

STATE OF VERMONT  
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT  
BRIDGE PROJECT

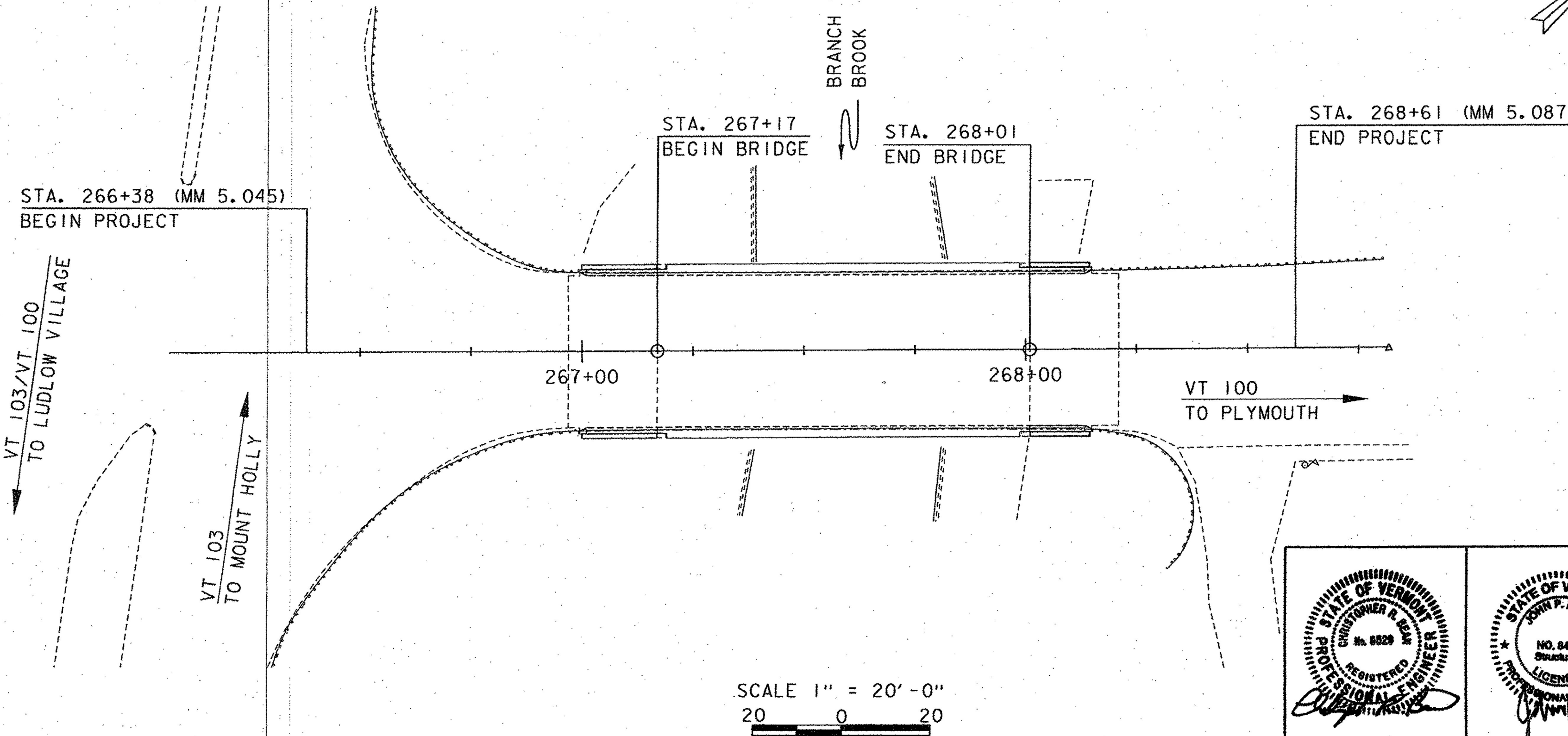
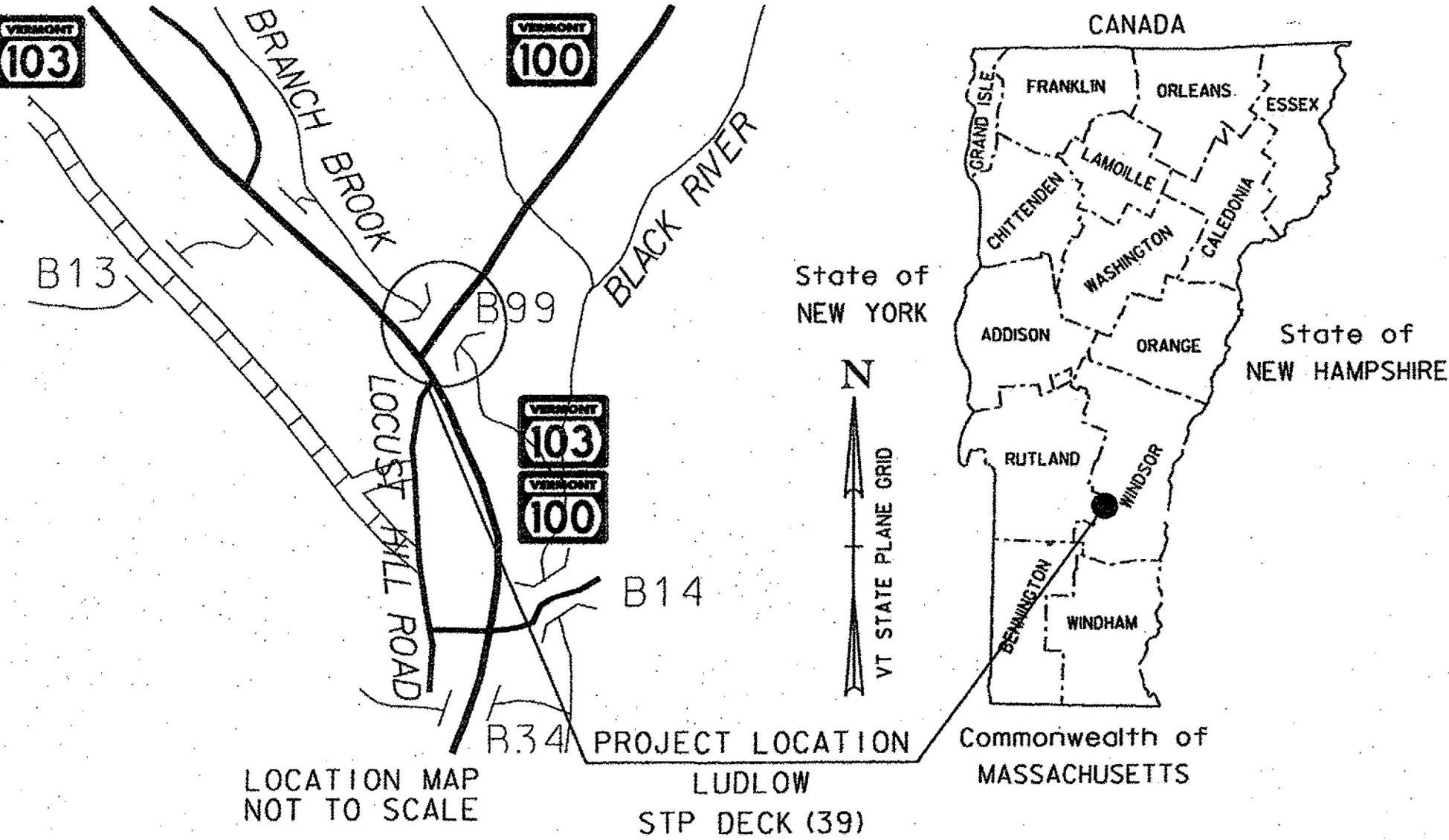
TOWN OF LUDLOW  
COUNTY OF WINDSOR

VT ROUTE 100 (MINOR ARTERIAL) BRIDGE NO. 99

PROJECT LOCATION: LOCATED IN THE TOWN OF LUDLOW, ON VT 100, APPROXIMATELY 0.028 MILES EASTERLY FROM THE INTERSECTION WITH VT 103.

PROJECT DESCRIPTION: WORK TO BE PERFORMED UNDER THIS PROJECT INCLUDES THE REPLACEMENT OF THE EXISTING BRIDGE DECK INCLUDING RELATED APPROACH WORK.

LENGTH OF STRUCTURE: 84.00 FEET  
LENGTH OF ROADWAY: 139.00 FEET  
LENGTH OF PROJECT: 223.00 FEET



CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2011, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JULY 20, 2011 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

QUALITY ASSURANCE PROGRAM : LEVEL 2

SURVEYED BY : CLD  
SURVEYED DATE : 09/21/2015

DATUM  
VERTICAL NAVD 88  
HORIZONTAL NAD 83

|                                                                                         |  |  |                                                                      |
|-----------------------------------------------------------------------------------------|--|--|----------------------------------------------------------------------|
|                                                                                         |  |  | DIRECTOR OF PROJECT DELIVERY<br>APPROVED: <i>TACM</i> DATE: 8/8/2016 |
| 540 Commercial Street<br>Manchester, NH 03101<br>(603) 668-8223<br>www.cldengineers.com |  |  | PROJECT MANAGER : TODD SUMNER, P.E.                                  |
| PROJECT NAME : LUDLOW<br>PROJECT NUMBER : STP DECK (39)                                 |  |  | SHEET 1 OF 42 SHEETS                                                 |



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- SD-502.00 10/10/2012 CONCRETE DETAILS AND NOTES
- SD-516.10 08/29/2011 BRIDGE JOINT ASPHALTIC PLUG
- SD-601.00 06/04/2010 STRUCTURAL STEEL DETAILS & NOTES

HIGHWAY SAFETY AND DESIGN DETAIL SHEETS

- HSD-621.06 11/03/2015 GUARDRAIL TERMINAL LABEL DETAIL

VAOT STANDARD SHEETS

- B-5 06/1/1994 EMBANKMENT ON EARTH SLOPE, EMBANKMENT ON ROCK SLOPE,MUCK EXCAVATION, TYPICAL SLOPE ROUNDING
- B-71 07/08/2005 STANDARDS FOR RESIDENTIAL AND COMMERCIAL DRIVES
- D-3 06/01/1994 TREATED GUTTERS
- E-127 08/08/1995 ROUTE MARKINGS AT RURAL INTERSECTIONS
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- E-191 02/01/1999 PAVEMENT MARKING DETAILS
- E-193 08/18/1995 PAVEMENT MARKING DETAILS
- G-1 11/10/2015 STEEL BEAM GUARDRAIL WITH STEEL POSTS, STEEL BEAM GUARDRAIL WITH WOOD POSTS
- G-1d 02/10/2014 STEEL BEAM GUARDRAIL APPROACH END TERMINAL, STEEL BEAM GUARDRAIL TRAILING END TERMINAL, ANCHOR FOR STEEL BEAM GUARDRAIL, STEEL BEAM MEDIAN BARRIER
- S-360A 04/23/2012 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM
- S-360B 04/23/2012 GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM
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- T-45 01/02/2013 SQUARE TUBE SIGN POST AND ANCHOR

| LRFR LOAD RATING FACTORS |                                                                                                                       |       |      |        |          |          |          |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------|-------|------|--------|----------|----------|----------|
| LOADING LEVELS           | TRUCK                                                                                                                 |       |      |        |          |          |          |
|                          | H-20                                                                                                                  | HL-93 | 3S2  | 6 AXLE | 3A. STR. | 4A. STR. | 5A. SEMI |
| TONNAGE                  | 20                                                                                                                    | 36    | 36   | 66     | 30       | 34.5     | 38       |
| INVENTORY                | 1.57                                                                                                                  | 1.29  |      |        |          |          |          |
| POSTING                  |                                                                                                                       |       |      |        |          |          |          |
| OPERATING                | 2.04                                                                                                                  | 1.68  | 4.18 | 2.72   | 2.82     | 3.38     | 3.59     |
| COMMENTS:                | 3S2, 6 AXLE, 4A. STR, AND 5A. SEMI TRUCKS CONTROLLED BY EXTERIOR BEAM SERVICE II, ALL OTHER TRUCKS CONTROLLED BY DECK |       |      |        |          |          |          |

PROJECT NOTES

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO STATE OF VERMONT, AGENCY OF TRANSPORTATION, 2011 STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, DATED 2014, AND ITS LATEST REVISIONS.
2. THE DESIGN LIVE LOAD SHALL BE HL-93.
3. ALL WORK AND ANY ASSOCIATED ACTIVITY ON THIS PROJECT SHALL BE PERFORMED WITHIN THE EXISTING RIGHT-OF-WAY LIMITS.
4. THE CONTRACTOR IS MADE AWARE THAT EXISTING UTILITIES ARE WITHIN THE CONSTRUCTION LIMITS OF BRIDGE NO. 99. THE LOCATION OF ANY UTILITY INFORMATION ON THE PLANS IS APPROXIMATE. NO CLAIMS ARE MADE TO THE ACCURACY OR COMPLETENESS OF THE UTILITIES SHOWN. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR LOCATING AND PROTECTING FROM DAMAGE ALL UTILITIES ON SITE DURING ALL STAGES OF CONSTRUCTION. ANY DAMAGE TO UTILITIES DUE DIRECTLY TO THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST TO THE STATE. SEE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
5. EMULSIFIED ASPHALT SHALL BE APPLIED ON ALL COLD PLANED SURFACES AT THE RATE OF 0.08 GAL/SY AND BETWEEN ALL COURSE OF PAVEMENT AT THE RATE OF 0.040 GAL/SY OR AS DIRECTED BY THE ENGINEER. PAYMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 900.680, "SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, TYPE IVB)".
6. ANY REQUIRED SAWCUT OF EXISTING PAVEMENT WILL BE CONSIDERED INCIDENTAL TO ITEM 900.680, "SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, TYPE IVB)".
7. ALL EDGES OF PAVEMENT SHALL BE BACKED UP TO FULL HEIGHT WITH AGGREGATE SHOULDER MATERIAL AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID UNDER ITEM 402.12, "AGGREGATE SHOULDERS".
8. THE CONTRACTOR SHALL COORDINATE WITH VTRANS DISTRICT 3 TRANSPORTATION ADMINISTRATOR, ROBERT FALEY AT 802-786-5826, BEFORE CLOSING THE BRIDGE.
9. EROSION CONTROL MEASURES SHALL BE UTILIZED AS REQUIRED AND SHALL CONFORM TO SECTION 105 OF THE STANDARD SPECIFICATIONS AND THE LOW RISK SITE HANDBOOK FOR EROSION PREVENTION AND SEDIMENT CONTROL FROM THE AGENCY OF NATURAL RESOURCES. PAYMENT FOR SILT FENCE WILL BE PAID FOR UNDER ITEM 649.515, "GEOTEXTILE FOR SILT FENCE, WOVEN WIRE REINFORCED". PAYMENT FOR ALL OTHER EROSION CONTROL MEASURES, IF APPLICABLE, WILL BE CONSIDERED INCIDENTAL TO OTHER ITEMS IN THE CONTRACT.
10. THE DESIGN INTENT IS TO ALLOW THE CONTRACTOR TO STAGE IN THE TRAVELED ROADWAY OF THE APPROACHES TO THE BRIDGE DURING THE CLOSURE PERIOD. ANY STAGING AREAS OUTSIDE OF THIS SHALL BE CLEARED FOR RESOURCES THROUGH THE VTRANS ENVIRONMENTAL UNIT.
11. THE CONTRACTOR SHALL MAINTAIN ACCESS TO THE DRIVEWAY ON THE NORTHEAST CORNER OF THE PROJECT. A TEMPORARY ACCESS DRIVE MAY BE REQUIRED TO FACILITATE CONSTRUCTION OPERATIONS. THE CONTRACTOR IS RESPONSIBLE FOR ANY ADDITIONAL PERMITTING REQUIRED TO CONSTRUCT A TEMPORARY ACCESS DRIVEWAY. ANY MATERIAL NEEDED TO BUILD A TEMPORARY DRIVE ACCESS WILL BE PAID UNDER ITEM 401.10, "AGGREGATE SURFACE COURSE". AN ESTIMATED QUANTITY OF 26 CY HAS BEEN INCLUDED IN THE ESTIMATE FOR THIS WORK.

TRAFFIC CONTROL

12. AS PART OF ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL INCLUSIVE)", THE CONTRACTOR SHALL SUBMIT A SITE SPECIFIC TRAFFIC CONTROL PACKAGE FOR ALL STAGES OF CONSTRUCTION TO THE PROJECT MANAGER FOR APPROVAL IN ACCORDANCE WITH SUBSECTION 105.03 AND SHALL BE STAMPED BY A PROFESSIONAL ENGINEER LICENSED IN AN APPROPRIATE DISCIPLINE IN THE STATE OF VERMONT. THE PACKAGE SHALL IDENTIFY CONSTRUCTION ACTIVITIES BEFORE, DURING, AND AFTER THE BRIDGE CLOSURE PERIOD, AND SHALL INCLUDE A LAYOUT SHOWING ALL ON- AND OFF-PROJECT SIGNS AND BARRICADES AND ANY OTHER DETAILS ASSOCIATED WITH THE TRAFFIC CONTROL.
13. ALL ITEMS REQUIRED TO PREPARE, SUBMIT, AND IMPLEMENT THE CONTRACTOR'S PLAN, INCLUDING ANY NECESSARY REVISIONS TO THE PLAN, WILL BE INCLUDED IN THE UNIT BID PRICE FOR ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)". THE PAY ITEM INCLUDES, BUT IS NOT LIMITED TO, THE FOLLOWING:

TRAFFIC CONTROL PLAN

TEMPORARY TRAFFIC BARRIERS

BARRICADES

DRUMS/CONES

PROJECT CONSTRUCTION SIGNING

TEMPORARY PAVEMENT MARKINGS (IF REQUIRED)

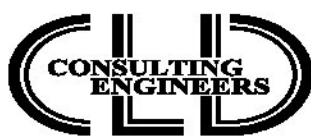
TRAFFIC CONTROL ITEMS NOT PAID FOR IN THE UNIT PRICE BID FOR ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)", AND PAID FOR SEPARATELY INCLUDE THE FOLLOWING:

ITEM 630.10, "UNIFORMED TRAFFIC OFFICERS"

ITEM 630.15, "FLAGGERS"

ITEM 641.15, "PORTABLE CHANGEABLE MESSAGE SIGN"

THE CONTRACTOR SHALL ALLOW TWO WEEKS FOR APPROVAL OF THE TRAFFIC CONTROL PLAN. NO WORK SHALL COMMENCE UNTIL THE CONTRACTOR HAS AN APPROVED TRAFFIC CONTROL PLAN.
14. DURING CLOSURE PERIOD, TRAFFIC SHALL BE MAINTAINED BY A REGIONAL DETOUR AS SHOWN ON SHEET 13. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR PROVIDING CLOSURE SIGNAGE AS SHOWN ON SHEET 13 IN ACCORDANCE WITH THE LATEST EDITION OF THE MUTCD AND VTRANS STANDARDS. PAYMENT FOR BRIDGE CLOSURE SIGNAGE WILL BE MADE UNDER ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)". ANY COORDINATION REQUIRED BETWEEN THE CONTRACTOR AND THE TOWN OF LUDLOW WILL BE AT NO ADDITIONAL COST TO THE STATE. SEE THE SPECIAL PROVISIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS REGARDING THE CLOSURE PERIOD.



|                                                       |                      |
|-------------------------------------------------------|----------------------|
| PROJECT NAME: LUDLOW                                  |                      |
| PROJECT NUMBER: STP DECK(39)                          |                      |
| FILE NAME: z15bi09notes-99.dgn                        | PLOT DATE: 8/3/2016  |
| PROJECT LEADER: J. BYATT                              | DRAWN BY: M. SMITH   |
| DESIGNED BY: S. BEAUMONT                              | CHECKED BY: N. CARON |
| INDEX OF SHEETS & PROJECT NOTES SHEET 1 SHEET 2 OF 42 |                      |



PAVEMENT REMOVAL ON APPROACH SLABS

15. THE FINAL ONE HALF INCH OF PAVEMENT ON THE AT-GRADE APPROACH SLABS SHALL BE REMOVED BY LOADER, GRADER, OR EQUIPMENT APPROVED BY THE ENGINEER. REMOVAL OF PAVEMENT ON THE APPROACH SLABS WILL BE PAID FOR UNDER ITEM 529.10, "REMOVAL OF BRIDGE PAVEMENT".
16. DURING AT-GRADE APPROACH SLAB PAVEMENT REMOVAL, THE CONTRACTOR SHALL EXERCISE CARE TO ENSURE NO DAMAGE OCCURS TO THE EXISTING AT-GRADE APPROACH SLABS. ANY DAMAGE TO AT-GRADE APPROACH SLABS SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. REPAIRS, IF APPLICABLE, SHALL BE MADE IN ACCORDANCE WITH SECTION 580.
17. THE AT-GRADE APPROACH SLABS SHALL BE CLEANED IN ACCORDANCE WITH SUBSECTION 580.04 AND TO THE SATISFACTION OF THE ENGINEER. REMOVAL OF THE BARRIER MEMBRANE, IF APPLICABLE, AND THE CLEANING OF THE AT-GRADE APPROACH SLABS WILL BE PAID FOR UNDER ITEM 580.16, "SURFACE PREPARATION FOR MEMBRANE". NO NEW BARRIER MEMBRANE WILL BE PLACED ON THE AT-GRADE APPROACH SLABS.

DECK REMOVAL AND RELATED ITEMS

18. ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE" WILL INCLUDE REMOVAL OF ANY PORTIONS OF THE EXISTING STRUCTURE AS SHOWN ON THE PLANS, INCLUDING THE EXISTING BRIDGE DECK AND CURBS, SHEAR STUD/SPIRALS, SCUPPERS, BARRIER MEMBRANE, PAVEMENT, AND BRIDGE RAILING. ITEM 529.25, "REMOVAL OF CONCRETE OR MASONRY" WILL INCLUDE REMOVAL OF THE TOPS OF THE EXISTING CONCRETE WINGWALLS AT THE END OF EACH WINGWALL, THE CONCRETE CHEEKWALL, AND THE APPROACH SLAB CURBS. ITEM 525.10, "REMOVAL OF EXISTING BRIDGE RAILING" WILL INCLUDE REMOVAL OF THE EXISTING BRIDGE RAIL ALONG THE TOPS OF THE WINGWALLS. SEE BITUMINOUS CONCRETE/CONCRETE REMOVAL PLAN ON SHEET 27.
19. THE TOPS OF THE EXISTING CONCRETE WINGWALLS, THE CONCRETE APPROACH SLAB CURBS, AND THE CONCRETE DECK AT THE CURTAIN WALL SHALL BE REMOVED BY MECHANICAL MEANS AND THE REMAINING CONCRETE SHALL HAVE NEAT LINES. PROTECT ALL ELEMENTS INTENDED TO REMAIN, AND MAINTAIN EXISTING REINFORCING AS NOTED. IF EXISTING REINFORCING IS DAMAGED OR HAS SIGNIFICANT SECTION LOSS, ADDITIONAL STEEL SHALL BE DRILLED AND GROUTED. PAYMENT FOR THIS WORK WILL BE INCLUDED UNDER ITEM 507.11, "REINFORCING STEEL, LEVEL 1" AND ITEM 507.16, "DRILLING AND GROUTING DOWELS". THE QUANTITIES FOR THESE TWO ITEMS AS SHOWN ON THE QUANTITY SUMMARY SHEETS INCLUDE AN ADDITIONAL ESTIMATED AMOUNT TO ACCOUNT FOR THIS WORK.
20. ONCE THE EXISTING PAVEMENT AND MEMBRANE ARE REMOVED FROM THE EXISTING AT-GRADE APPROACH SLABS, AND AFTER REMOVAL OF THE EXISTING BRIDGE DECK, ANY AREAS ON THE CONCRETE APPROACH SLABS, CONCRETE BEAM SEATS, AND THE FACES OF THE EXISTING CURTAIN WALLS THAT ARE FOUND TO BE UNSOUND SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER. THE METHOD FOR DETERMINING AREAS OF UNSOUND CONCRETE SHALL BE APPROVED BY THE ENGINEER. THE ENGINEER SHALL MAKE A DETERMINATION AS TO WHAT CLASS REPAIR IS REQUIRED TO REPAIR THE DETERIORATED PORTION OF THE CONCRETE BEAM SEAT AND THE LIMITS OF THE REPAIR. THE REPAIRS FOR THE CONCRETE BEAM SEAT WILL BE PAID FOR UNDER ITEM 580.13, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I" OR ITEM 580.14, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II, AS APPLICABLE. THE REPAIRS FOR THE CONCRETE APPROACH SLABS, CURTAIN WALLS, AND THE CLEANING OF ALL EFFLORESCENCE ON THE CONCRETE CURTAIN WALLS WILL BE PAID FOR UNDER ITEM 580.10, "REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS I", ITEM 580.11, "REPAIR OF CONCRETE SUPERSTRUCTURE, CLASS II", OR ITEM 580.12, "REPAIR OF CONCRETE SUPERSTRUCTURE, CLASS III", AS APPLICABLE. QUANTITIES FOR ITEMS 580.10, 580.11, 580.12, 580.13 AND 580.14 AS SHOWN ON THE QUANTITY SUMMARY SHEETS ARE ESTIMATED. HIGH PERFORMANCE CONCRETE, RAPID SET IS AN ACCEPTABLE ALTERNATE REPLACEMENT MATERIAL BUT WILL BE PAID FOR UNDER THE APPLICABLE REPAIR ITEM AS DETAILED ABOVE.

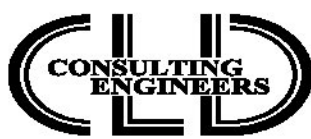
DECK REMOVAL AND RELATED ITEMS (CONTINUED)

21. AFTER THE REMOVAL OF THE EXISTING CONCRETE CHEEKWALL AT EACH BRIDGE CORNER, FLOWABLE FILL SHALL BE USED TO FILL ANY VOIDS BEHIND THE EXISTING CURTAIN WALL. THIS WORK WILL BE PAID FOR UNDER ITEM 541.45, "CONTROLLED DENSITY (FLOWABLE) FILL". THE EDGE SURFACE OF THE EXISTING CONCRETE CURTAIN WALL AT EACH BRIDGE CORNER SHALL BE CLEANED OF ANY DEBRIS OR LOOSE CONCRETE, ANY UNSOUND CONCRETE SHALL BE REMOVED, AND THE NEW CAST-IN-PLACE CONCRETE CURTAIN WALL EXTENSION SHALL BE POURED UP AGAINST THE EXISTING CONCRETE CURTAIN WALL SURFACE. PREPARING THE EXISTING CONCRETE SURFACE AND PLACING THE CURTAIN WALL EXTENSION WILL BE PAID FOR UNDER ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)".
22. THE JOINT BETWEEN THE NEW CONCRETE CURTAIN WALL EXTENSION AND THE END OF THE EXISTING CONCRETE WINGWALL SHALL BE FILLED WITH AN IMPERMEABLE CLOSED-CELL JOINT SEAL WITH EPOXY ADHESIVE CAPABLE OF ACCOMMODATING 0.34 INCHES OF EXPANSION AND 0.64 INCHES OF CONTRACTION AT 68 DEGREES. A JOINT DETAIL SHALL BE SUBMITTED TO THE PROJECT MANAGER FOR REVIEW AND APPROVAL. ALL COMPONENTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 900.608, "SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)".
- STEEL
23. AFTER ALL PAVEMENT AND MEMBRANE ARE REMOVED BUT PRIOR TO THE REMOVAL OF THE EXISTING CONCRETE DECK, THE CONTRACTOR SHALL TAKE TOP OF DECK ELEVATIONS EVERY 5 FEET ALONG THE CENTERLINE OF EACH BEAM FROM CENTERLINE TO CENTERLINE OF BEARING. AFTER THE EXISTING CONCRETE DECK HAS BEEN REMOVED, THE CONTRACTOR SHALL TAKE ELEVATIONS EVERY 5 FEET ALONG THE TOP OF EACH BEAM FROM CENTERLINE TO CENTERLINE OF BEARING. THE TOP OF DECK AND TOP OF BEAM ELEVATIONS SHALL THEN BE SENT TO THE ENGINEER FOR USE IN DETERMINING THE FINAL PROFILE AND HAUNCH DEPTHS. THE CONTRACTOR SHALL EXPECT 24 HOURS FOR VTRANS TO PREPARE THE REVISED PROFILE AND HAUNCH DEPTH CALCULATIONS.
24. THE EXISTING STRUCTURAL STEEL IS PAINTED WITH A MATERIAL THAT MAY CONTAIN LEAD. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE REGULATIONS WHEN HANDLING AND WORKING WITH THIS STEEL. ANY REMOVED STRUCTURAL STEEL, IF APPLICABLE, IS THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE AND ITS OFFICERS AND EMPLOYEES HARMLESS CONCERNING THE CONTRACTOR'S USE OR DISPOSITION OF THE REMOVED EXISTING STRUCTURAL STEEL.
25. UPON REMOVING THE DECK, THE TOPS OF THE BEAMS IN THE AREA OF THE SHEAR STUDS SHALL BE CLEANED IN ACCORDANCE WITH SSPC-SP11 REQUIREMENTS AND ALL APPLICABLE PROVISIONS PRIOR TO THE WELDING OF THE SHEAR STUDS. THE CONTRACTOR IS NOT REQUIRED TO APPLY NEW PAINT. THIS WORK WILL BE CONSIDERED INCIDENTAL TO ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE", EXCEPT AS NOTED IN PROJECT NOTE 26.
26. THE CONTRACTOR SHALL BE ADVISED TO TAKE EXPLORATORY CORINGS IN ALL AREAS WHERE EXISTING PAINT IS TO BE REMOVED UNDER THE DIRECTION OF THE ENGINEER PRIOR TO CONSTRUCTION TO DETERMINE THE PRESENCE OF LEAD. PAYMENT FOR LEAD PAINT TESTING WILL BE CONSIDERED INCIDENTAL TO ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE". IF LEAD PAINT REMOVAL IS REQUIRED, PAINT REMOVAL, SURFACE PREPARATION, CONTAINMENT, AND DISPOSAL WILL BE PAID FOR AS EXTRA WORK IN ACCORDANCE WITH 104.03. THE CONTRACTOR SHALL OBTAIN AND COMPLY WITH ALL NECESSARY LEAD ABATEMENT PERMITS.

REINFORCED CONCRETE

27. ALL CAST-IN-PLACE CONCRETE SHALL CONFORM TO THE SPECIFICATIONS FOR CONCRETE, HIGH PERFORMANCE CLASS A, EXCEPT AS NOTED. THE CONTRACTOR SHALL PROVIDE TESTING EQUIPMENT FOR CONCRETE IN ACCORDANCE WITH SUBSECTION 631.05.
28. A REINFORCING STEEL SCHEDULE AND SHOP DRAWINGS MEETING THE REQUIREMENTS OF SUBSECTION 105.03 SHALL BE SUBMITTED. PAYMENT FOR THIS WORK WILL BE CONSIDERED INCIDENTAL TO ITEM 507.11, "REINFORCING STEEL, LEVEL 1". ALL REINFORCING STEEL SHALL BE LEVEL 1 - EPOXY COATED AND MEET THE REQUIREMENTS OF SECTION 507.
29. TEST BARS SHALL BE PROVIDED IN ACCORDANCE WITH THE "VERMONT AGENCY OF TRANSPORTATION MATERIAL SAMPLING MANUAL" AVAILABLE ON THE AGENCY WEBSITE. A MINIMUM OF TWO TEST SECTIONS ARE REQUIRED FOR EACH SIZE, BRAND, AND GRADE OR TYPE OF REINFORCING. SEE THE MANUAL FOR ACCEPTABLE DIMENSIONS OF TEST SECTIONS. EXTRA BARS FOR TESTING PURPOSES SHALL BE SPECIFIED IN THE WORKING DRAWING SUBMITTAL.
30. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES EXCEPT THE UNDERSIDE OF THE DECK BETWEEN THE DRIP NOTCHES. THIS WORK WILL BE PAID FOR UNDER ITEM 514.10, "WATER REPELLENT, SILANE".
31. THE 1/2" EXPANSION MATERIAL IN THE JOINT BETWEEN THE CONCRETE WINGWALL AND THE APPROACH SLAB CURB WILL BE CONSIDERED INCIDENTAL TO ITEM 501.33, "CONCRETE, HIGH PERFORMANCE CLASS A".
32. MINIMUM CLEAR COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

|                                         |          |
|-----------------------------------------|----------|
| ALONG BACK FACES OF WALL AGAINST EARTH: | 2.0 INCH |
| ALONG TOP SURFACE OF DECK SLAB:         | 3.0 INCH |
| ALONG BOTTOM SURFACE OF DECK SLAB:      | 1.5 INCH |
| ELSEWHERE UNLESS OTHERWISE INDICATED:   | 3.0 INCH |



|                                                       |                      |
|-------------------------------------------------------|----------------------|
| PROJECT NAME: LUDLOW                                  |                      |
| PROJECT NUMBER: STP DECK(39)                          |                      |
| FILE NAME: z15bi09notes-99.dgn                        | PLOT DATE: 8/30/2016 |
| PROJECT LEADER: J. BYATT                              | DRAWN BY: M. SMITH   |
| DESIGNED BY: S. BEAUMONT                              | CHECKED BY: N. CARON |
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PRECAST CONCRETE DECK AND POST-TENSIONING

33. DESIGN VALUES:
- A. PRECAST CONCRETE COMPRESSIVE STRENGTH:  $f'c = 5,000$  PSI
  - B. REINFORCING STEEL, LEVEL 1 - EPOXY COATED:  $f_y = 60,000$  PSI
  - C. POST TENSIONING STRANDS: 0.6 INCH DIAMETER, 270 KSI, LOW RELAXATION 7-WIRE STRANDS.
  - D. ASSUMED MODULUS OF ELASTICITY: 28,500 KSI
  - E. THERE SHALL BE THREE STRANDS PER CONDUIT.
  - F. DESIGN BASED ON THE FOLLOWING POST-TENSION CONDUIT PARAMETERS:
    - COEFFICIENT OF FRICTION = 0.23
    - WOBBLE FRICTION COEFFICIENT = 0.0002/FT
    - NET FINAL COMPRESSIVE STRESS = 750 PSI
    - IF THE PROPOSED CONDUIT DOES NOT MEET THESE VALUES, THEN THE CONTRACTOR SHALL ADJUST THE JACKING FORCE TO PRODUCE THE FINAL POST-TENSIONING FORCE LISTED BELOW.
  - G. JACKING FORCE PER STRAND: 32.7 KIPS
  - H. FINAL FORCE PER STRAND: 30.35 KIPS (AFTER ALL LOSSES DUE TO FRICTION, ANCHORAGE SET, AND ELASTIC SHORTENING).
  - I. FINAL FORCE IN STRANDS SHALL BE UNIFORM ACROSS THE PANEL.
34. ALL DECK PANELS SHALL BE CAST FOR A MINIMUM OF 56 DAYS PRIOR TO POST-TENSIONING.
35. DECK PANELS SHALL BE ALLOWED TO SLIDE ON THE BEAMS DURING POST TENSIONING.
36. CONDUIT SHALL BE GROUTED WITH A CEMENTIOUS, PRE-BAGGED NON-SHRINK GROUT SPECIFICALLY FORMULATED FOR POST TENSIONING DUCTS.
37. POST-TENSIONING AND GROUTING SHALL BE PERFORMED BY QUALIFIED PERSONNEL WITH PREVIOUS EXPERIENCE IN PRECAST DECK PLACEMENT.
38. SHEAR KEY FACES SHALL HAVE  $\frac{1}{8}$ " COARSE AGGREGATE EXPOSED WITH A PROFILE SIMILAR TO ICRI ROUGHNESS PLAQUE CSP #7 COPYRIGHT 1997.
39. BEGIN POST-TENSIONING AT THE CENTER OF PANELS. DO NOT ALLOW MORE THAN 12.5 PERCENT OF THE POST-TENSIONING FORCE TO BE ECCENTRIC AT ANY TIME. SUBMIT STRESSING SEQUENCE TO THE ENGINEER AS PART OF THE FABRICATION DRAWINGS AND ERECTION PLAN.
40. THE CONTRACTOR IS RESPONSIBLE FOR DESIGN OF ALL LIFTING POINTS, PRESTRESSING (IF REQUIRED FOR ERECTION), LEVELING DEVICES, POST-TENSIONING ELEMENTS IN THE ANCHORAGE ZONE INCLUDING, BUT NOT LIMITED TO, THE BEARING PLATE ANCHOR HEADS AND METAL TRUMPETS, AND ADDITIONAL REINFORCEMENT IN THE ANCHORAGE ZONE (REQUIRED FOR SPLITTING, BURSTING, SPALLING, ETC.) INCLUDING THE LOCAL ZONE (REGION IMMEDIATELY SURROUNDING THE POST-TENSIONING DEVICE). THE CONTRACTOR IS RESPONSIBLE FOR CONSIDERATION OF STRENGTH, SERVICEABILITY, STIFFNESS, AND STABILITY OF THE PRECAST CONCRETE ELEMENTS AND ANY ADDITIONAL STRESSES ON THE PRECAST CONCRETE ELEMENTS FOR LOADS GENERATED DURING FABRICATION, TRANSPORTATION, ERECTION, AND CONSTRUCTION OPERATIONS.
41. ANY DAMAGE TO THE PRECAST CONCRETE DECK SLABS DUE DIRECTLY TO THE CONTRACTOR'S OPERATIONS SHALL BE REPAIRED AS DIRECTED BY THE ENGINEER AT NO ADDITIONAL COST TO THE STATE.

PRECAST CONCRETE DECK AND POST-TENSIONING (CONTINUED)

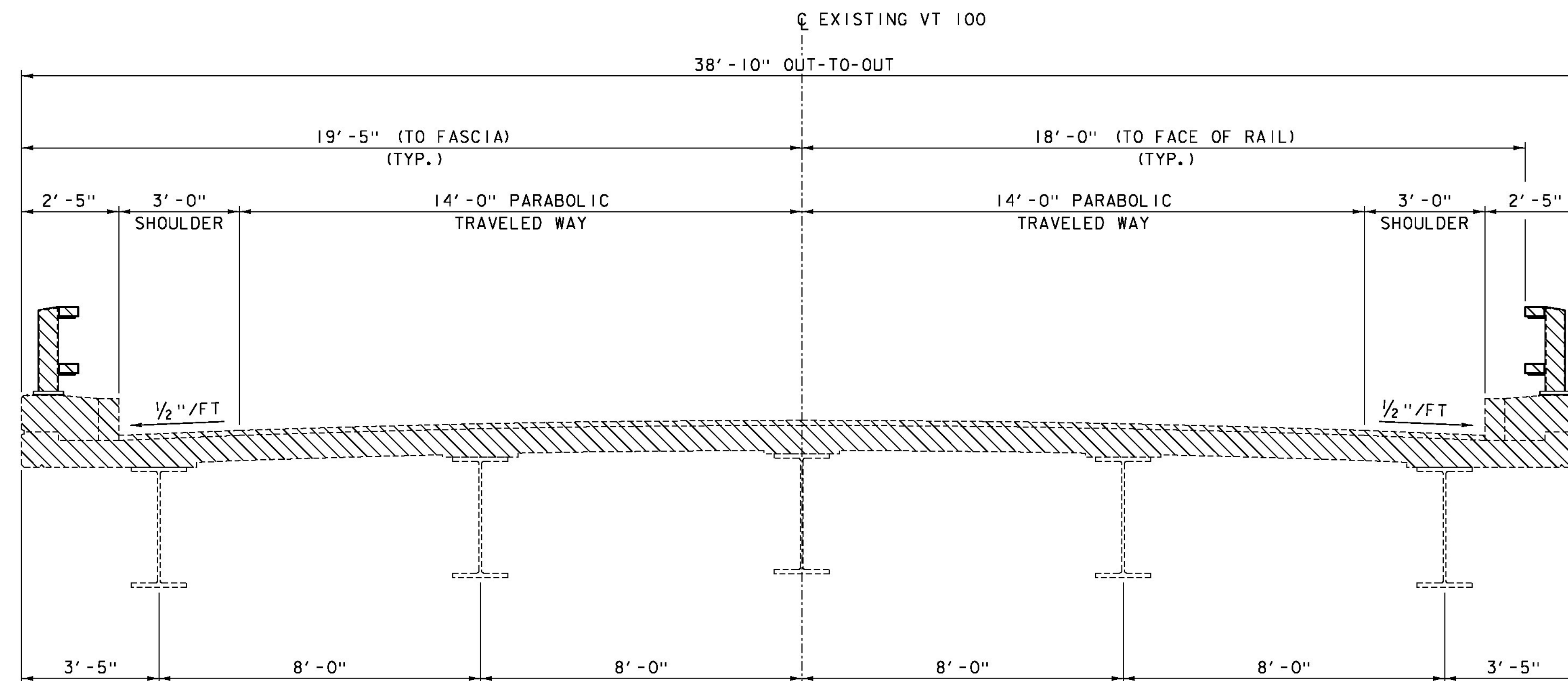
42. GALVANIZE BEARING PLATE ANCHOR HEADS AND METAL TRUMPETS AT ANCHORAGES ACCORDING TO MANUFACTURER'S RECOMMENDATIONS. DO NOT GALVANIZE GRIPPING WEDGES.
43. POST-TENSIONING STRANDS AND CONDUIT SHALL MEET THE REQUIREMENTS OF SECTION 510.
44. ANCHOR ASSEMBLIES, CONDUIT, GROUT FOR THE CONDUIT AND PANEL JOINTS, SPLIT SLEEVE CONNECTORS, AND POST-TENSIONING STRANDS SHALL BE INCLUDED IN ITEM 540.10, "PRECAST CONCRETE STRUCTURE (9" DECK SLABS)".
45. SHEAR CONNECTOR BLOCKOUTS, SHEAR KEYS, HAUNCHES, LEVELING DEVICE BLOCKOUTS, AND HANDHOLES FOR DUCT CONNECTIONS SHALL BE FILLED WITH MORTAR, TYPE IV CONFORMING TO THE REQUIREMENTS OF SUBSECTION 707.03 EXCEPT AS NOTED IN NOTE 46. COST FOR MORTAR WILL BE CONSIDERED INCIDENTAL TO ITEM 540.10, "PRECAST CONCRETE STRUCTURE (9" DECK SLABS)".
46. MORTAR, TYPE IV WITH EXPANSIVE ADDITIVES THAT REQUIRE ALL SURFACES TO BE CONFINED SHALL NOT BE USED FOR THE GROUT BEDS UNLESS THE CONTRACTOR PROVIDES A METHOD AND MEANS FOR CONFINEMENT THAT IS ACCEPTABLE TO THE ENGINEER.
47. THE DRILLING OF HOLES IN THE PRECAST CONCRETE ELEMENTS SHALL NOT BE PERMITTED. ANY LIFTING HOLES SHALL BE FILLED WITH MORTAR, TYPE IV CONFORMING TO THE REQUIREMENTS OF SUBSECTION 707.03. COST FOR MORTAR WILL BE CONSIDERED INCIDENTAL ITEM 540.10, "PRECAST CONCRETE STRUCTURE (9" DECK SLABS)".
48. PROPOSED SEQUENCE OF CONSTRUCTION:
- A. ERECT DECK SLABS.
  - B. ADJUST SLABS TO GRADE USING LEVELING DEVICES. ALL LEVELING BOLTS SHALL BE TORQUED TO APPROXIMATELY THE SAME VALUE WITHIN 20 PERCENT.
  - C. INSTALL POST TENSIONING STRANDS LOOSE IN CONDUIT AND SEAL CONDUIT.
  - D. PLACE MORTAR, TYPE IV IN TRANVERSE JOINTS ONLY. THE MORTAR SHALL BE RODDED OR VIBRATED TO ENSURE ALL VOIDS ARE FILLED.
  - E. MORTAR SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1000 PSI BASED ON MANUFACTURER'S RECOMMENDATIONS PRIOR TO STRESSING. THE GROUT NEED NOT BE CURED FOR THREE DAYS PRIOR TO COMMENCING POST-TENSIONING.
  - F. PROVIDE APPROPRIATE CUBE MOLDS AS DESCRIBED IN AASHTO T106 FOR 3 SETS OF 3 DAY CUBES, 3 SETS OF 28 DAY CUBES, AND A MINIMUM OF 3 MORE CUBES TO TEST FOR THE 1000 PSI MINIMUM.
  - G. STRESS POST-TENSIONING STRANDS USING A CALIBRATED JACK.
  - H. INSTALL SHEAR CONNECTORS.
  - I. GROUT POST TENSIONING CONDUIT, SHEAR CONNECTOR BLOCKOUTS, AND HAUNCHES BETWEEN THE BEAMS AND THE BOTTOM OF THE PRECAST DECK SLABS WITH MORTAR, TYPE IV.
  - J. POUR THE END CLOSURE POUR CONCRETE.
  - K. REMOVE LEVELING BOLTS AND GROUT RECESS WITH MORTAR, TYPE IV.

ALTERNATE SEQUENCE OF CONSTRUCTION MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.



|                                                       |                      |
|-------------------------------------------------------|----------------------|
| PROJECT NAME: LUDLOW                                  |                      |
| PROJECT NUMBER: STP DECK(39)                          |                      |
| FILE NAME: z15bi09notes-99.dgn                        | PLOT DATE: 8/3/2016  |
| PROJECT LEADER: J. BYATT                              | DRAWN BY: M. SMITH   |
| DESIGNED BY: S. BEAUMONT                              | CHECKED BY: N. CARON |
| INDEX OF SHEETS & PROJECT NOTES SHEET 3 SHEET 4 OF 42 |                      |

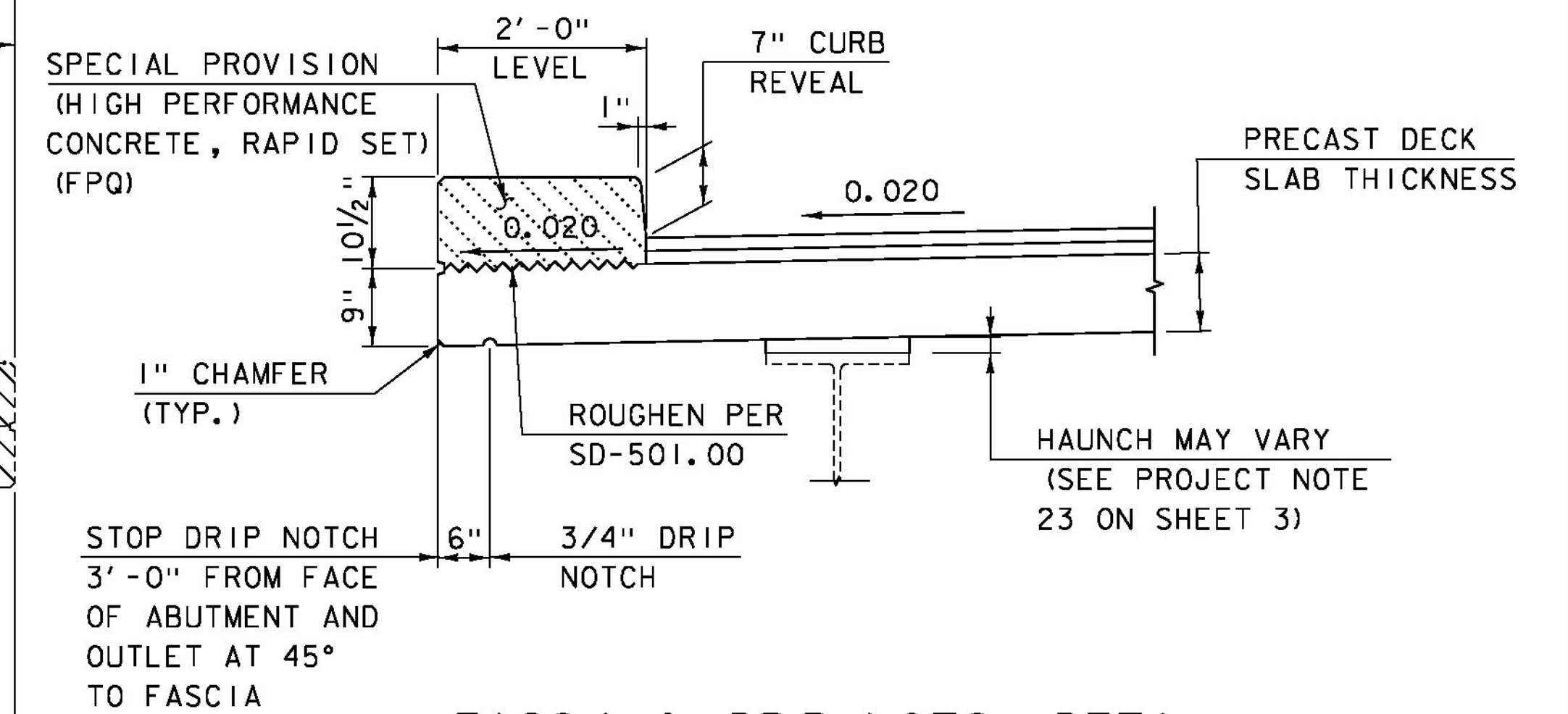




EXISTING BRIDGE SECTION

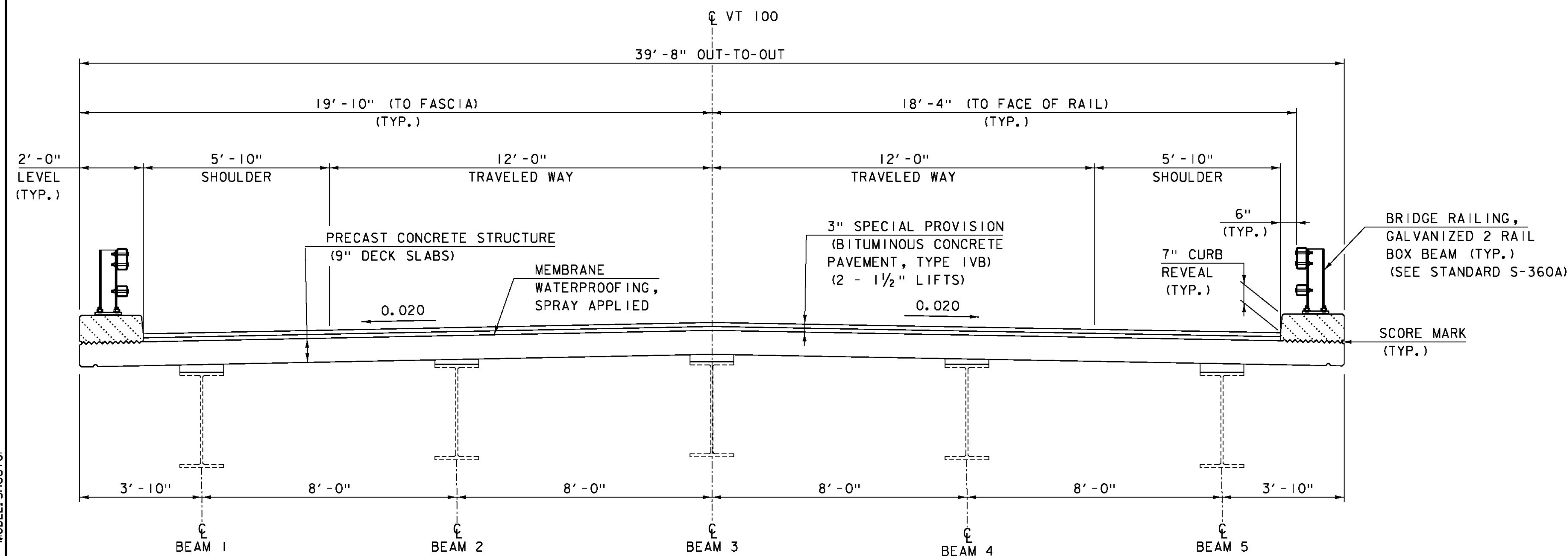
SCALE: 1/2" = 1'-0"

PARTIAL REMOVAL OF STRUCTURE



FASCIA & DRIP NOTCH DETAIL

SCALE: 3/4" = 1'-0"



TYPICAL BRIDGE SECTION

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

SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)

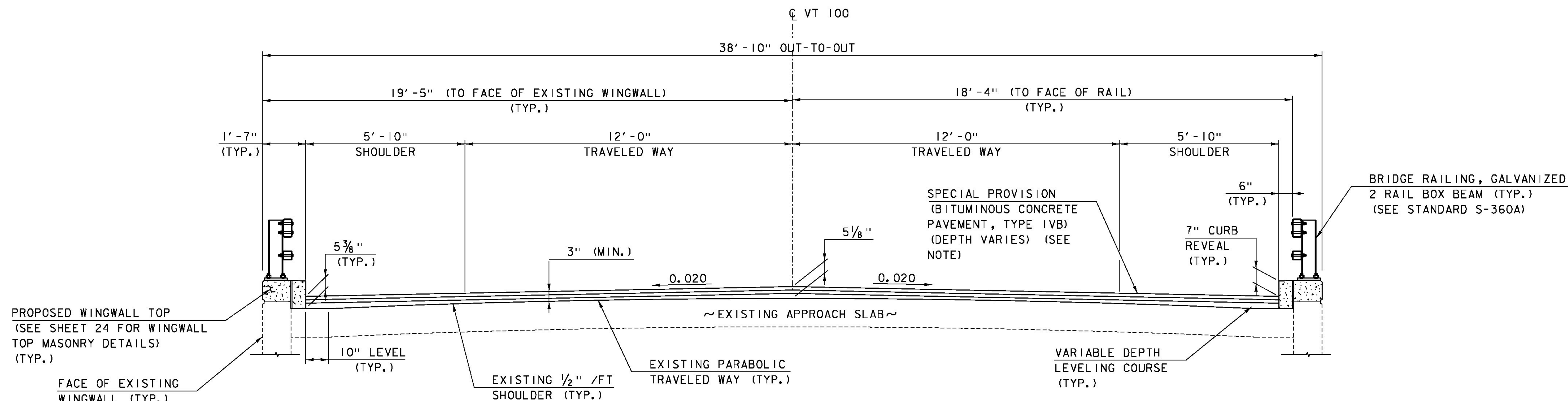
PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15bi09typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
TYPICAL BRIDGE SECTIONS SHEET 1

PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: S. BEAUMONT  
SHEET 5 OF 42





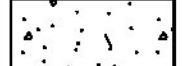


### TYPICAL APPROACH SLAB SECTION

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

NOTE: 3" SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, TYPE IVB) (2 - 1 1/2" LIFTS AND 1 - VARIABLE DEPTH LEVELING COURSE, TYPE IVB).

NOTES: SEE SHEET 24 FOR APPROACH SLAB CURB MASONRY DETAILS.

 CONCRETE, HIGH PERFORMANCE CLASS A

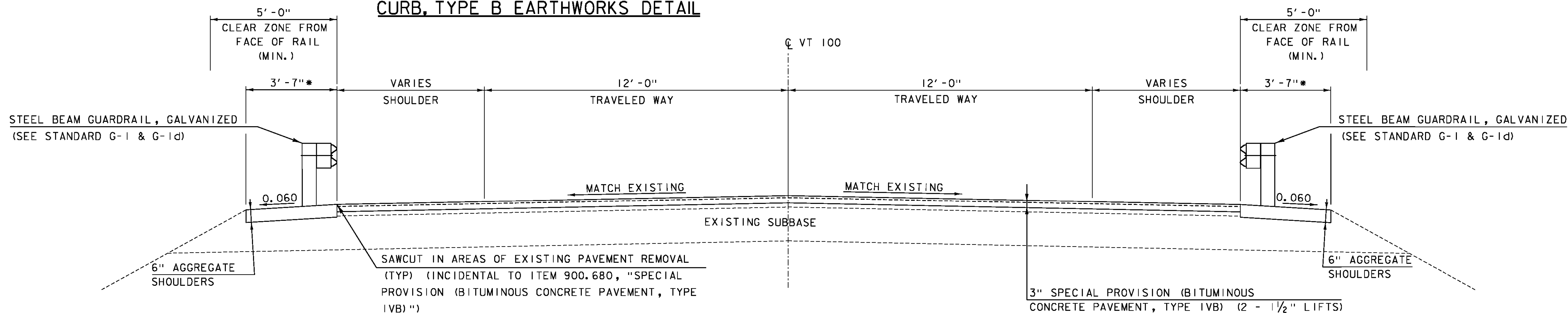
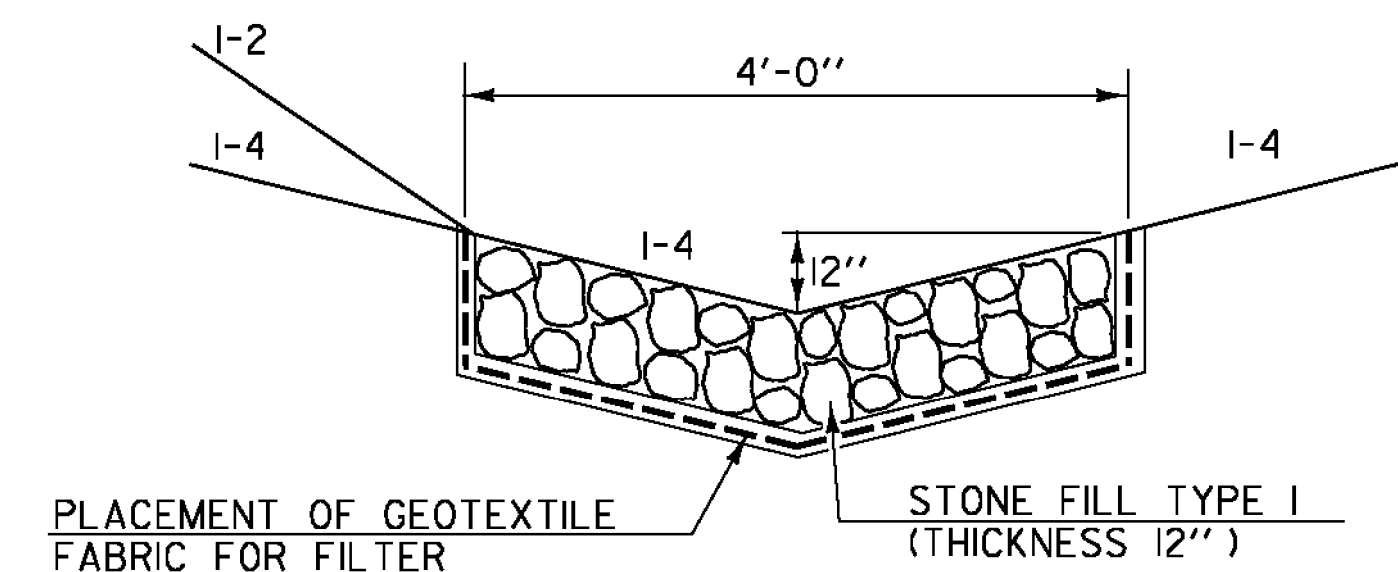
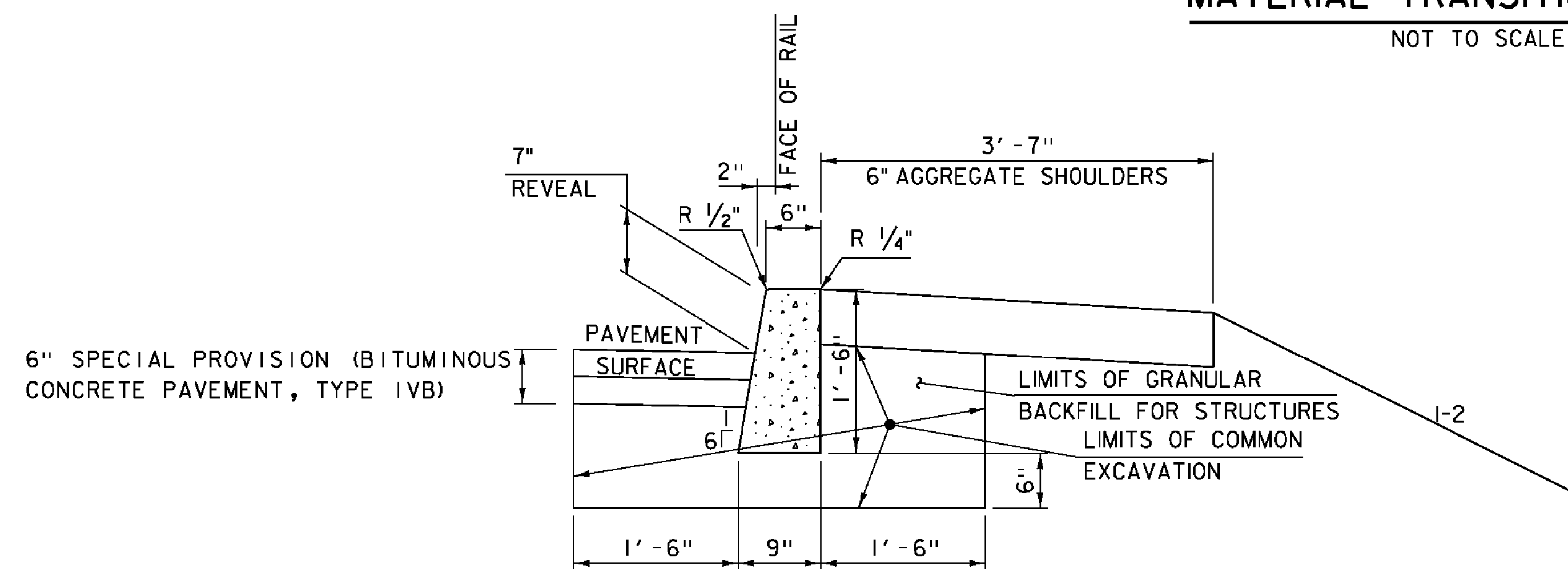
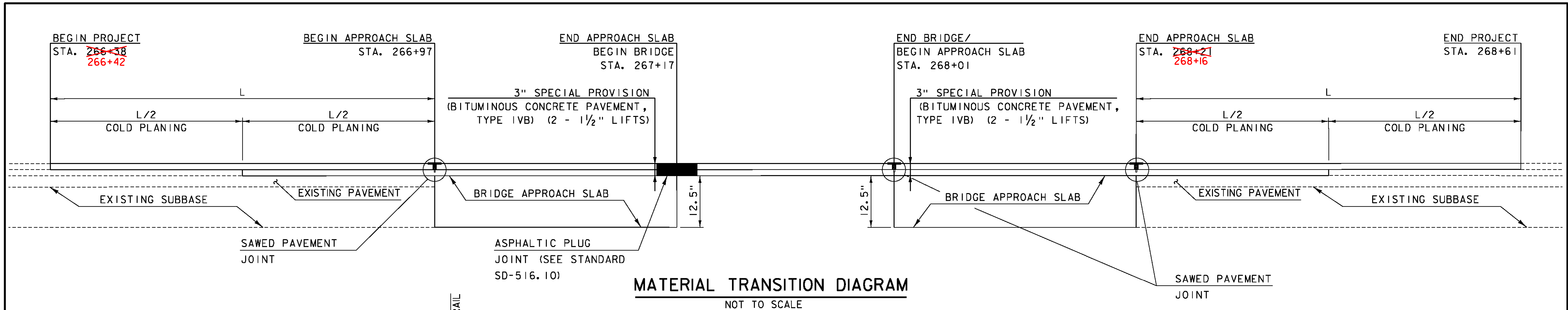


PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15bi09typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: S. BEAUMONT  
TYPICAL BRIDGE SECTIONS SHEET 2

PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: A. GIRALDI  
SHEET 6 OF 42





| MATERIAL TOLERANCES          |          |
|------------------------------|----------|
| SURFACE                      |          |
| - PAVEMENT (TOTAL THICKNESS) | +/- 1/4" |
| - AGGREGATE SURFACE COURSE   | +/- 1/2" |
| SUBBASE                      | +/- 1"   |

\*GUARDRAIL PANEL SHALL BE REDUCED TO A MINIMUM OF 2'-7" AS SHOWN IN THE LAYOUT SHEET



|                                |                   |
|--------------------------------|-------------------|
| PROJECT NAME:                  | LUDLOW            |
| PROJECT NUMBER:                | STP DECK(39)      |
| FILE NAME:                     | z15bi09typ-99.dgn |
| PROJECT LEADER:                | J. BYATT          |
| DESIGNED BY:                   | S. FORTIER        |
| TYPICAL ROADWAY SECTIONS SHEET |                   |
| PLOT DATE:                     | 8/3/2016          |
| DRAWN BY:                      | S. FORTIER        |
| CHECKED BY:                    | L. GREER          |
| SHEET                          | 7 OF 42           |



QUANTITY SHEET 1

| SUMMARY OF ESTIMATED QUANTITIES |  |  |  |  |  |  |  |  |         |                    |               |                    | TOTALS      |       | DESCRIPTIONS |                                                        |             |       | DETAILED SUMMARY OF QUANTITIES |      |       |
|---------------------------------|--|--|--|--|--|--|--|--|---------|--------------------|---------------|--------------------|-------------|-------|--------------|--------------------------------------------------------|-------------|-------|--------------------------------|------|-------|
|                                 |  |  |  |  |  |  |  |  | ROADWAY | EROSION<br>CONTROL | BRIDGE NO. 99 | FULL C.E.<br>ITEMS | GRAND TOTAL | FINAL | UNIT         | ITEMS                                                  | ITEM NUMBER | ROUND | QUANTITIES                     | UNIT | ITEMS |
|                                 |  |  |  |  |  |  |  |  | 50      |                    |               |                    | 50          |       | CY           | COMMON EXCAVATION                                      | 203.15      | 2.3   |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 20      |                    |               |                    | 20          |       | CY           | EARTH BORROW                                           | 203.30      | 2.6   |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 1       |                    |               |                    | 1           |       | CY           | TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)     | 204.22      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 30      |                    |               |                    | 30          |       | CY           | GRANULAR BACKFILL FOR STRUCTURES                       | 204.30      | 1     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 730     |                    |               |                    | 730         |       | SY           | COLD PLANING, BITUMINOUS PAVEMENT                      | 210.10      | 2     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 27      |                    |               |                    | 27          |       | CY           | AGGREGATE SURFACE COURSE                               | 401.10      | 0.3   |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 50      |                    |               |                    | 50          |       | TON          | AGGREGATE SHOULDERS                                    | 402.12      | 6     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 1       |                    |               |                    | 1           |       | LU           | PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)            | 406.50      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 4             |                    | 4           |       | CY           | CONCRETE, HIGH PERFORMANCE CLASS A                     | 501.33      | 0.97  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 2310          |                    | 2310        |       | LB           | REINFORCING STEEL, LEVEL I                             | 507.11      | 2.75  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 231           |                    | 231         |       | LF           | DRILLING AND GROUTING DOWELS                           | 507.16      | 0.55  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 1             |                    | 1           |       | LS           | SHEAR CONNECTORS (800 - 7" X 1")                       | 508.15      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 14            |                    | 14          |       | GAL          | WATER REPELLENT, SILANE                                | 514.10      | 0.27  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 36            |                    | 36          |       | LF           | BRIDGE EXPANSION JOINT, ASPHALTIC PLUG                 | 516.10      | 0.33  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 492           |                    | 492         |       | SY           | MEMBRANE WATERPROOFING, SPRAY APPLIED                  | 520.10      | 0.59  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 107           |                    | 107         |       | LF           | JOINT SEALER, HOT POURED                               | 524.11      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 69            |                    | 69          |       | LF           | REMOVAL OF EXISTING BRIDGE RAILING                     | 525.10      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 229           |                    | 229         |       | LF           | BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM             | 525.33      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 159           |                    | 159         |       | SY           | REMOVAL OF BRIDGE PAVEMENT                             | 529.10      | 0.48  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 1             |                    | 1           |       | EACH         | PARTIAL REMOVAL OF STRUCTURE                           | 529.20      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 8             |                    | 8           |       | CY           | REMOVAL OF CONCRETE OR MASONRY                         | 529.25      | 0.74  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 1             |                    | 1           |       | LS           | PRECAST CONCRETE STRUCTURE (9" DECK SLABS)             | 540.10      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 5             |                    | 5           |       | CY           | CONTROLLED DENSITY (FLOWABLE) FILL                     | 541.45      | 1     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 6             |                    | 6           |       | SY           | REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS I     | 580.10      | EST.  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 9             |                    | 9           |       | SY           | REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS II    | 580.11      | EST.  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 2             |                    | 2           |       | CY           | REPAIR OF CONCRETE SUPERSTRUCTURE SURFACE, CLASS III   | 580.12      | EST.  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 4             |                    | 4           |       | SY           | REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I       | 580.13      | EST.  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 2             |                    | 2           |       | SY           | REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II      | 580.14      | EST.  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 4423          |                    | 4423        |       | SF           | SURFACE PREPARATION FOR MEMBRANE                       | 580.16      | 0.33  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         | 3                  |               |                    | 3           |       | CY           | STONE FILL, TYPE I                                     | 613.10      | 0.04  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         | 20                 |               |                    | 20          |       | CY           | STONE FILL, TYPE II                                    | 613.11      | 4.89  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 160     |                    |               |                    | 160         |       | LF           | CAST-IN-PLACE CONCRETE CURB, TYPE B                    | 616.28      | 3.24  |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 187.5   |                    |               |                    | 187.5       |       | LF           | STEEL BEAM GUARDRAIL, GALVANIZED                       | 621.20      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 1       |                    |               |                    | 1           |       | EACH         | ANCHOR FOR STEEL BEAM RAIL                             | 621.60      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    | 4             |                    | 4           |       | EACH         | GUARDRAIL APPROACH SECTION, GALVANIZED 2 RAIL BOX BEAM | 621.72      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 275     |                    |               |                    | 275         |       | LF           | REMOVAL AND DISPOSAL OF GUARDRAIL                      | 621.80      | 2     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 340     |                    |               |                    | 340         |       | HR           | UNIFORMED TRAFFIC OFFICERS                             | 630.10      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  | 680     |                    |               |                    | 680         |       | HR           | FLAGGERS                                               | 630.15      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    |               | 1                  | 1           |       | LS           | FIELD OFFICE, ENGINEERS                                | 631.10      | -     |                                |      |       |
|                                 |  |  |  |  |  |  |  |  |         |                    |               | 1                  | 1           |       | LS           | TESTING EQUIPMENT, CONCRETE                            | 631.16      | -     |                                |      |       |



## QUANTITY SHEET 2

|                              |                        |
|------------------------------|------------------------|
| PROJECT NAME: LUDLOW         |                        |
| PROJECT NUMBER: STP DECK(39) |                        |
| FILE NAME: z15bi09qss-99.dgn | PLOT DATE: 8/30/2016   |
| PROJECT LEADER: J. BYATT     | DRAWN BY: M. SMITH     |
| DESIGNED BY: S. BEAUMONT     | CHECKED BY: A. GIRALDI |
| QUANTITY SHEET 2             | SHEET 9 OF 42          |



GENERAL INFORMATION

SYMBOLGY LEGEND NOTE

THE SYMBOLGY ON THIS SHEET IS INTENDED TO COVER STANDARD CONVENTIONAL SYMBOLGY. THE SYMBOLGY IS USED FOR EXISTING & PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROJECT ANNOTATION, AS NOTED ON PROJECT PLAN SHEETS. THIS LEGEND SHEET COVERS THE BASICS. SYMBOLGY ON PLANS MAY VARY, PLAN ANNOTATIONS AND NOTES SHOULD BE USED TO CLARIFY AS NEEDED.

R. O. W. ABBREVIATIONS (CODES) & SYMBOLS

| POINT    | CODE  | DESCRIPTION                  |
|----------|-------|------------------------------|
|          | CH    | CHANNEL EASEMENT             |
|          | CONST | CONSTRUCTION EASEMENT        |
|          | CUL   | CULVERT EASEMENT             |
|          | D&C   | DISCONNECT & CONNECT         |
|          | DIT   | DITCH EASEMENT               |
|          | DR    | DRAINAGE EASEMENT            |
|          | DRIVE | DRIVEWAY EASEMENT            |
|          | EC    | EROSION CONTROL              |
|          | HWY   | HIGHWAY EASEMENT             |
|          | I&M   | INSTALL & MAINTAIN EASEMENT  |
|          | LAND  | LANDSCAPE EASEMENT           |
|          | R&RES | REMOVE & RESET               |
|          | R&REP | REMOVE & REPLACE             |
|          | SR    | SLOPE RIGHT                  |
|          | UE    | UTILITY EASEMENT             |
|          | (P)   | PERMANENT EASEMENT           |
|          | (T)   | TEMPORARY EASEMENT           |
| ■        | BNDNS | BOUND SET                    |
| ▣        | BNDNS | BOUND TO BE SET              |
| ●        | IPNS  | IRON PIN SET                 |
| ⊙        | IPNS  | IRON PIN TO BE SET           |
| ⊠        | CALC  | EXISTING ROW POINT           |
| ○        | PROW  | PROPOSED ROW POINT           |
| [LENGTH] |       | LENGTH CARRIED ON NEXT SHEET |

COMMON TOPOGRAPHIC POINT SYMBOLS

| POINT | CODE   | DESCRIPTION               |
|-------|--------|---------------------------|
| ⊕     | APL    | BOUND APPARENT LOCATION   |
| ▣     | BM     | BENCHMARK                 |
| ▣     | BND    | BOUND                     |
| ▣     | CB     | CATCH BASIN               |
| ⊕     | COMB   | COMBINATION POLE          |
| ▣     | DITHR  | DROP INLET THROATED DNC   |
| ⊕     | EL     | ELECTRIC POWER POLE       |
| ⊙     | FPOLE  | FLAGPOLE                  |
| ○     | GASFIL | GAS FILLER                |
| ○     | GP     | GUIDE POST                |
| ×     | GSO    | GAS SHUT OFF              |
| ⊙     | GUY    | GUY POLE                  |
| ⊙     | GUYW   | GUY WIRE                  |
| ×     | GV     | GATE VALUE                |
| ⊕     | H      | TREE HARDWOOD             |
| △     | HCTRL  | CONTROL HORIZONTAL        |
| △     | HVCTRL | CONTROL HORIZ. & VERTICAL |
| ⊕     | HYD    | HYDRANT                   |
| ⊙     | IP     | IRON PIN                  |
| ⊙     | IPIPE  | IRON PIPE                 |
| ⊕     | LI     | LIGHT - STREET OR YARD    |
| ⊕     | MB     | MAILBOX                   |
| ○     | MH     | MANHOLE (MH)              |
| ▣     | MM     | MILE MARKER               |
| ⊙     | PM     | PARKING METER             |
| ▣     | PMK    | PROJECT MARKER            |
| ⊙     | POST   | POST STONE/WOOD           |
| ⊕     | RRSIG  | RAILROAD SIGNAL           |
| ⊕     | RRSL   | RAILROAD SWITCH LEVER     |
| ⊕     | S      | TREE SOFTWOOD             |
| ⊕     | SAT    | SATELLITE DISH            |
| ⊕     | SHRUB  | SHRUB                     |
| ⊕     | SIGN   | SIGN                      |
| ⊕     | STUMP  | STUMP                     |
| ⊕     | TEL    | TELEPHONE POLE            |
| ⊙     | TIE    | TIE                       |
| ⊕     | TSIGN  | SIGN W/DOUBLE POST        |
| ⊕     | VCTRL  | CONTROL VERTICAL          |
| ⊙     | WELL   | WELL                      |
| ×     | WSO    | WATER SHUT OFF            |

THESE ARE COMMON VAOT SURVEY POINT SYMBOLS FOR EXISTING FEATURES, ALSO USED FOR PROPOSED FEATURES WITH HEAVIER LINEWEIGHT, IN COMBINATION WITH PROPOSED ANNOTATION.

PROPOSED GEOMETRY CODES

| CODE | DESCRIPTION             |
|------|-------------------------|
| PC   | POINT OF CURVATURE      |
| PI   | POINT OF INTERSECTION   |
| CC   | CENTER OF CURVE         |
| PT   | POINT OF TANGENCY       |
| PCC  | POINT OF COMPOUND CURVE |
| PRC  | POINT OF REVERSE CURVE  |
| POB  | POINT OF BEGINNING      |
| POE  | POINT OF ENDING         |
| STA  | STATION PREFIX          |
| AH   | AHEAD STATION SUFFIX    |
| BK   | BACK STATION SUFFIX     |
| D    | CURVE DEGREE OF (100FT) |
| R    | CURVE RADIUS OF         |
| T    | CURVE TANGENT LENGTH    |
| L    | CURVE LENGTH OF         |
| E    | CURVE EXTERNAL DISTANCE |

UTILITY SYMBOLGY

UNDERGROUND UTILITIES

|           |                           |
|-----------|---------------------------|
| — UGU —   | UTILITY (GENERIC-UNKNOWN) |
| — — — — — | TELEPHONE                 |
| — — — — — | ELECTRIC                  |
| — — — — — | CABLE (TV)                |
| — UEC —   | ELECTRIC+CABLE            |
| — UET —   | ELECTRIC+TELEPHONE        |
| — UCT —   | CABLE+TELEPHONE           |
| — UECT —  | ELECTRIC+CABLE+TELEP.     |
| — — — — — | GAS LINE                  |
| — — — — — | WATER LINE                |
| — — — — — | SANITARY SEWER (SEPTIC)   |

ABOVE GROUND UTILITIES (AERIAL)

|           |                           |
|-----------|---------------------------|
| — AGU —   | UTILITY (GENERIC-UNKNOWN) |
| — — — — — | TELEPHONE                 |
| — — — — — | ELECTRIC                  |
| — C —     | CABLE (TV)                |
| — EC —    | ELECTRIC+CABLE            |
| — ET —    | ELECTRIC+TELEPHONE        |
| — — — — — | ELECTRIC+TELEPHONE        |
| — CT —    | CABLE+TELEPHONE           |
| — ECT —   | ELECTRIC+CABLE+TELEP.     |
| — — — — — | UTILITY POLE GUY WIRE     |

PROJECT CONSTRUCTION SYMBOLGY

PROJECT DESIGN & LAYOUT SYMBOLGY

|                        |                       |
|------------------------|-----------------------|
| — — — — — CZ — — — — — | CLEAR ZONE            |
| — — — — —              | PLAN LAYOUT MATCHLINE |

PROJECT CONSTRUCTION FEATURES

|                           |                            |
|---------------------------|----------------------------|
| — — — — —                 | TOP OF CUT SLOPE           |
| — — — — —                 | TOE OF FILL SLOPE          |
| ⊕ ⊕ ⊕ ⊕ ⊕                 | STONE FILL                 |
| — — — — —                 | BOTTOM OF DITCH &          |
| — — — — —                 | CULVERT PROPOSED           |
| — — — — —                 | STRUCTURE SUBSURFACE       |
| — — — — —                 | PROJECT DEMARCATION FENCE  |
| BF — — — — — BF — — — — — | BARRIER FENCE              |
| XXXXXXXXXXXXXXXXXXXX      | TREE PROTECTION ZONE (TPZ) |
| //// //// //// ////       | STRIPING LINE REMOVAL      |
| ~~~~ ~~~~ ~~~~ ~~~~       | SHEET PILES                |

CONVENTIONAL BOUNDARY SYMBOLGY

BOUNDARY LINES

|           |                                        |
|-----------|----------------------------------------|
| — — — — — | TOWN BOUNDARY LINE                     |
| — — — — — | COUNTY BOUNDARY LINE                   |
| — — — — — | STATE BOUNDARY LINE                    |
| — — — — — | PROPOSED STATE R.O.W. (LIMITED ACCESS) |
| — — — — — | PROPOSED STATE R.O.W.                  |
| — — — — — | STATE ROW (LIMITED ACCESS)             |
| — — — — — | STATE ROW                              |
| — — — — — | TOWN ROW                               |
| — — — — — | PERMANENT EASEMENT LINE (P)            |
| — — — — — | TEMPORARY EASEMENT LINE (T)            |
| — — — — — | SURVEY LINE                            |
| — — — — — | PROPERTY LINE (P/L)                    |
| — — — — — | SLOPE RIGHTS                           |
| — — — — — | 6F PROPERTY BOUNDARY                   |
| — — — — — | 4F PROPERTY BOUNDARY                   |
| — — — — — | HAZARDOUS WASTE                        |

EPSC LAYOUT PLAN SYMBOLGY

EPSC MEASURES

|              |                                            |
|--------------|--------------------------------------------|
| ONNOONNOONNO | FILTER CURTAIN                             |
| — — — — —    | SILT FENCE                                 |
| — — — — —    | SILT FENCE WOVEN WIRE                      |
| — — — — —    | CHECK DAM                                  |
| — — — — —    | DISTURBED AREAS<br>REQUIRING RE-VEGETATION |
| — — — — —    | EROSION MATTING                            |

ENVIRONMENTAL RESOURCES

|           |                                 |
|-----------|---------------------------------|
| — — — — — | WETLAND BOUNDARY                |
| — — — — — | RIPARIAN BUFFER ZONE            |
| — — — — — | WETLAND BUFFER ZONE             |
| — — — — — | SOIL TYPE BOUNDARY              |
| — — — — — | THREATENED & ENDANGERED SPECIES |
| — — — — — | HAZARDOUS WASTE AREA            |
| — — — — — | AGRICULTURAL LAND               |
| — — — — — | FISH & WILDLIFE HABITAT         |
| — — — — — | FLOOD PLAIN                     |
| — — — — — | ORDINARY HIGH WATER (OHW)       |
| — — — — — | STORM WATER                     |
| — — — — — | USDA FOREST SERVICE LANDS       |
| — — — — — | WILDLIFE HABITAT SUIT/CONN      |

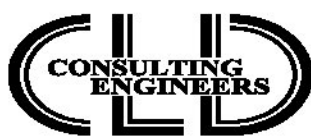
ARCHEOLOGICAL & HISTORIC

|           |                            |
|-----------|----------------------------|
| — — — — — | ARCHEOLOGICAL BOUNDARY     |
| — — — — — | HISTORIC DISTRICT BOUNDARY |
| — — — — — | HISTORIC AREA              |
| Ⓜ         | HISTORIC STRUCTURE         |

CONVENTIONAL TOPOGRAPHIC SYMBOLGY

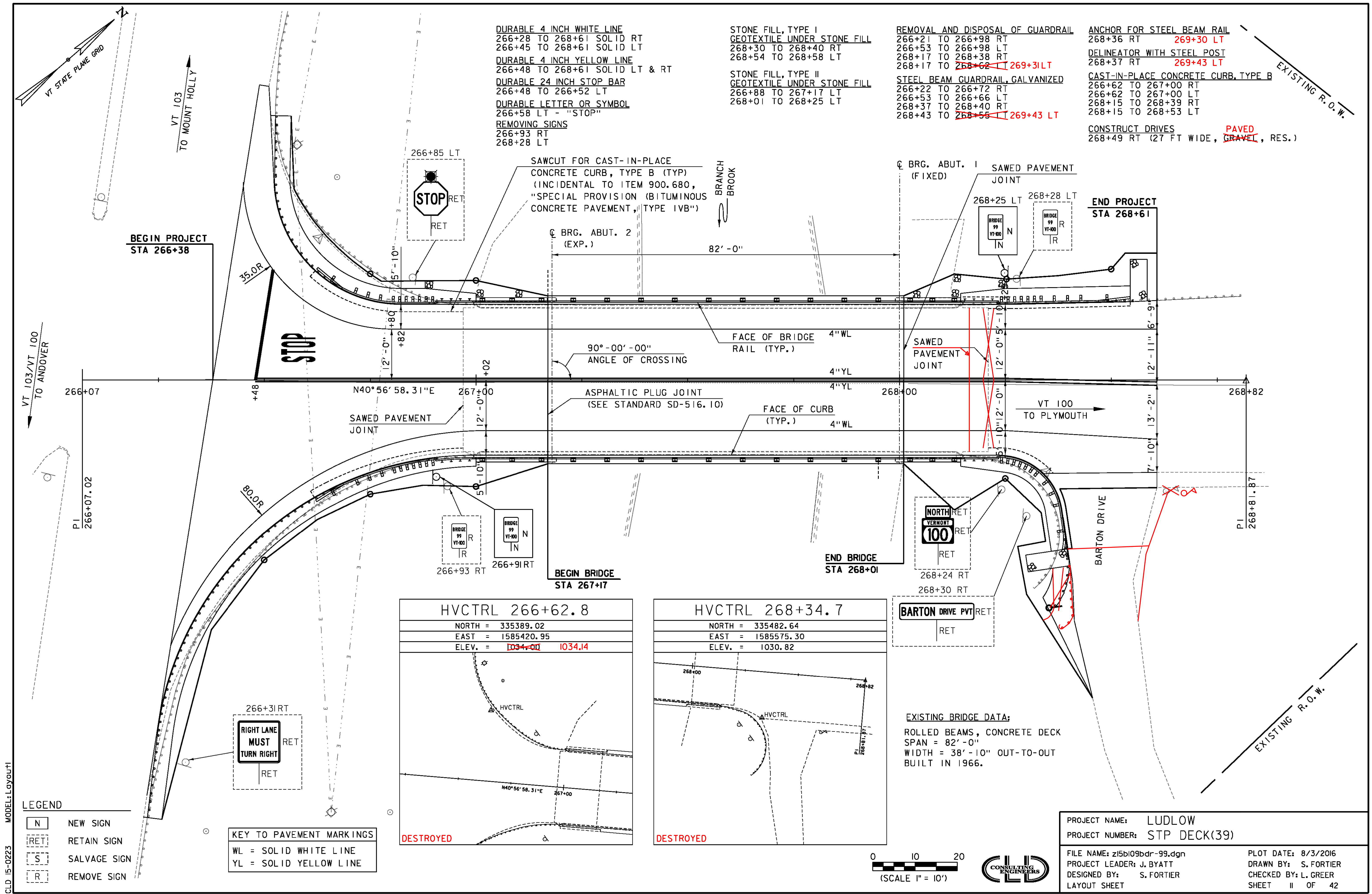
EXISTING FEATURES

|           |                    |
|-----------|--------------------|
| — — — — — | ROAD EDGE PAVEMENT |
| — — — — — | ROAD EDGE GRAVEL   |
| — — — — — | DRIVEWAY EDGE      |
| — — — — — | DITCH              |
| — — — — — | FOUNDATION         |
| — — — — — | FENCE (EXISTING)   |
| — — — — — | FENCE WOOD POST    |
| — — — — — | FENCE STEEL POST   |
| — — — — — | GARDEN             |
| — — — — — | ROAD GUARDRAIL     |
| — — — — — | RAILROAD TRACKS    |
| — — — — — | CULVERT (EXISTING) |
| — — — — — | STONE WALL         |
| — — — — — | WALL               |
| — — — — — | WOOD LINE          |
| — — — — — | BRUSH LINE         |
| — — — — — | HEDGE              |
| — — — — — | BODY OF WATER EDGE |
| — — — — — | LEDGE EXPOSED      |



|                                    |                      |
|------------------------------------|----------------------|
| PROJECT NAME:                      | LUDLOW               |
| PROJECT NUMBER:                    | STP_DECK(39)         |
| FILE NAME:                         | z15bi09legend-99.dgn |
| PROJECT LEADER:                    | J. BYATT             |
| DESIGNED BY:                       | L. GREER             |
| CONVENTIONAL SYMBOLGY LEGEND SHEET | SHEET 10 OF 42       |
| PLOT DATE:                         | 8/3/2016             |
| DRAWN BY:                          | P. McKECHNIE         |
| CHECKED BY:                        | S. FORTIER           |





DURABLE 4 INCH WHITE LINE  
266+28 TO 268+61 SOLID RT  
266+45 TO 268+61 SOLID LT  
DURABLE 4 INCH YELLOW LINE  
266+48 TO 268+61 SOLID LT & RT  
DURABLE 24 INCH STOP BAR  
266+48 TO 266+52 LT  
DURABLE LETTER OR SYMBOL  
266+58 LT - "STOP"  
REMOVING SIGNS  
266+93 RT  
268+28 LT

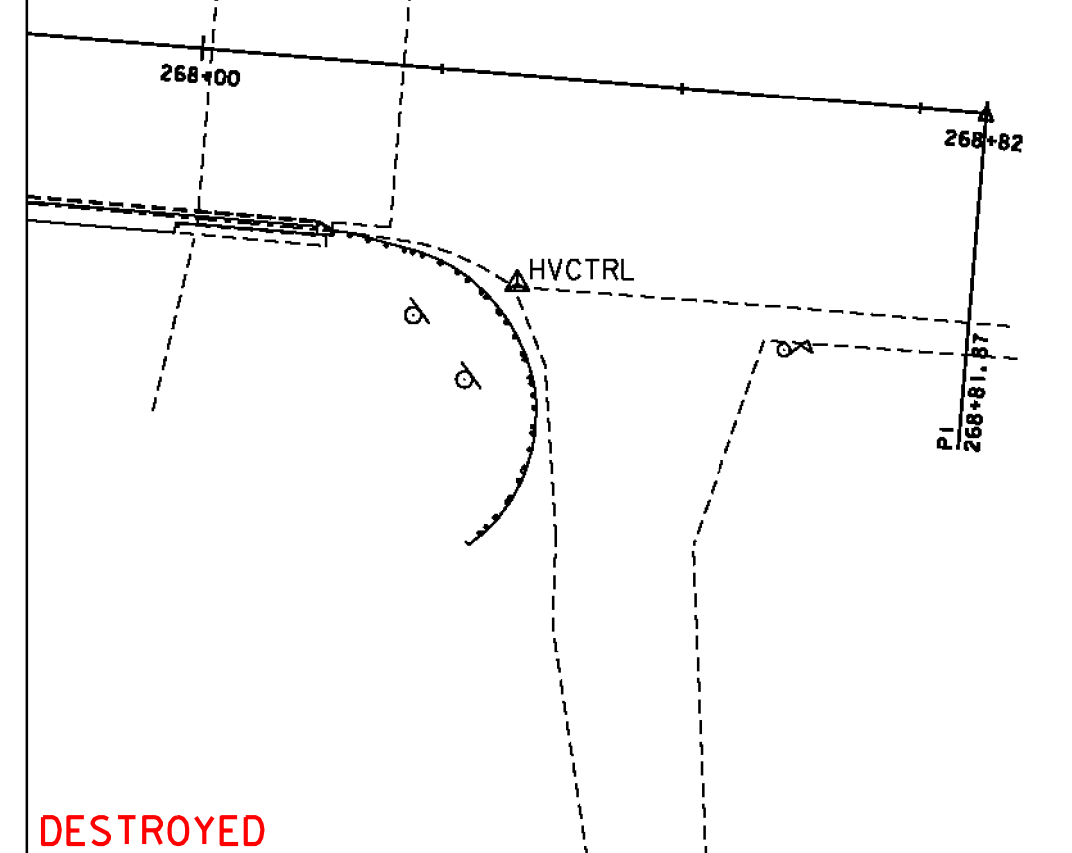
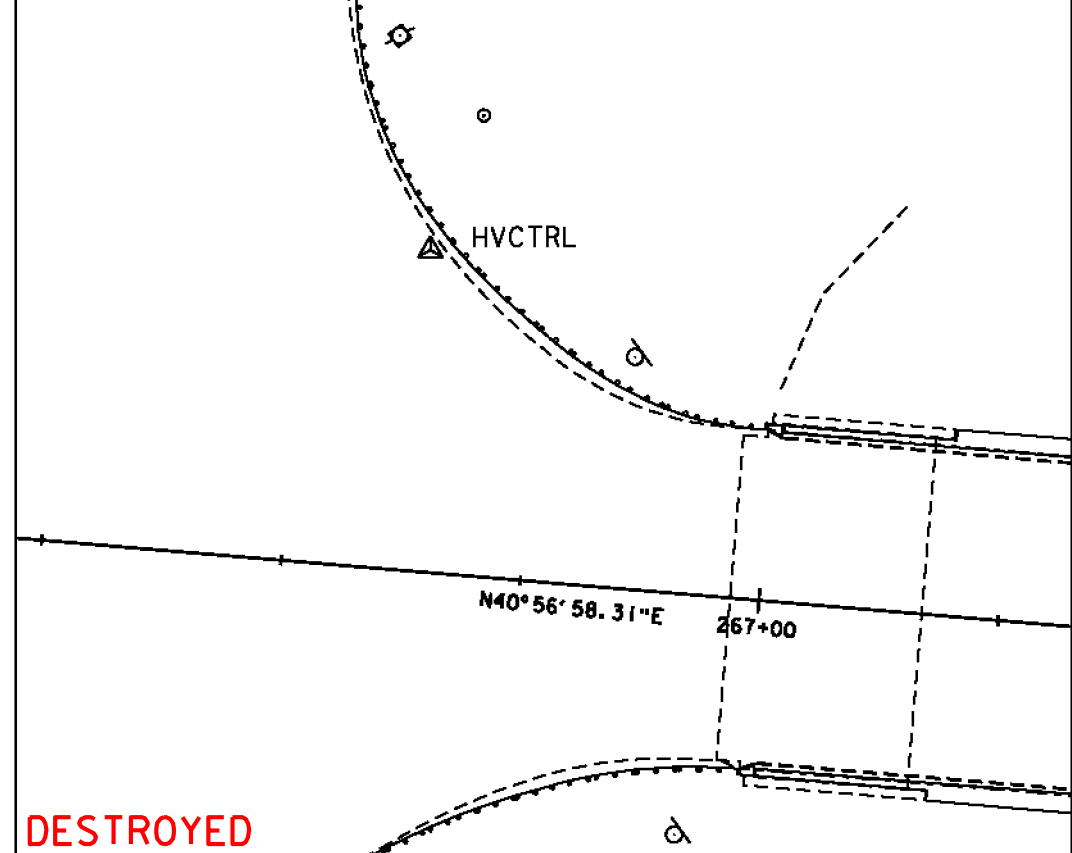
STONE FILL, TYPE I  
GEOTEXTILE UNDER STONE FILL  
266+30 TO 268+40 RT  
268+54 TO 268+58 LT  
STONE FILL, TYPE II  
GEOTEXTILE UNDER STONE FILL  
266+88 TO 267+17 LT  
268+01 TO 268+25 LT

REMOVAL AND DISPOSAL OF GUARDRAIL  
266+21 TO 266+98 RT  
266+53 TO 266+98 LT  
268+17 TO 268+38 RT  
268+17 TO ~~268+62~~ **269+31 LT**  
STEEL BEAM GUARDRAIL, GALVANIZED  
266+22 TO 266+72 RT  
266+53 TO 266+66 LT  
268+37 TO 268+40 RT  
268+43 TO ~~268+55~~ **269+43 LT**

ANCHOR FOR STEEL BEAM RAIL  
268+36 RT **269+30 LT**  
DELINEATOR WITH STEEL POST  
268+37 RT **269+43 LT**  
CAST-IN-PLACE CONCRETE CURB, TYPE B  
266+62 TO 267+00 RT  
266+62 TO 267+00 LT  
268+15 TO 268+39 RT  
268+15 TO 268+53 LT  
CONSTRUCT DRIVES **PAVED**  
268+49 RT (27 FT WIDE, ~~GRAVEL~~, RES.)

|                 |                                   |
|-----------------|-----------------------------------|
| HVCTRL 266+62.8 |                                   |
| NORTH =         | 335389.02                         |
| EAST =          | 1585420.95                        |
| ELEV. =         | <del>1034.00</del> <b>1034.14</b> |

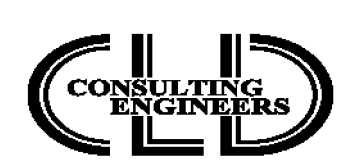
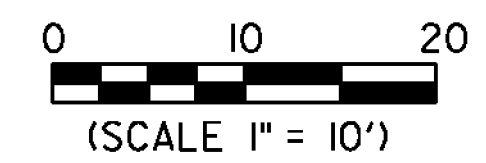
|                 |            |
|-----------------|------------|
| HVCTRL 268+34.7 |            |
| NORTH =         | 335482.64  |
| EAST =          | 1585575.30 |
| ELEV. =         | 1030.82    |



EXISTING BRIDGE DATA:  
ROLLED BEAMS, CONCRETE DECK  
SPAN = 82'-0"  
WIDTH = 38'-10" OUT-TO-OUT  
BUILT IN 1966.

