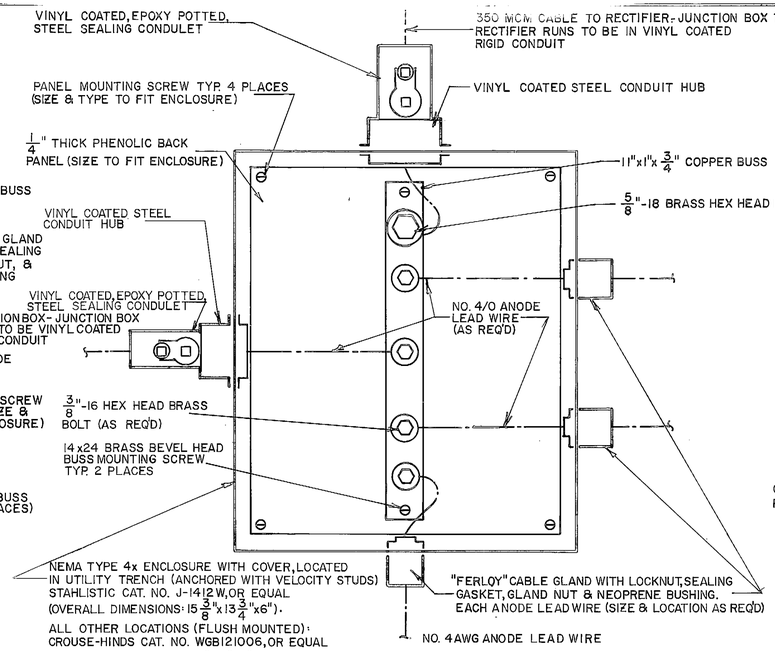
Ketchikan Alaska

EXISTING CATHODIC PROTECTION SYSTEM / DETAILS

DESIGNED Staff	CHECKED [illegible]	DRAWN [illegible]	DATE 11-85
PROJECT NUMBER X70010		SHEET 20 OF 24	



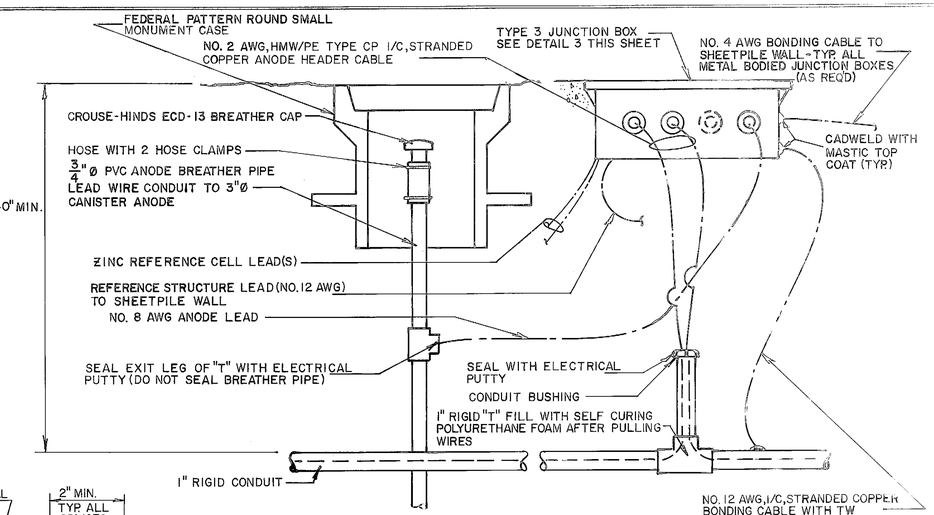
JUNCTION BOX TYPE 1 (1)



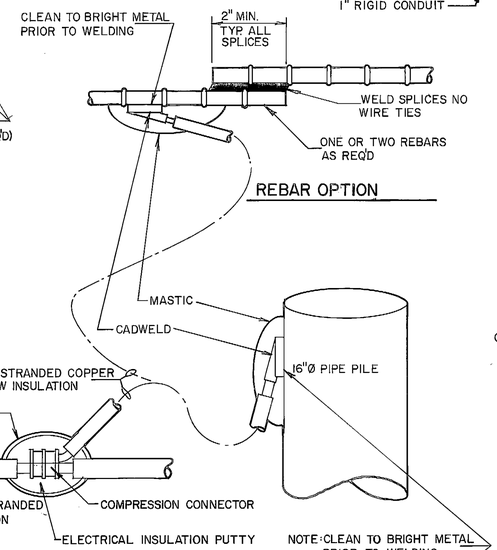
JUNCTION BOX NOTES:
1.) EACH BUSS CONNECTION SHALL BE MADE WITH AN APPROPRIATE SIZED LUG, WHICH WHEN INSTALLED SHALL RUN NO HOTTER THAN THE RUN OR TAP

