

DECK PLAN 1

**NOTES:**

1. FOR SECTION A-A, SEE SHEET B123 (DECK SECTIONS).
2. FOR PANEL DETAILS, SEE SHEETS B125 TO B138 (DECK PANEL DETAILS).
3. FOR ADDITIONAL DECK PANEL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
4. FOR SECTIONS E-E, F-F, G-G, J-J, L-L, AND M-M AND OTHER MISCELLANEOUS DECK DETAILS, SEE SHEETS B139 AND B140 (DECK DETAILS).
5. CONTRACTOR TO FIELD VERIFY SPAN DIMENSIONS PRIOR TO SUBMITTING SHOP DRAWINGS.

**LEGEND:**

- (XN) INDICATES DECK PANEL TYPE XN
- [Hatched Pattern] INDICATES LONGITUDINAL UHPC CLOSURE POUR
- [Hatched Pattern] INDICATES TRANSVERSE UHPC CLOSURE POUR
- N-N INDICATES SPANDREL NUMBER

**CLOSURE POUR SEQUENCING NOTES:**

1. PLACE END DAMS WITHIN LONGITUDINAL CLOSURE POURS ON EACH SIDE OF EVERY TRANSVERSE CLOSURE POUR WHERE INDICATED IN THESE PLANS.
2. POUR ALL LONGITUDINAL CLOSURE POURS BETWEEN PLACED DECK PANELS WITHIN A GIVEN BAY PRIOR TO MOVING ON TO THE NEXT BAY.
3. COMPLETE LONGITUDINAL CLOSURE POURS ON EITHER SIDE OF A TRANSVERSE CLOSURE POUR AND REMOVE ALL END DAMS PRIOR TO CASTING TRANSVERSE CLOSURE POURS.
4. COMPLETE TRANSVERSE CLOSURE POURS OVER THE SPANDREL COLUMNS PRIOR TO TRANSVERSE CLOSURE POURS OVER THE PIERS.
5. VERTICAL COLD JOINTS (CONSTRUCTION JOINTS) BETWEEN LONGITUDINAL AND TRANSVERSE CLOSURE POURS SHALL BE PERMITTED ONLY AT LOCATIONS INDICATED IN THESE PLANS OR AS ACCEPTED BY THE ENGINEER. HORIZONTAL COLD JOINTS WILL NOT BE PERMITTED.
6. EACH TRANSVERSE CLOSURE POUR SHALL BE CAST AS ONE CONTINUOUS POUR.

7. CONTRACTOR SHALL NOT PLACE CONSTRUCTION EQUIPMENT ON THE DECK PANELS UNTIL THE UHPC ATTAINS A MINIMUM COMPRESSIVE STRENGTH OF 15 KSI. CONTRACTOR SHALL FOLLOW THE SPECIAL PROVISIONS FOR CONSTRUCTION LOADS PERMITTED ON THE DECK PANELS.
8. THE MINIMUM UHPC COMPRESSIVE STRENGTH REQUIRED PRIOR TO OPENING THE BRIDGE TO TRAFFIC IS 15 KSI.

1 SEE SHEETS B122A-E FOR REVISED DECK PANEL LAYOUT BASED ON POST-CONTRACTOR SURVEY.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

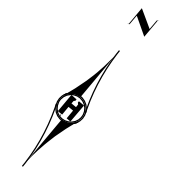
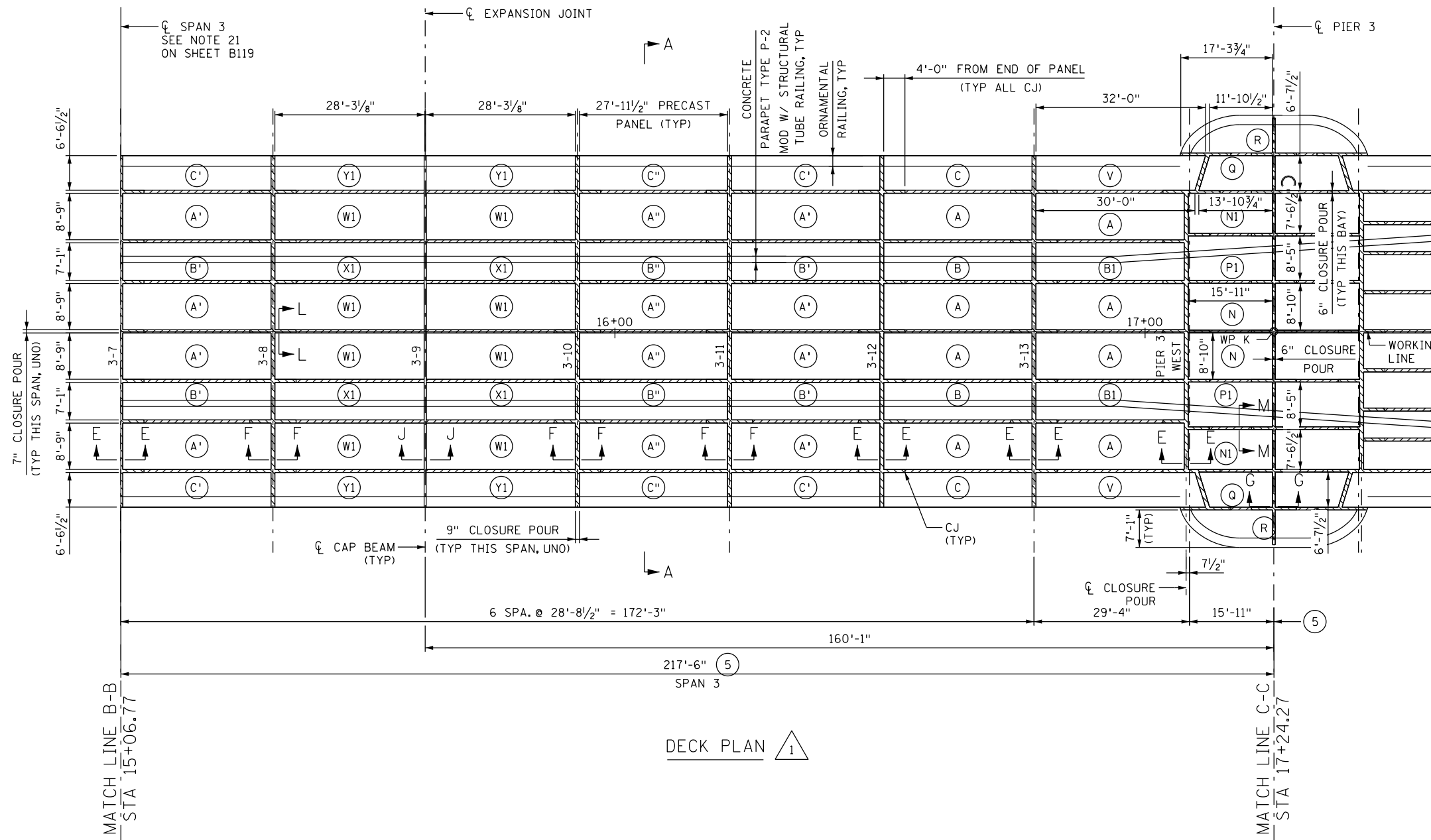
*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
 41308 LICENSE NO. 8/14/2014 DATE

DESIGN BY: CB  
 CAD BY: CB  
 CHECKED BY: EBR  
 LAST REVISION:

AS-BUILT - DECK PLAN (2 OF 4)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

SHEET  
 B120  
 B176



**LEGEND:**

- (XN) INDICATES DECK PANEL TYPE XN
- [Hatched Box] INDICATES LONGITUDINAL UHPC CLOSURE POUR
- [Diagonal Hatched Box] INDICATES TRANSVERSE UHPC CLOSURE POUR
- N-N INDICATES SPANDREL NUMBER

**NOTES:**

1. FOR SECTION A-A, SEE SHEET B123 (DECK SECTIONS).
2. FOR PANEL DETAILS, SEE SHEETS B125 TO B138 (DECK PANEL DETAILS).
3. FOR ADDITIONAL DECK PANEL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
4. FOR SECTIONS E-E, F-F, G-G, J-J, L-L, AND M-M AND OTHER MISCELLANEOUS DECK DETAILS, SEE SHEETS B139 AND B140 (DECK DETAILS).
5. CONTRACTOR TO FIELD VERIFY SPAN DIMENSIONS PRIOR TO SUBMITTING SHOP DRAWINGS.

① SEE SHEETS B122A-E FOR REVISED DECK PANEL LAYOUT BASED ON POST-CONTRACTOR SURVEY.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**

**41308**      **8/14/2014**  
 LICENSE NO.      DATE

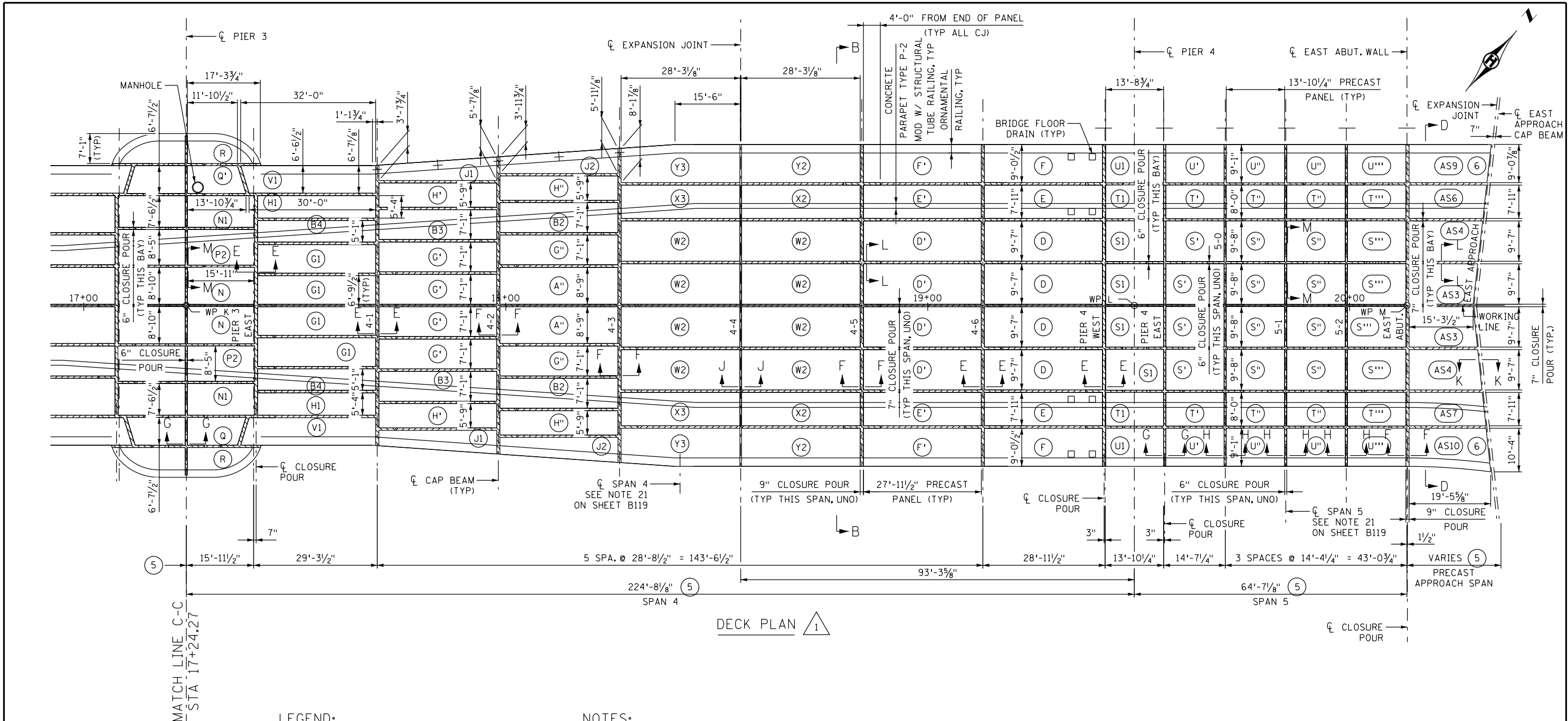
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**AS-BUILT - DECK PLAN (3 OF 4)**

**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**  
**BRIDGE 2441      S.P. 027-605-029**

**SHEET**

**B121**  
**B176**



**LEGEND:**

- (XN) INDICATES DECK PANEL TYPE XN
- (ASN) INDICATES APPROACH SPAN PANEL TYPE N
- [Hatched Box] INDICATES LONGITUDINAL UHPc CLOSURE POUR
- [Hatched Box] INDICATES TRANSVERSE UHPc CLOSURE POUR
- N-N INDICATES SPANDREL NUMBER

**NOTES:**

1. FOR SECTIONS B-B AND D-D, SEE SHEETS B123 AND B124 (DECK SECTIONS).
  2. FOR PANEL DETAILS, SEE SHEETS B125 TO B138 (DECK PANEL DETAILS).
  3. FOR ADDITIONAL DECK PANEL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
  4. FOR SECTIONS E-E, F-F, G-G, H-H, J-J, K-K, L-L, AND M-M AND OTHER MISCELLANEOUS DECK DETAILS, SEE SHEETS B139 AND B140 (DECK DETAILS).
  5. CONTRACTOR TO FIELD VERIFY SPAN DIMENSIONS PRIOR TO SUBMITTING SHOP DRAWINGS.
  6. FOR DEFINITION OF SIDEWALK ELEVATION TRANSITION, SEE EAST APPROACH MODIFICATIONS DETAILS (1 OF 3), SHEET B80.
- 1 SEE SHEETS B122A-E FOR REVISED DECK PANEL LAYOUT BASED ON POST-CONTRACTOR SURVEY.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**

41308      8/14/2014  
 LICENSE NO.      DATE

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**AS-BUILT - DECK PLAN (4 OF 4)**

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

**SHEET**  
 B122  
 B176

**DRAWING DATA:**

1. SURVEY INFORMATION USED TO LOCATE EXISTING SPANDREL COLUMNS AND TRANSVERSE PIER WALLS COMES FROM KNA/HTPO SURVEY PROVIDED IN HARD-COPY AT JUNE 30, 2015 WEEKLY MEETING. NOTE, NOT ALL INFORMATION WAS PROVIDED AND ASSUMPTIONS WERE MADE FOR SPANDREL 1-1, 3-6, 3-8, 4-1, 4-2, 4-3, 4-4 TRANSVERSE COLUMN WIDTH.

2. THIS DRAWING IS BASED ON ALIGNING THE FACE OF PRECAST CAP BEAMS WITH THE SURVEY POINTS PROVIDED BY KNA/HTPO AT THE SPANDREL COLUMNS OR TRANSVERSE PIER WALLS.

3. PROPOSED SPANDREL COLUMN AND CAP LOCATION AT SPANDREL 1-0 IS LOCATED BY EQUALLY DIVIDING THE DISTANCE FROM FACE OF WEST ABUTMENT TO FACE OF SPANDREL COLUMN 1-1 USING STATION, OFFSET AND COLUMN WIDTH INFORMATION FROM THE CONTRACTOR (KNA/HTPO). SPANDREL COLUMN 1-2 WAS LOCATED SIMILAR TO SPANDREL COLUMN 1-0.

4. PROPOSED SPANDREL COLUMN AND CAP LOCATIONS AT SPANDREL 5-0, 5-1 AND 5-2 ARE LOCATED BY EQUALLY DIVIDING THE DISTANCE FROM FACE OF EAST ABUTMENT TO FACE OF PIER 4 USING STATION, OFFSET AND COLUMN WIDTH INFORMATION FROM THE CONTRACTOR (KNA/HTPO). AS A RESULT OF THE MODIFICATIONS PROPOSED BY THE CONTRACTOR ON 8-13-15 NOTED BELOW, SPANDREL 5-0 WILL BE MOVED 2 INCHES TO THE EAST TO OBTAIN ADEQUATE DECK PANEL END BEARING ON THE EAST SIDE OF THE CAP BEAM AT 5-0.

5. THE DECK PANELS ARE LOCATED IN THIS DRAWING PER PLAN WITH THE FOLLOWING MODIFICATIONS PROPOSED BY THE CONTRACTOR ON 8-13-15:

**A. SPAN 1 AND 2**

I. LENGTHEN PANELS 65 THROUGH 68 BY ADDING 2.0' AT THE END OF THE EXPANSION DROP DOWN SECTION (DROP DOWN LENGTH CHANGE FROM 2'-4" (PLAN) TO 2'-6" ALONG THE BOTTOM OF DECK PANEL).

II. SHIFT PANELS ON LEFT SIDE OF THE BRIDGE (LOOKING UP STATION) OR UPSTREAM SIDE OF BRIDGE CENTERLINE ONLY (PANELS 9 THROUGH 68), 2.0' TO THE WEST.

III. PANELS 1 THROUGH 4 WILL BE PROPOSED AS CIP AND NEED TO BE SHORTENED TO THE WEST BY 2.0'.

IV. REGARDING UPSTREAM, EAST SIDE OF SPANDREL 2-2. THE DIMENSION FROM FACE OF CAP BEAM TO END OF PANEL 65-Y1 WAS 6 1/8 INCH ON THE PREVIOUS ITERATION OF THIS DOCUMENT. SHIFTING PANELS 2 INCHES TO THE WEST WOULD INCREASE THIS DIMENSION TO 8 1/8 INCH WHICH IS BELOW THE MINIMUM REQUIRED OF 8 1/4 INCH FOR A 9 INCH UHPC CLOSURE POUR. KRAEMER (KNA) STATED THEIR INDEPENDENT SURVEY ON AUGUST 8, 2015 AND HTPO'S VERIFICATION SURVEY ON AUGUST 12, 2015 INDICATE THAT THE BEARING DISTANCE AT THIS LOCATION IS 6 3/8 INCH AND ONCE THE PANELS ARE SHIFTED RESULTS IN 8 3/8 INCH WHICH IS GREATER THAN THE MINIMUM REQUIRED. THIS WAS FURTHER CLARIFIED ON A CALL BETWEEN DAN ENSER (HNTB) AND STEVE KALDENBACH (KNA) ON 8-27-15, KNA CLARIFIED THAT UPSTREAM COLUMN AT 2-2 WAS RE-SURVEYED AND FOUND TO BE 1/4 INCH EAST OF THE LOCATION PREVIOUSLY DETERMINED IN JUNE 30, 2015 SURVEY. THIS COLUMN IN THIS DRAWING WAS MOVED 1/4 INCH TO THE EAST, RESULTING IN A BEARING DISTANCE FROM THE WEST END OF PANEL 65-Y1 TO EAST FACE OF CAP BEAM OF 8 3/8 INCH, WHICH IS GREATER THAN THE REQUIRED 8 1/4 INCH DISTANCE.

V. REGARDING DOWNSTREAM, EAST SIDE OF SPANDREL 2-4. THE DIMENSION FROM FACE OF CAP BEAM TO END OF PANEL 88-C 7 1/8 INCH ON THE PREVIOUS ITERATIONS OF THIS DOCUMENT WHICH IS BELOW THE MINIMUM REQUIRED OF 8 1/4 INCH OR A 9 INCH UHPC CLOSURE POUR. KRAEMER'S INDEPENDENT SURVEY ON AUGUST 8, 2015 AND HTPO'S VERIFICATION SURVEY ON AUGUST 12, 2015 INDICATE THAT THE BEARING DISTANCE AT THIS LOCATION IS 8 1/4 INCH WHICH IS EQUAL TO THE MINIMUM REQUIRED.

**B. SPAN 3**

I. SHORTEN PANELS 116 THROUGH 123 BY 2.0'.

II. SHIFT PANELS (125 THROUGH 180) 2.0' TO WEST.

III. PANELS 173 THROUGH 180 WILL HAVE 2' LONGER LONGITUDINAL REINFORCING STEEL PROTRUDING TOWARD THE EAST, THE BARS ARE TO BE EMBEDDED INTO 11' UHPC JOINT ON PIER CAP 3-7. NOTE, THIS IS SLIGHTLY MODIFIED FROM CONTRACTOR'S PROPOSAL AFTER AGREEING ON 8-20-15 THAT THE LARGER JOINT IS BEST ACCOMPLISHED AT SPANDREL 3-7 WHERE THE JOINT IS FIXED, THUS NOT NEEDING TO MODIFY STAINLESS STEEL PLATES OR FORM A WIDER OPENING BETWEEN STAINLESS STEEL PLATES AT SPANDREL 3-6.

IV. PANELS 125 AND 132 MAY BE SHORTENED BY 2.0' INSTEAD OF PANELS 116 AND 123 IF BEARING DISTANCES OF THESE PANELS (116 & 123) ARE A CONCERN AFTER THE CURVED GEOMETRY OF THE EXISTING PIER 2 IS DETERMINED.

**C. SPAN 4 AND 5**

I. SHORTEN PANELS 248 THROUGH 255 BY 2.5'.

II. SHIFT ALL PANELS (257 THROUGH 358) 2.5' TO THE WEST.

III. PANELS 359 THROUGH 366 WILL BE PROPOSED AS CIP AND NEED TO BE LENGTHEN TO THE WEST BY 2.5'.

IV. PANELS 257 AND 266 MAY BE SHORTENED BY 2.5' INSTEAD OF PANELS 248 AND 255 IF BEARING DISTANCES OF THESE PANELS (248 & 255) ARE A CONCERN AFTER THE CURVED GEOMETRY OF THE EXISTING PIER 3 IS DETERMINED.

**GEOMETRIC CRITERIA**

**I. DECK PANELS AND UHPC CLOSURE POURS**

A. IF THE UHPC CLOSURE POURS GET WIDER THAN THE PLANS REQUIRE OR A PANEL IS SHORTENED OR LENGTHENED, THE LAP LENGTH BETWEEN THE LONGITUDINAL DECK REINFORCING BARS REQUIRED ON THE PLANS MUST BE ACHIEVED AND REINFORCEMENT BARS ADJUSTED ACCORDINGLY.

B. UHPC CLOSURE POURS ARE NOT ALLOWED TO BE NARROWER THAN REQUIRED ON THE PLANS.

C. FOR THE 6 INCH WIDE UHPC CLOSURE POURS (SECTION H-H, SHEET B139), IF THESE INCREASE IN WIDTH TO MORE THAN 8 INCH WIDE, THE BOTTOM #5 REINFORCEMENT BARS TRANSVERSE TO BRIDGE CENTERLINE MUST BE INCREASED TO #6 BARS.

D. FOR THE 9 INCH WIDE UHPC CLOSURE POURS (SECTION F-F, SHEET B139), IF THESE INCREASE IN WIDTH TO MORE THAN 11 INCH WIDE, THE SIZE OF THE TOP #5 REINFORCEMENT BAR TRANSVERSE TO BRIDGE CENTERLINE MUST BE INCREASED TO A #6 BAR AND THE BOTTOM #6 REINFORCEMENT BAR TRANSVERSE TO BRIDGE CENTERLINE MUST BE INCREASED TO A #7 BAR.

E. IF UHPC CLOSURE POURS INCREASE IN WIDTH AND THE PILASTER IS CENTERED IN THE JOINT, CONTRACTOR IS MADE AWARE THAT THE DISTANCE FROM FACE OF PILASTER TO END OF PRECAST DECK PANEL CURB WILL BE LONGER THAN THE PLANNED 2 INCHES AND THIS SHOULD BE EITHER FILLED WITH UHPC OR THE PRECAST DECK PANEL CURBING ADJUSTED ACCORDINGLY.

F. THE STAINLESS STEEL PLATE ON THE BOTTOM OF THE PRECAST DECK PANELS MUST BEAR ON THE PTFE SURFACE AT SPANDREL, PIER OR ABUTMENT PRECAST CAP BEAMS BY AT LEAST 5 INCHES. NOTE THAT THE PTFE IS INSET FROM THE FACE OF CAP BEAMS 1/2 INCH, SEE PLAN SHEET 116A.

G. THE STAINLESS STEEL PLATE ON THE BOTTOM OF THE PRECAST DECK PANELS MUST BEAR ON THE PTFE SURFACE AT APPROACH CAP BEAMS BY AT LEAST 6 1/2 INCHES.

H. THE BOTTOM SURFACE OF THE CONCRETE DECK PANELS IS NOT ALLOWED TO CONTACT THE PTFE OVER THE LIFE OF THE STRUCTURE. THEREFORE, THE MINIMUM DISTANCE FROM THE END OF A PRECAST DECK PANEL TO THE FACE OF A SPANDREL OR PIER CAP BEAM IS:

I. FOR 9 INCH UHPC CLOSURE POURS 8 1/4 INCH

II. FOR 6 INCH UHPC CLOSURE POURS 9 3/4 INCH

I. THE BOTTOM SURFACE OF THE CONCRETE DECK PANELS IS NOT ALLOWED TO CONTACT THE PTFE OVER THE LIFE OF THE STRUCTURE. THE DISTANCE FROM THE FACE OF SPANDREL CAP BEAMS TO THE END OF DECK PANELS AT EXPANSION JOINTS MUST BE GREATER THAN 1'-0 1/4" AND LESS THAN 1'-4".

**2. PRECAST CAP BEAMS ON ABUTMENT OR PIERS**

A. TRANSVERSE PRECAST CAP BEAMS SHALL BE PLACED SUCH THAT THEIR VERTICAL EAST/WEST FACE BE PLACED FLUSH OR IN LINE WITH THE EXISTING FACE OF THE WALL THE PRECAST CAP BEAM WILL BE PLACED ON. SEE PLANS SHEETS B89 (NOTE 4), B91 (NOTE 2), B97 (NOTE 4), B102 (NOTE 4).

B. LONGITUDINAL CAP BEAMS AT THE UPSTREAM AND DOWNSTREAM ENDS OF PIERS 1 AND 4 MUST BE PRECAST ACCOUNTING FOR ANY ADJUSTMENTS REQUIRED FOR FIT-UP WITH THE TRANSVERSE CAP BEAMS ON THE EAST OR WEST FACES OF PIERS 1 OR 4 WITH THE FOLLOWING CRITERIA:

I. VERTICAL GROUTED JOINTS BETWEEN LONGITUDINAL CAP BEAMS AND TRANSVERSE CAP BEAMS ARE 1 INCH WIDE PER PLAN. THIS GROUTED JOINT MAY BE INCREASED BY 1 INCH FOR A TOTAL WIDTH OF 2 INCHES WIDE.

II. IF VERTICAL GROUTED JOINT IS INCREASED IN WIDTH, HORIZONTAL DOWEL BARS CONNECTING THE TRANSVERSE CAP BEAM TO THE LONGITUDINAL CAP BEAM SHALL INCREASE IN LENGTH BY THE INCREASE IN WIDTH OF THE AS PLANNED 1 INCH WIDE JOINT.

III. IF ADJUST LENGTH OF PRECAST CAP BEAM TYPE 14 (PIER 1), ADJUST THE 11 INCH SPACING AND EFFECTED BARS ASSOCIATED WITH THE END IP511E BAR, SEE PLAN SHEET B99, PIER 1 PARTIAL DETAIL.

IV. CONTRACTOR IS TO REVIEW LOCATION OF TRANSVERSE CAP BEAMS ON EACH FACE OF PIER 4 AND ADJUST LENGTH OF PRECAST CAP BEAM TYPE 19 (PIER 4) AS NECESSARY TO MEET GEOMETRIC CRITERIA. IF ADJUSTMENT IS NEEDED, MAKE ADJUSTMENT TO THE 5 INCH SPACING AND EFFECTED BARS ASSOCIATED WITH THE END 4P512E BAR, SEE PLAN SHEET B99, PIER 4 PARTIAL DETAIL.

C. FOR CAP BEAM TYPE 17 AT ENDS OF PIERS 2 & 3 THE CONTRACTOR MUST SURVEY THE EXISTING PIER FACES AND CONSTRUCT CAP BEAM FLUSH WITH EXISTING FACES:

I. PER NOTE 4 ON SHEET B102, THE FACES OF THE CAP BEAM IN CONTACT WITH THE EXISTING PIER WALLS NEEDS TO MATCH THE EXISTING PIER WALL GEOMETRICS. THIS LEVEL OF SURVEY WAS NOT PROVIDED.

II. THE END OF THE OVERHANG CAN BE CONSIDERED INDEPENDENT OF THE EXISTING BRIDGE EXCEPT WHERE IT TIES INTO THE OUTSIDE LEGS OF THE "E" PRECAST SECTION AT THE PIER WALLS. UPON REVIEW OF THE EXISTING THICKNESSES DOCUMENTED IN THE CONTRACTOR'S SURVEY COMPARED TO THE PLAN DIMENSIONS, THE MAXIMUM INCREASE IN THE OUTSIDE WALL THICKNESS IS 1 INCH AND THE MAXIMUM DECREASE IN WALL THICKNESS IS 3/8 INCH. THUS, CONTRACTOR SHOULD CAST THE OUTSIDE OVERHANG EDGE PER PLAN WITH THE EXCEPTION THAT THIS OUTSIDE OVERHANG EDGE SHOULD TIE INTO THE OUTSIDE FACE OF THE EAST AND WEST WALLS SUCH THAT THE VERTICAL PORTION OF THIS FACE IS VERTICAL AND FLUSH WITH THE PIER WALL.

III. IT IS UNDERSTOOD THE CONTRACTOR WILL CAST THESE CAP BEAMS IN PLACE AND NOT PRECAST THEM. CONTRACTOR IS TO ADJUST BARS AS REQUIRED IN THE FORMS TO MEET MINIMUM EDGE CLEARANCE, OR MAXIMUM SPACING REQUIREMENTS. IN SITUATIONS WHERE BAR SPACING IS PROVIDED ON THE PLANS, ADJUST THE INDIVIDUAL BAR SPACING AS REQUIRED TO MEET EDGE CLEARANCES OR THE MAXIMUM BAR SPACING.

**3. PRECAST CAP BEAMS ON SPANDREL COLUMNS**

A. CENTERLINE OF PRECAST SPANDREL CAP BEAMS SHALL MATCH THE CENTERLINE OF EXISTING SPANDREL COLUMNS.

B. THE MAXIMUM CHANGE IN TRANSVERSE SPANDREL COLUMN CLEAR DISTANCE BETWEEN EXISTING PLANS AND THE EXISTING SPANDREL COLUMNS SURVEY SUPPORTING THE SAME PRECAST SPANDREL CAP BEAM IS 6 INCHES (+/-).

**4. BAR LOCATION REQUIREMENTS IF DECK PANEL GEOMETRY IS ADJUSTED**

A. THE MINIMUM EXTENSION OF REINFORCING BARS IN DECK PANELS PARALLEL TO BRIDGE CENTERLINE (OR LONGITUDINAL) AS REQUIRED ON THE PLANS MUST BE ACHIEVED, AT A MINIMUM. IF WIDER UHPC CLOSURE POURS ARE PROPOSED OR ANTICIPATED, LONGER BAR EXTENSIONS WILL BE REQUIRED.

B. LIFTING INSERT LOCATIONS MUST BE RE-EVALUATED IF DECK PANEL GEOMETRY IS CHANGED FROM THAT ON THE PLANS.

C. IF PANELS GET LONGER, OR SHORTER, IN THE DIRECTION PARALLEL TO BRIDGE CENTERLINE, THE TRANSVERSE BARS PERPENDICULAR TO BRIDGE CENTERLINE CAN BE SPACED AT EQUAL SPACES. THE NUMBER OF BARS AND EDGE CLEARANCES REQUIRED IN THE PLANS MUST BE MAINTAINED.

D. ADJUSTMENTS TO PRECAST DECK PANEL REINFORCEMENT MUST BE CARRIED THROUGH ADJACENT PANELS SUCH THAT ALL DECK PANELS FIT TOGETHER WITHOUT CONFLICT DURING THE ABC PERIOD. PLACEMENT OF LONGITUDINAL BARS MUST ACCOUNT FOR BAR FIT-UP IN THE UHPC JOINTS

**5. PRECAST ORNAMENTAL RAILING**

A. THE CENTERLINE OF ORNAMENTAL RAILING PILASTERS ARE TO BE LOCATED IN THE CENTER OF THE UHPC JOINTS UNLESS NOTED OTHERWISE.

B. PILASTERS THAT ARE OFFSET FROM THE CENTERLINE OF THE UHPC CLOSURE JOINT ON THE ORIGINAL PLANS SHALL REMAIN OFFSET IN THE MODIFIED OR SHIFTED LOCATION (SEE WEST AND EAST ABUTMENTS FOR EXAMPLE)

C. PRECAST ORNAMENTAL RAILING PANEL LENGTH SHALL BE ADJUSTED TO ACCOUNT FOR CONTRACTOR PROPOSED MODIFICATIONS TO THE PRECAST DECK PLAN GEOMETRY.

D. CONTRACTOR IS NOTIFIED THAT THE LOWER ENDS OF PRECAST ORNAMENTAL RAILING PANELS MAY REQUIRE A CHAMFER TO AVOID IMPACT WITH PILASTER STEEL POST BASE PLATES.

**6. SIDEWALK GRADES**

A. IF SIDEWALK GRADES ARE IMPACTED BY CONTRACTOR PROPOSED MODIFICATIONS TO THE AS PLANNED DECK PANEL GEOMETRY, THE CONTRACTOR SHALL MATCH INTO THE GRADES ON EITHER END OF AN EFFECTED PANEL.

**7. CONCRETE PARAPET (TYPE P-2 MODIFIED)**

A. IF PANEL ADJUSTMENTS OCCUR AT A BRIDGE CROSS SECTION WHERE THE INNER P-2 BARRIER IS IN TRANSITION OR SKewing ACROSS THE DECK, THE CONTRACTOR SHALL ADJUST R501E BARS ACCORDINGLY SUCH THAT THE CENTERLINE OF R501E BARS IS GREATER THAN 3 INCHES FROM THE END OF A PANEL BUT IN NO CASE SHALL R501E BARS BE SPACED GREATER THAN 1'-0" APART.

B. CONTRACTOR IS TO MAINTAIN INNER P-2 BARRIER TAPER POINTS AS NOTED IN THE PLANS AND ADJUST R501E BAR LOCATIONS ACCORDINGLY.

**NOTES:**

① SEE PRECAST DECK PANEL SHOP DRAWING 120 FOR DETAILS.

② SEE UHPC SHOP DRAWING 154 FOR DETAILS

**AS-BUILT - DECK PLAN NOTES - POST CONTRACTOR SURVEY**

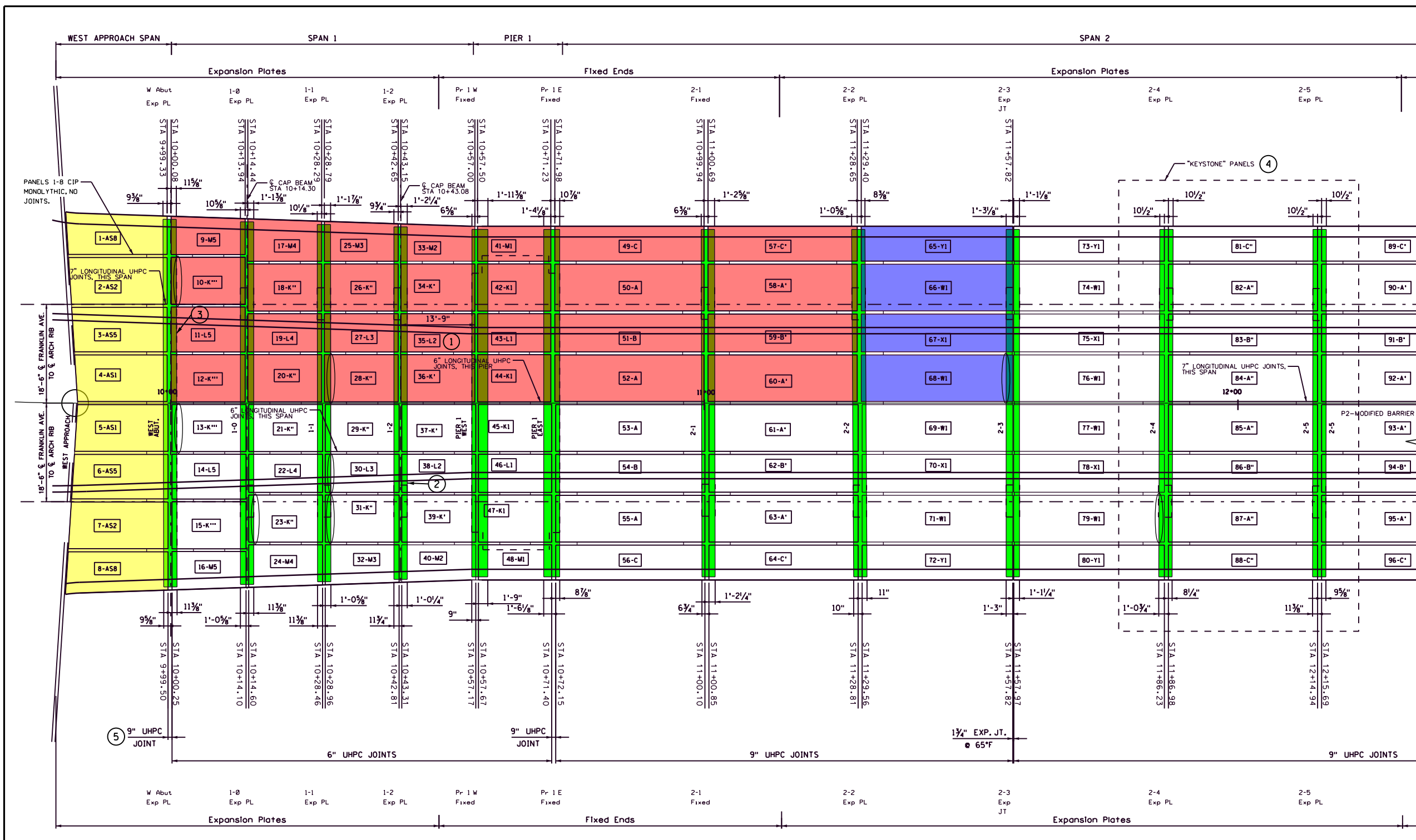
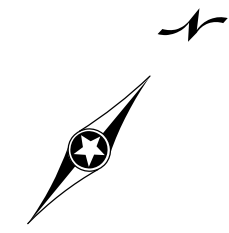
**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029**

**SHEET**

**B122A**

**B176**

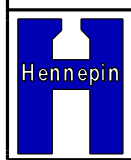




- LEGEND:**
- CAST-IN-PLACE
  - SHIFTED DECK PANEL
  - MODIFIED DECK PANEL
  - CAP BEAM
  - XX-X PANEL NO. AND TYPE
  - PTFE SHIM LOCATION.

**NOTES:**

- ① AS-BUILT LENGTH OF PANEL 35-L2 IS 13'-9". SEE NCR 03 FOR DETAILS
- ② MISPLACED STAINLESS STEEL PLATE PANEL 38-L2. SEE NCR 04 FOR DETAILS.
- ③ MISPLACED STAINLESS STEEL PLATE PANEL 11-L5. SEE NCR 05 FOR DETAILS
- ④ PANELS 81-88, PUSH THE PLATE BACK TO 1/4" PROJECTION AT SPANDRELS 2-4 AND 2-5. SEE RFI 39 FOR DETAILS.
- ⑤ TRANSVERSE UHPC JOINT WAS ELIMINATED IN FAVOR OF CIP APPROACH SPAN. MECHANICAL COUPLERS WERE USED. SEE RFI 68 FOR DETAILS.



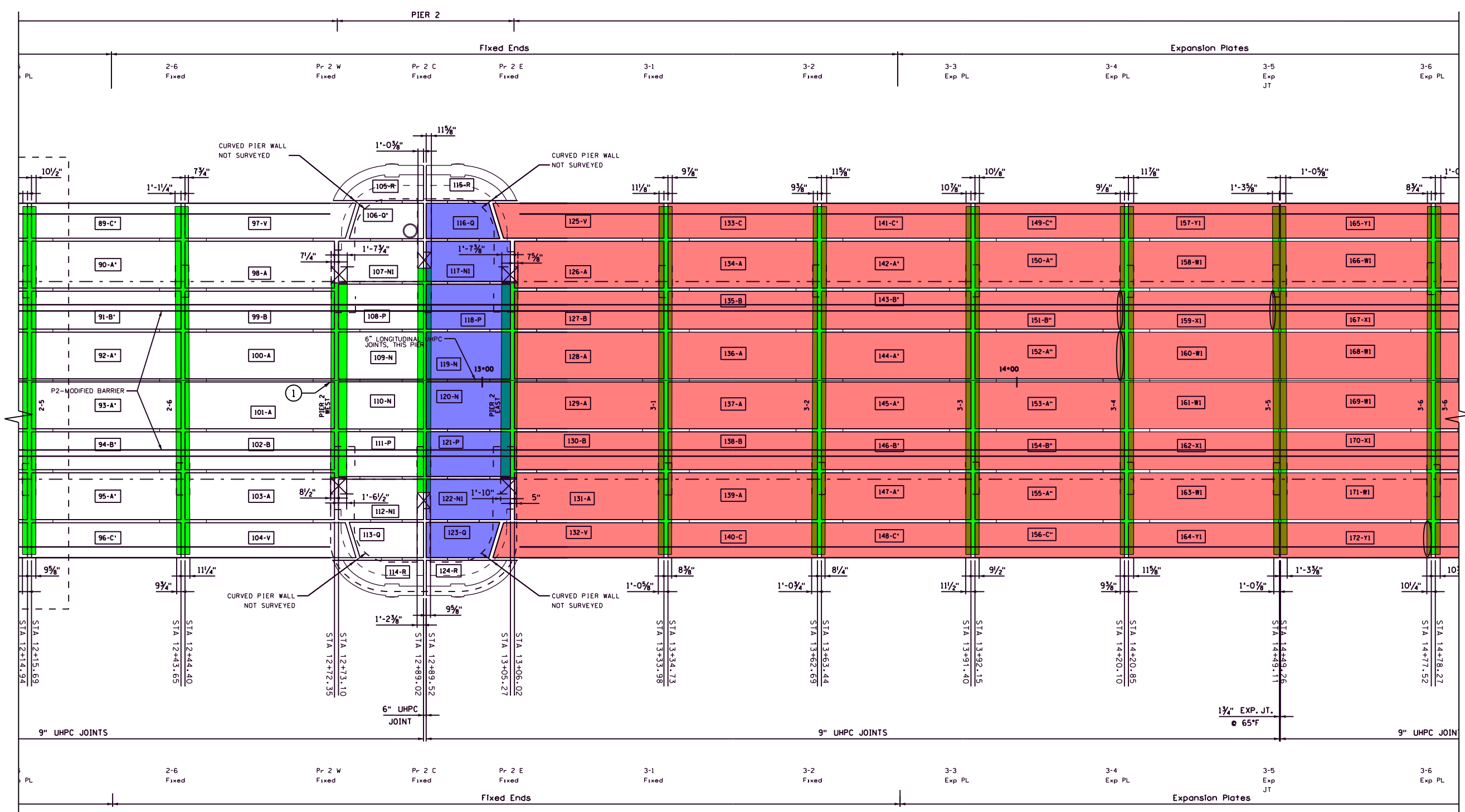
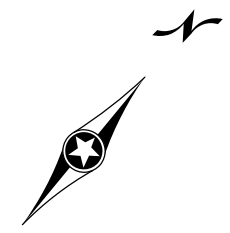
AS-BUILT - DECK PLAN - POST CONTRACTOR SURVEY (1 OF 4)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET

B122B

B176

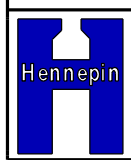


**NOTES:**

① PANEL 101-A, 3 TRANSVERSE BARS IN THE TOP MAT WERE DAMAGED. DRILLED AND INSTALLED 3 #5 (E) BAR WITH REDHEAD A7 EPOXY, 7 1/2" MIN. EMBEDMENT. SEE NCR 01 FOR DETAILS.

**LEGEND:**

- SHIFTED DECK PANEL
- MODIFIED DECK PANEL
- CAP BEAM
- XX-X PANEL NO. AND TYPE
- PTFE SHIM LOCATION.



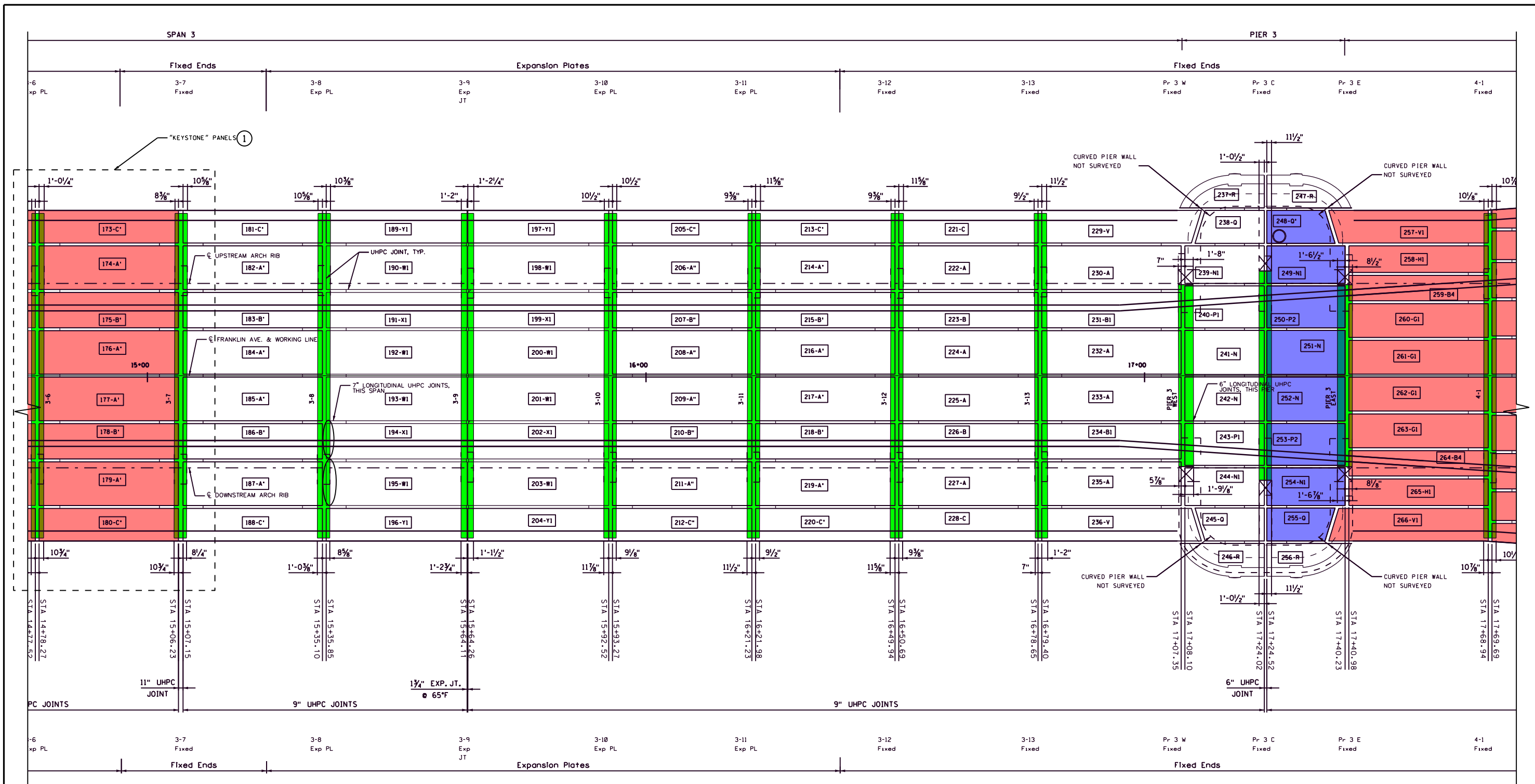
AS-BUILT - DECK PLAN - POST CONTRACTOR SURVEY (2 OF 4)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET

B122C

B176



**NOTES:**  
 ① PANELS 173-180, PUSH THE PLATE BACK TO A 1/4" PROJECTION AT SPANREL 3-6. SEE RFI 39 FOR DETAILS.

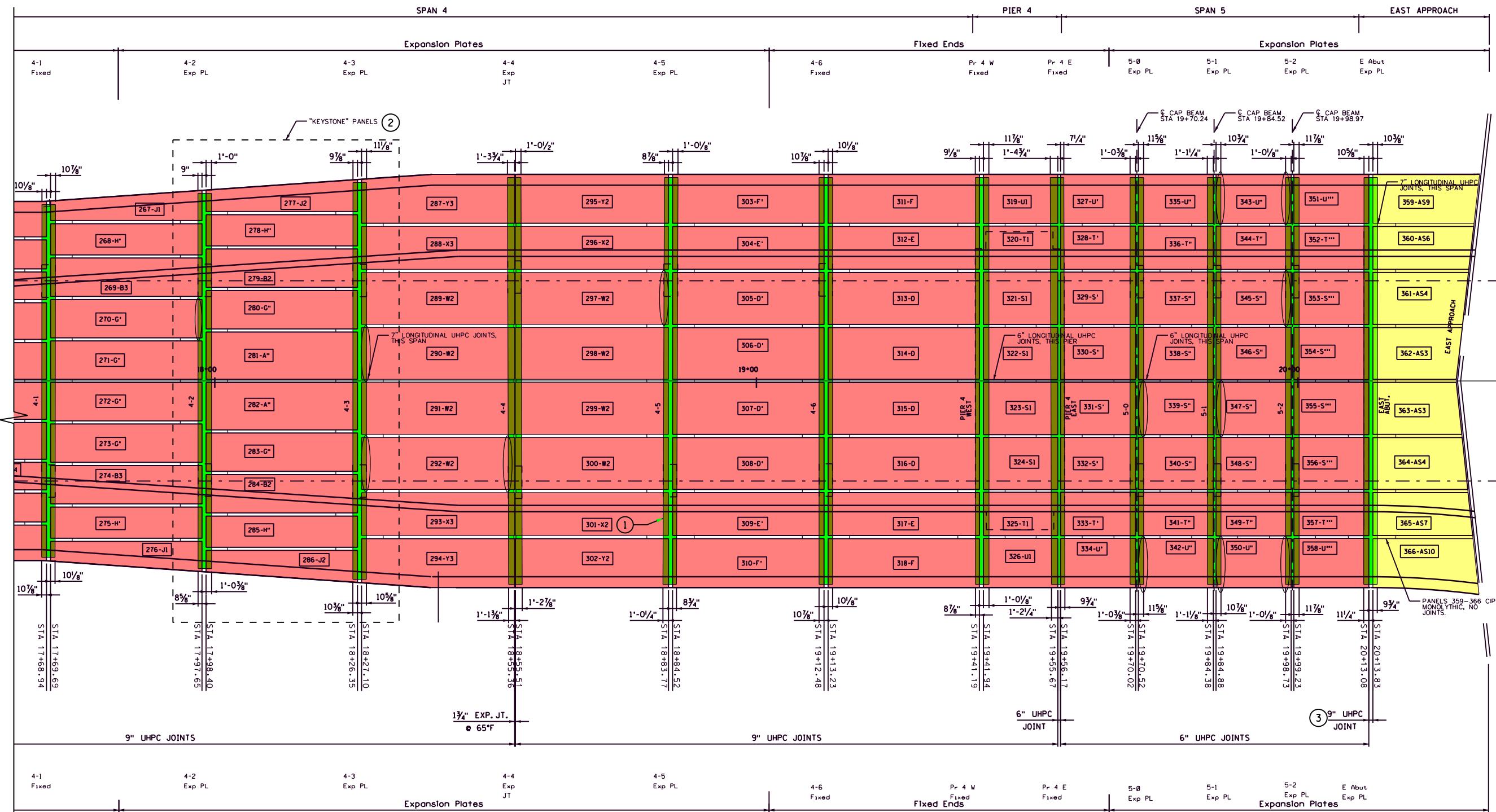


- LEGEND:**
- SHIFTED DECK PANEL
  - MODIFIED DECK PANEL
  - CAP BEAM
  - XX-X PANEL NO. AND TYPE
  - PTFE SHIM LOCATION.



**AS-BUILT - DECK PLAN - POST CONTRACTOR SURVEY (3 OF 4)**  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

**SHEET**  
 B122D  
 B176



**NOTES:**

- ① MISPLACED SS  $\bar{r}$  PANEL 301-X2. SEE NCR 06 FOR DETAILS
- ② PANELS 277-286, PUSH PLATE BACK TO  $\frac{1}{4}$ " PROJECTION AT SPANDRELS 4-2 AND 4-3. SEE RFI 39 FOR DETAILS.
- ③ TRANSVERSE UHPC JOINT WAS ELIMINATED IN FAVOR OF CIP APPROACH SPAN. MECAHNICAL COUPLERS WERE USED. SEE RFI 68 FOR DETAILS.

**LEGEND:**

- CAST-IN-PLACE
- SHIFTED DECK PANEL
- CAP BEAM
- XX-X PANEL NO. AND TYPE
- PTFE SHIM LOCATION.



AS-BUILT - DECK PLAN - POST CONTRACTOR SURVEY (4 OF 4)

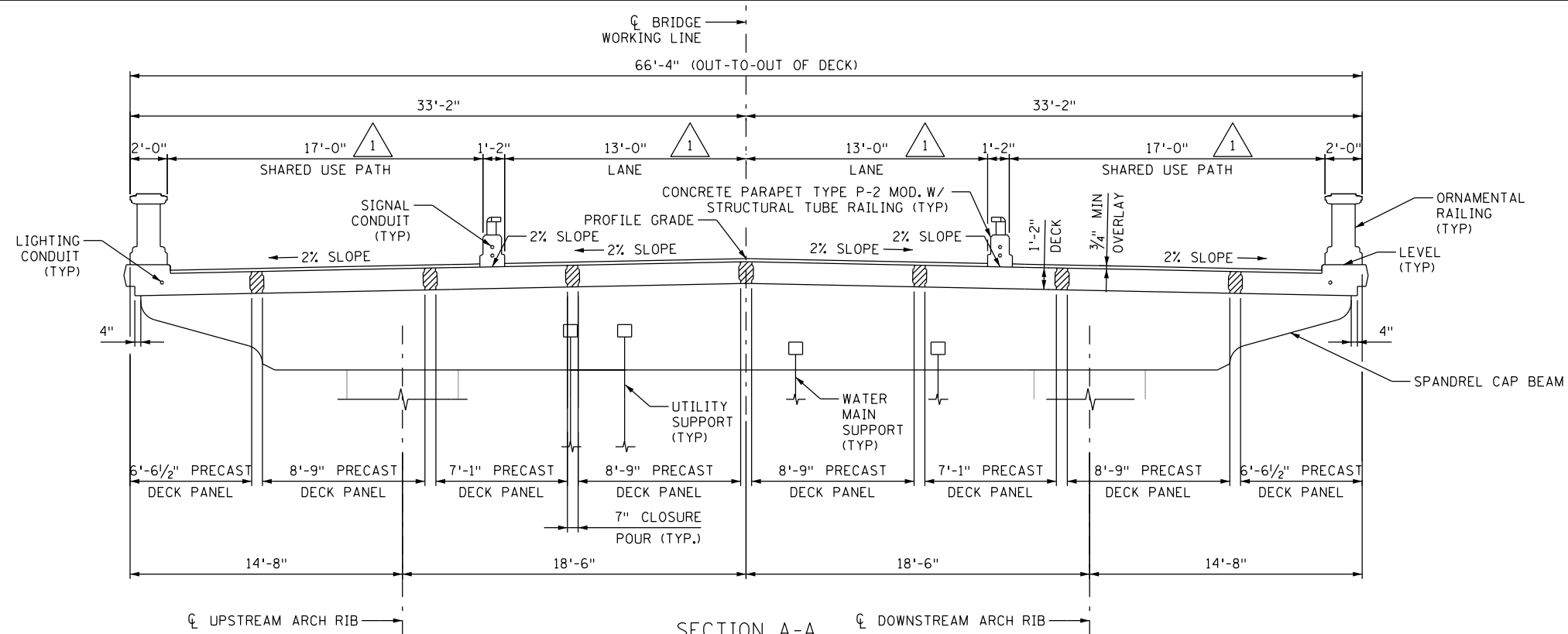
C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET

B122E

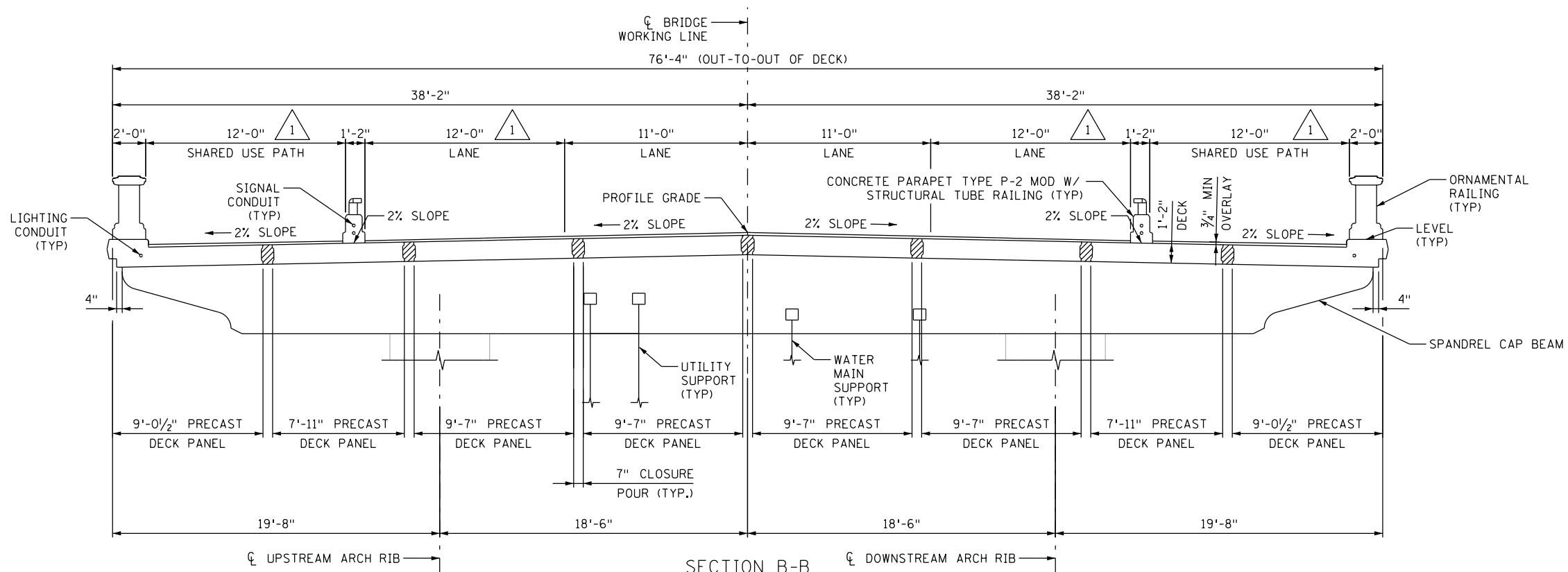
B176





SECTION A-A

STA 10+71.77 TO STA 12+72.73  
STA 13+05.81 TO STA 16+94.98



SECTION B-B

STA 18+44.13 TO STA 19+41.77

NOTES:

- FOR LOCATIONS OF SECTIONS A-A AND B-B, SEE SHEETS B119 TO B122 (DECK PLANS).
- FOR TYPICAL PANEL DETAILS AND REINFORCEMENT, SEE SHEETS B125 TO B138 (DECK PANEL DETAILS).
- FOR CLOSURE POUR DETAILS AND REINFORCEMENT, SEE SHEETS B139 AND B140 (DECK DETAILS).
- FOR WATERMAIN SUPPORT DETAILS, SEE SHEETS B172 AND B173 (WATERMAIN SUPPORT DETAILS).
- PARAPETS SHALL BE CAST ON DECK PANELS SUCH THAT THEY ARE PLUMB IN THE FINAL CONDITION.
- FOR UTILITY SUPPORT DETAILS, SEE SHEETS U1 THROUGH U4.

1 CONCRETE PARAPET TYPE P-2 MOD. REBAR OFF BY 1", ROADWAY WIDTH DECREASED BY 1" AND SHARED USE PATH INCREASED BY 1".

LEGEND:

INDICATES UHPC CLOSURE POUR



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

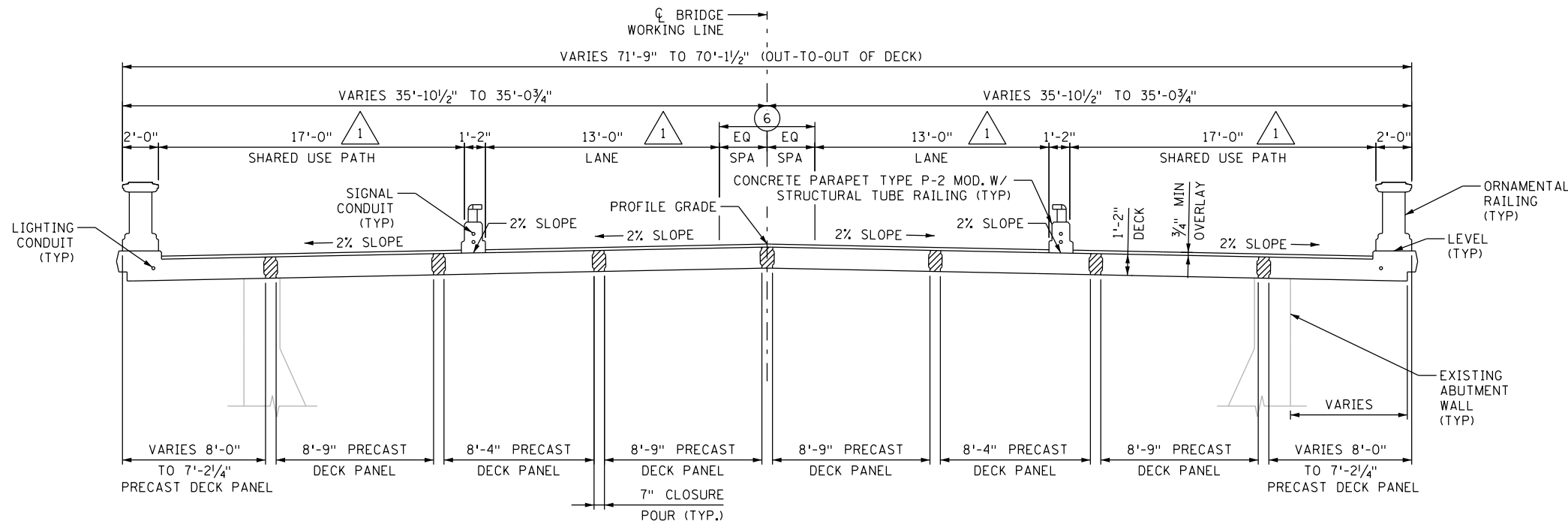
*Daniel F. Enser*  
DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308 8/14/2014  
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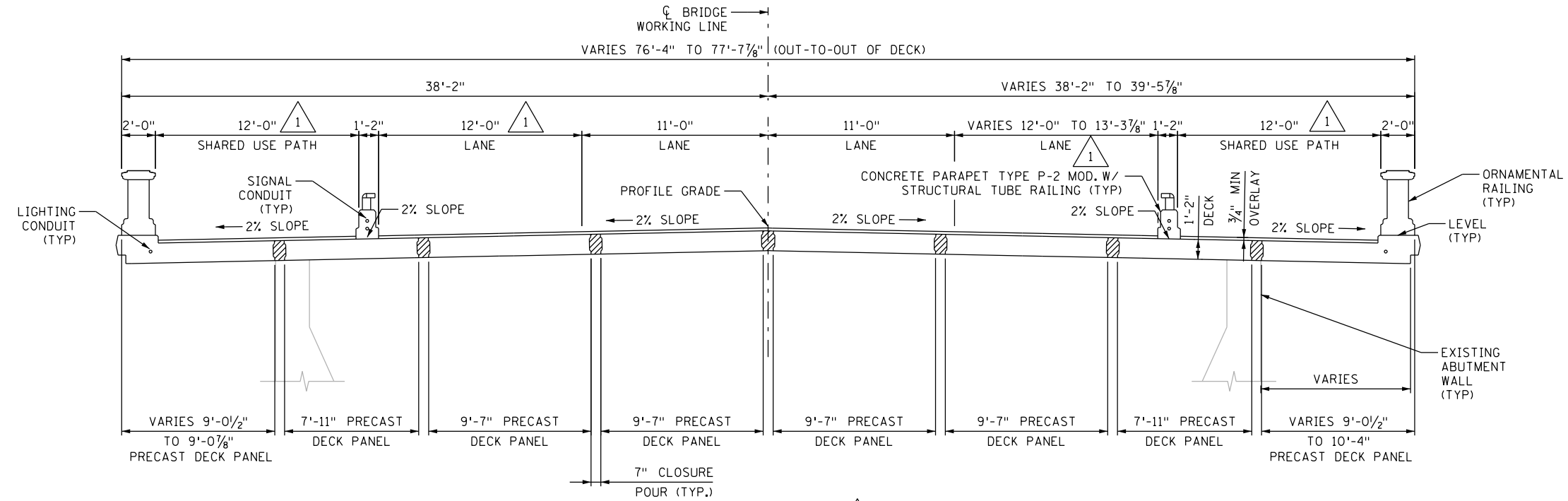
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CAD BY: EBR  
CHECKED BY: FP  
LAST REVISION: 7/14/2015

AS-BUILT - DECK SECTIONS (1 OF 2)  
C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET  
B123R  
B176



SECTION C-C 2  
 STA 9+83.13 TO STA 9+99.50



SECTION D-D 2  
 STA 20+14.04 TO STA 20+29.24

- NOTES:**
- FOR LOCATIONS OF SECTIONS C-C AND D-D, SEE SHEETS B119 AND B122 (DECK PLANS).
  - FOR TYPICAL PANEL DETAILS AND REINFORCEMENT, SEE SHEETS B125 TO B138 (DECK PANEL DETAILS).
  - FOR CLOSURE POUR DETAILS AND REINFORCEMENT, SEE SHEETS B139 AND B140 (DECK DETAILS).
  - FOR ADDITIONAL SECTIONS AT ABUTMENTS, SEE SHEETS B89 AND B91 (EAST AND WEST ABUTMENT MODIFICATION DETAILS).
  - SECTIONS AT PIERS SIMILAR. FOR ADDITIONAL DETAILS, SEE SHEETS B97 TO B99 AND B102 TO B104 (PIER 1 AND 4 AND PIER 2 AND 3 MODIFICATION DETAILS).
  - VARIES FROM 2'-7 7/8" TO 1'-10 3/4".
  - PARAPETS SHALL BE CAST ON DECK PANELS SUCH THAT THEY ARE PLUMB IN THE FINAL CONDITION.
- 1 CONCRETE PARAPET TYPE P-2 MOD. REBAR OFF BY 1", ROADWAY WIDTH DECREASED BY 1" AND SHARED USE PATH INCREASED BY 1".
- 2 PRE-CAST DECK PANELS REPLACED BY SINGLE CIP SLAB, ELIMINATING THE UHPC JOINTS. SEE RFI 68 FOR DETAILS.

**LEGEND:**  
 [Hatched Box] INDICATES UHPC CLOSURE POUR



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 DANIEL F. ENSER, PROFESSIONAL ENGINEER

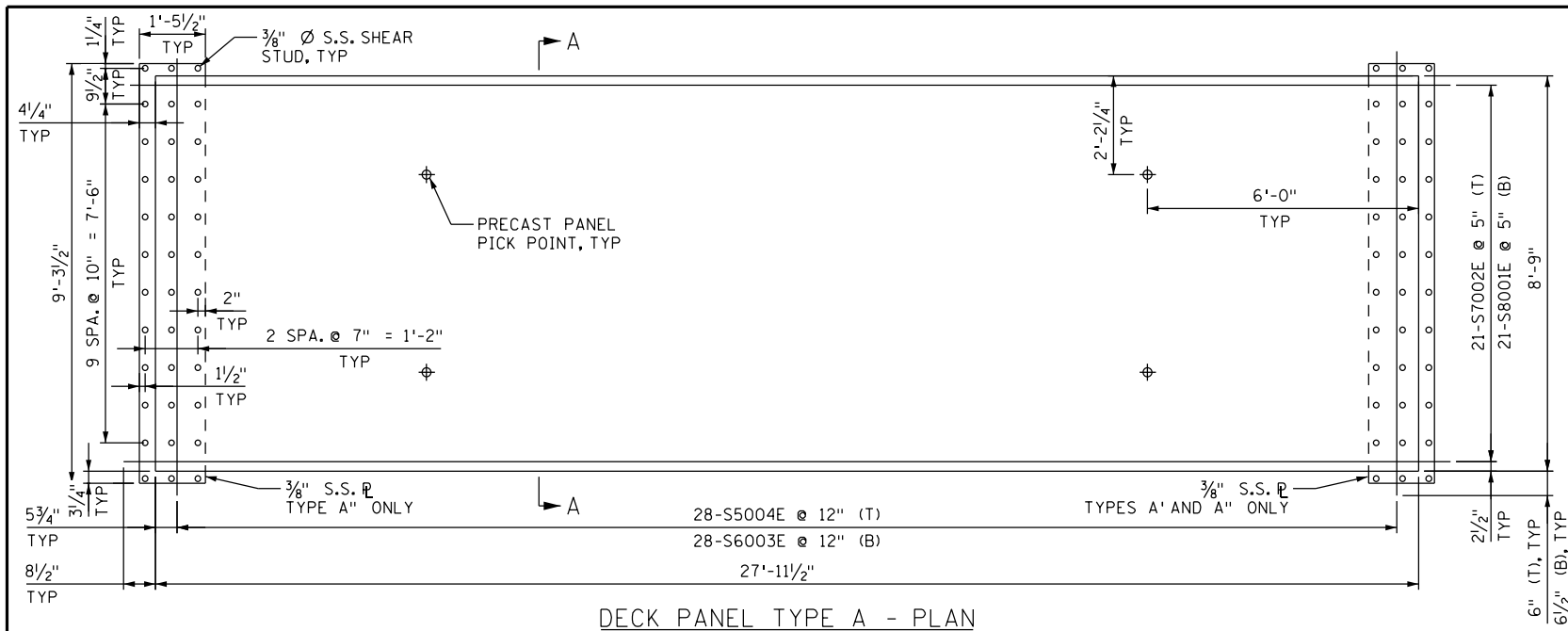
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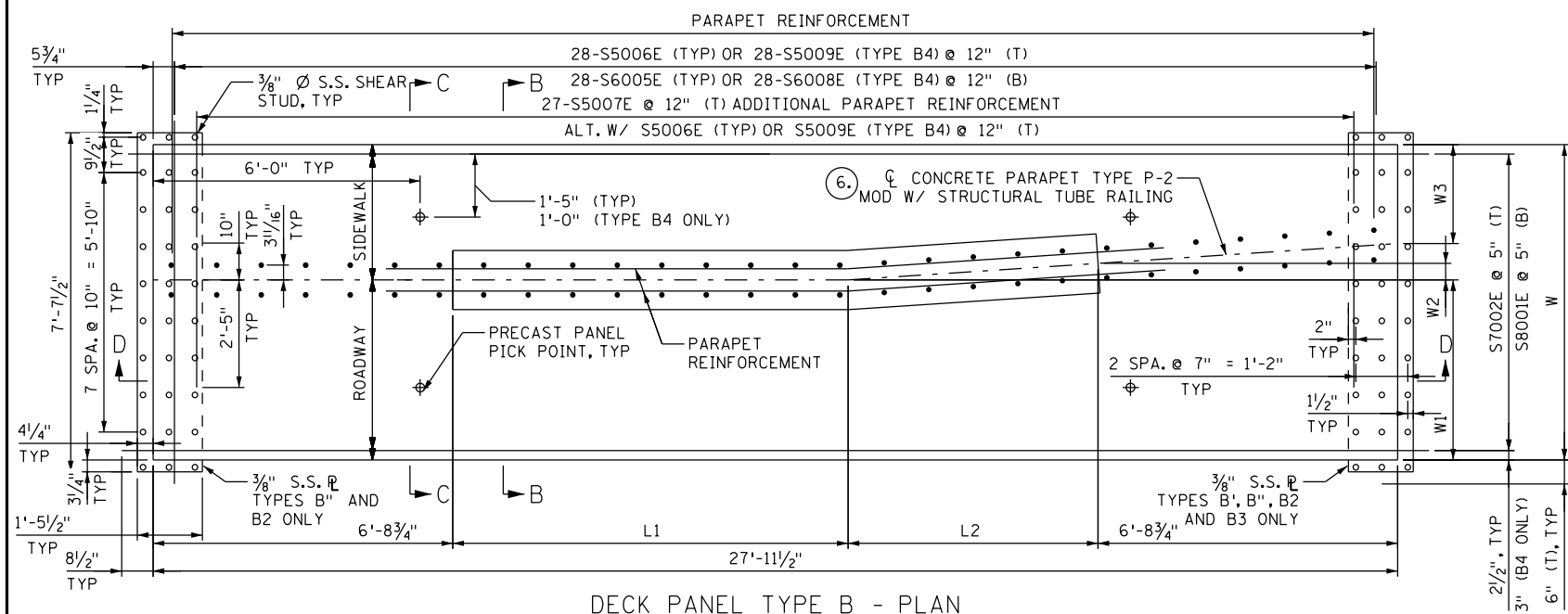
AS-BUILT - DECK SECTIONS (2 OF 2)

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 BRIDGE 2441 S.P. 027-605-029

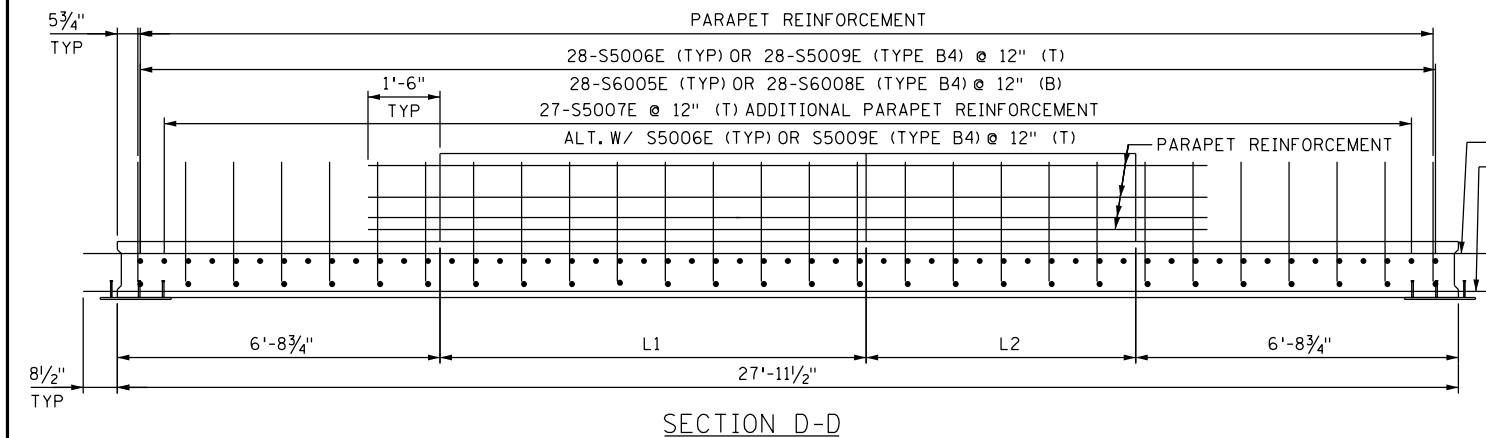
SHEET  
 B124  
 B176



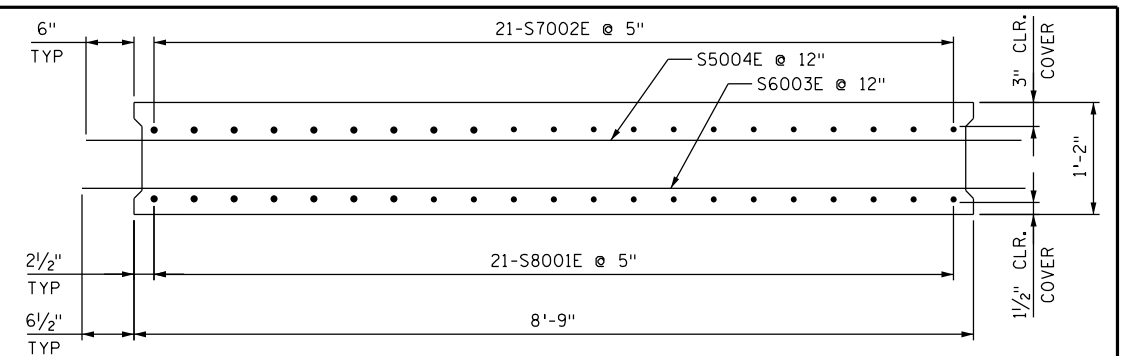
DECK PANEL TYPE A - PLAN



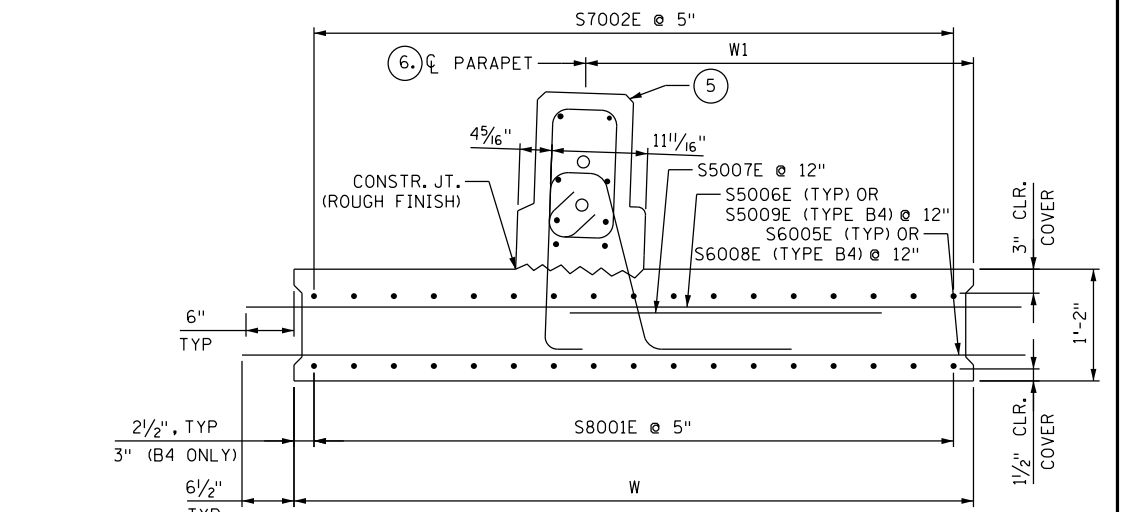
DECK PANEL TYPE B - PLAN



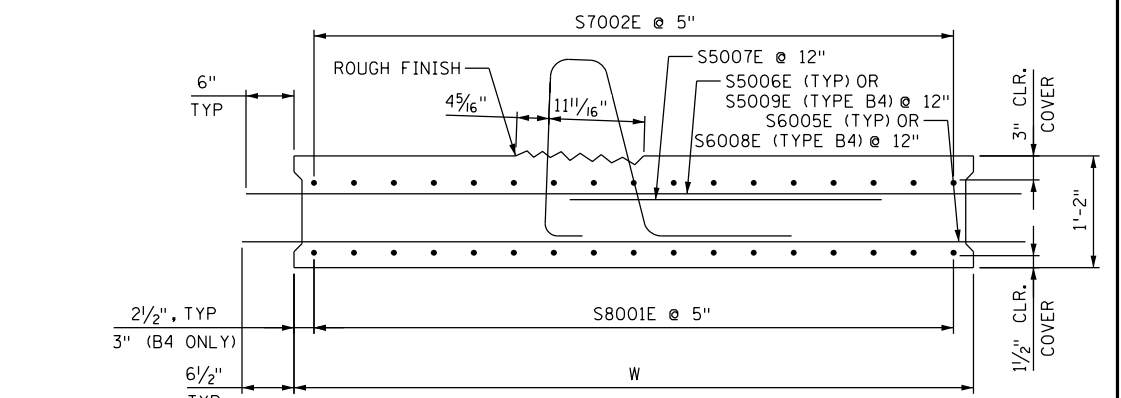
SECTION D-D



SECTION A-A



SECTION B-B



SECTION C-C

LEGEND:

- (T) INDICATES TOP
- S7002E @ 5" (T) AND S8001E @ 5" (B) INDICATES BOTTOM

NOTES:

- FOR DECK PANEL SHEAR KEY DETAIL AND CAMBER DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).

- FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
- FOR ADDITIONAL NOTES, SEE SHEET B117 (DECK PLAN 1 OF 4).

PANEL TYPE	L1	L2	W	W1	W2	W3	CAMBER
A	N/A	N/A	N/A	N/A	N/A	N/A	3/16"
B	14'-6"	0"	7'-1"	3'-11 1/2"	0"	3'-1 1/2"	1/4"
B1	8'-10 3/4"	5'-7 1/4"	7'-1"	3'-11 1/2"	4 1/2"	2'-3 5/8"	1/4"
B2	0"	14'-6"	7'-1"	3'-2 3/8"	11 5/8"	2'-0 1/4"	1/4"
B3	0"	14'-6"	7'-1"	2'-11 3/8"	11 5/8"	2'-3 1/4"	1/4"
B4	0"	14'-6"	5'-1"	1'-7 3/8"	11 5/8"	1'-7 1/4"	1/4"

- WHEN THE DECK PANELS ARE INSTALLED, THE PARAPET SHALL BE PLUMB.
- DIMENSIONS TO CENTERLINE OF CONCRETE PARAPET ARE MEASURED ALONG THE TOP OF DECK PANEL.



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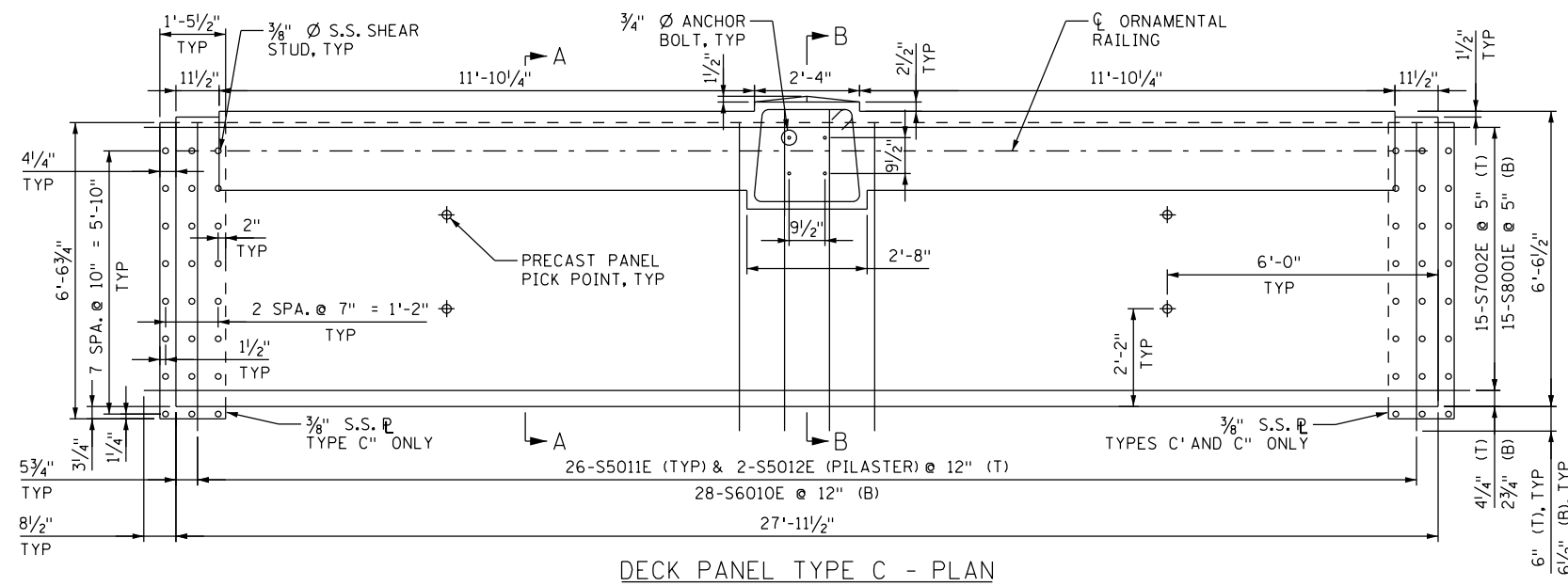
*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
 41308 LICENSE NO. 8/14/2014 DATE

DESIGN BY: **EBR**  
 CAD BY: **ET**  
 CHECKED BY: **FP**  
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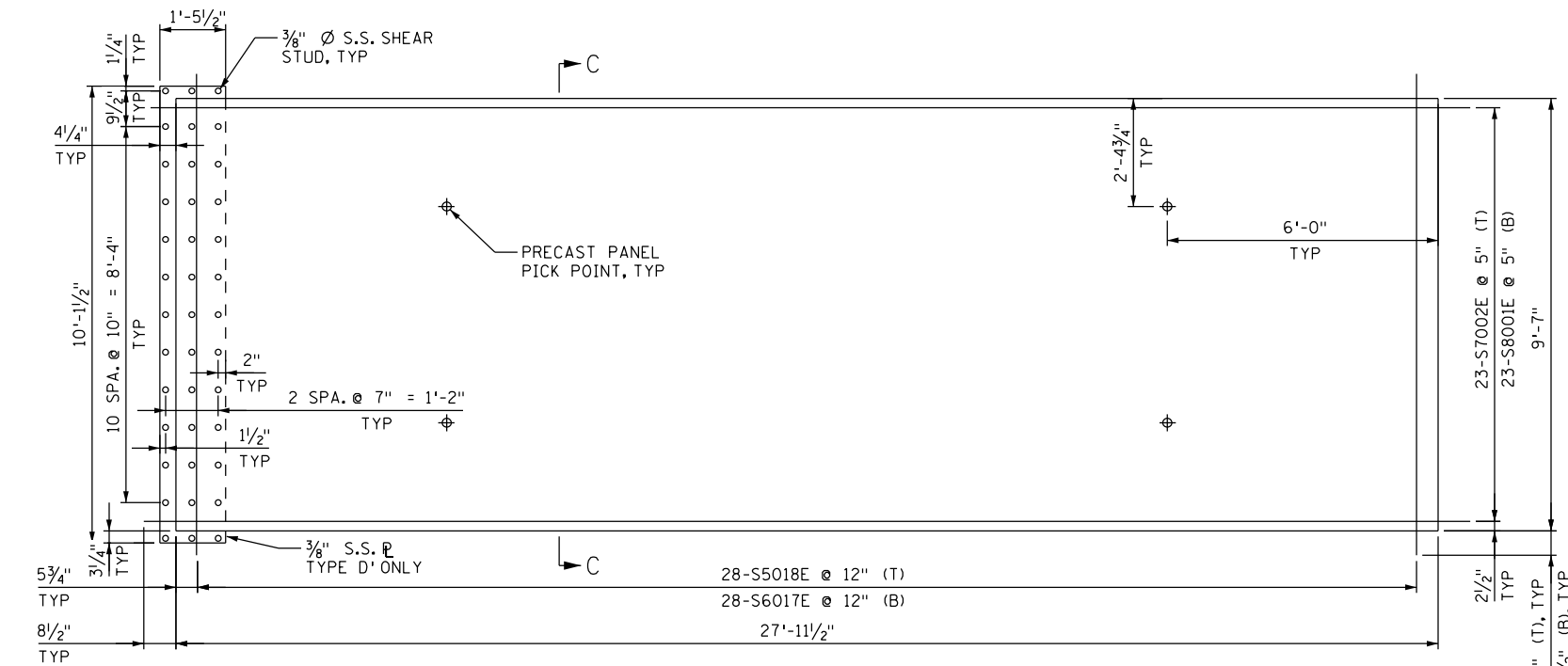
DECK PANEL DETAILS - TYPES A AND B

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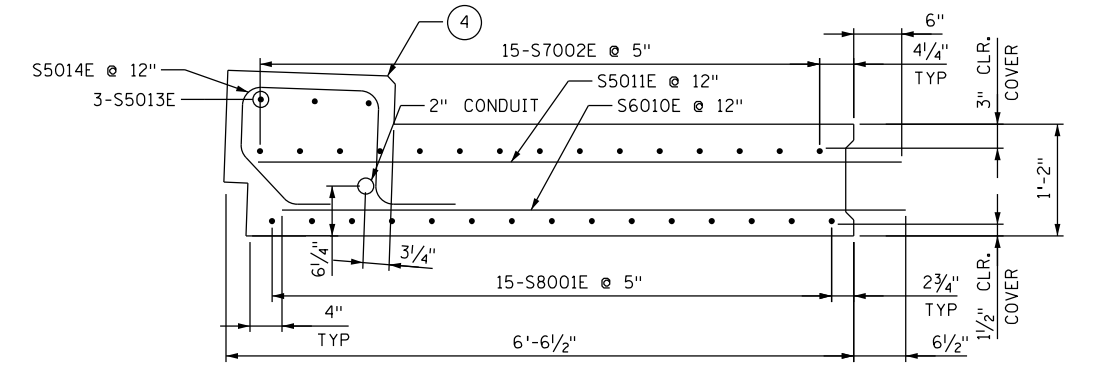
SHEET  
 B125  
 B176



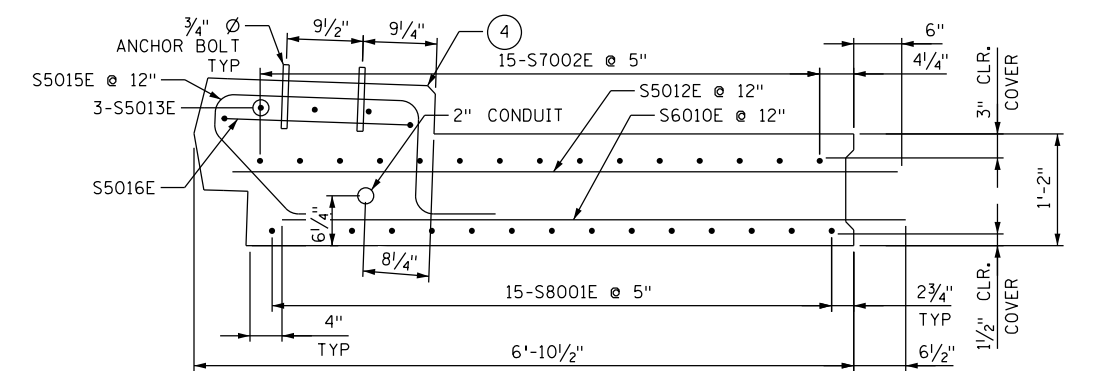
DECK PANEL TYPE C - PLAN



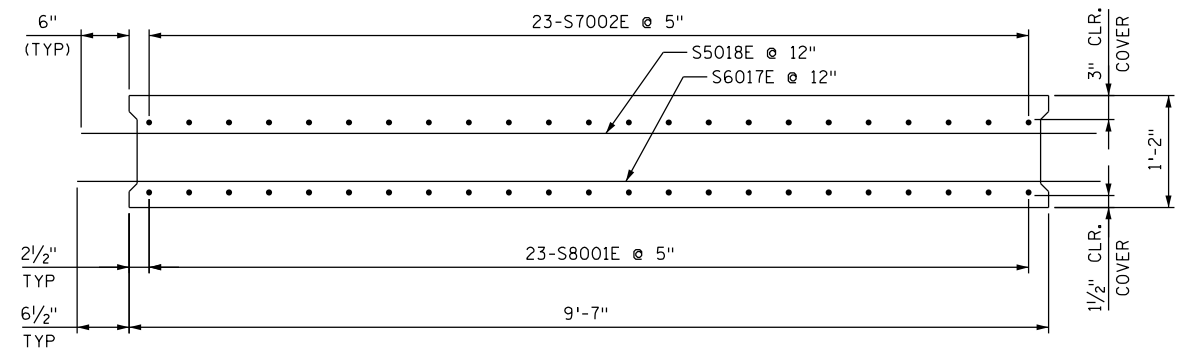
DECK PANEL TYPE D - PLAN



SECTION A-A



SECTION B-B



SECTION C-C

LEGEND:

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

NOTES:

1. FOR DECK PANEL SHEAR KEY DETAIL, CAMBER DETAIL, CURB DETAILS, AND ORNAMENTAL RAILING CONNECTION DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
2. FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
3. FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
4. WHEN THE DECK PANELS ARE INSTALLED, THE TOP OF CURB SHALL BE LEVEL, AND THE FACE OF CURB SHALL BE VERTICAL.

