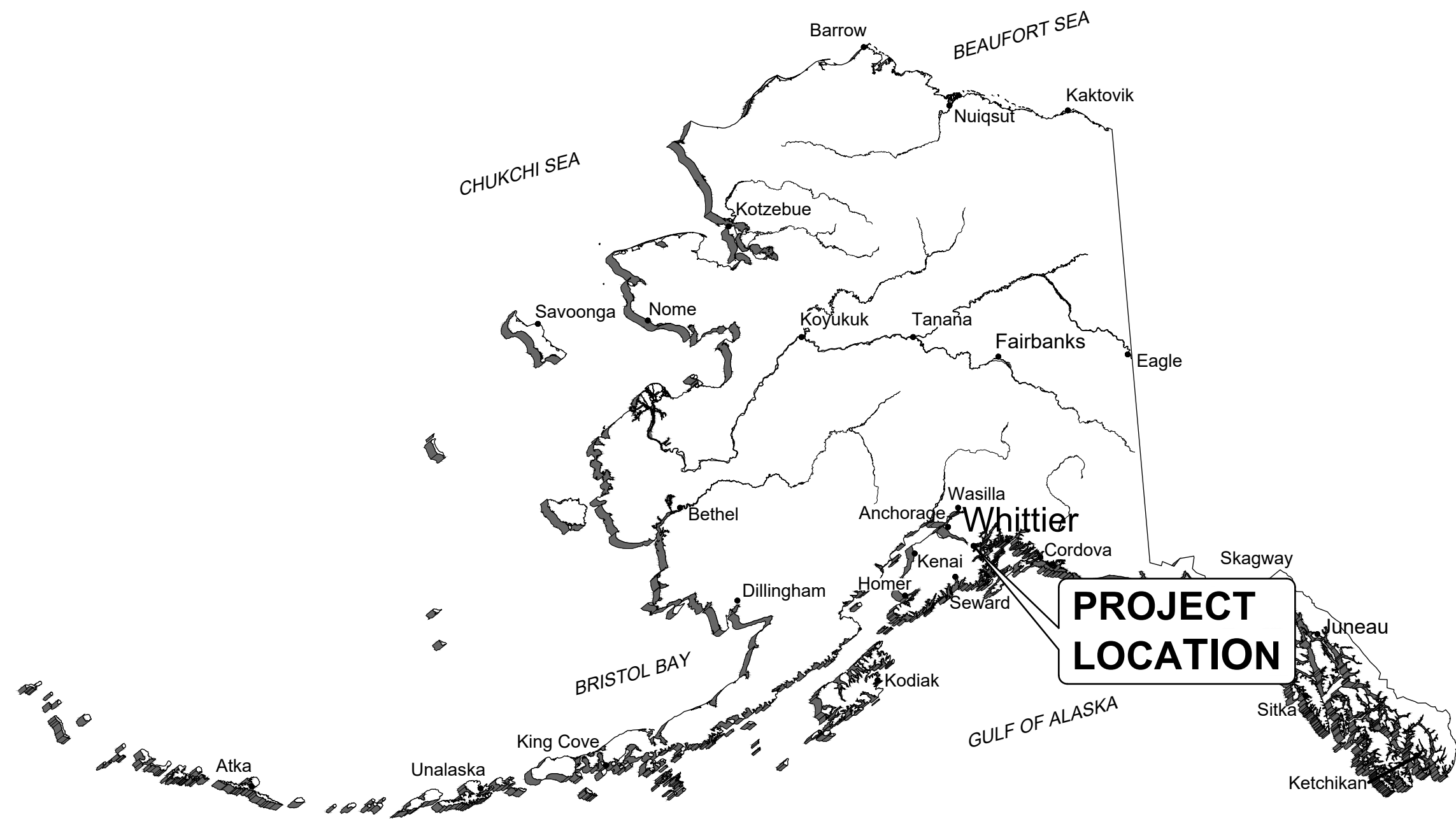


# ALASKA RAILROAD TIMBER TRESTLE REPAIR

DECEMBER 2025  
WHITTIER, ALASKA



STATE OF ALASKA

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SHEET NO.	SHEET TITLE
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VICINITY



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0	10/8/2025	ISSUED FOR CONSTRUCTION
1	12/11/2025	TIMBER SPEC. & CONNECT. TOLERANCES
REV	DATE	DESCRIPTION



DATE: 12/11/2025

1506 West 36th Avenue  
Anchorage, Alaska 99503  
Phone: 907.561.1011  
www.pndengineers.com  
AK LIC# AECC250



ARRC WHITTIER TIMBER  
TRESTLE BRACING REPAIR

COVER SHEET

DESIGNED BY:	SB	DATE:	10/08/2025
CHECKED BY:	SB	PROJECT NO:	201122

SHEET NO: 1 OF 5



GENERAL NOTES

OWNER: ALASKA RAILROAD CORPORATION (ARRC)  
THE DESIGN DRAWINGS AND SPECIFICATIONS SHALL BE POSTED PROMINENTLY AT THE CONTRACTOR'S  
ONSITE PROJECT OFFICE.

ANY DISCREPANCIES FOUND AMONG THE DRAWINGS, SPECIFICATIONS, SITE CONDITIONS, AND THESE  
NOTES SHALL BE REPORTED TO THE OWNER/ENGINEER AT ONCE. ANY FURTHER WORK PERFORMED BY THE  
CONTRACTOR AFTER FINDING SUCH DISCREPANCIES SHALL BE DONE AT HIS OWN RISK.

SCOPE  
REPLACE TRESTLE BRACING AND PILE CAP CONNECTION.

DESCRIPTION OF WORK  
ALL LABOR AND EQUIPMENT NECESSARY TO COMPLETE WORK SHALL BE FURNISHED. WORK SHALL BE  
DONE IN ACCORDANCE WITH THE PLANS, SPECIFICATIONS, AND PERMITS.

