

## GENERAL NOTES

**THE FOLLOWING NOTES APPLY EXCEPT WHERE SHOWN OTHERWISE**

CODE: DESIGN PER "GUIDE SPECIFICATIONS FOR DESIGN OF PEDESTRIAN BRIDGES", 2009 (INCLUDING 2015 INTERIM REVISIONS) & "LRFD BRIDGE DESIGN SPECIFICATIONS", 2020 (9TH EDITION) BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO) AND WSDOT BRIDGE DESIGN MANUAL (2022)

**SEISMIC PARAMETERS:**

- i. SITE CLASS = D
- ii. PGA = 0.528
- iii.  $S_s = 1.229$
- iv.  $S_1 = 0.429$

$R_s = 5.0$  CONSIDERED FOR PIN PILE SUPPORTING THE SUPER-STRUCTURE  
 $R_n = 0.8$  FOR ANCHORAGE AND CONNECTION DESIGN  
 BASE SHEAR (FOR SUB-STRUCTURE DESIGN) =  $(C_{90a} \times W)/R$   
 $= 0.166W$

MINIMUM SEISMIC BASE SHEAR =  $A_s \times W$   
 $= 0.528 \times W$  (GOVERNS AND CONSIDERED IN FINAL DESIGN.)

EARTH PRESSURE = 50 PCF (EQUIVALENT FLUID PRESSURE)  
 ACTIVE EARTH PRESSURE = 8 TIMES RETAINED SOIL HEIGHT (AT STRENGTH LEVEL)

**STRUCTURAL LOADS**

DESIGN LOADS: FOUNDATION ARE DESIGNED USING THE BRIDGE REACTIONS PROVIDED BY CONTECH ENGINEERED SOLUTIONS LLC. THE REACTIONS USED FOR THE DESIGN ARE IN CONTECH CONTRACT DRAWINGS WITH JOB NUMBER #670602 DATED 26TH AUGUST, 2022. ADDITIONALLY, BACKWALL HAS BEEN DESIGNED TO RESIST AN EARTH PRESSURE OF 50 PCF FOR ENTIRE HEIGHT UP TO BOTTOM OF ABUTMENT CAP.

**SHOP DRAWINGS**

SHOP DRAWINGS SHALL BE SUBMITTED FOR REVIEW PRIOR TO FABRICATION. SHOP DRAWING SUBMITTALS PROCESSED BY THE ENGINEER ARE NOT CHANGE ORDERS. THE PURPOSE OF SHOP DRAWING SUBMITTALS BY THE CONTRACTOR IS TO DEMONSTRATE TO THE ENGINEER THAT THE CONTRACTOR UNDERSTANDS THE DESIGN CONCEPT, BY INDICATING WHICH MATERIAL IS INTENDED TO BE FURNISHED AND INSTALLED, AND BY DETAILING THE INTENDED FABRICATION AND INSTALLATION METHODS. IF DEVIATIONS, DISCREPANCIES, OR CONFLICTS BETWEEN SHOP DRAWING SUBMITTALS AND THE CONTRACT DOCUMENTS ARE DISCOVERED EITHER PRIOR TO OR AFTER SHOP DRAWING SUBMITTALS ARE PROCESSED BY THE ENGINEER, THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL CONTROL AND SHALL BE FOLLOWED. SUBMITTAL REVIEW IS FOR GENERAL CONFORMANCE ONLY; THIS REVIEW DOES NOT CHECK DIMENSIONS OR QUANTITIES.

**FOUNDATIONS**

FOUNDATIONS TO BE SUPPORTED OVER STEEL PIN PILES AS CALLED OUT ON PLAN. PILES HAVE BEEN DESIGNED COVERING TWO CONDITIONS: CONDITION-I - DESIGN LOADS WITH SEISMIC ALONG WITH 50% SCOUR DESIGN FLOOD DEPTH; CONDITION-II - DESIGN LOADS WITHOUT SEISMIC BUT CONSIDERING "WORST CASE" SCOUR CONDITION.

**CONCRETE**

**A. CONCRETE**

ALL CAST-IN-PLACE CONCRETE SHALL BE WITH THE EXPOSURE CATEGORIES, WATER-CEMENT RATIOS, ENTRAINED AIR AND MINIMUM 28-DAY COMPRESSIVE STRENGTHS AS INDICATED IN THE CONCRETE SCHEDULE ON THIS SHEET.

ELEMENTS	EXPOSURE CATEGORY	$f_c$
FOUNDATION	F2 S0 C2	4000
HIGH STRENGTH NON-SHRINK GROUT UNDER BEARING PLATES (MASTER FLOW 928/EQUAL)	- - -	5000

CONCRETE MIX DESIGNS FOR ALL CONCRETE ELEMENTS SHALL COMPLY WITH SECTION 19.3 OF ACI318-14 BASED ON THE EXPOSURE CATEGORIES LISTED IN THE ABOVE TABLE. NO CALCIUM CHLORIDE SHALL BE USED IN ANY CONCRETE.

**B. REINFORCING**

ALL REINFORCING BARS SHALL BE NEW BILLET STEEL ASTM A615, GRADE 60 CONFIRMING TO ACI 318 SECTION 20.2.2.5. WELDABLE REINFORCING BARS SHALL CONFIRM TO ASTM A706. EPOXY COATED BARS (WHERE INDICATED ON PLAN, SHALL CONFORM TO ASTM A775. ALL WELDED WIRE REINFORCEMENT (WWR) SHALL CONFORM TO ASTM A185. EPOXY COATED WWR SHALL CONFORM TO ASTM A884, CLASS A. ALL HEADED SHEAR STUD REINFORCEMENT SHALL CONFORM TO ASTM A1044.

