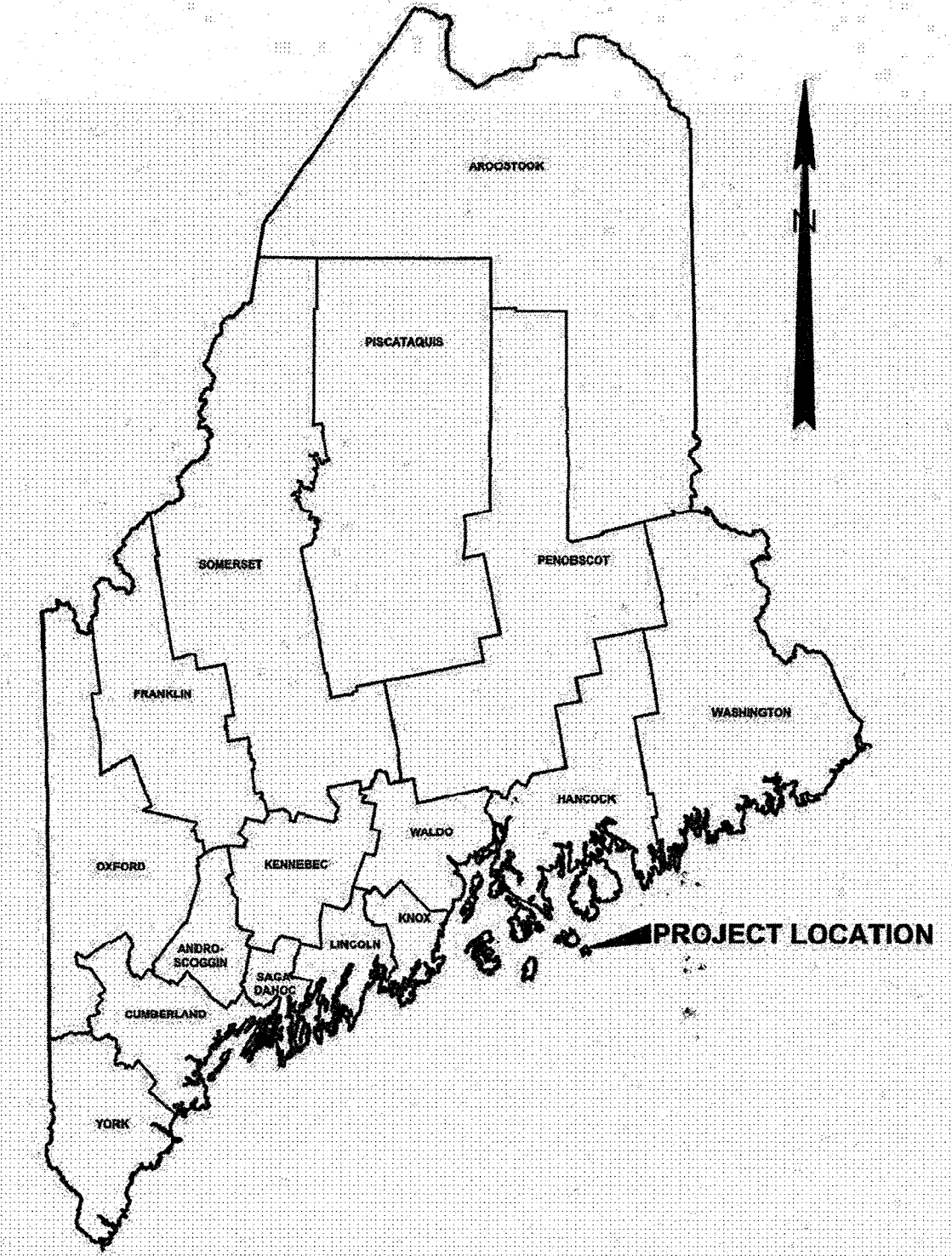


STATE OF MAINE DEPARTMENT OF TRANSPORTATION



TOWN OF FRENCHBORO HANCOCK COUNTY FRENCHBORO FERRY TERMINAL FENDER SYSTEM MODIFICATIONS FEDERAL PROJECT NO. 02220200 MAINEDOT WIN: 022202.00



INDEX OF SHEETS

SHEET NO. TITLE

GENERAL

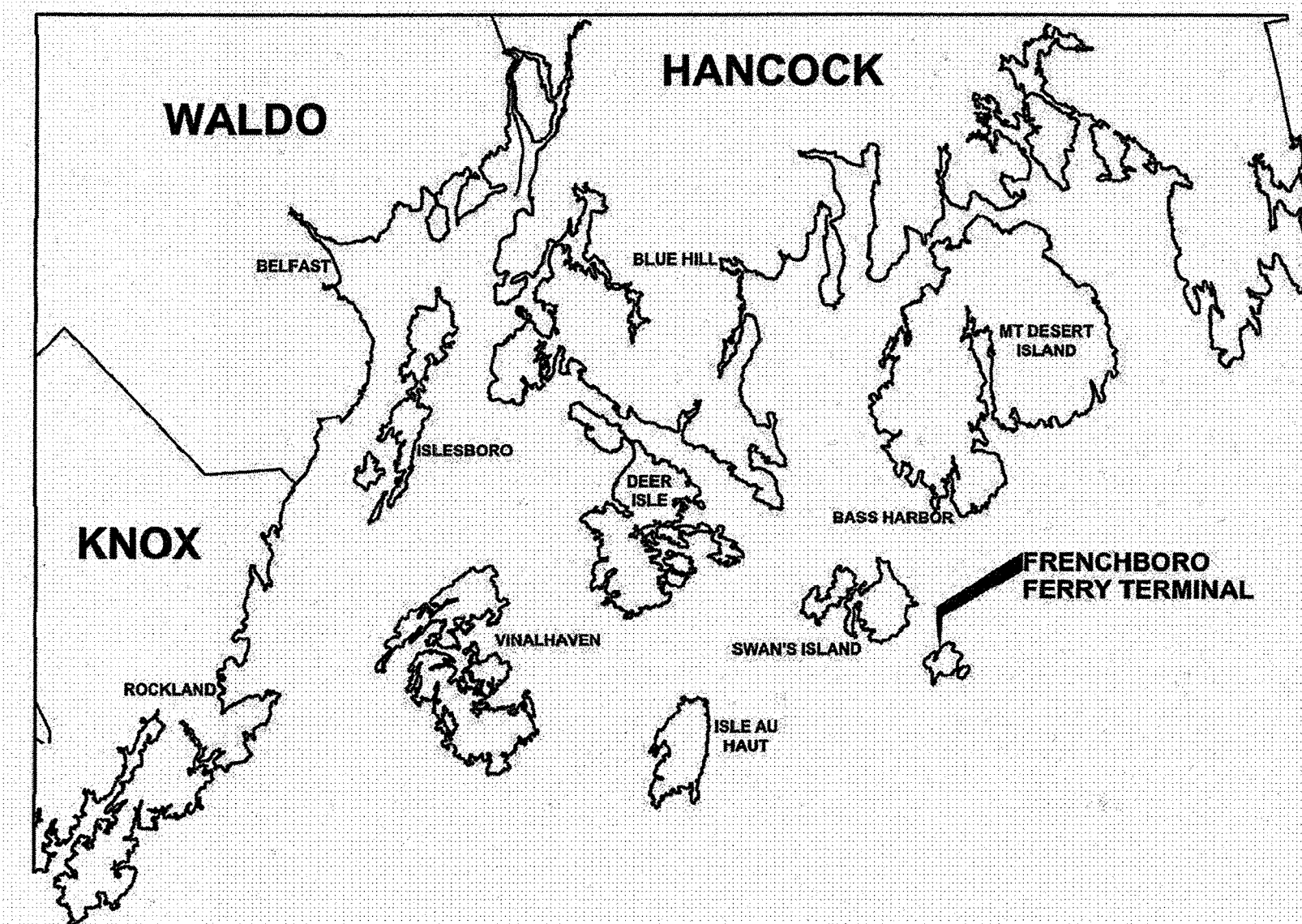
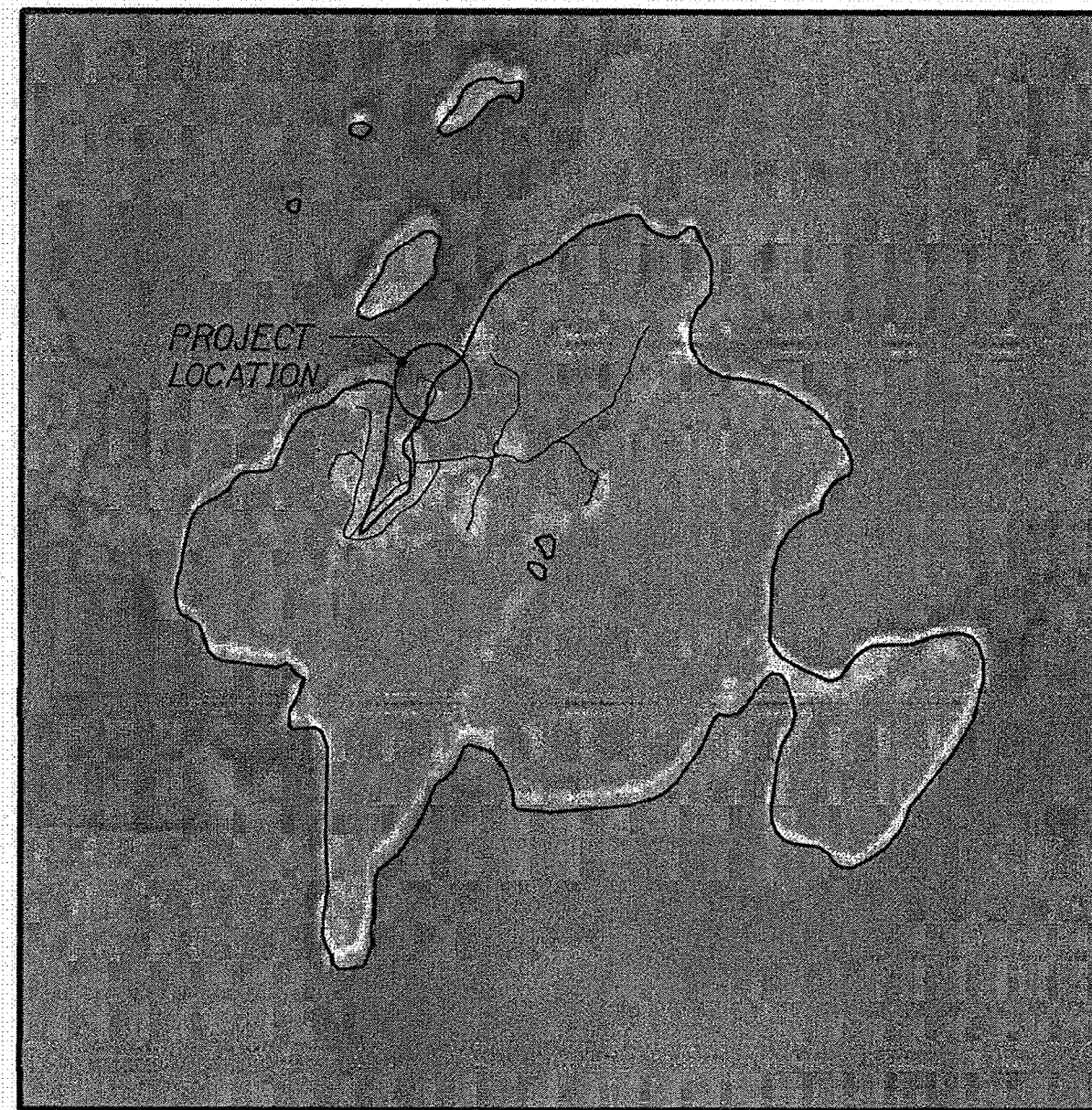
G01	1	TITLE SHEET
G02	2	GENERAL NOTES AND DESIGN CRITERIA
G03	3	EXISTING CONDITIONS
G04	4	BORING LOGS I
G05	5	BORING LOGS II

MARINE PLANS

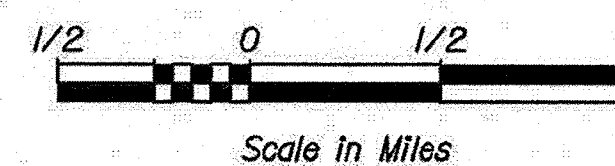
S01	6	SITE PLAN
S02	7	BERTH PLAN
S03	8	DOLPHIN FOUNDATION PLAN
S04	9	DOLPHIN FOUNDATION DETAILS
S05	10	DOLPHIN PLAN, ELEVATION AND DETAILS
S06	11	DOLPHIN DETAILS MOORING HARDWARE
S07	12	DOLPHIN DETAILS FENDER SYSTEM I
S08	13	DOLPHIN DETAILS FENDER SYSTEM II
S09	14	DOLPHIN DETAILS MISCELLANEOUS
S10	15	DOLPHIN DETAILS LADDERS I
S11	16	DOLPHIN DETAILS LADDERS II
S12	17	DOLPHIN DETAILS LADDERS III

THE PROFESSIONAL ENGINEER WHOSE STAMP APPEARS ON THIS COVER SHEET BEARS RESPONSIBILITY FOR THE FOLLOWING SHEETS WITHIN THIS DRAWING SET:
 GENERAL PLANS G01-G03
 STRUCTURAL PLANS S01-S12

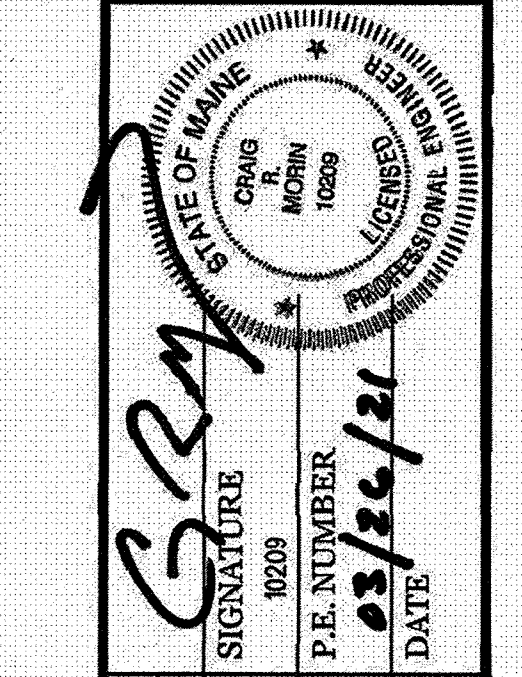
ADDITIONAL WORK APPEARS WITHIN THIS DRAWING SET AND IS THE RESPONSIBILITY OF THE FOLLOWING ORGANIZATIONS, WHOSE STAMP APPEARS ON THOSE INDIVIDUAL SHEETS:
 GENERAL PLANS G04-G05 GEOTECHNICAL BORING LOGS SCHONEWALD ENGINEERING



LOCATION MAP



STATE OF MAINE	DEPARTMENT OF TRANSPORTATION	DATE	1/31/21
APPROVED		COMMISSIONER	[Signature]
CHIEF ENGINEER		[Signature]	1-28-2021



PROGRAM	MULTIMEDIA
PROJECT MANAGER	AURELE CORNEAU I
DESIGNER	CRAIG R. MORIN, P.E.
CONSULTANT	HNTB CORPORATION
PROJECT RESIDENT	
CONTRACTOR	
PROJECT COMPLETION DATE	

FRENCHBORO FERRY TERMINAL FENDER SYSTEM MODIFICATIONS	FRENCHBORO	HANCOCK COUNTY
TITLE SHEET		

WIN 022202.00	FEDERAL PROJECT NO. 02220200
SHEET NUMBER	
G01	
1 OF 17	



Date: 3/22/2021

Username:

Division:

Filename: 001_Title.dgn

Date: 5/11/2021

Username:

Division:

Filename: 002_GeneralNotes.dgn

GENERAL NOTES

- 1. These notes contain general information and are not complete for construction purposes. Contractor shall verify information given here with specifications and other drawings and bring any conflicts to the Engineer's attention before beginning work.
2. All geotechnical notes may be found on Sheets G04 and G05.
3. All dimensions and details shall be verified by the Contractor prior to construction.
4. Contractor shall provide and maintain horizontal and vertical controls in the Maine state plane coordinate system.
5. The MaineDOT field office shall be placed on terminal property at a location approved/determined by the Resident. The Contractor shall make accommodations off-site for their field office, lay down area, restroom facilities, etc.

SPECIFICATIONS AND CODES

- 1. Project specifications titled, "Special Provisions For: Frenchboro Ferry Terminal Fender System Modifications", dated March 26, 2021.
2. State of Maine, Department of Transportation, Standard Specifications, November 2014. Including all supplemental specifications and special provisions.
3. Codes and other references
A. Unified Facilities Criteria Manuals:
UFC 4-150-06 Military Harbors and Coastal Facilities, with Change 1
UFC 4-150-07 Maintenance and Operation: Maintenance of Waterfront Facilities, with Change 1
UFC 4-150-08 Inspection of Mooring Hardware
UFC 4-151-10 General Criteria for Waterfront Construction, with Change 1
UFC 4-152-01 Design: Piers and Wharves
UFC 4-159-03 Design: Moorings, with Change 2
B. US Army Corps of Engineers: Coastal Engineering Manual, current edition
C. AASHTO LRFD specifications, 8th edition, 2017 with Interims
D. AWS, D1.1, "Structural Welding Code Steel", current edition
E. AWS, D1.2, "Structural Welding Code Aluminum", current edition

SURVEY CONTROL

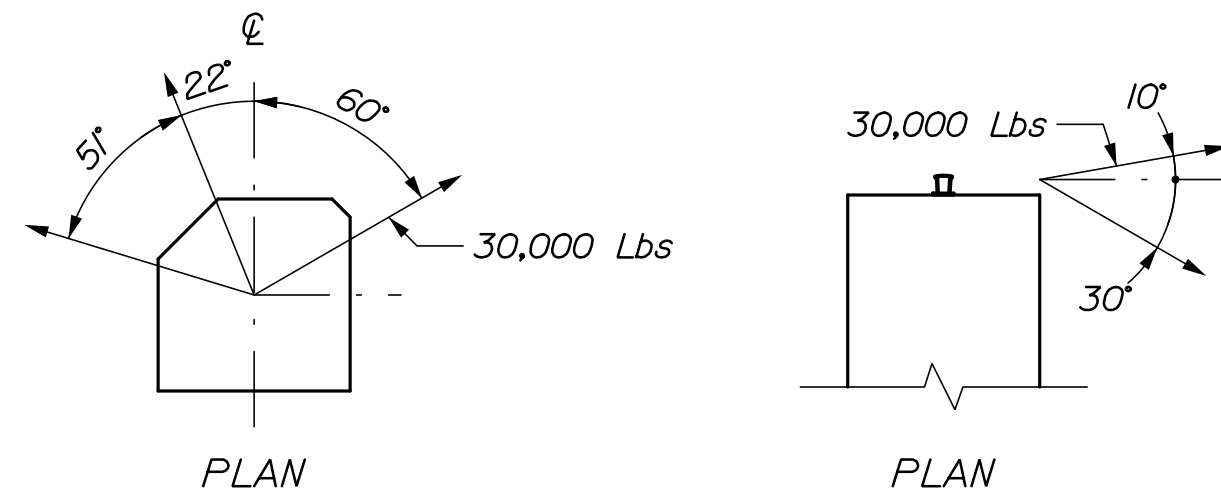
- 1. Vertical control for marine structures is in reference to MLLW (Mean Lower Low Water). To convert to National Geodetic Vertical Datum (NGVD), use the following formula:
E1 (NGVD) = E1 (MLLW) - 9.28 ft
2. Horizontal control is the Maine state plane coordinate system (east zone), NAD 27.

BERTHING LOADS

Table with 6 columns: Dolphin, Berthing Velocity (Ship Velocity, to Fender), App. Angle, Energy to Fender, Minimum Fender Design Energy, Max. Reaction on Dolphin. Rows include Turning Dolphins: Normal and Turning Dolphins: Extreme.

MOORING LOADS

Dolphin D4 Mooring line pull: Single line in each direction.



DOLPHIN/FENDER DESIGN LOADS

Design Vessel: MV Margaret Chase Smith*
Length = 166'-6"
Beam = 40'-0"
Max. Displacement = 633 long tons

* This vessel was chosen as the design vessel since it envelopes the existing vessel fleet as well as the new ferry currently in design (LOA = 154 ft).

Current Vessel: MV Captain Henry Lee
Length = 130'-0"
Beam = 36'-0"
Max. Displacement = 500 long tons (est.)

New Vessel: New Ferry (TBD)
Length = 154'-0"
Beam = 38'-0"
Max. Displacement = 600 long tons (est.)

FENDER NOTES

- 1. All dimensions, details and existing conditions shall be verified by the Contractor prior to construction.
2. Contractor's steel manufacturer shall design the fender panels for the indicated loads.
3. Embedded anchors for chains shall be set by chemical/adhesive material with 9 inch minimum edge distance and a minimum embedment of 12 times the diameter of the anchor. Strength of existing concrete is 3,000 psi.
4. Anchors shall be set by template.

STEEL PIPE PILES

- 1. Steel pipe piles shall conform to ASTM A252, Grade 3, Fy = 45 ksi minimum. Per standard specification 711.01, Concrete fill shall be MaineDOT class "A".
2. Piles shall be coated with fusion bonded epoxy in accordance with the specifications.
3. Pile splices shall not be allowed without prior approval of the Engineer of record.
4. Any portion of pile cracked, deformed, or otherwise damaged by pile driving shall be replaced.
5. Piles shall not be out of position shown by more than 2" longitudinally along the pile cap, and 2" transversely across the width of the pile cap.
6. The distance from the side of any pile to the nearest edge of concrete shall not be less than 9".
7. Piles shall be 16" dia, 5/8" wall steel pipe piles with concrete fill. Piles shall be fabricated of seamless or straight-seamed material. Spiral welded pipe pile is not permitted.

DEMOLITION NOTES

1. Demolition shall be conducted to prevent debris from falling into the ocean. To the maximum extent practicable, all construction debris, including any liquids or slurries that are produced as part of the demolition, shall be captured and disposed of properly. The Contractor shall comply with applicable permit conditions and environmental regulations listed in the specifications. Work shall include removal of any construction debris from the river and installation and maintenance of appropriate turbidity controls during demolition and construction such that no turbidity escapes the immediate work area. Underwater inspections may be conducted by the Owner's representative to ensure all demolition and construction debris is removed from the ocean.

ENVIRONMENTAL CONDITIONS

- 1. Wind: Transverse 50 plf Longitudinal 12 plf
Wind on Live Load: Transverse 100 plf
Wind on Structure: 40 psf
Thermal: Temp. Range for Concrete Structure = 80°F
2. Railings: Aluminum Pedestrian Vertical 50 plf Horizontal 50 plf (acting simultaneously)
3. Tidal ranges (elevations in feet):

Table titled 'Frenchboro***' showing Tidal Datums (NGVD29, MSL, MLW, MLLW, STND) for various points like Top of Dolphin, Highest Observed Tide, MHHW, MHW, NGVD29**, MSL, MLW, MLLW, Lowest Observed Tide, and STND (Station Datum).

* Along top edge of dolphin at corner nearest pen.
** NGVD29 conversion taken from archive project drawings.
*** No values recorded. Values estimated from Swan's Island.

LEGEND:

- Baseline
Plate
Centerline
Washboring
Flood Light
Navigation Marker Light
Site Light - Existing
Site Light - Proposed
Solar Lantern
Curbing
Diameter
Double Bitt
Chock
Ladder

ABBREVIATIONS:

- Cubic Yard
Each
Elevation In Feet
Hollow Structural Sections
Inside Diameter
1000 Pounds
Pounds
Linear Feet
Maximum
Minimum
Not Applicable
Not To Scale
On Center
Pounds Per Square Foot
Radius
Reference
Schedule
Square Feet
Typical
Unless Otherwise Noted
United States Army Corps of Engineers

STRUCTURAL STEEL AND MISCELLANEOUS STEEL FABRICATIONS

- 1. Steel shapes and plates shall be ASTM A709, Grade 36 typical, ASTM A709 Grade 50 where noted.
2. Steel pipes shall be ASTM A53, Grade B.
3. Steel tubing shall be ASTM A500, Grade B.
4. All bolts and nuts for steel connections shall conform to ASTM A325 and be hot-dip galvanized in accordance with ASTM A153. Set anchor bolts by template only. All bolts and nuts for timber connections shall conform to ASTM A307 and be hot-dip galvanized.
5. All miscellaneous steel, including all fasteners, chains, shackles, and u-bolts unless noted otherwise, shall be hot-dip galvanized. Galvanize items after fabrication. Stress relieve bends before galvanizing. Galvanizing damaged accidentally or due to field welding shall be restored with a field applied galvanizing compound.
6. Welding Electrodes: E70XX, Low Hydrogen
7. All welding shall be in accordance with the requirements of the structural welding code, D1.1 and D3.6, of the American Welding Association (AWS).

ALUMINUM ANODES

1. Cathodic protection for steel pipe piles and fender panels shall be 80 lb aluminum alloy. Dimensions shall conform to the general configuration shown on the Plans.

CONCRETE

- 1. Concrete basic design stresses shall be:
- Fill for Pipe Piles: Class "A"
- Fill for Double Bitts: Class "A"
- Cast-in-place (uon): Class "LP"
2. Concrete shall contain 5.0 gal/cy of calcium corrosion inhibitor admixture.
3. Clearances for reinforcement shall be 3" unless otherwise noted.
4. Chamfer all concrete edges 1" @ 45° unless otherwise noted.
5. All reinforcing shall be fully supported on non-metallic approved chairs. Reinforcing shall not be supported on timber blocks, bricks, concrete blocks, miscellaneous rebar, etc.
6. Construction joints shall be made only as shown unless approved otherwise.
7. All existing concrete surfaces to receive concrete shall be roughened to a minimum amplitude of 1/4" and coated with a product listed on the MaineDOT pre-qualified list of concrete bonding agents.
8. Wet curing of concrete is to begin within 30 minutes after concrete finishing, or as soon as possible without damaging finished surface.
9. All formwork for concrete shall be left in place and concrete surfaces shall be covered and kept moist for a period of not less than seven (7) full days after concrete placements.
10. Contractor shall submit detailed reinforcing drawings including bar and bending schedules to the Engineer for review and approval prior to delivery of any reinforcing steel.

11. All ferrous metal handling/lifting devices and existing embedded metals/anchors no longer in use shall be recessed or removed to a depth of one inch below the surface of the concrete and patched with an approved polymer-modified cementitious mortar. Devices located in areas to be totally encased in cast-in-place concrete shall be galvanized. Devices located in areas not to be encased in cast-in-place concrete shall be stainless steel, unless otherwise noted.

STEEL REINFORCEMENT

- 1. Reinforcing Steel: ASTM A775 Grade 60, deformed, epoxy coated, unless noted otherwise
2. Rock Anchors: ASTM A722, Grade 150, deformed, with triple corrosion protection
3. Splicing of reinforcing steel is permitted. Stagger splices one splice length minimum. No more than 50 percent of the reinforcing steel shall be spliced at any location. Provide a minimum splice length of 50 bar diameters, unless noted otherwise on the drawings.

