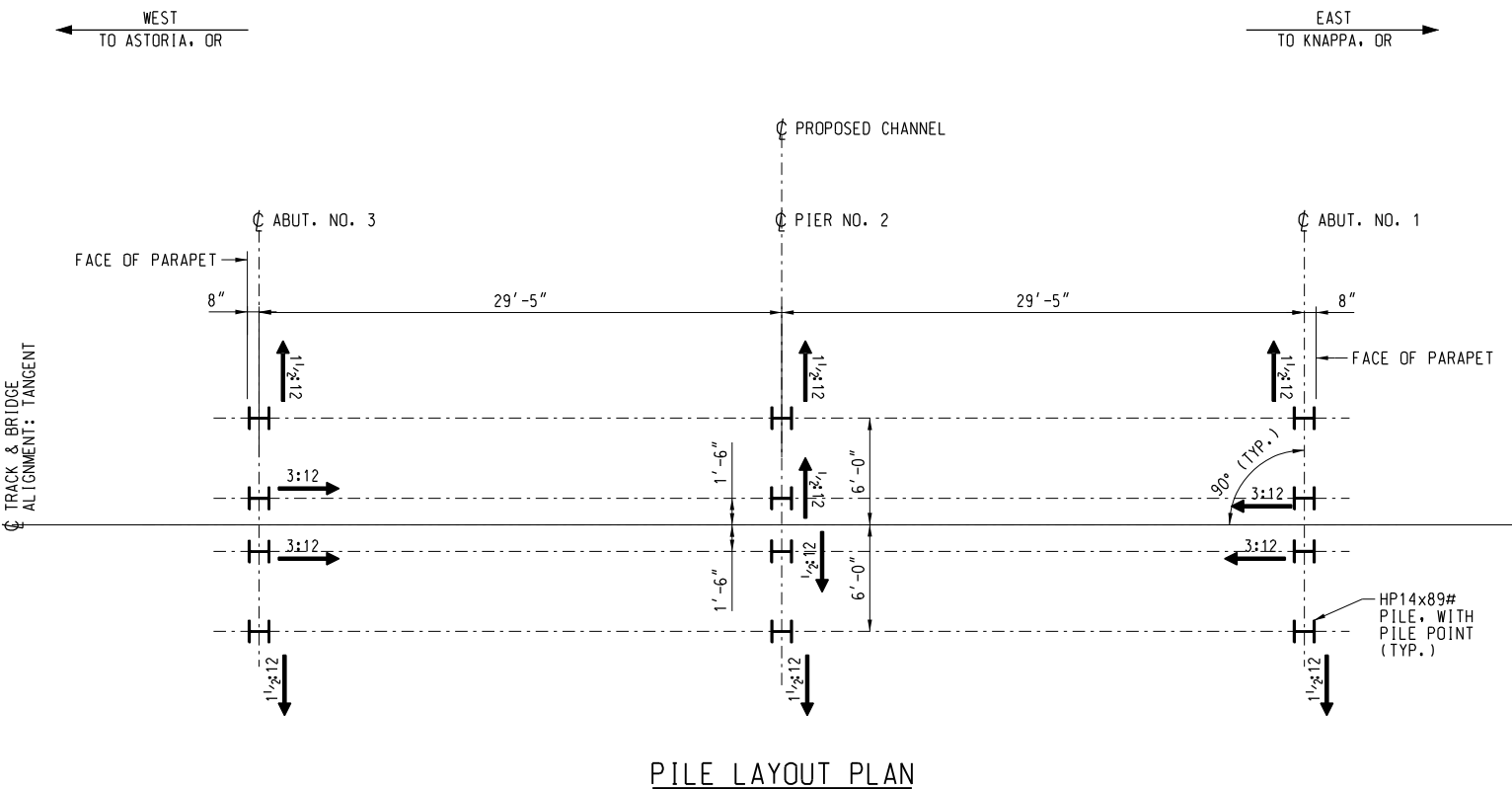


* SEE ELEVATION TABLE ON SHEET 17 OF 37 FOR ELEVATIONS.