ALL CONCRETE REINFORCEMENT SHALL BE DETAILED, FABRICATED, LABELED, SUPPORTED, SPACED IN FORMS, AND SECURED IN PLACE IN ACCORDANCE WITH THE PROCEDURES AND REQUIREMENTS OUTLINED IN THE LATEST EDITION OF ACI 318, AND THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES", ACI 315.

THE CONTRACTOR SHALL SUBMIT CHECKED SHOP DRAWINGS SHOWING REINFORCING DETAILS, INCLUDING STEEL SIZES, SPACING, PLACEMENT AND SUPPORT DETAILS AND DOWELS AT EXPANSION JOINTS FOR REVIEW PRIOR TO FABRICATION.

ALL REINFORCING SPLICES SHALL CONFORM TO THE REQUIREMENTS OF LATEST EDITION OF ACI 318 AND THE SPLICE TABLE INCLUDED IN THE STRUCTURAL DOCUMENTS UNO. ALL WWR SHALL BE LAPPED TWO (2) FULL MESH PANELS AND TIED SECURELY.

WHERE REQUIRED, DOWELS SHALL MATCH THE SIZE AND SPACING OF MAIN REINFORCING, UNO.

ALL MECHANICAL, PLUMBING AND ELECTRICAL EQUIPMENT PADS SHALL BE REINFORCED WITH AT LEAST ONE (1) LAYER OF 8X8-W4.0 X W4.0 WWR AT TOP CONTINUOUS, UNO. SEE WELDAC, PLUMBING AND ELECTRICAL DRAWINGS FOR ADDITIONAL REINFORCING REQUIREMENTS FOR PADS.

BAR SUPPORTS IN CONTACT WITH EXPOSED SURFACES SHALL BE PLASTIC TIPPED.

IN NON-PRESTRESSED CAST-IN-PLACE CONCRETE, THE SPECIFIED CONCRETE COVER FOR REINFORCEMENT SHALL NOT BE LESS THAN THE FOLLOWING, UNLESS LARGER COVER IS NOTED ELSEWHERE.

- CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3 IN.
- CONCRETE EXPOSED TO EARTH OR WEATHER: #5 THROUGH #18 BARS 2 IN.
- CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND: W31, OR D31 WIRE AND SMALLER 1-1/2 IN.
- SLABS, WALLS, JOISTS: #14 AND #18 BARS 1-1/2 IN.
- BEAMS, COLUMNS: #11 BAR AND SMALLER 3/4 IN.
- REINFORCEMENT, TIES, STIRRUPS, SPIRALS 1-1/2 IN.

ALL STAINLESS STEEL REINFORCING SHALL BE AUSTENITIC TYPE 316 DEFORMED BARS CONFORMING TO THE STANDARDS OF ASTM A276 AND ASTM A955.

USE #4 RAISER BARS FOR ALL SLABS/BEAMS.

**D. CURING AND SEALING**

PROVIDE SPECIFIED CURING COMPOUND AND SEALER FOR THE TOP SURFACE OF ALL SLAB WORK, UNLESS NOTED OTHERWISE.

**E. TOLERANCES**

ALL CONCRETE WORK SHALL CONFORM TO THE REQUIREMENTS OF ACI 117, LATEST EDITION, "SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS AND COMMENTARY", EXCEPT AS MODIFIED BY THESE DOCUMENTS.

**STRUCTURAL STEEL:**

WIDE FLANGE SHAPES TO BE ASTM A992, F<sub>y</sub>=50 KSI.  
 CHANNELS, ANGLES, AND PLATES TO BE ASTM A36, F<sub>y</sub>=36 KSI.  
 PIPE COLUMNS TO BE ASTM A53, GRADE B, F<sub>y</sub>=35 KSI.  
 HSS RECTANGULAR AND SQUARE STRUCTURAL TUBE TO BE ASTM A500, GRADE B, F<sub>y</sub>=46 KSI.  
 HSS ROUND STRUCTURAL TUBE TO BE ASTM A500, GRADE B, F<sub>y</sub>=42 KSI.

ALL STEEL EXCEPT STEEL EMBEDDED IN CONCRETE SHALL BE GIVEN ONE SHOP COAT OF APPROVED PAINT. ALL STEEL AND CONNECTION HARDWARE EXPOSED TO WEATHER TO BE HOT DIPPED GALVANIZED. WELDS TO BE 3/16" MINIMUM CONTINUOUS FILLET, BY CERTIFIED WELDERS USING E70XX ELECTRODES. ALL WELDING SHALL BE PERFORMED IN STRICT ADHERENCE TO AWS D1.1, AWS D1.5 AND TO A WRITTEN WELDING PROCEDURE SPECIFICATION (WPS) PER AWS D1.8. ALL WELDING PARAMETERS SHALL BE WITHIN THE ELECTRODE MANUFACTURER'S RECOMMENDATIONS. WELDING PROCEDURES SHALL BE SUBMITTED TO THE OWNER'S TESTING AGENCY FOR REVIEW BEFORE STARTING FABRICATION OR ERECTIONS. COPIES OF THE WPS SHALL BE ON SITE AND AVAILABLE TO ALL WELDERS AND THE SPECIAL INSPECTOR.

