

TIP PROJECT: C-4901A

CONTRACT: C203160

STATE OF NORTH CAROLINA
RAIL DIVISION



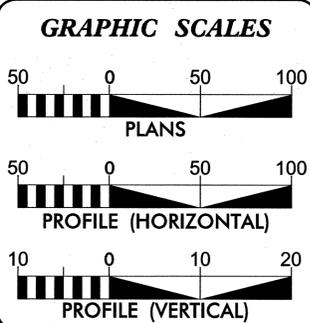
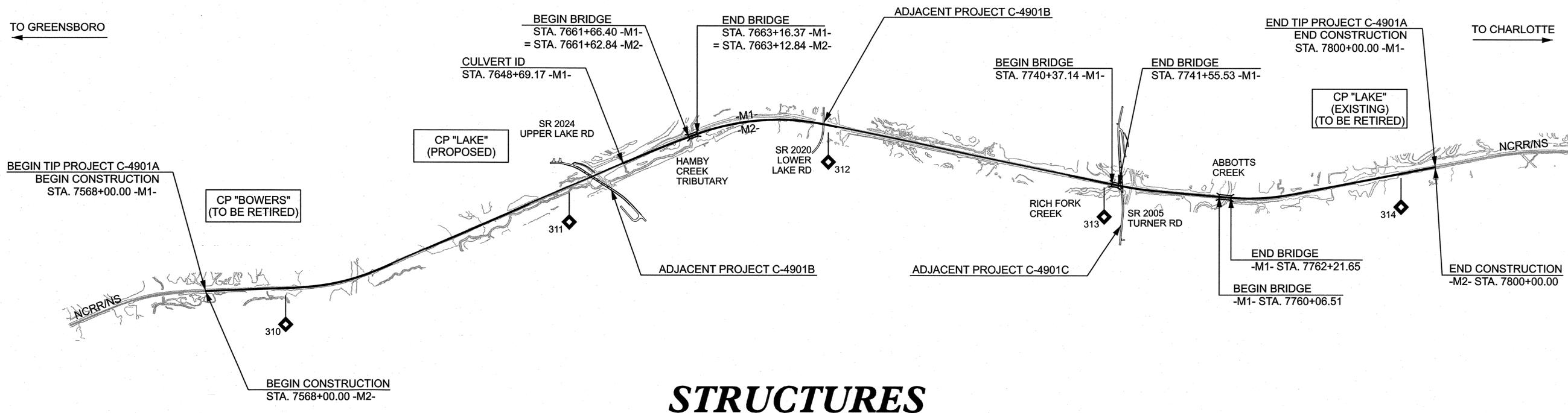
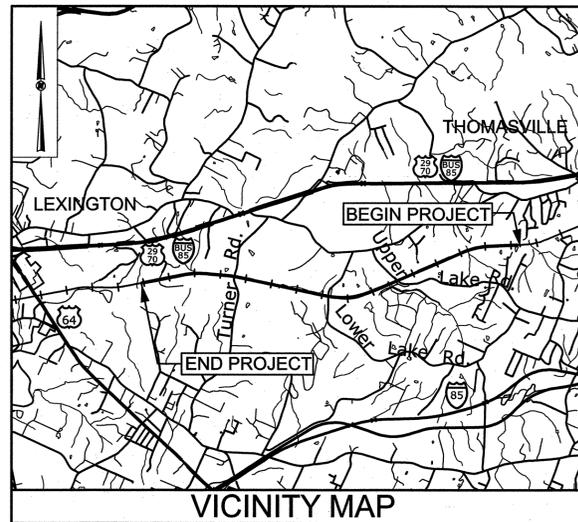
| | | |
|--------------------|-----------------------------|---------------------|
| STATE | STATE PROJECT REFERENCE NO. | |
| N.C. | C-4901A | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION |
| 49010.1.STR03TIB | | P.E./UTIL. P.E. |
| 49010.1.STR04T3 | | P.E./UTIL. P.E. |
| 43219.2.STR02C4901 | | ROW |
| 49010.3.STR01T4A | FRA-FR-HSR-0006-10-01-00 | CONST./UTIL. CONST. |

DAVIDSON COUNTY

**LOCATION: NCRR MAINLINE BOWERS TO LAKE RAILROAD ROADBED
(MP 309.8 TO MP 314.0)**

TYPE OF WORK:

- BRIDGE ON NCRR OVER HAMBY CREEK TRIBUTARY
- MODIFICATIONS TO BRIDGE ON NCRR OVER RICHFORK CREEK
- MODIFICATIONS TO BRIDGE ON NCRR OVER ABBOTTS CREEK
- MODIFICATIONS TO CULVERT ON NCRR OVER TRIBUTARY TO HAMBY CREEK



| PROJECT LENGTH | |
|----------------------------------|-------------|
| LENGTH OF RAIL TIP PROJECT | 4.303 MILES |
| LENGTH OF STRUCTURES TIP PROJECT | 0.091 MILES |
| TOTAL LENGTH OF TIP PROJECT | 4.394 MILES |

Prepared in the Office of:
HNTB HNTB NORTH CAROLINA, P.C.
 343 E. Six Forks Road, Suite 200
 Raleigh, North Carolina 27609
 NC License No: C-1554

2012 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
AUGUST 2012

LETTING DATE:
JUNE 18, 2013

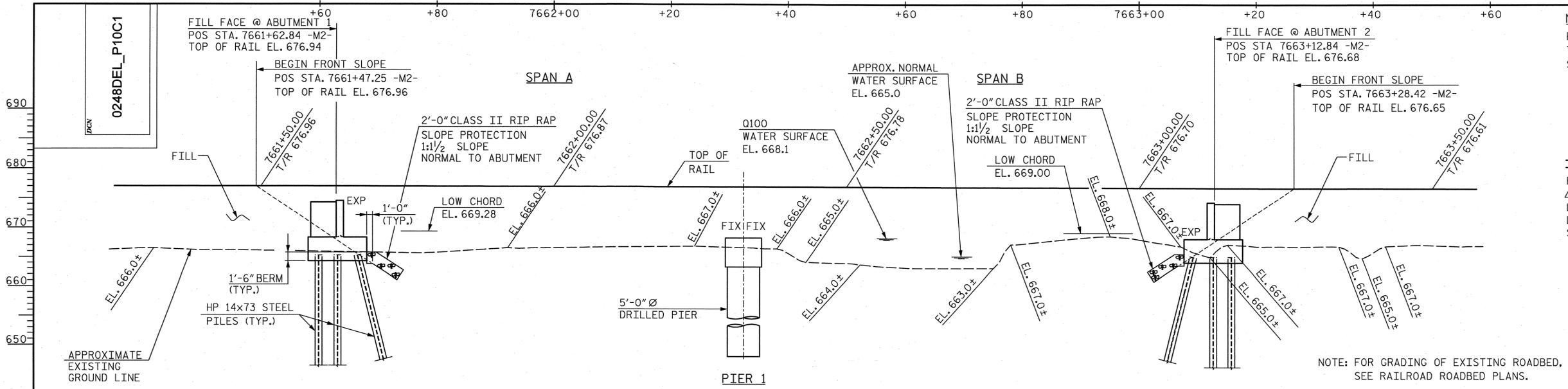
STRUCTURES ENGINEER

SEAL 27812

DAVID W. HAWKINS
ENGINEER

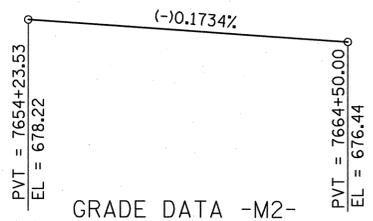
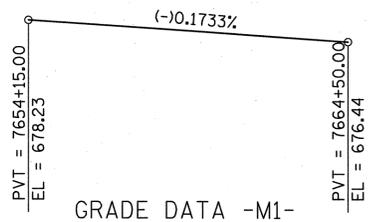
David W. Hawkins
SIGNATURE: P.E.

NC DEPARTMENT OF TRANSPORTATION
RAIL DIVISION
 PLANNING AND DEVELOPMENT



NOTES:
FOR GENERAL NOTES, SEE "GENERAL DRAWING: TOTAL BILL OF MATERIAL & GENERAL NOTES" SHEET 3 OF 3.

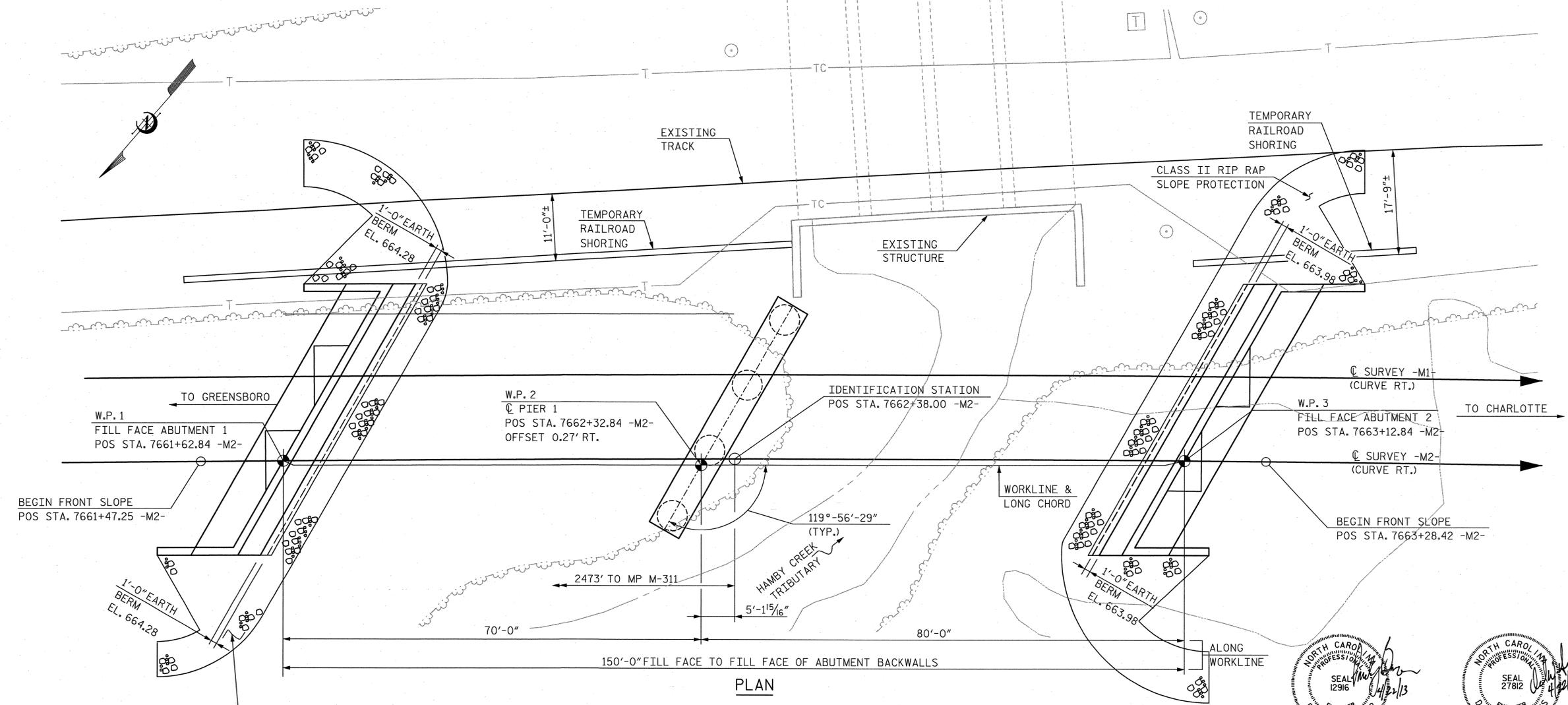
| CURVE DATA -M1- (M1 C3115) | CURVE DATA -M2- (M2 C3115) |
|-------------------------------------|-------------------------------------|
| PIs STA 7663+35.91 | PIs STA 7663+36.50 |
| $\Delta s = 2^\circ-41'-11.8"$ (RT) | $\Delta s = 2^\circ-41'-11.8"$ (RT) |
| Ls = 403.00 FT. | Ls = 403.00 FT. |
| LT = 268.70 FT. | LT = 268.70 FT. |
| ST = 134.36 FT. | ST = 134.36 FT. |



I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7662+38.00 -M2-
MILE POST: 311.47
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
BRIDGE ON NCRR MAINLINE
OVER HAMBY CREEK TRIBUTARY
BETWEEN SR 2024 AND SR 2020



| HYDRAULIC DATA | | OVERTOPPING FLOOD DATA | |
|-----------------------------|-------------|--------------------------------|-----------|
| DESIGN DISCHARGE | 2,100 CFS | OVERTOPPING DISCHARGE | 3,120 CFS |
| FREQUENCY OF DESIGN FLOOD | 100 YRS. | FREQUENCY OF OVERTOPPING FLOOD | >500 YRS. |
| DESIGN HIGH WATER ELEVATION | 668.05 | OVERTOPPING FLOOD ELEVATION | 676.15 |
| DRAINAGE AREA | 5.5 SQ. MI. | | |

PAUL J. BARBER
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 12916
DATE 2/13

DAVID W. HAWKINS
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 27812
DATE 2/13

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-1 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 64 |

HNTB NORTH CAROLINA, P.C.
License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

DRAWN BY: M. WRIGHT DATE: 2/13
CHECKED BY: P. BARBER DATE: 2/13
DWG. NO. 1

FOUNDATION NOTES:

THE ALLOWABLE BEARING CAPACITY FOR PILES AT ABUTMENT 1 IS 80 TONS/PILE.

INSTALL PILES AT ABUTMENT 1 TO A REQUIRED BEARING CAPACITY OF 160 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF 2.0.

THE ALLOWABLE BEARING CAPACITY FOR PILES AT ABUTMENT 2 IS 80 TONS/PILE.

INSTALL PILES AT ABUTMENT 2 TO A REQUIRED BEARING CAPACITY OF 160 TONS PER PILE. THE REQUIRED BEARING CAPACITY IS EQUAL TO THE ALLOWABLE BEARING CAPACITY WITH A MINIMUM FACTOR OF SAFETY OF 2.0.

INSTALL PILES AT ABUTMENT 1 TO A TIP ELEVATION NO HIGHER THAN 647.0 FEET.

INSTALL PILES AT ABUTMENT 2 TO A TIP ELEVATION NO HIGHER THAN 647.0 FEET

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT ABUTMENT 1. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 647.0 FEET. FOR PILE EXCAVATION, SEE SPECIAL PROVISIONS.

PILE EXCAVATION IS REQUIRED TO INSTALL PILES AT ABUTMENT 2. EXCAVATE HOLES AT PILE LOCATIONS TO ELEVATION 647.0 FEET. FOR PILE EXCAVATION, SEE SPECIAL PROVISIONS.

CONCRETE OR GROUT IS REQUIRED TO FILL HOLES FOR PILE EXCAVATIONS AT ABUTMENT 1 AND ABUTMENT 2.

FOR PILES, SEE SPECIAL PROVISIONS.

DRILLED PIERS AT PIER 1 ARE DESIGNED FOR END BEARING ONLY. CHECK FIELD CONDITIONS FOR THE REQUIRED END BEARING CAPACITY OF 70 TSF.

DRILLED PIERS AT PIER 1 ARE DESIGNED FOR AN APPLIED LOAD OF 540 TONS EACH AT THE TOP OF THE COLUMN.

THE SCOUR CRITICAL ELEVATION FOR PIER 1 IS ELEVATION 660.0. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

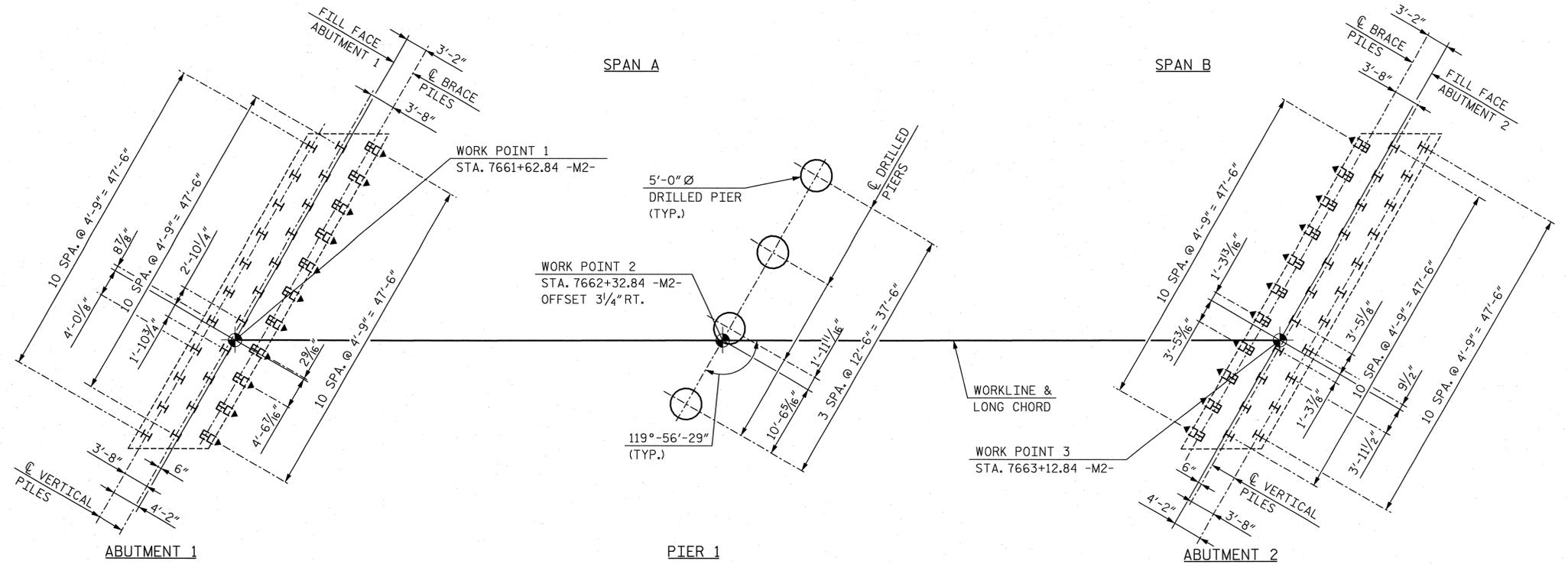
INSTALL DRILLED PIERS AT PIER 1 THAT EXTEND TO AN ELEVATION NO HIGHER THAN 648.0 FT., AND SATISFY THE REQUIRED END BEARING CAPACITY. PIER SHALL HAVE A MINIMUM PENETRATION OF 5.0' INTO ROCK AS DEFINED BY THE DRILLED PIERS SPECIAL PROVISION.

PERMANENT STEEL CASINGS ARE REQUIRED FOR DRILLED PIERS AT PIER 1. DO NOT EXTEND PERMANENT CASINGS BELOW ELEVATION 652.0 FEET WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

SID INSPECTIONS ARE REQUIRED FOR DRILLED PIERS AT PIER 1.

CSL TUBES AND TESTING IS REQUIRED FOR DRILLED PIERS AT PIER 1. FOR CROSSHOLE SONIC LOGGING, SEE SPECIAL PROVISIONS.

FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.



FOUNDATION LAYOUT

NOTES: \odot SURVEY -M1- & -M2- NOT SHOWN FOR CLARITY.

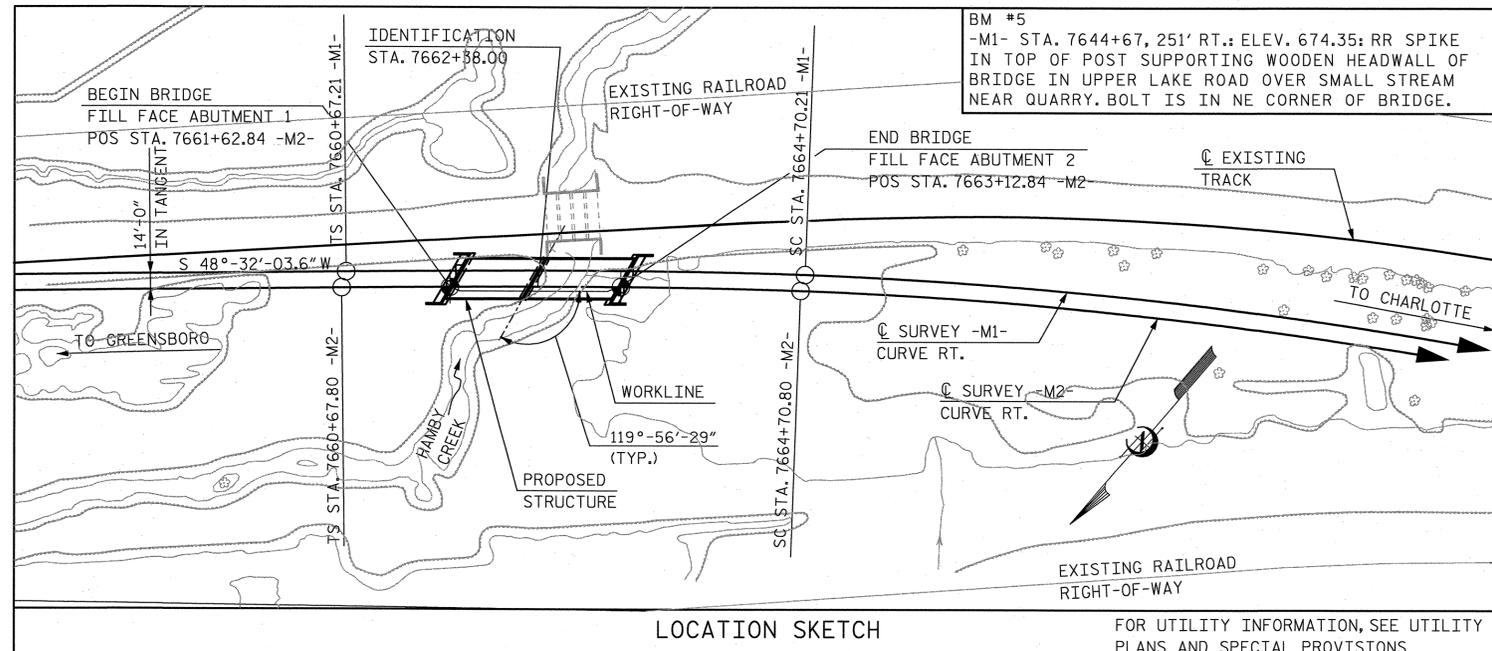
\triangleleft INDICATES PILE TO BE BATTERED 3:12 IN DIRECTION OF ARROW.

ALL DIMENSIONS ARE PARALLEL OR NORMAL TO FILL FACE ABUTMENTS OR \odot PIER.

FOR FOUNDATION ELEVATIONS AND DETAILS, SEE PIER AND ABUTMENT DETAILS.

ALL PILES ARE STEEL HP 14x73.

ALL DIMENSIONS TO BATTERED PILES ARE AT BOTTOM OF CAP ELEVATION.



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS



PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47
 SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 FOUNDATION LAYOUT,
 FOUNDATION NOTES
 & LOCATION SKETCH

| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
|-----------------------|------------|---|----------------------|
| DRAWN BY: M. WRIGHT | DATE: 2/13 | DWG. NO. 2 | |
| CHECKED BY: P. BARBER | DATE: 2/13 | | |
| REVISIONS | | | |
| NO. | BY: | DATE: | TOTAL SHEETS |
| 1 | | | 4 |
| 2 | | | 4 |
| | | | SHEET NO. S-2 |

GENERAL NOTES:

ASSUMED LIVE LOAD = AREMA E80 OR ALTERNATE LIVE LOAD

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF AREMA'S MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES, AND NORFOLK SOUTHERN CORPORATION'S "GUIDELINES FOR DESIGN OF HIGHWAY SEPARATION STRUCTURES UNDER RAILROAD (UNDERPASS GRADE SEPARATION)"

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC ZONE 1.

REINFORCING STEEL SHALL BE ASTM DESIGNATION A615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED. FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", A.C.I. 315-80. ALL REINFORCING IN THE CONCRETE DECK SLAB AND PARAPETS SHALL BE EPOXY COATED.

EXPANSION JOINT MATERIAL SHALL BE EITHER RUBBER OR CORK CONFORMING WITH AASHTO SPECIFICATIONS M-153-84 EXCEPT AS SHOWN ON THE PLANS OR IN THE SPECIAL PROVISIONS. CELLULAR AND BULB TYPE WATERSTOPS AND RUBBER JOINT COMPOUNDS SHALL BE AS SHOWN ON THE PLANS AND IN THE SPECIAL PROVISIONS.

STRUCTURE DRAINAGE SYSTEM: METAL DRAINS BEHIND ABUTMENTS AND IN BALLAST TROUGH OF BRIDGE SHALL BE AS SHOWN ON THE PLANS AND OUTLINED IN THE SPECIAL PROVISIONS. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED TO THE CHIEF ENGINEER BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, GA, FOR APPROVAL.

DAMPPOOFING: PIER CAP UP TO GROUND LINE, BACK OF BACKWALLS AND ABUTMENT SEATS, AND BACK OF WINGS SHALL BE DAMPPOOFED WITH METHOD "B" DAMPPOOFING.

WATERPROOFING: BRIDGE DECK, ALL CONSTRUCTION JOINTS AND ANY VISIBLE SHRINKAGE CRACKS WHICH WILL BE COVERED BY FILL SHALL BE WATERPROOFED WITH A COLD LIQUID-APPLIED ELASTOMERIC MEMBRANE. FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

WATERPROOFING IS REQUIRED AT THE FOLLOWING LOCATIONS:
 1. BRIDGE DECK AND INSIDE OF CONCRETE PARAPET AS SHOWN ON "TYPICAL SECTION".
 2. ALONG FULL CIRCUMFERENCE OF EACH TOP OF DRILLED PIER TO PIER CAP INTERFACE.
 3. ALONG FILL FACE OF HORIZONTAL CONSTRUCTION JOINT AT TOP OF FOOTING ELEVATION AT EACH ABUTMENT.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2012, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS (STRUCTURAL STEEL IN ACCORDANCE WITH CURRENT AREMA SPECIFICATIONS).

ALL CONCRETE SHALL BE 4,500 PSI CLASS AA CONCRETE WITH NO. 57 OR 67 COARSE AGGREGATE AND SHALL BE AIR-ENTRAINED. MINIMUM CEMENT CONTENT PER CUBIC YARD OF CONCRETE SHALL BE 6.5 BAGS. NO SUBSTITUTION OF FLYASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. CHAMFER ALL EXPOSED EDGES AND CORNERS 3/4" EXCEPT AS NOTED. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THIS STRUCTURE.

CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED SATISFACTORY TO THE ENGINEER AND/OR NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR METAL RAIL (ALUMINUM), SEE SPECIAL PROVISIONS.

FOR SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.

FOR CONDUIT IN PARAPETS, SEE SPECIAL PROVISIONS.

FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.

FOR FINE AND COARSE AGGREGATE, SEE SPECIAL PROVISIONS.

SEE "STRUCTURAL STEEL DETAILS" SHEET FOR STRUCTURAL STEEL NOTES.

FOR BACKFILL BEHIND ABUTMENTS AND OTHER BACKFILL AROUND THE STRUCTURE, SEE SPECIAL PROVISION "BACKFILLING AROUND STRUCTURES".

FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR WATERSTOPS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC FLASHING, SEE SPECIAL PROVISIONS.

FOR RUBBER JOINT COMPOUNDS, SEE SPECIAL PROVISIONS.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR RAILROAD TRACKWORK, SEE RAILROAD TRACKWORK PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CONCRETE PARAPET, SEE SPECIAL PROVISIONS.

FOR WATERPROOFING, SEE SPECIAL PROVISIONS.

FOR TEMPORARY RAILROAD SHORING, SEE SPECIAL PROVISIONS.

THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.

ALL BAR SUPPORTS AND ALL INCIDENTAL REINFORCING STEEL USED IN THE DECK AND PARAPET SHALL BE EPOXY COATED IN ACCORDANCE WITH THE NCDOT STANDARD SPECIFICATIONS.

THE EXISTING 43' WIDE x 58' LONG ARCH STRUCTURE CONSISTING OF FOUR 10' WIDE x 9' TALL SPANS SHALL BE REMOVED. THE CONCRETE STRUCTURE UTILIZES SPREAD FOOTINGS AT SUPPORT LOCATIONS AND PARALLEL WINGS AT BOTH INLET AND OUTLET.

THE EXISTING STRUCTURE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH "HEC 18- EVALUATING SCOUR AT BRIDGES."

CONTRACTOR IS ADVISED THAT BURIED RAILROAD UTILITIES EXIST IN THE IMMEDIATE VICINITY OF THE PROPOSED STRUCTURE. THE CONTRACTOR SHALL COORDINATE WITH NORFOLK SOUTHERN RAILWAY COMPANY TO HAVE CONFLICTING UTILITIES RELOCATED PRIOR TO ANY CONSTRUCTION ACTIVITIES THAT WOULD DISRUPT THOSE UTILITIES IN THEIR CURRENT LOCATION.

TOTAL BILL OF MATERIAL

| | TEMPORARY RAILROAD SHORING FOR ABUTMENT 1 STA. 7662+38.00 -M2- | TEMPORARY RAILROAD SHORING FOR ABUTMENT 2 STA. 7662+38.00 -M2- | REMOVAL OF EXISTING STRUCTURE AT STA. 7662+38.00 -M2- | FOUNDATION EXCAVATION FOR PIER 1 AT STA. 7662+38.00 -M2- | PILE EXCAVATION IN SOIL | PILE EXCAVATION NOT IN SOIL | 5'-0" DIA. DRILLED PIERS IN SOIL | 5'-0" DIA. DRILLED PIERS NOT IN SOIL | PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER | SID INSPECTIONS | CSL TESTING | REINFORCED CONCRETE DECK SLAB |
|----------------|--|--|---|--|-------------------------|-----------------------------|----------------------------------|--------------------------------------|--|-----------------|-------------|-------------------------------|
| | LUMP SUM | LUMP SUM | LUMP SUM | LUMP SUM | L.F. | L.F. | L.F. | L.F. | L.F. | EACH | EACH | SQ. FEET |
| SUPERSTRUCTURE | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 5,363 |
| ABUTMENT 1 | LUMP SUM | --- | --- | --- | 363 | 231 | --- | --- | --- | --- | --- | --- |
| PIER 1 | --- | --- | --- | LUMP SUM | --- | --- | 43.0 | 20.0 | 46.9 | 4 | 4 | --- |
| ABUTMENT 2 | --- | LUMP SUM | --- | --- | 396 | 198 | --- | --- | --- | --- | --- | --- |
| TOTAL | LUMP SUM | LUMP SUM | LUMP SUM | LUMP SUM | 759 | 429 | 43.0 | 20.0 | 46.9 | 4 | 4 | 5,363 |

TOTAL BILL OF MATERIAL

| | CLASS AA CONCRETE | REINFORCING STEEL | APPROX. 565,779 LBS. STRUCTURAL STEEL | PAINTING OF STRUCTURAL STEEL | HP 14 x 73 STEEL PILES | WATER-PROOFING | METHOD B DAMPPROOFING | METAL RAIL (ALUMINUM) | CONCRETE PARAPET | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE | SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES | STRUCTURE DRAINAGE SYSTEM |
|----------------|-------------------|-------------------|---------------------------------------|------------------------------|------------------------|----------------|-----------------------|-----------------------|------------------|--------------------------------|-------------------------|---|---------------------------|
| | CU. YARDS | LBS. | LUMP SUM | LUMP SUM | NO. | L.F. | SQ. YARDS | SQ. YARDS | L.F. | L.F. | TON | SQ. YARDS | LUMP SUM |
| SUPERSTRUCTURE | --- | --- | LUMP SUM | LUMP SUM | --- | --- | 569.7 | --- | 365.3 | 293.7 | --- | --- | LUMP SUM |
| ABUTMENT 1 | 115.9 | 9,686 | --- | --- | 33 | 627 | 11.7 | 104.2 | --- | --- | 160 | 177 | --- |
| PIER 1 | 45.1 | 23,509 | --- | --- | --- | --- | 10.5 | 40.0 | --- | --- | --- | --- | --- |
| ABUTMENT 2 | 116.1 | 9,686 | --- | --- | 33 | 627 | 11.7 | 104.6 | --- | --- | 162 | 180 | --- |
| TOTAL | 277.1 | 42,881 | LUMP SUM | LUMP SUM | 66 | 1,254 | 603.6 | 248.8 | 365.3 | 293.7 | 322 | 357 | LUMP SUM |

INDEX OF DRAWINGS

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PROJECT NO. C-4901A

DAVIDSON COUNTY

STATION: 7662+38.00 -M2-

MILE POST: 311.47

SHEET 3 OF 3



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

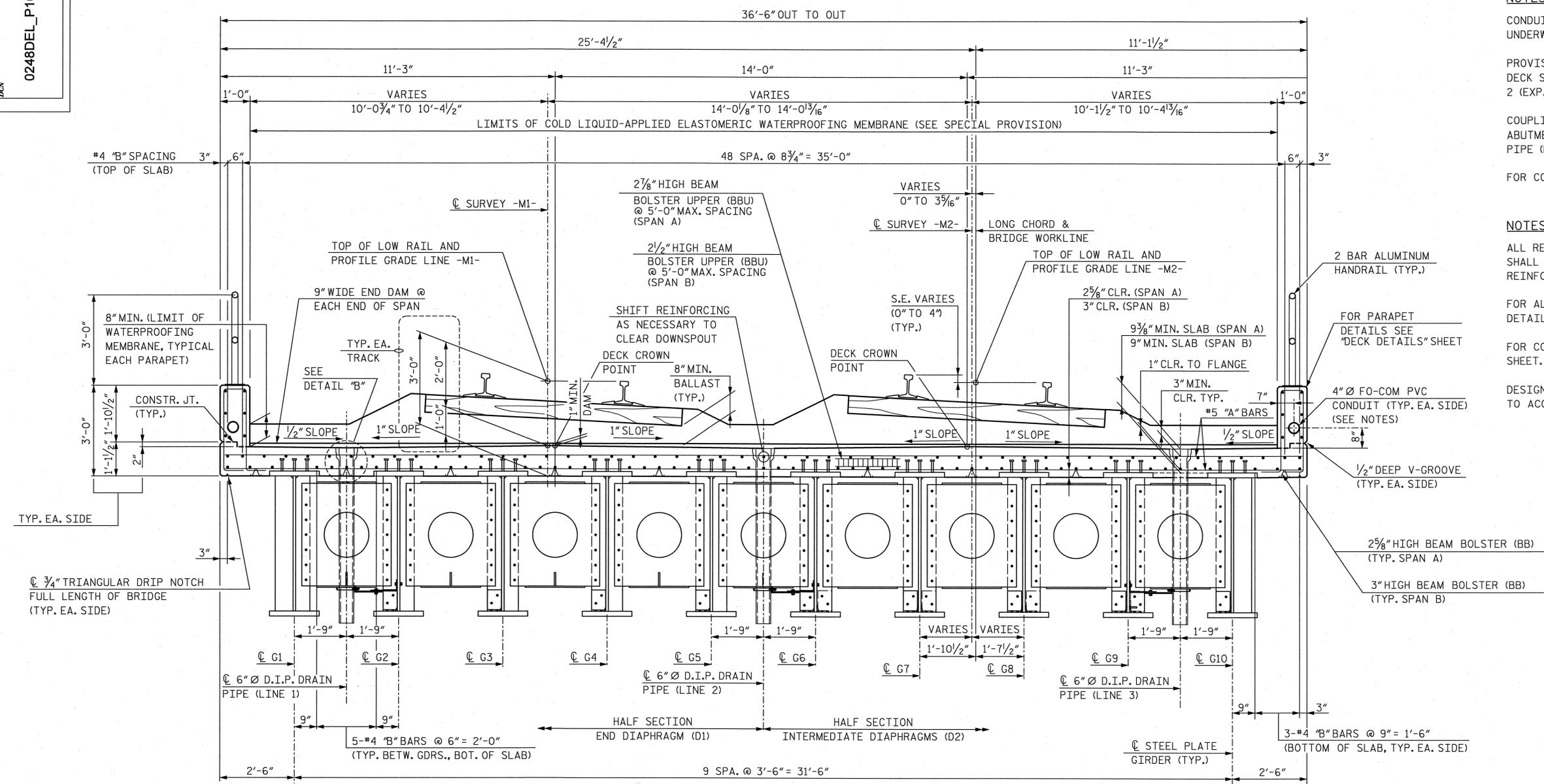
TOTAL BILL OF MATERIAL & GENERAL NOTES

| | | | | | | | |
|--|-----------|-----|-------|-----|-----|-------|--|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | REVISIONS | | | | | | SHEET NO. S-3 TOTAL SHEETS 64 |
| | NO. | BY: | DATE: | NO. | BY: | DATE: | |
| DRAWN BY: <u>J. BAYNE</u> DATE: <u>2/13</u> CHECKED BY: <u>P. BARBER</u> DATE: <u>2/13</u> DWG. NO. 3 | 1 | | | 3 | | | |
| | 2 | | | 4 | | | |

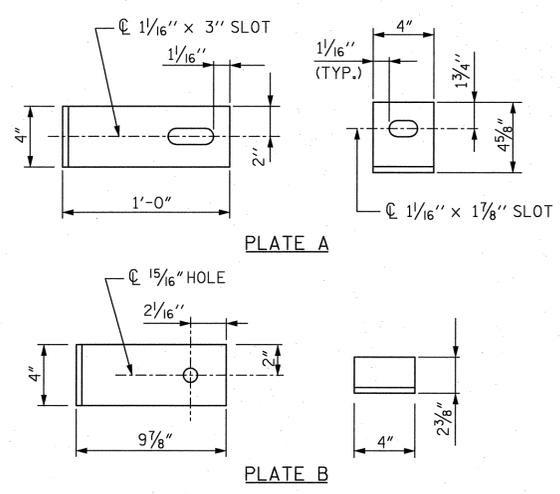
0248DEL_P10C1

NOTES FOR CONDUIT IN PARAPETS
 CONDUIT TO BE 4" DIA. IN ACCORDANCE WITH UNDERWRITER'S LABORATORY SPECIFICATIONS.
 PROVISIONS SHALL BE MADE FOR EXPANSION BETWEEN DECK SLAB AT EXPANSION JOINTS AT ABUTMENT 1 AND 2 (EXPANSION FITTINGS).
 COUPLING SHALL BE PROVIDED BEHIND BACKWALL OF ABUTMENT 1 AND 2 FOR CONNECTION TO 4" DIA. RIGID PIPE (RIGID PIPE BY RAILWAY COMPANY).
 FOR CONDUIT IN PARAPETS, SEE SPECIAL PROVISIONS.

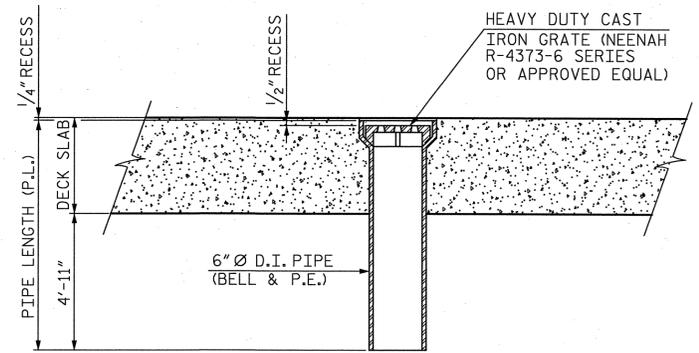
NOTES:
 ALL REINFORCING STEEL IN THE DECK AND PARAPETS SHALL BE EPOXY COATED. CLEAR COVER TO ALL REINFORCING IS 2" MINIMUM UNLESS NOTED OTHERWISE.
 FOR ALUMINUM HANDRAIL DETAILS, SEE "METAL HANDRAIL DETAILS" SHEETS.
 FOR CONCRETE PARAPET DETAILS, SEE "DECK DETAILS" SHEET.
 DESIGN INCLUDES WEIGHT OF 6" ADDITIONAL BALLAST TO ACCOUNT FOR FUTURE RESURFACING OF TRACK.



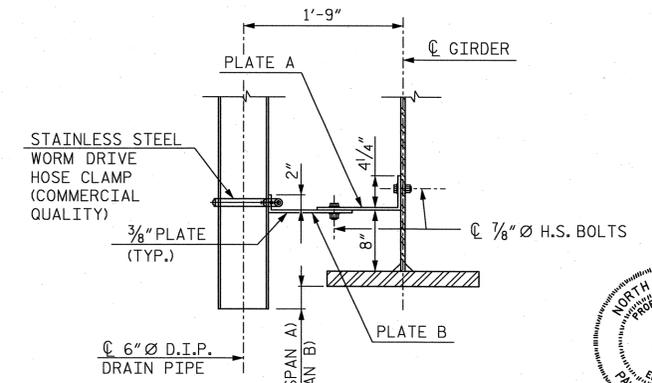
TYPICAL SECTION
(ALL SPANS SIMILAR)



DRAINAGE PIPE SUPPORT CONNECTION PLATES



DETAIL "B"



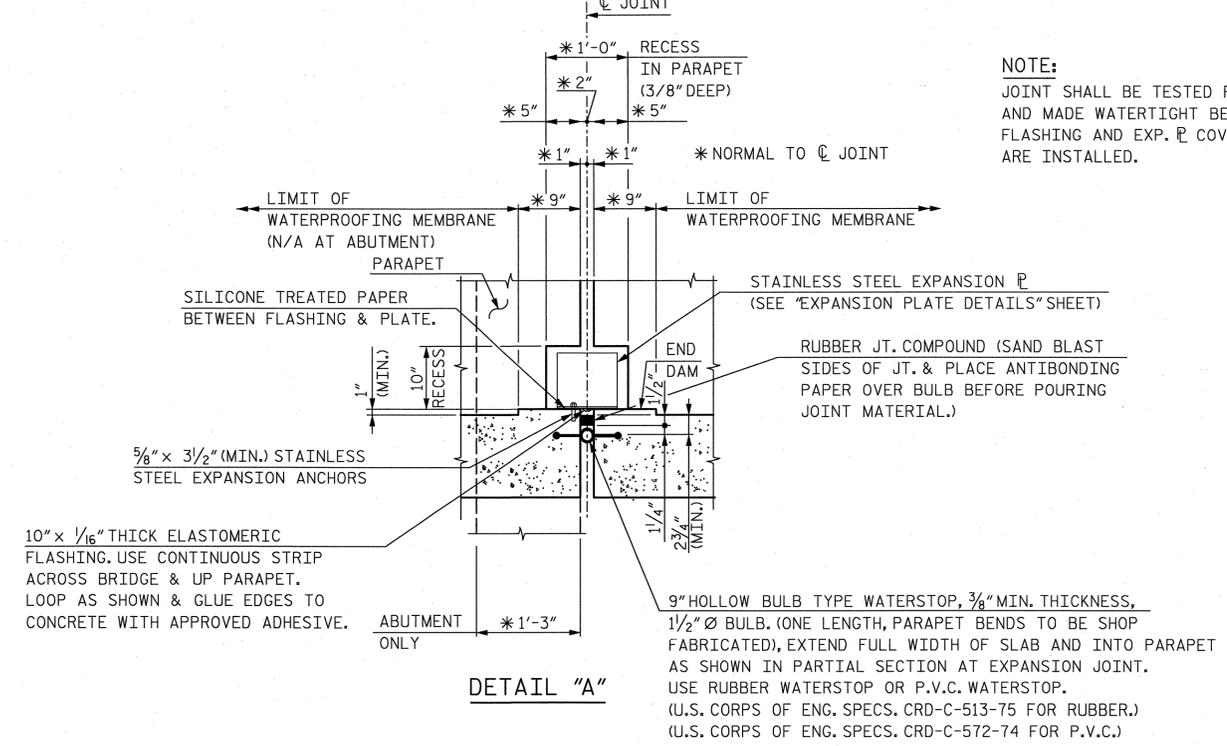
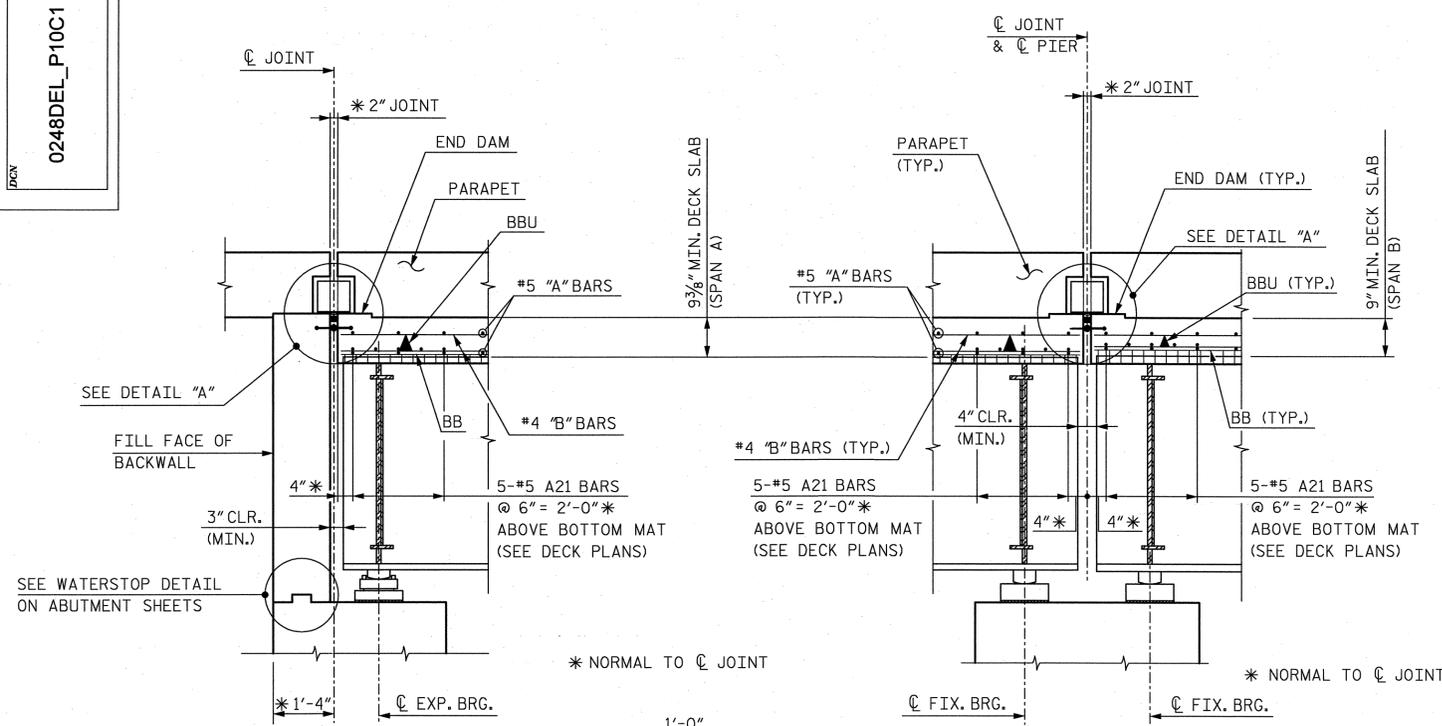
DRAINAGE PIPE SUPPORT DETAIL



PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47

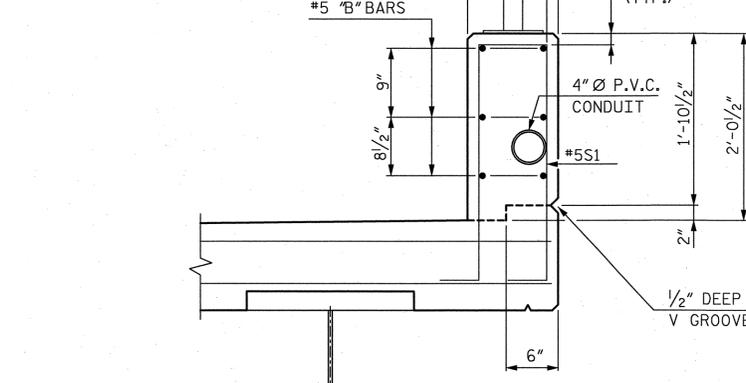
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 TYPICAL SECTION

| | | | |
|------------------------------|--------------------|---|-----|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
| DRAWN BY: <u>M. WRIGHT</u> | DATE: <u>12/12</u> | DWG. NO. <u>4</u> | |
| CHECKED BY: <u>P. BARBER</u> | DATE: <u>2/13</u> | | |
| REVISIONS | | SHEET NO. | |
| NO. | BY: | DATE: | NO. |
| 1 | | | 3 |
| 2 | | | 4 |
| TOTAL SHEETS | | S-4 | |
| 64 | | | |



NOTE:
 JOINT SHALL BE TESTED FOR LEAKS AND MADE WATERTIGHT BEFORE FLASHING AND EXP. PLATE COVER ARE INSTALLED.

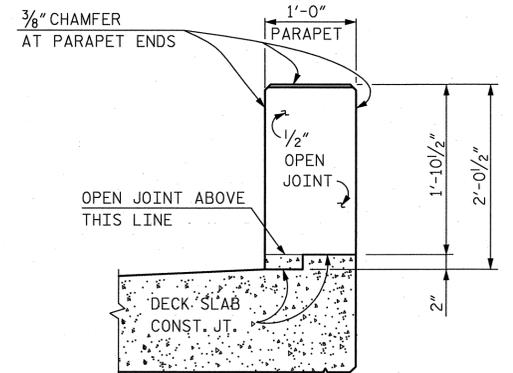
SECTION A-A
 (ABUT. 1 SHOWN, ABUT. 2 SIMILAR)



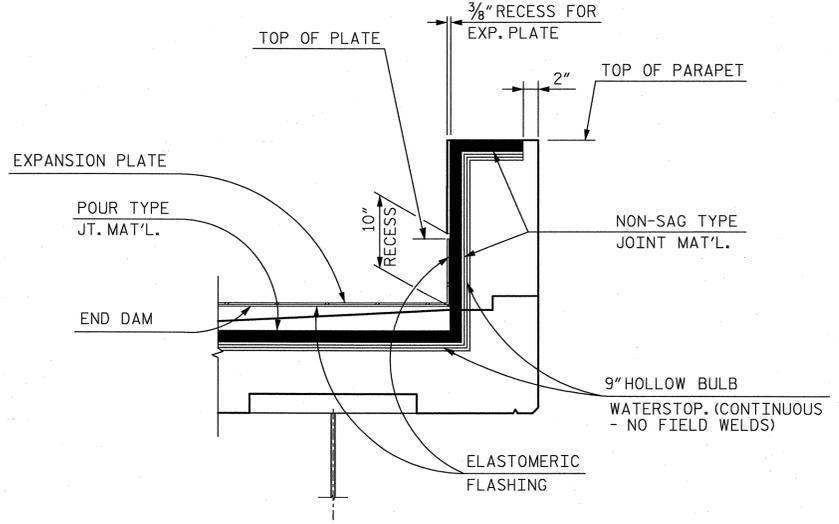
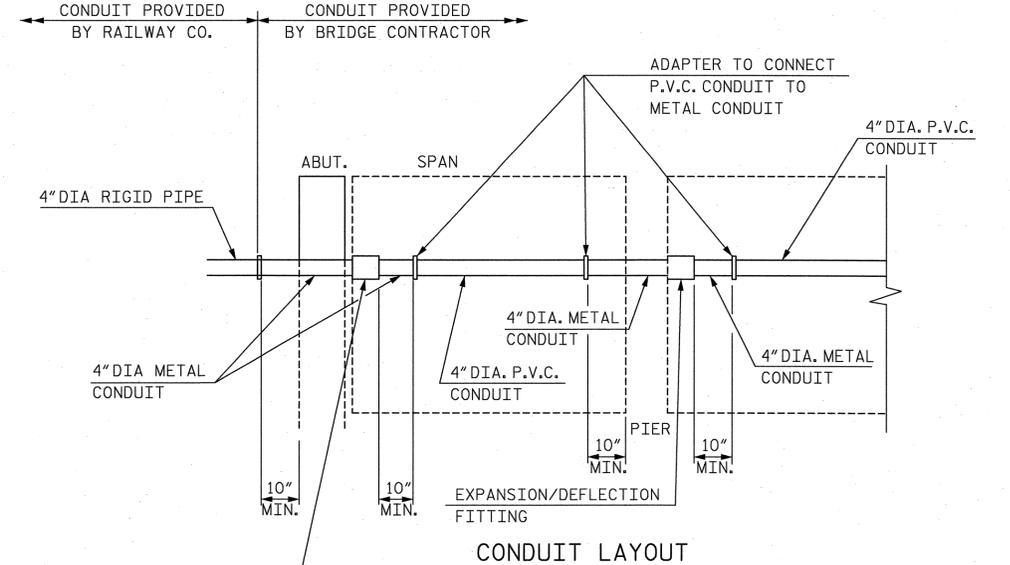
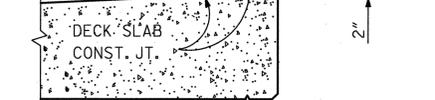
SECTION B-B
 (PIER 1)



SECTION THRU PARAPET



SECTION THRU OPEN JOINT IN PARAPET



PART SECTION AT EXPANSION JOINT

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
DECK DETAILS

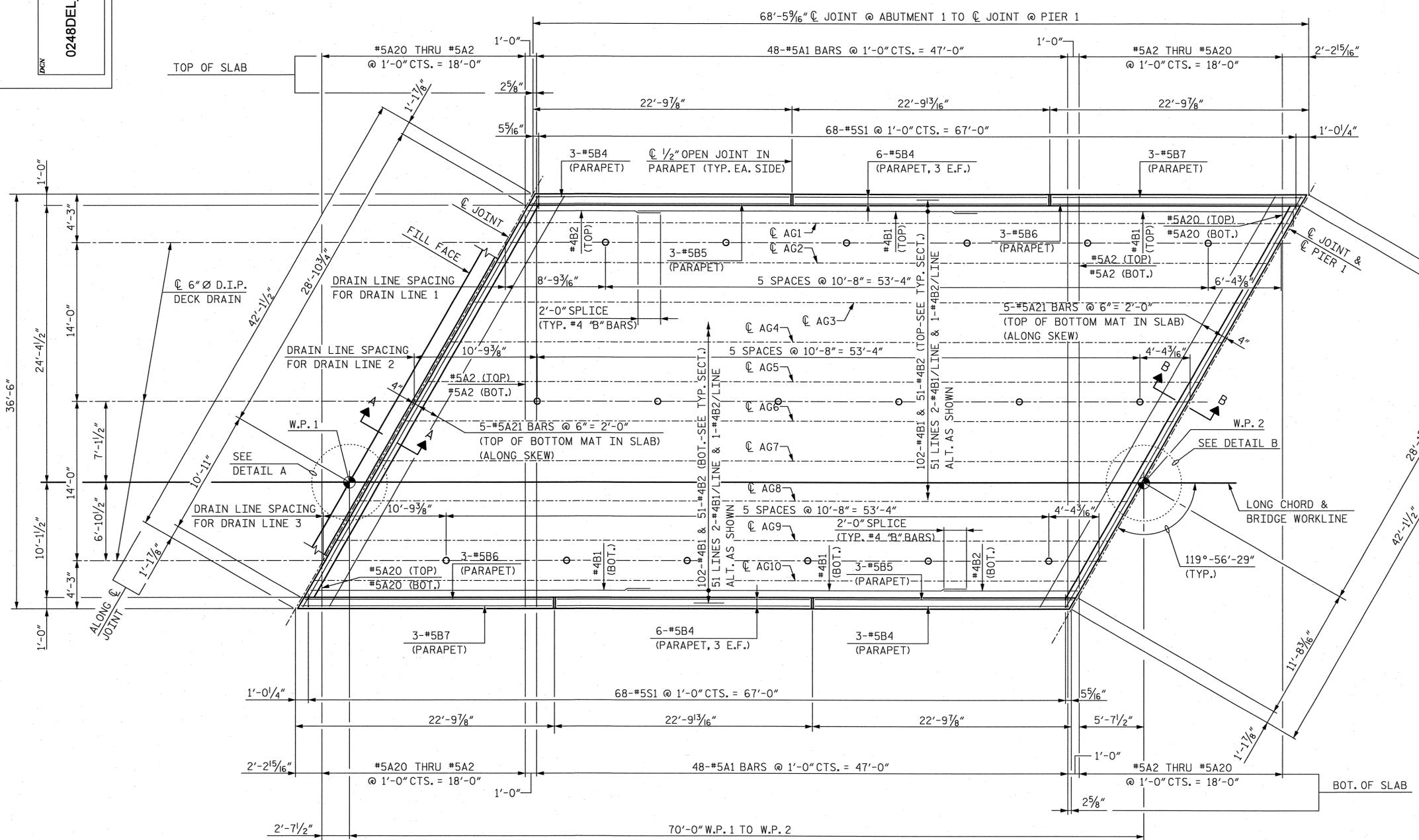
PAUL J. BARBER
 ENGINEER
 SEAL 12916
 1/27/13

DAVID W. HAWKINS
 ENGINEER
 SEAL 27812
 1/27/13

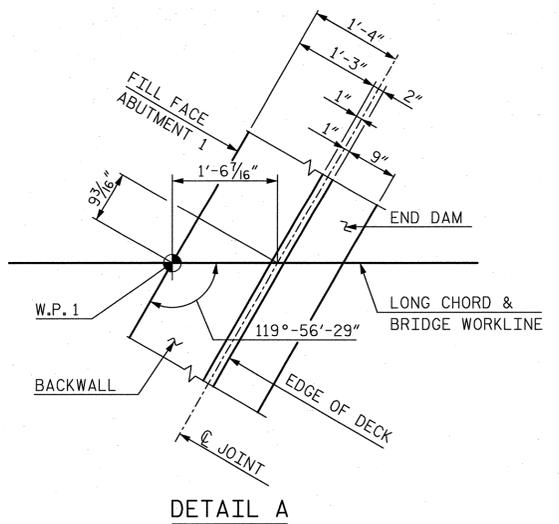
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
|-----------------------|-----|---|------------|
| DRAWN BY: M. WRIGHT | | DATE: 12/12 | DWG. NO. 5 |
| CHECKED BY: P. BARBER | | DATE: 2/13 | |
| REVISIONS | | | |
| NO. | BY: | DATE: | |
| 1 | | | 3 |
| 2 | | | 4 |

SHEET NO.
S-5
 TOTAL SHEETS
64

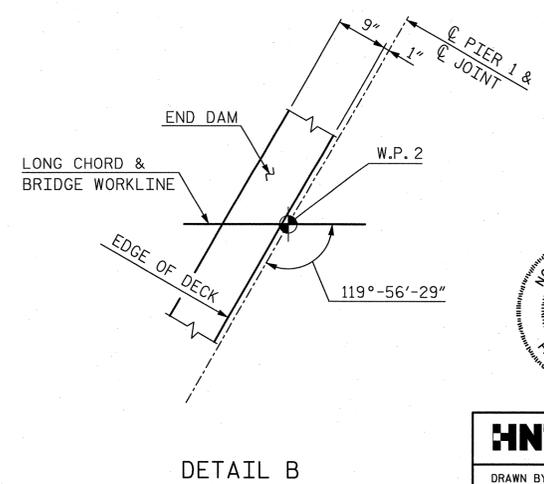
0248DEL_P10C1



NOTES:
 ALL REINFORCING SHALL BE EPOXY COATED.
 FOR SECTION A-A & B-B SEE "DECK DETAILS" SHEET.
 FOR CONCRETE PARAPET DETAILS, SEE "DECK DETAILS" SHEET.
 FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "TYPICAL SECTION" SHEET.
 *5S1 BARS IN PARAPET MAY BE SHIFTED SLIGHTLY TO MAINTAIN PROPER CLEARANCE TO EXPANSION JOINTS IN PARAPET.
 SLAB BARS MAY BE SHIFTED SLIGHTLY TO AVOID DECK DRAIN LOCATIONS.
 E.F. = EACH FACE



PLAN - SPAN A
 @ SURVEY -M1- & -M2- ARE NOT SHOWN FOR CLARITY.