2.) ALL METAL BODIED JUNCTION BOXES NOT LOCATED IN THE UTILITY TRENCH SHALL BE BONDED TO THE CLOSEST SHEET PILING

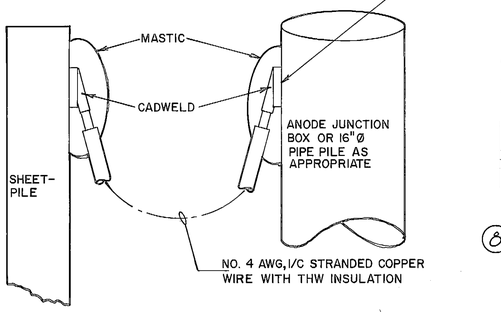
JUNCTION BOX TYPE 2 (2)



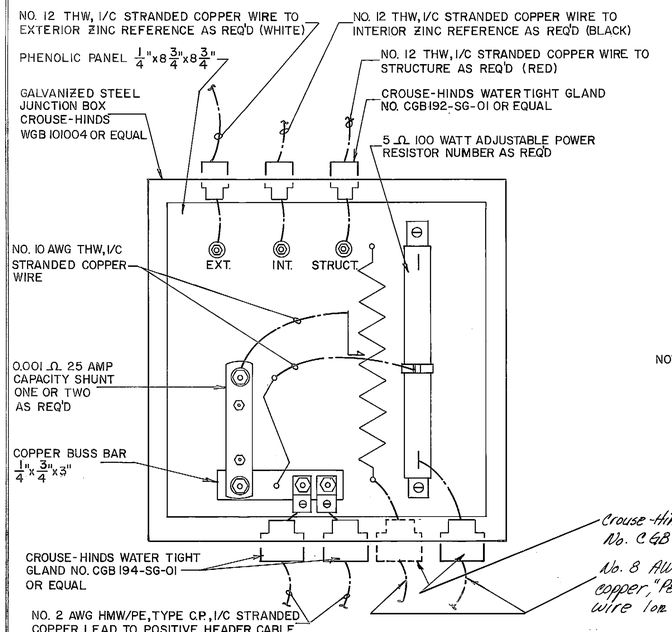
3"Ø CANISTER ANODE BREATHER/JUNCTION BOX TYPE 3 (7)



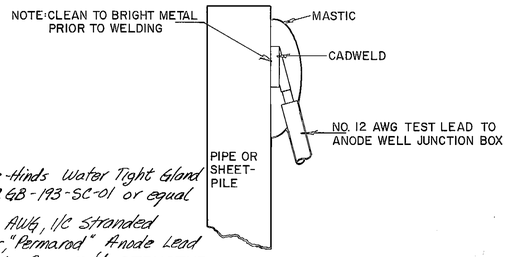
MARINE PIPE PILE NEGATIVE BOND (5)



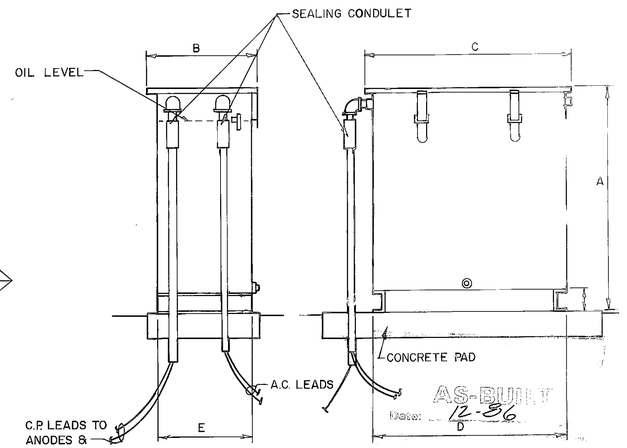
SHEETPILE-PIPE PILE/JUNCTION BOX NEGATIVE BOND (6)



JUNCTION BOX TYPE 3 (3)



STRUCTURE TEST LEAD CONNECTION (4)



TYPE	A	B	C	D	E
"D"	40 7/16	21 1/4	39 1/4	36 1/4	18
A,B,C	56 7/16	23 1/4	51 1/4	48 1/4	20

Note: This sheet reprinted from existing system plans - KVMF - Contract No. 1, Project No. K61216

RECTIFI (8)

