

# ALASKA RAILROAD CORPORATION

## CAPITAL PROJECTS

P.O. BOX 107500, ANCHORAGE, ALASKA 99510-7500

### FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3

### ISSUE FOR FABRICATION

FEBRUARY 14, 2025

DESIGNED BY: ML  
 CHECKED BY: KK  
 DRAFTED BY: MEM

2/14/2025  
 HDR ENGINEERING, INC.  
 582 E. 36TH AVE., SUITE 500  
 ANCHORAGE, AK 99503-4169  
 (907) 644-2000  
 LICENSE #: AECC569

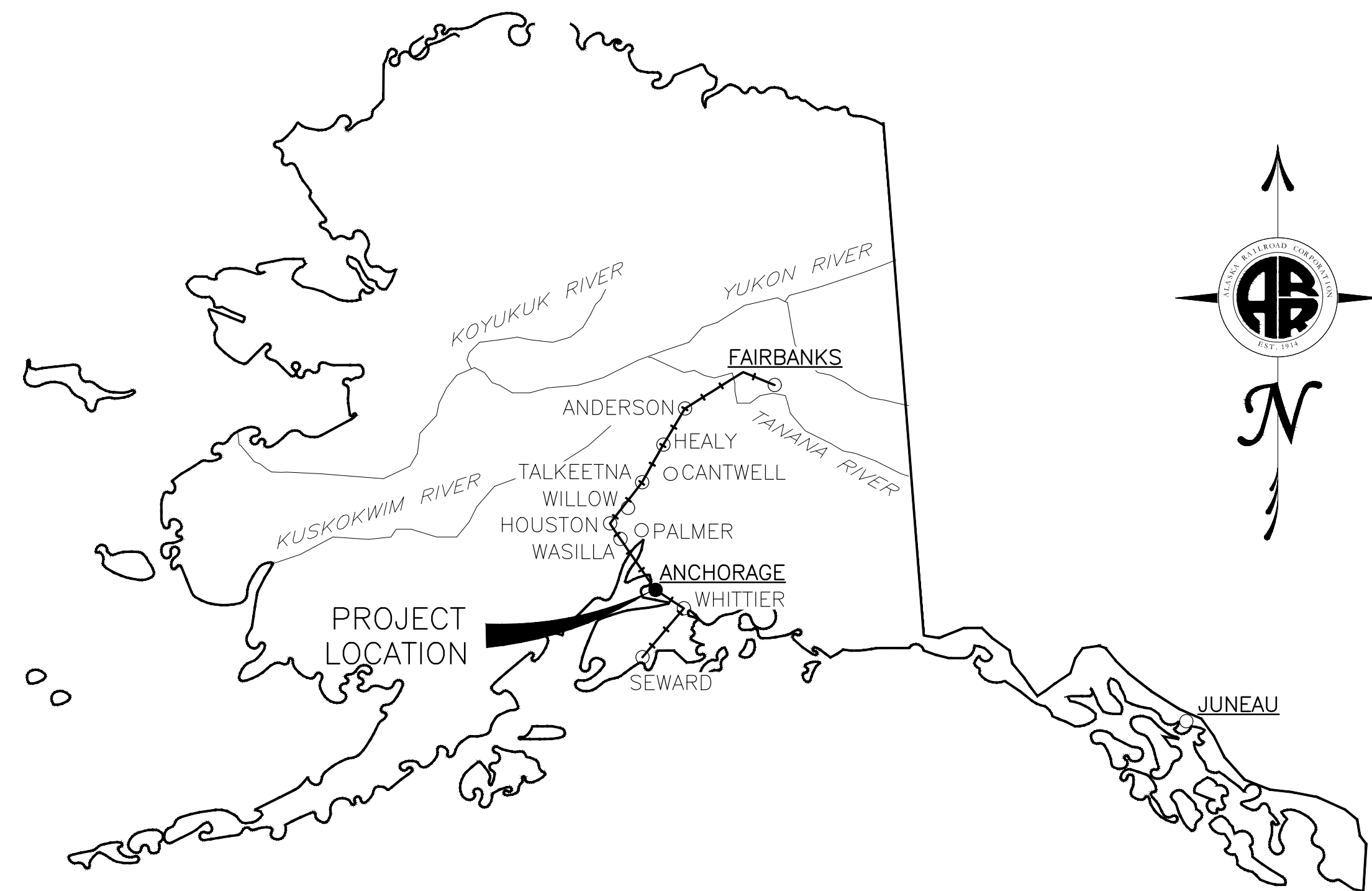
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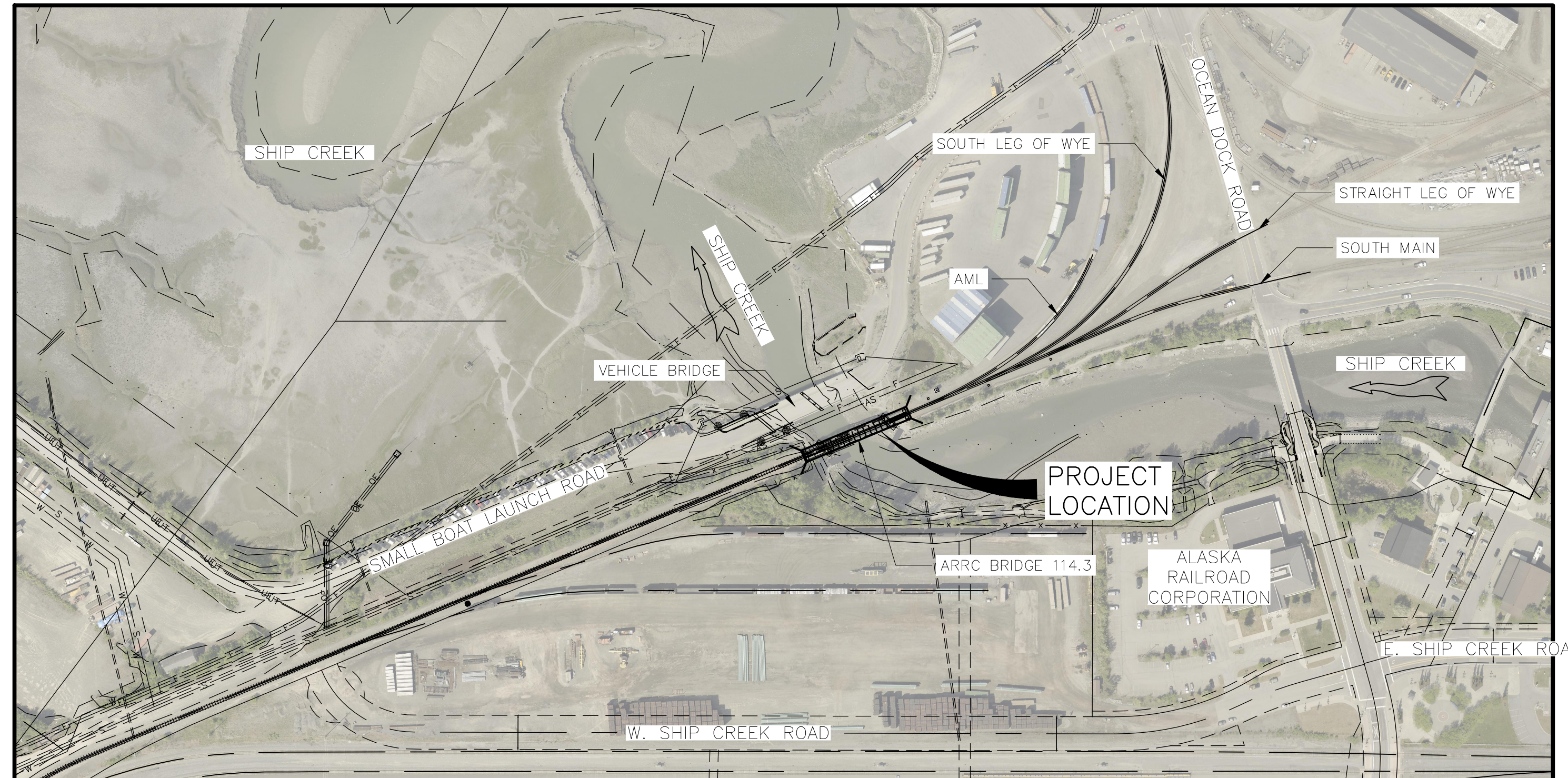
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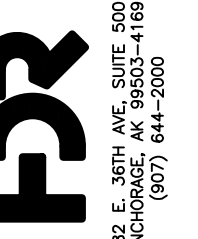
VICINITY MAP  
 N.T.S.



SITE MAP  
 N.T.S.

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CAPITAL PROJECTS  
 P.O. BOX 107500  
 ANCHORAGE, ALASKA 99510-7500

PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3

SHEET TITLE: COVER SHEET

AFE NO. 11228  
 YEAR 2025  
 SHEET 01 of 22



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**DESIGN NOTES:**

- ALL NEW COMPONENTS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE 2024 AREMA MANUAL FOR RAILWAY ENGINEERING, CHAPTER 9 – SEISMIC DESIGN FOR RAILWAY STRUCTURES, AND CHAPTER 15 – STEEL STRUCTURES.
- DESIGN LOADS ARE IN ACCORDANCE WITH AREMA MANUAL FOR RAILWAY ENGINEERING AND THE FOLLOWING:
 

|                             |   |
|-----------------------------|---|
| BALLAST DEPTH (FROM T/TIE): | 30" MAXIMUM, 15" MINIMUM                            |
| LIVE LOAD:                  | COOPER E80 OR ALTERNATIVE LIVE LOAD                 |
| IMPACT PERCENT:             | DIESEL IMPACT = 0.9*(40-3*L <sup>2</sup> /1600)*(%) |
| LIVE LOAD ECCENTRICITY:     | 6"± FROM C <sub>c</sub> BRIDGE AND TRACK            |
| CENTRIFUGAL FORCE:          | NONE  |
| TRACK SPEED:                | 60 MPH (PASSENGER & FREIGHT)                        |
- THE FOLLOWING TABLE REPRESENTS THE RATING SUMMARY OF THE PRIMARY LOAD CARRYING ELEMENTS OF THE SPANS IN TERMS OF COOPER'S EQUIVALENT LOAD:

| SPAN       | CONTROLLING DESIGN LOAD | NORMAL STRESS RATING | MAXIMUM STRESS RATING | MAXIMUM STRESS RATING (N-1 GIRDERS) |
|------------|-------------------------|----------------------|-----------------------|-------------------------------------|
| 79'-0" DPG | E-80                    | E-98.5               | E-164.8               | E-80.8                              |
| 30'-0" SBM | ALT LL (E-95)           | E-126.6              | E-225.4               | E-128.5                             |

**STRUCTURAL STEEL NOTES:**

- FABRICATION AND WORKMANSHIP SHALL CONFORM TO CURRENT AREMA MANUAL FOR RAILWAY ENGINEERING, CHAPTER 15, STEEL STRUCTURES AND PROJECT SPECIFICATIONS.
- ALL STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING MATERIAL SPECIFICATIONS EXCEPT AS NOTED:
 

|  |                     |
|--|---------------------|
| PLATE GIRDERS, BEARING STIFFENERS, PLATE GIRDER DIAPHRAGMS, & ROLLED BEAMS | ASTM A709 GR 50W T2 |
| DECK PLATES  | ASTM A709 GR 50 T2  |
| ALL OTHER STRUCTURAL STEEL   | ASTM A709 GR 50W    |
- ALL STRUCTURAL BOLTS SHALL BE HIGH-STRENGTH (H.S.) STRUCTURAL BOLTS CONFORMING TO ASTM F3125, GRADE A325, TYPE 3 WITH HEAVY HEX NUTS (ASTM A563, GRADE DH3) AND ROUND, FLAT, HARDENED WASHERS (ASTM F436, TYPE 3) UNDER THE TURNED ELEMENT.
- UNLESS NOTED OTHERWISE, FAYING SURFACES SHALL MEET CLASS B SURFACE CONNECTION REQUIREMENTS (SLIP CRITICAL). HIGH STRENGTH BOLTS SHALL BE INSTALLED WITH THE 'TURN OF THE NUT METHOD.'
- BOLTS SHALL BE INSTALLED SO THAT THE BOLT HEADS ARE ON THE OUTSIDE (EXPOSED) SURFACE OF THE MEMBER UNLESS OTHERWISE SHOWN ON THE DRAWINGS.
- PERMANENTLY PIECE MARK EACH SHOP FABRICATED COMPONENT WITH A LOW STRESS STAMP.
- WELDING SHALL BE IN ACCORDANCE WITH AWS D1.5 BRIDGE WELDING CODE AND THE PROJECT SPECIFICATIONS. WELD MATERIAL SHALL MATCH THE BASE METAL IN STRENGTH AND FINISHED APPEARANCE.
- NONDESTRUCTIVE TESTING OF WELDS SHALL BE IN ACCORDANCE WITH AREMA CHAPTER 15, SECTION 3.5, THE CURRENT AWS D1.5, AND THE PROJECT SPECIFICATIONS.
- FABRICATOR SHALL DEVELOP LIFTING DETAILS AND SUBMIT TO OWNER FOR APPROVAL.
- STEEL FABRICATION SHALL NOT BEGIN UNTIL SHOP DRAWINGS & WELD PROCEDURES HAVE BEEN APPROVED BY THE OWNER.
- GIRDERS SHALL BE FULLY SHOP ASSEMBLED AND MATCH MARKED PRIOR TO SHIPMENT. MATCH MARKING SHALL BE BY ETCHING, SCORING, OR OTHER MECHANICAL MEANS.

**WATERPROOFING NOTES:**

- WATERPROOFING SHALL BE APPLIED TO STEEL BRIDGE DECKS IN THE FIELD BY BRIDGE CONSTRUCTION CONTRACTOR AFTER SPANS HAVE BEEN FULLY ASSEMBLED PRIOR TO PLACEMENT OF BALLAST OR TRACK MATERIALS WHEN SPECIFIED IN THE BRIDGE CONSTRUCTION PLANS. APPLY WATERPROOFING TO BRIDGE DECK IN ACCORDANCE WITH THE PLANS AND PROJECT SPECIFICATIONS.
- WATERPROOFING SHALL BE BRIDGE DECK MEMBRANE WITH INTEGRATED BALLAST MAT AS MANUFACTURED BY BRIDGE PRESERVATION LLC, OR APPROVED EQUIVALENT.
- INTEGRATED BALLAST MAT SHALL BE MINIMUM ¼" THICK.

**BEARING NOTES:**

- FABRICATION AND WORKMANSHIP SHALL CONFORM TO CURRENT AREMA MANUAL FOR RAILWAY ENGINEERING, CHAPTER 15, STEEL STRUCTURES AND PROJECT SPECIFICATIONS.
- ALL STRUCTURAL STEEL BEARING COMPONENTS SHALL CONFORM TO ASTM A709 GR 50W.
- ANCHOR RODS SHALL BE ALL THREADED ROD AND MEET THE REQUIREMENTS OF ASTM F1554, GR 105. EACH ANCHOR ROD SHALL BE SUPPLIED WITH ONE WASHER (ASTM F436, TYPE 1) AND TWO HEAVY HEX NUTS (ASTM A563, DH, CLASS 2B). ANCHOR ROD, WASHER AND NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM F2329.
- LAMINATED ELASTOMERIC BEARING PADS SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

**MISCELLANEOUS STEEL NOTES:**

- COVER PLATES, WALKWAY BRACKETS, DRAIN CHAINS AND STEEL HANDRAIL PANELS SHALL BE FABRICATED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
- WALKWAY GRATING SHALL BE PACIFIC GRATING 38W4 BAR GRATING WITH 2¼" x ¼" SERRATED BARS AT 2½" C-C SPACING WITH 4" C-C CROSS BARS OR APPROVED EQUIVALENT.
- STEEL HANDRAIL PANELS AND WALKWAY GRATING SHALL BE GALVANIZED IN ACCORDANCE WITH PROJECT SPECIFICATIONS.
- ALL ELEMENTS SHALL BE FREE OF FINIS, ABRASIONS, ROUGH OR SHARP EDGES AND OTHER SURFACE DEFECTS.
- HANDRAIL PANELS ON WALKWAY SHALL BE ERECTED PLUMB AND IN-LINE.
- MISCELLANEOUS STRUCTURAL STEEL ELEMENTS SUCH AS ANGLES, PLATES, ETC. SHALL BE ASTM A709 GR50W UNLESS NOTED OTHERWISE.
- DRAINAGE CHAINS SHALL BE STEEL COIL CHAIN MEETING THE REQUIREMENTS OF ASTM A319 OR A413, GR 30, GALVANIZED. BENT STEEL SUPPORT PIPE SHALL MEET THE REQUIREMENTS OF ASTM A500, GR B, GALVANIZED.

| TABLE OF ESTIMATED LIFTING WEIGHTS      |                  |
|---|------------------|
| ITEM DESCRIPTION                        | WEIGHT EA. (LBS) |
| 79' DPG - 3 GIRDER SHOP ASSEMBLY**      | 155,425          |
| 79' DPG - 2 GIRDER SHOP ASSEMBLY**      | 104,730          |
| 30' SBM - 3 BEAM SHOP ASSEMBLY**        | 30,550           |
| 30' SBM - 2 BEAM SHOP ASSEMBLY**        | 21,230           |
| INTERMEDIATE DIAPHRAGM MK ID1           | 84               |
| INTERMEDIATE DIAPHRAGM MK ID2           | 128              |
| END DIAPHRAGM MK ED1                    | 41               |
| END DIAPHRAGM MK ED2                    | 187              |
| FIELD CLOSURE DECK PLATE MK DP5 & DP7   | 705              |
| FIELD CLOSURE DECK PLATE MK DP6         | 637              |
| FIELD CLOSURE DECK PLATE MK DP14 & DP19 | 874              |
| FIELD CLOSURE DECK PLATE MK DP15-DP18   | 1,063            |
| COVER PLATE MK CP1                      | 150              |
| COVER PLATE MK CP2                      | 145              |
| WALKWAY BRACKET MK WB1                  | 68               |
| BAR GRATING PANEL - 29'-0"              | 1,044            |
| BAR GRATING PANEL - 20'-11"             | 753              |
| BAR GRATING PANEL - 15'-1"              | 543              |
| BAR GRATING PANEL - 15'-0"              | 540              |
| HANDRAIL PANEL MK HP1L/R                | 516              |
| HANDRAIL PANEL MK HP2L/R                | 305              |
| HANDRAIL PANEL MK HP3L/R                | 326              |
| HANDRAIL PANEL MK HP4L/R                | 306              |
| HANDRAIL PANEL MK HP5L/R                | 328              |
| BALLAST CATCHMENT PAN                   | 270              |

\*\* SHOP ASSEMBLED GIRDER AND BEAM UNITS ARE TO BE FULLY SHOP ASSEMBLED AND LOADED FOR SHIPPING AS SINGLE UNITS. ASSEMBLIES INCLUDE THE FOLLOWING ITEMS: GIRDERS, BEAMS, STIFFENERS, DIAPHRAGM CONNECTORS, INTERMEDIATE DIAPHRAGMS, END DIAPHRAGMS, DECK SUPPORT BRACKETS, DECK PLATES, DRAINAGE COMPONENTS, CURB BEAMS AND 5% INCREASE FOR FASTENERS. SEE SECUREMENT PLANS FOR ADDITIONAL SHIPPING CONFIGURATIONS AND REQUIREMENTS.

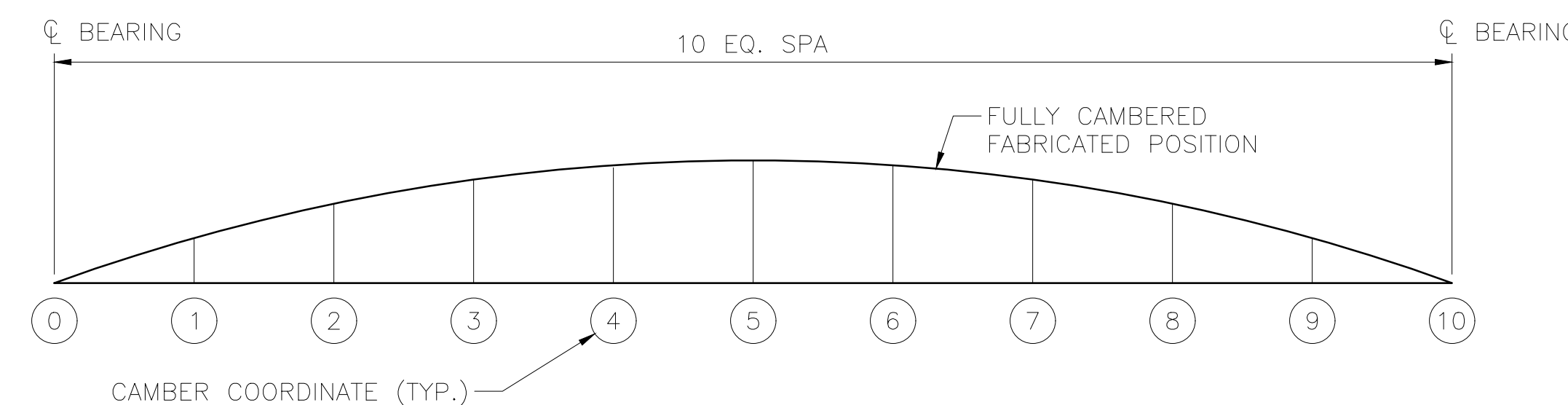
| BID SCHEDULE |  |          |                |
|--------------|--|----------|----------------|
| BID ITEM     | ITEM DESCRIPTION   | PAY UNIT | TOTAL QUANTITY |
| 1.1          | 79' DECK PLATE GIRDER (DPG) SPAN (2 SPANS)                   | LS       | 1              |
| 1.2          | 30' ROLLED STEEL BEAM (SBM) SPAN (1 SPAN)                    | LS       | 1              |
| 2.1          | ELASTOMERIC BEARING PADS, LOT (FOR 79' DPG SPAN - SET OF 10) | LOT      | 2              |
| 2.2          | ELASTOMERIC BEARING PADS, LOT (FOR 30' SBM SPAN - SET OF 10) | LOT      | 1              |

| SUMMARY OF ESTIMATED STRUCTURAL STEEL QUANTITIES |      |     |              |
|--|------|-----|--------------|
| ITEM DESCRIPTION                                 | UNIT | QTY | WEIGHT (LBS) |
| 79' DECK PLATE GIRDER SPAN (ASSEMBLED)*          | EA   | 2   | 278,500      |
| 30' ROLLED STEEL BEAM SPAN (ASSEMBLED)*          | EA   | 1   | 61,200       |
| TOTAL STRUCTURAL STEEL SPANS                     | EA   | 3   | 618,200      |

\* INCLUDES ALL COMPONENTS NECESSARY TO ASSEMBLE THE STRUCTURAL STEEL SPAN INCLUDING BUT NOT LIMITED TO: GIRDERS, DIAPHRAGMS, STIFFENERS, CONNECTORS, DECK PLATES, CURBS, COVER PLATES, SUPPORT BRACKETS, WALKWAY GRATING, HANDRAILING, DRAINAGE COMPONENTS, SOLE PLATES, ANCHOR RODS, AND 5% INCREASE FOR FASTENERS (TEMPORARY AND PERMANENT) AS SHOWN ON THESE PLANS.