DECK PANEL CAMBER TABLE	
PANEL TYPE	CAMBER
C	3/16"
D	3/16"



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**

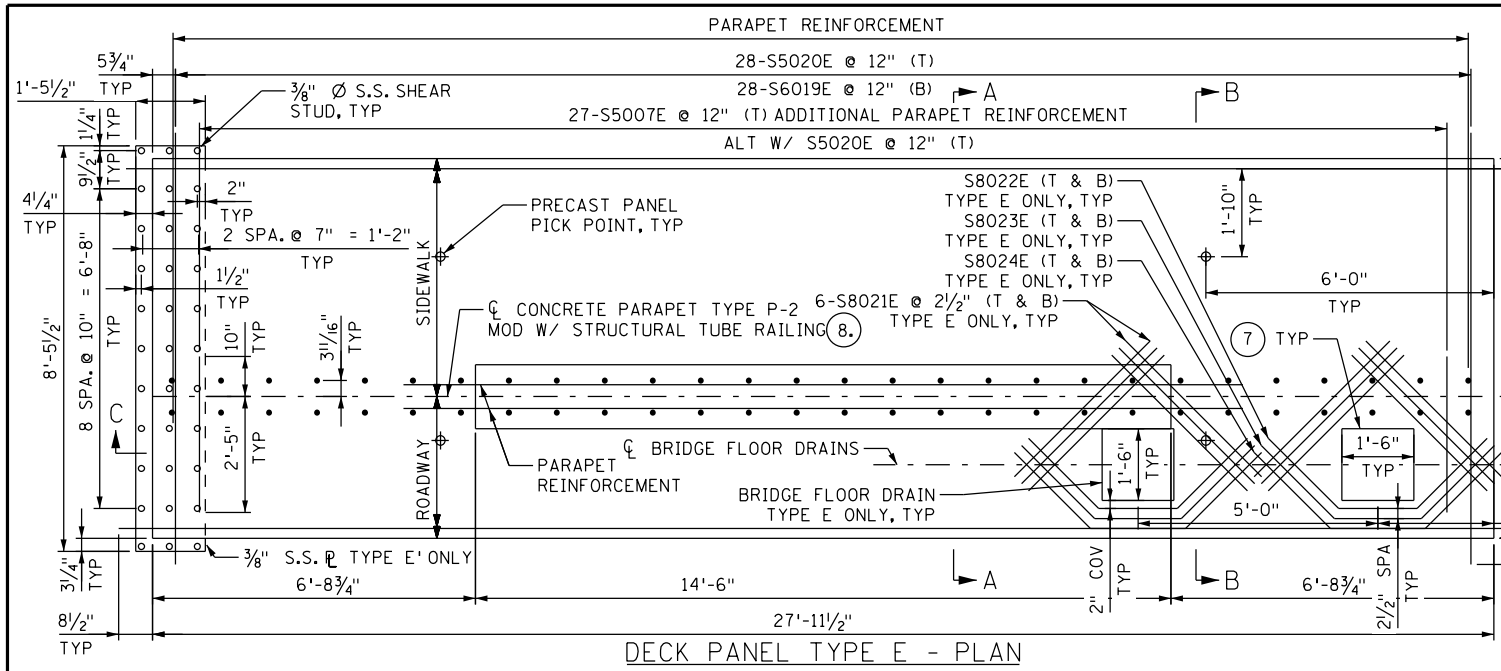
41308      8/14/2014  
 LICENSE NO.      DATE

DESIGN BY: EBR  
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 CHECKED BY: FP  
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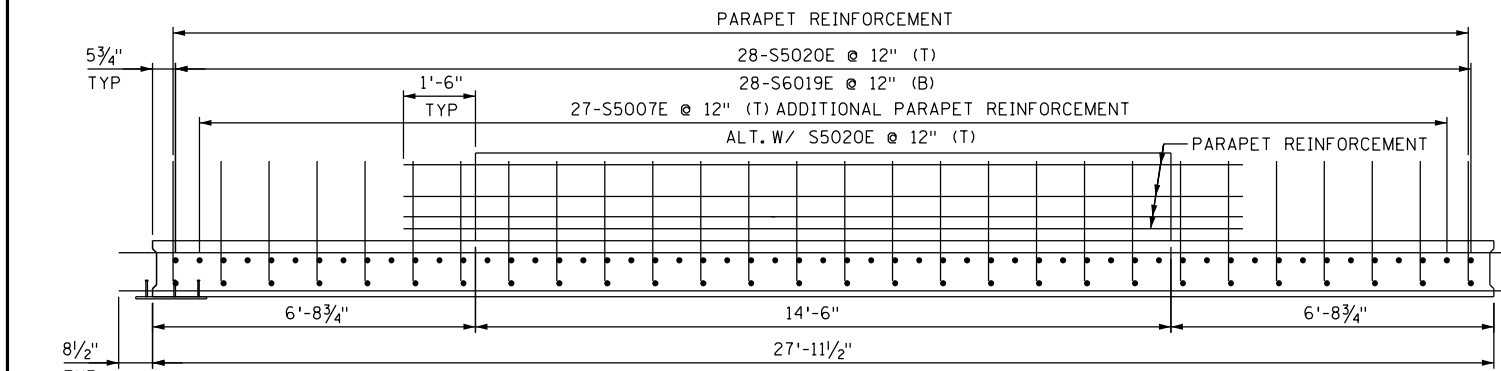
DECK PANEL DETAILS - TYPES C AND D

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SHEET  
 B126R2  
 B176

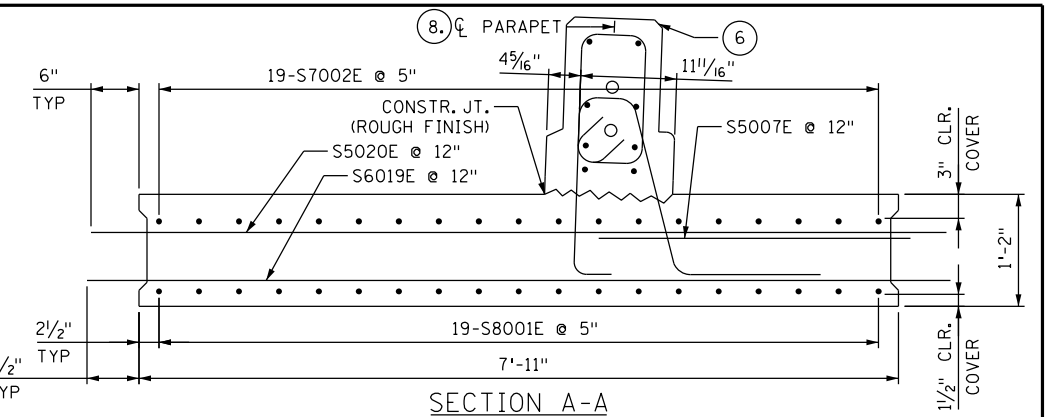


DECK PANEL TYPE E - PLAN

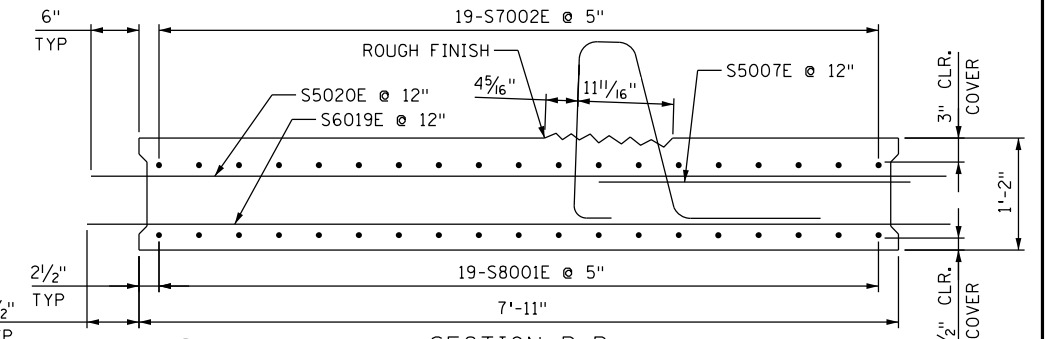


DECK PANEL TYPE F - PLAN

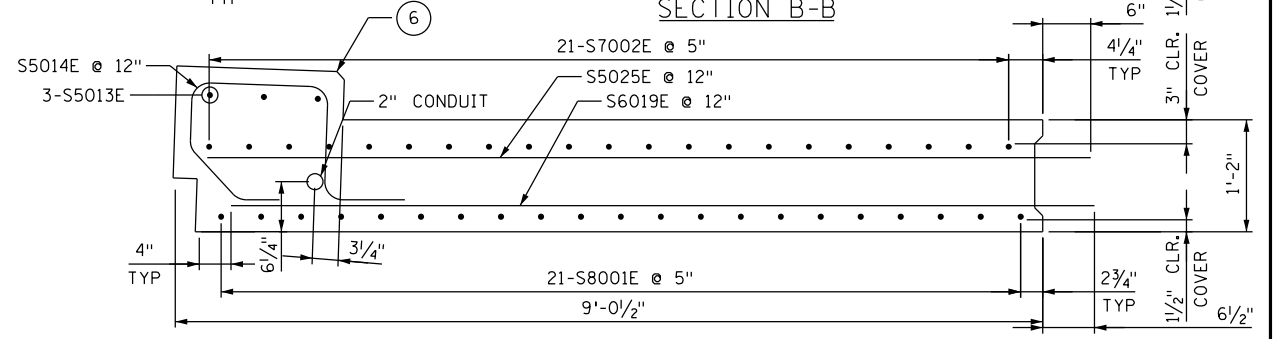
DECK PANEL CAMBER TABLE	
PANEL TYPE	CAMBER
E	1/4"
F	3/16"



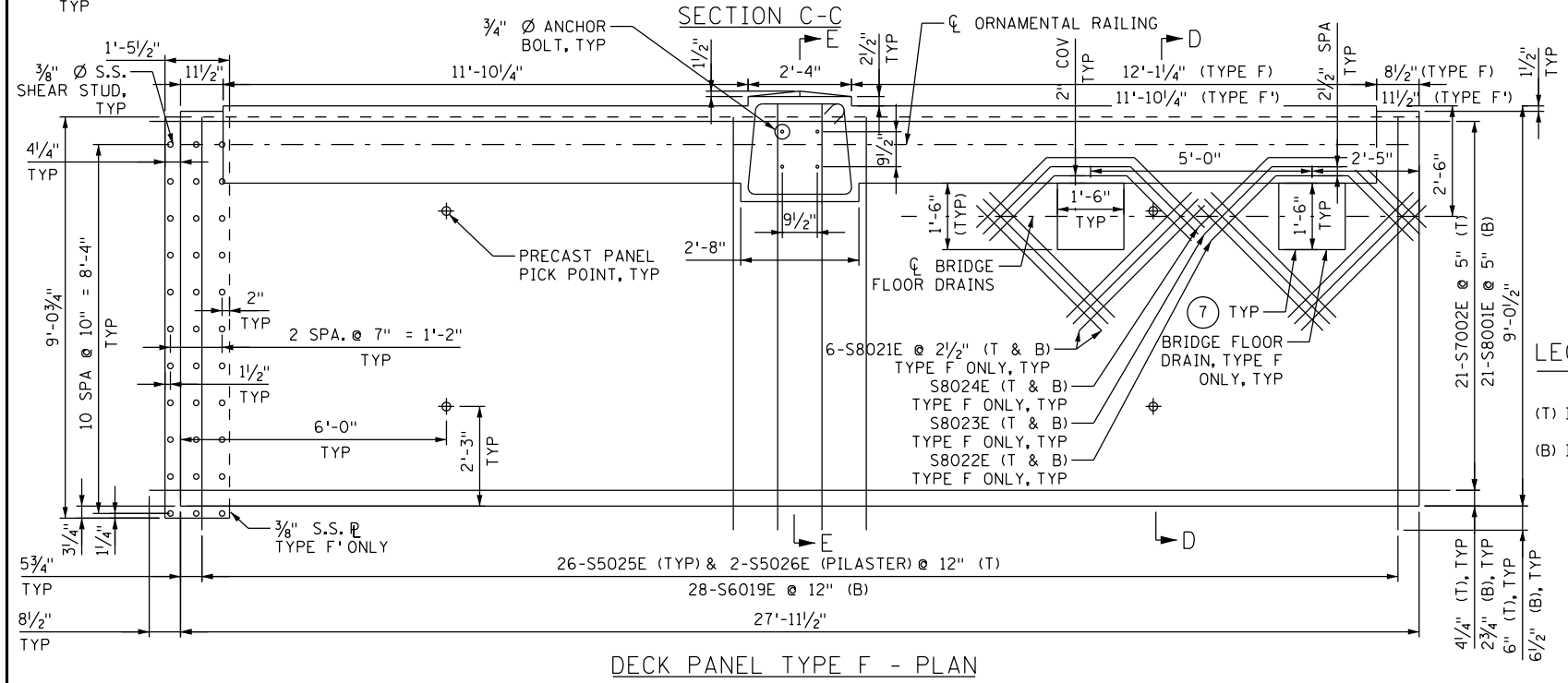
SECTION A-A



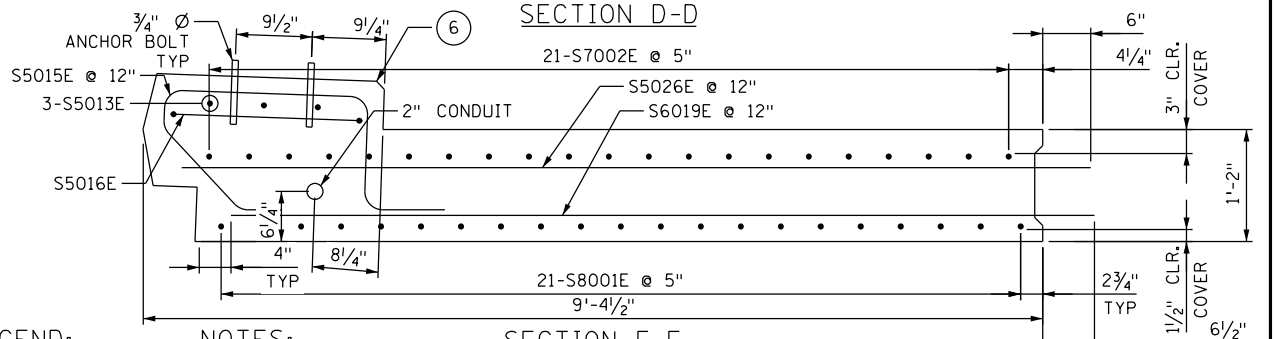
SECTION B-B



SECTION D-D



SECTION C-C



SECTION E-E

LEGEND:

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

NOTES:

- FOR DECK PANEL SHEAR KEY DETAIL, CAMBER DETAIL, CURB DETAILS, AND ORNAMENTAL RAILING CONNECTION DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
- FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
- FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
- FOR CONCRETE PARAPET REINFORCEMENT DETAILS, P-2 TUBE RAILING ANCHORAGE INSERTS, AND CONDUIT LOCATIONS IN PARAPET, SEE SHEET B151 (CONCRETE PARAPET (TYPE P-2 MODIFIED) W/ STRUCTURAL TUBE RAILING).
- FOR BRIDGE FLOOR DRAIN DETAILS, SEE SHEET B169 (BRIDGE DRAINAGE DETAILS).
- WHEN THE DECK PANELS ARE INSTALLED, THE PARAPET SHALL BE PLUMB, THE TOP OF CURB SHALL BE LEVEL, AND THE FACE OF CURB SHALL BE VERTICAL.
- ALL DECK REINFORCEMENT TO BE CUT 2" CLEAR OF FLOOR DRAIN.
- DIMENSIONS TO CENTERLINE OF CONCRETE PARAPET ARE MEASURED ALONG THE TOP OF DECK PANEL.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*

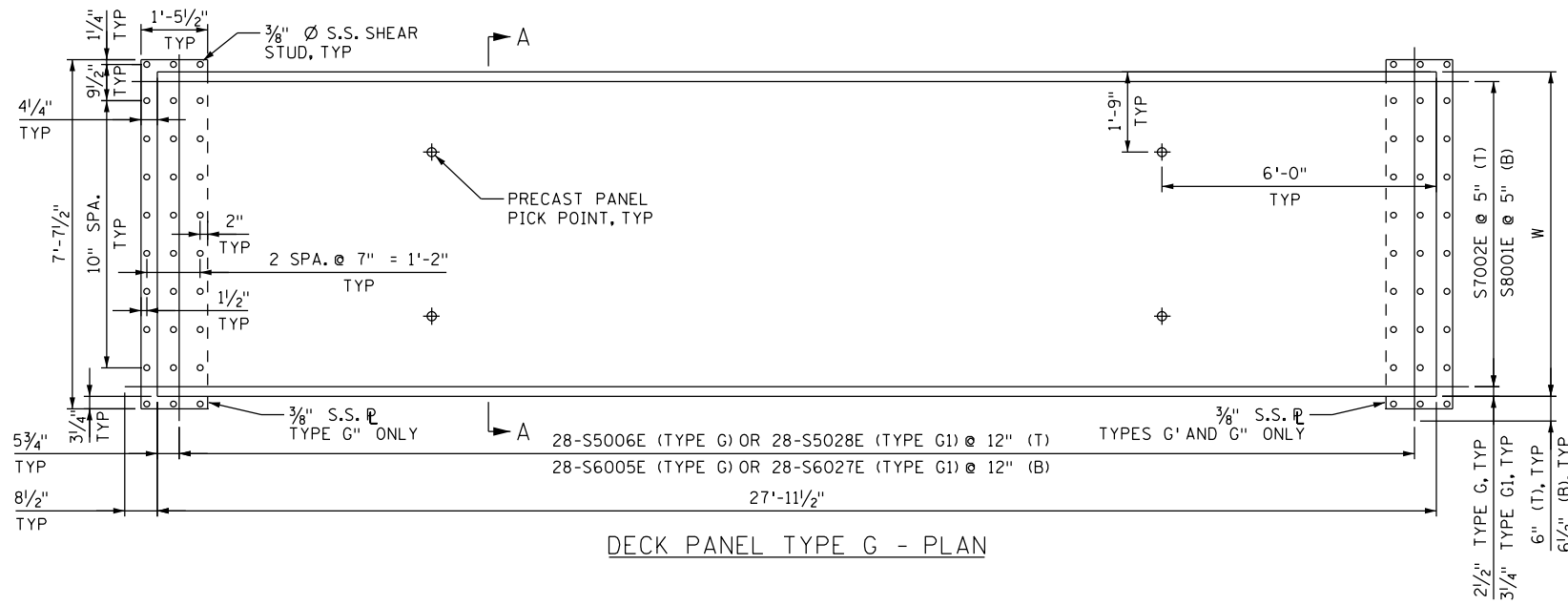
DANIEL F. ENSER, PROFESSIONAL ENGINEER  
 41308 LICENSE NO.  
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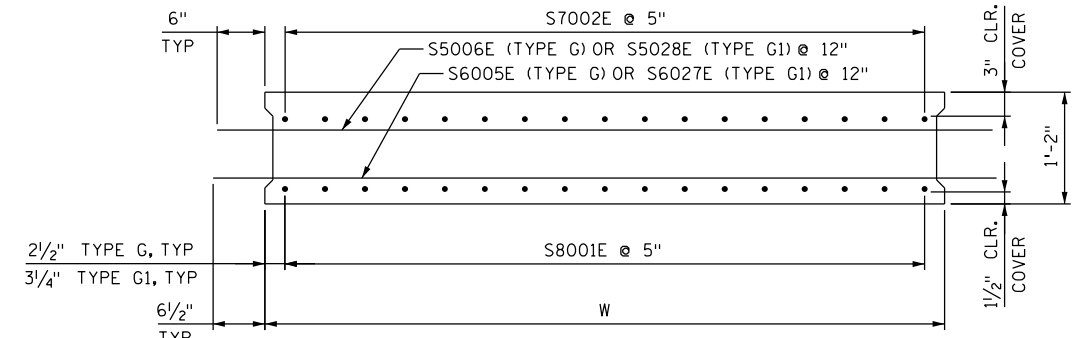
DECK PANEL DETAILS - TYPES E AND F

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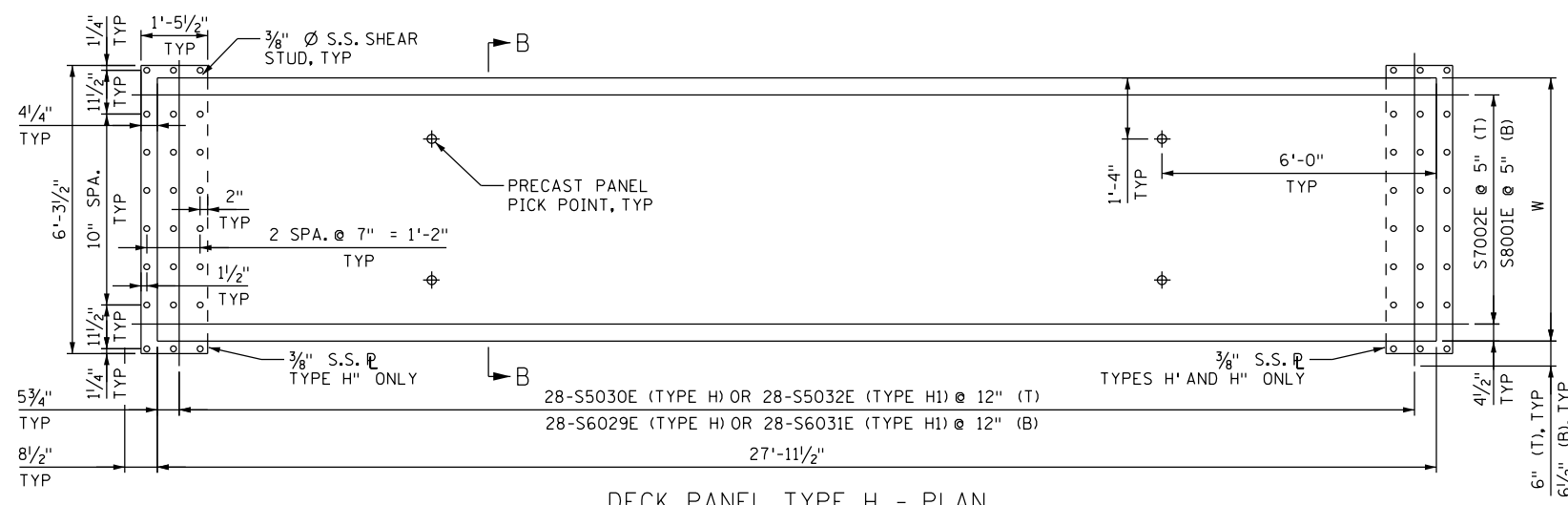
SHEET  
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 B176



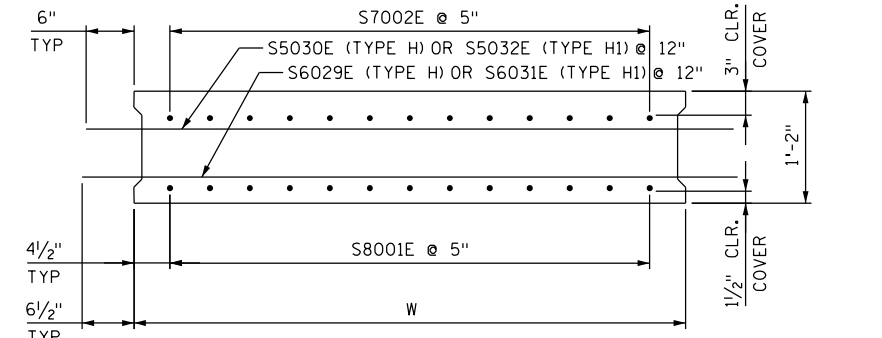
DECK PANEL TYPE G - PLAN



SECTION A-A



DECK PANEL TYPE H - PLAN



SECTION B-B

DECK PANEL DIMENSION TABLE

PANEL TYPE	W	CAMBER
G	7'-1"	3/16"
G1	6'-9 1/2"	3/16"
H	5'-9"	3/16"
H1	5'-4"	3/16"

LEGEND:

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

NOTES:

1. FOR DECK PANEL SHEAR KEY DETAIL AND CAMBER DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
2. FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
3. FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
 DANIEL F. ENSER, PROFESSIONAL ENGINEER

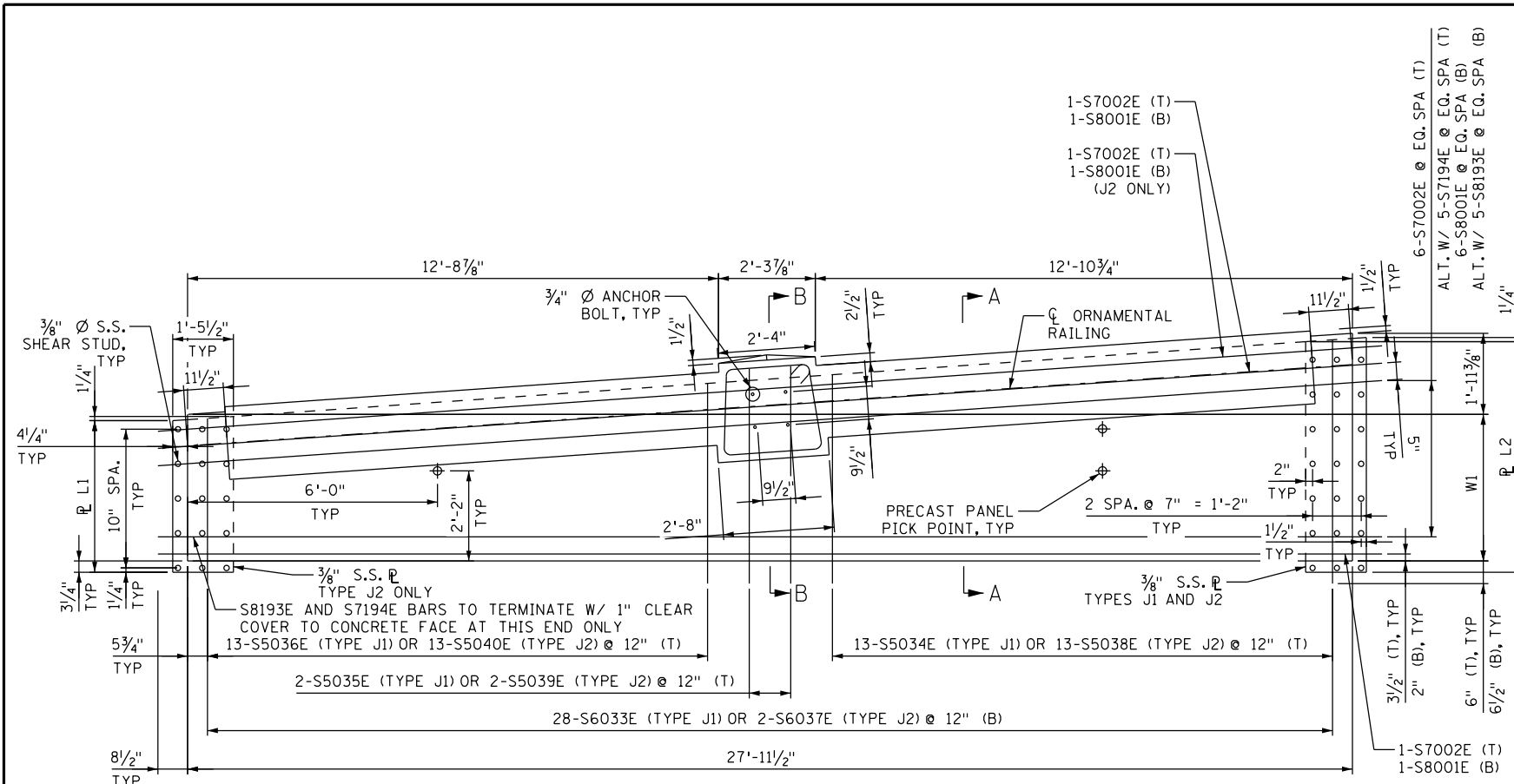
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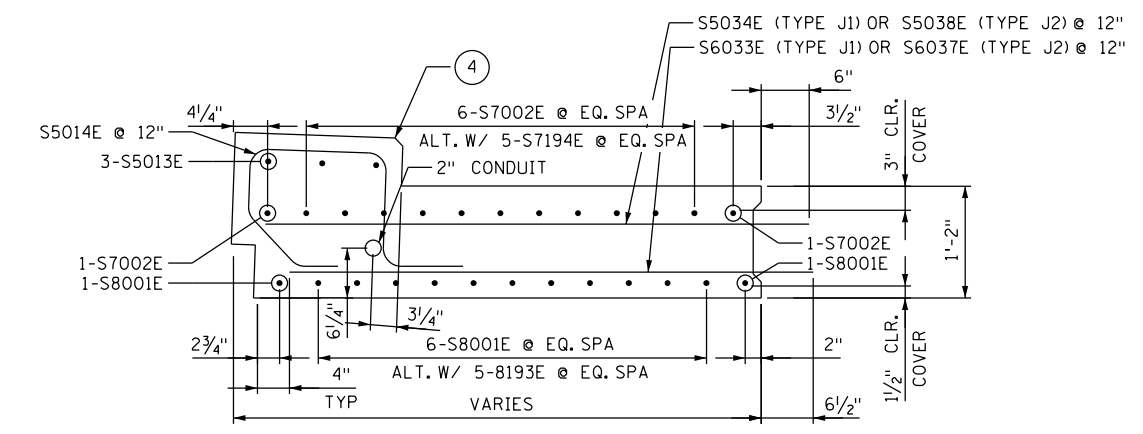
DECK PANEL DETAILS - TYPES G AND H

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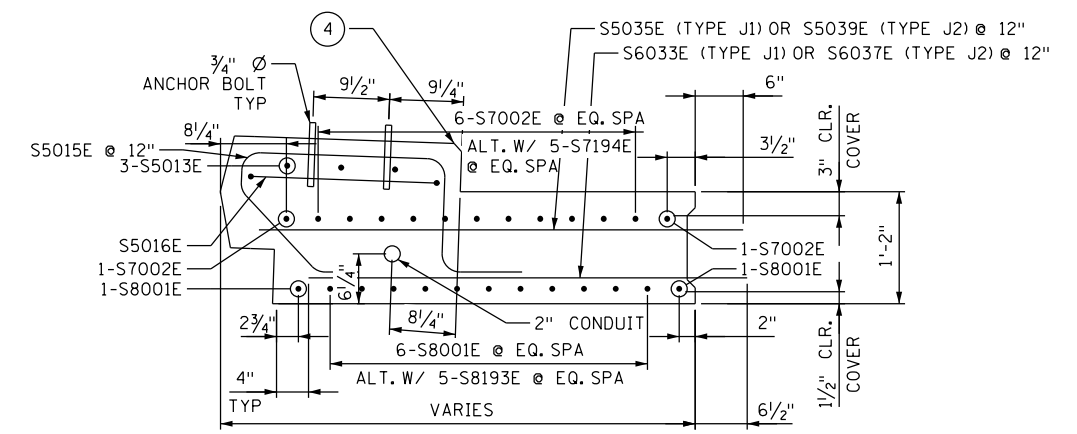
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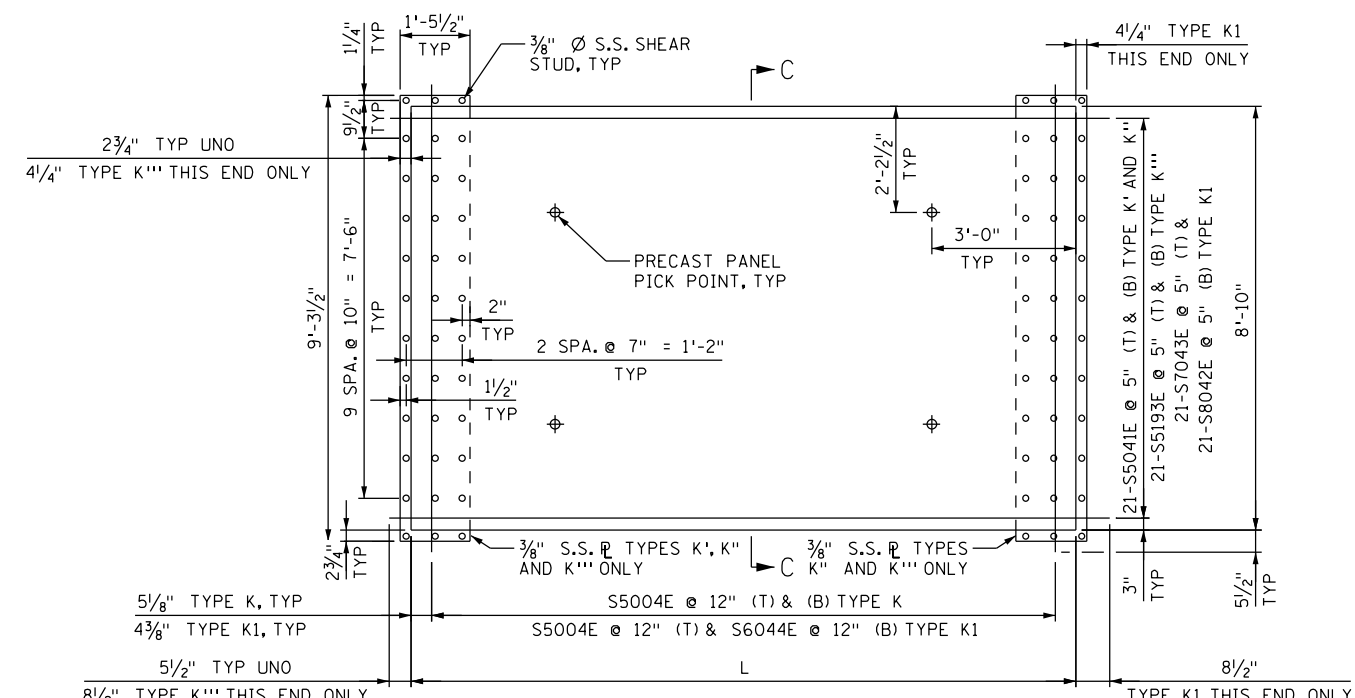
DECK PANEL TYPE J - PLAN



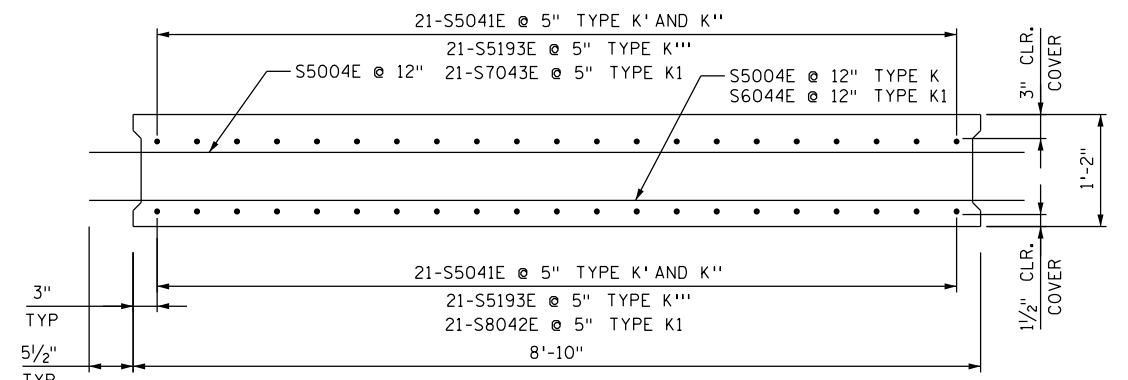
SECTION A-A



SECTION B-B



DECK PANEL TYPE K - PLAN



SECTION C-C

LEGEND:

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

NOTES:

1. FOR DECK PANEL SHEAR KEY DETAIL, CAMBER DETAIL, CURB DETAILS, AND ORNAMENTAL RAILING CONNECTION DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
2. FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
3. FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
4. WHEN THE DECK PANELS ARE INSTALLED, THE TOP OF CURB SHALL BE LEVEL, AND THE FACE OF CURB SHALL BE VERTICAL.

DECK PANEL DIMENSION TABLE					
PANEL TYPE	L	W1	ℓ L1	ℓ L2	CAMBER
J1	N/A	3'-7 3/4"	N/A	5'-6 3/8"	3/16"
J2	N/A	3'-11 3/4"	3'-11 3/4"	5'-10 1/2"	3/16"
K	13'-10 1/4"	N/A	N/A	N/A	0"
K1	13'-8 3/4"	N/A	N/A	N/A	0"



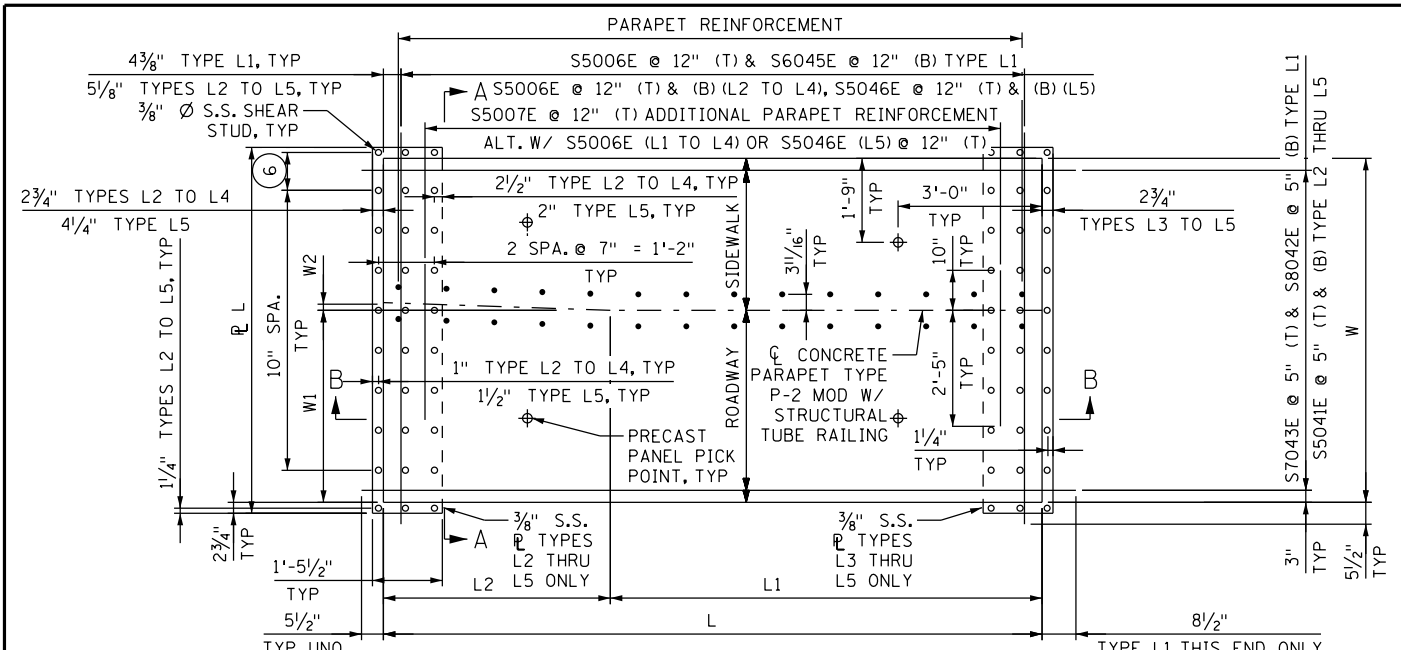
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*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
 41308 8/14/2014  
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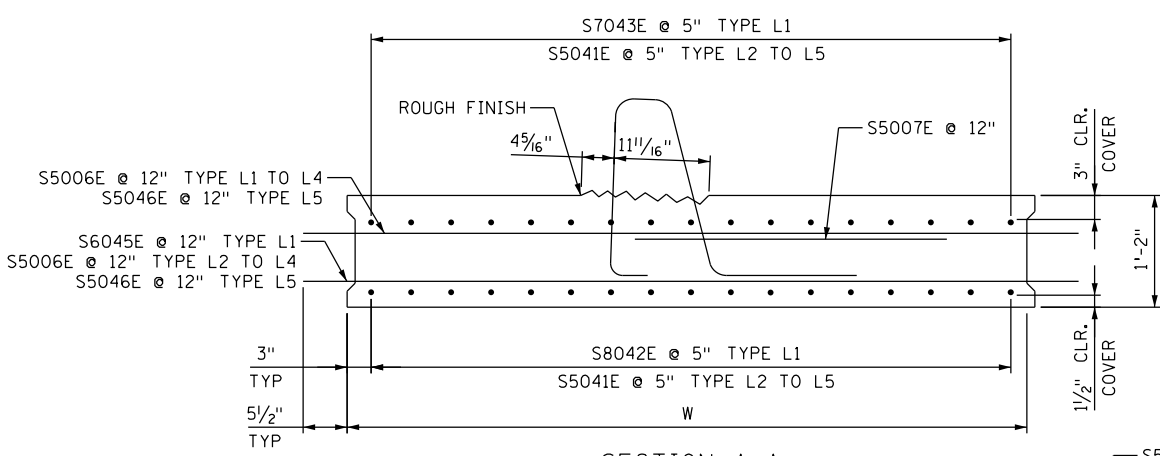
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 LAST REVISION: 7/27/2015

DECK PANEL DETAILS - TYPES J AND K  
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 BRIDGE 2441 S.P. 027-605-029

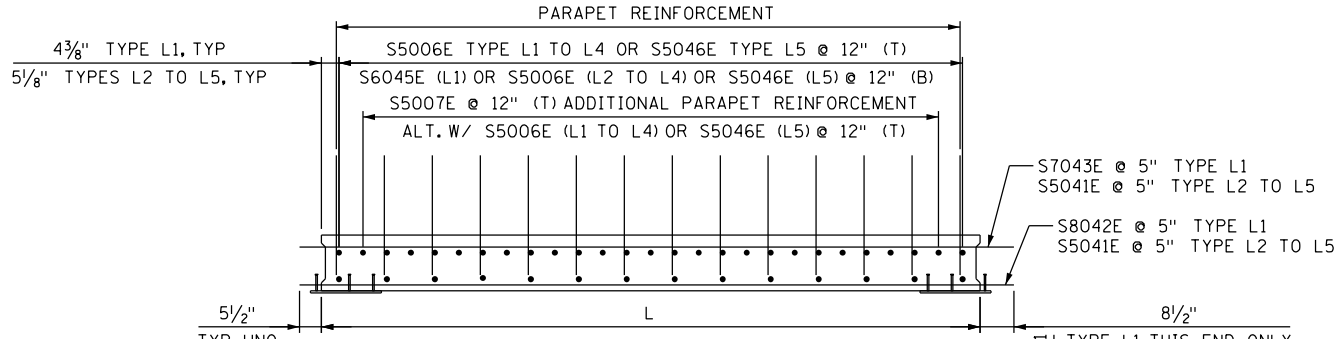
SHEET  
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 B176



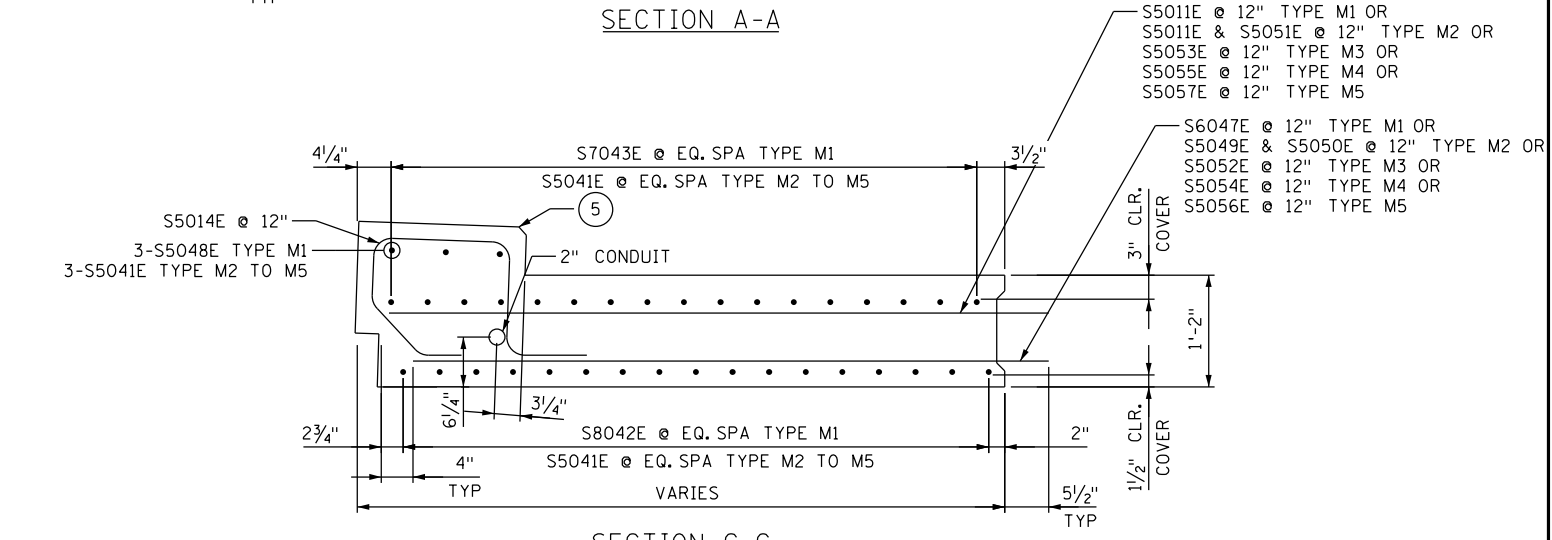
DECK PANEL TYPE L - PLAN



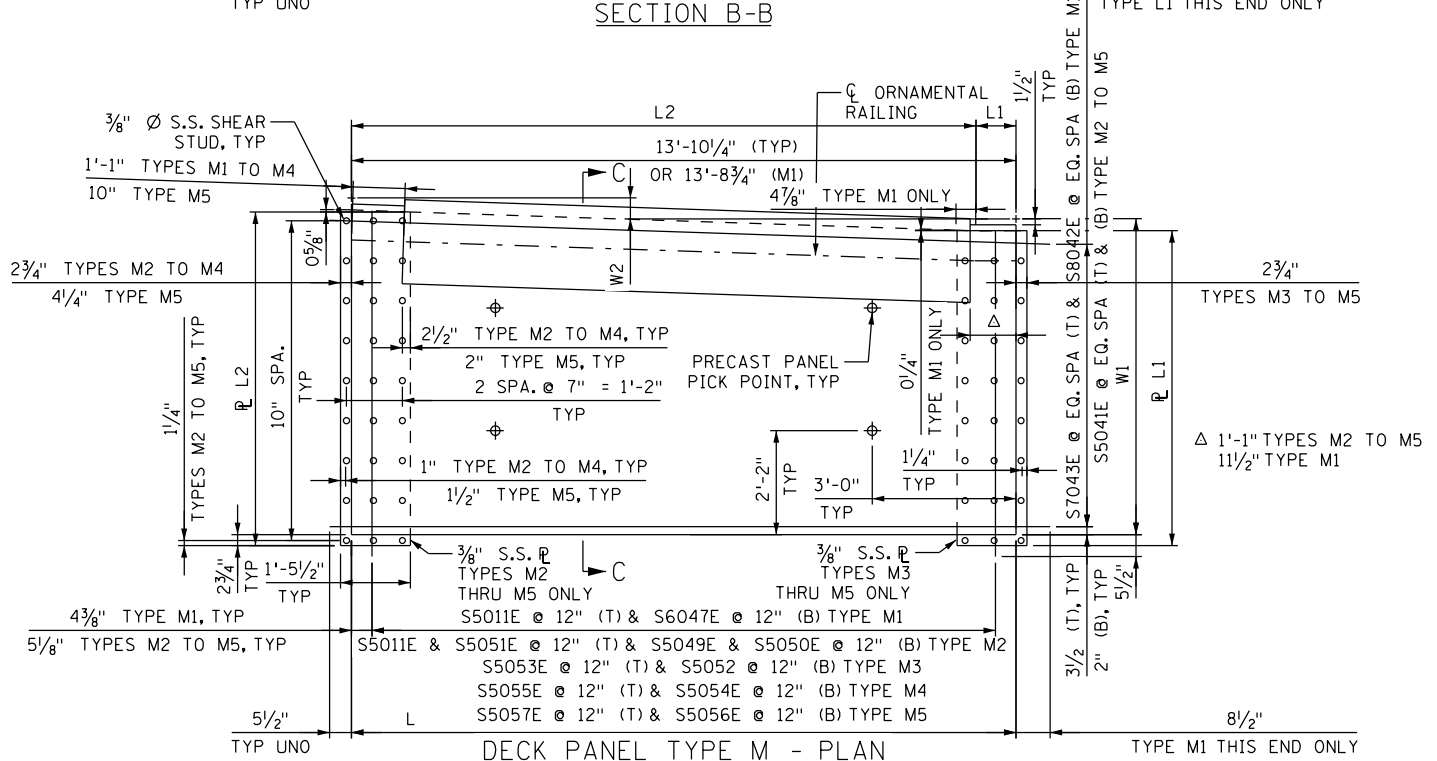
SECTION A-A



SECTION B-B



SECTION C-C



DECK PANEL TYPE M - PLAN

PANEL TYPE	L	L1	L2	W	W1	W2	ℓ L	ℓ L1	ℓ L2	CAMBER
L1	13'-8 3/4"	13'-8 3/4"	0"	7'-2"	4'-0"	0"	N/A	N/A	N/A	0"
L2	13'-10 1/4"	1'-2 3/8"	12'-7 7/8"	7'-2"	4'-0"	5 1/8"	7'-7 1/2"	N/A	N/A	0"
L3	13'-10 1/4"	0"	13'-10 1/4"	7'-2"	4'-5 1/4"	5 1/2"	7'-7 1/2"	N/A	N/A	0"
L4	13'-10 1/4"	0"	13'-10 1/4"	7'-2"	4'-11"	5 1/2"	7'-7 1/2"	N/A	N/A	0"
L5	13'-10 1/4"	0"	13'-10 1/4"	8'-5"	5'-4 3/4"	5 1/2"	8'-10 1/2"	N/A	N/A	0"
M1	13'-8 3/4"	13'-8 3/4"	0"	N/A	6'-7"	0"	N/A	N/A	N/A	0"
M2	13'-10 1/4"	10"	13'-0 1/4"	N/A	6'-7"	5 1/4"	N/A	N/A	6'-11 1/2"	0"
M3	13'-10 1/4"	0"	13'-10 1/4"	N/A	7'-0 3/8"	5 1/2"	N/A	7'-0 5/8"	7'-5 1/4"	0"
M4	13'-10 1/4"	0"	13'-10 1/4"	N/A	7'-6 3/8"	5 1/2"	N/A	7'-6 3/8"	7'-10 7/8"	0"
M5	13'-10 1/4"	0"	13'-10 1/4"	N/A	6'-8 7/8"	5 1/2"	N/A	6'-9 7/8"	7'-13 1/4"	0"

LEGEND:

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

NOTES:

- FOR DECK PANEL SHEAR KEY DETAIL, CAMBER DETAIL, CURB DETAILS, AND ORNAMENTAL RAILING CONNECTION DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
- FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
- FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
- FOR CONCRETE PARAPET REINFORCEMENT DETAILS, SEE SHEET B151 (CONCRETE PARAPET (TYPE P-2 MODIFIED) W/ STRUCTURAL TUBE RAILING).
- WHEN THE DECK PANELS ARE INSTALLED, THE PARAPET SHALL BE PLUMB, THE TOP OF CURB SHALL BE LEVEL, AND THE FACE OF CURB SHALL BE VERTICAL.
- 9 1/2" TYPES L2 TO L4, TYP  
12" TYPE L5, TYP



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

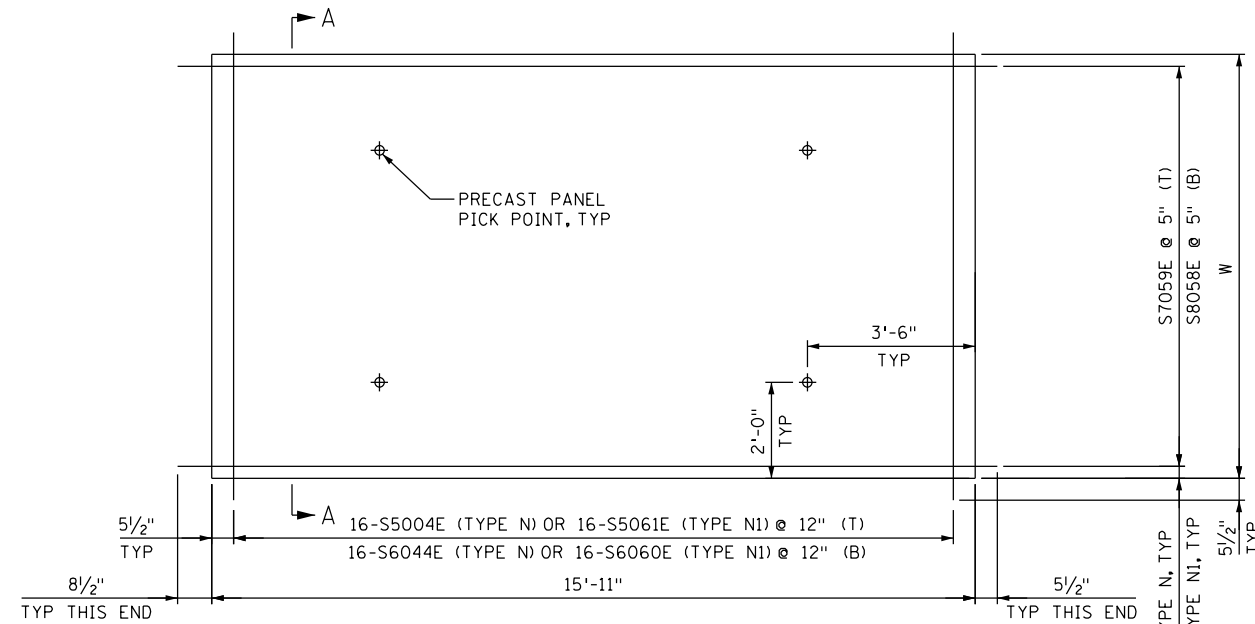
*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
 41308 LICENSE NO. 8/14/2014 DATE

DESIGN BY: EBR  
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 CHECKED BY: FP  
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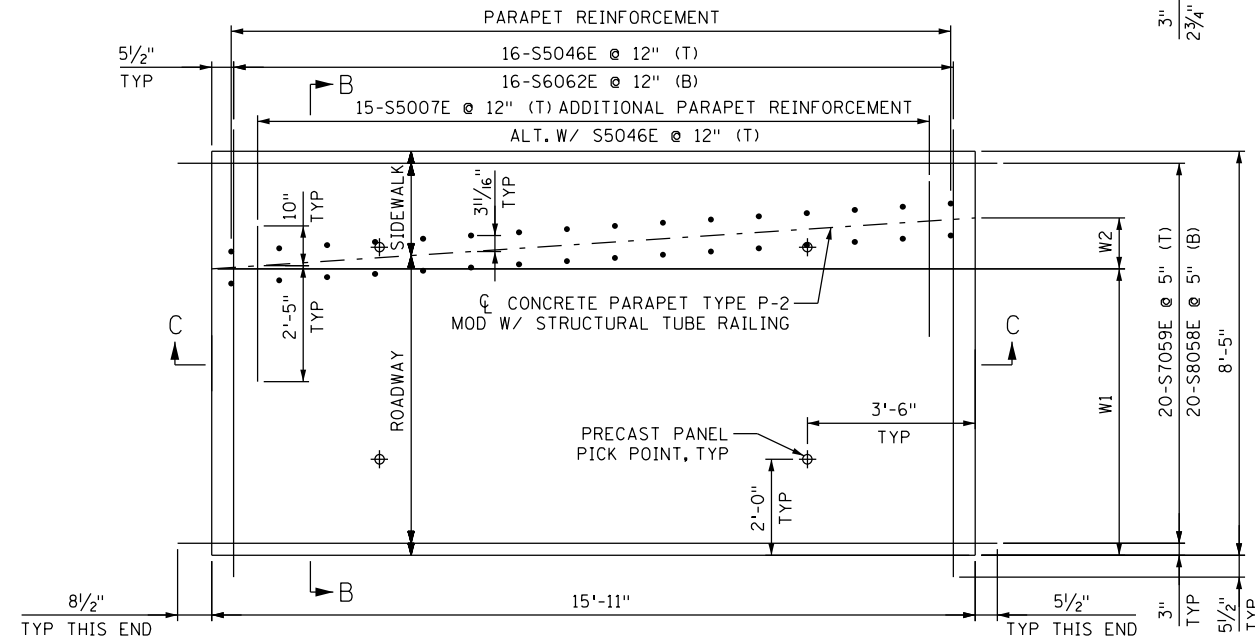
DECK PANEL DETAILS - TYPES L AND M  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

SHEET  
 B130R2  
 B176

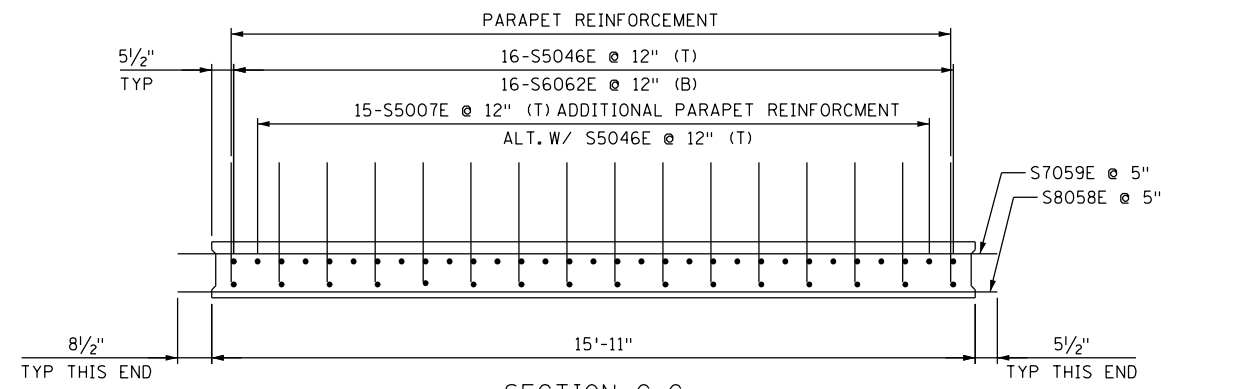




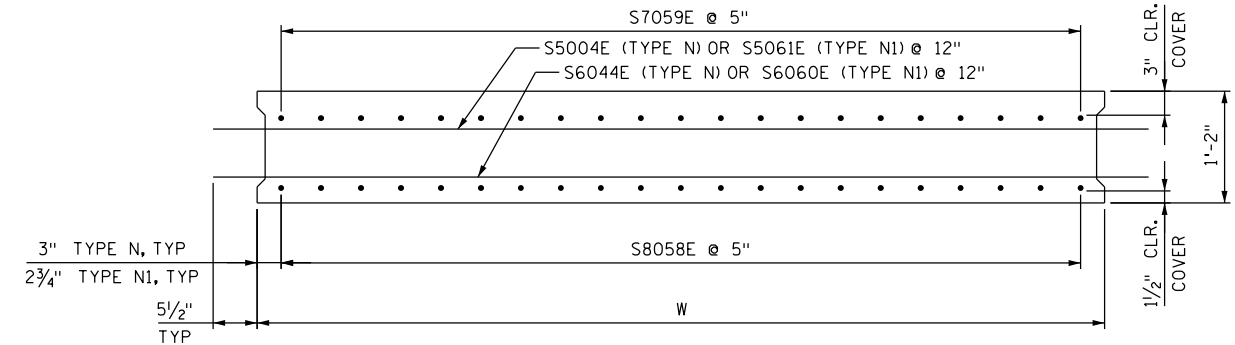
DECK PANEL TYPE N - PLAN



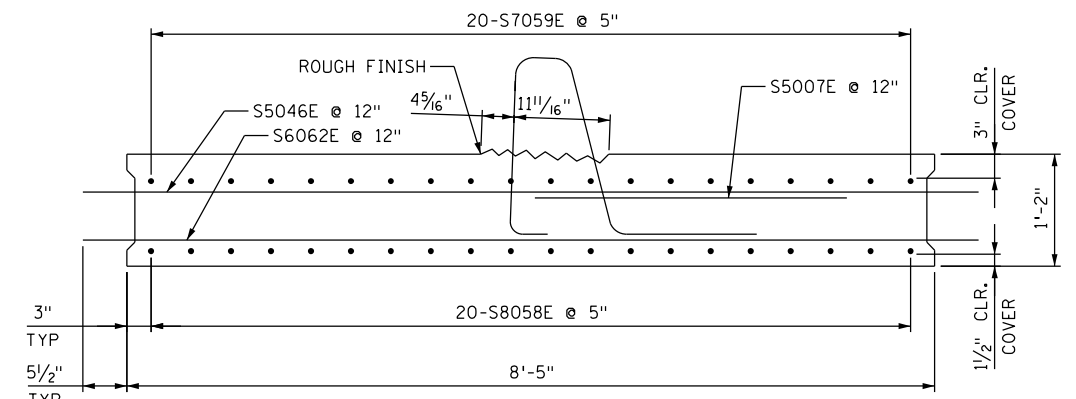
DECK PANEL TYPE P - PLAN



SECTION C-C



SECTION A-A



SECTION B-B

LEGEND:

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

NOTES:

1. FOR DECK PANEL SHEAR KEY DETAIL AND CAMBER DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
2. FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
3. FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
4. FOR CONCRETE PARAPET REINFORCEMENT DETAILS, SEE SHEET B151 (CONCRETE PARAPET (TYPE P-2 MODIFIED) W/ STRUCTURAL TUBE RAILING).
5. WHEN THE DECK PANELS ARE INSTALLED, THE PARAPET SHALL BE PLUMB.

DECK PANEL DIMENSION TABLE				
PANEL TYPE	W	W1	W2	CAMBER
N	8'-10"	N/A	N/A	0"
N1	7'-6 1/2"	N/A	N/A	0"
P	N/A	4'-0"	0"	0"
P1	N/A	4'-10 1/2"	1'-0 3/4"	0"
P2	N/A	5'-11 5/8"	1'-0 3/4"	0"



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*

DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308  
LICENSE NO.

8/14/2014  
DATE

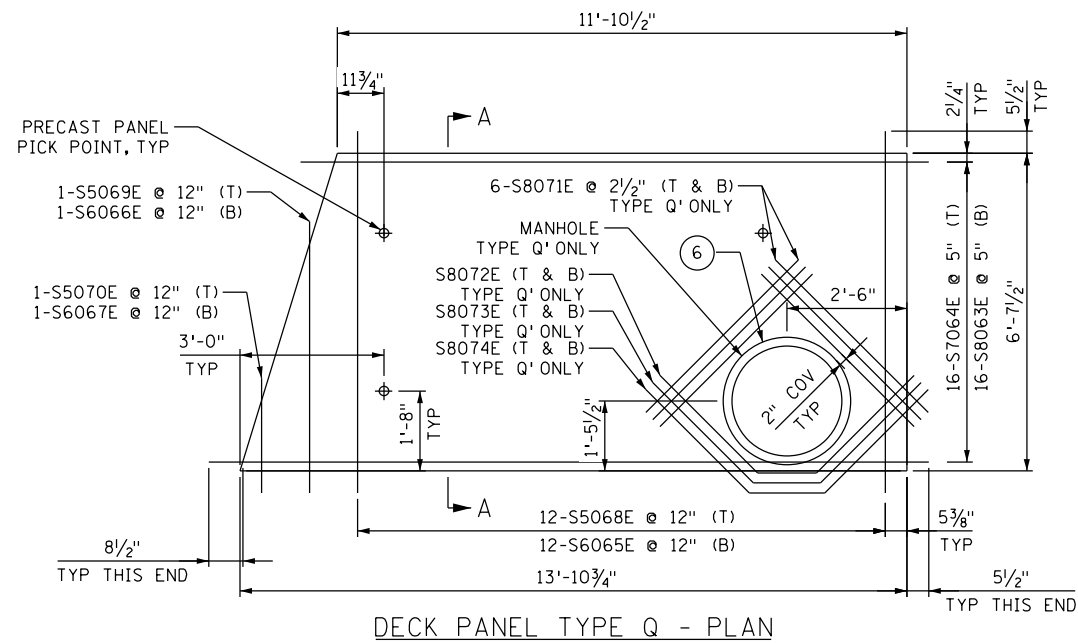
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DECK PANEL DETAILS - TYPES N AND P

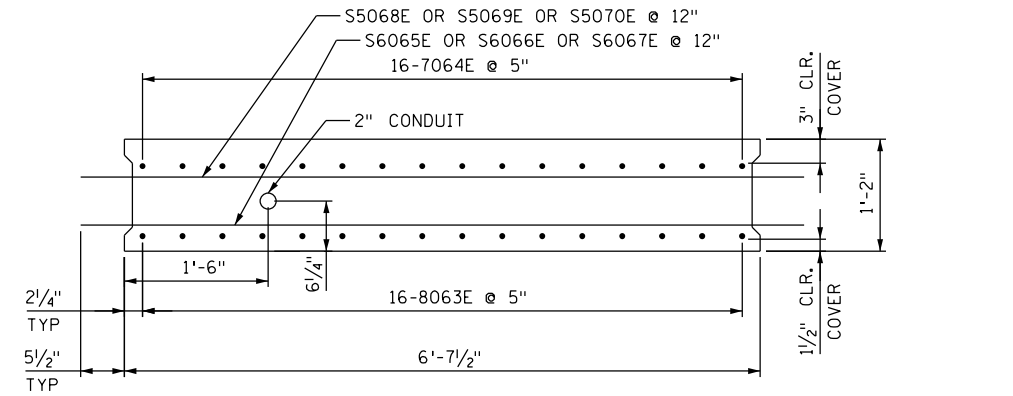
C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET

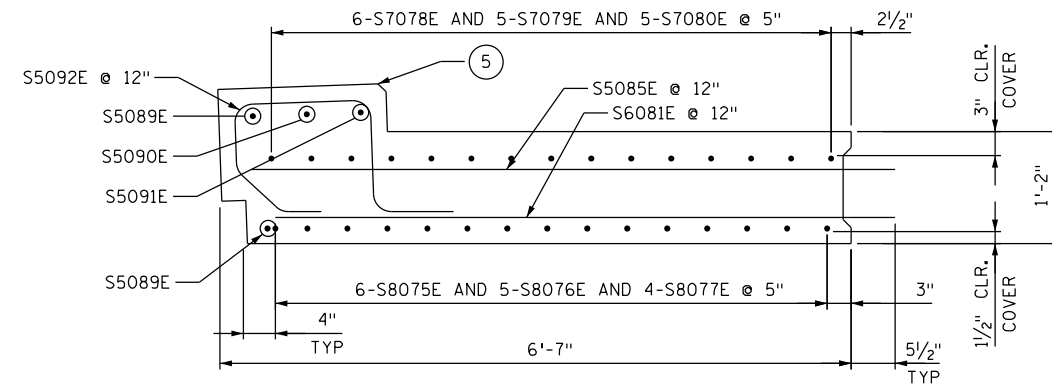
B131  
B176



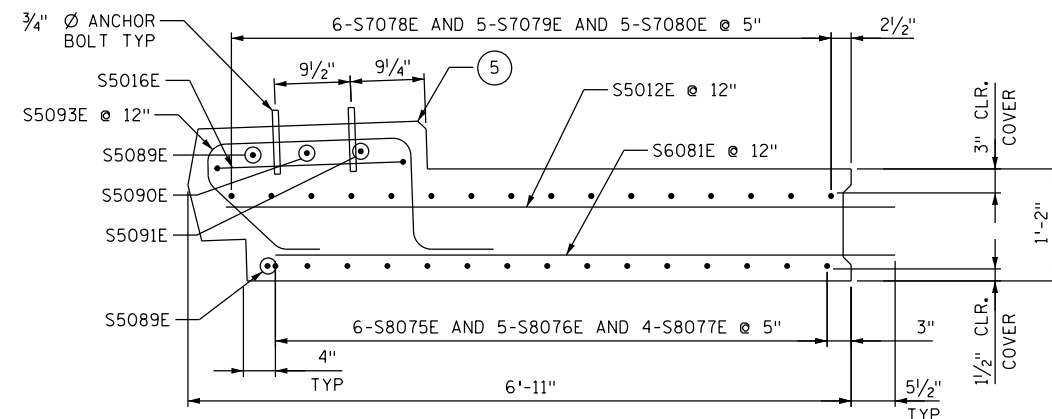
DECK PANEL TYPE Q - PLAN



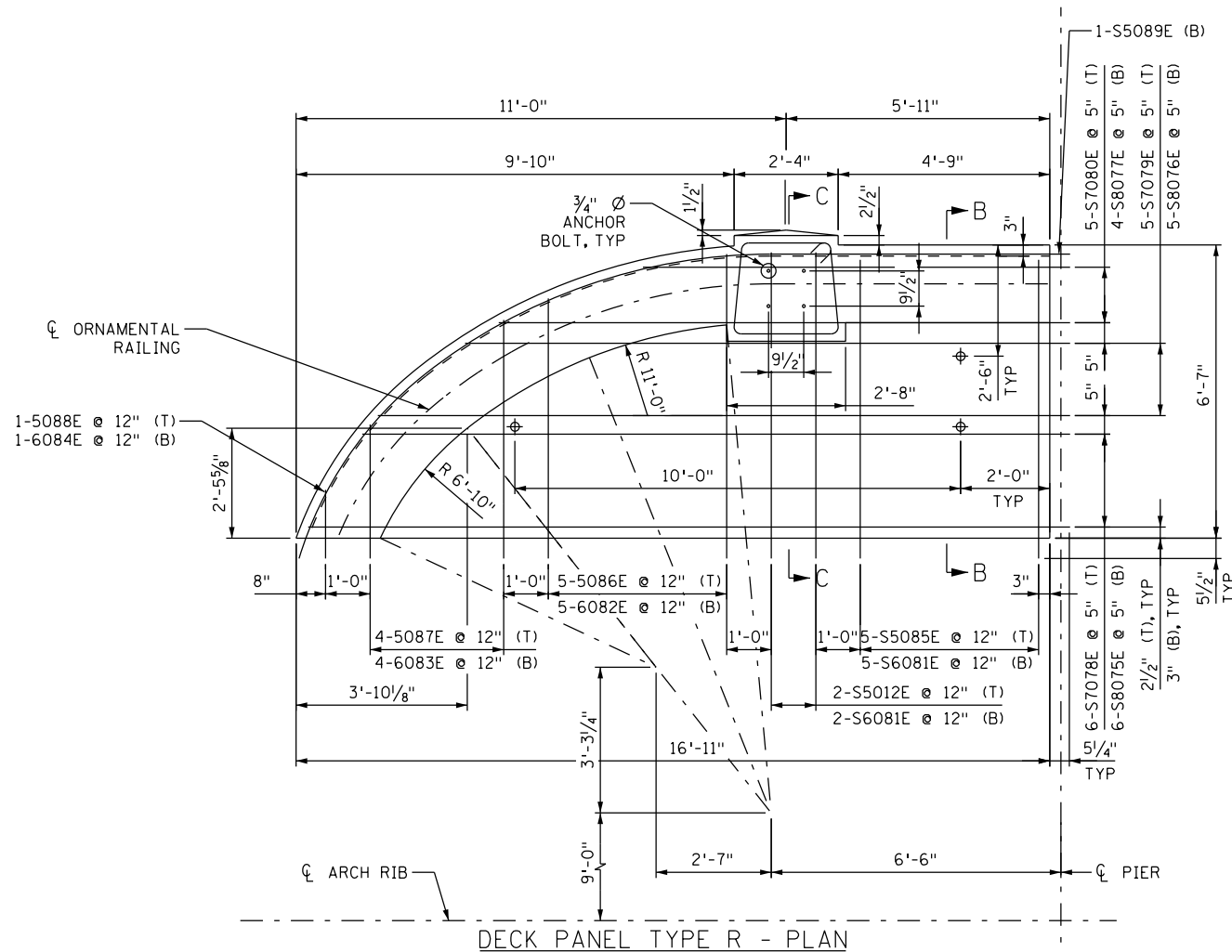
SECTION A-A



SECTION B-B



SECTION C-C



DECK PANEL TYPE R - PLAN

LEGEND:

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

DECK PANEL CAMBER TABLE	
PANEL TYPE	CAMBER
Q	0"
R	0"

NOTES:

1. FOR DECK PANEL SHEAR KEY DETAIL, CAMBER DETAIL, CURB DETAILS, AND ORNAMENTAL RAILING CONNECTION DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
2. FOR DECK PANEL ELEVATIONS, SEE SHEET B141 AND B142 (DECK ELEVATION TABLE).
3. FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
4. FOR MANHOLE DETAILS, SEE SHEET B171 (MANHOLE DETAILS).
5. WHEN THE DECK PANELS ARE INSTALLED, THE TOP OF CURB SHALL BE LEVEL, AND THE FACE OF CURB SHALL BE VERTICAL.
6. ALL DECK REINFORCEMENT TO BE CUT 2" CLEAR OF MANHOLE.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*

DANIEL F. ENSER, PROFESSIONAL ENGINEER

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8/14/2014  
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 LAST REVISION: 5/14/2015

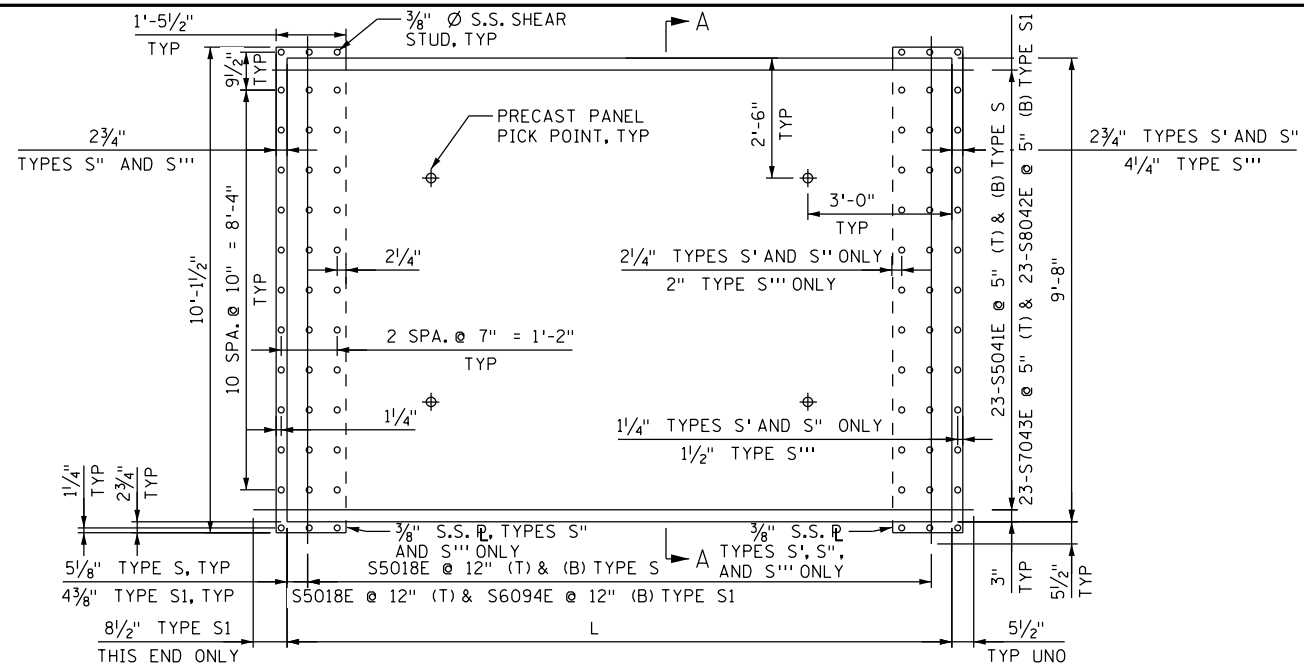
DECK PANEL DETAILS - TYPES Q AND R

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 BRIDGE 2441 S.P. 027-605-029

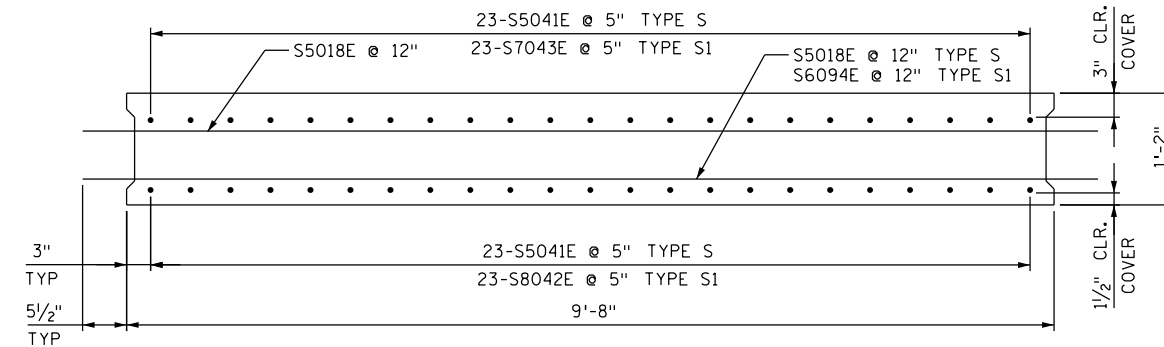
SHEET

B132R2

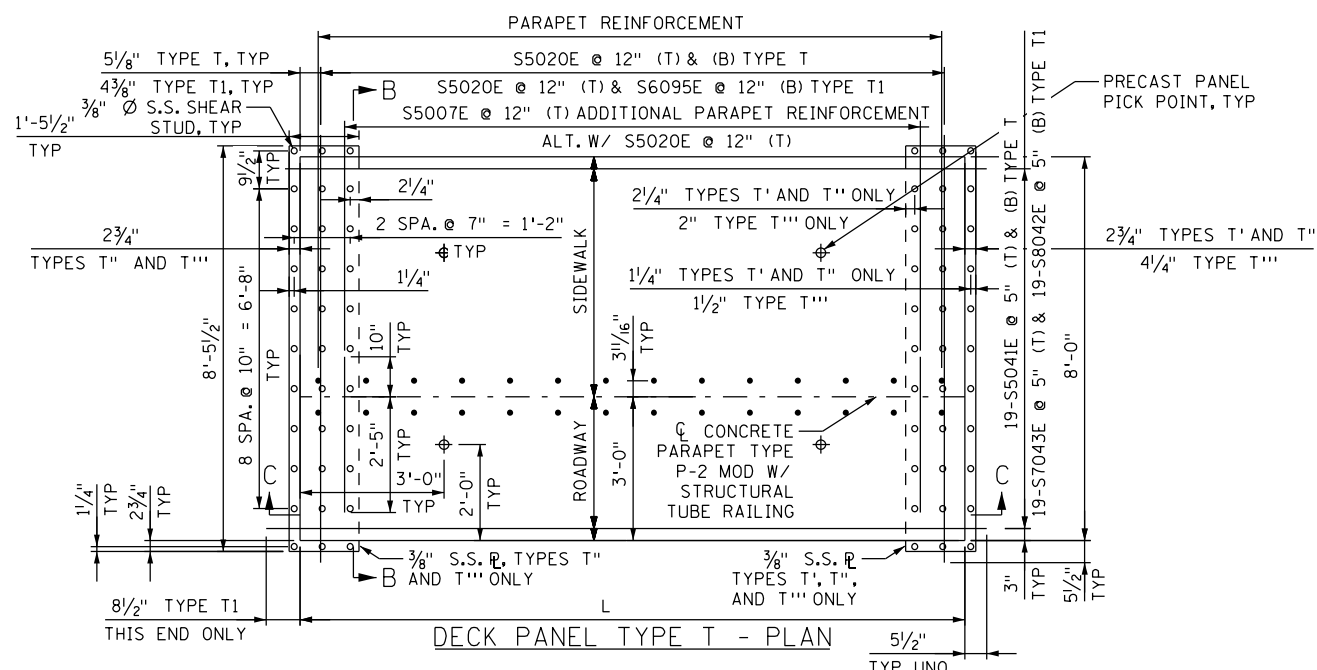
B176



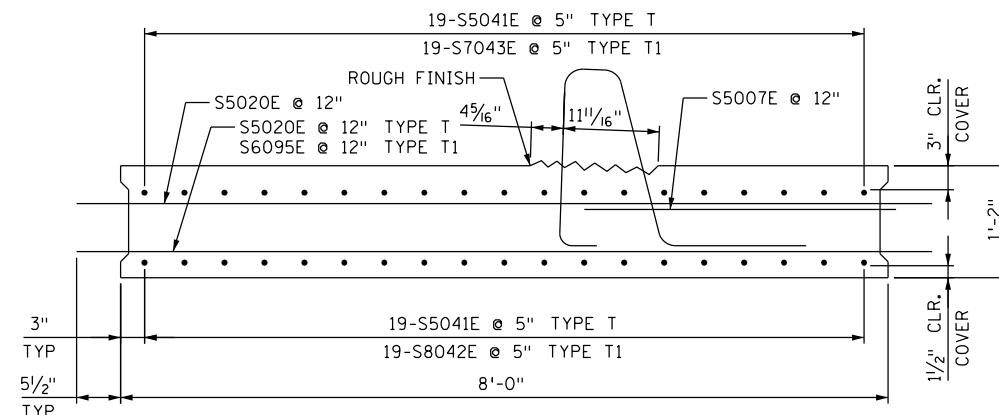
DECK PANEL TYPE S - PLAN



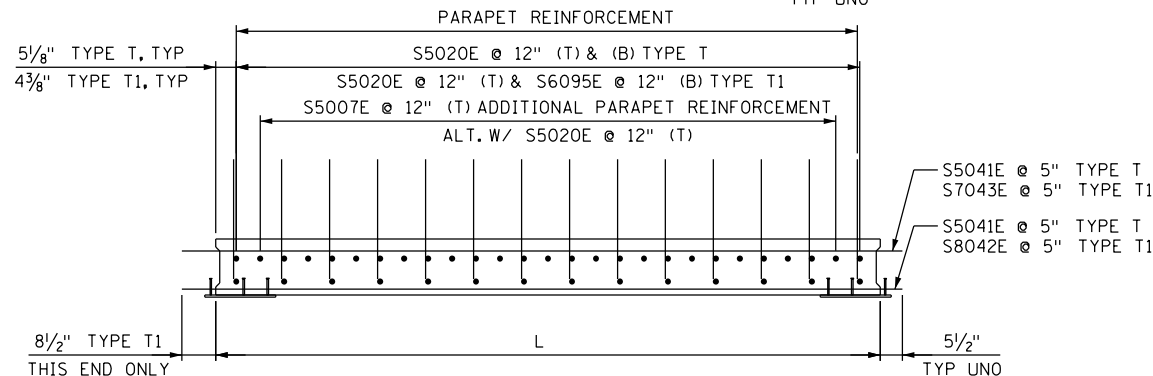
SECTION A-A



DECK PANEL TYPE T - PLAN



SECTION B-B



SECTION C-C

LEGEND:

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

NOTES:

1. FOR DECK PANEL SHEAR KEY DETAIL AND CAMBER DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
2. FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
3. FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
4. FOR CONCRETE PARAPET REINFORCEMENT DETAILS, SEE SHEET B151 (CONCRETE PARAPET (TYPE P-2 MODIFIED) W/ STRUCTURAL TUBE RAILING).
5. WHEN THE DECK PANELS ARE INSTALLED, THE PARAPET SHALL BE PLUMB.

DECK PANEL DIMENSION TABLE

PANEL TYPE	L	CAMBER
S	13'-10 1/4"	0"
S1	13'-8 3/4"	0"
T	13'-10 1/4"	0"
T1	13'-8 3/4"	0"



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*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**

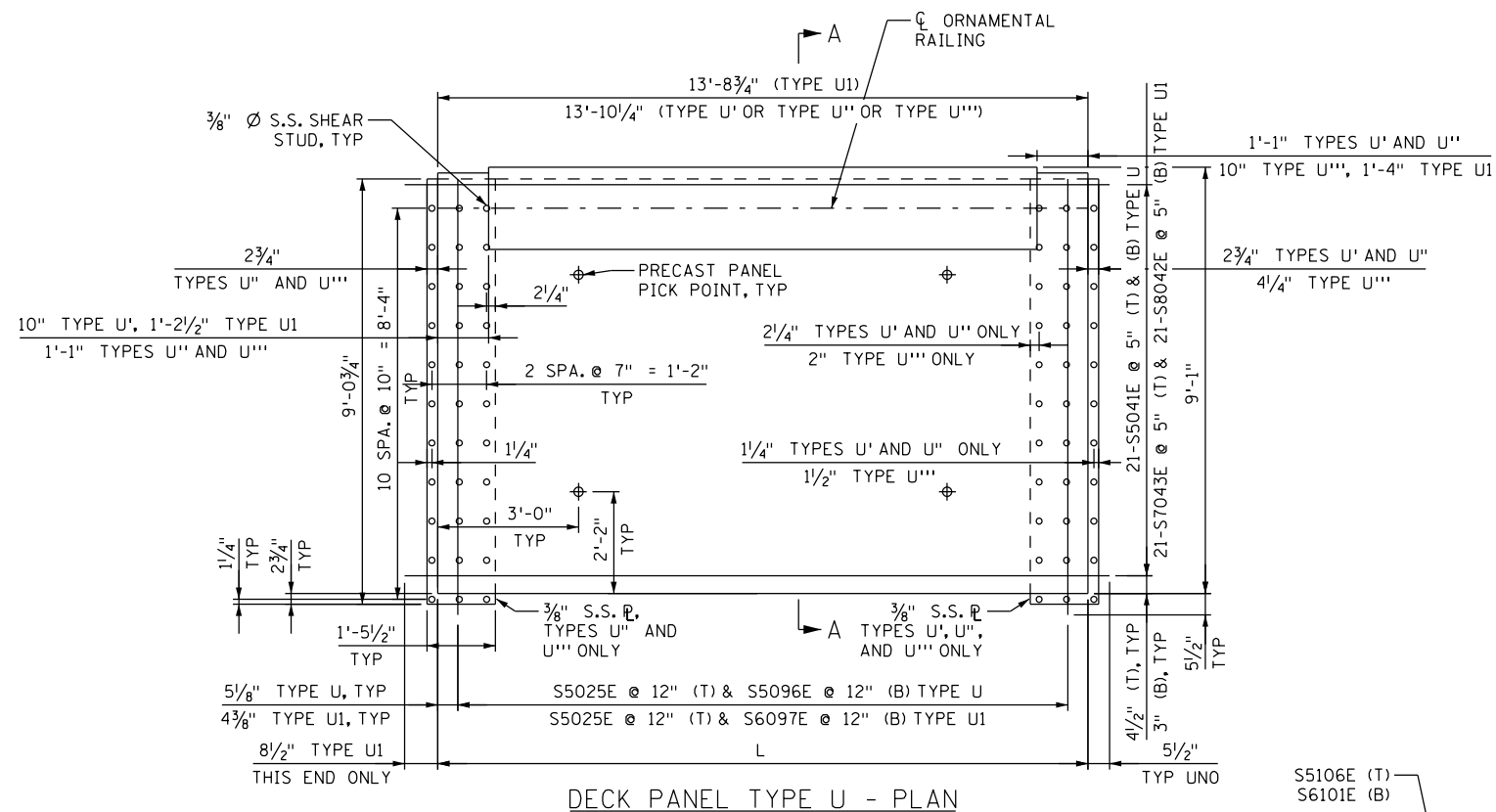
**41308**      **8/14/2014**  
 LICENSE NO.      DATE

**DESIGN BY:**      EBR  
**CAD BY:**      ET  
**CHECKED BY:**      FP  
**LAST REVISION:**      \_\_\_\_\_

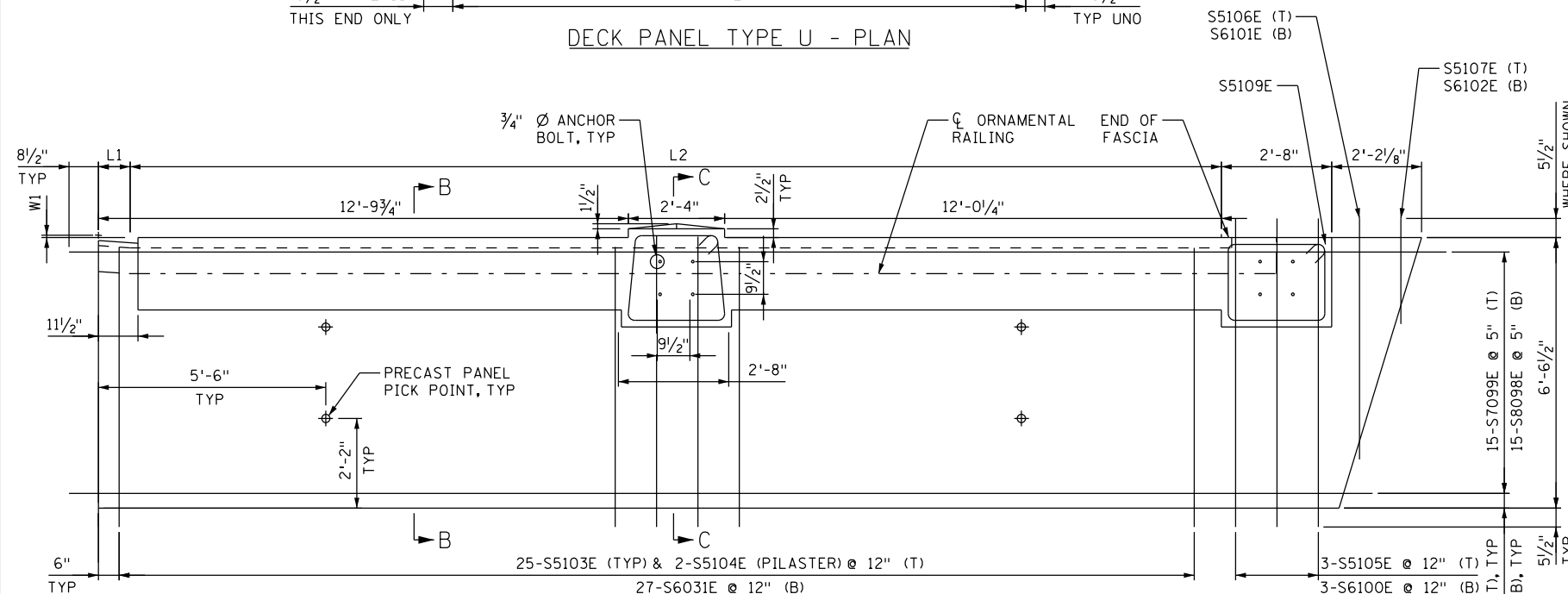
DECK PANEL DETAILS - TYPES S AND T

**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**  
**BRIDGE 2441      S.P. 027-605-029**

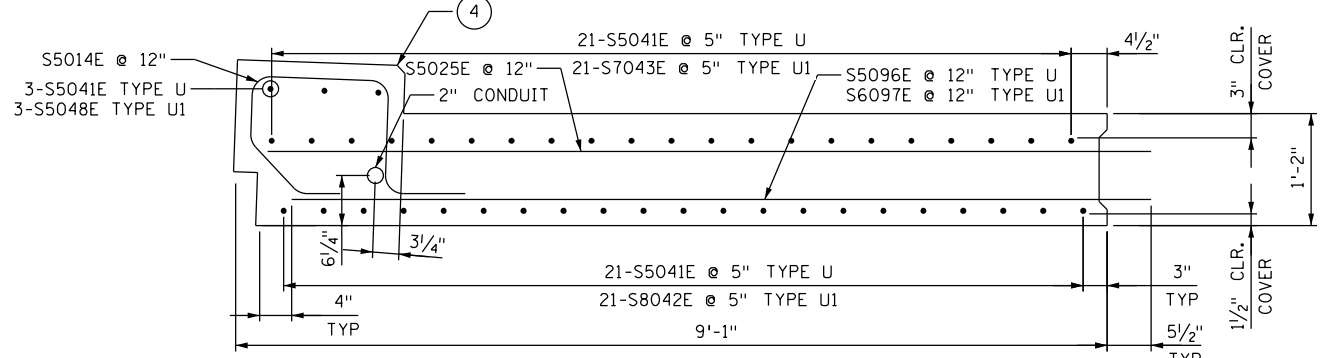
**SHEET**  
**B133**  
**B176**



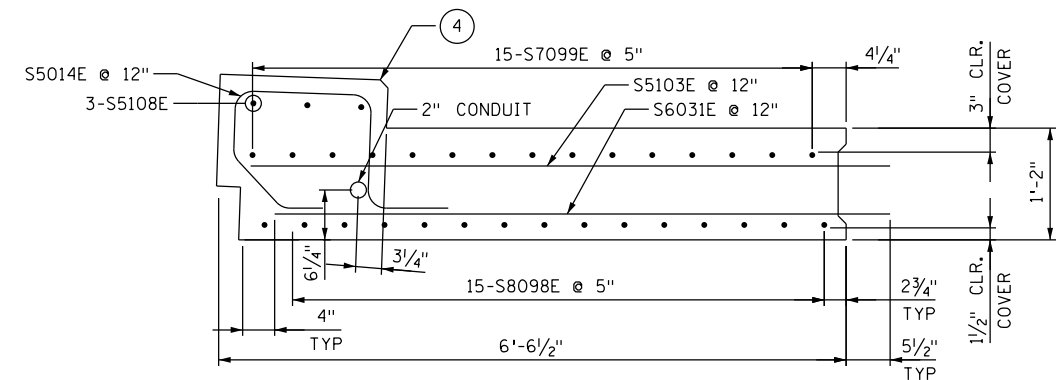
DECK PANEL TYPE U - PLAN



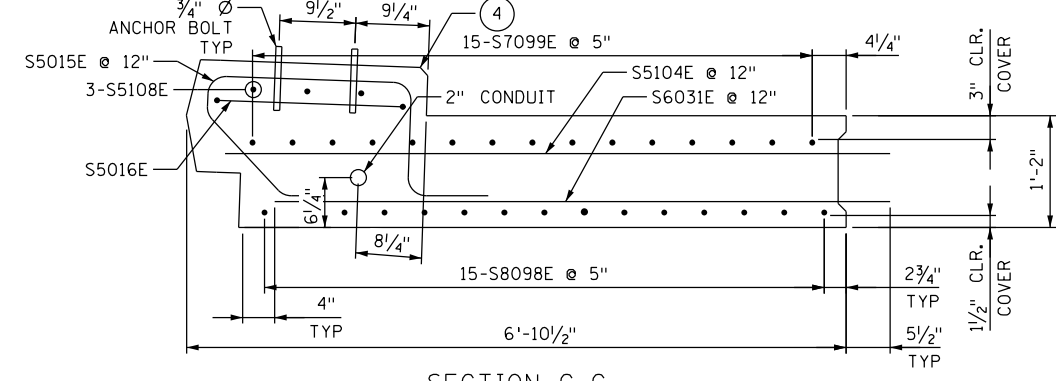
DECK PANEL TYPE V - PLAN



SECTION A-A



SECTION B-B



SECTION C-C

LEGEND:

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

NOTES:

1. FOR DECK PANEL SHEAR KEY DETAIL, CAMBER DETAIL, CURB DETAILS, AND ORNAMENTAL RAILING CONNECTION DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
2. FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
3. FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
4. WHEN THE DECK PANELS ARE INSTALLED, THE TOP OF CURB SHALL BE LEVEL, AND THE FACE OF CURB SHALL BE VERTICAL.