APPLICABLE CODES  
ALL LOCAL CODES PLUS THE FOLLOWING SPECIFICATIONS, STANDARDS AND CODES ARE PART OF THESE  
GENERAL NOTES:

- 1. 2021 IBC
- 2. ASCE 7-16
- 3. NDS 2018

IN THE EVENT THAT THERE IS A CONFLICT BETWEEN THE ABOVE REFERENCES AND THESE GENERAL NOTES  
THE FOLLOWING PRIORITY WILL BE FOLLOWED:

- 1. ALL PROJECT PERMIT REQUIREMENTS
- 2. THESE GENERAL NOTES AND PLANS
- 3. LOCAL CODES

THE SPECIFICATIONS, STANDARDS AND CODES LISTED ABOVE IN ORDER OF PRECEDENCE

NOTE: THE AFOREMENTIONED CODES WERE USED IN THE DEVELOPMENT OF LOADS AND FOR THE DESIGN  
OF ELEMENTS OF THE TRESTLE. HOWEVER, BASED ON OWNER DEMANDS, THE STRUCTURE IS NOT  
ADEQUATELY DESIGNED TO RESIST CODE MINIMUM LOADS. THE STRUCTURE IS NOT CODE COMPLIANT AND  
SHOULD BE REPLACED OR REMOVED IN THE IMMEDIATE FUTURE.

DESIGN PARAMETERS

STRUCTURE ELVEVATIONS AND TIDAL LEVELS

ELEVATION	
HIGH ASTRONOMICAL TIDE (HAT)	15.8 FT
MEAN HIGHER HIGH WATER (MHHW)	12.2 FT
MEAN HIGH WATER (MHW)	11.3 FT
MEAN LOW WATER (MLW)	1.5 FT
MEAN LOWER LOW WATER (MLLW)	0.0 FT
LOW ASTRONOMICAL TIDE (LAT)	-4.0 FT

IT IS THE OWNERS RESPONSIBILITY TO PROVIDE BARRIERS, RAILING, GUARDS, GATES, ADDITIONAL SIGNAGE,  
ETC. AS REQUIRED FOR SAFE OPERATIONS OF THIS FACILITY.

DESIGN CRITERIA -  
TIMBER TRESTLE WAS EVALUATED FOR REDUCED DESIGN LOADS COMPARED TO ORIGINAL CONSTRUCTION.  
DEAD, LIVE, SNOW, AND EARTHQUAKE LOADS WERE CONSIDERED IN ANALYSIS.

DEAD LOAD -  
SELF WEIGHT OF TRESTLE

LIVE LOADS -  
JOHN DEERE 334P SKID STEER (18 KIP TIPPING AXLE LOAD).

SNOW LOADS -  
GROUND SNOW LOAD OF 432 PSF.  
SNOW LOAD OF 40 PSF CONSIDERED FOR SEISMIC LOADING.

EARTHQUAKE -  
EARTHQUAKE LOADING  
SEISMIC PARAMETERS:  
SEISMIC DESIGN CATEGORY = D  
TRESTLE PERIOD = 0.424 s  
AASHTO RISK-TARGETED GROUND MOTIONS, 1.5% TARGETED RISK  
IN 75 YEARS. SELECTED COEFFICIENTS BELOW:

SITE ADJUSTED SPECTRAL ACCELERATION COEFFICIENTS (S <sub>a</sub> )			
PERIOD (SEC)	ACCELERATION (g)	PERIOD (SEC)	ACCELERATION (g)
0.00	0.66	1.00	0.70
0.10	1.37	1.50	0.48
0.25	1.42	2.00	0.36
0.50	1.10	3.00	0.25
0.75	0.87	4.00	0.19

MATERIALS

TIMBER -  
TIMBER SHALL BE S4S DOUGLAS FIR-LARCH NO. 2 OR BETTER AND TREATED PER AWPA STANDARD UC5A  
FOR MARINE ENVIRONMENTS. THIS INCLUDES, BUT IS NOT LIMITED TO CHROMATED COPPER ARSENATE  
(CCA) AND AMMONIACAL COPPER ZINC ARSENATE (ACZA). THE USE OF CREOSOTE SHALL NOT BE  
PERMITTED.

IF SPECIFIED SIZE OF DIMENSIONAL LUMBER IS UNAVAILABLE, THE NEXT LARGEST SIZE MAY BE USED AS A  
SUBSTITUTE.

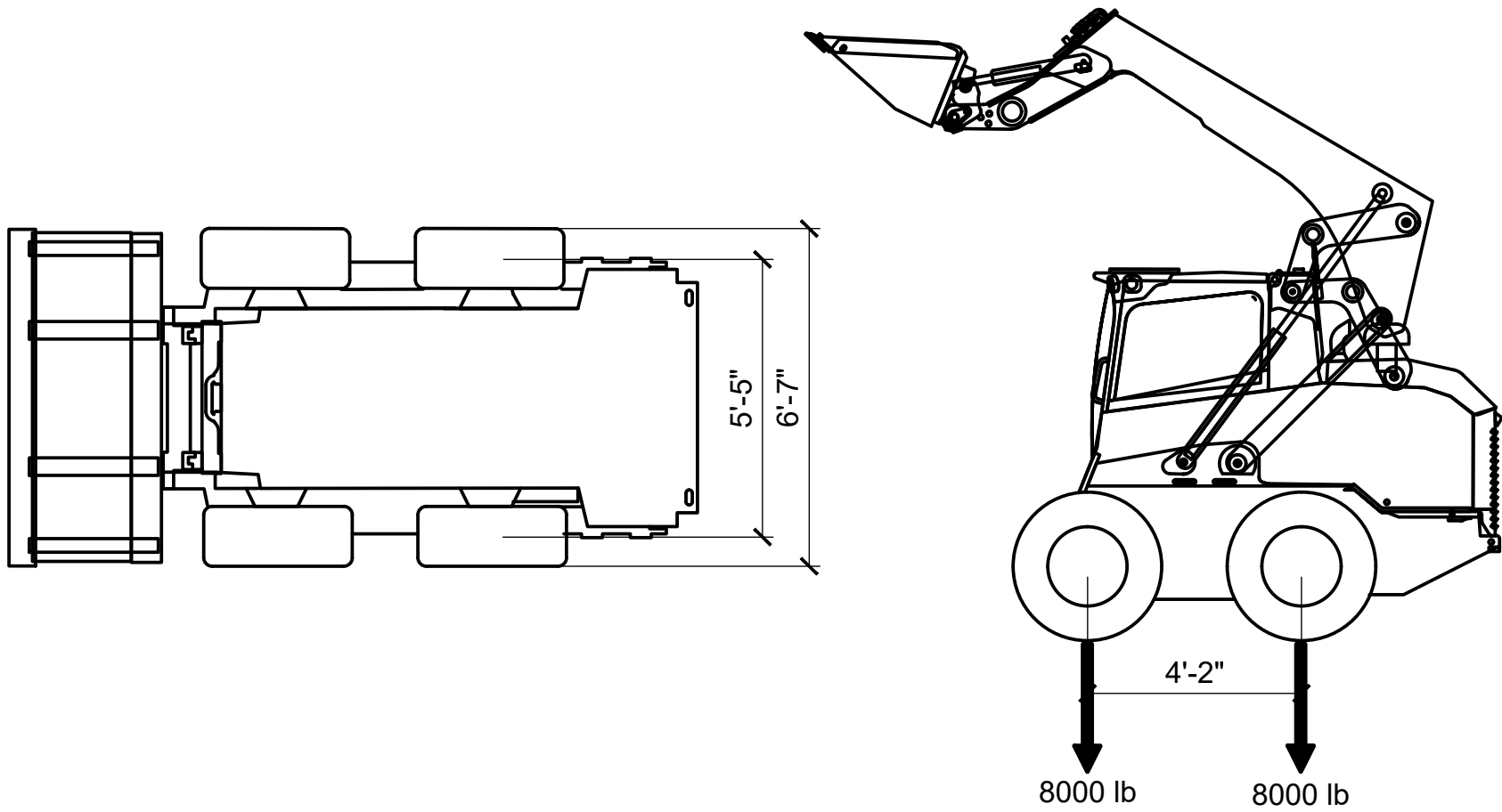
STRUCTURAL STEEL -  
ALL STEEL PLATE SHALL BE ASTM A36 OR APPROVED EQUAL.