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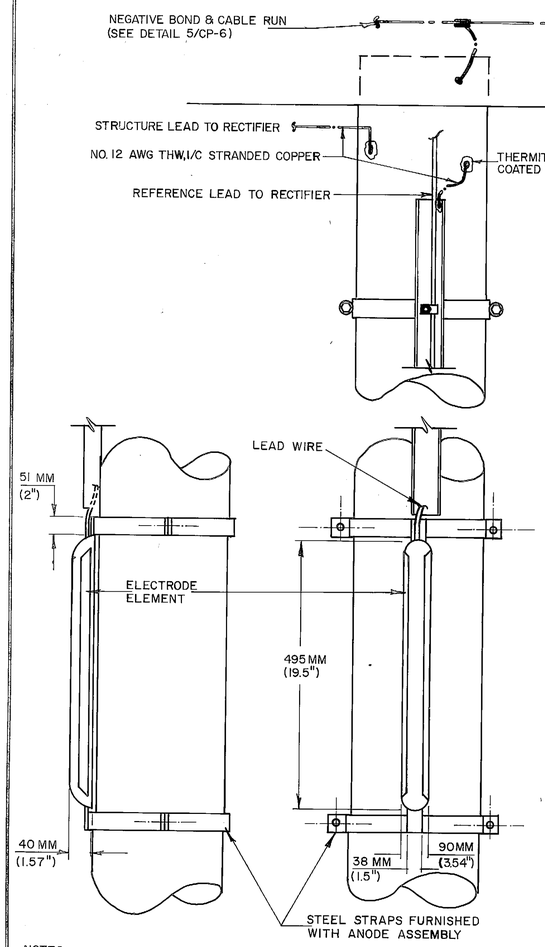
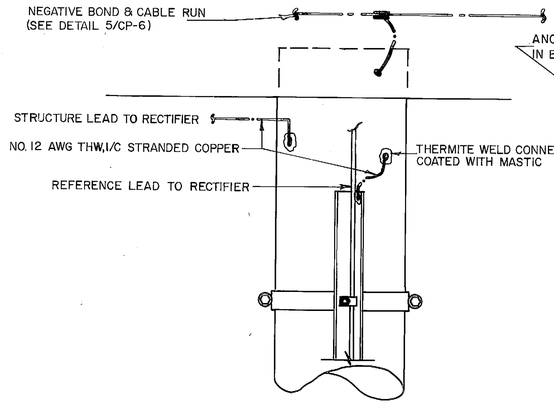
EXISTING CAT. PROTECTION SYSTEM DETAILS

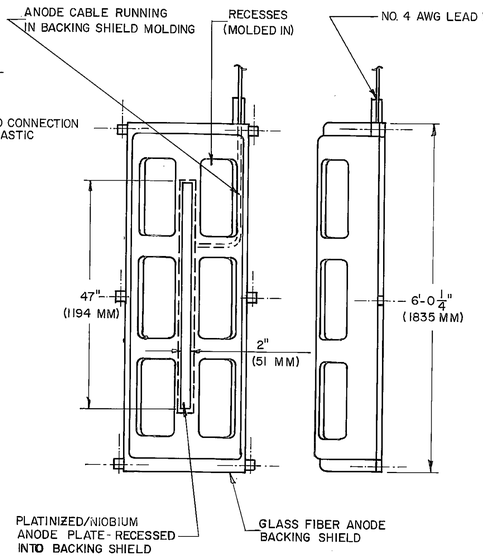
DESIGNED	CHECKED	DRAWN	DATE
—	—	—	11-85
PROJECT NUMBER	X70010	SHEET	21 OF 24



NOTES:
1. COMPLETE REFERENCE ELECTRODE ENCAPSULATED IN GLASS REINFORCED POLYESTER RESIN
2. ELECTRODE ELEMENT IS HIGH PURITY ZINC (99.9 %)
3. MAY BE BOLTED DIRECTLY TO SHEETPILING WITHOUT USE OF WRAP A ROUND PIPE PILE STRAPS

MARINE ZINC REFERENCE ELECTRODE (1)