**ABBREVIATIONS**

|                |   |
|----------------|---|
| AREMA          | AMERICAN RAILWAY ENGINEERING AND MAINTENANCE OF WAY ASSOCIATION |
| ARRC           | ALASKA RAILROAD CORPORATION                                     |
| ASTM           | AMERICAN SOCIETY FOR TESTING AND MATERIALS                      |
| AWS            | AMERICAN WELDING SOCIETY  |
| C-C            | CENTER-TO-CENTER  |
| C <sub>c</sub> | CENTERLINE  |
| DPG            | DECK PLATE GIRDER   |
| EMBED.         | EMBEDDED  |
| GR             | GRADE   |
| H.S.           | HIGH STRENGTH   |
| MAX            | MAXIMUM   |
| MIN            | MINIMUM   |
| MK             | MARK  |
| O-O            | OUT-TO-OUT  |
| PROJ.          | PROJECTION  |
| REQ'D          | REQUIRED  |
| SAW            | SUBMERGED ARC WELDING   |
| SBM            | STEEL BEAM  |
| STD.           | STANDARD  |
| T/TIE          | TOP OF TIE  |
| TYP.           | TYPICAL   |



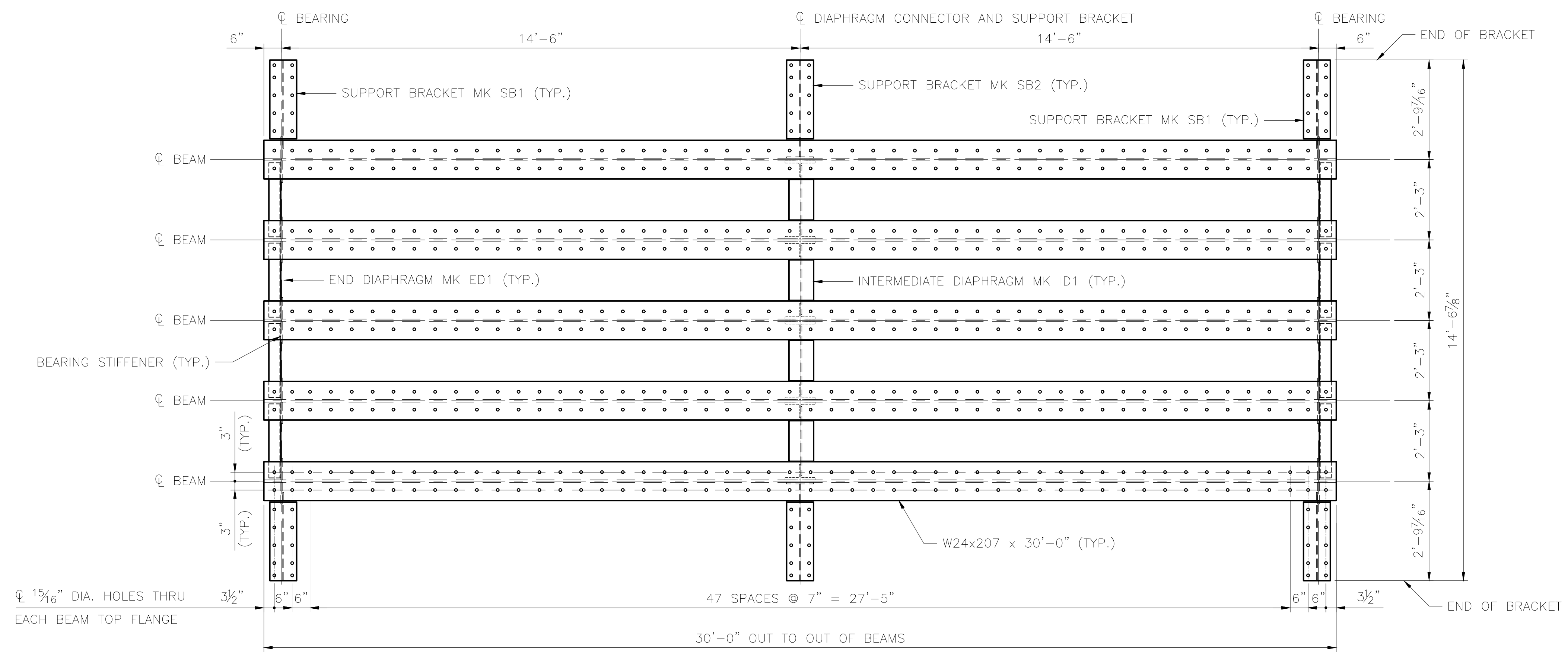
| GIRDER DEFLECTION & CAMBER DATA |    |       |       |      |      |        |      |      |       |       |    |
|---------------------------------|----|-------|-------|------|------|--------|------|------|-------|-------|----|
| CAMBER COORDINATES              | 0  | 1     | 2     | 3    | 4    | 5      | 6    | 7    | 8     | 9     | 10 |
| DEFLECTION/CAMBER               | 0" | 5/16" | 9/16" | 3/4" | 7/8" | 15/16" | 7/8" | 3/4" | 9/16" | 5/16" | 0" |

**CAMBER DIAGRAM FOR 79' DPG SPAN**

SCALE: NTS

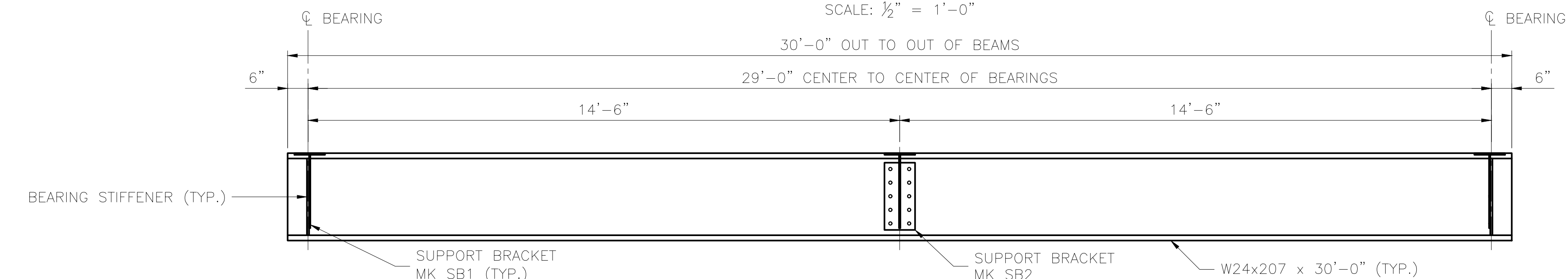
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|   |          |
| CAPITAL PROJECTS<br>P.O. BOX 107500<br>ANCHORAGE, ALASKA 99510-7500   |          |
| PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3<br>SHEET TITLE: STRUCTURAL STEEL NOTES |          |
| AFE NO.   | 11228    |
| YEAR  | 2025     |
| SHEET   | 02 OF 22 |

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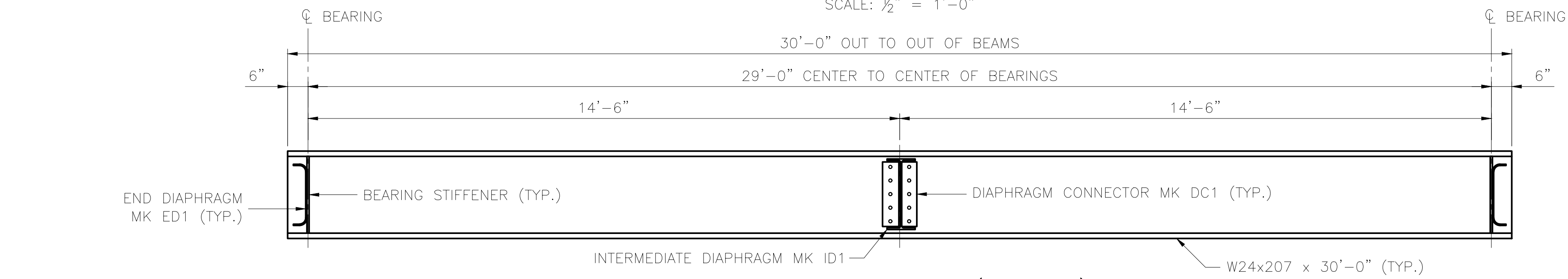
**FRAMING PLAN (SPAN 1)**

SCALE: 1/2" = 1'-0"



**EXTERIOR ELEVATION (SPAN 1)**

SCALE: 1/2" = 1'-0"



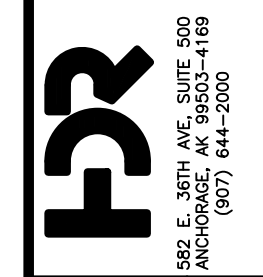
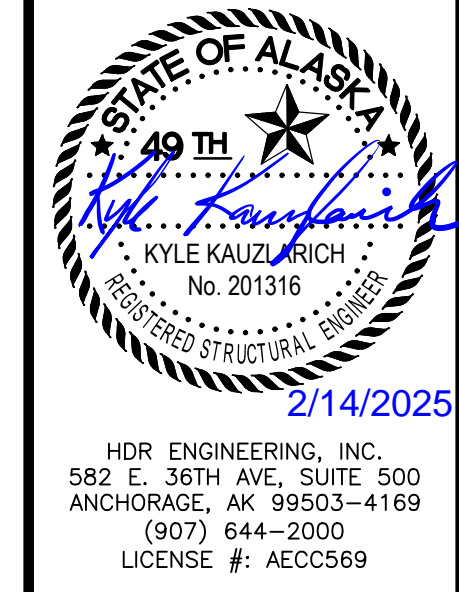
**INTERIOR ELEVATION (SPAN 1)**

SCALE: 1/2" = 1'-0"

**STRESS TABLE**

| SPAN LENGTH (L) | BEAM SECTION | SHEAR         |               |            |           | FLEXURE                  |                             |                  |                  |               |              | DEFLECTION               |                                   |                |                          |                             |
|-----------------|--------------|---------------|---------------|------------|-----------|--------------------------|-----------------------------|------------------|------------------|---------------|--------------|--------------------------|-----------------------------------|----------------|--------------------------|-----------------------------|
|                 |              | DEAD LOAD (K) | LIVE LOAD (K) | IMPACT (K) | TOTAL (K) | WEB AREA (Aw)            |                             | DEAD LOAD (K-FT) | LIVE LOAD (K-FT) | IMPACT (K-FT) | TOTAL (K-FT) | SECTION MODULUS (Sx)     |                                   | ALLOWABLE (IN) | MOMENT OF INERTIA (Ix)   |                             |
|                 |              |               |               |            |           | REQ'D (IN <sup>2</sup> ) | PROVIDED (IN <sup>2</sup> ) |                  |                  |               |              | REQ'D (IN <sup>3</sup> ) | PROVIDED (NET) (IN <sup>3</sup> ) |                | REQ'D (IN <sup>4</sup> ) | PROVIDED (IN <sup>4</sup> ) |
| 29'-0"          | W24X207      | 19            | 69            | 35         | 123       | 7.0                      | 22.4                        | 141              | 440              | 224           | 805          | 351                      | 467                               | 0.54           | 6694                     | 6820                        |

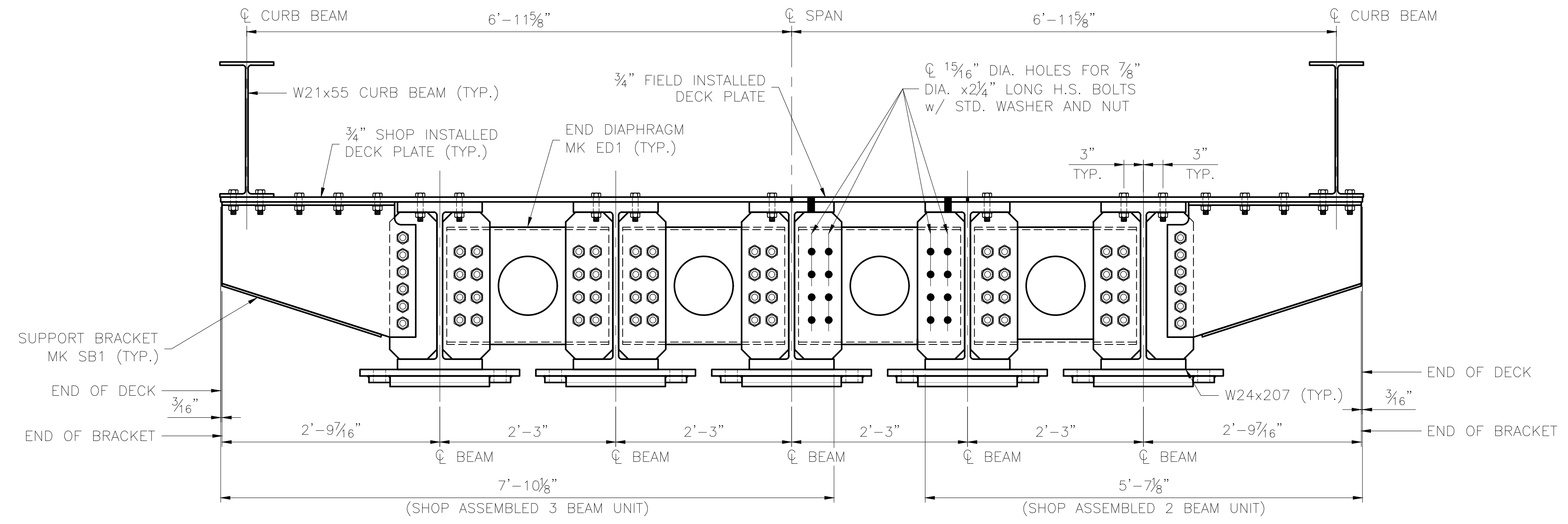
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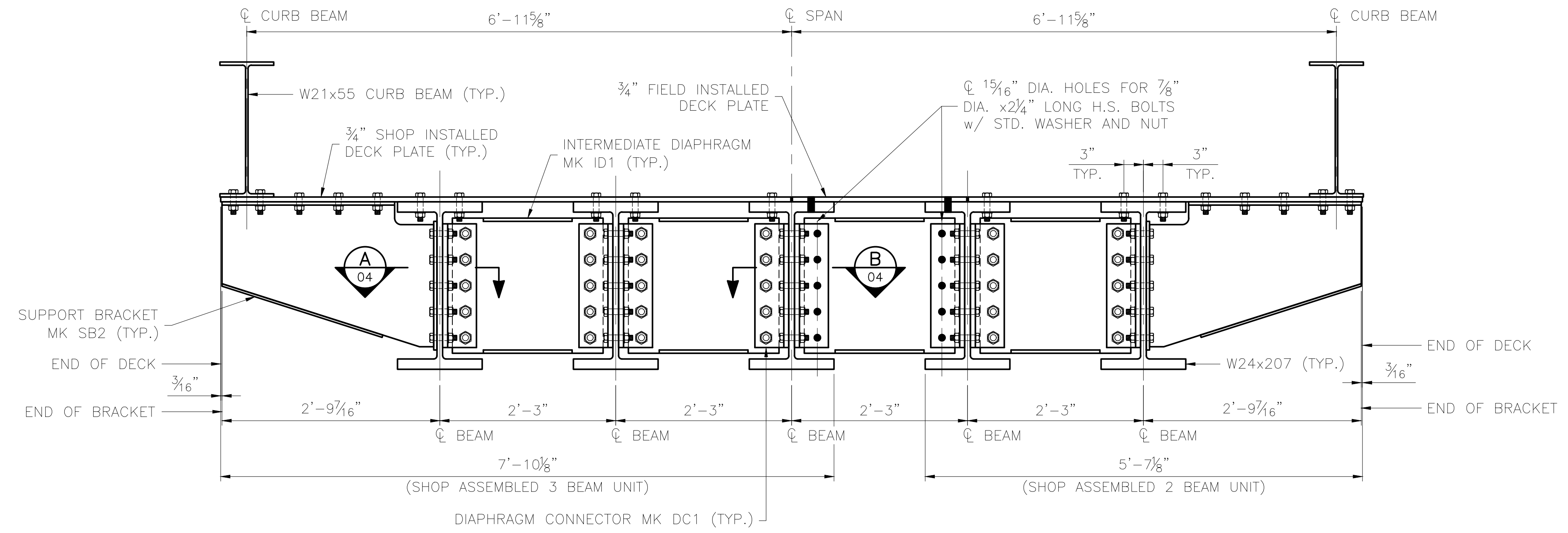
ALASKA RAILROAD  
 CAPITAL PROJECTS  
 P.O. BOX 107500  
 ANCHORAGE, ALASKA 99510-7500  
 PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3  
 SHEET TITLE: 30'-0" BEAM SPAN - FRAMING PLAN  
 AFE NO. 11228  
 YEAR 2025  
 SHEET 03 OF 22



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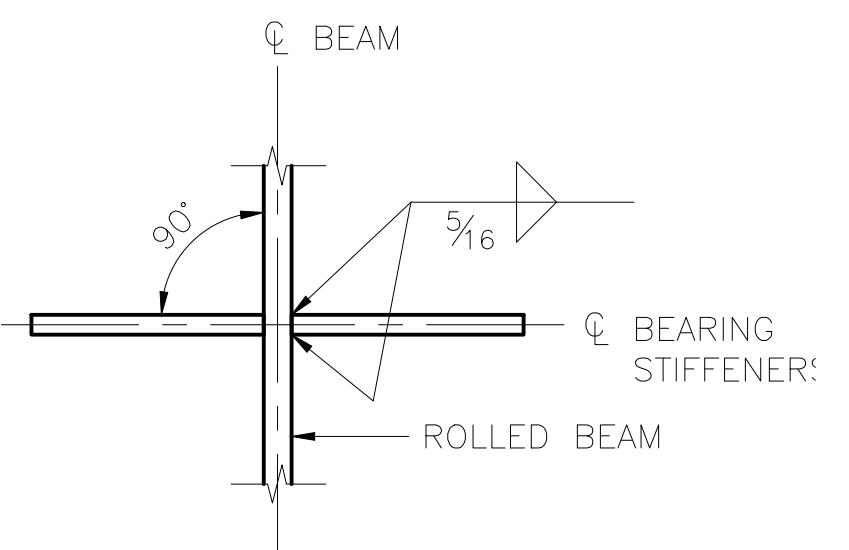


**TYPICAL SECTION AT END DIAPHRAGM**  
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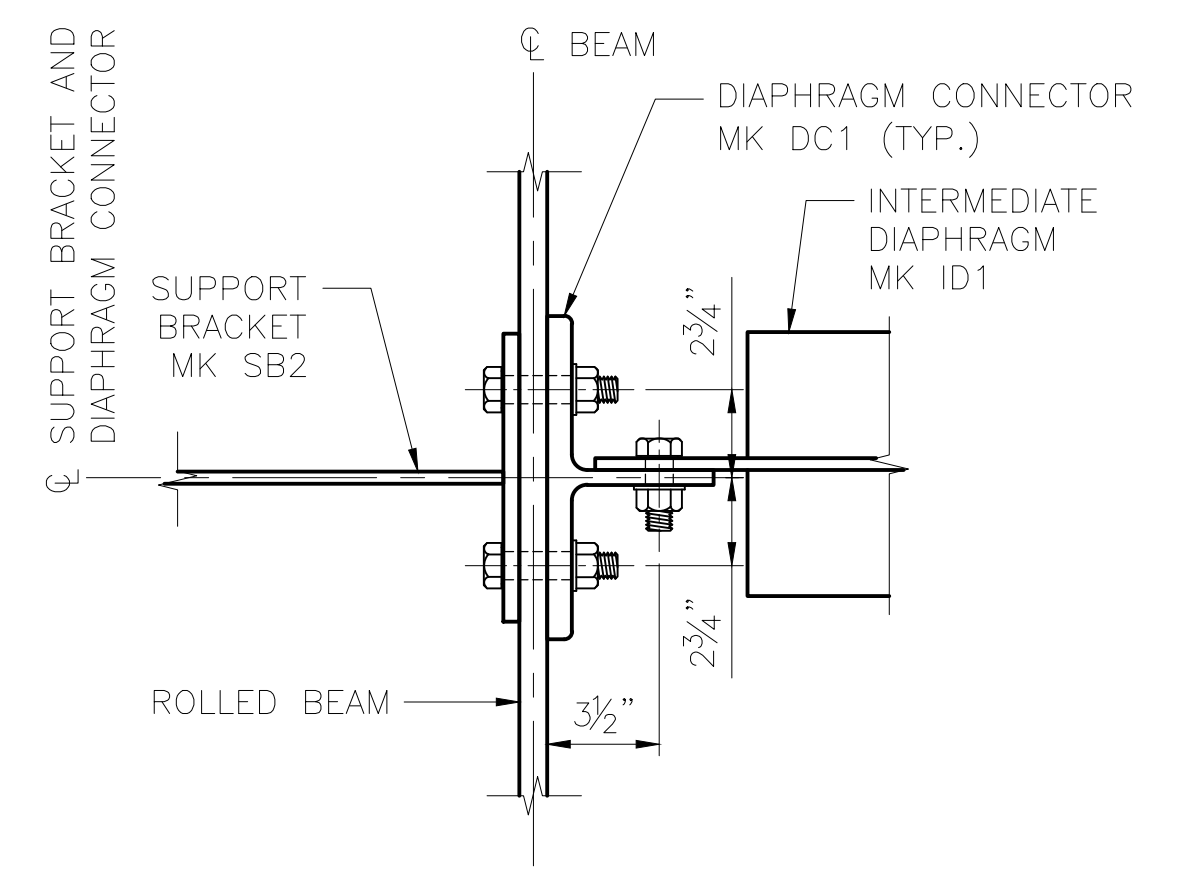


**TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM**  
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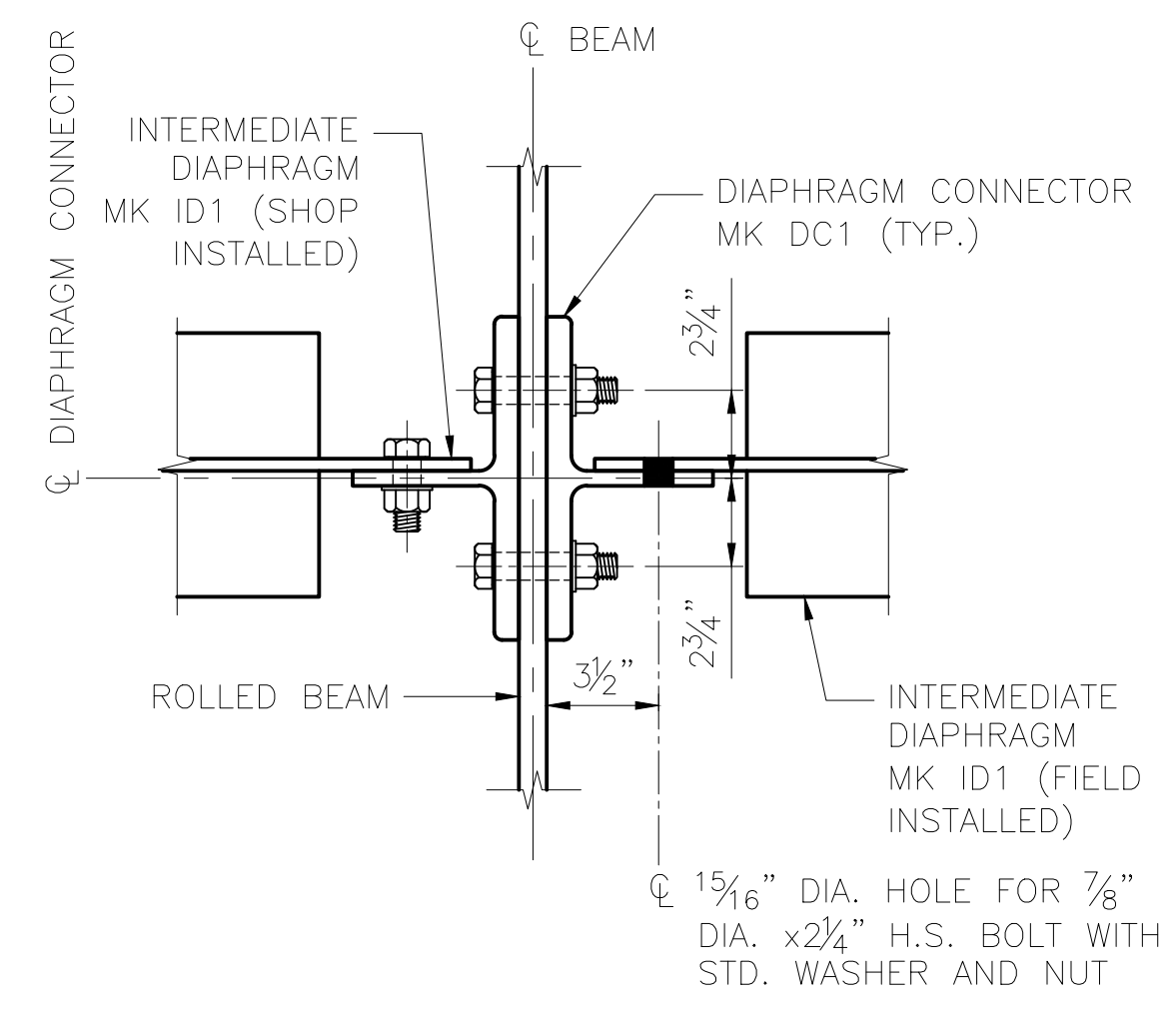
- NOTES:**
1. FOR DIAPHRAGM, DIAPHRAGM CONNECTOR AND BRACKET DETAILS SEE SHEET 5.
  2. FOR DECK PLATE DETAILS SEE SHEETS 11, 12 AND 13.
  3. FOR CURB BEAM DETAILS SEE SHEET 16.



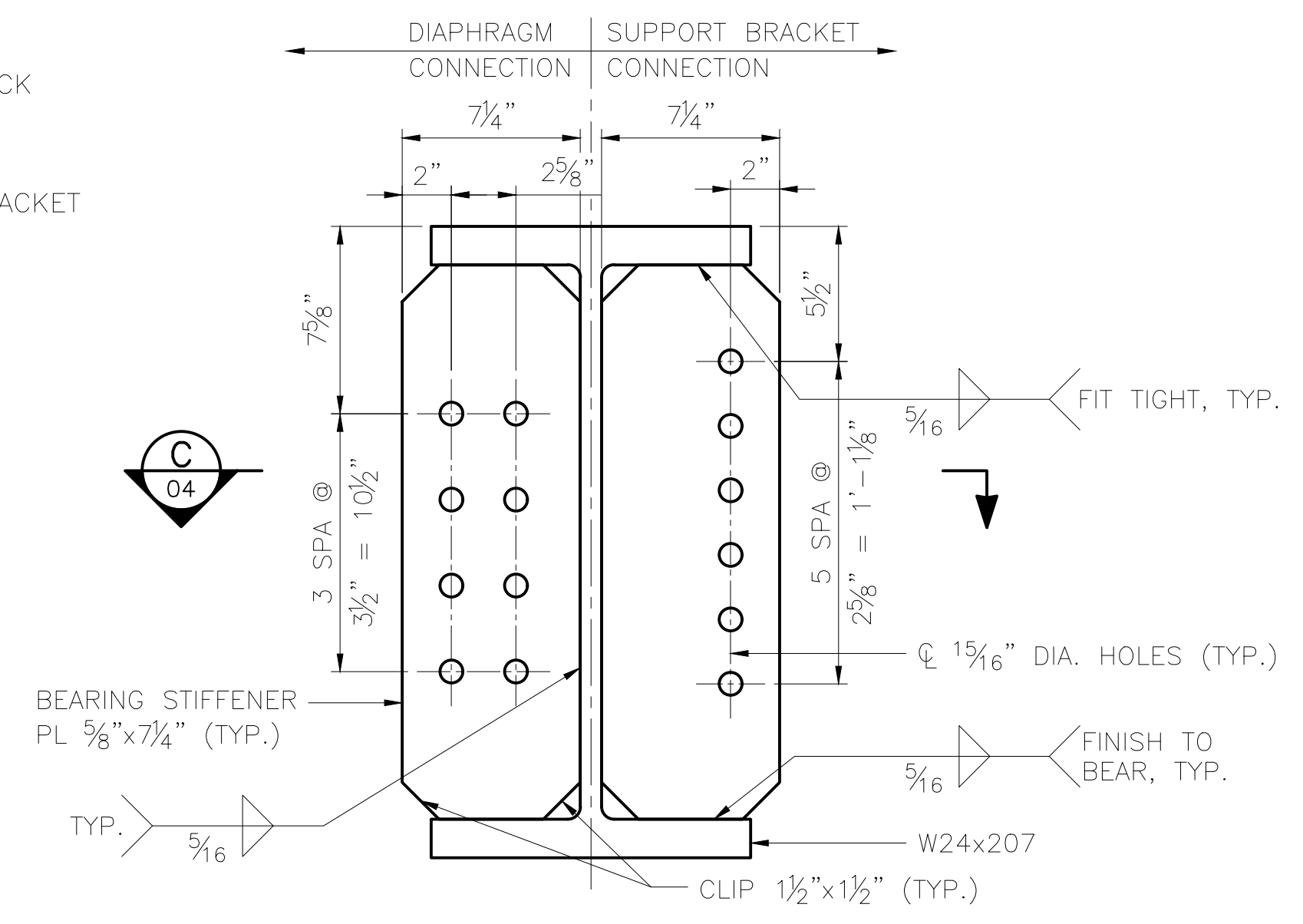
**SECTION C**  
SCALE: 2" = 1'-0"



**SECTION A**  
SCALE: 2" = 1'-0"



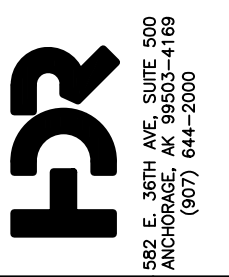
**SECTION B**  
SCALE: 2" = 1'-0"