STATE OF MAINE DEPARTMENT OF TRANSPORTATION
FRENCHBORO FERRY TERMINAL
GENERAL NOTES AND DESIGN CRITERIA
SHEET NUMBER G02
2 OF 17
WIN 022202.00

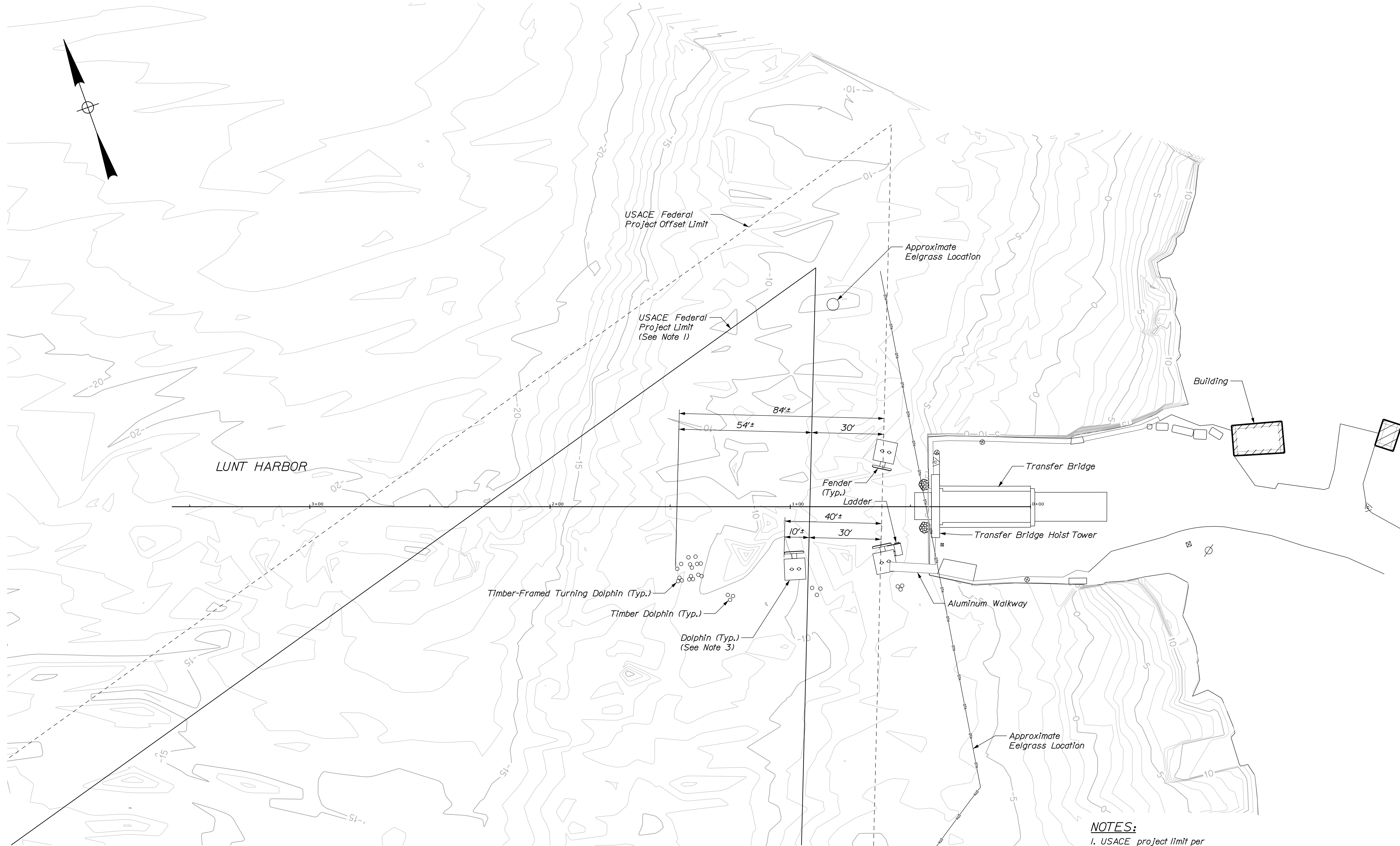


Filename: 003_Existing Conditions.dgn

Username: P. Bishop

Division: C. Morin

Date: 5/11/2021



- NOTES:**
1. USACE project limit per <https://www.nae.usace.army.mil/Missions/Navigation/Maine-Projects/>. Offset limit dimension determined by 3x water depth (MLLW).
 2. Eelgrass Limits are approximated boundaries based on a dive survey conducted in July 2020 by MaineDOT. Contractor shall avoid disturbance to eelgrass areas; no spudding.
 3. Prior to onset of construction, the Contractor shall verify the geometry and layout of the three existing dolphins for conformance with the original design drawings dated September 2013 (WIN: 18386.00)

STATE OF MAINE DEPARTMENT OF TRANSPORTATION		DATE 03/21 03/21		SIGNATURE 10209	
FRENCHBORO FERRY TERMINAL		BY P. Bishop C. Morin		P.E. NUMBER DATE	
EXISTING CONDITIONS		PROJ. MANAGER DESIGN-DETAILED CHECKED-REVIEWED DESIGN-DETAILED REVISIONS 1 REVISIONS 2 REVISIONS 3 REVISIONS 4 FIELD CHANGES		WIN 022202.00	
SHEET NUMBER G03		3 OF 17			



SCHONEWALD ENGINEERING ASSOCIATES, INC.		PROJECT: Fender System Modifications Maine State Ferry Terminal Frenchboro, Maine		Boring No.: MB-FBORO-102-18 WIN: 22202.00		
Driller: New England Boring Contractors	Elevation (ft.): -11.8 ft (mudline)	Core Barrel: N02 (wireline)	Operator: Enos / Shore	Return: MLW	Sampler: standard split spoon	
Logged By: Schonewald	Rig Type: Mobile Drill B-53	Hammer Wt./Fall: 140 lbs / 30 inches	Date Start/Finish: 8/13/18 1515 - 8/14/18 1355	Drilling Method: closed wash boring	Hammer Type: auto hammer	
Boring Location: per plan 18981	Coating ID/OD: HW to 35 #1; NW to 35.6 ft	Hammer Efficiency: 0.806	Auger ID/OD: n/a	Water Level: n/a		
<p>IN-SITU SAMPLING AND TESTING: D = Split Spoon Sample M = Unsuccessful Split Spoon Sample attempt T = Thin Wall Tube Sample M = Unsuccessful Thin Wall Tube Sample attempt V = In Situ Vane Shear Test W = Unsuccessful In Situ Vane Shear Test attempt</p> <p>ADDITIONAL DEFINITIONS: N = uncorrected N value N₆₀ = N value corrected for hammer efficiency S_u = In Situ Fracture Shear Strength (psf) R = Rock Core Sample RQD = Rock Quality Designation (%)</p> <p>LABORATORY TEST RESULTS: L = Liquid Limit / Plasticity Limit / Plasticity Index W = water content, percent P = Percent Fines from grain size analysis UCT = unconfined compressive strength of rock</p>						
Depth (ft.)	Sample No.	Depth (ft.)	Grain Size (mm)	Grain Size (mm)	Visual Description and Remarks	Lab. Testing Results
0	10	0.0 - 2.0	38-20-17-14	7.610	10: Brown grey, GRAVEL, trace to little fine to coarse sand, trace silt. RECENT MARINE SEDIMENT	
5	20	5.5 - 7.5	11-3-2-2	5 8	20: Grey, loose, Silty fine to coarse SAND, trace fine gravel appears to be mostly wash.	
10	30	10.0 - 12.0	7-5-1-2	6 9	30: Brown grey, fine to medium SANDY ORGANIC SILT, little gravel, trace coarse sand with numerous shells.	
15	40	15.0 - 17.0	WDH/12"-2-2	2 3	40: Grey, soft, Silty CLAY, little fine to medium sand with numerous shell fragments and occasional fine gravel and coarse sand.	
20	50	20.0 - 22.0	4-1-1/12"	2 3	50: Grey, v. loose, Interbedded, Silty fine to medium SAND with shells; Silty CLAY with shells and random pieces of fine gravel and fine to medium SAND, little to some silt with shells.	
<p>8/13/18 1505 hrs: 8.0' top outboard (westerly) dolphin to water; 7.7' barge deck to water; 28.1' barge deck to mudline top of outboard dolphin elev. 16.60 ft MLW 63' cleat of outboard dolphin to borehole approx. 2' southerly of line through cleats on two southerly dolphins.</p> <p>Stratification lines represent approximate boundaries between soil types; transitions may be gradual. * Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.</p>						

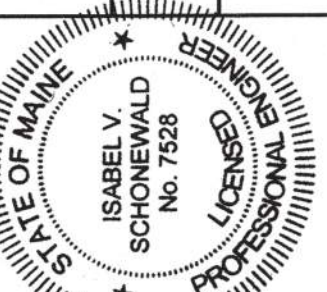
Page 1 of 3
Boring No.: MB-FBORO-102-18

SCHONEWALD ENGINEERING ASSOCIATES, INC.		PROJECT: Fender System Modifications Maine State Ferry Terminal Frenchboro, Maine		Boring No.: MB-FBORO-102-18 WIN: 22202.00		
Driller: New England Boring Contractors	Elevation (ft.): -11.8 ft (mudline)	Core Barrel: N02 (wireline)	Operator: Enos / Shore	Return: MLW	Sampler: standard split spoon	
Logged By: Schonewald	Rig Type: Mobile Drill B-53	Hammer Wt./Fall: 140 lbs / 30 inches	Date Start/Finish: 8/13/18 1515 - 8/14/18 1355	Drilling Method: closed wash boring	Hammer Type: auto hammer	
Boring Location: per plan 18981	Coating ID/OD: HW to 35 #1; NW to 35.6 ft	Hammer Efficiency: 0.806	Auger ID/OD: n/a	Water Level: n/a		
<p>IN-SITU SAMPLING AND TESTING: D = Split Spoon Sample M = Unsuccessful Split Spoon Sample attempt T = Thin Wall Tube Sample M = Unsuccessful Thin Wall Tube Sample attempt V = In Situ Vane Shear Test W = Unsuccessful In Situ Vane Shear Test attempt</p> <p>ADDITIONAL DEFINITIONS: N = uncorrected N value N₆₀ = N value corrected for hammer efficiency S_u = In Situ Fracture Shear Strength (psf) R = Rock Core Sample RQD = Rock Quality Designation (%)</p> <p>LABORATORY TEST RESULTS: L = Liquid Limit / Plasticity Limit / Plasticity Index W = water content, percent P = Percent Fines from grain size analysis UCT = unconfined compressive strength of rock</p>						
Depth (ft.)	Sample No.	Depth (ft.)	Grain Size (mm)	Grain Size (mm)	Visual Description and Remarks	Lab. Testing Results
55	R5	52.2 - 57.2	R01: 50°-83%		R5: Similar to R4. One fracture zone at 52.2 ft. 435/ 2145/ 2125/ 2140/ 2145 min/sec/ft ROCK QUALITY = GOOD	
60	R6	57.2 - 62.2	R01: 52°-81%		R6: Similar to R4. 2115/ 2125/ 2140/ 2140/ 2145 min/sec/ft ROCK QUALITY = GOOD	
<p>8/13/18 1505 hrs: 8.0' top outboard (westerly) dolphin to water; 7.7' barge deck to water; 28.1' barge deck to mudline top of outboard dolphin elev. 16.60 ft MLW 63' cleat of outboard dolphin to borehole approx. 2' southerly of line through cleats on two southerly dolphins.</p> <p>Stratification lines represent approximate boundaries between soil types; transitions may be gradual. * Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.</p>						

Page 3 of 3
Boring No.: MB-FBORO-102-18

SCHONEWALD ENGINEERING ASSOCIATES, INC.		PROJECT: Fender System Modifications Maine State Ferry Terminal Frenchboro, Maine		Boring No.: MB-FBORO-102-18 WIN: 22202.00		
Driller: New England Boring Contractors	Elevation (ft.): -11.8 ft (mudline)	Core Barrel: N02 (wireline)	Operator: Enos / Shore	Return: MLW	Sampler: standard split spoon	
Logged By: Schonewald	Rig Type: Mobile Drill B-53	Hammer Wt./Fall: 140 lbs / 30 inches	Date Start/Finish: 8/13/18 1515 - 8/14/18 1355	Drilling Method: closed wash boring	Hammer Type: auto hammer	
Boring Location: per plan 18981	Coating ID/OD: HW to 35 #1; NW to 35.6 ft	Hammer Efficiency: 0.806	Auger ID/OD: n/a	Water Level: n/a		
<p>IN-SITU SAMPLING AND TESTING: D = Split Spoon Sample M = Unsuccessful Split Spoon Sample attempt T = Thin Wall Tube Sample M = Unsuccessful Thin Wall Tube Sample attempt V = In Situ Vane Shear Test W = Unsuccessful In Situ Vane Shear Test attempt</p> <p>ADDITIONAL DEFINITIONS: N = uncorrected N value N₆₀ = N value corrected for hammer efficiency S_u = In Situ Fracture Shear Strength (psf) R = Rock Core Sample RQD = Rock Quality Designation (%)</p> <p>LABORATORY TEST RESULTS: L = Liquid Limit / Plasticity Limit / Plasticity Index W = water content, percent P = Percent Fines from grain size analysis UCT = unconfined compressive strength of rock</p>						
Depth (ft.)	Sample No.	Depth (ft.)	Grain Size (mm)	Grain Size (mm)	Visual Description and Remarks	Lab. Testing Results
25	R1	30.0 - 31.5	7-18-50/6"	68 103	60: Grey, Silty fine to medium SAND, some gravel, trace coarse sand, TILL	
35	R7	35.0 - 35.5	9-30/6"	N02	70: Grey, Silty GRAVEL, some fine to coarse sand.	
40	R2	40.6 - 45.6	R01: 37°-62%		Top of bedrock at Elev. -31.4 ft. R1: Bedrock: Very hard, fresh, fine to medium grained, pink grey blottish-cream GRANITE. Close, typically low angle break at undulating, rough, fresh to discolored, and open with occasional fine infilling. (Davenport Granite Fluctuation) core fines: 310/ 1145/ 1145/ 2110/ 2105 min/sec/ft ROCK QUALITY = POOR	UCT @= 26.19 ksi
45	R3	45.6 - 47.7	R01: 16°-64%		R2: Similar to R1, except one near vertical infilled crack from 43.1 to 44.8 ft (barely rock altered along crack margin); moderately spaced breaks; and open fracture from 40.6 to 40.8 ft. - 1330/ 1145/ 2100/ 2105 min/sec/ft ROCK QUALITY = FAIR	UCT @= 27.47 ksi
50	R4	47.7 - 52.2	R01: 50°-83%		R3: Similar to R1, except close breaks below 47.0 ft. 2110/ 1150/ - min/sec/ft ROCK QUALITY = FAIR	
55	R4	47.7 - 52.2	R01: 50°-83%		R4: Similar to R1, except widely spaced breaks. One near vertical infilled crack from 47.7 to 48.9 ft and one inclusion. - 2140/ 2155/ 2155/ - min/sec/ft. ROCK QUALITY = EXCELLENT	
<p>8/13/18 1505 hrs: 8.0' top outboard (westerly) dolphin to water; 7.7' barge deck to water; 28.1' barge deck to mudline top of outboard dolphin elev. 16.60 ft MLW 63' cleat of outboard dolphin to borehole approx. 2' southerly of line through cleats on two southerly dolphins.</p> <p>Stratification lines represent approximate boundaries between soil types; transitions may be gradual. * Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.</p>						

Page 2 of 3
Boring No.: MB-FBORO-102-18



SIGNATURE: *G. Schonewald*
 P.E. NUMBER: 7328
 DATE: 5/29/19

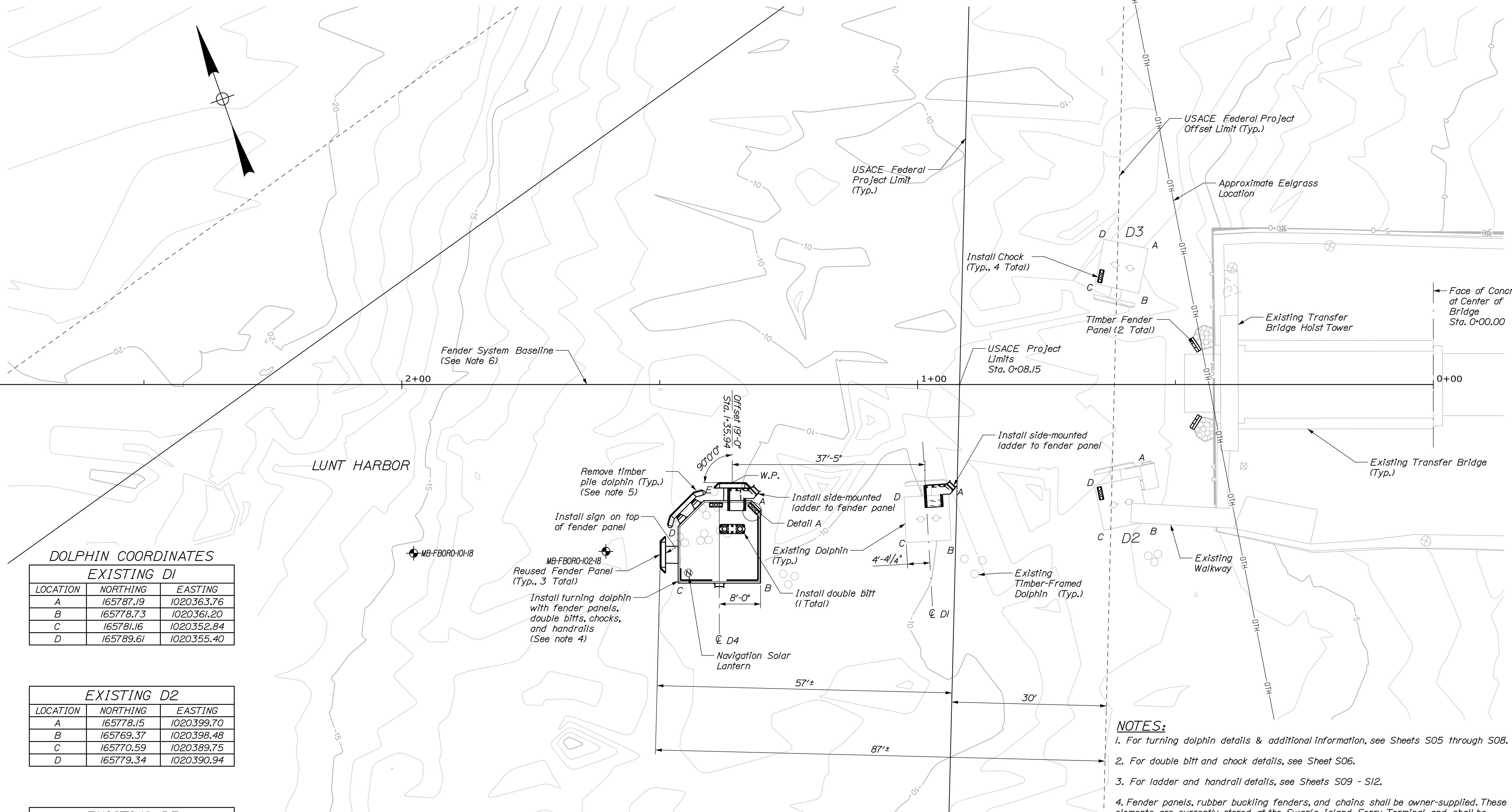
PROJ. MANAGER	DATE
DESIGN-DETAILED	05/19
CHECKED-REVIEWED	05/19
DESIGN-DETAILED	
REVISIONS	
REVISIONS	
REVISIONS	
REVISIONS	
FIELD CHANGES	

Date: 5/11/2021

Username:

Division:

Filename: 006_Site Plan.dgn



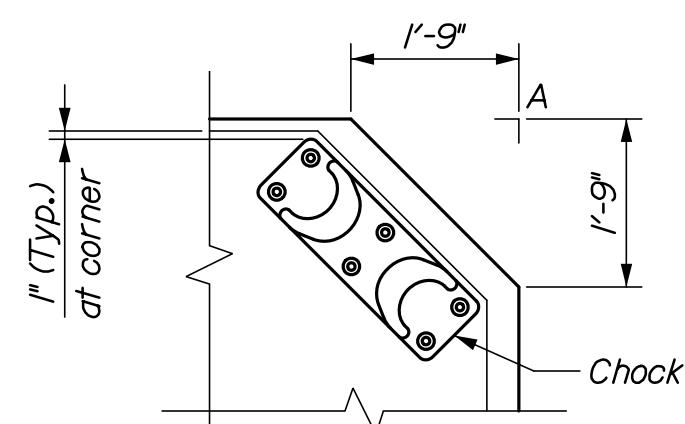
DOLPHIN COORDINATES

EXISTING D1		
LOCATION	NORTHING	EASTING
A	165787.19	1020363.76
B	165778.73	1020361.20
C	165781.16	1020352.84
D	165789.61	1020355.40

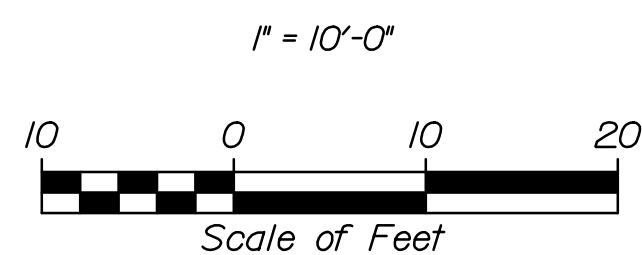
EXISTING D2		
LOCATION	NORTHING	EASTING
A	165778.15	1020399.70
B	165769.37	1020398.48
C	165770.59	1020389.75
D	165779.34	1020390.94

EXISTING D3		
LOCATION	NORTHING	EASTING
A	165819.17	1020416.13
B	165811.63	1020411.50
C	165816.21	1020404.10
D	165823.76	1020408.66

PROPOSED D4		
LOCATION	NORTHING	EASTING
A	165798.28	1020328.96
B	165783.20	1020323.61
C	165788.55	1020308.53
D	165798.91	1020312.21
E	165801.95	1020318.60



SITE PLAN



NOTES:

- For turning dolphin details & additional information, see Sheets S05 through S08.
- For double bitt and chock details, see Sheet S06.
- For ladder and handrail details, see Sheets S09 - S12.
- Fender panels, rubber buckling fenders, and chains shall be owner-supplied. These elements are currently stored at the Swan's Island Ferry Terminal, and shall be retrieved and transported to the site by the Contractor.
- Timber piles within the footprint of the dolphin shall be removed by extraction. Timber piles adjacent to the proposed dolphin shall also be extracted to facilitate dolphin construction.
- Baseline was developed using information from 2013 As-built plans, Sheet S-3.
- The Contractor shall repair existing concrete as directed by the Resident. Concrete repairs shall be measured for payment under pay items, 518.50, 518.51, and 518.60, Repair of Upward Facing Surfaces - Reinforcing Steel < 8 inches, Repair of Upward Facing Surfaces - below Reinforcing Steel, and Repair of Vertical Surfaces < 8 inches, respectively.
- Eelgrass Limits are approximated boundaries based on a dive survey conducted in July 2020 by MaineDOT. Contractor shall avoid disturbance to eelgrass areas; no spudding.
- Contractor shall provide a layout drawing of the pen with existing dolphins and proposed dolphin along with fender dimensions prior to installing pipe piles.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SIGNATURE
10209

P.E. NUMBER

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

DATE

SHEET NUMBER

S01

6 OF 17



WIN
022202.00

FRENCHBORO
FERRY TERMINAL

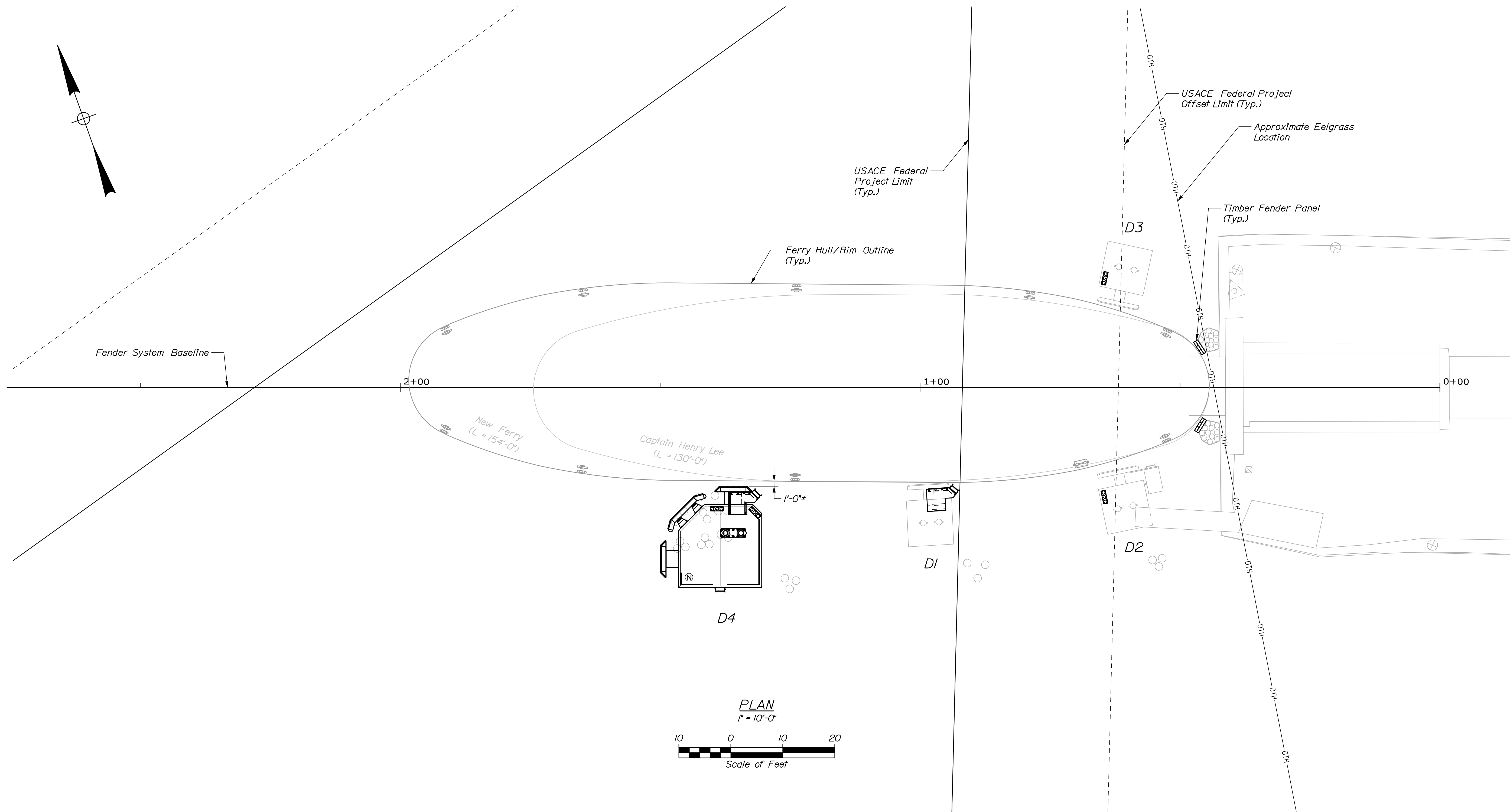
SITE PLAN

Date: 5/11/2021

Username:

Division:

Filename: 007_Berth Plan.dgn



- NOTES:**
1. MV Captian Henry Lee is currently in operation. New ferry is proposed.
 2. MV Margaret Chase Smith not shown. Ferry is too wide for the pen and does not use this terminal.
 3. Offset dimensions shown for new ferry are provided for future planning puposes. Modifications to the fender panels at dolphins D1 and D4 should be considered for new Ferry operations.