DECK PANEL DIMENSION TABLE					
PANEL TYPE	L	L1	L2	W1	CAMBER
U	13'-10 1/4"	N/A	N/A	N/A	0"
U1	13'-8 3/4"	N/A	N/A	N/A	0"
V	N/A	0"	27'-1 1/8"	0"	5/16"
V1	N/A	9/4"	26'-4 5/8"	5/8"	5/16"



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

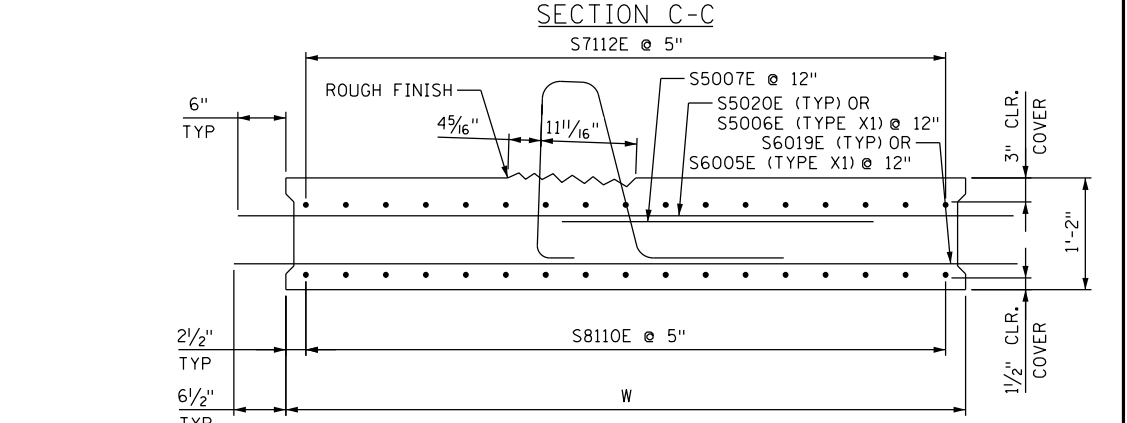
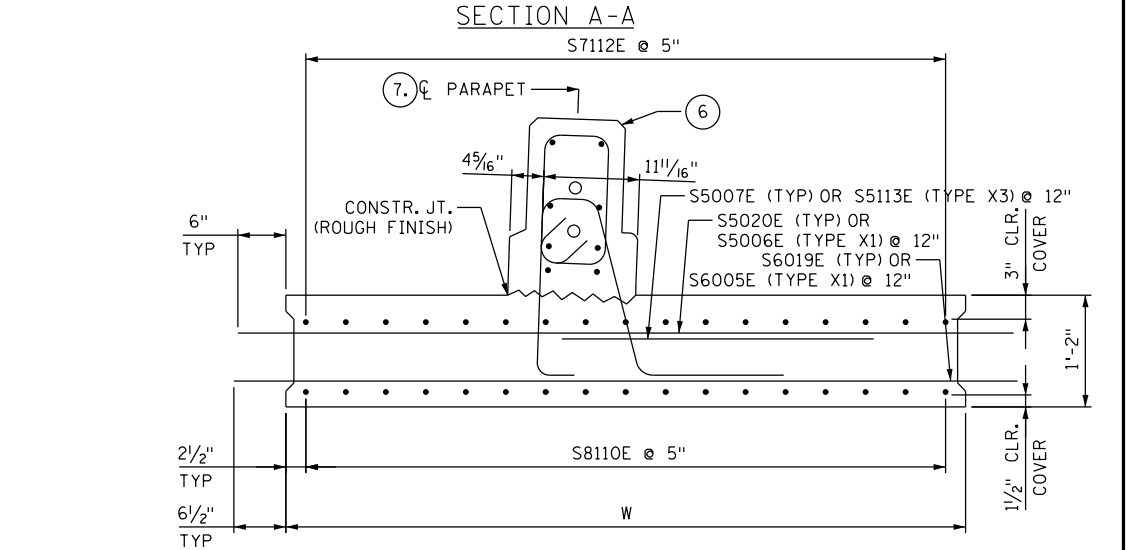
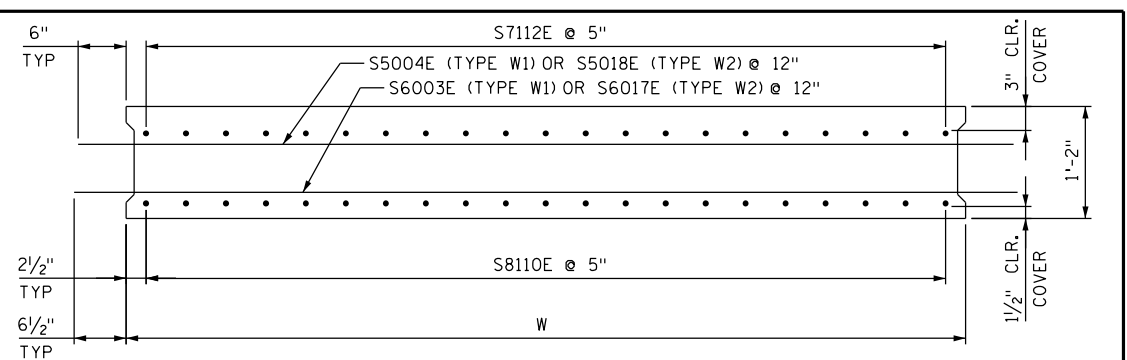
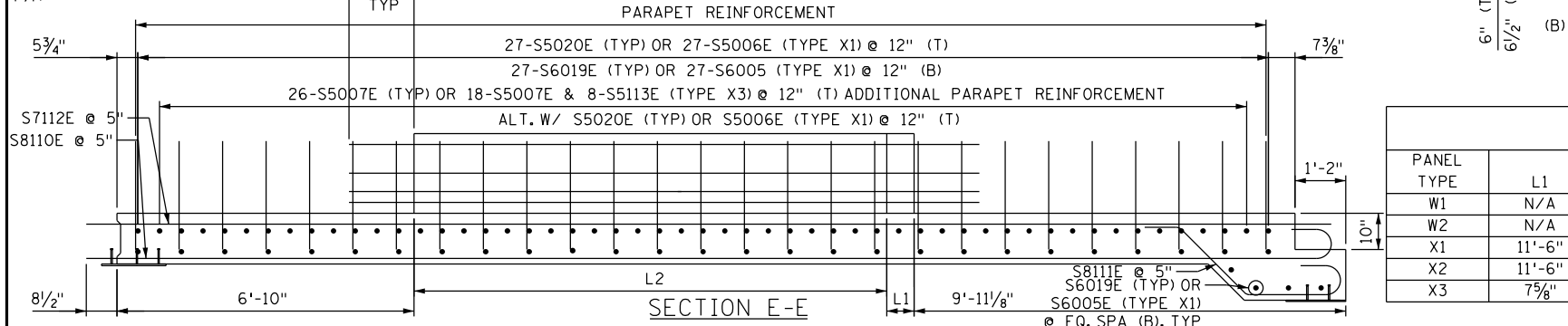
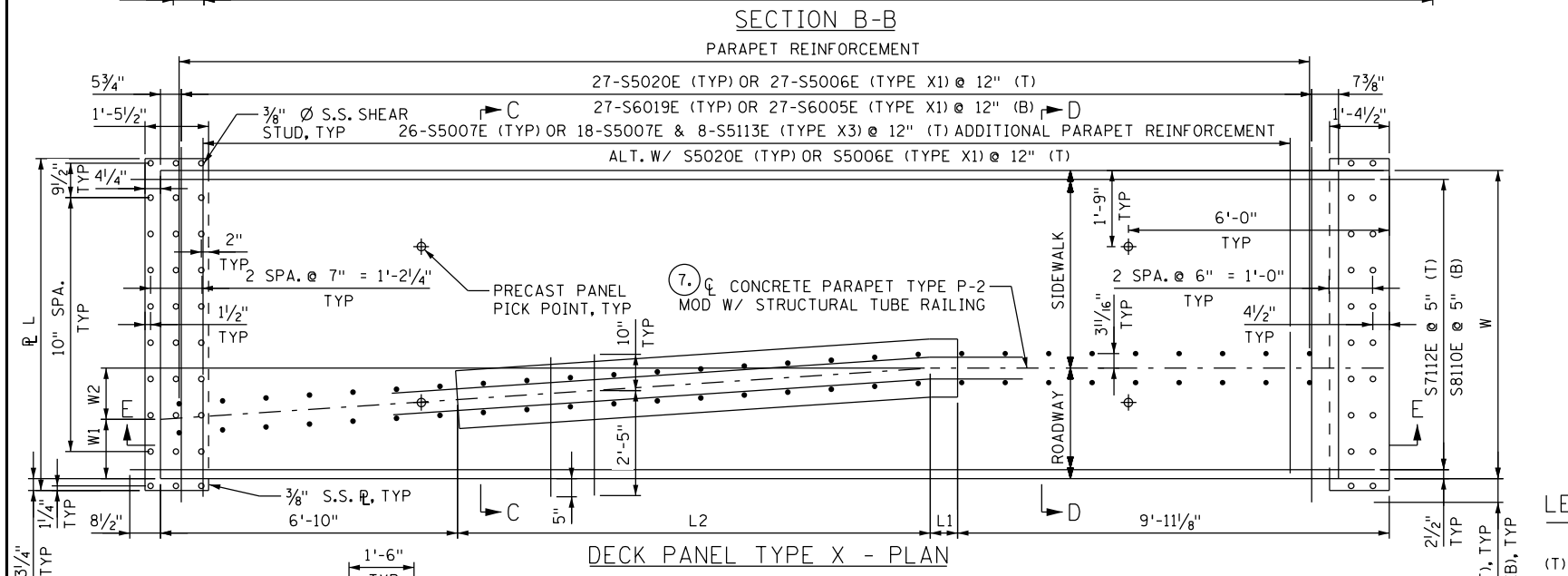
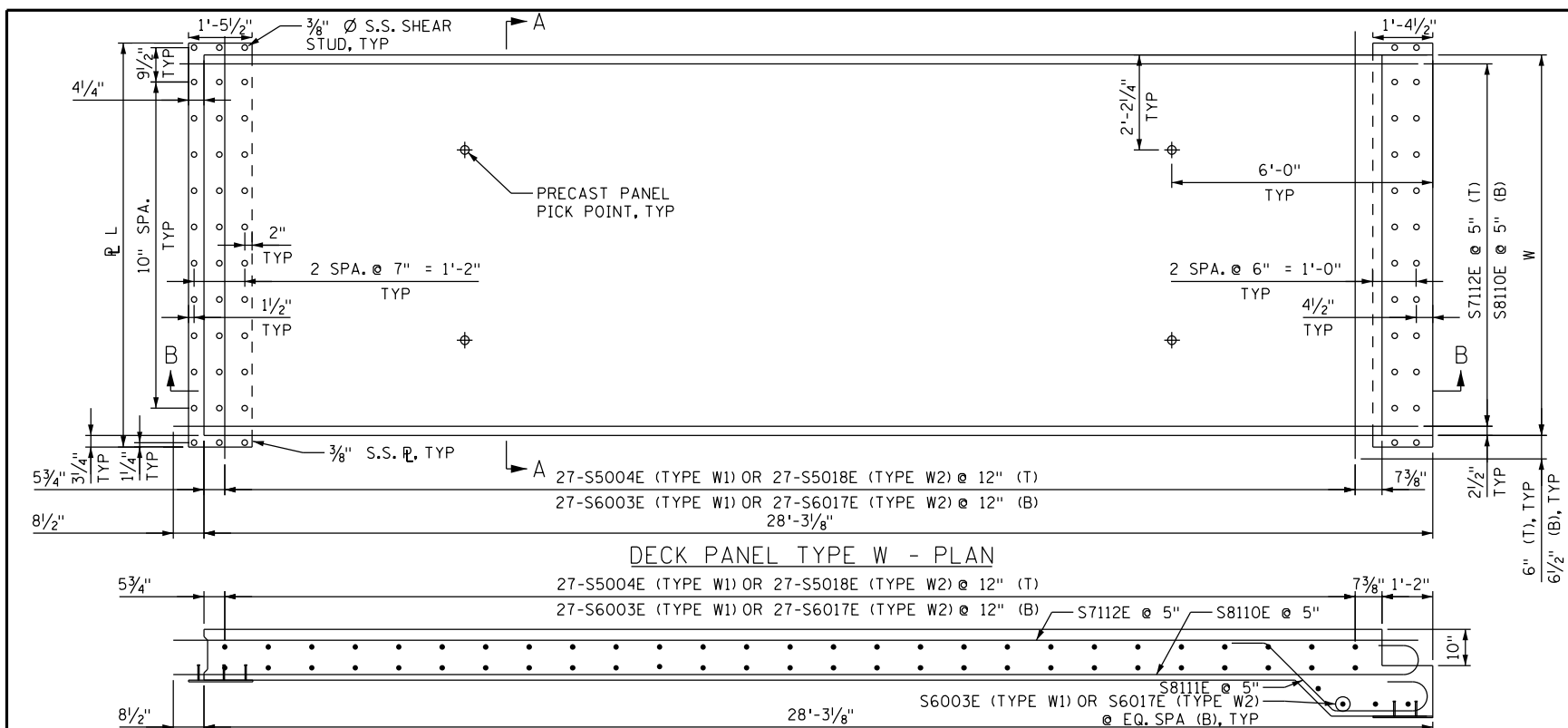
*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
 41308 LICENSE NO. 8/14/2014 DATE

DESIGN BY: EBR  
 CAD BY: ET  
 CHECKED BY: FP  
 LAST REVISION: 5/14/2015

DECK PANEL DETAILS - TYPES U AND V

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

SHEET  
 B134R2  
 B176



**LEGEND:**

- (T) INDICATES TOP
- (B) INDICATES BOTTOM

**NOTES:**

1. FOR DECK HAUNCH AND EXPANSION JOINT DETAILS, SEE SHEET B139 (DECK DETAILS 1 OF 2).
2. FOR DECK PANEL SHEAR KEY DETAIL, CAMBER DETAIL, CURB DETAILS, AND ORNAMENTAL RAILING

**SECTION D-D**

3. FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
4. FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
5. FOR CONCRETE PARAPET REINFORCEMENT DETAILS AND P-2 TUBE RAILING ANCHORAGE INSERT AND CONDUIT LOCATIONS IN PARAPET, SEE SHEET B151 (CONCRETE PARAPET (TYPE P-2 MODIFIED) W/ STRUCTURAL TUBE RAILING).
6. WHEN THE DECK PANELS ARE INSTALLED, THE PARAPET SHALL BE PLUMB.
7. DIMENSIONS TO CENTERLINE OF CONCRETE PARAPET ARE MEASURED ALONG THE TOP OF DECK PANEL.

DECK PANEL DIMENSION TABLE							
PANEL TYPE	L1	L2	W	W1	W2	RL	CAMBER
W1	N/A	N/A	8'-9"	N/A	N/A	9'-3 1/2"	3/16"
W2	N/A	N/A	9'-7"	N/A	N/A	10'-1 1/2"	3/16"
X1	11'-6"	0"	7'-1"	3'-11 1/2"	0"	7'-7 1/2"	3/16"
X2	11'-6"	0"	7'-11"	2'-11 1/2"	0"	8'-5 1/2"	3/16"
X3	7 5/8"	10'-10 3/8"	7'-11"	1'-9 3/8"	1'-2 1/8"	8'-5 1/2"	3/16"



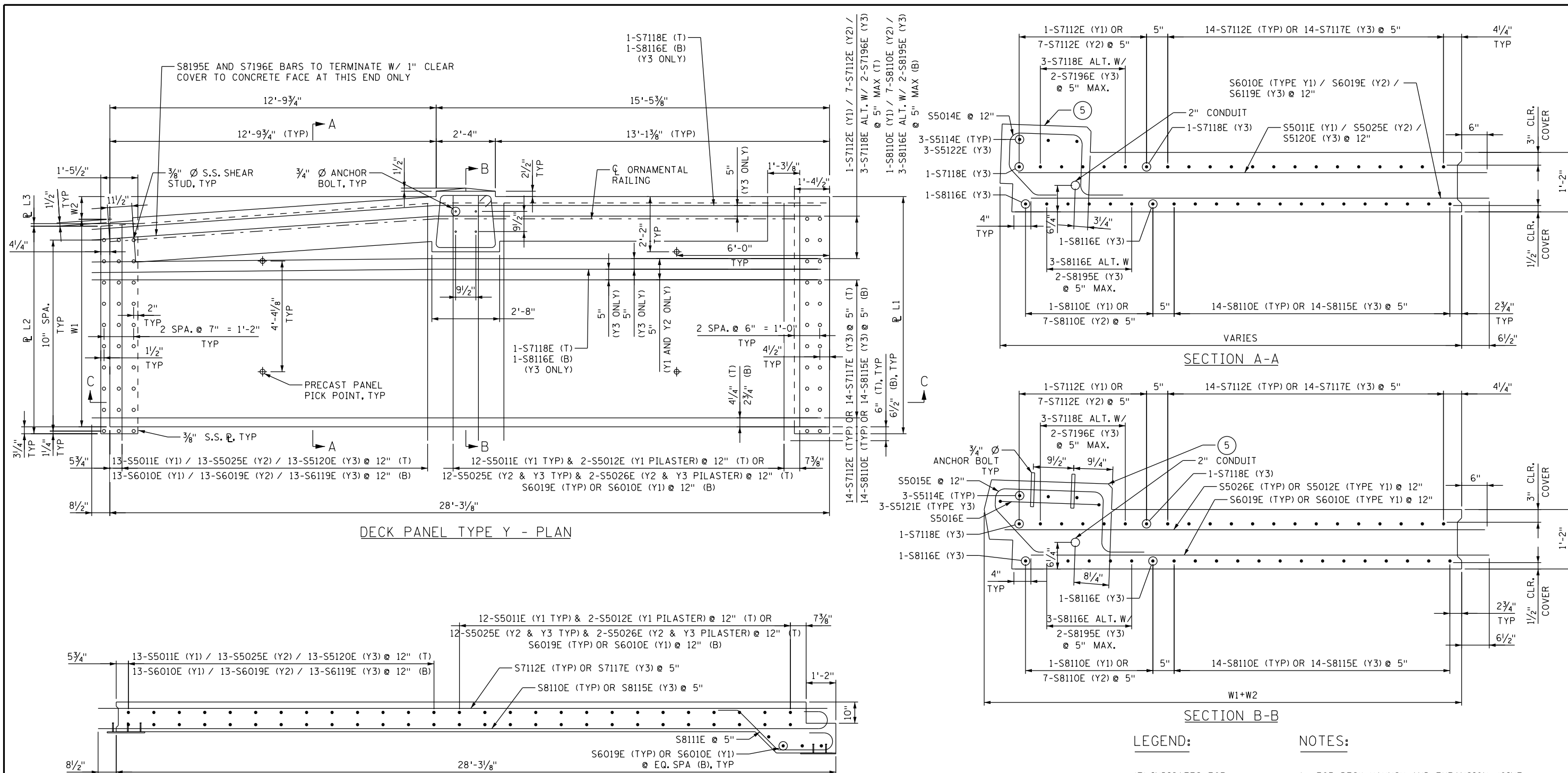
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
 41308 LICENSE NO. 8/14/2014 DATE

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**CHECKED BY:** FP  
**LAST REVISION:** 10/05/2015

**DECK PANEL DETAILS - TYPES W AND X**  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

**SHEET**  
 B135R  
 B176



**DECK PANEL DIMENSION TABLE**

PANEL TYPE	W1	W2	℄ L1	℄ L2	℄ L3	CAMBER
Y1	6'-6 1/2"	0"	6'-6 3/4"	6'-6 3/4"	0"	3/16"
Y2	9'-0 1/2"	0"	9'-0 3/4"	9'-0 3/4"	0"	3/16"
Y3	8'-1 7/8"	10 5/8"	9'-0 3/4"	8'-1 3/4"	1 1/4"	3/16"



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**

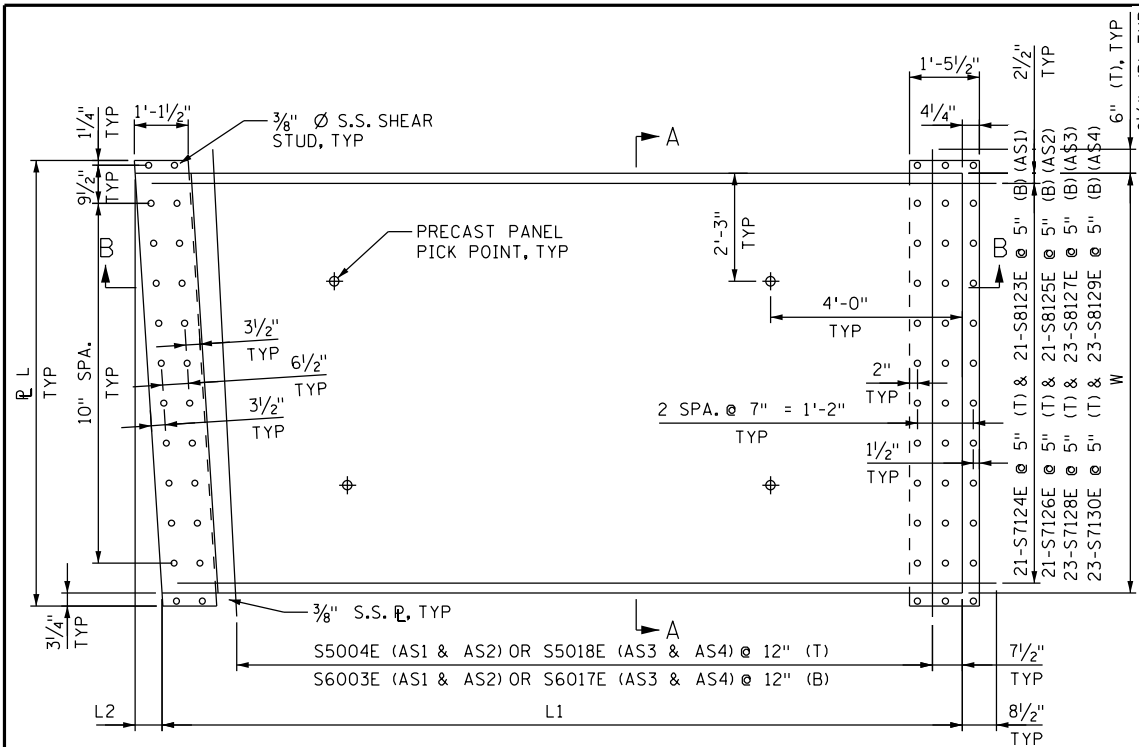
**41308**      **8/14/2014**  
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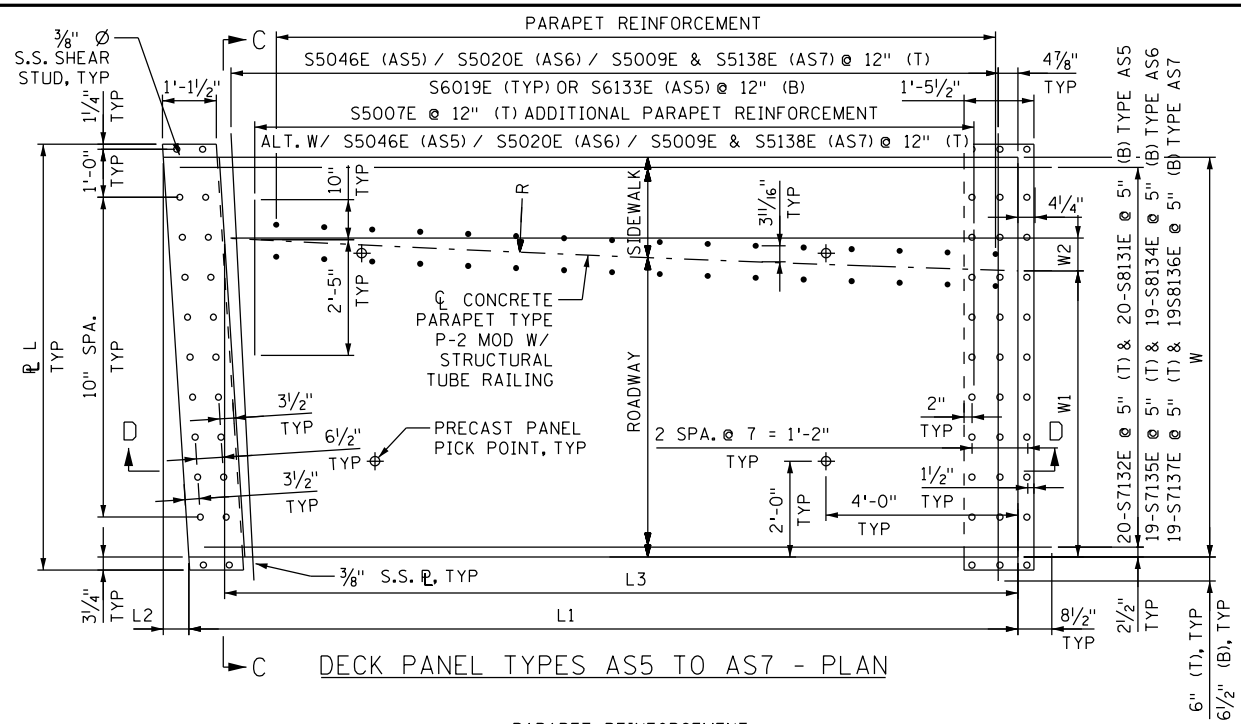
**DECK PANEL DETAILS - TYPE Y**

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**BRIDGE 2441    S.P. 027-605-029**

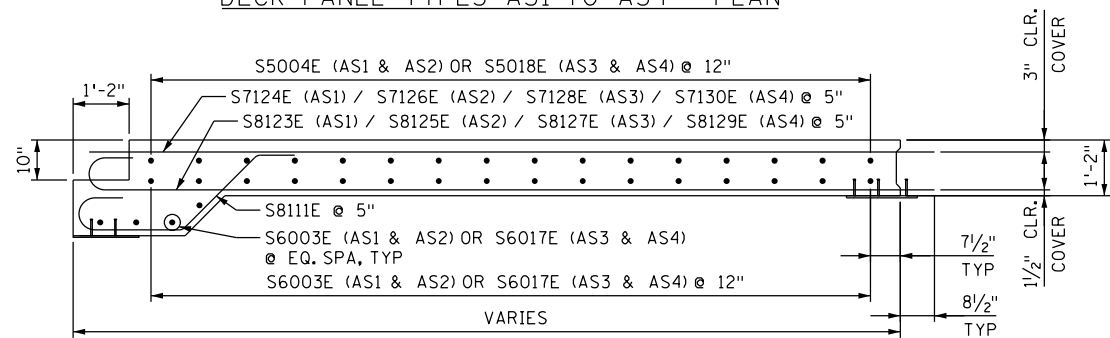
**SHEET**  
**B136R3**  
**B176**



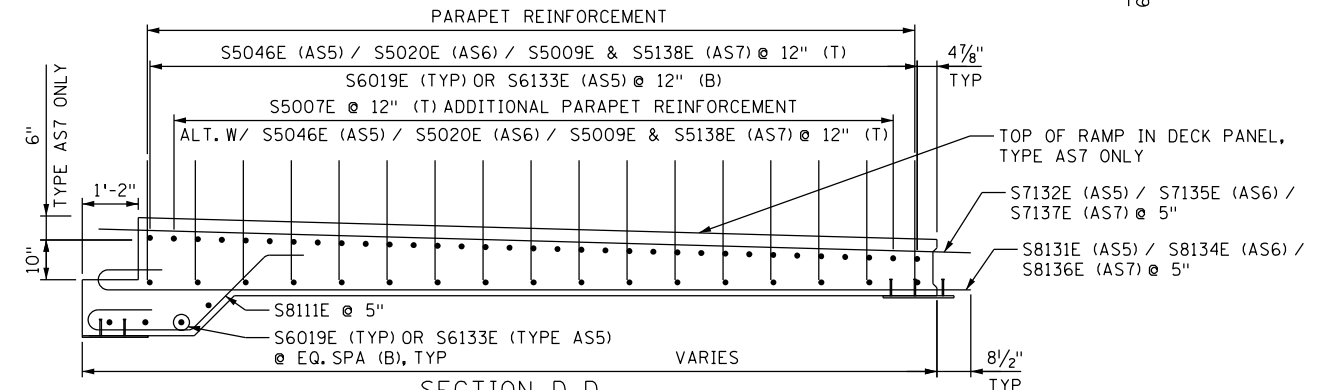
DECK PANEL TYPES AS1 TO AS4 - PLAN



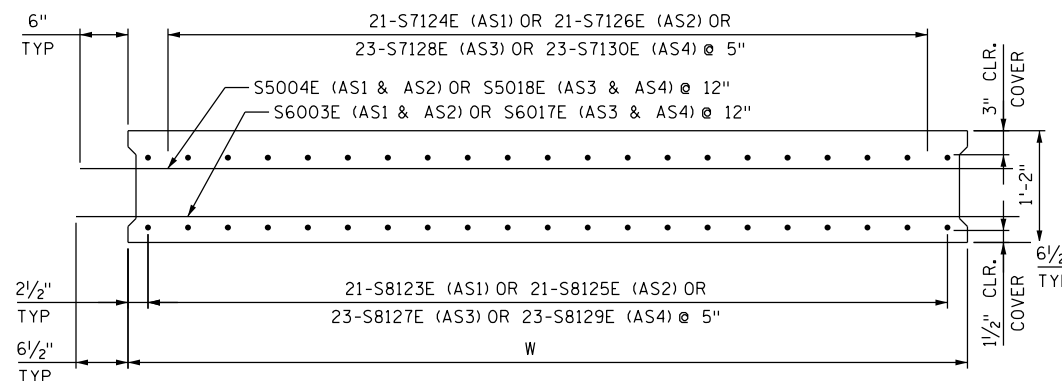
DECK PANEL TYPES AS5 TO AS7 - PLAN



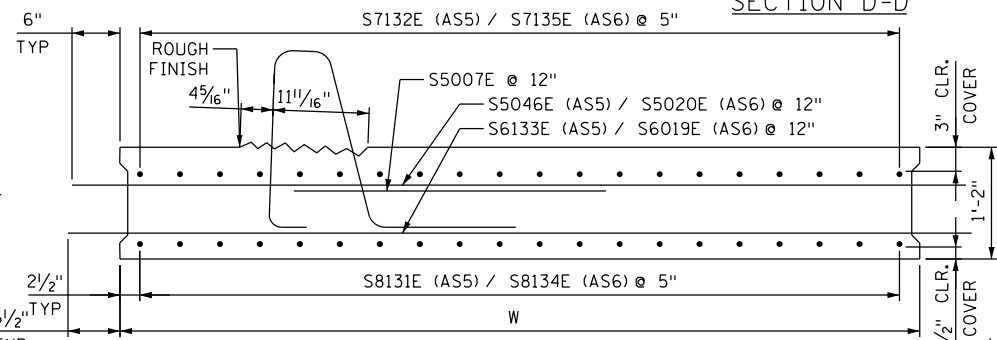
SECTION B-B



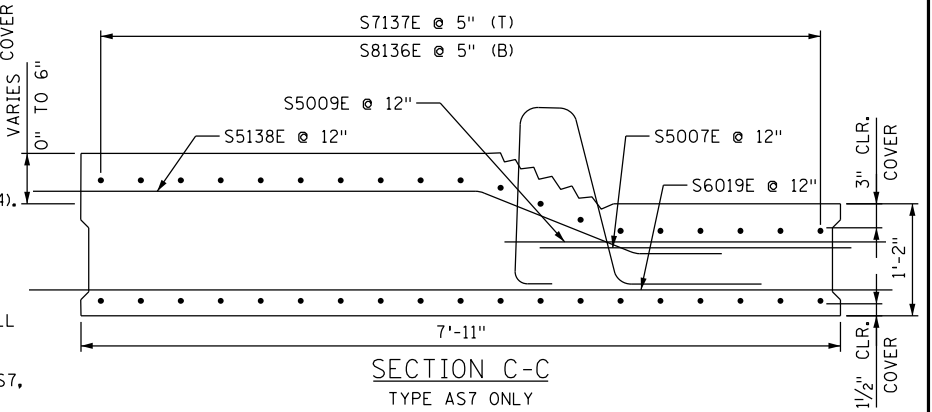
SECTION D-D



SECTION A-A



SECTION C-C  
TYPES AS5 & AS6 ONLY



SECTION C-C  
TYPE AS7 ONLY

DECK PANEL DIMENSION TABLE					
PANEL TYPE	L1	L2	W	PL	CAMBER
AS1	17'-0 5/8"	6 5/8"	8'-9"	9'-3 1/2"	0"
AS2	18'-2 1/4"	6 5/8"	8'-9"	9'-3 1/2"	1/16"
AS3	15'-3 1/2"	1'-1 1/8"	9'-7"	10'-1 1/2"	0"
AS4	16'-5 3/8"	1'-1 1/8"	9'-7"	10'-1 1/2"	0"

LEGEND:

(T) INDICATES TOP  
(B) INDICATES BOTTOM

NOTES:

- FOR DECK HAUNCH AND EXPANSION JOINT DETAILS, SEE SHEET B139 (DECK DETAILS 1 OF 2).
- FOR DECK PANEL SHEAR KEY DETAIL AND CAMBER 6. WHEN THE DECK PANELS ARE INSTALLED, THE PARAPET SHALL BE PLUMB.
- FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
- FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
- FOR CONCRETE PARAPET REINFORCEMENT DETAILS, SEE SHEET B151 (CONCRETE PARAPET (TYPE P-2 MODIFIED) W/ STRUCTURAL TUBE RAILING).
- FOR DECK PANEL DIMENSION TABLE TYPES AS5, AS6, AND AS7, SEE SHEET B138 (DECK PANEL DETAILS TYPE AS 2 OF 2).



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DANIEL F. ENSER, PROFESSIONAL ENGINEER

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LICENSE NO.

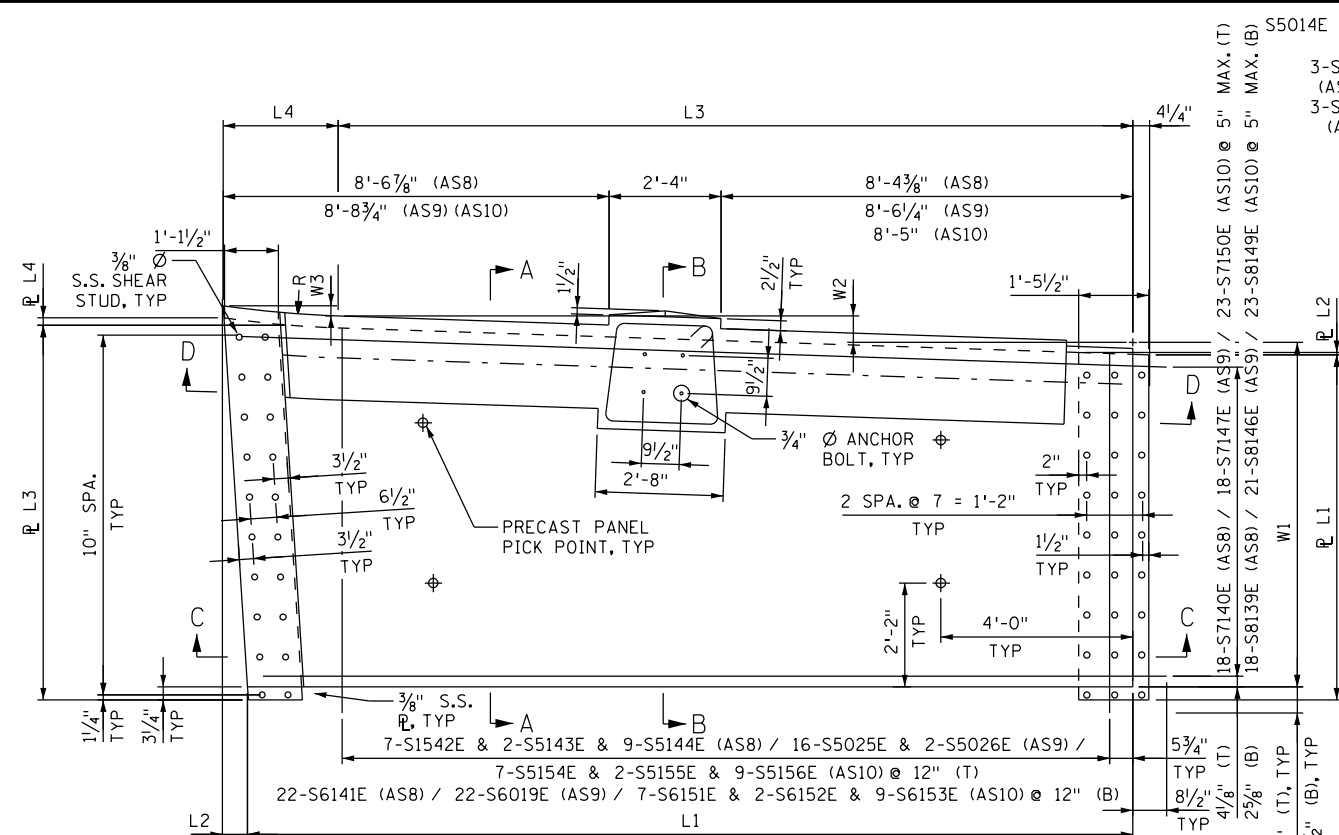
8/14/2014  
DATE

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LAST REVISION: 5/29/2015

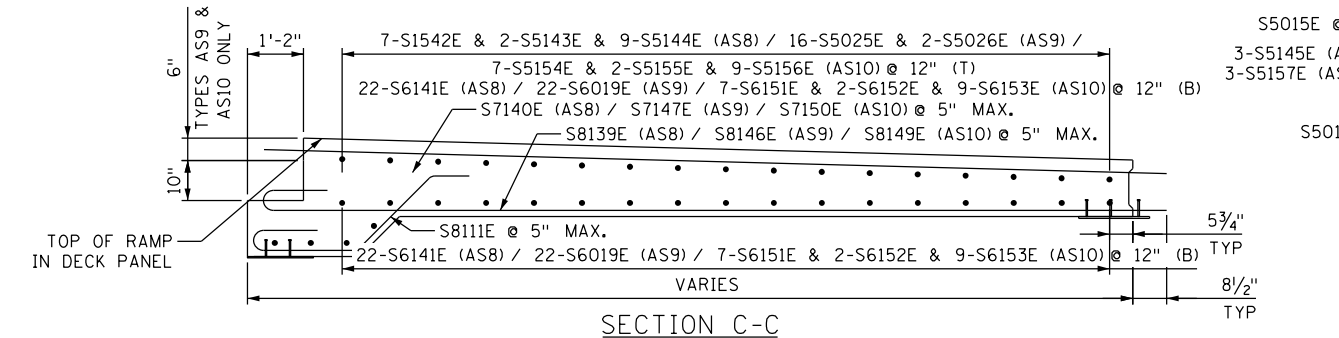
DECK PANEL DETAILS - TYPE AS (1 OF 2)

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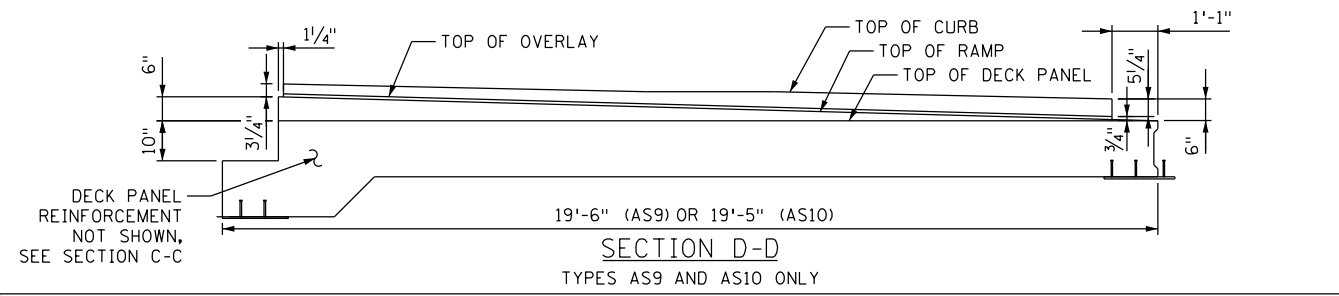
SHEET  
B137R  
B176



DECK PANEL TYPES AS8 TO AS10 - PLAN

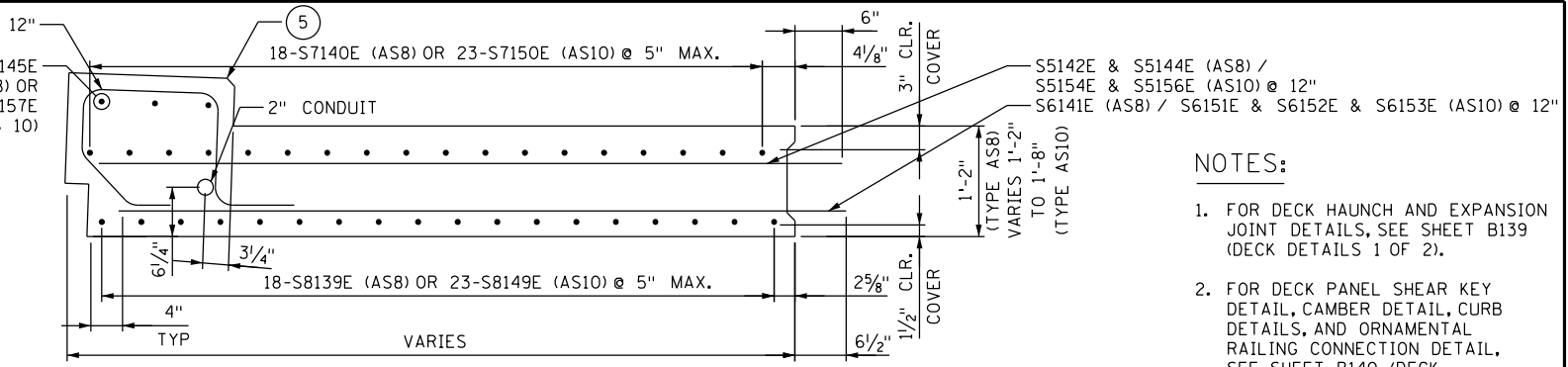


SECTION C-C

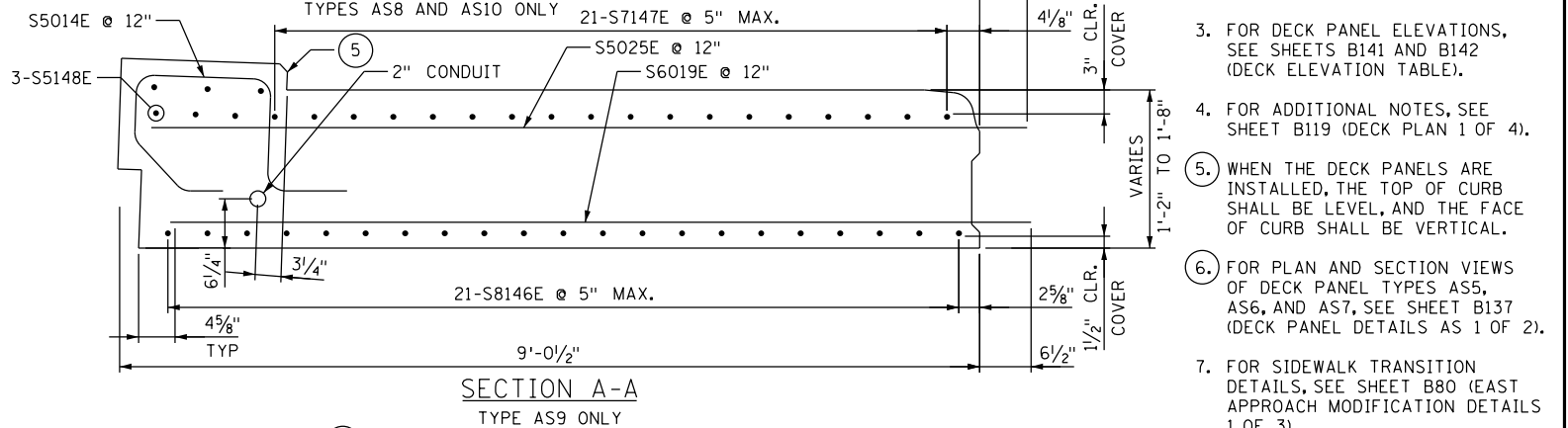


SECTION D-D  
TYPES AS9 AND AS10 ONLY

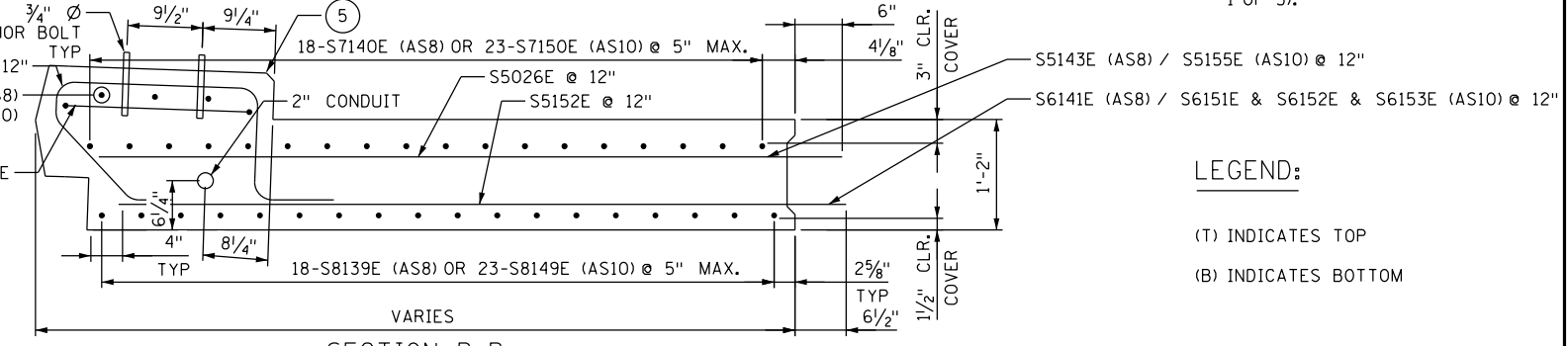
DECK PANEL DIMENSION TABLE																
PANEL TYPE ⑥	L1	L2	L3	L4	W	W1	W2	W3	R	PL	PL1	PL2	PL3	PL4	CAMBER	
AS5	17'-7 3/8"	6 1/4"	18'-0 3/8"	N/A	8'-4"	5'-10 1/8"	7 1/4"	N/A	0"	8'-10 1/2"	N/A	N/A	N/A	N/A	1/16"	
AS6	17'-6"	10 3/4"	17'-11 1/4"	N/A	7'-11"	2'-11 5/8"	0"	N/A	0"	8'-5 1/2"	N/A	N/A	N/A	N/A	0"	
AS7	17'-5 1/2"	10 1/8"	17'-10 1/2"	N/A	7'-11"	2'-11 1/2"	1'-0"	N/A	169'-5"	8'-5 1/2"	N/A	N/A	N/A	N/A	0"	
AS8	18'-9 1/4"	6"	16'-6 3/4"	2'-8 1/2"	N/A	7'-2 1/4"	6 5/8"	3 1/8"	21'-10 3/4"	N/A	7'-2 5/8"	0 5/8"	7'-6 3/4"	2 1/8"	1/16"	
AS9	18'-6 3/4"	1'-0 3/8"	18'-5"	1'-2 1/8"	N/A	9'-0 1/2"	0"	3/8"	19'-4"	N/A	9'-0 3/4"	0"	8'-9 1/2"	3/8"	1/16"	
AS10	18'-4 3/8"	1'-1 1/4"	0"	19'-5 5/8"	N/A	9'-0 1/2"	0"	1'-3 1/2"	154'-10"	N/A	9'-0 3/4"	0 1/8"	9'-10 1/8"	2 1/8"	1/16"	



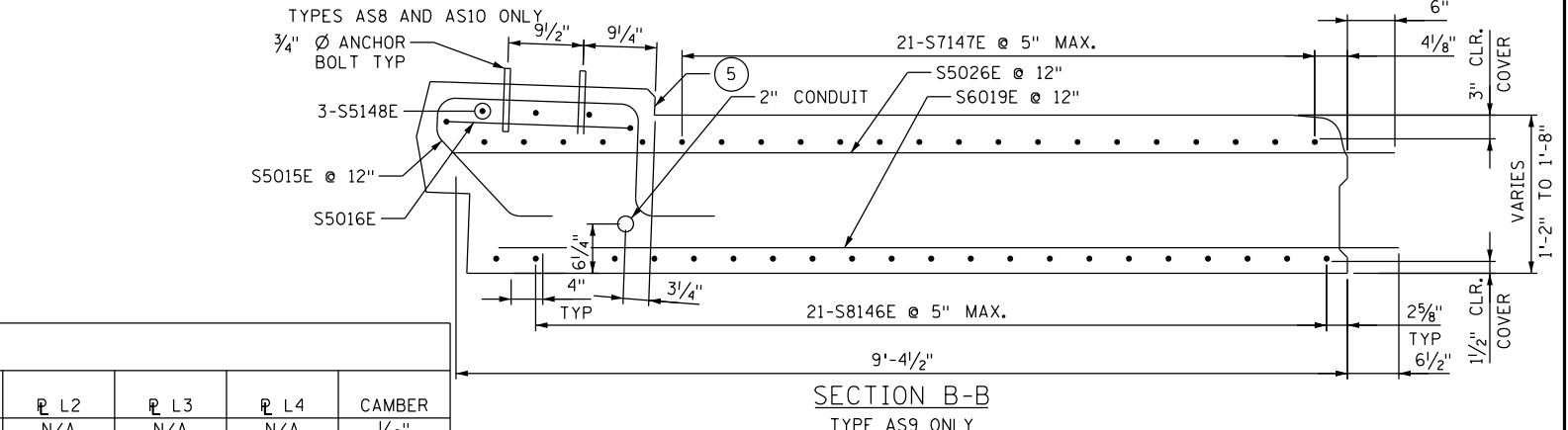
SECTION A-A



SECTION A-A  
TYPE AS9 ONLY



SECTION B-B



SECTION B-B  
TYPE AS9 ONLY

- NOTES:**
- FOR DECK HAUNCH AND EXPANSION JOINT DETAILS, SEE SHEET B139 (DECK DETAILS 1 OF 2).
  - FOR DECK PANEL SHEAR KEY DETAIL, CAMBER DETAIL, CURB DETAILS, AND ORNAMENTAL RAILING CONNECTION DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
  - FOR DECK PANEL ELEVATIONS, SEE SHEETS B141 AND B142 (DECK ELEVATION TABLE).
  - FOR ADDITIONAL NOTES, SEE SHEET B119 (DECK PLAN 1 OF 4).
  - WHEN THE DECK PANELS ARE INSTALLED, THE TOP OF CURB SHALL BE LEVEL, AND THE FACE OF CURB SHALL BE VERTICAL.
  - FOR PLAN AND SECTION VIEWS OF DECK PANEL TYPES AS5, AS6, AND AS7, SEE SHEET B137 (DECK PANEL DETAILS AS 1 OF 2).
  - FOR SIDEWALK TRANSITION DETAILS, SEE SHEET B80 (EAST APPROACH MODIFICATION DETAILS 1 OF 3).

- LEGEND:**
- (T) INDICATES TOP
  - (B) INDICATES BOTTOM



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*

DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308 8/14/2014

LICENSE NO. DATE

DESIGN BY: EBR

CAD BY: ET

CHECKED BY: FP

LAST REVISION: 11/24/2015

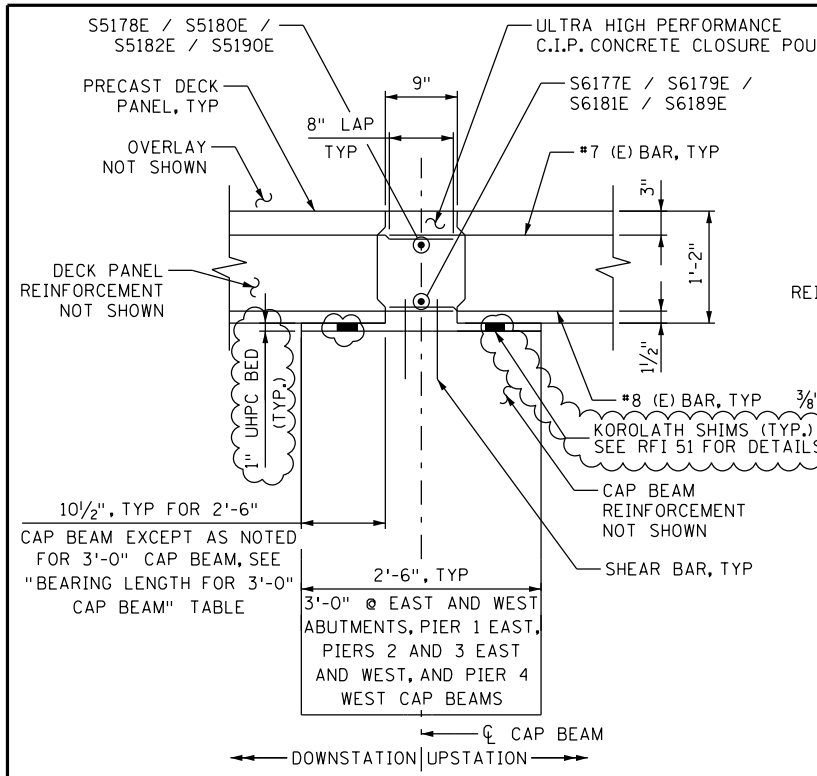
DECK PANEL DETAILS - TYPE AS (2 OF 2)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705

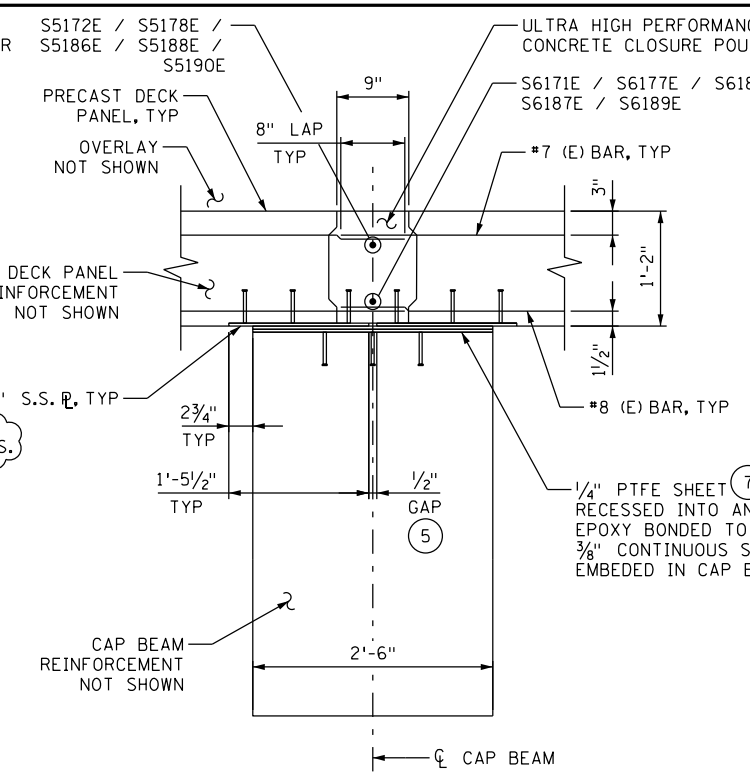
BRIDGE 2441 S.P. 027-605-029

SHEET B138R4 B176

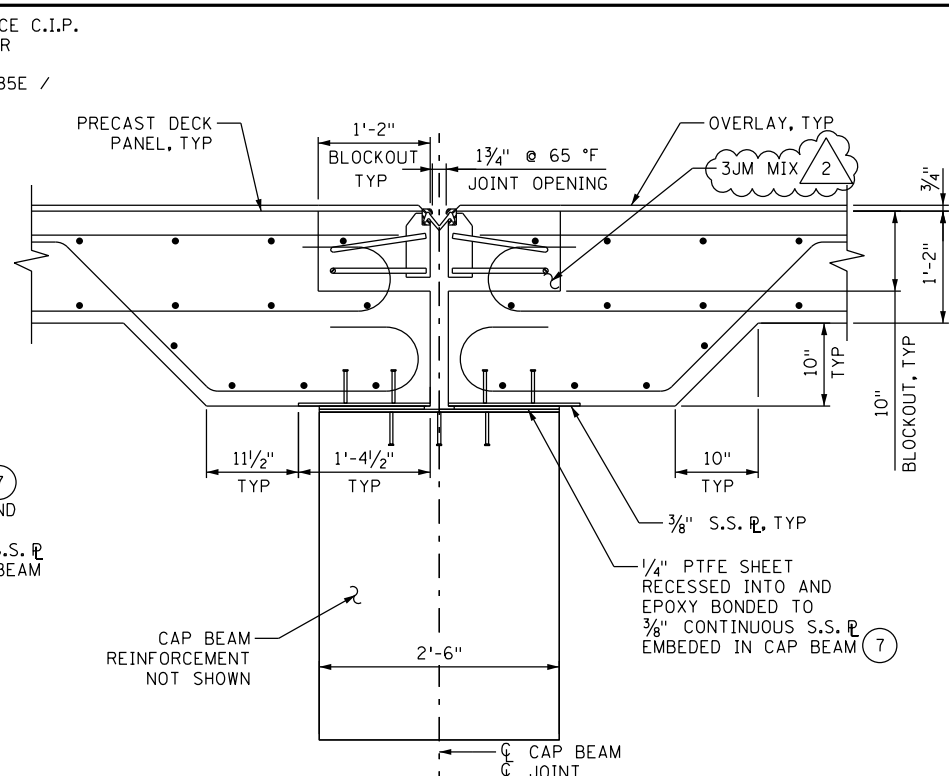




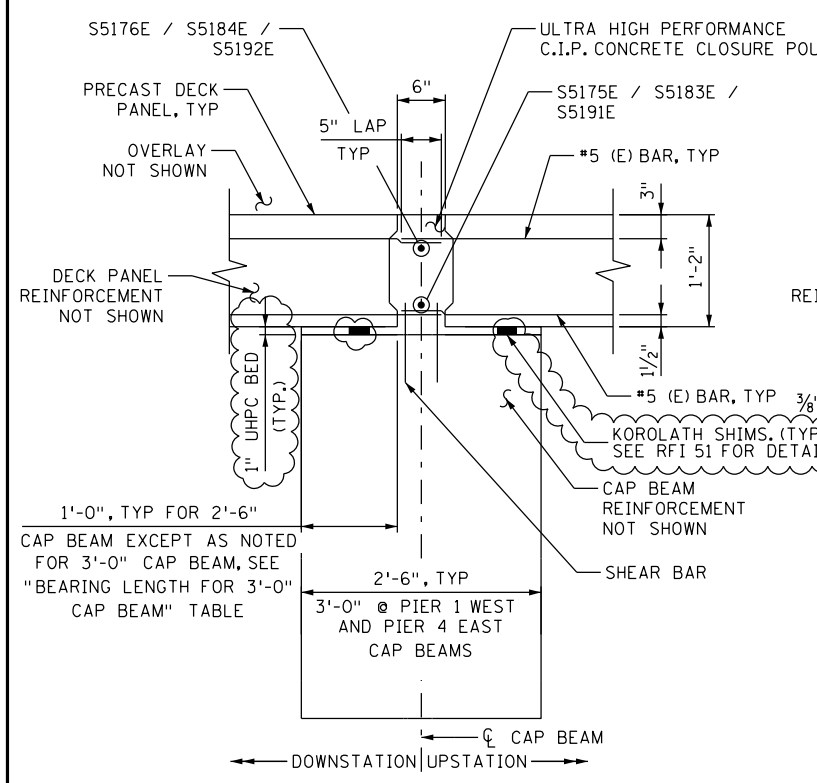
SECTION E-E  
FIXED TRANSVERSE 9" CLOSURE POUR DETAIL



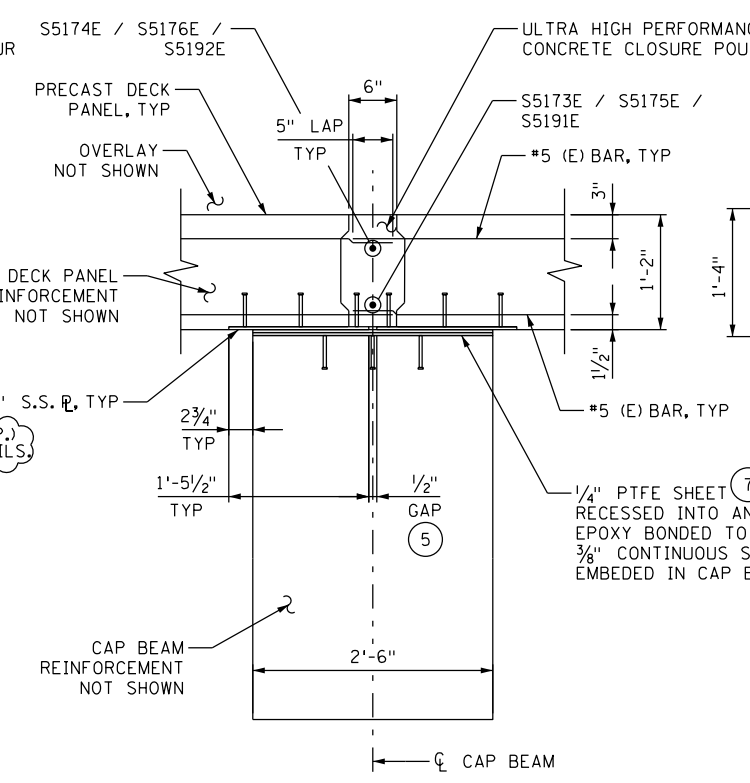
SECTION F-F  
SLIDING TRANSVERSE 9" CLOSURE POUR DETAIL



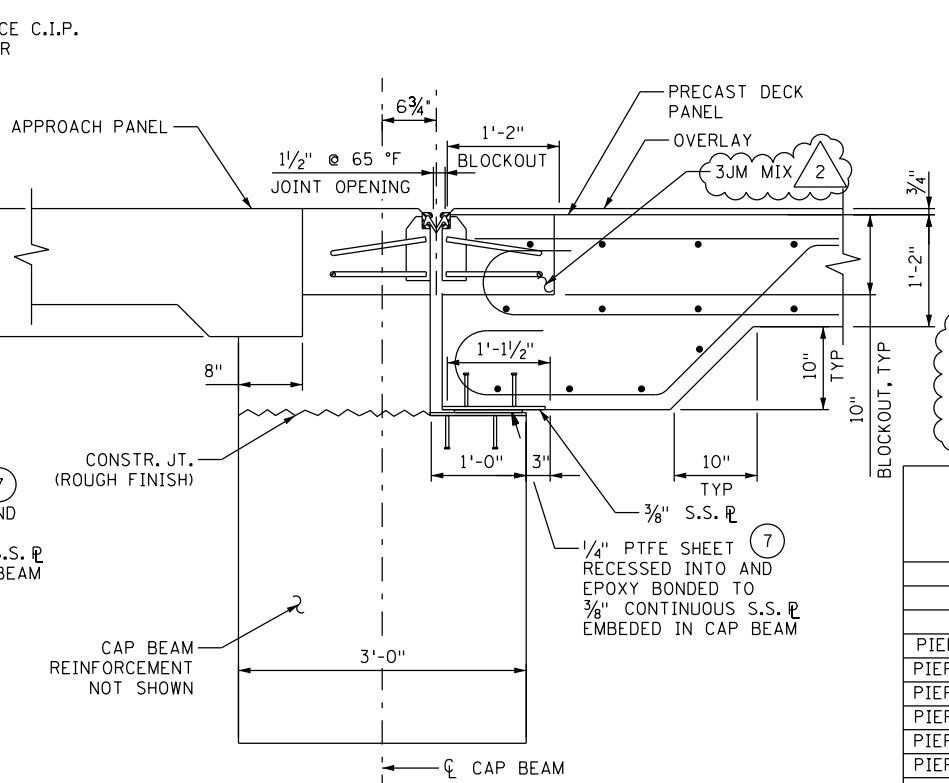
SECTION J-J  
TYPICAL EXPANSION JOINT DETAIL



SECTION G-G  
FIXED TRANSVERSE 6" CLOSURE POUR DETAIL



SECTION H-H  
SLIDING TRANSVERSE 6" CLOSURE POUR DETAIL



SECTION K-K  
APPROACH CAP BEAM EXPANSION JOINT DETAIL

LEGEND:  
(E) INDICATES EPOXY COATED

- NOTES:
1. THE CONTRACTOR SHALL PERFORM A TEST POUR OF THE OVERLAY FOR REVIEW. THE CONTRACTOR MAY NOT COMMENCE OVERLAY OPERATIONS UNTIL ACCEPTANCE OF THE TEST POUR BY HENNEPIN COUNTY.
  2. SEAL ALL CLOSURE POUR JOINTS WITH A METHACRYLATE SEALER AS PER REQUIREMENTS OF THE OVERLAY SPECIAL PROVISIONS PRIOR TO PLACING OVERLAY.
  3. FOR CAP BEAM REINFORCEMENT DETAILS, SEE SHEETS B92, B93, B98, B103, AND B111 TO B116 (EAST AND WEST ABUTMENT MODIFICATION DETAILS, PIER 1 AND 4 MODIFICATION DETAILS, PIER 2 AND 3 MODIFICATION DETAILS, AND CAP BEAM REINFORCEMENT DETAILS).
  4. FOR EXPANSION JOINT DETAILS, SEE SHEETS B166 AND B167 (EXPANSION JOINT DETAILS).
  5. FOR DECK SLIDING PLATE DETAIL, SEE SHEET B140 (DECK DETAILS 2 OF 2).
  6. WHERE THE DECK IS CONTINUOUS OVER THE CAP BEAMS, CONNECT THE CONDUITS WITHIN ADJACENT PANELS WITH FLEXIBLE 2 INCH CONDUIT IN UHPC CLOSURE POUR.
  7. PTFE SHEET SHALL FILL THE RECESS IN THE S.S. PLATE AND EXTEND TO LIMITS OF RECESS. SEE SHEET B116A FOR ADDITIONAL INFORMATION.

- 1 DECK PANEL STUDS SHALL BE 3 1/2" LONG X 3/8" Ø SEE RFI 16 FOR DETAILS.
- 2 SEE RFI 58 FOR DETAILS.

BEARING LENGTH FOR 3'-0" CAP BEAM (MEASURED ON THE DOWNSTATION SIDE)	
LOCATION	DIMENSION
FIXED TRANSVERSE 9" CLOSURE POUR	
WEST ABUTMENT	1'-0" (2'-6" CAP BEAM)
PIER 1 EAST CAP BEAM	1'-7 1/2"
PIER 4 WEST CAP BEAM	7 1/2" (2'-6" CAP BEAM)
PIER 2 WEST CAP BEAM	6 1/2"
PIER 2 EAST CAP BEAM	1'-9"
PIER 3 WEST CAP BEAM	6"
PIER 3 EAST CAP BEAM	1'-8 1/2"
EAST ABUTMENT	
EAST ABUTMENT	9" (2'-6" CAP BEAM)
FIXED TRANSVERSE 6" CLOSURE POUR	
PIER 1 WEST CAP BEAM	9"
PIER 4 EAST CAP BEAM	1'-3" (2'-6" CAP BEAM)



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

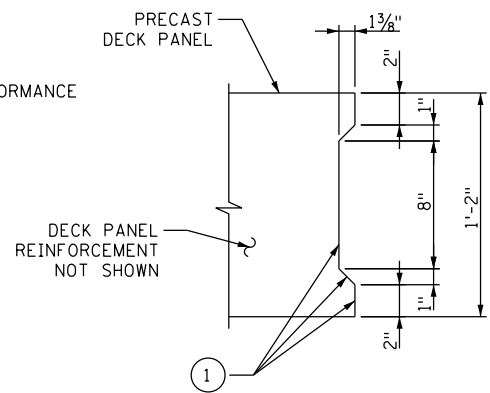
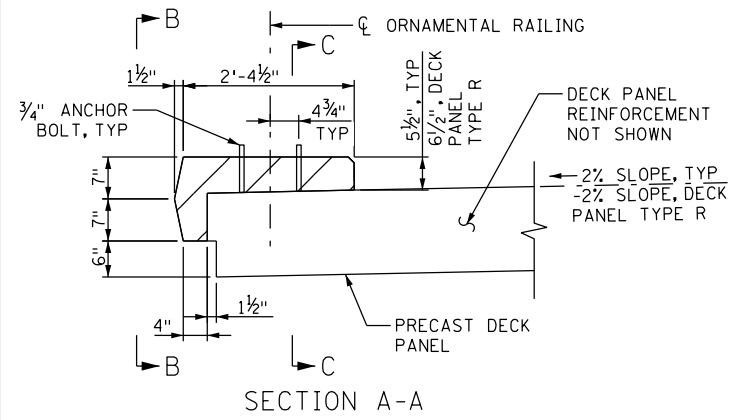
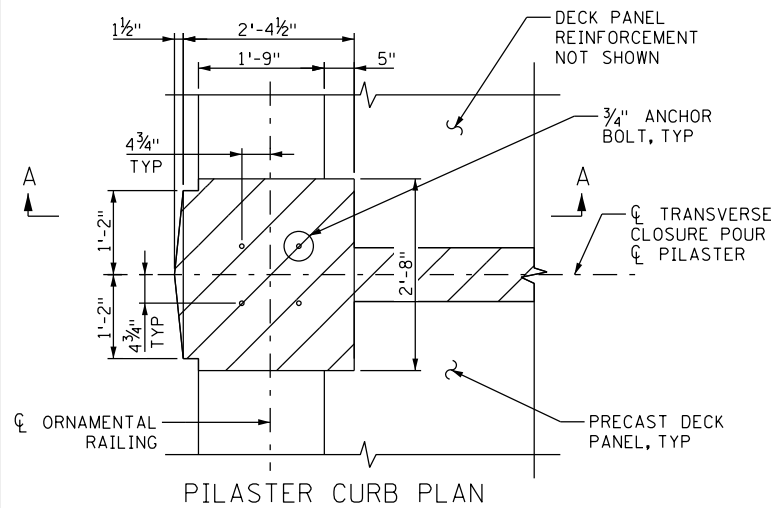
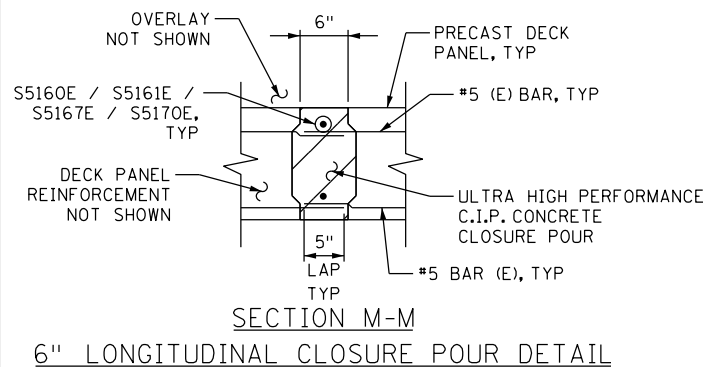
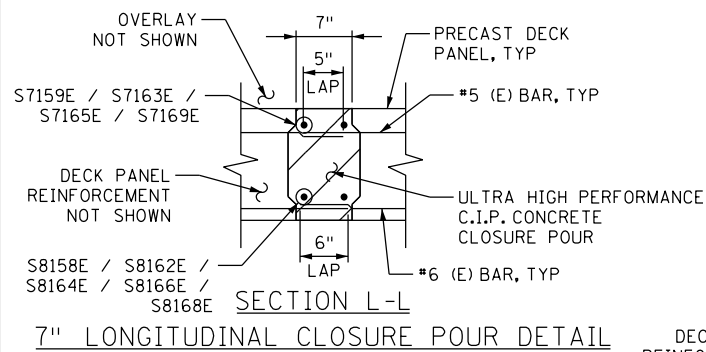
*Daniel F. Enser*  
DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308 8/14/2014  
LICENSE NO. DATE

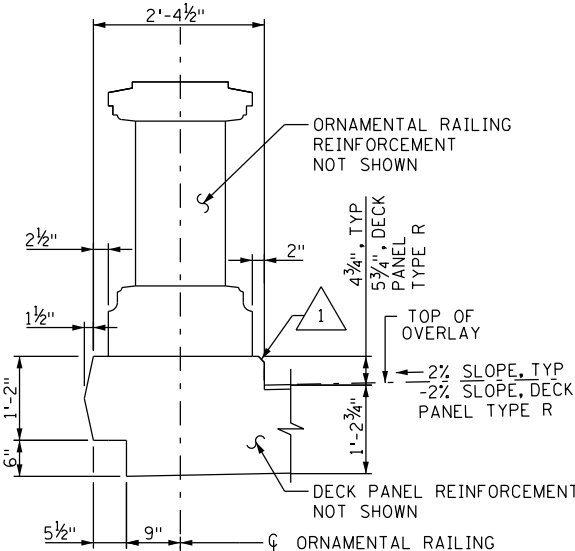
DESIGN BY: CB  
CAD BY: CB  
CHECKED BY: FP  
LAST REVISION: 11/24/2015

AS-BUILT - DECK DETAILS (1 OF 2)  
C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

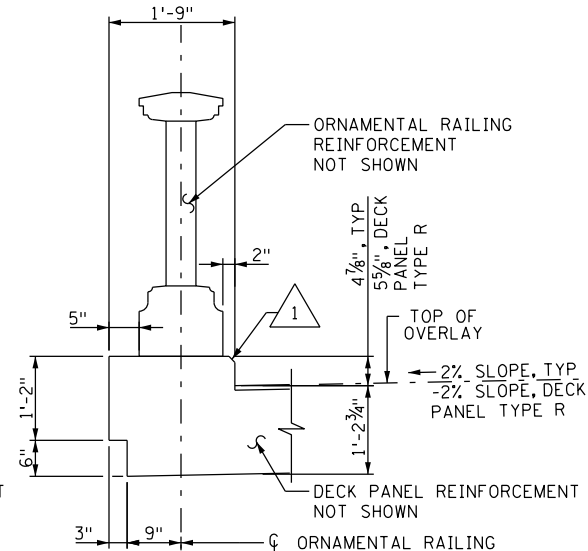
SHEET  
B139R2  
B176



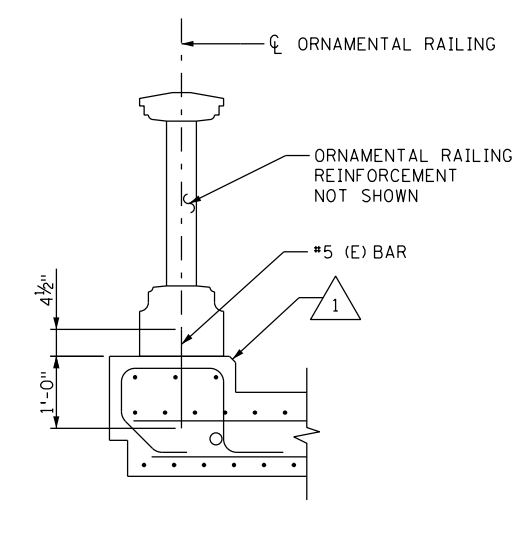
SHEAR KEY DETAIL



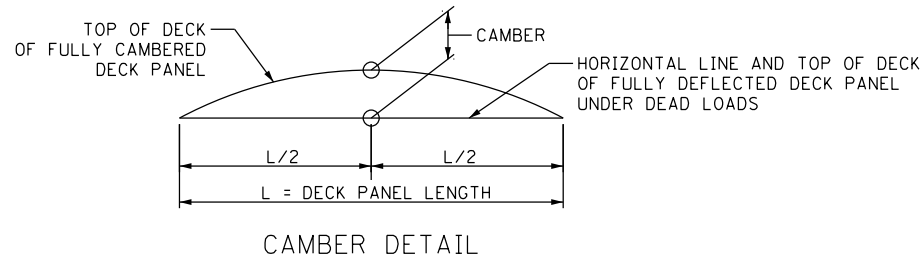
CURB DETAIL AT PILASTERS



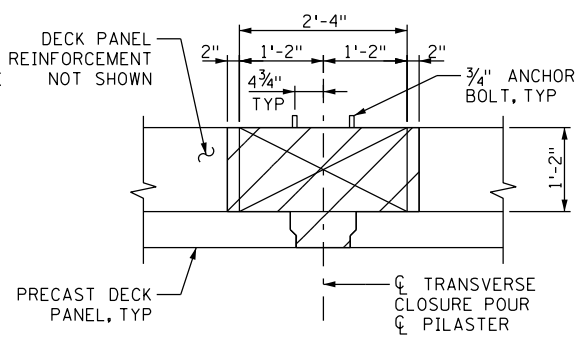
CURB DETAIL BETWEEN PILASTERS



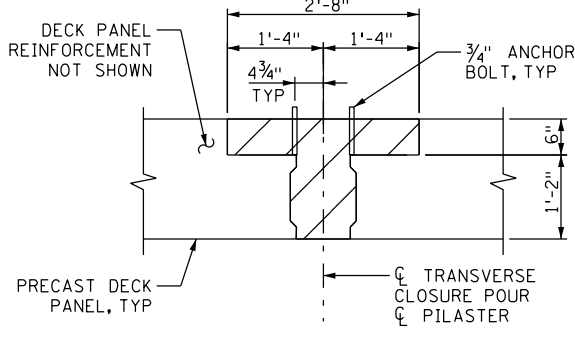
ORNAMENTAL RAILING CONNECTION DETAIL



CAMBER DETAIL



VIEW B-B



SECTION C-C

LEGEND:

- INDICATES UHPC CLOSURE POUR
- (E) INDICATES EPOXY COATED

NOTES:

1. IMMEDIATELY PRIOR TO PRECAST CONCRETE PLACEMENT DURING FABRICATION, THOROUGHLY COAT THE FACES OF THE FORMWORK AT ALL CLOSURE JOINTS WITH AN APPROVED CONCRETE RETARDING ADMIXTURE. IMMEDIATELY AFTER FORMS ARE STRIPPED, USE A HIGH-PRESSURE STREAM OF WATER TO ROUGHEN THE FACES AT ALL CLOSURE JOINTS TO AN AMPLITUDE OF 1/4 INCH TO EXPOSE, WITHOUT DISPLACING, COARSE AGGREGATE.
2. EDGES OF CLOSURE POUR SHALL BE SATURATED SURFACE DRY PRIOR TO PLACING UHPC. ALL CONCRETE FACES TO BE IN CONTACT WITH UHPC SHALL BE CLEANED PRIOR TO PLACING UHPC.
3. MAXIMUM DIFFERENTIAL ELEVATION BETWEEN TOP OF DECK EDGES OF ADJACENT PANELS AT ANY POINT ALONG THE LENGTH OF A LONGITUDINAL CLOSURE JOINT IS 1/4".
4. AT FIXED LOCATIONS, CORRECTIONS SHALL BE MADE BY ADJUSTING THE BEARING ELEVATIONS AT ONE OR BOTH ENDS OF THE PANELS USING SHIMS (KORALATH SHIMS, SEE RFI 51 FOR DETAILS) TO SATISFY THE 1/4" TOLERANCE STATED IN NOTE 3. SHIMS USED FOR THIS PURPOSE ARE CONSIDERED INCIDENTAL TO PANEL ERECTION.
5. REDUCING EXCESSIVE DIFFERENTIAL ELEVATION BY OTHER METHODS, SUCH AS GRINDING, JACKING, AND BALLASTING, SHALL NOT BE USED WITHOUT ACCEPTANCE BY HENNEPIN COUNTY. IF ACCEPTED, THE ALTERNATE METHOD(S) SHALL BE EXECUTED AT NO ADDITIONAL COST TO HENNEPIN COUNTY.
6. FOR ORNAMENTAL RAILING DETAILS AND REINFORCEMENT DETAILS, SEE SHEETS B152 TO B162 (ORNAMENTAL RAILING DETAILS).
7. FOR DECK PANEL REINFORCEMENT DETAILS AND FOR THE LOCATION OF CURBS AND PILASTERS, SEE SHEETS B125 TO B138 (DECK PANEL DETAILS).
8. DECK PANEL CAMBERS ARE BASED ON THE TOTAL PRECAST DECK PANEL AND PRECAST CONCRETE PARAPET WEIGHT. IF THE CONTRACTOR CHOOSES TO MODIFY THE LENGTH OF PRECAST PARAPET INTEGRAL WITH THE DECK PANEL, HE SHALL SUBMIT REVISED CALCULATED DECK PANEL CAMBER TO HENNEPIN COUNTY FOR REVIEW AND SHALL CAMBER THE DECK PANELS ACCORDING TO THE ACCEPTED SUBMITTAL.
9. SEAL OR FORM GAP PRIOR TO PLACING UHPC.

1 DIMENSION OF INTERIOR CORNER IN THE DECK PANEL SHALL BE 3/4". CORNER OF THE ENTABLATURE SHALL NOT BE CHAMFERED.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
 41308 LICENSE NO. 8/14/2014 DATE

DESIGN BY: CB  
 CAD BY: ET  
 CHECKED BY: FP  
 LAST REVISION: 6/24/2015

AS-BUILT - DECK DETAILS (2 OF 2)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

SHEET  
 B140R2  
 B176

DECK ELEVATION TABLE						
LOCATION	STATION	POINT	A	B	C	WORKING LINE CL ROADWAY
			WORKING LINE OFFSET (FT)			
			31.0	14.3	13.0	
			33.5	16.8	15.5	0.0
WEST APPROACH CAP BEAM	9+81.75	1	822.12	822.45	822.48	822.79
		2	822.05	822.39	822.41	822.72
		3	0.80	0.80	0.80	0.80
			33.2	16.5	15.2	0.0
MIDSPAN	9+90.88	1	822.18	822.51	822.54	822.84
		2	822.11	822.45	822.47	822.77
		3	0.75	0.75	0.75	0.75
			32.9	16.2	14.9	0.0
WEST ABUTMENT CAP BEAM	10+00.00	1	822.23	822.57	822.59	822.89
		2	822.17	822.50	822.53	822.83
		3	0.79	0.79	0.79	0.79
			32.8	16.0	14.6	0.0
MIDSPAN	10+07.18	1	822.28	822.62	822.65	822.94
		2	822.22	822.56	822.58	822.88
		3	0.75	0.75	0.75	0.75
			32.6	15.7	14.4	0.0
SPANDREL COLUMN 1-0	10+14.36	1	822.35	822.69	822.71	823.00
		2	822.28	822.62	822.65	822.94
		3	0.79	0.79	0.79	0.79
			32.2	15.5	14.1	0.0
MIDSPAN	10+21.53	1	822.43	822.76	822.78	823.07
		2	822.36	822.70	822.72	823.01
		3	0.75	0.75	0.75	0.75
			31.9	15.2	13.9	0.0
SPANDREL COLUMN 1-1	10+28.71	1	822.50	822.84	822.86	823.14
		2	822.44	822.77	822.80	823.07
		3	0.79	0.79	0.79	0.79
			31.7	15.0	13.7	0.0
MIDSPAN	10+35.89	1	822.59	822.92	822.95	823.22
		2	822.52	822.86	822.88	823.16
		3	0.75	0.75	0.75	0.75
			31.4	14.8	13.4	0.0
SPANDREL COLUMN 1-2	10+43.06	1	822.68	823.01	823.04	823.31
		2	822.62	822.95	822.98	823.24
		3	0.79	0.79	0.79	0.79
			31.2	14.5	13.2	0.0
MIDSPAN	10+50.49	1	822.78	823.11	823.14	823.40
		2	822.71	823.05	823.07	823.34
		3	0.75	0.75	0.75	0.75

LOCATION	STATION	POINT	A	B	C	WORKING LINE CL ROADWAY
			WORKING LINE OFFSET (FT)			
			31.0	14.3	13.0	
CAP BEAM PIER 1 WEST	10+57.92	1	822.88	823.22	823.24	823.50
		2	822.82	823.16	823.18	823.44
		3	0.79	0.79	0.79	0.79
MIDSPAN	10+64.53	1	822.98	823.31	823.34	823.60
		2	822.92	823.25	823.28	823.54
		3	0.75	0.75	0.75	0.75
			32.9	16.2	14.9	0.0
CAP BEAM PIER 1 EAST	10+71.27	1	823.09	823.42	823.45	823.71
		2	823.02	823.35	823.38	823.64
		3	0.86	0.86	0.86	0.86
MIDSPAN	10+85.88	1	823.34	823.67	823.70	823.96
		2	823.28	823.61	823.64	823.89
		3	0.75	0.75	0.75	0.75
			32.6	15.7	14.4	0.0
SPANDREL COLUMN 2-1	11+00.48	1	823.61	823.95	823.97	824.23
		2	823.55	823.89	823.91	824.16
		3	0.91	0.91	0.91	0.91
MIDSPAN	11+14.83	1	823.91	824.24	824.27	824.53
		2	823.85	824.18	824.21	824.47
		3	0.75	0.75	0.75	0.75
			32.4	15.4	14.1	0.0
SPANDREL COLUMN 2-2	11+29.19	1	824.24	824.57	824.60	824.86
		2	824.18	824.51	824.54	824.78
		3	0.90	0.90	0.90	0.90
MIDSPAN	11+43.54	1	824.58	824.91	824.94	825.20
		2	824.52	824.85	824.88	825.14
		3	0.75	0.75	0.75	0.75
			32.4	15.4	14.1	0.0
SPANDREL COLUMN 2-3	11+57.90	1	824.93	825.26	825.29	825.55
		2	825.86	825.19	825.22	825.48
		3	0.75	0.75	0.75	0.75
MIDSPAN	11+72.25	1	825.27	825.60	825.63	825.89
		2	825.21	825.54	825.57	825.83
		3	0.75	0.75	0.75	0.75
			32.5	15.5	14.2	0.0
SPANDREL COLUMN 2-4	11+86.61	1	825.62	825.95	825.98	826.24
		2	825.55	825.88	825.91	826.17
		3	0.75	0.75	0.75	0.75
MIDSPAN	12+00.96	1	825.96	826.29	826.32	826.58
		2	825.90	826.23	826.26	826.52
		3	0.75	0.75	0.75	0.75
			32.6	15.7	14.4	0.0
SPANDREL COLUMN 2-5	12+15.31	1	826.31	826.64	826.67	826.93
		2	826.24	826.57	826.60	826.86
		3	0.75	0.75	0.75	0.75
MIDSPAN	12+29.67	1	826.65	826.98	827.01	827.27
		2	826.59	826.92	826.95	827.21
		3	0.75	0.75	0.75	0.75
			32.6	15.7	14.4	0.0
SPANDREL COLUMN 2-6	12+44.02	1	826.99	827.33	827.35	827.61
		2	826.93	827.27	827.29	827.55
		3	0.75	0.75	0.75	0.75
MIDSPAN	12+58.67	1	827.35	827.68	827.71	827.97
		2	827.28	827.61	827.64	827.90
		3	0.75	0.75	0.75	0.75
			32.7	15.8	14.5	0.0
CAP BEAM PIER 2 WEST	12+73.31	1	827.70	828.03	828.06	828.32
		2	827.63	827.96	827.99	828.25
		3	0.75	0.75	0.75	0.75
			38.1	14.3	13.0	0.0
MIDSPAN	12+81.35	1	827.75	828.22	828.25	828.51
		2	827.69	828.16	828.19	828.45
		3	0.75	0.75	0.75	0.75
			31.4	14.8	13.4	0.0
CAP BEAM PIER 2 CENTER	12+89.27	1	827.94	828.41	828.44	828.70
		2	827.88	828.35	828.38	828.64
		3	0.75	0.75	0.75	0.75
MIDSPAN	12+97.17	1	828.13	828.60	828.63	828.89
		2	828.07	828.54	828.57	828.83
		3	0.75	0.75	0.75	0.75

1 ELEVATIONS PRESENTED HERE ARE THEORETICAL. A COMPLETE SURVEY OF THE BRIDGE DECK SURFACE IS RECOMMENDED. THESE ELEVATIONS ARE SUBJECT TO CHANGE DUE TO THERMAL AND TIME DEPENDENT EFFECTS.

LOCATION	STATION	POINT	A	B	C	WORKING LINE CL ROADWAY
			WORKING LINE OFFSET (FT)			
			31.0	14.3	13.0	
CAP BEAM PIER 2 EAST	13+05.19	1	828.46	828.80	828.82	829.08
		2	828.40	828.74	828.76	829.02
		3	0.75	0.75	0.75	0.75
MIDSPAN	13+19.85	1	828.81	829.14	829.17	829.43
		2	828.75	829.08	829.11	829.37
		3	0.75	0.75	0.75	0.75
			32.9	16.2	14.9	0.0
SPANDREL COLUMN 3-1	13+34.52	1	829.17	829.50	829.53	829.79
		2	829.10	829.43	829.46	829.72
		3	0.75	0.75	0.75	0.75
MIDSPAN	13+48.88	1	829.51	829.84	829.87	830.13
		2	829.45	829.78	829.81	830.07
		3	0.77	0.77	0.77	0.77
			32.9	16.2	14.9	0.0
SPANDREL COLUMN 3-2	13+63.23	1	829.85	830.18	830.21	830.47
		2	829.79	830.12	830.15	830.41
		3	0.75	0.75	0.75	0.75
MIDSPAN	13+77.58	1	830.16	830.49	830.52	830.78
		2	830.08	830.41	830.44	830.70
		3	0.95	0.95	0.95	0.95
			33.0	16.3	15.0	0.0
SPANDREL COLUMN 3-3	13+91.94	1	830.44	830.77	830.80	831.06
		2	830.38	830.71	830.74	831.00
		3	0.75	0.75	0.75	0.75
MIDSPAN	14+06.29	1	830.68	831.01	831.04	831.30
		2	830.60	830.93	830.96	831.22
		3	0.95	0.95	0.95	0.95
			33.0	16.3	15.0	0.0
SPANDREL COLUMN 3-4	14+20.65	1	830.89	831.22	831.25	831.51
		2	830.83	831.16	831.19	831.45
		3	0.75	0.75	0.75	0.75
MIDSPAN	14+35.00	1	831.06	831.39	831.42	831.68
		2	830.98	831.31	831.34	831.60
		3	0.95	0.95	0.95	0.95
			33.1	16.4	15.1	0.0
SPANDREL COLUMN 3-5	14+49.35	1	831.20	831.53	831.56	831.82
		2	831.14	831.47	831.50	831.76
		3	0.75	0.75	0.75	0.75
MIDSPAN	14+63.71	1	831.30	831.63	831.66	831.92
		2	831.25	831.58	831.61	831.84
		3	0.95	0.95	0.95	0.95
			33.1	16.4	15.1	0.0
SPANDREL COLUMN 3-6	14+78.06	1	831.37	831.70	831.73	831.99
		2	831.31	831.64	831.67	831.93
		3	0.75	0.75	0.75	0.75
MIDSPAN	14+92.42	1	831.40	831.73	831.76	832.02
		2	831.33	831.66	831.69	831.95
		3	0.95	0.95	0.95	0.95
			33.1	16.4	15.1	0.0
SPANDREL COLUMN 3-7	15+06.77	1	831.40	831.74	831.76	832.02
		2	831.34	831.68	831.70	831.96
		3	0.75	0.75	0.75	0.75
MIDSPAN	15+21.12	1	831.37	831.70	831.73	831.99
		2	831.29	831.62	831.65	831.91
		3	0.75	0.95	0.95	0.95
			33.1	16.4	15.1	0.0
SPANDREL COLUMN 3-8	15+35.48	1	831.30	831.63	831.66	831.92
		2	831.23	831.56	831.59	831.85
		3	0.75	0.75	0.75	0.75
MIDSPAN	15+49.83	1	831.19	831.52	831.55	831.81

LOCATION	STATION	POINT	A	B	C	WORKING LINE CL ROADWAY
			WORKING LINE OFFSET (FT)			
			31.0	14.3	13.0	0.0
SPANDREL COLUMN 3-10	15+92.90	1	830.67	831.00	831.03	831.29
		2	830.61	830.94	830.97	831.23
		3	0.75	0.75	0.75	0.75
MIDSPAN	16+07.25	1	830.42	830.75	830.78	831.04
		2	830.34	830.67	730.70	830.96
		3	0.95	0.95	0.95	0.95
SPANDREL COLUMN 3-11	16+21.60	1	830.14	830.48	830.50	830.76
		2	830.08	830.42	830.44	830.70
		3	0.75	0.75	0.75	0.75
MIDSPAN	16+35.96	1	829.83	830.16	830.19	830.45
		2	829.75	830.08	830.11	830.37
		3	0.95	0.95	0.95	0.95
SPANDREL COLUMN 3-12	16+50.31	1	829.48	829.82	829.84	830.10
		2	829.42	829.76	829.78	830.04
		3	0.75	0.75	0.75	0.75
MIDSPAN	16+64.67	1	829.10	829.43	829.46	829.72
		2	829.02	829.35	829.38	829.64
		3	0.95	0.95	0.95	0.95
SPANDREL COLUMN 3-13	16+79.02	1	828.68	829.01	829.04	829.30
		2	828.62	828.95	828.98	829.24
		3	0.75	0.75	0.75	0.75
MIDSPAN	16+93.69	1	828.22	828.55	828.58	828.84
		2	828.14	828.47	828.50	828.76
		3	0.93	0.93	0.93	0.93

LOCATION	STATION	POINT	A	B	C	WORKING LINE CL ROADWAY
			WORKING LINE OFFSET (FT)			
			31.1	19.3	18.0	0.0
SPANDREL COLUMN 4-1	17+69.52	1	825.58	825.82	825.84	826.20
		2	825.52	825.76	825.78	826.14
		3	0.75	0.75	0.75	0.75
MIDSPAN	17+83.88	1	825.06	825.29	825.32	825.70
		2	825.00	825.23	825.26	825.64
		3	0.75	0.75	0.75	0.75
SPANDREL COLUMN 4-2	17+98.23	1	824.54	824.77	824.80	825.20
		2	824.48	824.71	824.74	825.14
		3	0.75	0.75	0.75	0.75
MIDSPAN	18+12.58	1	824.02	824.26	824.28	824.70
		2	823.96	824.19	824.22	824.63
		3	0.75	0.75	0.75	0.75
SPANDREL COLUMN 4-3	18+26.94	1	823.49	823.73	823.76	824.19
		2	823.43	823.67	823.70	824.13
		3	0.75	0.75	0.75	0.75
MIDSPAN	18+41.29	1	822.97	823.21	823.23	823.69
		2	822.91	823.15	823.17	823.63
		3	0.75	0.75	0.75	0.75
SPANDREL COLUMN 4-4	18+55.65	1	822.47	822.70	822.73	823.19
		2	822.41	822.64	822.67	823.13
		3	0.75	0.75	0.75	0.75
MIDSPAN	18+70.00	1	821.97	822.20	822.23	822.69
		2	821.90	822.13	822.16	822.62
		3	0.75	0.75	0.75	0.75
SPANDREL COLUMN 4-5	18+84.35	1	821.46	821.70	821.72	822.18
		2	821.40	821.64	821.64	822.12
		3	0.75	0.75	0.75	0.75
MIDSPAN	18+98.71	1	820.96	821.20	821.22	821.68
		2	820.90	821.14	821.16	821.62
		3	0.75	0.75	0.75	0.75
SPANDREL COLUMN 4-6	19+13.06	1	820.46	820.69	820.72	821.18
		2	820.40	820.63	820.66	821.12
		3	0.75	0.75	0.75	0.75
MIDSPAN	19+27.54	1	819.95	820.19	820.21	820.67
		2	819.89	820.13	820.15	820.61
		3	0.75	0.75	0.75	0.75
CAP BEAM PIER 4 WEST	19+42.02	1	819.45	819.68	819.71	820.17
		2	819.38	819.11	818.64	820.10
		3	0.75	0.75	0.75	0.75
MIDSPAN	19+48.95	1	819.20	819.44	819.46	819.92
		2	819.14	819.38	819.40	819.86
		3	0.78	0.78	0.78	0.78

LOCATION	STATION	POINT	A	B	C	WORKING LINE CL ROADWAY
			WORKING LINE OFFSET (FT)			
			36.0	24.3	23.0	0.0
CAP BEAM PIER 4 EAST	19+55.88	1	818.96	819.19	819.22	819.68
		2	818.90	819.13	819.16	819.62
		3	0.75	0.75	0.75	0.75
MIDSPAN	19+63.18	1	818.71	818.94	818.97	819.43
		2	818.64	818.87	818.90	819.36
		3	0.75	0.75	0.75	0.75
SPANDREL COLUMN 5-0	19+70.48	1	818.45	818.68	818.71	819.17
		2	818.39	818.62	818.65	819.11
		3	0.75	0.75	0.75	0.75
MIDSPAN	19+77.66	1	818.20	818.43	818.46	818.92
		2	818.14	818.37	818.40	818.86
		3	0.75	0.75	0.75	0.75
SPANDREL COLUMN 5-1	19+84.83	1	817.95	818.18	818.21	818.67
		2	817.89	818.12	818.15	818.61
		3	0.75	0.75	0.75	0.75
MIDSPAN	19+92.01	1	817.70	817.93	817.96	818.42
		2	817.63	817.86	817.89	818.35
		3	0.75	0.75	0.75	0.75
SPANDREL COLUMN 5-2	19+99.19	1	817.45	817.68	817.71	818.17
		2	817.38	817.61	817.64	818.10
		3	0.75	0.75	0.75	0.75
MIDSPAN	20+06.36	1	817.19	817.43	817.45	817.91
		2	817.13	817.37	817.39	817.85
		3	0.75	0.75	0.75	0.75
CAP BEAM PIER 3 WEST	17+08.35	1	827.72	828.04	828.07	828.34
		2	827.66	827.98	828.01	828.28
		3	0.75	0.75	0.75	0.75
MIDSPAN	17+16.38	1	827.44	827.74	827.77	828.06
		2	827.38	827.68	827.71	828.00
		3	0.75	0.75	0.75	0.75
CAP BEAM PIER 3 CENTER	17+24.27	1	827.03	827.46	827.49	827.79
		2	826.96	827.39	827.42	827.72
		3	0.75	0.75	0.75	0.75
MIDSPAN	17+32.19	1	826.75	827.17	827.20	827.51
		2	826.69	827.11	827.14	827.45
		3	0.75	0.75	0.75	0.75
CAP BEAM PIER 3 EAST	17+40.23	1	826.61	826.88	826.91	827.23
		2	826.55	826.82	826.85	827.17
		3	0.75	0.75	0.75	0.75
MIDSPAN	17+54.88	1	826.10	826.35	826.38	826.72
		2	826.03	826.29	826.32	826.65
		3	0.75	0.75	0.75	0.75

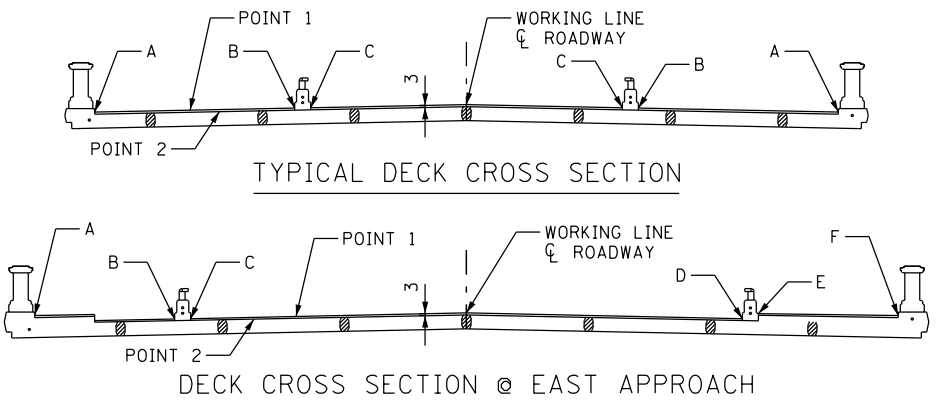
**NOTES:**

- CONTRACTOR SHALL SURVEY THE TOP OF DECK ELEVATIONS AFTER DECK PANELS ARE SET AND SHALL PROVIDE DATA TO ENGINEER FOR REVIEW. OVERLAY SHALL NOT BE PLACED UNTIL THE REVIEW IS COMPLETED AND ANY PROFILE ADJUSTMENTS ARE MADE.
- FOR ADDITIONAL NOTES, SEE SHEET B141 (DECK ELEVATION TABLE 1 OF 2).

**1** ELEVATIONS PRESENTED HERE ARE THEORETICAL. A COMPLETE SURVEY OF THE BRIDGE DECK SURFACE IS RECOMMENDED. THESE ELEVATIONS ARE SUBJECT TO CHANGE DUE TO THERMAL AND TIME DEPENDENT EFFECTS.