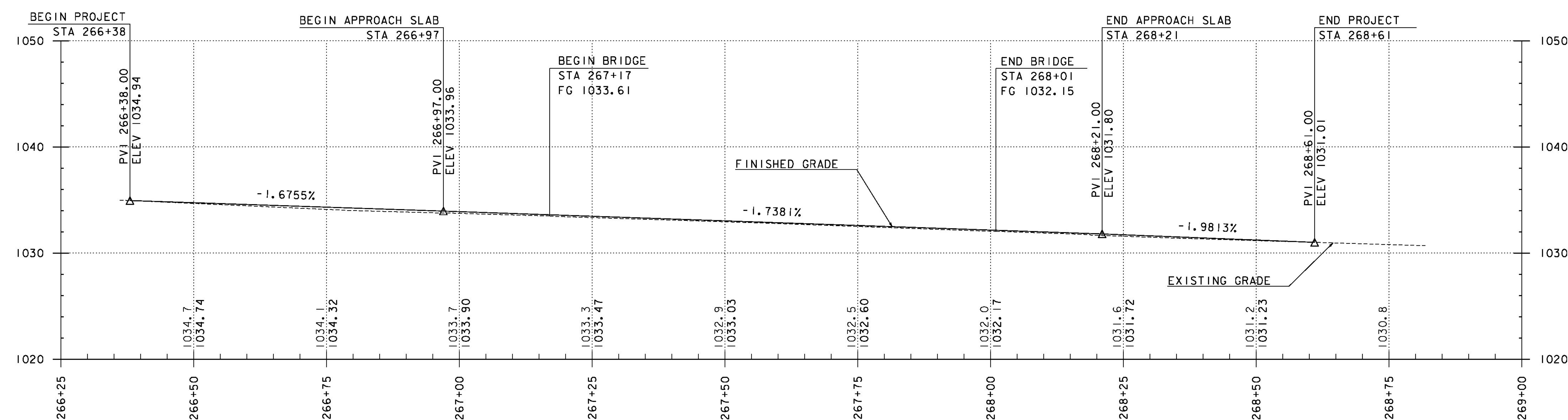
- LEGEND
- [N] NEW SIGN
  - [RET] RETAIN SIGN
  - [S] SALVAGE SIGN
  - [R] REMOVE SIGN

KEY TO PAVEMENT MARKINGS  
WL = SOLID WHITE LINE  
YL = SOLID YELLOW LINE



|                 |                   |
|-----------------|-------------------|
| PROJECT NAME:   | LUDLOW            |
| PROJECT NUMBER: | STP DECK(39)      |
| FILE NAME:      | z15bi09bdr-99.dgn |
| PROJECT LEADER: | J. BYATT          |
| DESIGNED BY:    | S. FORTIER        |
| LAYOUT SHEET    |                   |
| PLOT DATE:      | 8/3/2016          |
| DRAWN BY:       | S. FORTIER        |
| CHECKED BY:     | L. GREER          |
| SHEET           | II OF 42          |





- NOTES**
1. STATIONS AND ELEVATIONS ARE IN FEET.
  2. THE ELEVATIONS SHOWN TO THE NEAREST TENTH ARE THE EXISTING GROUND ALONG THE CENTERLINE.
  3. THE ELEVATIONS SHOWN TO THE NEAREST HUNDRETH ARE THE FINISHED GRADE ALONG THE CENTERLINE.
  4. PROPOSED PROFILE SHOWN IS FOR INFORMATIONAL PURPOSES ONLY. FINAL FINISHED GRADE SHALL BE DETERMINED BY THE PROJECT MANAGER AFTER TOP OF DECK AND TOP OF BEAM ELEVATIONS ARE SURVEYED. SEE PROJECT NOTE 23 ON SHEET 3.

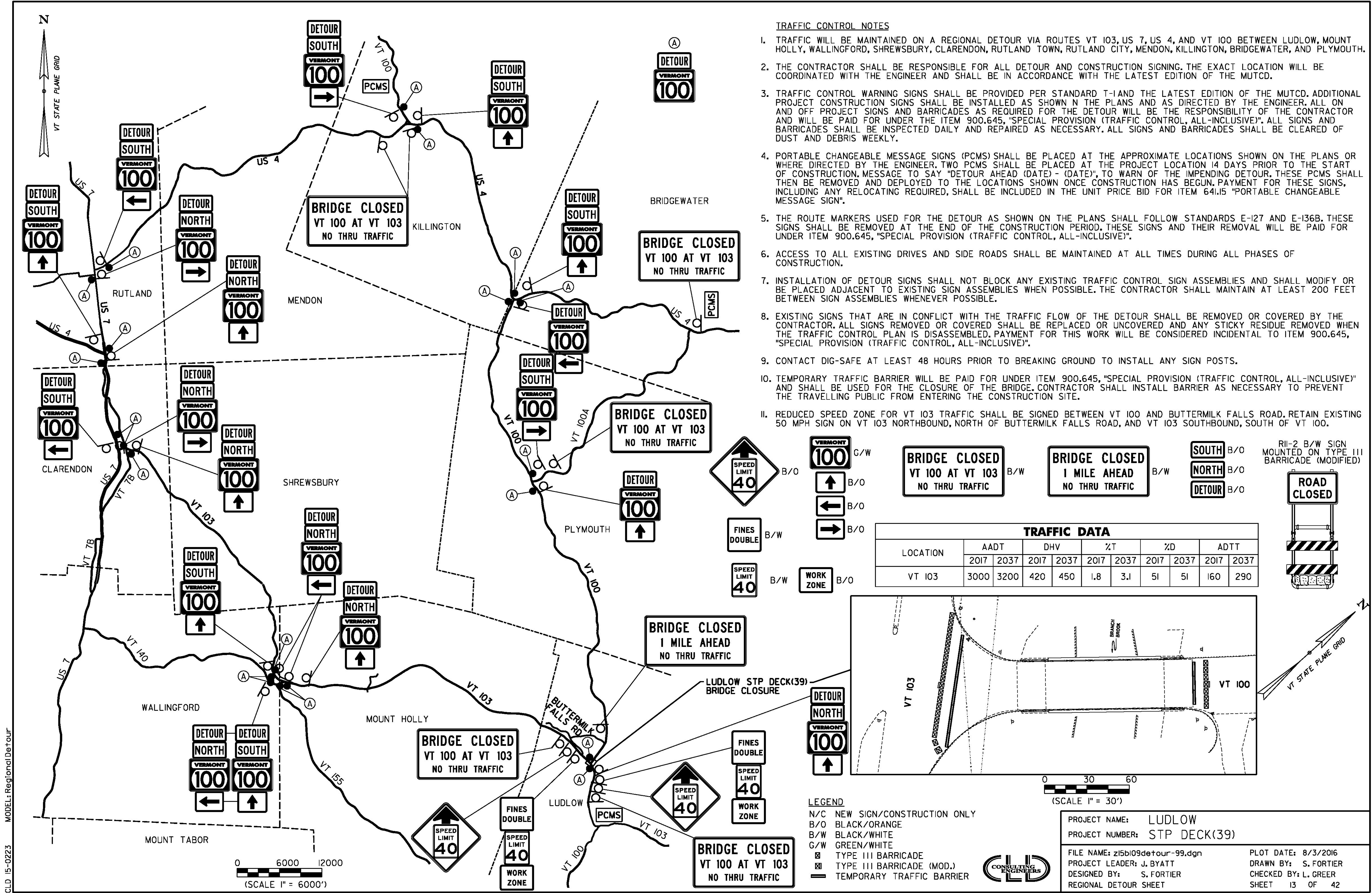
**VT 100 PROFILE**  
HOR. SCALE 1" = 10'-0"  
VER. SCALE 1" = 20'-0"

CLD 15-0223 MODEL-Profile



|                              |                      |
|------------------------------|----------------------|
| PROJECT NAME: LUDLOW         |                      |
| PROJECT NUMBER: STP DECK(39) |                      |
| FILE NAME: z15bi09pro-99.dgn | PLOT DATE: 8/3/2016  |
| PROJECT LEADER: J. BYATT     | DRAWN BY: S. FORTIER |
| DESIGNED BY: S. FORTIER      | CHECKED BY: L. GREER |
| PROFILE SHEET                | SHEET 12 OF 42       |

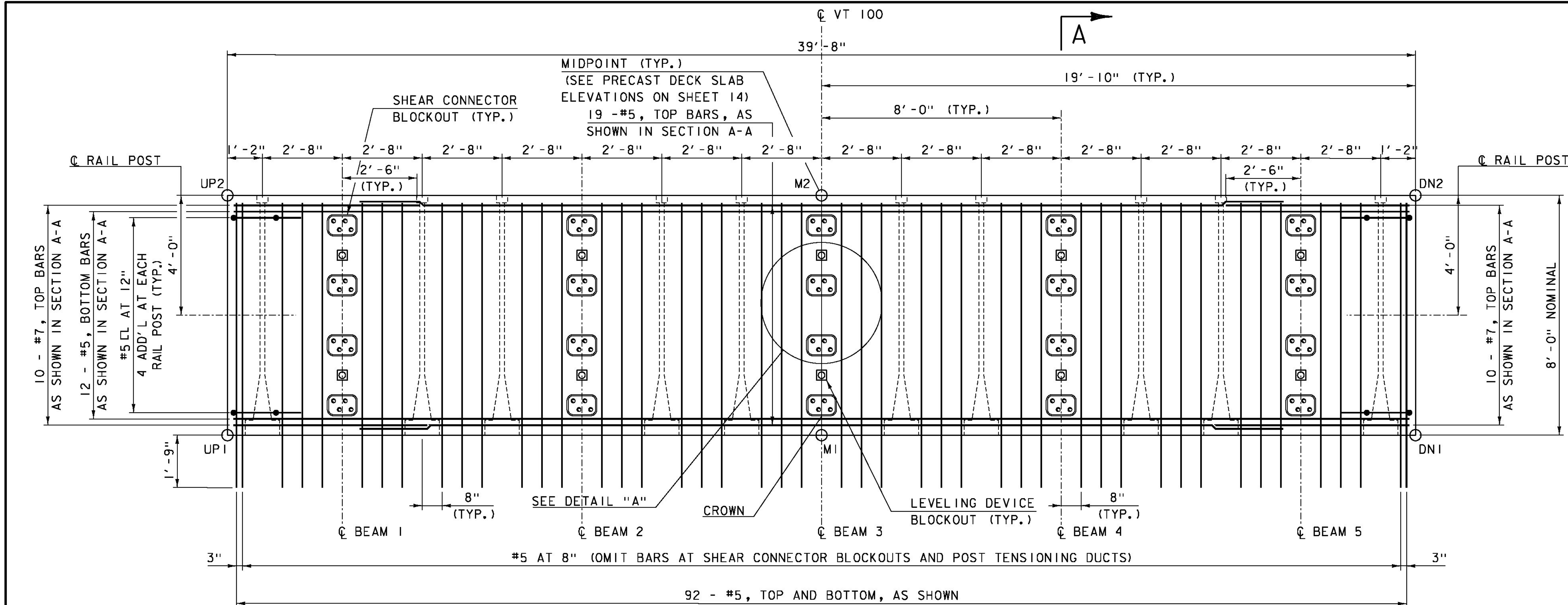






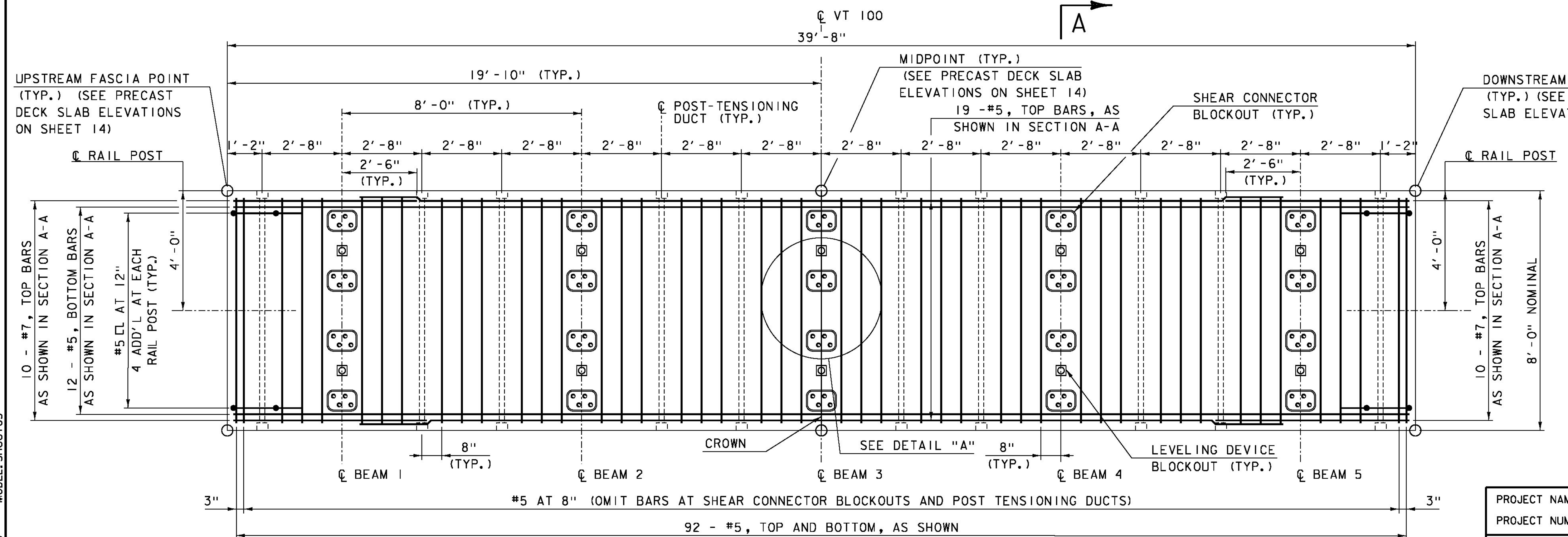






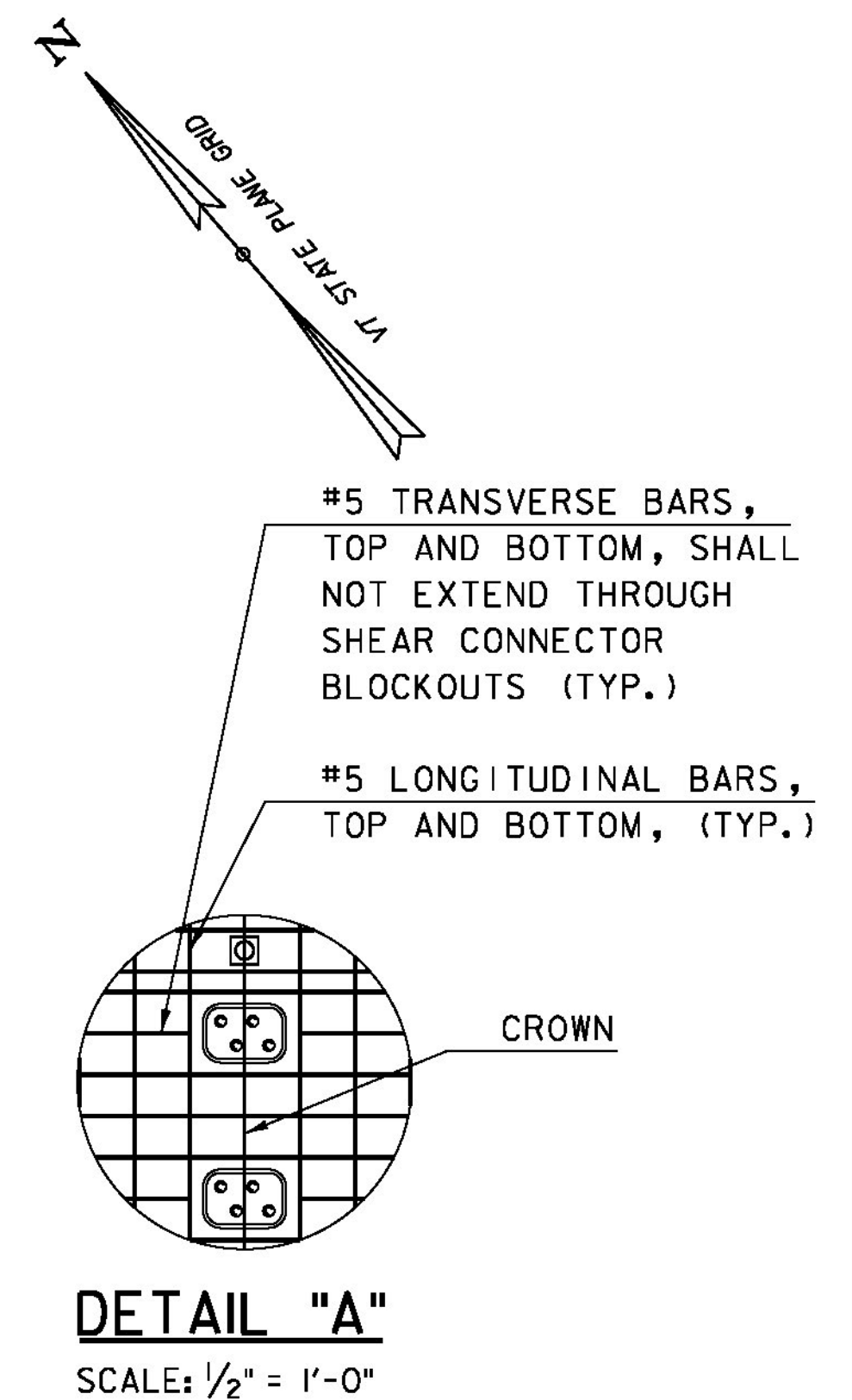
**PRECAST SLAB U1 PLAN**

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



**PRECAST SLAB U2 PLAN**

SCALE: 1/2" = 1'-0"  
(8 REQUIRED)



**NOTES:**

- 3" CLEAR FROM SLAB EDGES. 1" MIN. CLEAR FROM ALL BLOCKOUTS, POCKETS, OR LEVELING DEVICES.
- 2'-2" SPLICE UNLESS OTHERWISE SPECIFIED ON PLANS.
- 10" HOOK UNLESS OTHERWISE SPECIFIED ON PLANS.
- SEE SHEET 17 FOR TYPICAL PRECAST SLAB SECTION AND SECTION A-A.
- SEE SHEET 20 FOR ANCHORAGE ZONE REINFORCEMENT.

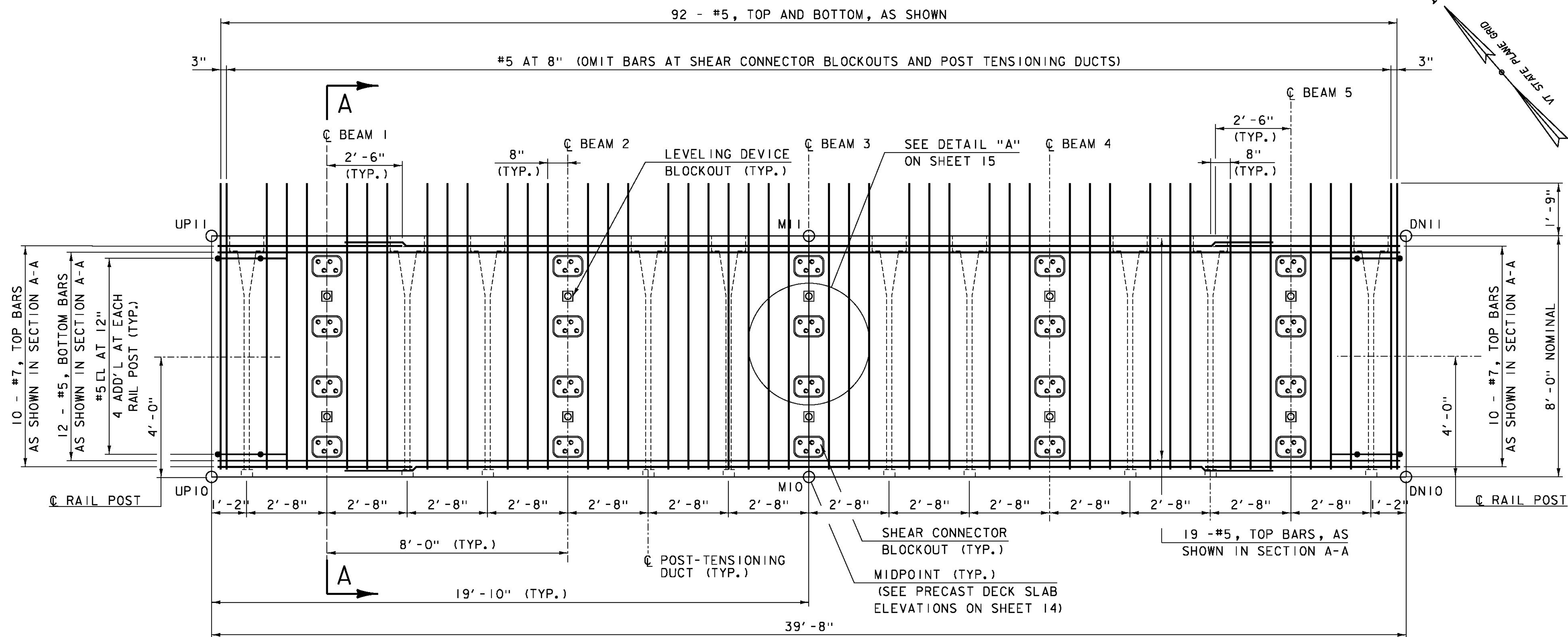
PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15b109typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
DECK DETAILS SHEET 2

PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: S. BEAUMONT  
SHEET 15 OF 42





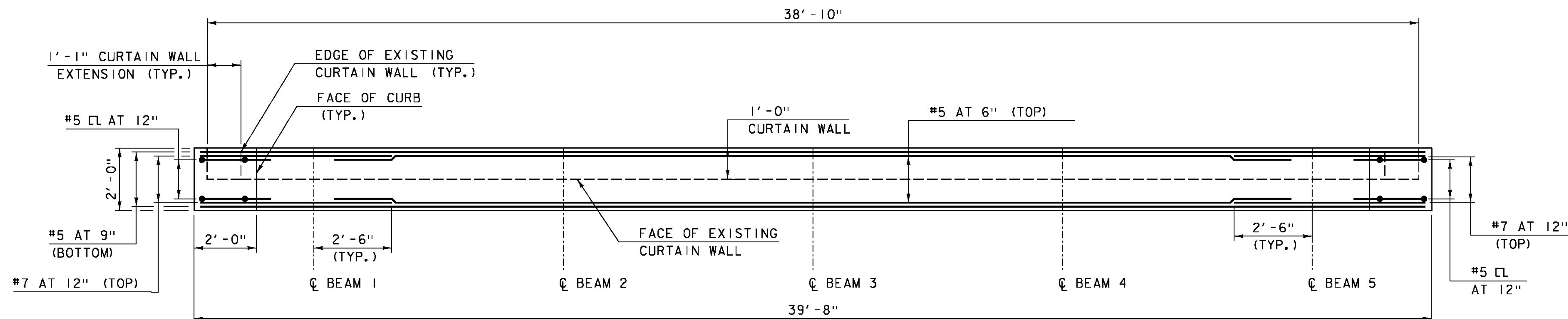


### PRECAST SLAB U3 PLAN

SCALE:  $\frac{1}{2}" = 1'-0"$

#### NOTES:

- 3" CLEAR FROM SLAB EDGES. 1" MIN. CLEAR FROM ALL BLOCKOUTS, POCKETS, OR LEVELING DEVICES.
- 2'-2" SPLICE UNLESS OTHERWISE SPECIFIED ON PLANS.
- 10" HOOK UNLESS OTHERWISE SPECIFIED ON PLANS.
- SEE SHEET 17 FOR TYPICAL PRECAST SLAB SECTION AND SECTION A-A.
- SEE SHEET 20 FOR ANCHORAGE ZONE REINFORCEMENT.
- FOR END CLOSURE POUR SECTION, SEE "JOINT DETAIL AT ABUTMENT 2" ON SHEET 21.
- FOR END CLOSURE POUR REINFORCEMENT, SEE END CLOSURE POUR AND CURTAIN WALL EXTENSION MASONRY AND REINFORCING ELEVATION ON SHEET 25.



### END CLOSURE POUR MASONRY AND REINFORCING PLAN

SCALE:  $\frac{1}{2}" = 1'-0"$

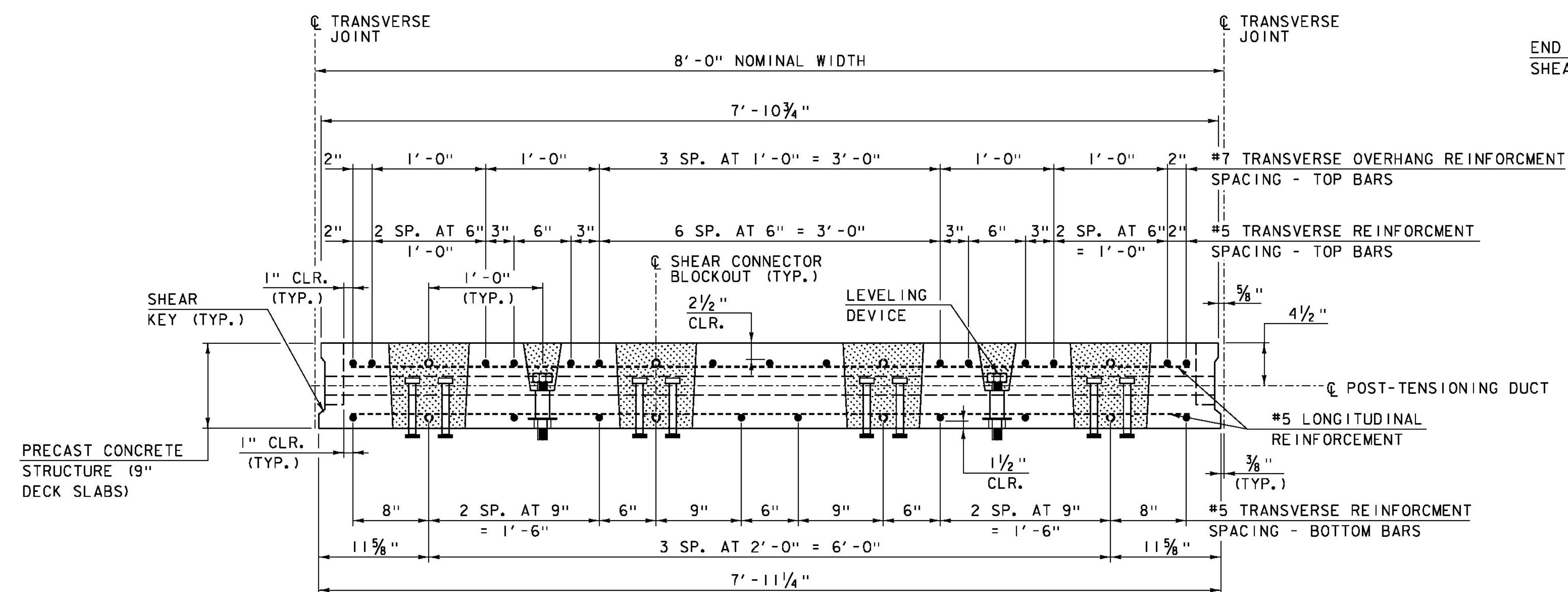
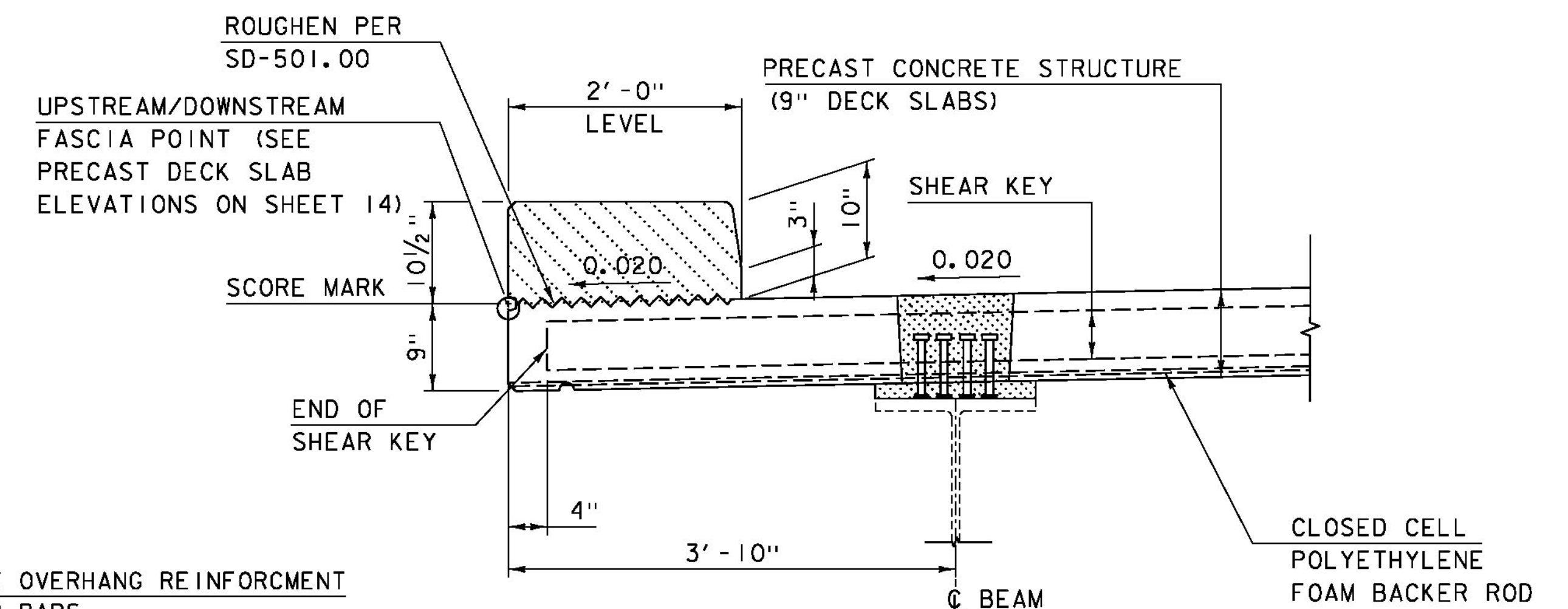
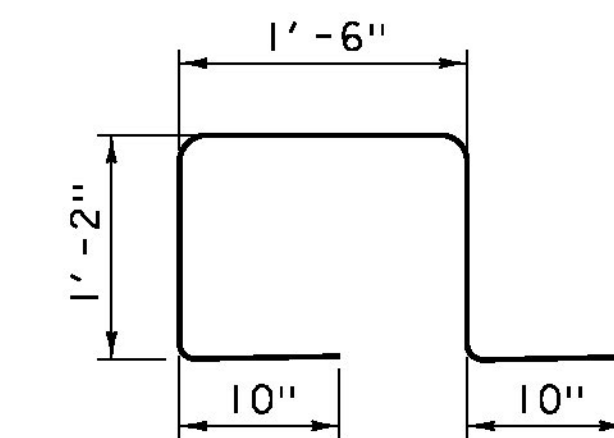
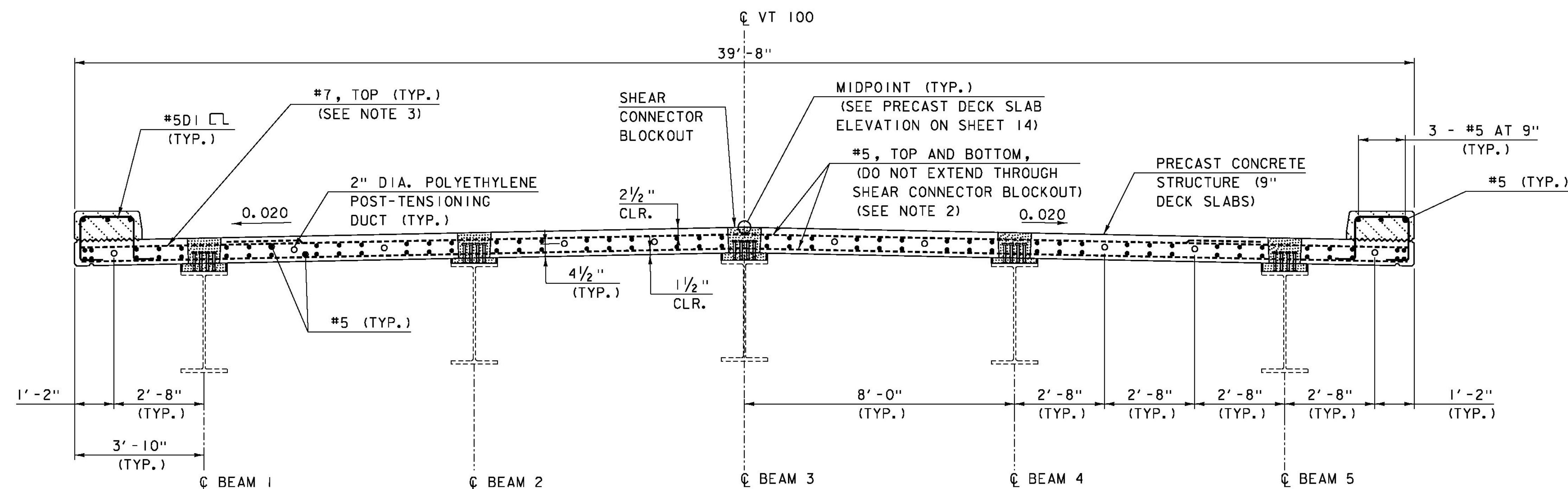
PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15bi09typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
DECK DETAILS SHEET 3

PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: S. BEAUMONT  
SHEET 16 OF 42







### TYPICAL OVERHANG SECTION

SCALE: 1" = 1'-0"

**SECTION A-A**

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

- NOTES:

1. 3" CLEAR FROM SLAB/CURB EDGES. 1" MIN. CLEAR FROM ALL BLOCKOUTS, POCKETS, OR LEVELING DEVICES.
2. TRANSVERSE AND LONGITUDINAL REINFORCING DO NOT EXTEND THROUGH SHEAR CONNECTOR BLOCKOUT. REINFORCEMENT SHOWN DASHED FOR CLARITY. SEE PRECAST SLAB PLANS AND DETAIL "A" ON SHEETS 15 AND 16.
3. #7 TRANSVERSE OVERHANG REINFORCEMENT SHOWN FOR CLARITY ONLY. BARS ARE NOT LOCATED AT SHEAR CONNECTOR BLOCKOUT LOCATIONS. SEE SECTION A-A FOR TRANSVERSE OVERHANG REINFORCEMENT SPACING.
4. SEE SHEET 5 FOR FASCIA AND DRIP NOTCH DETAIL.

|                 |              |
|-----------------|--------------|
| PROJECT NAME:   | LUDLOW       |
| PROJECT NUMBER: | STP DECK(39) |

FILE NAME: z15b109+yp-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
DECK DETAILS SHEET 4

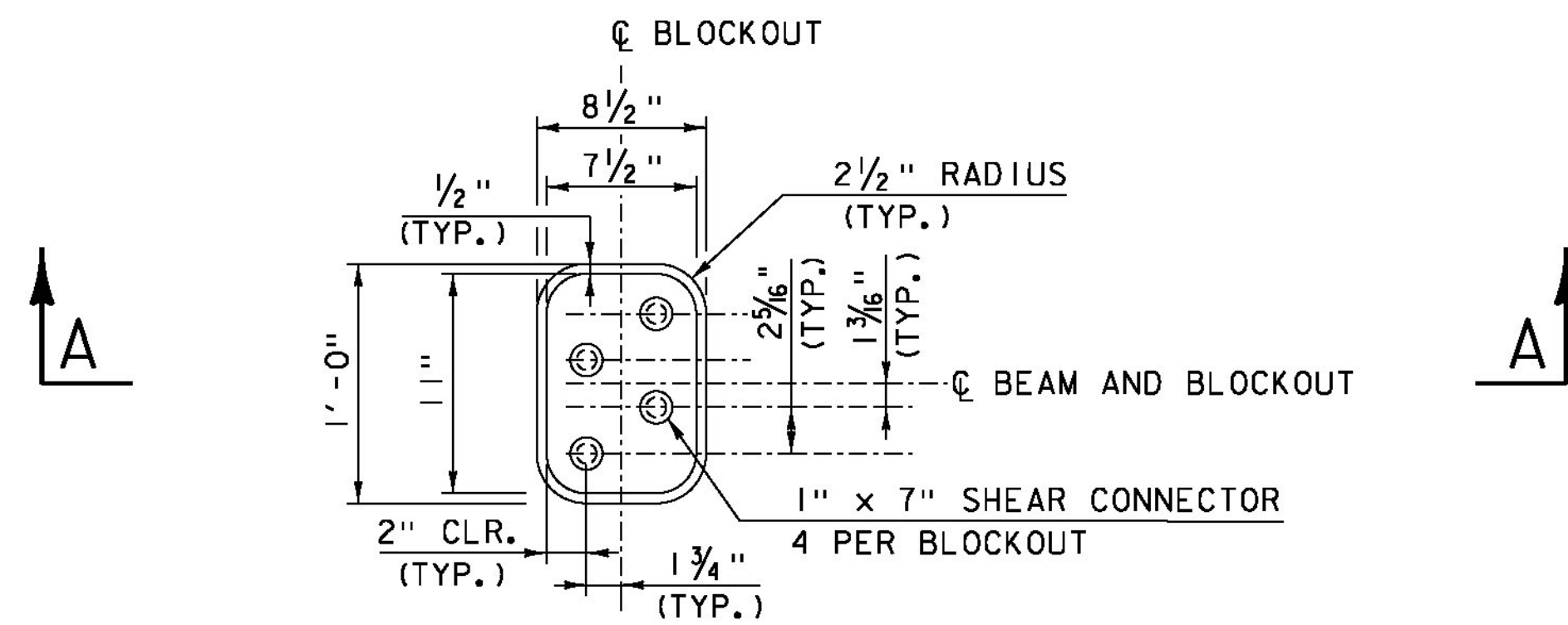
PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: S. BEAUMONT  
SHEET 17 OF 42

 SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)

|                                                                                       |                                                     |
|---------------------------------------------------------------------------------------|-----------------------------------------------------|
|  | MORTAR, TYPE IV (COST<br>INCIDENTAL TO ITEM 540.10) |
|---------------------------------------------------------------------------------------|-----------------------------------------------------|

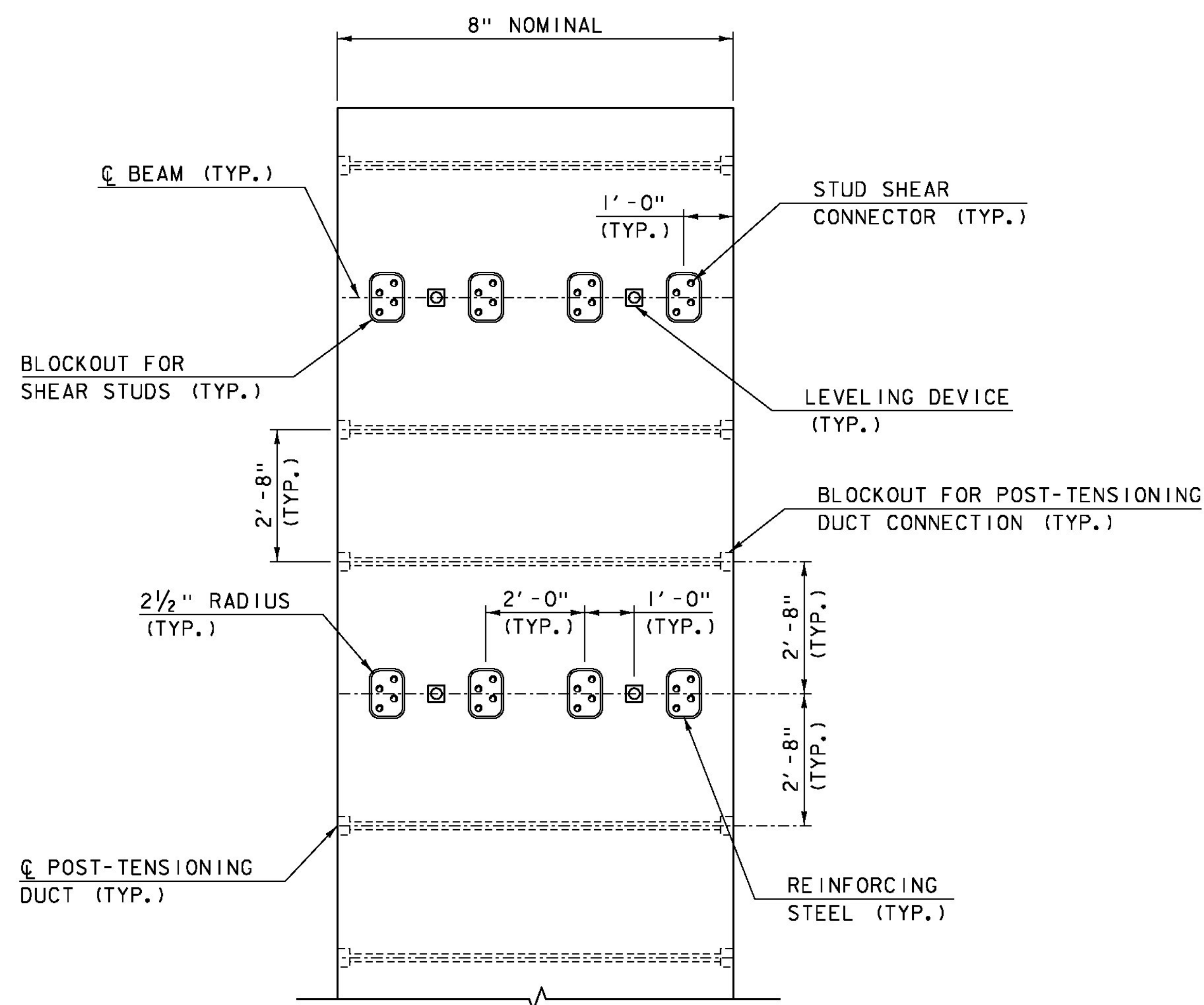






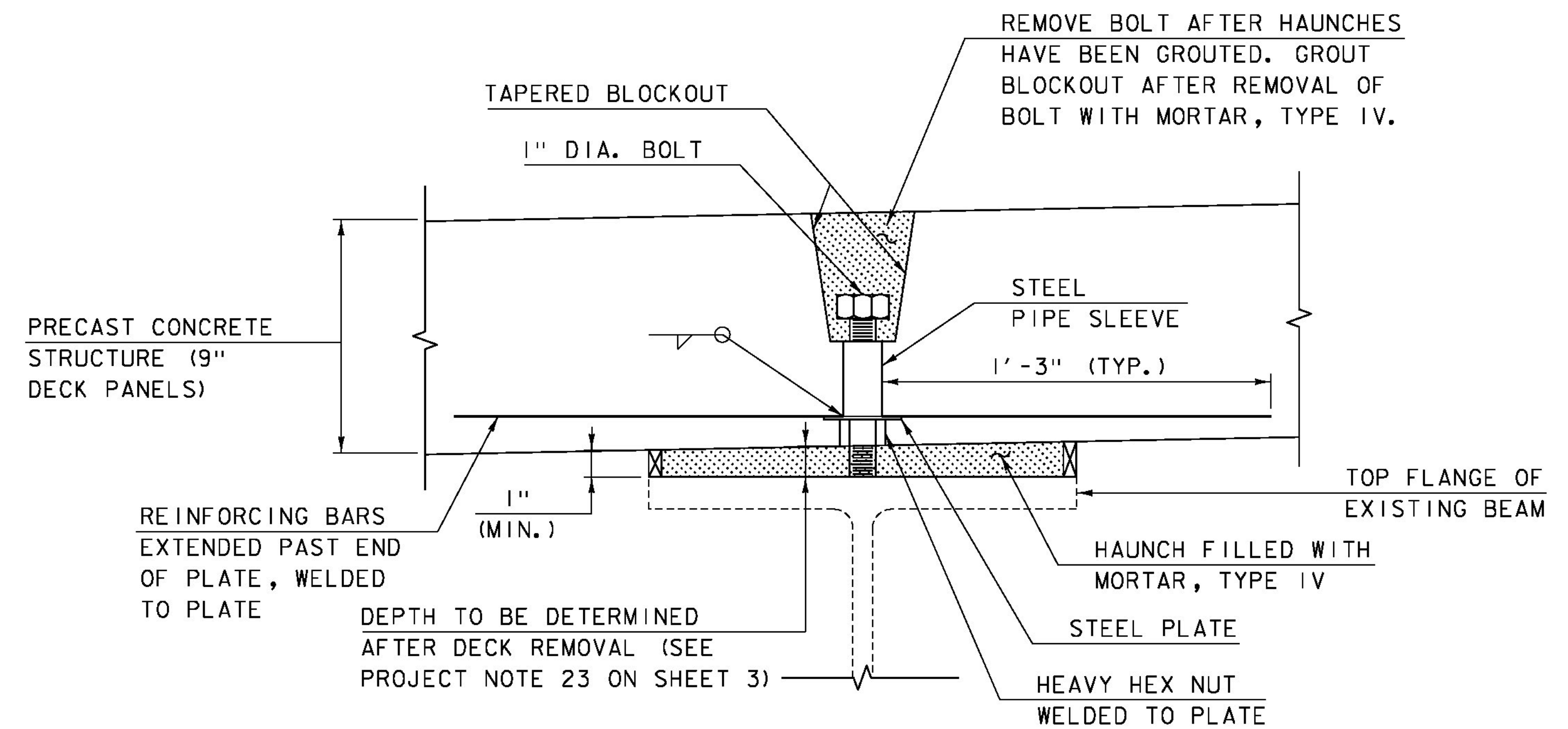
**SHEAR CONNECTOR BLOCKOUT DETAIL**

SCALE:  $1\frac{1}{2}" = 1'-0"$



**SHEAR CONNECTOR BLOCKOUT PLAN**

SCALE:  $1\frac{1}{2}" = 1'-0"$



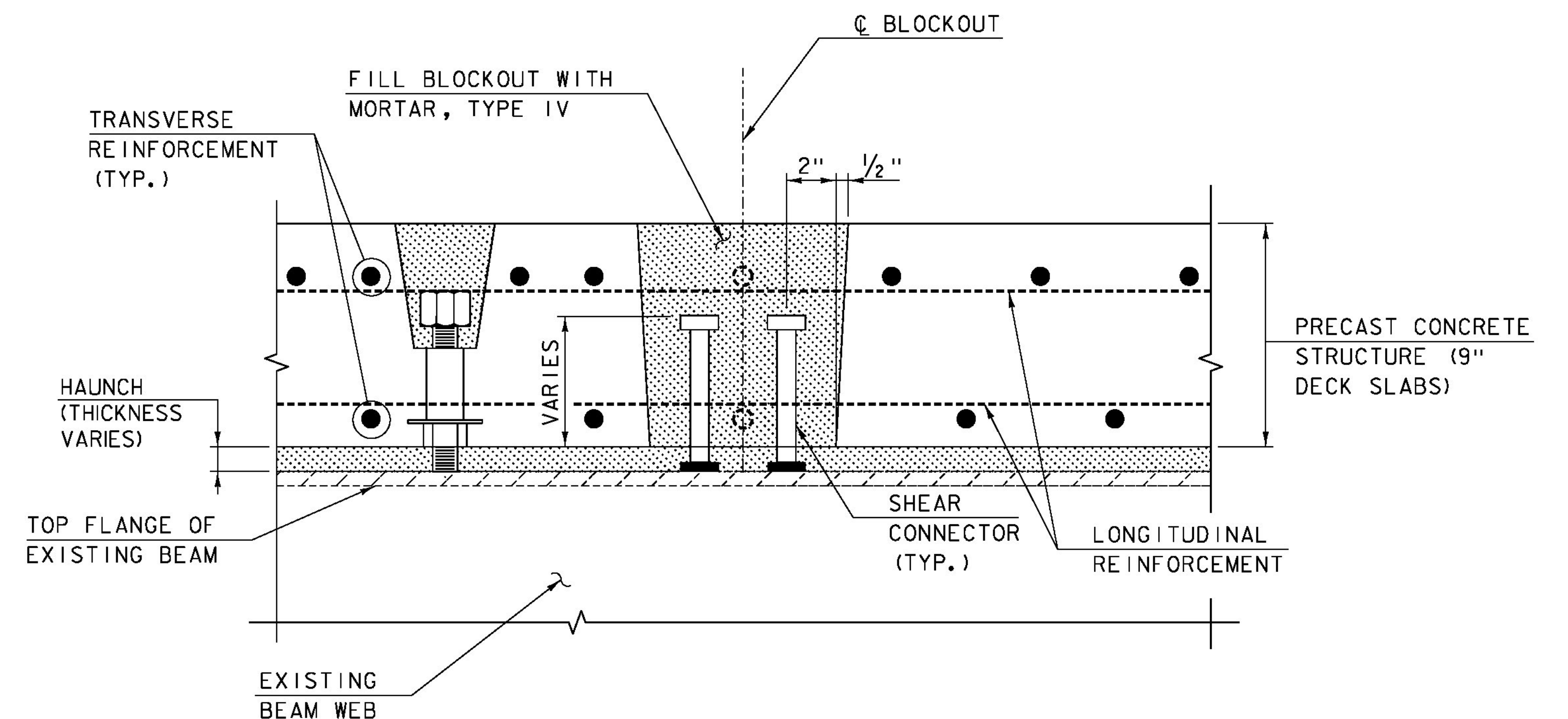
**LEVELING DEVICE DETAIL**

SCALE:  $3" = 1'-0"$

**NOTES:**

THE CONTRACTOR IS RESPONSIBLE FOR THE DESIGN OF THE LEVELING DEVICE BASED ON THE WEIGHT OF THE SLABS AND THE NUMBER OF DEVICES.

ALTERNATE DEVICES MAY BE SUBSTITUTED WITH APPROVAL FROM THE PROJECT MANAGER.



**SECTION A-A**

SCALE:  $3" = 1'-0"$

**NOTE:**

TRANSVERSE AND LONGITUDINAL REINFORCING DO NOT EXTEND THROUGH SHEAR CONNECTOR BLOCKOUT. REINFORCEMENT SHOWN DASHED FOR CLARITY. SEE PRECAST SLAB PLANS AND DETAIL "A" ON SHEETS 15 AND 16.

MORTAR, TYPE IV (COST INCIDENTAL TO ITEM 540.10)

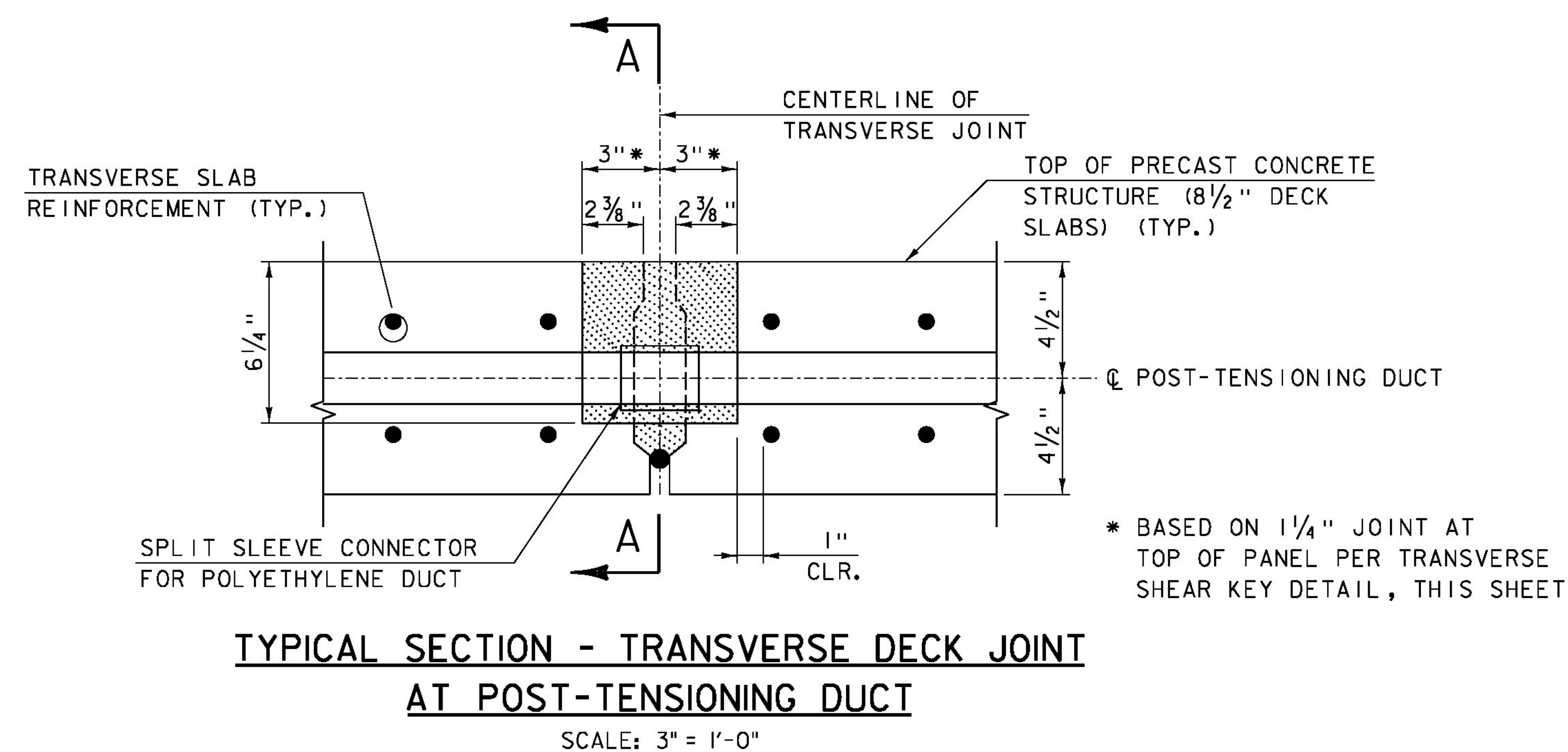
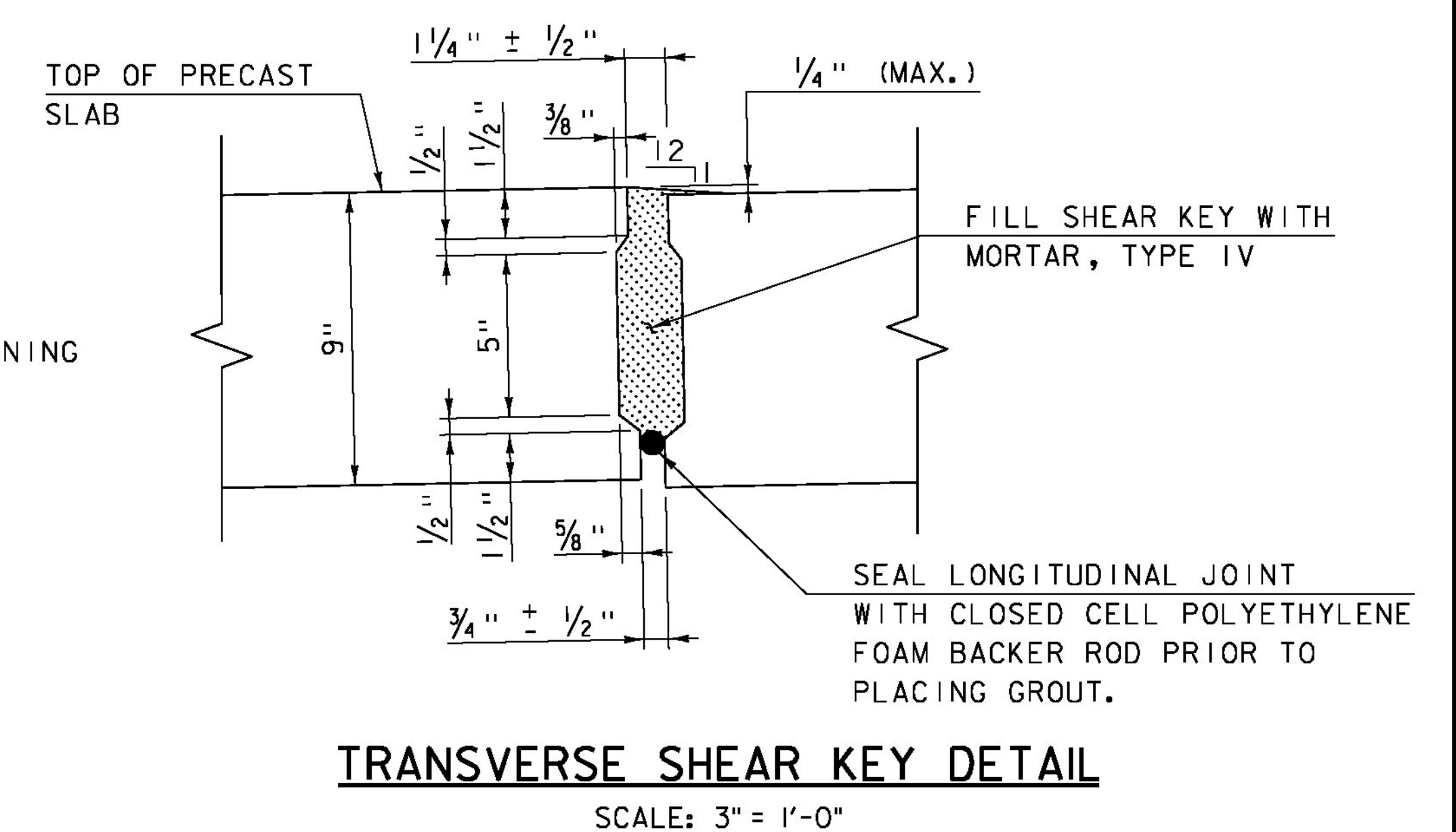
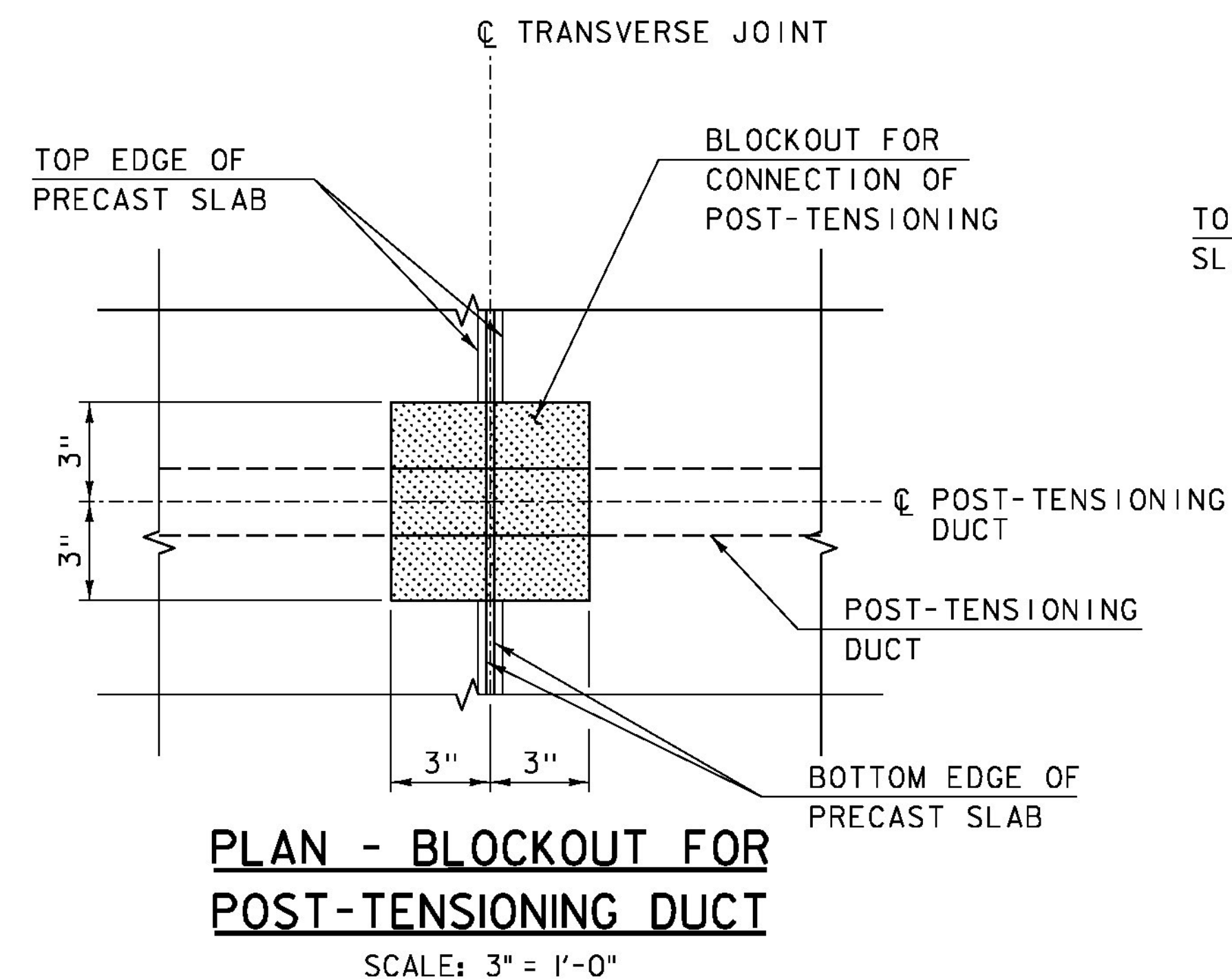
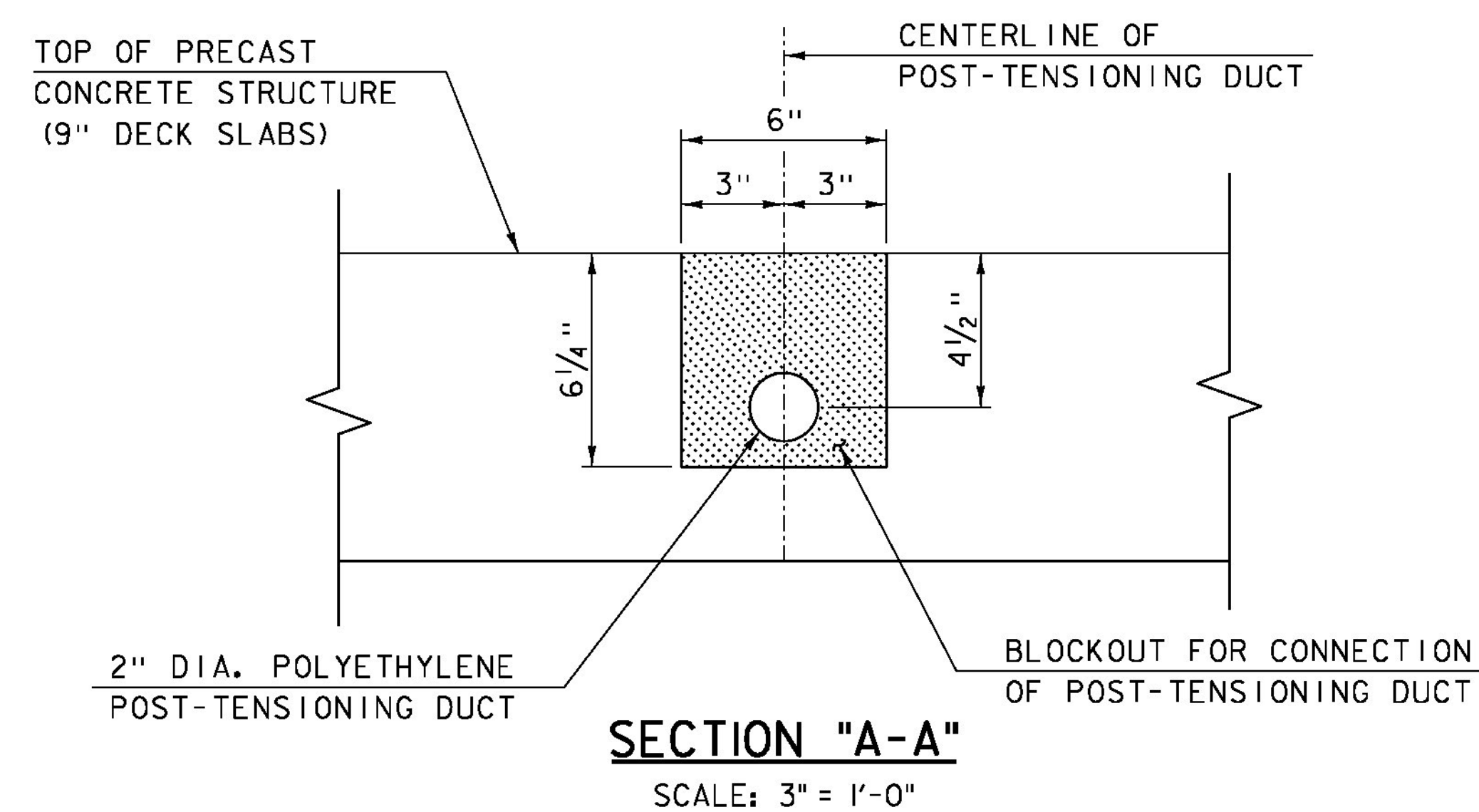


PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15bi09typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
DECK DETAILS SHEET 5

PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: S. BEAUMONT  
SHEET 18 OF 42





NOTE: LONGITUDINAL SLAB REINFORCEMENT NOT SHOWN FOR CLARITY.

1. THE SLAB SHALL BE PLACED AT THE NOMINAL SPACING SHOWN ON THE PLANS WITH A 3/4" WIDE GAP BETWEEN THE SLABS. THE WIDTH OF THIS GAP CAN VARY DUE TO TOLERANCES OF THE SLABS.
2. MORTAR, TYPE IV FOR SHEAR KEYS SHALL BE RODDED OR VIBRATED TO ENSURE THAT ALL VOIDS IN THE SHEAR KEYS ARE FILLED.
3. POST-TENSIONING DUCT SHOWN IS FOR 3 - 0.6" DIA. PRESTRESSING STRANDS. ALTERNATE DUCTS MAY BE USED. THE CONNECTION OF THE DUCT SHALL BE WATERTIGHT.
4. FILL BLOCKOUT WITH MORTAR, TYPE IV SIMULTANEOUSLY WITH THE TRANSVERSE SHEAR KEYS.
5. FORM SHEAR KEY ALONG INTERFACE OF PRECAST SLABS AND CLOSURE POUR.

MORTAR, TYPE IV (COST INCIDENTAL TO ITEM 540.10, "PRECAST CONCRETE STRUCTURE (9" DECK SLABS)").

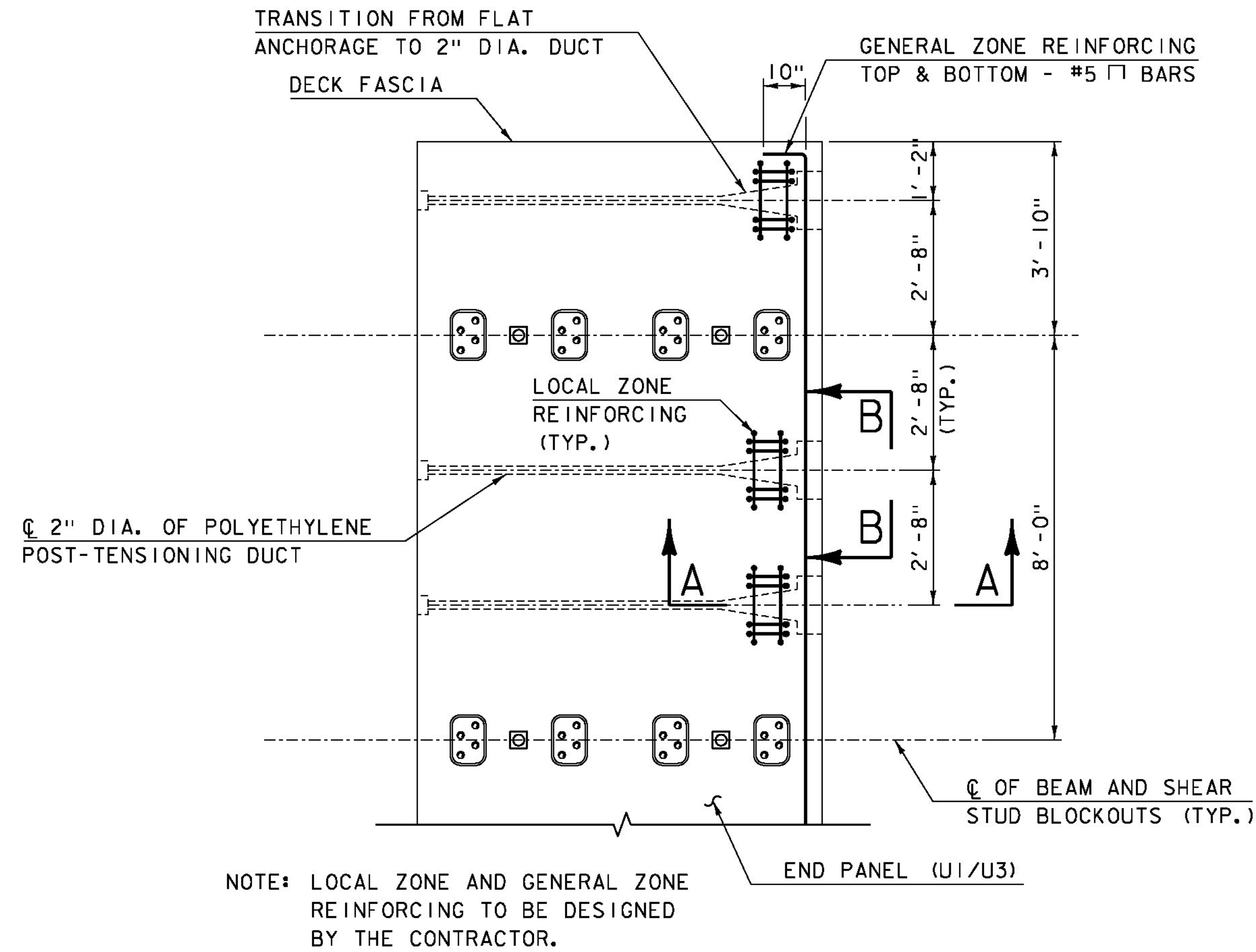


PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15bi09typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
DECK DETAILS SHEET 6

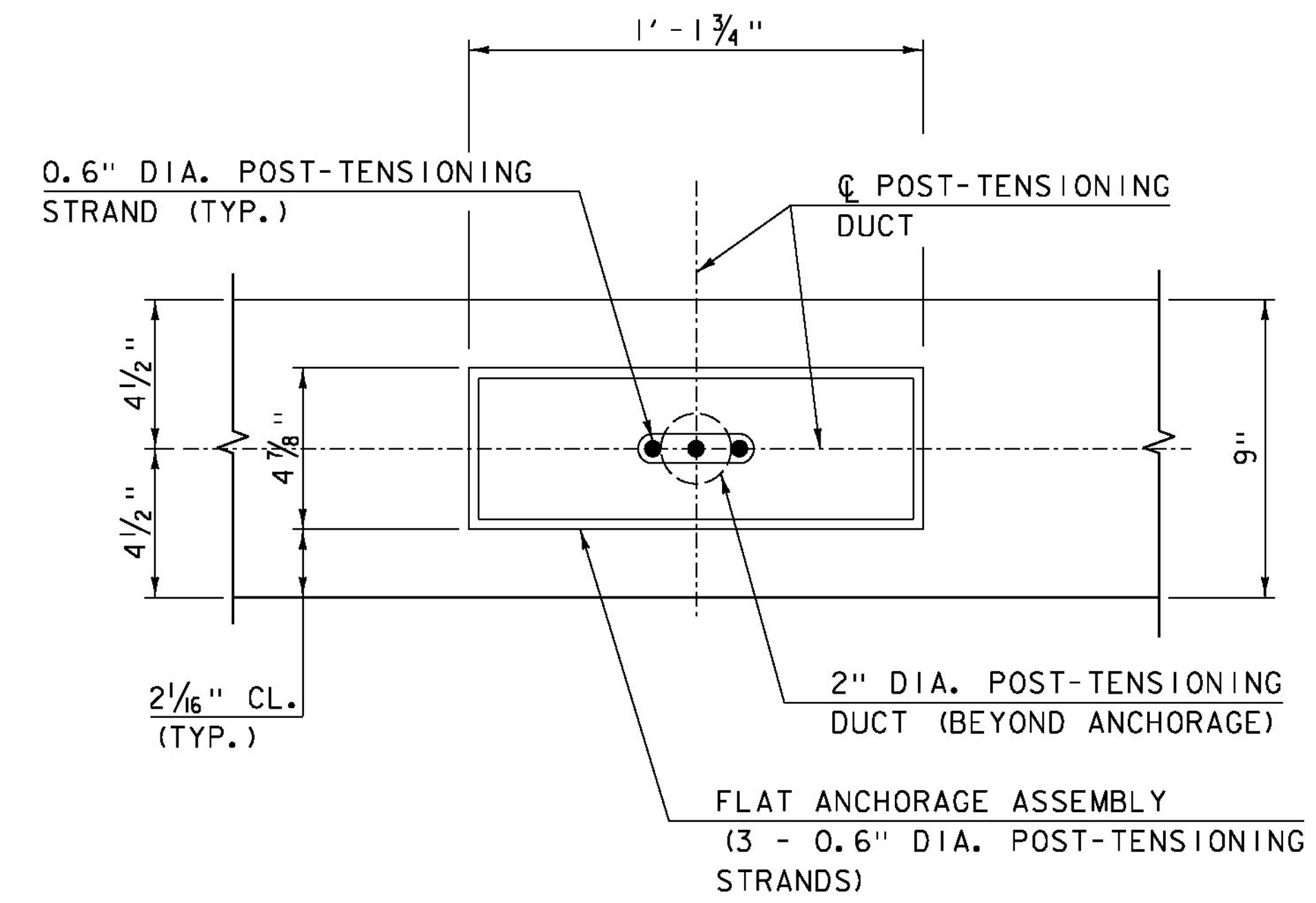
PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: S. BEAUMONT  
SHEET 19 OF 42





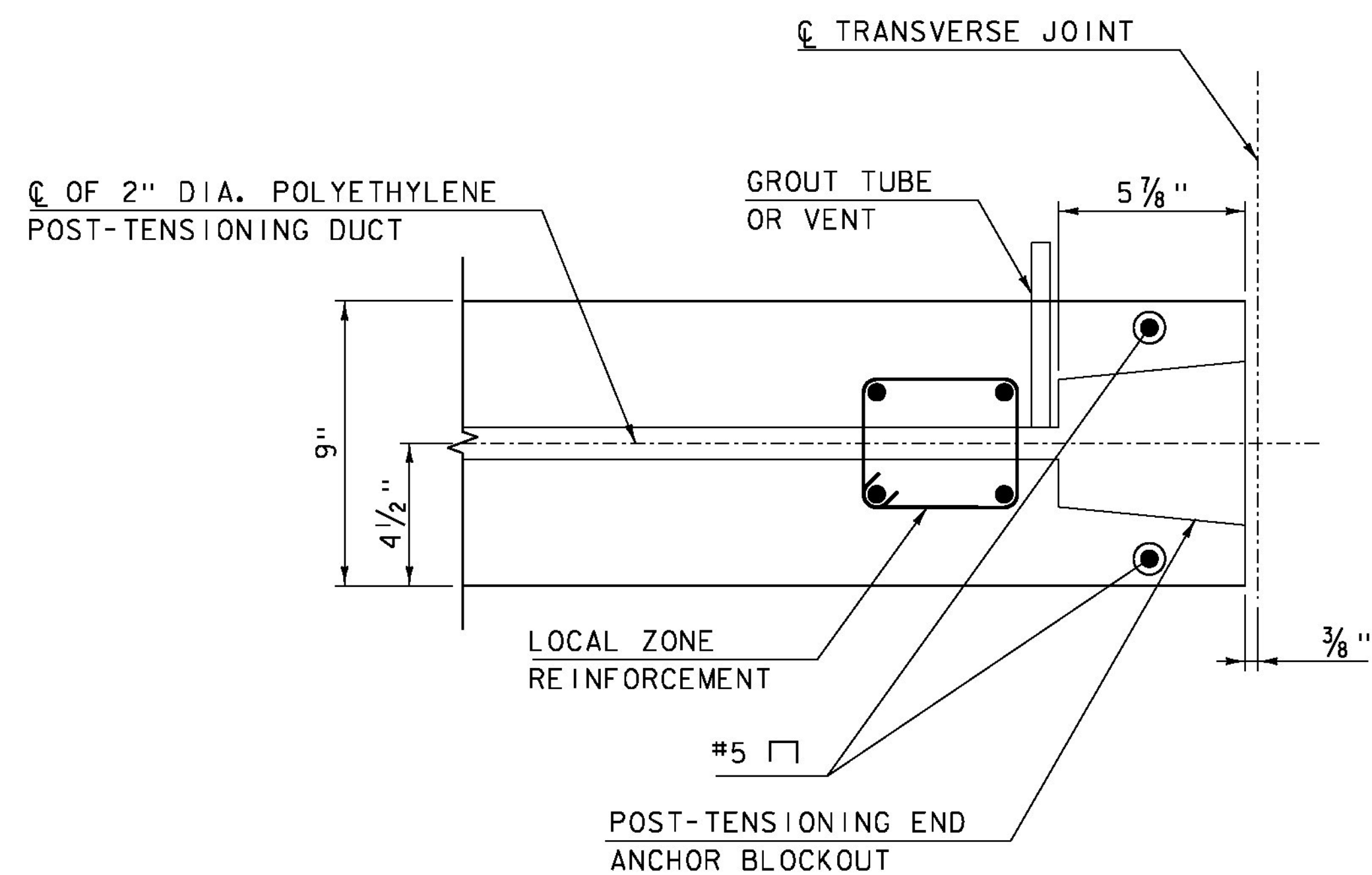
### END ANCHORAGE DETAILS FOR POST-TENSIONING

SCALE:  $\frac{1}{2}" = 1'-0"$



### SECTION B-B

SCALE: 3" = 1'-0"



### SECTION A-A

SCALE: 3" = 1'-0"

NOTE: 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.