BOLTS -  
BOLTS CONNECTING TIMBER TO TIMBER AND TIMBER TO STEEL SHALL CONFORM TO ASTM A307.

TRESTLE DESIGN LOADS -  
1. TRESTLE SHALL BE POSTED FOR MAXIMUM GVW OF 8 TONS.  
2. SNOW SHALL NOT BE PERMITTED IN EXCESS OF 24" IN HEIGHT ON TRESTLE DECK.

GALVANIZING -  
ALL BOLTS SHALL BE HOT DIP GALVANIZED. STRUCTURAL STEEL SHAPES AND PLATE SHALL BE HOT DIP  
GALVANIZED OR SPRAY METALLIZED.

CONTRACTOR SUBMITTALS:  
1) TIMBER MATERIAL GRADE AND TREATMENT CERTIFICATIONS.  
2) LAG BOLT CUT SHEET.  
3) STEEL MTR's AND/OR CUT SHEETS.



1 2 SKID-STEER DESIGN VEHICLE  
NTS



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TRESTLE BRACING REPAIR

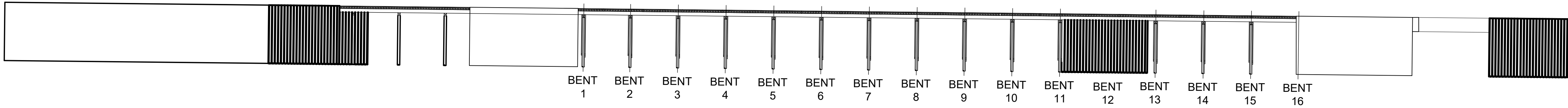
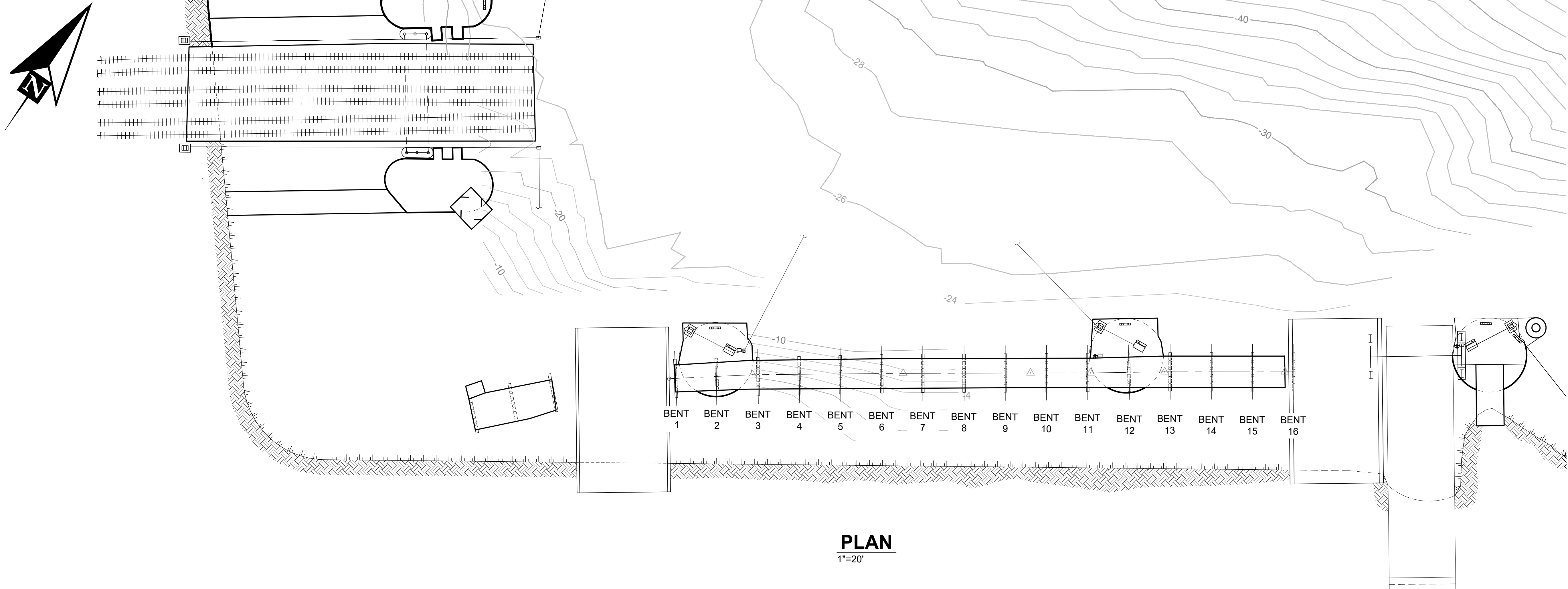
GENERAL NOTES