**BEARING STIFFENER INSTALLATION DETAIL**  
SCALE: 2" = 1'-0"

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 DRAFTED BY: MEM

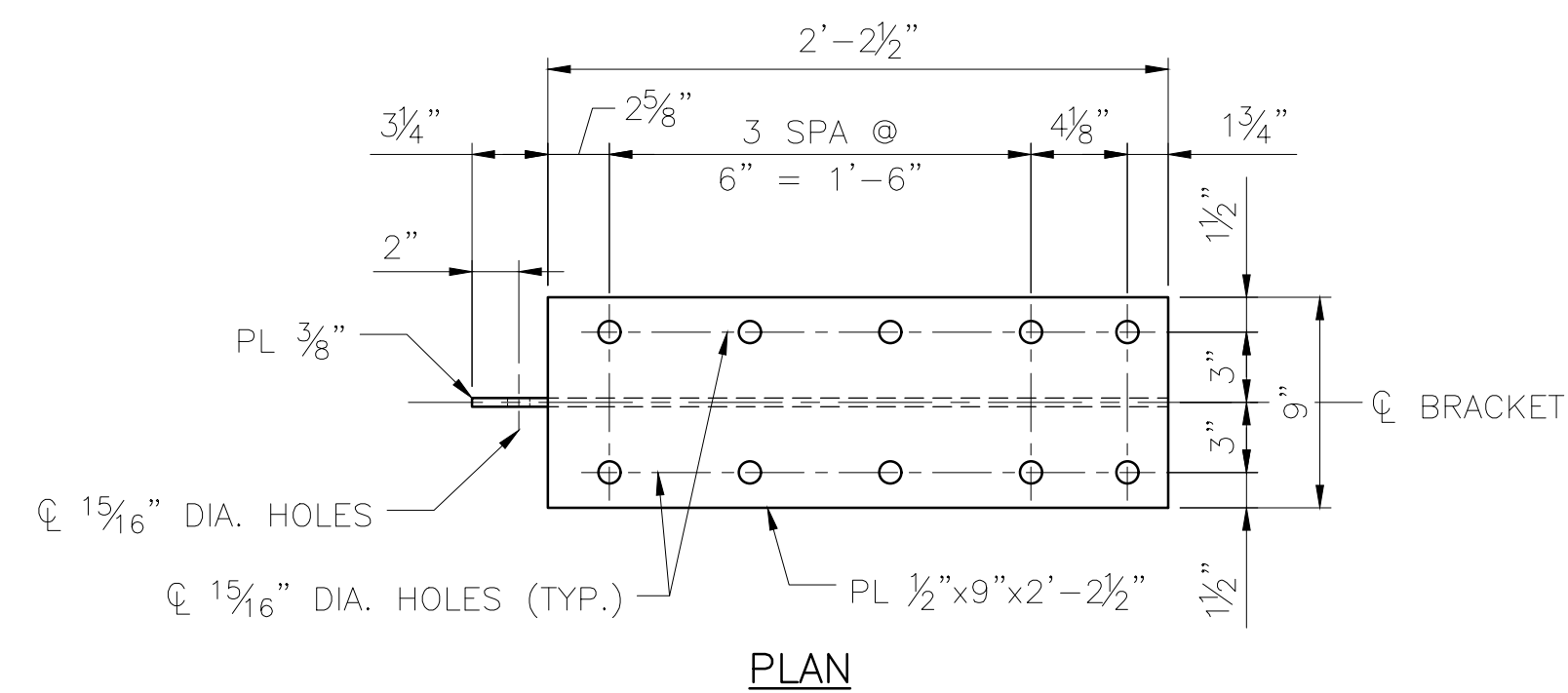
2/14/2025  
 HDR ENGINEERING, INC.  
 582 E. 35TH AVE, SUITE 500  
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 LICENSE #: AECC569



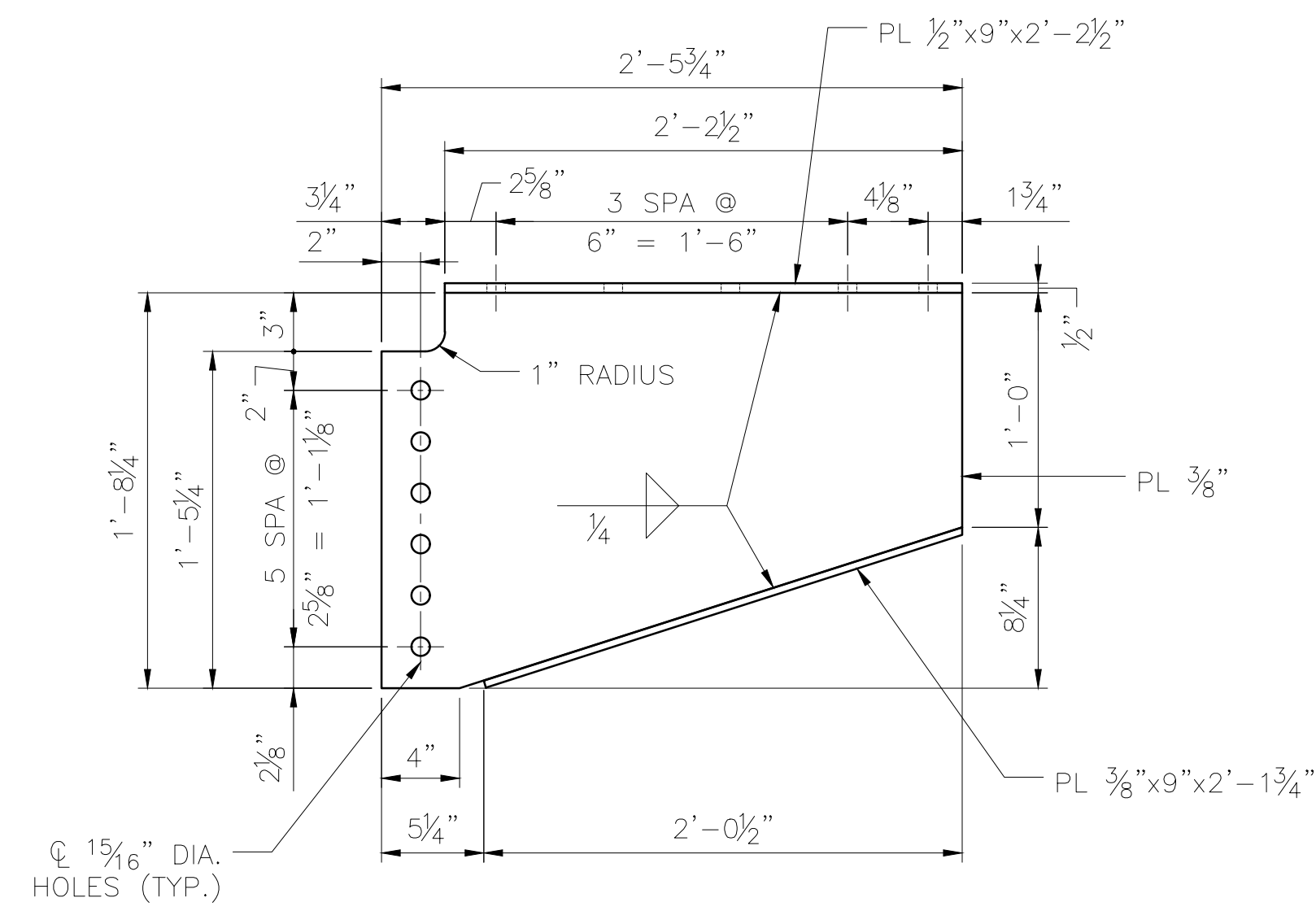
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**ALASKA RAILROAD**  
 PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3  
 SHEET TITLE: 30'-0" BEAM SPAN - STEEL DETAILS (1 OF 2)

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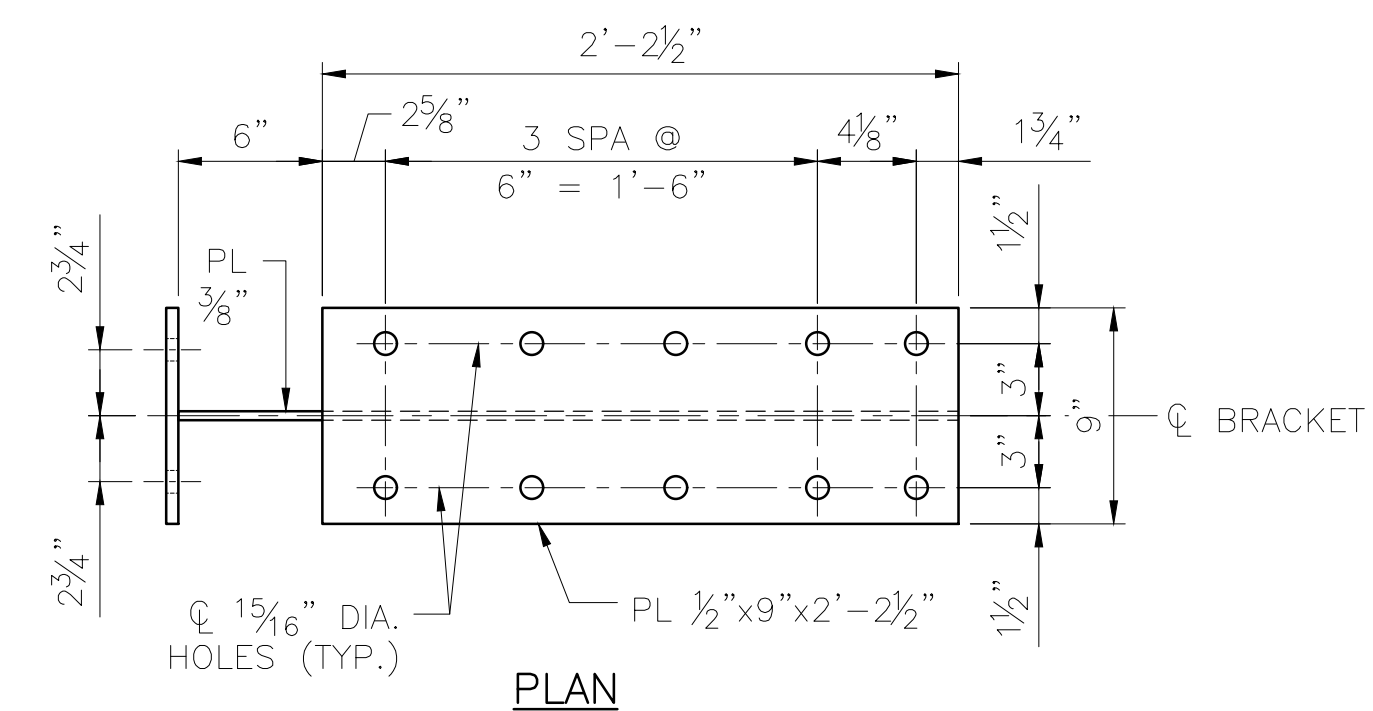


PLAN

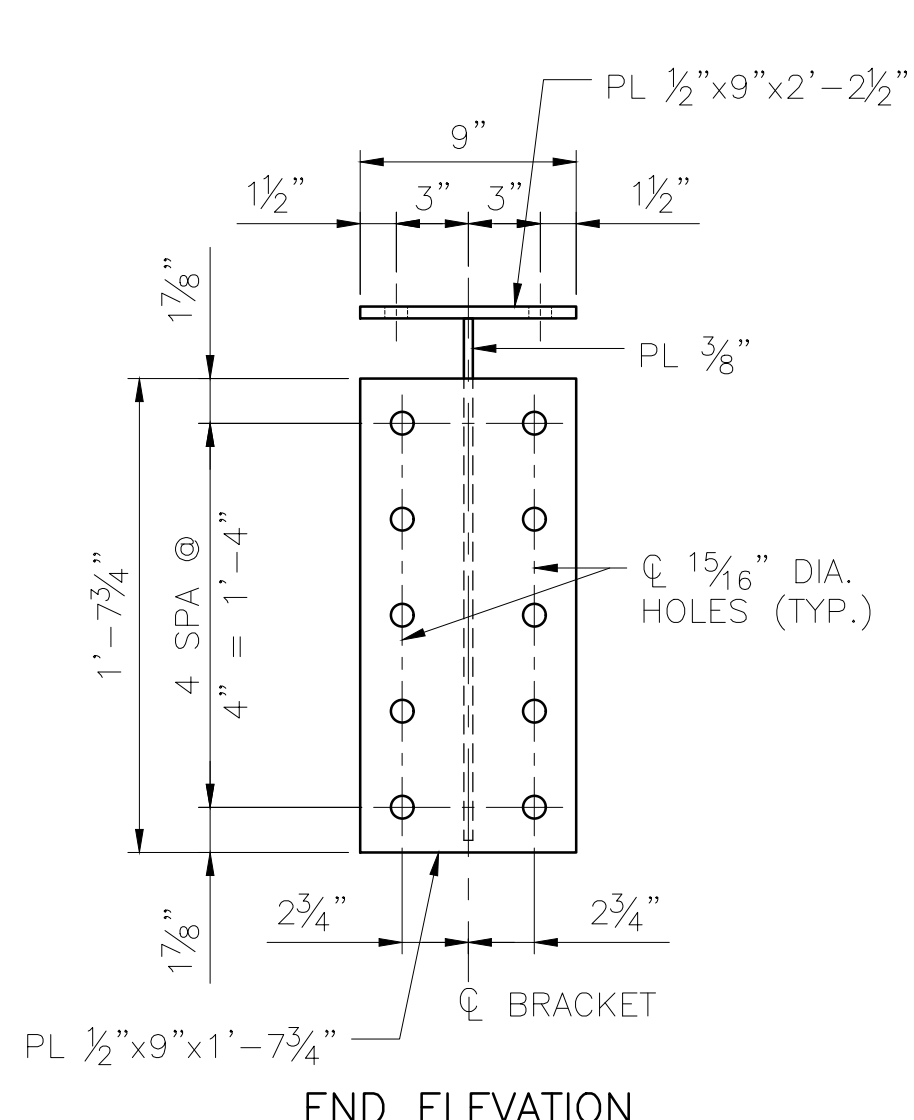


SUPPORT BRACKET MK SB1

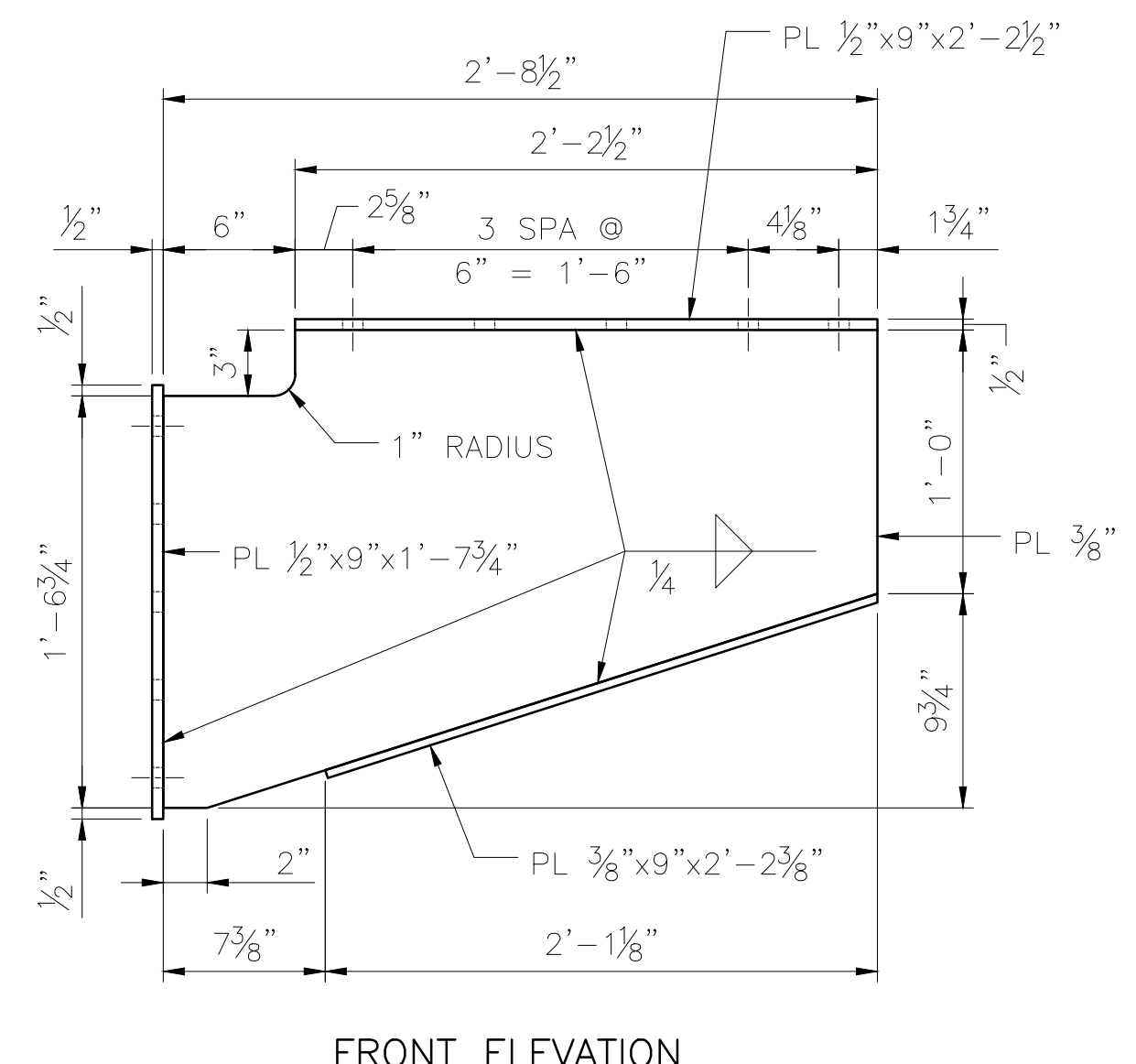
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 ESTIMATED WEIGHT = 110 LBS



PLAN



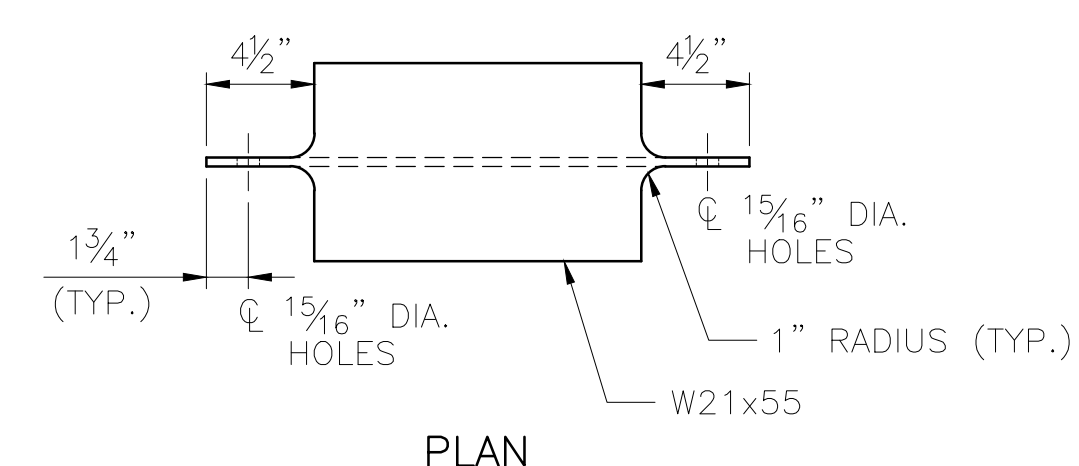
END ELEVATION



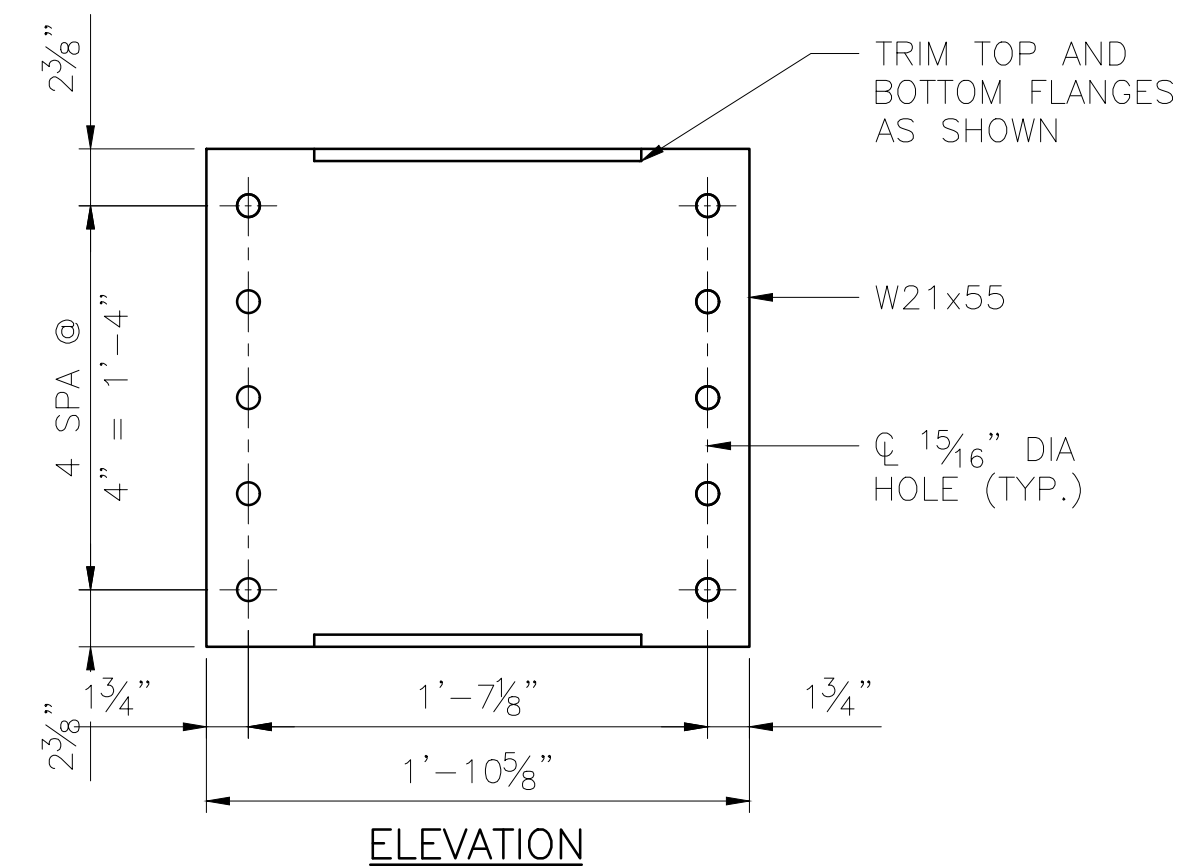
FRONT ELEVATION

SUPPORT BRACKET MK SB2

SCALE: 1/2" = 1'-0"  
 2 ~ REQUIRED  
 ESTIMATED WEIGHT = 142 LBS



PLAN

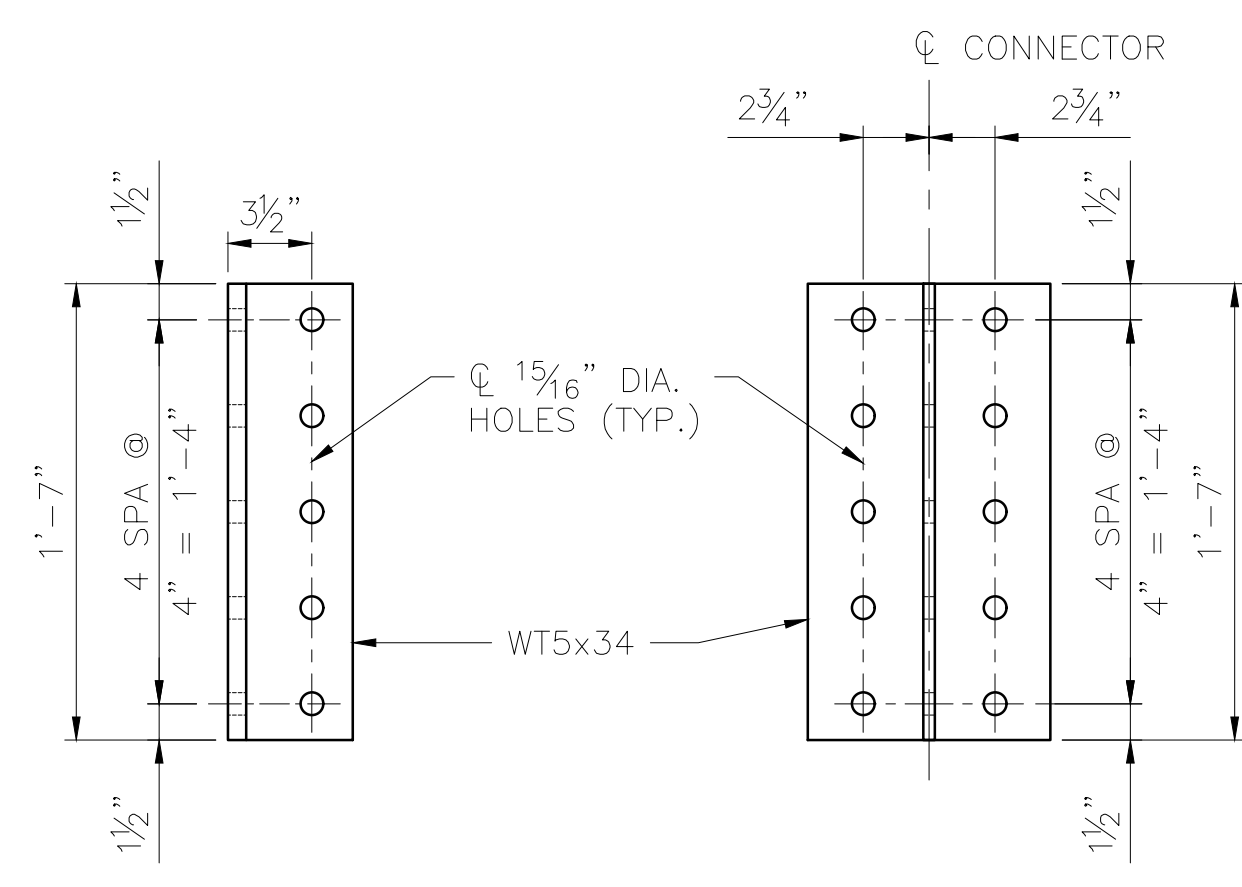


ELEVATION

INTERMEDIATE DIAPHRAGM MK ID1

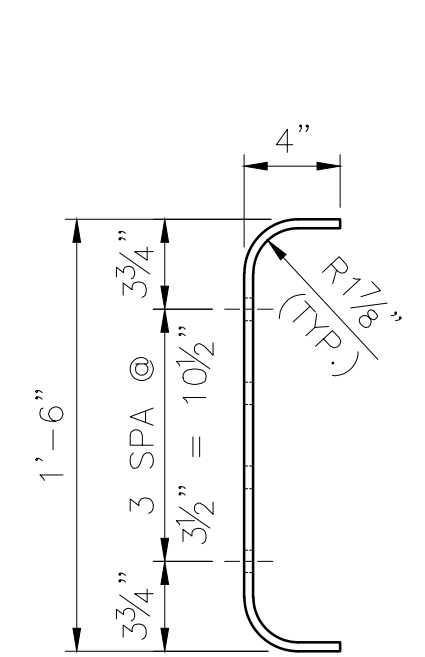
SCALE: 1/2" = 1'-0"  
 4 ~ REQUIRED  
 ESTIMATED WEIGHT = 84 LBS

OPTION: FABRICATOR MAY SUBMIT A REQUEST TO FABRICATE INTERMEDIATE DIAPHRAGM MK ID1 WITH WELDED PLATES IN LIEU OF COPING FLANGES OF W-SECTION IF THE CHANGE PROVIDES A NET SAVINGS TO THE PROJECT.