**LEGEND:**

- 1 - ELEVATIONS AT TOP OF ROADWAY
- 2 - ELEVATIONS AT TOP OF DECK PANELS
- 3 - ESTIMATED OVERLAY THICKNESS (INCHES)



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
**41308**      **8/14/2014**  
 LICENSE NO.      DATE

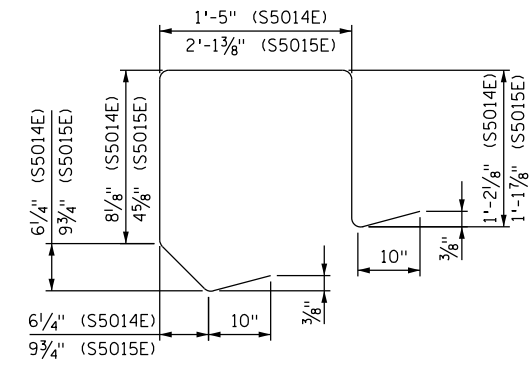
**DESIGN BY:** FP  
**CAD BY:** FP  
**CHECKED BY:** CB  
**LAST REVISION:**

**AS-BUILT - DECK ELEVATION TABLE (2 OF 2)**  
**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**  
**BRIDGE 2441 S.P. 027-605-029**

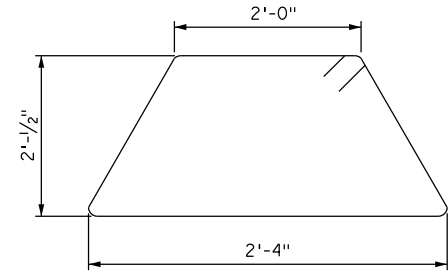
**SHEET**  
**B142**  
**B176**

BILL OF REINFORCEMENT DECK PANELS					
PANEL TYPE	BAR MARK	NO	LENGTH	SHAPE	LOCATION
A	S8001E	21	29'-4 1/2"	STR	D/L (B)
	S7002E	21	29'-4 1/2"	STR	D/L (T)
	S6003E	28	9'-10"	STR	D/T (B)
	S5004E	28	9'-9"	STR	D/T (T)
B	S8001E	17	29'-4 1/2"	STR	D/L (B)
	S7002E	17	29'-4 1/2"	STR	D/L (T)
	S6005E	28	8'-2"	STR	D/T (B)
	S5006E	28	8'-1"	STR	D/T (T)
B1	S5007E	27	3'-3"	STR	B/T (T)
	S8001E	17	29'-4 1/2"	STR	D/L (B)
	S7002E	17	29'-4 1/2"	STR	D/L (T)
B2	S6005E	28	8'-2"	STR	D/T (B)
	S5006E	28	8'-1"	STR	D/T (T)
	S5007E	27	3'-3"	STR	B/T (T)
B3	S8001E	17	29'-4 1/2"	STR	D/L (B)
	S7002E	17	29'-4 1/2"	STR	D/L (T)
	S6005E	28	8'-2"	STR	D/T (B)
	S5006E	28	8'-1"	STR	D/T (T)
B4	S5007E	27	3'-3"	STR	B/T (T)
	S8001E	12	29'-4 1/2"	STR	D/L (B)
	S7002E	12	29'-4 1/2"	STR	D/L (T)
	S5007E	27	3'-3"	STR	B/T (T)
C	S6008E	28	6'-2"	STR	D/T (B)
	S5009E	28	6'-1"	STR	D/T (T)
	S8001E	15	29'-4 1/2"	STR	D/L (B)
	S7002E	15	29'-4 1/2"	STR	D/L (T)
D	S6010E	28	6'-6"	STR	D/T (B)
	S5011E	26	6'-8 1/2"	STR	D/T (T)
	S5012E	2	7'-0 1/2"	STR	D/T (T)
	S5013E	3	29'-4 1/2"	STR	C/L (T)
	S5014E	26	5'-8 1/8"	BENT	C/TIE
	S5015E	2	6'-5 5/8"	BENT	P/TIE
	S5016E	1	9'-3"	BENT	P/TIE
E	S8001E	23	29'-4 1/2"	STR	D/L (B)
	S7002E	23	29'-4 1/2"	STR	D/L (T)
	S6017E	28	10'-8"	STR	D/T (B)
	S5018E	28	10'-7"	STR	D/T (T)
F	S8001E	19	29'-4 1/2"	STR	D/L (B)
	S7002E	19	29'-4 1/2"	STR	D/L (T)
	S5007E	27	3'-3"	STR	B/T (T)
	S6019E	28	9'-0"	STR	D/T (B)
	S5020E	28	8'-11"	STR	D/T (T)
	S8021E	24	4'-0"	STR	D/OPENING
	S8022E	4	5'-9 3/8"	BENT	D/OPENING
	S8023E	4	6'-1 1/2"	BENT	D/OPENING
	S8024E	4	6'-5 1/2"	BENT	D/OPENING
	S8001E	21	29'-4 1/2"	STR	D/L (B)
S7002E	21	29'-4 1/2"	STR	D/L (T)	
S5013E	3	29'-4 1/2"	STR	C/L (T)	
S5014E	26	5'-8 1/8"	BENT	C/TIE	
S5015E	2	6'-5 5/8"	BENT	P/TIE	
S5016E	1	9'-3"	BENT	P/TIE	
S6019E	28	9'-0"	STR	D/T (B)	
S8021E	24	4'-0"	STR	D/OPENING	
S8022E	4	5'-9 3/8"	BENT	D/OPENING	
S8023E	4	6'-1 1/2"	BENT	D/OPENING	

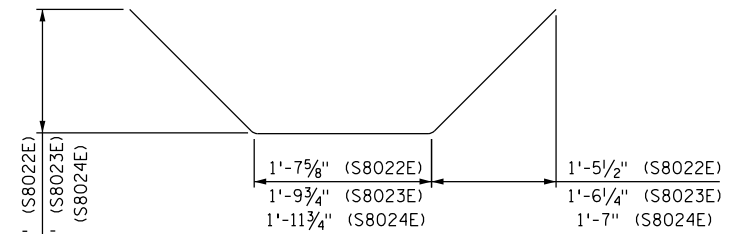
BILL OF REINFORCEMENT DECK PANELS (CONT.)					
PANEL TYPE	BAR MARK	NO	LENGTH	SHAPE	LOCATION
F	S8024E	4	6'-5 1/2"	BENT	D/OPENING
	S5025E	26	9'-2 1/2"	STR	D/T (T)
	S5026E	2	9'-6 1/2"	STR	D/T (T)
G	S8001E	17	29'-4 1/2"	STR	D/L (B)
	S7002E	17	29'-4 1/2"	STR	D/L (T)
	S6005E	28	8'-2"	STR	D/T (B)
G1	S5006E	28	8'-1"	STR	D/T (T)
	S8001E	16	29'-4 1/2"	STR	D/L (B)
	S7002E	16	29'-4 1/2"	STR	D/L (T)
H	S6027E	28	7'-10 1/2"	STR	D/T (B)
	S5028E	28	7'-9 1/2"	STR	D/T (T)
	S8001E	13	29'-4 1/2"	STR	D/L (B)
H1	S7002E	13	29'-4 1/2"	STR	D/L (T)
	S6029E	28	6'-10"	STR	D/T (B)
	S5030E	28	6'-9"	STR	D/T (T)
J1	S8001E	12	29'-4 1/2"	STR	D/L (B)
	S7002E	12	29'-4 1/2"	STR	D/L (T)
	S6031E	28	6'-5"	STR	D/T (B)
	S5032E	28	6'-4"	STR	D/T (T)
	S8001E	8	29'-4 1/2"	STR	D/L (B)
	S7002E	8	29'-4 1/2"	STR	D/L (T)
	S5013E	3	29'-4 1/2"	STR	C/L (T)
J2	S5014E	26	5'-8 1/8"	BENT	C/TIE
	S5015E	2	6'-5 5/8"	BENT	P/TIE
	S5016E	1	9'-3"	BENT	P/TIE
	S6033E	28	4'-8 3/4"	STR	D/T (B) SERIES
	S5034E	13	5'-5 3/8"	STR	D/T (T) SERIES
	S5035E	2	4'-11 1/4"	STR	D/T (T) SERIES
	S5036E	13	4'-5 5/8"	STR	D/T (T) SERIES
	S8193E	5	28'-7"	STR	D/L (B)
	S7194E	5	28'-7"	STR	D/L (T)
	S8001E	9	29'-4 1/2"	STR	D/L (B)
	S7002E	9	29'-4 1/2"	STR	D/L (T)
	S5013E	3	29'-4 1/2"	BENT	C/L (T)
	S5014E	26	5'-8 1/8"	BENT	C/TIE
S5015E	2	6'-5 5/8"	STR	P/TIE	
S5016E	1	9'-3"	STR	P/TIE	
K	S6037E	28	5'-0 3/4"	STR	D/T (B) SERIES
	S5038E	13	5'-9 3/8"	STR	D/T (T) SERIES
	S5039E	2	5'-3 1/4"	STR	D/T (T) SERIES
	S5040E	13	4'-9 3/8"	STR	D/T (T) SERIES
K1	S8193E	5	28'-7"	STR	D/L (B)
	S7194E	5	28'-7"	STR	D/L (T)
L1	S5004E	28	9'-9"	STR	D/T (B) & (T)
	S5041E	42	14'-9 1/4"	STR	D/L (B) & (T)
	S5004E	28	9'-9"	STR	D/T (B) & (T)
	S5193E	42	15'-0 1/4"	STR	D/L (B) & (T)
	S5004E	14	9'-9"	STR	D/T (T)
	S8042E	21	14'-10 3/4"	STR	D/L (B)
L2	S7043E	21	14'-10 3/4"	STR	D/L (T)
	S6044E	14	9'-9"	STR	D/T (B)
	S5006E	14	8'-1"	STR	D/T (B)
L3	S8042E	17	14'-10 3/4"	STR	D/L (B)
	S7043E	17	14'-10 3/4"	STR	D/L (T)
	S6045E	14	8'-1"	STR	D/T (B)
L4	S5006E	28	8'-1"	STR	D/T (B) & (T)
	S5007E	13	3'-3"	STR	B/T (T)
	S5041E	34	14'-9 1/4"	STR	D/L (B) & (T)
	S5006E	28	8'-1"	STR	D/T (B) & (T)



S5014E & S5015E



S5016E



S8022E, S8023E & S8024E

VARIES FROM 5'-7 3/4" TO 3'-9 5/8" (S6033E)  
 VARIES FROM 5'-10 1/4" TO 5'-1/2" (S5034E)  
 VARIES FROM 4'-11 5/8" TO 4'-10 3/4" (S5035E)  
 VARIES FROM 4'-10" TO 4'-0 1/2" (S5036E)  
 VARIES FROM 5'-11 3/4" TO 4'-1 5/8" (S6037E)  
 VARIES FROM 6'-2 1/4" TO 5'-4 1/2" (S5038E)  
 VARIES FROM 5'-3 5/8" TO 5'-2 3/4" (S5039E)  
 VARIES FROM 5'-2" TO 4'-4 1/4" (S5040E)

S6033E, S5034E, S5035E, S5036E, S6037E, S5038E, S5039E & S5040E

- NOTES:  
 ① BAR NOT INCLUDED IN PANEL E'  
 ② BAR NOT INCLUDED IN PANEL F'



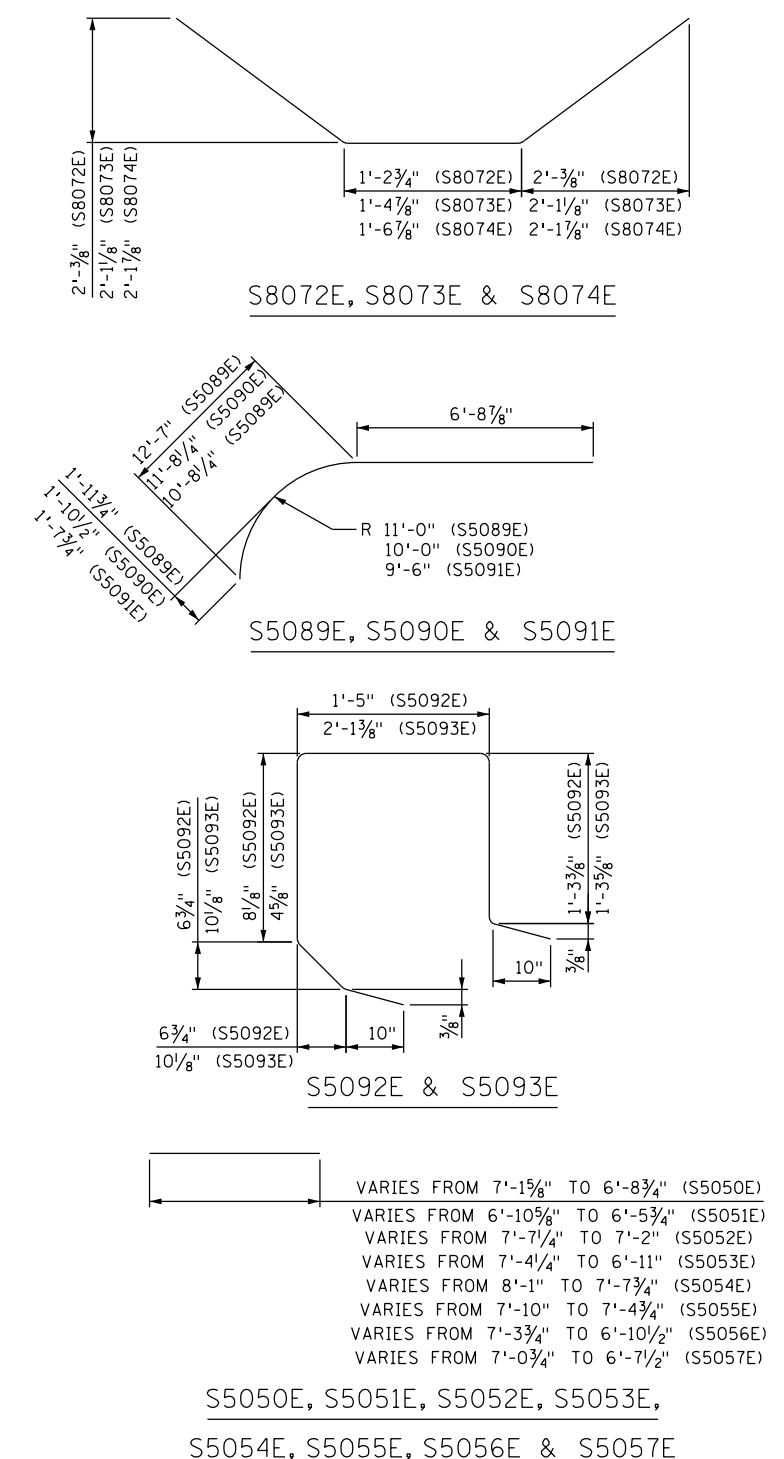
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
*Daniel F. Enser*  
 DANIEL F. ENSER, PROFESSIONAL ENGINEER  
 41308 8/14/2014  
 LICENSE NO. DATE

DESIGN BY: CB  
 CAD BY: ET  
 CHECKED BY: CB  
 LAST REVISION: 7/22/2015

SUPERSTRUCTURE SLAB BAR LIST (1 OF 5)  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029  
 SHEET B143R B176

BILL OF REINFORCEMENT DECK PANELS					
PANEL TYPE	BAR MARK	NO	LENGTH	SHAPE	LOCATION
L5	S5007E	13	3'-3"	STR	B/T (T)
	S5041E	40	14'-9 <sup>1</sup> / <sub>4</sub> "	STR	D/L (B) & (T)
	S5046E	28	9'-4"	STR	D/T (B) & (T)
M1	S5011E	14	6'-8 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5014E	14	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
	S8042E	15	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	D/L (B)
	S7043E	15	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	D/L (T)
	S6047E	14	6'-5 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)
	S5048E	3	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	C/L (T)
M2	S5011E	1	6'-8 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5014E	14	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
	S5041E	35	14'-9 <sup>1</sup> / <sub>4</sub> "	STR	D/L (B) & (T) & C/L (T)
	S5049E	1	6'-5 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)
M3	S5050E	13	6'-11 <sup>1</sup> / <sub>4</sub> "	STR	D/T (B) SERIES
	S5051E	13	6'-8 <sup>1</sup> / <sub>4</sub> "	STR	D/T (T) SERIES
	S5014E	14	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
M4	S5041E	37	14'-9 <sup>1</sup> / <sub>4</sub> "	STR	D/L (B) & (T) & C/L (T)
	S5052E	14	7'-4 <sup>3</sup> / <sub>8</sub> "	STR	D/T (B) SERIES
	S5053E	14	7'-1 <sup>5</sup> / <sub>8</sub> "	STR	D/T (T) SERIES
M5	S5014E	14	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
	S5041E	35	14'-9 <sup>1</sup> / <sub>4</sub> "	STR	D/L (B) & (T) & C/L (T)
	S5056E	14	7'-1 <sup>1</sup> / <sub>8</sub> "	STR	D/T (B) SERIES
N	S5057E	14	6'-10 <sup>1</sup> / <sub>8</sub> "	STR	D/T (T) SERIES
	S5004E	16	9'-9"	STR	D/T (T)
	S6044E	16	9'-9"	STR	D/T (B)
N1	S8058E	21	17'-1"	STR	D/L (B)
	S7059E	21	17'-1"	STR	D/L (T)
	S8058E	18	17'-1"	STR	D/L (B)
P	S7059E	18	17'-1"	STR	D/L (T)
	S6060E	16	8'-5 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)
	S5061E	16	8'-5 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
P1	S5007E	15	3'-3"	STR	B/T (T)
	S5046E	16	9'-4"	STR	D/T (T)
	S8058E	20	17'-1"	STR	D/L (B)
P2	S7059E	20	17'-1"	STR	D/L (T)
	S6062E	16	9'-4"	STR	D/T (B)
	S5007E	15	3'-3"	STR	B/T (T)
Q	S5046E	16	9'-4"	STR	D/T (T)
	S8058E	20	17'-1"	STR	D/L (B)
	S7059E	20	17'-1"	STR	D/L (T)
	S6062E	16	9'-4"	STR	D/T (B)
	S5007E	15	3'-3"	STR	B/T (T)
	S8063E	16	14'-0 <sup>3</sup> / <sub>4</sub> "	STR	D/L (B) SERIES
	S7064E	16	14'-0 <sup>3</sup> / <sub>4</sub> "	STR	D/L (T) SERIES
	S6065E	12	7'-6 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)
	S6066E	1	5'-7 <sup>7</sup> / <sub>8</sub> "	STR	D/T (B)
	S6067E	1	2'-4 <sup>5</sup> / <sub>8</sub> "	STR	D/T (B)
	S5068E	12	7'-6 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5069E	1	5'-7 <sup>7</sup> / <sub>8</sub> "	STR	D/T (T)
	S5070E	1	2'-4 <sup>5</sup> / <sub>8</sub> "	STR	D/T (T)
	S8071E	12	4'-6"	STR	D/OPENING
S8072E	2	6'-11 <sup>3</sup> / <sub>4</sub> "	BENT	D/OPENING	

BILL OF REINFORCEMENT DECK PANELS (CONT.)					
PANEL TYPE	BAR MARK	NO	LENGTH	SHAPE	LOCATION
Q	S8073E	2	7'-3 <sup>7</sup> / <sub>8</sub> "	BENT	D/OPENING
	S8074E	2	7'-8 <sup>1</sup> / <sub>8</sub> "	BENT	D/OPENING
R	S5016E	1	9'-3"	BENT	P/TIE
	S5012E	2	7'-0 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S8075E	6	16'-2"	STR	D/L (B) SERIES
	S8076E	5	14'-0 <sup>3</sup> / <sub>4</sub> "	STR	D/L (B) SERIES
	S8077E	4	11'-2 <sup>1</sup> / <sub>2</sub> "	STR	D/L (B) SERIES
	S7078E	6	16'-6"	STR	D/L (T) SERIES
	S7079E	5	14'-6 <sup>3</sup> / <sub>4</sub> "	STR	D/L (T) SERIES
	S7080E	5	10'-9 <sup>1</sup> / <sub>2</sub> "	STR	D/L (T) SERIES
	S6081E	7	6'-5 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)
	S6082E	5	6'-0"	STR	D/T (B) SERIES
	S6083E	4	3'-10 <sup>1</sup> / <sub>8</sub> "	STR	D/T (B) SERIES
	S6084E	1	1'-0 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)
	S5085E	5	6'-8 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5086E	5	6'-4"	STR	D/T (T) SERIES
	S5087E	4	4'-2 <sup>1</sup> / <sub>8</sub> "	STR	D/T (T) SERIES
	S5088E	1	1'-6 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5089E	2	20'-1 <sup>1</sup> / <sub>2</sub> "	BENT	D/L (B) & C/L (T)
	S5090E	1	19'-2 <sup>1</sup> / <sub>2</sub> "	BENT	C/L (T)
S5091E	1	18'-1"	BENT	C/L (T)	
S5092E	18	5'-10"	BENT	C/TIE	
S5093E	2	6'-8"	BENT	P/TIE	
S	S5018E	28	10'-7"	STR	D/T (B) & (T)
	S5041E	46	14'-9 <sup>1</sup> / <sub>4</sub> "	STR	D/L (B) & (T)
S1	S5018E	14	10'-7"	STR	D/T (T)
	S8042E	23	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	D/L (B)
T	S7043E	23	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	D/L (T)
	S6094E	14	10'-7"	STR	D/T (B)
T1	S5007E	13	3'-3"	STR	B/T (T)
	S5020E	28	8'-11"	STR	D/T (B) & (T)
U	S5041E	38	14'-9 <sup>1</sup> / <sub>4</sub> "	STR	D/L (B) & (T)
	S5007E	13	3'-3"	STR	B/T (T)
	S5020E	14	8'-11"	STR	D/T (T)
U1	S8042E	19	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	D/L (B)
	S7043E	19	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	D/L (T)
	S6095E	14	8'-11"	STR	D/T (B)
V	S5014E	14	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
	S5025E	14	9'-2 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5041E	45	14'-9 <sup>1</sup> / <sub>4</sub> "	STR	D/L (B) & (T) & C/L (T)
	S5096E	14	8'-11 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)
	S5014E	14	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
	S5025E	14	9'-2 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S8042E	21	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	D/L (B)
	S7043E	21	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	D/L (T)
	S5048E	3	14'-10 <sup>3</sup> / <sub>4</sub> "	STR	C/L (T)
	S6097E	14	8'-11 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)
	S5014E	25	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
	S5015E	5	6'-5 <sup>5</sup> / <sub>8</sub> "	BENT	P/TIE
	S5016E	1	9'-3"	BENT	P/TIE
	S6031E	27	6'-5"	STR	D/T (B)
S8098E	15	32'-5 <sup>1</sup> / <sub>8</sub> "	STR	D/L (B) SERIES	
S7099E	15	32'-5 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T) SERIES	
S6100E	3	7'-5 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)	
S6101E	1	6'-3 <sup>3</sup> / <sub>8</sub> "	STR	D/T (B)	
S6102E	1	3'-0 <sup>1</sup> / <sub>8</sub> "	STR	D/T (B)	
S5103E	25	6'-8"	STR	D/T (T)	
S5104E	2	7'-0"	STR	D/T (T)	
S5105E	3	7'-5 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)	
S5106E	1	6'-3 <sup>3</sup> / <sub>8</sub> "	STR	D/T (T)	

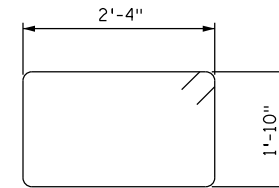


- NOTES:
- BAR BENDING DIAGRAMS FOR BARS S5014E, S5015E AND S5016E ARE LOCATED ON SHEET B143 (SUPERSTRUCTURE SLAB BAR LIST 1 OF 5).
  - BAR BENDING DIAGRAMS FOR BARS S8063E, S7064E, S8075E THRU S7080E, S6082E, S6083E, S5086E, S5087E, S8098E AND S7099E ARE LOCATED ON SHEET B146 (SUPERSTRUCTURE SLAB BAR LIST 4 OF 5).
- ③ BAR NOT INCLUDED IN PANEL Q

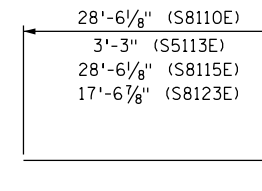
	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.	<b>DESIGN BY:</b> CB <b>CAD BY:</b> ET <b>CHECKED BY:</b> CB <b>LAST REVISION:</b> 3/30/2015	<b>SUPERSTRUCTURE SLAB BAR LIST (2 OF 5)</b> <b>C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705</b> <b>BRIDGE 2441 S.P. 027-605-029</b>	<b>SHEET</b> <b>B144R</b> <b>B176</b>
	 <b>DANIEL F. ENSER, PROFESSIONAL ENGINEER</b> 41308 8/14/2014 LICENSE NO. DATE			

BILL OF REINFORCEMENT DECK PANELS					
PANEL TYPE	BAR MARK	NO	LENGTH	SHAPE	LOCATION
V	S5107E	1	3'-0 <sup>1</sup> / <sub>8</sub> "	STR	D/T (T)
	S5108E	3	29'-8"	STR	C/L (T)
	S5109E	1	9'-2"	BENT	P/TIE
V1	S5014E	25	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
	S5015E	5	6'-5 <sup>5</sup> / <sub>8</sub> "	BENT	P/TIE
	S5016E	1	9'-3"	BENT	P/TIE
	S6031E	27	6'-5"	STR	D/T (B)
	S8098E	15	32'-5 <sup>1</sup> / <sub>8</sub> "	STR	D/L (B) SERIES
	S7099E	15	32'-5 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T) SERIES
	S6100E	3	7'-5 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B)
	S6101E	1	6'-3 <sup>3</sup> / <sub>8</sub> "	STR	D/T (B)
	S6102E	1	3'-0 <sup>1</sup> / <sub>8</sub> "	STR	D/T (B)
	S5103E	25	6'-8"	STR	D/T (T)
	S5104E	2	7'-0"	STR	D/T (T)
	S5105E	3	7'-5 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5106E	1	6'-3 <sup>3</sup> / <sub>8</sub> "	STR	D/T (T)
	S5107E	1	3'-0 <sup>1</sup> / <sub>8</sub> "	STR	D/T (T)
	S5108E	3	29'-8"	STR	C/L (T)
	S5109E	1	9'-2"	BENT	P/TIE
	W1	S6003E	31	9'-10"	STR
S5004E		27	9'-9"	STR	D/T (T)
S8110E		21	29'-5 <sup>1</sup> / <sub>8</sub> "	BENT	D/L (B)
S8111E		21	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
W2	S7112E	21	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T)
	S6017E	31	10'-8"	STR	D/T (B)
	S5018E	27	10'-7"	STR	D/T (T)
	S8110E	23	29'-5 <sup>1</sup> / <sub>8</sub> "	BENT	D/L (B)
X1	S8111E	23	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S7112E	23	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T)
	S6005E	31	8'-2"	STR	D/T (B)
	S5006E	27	8'-1"	STR	D/T (T)
X2	S5007E	26	3'-3"	STR	B/T (T)
	S8110E	17	29'-5 <sup>1</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8111E	17	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S7112E	17	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T)
X3	S5007E	26	3'-3"	STR	B/T (T)
	S6019E	31	9'-0"	STR	D/T (B)
	S5020E	27	8'-11"	STR	D/T (T)
	S8110E	19	29'-5 <sup>1</sup> / <sub>8</sub> "	BENT	D/L (B)
Y1	S8111E	19	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S7112E	19	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T)
	S5113E	8	3'-10"	BENT	B/T (T)
	S6010E	31	6'-6"	STR	D/T (B)
Y2	S5011E	25	6'-8 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5012E	2	7'-0 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5014E	25	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
	S5015E	2	6'-5 <sup>5</sup> / <sub>8</sub> "	BENT	P/TIE
	S5016E	1	9'-3"	BENT	P/TIE
	S8110E	15	29'-5 <sup>1</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8111E	15	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S7112E	15	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T)
	S5114E	3	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	C/L (T)
	S5014E	25	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
S5015E	2	6'-5 <sup>5</sup> / <sub>8</sub> "	BENT	P/TIE	

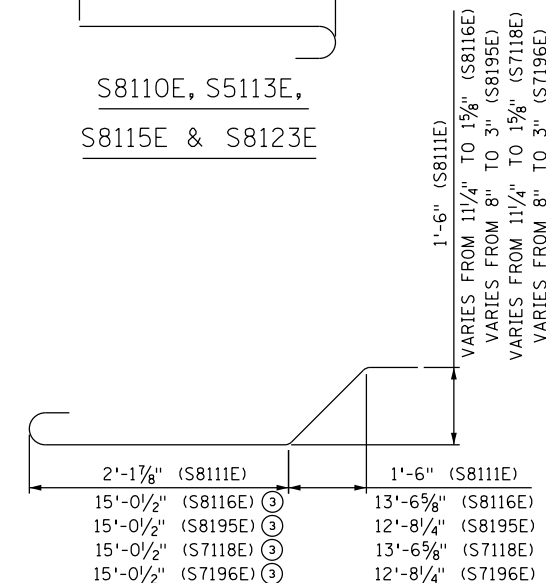
BILL OF REINFORCEMENT DECK PANELS (CONT.)					
PANEL TYPE	BAR MARK	NO	LENGTH	SHAPE	LOCATION
Y2	S5016E	1	9'-3"	BENT	P/TIE
	S6019E	31	9'-0"	STR	D/T (B)
	S5025E	25	9'-2 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5026E	2	9'-6 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S8110E	21	29'-5 <sup>1</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8111E	21	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S7112E	21	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T)
	S5114E	3	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	C/L (T)
	S5014E	25	5'-8 <sup>1</sup> / <sub>8</sub> "	BENT	C/TIE
	S5015E	2	6'-5 <sup>5</sup> / <sub>8</sub> "	BENT	P/TIE
	S5016E	1	9'-3"	BENT	P/TIE
	S6019E	18	9'-0"	STR	D/T (B)
	S5025E	12	9'-2 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
	S5026E	2	9'-6 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T)
Y3	S8111E	21	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8115E	14	29'-5 <sup>1</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8116E	5	29'-5 <sup>1</sup> / <sub>4</sub> "	BENT	D/L (B) SERIES
	S7117E	14	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T)
	S7118E	5	28'-6 <sup>1</sup> / <sub>4</sub> "	BENT	D/L (T) SERIES
	S6119E	13	8'-6 <sup>3</sup> / <sub>4</sub> "	STR	D/T (B) SERIES
	S5120E	13	8'-9 <sup>3</sup> / <sub>8</sub> "	STR	D/T (T) SERIES
	S5121E	3	15'-9 <sup>1</sup> / <sub>2</sub> "	STR	C/L (T)
	S5122E	3	14'-2 <sup>1</sup> / <sub>4</sub> "	STR	C/L (T)
	S8195E	2	28'-8"	BENT	D/L (B) SERIES
	S7196E	2	27'-9"	BENT	D/L (T) SERIES
	S6003E	20	9'-10"	STR	D/T (B)
	S5004E	16	9'-9"	STR	D/T (T)
	S8111E	21	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
AS1	S8123E	21	18'-6"	BENT	D/L (B) SERIES
	S7124E	21	17'-7"	STR	D/L (T) SERIES
	S6003E	21	9'-10"	STR	D/T (B)
	S5004E	17	9'-9"	STR	D/T (T)
AS2	S8111E	21	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8125E	21	19'-7 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B) SERIES
	S7126E	21	18'-8 <sup>5</sup> / <sub>4</sub> "	STR	D/L (T) SERIES
	S6017E	19	10'-8"	STR	D/T (B)
AS3	S5018E	15	10'-7"	STR	D/T (T)
	S8111E	23	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8127E	23	17'-0 <sup>1</sup> / <sub>8</sub> "	BENT	D/L (B) SERIES
	S7128E	23	16'-1 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T) SERIES
AS4	S6017E	20	10'-8"	STR	D/T (B)
	S5018E	16	10'-7"	STR	D/T (T)
	S8111E	23	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8129E	23	18'-2"	BENT	D/L (B) SERIES
AS5	S7130E	23	17'-3"	STR	D/L (T) SERIES
	S5007E	16	3'-3"	STR	B/T (T)
	S5046E	17	9'-4"	STR	D/T (T)
	S8111E	20	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
AS6	S8131E	20	19'-0 <sup>3</sup> / <sub>4</sub> "	BENT	D/L (B) SERIES
	S7132E	20	18'-1 <sup>3</sup> / <sub>4</sub> "	STR	D/L (T) SERIES
	S6133E	21	9'-5"	STR	D/T (B)
	S5007E	16	3'-3"	STR	B/T (T)
AS7	S6019E	21	9'-0"	STR	D/T (B)
	S5020E	17	8'-11"	STR	D/T (T)
	S8111E	19	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8134E	19	19'-1 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B) SERIES
	S7135E	19	18'-2 <sup>3</sup> / <sub>8</sub> "	STR	D/L (T) SERIES
	S5007E	16	3'-3"	STR	B/T (T)
	S5009E	17	6'-1"	STR	D/T (T)
AS7	S6019E	21	9'-0"	STR	D/T (B)
	S8111E	19	6'-0 <sup>3</sup> / <sub>8</sub> "	BENT	D/L (B)
	S8136E	19	19'-0 <sup>7</sup> / <sub>8</sub> "	BENT	D/L (B) SERIES



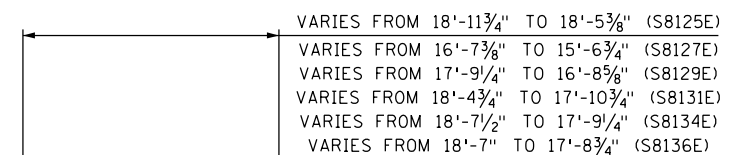
S5109E



S8110E, S5113E,  
S8115E & S8123E



S8111E, S8116E, S7118E, S8195E, & S7196E



S8125E, S8127E, S8129E,  
S8131E, S8134E & S8136E

NOTES:

- BAR BENDING DIAGRAMS FOR BARS S5014E, S5015E AND S5016E ARE LOCATED ON SHEET B143 (SUPERSTRUCTURE SLAB BAR LIST 1 OF 5).
  - BAR BENDING DIAGRAMS FOR BARS S8098E, S7099E, S6119E, S5120E, S7124E, S7126E, S7128E, S7130E, S7132E, AND S7135E ARE LOCATED ON SHEET B146 (SUPERSTRUCTURE SLAB BAR LIST 4 OF 5).
- ③ FOR BARS S8116E AND 7118E, HOOK IS ORIENTED 90° FROM PLAN.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308 8/14/2014  
LICENSE NO. DATE

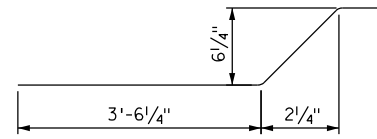
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CAD BY: ET  
CHECKED BY: CB  
LAST REVISION: 7/27/2015

SUPERSTRUCTURE SLAB BAR LIST (3 OF 5)  
C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

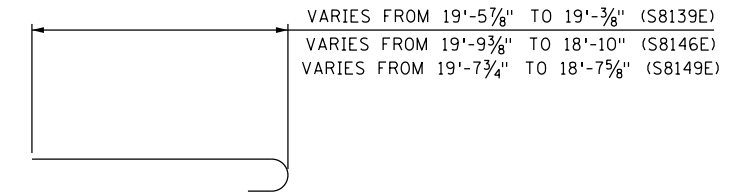
SHEET  
B145R  
B176

**BILL OF REINFORCEMENT  
DECK PANELS**

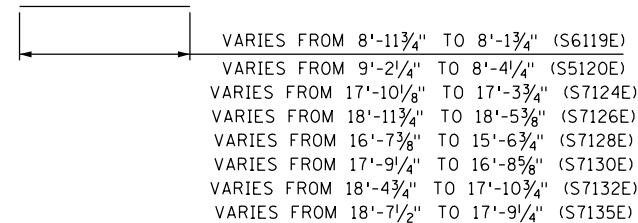
PANEL TYPE	BAR MARK	NO	LENGTH	SHAPE	LOCATION
AS7	S7137E	19	18'-1 $\frac{7}{8}$ "	STR	D/L (T) SERIES
	S5138E	17	8'-1 $\frac{1}{2}$ "	STR	D/T (T) SERIES
AS8	S5014E	16	5'-8 $\frac{1}{8}$ "	BENT	C/TIE
	S5015E	2	6'-5 $\frac{5}{8}$ "	BENT	P/TIE
	S5016E	1	9'-3"	BENT	P/TIE
	S8111E	18	6'-0 $\frac{3}{8}$ "	BENT	D/L (B)
	S8139E	18	20'-2 $\frac{1}{8}$ "	BENT	D/L (B) SERIES
	S7140E	18	19'-3 $\frac{1}{4}$ "	STR	D/L (T) SERIES
	S6141E	22	7'-5 $\frac{3}{8}$ "	STR	D/T (B) SERIES
	S5142E	7	7'-10 $\frac{1}{8}$ "	STR	D/T (T) SERIES
	S5143E	2	7'-8 $\frac{1}{4}$ "	STR	D/T (T) SERIES
	S5144E	9	7'-6 $\frac{1}{8}$ "	STR	D/T (T) SERIES
	S5145E	3	19'-5 $\frac{1}{2}$ "	STR	C/L (T)
AS9	S5014E	16	5'-8 $\frac{1}{8}$ "	BENT	C/TIE
	S5015E	2	6'-5 $\frac{5}{8}$ "	BENT	P/TIE
	S5016E	1	9'-3"	BENT	P/TIE
	S6019E	22	9'-0"	STR	D/T (B)
	S5025E	16	9'-2 $\frac{1}{2}$ "	STR	D/T (T)
	S5026E	2	9'-6 $\frac{1}{2}$ "	STR	D/T (T)
	S8111E	21	6'-0 $\frac{3}{8}$ "	BENT	D/L (B)
	S8146E	21	20'-2 $\frac{3}{4}$ "	BENT	D/L (B) SERIES
	S7147E	21	19'-4"	STR	D/L (T) SERIES
	S5148E	3	19'-8 $\frac{7}{8}$ "	STR	C/L (T)
AS10	S5014E	16	5'-8 $\frac{1}{8}$ "	BENT	C/TIE
	S5015E	2	6'-5 $\frac{5}{8}$ "	BENT	P/TIE
	S5016E	1	9'-3"	BENT	P/TIE
	S8111E	23	6'-0 $\frac{3}{8}$ "	BENT	D/L (B)
	S8149E	23	20'-0 $\frac{3}{4}$ "	BENT	D/L (B) SERIES
	S7150E	23	19'-1 $\frac{7}{8}$ "	STR	D/L (T) SERIES
	S6151E	7	9'-9"	STR	D/T (B) SERIES
	S6152E	2	9'-4 $\frac{1}{4}$ "	STR	D/T (B) SERIES
	S6153E	9	9'-1 $\frac{1}{8}$ "	STR	D/T (B) SERIES
	S5154E	7	9'-11 $\frac{1}{2}$ "	STR	D/T (T) SERIES
	S5155E	2	9'-6 $\frac{3}{4}$ "	STR	D/T (T) SERIES
	S5156E	9	9'-4 $\frac{1}{8}$ "	STR	D/T (T) SERIES
	S5157E	3	19'-7 $\frac{7}{8}$ "	STR	C/L (T)



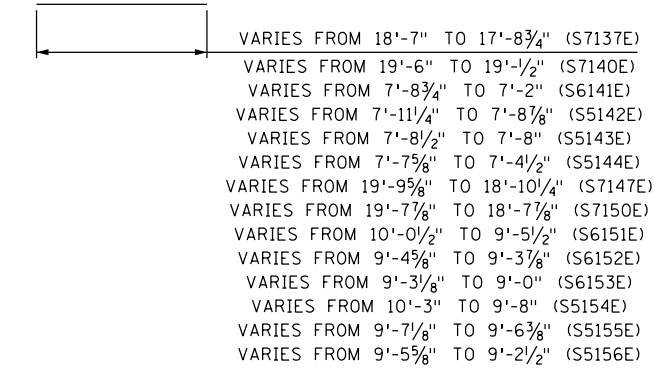
S5138E



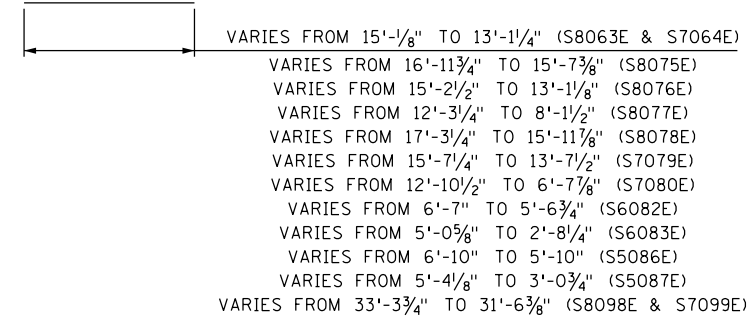
S8139E, S8146E,  
S8149E



S6119E, S5120E, S7124E, S7126E,  
S7128E, S7130E, S7312E, & S7135E



S7137E, S7140E, S6141E, S5142E, S5143E,  
S5144E, S7147E, S7150E, S6151E, S6152E  
S6153E, S5154E, S5155E & S5156E



S8063E, S7064E, S8075E, S8076E, S8077E,  
S8078E, S7079E, S7080E, S6082E, S6083E,  
S5086E, S5087E, S8098E & S7099E

**NOTES:**

1. BAR BENDING DIAGRAMS FOR BARS S5014E, S5015E AND S5016E ARE LOCATED ON SHEET B143 (SUPERSTRUCTURE SLAB BAR LIST 1 OF 5).
2. BAR BENDING DIAGRAM FOR BAR S8111E IS LOCATED ON SHEET B145 (SUPERSTRUCTURE SLAB BAR LIST 3 OF 5).



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308      8/14/2014  
LICENSE NO.      DATE

DESIGN BY: CB  
CAD BY: ET  
CHECKED BY: CB  
LAST REVISION:

**SUPERSTRUCTURE SLAB BAR LIST (4 OF 5)**

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441      S.P. 027-605-029

**SHEET**  
B146  
B176



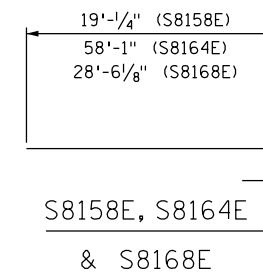
**BILL OF REINFORCEMENT  
ULTRA-HIGH PERFORMANCE C.I.P. CONCRETE CLOSURE POURS**

POUR TYPE	BAR MARK	NO	LENGTH	SHAPE	LOCATION	
LONGITUDINAL	S8158E	28	19'-11 <sup>1</sup> / <sub>4</sub> "	BENT	D/L (B) 7" CP @ AP-W TO AB-W, AP-E TO AB-E	
	S7159E	28	19'-0 <sup>1</sup> / <sub>4</sub> "	STR	D/L (T) 7" CP @ AP-W TO AB-W, AP-E TO AB-E	
	S5160E	14	14'-9 <sup>1</sup> / <sub>4</sub> "	STR	D/L (B) & (T) 6" CP @ AB-W TO 1-0	
	S5161E	14	57'-11 <sup>1</sup> / <sub>2</sub> "	STR	D/L (B) & (T) 6" CP @ 1-0 TO P1-E	
	S8162E	110	29'-4 <sup>1</sup> / <sub>2</sub> "	STR	D/L (B) 7" CP @ P1-E TO 2-1, P2-E TO 3-1, 3-13 TO P3-W, P3-E TO 4-3, 4-6 TO P4-W	
	S7163E	110	29'-4 <sup>1</sup> / <sub>2</sub> "	STR	D/L (T) 7" CP @ P1-E TO 2-1, P2-E TO 3-1, 3-13 TO P3-W, P3-E TO 4-3, 4-6 TO P4-W	
	S8164E	98	59'-0"	BENT	D/L (B) 7" CP @ 2-1 TO 2-5, 3-3 TO 3-11, 4-4 TO 4-6	
	S7165E	140	58'-1"	STR	D/L (T) 7" CP @ 2-1 TO P2-W, 3-1 TO 3-13, 4-4 TO 4-6	
	S8166E	42	58'-1"	STR	D/L (B) 7" CP @ 2-5 TO P2-W, 3-1 TO 3-3, 3-11 TO 3-13	
	S5167E	36	33'-9"	STR	D/L (B) & (T) 6" CP @ P2-W TO P2-E, P3-W TO P3-E	
	S8168E	14	29'-5 <sup>1</sup> / <sub>8</sub> "	BENT	D/L (B) 7" CP @ 4-3 TO 4-4	
	S7169E	14	28'-6 <sup>1</sup> / <sub>8</sub> "	STR	D/L (T) 7" CP @ 4-3 TO 4-4	
	S5170E	28	36'-11 <sup>1</sup> / <sub>8</sub> "	STR	D/L (B) & (T) 6" CP @ P4-W TO AB-E	
	S6171E	2	34'-9"	STR	D/T (B) 9" CP @ AB-W	
	S5172E	2	35'-3 <sup>3</sup> / <sub>4</sub> "	STR	D/T (T) 9" CP @ AB-W	
	TRANSVERSE	S5173E	4	34'-3"	STR	D/T (B) 6" CP @ 1-0 TO 1-1
		S5174E	4	34'-10"	STR	D/T (T) 6" CP @ 1-0 TO 1-1
S5175E		4	33'-3 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B) 6" CP @ 1-2 TO P1-W	
S5176E		4	33'-10 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T) 6" CP @ 1-2 TO P1-W	
S6177E		36	32'-10 <sup>1</sup> / <sub>4</sub> "	STR	D/T (B) 9" CP @ P1-E TO 2-2, 2-4 TO 2-6, 3-1 TO 3-4, 3-6 TO 3-8, 3-10 TO 3-13, 4-1	
S5178E		36	33'-5"	STR	D/T (T) 9" CP @ P1-E TO 2-2, 2-4 TO 2-6, 3-1 TO 3-4, 3-6 TO 3-8, 3-10 TO 3-13, 4-1	
S6179E		4	52'-11"	STR	D/T (B) 9" CP @ P2-W, P2-E, P3-W, P3-E	
S5180E		4	52'-11"	STR	D/T (T) 9" CP @ P2-W, P2-E, P3-W, P3-E	
S6181E		8	7'-7 <sup>1</sup> / <sub>2</sub> "	STR	D/T (B) 9" CP @ P2-W, P2-E, P3-W, P3-E	
S5182E		8	7'-7 <sup>1</sup> / <sub>2</sub> "	STR	D/T (T) 9" CP @ P2-W, P2-E, P3-W, P3-E	
S5183E		4	40'-4 <sup>3</sup> / <sub>4</sub> "	STR	D/T (B) 6" CP @ CL P2, CL P3	
S5184E		4	40'-11 <sup>3</sup> / <sub>4</sub> "	STR	D/T (T) 6" CP @ CL P2, CL P3	
S6185E		2	34'-11 <sup>1</sup> / <sub>4</sub> "	STR	D/T (B) 9" CP @ 4-2	
S5186E		2	35'-6"	STR	D/T (T) 9" CP @ 4-2	
S6187E		2	36'-11 <sup>1</sup> / <sub>4</sub> "	STR	D/T (B) 9" CP @ 4-3	
S5188E		2	37'-6"	STR	D/T (T) 9" CP @ 4-3	
S6189E		8	37'-10 <sup>1</sup> / <sub>4</sub> "	STR	D/T (B) 9" CP @ 4-5 TO P4-W, AB-E	
S5190E		8	38'-5"	STR	D/T (T) 9" CP @ 4-5 TO P4-W, AB-E	
S5191E		8	37'-6 <sup>1</sup> / <sub>4</sub> "	STR	D/T (B) 6" CP @ P4-E TO 5-2	
S5192E		8	38'-1 <sup>1</sup> / <sub>4</sub> "	STR	D/T (T) 6" CP @ P4-E TO 5-2	

**SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE SLAB**

ITEM	UNIT	QUANTITY TOTAL
FLOOR DRAIN TYPE B701	EACH	4
EXPANSION JOINT DEVICES TYPE 4	LIN FT	425
PREMIXED POLYMER CONCRETE (PPC) WEARING COURSE	SQ FT	70,199
PRECAST DECK PANELS	LUMP SUM	1
CONCRETE ①	CU YD	2,987
UHPC ①	CU YD	311
REINFORCEMENT BARS (EPOXY COATED) ①	POUND	1,369,909
STAINLESS STEEL ①	POUND	76,493
STAINLESS STEEL SHEAR STUDS ①	EACH	13,066
2" RIGID METAL CONDUIT ①	LIN FT	2,080
CASTING ASSEMBLY	EACH	2

① INCLUDED IN THE BID PRICE FOR ALL PRECAST DECK PANELS.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*

DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308  
LICENSE NO.

8/14/2014  
DATE

DESIGN BY: CB  
CAD BY: ET  
CHECKED BY: CB  
LAST REVISION:

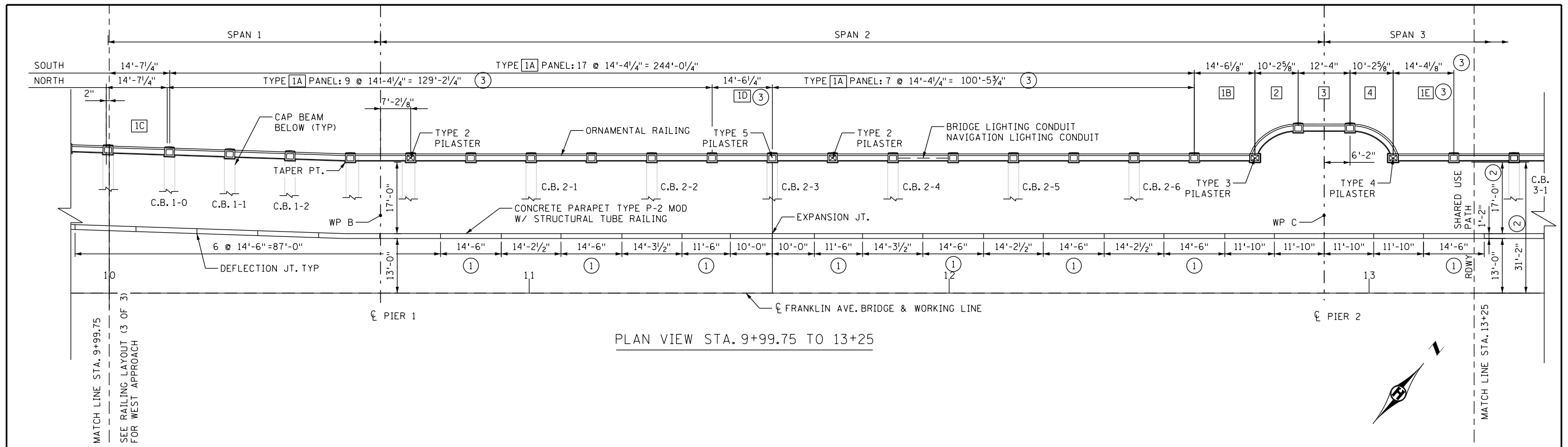
SUPERSTRUCTURE SLAB BAR LIST (5 OF 5)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

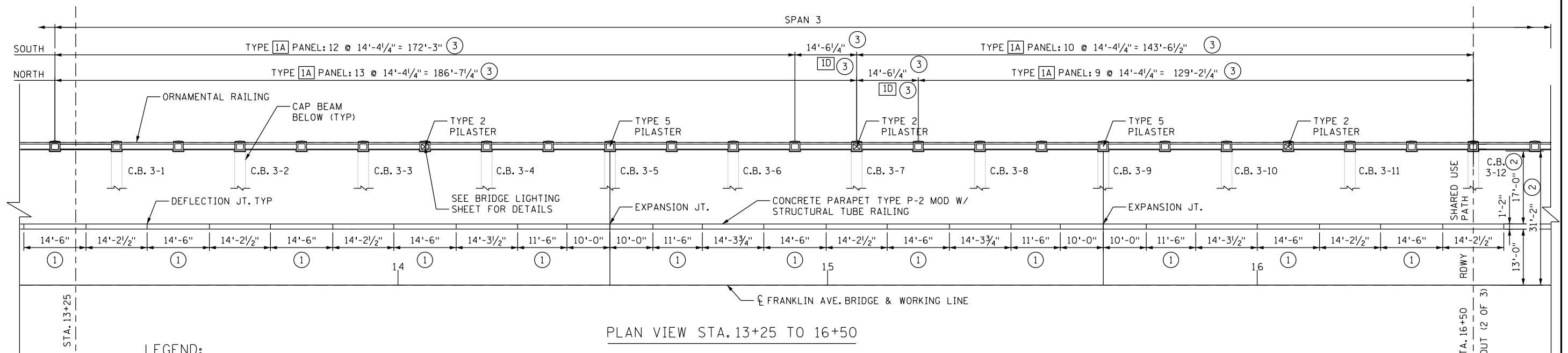
SHEET

B147

B176



PLAN VIEW STA. 9+99.75 TO 13+25



PLAN VIEW STA. 13+25 TO 16+50

**LEGEND:**

- C.B. - CAP BEAM
- ORNAMENTAL RAIL PILASTER TYPE 1 UNLESS OTHERWISE NOTED
- ORNAMENTAL RAIL PILASTER W/ LIGHT
- ORNAMENTAL RAIL PANEL TYPE

**NOTE:**

1. RAILINGS ARE SYMMETRICAL ABOUT  $\phi$  OF BRIDGE, UNLESS NOTED OTHERWISE.
2. SEE SHEET B152 FOR PILASTER AND PANEL DETAILS.
3. SEE SHEET B151 FOR PARAPET AND TUBE RAILING DETAILS.

- ① CONTRACTOR HAS OPTION TO PRECAST CONCRETE PARAPET TYPE P-2 MOD SEGMENT WITH DECK PANEL. CONTRACTOR SHALL PROVIDE SHOP DRAWINGS FOR PRECAST PARAPET OPTION.
- ② MEASURED TO FACE OF PILASTER BASE.

- ③ REVISED PER RFI 21. LOCATION OF CAP BEAMS SHOWN ON THIS SHEET ARE DETERMINED FROM EXISTING PLANS. PILASTERS MAY NOT BE CENTERED ON SURVEYED CAP BEAM LOCATION AND ARE ADJUSTED HERE FOR FIT-UP WITH PRECAST DECK PANELS PER RFI 21.

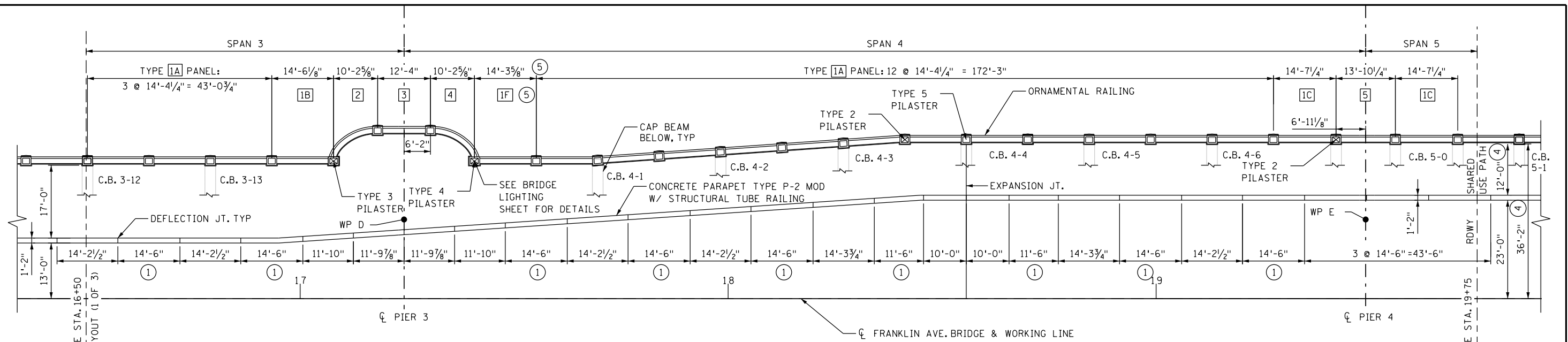


I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

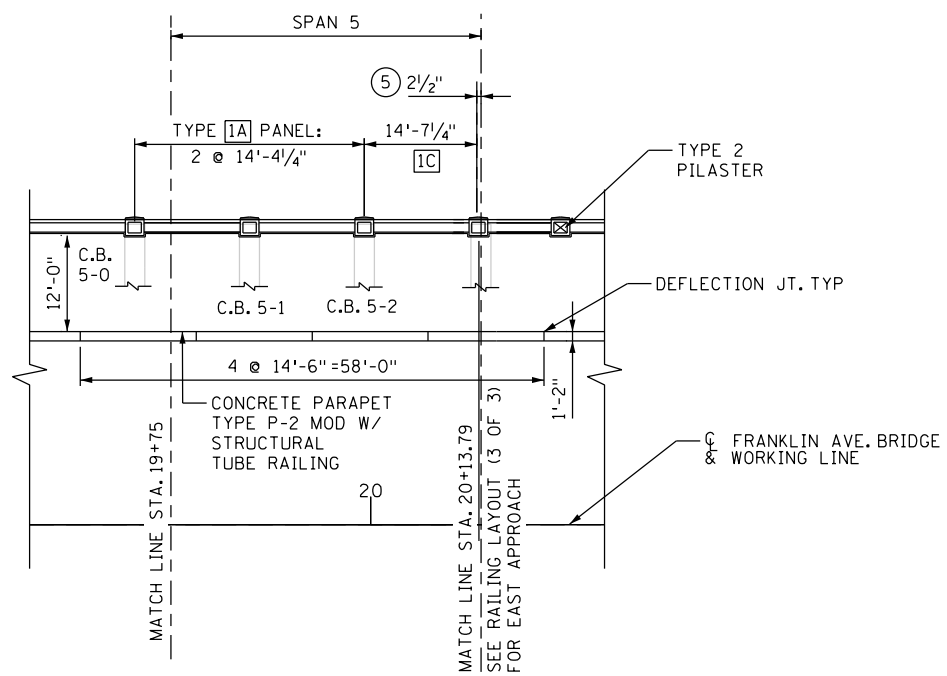
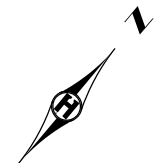
*Aaron J. Nelson*  
**AARON J. NELSON, PROFESSIONAL ENGINEER**  
 43101 LICENSE NO. 8/14/2014 DATE

**DESIGN BY:** AJN  
**CAD BY:** NTT  
**CHECKED BY:** AMK  
**LAST REVISION:** 12/03/2015

<b>RAILING LAYOUT (1 OF 3)</b>	<b>SHEET</b>
C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705 BRIDGE 2441 S.P. 027-605-029	B148R B176



PLAN VIEW STA. 16+50 TO 19+75



PLAN VIEW STA. 19+75 TO 20+13.79

**LEGEND:**

- C.B. -CAP BEAM
- ORNAMENTAL RAIL PILASTER TYPE 1 UNLESS OTHERWISE NOTED
- ORNAMENTAL RAIL PILASTER W/ LIGHT
- ORNAMENTAL RAIL PANEL TYPE
- CONTRACTOR HAS OPTION TO PRECAST CONCRETE PARAPET TYPE P-2 MOD WITH DECK PANEL

**NOTE:**

1. RAILINGS ARE SYMMETRICAL ABOUT  $\bar{C}$  OF BRIDGE.
2. SEE ORNAMENTAL RAILING DETAIL SHEETS FOR PILASTER AND PANEL DETAILS.
3. SEE SHEET B151 FOR PARAPET AND TUBE RAIL DETAILS.
- ④ MEASURED TO FACE OF PILASTER BASE.
- ⑤ REVISED PER RFI 21. LOCATION OF CAP BEAMS SHOWN ON THIS SHEET ARE DETERMINED FROM EXISTING PLANS. PILASTERS MAY NOT BE CENTERED ON SURVEYED CAP BEAM LOCATION AND ARE ADJUSTED HERE FOR FIT-UP WITH PRECAST DECK PANELS PER RFI 21.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

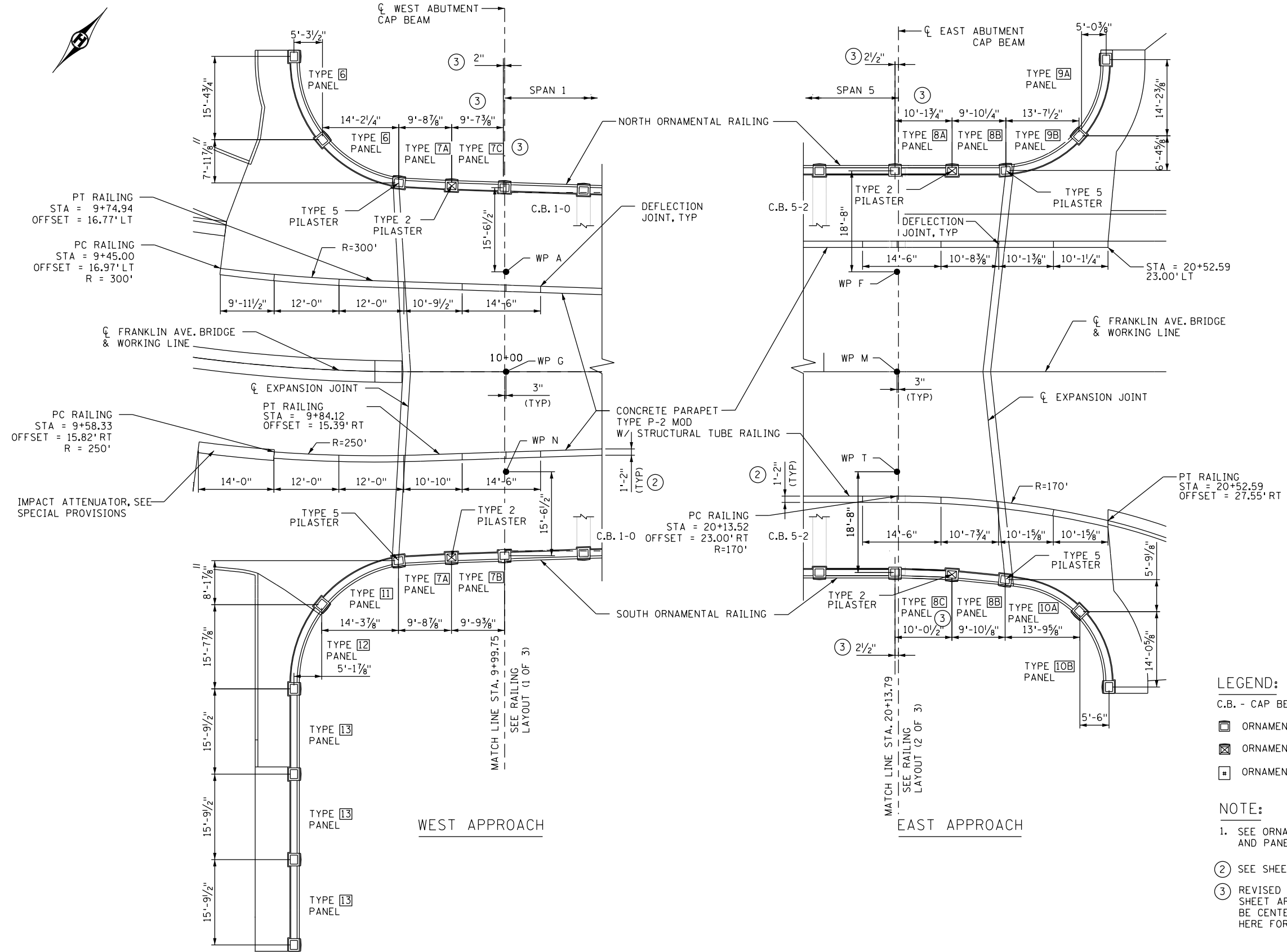
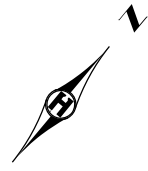
*Aaron J. Nelson*  
**AARON J. NELSON, PROFESSIONAL ENGINEER**  
 43101      8/14/2014  
 LICENSE NO.      DATE

**DESIGN BY:** AJN  
**CAD BY:** NTT  
**CHECKED BY:** AMK  
**LAST REVISION:** 12/03/2015

**RAILING LAYOUT (2 OF 3)**

**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**  
**BRIDGE 2441      S.P. 027-605-029**

**SHEET**  
 B149R2  
 B176



**LEGEND:**

- C.B. - CAP BEAM
- ORNAMENTAL RAIL PILASTER TYPE 1 UNLESS OTHERWISE NOTED
- ORNAMENTAL RAIL PILASTER W/ LIGHT
- ORNAMENTAL RAIL PANEL TYPE

**NOTE:**

1. SEE ORNAMENTAL RAILING DETAIL SHEETS FOR PILASTER AND PANEL DETAILS.
- ② SEE SHEET B151 FOR MORE INFORMATION.
- ③ REVISED PER RFI 21. LOCATION OF CAP BEAMS SHOWN ON THIS SHEET ARE DETERMINED FROM EXISTING PLANS. PILASTERS MAY NOT BE CENTERED ON SURVEYED CAP BEAM LOCATION AND ARE ADJUSTED HERE FOR FIT-UP WITH PRECAST DECK PANELS PER RFI 21.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

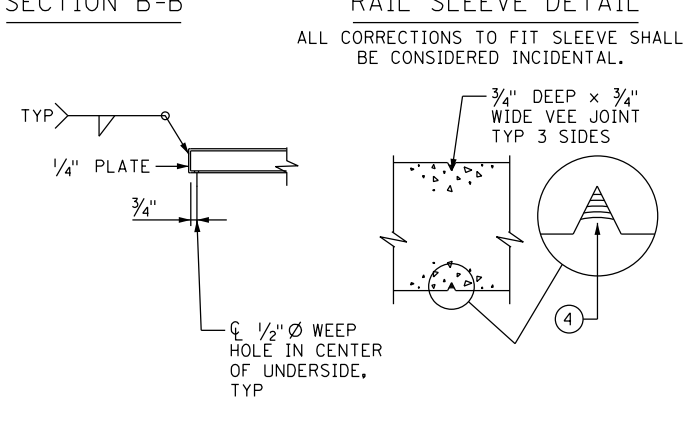
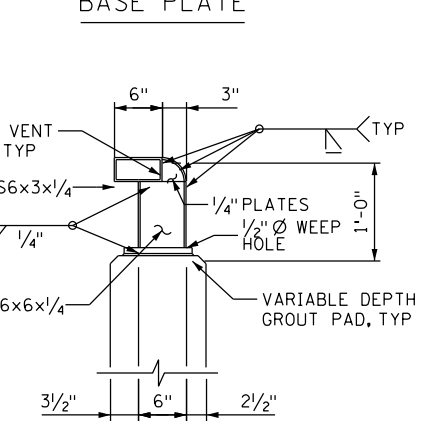
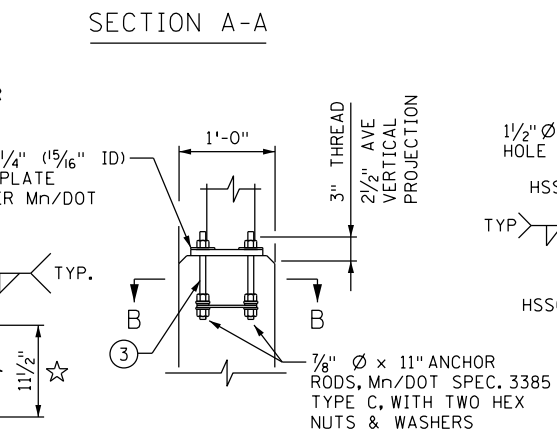
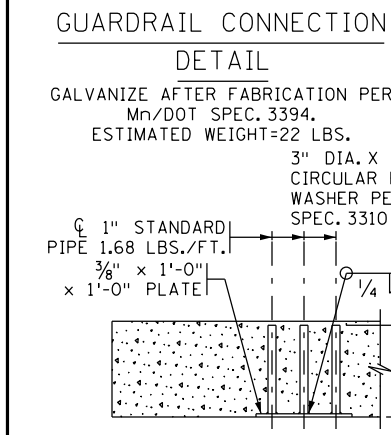
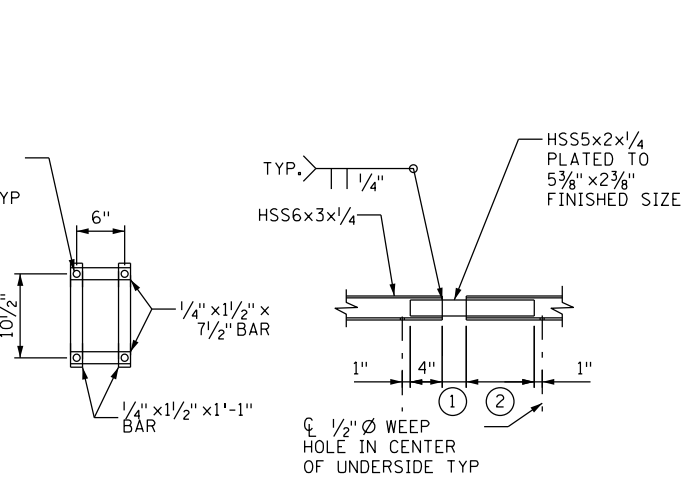
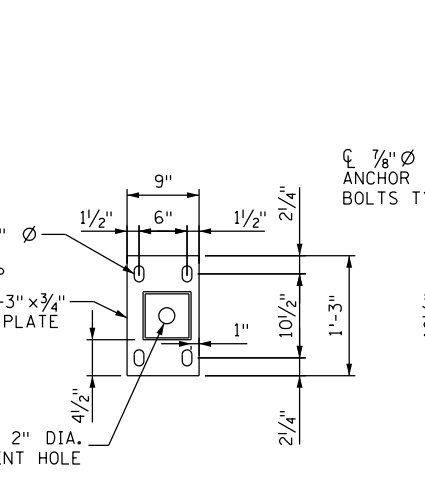
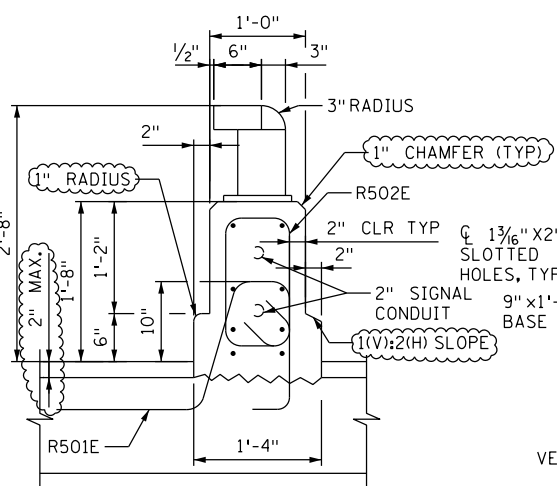
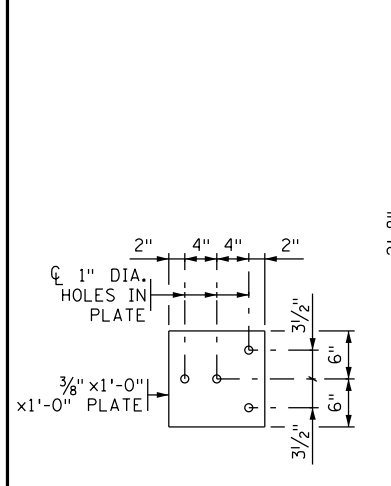
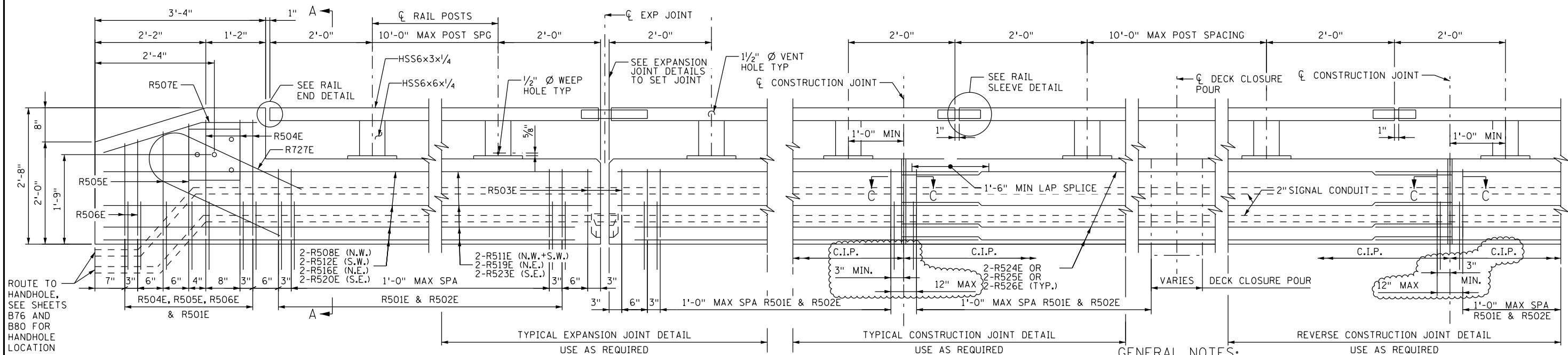
*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
 41308 03/10/2016  
 LICENSE NO. DATE

**DESIGN BY:** AJN  
**CAD BY:** NTT  
**CHECKED BY:** AMK  
**LAST REVISION:** 05/23/2016

**RAILING LAYOUT (3 OF 3)**

**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**  
**BRIDGE 2441 S.P. 027-605-029**

**SHEET**  
**B150R5**  
**B176**



**GENERAL NOTES:**

FOR PAYMENT OF "TYPE MOD P-2 (TL-2) RAILING CONCRETE (3Y46)" MEASURE LENGTH OF CIP CONCRETE RAILING BETWEEN END FACES, INTERIOR FACES AND PRECAST FACES, IF APPLICABLE. 1

FOR PAYMENT OF "PRECAST TYPE MOD P-2 (TL-2) RAILING CONCRETE (3Y46)" MEASURE LENGTH OF PRECAST CONCRETE RAILING BETWEEN PRECAST FACES, IF APPLICABLE. 1

FOR PAYMENT OF "STRUCTURAL TUBE RAILING DESIGN T-1" MEASURE LENGTH OF RAIL FROM END TO END OF TUBING. DO NOT DEDUCT FOR JOINTS.

- FINISH ALL EDGES OF RAIL WITH 1/2" CHAMFER, EXCEPT WHERE OTHERWISE NOTED.
  - MAX. SPACING OF CONCRETE CONTROL JOINTS SHALL BE 10'-0"
  - SLIP FORMING OF CONCRETE PARAPET IS NOT PERMITTED.
  - PROVIDE CORRECT ALIGNMENT FOR ANCHORAGES BY PLACING THEM ACCURATELY AND NORMAL TO GRADE. SEE SPECIAL PROVISIONS.
  - PROVIDE STRUCTURAL STEEL PER Mn/DOT SPEC. 3309. PROVIDE STRUCTURAL TUBES PER A.S.T.M. A500, GRADE B AS SPECIFIED IN Mn/DOT SPEC. 3361.
  - GALVANIZE BOLTS, NUTS, AND WASHERS PER Mn/DOT SPEC. 3392 AFTER FABRICATION.
  - GALVANIZE ALL OTHER STRUCTURAL STEEL PER Mn/DOT SPEC. 3394, AFTER FABRICATION.
  - PRICE BID FOR "STRUCTURAL TUBE RAILING DESIGN T-1" INCLUDES ANCHORAGES AND ALL MATERIAL ABOVE TOP OF CONCRETE BARRIER.
  - ALL MATERIAL IN THE CONCRETE PARAPET IS LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
  - SEE SPECIAL PROVISIONS FOR PAINT REQUIREMENTS.
  - CONTINUOUSLY GROUND THE METAL RAILING AS DIRECTED IN THE SPECIAL PROVISIONS. REFER TO THE ELECTRICAL PLANS AND ELECTRICAL SPECIAL PROVISIONS FOR DETAILS REGARDING BONDING MULTIPLE ELECTRICAL GROUNDING SYSTEMS.
  - 2" SIGNAL CONDUIT SHALL BE INCLUDED IN THE COST FOR "CONDUIT SYSTEM (SIGNALS)".
- 1 1" AT RAILING JOINTS. AT EXPANSION JOINTS, MAKE 1" LARGER THAN GAP IN EXPANSION JOINTS.
  - 2 5" AT RAILING JOINTS AND 8" AT EXPANSION JOINTS.
  - 3 SUBSTITUTION OF CHEMICAL ANCHOR RODS FOR CAST-IN-PLACE ANCHORAGE IS NOT PERMITTED.
  - 4 SEE SPECIAL PROVISIONS FOR JOINT SEALING REQUIREMENTS.

1 MODIFIED PER RFI 36. 2 SEE P2 METAL RAIL SHOP DRAWING 59 FOR DETAILS.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*

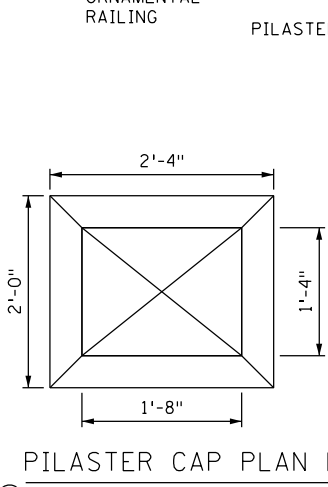
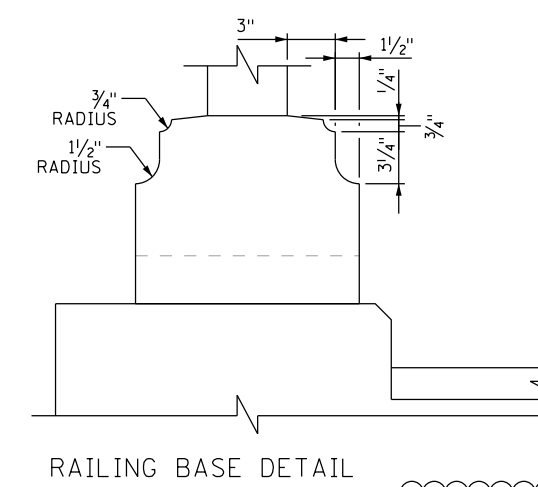
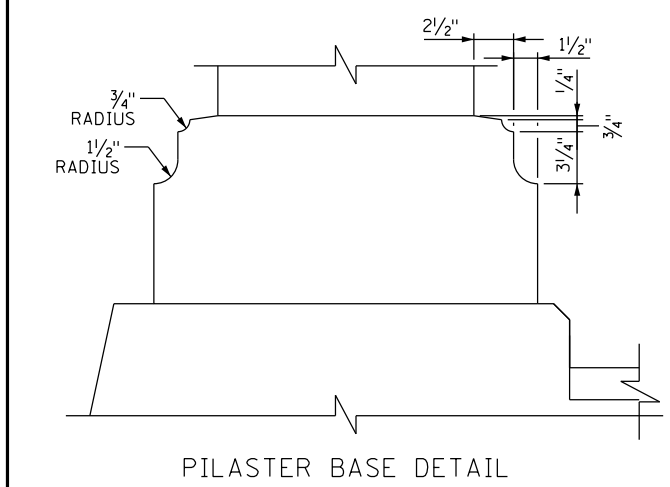
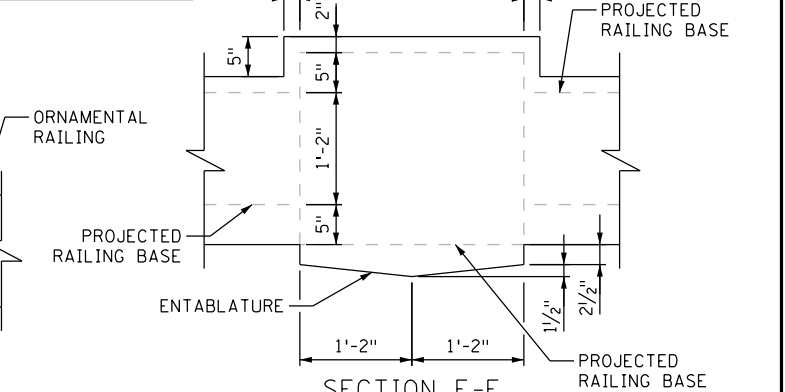
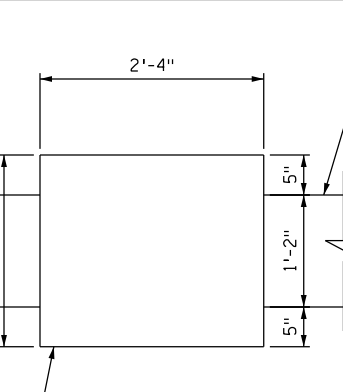
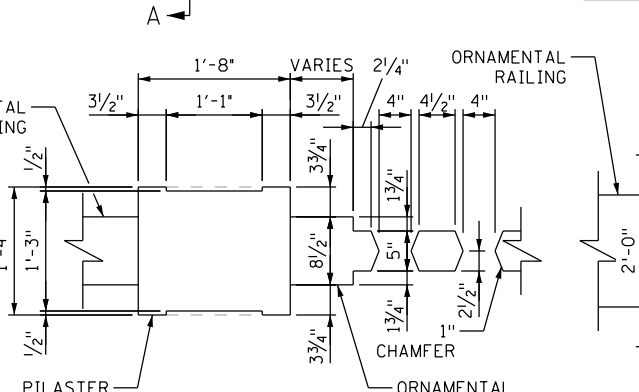
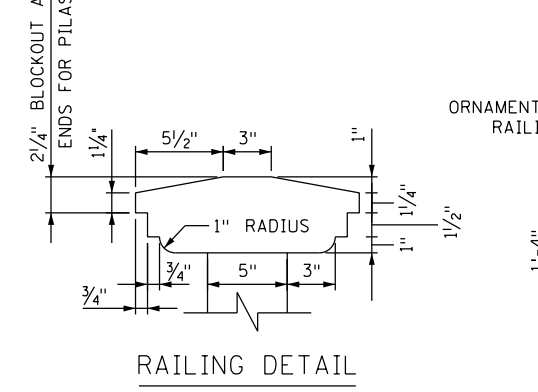
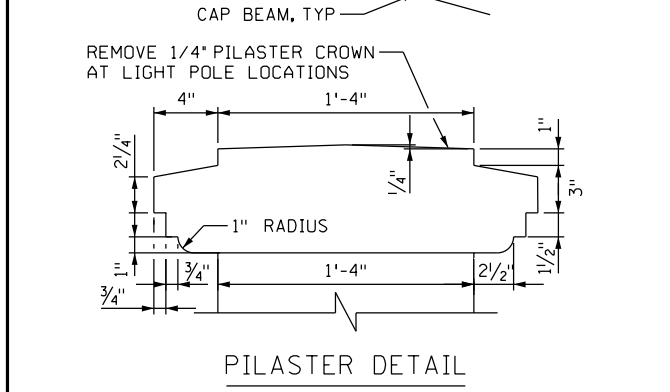
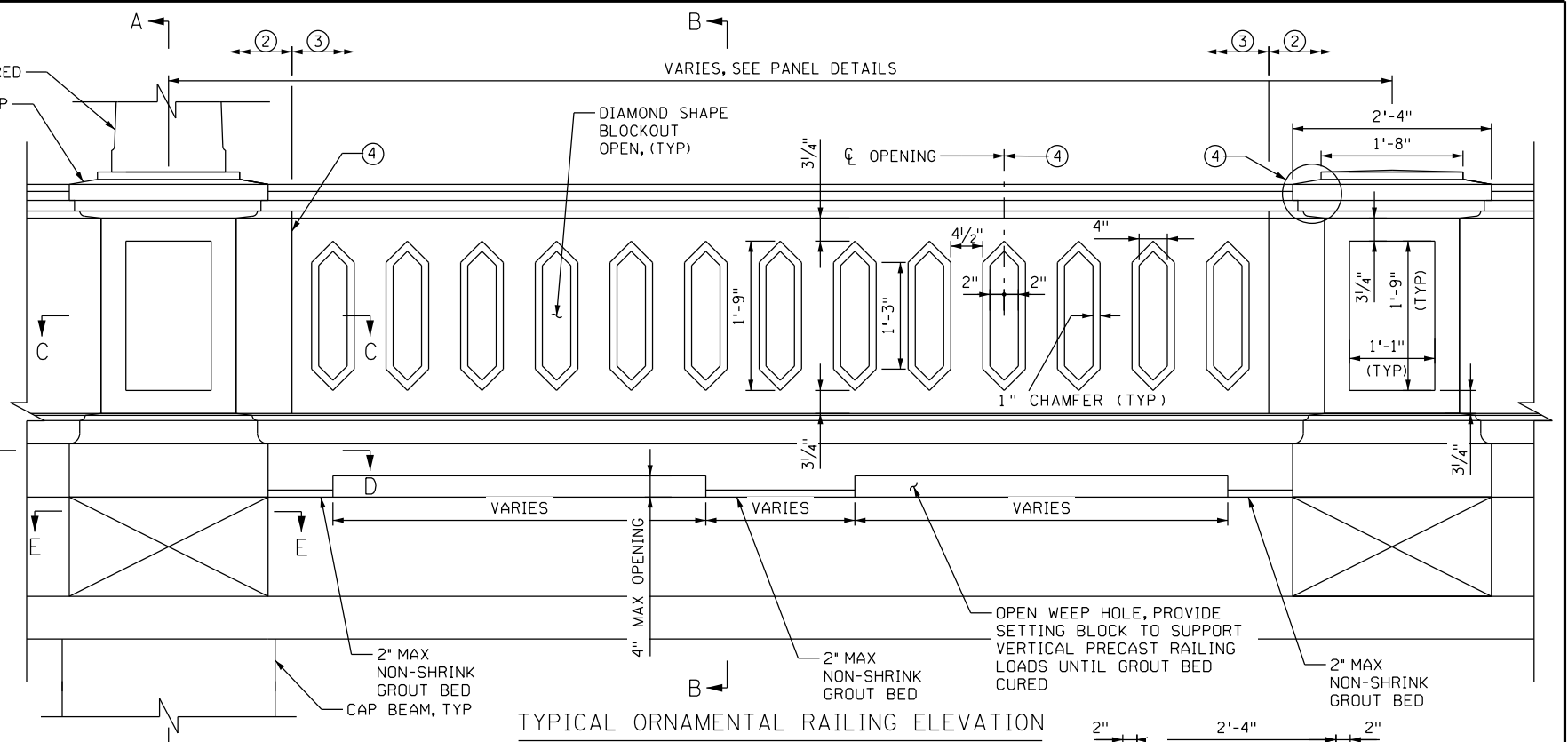
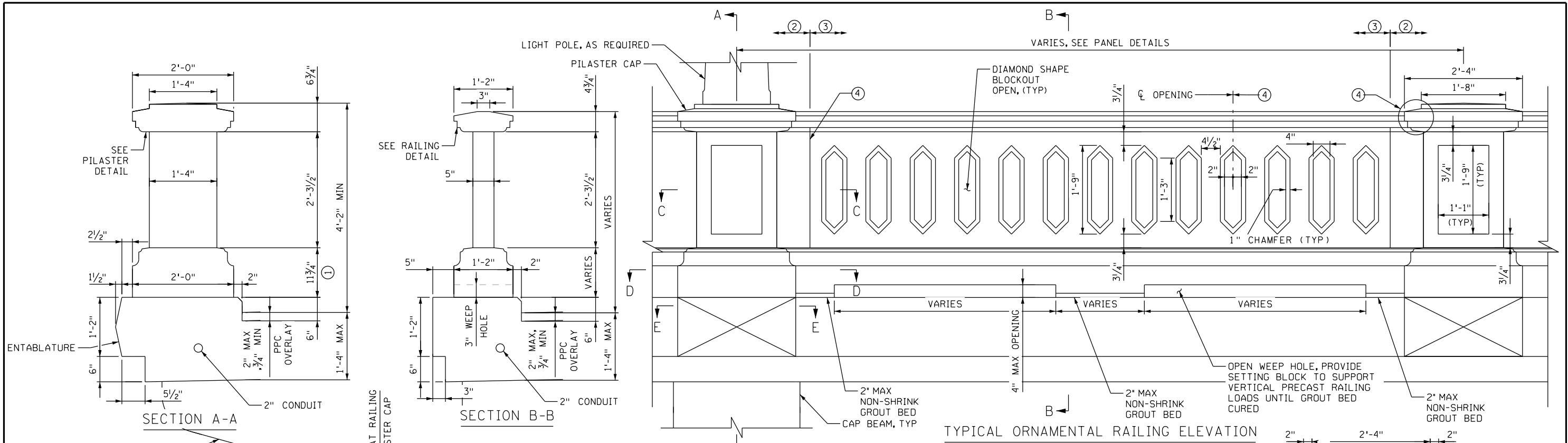
DANIEL F. ENSER, PROFESSIONAL ENGINEER  
 41308 LICENSE NO. 8/14/2014 DATE

DESIGN BY: AJN  
 CAD BY: RAM  
 CHECKED BY: AMK  
 LAST REVISION: 05/23/2016

AS-BUILT - CONCRETE PARAPET (TYPE P-2 MODIFIED) W/ STRUCTURAL TUBE RAILING

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

SHEET  
 B151R4  
 B176

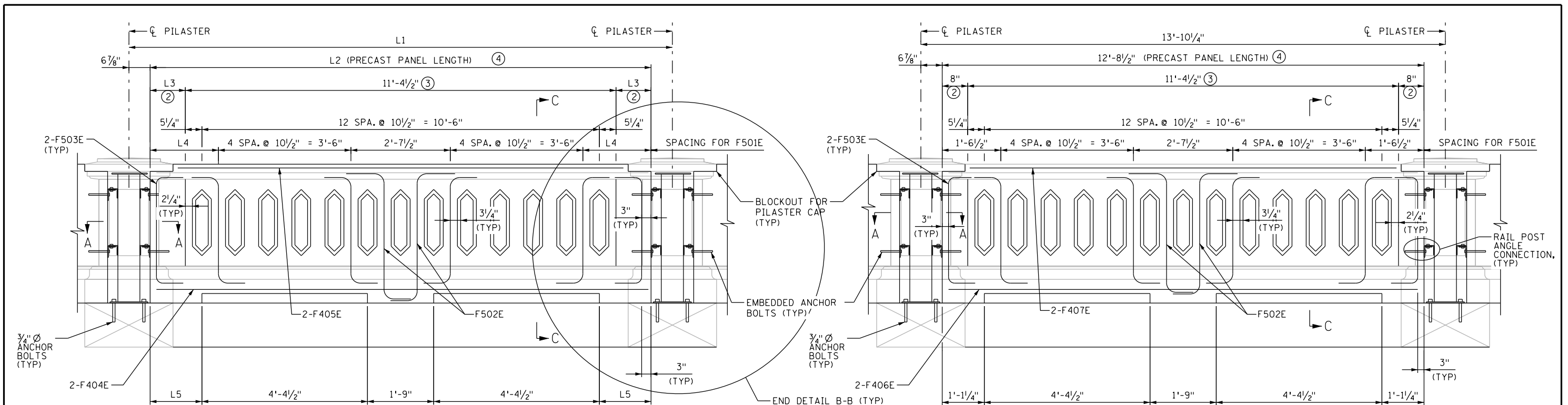


**NOTES:**  
 THE FRANKLIN AVENUE BRIDGE IS LISTED ON THE NATIONAL REGISTER OF HISTORIC PLACES AND IS A CITY OF MINNEAPOLIS HISTORIC LANDMARK. CONTRACTOR TO SUBMIT SHOP DRAWINGS OF ALL RAIL PANELS AND PILASTERS SHOWING GEOMETRY AND RELATIONSHIP BETWEEN INDIVIDUAL PARTS FOR ACCEPTANCE OF THE ENGINEER, IN CONSULTATION WITH THE CULTURAL RESOURCES REPRESENTATIVE.  
 VERTICAL PILASTER LINES SHALL BE PLUMB AND HORIZONTAL PILASTER LINES SHALL BE LEVEL.

- ① AT CENTERLINE OF PILASTER.
- ② 8 1/2" CENTER RAILING THICKNESS.
- ③ 5" CENTER RAILING THICKNESS.
- ④ ALL VERTICAL RAILING PANEL LINES SHALL BE PLUMB ALONG THE ENTIRE LENGTH OF THE RAILING. 1'-9" DIAMOND SHAPE BLOCK OUTS IN THE RAILING SHALL MAINTAIN THEIR SHAPE AND SHALL BE SYMMETRIC ABOUT THEIR CENTERLINES. VERTICAL LINES MAY FOLLOW GRADES BELOW 0.5%. TOP HORIZONTAL LINES OF RAIL PANEL HAND RAIL SHALL MATCH INTO THE HORIZONTAL LINES OF THE PILASTER CAP. ADJUST 1" NON-SHRINK GROUT BED BELOW RAILING AS REQUIRED FOR FIT AND ALIGNMENT WITH PILASTER.

1 SEE PRECAST ORNAMENTAL RAILING SHOP DRAWING 155 FOR DETAILS.

	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA. 	<b>DESIGN BY:</b> AJN <b>CAD BY:</b> RAM <b>CHECKED BY:</b> AMK <b>LAST REVISION:</b> 12/08/2015	<b>AS-BUILT - ORNAMENTAL RAILING DETAILS (1 OF 11)</b> C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705 BRIDGE 2441 S.P. 027-605-029	<b>SHEET</b> B152R3 B176
	AARON J. NELSON, PROFESSIONAL ENGINEER 43101 LICENSE NO. 8/14/2014 DATE			



TYPE 1

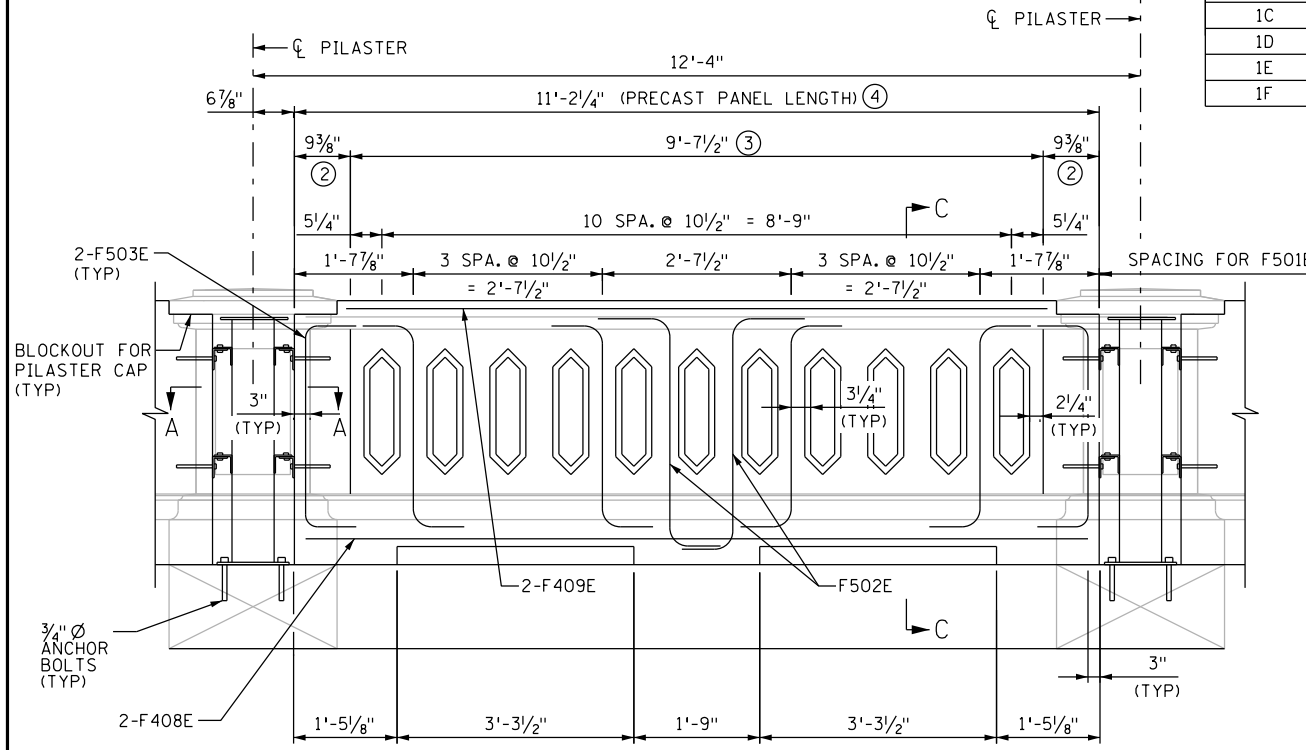
PILASTER AND ARCHITECTURAL LINES IN RAILING CAP SCREENED FOR CLARITY SEE SHEET B163A FOR STEEL POST DETAILS.

TYPE 5

PILASTER AND ARCHITECTURAL LINES IN RAILING CAP SCREENED FOR CLARITY SEE SHEET B163A FOR STEEL POST DETAILS.