DESIGNED BY:	SB	DATE:	10/08/2025
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SHEET NO:  
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BRACE CONDITION SUMMARY																
BENT	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
NORTH BRACE	REPLACE	N/A	REPLACE	OK	OK	REPLACE	REPLACE	REPLACE	OK	REPLACE	REPLACE	N/A	OK	REPLACE	REPLACE	REPLACE
SOUTH BRACE	REPLACE	N/A	REPLACE	OK	OK	OK	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	N/A	REPLACE	REPLACE	REPLACE	REPLACE
HORIZ. BRACE	REPLACE	N/A	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	N/A	OK	REPLACE	OK	REPLACE
CAP CONNECTION	REPLACE	N/A	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	REPLACE	N/A	REPLACE	REPLACE	REPLACE	REPLACE

- NOTE:
- (1) REPLACE TRESTLE CONNECTIONS AT JOINTS INCLUDING A REPLACEMENT MEMBER (ALL BRACES BEING REPLACED NEED REPLACEMENT CONNECTIONS).
  - (2) BRACES ARE DENOTED BY THE DIRECTION RELATIVE TO THE OTHER BRACE THE CONNECTION IS MADE TO THE PILE CAP. e.g., IF LOOKING EAST, THE BRACE CONNECTED TO THE TOP LEFT OF THE PILE CAP IS THE NORTH BRACE AND THE BRACE CONNECTED TO THE TOP RIGHT OF THE PILE CAP IS THE SOUTH BRACE.
  - (3) PROVIDE PILE TO PILE CAP CONNECTIONS AT EVERY PILE TO PILE CAP JOINT. PILE CAP CONNECTION INCLUDES TENSION STRAP, PILE CLAMP, AND WEDGE SHIMS.
  - (4) TWO BENTS HAVE MORE THAN FOUR PILES (OLDER PILES THAT HAVE BEEN REPLACED AND LEFT IN PLACE). DO NOT ATTEMPT TO REPAIR TO CONNECT OLDER/DAMAGED PILES AS PART OF THIS REPAIR PROCEDURE.



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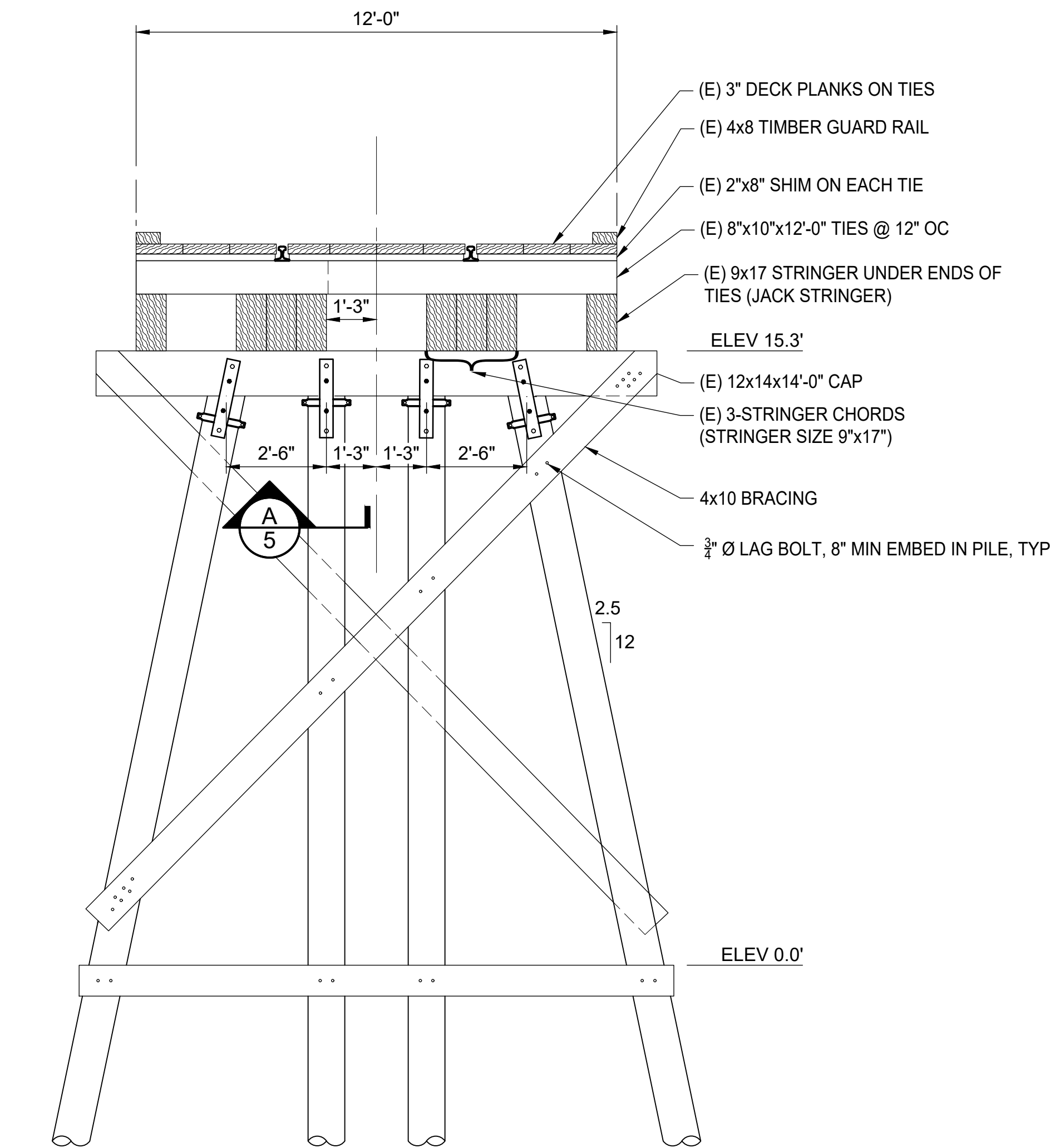
PROJECT:  
**ARRC WHITTIER TIMBER  
TRESTLE BRACING REPAIR**