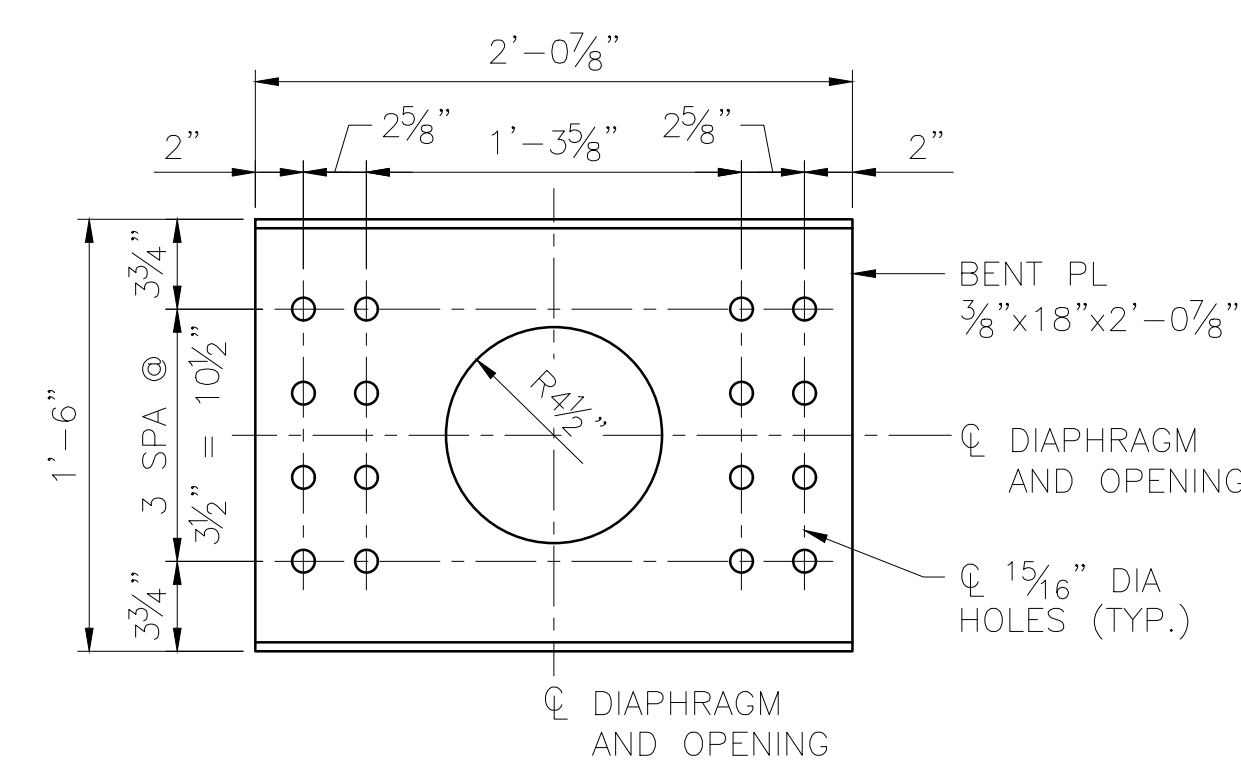


DIAPHRAGM CONNECTOR MK DC1

SCALE: 1/2" = 1'-0"  
 8 ~ REQUIRED  
 ESTIMATED WEIGHT = 54 LBS



END ELEVATION



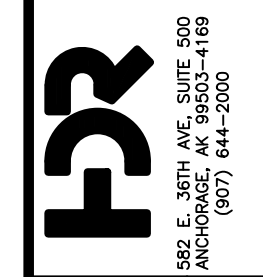
FRONT ELEVATION

END DIAPHRAGM MK ED1

SCALE: 1/2" = 1'-0"  
 8 ~ REQUIRED  
 ESTIMATED WEIGHT = 41 LBS

|              |     |
|--------------|-----|
| DESIGNED BY: | ML  |
| CHECKED BY:  | KK  |
| DRAFTED BY:  | MEM |

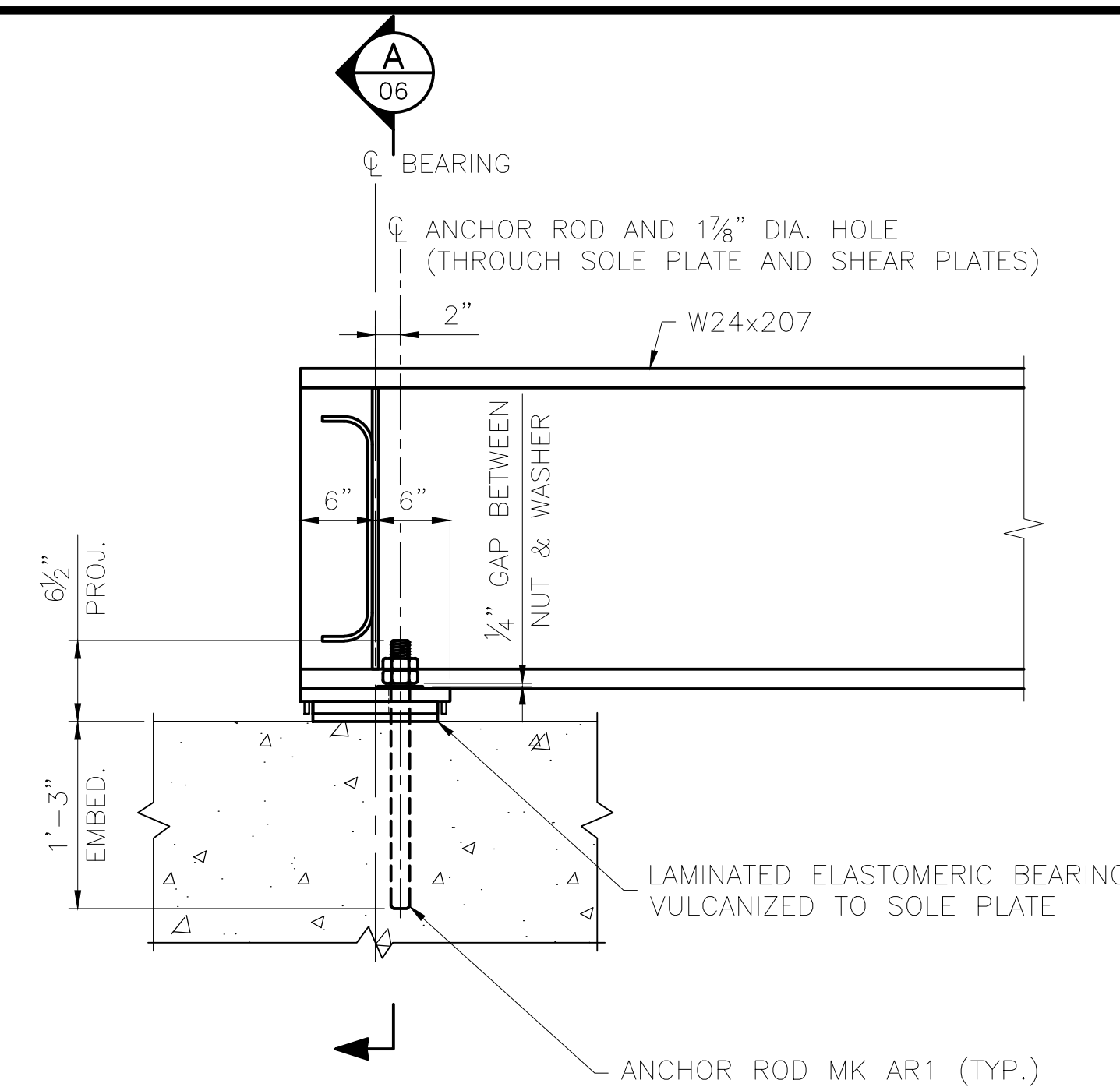
2/14/2025  
 HDR ENGINEERING, INC.  
 582 E. 36TH AVE, SUITE 500  
 ANCHORAGE, AK 99503-4169  
 (907) 644-2000  
 LICENSE #: AECC569



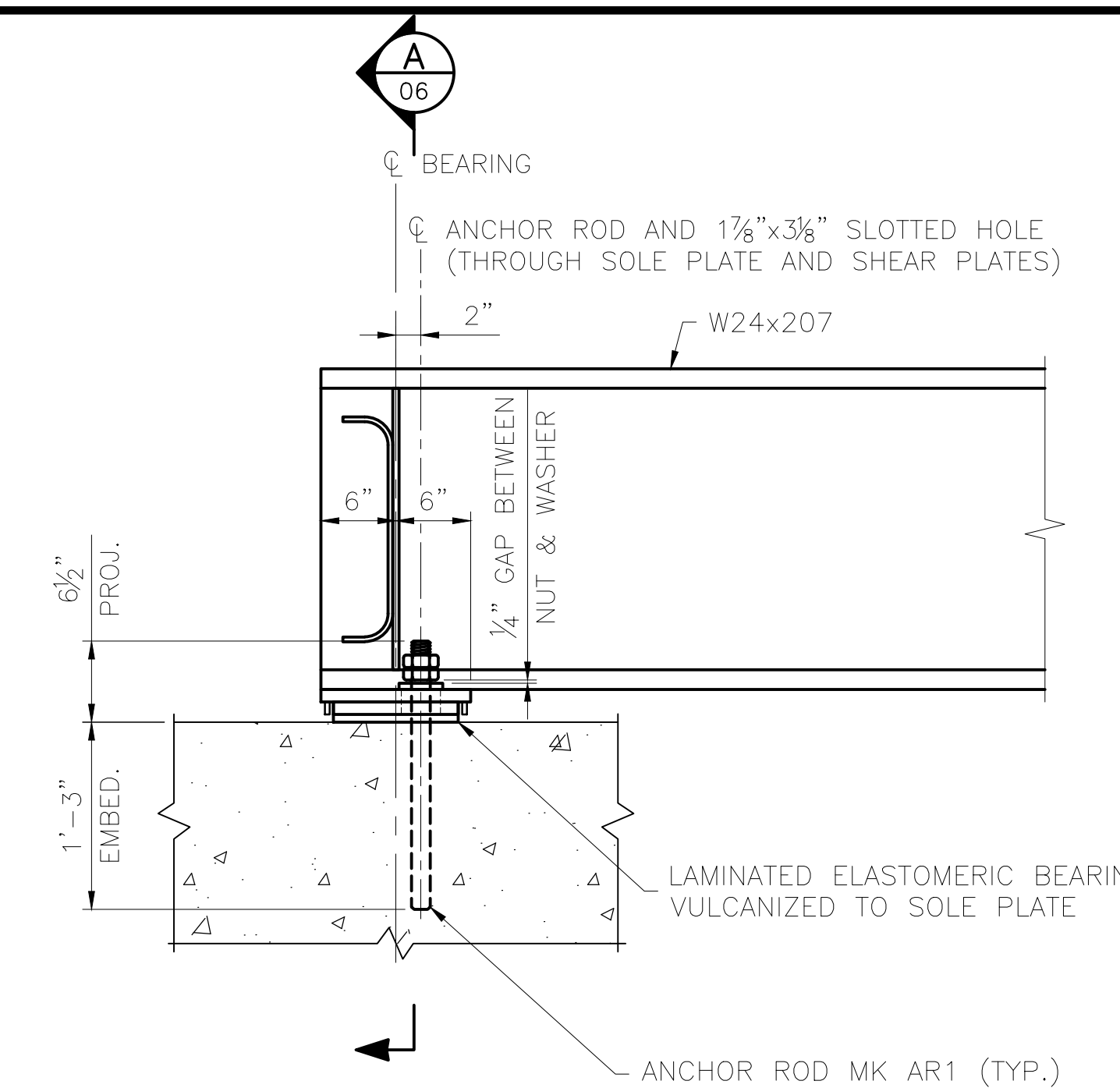
|  |  |
|--|--|
| <b>CAPITAL PROJECTS</b><br>P.O. BOX 107500<br>ANCHORAGE, ALASKA 99510-7500                                   |  |
| PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3 | SHEET TITLE: 30'-0" BEAM SPAN - STEEL DETAILS (2 OF 2) |
| AFE NO.  | 11228  |
| YEAR   | 2025   |
| SHEET  | 05 OF 22   |



DRAWING LOCATION: C:\PWORKING\WEST01\14079759\BR\_114.3\_SHIP\_CREEK\_06.DWG  
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 SCALE: AS NOTED  
 PUBLISHED: CTB  
 ARR: CTB\_2023.CTB

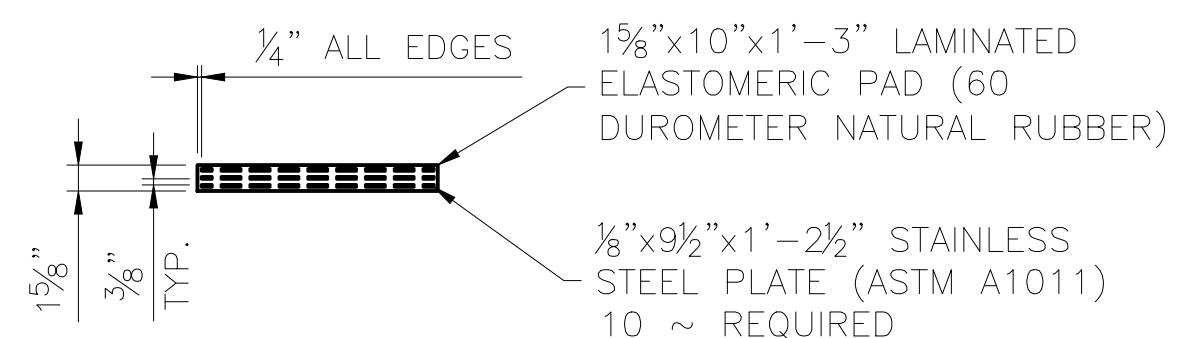
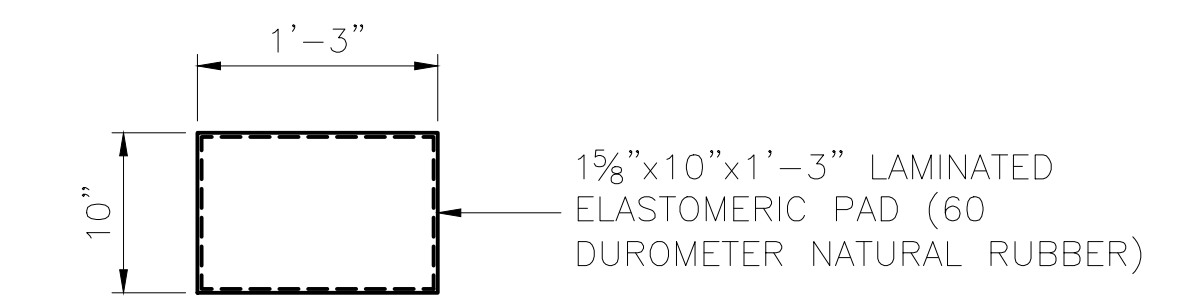


**FIXED BEARING ELEVATION**

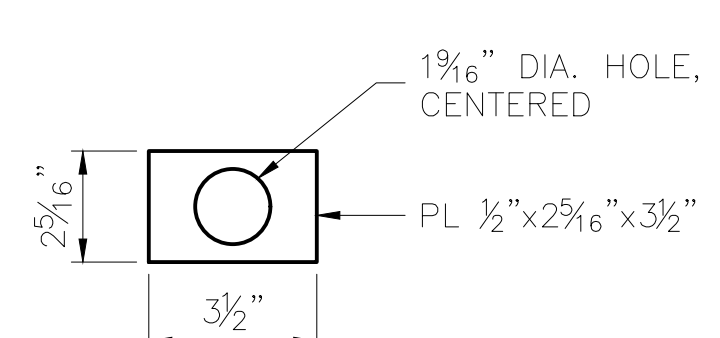


**EXPANSION BEARING ELEVATION**

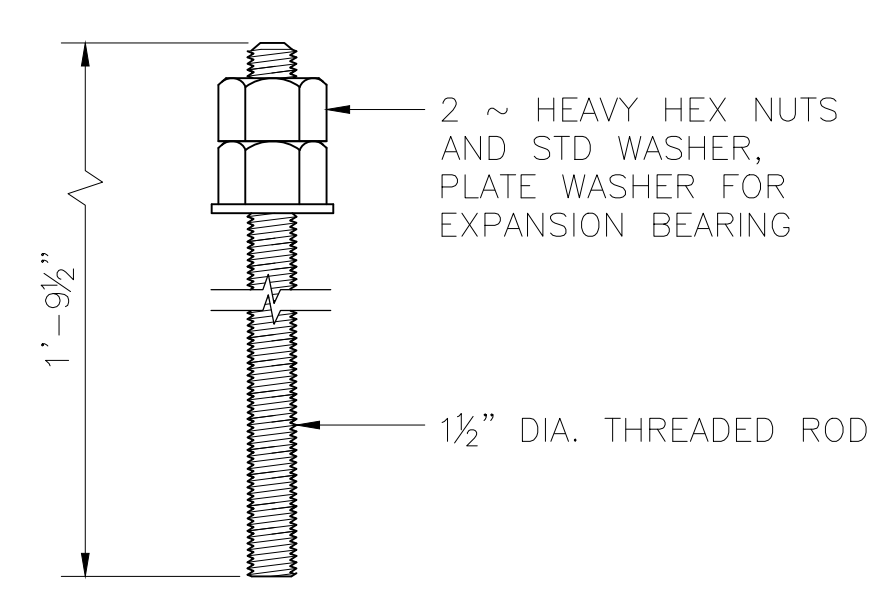
**SPAN 1 BEARING DETAIL**  
SCALE: 1" = 1'-0"



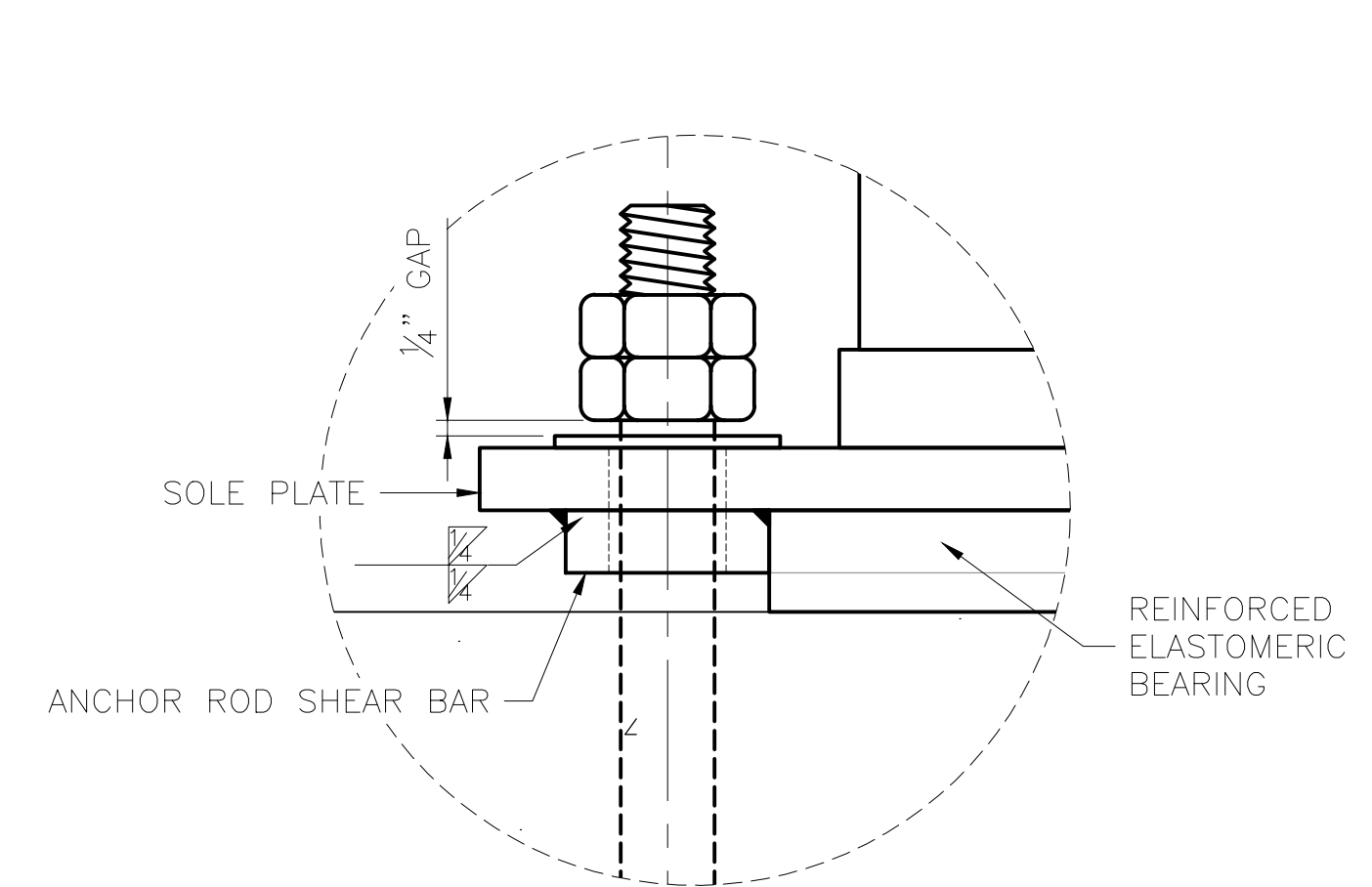
**LAMINATED ELASTOMERIC PAD DETAIL**  
SCALE: 1" = 1'-0"



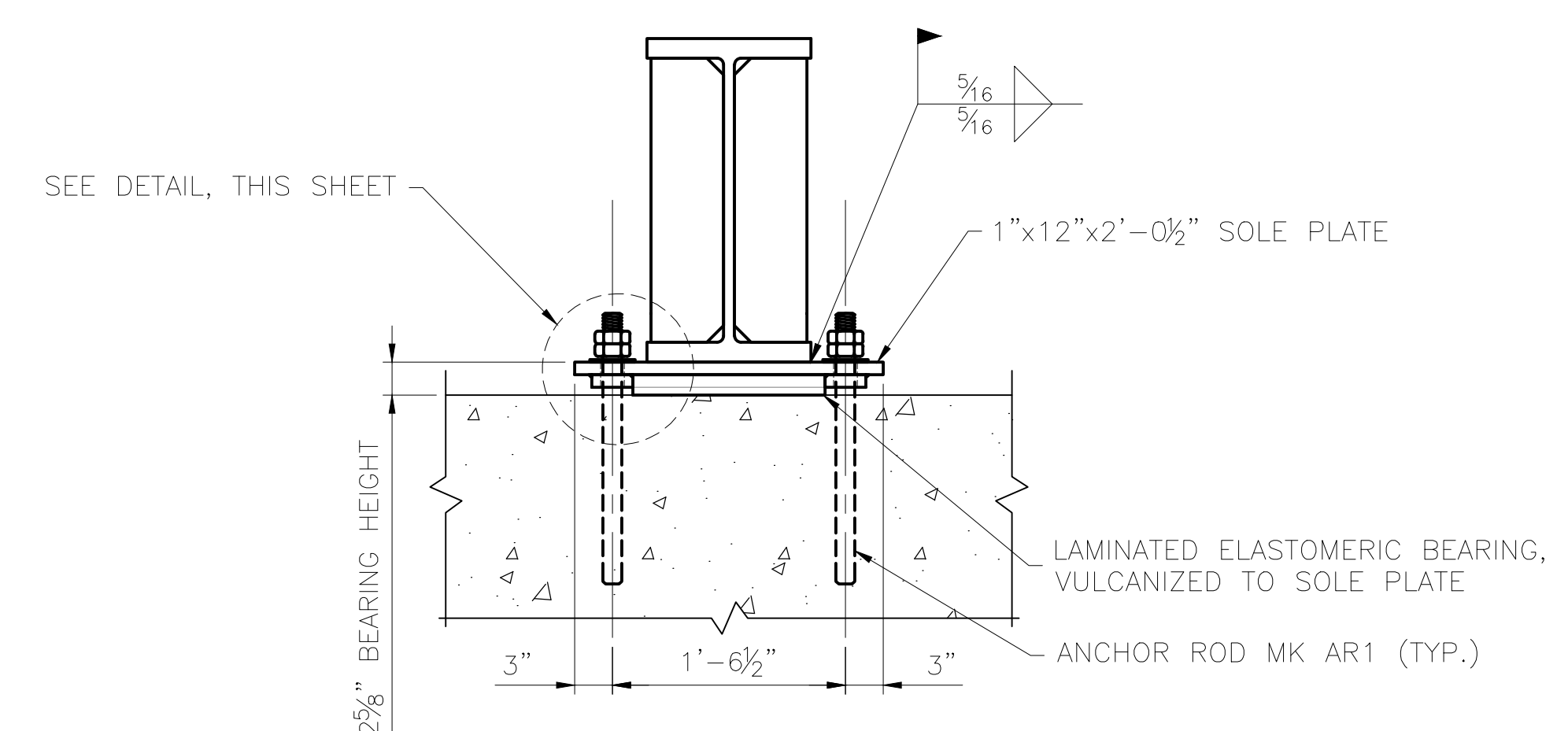
**PLATE WASHER**  
SCALE: 3" = 1'-0"  
10 ~ REQUIRED  
ASTM F1554, GR. 105 GALVANIZED