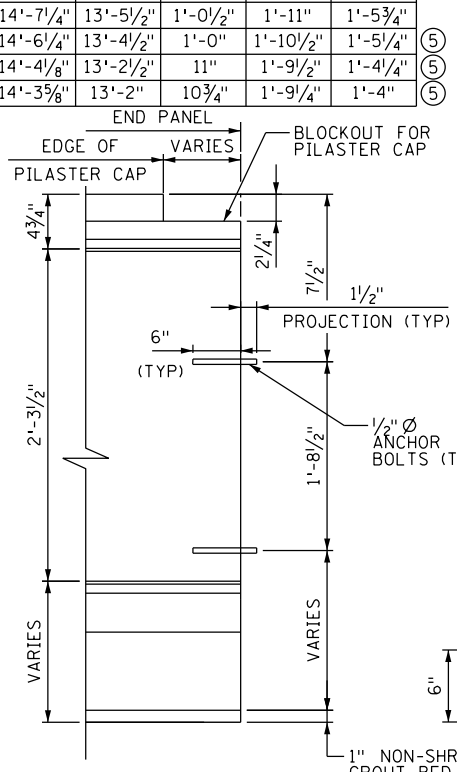
ORNAMENTAL RAILING DIMENSION TABLE

PANEL TYPE	L1	L2	L3	L4	L5
1A	14'-4 1/4"	13'-2 1/2"	11"	1'-9 1/2"	1'-4 1/4"
1B	14'-6 1/8"	13'-4 1/2"	1'-0"	1'-10 1/2"	1'-5 1/4"
1C	14'-7 1/4"	13'-5 1/2"	1'-0 1/2"	1'-11"	1'-5 3/4"
1D	14'-6 1/4"	13'-4 1/2"	1'-0"	1'-10 1/2"	1'-5 1/4"
1E	14'-4 1/8"	13'-2 1/2"	11"	1'-9 1/2"	1'-4 1/4"
1F	14'-3 5/8"	13'-2"	10 3/4"	1'-9 1/4"	1'-4"

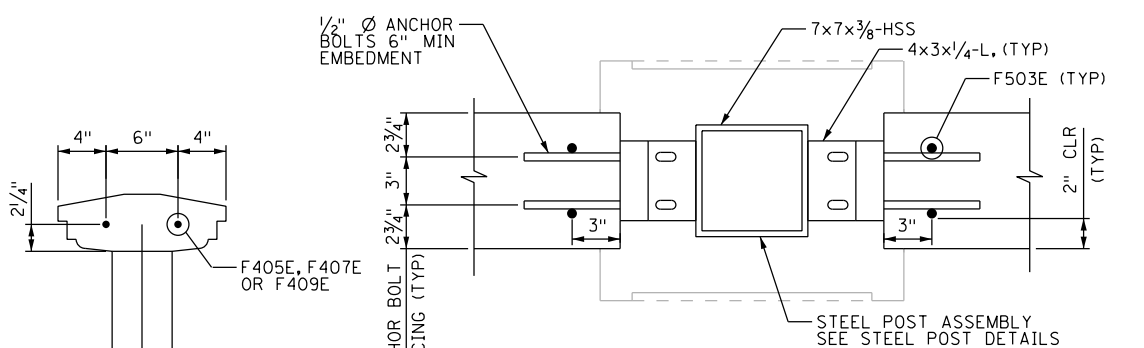


TYPE 3

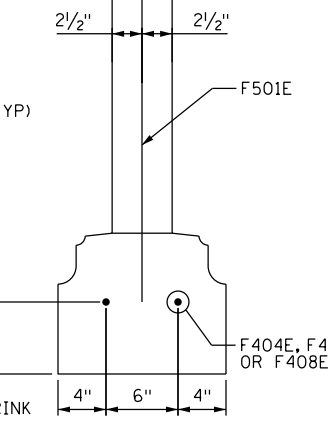
PILASTER AND ARCHITECTURAL LINES IN RAILING CAP SCREENED FOR CLARITY SEE SHEET B163A FOR STEEL POST DETAILS.



TYPICAL END DETAIL B-B



SECTION A-A



SECTION C-C

NOTES:

- ORNAMENTAL RAILING SUGGESTED CONSTRUCTION SEQUENCE:
- SET STEEL POST ANCHORAGE AND LIGHTING CONDUIT PRIOR TO CLOSURE POURS.
  - AFTER CLOSURE POURS HAVE CURED, SET AND PLUMB PRECAST RAILING.
  - BOLT STEEL POST TO ANCHORS.
  - CONNECT STEEL ANGLES TO THE CONCRETE RAILING AND STEEL POSTS.
  - ADD BOLTS AS REQUIRED FOR LIGHT POLE BASE PLATE.
  - ATTACH LIGHTING PULL BOXES AND CONNECT CONDUIT.
  - FORM AND CAST PILASTERS.
  - AFTER PILASTERS CURE, CONNECT LIGHT POLES AND CONNECT ELECTRICAL.
- 1/2" Ø AND 3/4" Ø ANCHOR BOLTS SHALL BE INCLUDED IN THE COST FOR BID ITEM 2405.603 "PRECAST CONCRETE ORNAMENTAL RAILING"
- SEE SHEET B152 FOR ADDITIONAL INFORMATION.
  - 8 1/2" CENTER RAILING THICKNESS.
  - 5" CENTER RAILING THICKNESS.
  - LENGTH FOR PAYMENT, SEE SPECIAL PROVISIONS.
  - REVISED PER RF1 21



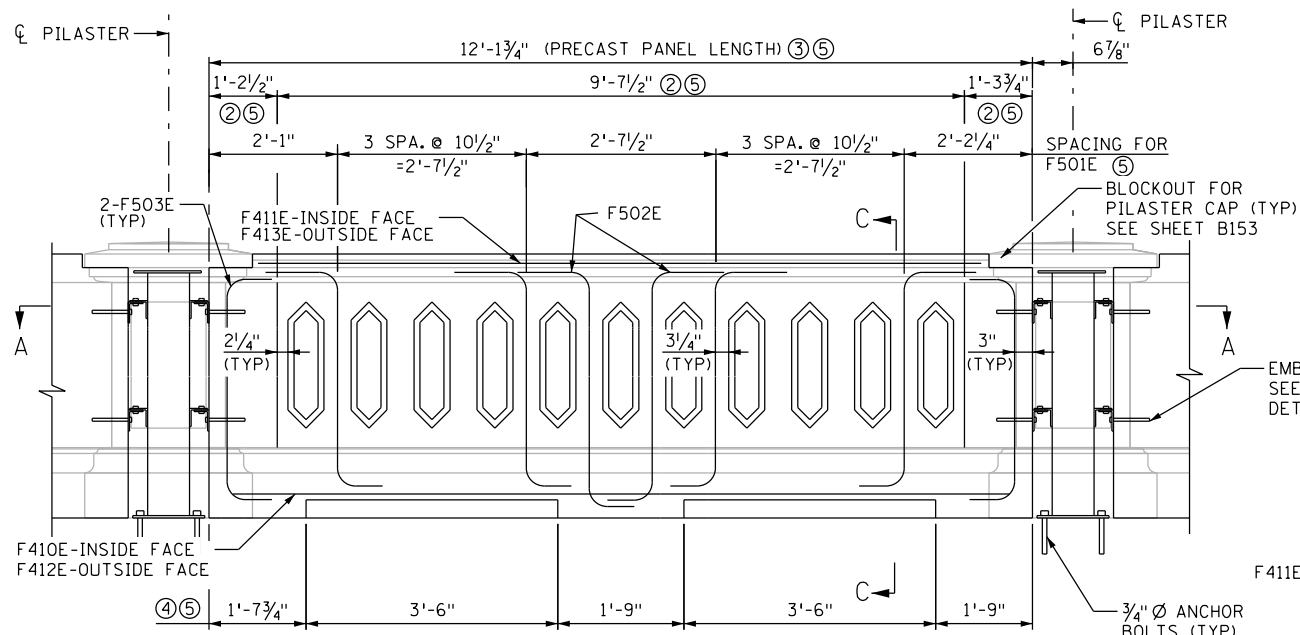
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*  
**AARON J. NELSON, PROFESSIONAL ENGINEER**  
 43101 LICENSE NO. 8/14/2014 DATE

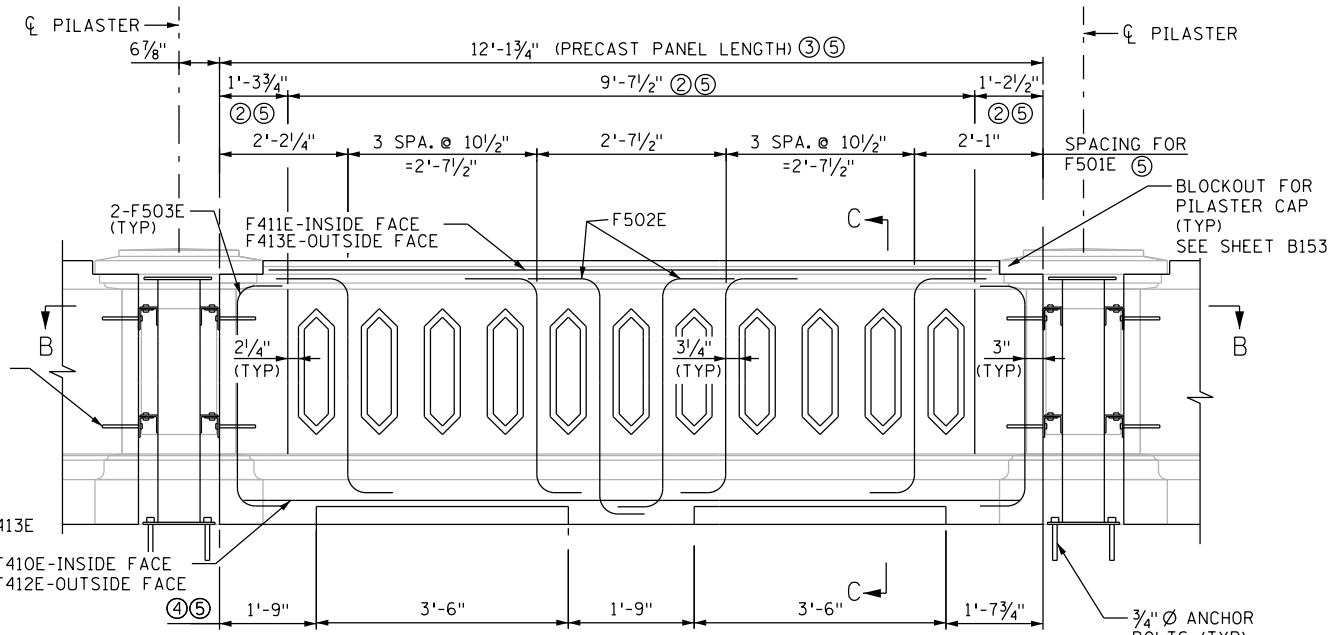
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 CAD BY: RAM  
 CHECKED BY: AMK  
 LAST REVISION: 12/15/2015

ORNAMENTAL RAILING DETAILS (2 OF 11)  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

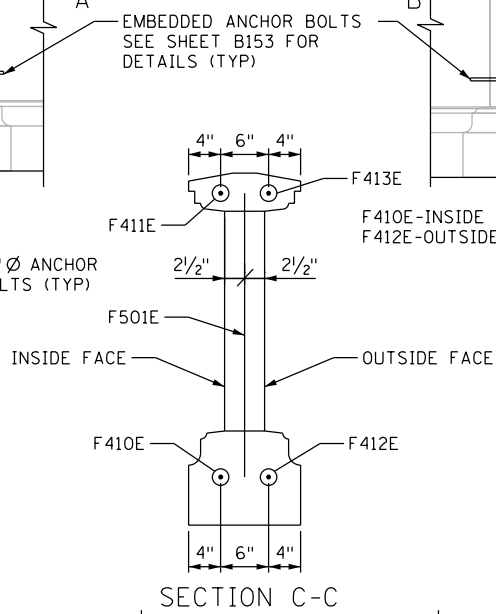
SHEET  
 B153R3  
 B176



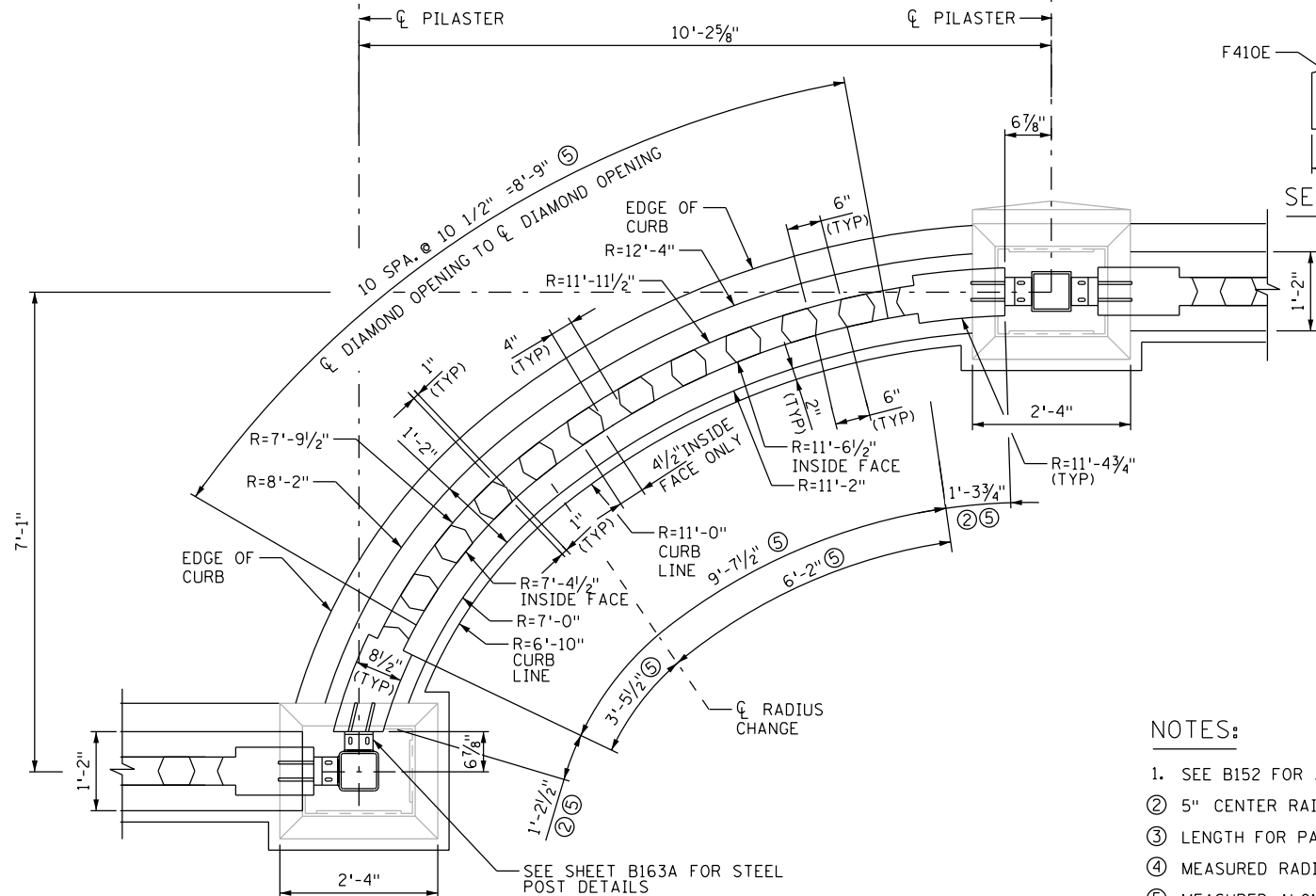
TYPE 2  
PILASTER AND ARCHITECTURAL LINES  
IN RAILING CAP SCREENED FOR CLARITY



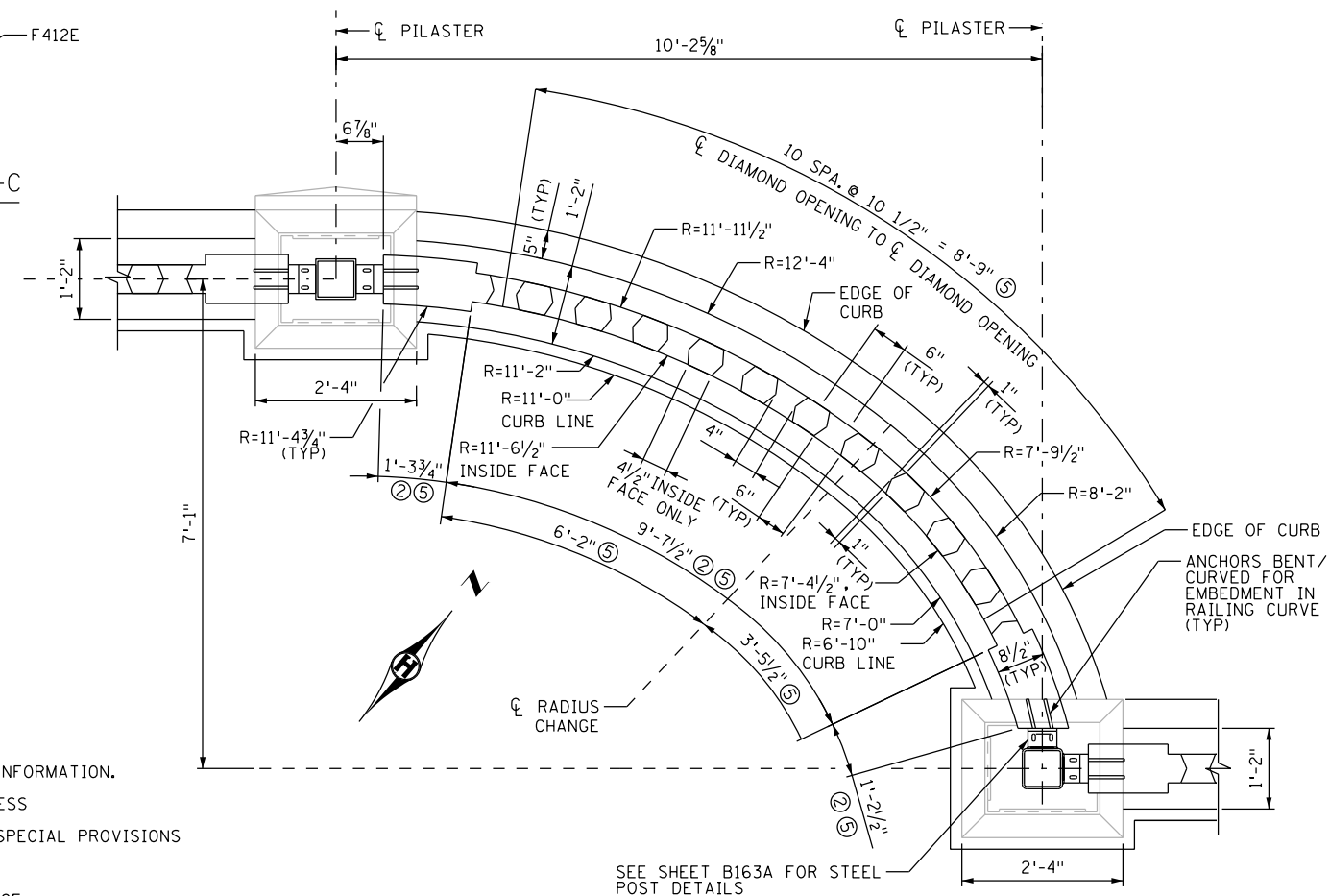
TYPE 4  
PILASTER AND ARCHITECTURAL LINES  
IN RAILING CAP SCREENED FOR CLARITY



SECTION C-C



SECTION A-A  
PILASTER SCREENED FOR CLARITY



SECTION B-B  
PILASTER SCREENED FOR CLARITY

NOTES:

- 1. SEE B152 FOR ADDITIONAL INFORMATION.
- 2. 5" CENTER RAILING THICKNESS
- 3. LENGTH FOR PAYMENT, SEE SPECIAL PROVISIONS
- 4. MEASURED RADIAL
- 5. MEASURED ALONG INSIDE FACE



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

AARON J. NELSON, PROFESSIONAL ENGINEER

43101  
LICENSE NO.

8/14/2014  
DATE

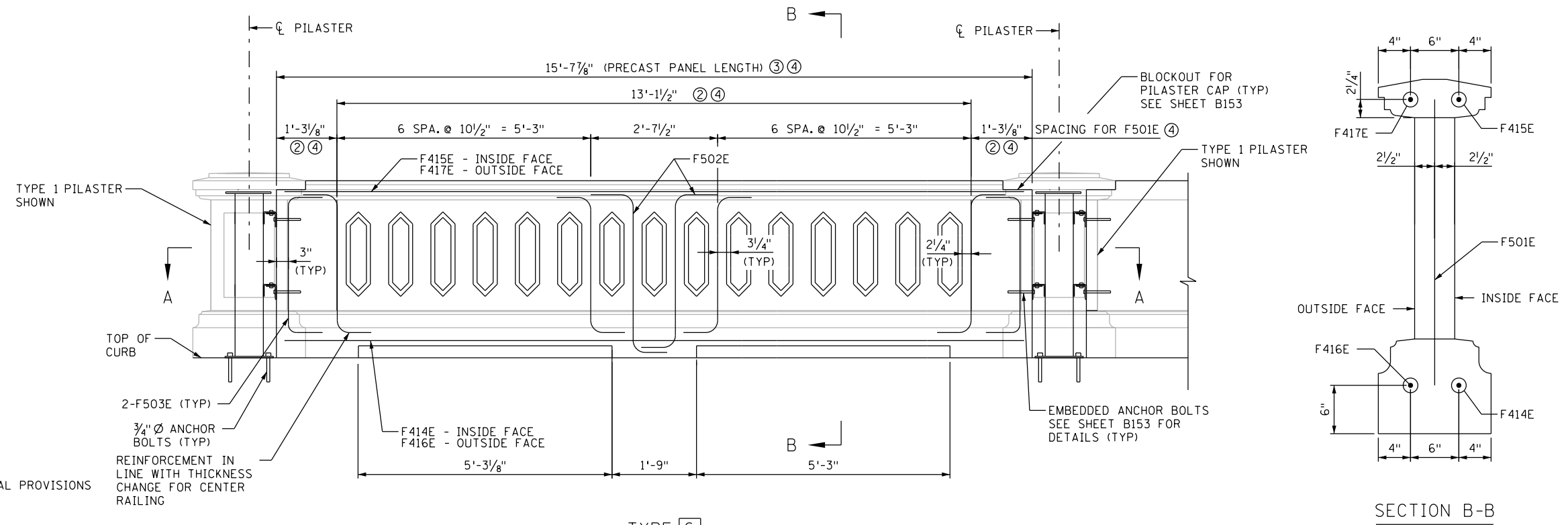
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CAD BY: NTT  
CHECKED BY: DFE  
LAST REVISION: 12/03/2015

ORNAMENTAL RAILING DETAILS (3 OF 11)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET  
B154R3  
B176



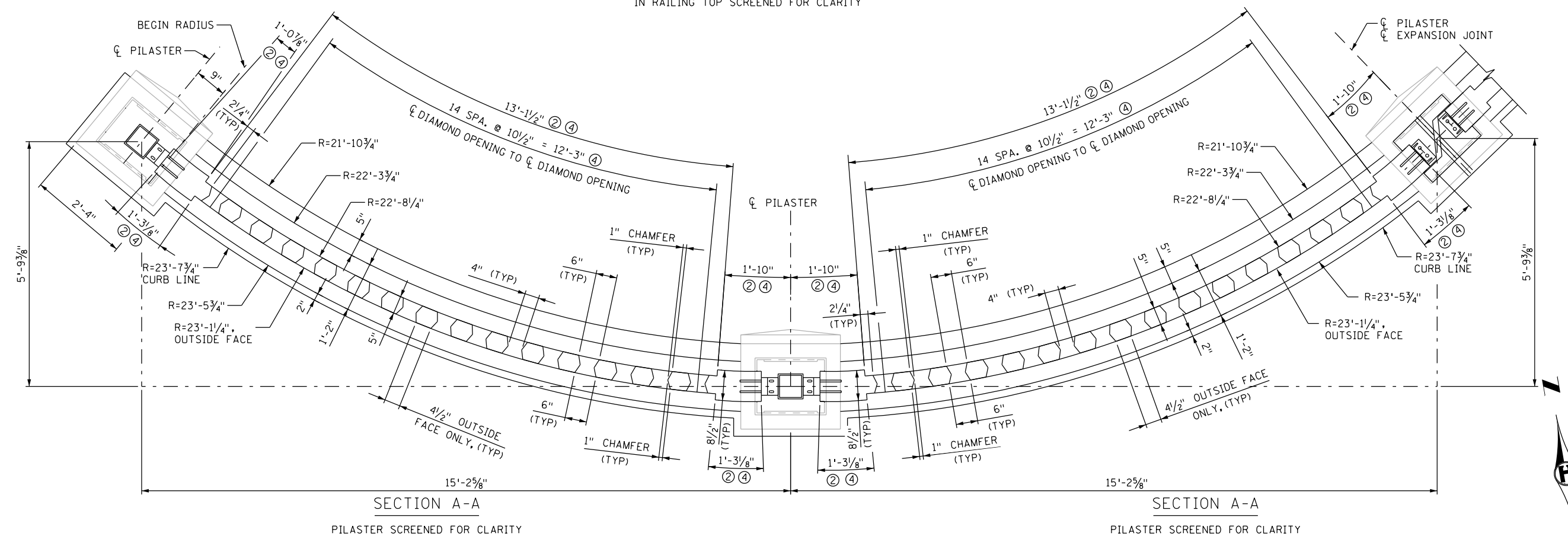


- NOTES:**
- 1. SEE SHEET B152 FOR ADDITIONAL INFORMATION.
  - ② 5" CENTER RAILING THICKNESS
  - ③ LENGTH FOR PAYMENT, SEE SPECIAL PROVISIONS
  - ④ MEASURED ALONG OUTSIDE FACE

2-F503E (TYP)  
 3/4" Ø ANCHOR BOLTS (TYP)  
 REINFORCEMENT IN LINE WITH THICKNESS CHANGE FOR CENTER RAILING

**TYPE 6**  
 PILASTER AND ARCHITECTURAL LINES  
 IN RAILING TOP SCREENED FOR CLARITY

**SECTION B-B**



**SECTION A-A**  
 PILASTER SCREENED FOR CLARITY

**SECTION A-A**  
 PILASTER SCREENED FOR CLARITY



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*  
 AARON J. NELSON, PROFESSIONAL ENGINEER

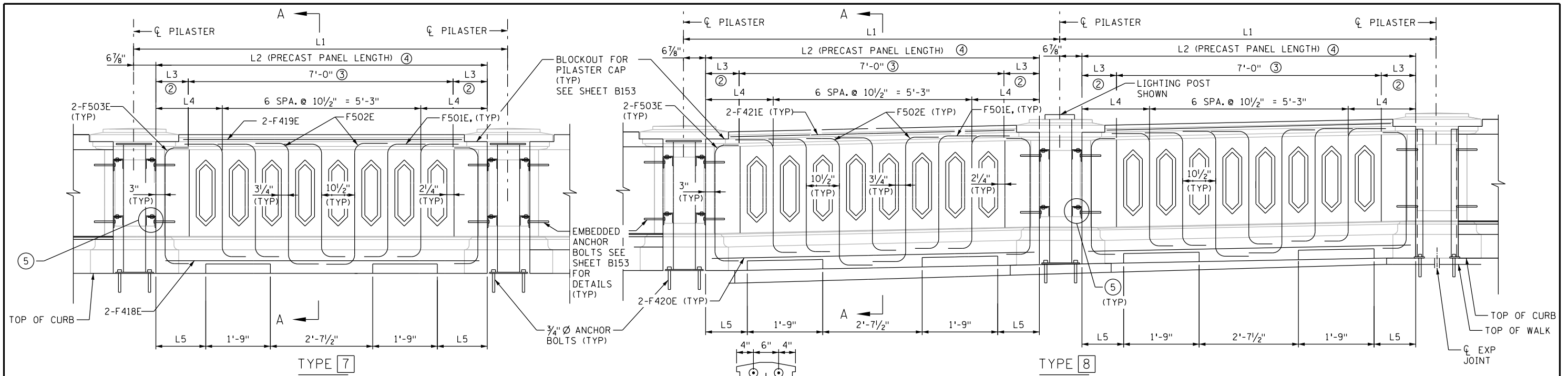
43101      8/14/2014  
 LICENSE NO.      DATE

DESIGN BY: AJN  
 CAD BY: NTT  
 CHECKED BY: AMK  
 LAST REVISION: 11/24/2015

ORNAMENTAL RAILING DETAILS (4 OF 11)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

SHEET  
 B155R3  
 B176

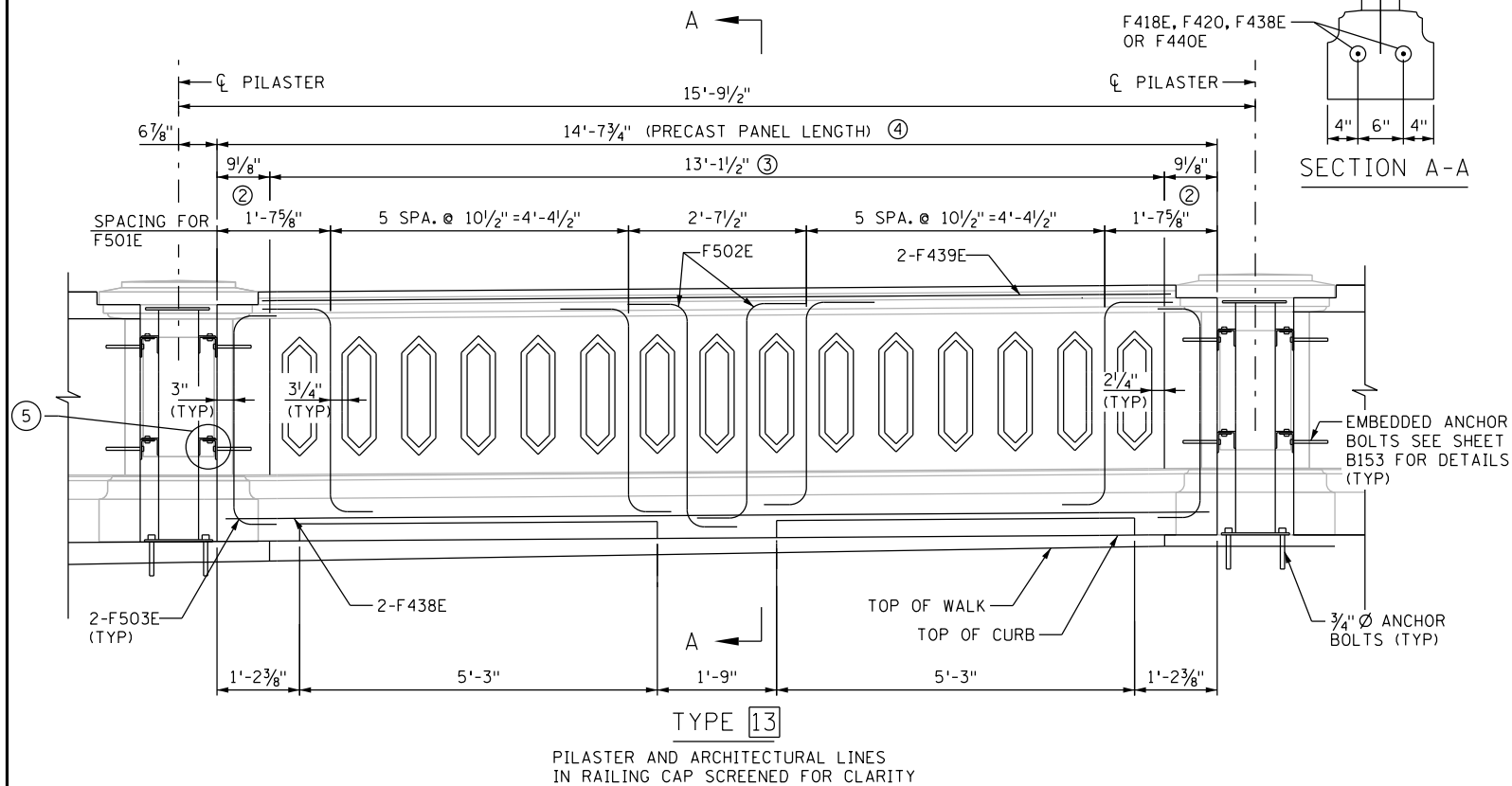
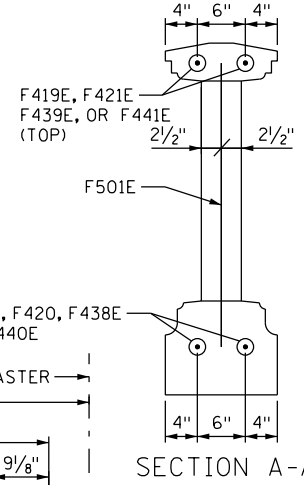


PILASTER AND ARCHITECTURAL LINES  
IN RAILING CAP SCREENED FOR CLARITY  
SEE SHEET B163A FOR STEEL POST DETAILS.

PILASTER AND ARCHITECTURAL LINES  
IN RAILING CAP SCREENED FOR CLARITY  
SEE SHEET B163A FOR STEEL POST DETAILS.

**NOTES:**

1. SEE SHEET B152 FOR ADDITIONAL INFORMATION.
- ② 8 1/2" CENTER RAILING THICKNESS
- ③ 5" CENTER RAILING THICKNESS
- ④ LENGTH FOR PAYMENT SEE SPECIAL PROVISIONS.
- ⑤ SEE SHEET B163 FOR RAIL POST CONNECTION DETAILS
- ⑥ REVISED PER RFI 21



ORNAMENTAL RAILING DIMENSION TABLE					
PANEL TYPE	L1	L2	L3	L4	L5
7A	9'-9"	8'-7 1/4"	9 5/8"	1'-8 1/8"	1'-2 7/8"
7B	9'-9 1/2"	8'-7 3/4"	9 7/8"	1'-8 3/8"	1'-3 1/8"
7C	9'-7 1/2"	8'-5 3/4"	8 7/8"	1'-7 3/8"	1'-2 1/8"
8A	10'-1 3/4"	9'-0"	1'-0"	1'-10 1/2"	1'-5 1/4"
8B	9'-10"	8'-8 1/2"	10 1/4"	1'-8 3/4"	1'-3 1/2"
	9'-10 5/8"				
8C	10'-0 1/2"	8'-11"	11 1/2"	1'-10"	1'-4 3/4"



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

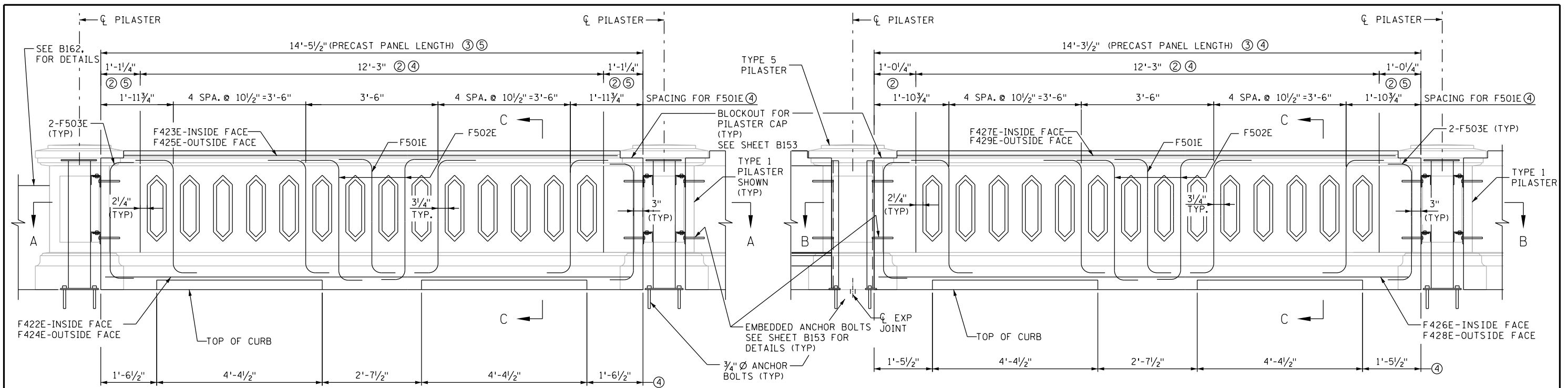
*Aaron J. Nelson*  
**AARON J. NELSON, PROFESSIONAL ENGINEER**  
 43101 LICENSE NO. 8/14/2014 DATE

**DESIGN BY:** AJN  
**CAD BY:** NTT  
**CHECKED BY:** AMK  
**LAST REVISION:** 12/15/2015

**ORNAMENTAL RAILING DETAILS (5 OF 11)**

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

**SHEET**  
 B156R4  
 B176

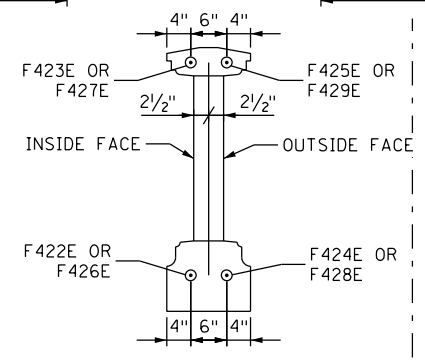
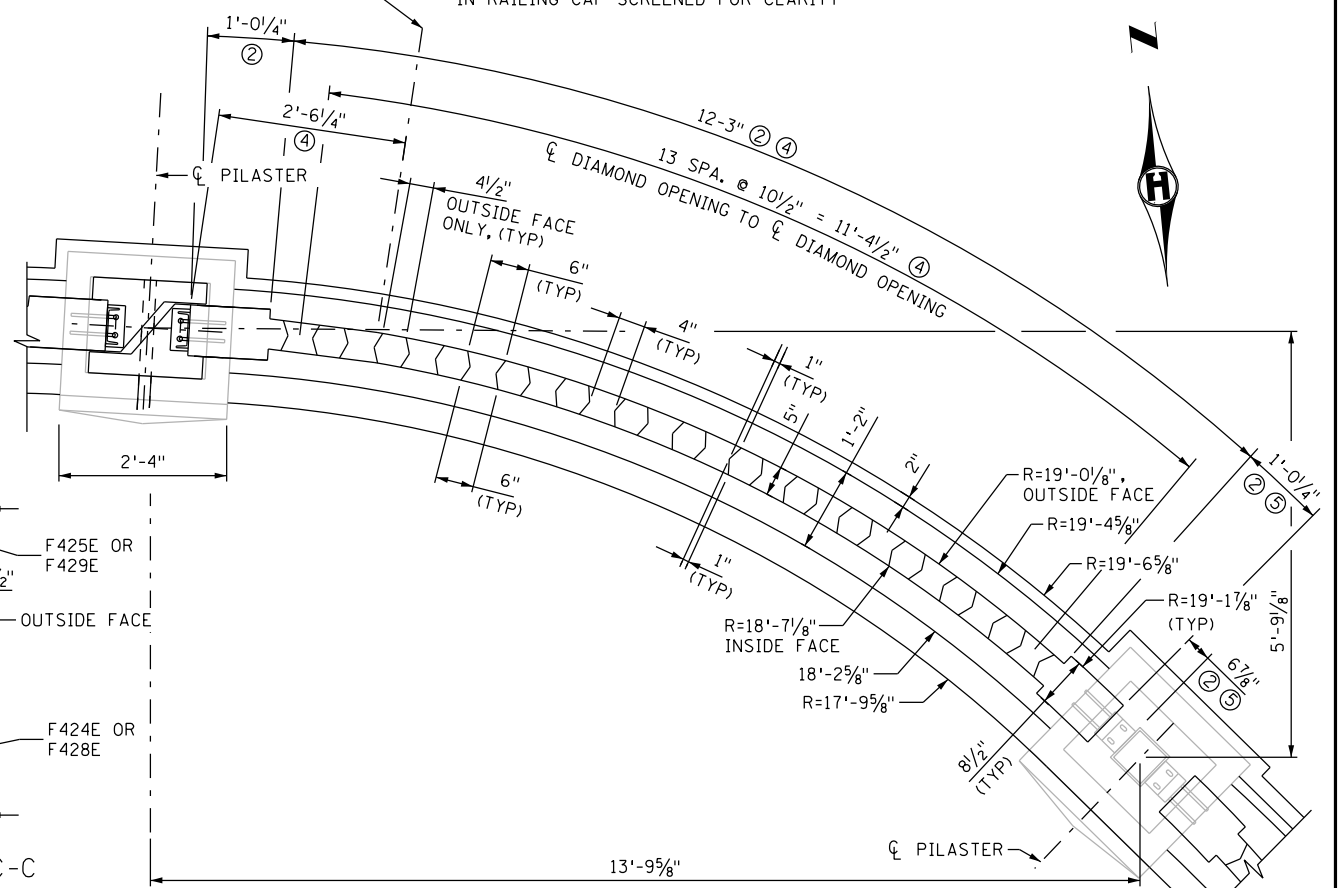
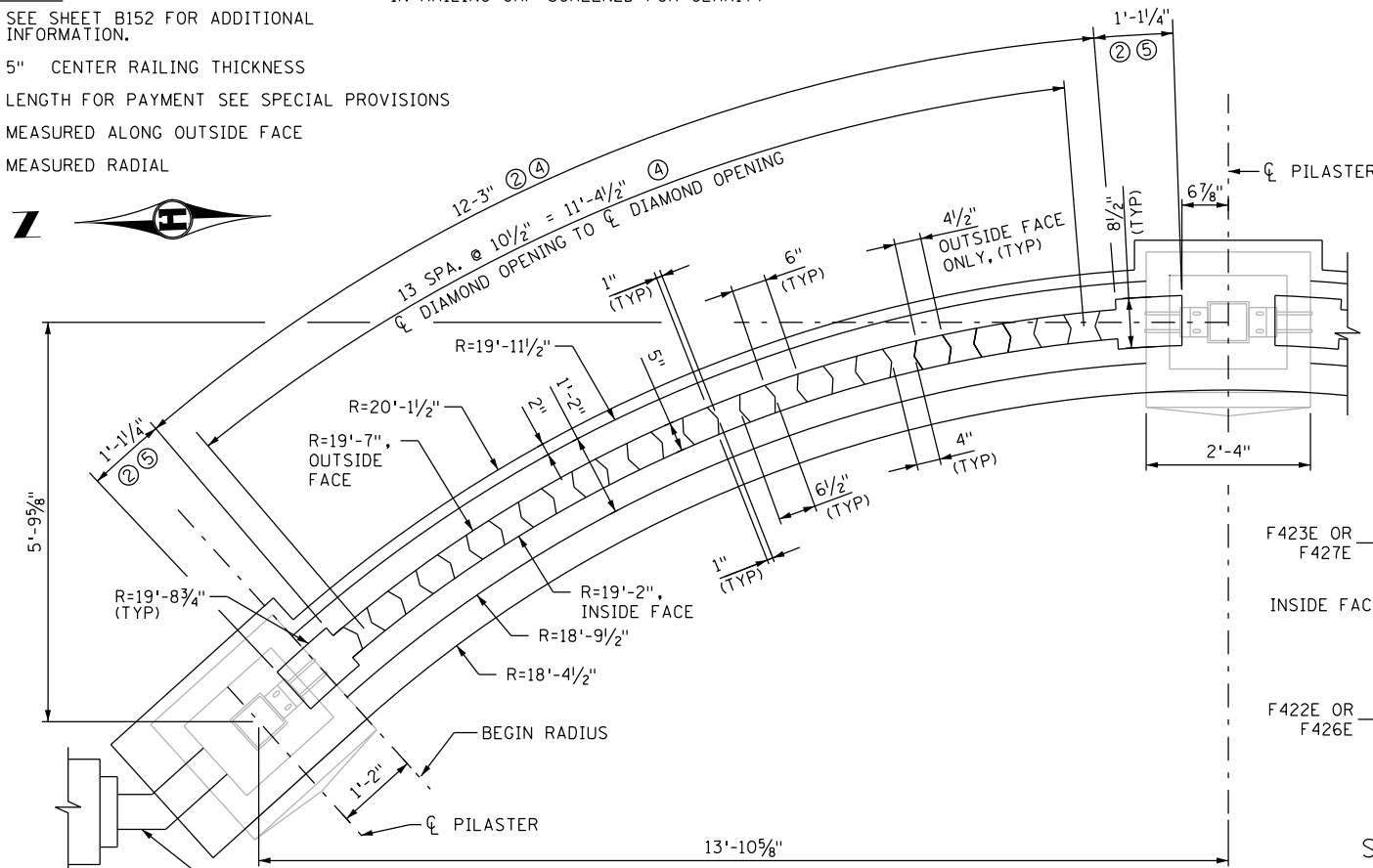


**NOTES:**

1. SEE SHEET B152 FOR ADDITIONAL INFORMATION.
- ② 5" CENTER RAILING THICKNESS
- ③ LENGTH FOR PAYMENT SEE SPECIAL PROVISIONS
- ④ MEASURED ALONG OUTSIDE FACE
- ⑤ MEASURED RADIAL

PILASTER AND ARCHITECTURAL LINES IN RAILING CAP SCREENED FOR CLARITY

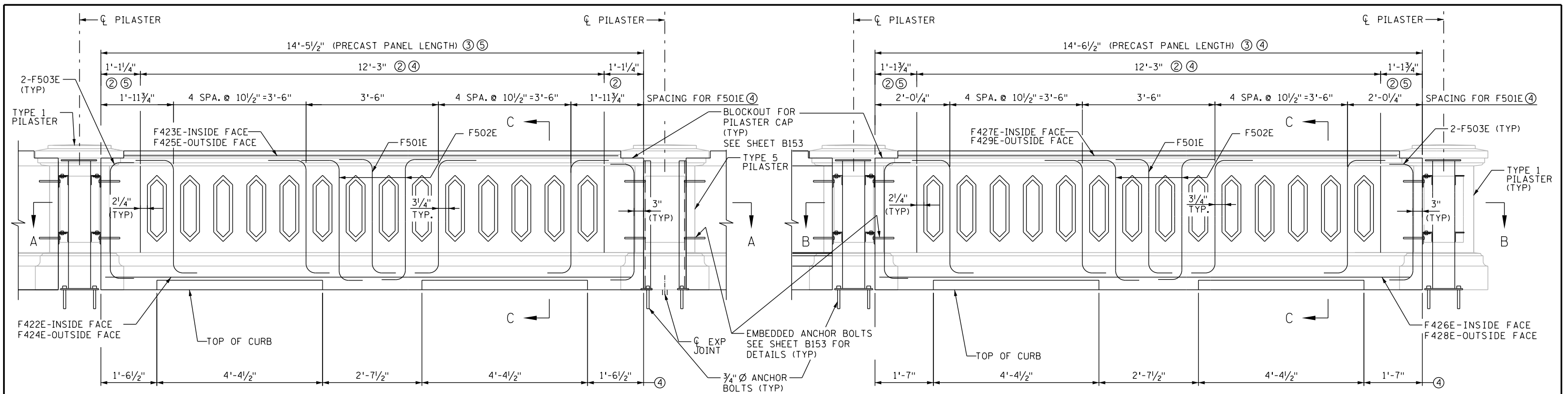
PILASTER AND ARCHITECTURAL LINES IN RAILING CAP SCREENED FOR CLARITY



SECTION A-A  
PILASTER SCREENED FOR CLARITY

SECTION B-B  
PILASTER SCREENED FOR CLARITY

	I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.	<b>DESIGN BY:</b> AJN <b>CAD BY:</b> NTT <b>CHECKED BY:</b> AMK <b>LAST REVISION:</b> 03/09/2016	<b>ORNAMENTAL RAILING DETAILS (6 OF 11)</b> C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705 BRIDGE 2441 S.P. 027-605-029	<b>SHEET</b> B157R4 B176
	 TRAVIS F. KONDA, PROFESSIONAL ENGINEER 48851      8/14/2014 LICENSE NO.      DATE			

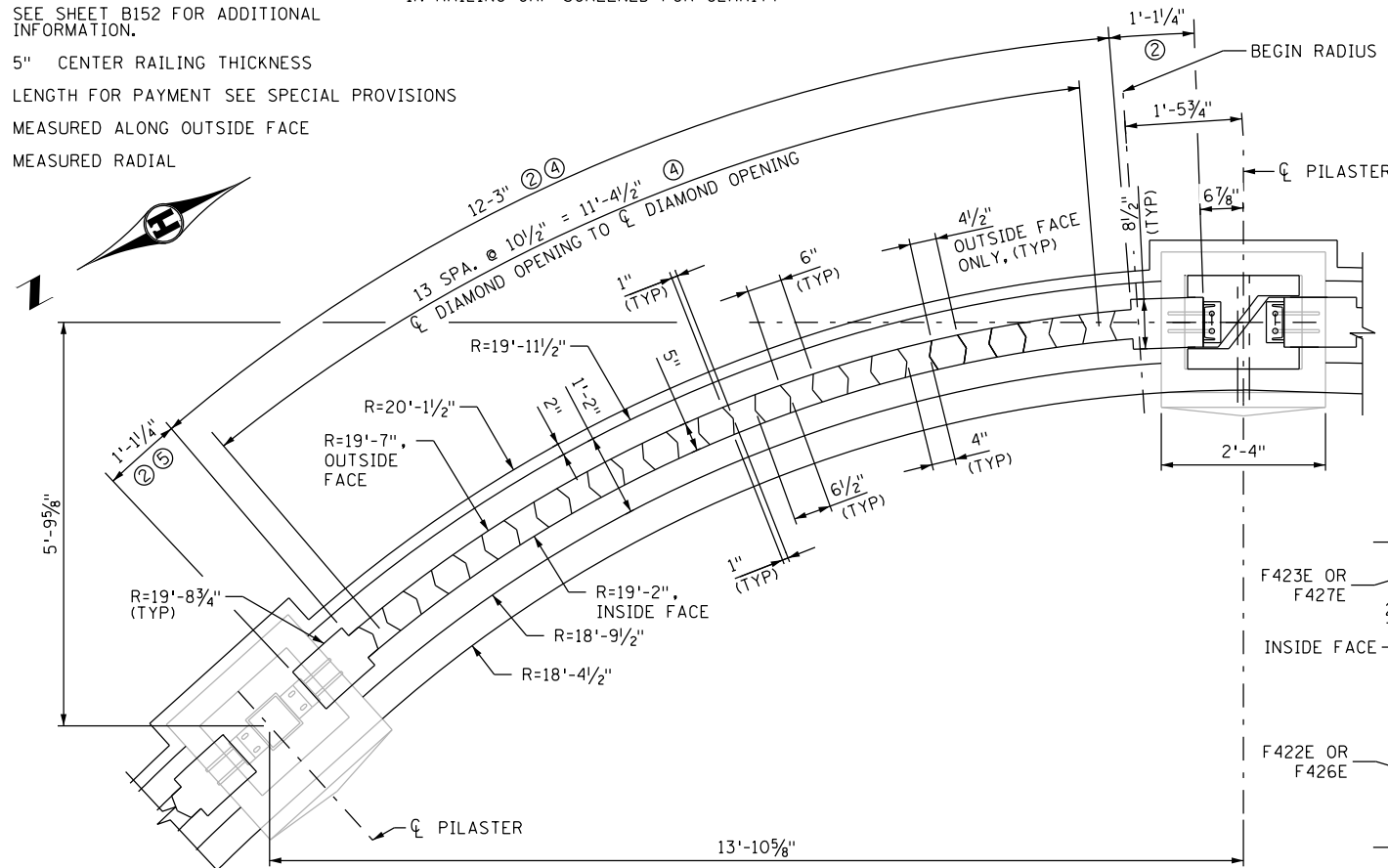


**NOTES:**

1. SEE SHEET B152 FOR ADDITIONAL INFORMATION.
2. 5" CENTER RAILING THICKNESS
3. LENGTH FOR PAYMENT SEE SPECIAL PROVISIONS
4. MEASURED ALONG OUTSIDE FACE
5. MEASURED RADIAL

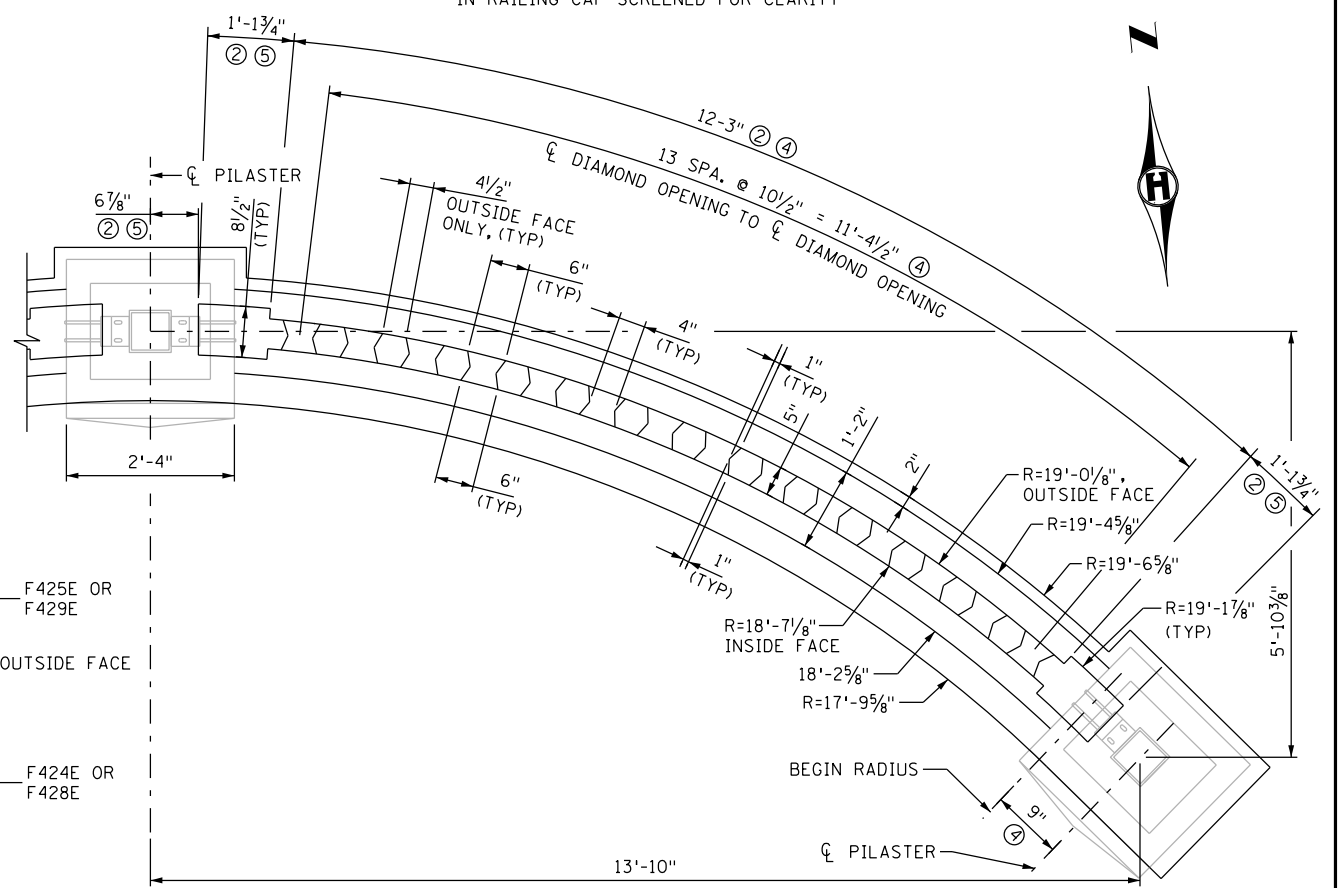
PILASTER AND ARCHITECTURAL LINES  
IN RAILING CAP SCREENED FOR CLARITY

PILASTER AND ARCHITECTURAL LINES  
IN RAILING CAP SCREENED FOR CLARITY



SECTION A-A

PILASTER SCREENED FOR CLARITY



SECTION B-B

PILASTER SCREENED FOR CLARITY



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

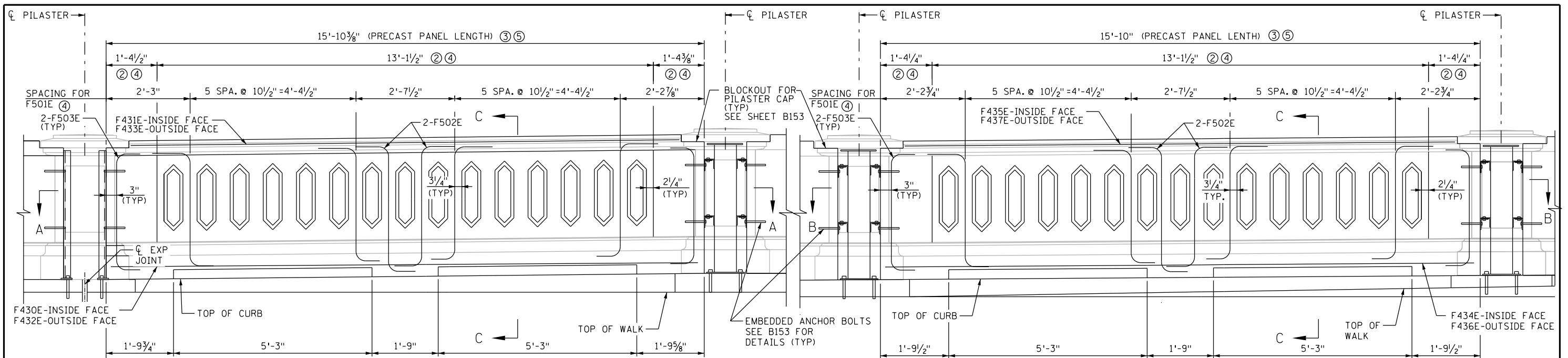
AARON J. NELSON, PROFESSIONAL ENGINEER

43101 8/14/2014  
LICENSE NO. DATE

DESIGN BY: AJN  
CAD BY: NTT  
CHECKED BY: AMK  
LAST REVISION: 12/15/2015

ORNAMENTAL RAILING DETAILS (6A OF 11)  
C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET  
B157AR  
B176



**NOTES:**

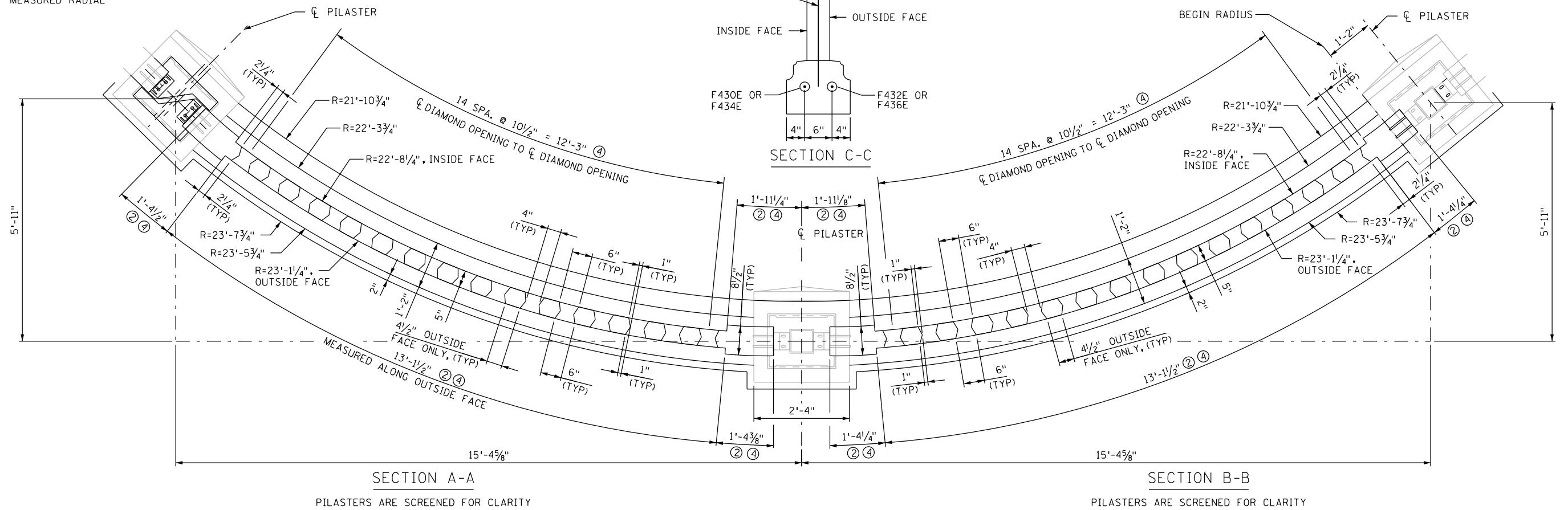
- 1. SEE B152 FOR ADDITIONAL INFORMATION.
- ② 5" CENTER RAILING THICKNESS
- ③ LENGTH FOR PAYMENT SEE SPECIAL PROVISIONS
- ④ MEASURED ALONG OUTSIDE FACE
- ⑤ MEASURED RADIAL

**TYPE 11**

PILASTER AND ARCHITECTURAL LINES IN RAILING CAP SCREENED FOR CLARITY

**TYPE 12**

PILASTER AND ARCHITECTURAL LINES IN RAILING CAP SCREENED FOR CLARITY



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*  
**AARON J. NELSON, PROFESSIONAL ENGINEER**

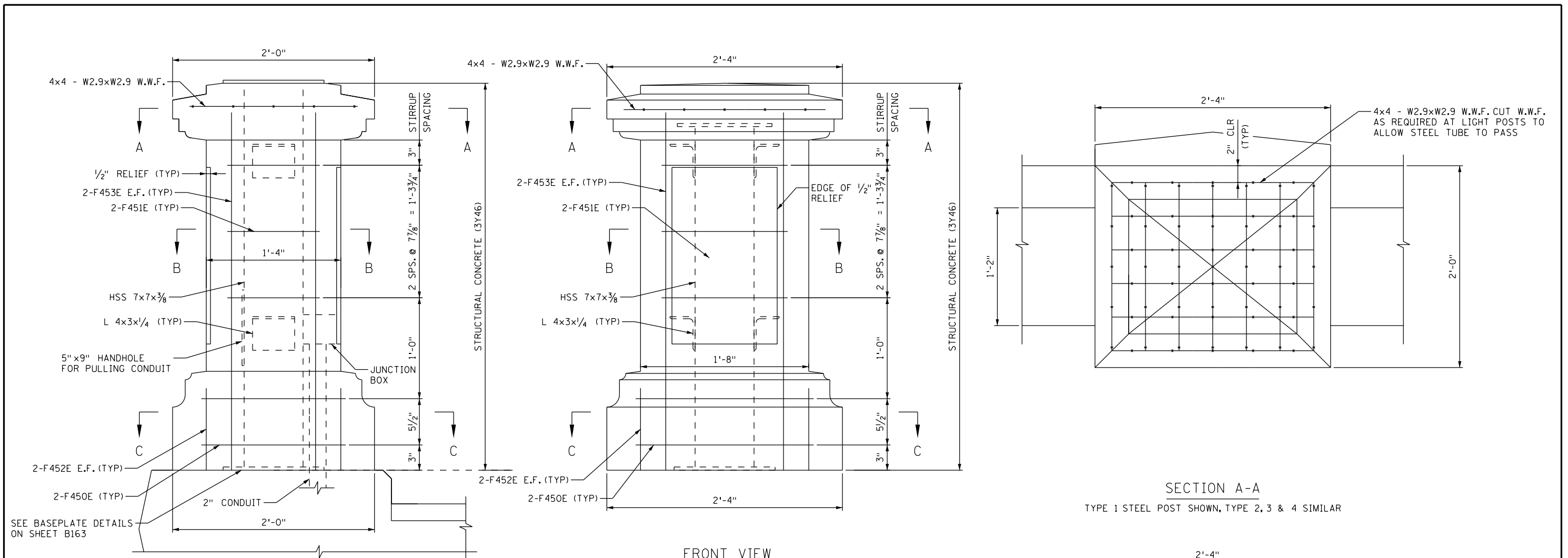
**43101**      **8/14/2014**  
 LICENSE NO.      DATE

**DESIGN BY:** AJN  
**CAD BY:** NTT  
**CHECKED BY:** AMK  
**LAST REVISION:** 12/15/2015

**ORNAMENTAL RAILING DETAILS (7 OF 11)**

**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**  
**BRIDGE 2441 S.P. 027-605-029**

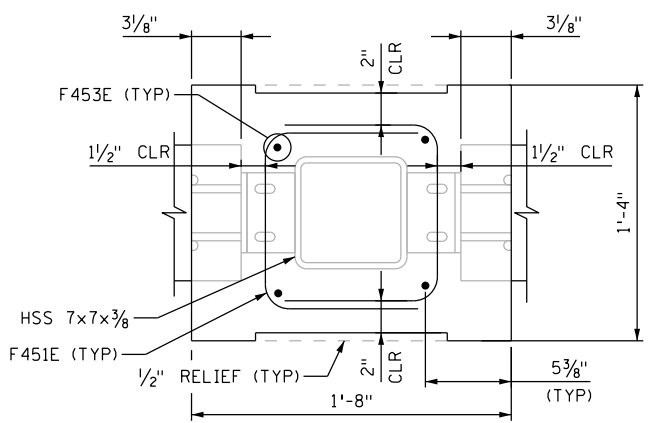
**SHEET**  
**B158R3**  
**B176**



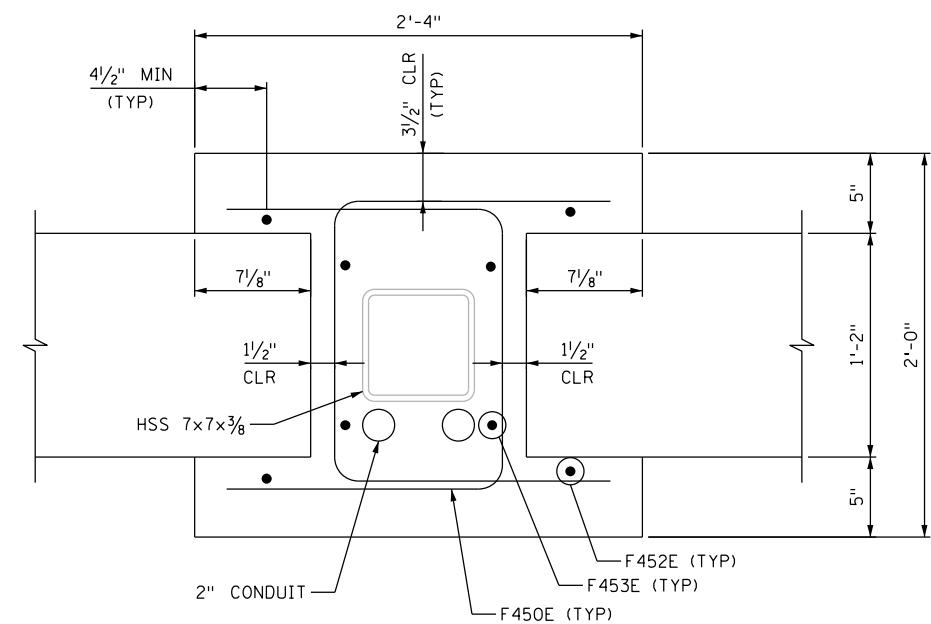
**PILASTER ELEVATION**  
TYPE 2 STEEL POST SHOWN

**FRONT VIEW**  
TYPE 1 STEEL POST SHOWN, TYPE 3 & 4 SIMILAR

**SECTION A-A**  
TYPE 1 STEEL POST SHOWN, TYPE 2, 3 & 4 SIMILAR



**SECTION B-B**  
ADJUST F453E AND F451E AS REQUIRED TO AVOID CONNECTION ANGLES AND JUNCTION BOX.



**SECTION C-C**

- NOTES:**
1. COST FOR WELDED WIRE FABRIC SHALL BE INCLUDED IN THE BID PRICE FOR ITEM NUMBER 2401.501 "STRUCTURAL CONCRETE (3Y46)".
  2. PROVIDE WELDED WIRE FABRIC PER MNDOT SPEC 3303. GALVANIZE WELDED WIRE FABRIC TO CLASS A PER ASTM 641.
  3. SEE SHEET B152 FOR ADDITIONAL PILASTER AND ENTABLATURE DETAILS.



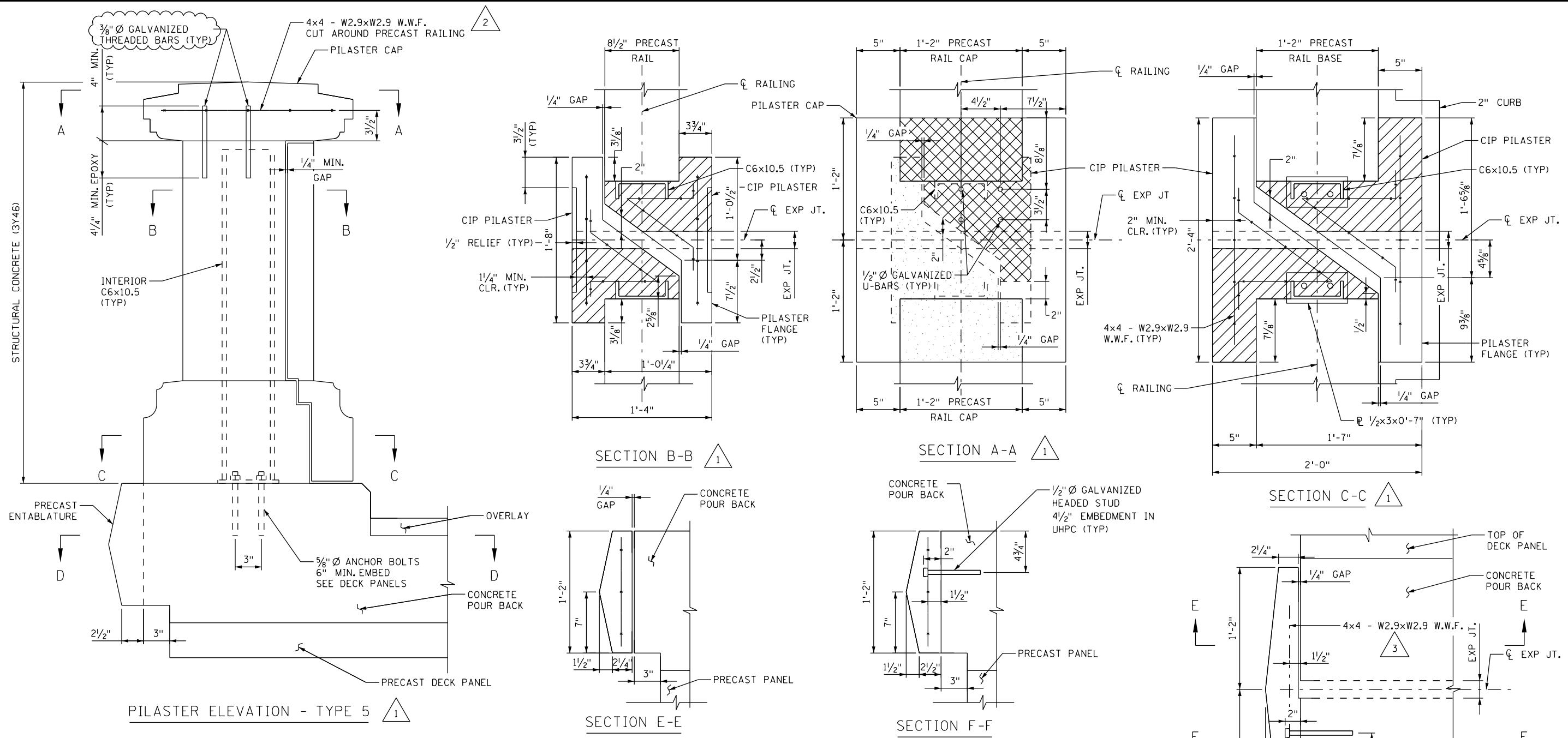
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*  
**AARON J. NELSON, PROFESSIONAL ENGINEER**  
 43101      8/14/2014  
 LICENSE NO.      DATE

**DESIGN BY:** AJN  
**CAD BY:** NTT  
**CHECKED BY:** AMK  
**LAST REVISION:** 11/24/2015

**ORNAMENTAL RAILING DETAILS (8 OF 11)**  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

**SHEET**  
 B159R  
 B176



**NOTES:**

- PILASTER FLANGE IS ARCHITECTURAL AND NOT DESIGNED FOR SIGNIFICANT LOADING.
- COST FOR WELDED WIRE FABRIC SHALL BE INCLUDED IN THE BID PRICE FOR ITEM NUMBER 2401.501 "STRUCTURAL CONCRETE (3Y46)".
- PROVIDE WELDED WIRE FABRIC PER MNDOT SPEC 3303 GALVANIZE WELDED WIRE FABRIC TO CLASS A PER ASTM 641.
- SEE SHEET B152 FOR ADDITIONAL PILASTER AND ENTABLATURE DETAILS.
- 1/2" Ø HEADED STUD AND U-BARS SHALL BE GALVANIZED PER MNDOT SPEC. 3392 PRIOR TO ENTABLATURE FABRICATION.
- CONCRETE POUR BACK MATERIAL SHALL BE SAME MATERIAL USED TO CAST PRECAST DECK PANELS.

- 1 MODIFIED FOR CONSTRUCTABILITY AT THE CONTRACTOR'S REQUEST. SEE SHEET B161A FOR REVISED GEOMETRY AND REINFORCING.
- 2 #3 (E) BARS EACH WAY INSTEAD W.W.F.
- 3 #3 (E) BARS W/ #3 (E) TIES INSTEAD W.W.F.

**LEGEND**

- DENOTES SIDE OF PILASTER CONNECTED TO DECK PANEL
- DENOTES SIDE OF CAP CONNECTED TO STRUCTURE (PILASTER AND RAILING)
- DENOTES 1/4" GAP BETWEEN CAP AND STRUCTURE BELOW (PILASTER AND RAILING)



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*  
**AARON J. NELSON, PROFESSIONAL ENGINEER**

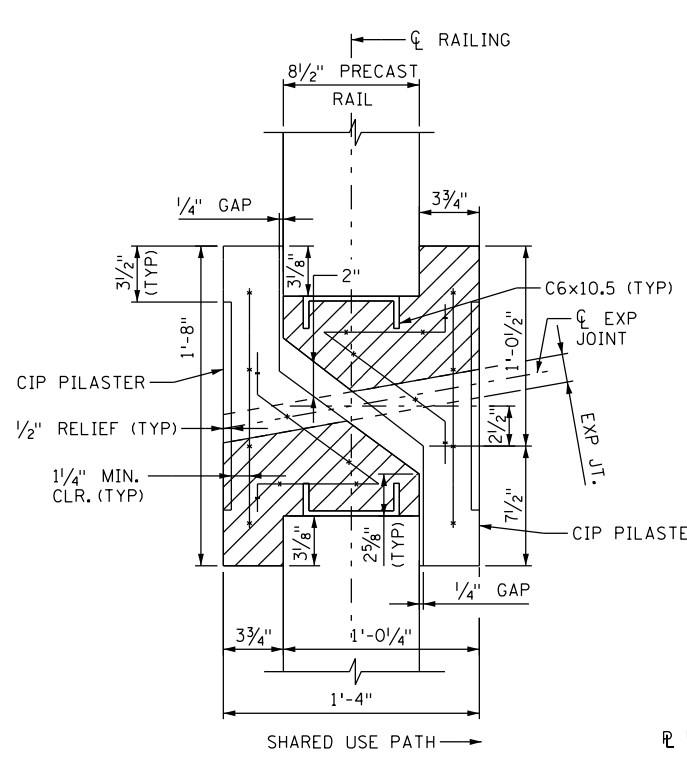
**43101**      **8/14/2014**  
 LICENSE NO.      DATE

**DESIGN BY:** AJN  
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**LAST REVISION:** 12/15/2015

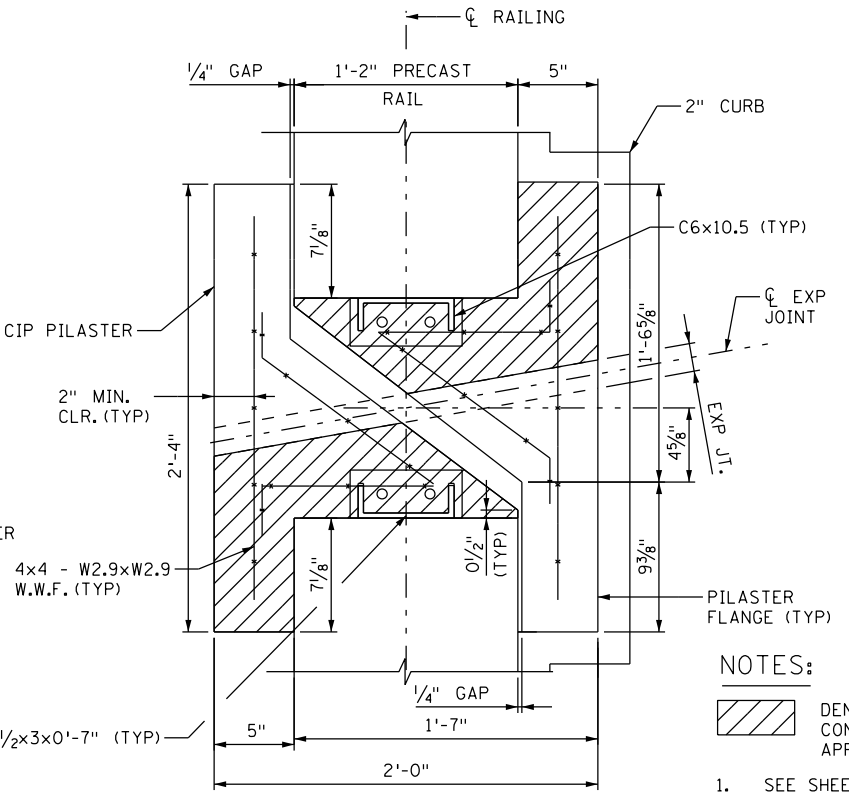
**AS-BUILT - ORNAMENTAL RAILING DETAILS (9 OF 11)**

**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**  
**BRIDGE 2441 S.P. 027-605-029**

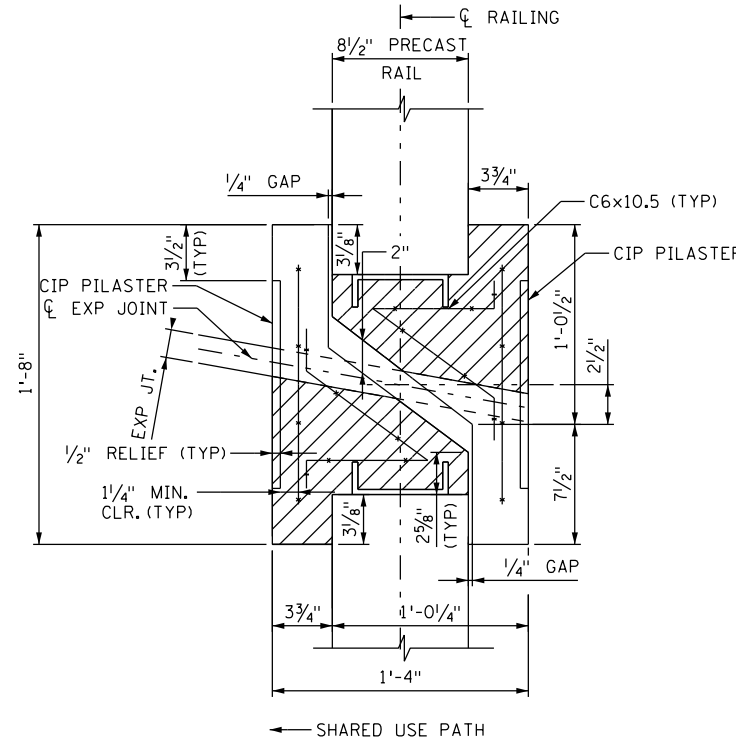
**SHEET**  
**B160R3**  
**B176**



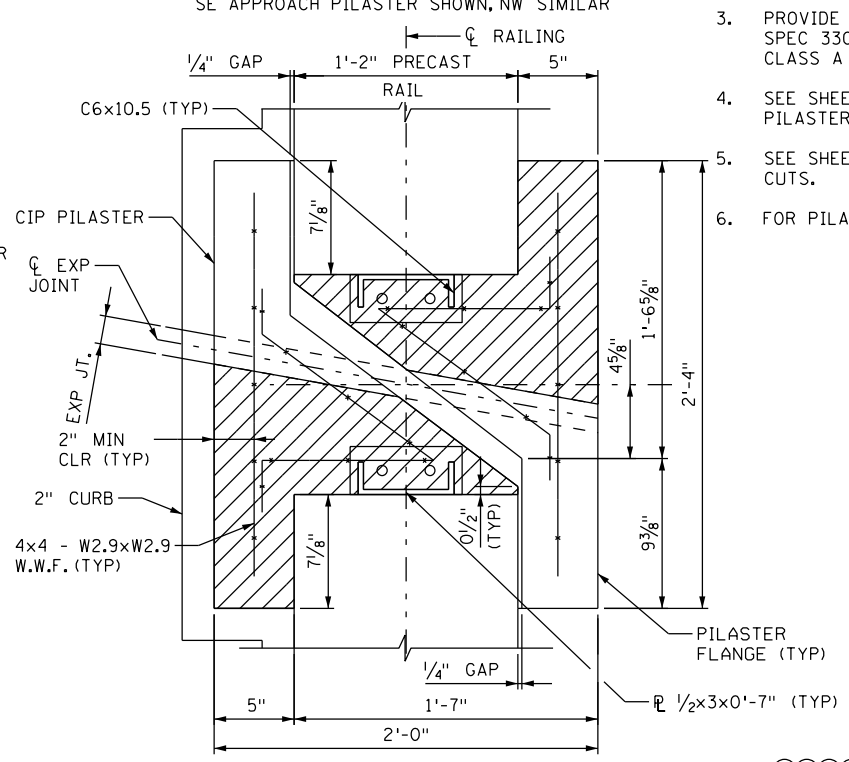
SECTION B-B 1  
SE APPROACH PILASTER SHOWN, NW SIMILAR



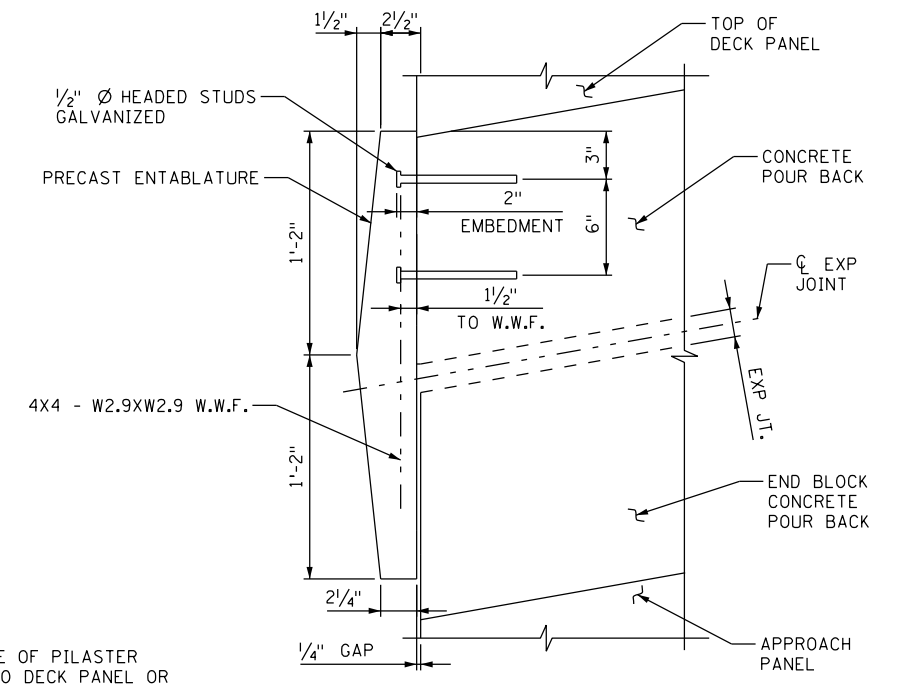
SECTION C-C 1  
SE APPROACH PILASTER SHOWN, NW SIMILAR



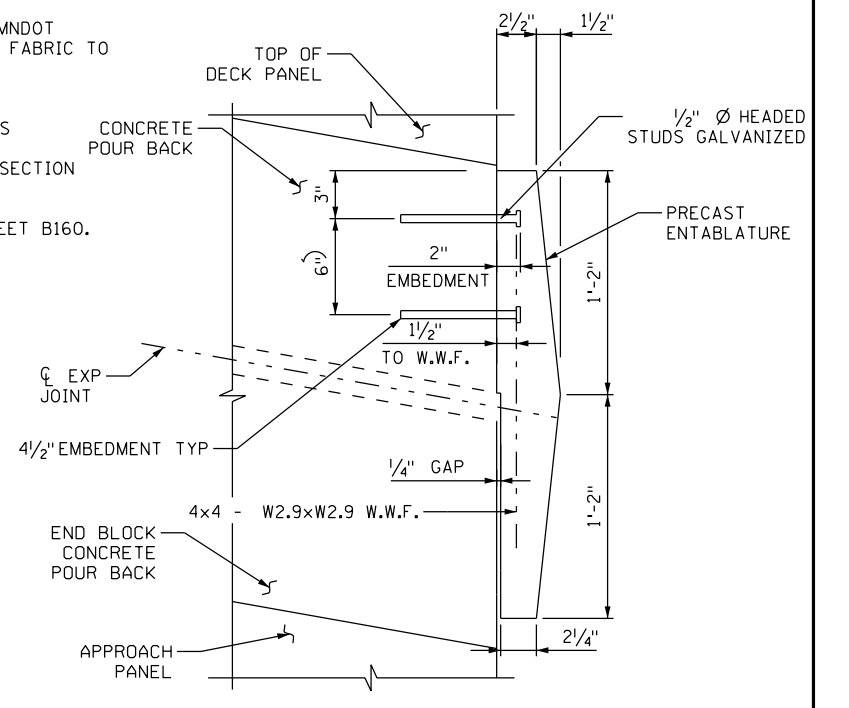
SECTION B-B 1  
NE APPROACH PILASTER SHOWN, SW SIMILAR



SECTION C-C 1  
NE APPROACH PILASTER SHOWN, SW SIMILAR



SECTION D-D  
SE OR NW APPROACH PILASTER



SECTION D-D  
NE OR SW APPROACH PILASTER

NOTES:

- 1. SEE SHEET B160 FOR PILASTER CAP DETAILS
- 2. COST FOR WELDED WIRE FABRIC SHALL BE INCLUDED IN THE BID PRICE FOR ITEM NUMBER 2401.501 "STRUCTURAL CONCRETE (3Y46)."
- 3. PROVIDE WELDED WIRE FABRIC PER MNDOT SPEC 3303. GALVANIZE WELDED WIRE FABRIC TO CLASS A PER ASTM 641.
- 4. SEE SHEET B152 FOR ADDITIONAL PILASTER AND ENTABLATURE DETAILS
- 5. SEE SHEET B160 FOR LOCATION OF SECTION CUTS.
- 6. FOR PILASTER CAP DETAILS, SEE SHEET B160.

1 MODIFIED FOR CONSTRUCTABILITY AT THE CONTRACTOR'S REQUEST. SEE SHEET B161A FOR REVISED GEOMETRY AND REINFORCING.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*  
AARON J. NELSON, PROFESSIONAL ENGINEER

43101 8/14/2014  
LICENSE NO. DATE

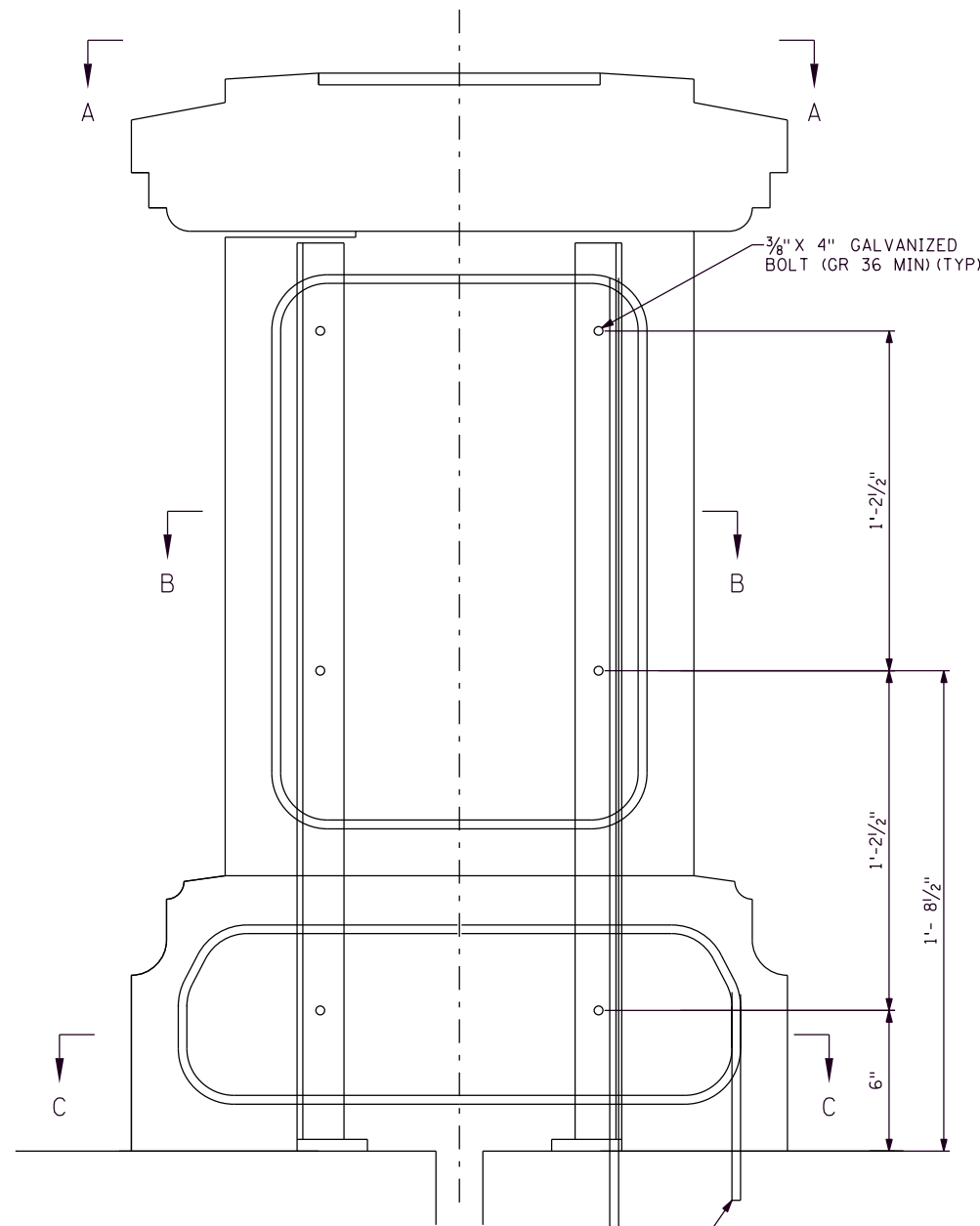
DESIGN BY: AJN  
CAD BY: RAM  
CHECKED BY: AMK  
LAST REVISION: 12/03/2015

AS-BUILT - ORNAMENTAL RAILING DETAILS (10 OF 11)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET  
B161R2  
B176

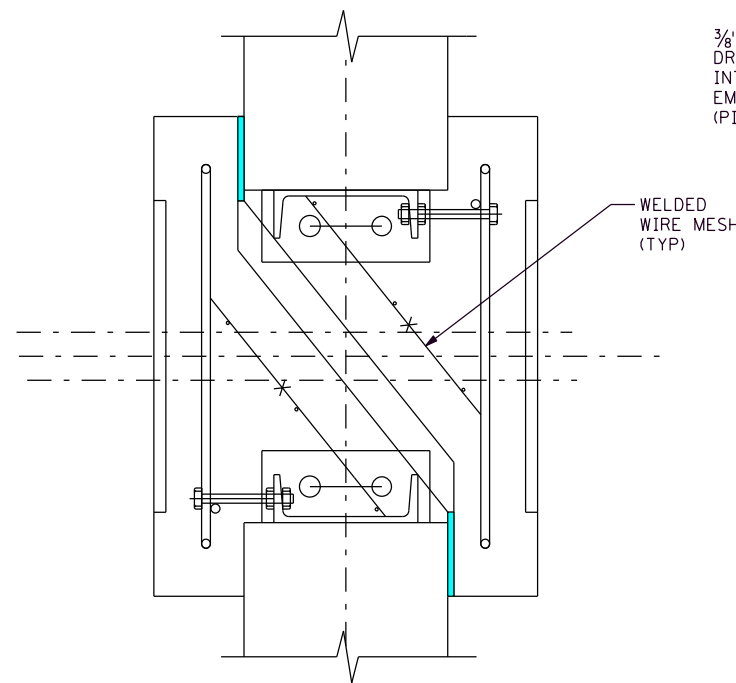




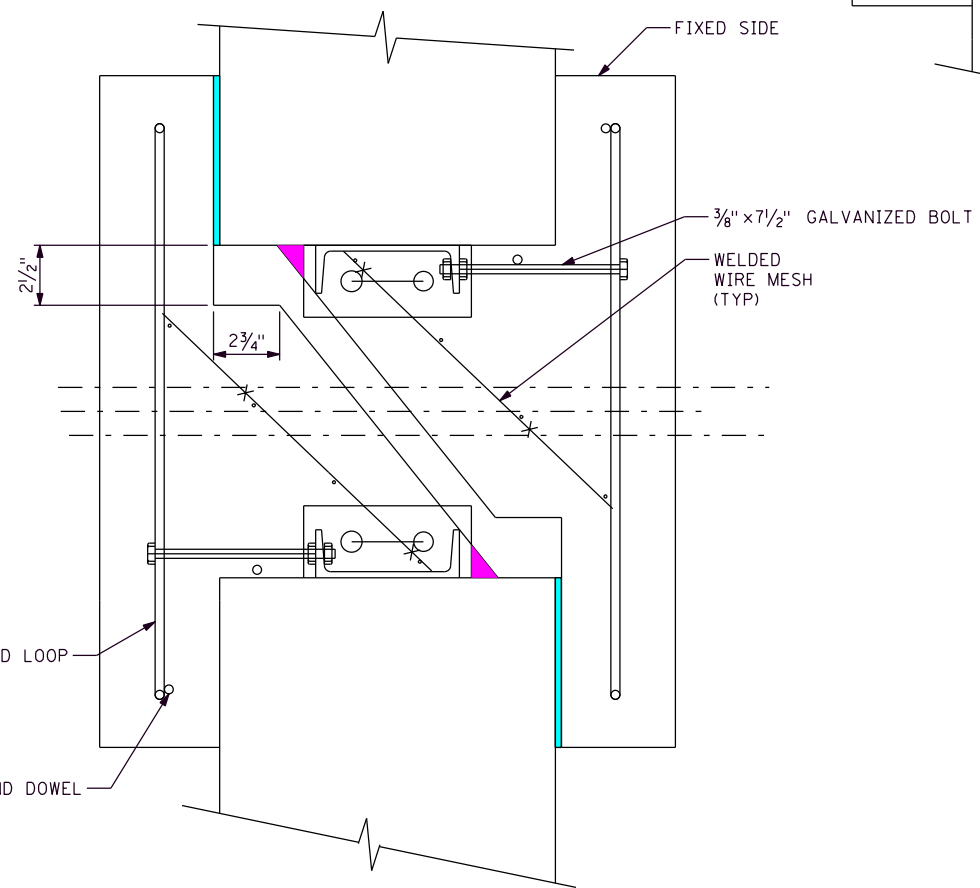
PILASTER ELEVATION - TYPE 5

LEGEND

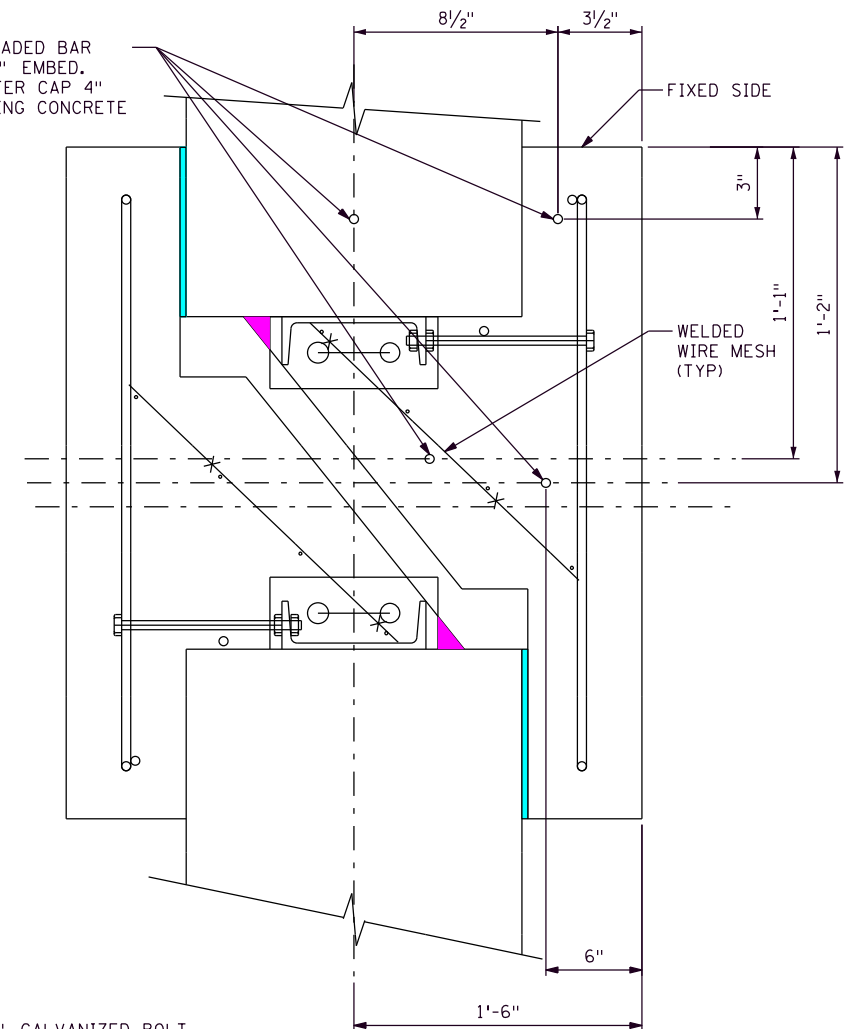
- 1/2" THICK STRUCTURAL FOAM TO STAY IN PLACE
- BIT FELT MATERIAL TO STAY IN PLACE



SECTION B - B



SECTION C - C



SECTION A - A

- 3(E) EPOXY REBAR CLOSED LOOP
- 3(E) EPOXY REBAR DRILL AND DOWEL



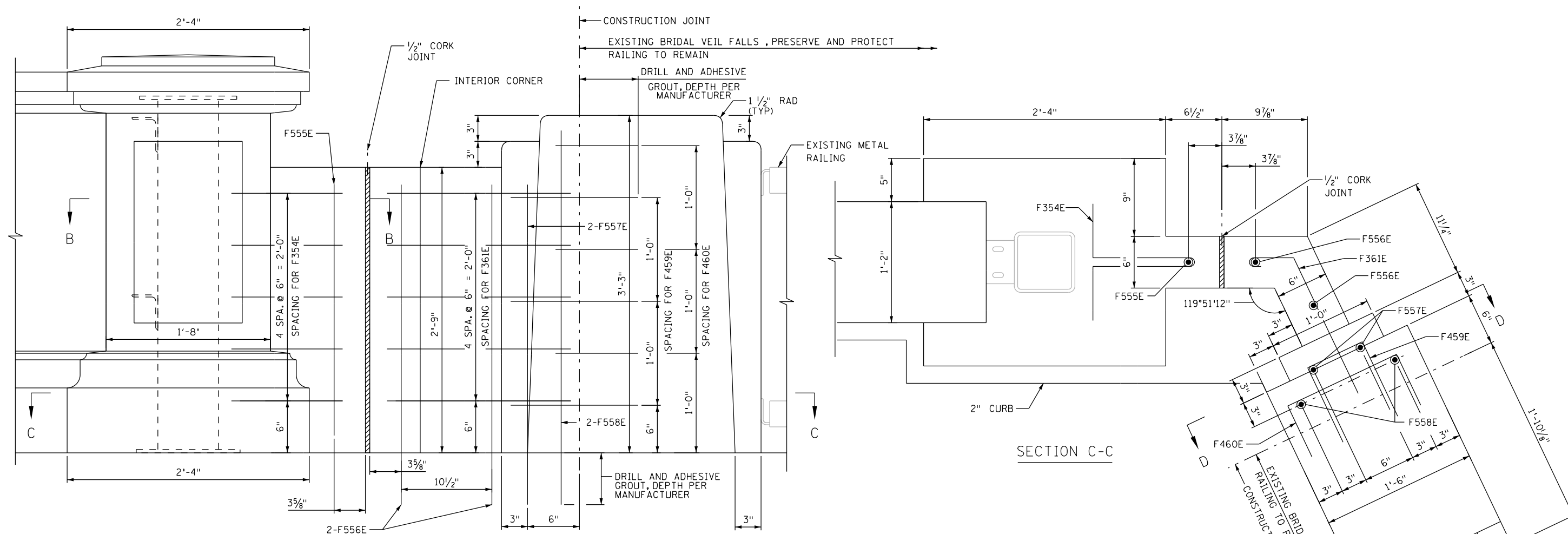
AS-BUILT - ORNAMENTAL RAILING DETAILS (10A OF 11)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET

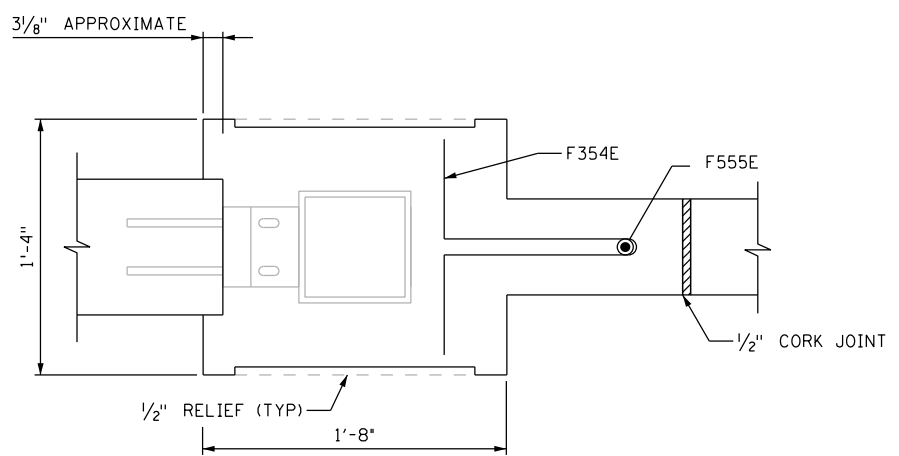
B161A

B176



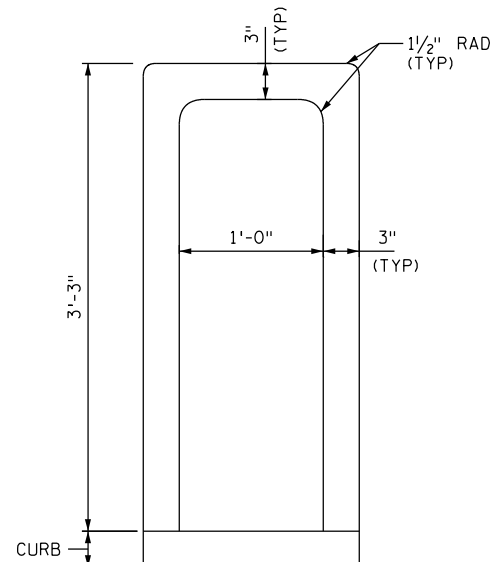
N.E. END RAILING ELEVATION  
EXPANDED ELEVATION SHOWN

SECTION C-C



SECTION B-B

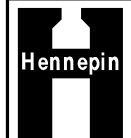
ANGLES ON NORTH FACE OF POST NOT REQUIRED



SECTION D-D

NOTES:

1. ALL DIMENSIONS TO BE FIELD VERIFIED PRIOR TO CONSTRUCTION.
2. SEE B159 FOR PILASTER REINFORCEMENT.
3. 1/2" CORK JOINT SHALL CONFORM TO MNDOT SPEC 3702 AND SHALL BE INCLUDED IN THE COST FOR ITEM NUMBER 2401.501 "STRUCTURAL CONCRETE (3Y46)."
4. CONCRETE FOR WALL CONNECTION SHALL BE STRUCTURAL CONCRETE (3Y46) AND PAID FOR UNDER ITEM NUMBER 2401.501 "STRUCTURAL CONCRETE (3Y46)."