TITLE:  
**PLAN & PROFILE**

DESIGNED BY:	SB	DATE:	10/08/2025
CHECKED BY:	SB	PROJECT NO:	201122

SHEET NO:  
**3** OF **5**

12/9/25 - PKRAENZLEIN - J:\2020\201122 ARRC Tem Marine Engineering\17 Whittier Marine Terminal Inspection\Drawings\04 Typical Section.dwg



1  
4  
TYPICAL SECTION AT TRESTLE  
3/8" = 1'-0"



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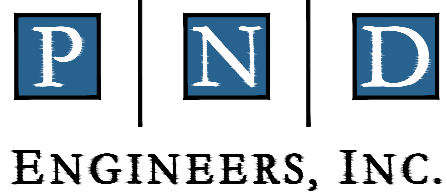
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PROJECT: ARRC WHITTIER TIMBER  
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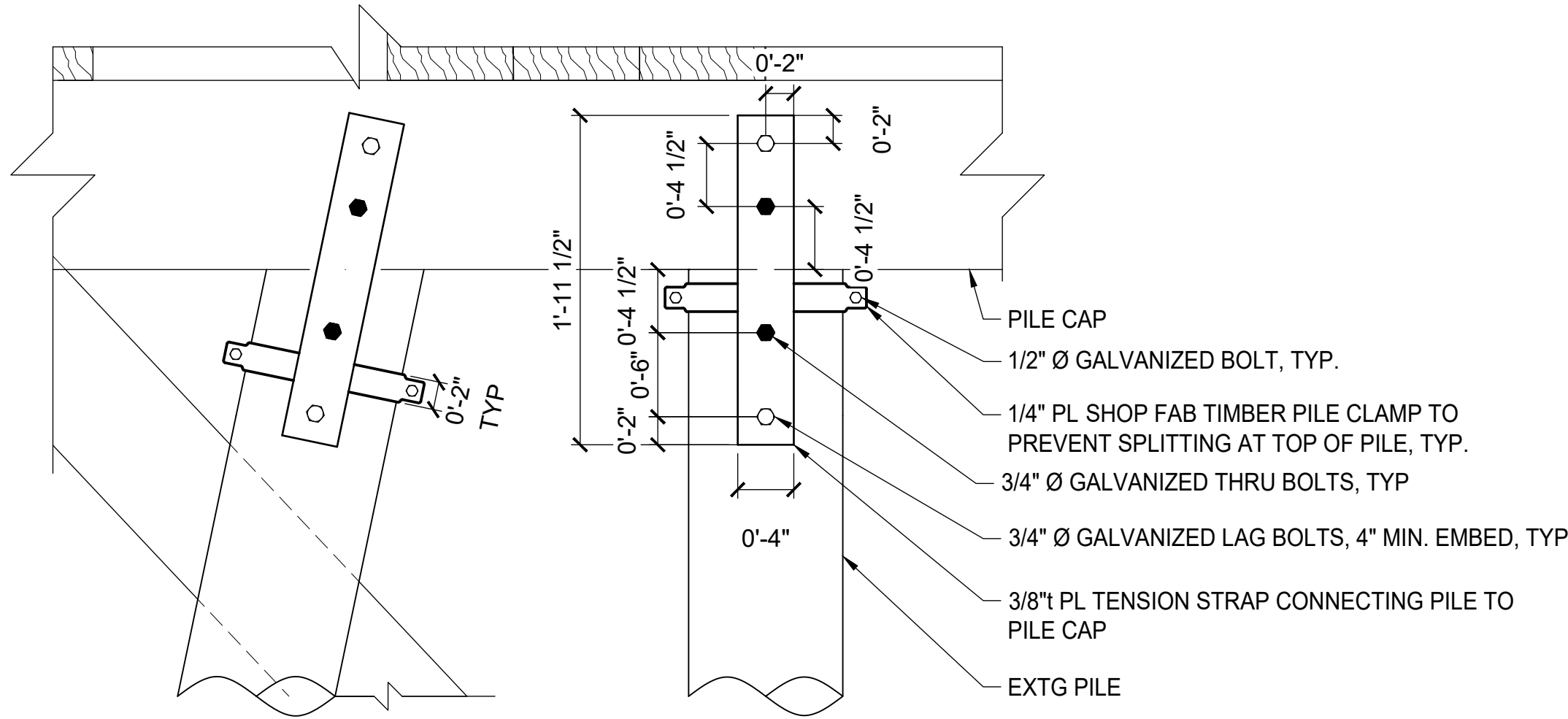
TITLE: TYPICAL SECTION