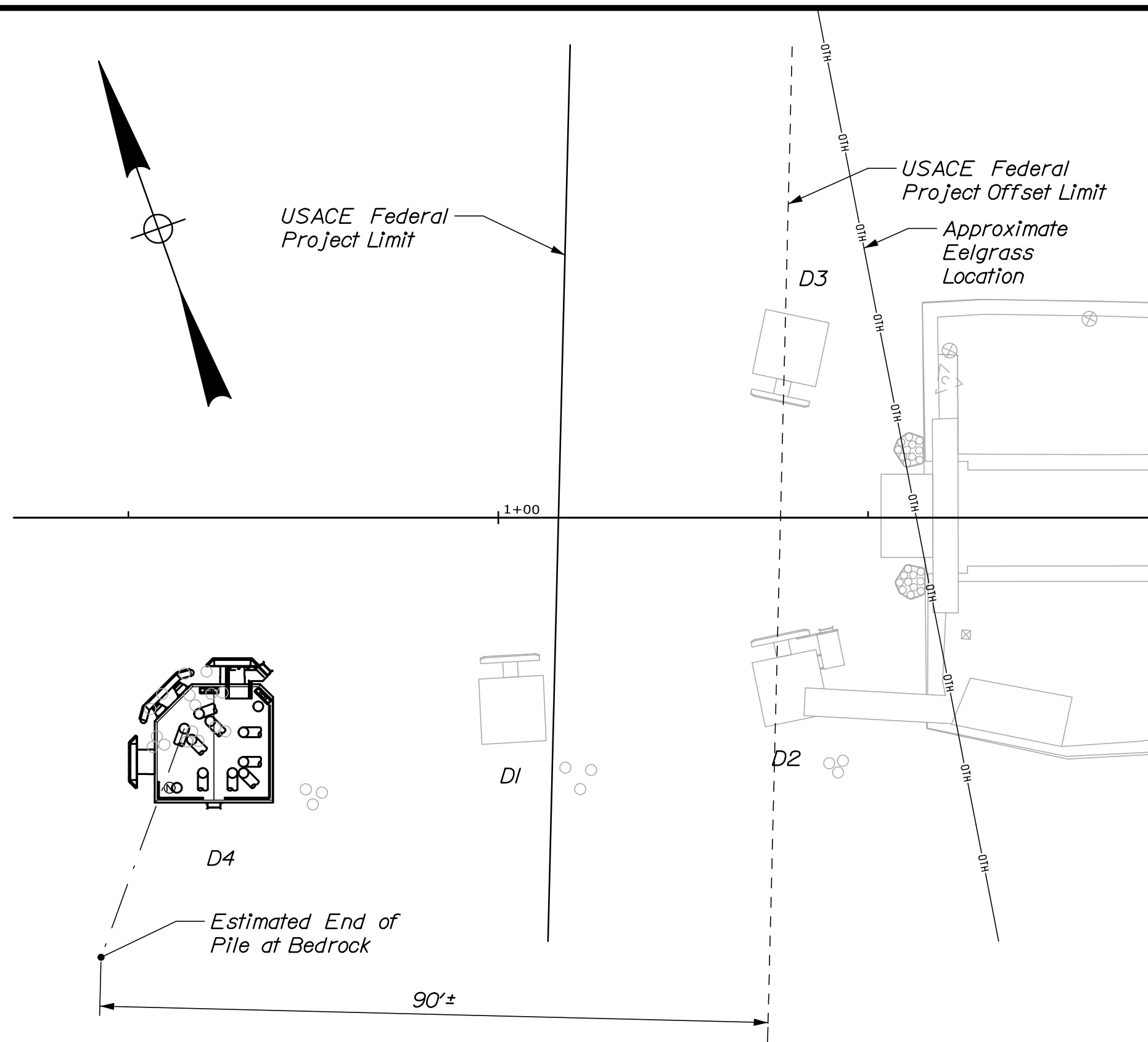
STATE OF MAINE DEPARTMENT OF TRANSPORTATION		SIGNATURE 10209	
FRENCHBORO FERRY TERMINAL		P.E. NUMBER 10209	
BERTH PLAN		DATE	
SHEET NUMBER S02		DATE	
7 OF 17		DATE	
HNTB		DATE	
WIN 022202.00		DATE	

Date: 5/11/2021

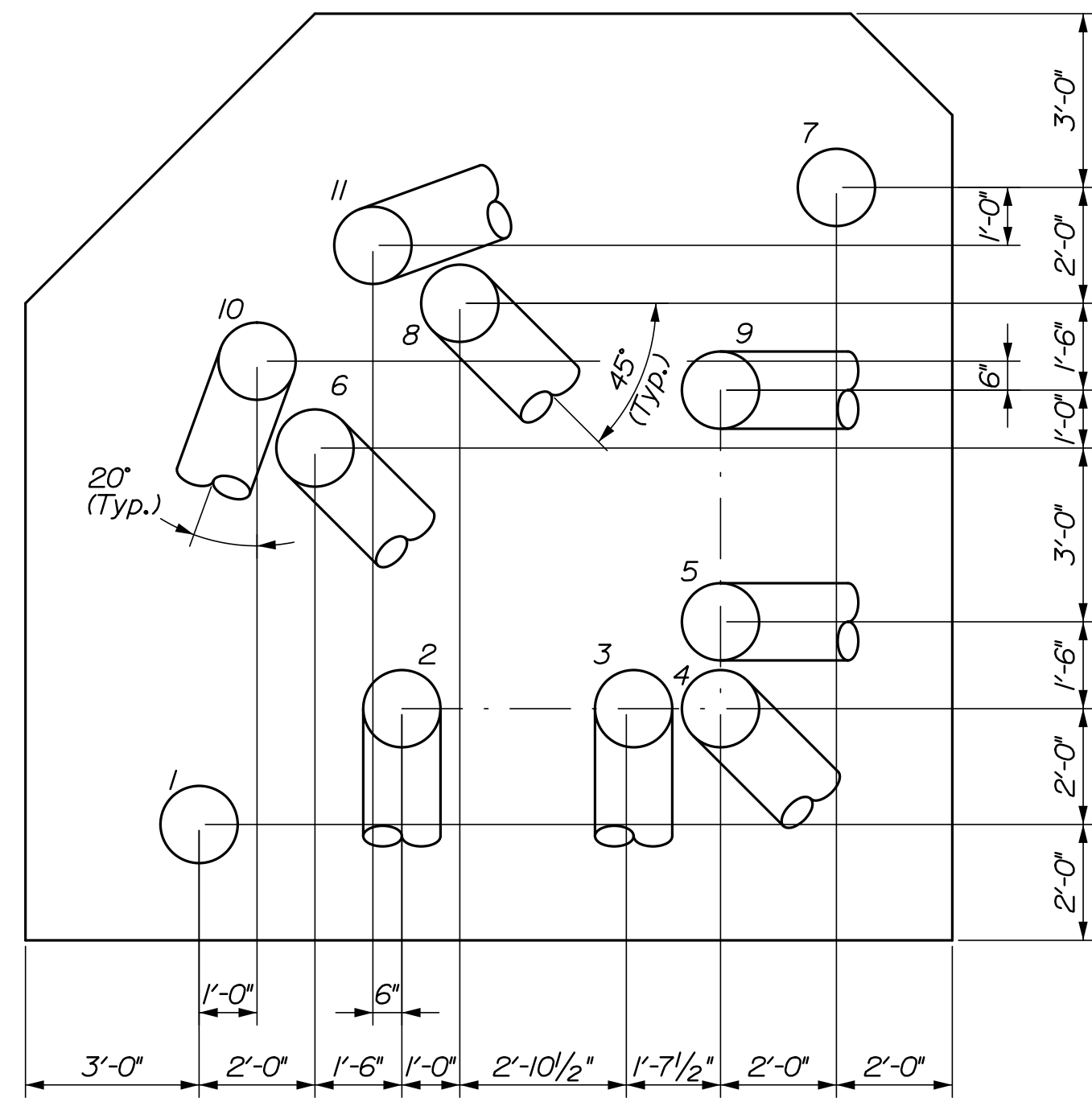
Username:

Division:

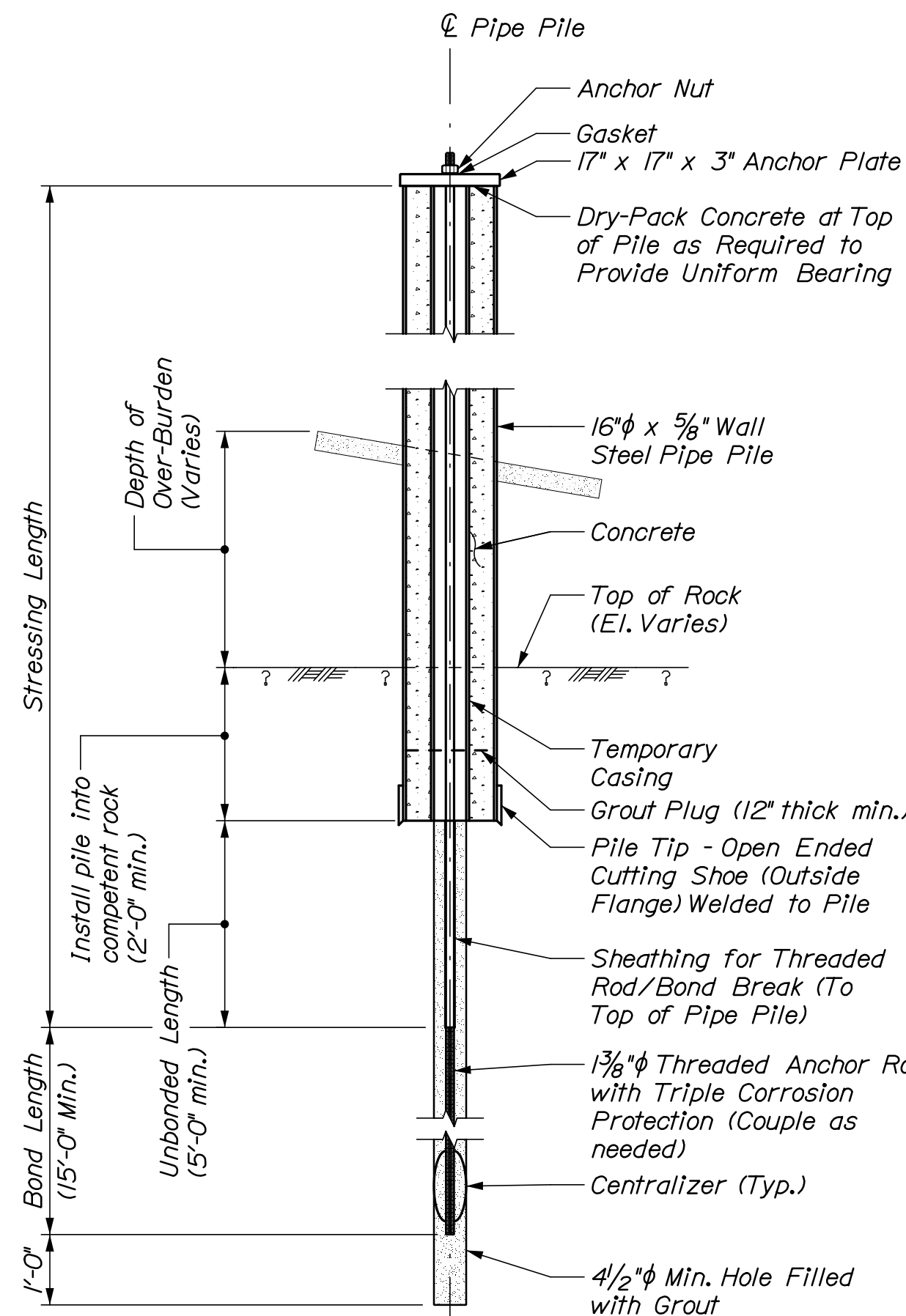
Filename: 008_Dolphin Foundation Plan.dgn



PLAN
1/16" = 1'-0"



D4 FOUNDATION PLAN
(Dimensions shown at pile cut-off elevation)
3/8" = 1'-0"



ROCK ANCHOR DETAIL
1/2" = 1'-0"

STEEL PILE TABLE			
	Pile No.	Estimated Pile Length	Vertical or Batter (Rise/Run)
Turning Dolphin D4	1	66	Vert.
	2	69	Batter 4:12
	3	69	Batter 4:12
	4	69	Batter 4:12
	5	69	Batter 4:12
	6	69	Batter 4:12
	7	66	Vert.
	8	69	Batter 4:12
	9	69	Batter 4:12
	10	67	Batter 2:12
	11	67	Batter 2:12

NOTES:

- A length of 5' has been included for contingency to each estimated pile length to determine order length.
- All steel pipe piles shall have rock anchors. For rock anchors, see detail.
- All steel pipe piles shall have aluminum anodes.
- For anode details, see Sheet S04.
- Pile splices shall not be allowed without prior approval of the Engineer of Record (EOR). Pile splices approved by the EOR and installed by the Contractor to achieve the installed pile length as noted herein shall be incidental to pay item 501.241, Steel Pipe Piles In-Place.

PILE AND ROCK ANCHOR SUGGESTED CONSTRUCTION SEQUENCE:

- Advance pipe pile open ended using drilling methods to top of competent rock and socket into competent rock per detail.
- Pile shall be cut off at final top elevation to perform anchor load test. Refer to structural drawings for top of pile elevations.
- Clean and flush rock cuttings and soil from inside the pile and socket. Confirm pile socketed into bedrock per detail. Check tolerances. Inspect integrity of pipe pile. Resident shall accept pipe pile prior to grout plug installation. Install grout plug; 12" thick minimum.
- Install temporary casing with centralizers as needed until it is seated into the grout plug to bedrock at the bottom of pile.
- Insert rock anchor drill casing and drill bit into temporary casing and drill anchor hole. Minimum length of anchor hole per the detail.
- Clean and flush rock cuttings from anchor hole. Do not allow drill cuttings to enter the pipe pile.
- Install triple corrosion protected anchor, sheathing and centralizers, preassembled to the required dimensions.
- Using tremie methods, fill the annular space between the anchor rod / sheathing and the anchor hole with 5,000 psi cement grout to above the top of the bedrock surface.
- Install anchor plate at top of anchor with hex nut and hardened washer.
- Verify that pile head is restrained from moving laterally by fixing the pile head to the pile template, falsework or other appropriate means.
- Perform rock anchor proof and performance tests to 133% of the max. pile tension load (See pile schedule). Release proof load and remove anchor plate.
- Place concrete in the annular space between the anchor rod sheathing and the pipe pile as the temporary casing is withdrawn, maintaining the concrete surface above the bottom of the temporary casing at all times.
- Re-install anchor plate at top of anchor with hex nut and hardened washer. Apply 110% of the max. pile tension load (see pile schedule). Lock off rock anchor.
- Proceed with dolphin construction.

Pile Load Schedule	
Max. Factored Applied Pile Compression Load (LRFD):	345 kips
Max. Factored Applied Pile Tension Load (LRFD):	217 kips
Max. Applied Pile Tension Load (ASD):	112 kips
Min. Pile Compression Resistance (LRFD):	390 kips
Min. Rock Anchor Tension Capacity (ASD):	361 kips
Rock Anchor Test Load:	150 kips
Rock Anchor Lock Off Load:	124 kips

NOTES:

- In the absence of definitive guidance in AASHTO's LRFD Bridge Design Specifications (LRFD Manual), Article 10.7.3.2.3 "Point Bearing Piles on Rock - Piles Driven to Hard Rock," the geotechnical axial capacity of pipe piles end-bearing on rock was determined using established ASD methods with a Factor of Safety of 2.0, equivalent to a resistance factor of 0.5 as required per the LRFD Manual.
- The tensile capacity of rock anchors was determined using established ASD methods in the absence of definitive guidance in the LRFD Manual, Article 11.9.4.2 - "Anchor Pullout Capacity." A resistance factor equal to 1.0 is allowed per the LRFD Manual since all the rock anchors will be tested.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

PROJ. MANAGER
DESIGN-DETAILED
CHECKED-REVIEWED
DESIGN-DETAILED
DESIGN-DETAILED
REVISIONS 1
REVISIONS 2
REVISIONS 3
FIELD CHANGES

DATE
03/21
03/21

BY
P. Bishop
C. Morin

SIGNATURE
10209

P.E. NUMBER
DATE

FRENCHBORO
FERRY TERMINAL

DOLPHIN
FOUNDATION PLAN

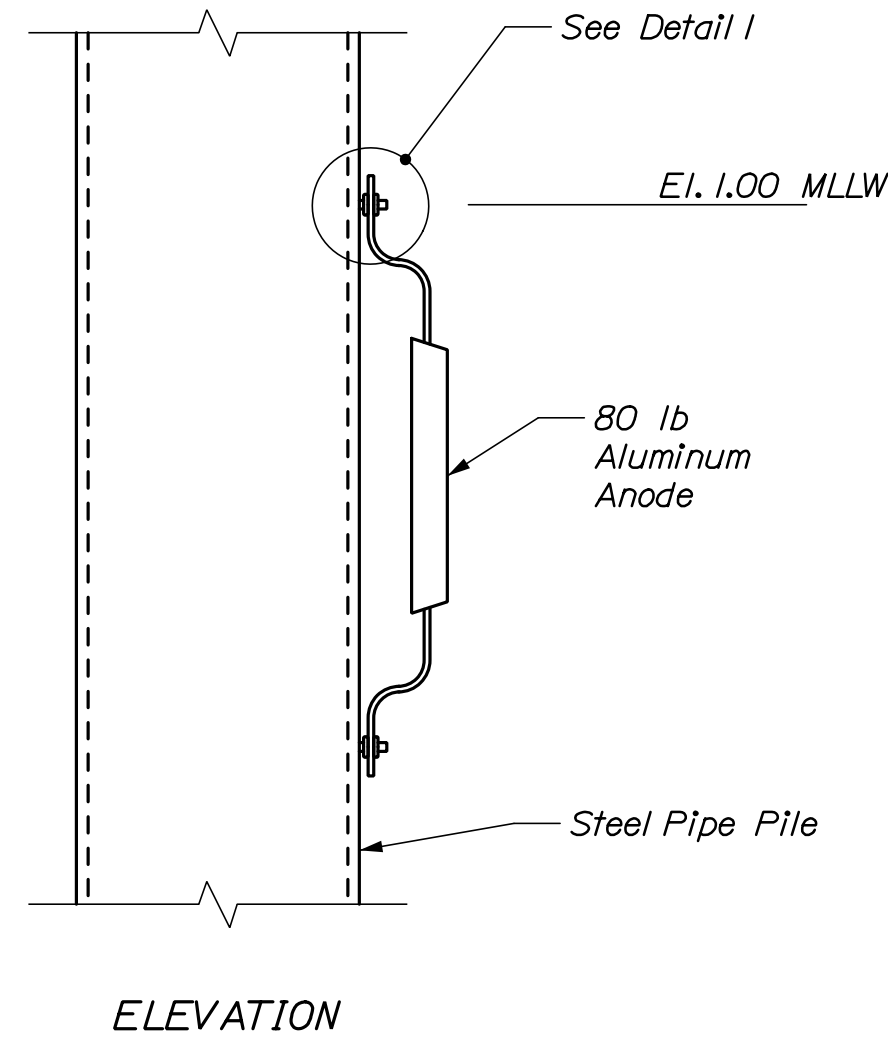
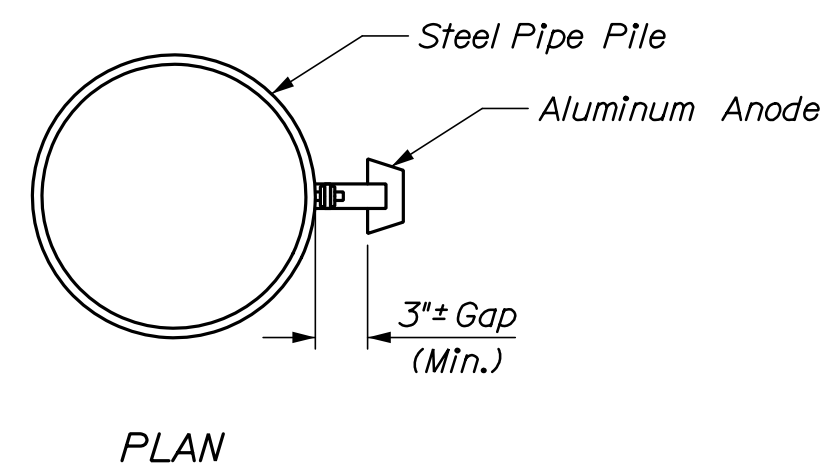
SHEET NUMBER

S03

8 OF 17

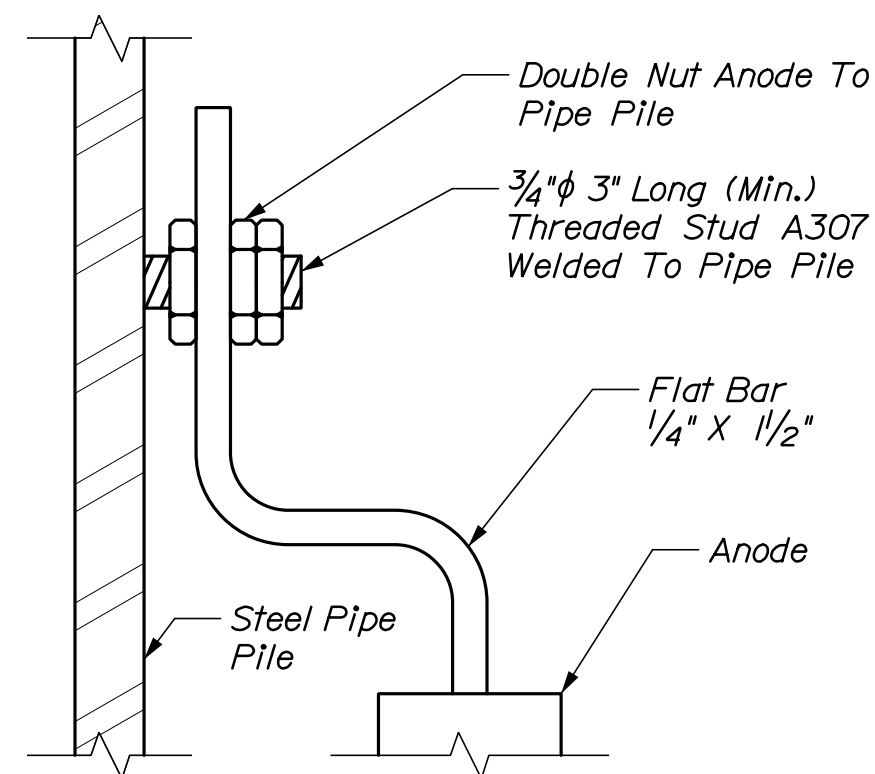


WIN
022202.00



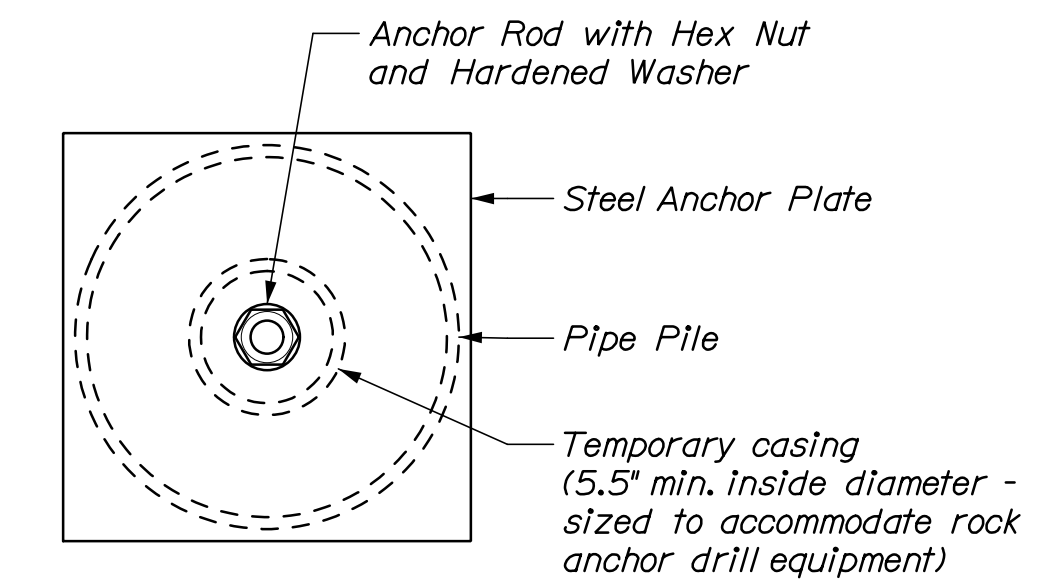
Note: Anode shall be positioned along the inshore face of piles. Set top of Anode at +1.00 MLLW

ANODE DETAIL
N.T.S.

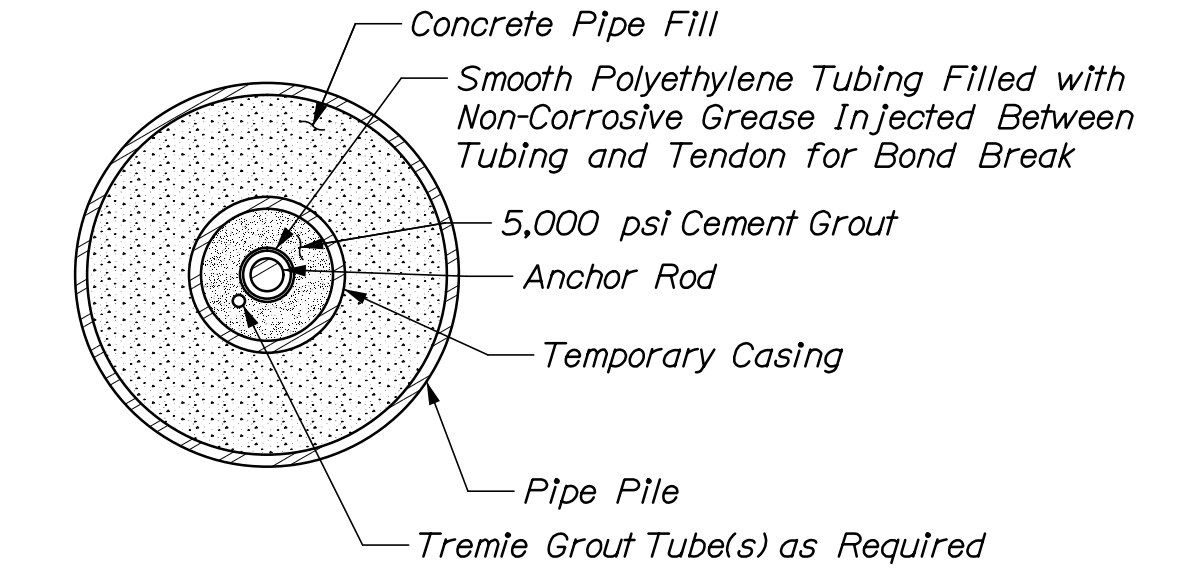


Note: Studs and hardware shall be A307.

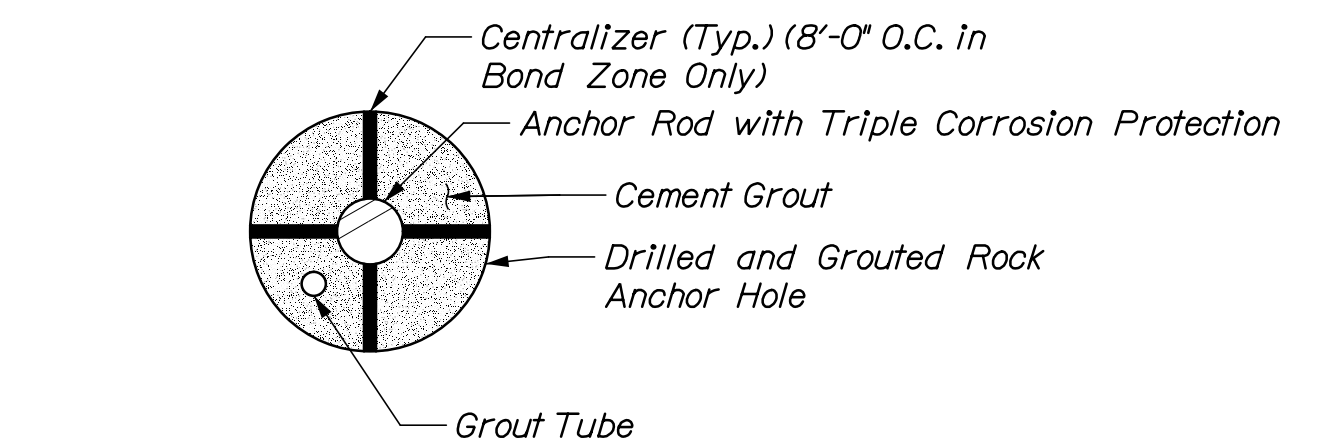
N.T.S.



N.T.S.



N.T.S.