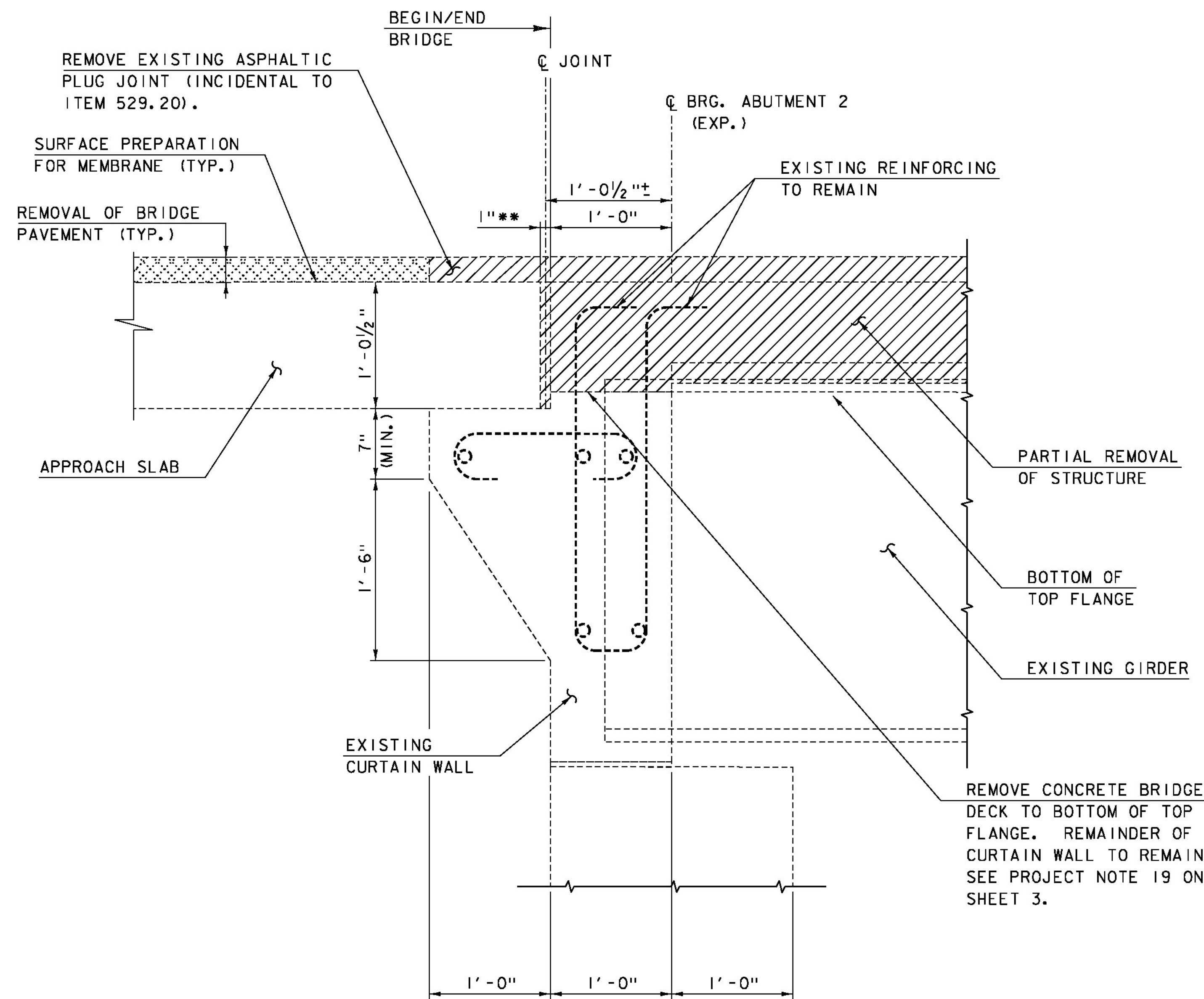
PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15bi09typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: N. CARON  
DECK DETAILS SHEET 7

PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: S. BEAUMONT  
SHEET 20 OF 42



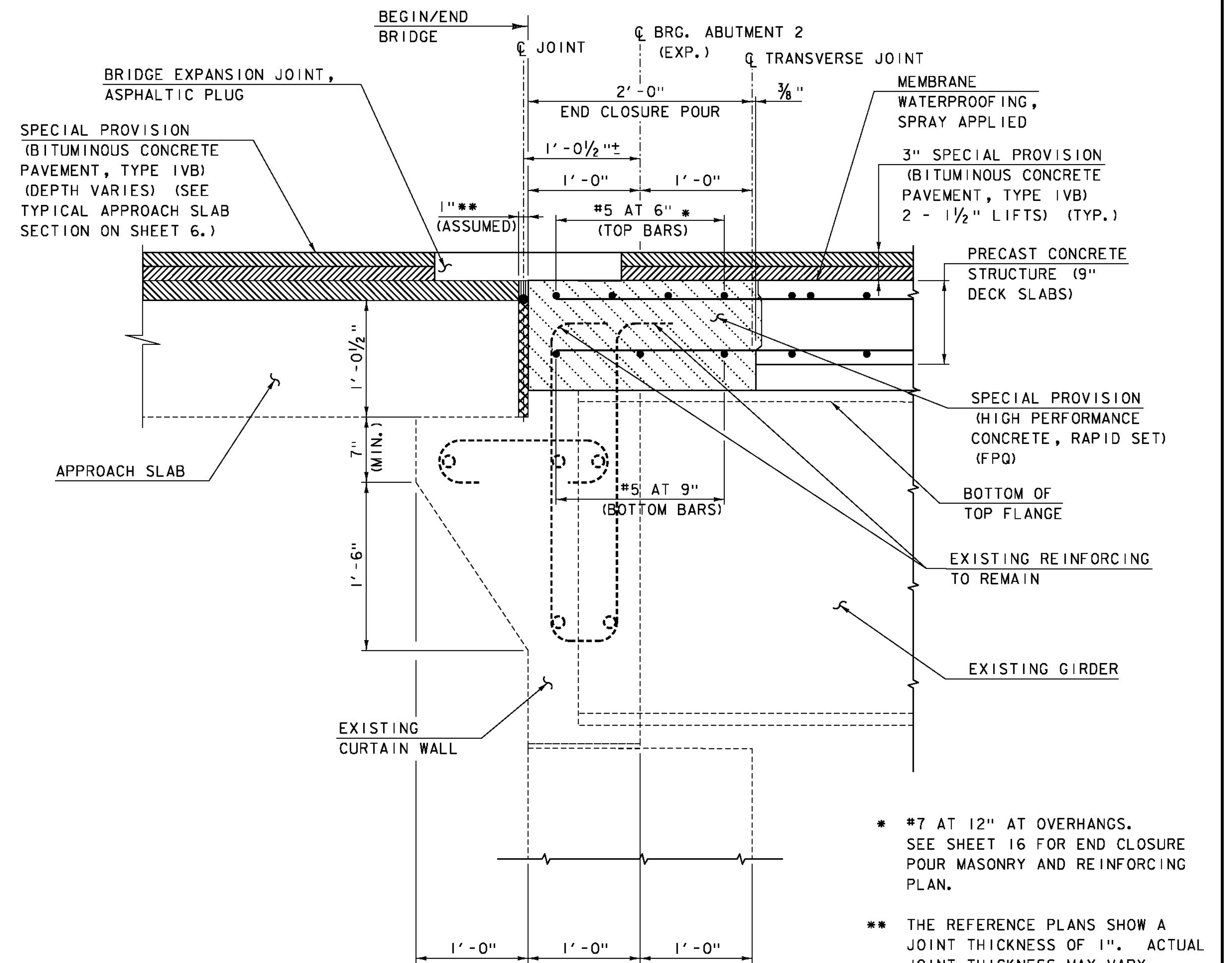




**DECK REMOVAL DETAIL AT ABUTMENT 2**

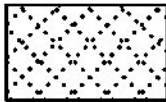
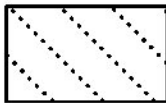
SCALE: 1 1/2" = 1'-0"

NOTE: ABUTMENT 2 REMOVAL AND ASPHALTIC PLUG JOINT DETAILS SHOWN.  
ABUTMENT 1 REMOVAL AND SAWED PAVEMENT JOINT DETAILS SIMILAR.



**JOINT DETAIL AT ABUTMENT 2**

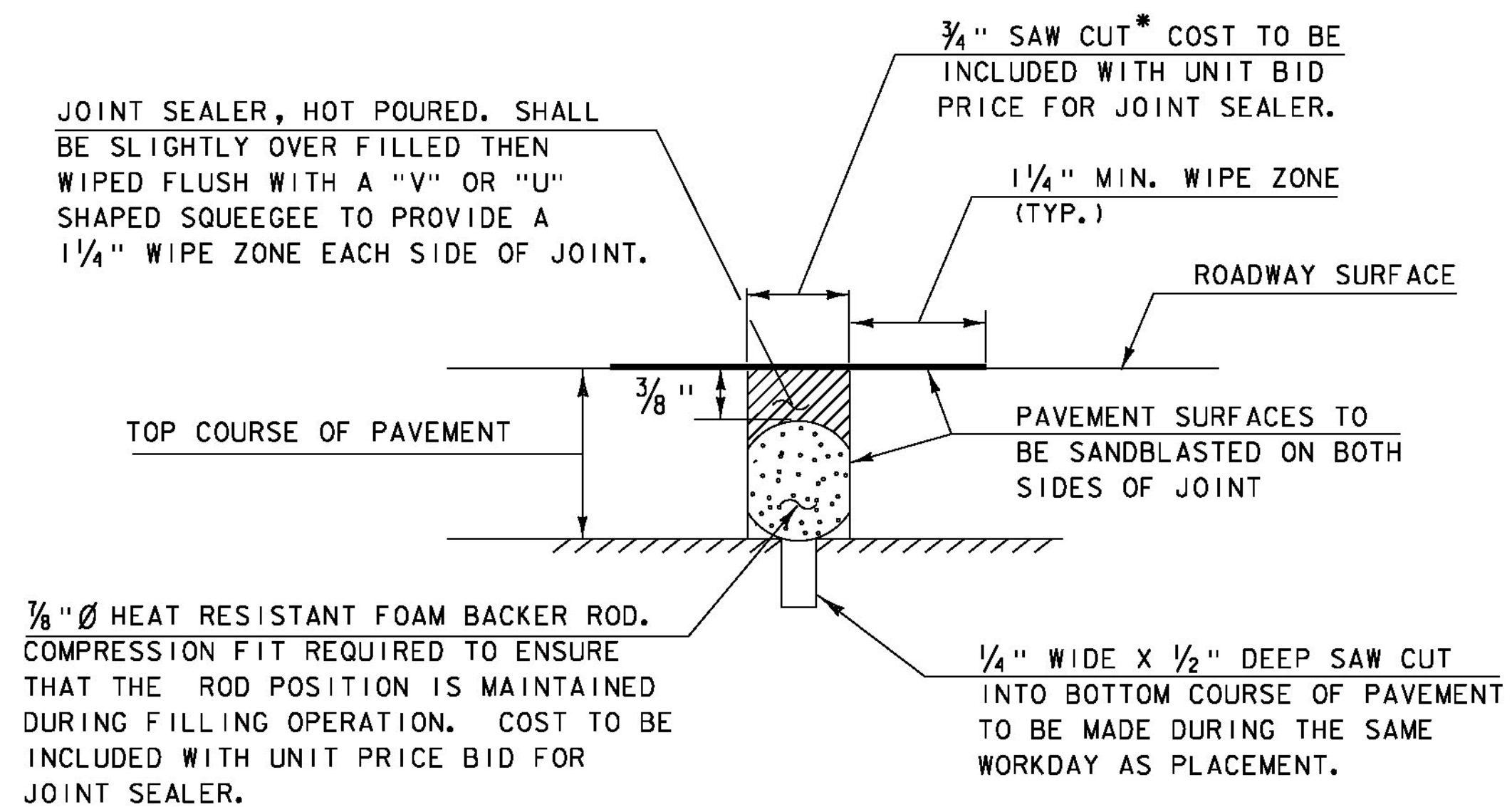
SCALE: 1 1/2" = 1'-0"

-  REMOVAL OF BRIDGE PAVEMENT
-  PARTIAL REMOVAL OF STRUCTURE
-  SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)

|                              |                        |
|------------------------------|------------------------|
| PROJECT NAME: LUDLOW         |                        |
| PROJECT NUMBER: STP DECK(39) |                        |
| FILE NAME: z15b109typ-99.dgn | PLOT DATE: 8/3/2016    |
| PROJECT LEADER: J. BYATT     | DRAWN BY: M. SMITH     |
| DESIGNED BY: S. BEAUMONT     | CHECKED BY: A. GIRALDI |
| JOINT DETAILS SHEET 1        | SHEET 21 OF 42         |





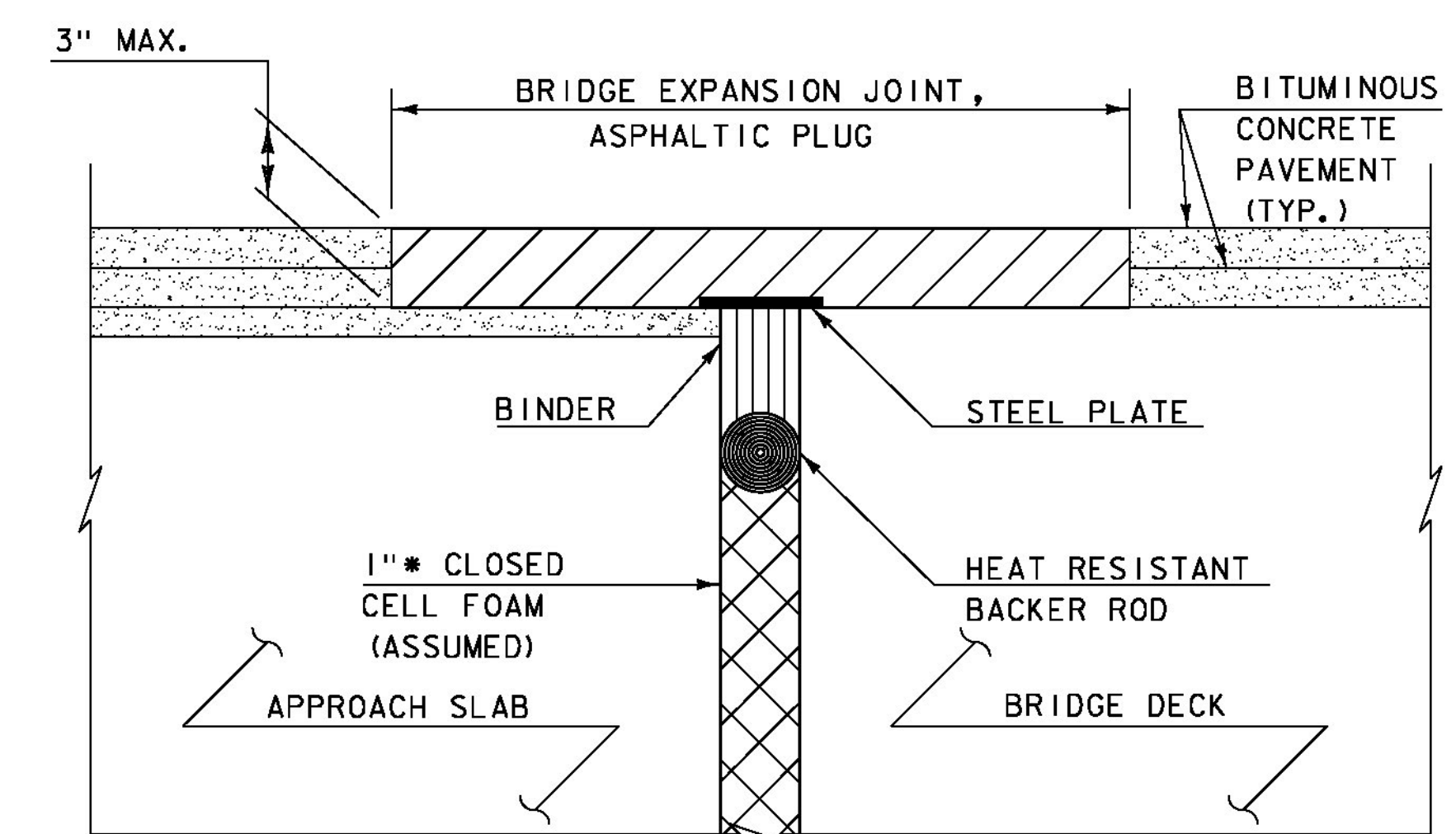


### SAWED PAVEMENT JOINT DETAIL

(NOT TO SCALE)

\*

JOINT IS TO BE LOCATED ACCURATELY BY STRING LINING, OR OTHER MEANS, PRIOR TO PAVING, SO THAT THE SAW CUT WILL BE MADE DIRECTLY OVER THE END OF CONCRETE DECK. JOINT SHALL BE CUT DRY IN A SINGLE PASS AND BE SEALED WITHIN 24 HOURS OR PRIOR TO EXPOSURE TO TRAFFIC. JOINT SHALL BE CLEANED PRIOR TO APPLYING THE JOINT SEALER. ALL WORK WILL BE PAID FOR UNDER ITEM 524.11, "JOINT SEALER, HOT POURED".



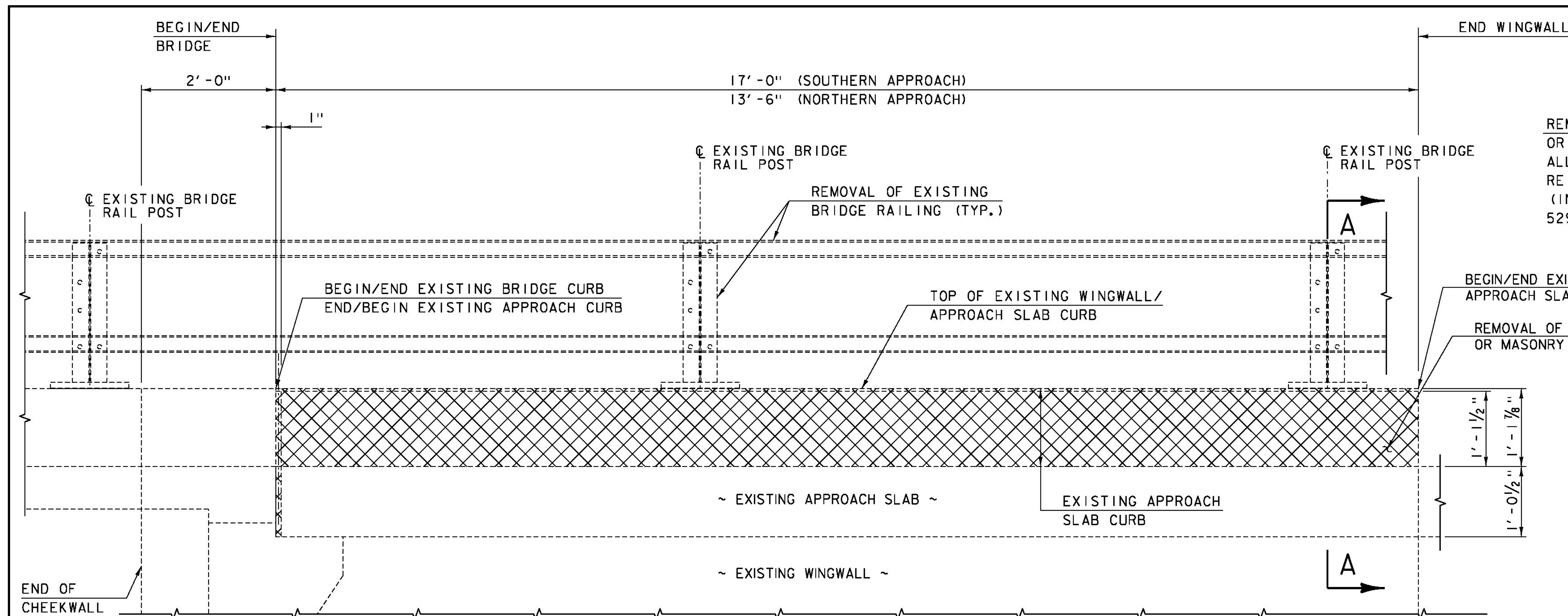
\* THE REFERENCE PLANS SHOW A 1" JOINT BETWEEN THE APPROACH SLAB AND CONCRETE DECK. ACTUAL THICKNESS MAY VARY.

### ASPHALTIC PLUG-TYPE JOINT DETAIL

(NOT TO SCALE)

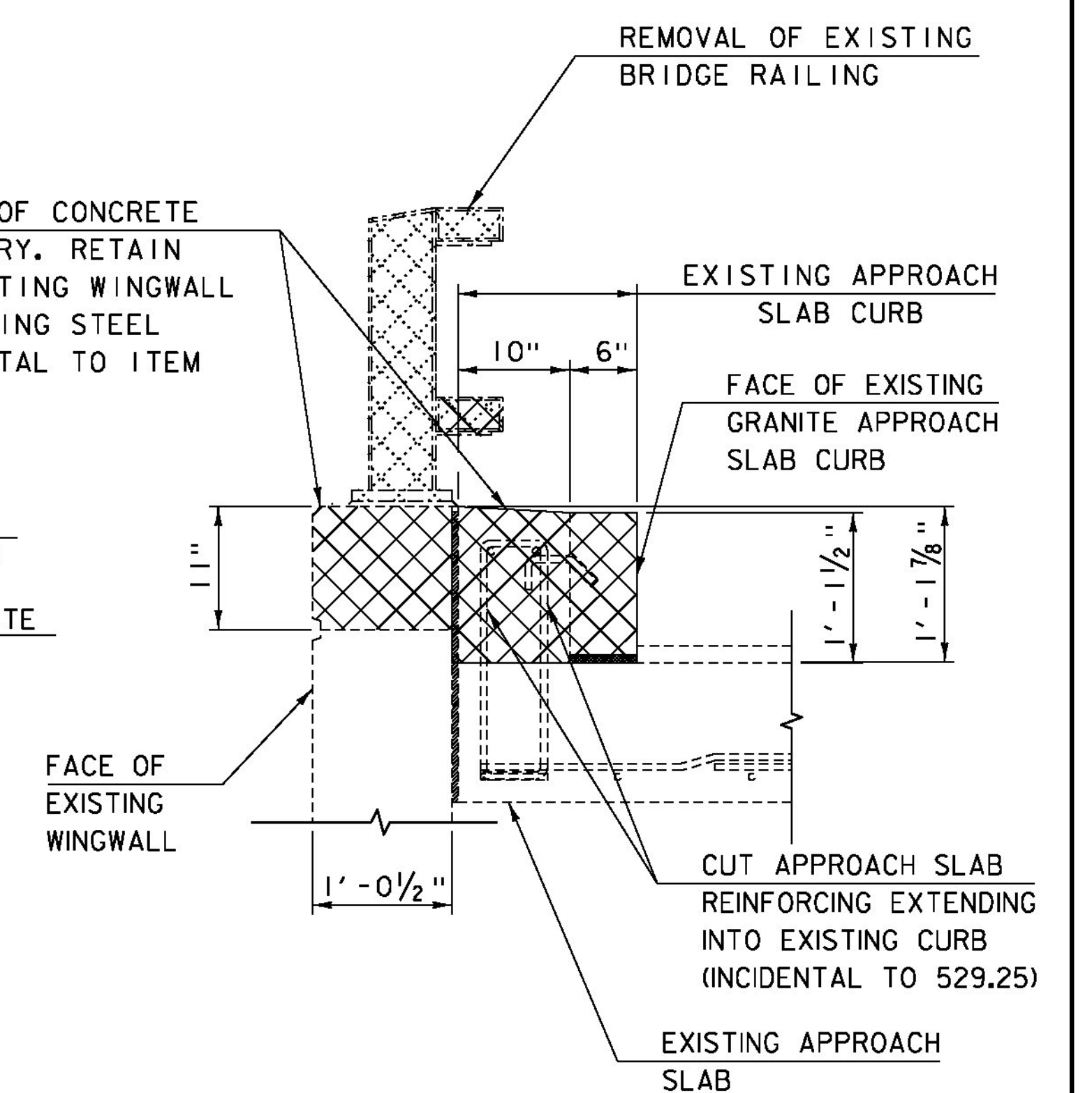
NOTE: SEE STANDARD SD-516.10 FOR ADDITIONAL INFORMATION.





### APPROACH SLAB CURB REMOVAL ELEVATION

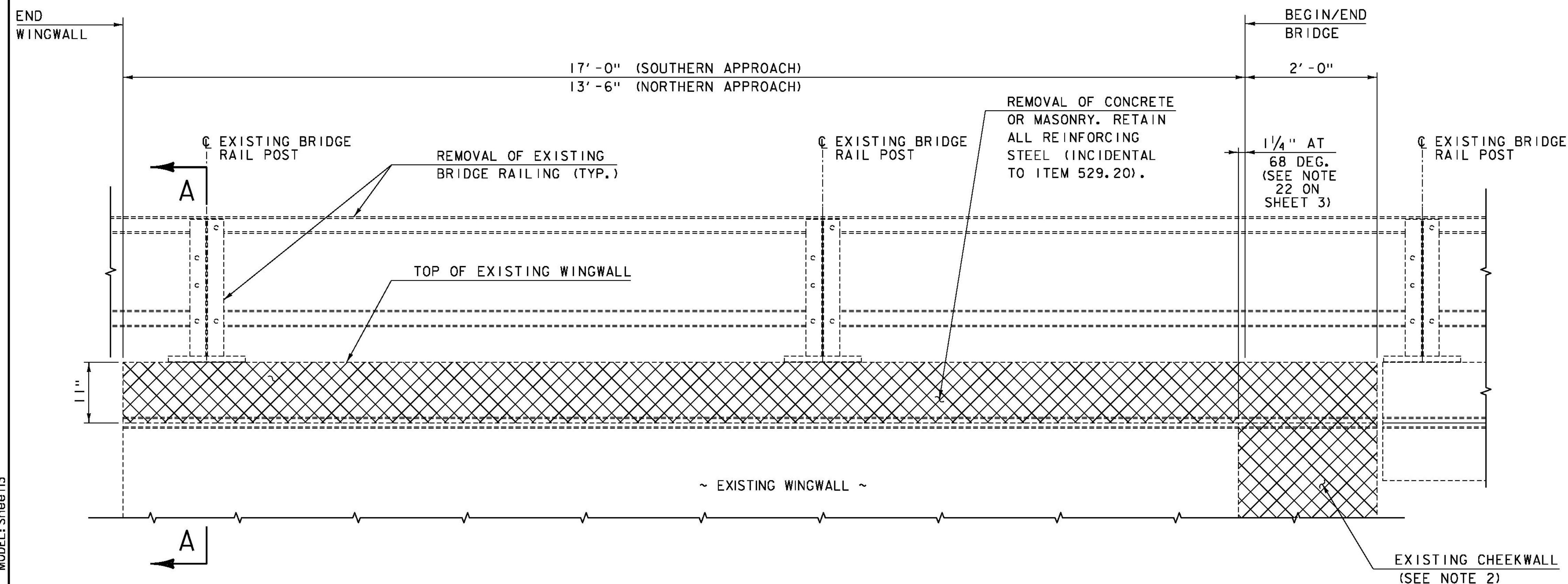
(SW CURB SHOWN, OTHERS SIMILAR)  
SCALE: 1" = 1'-0"



NOTE: REMOVAL OF GRANITE CURB WILL BE PAID FOR UNDER ITEM 529.25, "REMOVAL OF CONCRETE OR MASONRY".

### SECTION A-A

SCALE: 1" = 1'-0"

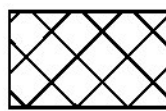


### WINGWALL REMOVAL ELEVATION

(SW WINGWALL SHOWN, OTHERS SIMILAR)  
SCALE: 1" = 1'-0"

NOTE:

- SEE SHEET 24 FOR PROPOSED CONCRETE APPROACH SLAB AND PROPOSED CONCRETE WINGWALL MASONRY AND REINFORCING DETAILS.
- SEE SHEETS 25 AND 26 FOR EXISTING CHEEKWALL REMOVAL DETAILS.

-  REMOVAL OF EXISTING BRIDGE RAILING
-  REMOVAL OF CONCRETE OR MASONRY (SEE PROJECT NOTES 18 AND 19 ON SHEET 3).

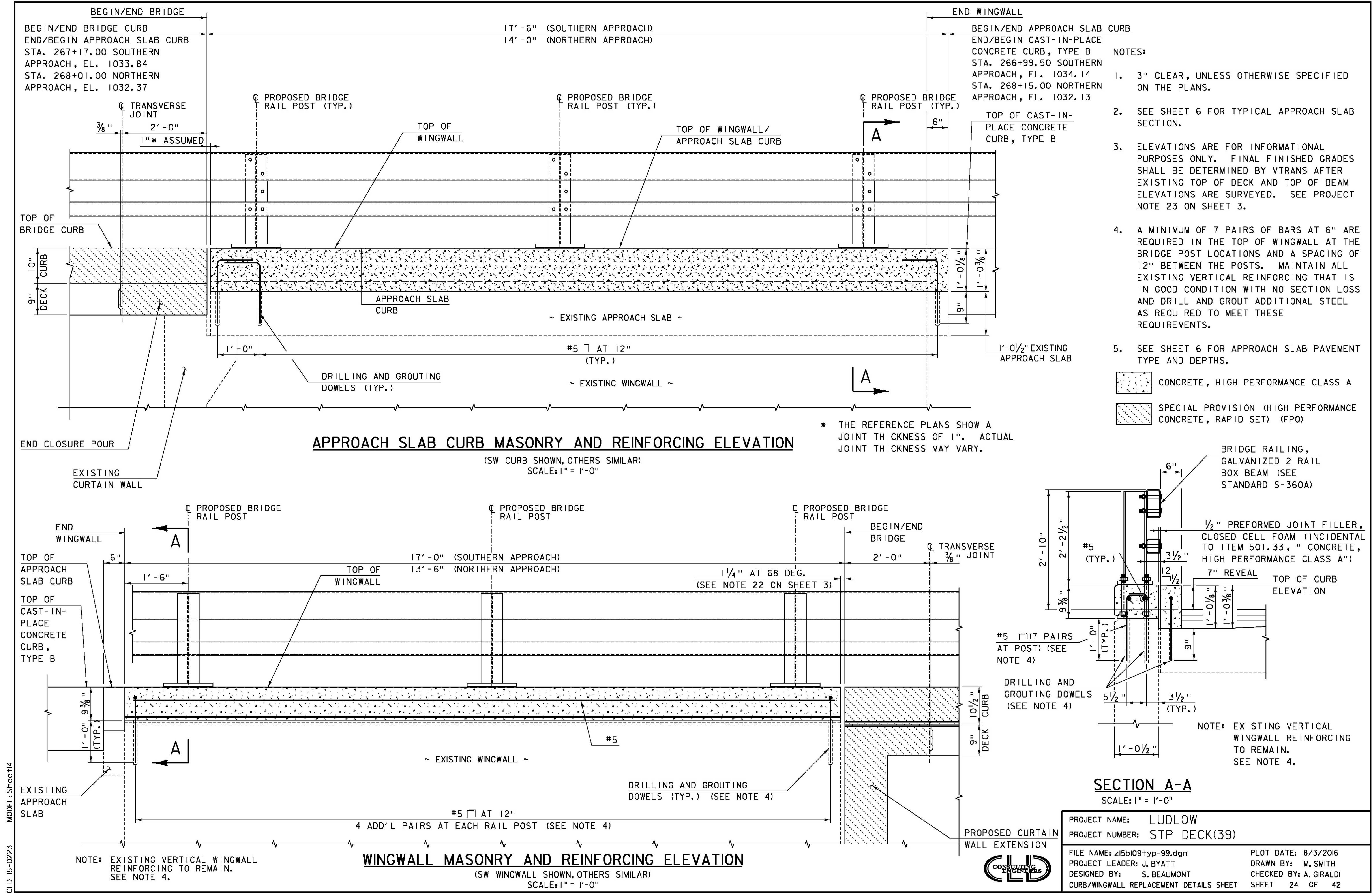
PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15bi09typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: S. BEAUMONT  
CURB/WINGWALL REMOVAL DETAILS SHEET

PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: A. GIRALDI  
SHEET 23 OF 42



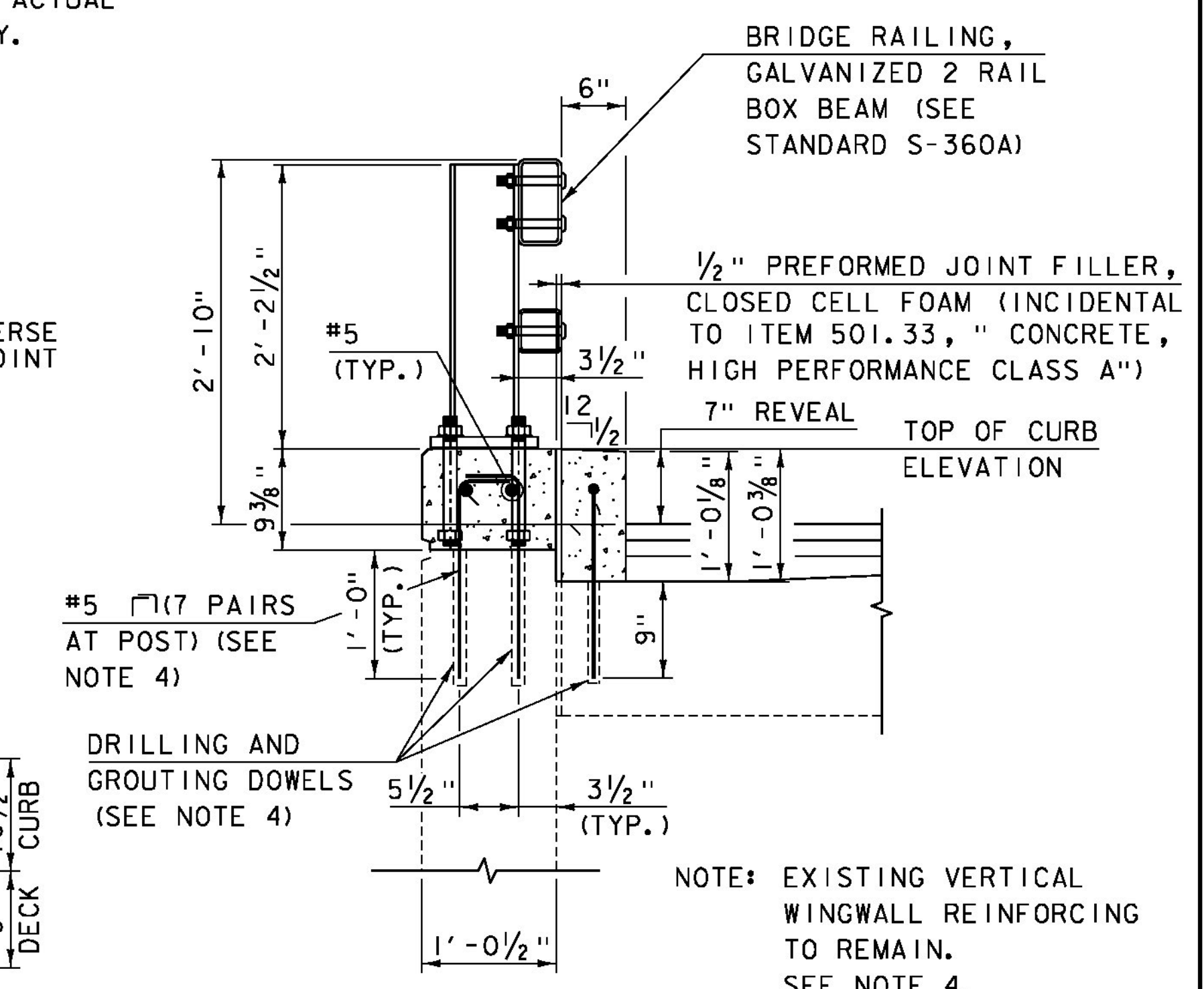




- NOTES:
- 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
  - SEE SHEET 6 FOR TYPICAL APPROACH SLAB SECTION.
  - ELEVATIONS ARE FOR INFORMATIONAL PURPOSES ONLY. FINAL FINISHED GRADES SHALL BE DETERMINED BY VTRANS AFTER EXISTING TOP OF DECK AND TOP OF BEAM ELEVATIONS ARE SURVEYED. SEE PROJECT NOTE 23 ON SHEET 3.
  - A MINIMUM OF 7 PAIRS OF BARS AT 6" ARE REQUIRED IN THE TOP OF WINGWALL AT THE BRIDGE POST LOCATIONS AND A SPACING OF 12" BETWEEN THE POSTS. MAINTAIN ALL EXISTING VERTICAL REINFORCING THAT IS IN GOOD CONDITION WITH NO SECTION LOSS AND DRILL AND GROUT ADDITIONAL STEEL AS REQUIRED TO MEET THESE REQUIREMENTS.
  - SEE SHEET 6 FOR APPROACH SLAB PAVEMENT TYPE AND DEPTHS.

CONCRETE, HIGH PERFORMANCE CLASS A

SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)



SECTION A-A

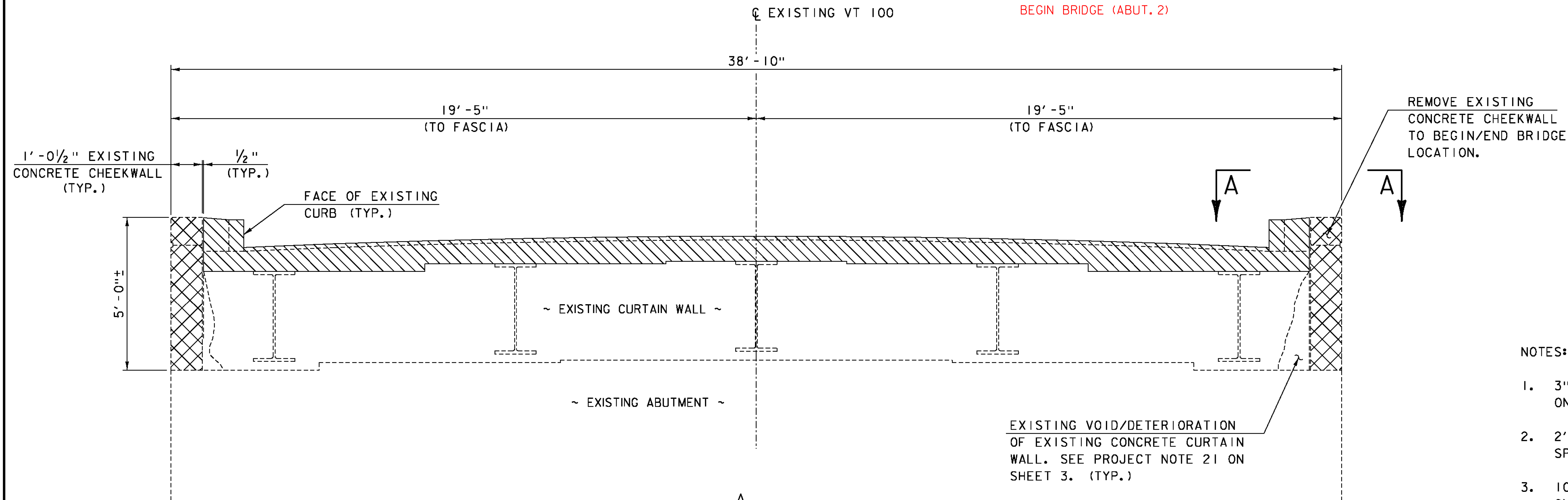
SCALE: 1" = 1'-0"

|                                         |                   |
|-----------------------------------------|-------------------|
| PROJECT NAME:                           | LUDLOW            |
| PROJECT NUMBER:                         | STP DECK(39)      |
| FILE NAME:                              | z15bi09typ-99.dgn |
| PROJECT LEADER:                         | J. BYATT          |
| DESIGNED BY:                            | S. BEAUMONT       |
| CURB/WINGWALL REPLACEMENT DETAILS SHEET |                   |
| PLOT DATE:                              | 8/3/2016          |
| DRAWN BY:                               | M. SMITH          |
| CHECKED BY:                             | A. GIRALDI        |
| SHEET                                   | 24 OF 42          |

MODEL: Sheet14

CLD 15-0223



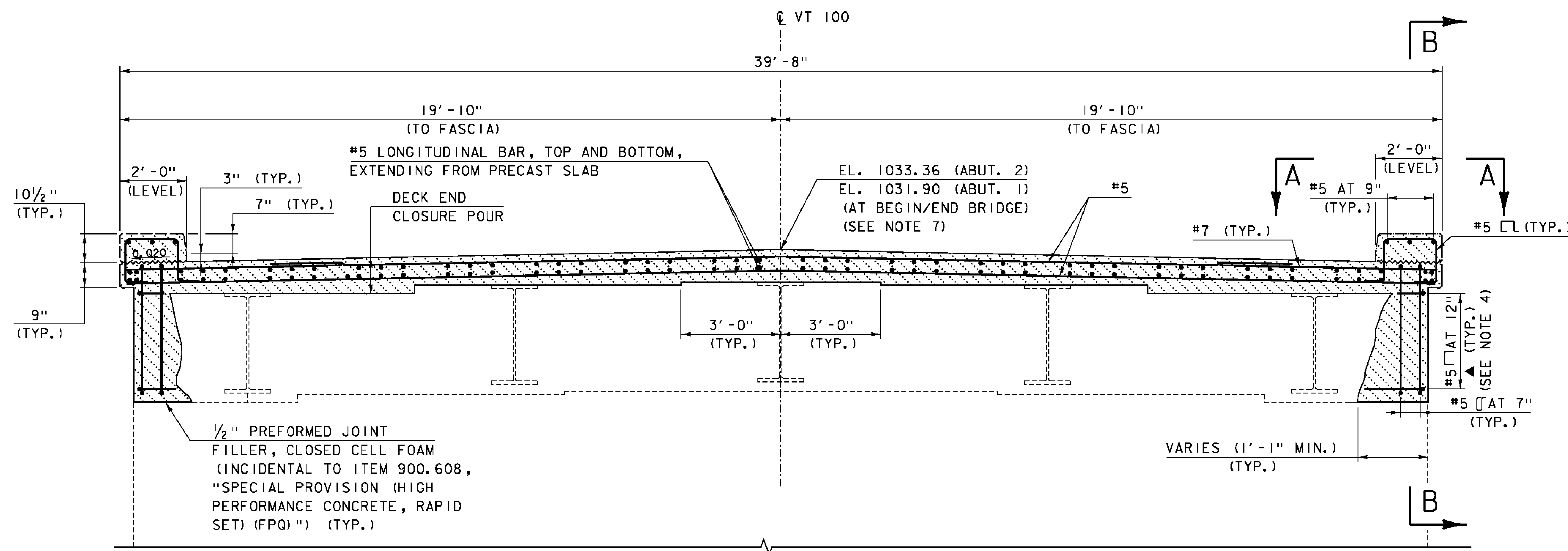


### CHEEKWALL REMOVAL LIMITS

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

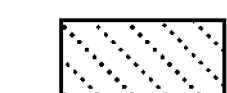
#### NOTES:

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. 2'-2" SPLICE UNLESS OTHERWISE SPECIFIED ON THE PLANS.
3. 10" HOOK UNLESS OTHERWISE SPECIFIED ON THE PLANS.
4. SPLICE NEW CURTAIN WALL EXTENSION REINFORCING TO EXISTING EXPOSED CURTAIN WALL REINFORCING.
5. SEE SHEET 26 FOR SECTION A-A AND B-B.
6. SEE SHEET 16 FOR END CLOSURE POUR MASONRY AND REINFORCING PLAN.
7. ELEVATIONS ARE FOR INFORMATIONAL PURPOSES ONLY. FINAL FINISHED GRADES SHALL BE DETERMINED BY VTRANS AFTER EXISTING TOP OF DECK AND TOP OF BEAM ELEVATIONS ARE SURVEYED. SEE PROJECT NOTE 23 ON SHEET 3.



### END CLOSURE POUR AND CURTAIN WALL MASONRY AND REINFORCING ELEVATION

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

-  PARTIAL REMOVAL OF STRUCTURE
-  REMOVAL OF CONCRETE OR MASONRY (SEE PROJECT NOTES 18 AND 19 ON SHEET 3).
-  SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)

PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

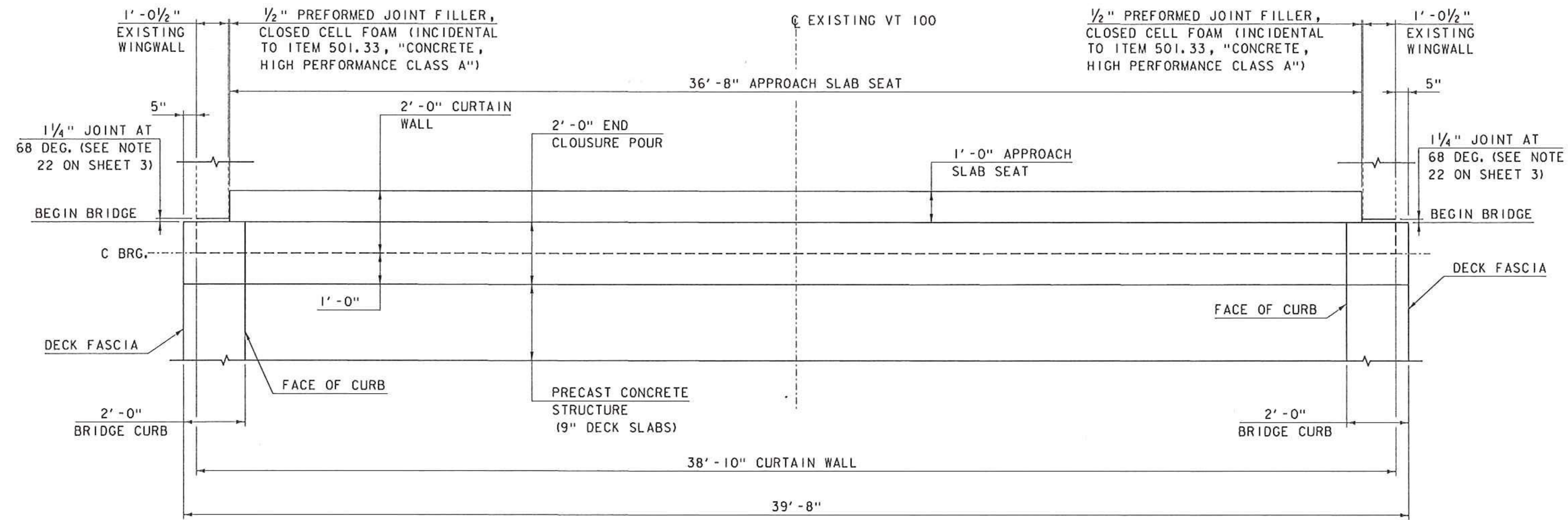
FILE NAME: z15bi09typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: S. BEAMONT  
REMOVAL AND CURTAIN WALL DETAILS SHEET 1

PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: A. GIRALDI  
SHEET 25 OF 42





New Curtain Wall, Abut 1

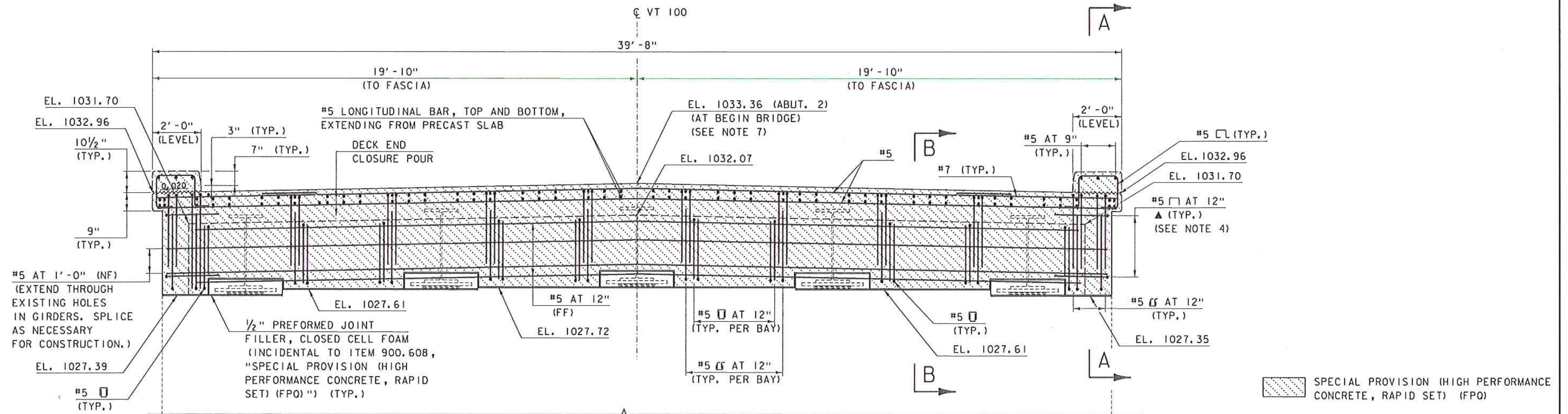


CURTAIN WALL MASONRY PLAN

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

NOTES:

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. 2'-2" SPLICE UNLESS OTHERWISE SPECIFIED ON THE PLANS.
3. 10" HOOK UNLESS OTHERWISE SPECIFIED ON THE PLANS.
4. FF= FAR FACE  
NF= NEAR FACE



END CLOSURE POUR AND CURTAIN WALL MASONRY AND REINFORCING ELEVATION

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

SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPO)

PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15b109typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: S. BEAMONT  
CURTAIN WALL DETAILS SHEET I

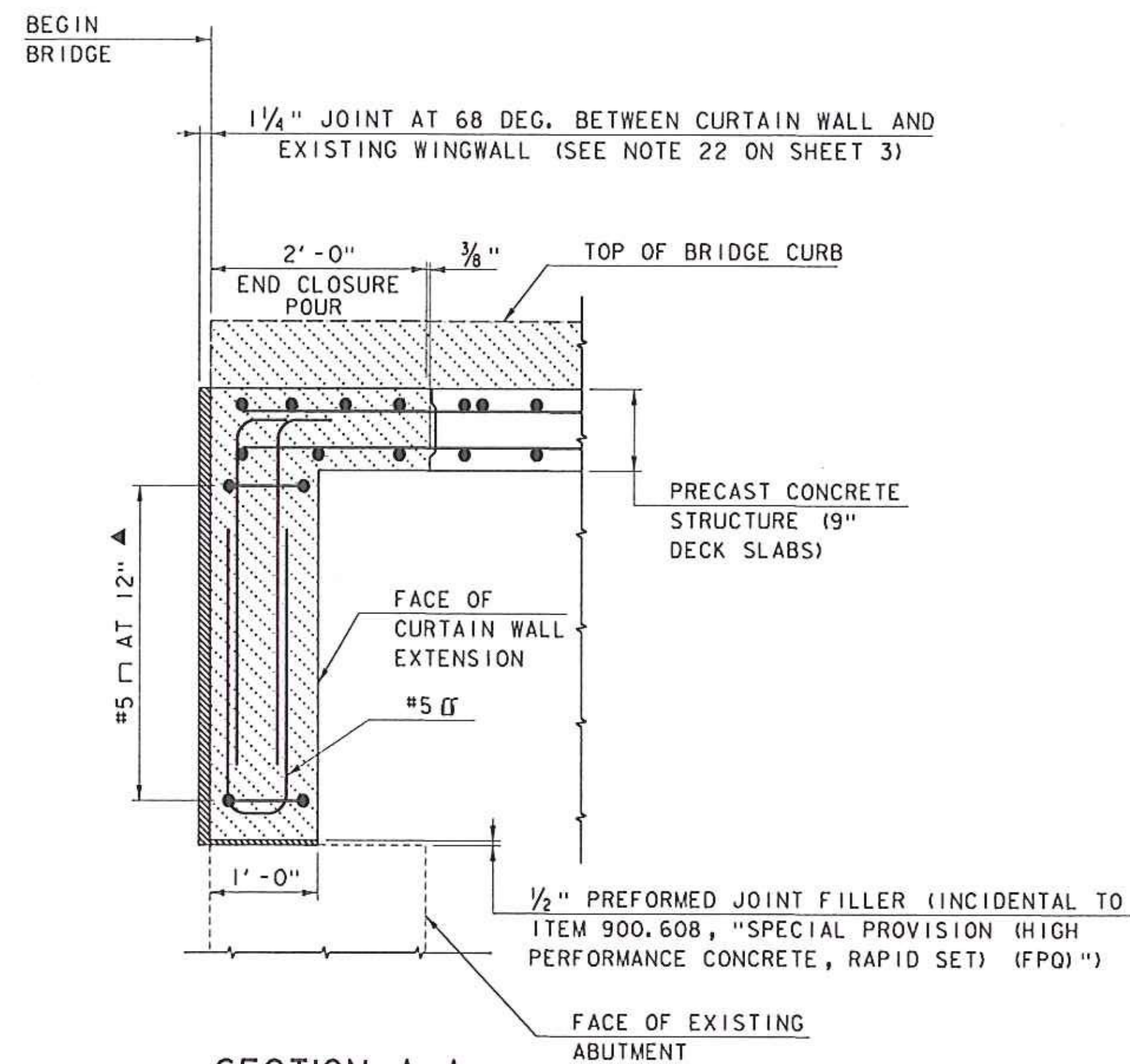
PLOT DATE: 5/17/2017  
DRAWN BY: M. SMITH  
CHECKED BY: A. GIRALDI  
SHEET 254 OF 1



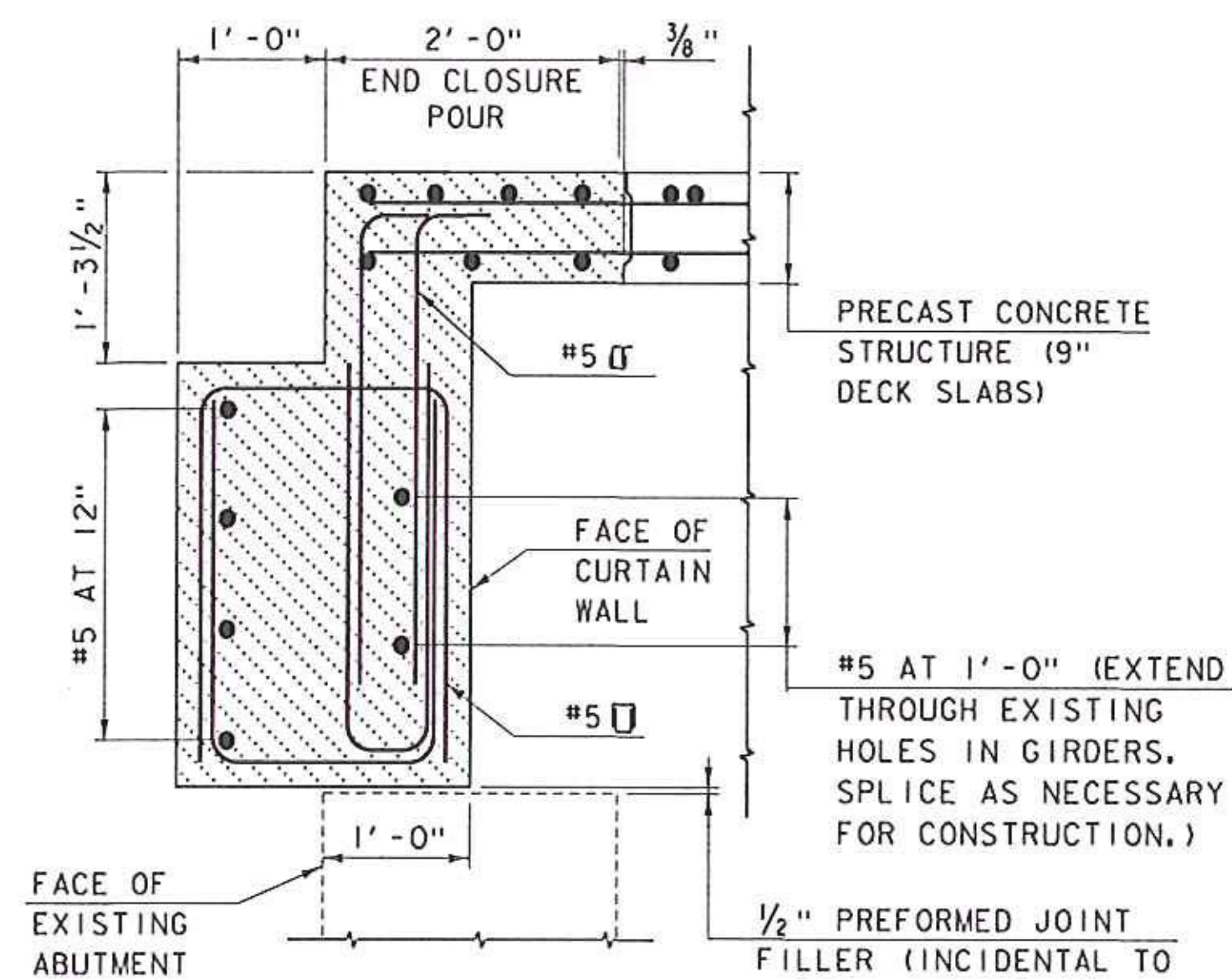
MODEL: Default  
CLD 15-0223



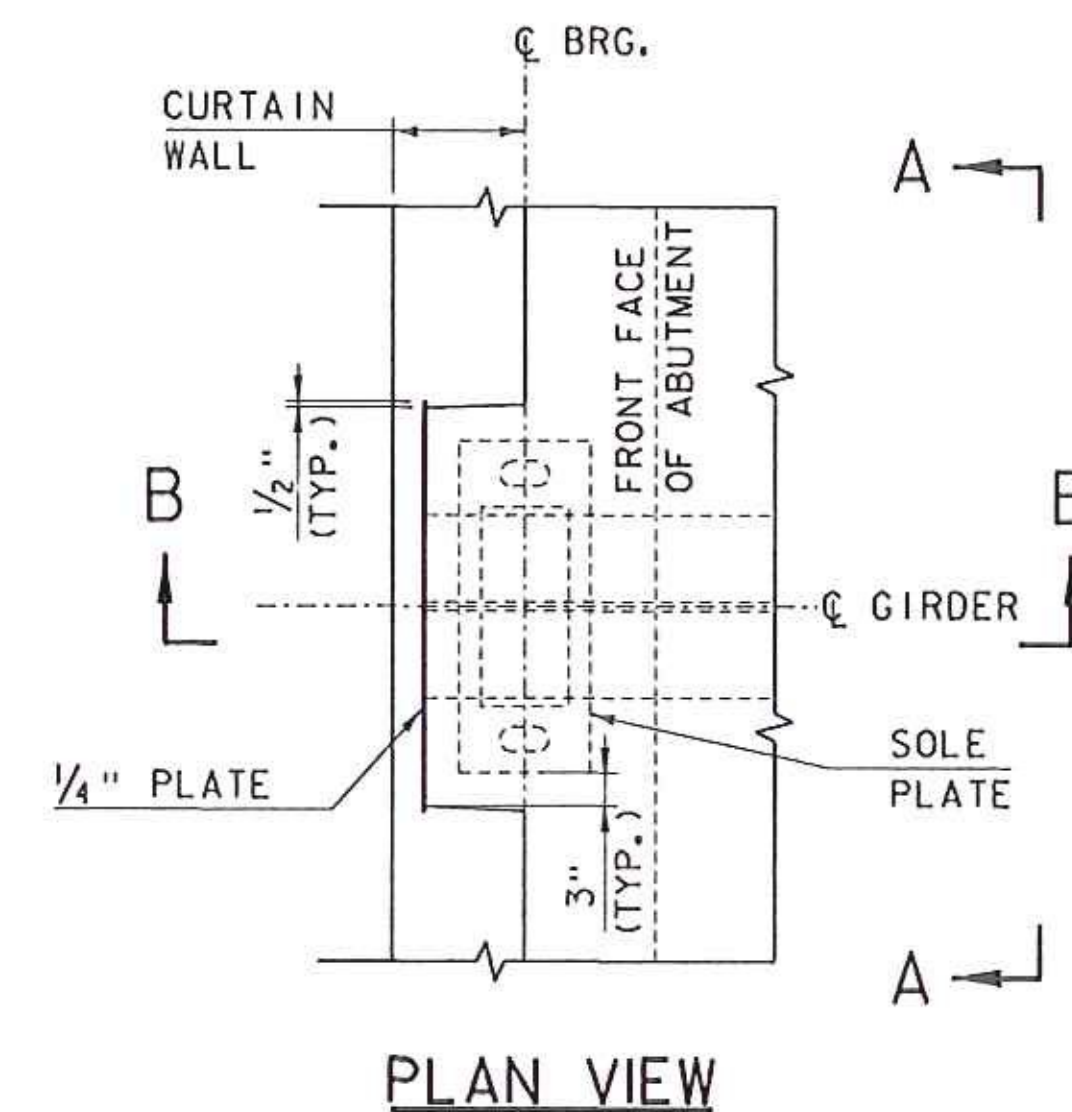
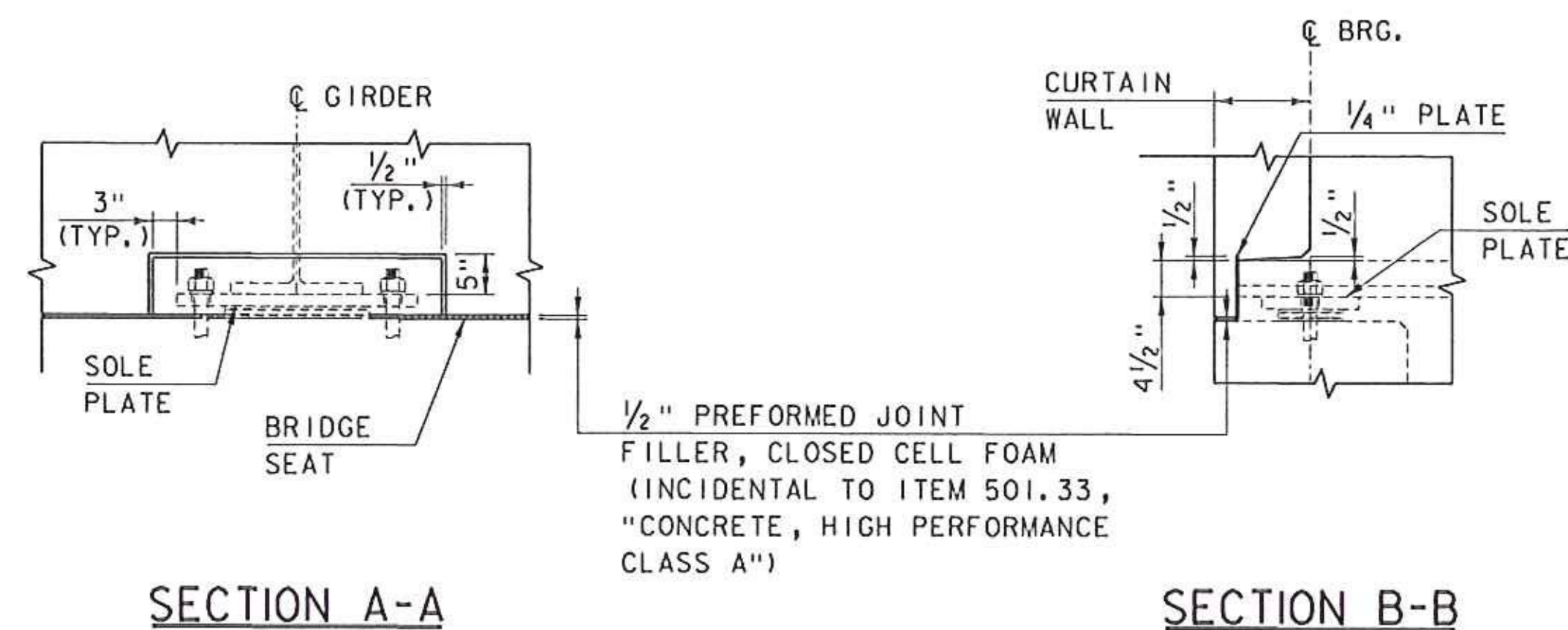
New Curtain Wall, Abut 1



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



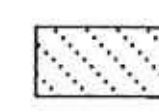
SECTION B-B  
SCALE: 1" = 1'-0"



CONCRETE CURTAIN WALL  
BLOCKOUTS AROUND BEARINGS  
SCALE: 3/4" = 1'-0"

NOTES:

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. 10" HOOK UNLESS OTHERWISE SPECIFIED ON THE PLANS.

 SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPO)

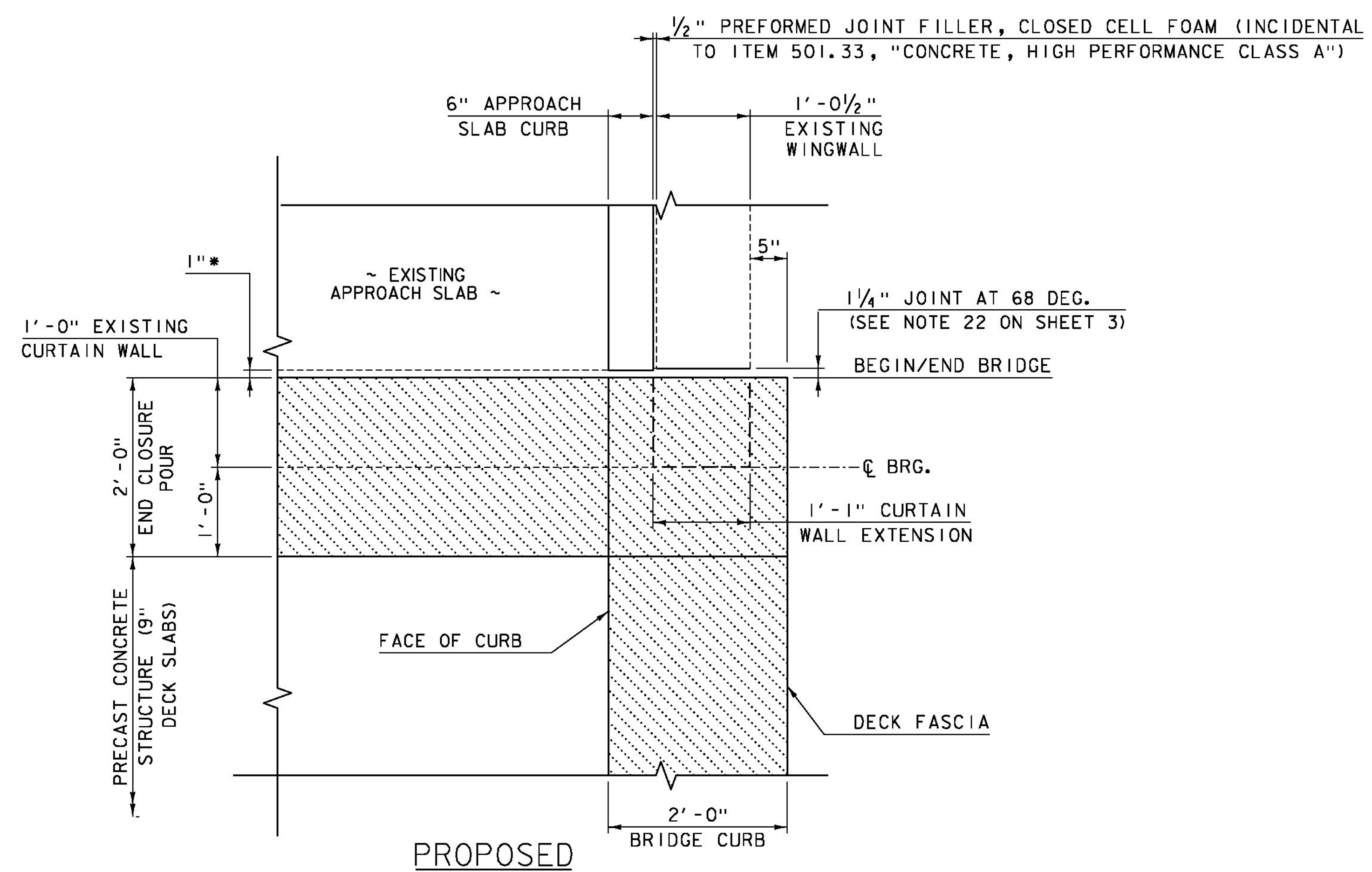


PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

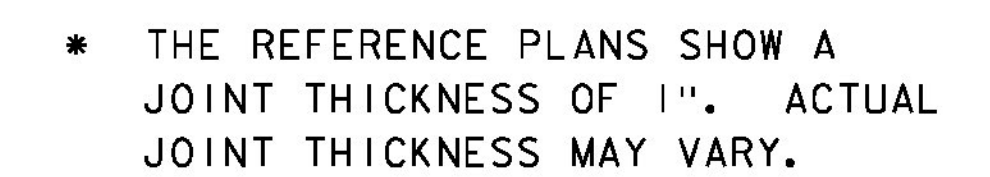
FILE NAME: z15b109typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: S. BEAUMONT  
CURTAIN WALL DETAILS SHEET 2

PLOT DATE: 5/17/2017  
DRAWN BY: M. SMITH  
CHECKED BY: A. GIRALDI  
SHEET 258 OF 1





SCALE: 1" = 1'-0"



SCALE: 1" = 1'-0"

NOTES:

1. 3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2. 10" HOOK UNLESS OTHERWISE SPECIFIED ON THE PLANS.

 PARTIAL REMOVAL OF STRUCTURE

 REMOVAL OF CONCRETE OR MASONRY  
(SEE PROJECT NOTES 18 AND 19 ON SHEET 3).

 SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, RAPID SET) (FPQ)

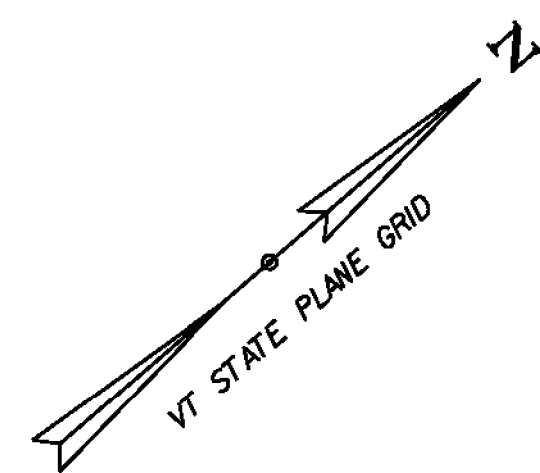
|                 |              |
|-----------------|--------------|
| PROJECT NAME:   | LUDLOW       |
| PROJECT NUMBER: | STP DECK(39) |

|                                          |                        |
|------------------------------------------|------------------------|
| FILE NAME: z15bl09+yp-99.dgn             | PLOT DATE: 8/3/2016    |
| PROJECT LEADER: J. BYATT                 | DRAWN BY: M. SMITH     |
| DESIGNED BY: S. BEAUMONT                 | CHECKED BY: A. GIRALDI |
| REMOVAL AND CURTAIN WALL DETAILS SHEET 2 | SHEET 26 OF 42         |

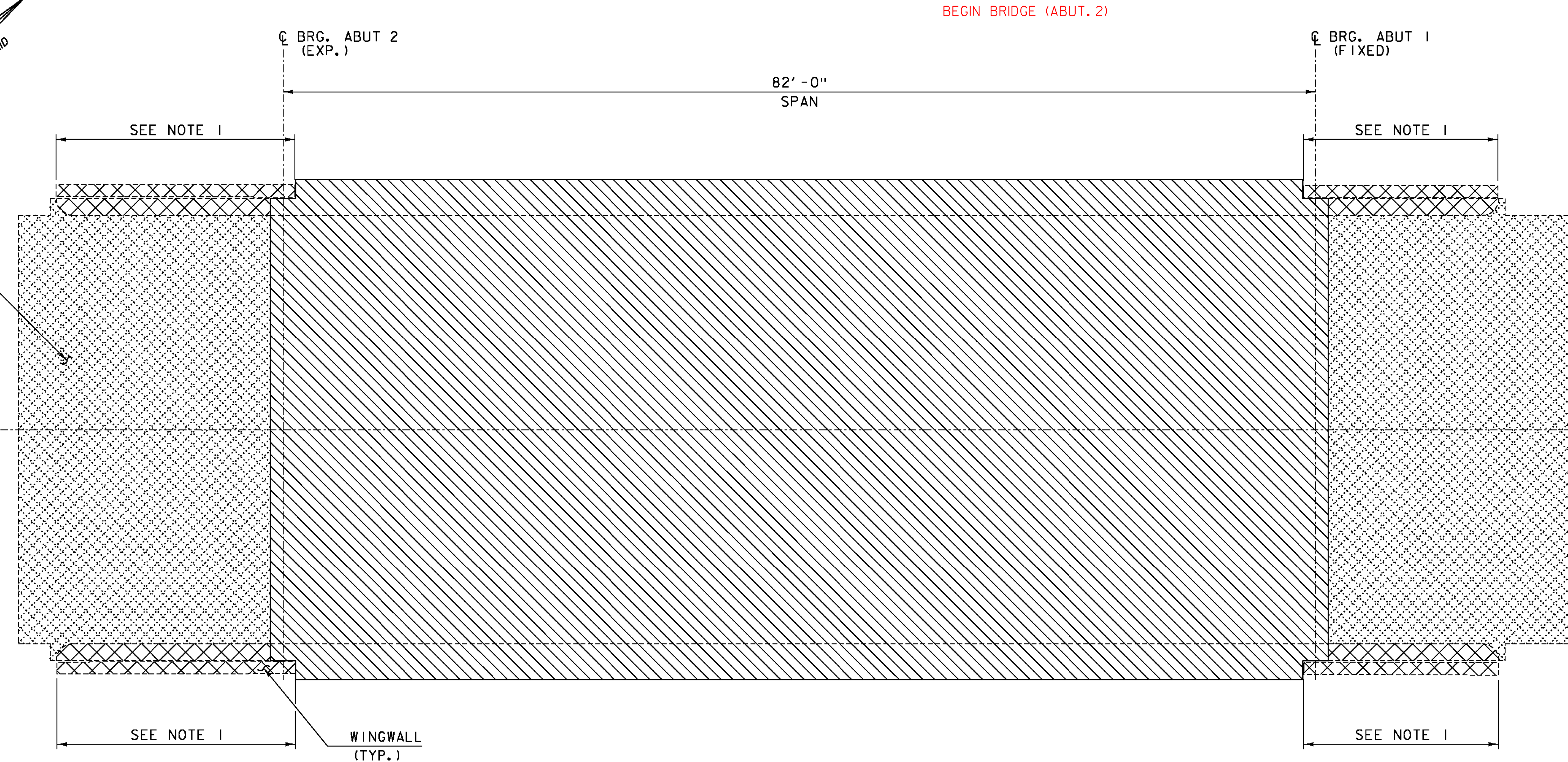




CLD 15-0223 MODEL: Sheet17



AT-GRADE  
APPROACH  
SLAB (TYP.)



### BITUMINOUS CONCRETE/ CONCRETE REMOVAL PLAN

SCALE:  $\frac{3}{16}$ " = 1'-0"

-  REMOVE BIT. CONC. PAVEMENT TO TOP OF AT-GRADE APPROACH SLABS (PAID FOR UNDER ITEM 529.10). SEE PROJECT NOTE 15 ON SHEET 3. REMOVE BARRIER MEMBRANE (PAID FOR UNDER ITEM 580.16), IF APPLICABLE. SEE PROJECT NOTE 17 ON SHEET 3.
-  REMOVE CONCRETE BRIDGE DECK (PAID FOR UNDER ITEM 529.20). SEE PROJECT NOTE 18 ON SHEET 3.
-  REMOVE CONCRETE APPROACH SLAB CURB AND TOPS OF WINGWALLS (PAID FOR UNDER ITEM 529.25). SEE PROJECT NOTES 18 AND 19 ON SHEET 3.

### NOTES:

1. REMOVE BRIDGE RAIL (PAID FOR UNDER ITEM 529.20).
2. SEE DECK REMOVAL AND RELATED ITEMS NOTES AND PAVEMENT REMOVAL ON APPROACH SLABS NOTES ON SHEET 3.



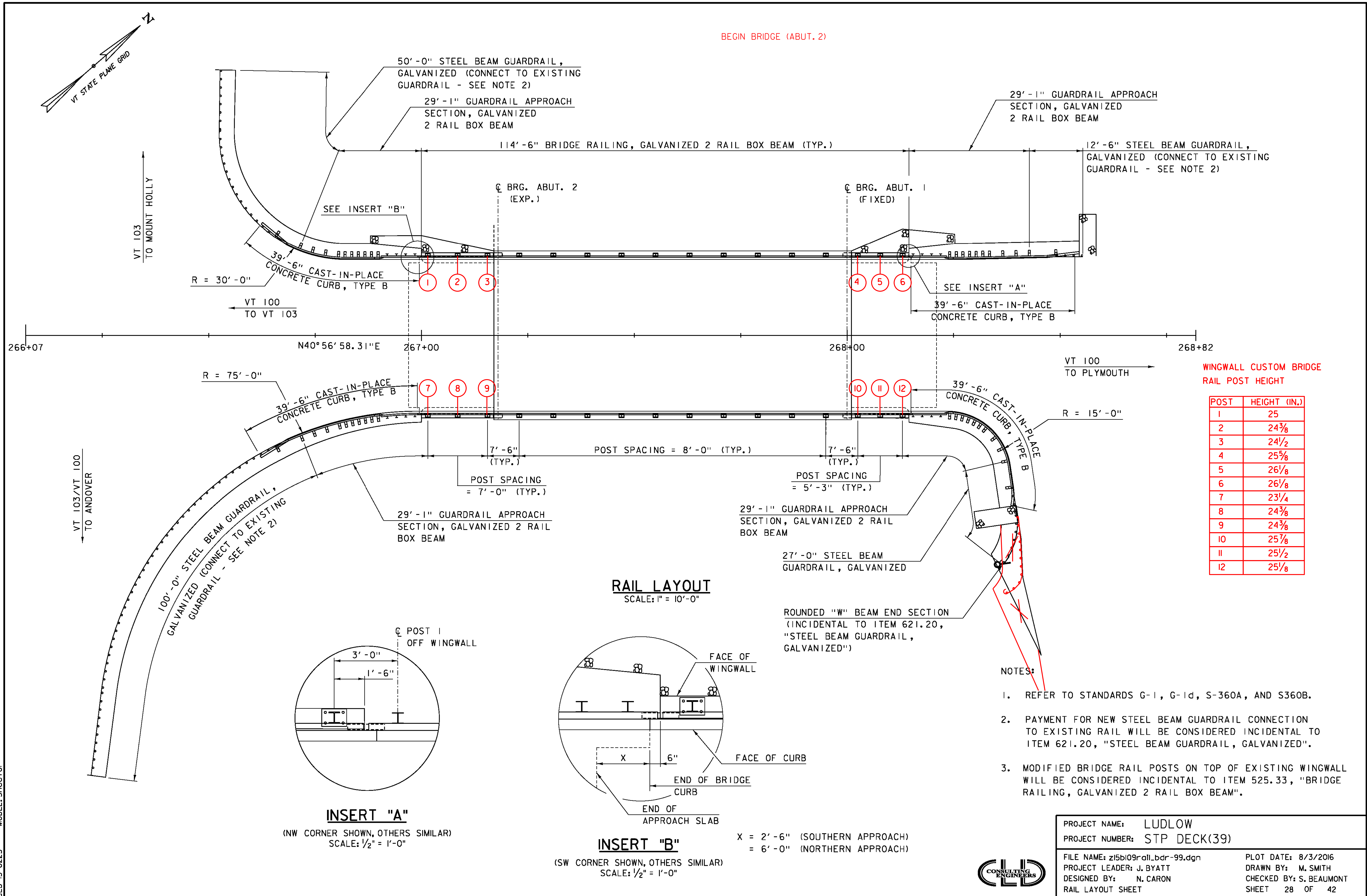
PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15b109typ-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: S. BEAUMONT  
BITUMINOUS CONCRETE REMOVAL PLAN SHEET SHEET 27 OF 42

PLOT DATE: 8/3/2016  
DRAWN BY: M. SMITH  
CHECKED BY: N. CARON



CLD 15-0223 MODEL: Sheet01





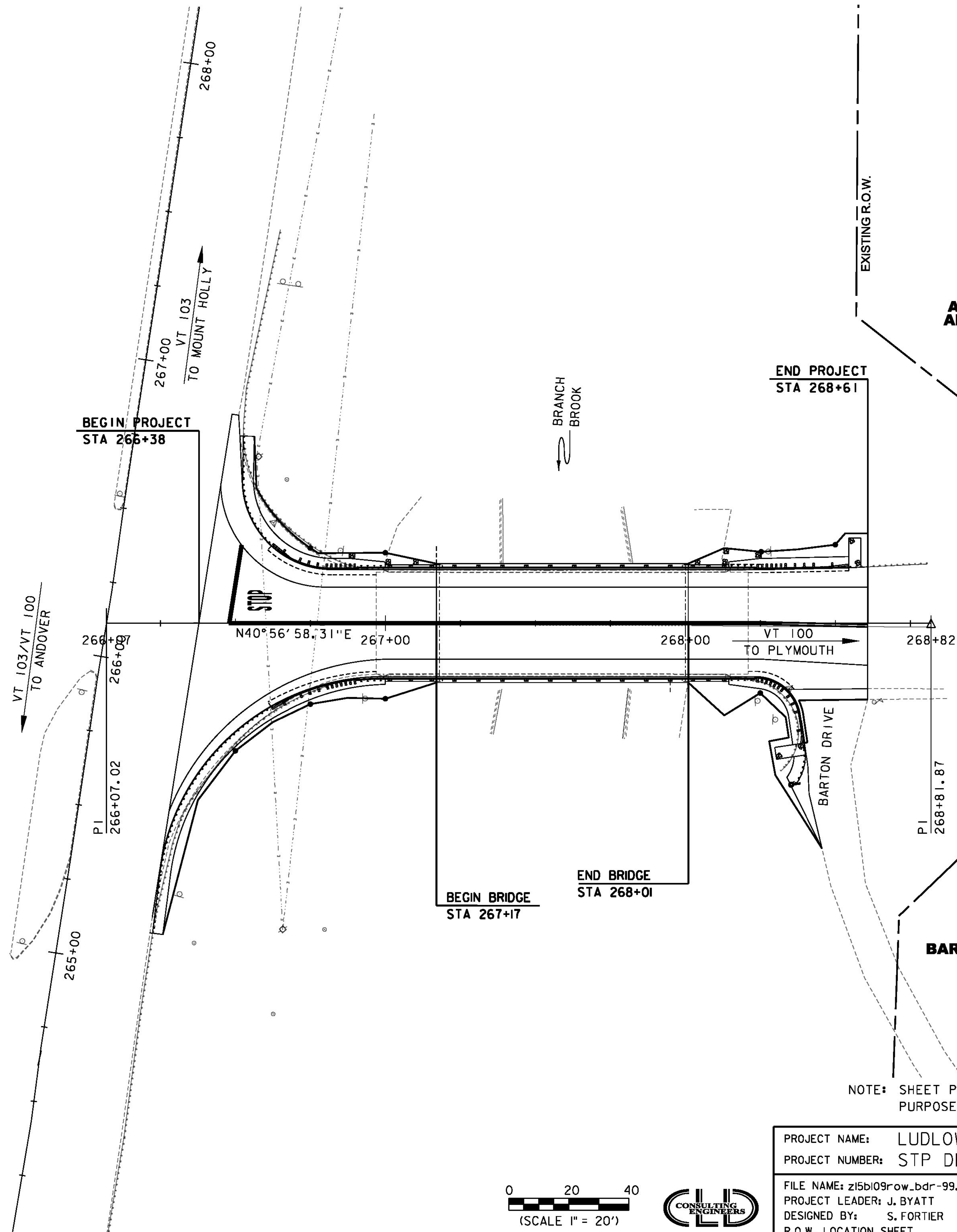
CLD 15-0223 MODEL: Layout1

N/F  
KRUM, DAVID E.

N/F  
DEBICK, JOHN

N/F  
MOLTA, DEAN D. & SYLVIA L.

EXISTING R.O.W.



NOTE: SHEET PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

0 20 40  
(SCALE 1" = 20')



PROJECT NAME: LUDLOW  
PROJECT NUMBER: STP DECK(39)

FILE NAME: z15bi09row\_bdr-99.dgn  
PROJECT LEADER: J. BYATT  
DESIGNED BY: S. FORTIER  
R.O.W. LOCATION SHEET

PLOT DATE: 8/3/2016  
DRAWN BY: S. FORTIER  
CHECKED BY: L. GREER  
SHEET 29 OF 42



# INDEX OF SHEETS

|       |                                                                                     |
|-------|-------------------------------------------------------------------------------------|
| 1     | TITLE                                                                               |
| 2-2A  | COMPOSITE QUANTITY                                                                  |
| 3     | LUDLOW F 025-1(29)S TYPICAL                                                         |
| 4     | TRAFFIC ITEM AND SIGN SUMMARY                                                       |
| 5     | PAVEMENT MARKING DETAILS F 025-1(29)S                                               |
| 6-8   | DECK REHABILITATION AND GENERAL NOTES                                               |
| 9     | ONE WAY TEMPORARY TRAFFIC SIGNAL DETAIL BRIDGE #33 (WITH TEMPORARY FLASHING BEACON) |
| 10    | ONE WAY TEMPORARY TRAFFIC SIGNAL DETAIL BRIDGE #99                                  |
| 11    | TRAFFIC SIGN SUMMARY SHEET AND NOTES F-DECK (22)S                                   |
| 12    | PAVEMENT MARKING DETAILS F-DECK (22)S                                               |
| 13-14 | TYPICAL DETAILS F-DECK (22)S                                                        |
| 15-18 | BRIDGE #99 INFORMATION SHEETS (4 SHEETS)                                            |
| 19-21 | BRIDGE #33 INFORMATION SHEETS (3 SHEETS)                                            |

## STANDARD SHEETS

|    |           |          |
|----|-----------|----------|
| 22 | B-16      | 12-14-71 |
| 23 | E-2       | 2-3-86R  |
| 24 | E-6       | 2-3-86R  |
| 25 | E-7       | 2-3-86R  |
| 26 | E-7A      | 2-3-86R  |
| 27 | E-8       | 2-3-86R  |
| 28 | E-15      | 2-3-86R  |
| 29 | E-15B     | 2-3-86R  |
| 30 | E-15C     | 2-3-86R  |
| 31 | E-19      | 2-3-86R  |
| 32 | E-19B     | 2-3-86R  |
| 33 | E-24A     | 2-3-86R  |
| 34 | E-29      | 2-3-86R  |
| 35 | E-33      | 2-3-86R  |
| 36 | E-34      | 2-3-86R  |
| 37 | E-36      | 2-3-86R  |
| 38 | E-39      | 2-3-86R  |
| 39 | E-50      | 2-3-86R  |
| 40 | SCB-DI-75 | 9-14-81R |

Date OCT 27 1987

FRANK W. Whitcomb CONSTRUCTION Corporation  
Contractor

*[Signature]*  
Signature

*[Signature]*  
Title

*[Signature]*  
Transportation Secretary's Signature

## CONVENTIONAL SIGNS

|                    |       |
|--------------------|-------|
| COUNTY LINE        | ---   |
| TOWN LINE          | ---   |
| LIMITS OF ACCESS   | ---   |
| POINT OF ACCESS    | X     |
| FENCE LINE         | ---   |
| STONE WALL         | ----- |
| TRAVELED WAY       | ---   |
| GUARD RAIL         | ---   |
| RAILROAD           | ---   |
| SURVEY LINE        | ---   |
| CULVERT            | ---   |
| POWER POLE         | ---   |
| TELEPHONE POLE     | ---   |
| TREES              | ● *   |
| CONTROL OF ACCESS  | ---   |
| PROPERTY LINE      | ---   |
| PLANT YARDING LINE | ---   |
| SLOPE INDENTS      | ---   |
| TOP OF CUT         | ---   |
| TOE OF SLOPE       | ---   |

# STATE OF VERMONT AGENCY OF TRANSPORTATION



## PROPOSED IMPROVEMENT TOWNS OF LUDLOW & MT. HOLLY COUNTYS OF WINDSOR & RUTLAND

BEGINNING IN THE TOWN OF LUDLOW ON VT 103 MM 2.862 ~ MM 4.059, RESURFACING AND NEW PAVEMENT MARKINGS (F025-1(29)S)  
LUDLOW VT 100 BRIDGE #99, INSTALL TRAFFIC CONTROL, REHABILITATE DECK, REMOVE TRAFFIC CONTROL  
MT. HOLLY VT 103 BRIDGE #33, INSTALL TRAFFIC CONTROL, REHABILITATE DECK, REMOVE TRAFFIC CONTROL.