STEEL TO STEEL BOLTED CONNECTIONS ARE SHOWN TO BE BEARING-TYPE CONNECTIONS USING A325 BOLTS WITH THREADS INCLUDED IN THE SHEAR PLANE. HOLE SIZE SHALL BE IN ACCORDANCE WITH AISC SPECIFICATION FOR BEARING CONNECTION AND BOLTS SHALL BE TIGHTENED TO SNUG-TIGHT CONDITION, WHERE BOLTS ARE NOTED A325SC, CONNECTIONS SHALL BE FRICTION-TYPE CONNECTIONS WITH BOLTS TENSIONED AND USING APPROPRIATE HARDENED STEEL WASHERS AS REQUIRED BY AISC STANDARDS.

ANCHOR BOLTS EMBEDDED IN CONCRETE ARE ASTM F1554 GRADE 105, UNLESS OTHERWISE NOTED. NO WELDING TO OR BENDING OF HIGH STRENGTH ANCHOR BOLTS IS PERMITTED.

PLATE WASHER SHALL CONFORM TO SPECIFICATIONS OF AASHTO M293 AND NUTS TO CONFORM TO SPECIFICATIONS OF ASTM A563 GRADE DH HEAVY HEX NUTS.

SUBMIT SHOP DRAWINGS PREPARED BY AN EXPERIENCED DETAILER FOR REVIEW PRIOR TO FABRICATION. SHOP DRAWINGS TO BE COMPLETE, SHOWING ALL WELDS AND MATERIAL GRADES. PROVIDE A PLAN LOCATION OR DETAIL REFERENCE FOR EACH SHOP DRAWING. FOR MINOR STEEL-TO-STEEL CONNECTIONS OF 12" AND SMALLER STEEL MEMBERS: IF AN EXPLICIT CONNECTION IS NOT SHOWN ON THE STRUCTURAL DRAWINGS, DETAILER IS TO PROPOSE A CONNECTION SIMILAR TO THE CONNECTIONS ON THE DRAWINGS OR PER AISC STANDARD CONNECTIONS, ON THE SHOP DRAWING, CLOUD THE CONNECTION AND STATE "VERIFY." SHOP DRAWINGS NOT MEETING THESE CONDITIONS WILL BE REJECTED. REVIEW OF SHOP DRAWINGS BY THE ENGINEER IS FOR DESIGN INTENT ONLY, AND DOES NOT INCLUDE VERIFICATION OF DIMENSIONS AND QUANTITIES. VERIFICATION OF DIMENSIONS AND QUANTITIES ARE THE RESPONSIBILITY OF THE CONTRACTOR.

STEEL FABRICATORS AND DETAILERS: BASE BID TO INCLUDE STEEL DETAILER AND FABRICATOR TIME AND COSTS FOR ROUTINE CONSTRUCTION QUESTIONS. ROUTINE CONSTRUCTION QUESTIONS INCLUDE DIMENSIONAL QUESTIONS AND MINOR FRAMING QUESTIONS. ROUTINE CONSTRUCTION QUESTIONS ARE PART OF THE NORMAL CONSTRUCTION PROCESS, AND ARE TO BE INCLUDED IN THE BASE BID.

**SCOPE OF STRUCTURAL ENGINEERING SERVICES:**

THE STRUCTURAL ENGINEER HAS PERFORMED THE STRUCTURAL DESIGN AND PREPARED THE STRUCTURAL WORKING DRAWINGS FOR THIS PROJECT. THE CONSTRUCTION MUST BE PERFORMED IN STRICT ACCORDANCE WITH THE STRUCTURAL DRAWINGS. ANY DEVIATION FROM THE DRAWINGS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER. ERRORS AND/OR OMISSIONS FOUND ON THE STRUCTURAL DRAWINGS MUST BE BROUGHT TO THE STRUCTURAL ENGINEER'S ATTENTION IMMEDIATELY.

ARCHITECTURAL DRAWINGS ARE THE PRIME CONTRACT DRAWINGS. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL DRAWINGS. PRIMARY STRUCTURAL ELEMENTS ARE DIMENSIONED ON THE STRUCTURAL PLANS AND DETAILS. THE GENERAL CONTRACTOR SHALL VERIFY AND COORDINATE DIMENSIONS AMONG ALL DRAWINGS. ANY DISCREPANCIES, CONTRADICTIONS, OR OMISSIONS SHALL BE REPORTED TO THE ARCHITECT FOR RESOLUTION PRIOR TO PROCEEDING WITH WORK OR FABRICATION OF THE ITEM(S) IN QUESTION.

THE STRUCTURAL ENGINEER IS RESPONSIBLE FOR THE DESIGN OF THE PRIMARY STRUCTURAL SYSTEM, EXCEPT FOR ANY COMPONENTS NOTED ABOVE. RESPONSIBILITY FOR ANY SECONDARY STRUCTURAL AND NON-STRUCTURAL SYSTEMS NOT SHOWN ON THE STRUCTURAL PLANS RESTS WITH SOMEONE OTHER THAN THE STRUCTURAL ENGINEER.