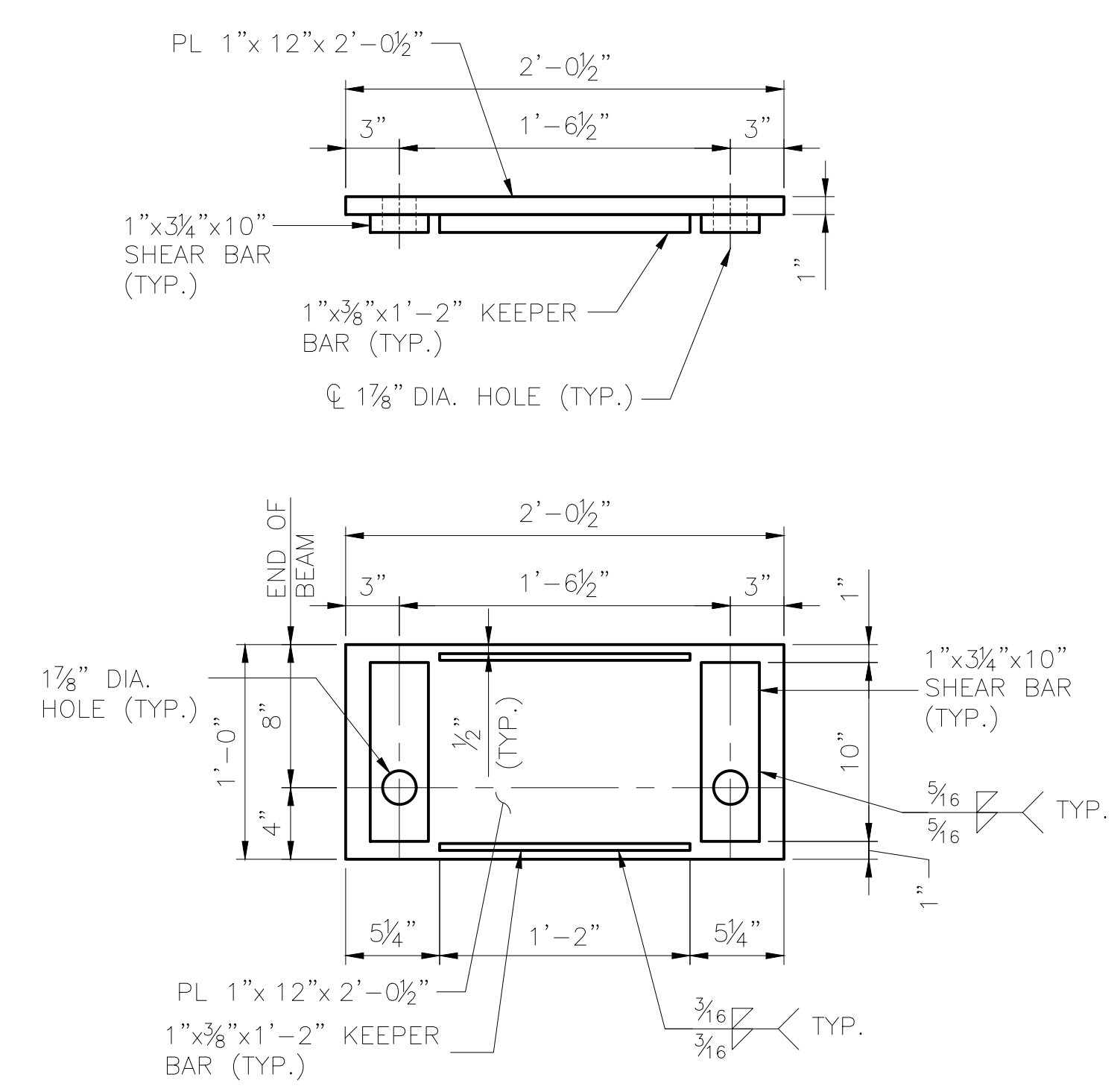
**ANCHOR ROD MK AR1**  
SCALE: 1 1/2" = 1'-0"  
20 ~ REQUIRED  
ASTM F1554, GR. 105 GALVANIZED ASSEMBLY



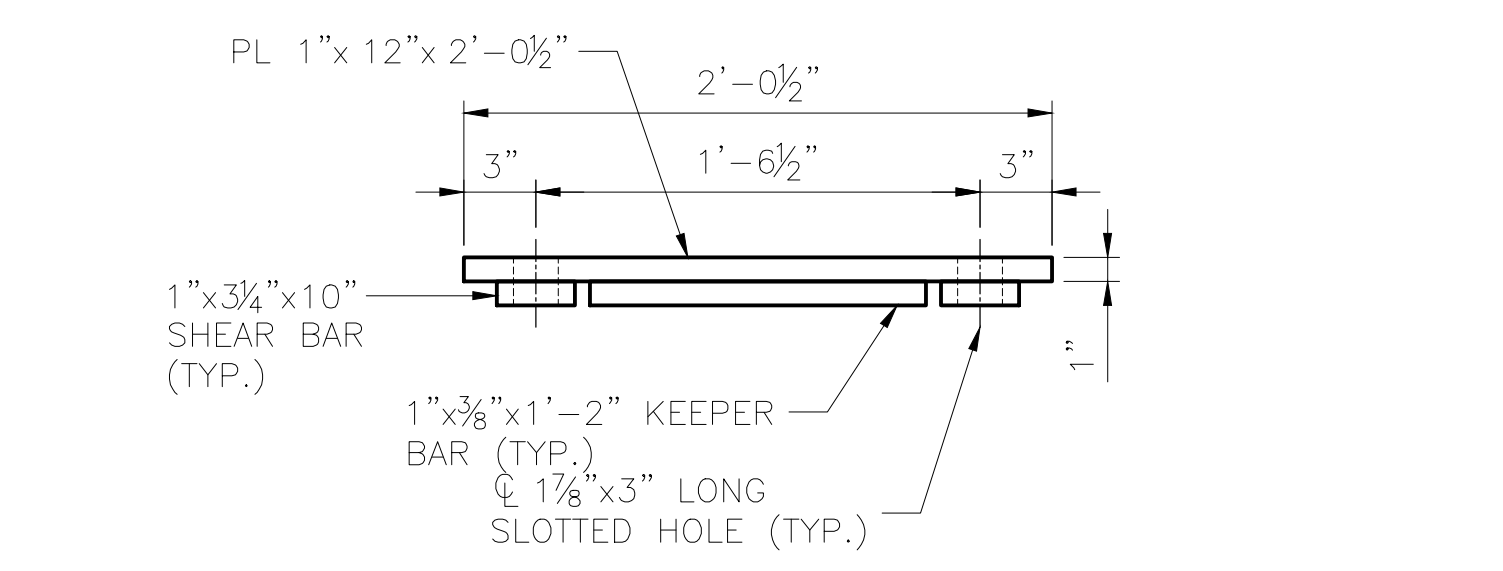
**ANCHOR ROD SHEAR PLATE DETAIL**  
SCALE: 4" = 1'-0"



**SECTION A-06**  
SCALE: 1" = 1'-0"



**SOLE PLATE MK SP1 (FIXED)**  
SCALE: 1 1/2" = 1'-0"



**SOLE PLATE MK SP2 (EXPANSION)**  
SCALE: 1 1/2" = 1'-0"

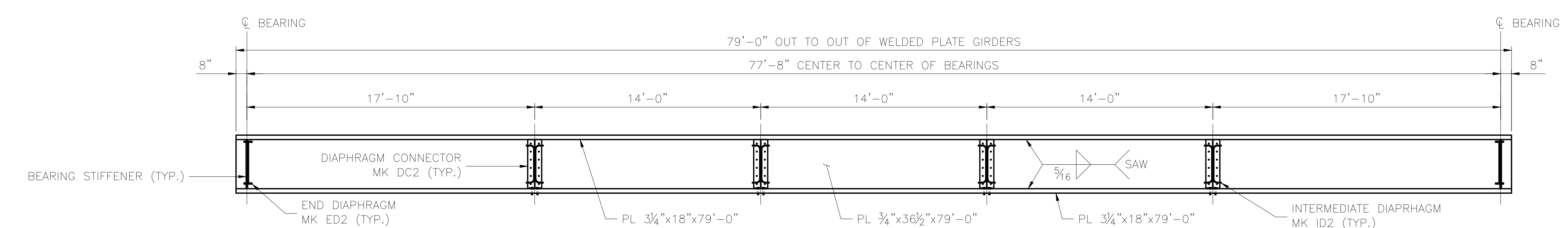
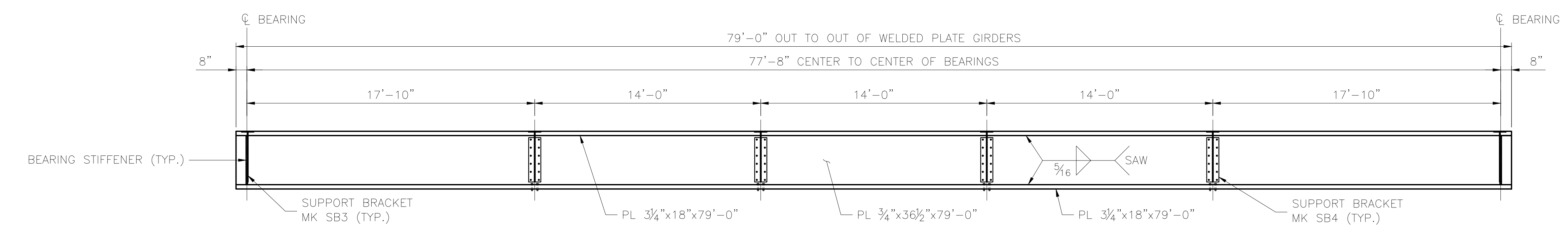
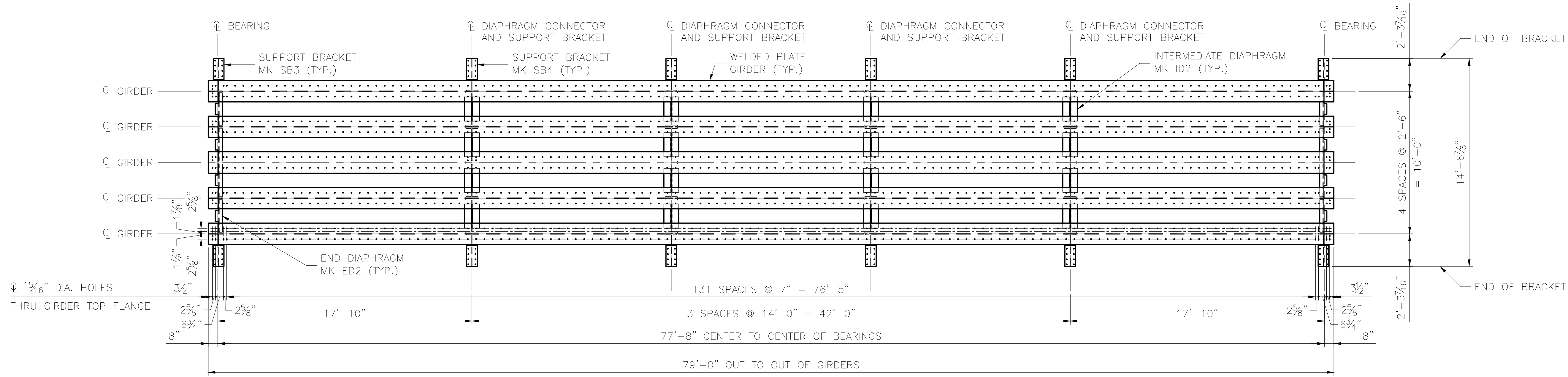
|              |     |
|--------------|-----|
| DESIGNED BY: | ML  |
| CHECKED BY:  | KK  |
| DRAFTED BY:  | MEM |

2/14/2025  
 HDR ENGINEERING, INC.  
 582 E. 36TH AVE, SUITE 500  
 ANCHORAGE, AK 99503-4169  
 (907) 644-2000  
 LICENSE #: AECC569

**HR**  
 800 E. 30TH AVE, SUITE 500  
 ANCHORAGE, AK 99503-4169  
 (907) 644-2000

|  |  |
|--|--|
| <b>CAPITAL PROJECTS</b><br>P.O. BOX 107500<br>ANCHORAGE, ALASKA 99510-7500 | PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3 |
|  | SHEET TITLE: 30'-0" BEAM SPAN - BEARING DETAILS  |
| AFE NO. 11228  | YEAR 2025  |
| SHEET 06 OF 22   |  |

DRAWING LOCATION: C:\PWORKING\WEST01\14079759\BR\_114.3\_SHIP\_CREEK\_07.DWG  
 DATE: 2/14/2025 8:51 AM  
 TIME: 8:51 AM  
 SCALE: AS NOTED  
 PUBLISHED: CTB  
 ARRC\_CTIB\_2023.CTIB



**NOTE:**  
1. FOR CAMBER DIAGRAM SEE SHEET 02.

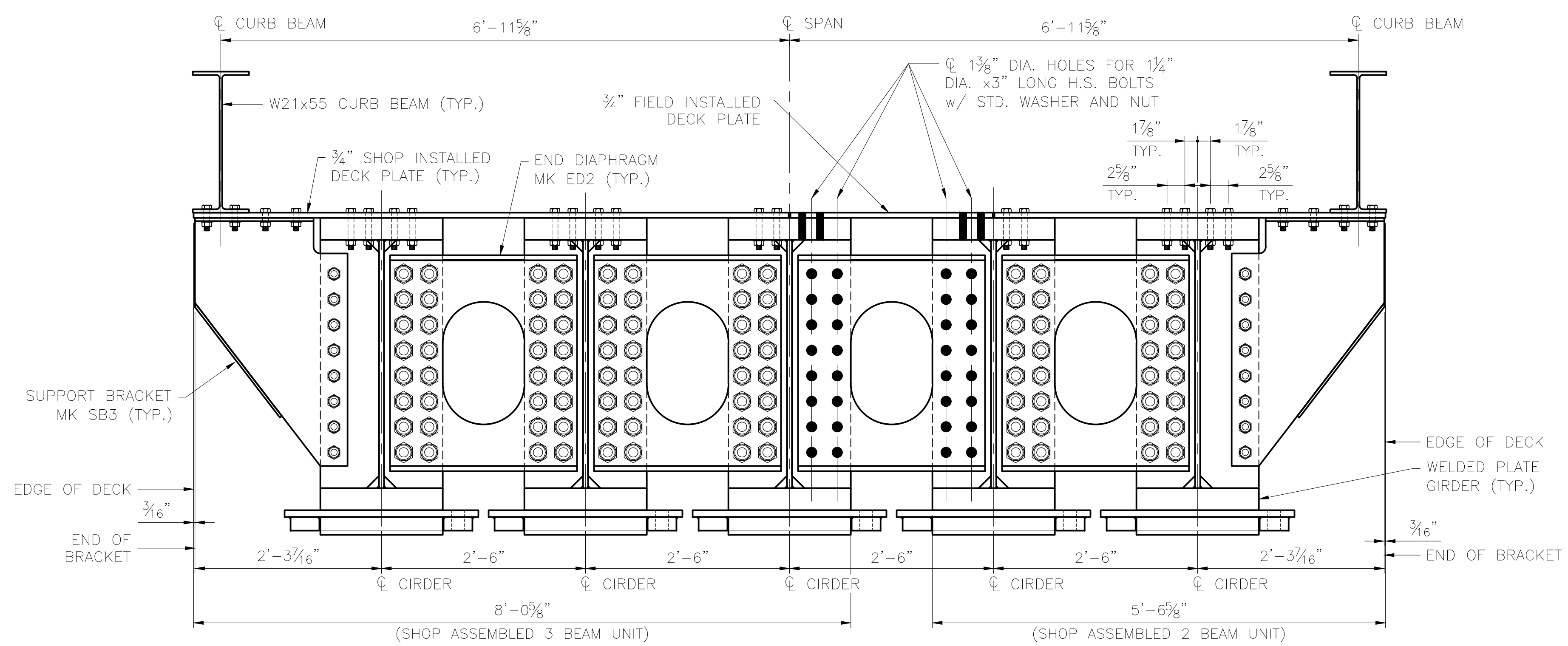
|                 |  | STRESS TABLE  |               |            |           |                          |                             |                  |                  |               |              |                          |                                   |                |                           |                             |  |
|-----------------|--|---------------|---------------|------------|-----------|--------------------------|-----------------------------|------------------|------------------|---------------|--------------|--------------------------|-----------------------------------|----------------|---------------------------|-----------------------------|--|
| SPAN LENGTH (L) | GIRDER SECTION   | SHEAR         |               |            |           | FLEXURE                  |                             |                  |                  |               |              | DEFLECTION               |                                   |                |                           |                             |  |
|                 |  | DEAD LOAD (K) | LIVE LOAD (K) | IMPACT (K) | TOTAL (K) | WEB AREA (Aw)            |                             | DEAD LOAD (K-FT) | LIVE LOAD (K-FT) | IMPACT (K-FT) | TOTAL (K-FT) | SECTION MODULUS (Sx)     |                                   | ALLOWABLE (IN) | MOMENT OF INERTIA (Ix)    |                             |  |
|                 |  |               |               |            |           | REQ'D (IN <sup>2</sup> ) | PROVIDED (IN <sup>2</sup> ) |                  |                  |               |              | REQ'D (IN <sup>3</sup> ) | PROVIDED (NET) (IN <sup>3</sup> ) |                | *REQ'D (IN <sup>4</sup> ) | PROVIDED (IN <sup>4</sup> ) |  |
| 77'-8"          | TOP FLANGE: 3/4"x18"<br>BOTTOM FLANGE: 3/4"x18"<br>WEB PLATE: 3/4"x36 1/2" | 64            | 115           | 47         | 226       | 12.9                     | 27.4                        | 1246             | 1968             | 803           | 4017         | 1753                     | 2034                              | 1.46           | 55282                     | 49359                       |  |

\* THE PROVIDED MOMENT OF INERTIA FOR DEFLECTION DOES NOT MEET THE REQUIRED MOMENT OF INERTIA FOR L/640 ALLOWABLE DEFLECTION BASED ON 20 MPH TRACK SPEED AND TRACK CENTERED OVER THE SPAN. THE PROVIDED SECTION RESULT IN AN ADDITIONAL DEFLECTION BEYOND ALLOWABLE OF LESS THAN 3/16" FOR AN EXTERIOR GIRDER WHICH HAS BEEN DEEMED ACCEPTABLE FOR THIS LOCATION BY ARRC.

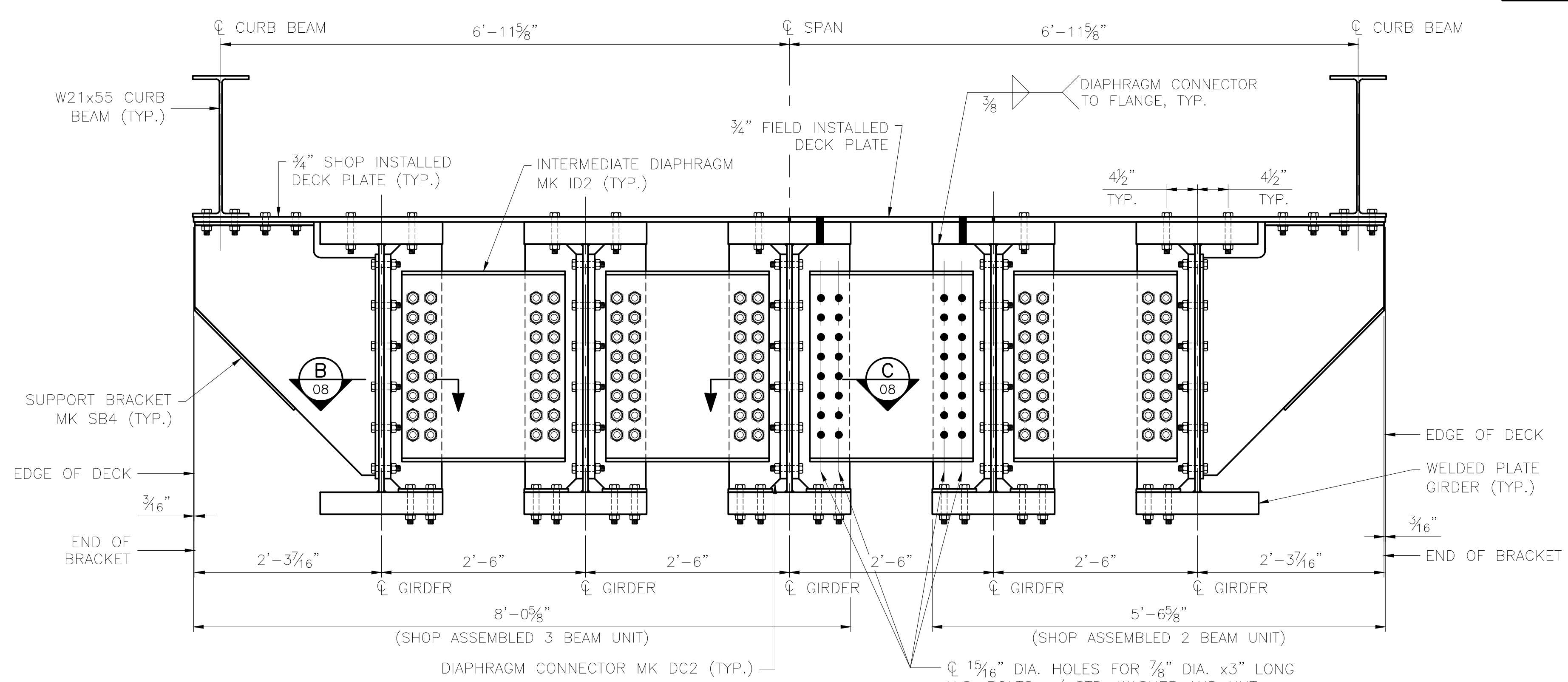
|  |          |
|--|----------|
| DESIGNED BY:   | ML       |
| CHECKED BY:  | KK       |
| DRAFTED BY:  | MEM      |
|  |          |
| HDR ENGINEERING, INC.<br>582 E. 36TH AVE., SUITE 500<br>ANCHORAGE, AK 99503-4169<br>(907) 644-2000<br>LICENSE #: AECC569 |          |
|  |          |
| CAPITAL PROJECTS<br>P.O. BOX 107500<br>ANCHORAGE, ALASKA 99510-7500  |          |
| PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3             |          |
| SHEET TITLE: 79'-0" GIRDER SPAN - FRAMING PLAN   |          |
| AFE NO.  | 11228    |
| YEAR   | 2025     |
| SHEET  | 07 OF 22 |



DRAWING LOCATION: C:\PWORKING\WEST01\4079759\BR\_114.3\_SHIP\_CREEK\_08.DWG  
 PUBLISHED CTB: ARRC\_CTb\_2023.CTB  
 SCALE: AS NOTED  
 DATE: 2/14/2025 8:52 AM  
 TIME: 8:52 AM  
 DESIGNED BY: ML  
 CHECKED BY: KK  
 DRAFTED BY: MEM