NOTES:

1. PILE SPACING DIMENSIONS ARE GIVEN AT BOTTOM OF PRECAST CAP.
2. ALL PILES TO BE HP14x89# WITH PILE POINTS.
3. PILE CUTOFF MUST BE CAREFULLY MADE TO ENSURE FULL CONTACT BETWEEN PILE AND CAP.
4. USE WELD METAL TO WRITE THE DATE AND AVERAGE PILE DEPTH IN 3 INCH TALL LETTERS ON EACH BENT.
5. AFTER PRECAST CONCRETE MEMBERS ARE SET AND WELDED IN PLACE, FILL RECESSES AT LIFT ANCHORS WITH CEMENT GROUT TO TOP OF SURROUNDING CONCRETE.
6. PILES SHALL BE DRIVEN TO AN ESTIMATED TIP ELEVATION OF (-)36.
7. ARROWS SHOW DIRECTION AND AMOUNT OF PILE BATTER.
8. PILES SHALL BE DRIVEN TO A MINIMUM ULTIMATE RESISTANCE OF 663 KIPS AS DETERMINED BY THE G&W SPECIFICATION SECTION 520.

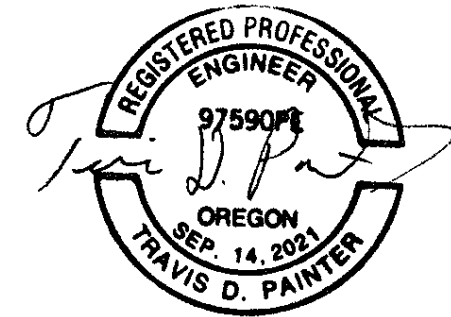


Know what's below.
Call before you dig.

ATTENTION !

INFORMATION SHOWN ON THESE PLANS CONCERNING TYPE AND LOCATION OF UNDERGROUND OR ABOVE GROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE.

THE CONTRACTOR SHALL VERIFY THE LOCATION OF UNDERGROUND AND OVERHEAD UTILITIES BEFORE BEGINNING CONSTRUCTION.