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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF DECK - SPAN A

NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 12916
 ENGINEER
 PAUL J. BARBER

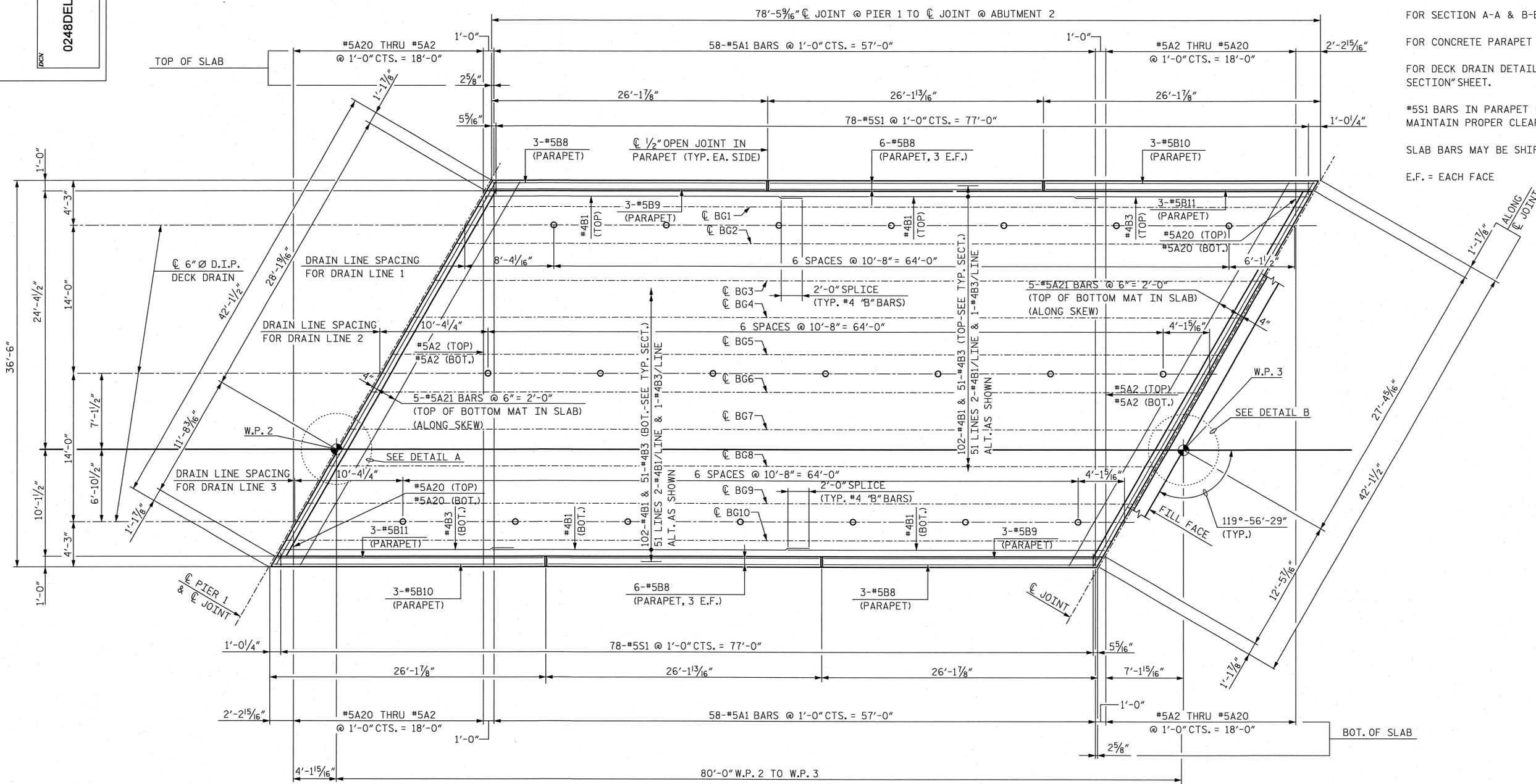
NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 27812
 ENGINEER
 DAVID W. HAWKINS

| | | | |
|-----------------------|-------------|---|--|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
| DRAWN BY: M. WRIGHT | DATE: 12/12 | DWG. NO. 6 | |
| CHECKED BY: P. BARBER | DATE: 2/13 | | |

| REVISIONS | | | |
|-----------|-----|-------|--|
| NO. | BY: | DATE: | |
| 1 | | | |
| 2 | | | |

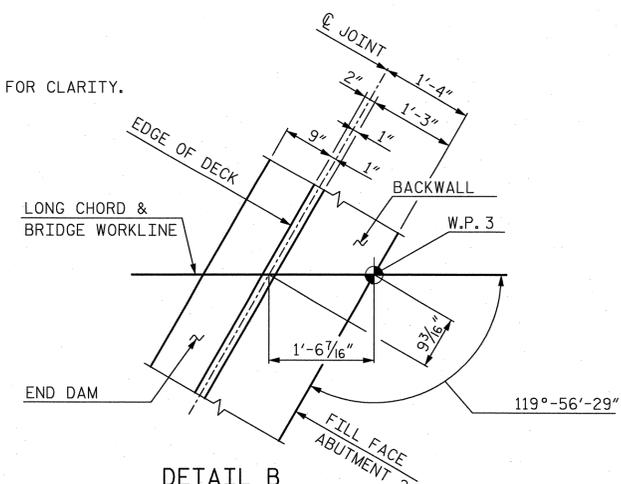
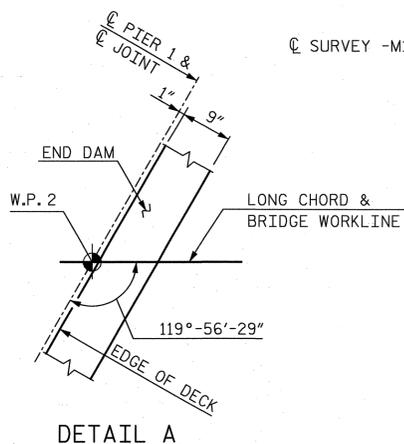
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| SHEET NO. | S-6 |
| TOTAL SHEETS | CA |

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NOTES:
 ALL REINFORCING SHALL BE EPOXY COATED.
 FOR SECTION A-A & B-B SEE "DECK DETAILS" SHEET.
 FOR CONCRETE PARAPET DETAILS, SEE "DECK DETAILS" SHEET.
 FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "TYPICAL SECTION" SHEET.
 *5S1 BARS IN PARAPET MAY BE SHIFTED SLIGHTLY TO MAINTAIN PROPER CLEARANCE TO EXPANSION JOINTS IN PARAPET.
 SLAB BARS MAY BE SHIFTED TO AVOID DECK DRAIN LOCATIONS.
 E.F. = EACH FACE

PLAN - SPAN B
 C SURVEY -M1- & -M2- ARE NOT SHOWN FOR CLARITY.



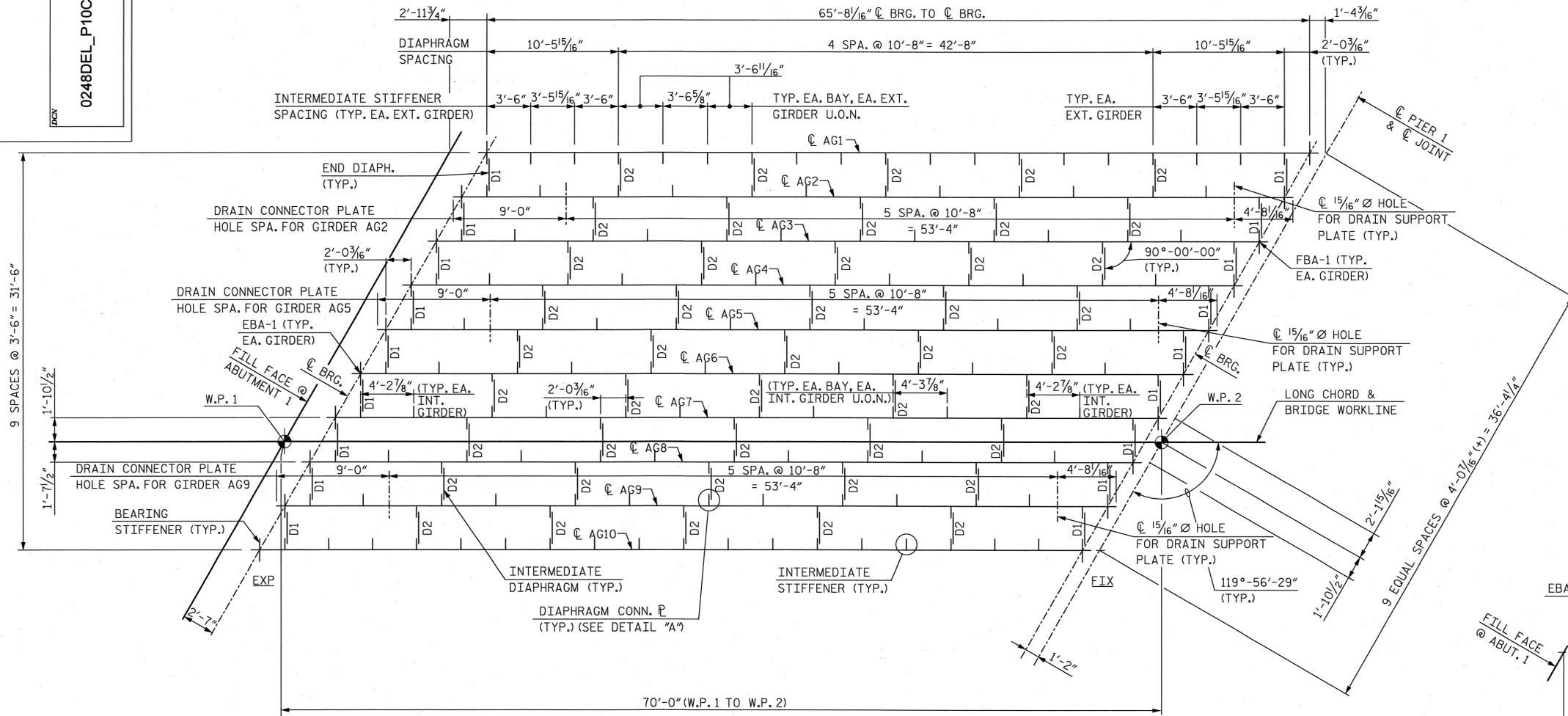
PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF DECK - SPAN B



| | | | | | | | |
|-------------|-----------------------|---|------------------|-----------|-------|-----------|-----|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. | |
| 1 | BY: M. WRIGHT | DATE: 12/12 | 3 | BY: | DATE: | 1 | S-7 |
| 2 | CHECKED BY: P. BARBER | DATE: 2/13 | 4 | | | 2 | |
| DWG. NO. 7 | | | TOTAL SHEETS: 64 | | | | |

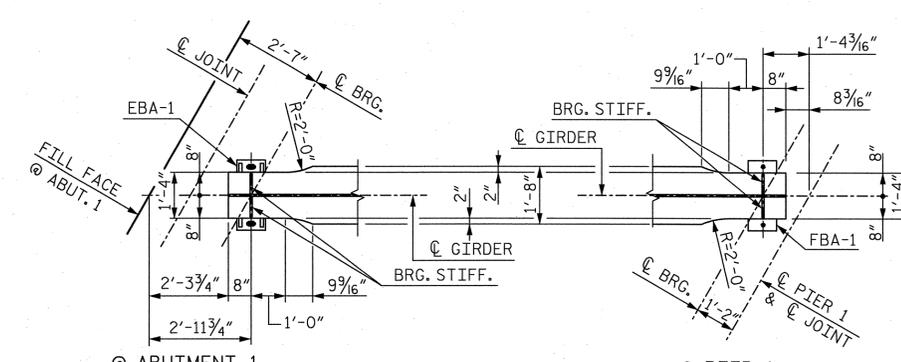
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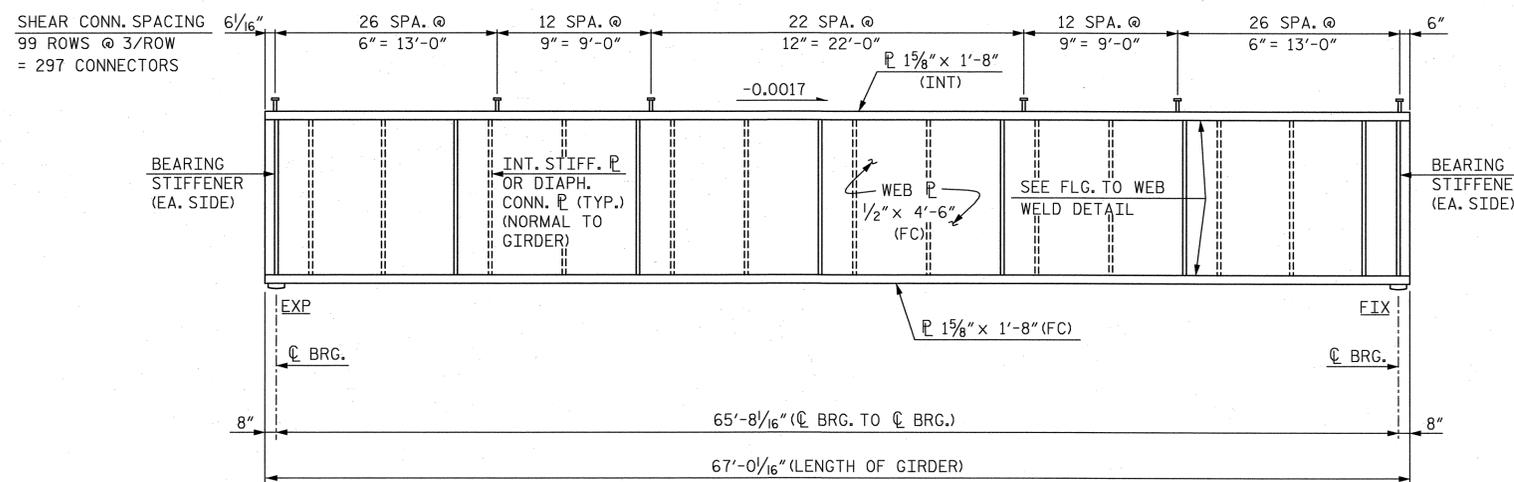
FRAMING PLAN - SPAN A

NOTE: U.O.N. = UNLESS OTHERWISE NOTED

NOTES:
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.
 ABUTMENT FILL FACE, C PIER AND C BEARINGS ARE PARALLEL.
 NO SHOP CAMBER REQUIRED.
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:
 • STRUCTURAL STEEL NOTES
 • DIAPHRAGM DETAILS
 • STIFFENER AND CONNECTOR P DETAILS
 • SHEAR CONNECTOR DETAILS
 • FLANGE TO WEB WELD DETAIL
 FOR BEARINGS, SEE "BEARING DETAILS" SHEET.
 FOR DRAIN PIPE SUPPORT DETAILS, SEE "TYPICAL SECTION" SHEET.
 FLANGE AND WEB SHOP SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.
 FLANGE AND WEB SHOP SPLICE SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0". SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAIL.
 FC = FRACTURE CRITICAL
 INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.
 U.O.N. = UNLESS OTHERWISE NOTED.

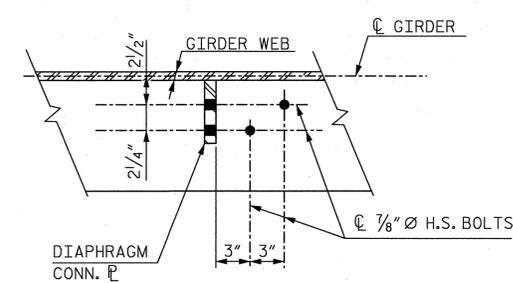


BOTTOM FLANGE GIRDER END DETAILS - SPAN A



TYPICAL GIRDER ELEVATION - SPAN A

(INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)



DETAIL "A"

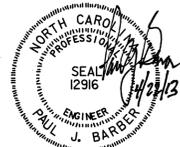
(RIGHT SIDE OF WEB SHOWN, LEFT SIDE SIMILAR)

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DAVIDSON COUNTY
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

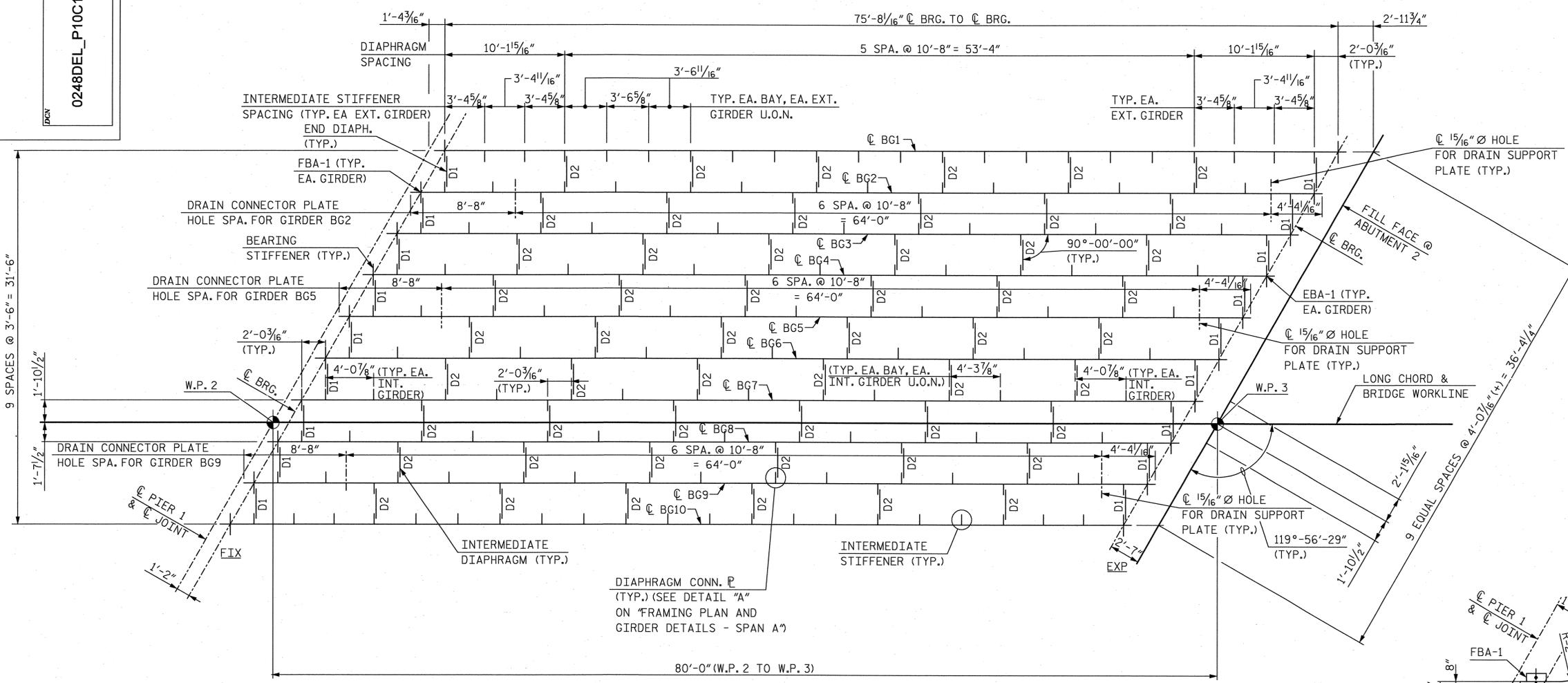
SUPERSTRUCTURE

FRAMING PLAN
 AND GIRDER DETAILS
 SPAN A



| | | | | | | | |
|--|---|--------------|-----|--------------|--------------|-----|--|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | REVISIONS | | | | | | SHEET NO. S-8 TOTAL SHEETS 64 |
| | DRAWN BY: <u>M. WRIGHT</u> DATE: <u>12/12</u> CHECKED BY: <u>P. BARBER</u> DATE: <u>1/13</u> DWG. NO. <u>8</u> | NO. <u>1</u> | BY: | DATE: | NO. <u>3</u> | BY: | |
| | NO. <u>2</u> | | | NO. <u>4</u> | | | |

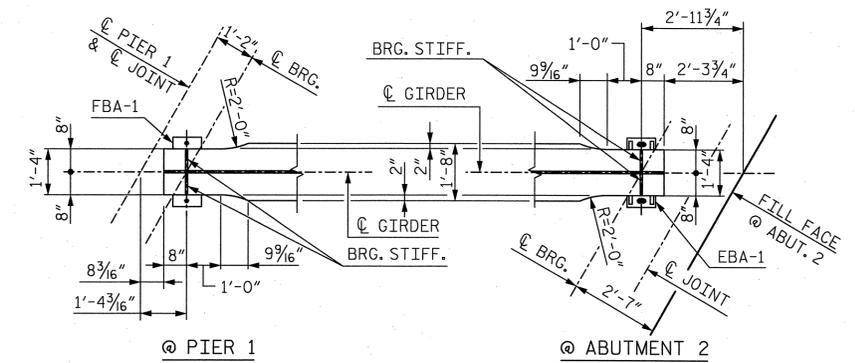
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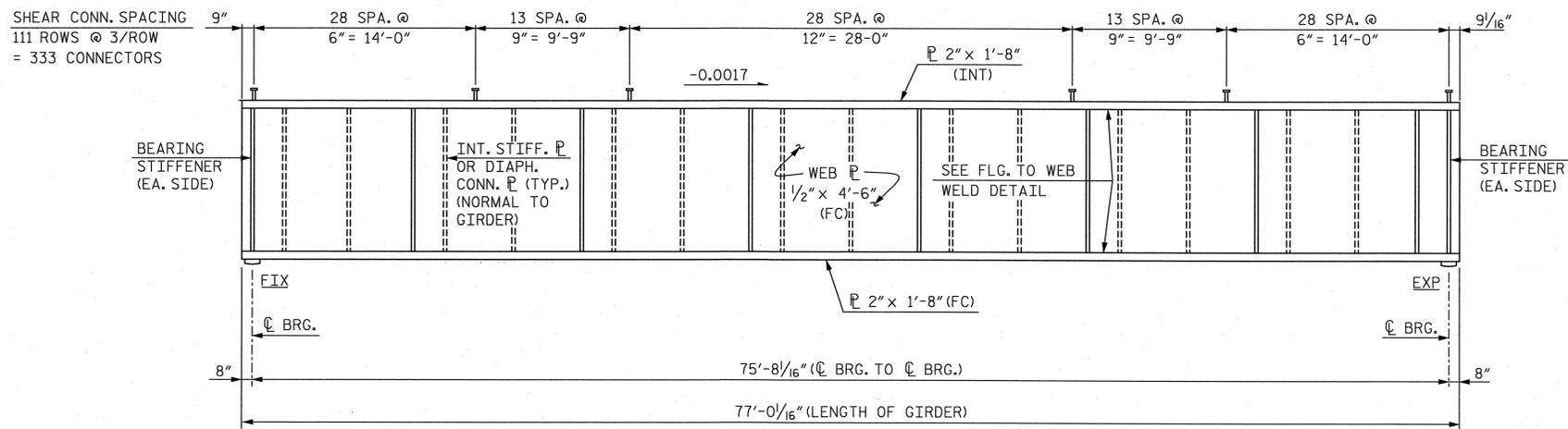
FRAMING PLAN - SPAN B

NOTE: U.O.N. = UNLESS OTHERWISE NOTED

NOTES:
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.
 ABUTMENT FILL FACE, C PIER AND C BEARINGS ARE PARALLEL.
 NO SHOP CAMBER REQUIRED.
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:
 • STRUCTURAL STEEL NOTES
 • DIAPHRAGM DETAILS
 • STIFFENER AND CONNECTOR P DETAILS
 • SHEAR CONNECTOR DETAILS
 • FLANGE TO WEB WELD DETAIL
 FOR BEARINGS, SEE "BEARING DETAILS" SHEET.
 FOR DRAIN PIPE SUPPORT DETAILS, SEE "TYPICAL SECTION" SHEET.
 FLANGE AND WEB SHOP SPLICES SHALL BE MADE WITH FULL PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR APPROVAL.
 FLANGE AND WEB SHOP SPLICE SHALL BE STAGGERED LONGITUDINALLY A MINIMUM OF 2'-0". SEE "STRUCTURAL STEEL DETAILS" SHEET FOR DETAIL.
 FC = FRACTURE CRITICAL
 INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.
 U.O.N. = UNLESS OTHERWISE NOTED.

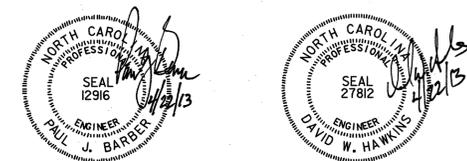


BOTTOM FLANGE GIRDER END DETAILS - SPAN B



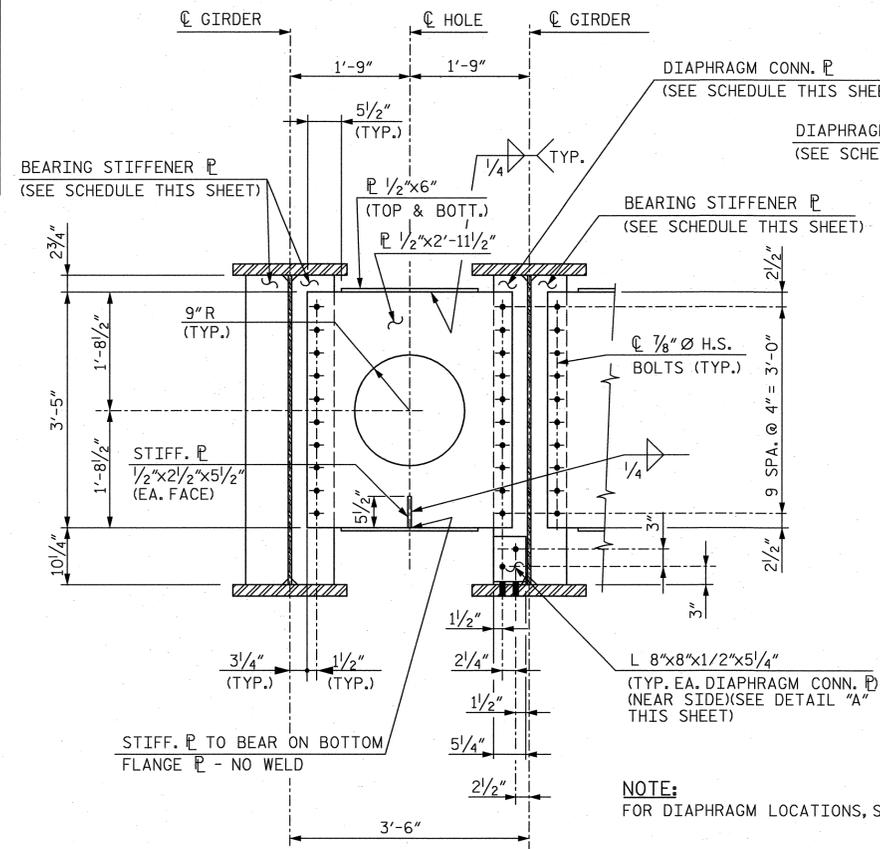
TYPICAL GIRDER ELEVATION - SPAN B
 (INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)

PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47

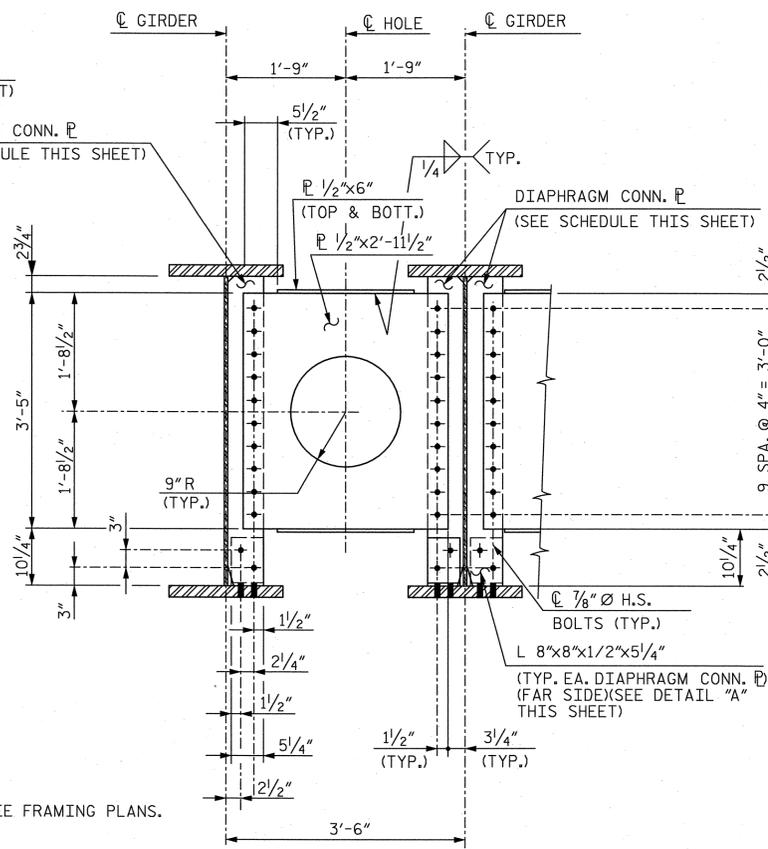


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN
 AND GIRDER DETAILS
 SPAN B

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|---|---------------------------------------|--------------------------------------|---------------------------------------|---------------------------------------|-------------------------------|-------------------------------|--|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 DRAWN BY: M. WRIGHT DATE: 12/12 CHECKED BY: P. BARBER DATE: 1/13 DWG. NO. 9 | REVISIONS | | | | | | SHEET NO. S-9 TOTAL SHEETS 6 |
| | NO. 1 BY: M. WRIGHT DATE: 12/12 | NO. 2 BY: P. BARBER DATE: 1/13 | NO. 3 BY: [Signature] DATE: [] | NO. 4 BY: [Signature] DATE: [] | NO. 5 BY: [] DATE: [] | NO. 6 BY: [] DATE: [] | NO. 7 BY: [] DATE: [] |



SECTION @ END DIAPHRAGM (D1)



SECTION @ INTERMEDIATE DIAPHRAGM (D2)

STRUCTURAL STEEL NOTES

DESIGN DATA:

- STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:
- GIRDER FLANGES AND WEB: A709, GRADE 50.
- MISCELLANEOUS MATERIAL: A709, GRADE 50.
- ANCHOR BOLTS FOR BEARING DEVICES SHALL CONFORM TO ASTM A449. ANCHOR BOLTS, NUTS, AND PLATE WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH AASHTO M232.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED. ALL DIMENSIONS ARE SHOWN AT 60°F.

NORFOLK SOUTHERN CORPORATION SHALL BE FURNISHED COPIES OF MILL TEST REPORTS FOR ALL MATERIALS EXCEPT MISCELLANEOUS PLATES AND SHAPES. REPORTS SHALL INDICATE COMPLIANCE WITH ALL SPECIFIED REQUIREMENTS.

SHOP INSPECTION SHALL BE BY NORFOLK SOUTHERN CORPORATION OR ITS AUTHORIZED AGENT. SEE STRUCTURAL STEEL SPECIAL PROVISION FOR ADDITIONAL WELDING INSPECTION OF FLANGE PLATE TO WEB PLATE WELDS.

FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

BOLTED CONNECTIONS SHALL BE MADE WITH 7/8" Ø ASTM A325, TYPE 1 HIGH STRENGTH BOLTS WITH HEAVY HEX HEAD, HEAVY HEX NUT AND HARDENED WASHERS IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS USING THE TURN OF THE NUT METHOD. DIRECT TENSION INDICATORS SHALL NOT BE USED.

SHOP DRAWINGS SHALL BE APPROVED BY THE CHIEF ENGINEER - BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, G.A. SHOP DRAWINGS SHALL BE LABELED 'NORFOLK SOUTHERN MP NS-311.47'.

BOLT HOLES IN STRUCTURAL STEEL MEMBERS SHALL BE STANDARD SIZE UNLESS OTHERWISE INDICATED ON THE PLANS.

HIGH STRENGTH BOLTS, NUTS & WASHERS SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695.

ANCHOR BOLTS SHALL BE 1/4" Ø IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS AND SHALL BE GROUTED IN FORMED HOLES AFTER GIRDERS ARE ERECTED.

BEARING PADS SHALL BE USED WHENEVER STEEL MASONRY PLATE, OR OTHER STEEL BEARING PLATE, BEARS ON CONCRETE. PADS SHALL BE PREFORMED FABRIC BEARING PADS, 1/2" THICK. FOR PAD REQUIREMENTS, SEE STRUCTURAL STEEL SPECIAL PROVISIONS.

SHEAR CONNECTORS ON GIRDERS MAY BE SHIFTED UP TO 1" AS NECESSARY TO CLEAR FLANGE SPLICE WELDS.

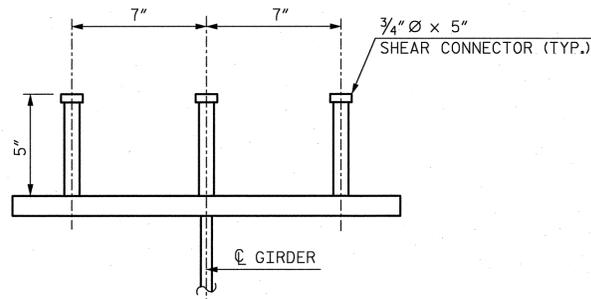
WEB SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED WEB PIECE LENGTHS TO 45'-0". PERMITTED WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15'-0" OF MAXIMUM DEAD LOAD DEFLECTION AND SHALL BE LOCATED 6" MIN. FROM CONNECTOR PLATE OR INTERMEDIATE STIFFENER WELDS. FLANGE AND WEB SHOP SPLICES SHALL CONFORM TO SHOP SPLICE DETAILS SHOWN ON THE PLANS.

STRUCTURAL STEEL ELEMENTS DENOTED AS "FC" ARE FRACTURE CRITICAL AND SHALL MEET IMPACT TEST REQUIREMENTS SET FORTH IN THE FRACTURE CONTROL PLAN OF THE AREMA MANUAL, CHAPTER 15, SECTION 1.14. NOTCH TOUGHNESS REQUIREMENTS AND TESTING SHALL BE BASED ON ZONE 2 REQUIREMENTS.

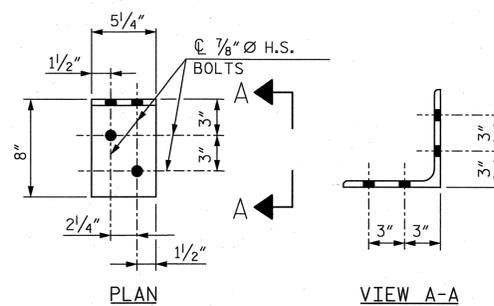
STRUCTURAL STEEL ELEMENTS DENOTED AS "INT" SHALL MEET IMPACT TEST REQUIREMENTS SET FORTH IN THE FRACTURE CONTROL PLAN OF THE AREMA MANUAL, CHAPTER 15, SECTION 1.2. TESTING SHALL BE BASED ON ZONE 2 REQUIREMENTS.

ALL WELDING CONNECTIONS SHALL BE MADE WITH SERIES E70 WELDING ELECTRODES.

FOR DRAINAGE PIPE SUPPORT DETAIL, SEE "TYPICAL SECTION" SHEET.



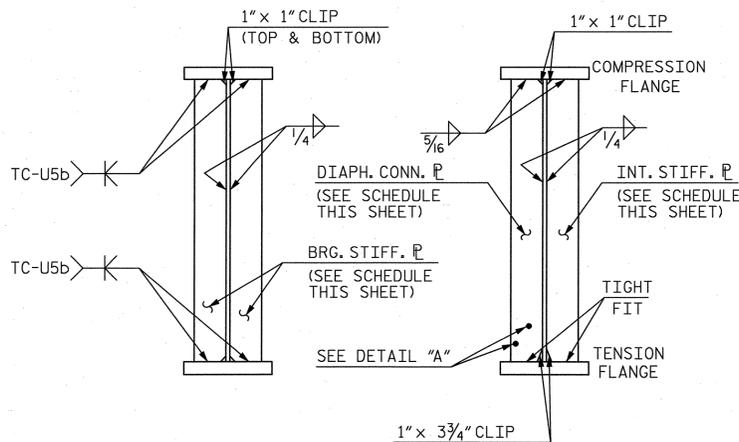
SHEAR CONNECTOR DETAIL (TYP. ALL GIRDERS)



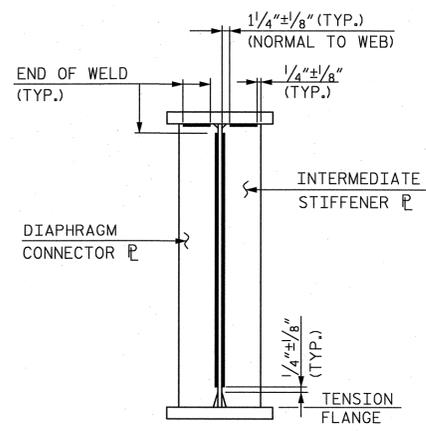
DETAIL "A" (L 8"x8"x1/2"x5/4")

| STIFF./CONN. P SCHEDULE | | |
|-------------------------|-----------------|-----------------|
| TYPE | SPAN A | SPAN B |
| BRG. STIFF. | P 3/4" x 7 1/2" | P 3/4" x 7 1/2" |
| DIAPH. CONN. P | P 1/2" x 6" | P 1/2" x 6" |
| INT. STIFF. | P 1/2" x 6" | P 1/2" x 6" |

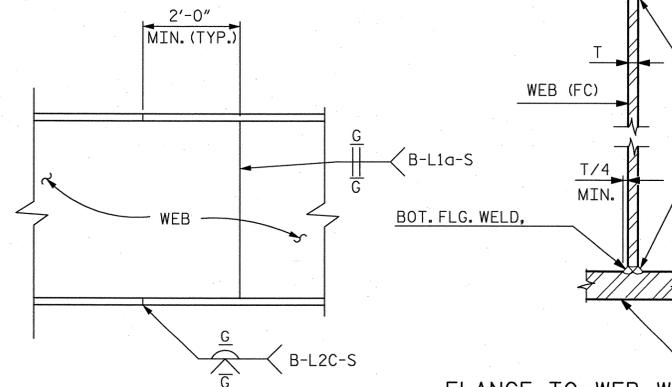
NOTE: SEE FRAMING PLANS FOR STIFFENER/CONN. P LOCATIONS



STIFFENER/CONN. P DETAILS

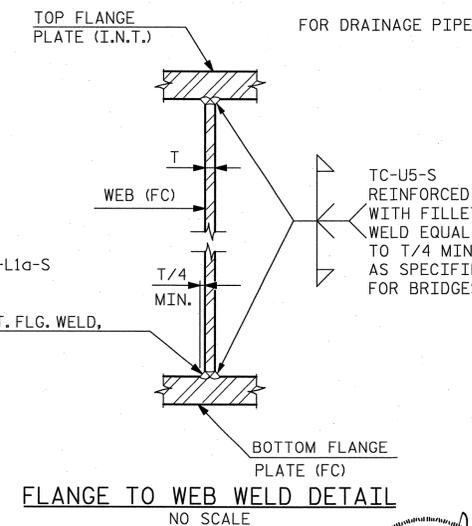


WELD TERMINATION DETAILS (FILLET WELDS ONLY)



NOTES:
ELECTROSLAG WELDING IS NOT PERMITTED.
ULTRASONIC OR RADIOGRAPHIC INSPECTION IS REQUIRED FOR ALL FLANGE AND WEB SPLICE WELDS. SEE SPECIAL PROVISIONS.
GRIND WELDS IN DIRECTION OF STRESS ONLY (I.E. PARALLEL TO Q GIRDER).

SHOP SPLICE DETAILS



FLANGE TO WEB WELD DETAIL NO SCALE

TC-U5-S REINFORCED WITH FILLET WELD EQUAL TO T/4 MIN. AS SPECIFIED FOR BRIDGES
FC = FRACTURE CRITICAL
INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.

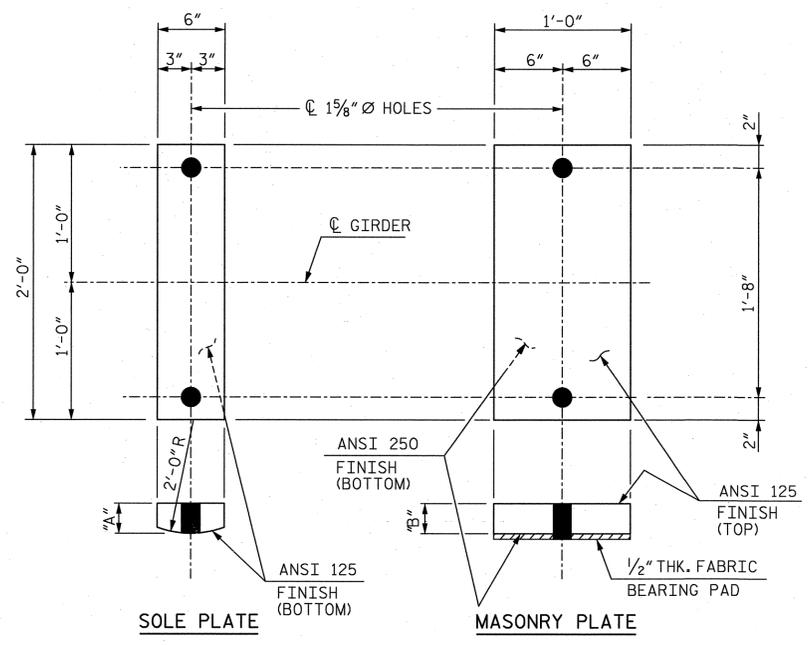


PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7662+38.00 -M2-
MILE POST: 311.47

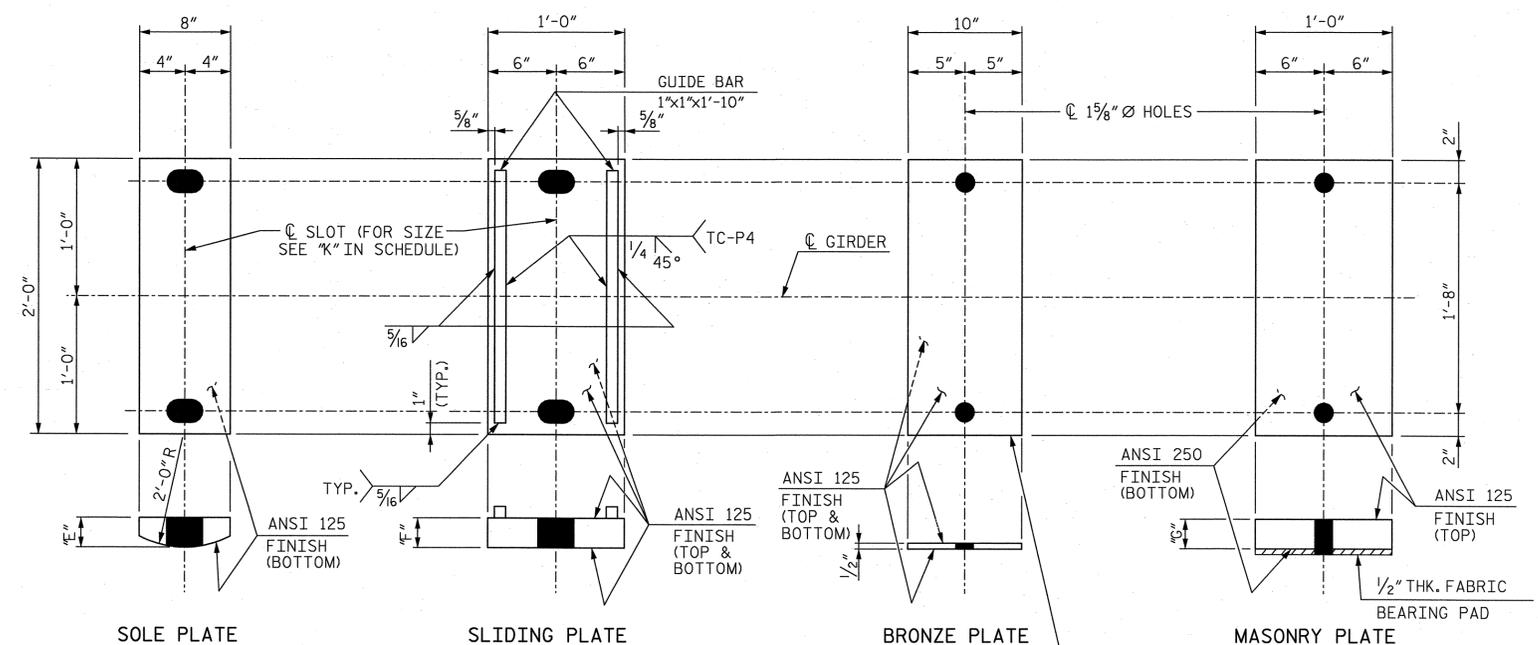
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS

| HNTB | | HNTB NORTH CAROLINA, P.C. | | REVISIONS | | | SHEET NO. |
|----------------------|------------|--|-----|-----------|--------------|-------|-----------|
| License No. C-1554 | | 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | NO. | BY: | DATE: | S-10 |
| DRAWN BY M. WRIGHT | DATE 12/12 | NO. 3 | BY: | DATE: | TOTAL SHEETS | 4 | |
| CHECKED BY P. BARBER | DATE 1/13 | NO. 4 | BY: | DATE: | | | |

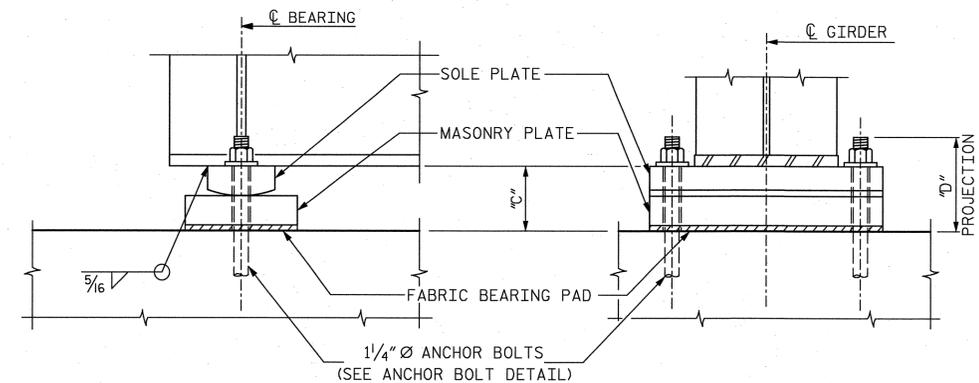
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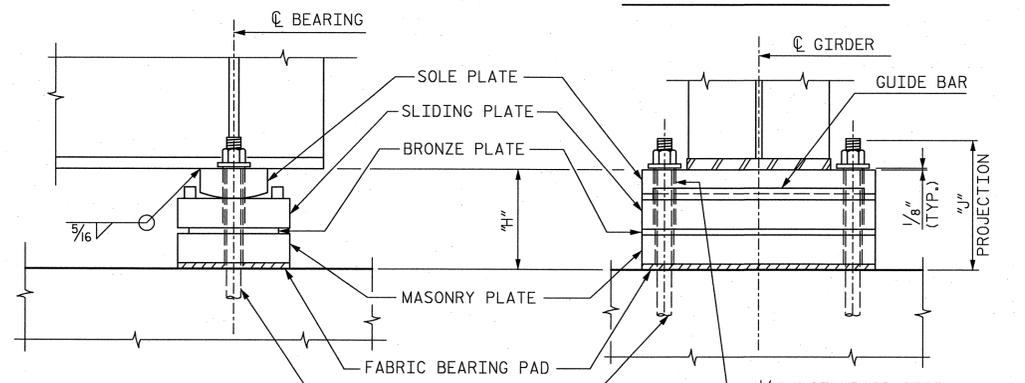
FIXED BEARINGS



EXPANSION BEARINGS



FIXED BEARING ASSEMBLY (FBA-1)
(20 REQ'D)



EXPANSION BEARING ASSEMBLY (EBA-1)
(20 REQ'D)

BRONZE PLATE TO BE ASTM B22 - COPPER ALLOY 913 OR ASTM B100 - COPPER ALLOY 510. TOP SURFACE TO BE SELF LUBRICATING.

NOTES:
ANCHOR BOLTS, SLIDING PLATE (EXPANSION BEARING) AND MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL BE HOT DIPPED GALVANIZED.

ALL PLATE SURFACES SHALL BE PAINTED WITH A 3 COAT PAINT SYSTEM EXCEPT AS SPECIFIED BELOW.

(A) THE SLIDING PLATE (EXPANSION BEARING) SHALL NOT BE PAINTED BUT SHALL RECEIVE A COAT OF LUBRICATION.

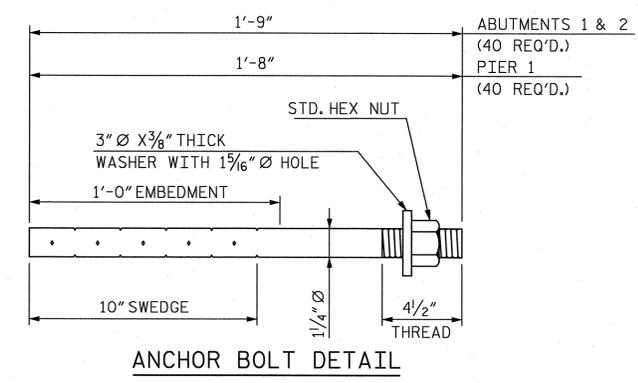
(B) THE MASONRY PLATE (FIXED AND EXPANSION BEARINGS) SHALL NOT BE PAINTED.

(C) THE BOTTOM SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED BUT SHALL RECEIVE A SINGLE COAT OF PRIMER APPLIED IN THE SHOP.

(D) THE TOP SURFACE OF THE SOLE PLATE SHALL NOT BE PAINTED IN THE VICINITY OF THE WELD BETWEEN THE SOLE PLATE AND THE BOTTOM FLANGE.

FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.
FOR SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.

| GIRDER | BEARING PLATE SCHEDULE | | | | | | | | | |
|--------|------------------------|--------|--------|-----|---------------------------|--------|--------|--------|-----|-------|
| | DIMENSIONS | | | | | | | | | |
| | FIXED BEARING (FBA-1) | | | | EXPANSION BEARING (EBA-1) | | | | | |
| | "A" | "B" | "C" | "D" | "E" | "F" | "G" | "H" | "J" | "K" |
| AG1 | 1 1/2" | 3 3/8" | 5 1/8" | 8" | 1 1/2" | 1 1/2" | 2" | 6" | 9" | 2"x4" |
| AG2 | 1 1/2" | 3 1/8" | 5 1/8" | 8" | 1 1/2" | 1 1/2" | 2" | 6" | 9" | 2"x4" |
| AG3 | 1 1/2" | 3 1/4" | 5 1/4" | 8" | 1 1/2" | 1 1/2" | 2" | 6" | 9" | 2"x4" |
| AG4 | 1 1/2" | 3 1/4" | 5 1/4" | 8" | 1 1/2" | 1 1/2" | 2 1/8" | 6 1/8" | 9" | 2"x4" |
| AG5 | 1 1/2" | 3 1/4" | 5 1/4" | 8" | 1 1/2" | 1 1/2" | 2 1/8" | 6 1/8" | 9" | 2"x4" |
| AG6 | 1 1/2" | 3 3/8" | 5 3/8" | 8" | 1 1/2" | 1 1/2" | 2 1/8" | 6 1/8" | 9" | 2"x4" |
| AG7 | 1 1/2" | 3 3/8" | 5 3/8" | 8" | 1 1/2" | 1 1/2" | 2 1/4" | 6 1/4" | 9" | 2"x4" |
| AG8 | 1 1/2" | 3 3/8" | 5 3/8" | 8" | 1 1/2" | 1 1/2" | 2 1/4" | 6 1/4" | 9" | 2"x4" |
| AG9 | 1 1/2" | 3 1/2" | 5 1/2" | 8" | 1 1/2" | 1 1/2" | 2 1/4" | 6 1/4" | 9" | 2"x4" |
| AG10 | 1 1/2" | 3 1/2" | 5 1/2" | 8" | 1 1/2" | 1 1/2" | 2 3/8" | 6 3/8" | 9" | 2"x4" |
| BG1 | 1 1/2" | 2 3/4" | 4 3/4" | 8" | 1 1/2" | 1 3/4" | 2" | 6 1/4" | 9" | 2"x4" |
| BG2 | 1 1/2" | 2 3/4" | 4 3/4" | 8" | 1 1/2" | 1 3/4" | 2" | 6 1/4" | 9" | 2"x4" |
| BG3 | 1 1/2" | 2 3/4" | 4 3/4" | 8" | 1 1/2" | 1 3/4" | 2" | 6 1/4" | 9" | 2"x4" |
| BG4 | 1 1/2" | 2 3/4" | 4 3/4" | 8" | 1 1/2" | 1 3/4" | 2" | 6 1/4" | 9" | 2"x4" |
| BG5 | 1 1/2" | 2 1/8" | 4 1/8" | 8" | 1 1/2" | 1 3/4" | 2 1/8" | 6 3/8" | 9" | 2"x4" |
| BG6 | 1 1/2" | 2 1/8" | 4 1/8" | 8" | 1 1/2" | 1 3/4" | 2 1/8" | 6 3/8" | 9" | 2"x4" |
| BG7 | 1 1/2" | 3" | 5" | 8" | 1 1/2" | 1 3/4" | 2 1/8" | 6 3/8" | 9" | 2"x4" |
| BG8 | 1 1/2" | 3" | 5" | 8" | 1 1/2" | 1 3/4" | 2 1/4" | 6 1/2" | 9" | 2"x4" |
| BG9 | 1 1/2" | 3" | 5" | 8" | 1 1/2" | 1 3/4" | 2 1/4" | 6 1/2" | 9" | 2"x4" |
| BG10 | 1 1/2" | 3" | 5" | 8" | 1 1/2" | 1 3/4" | 2 1/4" | 6 1/2" | 9" | 2"x4" |



ANCHOR BOLT DETAIL

NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 12916
PAUL J. BARBER
12/13

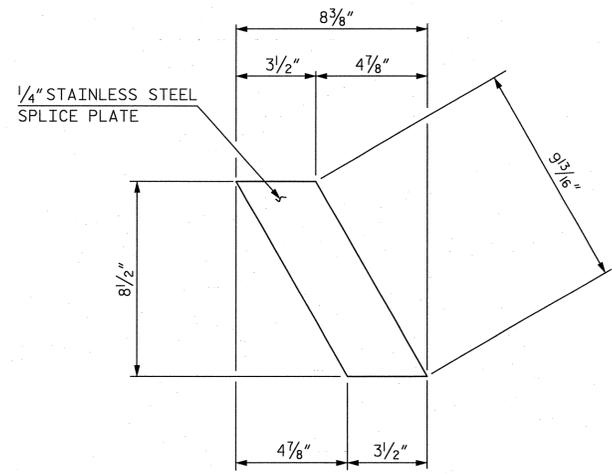
NORTH CAROLINA PROFESSIONAL ENGINEER
SEAL 27812
DAVID W. HAWKINS
12/13

PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7662+38.00 -M2-
MILE POST: 311.47

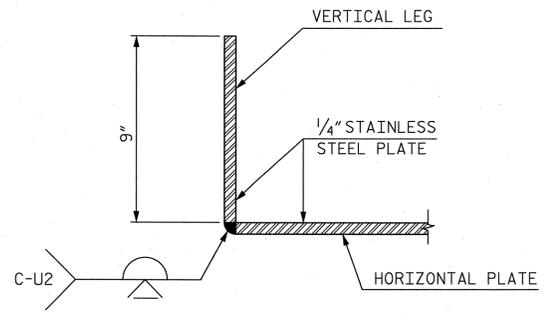
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
BEARING DETAILS

| | | | | | |
|--|---|---------------------------|------------------|------------------------------------|---|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | REVISIONS | | | | SHEET NO. S-11 TOTAL SHEETS 64 |
| | DRAWN BY: M. WRIGHT CHECKED BY: D. RAGAN | DATE: 12/12 DATE: 2/13 | NO.: 1 NO.: 2 | BY: [Signature] BY: [Signature] | |

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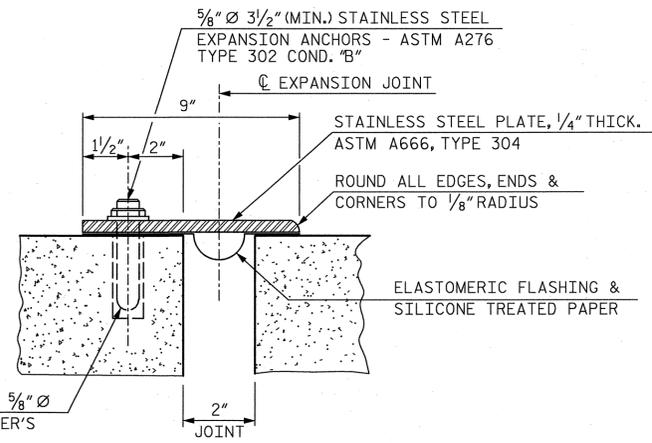


DETAIL A



SECTION A-A

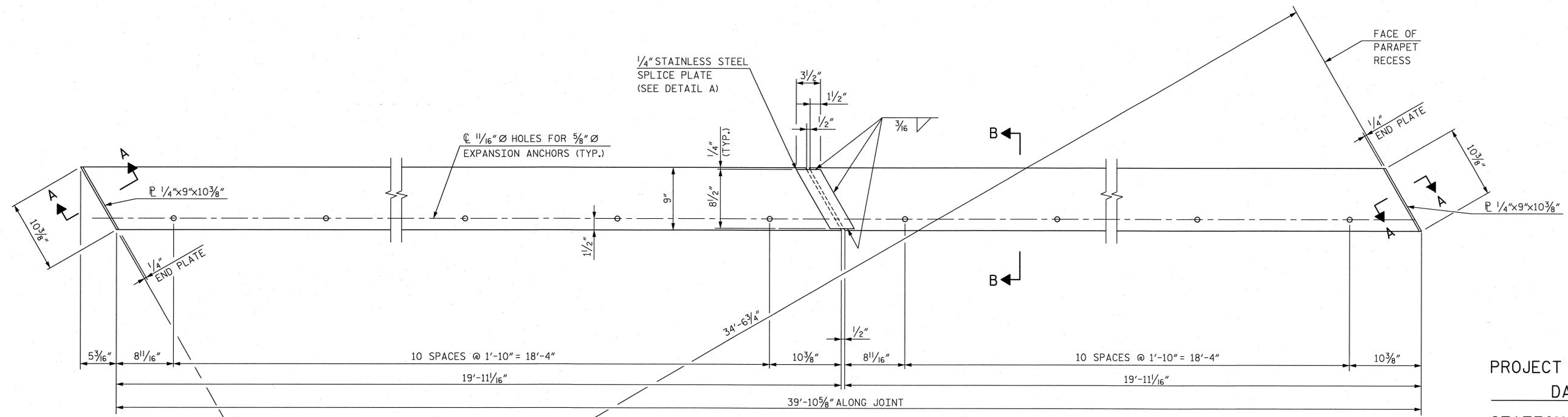
DRILL HOLE IN CONCRETE FOR 5/8" Ø ANCHOR - AS PER MANUFACTURER'S INSTRUCTIONS



SECTION B-B

DETAIL OF EXPANSION ANCHOR AND PLATE

SEE DETAIL A ON 'DECK DETAILS' SHEET FOR ADDITIONAL JOINT INFORMATION.



PLAN - EXPANSION PLATE

(3 REQUIRED)

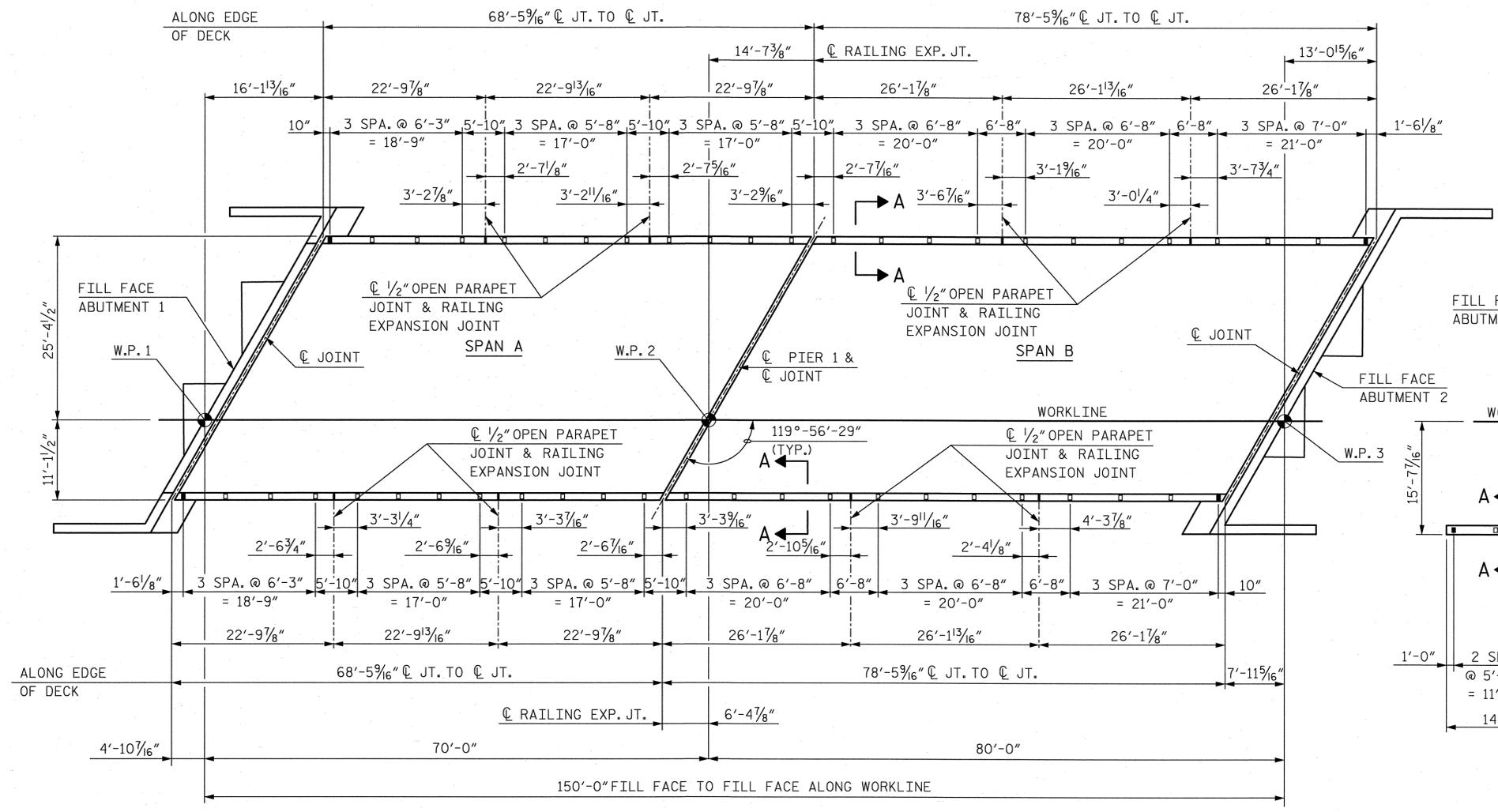
NOTE: PAYMENT FOR THE EXPANSION PLATE AND EXPANSION ANCHORS IS INCLUDED IN THE COST FOR STRUCTURE STEEL.
 PLATE SHALL BE ANCHORED AT BACKWALL OF ABUTMENT 1 & 2, AND SPAN A SIDE OF PIER 1.

PROJECT NO. C-4901A
DAVIDSON COUNTY
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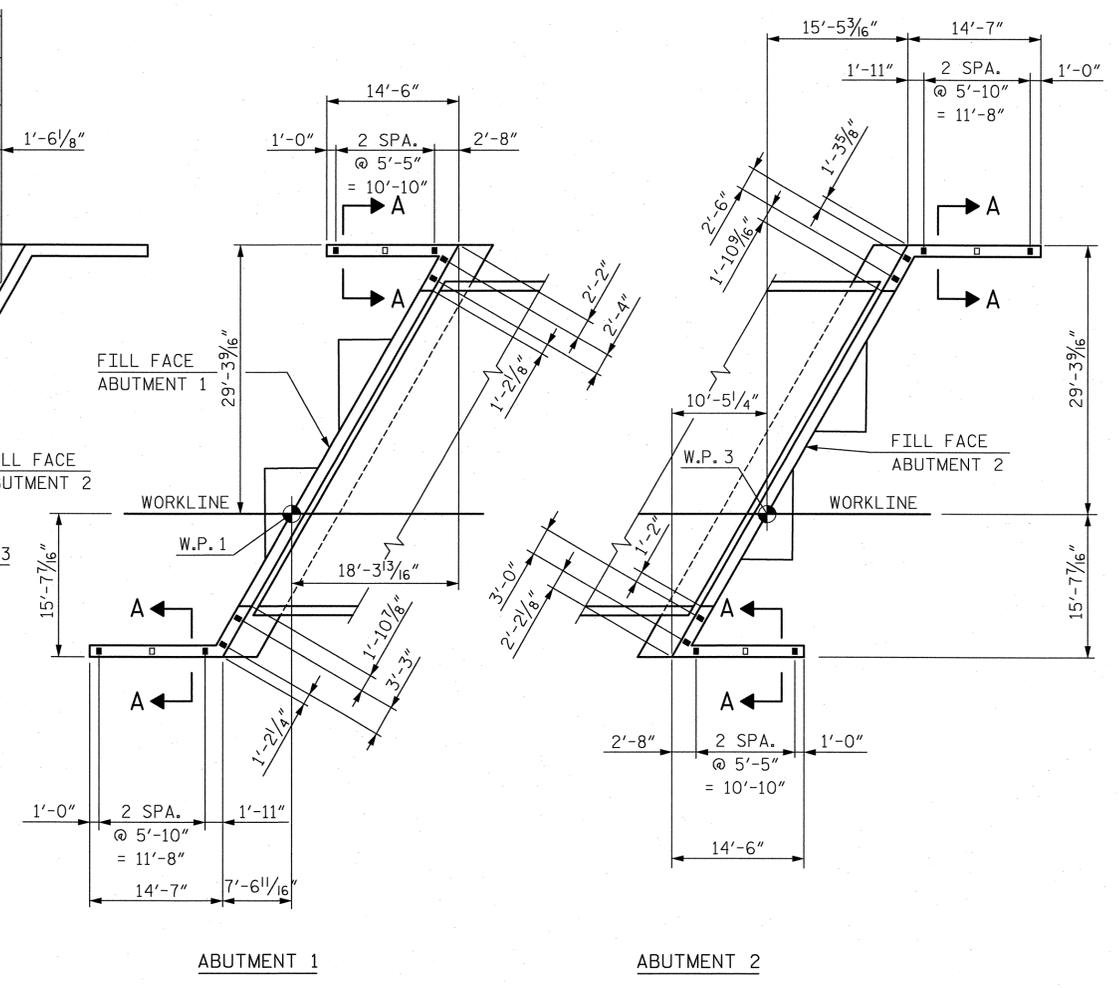
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 EXPANSION
 PLATE DETAILS



| | | | | |
|---|-------------|--------------|-------|-----------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. |
| DRAWN BY: M. WRIGHT | DATE: 12/12 | NO. 3 | BY: | S-12 |
| CHECKED BY: P. BARBER | DATE: 2/13 | NO. 4 | DATE: | |
| DWG. NO. 12 | | TOTAL SHEETS | | 64 |



METAL HANDRAIL POST SPACING - BRIDGE



METAL HANDRAIL POST SPACING - WINGWALLS

LEGEND:

- - END POST
- - INTERIOR POST

NOTE: FOR SECTION A-A, SEE SHEET 2 OF 2.

ALL DIMENSIONS SHOWN ARE ALONG EXTERIOR FACE OF PARAPET/WINGWALL.

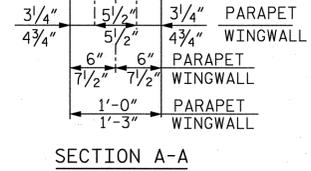
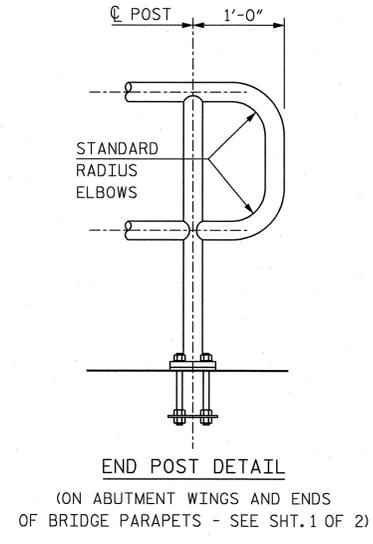
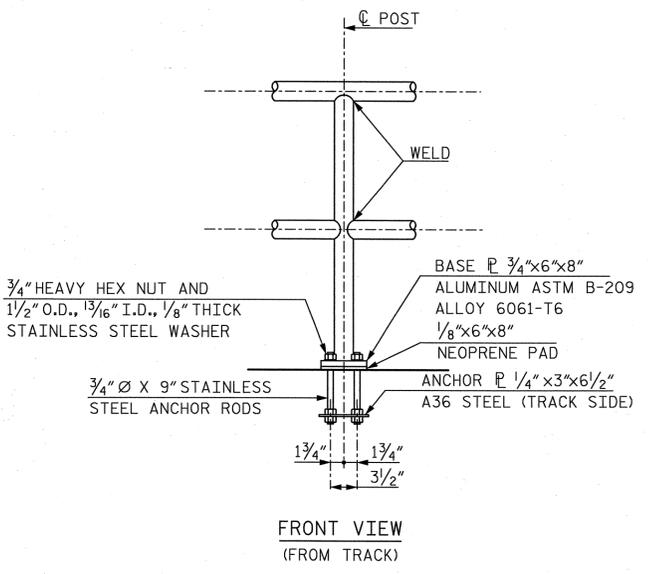
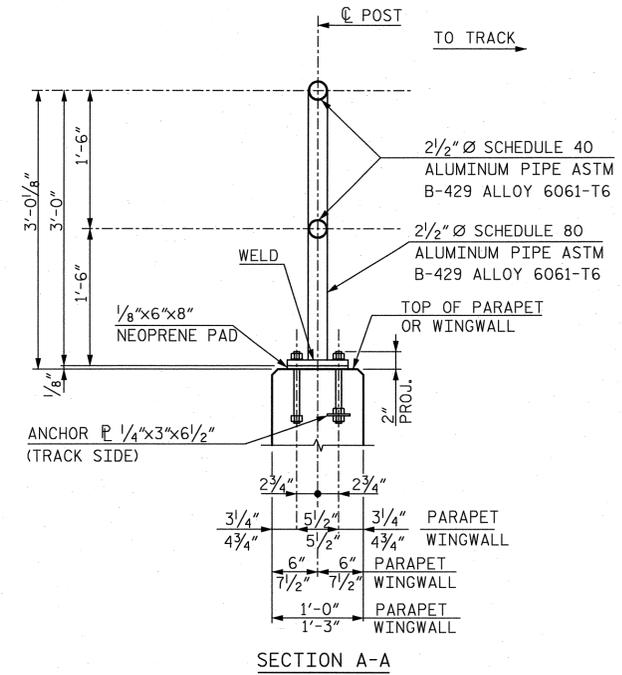
PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47
 SHEET 1 OF 2



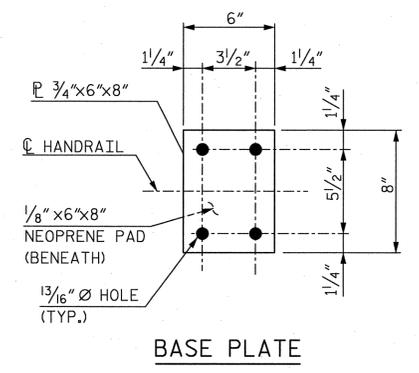
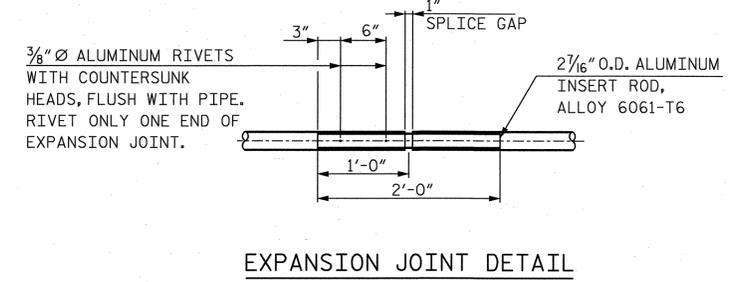
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 METAL HANDRAIL
 DETAILS

| | | | | | | |
|-----------------------|-----------|---|-------------|-----------|-------|--|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. S-13 TOTAL SHEETS 64 |
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | M. WRIGHT | 12/12 | 3 | | | |
| 2 | P. BARBER | 1/13 | 4 | | | |
| DRAWN BY: M. WRIGHT | | DATE: 12/12 | DWG. NO. 13 | | | |
| CHECKED BY: P. BARBER | | DATE: 1/13 | | | | |

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ALUMINUM HANDRAIL AND POST



NOTES:
JOINTS IN RAILING (SPlice GAP) SHALL BE LOCATED AS SHOWN IN POST SPACING PLAN.

ALUMINUM PIPE TO BE ASTM B-429, ALLOY 6061-T6 AND BASE PLATE TO BE ASTM B-209, ALLOY 6061-T6.

STAINLESS STEEL BOLTS, CAP SCREWS, AND NUTS TO BE ASTM A-276 TYPE 304. STAINLESS STEEL WASHERS TO BE ASTM A-276 TYPE 302.

POSTS TO BE SET PERPENDICULAR TO TOP OF PARAPET AND RAILS SHALL BE PLACED PARALLEL TO THE GRADE OF THE BRIDGE.

CERTIFIED MILL REPORTS ARE REQUIRED FOR RAIL AND POSTS. SHOP INSPECTIONS ARE NOT REQUIRED BY THE RAILROAD BUT MAY BE REQUIRED BY NCDOT.

AFTER ANCHOR ROD NUTS HAVE BEEN TIGHTENED, THREADS SHALL BE SCORED TO LOCK NUTS.

CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURES THE CONTRACTOR MAY AT HIS OPTION HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

ANCHOR PLATES SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36.

ANCHOR RODS SHALL CONFORM TO ASTM SPECIFICATION A276 TYPE 302 OR 304, STAINLESS STEEL AND THREADS SHALL BE ROLLED, NOT CUT.

UPPER ANCHOR ROD NUTS SHALL BE HEAVY HEX NUTS, PER ASTM A276 TYPE 302 OR 304 STAINLESS STEEL.

LOWER ANCHOR ROD NUTS SHALL BE HEAVY STEEL HEX NUTS, PER ASTM A563.

THE CENTERLINE OF ANY SPLICE AND/OR EXPANSION JOINT IS TO BE LOCATED AT LEAST 2'-0\"/>

WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS STRUCTURAL WELDING CODE - ALUMINUM.

THE LENGTH OF METAL RAIL TO BE PAID FOR SHALL BE THE CONTINUOUS LENGTH MEASURED FROM END TO END OF RAIL, ALONG THE TOP RAIL.

SHOP DRAWINGS FOR RAILINGS ARE REQUIRED AND SHALL BE SUBMITTED FOR APPROVAL.

FOR METAL RAIL (ALUMINUM), SEE SPECIAL PROVISIONS.

PAY LENGTH = 365.3'

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47
 SHEET 2 OF 2



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 METAL HANDRAIL
 DETAILS

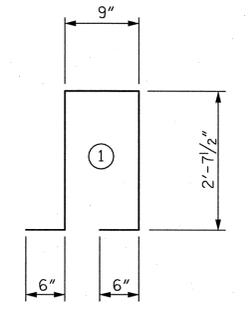
| | | | | | |
|-----------------------|-----|---|--------------------------|-----|---------------------------|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | | |
| DRAWN BY: J. BAYNE | | DATE: 7/12 | | | |
| CHECKED BY: P. BARBER | | DATE: 1/13 | | | |
| DWG. NO. 14 | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | SHEET NO. S-14 | | TOTAL SHEETS 64 |

0248DEL_P10C1

EPOXY-COATED REINFORCING STEEL

| SPAN A | | | | | | SPAN B | | | | | |
|--------|-----|------|------|---------|--------|--------|-----|------|------|---------|--------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| A1 | 96 | 5 | STR. | 36'-2" | 3,621 | A1 | 116 | 5 | STR. | 36'-2" | 4,376 |
| A2 | 4 | 5 | STR. | 34'-5" | 144 | A2 | 4 | 5 | STR. | 34'-5" | 144 |
| A3 | 4 | 5 | STR. | 32'-8" | 136 | A3 | 4 | 5 | STR. | 32'-8" | 136 |
| A4 | 4 | 5 | STR. | 30'-11" | 129 | A4 | 4 | 5 | STR. | 30'-11" | 129 |
| A5 | 4 | 5 | STR. | 29'-2" | 122 | A5 | 4 | 5 | STR. | 29'-2" | 122 |
| A6 | 4 | 5 | STR. | 27'-5" | 114 | A6 | 4 | 5 | STR. | 27'-5" | 114 |
| A7 | 4 | 5 | STR. | 25'-8" | 107 | A7 | 4 | 5 | STR. | 25'-8" | 107 |
| A8 | 4 | 5 | STR. | 24'-0" | 100 | A8 | 4 | 5 | STR. | 24'-0" | 100 |
| A9 | 4 | 5 | STR. | 22'-3" | 93 | A9 | 4 | 5 | STR. | 22'-3" | 93 |
| A10 | 4 | 5 | STR. | 20'-6" | 86 | A10 | 4 | 5 | STR. | 20'-6" | 86 |
| A11 | 4 | 5 | STR. | 18'-9" | 78 | A11 | 4 | 5 | STR. | 18'-9" | 78 |
| A12 | 4 | 5 | STR. | 17'-0" | 71 | A12 | 4 | 5 | STR. | 17'-0" | 71 |
| A13 | 4 | 5 | STR. | 15'-3" | 64 | A13 | 4 | 5 | STR. | 15'-3" | 64 |
| A14 | 4 | 5 | STR. | 13'-7" | 57 | A14 | 4 | 5 | STR. | 13'-7" | 57 |
| A15 | 4 | 5 | STR. | 11'-10" | 49 | A15 | 4 | 5 | STR. | 11'-10" | 49 |
| A16 | 4 | 5 | STR. | 10'-1" | 42 | A16 | 4 | 5 | STR. | 10'-1" | 42 |
| A17 | 4 | 5 | STR. | 8'-4" | 35 | A17 | 4 | 5 | STR. | 8'-4" | 35 |
| A18 | 4 | 5 | STR. | 6'-7" | 27 | A18 | 4 | 5 | STR. | 6'-7" | 27 |
| A19 | 4 | 5 | STR. | 4'-10" | 20 | A19 | 4 | 5 | STR. | 4'-10" | 20 |
| A20 | 4 | 5 | STR. | 3'-2" | 13 | A20 | 4 | 5 | STR. | 3'-2" | 13 |
| A21 | 10 | 5 | STR. | 41'-8" | 435 | A21 | 10 | 5 | STR. | 41'-8" | 435 |
| B1 | 204 | 4 | STR. | 30'-0" | 4,088 | B1 | 204 | 4 | STR. | 30'-0" | 4,088 |
| B2 | 102 | 4 | STR. | 12'-0" | 818 | B3 | 102 | 4 | STR. | 22'-0" | 1,499 |
| | | | | TOTAL | 10,449 | | | | | TOTAL | 11,885 |
| B4 | 18 | 5 | STR. | 22'-5" | 421 | B8 | 18 | 5 | STR. | 25'-9" | 483 |
| B5 | 6 | 5 | STR. | 22'-9" | 142 | B9 | 6 | 5 | STR. | 26'-1" | 163 |
| B6 | 6 | 5 | STR. | 21'-10" | 137 | B10 | 6 | 5 | STR. | 25'-6" | 160 |
| B7 | 6 | 5 | STR. | 22'-2" | 139 | B11 | 6 | 5 | STR. | 25'-2" | 157 |
| S1 | 136 | 5 | 1 | 7'-0" | 993 | S1 | 156 | 5 | 1 | 7'-0" | 1,139 |
| | | | | TOTAL | 1,832 | | | | | TOTAL | 2,102 |

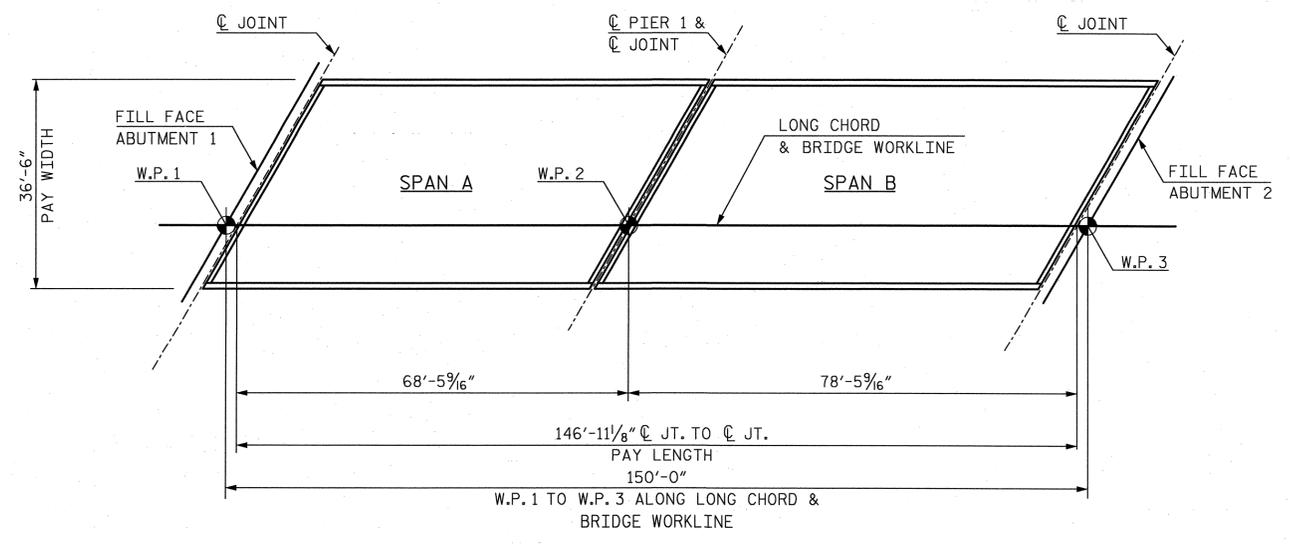
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

| | EPOXY COATED REINFORCING STEEL (LBS.) | CLASS AA CONCRETE (CU. YDS.) | |
|----------|---------------------------------------|------------------------------|----------|
| | | DECK SLAB | PARAPETS |
| SPAN "A" | 12,281 | 83.2 | 9.5 |
| SPAN "B" | 13,987 | 93.8 | 10.8 |
| TOTALS | 26,268 | 177.0 | 20.3 |

| TOTAL SUPERSTRUCTURE QUANTITIES | | | |
|---------------------------------|-------------------------------|--------------------------------|-------------------|
| | REINFORCED CONCRETE DECK SLAB | EPOXY COATED REINFORCING STEEL | CLASS AA CONCRETE |
| | SQ. FT. | LBS. | CU. YDS. |
| DECK SLAB | 5,363 | 22,334 | 177.0 |
| PARAPET | — | 3,934 | 20.3 |
| TOTALS | 5,363 | 26,268 | 197.3 |



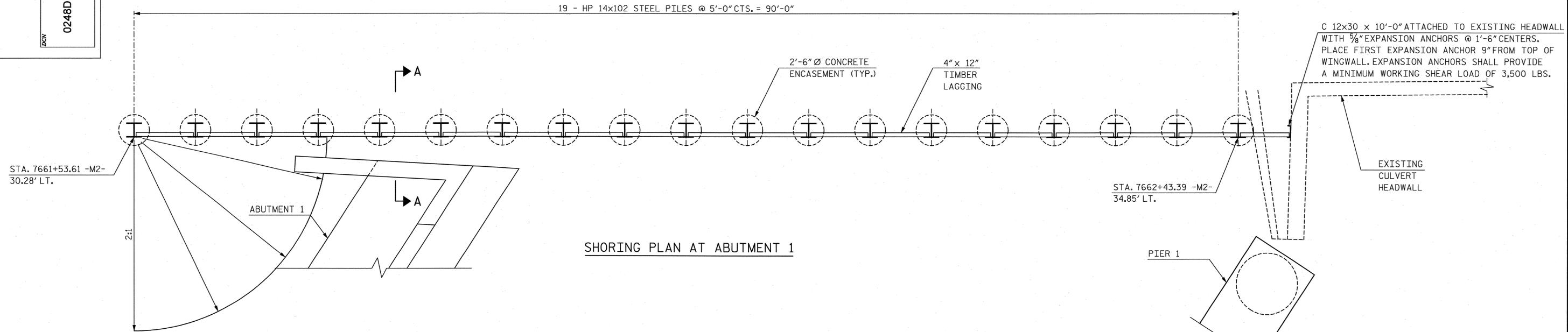
LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB (SQ. FEET = 5,363)

PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47

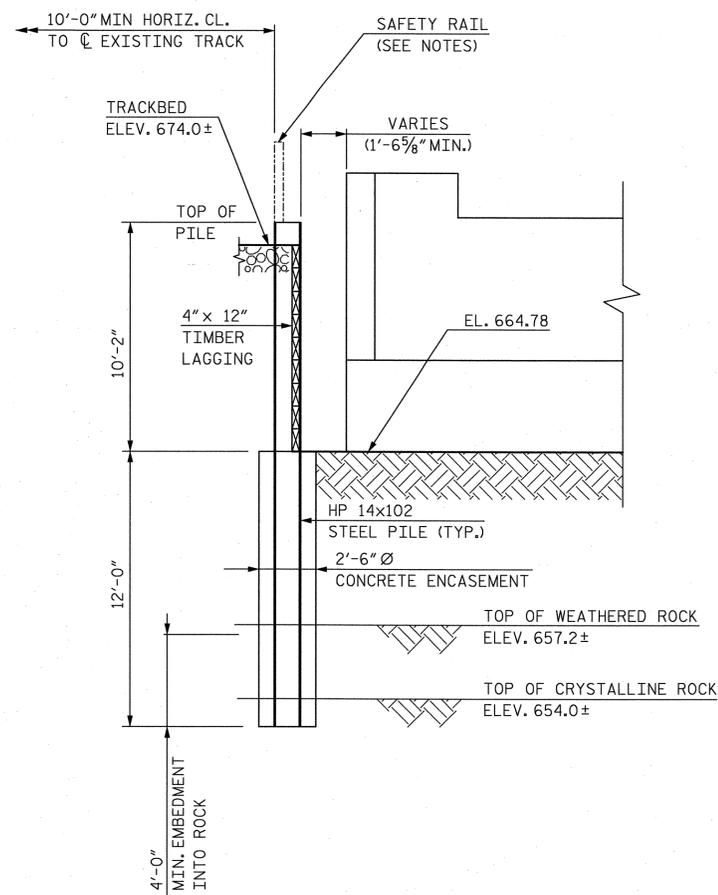


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 BILL OF MATERIAL

| | | | | |
|---|------------|-----------|-----|----------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 543 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. S-15 |
| DRAWN BY M. WRIGHT | DATE 12/12 | NO. 3 | BY: | TOTAL SHEETS 4 |
| CHECKED BY P. BARBER | DATE 2/13 | NO. 4 | BY: | GA |
| DWG. NO. 15 | | | | |



SHORING PLAN AT ABUTMENT 1



SECTION A-A

NOTES:

- ALL SHORING MATERIAL SHALL BE IN "LIKE NEW" CONDITION.
- ALL STEEL USED FOR SHORING SHALL BE ASTM A572 GRADE 50.
- LAGGING SHALL BE 4" x 12" SOUTHERN PINE (GRADE-DENSE STRUCTURAL 65).
- CONCRETE FOR 2'-6" Ø PILE ENCASEMENT SHALL BE CLASS A (3,000 PSI).
- CONTRACTOR SHALL PROVIDE A SAFETY RAIL ALONG THE FULL LENGTH OF TEMPORARY SHORING. SAFETY RAIL SHALL EXTEND A MINIMUM OF 3'-6" ABOVE TRACK BED ELEVATION AND SHALL CONFORM TO THE REQUIREMENTS OF AREMA 15.8.5.2 AND 15.8.5.3.
- FOR SHORING LOCATION RELATIVE TO EXISTING TRACK 2 CENTERLINE, SEE GENERAL DRAWING.

CONSTRUCTION SEQUENCE:

1. CONSTRUCT TEMPORARY RAILROAD SHORING TO LIMITS SHOWN AND EXCAVATE ACCORDINGLY.
2. CONSTRUCT ABUTMENT 1 AND PIER 1 AS SHOWN.
3. CONSTRUCT PROPOSED RAILROAD EMBANKMENT BEHIND ABUTMENT 1. REMOVE LAGGING AS BACK FILLING PROGRESSES.
4. CONSTRUCT SUPERSTRUCTURE.
5. SHIFT RAIL TRAFFIC FROM EXISTING TRACK TO PROPOSED STRUCTURE.
6. CONSTRUCT RAILROAD EMBANKMENT TO FINAL PROPOSED GRADE.
7. REMOVE TEMPORARY RAILROAD SHORING. SOLDIER PILES SHALL BE CUT-OFF 1'-0" BELOW PROPOSED GROUNDLINE AT TIME OF REMOVAL.

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

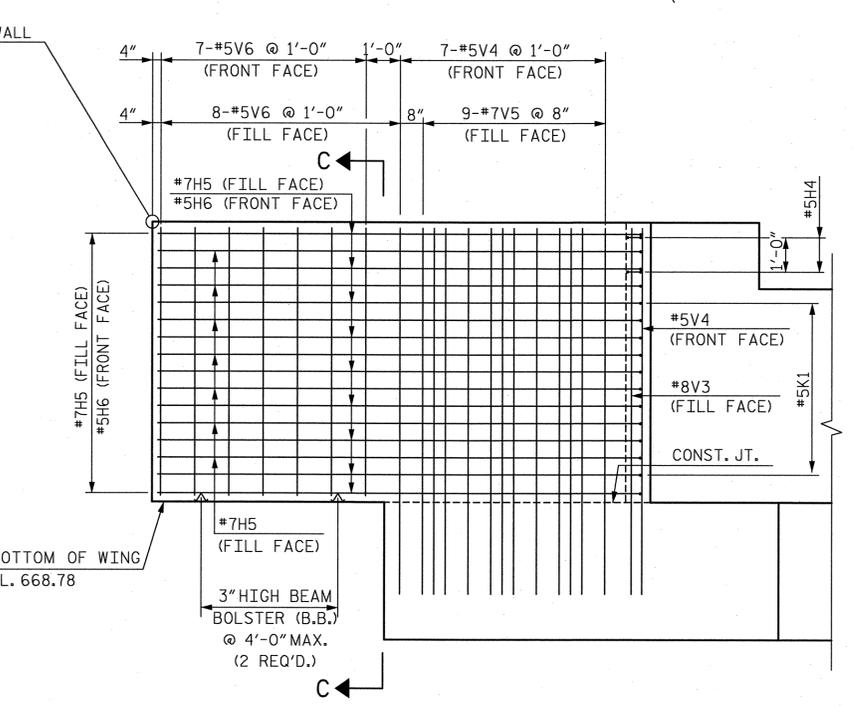
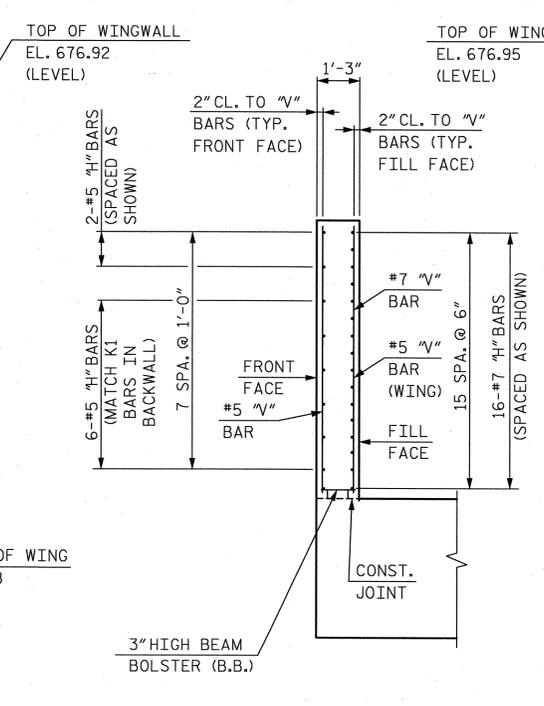
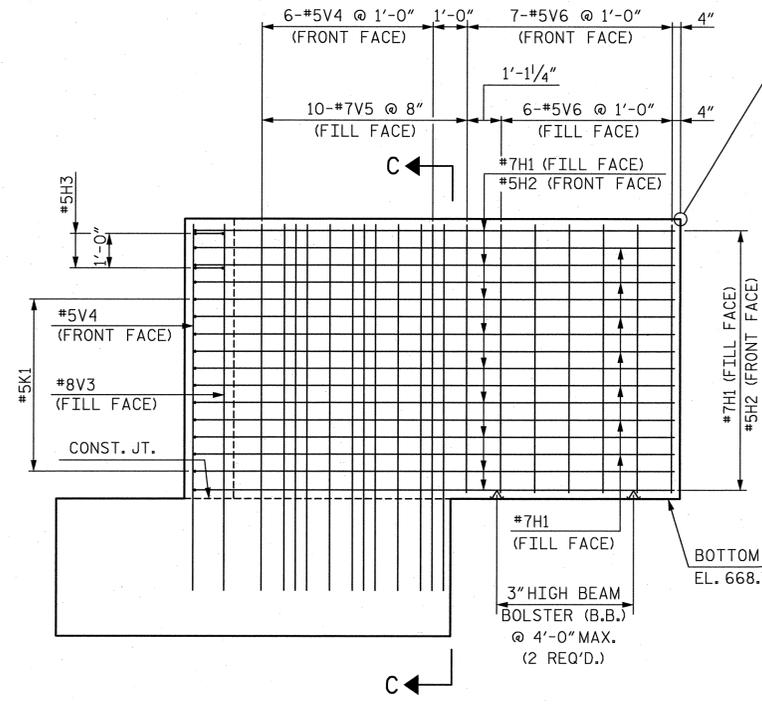
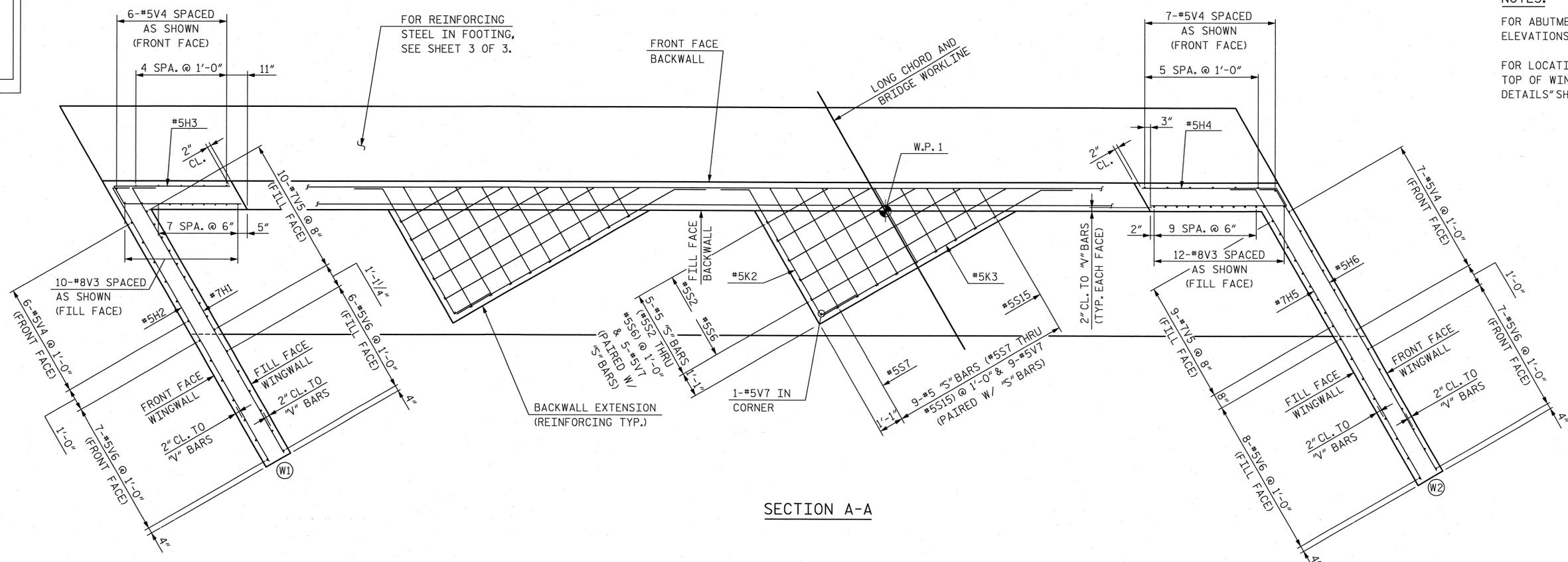
SUBSTRUCTURE

ABUTMENT 1
 SHORING

| | | | | |
|---|------------|------------------|-------------------|-----------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. |
| DRAWN BY: J. BAYNE | DATE: 2/13 | NO. 1 | BY: [Signature] | S-16 |
| CHECKED BY: D. HAWKINS | DATE: 2/13 | NO. 2 | DATE: [Signature] | |
| DWG. NO. 16 | | TOTAL SHEETS: 64 | | |

0248DEL_P10C1

NOTES:
 FOR ABUTMENT DIMENSIONS AND ELEVATIONS, SEE SHEET 1 OF 3.
 FOR LOCATIONS OF HANDRAIL ANCHORAGES IN TOP OF WINGWALLS, SEE "METAL HANDRAIL DETAILS" SHEETS.

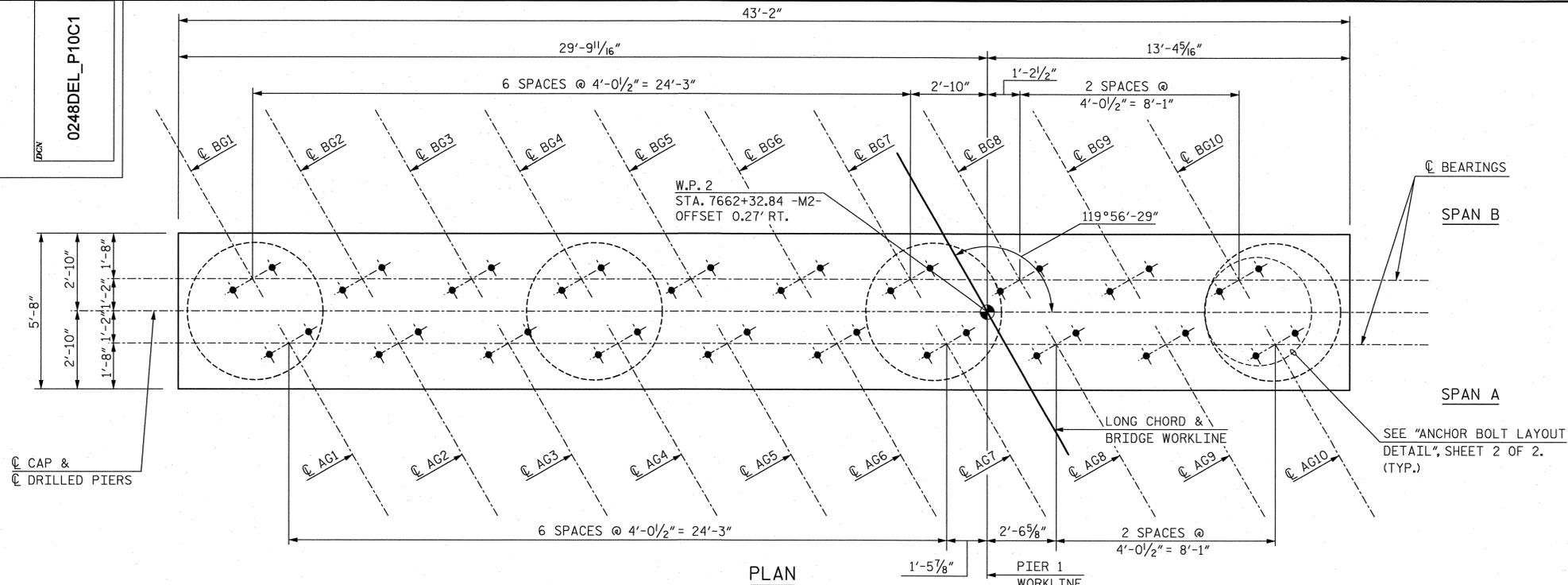


PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47
 SHEET 2 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 ABUTMENT 1

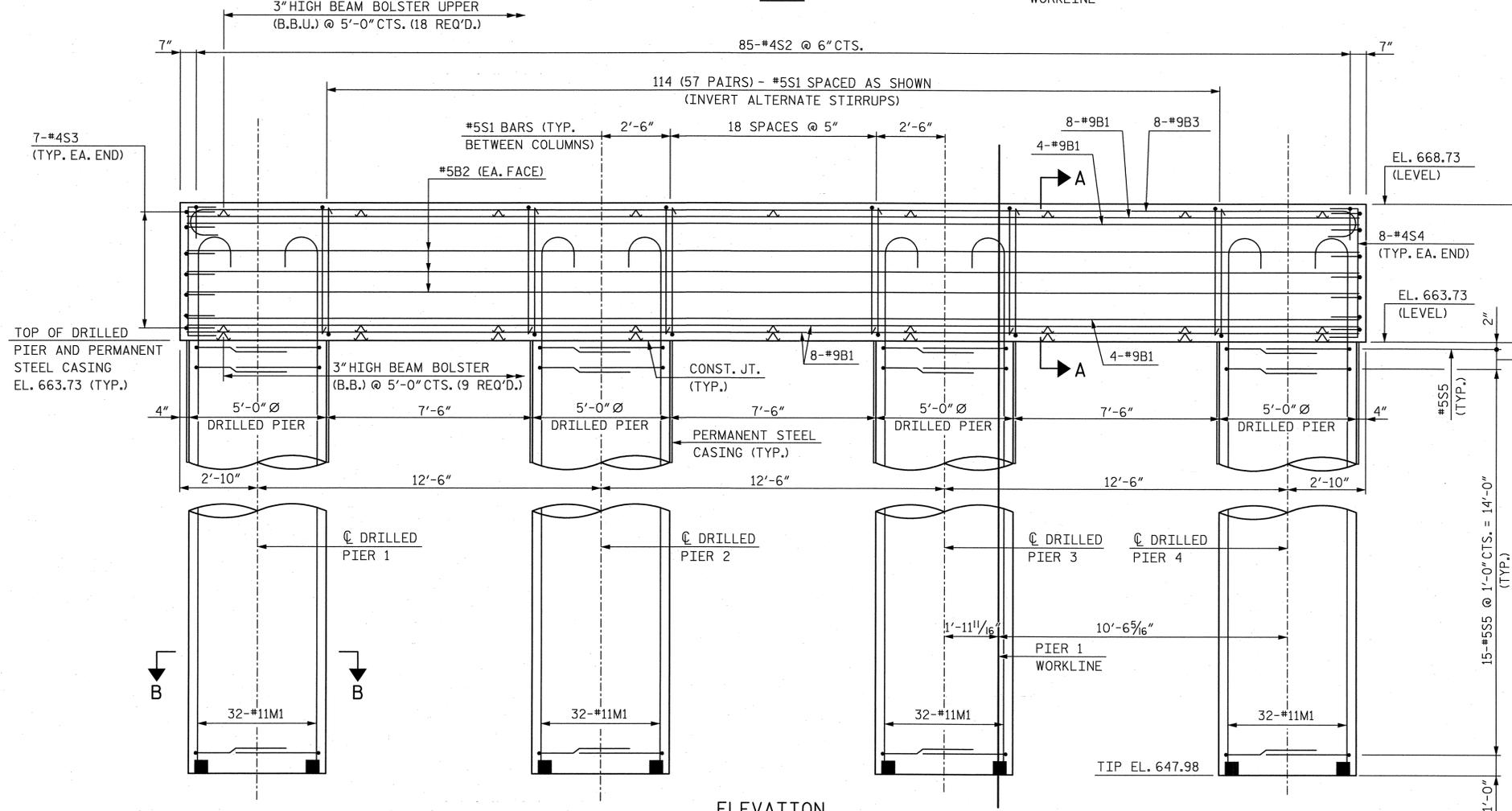
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|---|------------|-----------|-----------------|--------------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. S-18 |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | NO. 3 | BY: [Signature] | TOTAL SHEETS: 64 |
| CHECKED BY: S. FISHER | DATE: 2/13 | NO. 4 | BY: [Signature] | |
| DWG. NO. 18 | | | | |

0248DEL_P10C1

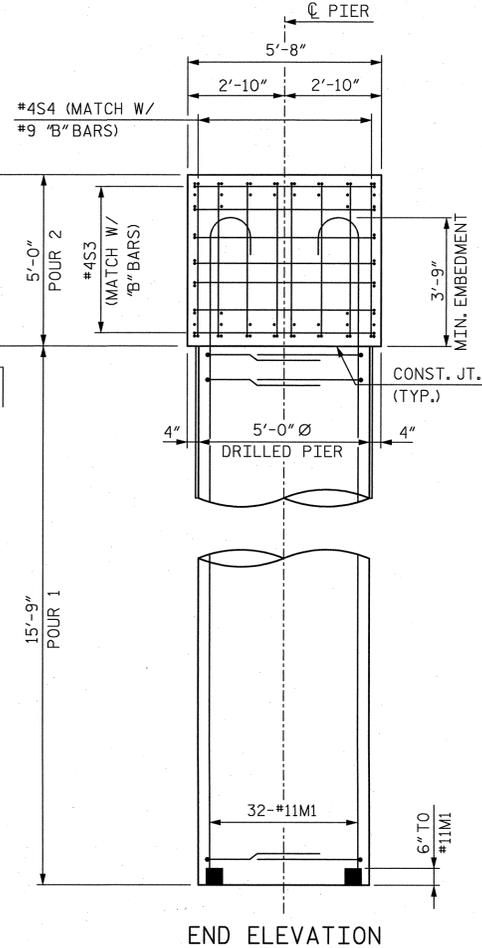


PLAN

NOTES:
 ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO ϕ PIER UNLESS NOTED.
 STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR ANCHOR BOLTS.
 HOOKS ON "M" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.
 ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEMS FOR "REINFORCING STEEL".