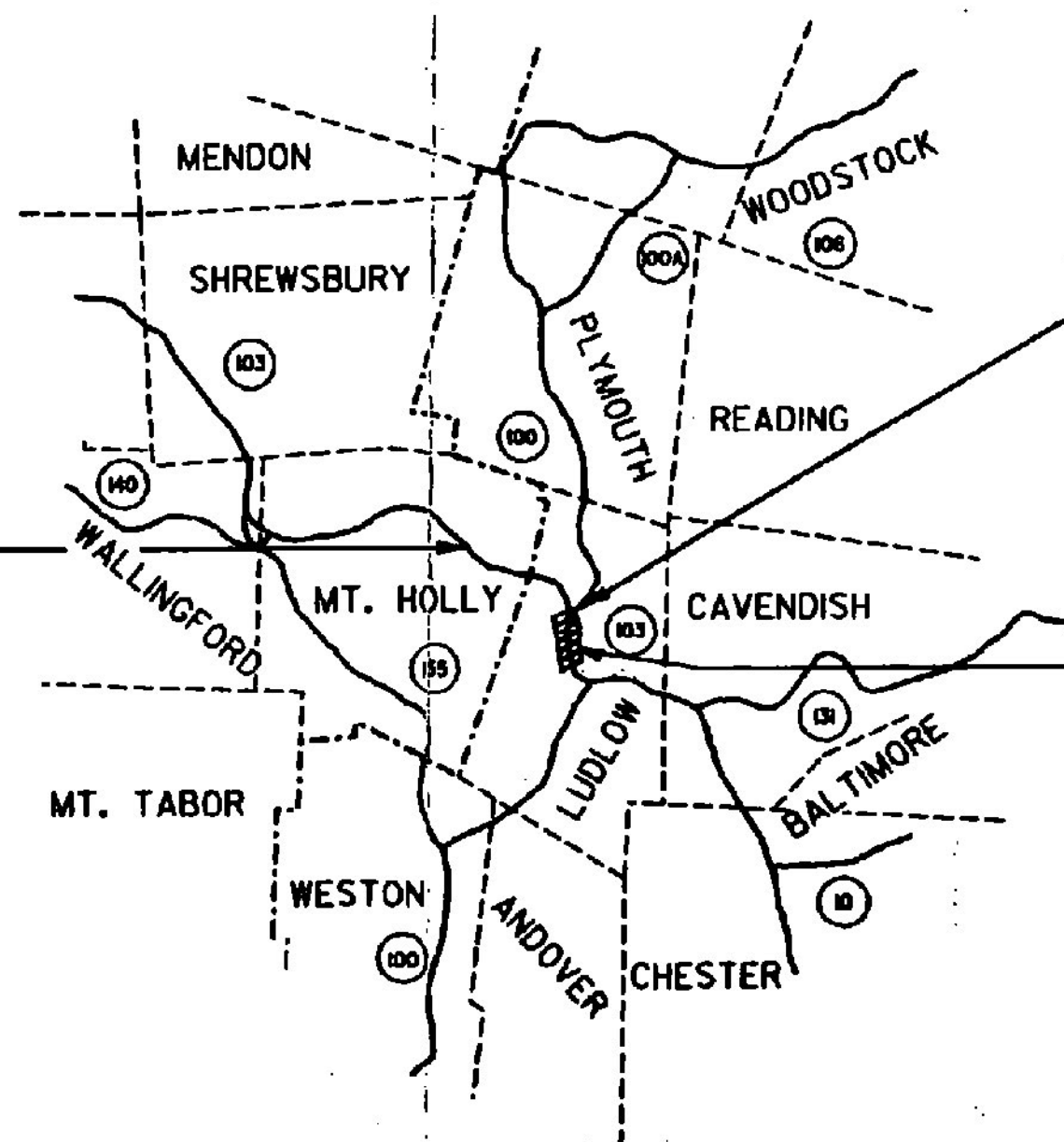
LENGTH OF F 025-1(29)S : 1.197 MILES  
6320 FEET  
LENGTH OF STRUCTURE : BRIDGE #99 = 84.00'  
BRIDGE #33 = 84.51'

TOTAL LENGTH OF STRUCTURES = 168.51'

F-DECK (22)S  
BRIDGE #33

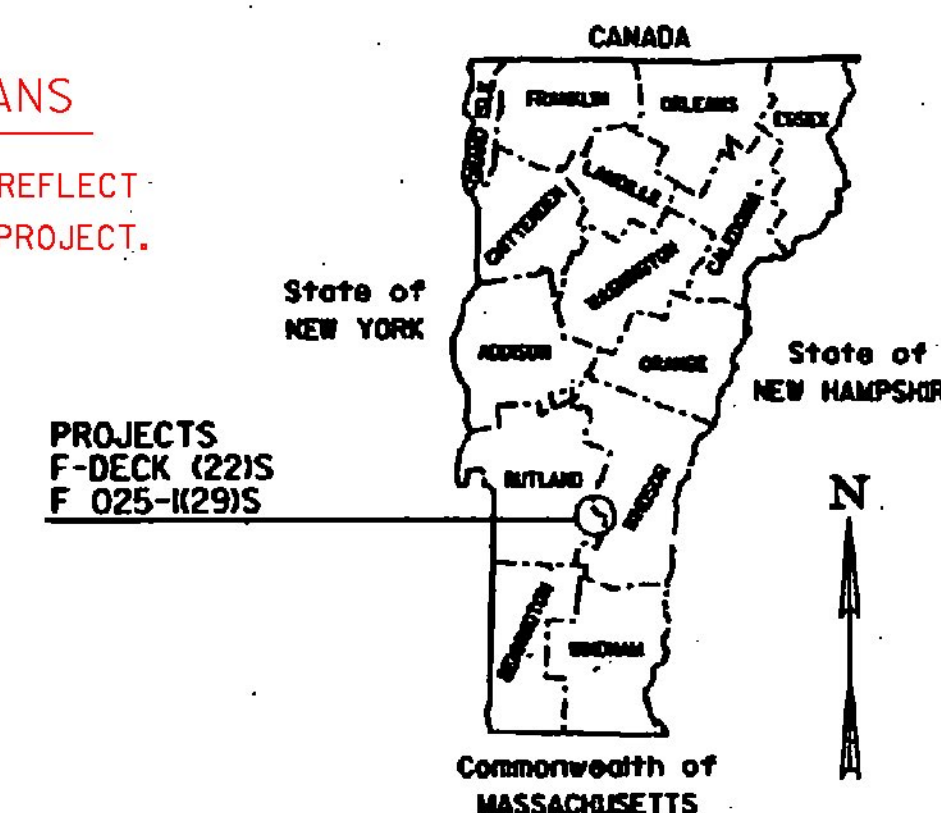
F-DECK (22)S  
BRIDGE #99

F 025-1(29)S  
MM 2.862 ~ MM 4.059



## CONTRACT PLANS

THESE PLANS DO NOT REFLECT  
CHANGES MADE ON THE PROJECT.

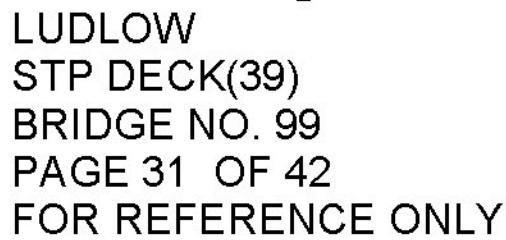


PROJECT PROCESSED UNDER  
SECONDARY ROAD PLAN

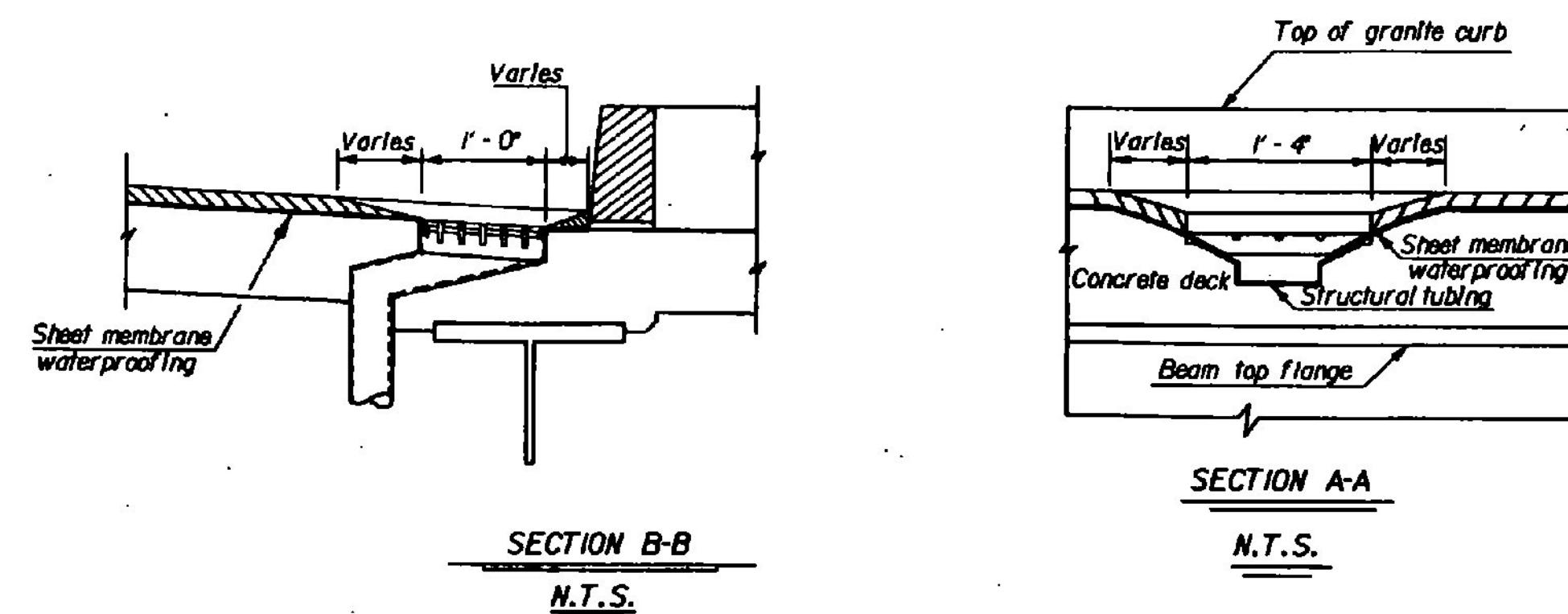
THESE PLANS ARE SUBJECT TO SUCH ENGINEERING  
CHANGES AS MAY BE REQUIRED BY THE FEDERAL HIGHWAY  
ADMINISTRATION OR THE CHIEF ENGINEER.  
CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE  
WITH THESE PLANS AND THE STANDARD SPECIFICATIONS  
FOR CONSTRUCTION DATED 1986, AS APPROVED BY THE  
FEDERAL HIGHWAY ADMINISTRATION ON NOVEMBER 24, 1986  
FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT  
REVISIONS AND SUCH REVISED SPECIFICATIONS AND  
SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE  
PLANS.

|                                                                |              |
|----------------------------------------------------------------|--------------|
| SUBMITTED BY ORDER OF THE STATE TRANSPORTATION BOARD           |              |
| APPROVED <i>[Signature]</i>                                    | DATE 7/14/87 |
| CHIEF ENGINEER                                                 |              |
| DEPARTMENT OF TRANSPORTATION<br>FEDERAL HIGHWAY ADMINISTRATION |              |
| APPROVED _____                                                 | DATE _____   |
| DIVISION ADMINISTRATOR                                         |              |
| LUDLOW, MT. HOLLY                                              |              |
| PROJECT F 025-1(29)S                                           |              |
| SHEET 1 OF 40 SHEETS                                           |              |





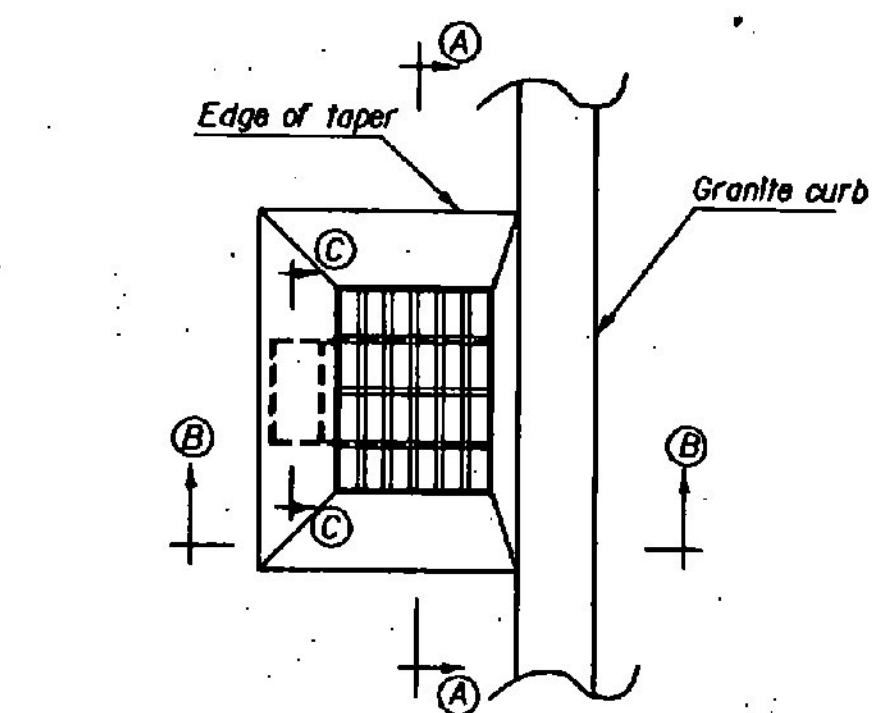




Note: Mark location of scupper; install membrane; make a "X" incision on diagonals of scupper; trim, seal, and wrap into scupper.

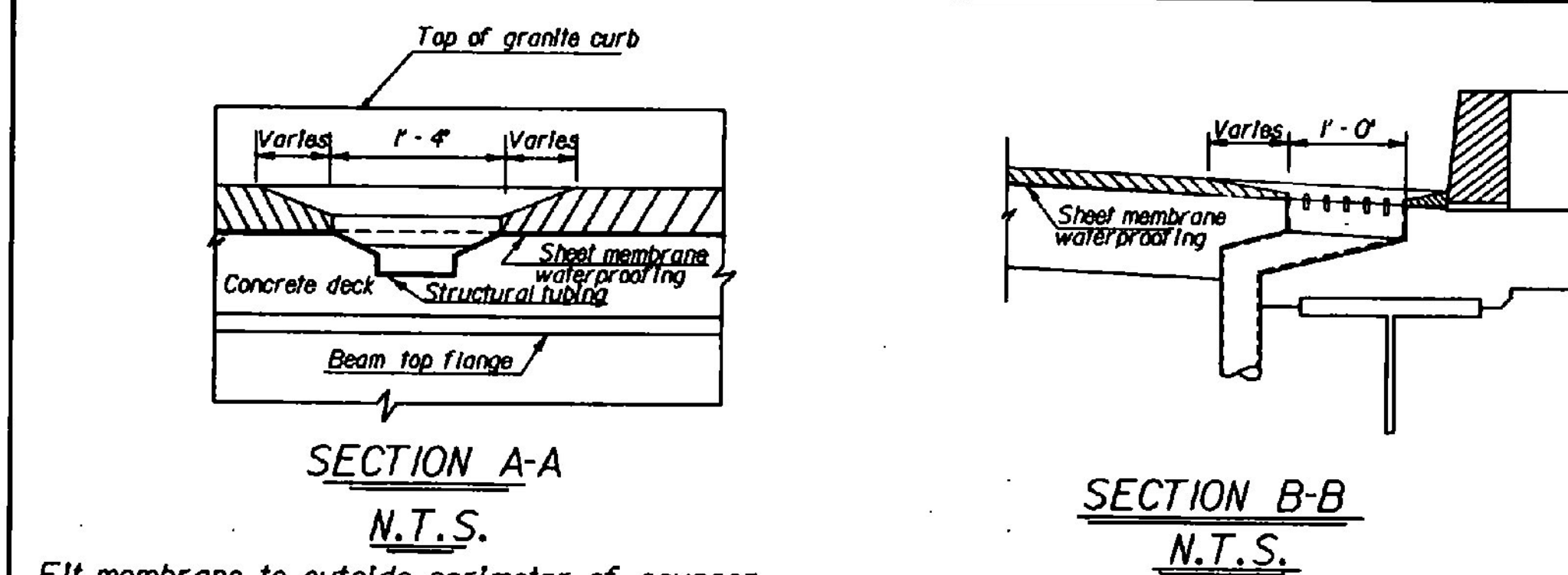
### MEMBRANE DETAIL FOR SCUPPERS FLUSH WITH DECK

①

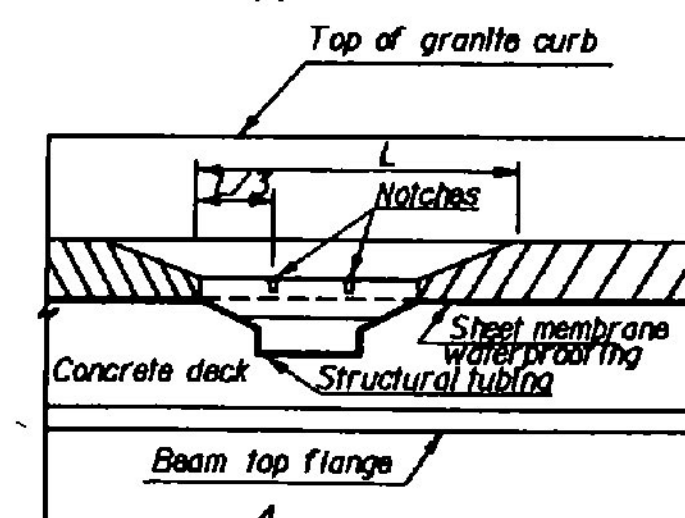


PLAN VIEW  
(TYP. FOR DETAILS NO. 1 & 2)  
N.T.S.

③



Fit membrane to outside perimeter of scupper.

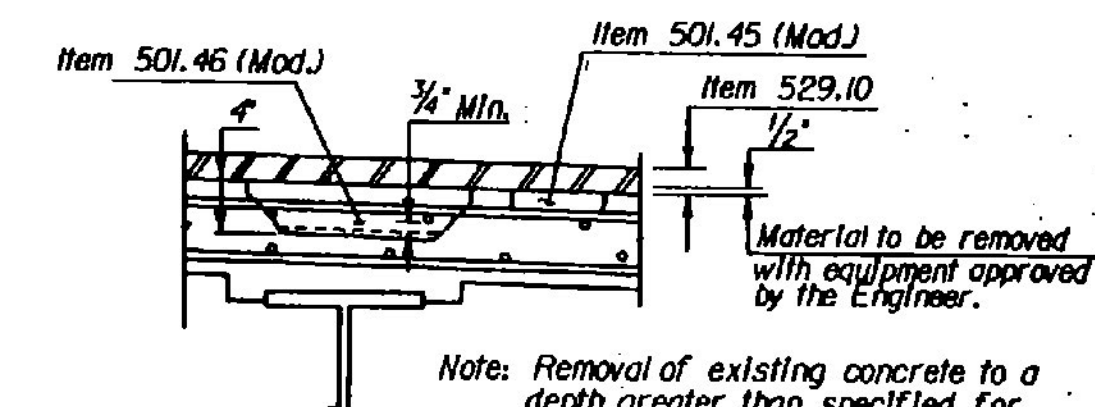


SECTION C-C  
N.T.S.  
Note: Notch scupper 1/2" wide to top of concrete on three sides.  
This work to be subsidiary to the Item 519.20

### MEMBRANE DETAIL FOR RAISED SCUPPERS

②

Note: All edges of repair areas are to be saw cut square and a minimum of one (1) inch deep.  
Note: Item 501.45 (Mod.) shall include removal of concrete to a maximum depth as determined by the top of the top bars of reinforcing steel.



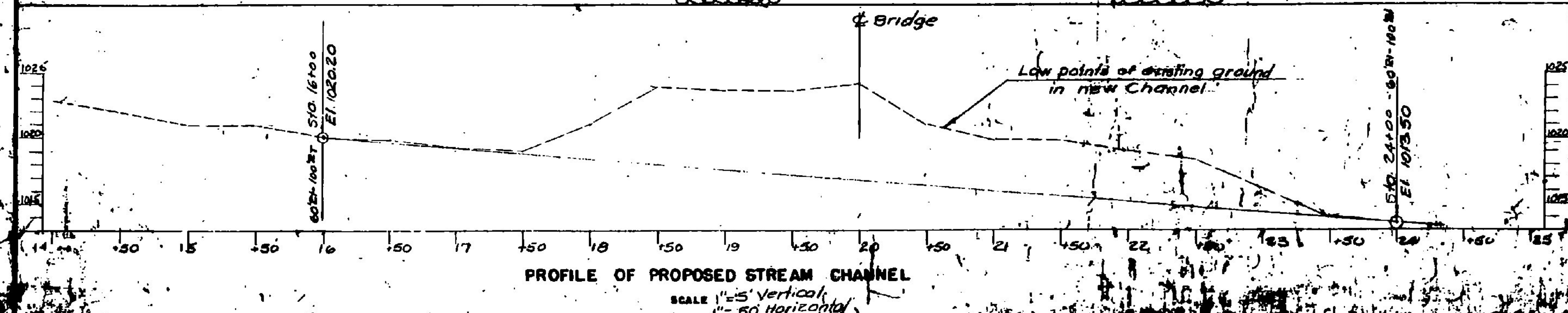
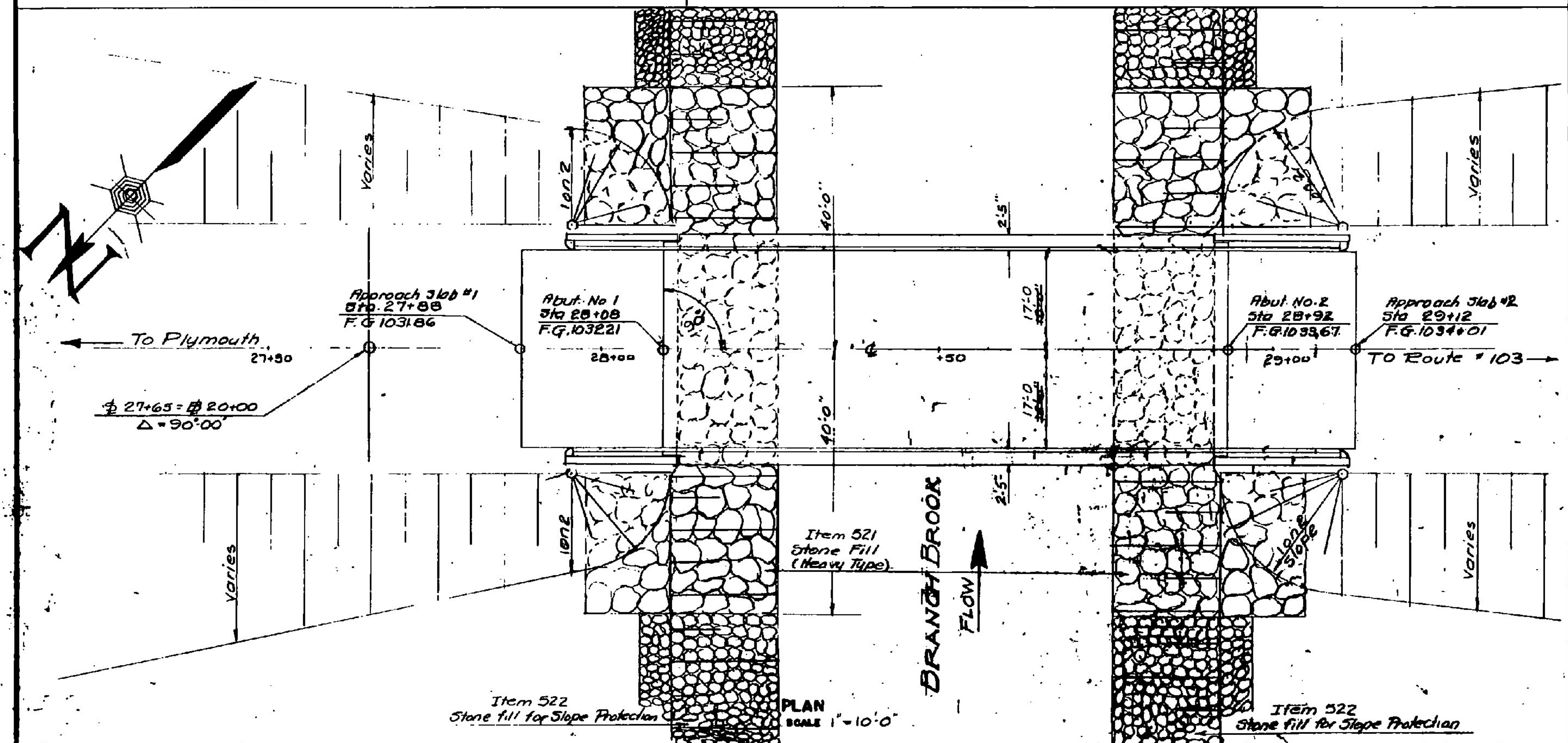
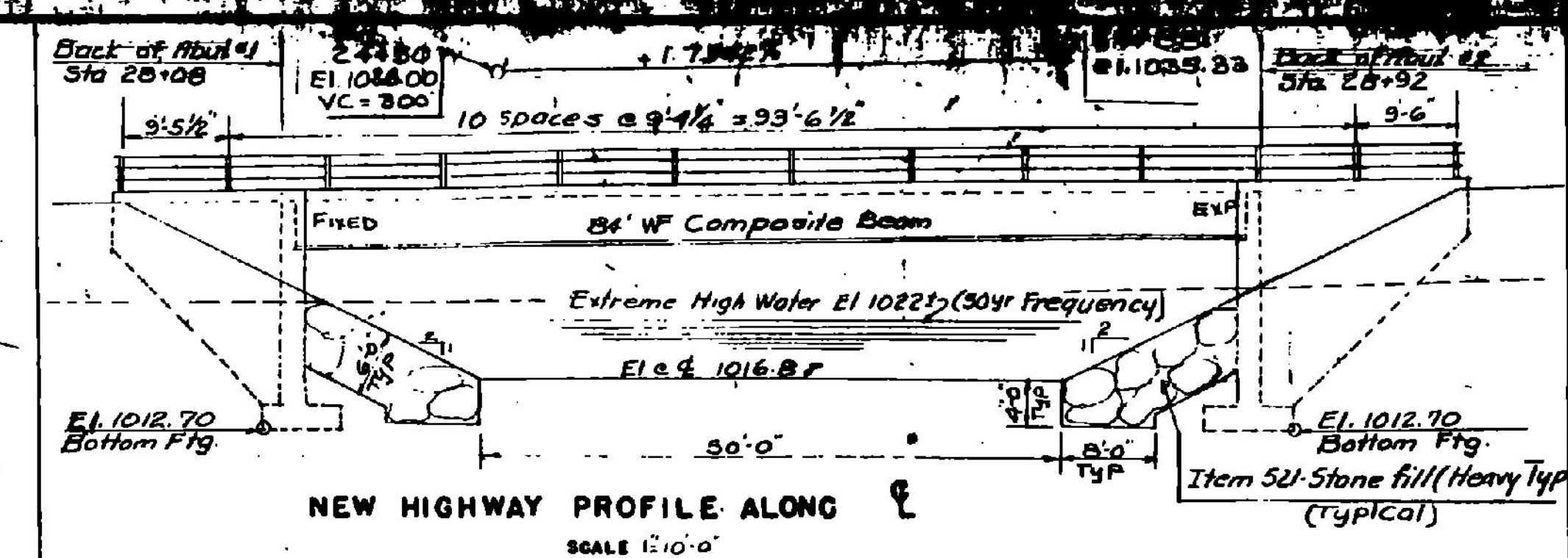
Note: Removal of existing concrete to a depth greater than specified for Item 501.46 (Mod.) shall be paid under the Item 529.25 (Mod.).

### TYPICAL LIMITS FOR REMOVAL ITEMS N T S

④

| STATE OF VERMONT<br>AGENCY OF TRANSPORTATION |                    |                               |             |
|----------------------------------------------|--------------------|-------------------------------|-------------|
| Town Of                                      | LUDLOW - MT. HOLLY |                               | Bridge No.  |
| Highway No.                                  | VT 100 & VT 103    |                               | Log Sta.    |
| DECK REHABILITATION                          |                    |                               | Surv. Sta.  |
| TYPICAL DETAILS                              |                    |                               |             |
| Designed By                                  | G.S. ROGERS        | Drawn By                      | D.W. NEWTON |
| Checked By                                   | Date               | Bridge Design Supervisor      | Date        |
| PROJECT                                      |                    | PROJECT NO.                   |             |
| LUDLOW - MT. HOLLY                           |                    | F-DECK (22) S                 |             |
| I&C Info.                                    |                    | ZFA130.321 SCUPPER REHAB. DGN |             |
| Bridge Sheet No.                             |                    | PRF. LUDMTHLY                 |             |
|                                              |                    | Sheet 14 of 40                |             |





HIGHWAY NO 1742 NAME OF HIGHWAY \_\_\_\_\_  
STRUCTURE NO \_\_\_\_\_ COUNTY WINDSOR TOWN LUDLOW  
PROJECT NO F025-1(6) LOCATION BRANCH BROOK

EXISTING STRUCTURE

1 RATED LOADING OF EXISTING STRUCTURE H-15 Live Loading  
2 TYPE OF EXISTING STRUCTURE Concrete I Beams  
3 UNDERCLEARANCE ELEVATION OF EXISTING STRUCTURE 4.9±  
4 WHAT DISPOSITION SHOULD BE MADE OF EXISTING STRUCTURE Remove COST OF REMOVAL \$500.  
5 SHOULD EXISTING STRUCTURE BE USED TO MAINTAIN TRAFFIC DURING CONSTRUCTION OF NEW STRUCTURE NO  
6 SHOULD NEW TEMPORARY STRUCTURE BE BUILT NO  
7 ORDINARY HIGH WATER SURFACE ELEV. AT EXISTING STRUCTURE 1021.1(4) WATERWAY TO ORDINARY H.W. 1200±  
8 EXTREME HIGH WATER AT EXISTING STRUCTURE \_\_\_\_\_  
9 SPAN OF EXISTING BRIDGE UPSTREAM 39 WATERWAY TO EXTREME H.W. 500± 3/4  
10 SPAN OF EXISTING BRIDGE DOWNSTREAM None WATERWAY TO EXTREME H.W. \_\_\_\_\_  
11 TYPE OF FOUNDATION UNDER EXISTING ABUTMENTS \_\_\_\_\_

12 DOES ALL WATER AT FLOOD ELEVATION PASS THROUGH EXISTING STRUCTURE \_\_\_\_\_  
13 IF NOT AT WHAT ELEVATION IS RELIEF AFFORDED \_\_\_\_\_  
14 ADDITIONAL WATERWAY AREA PROVIDED \_\_\_\_\_

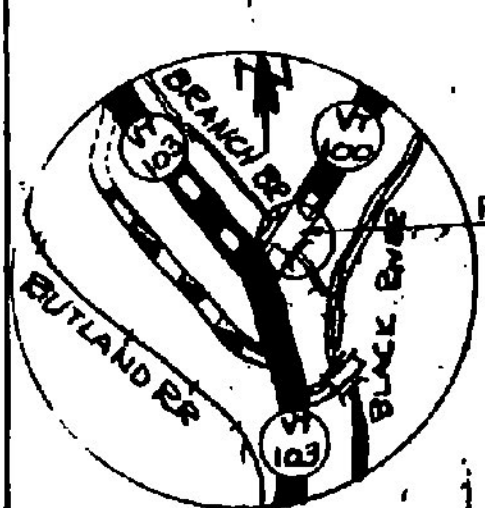
NEW STRUCTURE

1 RECOMMENDED TYPE OF STRUCTURE 202.84' span Composite WF Beams  
2 RECOMMENDED CLEAR SPAN OR SPANS one span 80  
3 MEASURED PARALLEL TO NEW HIGHWAY 80'  
4 MEASURED AT RIGHT ANGLES TO STREAM 80'  
5 ARE THERE OBJECTIONS TO A PIEN IN THE STREAM, AND/WHY YES OR NO NA  
6 ORDINARY HIGH WATER ELEVATION AT NEW STRUCTURE 1020 ± (3'±)  
7 EXTREME HIGH WATER ELEVATION AT NEW STRUCTURE 1022 SOURCE OF INFORMATION Computed  
8 IS ALL WATER INTENDED TO PASS THROUGH NEW STRUCTURE? YES  
9 DOES WATER REACH ITS MAXIMUM HIGH WATER ELEVATION RAPIDLY? NO IS ORDINARY SIDE CHANNEL? NO  
10 LOW WATER ELEVATION AT NEW STRUCTURE 1018 ± (1'±)  
11 DRAINAGE AREA IN ACRES ABOVE STRUCTURE 2432 CHARACTER OF TERRAIN Mountainous  
12 IS STREAM EVER DRY? NO  
13 VELOCITY OF STREAM AT HIGH WATER STAGE B15 ESTIMATED DISCHARGE 2600 CFS  
14 AREA FULL OPENING 900± AREA BELOW ORDINARY H.W. 175 ±  
15 CHARACTER OF SCOUR \_\_\_\_\_  
16 ESTIMATED DRAINAGE AREA ABOVE NATURAL OR ARTIFICIAL STORAGE NA  
17 VERTICAL CLEARANCE ABOVE FLOOD ELEVATION 7.0±  
18 ARE SIDEWALKS REQUIRED, IF SO ON WHAT SIDE NO  
19 RECOMMENDED TYPE OF PAVEMENT 1/2" Bit Conc Pavt. 4" Base 4" Sub  
20 TRAFFIC TO BE MAINTAINED UNDER ITEM NO. NA ONE OR TWO WAYS \_\_\_\_\_ PROBABLY ONE  
21 PROBABLE COST OF CLEARING AND GRUBBING STREAM CHANNEL AT STRUCTURE SITE? NA  
22 SHOULD PROVISIONS BE MADE FOR PUBLIC UTILITIES? NO  
23 ESTIMATED ALLOWABLE LOAD ON FOUNDATIONS 2500± lb SHOULD PILES BE USED? NO

**FOUNDATION INFORMATION**

OBTAINED FOR DESIGN PURPOSES ONLY, AND THE STATE ASSUMES NO RESPONSIBILITY FOR THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN. SOILS ARE NOT ENCOUNTERED AT ANY PIER OR ANCHORAGE LOCATION.

Note - For Detail of Superstructure - See 4A of A-1



|                                                                                               |                                                                                                                                               |
|-----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|
| <p>F-DECK (22)5, BR # 99<br/>THIS SHEET FOR INFORMATION ONLY</p>                              | <p>Sheet Revised 5-8-68<br/>BR 3 OF 9</p>                                                                                                     |
| <p>Recommended for Approval<br/><i>Emory</i> 6/1/68<br/>Bridge Engineer Date</p>              | <p>STATE OF VERMONT<br/>DEPARTMENT OF HIGHWAYS</p>                                                                                            |
| <p>Recommended for Approval<br/><i>R.H. [unclear]</i> 6/1/68<br/>Asst Chief Engineer Date</p> | <p>IN THE TOWN OF<br/>N. L. [unclear] - 100<br/>ROUTE NO. V-100-100 ST. [unclear]</p>                                                         |
| <p>Approved by<br/><i>[Signature]</i> 6/1/68<br/>Chief Engineer Date</p>                      | <p>SUBMITTED BY [unclear] CHECKED BY [unclear]<br/>DRAWN BY [unclear] DESIGNED BY [unclear]<br/>PROJECT NO. [unclear] SHEET NO. [unclear]</p> |
| <p>1</p>                                                                                      | <p>SHEET 1 OF 9</p>                                                                                                                           |

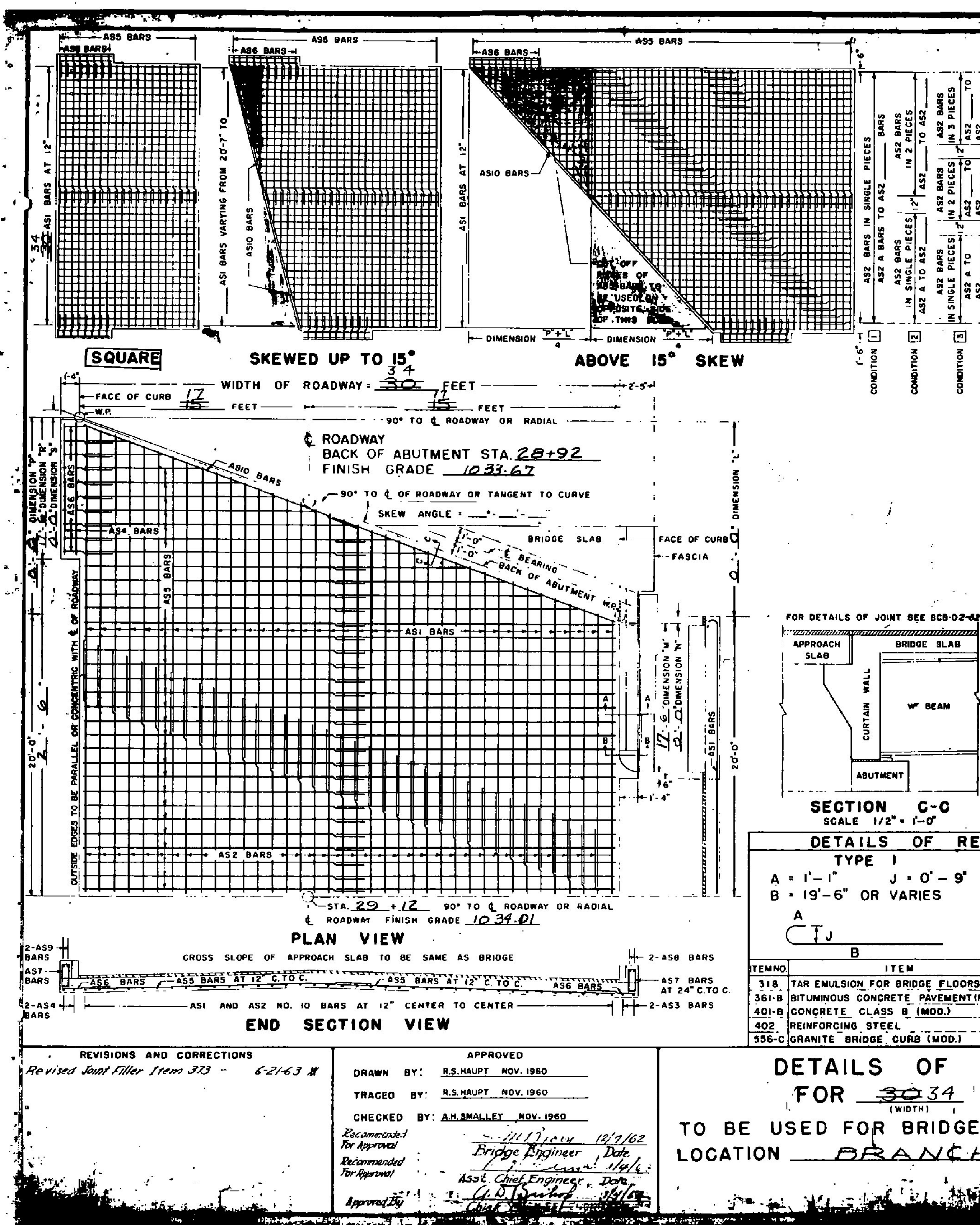








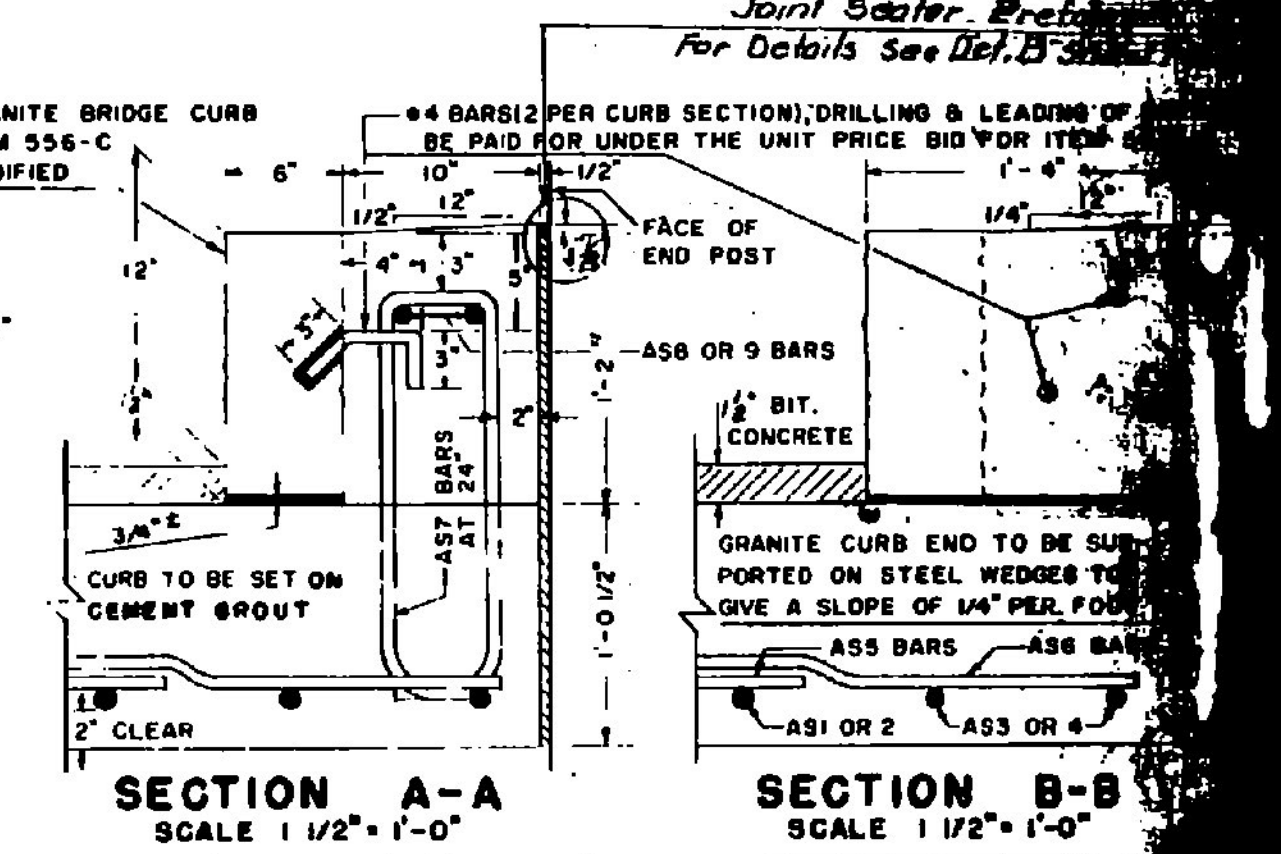
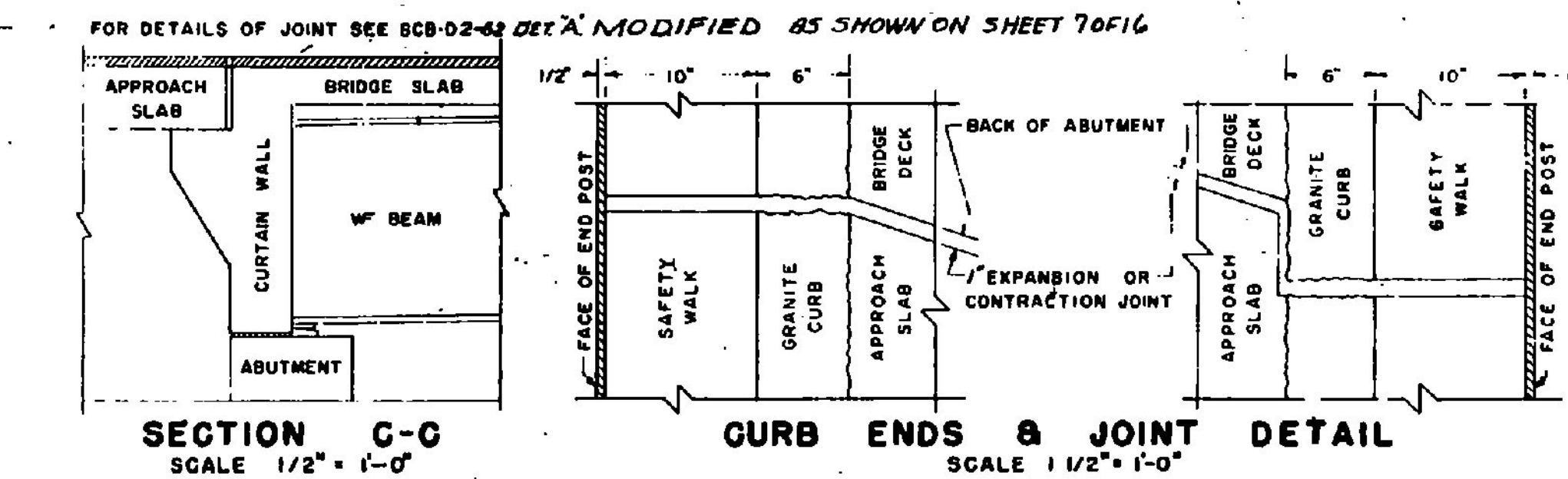




| 34' ROADWAY              | 38' ROADWAY              | 42' ROADWAY              | 44' ROADWAY              | ROADWAY                  |
|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
| NO. PIECES               | NO. PIECES               | NO. PIECES               | NO. PIECES               | NO. PIECES               |
| SIZE                     | SIZE                     | SIZE                     | SIZE                     | SIZE                     |
| LENGTH                   | LENGTH                   | LENGTH                   | LENGTH                   | LENGTH                   |
| MARK                     | MARK                     | MARK                     | MARK                     | MARK                     |
| TYPE                     | TYPE                     | TYPE                     | TYPE                     | TYPE                     |
| REMARKS                  | REMARKS                  | REMARKS                  | REMARKS                  | REMARKS                  |
| SQUARE OR SKEWED         | SQUARE OR SKEWED         | SQUARE OR SKEWED         | SQUARE OR SKEWED         | SQUARE OR SKEWED         |
| 2 10 17-0 AS3 STR.       | 2 10 17-0 AS3 STR.       | 2 10 17-0 AS3 STR.       | 2 10 17-0 AS3 STR.       | 2 10 17-0 AS3 STR.       |
| 2 10 17-0 AS4 STR.       | 2 10 17-0 AS4 STR.       | 2 10 17-0 AS4 STR.       | 2 10 17-0 AS4 STR.       | 2 10 17-0 AS4 STR.       |
| 2 10 17-0 AS5 STR.       | 2 10 17-0 AS5 STR.       | 2 10 17-0 AS5 STR.       | 2 10 17-0 AS5 STR.       | 2 10 17-0 AS5 STR.       |
| 2 10 17-0 AS6 STR.       | 2 10 17-0 AS6 STR.       | 2 10 17-0 AS6 STR.       | 2 10 17-0 AS6 STR.       | 2 10 17-0 AS6 STR.       |
| 2 10 17-0 AS7 STR.       | 2 10 17-0 AS7 STR.       | 2 10 17-0 AS7 STR.       | 2 10 17-0 AS7 STR.       | 2 10 17-0 AS7 STR.       |
| 2 10 17-0 AS8 STR.       | 2 10 17-0 AS8 STR.       | 2 10 17-0 AS8 STR.       | 2 10 17-0 AS8 STR.       | 2 10 17-0 AS8 STR.       |
| 2 10 17-0 AS9 STR.       | 2 10 17-0 AS9 STR.       | 2 10 17-0 AS9 STR.       | 2 10 17-0 AS9 STR.       | 2 10 17-0 AS9 STR.       |
| SQUARE                   | SQUARE                   | SQUARE                   | SQUARE                   | SQUARE                   |
| 2 10 20-7 AS1 STR.       | 2 10 20-7 AS1 STR.       | 2 10 20-7 AS1 STR.       | 2 10 20-7 AS1 STR.       | 2 10 20-7 AS1 STR.       |
| 2 10 20-7 AS2 STR.       | 2 10 20-7 AS2 STR.       | 2 10 20-7 AS2 STR.       | 2 10 20-7 AS2 STR.       | 2 10 20-7 AS2 STR.       |
| SKEWED UP TO 15°         | SKEWED UP TO 15°         | SKEWED UP TO 15°         | SKEWED UP TO 15°         | SKEWED UP TO 15°         |
| 3 10 20-7 AVE AS1 STR. 1 | 3 10 20-7 AVE AS1 STR. 1 | 3 10 20-7 AVE AS1 STR. 1 | 3 10 20-7 AVE AS1 STR. 1 | 3 10 20-7 AVE AS1 STR. 1 |
| 3 10 20-7 AVE AS2 STR. 2 | 3 10 20-7 AVE AS2 STR. 2 | 3 10 20-7 AVE AS2 STR. 2 | 3 10 20-7 AVE AS2 STR. 2 | 3 10 20-7 AVE AS2 STR. 2 |
| ALL SKEWED SPANS         | ALL SKEWED SPANS         | ALL SKEWED SPANS         | ALL SKEWED SPANS         | ALL SKEWED SPANS         |
| 2 5 29-6 AS1 STR.        | 2 5 29-6 AS1 STR.        | 2 5 29-6 AS1 STR.        | 2 5 29-6 AS1 STR.        | 2 5 29-6 AS1 STR.        |
| ABOVE 15° SKEW           | ABOVE 15° SKEW           | ABOVE 15° SKEW           | ABOVE 15° SKEW           | ABOVE 15° SKEW           |
| 3 10 20-7 AS1 STR.       | 3 10 20-7 AS1 STR.       | 3 10 20-7 AS1 STR.       | 3 10 20-7 AS1 STR.       | 3 10 20-7 AS1 STR.       |
| 3 10 20-7 AVE AS2 STR. 4 | 3 10 20-7 AVE AS2 STR. 4 | 3 10 20-7 AVE AS2 STR. 4 | 3 10 20-7 AVE AS2 STR. 4 | 3 10 20-7 AVE AS2 STR. 4 |
| 3 10 20-7 AS3 STR. 2     | 3 10 20-7 AS3 STR. 2     | 3 10 20-7 AS3 STR. 2     | 3 10 20-7 AS3 STR. 2     | 3 10 20-7 AS3 STR. 2     |

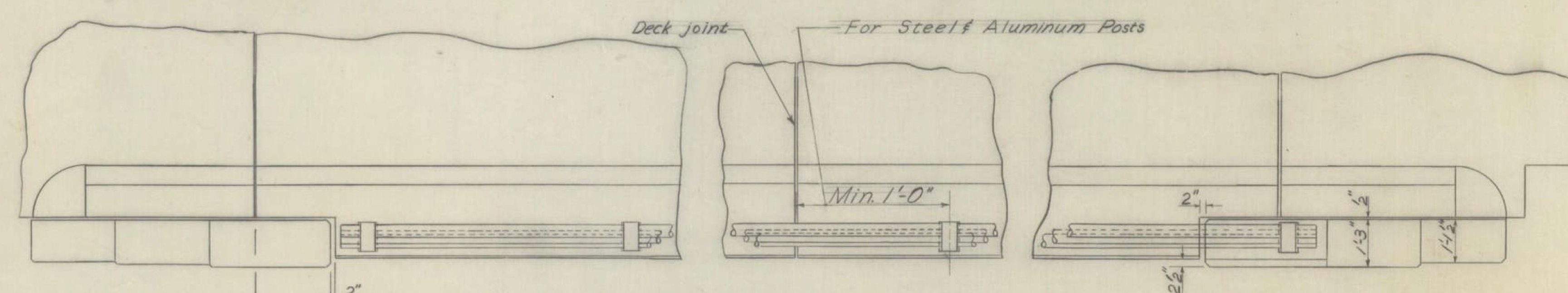
REMARKS: 1. ASI BAR "B" DIMENSION VARIES FROM 19'-6" TO 20'-0" (IN FEET) + NUMBER OF PIECES. CUT BARS IN THE FIELD USING CUT OFF, REDUCED TO OPPOSITE HALF OF SLAB. 2. ASI BAR "C" DIMENSION VARIES FROM 19'-6" TO 20'-0" (IN FEET) + NUMBER OF PIECES. CUT BARS IN THE FIELD USING CUT OFF, REDUCED TO OPPOSITE HALF OF SLAB. 3. THE LENGTH OF ASI BARS VARIES FROM 19'-6" TO 20'-0" (IN FEET) + NUMBER OF PIECES. CUT BARS IN THE FIELD USING CUT OFF, REDUCED TO OPPOSITE HALF OF SLAB. 4. THE LOCATION OF SPLICES IS LEFT TO THE OPTION OF THE DESIGNER. THE NO. PIECES SHOWN ARE FOR CONDITION 1. (FOR CONDITION 2 & 3, SEE REIN. SCHEDULE.)

GENERAL NOTES: ALL REINFORCING STEEL SHALL BE DETAILED ON THE REINFORCING STEEL SCHEDULE. WHEN A BAR LENGTH VARIES IN INCREMENTS EACH BAR MUST BE DETAILED. SPLICES SHALL BE 2'-0" FOR NUMBER 5 BARS, AND 4'-0" FOR NUMBER 10 BARS. ALL WORK AND MATERIALS SHALL CONFORM TO THE STATE OF VERMONT, DEPARTMENT OF HIGHWAYS, STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION DATED JANUARY 1956, AND THE A.A.S.H.O. SPECIFICATIONS DATED 1964. DESIGNED FOR MED.

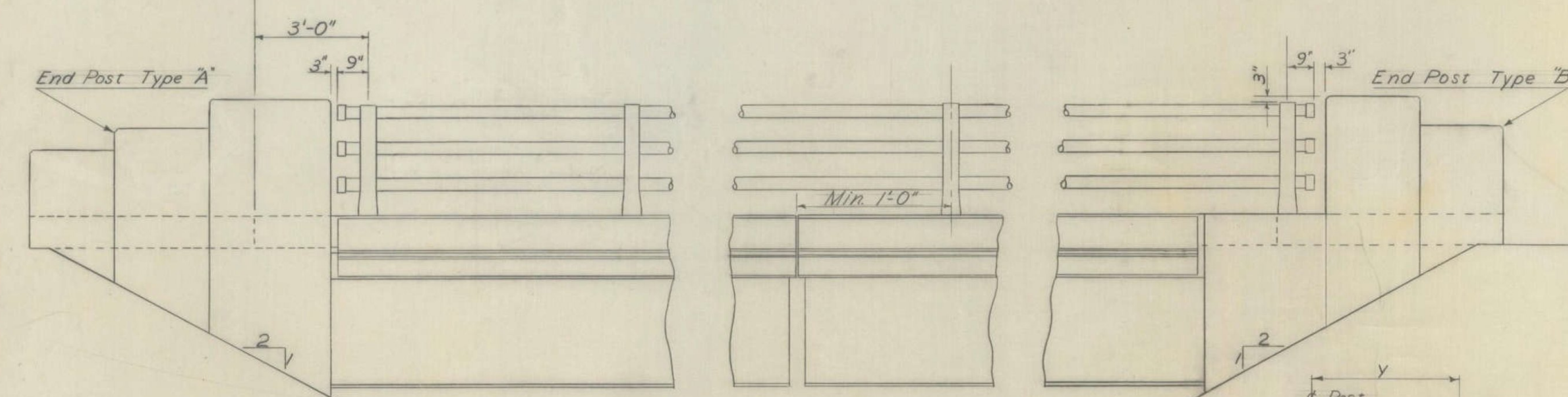


| DETAILS OF REINFORCING BARS |  |  |  | REINFORCING STEEL |  |  |  | QUANTITY COMPUTATION                                                                                                                                     |  |  |  |
|-----------------------------|--|--|--|-------------------|--|--|--|----------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|
| TYPE I                      |  |  |  | TYPE S6 C         |  |  |  | W = WIDTH OF ROADWAY Z = 20 + DIMENSION "P" + 1 T = DIMENSION "T" + 1                                                                                    |  |  |  |
| A = 1'-1" J = 0'-9"         |  |  |  | A = 0'-6" C       |  |  |  | W = 30-34 Z = 20 T = 17-5                                                                                                                                |  |  |  |
| B = 19'-6" OR VARIES        |  |  |  | B = 1'-9" D       |  |  |  | BITUMINOUS CONCRETE = W x Z x 0.0098 = 5.138 x 20 = 0.0098 x 20 TONS                                                                                     |  |  |  |
| A                           |  |  |  | B                 |  |  |  | TAR EMULSION = W x Z x 0.0444 = 5.138 x 20 = 0.0444 x 20 TONS                                                                                            |  |  |  |
| B                           |  |  |  | C                 |  |  |  | CONCRETE CLASS B = W x Z x 0.0386 + T x 0.1029 + (T - 1.0333) x 0.0733 = 5.138 x 20 = 0.0386 x 20 + 17.5 x 0.1029 + (17.5 - 1.0333) x 0.0733 = 2.26 TONS |  |  |  |
| C                           |  |  |  | D                 |  |  |  | GRANITE BRIDGE CURB = 2(T + 0'-5") x LINEAR FEET 2(17.5 + 0.25) = 36 LINEAR FEET                                                                         |  |  |  |
| D                           |  |  |  | E                 |  |  |  | BAR LENGTHS: AS3 BARS x DIMENSION "M" - 0'-6"                                                                                                            |  |  |  |
| E                           |  |  |  | F                 |  |  |  | AS4 BARS x DIMENSION "R" - 0'-6"                                                                                                                         |  |  |  |
| F                           |  |  |  | G                 |  |  |  | AS5 BARS x 3'-6"                                                                                                                                         |  |  |  |
| G                           |  |  |  | H                 |  |  |  | AS6 BARS x 3'-0"                                                                                                                                         |  |  |  |
| H                           |  |  |  | I                 |  |  |  | AS7 BARS x 3'-0"                                                                                                                                         |  |  |  |
| I                           |  |  |  | J                 |  |  |  | AS8 BARS x DIMENSION "M" - 2'-2"                                                                                                                         |  |  |  |
| J                           |  |  |  | K                 |  |  |  | AS9 BARS x DIMENSION "R" - 2'-2"                                                                                                                         |  |  |  |
| K                           |  |  |  | L                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| L                           |  |  |  | M                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| M                           |  |  |  | N                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| N                           |  |  |  | O                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| O                           |  |  |  | P                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| P                           |  |  |  | Q                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| Q                           |  |  |  | R                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| R                           |  |  |  | S                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| S                           |  |  |  | T                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| T                           |  |  |  | U                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| U                           |  |  |  | V                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| V                           |  |  |  | W                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| W                           |  |  |  | X                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| X                           |  |  |  | Y                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| Y                           |  |  |  | Z                 |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| Z                           |  |  |  | AA                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AA                          |  |  |  | AB                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AB                          |  |  |  | AC                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AC                          |  |  |  | AD                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AD                          |  |  |  | AE                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AE                          |  |  |  | AF                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AF                          |  |  |  | AG                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AG                          |  |  |  | AH                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AH                          |  |  |  | AI                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AI                          |  |  |  | AJ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AJ                          |  |  |  | AK                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AK                          |  |  |  | AL                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AL                          |  |  |  | AM                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AM                          |  |  |  | AN                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AN                          |  |  |  | AO                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AO                          |  |  |  | AP                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AP                          |  |  |  | AQ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AQ                          |  |  |  | AR                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AR                          |  |  |  | AS                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AS                          |  |  |  | AT                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AT                          |  |  |  | AU                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AU                          |  |  |  | AV                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AV                          |  |  |  | AW                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AW                          |  |  |  | AX                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AX                          |  |  |  | AY                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AY                          |  |  |  | AZ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| AZ                          |  |  |  | BA                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BA                          |  |  |  | BB                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BB                          |  |  |  | BC                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BC                          |  |  |  | BD                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BD                          |  |  |  | BE                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BE                          |  |  |  | BF                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BF                          |  |  |  | BG                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BG                          |  |  |  | BH                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BH                          |  |  |  | BI                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BI                          |  |  |  | BJ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BJ                          |  |  |  | BK                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BK                          |  |  |  | BL                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BL                          |  |  |  | BM                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BM                          |  |  |  | BN                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BN                          |  |  |  | BO                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BO                          |  |  |  | BP                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BP                          |  |  |  | BQ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BQ                          |  |  |  | BR                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BR                          |  |  |  | BS                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BS                          |  |  |  | BT                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BT                          |  |  |  | BU                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BU                          |  |  |  | BV                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BV                          |  |  |  | BW                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BW                          |  |  |  | BX                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BX                          |  |  |  | BY                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BY                          |  |  |  | BZ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| BZ                          |  |  |  | CA                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CA                          |  |  |  | CB                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CB                          |  |  |  | CC                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CC                          |  |  |  | CD                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CD                          |  |  |  | CE                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CE                          |  |  |  | CF                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CF                          |  |  |  | CG                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CG                          |  |  |  | CH                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CH                          |  |  |  | CI                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CI                          |  |  |  | CJ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CJ                          |  |  |  | CK                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CK                          |  |  |  | CL                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CL                          |  |  |  | CM                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CM                          |  |  |  | CN                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CN                          |  |  |  | CO                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CO                          |  |  |  | CP                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CP                          |  |  |  | CQ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CQ                          |  |  |  | CR                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CR                          |  |  |  | CS                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CS                          |  |  |  | CT                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CT                          |  |  |  | CU                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CU                          |  |  |  | CV                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CV                          |  |  |  | CW                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CW                          |  |  |  | CX                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CX                          |  |  |  | CY                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CY                          |  |  |  | CZ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| CZ                          |  |  |  | DA                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DA                          |  |  |  | DB                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DB                          |  |  |  | DC                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DC                          |  |  |  | DD                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DD                          |  |  |  | DE                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DE                          |  |  |  | DF                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DF                          |  |  |  | DG                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DG                          |  |  |  | DH                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DH                          |  |  |  | DI                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DI                          |  |  |  | DJ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DJ                          |  |  |  | DK                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DK                          |  |  |  | DL                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DL                          |  |  |  | DM                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DM                          |  |  |  | DN                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DN                          |  |  |  | DO                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DO                          |  |  |  | DP                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DP                          |  |  |  | DQ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DQ                          |  |  |  | DR                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DR                          |  |  |  | DS                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DS                          |  |  |  | DT                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DT                          |  |  |  | DU                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DU                          |  |  |  | DV                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DV                          |  |  |  | DW                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DW                          |  |  |  | DX                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DX                          |  |  |  | DY                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DY                          |  |  |  | DZ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| DZ                          |  |  |  | EA                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EA                          |  |  |  | EB                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EB                          |  |  |  | EC                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EC                          |  |  |  | ED                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| ED                          |  |  |  | EE                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EE                          |  |  |  | EF                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EF                          |  |  |  | EG                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EG                          |  |  |  | EH                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EH                          |  |  |  | EI                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EI                          |  |  |  | EJ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EJ                          |  |  |  | EK                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EK                          |  |  |  | EL                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EL                          |  |  |  | EM                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EM                          |  |  |  | EN                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EN                          |  |  |  | EO                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EO                          |  |  |  | EP                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EP                          |  |  |  | EQ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EQ                          |  |  |  | ER                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| ER                          |  |  |  | ES                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| ES                          |  |  |  | ET                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| ET                          |  |  |  | EU                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EU                          |  |  |  | EV                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EV                          |  |  |  | EW                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EW                          |  |  |  | EX                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EX                          |  |  |  | EY                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EY                          |  |  |  | EZ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| EZ                          |  |  |  | FA                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FA                          |  |  |  | FB                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FB                          |  |  |  | FC                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FC                          |  |  |  | FD                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FD                          |  |  |  | FE                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FE                          |  |  |  | FF                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FF                          |  |  |  | FG                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FG                          |  |  |  | FH                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FH                          |  |  |  | FI                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FI                          |  |  |  | FJ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FJ                          |  |  |  | FK                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FK                          |  |  |  | FL                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FL                          |  |  |  | FM                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FM                          |  |  |  | FN                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FN                          |  |  |  | FO                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FO                          |  |  |  | FP                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FP                          |  |  |  | FQ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FQ                          |  |  |  | FR                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FR                          |  |  |  | FS                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FS                          |  |  |  | FT                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FT                          |  |  |  | FU                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FU                          |  |  |  | FV                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FV                          |  |  |  | FW                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FW                          |  |  |  | FX                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FX                          |  |  |  | FY                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FY                          |  |  |  | FZ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| FZ                          |  |  |  | GA                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GA                          |  |  |  | GB                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GB                          |  |  |  | GC                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GC                          |  |  |  | GD                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GD                          |  |  |  | GE                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GE                          |  |  |  | GF                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GF                          |  |  |  | GG                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GG                          |  |  |  | GH                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GH                          |  |  |  | GI                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GI                          |  |  |  | GJ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GJ                          |  |  |  | GK                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GK                          |  |  |  | GL                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GL                          |  |  |  | GM                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GM                          |  |  |  | GN                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GN                          |  |  |  | GO                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GO                          |  |  |  | GP                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GP                          |  |  |  | GQ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GQ                          |  |  |  | GR                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GR                          |  |  |  | GS                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GS                          |  |  |  | GT                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GT                          |  |  |  | GU                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GU                          |  |  |  | GV                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GV                          |  |  |  | GW                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GW                          |  |  |  | GX                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GX                          |  |  |  | GY                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GY                          |  |  |  | GZ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| GZ                          |  |  |  | HA                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HA                          |  |  |  | HB                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HB                          |  |  |  | HC                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HC                          |  |  |  | HD                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HD                          |  |  |  | HE                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HE                          |  |  |  | HF                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HF                          |  |  |  | HG                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HG                          |  |  |  | HH                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HH                          |  |  |  | HI                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HI                          |  |  |  | HJ                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HJ                          |  |  |  | HK                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HK                          |  |  |  | HL                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HL                          |  |  |  | HM                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HM                          |  |  |  | HN                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HN                          |  |  |  | HO                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HO                          |  |  |  | HP                |  |  |  | TOTAL WEIGHT = 4301.38                                                                                                                                   |  |  |  |
| HP                          |  |  |  | HQ                |  |  |  |                                                                                                                                                          |  |  |  |



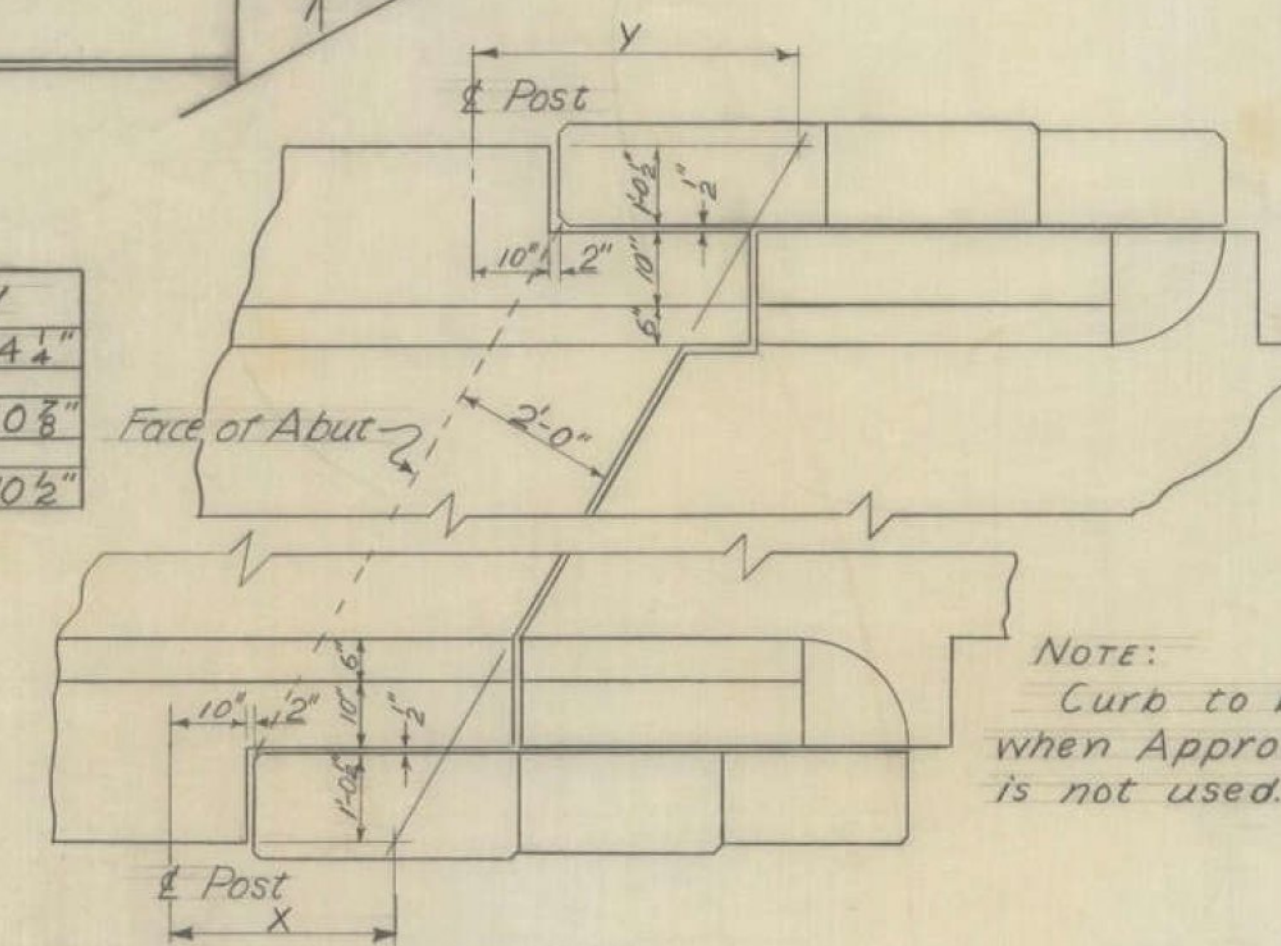


TYPICAL PLAN



TYPICAL ELEVATION

| SKEW | X         | Y          |
|------|-----------|------------|
| 15°  | 2'-9 1/2" | 3'-4 1/4"  |
| 30°  | 2'-8 1/2" | 3'-10 3/8" |
| 45°  | 2'-9 1/2" | 4'-10 1/2" |



PLAN FOR SKEWED ENDS

GENERAL RAILING NOTES

All posts to be set normal to the grade.  
 Prior to fabrication of the railing, shop drawings shall be submitted to the Highway Department for approval.  
 One anchor bolt template shall be supplied for each type of post.  
 Tubular rails, rail posts, box section inserts, wedges, end caps, anchor bolts, nuts, washers, anchor bolt templates, shims & all labor, tools, equipment and incidentals necessary to complete the acceptable railing installation shall be included in the Unit Price bid for Item 572.  
 All bolts, nuts & washers shall be galvanized to A.S.T.M.-A-153-61.

GALVANIZED METAL RAILING

Intermediate Three Tube Post - Malleable Iron Casting - A.S.T.M. A-47 GR. 35018, galvanize to A.S.T.M. A-123-59.  
 Maximum post spacing shall be 10'-0".  
 Except for end sections and panels over expansion joints, all rails shall run continuous through two consecutive posts. Rails shall be so arranged, that no more than two splices will be adjacent to any given post. (In effect stagger joints as much as is practical.)

ALUMINUM RAILING

Posts shall meet A.A.S.H.O. Designation M-193-61. Rails shall meet A.S.T.M. - Specification B 235-61 Alloy-6061 Cond. T-6.  
 Maximum post spacing shall be 7'-2".  
 Aluminum railing posts are to be set on pads 3/8" thick of a non-conductive material meeting the approval of the Engineer and the edges are to be sealed with an Aluminum Impregnated Caulking Compound.  
 Except for end sections all rails shall run continuous through three consecutive railing spans. With the exclusion of the end posts, the joints shall be placed so that there will be no more than one rail splice at each post.

GALVANIZED METAL RAILING (CONTINUED)

All rail splices and end caps shall be tested after galvanizing to assure proper clearances for field erection.

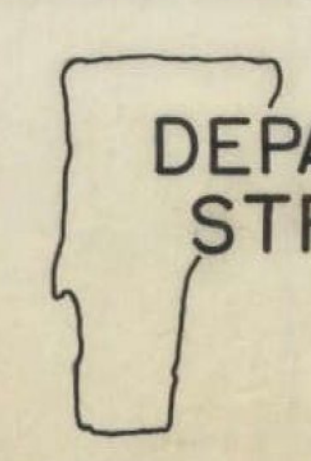
NOTE:  
 Curb to be modified when Approach Slab is not used.

REVISIONS & CORRECTIONS  
 Note added for testing rail splices after galvanizing. 9/29/64 WMS.

Drawn By: W Date: Dec 1/1962  
 Traced By: W Date: Dec 1/1962  
 Checked By: EEB WMS RSH Date: Dec 1/1962  
 Recommended WMS 12/7/62  
 For Approval Bridge Engineer Date  
 Recommended WMS 11/16/63  
 For Approval Assist. Chief Engineer Date  
 Approved By A. D. Bullock 1/4/63  
 Chief Engineer Date

DETAILS OF BRIDGE RAILING  
 PLAN & ELEVATION

EITHER ALUMINUM OR GALVANIZED METAL  
 RAILING MAY BE USED



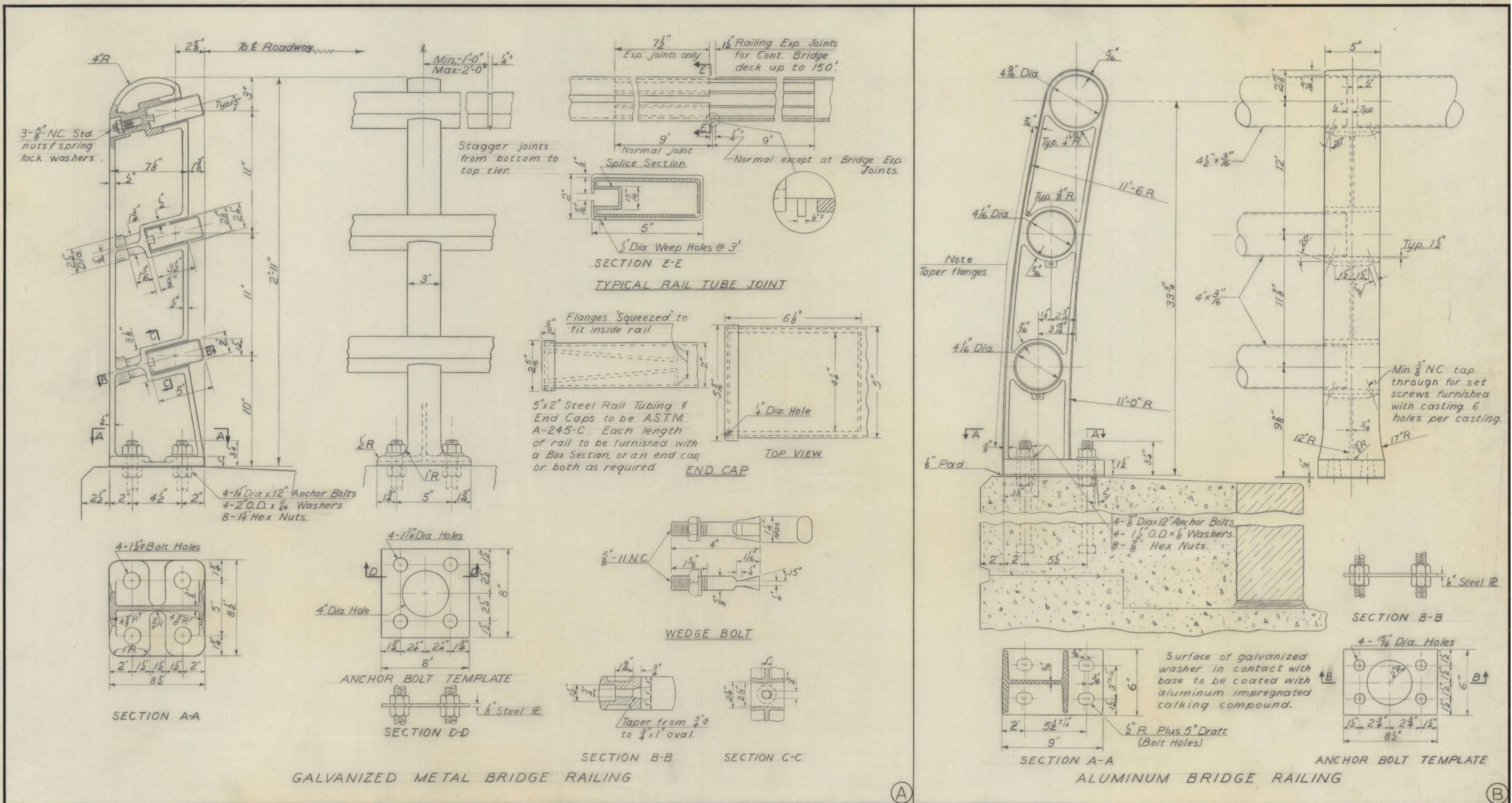
VERMONT  
 DEPARTMENT OF HIGHWAYS  
 STRUCTURE STANDARDS

SB-5G-62

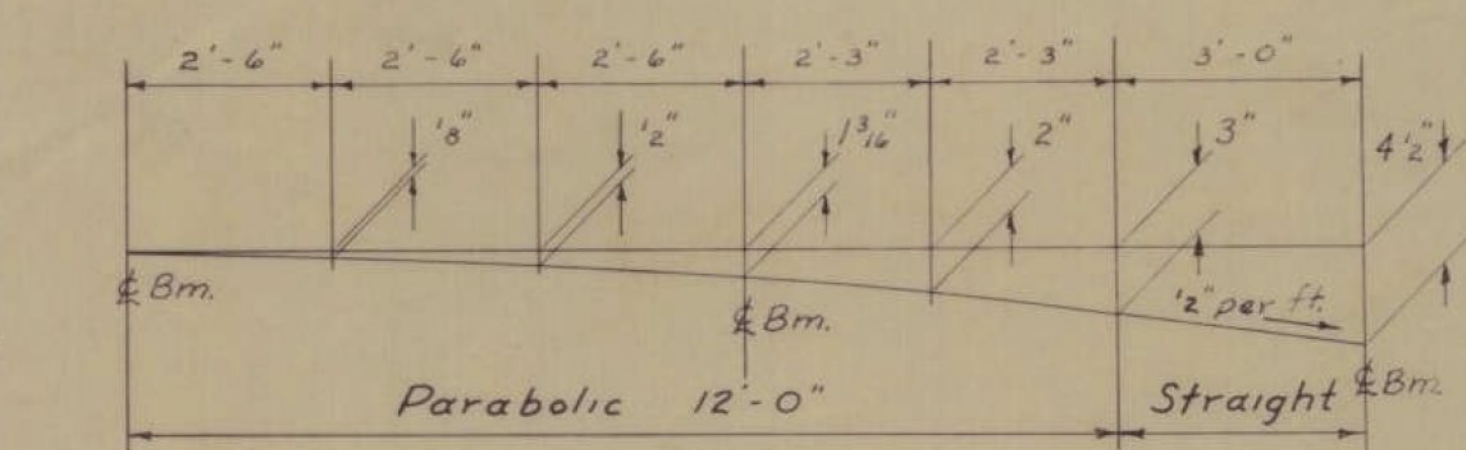
SHEET 1 OF 2

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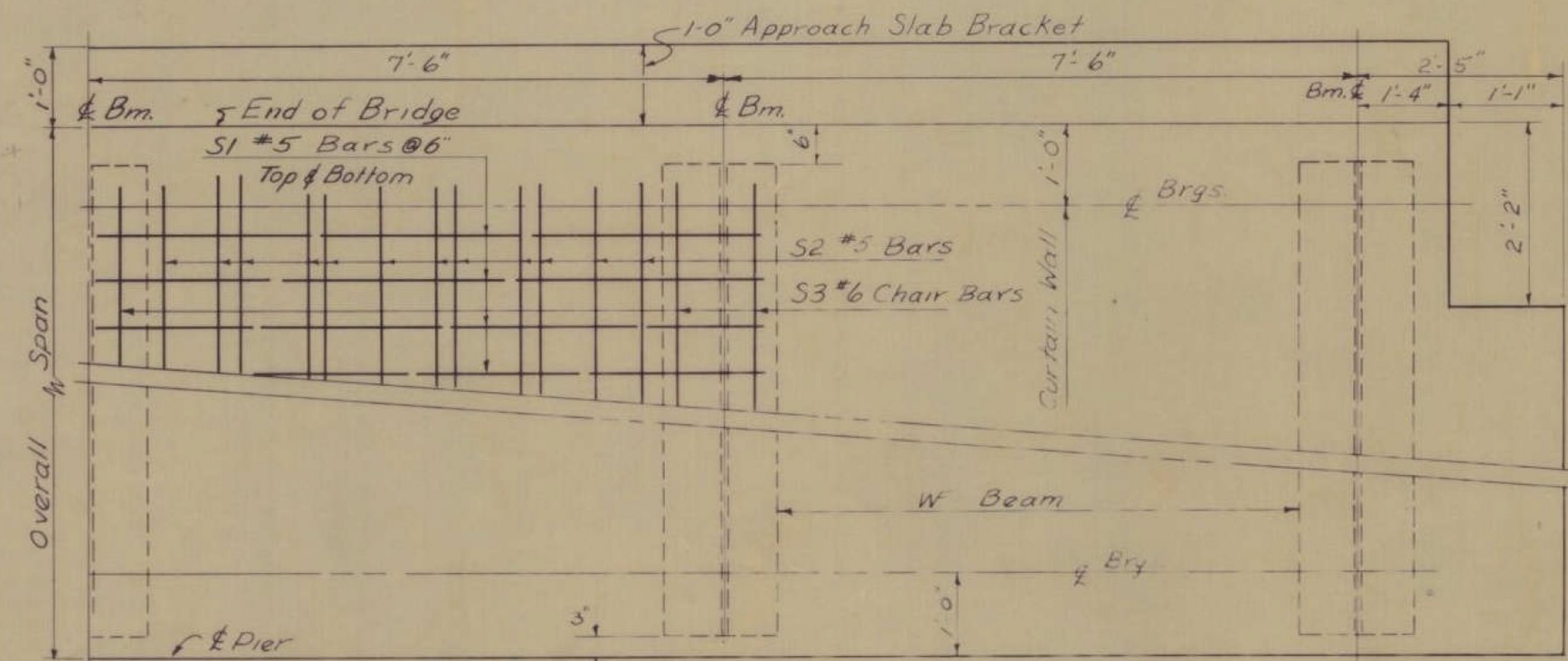




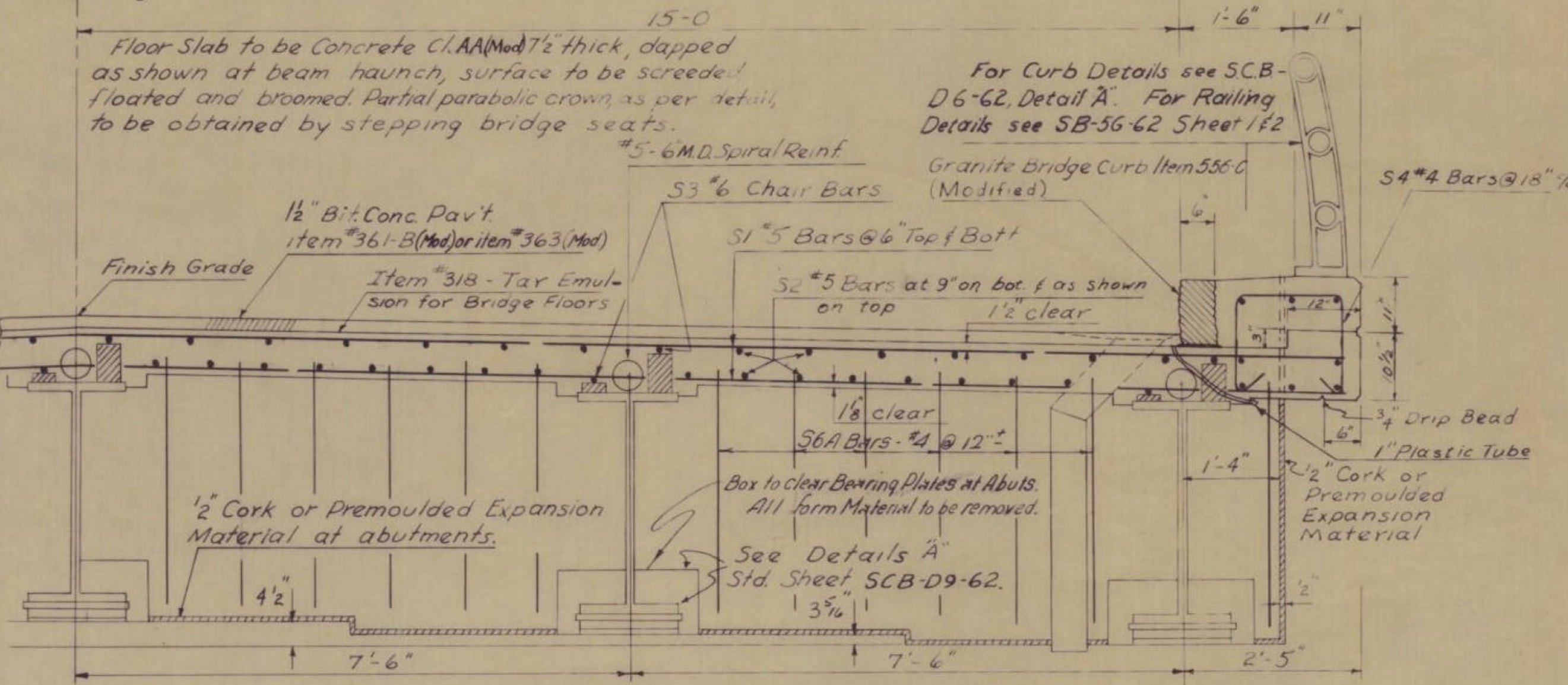




DETAIL OF PARTIAL PARABOLIC CROWN OF SLAB



HALF PLAN



TYPICAL HALF SECTION

Revisions & Corrections

Drawn By: R.S.H. June 1960  
 Traced By: R.S.H. June 1960  
 Checked By: R.T.B. & R.S.H. July 1960

Recommended For Approval: LMR 12/1/62  
 Bridge Engineer Date  
 Recommended For Approval: ASST. CHIEF ENGINEER 11/1/63  
 Date  
 Approved By: CHIEF ENGINEER 11/1/63  
 Date

TYPICAL SECTION, PLAN VIEW, & QUANTITIES  
 30 FOOT ROADWAY W/ BEAM BRIDGES  
 DESIGN LOADING - H-20-S16-44 (A.S.T.M. - A36-62T STEEL)  
 34-44 NON COMPOSITE, 49-99 COMPOSITE  
 FOR ADDITIONAL DETAILS SEE STANDARD SCB-D-62