THE STRUCTURE SHOWN ON THESE DRAWINGS IS STRUCTURALLY SOUND ONLY IN ITS COMPLETED FORM. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY BRACING TO STABILIZE THE BUILDING DURING CONSTRUCTION.

THE STRUCTURAL ENGINEER IS NOT RESPONSIBLE FOR, AND WILL NOT HAVE CONTROL OF, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES OR PROCEDURES, OR FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE CONSTRUCTION WORK, NOR WILL HE BE RESPONSIBLE FOR THE CONTRACTOR'S FAILURE TO CARRY OUT THE CONSTRUCTION WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

FIELD MEASUREMENTS AND THE VERIFICATION OF FIELD DIMENSIONS ARE NOT PART OF THE STRUCTURAL ENGINEER'S RESPONSIBILITY. THE CONTRACTOR MUST CHECK ALL (ASSUMED) EXISTING CONDITIONS SHOWN ON THESE DRAWINGS FOR ACCURACY AND NOTIFY THE STRUCTURAL ENGINEER OF ANY DISCREPANCIES.

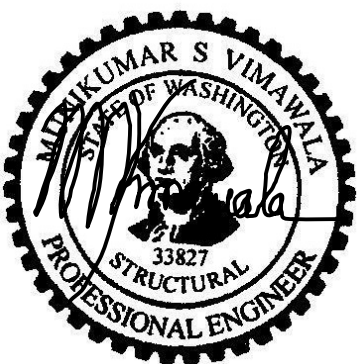
OMISSIONS FROM THE DRAWINGS OR SPECIFICATIONS OR THE INADVERTENT MISLABELING OF DETAILS OF WORK WHICH ARE MANIFESTLY NECESSARY TO CARRY OUT THE INTENT OF THE DRAWINGS AND SPECIFICATIONS, OR WHICH ARE CUSTOMARILY PERFORMED, SHALL NOT RELIEVE THE CONTRACTOR FROM PERFORMING SUCH OMITTED OR INADVERTENT MISLABELED DETAILS OF THE WORK BUT THEY SHALL BE PERFORMED AS IF FULLY AND CORRECTLY SET FORTH AND DESCRIBED IN THE DRAWINGS AND SPECIFICATIONS.

## SPECIAL INSPECTIONS

SPECIAL INSPECTION SCHEDULE				
REQUIRED INSPECTIONS, VERIFICATION AND TESTS OF CONCRETE CONSTRUCTION				
TYPE	CONTINUOUS	PERIODIC	REFERENCE STANDARD	IBC REFERENCE
REINFORCING BAR WELDING:				
a. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706		X	AWS D1.4 ACI 318: 26.6.4	
b. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16"		X		
c. INSPECT ALL OTHER WELDS		X		
INSPECT ANCHORS CAST IN CONCRETE.				
		X	ACI 318: 17.8.2	
INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS (b)				
a. ADHESIVE ANCHORS INSTALLED HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS	X		ACI 318: 17.8.2.4	
b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN (a)		X	ACI 318: 17.8.2	
VERIFY USE OF REQUIRED DESIGN MIX ( $f_c > 2500$ PSI)				
		X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PREDFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE				
	X		ASTM C172 ACI 318: 26.4, 26.12 ASTM C31	1908.1
INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES				
	X		ACI 318: 26.5	1908.6, 1908.7, 1908.8
VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES				
		X	ACI 318: 26.5.3-26.5.5	1908.9
INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED				
		X	ACI 318: 26.11.1.2(b)	

REQUIRED INSPECTIONS AND VERIFICATIONS FOR PIN PILES				
TYPE	CONTINUOUS	PERIODIC	REFERENCE STANDARD	IBC REFERENCE
STEEL PIN PILE INSTALLATION.				
	X			IBC 1705.9

REVISION	DATE
RESPONSE TO CITY COMMENTS	2023-06-13
RESPONSE TO CITY COMMENTS	2023-07-21
RESPONSE TO CITY COMMENTS	2023-09-27



# PSM

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CARNATION, WASHINGTON

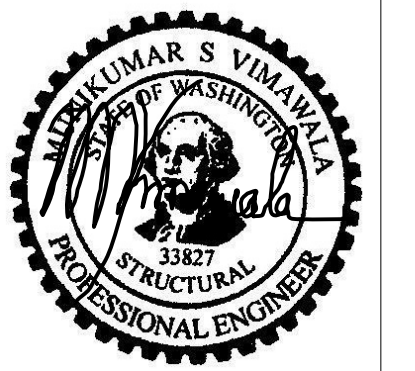
SHEET CONTENTS:  
 GENERAL NOTES AND  
 SPECIAL INSPECTIONS

JOB No.	23029
DWN BY:	SMV
CHKD BY:	PSM
DATE:	09-27-2023

SHEET No.