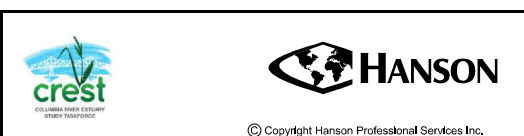


EXPIRES: 12/31/2024

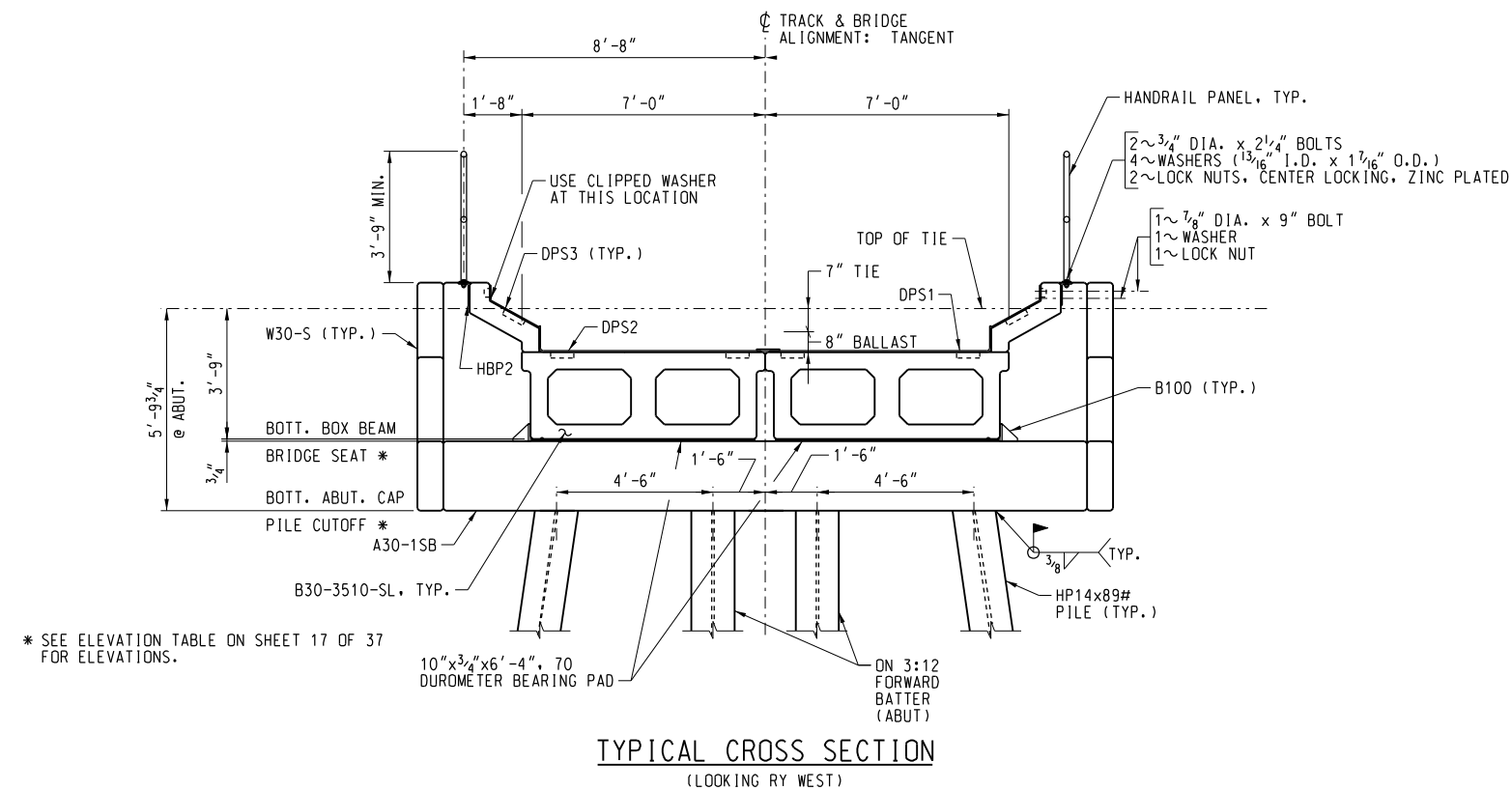
NO.	TDP BY	DATE	REVISION DESCRIPTION
1	TDP	2024/02/13	PILE ULTIMATE

CLC DRAWN	TDP DESIGNED	TDP CHECKED
TDP APPROVED	2/23/2023 DATE	I6L OI08 PROJECT

**COLUMBIA RIVER ESTUARY STUDY TASKFORCE
RAILROAD RESTORATION
WOLF BAY - DRAFT 100% DESIGN**

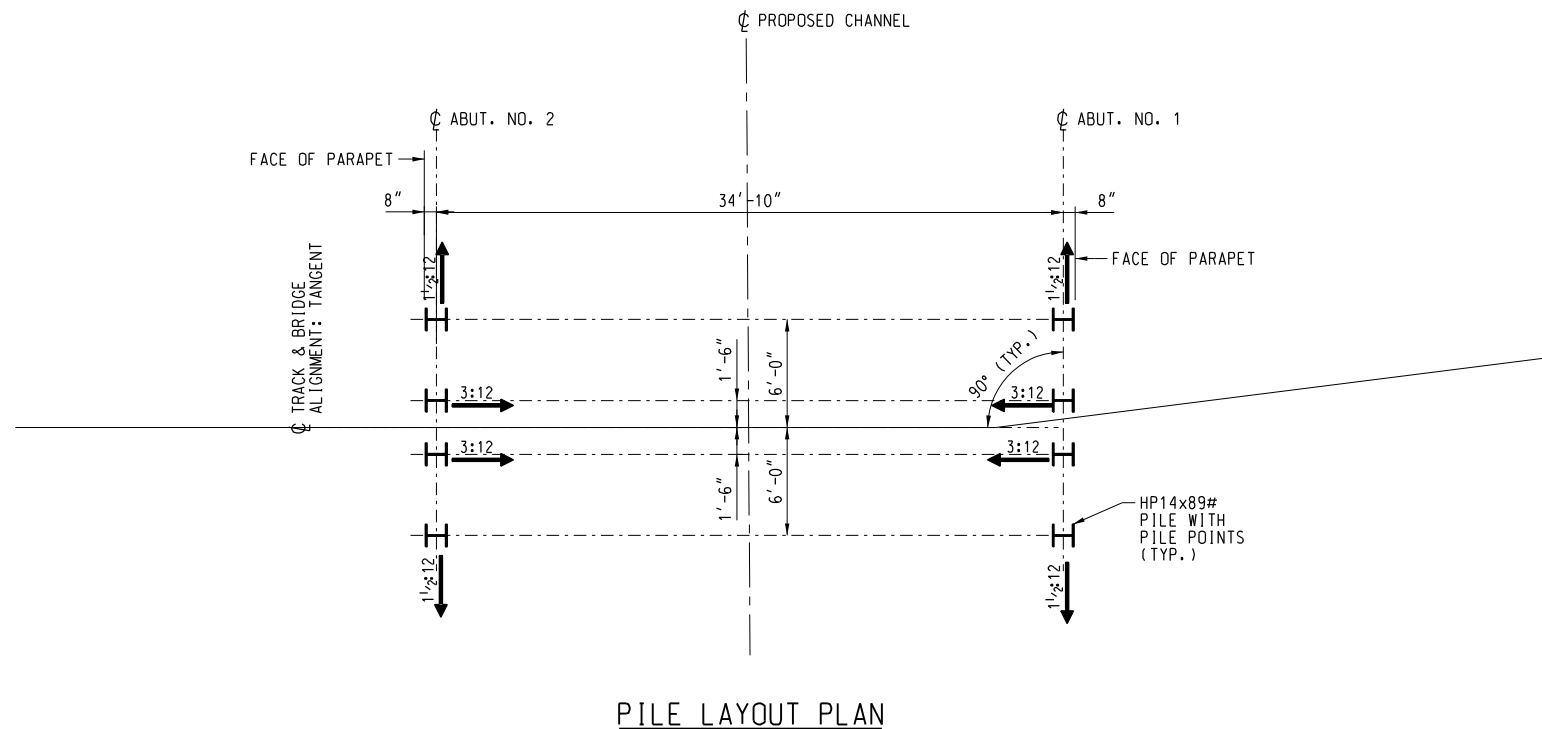


**BRIDGE 92.5 WOLF BAY A
TYPICAL SECTION AND PILE
LAYOUT PLAN**



NOTES:

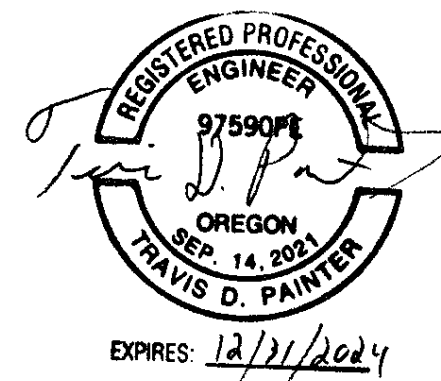
1. PILE SPACING DIMENSIONS ARE GIVEN AT BOTTOM OF PRECAST CAP.
2. ALL PILES TO BE HP14x89# WITH PILE POINTS.
3. PILE CUTOFF MUST BE CAREFULLY MADE TO ENSURE FULL CONTACT BETWEEN PILE AND CAP.