TABLE OF QUANTITIES FOR SINGLE (SQUARE) SPAN

|                                           |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |                 |
|-------------------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| Span, Out to Out                          | 99-0            | 94-0            | 89-0            | 84-0            | 79-0            | 74-0            | 69-0            | 64-0            | 59-0            | 54-0            | 49-0            | 44-0            | 39-0            | 34-0            |
| Span, E to E Brngs.                       | 97-0            | 92-0            | 87-0            | 82-0            | 77-0            | 72-0            | 67-0            | 62-0            | 57-0            | 52-0            | 47-0            | 42-0            | 37-0            | 32-0            |
| Length of Bms.                            | 98-0            | 93-0            | 88-0            | 83-0            | 78-0            | 73-0            | 68-0            | 63-0            | 58-0            | 53-0            | 48-0            | 43-0            | 38-0            | 33-0            |
| Size W Beam                               | 36WF280         | 36WF245         | 36WF230         | 36WF230         | 36WF194         | 36WF170         | 36WF150         | 36WF135         | 36WF135         | 36WF135         | 36WF135         | 36WF135         | 33WF118         | 30WF108         |
| Lgth f Size Cover (Bott. only)            | 6'-1 1/2"       | 6'-7 1/2"       | 5'-5 1/2"       | 4'-5 1/2"       | 4'-9 1/2"       | 4'-1 1/2"       | 4'-5 1/2"       | 4'-2 1/2"       | 3'-11 1/2"      | 2'-11 1/2"      | 2'-11 1/2"      | 2'-11 1/2"      | 2'-11 1/2"      | 2'-11 1/2"      |
| Dead Load Deflection                      | 3 1/2"          | 3 1/8"          | 2 5/8"          | 2 1/4"          | 1 7/8"          | 1 5/8"          | 1 3/8"          | 1 1/8"          | 7/8"            | 5/8"            | 1/2"            | 3/8"            | 1/4"            | 1/4"            |
| Dia. of Spiral Bars                       | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              |
| Mean Dia. of Spiral                       | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              |
| Spiral Pitch 0'-10' from Brng.            | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" | Double @ 5 1/2" |
| " " 10'-20' or E Span                     | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" | Double @ 6 1/2" |
| " " 20'-30' or E Span                     | 4"              | 4"              | 4 1/2"          | 4 1/2"          | 4 1/2"          | 4 1/2"          | 4 1/2"          | 4 1/2"          | 5"              | 5 1/2"          | 6"              | 6"              | 6"              | 6"              |
| " " 30'-40' or E Span                     | 5"              | 5"              | 5"              | 6"              | 6"              | 6"              | 6"              | 6"              | 5"              | 5"              | 5"              | 5"              | 5"              | 5"              |
| " " 40'-E Span                            | 6 1/2"          | 6 1/2"          | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              | 6"              |
| *Tot. Struct. Steel (1 span) (lbs.)       | 163,590         | 145,670         | 126,840         | 112,050         | 92,150          | 76,670          | 62,740          | 52,610          | 45,490          | 41,150          | 35,830          | 32,390          | 24,240          | 19,280          |
| Reinforcing Bars - S1                     | 376             | 376             | 356             | 336             | 316             | 296             | 276             | 256             | 236             | 216             | 196             | 176             | 156             | 136             |
| " " - S2                                  | 225             | 225             | 225             | 225             | 225             | 225             | 225             | 150             | 150             | 150             | 150             | 150             | 150             | 75              |
| " " - S3                                  | 30              | 30              | 30              | 30              | 30              | 30              | 30              | 20              | 20              | 20              | 20              | 20              | 20              | 10              |
| " " - S4                                  | 132             | 126             | 120             | 112             | 106             | 100             | 92              | 86              | 80              | 72              | 66              | 60              | 52              | 46              |
| " " - S5                                  | 16              | 16              | 16              | 16              | 16              | 16              | 16              | 16              | 16              | 16              | 16              | 16              | 16              | 16              |
| " " - S6A                                 | 52              | 52              | 52              | 52              | 52              | 52              | 52              | 52              | 52              | 52              | 52              | 52              | 52              | 52              |
| " " - S7                                  | 44              | 44              | 44              | 44              | 44              | 44              | 44              | 44              | 44              | 44              | 44              | 44              | 44              | 44              |
| Tot. Weight - Reinf. Bars (lbs.)          | 25,300          | 24,100          | 22,900          | 21,700          | 20,400          | 19,300          | 18,000          | 16,600          | 15,400          | 14,200          | 13,000          | 11,800          | 10,600          | 9,200           |
| Approx. Wt. Spiral Reinf. (lbs.)          | 2,580           | 2,550           | 2,380           | 2,190           | 2,160           | 2,040           | 1,990           | 1,860           | 1,700           | 1,560           | 1,440           | 1,300           | 1,180           | 1,060           |
| Tot. Cu Yds. Conc. Class AA (cu yds.)     | 116             | 111             | 106             | 101             | 95              | 90              | 85              | 79              | 73              | 68              | 63              | 58              | 51              | 45              |
| Tot. Wt. Bitum. Conc. Pavt. (Mod.) (tons) | 32              | 30              | 29              | 27              | 26              | 24              | 22              | 21              | 19              | 18              | 16              | 15              | 13              | 12              |
| Tar Emulsion for Bridge Floors (gals)     | 132             | 125             | 119             | 112             | 105             | 99              | 92              | 85              | 79              | 72              | 65              | 59              | 52              | 45              |
| Approx. Quantity 3/4" x 7 Studs           | 3,180           | 3,120           | 2,940           | 2,680           | 2,640           | 2,500           | 2,440           | 2,280           | 2,120           | 1,900           | 1,760           | 1,600           | 1,440           | 1,280           |
| Approx. Quantity 3/4" x 7 Studs           | 2,110           | 2,080           | 1,960           | 1,790           | 1,760           | 1,670           | 1,630           | 1,520           | 1,410           | 1,270           | 1,170           | 1,060           | 950             | 840             |

REINFORCING STEEL SCHEDULE

| Span | S1-#5  | S2-#5  | S3-#6  | S4-#4  | S5-#5  | S6A-#4 |
|------|--------|--------|--------|--------|--------|--------|
|      | 34'-4" | 34'-4" | 34'-4" | 34'-4" | 34'-4" | 34'-4" |
|      | Str.   | Str.   | Str.   | Str.   | Str.   | Str.   |
|      | Length | Length | Length | Length | Length | Length |
| 34   | 33'-6" | 33'-6" | 33'-6" | 33'-6" | 33'-6" | 33'-6" |
| 39   | 20'-3" | 20'-6" | 20'-6" | 20'-6" | 20'-6" | 20'-6" |
| 44   | 22'-9" | 23'-0" | 23'-0" | 23'-0" | 23'-0" | 23'-0" |
| 49   | 25'-3" | 25'-6" | 25'-6" | 25'-6" | 25'-6" | 25'-6" |
| 54   | 27'-9" | 28'-0" | 28'-0" | 28'-0" | 28'-0" | 28'-0" |
| 59   | 30'-3" | 30'-6" | 30'-6" | 30'-6" | 30'-6" | 30'-6" |
| 64   | 32'-9" | 33'-0" | 33'-0" | 33'-0" | 33'-0" | 33'-0" |
| 69   | 24'-3" | 24'-6" | 24'-6" | 24'-6" | 24'-6" | 24'-6" |
| 74   | 26'-0" | 26'-3" | 26'-3" | 26'-3" | 26'-3" | 26'-3" |
| 79   | 27'-6" | 28'-0" | 28'-0" | 28'-0" | 28'-0" | 28'-0" |
| 84   | 29'-3" | 29'-6" | 29'-6" | 29'-6" | 29'-6" | 29'-6" |
| 89   | 31'-0" | 31'-3" | 31'-3" | 31'-3" | 31'-3" | 31'-3" |
| 94   | 32'-6" | 33'-0" | 33'-0" | 33'-0" | 33'-0" | 33'-0" |
| 99   | 34'-3" | 34'-6" | 34'-6" | 34'-6" | 34'-6" | 34'-6" |

DEPARTMENT OF HIGHWAYS  
 STANDARD STRUCTURES

SCB-30-62

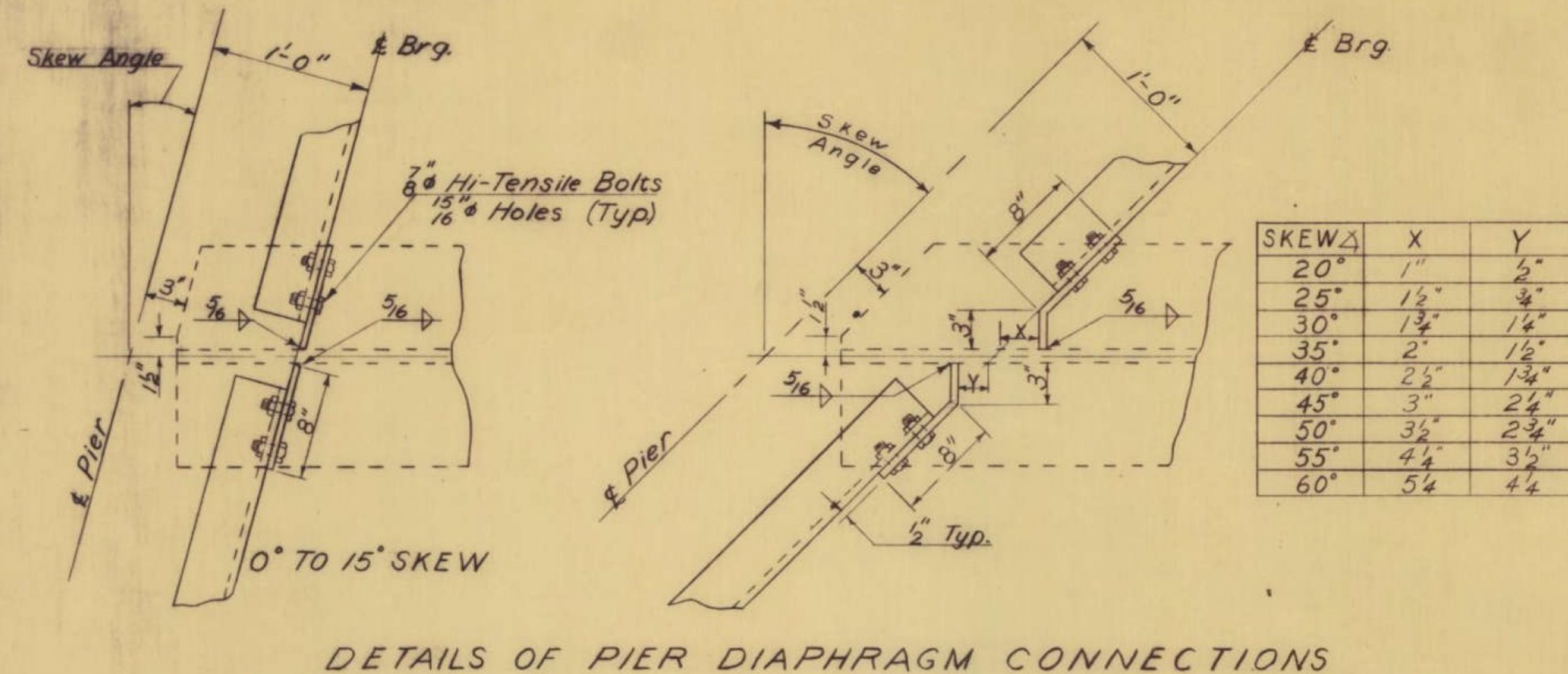






VERMONT  
DEPARTMENT OF HIGHWAYS  
STRUCTURE STANDARDS





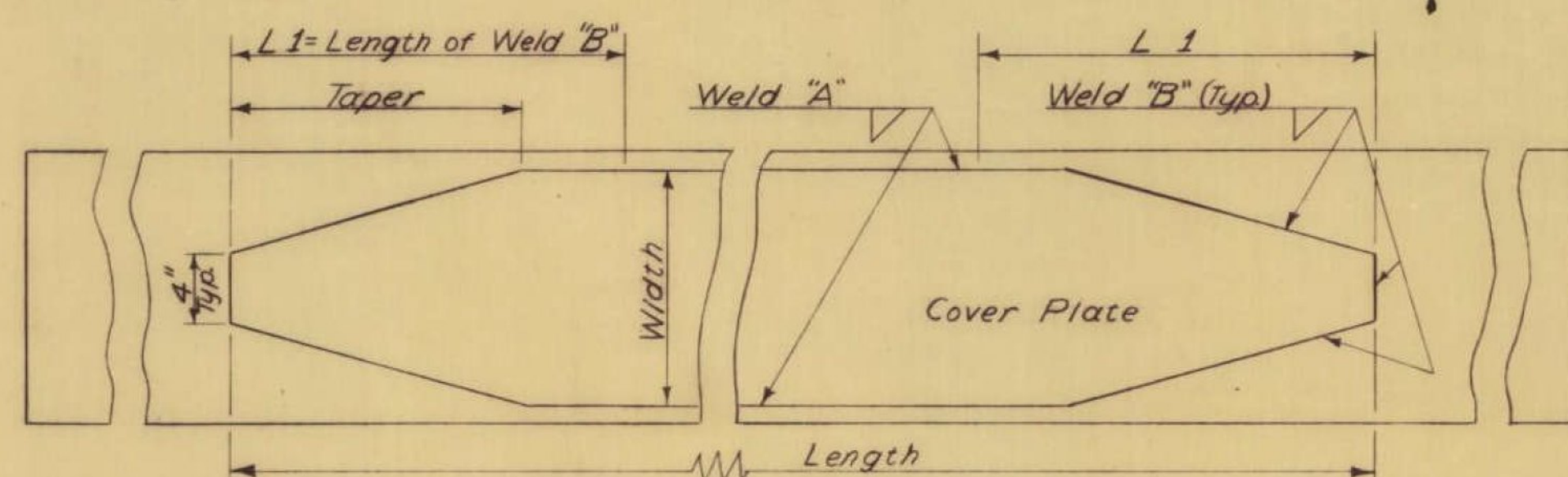
DETAILS OF PIER DIAPHRAGM CONNECTIONS

Max. Design 7'-6" Bm Spacing SCB-24, 30, 38, 44-62

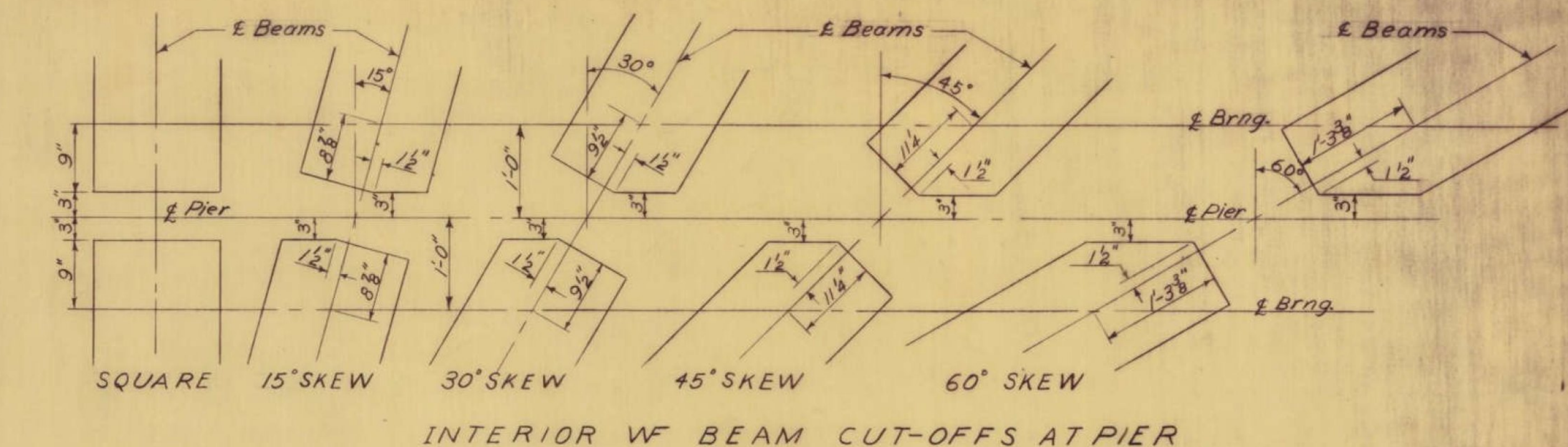
| SPAN   | COVER PL. LENGTH | WIDTH | THICK-NESS | TAPER | WELD "A" | WELD "B" | L 1       |
|--------|------------------|-------|------------|-------|----------|----------|-----------|
| 99'-0" | 66'-1"           | 14"   | 1 1/2"     | 1'-6" | 3/8"     | 1/2"     | 3'-5 1/2" |
| 94'-0" | 65'-7"           | 14"   | 1 1/2"     | 1'-6" | 3/8"     | 1/2"     | 3'-5 1/2" |
| 89'-0" | 59'-5"           | 14"   | 1 1/4"     | 1'-6" | 3/8"     | 1/2"     | 2'-10"    |
| 84'-0" | 49'-5"           | 14"   | 3/8"       | 1'-6" | 3/8"     | 1/2"     | 1'-11"    |
| 79'-0" | 49'-10"          | 10"   | 1 1/4"     | 1'-0" | 3/8"     | 1/2"     | 2'-0"     |
| 74'-0" | 47'-1"           | 10"   | 1 1/8"     | 1'-0" | 3/8"     | 1/2"     | 1'-9 1/2" |
| 69'-0" | 45'-9"           | 10"   | 1"         | 1'-0" | 3/8"     | 1/2"     | ---       |
| 64'-0" | 42'-5"           | 10"   | 3/8"       | 1'-0" | 3/8"     | 1/2"     | ---       |
| 59'-0" | 31'-11"          | 10"   | 1/2"       | 1'-0" | 3/8"     | 1/2"     | ---       |
| 54'-0" | 27'-1"           | 8"    | 1/2"       | 1'-0" | 3/8"     | 1/2"     | ---       |

Max. Design 7'-0" Bm Spacing SCB-42-62

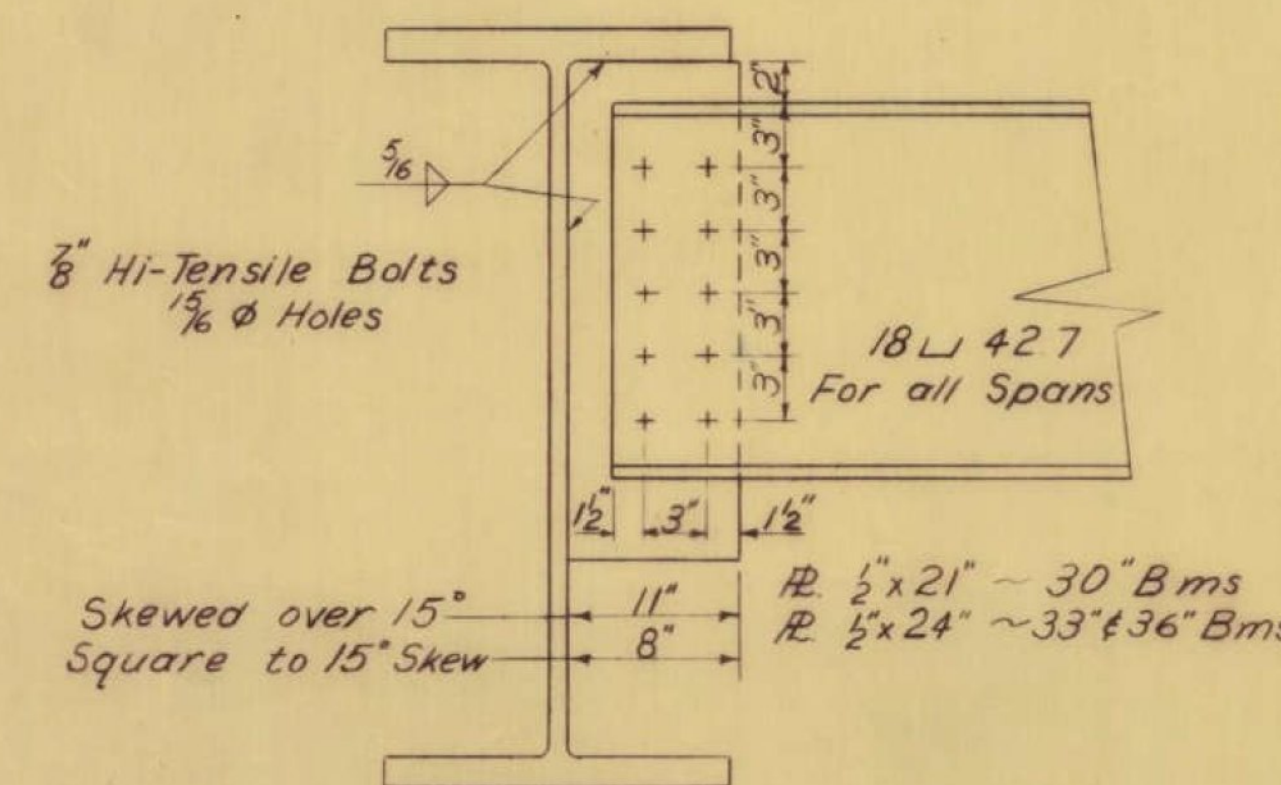
| COVER PL. LENGTH | WIDTH | THICK-NESS | TAPER | WELD "A" | WELD "B" | L 1       |
|------------------|-------|------------|-------|----------|----------|-----------|
| 67'-5"           | 14"   | 1 1/2"     | 1'-6" | 3/8"     | 1/2"     | 3'-5"     |
| 64'-7"           | 14"   | 1 3/8"     | 1'-6" | 3/8"     | 1/2"     | 3'-5 1/2" |
| 54'-9"           | 14"   | 1"         | 1'-6" | 3/8"     | 1/2"     | 2'-3"     |
| 45'-1"           | 14"   | 3/8"       | 1'-6" | 3/8"     | 1/2"     | ---       |
| 48'-11"          | 10"   | 1 1/8"     | 1'-0" | 3/8"     | 1/2"     | 1'-9 1/2" |
| 48'-1"           | 10"   | 1"         | 1'-0" | 3/8"     | 1/2"     | ---       |
| 41'-3"           | 10"   | 3/4"       | 1'-0" | 3/8"     | 1/2"     | ---       |
| 37'-8"           | 10"   | 3/8"       | 1'-0" | 3/8"     | 1/2"     | ---       |
| 29'-1"           | 8"    | 1/2"       | 1'-0" | 3/8"     | 1/2"     | ---       |
| 27'-1"           | 8"    | 1/2"       | 1'-0" | 3/8"     | 1/2"     | ---       |



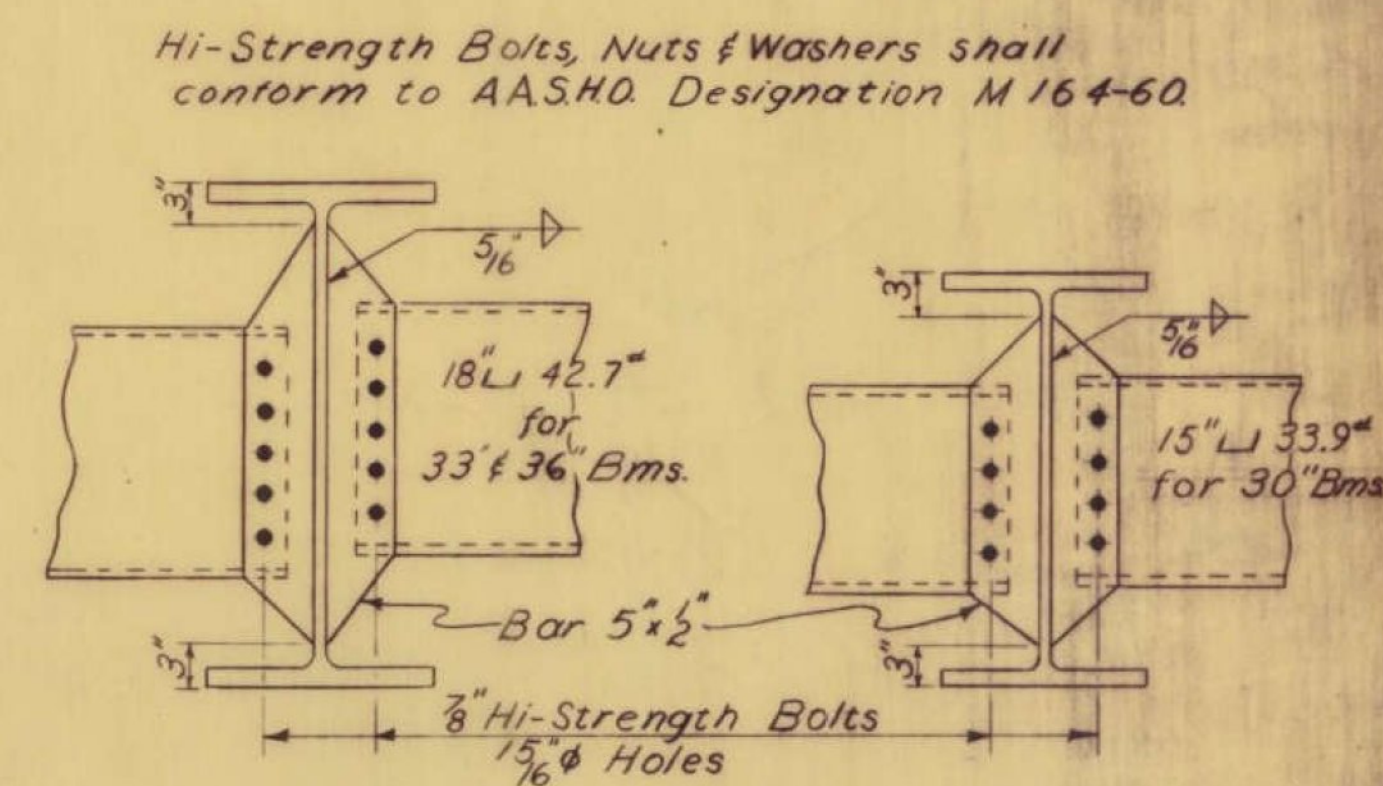
COVER PLATE DETAILS



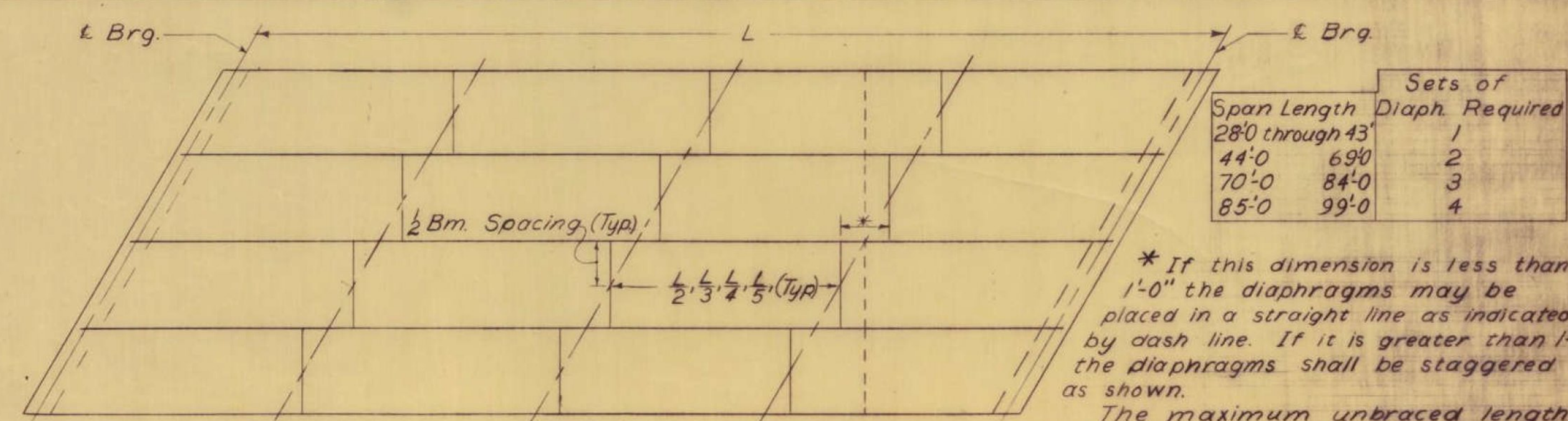
INTERIOR WF BEAM CUT-OFFS AT PIER



PIER DIAPHRAGMS



INTERMEDIATE DIAPHRAGMS



DIAPHRAGM LOCATION PLAN

| Span Length        | Sets of Diaph. Required |
|--------------------|-------------------------|
| 28'-0" through 43' | 1                       |
| 44'-0" 69'-0"      | 2                       |
| 70'-0" 84'-0"      | 3                       |
| 85'-0" 99'-0"      | 4                       |

\* If this dimension is less than 1'-0" the diaphragms may be placed in a straight line as indicated by dash line. If it is greater than 1'-0" the diaphragms shall be staggered as shown.  
The maximum unbraced length of beam in all cases shall be 25'-0"

REVISIONS & CORRECTIONS  
Added size of Diaphragms on Detail D 6/21/63 M

Drawn By: *M. J. O'Connell* Date: Dec 1, 1962  
Traced By: *M. J. O'Connell* Date: Dec 1, 1962  
Checked By: *E. E. R. W. M. S. R. S. H.* Date: Dec 1, 1962  
Recommended For Approval: *M. J. O'Connell* Date: 12/1/62  
Recommended For Approval: *R. H. O'Connell* Date: 1/4/63  
Approved By: *A. D. O'Connell* Date: 1/4/63  
Chief Engineer

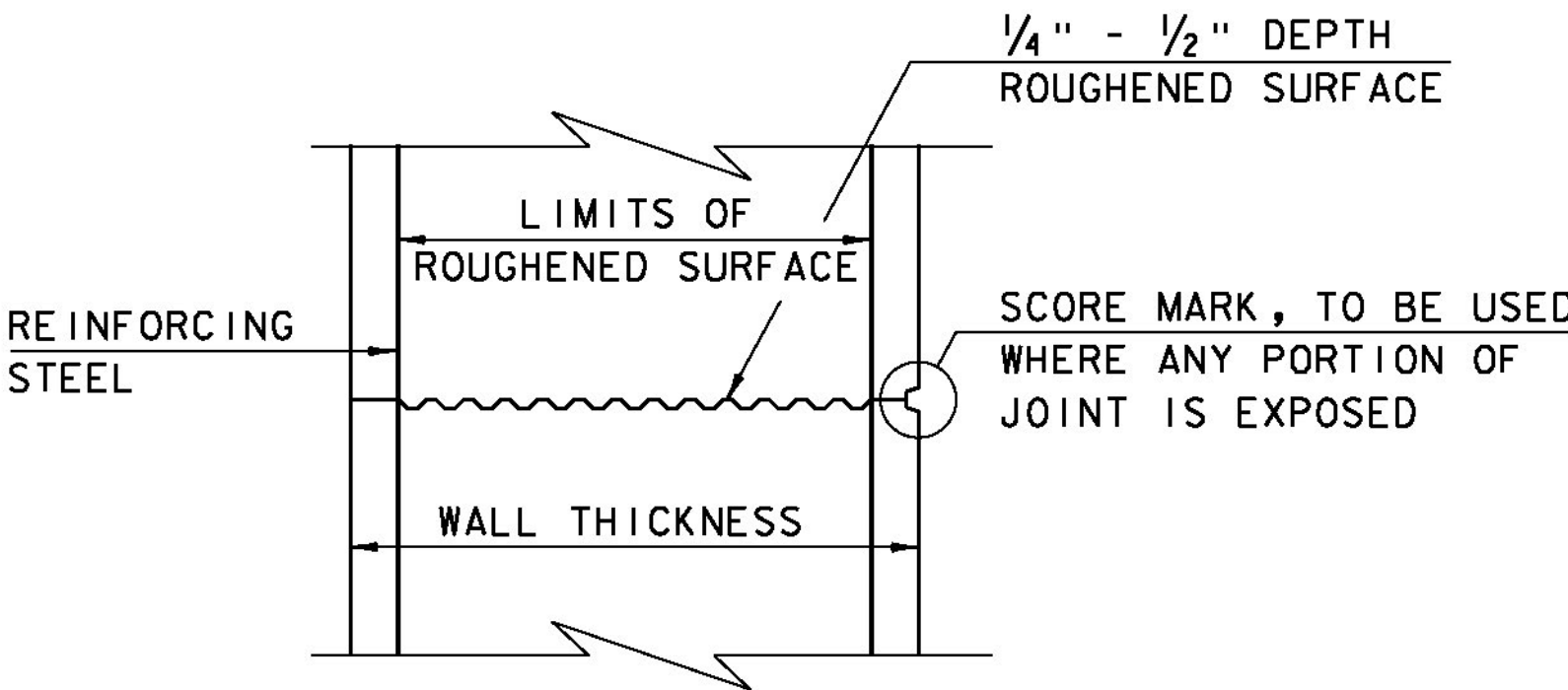
DETAILS OF WF BEAM BRIDGES  
STRUCTURAL STEEL DETAILS  
A D E DIAPHRAGM DETAILS  
B WF BEAM CUT-OFFS  
C COVER PLATE DETAILS

VERMONT  
DEPARTMENT OF HIGHWAYS  
STRUCTURE STANDARDS  
**SCB-D7-62**



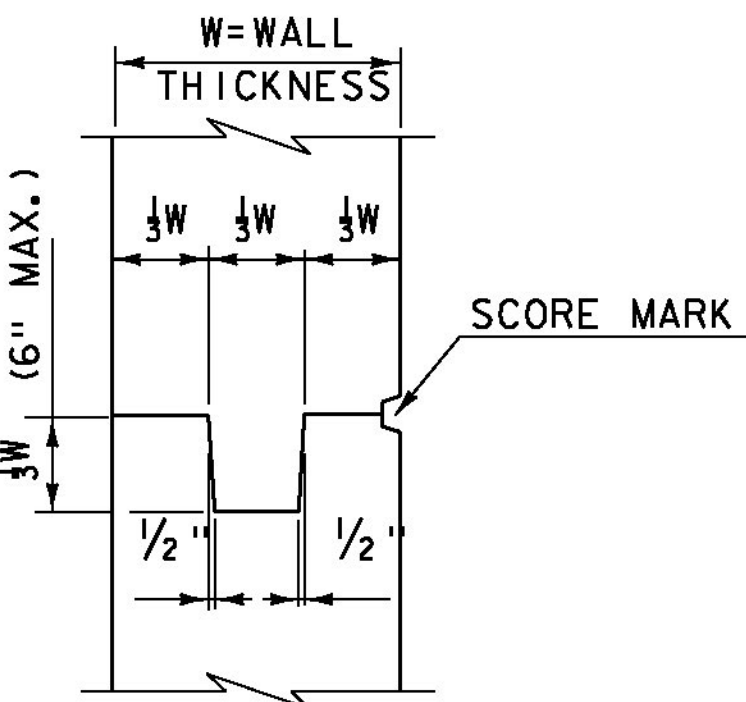
CONCRETE GENERAL NOTES

- 1. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" x 1"
- 2. REINFORCING STEEL SIZE AND SPACING SHOWN IN THE PLANS IS BASED ON 60 KSI STEEL, UNLESS NOTED OTHERWISE. WITH THE ENGINEER'S PERMISSION, BAR SIZE AND SPACING MAY BE MODIFIED ACCORDING TO THE LATEST AASHTO LRFD BRIDGE DESIGN SPECIFICATION AND STRUCTURES DESIGN MANUAL WHEN USING HIGHER STRENGTH STEEL.

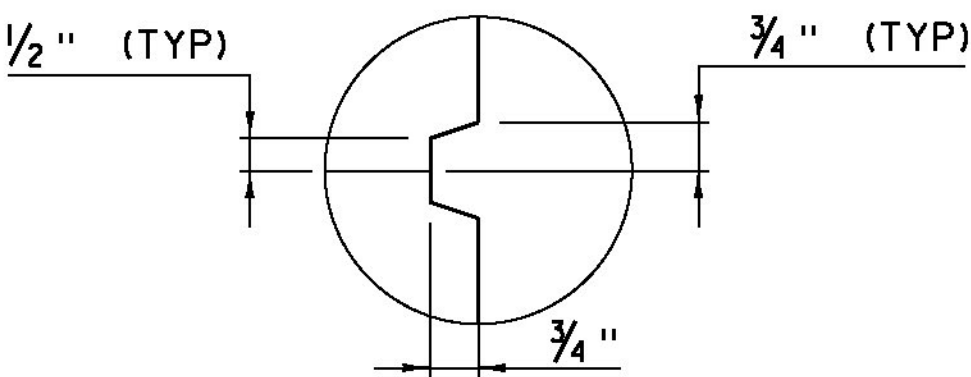


TYPICAL HORIZONTAL CONSTRUCTION JOINT  
(NOT TO SCALE)

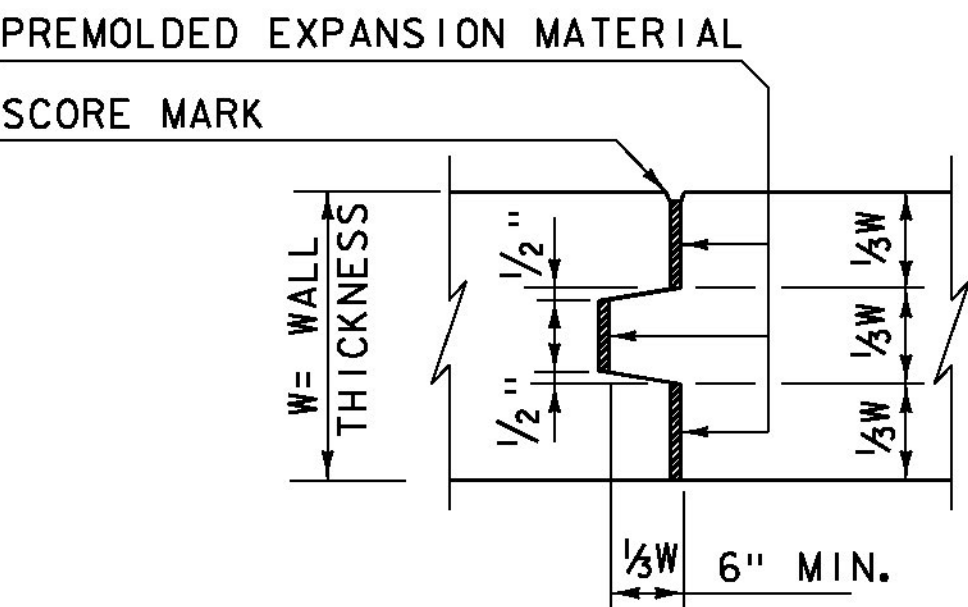
- 1. THE SURFACE OF THE CONCRETE CONSTRUCTION JOINTS SHALL BE CLEANED AND FREE OF LAITANCE.
- 2. IMMEDIATELY BEFORE NEW CONCRETE IS PLACED, ALL CONSTRUCTION JOINTS SHALL BE WETTED AND STANDING WATER REMOVED.



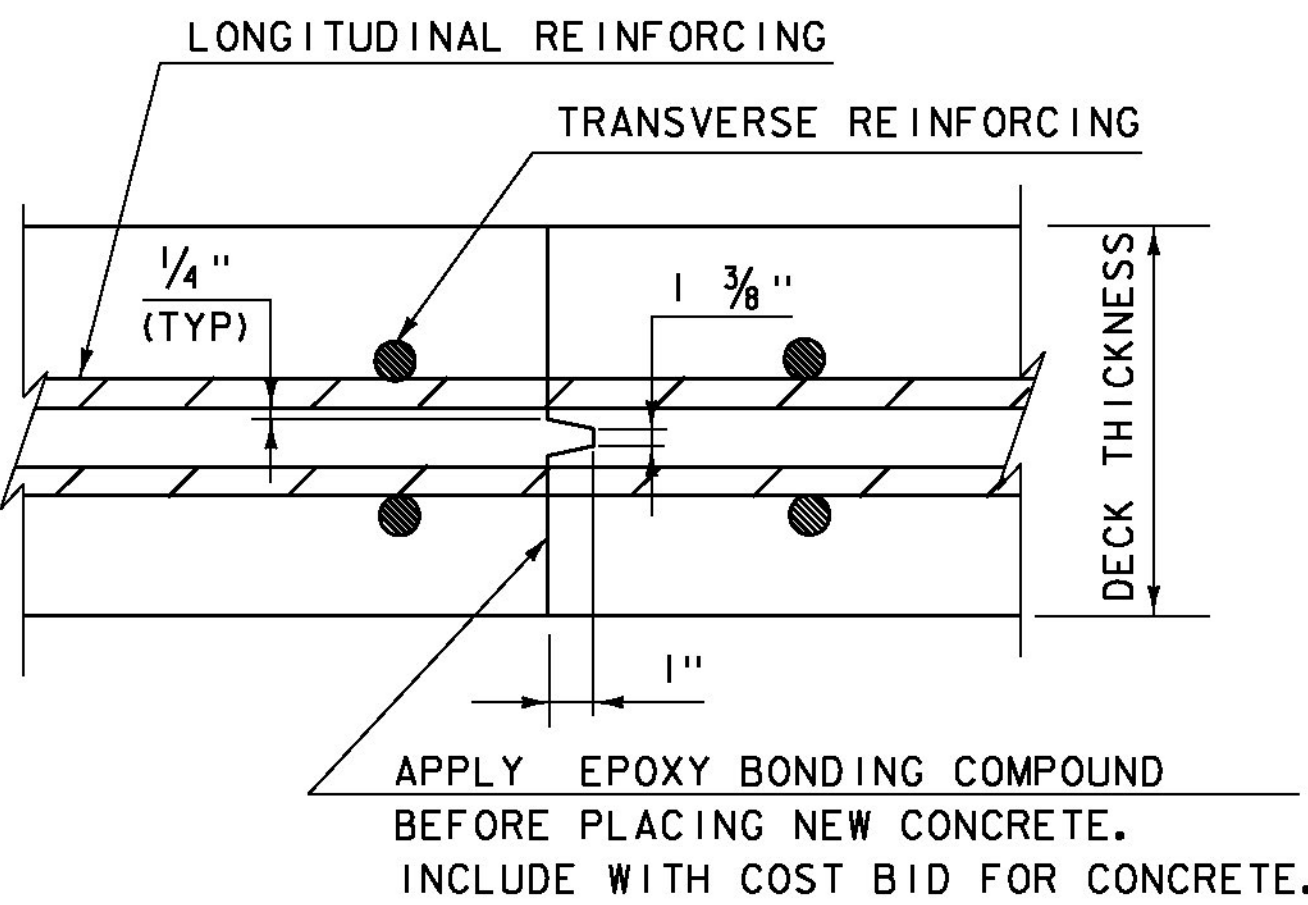
TYPICAL CONCRETE CONSTRUCTION JOINT  
(NOT TO SCALE)



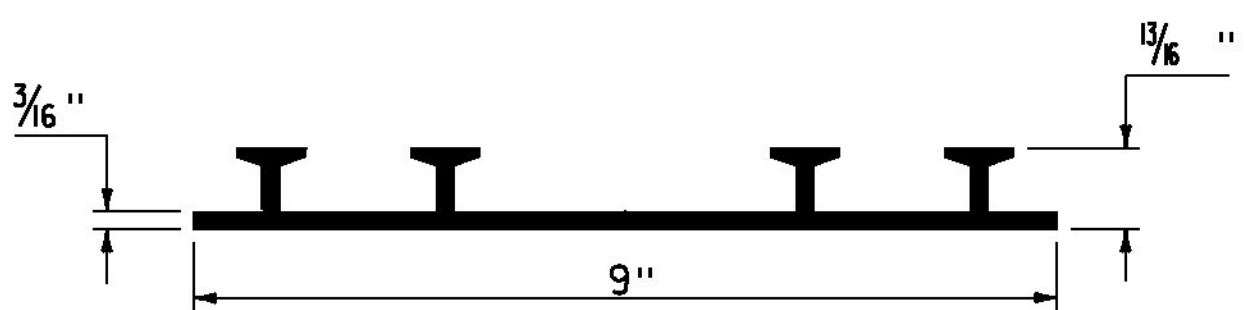
SCORE MARK DETAIL  
(NOT TO SCALE)



TYPICAL CONCRETE EXPANSION JOINT  
(NOT TO SCALE)



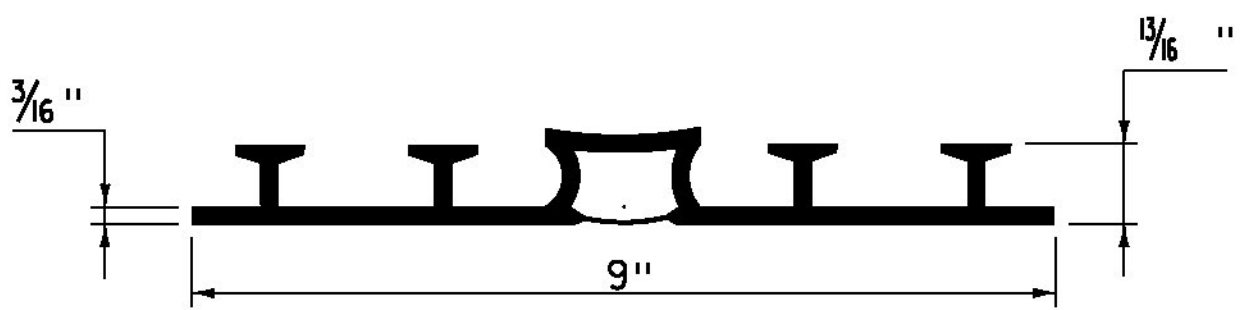
TRANSVERSE BRIDGE SLAB  
CONSTRUCTION JOINT DETAILS  
(NOT TO SCALE)



P.V.C. WATERSTOP FOR  
CONSTRUCTION JOINTS  
(NOT TO SCALE)

PAYMENT FOR THE P.V.C. WATERSTOP SHALL BE INCIDENTAL TO THE UNIT BID PRICE FOR THE ADJACENT CONCRETE.

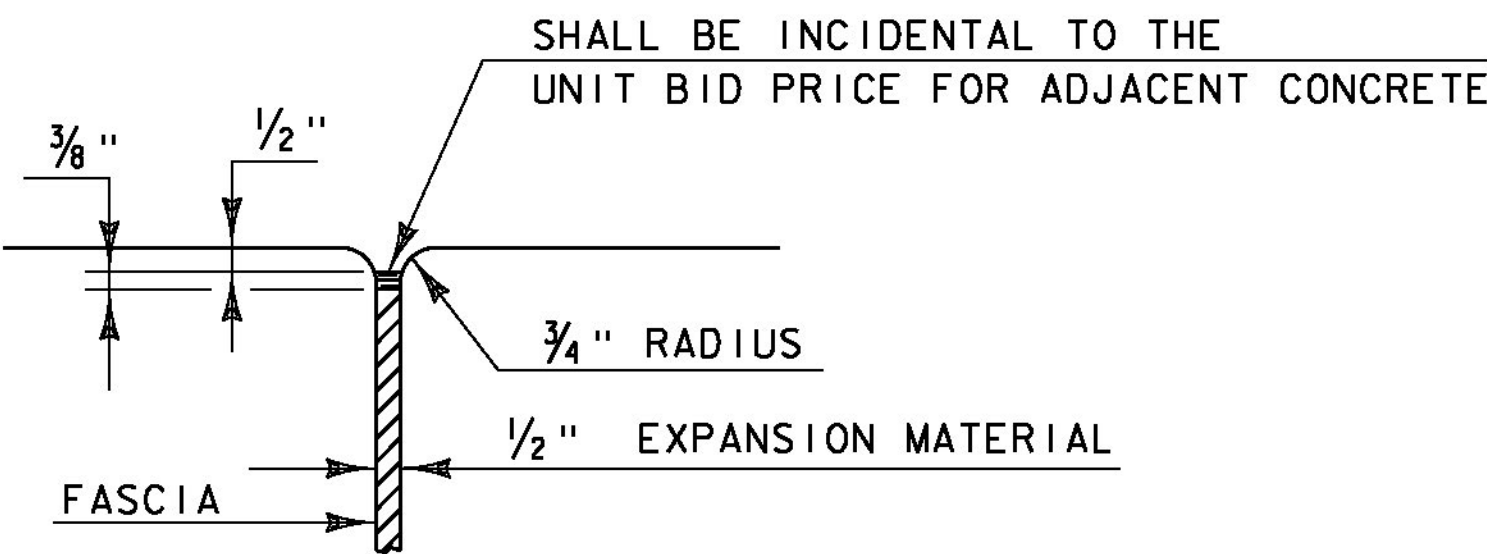
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



P.V.C. WATERSTOP FOR  
EXPANSION JOINTS  
(NOT TO SCALE)

PAYMENT FOR THE P.V.C. WATERSTOP SHALL BE INCIDENTAL TO THE UNIT BID PRICE FOR THE ADJACENT CONCRETE.

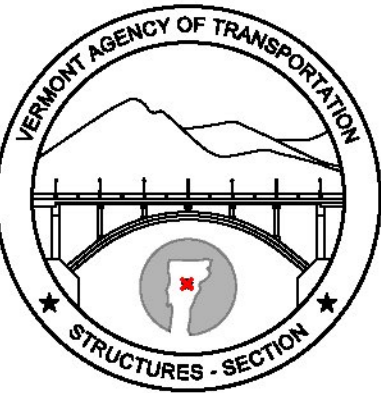
OTHER CONFIGURATIONS OF WATERSTOP MAY BE USED UPON APPROVAL OF THE ENGINEER.



JOINT BETWEEN FASCIA  
AND WINGWALL  
(NOT TO SCALE)

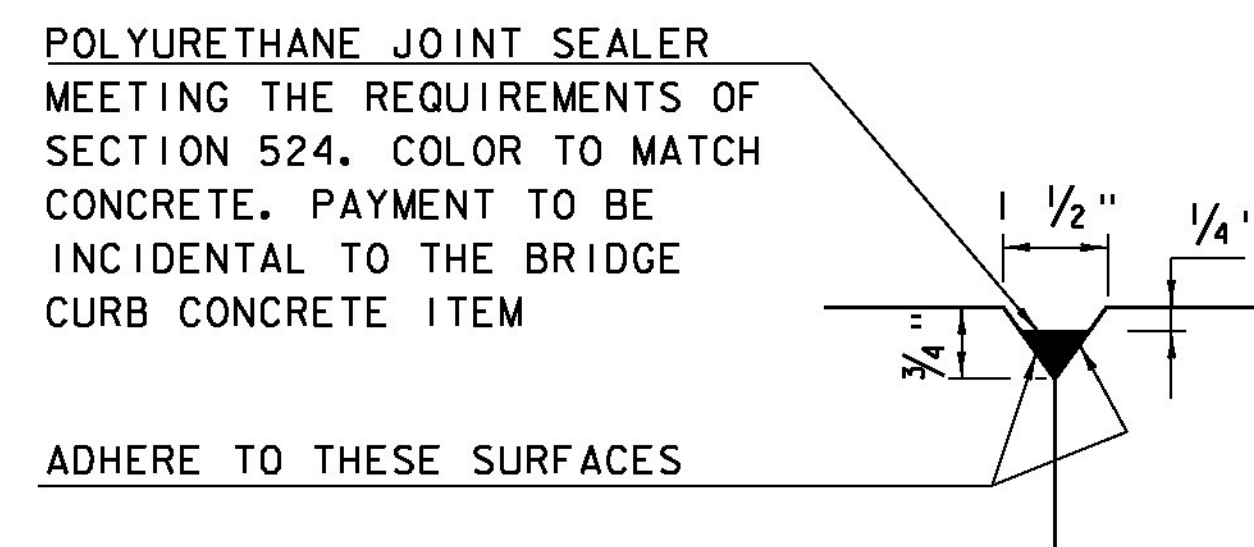
| REVISIONS        |                                                               |
|------------------|---------------------------------------------------------------|
| MAY 7, 2010      | APPROVED FOR USE BY VAOT STRUCTURES SECTION                   |
| FEBRUARY 9, 2012 | REBAR SUBSTITUTION ALLOWANCE ADDED TO CONCRETE GENERAL NOTES. |
|                  |                                                               |
|                  |                                                               |
|                  |                                                               |
|                  |                                                               |
|                  |                                                               |

CONCRETE  
DETAILS AND NOTES

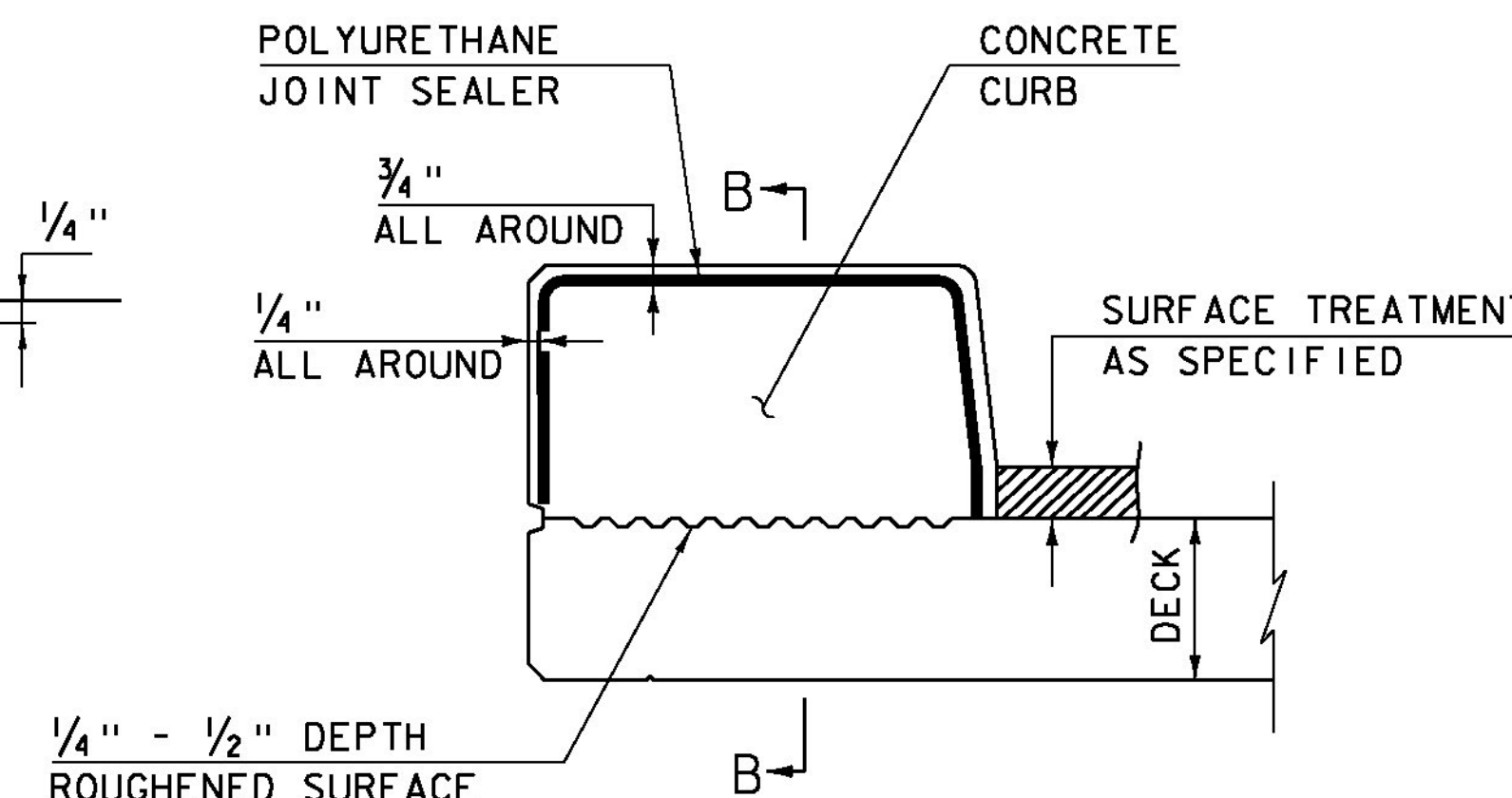


STRUCTURES  
DETAIL  
SD-501.00



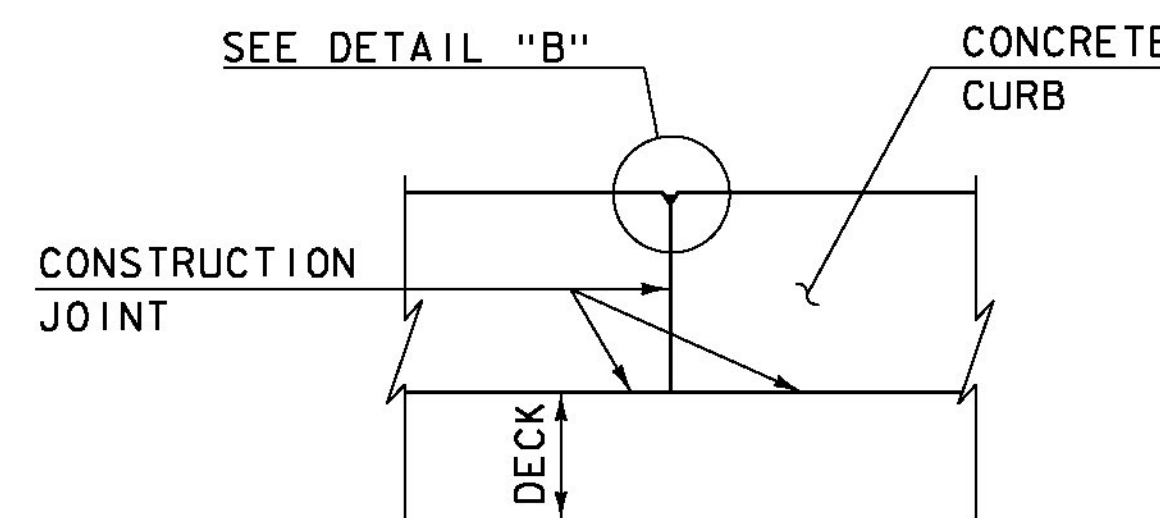


DETAIL "B"  
(NOT TO SCALE)

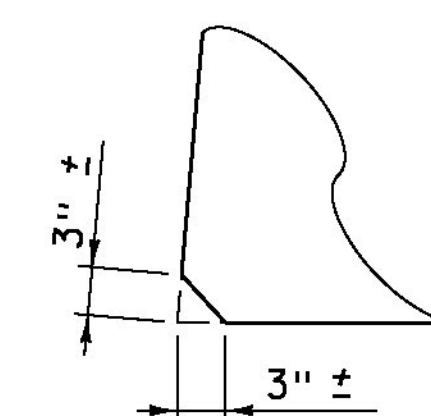


CONCRETE CURB JOINT SECTION  
(NOT TO SCALE)

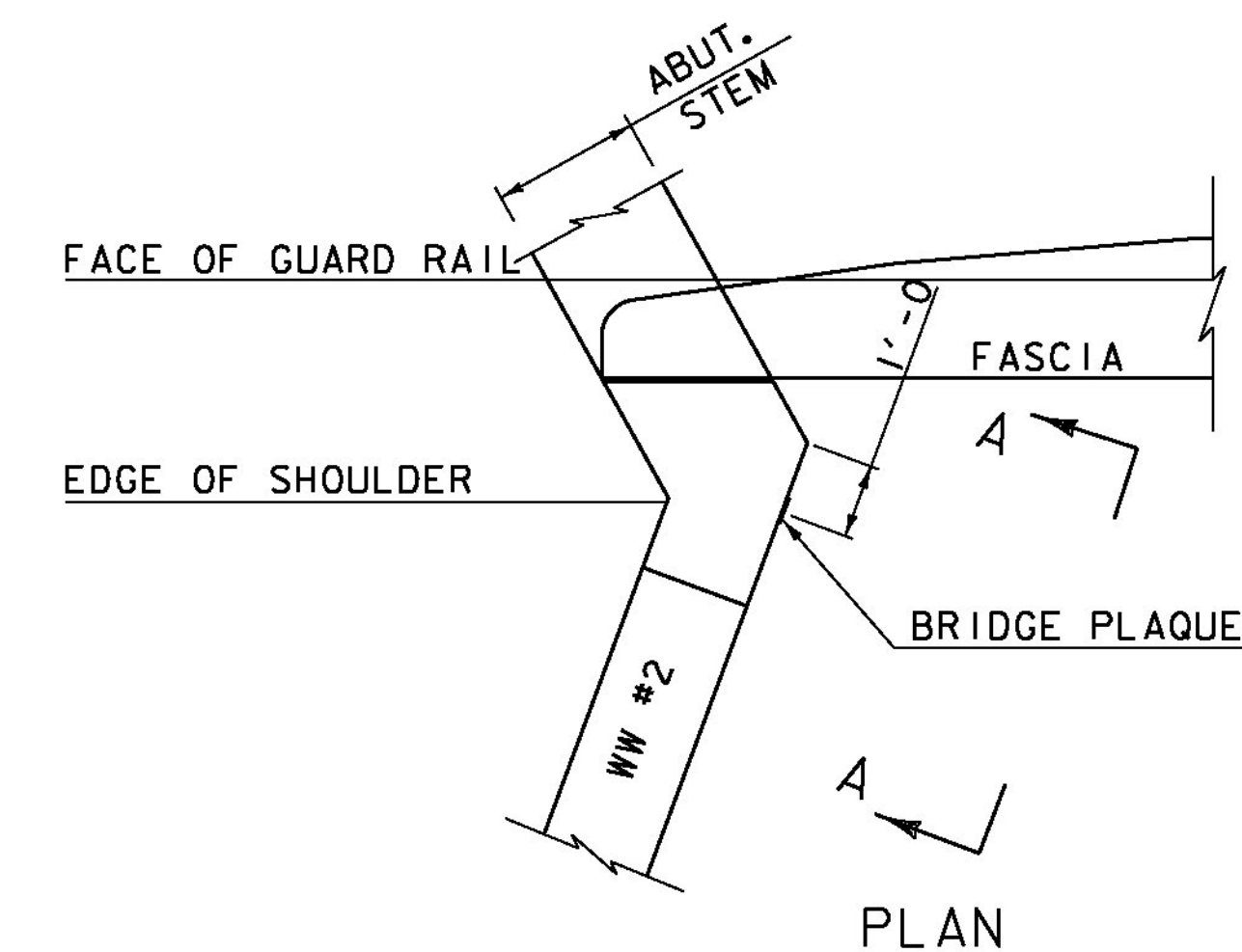
1. SEE TYPICAL HORIZONTAL CONSTRUCTION JOINT DETAIL FOR ADDITIONAL INFORMATION



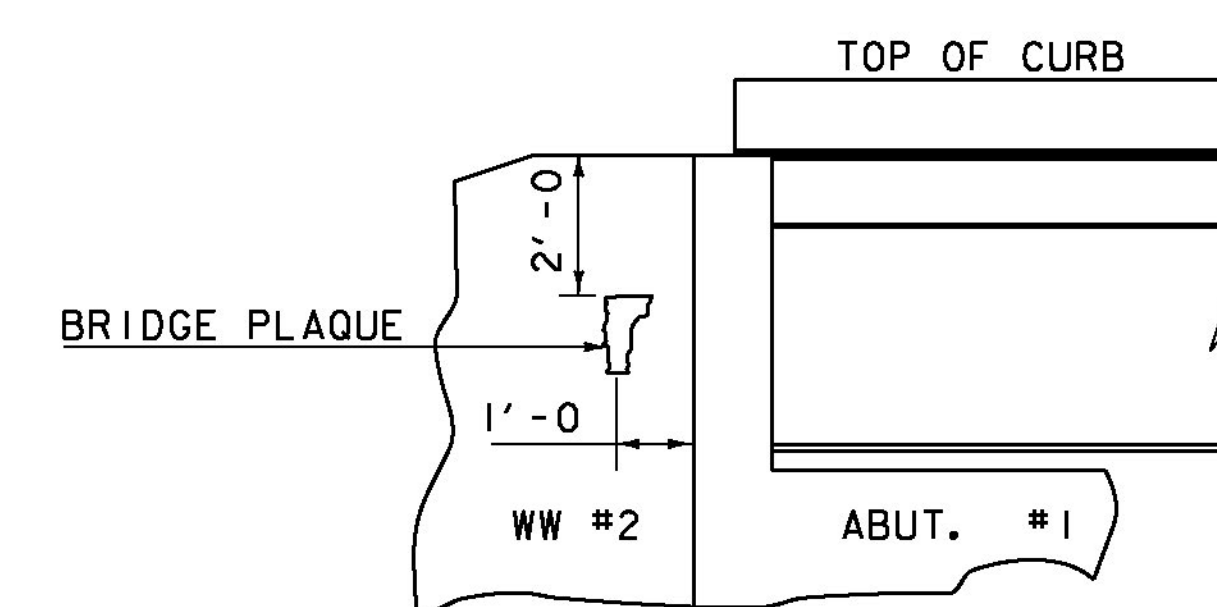
SECTION B - B  
(NOT TO SCALE)



ACUTE ANGLE  
CLIP DETAIL  
(NOT TO SCALE)



PLAN



VIEW "A - A"

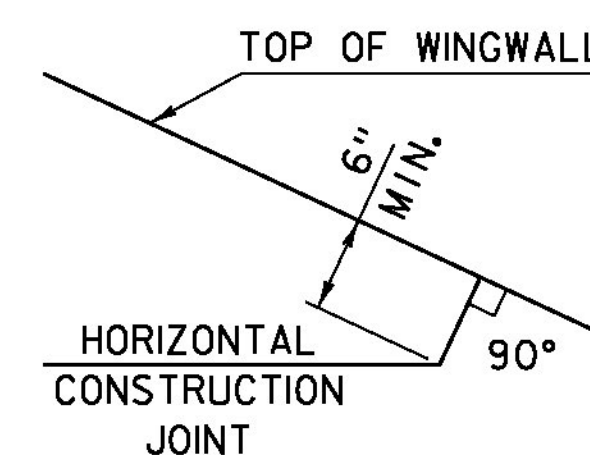
BRIDGE PLAQUE  
(NOT TO SCALE)

THE BRIDGE PLAQUE WILL BE SUPPLIED BY THE AGENCY OF TRANSPORTATION AND SHALL BE INSTALLED BY THE CONTRACTOR AT ABUTMENT #1 ON THE RIGHT SIDE AS SHOWN OR AS DIRECTED BY THE ENGINEER.

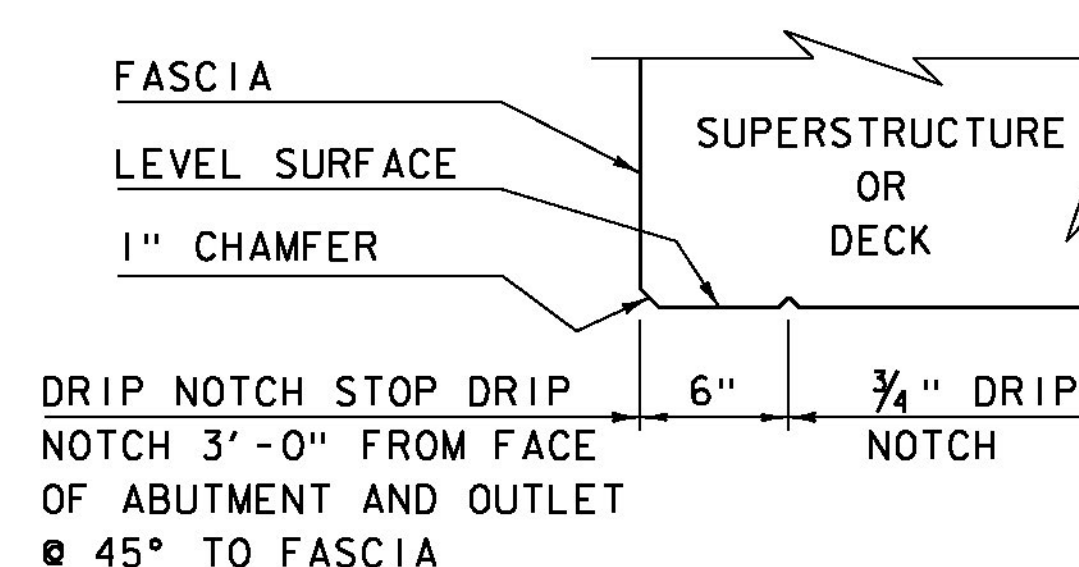
PAYMENT FOR INSTALLATION OF THE BRIDGE PLAQUE SHALL BE INCIDENTAL TO THE ADJACENT CONCRETE.

### CONCRETE CURB JOINT NOTES

1. CONCRETE CURBS MAY BE PLACED IN ONE CONTINUOUS OPERATION IF AN APPROVED SHRINKAGE REDUCING ADMIXTURE LISTED IN THE SPECIAL PROVISIONS IS USED WITH THE CONCRETE MIX DESIGN. PAYMENT FOR THE SHRINKAGE REDUCING ADMIXTURE WILL BE INCIDENTAL TO THE BRIDGE CURB CONCRETE ITEM.
2. IF THE CONTRACTOR CHOOSES NOT TO USE AN APPROVED SHRINKAGE REDUCING ADMIXTURE, THE CURBS SHALL BE CONSTRUCTED WITH CONSTRUCTION JOINTS SPACED AT A MAXIMUM OF 15'-0" CENTER TO CENTER AND 2'-0" MINIMUM FROM THE CENTER OF NEAREST BRIDGE RAILING POST.
3. ON MULTI-SPAN CONTINUOUS SUPERSTRUCTURES, REGARDLESS OF WHETHER APPROVED SHRINKAGE REDUCING ADMIXTURE IS USED, CURB JOINTS SHALL BE LOCATED OVER THE CENTERLINE OF PIERS AND 7'-0" EACH SIDE OF THE CENTERLINE OF EACH PIER.
4. WHEN CURB JOINTS ARE USED THE CURBS SHALL BE PLACED IN ALTERNATE SECTIONS WITH A MINIMUM OF 48 HOUR DELAY BETWEEN ADJACENT PLACEMENTS.
5. LONGITUDINAL REINFORCING SHALL BE CONTINUOUS THROUGH CURB CONSTRUCTION JOINTS. CURB STIRRUP BARS SHALL BE TURNED AS NECESSARY TO MAINTAIN COVER IN THE FLARED CURB ENDS.
6. THE JOINT SPACING AND DETAILS SHOWN SHALL APPLY TO SIDEWALKS WHEN SHOWN IN THE PLANS.



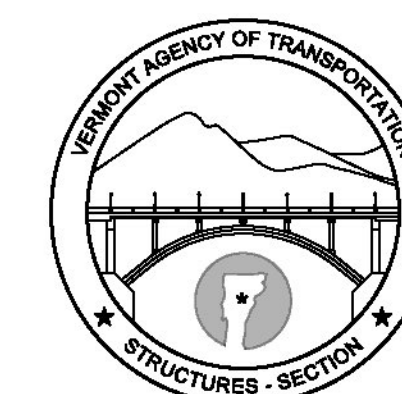
HORIZONTAL WINGWALL  
CONSTRUCTION JOINT  
(NOT TO SCALE)



DRIP NOTCH DETAIL  
(NOT TO SCALE)

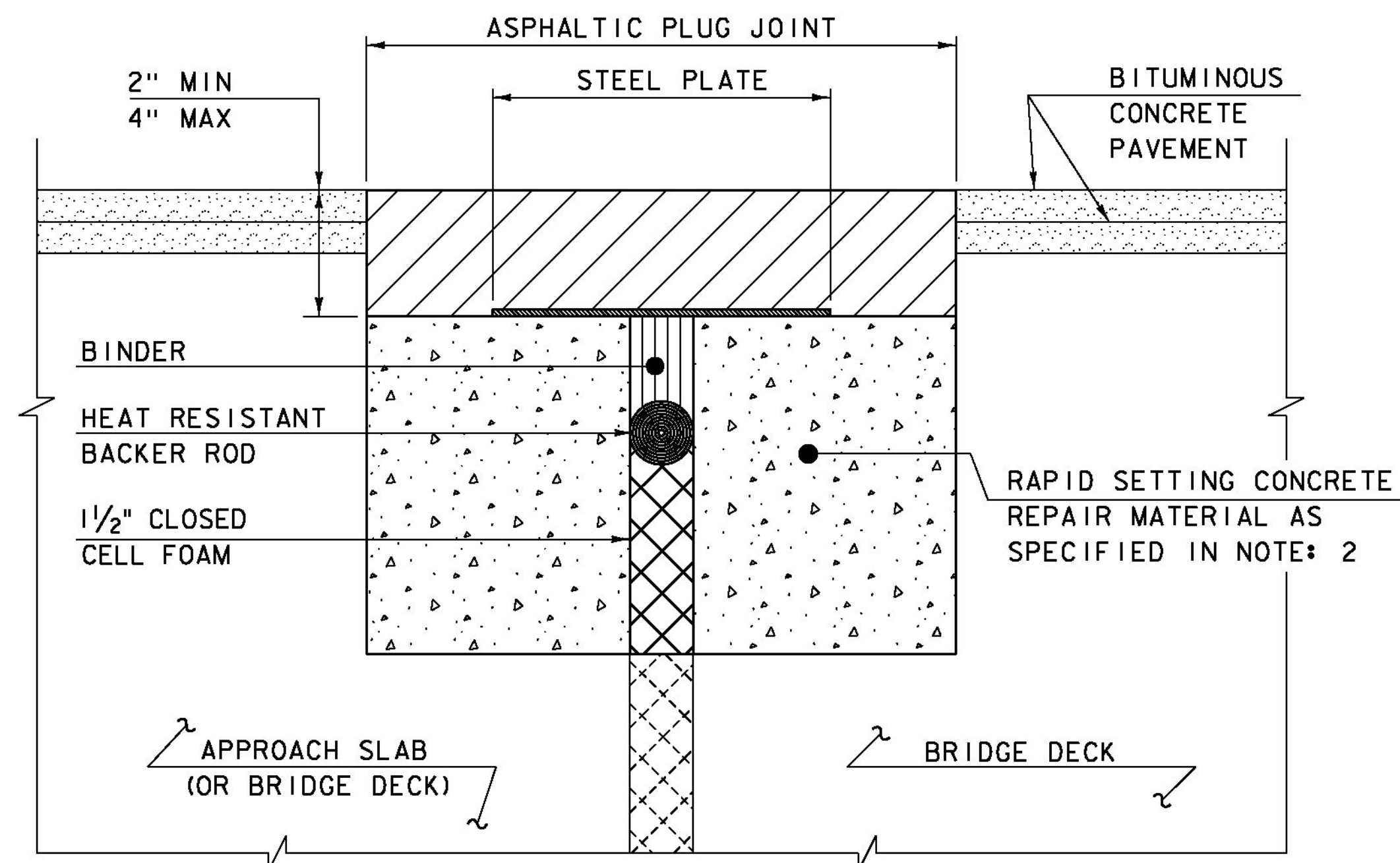
| REVISIONS        |                                                     |
|------------------|-----------------------------------------------------|
| MAY 7, 2010      | APPROVED FOR USE BY VAOT STRUCTURES SECTION         |
| JUNE 4, 2010     | MODIFIED AND ADDED TWO DETAILS                      |
| OCTOBER 10, 2012 | MODIFIED HORZ. JOINT WINGWALL ADD 6" MIN. DIMENSION |
|                  |                                                     |
|                  |                                                     |
|                  |                                                     |
|                  |                                                     |

## CONCRETE DETAILS AND NOTES



STRUCTURES  
DETAIL  
SD-502.00

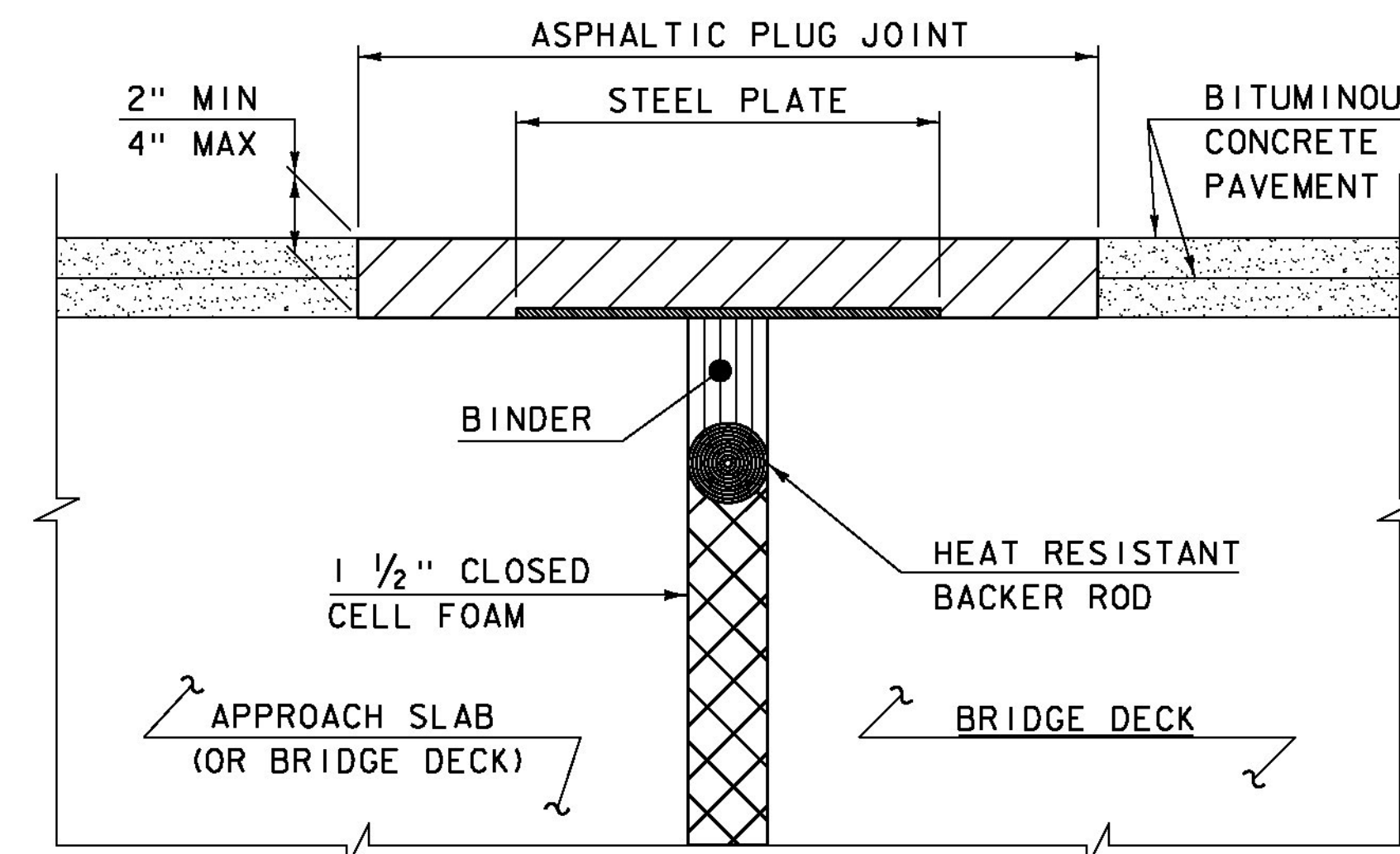




ASPHALTIC PLUG JOINT DETAIL - REHAB

**NOTES:**

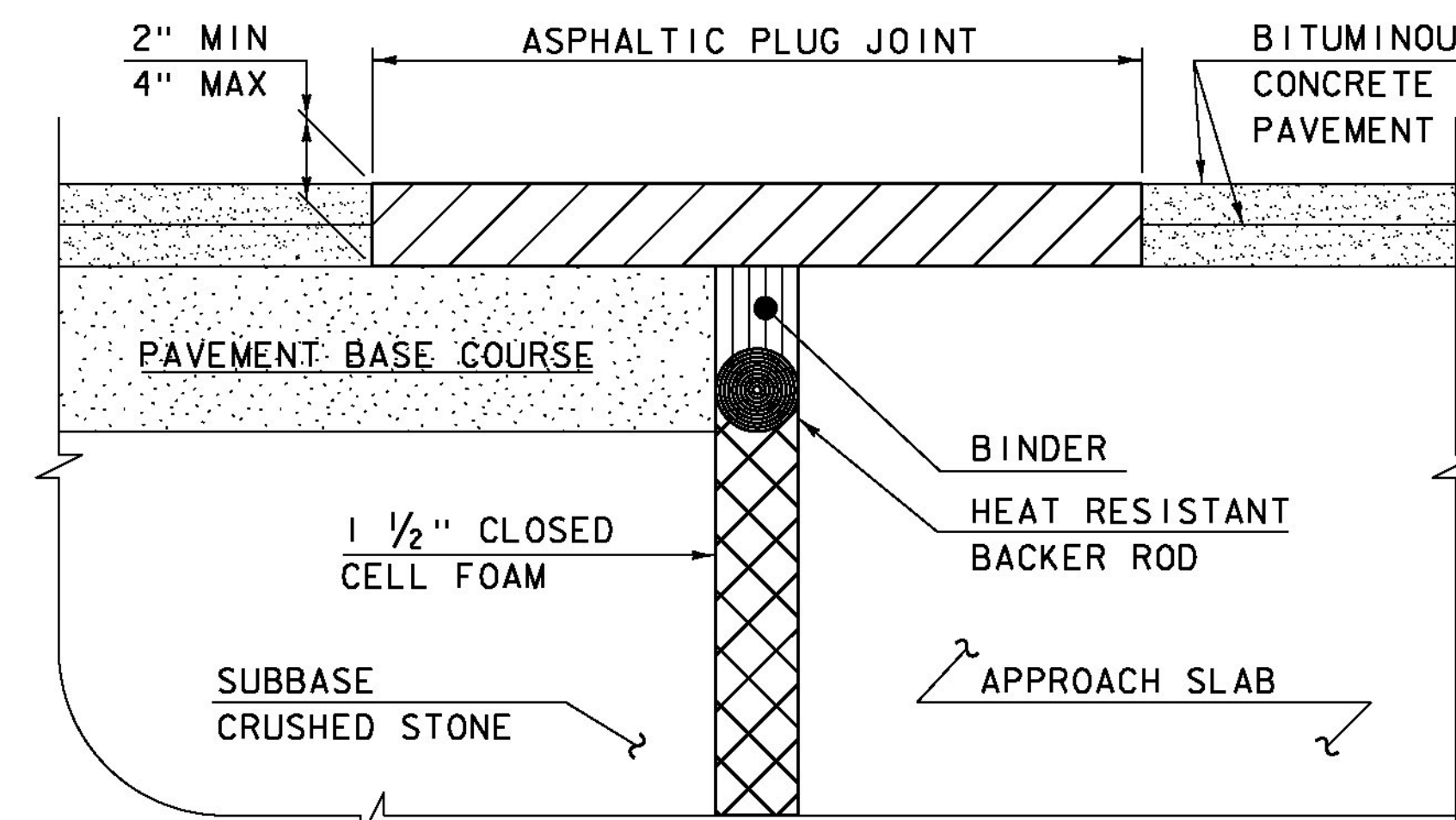
1. THE CONTRACTOR SHALL REMOVE ALL ASPHALTIC PLUG JOINT MATERIAL AND DETERIORATED CONCRETE AS DIRECTED BY THE ENGINEER. REMOVAL OF THE FIRST 4 INCHES OF MATERIAL SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 516.10 BRIDGE EXPANSION JOINT, ASPHALTIC PLUG. ANY REMOVAL OF MATERIAL GREATER THAN 4 INCHES SHALL BE INCLUDED IN THE BID PRICE OF ITEM 580.20 RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE.
2. THE CONTRACTOR SHALL REPLACE REMOVED MATERIAL THAT IS LESS THAN 4" FROM FINISHED GRADE WITH ASPHALTIC PLUG JOINT MATERIAL MEETING THE REQUIREMENTS OF SUBSECTION 707.15. ALL REMOVED MATERIAL THAT IS GREATER THAN 4 INCHES FROM FINISHED GRADE SHALL BE REPLACED WITH RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE MEETING THE REQUIREMENTS OF SUBSECTION 780.04.
3. REINFORCING STEEL NOT SHOWN FOR CLARITY.
4. PLACE 1/4" THICK BY 8" WIDE SECTIONS OF STEEL PLATE OVER THE CENTER OF THE MOVEMENT GAP. SECURE THE PLATES FROM MOVING BY INSERTING LOCATING PINS THROUGH THE PRE-STAMPED HOLES INTO BACKER ROD AND COVER WITH HOT BINDER. THE STEEL PLATES MAY BE OMITTED WHERE THE ENGINEER DETERMINES THAT THE APPROACH SLAB OR BRIDGE DECK WILL PROVIDE INADEQUATE SUPPORT AND WHERE VERTICAL MOVEMENT OF THE PLATES MIGHT OCCUR.



ASPHALTIC PLUG JOINT DETAIL "A" - NEW

**NOTE:**

PLACE 1/4" THICK BY 8" WIDE SECTIONS OF STEEL PLATE OVER THE CENTER OF THE MOVEMENT GAP. SECURE THE PLATES FROM MOVING BY INSERTING LOCATING PINS THROUGH THE PRE-STAMPED HOLES INTO BACKER ROD AND COVER WITH HOT BINDER.



ASPHALTIC PLUG JOINT DETAIL "B" - NEW

**ASPHALTIC PLUG JOINT NOTES**

**INSTALLATION:**

1. LOCATE THE JOINT CENTRALLY OVER THE DECK OVERLAY EXPANSION GAP OR FIXED JOINT, MARKED OUT TO THE MANUFACTURER'S RECOMMENDED WIDTH.
2. REMOVE THE BITUMINOUS CONCRETE PAVEMENT FULL DEPTH AS SHOWN ON THE PLANS. THE PAVEMENT SHALL BE DRY AND SAW CUT TO THE LIMITS REQUIRED TO PLACE THE JOINT. A PNEUMATIC HAMMER AND CHISEL MAY BE USED ADJACENT TO THE CURB ONLY WHEN SAW CUTTING IS NOT POSSIBLE.
3. BLAST CLEAN THE JOINT AREA OF DEBRIS, ASPHALT AND SHEET MEMBRANE. THOROUGHLY DRY THE JOINT AREA WITH COMPRESSED AIR PRIOR TO APPLYING BINDER MATERIAL.
4. PLACE PROPERLY SIZED HEAT RESISTANT BACKER ROD IN THE MOVEMENT GAP ALLOWING FOR 1" +/- OF BINDER ABOVE THE ROD.
5. HEAT AND PLACE THE BINDER MATERIAL AS RECOMMENDED BY THE MANUFACTURER.
6. IMMEDIATELY AFTER TOP COATING, CAST AN ANTI-SKID MATERIAL OVER THE JOINT TO REDUCE THE RISK OF TRACKING.

**WEATHER LIMITATIONS**

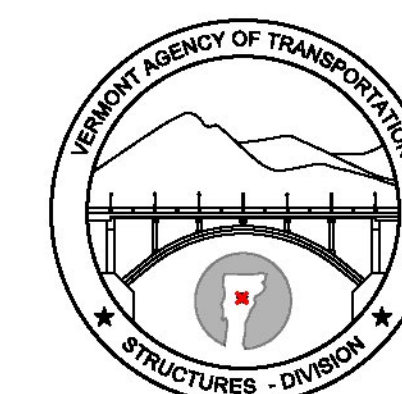
APPLY BINDER MATERIAL ONLY WHEN THE FOLLOWING CONDITIONS PREVAIL OR AS RECOMMENDED BY THE MANUFACTURER:

1. THE AMBIENT AIR TEMPERATURE IS AT LEAST 10 DEG C (50 DEG F) AND RISING.
2. THE ROAD SURFACE IS DRY.
3. WEATHER CONDITIONS OR OTHER CONDITIONS ARE FAVORABLE AND ARE EXPECTED TO REMAIN SO FOR THE PERFORMANCE OF SATISFACTORY WORK.