ELEVATION



END ELEVATION

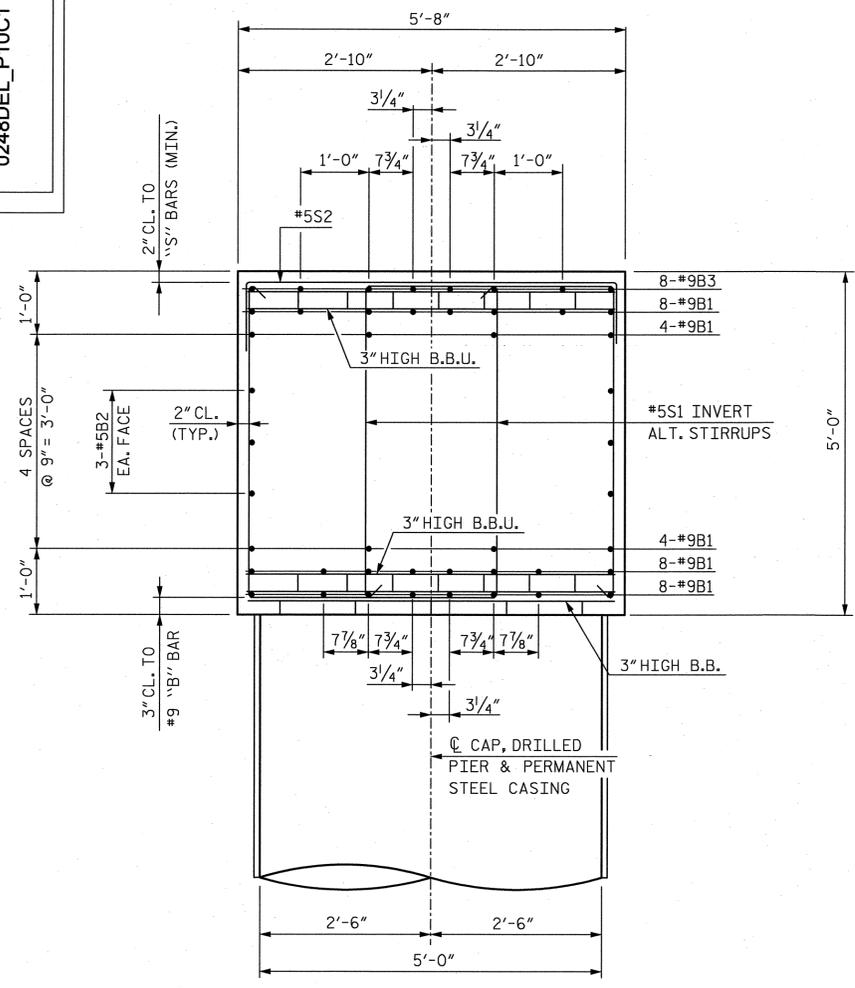


PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47
 SHEET 1 OF 2

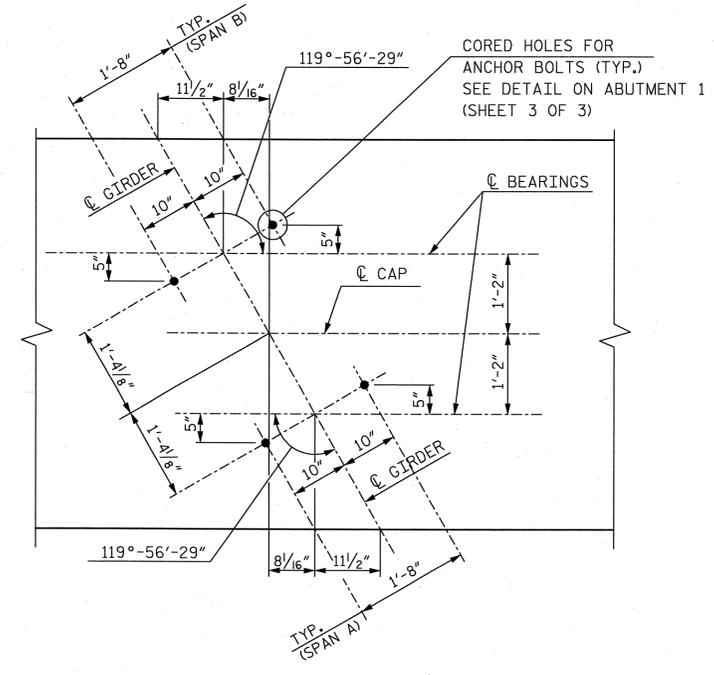
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 PIER 1

| | | | | | | |
|---|-----------|-----------|-----|-----------|-------|--------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-20 |
| 1 | M. WRIGHT | 2/13 | 3 | | | |
| 2 | S. FISHER | 2/13 | 4 | | | TOTAL SHEETS 64 |

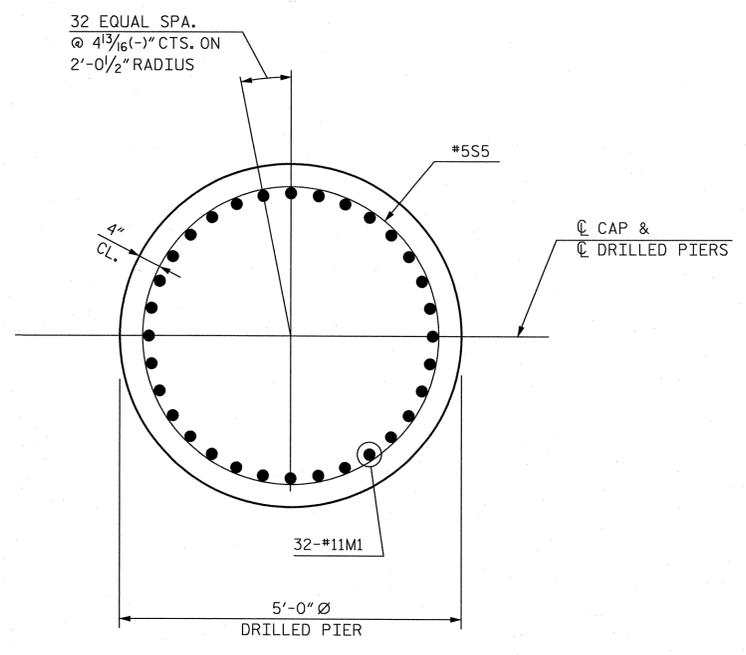
0248DEL_P10C1



SECTION A-A

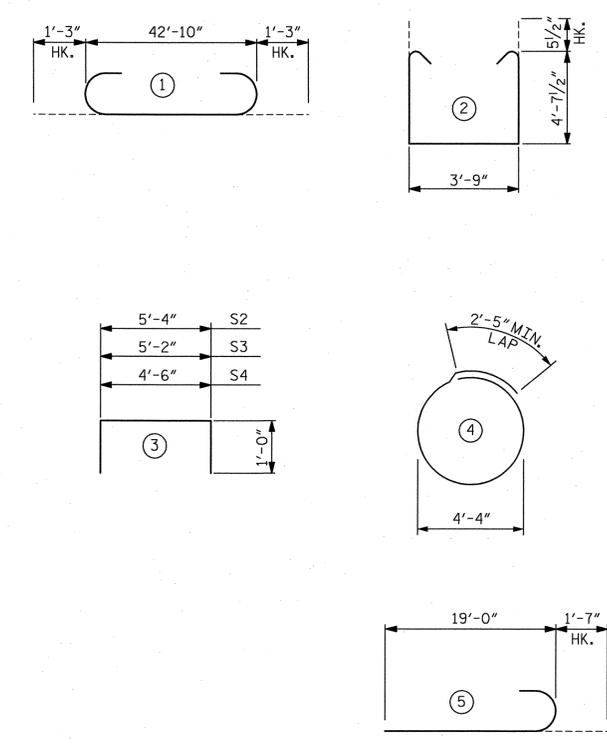


ANCHOR BOLT LAYOUT DETAIL



SECTION B-B

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

| PIER 1 | | | | | |
|--------|-----|------|------|---------|--------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 32 | 9 | STR. | 42'-10" | 4,660 |
| B2 | 6 | 5 | STR. | 42'-10" | 268 |
| B3 | 8 | 9 | 1 | 45'-4" | 1,233 |
| M1 | 128 | 11 | 5 | 20'-7" | 13,998 |
| S1 | 114 | 5 | 2 | 13'-11" | 1,655 |
| S2 | 85 | 4 | 3 | 7'-4" | 416 |
| S3 | 14 | 4 | 3 | 7'-2" | 67 |
| S4 | 16 | 4 | 3 | 6'-6" | 69 |
| S5 | 64 | 5 | 4 | 16'-0" | 1,068 |

QUANTITIES

| ITEM | TOTAL |
|--|------------|
| REINFORCING STEEL | LBS 23,434 |
| CLASS AA CONCRETE: | |
| POUR 2 | C.Y. 45.3 |
| 5'-0" DIA. DRILLED PIERS | NO. 4 |
| DRILLED PIERS, NOT IN SOIL | L.F. 20.0 |
| DRILLED PIERS, IN SOIL | L.F. 43.0 |
| DRILLED PIER CONCRETE POUR 1 | C.Y. 45.8 |
| PERMANENT STEEL CASING FOR 5'-0" DIA. DRILLED PIER | L.F. 46.9 |

PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47
 SHEET 2 OF 2

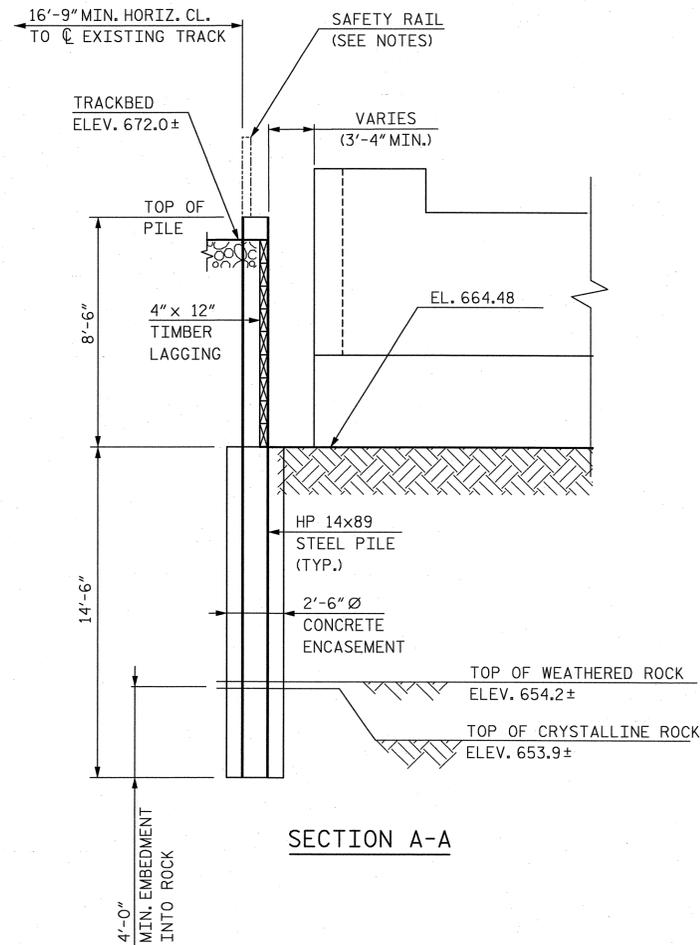
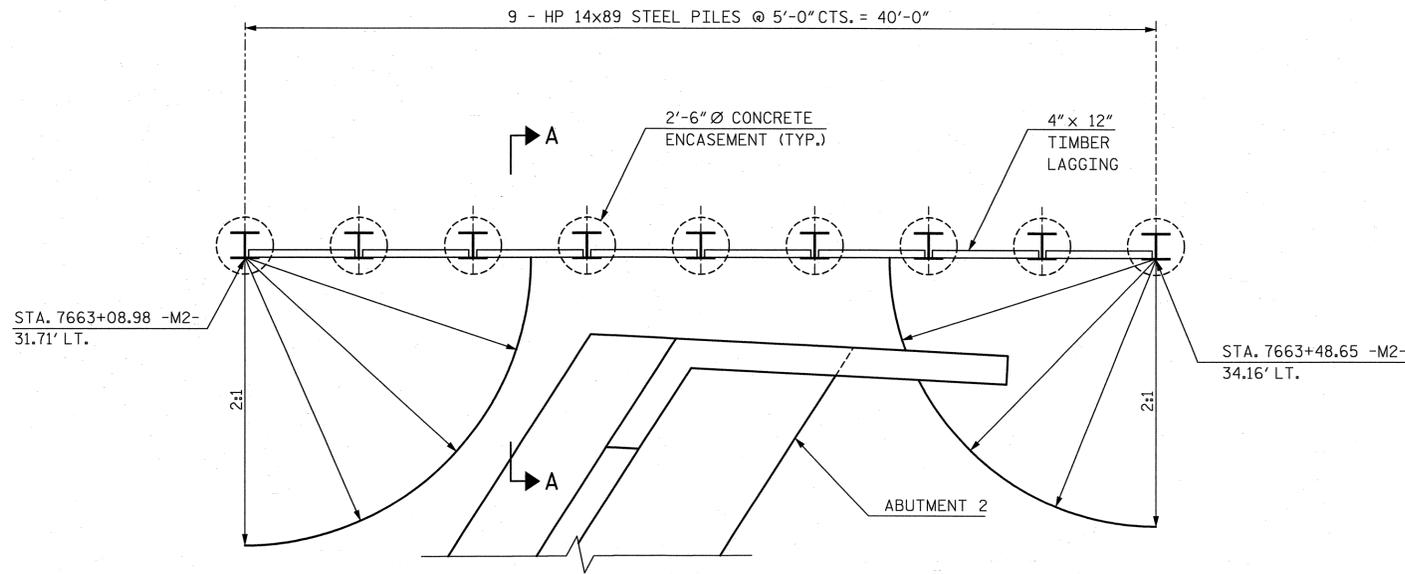


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 PIER 1

HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: M. WRIGHT DATE: 2/13 DWG. NO. 21
 CHECKED BY: S. FISHER DATE: 2/13

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-21 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 64 |

0248DEL_P10C1



NOTES:

- ALL SHORING MATERIAL SHALL BE IN "LIKE NEW" CONDITION.
- ALL STEEL USED FOR SHORING SHALL BE ASTM A572 GRADE 50.
- LAGGING SHALL BE 4" x 12" SOUTHERN PINE (GRADE-DENSE STRUCTURAL 65).
- CONCRETE FOR 2'-6" Ø PILE ENCASEMENT SHALL BE CLASS A (3,000 PSI).
- CONTRACTOR SHALL PROVIDE A SAFETY RAIL ALONG THE FULL LENGTH OF TEMPORARY SHORING. SAFETY RAIL SHALL EXTEND A MINIMUM OF 3'-6" ABOVE TRACK BED ELEVATION AND SHALL CONFORM TO THE REQUIREMENTS OF AREMA 15.8.5.2 AND 15.8.5.3.
- FOR SHORING LOCATION RELATIVE TO EXISTING TRACK 2 CENTERLINE, SEE GENERAL DRAWING.

CONSTRUCTION SEQUENCE:

1. CONSTRUCT TEMPORARY RAILROAD SHORING TO LIMITS SHOWN AND EXCAVATE ACCORDINGLY.
2. CONSTRUCT ABUTMENT 2 AS SHOWN.
3. CONSTRUCT PROPOSED RAILROAD EMBANKMENT BEHIND ABUTMENT 2. REMOVE LAGGING AS BACK FILLING PROGRESSES.
4. CONSTRUCT SUPERSTRUCTURE.
5. SHIFT RAIL TRAFFIC FROM EXISTING TRACK TO PROPOSED STRUCTURE.
6. CONSTRUCT RAILROAD EMBANKMENT TO FINAL PROPOSED GRADE.
7. REMOVE TEMPORARY RAILROAD SHORING. SOLDIER PILES SHALL BE CUT-OFF 1'-0" BELOW PROPOSED GROUNDLINE AT TIME OF REMOVAL.

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE

ABUTMENT 2
 SHORING

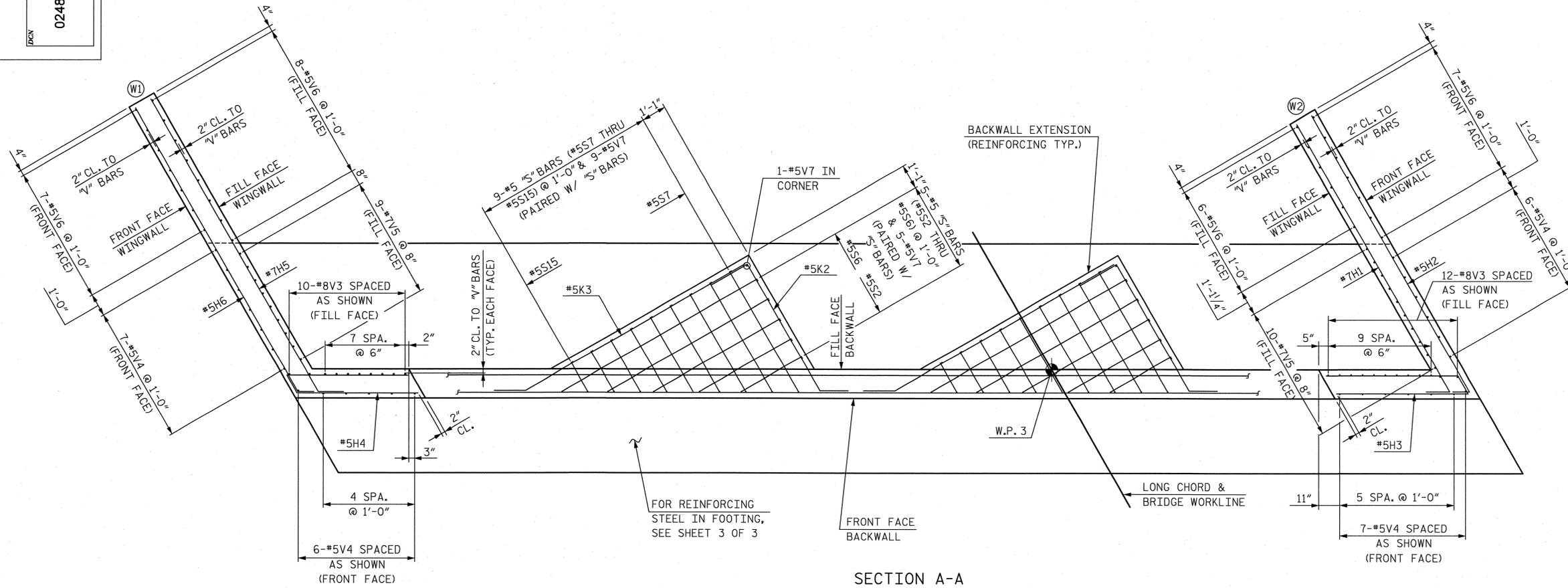


| | | | | | |
|---|------------|-----------|-----|-------|--------------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | | SHEET NO. S-22 |
| DRAWN BY: J. BAYNE | DATE: 2/13 | NO. 1 | BY: | DATE: | TOTAL SHEETS |
| CHECKED BY: D. HAWKINS | DATE: 2/13 | NO. 2 | BY: | DATE: | 64 |
| DWG. NO. 22 | | NO. 3 | BY: | DATE: | |
| | | NO. 4 | BY: | DATE: | |

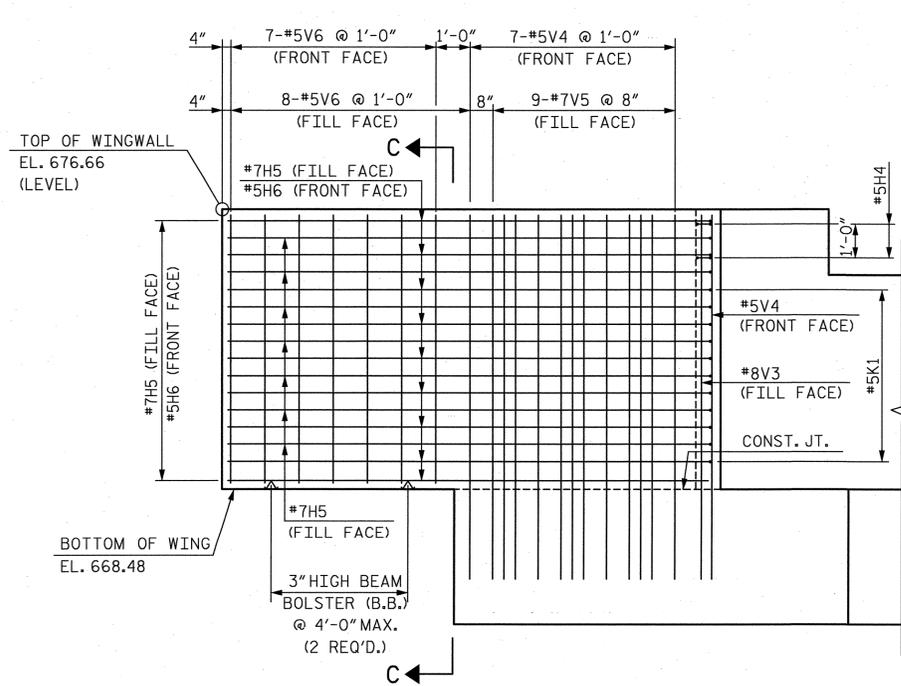
NOTES:

FOR ABUTMENT DIMENSIONS AND ELEVATIONS, SEE SHEET 1 OF 3.

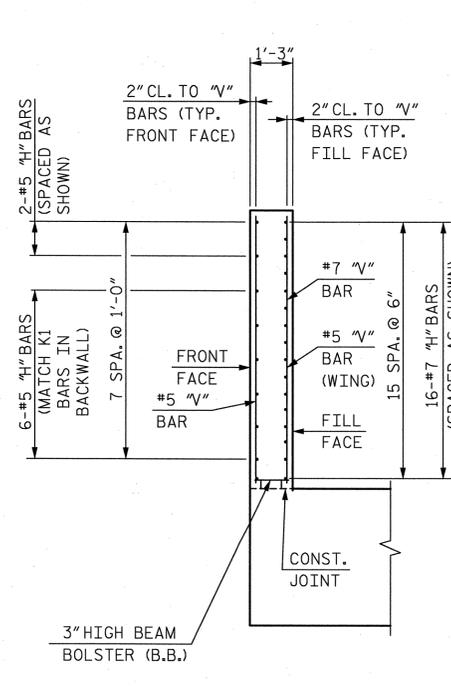
FOR LOCATIONS OF HANDRAIL ANCHORAGES IN TOP OF WINGWALLS, SEE "METAL HANDRAIL DETAILS" SHEETS.



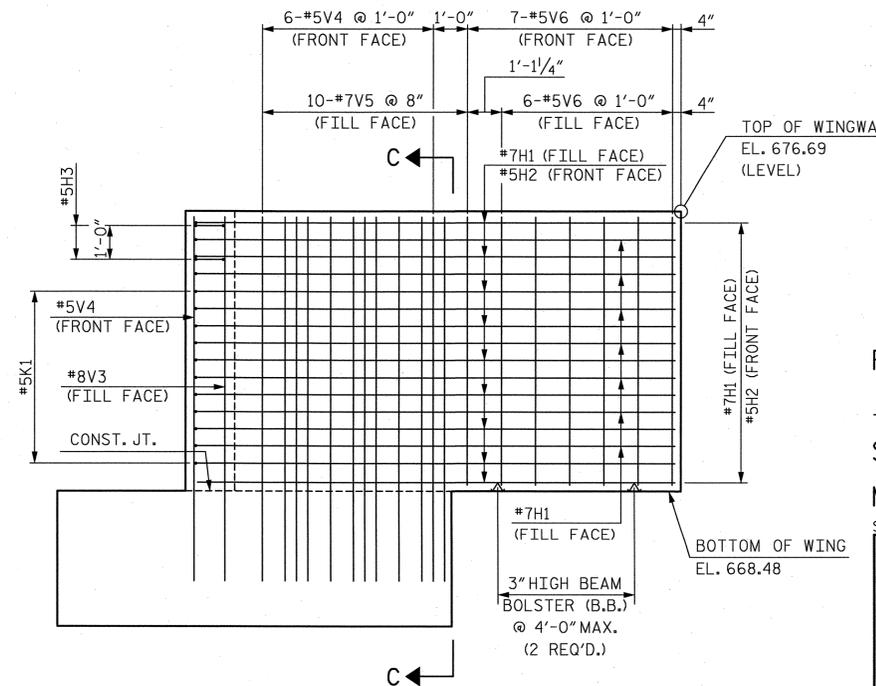
SECTION A-A



ELEVATION OF WING (W1)



SECTION C-C



ELEVATION OF WING (W2)



PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47
 SHEET 2 OF 3

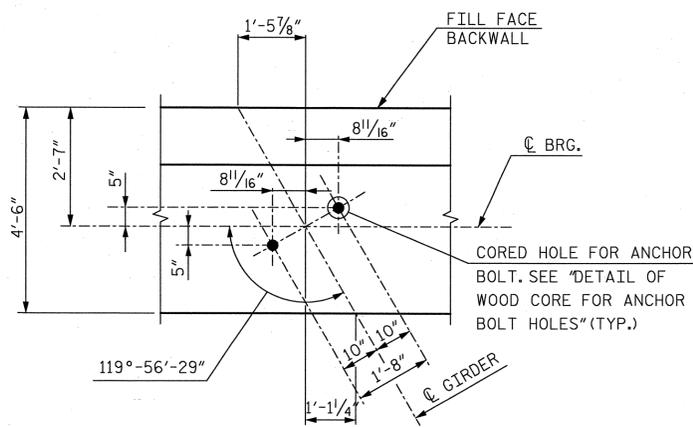
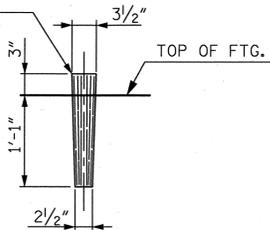
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 ABUTMENT 2

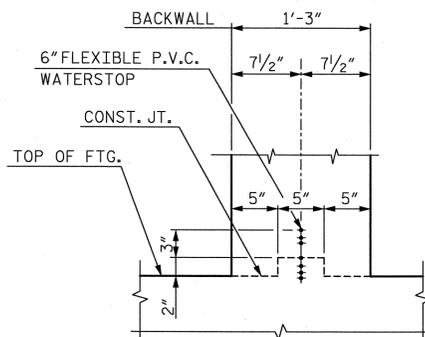
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|-----------------------|-----|---|--------------------------|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
| DRAWN BY: M. WRIGHT | | DATE: 2/13 | |
| CHECKED BY: S. FISHER | | DATE: 2/13 | |
| DWG. NO. 24 | | | |
| REVISIONS | | | |
| NO. | BY: | DATE: | |
| 1 | | | |
| 2 | | | |
| | | | SHEET NO. S-24 |
| | | | TOTAL SHEETS CA |

0248DEL_P10C1

WOOD CORE 3 1/2" Ø x 2 1/2" Ø x 1'-4"
TO BE REMOVED AFTER CONCRETE
HAS TAKEN INITIAL SET.



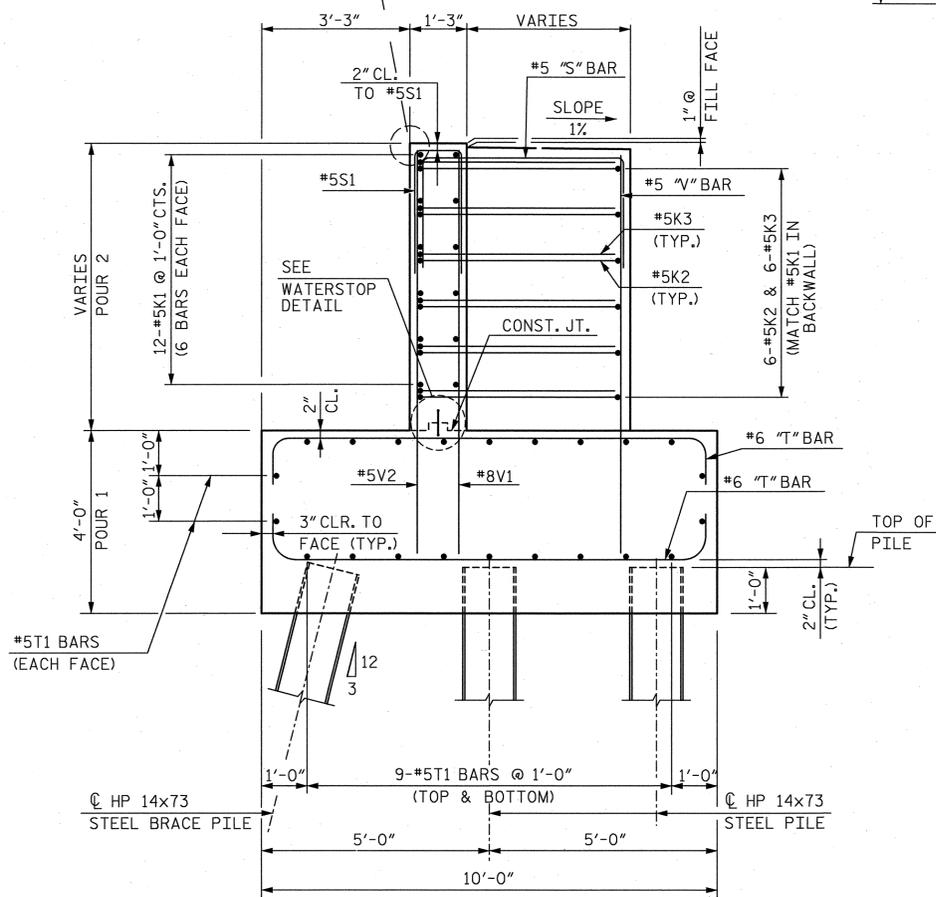
ANCHOR BOLT LAYOUT DETAIL



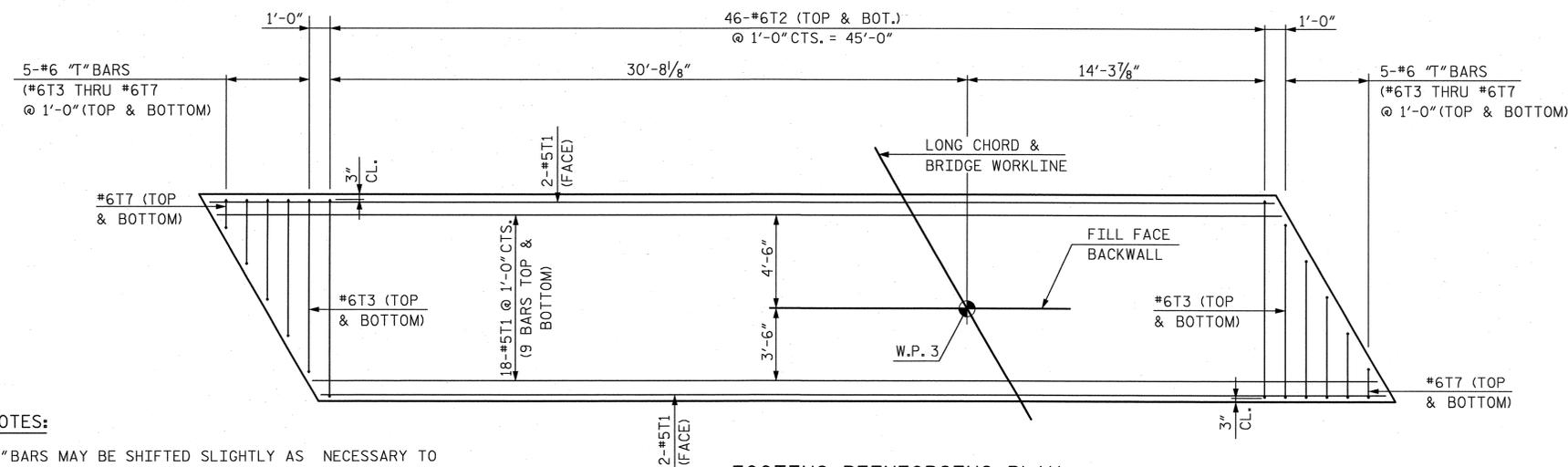
WATERSTOP DETAIL

BULB-TYPE WATERSTOP REQUIRED
FOR DETAILS OF BULB-TYPE
WATERSTOP, SEE DETAIL "A"
ON "DECK DETAILS" SHEET.

DETAIL OF WOOD CORE FOR
ANCHOR BOLT HOLES



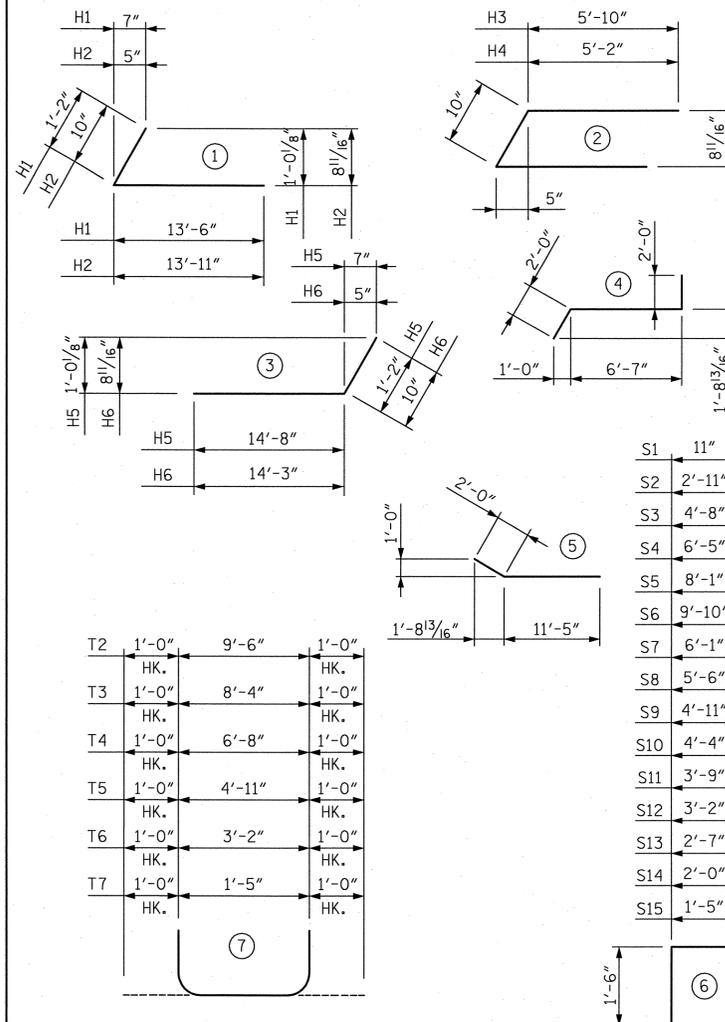
SECTION B-B



FOOTING REINFORCING PLAN

NOTES:
"T" BARS MAY BE SHIFTED SLIGHTLY AS NECESSARY TO
CLEAR ANCHOR BOLTS.
FOR FOOTING LAYOUT AND DIMENSIONS, SEE SHEET 1 OF 3.

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF REINFORCING

| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
|------------|-----|------|------|---------|--------|
| ABUTMENT 2 | | | | | |
| H1 | 16 | 7 | 1 | 14'-8" | 480 |
| H2 | 9 | 5 | 1 | 14'-9" | 138 |
| H3 | 2 | 5 | 2 | 12'-6" | 26 |
| H4 | 2 | 5 | 2 | 11'-2" | 23 |
| H5 | 16 | 7 | 3 | 15'-10" | 518 |
| H6 | 9 | 5 | 3 | 15'-1" | 142 |
| K1 | 12 | 5 | STR. | 51'-5" | 644 |
| K2 | 12 | 5 | 4 | 10'-7" | 132 |
| K3 | 12 | 5 | 5 | 13'-5" | 168 |
| S1 | 39 | 5 | 6 | 3'-11" | 159 |
| S2 | 2 | 5 | 6 | 5'-11" | 12 |
| S3 | 2 | 5 | 6 | 7'-8" | 16 |
| S4 | 2 | 5 | 6 | 9'-5" | 20 |
| S5 | 2 | 5 | 6 | 11'-1" | 23 |
| S6 | 2 | 5 | 6 | 12'-10" | 27 |
| S7 | 2 | 5 | 6 | 9'-1" | 19 |
| S8 | 2 | 5 | 6 | 8'-6" | 18 |
| S9 | 2 | 5 | 6 | 7'-11" | 17 |
| S10 | 2 | 5 | 6 | 7'-4" | 15 |
| S11 | 2 | 5 | 6 | 6'-9" | 14 |
| S12 | 2 | 5 | 6 | 6'-2" | 13 |
| S13 | 2 | 5 | 6 | 5'-7" | 12 |
| S14 | 2 | 5 | 6 | 5'-0" | 10 |
| S15 | 2 | 5 | 6 | 4'-5" | 9 |
| T1 | 22 | 5 | STR. | 51'-2" | 1,174 |
| T2 | 92 | 6 | 7 | 11'-6" | 1,589 |
| T3 | 4 | 6 | 7 | 10'-4" | 62 |
| T4 | 4 | 6 | 7 | 8'-8" | 52 |
| T5 | 4 | 6 | 7 | 6'-11" | 42 |
| T6 | 4 | 6 | 7 | 5'-2" | 31 |
| T7 | 4 | 6 | 7 | 3'-5" | 21 |
| V1 | 80 | 8 | STR. | 8'-9" | 1,869 |
| V2 | 40 | 5 | STR. | 8'-9" | 365 |
| V3 | 22 | 8 | STR. | 10'-8" | 627 |
| V4 | 26 | 5 | STR. | 10'-8" | 289 |
| V5 | 19 | 7 | STR. | 10'-8" | 414 |
| V6 | 28 | 5 | STR. | 7'-9" | 226 |
| V7 | 30 | 5 | STR. | 8'-8" | 271 |

QUANTITIES

| ITEM | TOTAL |
|------------------------------|---------------|
| REINFORCING STEEL | LBS. 9,687 |
| CLASS AA CONCRETE BREAKDOWN: | |
| POUR 1 | |
| FOOTING | CU. YDS 76.8 |
| POUR 2 | |
| BACKWALL & WINGS | CU. YDS 39.3 |
| TOTAL | CU. YDS 116.1 |
| HP 14 X 73 STEEL PILES | NO. 33 |
| | L.F. 627 |
| PILE EXCAVATION IN SOIL | L.F. 396 |
| PILE EXCAVATION NOT IN SOIL | L.F. 198 |

PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7662+38.00 -M2-
MILE POST: 311.47
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

ABUTMENT 2

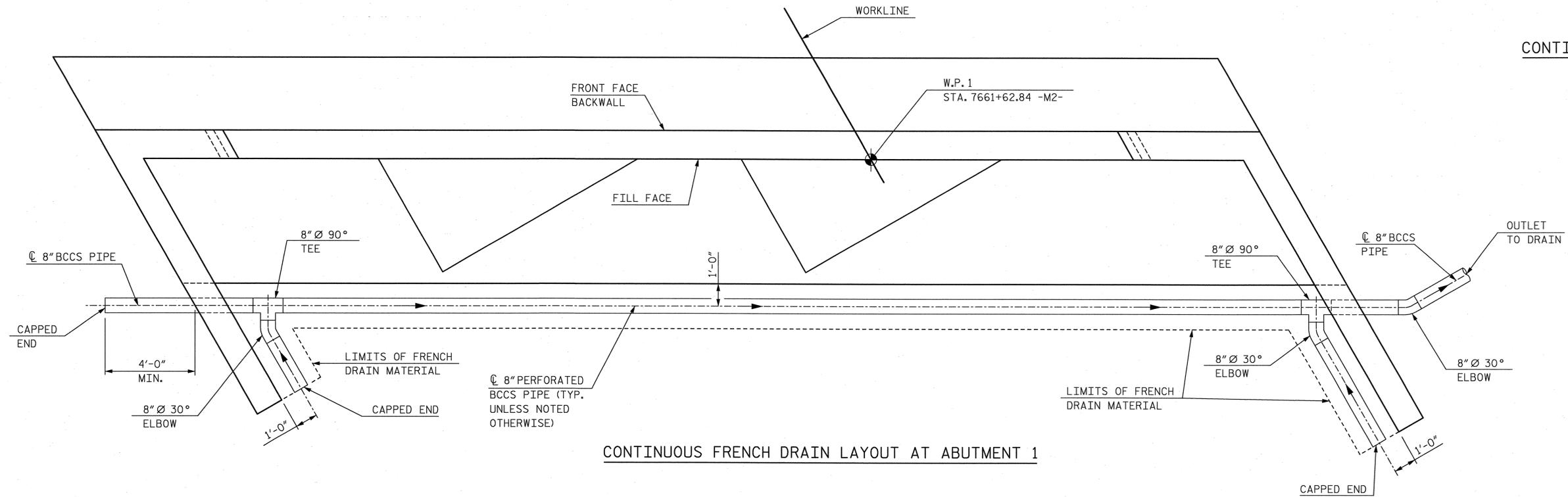


HNTB HNTB NORTH CAROLINA, P.C.
License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: M. WRIGHT DATE: 2/13 DWG. NO. 25
CHECKED BY: S. FISHER DATE: 2/13

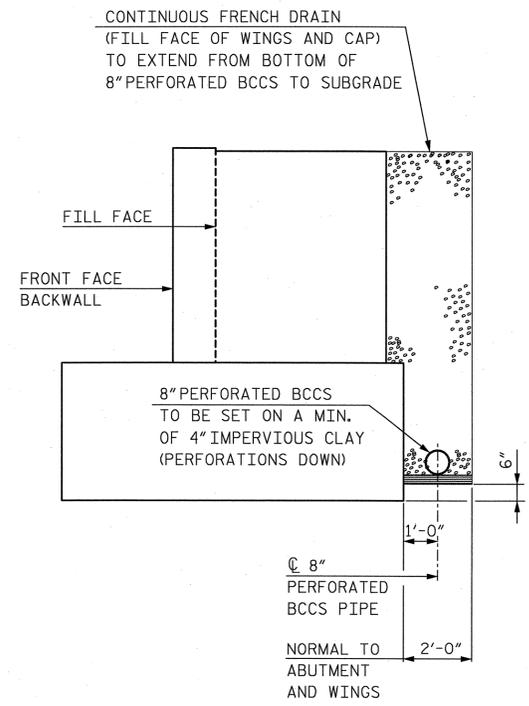
| REVISIONS | | | | | | TOTAL SHEETS |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | 4 |
| 2 | | | 4 | | | 5 |

SHEET NO.
S-25

0248DEL_P10C1



CONTINUOUS FRENCH DRAIN LAYOUT AT ABUTMENT 1



CONTINUOUS FRENCH DRAIN DETAIL

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47

SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

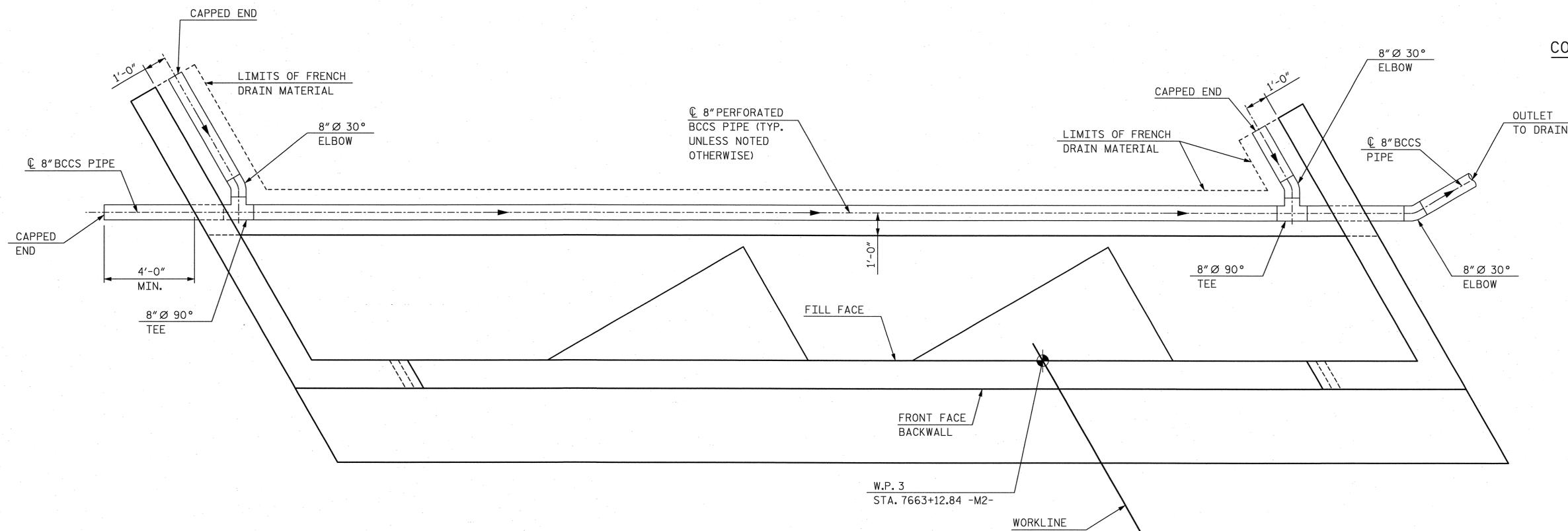
STRUCTURE
 DRAINAGE
 DETAILS



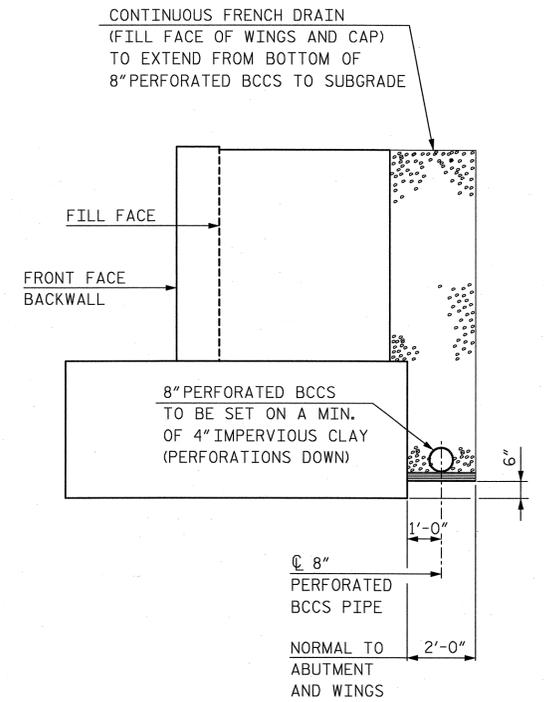
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|----------------------|------------|---|--|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | DWG. NO. 26 | |
| CHECKED BY: D. RAGAN | DATE: 2/13 | | |

| REVISIONS | | | | | |
|-----------|-----|-------|-----|-----|-------|
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

| | |
|--------------|-------------|
| SHEET NO. | S-26 |
| TOTAL SHEETS | 64 |



CONTINUOUS FRENCH DRAIN LAYOUT AT ABUTMENT 2



CONTINUOUS FRENCH DRAIN DETAIL

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

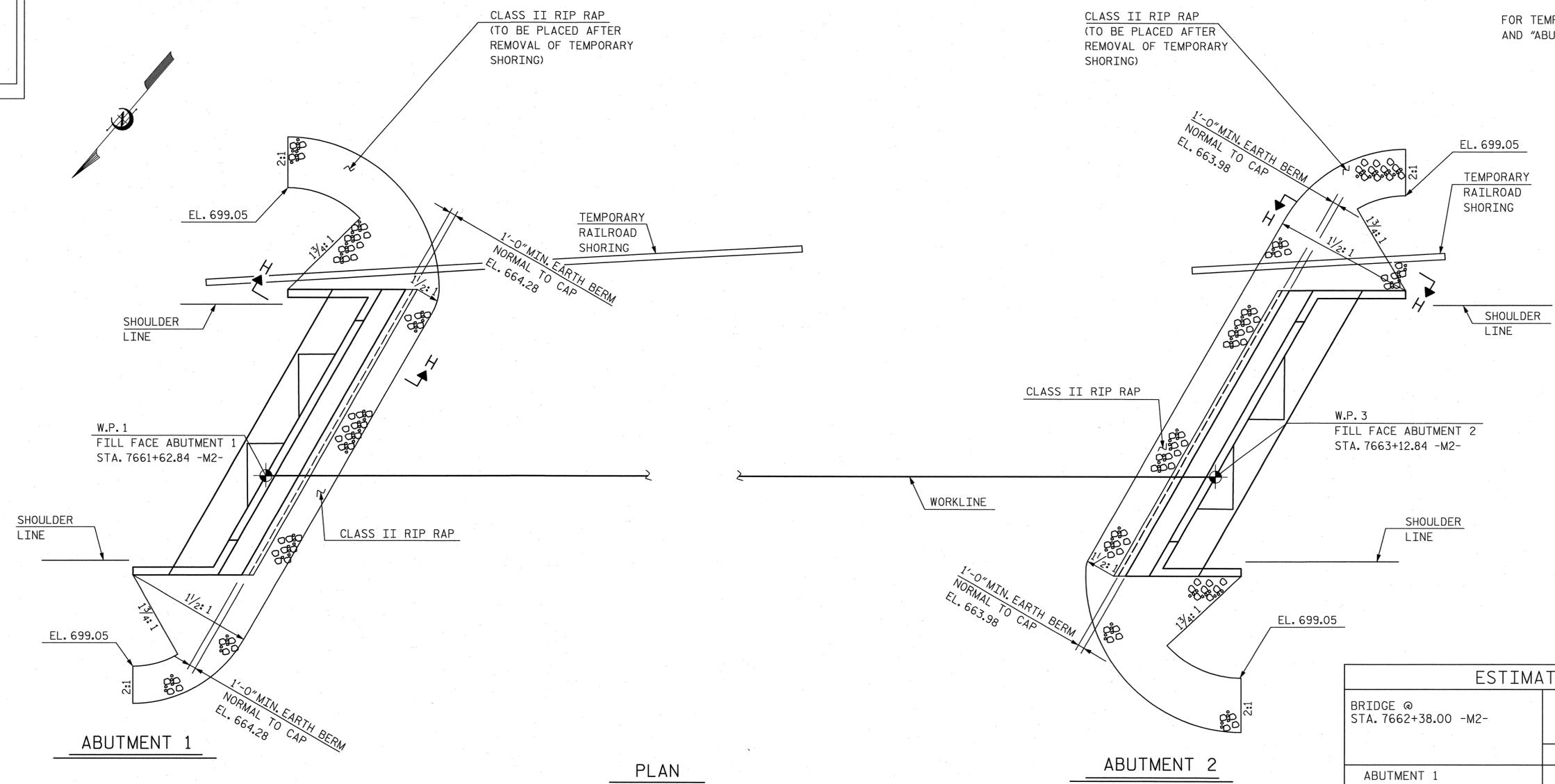
STRUCTURE
 DRAINAGE
 DETAILS



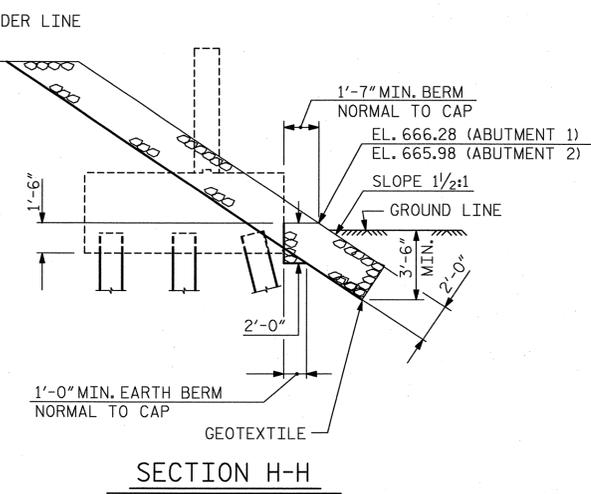
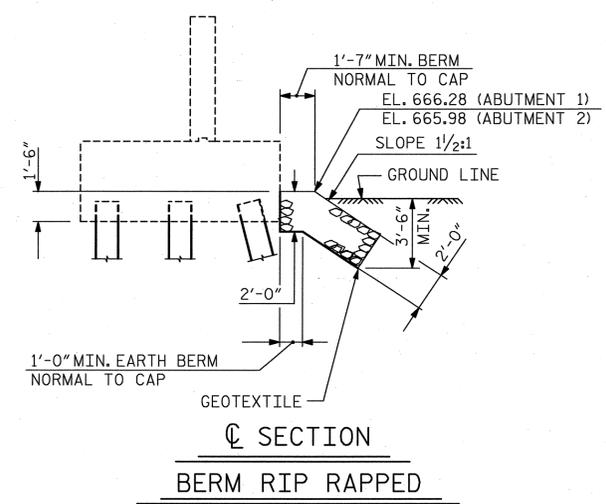
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|---|------------|-----------|-----|------------------|-------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. | |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | NO. 1 | BY: | NO. 3 | DATE: |
| CHECKED BY: D. RAGAN | DATE: 2/13 | NO. 2 | BY: | NO. 4 | DATE: |
| DWG. NO. 27 | | | | TOTAL SHEETS: 64 | |

0248DEL_P10C1

NOTES:
 FOR BERM WIDTH DIMENSIONS, SEE GENERAL DRAWING.
 FOR TEMPORARY RAILROAD SHORING, SEE "ABUTMENT 1 SHORING" AND "ABUTMENT 2 SHORING" SHEETS.



| ESTIMATED QUANTITIES | | |
|----------------------------------|--------------------------------------|----------------------------|
| BRIDGE @ STA. 7662+38.00 -M2- | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE |
| | TONS | SQUARE YARDS |
| ABUTMENT 1 | 160 | 177 |
| ABUTMENT 2 | 162 | 180 |



PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7662+38.00 -M2-
 MILE POST: 311.47

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 RIP RAP
 DETAILS



| | | | | | |
|---|-----------|-----------|------------------|-----------|-------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | M. WRIGHT | 1/13 | 3 | | |
| 2 | D. RAGAN | 2/13 | 4 | | |
| DRAWN BY: M. WRIGHT DATE: 1/13 | | | DWG. NO. 28 | | |
| CHECKED BY: D. RAGAN DATE: 2/13 | | | TOTAL SHEETS: 64 | | |

INDEX OF DRAWINGS

- 1 GENERAL DRAWING: GENERAL PLAN & ELEVATION (SHEET 1 OF 3)
- 2 GENERAL DRAWING: LOCATION SKETCH, GENERAL NOTES AND TOTAL BILL OF MATERIAL (SHEET 2 OF 3)
- 3 GENERAL DRAWING: CONSTRUCTION SEQUENCE (SHEET 3 OF 3)
- 4 SUPERSTRUCTURE: TYPICAL SECTION
- 5 SUPERSTRUCTURE: WALKWAY AND HANDRAIL PLAN
- 6 SUPERSTRUCTURE: WALKWAY AND HANDRAIL DETAILS
- 7 SUPERSTRUCTURE: WALKWAY AND TIE ROD DETAILS
- 8 SUBSTRUCTURE: WINGWALL EXTENSION DETAILS

NOTES:

FOR GENERAL NOTES, SEE "GENERAL DRAWING: LOCATION SKETCH, GENERAL NOTES AND TOTAL BILL OF MATERIAL" SHEET.

CURVE DATA FOR -M1-

PIs STA 7742+58.13
 $\theta_s = 1^\circ-58'-53.0''$ (LT)
 Ls = 403.00 FT.
 LT = 268.68 FT.
 ST = 134.35 FT.

CURVE DATA FOR -M2-

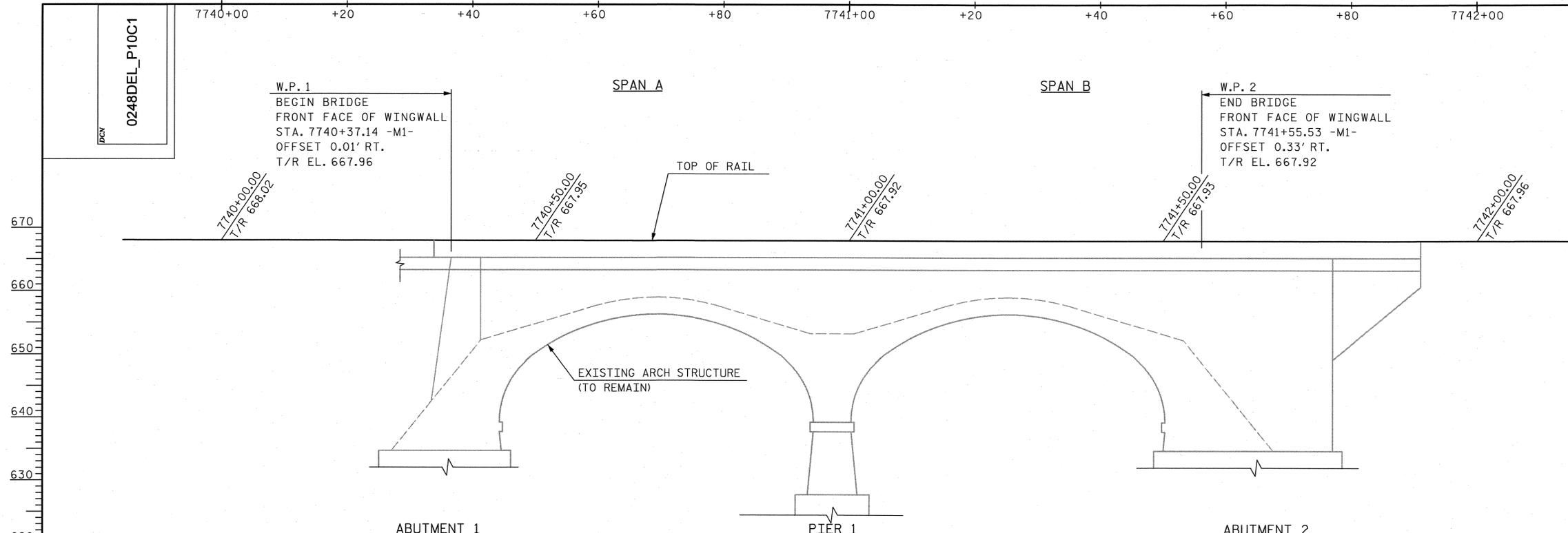
PIs STA 7742+61.10
 $\theta_s = 2^\circ-00'-53.9''$ (LT)
 Ls = 403.00 FT.
 LT = 268.68 FT.
 ST = 134.35 FT.