## S1.0

REVISION	DATE
RESPONSE TO CITY COMMENTS 1	2023-06-13
RESPONSE TO CITY COMMENTS 2	2023-07-21
RESPONSE TO CITY COMMENTS 3	2023-09-27



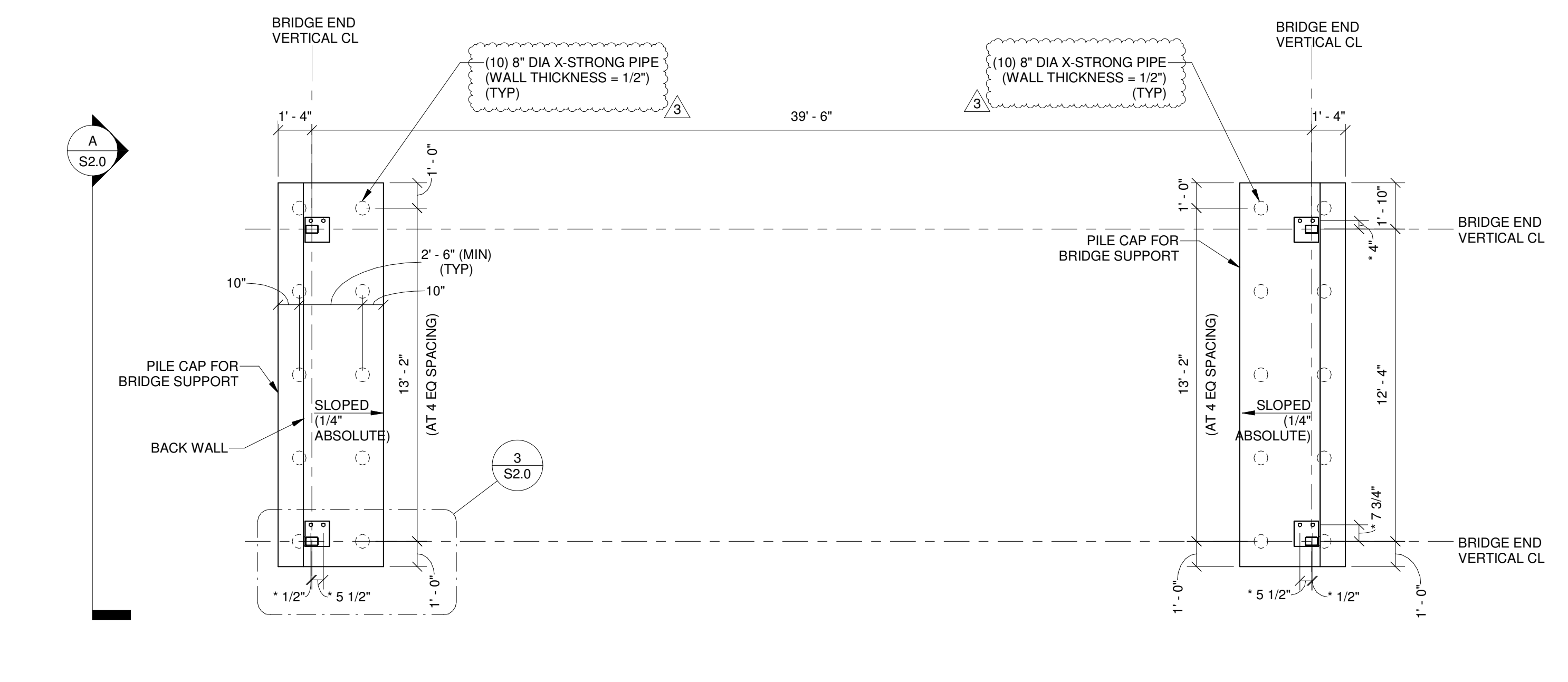
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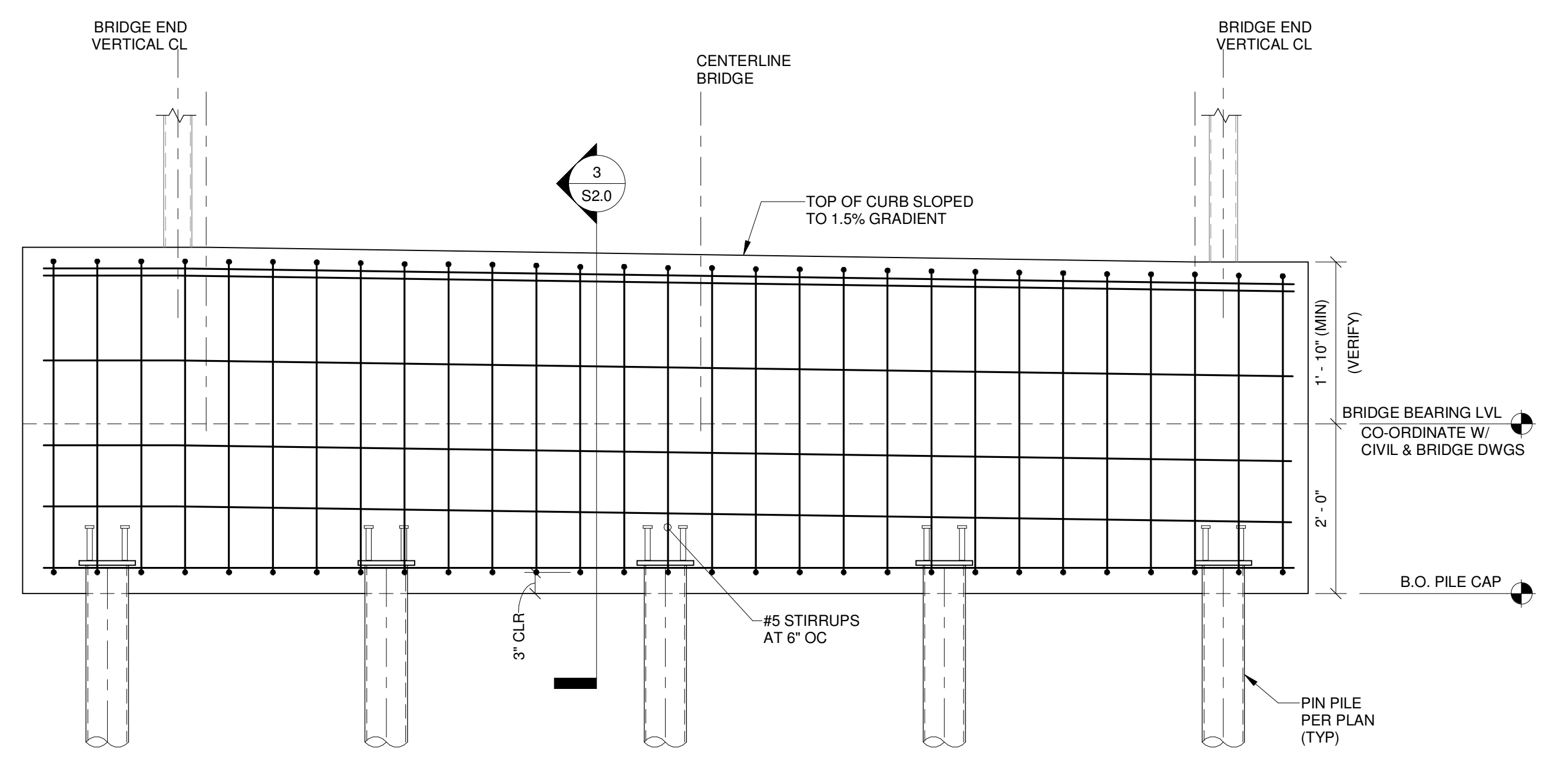
**SHEET CONTENTS:  
 PILE LAYOUT PLAN,  
 SECTION AND DETAILS**