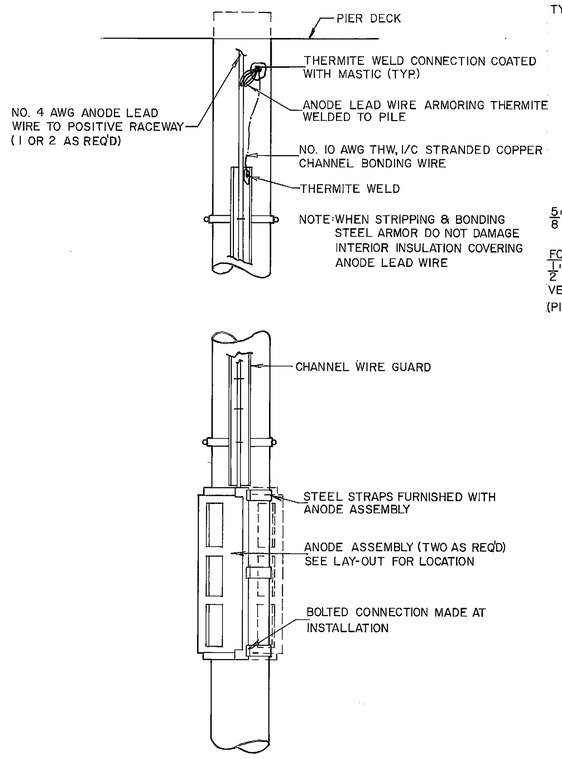


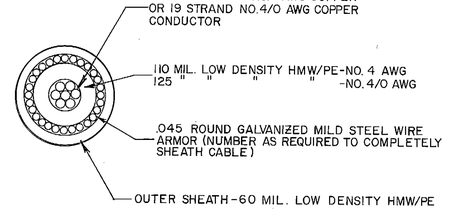


ANODE SHIELD MOLDED TO FIT PILE DIAMETER

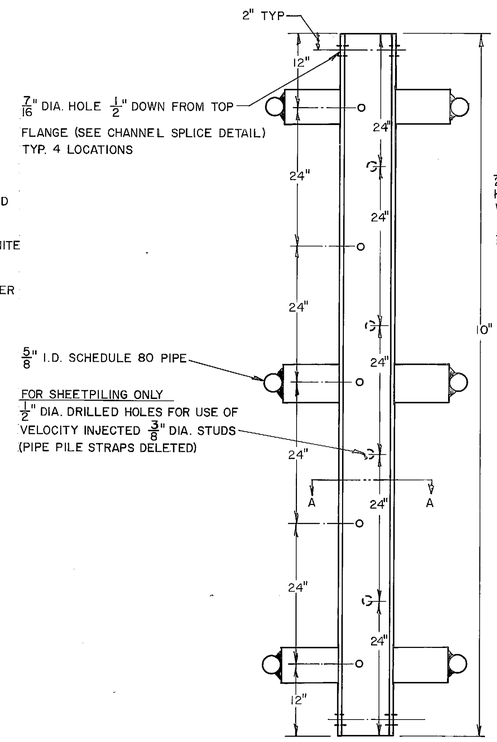
NOTE: ALL REFERENCE LEAD, STRUCTURE BONDING, PILE & ANODE SLED LEAD WIRES TO RUN CONTINOUS IN CHANNEL WIRE GUARD FROM REFERENCE CELL, PILE ANODE, OR DREDGE LEVEL (ANODE SLEDS) TO WITHIN 2'-0" OF THE BOTTOM OF THE CONCRETE DECKING (OR SHEETPILE CUT-OFF IF DECKING NOT PRESENT), & IN CONTINOUS VINYL COATED (40 MIL. MIN) STEEL RIGID CONDUIT THEREAFTER TO THE RECTIFIER. ALL CONDUIT MOUNTING HARDWARE (HANGERS, CLIPS, ETC) TO BE VINYL COATED (40 MIL. MIN.).

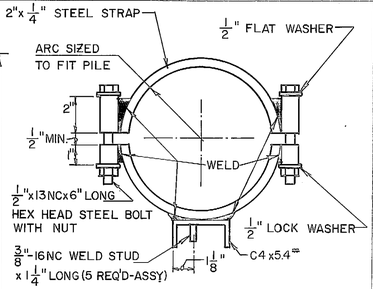
PILE MOUNTED ANODE (2)



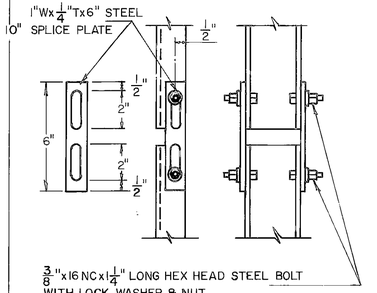


SECTION ANODE LEAD WIRE (5)





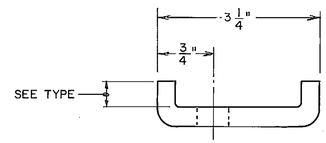
SECTION A-A



3/8"x16 NC x 1 1/4" LONG HEX HEAD STEEL BOLT
WITH LOCK WASHER & NUT

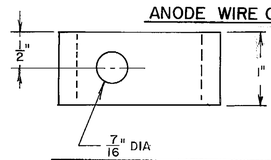
CHANNEL SPLICE DETAIL

CHANNEL WIRE GUARD (3)



TYPE: "A"= 5/16", NO. 8 HMW/PE
"B"= 9/16", NO. 4 ARMORED CABLE & NO. 4/0
"C"= 3/16", NO. 12 THW CABLE

NOTE: MAKE FROM 1/4"x 1" F.B.