4. USE WELD METAL TO WRITE THE DATE AND AVERAGE PILE DEPTH IN 3 INCH TALL LETTERS ON EACH BENT.
5. AFTER PRECAST CONCRETE MEMBERS ARE SET AND WELDED IN PLACE, FILL RECESSES AT LIFT ANCHORS WITH CEMENT GROUT TO TOP OF SURROUNDING CONCRETE.
6. PILES SHALL BE DRIVEN TO AN ESTIMATED TIP ELEVATION OF (-)90.5.
7. ARROWS SHOW DIRECTION AND AMOUNT OF PILE BATTER.
8. PILES SHALL BE DRIVEN TO A MINIMUM ULTIMATE RESISTANCE OF 663 KIPS AS DETERMINED BY G&W SPECIFICATION 520.



ATTENTION !

INFORMATION SHOWN ON THESE PLANS CONCERNING TYPE AND LOCATION OF UNDERGROUND OR ABOVE GROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE.

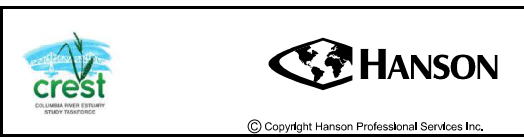
THE CONTRACTOR SHALL VERIFY THE LOCATION OF UNDERGROUND AND OVERHEAD UTILITIES BEFORE BEGINNING CONSTRUCTION.