JOB No.	23029
DWN BY:	SMV
CHKD BY:	PSM
DATE:	09-27-2023
SHEET No.	

**S2.0**



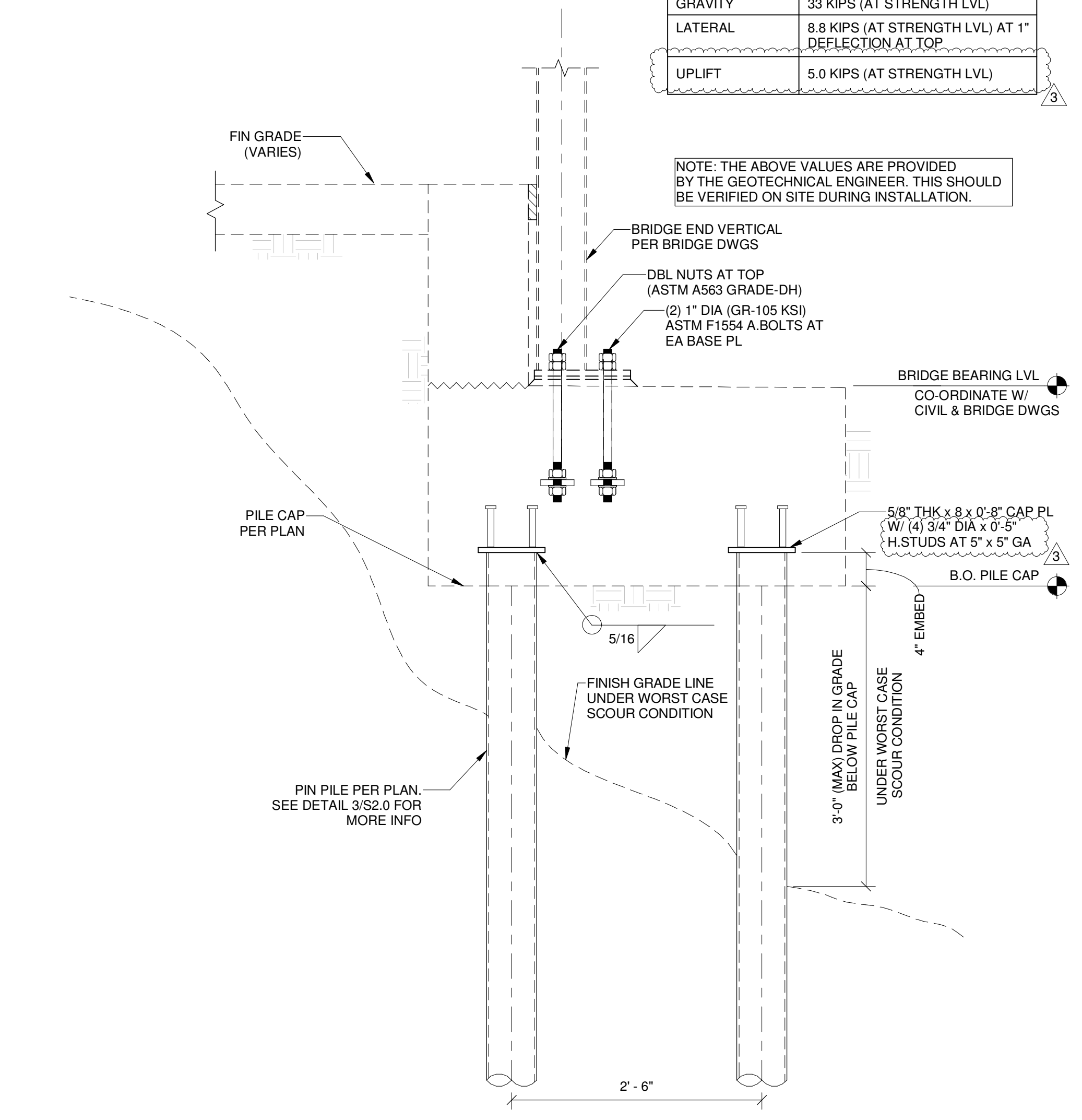
**1 PILE LAYOUT PLAN**  
 1/4" = 1'-0"