ANODE WIRE CLIP (4)

AS-BUILT
Date: 12-86

This sheet reprinted from existing system plans KVMF Contract I, Proj K61216.

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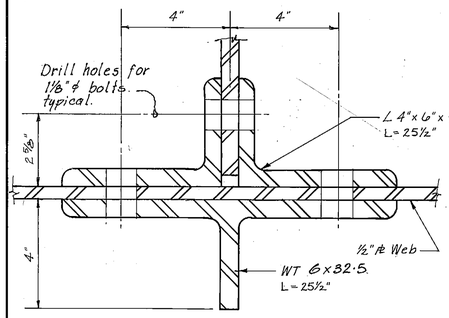
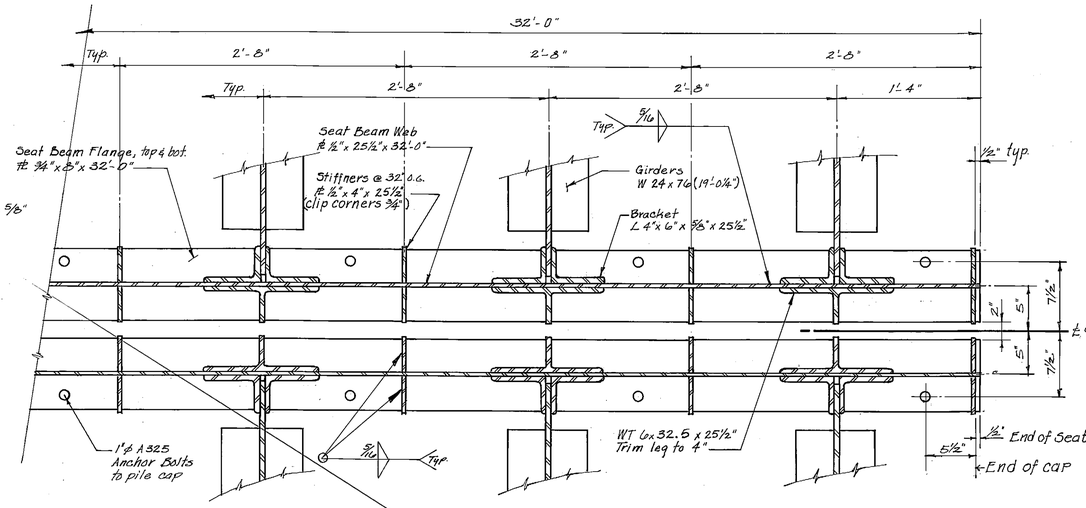
EXISTING CAT. PROTECTION SYSTEM DETAILS

DESIGNED	CHECKED	DRAWN	DATE 11-85
PROJECT NUMBER X70010		SHEET 22 OF 24	



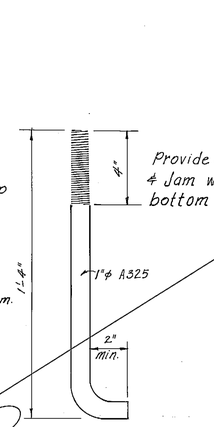
SECTION B - B

3/8" = 1'-0"



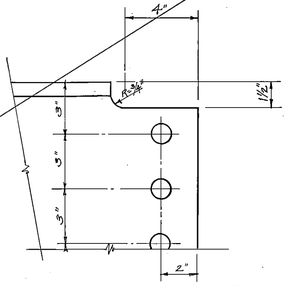
SECTION C - C

1½" = 1'-0" scale



Typ. "A.B." Detail (1)