GRADE DATA -M1-

PI = 7740+85.00
 EL = 666.95'
 VC = 780'

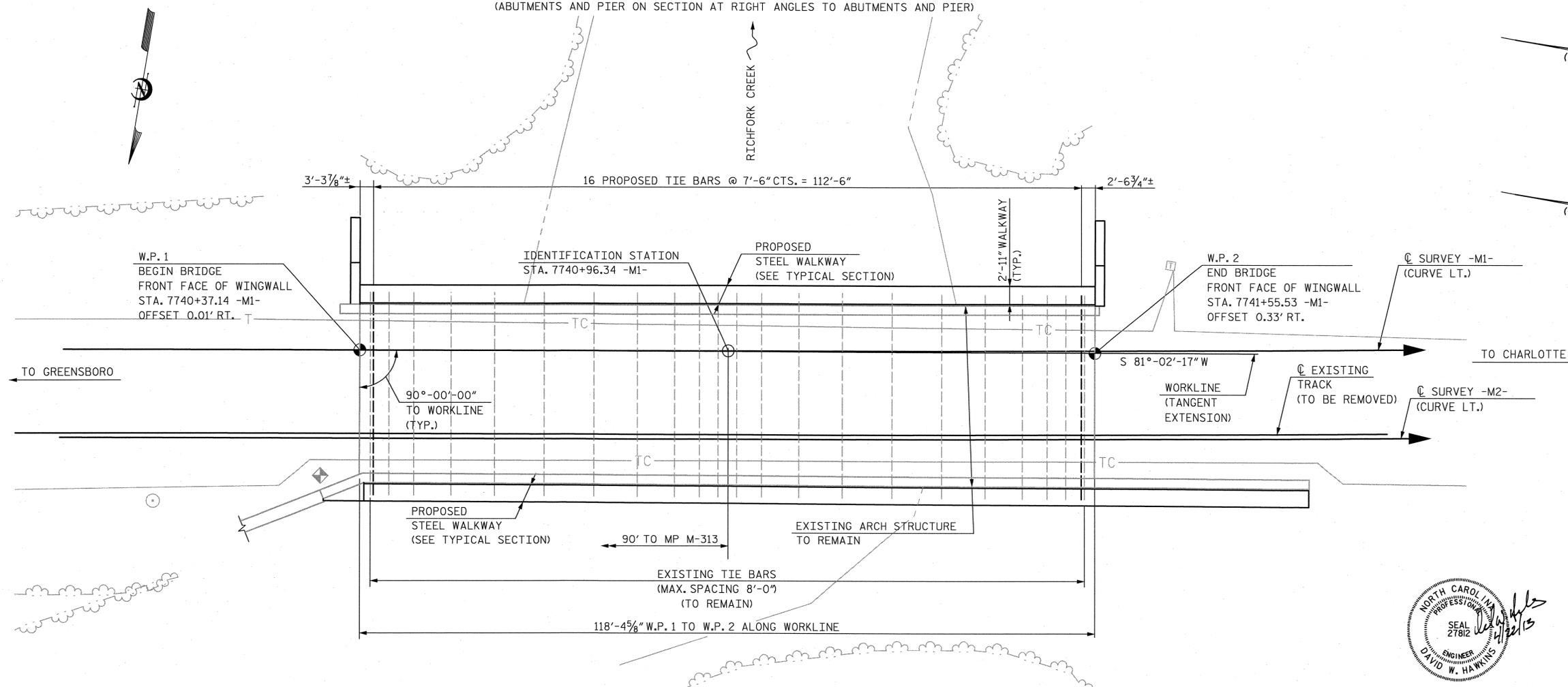
GRADE DATA -M2-

PI = 7740+85.00
 EL = 666.95'
 VC = 780'



SECTION ALONG C SURVEY -M1-

(ABUTMENTS AND PIER ON SECTION AT RIGHT ANGLES TO ABUTMENTS AND PIER)



PLAN

NOTE: WORKLINE FOR BRIDGE SHALL BE THE -M1- TANGENT AND ITS EXTENSION.

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7740+96.34 -M1-
 MILE POST: 313.02
 SHEET 1 OF 3

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 BRIDGE ON NCR MAINLINE
 OVER RICHFORK CREEK
 BETWEEN SR 2020 AND SR 2005

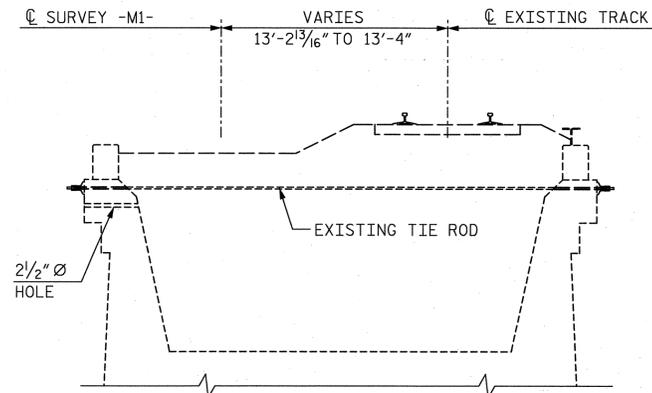


HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609

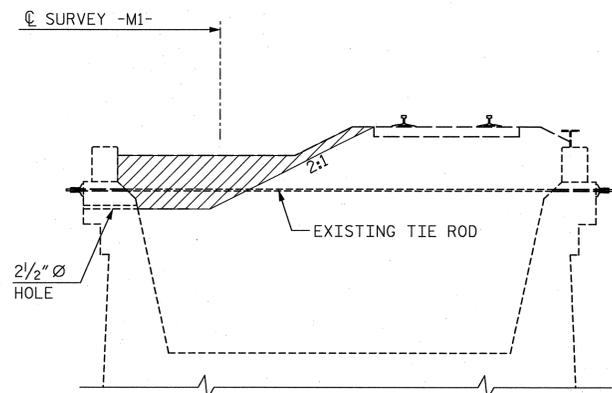
DRAWN BY: M. WRIGHT DATE: 12/12
 CHECKED BY: D. HAWKINS DATE: 2/13

DWG. NO. 1

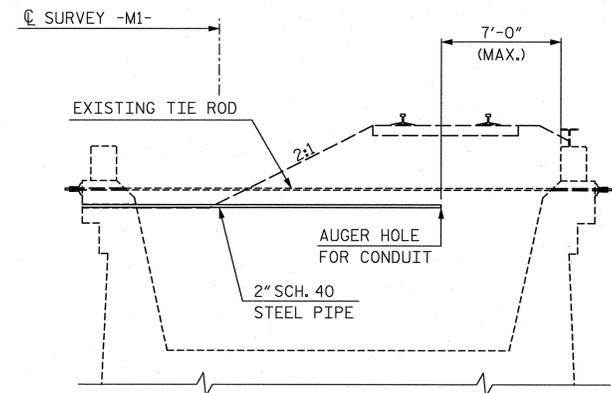
| REVISIONS | | | | | | SHEET NO. S-29 |
|-----------|-----|-------|-----|-----|-------|---------------------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | TOTAL SHEETS 64 |
| 2 | | | 4 | | | |



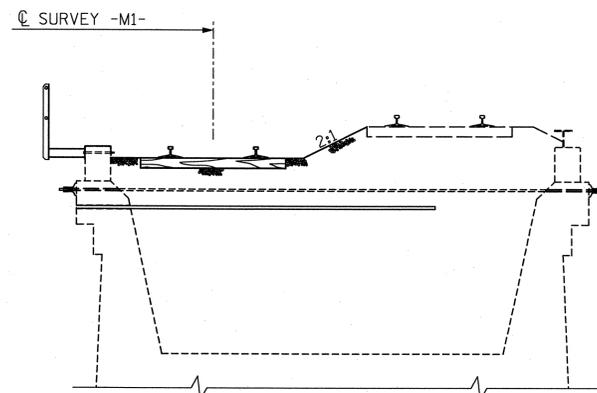
STAGE 1: DRILL 2 1/2" Ø HOLES ON -M1- SIDE FOR NEW TIE RODS SHOWN ON "WALER AND TIE ROD DETAILS" SHEET.



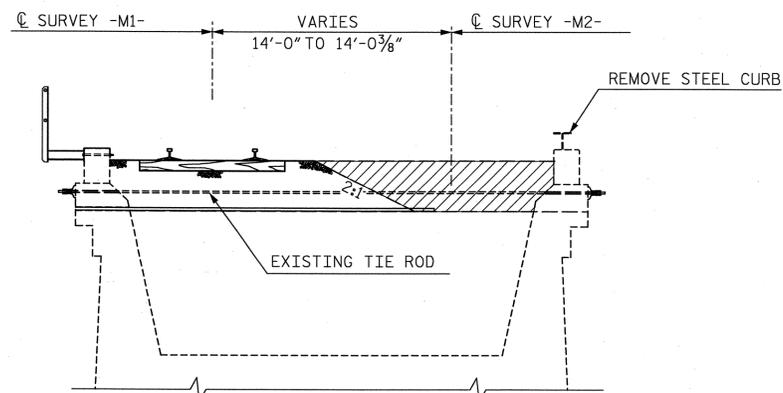
STAGE 2: REMOVE BALLAST ON -M1- SIDE DOWN TO BOTTOM OF TIE ROD HOLE AS SHOWN.



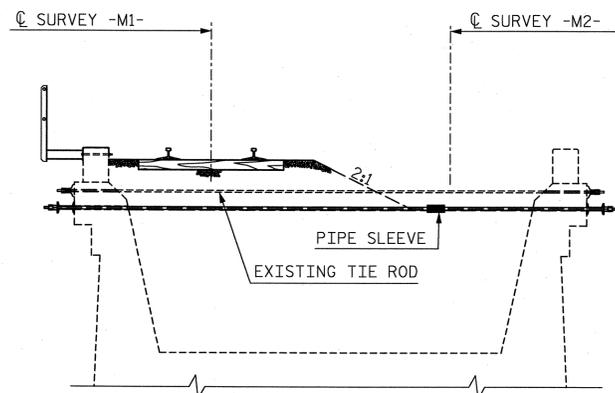
STAGE 3: INSTALL 2" SCHEDULE 40 STEEL PIPE ON TOP OF EXCAVATED SUBGRADE. CONDUIT SHALL EXTEND TO THE OUTSIDE OF THE SPANDREL WALL. FILL IN THE GAP BETWEEN HOLE AND PIPE WITH GROUT.



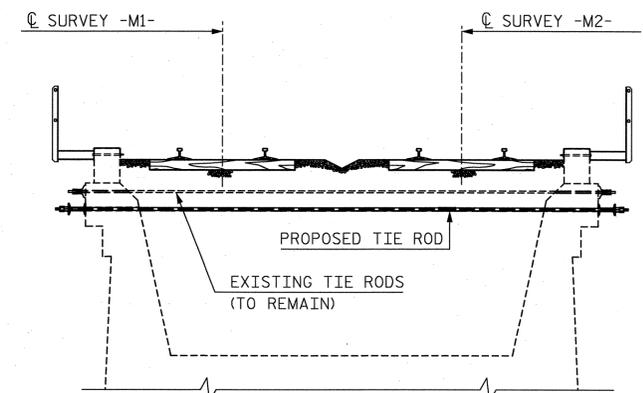
STAGE 4: INSTALL WALKWAY AND HANDRAIL ON -M1- SIDE. TRACK CONTRACTOR TO BUILD AND COMPLETE -M1- ACROSS BRIDGE AND OPEN RAIL FOR TRAFFIC.



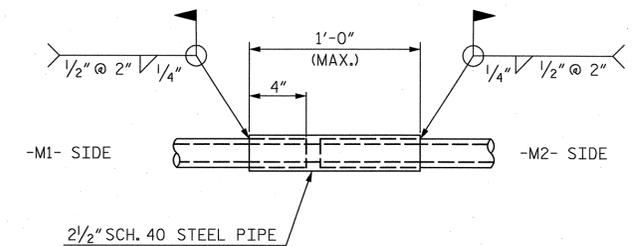
STAGE 5: TRACK CONTRACTOR TO REMOVE EXISTING TRACK AS NOTED ON THE TRACK PLANS. REMOVE BALLAST FROM UNDER EXISTING TRACK TO PROPOSED TIE ROD ELEVATION AND EXPOSE END OF -M1- SIDE STEEL CONDUIT. REMOVE STEEL CURB ON EXISTING TRACK SIDE.



STAGE 6: DRILL 2 1/2" HOLES ON EXISTING -M2- SIDE FOR NEW TIE RODS AT LOCATIONS SHOWN ON PLANS. EXTEND 2" SCH. 40 STEEL PIPE AS IN STAGE 3, USING PIPE SLEEVE (SEE DETAIL). INSTALL 1 3/8" Ø TIE ROD AND COMPLETELY FILL 2" SCH. 40 STEEL PIPE WITH GROUT. INSTALL WALERS AND TIE ROD NUTS. THE THREAD OF THE TIE ROD SHALL THEN BE BURRED WITH A SHARP POINTED TOOL.



STAGE 7: INSTALL WALKWAY AND HANDRAIL ON -M2- SIDE. TRACK CONTRACTOR TO BUILD AND COMPLETE -M2- ACROSS BRIDGE AND OPEN FOR RAIL TRAFFIC.



PIPE STEEVE DETAIL

NOTE:
CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO ENSURE THAT EXISTING TIE RODS ARE PROTECTED FROM DAMAGE DURING CONSTRUCTION ACTIVITIES.

PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7740+96.34 -M1-
MILE POST: 313.02
SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

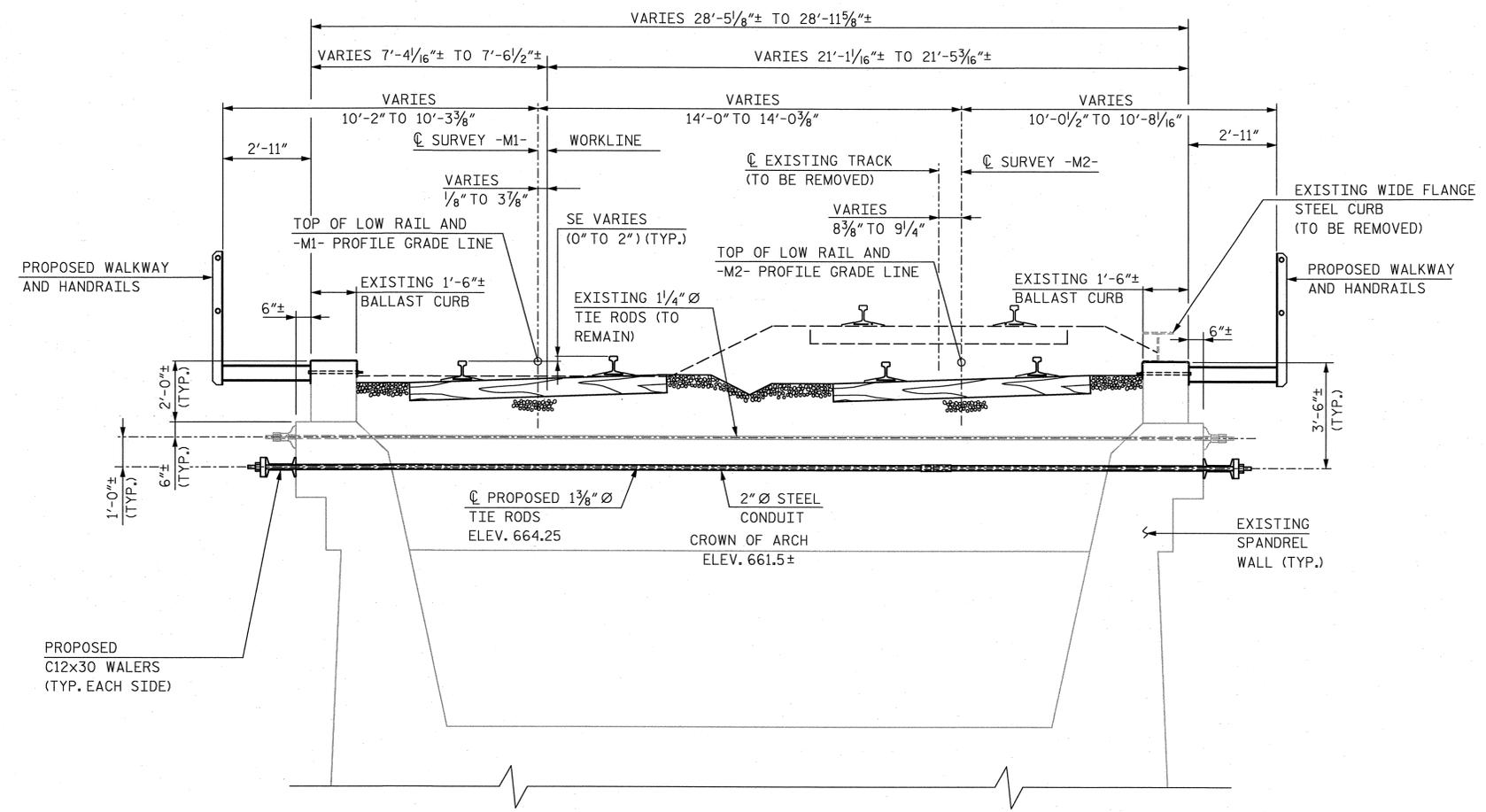
GENERAL DRAWING

CONSTRUCTION SEQUENCE



| | | | | | | | |
|-------------|------------|--|----------|-----------|-------|--------------|--|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. | |
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-31 | |
| 1 | J. BAYNE | 12/12 | 3 | | | TOTAL SHEETS | |
| 2 | D. HAWKINS | 2/13 | 4 | | | 64 | |
| DRAWN BY | | DATE | DWG. NO. | | | | |
| CHECKED BY | | DATE | 3 | | | | |

NOTES:
 FOR WALKWAY AND HANDRAIL DETAILS, SEE "WALKWAY AND HANDRAIL PLAN" AND "WALKWAY AND HANDRAIL DETAILS" SHEETS.
 FOR TIE ROD AND WALER DETAILS, SEE "WALER AND TIE ROD DETAILS" SHEET.



TYPICAL SECTION

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7740+96.34 -M1-
 MILE POST: 313.02

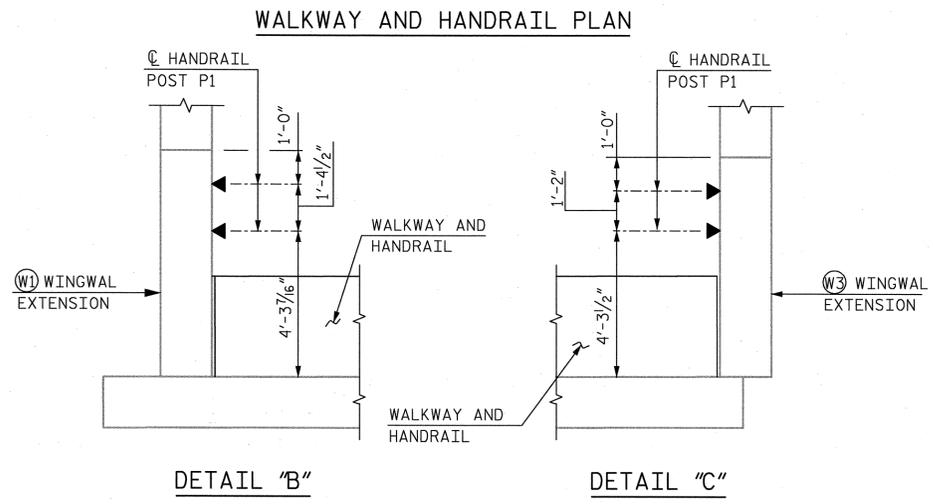
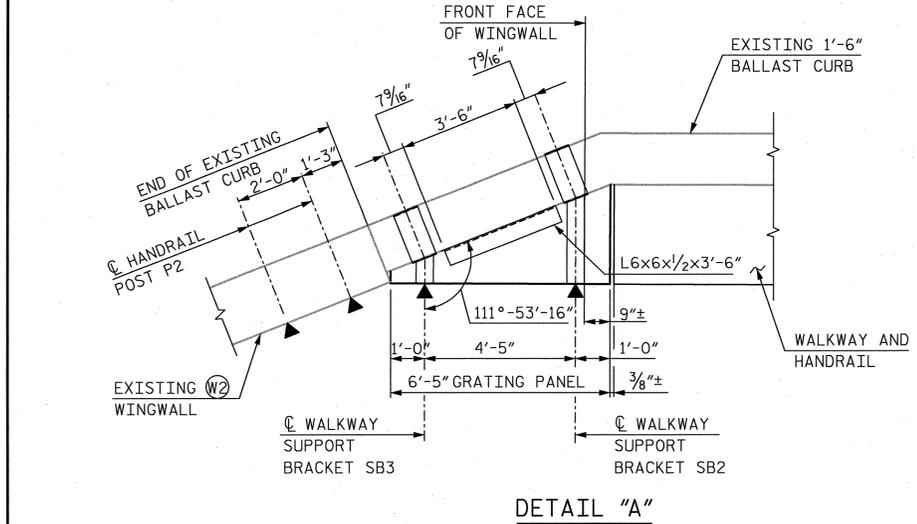
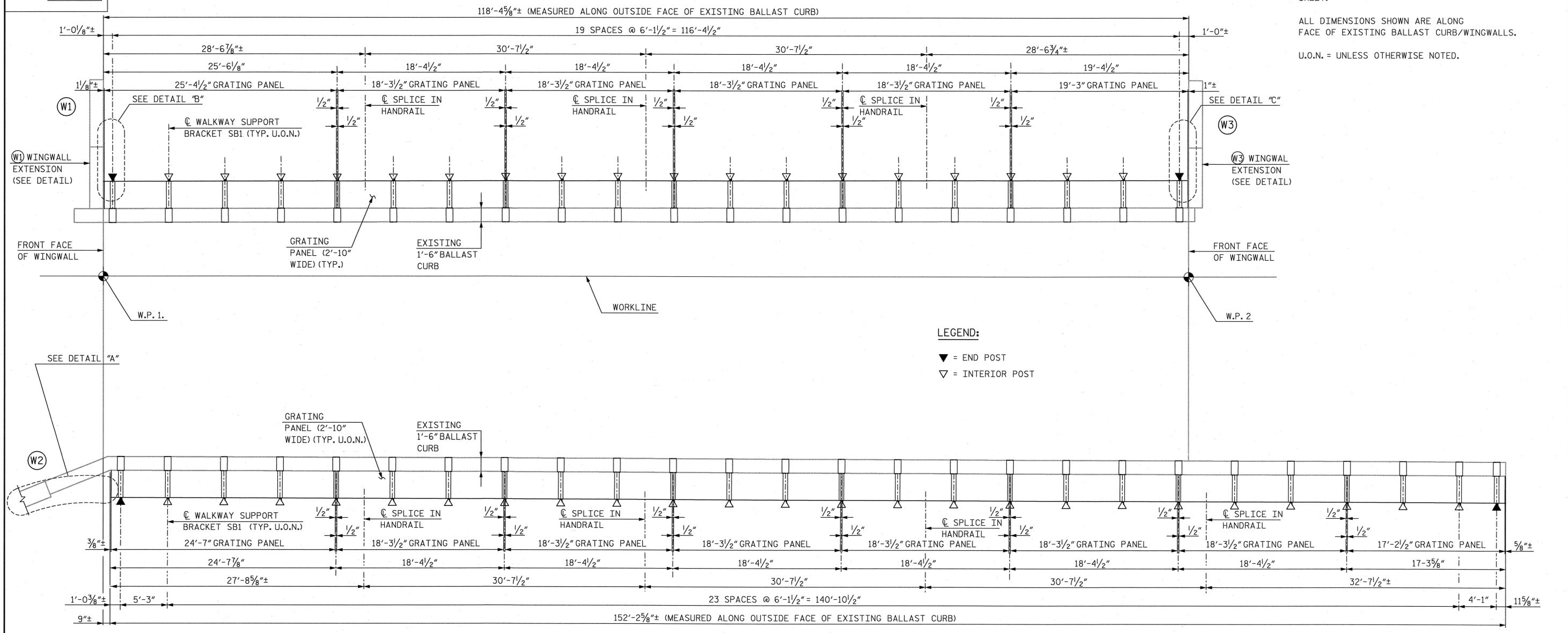
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 TYPICAL SECTION



| | | | | |
|---|-------------|-----------|-------|--------------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. S-32 |
| DRAWN BY: M. WRIGHT | DATE: 12/12 | NO. 3 | BY: | TOTAL SHEETS CA |
| CHECKED BY: D. HAWKINS | DATE: 2/13 | NO. 4 | DATE: | |

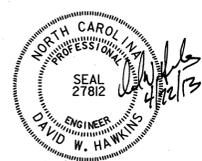
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NOTES:
 FOR WINGWALL EXTENSION DETAILS, SEE "WINGWALL EXTENSION DETAILS" SHEET.
 FOR WALKWAY AND HANDRAIL DETAILS, SEE "WALKWAY AND HANDRAIL DETAILS" SHEET.
 ALL DIMENSIONS SHOWN ARE ALONG FACE OF EXISTING BALLAST CURB/WINGWALLS.
 U.O.N. = UNLESS OTHERWISE NOTED.



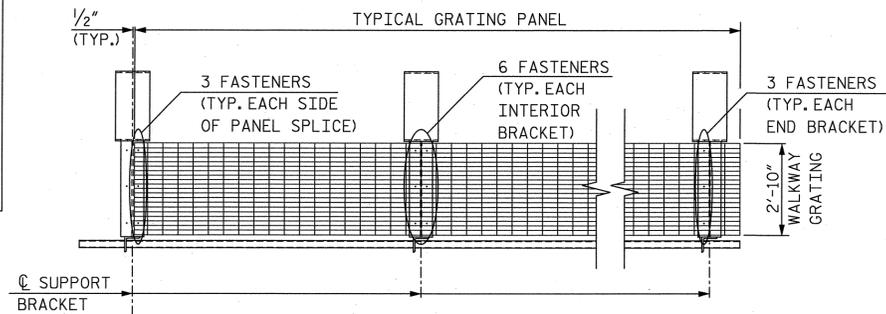
PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7740+96.34 -M1-
 MILE POST: 313.02

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 WALKWAY AND HANDRAIL PLAN

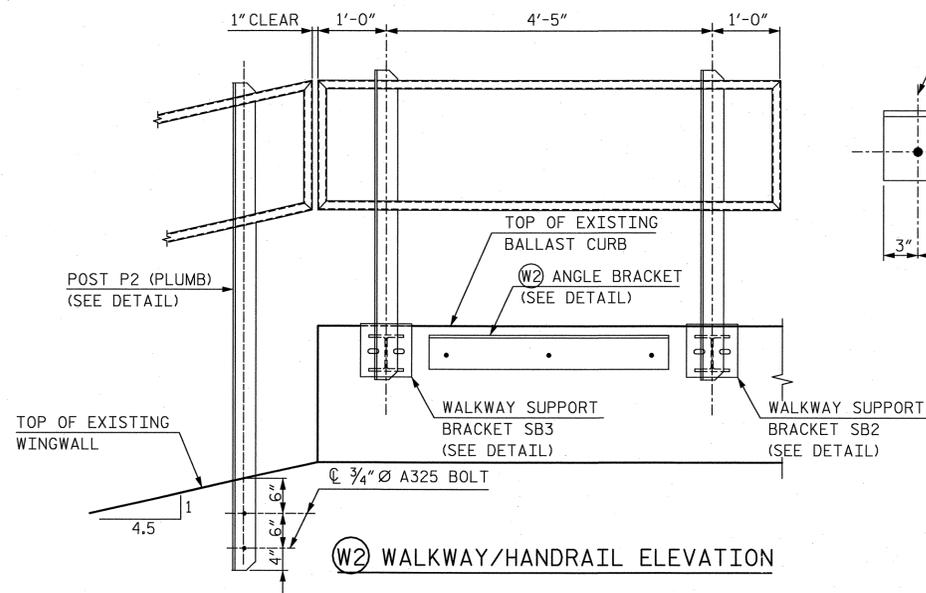


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|---|------------|------------|-----|--------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. |
| NO. | BY: | DATE: | NO. | BY: |
| 1 | J. BAYNE | 12/12 | 3 | |
| 2 | D. HAWKINS | 2/13 | 4 | |
| DRAWN BY: J. BAYNE DATE: 12/12 | | DWG. NO. 5 | | TOTAL SHEETS: 5-33 |
| CHECKED BY: D. HAWKINS DATE: 2/13 | | | | GA |

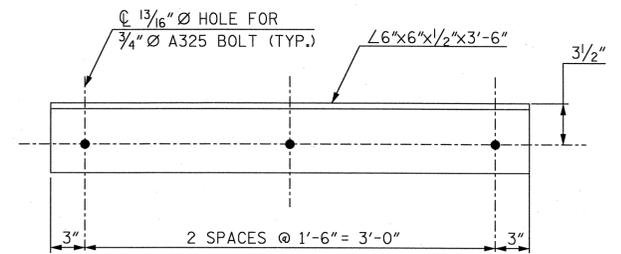
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PARTIAL WALKWAY PLAN



W2 WALKWAY/HANDRAIL ELEVATION



W2 ANGLE BRACKET

MATERIAL REQUIREMENTS

CONTRACTOR SHALL SUBMIT WALKWAY AND HANDRAIL SHOP DRAWINGS FOR APPROVAL PRIOR TO FABRICATION AND INSTALLATION.

WALKWAY AND HANDRAIL SHALL MEET THE FOLLOWING MATERIAL REQUIREMENTS:
 WALKWAY SUPPORT BRACKET - ASTM A36
 HANDRAIL PIPE - ASTM A53 GRADE B
 CARRIAGE BOLT - ASTM A307 GRADE A
 ELASTIC LOCKNUT - MIL-N-25027
 FLAT CIRCULAR WASHER - ASTM F436

WALKWAY GRATING SHALL BE 2'-10" WIDE PANELS WITH 1 3/4" BEARING BARS ON 1 3/8" CENTERS AND CROSS BARS ON 4" CENTERS (NAAMM W-19-4).

WALKWAY GRATING PANELS SHALL BE FULLY HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A123 AND SHALL HAVE A SERRATED TOP SURFACE.

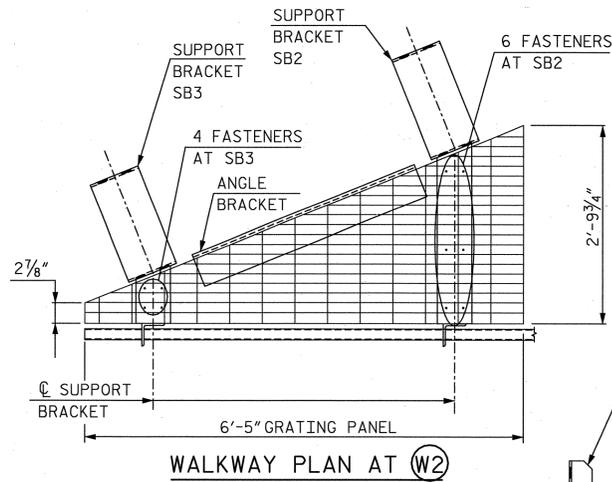
A325 BOLTS FOR ATTACHMENT OF POST P1 AND P2 AND W2 ANGLE BRACKET SHALL BE INSTALLED USING AN ADHESIVE ANCHOR SYSTEM. ADHESIVE ANCHOR SYSTEM SHALL PROVIDE A WORKING LOAD OF 2,500 LBS. FIELD TESTING OF ADHESIVE ANCHORS IS NOT REQUIRED.

EXCEPT FOR THE GALVANIZED GRATING PANELS, WALKWAY ASSEMBLIES SHALL BE SHOP-PAINTED WITH AN APPROVED INORGANIC ZINC-ACRYLIC SYSTEM IN ACCORDANCE WITH PAINTING STRUCTURAL STEEL SPECIAL PROVISION. TOP COAT SHALL BE WHITE.

A307 AND A325 BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM B695.

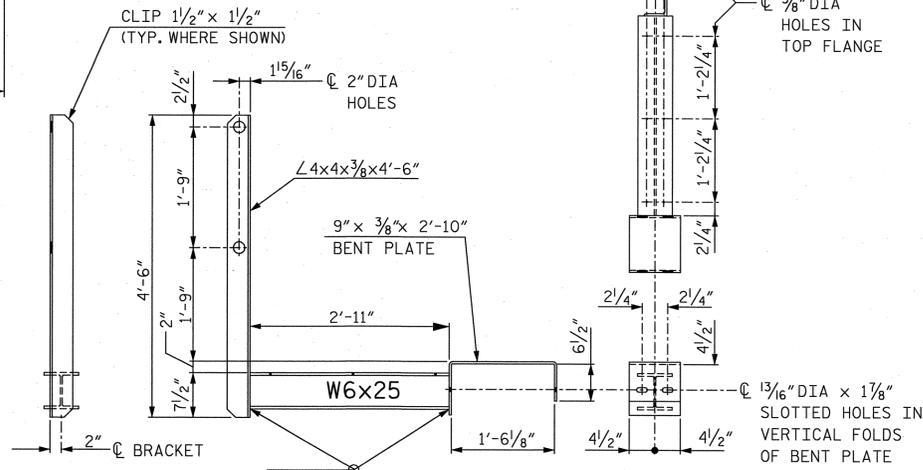
PAYMENT FOR WINGWALL EXTENSION HANDRAILS SHALL BE INCLUDED IN UNIT COST FOR METAL RAIL AND WALKWAY.

METAL RAIL AND WALKWAY PAY LENGTH : 277.0 LIN. FT.

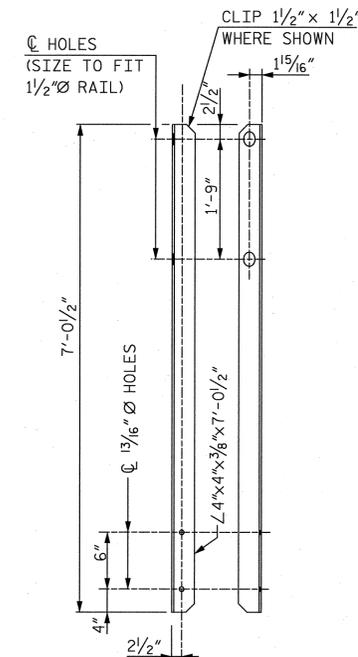


WALKWAY PLAN AT W2

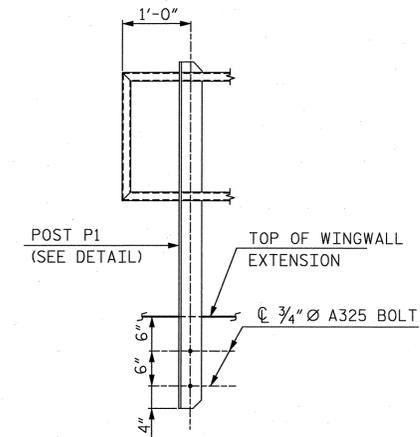
NOTE:
 GRATING PANELS SHALL BE ATTACHED TO THE SUPPORT BRACKETS USING STANDARD PANEL FASTENERS. THE 3/8" DIA HOLES PROVIDED IN THE W6x25 TOP FLANGE MAY BE USED FOR THIS PURPOSE. ATTACHMENT DETAILS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.



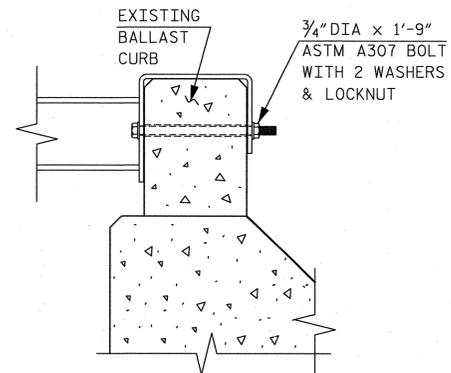
WALKWAY AND HANDRAIL SUPPORT BRACKET (SB1) DETAILS



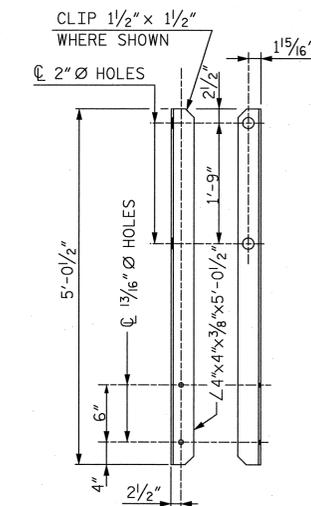
POST P2 DETAIL



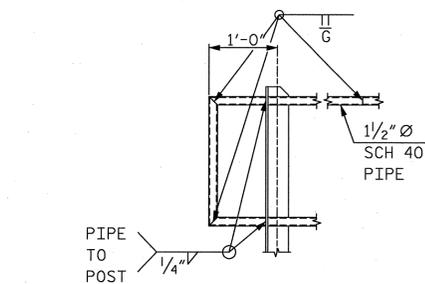
WINGWALL EXTENSION HANDRAIL DETAILS
 (TYPICAL W1 AND W3 WINGWALLS)



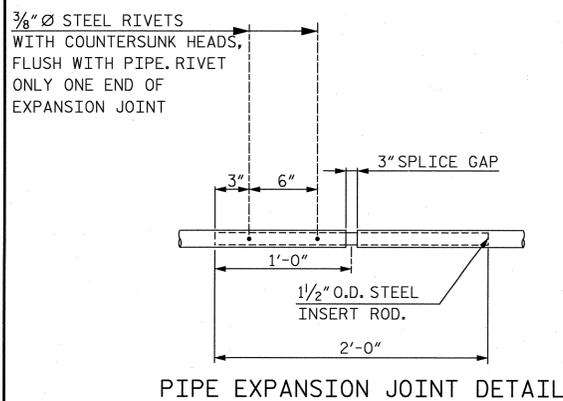
DETAIL OF ATTACHMENT AT BALLAST CURB



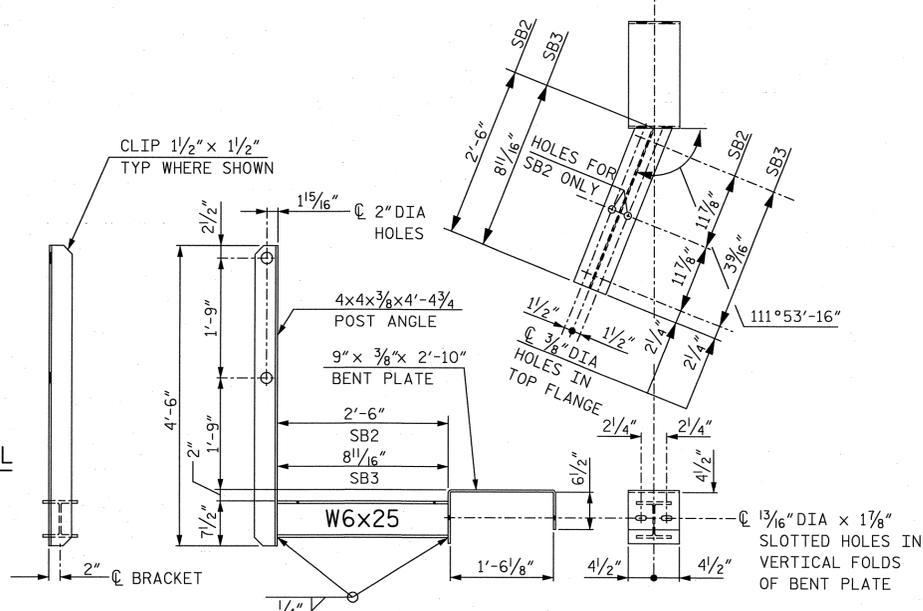
POST P1 DETAIL



HANDRAIL DETAIL



PIPE EXPANSION JOINT DETAIL



WALKWAY AND HANDRAIL SUPPORT BRACKET (SB2 & SB3) DETAILS



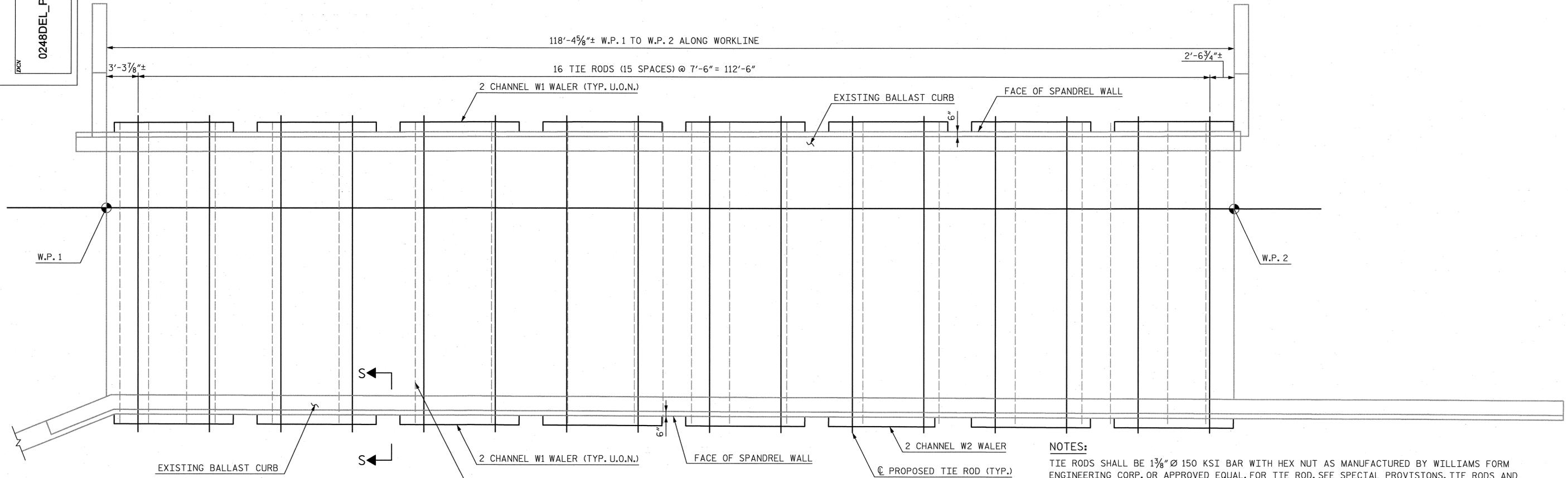
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DRAWN BY: J. BAYNE DATE: 12/12
 CHECKED BY: D. HAWKINS DATE: 2/13 DWG. NO. 6

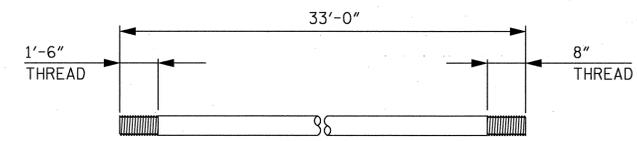
PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7740+96.34 -M1-
 MILE POST: 313.02

| | | | | | |
|--|-----|-------|-----|-----|-------|
| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
| SUPERSTRUCTURE | | | | | |
| WALKWAY AND HANDRAIL DETAILS | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| SHEET NO. | | | | | S-34 |
| TOTAL SHEETS | | | | | 64 |

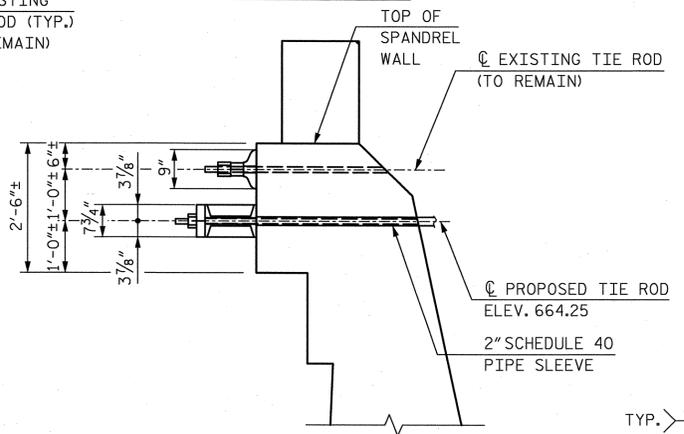
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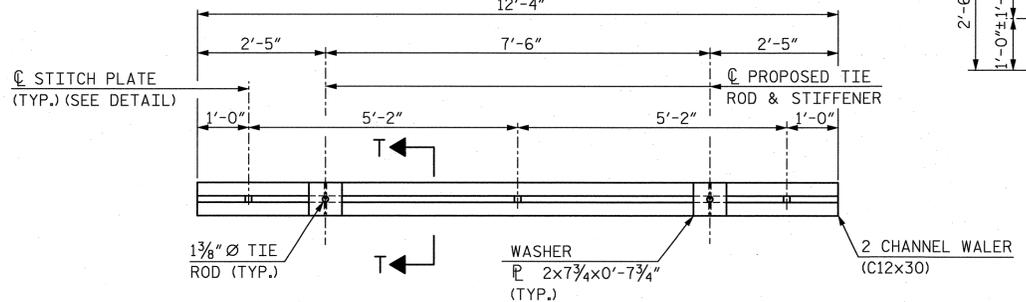
TIE ROD PLAN



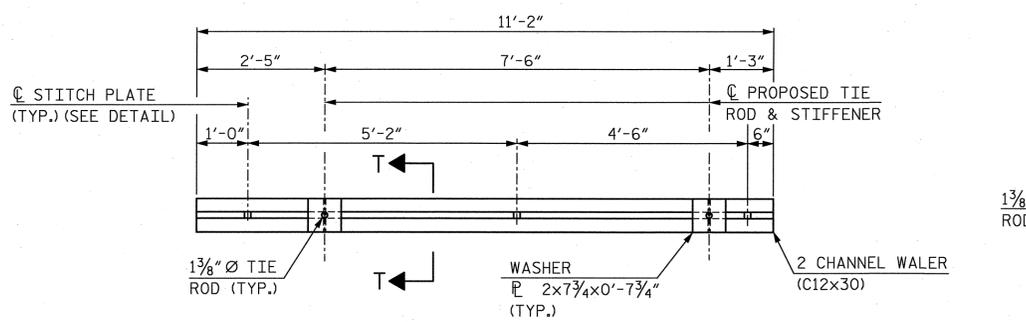
TIE ROD DETAIL



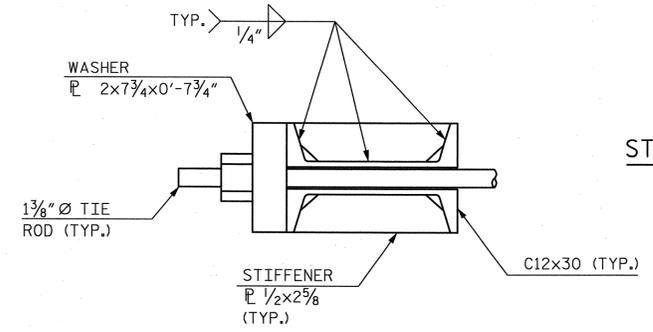
SECTION S-S



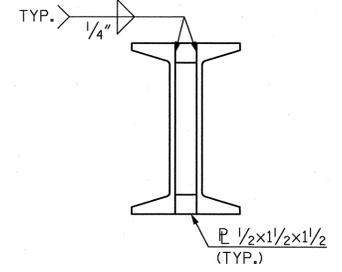
W1 WALER DETAIL



W2 WALER DETAIL



SECTION T-T



STITCH PLATE DETAIL

NOTES:

TIE RODS SHALL BE 1 3/8" Ø 150 KSI BAR WITH HEX NUT AS MANUFACTURED BY WILLIAMS FORM ENGINEERING CORP. OR APPROVED EQUAL. FOR TIE ROD, SEE SPECIAL PROVISIONS. TIE RODS AND HEX NUTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 AND ASTM A143. MECHANICAL CLEANING SHALL BE UTILIZED IN THE GALVANIZING PROCESS.

ALL STEEL PARTS OTHER THAN THE TIE BAR AND HEX NUT SHALL BE A709 GRADE 50 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.

EXISTING TIE RODS SHALL REMAIN. CONTRACTOR SHALL TAKE APPROPRIATE MEASURES TO ENSURE THAT EXISTING TIE RODS ARE PROTECTED FROM DAMAGE DURING CONSTRUCTION ACTIVITIES,

PRIOR TO INSTALLING WALERS AND TIE ROD NUTS, CONTRACTOR SHALL COMPLETELY FILL 2" SCHEDULE 40 PIPE WITH GROUT.

TIE ROD NUTS SHALL BE INSTALLED TO A SNUG TIGHT CONDITION. SNUG TIGHT IS DEFINED AS THE FULL EFFORT OF A MAN USING AN ORDINARY SPUD WRENCH.

FOR TIE ROD INSTALLATION, SEE "CONSTRUCTION SEQUENCE" SHEET.

U.O.N. = UNLESS OTHERWISE NOTED.