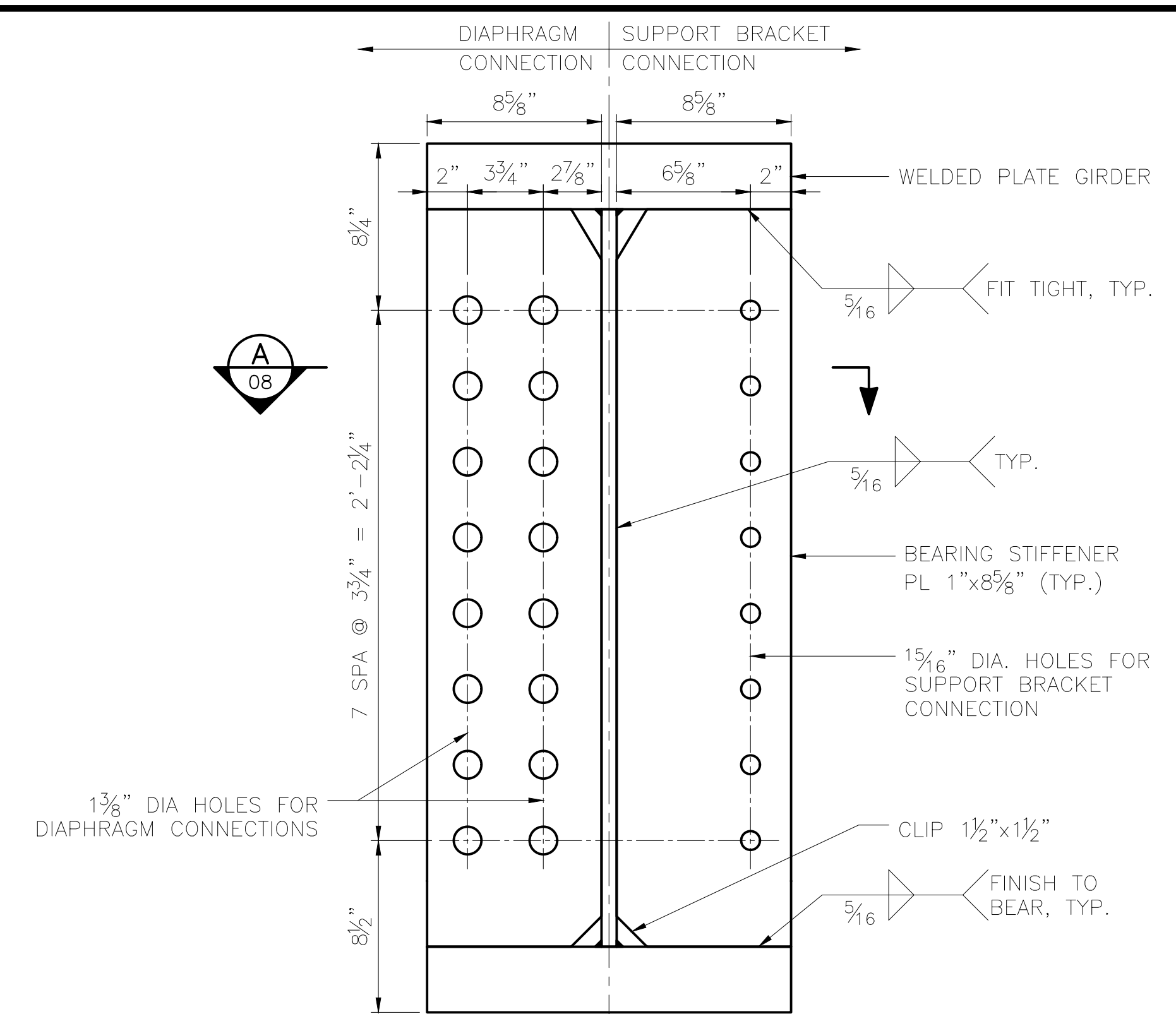


**TYPICAL SECTION AT END DIAPHRAGM**  
SCALE: 1" = 1'-0"

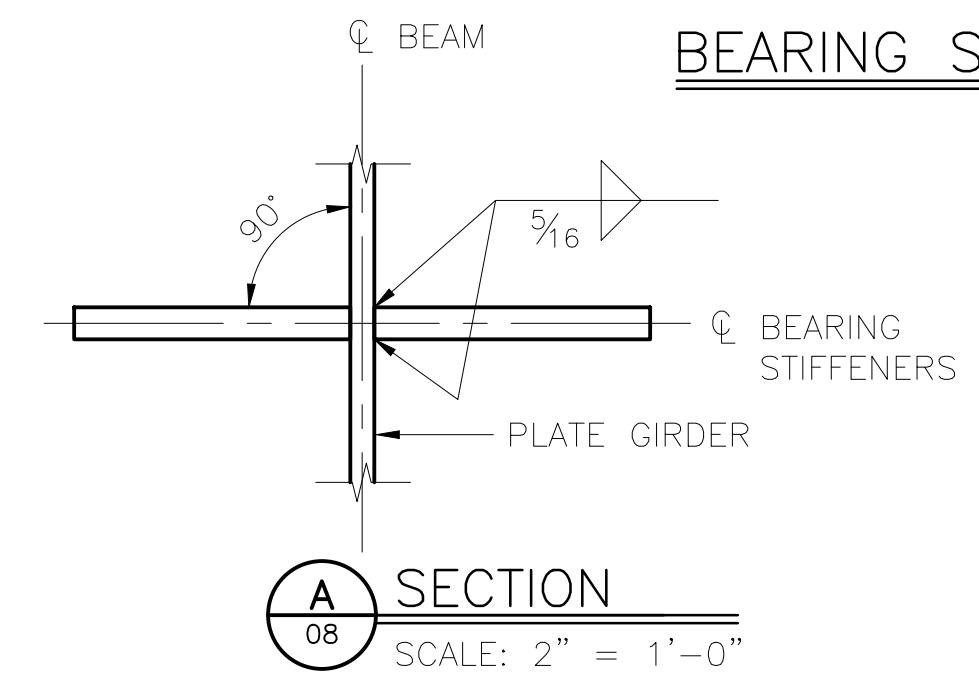


**TYPICAL SECTION AT INTERMEDIATE DIAPHRAGM**  
SCALE: 1" = 1'-0"

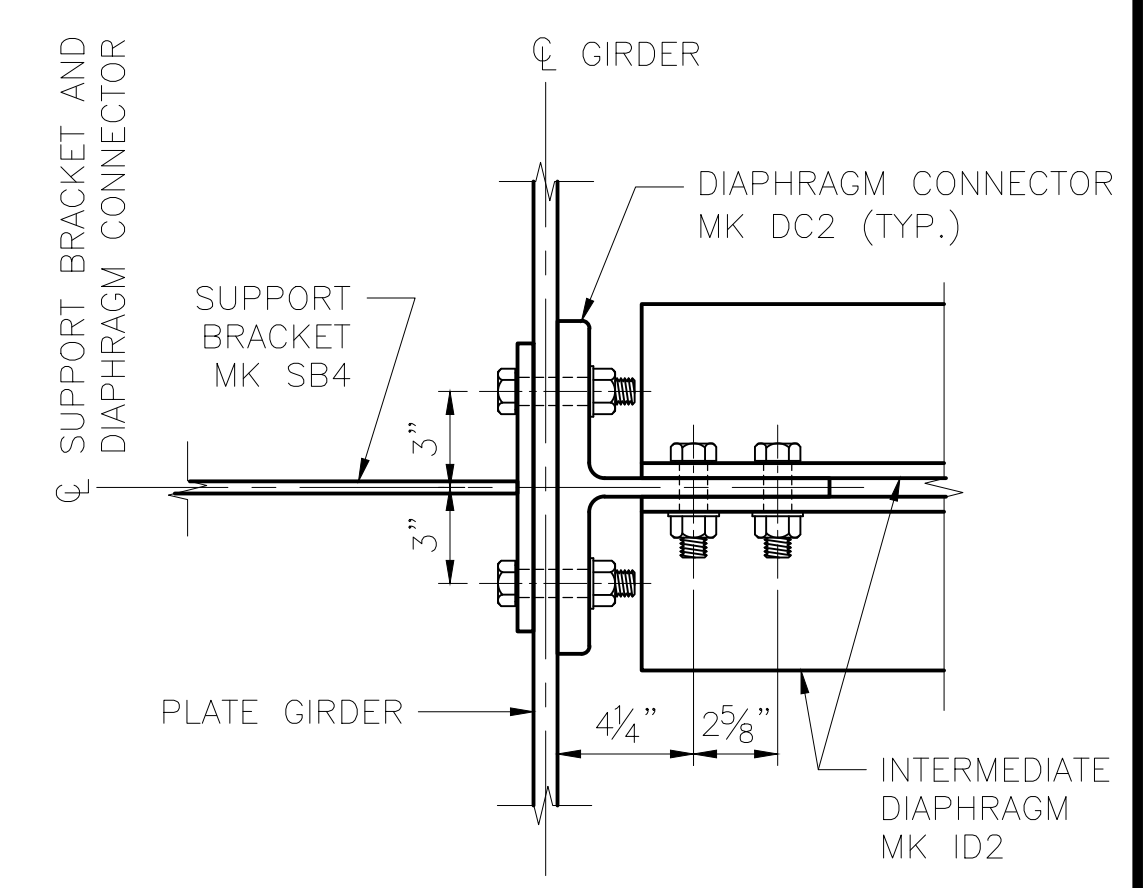
- NOTES:**
- FOR DIAPHRAGM, DIAPHRAGM CONNECTOR AND BRACKET DETAILS SEE SHEET 09.
  - FOR DECK PLATE DETAILS SEE SHEETS 11, 13, 14 AND 15.
  - FOR CURB BEAM DETAILS SEE SHEET 16.



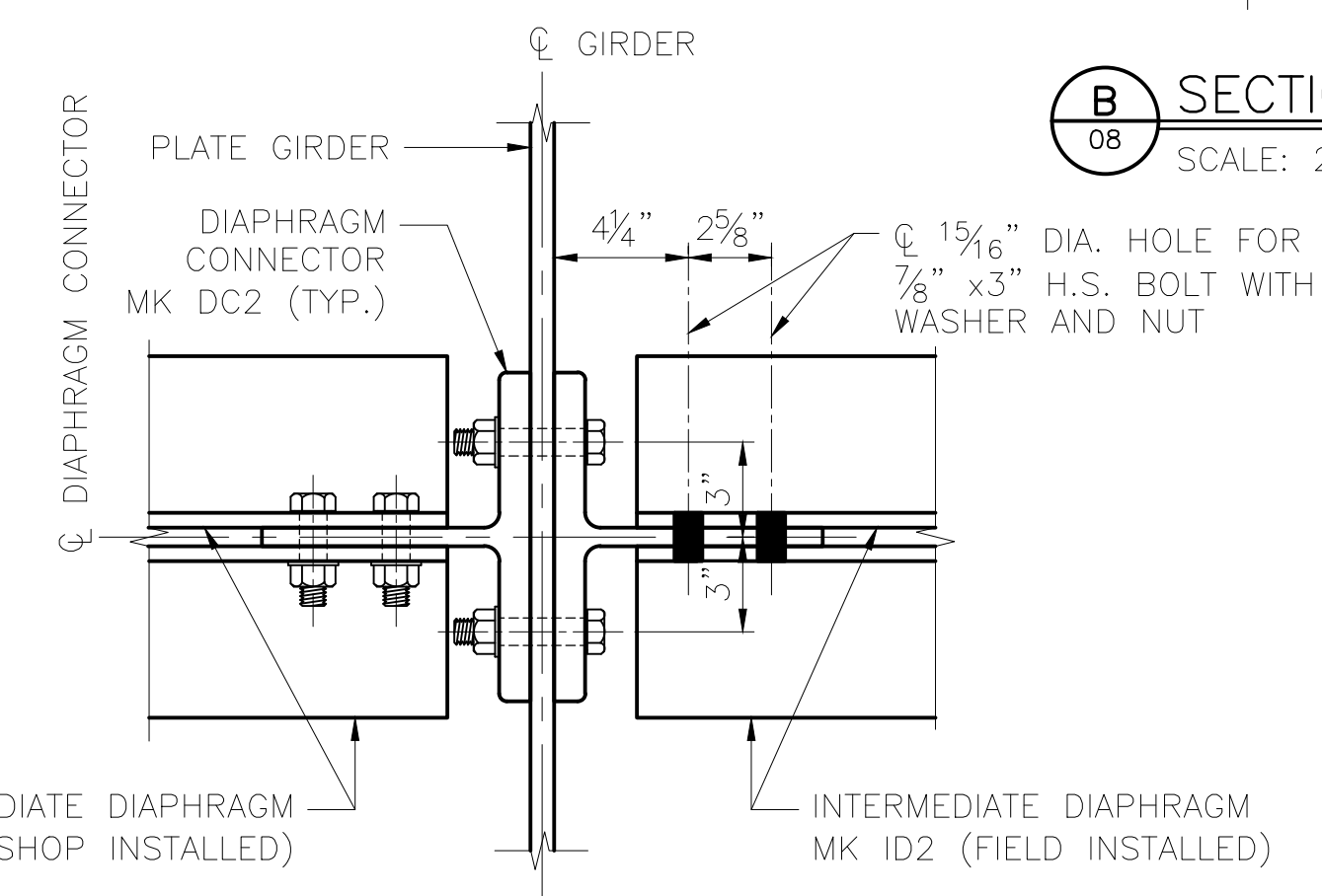
**BEARING STIFFENER INSTALLATION DETAIL**  
SCALE: 2" = 1'-0"



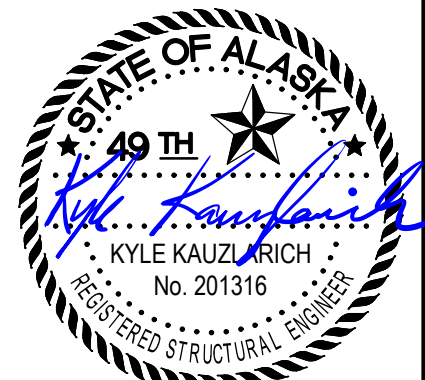

**SECTION A**  
SCALE: 2" = 1'-0"



**SECTION B**  
SCALE: 2" = 1'-0"

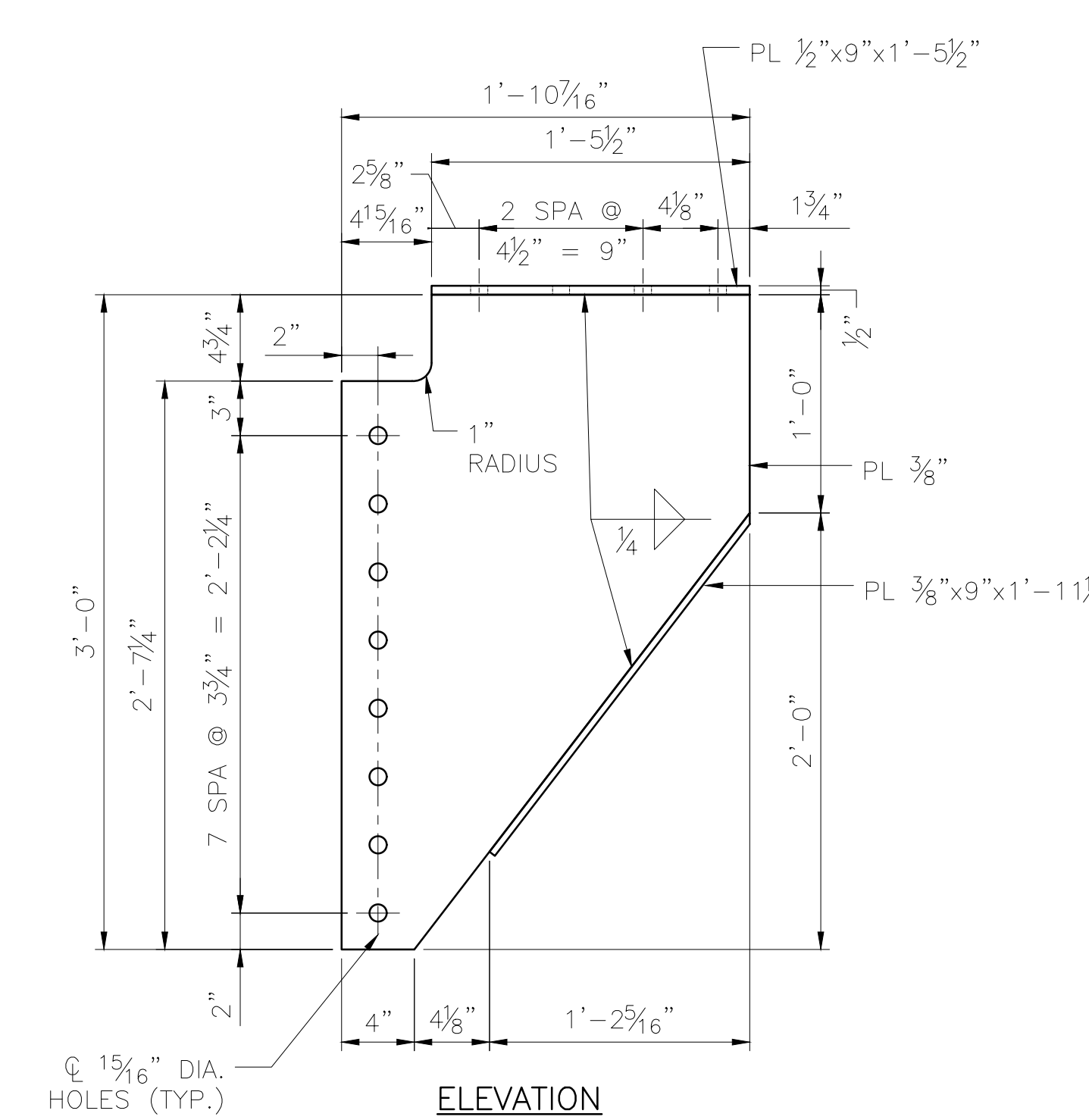
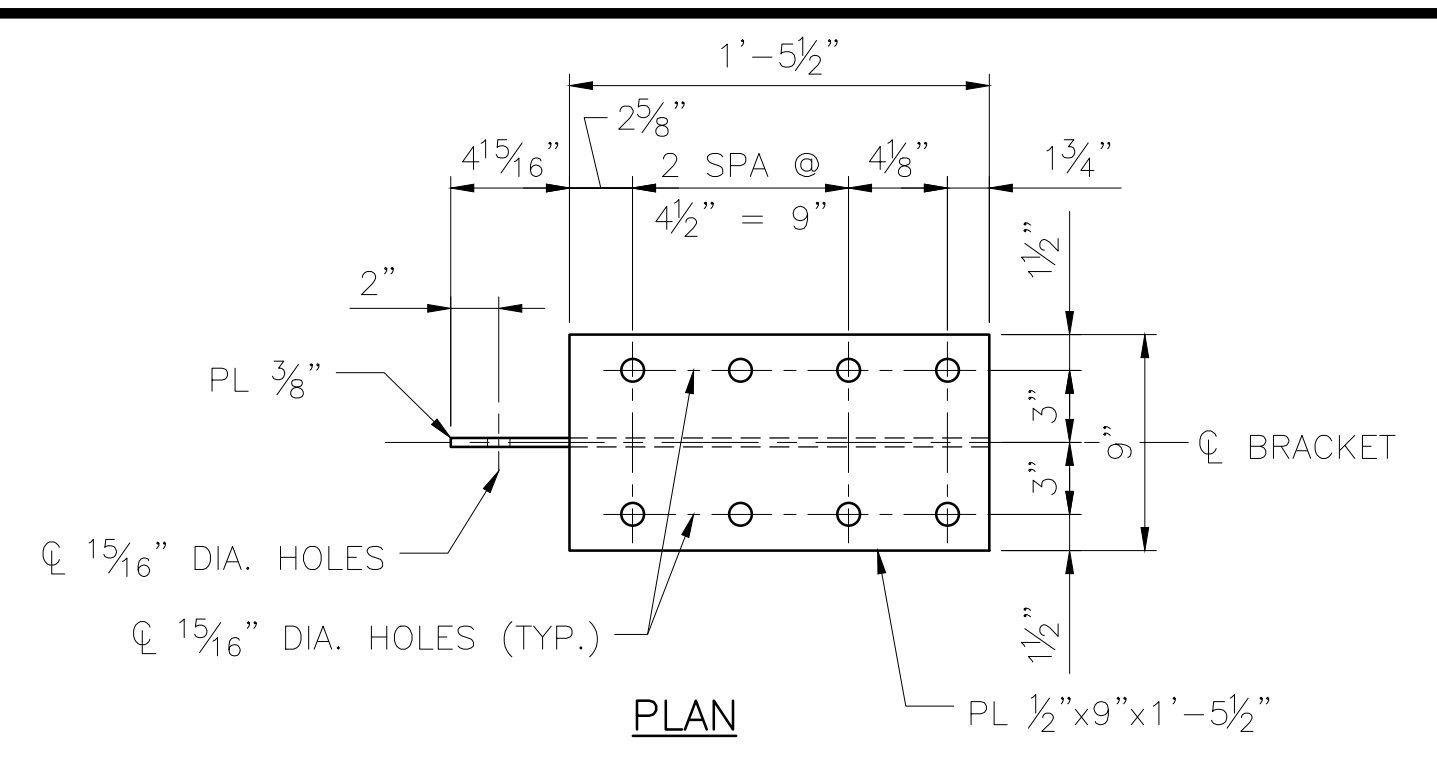


**SECTION C**  
SCALE: 2" = 1'-0"

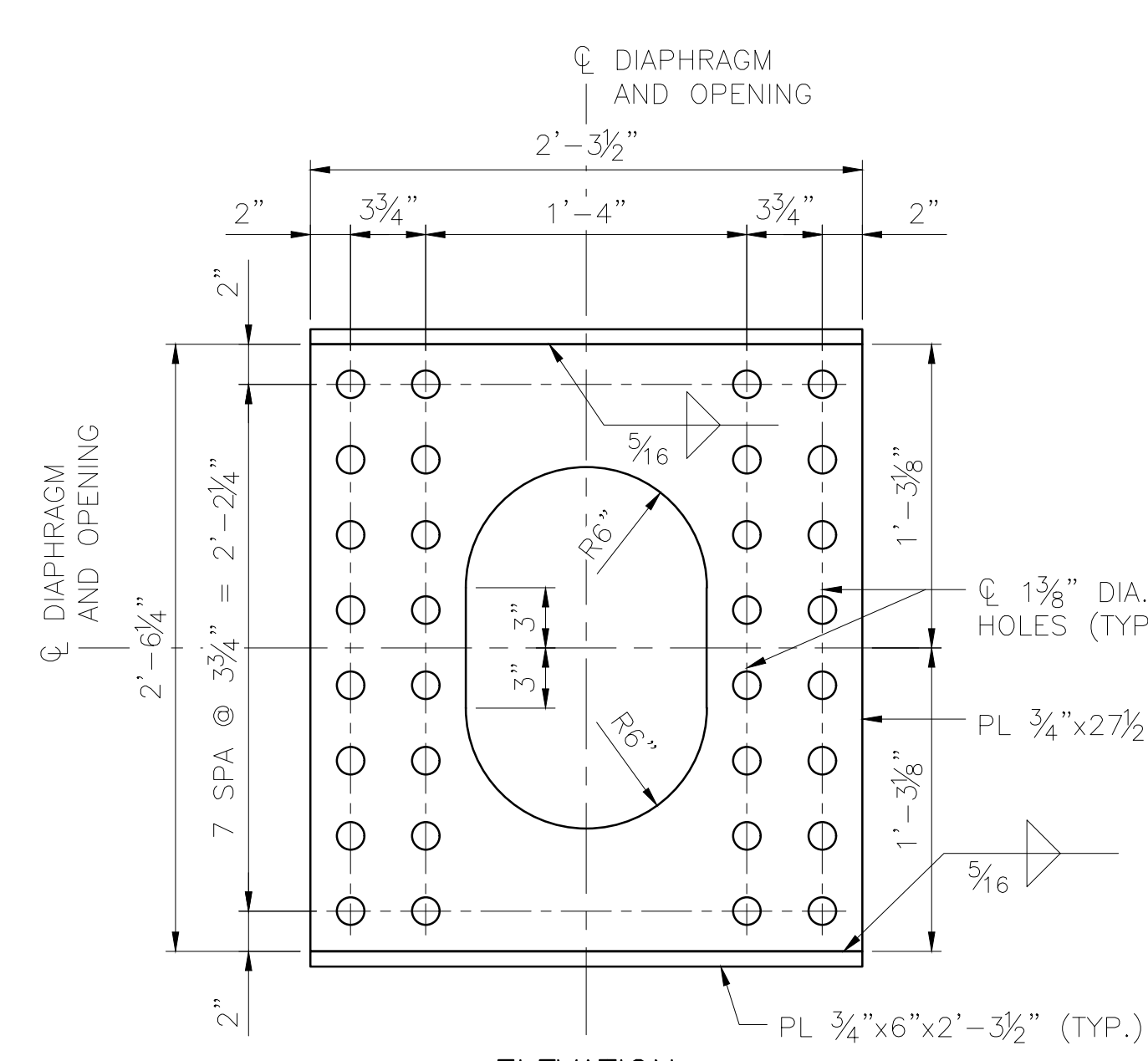
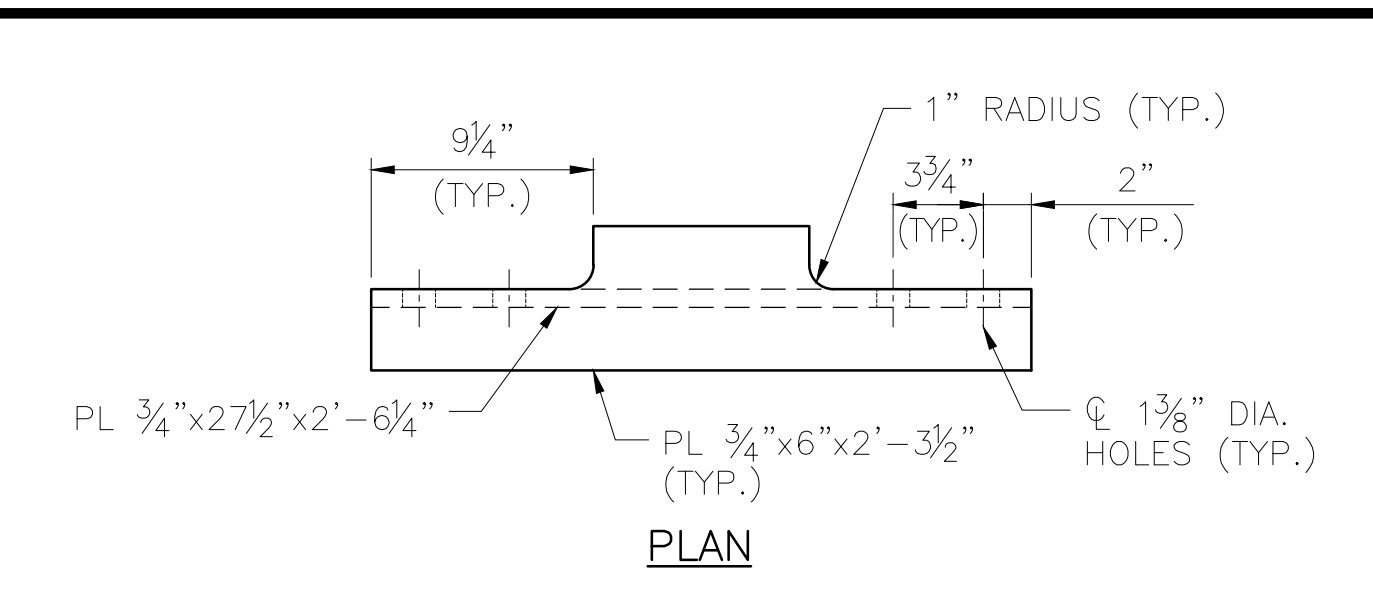
|   |   |
|---|---|
| DESIGNED BY: ML<br>CHECKED BY: KK<br>DRAFTED BY: MEM                                  |  <p style="font-size: small; margin-top: 5px;">           2/14/2025<br/>           HDR ENGINEERING, INC.<br/>           582 E. 35TH AVE., SUITE 500<br/>           ANCHORAGE, AK 99503-4169<br/>           (907) 644-2000<br/>           LICENSE #: AECC569         </p> |
|  |   |
| CAPITAL PROJECTS<br>P.O. BOX 107500<br>ANCHORAGE, ALASKA 99510-7500                   | PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3<br>SHEET TITLE: 79'-0" GIRDER SPAN - STEEL DETAILS (1 OF 2)  |
| AFE NO. 11228<br>YEAR 2025<br>SHEET 08 OF 22  |   |