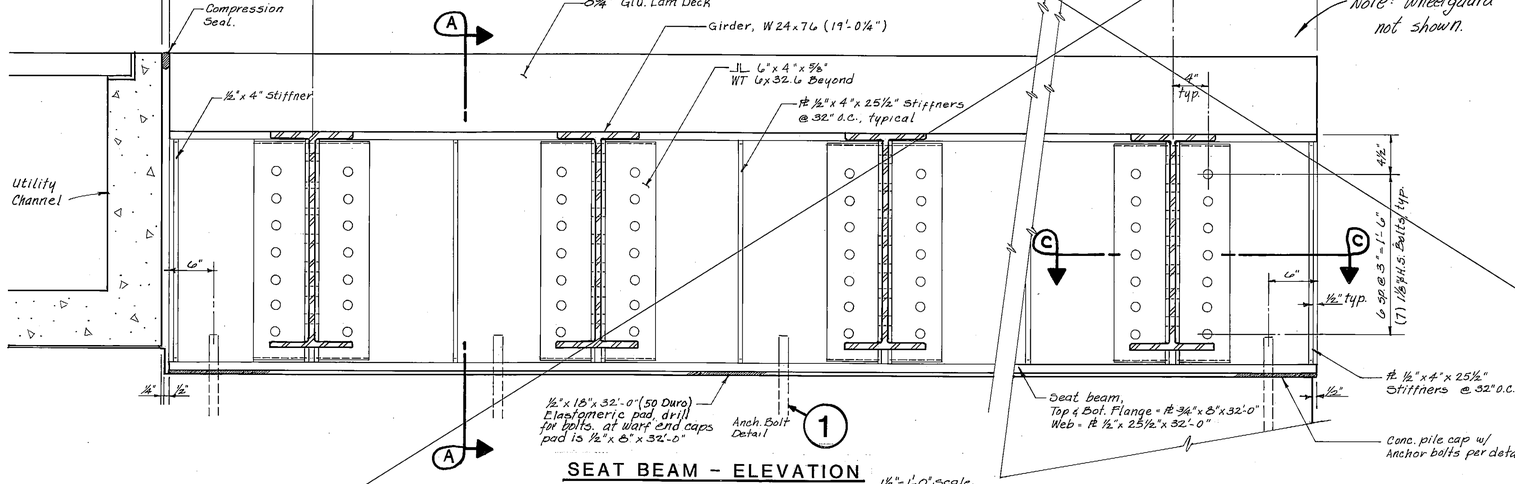
N.T.S.



Typical Girder End (2)

N.T.S.

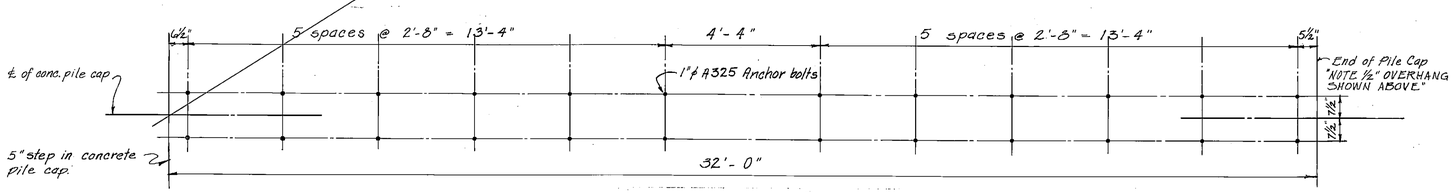
VOID NOT USED



SEAT BEAM - ELEVATION

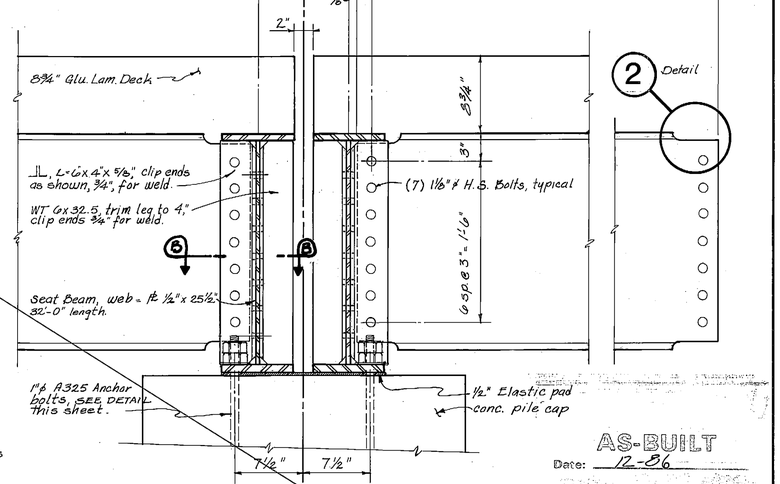
1½" = 1'-0" scale

Note: Wheelguard not shown.