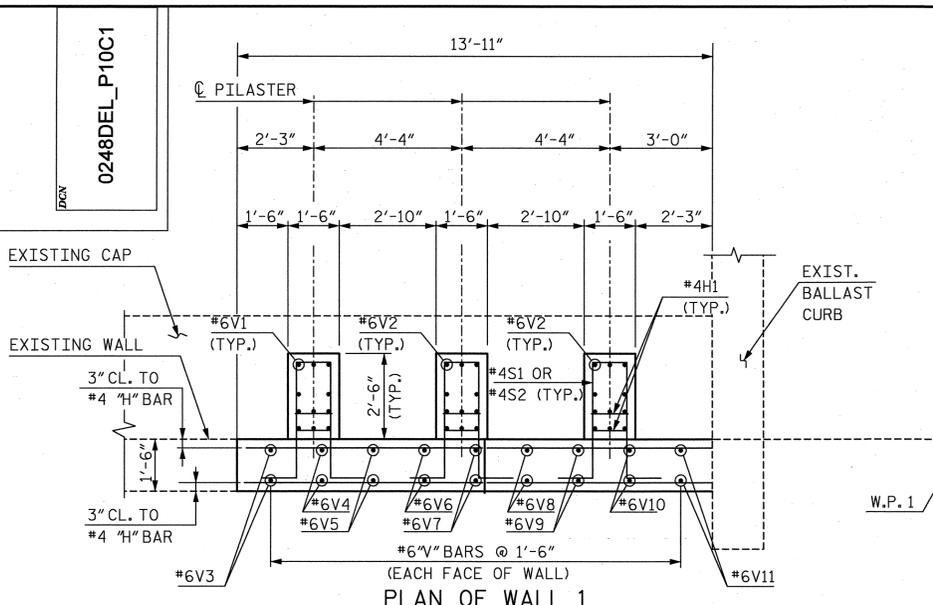
PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7740+96.34 -M1-
 MILE POST: 313.02

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 WALER AND TIE ROD DETAILS

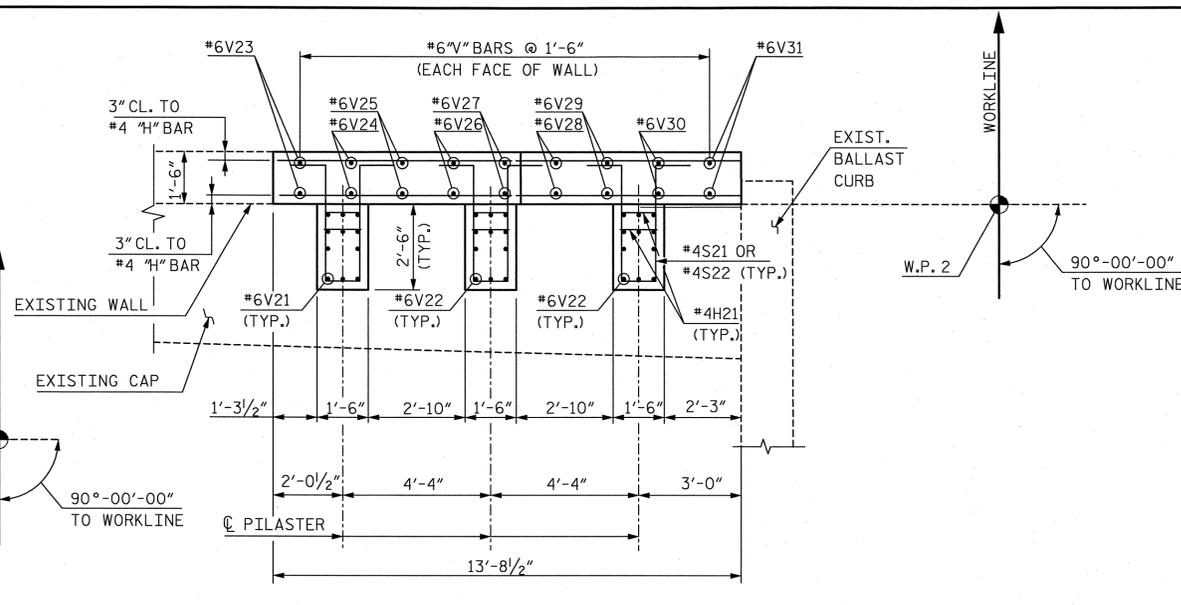


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|---|------------|---|-----------------------------------|-----|------------------------|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | J. BAYNE | 12/12 | 3 | | |
| 2 | D. HAWKINS | 2/13 | 4 | | |
| DRAWN BY: J. BAYNE DATE: 12/12 DWG. NO. 7 | | | CHECKED BY: D. HAWKINS DATE: 2/13 | | |
| REVISIONS | | | | | SHEET NO. S-35 |
| | | | | | TOTAL SHEETS 64 |

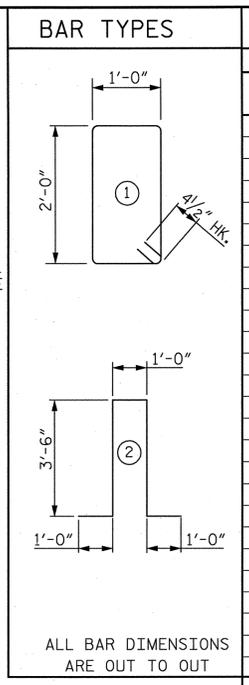
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PLAN OF WALL 1



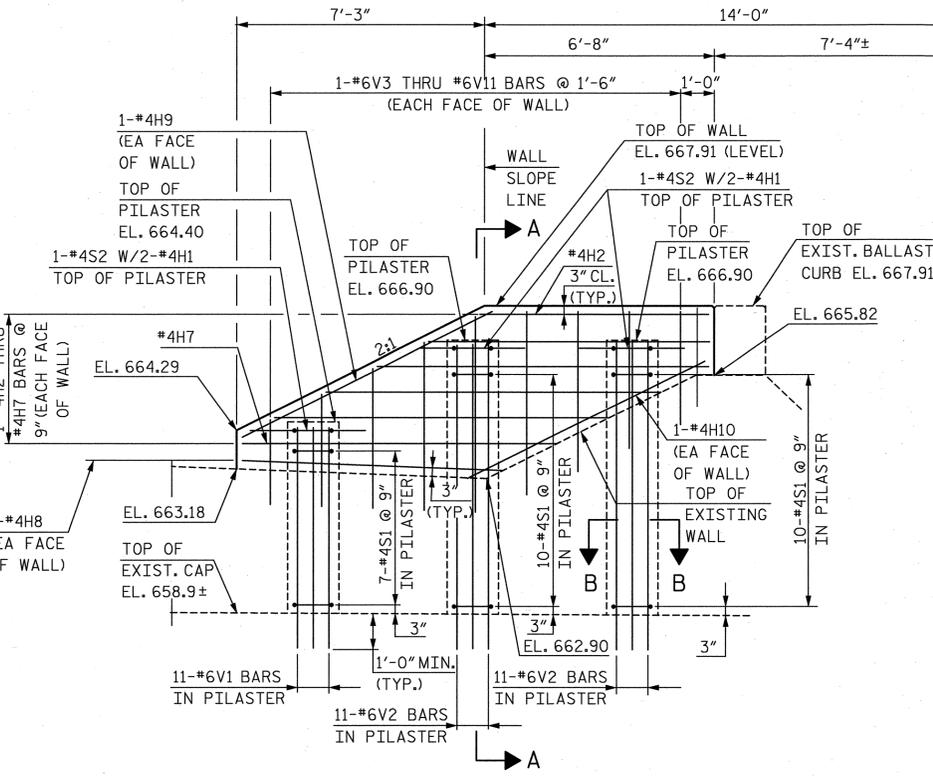
PLAN OF WALL 2



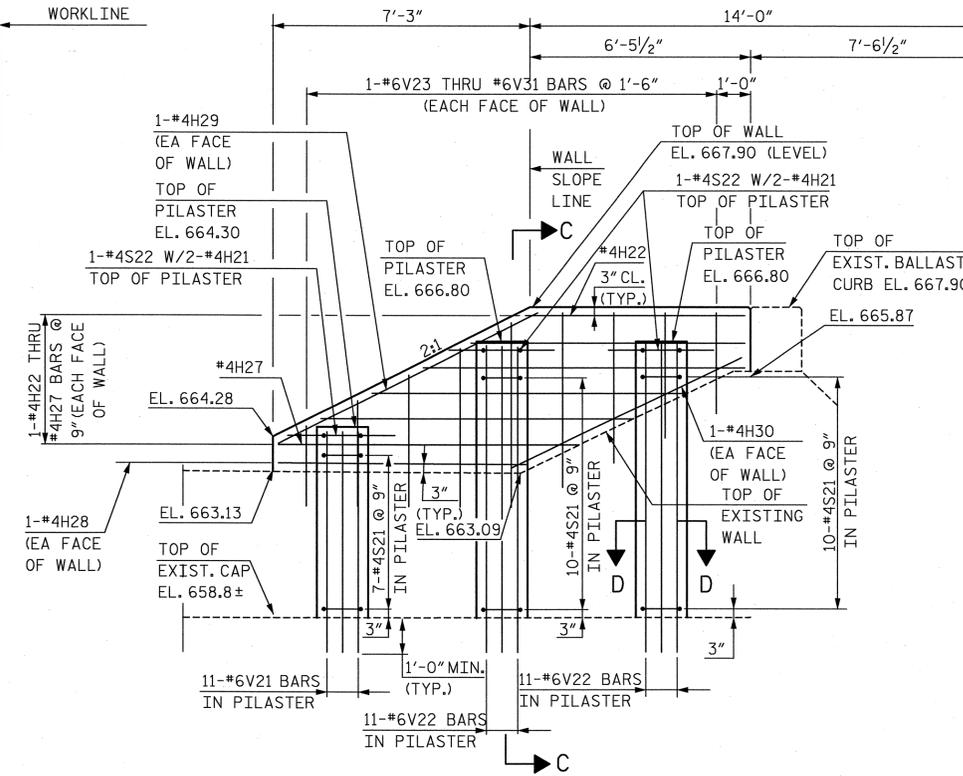
ALL BAR DIMENSIONS ARE OUT TO OUT

| BILL OF MATERIAL | | | | | |
|------------------|-----|------|------|--------|--------|
| WALL 1 | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| H1 | 6 | 4 | STR | 1'-0" | 4 |
| H2 | 2 | 4 | STR | 6'-4" | 8 |
| H3 | 2 | 4 | STR | 7'-10" | 10 |
| H4 | 2 | 4 | STR | 9'-4" | 12 |
| H5 | 2 | 4 | STR | 9'-4" | 12 |
| H6 | 2 | 4 | STR | 9'-4" | 12 |
| H7 | 2 | 4 | STR | 8'-6" | 11 |
| H8 | 2 | 4 | STR | 7'-0" | 9 |
| H9 | 2 | 4 | STR | 8'-1" | 11 |
| H10 | 2 | 4 | STR | 6'-3" | 8 |
| S1 | 27 | 4 | 1 | 6'-9" | 122 |
| S2 | 3 | 4 | 2 | 10'-0" | 20 |
| V1 | 11 | 6 | STR | 6'-3" | 103 |
| V2 | 22 | 6 | STR | 8'-9" | 289 |
| V3 | 2 | 6 | STR | 2'-4" | 7 |
| V4 | 2 | 6 | STR | 3'-2" | 10 |
| V5 | 2 | 6 | STR | 3'-11" | 12 |
| V6 | 2 | 6 | STR | 4'-9" | 14 |
| V7 | 2 | 6 | STR | 5'-7" | 17 |
| V8 | 2 | 6 | STR | 5'-3" | 16 |
| V9 | 2 | 6 | STR | 4'-6" | 14 |
| V10 | 2 | 6 | STR | 3'-9" | 11 |
| V11 | 2 | 6 | STR | 3'-1" | 9 |
| | | | | TOTAL | 741 |

| BILL OF MATERIAL | | | | | |
|------------------|-----|------|------|--------|--------|
| WALL 2 | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| H21 | 6 | 4 | STR | 1'-0" | 4 |
| H22 | 2 | 4 | STR | 6'-1" | 8 |
| H23 | 2 | 4 | STR | 7'-7" | 10 |
| H24 | 2 | 4 | STR | 9'-1" | 12 |
| H25 | 2 | 4 | STR | 9'-1" | 12 |
| H26 | 2 | 4 | STR | 9'-1" | 12 |
| H27 | 2 | 4 | STR | 8'-6" | 11 |
| H28 | 2 | 4 | STR | 7'-0" | 9 |
| H29 | 2 | 4 | STR | 8'-1" | 11 |
| H30 | 2 | 4 | STR | 6'-3" | 8 |
| S21 | 27 | 4 | 1 | 6'-9" | 122 |
| S22 | 3 | 4 | 2 | 10'-0" | 20 |
| V21 | 11 | 6 | STR | 6'-3" | 103 |
| V22 | 22 | 6 | STR | 8'-9" | 289 |
| V23 | 2 | 6 | STR | 2'-3" | 7 |
| V24 | 2 | 6 | STR | 3'-0" | 9 |
| V25 | 2 | 6 | STR | 3'-10" | 12 |
| V26 | 2 | 6 | STR | 4'-8" | 14 |
| V27 | 2 | 6 | STR | 5'-5" | 16 |
| V28 | 2 | 6 | STR | 5'-2" | 16 |
| V29 | 2 | 6 | STR | 4'-5" | 13 |
| V30 | 2 | 6 | STR | 3'-8" | 11 |
| V31 | 2 | 6 | STR | 3'-0" | 9 |
| | | | | TOTAL | 738 |

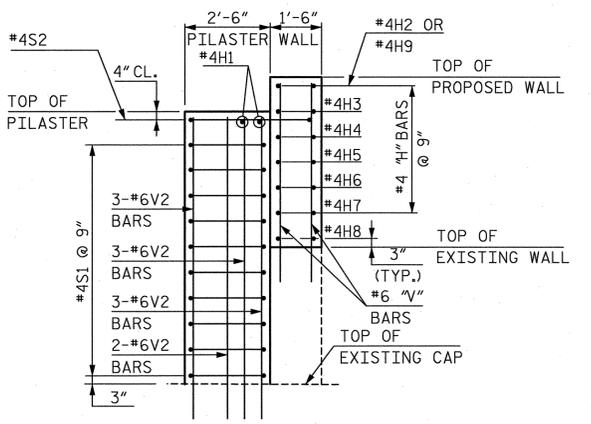


ELEVATION OF WALL 1

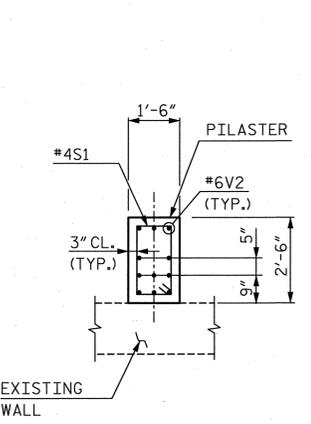


ELEVATION OF WALL 2

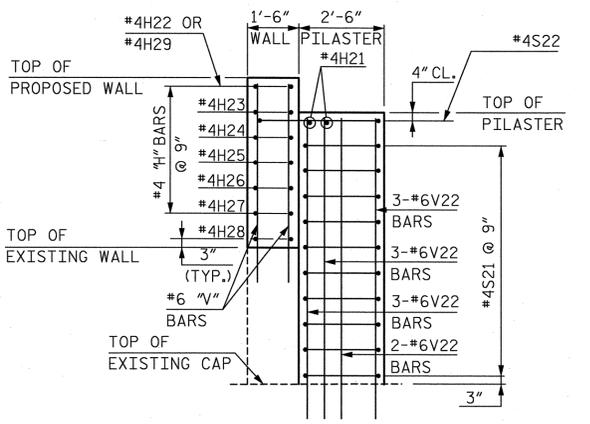
NOTES:
 THE CONTRACTOR SHALL USE AN ADHESIVE ANCHOR SYSTEM FOR THE #6 "V" BARS IN THE PILASTER AND WINGWALL EXTENSION. NO FIELD TESTING IS REQUIRED. THE YIELD LOAD OF THE #6 "V" BARS IS 26.4 KIPS. ADHESIVE ANCHOR SYSTEM SHALL DEVELOP 125% OF THE YIELD LOAD OF THE BAR. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.
 THE TOP SURFACE OF EXISTING WALLS AND CAPS SHALL BE FREE OF DEBRIS AND UNSOUND CONCRETE PRIOR TO PLACEMENT OF WALL EXTENSION AND PILASTER.
 THE TOP SURFACE OF EXISTING WALLS AND CAPS SHALL BE ROUGHENED TO 1/4" AMPLITUDE PRIOR TO PLACEMENT OF WALL EXTENSION AND PILASTER.



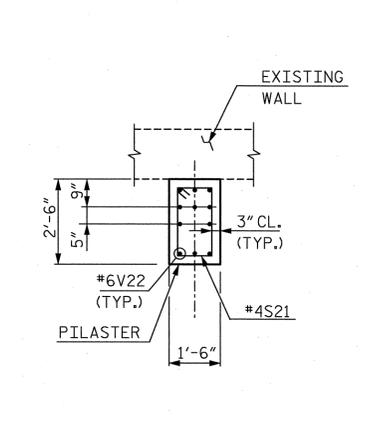
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

| QUANTITIES | | |
|--------------------|------|-------|
| WALL 1 | | |
| ITEM | | TOTAL |
| REINFORCING STEEL | LBS | 741 |
| CLASS AA CONCRETE: | C.Y. | 5.5 |
| WALL 2 | | |
| ITEM | | TOTAL |
| REINFORCING STEEL | LBS | 738 |
| CLASS AA CONCRETE: | C.Y. | 5.4 |

PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7740+96.34 -M1-
 MILE POST: 313.02

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 WINGWALL EXTENSION
 DETAILS



HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY: J. BAYNE DATE: 2/13
 CHECKED BY: K. DICKENS DATE: 2/13 DWG. NO. 8

| REVISIONS | | | | | |
|-----------|-----|-------|-----|-----|-------|
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

SHEET NO. S-36
 TOTAL SHEETS 64

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7760+00 +20 +40 +60 +80 7761+00 +20 +40 +60 +80 7762+00 +20 +40 +60

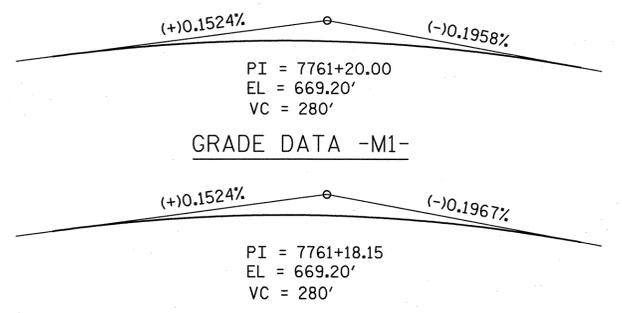
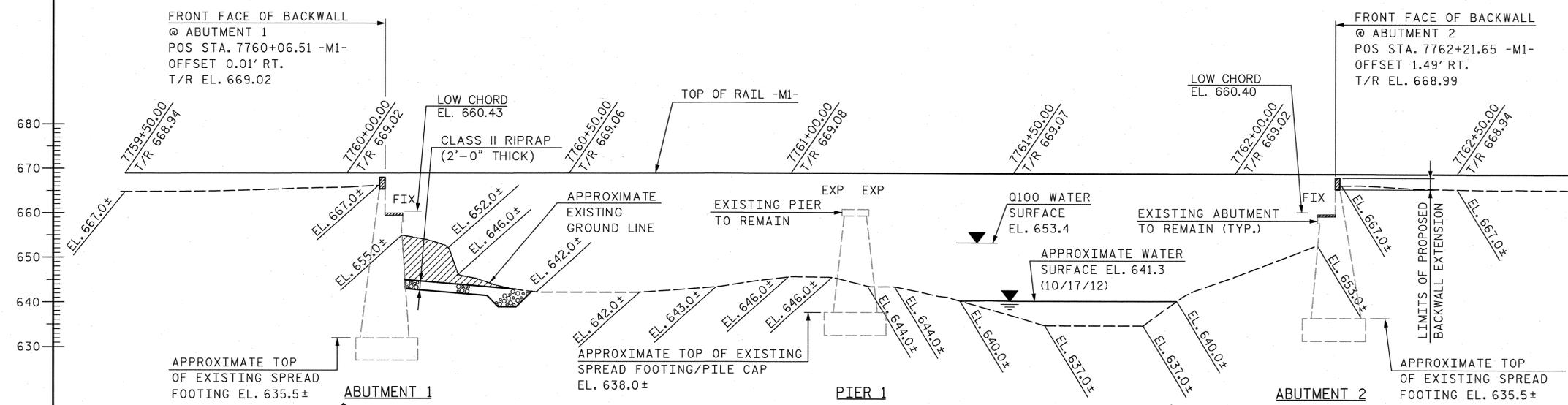
NOTES:
FOR GENERAL NOTES, SEE "GENERAL DRAWING: GENERAL NOTES AND INDEX OF DRAWINGS" SHEET.

CURVE DATA FOR -M1- (M1 3134)

PIs STA 7762+40.11
Δs = 2°-39'-10.9" (LT)
Ls = 403.00 FT.
LT = 268.70 FT.
ST = 134.36 FT.

CURVE DATA FOR -M2- (M2 3134)

PIs STA 7762+48.47
Δs = 2°-41'-11.8" (LT)
Ls = 403.00 FT.
LT = 268.70 FT.
ST = 134.36 FT.



HYDRAULIC DATA
DESIGN DISCHARGE 10700 CFS
FREQUENCY OF DESIGN FLOOD 100 YRS.
DESIGN HIGH WATER ELEVATION 653.4
DRAINAGE AREA 72.1 SQ. MI.

OVERTOPPING FLOOD DATA
OVERTOPPING DISCHARGE N/A
FREQUENCY OF OVERTOPPING FLOOD >500+ YRS.
OVERTOPPING FLOOD ELEVATION 668.3

I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS

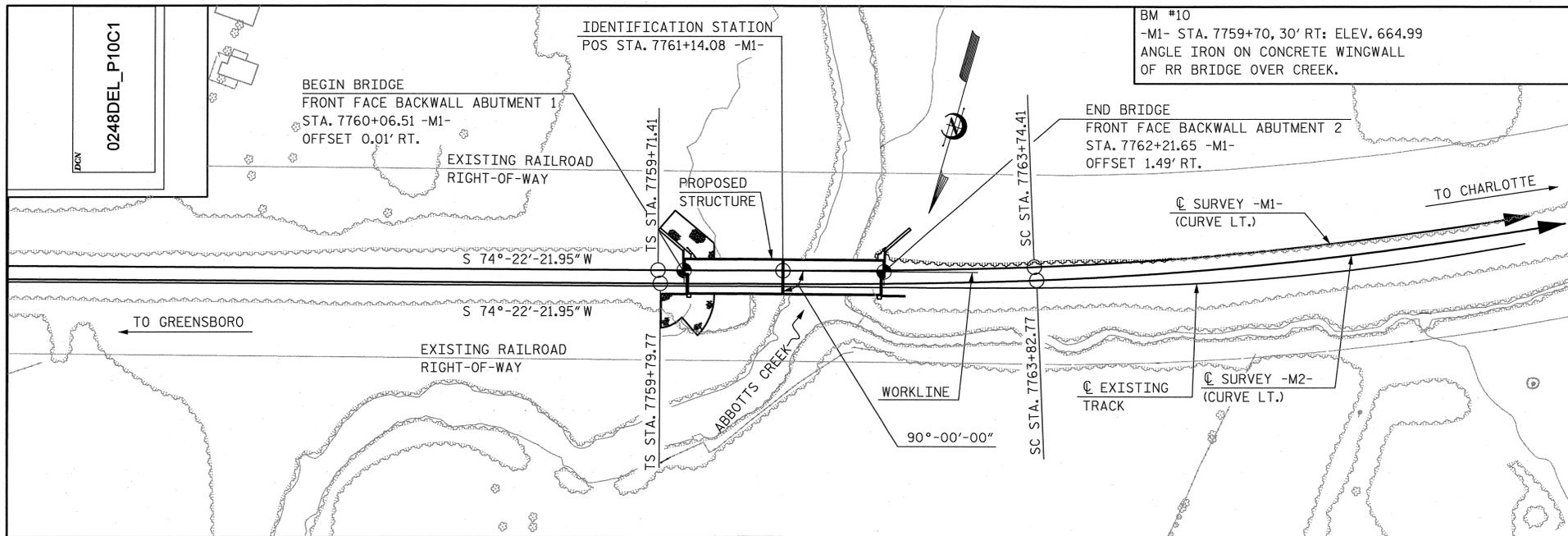
PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7761+14.08 -M1-
MILE POST: 313.40
SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
GENERAL DRAWING
BRIDGE ON NCR MAINLINE
OVER ABBOTTS CREEK
BETWEEN SR 2005 AND US 64

Professional Engineer seals for Paul J. Barber (Seal 12916) and David W. Hawkins (Seal 27812).

| | | | | | | |
|---|-----|-----------|-----|-----------|-------|--------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |
| 1 | | 2/13 | 3 | | | 64 |
| 2 | | 2/13 | 4 | | | |

PLAN



LOCATION SKETCH

FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS

TOTAL BILL OF MATERIAL

| | REMOVAL OF EXISTING STRUCTURE AT STATION 7761+14.08 -M1- | UNCLASSIFIED STRUCTURE EXCAVATION AT STATION 7761+14.08 -M1- | REINFORCED CONCRETE DECK SLAB | CLASS AA CONCRETE | REINFORCING STEEL | APPROX. 1,292,176 LBS. STRUCTURAL STEEL | PAINTING OF STRUCTURAL STEEL | WATER-PROOFING | METHOD B DAMPPROOFING | METAL RAIL (ALUMINUM) | CONCRETE PARAPET | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE | SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES | STRUCTURE DRAINAGE SYSTEM | EPOXY MORTAR REPAIR |
|----------------|--|--|-------------------------------|-------------------|-------------------|---|------------------------------|----------------|-----------------------|-----------------------|------------------|--------------------------------|-------------------------|---|---------------------------|---------------------|
| | LUMP SUM | LUMP SUM | SQ. FEET | CU. YARDS | LBS. | LUMP SUM | LUMP SUM | SQ. YARDS | SQ. YARDS | L.F. | L.F. | TON | SQ. YARDS | LUMP SUM | LUMP SUM | SQ. FEET |
| SUPERSTRUCTURE | --- | --- | 7,932 | --- | --- | LUMP SUM | LUMP SUM | 850.1 | --- | 488.4 | 423.9 | --- | --- | LUMP SUM | LUMP SUM | --- |
| ABUTMENT 1 | --- | LUMP SUM | --- | 15.7 | 2,583 | --- | --- | 12.5 | 25.2 | --- | --- | 557 | 619 | --- | --- | 194.6 |
| PIER 1 | --- | --- | --- | 3.7 | 543 | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | 195.9 |
| ABUTMENT 2 | --- | --- | --- | 15.6 | 2,580 | --- | --- | 12.4 | 25.0 | --- | --- | --- | --- | --- | --- | 183.7 |
| TOTAL | LUMP SUM | LUMP SUM | 7,932 | 35.0 | 5,706 | LUMP SUM | LUMP SUM | 875.0 | 50.2 | 488.4 | 423.9 | 557 | 619 | LUMP SUM | LUMP SUM | 574.2 |

EXISTING TPG STRUCTURE AND PORTIONS OF EXISTING BACKWALLS AND GIRDER SEATS SHALL BE REMOVED AS SHOWN IN THE PLANS. REMOVAL OF THESE ITEMS SHALL BE PAID FOR ON A LUMP SUM BASIS AS REMOVAL OF EXISTING STRUCTURE AT STATION 7761+14.08 -M1-.

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40
 SHEET 2 OF 3



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 LOCATION SKETCH
 AND
 TOTAL BILL OF MATERIAL

| | | | | | |
|---|------------|-----------|-----|-------|--------------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | | SHEET NO. S-38 |
| DRAWN BY: J. BAYNE | DATE: 2/13 | NO. 3 | BY: | DATE: | TOTAL SHEETS |
| CHECKED BY: D. HAWKINS | DATE: 3/13 | NO. 4 | BY: | DATE: | 64 |
| DWG. NO. 2 | | | | | |

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GENERAL NOTES

ASSUMED LIVE LOAD = AREMA E80 OR ALTERNATE LIVE LOAD.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

THIS BRIDGE SUPERSTRUCTURE AND SUBSTRUCTURE MODIFICATIONS HAVE BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF AREMA'S MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES, AND NORFOLK SOUTHERN CORPORATION'S "GUIDELINES FOR DESIGN OF HIGHWAY SEPARATION STRUCTURES UNDER RAILROAD (UNDERPASS GRADE SEPARATION)".

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC ZONE 1.

REINFORCING STEEL SHALL BE ASTM DESIGNATION A615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED. FABRICATION TO BE IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE", A.C.I. 315-80. ALL REINFORCING IN THE CONCRETE DECK SLAB AND PARAPETS SHALL BE EPOXY COATED.

EXPANSION JOINT MATERIAL SHALL BE EITHER RUBBER OR CORK CONFORMING WITH AASHTO SPECIFICATIONS M-153-84 EXCEPT AS SHOWN ON THE PLANS OR IN THE SPECIAL PROVISIONS. CELLULAR AND BULB TYPE WATERSTOPS AND RUBBER JOINT COMPOUNDS SHALL BE AS SHOWN ON THE PLANS AND IN THE SPECIAL PROVISIONS.

STRUCTURE DRAINAGE SYSTEM: METAL DRAINS IN BALLAST TROUGH OF BRIDGE SHALL BE AS SHOWN ON THE PLANS AND OUTLINED IN THE SPECIAL PROVISIONS. DETAILS OF THE DRAINAGE SYSTEM SHALL BE SUBMITTED TO THE CHIEF ENGINEER BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, GA. FOR APPROVAL.

DAMP PROOFING: BACK OF PROPOSED BACKWALLS AND BACK OF PROPOSED WINGS SHALL BE DAMP PROOFED WITH METHOD "B" DAMP PROOFING.

WATER PROOFING: BRIDGE DECK, ALL CONSTRUCTION JOINTS AND ANY VISIBLE SHRINKAGE CRACKS WHICH WILL BE COVERED BY FILL SHALL BE WATER PROOFED WITH A COLD LIQUID-APPLIED ELASTOMERIC MEMBRANE. FOR WATER PROOFING, SEE SPECIAL PROVISIONS.

WATER PROOFING IS REQUIRED AT THE FOLLOWING LOCATIONS:
1. BRIDGE DECK AND INSIDE OF CONCRETE PARAPET AS SHOWN ON "TYPICAL SECTION".
2. ALONG FILL FACE OF HORIZONTAL CONSTRUCTION JOINT BETWEEN PROPOSED BACKWALL/WINGWALL EXTENSION AND EXISTING BACKWALL/WINGWALL.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR PLACING LOAD ON STRUCTURE MEMBERS, SEE SPECIAL PROVISIONS.

ALL MATERIALS AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2012, NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE ON PLANS, OR IN THE SPECIAL PROVISIONS (STRUCTURAL STEEL IN ACCORDANCE WITH CURRENT AREMA SPECIFICATIONS).

ALL CONCRETE SHALL BE 4,500 PSI CLASS AA CONCRETE WITH NO. 57 OR 67 COARSE AGGREGATE AND SHALL BE AIR-ENTRAINED. MINIMUM CEMENT CONTENT PER CUBIC YARD OF CONCRETE SHALL BE 6.5 BAGS. NO SUBSTITUTION OF FLYASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. CHAMFER ALL EXPOSED EDGES AND CORNERS 3/4" EXCEPT AS NOTED. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THIS STRUCTURE.

CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED SATISFACTORY TO THE ENGINEER AND/OR NORFOLK SOUTHERN RAILWAY COMPANY. ALL METHODS OF HANDLING THE WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY COMPANY BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.

NEEDLE BEAMS WILL NOT BE ALLOWED UNLESS OTHERWISE CALLED FOR ON THE PLANS OR APPROVED BY THE ENGINEER.

FOR METAL RAIL (ALUMINUM), SEE SPECIAL PROVISIONS.

FOR SELF-LUBRICATING EXPANSION BEARING ASSEMBLIES, SEE SPECIAL PROVISIONS.

FOR CONDUIT IN PARAPETS, SEE SPECIAL PROVISIONS.

FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.

FOR FINE AND COARSE AGGREGATE, SEE SPECIAL PROVISIONS.

SEE "STRUCTURAL STEEL DETAILS" SHEET 1 OF 2 FOR STRUCTURAL STEEL NOTES.

FOR BACKFILL BEHIND ABUTMENTS AND OTHER BACKFILL AROUND THE STRUCTURE, SEE SPECIAL PROVISION "BACKFILLING AROUND STRUCTURES".

FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR WATERSTOPS, SEE SPECIAL PROVISIONS.

FOR ELASTOMERIC FLASHING, SEE SPECIAL PROVISIONS.

FOR RUBBER JOINT COMPOUNDS, SEE SPECIAL PROVISIONS.

FOR STRUCTURE DRAINAGE SYSTEM, SEE SPECIAL PROVISIONS.

FOR STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

FOR RAILROAD TRACKWORK, SEE RAILROAD TRACKWORK PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CONCRETE PARAPET, SEE SPECIAL PROVISIONS.

FOR WATER PROOFING, SEE SPECIAL PROVISIONS.

FOR EPOXY MORTAR REPAIRS, SEE SPECIAL PROVISIONS.

THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.

ALL BAR SUPPORTS AND ALL INCIDENTAL REINFORCING STEEL USED IN THE DECK AND PARAPET SHALL BE EPOXY COATED IN ACCORDANCE WITH THE NCDOT STANDARD SPECIFICATIONS.

THE SUPERSTRUCTURE OF THE EXISTING TWO SPAN STRUCTURE CONSISTING OF DUAL THRU-PLATE GIRDER SPANS OF 105'-11" AND 108'-8" SHALL BE REMOVED.

THESE DRAWINGS HAVE BEEN PREPARED BASED ON THE BEST INFORMATION AVAILABLE. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS IN CONSTRUCTION DETAILS AND QUANTITIES. THE CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION OF ALL DETAILS INCLUDING GEOMETRY AND ELEVATIONS PRIOR TO THE FABRICATION OR INSTALLATION OF ANY MATERIAL. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER, OR AUTHORIZED REPRESENTATIVE, COPIES OF FIELD SURVEYS AND VERIFICATIONS FOR THE INCLUSION INTO THE CONSTRUCTION RECORDS FOR THE PROJECT.

REMOVAL OF THE EXISTING BRIDGE SUPERSTRUCTURE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE SUPERSTRUCTURE AND SUBMIT PLANS FOR DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

TRACKWORK SHALL BE CONSTRUCTED BY OTHERS. TRACKWORK SHALL INCLUDE BALLAST, TIES, RAILS AND OTHER TRACK MATERIAL. COORDINATION WILL BE REQUIRED BETWEEN THE TRACK CONTRACTOR AND THE BRIDGE CONTRACTOR TO ACCOMMODATE PROPOSED SUPERSTRUCTURE AND SUBSTRUCTURE MODIFICATIONS.

△ INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 7761+14.08 -M1-".

△ INASMUCH AS THE EXISTING BRIDGE TIES CONTAIN CREOSOTE OR OTHER PRESERVATIVE TREATMENT, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING CREOSOTE OR OTHER PRESERVATIVE TREATMENT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 7761+14.08 -M1-".

INDEX OF DRAWINGS

- 1 GENERAL DRAWING: GENERAL PLAN & ELEVATION (SHEET 1 OF 3)
- 2 GENERAL DRAWING: LOCATION SKETCH AND TOTAL BILL OF MATERIAL (SHEET 2 OF 3)
- 3 GENERAL DRAWING: GENERAL NOTES AND INDEX OF DRAWINGS (SHEET 3 OF 3)
- 4 SEQUENCE OF CONSTRUCTION (SHEET 1 OF 2)
- 5 SEQUENCE OF CONSTRUCTION (SHEET 2 OF 2)
- 6 SUPERSTRUCTURE: TYPICAL SECTION
- 7 SUPERSTRUCTURE: DECK DETAILS
- 8 SUPERSTRUCTURE: PLAN OF DECK - SPAN A
- 9 SUPERSTRUCTURE: PLAN OF DECK - SPAN B
- 10 SUPERSTRUCTURE: FRAMING PLAN & GIRDER DETAILS - SPAN A
- 11 SUPERSTRUCTURE: FRAMING PLAN & GIRDER DETAILS - SPAN B
- 12 SUPERSTRUCTURE: STRUCTURAL STEEL DETAILS (SHEET 1 OF 2)
- 13 SUPERSTRUCTURE: STRUCTURAL STEEL DETAILS (SHEET 2 OF 2)
- 14 SUPERSTRUCTURE: BEARING DETAILS
- 15 SUPERSTRUCTURE: EXPANSION PLATE DETAILS (SHEET 1 OF 2)
- 16 SUPERSTRUCTURE: EXPANSION PLATE DETAILS (SHEET 2 OF 2)
- 17 SUPERSTRUCTURE: METAL HANDRAIL DETAILS (SHEET 1 OF 2)
- 18 SUPERSTRUCTURE: METAL HANDRAIL DETAILS (SHEET 2 OF 2)
- 19 SUPERSTRUCTURE: BILL OF MATERIAL
- 20 SUBSTRUCTURE: ABUTMENT 1 (SHEET 1 OF 2)
- 21 SUBSTRUCTURE: ABUTMENT 1 (SHEET 2 OF 2)
- 22 SUBSTRUCTURE: PIER 1 (SHEET 1 OF 2)
- 23 SUBSTRUCTURE: PIER 1 (SHEET 2 OF 2)
- 24 SUBSTRUCTURE: ABUTMENT 2 (SHEET 1 OF 2)
- 25 SUBSTRUCTURE: ABUTMENT 2 (SHEET 2 OF 2)
- 26 RIP RAP DETAILS

PROJECT NO. C-4901A

DAVIDSON COUNTY

STATION: 7761+14.08 -M1-

MILE POST: 313.40

SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING

GENERAL NOTES

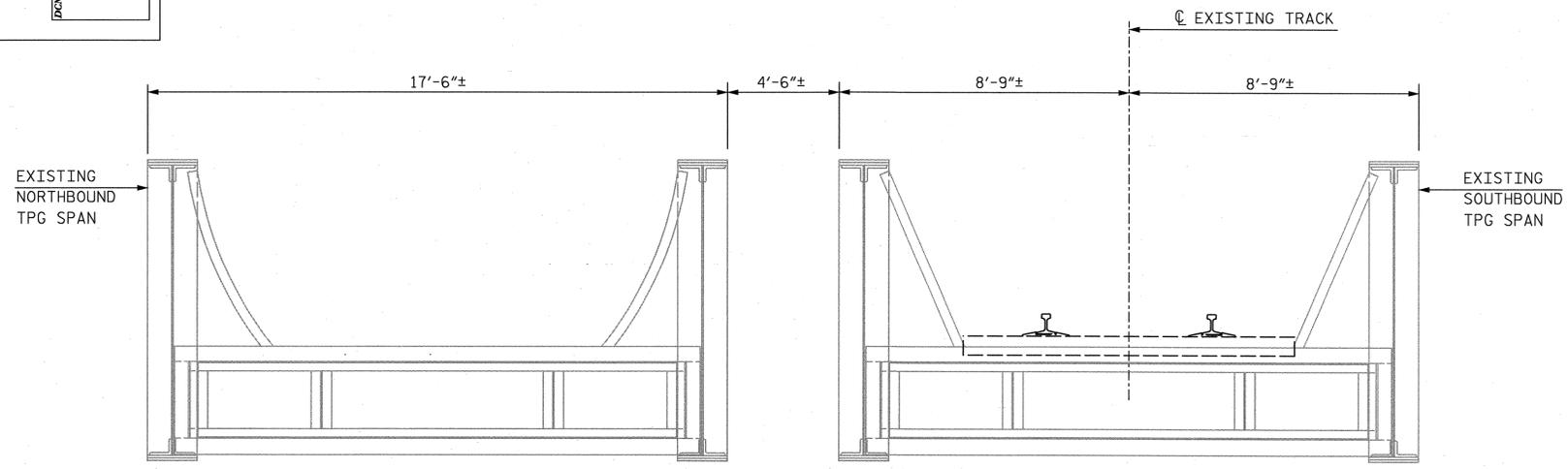
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INDEX OF DRAWINGS

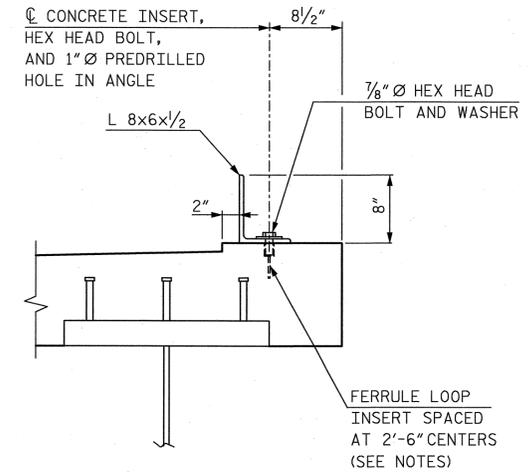


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|-------------|--|------|-----------|----------|--------------------------|
| HNTB | HNTB NORTH CAROLINA, P.C. | | REVISIONS | | SHEET NO. S-39 |
| | License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | NO. | DATE: | |
| DRAWN BY | J. BAYNE | DATE | 2/13 | DWG. NO. | 3 |
| CHECKED BY | D. HAWKINS | DATE | 2/13 | | |

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EXISTING BRIDGE TYPICAL SECTION



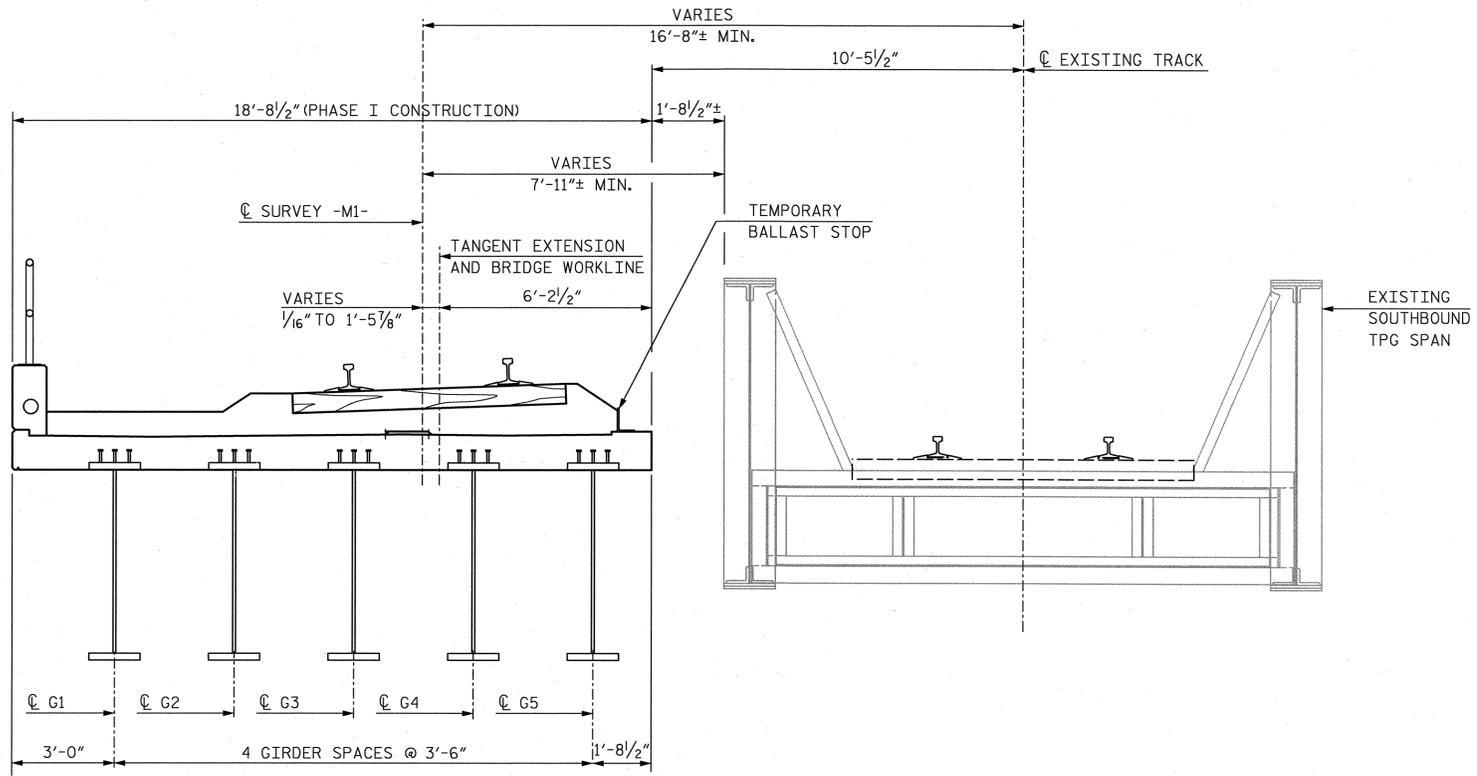
TEMPORARY BALLAST STOP DETAIL

NOTES:
 IN ORDER TO CARRY OUT THE WORK WITH THE LEAST POSSIBLE DISRUPTION TO SCHEDULED RAIL TRAFFIC, CONTRACTOR IS EXPECTED TO ADJUST WORKING HOURS OR WORK WEEK TO ACCOMMODATE TRACK AVAILABILITY BASED ON TYPICAL TRAIN SCHEDULES. TEMPORARY TRACK OUTAGES SHALL BE AT THE SOLE DISCRETION OF THE OPERATING RAILROAD. FOR "PROTECTION OF RAILWAY INTEREST", SEE PROJECT SPECIFICATIONS.

THE L 8x6x1/2 FOR THE TEMPORARY BALLAST STOP SHALL BE A36 STEEL AND ANCHORED TO THE DECK AS SHOWN IN THE DETAIL ON THIS SHEET. INSERTS SHALL BE CAST INTO THE DECK SURFACE AT MAXIMUM 2'-6" CENTERS AND SO AS TO AVOID THE TOP MAT OF REBAR AND GIRDER SHEAR STUDS. INSERTS SHALL PROVIDE A SAFE WORKING TENSION LOAD OF 5,200 LBS. AND SAFE WORKING SHEAR LOAD OF 1,800 LBS. AFTER THE PHASE 2 CONSTRUCTION HAS BEEN COMPLETED AND WATERPROOFED, REMOVE THE TEMPORARY BALLAST STOP AND GROUT THE INSERTS WITH A HIGH STRENGTH, NON-METALLIC, PORTLAND CEMENT GROUT IN ACCORDANCE WITH THE SPECIAL PROVISIONS. ALL LABOR, MATERIALS AND OTHER INCIDENTALS REQUIRED FOR TEMPORARY BALLAST STOPS SHALL BE PAID FOR UNDER THE PAY ITEM "REINFORCED CONCRETE DECK SLAB."

PHASE I CONSTRUCTION

1. REMOVE EXISTING NORTHBOUND TPG SPAN AT PROPOSED -M1- TRACK LOCATION.
2. CONSTRUCT PHASE I PIER CAP, ABUTMENT CAP AND ABUTMENT BACKWALL MODIFICATIONS AS SHOWN IN PLANS.
3. CONSTRUCT SUPERSTRUCTURE TO PHASE I LIMITS SHOWN IN TYPICAL SECTION.
4. WATERPROOF SURFACE OF PHASE I SUPERSTRUCTURE, INCLUDING 1'-2" EDGE DAM. INSERTS SHALL BE PROTECTED DURING WATERPROOFING OPERATIONS.
5. INSTALL BALLAST STOP.
6. TRACK CONTRACTOR TO BUILD AND COMPLETE -M1- ACROSS BRIDGE AND OPEN RAIL TO TRAFFIC.



PHASE I TYPICAL SECTION

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEQUENCE OF CONSTRUCTION



| | | | | | |
|---|------------|-----------|-----------------|-----------|------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. | |
| DRAWN BY: J. BAYNE | DATE: 2/13 | NO. 1 | BY: [Signature] | DATE: | S-40 |
| CHECKED BY: D. HAWKINS | DATE: 2/13 | NO. 2 | BY: [Signature] | DATE: | |

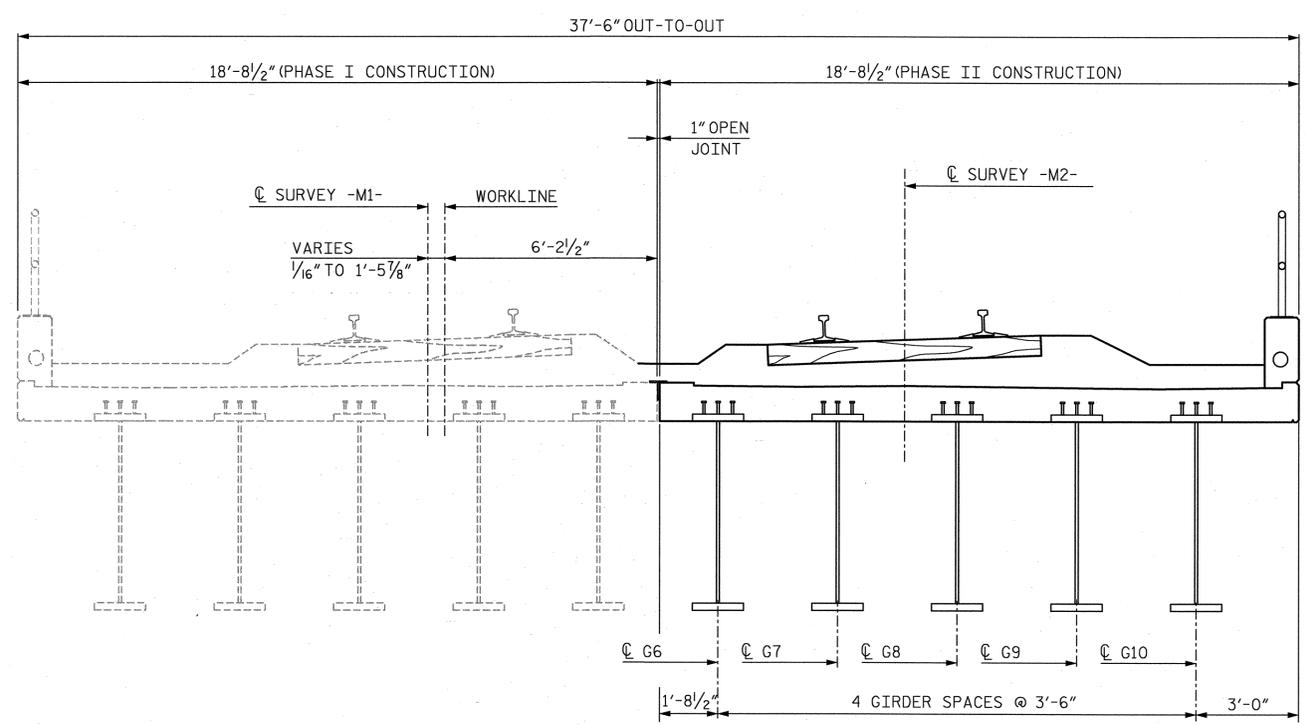
NOTES:

DIAPHRAGM CONNECTIONS IN THE CENTER BAY SHALL NOT BE PERFORMED UNDER ACTIVE TRACK CONDITIONS. THEREFORE, ONE OR MORE TEMPORARY TRACK OUTAGES MAY BE REQUIRED FOR THIS WORK. FOR A GIVEN SPAN, ALL WORK REQUIRED FOR FIELD DIAPHRAGM CONNECTIONS SHALL BE MADE DURING A SINGLE TRACK OUTAGE. FOR DIAPHRAGM CONNECTIONS IN CENTER BAY, SEE "STRUCTURAL STEEL DETAILS" SHEET 1 OF 2. TEMPORARY TRACK OUTAGES SHALL BE AT THE SOLE DISCRETION OF THE OPERATING RAILROAD.

CONSTRUCT AND REMOVE TEMPORARY BALLAST STOP AS DETAILED ON SHEET 1 OF 2. TEMPORARY BALLAST STOPS SHALL REMAIN IN PLACE UNTIL AFTER PHASE II CONSTRUCTION HAS BEEN COMPLETED AND WATERPROOFED.

PHASE II CONSTRUCTION

1. REMOVE EXISTING SOUTHBOUND TPG SPAN AT PROPOSED -M2- TRACK LOCATION.
2. CONSTRUCT PHASE II PIER CAP, ABUTMENT CAP AND BACKWALL MODIFICATIONS AS SHOWN IN PLANS.
3. CONSTRUCT SUPERSTRUCTURE TO PHASE II LIMITS SHOWN IN TYPICAL SECTION. D3 AND D4 DIAPHRAGM CONNECTIONS TO PHASE I SUPERSTRUCTURE SHALL NOT BE MADE UNTIL AFTER PHASE II BRIDGE DECK HAS CURED FOR A MINIMUM OF 14 DAYS AND ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4500 PSI.
4. COMPLETE DIAPHRAGM CONNECTIONS IN CENTER BAY AS SHOWN ON "STRUCTURAL STEEL DETAILS" SHEET 1 OF 2 AND AS NOTED HEREIN. PLACE TEMPORARY WEIGHT ON PHASE II SUPERSTRUCTURE TO VERTICALLY ALIGN DECK EDGES PRIOR TO COMPLETING D3 AND D4 CONNECTIONS.
5. WATERPROOF SURFACE OF PHASE II SUPERSTRUCTURE. ENSURE A MINIMUM OVERLAP OF 2" WITH PHASE I WATERPROOFING. REMOVE TEMPORARY BALLAST STOP AFTER WATERPROOFING HAS CURED IN ACCORDANCE WITH MEMBRANE SUPPLIER RECOMMENDATIONS.
6. TRACK CONTRACTOR TO BUILD AND COMPLETE -M2- ACROSS BRIDGE AND OPEN RAIL FOR TRAFFIC.

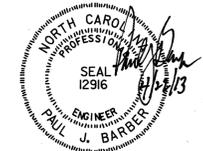


PHASE II TYPICAL SECTION

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40
 SHEET 2 OF 2

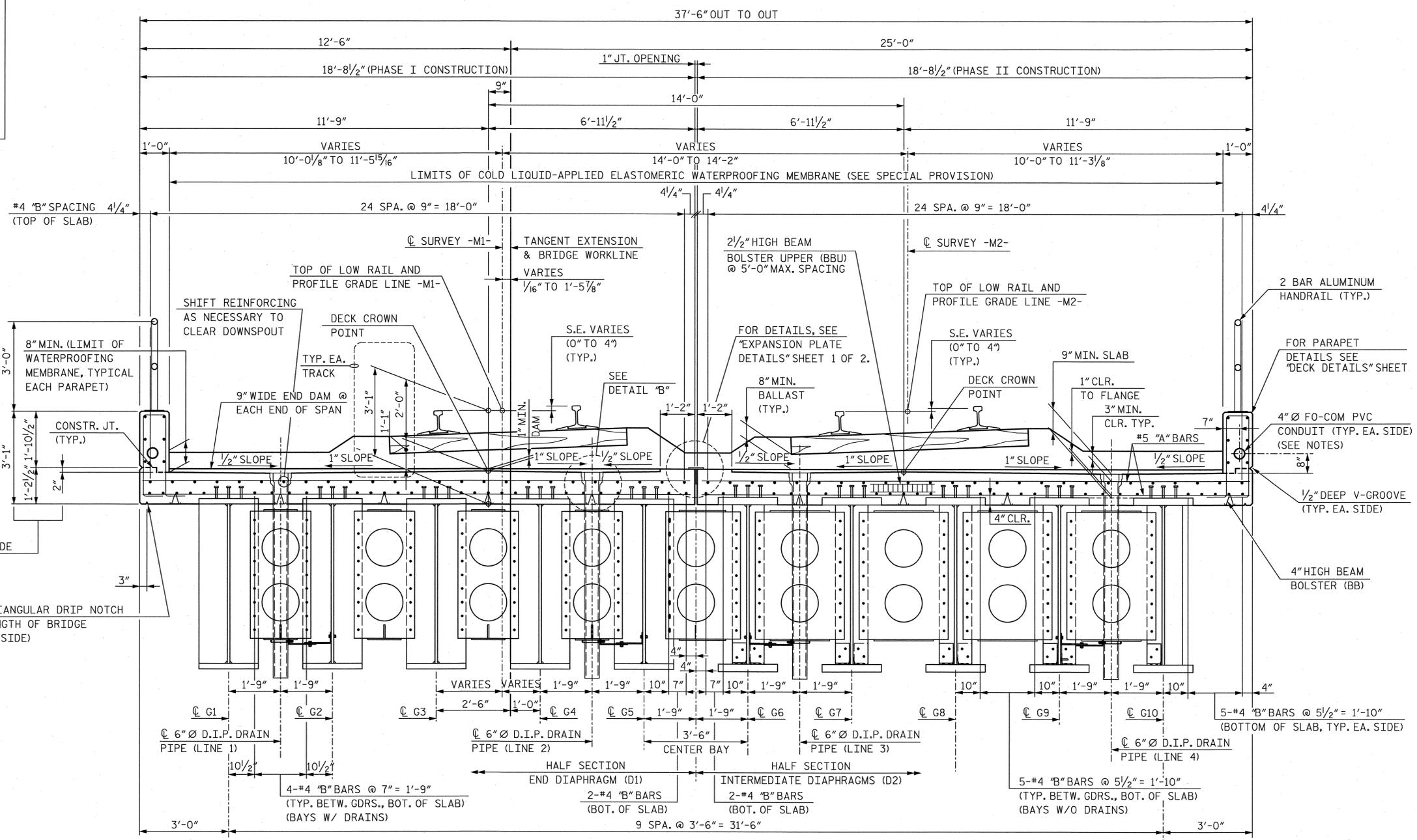
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SEQUENCE OF CONSTRUCTION



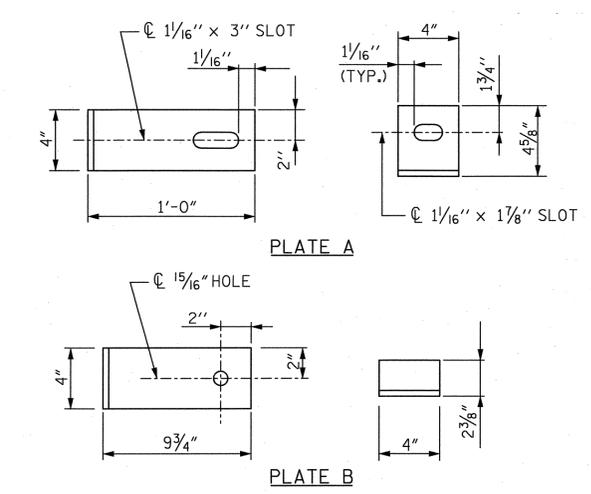
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|---|------------|-----------|-----------------|-------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. |
| DRAWN BY: J. BAYNE | DATE: 2/13 | NO. 1 | BY: [Signature] | DATE: [Signature] |
| CHECKED BY: D. HAWKINS | DATE: 2/13 | NO. 2 | BY: [Signature] | DATE: [Signature] |
| DWG. NO. 5 | | NO. 3 | BY: [Signature] | DATE: [Signature] |
| | | NO. 4 | BY: [Signature] | DATE: [Signature] |
| | | | | TOTAL SHEETS: 41 |

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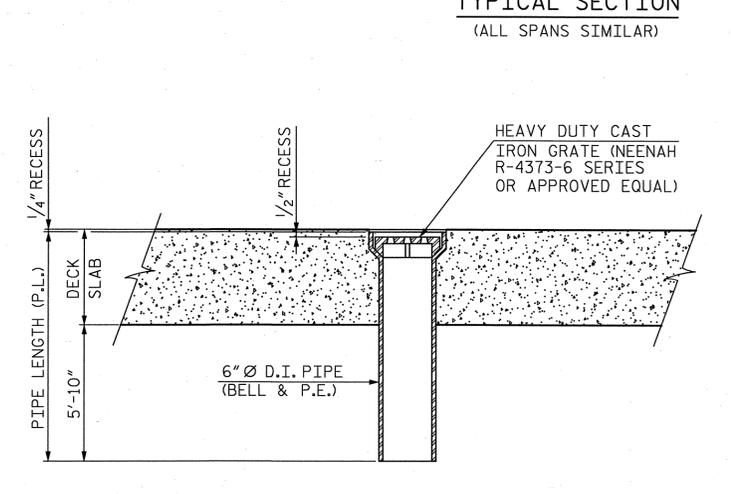


NOTES FOR CONDUIT IN PARAPETS
 CONDUIT TO BE 4" DIA. IN ACCORDANCE WITH UNDERWRITER'S LABORATORY SPECIFICATIONS.
 PROVISIONS SHALL BE MADE FOR EXPANSION BETWEEN DECK SLAB AT EXPANSION JOINT AT PIER 1 (EXPANSION FITTINGS).
 COUPLING SHALL BE PROVIDED BEHIND BACKWALL OF ABUTMENT 1 AND 2 FOR CONNECTION TO 4" DIA. RIGID PIPE (RIGID PIPE BY RAILWAY COMPANY).
 FOR CONDUIT IN PARAPETS, SEE SPECIAL PROVISIONS.

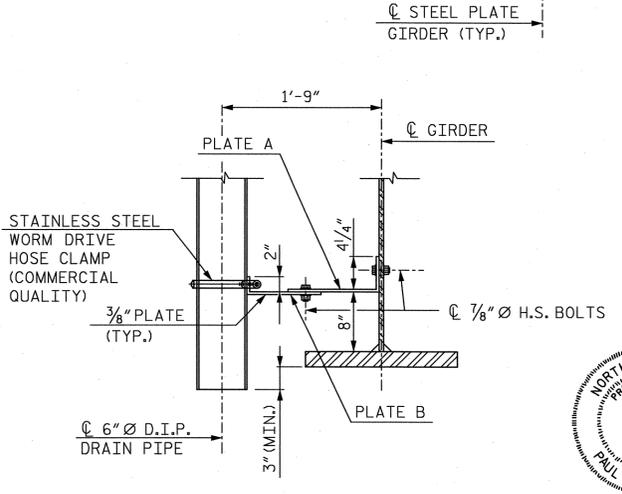
NOTES:
 ALL REINFORCING STEEL IN THE DECK AND PARAPETS SHALL BE EPOXY COATED. CLEAR COVER TO ALL REINFORCING IS 2" MINIMUM UNLESS NOTED OTHERWISE.
 FOR ALUMINUM HANDRAIL DETAILS, SEE 'METAL HANDRAIL DETAILS' SHEETS.
 FOR CONCRETE PARAPET DETAILS, SEE 'DECK DETAILS' SHEET.
 DESIGN INCLUDES WEIGHT OF 6" ADDITIONAL BALLAST TO ACCOUNT FOR FUTURE RESURFACING OF TRACK.