N.T.S.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

WIN
022202.00

PROJ. MANAGER	DATE	SIGNATURE
DESIGN-DETAILED	03/21	
CHECKED-REVIEWED	03/21	
DESIGN-DETAILED		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

FRENCHBORO
FERRY TERMINAL
DOLPHIN FOUNDATION
DETAILS

SHEET NUMBER

S04

9 OF 17

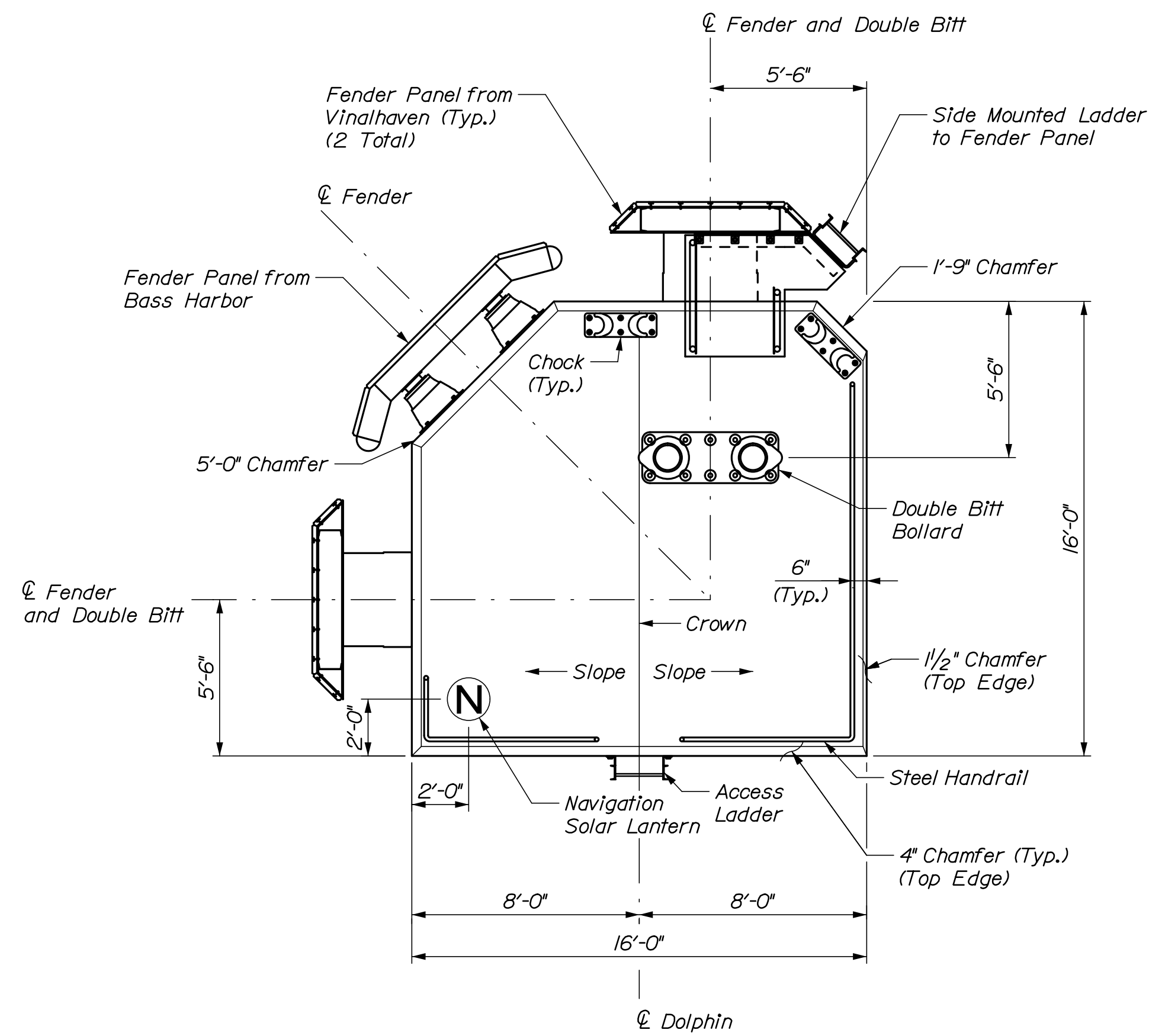


Date: 5/11/2021

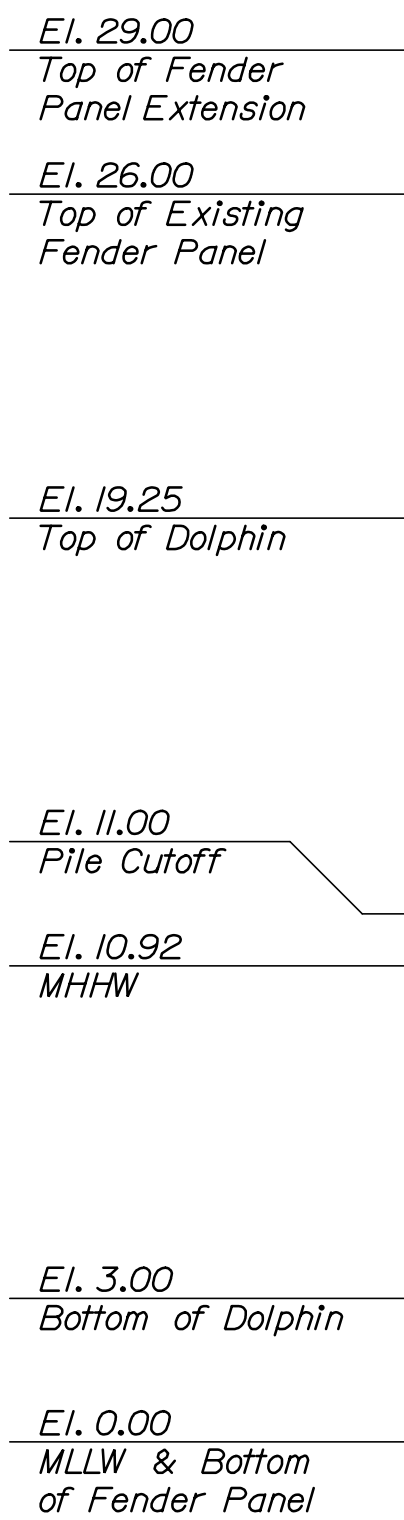
Username:

Division:

Filename: 010_Dolphin Plan and Elevation.dgn

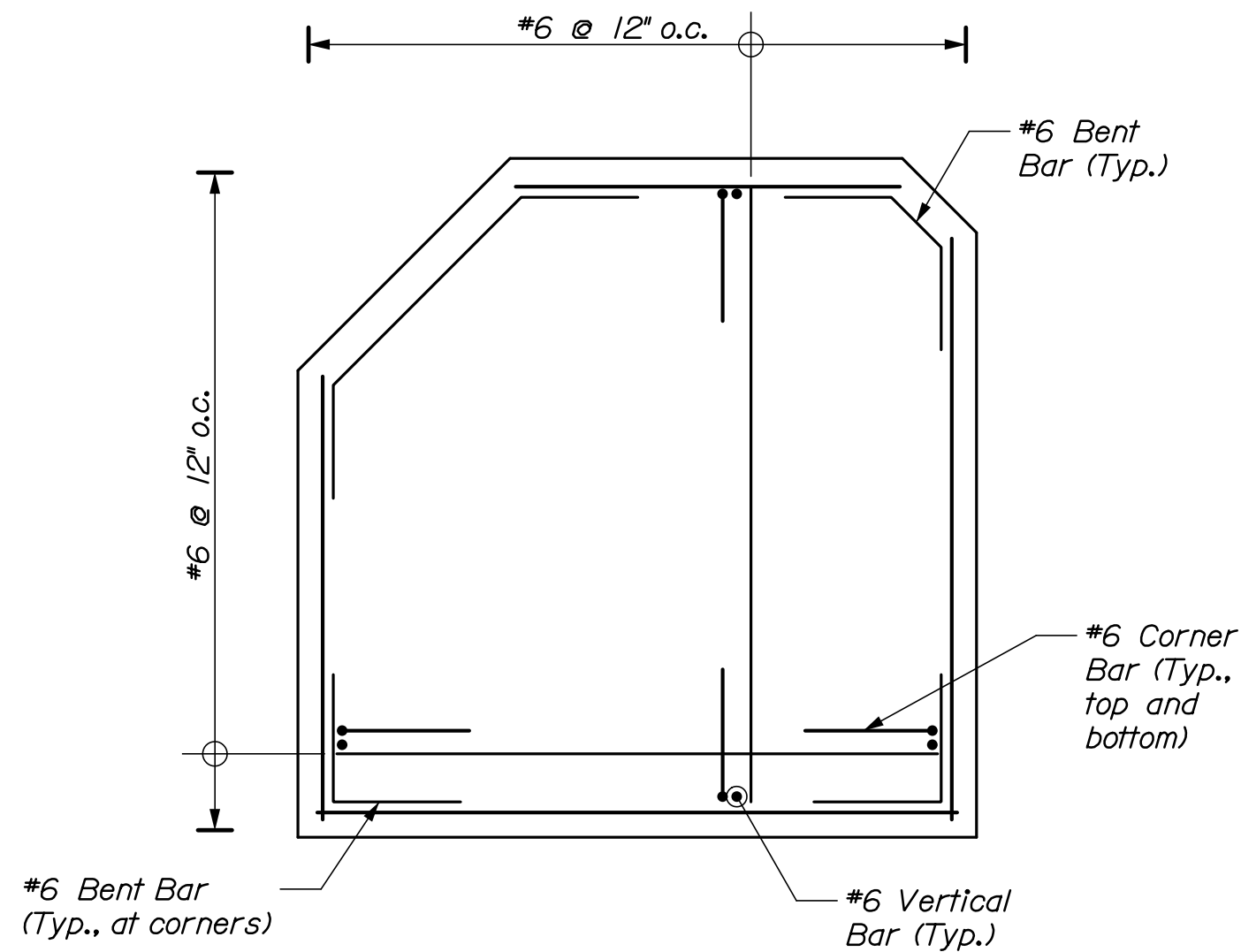


**TURNING DOLPHIN
PLAN**
1/4" = 1'-0"

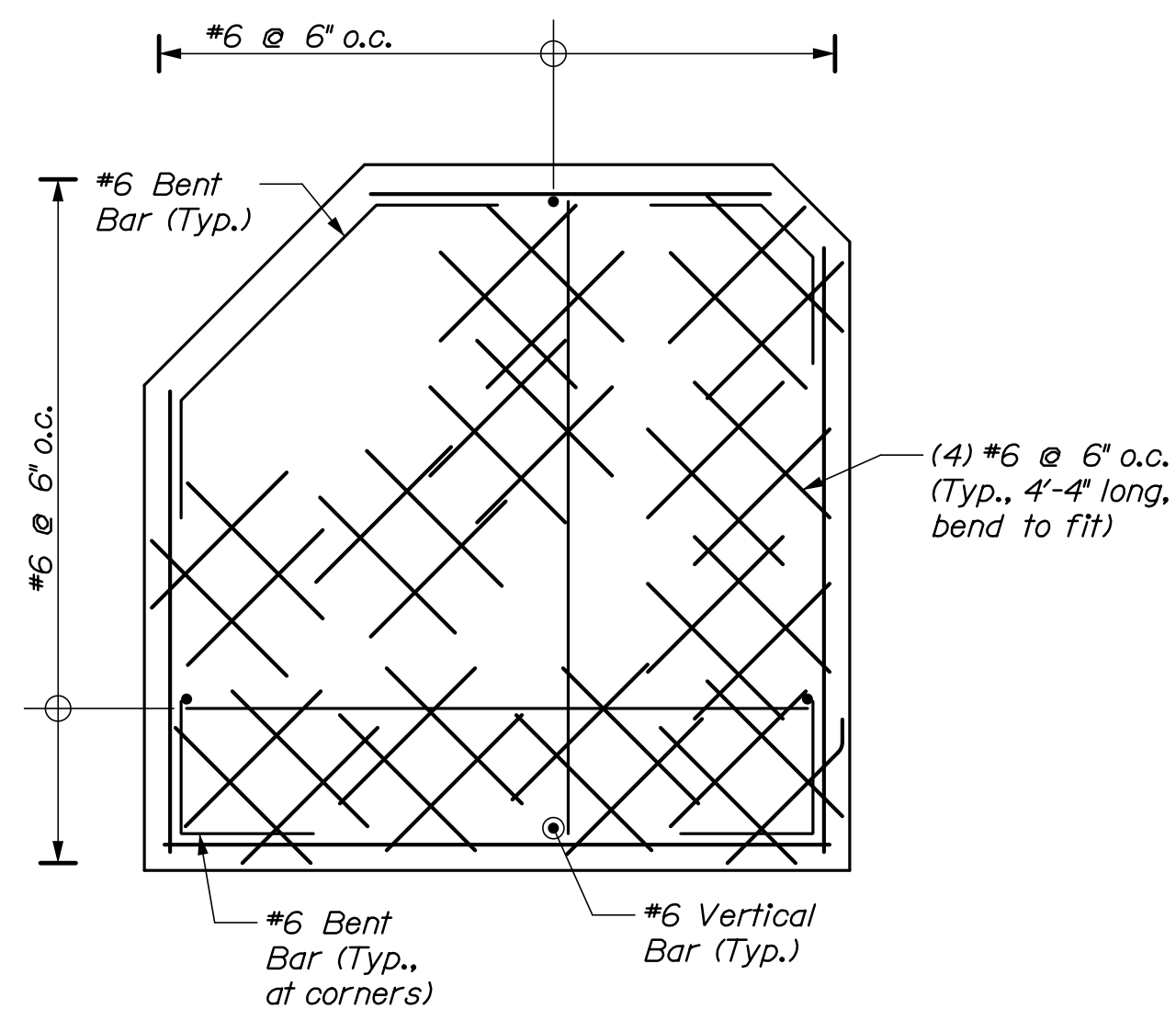


**TURNING DOLPHIN
ELEVATION**

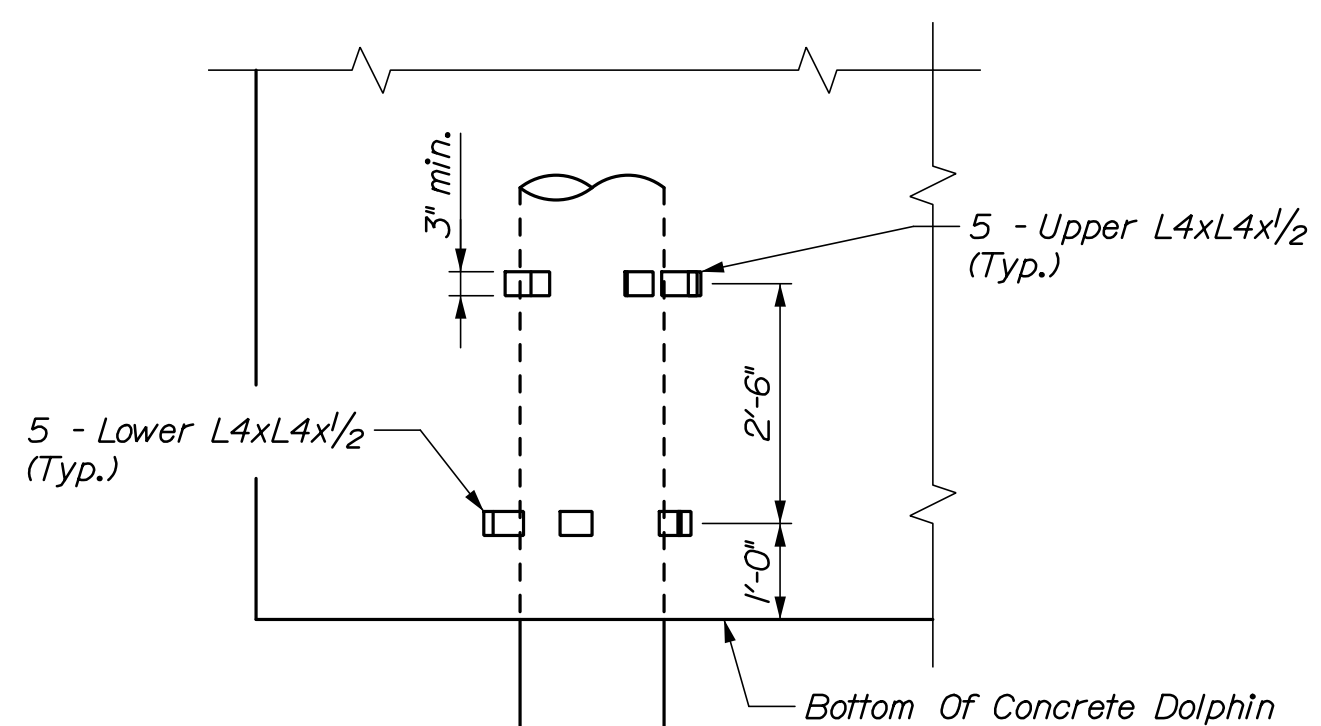
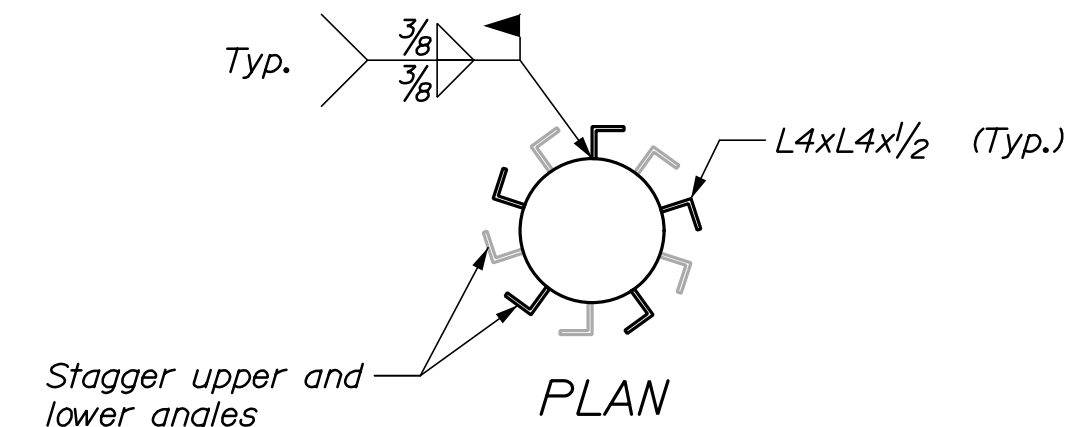
(Select fenders and chocks not shown for clarity)
1/4" = 1'-0"



SECTION A-A
(Same as shown for El. 9.50 - 11.00, but with pile cutouts)
1/4" = 1'-0"



SECTION B-B
1/4" = 1'-0"



PILE SHEAR REINFORCEMENT
1/2" = 1'-0"

NOTES:

1. For anode details, see Sheet S04.
2. For double bitt and chock details, see Sheet S06.
3. For handrail details, see Sheet S09.
4. For access ladder details, see Sheet S10 through S12.
5. All reinforcing shall be cut to maintain 2" clear from piles and 3" clear of concrete surfaces.
6. Reinforcing bars shall be adjusted to maintain 1" clear from anchor rods.
7. Crown slope at top of dolphin shall be 1/4" per foot and pitched as shown.

TURNING DOLPHIN REINFORCING TYPICAL SECTION
1/4" = 1'-0"

STATE OF MAINE DEPARTMENT OF TRANSPORTATION		SIGNATURE 10/209		P.E. NUMBER 10209		DATE	
PROJ. MANAGER	DESIGN-DETAILED	CHECKED-REVIEWED	DESIGN-DETAILED	REVISIONS 1	REVISIONS 2	REVISIONS 3	REVISIONS 4
N. Willey	C. Morin	P. Bishop	C. Morin				
DATE	BY	DATE	BY	DATE	BY	DATE	BY
03/21	P. Bishop	03/21	C. Morin				
FIELD CHANGES							
FRENCHBORO FERRY TERMINAL				DOLPHIN PLAN, ELEVATION, AND DETAILS			
SHEET NUMBER S05							
WIN 022202.00				10 OF 17			

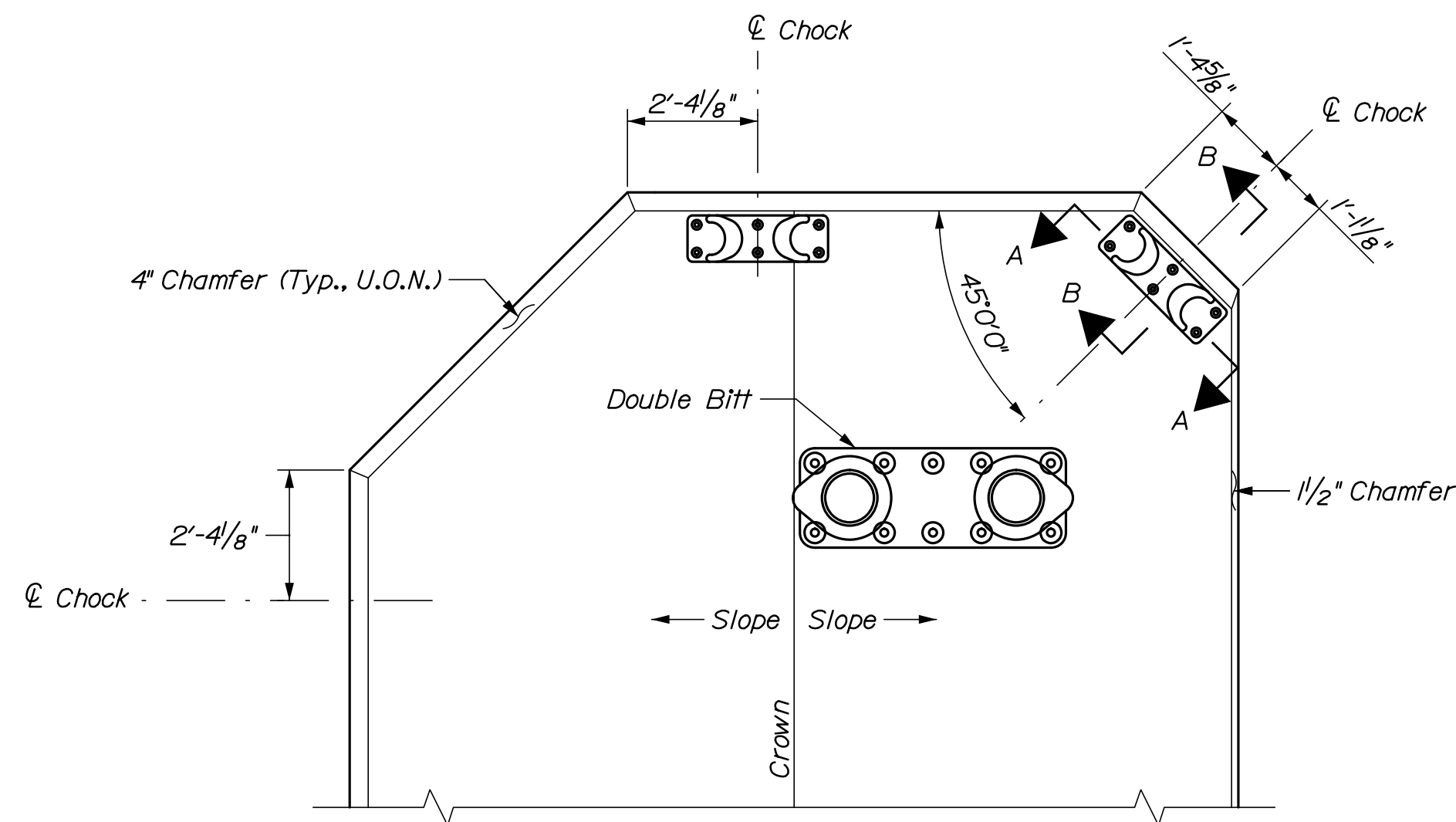


Date: 5/11/2021

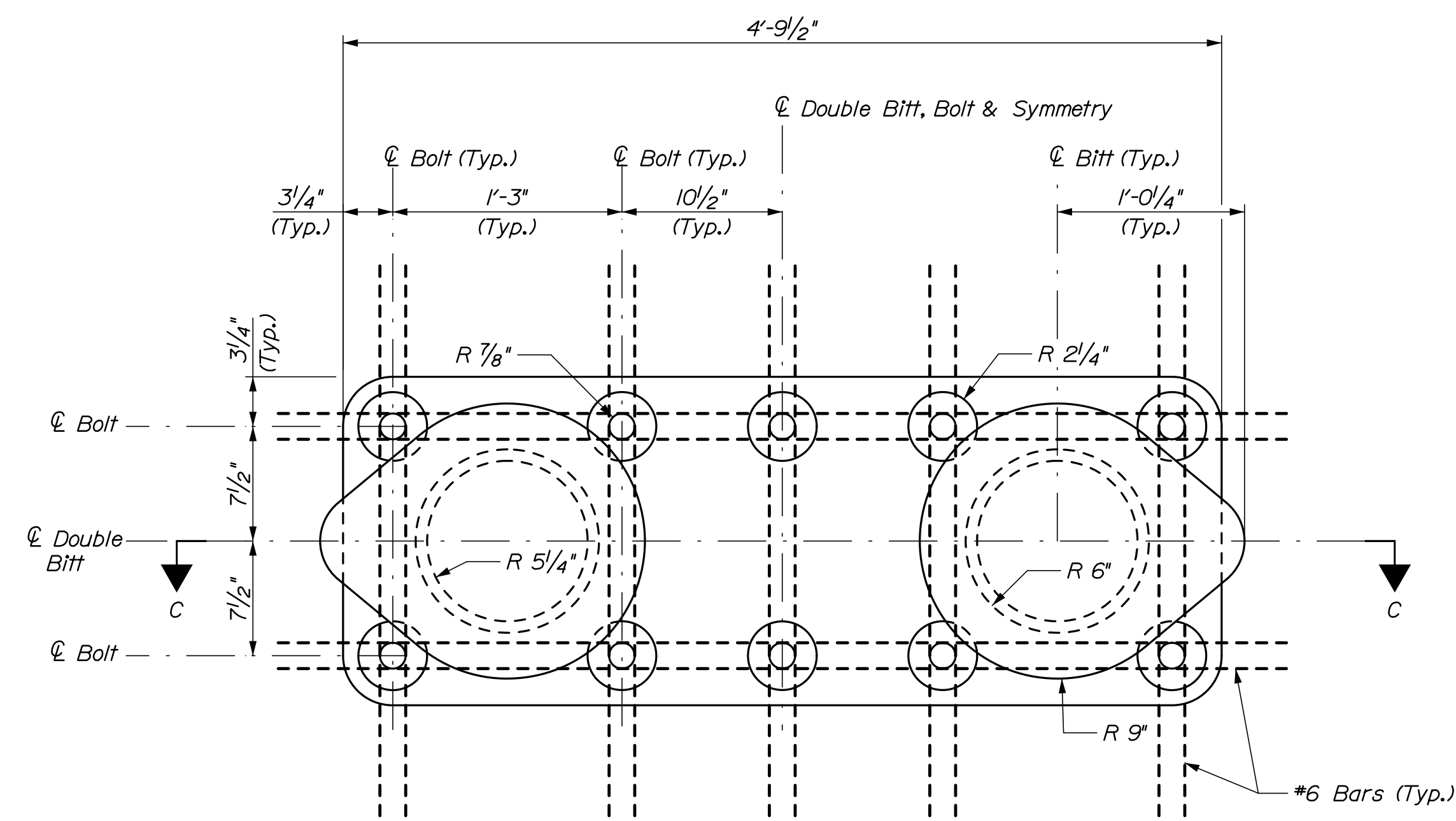
Username:

Division:

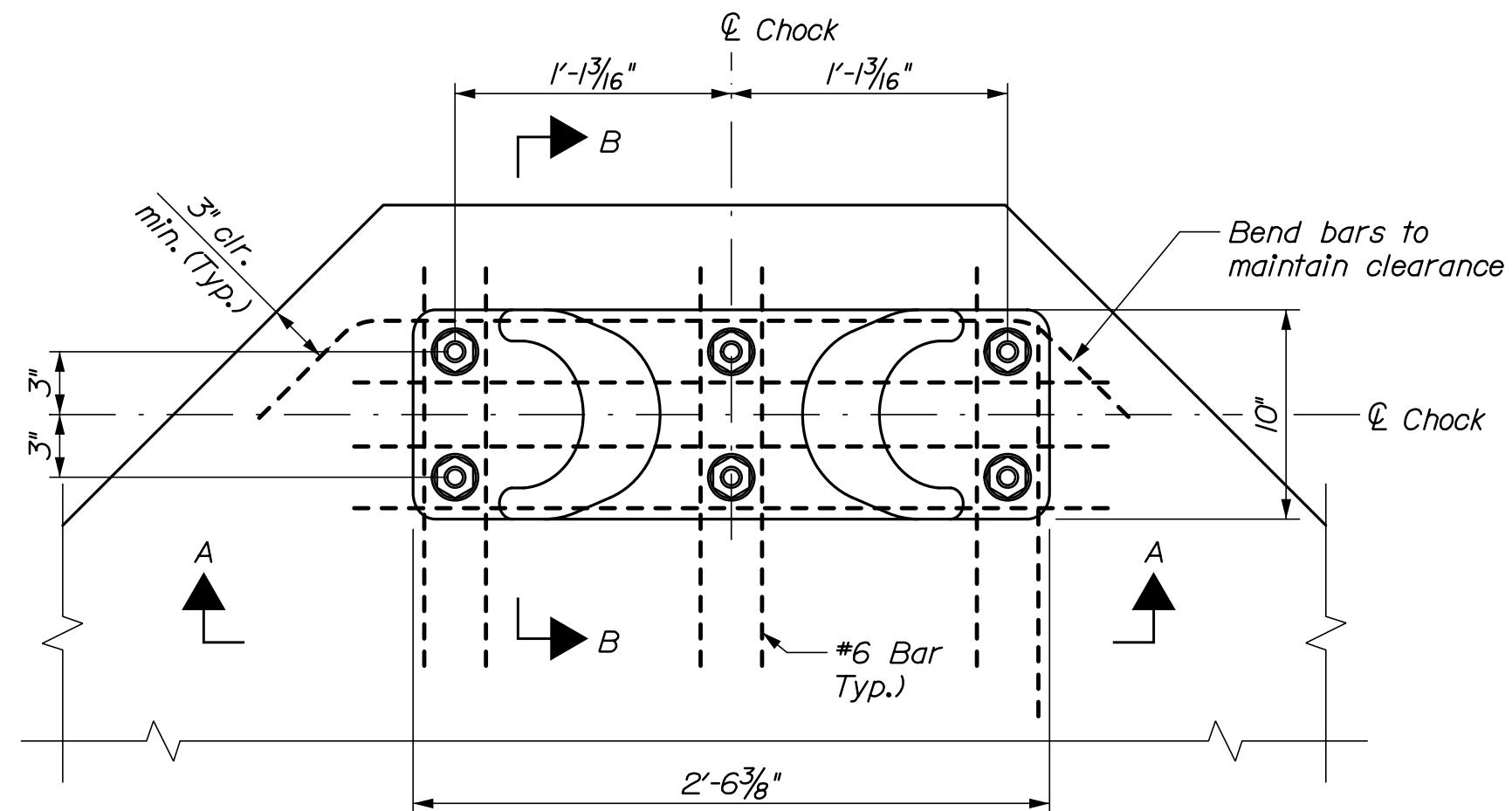
Filename: 011_Mooring Hardware.dgn



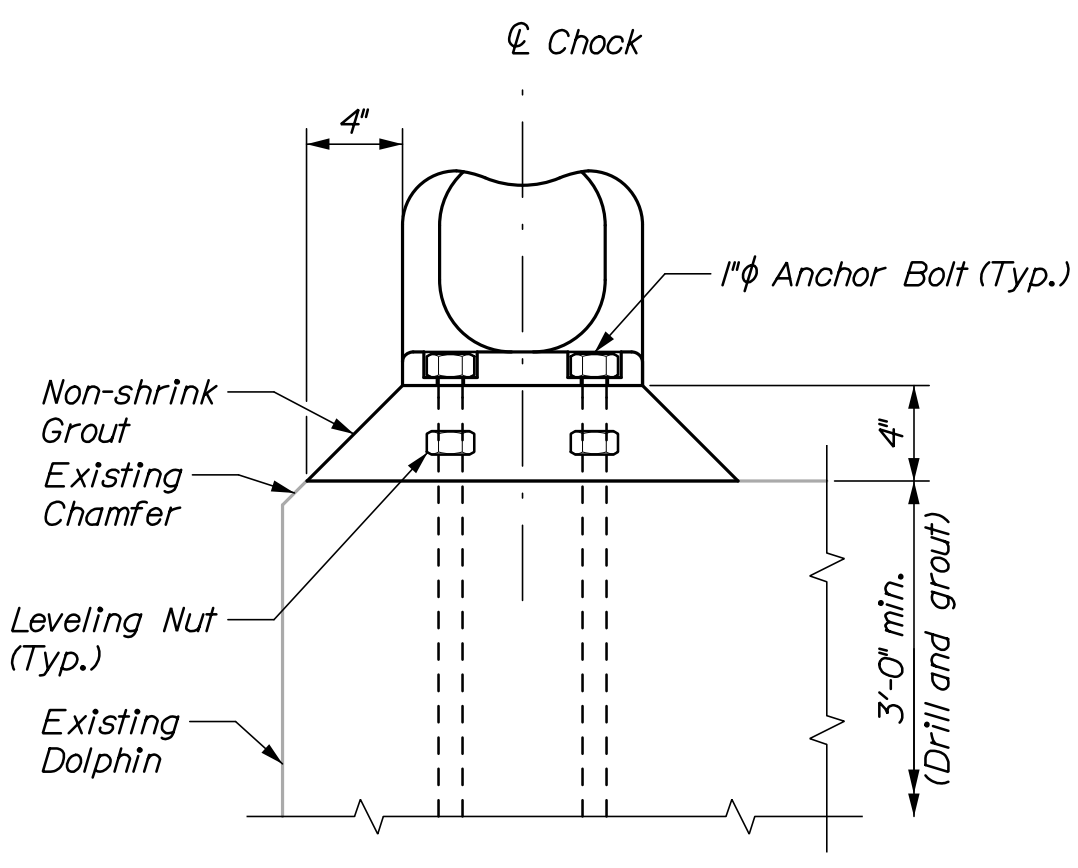
PLAN VIEW OF PROPOSED DOLPHIN
(Hand rails, lights, and fenders not shown for clarity)
3/8" = 1'-0"



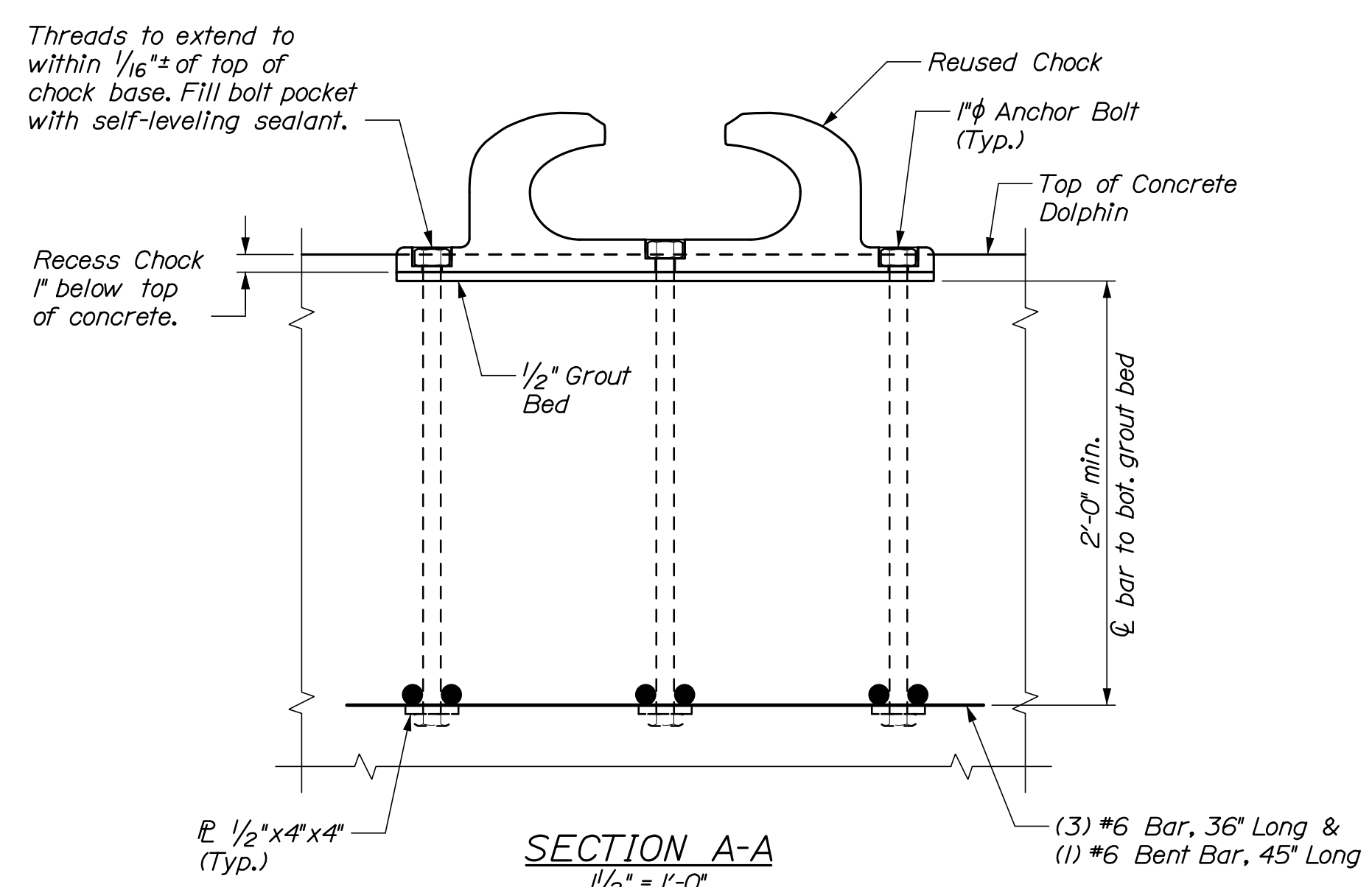
DOUBLE BITT PLAN
1/2" = 1'-0"



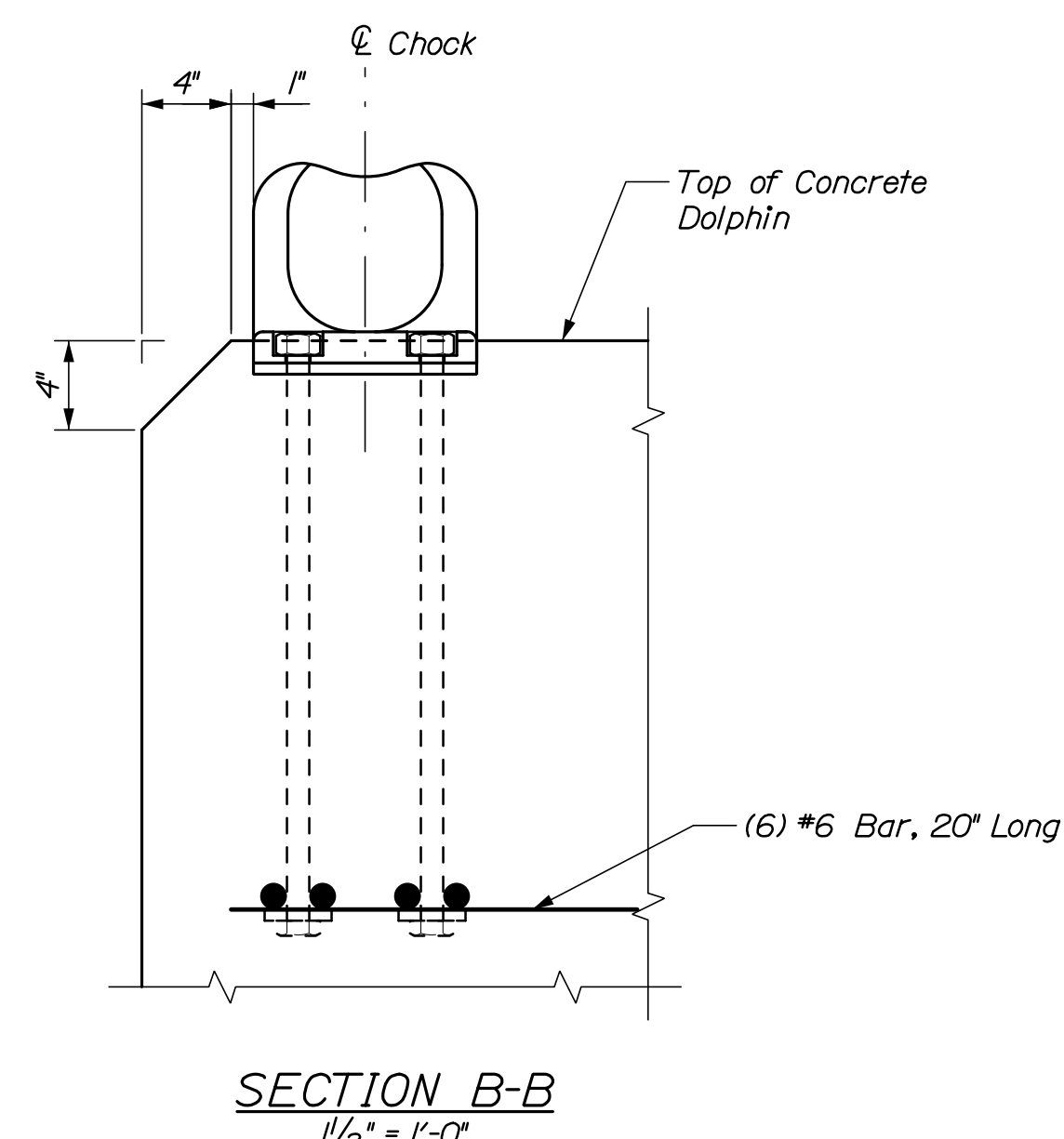
CHOCK PLAN AT CHAMFER
1/2" = 1'-0"



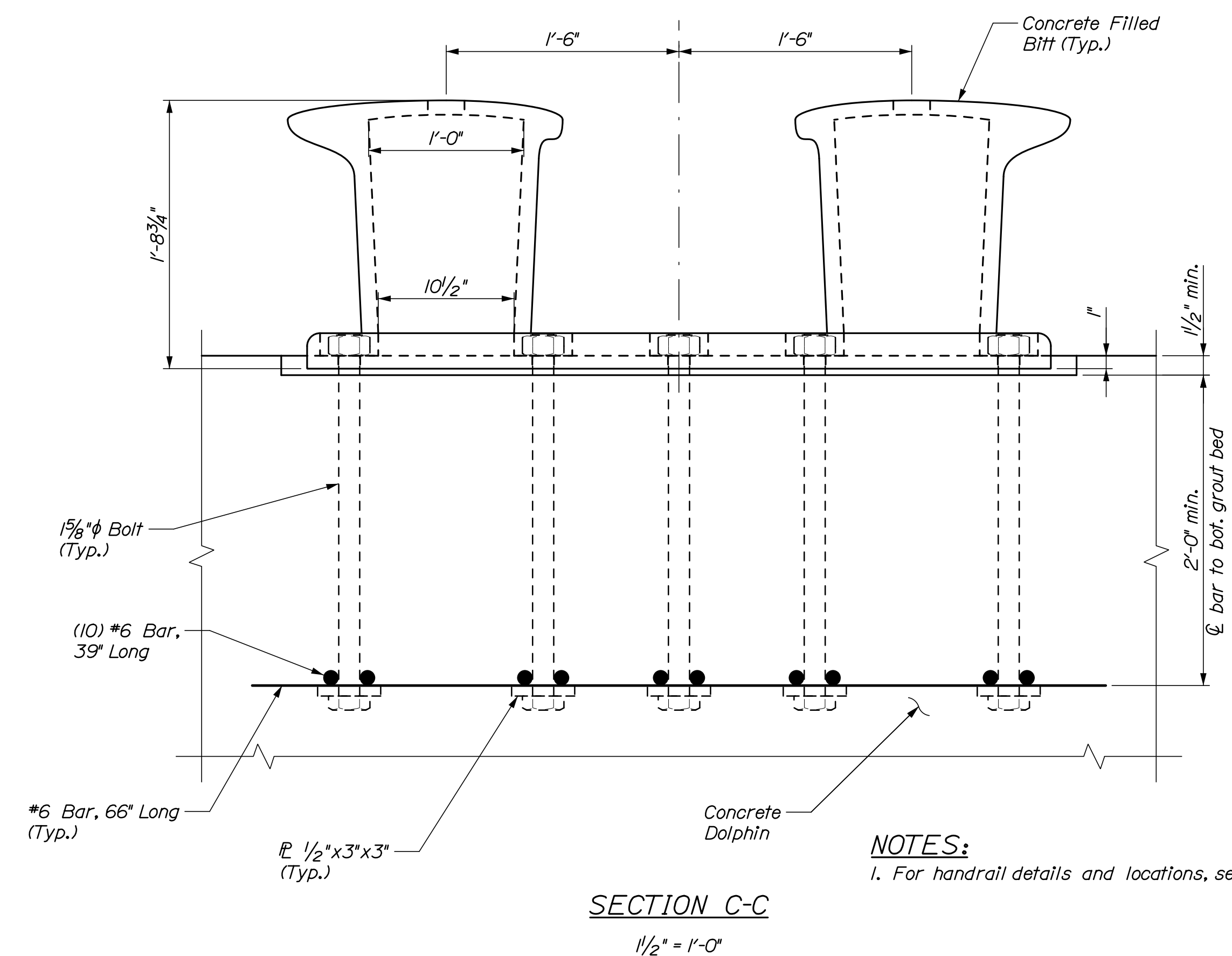
EXISTING CONCRETE CHOCK DETAIL
1/2" = 1'-0"



SECTION A-A
1/2" = 1'-0"



SECTION B-B
1/2" = 1'-0"



SECTION C-C
1/2" = 1'-0"

NOTES:
1. For handrail details and locations, see Sheet S09.

STATE OF MAINE DEPARTMENT OF TRANSPORTATION		SIGNATURE 10209		P.E. NUMBER DATE	
PROJ. MANAGER	BY	DATE	DESIGN-DETAILED	CHECKED-REVIEWED	DESIGN-DETAILED
FRENCHBORO FERRY TERMINAL	N. Willey P. Bishop C. Morin	03/21 03/21	N. Willey C. Morin	P. Bishop C. Morin	C. Morin
DOLPHIN DETAILS MOORING HARDWARE			REVISIONS 1	REVISIONS 2	REVISIONS 3
SHEET NUMBER S06			REVISIONS 4	FIELD CHANGES	
11 OF 17			WIN 022202.00		

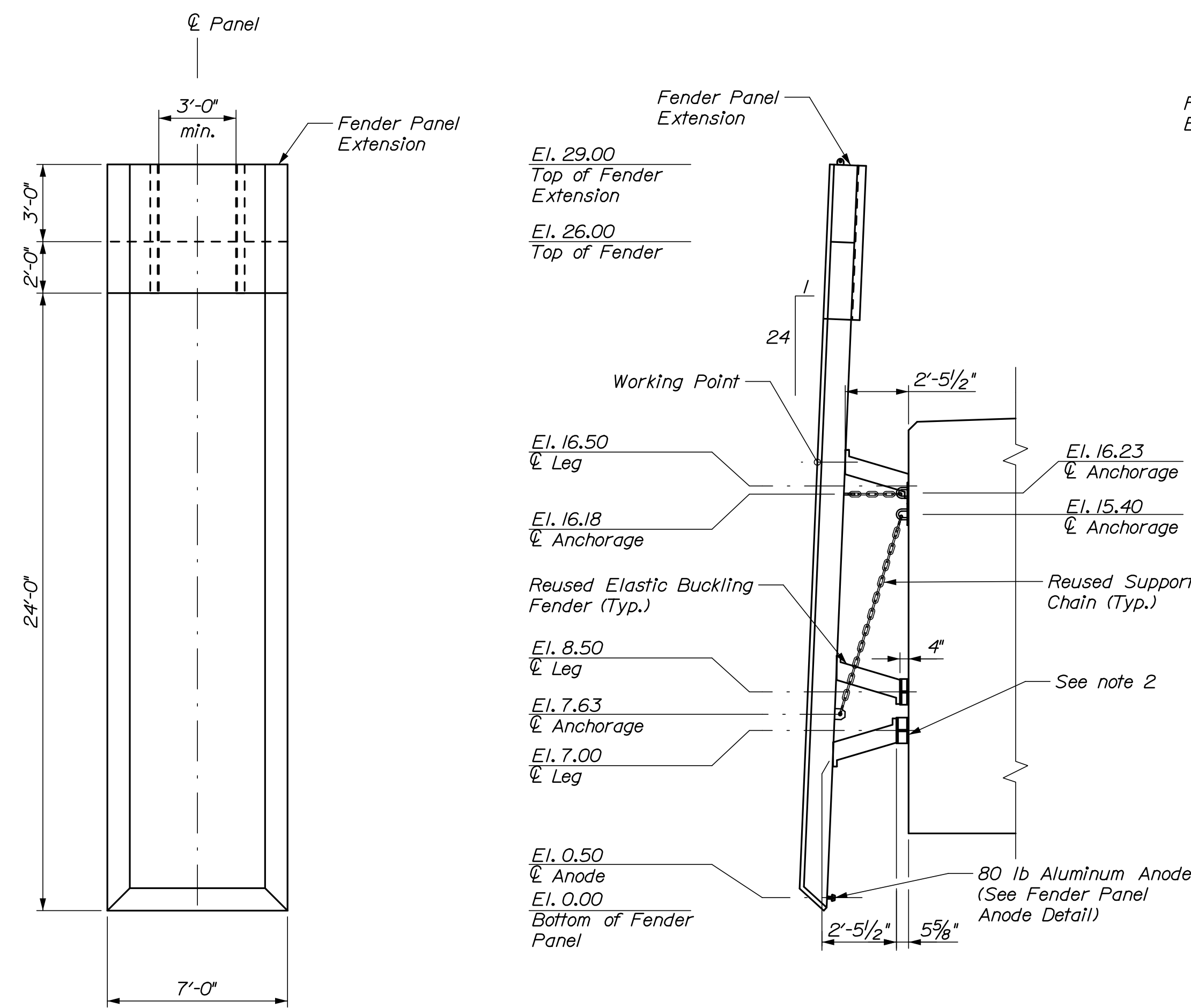


Date: 5/11/2021

Username:

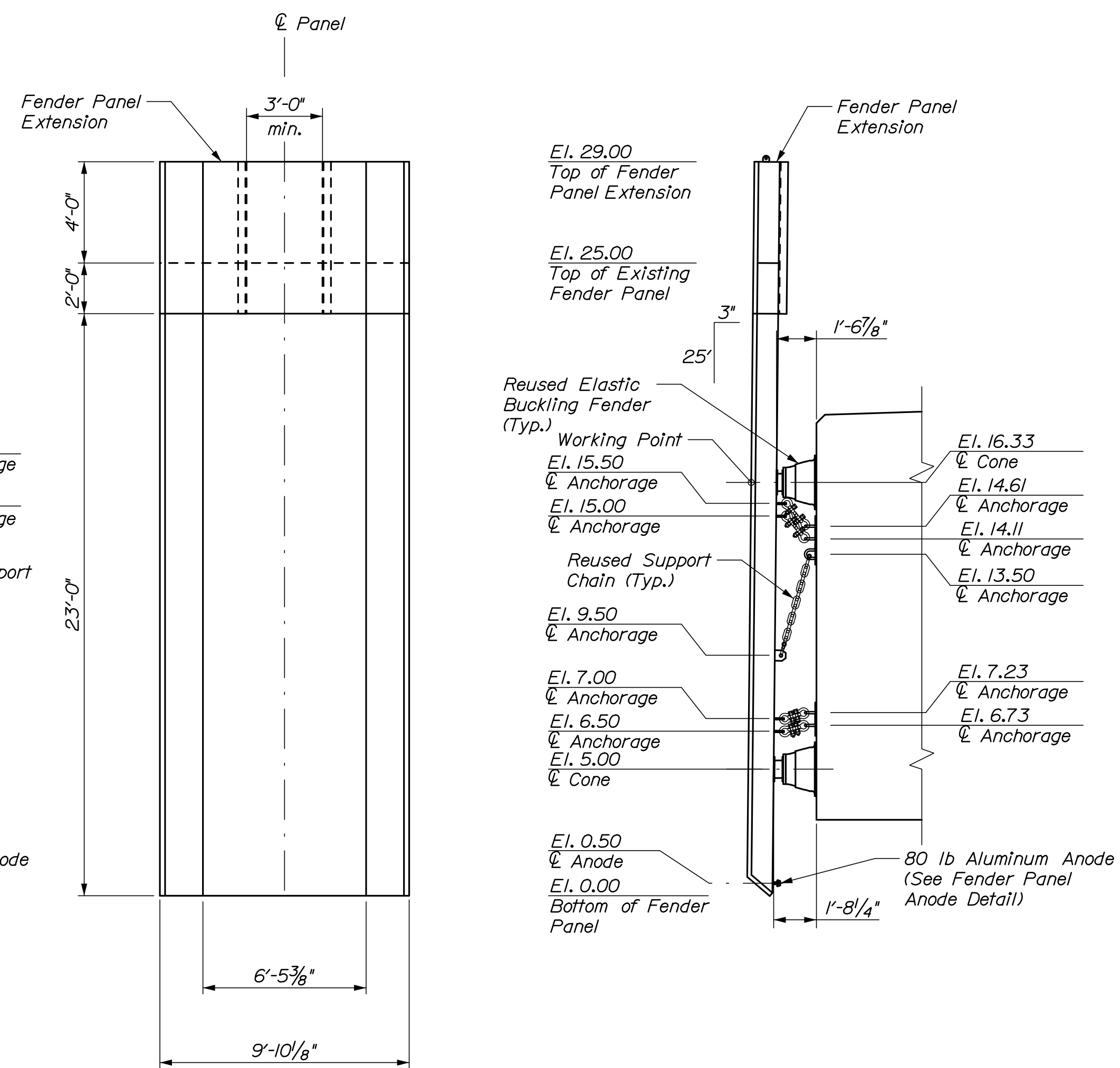
Division:

Filename: 012_Fender System 1.dgn



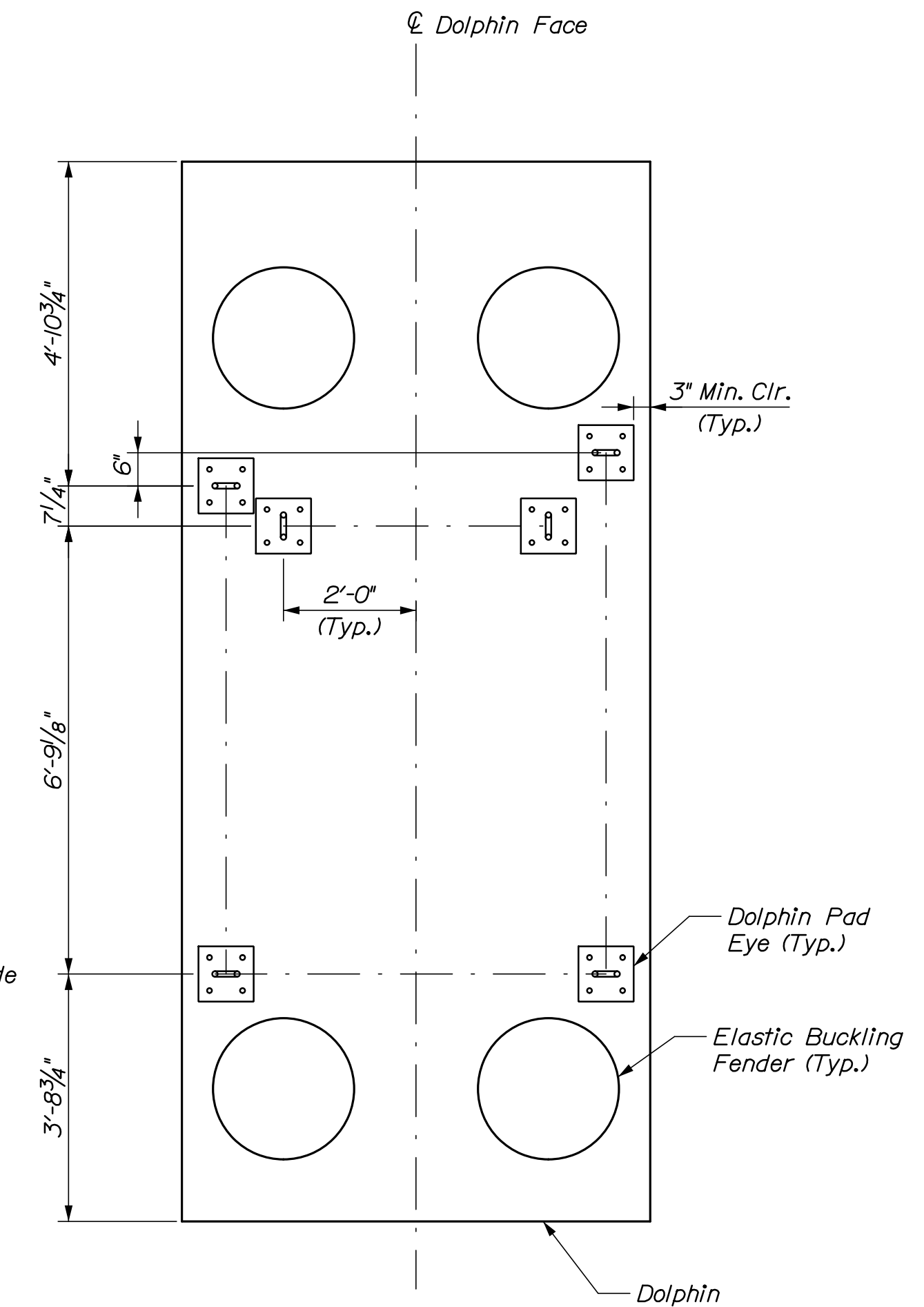
**EXISTING PANEL
(FROM VINALHAVEN)**
1/4" = 1'-0"