ANCHOR BOLT LAYOUT

½" = 1'-0" scale



AS-BUILT

Date: 12-86

SECTION A - A

1½" = 1'-0" Scale

NOTE: Galvanize after fabrication

STAMP

STATE OF ALASKA 49TH John T. Scott, II CE 4755 REGISTERED PROFESSIONAL ENGINEER

11-25-85

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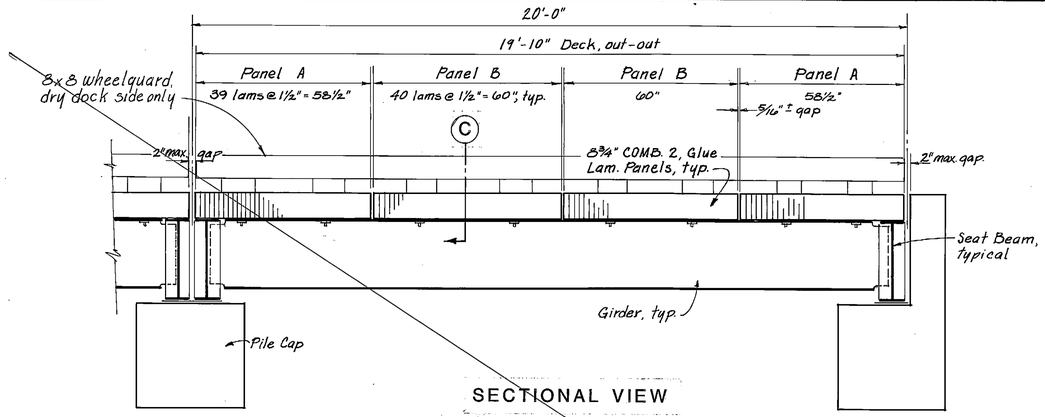
STEEL SUPERSTRUCTURE

ALTERNATE "B"

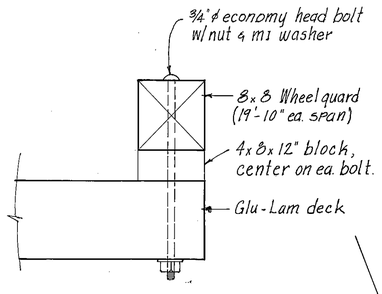
DESIGNED JS	CHECKED JAL	DRAWN geoal	DATE Nov 85
PROJECT NUMBER X 70010		SHEET 23	OF 24