DRAINAGE PIPE SUPPORT CONNECTION PLATES



DETAIL "B"



DRAINAGE PIPE SUPPORT DETAIL

TYPICAL SECTION
(ALL SPANS SIMILAR)

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
 TYPICAL SECTION

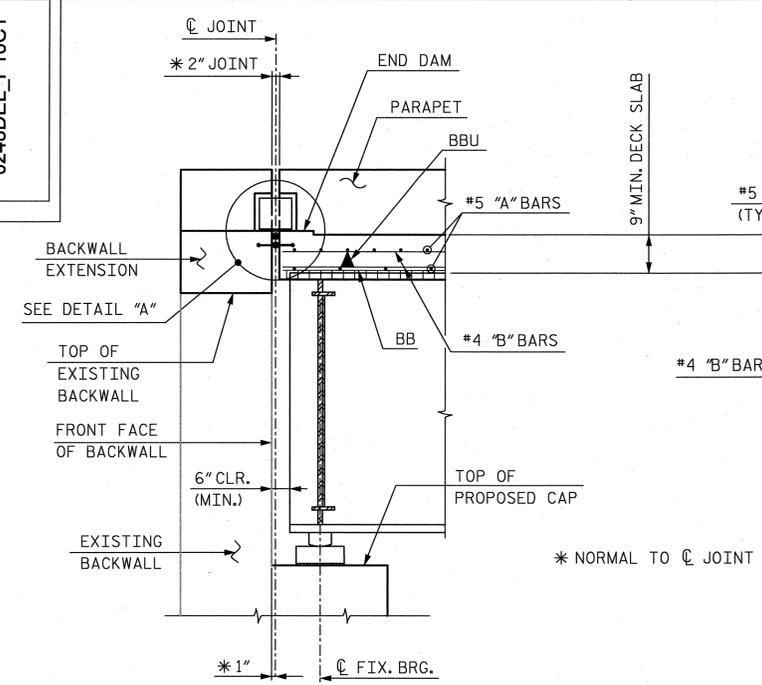
PAUL J. BARBER
 ENGINEER
 SEAL 12916

DAVID W. HAWKINS
 ENGINEER
 SEAL 27812

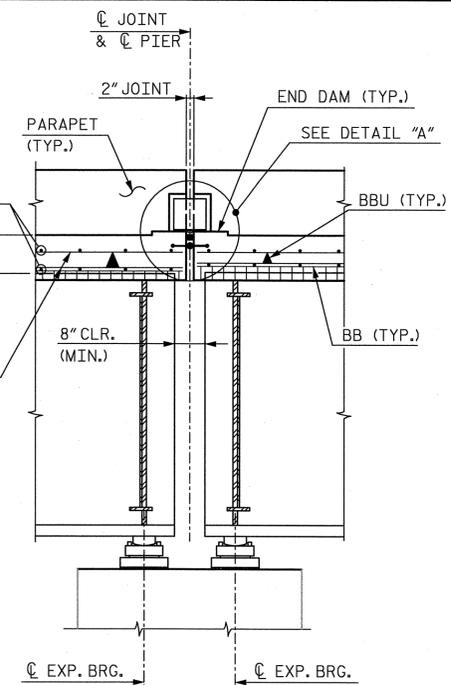
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
|-----------------------|------------|---|---|
| DRAWN BY: M. WRIGHT | DATE: 2/13 | DWG. NO. 6 | |
| CHECKED BY: P. BARBER | DATE: 2/13 | | |
| REVISIONS | | | |
| NO. | BY: | DATE: | |
| 1 | | | 3 |
| 2 | | | 4 |

SHEET NO. **S-42**
 TOTAL SHEETS **4**

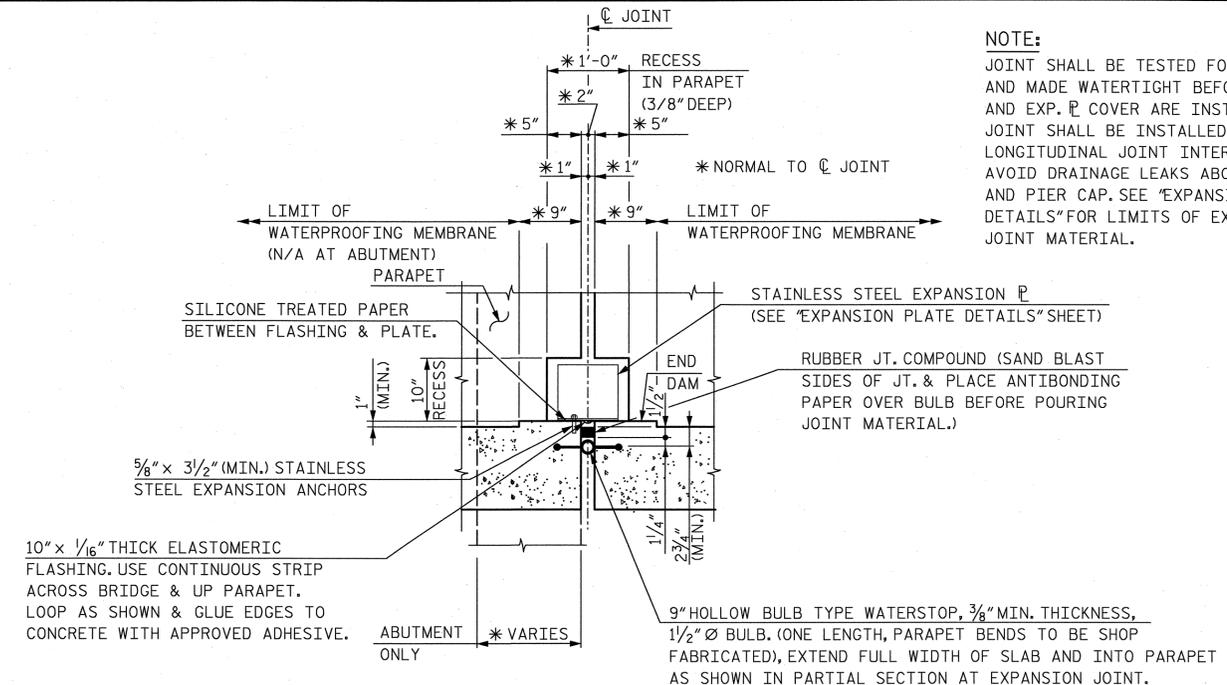
0248DEL_P10C1



SECTION A-A
(ABUT. 1 SHOWN, ABUT. 2 SIMILAR)

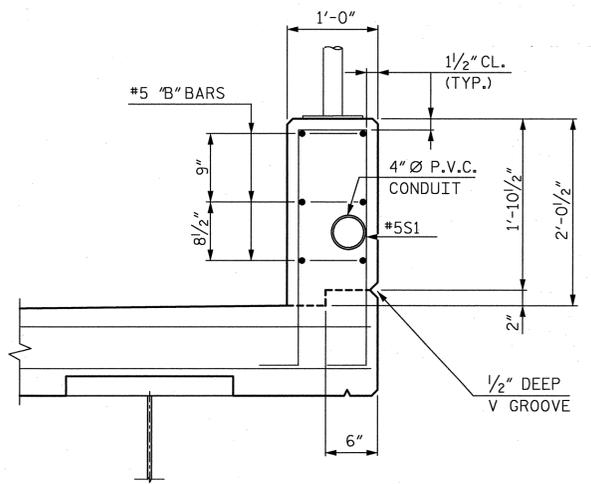


SECTION B-B
(PIER 1)

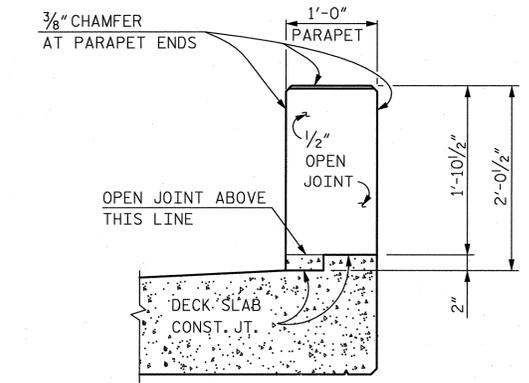


DETAIL "A"

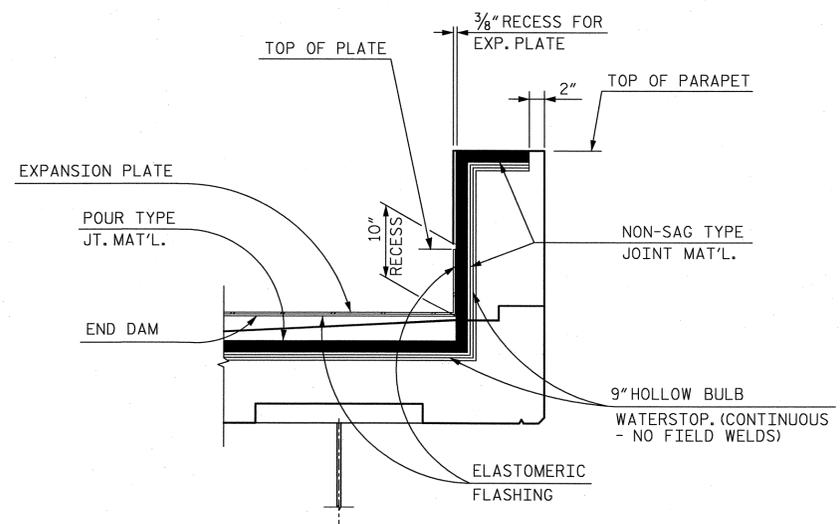
NOTE:
JOINT SHALL BE TESTED FOR LEAKS AND MADE WATERTIGHT BEFORE FLASHING AND EXP. PLATE COVER ARE INSTALLED. JOINT SHALL BE INSTALLED AT LONGITUDINAL JOINT INTERSECTION TO AVOID DRAINAGE LEAKS ABOVE ABUTMENT AND PIER CAP. SEE "EXPANSION PLATE DETAILS" FOR LIMITS OF EXPANSION JOINT MATERIAL.



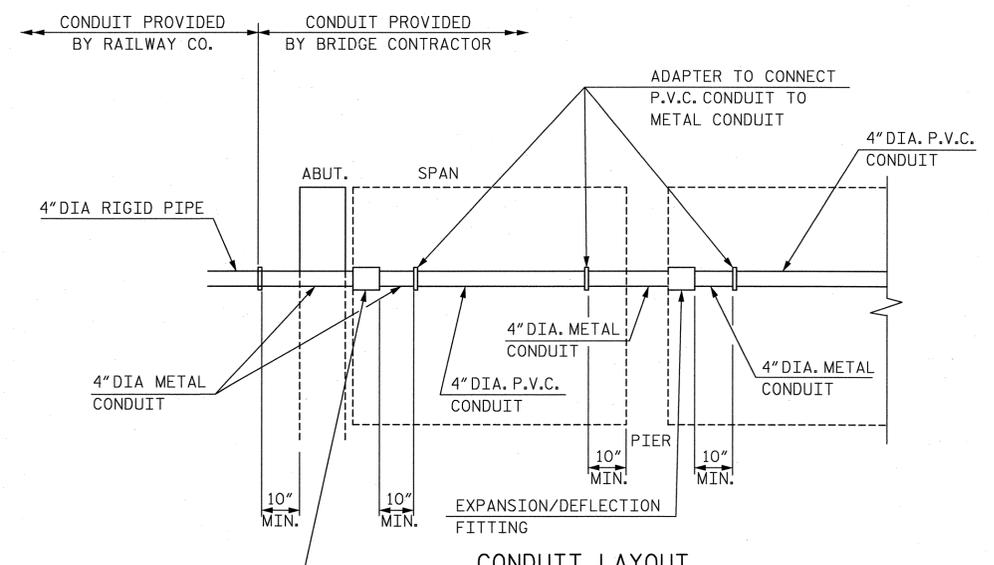
SECTION THRU PARAPET



SECTION THRU OPEN JOINT IN PARAPET



PART SECTION AT EXPANSION JOINT



CONDUIT LAYOUT

PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7761+14.08 -M1-
MILE POST: 313.40

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

DECK DETAILS

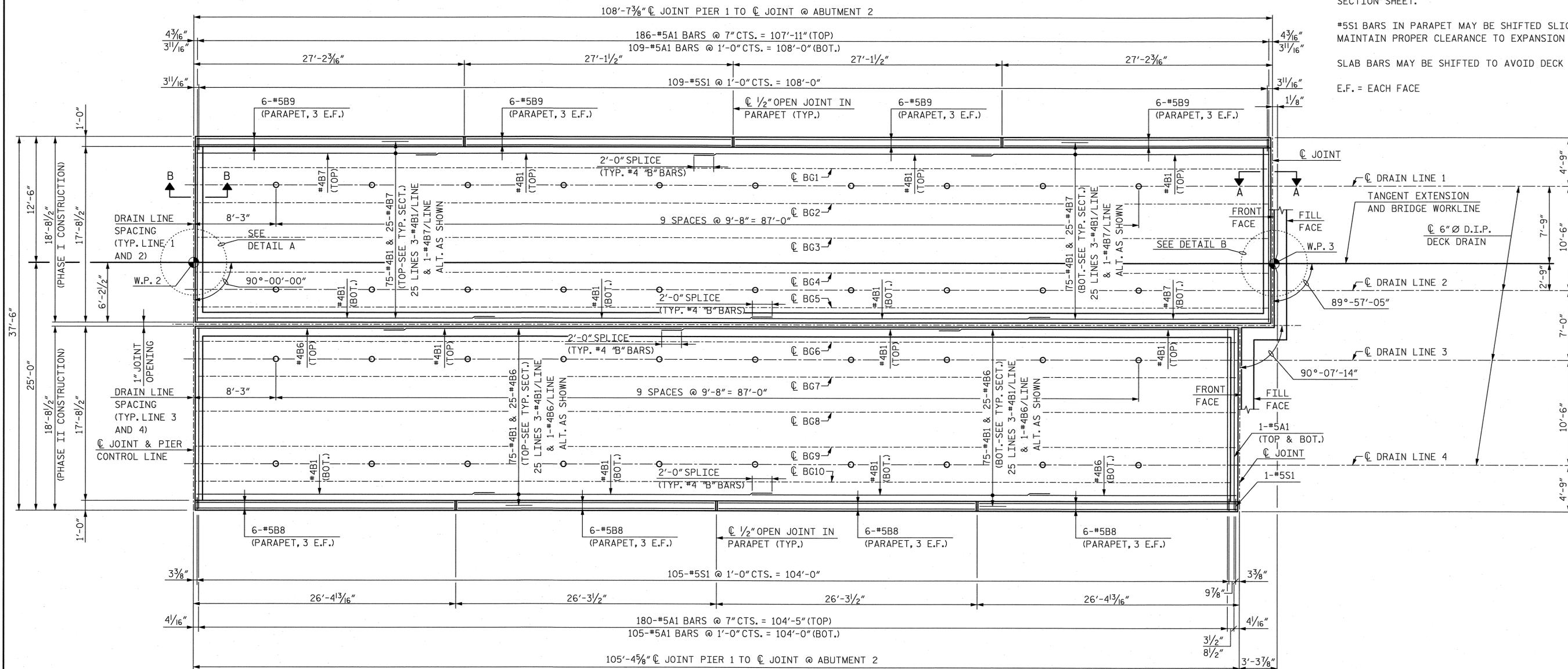


HNTB HNTB NORTH CAROLINA, P.C.
License No. C-1554
343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
DRAWN BY: M. WRIGHT DATE: 12/12
CHECKED BY: P. BARBER DATE: 2/13
DWG. NO. 7

| REVISIONS | | | | | | SHEET NO. S-43 |
|-----------|-----|-------|-----|-----|-------|--------------------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | TOTAL SHEETS 4 |
| 2 | | | 4 | | | |

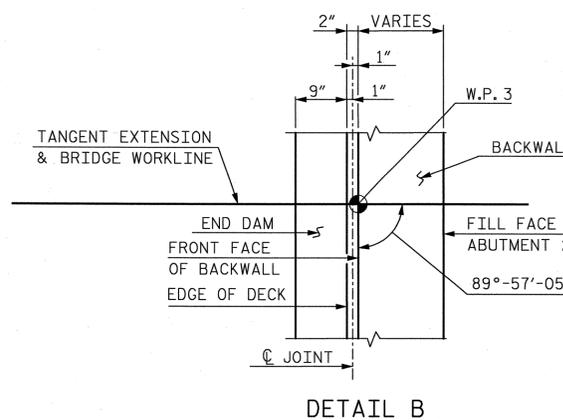
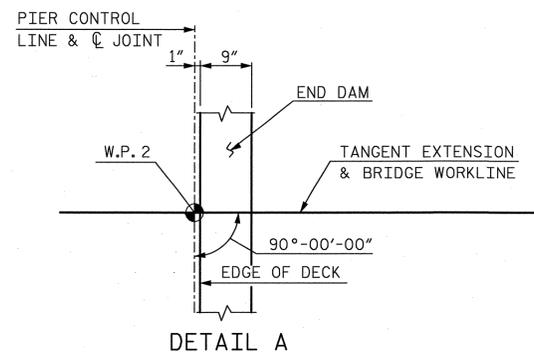
NOTES:

- ALL REINFORCING SHALL BE EPOXY COATED.
- FOR SECTION A-A & B-B SEE "DECK DETAILS" SHEET.
- FOR CONCRETE PARAPET DETAILS, SEE "DECK DETAILS" SHEET.
- FOR DECK DRAIN DETAIL SEE DETAIL "B" ON "TYPICAL SECTION" SHEET.
- *5S1 BARS IN PARAPET MAY BE SHIFTED SLIGHTLY TO MAINTAIN PROPER CLEARANCE TO EXPANSION JOINTS IN PARAPET.
- SLAB BARS MAY BE SHIFTED TO AVOID DECK DRAIN LOCATIONS.
- E.F. = EACH FACE



PLAN - SPAN B

☉ SURVEY -M1- & -M2- ARE NOT SHOWN FOR CLARITY.

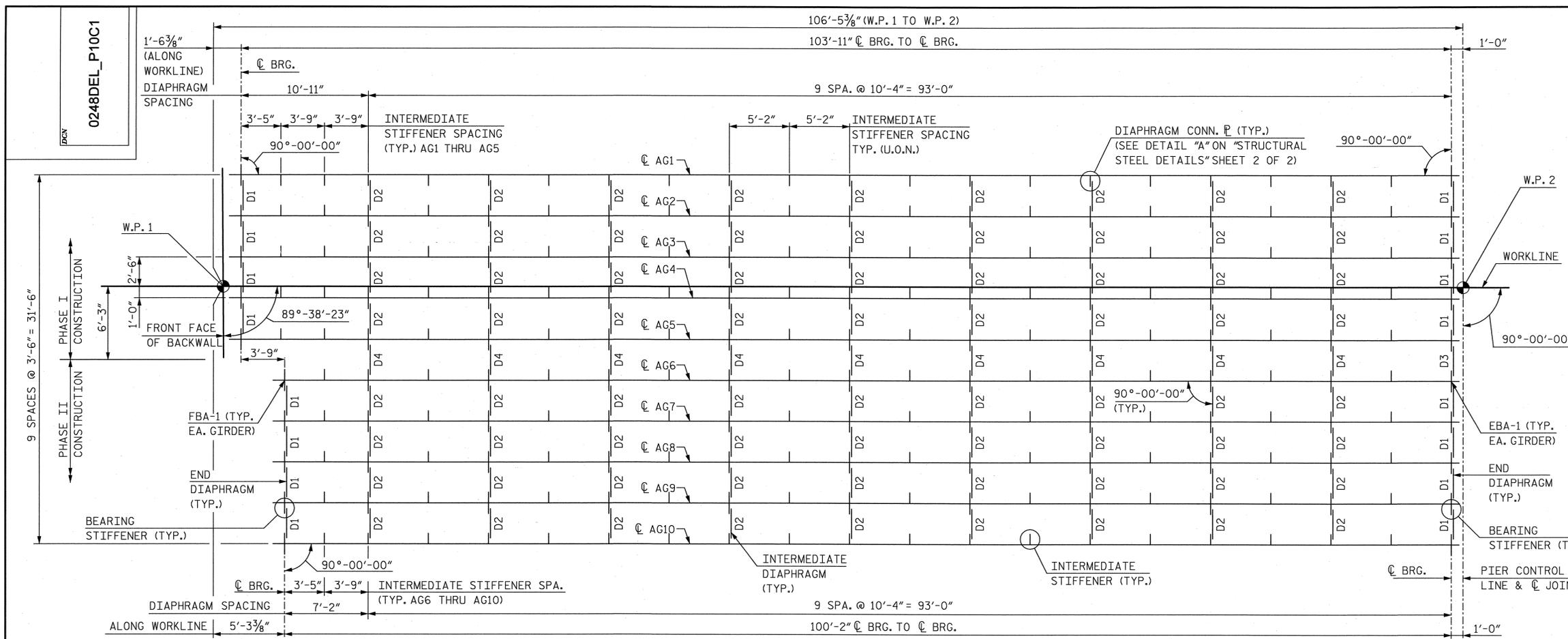


PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40

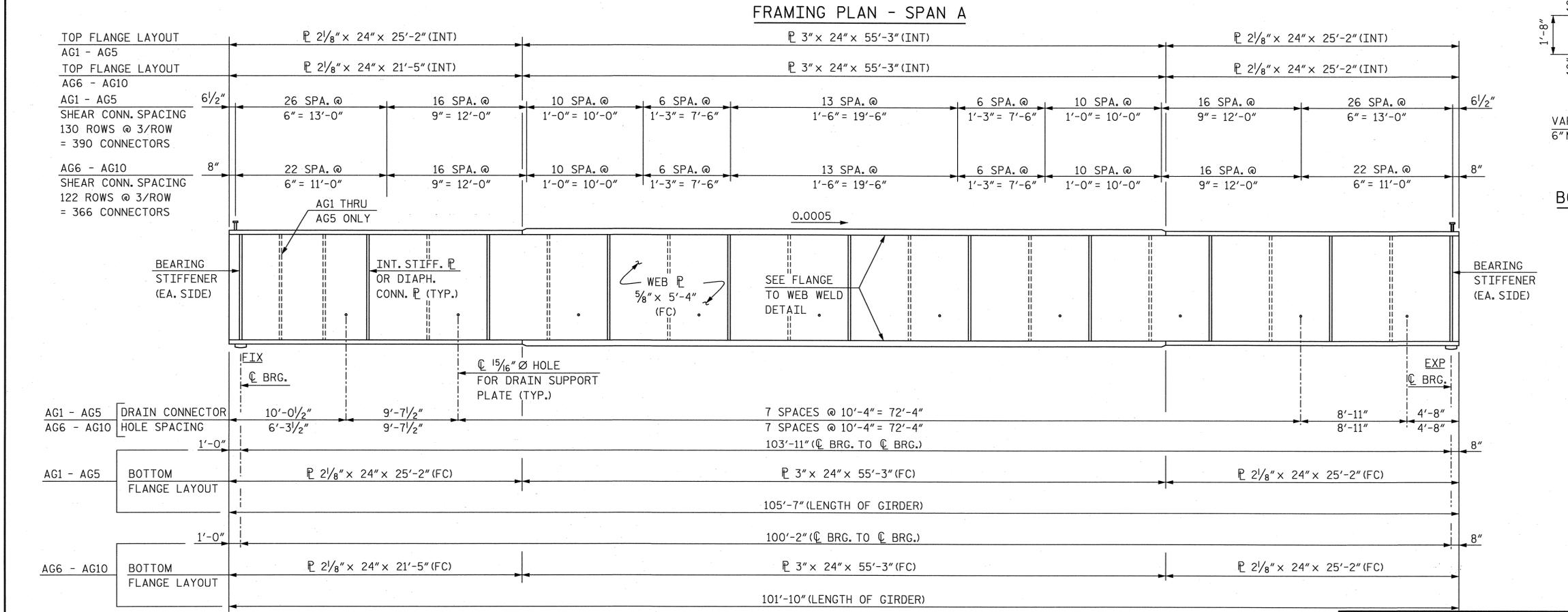
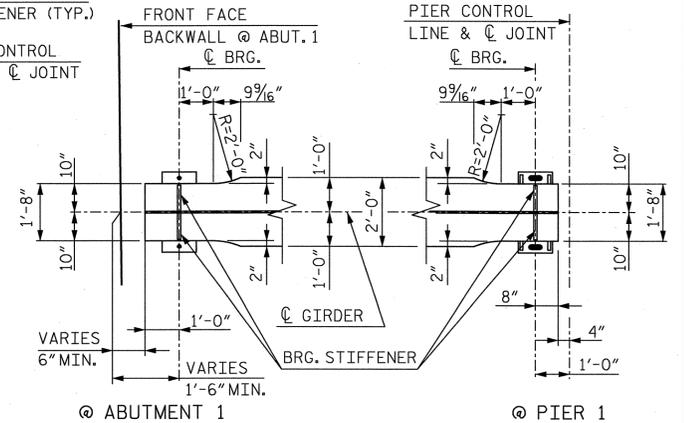
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 PLAN OF DECK - SPAN B



| | | | | | |
|--|--|--|--|--|--------------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | REVISIONS | | | | SHEET NO. S-45 |
| | DRAWN BY: <u>M. WRIGHT</u> DATE: <u>2/13</u> CHECKED BY: <u>P. BARBER</u> DATE: <u>2/13</u> | NO. <u>1</u> BY: <u></u> DATE: <u></u> | NO. <u>3</u> BY: <u></u> DATE: <u></u> | NO. <u>4</u> BY: <u></u> DATE: <u></u> | |



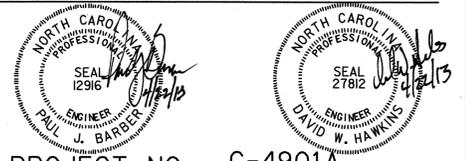
NOTES:
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.
 PIER CONTROL LINE AND \bar{C} BEARINGS ARE PARALLEL.
 CUT AG1 THRU AG5 GIRDER WEB FOR $1\frac{3}{16}$ " CAMBER
 CUT AG6 THRU AG10 GIRDER WEB FOR 1" CAMBER. ADJUST
 END CUTS AND DIMENSIONS AS REQUIRED.
 DIAPHRAGM D3 AND D4 TO BE INCLUDED IN PHASE II
 CONSTRUCTION.
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:
 • STRUCTURAL STEEL NOTES
 • DIAPHRAGM DETAILS
 • STIFFENER AND CONNECTOR \bar{P} DETAILS
 • SHEAR CONNECTOR DETAILS
 • FLANGE TO WEB WELD DETAIL
 FOR BEARINGS, SEE "BEARING DETAILS" SHEET.
 FOR DRAIN PIPE SUPPORT DETAILS, SEE "TYPICAL
 SECTION" SHEET.
 FLANGE AND WEB SHOP SPLICES SHALL BE MADE WITH FULL
 PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL
 STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD
 CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS
 FOR APPROVAL.
 FLANGE AND WEB SHOP SPLICE SHALL BE STAGGERED
 LONGITUDINALLY A MINIMUM OF 2'-0". SEE "STRUCTURAL
 STEEL DETAILS" SHEET FOR DETAIL.
 FC = FRACTURE CRITICAL
 INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS
 REQUIRING IMPROVED NOTCH TOUGHNESS.
 U.O.N. = UNLESS OTHERWISE NOTED.



FRAMING PLAN - SPAN A

BOTTOM FLANGE GIRDER END DETAILS - SPAN A

PROJECT NO. **C-4901A**
 DAVIDSON COUNTY
 STATION: **7761+14.08 -M1-**
 MILE POST: **313.40**

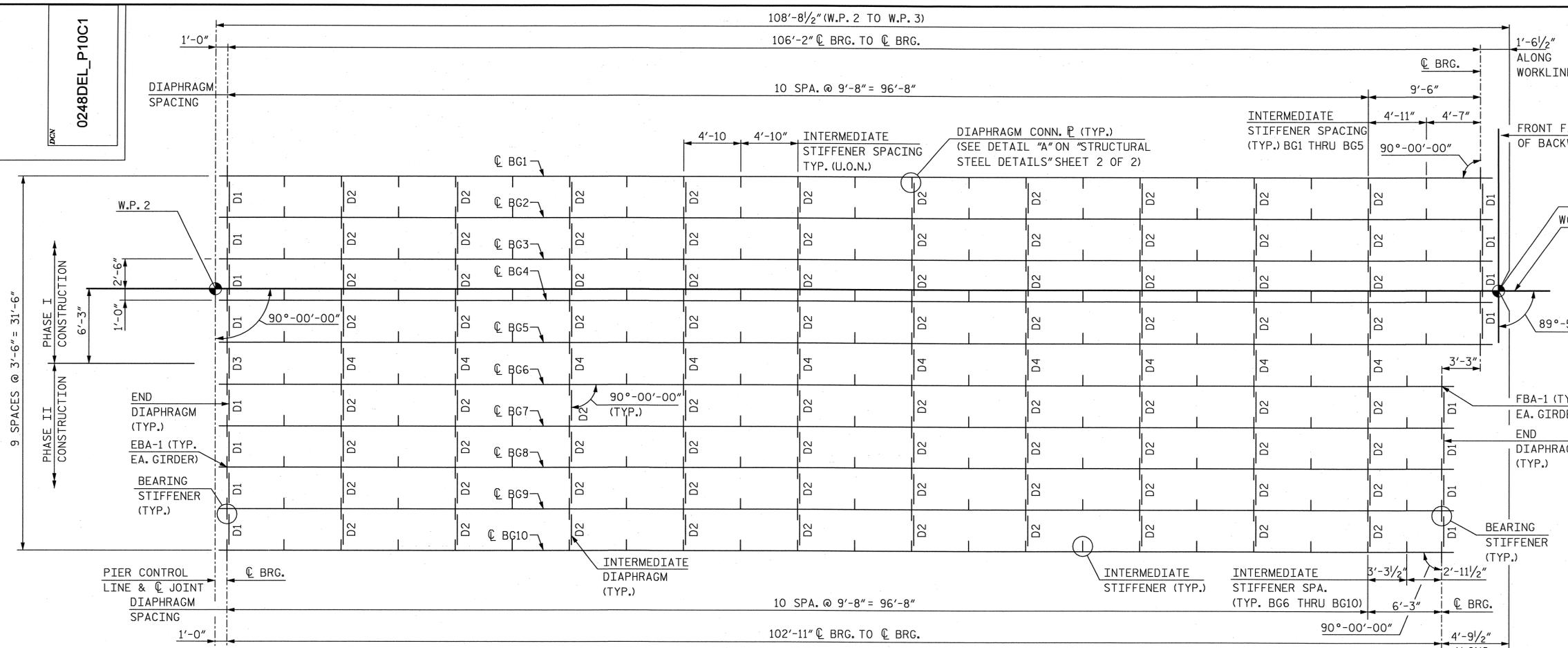


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
FRAMING PLAN
AND GIRDER DETAILS
SPAN A

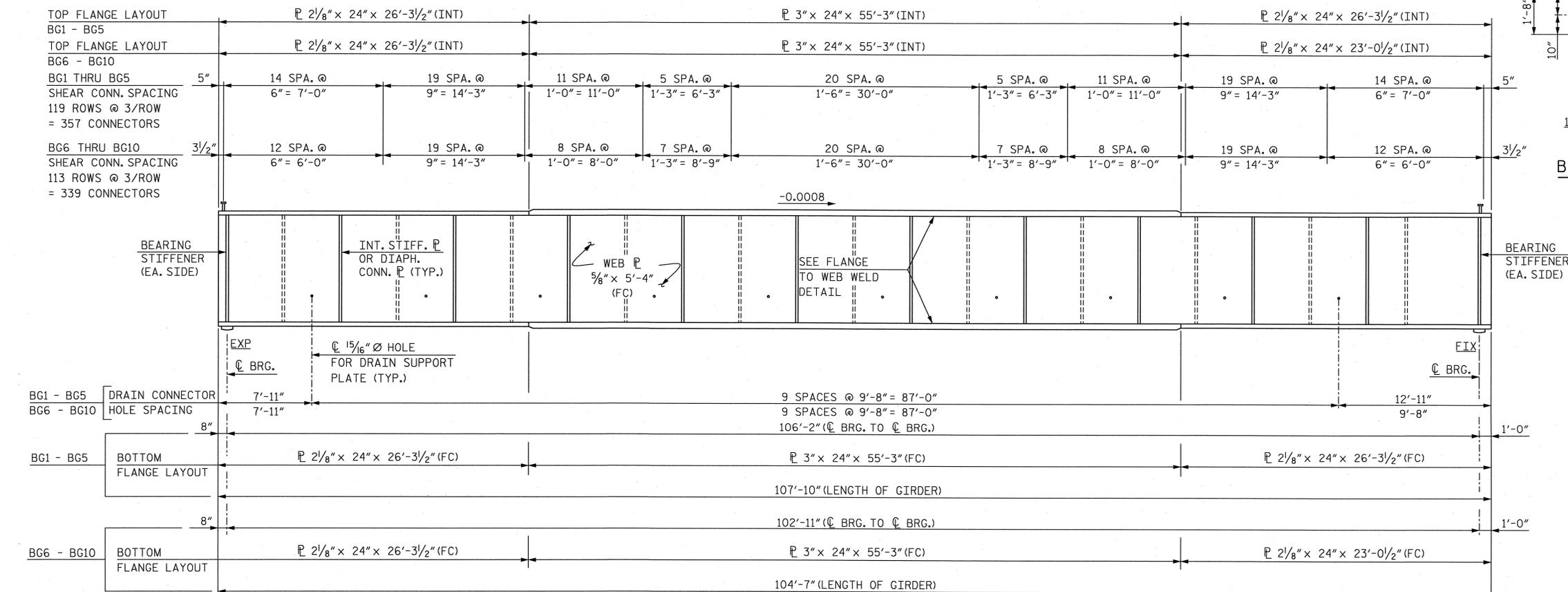
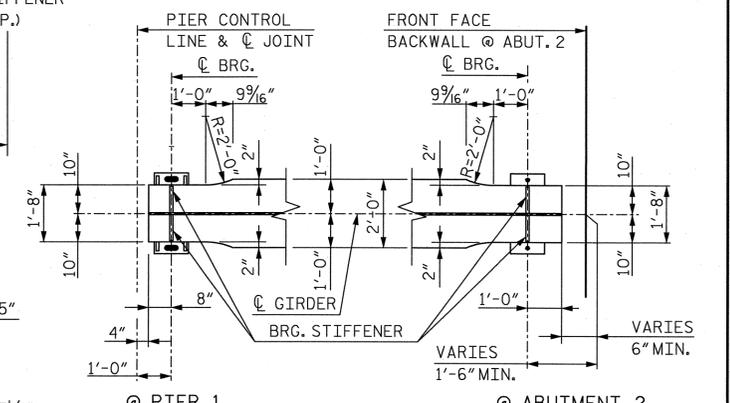
TYPICAL GIRDER ELEVATION - SPAN A
 (INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)

| | | | |
|------------------------|------------|---|--------------|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
| DROWN BY: J. BAYNE | DATE: 2/13 | DWG. NO. 10 | |
| CHECKED BY: K. DICKENS | DATE: 2/13 | | |
| REVISIONS | | SHEET NO. S-46 | |
| NO. | BY: | DATE: | TOTAL SHEETS |
| 1 | 3 | | 4 |
| 2 | 4 | | CA |

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NOTES:
 ALL DIMENSIONS ON THIS DRAWING ARE HORIZONTAL.
 PIER CONTROL LINE AND $\text{\textcircled{C}}$ BEARINGS ARE PARALLEL.
 CUT BG1 THRU BG5 GIRDER WEB FOR 1/4" CAMBER
 CUT BG6 THRU BG10 GIRDER WEB FOR 1/8" CAMBER. ADJUST
 END CUTS AND DIMENSIONS AS REQUIRED.
 DIAPHRAGM D3 AND D4 TO BE INCLUDED IN PHASE II
 CONSTRUCTION.
 REFER TO "STRUCTURAL STEEL DETAILS" SHEET FOR:
 • STRUCTURAL STEEL NOTES
 • DIAPHRAGM DETAILS
 • STIFFENER AND CONNECTOR $\text{\textcircled{P}}$ DETAILS
 • SHEAR CONNECTOR DETAILS
 • FLANGE TO WEB WELD DETAIL
 FOR BEARINGS, SEE "BEARING DETAILS" SHEET.
 FOR DRAIN PIPE SUPPORT DETAILS, SEE "TYPICAL
 SECTION" SHEET.
 FLANGE AND WEB SHOP SPLICES SHALL BE MADE WITH FULL
 PENETRATION GROOVE WELDS. SEE DETAILS ON "STRUCTURAL
 STEEL DETAILS" SHEET. FABRICATOR IS TO SHOW WELD
 CONFIGURATION AND JOINT PREPARATION ON SHOP DRAWINGS FOR
 APPROVAL.
 FLANGE AND WEB SHOP SPLICE SHALL BE STAGGERED
 LONGITUDINALLY A MINIMUM OF 2'-0". SEE "STRUCTURAL
 STEEL DETAILS" SHEET FOR DETAIL.
 FC = FRACTURE CRITICAL
 INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS
 REQUIRING IMPROVED NOTCH TOUGHNESS.
 U.O.N. = UNLESS OTHERWISE NOTED.



PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40

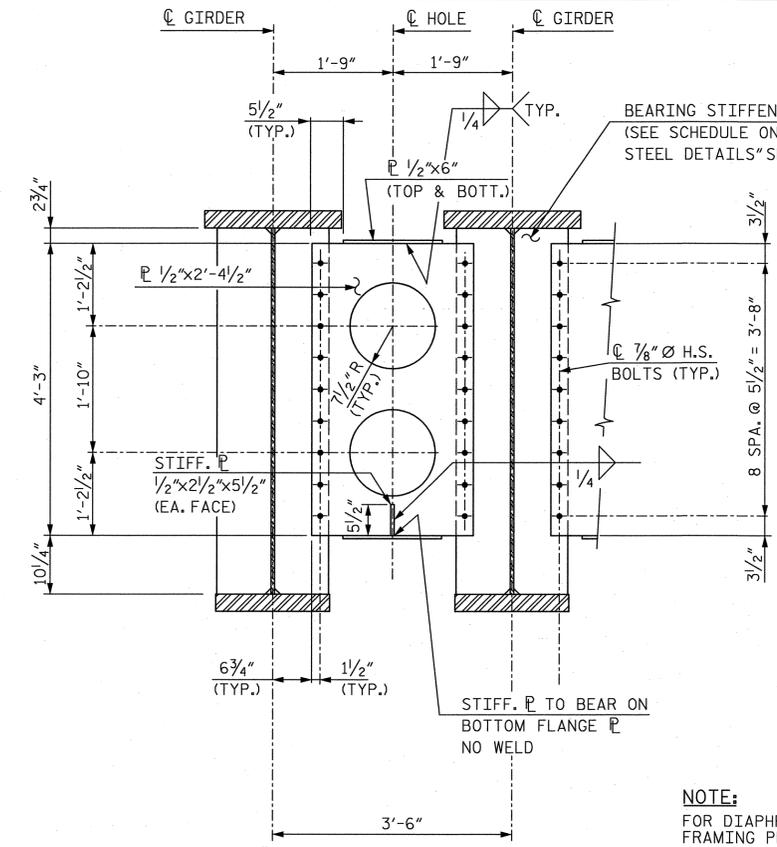
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 FRAMING PLAN
 AND GIRDER DETAILS
 SPAN B

TYPICAL GIRDER ELEVATION - SPAN B
 (INTERIOR GIRDER SHOWN, EXTERIOR GIRDER SIMILAR)

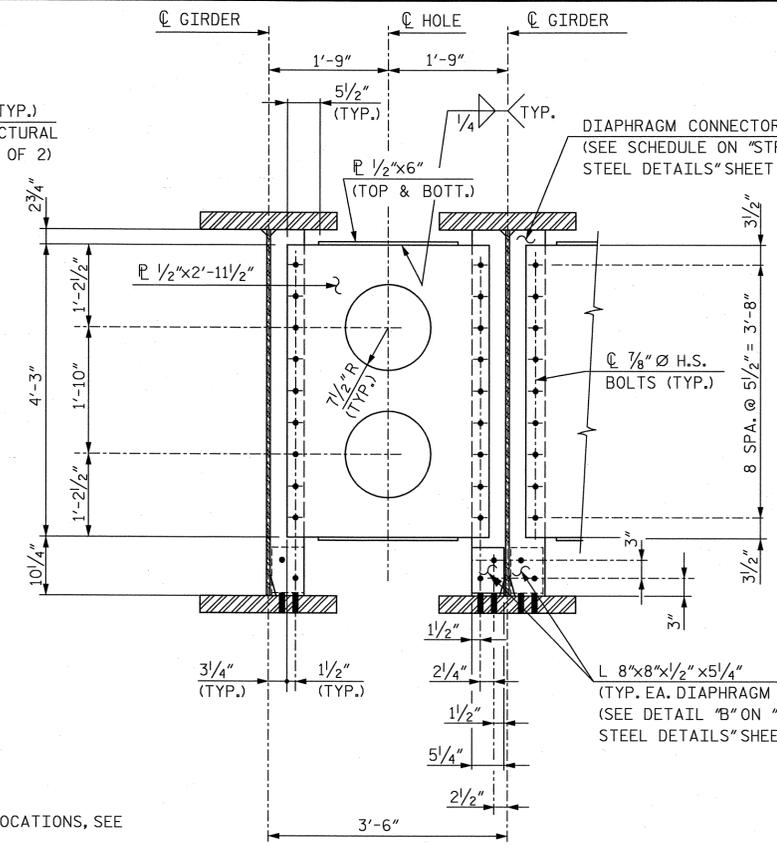
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| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
| DRAWN BY: J. BAYNE | DATE: 2/13 | CHECKED BY: K. DICKENS | DATE: 2/13 |
| DWG. NO. II | | REVISIONS | |
| NO. | BY: | DATE: | NO. |
| 1 | | | 3 |
| 2 | | | 4 |

SHEET NO.
S-47
 TOTAL SHEETS
 64

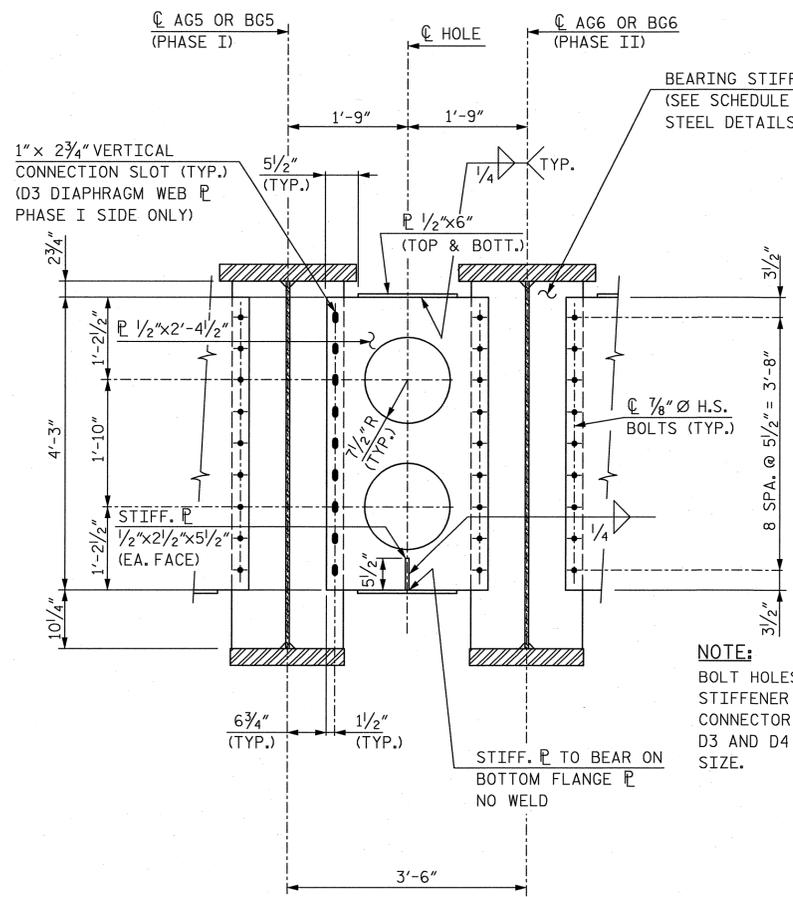
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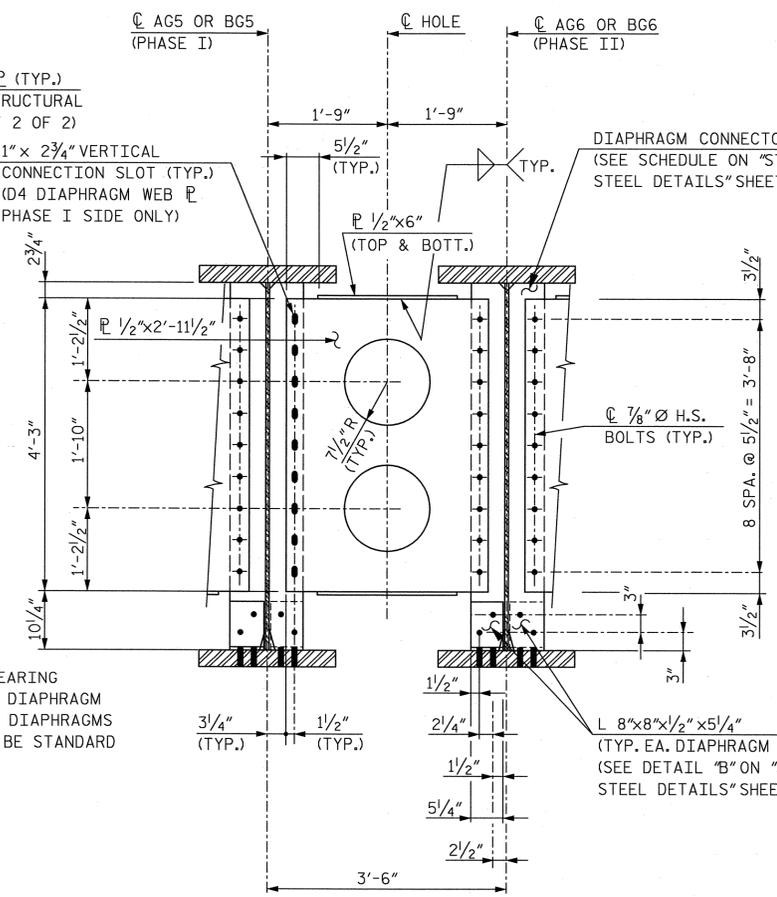
SECTION @ END DIAPHRAGM (D1)



SECTION @ INTERMEDIATE DIAPHRAGM (D2)



SECTION @ END DIAPHRAGM (D3)



SECTION @ INTERMEDIATE DIAPHRAGM (D4)

NOTE:
FOR DIAPHRAGM LOCATIONS, SEE FRAMING PLANS.

NOTE:
BOLT HOLES IN BEARING STIFFENER P AND DIAPHRAGM CONNECTOR P FOR DIAPHRAGMS D3 AND D4 SHALL BE STANDARD SIZE.

NOTE:
FOR INSTALLATION OF DIAPHRAGMS D3 AND D4 SEE "CONSTRUCTION SEQUENCE" SHEET 2 OF 2.

STRUCTURAL STEEL NOTES

DESIGN DATA:

- STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:
 - GIRDER FLANGES AND WEB: A709, GRADE 50.
 - MISCELLANEOUS MATERIAL: A709, GRADE 50.
 - ANCHOR BOLTS FOR BEARING DEVICES SHALL CONFORM TO ASTM A449. ANCHOR BOLTS, NUTS, AND PLATE WASHERS SHALL BE HOT-DIPPED GALVANIZED IN ACCORDANCE WITH AASHTO M232.

ALL DIMENSIONS SHOWN ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED. ALL DIMENSIONS ARE SHOWN AT 60°F.

NORFOLK SOUTHERN CORPORATION SHALL BE FURNISHED COPIES OF MILL TEST REPORTS FOR ALL MATERIALS EXCEPT MISCELLANEOUS PLATES AND SHAPES. REPORTS SHALL INDICATE COMPLIANCE WITH ALL SPECIFIED REQUIREMENTS.

SHOP INSPECTION SHALL BE BY NORFOLK SOUTHERN CORPORATION OR ITS AUTHORIZED AGENT. SEE STRUCTURAL STEEL SPECIAL PROVISION FOR ADDITIONAL WELDING INSPECTION OF FLANGE PLATE TO WEB PLATE WELDS.

FOR PAINTING STRUCTURAL STEEL, SEE SPECIAL PROVISIONS.

BOLTED CONNECTIONS SHALL BE MADE WITH 7/8" Ø ASTM A325, TYPE 1 HIGH STRENGTH BOLTS WITH HEAVY HEX HEAD, HEAVY HEX NUT AND HARDENED WASHERS IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS USING THE TURN OF THE NUT METHOD. DIRECT TENSION INDICATORS SHALL NOT BE USED.

SHOP DRAWINGS SHALL BE APPROVED BY THE CHIEF ENGINEER - BRIDGES AND STRUCTURES, NORFOLK SOUTHERN CORPORATION, ATLANTA, G.A. SHOP DRAWINGS SHALL BE LABELED "NORFOLK SOUTHERN MP NS-313.40"

BOLT HOLES IN STRUCTURAL STEEL MEMBERS SHALL BE STANDARD SIZE UNLESS OTHERWISE INDICATED ON THE PLANS.

HIGH STRENGTH BOLTS, NUTS & WASHERS SHALL BE MECHANICALLY GALVANIZED IN ACCORDANCE WITH ASTM B695.

ANCHOR BOLTS SHALL BE 1/4" Ø IN ACCORDANCE WITH A.R.E.M.A. SPECIFICATIONS AND SHALL BE GROUTED IN FORMED HOLES AFTER GIRDERS ARE ERECTED.

BEARING PADS SHALL BE USED WHENEVER STEEL MASONRY PLATE, OR OTHER STEEL BEARING PLATE, BEARS ON CONCRETE. PADS SHALL BE PREFORMED FABRIC BEARING PADS, 1/2" THICK. FOR PAD REQUIREMENTS, SEE STRUCTURAL STEEL SPECIAL PROVISIONS.

SHEAR CONNECTORS ON GIRDERS MAY BE SHIFTED AS NECESSARY TO CLEAR FLANGE SPLICE WELDS.

WEB SHOP SPLICES ARE PERMITTED TO LIMIT THE MAXIMUM REQUIRED WEB PIECE LENGTHS TO 45'-0". PERMITTED WEB SHOP SPLICES SHALL NOT BE LOCATED WITHIN 15'-0" OF MAXIMUM DEAD LOAD DEFLECTION AND SHALL BE LOCATED 6" MIN. FROM CONNECTOR PLATE OR INTERMEDIATE STIFFENER WELDS. FLANGE AND WEB SHOP SPLICES SHALL CONFORM TO SHOP SPLICE DETAILS SHOWN ON THE PLANS.

STRUCTURAL STEEL ELEMENTS DENOTED AS "FC" ARE FRACTURE CRITICAL AND SHALL MEET IMPACT TEST REQUIREMENTS SET FORTH IN THE FRACTURE CONTROL PLAN OF THE AREMA MANUAL, CHAPTER 15, SECTION 1.14. NOTCH TOUGHNESS REQUIREMENTS AND TESTING SHALL BE BASED ON ZONE 2 REQUIREMENTS.

STRUCTURAL STEEL ELEMENTS DENOTED AS "INT" SHALL MEET IMPACT TEST REQUIREMENTS SET FORTH IN THE FRACTURE CONTROL PLAN OF THE AREMA MANUAL, CHAPTER 15, SECTION 1.2. TESTING SHALL BE BASED ON ZONE 2 REQUIREMENTS.

ALL WELDING CONNECTIONS SHALL BE MADE WITH SERIES E70 WELDING ELECTRODES.

FOR DRAINAGE PIPE SUPPORT DETAIL, SEE "TYPICAL SECTION" SHEET.

FC = FRACTURE CRITICAL

INT = NON-FRACTURE CRITICAL MEMBERS OR COMPONENTS REQUIRING IMPROVED NOTCH TOUGHNESS.

PROJECT NO. C-4901A

DAVIDSON COUNTY

STATION: 7761+14.08 -M1-

MILE POST: 313.40

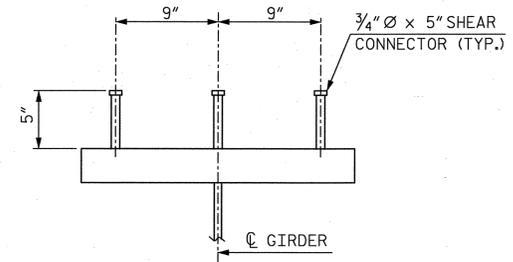
SHEET 1 OF 2



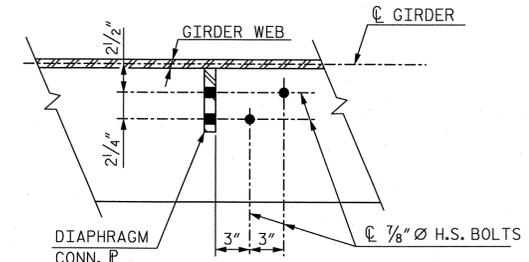
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS

| | | | | | | |
|---|------------|-----------|-----|-----------|-------|----------------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-48 TOTAL SHEETS CA |
| 1 | J. BAYNE | 2/13 | 3 | | | |
| 2 | K. DICKENS | 2/13 | 4 | | | |

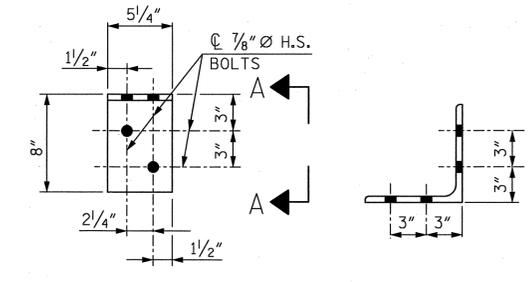
DWG
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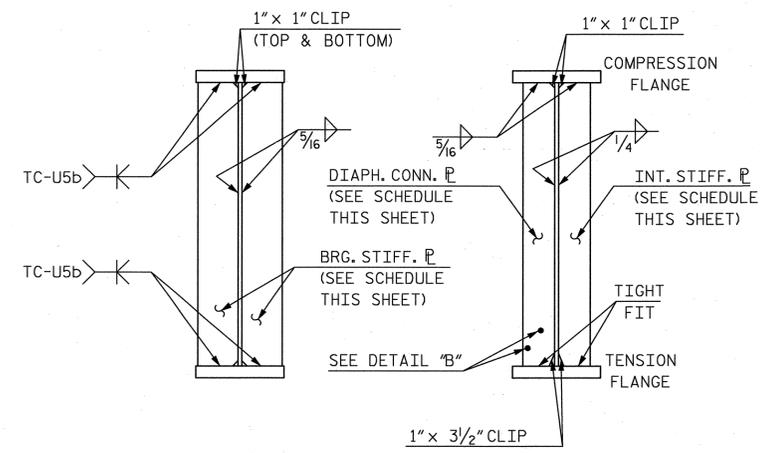
**SHEAR CONNECTOR
DETAIL**
(TYP. ALL GIRDERS)



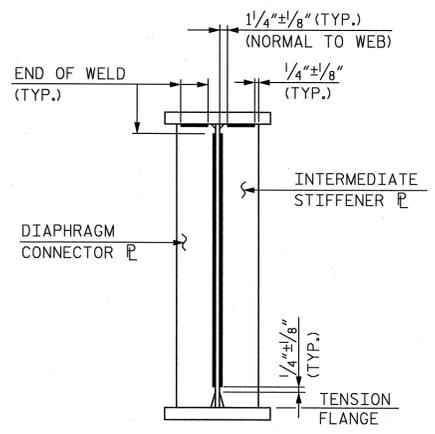
DETAIL "A"
(RIGHT SIDE OF WEB SHOWN, LEFT SIDE SIMILAR)



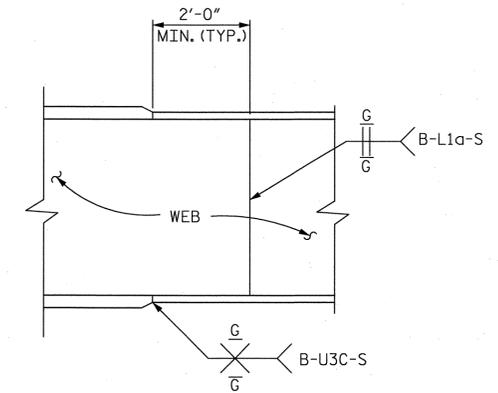
DETAIL "B"
(L 8"x8"x1/2"x5/4")



STIFFENER/CONN. PLATE DETAILS



WELD TERMINATION DETAILS
(FILLET WELDS ONLY)

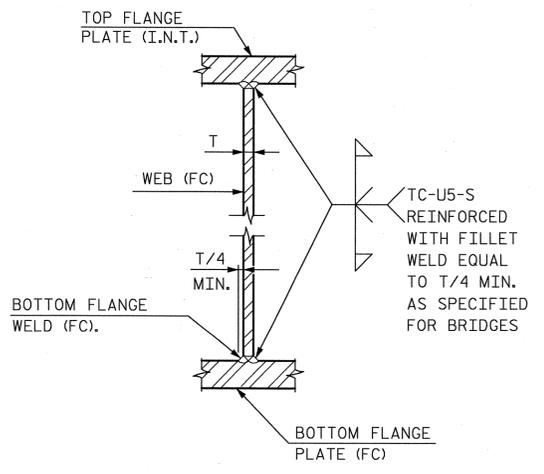


NOTES:
ELECTROSLAG WELDING IS NOT PERMITTED.
ULTRASONIC OR RADIOGRAPHIC INSPECTION IS REQUIRED FOR ALL FLANGE AND WEB SPLICE WELDS. SEE SPECIAL PROVISIONS.
GRIND WELDS IN DIRECTION OF STRESS ONLY (I.E. PARALLEL TO G GIRDER).