**EXISTING PANEL ELEVATION
(FROM VINALHAVEN)**
(Foundation piles and hardware not shown for clarity)
1/4" = 1'-0"

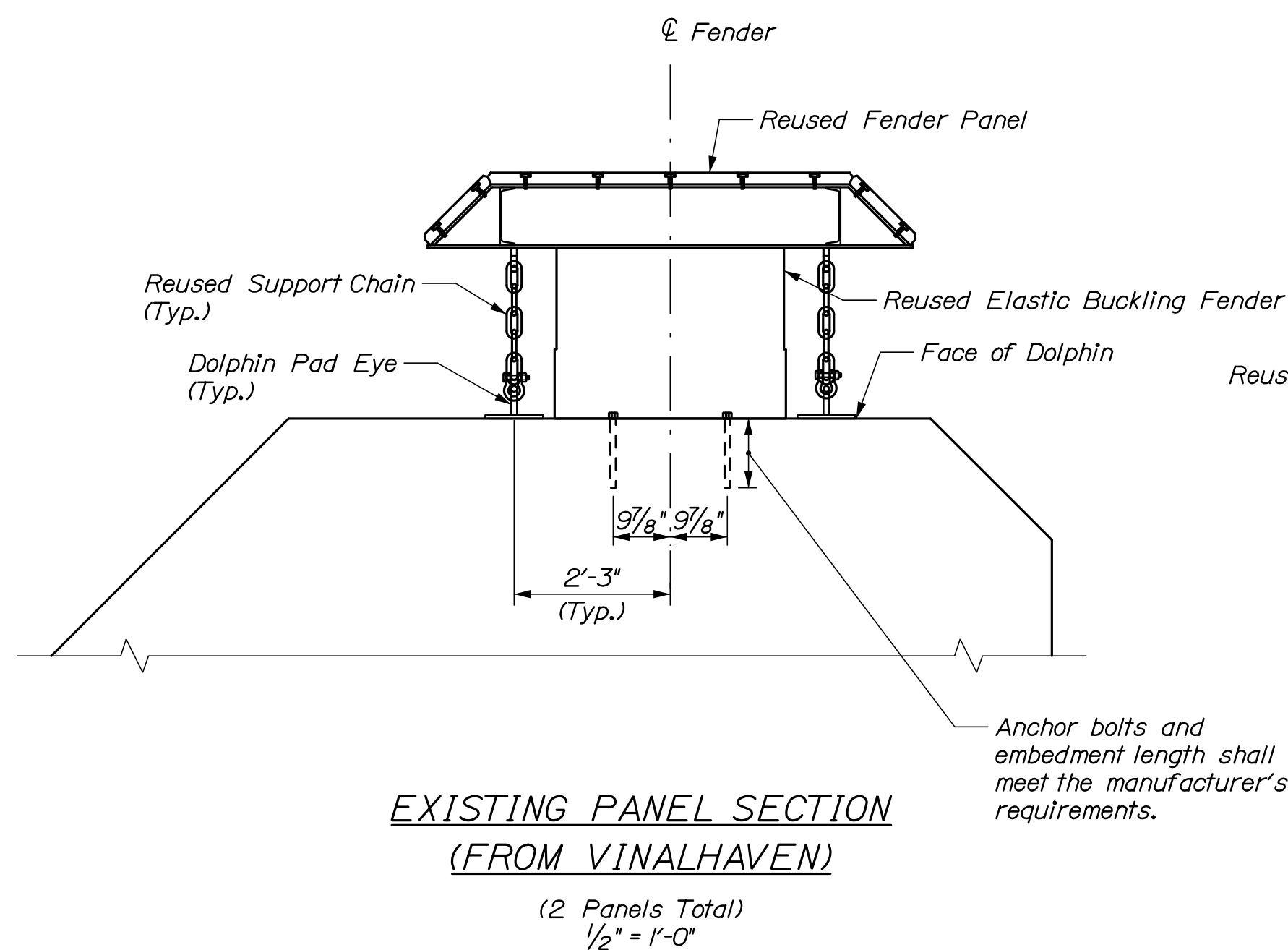


**EXISTING PANEL
(FROM BASS HARBOR)**
1/4" = 1'-0"

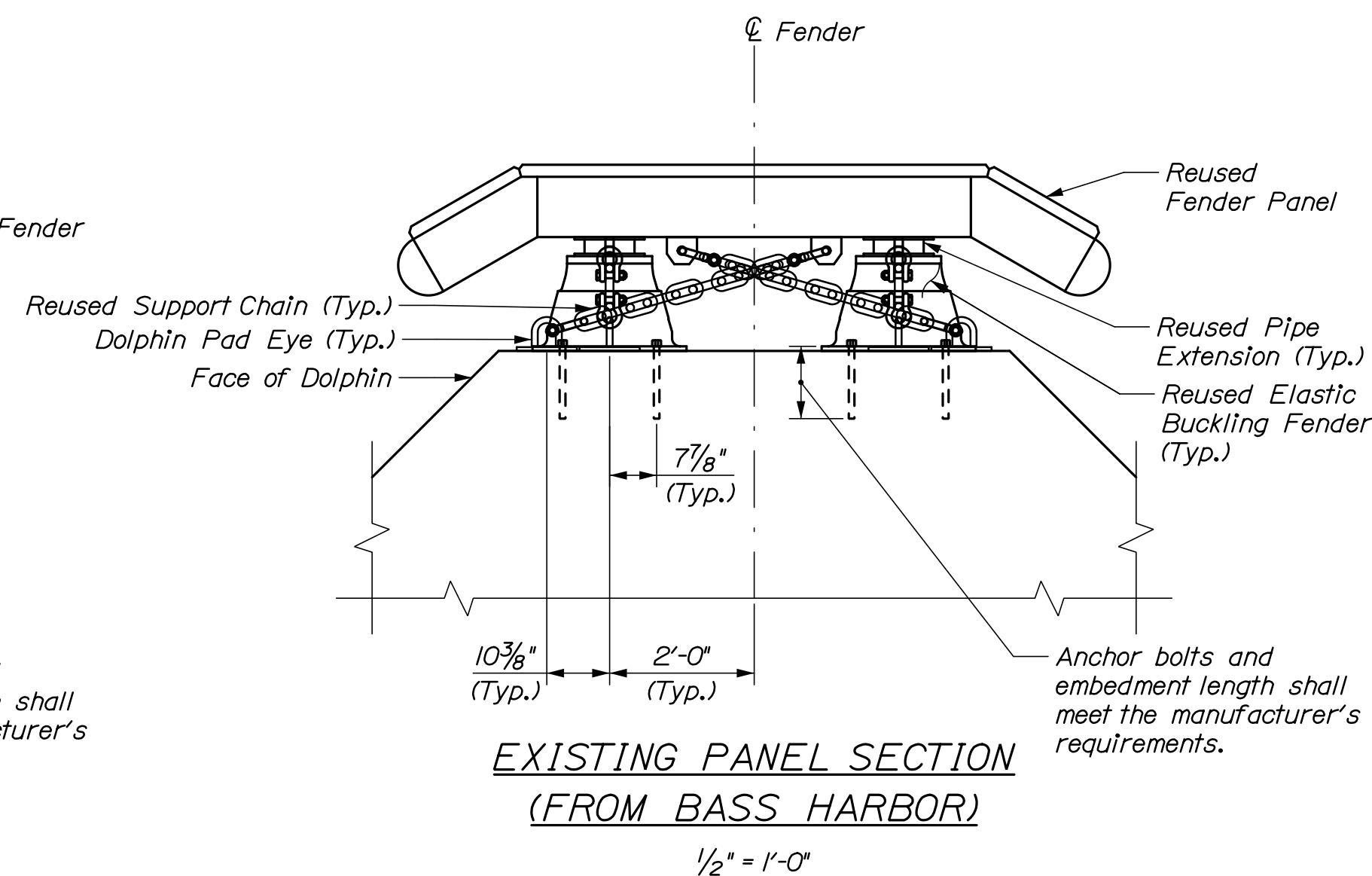
**EXISTING PANEL ELEVATION
(FROM BASS HARBOR)**
(Foundation piles and hardware not shown for clarity)
1/4" = 1'-0"



**EXISTING PANEL DETAIL
(DOLPHIN PAD EYE LOCATIONS)
(FROM BASS HARBOR)**
1/2" = 1'-0"



**EXISTING PANEL SECTION
(FROM VINALHAVEN)**
(2 Panels Total)
1/2" = 1'-0"



**EXISTING PANEL SECTION
(FROM BASS HARBOR)**
1/2" = 1'-0"

NOTES

- Existing chains, dog bones, and connectors shall be reused unless damaged or corroded. The Resident shall determine if replacement is required and the Contractor shall replace in kind.
- Existing steel fender blocks from Vinalhaven dolphin DI shall not be used.
- Contractor shall use fender plate or fender block detail to maintain proposed fender panel alignment.
- For dolphin pad eye, panel anode and steel fender block details, see Sheet S08.
- Contractor to replace broken or bent chain links, dog bones, or chain tensioner in kind.
- Contractor shall remove obstructions or modify detail for panel extension.

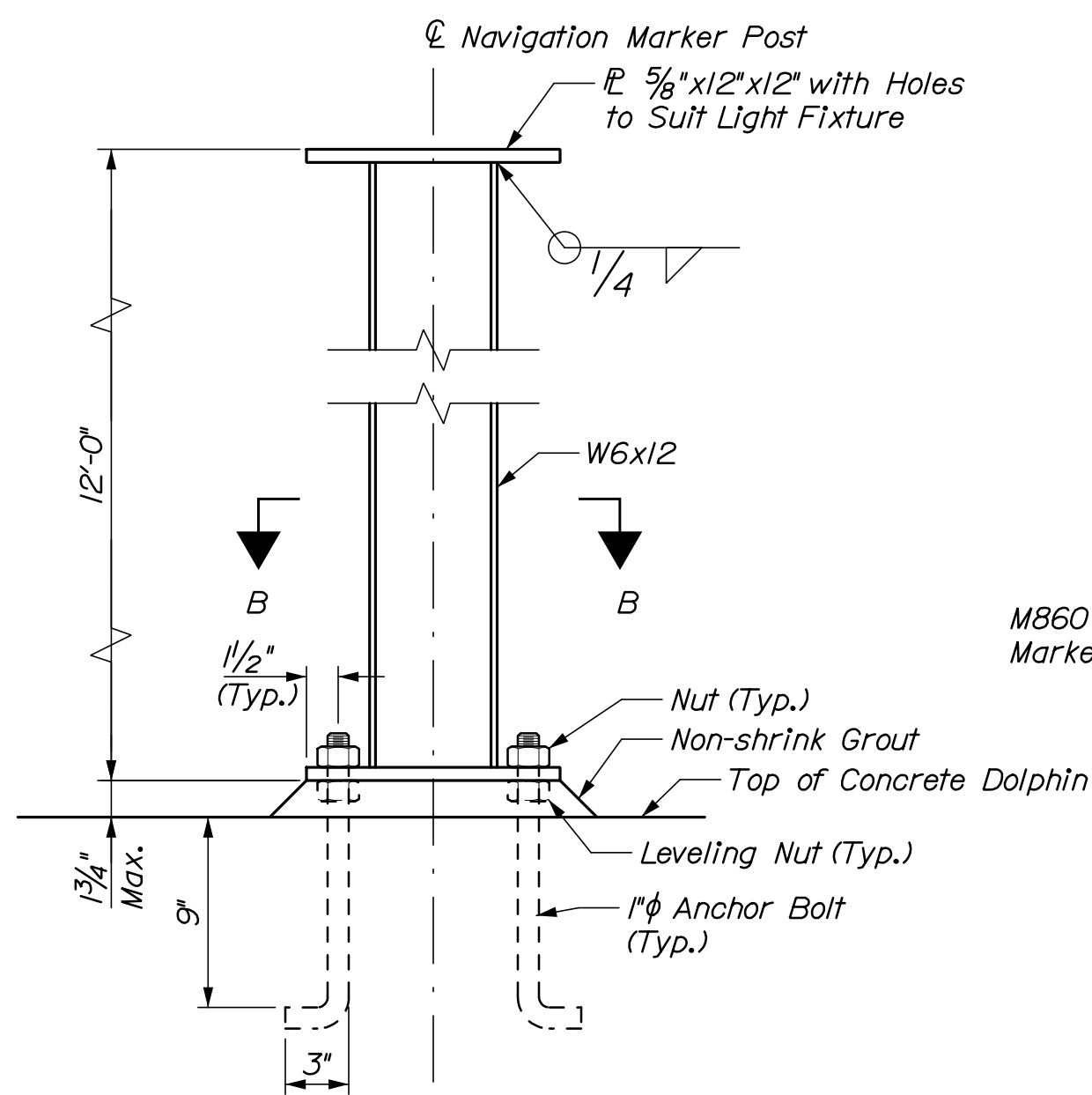
PROJ. MANAGER	BY	DATE	SIGNATURE	P.E. NUMBER	DATE
N. Willey	P. Bishop	03/21		10209	
C. Morin	C. Morin	03/21			
DESIGN-DETAILED					
CHECKED-REVIEWED					
DESIGN-DETAILED					
REVISIONS 1					
REVISIONS 2					
REVISIONS 3					
REVISIONS 4					
FIELD CHANGES					

Date: 5/11/2021

Username:

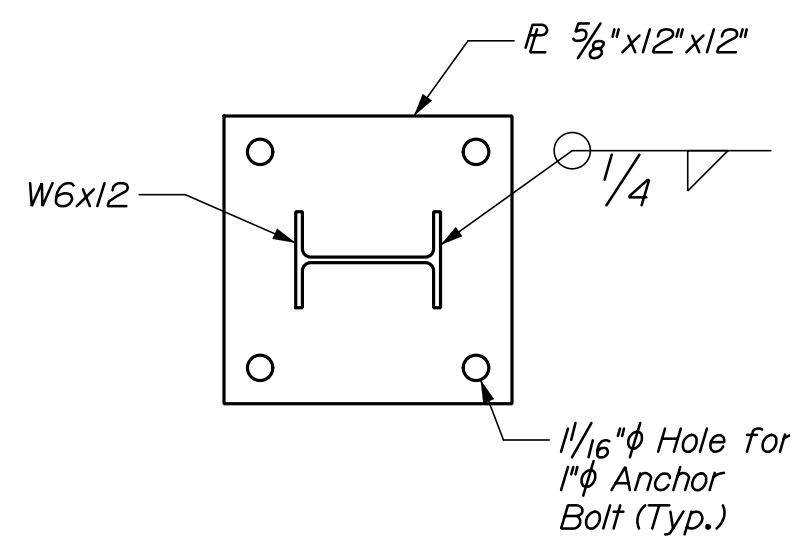
Division:

Filename: 014_Miscellaneous Details.dgn



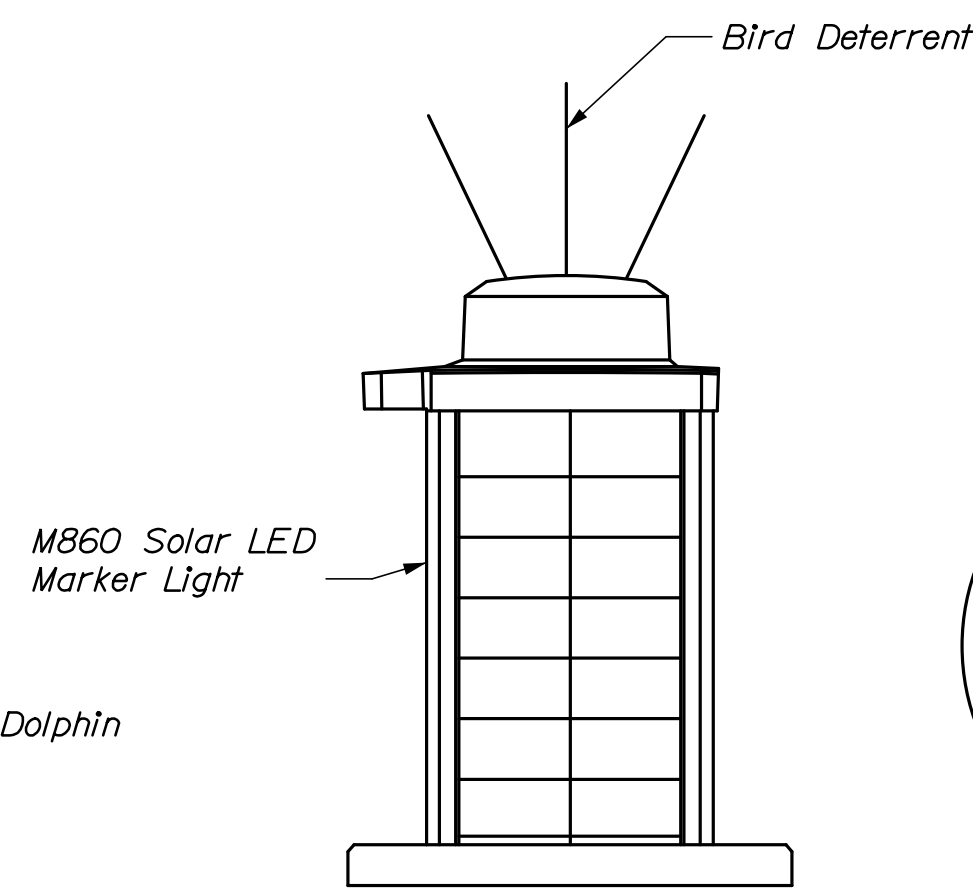
NAVIGATION MARKER INSTALLATION DETAIL

1/2" = 1'-0"



SECTION B-B

1/2" = 1'-0"



ELEVATION

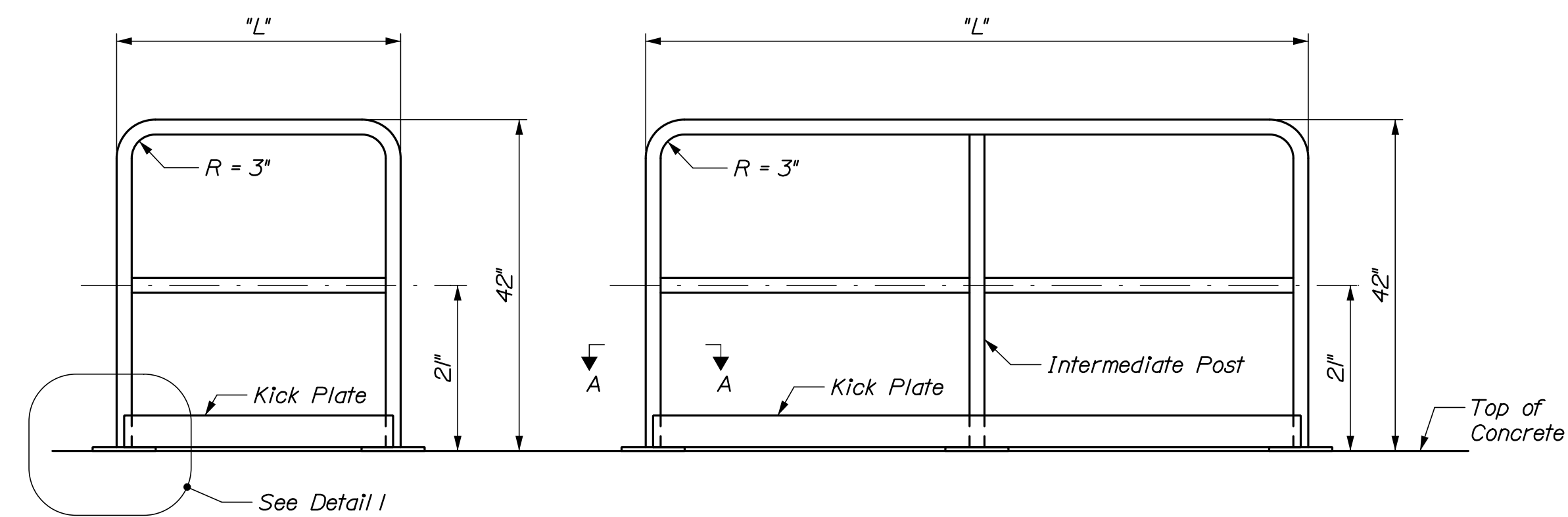
BOTTOM

SOLAR LANTERN DETAIL

3" = 1'-0"

TABLE 1
LANTERN SUMMARY TABLE

Location	Model	Range (Nm)	Lens
Dolphin D4	M860	4-7	Red



Type 1
Handrail

Type 2
Handrail

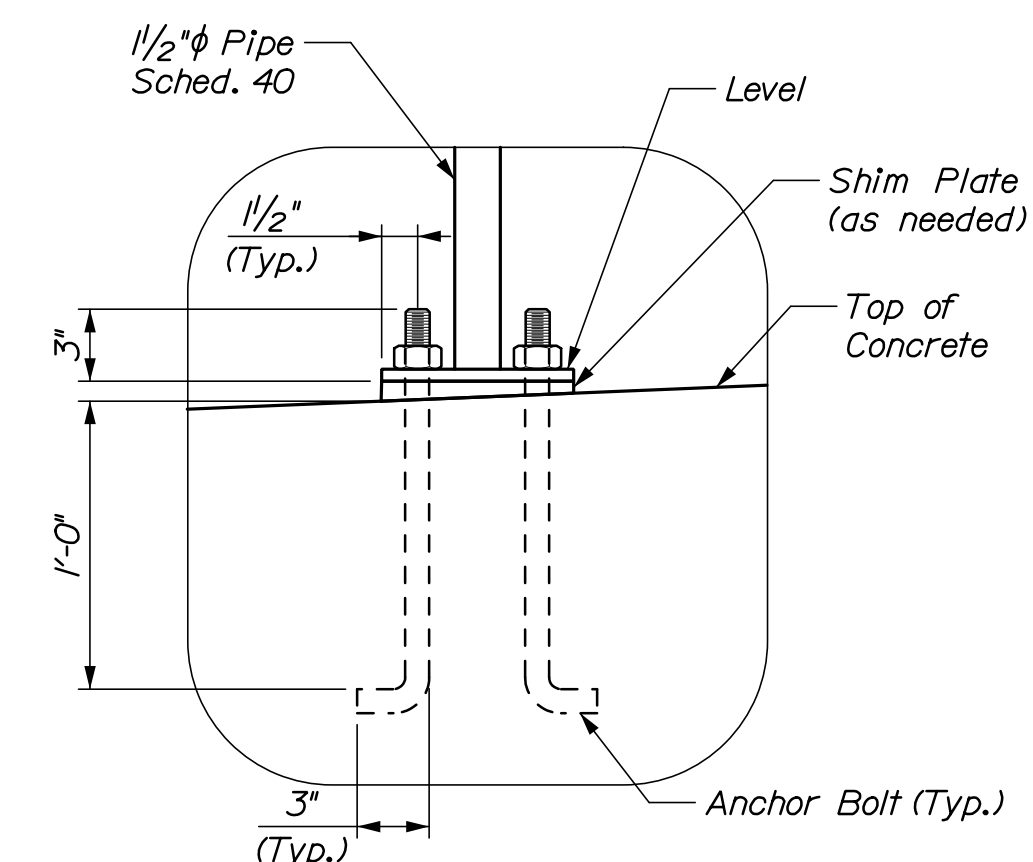
HANDRAIL DETAIL

3/4" = 1'-0"

TABLE 1
HANDRAIL SUMMARY TABLE

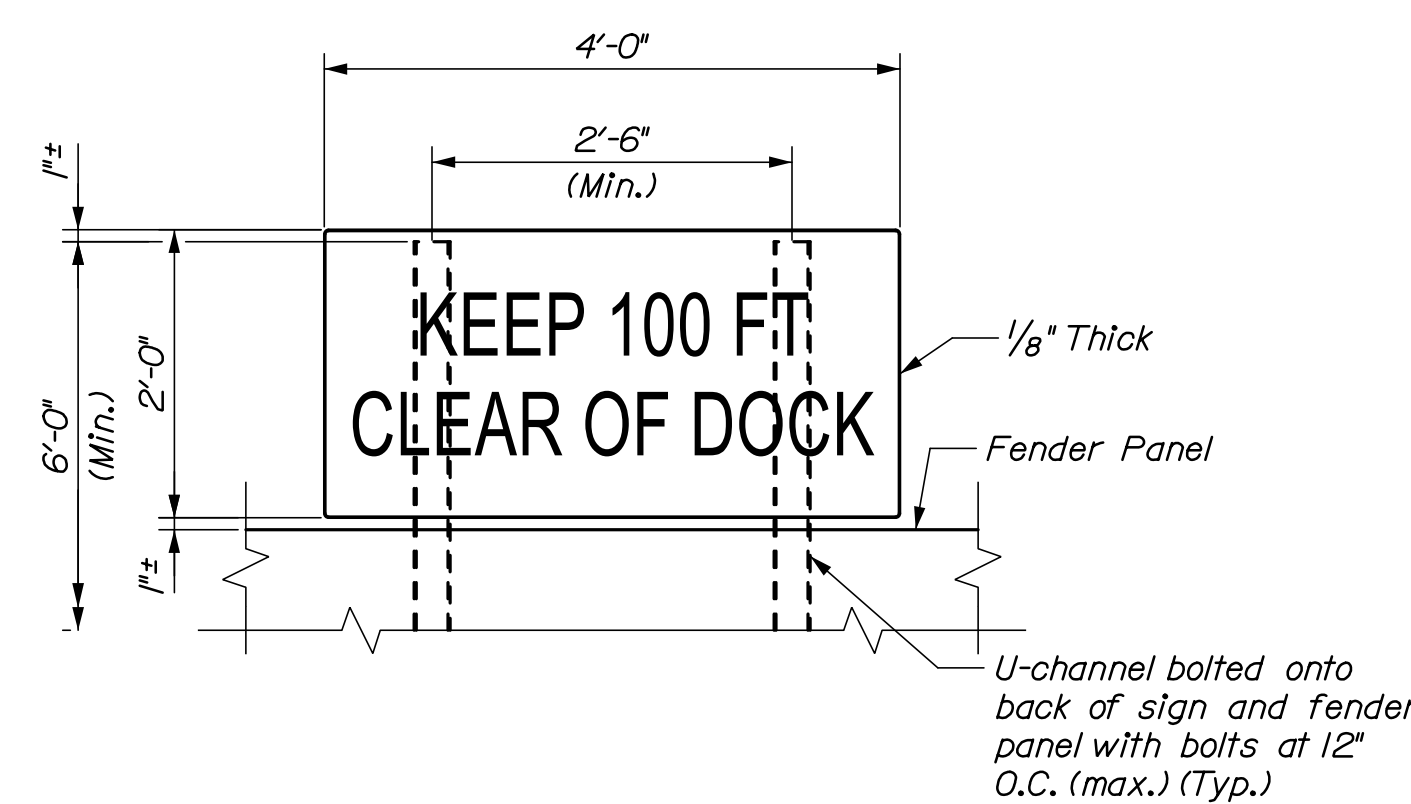
Dolphin	Location	Identification
D4	S	T2 - 8'-2" - 1
D4	S	T2 - 18'-6" - 3