SECTIONAL VIEW

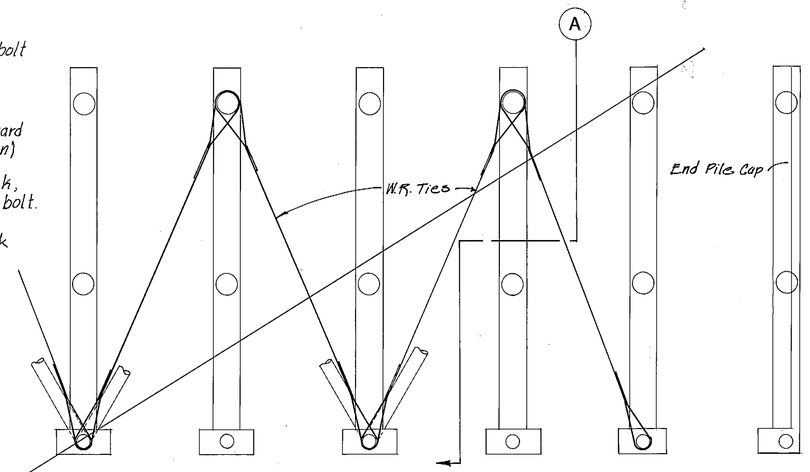
GLU-LAM DECK ASSEMBLY

½"=1'-0" SCALE



WHEELGUARD C

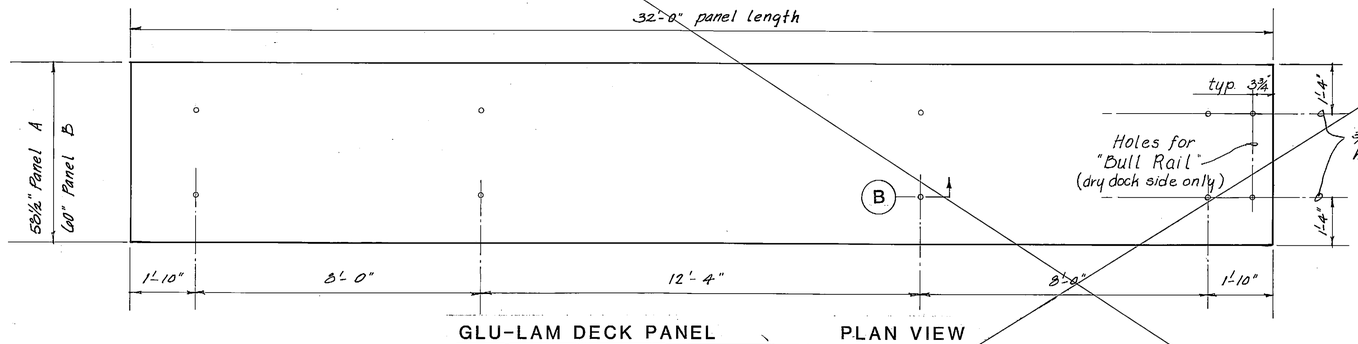
drydock side only



WIRE ROPE DIAGONAL TIES PLAN VIEW

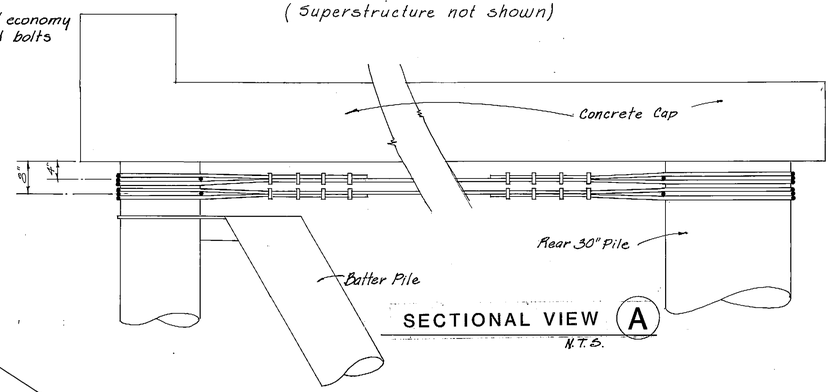
N.T.S.

(Superstructure not shown)



GLU-LAM DECK PANEL PLAN VIEW

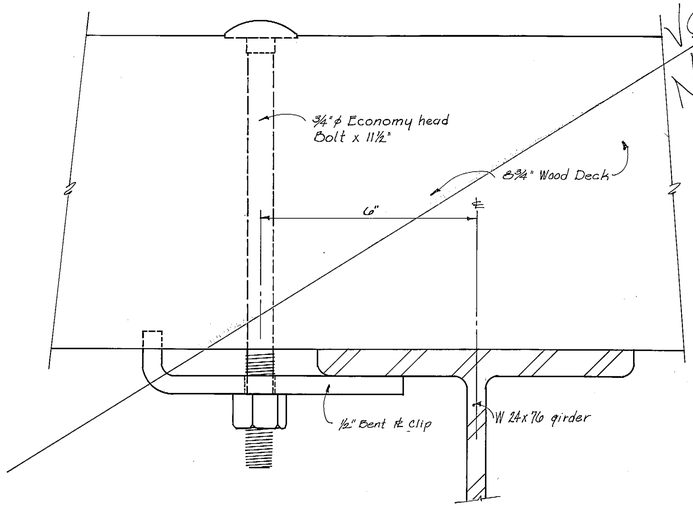
½"=1'-0" Scale



SECTIONAL VIEW A

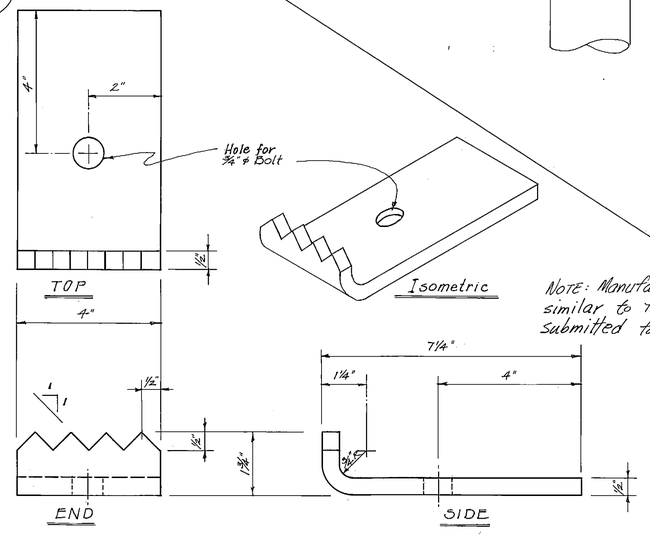
N.T.S.

VOID NOT USED



DECK CLIP ASSEMBLY B

½ Full Size



DECK CLIP

½ Full Size

⅞" ϕ Wire rope x G x 9, galvanized, regular lay, I.W.R.C., min. breaking strength of 35 tons. Double wrap around indicated piles as shown. Secure with 4 wire clips after preloading to 5 tons or at sufficient load to remove all slack whichever is less.

NOTE: Manufactured Deck Clips similar to that shown may be submitted for approval.

AS-BUILT

Date: 12-86

STAMP

STATE OF ALASKA 49TH

John T. Scott, II CE 4755

REGISTERED PROFESSIONAL ENGINEER

11-25-85

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GLU-LAM DECK ALTERNATE "B"

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PROJECT NUMBER X70010		SHEET 24	OF 24