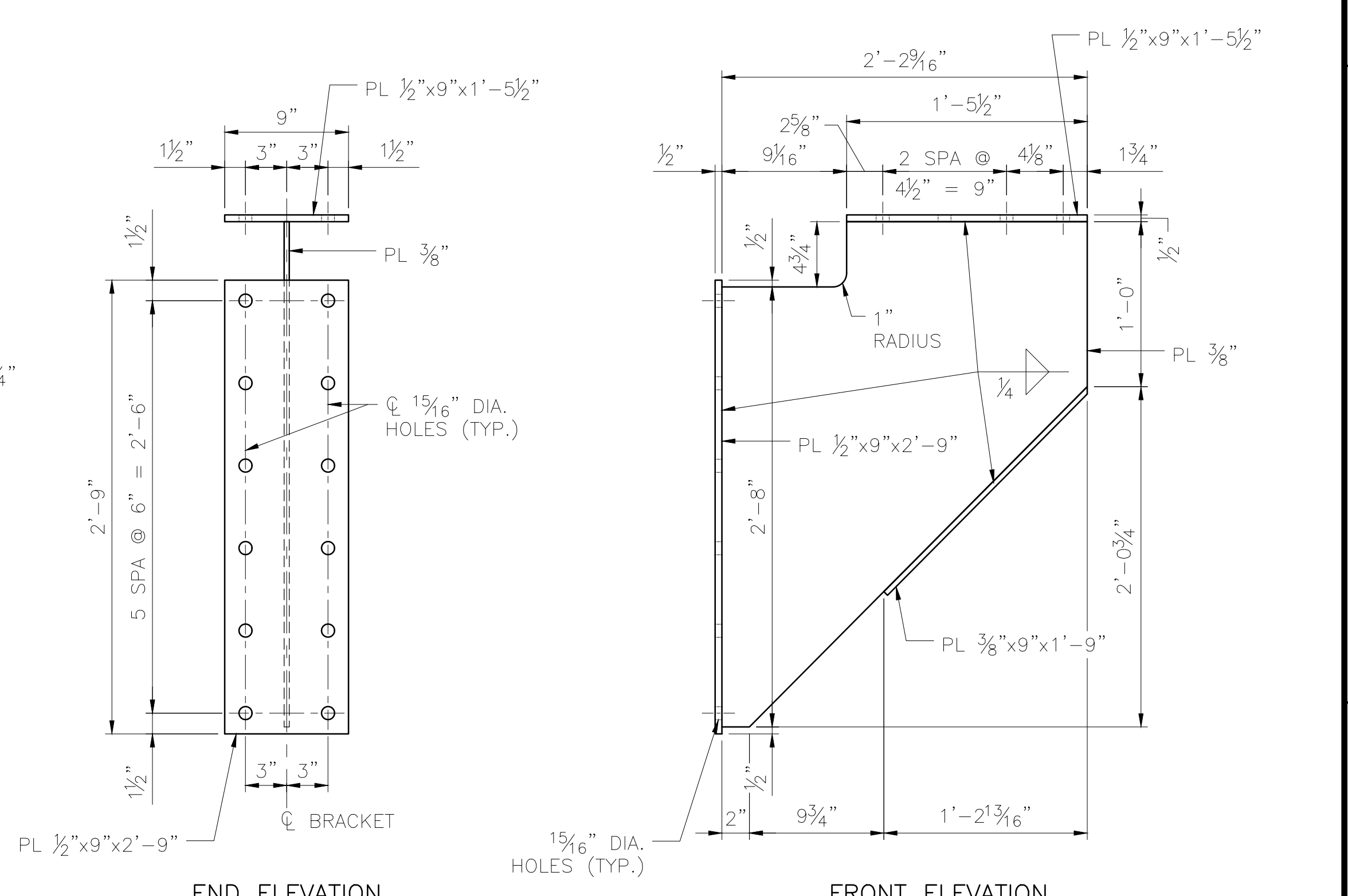
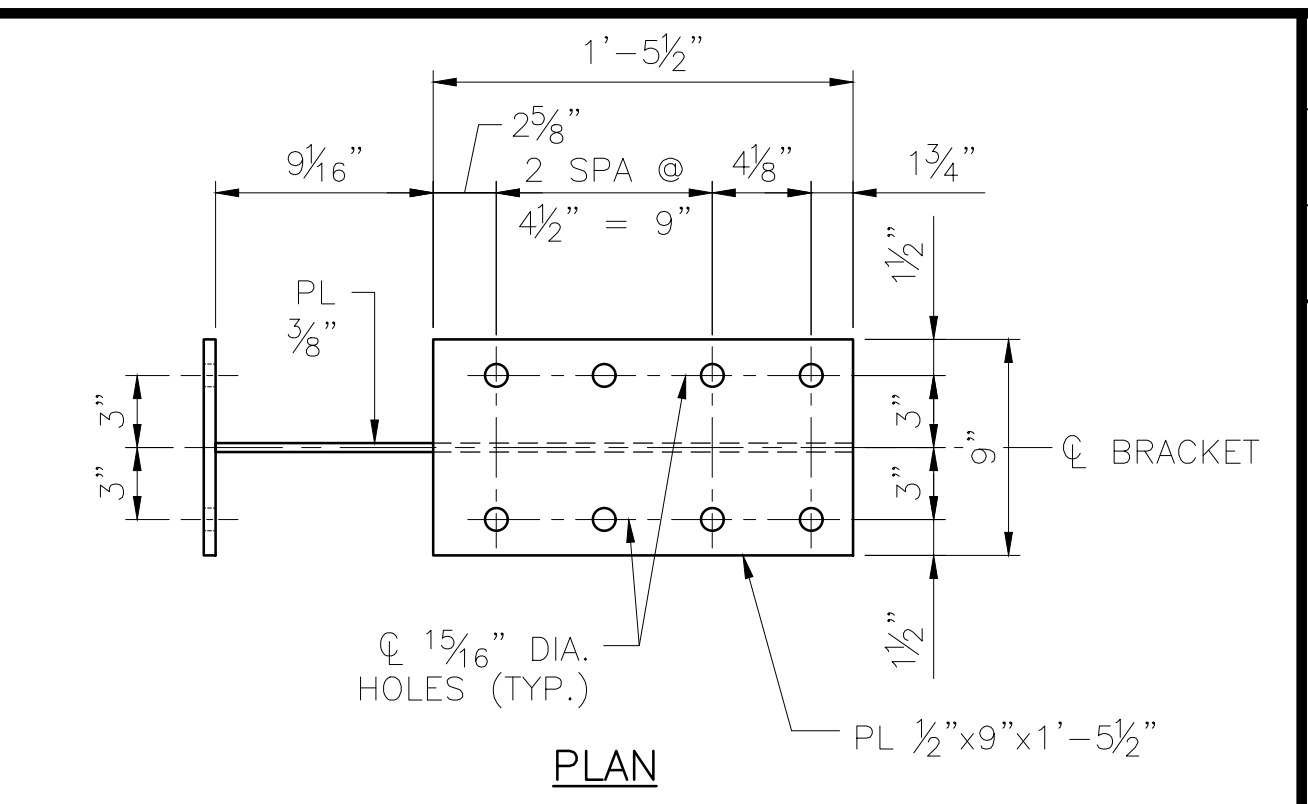
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 DATE: 2/14/2025 8:52 AM  
 SCALE: AS NOTED  
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 ARR: CTB\_2023.CTIB



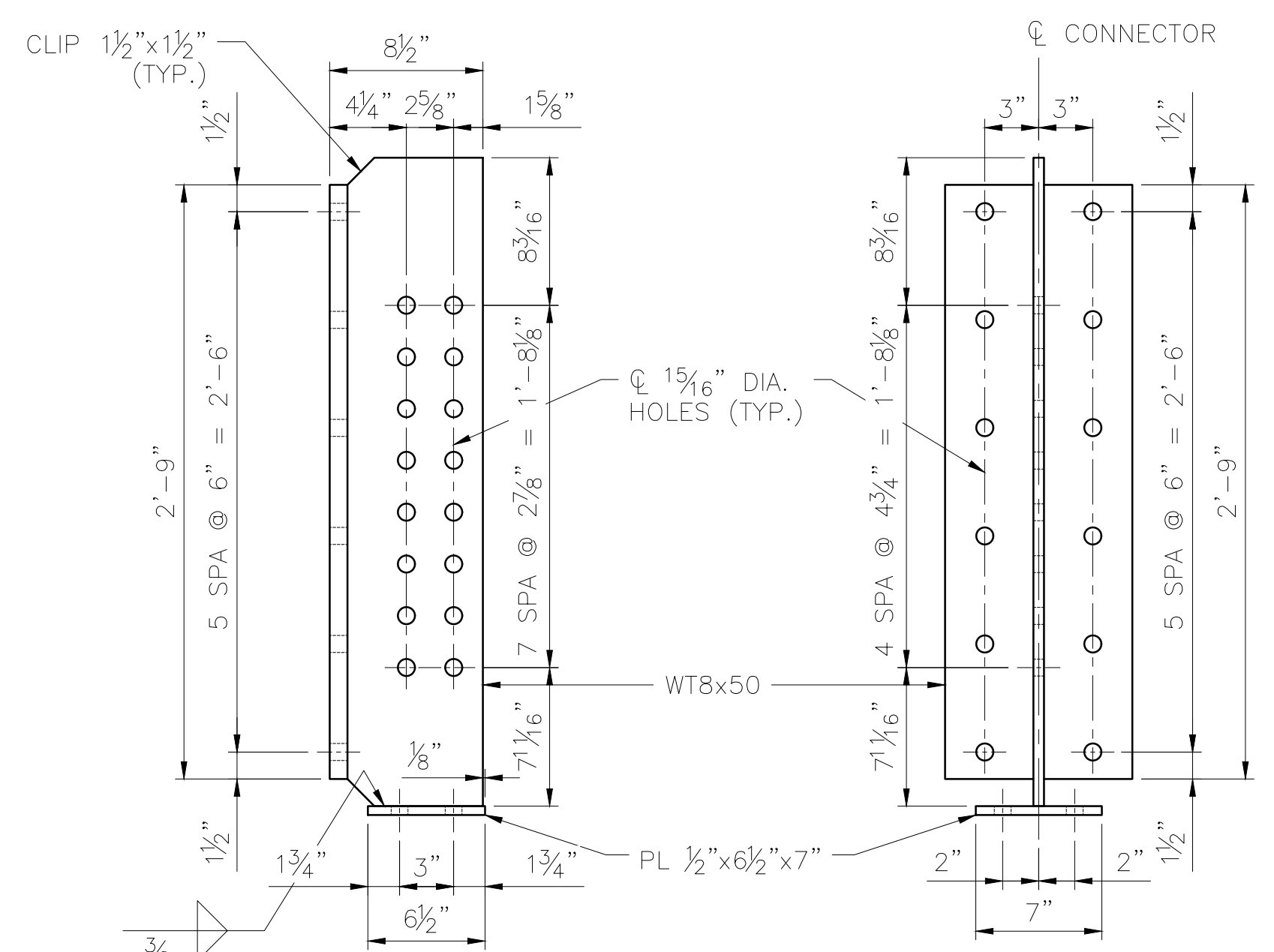
**SUPPORT BRACKET MK SB3**  
 SCALE: 1/2" = 1'-0"  
 8 ~ REQUIRED  
 ESTIMATED WEIGHT = 106 LBS



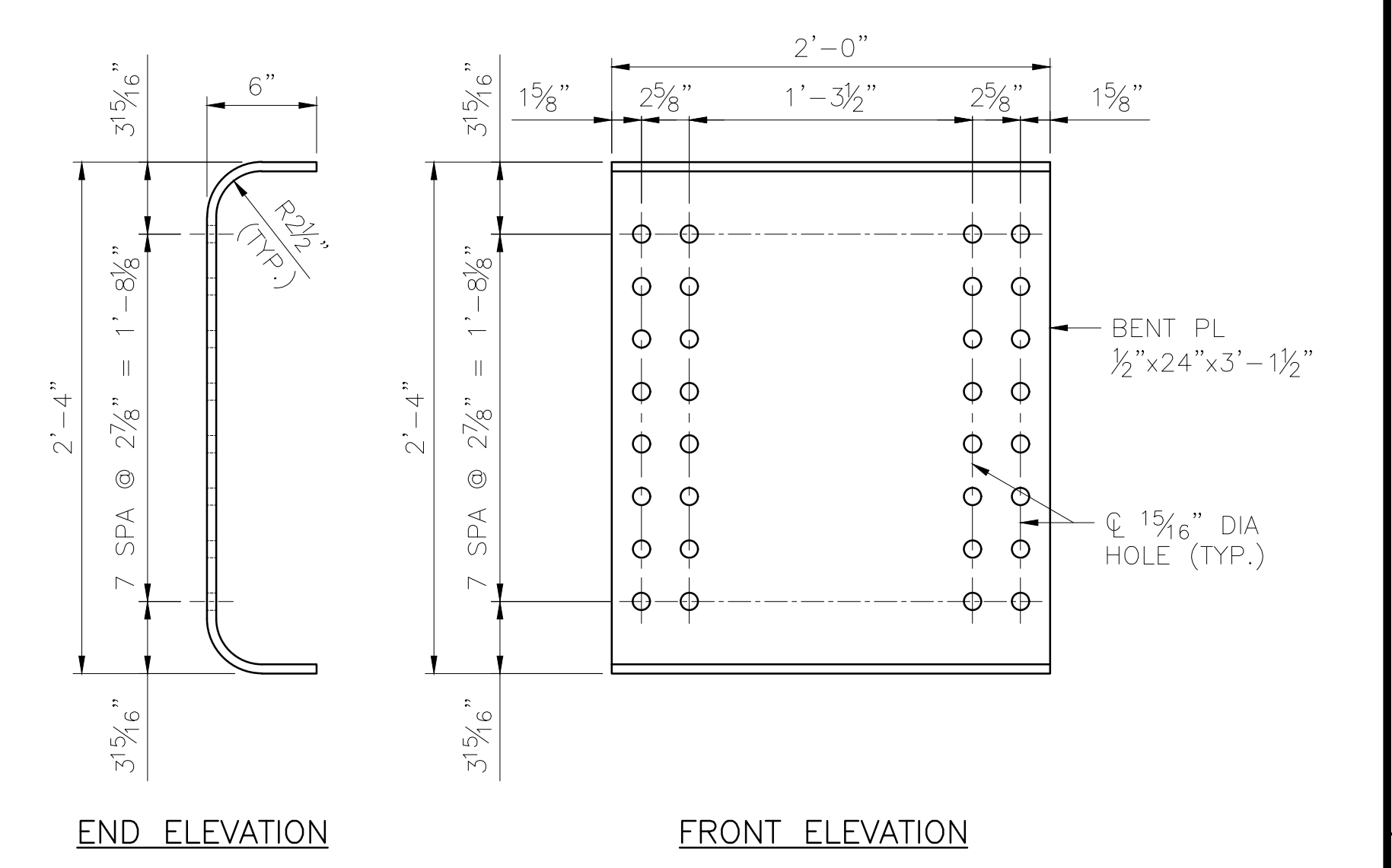
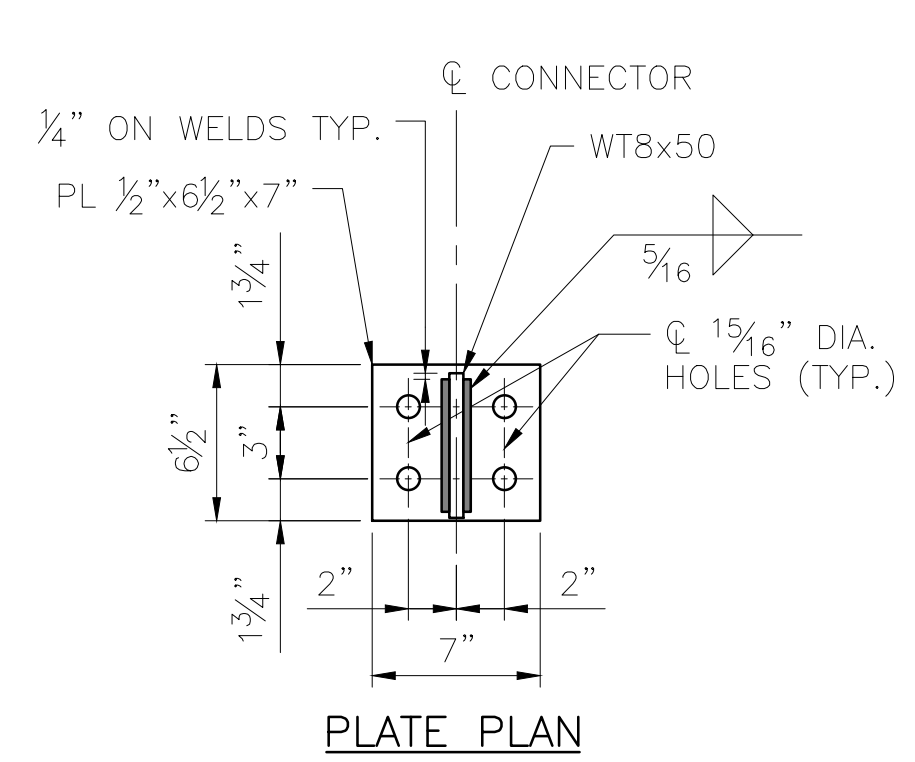
**END DIAPHRAGM MK ED2**  
 SCALE: 1/2" = 1'-0"  
 16 ~ REQUIRED  
 ESTIMATED WEIGHT = 187 LBS



**SUPPORT BRACKET MK SB4**  
 SCALE: 1/2" = 1'-0"  
 16 ~ REQUIRED  
 ESTIMATED WEIGHT = 151 LBS



**DIAPHRAGM CONNECTOR MK DC2**  
 SCALE: 1/2" = 1'-0"  
 64 ~ REQUIRED  
 ESTIMATED WEIGHT = 156 LBS

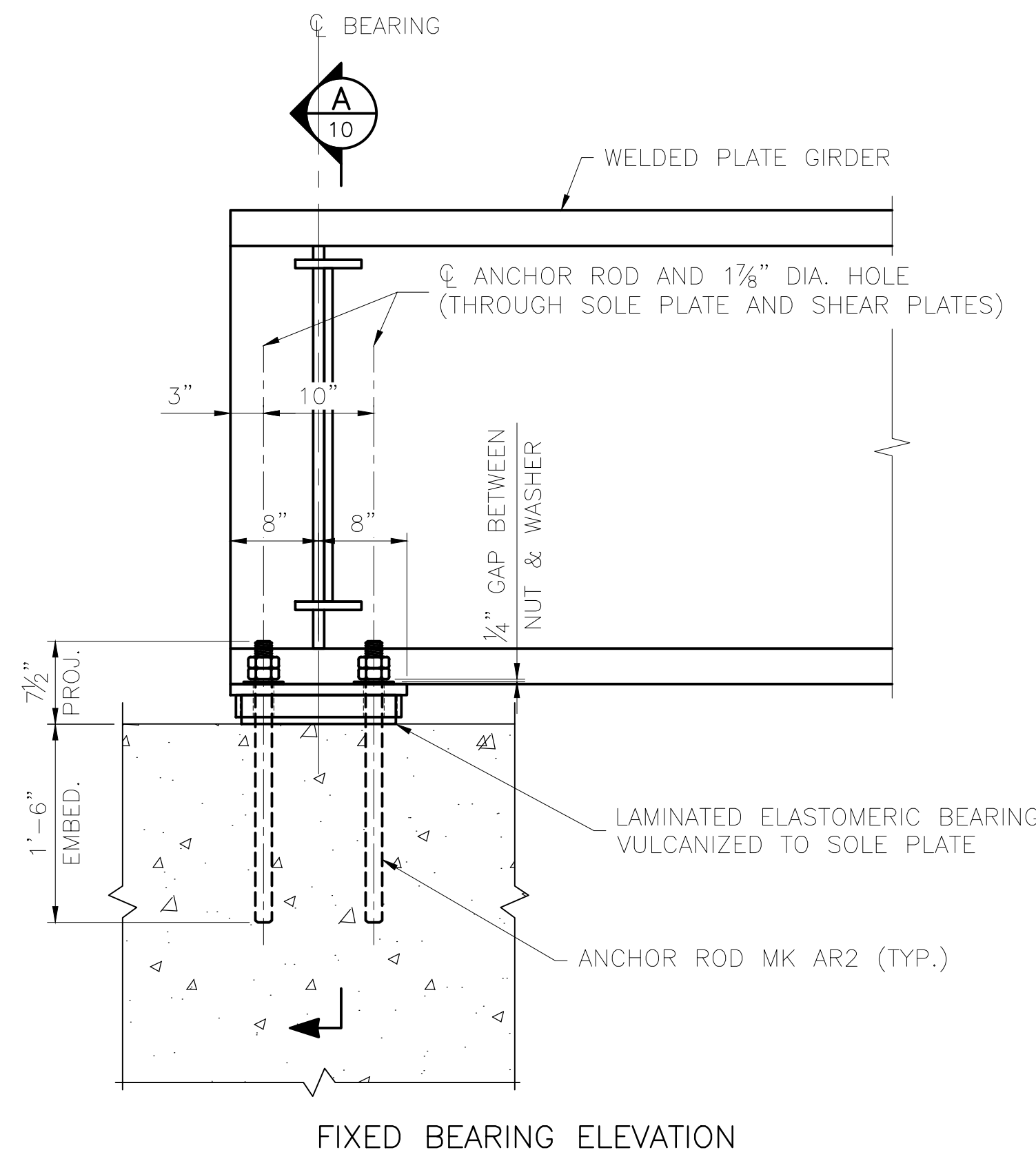


**INTERMEDIATE DIAPHRAGM MK ID2**  
 SCALE: 1/2" = 1'-0"  
 64 ~ REQUIRED  
 ESTIMATED WEIGHT = 128 LBS

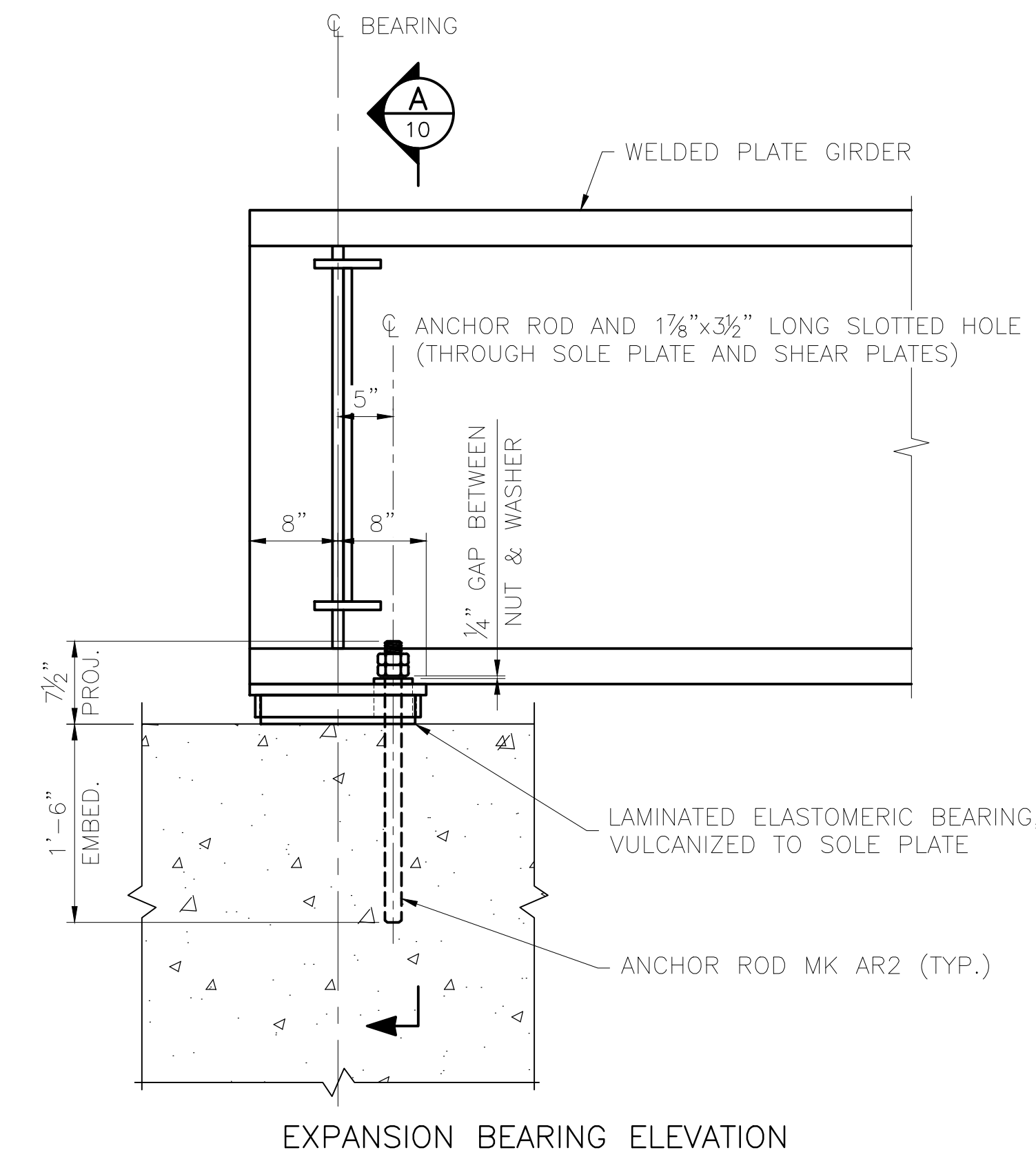
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|--|----------|
| DESIGNED BY:   | ML       |
| CHECKED BY:  | KK       |
| DRAFTED BY:  | MEM      |
|  |          |
| 2/14/2025<br>HDR ENGINEERING, INC.<br>582 E. 35TH AVE, SUITE 500<br>ANCHORAGE, AK 99503-4169<br>(907) 644-2000<br>LICENSE #: AECC569 |          |
|  |          |
| <b>CAPITAL PROJECTS</b><br>P.O. BOX 107500<br>ANCHORAGE, ALASKA 99510-7500   |          |
| PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3                         |          |
| SHEET TITLE: 79'-0" GIRDER SPAN - STEEL DETAILS (2 OF 2)   |          |
| AFE NO.  | 11228    |
| YEAR   | 2025     |
| SHEET  | 09 OF 22 |



DRAWING LOCATION: C:\PWORKING\WEST01\4079759\BR\_114.3\_SHIP\_CREEK\_10.DWG  
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 TIME: AS NOTED  
 SCALE: AS NOTED  
 PUBLISHED: CTB  
 ARR: CTB\_2023.CTB



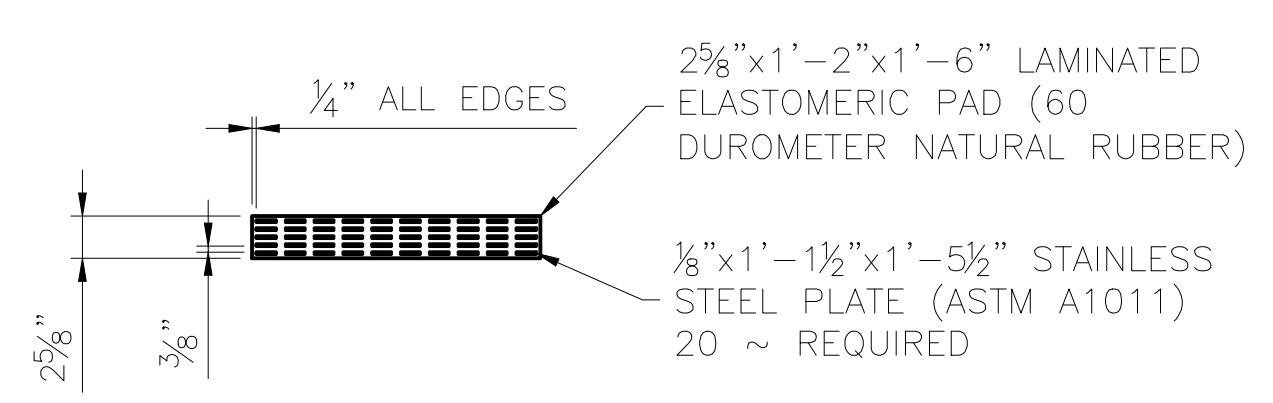
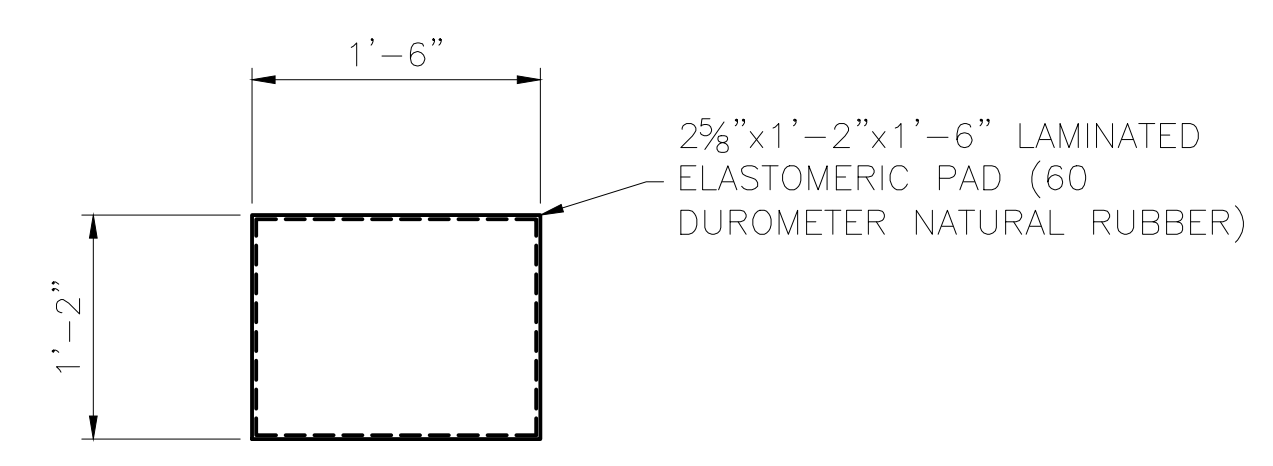
**FIXED BEARING ELEVATION**