Railing
Identification: T2 - L - X
Type ↑ Inter. Post
Length ↑ Quantity



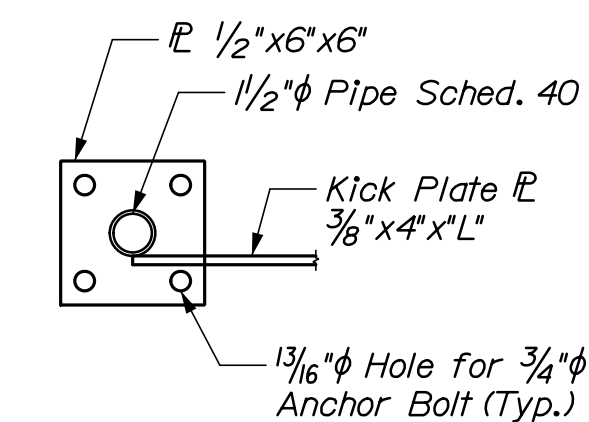
DETAIL 1

(Applies to all railing mounting locations.
Kick plate not shown for clarity)
1/2" = 1'-0"



SIGN DETAIL

3/4" = 1'-0"

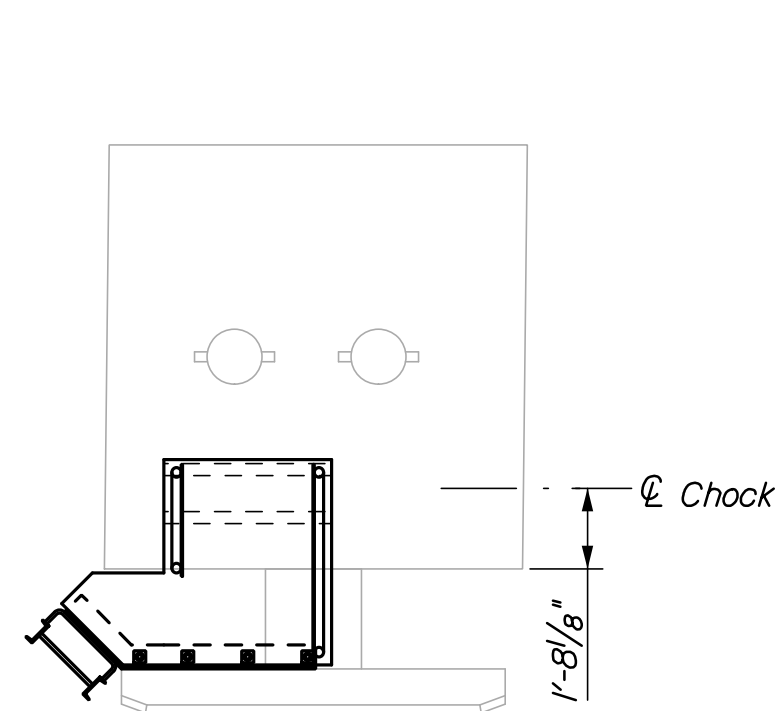


SECTION A-A

1/2" = 1'-0"

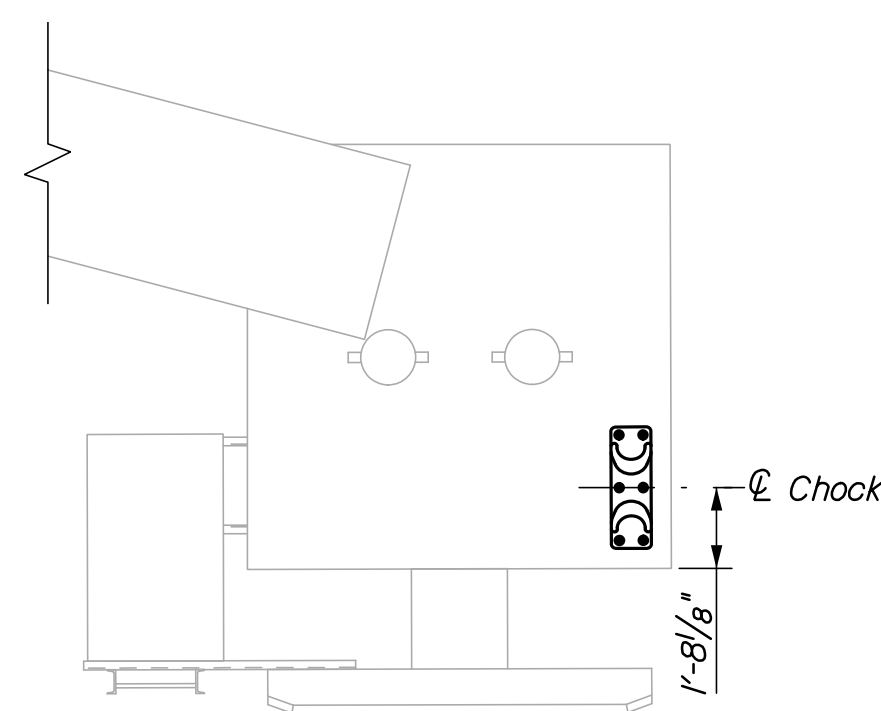
NOTES:

- Solar lantern shall be a Carmanah 860 lantern or approved equal.
- Solar lantern shall be self-contained.
- Solar lantern shall have an optical performance of 230 cd or more for the red lens.
- Solar lantern shall have an ingress protection of 68 or better.
- Solar lantern light shall be LED.
- The solar modules of the lantern shall be high-efficiency cells with embedded MPPT.
- For additional details on chock setting, see Sheet S06.
- Contractor shall support the navigation sign along the back of the fender panel with a pair of U-channels in accordance with Special Provision 645, Highway Signing.
- All steel components for navigation marker post, handrails, and sign supports shall be hot-dip galvanized.



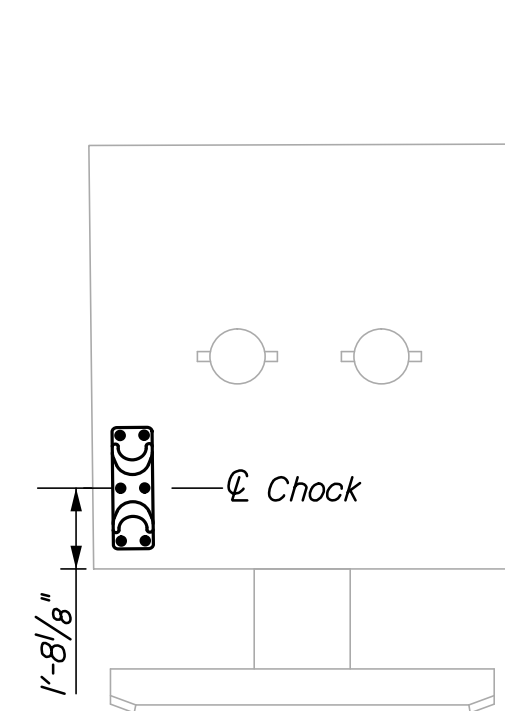
D1 CHOCK PLAN

1/4" = 1'-0"



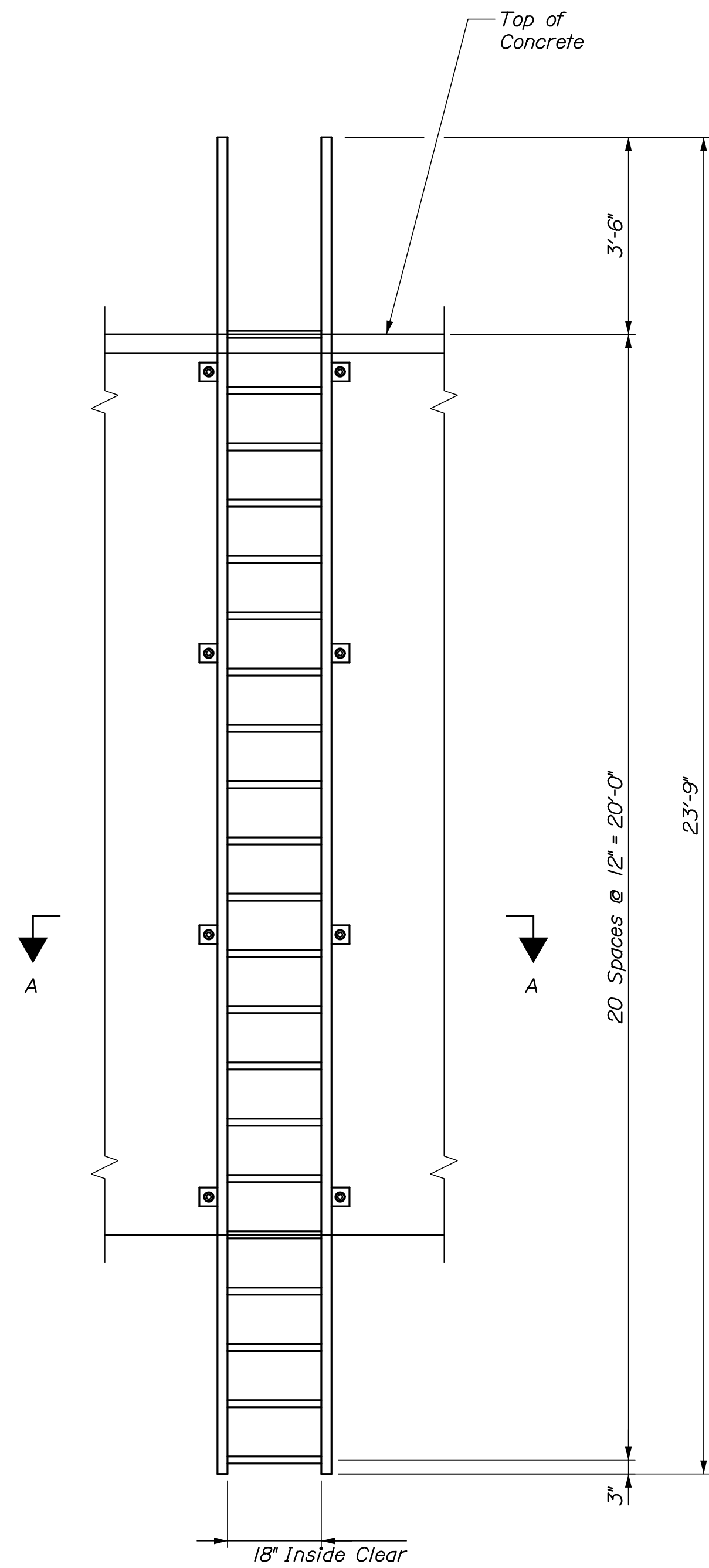
D2 CHOCK PLAN

1/4" = 1'-0"



D3 CHOCK PLAN

1/4" = 1'-0"

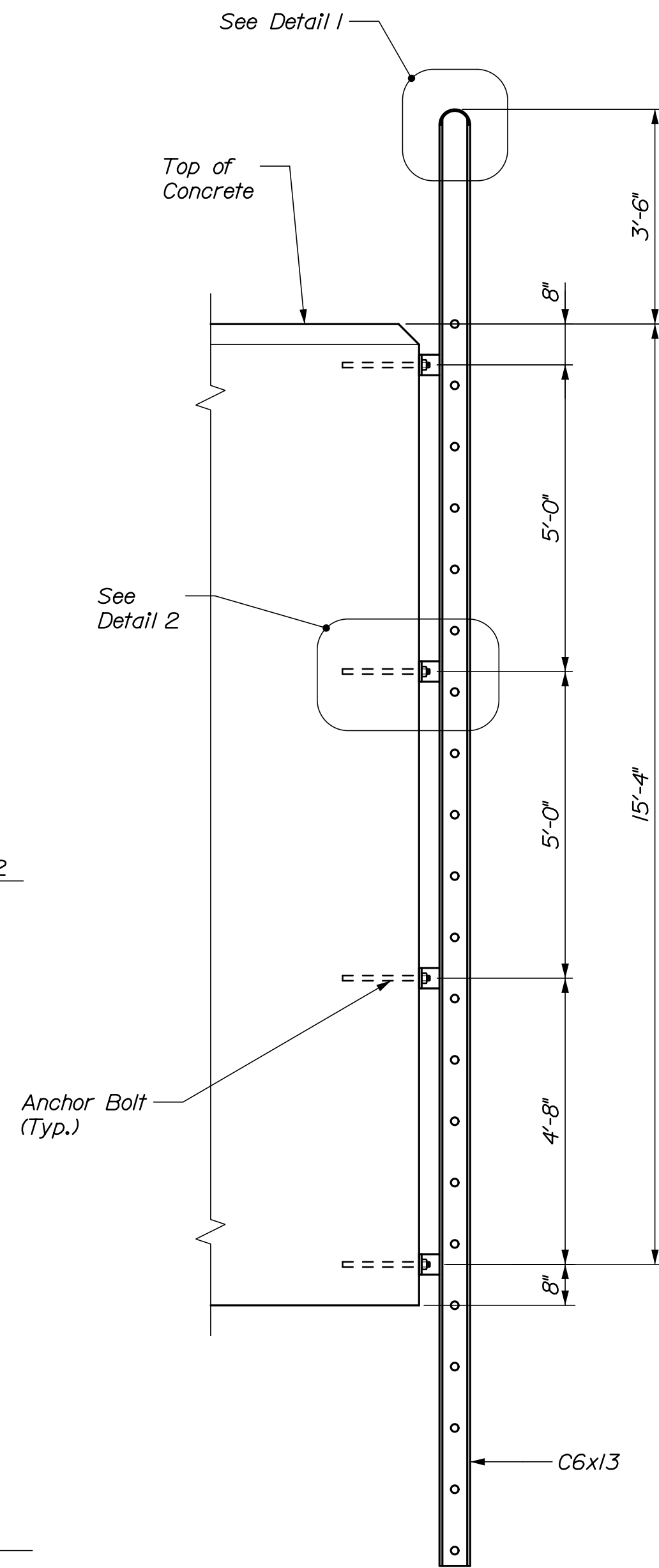


DOLPHIN ACCESS LADDER

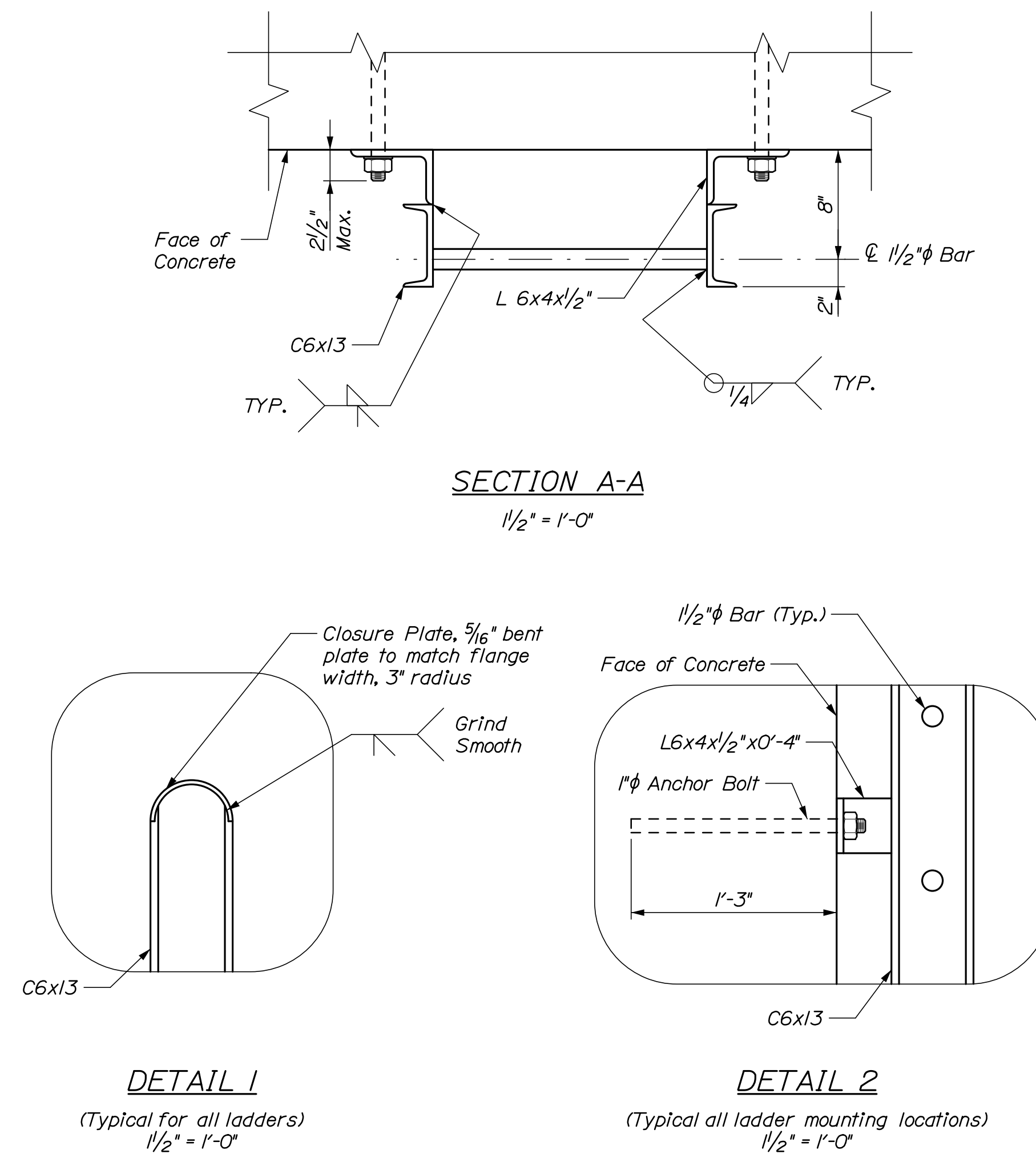
1/2" = 1'-0"

El. 0.00
MLLW

El. 10.92
MHHW



SECTION



SECTION A-A

1/2" = 1'-0"

DETAIL 1

(Typical for all ladders)
1/2" = 1'-0"

DETAIL 2

(Typical all ladder mounting locations)
1/2" = 1'-0"

NOTES:

1. The panel mounted access ladder shall be designed by the Contractor for a 350 Lb concentrated vertical load acting at any point on the ladder. The ladder shall conform with all applicable provisions of OSHA regulations for ladders and with dimensions shown on the drawings. The ladder assembly shall be hot-dip galvanized after fabrication.

PROJ. MANAGER	BY	DATE
DESIGN-DETAILED N. Willey	P. Bishop	03/21
CHECKED-REVIEWED C. Morin	C. Morin	03/21
DESIGN-DETAILED		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

Date: 5/11/2021

Username:

Division:

Filename: 016_Miscellaneous Details III.dgn

El. 31.00

A

A

El. 19.25
Top of Dolphin

B

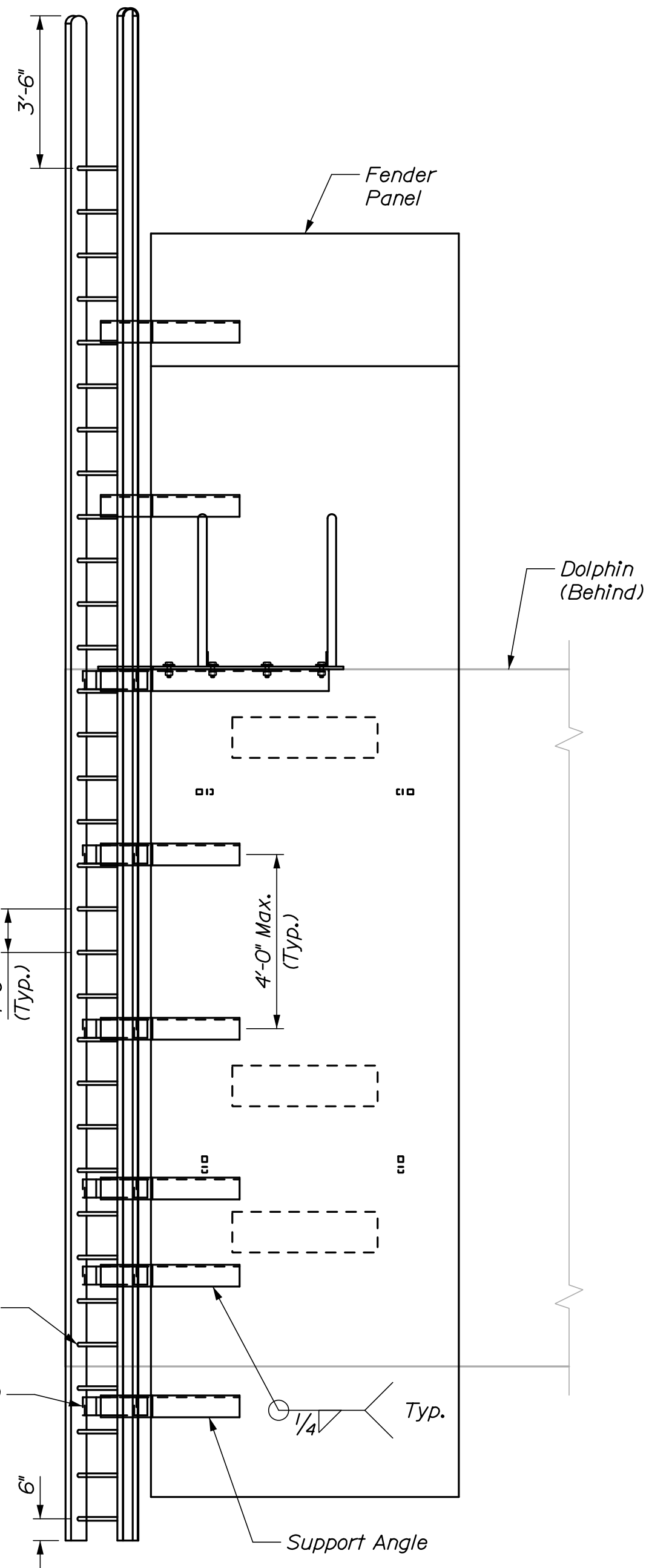
B

El. -2.00
Bottom of Ladder

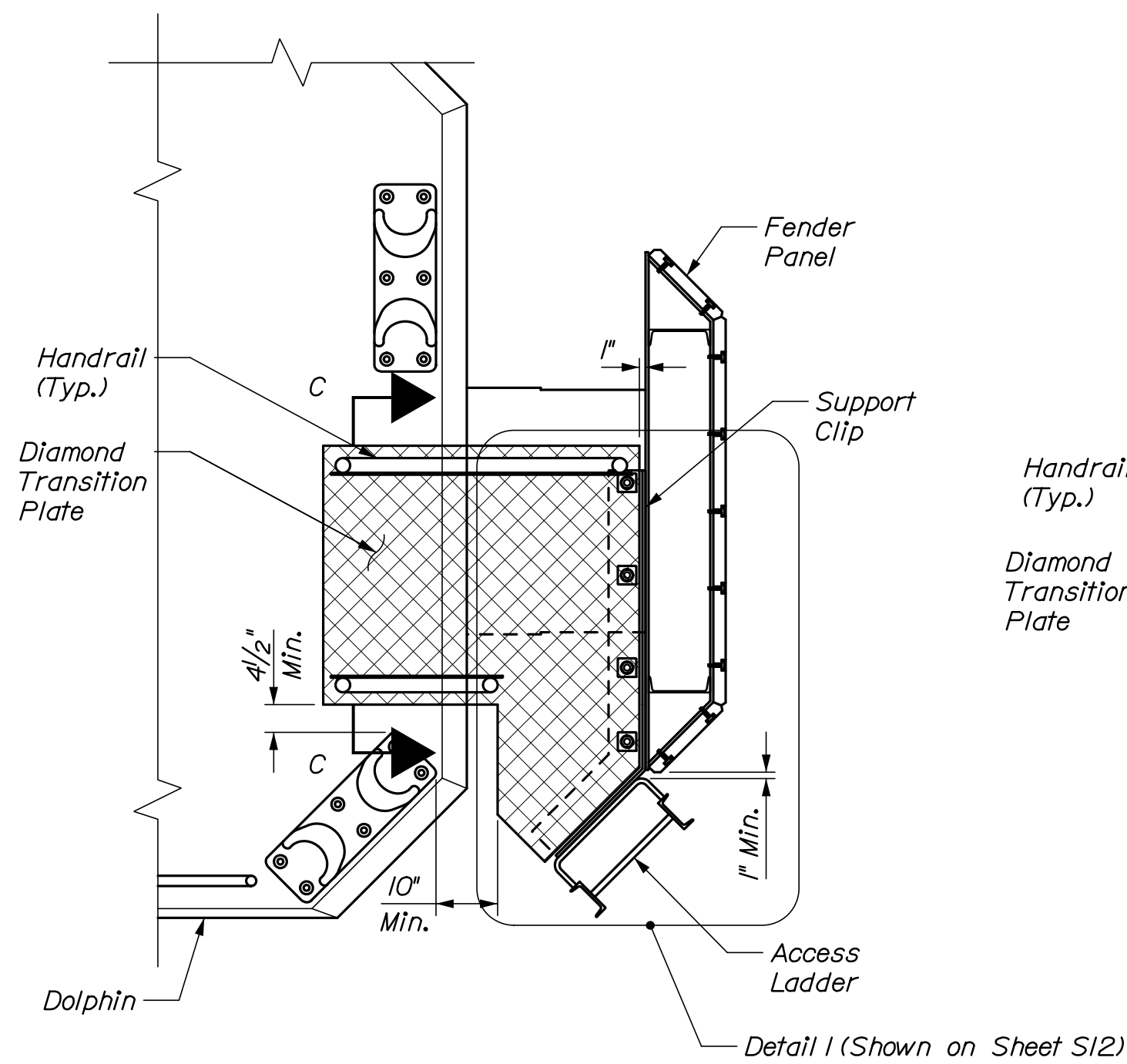
SIDE ELEVATION

FENDER ACCESS LADDER

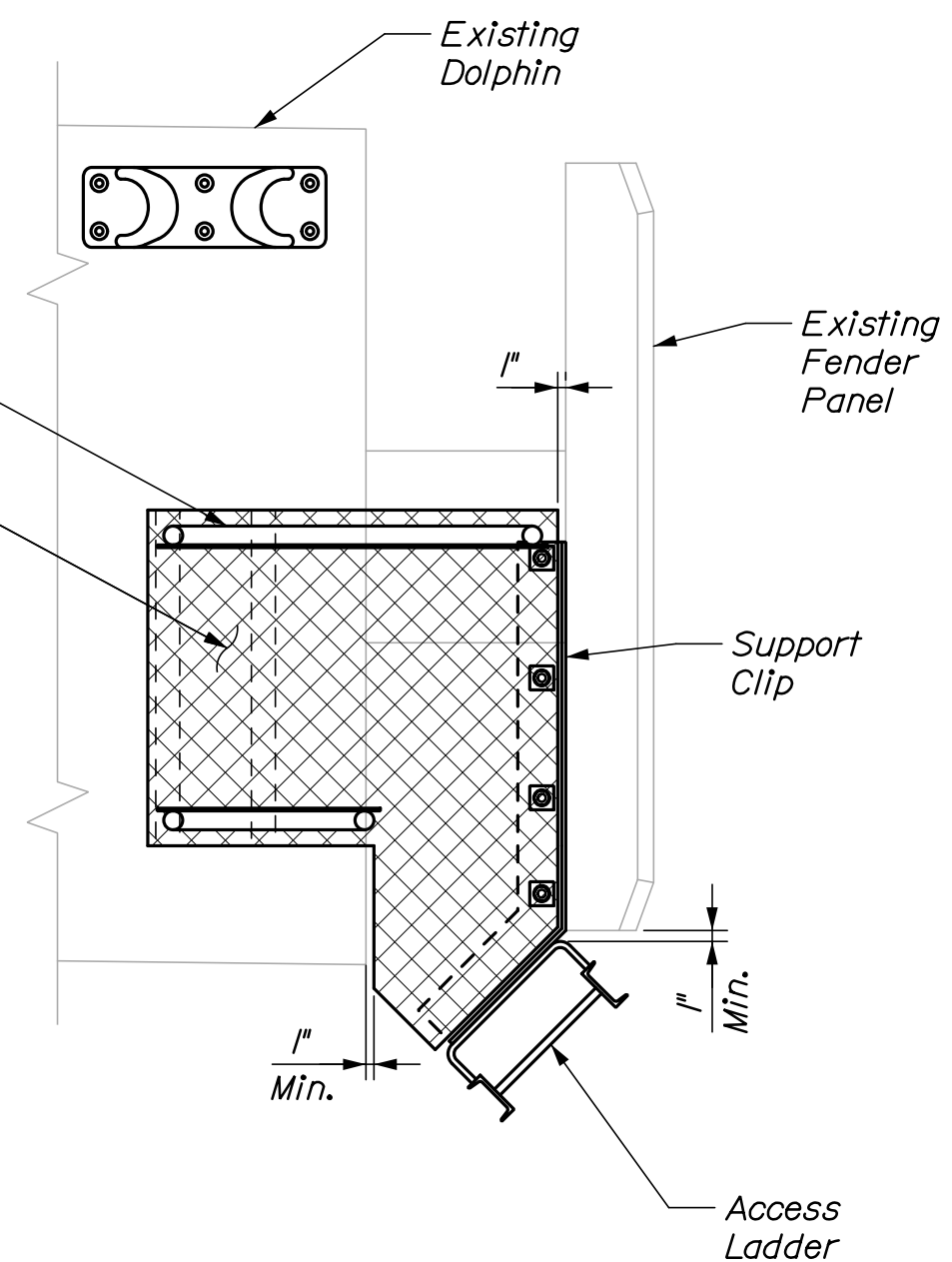
(D4 shown, D1 similar)
3/8" = 1'-0"