NO.	TDP BY	DATE	PILE ULTIMATE REVISION DESCRIPTION
1	TDP	2024/02/13	PILE ULTIMATE REVISION DESCRIPTION

CLC DRAWN	TDP DESIGNED	TDP CHECKED
TDP	2/23/2023	I6L_OI08
APPROVED	DATE	PROJECT

**COLUMBIA RIVER ESTUARY STUDY TASKFORCE
RAILROAD RESTORATION
WOLF BAY - DRAFT 100% DESIGN**



**BRIDGE 92.1 WOLF BAY D
TYPICAL SECTION AND
PILE LAYOUT PLAN**

GENERAL NOTES:

LOADING:

1. LIVE LOAD: COOPER E80
2. IMPACT: DIESEL IMPACT

CONCRETE:

1. CONCRETE MATERIAL, PLACING AND CURING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED IN THE PROJECT SPECIFICATIONS.
2. MINIMUM COMPRESSIVE STRENGTH OF THE PRECAST PRE-STRESSED CONCRETE IS SHOWN ON BEAM SHEETS.
3. MINIMUM COMPRESSIVE STRENGTH OF PRECAST NON-PRESTRESSED CONCRETE (EXCEPT CONCRETE CURBS) SHALL BE 4,500 psi.
4. MINIMUM COMPRESSIVE STRENGTH OF CURB CONCRETE SHALL BE 4,000 psi AT 28 DAYS.
5. ESTIMATED WEIGHT OF PRECAST COMPONENTS PROVIDED THROUGHOUT ARE BASED ON NOMINAL DIMENSIONS AND A CONCRETE UNIT WEIGHT OF 156 POUNDS PER CUBIC FOOT. WEIGHTS SHOWN INCLUDE ESTIMATED WEIGHTS OF EMBED PLATES.

REINFORCING STEEL:

1. REINFORCING STEEL MATERIAL FABRICATION AND INSTALLATION SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS. BARS CROSSING CURB JOINT SHALL CONFORM TO A.S.T.M. A1035 ARE NOTED IN THE BENDING DIAGRAM.
2. TACK WELDING OF REINFORCING IS PROHIBITED.

PRESTRESSING STRANDS:

1. STRAND SHALL BE TESTED IN ACCORDANCE WITH P.C.I. RECOMMENDATIONS (MOUSTAFA METHOD) AND CERTIFIED BY THE FABRICATOR AS HAVING ADEQUATE BOND CHARACTERISTICS TO SATISFY THE PREDICTION EQUATIONS FOR TRANSFER AND DEVELOPMENT LENGTH GIVEN IN THE A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING.
2. AN ALTERNATIVE STRAND PATTERN WHICH HAS THE SAME ECCENTRICITY AS THE PATTERN SHOWN AND IS BETTER SUITED TO THE MANUFACTURER'S FACILITIES WILL BE CONSIDERED. MANUFACTURER MUST SUBMIT PLANS AND COMPUTATIONS FOR RAILROAD APPROVAL PRIOR TO CASTING.
3. PRESTRESSING STRAND MATERIAL, FABRICATION, INSTALLATION AND STRESSING SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE PROJECT SPECIFICATIONS.

CONCRETE CURB:

1. CURB SHALL BE CAST ON PRESTRESSED BEAM AFTER STRANDS ARE DETENSIONED. BOND NEW CONCRETE TO PRESTRESSED BEAM USING APPROVED CONCRETE BONDING AGENT ACCORDING TO MANUFACTURER'S INSTRUCTIONS.
2. PREFORMED 1/2" x 6" ASPHALT EXPANSION BOARD SHALL BE PLACED TO DIVIDE CURB INTO EQUAL SEGMENTS. SEE TABLE ON THIS SHEET FOR NUMBER OF SEGMENTS. SEAL TOP AND SIDES OF CURB AT ASPHALT EXPANSION BOARD WITH APPROVED JOINT SEALANT. A 3" DIAMETER DRAIN OPENING SHALL BE FORMED AT THE CENTER OF EACH CURB JOINT AT THE BASE.
3. IF LENGTH OF CURB CANNOT BE EQUALLY SPACED, ADJUST CURB LENGTH SO THAT JOINT BETWEEN CURBS IS AT LEAST 12" FROM HANDRAIL POST HOLES. LENGTH OF STRAIGHT REINFORCING STEEL IN CURBS SHALL THEN BE RECALCULATED TO ACCOMMODATE A 2 1/2" CLEAR AT ENDS OF CURBS.