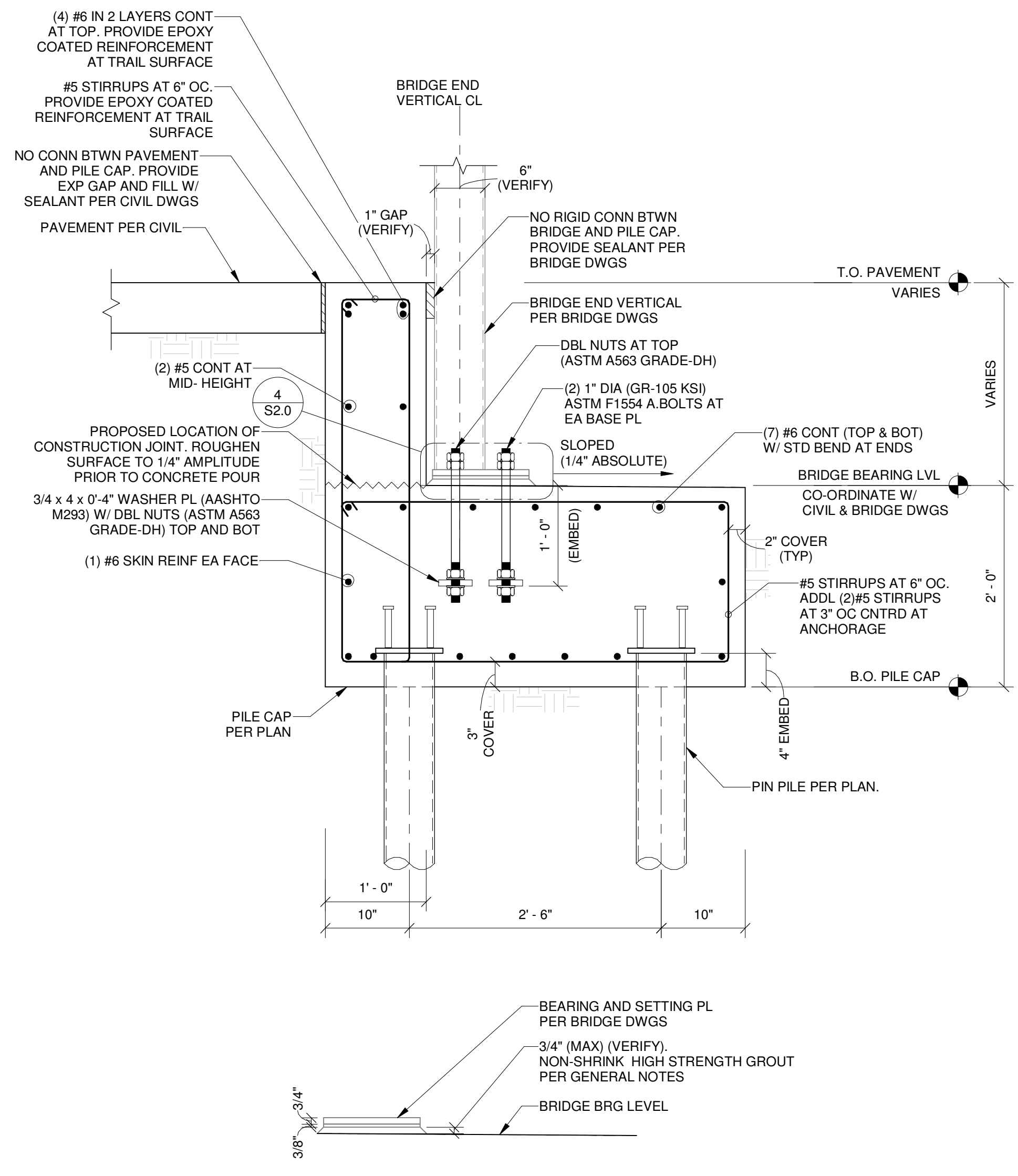
**A SECTION**  
 3/4" = 1'-0"

PILE CAPACITY	
GRAVITY	33 KIPS (AT STRENGTH LVL)
LATERAL	8.8 KIPS (AT STRENGTH LVL) AT 1" DEFLECTION AT TOP
UPLIFT	5.0 KIPS (AT STRENGTH LVL)

NOTE: THE ABOVE VALUES ARE PROVIDED BY THE GEOTECHNICAL ENGINEER. THIS SHOULD BE VERIFIED ON SITE DURING INSTALLATION.