DETAILS ON THIS SHEET ARE NOT TO SCALE.

| REVISIONS       |                                             |
|-----------------|---------------------------------------------|
| MAY 7, 2010     | APPROVED FOR USE BY VAOT STRUCTURES SECTION |
| AUGUST 29, 2011 | ADD DETAIL "B" AND REV. NOTES               |
|                 |                                             |
|                 |                                             |
|                 |                                             |
|                 |                                             |
|                 |                                             |

# BRIDGE JOINT ASPHALTIC PLUG

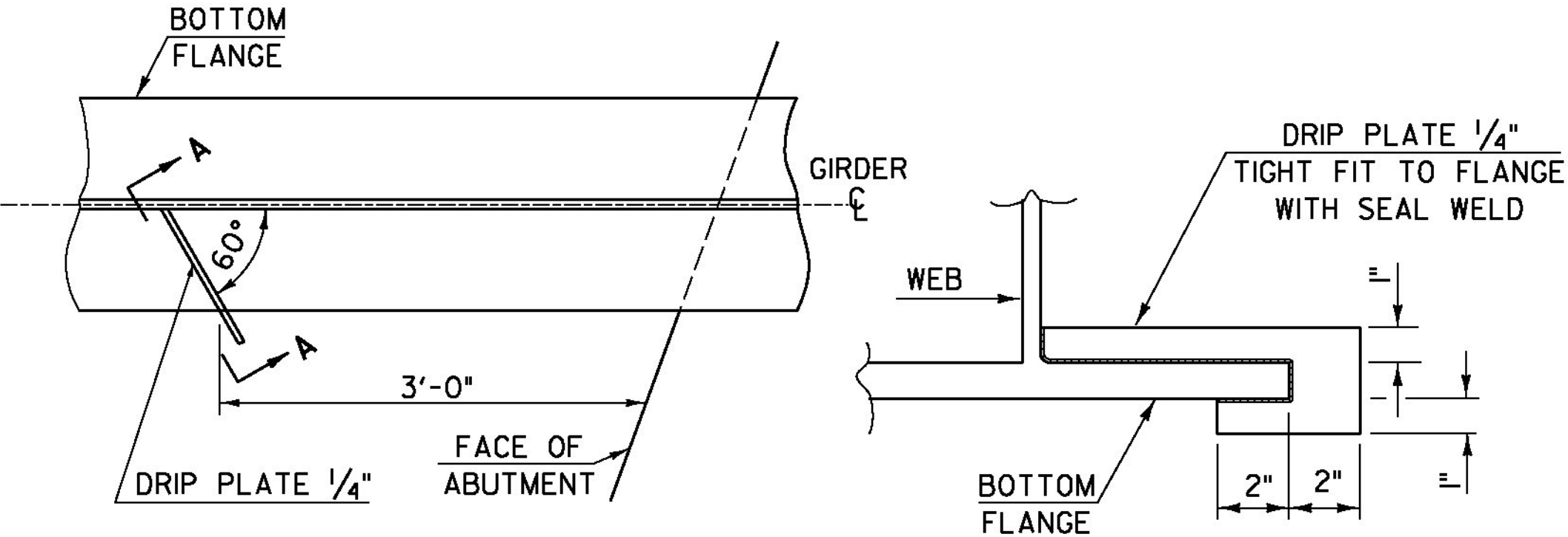


STRUCTURES  
DETAIL  
SD-516.10



STRUCTURAL STEEL GENERAL NOTES:

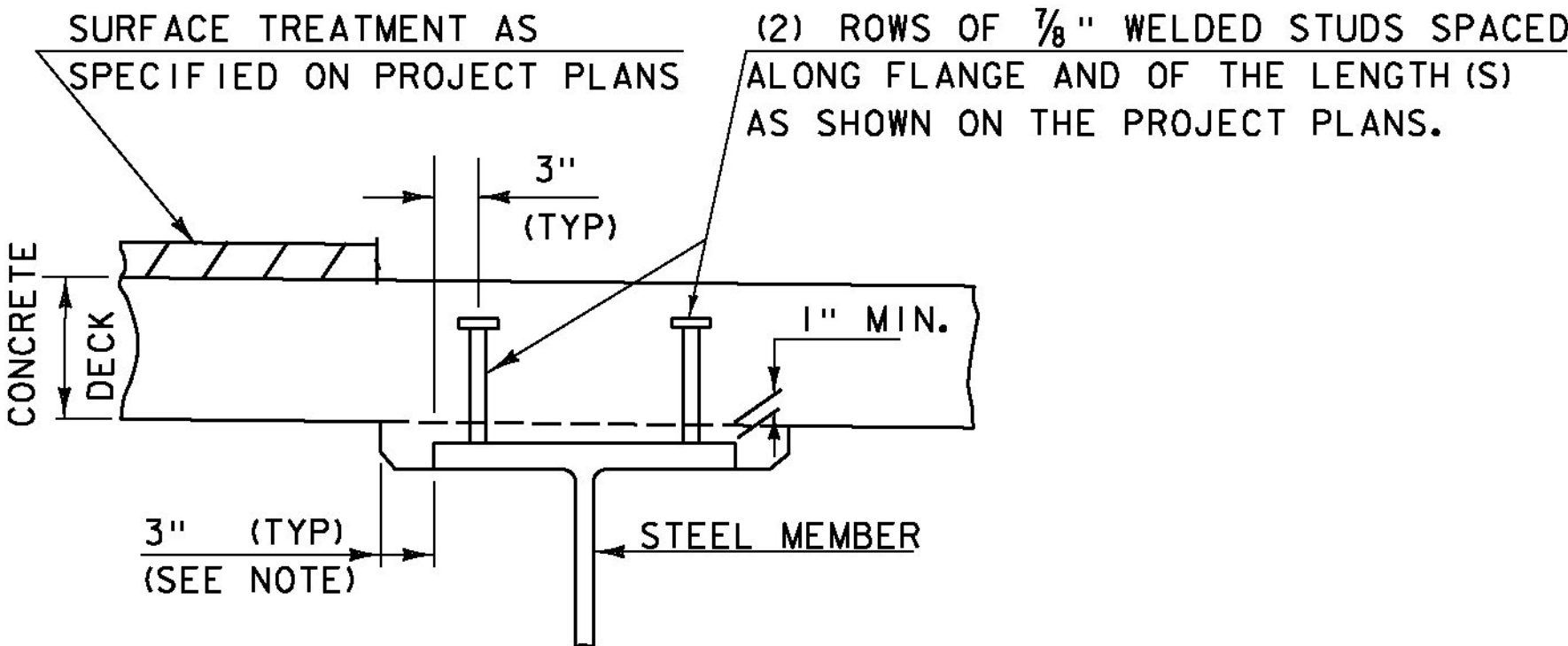
- 1. ALL FIELD CONNECTIONS SHALL BE MADE WITH 7/8" DIAMETER HIGH-STRENGTH BOLTS IN 15/16" DIAMETER HOLES, PER SUBSECTION 506.I9, UNLESS OTHERWISE SPECIFIED.
- 2. ALL HOLES IN THE WEBS OF THE FASCIA GIRDERS THAT ARE NOT OTHERWISE FILLED, SHALL BE FILLED WITH EITHER BUTTON HEAD OR HEX HEAD BOLTS. THESE BOLTS SHALL BE TIGHTENED IN ACCORDANCE WITH SUBSECTION 506.I9.
- 3. ALL WELDING SHALL CONFORM TO THE PROVISIONS OF SUBSECTION 506.I0.
- 4. ANY CONNECTIONS THAT ARE NOT DETAILED ON THE PLANS SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE STRUCTURES ENGINEER FOR APPROVAL.
- 5. STRUCTURAL STEEL MEMBERS DESIGNATED "CVN" IN THE PLANS SHALL BE CHARPY V-NOTCH TESTED IN ACCORDANCE WITH SUBSECTION 714.01 OF THE STANDARD SPECIFICATIONS.
- 6. ENDS OF GIRDERS ARE TO BE VERTICAL IN THEIR FINAL POSITION.
- 7. AFTER SUPERSTRUCTURE STEEL HAS BEEN ERECTED, ELEVATIONS ALONG THE TOP OF THE GIRDERS SHALL BE TAKEN AS DIRECTED BY THE RESIDENT ENGINEER FOR USE IN DETERMINING FINISHED GRADES.



PLAN DRIP PLATE

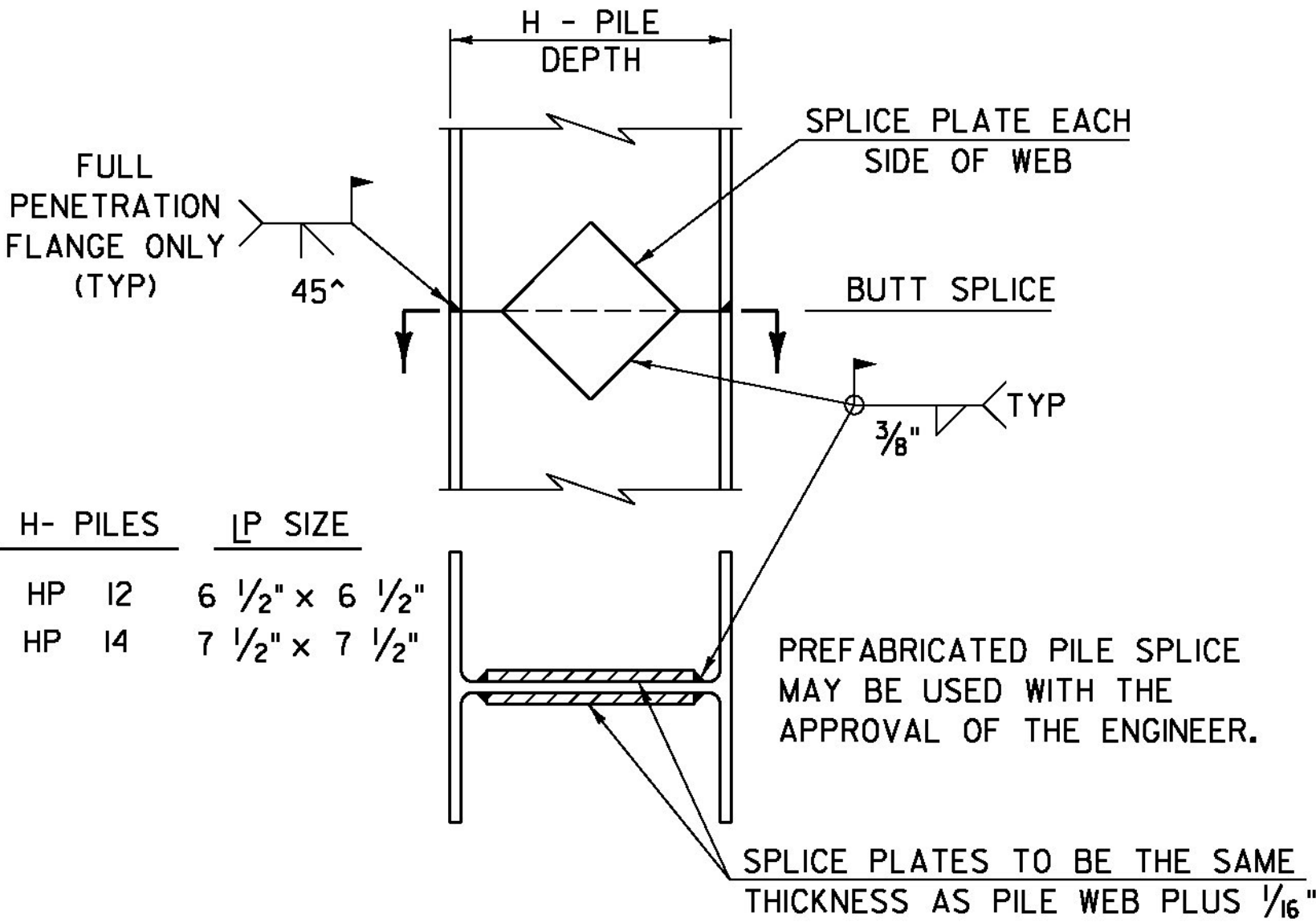
SECTION A - A

NOTE: DRIP PLATES SHALL BE PLACED ON OUTSIDE EDGE OF FASCIA GIRDERS ON THE HIGH SIDE OF ALL PIERS AND ABUTMENTS OR AS INDICATED ON PROJECT PLANS.



NOTE:  
THE 3" HORIZONTAL SECTION MAY BE ELIMINATED FOR FORMING SYSTEMS DESIGNED FOR THE CONSTRUCTION OF VERTICAL HAUNCHES. ANY VOIDS RESULTING FROM FORMING SYSTEM ELEMENTS SHALL BE FILLED WITH JOINT SEALER, POLYURETHANE MEETING THE REQUIREMENTS OF SECTION 524. THE COST OF THE JOINT SEALER, POLYURETHANE SHALL BE INCIDENTAL TO THE ADJACENT CONCRETE.

HAUNCH AND SHEAR CONNECTOR DETAIL

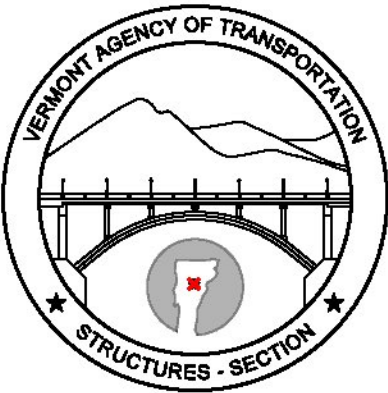


DETAIL OF PILE SPLICE

DETAILS ON THIS SHEET ARE "NOT TO SCALE" UNLESS NOTED OTHERWISE.

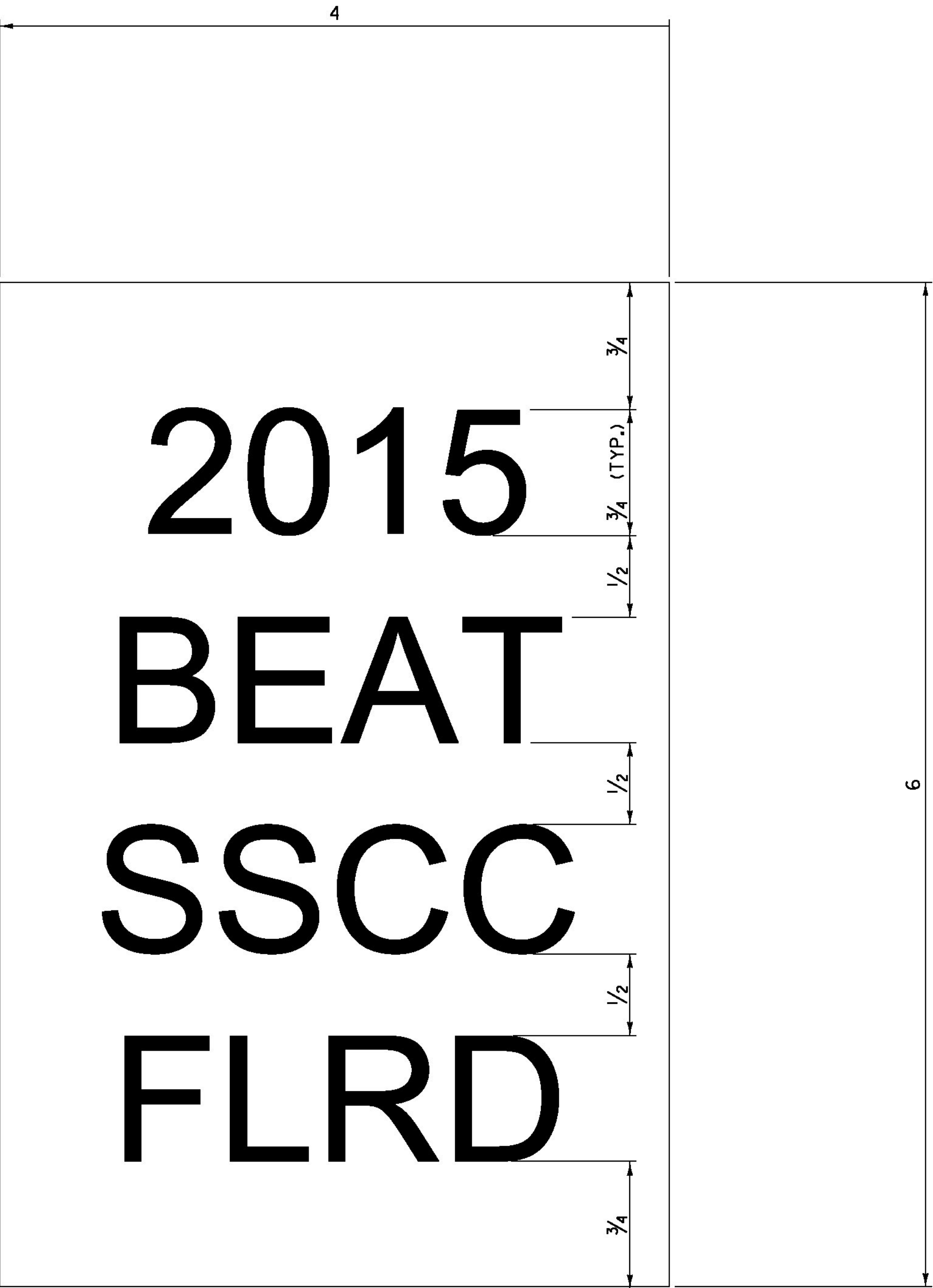
| REVISIONS    |                                             |
|--------------|---------------------------------------------|
| MAY 7, 2010  | APPROVED FOR USE BY VAOT STRUCTURES SECTION |
| JUNE 4, 2010 | MODIFIED NOTES                              |
|              |                                             |
|              |                                             |
|              |                                             |
|              |                                             |
|              |                                             |
|              |                                             |

STRUCTURAL STEEL  
DETAILS & NOTES



STRUCTURES  
DETAIL  
SD-601.00





**GENERAL NOTES:**

1. LINE ONE SHALL INDICATE THE INSTALLATION YEAR (YYYY).
2. LINE TWO SHALL INDICATE THE MODEL AS IDENTIFIED ON THE APPROVED PRODUCTS LIST. FOR GENERIC INSTALLATIONS THE STANDARD DRAWING DESIGNATION OR NAME AS IDENTIFIED IN THE FHWA ELIGIBILITY LETTER SHALL BE USED.
3. LINE THREE SHALL INDICATE ADDITIONAL MODEL INFORMATION IF NECESSARY.
4. LINE FOUR SHALL INDICATE FLARED (FLRD) OR TANGENT (TANG).
5. LEGEND SHALL BE ONE ARIEL FONT.
6. LEGEND SHALL BE BLACK ON A WHITE BACKGROUND, LEGEND AND BACKGROUND SHALL NOT BE REFLECTIVE.
7. SUITABLE MATERIAL SHALL BE USED SO AS TO NOT DETERIORATE DURING EXPOSURE TO WEATHER.
8. LABELS SHALL BE APPLIED IN SUCH A WAY THAT THEY REMAIN INTACT DURING THE LIFE OF THE TERMINAL.
9. FOR W-BEAM GUARDRAIL, LABEL SHALL BE PLACED ON THE TOP OF POST ONE FACING AWAY FROM TRAFFIC.
10. FOR BOX BEAM GUARDRAIL, LABEL SHALL BE PLACED ON THE BOX BEAM ADJACENT TO POST ONE FACING AWAY FROM TRAFFIC.
11. PAYMENT SHALL BE INCIDENTAL TO OTHER TRAFFIC BARRIER ITEMS.
12. ALL DIMENSIONS IN INCHES.

| REV.                                                | DATE         | DESCRIPTION       |
|-----------------------------------------------------|--------------|-------------------|
| 0                                                   | NOV. 3, 2015 | ORIGINAL APPROVAL |
|                                                     |              |                   |
|                                                     |              |                   |
|                                                     |              |                   |
| OTHER DETAILS REQUIRED: NONE                        |              |                   |
| DETAILS APPROVED FOR USE BY HIGHWAY SAFETY & DESIGN |              |                   |

GUARDRAIL TERMINAL LABEL DETAIL



HIGHWAY SAFETY  
& DESIGN DETAIL  
HSD - 621.06



DA RUISSON A

WWW.DOLYSE



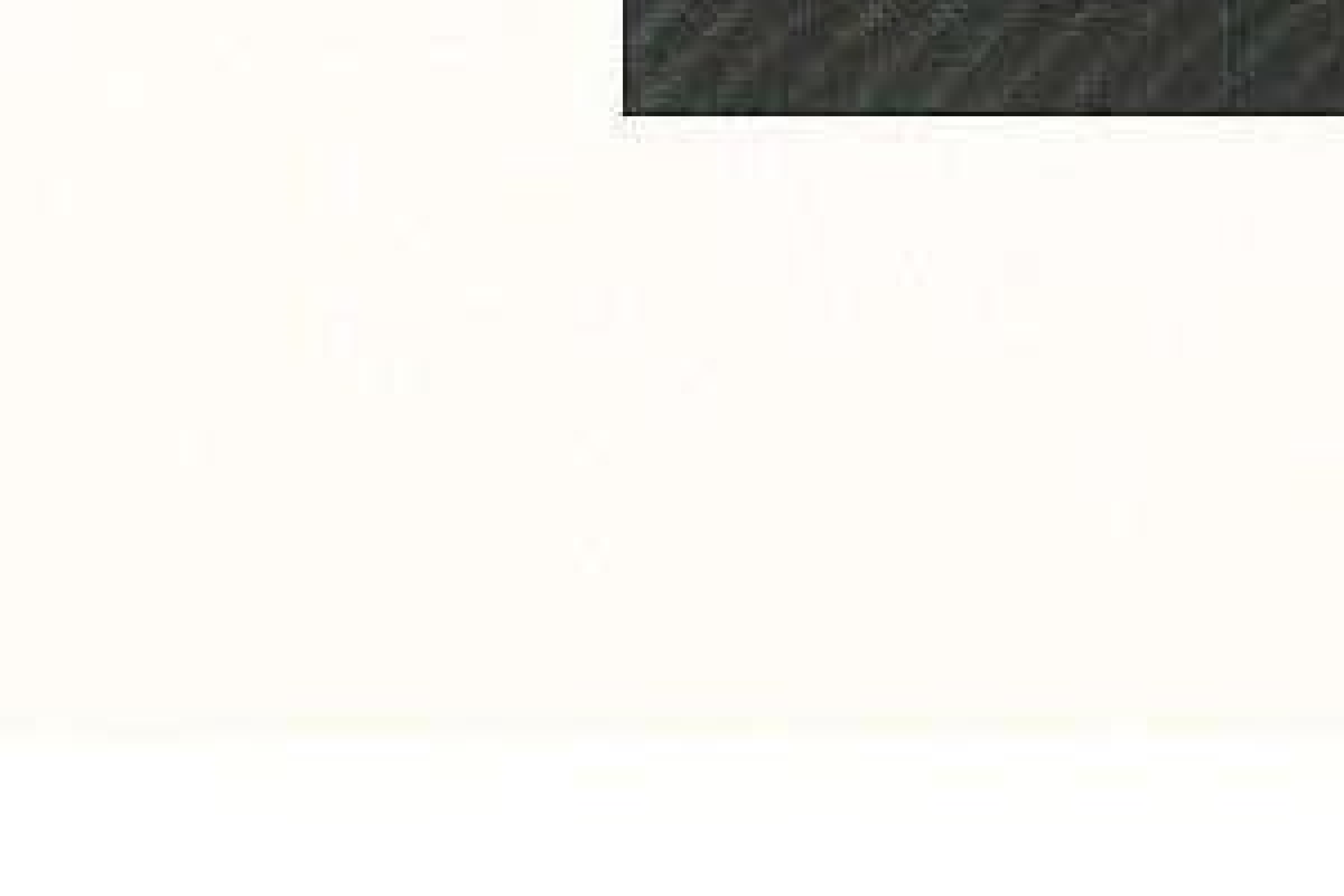
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[www.polyset.com](http://www.polyset.com)





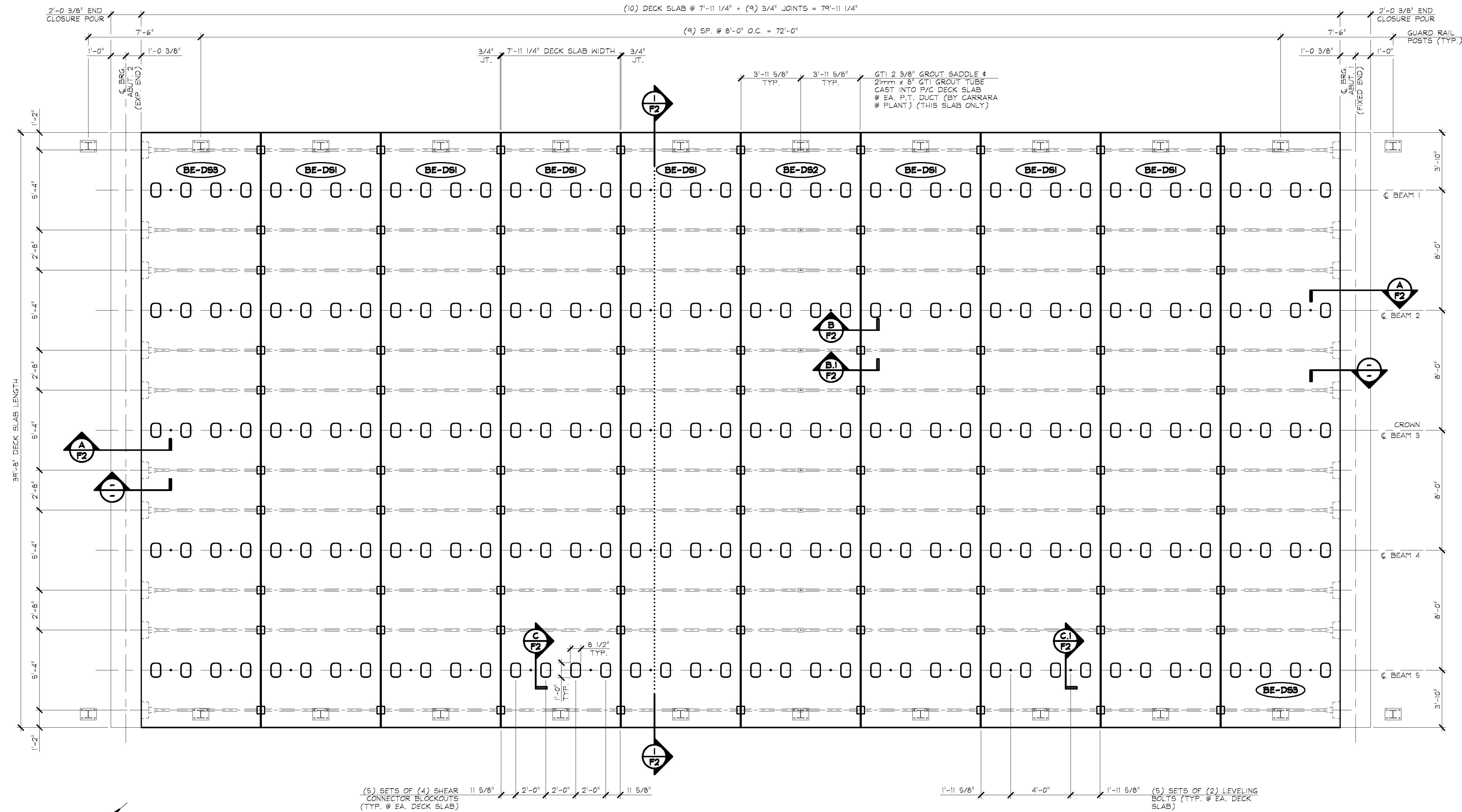




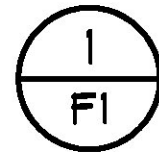
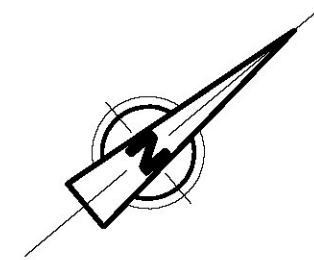








- GENERAL NOTES**
1. MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI.
  2. MIN. CONCRETE STRENGTH FOR HANDLING SHALL BE 4,000 PSI.
  3. REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31), AND SHALL BE EPOXY COATED, AS NOTED.
  4. THE TOP OF DECK SLABS SHALL RECEIVE A SMOOTH FLOAT FINISH (UNLESS NOTED OTHERWISE).
  5. A SELF RETARDER SHALL BE PLACED ON THE SHEAR KEY FORMS PRIOR TO CASTING THE SLABS. AFTER CURING AND AFTER THE FORMS ARE REMOVED, THE EDGES SHALL RECEIVE A POWER WASH TO REMOVE THE RESIDUE FROM THE RETARDER. THE SURFACE SHOULD THEN EXHIBIT A PITTED SURFACE WITH SOME EXPOSED AGGREGATE PROVIDING AN IMPROVED BONDING SURFACE FOR THE SHEAR KEY MORTAR.
  6. DECK SLABS SHALL BE HANDLED AND ERECTED USING THE LIFTING INSERTS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. DECK SLABS SHALL BE STORED & TRANSPORTED WITH TIMBER SUPPORTS AT LIFT LOCATIONS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
  7. MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. PS10.02 AND PS10.05 RESPECTIVELY.  
DESIGN MIX: J.P.C. BRIDGE MIX #42&M - NO DCI
  8. QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
  9. CURING METHOD: AS SOON AS THE TOP OF DECK SLAB IS FINISHED, A COVER OF POLY WILL BE PLACED OVER THE DECK SLAB. NATURAL CURE WITH NO EXTERNAL HEAT APPLIED. AMBIENT ENCLOSURE TEMPERATURE SHALL BE MONITORED. UNITS SHALL NOT BE EXPOSED TO TEMPERATURE DIFFERENTIAL GREATER THAN 40F. UNITS SHALL NOT BE EXPOSED TO A TEMPERATURES LESS THAN 32F UNTIL DESIGN STRENGTH IS ACHIEVED.
  10. DUNNAGE IS LOCATED UNDER LIFTER POSITIONS
  11. THE DRILLING OF HOLES OR USE OF POWER ACTUATED TOOLS ON DECK SLABS SHALL NOT BE PERMITTED.
  12. THE DECK SLABS SHALL BE ORIENTED AND ERECTED WITH THE MARK-END AS SHOWN ON PLANS.



**PRECAST CONCRETE DECK SLAB LAYOUT**

1/4" = 1'-0"

APPROVAL STAMP:

**J.P. CARRARA & SONS INC.**

Precast & Prestress Manufacturer  
2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone: (802) 388-6361 Fax: (802) 388-9010

THE BELDEN COMPANY  
CONTRACTOR  
RUTLAND, VERMONT

**STATE OF VERMONT AGENCY OF TRANSPORTATION  
COUNTY OF WINDSOR**

DATE: NOV. 1, 2016

SCALE: NOTED

**TOWN OF LUDLOW  
VT ROUTE 100 (MINOR ARTERIAL)  
BRIDGE NO.: 99 PROJECT NO.: STP DECK(39)**

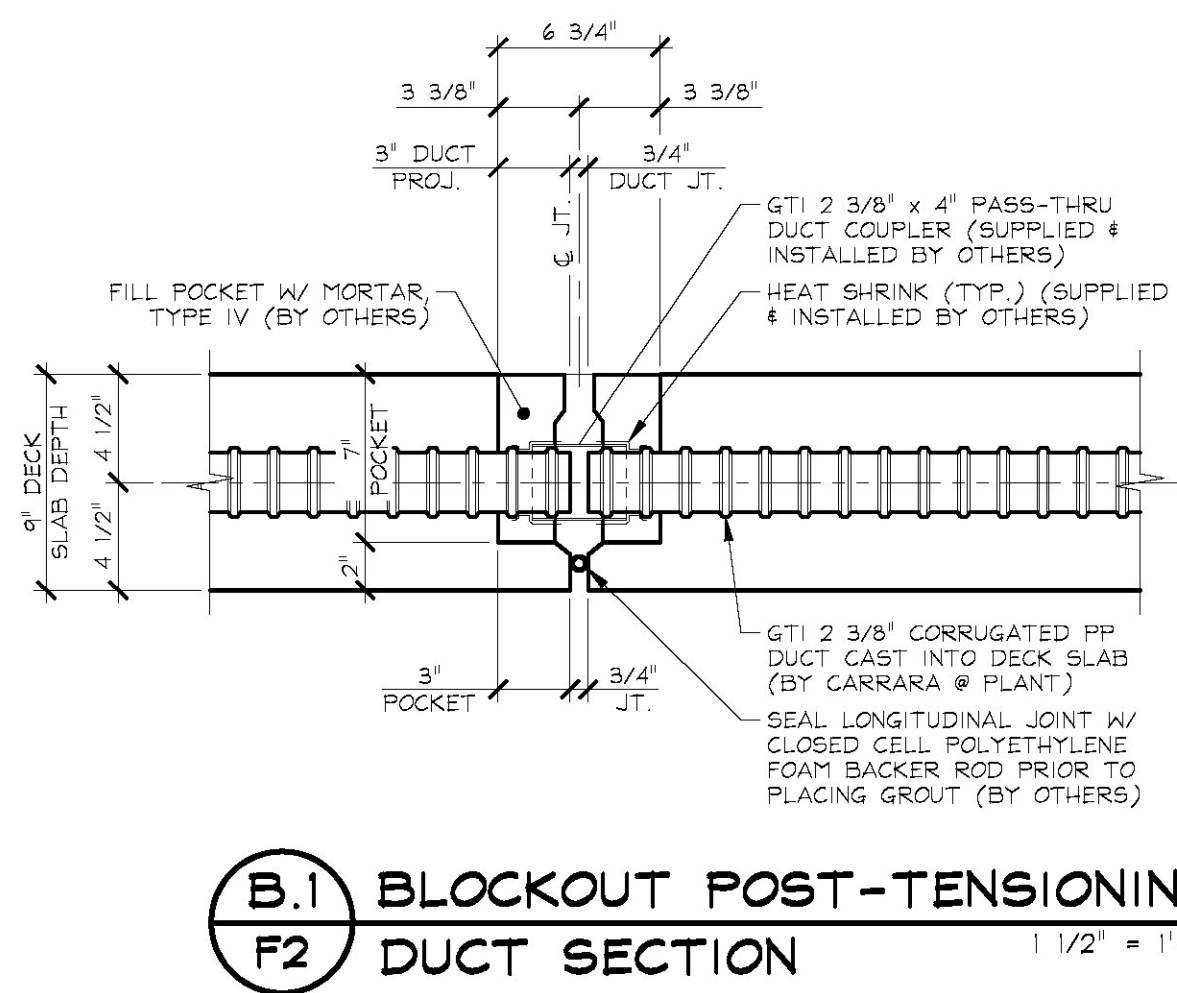
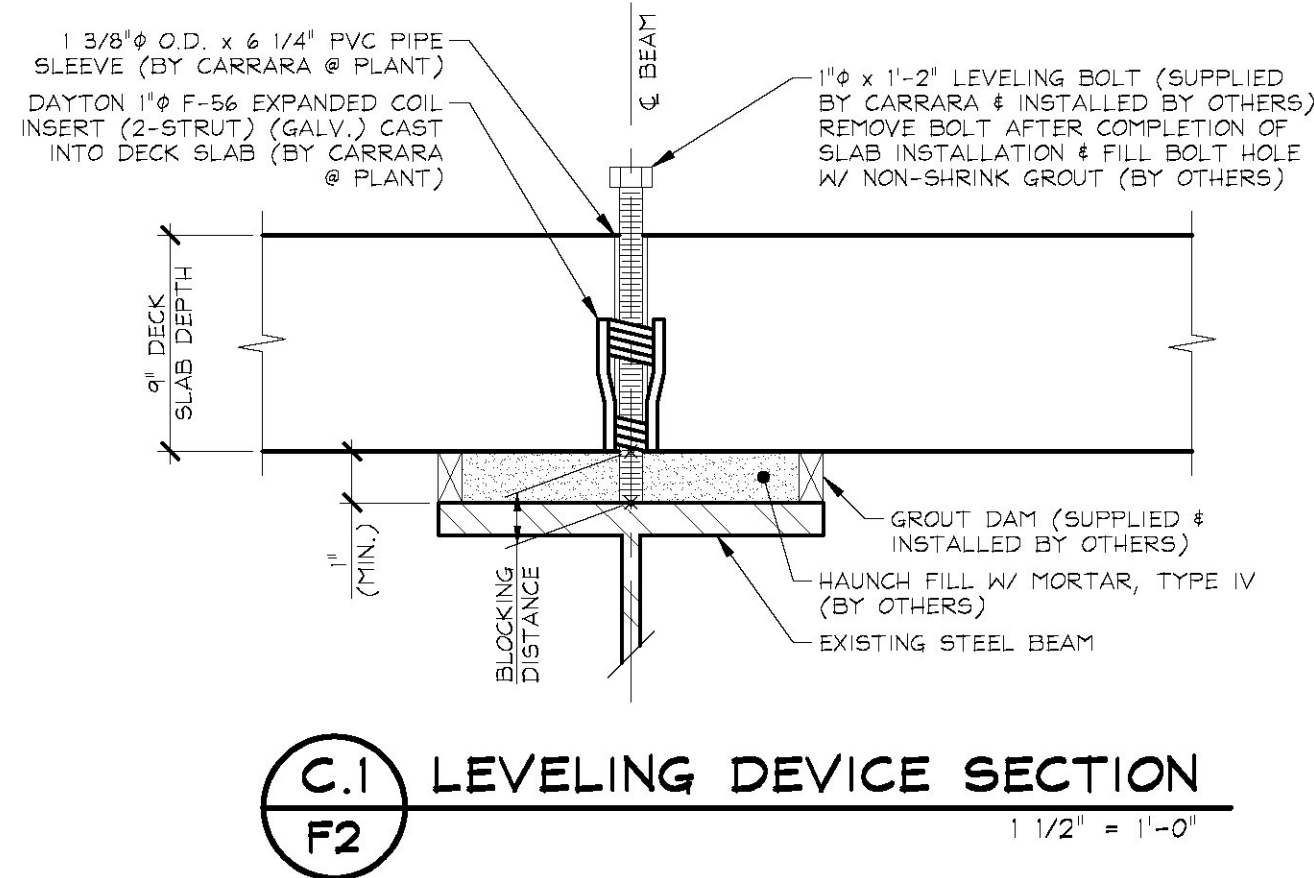
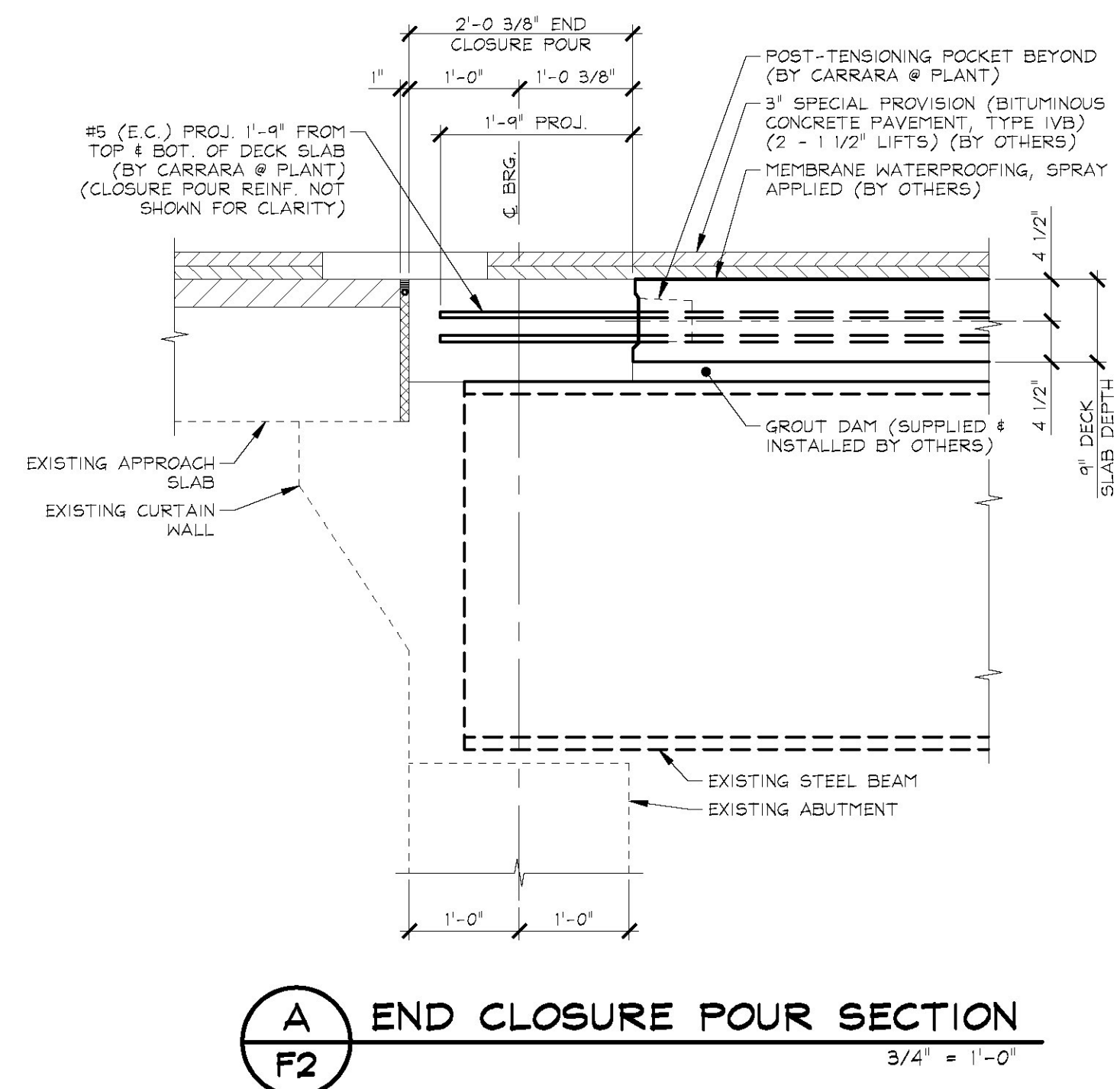
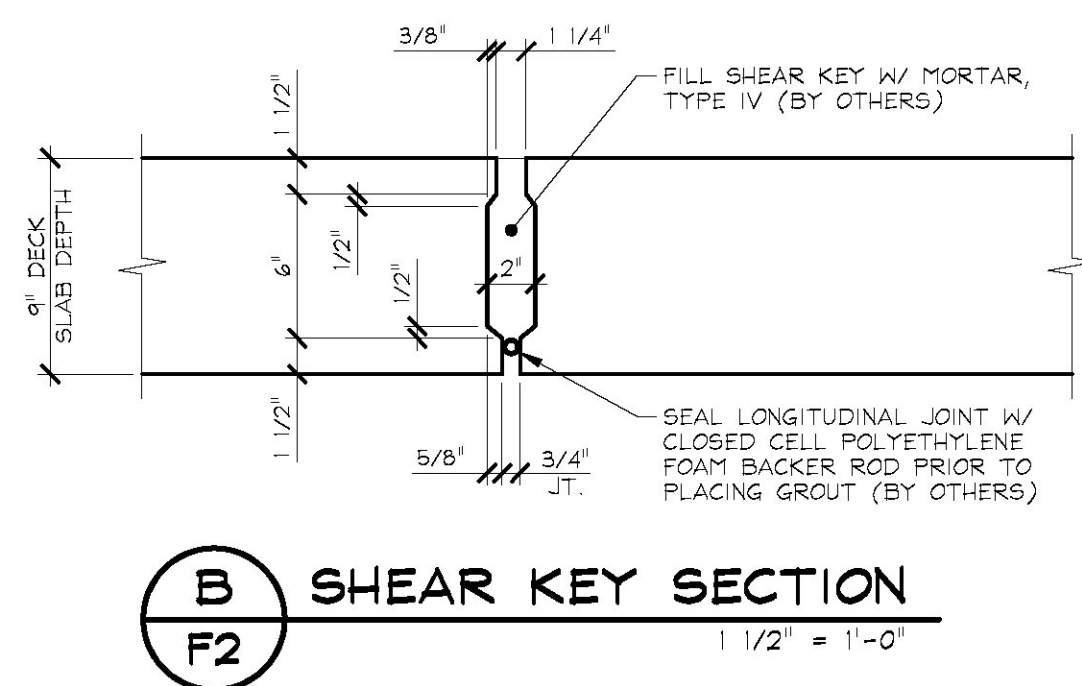
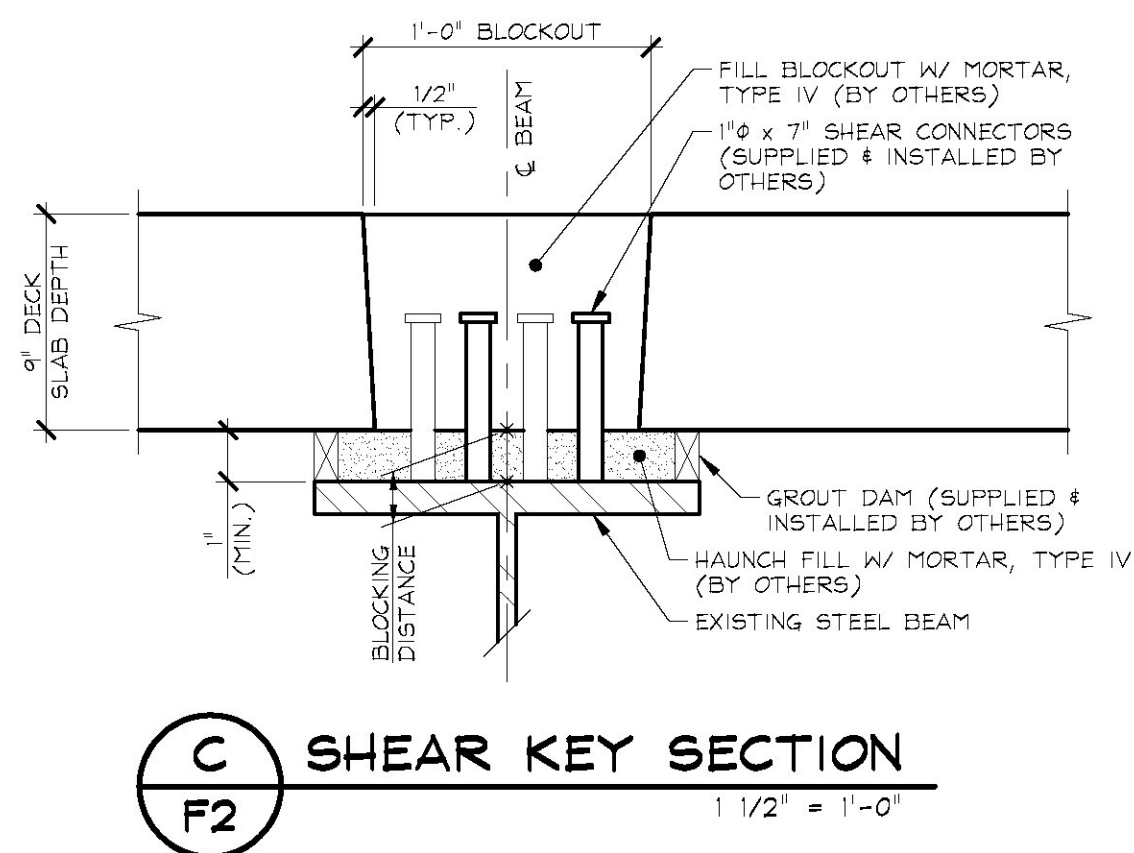
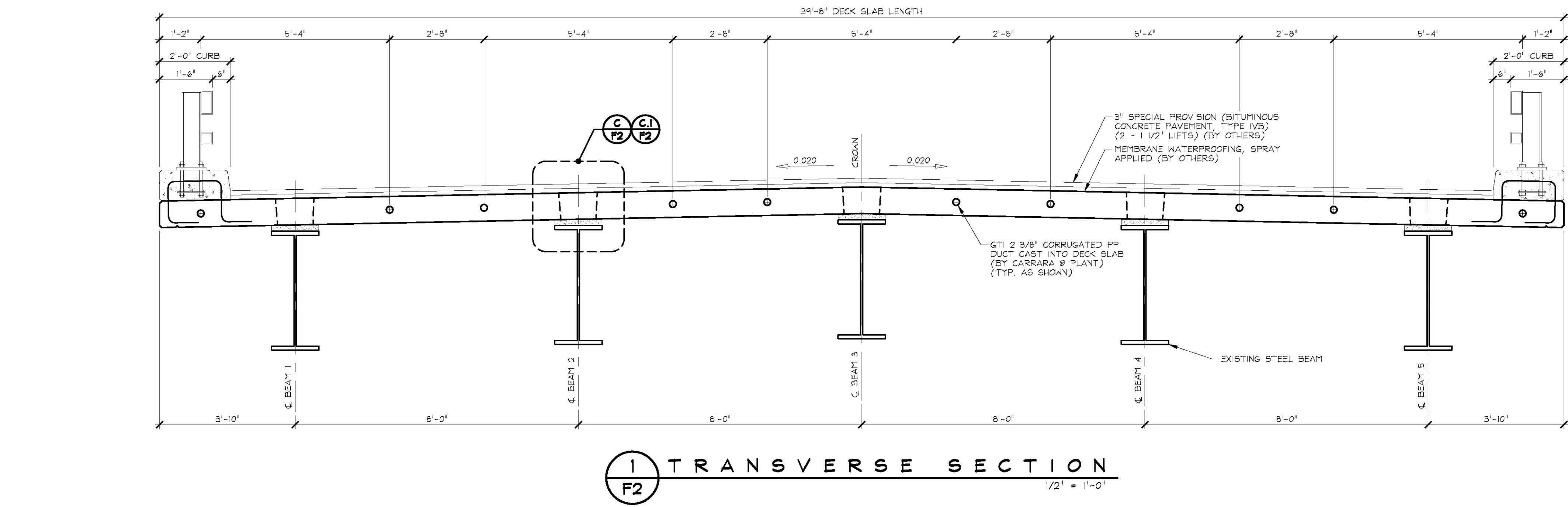
CHKD: A.S. DFTM: B.L.

JOB NO: 23499-016

**PRECAST CONCRETE  
DECK SLAB LAYOUT**

DWG. NO: **F1**



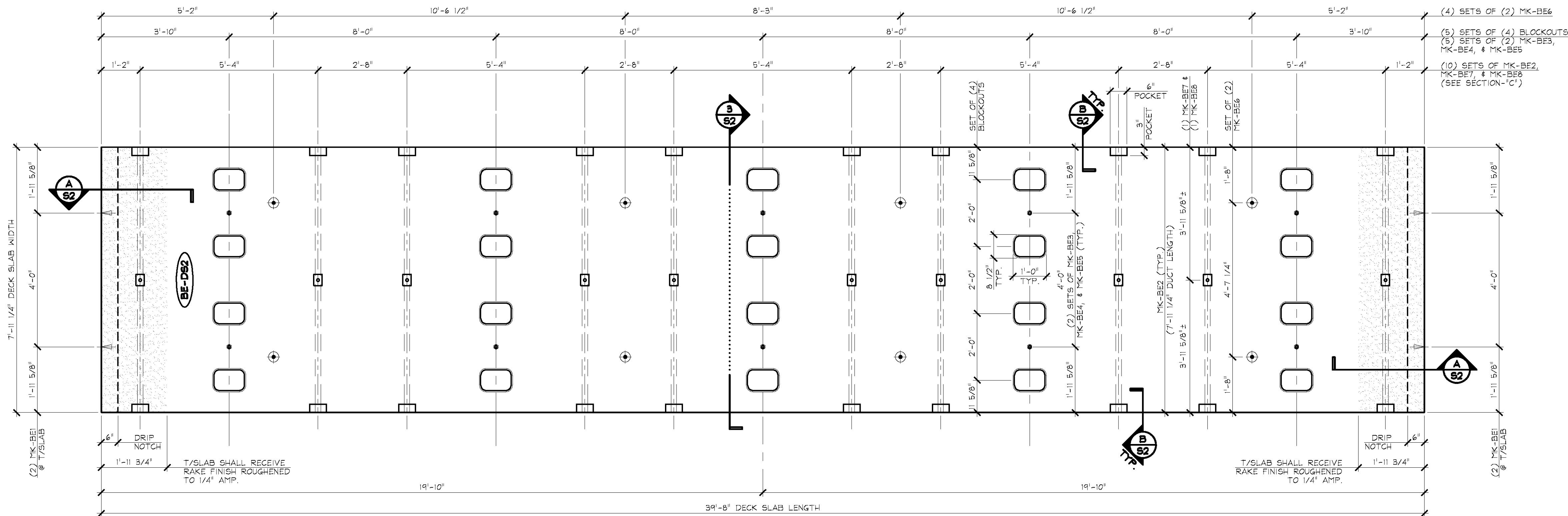


|                 |                                                                                                                                                            |  |                                                      |                    |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------|--------------------|
| APPROVAL STAMP: | <b>J.P. CARRARA &amp; SONS INC.</b><br>Precast & Prestress Manufacturer<br>2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010 |  | THE BELDEN COMPANY<br>CONTRACTOR<br>RUTLAND, VERMONT |                    |
|                 | STATE OF VERMONT AGENCY OF TRANSPORTATION<br>COUNTY OF WINDSOR                                                                                             |  | DATE:                                                | NOV. 1, 2016       |
|                 | TOWN OF LUDLOW<br>VT ROUTE 100 (MINOR ARTERIAL)<br>BRIDGE NO.: 99 PROJECT NO.: STP DECK(39)                                                                |  | SCALE:                                               | NOTED              |
|                 | TRANSVERSE SECTION & DETAILS                                                                                                                               |  | CHKD: A.S. DFTM: B.L.<br>JOB NO: 23499-016           | DWG. NO: <b>F2</b> |

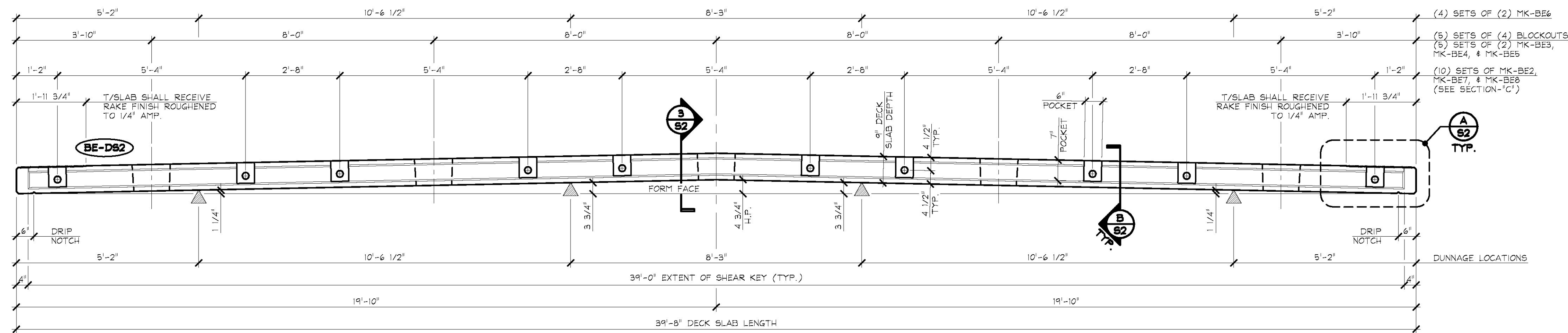




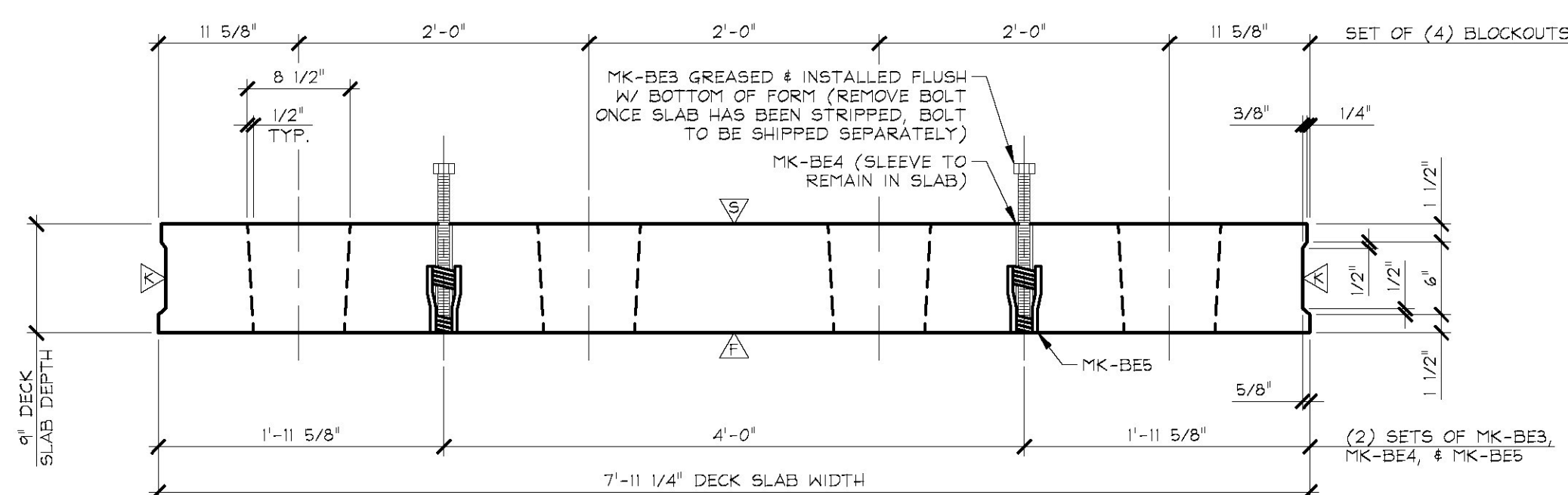




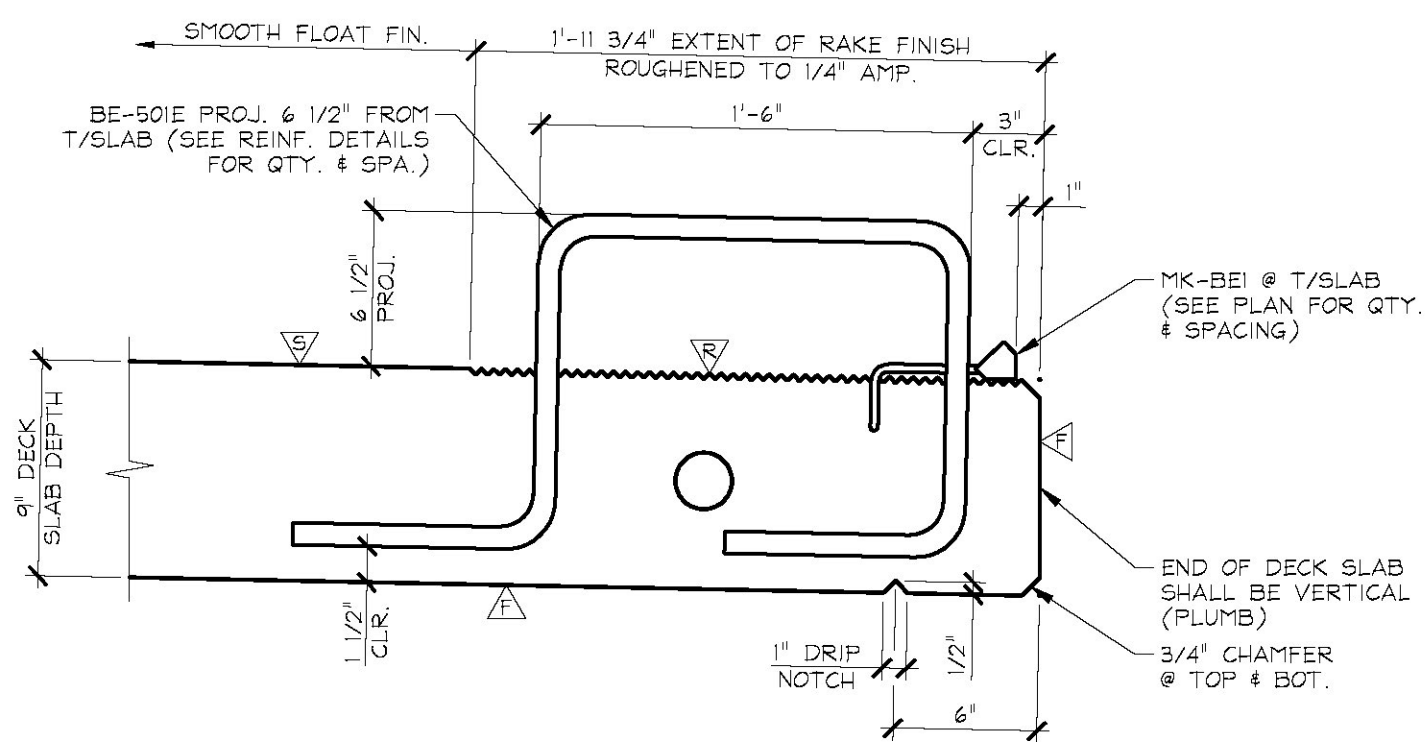
1 DIMENSIONAL PLAN VIEW IN FORM  
1/2" = 1'-0"



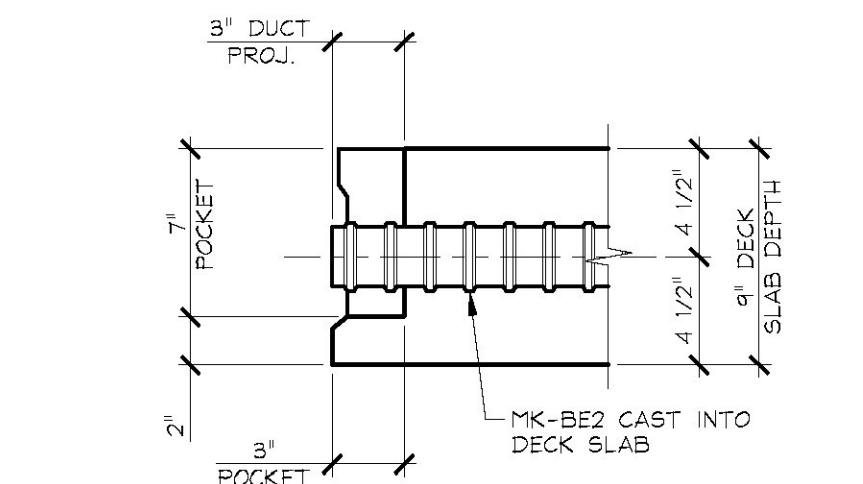
2 DIMENSIONAL ELEVATION  
1/2" = 1'-0"



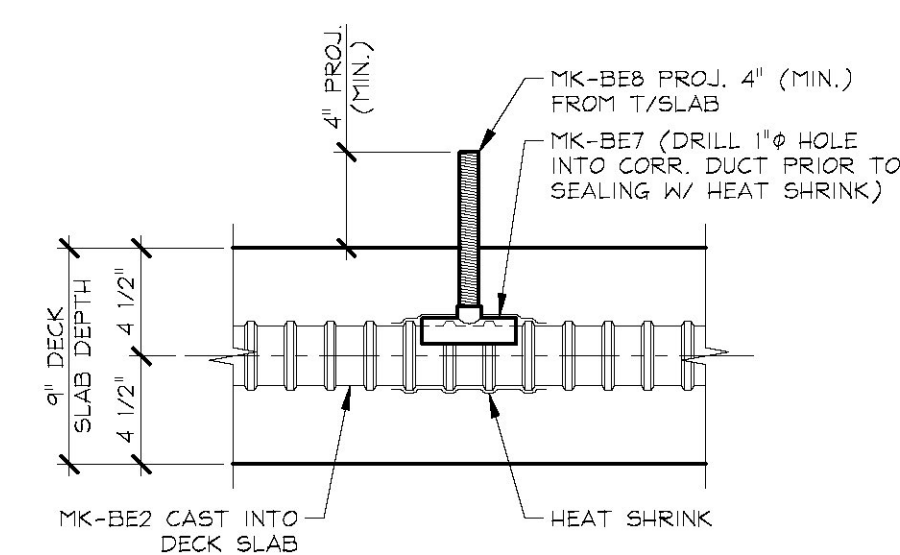
3 DIMENSIONAL SECTION  
1" = 1'-0"



A SECTION - "A"  
1 1/2" = 1'-0"



B SECTION - "B"  
1 1/2" = 1'-0"



C SECTION - "C"  
1 1/2" = 1'-0"

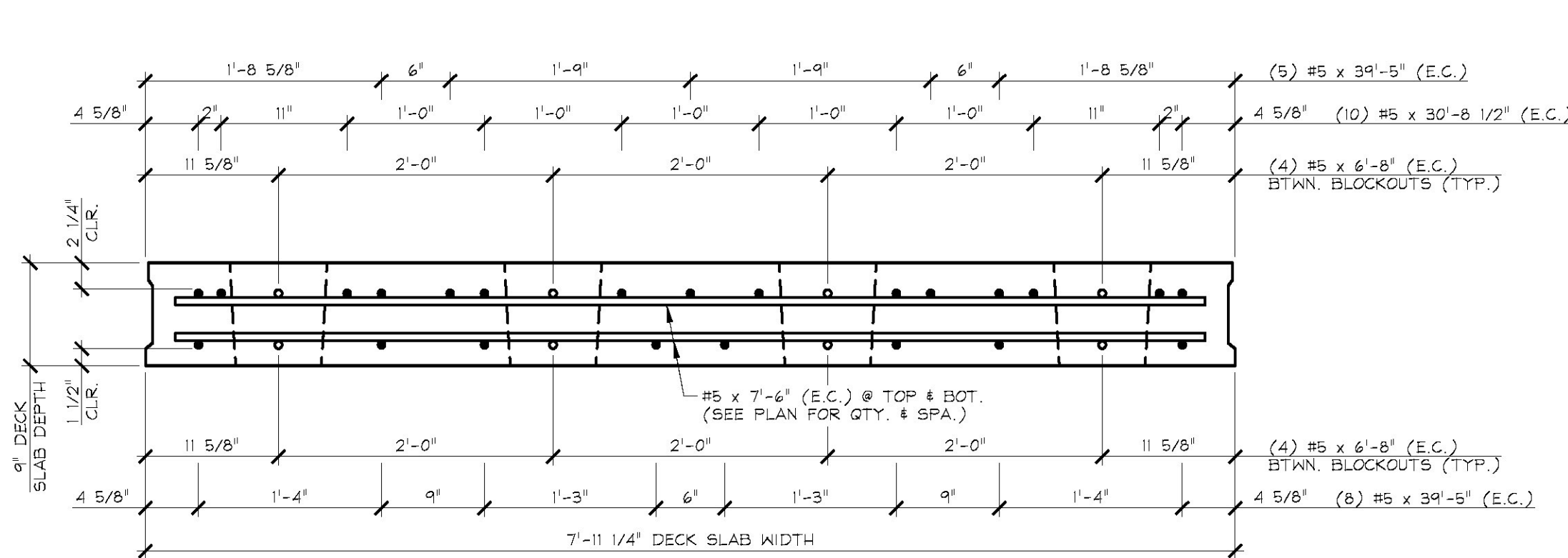
- △ DENOTES FORM FINISH
- △ DENOTES SMOOTH FLOAT FINISH
- △ DENOTES ROUGHENED FINISH (SEE GENERAL NOTE #5, SHEET "F")
- △ DENOTES RAKE FINISH ROUGHENED TO 1/4" AMPLITUDE

SHOP NOTE:  
SEE DRAWING NO. "S3" FOR  
REINFORCING INFORMATION

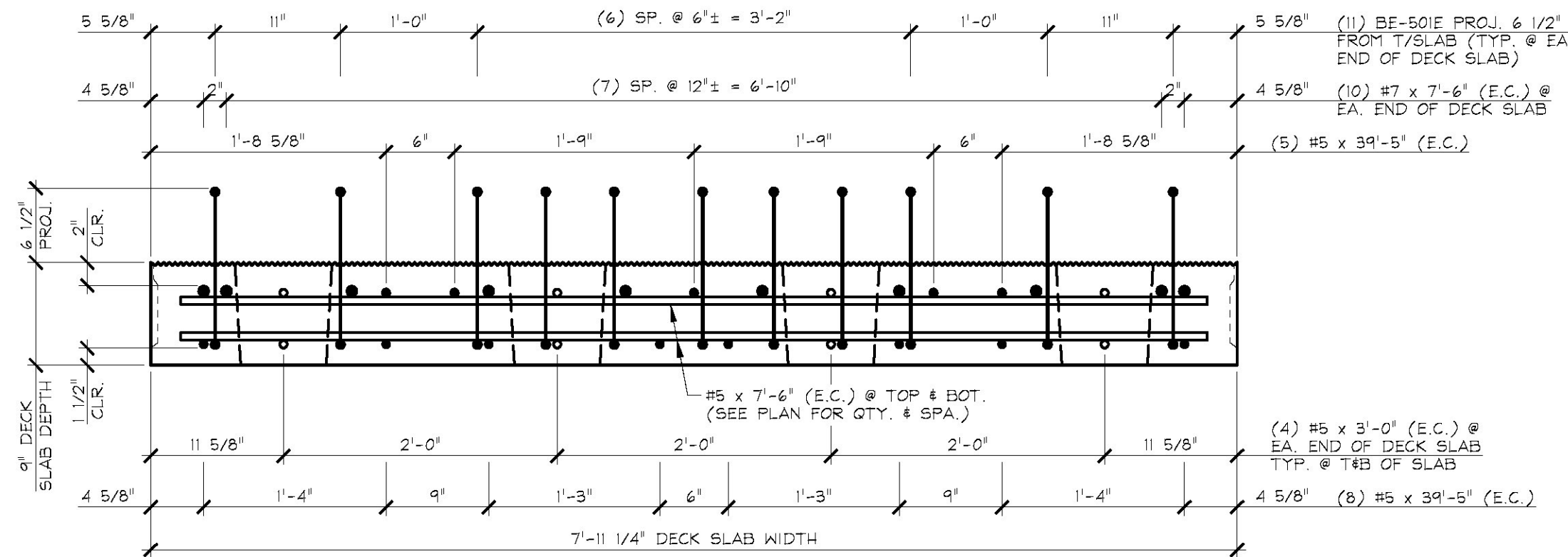
| MARK:                     | BE-DS2 | QTY.:                                                                | 1 | WT.: | 17.02 T | VOL.: | 8.41 cy   |
|---------------------------|--------|----------------------------------------------------------------------|---|------|---------|-------|-----------|
| MATERIAL LIST / DECK SLAB |        |                                                                      |   |      |         |       |           |
| ITEM                      | MARK   | DESCRIPTION                                                          |   |      |         |       | QTY.      |
| 1                         | MK-BE1 | DAYTON C-24 TYPE 4-APR DECK FORM HANGER (GALV.)                      |   |      |         |       | 4         |
| 2                         | MK-BE2 | GTI 2 3/8" x 7'-11 1/4" LONG CORRUGATED PP DUCT (SUPPLIED BY OTHERS) |   |      |         |       | 10        |
| 3                         | MK-BE3 | 1" x 1'-2" LEVELING BOLT (COIL THREAD)                               |   |      |         |       | 10        |
| 4                         | MK-BE4 | 1 3/8" O.D. x 6 1/4" PVC PIPE SLEEVE                                 |   |      |         |       | 10        |
| 5                         | MK-BE5 | DAYTON 1" F-56 EXPANDED COIL INSERT (2-STRUT) (GALV.)                |   |      |         |       | 10        |
| 6                         | MK-BE6 | 4T x 7 1/8" SWIFT LIFT LIFTER (GALV.)                                |   |      |         |       | 8         |
| 7                         | MK-BE7 | GTI 2 3/8" GROUT SADDLE (SUPPLIED BY OTHERS)                         |   |      |         |       | 10        |
| 8                         | MK-BE8 | 21mm x 8" GTI GROUT TUBE (SUPPLIED BY OTHERS)                        |   |      |         |       | 10        |
| 9                         |        | HEAT SHRINK (SUPPLIED BY OTHERS)                                     |   |      |         |       | AS REQ'D. |
| 10                        |        |                                                                      |   |      |         |       |           |

|                 |                                                                                                                                                                |  |                                                      |  |
|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------|--|
| APPROVAL STAMP: | <b>J.P. CARRARA &amp; SONS INC.</b><br>Precast & Prestress Manufacturer<br>2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone: (802) 388-6361 Fax: (802) 388-9010 |  | THE BELDEN COMPANY<br>CONTRACTOR<br>RUTLAND, VERMONT |  |
|                 | STATE OF VERMONT AGENCY OF TRANSPORTATION<br>COUNTY OF WINDSOR                                                                                                 |  | DATE: NOV. 1, 2016<br>SCALE: NOTED                   |  |
|                 | TOWN OF LUDLOW<br>VT ROUTE 100 (MINOR ARTERIAL)<br>BRIDGE NO.: 99 PROJECT NO.: STP DECK(39)                                                                    |  | CHKD: A.S. DFTM: B.L.<br>JOB NO: 23499-016           |  |
|                 | PRECAST DECK SLAB<br>DIMENSIONAL DETAILS                                                                                                                       |  | DWG. NO: <b>S2</b>                                   |  |

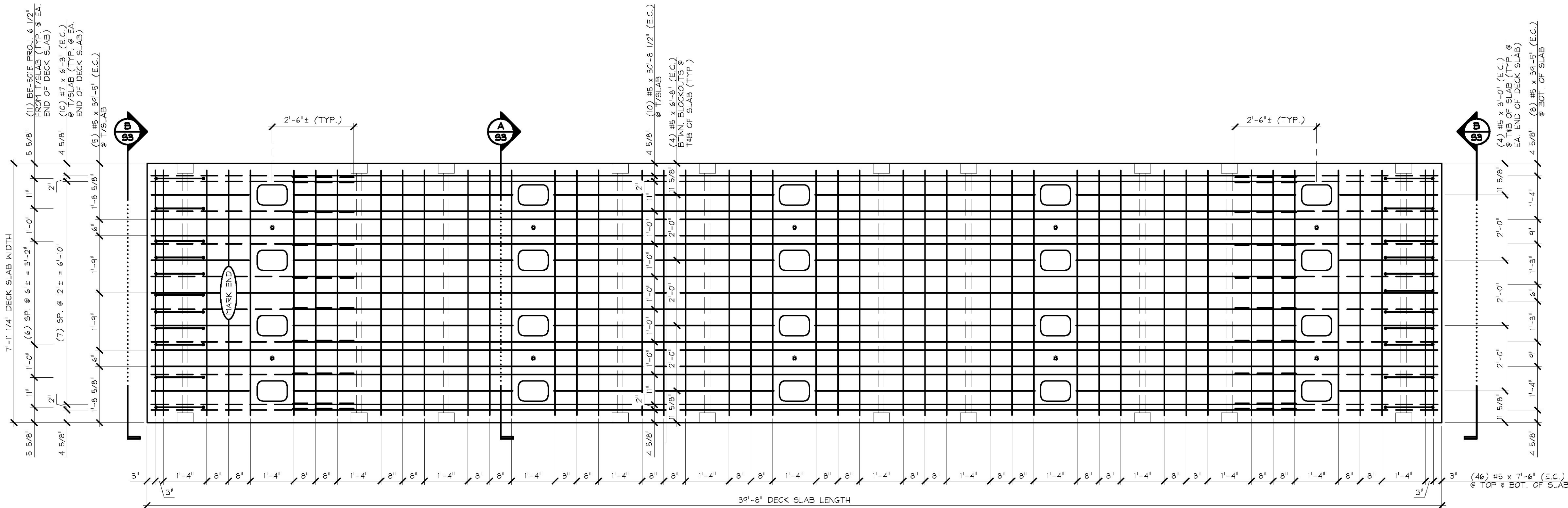




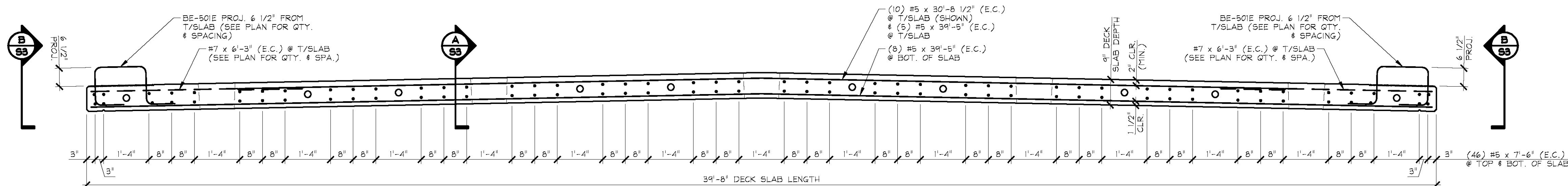
**A REINFORCING SECTION**  
**S3 @ MID-SPAN**  
1" = 1'-0"



**B REINFORCING SECTION**  
**S3 @ BEAM END**  
1" = 1'-0"



**1 REINFORCING PLAN VIEW IN FORM**  
**S3**  
1/2" = 1'-0"

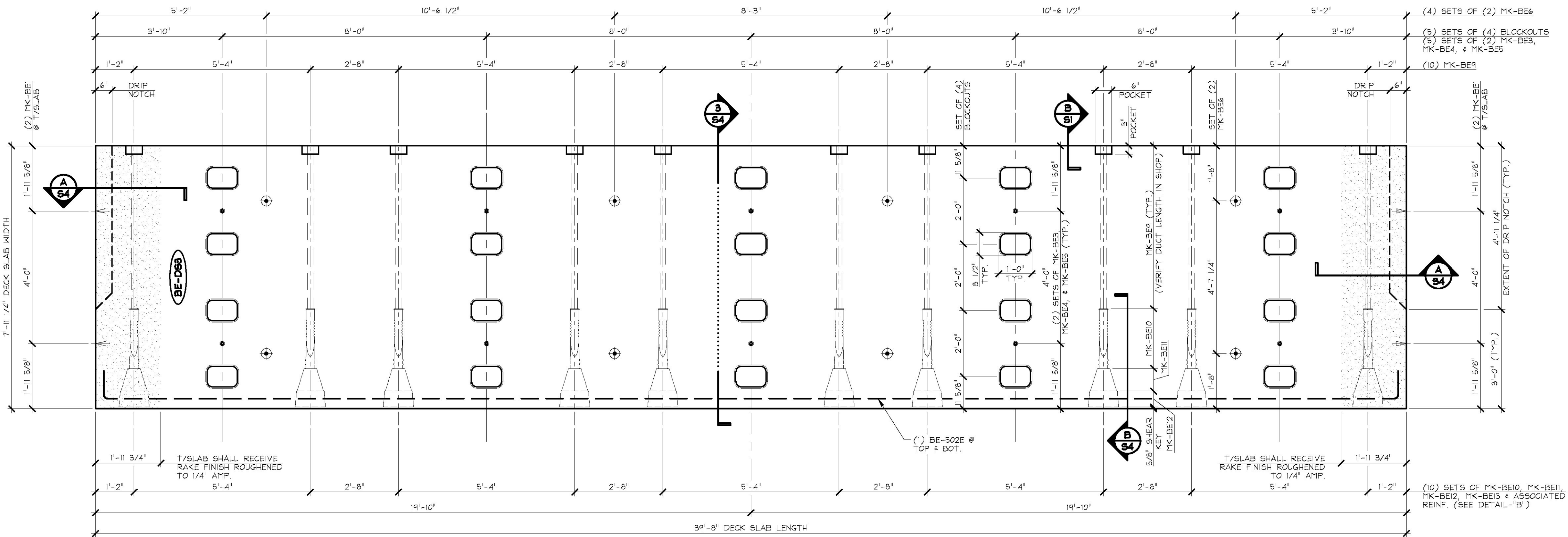


**2 REINFORCING ELEVATION**  
**S3**  
1/2" = 1'-0"

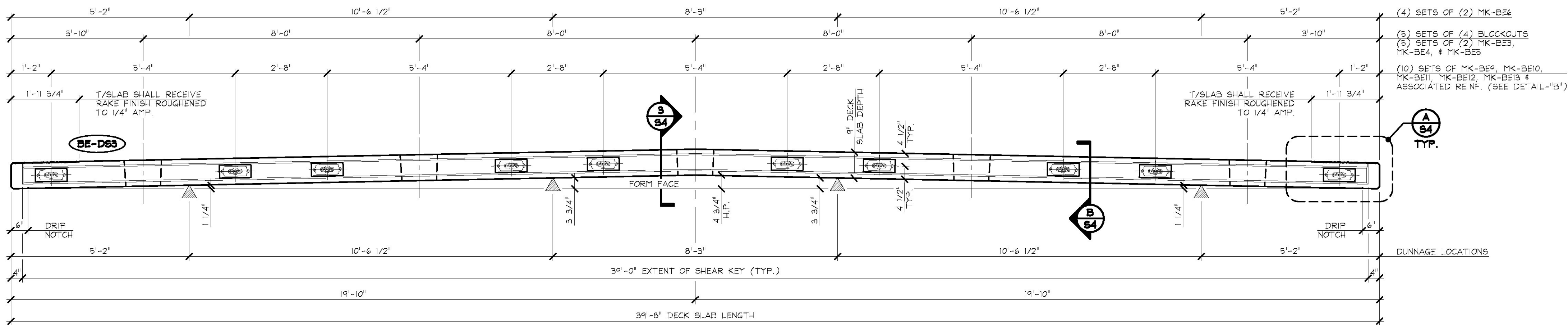
| MARK:                     | BE-DS1  | QTY.:                          | 7    |
|---------------------------|---------|--------------------------------|------|
| MARK:                     | BE-DS2  | QTY.:                          | 1    |
| MATERIAL LIST / DECK SLAB |         |                                |      |
| ITEM                      | MARK    | DESCRIPTION                    | QTY. |
| 1                         | BE-DS1E | #5 BENT BAR (EPOXY COATED)     | 22   |
| 2                         |         | #5 x 3'-0" (EPOXY COATED)      | 16   |
| 3                         |         | #5 x 6'-8" (EPOXY COATED)      | 32   |
| 4                         |         | #5 x 7'-6" (EPOXY COATED)      | 42   |
| 5                         |         | #5 x 30'-8 1/2" (EPOXY COATED) | 10   |
| 6                         |         | #5 x 39'-5" (EPOXY COATED)     | 13   |
| 7                         |         |                                |      |
| 8                         |         | #7 x 6'-3" (EPOXY COATED)      | 20   |
| 9                         |         |                                |      |
| 10                        |         |                                |      |

|                 |                                                                                                                                                            |  |                                                      |                   |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------|-------------------|
| APPROVAL STAMP: | <b>J.P. CARRARA &amp; SONS INC.</b><br>Precast & Prestress Manufacturer<br>2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010 |  | THE BELDEN COMPANY<br>CONTRACTOR<br>RUTLAND, VERMONT |                   |
|                 | STATE OF VERMONT AGENCY OF TRANSPORTATION<br>COUNTY OF WINDSOR                                                                                             |  | DATE:                                                | NOV. 1, 2016      |
|                 | TOWN OF LUDLOW<br>VT ROUTE 100 (MINOR ARTERIAL)<br>BRIDGE NO.: 99 PROJECT NO.: STP DECK(39)                                                                |  | SCALE:                                               | NOTED             |
|                 | PRECAST DECK SLAB<br>REINFORCING DETAILS                                                                                                                   |  | CHKD: A.S. DFTM: B.L.                                | JOB NO: 23499-016 |
|                 |                                                                                                                                                            |  | DWG. NO:                                             | <b>S3</b>         |

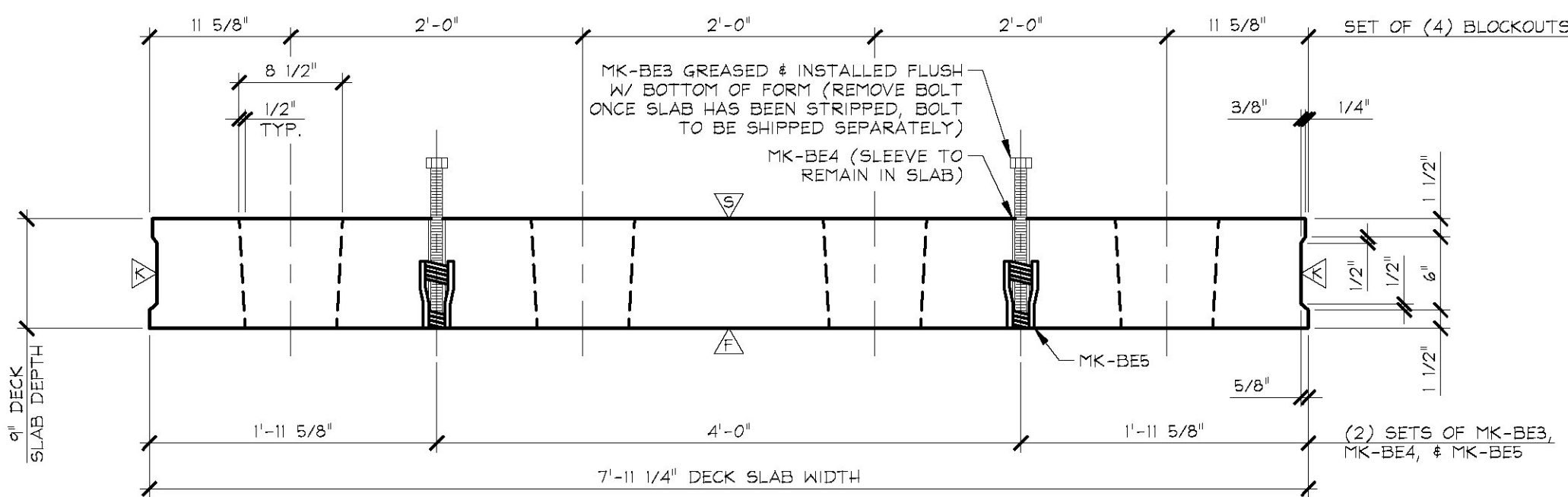




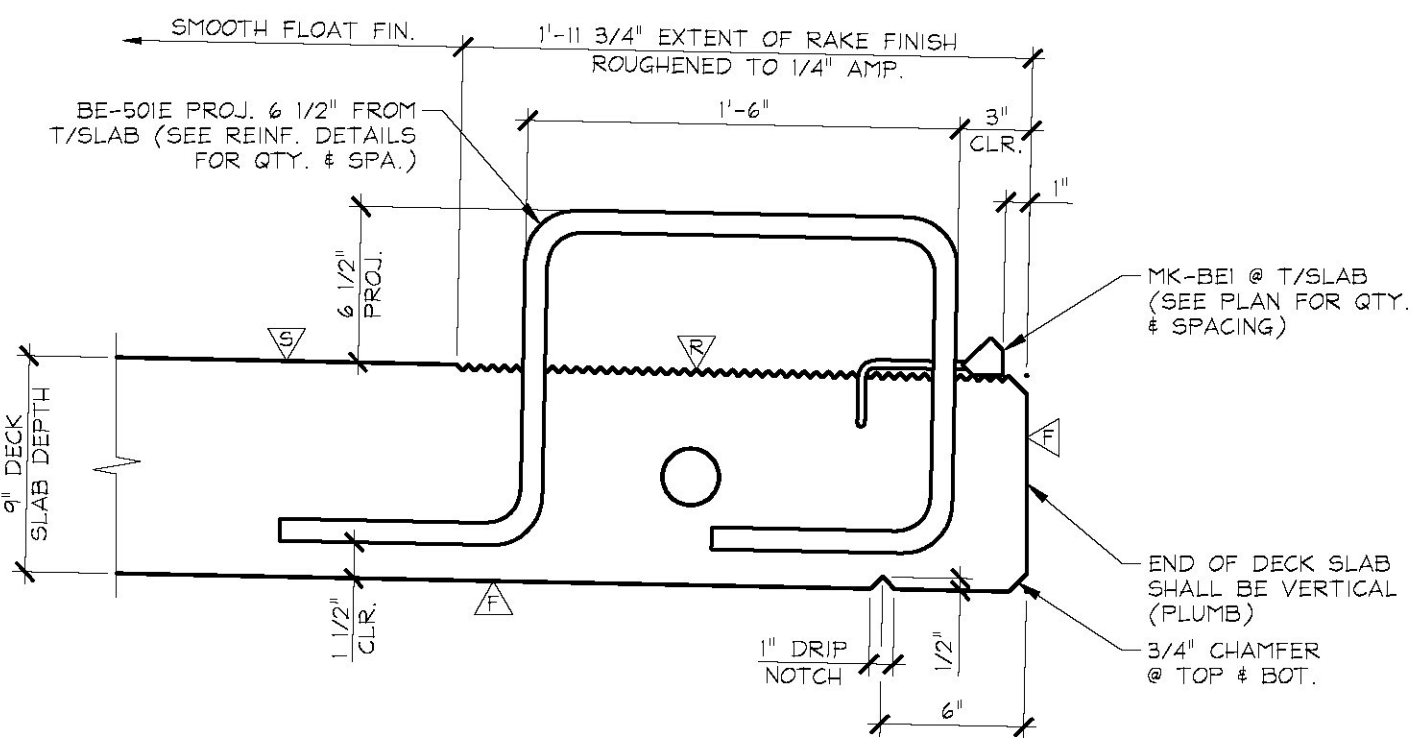
1 DIMENSIONAL PLAN VIEW IN FORM  
1/2" = 1'-0"



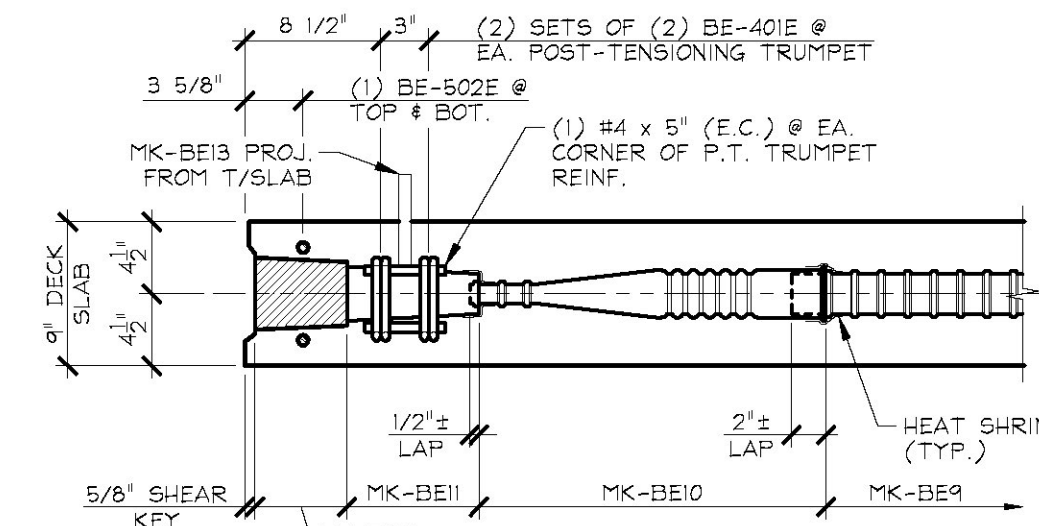
2 DIMENSIONAL ELEVATION  
1/2" = 1'-0"



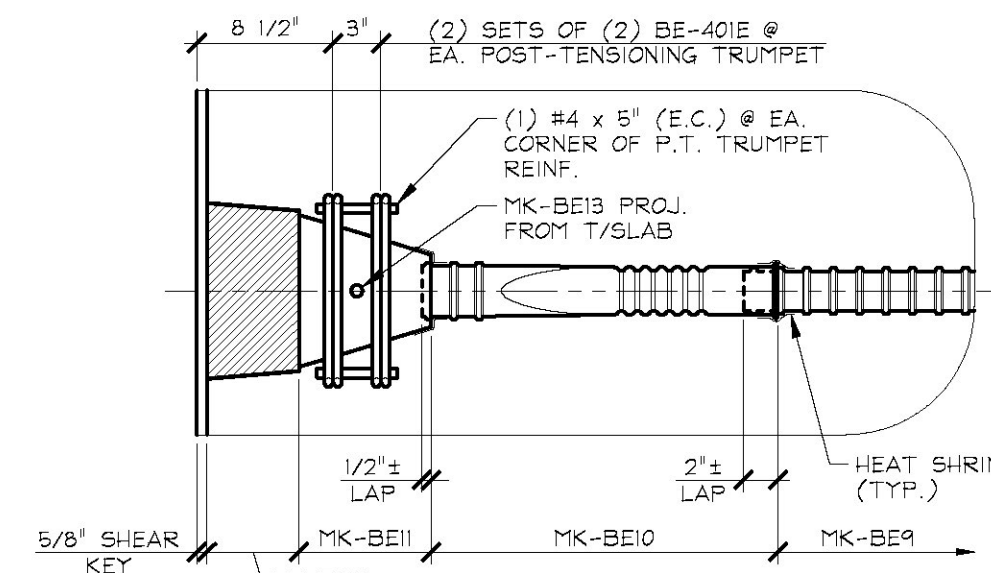
3 DIMENSIONAL SECTION  
1" = 1'-0"



SECTION - "A"  
1 1/2" = 1'-0"



SECTION



PLAN VIEW

B DETAIL - "B"  
1" = 1'-0"

- △ DENOTES FORM FINISH
- △ DENOTES SMOOTH FLOAT FINISH
- △ DENOTES ROUGHENED FINISH (SEE GENERAL NOTE #5, SHEET "F")
- △ DENOTES RAKE FINISH ROUGHENED TO 1/4" AMPLITUDE

SHOP NOTE:  
SEE DRAWING NO. "S5" FOR  
REINFORCING INFORMATION

| MARK:                     | BE-DS3  | QTY.:                                                                                     | 2 | WT.: | 17.02 T | VOL.:     | 8.41 cy |
|---------------------------|---------|-------------------------------------------------------------------------------------------|---|------|---------|-----------|---------|
| MATERIAL LIST / DECK SLAB |         |                                                                                           |   |      |         |           |         |
| ITEM                      | MARK    | DESCRIPTION                                                                               |   |      |         | QTY.      |         |
| 1                         | MK-BE1  | DAYTON C-24 TYPE 4-APR DECK FORM HANGER (GALV.)                                           |   |      |         | 4         |         |
| 2                         | MK-BE3  | 1"Ø x 1'-2" LEVELING BOLT (COIL THREAD)                                                   |   |      |         | 10        |         |
| 3                         | MK-BE4  | 1 3/8"Ø O.D. x 6 1/4" PVC PIPE SLEEVE                                                     |   |      |         | 10        |         |
| 4                         | MK-BE5  | DAYTON 1"Ø F-56 EXPANDED COIL INSERT (2-STRUT) (GALV.)                                    |   |      |         | 10        |         |
| 5                         | MK-BE6  | 4T x 7 1/8" SWIFT LIFT LIFTER (GALV.)                                                     |   |      |         | 5         |         |
| 6                         | MK-BE9  | GTI 2 3/8" x 5'-0 7/8" LONG CORRUGATED PP DUCT (SUPPLIED BY OTHERS)                       |   |      |         | 10        |         |
| 7                         | MK-BE10 | GTI 1'x3' TRANSITION PIECE (SUPPLIED BY OTHERS)                                           |   |      |         | 10        |         |
| 8                         | MK-BE11 | POST-TENSIONING TRUMPET [DSI 4-0 6' FLAT ANCHOR (GALV.) w/ HARDWARE] (SUPPLIED BY OTHERS) |   |      |         | 10        |         |
| 9                         | MK-BE12 | DSI POCKET FORMER (SUPPLIED BY OTHERS)                                                    |   |      |         | 10        |         |
| 10                        | MK-BE13 | 3/4" x 6" NPT PIPE NIPPLE (SUPPLIED BY OTHERS)                                            |   |      |         | 10        |         |
| 11                        |         | HEAT SHRINK (SUPPLIED BY OTHERS)                                                          |   |      |         | AS REQ'D. |         |
| 12                        |         |                                                                                           |   |      |         |           |         |
| 13                        | BE-401E | #4 BENT BAR (EPOXY COATED)                                                                |   |      |         | 40        |         |
| 14                        |         | #4 x 0'-5" (EPOXY COATED)                                                                 |   |      |         | 40        |         |
| 15                        |         |                                                                                           |   |      |         |           |         |
| 16                        | BE-502E | #6 BENT BAR (EPOXY COATED)                                                                |   |      |         | 2         |         |
| 17                        |         |                                                                                           |   |      |         |           |         |
| 18                        |         |                                                                                           |   |      |         |           |         |
| 19                        |         |                                                                                           |   |      |         |           |         |
| 20                        |         |                                                                                           |   |      |         |           |         |

APPROVAL STAMP:

J.P. CARRARA & SONS INC.