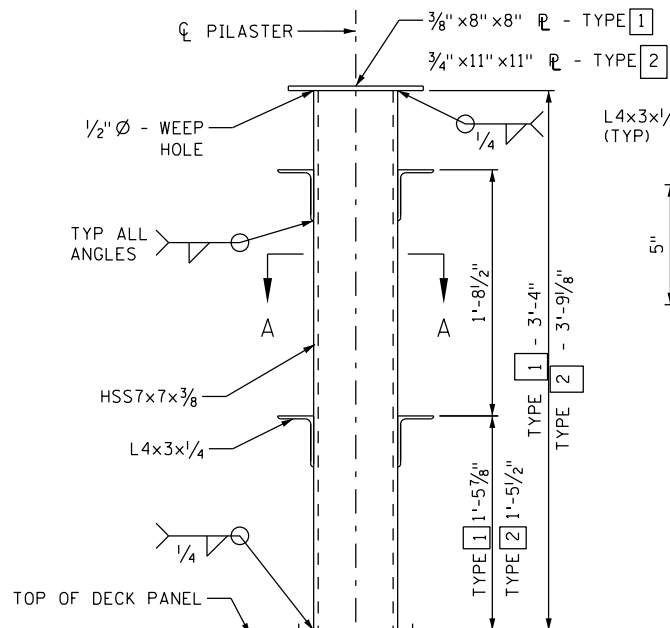
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*  
**AARON J. NELSON, PROFESSIONAL ENGINEER**  
 43101 8/14/2014  
 LICENSE NO. DATE

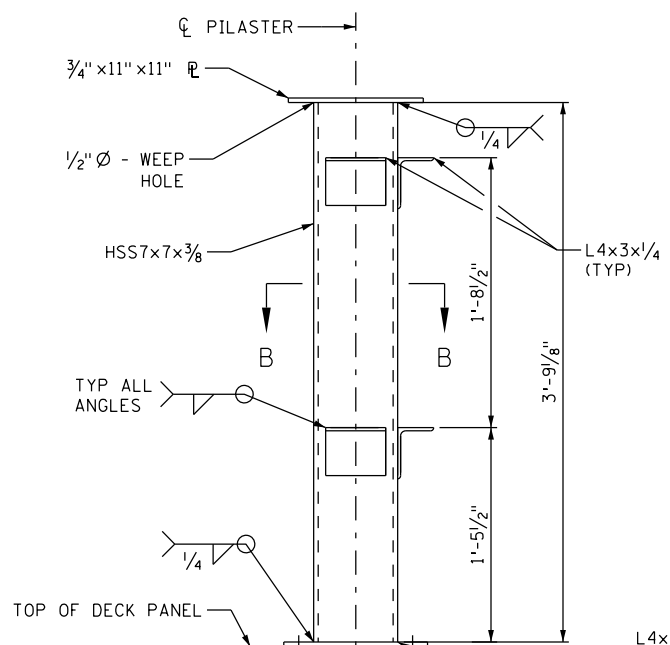
DESIGN BY: AJN  
 CAD BY: RAM  
 CHECKED BY: AMK  
 LAST REVISION: 11/24/2015

ORNAMENTAL RAILING DETAILS (11 OF 11)  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

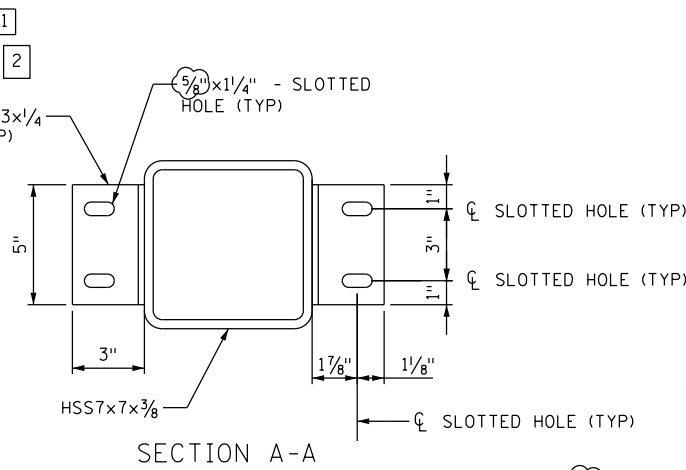
SHEET  
 B162R  
 B176



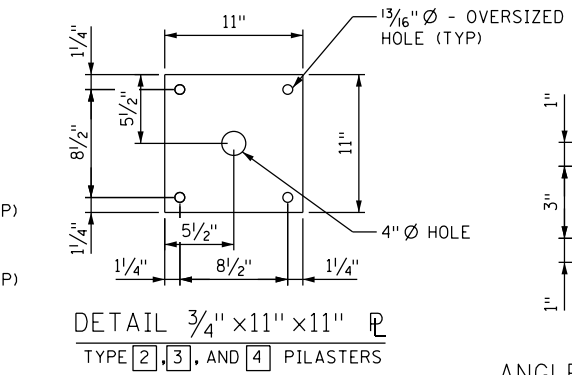
POST AT TYPE 1 & 2 PILASTER



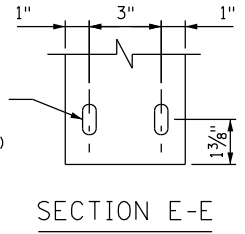
POST AT TYPE 3 & 4 PILASTER  
SEE SHEET B163A FOR PLATE ORIENTATION



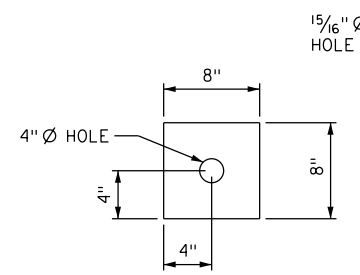
SECTION A-A



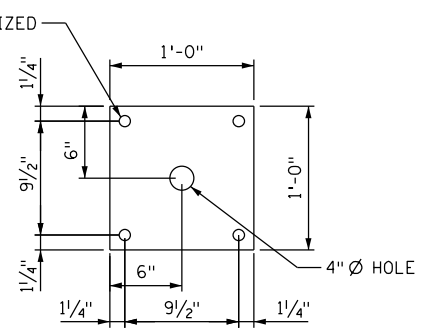
DETAIL 3/4" x 11" x 11" PLATE  
TYPE 2, 3, AND 4 PILASTERS



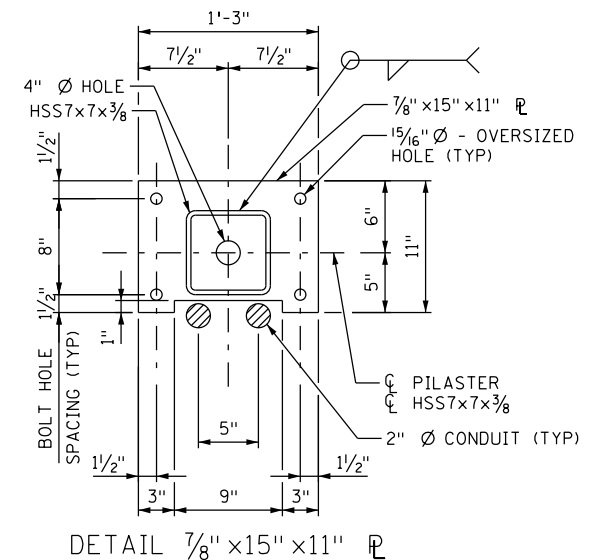
SECTION E-E



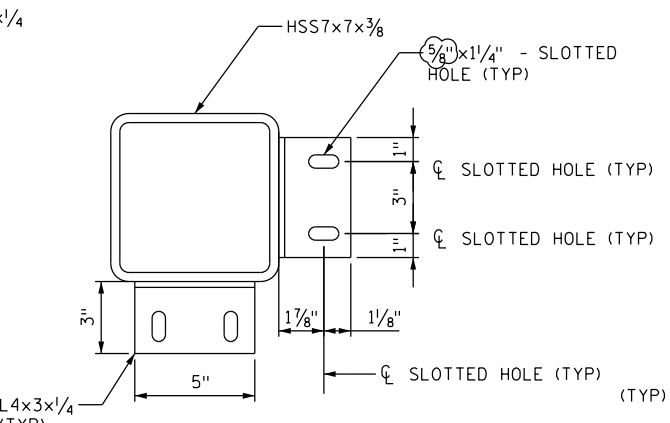
DETAIL 3/8" x 8" x 8" PLATE  
TYPE 1 PILASTER ONLY



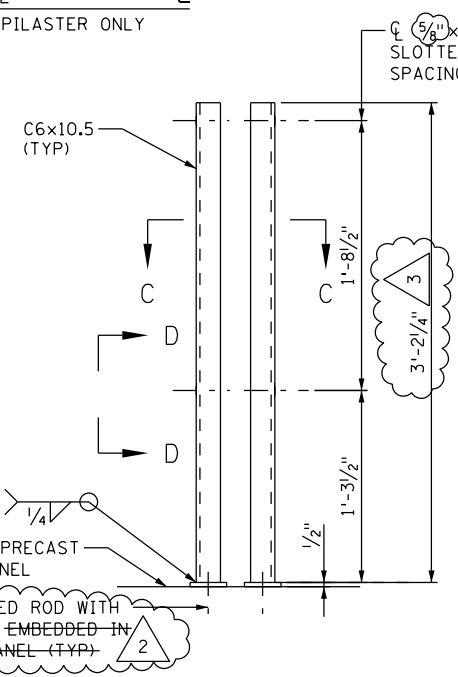
DETAIL 1/2" x 12" x 12" PLATE  
TYPE 1 PILASTER ONLY



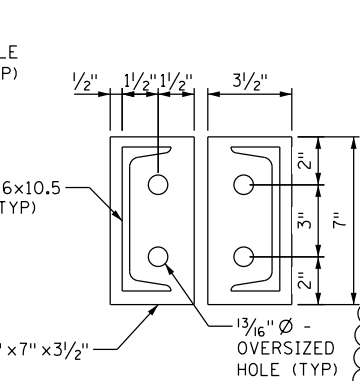
DETAIL 7/8" x 15" x 11" PLATE



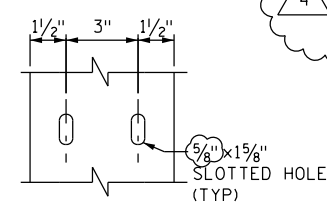
SECTION B-B



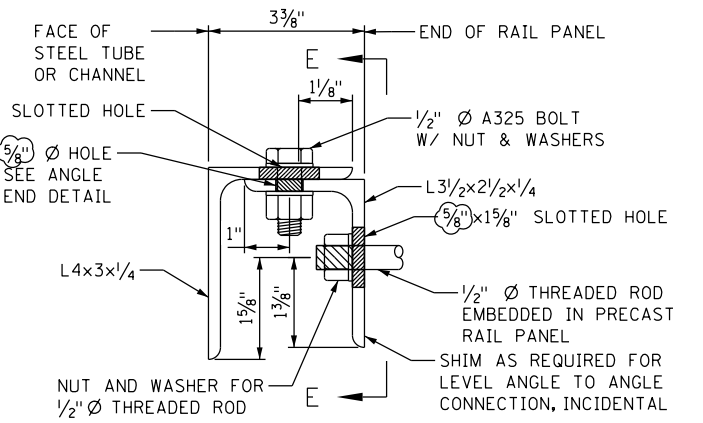
POST AT TYPE 5 PILASTER



SECTION C-C



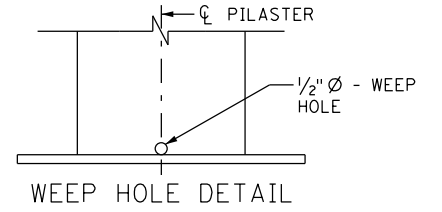
VIEW D-D



RAIL-POST ANGLE CONNECTION  
TYPE 1, 2, 3, AND 4 PILASTERS ONLY

- NOTES:
1. PROVIDE CORRECT ALIGNMENT FOR ANCHORAGES BY PLACING THEM ACCURATELY AND PLUMB. SEE SPECIAL PROVISIONS.
  2. PROVIDE STRUCTURAL STEEL PER Mn/DOT SPEC. 3310. PROVIDE STRUCTURAL TUBES PER A.S.T.M. A500, GRADE B AS SPECIFIED IN Mn/DOT SPEC. 3361.
  3. GALVANIZE BOLTS, NUTS, AND WASHERS PER Mn/DOT SPEC. 3392 AFTER FABRICATION.
  4. GALVANIZE ALL OTHER STRUCTURAL STEEL PER Mn/DOT SPEC. 3394, AFTER FABRICATION.
  5. FOR HAND HOLE DETAILS FOR POST AT PILASTERS 2, 3 AND 4, SEE SHEET B163A.
  6. STEEL POST AT THE END PILASTERS AT THE END OF THE WALLS REQUIRE ANGLES ON ONLY ONE SIDE FOR CONNECTIONS.
  7. INCLUDE BOLTS, NUTS AND WASHERS IN THE COST FOR BID ITEM 2402.521 "STRUCTURAL STEEL (3310)". BOLT NUT AND WASHER WEIGHT ARE CONSIDERED INCIDENTAL AND NO MEASUREMENT FOR WEIGHT WILL BE TAKEN.
  8. 4" Ø HOLES SHALL BE PLUGGED AFTER CONDUIT DRAWN THROUGH FOR LIGHTING.
  9. ALL 4" Ø HOLES AND 1/2" Ø WEEP HOLES SHALL BE PLUGGED PRIOR TO CASTING PILASTER.

- 2 DRILL AND INSTALL WITH REDHEAD AT ADHESIVE, 6 5/8" MINIMUM EMBEDMENT. SEE RFI 34 FOR DETAILS.
- 3 MODIFIED FOR CONSTRUCTIBILITY AT THE CONTRACTOR'S REQUEST.
- 4 SEE ORNAMENTAL RAILING POST SHOP DRAWING 144 FOR DETAILS.



WEEP HOLE DETAIL



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*  
AARON J. NELSON, PROFESSIONAL ENGINEER

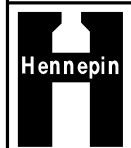
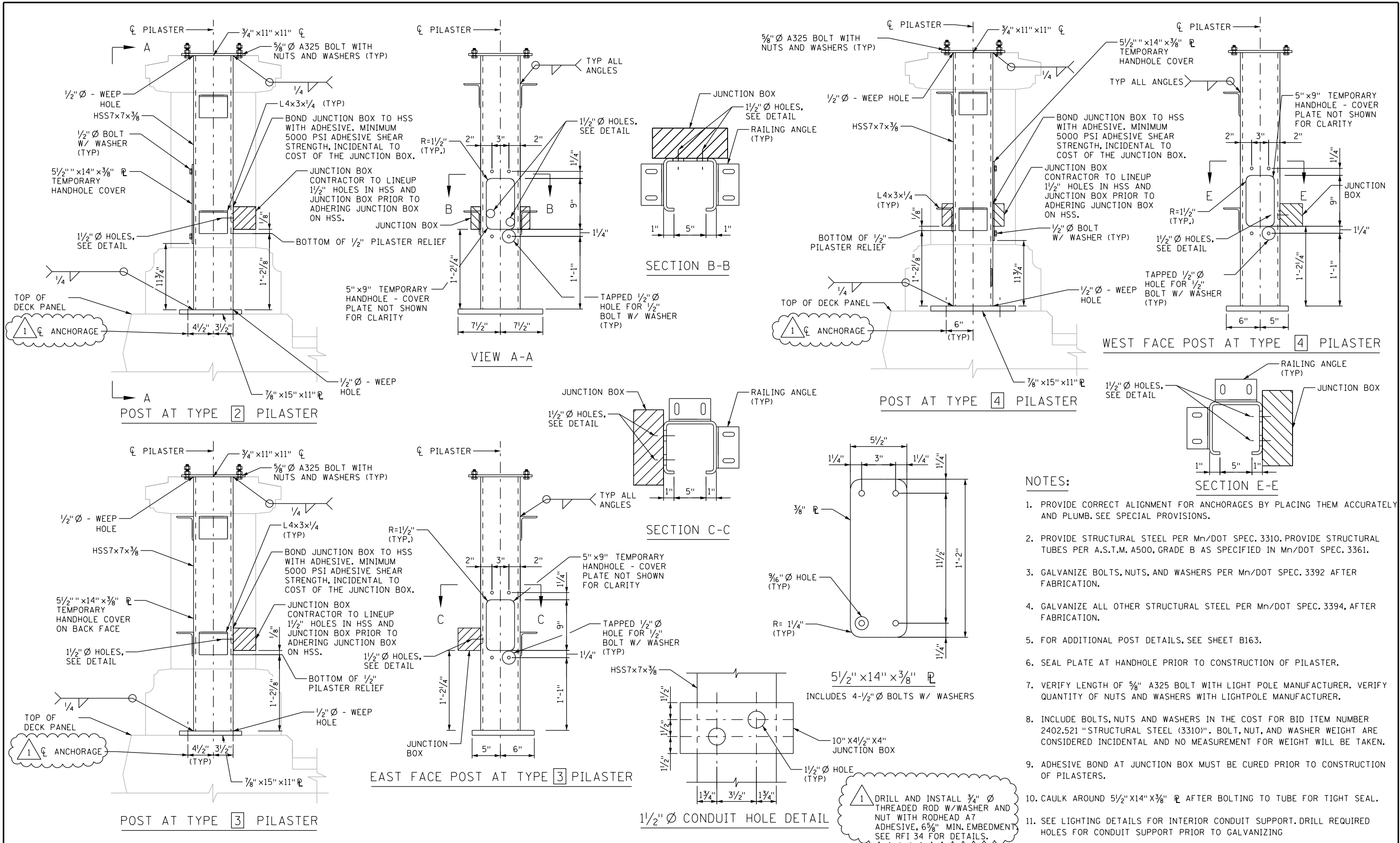
43101 8/14/2014  
LICENSE NO. DATE

DESIGN BY: AJN  
CAD BY: NTT  
CHECKED BY: AMK  
LAST REVISION: 12/15/2015

AS-BUILT - ORNAMENTAL RAILING STEEL POST DETAILS (1 OF 2)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET  
B163R3  
B176



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*

**AARON J. NELSON, PROFESSIONAL ENGINEER**

**43101**      **8/14/2014**

LICENSE NO.      DATE

**DESIGN BY:** AJN

**CAD BY:** PRE

**CHECKED BY:** AMK

**LAST REVISION:** 12/15/2015

**AS-BUILT - ORNAMENTAL RAILING STEEL POST DETAILS (2 OF 2)**

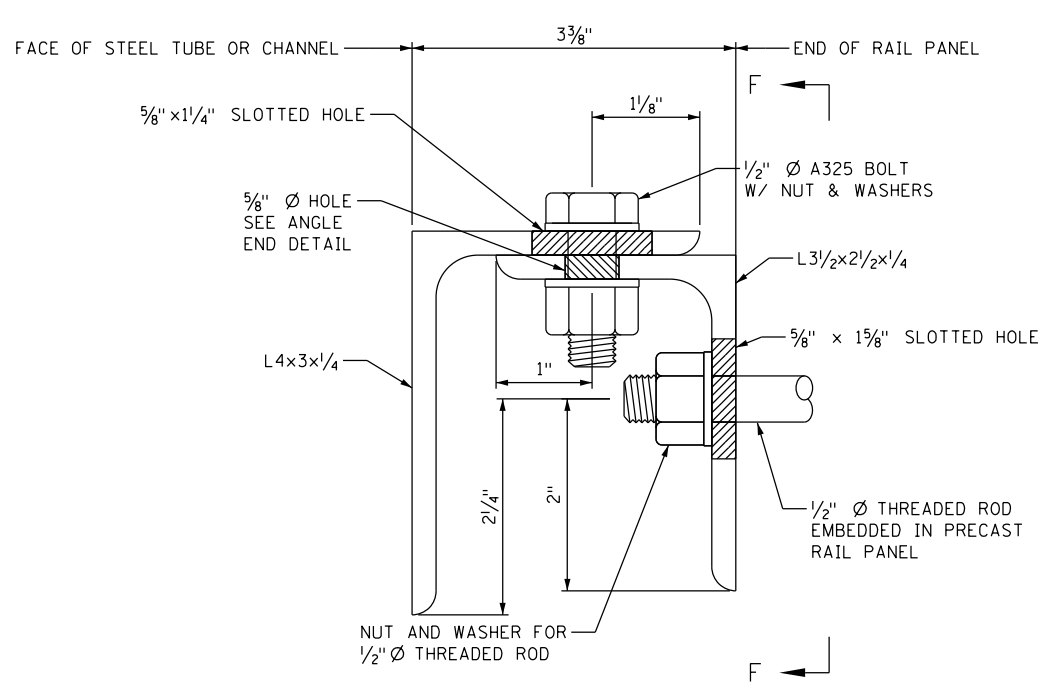
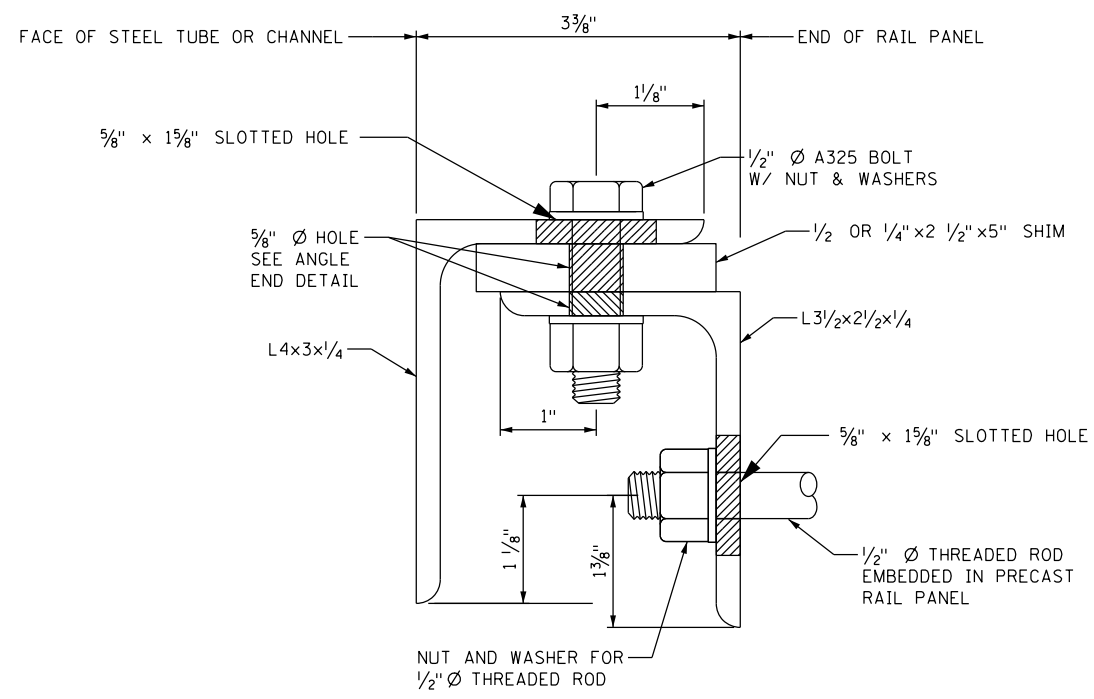
**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**

**BRIDGE 2441 S.P. 027-605-029**

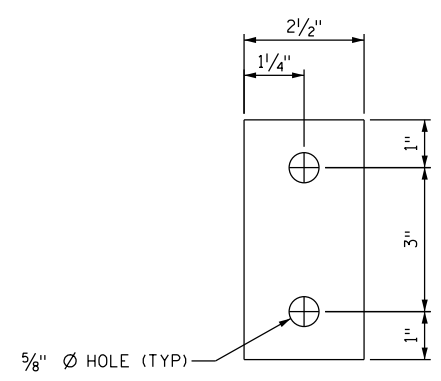
**SHEET**

**B163AR3**

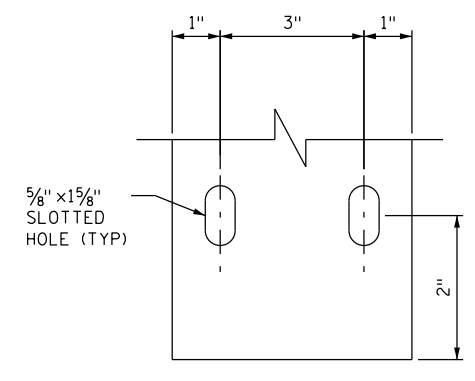
**B176**



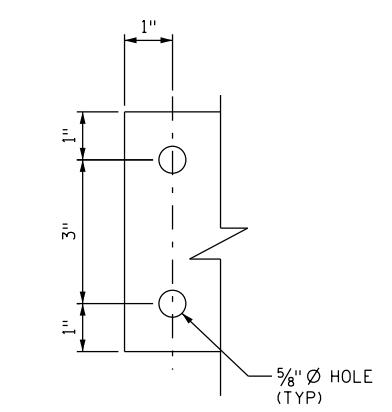
RAIL-POST ANGLE CONNECTION ①  
 TYPE 1, 2, 3, AND 4 PILASTERS ONLY



TYPICAL 1/4" OR 1/2" THICK SHIM



SECTION F-F



ANGLE END DETAIL

NOTES:

- ① COMBINATION OF SHIMS AND LOOSE CLIPS WERE USED ON 55 PANELS TO ADDRESS MISPLACED EMBEDDED BOLTS AND THE LOCATIONS WHERE THE BOLTS WERE PLACED HIGHER THAN THE PLAN SHEET.



BILL OF REINFORCEMENT INTERIOR RAILING				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
R501E	2257	6'-4 1/2"	BENT	PLACED IN DECK
R502E	2248	4'-11"	BENT	STIRRUP
R503E	40	3'-9"	BENT	STIRRUP AT JOINT
R504E	12	6'-11"	BENT	STIRRUP
R505E	4	6'-5"	BENT	STIRRUP
	SER OF	TO		
	2	6'-9"		
R506E	8	5'-11"	BENT	STIRRUP
R507E	8	3'-3"	BENT	STIRRUP
R508E	8	9'-7"	STR	NW, END
R509E	2	9'-2"	STR	NW, END MIDDLE
R510E	2	8'-5"	STR	NW, END TOP
R511E	32	13'-6"	STR	LONGITUDINAL, NW & S.W.
R512E	8	11'-8"	STR	SW, END
R513E	2	11'-4"	STR	SW, END MIDDLE
R514E	2	10'-7"	STR	SW, END TOP
R515E	16	11'-6"	STR	LONGITUDINAL, SW
R516E	8	9'-9"	STR	NE, END
R517E	2	9'-5"	STR	NE, END MIDDLE
R518E	2	8'-8"	STR	NE, END TOP
R519E	8	11'-6"	STR	LONGITUDINAL, NE
R520E	8	10'-5"	STR	SE, END
R521E	2	9'-5 1/2"	STR	SE, END MIDDLE
R522E	2	8'-8 1/2"	STR	SE, END TOP
R523E	8	11'-7"	STR	LONGITUDINAL, SE
R524E	96	9'-6 1/4"	STR	FOR 10' PANELS
R525E	192	6'-5 3/4"	STR	FOR 11.5' TO 11.83' PANELS
R526E	636	8'-2"	STR	FOR 14'-2 1/2" OR LARGER PANELS
R727E	2	6'-6"	BENT	END RAIL GUARD ATTACHMENT

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 1 (130 PANELS, 130 SETS REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	10	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F404E	2	12'-10"	STR	HORIZONTAL, BASE
F405E	2	11'-8"	STR	HORIZONTAL, TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 2 (4 PANELS, 4 SETS REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	8	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F410E	1	11'-8"	STR	HORIZ, INSIDE BOT
F411E	1	10'-6"	STR	HORIZ, INSIDE TOP
F412E	1	12'-4"	STR	HORIZ, OUTSIDE BOT
F413E	1	11'-0"	STR	HORIZ, OUTSIDE TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 3 (4 PANELS, 4 SETS REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	8	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F408E	2	10'-10"	STR	HORIZONTAL, BASE
F409E	2	9'-8"	STR	HORIZONTAL, TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 4 (4 PANELS, 4 SETS REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	8	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F410E	1	11'-8"	STR	HORIZ, INSIDE BOT
F411E	1	10'-6"	STR	HORIZ, INSIDE TOP
F412E	1	12'-4"	STR	HORIZ, OUTSIDE BOT
F413E	1	11'-0"	STR	HORIZ, OUTSIDE TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 5 (2 PANELS, 2 SETS REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	10	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F406E	2	12'-4"	STR	HORIZONTAL, BASE
F407E	2	11'-1"	STR	HORIZONTAL, TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 6 (2 PANELS, 2 SETS REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	14	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F414E	1	14'-9"	STR	HORIZ, INSIDE BOT
F415E	1	13'-10"	STR	HORIZ, INSIDE TOP
F416E	1	15'-4"	STR	HORIZ, OUTSIDE BOT
F417E	1	14'-2"	STR	HORIZ, OUTSIDE TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 7 (4 PANELS, 4 SETS REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	5	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F418E	2	8'-3"	STR	HORIZONTAL, BASE
F419E	2	7'-1"	STR	HORIZONTAL, TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 8 (4 PANELS, 4 SETS REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	5	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F420E	2	8'-4"	STR	HORIZONTAL, BASE
F421E	2	7'-2"	STR	HORIZONTAL, TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 9*				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	11	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F422E	1	13'-9"	STR	HORIZ, INSIDE BOT
F423E	1	12'-7"	STR	HORIZ, INSIDE TOP
F424E	1	14'-2"	STR	HORIZ, OUTSIDE BOT
F425E	1	13'-0"	STR	HORIZ, OUTSIDE TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 10 (2 PANELS, 2 SETS REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	11	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F426E	1	13'-7"	STR	HORIZ, INSIDE BOT
F427E	1	12'-4"	STR	HORIZ, INSIDE TOP
F428E	1	13'-11"	STR	HORIZ, OUTSIDE BOT
F429E	1	12'-8"	STR	HORIZ, OUTSIDE TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 11 (1 PANEL, 1 SET REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	12	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F430E	1	15'-2"	STR	HORIZ, INSIDE BOT
F431E	1	14'-0"	STR	HORIZ, INSIDE TOP
F432E	1	15'-6"	STR	HORIZ, OUTSIDE BOT
F433E	1	14'-4"	STR	HORIZ, OUTSIDE TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 12 (1 PANEL, 1 SET REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	12	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F434E	1	15'-2"	STR	HORIZ, INSIDE BOT
F435E	1	14'-0"	STR	HORIZ, INSIDE TOP
F436E	1	15'-6"	STR	HORIZ, OUTSIDE BOT
F437E	1	14'-4"	STR	HORIZ, OUTSIDE TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

BILL OF REINFORCEMENT ORNAMENTAL RAILING TYPE 13 (3 PANEL, 3 SET REQUIRED)				
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F501E	12	4'-7 1/2"	BENT	VERTICAL
F502E	2	4'-11"	BENT	VERTICAL
F503E	4	4'-7 1/2"	BENT	PANEL ENDS
F438E	2	14'-3"	STR	HORIZONTAL, BASE
F439E	2	13'-1"	STR	HORIZONTAL, TOP
F544E	2	1'-5"	STR	DOWEL BARS IN DECK

\* 2 PANELS, 2 SETS REQUIRED



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308 08/14/2014  
LICENSE NO. DATE

DESIGN BY: AJN  
CAD BY: NTT  
CHECKED BY: AMK  
LAST REVISION: 05/23/2016

PARAPET AND RAILING BAR LIST AND QUANTITIES (1 OF 2)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET

B164R4

B176

**BILL OF REINFORCEMENT-PILASTER** (153 PILASTERS WITH BARS, 153 SETS REQUIRED)

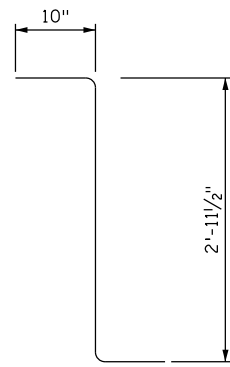
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F450E	4	4'-2 1/2"	BENT	STIRRUP, AT PANELS
F451E	6	2'-8"	BENT	STIRRUP
F452E	4	0'-9"	STR	VERTICAL, AT BASE
F453E	4	3'-6 3/4"	STR	VERTICAL

**BILL OF REINFORCEMENT BRIDAL VEIL FALLS CONNECTION**

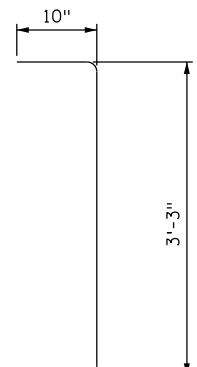
BAR MARK	NO	LENGTH	SHAPE	LOCATION
F354E	5	4'-3"	BENT	STIRRUP
F555E	1	2'-5"	STR	VERTICAL
F556E	2	3'-1"	STR	VERT. DOWEL, CORNER
F557E	2	3'-4"	STR	VERTICAL DOWEL
F558E	2	3'-7"	STR	VERTICAL DOWEL
F459E	3	2'-10"	BENT	STIRRUP DOWEL
F460E	3	2'-10"	BENT	STIRRUP DOWEL
F361E	5	2'-3"	BENT	STIRRUP, CORNER

**SUMMARY OF QUANTITIES FOR ORNAMENTAL RAILING**

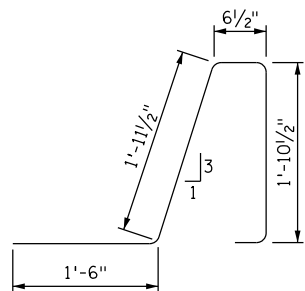
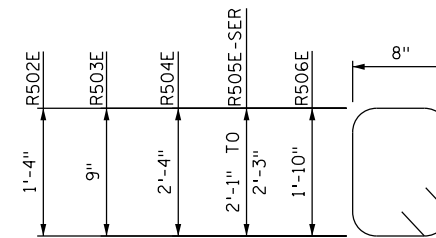
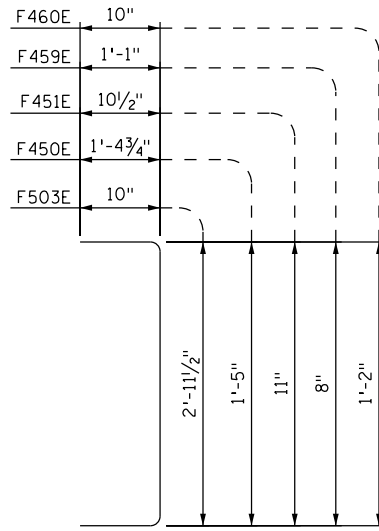
ITEM	UNIT	QUANTITY TOTAL	
① STRUCTURAL CONCRETE (3Y46)	CY	67	47,374
TYPE MOD P-2 (TL-2) RAILING CONCRETE	LF	<del>1454</del> 1427	<del>47,078</del> 1440
①④ REINFORCEMENT BARS (EPOXY COATED)	LBS	45,097	44,985
② STRUCTURAL STEEL (3310)	LBS	<del>6110</del> 6997	8850
③ STRUCTURAL STEEL (3361)	LBS	17,005	
STRUCTURAL TUBE RAILING DESIGN T-1	LF	<del>2235</del> 2205	2221
⑤ PRECAST TYPE MODIFIED P-2 (TL-2) RAILING CONCRETE (3Y46)	LF	764	
PRECAST CONCRETE ORNAMENTAL RAILING	LF	<del>2117</del>	2122
ANCHORAGES TYPE 1	EA	6	
ANCHORAGES TYPE 3	EA	12	



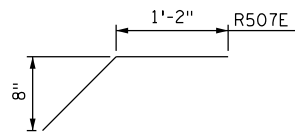
F501E



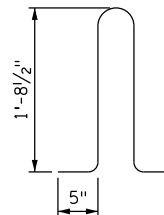
F502E



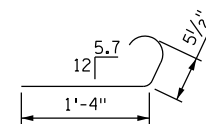
R501E



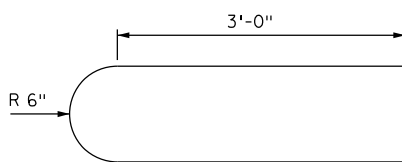
R507E



F354E



F361E



R727E

**NOTES:**

- ① INCLUDES PILASTERS AND BRIDAL VEIL FALLS CONNECTION.
- ② INCLUDES PLATES, SHAPES AND ANGLES.
- ③ INCLUDES HSS SHAPES.
- ④ INCLUDES CAST-IN-PLACE INTERIOR PARAPETS.
- ⑤ INCLUDES 11,130 LBS REINFORCEMENT BARS (EPOXY COATED).
6. "-SER" INDICATES A SERIES BAR.



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*Daniel F. Enser*

DANIEL F. ENSER, PROFESSIONAL ENGINEER

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DESIGN BY: AJN  
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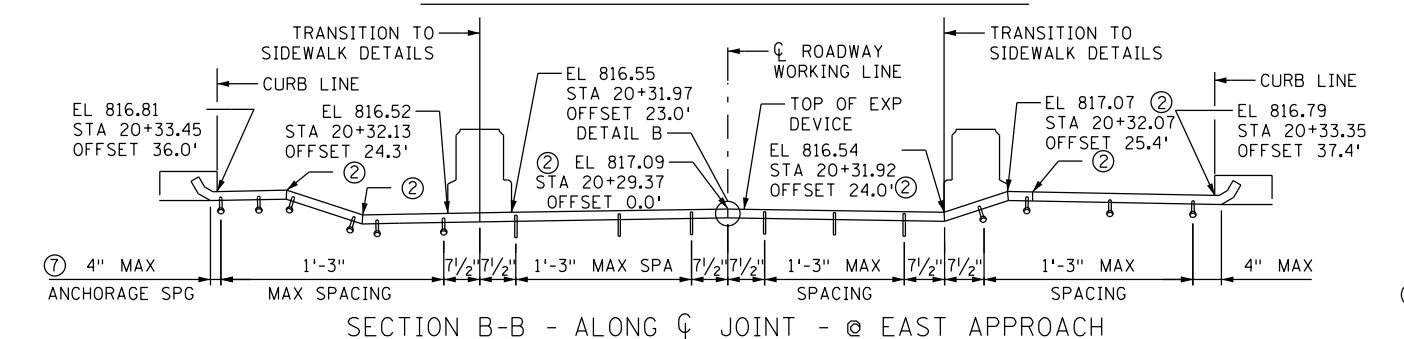
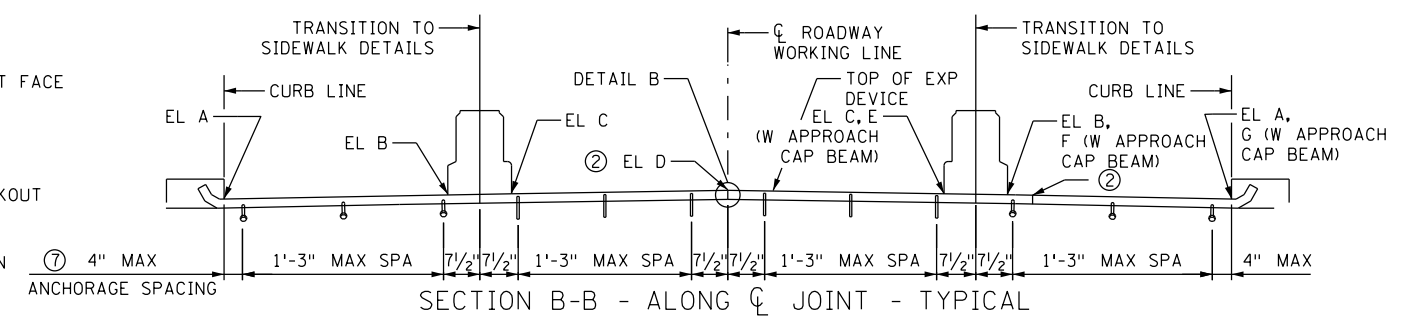
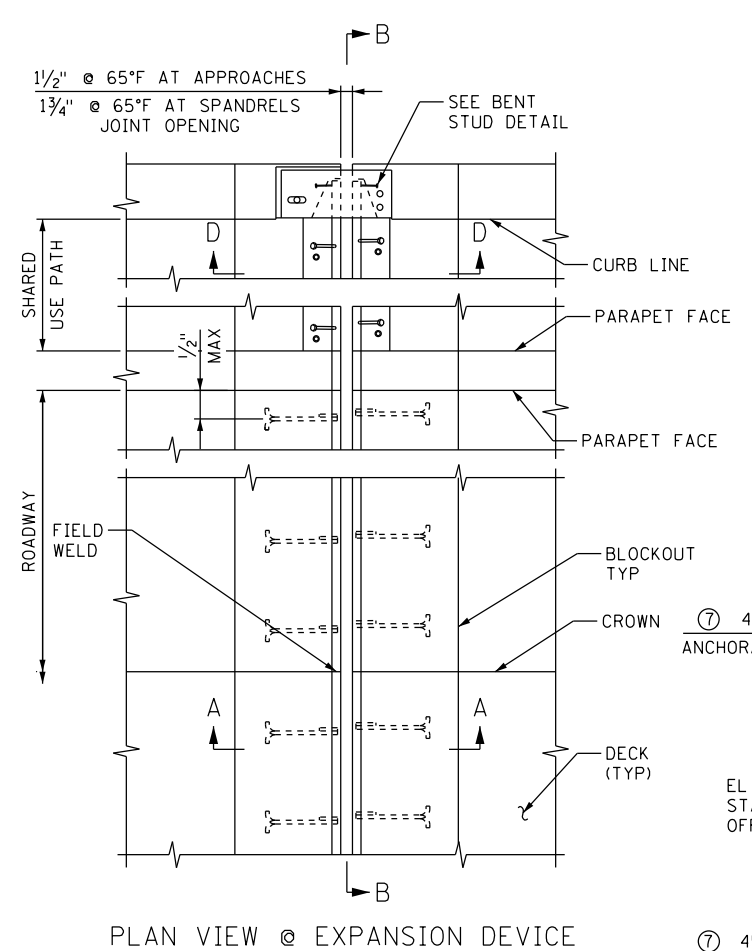
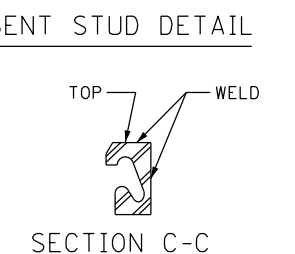
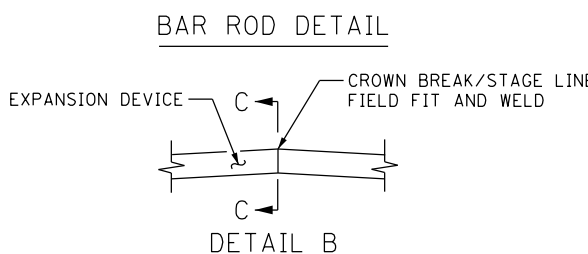
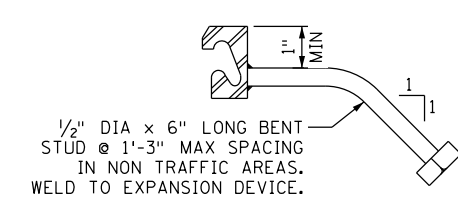
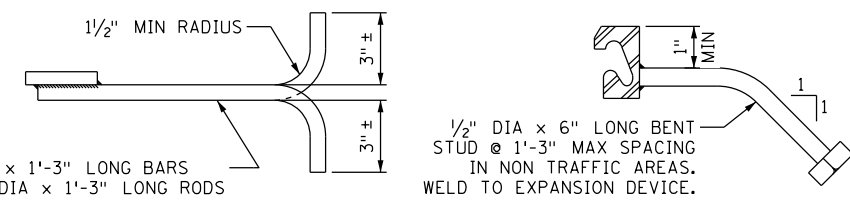
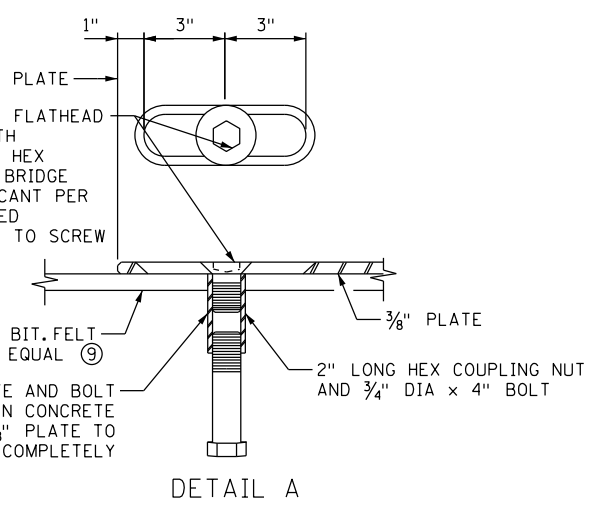
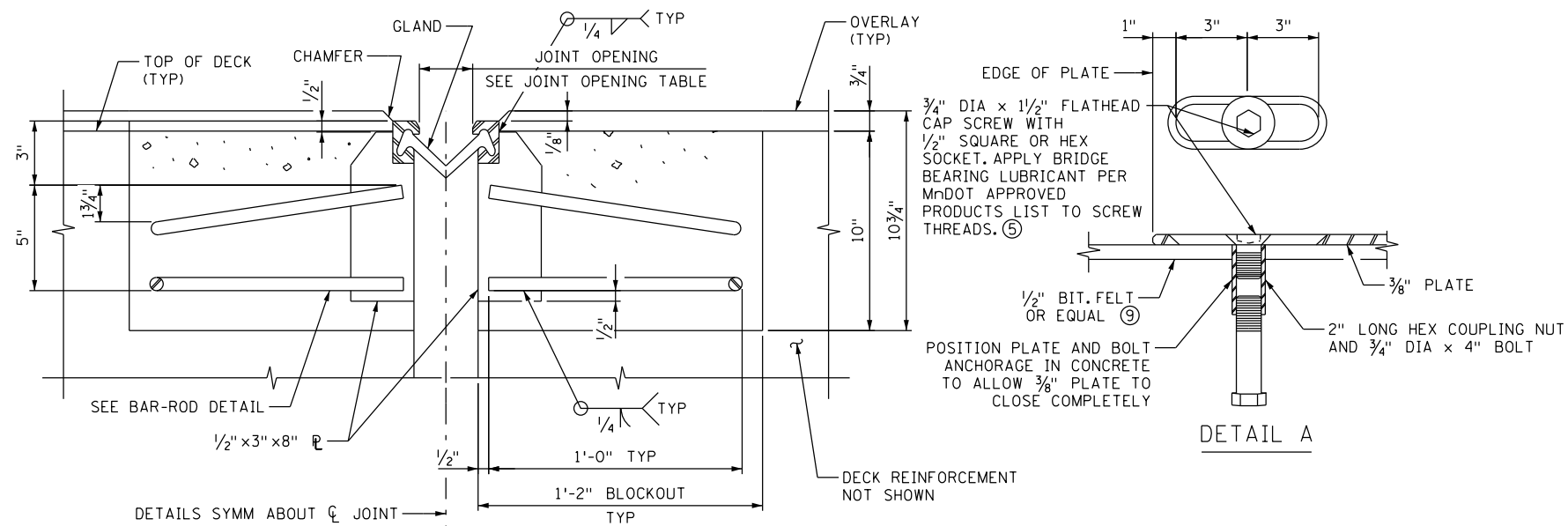
**PARAPET AND RAILING BAR LIST AND QUANTITIES (2 OF 2)**

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

**SHEET**

B165R4

B176



JOINT ELEVATION TABLE								
LOCATION	STATION	A	B	C	D	E	F	G
		WORKING LINE OFFSET (FT)						
WEST APPROACH	9+80.06	822.10	-	-	-	-	-	-
	9+81.31	-	822.44	-	-	-	-	-
	9+81.40	-	-	822.48	-	-	-	-
	9+82.41	-	-	-	822.78	-	-	-
	9+81.47	-	-	-	-	822.47	-	-
	9+81.40	-	-	-	-	-	822.44	-
9+80.48	-	-	-	-	-	-	822.08	
		WORKING LINE OFFSET (FT)						
		31.0	14.3	13.0	0.0			
SC 2-3	11+57.90	824.92	825.25	825.28	825.54	N/A	N/A	N/A
SC 3-5	14+49.35	831.19	831.52	831.55	831.81			
SC 3-9	15+64.19	831.04	831.37	831.40	831.66			
		WORKING LINE OFFSET (FT)						
		36.0	24.3	23.0	0.0	N/A	N/A	N/A
SC 4-4	18+55.65	822.45	822.68	822.71	823.17			

SC DENOTES SPANDREL COLUMN  
ALL STATIONS ARE TAKEN AT WORKING LINE

JOINT OPENING [IN] TABLE						
LOCATION	STATION	TEMPERATURE				
		-30°F	45°F	65°F	90°F	120°F
WEST APPROACH	9+82.37	1.857	1.575	1.50	1.406	1.293
SC 2-3	11+57.90	3.821	2.186	1.75	1.205	0.551
SC 3-5	14+49.35	3.314	2.079	1.75	1.338	0.844
SC 3-9	15+64.19	3.300	2.076	1.75	1.342	0.853
SC 4-4	18+55.65	3.807	2.183	1.75	1.209	0.560
EAST APPROACH	20+29.45	1.851	1.574	1.50	1.407	1.296

SC DENOTES SPANDREL COLUMN  
ALL STATIONS ARE TAKEN AT WORKING LINE

NOTES:

1. GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER SPEC. 3394. GALVANIZE FASTENERS AS PER SPEC. 3392.
2. JOINTS IN EXTRUSION SHALL BE LOCATED AT BREAKS IN TRANSVERSE PROFILE AND AT STAGED CONSTRUCTION LIMITS. JOINTS SHALL BE CLOSE FIT AND WELDED. REPAIR AFTER WELDING AS PER SPEC. 2471.3L.
3. STRUCTURAL STEEL SHALL COMPLY WITH SPEC. 3306 OR SPEC. 3309.
4. EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF 1/8" IN 10 FT.
5. 3/4" DIA FLATHEAD CAP SCREW WITH 1/2" SQUARE OR HEX SOCKET PER SPEC. 3391. CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE. APPLY BRIDGE BEARING LUBRICANT PER MNDOT APPROVED PRODUCTS LIST TO SCREW THREADS.
6. LENGTH OF PAYMENT FOR DEVICE IS FROM OUT TO OUT OF EXTRUSION ALONG CENTERLINE OF JOINT.
7. DIMENSIONS ARE ALONG CENTERLINE OF JOINT.
8. PLACE BAR-ROD NORMAL TO JOINT.
9. USE THE LARGEST SINGLE PIECE POSSIBLE. USE OF SMALL PIECES OF SCRAPS SECURED TOGETHER IS PROHIBITED.
10. FOR EXPANSION JOINT LOCATIONS, SEE SHEETS B119 TO B122 (DECK PLAN).
11. FOR DECK REINFORCEMENT DETAILS, SEE SHEETS B125 TO B140 (DECK PANEL DETAILS AND DECK DETAILS).
12. FOR THE LOCATION OF DETAIL A AND FOR SECTION D-D, SEE SHEET B167 (EXPANSION JOINT DETAILS 2 OF 2).

1 SEE EXPANSION JOINT SHOP DRAWING 57 FOR DETAILS.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308 8/14/2014  
LICENSE NO. DATE

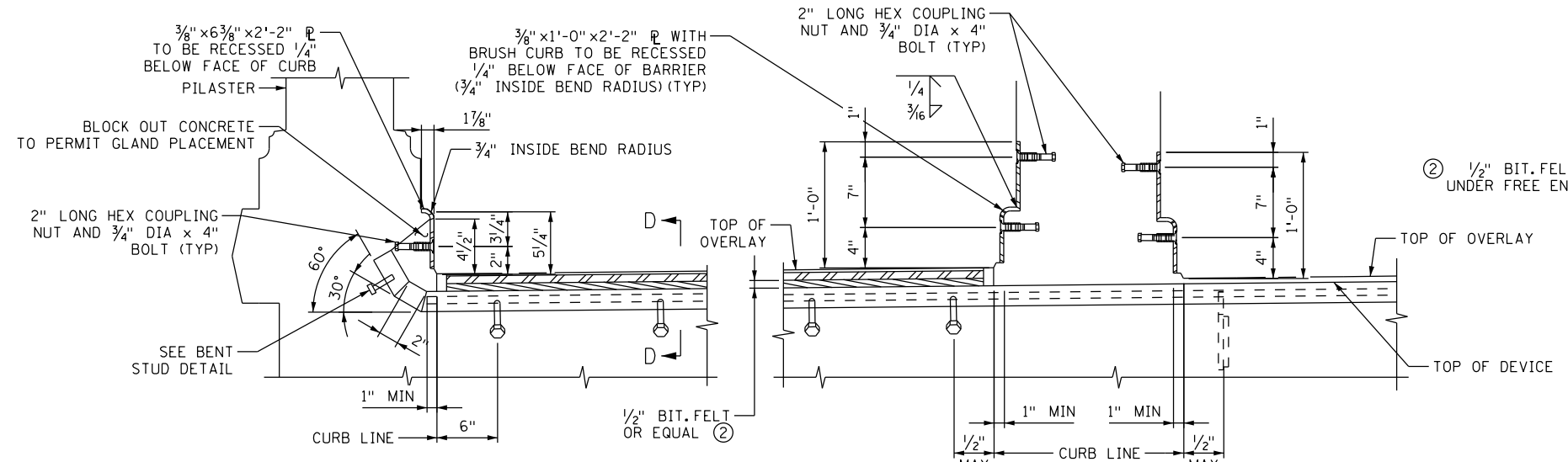
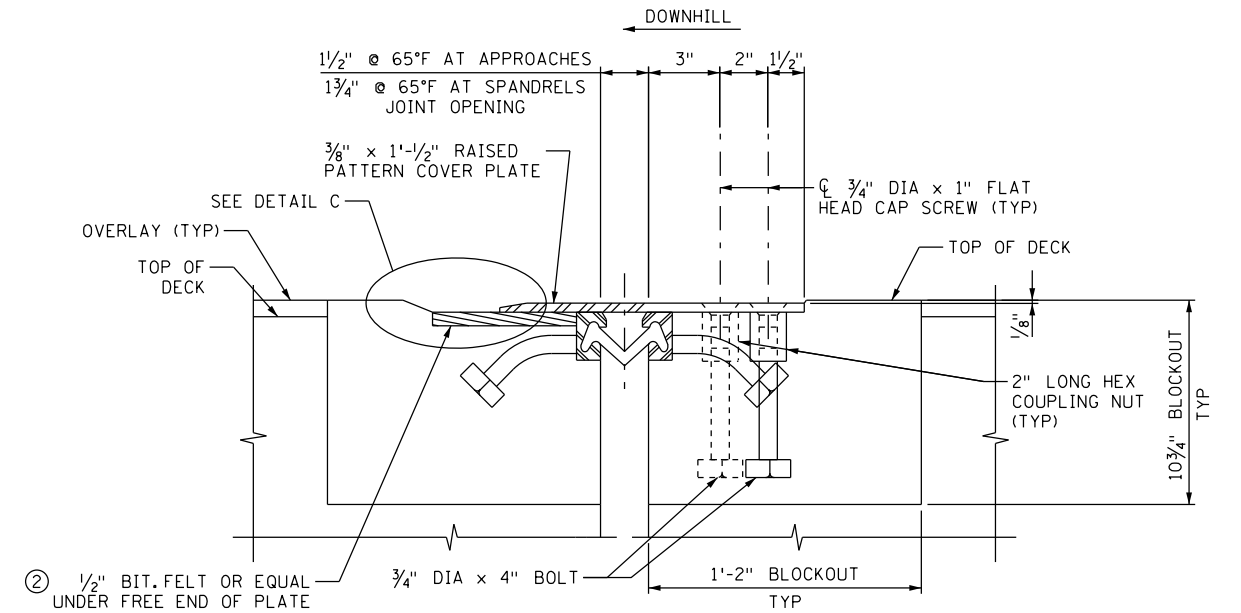
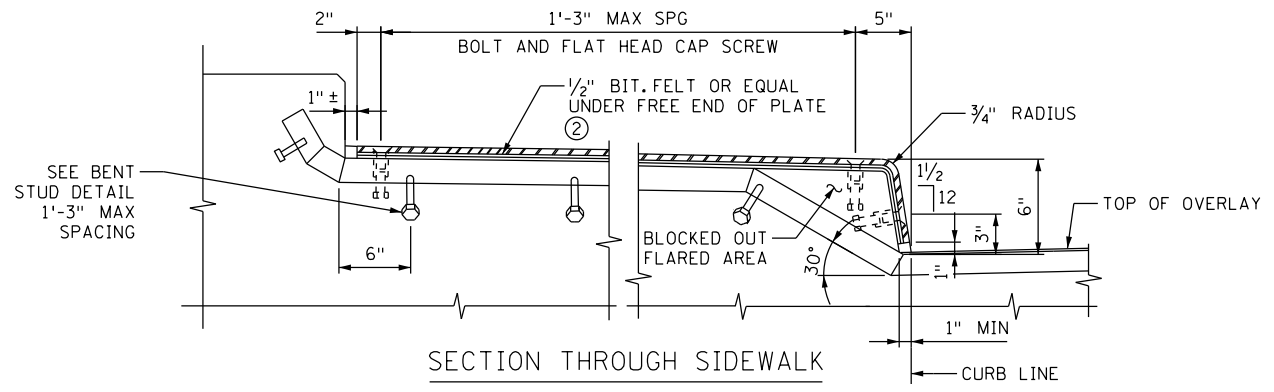
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AS-BUILT - EXPANSION JOINT DETAILS (1 OF 2)

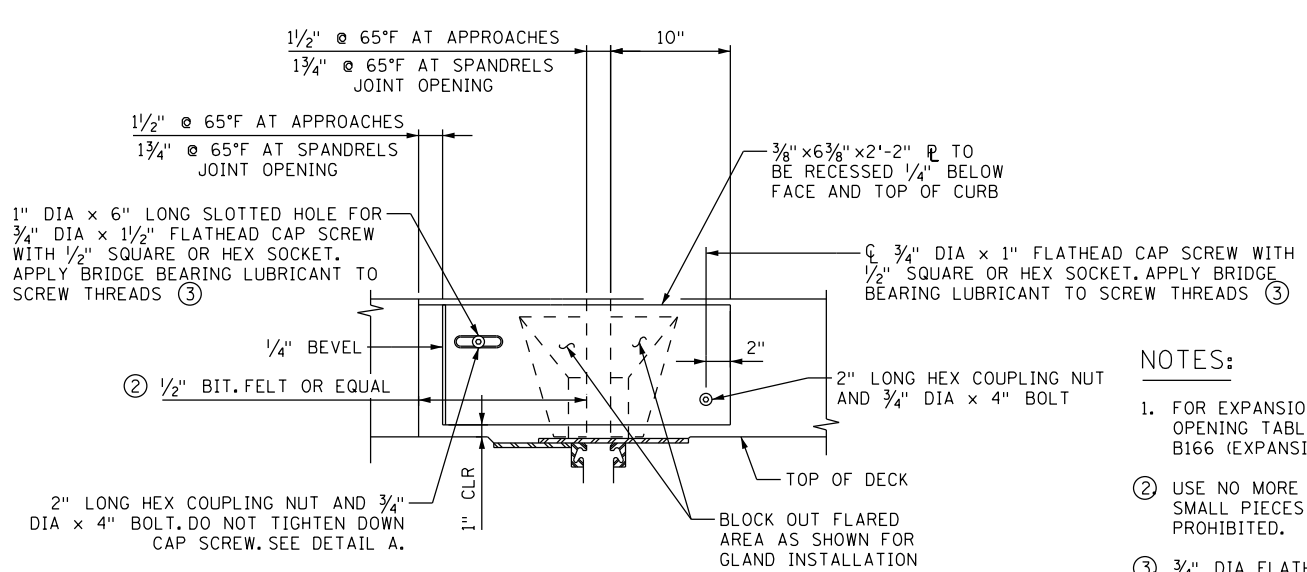
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SHEET  
B166R  
B176





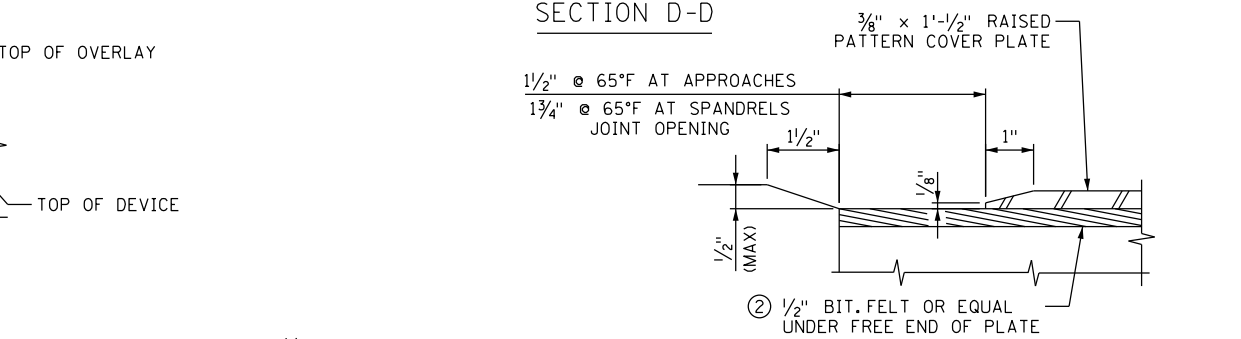
CONCRETE CURB SECTION THROUGH BARRIER AND CURB



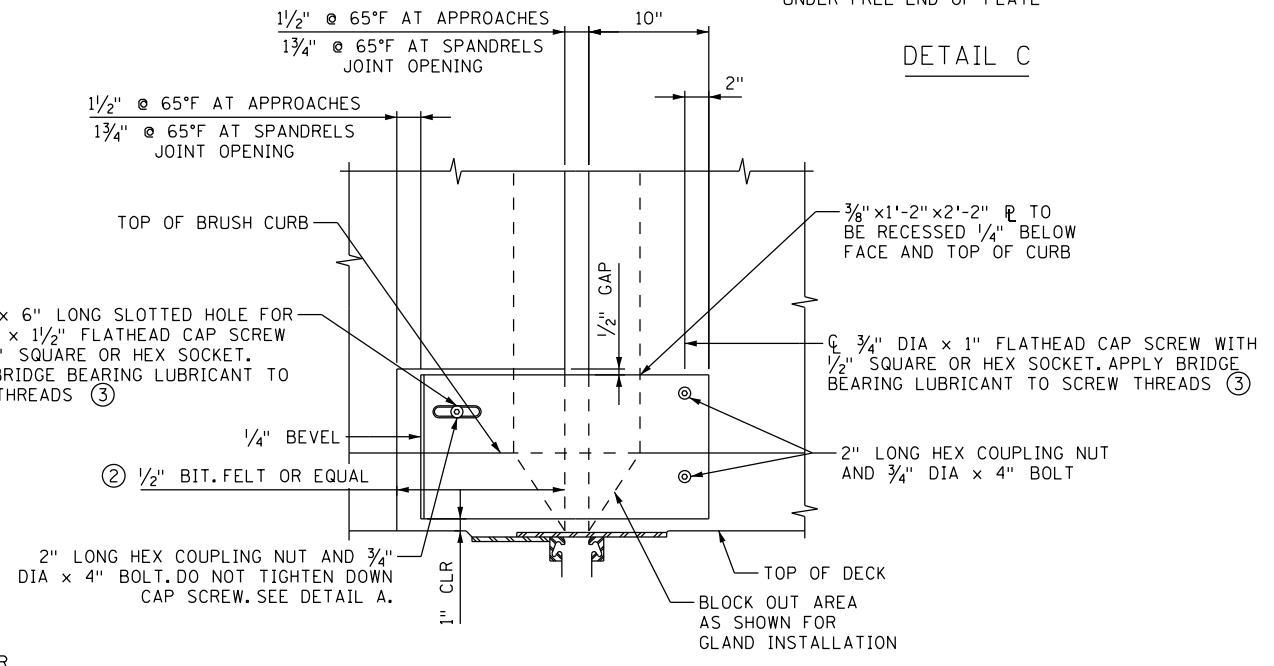
INSIDE ELEVATION OF CONCRETE CURB

NOTES:

1. FOR EXPANSION JOINT NOTES, DETAIL A, JOINT OPENING TABLE, AND BENT STUD DETAIL, SEE SHEET B166 (EXPANSION JOINT DETAILS 1 OF 2).
2. USE NO MORE THAN 3 PIECES. USE OF SMALL PIECES OF SCRAPS SECURED TOGETHER IS PROHIBITED.
3. 3/4\"/>



DETAIL C



ELEVATION OF TYPE P-2 PARAPET



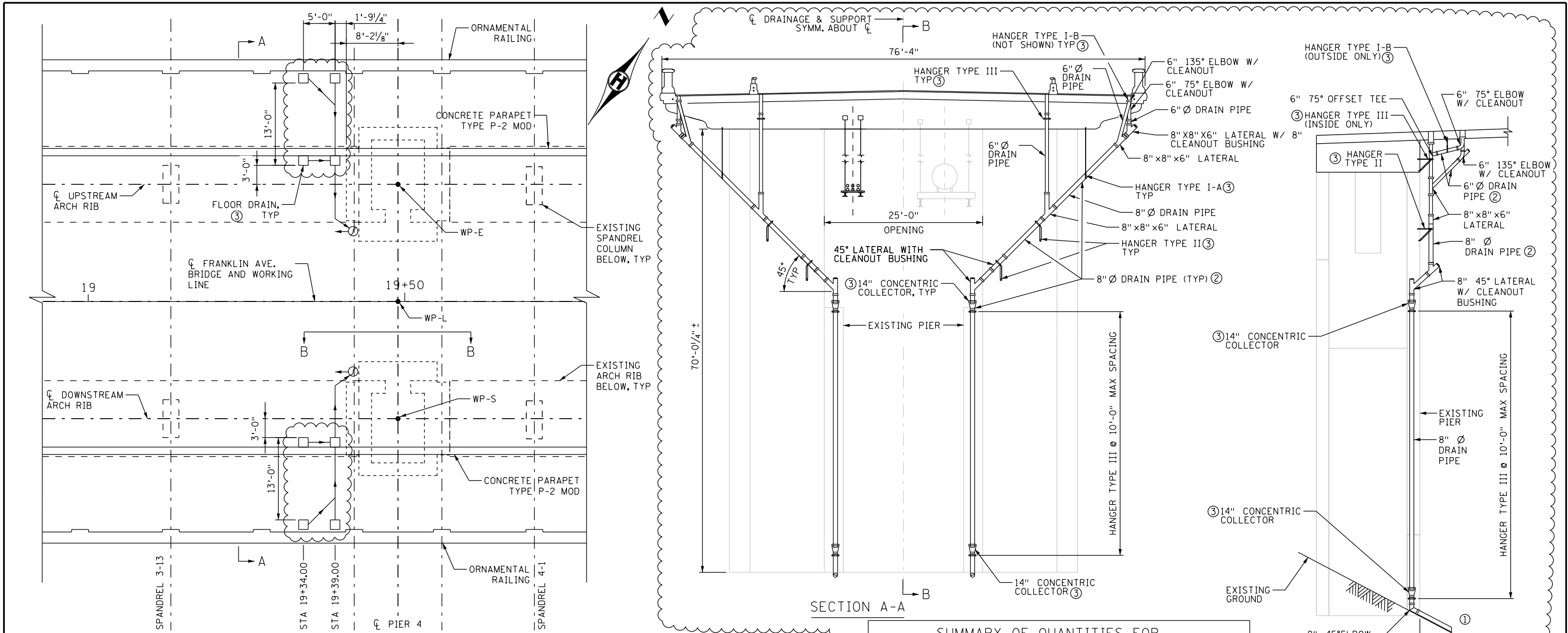
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
**DANIEL F. ENSER, PROFESSIONAL ENGINEER**  
 41308 LICENSE NO. 8/14/2014 DATE

DESIGN BY: FP  
 CAD BY: FP  
 CHECKED BY: CB  
 LAST REVISION: 12/03/2015

EXPANSION JOINT DETAILS (2 OF 2)  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

SHEET  
 B167R2  
 B176



**NOTES:**

1. REMOVE EXISTING ABOVE GROUND DRAINAGE PIPES, SCUPPERS, AND SUPPORT BRACKETS ON PIERS 1, 2, 3 AND 4. REMOVAL PAID AS PART OF "REMOVE CONCRETE BRIDGE DECK".
2. DRAINAGE ELEMENTS SHALL REMAIN INPLACE AND FUNCTIONAL UNTIL THE REMOVAL OF THE DECK.
3. ABANDON EXISTING MANHOLE AT PIER ONE, FILL THE EXISTING MANHOLE WITH GRANULAR MATERIAL. PLUG INLET AND OUTLET PIPES PRIOR TO FILLING. REMOVE CASTING, AND REMOVE MANHOLE STRUCTURE WITHIN AT LEAST ONE FOOT BELOW EXISTING GROUND. CAP WITH METAL PLATE. BACKFILL AND RESTORE EXISTING GROUND.
4. ALTERNATE SCUPPER DESIGN MUST HAVE EQUAL OR GREATER FREE OPEN AREA AND BE SUBMITTED FOR REVIEW AND ACCEPTANCE BY THE ENGINEER.
5. UNLESS NOTED OTHERWISE, ENTIRE DRAINAGE SYSTEM SHALL BE CONSTRUCTED OF FIBERGLASS PIPE OF THE DIAMETER SHOWN ON THE PLAN, SEE SPECIAL PROVISIONS. UNLESS OTHERWISE NOTED, CONNECTIONS OR FITTINGS SHALL BE THE INDUSTRY STANDARD FOR THIS APPLICATION TO ACHIEVE A DURABLE, LOW MAINTENANCE AND WATERTIGHT OVERALL SYSTEM.
6. WORKMANSHIP AND FABRICATION PER MNDOT SPEC. 2471.
7. GALVANIZE BOLTS, NUTS, WASHERS, RODS, AND INSERTS FOR PIPE BRACKET AND HANGERS PER MNDOT SPEC. 3392.
8. PIPE CLAMPS SHALL FIT TIGHT AROUND DRAIN PIPE, PROVIDE SPACER AS REQUIRED. SPACERS TO BE ACCEPTED BY ENGINEER.
9. HANGERS TO BE PAINTED IN ACCORDANCE WITH THE MNDOT STANDARD SPEC 2478 INCIDENTAL TO "BRIDGE DRAINAGE SYSTEM" LUMP SUM. PAINT COLOR SHALL BE ACCEPTED BY THE ENGINEER AND SHALL MATCH THE COLOR OF THE CONCRETE COATING.
10. THE DECK DRAIN UNIT SHALL BE ADEQUATELY BRACED AND SUPPORTED DURING PRECAST DECK PANEL CONCRETE PLACEMENT SUCH THAT THE FINAL POSITION AND GRADE OF THE CASTING ARE CORRECT PER THESE PLANS.
11. CONTRACTOR SHALL SUBMIT ALL SHOP DRAWINGS FOR ACCEPTANCE. SHOP DRAWINGS SHALL SHOW COMPLETE DETAILS OF DRAINAGE SYSTEM INCLUDING, BUT NOT LIMITED TO, ALL ITEMS DETAILED ON DRAINAGE DETAIL DRAWINGS.
12. ALL ELEVATIONS AND PIPE OFFSET DIMENSIONS ARE BASED ON THEORETICAL FINAL PROFILE GRADE. SHIMS MAY BE REQUIRED IF ACTUAL CAMBERS AND ELEVATIONS ARE DIFFERENT THAN PREDICTED.

**SUMMARY OF QUANTITIES FOR BRIDGE DRAINAGE SYSTEM**

ITEM	UNIT	QUANTITY TOTAL
FLOOR DRAIN ASSEMBLY	EACH	8
6" Ø DRAIN PIPE	LIN. FT.	86
8" Ø DRAIN PIPE	LIN. FT.	194
8" Ø DRAIN 45° ELBOW	EACH	2
6" Ø DRAIN FLANGE	EACH	8
HANGER TYPE I-A (SIZE VARIES)	EACH	2
HANGER TYPE I-B (SIZE VARIES)	EACH	4
HANGER TYPE II (SIZE VARIES)	EACH	4
HANGER TYPE III (SIZE VARIES)	EACH	16
8" - 14" Ø DRAIN CONCENTRIC COLLECTOR	EACH	4
6" Ø DRAIN 75° ELBOW W/ CLEANOUT	EACH	2
6" Ø DRAIN 75° OFFSET TEE	EACH	2
8" Ø DRAIN Y (8" MAINLINE AND 6" LATERAL) W/ CLEANOUT BUSHING	EACH	2
6" Ø DRAIN 135° ELBOW W/ CLEANOUT	EACH	2
8" Ø DRAIN Y (8" MAINLINE AND 8" LATERAL) W/ CLEANOUT BUSHING	EACH	4
8" Ø DRAIN Y (8" MAINLINE AND 6" LATERAL)	EACH	4

APPROXIMATE QUANTITIES PROVIDED ARE FOR INFORMATION ONLY AND ARE NOT INTENDED TO BE ALL INCLUSIVE OF REQUIREMENTS OF THE DRAINAGE SYSTEM. PAYMENT WILL BE MADE UNDER THE LUMP SUM ITEM "DRAINAGE SYSTEM BRIDGE DECK".

**NOTES:**

- ① RIP RAP CLASS II PER MNDOT STD PLATE 3133. AT MINIMUM, USE QUANTITIES LISTED ON STD PLATE FOR 12" PIPE.
- ② MINIMUM SLOPE ON ALL DRAIN PIPES 1:4 (V:H)
- ③ SEE BRIDGE DRAINAGE SHEETS B169 AND B170 FOR ADDITIONAL INFORMATION.
- ④ SEE PIER 4 DRAINAGE SYSTEM SHOP DRAWING 179 FOR DETAILS.



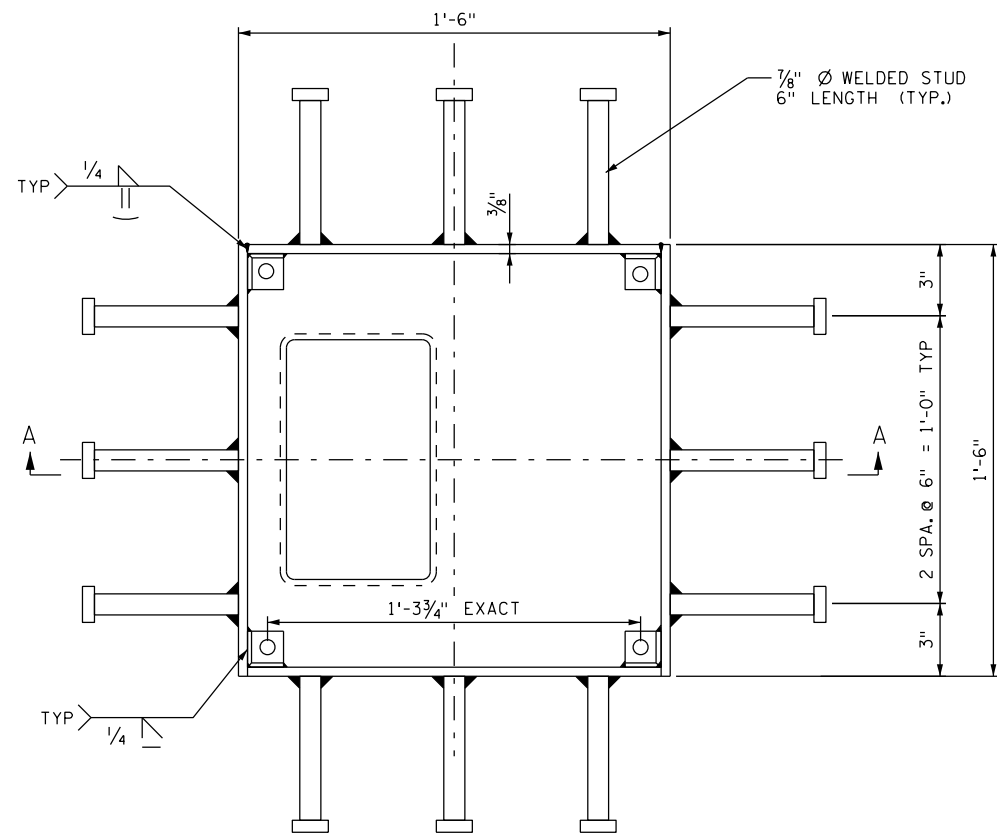
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Karen L. Allen*  
**KAREN L. ALLEN, PROFESSIONAL ENGINEER**  
 16119 LICENSE NO. 8/14/2014 DATE

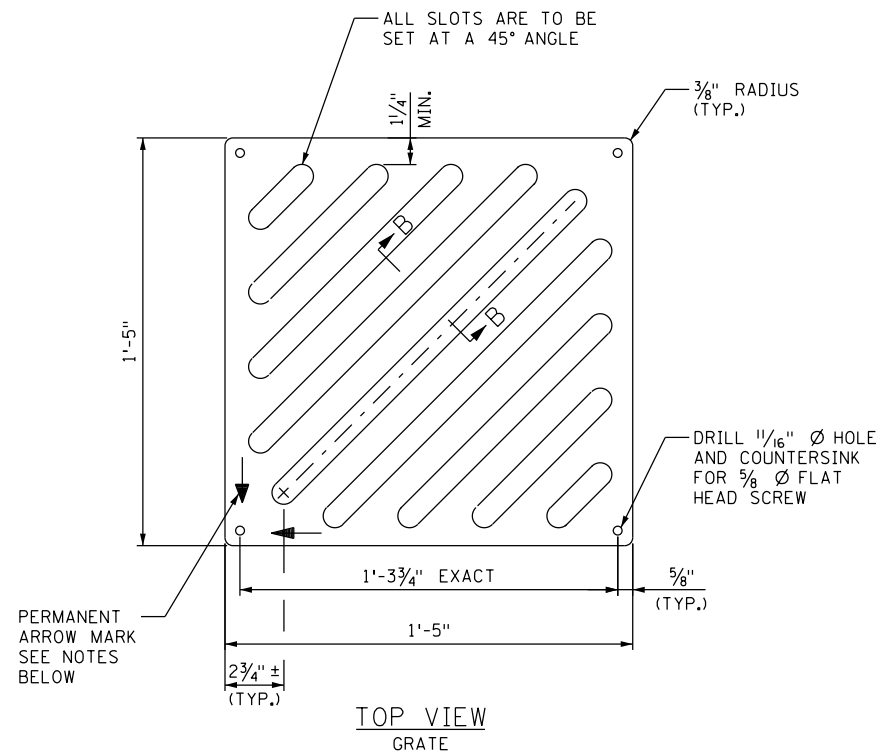
**DESIGN BY:** KLA  
**CAD BY:** RAM/SJL  
**CHECKED BY:** AJN  
**LAST REVISION:** 8/15/2016

**AS-BUILT - BRIDGE DRAINAGE LAYOUT**  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

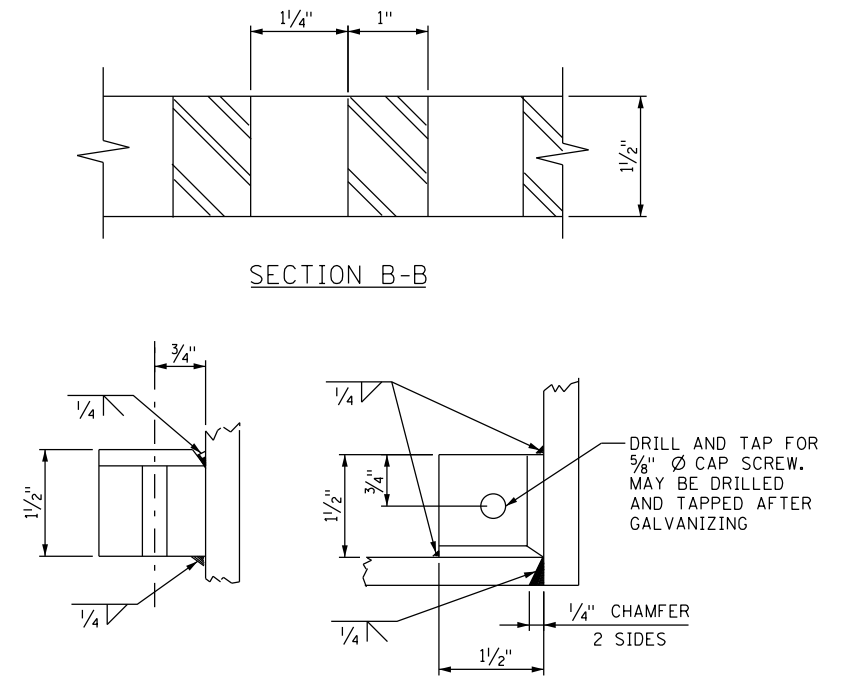
**SHEET**  
 B168R2  
 B176



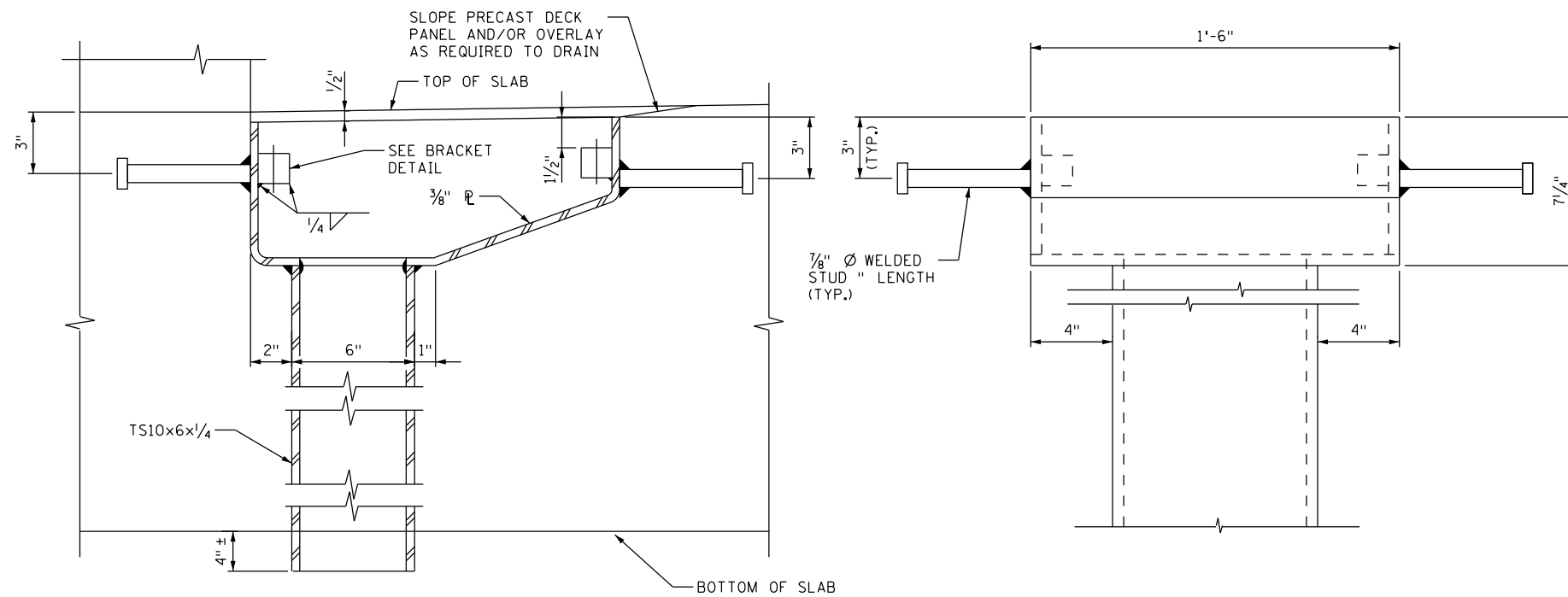
TOP VIEW  
FLOOR DRAIN



TOP VIEW  
GRATE



BRACKET DETAIL



SECTION A-A

FRONT VIEW

NOTES:

1. ALL STEEL PLATES PER Mn/DOT SPEC. 3306. CAST IRON MAY BE USED AS AN ALTERNATE. FABRICATE GRATE USING AUTOMATICALLY CONTROLLED CUTTING TORCH.
2. CAST IRON GRATE, PER Mn/DOT SPEC. 3321, CLASS 35B, MAY BE USED AS AN ALTERNATE.
3. WORKMANSHIP AND FABRICATION PER Mn/DOT SPEC. 2471.
4. BLAST CLEAN FLOOR DRAIN AND GRATE AFTER FABRICATION. GALVANIZE, EXCEPT CAST IRON, PER Mn/DOT SPEC. 3394.
5. GALVANIZE HARDWARE PER Mn/DOT SPEC. 3392.
6. INSTALL GRATE WITH ARROW ON CURB SIDE AND IN DIRECTION OF FLOW.
7. MATERIAL ON THIS DETAIL SHALL BE INCLUDED IN SCUPPER ASSEMBLY.
8. GRATE OPENING AREA IS 106 SQ. IN.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

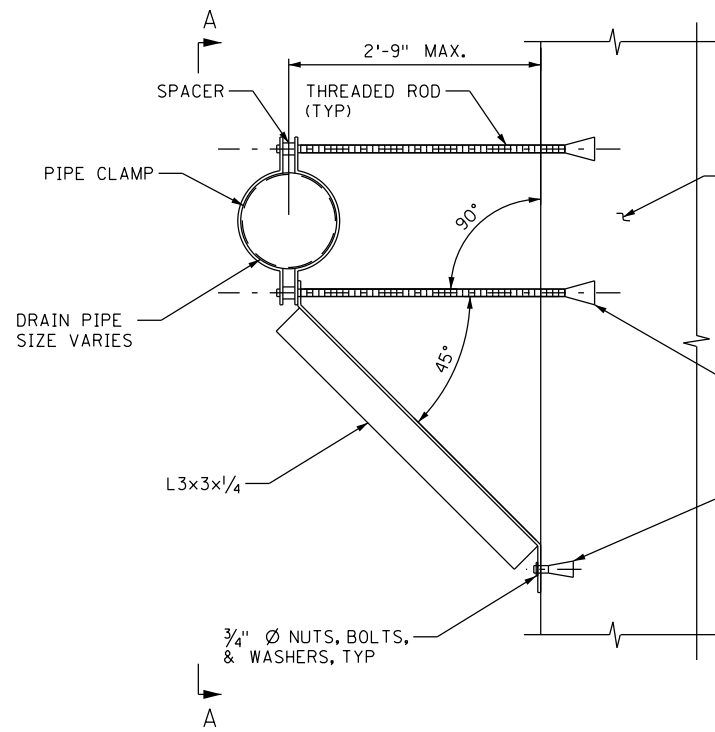
*Aaron J. Nelson*  
AARON J. NELSON, PROFESSIONAL ENGINEER

43101 8/14/2014  
LICENSE NO. DATE

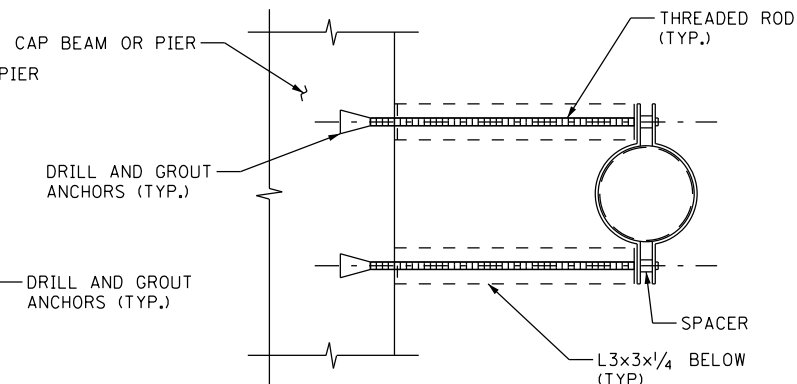
DESIGN BY: RAM  
CAD BY: SJL  
CHECKED BY: AJN  
LAST REVISION:

BRIDGE DRAINAGE DETAILS (1 OF 2)  
C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

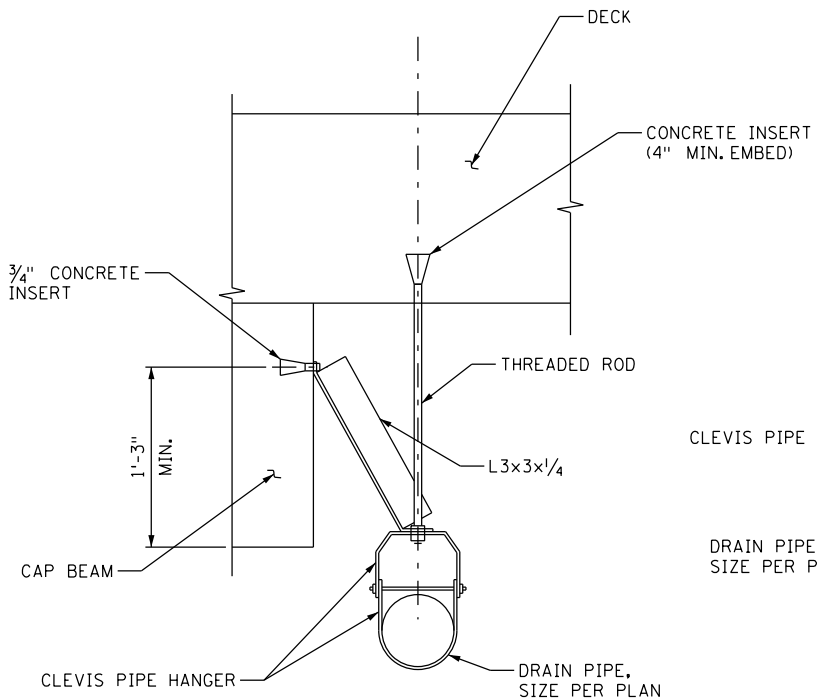
SHEET  
B169  
B176



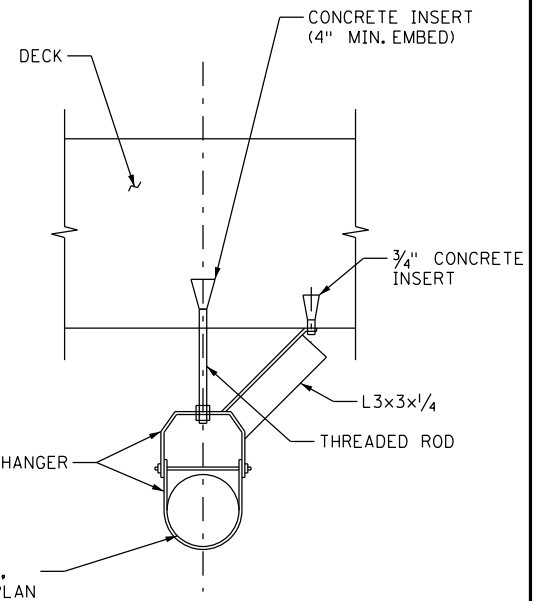
HANGER TYPE II



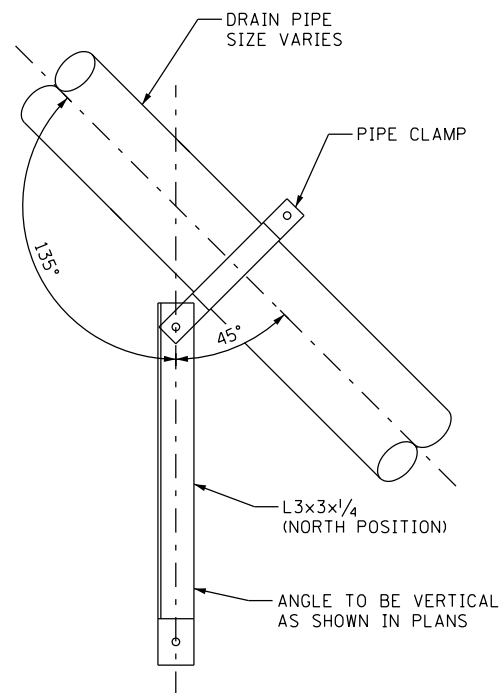
SECTION B-B



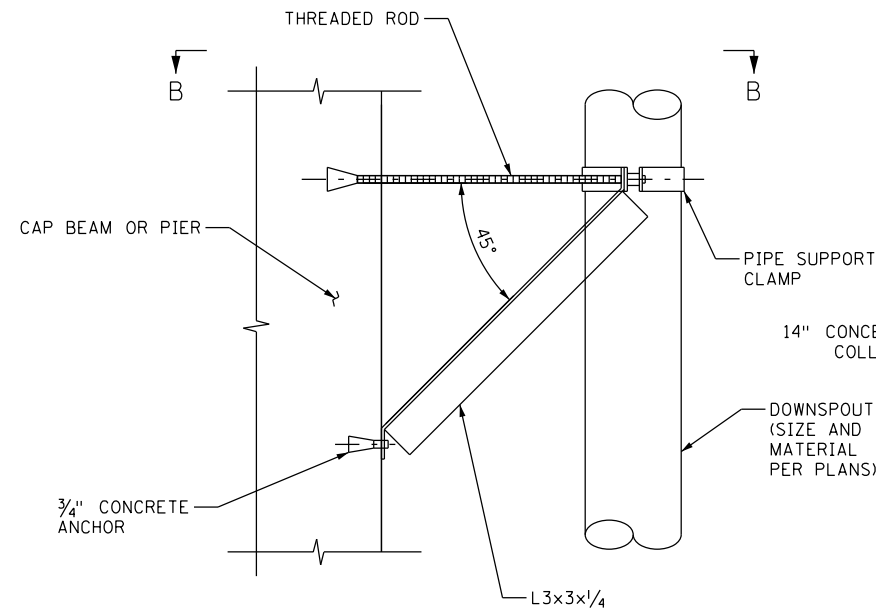
HANGER TYPE I-A



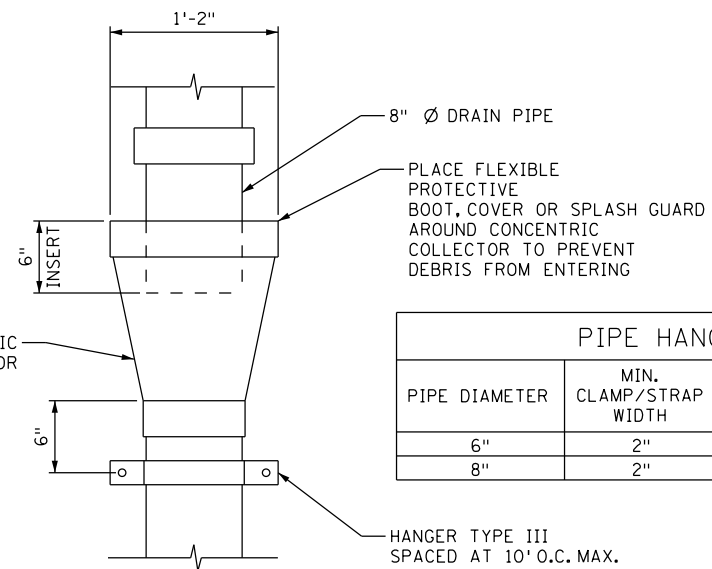
HANGER TYPE I-B



SECTION A-A  
HANGER ON NORTH COLUMN SHOWN,  
MIRROR FOR SOUTH COLUMN HANGER



HANGER TYPE III  
DOWNSPOUT PIPE CLAMP HANGER



CONCENTRIC COLLECTOR DETAIL  
CONNECTION TO DOWNSPOUT

PIPE HANGER DIMENSION TABLE				
PIPE DIAMETER	MIN. CLAMP/STRAP WIDTH	MIN. ROD/BOLT DIAMETER	MIN. SAFE SERVICE LOAD	MIN. HANGER SPACING
6"	2"	3/4"	2500 LBS	10'
8"	2"	3/4"	2500 LBS	10'

NOTES:

- PIPE SUPPORTS SHALL BE PLACED WITHIN 5'-0" OF EACH END OF THE PIPE AND AT MAXIMUM INTERVAL OF 10'-0" O.C.
- PIPE SUPPORTS, STEEL STRUTS, HARDWARE, AND CONCRETE INSERTS SHALL BE GALVANIZED STEEL.