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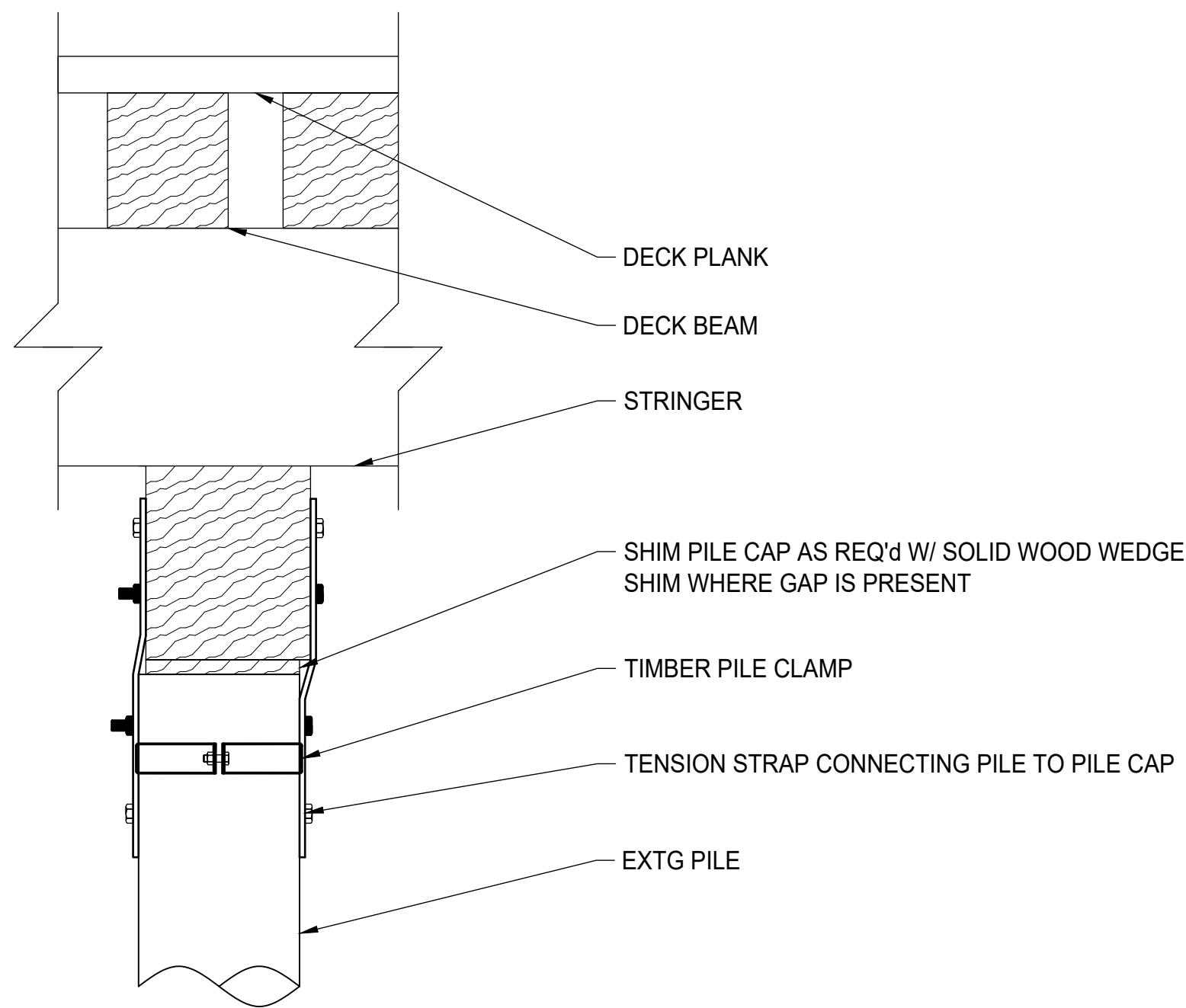