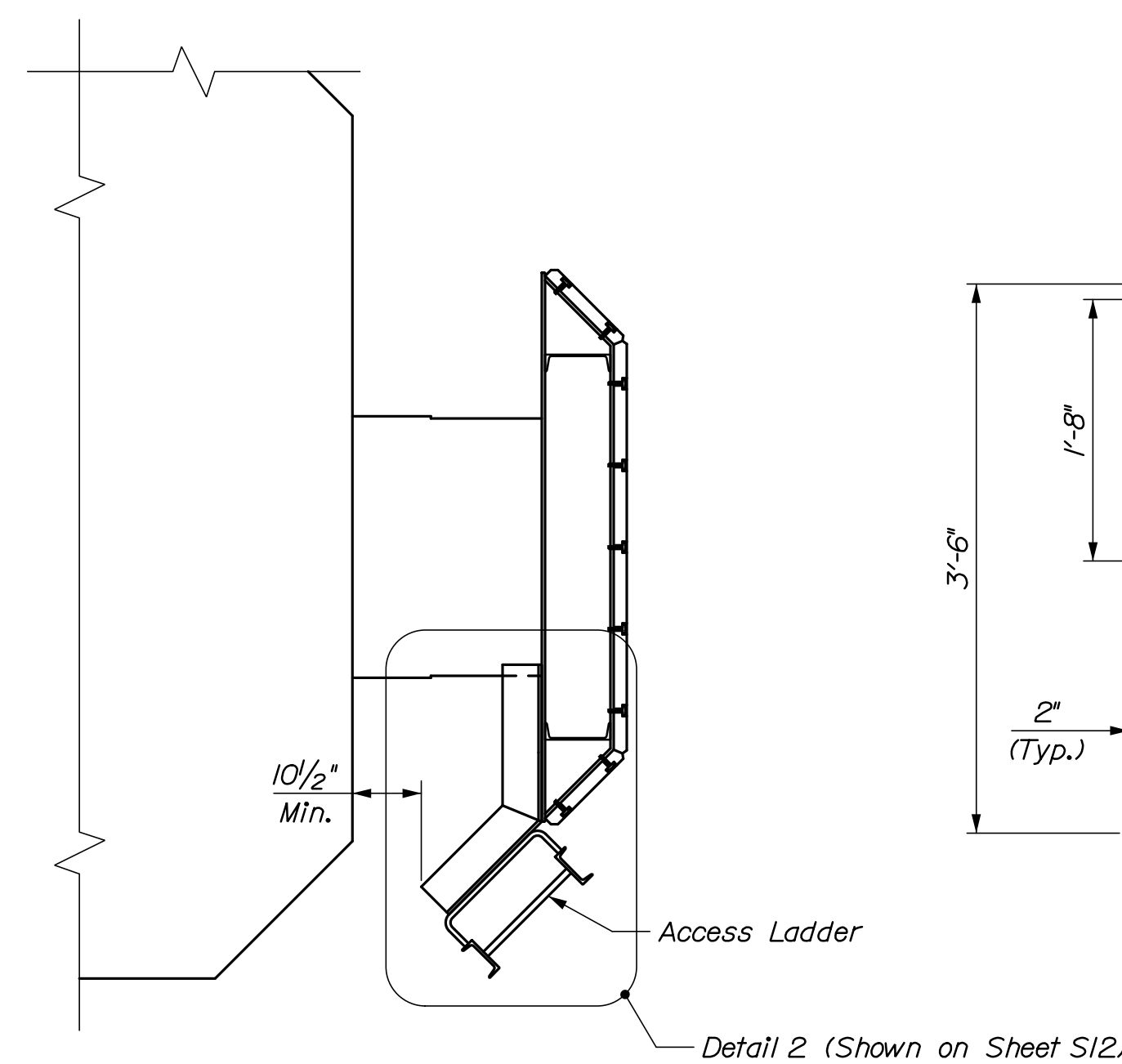
FRONT ELEVATION
(Dolphin D4 shown screened for clarity, D1 similar)



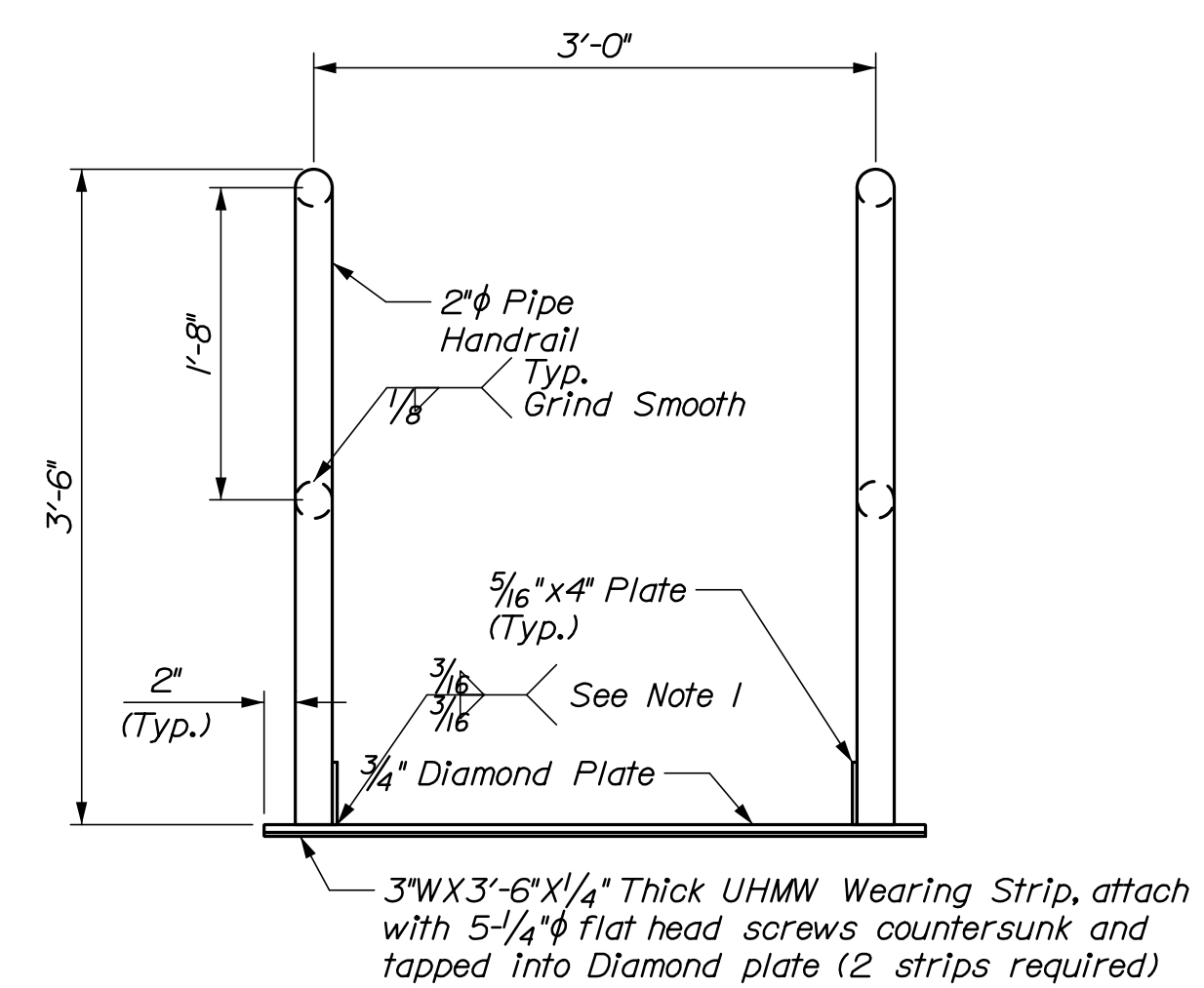
D4 SECTION A-A
1/2" = 1'-0"



D1 SECTION A-A
1/2" = 1'-0"



SECTION B-B
(D4 shown, D1 similar)
1/2" = 1'-0"



SECTION C-C
(D4 shown, D1 similar)
1/2" = 1'-0"

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

DATE: 03/21
BY: P. Bishop, C. Morin
DESIGN-DETAILED: N. Willey, C. Morin
CHECKED-REVIEWED: C. Morin
DESIGN-DETAILED: C. Morin
REVISIONS: 1, 2, 3, 4
FIELD CHANGES

SIGNATURE: 10209
P.E. NUMBER
DATE

FRENCHBORO
FERRY TERMINAL
DOLPHIN DETAILS
LADDERS II

SHEET NUMBER
S11
16 OF 17



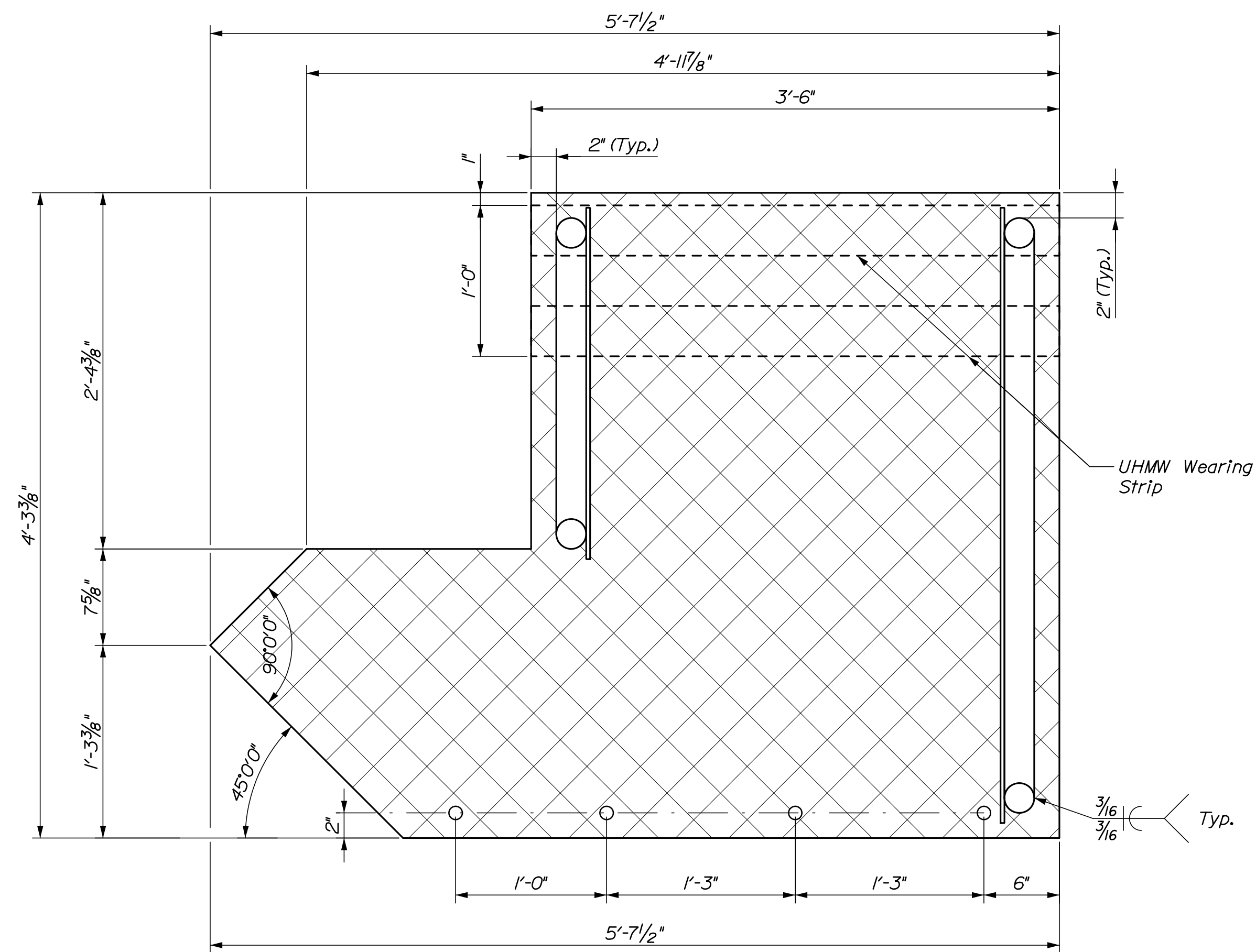
WIN
022202.00

Date: 5/11/2021

Username:

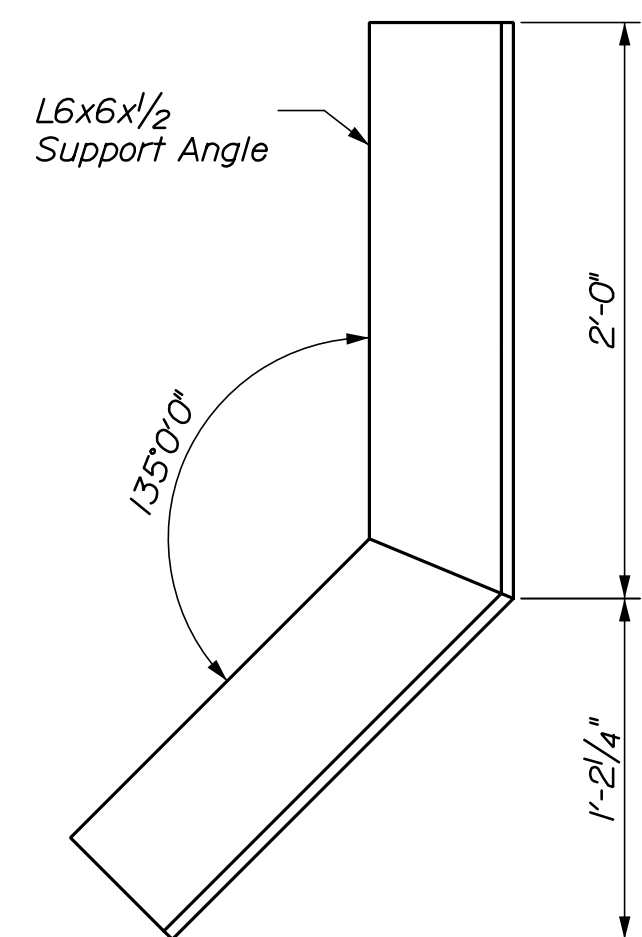
Division:

Filename: 017_Miscellaneous Details IV.dgn



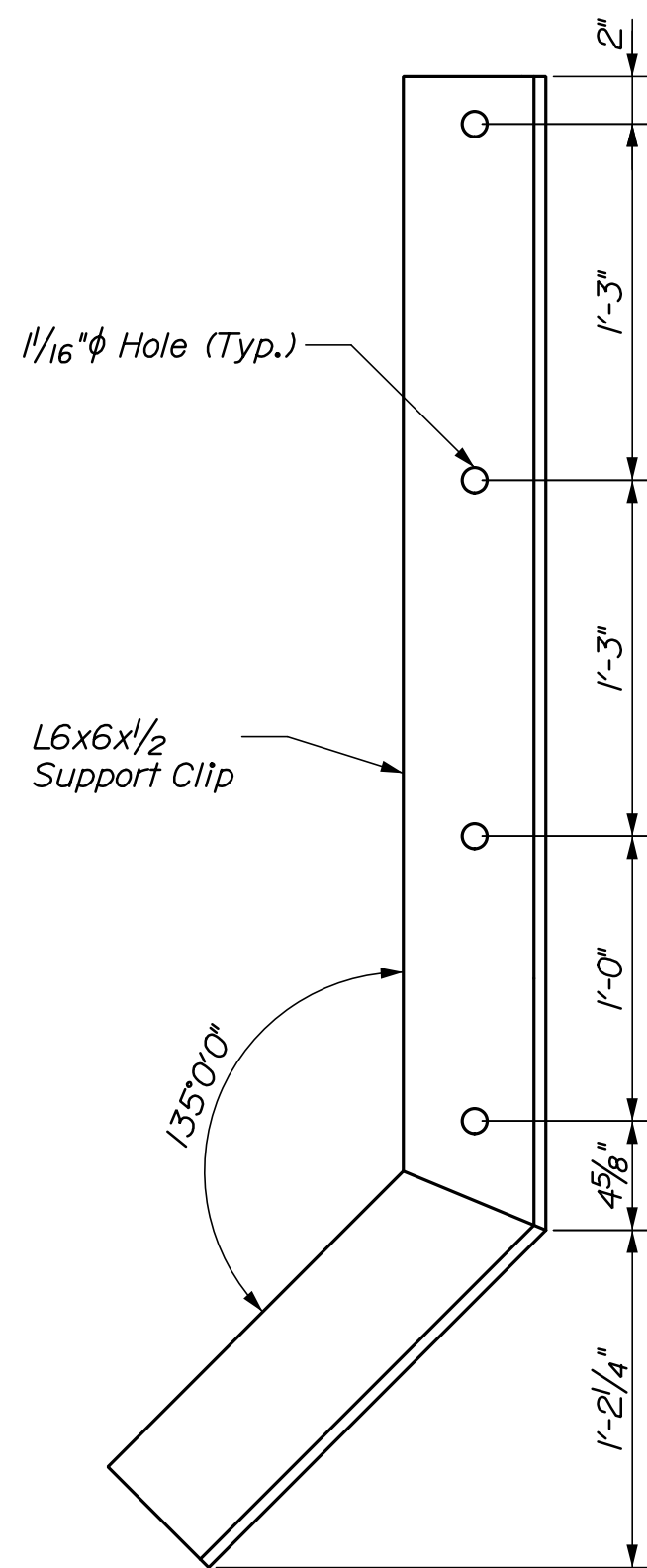
DIAMOND TRANSITION PLATE DETAIL

1/2" = 1'-0"



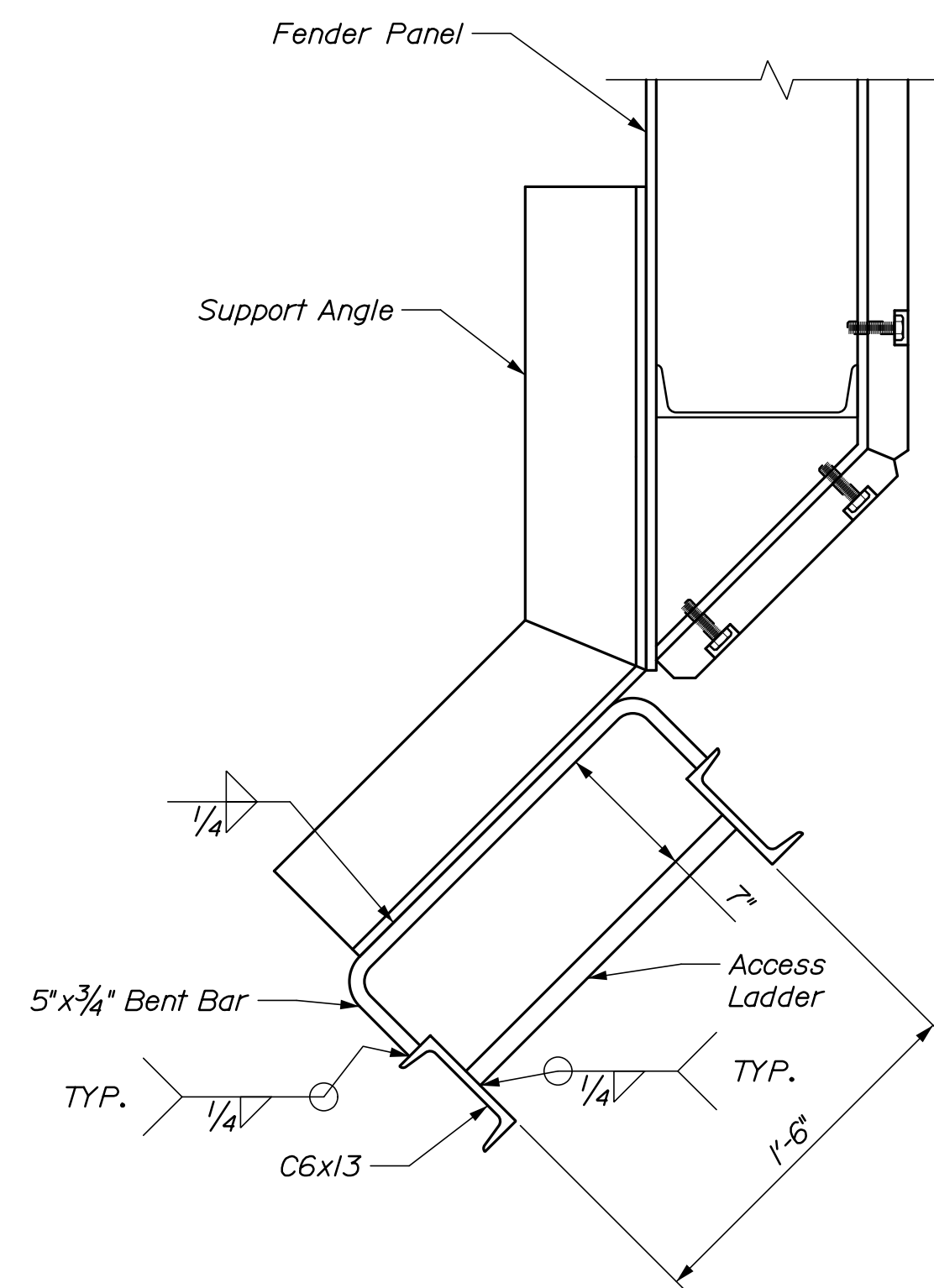
SUPPORT ANGLE DETAIL

1/2" = 1'-0"



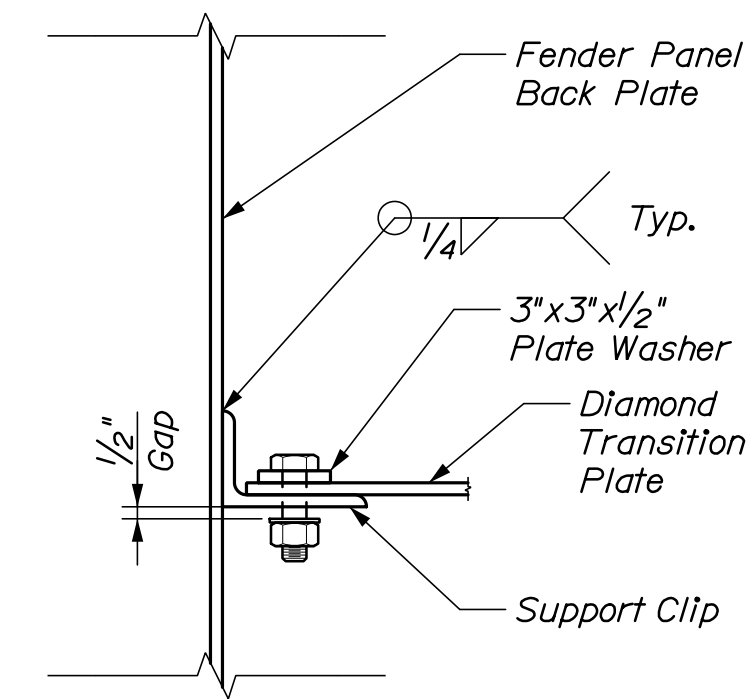
SUPPORT CLIP DETAIL

1/2" = 1'-0"



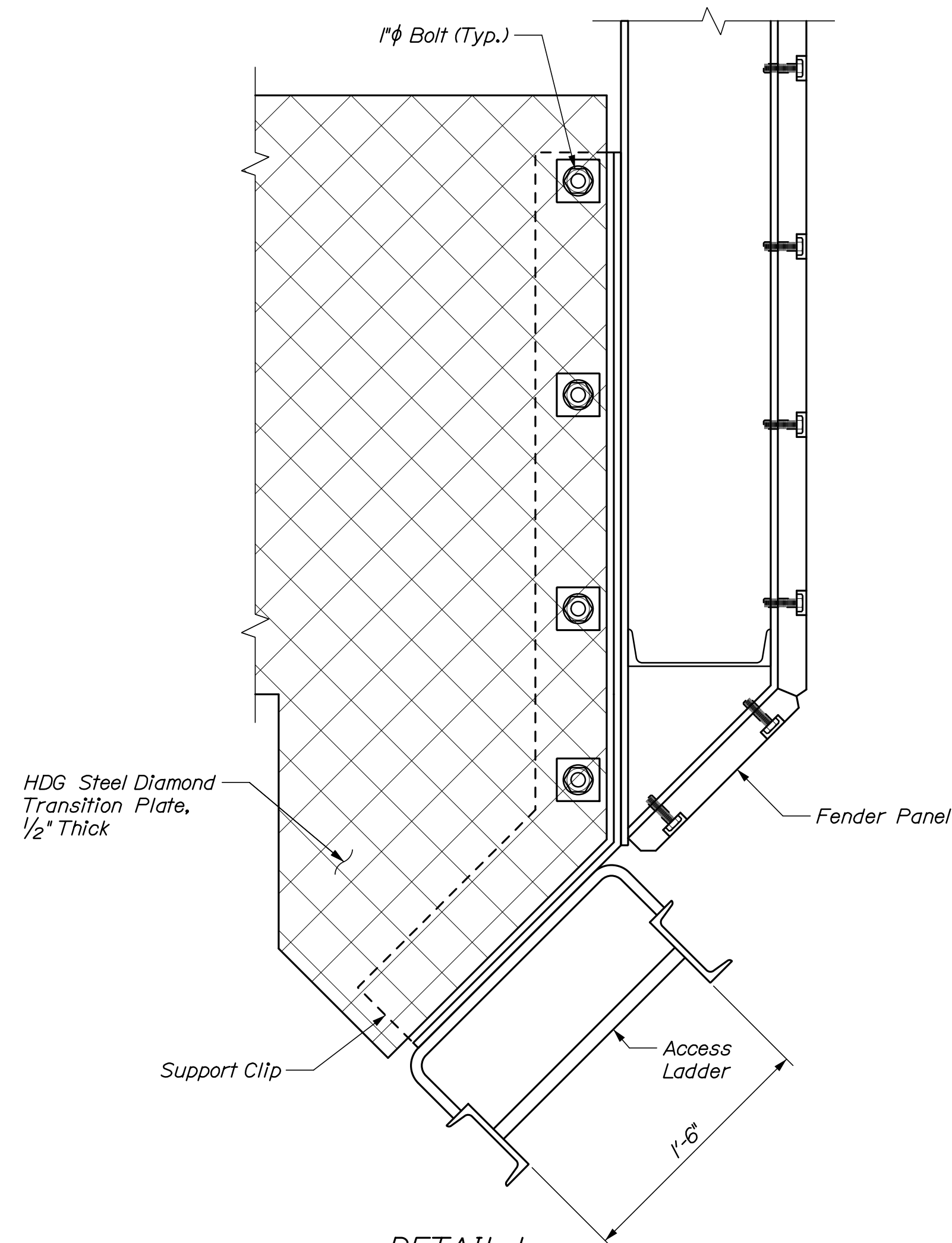
DETAIL 2

1/2" = 1'-0"



SUPPORT CLIP ATTACHMENT DETAIL

1/2" = 1'-0"



DETAIL 1

(Hand rail not shown for clarity)
1/2" = 1'-0"

NOTES:
1. Grind tread flat to weld plate (Typ.)

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

PROJ. MANAGER
DESIGN-DETAILED
CHECKED-REVIEWED
DESIGN-DETAILED
REVISIONS 1
REVISIONS 2
REVISIONS 3
REVISIONS 4
FIELD CHANGES

BY
P. Bishop
C. Morin

DATE
03/21
03/21

SIGNATURE
10209

P.E. NUMBER
DATE

FRENCHBORO
FERRY TERMINAL

DOLPHIN DETAILS
LADDERS III

SHEET NUMBER
S12
17 OF 17

WIN
022202.00