1 SEE BRIDGE DRAINAGE HANGER SYSTEM SHOP DRAWING 135 FOR DETAILS.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308 8/14/2014  
LICENSE NO. DATE

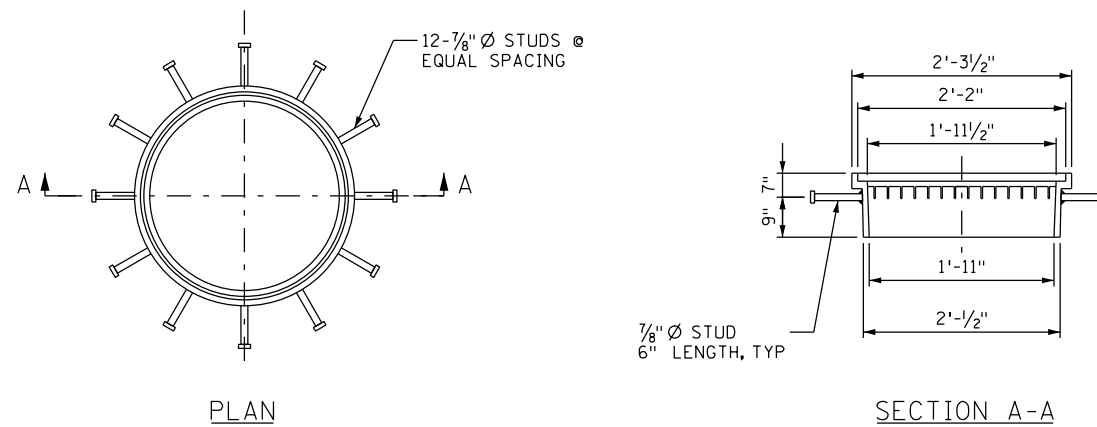
DESIGN BY: RAM  
CAD BY: SJL  
CHECKED BY: AJN  
LAST REVISION: 08/15/2016

AS-BUILT - BRIDGE DRAINAGE DETAILS (2 OF 2)

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET

B170R  
B176



STANDARD MANHOLE CASTING

NOTES:

1. ALL STEEL PLATES PER Mn/DOT SPEC. 3306. CAST IRON MAY BE USED AS AN ALTERNATE.
2. WORKMANSHIP AND FABRICATION PER Mn/DOT SPEC. 2471.
3. BLAST CLEAN MANHOLE CASTING AFTER FABRICATION. GALVANIZE, EXCEPT CAST IRON, PER Mn/DOT SPEC. 3394.
4. GALVANIZE HARDWARE PER Mn/DOT SPEC. 3392.
5. FOR MANHOLE COVER DETAILS, SEE STANDARD PLATE NO. WATR-2000A-R2, STANDARD MANHOLE.
6. CASTING TO PROJECT BELOW BRIDGE DECK TO ACT AS A DRIP CATCH.
7. MANHOLE COVER SHALL BE RATED FOR A WHEEL LOAD CAPACITY OF AT LEAST 16,000 POUNDS.
8. COVER SHALL BE LOCKABLE WITH TAMPERPROOF BOLTS THAT ARE RECESSED.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Aaron J. Nelson*  
 AARON J. NELSON, PROFESSIONAL ENGINEER

43101 8/14/2014  
 LICENSE NO. DATE

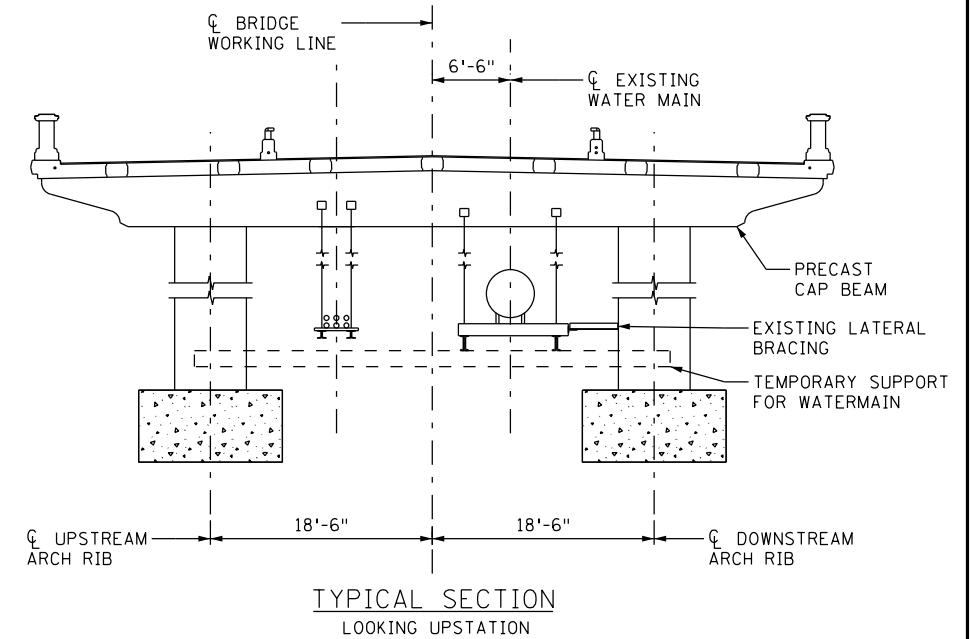
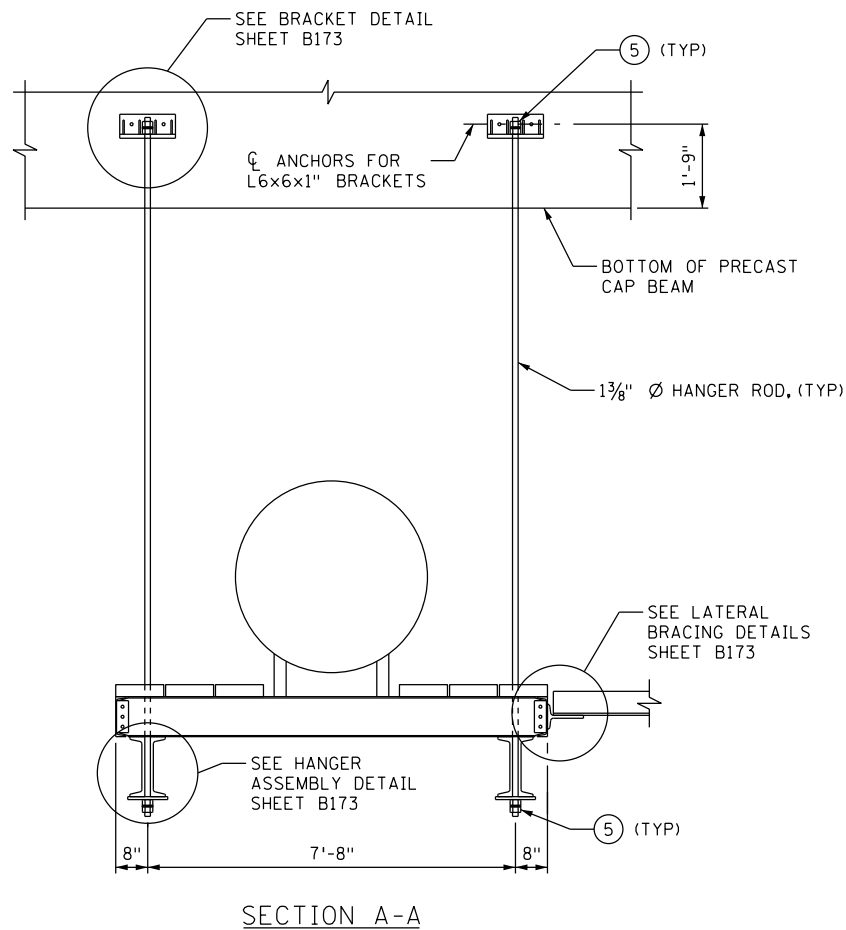
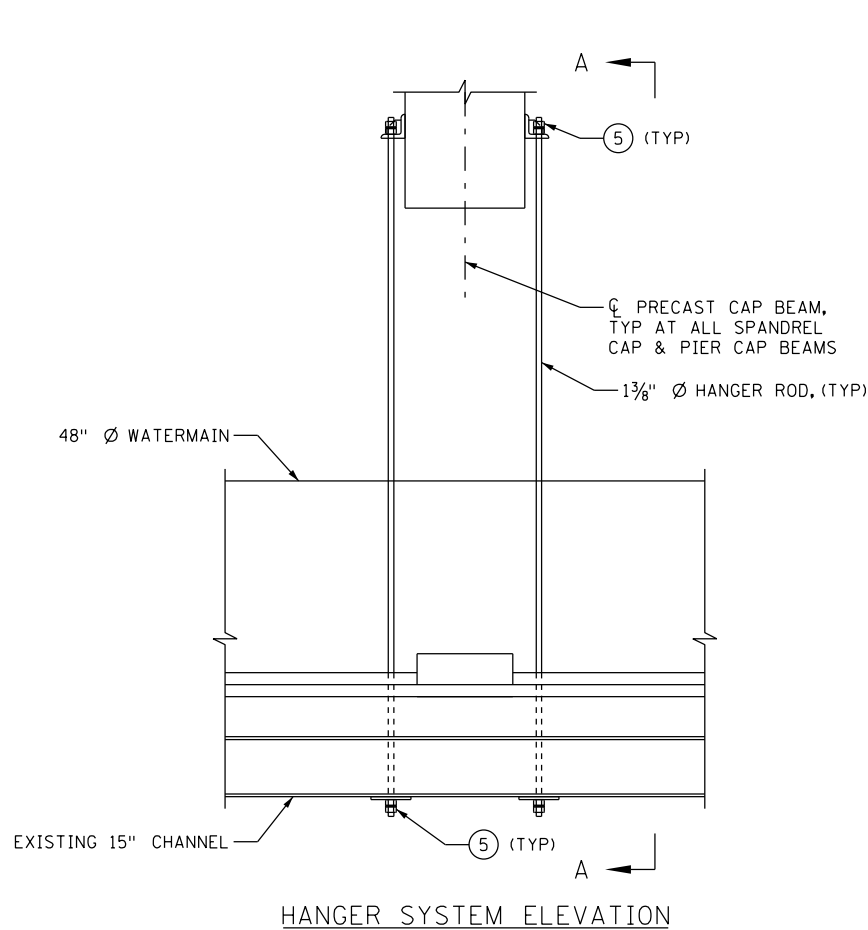
DESIGN BY: AJN  
 CAD BY: NTT  
 CHECKED BY: DFE  
 LAST REVISION: 10/08/2014

MANHOLE DETAILS  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

SHEET  
 B171R  
 B176

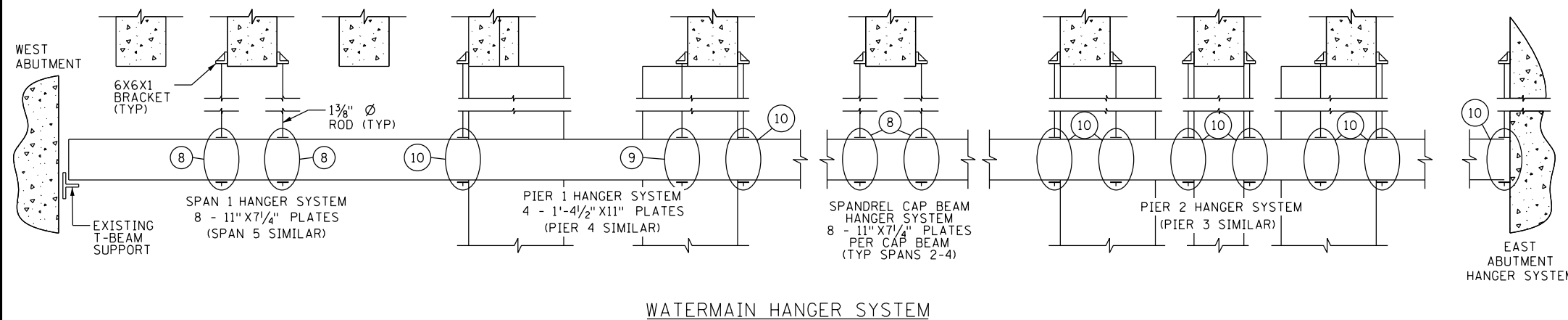
**SUMMARY OF QUANTITIES  
WATER MAIN HANGER SYSTEM <sup>⑥</sup>**

ITEM	UNIT	QUANTITY
1 3/8" DIAMETER RODS	EACH	146
L6X6X1" (1'-2" LONG)	EACH	146
HANGER ROD (3/4" DIAMETER)	EACH	2
L6X4X1/2" (1'-4" LONG)	EACH	2
L5X3 1/2 X 7/16" (9" LONG)	EACH	2
L5X3 1/2 X 7/16" (3'-2" LONG)	EACH	2
11" X 7/4" X 3/4"	EACH	216
1'-4 1/4" X 11" X 3/4"	EACH	8



**NOTES:**

- RODS SHALL COMPLY WITH SPEC. 3313, TYPE 1.
- STEEL SHAPES AND PLATES SHALL COMPLY WITH SPEC. 3306.
- CONCRETE INSERTS SHALL BE APPROVED TYPE MALLEABLE IRON MATERIAL AS PER SPEC. 3324, GRADE 35018. TAP AFTER GALVANIZED.
- GALVANIZED BOLTS, NUTS, WASHERS, RODS, INSERTS AND ANCHOR BOLTS AS PER SPEC. 3392. GALVANIZED ALL OTHER STEEL AS PER SPEC. 3394, AFTER FABRICATION.
- DOUBLE NUTS.
- ALL MATERIALS LISTED ABOVE ARE TO BE INCLUDED IN "WATERMAIN HANGER SYSTEM". TABLE IS FOR CONTRACTOR CONVENIENCE ONLY.
- PRESERVE AND PROTECT WATERMAIN WALKWAY PLANKS. CONTRACTOR SHALL REMOVE HANGERS FROM EXISTING WATERMAIN WALKWAY PLANKS BY PULLING THE HANGER THROUGH THE HOLE PROVIDED. CUTTING OF PLANKS IS NOT ALLOWED WITHOUT PRIOR ACCEPTANCE OF THE ENGINEER. TO REINSTALL HANGER RODS, 1/2" DIAMETER HOLES SHALL BE DRILLED IN EXISTING PLANKS AND HANGERS THREAD THROUGH.
- 11" X 7/4" PLATES - SEE SHEET B173 FOR DETAILS.
- 1'-4 1/4" X 11" PLATE SEE B173 FOR DETAILS.
- NO NEW PLATES REQUIRED, EXISTING PLATES AND BOLTS TO REMAIN.
- PRIOR TO REMOVAL OF EXISTING PLATE, PROVIDE TEMPORARY LATERAL SUPPORT FOR DOUBLE CHANNEL STABILITY.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*AM Kingsley*  
ANGELA M. KINGSLEY, PROFESSIONAL ENGINEER

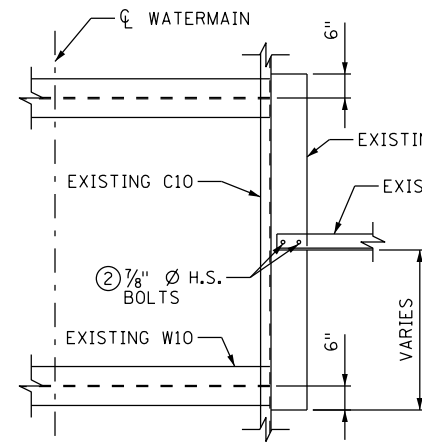
47097      8/14/2014  
LICENSE NO.      DATE

**DESIGN BY:** AMK  
**CAD BY:** DPS  
**CHECKED BY:** AJN  
**LAST REVISION:** 7/14/2015

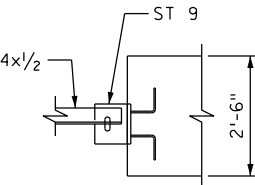
**WATERMAIN SUPPORT DETAILS (1 OF 2)**

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

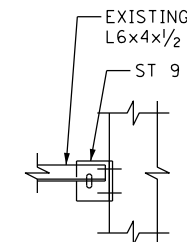
**SHEET**  
B172R  
B176



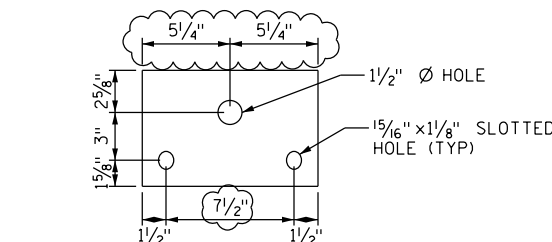
PLAN - HANGER



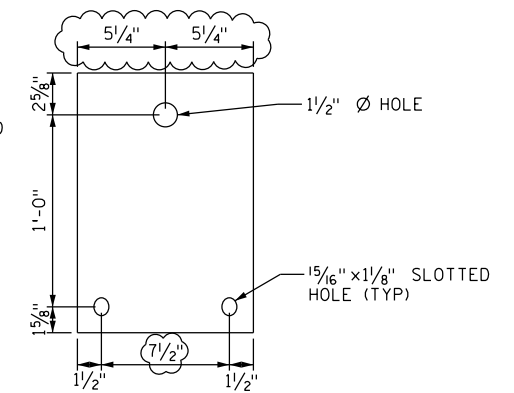
PLAN - SPANDREL



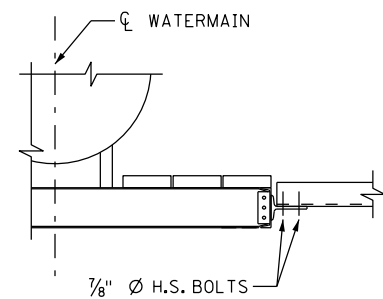
PLAN - PIER WALL



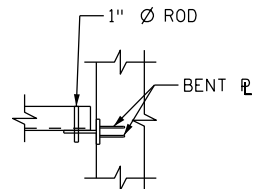
10 1/2 X 7 1/4 X 3/4 PL - DETAIL 1



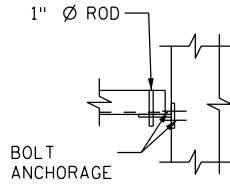
1'-4 1/4 X 10 1/2 X 3/4 PL - DETAIL 1



HANGER

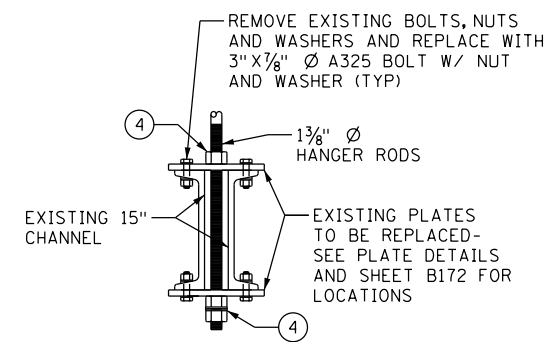


SPANDREL

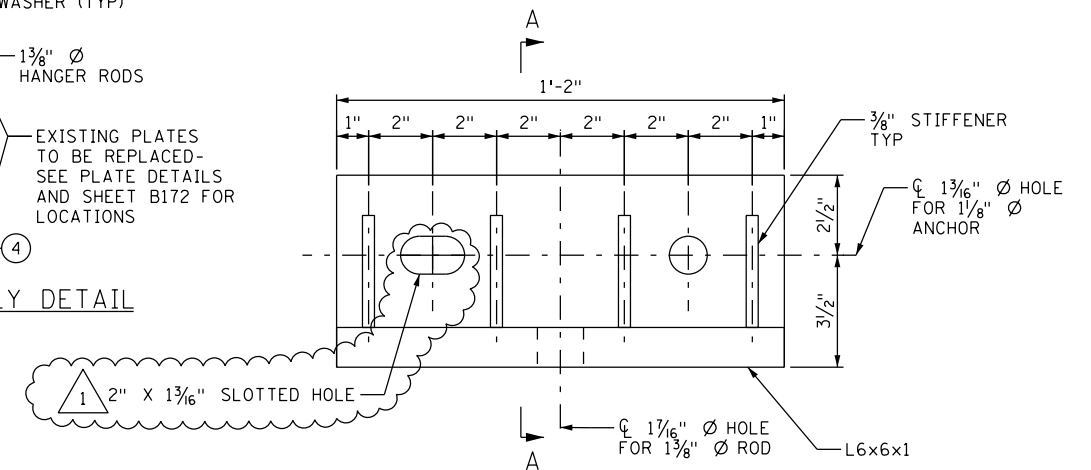


PIER WALL

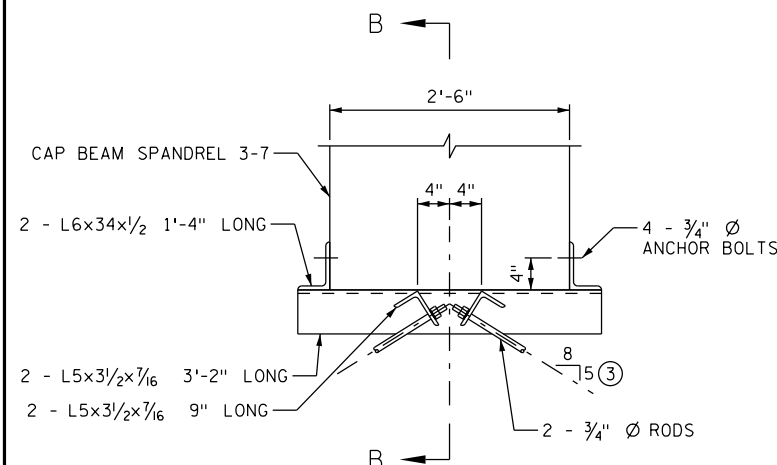
LATERAL BRACING DETAILS



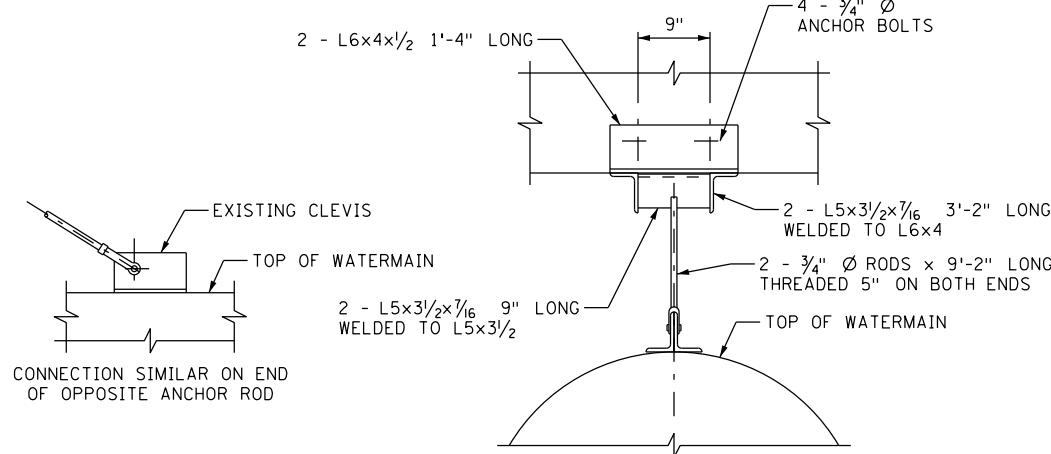
HANGER ASSEMBLY DETAIL



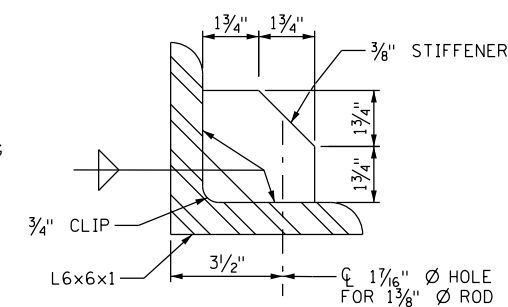
BRACKET DETAIL



LONGITUDINAL RESTRAINT



SECTION B-B



SECTION A-A

NOTES:

1. HIGH STRENGTH BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A325.
2. REPLACE BOLTS PRIOR TO REMOVAL OF TEMPORARY SUPPORT.
3. CONTRACTOR TO VERIFY IN FIELD AFTER DECK PANEL PLACEMENT.
4. DOUBLE NUTS OR JAM NUTS OR LOCK NUTS.
5. FIELD MEASURE EXISTING PLATE DIMENSIONS PRIOR TO MANUFACTURE OF NEW PLATES.
6. INCLUDE COST FOR BOLTS NUTS AND WASHERS IN COST FOR HANGER SYSTEM.
7. SEE SHEET B172 FOR ADDITIONAL INFORMATION.

1 MODIFIED PER RFI 57



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Angela M. Kingsley*  
ANGELA M. KINGSLEY, PROFESSIONAL ENGINEER

47097 8/14/2014  
LICENSE NO. DATE

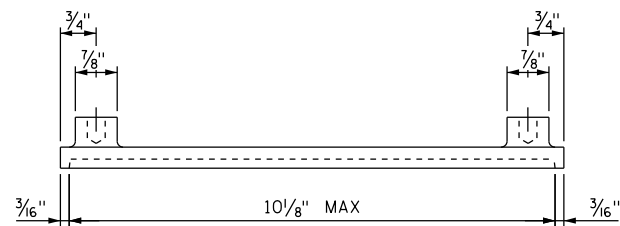
DESIGN BY: AMK  
CAD BY: DPS  
CHECKED BY: AJN  
LAST REVISION:

AS-BUILT - WATERMAIN SUPPORT DETAILS (2 OF 2)

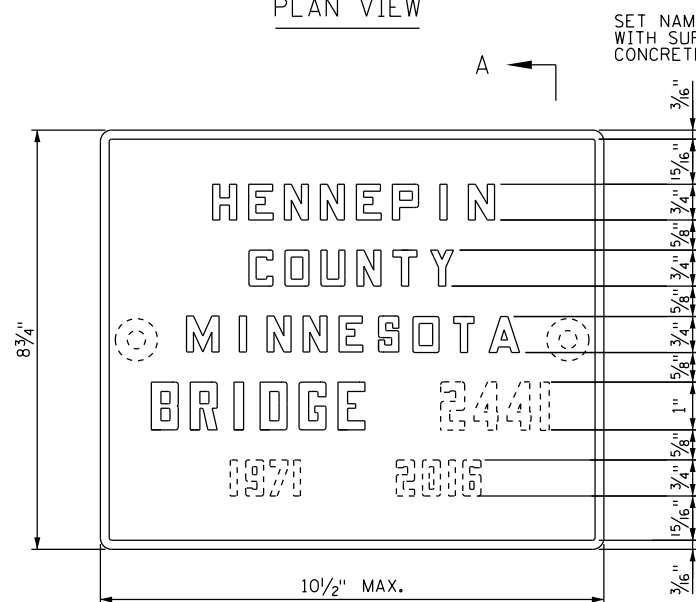
C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET

B173  
B176



PLAN VIEW



ELEVATION

THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE: 2441  
YEAR: 1971 YEAR: 2016

NOTES:

- SHOP DRAWING REQUIRED
- MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3327.
- LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.
- DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".
- HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.
- TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.
- FURNISH 2 STEEL BOLTS 3/8" DIA. x 3" LONG WITH EACH PLATE.
- ALL DIMENSIONS FOR 3/4" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

CENTER NAMEPLATE ON PILASTER

MODIFIED - A

APPROVED: NOVEMBER 22, 2002

*Daniel F. Enser*  
STATE BRIDGE ENGINEER

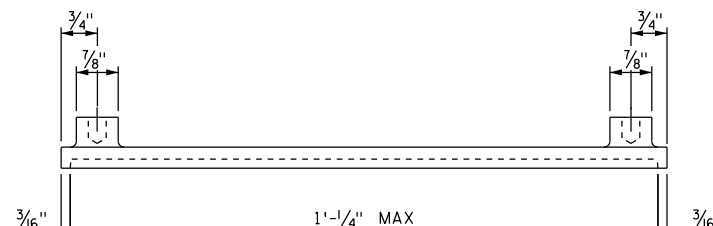
STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION

BRIDGE NAMEPLATE  
(FOR BRIDGE RECONSTRUCTION)

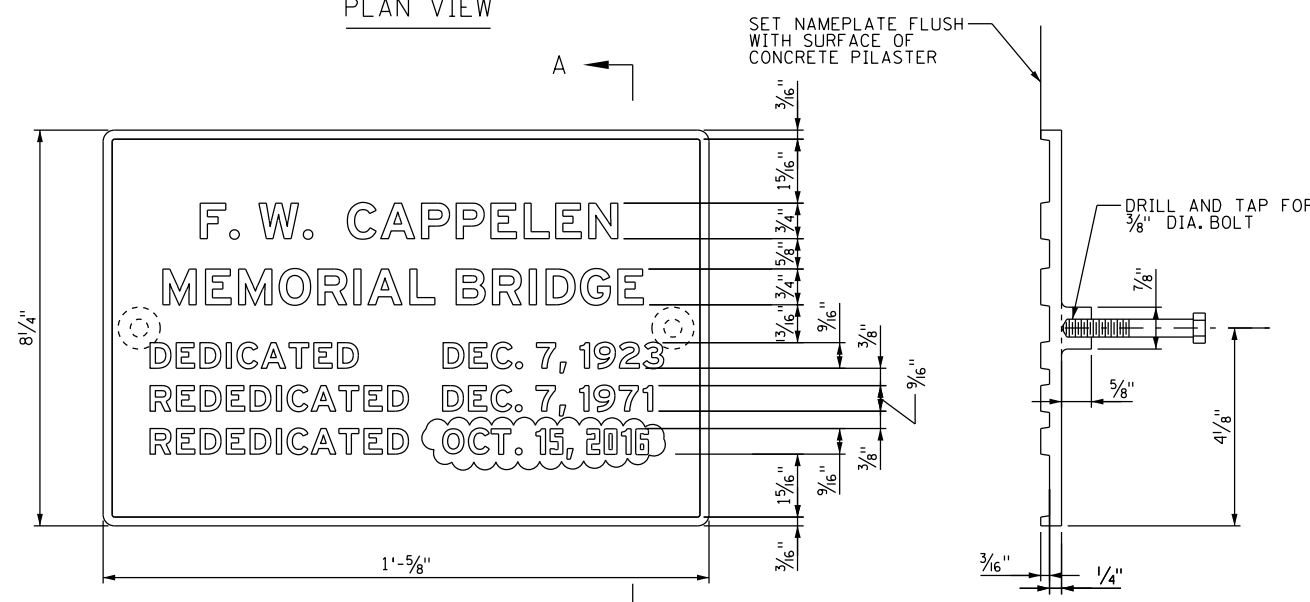
REVISION

DETAIL NO.

B102



PLAN VIEW



ELEVATION

THE DASHED TEXT SHOWN ABOVE IS TO BE CONFIRMED WITH THE ENGINEER PRIOR TO FABRICATING THE NAMEPLATE.

NOTES:

- SHOP DRAWING REQUIRED
- MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3327.
- LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.
- DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".
- HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.
- TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.
- FURNISH 2 STEEL BOLTS 3/8" DIA. x 3" LONG WITH EACH PLATE.
- ALL DIMENSIONS FOR 3/4" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

CENTER NAMEPLATE ON PILASTER

MODIFIED - B

APPROVED: NOVEMBER 22, 2002

*Daniel F. Enser*  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION

BRIDGE NAMEPLATE  
(FOR BRIDGE RECONSTRUCTION)

REVISION

DETAIL NO.

B102



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
DANIEL F. ENSER, PROFESSIONAL ENGINEER

41308  
LICENSE NO.

8/14/2014  
DATE

DESIGN BY:

DFE

CAD BY:

PRE

CHECKED BY:

DFE

LAST REVISION:

AS-BUILT - BRIDGE DETAILS

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET

B174

B176



CONCRETE WEARING COURSE

LOW SLUMP  
 OTHER PREMIXED POLYMER CONCRETE (PPC) - KWIKBOND POLYMERS  
TYPE OR MANUFACTURER \_\_\_\_\_

EXPANSION JOINTS

JOINT MANUFACTURER \_\_\_\_\_  
MANUFACTURER'S IDENTIFICATION COMMERCIAL FABRICATOR, INC.  
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED \_\_\_\_\_  
GLAND MANUFACTURER \_\_\_\_\_  
NAME AND ADDRESS (CITY, STATE) \_\_\_\_\_  
SIZE OF GLAND \_\_\_\_\_  
MANUFACTURER'S IDENTIFICATION \_\_\_\_\_  
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED \_\_\_\_\_

ELASTOMERIC BEARING PADS

PAD MANUFACTURER NOT APPLICABLE  
NAME AND ADDRESS (CITY, STATE) \_\_\_\_\_

SPECIAL SURFACE FINISH

SYSTEM: \_\_\_\_\_ COLOR: \_\_\_\_\_

FINISHING ROADWAY FACES OF BARRIER RAILING

TYPE: \_\_\_\_\_ COLOR: \_\_\_\_\_

ANTI-GRAFFITI COATING

MANUFACTURER NOT APPLICABLE  
NAME AND ADDRESS (CITY, STATE) \_\_\_\_\_  
PRODUCT NAME: \_\_\_\_\_ LOCATION: \_\_\_\_\_

PAINT SYSTEM

Mn/DOT SPECIFICATION NUMBER \_\_\_\_\_ 2478 OR 2479 OR OTHER \_\_\_\_\_  
MANUFACTURER \_\_\_\_\_  
NAME AND ADDRESS (CITY, STATE) \_\_\_\_\_  
PRIME COAT \_\_\_\_\_  
Mn/DOT MATERIAL SPECIFICATION NUMBER \_\_\_\_\_  
INTERMEDIATE COAT \_\_\_\_\_  
Mn/DOT MATERIAL SPECIFICATION NUMBER \_\_\_\_\_  
FINISH COAT \_\_\_\_\_  
Mn/DOT MATERIAL SPECIFICATION NUMBER \_\_\_\_\_ COLOR \_\_\_\_\_

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)  
DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. \_\_\_\_\_  
BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. \_\_\_\_\_  
SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. \_\_\_\_\_  
(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. \_\_\_\_\_  
COMMENTS: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
NUMBER OF BRIDGE SUPPLEMENTAL AGREEMENTS: \_\_\_\_\_ COST: \$ \_\_\_\_\_  
LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

BRIDGE REMOVAL / BRIDGE OPENING

NUMBER OF AND DATE OLD BRIDGE WAS REMOVED (IF APPLICABLE): \_\_\_\_\_  
BRIDGE NUMBER 2441 DATE REMOVED NOT APPLICABLE  
DATE NEW BRIDGE WAS OPENED TO TRAFFIC 09/01/2016  
NOTIFY THE BRIDGE OFFICE BRIDGE MANAGEMENT UNIT WITH THIS INFORMATION AS SOON AS POSSIBLE. (651) 366-4557

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.  
FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES  NO   
NEW UTILITY CONDUIT AND UTILITY HANGER SYSTEM WERE INSTALLED UNDERSIDE OF THE BRIDGE DECK. THESE CONDUITS BELONG TO THREE PRIVATE UTILITY COMPANIES, CENTURY LINK (4 CONDUITS), COMCAST (1 CONDUIT) AND ZAYO COMMUNICATIONS (1 CONDUIT). SEE SHEETS U1-U4 FOR DETAILS.  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

POST CONTRACTOR FIELD SURVEY SHOWED EXISTING SPANDRELS RECEIVING NEW CAP BEAMS WERE NOT AT THE LOCATION DESCRIBED IN THE 1970 CONTRACT DOCUMENT. THROUGH EXTENSIVE SURVEY, 186 PANELS WERE SHIFTED AND 20 PANELS WERE MODIFIED FOR PROPER SUBSTRUCTURE FITMENT, SEE RFI 21 AND SHEETS B122A - E FOR DETAILS  
DURING FABRICATION OF CONCRETE PAPAPE (TYPE P-2 MODIFIED) DECK PANELS, REBAR BECAME OFF BY 1", THEREFORE ROADWAY WIDTH DECREASED BY 1" AND SHARED USE PATH INCREASED BY 1". SEE SHEET B8 FOR TYPICAL CROSS SECTION DETAILS.  
PTFE SHIMS WERE USED TO ACHIEVE ADEQUATE BEARING BETWEEN THE PRECAST SPANDREL CAP BEAM AND PRECAST DECK PANEL (SLIDING AND EXPANSION). SEE SHEETS B122A - E FOR PTFE SHIM LOCATION.  
EXPANSION PILASTERS WERE MODIFIED FOR CONSTRUCTABILITY AT THE CONTRACTOR'S REQUEST, SEE SHEETS B160 - B161A.  
FOR LOCATIONS, WHERE CONTRACTOR COULDN'T ACHIEVE ADEQUATE EMBEDMENT DEPTH FOR THE CONNECTION BETWEEN TRANSVERSE CAP BEAMS AND EXISTING SPANDREL COLUMN/ARCH RIB, GRADE 105 HIGH STRENGTH THREADED BARS WERE USED IN LIEU OF GRADE 60 EPOXY COATED REINFORCEMENT, SEE SHEET B118A FOR DETAILS.

THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:

INSPECTOR(S) SIGNATURE \_\_\_\_\_ DATE \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_ DATE \_\_\_\_\_  
PROJECT ENGINEER/SUPERVISOR SIGNATURE \_\_\_\_\_

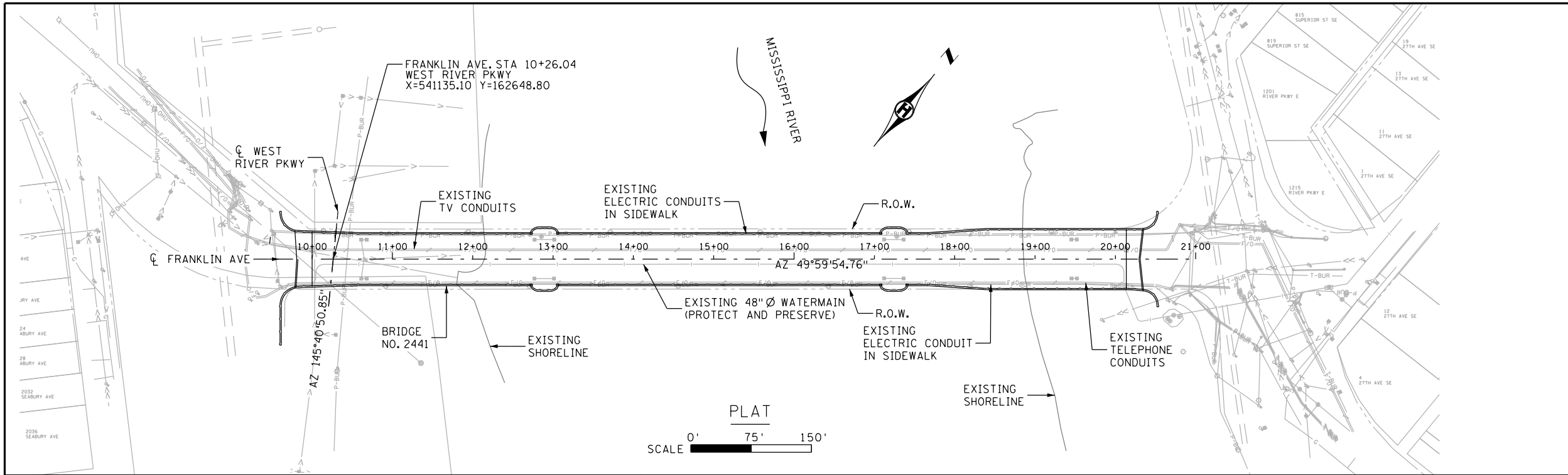
AT THE TIME OF THE FINAL, THIS COMPLETED AS-BUILT BRIDGE DATA SHEET MUST BE SUBMITTED TO THE BRIDGE OFFICE - ATTN: REGIONAL CONSTRUCTION ENGINEER (MS610).



DESIGN BY: AJN  
CAD BY: PRE  
CHECKED BY: DFE  
LAST REVISION: \_\_\_\_\_

AS-BUILT BRIDGE DATA  
**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**  
**BRIDGE 2441 S.P. 027-605-029**

SHEET  
B175  
B176



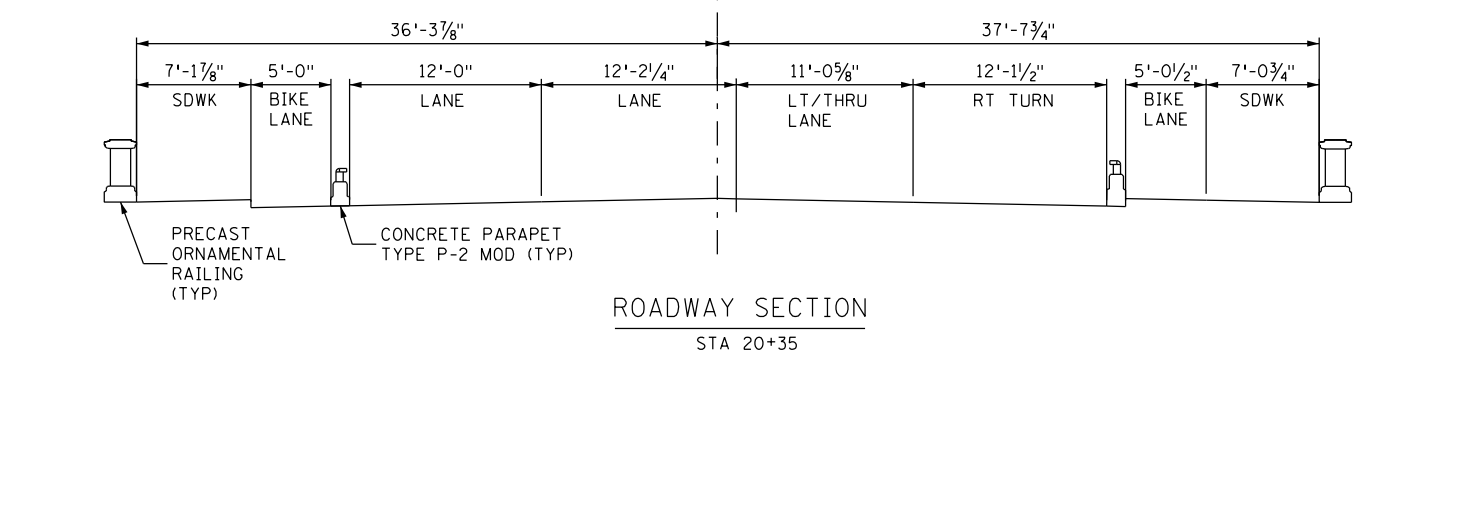
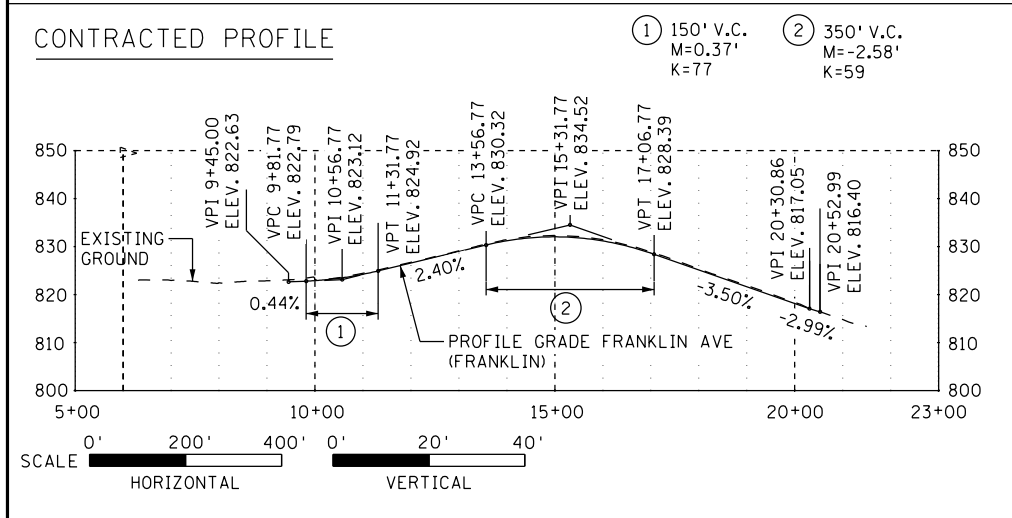
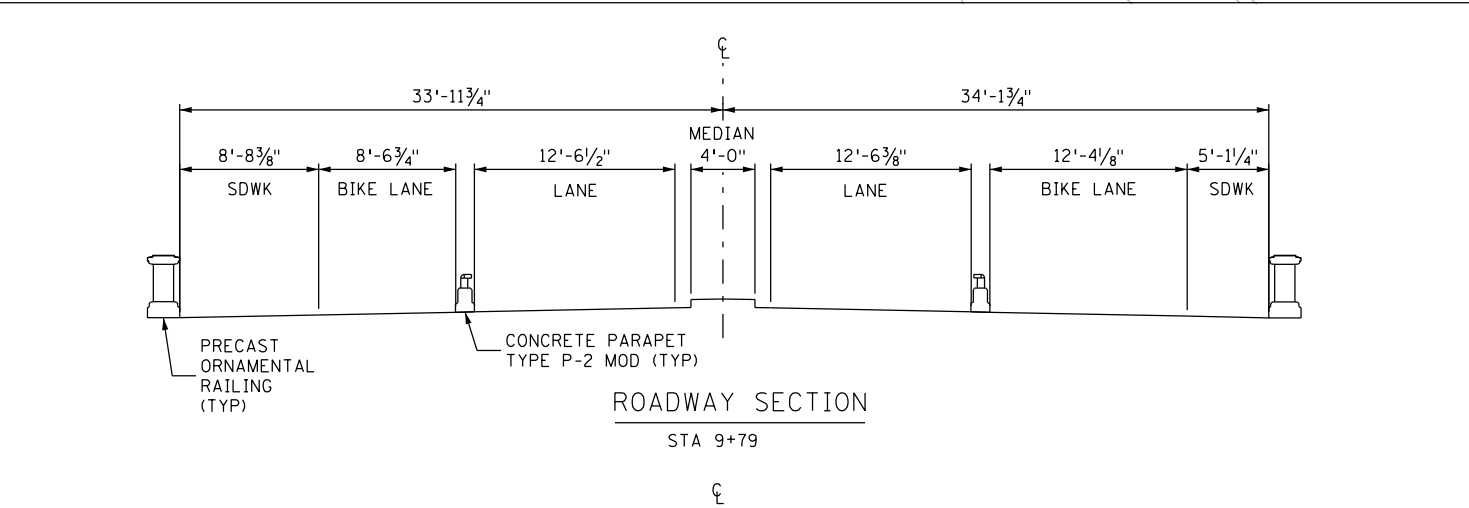
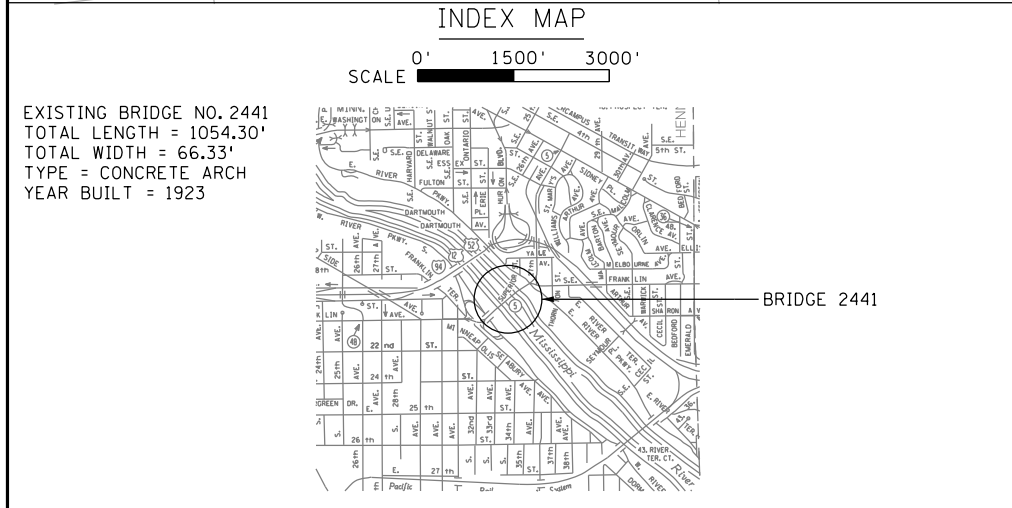
LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

- SPECIAL FEATURES: NONE
- OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM  
UPSTREAM:  
INTERSTATE 94 BRIDGE  
LOCATED 0.2 MILES UPSTREAM OF THE FRANKLIN AVE. BRIDGE  
MAIN SPAN LENGTH - N/A  
STRUCTURE LENGTH - N/A  
WATERWAY OPENING - N/A  
DOWNSTREAM:  
PACIFIC RAILROAD BRIDGE  
LOCATED 0.8 MILES DOWNSTREAM OF THE FRANKLIN AVE. BRIDGE  
MAIN SPAN LENGTH - N/A  
STRUCTURE LENGTH - N/A  
WATERWAY OPENING - N/A
- APPARENT HIGHWATER ELEV. - N/A

HYDRAULIC ENGINEER'S RECOMMENDATION

DATE: 10/16/2013  
DRAINAGE AREA: 19,680 SQUARE MILES (AT FRANKLIN AVE. BRIDGE)  
MAX. FLOOD ON RECORD:  
1965 FLOOD: 91,100 CFS  
MAXIMUM OBSERVED HIGHWATER ELEVATION: 734.0 FT (1929 DATUM)

DESIGN FLOOD (100 YR. FREQ.): N/A  
DESIGN STAGE ELEVATION (WITHOUT BRIDGE): 736.8 FT (1929 DATUM)  
DESIGN MEAN VELOCITY THRU STRUCTURE (PROPOSED BRIDGE): N/A  
TOTAL STAGE INCREASE (PROPOSED BRIDGE): N/A  
LOW MEMBER AT OR ABOVE ELEVATION: 787.13 FT  
WATERWAY AREA REQUIRED BELOW ELEVATION N/A (INPLACE BRIDGE): N/A  
BASIC FLOOD (100 YR. FREQ.): N/A  
STAGE ELEV. (INPLACE BRIDGE): N/A  
TOTAL STAGE INCREASE (INPLACE BRIDGE): N/A  
MEAN VELOCITY THROUGH STRUCTURE (INPLACE BRIDGE): N/A  
FLOWLINE ELEVATION: N/A  
SKEW ANGLE: N/A  
ESTIMATED DEPTH OF PIER SCOUR: N/A; SCOUR CODE "R-CRIT; MONITOR"



BRIDGE SURVEY SHEETS MADE FROM:

BENCH MARK 1 ELEVATION 816.128 (NGVD 1929)  
LOCATION  
MONUMENT BR730SE  
X=541959.784  
Y=163264.003  
BENCH MARK 2 ELEVATION 823.162 (NGVD 1929)  
LOCATION  
MONUMENT BR730NW  
X=541046.333  
Y=162651.413

**BRIDGE SURVEY**

BRIDGE LOCATED AT  
FRANKLIN AVENUE (C.S.A.H.5)  
OVER MISSISSIPPI RIVER

SEC. 30 T29N R23W  
CITY OF MINNEAPOLIS HENNEPIN COUNTY

**BRIDGE NO. 2441**



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Daniel F. Enser*  
DANIEL F. ENSER, PROFESSIONAL ENGINEER

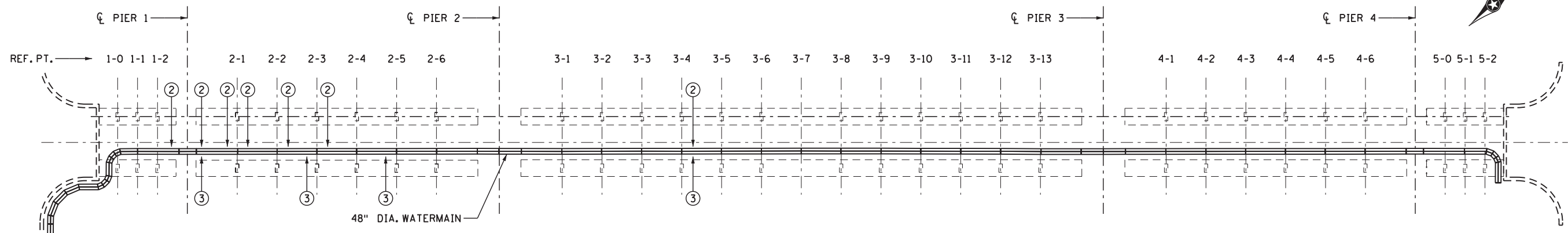
41308 8/14/2014  
LICENSE NO. DATE

DESIGN BY: AMK  
CAD BY: RAM  
CHECKED BY: AJN  
LAST REVISION:

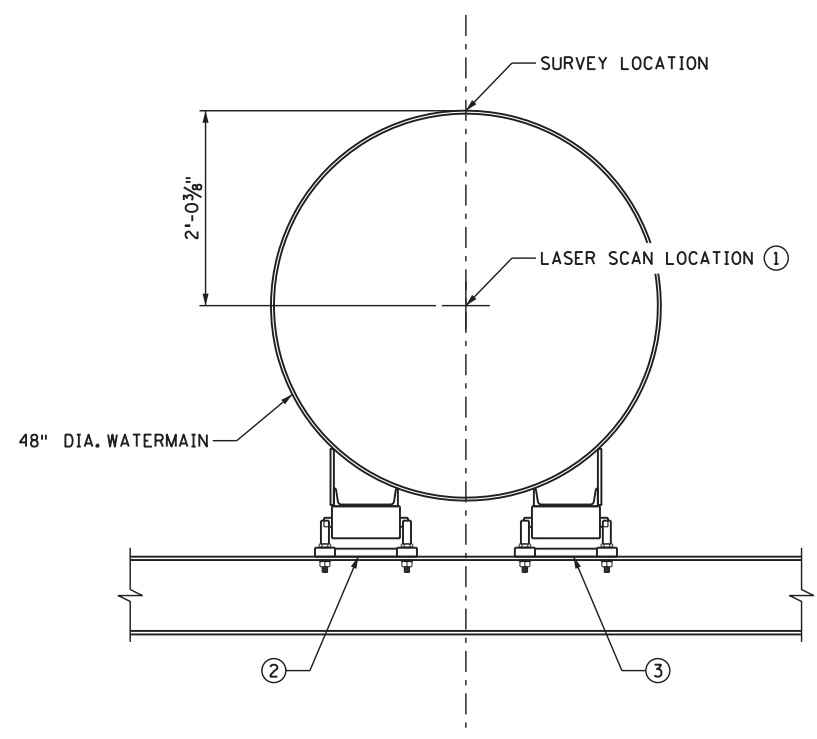
BRIDGE SURVEY

C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
BRIDGE 2441 S.P. 027-605-029

SHEET  
B176  
B176



**WATERMAIN PLAN**



**WATERMAIN TRANSVERSE SECTION**  
SHOWN LOOKING NORTH AT SUPPORT BRACKET


REF. PT.	WATERMAIN GEOMETRY											
	LASER SCAN (MAY 2013) (1)			SURVEY (SUBMITTAL 1)			SURVEY (SUBMITTAL 2)			SURVEY (SUBMITTAL 3)		
	X	Y	ELEV.	X	Y	ELEV.	X	Y	ELEV.	X	Y	ELEV.
1-0	N/A	N/A	N/A									
1-1	541141.217	162645.560	814.10									
1-2	N/A	N/A	N/A									
2-1	541196.479	162691.913	815.11									
2-2	541218.217	162710.159	815.48									
2-3	541240.123	162728.604	815.83									
2-4	541262.082	162747.036	816.23									
2-5	541284.088	162765.526	816.47									
2-6	541306.146	162784.114	816.77									
3-1	541375.306	162841.989	818.35									
3-2	541397.178	162860.488	818.87									
3-3	541419.208	162879.054	819.32									
3-4	541441.352	162897.602	819.86									
3-5	541463.224	162916.028	820.18									
3-6	541485.257	162934.582	820.36									
3-7	541507.180	162953.039	820.23									
3-8	541529.096	162971.419	819.83									
3-9	541551.259	162989.987	819.42									
3-10	541573.239	163008.335	818.95									
3-11	541595.329	163026.793	818.26									
3-12	541617.348	163045.240	817.59									
3-13	541639.748	163063.759	816.91									
4-1	541708.568	163121.633	814.68									
4-2	541730.666	163140.212	814.01									
4-3	541752.536	163158.600	813.31									
4-4	541774.503	163177.024	812.57									
4-5	541796.459	163195.436	811.88									
4-6	541818.462	163213.952	811.13									
5-0	N/A	N/A	N/A									
5-1	541873.274	163259.939	810.77									
5-2	N/A	N/A	N/A									

SCHEDULE OF QUANTITIES - WATERMAIN SUPPORT REPAIRS AND PAINTING			
ITEM NO.	ITEM	UNIT	QUANTITY TOTAL
2013.602	TCLP TEST	EACH	1
2402.602	REPAIR WATERMAIN SUPPORTS	EACH	11
2476.601	LEAD SUBSTANCES COLLECTION & DISPOSAL	LUMP SUM	1
2478.601	ORGANIC ZINC-RICH PAINT SYSTEM (OLD)	LUMP SUM	1

- NOTES:**
- ① COORDINATES AND ELEVATIONS WERE TAKEN AT APPROX.  $\phi$  SPANDREL COLUMN AT CENTER OF PIPE. 2.03 FT WAS ADDED TO ELEVATION TO DETERMINE MAY 2013 TOP OF PIPE ELEVATION.
  - ② REPLACE CRACKED ROLLER STAND WEST SIDE. SEE SHEET WM2 FOR DETAILS.
  - ③ REPLACE CRACKED ROLLER STAND EAST SIDE. SEE SHEET WM2 FOR DETAILS.

Plotted by: dan.crawford at 8:46:19 AM  
 9/17/2014  
 File path: \\ONESERVER\Public\projects\1061-1-Mpls Franklin Water Main\2 - production\c - work\cd\BR2441\_S12001.dgn

REVISIONS	DATE	BY
⚠ ITEM NUMBER CHANGED	9/14	DPC

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
  
 LIC. NO. 21838  
 PRINTED OR TYPED NAME: STEVEN A. OLSON DATE: 9/17/2014

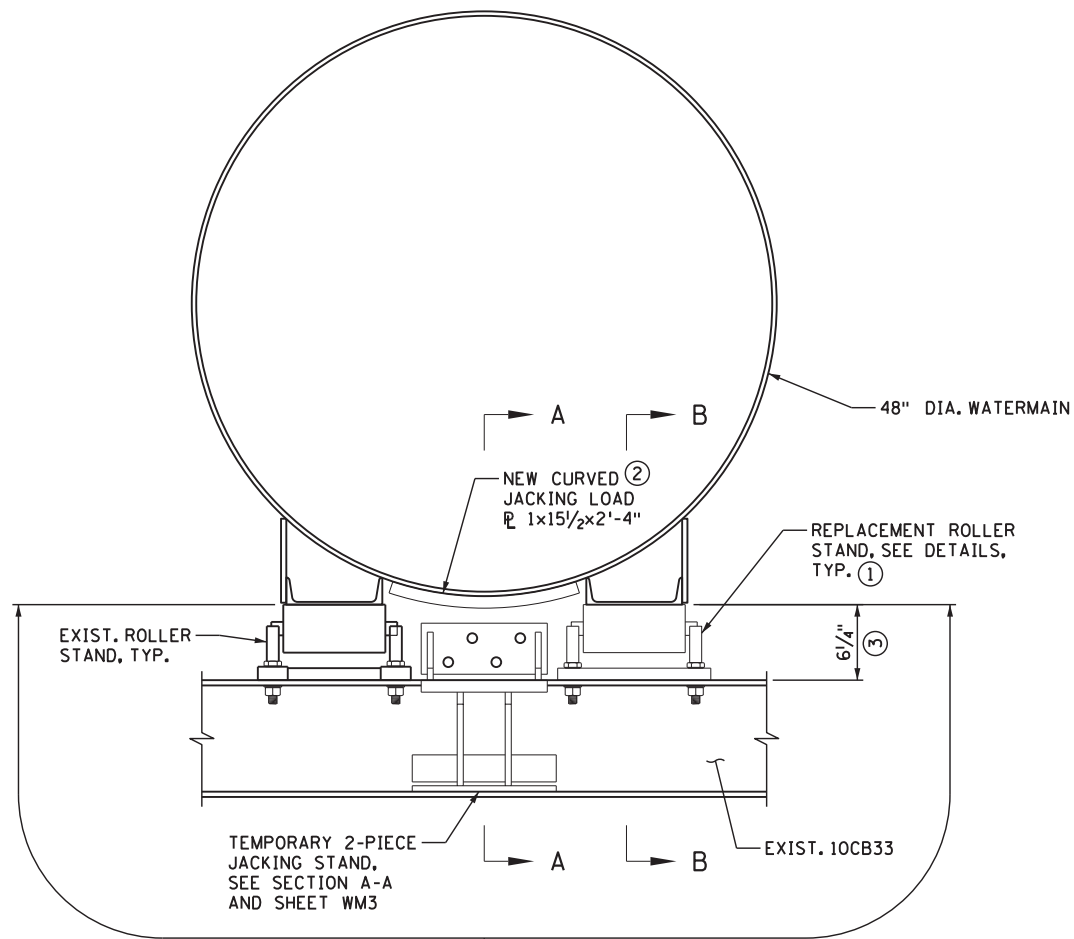


Olson & Nesvold Engineers, P.S.C.  
 7825 Washington Ave. S., Suite 100  
 Bloomington, MN 55439-2431

**TITLE:**  
 WATERMAIN GEOMETRY AND REPAIRS

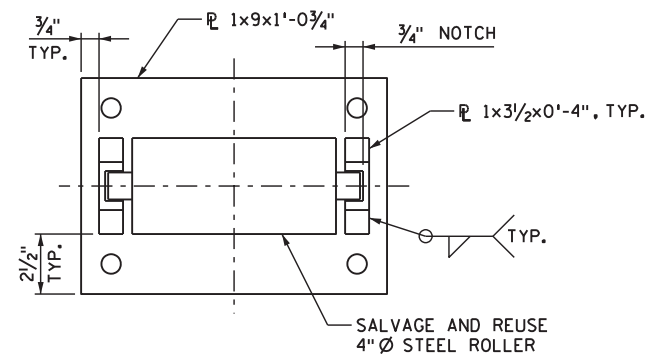
DES: SAO	DR: DPC	APPROVED:	BRIDGE NO. 2441
CHK: DPC	CHK: SAO		
SHEET NO. WM1R OF 3 SHEETS			

Plotted by: steve.olson at 12:43:47 PM  
 Plotted on: 8/18/2014  
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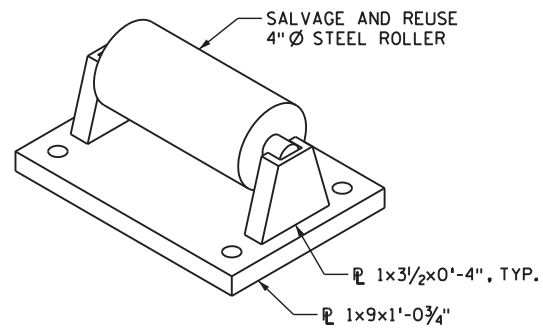


STEEL COMPONENTS TO BE PAINTED, SEE SPECIAL PROVISIONS

**TYPICAL REPAIR SECTION**

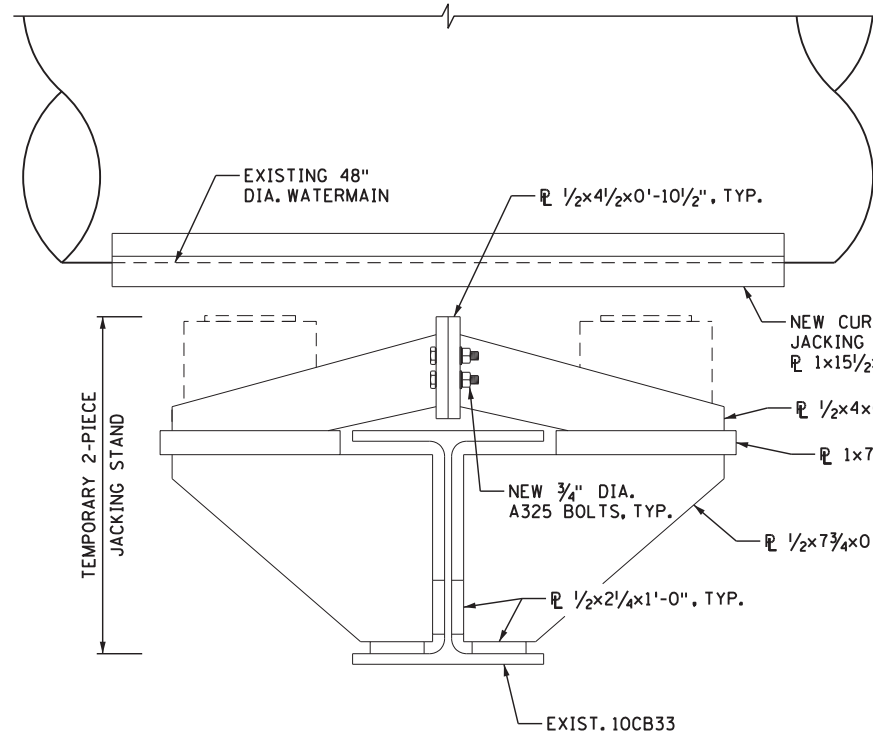


**ASSEMBLY PLAN**

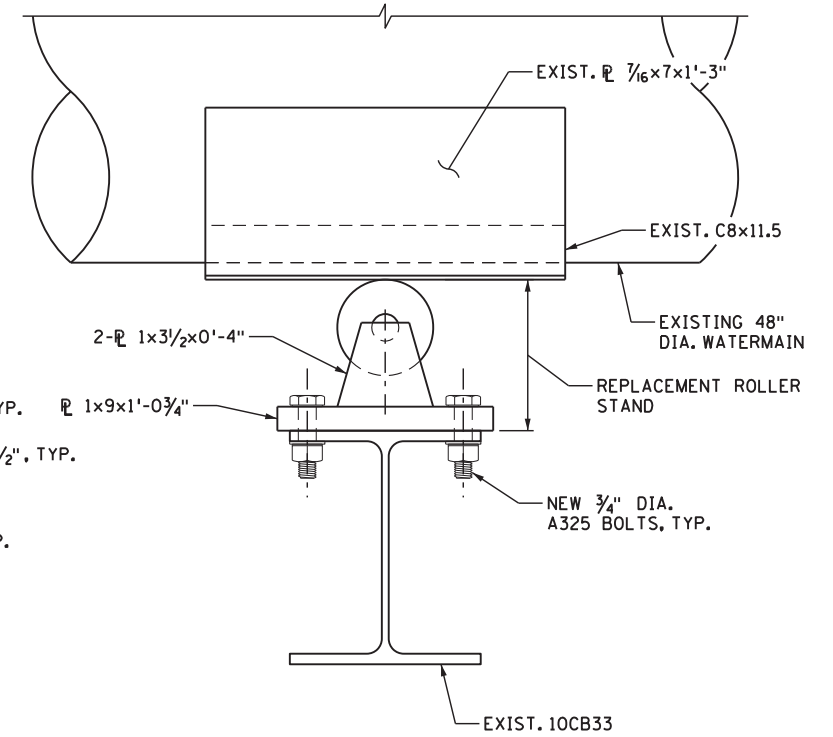


**ASSEMBLY ISOMETRIC**

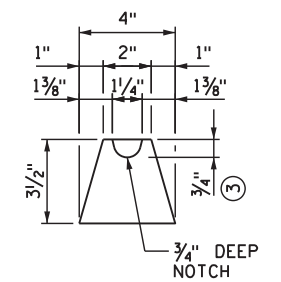
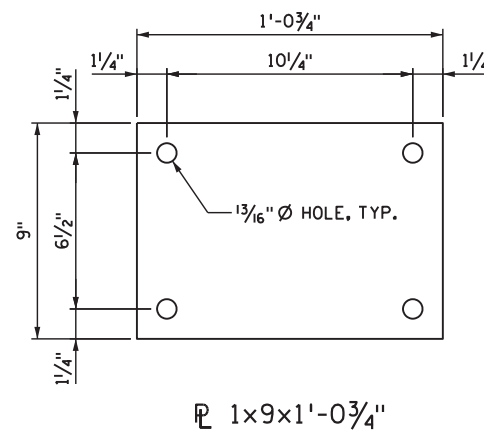
**REPLACEMENT ROLLER STAND DETAILS**



**SECTION A-A**



**SECTION B-B**



**NOTES:**

- ① SEE SHEET WM1 FOR LOCATIONS.
- ② PLACE 1/8" NEOPRENE SHEET 15 1/2" x 2'-4" BETWEEN LOAD PLATE AND WATERMAIN PIPE.
- ③ SET NOTCH TO ACCEPT SALVAGED STEEL ROLLER ASSEMBLY TO PROVIDE AN OVERALL HEIGHT FROM BOTTOM OF ROLLER STAND TO TOP OF 4" Ø STEEL ROLLER THAT IS EXPECTED TO BE 6 1/4".

REVISIONS	DATE	BY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Steven A. Olson*  
 LIC. NO. 21838  
 PRINTED OR TYPED NAME: STEVEN A. OLSON DATE: 8/18/2014



Olson & Nesvold Engineers, P.S.C.  
 7825 Washington Ave. S., Suite 100  
 Bloomington, MN 55439-2431

TITLE: WATERMAIN ROLLER STAND REPLACEMENT (1 OF 2)

DES: SAO	DR: DPC	APPROVED:
CHK: DPC	CHK: SAO	
SHEET NO. WM2 OF 3 SHEETS		

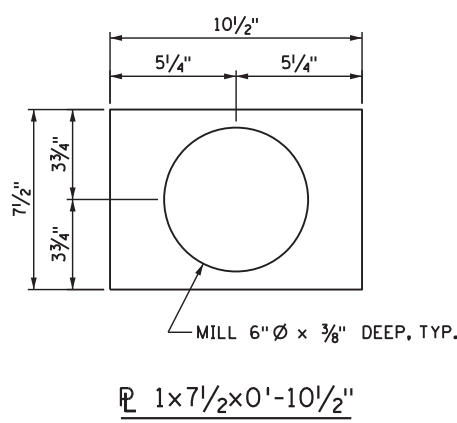
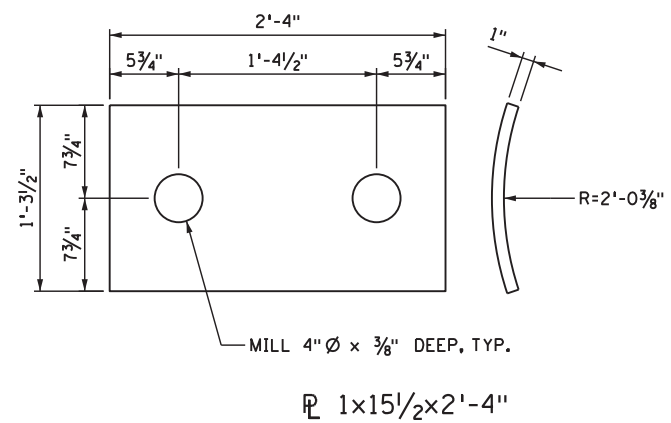
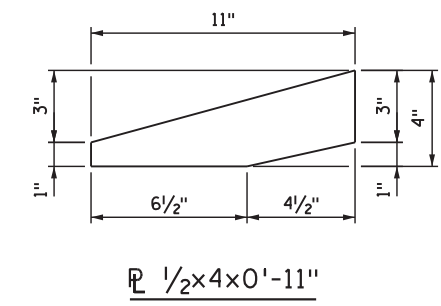
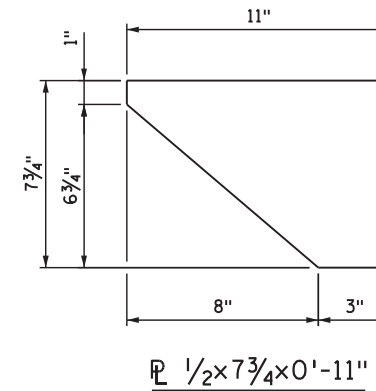
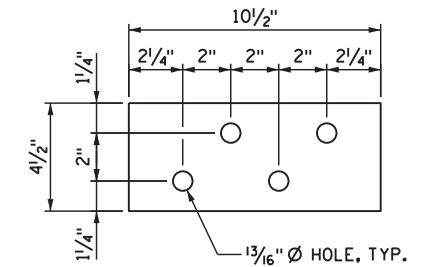
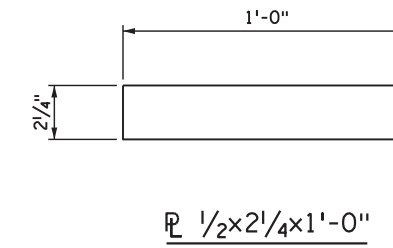
BRIDGE NO. 2441

**ROLLER STAND NOTES:**

- ROLLER STAND REPLACEMENT SHALL BE PERFORMED PRIOR TO APPLICATION OF THE TOP COAT OF PAINT FOR THE STEEL ELEMENTS OF THE WALKWAY AND WATERMAIN SUPPORT SYSTEM.
- NEW ROLLER STANDS SHALL BE SHOP PRIMED.
- FOUR WEEKS PRIOR TO BEGINNING REPAIR ACTIVITIES, THE CONTRACTOR SHALL PROVIDE DETAILS AND CALCULATIONS DEMONSTRATING THAT THEIR JACKING SYSTEM HAS ADEQUATE CAPACITY (LOAD AND DISPLACEMENT) TO PERMIT REMOVAL OF THE EXISTING DAMAGED BEARINGS WITH NEW BEARING SUPPORTS.
- THE JACKING SYSTEM SHALL NOT DAMAGE THE EXISTING WATERMAIN OR THE EXISTING SUPPORT SYSTEM.
- CONCEPTUAL DETAILS OF A JACKING SCHEME ARE PROVIDED ON SHEET WMI OF 2. A CONCEPTUAL ROLLER STAND REPLACEMENT SEQUENCE IS PROVIDED ON THIS SHEET.
- THE JACK STAND SHALL BECOME THE PROPERTY OF AND BE DELIVERED TO THE MINNEAPOLIS WATERWORKS GROUP AT THE COMPLETION OF THE PROJECT.

**CONCEPTUAL ROLLER STAND REPLACEMENT SEQUENCE:**

- INSTALL JACK STAND ON TRANSVERSE BEAM
- INSTALL HYDRAULIC JACKS POWERED BY A HAND OPERATED HYDRAULIC PUMP. PRESSURE IN THE HYDRAULIC JACKS SHALL BE EQUAL AT ALL TIMES.
- INSTALL CURVED LOAD PLATE
- SLOWLY LOAD THE JACKS UNTIL THE ROLLERS ARE FREE OF THE WATERMAIN SUPPORT CHANNELS. GAP BETWEEN ROLLERS AND SUPPORT CHANNEL CAN NOT EXCEED 1/2 INCH. LOCK OFF HYDRAULIC JACKS TO PREVENT RETRACTION OF THE CYLINDERS. TOTAL LOAD APPLIED BY THE JACKS SHALL NOT EXCEED 25 KIPS.
- REMOVE EXISTING DAMAGED ROLLER STANDS.
- PREP AND APPLY PRIMER TO THE TRANVERSE BEAM BELOW THE ROLLER STAND.
- INSTALL NEW COMPONENTS.
- SLOWLY LOWER THE HYDRAULIC JACKS TO RETURN THE WATERMAIN LOAD TO THE ROLLER SUPPORTS. CONFIRM BOTH ROLLERS ARE ENGAGED AND SUPPORTING THE WATERMAIN.
- REMOVE CURVED LOAD PLATE. REMOVE HYDRAULIC JACKS. REMOVE JACK STAND.

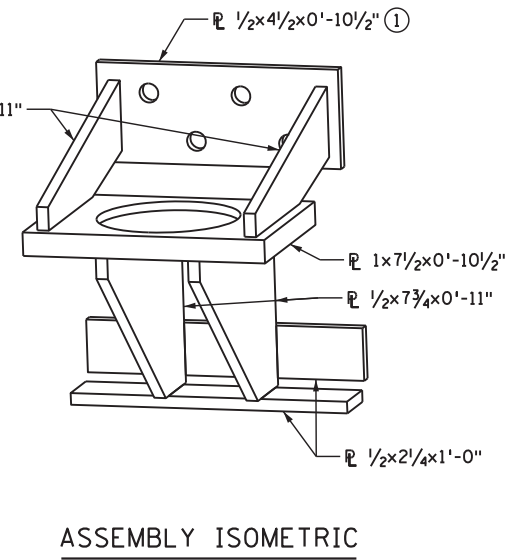
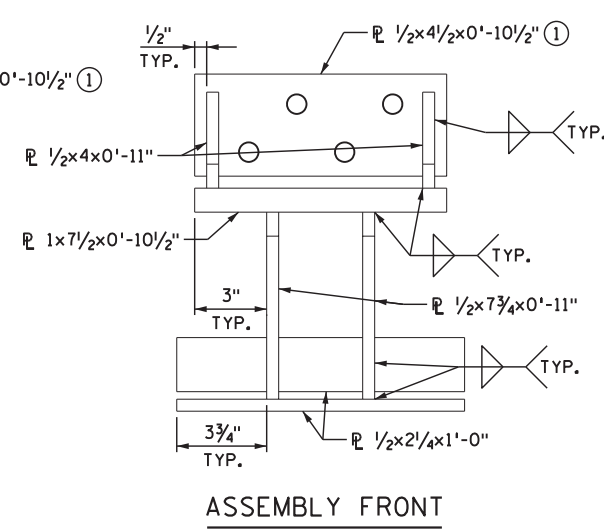
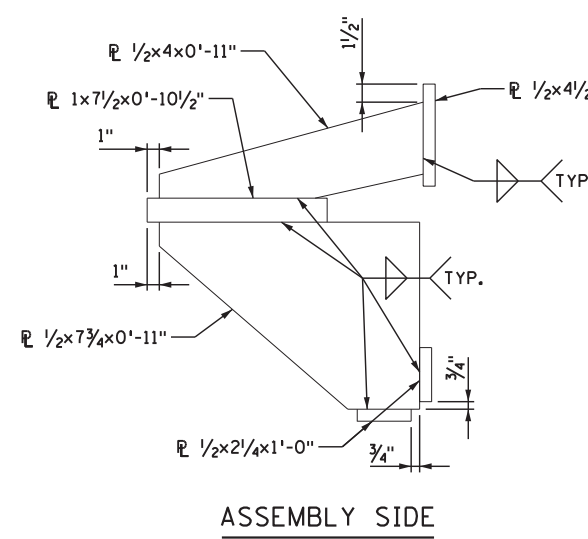


**BILL OF MATERIALS - REPLACEMENT ROLLER STAND ②**  
PER EACH REPAIR LOCATION

ITEM	NO. REQ'D	LBS
PL 1 x 9 x 1'-0 3/4"	1	33
PL 1 x 3 1/2 x 0'-4"	2	8

**BILL OF MATERIALS - TEMPORARY 2-PIECE JACKING STAND**

ITEM	NO. REQ'D	LBS
PL 1/2 x 2 1/4 x 1'-0"	4	16
PL 1/2 x 4 1/2 x 0'-10 1/2"	4	27
PL 1/2 x 7 3/4 x 0'-11"	4	48
PL 1 x 7 1/2 x 0'-10 1/2"	2	45
PL 1/2 x 4 x 0'-11"	4	25
PL 1/2 x 4 1/2 x 0'-10 1/2"	2	14
CURVED PL 1 x 15 1/2 x 2'-4"	1	124
1/8" NEOPRENE 15 1/2" x 2'-4"	1	
3/4" Ø A325 BOLTS	4	



**TEMPORARY 2-PIECE JACKING STAND DETAILS**  
(CONCEPTUAL)

- NOTES:**
- WELD PLATE ON 1 BRACKET OPPOSITE HAND SO HOLES LINE UP ONCE ASSEMBLED INTO FINAL POSITION.
  - ALL STEEL SHALL MEET MNDOT SPEC. 3309.