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1  
5 NTS

**PILE TO PILE CAP CONNECTION DETAIL**

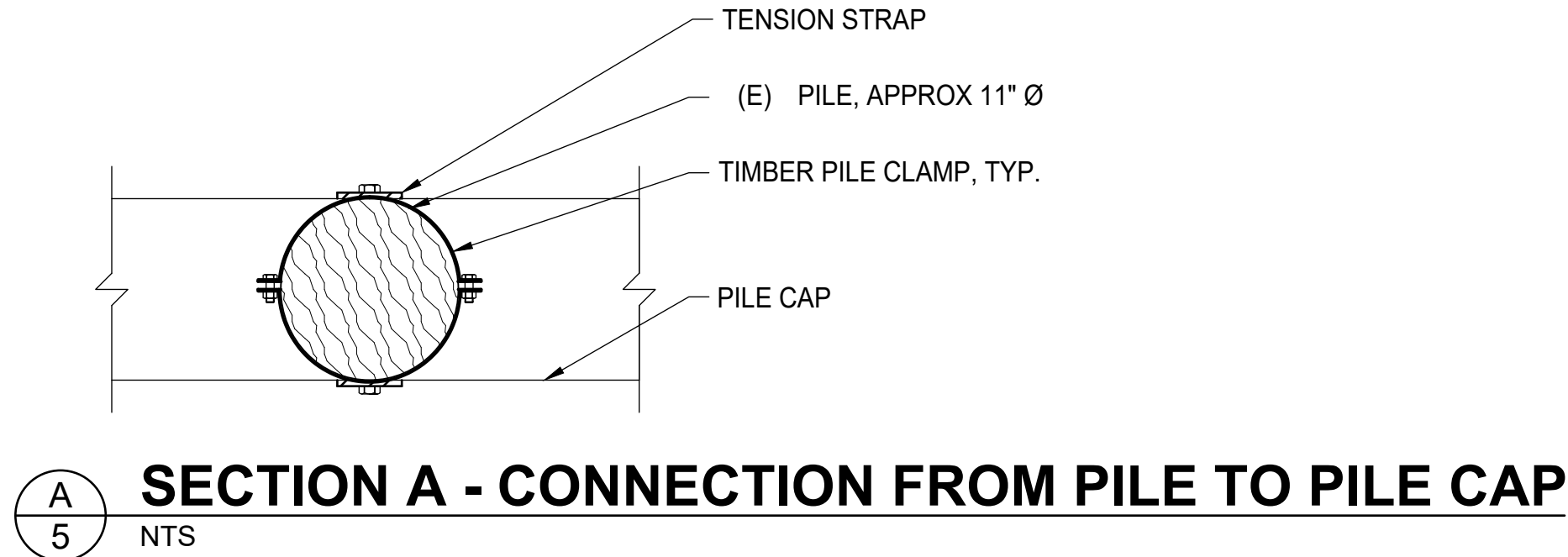


2  
5 NTS

**PILE TO PILE CAP CONNECTION DETAIL**

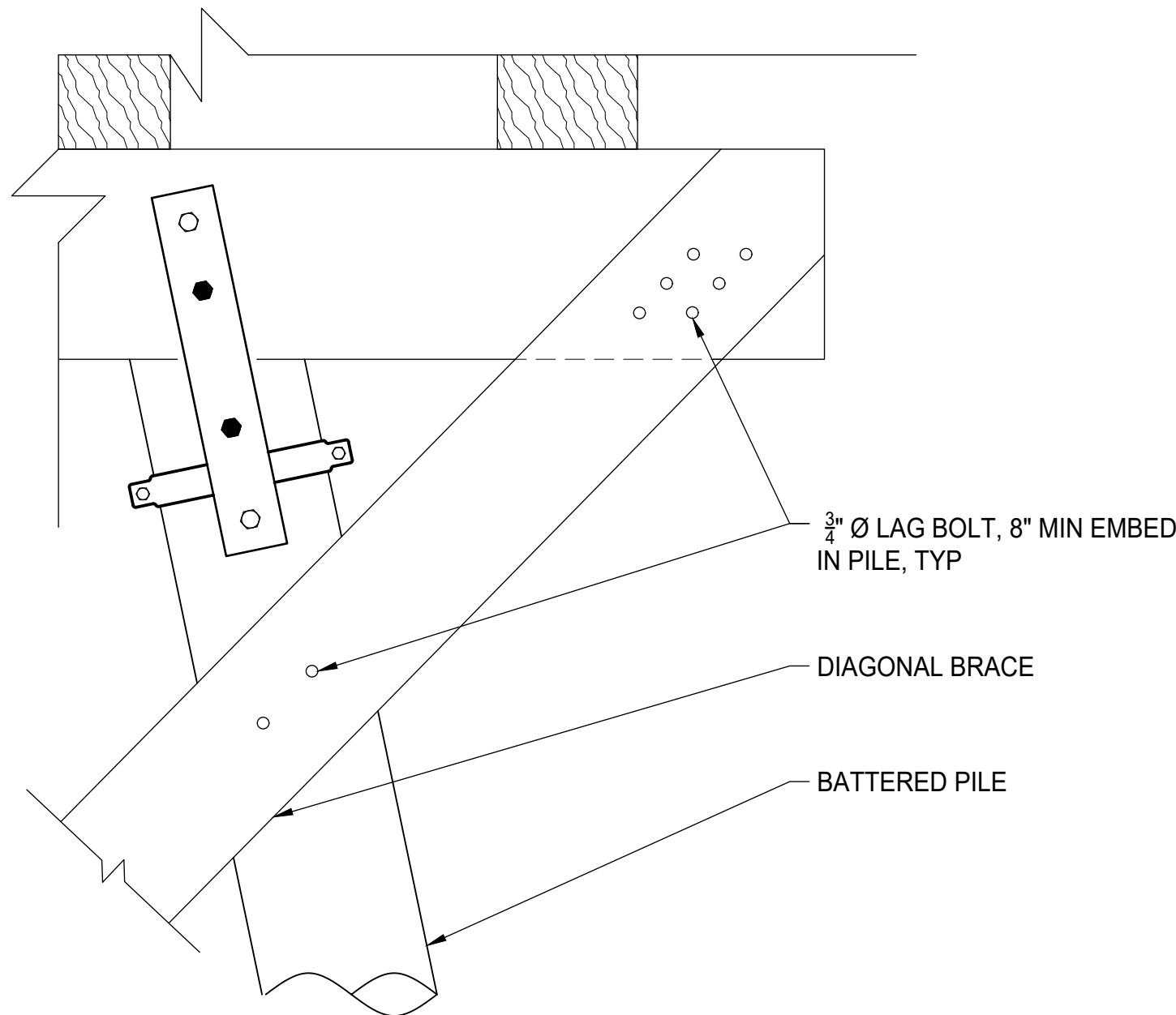
- NOTE:
- ALL STEEL PLATE AND CONNECTIONS MUST BE GALVANIZED OR SPRAY METALLIZED.
  - SHIM PILE TO PILE CAP CONNECTION BASED ON FIELD CONDITIONS TO ENSURE BEARING BETWEEN PILE CAP AND PILE. PILE CAP SHALL BE SHIMMED TO THAT ALL PILE CAP IS BEARING ON ALL PILES (DETAIL-2, SHEET-5).
  - CONNECTION LOCATION MAY BE RELOCATED UP TO 1' FROM SPECIFIED LOCATION DUE TO FIELD TIMBER CONDITIONS IMPACTING THE EFFECTIVENESS OF THE CONNECTION.

1



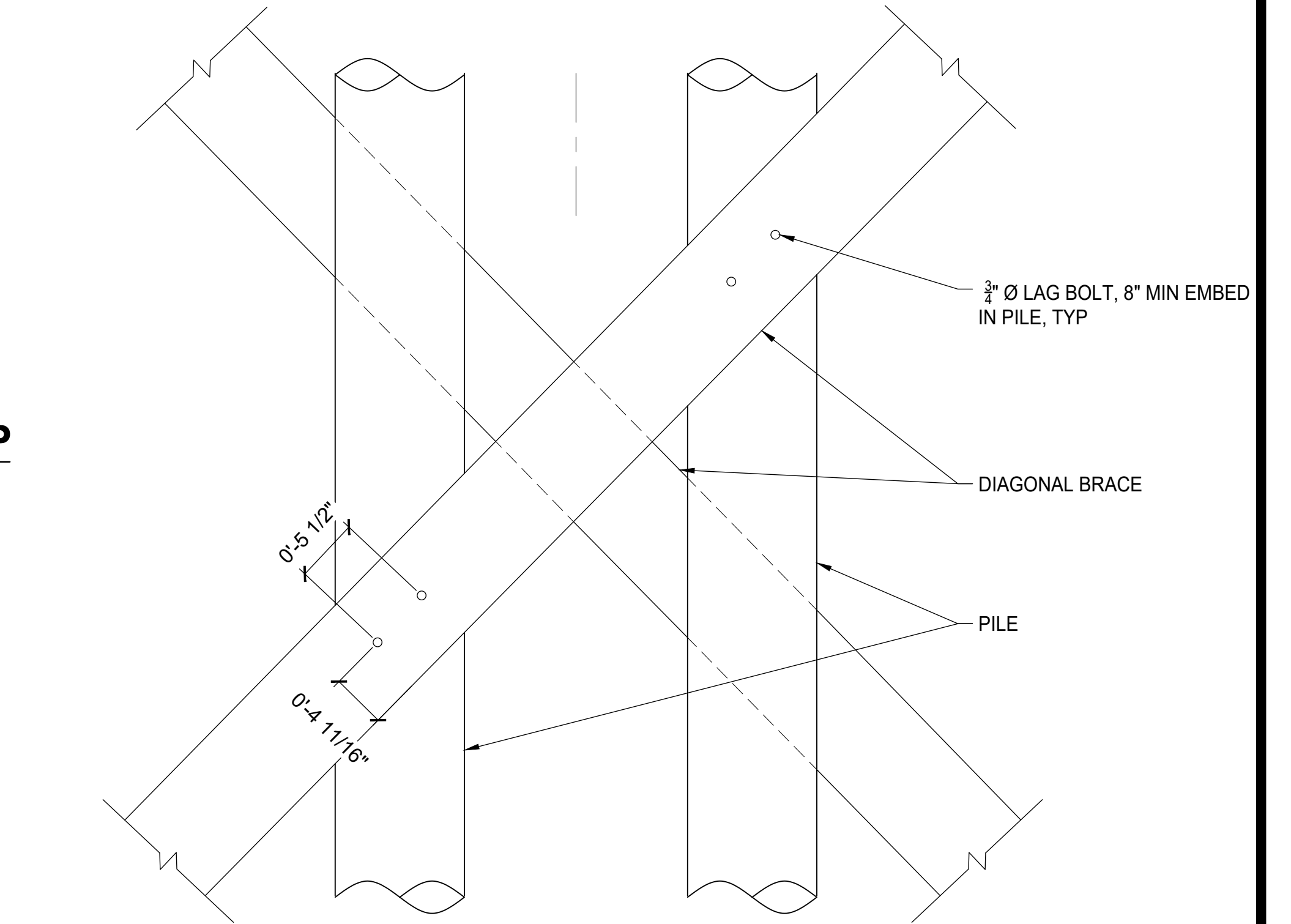
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**SECTION A - CONNECTION FROM PILE TO PILE CAP**