**EXPANSION BEARING ELEVATION**

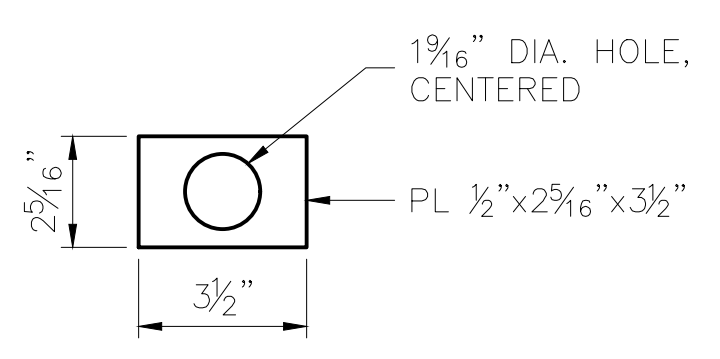
**SPAN 2 & 3 BEARING DETAIL**

SCALE: 1" = 1'-0"



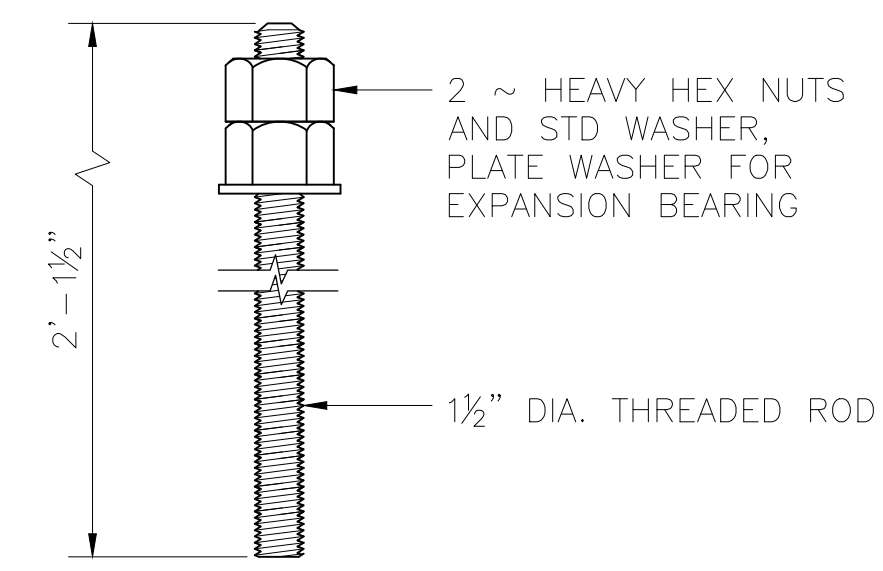
**LAMINATED ELASTOMERIC PAD DETAIL**

SCALE: 1" = 1'-0"



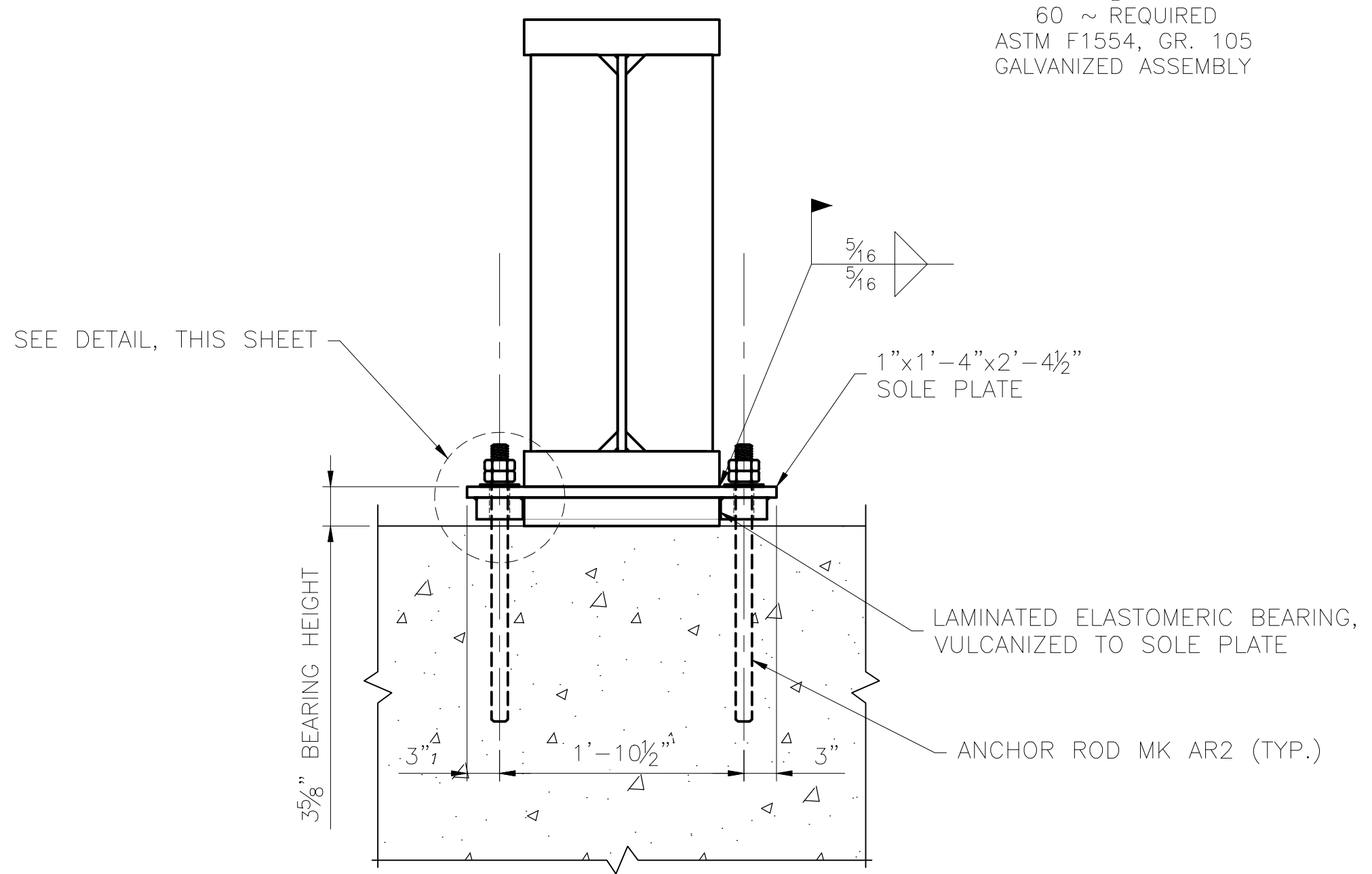
**PLATE WASHER**

SCALE: 3" = 1'-0"  
 20 ~ REQUIRED  
 ASTM F1554, GR. 105  
 GALVANIZED



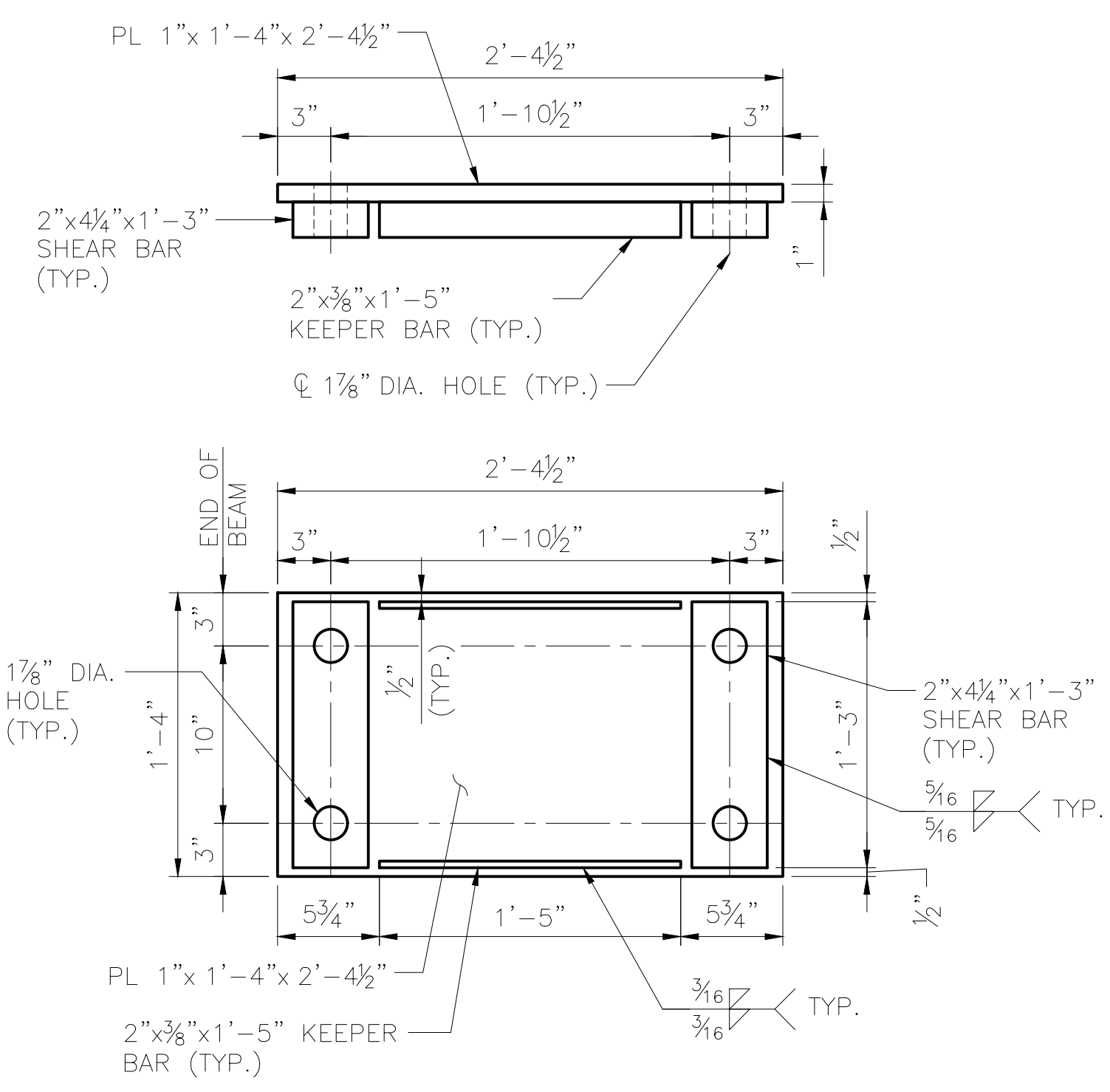
**ANCHOR ROD MK AR2**

SCALE: 1 1/2" = 1'-0"  
 60 ~ REQUIRED  
 ASTM F1554, GR. 105  
 GALVANIZED ASSEMBLY



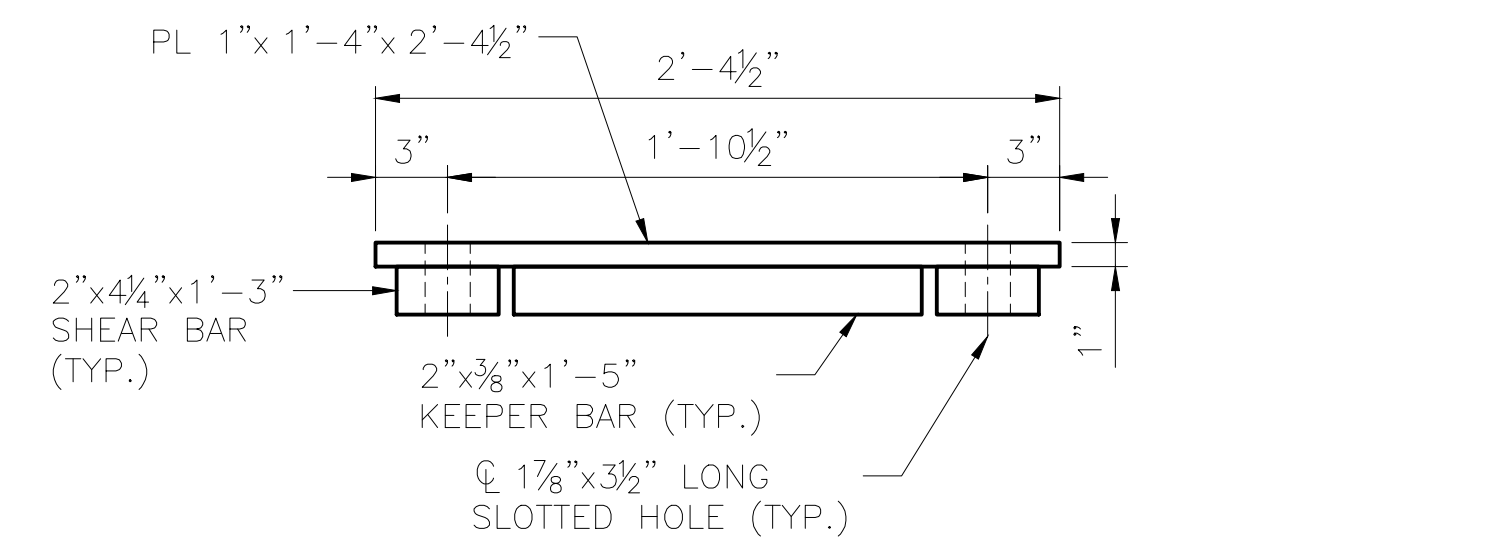
**SECTION**

SCALE: 1" = 1'-0"



**SOLE PLATE MK SP3 (FIXED)**

SCALE: 1 1/2" = 1'-0"



**SOLE PLATE MK SP4 (EXPANSION)**

SCALE: 1 1/2" = 1'-0"

|              |     |
|--------------|-----|
| DESIGNED BY: | ML  |
| CHECKED BY:  | KK  |
| DRAFTED BY:  | MEM |

STATE OF ALASKA  
 49th  
 KYLE KAULRICH  
 No. 201316  
 REGISTERED STRUCTURAL ENGINEER  
 2/14/2025  
 HDR ENGINEERING, INC.  
 582 E. 36TH AVE, SUITE 500  
 ANCHORAGE, AK 99503-4169  
 (907) 644-2000  
 LICENSE #: AECC569

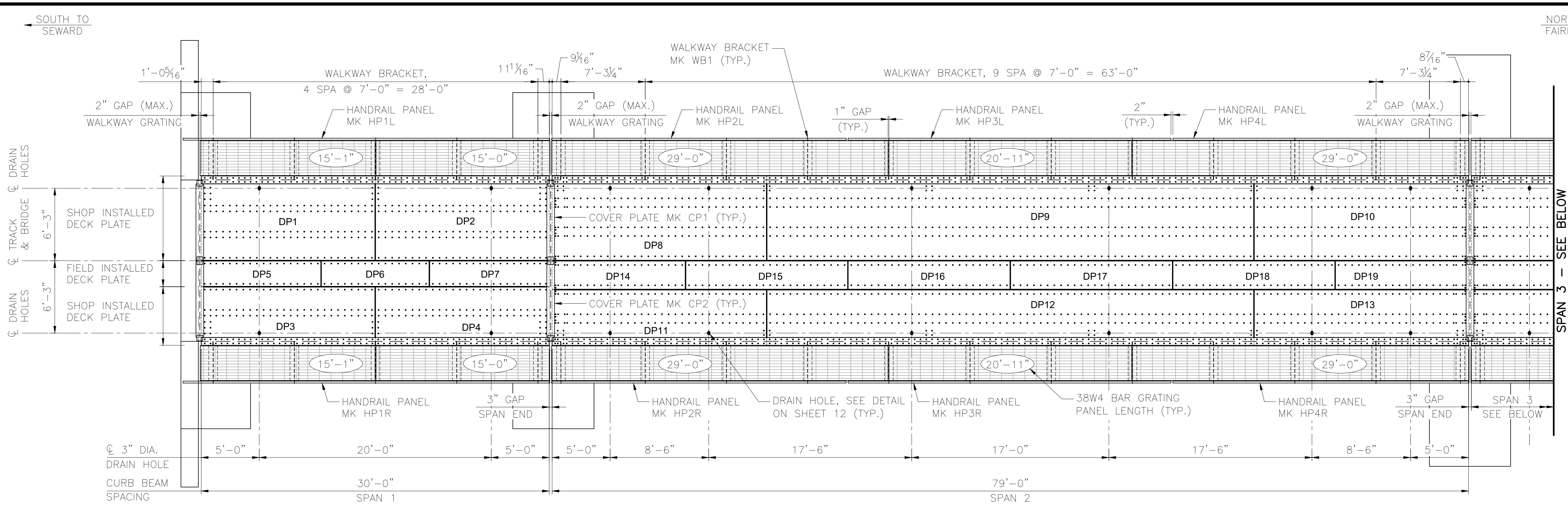
**HR**  
 400 E. 30TH AVE, SUITE 500  
 ANCHORAGE, AK 99503-4169  
 (907) 644-2000

**CAPITAL PROJECTS**  
 P.O. BOX 107500  
 ANCHORAGE, ALASKA 99510-7500  
**ALASKA RAILROAD**  
 PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3  
 SHEET TITLE: 79' - 0" GIRDER SPAN - BEARING DETAILS

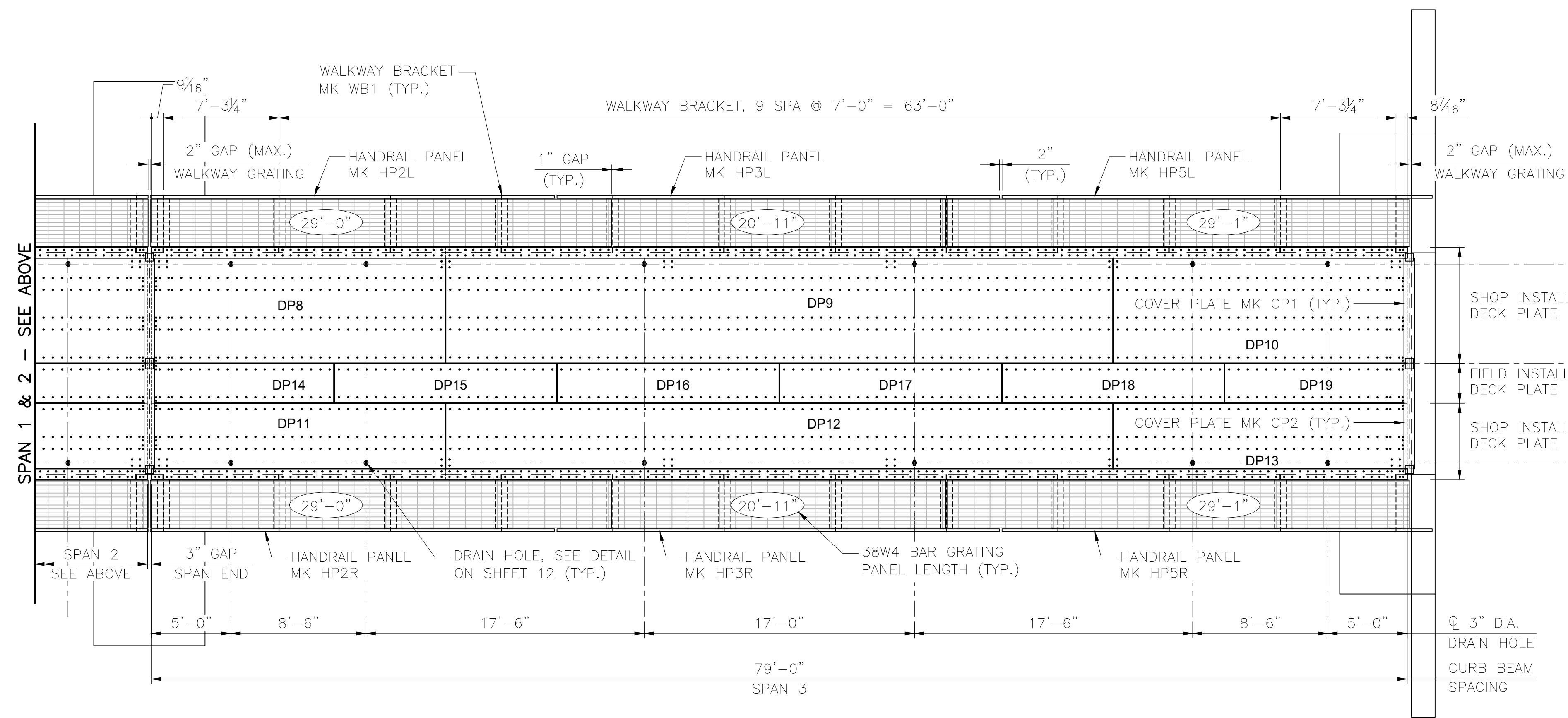
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|---------|----------|
| AFE NO. | 11228    |
| YEAR    | 2025     |
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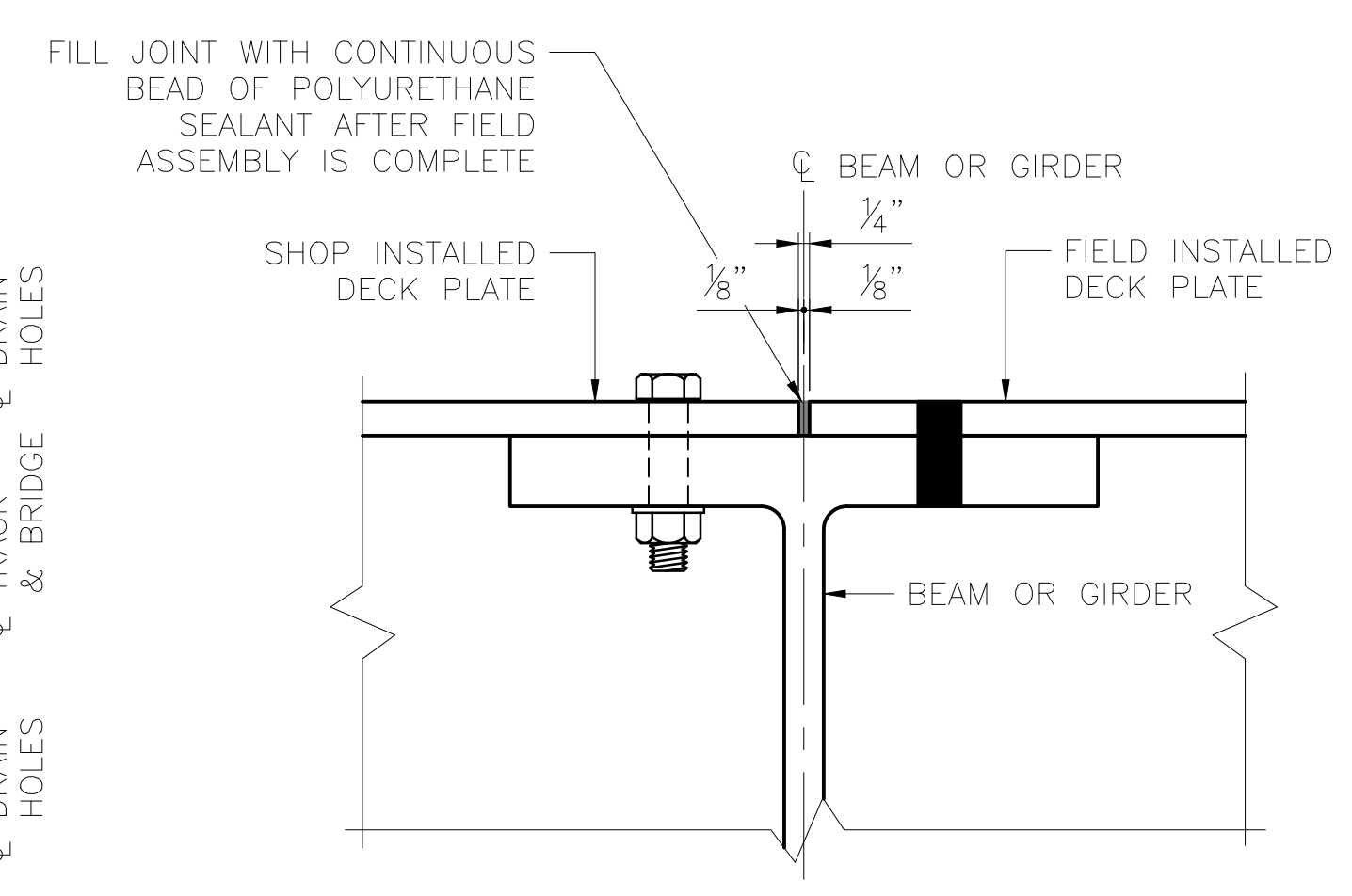
DRAWING LOCATION: C:\PWORKING\WEST01\4079759\BR\_114.3\_SHIP\_CREEK\_11.DWG  
 DATE: 2/14/2025 8:53 AM  
 TIME: 8:53 AM  
 SCALE: AS NOTED  
 PUBLISHED CTB: ARRC\_CTb\_2023.CTB



**DECK PLAN**  
SCALE: 1" = 5'



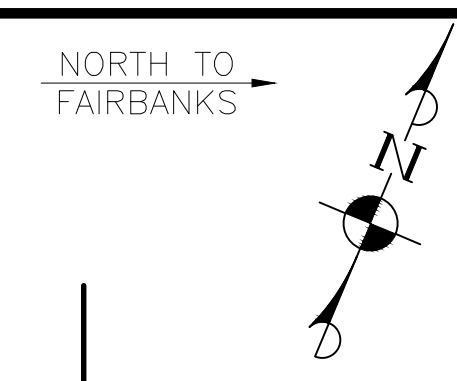
**DECK PLAN**  
SCALE: 1" = 5'



**DECK PLATE DETAIL**  
SCALE: 3" = 1'-0"

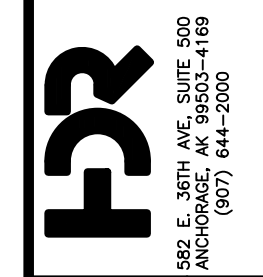
**NOTES:**

1. WALKWAY GRATING SHALL BE CAPABLE OF SUPPORTING 85 PSF UNIFORM LIVE LOAD PRESSURE AND SHALL HAVE A DEFLECTION AT MIDSPAN NOT GREATER THAN L/160 UNDER A 250 LB CONCENTRATED LOAD FOR THE MAXIMUM SPAN LENGTH NOTED.
2. WALKWAY GRATING SHALL HAVE A MAXIMUM OPENING SIZE OF 2"x4" AND HAVE A SERRATED SURFACE TEXTURE.



|              |     |
|--------------|-----|
| DESIGNED BY: | ML  |
| CHECKED BY:  | KK  |
| DRAFTED BY:  | MEM |

HDR ENGINEERING, INC.  
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 LICENSE #: AECC569



**CAPITAL PROJECTS**  
 P.O. BOX 107500  
 ANCHORAGE, ALASKA 99510-7500

**ALASKA RAILROAD**  
 PROJECT: FABRICATION AND SUPPLY OF 2~79' DECK PLATE GIRDER SPANS AND 1~30' ROLLED BEAM SPAN FOR BRIDGE 114.3  
 SHEET TITLE: WALKWAY AND DECK PLAN

|         |          |
|---------|----------|
| AFE NO. | 11228    |
| YEAR    | 2025     |
| SHEET   | 11 OF 22 |