Plotted by: steve.olson at 12:44:28 PM  
 Plotted on: 8/18/2014  
 File path: P:\PROJECTS\1061-1-Mpls Franklin Water Main\2 - Production\C - Work\CD\BR2441\_S12003.dgn

REVISIONS	DATE	BY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Steven A. Olson*  
LIC. NO. 21838  
PRINTED OR TYPED NAME: STEVEN A. OLSON DATE: 8/18/2014



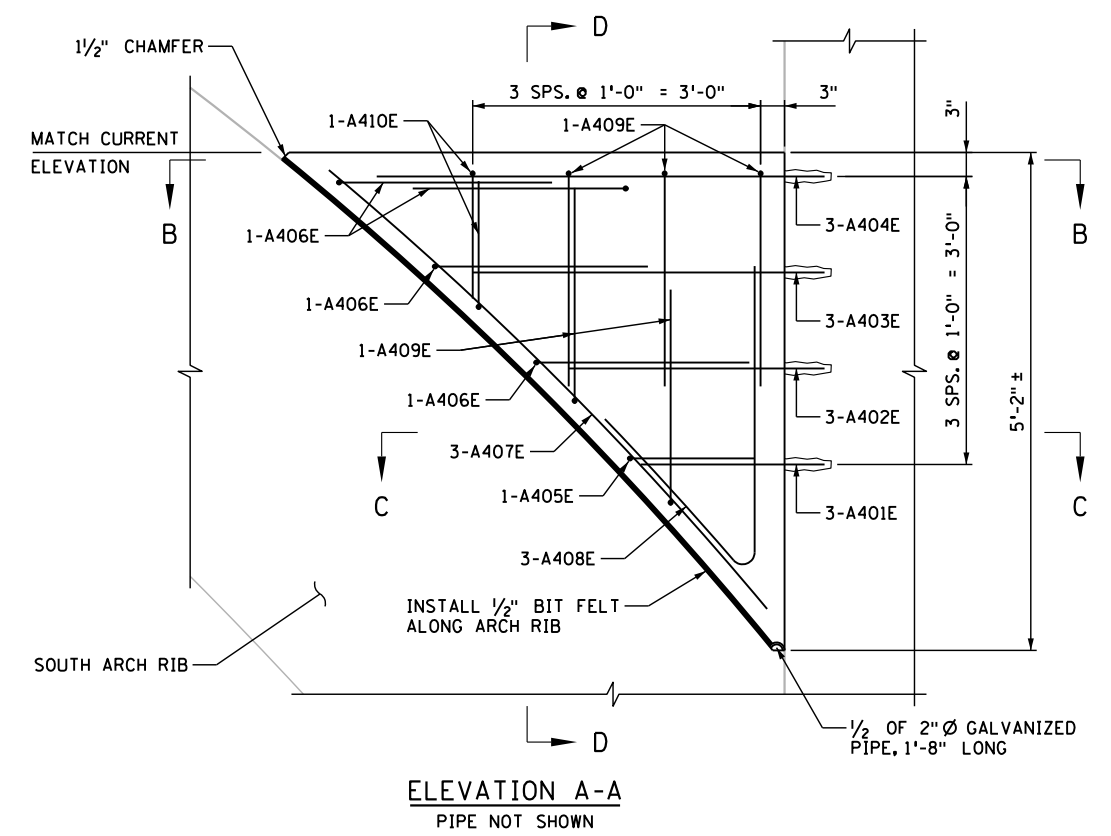
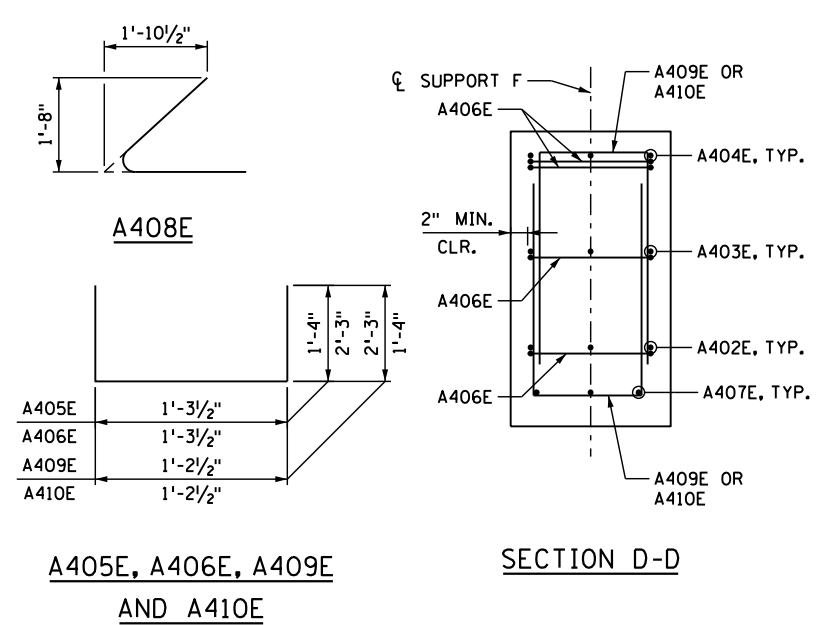
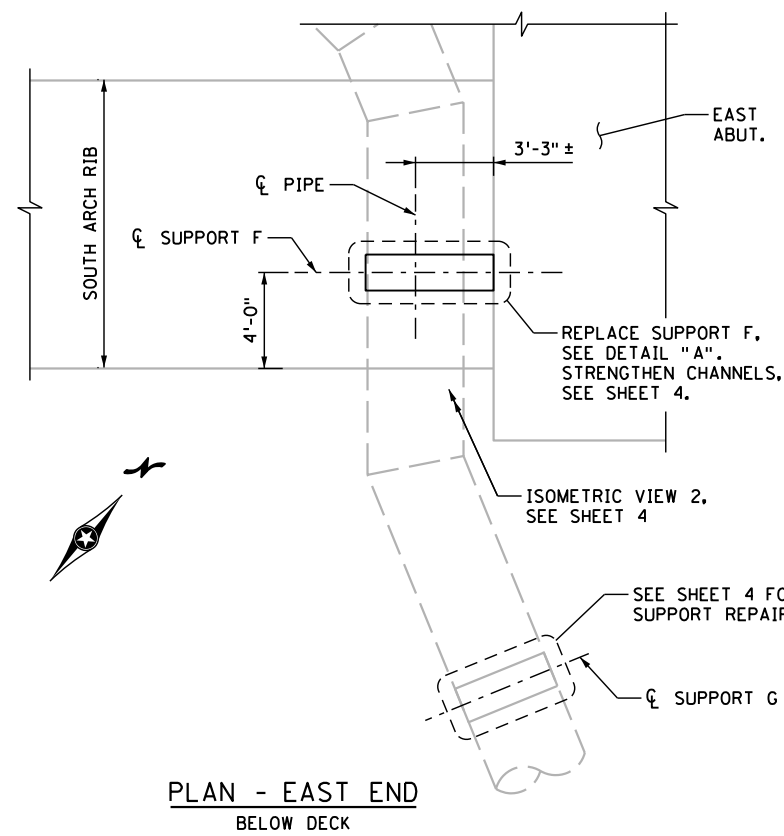
**Olson & Nesvold Engineers, P.S.C.**  
7825 Washington Ave. S., Suite 100  
Bloomington, MN 55439-2431

TITLE:  
**WATERMAIN ROLLER STAND REPLACEMENT (2 OF 2)**

DES: SAO	DR: DPC	APPROVED:
CHK: DPC	CHK: SAO	
SHEET NO. WM3 OF 3 SHEETS		

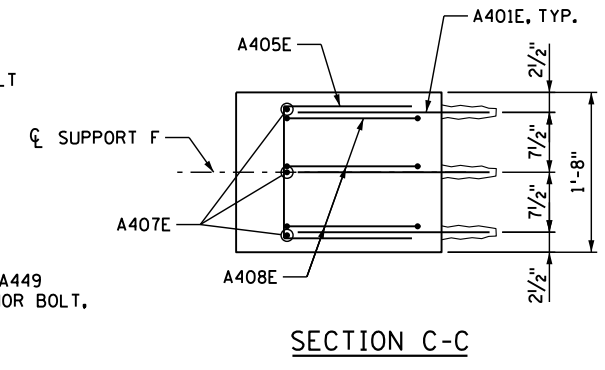
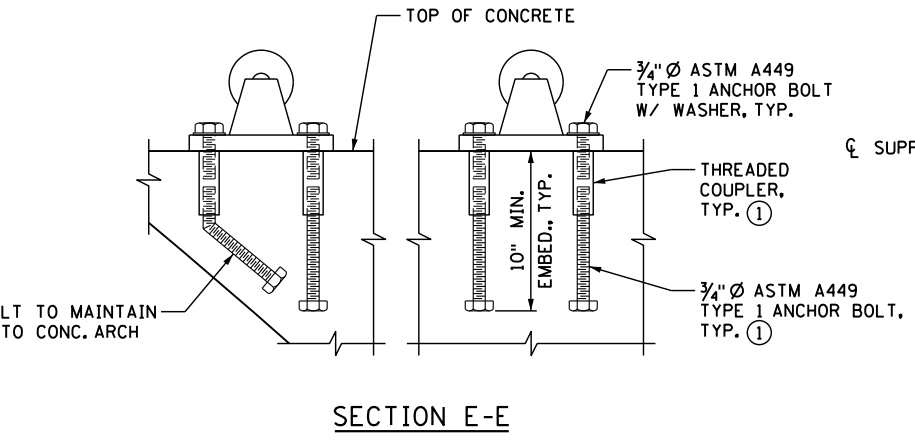
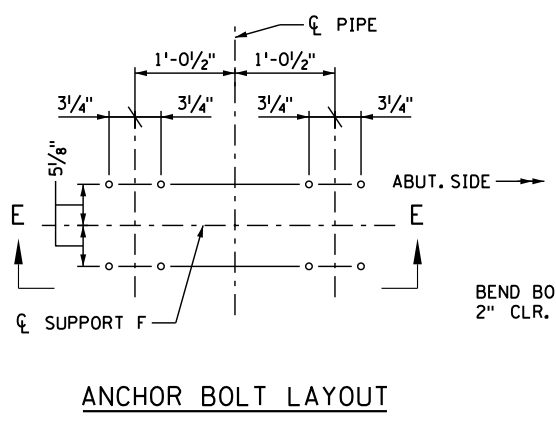
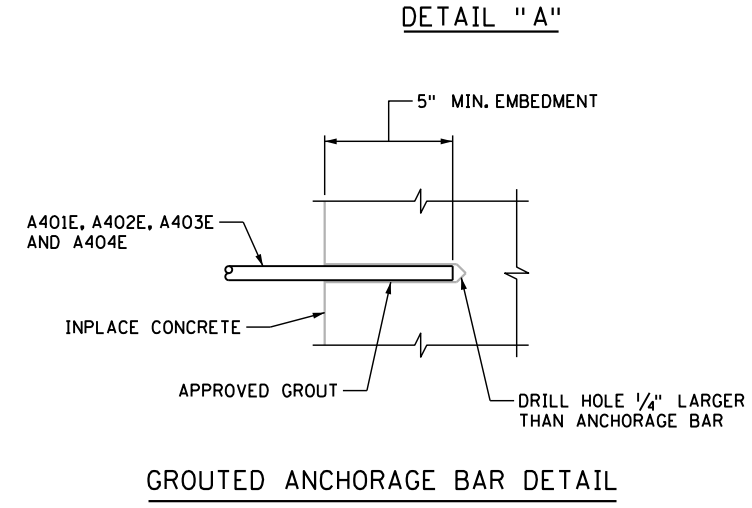
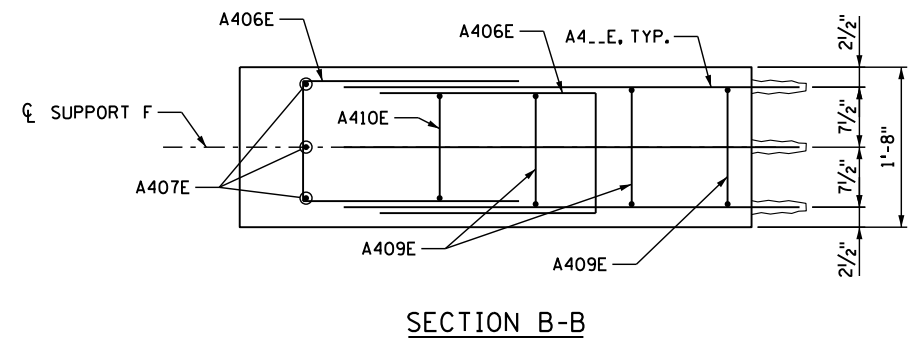
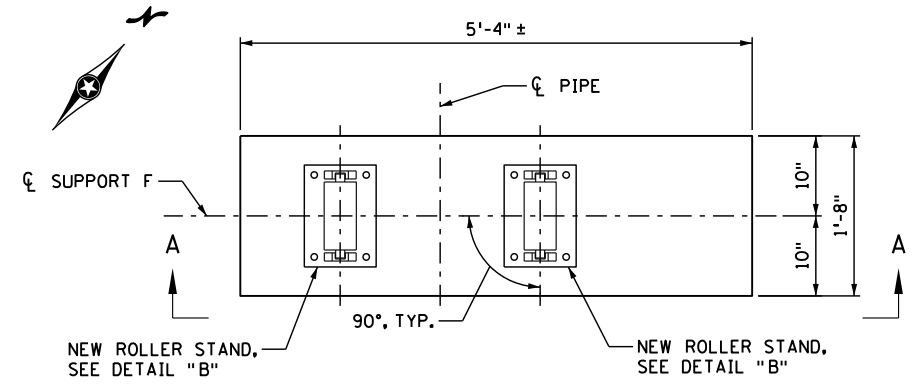
BRIDGE NO.  
2441

Plotted by: Dan.Crawford at 12:40:03 PM  
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**BILL OF REINFORCEMENT SUPPORT F**

BAR MARK	NO.	LENGTH	SHAPE	LOCATION
A401E	3	1'-11"	STR	HORIZ DOWEL
A402E	3	2'-8"	STR	HORIZ DOWEL
A403E	3	3'-8"	STR	HORIZ DOWEL
A404E	3	4'-8"	STR	HORIZ DOWEL
A405E	1	4'-0"	BENT	HORIZ CAP
A406E	4	5'-10"	BENT	HORIZ CAP
A407E	3	6'-4"	STR	ALONG ARCH
A408E	3	6'-0"	BENT	VERTICAL
A409E	5	5'-9"	BENT	VERTICAL
A410E	2	3'-11"	BENT	VERTICAL



**NOTES:**  
 ① EMBEDDED IN CONCRETE.

REVISIONS	DATE	BY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

LIC. NO. 21838  
 STEVEN A. OLSON  
 DATE 9/12/2016



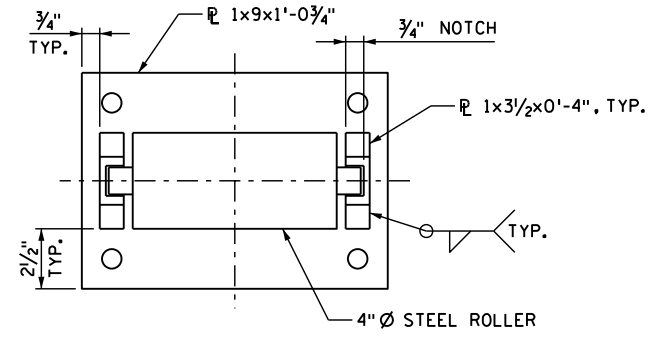
Olson & Nesvold Engineers, P.S.C.  
 7825 Washington Ave. S., Suite 100  
 Bloomington, MN 55439-2431

TITLE:  
**WATERMAIN SUPPORT REPAIR DETAILS**

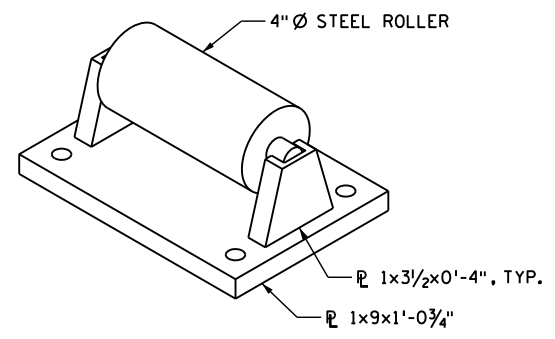
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CHK: UMD	CHK: SAO	
SHEET NO. 1 OF 4 SHEETS		

BRIDGE NO.  
 2441

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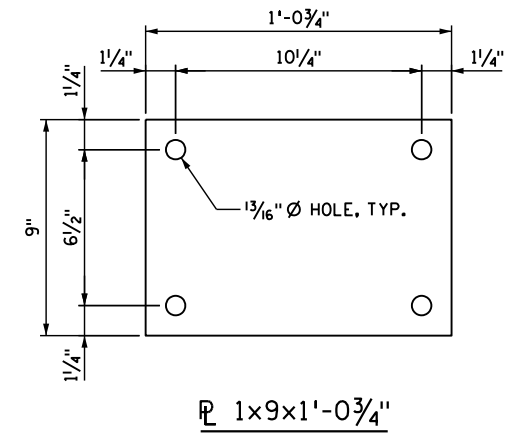
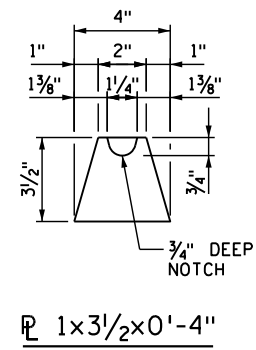
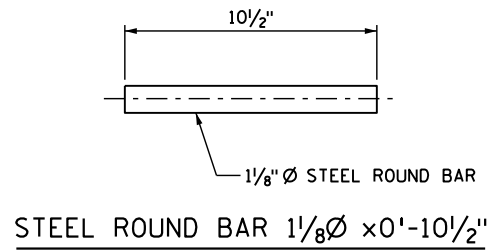
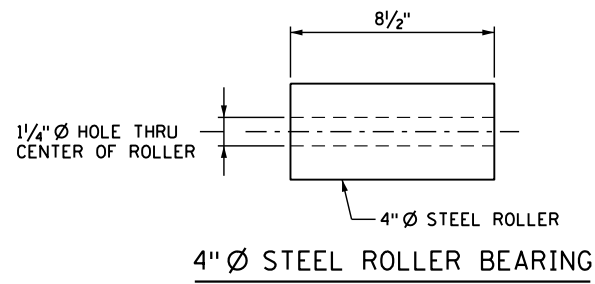


ASSEMBLY PLAN



ASSEMBLY ISOMETRIC

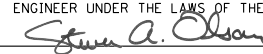
REPLACEMENT ROLLER STAND DETAILS




BILL OF MATERIALS ①		
REPLACEMENT ROLLER STAND		
PER EACH REPAIR LOCATION		
ITEM	NO. REQ'D	LBS
$\mathbb{R}$ 1x9x1'-0 3/4"	1	33
$\mathbb{R}$ 1x3 1/2x0'-4"	2	8
STEEL ROUND BAR 1 1/8" $\emptyset$ x 0'-10 1/2"	1	
4" $\emptyset$ STEEL ROLLER BEARING	1	

① ALL STEEL SHALL MEET MNDOT SPEC. 3309 AND BE HOT DIP GALVANIZED.

REVISIONS	DATE	BY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
  
 LIC. NO. 21838  
 PRINTED OR TYPED NAME: STEVEN A. OLSON DATE: 9/12/2016

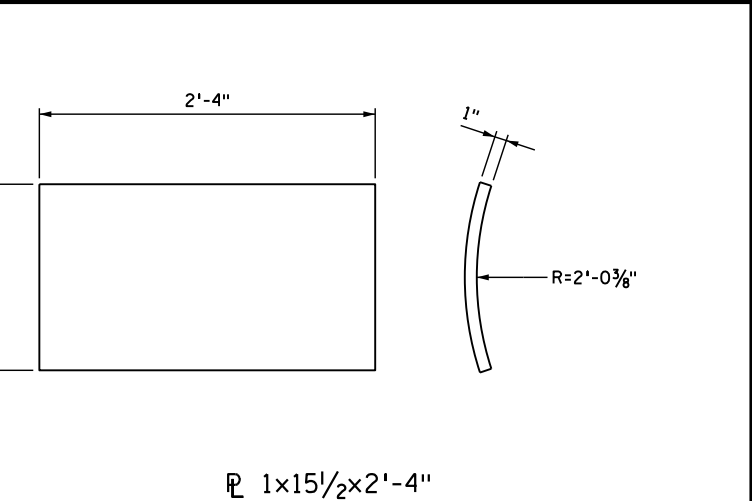
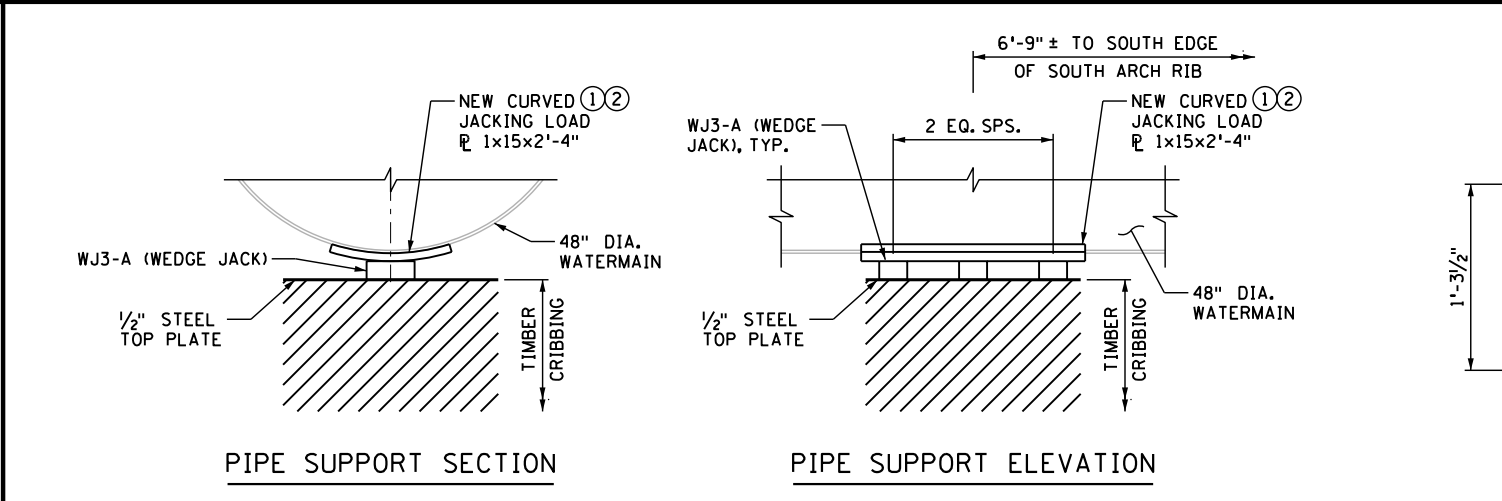
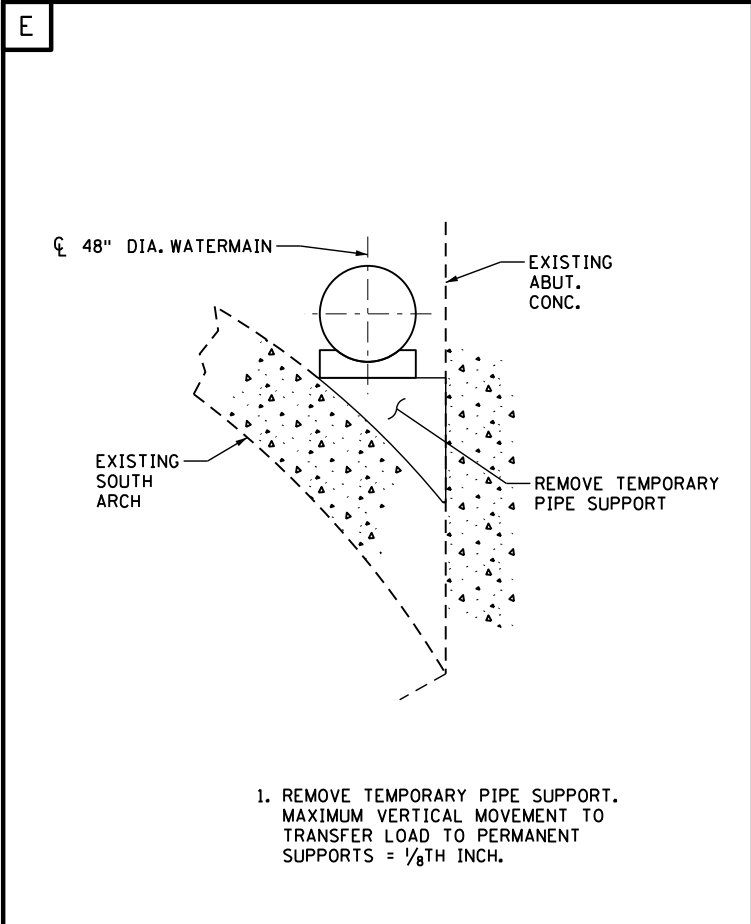
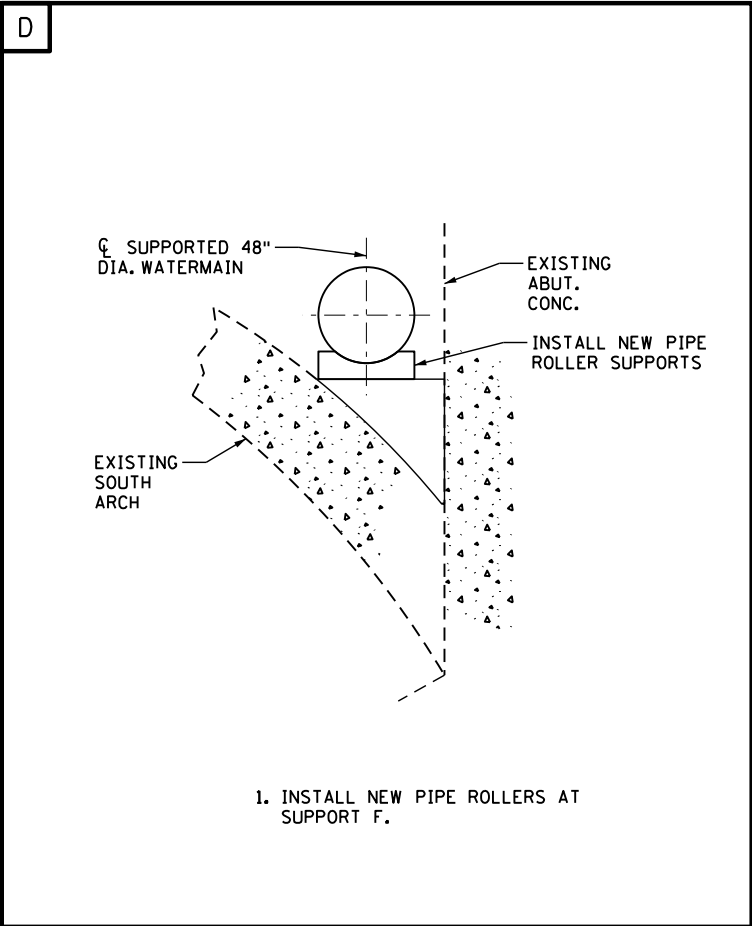
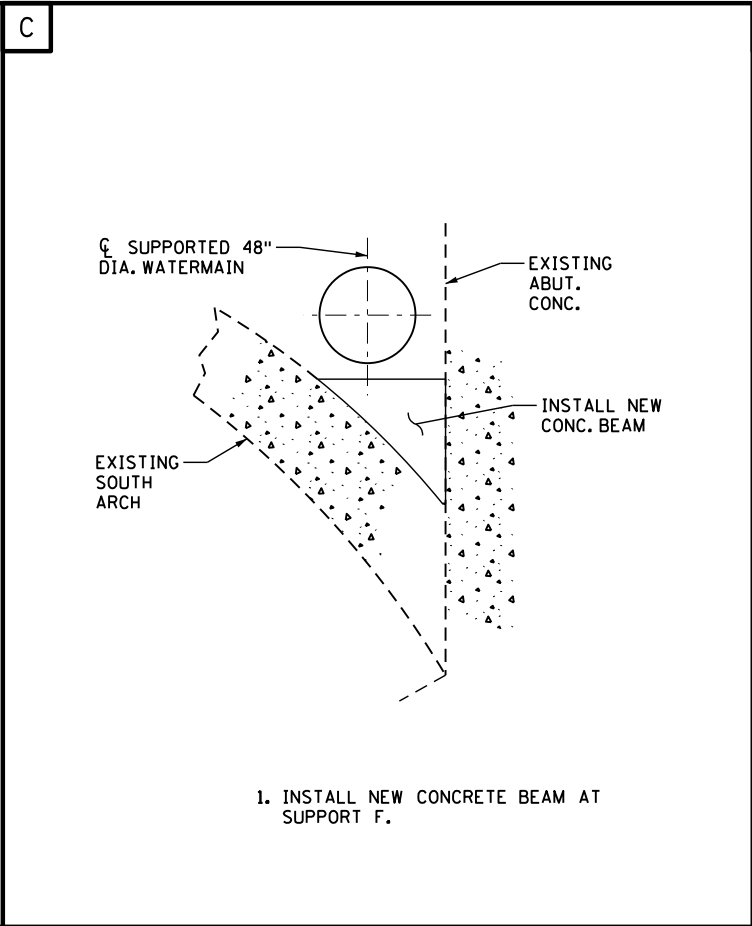
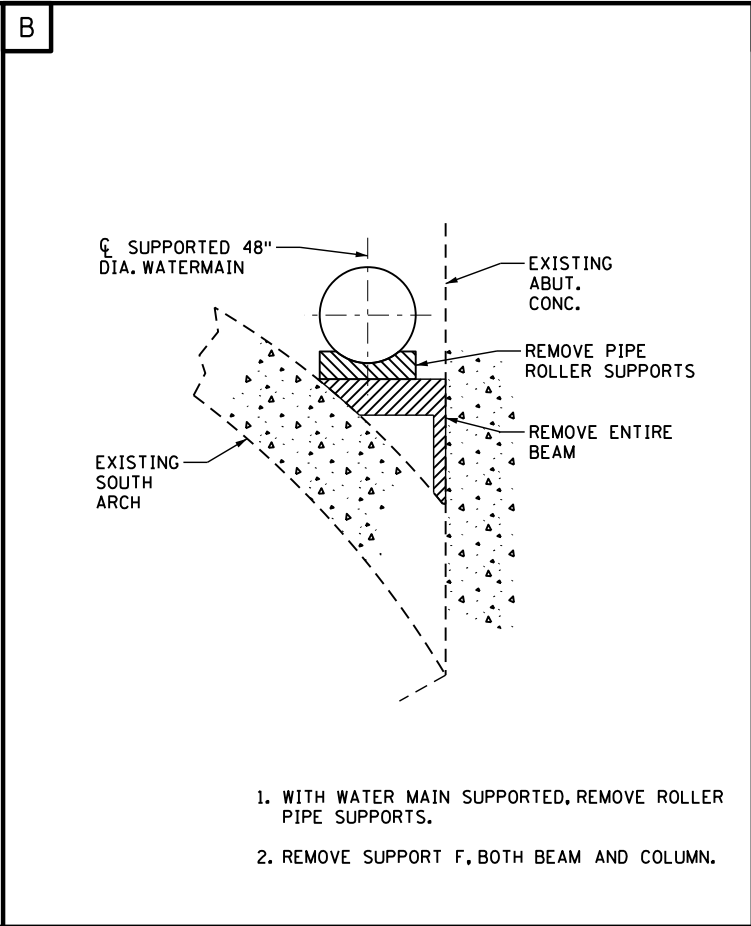
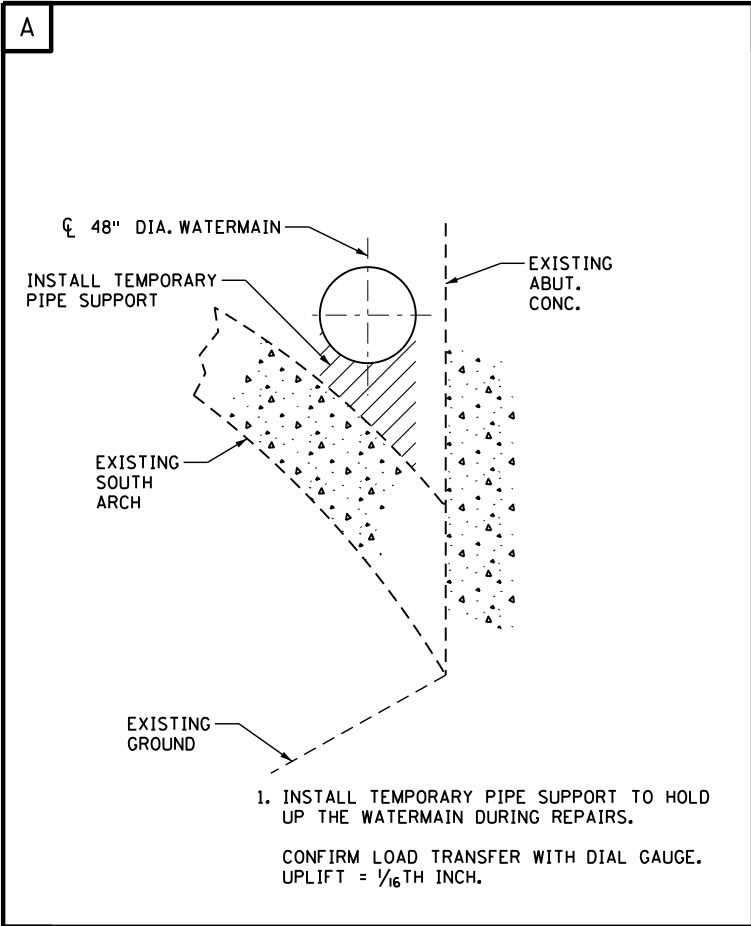

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 7825 Washington Ave. S., Suite 100  
 Bloomington, MN 55439-2431

TITLE: ROLLER STAND DETAILS

DES: SAO DR: DPC APPROVED:  
 CHK: UMD CHK: SAO  
 SHEET NO. 2 OF 4 SHEETS

BRIDGE NO. 2441

Plotted by: Dan.Crawford at 1:15:09 PM  
 Plotted on: 9/12/2016  
 File path: \\ONESESERVER\Public\Projects\1061-1-Mpls Franklin Water Main\2 - production\c - work\cd\East Abutment Support Repairs 8-9-16\BR2441\_STG001.dgn



**BILL OF MATERIALS - TEMPORARY PIPE SUPPORT**

ITEM	NO. REQ'D	LBS
CURVED 1x15 1/2 x 2'-4"	1	124
1/8" NEOPRENE 15 1/2" x 2'-4"	1	
WEDGE JACK	3	

- NOTES:**
- ① PLACE 1/8" NEOPRENE SHEET 15 1/2" x 2'-4" BETWEEN LOAD PLATE AND WATERMAIN PIPE.
  - ② PROVIDE STABLE CONTACT BETWEEN WEDGE JACK AND CURVED JACKING LOAD PLATE.

REVISIONS	DATE	BY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Steven A. Olson*  
 LIC. NO. 21838  
 PRINTED OR TYPED NAME: STEVEN A. OLSON      DATE: 9/12/2016

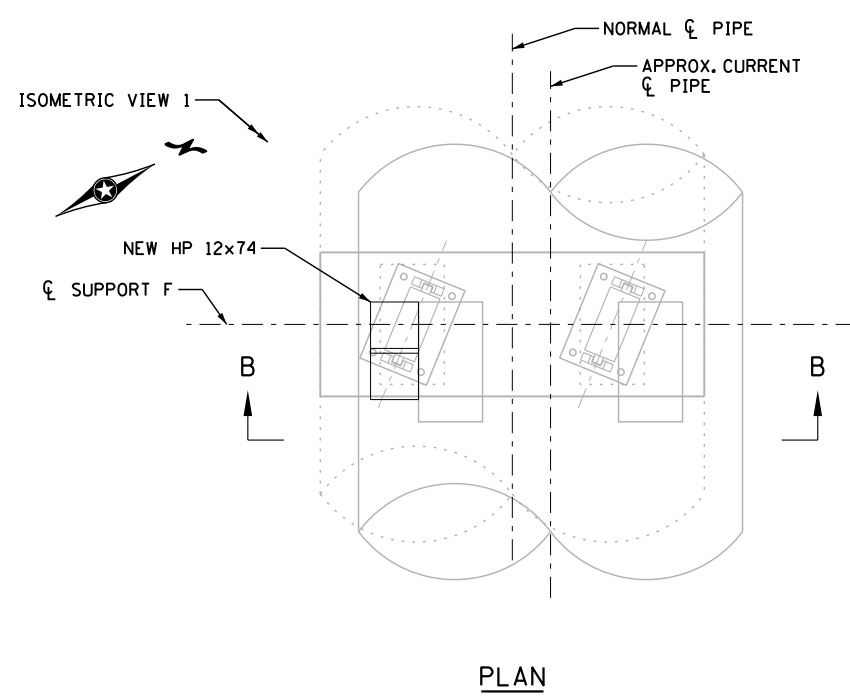
**Olson & Nesvold Engineers, P.S.C.**  
 7825 Washington Ave. S., Suite 100  
 Bloomington, MN 55439-2431

**TITLE: CONCEPTUAL CONSTRUCTION SEQUENCE AND JACKING DETAILS**

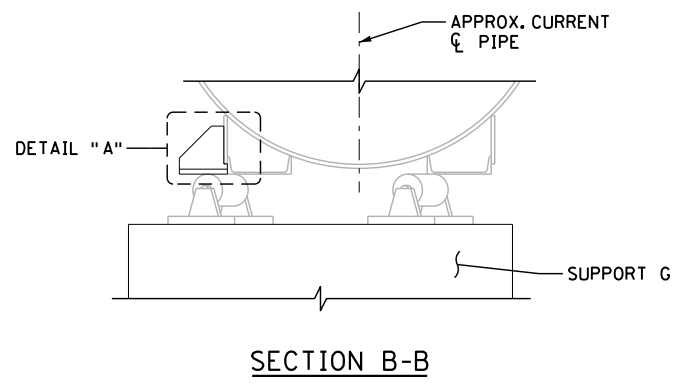
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SHEET NO. 3 OF 4 SHEETS			



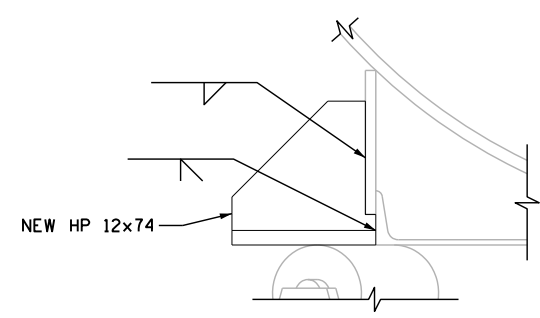
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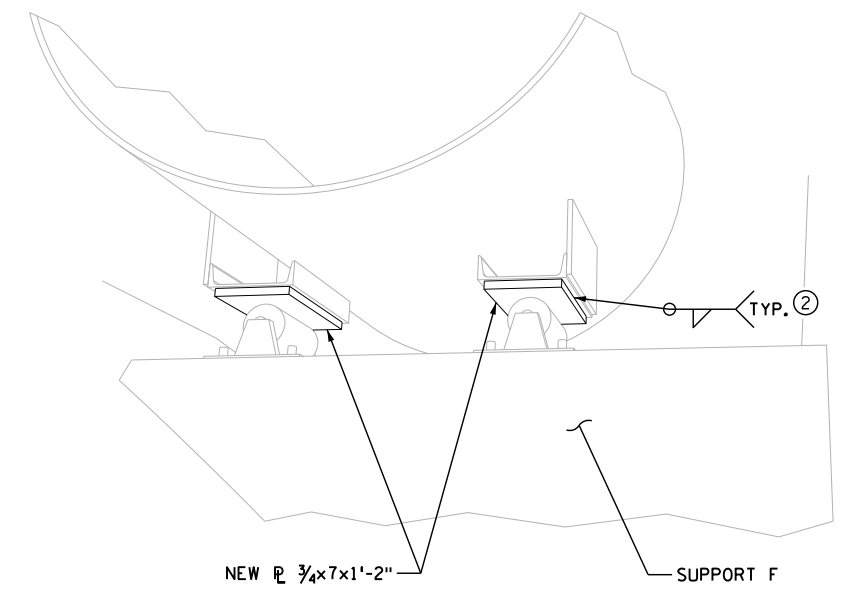
PLAN



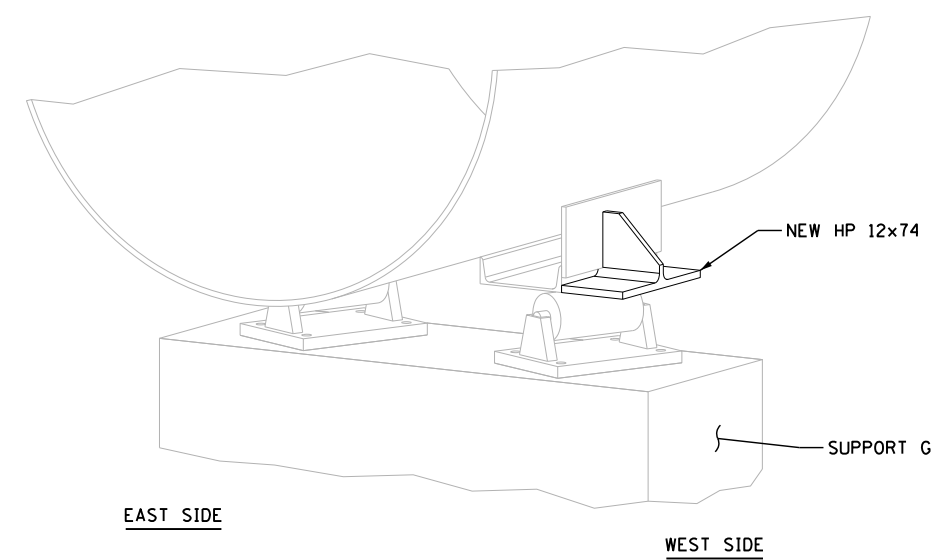
SECTION B-B



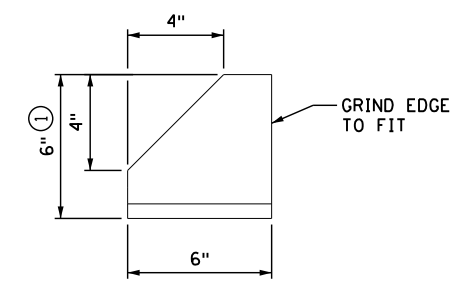
DETAIL "A"



ISOMETRIC VIEW 2



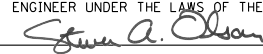
ISOMETRIC VIEW 1



SIDE ELEVATION  
NEW HP 12x74

- NOTES:**
- ① CUT HP 12x74 IN HALF ALONG WEB.
  - ② CENTER PLATE ON BOTTOM OF EXISTING CHANNEL. NEW PLATE SHOULD BE APPROX. 1/2" SHORTER ALL AROUND THAN CHANNEL.

REVISIONS	DATE	BY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
  
 L.I.C. NO. 21838  
 PRINTED OR TYPED NAME: STEVEN A. OLSON DATE: 9/12/2016



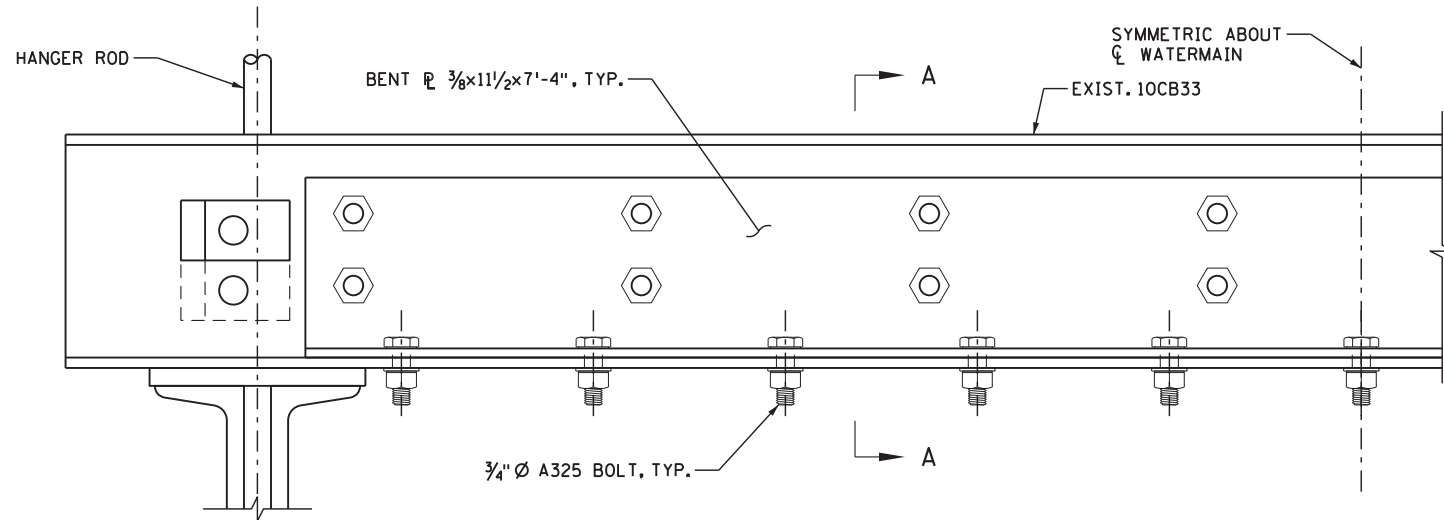
Olson & Nesvold Engineers, P.S.C.  
 7825 Washington Ave. S., Suite 100  
 Bloomington, MN 55439-2431

TITLE: WATERMAIN REPAIR DETAILS  
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 CHK: UMD CHK: SAO

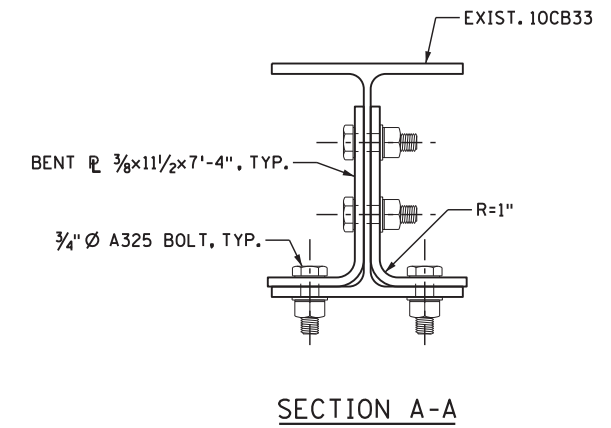
SHEET NO. 4 OF 4 SHEETS

BRIDGE NO. 2441

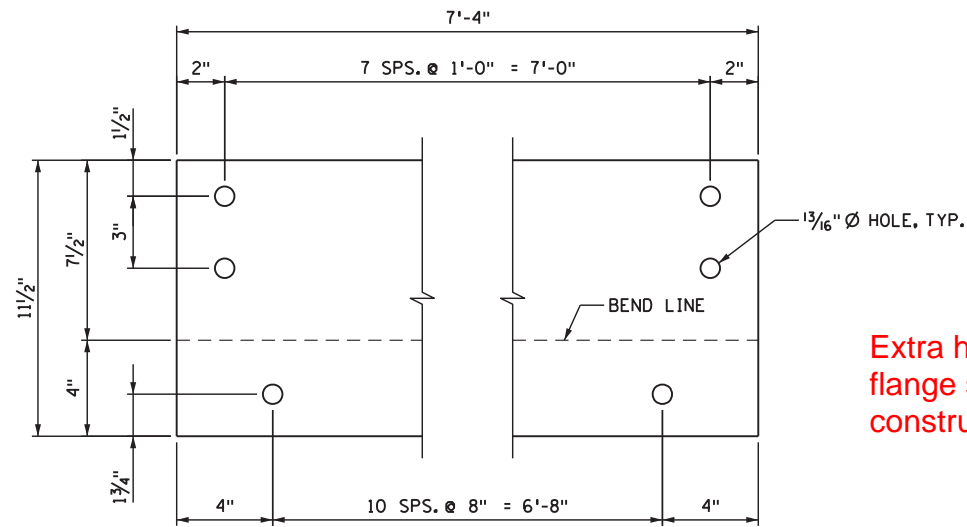
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CROSS BEAM ELEVATION



SECTION A-A



Extra holes were drilled in the bottom flange sections of the bent plates for constructibility.

BILL OF MATERIALS - CROSS BEAM REPAIR

ITEM	NO. REQ'D	LBS
BENT PLATE 3/8x11 1/2x7'-4"	2	216
3/4" A325 BOLTS	38	


NOTE:

- ① PLACE BENT PLATE INTO POSITION AND FIELD DRILL HOLES THROUGH EXISTING 10CB33.

REVISIONS	DATE	BY

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Steven A. Olson*  
 LIC. NO. 21838  
 PRINTED OR TYPED NAME: STEVEN A. OLSON DATE: 10/11/2016

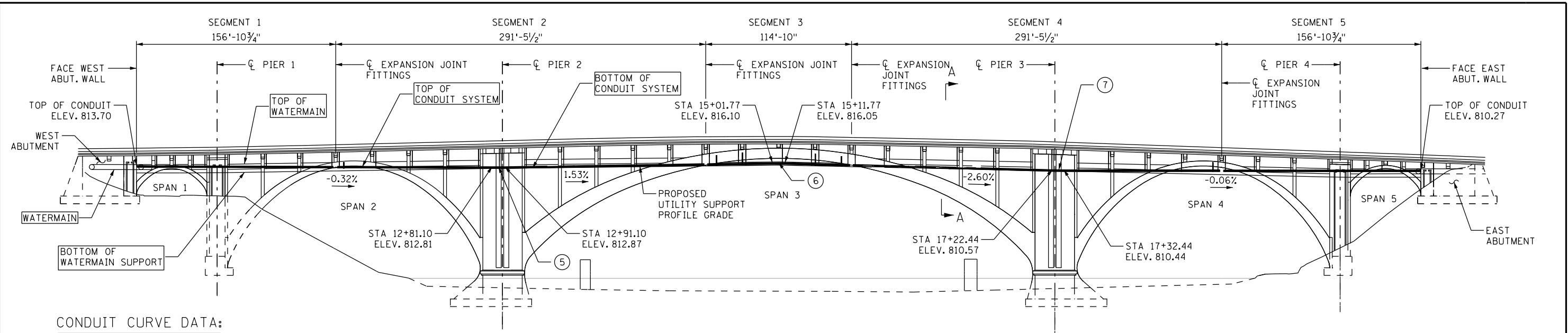


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 7825 Washington Ave. S., Suite 100  
 Bloomington, MN 55439-2431

TITLE: WATERMAIN CROSS BEAM REPAIR

DES: SAO	DR: DPC	APPROVED:
CHK: DPC	CHK: SAO	
SHEET NO. 1 OF 1 SHEETS		

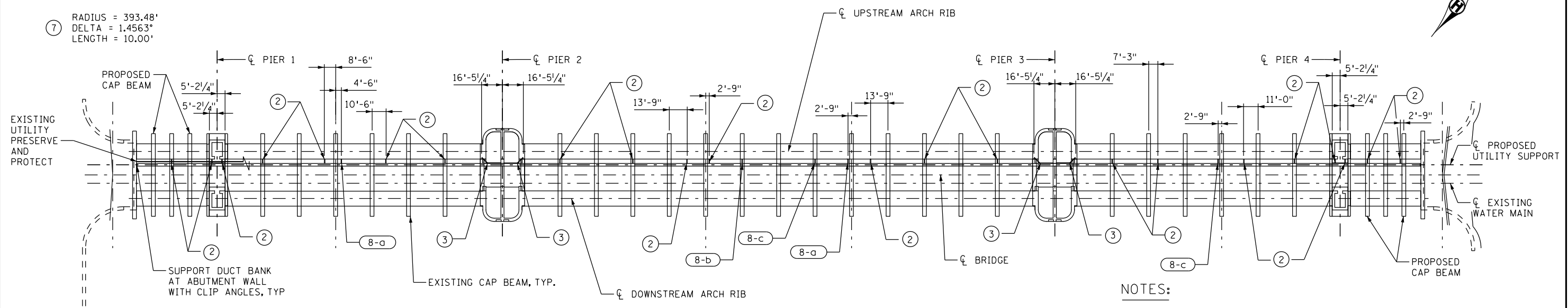
BRIDGE NO. 2441



**CONDUIT CURVE DATA:**

- ⑤ RADIUS = 540.58'  
DELTA = 1.0599°  
LENGTH = 10.00'
- ⑥ RADIUS = 242.14'  
DELTA = 2.3665°  
LENGTH = 10.00'
- ⑦ RADIUS = 393.48'  
DELTA = 1.4563°  
LENGTH = 10.00'

**ELEVATION**



**PLAN**

DECK NOT SHOWN FOR CLARITY

**UTILITY SUPPORT SEQUENCE:**

TEMPORARY CONDITION 1 - INSTALL UTILITY SUPPORT AND CONDUIT AT INDICATED GEOMETRIC PROFILE GRADE. SUSPEND UTILITY SUPPORT AND CONDUIT FROM EXISTING CAP BEAMS WITH DRILL AND EPOXY ANCHOR BOLTS.

TEMPORARY CONDITION 2 - TEMPORARILY SUPPORT UTILITY SUPPORT AND CONDUIT SYSTEM. MAINTAIN THE UTILITY SUPPORT AND CONDUIT GEOMETRIC PROFILE DURING DECK AND CAP BEAM REMOVAL AND REPLACEMENT. TEMPORARY SUPPORT TO BE DESIGNED BY THE CONTRACTOR, CERTIFIED BY A PROFESSIONAL ENGINEER IN THE STATE OF MINNESOTA, AND SUBMITTED FOR REVIEW. THE TEMPORARY SUPPORT SYSTEM(S) FOR THE UTILITY SUPPORT SHALL BE DESIGNED, AT A MINIMUM, TO MEET THE REQUIREMENTS OF THE MNDOT LRFD BRIDGE DESIGN MANUAL, AASHTO GUIDE DESIGN SPECIFICATIONS FOR BRIDGE TEMPORARY WORKS AND THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.

FINAL CONDITION - SUSPEND UTILITY SUPPORT AND CONDUIT FROM PROPOSED CAP BEAMS UTILIZING ANCHOR BOLTS IN THREADED INSERTS.

**NOTES:**

1. FOR DETAILS AND NOTES, SEE UTILITY SUPPORT DETAILS SHEETS.
- ② FOR LATERAL STRUT DETAILS, SEE UTILITY SUPPORT DETAILS SHEET U3.
- ③ FOR LATERAL BRACING DETAILS, SEE UTILITY SUPPORT DETAILS SHEET U3.
4. FOR SECTION A-A, SEE UTILITY SUPPORT DETAILS SHEET U2.
- ⑧ FOR INCLINED LATERAL STRUT DETAILS, SEE SHEET U4
9. ALL UTILITY SUPPORT FABRICATION AND WELDING SHALL FOLLOW MNDOT SPEC. 2471
10. DESIGN DETERMINED FROM PLAN DIMENSIONS, CONTRACTOR TO FIELD VERIFY DIMENSIONS OF EXISTING STRUCTURE AND NOTIFY THE ENGINEER OF DEVIATIONS FROM PLAN DIMENSIONS.

① SEE UTILITY SUPPORT SYSTEM SHOP DRAWING 133 FOR DETAILS.



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Travis F. Konda*  
**TRAVIS F. KONDA, PROFESSIONAL ENGINEER**  
 LICENSE NO. **48851** DATE **7/14/2015**

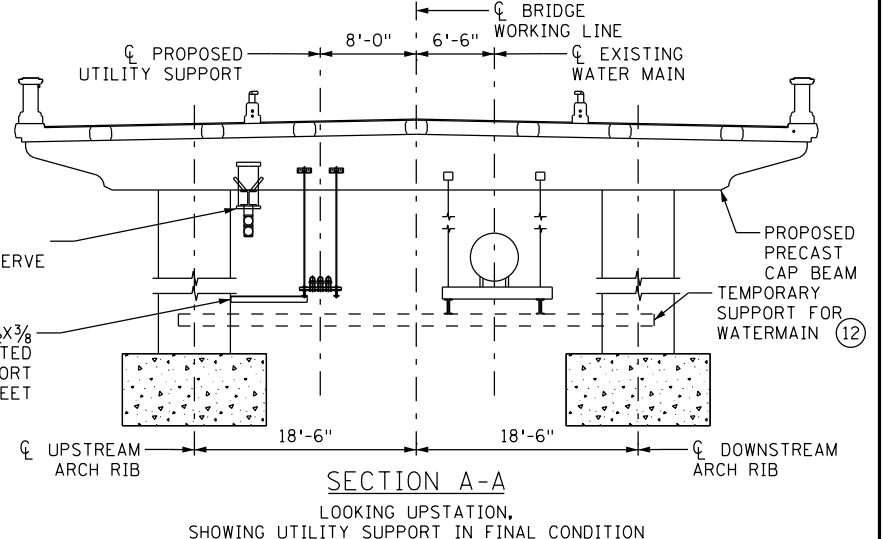
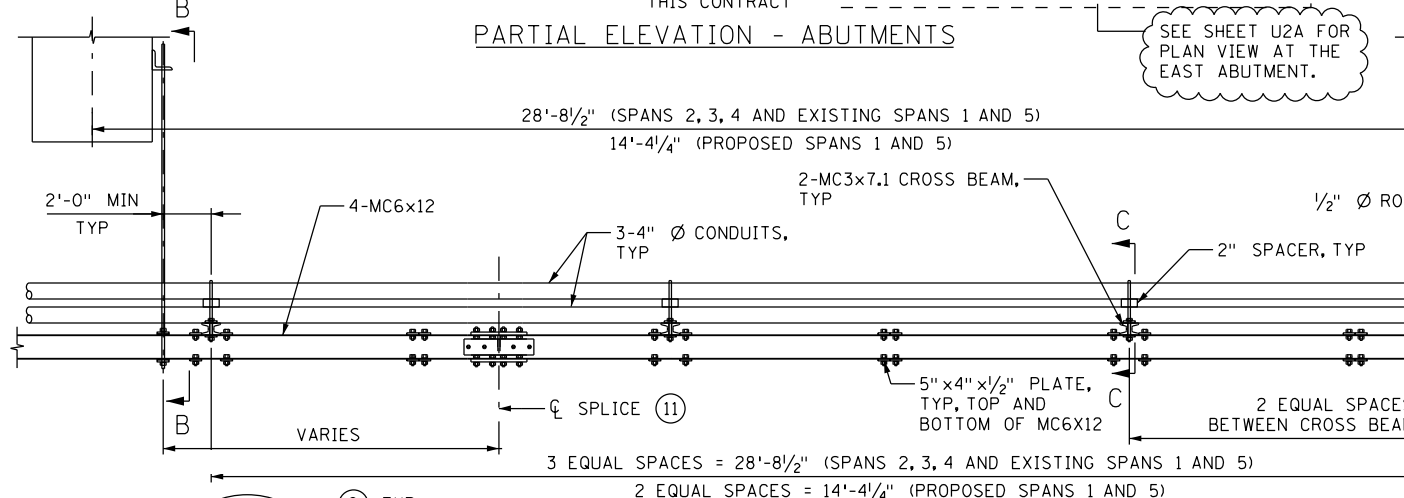
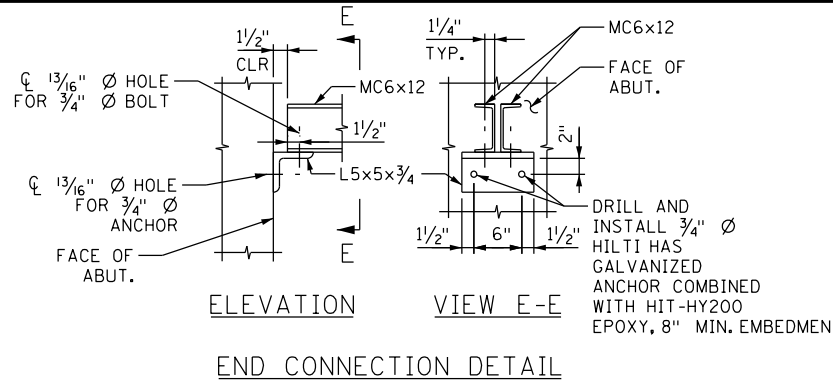
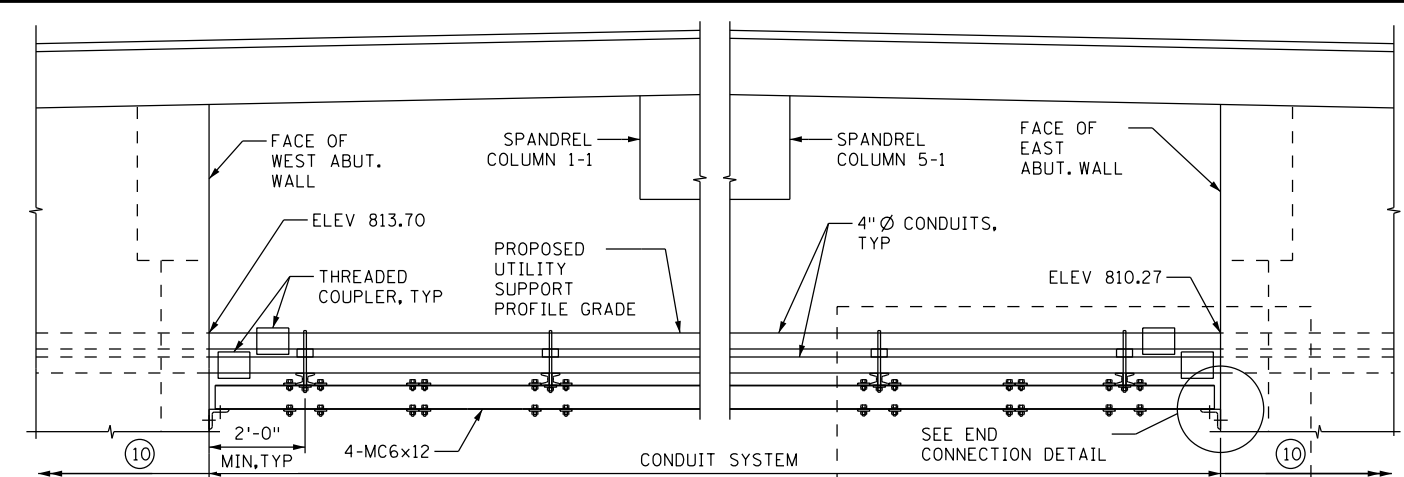
**DESIGN BY:** TFK  
**CAD BY:** MGR  
**CHECKED BY:** DFE  
**LAST REVISION:**

**AS-BUILT - UTILITY SUPPORT PLAN AND ELEVATION**  
**C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705**  
**BRIDGE 2441 S.P. 027-605-029**

**SHEET**  
 U1  
 U4

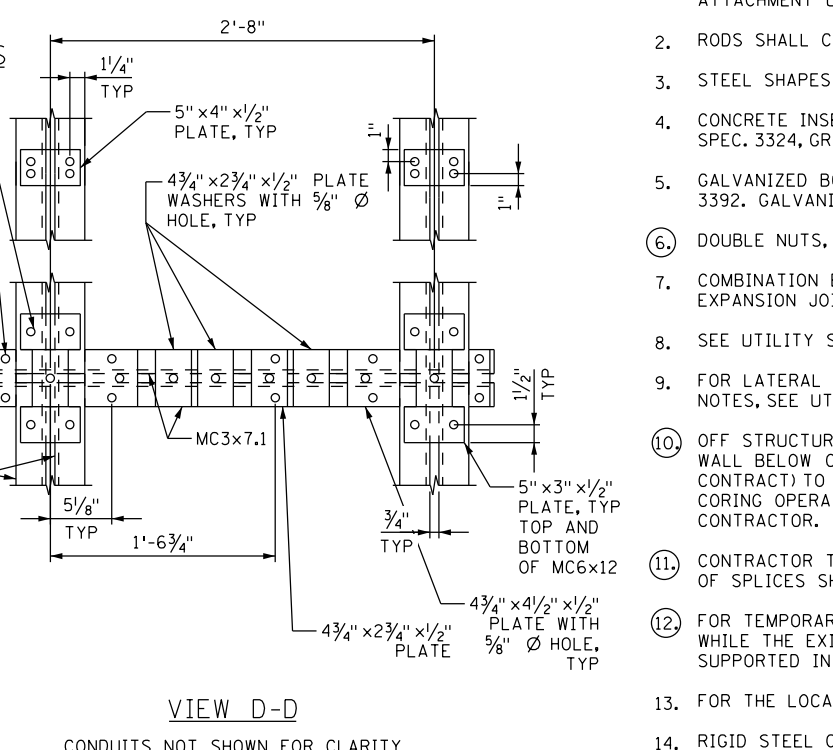
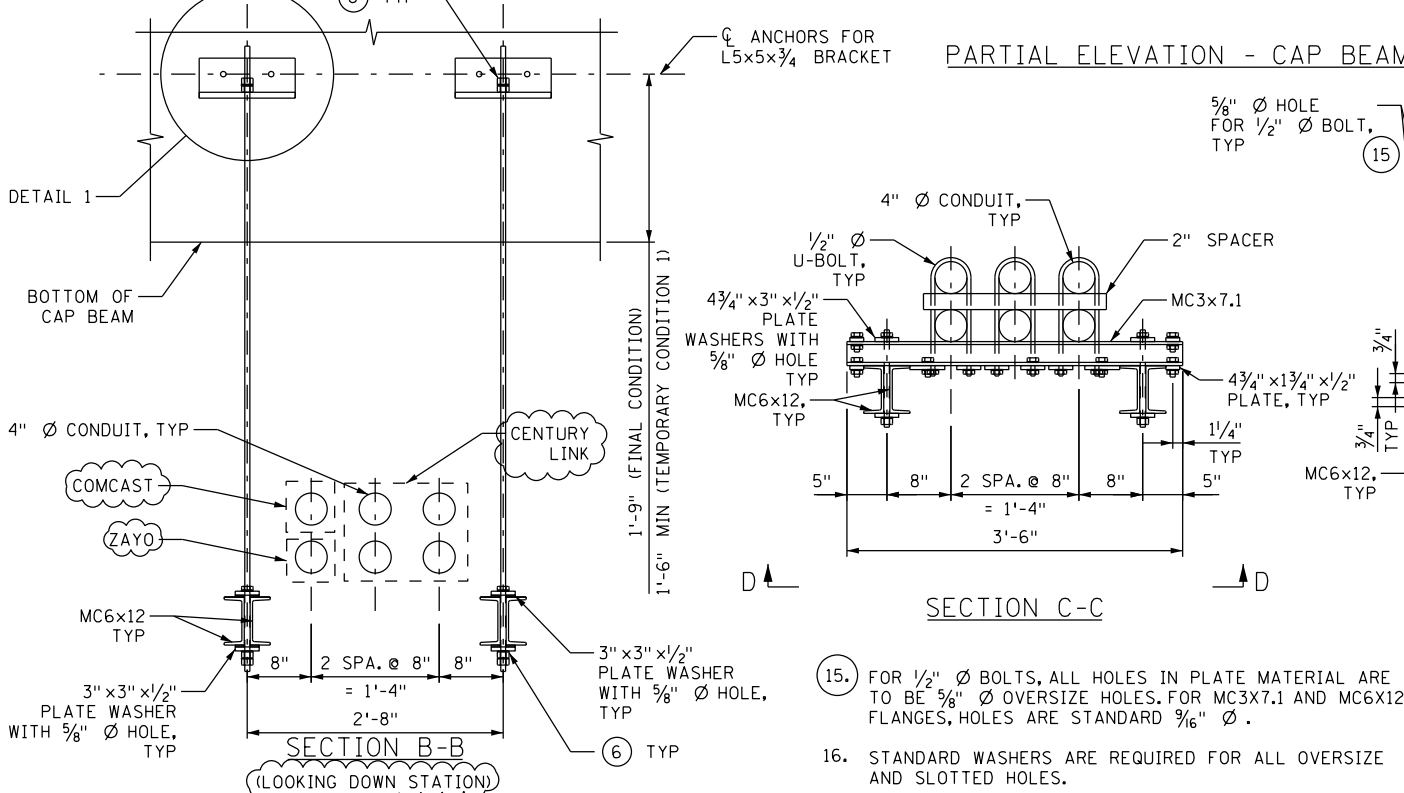
① SUMMARY OF QUANTITIES CONDUIT SYSTEM

ITEM	UNIT	QUANTITY TOTAL
4" DIA. RIGID STEEL CONDUIT	LIN FT	6069
COMB EXP/DEFL FITTINGS (4" RS)	UNITS	24
1/2" THREADED RODS	UNITS	94
CONNECTION ASSEMBLY (UBOLTS WASHERS AND SPACERS)	UNITS	117
MC6x12	LIN FT	4,023
MC3x7.1	LIN FT	819



NOTES:

- ALL MATERIAL LISTED IS TO BE INCLUDED IN "CONDUIT SYSTEM". TABLE IS FOR CONTRACTOR CONVENIENCE ONLY. PAYMENT FOR TEMPORARY WATERMAIN SUPPORT ATTACHMENT UTILITY SUPPORT AND CONDUIT BY LUMP SUM.
- RODS SHALL COMPLY WITH SPEC. 3313, TYPE 1.
- STEEL SHAPES AND PLATES SHALL COMPLY WITH SPEC. 3306.
- CONCRETE INSERTS SHALL BE APPROVED TYPE MALLEABLE IRON. MATERIAL AS PER SPEC. 3324, GRADE 35018. TAP AFTER GALVANIZED (FOR FINAL CONDITION).
- GALVANIZED BOLTS, NUTS, WASHERS, RODS, INSERTS AND ANCHOR BOLTS AS PER SPEC. 3392. GALVANIZE ALL OTHER STEEL AS PER SPEC. 3394 AFTER FABRICATION.
- DOUBLE NUTS, JAM NUTS OR LOCK NUTS.
- COMBINATION EXPANSION/DEFLECTION FITTINGS REQUIRED AT ALL PROPOSED DECK EXPANSION JOINT LOCATIONS.
- SEE UTILITY SUPPORT PLAN AND ELEVATION FOR UTILITY PROFILE GRADE GEOMETRY
- FOR LATERAL BRACING SUPPORT, DETAIL 1, MC6x12 SPLICE DETAILS, AND ADDITIONAL NOTES, SEE UTILITY SUPPORT DETAILS SHEET U3.
- OFF STRUCTURE CONDUIT SYSTEM BY OTHERS. CORE THROUGH EXISTING ABUTMENT WALL BELOW CAP BEAM. UTILITY SUPPORT INSTALLATION CONTRACTOR (THIS CONTRACT) TO COORDINATE AND STAGE UTILITY SUPPORT, CONDUIT, AND CONCRETE CORING OPERATION (NOT IN THIS CONTRACT) WITH OFF STRUCTURE UTILITY CONTRACTOR.
- CONTRACTOR TO DETERMINE NUMBER AND LOCATION OF MC6x12 SPLICES. PLACEMENT OF SPLICES SHALL BE SELECTED TO MAINTAIN THE PROPOSED UTILITY GEOMETRY.
- FOR TEMPORARY CONDITION 2, CONTRACTOR TO SUPPORT THE UTILITY SUPPORT WHILE THE EXISTING CAP BEAMS ARE BEING REPLACED. UTILITIES SHALL BE SUPPORTED IN SUCH A WAY AS TO REMAIN AT THEIR FINAL ELEVATION.
- FOR THE LOCATION OF SECTION A-A, SEE SHEET U1.
- RIGID STEEL CONDUIT AND FITTINGS SHALL COMPLY WITH SPEC. 3801



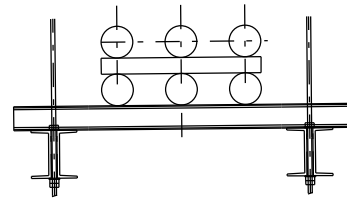
I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Travis F. Konda*  
**TRAVIS F. KONDA, PROFESSIONAL ENGINEER**  
 48851 LICENSE NO. 7/14/2015 DATE

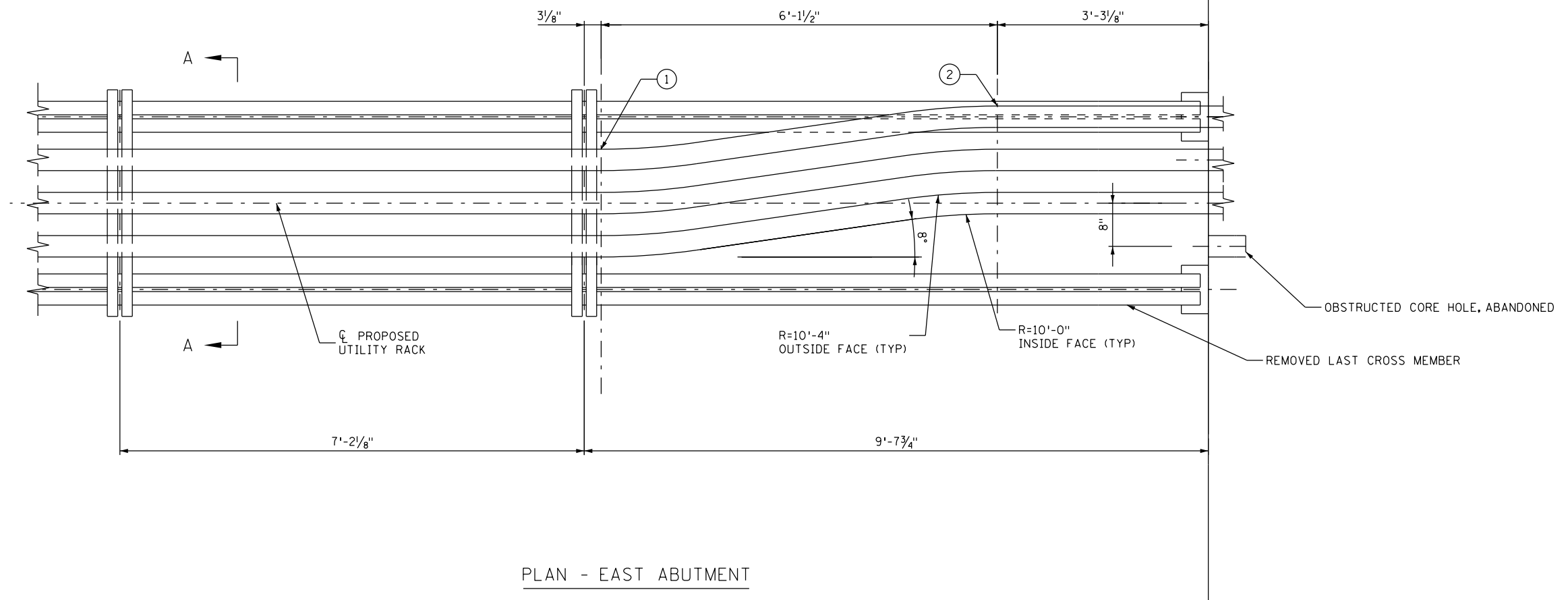
DESIGN BY: TFK  
 CAD BY: MGR  
 CHECKED BY: DFE  
 LAST REVISION: 11/05/2015

AS-BUILT - UTILITY SUPPORT DETAILS  
 C.S.A.H. 5 / HENNEPIN COUNTY PROJECT 0705  
 BRIDGE 2441 S.P. 027-605-029

SHEET  
 U2R  
 U4



SECTION A-A



PLAN - EAST ABUTMENT

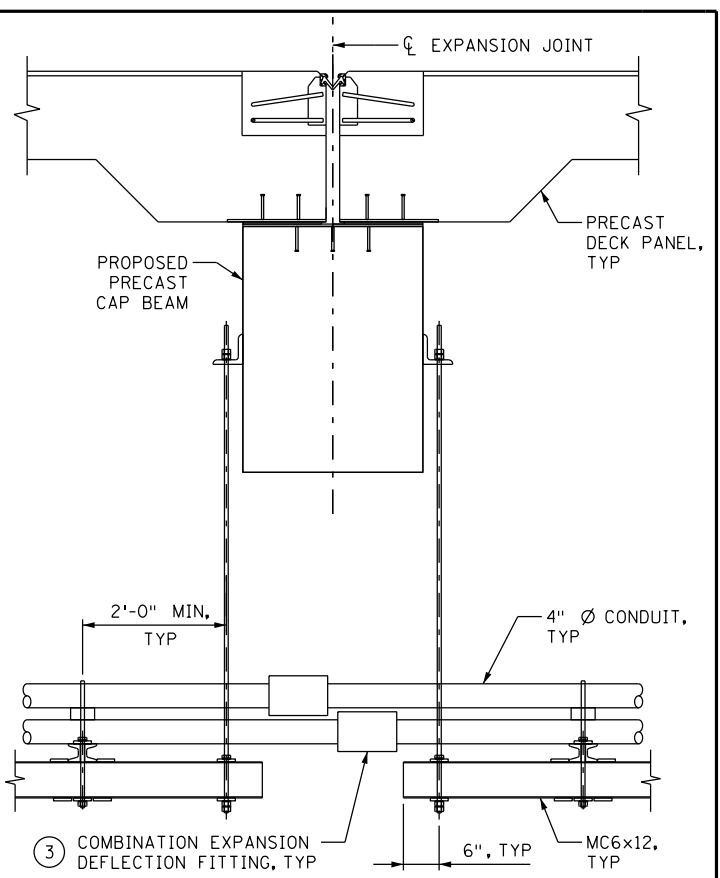
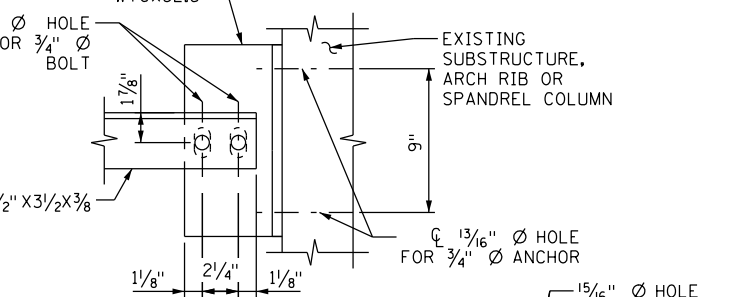
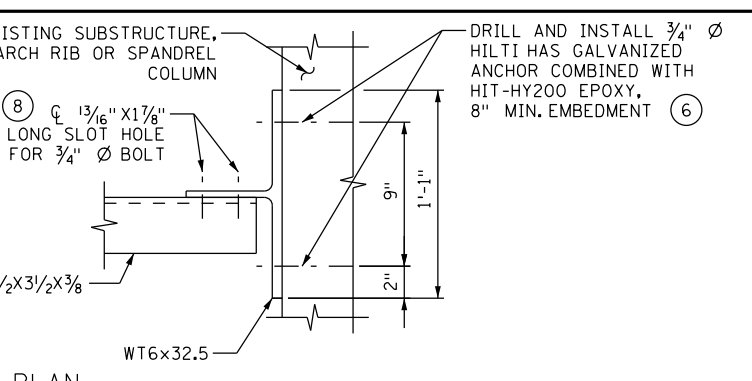
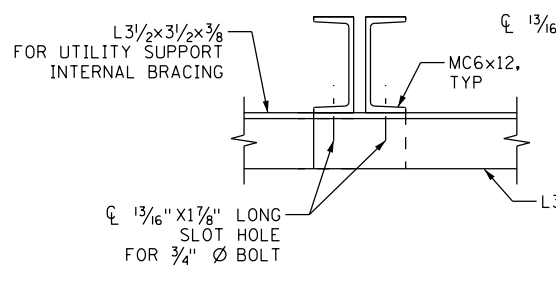
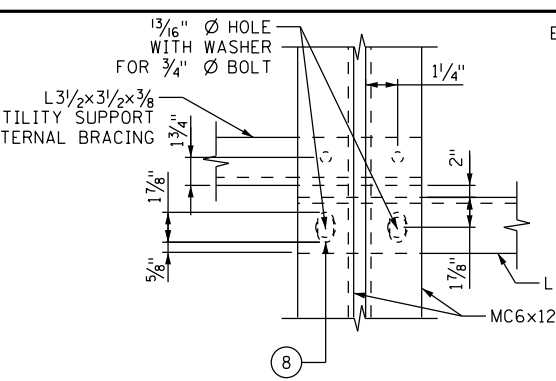
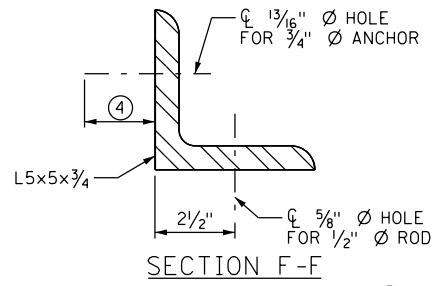
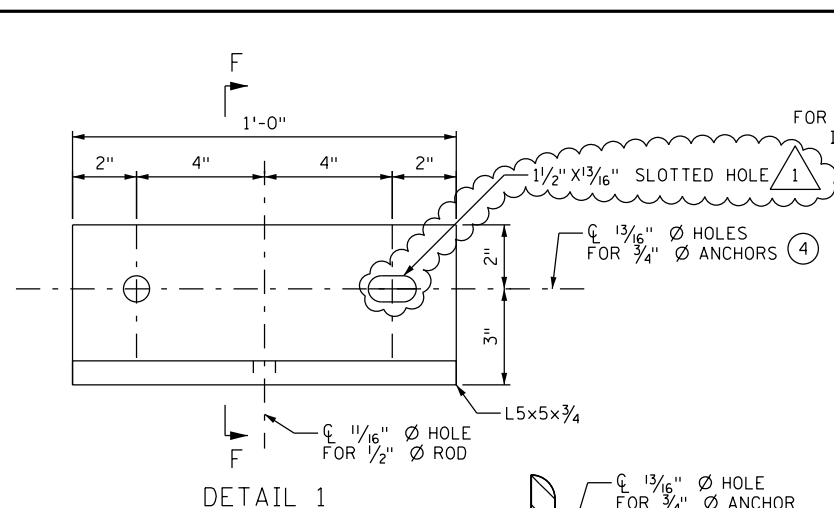
NOTES:

CONDUITS WERE BENT TO ACCOMMODATE THE OBSTRUCTED CORE HOLE, SHIFTING THE DUCT BANK 8" UPSTREAM.

- ① BEGIN BEND
- ② END BEND

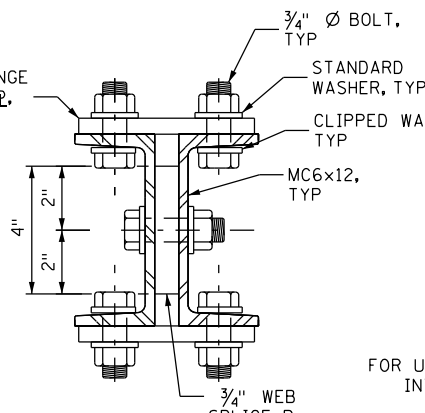
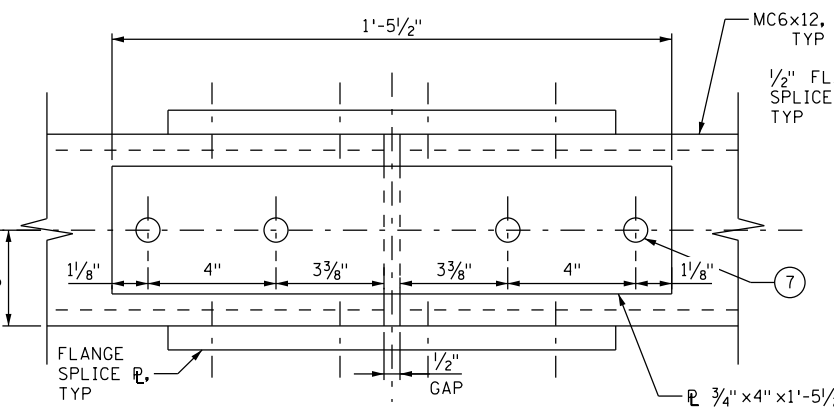
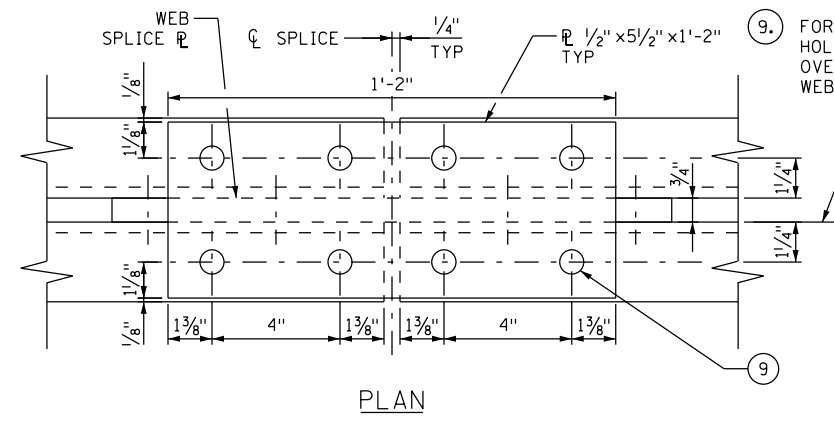


AS-BUILT - UTILITY SUPPORT DETAILS		SHEET
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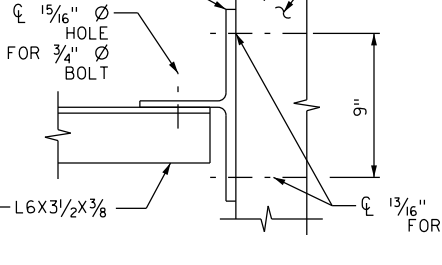
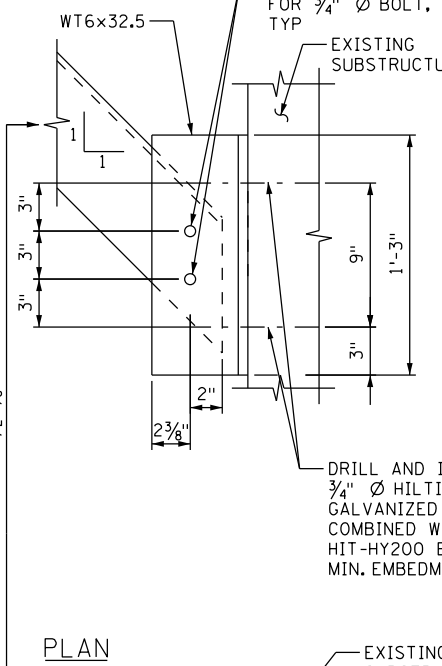
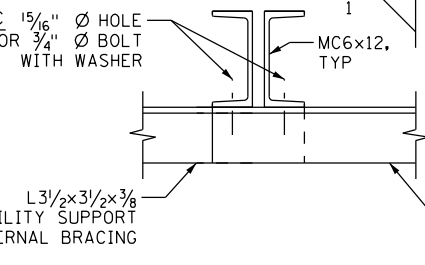
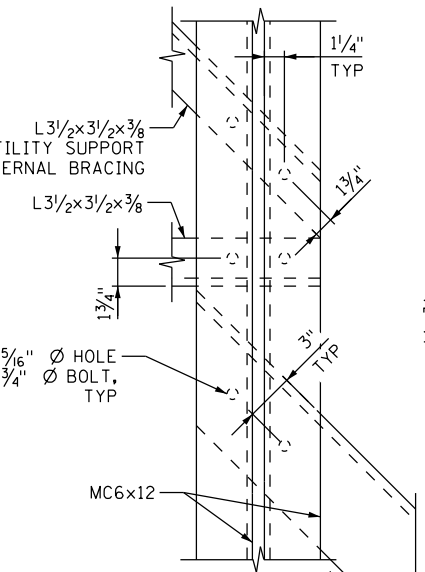


8. ALL BOLTS FOR THE L3/2"x3/2"x3/8" LATERAL STRUT MEMBERS ARE TO BE SNUG TIGHT ONLY WITH DOUBLE NUTS, JAM NUTS OR LOCK NUTS IN PLACE.

9. FOR 3/4" Ø BOLTS IN MC6x12 CONNECTION, ALL HOLES IN PLATE MATERIAL ARE TO BE 15/16" Ø OVERSIZE HOLES. FOR MC6x12 FLANGES AND WEBS, HOLES ARE STANDARD 13/16" Ø.



LATERAL BRACING DETAILS



- NOTES:
- HIGH STRENGTH BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A325.
  - FOR ADDITIONAL NOTES, SEE SHEET U1.
  - COMBINATION EXPANSION DEFLECTION FITTINGS SHALL BE CAPABLE OF ALLOWING A MINIMUM OF 4" OF TOTAL AXIAL MOVEMENT AND SHALL BE PROVIDED AT ALL FINAL BRIDGE EXPANSION JOINT LOCATIONS.
  - FOR TEMPORARY CONDITION 1 - DRILL AND INSTALL 3/4" Ø HILTI HAS ANCHORS WITH HIT-HY200 EPOXY WITH 8" EMBEDMENT, OR SIMILAR, AS ACCEPTED BY THE ENGINEER, FOR CONNECTIONS TO THE EXISTING CAP BEAMS. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL ASSESS THE CONDITION OF THE EXISTING CAP BEAM FOR SOUND CONCRETE AT THE ANCHOR LOCATIONS AND NOTIFY THE ENGINEER IN THE INSTANCE OF UNSOUND CONCRETE AT THE ANCHOR LOCATION. FOR FINAL CONDITION - INSTALL DAYTON SUPERIOR THREADED INSERT F57 OR SIMILAR, AS ACCEPTED BY THE ENGINEER, FOR ANCHOR BOLT CONNECTION TO THE PROPOSED CAP BEAMS.
  - FOR INTERNAL BRACING DETAILS, SEE SHEET U4.
  - DRILL AND INSTALL HILTI HAS GALVANIZED ANCHORS WITH HIT-HY200 EPOXY OR SIMILAR, AS ACCEPTED BY THE ENGINEER, FOR THE LATERAL STRUT AND LATERAL BRACING DETAILS TO THE EXISTING ARCH RIBS, SPANDREL COLUMNS, AND SUBSTRUCTURE ELEMENTS. PRIOR TO INSTALLATION, THE CONTRACTOR SHALL ASSESS THE CONDITION OF THE EXISTING CONCRETE AT THE ANCHOR LOCATIONS AND NOTIFY THE ENGINEER IN THE INSTANCE OF UNSOUND CONCRETE AT THE ANCHOR LOCATION. NOTIFY ENGINEER IF REBAR OR EMBEDDED ANGLES ARE ENCOUNTERED.
  - UTILITY SUPPORT PROFILE GRADE ANGLE DEVIATIONS TO BE ACCOMMODATED BY PLACING MC6x12 SPLICES WITH OVERSIZED HOLES NEAR LOCATION OF GRADE CHANGES.

1 MODIFIED PER RFI 57



I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

*Travis Konda*

TRAVIS F. KONDA, PROFESSIONAL ENGINEER

48851 7/14/2015

LICENSE NO. DATE

DESIGN BY: TFK

CAD BY: MGR

CHECKED BY: DFE

LAST REVISION: 11/05/2015

AS-BUILT - UTILITY SUPPORT DETAILS

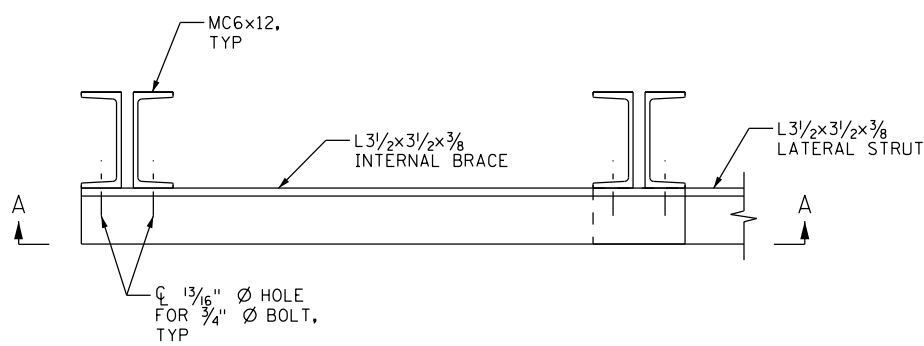
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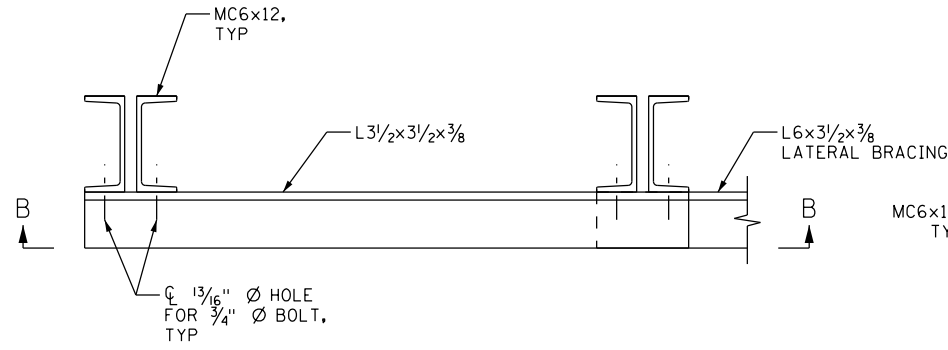
SHEET

U3R

U4

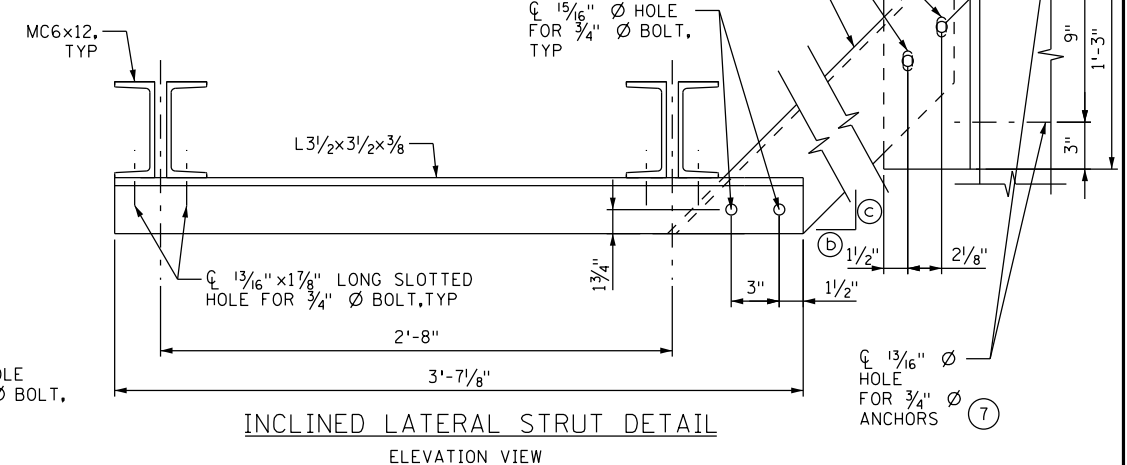


UTILITY SUPPORT INTERNAL BRACING  
LOOKING BACK STATION

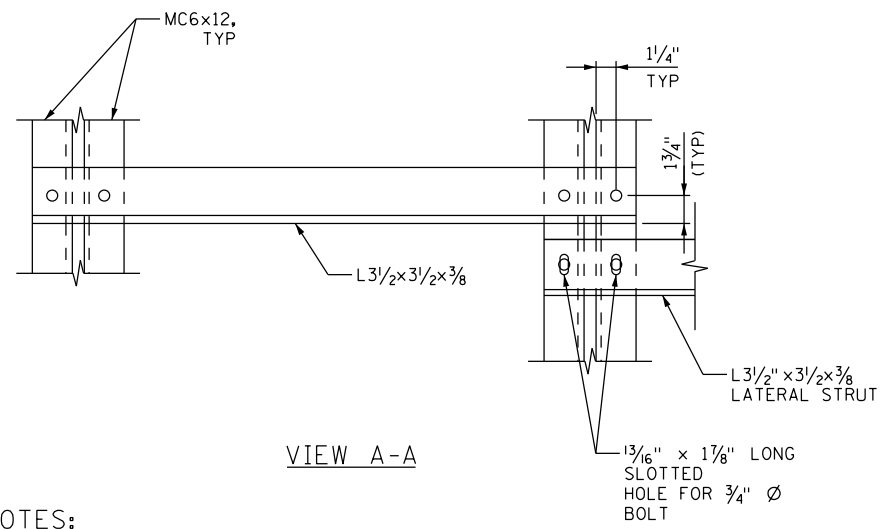


INCLINED LATERAL STRUT SLOPE

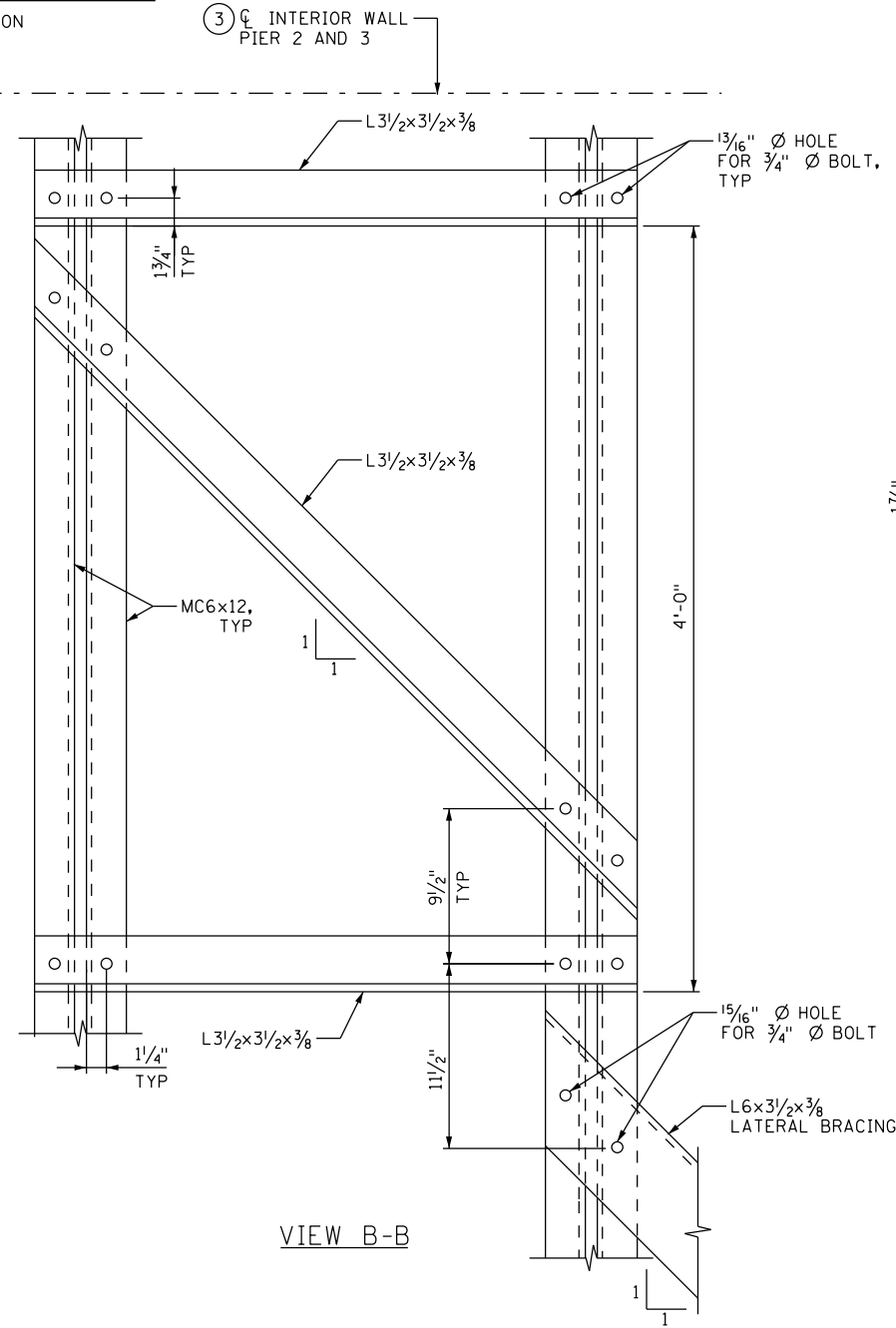
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8-b	1	1.63
8-c	1	2



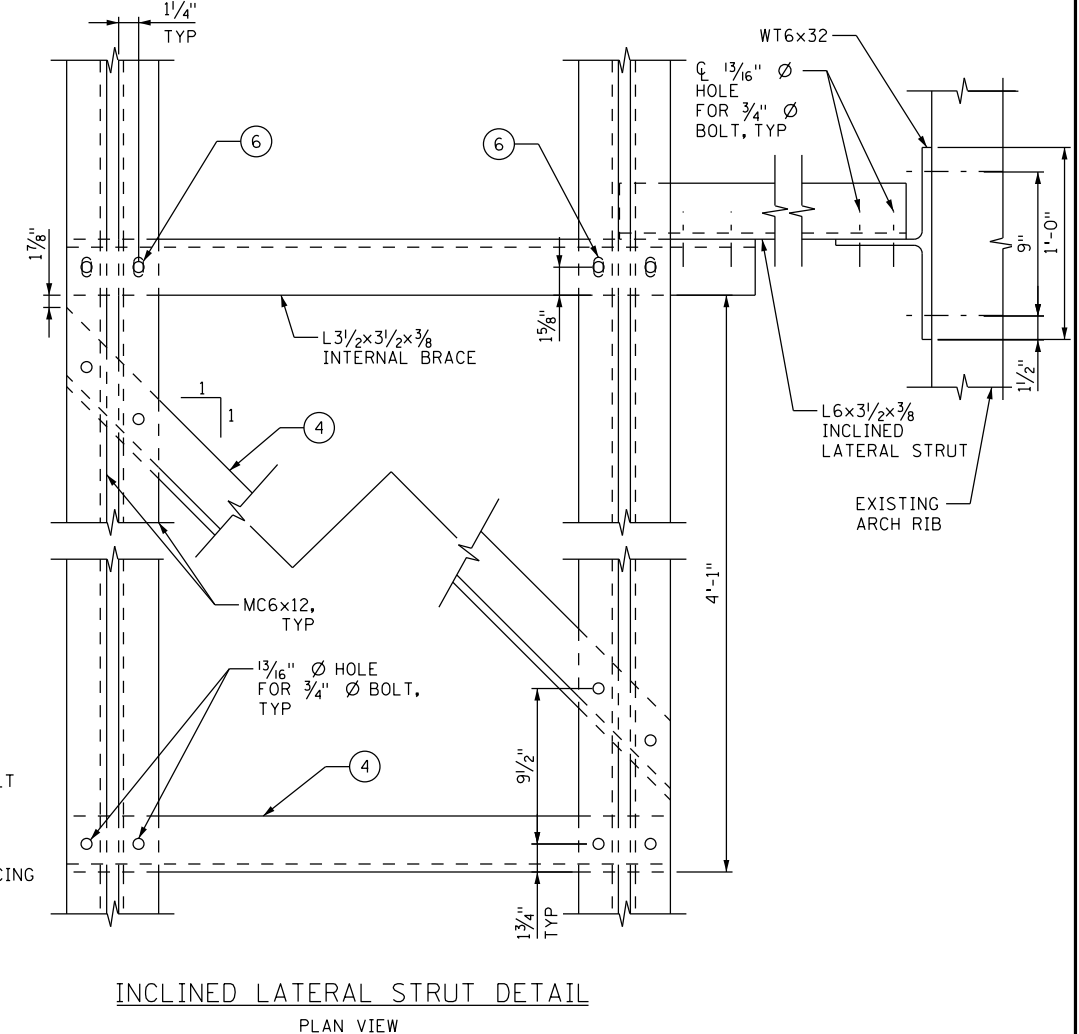
INCLINED LATERAL STRUT DETAIL  
ELEVATION VIEW



VIEW A-A



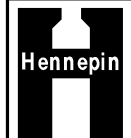
VIEW B-B



INCLINED LATERAL STRUT DETAIL  
PLAN VIEW

NOTES:

- HIGH STRENGTH BOLTS SHALL MEET THE REQUIREMENTS OF ASTM A325.
- FOR ADDITIONAL NOTES AND INFORMATION, SEE SHEETS U2 AND U3.
- AT PIERS 2 AND 3, MIRROR ABOUT  $\phi$  INTERIOR WALL.
- DOWNSTATION INCLINED LATERAL STRUT FOR SEGMENTS 3 SHOWN, MIRROR ABOUT MIDSPAN OF SEGMENT 3 FOR UPSTATION LATERAL STRUT. DIAGONAL INTERNAL BRACING FOR INCLINED LATERAL STRUT LOCATED AT EACH END OF SEGMENT 3 ONLY.
- AT LOCATIONS OF INTERNAL BRACING, ADJUST THE MC3X7.1 CROSS BEAMS  $\pm 1'-0"$  TO AVOID CONFLICTS WITH CONNECTION HARDWARE.
- ALL BOLTS FOR THE  $L3/2 \times 3/2 \times 3/8$  ANGLES ATTACHED TO THE INCLINED LATERAL STRUTS ARE TO BE SNUG TIGHT ONLY WITH DOUBLE NUTS, JAM NUTS, OR LOCK NUTS IN PLACE.
- FOR DETAILS ON  $3/4"$   $\phi$  ANCHORS, SEE SHEET U3.
- ALL SLOTTED AND OVERSIZED HOLES ARE TO BE PLACED IN THE ANGLE OR WT SECTIONS AS NOTED.



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UTILITY SUPPORT BRACING

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SHEET  
 U4R  
 U4