Precast & Prestress Manufacturer

2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010

THE BELDEN COMPANY

CONTRACTOR

RUTLAND, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION

COUNTY OF WINDSOR

TOWN OF LUDLOW

VT ROUTE 100 (MINOR ARTERIAL)

BRIDGE NO.: 99 PROJECT NO.: STP DECK(39)

PRECAST DECK SLAB

DIMENSIONAL DETAILS

DATE: NOV. 1, 2016

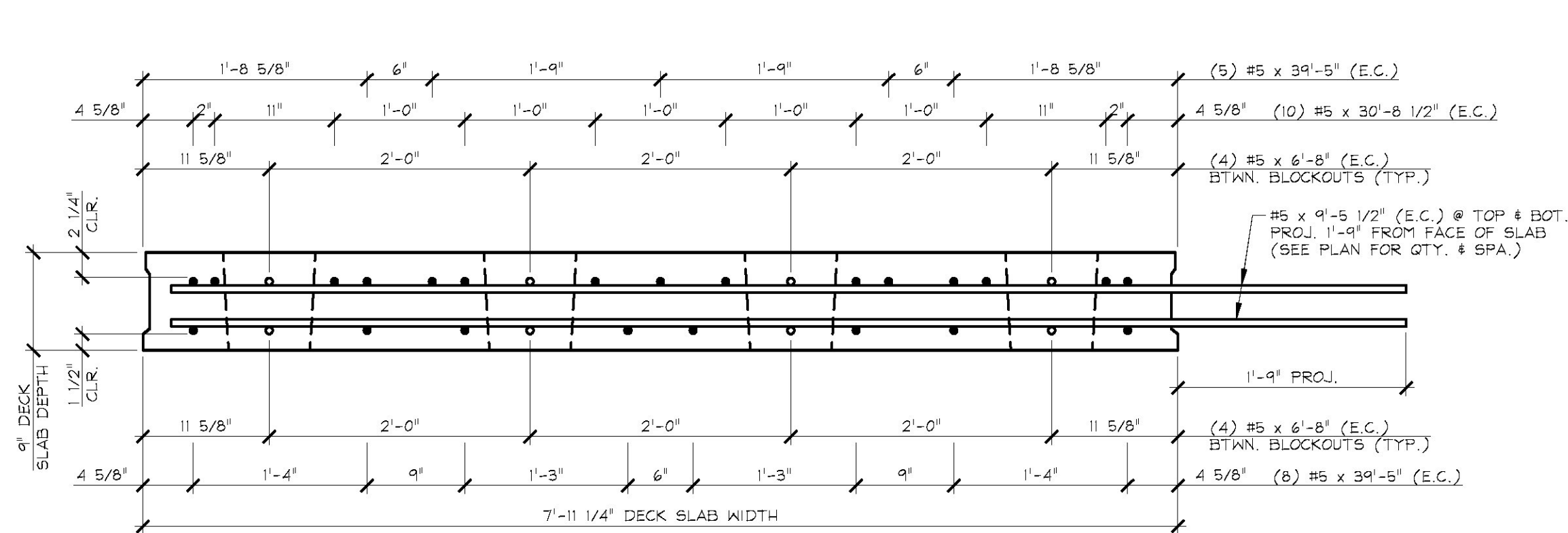
SCALE: NOTED

CHKD: A.S. DFTM: B.L.

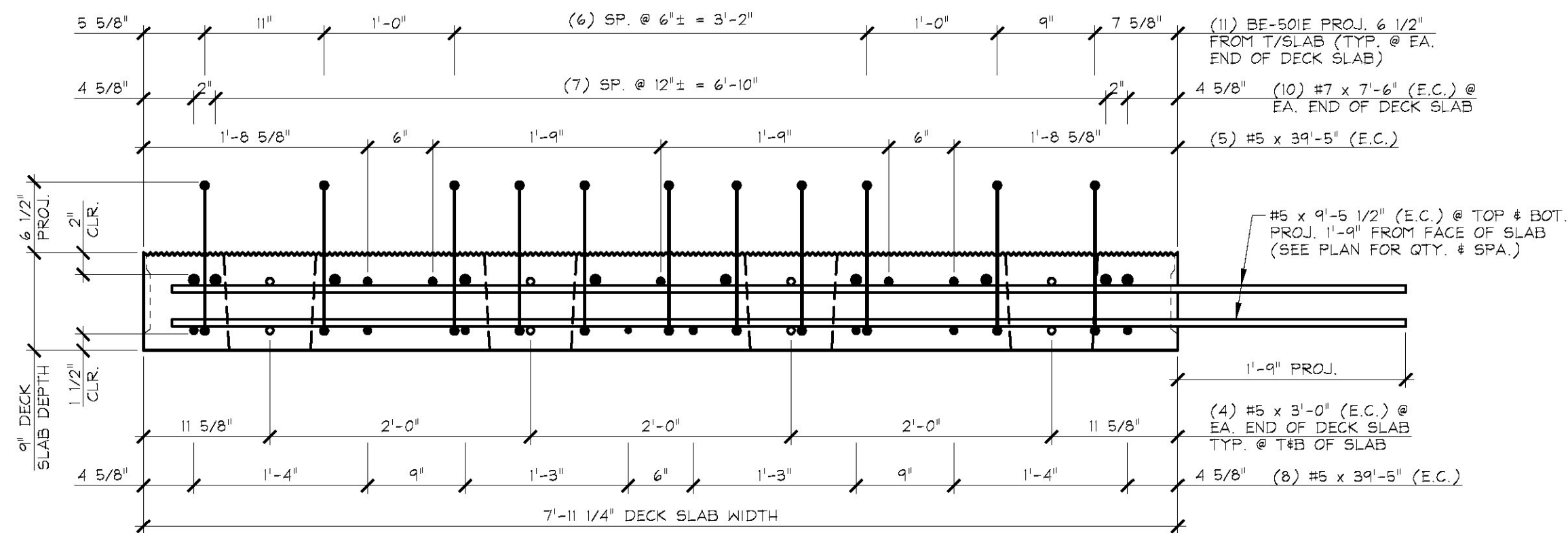
JOB NO: 23499-016

DWG. NO: S4

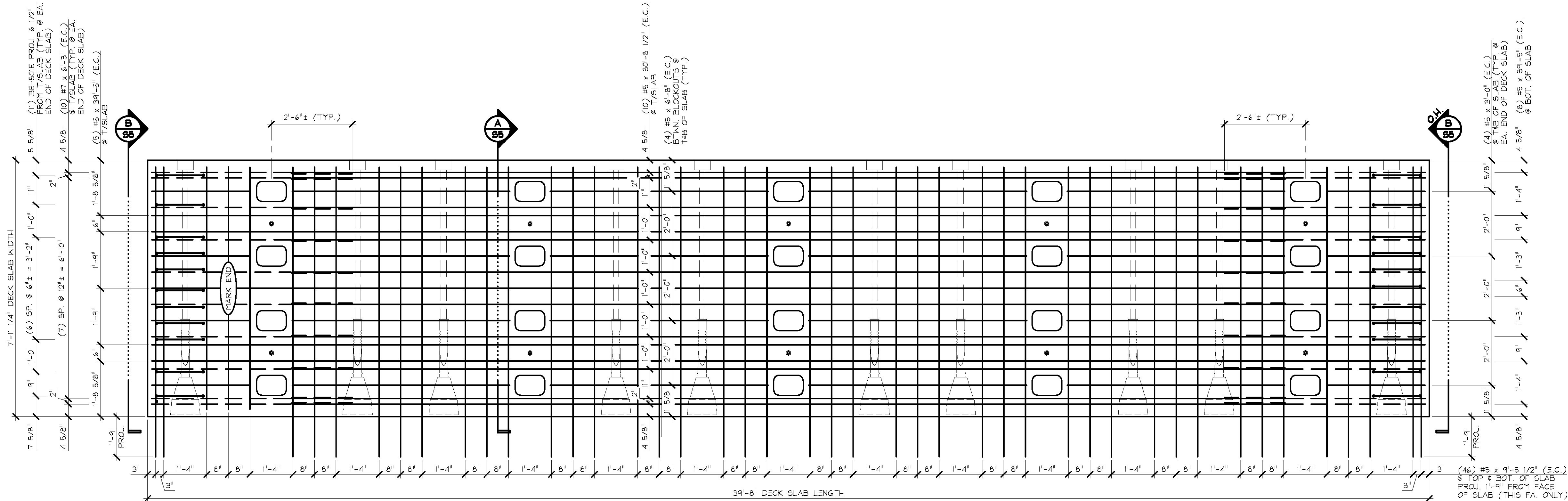




**A REINFORCING SECTION**  
**S5 @ MID-SPAN**  
1" = 1'-0"

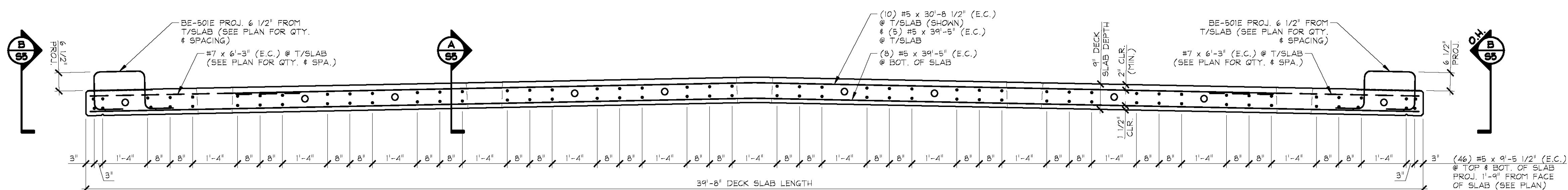


**B REINFORCING SECTION**  
**S5 @ BEAM END**  
1" = 1'-0"



**1 REINFORCING PLAN VIEW IN FORM**  
**S5**  
1/2" = 1'-0"

**SHOP NOTE:**  
SEE DRAWING NO. "S4" FOR ADDITIONAL  
REQUIRED REINFORCING NOT SHOWN ON  
THIS SHEET.

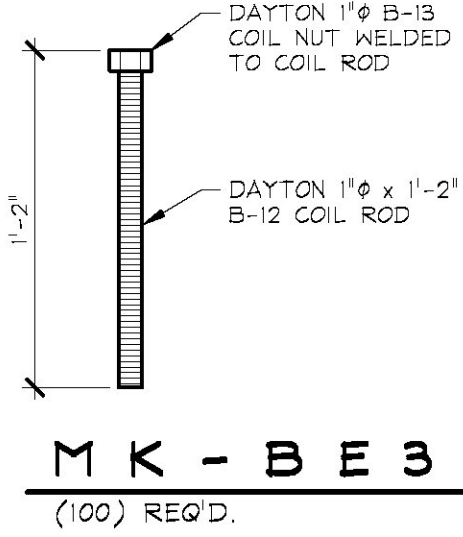
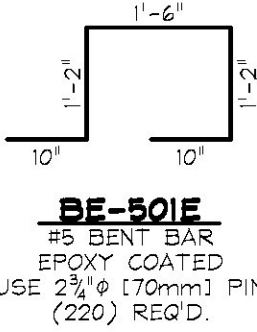
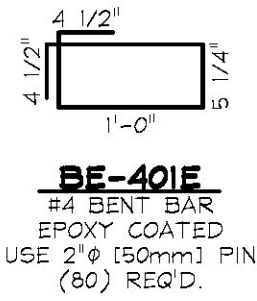


**2 REINFORCING ELEVATION**  
**S5**  
1/2" = 1'-0"

|                           |         |                                |      |
|---------------------------|---------|--------------------------------|------|
| MARK: BE-DS3              |         | QTY.: 2                        |      |
| MATERIAL LIST / DECK SLAB |         |                                |      |
| ITEM                      | MARK    | DESCRIPTION                    | QTY. |
| 1                         | BE-501E | #5 BENT BAR (EPOXY COATED)     | 22   |
| 2                         |         | #5 x 3'-0" (EPOXY COATED)      | 16   |
| 3                         |         | #5 x 6'-8" (EPOXY COATED)      | 32   |
| 4                         |         | #5 x 9'-5 1/2" (EPOXY COATED)  | 42   |
| 5                         |         | #5 x 30'-8 1/2" (EPOXY COATED) | 10   |
| 6                         |         | #5 x 39'-5" (EPOXY COATED)     | 13   |
| 7                         |         |                                |      |
| 8                         |         | #7 x 6'-3" (EPOXY COATED)      | 20   |
| 9                         |         |                                |      |
| 10                        |         |                                |      |

|                 |                                                                                                                                                            |  |                                                        |              |
|-----------------|------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------|--------------|
| APPROVAL STAMP: | <b>J.P. CARRARA &amp; SONS INC.</b><br>Precast & Prestress Manufacturer<br>2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010 |  | THE BELDEN COMPANY<br>CONTRACTOR<br>RUTLAND, VERMONT   |              |
|                 | STATE OF VERMONT AGENCY OF TRANSPORTATION<br>COUNTY OF WINDSOR                                                                                             |  | DATE:                                                  | NOV. 1, 2016 |
|                 | TOWN OF LUDLOW<br>VT ROUTE 100 (MINOR ARTERIAL)<br>BRIDGE NO.: 99 PROJECT NO.: STP DECK(39)                                                                |  | SCALE:                                                 | NOTED        |
|                 | PRECAST DECK SLAB<br>REINFORCING DETAILS                                                                                                                   |  | CHKD: A.S. DFTM: B.L.<br>JOB NO: 23499-016<br>DWG. NO: | <b>S5</b>    |





| MISCELLANEOUS MATERIALS |         |           |                                                                                             |                       |
|-------------------------|---------|-----------|---------------------------------------------------------------------------------------------|-----------------------|
| ITEM                    | MARK    | QTY.      | DESCRIPTION                                                                                 | REMARKS               |
| 1                       | MK-BE1  | 40        | DAYTON C-24 TYPE 4-APR DECK FORM HANGER                                                     | GALVANIZED            |
| 2                       | MK-BE2  | 80        | GTI 2 3/8" x 7'-11 1/4" LONG CORRUGATED PP DUCT                                             | SUPPLIED BY OTHERS    |
| 3                       | MK-BE3  | 100       | 1"φ x 1'-2" LEVELING BOLT (COIL THREAD)                                                     | SEE DETAIL THIS SHEET |
| 4                       | MK-BE4  | 100       | 1 3/8"φ O.D. x 6 1/4" PVC PIPE SLEEVE                                                       |                       |
| 5                       | MK-BE5  | 100       | DAYTON 1"φ F-56 EXPANDED COIL INSERT (2-STRUT)                                              | GALVANIZED            |
| 6                       | MK-BE6  | 80        | 4T x 7 1/8" SWIFT LIFT LIFTER                                                               | GALVANIZED            |
| 7                       | MK-BE7  | 10        | GTI 2 3/8" GROUT SADDLE                                                                     | SUPPLIED BY OTHERS    |
| 8                       | MK-BE8  | 10        | 21mm x 8" GTI GROUT TUBE                                                                    | SUPPLIED BY OTHERS    |
| 9                       | MK-BE9  | 20        | GTI 2 3/8" x 5'-0 7/8" LONG CORRUGATED PP DUCT (ADJUST LENGTH AS REQ'D. AFTER INSTALLATION) | SUPPLIED BY OTHERS    |
| 10                      | MK-BE10 | 20        | GTI 1"x3" TRANSITION PIECE                                                                  | SUPPLIED BY OTHERS    |
| 11                      | MK-BE11 | 20        | POST-TENSIONING TRUMPET (DSI 4-0.6" FLAT ANCHOR (GALV.) W/ HARDWARE)                        | SUPPLIED BY OTHERS    |
| 12                      | MK-BE12 | 20        | DSI POCKET FORMER                                                                           | SUPPLIED BY OTHERS    |
| 13                      | MK-BE13 | 20        | 3/4" x 6" NPT PIPE NIPPLE                                                                   | SUPPLIED BY OTHERS    |
| 14                      |         |           |                                                                                             |                       |
| 15                      |         | AS REQ'D. | HEAT SHRINK                                                                                 | SUPPLIED BY OTHERS    |
| 16                      |         |           |                                                                                             |                       |
| 17                      |         |           |                                                                                             |                       |
| 18                      |         | 80        | #4 x 0'-5" (EPOXY COATED)                                                                   |                       |
| 19                      |         |           |                                                                                             |                       |
| 20                      |         | 160       | #5 x 3'-0" (EPOXY COATED)                                                                   |                       |
| 21                      |         | 320       | #5 x 6'-8" (EPOXY COATED)                                                                   |                       |
| 22                      |         | 736       | #5 x 7'-6" (EPOXY COATED)                                                                   |                       |
| 23                      |         | 100       | #5 x 30'-8 1/2" (EPOXY COATED)                                                              |                       |
| 24                      |         | 130       | #5 x 3'-5" (EPOXY COATED)                                                                   |                       |
| 25                      |         | 184       | #5 x 9'-5 1/2" (EPOXY COATED)                                                               |                       |
| 26                      |         |           |                                                                                             |                       |
| 27                      |         | 200       | #7 x 6'-3" (EPOXY COATED)                                                                   |                       |
| 28                      |         |           |                                                                                             |                       |
| 29                      |         |           |                                                                                             |                       |
| 30                      |         |           |                                                                                             |                       |

|                 |                                                                                                                                                           |  |                                                      |            |
|-----------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|--|------------------------------------------------------|------------|
| APPROVAL STAMP: | <b>J.P. CARRARA &amp; SONS INC.</b><br>Precast & Prestress Manufacturer<br>2464 CASE ST., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010 |  | THE BELDEN COMPANY<br>CONTRACTOR<br>RUTLAND, VERMONT |            |
|                 | <b>STATE OF VERMONT AGENCY OF TRANSPORTATION<br/>COUNTY OF WINDSOR</b>                                                                                    |  | DATE: NOV. 1, 2016                                   |            |
|                 |                                                                                                                                                           |  | SCALE: NOTED                                         |            |
|                 | <b>TOWN OF LUDLOW<br/>VT ROUTE 100 (MINOR ARTERIAL)<br/>BRIDGE NO.: 99 PROJECT NO.: STP DECK(39)</b>                                                      |  | CHKD: A.S.                                           | DFTM: B.L. |
|                 |                                                                                                                                                           |  | JOB NO:                                              | 23499-016  |
|                 | <b>MATERIALS LIST</b>                                                                                                                                     |  | DWG. NO:                                             | M1         |





REV.1

SHOP DRAWINGS  
&  
CALCULATIONS

For

LUDLOW  
POST-TENSIONED VT DECK PANELS

STATE OF VERMONT  
AGENCY OF TRANSPORTATION

PREPARED FOR

CONSTRUCTIVE SERVICES, INC.

SUBMITTED FOR FINAL APPROVAL

November 22, 2016

| SHOP DRAWING REVIEW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                           |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------|
| <input type="checkbox"/> REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.                                                                                                                                                                                                                                                                                                                                                          |                                                                                           |
| <input type="checkbox"/> REJECTED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input type="checkbox"/> REVISE AND RESUBMIT                                              |
| <input checked="" type="checkbox"/> APPROVED AS NOTED                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                           |
| CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DO NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THEIR WORK WITH THAT OF ALL OTHER TRADES, AND PERFORMING THEIR WORK IN A SAFE AND SATISFACTORY MANNER. |                                                                                           |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | CLD Consulting Engineers<br>540 Commercial Street<br>Manchester, NH 03101<br>603-689-6223 |
| Job Number: 150223<br>Reviewed by: N. CARON<br>Date: 12/15/2016                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                           |

Vermont Agency of Transportation  
**RECEIVED**

CK'D BY CLD OK'D BY TAS  
December 7, 2016

RESUBMIT No Approved AsNoted  
BY T Sumner DATE 12/16/16



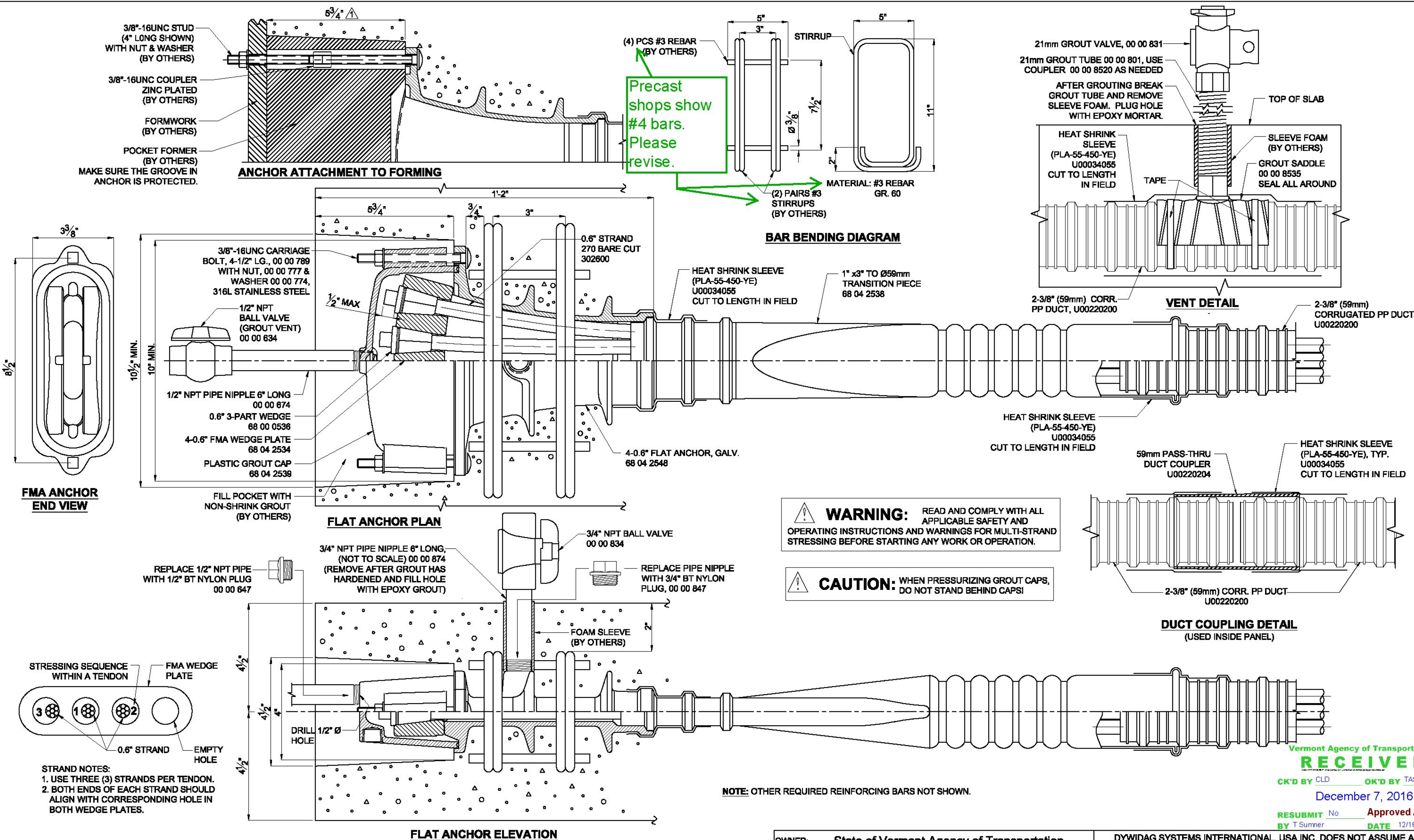


## INDEX

### PAGE NO.: CONTENTS:

|        |                                                       |
|--------|-------------------------------------------------------|
| Page 3 | 4-0.6" Flat Anchorage System Assembly Drawing - PT-1  |
| Page 4 | Deck Slab Tendon Layout and Stressing Schedule - PT-2 |
| Page 5 | Stressing Calculations                                |

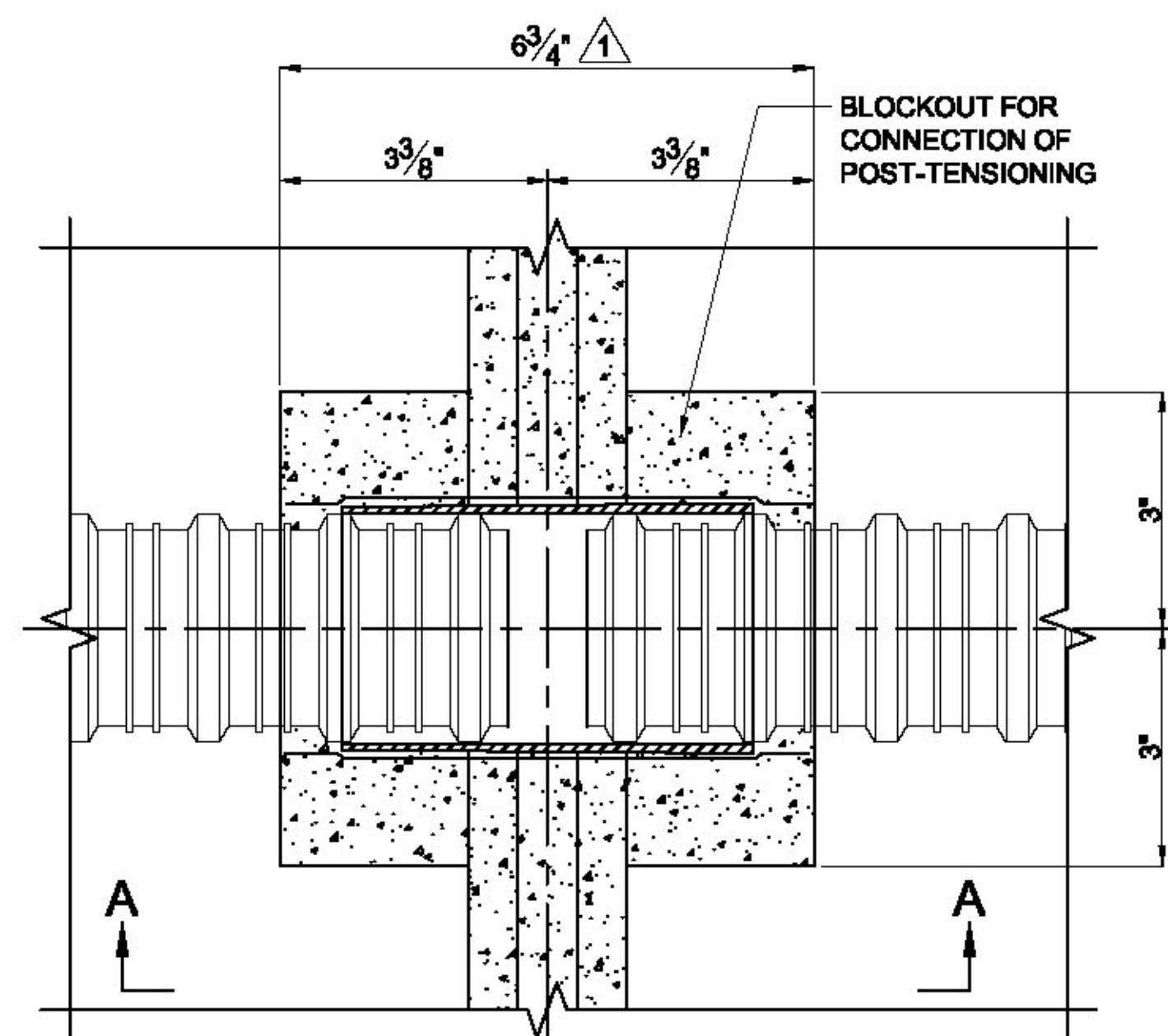




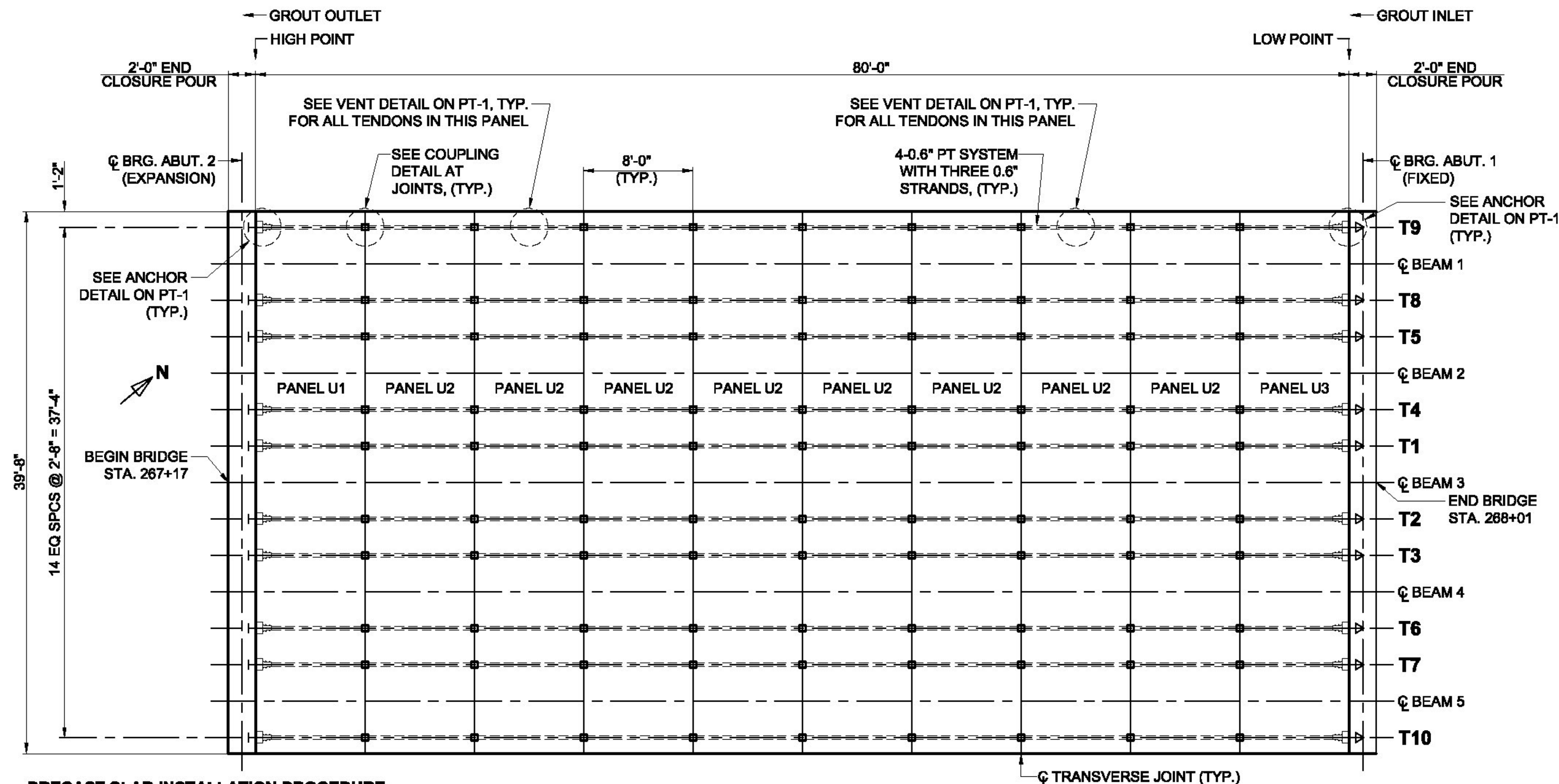
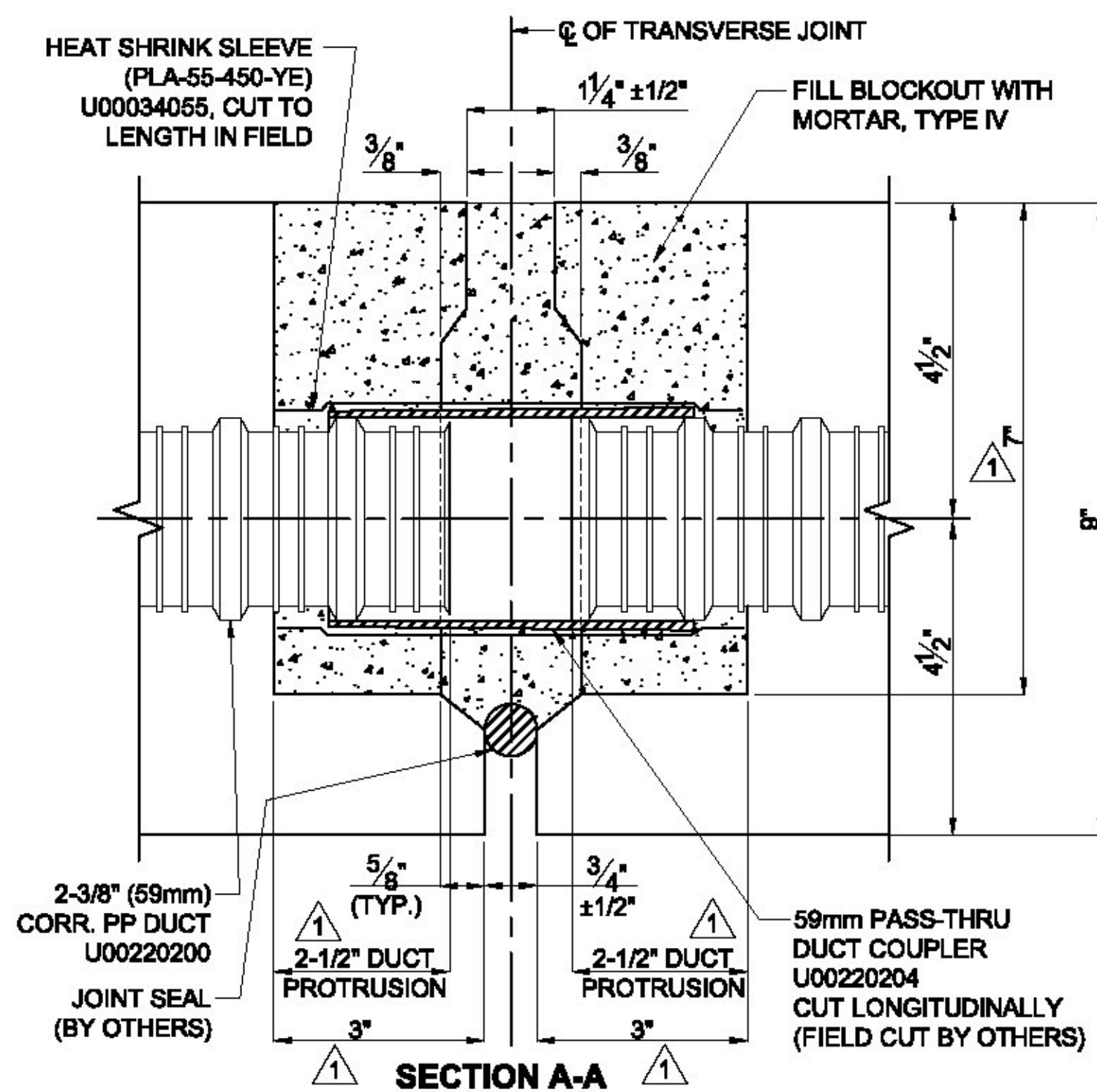
| PART NO.   | DESCRIPTION                      | MATERIAL SPECIFICATION                | PART NO.   | DESCRIPTION                         | MATERIAL SPECIFICATION |
|------------|----------------------------------|---------------------------------------|------------|-------------------------------------|------------------------|
| 302600     | 0.6" STRAND 270 BARE CUT         | 0.6" DIA. LOWLAX STRAND PER ASTM A416 | 00 00 834  | 3/4" NPT BALL VALVE                 | PVC                    |
| 68 04 2548 | 4-0.6" FMA ANCHOR GALV.          | DUCTILE IRON, 80-55-06 ASTM A536      | 00 00 634  | 1/2" NPT BALL VALVE                 | PVC                    |
| 68 04 2534 | 4-0.6" FMA WEDGE PLATE           | DUCTILE IRON, 80-55-06 ASTM A536      | 00 00 847  | 3/4" BT PLUG                        | NYLON                  |
| 68 04 2539 | 4-0.6" PLASTIC GROUT CAP         | NYLON 6, 20% GLASS FILLED             | 00 00 647  | 1/2" BT PLUG                        | NYLON                  |
| 68 00 0536 | 0.6" 3-PART WEDGE                | COLD DRAWN C12L14 BAR                 | 00 00 789  | 3/8"-16UNC CARRIAGE BOLT 4-1/2" LG. | 316L STAINLESS STEEL   |
| U00220200  | 2-3/8" (59mm) CORR. PP DUCT      | PPEX3                                 | 00 00 777  | HEX NUT                             |                        |
| U00220204  | 59mm PASS-THRU DUCT COUPLER      | HDPE OR POLYPROPENE                   | 00 00 774  | WASHER                              |                        |
| 68 04 2538 | 1" x3" TO Ø59mm TRANSITION PIECE | POLYETHYLENE                          | 00 00 8535 | GROUT SADDLE                        | HDPE                   |
| U00034055  | HEAT SHRINK SLEEVE PLA-55-450-YE | PER CANUSA SPECS.                     | 00 00 801  | 21mm GROUT TUBE                     | HDPE                   |
| 00 00 674  | 3/4" NPT PIPE NIPPLE 6" LONG     | SCH 40 BLACK WELDED STEEL             | 00 00 8520 | 21mm GROUT TUBE COUPLER             | HDPE                   |
| 00 00 674  | 1/2" NPT PIPE NIPPLE 6" LONG     | SCH 40 BLACK WELDED STEEL             | 00 00 831  | 21mm GROUT VALVE                    | PLASTIC                |

|                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |                                                                                                                                                                                |  |         |  |         |  |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|---------|--|---------|--|--|--|
| OWNER: State of Vermont Agency of Transportation                                                                                                                                                                                                                                                                                                                                                                               |  |  |  | DYWIDAG SYSTEMS INTERNATIONAL, USA INC. DOES NOT ASSUME ANY LIABILITY FOR THE DESIGN OF THIS STRUCTURE. THIS SHOP DRAWING IS INTENDED TO PROVIDE POST TENSIONING DETAILS ONLY. |  |         |  |         |  |  |  |
| CONTRACTOR: CONSTRUCTIVE SERVICES, INC.                                                                                                                                                                                                                                                                                                                                                                                        |  |  |  |                                                                                                                                                                                |  |         |  |         |  |  |  |
| PROJECT: LUDLOW VT DECK PANELS                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  |                                                                                                                                                                                |  |         |  |         |  |  |  |
| 4-0.6" FLAT ANCHORAGE SYSTEM ASSEMBLY DRAWING                                                                                                                                                                                                                                                                                                                                                                                  |  |  |  |                                                                                                                                                                                |  |         |  |         |  |  |  |
| DATE: 11/10/16                                                                                                                                                                                                                                                                                                                                                                                                                 |  |  |  | DWG: GM                                                                                                                                                                        |  | CHK: SN |  | APP: SN |  |  |  |
| THIS DRAWING, THE PERTINENT ENCLOSURES, DESCRIPTIONS, CALCULATIONS ETC. AND THEIR CONTENTS ARE THE PROPERTY OF DYWIDAG SYSTEMS INTERNATIONAL, USA, INC. THEY ARE NOT ALLOWED TO BE DUPLICATED WITHOUT OUR PERMISSION. THEY ARE ALSO NOT TO BE SHOWN OR EXPLAINED FOR ANY REASON TO A THIRD PARTY OTHER THAN FOR REASONS EXPRESSLY INTENDED BY DSI'S SUBMITTAL TO THE ORIGINAL RECEIVER. THEY HAVE TO BE RETURNED UPON REQUEST. |  |  |  |                                                                                                                                                                                |  |         |  |         |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  | DYWIDAG-SYSTEMS INTERNATIONAL, USA, INC.                                                                                                                                       |  |         |  |         |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  | POST TENSIONING / REINFORCING UNIT PHONE: 630-739-1100                                                                                                                         |  |         |  |         |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  | 320 MARMON DRIVE - BOLINGBROOK, IL FAX: 630-739-1405                                                                                                                           |  |         |  |         |  |  |  |
|                                                                                                                                                                                                                                                                                                                                                                                                                                |  |  |  |                                                                                           |  |         |  |         |  |  |  |





**COUPLING DETAIL AT JOINTS**  
(USED AT DUCT BLOCKOUT IN BETWEEN PANELS)



**PRECAST SLAB INSTALLATION PROCEDURE:**

1. ERECT DECK SLABS.
2. ADJUST SLABS TO GRADE USING LEVELING DEVICES. ALL LEVELING BOLTS SHALL BE TORQUED TO APPROXIMATELY THE SAME VALUE WITHIN 20%.
3. INSTALL DUCT COUPLER AS SHOWN. INSTALL PT STRANDS LOOSE IN DUCT
4. COMPLETE OTHER WORKS PER CONTRACT PLANS SHEET 4 OF 42..
5. STRESS PT TENDONS FOLLOWING THE PROVIDED STRESSING SEQUENCE ON THIS SHEET. MAKE SURE TO STRESS EACH OF 3 STRANDS IN EACH TENDON TO THE REQUIRED JACKING FORCE FOLLOWING THE SEQUENCE AS SHOWN ON SHEET PT-1. SEE TABLE FOR JACKING FORCE AND ELONGATIONS
6. AFTER STRESSING RECORDS ARE APPROVED BY ENGINEER OF RECORDS, CUT TAILS AND GROUT EACH DUCT FROM THE NORTH END AS SHOWN. USE ALL OTHER GROUT TUBES AS VENT.
7. POURBACK THE BLOCKOUTS WITH NON-SHRINK GROUT

**POST-TENSIONING LAYOUT PLAN**

| TENDON | 100% JACKING FORCE PER STRAND (KIPS) | LOCK-OFF FORCE PER STRAND (KIPS) | REQUIRED ELONGATION BETWEEN 20% AND 100% |                     |
|--------|--------------------------------------|----------------------------------|------------------------------------------|---------------------|
|        |                                      |                                  | BEFORE LOCK-OFF (IN)                     | AFTER LOCK-OFF (IN) |
| ALL    | 33.4                                 | 30.7                             | 4.28                                     | 3.96                |

**LEGEND**

- T1 → STRESSING SEQUENCE
- TENDON MARK
- STRESSING END
- DEAD END

Vermont Agency of Transportation  
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CK'D BY CLD OK'D BY TAS  
December 7, 2016

RESUBMIT No Approved  
BY T Sumner DATE 12/16/16

|                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                                                                                |          |                    |                   |      |       |            |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------------|-------------------|------|-------|------------|
| OWNER: State of Vermont Agency of Transportation                                                                                                                                                                                                                                                                                                                                                                              |  | DYWIDAG SYSTEMS INTERNATIONAL, USA INC. DOES NOT ASSUME ANY LIABILITY FOR THE DESIGN OF THIS STRUCTURE. THIS SHOP DRAWING IS INTENDED TO PROVIDE POST TENSIONING DETAILS ONLY. |          |                    |                   |      |       |            |
| CONTRACTOR: CONSTRUCTIVE SERVICES, INC.                                                                                                                                                                                                                                                                                                                                                                                       |  |                                                                                                                                                                                |          |                    |                   |      |       |            |
| PROJECT: LUDLOW VT DECK PANELS                                                                                                                                                                                                                                                                                                                                                                                                |  |                                                                                                                                                                                |          |                    |                   |      |       |            |
| DECK SLAB TENDON LAYOUT AND STRESSING SCHEDULE                                                                                                                                                                                                                                                                                                                                                                                |  | WEIGHT                                                                                                                                                                         | REV.     | DATE               | ISSUE DESCRIPTION | NAME | CHKD. | JOB NUMBER |
|                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                                                                                | 0        | 11-11-16           | FOR APPROVAL      | GM   | SN    | J115139    |
|                                                                                                                                                                                                                                                                                                                                                                                                                               |  |                                                                                                                                                                                | 11-22-16 | FOR FINAL APPROVAL | GM                | SN   |       |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                               |  | SCALE                                                                                                                                                                          |          |                    |                   |      |       |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                               |  | 3/32" = 1'-0"                                                                                                                                                                  |          |                    |                   |      |       |            |
|                                                                                                                                                                                                                                                                                                                                                                                                                               |  | 3" = 1'-0"                                                                                                                                                                     |          |                    |                   |      |       |            |
| DATE: 11-10-16 DWG: GM CHK: SN APP: SN                                                                                                                                                                                                                                                                                                                                                                                        |  | DRAWING NUMBER: PT-2                                                                                                                                                           |          |                    |                   |      |       |            |
| THIS DRAWING, THE PERTINENT ENCLOSURES, DESCRIPTIONS, CALCULATIONS ETC. AND THEIR CONTENTS ARE THE PROPERTY OF DYWIDAG SYSTEMS INTERNATIONAL, USA, INC. THEY ARE NOT ALLOWED TO BE DUPLICATED WITHOUT OUR PERMISSION. THEY ARE ALSO NOT TO BE SHOWN OR EXPLAINED FOR ANY REASON TO A THIRD PARTY OTHER THAN FOR REASONS EXPRESSLY INTENDED BY DSI% SUBMITTAL TO THE ORIGINAL RECEIVER. THEY HAVE TO BE RETURNED UPON REQUEST. |  | <b>DYWIDAG-SYSTEMS INTERNATIONAL, USA, INC.</b><br>POST TENSIONING / REINFORCING UNIT PHONE: 630-739-1100<br>320 MARION DRIVE - BOLINGBROOK, IL FAX: 630-739-1405              |          |                    |                   |      |       |            |





ADAPT Corporation  
1733 Woodside Rd., Suite 220  
Redwood City, CA, 94061, USA

ADAPT CORPORATION  
1733 Woodside Road, Suite 220, Redwood City, CA 94061 USA  
Tel: (650) 306 2400, Fax: (650) 306 2401  
E-mail: support@adaptsoft.com, Web site: www.adaptsoft.com

ADAPT-FELT Standard 2014  
ADAPT POST-TENSIONING STRESS LOSS & ELONGATION PROGRAM  
This program calculates the long-term and immediate stress losses in a post-tensioned tendon. It outputs the elongations at the stressing ends and the final stress profile along the tendon.

DATE: Nov 15, 2016

TIME: 09:49:41

PROJECT TITLE :

LUDLOW VT DECK PANELS

SPECIFIC TITLE :

TYPICAL PT TENDON

Vermont Agency of Transportation

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December 7, 2016

RESUBMIT No Approved

BY T Sumner DATE 12/16/16

F R I C T I O N   &   E L O N G A T I O N   C A L C U L A T I O N S :

INPUT PARAMETERS :

Coefficient of angular friction (meu).....

0.23000 /radian

Coefficient of wobble friction (K).....

0.00020 rad/ft

Ultimate strength of strand .....

270.00 ksi

Ratio of jacking stress to strand's ultimate strength

0.57

Anchor set .....

0.38 inch

Cross-sectional area of strand .....

0.217 inch^2

Total Number of Strands per Tendon.....

3

Modulus of elasticity of strand .....

28500.00 ksi

STRESSING .....

AT RIGHT END

LEGEND :

P ..... = Tendon profile type defined as: 1=reversed parabola;  
2=partial/regular parabola; 3=harped; 4=general; 5=straight;  
6=extended reversed parabola; 7=cantilever down

X1/L etc = horizontal distances to control points in geometry of the  
tendon divided by span length

Stresses tabulated are after anchor set but before long-term losses.

TENDON ID, GEOMETRY AND STRESS PROFILE (Typical PT tendon)

| LENGTH |        | < TENDON HEIGHT in.> |        |        | Horizontal ratios |       |       | <- STRESS (ksi) --> |         |         |       |
|--------|--------|----------------------|--------|--------|-------------------|-------|-------|---------------------|---------|---------|-------|
| SPAN   | ft     | P                    | start  | center | right             | X1/L  | X2/L  | X3/L                | start   | center  | right |
| -1---- | 2----- | 3----                | 4----- | 5----- | 6-----            | 7---- | 8---- | 9-----              | 10----- | 11----- | 12-   |



179.5014.504.504.500.050.500.05142.69141.48140.26

79.50 ft (total length of tendon)

SUMMARY :

|                                             |        |     |
|---------------------------------------------|--------|-----|
| Average initial stress (after release)..... | 141.48 | ksi |
| Long term stress losses .....               | 0.00   | ksi |
| Final average stress .....                  | 141.48 | ksi |
| Final average force in tendon .....         | 92.10  | k   |

|                                                           |       |      |
|-----------------------------------------------------------|-------|------|
| Anchor set influence from right pull (142.69ksi;0.528) .. | 79.50 | ft   |
| Elongation at right pull before anchor set .....          | 5.111 | inch |
| Elongation at right pull after anchor set .....           | 4.736 | inch |

|                                                                   |        |         |
|-------------------------------------------------------------------|--------|---------|
| Total elongation after anchor set .....                           | 4.736  | inch    |
| Ratio of total elongation to tendon length after anchor set ..... | 0.060  | inch/ft |
| Jacking force .....                                               | 100.19 | k       |

CRITICAL STRESS RATIOS :

At stressing 0.570; At anchorage 0.528; Max along tendon 0.528

Vermont Agency of Transportation

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December 7, 2016

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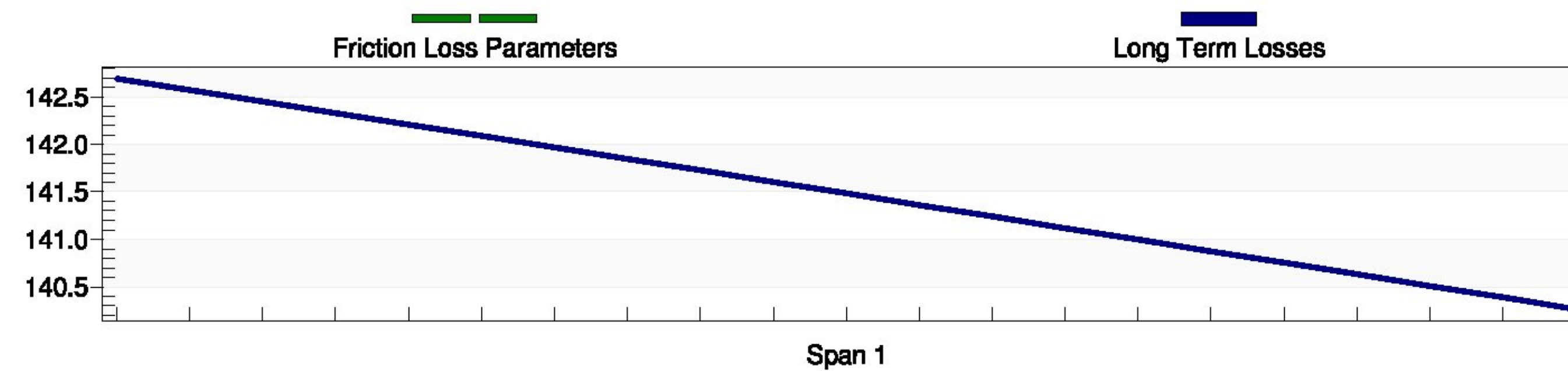
BY T Sumner DATE 12/16/16



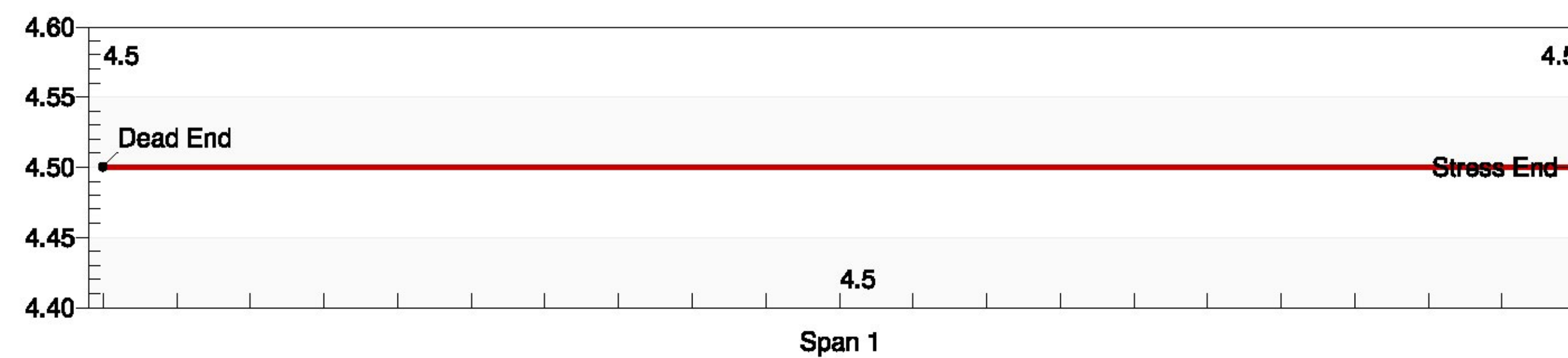
Date: 11/15/2016 Time: 09:54

1.2 FILE NAME : Typical PT tendon

## 2 - TENDON STRESSES [ksi]



### 3 - TENDON PROFILE [in]



#### 4 - SUMMARY

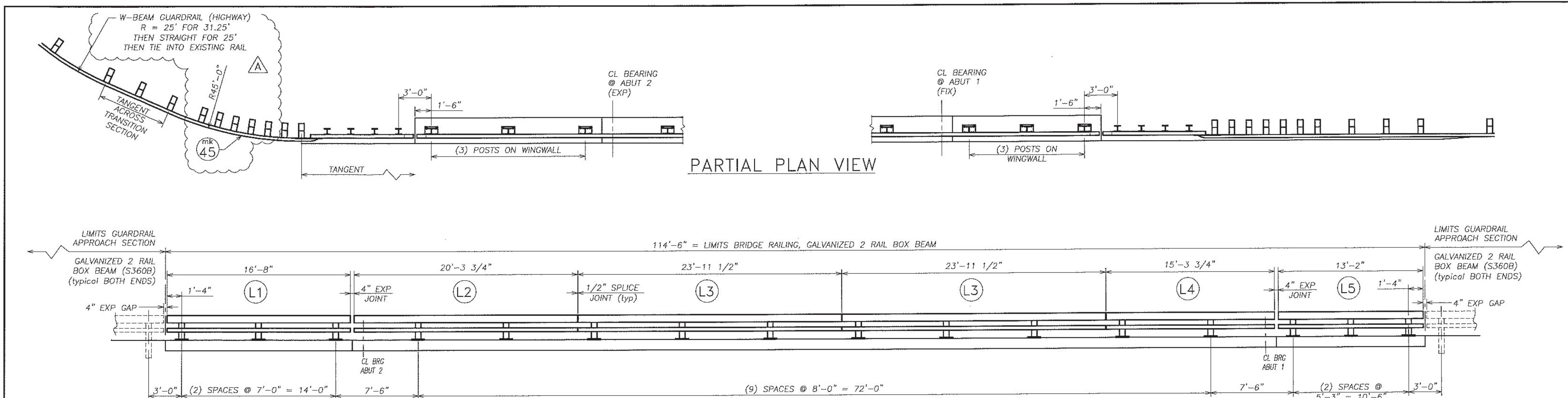
|                                                                      |        |         |
|----------------------------------------------------------------------|--------|---------|
| Average initial stress (after release).....                          | 141.48 | ksi     |
| Long term stress losses .....                                        | 0.00   | ksi     |
| Final average stress .....                                           | 141.48 | ksi     |
| Final average force in tendon .....                                  | 92.10  | k       |
|                                                                      |        |         |
| Anchor set influence from right pull (142.69ksi;0.528) ..            | 79.50  | ft      |
| Elongation at right pull before anchor set .....                     | 5.111  | inch    |
| Elongation at right pull after anchor set .....                      | 4.736  | inch    |
|                                                                      |        |         |
| Total elongation after anchor set .....                              | 4.736  | inch    |
| Ratio of total elongation to<br>tendon length after anchor set ..... | 0.060  | inch/ft |
| Jacking force .....                                                  | 100.19 | k       |

CRITICAL STRESS RATIOS :  
At stressing 0.570; At anchorage 0.528; Max along tendon 0.528

## 5 - DESIGNER'S NOTES

Vermont Agency of Transportation  
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2016 DEC 7 10:03 AM VT Agency of Transportation/Transportation Services  
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BILL OF MATERIAL  
BOTH SIDES OF BRIDGE

| Qty                 | mk | Description                                                                                       | Spec.       |
|---------------------|----|---------------------------------------------------------------------------------------------------|-------------|
| 229 LF              |    | ITEM 525.33 BRIDGE RAILING, GALVANIZED, 2 RAIL BOX BEAM                                           |             |
| 32                  |    | BRIDGE RAILING POST W6 x 25 x 2'-2.375" OAH WITH 1 x 10 x 14 BASE PLATE (GLV)                     | A709 gr 50  |
| 6                   |    | SPLICE TUBE (FOR 8X4 RAIL) HSS 7 x 3 x 3/8 x 1'-8.000" OAL w/ TAPPED HOLES & 2 WELDED NUTS (GLV)  | A500 gr B   |
| 6                   |    | SPLICE TUBE (FOR 4X4 RAIL) HSS 3 x 3 x 5/16 x 1'-8.000" OAL w/ TAPPED HOLES & 2 WELDED NUTS (GLV) | A500 gr B   |
| 4                   |    | EXP SPLICE (FOR 8X4 RAIL) HSS 7 x 3 x 3/8 x 1'-11.750" OAL w/ TAPPED HOLES & 2 WELDED NUTS (GLV)  |             |
| 4                   |    | EXP SPLICE (FOR 4X4 RAIL) HSS 3 x 3 x 5/16 x 1'-11.750" OAL w/ TAPPED HOLES & 2 WELDED NUTS (GLV) |             |
| 2                   | L1 | UPPER RAIL TUBE 8 x 4 x 5/16 16'-8.000" OAL (GLV) exp slots both ends                             | A500 gr B   |
| 2                   | L2 | UPPER RAIL TUBE 8 x 4 x 5/16 20'-3.750" OAL (GLV) 1 end slots, 1 end holes                        | A500 gr B   |
| 4                   | L3 | UPPER RAIL TUBE 8 x 4 x 5/16 23'-11.500" OAL (GLV) splice holes both ends                         | A500 gr B   |
| 2                   | L4 | UPPER RAIL TUBE 8 x 4 x 5/16 15'-3.750" OAL (GLV) 1 end slots, 1 end holes                        | A500 gr B   |
| 2                   | L5 | UPPER RAIL TUBE 8 x 4 x 5/16 13'-2.000" OAL (GLV) exp slots both ends                             | A500 gr B   |
| 2                   | L1 | LOWER RAIL TUBE 4 x 4 x 1/4 16'-8.000" OAL (GLV) exp slots both ends                              | A500 gr B   |
| 2                   | L2 | LOWER RAIL TUBE 4 x 4 x 1/4 20'-3.750" OAL (GLV) 1 end slots, 1 end holes                         | A500 gr B   |
| 4                   | L3 | LOWER RAIL TUBE 4 x 4 x 1/4 23'-11.500" OAL (GLV) splice holes both ends                          | A500 gr B   |
| 2                   | L4 | LOWER RAIL TUBE 4 x 4 x 1/4 15'-3.750" OAL (GLV) 1 end slots, 1 end holes                         | A500 gr B   |
| 2                   | L5 | LOWER RAIL TUBE 4 x 4 x 1/4 13'-2.000" OAL (GLV) exp slots both ends                              | A500 gr B   |
| anchors on bridge   |    |                                                                                                   |             |
| 20                  |    | ANCHOR SPACER PLATE PL 0.375 x 13.000 x 9.375                                                     | A709 gr 36  |
| 80                  |    | ANCHOR STUD DBL END PART THREAD - 1" DIA x 12.000 w/ 2.250" THD EACH END (GLV)                    | A449        |
| 160                 |    | HEAVY HEX NUT 1" (GLV)                                                                            | A563 DH     |
| 80                  |    | ROUND WASHER (SAE) - 1" DIA SMALL (GLV)                                                           | F436        |
| 80                  |    | JAM NUT 1" (GALV)                                                                                 | A563 DH     |
| anchors on wingwall |    |                                                                                                   |             |
| 12                  |    | ANCHOR STUD DBL END PART THREAD - 1" DIA x 12.000 w/ 2.250" THD EACH END (GLV)                    | A449        |
| 24                  |    | HEAVY HEX NUT 1" (GLV)                                                                            | A563 DH     |
| 12                  |    | ROUND WASHER (SAE) - 1" DIA SMALL (GLV)                                                           | F436        |
| 128                 |    | ROUND HEAD POST BOLT slot or wrench head - no shoulder 3/4" DIA x 6" LG. FULL BODY (GLV)          | A449 / A325 |
| 128                 |    | LOCK NUT 3/4" (GLV)                                                                               | A563 DH     |
| 128                 |    | ROUND WASHER (SAE) 3/4" (GLV)                                                                     | F436        |
| 80                  |    | HEX HEAD BOLT 5/8" DIA x 1.75" LG. (GLV)                                                          | A325        |
| 80                  |    | ROUND WASHER (SAE) 5/8" (GLV)                                                                     | F436        |
| 32                  |    | SPACER PIPE - GALVANIZED 3/4" SCH. 40 x 1/2" LONG (GLV)                                           | A53 gr B    |
| 32                  |    | BEARING PAD 0.125" THICK x 10.000 x 14.000 (NEOPRENE 80 duro +/-10)                               | aashto M251 |

NORTHWEST SIDE RAILING ELEVATION  
LOOKING AT TRAFFIC FACE OF RAILING  
FACING NORTHWEST FROM CENTERLINE OF ROAD

Vermont Agency of Transportation  
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December 29, 2016  
RESUBMIT No Approved AsNoted  
BY T Sumner DATE 01/03/2016

|     |                     |          |
|-----|---------------------|----------|
| A   | corrected submittal | 12-29-16 |
| 0   | initial submittal   | 10-26-16 |
| No. | Remarks             | Date     |

REVISIONS - APPLIES TO SET

SHOP DRAWING REVIEW

☐ REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.

☐ REJECTED ☐ REVISE AND RESUBMIT ☒ APPROVED AS NOTED

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DID NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS, SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION, COORDINATING THEIR WORK WITH THAT OF ALL OTHER TRADES, AND PERFORMING THEIR WORK IN A SAFE AND SATISFACTORY MANNER.

CLD Consulting Engineers  
400 Commercial Street  
Manchester, NH 03101  
603-666-8223

Job Number: 15-0223  
Reviewed by: NDC  
Date: 1/3/2017

**HIGHWAY SAFETY CORP**  
GLASTONBURY, CT  
860-633-9445

ITEM 525.33 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM (S-360A)

ITEM 621.72 GUARDRAIL APPROACH, GALV 2 RAIL BOX BEAM (S-360B)

TOWN OF LUDLOW, VERMONT

VT ROUTE 100 - (MINOR ARTERIAL) BRIDGE #99

WINDSOR COUNTY STP DECK (39)

GENERAL CONTRACTOR

SUB CONTRACTOR

LAFAYETTE

SCALE

10-20-16

SCALE

NONE

SIZE

D

CERTIFIED FABRICATOR

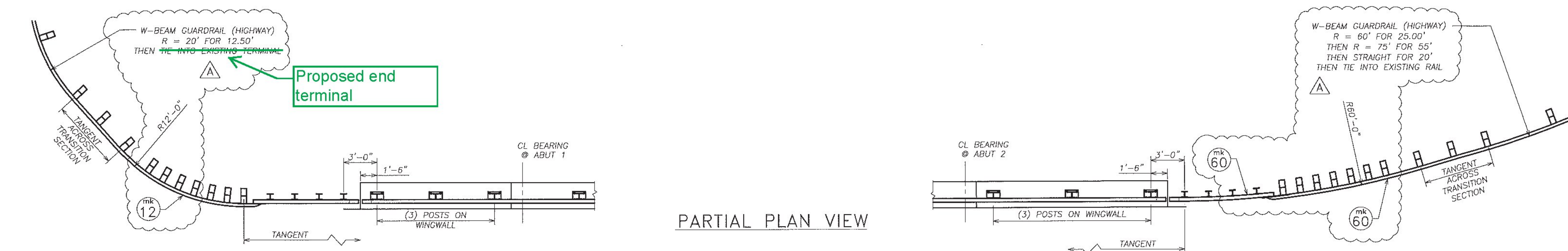
NSC JOB NO.

2141

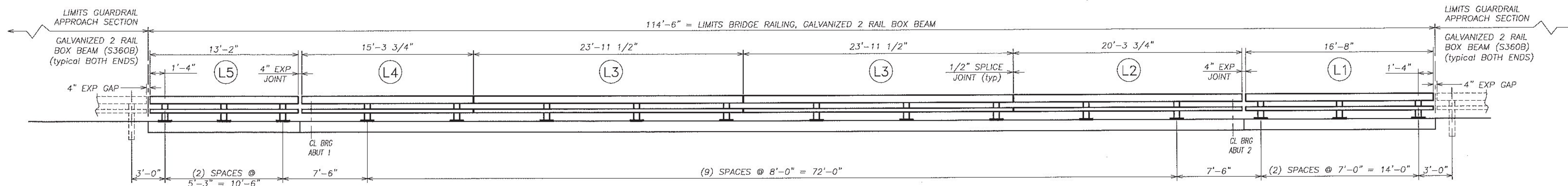
SHEET NO.

1 of 4

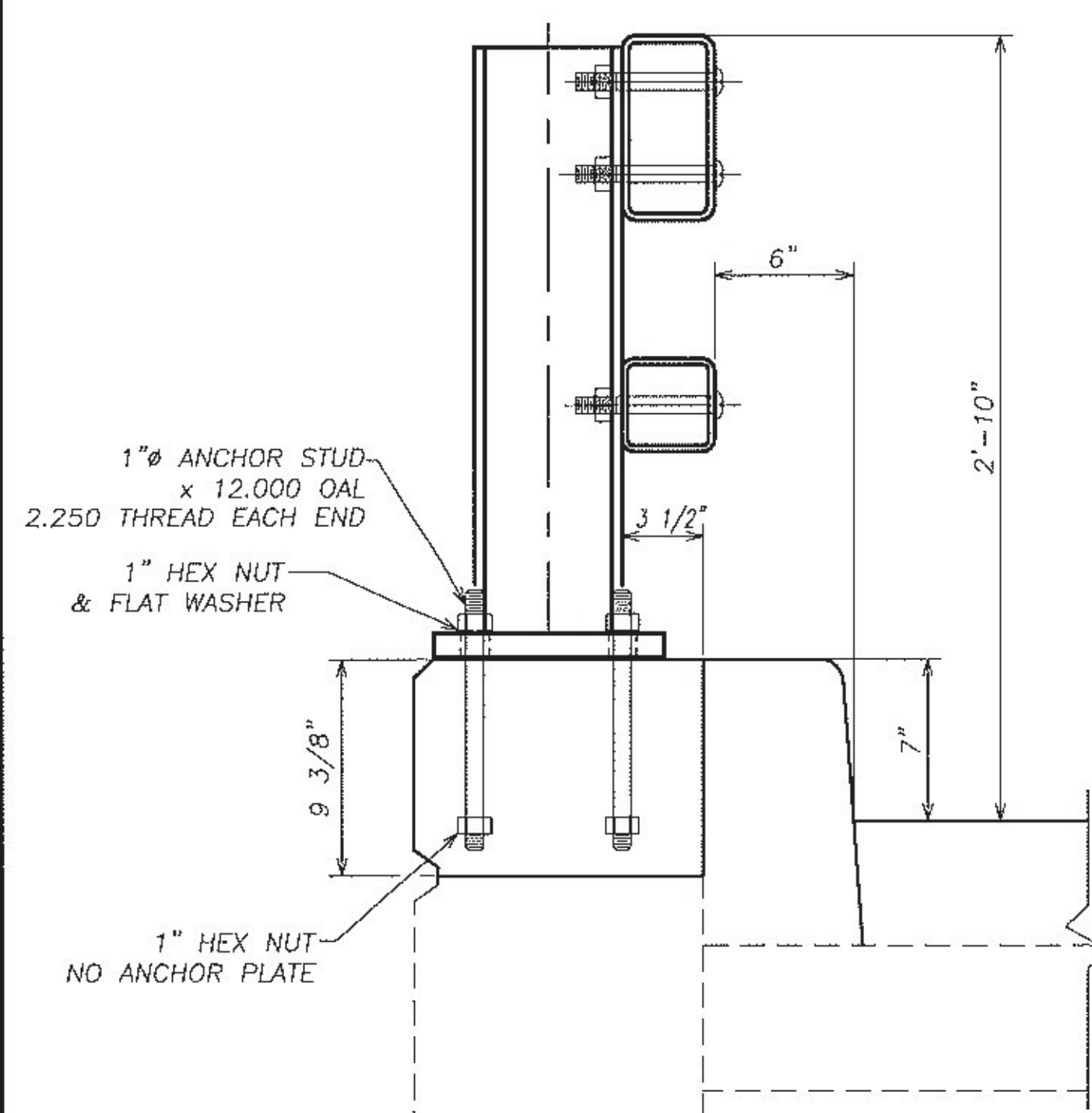




PARTIAL PLAN VIEW



SOUTHEAST SIDE RAILING ELEVATION  
LOOKING AT TRAFFIC FACE OF RAILING  
FACING SOUTHEAST FROM CENTERLINE OF ROAD



MODIFIED POST INSTALLATION  
ON WINGWALLS  
SEE SHEET 3 FOR TYPICAL POST ON BRIDGE

NOTES:

1. ALL WORK AND MATERIALS SHALL CONFORM TO SECTION 525.
2. PRIOR TO GALVANIZING, ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 1/16" RADIUS AND BE FREE OF BURRS.
3. ALL POSTS SHALL BE SET NORMAL TO GRADE.
4. SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO (2) RAIL POSTS AND PREFERABLY TO AT LEAST FOUR (4) POSTS.
5. RAIL TUBE EXPANSION JOINT SHALL BE PROVIDED IN ANY RAIL BAY SPANNING THE END OF AN INTEGRAL ABUTMENT BRIDGE AND AT ALL SUPERSTRUCTURE EXPANSION JOINTS. EXPANSION JOINT WIDTH SHALL BE 4" AT 68°F AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES.
6. HOLES IN RAILS FOR RAIL TUBE ATTACHMENT SHALL BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AN APPROVED ZINC-RICH PAINT PRIOR TO INSTALLATION.
7. RAIL POST ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.
8. RAIL TUBES SHALL BE ATTACHED USING 3/4" FULL DIAMETER BODY ASTM A449 ROUND HEAD BOLTS INSERTED THROUGH THE FACE OF THE TUBE. HOLES IN POSTS SHALL BE 1/16" LARGER THAN THE BOLT SIZE.
9. ANY BENDING OR CURVING OF RAIL SHALL BE DONE IN A FABRICATION PLANT IN ACCORDANCE WITH SUBMITTED PROCEDURES.
10. THE MINIMUM DISTANCE FROM A POST TO AN EXPANSION JOINT SHALL BE SUCH TO MAINTAIN MINIMUM EDGE DISTANCE OF 5" FROM ANY ANCHOR STUD TO THE END OF THE SLAB, OR TO THE EXPANSION JOINT RECESS POUR, IF ONE IS USED.
11. A DELINEATOR (SEE VAOT STANDARD DRAWING G-1 FOR DETAILS) SHALL BE INSTALLED AT NEAREST POST TO 30 FT SPACING. WHITE IS TO BE INSTALLED ON THE DRIVER'S RIGHT. FOR ONE WAY BRIDGES, YELLOW IS TO BE INSTALLED ON THE DRIVER'S LEFT. PAYMENT SHALL BE INCIDENTAL TO OTHER ITEMS.
12. THIS RAILING MEETS THE REQUIREMENTS FOR A TL-4 SERVICE LEVEL.

MATERIALS

RAIL TUBES.....ASTM A500 GRADE B OR ASTM A501  
RAIL POSTS AND BASE PLATES.....ASTM A709/A709M, GRADE 50  
ALL OTHER SHAPES AND PLATES.....ASTM A709/A709M, GARDE 36  
ANCHOR STUDS.....ASTM A449  
ALL OTHER BOLTS (UNLESS NOTED).....AASHTO M164, TYPE1

NUTS FOR AASHTO M164 BOLTS AND FOR ANCHOR STUDS SHALL COMPLY WITH AASHTO M291 (ASTM A563).

WASHERS SHALL COMPLY WITH AASHTO M293 (ASTM F436) SPECIFICATIONS.

1/8" PAD SHALL COMPLY WITH STANDARD SPECIFICATION SUBSECTION 731.01 OR 731.02.

RAIL POSTS AND BASE PLATES SHALL BE TESTED FOR IMPACT PROPERTIES IN ACCORDANCE WITH ASTM A370 CHARTY IMPACT TESTING USING TYPE A SPECIMEN.