CEMENTITIOUS GROUT:

1. UNLESS OTHERWISE SPECIFIED, GROUT SHALL BE NON-SHRINK GROUT CONFORMING TO A.S.T.M. C1107, WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 p.s.i.
2. GROUT SHALL BE MIXED PER MANUFACTURER'S INSTRUCTIONS TO ACHIEVE A PLASTIC CONSISTENCY. LIQUID, OR FLOWABLE, MIX SHALL NOT BE USED UNLESS IT IS PLACED IN A FORM AND PROPERLY CONSOLIDATED.
3. WHEN GROUT IS USED AS A LEVELING PAD, WEDGES MAY BE PLACED IN THE CORNERS OF THE GROUT AREA TO MAINTAIN PROPER ELEVATION OF THE SUPPORTED MEMBER. WHEN USING THIS PROCEDURE, THE WEDGES ARE PLACED AND ELEVATIONS CHECKED PRIOR TO MIXING AND PLACING GROUT. GROUT SHALL BE PLACED SO THAT WHEN THE MEMBER IS SET IN PLACE, GROUT IS DISPLACED ENSURING CONSISTENT CONTACT BETWEEN THE GROUT AND THE SURFACE OF THE ADJOINING MEMBERS. REMOVE THE WEDGES AFTER INITIAL SET OF GROUT AND PATCH HOLES WITH GROUT.
4. WHEN USING GROUT TO ANCHOR BARS IN CONCRETE, GROUT SHALL BE MIXED TO A FLOWABLE CONSISTENCY PER MANUFACTURER'S INSTRUCTIONS. WHEN NOT CALLED OUT ON PLANS OR IN MANUFACTURER'S INSTRUCTIONS, DRILLED HOLES SHALL BE A MINIMUM OF 1/4" GREATER IN DIAMETER THAN THE ANCHORED BAR.
5. ALL SURFACES SHALL BE DRY, CLEANED AND FREE OF DUST, DIRT, OR OTHER DEBRIS.

EPOXY:

1. EPOXY RESINS USED FOR ANCHORING DOWEL BARS OR ANCHOR BOLTS SHALL CONFORM TO A.S.T.M. C881 TYPE IV. ANCHORAGE DEVICES SHALL BE DEFORMED REINFORCING BARS, SWAGED ANCHOR BOLTS, OR THREADED RODS. SMOOTH BARS SHALL NOT BE USED WITH EPOXY ANCHORAGE.
2. EPOXY RESINS USED FOR BONDING HARDENED CONCRETE TO HARDENED CONCRETE SHALL CONFORM TO A.S.T.M. C881 TYPE IV. APPROPRIATE MEASURES SHALL BE TAKEN TO ENSURE FIRM CONTACT BETWEEN THE EPOXY AND BONDED SURFACES.
3. EPOXY RESINS USED FOR BONDING FRESH CONCRETE TO HARDENED CONCRETE SHALL CONFORM TO A.S.T.M. C881 TYPE V.
4. MIXING AND PLACEMENT OF EPOXY RESIN MATERIALS SHALL BE PERFORMED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. ALL SURFACES SHALL BE DRY, CLEAN AND FREE OF DUST, DIRT, OR OTHER DEBRIS.

STEEL NOTES:

1. MATERIAL: STRUCTURAL STEEL CHANNELS, BARS, PLATES AND ANGLES SHALL CONFORM TO A.S.T.M. A36.
2. STANDARD BLACK PIPE SHALL CONFORM TO A.S.T.M. A53. UNCOATED PIPE SHALL BE USED.
3. FABRICATION AND ARC WELDING OF STRUCTURAL STEEL AND HANDRAIL PANELS SHALL BE IN ACCORDANCE WITH CHAPTER 15, PART 3 OF THE CURRENT A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING. MIG WELDING SHALL BE USED ON HANDRAIL PANELS.
4. GALVANIZING SHALL CONFORM TO A.S.T.M. A123. PIECES REQUIRING GALVANIZING ARE NOTED IN THESE STANDARD PLANS.
5. AFTER GALVANIZING, ALL ELEMENTS SHALL BE FREE OF FINS, ABRASIONS, ROUGH OR SHARP EDGES AND OTHER SURFACE DEFECTS.
6. HANDRAIL PANELS ON WALKWAYS SHALL BE ERECTED PLUMB AND IN LINE.
7. D-RINGS SHALL BE 3" I.D., MADE OF STEEL FOR HEAVY-DUTY USE, PROVIDED WITH WELD-ON BRACKET, AND HAVE A MINIMUM SAFE WORKING LOAD OF 1,000 LBS. COMPONENTS REQUIRING D-RINGS ARE SHOWN IN THESE STANDARD PLANS.
8. SHEAR CONNECTOR STUDS SHALL CONFORM TO A.S.T.M. A108 GRADE 1020.
9. SHEAR CONNECTOR STUDS SHALL BE AUTOMATICALLY END WELDED WITH COMPLETE FUSION IN ACCORDANCE WITH SECTION 7 OF THE CURRENT A.W.S. STRUCTURAL WELDING CODE D1.1.