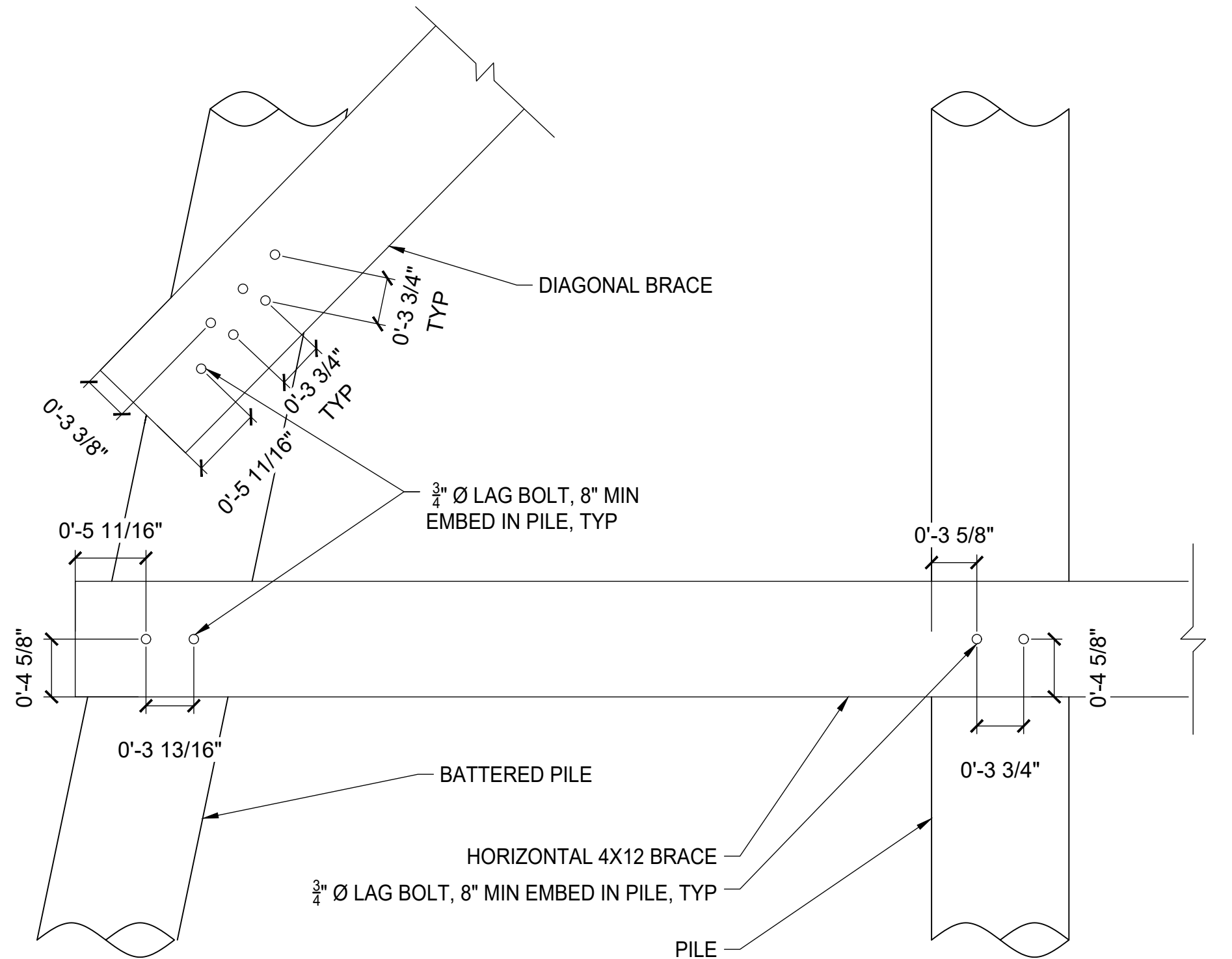
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**DIAGONAL BRACE CONNECTION DETAIL**



4  
5 NTS

**DIAGONAL BRACE CONNECTIONS TO PILES DETAIL**



5  
5 NTS

**DIAGONAL AND HORIZONTAL BRACE CONNECTION DETAIL**

**ALASKA**  
RAILROAD

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