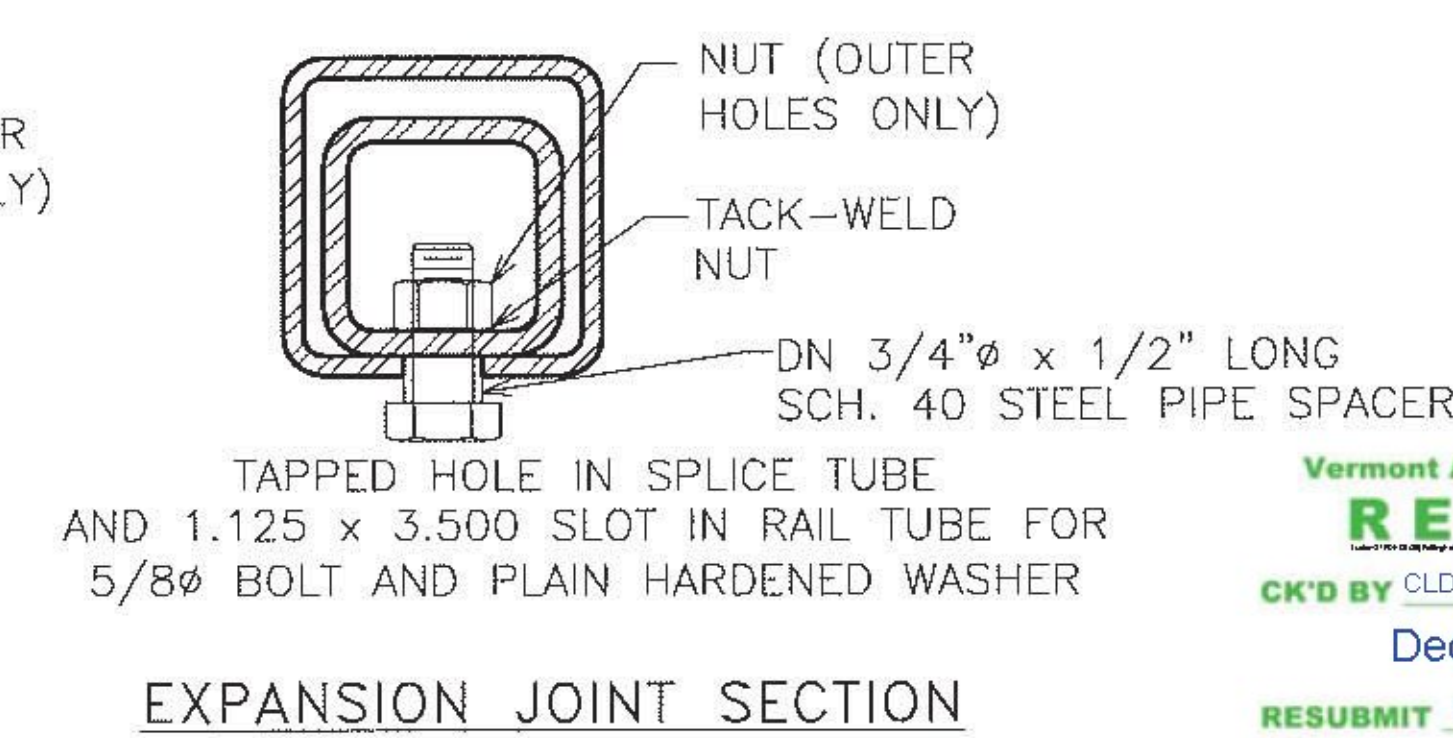
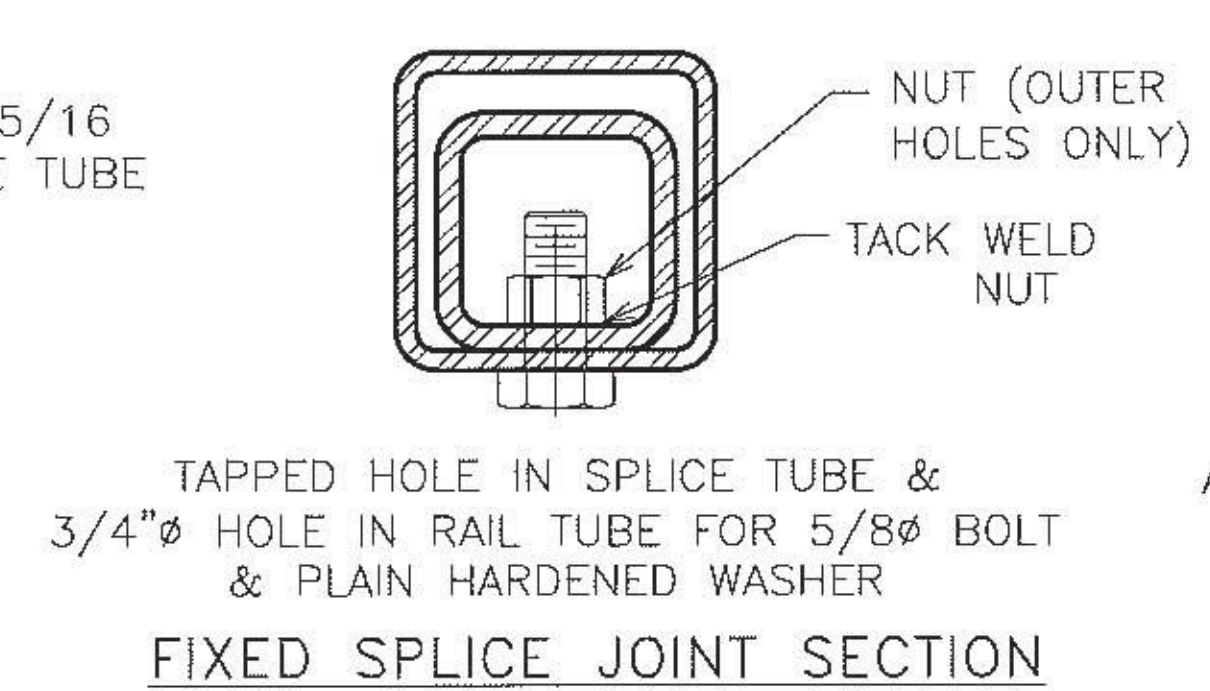
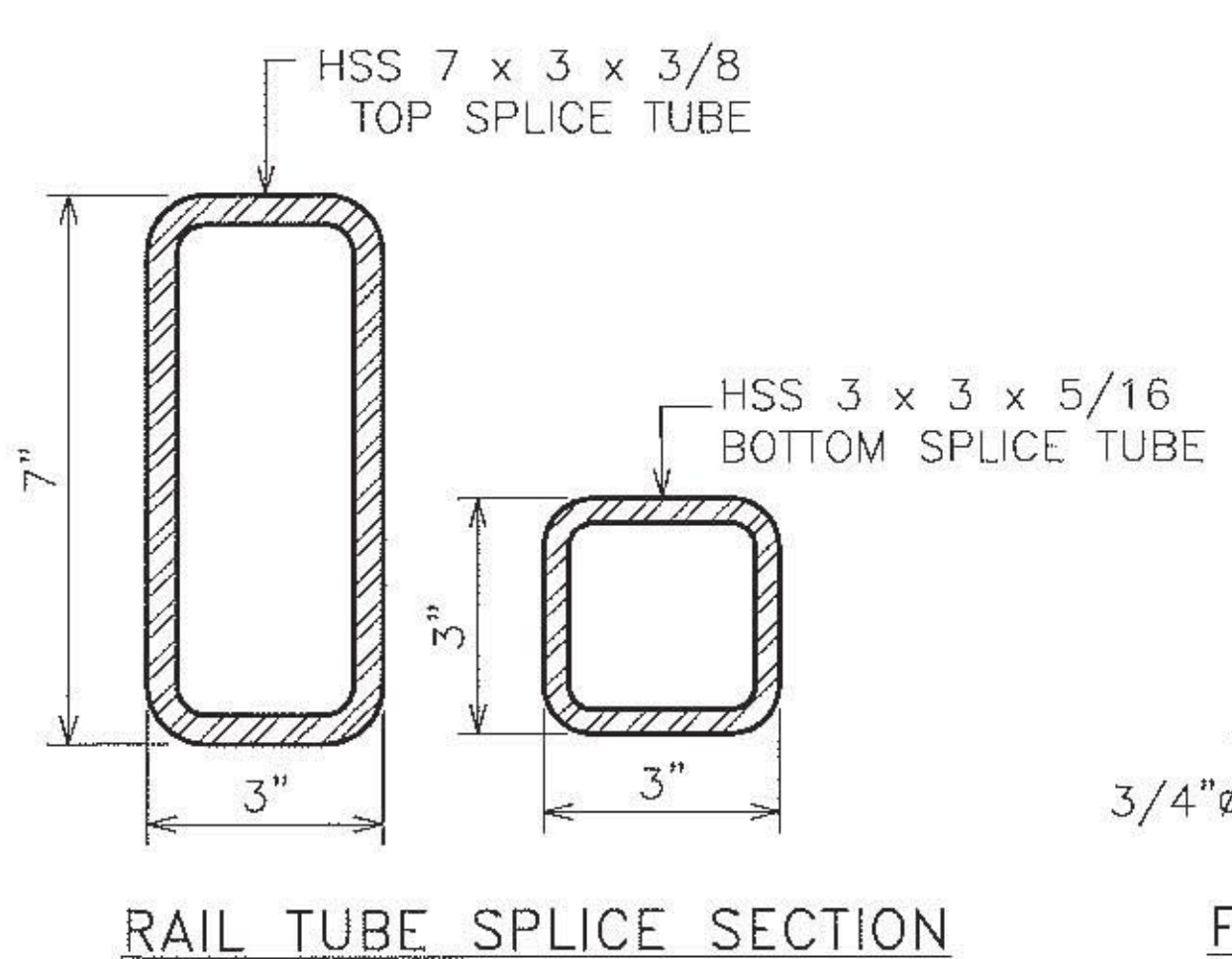
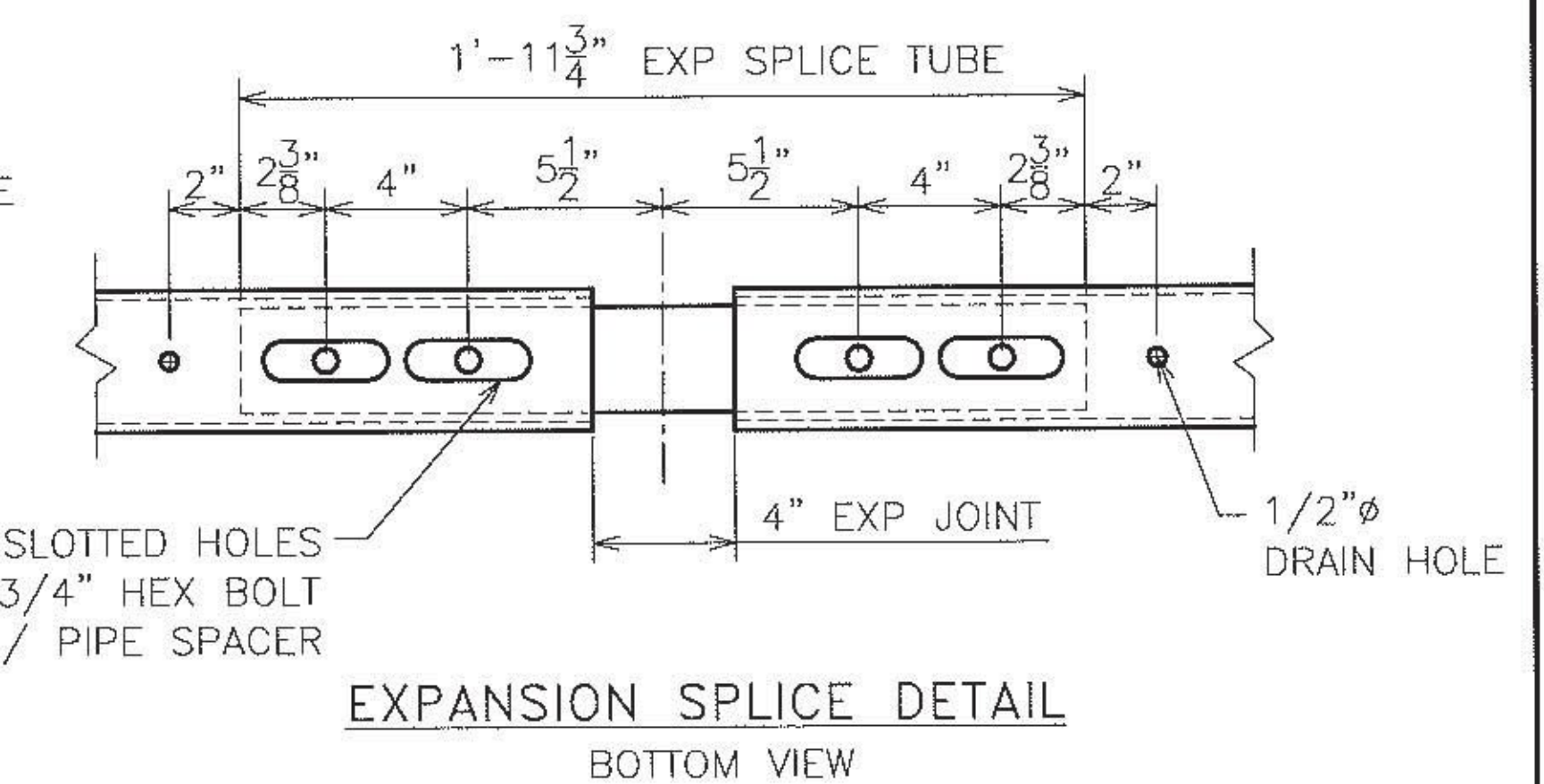
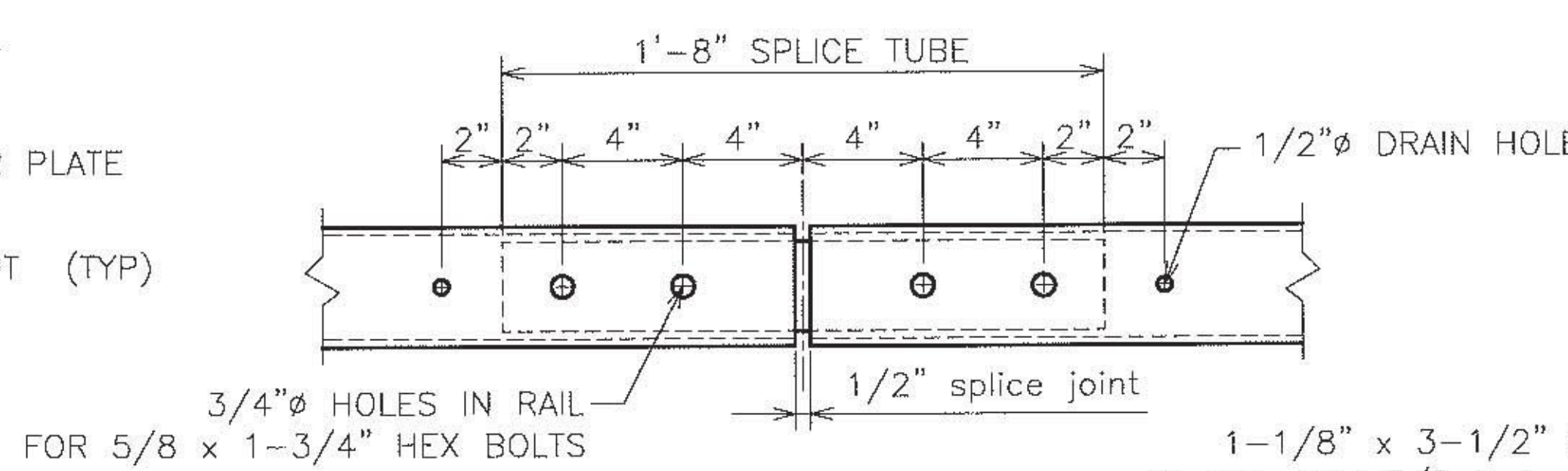
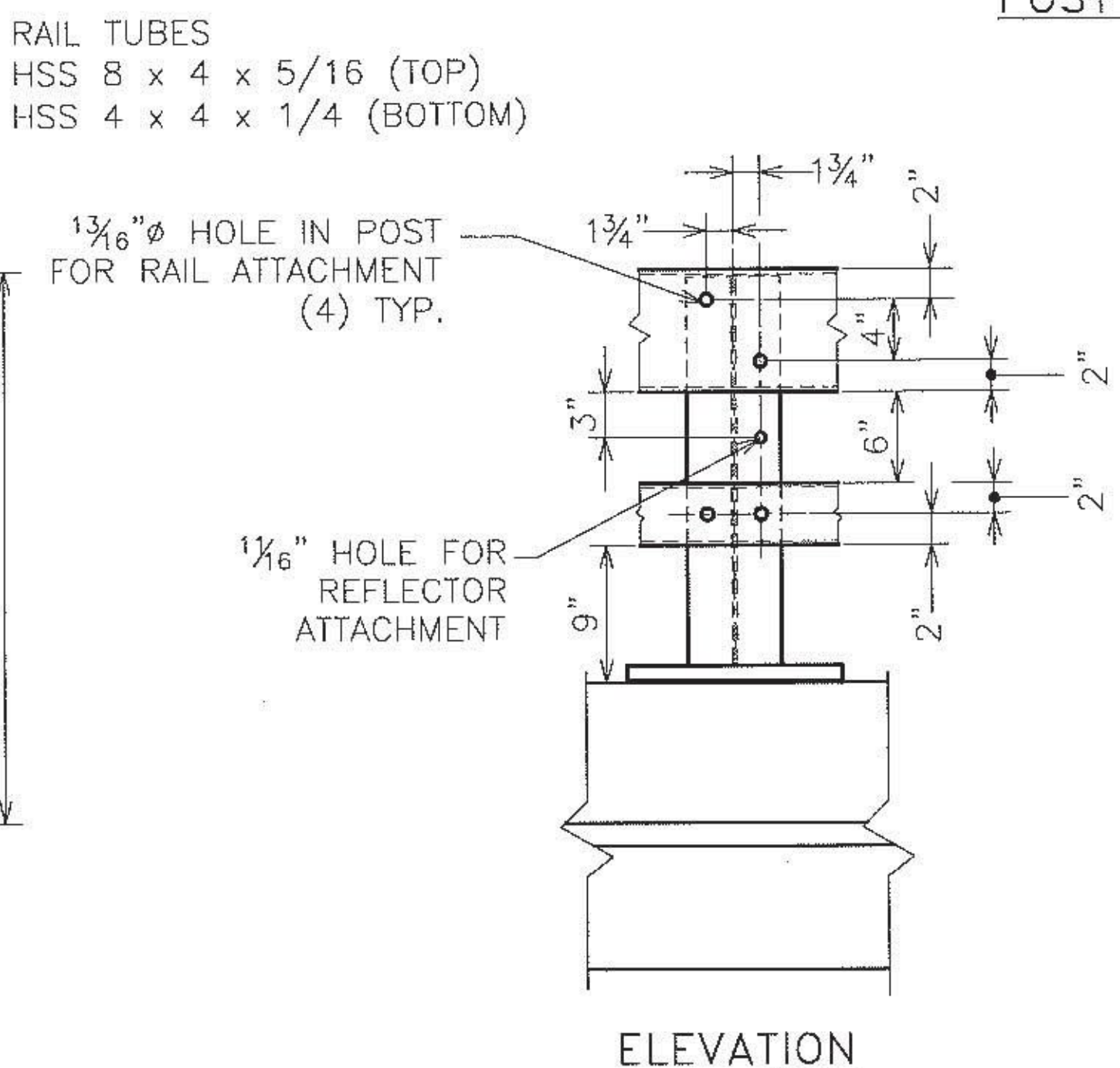
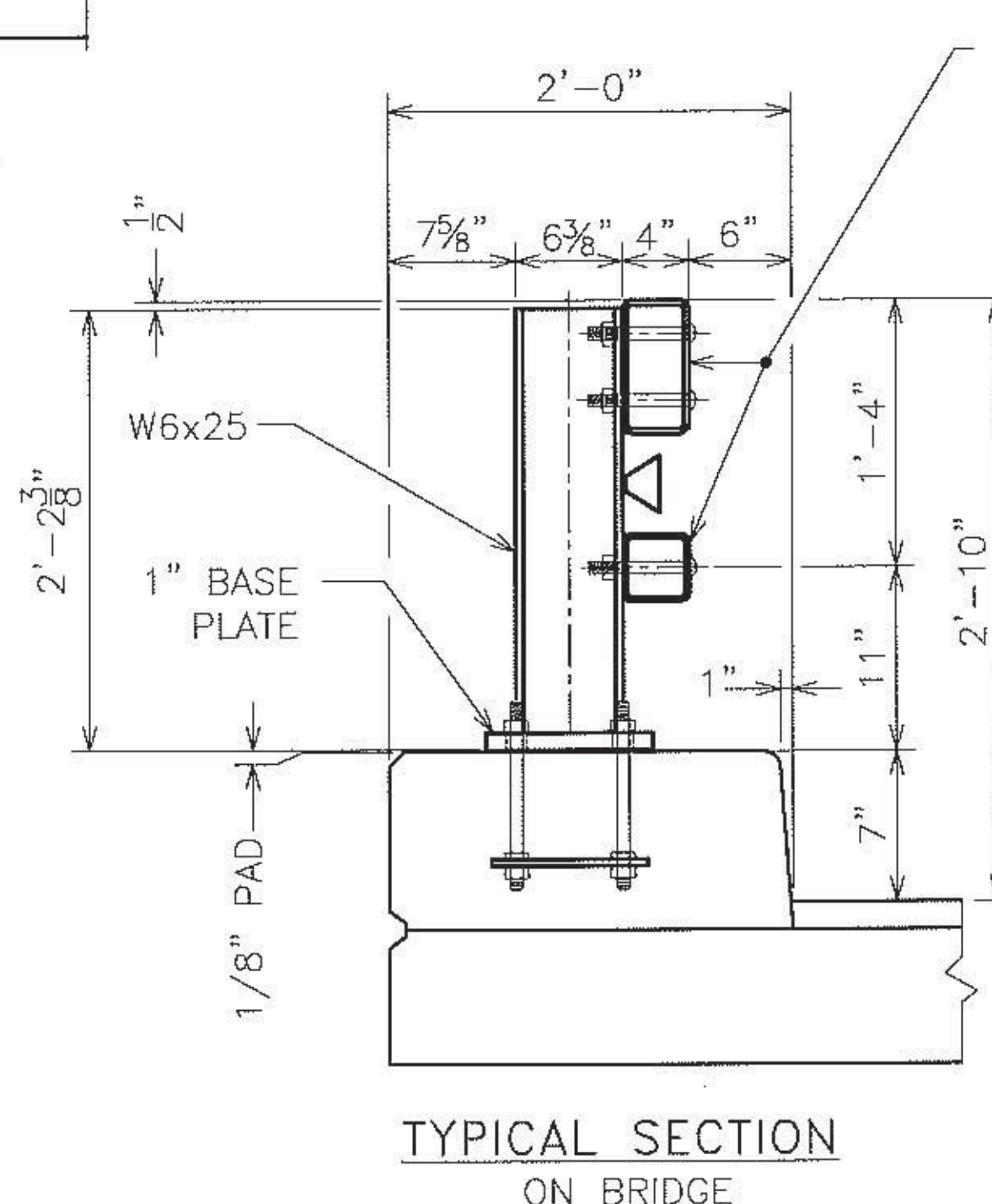
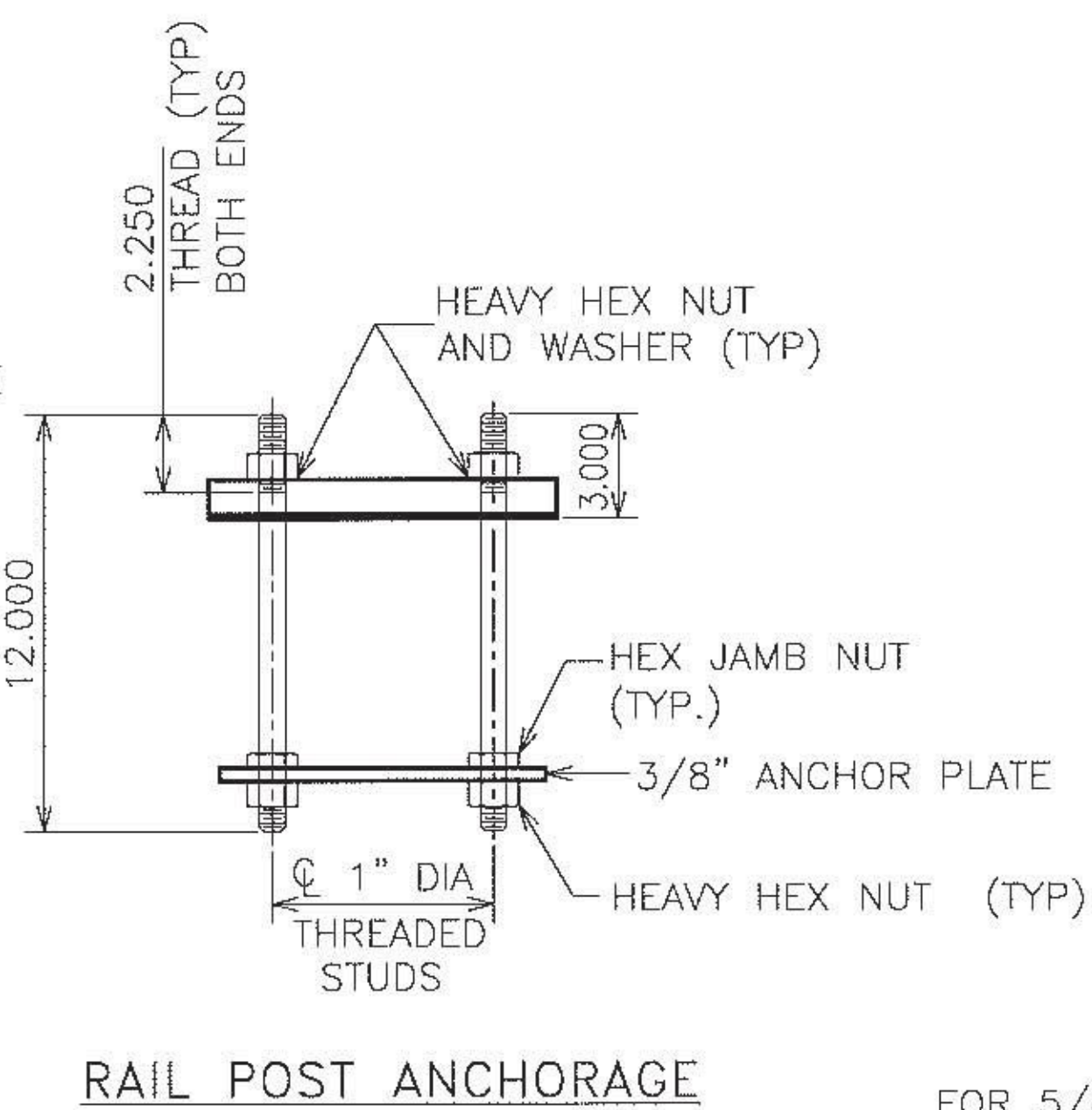
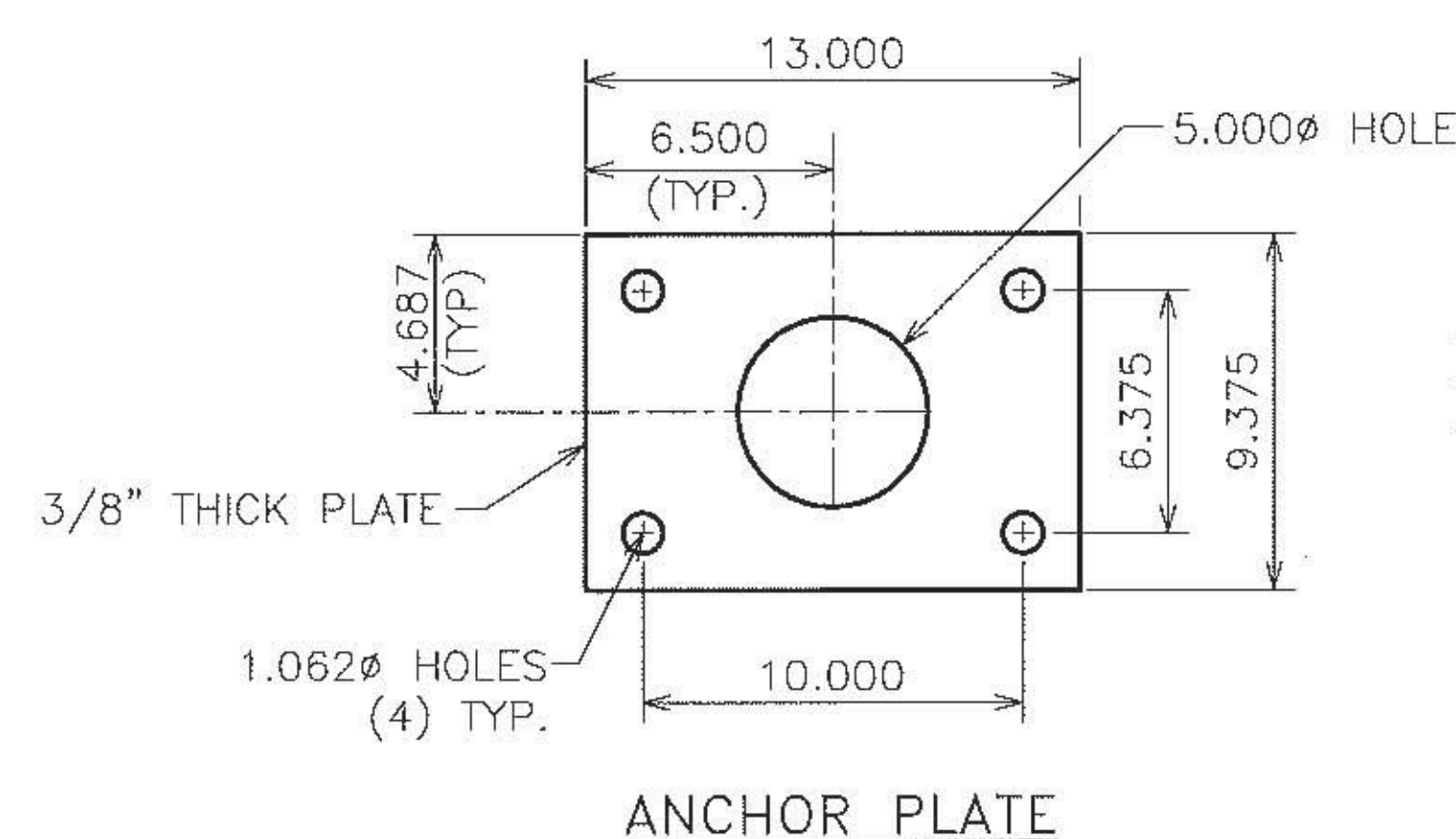
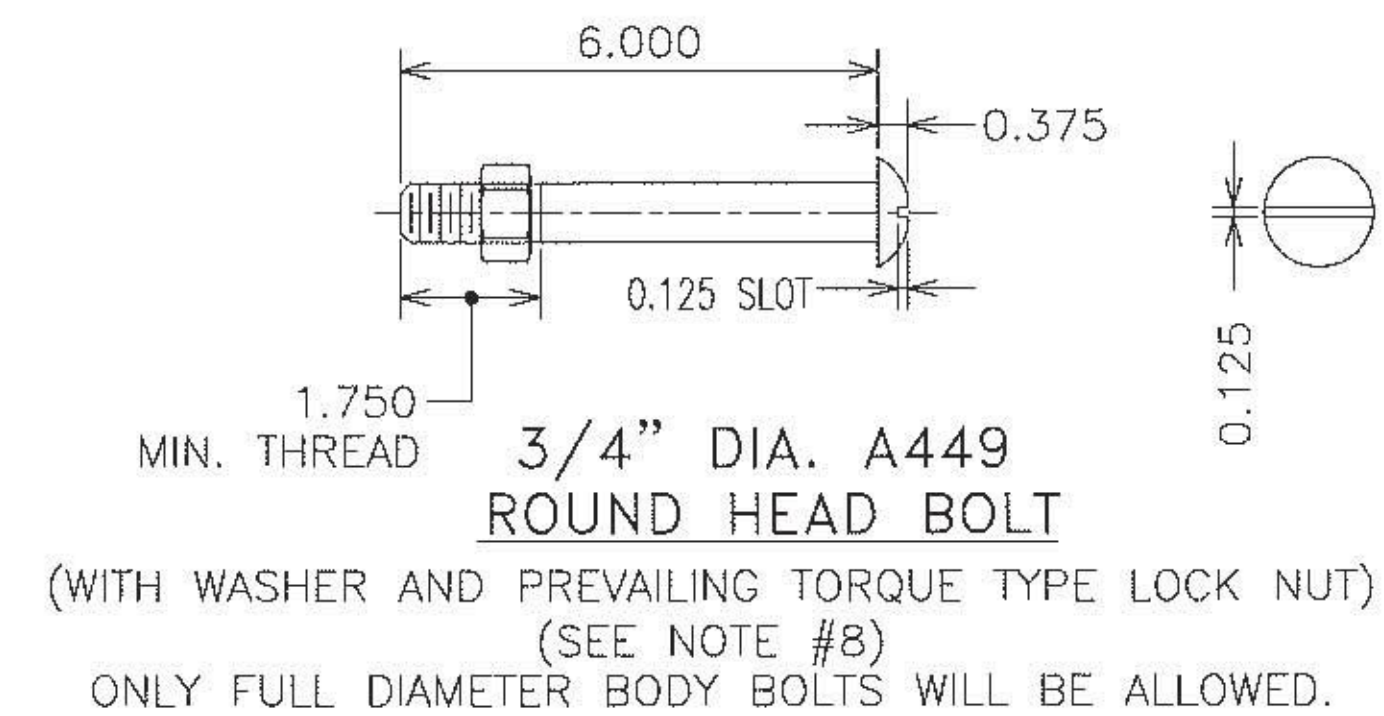
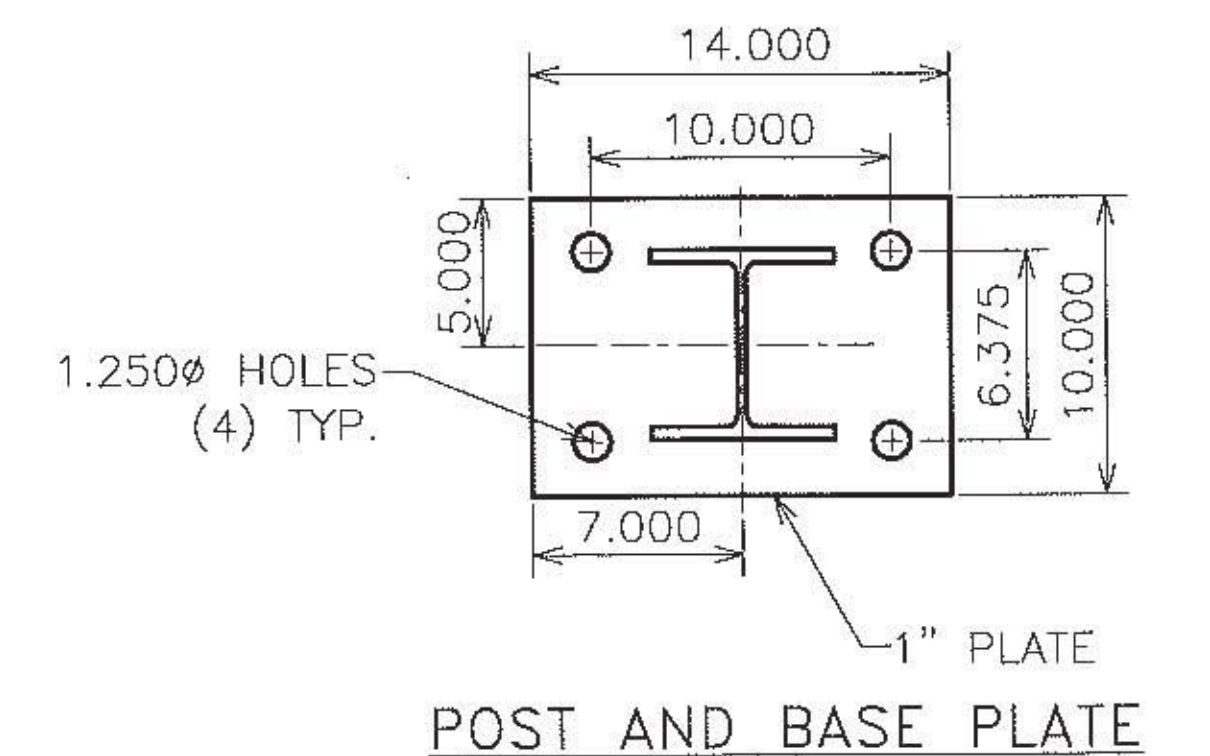
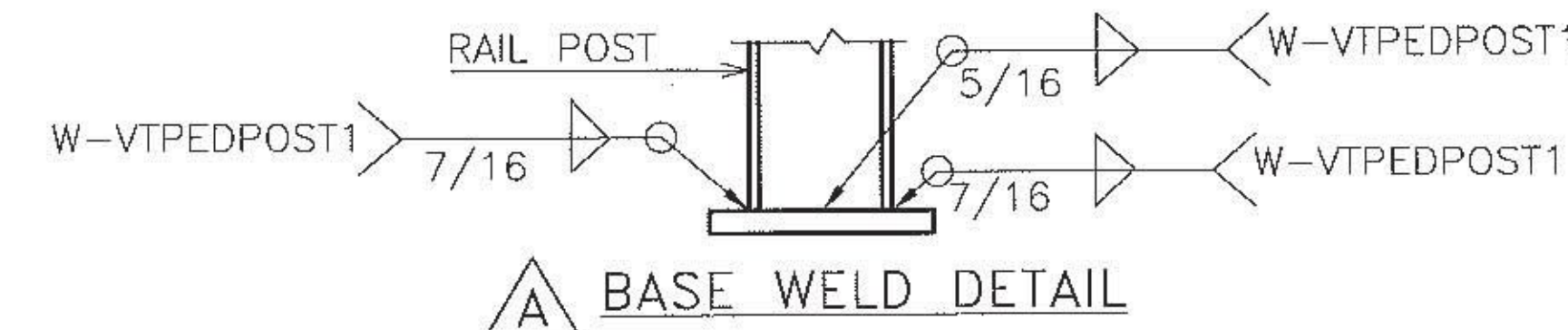
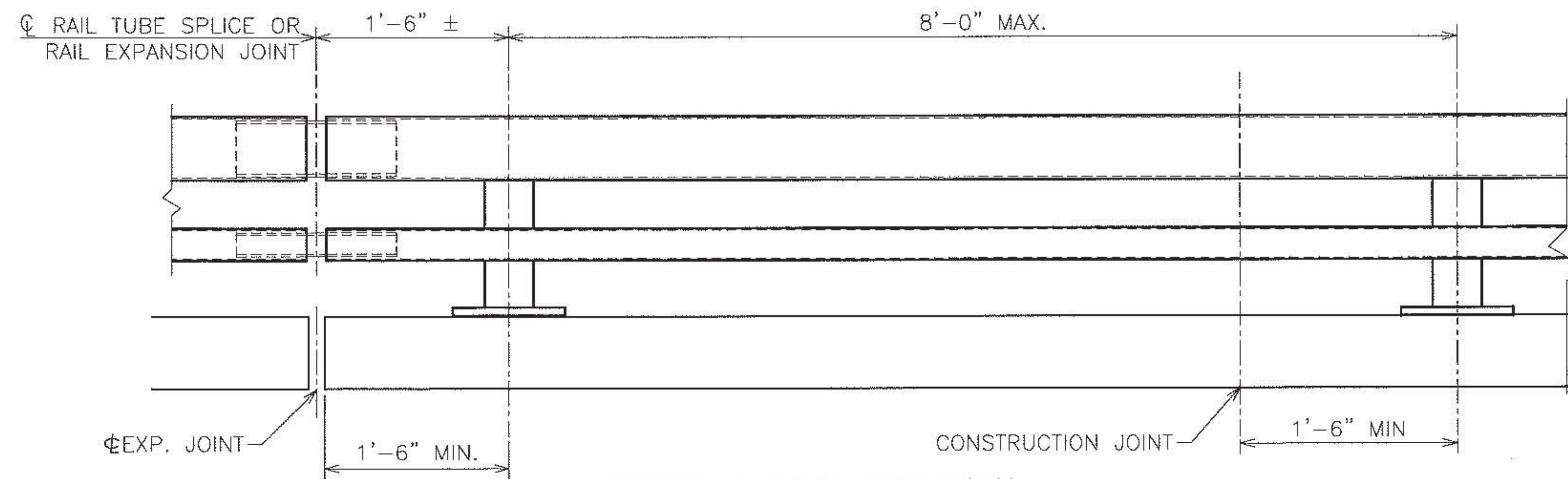
Vermont Agency of Transportation  
**RECEIVED**

CK'D BY CLD OK'D BY TAS  
December 29, 2016  
RESUBMIT No Approved AsNoted  
BY T Sumner DATE 01/03/2016

| SHOP DRAWING REVIEW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.                                                                                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> REJECTED <input type="checkbox"/> REVISE AND RESUBMIT <input checked="" type="checkbox"/> APPROVED AS NOTED |
| CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DID NOT RELIEVE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS; SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION; COORDINATING THEIR WORK WITH THAT OF ALL OTHER TRADES; AND PERFORMING THEIR WORK IN A SAFE AND SATISFACTORY MANNER. |                                                                                                                                      |
| CLD Consulting Engineers<br>540 Commercial Street<br>Manchester, NH 03101<br>603-669-4225                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Job Number: 15-0223<br>Reviewed by: NDC<br>Date: 1/3/2017                                                                            |

| HIGHWAY SAFETY CORP                                                                                                              |                             |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------|
| GLASTONBURY, CT<br>860-633-9445                                                                                                  |                             |
| ITEM 525.33 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM (S-360A)<br>ITEM 621.72 GUARDRAIL APPROACH, GALV 2 RAIL BOX BEAM (S-360B) | <b>CERTIFIED FABRICATOR</b> |
| TOWN OF LUDLOW, VERMONT<br>VT ROUTE 100 - (MINOR ARTERIAL) BRIDGE #99<br>WINDSOR COUNTY STP DECK (39)                            |                             |
| GENERAL CONTRACTOR                                                                                                               | HSC JOB NO. 2141            |
| SUB CONTRACTOR LAFAYETTE                                                                                                         | SHEET NO. 2 of 4            |
| DRAWN PAR CHECKED DATE 10-20-16 SCALE NONE SIZE D                                                                                |                             |



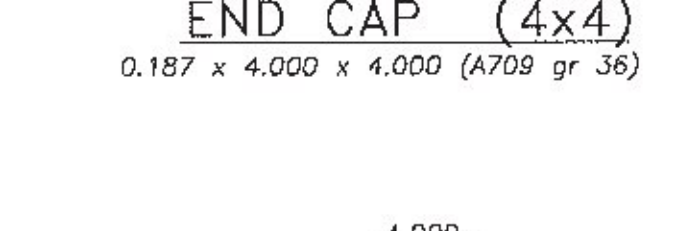
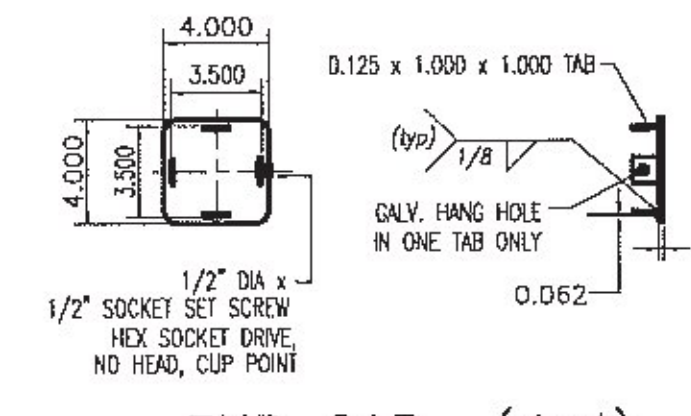
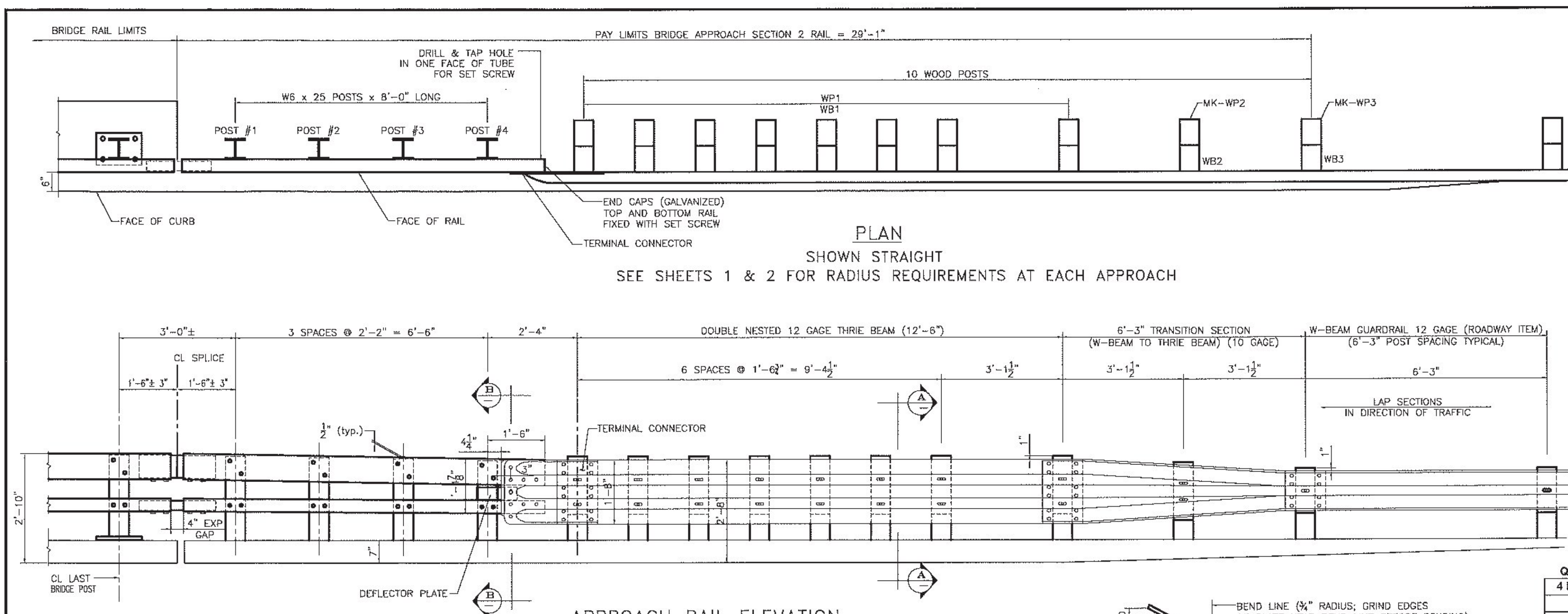


Vermont Agency of Transportation  
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December 29, 2016  
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BY T Sumner DATE 01/03/2016

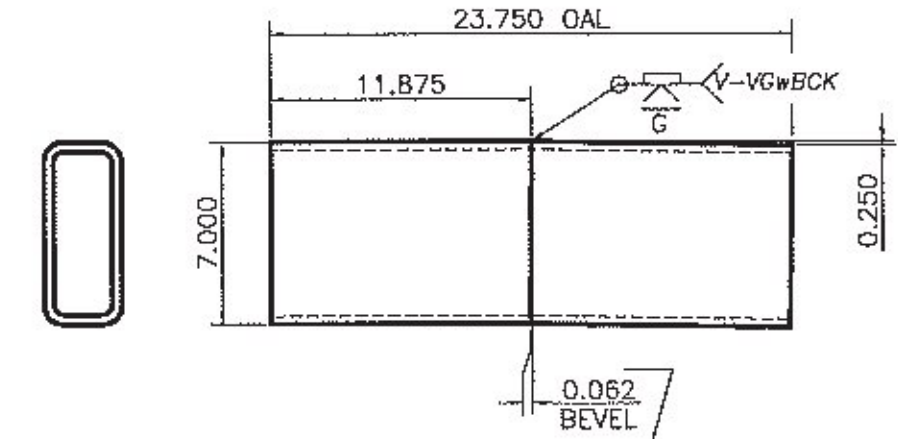
| SHOP DRAWING REVIEW                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                      |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|
| REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                      |
| <input type="checkbox"/> AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.                                                                                                                                                                                                                                                                                                                                                                                                                           | <input type="checkbox"/> REJECTED <input type="checkbox"/> REVISE AND RESUBMIT <input checked="" type="checkbox"/> APPROVED AS NOTED |
| CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DID NOT RELIEVE THE CONTRACTOR FROM COMPLIANCE WITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPONSIBLE FOR CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS; SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION; COORDINATING THEIR WORK WITH THAT OF ALL OTHER TRADES; AND PERFORMING THEIR WORK IN A SAFE AND SATISFACTORY MANNER. |                                                                                                                                      |
| CLD Consulting Engineers<br>540 Commercial Street<br>Manchester, NH 03101<br>603-669-8223                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Job Number: 15-0223<br>Reviewed by: NDC<br>Date: 1/3/2017                                                                            |

| HIGHWAY SAFETY CORP.                                                                                                             |                                         |
|----------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|
| GLASTONBURY, CT<br>860-633-9445                                                                                                  |                                         |
| ITEM 525.33 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM (S-360A)<br>ITEM 621.72 GUARDRAIL APPROACH, GALV 2 RAIL BOX BEAM (S-360B) |                                         |
| TOWN OF LUDLOW, VERMONT<br>VT ROUTE 100 - (MINOR ARTERIAL) BRIDGE #99<br>WINDSOR COUNTY STP DECK (39)                            |                                         |
| GENERAL CONTRACTOR                                                                                                               | CERTIFIED FABRICATOR                    |
| SUB CONTRACTOR                                                                                                                   | HSC JOB NO. 2141                        |
| LAFAYETTE                                                                                                                        | SHEET NO. 3 of 4                        |
| DRAWN PAR                                                                                                                        | CHECKED DATE 10-20-16 SCALE NONE SIZE D |





- NOTES:
1. PAYMENT FOR GUARDRAIL APPROACH SECTION - GALVANIZED 2 RAIL, SHALL INCLUDE THE TERMINAL CONNECTOR, THE CONNECTION PLATE, THE DEFLECTOR PLATE, RAIL, POSTS, BLOCKS AND ATTACHMENT HARDWARE.
  2. ALL APPROACH RAIL SPLICES SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW.
  3. TUBE AND STEEL POST MATERIALS, DIMENSION SIZES AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGE RAIL UNLESS OTHERWISE NOTED.
  4. APPROACH RAIL BOLTS SHALL BE ASTM A307 GRADE A AND NUTS SHALL BE ASTM M291 (ASTM 563 GRADE A OR BETTER (GALVANIZED)). WASHERS SHALL BE ASTM F844.
  5. WELD TOP SPLICE BAR TO FIT BEND. USE COMPLETE PENETRATION WELD (B-U2e).



ANGLED SPLICE DETAIL  
HSS 7 x 3 x 3/8 - FOR UPPER RAIL SPLICE  
SEE BRIDGE RAIL SHEET FOR DETAIL ON LOWER RAIL SPLICE TUBE

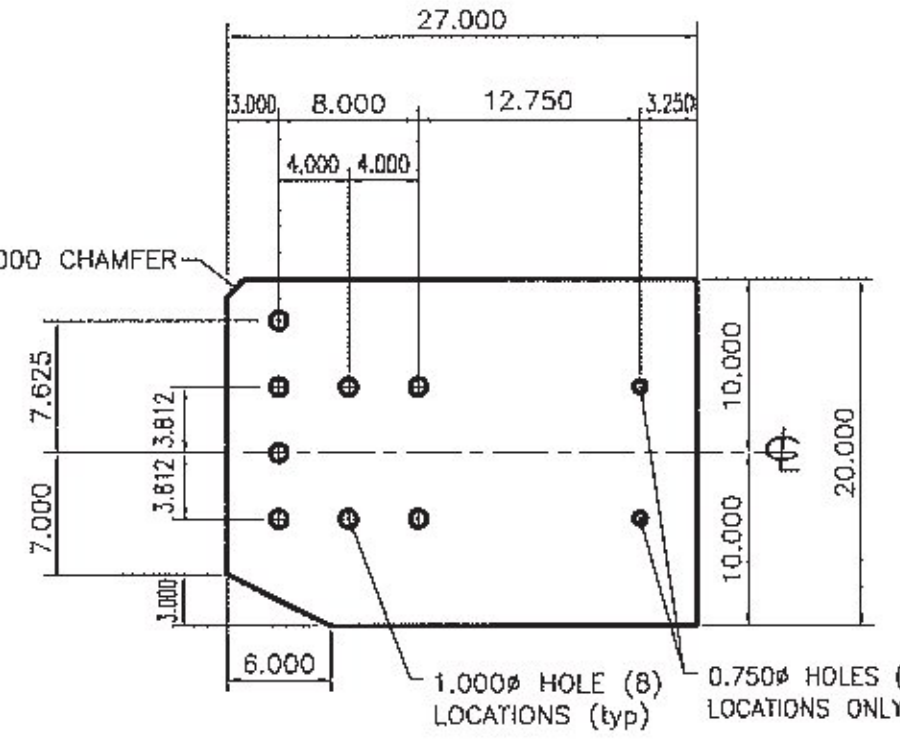
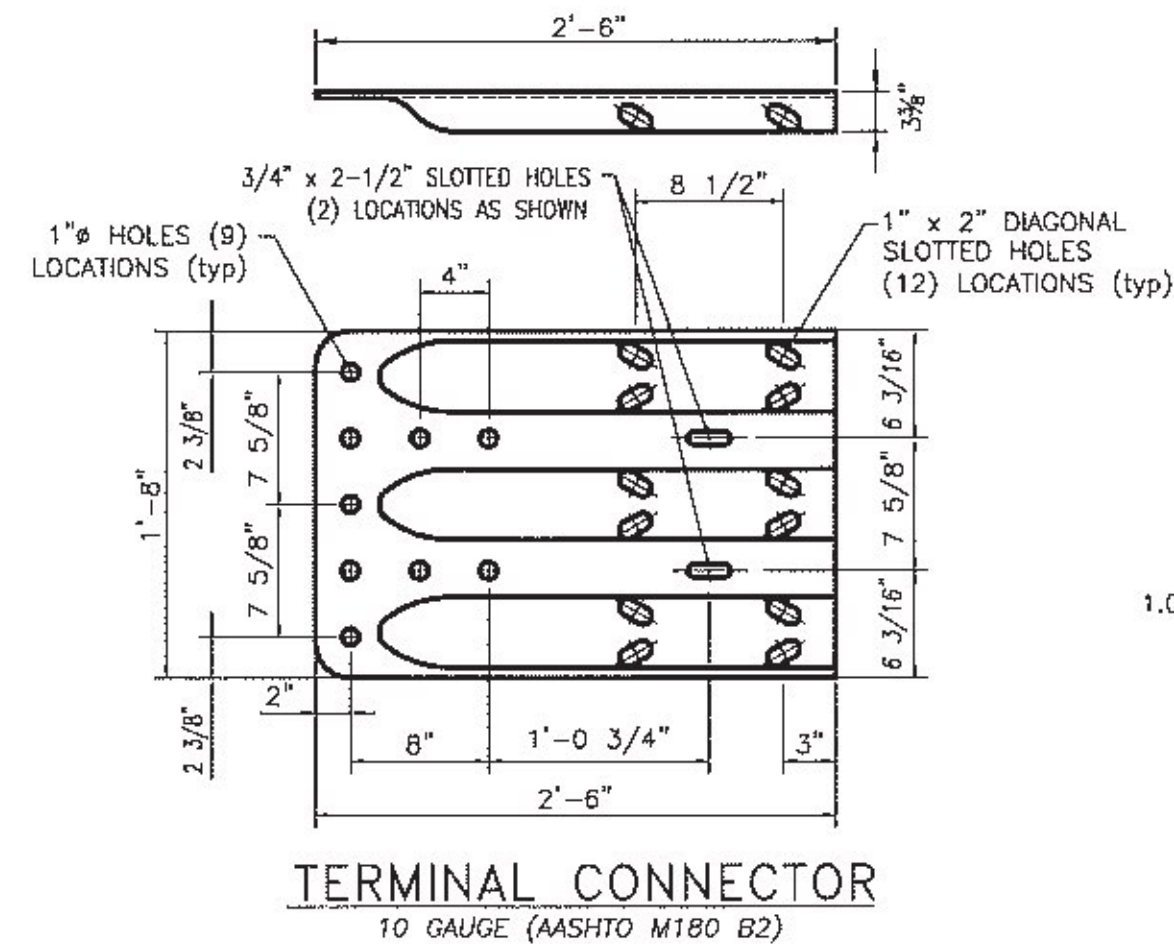
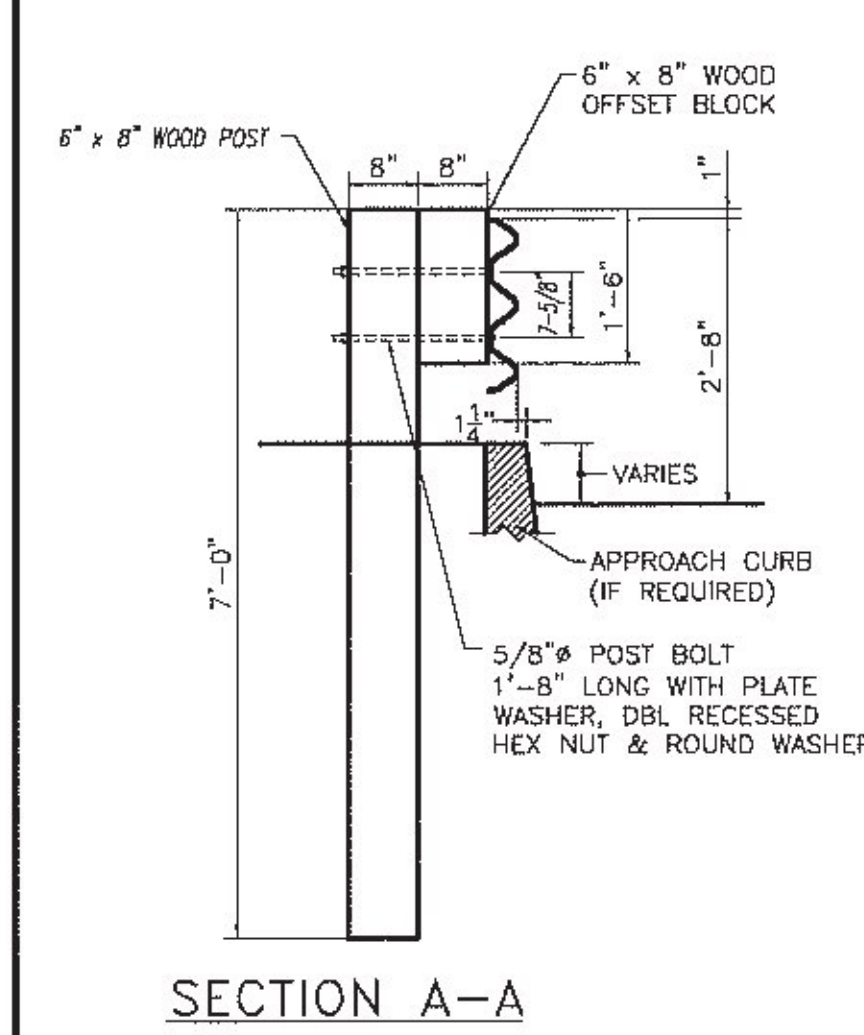
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December 29, 2016

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BY T Sumner DATE 01/03/2016

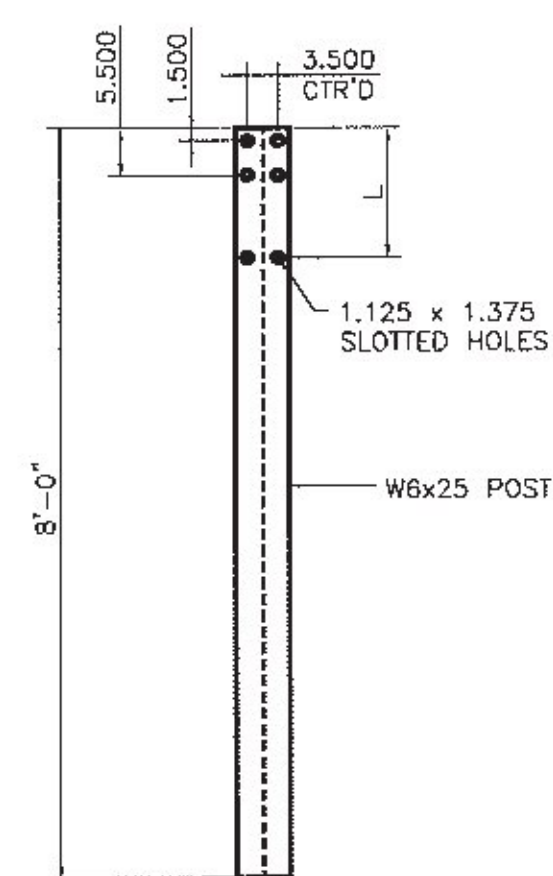
BILL OF MATERIAL

| Qty  | mk | Description                                                                                              | Spec.          |
|------|----|----------------------------------------------------------------------------------------------------------|----------------|
| 4 EA |    | ITEM 621.72 GUARDRAIL APPROACH SECTION, GALVANIZED, 2 RAIL BOX BEAM                                      |                |
| 4    | 01 | W6x25 APPROACH POST - #1 x 8'-0" OAL (GALV)                                                              | A709 gr 50     |
| 4    | 02 | W6x25 APPROACH POST - #2 x 8'-0" OAL (GALV)                                                              | A709 gr 50     |
| 4    | 03 | W6x25 APPROACH POST - #3 x 8'-0" OAL (GALV)                                                              | A709 gr 50     |
| 4    | 04 | W6x25 APPROACH POST - #4 x 8'-0" OAL (GALV)                                                              | A709 gr 50     |
| 3    |    | UPPER RAIL APPROACH TUBE HSS 8 x 4 x 5/16 x 9'-4.000" w/ 3.500 SLOTS FOR 4" EXP GAP (GALV)               | A500 gr B      |
| 3    |    | LOWER RAIL APPROACH TUBE HSS 4 x 4 x 5/16 x 9'-4.000" w/ 3.500 SLOTS FOR 4" EXP GAP (GALV)               | A500 gr B      |
| 1    | 60 | UPPER RAIL APPROACH TUBE HSS 8 x 4 x 5/16 x 9'-4.000" w/ 3.500 SLOTS FOR 4" EXP GAP (GLV) 60"R           | A500 gr B      |
| 1    | 60 | LOWER RAIL APPROACH TUBE HSS 4 x 4 x 5/16 x 9'-4.000" w/ 3.500 SLOTS FOR 4" EXP GAP (GALV) 60"R          | A500 gr B      |
| 4    |    | CONNECTION PLATE PL 0.375" x 20.000" x 27.000" (GALV)                                                    | A709 gr 36     |
| 2    |    | DEFLECTOR PLATE (RIGHT) PL 0.375 x 4.000 x 13.375 (GALV)                                                 | A709 gr 36     |
| 2    |    | DEFLECTOR PLATE (LEFT) PL 0.375 x 4.000 x 13.375 (GALV)                                                  | A709 gr 36     |
| 4    |    | END CAP FOR 8x4 TUBE 0.187 THICK PLATE 8.000 x 4.000 w/ WELDED TABS (GALV)                               | A709 gr 36     |
| 4    |    | END CAP FOR 4x4 TUBE 0.187 THICK PLATE 4.000 x 4.000 w/ WELDED TABS (GALV)                               | A709 gr 36     |
| 4    |    | (ANGLED) SPLICE TUBE (EXPANSION) FOR 8x4 UPPER RAIL HSS 7 x 3 x 3/8 x 1'-11.750" OAL (GALV)              | A500 gr B      |
| 4    |    | SPLICE TUBE (EXPANSION) FOR 4x4 LOWER RAIL HSS 3 x 3 x 5/16 x 1'-11.750" OAL (GALV)                      | A500 gr B      |
| 32   |    | WOOD POST (WP1) 6 x 8 x 7'-0"                                                                            | TIMBER         |
| 32   |    | WOOD BLOCKOUT (WB1) 6 x 8 x 1'-4"                                                                        | TIMBER         |
| 4    |    | WOOD POST (WP2) 6 x 8 x 7'-0"                                                                            | TIMBER         |
| 4    |    | WOOD BLOCKOUT (WB2) 6 x 8 x 1'-6"                                                                        | TIMBER         |
| 4    |    | WOOD POST (WP3) 6 x 8 x 7'-0"                                                                            | TIMBER         |
| 4    |    | WOOD BLOCKOUT (WB3) 6 x 8 x 1'-2"                                                                        | TIMBER         |
| 4    |    | THREE FLAT LIP BRIDGE SHOE (MODIFIED) 10 GA. GALV                                                        | aashto M180 B2 |
| 2    |    | THREE TRANSITION PANEL 6'-3" / 3'-1 1/2" 10 GA. GALV.                                                    | aashto M180 B2 |
| 2    | 46 | THREE TRANSITION PANEL 6'-3" / 3'-1 1/2" 10 GA. GALV. (45"R CONVEX CURVE)                                | aashto M180 B2 |
| 2    | 12 | THREE TRANSITION PANEL 6'-3" / 3'-1 1/2" 10 GA. GALV. (12"R CONVEX CURVE)                                | aashto M180 B2 |
| 2    | 60 | THREE TRANSITION PANEL 6'-3" / 3'-1 1/2" 10 GA. GALV. (60"R CONVEX CURVE)                                | aashto M180 B2 |
| 8    |    | THREE PANEL 12'-6" / 1'-6 3/4" 12 GA. GALV.                                                              | aashto M180 A2 |
| 92   |    | ROUND HEAD POST BOLT slot or wrench head - no shoulder 3/4" DIA x 6" LG. (GLV) w/ LOCK NUT & FLAT WASHER | A449           |
| 4    |    | ROUND HEAD POST BOLT slot or wrench head - no shoulder 3/4" DIA x 2" LG. (GLV) w/ HEX NUT                | A449           |
| 8    |    | ROUND HEAD POST BOLT - oval shoulder 5/8" DIA x 1'-8" LG. (GALV) w/ DBL RECESS NUT, FLAT WASHER          | A307           |
| 70   |    | ROUND HEAD POST BOLT - oval shoulder 5/8" DIA x 1'-6" LG. (GALV) w/ DBL RECESS NUT, FLAT WASHER          | A307           |
| 32   |    | HEX HEAD BOLT 5/8 x 1-3/4" (GALV) w/ FLAT WASHER                                                         | A325           |
| 128  |    | PANEL SPLICE BOLT 5/8 x 1-1/4" (GALV) w/ DOUBLE RECESSED NUT                                             | A307           |
| 78   |    | RECTANGULAR PLATE WASHER 0.187 x 1.750 x 3.000 (GALV)                                                    | A709 gr 36     |
| 32   |    | SPACER PIPE - GALVANIZED SCH. 40 x 1/2" LONG (GLV)                                                       | A53 gr B       |



DEFLECTOR PLATE

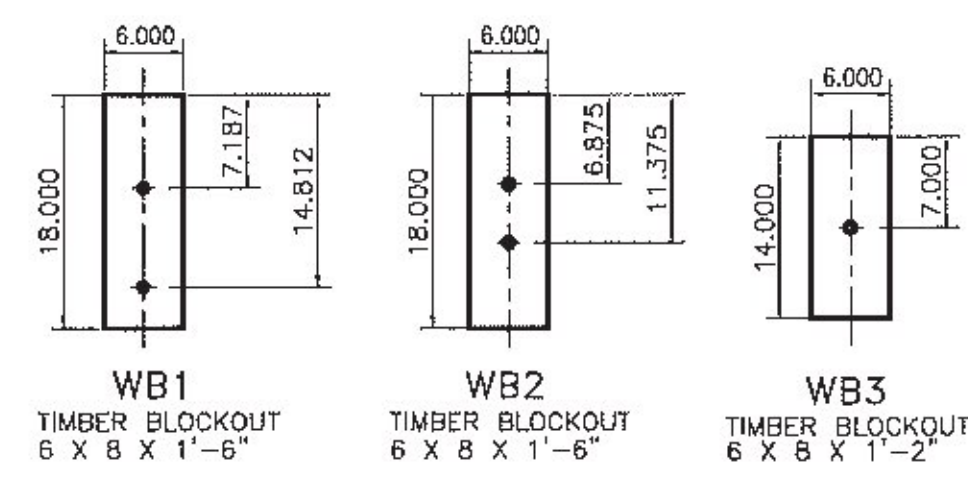
0.375 x 4.000 x 13.375 (A709 gr 36)  
RIGHT HAND APPROACH SHOWN - LEFT HAND BENT OPPOSITE



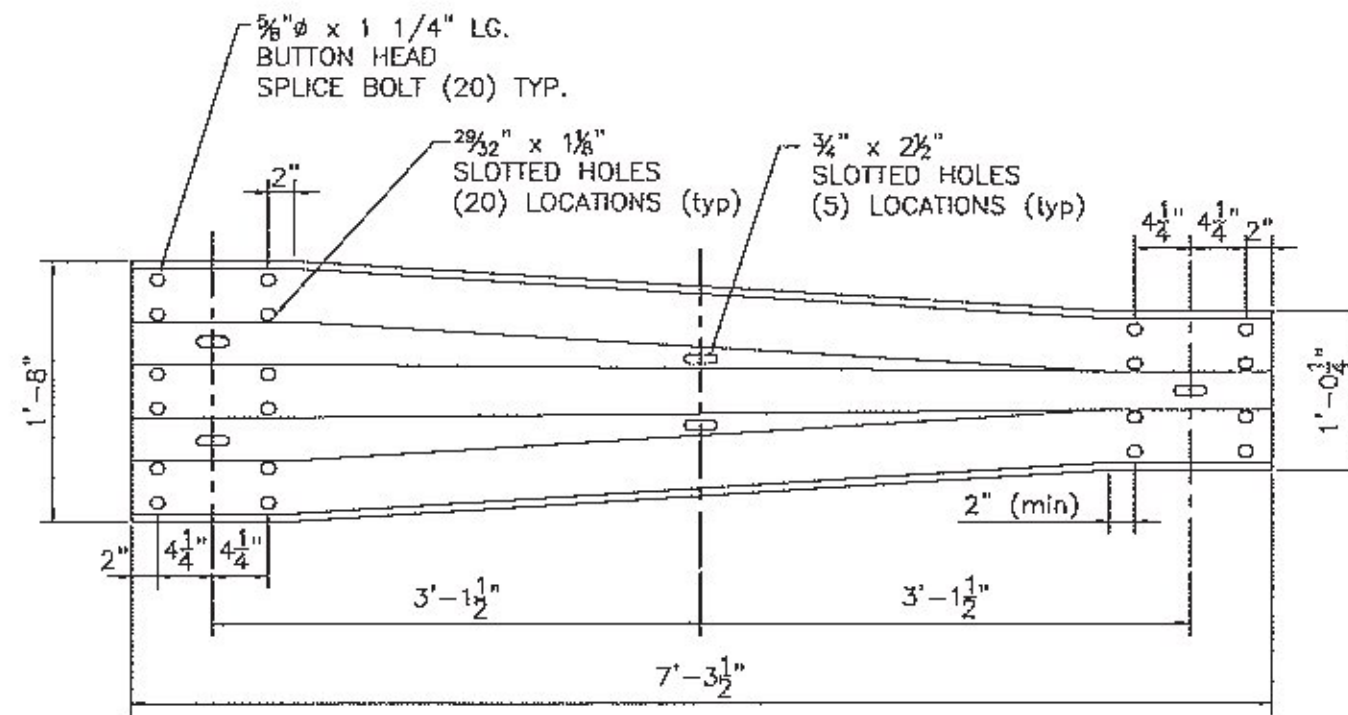
STEEL POST

STEEL POST CHART

| No. | L         |
|-----|-----------|
| #1  | 1'-3.250" |
| #2  | 1'-3.000" |
| #3  | 1'-2.687" |
| #4  | 1'-2.375" |

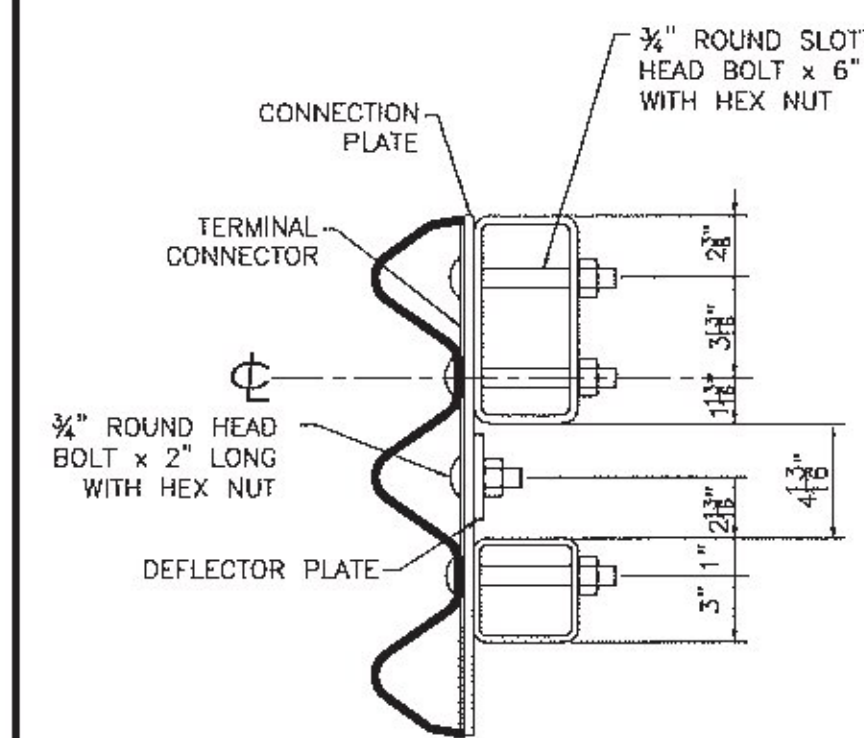


WOOD BLOCK DETAILS



THRIE TRANSITION PANEL

10 GAUGE (AASHTO M180 B2)



SECTION B-B

**SHOP DRAWING REVIEW**

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CLD Consulting Engineers  
545 Commercial Street  
Manchester, NH 03101  
603-688-5223

Job Number: 15-0223  
Reviewed by: NDC  
Date: 1/3/2017

**HIGHWAY SAFETY CORP**  
GLASTONBURY, CT  
860-633-9445

ITEM 525.33 BRIDGE RAILING, GALVANIZED 2 RAIL BOX BEAM (S-360A)  
ITEM 621.72 GUARDRAIL APPROACH, GALV 2 RAIL BOX BEAM (S-360B)

TOWN OF LUDLOW, VERMONT  
VT ROUTE 100 - (MINOR ARTERIAL) BRIDGE #99  
WINDSOR COUNTY STP DECK (39)

GENERAL CONTRACTOR  
SUB CONTRACTOR LAFAYETTE

DATE 10-20-16 SCALE NONE SIZE D

CERTIFIED FABRICATOR

HSS JOB NO. 2141  
SHEET NO. 4 of 4



# Highway Safety Corporation

Glastonbury, CT

## Welding Procedure Specification

Material specification A572 gr 50, A709 Gr 50

Welding process Gas Metal Arc Welding (GMAW) Spray Transfer

Manual, semi-automatic, or automatic Semi-Automatic

Position of welding Flat (1F) or Horizontal (2F)

Filler metal specification AWS A5.18

Filler metal classification ER70S-6

Electrode and manufacturer Lincoln Electric Lincoln Weld L-56

Flux and manufacturer N/A

Shielding gas 86% Argon / 14% CO2 Flow rate 38 - 46 CFH

Single or multiple pass Single or Multiple

Single or multiple arc Single

Welding current DCEP

Polarity Reverse - electrode positive

Welding progression Stringers

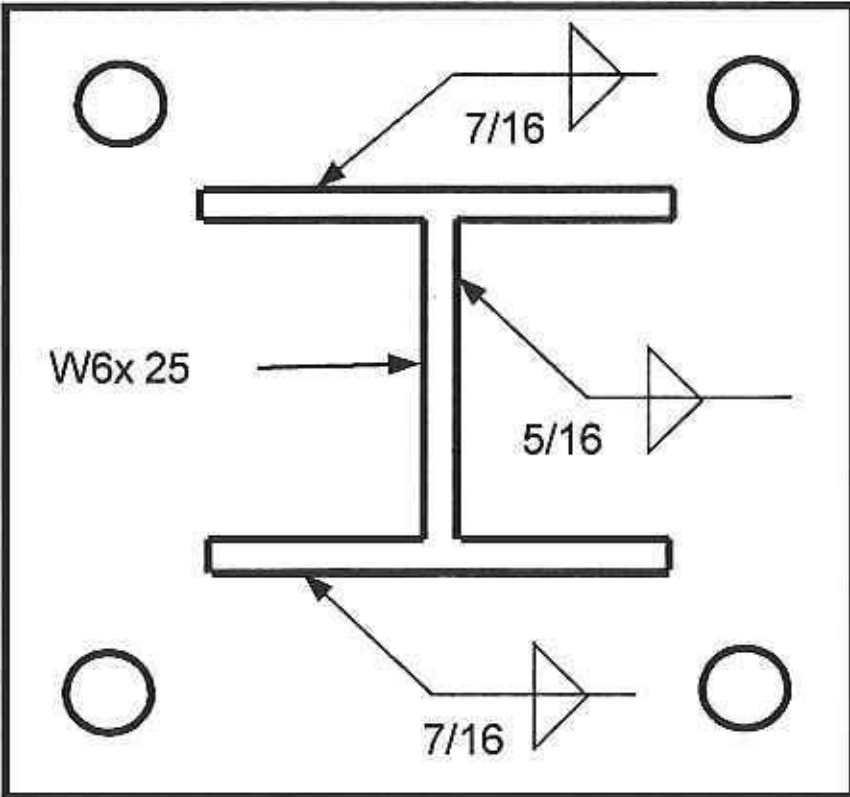
Root treatment clean base metal

Preheat and interpass temperature base metal up to 3/4" (50°F) ; over 3/4 thru 1-1/2" ( 150°F ) : over 1-1/2" thru 2-1/2" (225°F)

Postweld heat treatment None

Electrode extension 3/4" ± 1/4"

### WELDING PROCEDURE

| Weld size | Pass no. | Electrode size | Welding parameters |             | Travel speed | Joint detail                                                                          |
|-----------|----------|----------------|--------------------|-------------|--------------|---------------------------------------------------------------------------------------|
|           |          |                | Amperes            | Volts       |              |                                                                                       |
| 5/16"     | 1        | 1/16"          | 310 A<br>± 30      | 29 V<br>± 1 | 17 - 19 ipm  |  |
| 7/16"     | 1 & 2    | 1/16"          | ↓                  | ↓           | ↓            |                                                                                       |
|           |          |                |                    |             |              |                                                                                       |

Vermont Agency of Transportation  
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CLD Consulting Engineers  
540 Commercial Street  
Manchester, NH 03101  
603-668-5223

Job Number: 15-0223  
Reviewed by: NDC  
Date: 1/3/2017

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.5

WPS no. W-VTPEDPOST1

Revision no. 2

Supporting PQR no. HSCTGD15052416

Project Name Ludlow, VT

Fabricator Highway Safety Corp

Prepared By: Paul Radice

Date 12/21/16

Project Number STP DECK (39)

**Paul A Radice**  
CWI 98070221  
QC1 EXP. 7/1/2019



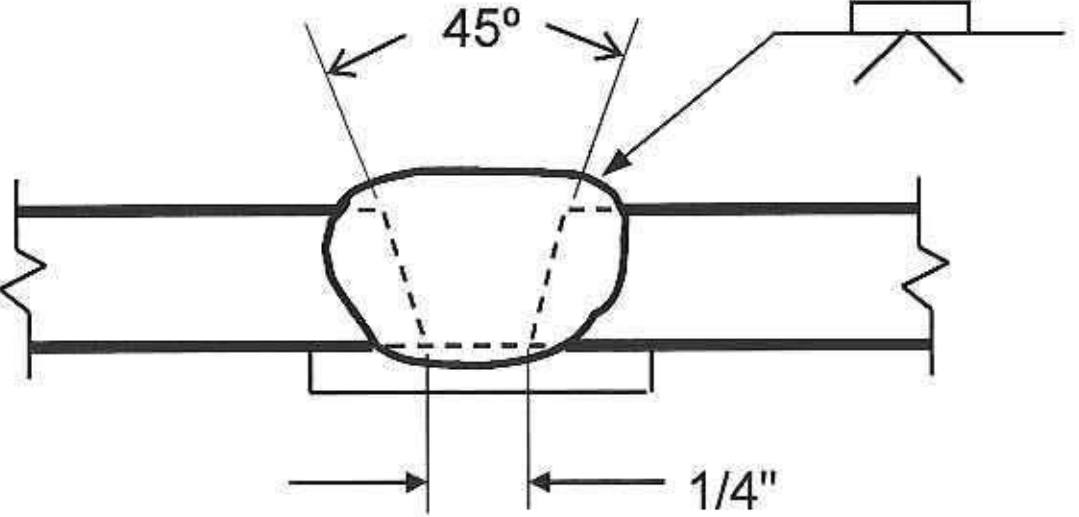
# Highway Safety Corporation

Glastonbury, CT

## Welding Procedure Specification

|                                      |                                    |           |             |
|--------------------------------------|------------------------------------|-----------|-------------|
| Material specification               | ASTM A500 gr B                     |           |             |
| Welding process                      | Gas Metal Arc Welding (GMAW)       |           |             |
| Manual, semi-automatic, or automatic | Semi-Automatic                     |           |             |
| Position of welding                  | Flat (1F)                          |           |             |
| Filler metal specification           | AWS A5.18                          |           |             |
| Filler metal classification          | ER70S-6                            |           |             |
| Electrode and manufacturer           | Lincoln Electric Lincoln Weld L-56 |           |             |
| Flux and manufacturer                | N/A                                |           |             |
| Shielding gas                        | 86% Argon / 14% CO2                | Flow rate | 38 - 46 CFH |
| Single or multiple pass              | Single                             |           |             |
| Single or multiple arc               | Single                             |           |             |
| Welding current                      | DCEP                               |           |             |
| Polarity                             | Reverse - electrode positive       |           |             |
| Welding progression                  | Stringers                          |           |             |
| Root treatment                       | clean base metal                   |           |             |
| Preheat and interpass temperature    | base metal up to 3/4" (50°F)       |           |             |
| Postweld heat treatment              | None                               |           |             |
| Electrode extension                  | 3/4" ± 1/4"                        |           |             |

### WELDING PROCEDURE

| Weld size | Pass no. | Electrode size | Welding parameters |             | Travel speed | Joint detail                                                                                      |
|-----------|----------|----------------|--------------------|-------------|--------------|---------------------------------------------------------------------------------------------------|
|           |          |                | Amperes            | Volts       |              |                                                                                                   |
|           | 1        | 1/16"          | 310 A<br>± 30      | 29 V<br>± 1 | 17 - 19 ipm  | B-U2a-GF<br> |

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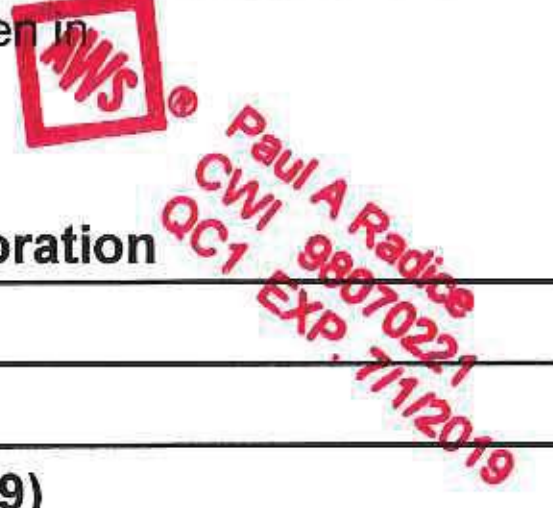
 CLD Consulting Engineers  
240 Commercial Street  
Manchester, NH 03101  
603-688-5223

Job Number: 16-U223  
Reviewed by: NDC  
Date: 12/2017

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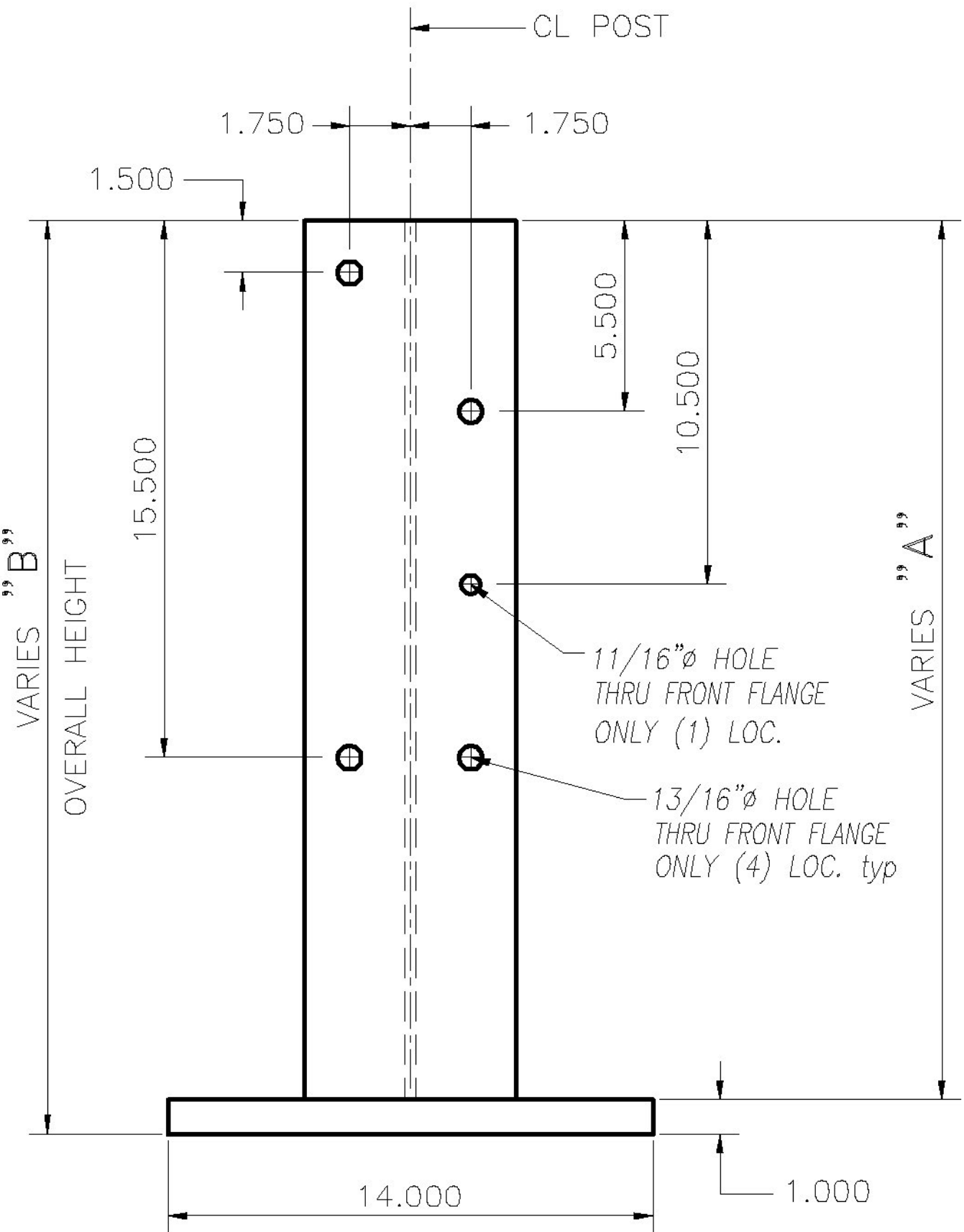
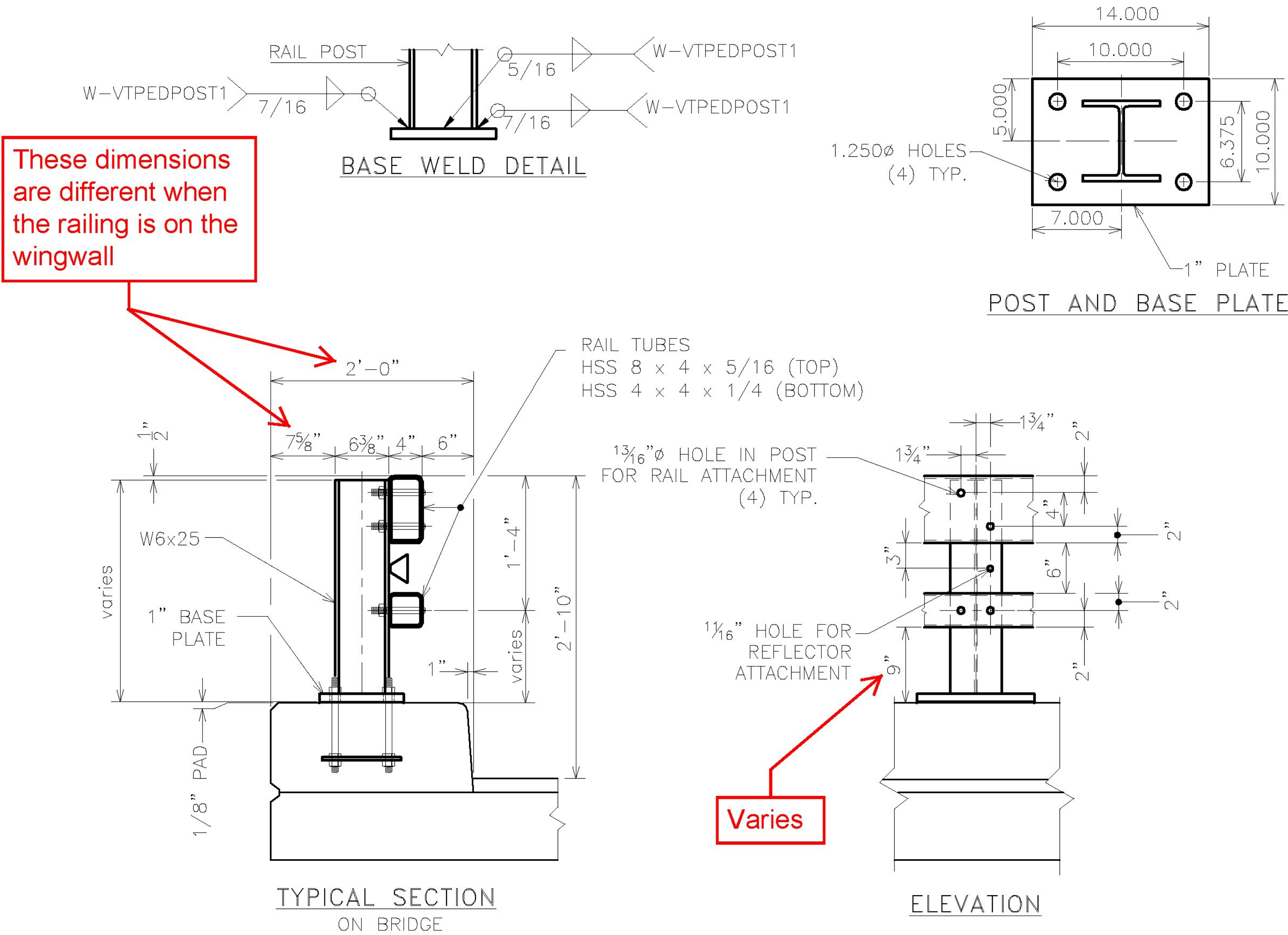
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|                    |                |                |                            |
|--------------------|----------------|----------------|----------------------------|
| WPS no.            | W-VGwBCK       | Fabricator     | Highway Safety Corporation |
| Revision no.       | 2              | Prepared By:   | Paul Radice                |
| Supporting PQR no. | HSCTGD15052416 | Date           | 12/21/16                   |
| Project Name       | Ludlow, VT     | Project Number | STP DECK (39)              |





POST REPLACEMENT – refer to original approved shop drawing 2141 for additional notes & info



RAILING POST W6 x 25 x height varies w/ 1 x 10 x 14 BASE PLATE (GLV)

| QTY | dim "A" post height | dim "B" OAH incl plate | MTL        |
|-----|---------------------|------------------------|------------|
| 1   | 21.750              | 22.750                 | A709 gr 50 |
| 3   | 22.875              | 23.875                 | A709 gr 50 |
| 1   | 23.000              | 24.000                 | A709 gr 50 |
| 1   | 23.500              | 24.500                 | A709 gr 50 |
| 1   | 23.625              | 24.625                 | A709 gr 50 |
| 1   | 24.000              | 25.000                 | A709 gr 50 |
| 1   | 24.125              | 25.125                 | A709 gr 50 |
| 1   | 24.375              | 25.375                 | A709 gr 50 |
| 2   | 24.625              | 25.625                 | A709 gr 50 |

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2141C shop drawing 01.pdf  
CK'D BY CLD OK'D BY TAS  
June 20, 2017  
RESUBMIT no Approved AsNoted  
BY Todd Sumner DATE 06/21/17

| No.                        | Remarks           | Date     |
|----------------------------|-------------------|----------|
| 0                          | Initial submittal | 06-16-17 |
| REVISIONS – APPLIES TO SET |                   |          |

**HIGHWAY SAFETY CORP**  
GLASTONBURY, CT  
860-653-9445

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TOWN OF LUDLOW, VERMONT  
VT ROUTE 100 – (MINOR ARTERIAL) BRIDGE #99  
WINDSOR COUNTY STP DECK (39)

NSC CERTIFIED FABRICATOR  
NSC JOB NO. 2141C  
SHEET NO. 1 of 1

SUB CONTRACTOR LAFAYETTE  
DRAWN PAR CHECKED rwl DATE 06-16-17 SCALE NONE SIZE D