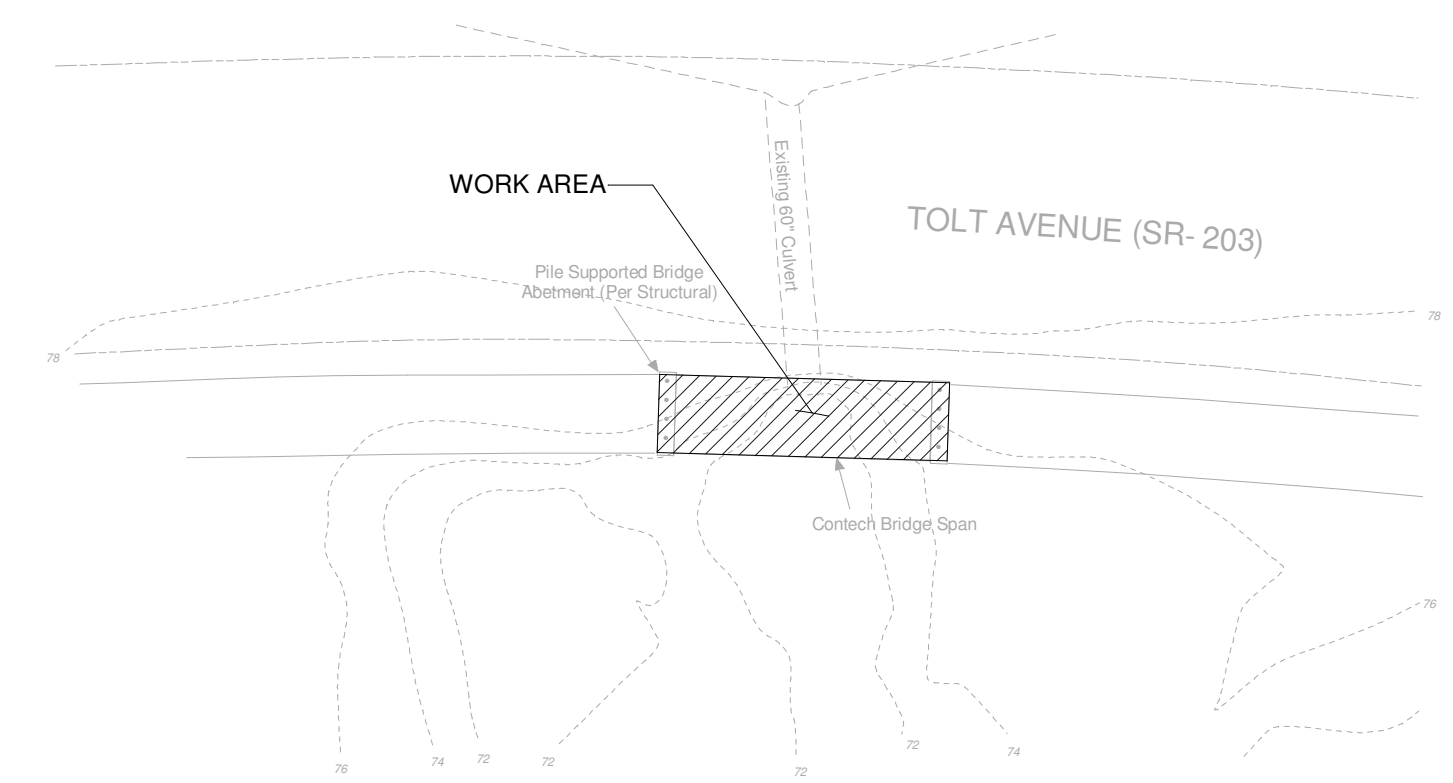
**2 TYPICAL PIN PILE INSTALLATION DETAIL**  
 1" = 1'-0"



**3 DETAIL**  
 1" = 1'-0"

- FOUNDATION NOTES**
- FINAL LAYOUT OF BRIDGE, A BOLTS AND BEARING LEVEL FOR BRIDGE ALONG WITH ELEVATION OF RIGID PAVEMENT (BEYOND) TO BE COORDINATED WITH CONTECH DRAWINGS (BRIDGE EOR) AND CIVIL CONSULTANT. IN CASE OF ANY DISCREPANCY PLEASE REPORT TO EOR BEFORE PROCEEDING FURTHER.
  - STEEL PIN PILES TO BE GALVANIZED CONFORMING TO ASTM A123 OR AASHTO M111 AND GALVANIZING REPAIR, IF REQUIRED, FOR FIELD WELDED CAPS AND OTHER DAMAGES TO COMPLY WITH PROCEDURES AND DETAILING PROVIDED IN ASTM A780.
  - STEEL PIN PILES TO BE DRIVEN TO REFUSAL TO ACHIEVE A CAPACITY AS DETAILED IN 2/S2.0.
  - PILES TO BE DRIVEN VERTICALLY PLUMB. SEE GEOTECHNICAL REPORT OF THIS PROJECT FOR ADDITIONAL INSTALLATION REQUIREMENTS.
  - GC TO ENSURE INSTALLATION OF NEW PIN PILES DOES NOT FOUL WITH ANY EXISTING UNDERGROUND UTILITY LINES. IN CASE OF ANY CONFLICT REPORT TO EOR BEFORE PROCEEDING FURTHER.
  - SEE S1.0 FOR GENERAL NOTES AND SPECIAL INSPECTIONS.

NOTE: \* INDICATES DIM STRING W/ LAYOUT OF A BOLTS. VERIFY W/ BRIDGE DRAWINGS AND REPORT TO EOR IN CASE OF DISCREPANCY.



**KEY PLAN**