PILES:

1. STEEL PILE MATERIAL SHALL CONFORM TO A.S.T.M. A572 GRADE 50.
2. PILES SHALL BE DRIVEN IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS. STEEL BEARING PILES SHALL BE DRIVEN TO REFUSAL IF POSSIBLE OR TO A MINIMUM ULTIMATE RESISTANCE OF 663 KIPS AS DETERMINED BY G&W SPECIFICATION 520.
3. HAMMERS MUST BE APPROVED BY ENGINEER PRIOR TO USE. PILE DRIVING CRITERIA SHALL BE SUPPLIED BY THE SYSTEM STRUCTURES OFFICE.
4. ESTIMATED PILE LENGTHS ARE NOT TO BE USED AS BEARING OR DESIGN CRITERIA. ACTUAL PILE DEPTHS REQUIRED TO MEET DESIGN ARE DEPENDENT ON SITE SOIL CONDITIONS ACCORDING TO THE BORING LOG AND PILE DRIVING EQUIPMENT.
5. AFTER PILES ARE DRIVEN, THEY SHALL BE PULLED, IF NECESSARY, AND HELD IN THE PROPER LOCATION AND CUT OFF AT THE PROPER ELEVATION. THEY SHALL CONTINUE BEING HELD UNTIL THE PRECAST CAPS HAVE BEEN SET AND WELDED TO STEEL BEARING PILES.

PAINTING:

1. EXPOSED PORTIONS OF PILE PLATES, EXPOSED PORTIONS OF PILING BETWEEN BOTTOM OF CAP AND ONE FOOT BELOW GROUND LINE, CHANNEL BRACING, ANGLE HANDRAIL AND ABRASIONS OR CUTS ON PAINTED STEEL SHALL BE PAINTED WITH ONE (1) FIELD COAT OF SELF-PRIMING, ALUMINUM PIGMENTED, LOW STRESS, HIGH SOLIDS MASTIC. PAINT APPLICATION SHALL BE TO A MINIMUM DRY FILM THICKNESS OF 8 MILS. ALL AREAS TO BE PAINTED SHALL BE CLEANED IN ACCORDANCE WITH THE STEEL STRUCTURES PAINTING COUNCIL SURFACE PREPARATION SPECIFICATION SSPC-SP6. PAINT SHALL BE APPLIED IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.

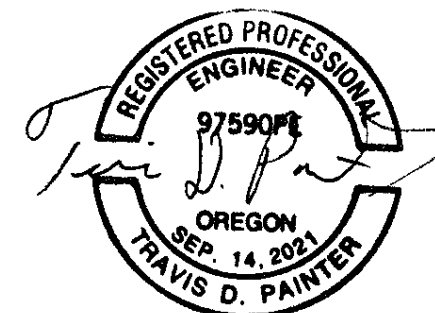
MANUFACTURER'S NOTES:

1. PRODUCTION PROCEDURES AND DIMENSIONAL TOLERANCES FOR THE MANUFACTURE OF PRECAST, PRESTRESSED BEAMS SHALL BE IN ACCORDANCE WITH THE A.R.E.M.A. MANUAL FOR RAILWAY ENGINEERING THE PRESTRESSED CONCRETE INSTITUTE'S CURRENT MANUAL MNL-116 FOR QUALITY CONTROL, AND PROJECT SPECIFICATIONS.
2. SURFACES SHALL BE FORMED IN A MANNER WHICH WILL PRODUCE A SMOOTH AND UNIFORM APPEARANCE WITHOUT RUBBING OR PLASTERING, UNLESS OTHERWISE NOTED. EXPOSED EDGES OF 90-DEGREES OR LESS ARE TO BE CHAMFERED 3/4" x 3/4". UNFORMED SURFACES SHALL HAVE A SMOOTH FINISH FREE OF ALL FLOAT AND TROWEL MARKS.
3. THE AREA AROUND LIFTING LOOPS SHALL NOT BE RECESSED. LIFTING LOOPS TO BE REMOVED IN FILED FLUSH WITH CONCRETE SURFACE.
4. IF LIFTED WITH SLINGS INSTEAD OF LIFTING LOOPS, SLINGS MUST NOT BE PLACED MORE THAN 3'-0" FROM ENDS OF BEAMS.
5. FABRICATOR IS RESPONSIBLE FOR DEVELOPING LIFTING LOOP ANCHORAGE DETAIL TO PROVIDE SAFETY FACTOR OF 4 ON WORKING LOAD. DETAIL SHALL BE PROOF-TESTED WITH TEST RESULTS KEPT ON FILE BY FABRICATOR AND AVAILABLE FOR INSPECTION BY THE RAILROAD.
6. COIL LOOP INSERTS ARE TO BE DOUBLE FLARED, 1 1/4" x 12" AND HAVE A SAFE WORKING LOAD OF 13,500 LBS. WITH A 4 TO 1 SAFETY FACTOR. THE INSERTS ARE TO BE COMPLETELY RECESSED WITH 1 1/4" DIA. x 13" SPIRAL BOLTS ATTACHED TO CAP FOR SHIPMENT.
7. BENT CAPS AND ABUTMENT CAPS SHALL BE PROVIDED WITH SUFFICIENT ELECTRICAL GROUND CONNECTION BETWEEN EMBED PLATES, TO AID IN FIELD WELD PROCEDURES.

ABBREVIATIONS:

Z	ANGLE
C	CENTERLINE
B.S.	BOTH SIDES
BOT.	BOTTOM
CONC.	CONCRETE
C.Y.	CUBIC YARD
DIA.	DIAMETER
E.F.	EACH FACE
EST.	ESTIMATED
FT.	FOOT
H	BENT HEIGHT
I.D.	INSIDE DIAMETER
IN.	INCHES
ksi	KIPS PER SQUARE INCH
L	BEAM LENGTH (L = S - 2")
LBS.	POUNDS
MIN.	MINIMUM
MAX.	MAXIMUM
N/A	NOT APPLICABLE
NO.	NUMBER
O.D.	OUTSIDE DIAMETER
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
psi	POUND PER SQUARE INCH
S	SPAN LENGTH
SPA.	SPACE
STD.	STANDARD
STR.	STRAIGHT
SYM.	SYMMETRIC
(TYP.)	TYPICAL
VERT.	VERTICAL
WT.	WEIGHT

SPACING TABLE				
USE TO LAYOUT HANDRAIL PANEL, WALKWAY BRACKET SPACING AND CURB JOINT				
SPAN LENGTH 'S'	SLOPED CURB			NO. OF CURB SEGMENTS
	HANDRAIL LAYOUT	'C'	'D'	
14'-0"	A	6'-0"	-	3
15'-0"	A	6'-6"	-	3
16'-0"	A	7'-0"	-	3
17'-0"	A	7'-6"	-	3
18'-0"	A	8'-0"	-	3
19'-0"	A	8'-6"	-	3
20'-0"	A	9'-0"	-	3
21'-0"	A	9'-6"	-	3
22'-0"	A	10'-0"	-	3
23'-0"	B	5'-6"	10'-0"	4
24'-0"	B	6'-0"	10'-0"	4
25'-0"	B	6'-6"	10'-0"	4
26'-0"	B	7'-0"	10'-0"	4
27'-0"	B	7'-6"	10'-0"	4
28'-0"	B	8'-0"	10'-0"	4
29'-0"	B	8'-6"	10'-0"	4
30'-0"	B	9'-0"	10'-0"	4
31'-0"	B	9'-6"	10'-0"	4
32'-0"	B	10'-0"	10'-0"	4
33'-0"	C	5'-6"	2 @ 10'-0"	5
34'-0"	C	6'-0"	2 @ 10'-0"	5
35'-0"	C	6'-6"	2 @ 10'-0"	5
36'-0"	C	7'-0"	2 @ 10'-0"	5



© Copyright Hanson Professional Services Inc.