SHOP SPLICE DETAILS

| STIFF./CONN. PLATE SCHEDULE | | |
|-----------------------------|----------------|----------------|
| TYPE | SPAN A | SPAN B |
| BRG. STIFF. | PL 1" x 9 1/2" | PL 1" x 9 1/2" |
| DIAPH. CONN. PL. | PL 1/2" x 6" | PL 1/2" x 6" |
| INT. STIFF. | PL 1/2" x 6" | PL 1/2" x 6" |

NOTE: SEE FRAMING PLANS FOR STIFFENER/CONN. PLATE LOCATIONS



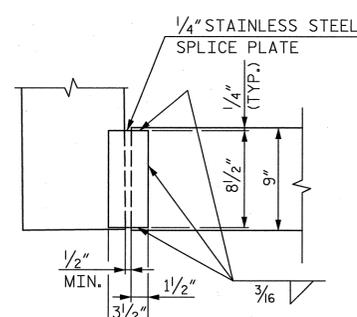
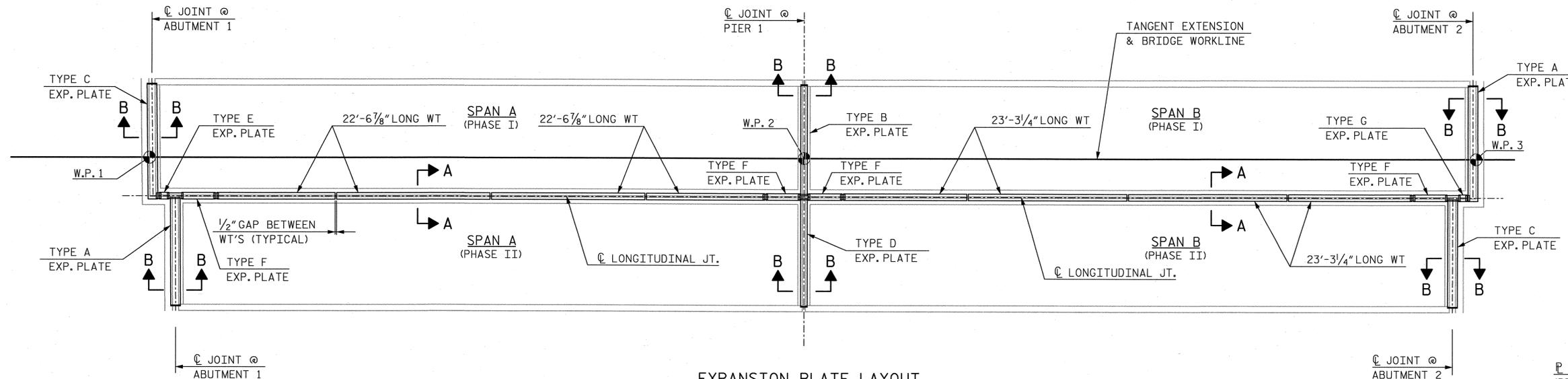
FLANGE TO WEB WELD DETAIL
NO SCALE

PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7761+14.08 -M1-
MILE POST: 313.40
SHEET 2 OF 2

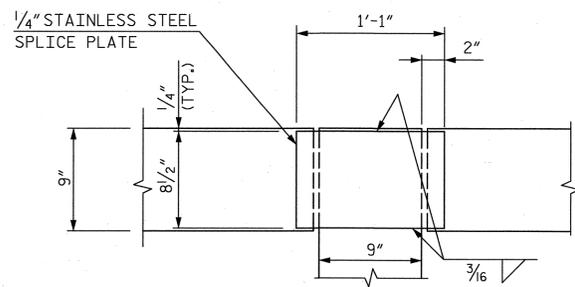
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUPERSTRUCTURE
STRUCTURAL STEEL DETAILS



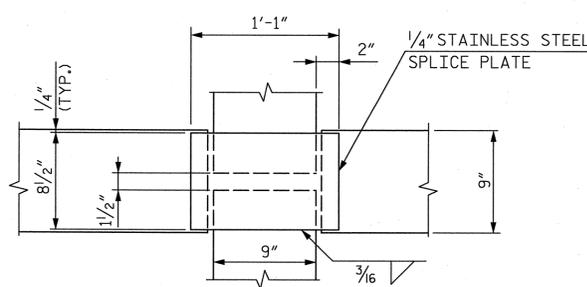
| HNTB | | HNTB NORTH CAROLINA, P.C. | | REVISIONS | | | SHEET NO. |
|------------------------|------------|--|--|-----------|-----|-------|--------------|
| License No. C-1554 | | 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | NO. | BY: | DATE: | S-49 |
| DRAWN BY: J. BAYNE | DATE: 2/13 | DWG. NO. 13 | | 1 | | | TOTAL SHEETS |
| CHECKED BY: K. DICKENS | DATE: 2/13 | | | 2 | | | 64 |



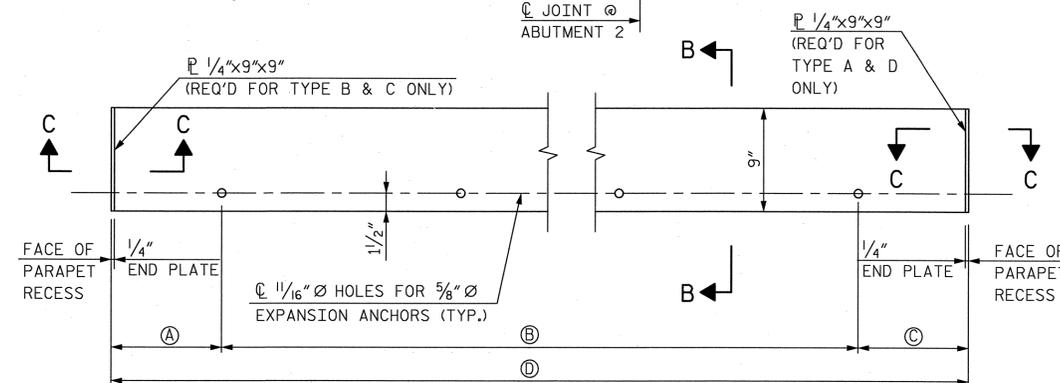
DETAIL A
(2 REQUIRED)



DETAIL B
(2 REQUIRED)



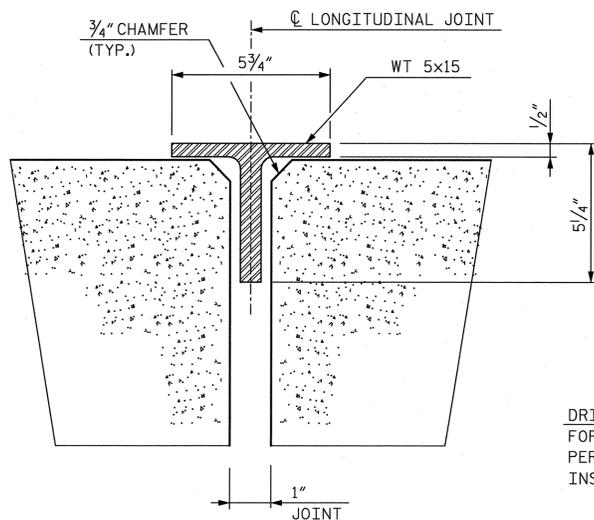
DETAIL C
(1 REQUIRED)



PLAN - EXPANSION PLATE

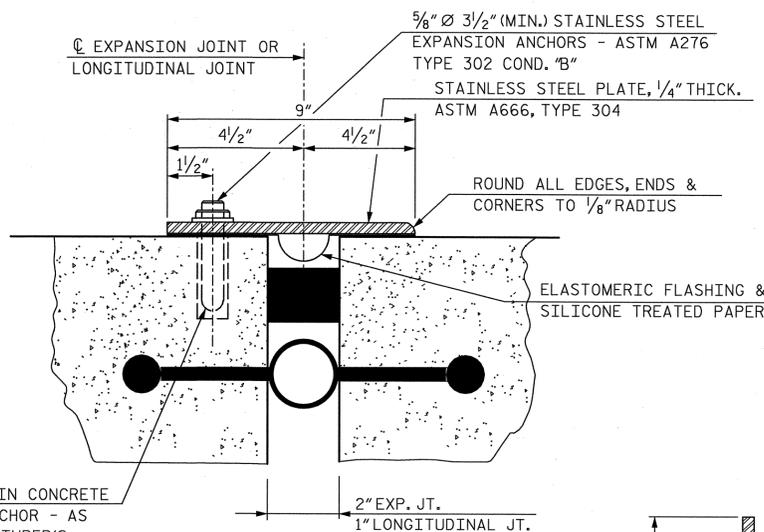
| STAINLESS STEEL PLATE DIMENSIONS | | | | | NUMBER REQUIRED |
|----------------------------------|---------|--------------------------|---------|------------|-----------------|
| TYPE | (A) | (B) | (C) | (D) | |
| A | 12" | 9 SPA. @ 1'-10" = 16'-6" | 7 7/8" | 18'-1 1/8" | 2 |
| B | 7 5/16" | 9 SPA. @ 1'-10" = 16'-6" | 7 5/16" | 17'-8 5/8" | 1 |
| C | 7 7/8" | 9 SPA. @ 1'-10" = 16'-6" | 12" | 18'-1 1/8" | 2 |
| D | 7 5/16" | 9 SPA. @ 1'-10" = 16'-6" | 7 5/16" | 17'-8 5/8" | 1 |
| E | 5" | 2 SPA. @ 1'-0" = 2'-0" | 5" | 2'-10" | 1 |
| F | 11" | 2 SPA. @ 1'-10" = 3'-8" | 11" | 5'-6" | 4 |
| G | 5 5/16" | 2 SPA. @ 8 1/2" = 1'-5" | 5 5/16" | 2'-3 5/8" | 1 |

NOTE: PAYMENT FOR THE EXPANSION PLATES, EXPANSION ANCHORS, AND WT'S IS INCLUDED IN THE COST FOR STRUCTURAL STEEL.



SECTION A-A

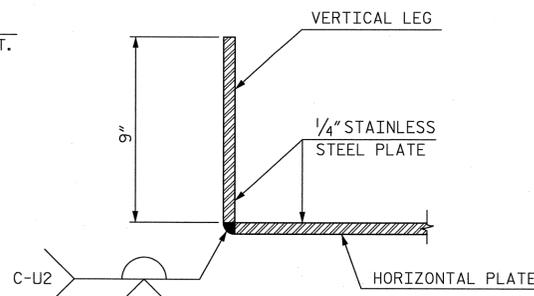
WT MEMBERS AND STEEL SPLICE PLATE (DETAIL 'D') SHALL BE ASTM A36 STEEL AND SHALL BE GALVANIZED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS. PRIOR TO WELDING, GRIND THE SURFACE OF THE WT MEMBER AND PLATE. AFTER WELDING DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.



SECTION B-B

DETAIL OF EXPANSION ANCHOR AND PLATE

SEE DETAIL A ON 'DECK DETAILS' SHEET FOR ADDITIONAL JOINT INFORMATION.



SECTION C-C

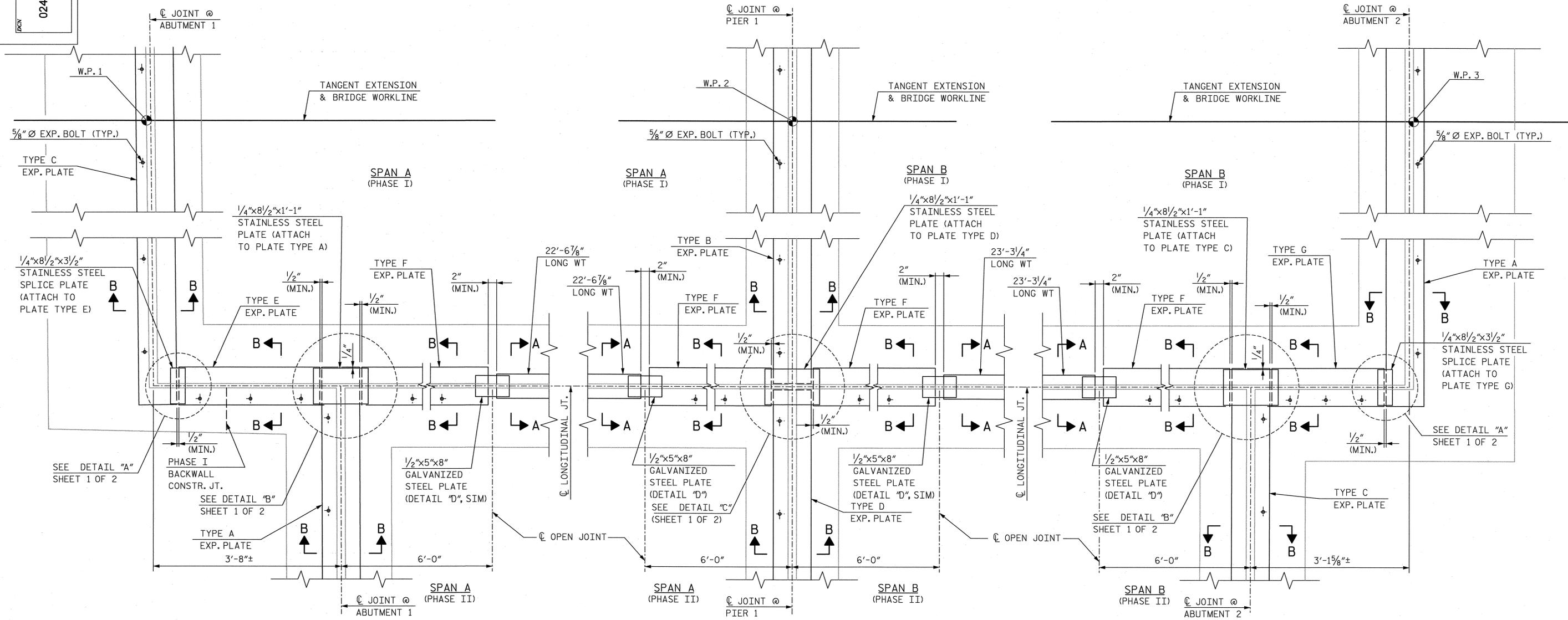
PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40
 SHEET 1 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 EXPANSION
 PLATE DETAILS



| | | | | |
|---|------------|-----------|-----|--------------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. S-51 |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | NO.: | BY: | TOTAL SHEETS |
| CHECKED BY: P. BARBER | DATE: 2/13 | 1 | 3 | 4 |
| | | 2 | 4 | 4 |

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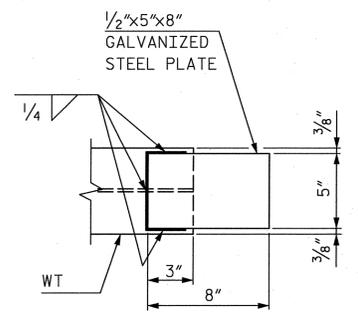


EXPANSION PLATE LAYOUT @ ABUTMENT 1

EXPANSION PLATE LAYOUT @ PIER 1

EXPANSION PLATE LAYOUT @ ABUTMENT 2

NOTE: ALL EXPANSION PLATES AND WT MEMBERS ALONG LONGITUDINAL JOINT WILL BE INSTALLED AS PART OF PHASE II CONSTRUCTION.



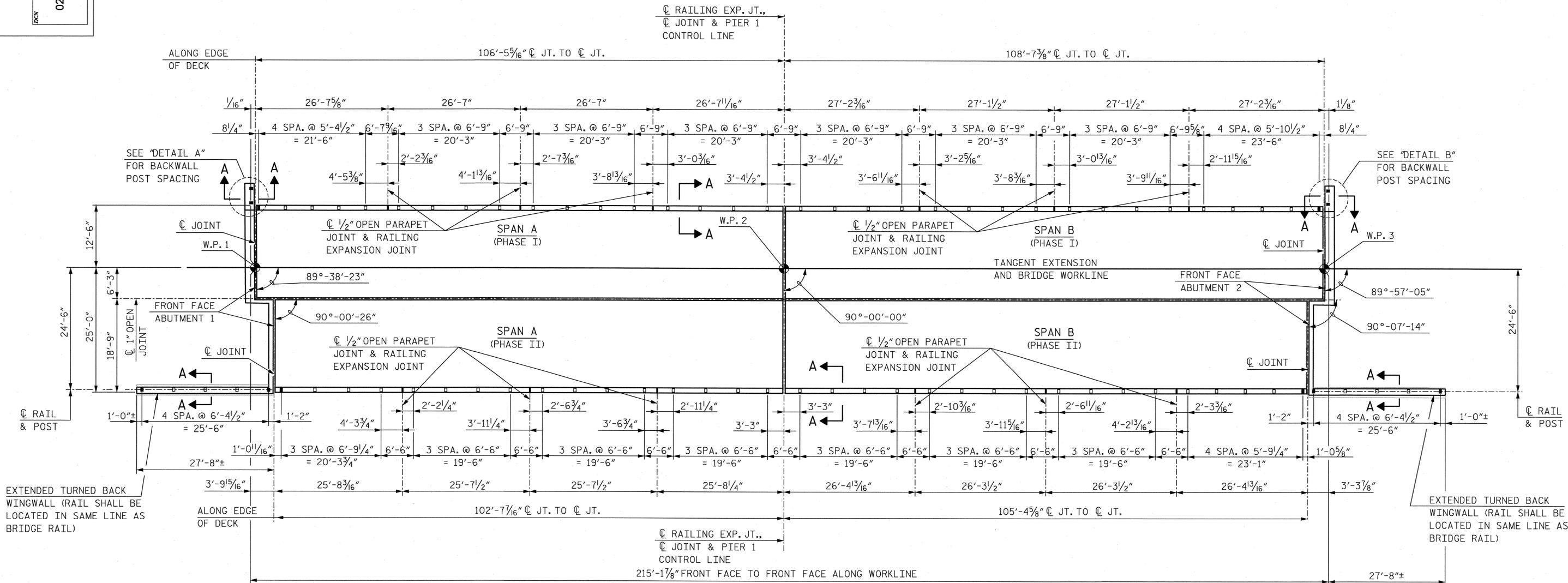
DETAIL D (4 REQ'D)

PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUPERSTRUCTURE
 EXPANSION
 PLATE DETAILS



| | | | | |
|---|------------|-----------|-----------------|--------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | TOTAL SHEETS |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | NO. 3 | BY: [Signature] | 4 |
| CHECKED BY: P. BARBER | DATE: 2/13 | NO. 4 | BY: [Signature] | 4 |
| DWG. NO. 16 | | | | S-52 |

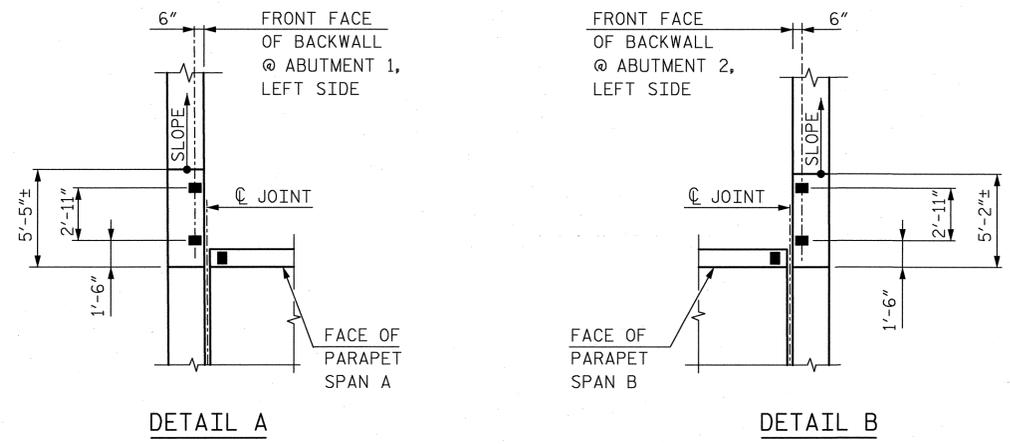


METAL HANDRAIL POST SPACING

- LEGEND:**
- - END POST
 - - INTERIOR POST

NOTE: FOR SECTION A-A, SEE SHEET 2 OF 2.

ALL DIMENSIONS SHOWN ARE ALONG EXTERIOR FACE OF PARAPET.



PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40
 SHEET 1 OF 2



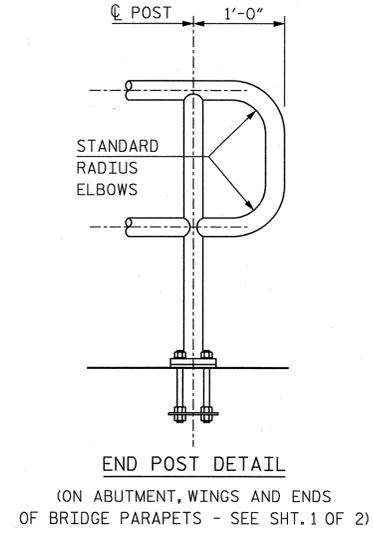
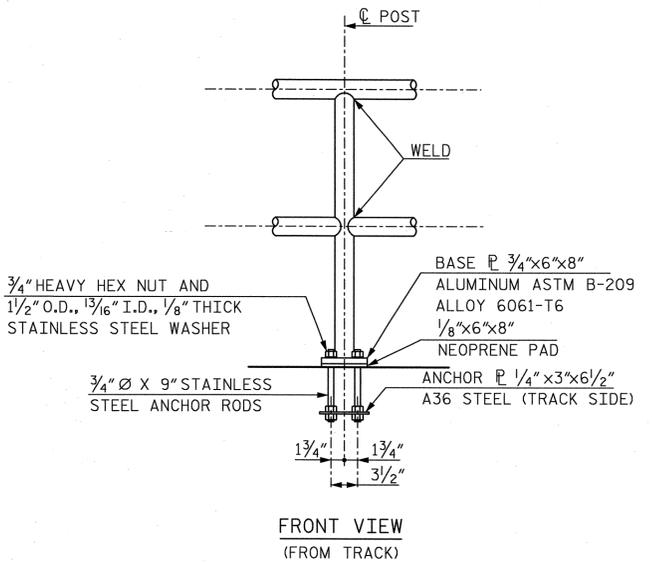
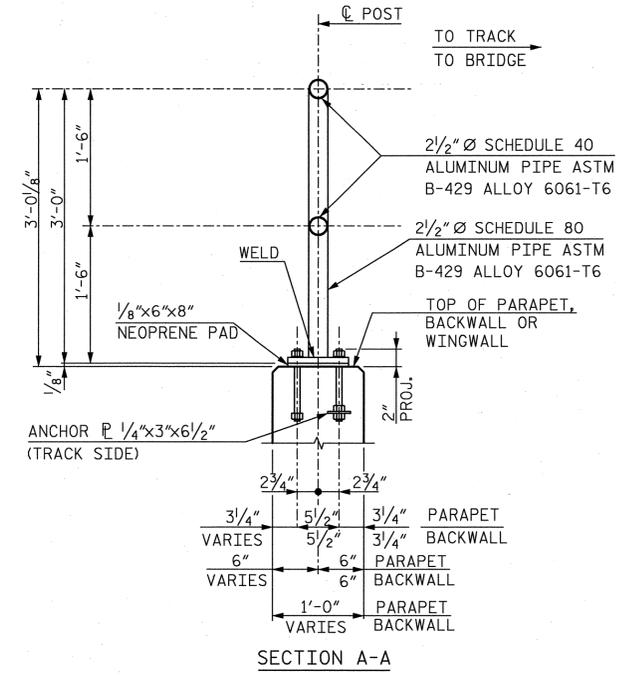
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
SUPERSTRUCTURE
METAL HANDRAIL
DETAILS

| | | | |
|-----------------------|------------|---|--|
| HNTB | | HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | DWG. NO. 17 | |
| CHECKED BY: F. BARBER | DATE: 2/13 | | |

| REVISIONS | | | |
|-----------|-----|-------|---|
| NO. | BY: | DATE: | |
| 1 | | | 3 |
| 2 | | | 4 |

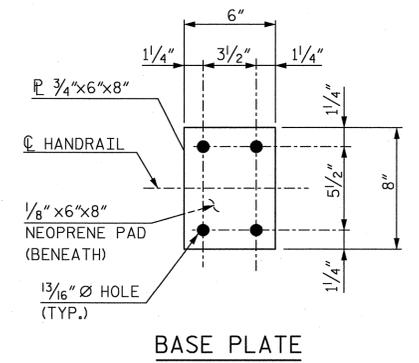
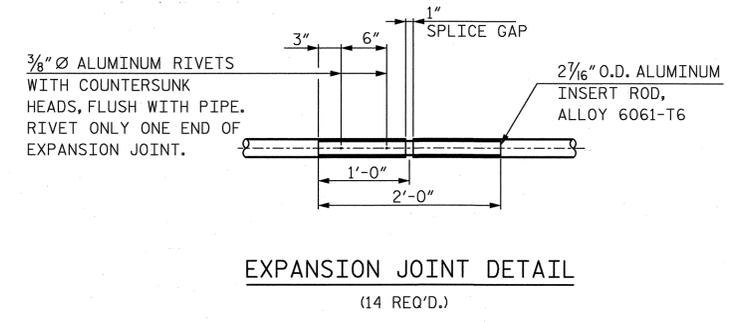
| | |
|--------------|-------------|
| SHEET NO. | S-53 |
| TOTAL SHEETS | 64 |

0248DEL_P10C1



NOTE: FOR RAIL LOCATION ON WINGWALLS, SEE SHEET 1 OF 2.
RAIL ON WINGWALLS SHALL ALIGN WITH BRIDGE RAIL.
WINGWALL C RAIL SHALL BE A MINIMUM OF 6" FROM EDGE OF WALL.

ALUMINUM HANDRAIL AND POST

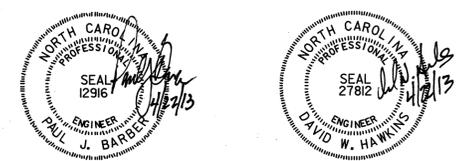


PAY LENGTH PHASE I = 225.5'
PAY LENGTH PHASE II = 262.9'
TOTAL PAY LENGTH = 488.4'

NOTES:
JOINTS IN RAILING (SPLICE GAP) SHALL BE LOCATED AS SHOWN IN POST SPACING PLAN.
ALUMINUM PIPE TO BE ASTM B-429, ALLOY 6061-T6 AND BASE PLATE TO BE ASTM B-209, ALLOY 6061-T6.
STAINLESS STEEL BOLTS, CAP SCREWS, AND NUTS TO BE ASTM A-276 TYPE 304. STAINLESS STEEL WASHERS TO BE ASTM A-276 TYPE 302.
POSTS TO BE SET PERPENDICULAR TO TOP OF PARAPET AND RAILS SHALL BE PLACED PARALLEL TO THE GRADE OF THE BRIDGE.
CERTIFIED MILL REPORTS ARE REQUIRED FOR RAIL AND POSTS. SHOP INSPECTIONS ARE NOT REQUIRED BY THE RAILROAD BUT MAY BE REQUIRED BY NCDOT.
AFTER ANCHOR ROD NUTS HAVE BEEN TIGHTENED, THREADS SHALL BE SCORED TO LOCK NUTS.
CURVED RAIL USAGE: WHERE RAILS ARE TO BE USED ON BRIDGES ON HORIZONTAL AND/OR VERTICAL CURVATURES THE CONTRACTOR MAY AT HIS OPTION HAVE THE REQUIRED CURVATURE IN THE RAIL FORMED IN THE SHOP OR IN THE FIELD. IN EITHER EVENT THE RAIL SHALL CONFORM WITHOUT BUCKLING OR KINKING TO THE REQUIRED CURVATURE IN A UNIFORM MANNER ACCEPTABLE TO THE ENGINEER.

ANCHOR PLATES SHALL BE STEEL CONFORMING TO ASTM SPECIFICATION A36.
ANCHOR RODS SHALL CONFORM TO ASTM SPECIFICATION A276 TYPE 302 OR 304, STAINLESS STEEL AND THREADS SHALL BE ROLLED, NOT CUT.
UPPER ANCHOR ROD NUTS SHALL BE HEAVY HEX NUTS, PER ASTM A276 TYPE 302 OR 304 STAINLESS STEEL.
LOWER ANCHOR ROD NUTS SHALL BE HEAVY STEEL HEX NUTS, PER ASTM A563.
THE CENTERLINE OF ANY SPLICE AND/OR EXPANSION JOINT IS TO BE LOCATED AT LEAST 2'-0" AWAY FROM CENTERLINE OF POST. EXPANSION AND/OR SPLICE JOINTS FOR EACH RAIL OF TWO RAILINGS ARE TO BE PLACED IN THE SAME LOCATION AND IN THE SAME PANEL.
WELDING SHALL BE IN ACCORDANCE WITH THE CURRENT AWS STRUCTURAL WELDING CODE - ALUMINUM.
THE LENGTH OF METAL RAIL TO BE PAID FOR SHALL BE THE CONTINUOUS LENGTH MEASURED FROM END TO END OF RAIL, ALONG THE TOP RAIL.
SHOP DRAWINGS FOR RAILINGS ARE REQUIRED AND SHALL BE SUBMITTED FOR APPROVAL.
FOR METAL RAIL (ALUMINUM), SEE SPECIAL PROVISIONS.

PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7761+14.08 -M1-
MILE POST: 313.40
SHEET 2 OF 2

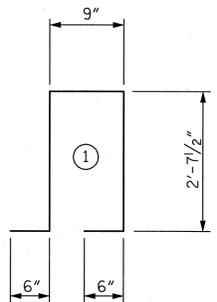


| | | | | | |
|---|------------|-----------|-----|-------|--------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | | TOTAL SHEETS |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | NO.: | BY: | DATE: | 64 |
| CHECKED BY: P. BARBER | DATE: 2/13 | 1 | 3 | | |
| | | 2 | 4 | | |

0248DEL_P10C1

EPOXY-COATED REINFORCING STEEL

| SPAN A | | | | | | | SPAN B | | | | | | | | |
|----------------|----------|-----|------|------|--------|--------|----------|----------------|----------|------|------|---------|--------|--|--------|
| PHASE I | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | PHASE I | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | | |
| SLAB | A1 | 289 | 5 | STR. | 18'-4" | 5,526 | SLAB | A1 | 295 | 5 | STR. | 18'-4" | 5,641 | | |
| | B1 | 150 | 4 | STR. | 30'-0" | 3,006 | | B1 | 150 | 4 | STR. | 30'-0" | 3,006 | | |
| | B3 | 50 | 4 | STR. | 22'-0" | 735 | | B7 | 50 | 4 | STR. | 24'-2" | 807 | | |
| | SUBTOTAL | | | | | | | 9,267 | SUBTOTAL | | | | | | 9,454 |
| PARAPET | B5 | 24 | 5 | STR. | 26'-2" | 655 | PARAPET | B9 | 24 | 5 | STR. | 26'-9" | 670 | | |
| | S1 | 107 | 5 | 1 | 7'-0" | 781 | | S1 | 109 | 5 | 1 | 7'-0" | 796 | | |
| | SUBTOTAL | | | | | | | 1,436 | SUBTOTAL | | | | | | 1,466 |
| PHASE I TOTAL | | | | | | | 10,703 | PHASE I TOTAL | | | | | | | 10,920 |
| PHASE II | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | PHASE II | BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | | |
| SLAB | A1 | 279 | 5 | STR. | 18'-4" | 5,335 | SLAB | A1 | 287 | 5 | STR. | 18'-4" | 5,488 | | |
| | B1 | 150 | 4 | STR. | 30'-0" | 3,006 | | B1 | 150 | 4 | STR. | 30'-0" | 3,006 | | |
| | B2 | 50 | 4 | STR. | 18'-2" | 607 | | B6 | 50 | 4 | STR. | 20'-11" | 699 | | |
| | SUBTOTAL | | | | | | | 8,948 | SUBTOTAL | | | | | | 9,193 |
| PARAPET | B4 | 24 | 5 | STR. | 25'-2" | 630 | PARAPET | B8 | 24 | 5 | STR. | 25'-11" | 649 | | |
| | S1 | 103 | 5 | 1 | 7'-0" | 752 | | S1 | 106 | 5 | 1 | 7'-0" | 774 | | |
| | SUBTOTAL | | | | | | | 1,382 | SUBTOTAL | | | | | | 1,423 |
| PHASE II TOTAL | | | | | | | 10,330 | PHASE II TOTAL | | | | | | | 10,616 |



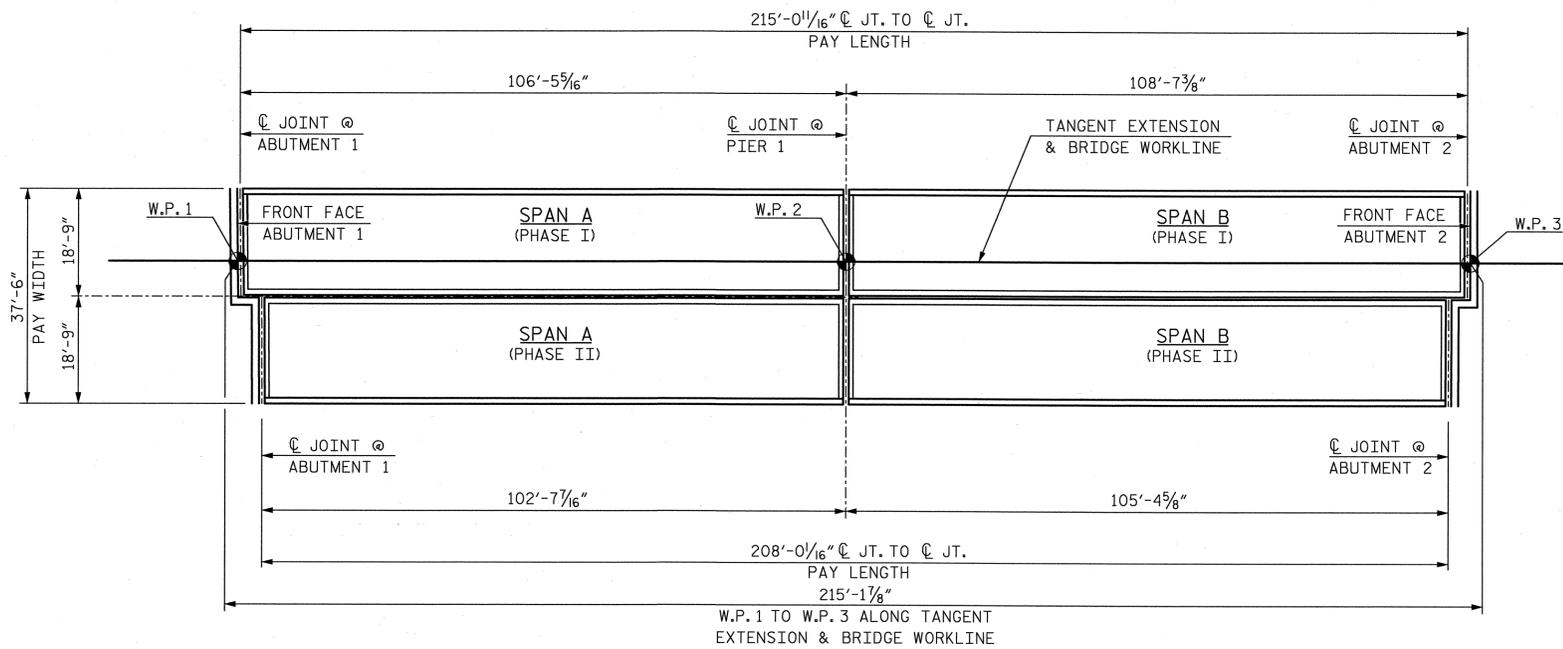
ALL BAR DIMENSIONS ARE OUT TO OUT

QUANTITY BREAKDOWN BY SPAN

| | EPOXY COATED REINFORCING STEEL (LBS.) | | CLASS AA CONCRETE (CU. YDS.) | | | |
|----------|---------------------------------------|---------|------------------------------|---------|----------|---------|
| | | | DECK SLAB | | PARAPETS | |
| | PHASE 1 | PHASE 2 | PHASE 1 | PHASE 2 | PHASE 1 | PHASE 2 |
| SPAN "A" | 10,703 | 10,330 | 64.4 | 62.0 | 7.4 | 7.1 |
| SPAN "B" | 10,920 | 10,616 | 65.7 | 63.7 | 7.5 | 7.3 |
| TOTALS | 21,623 | 20,946 | 130.1 | 125.7 | 14.9 | 14.4 |

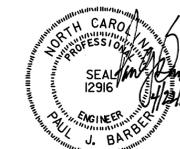
TOTAL SUPERSTRUCTURE QUANTITIES

| | REINFORCED CONCRETE DECK SLAB | EPOXY COATED REINFORCING STEEL | CLASS AA CONCRETE |
|-----------|-------------------------------|--------------------------------|-------------------|
| | SQ. FT. | LBS. | CU. YDS. |
| DECK SLAB | 7,932 | 36,862 | 255.8 |
| PARAPET | | 5,707 | 29.3 |
| TOTALS | 7,932 | 42,569 | 285.1 |



LAYOUT FOR COMPUTING AREA OF REINFORCED CONCRETE DECK SLAB
(SQ. FEET PHASE I = 4,032)
(SQ. FEET PHASE II = 3,900)

PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7761+14.08 -M1-
MILE POST: 313.40

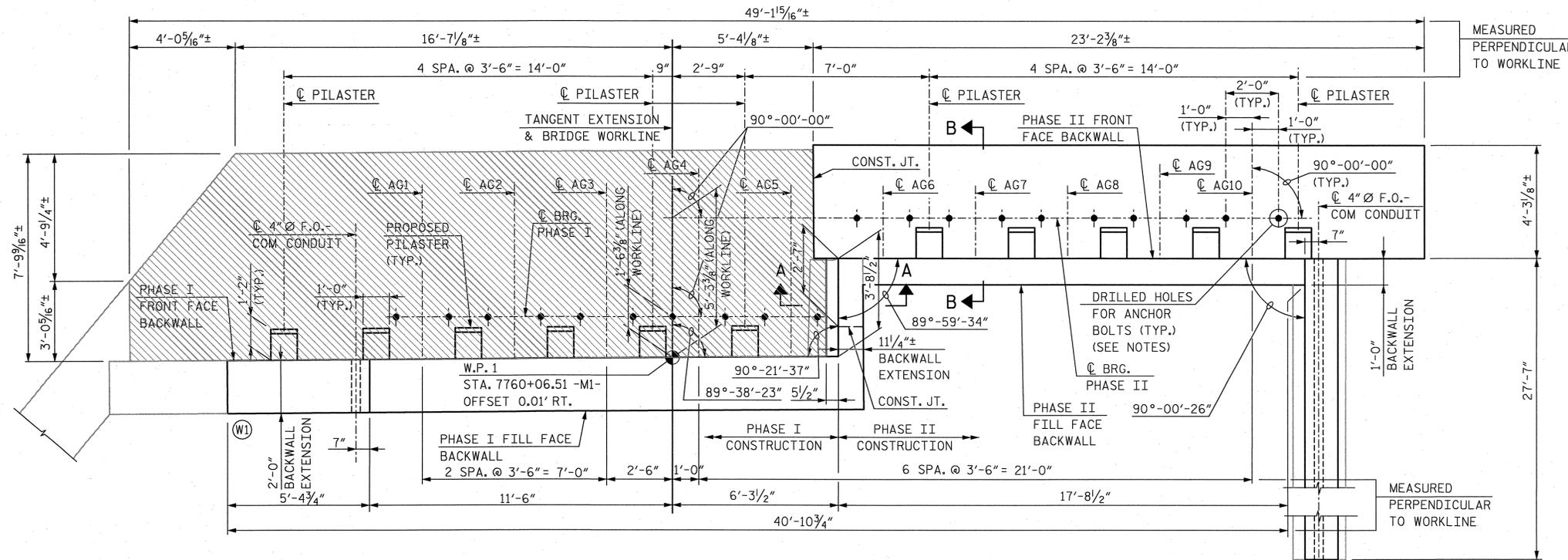


STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUPERSTRUCTURE

BILL OF MATERIAL

| HNTB | | HNTB NORTH CAROLINA, P.C. | | REVISIONS | | | | | | SHEET NO. |
|-----------------------|------------|--|--|-----------|-----|-------|-----|-----|-------|--------------|
| License No. C-1554 | | 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | NO. | BY: | DATE: | NO. | BY: | DATE: | S-55 |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | DWG. NO. 19 | | 1 | | | 3 | | | TOTAL SHEETS |
| CHECKED BY: P. BARBER | DATE: 2/13 | | | 2 | | | 4 | | | 64 |



NOTES:

FOR SECTION C-C, D-D, E-E, F-F, AND G-G, SEE SHEET 2 OF 2.

CONDUIT TO BE 4" Ø IN ACCORDANCE WITH UNDERWRITERS LABORATORY SPECIFICATIONS.

THE CONTRACTOR SHALL USE AN ADHESIVE ANCHOR SYSTEM FOR THE #6 "V" BARS, #4 "K" BARS AND #4D1 DOWELS IN THE PILASTER, BACKWALL AND WINGWALL EXTENSION. NO FIELD TESTING IS REQUIRED. THE YIELD LOAD OF THE #6 "V" BARS IS 26.4 KIPS. THE YIELD LOAD FOR THE #4 "K" BARS AND #4 "D" DOWELS IS 12.0 KIPS. ADHESIVE ANCHOR SYSTEM SHALL DEVELOP 125% OF THE YIELD LOAD OF THE BAR. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

THE TOP SURFACE OF EXISTING WALLS AND CAPS SHALL BE FREE OF DEBRIS AND UNSOUND CONCRETE PRIOR TO PLACEMENT OF WALL EXTENSION AND PILASTER.

THE TOP SURFACE OF EXISTING WALLS AND CAPS SHALL BE ROUGHENED TO 1/4" AMPLITUDE PRIOR TO PLACEMENT OF WALL EXTENSION AND PILASTER.

REMOVE EXISTING ANCHOR BOLTS TO A MINIMUM DEPTH OF 3" BELOW PROPOSED TOP OF CAP PRIOR TO PLACEMENT OF EPOXY MORTAR OR CLASS AA CONCRETE.

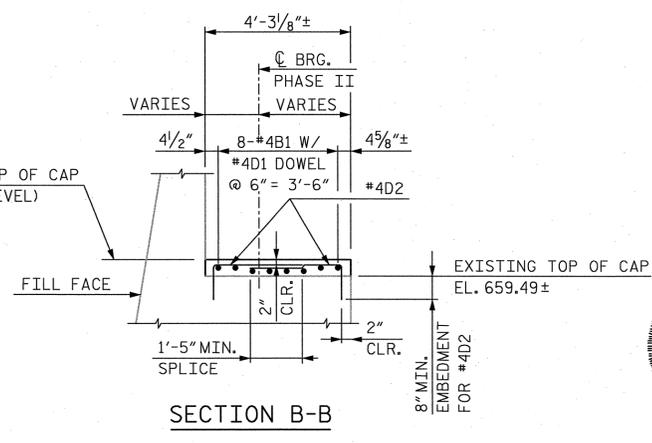
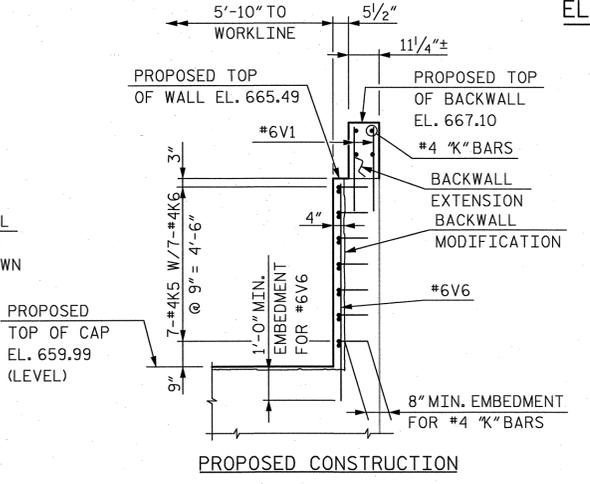
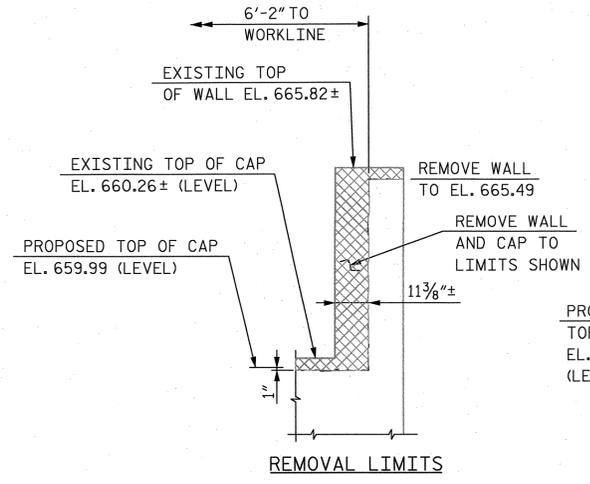
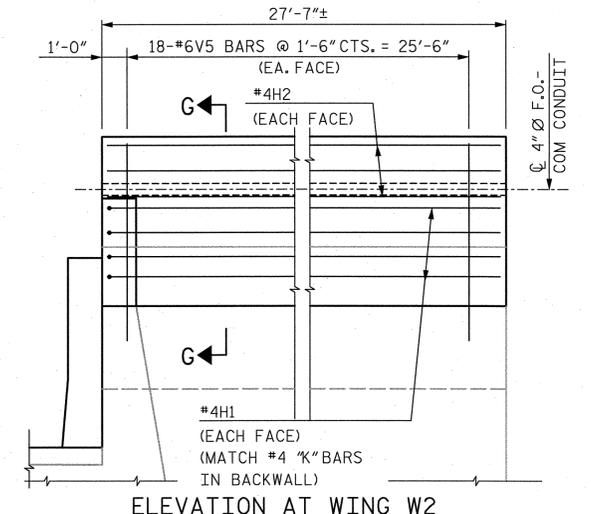
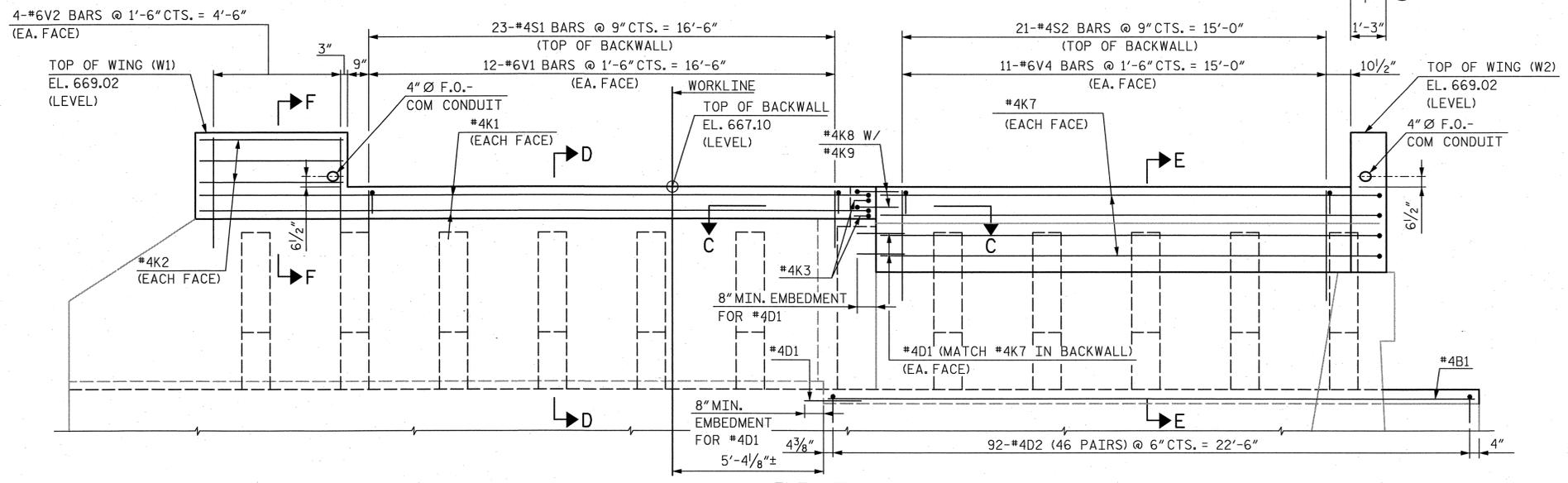
██ DENOTES CONCRETE MILLING OF ABUTMENT CAP FOR PLACEMENT OF NEW BEARINGS.

PHASE I CL BRG. AND PHASE II CL BRG. ARE PARALLEL.

*4B1 BARS MAY BE SHIFTED SLIGHTLY TO CLEAR ANCHOR BOLTS.

IF FREEZING WEATHER IS ENCOUNTERED, FILL ANCHOR BOLT HOLES WITH ANTIFREEZE AND SAWDUST.

FOR LOCATION OF HANDRAIL ANCHORAGES IN TOP OF WINGWALLS, SEE "METAL HANDRAIL DETAILS" SHEETS.



PROJECT NO. C-4901A

DAVIDSON COUNTY

STATION: 7761+14.08 -M1-

MILE POST: 313.40

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

ABUTMENT 1

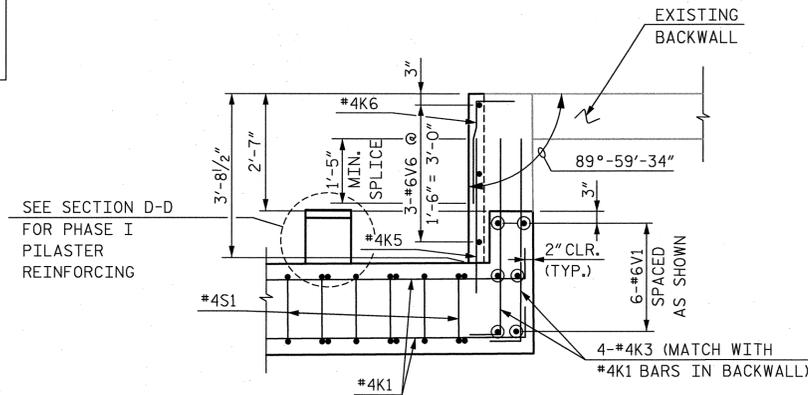


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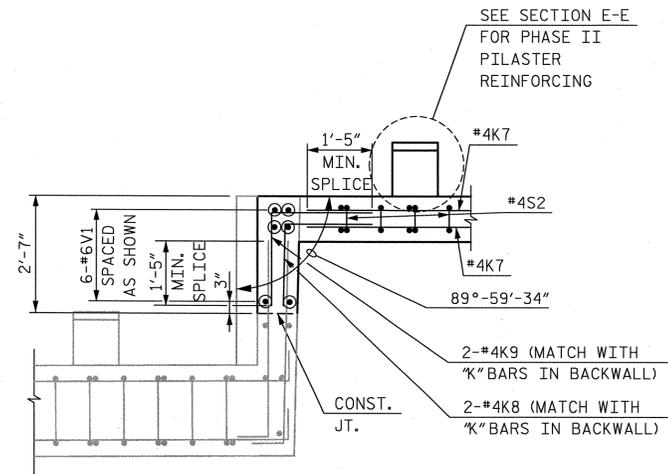
DRAWN BY: M. WRIGHT DATE: 2/13
CHECKED BY: D. HAWKINS DATE: 3/13

DWG. NO. 20

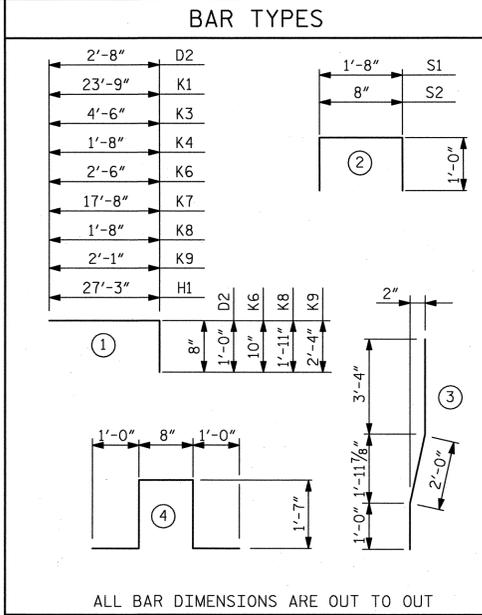
| REVISIONS | | | | | | SHEET NO. S-56 |
|-----------|-----|-------|-----|-----|-------|--------------------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | TOTAL SHEETS 64 |
| 2 | | | 4 | | | |



PHASE I CONSTRUCTION



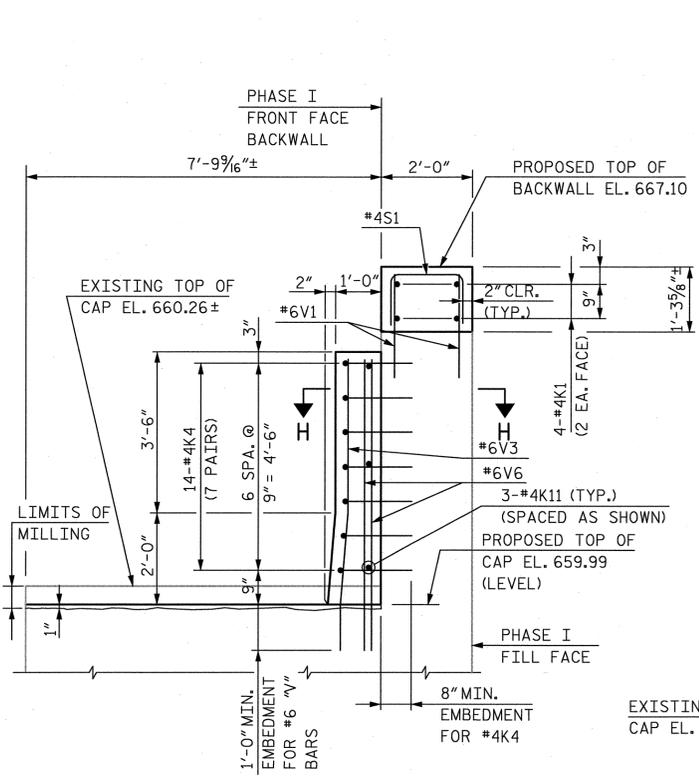
PHASE II CONSTRUCTION



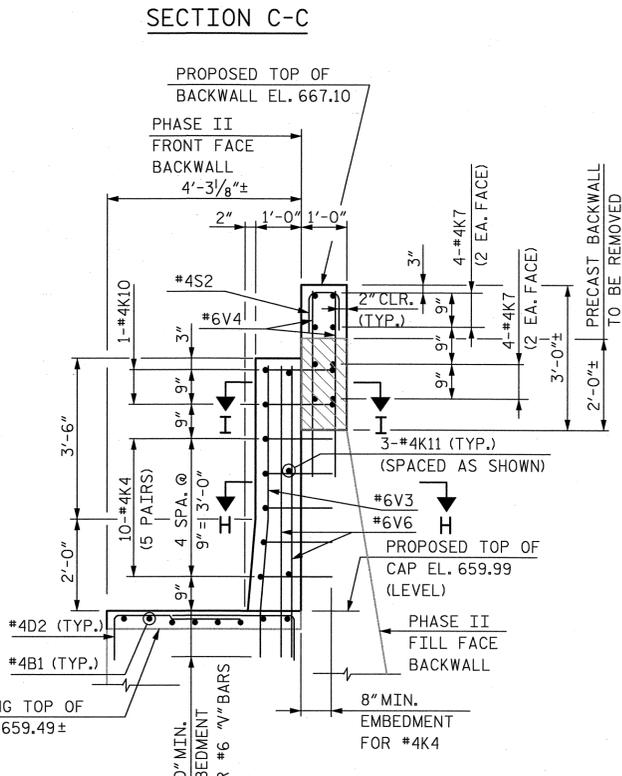
ALL BAR DIMENSIONS ARE OUT TO OUT

| BILL OF REINFORCING | | | | | |
|-----------------------|-----|------|------|---------|--------|
| ABUTMENT 1 - PHASE I | | | | | |
| MARK | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| K1 | 4 | 4 | | 24'-5" | 65 |
| K2 | 6 | 4 | STR. | 5'-0" | 20 |
| K3 | 4 | 4 | | 5'-2" | 14 |
| K4 | 84 | 4 | | 2'-4" | 131 |
| K5 | 7 | 4 | STR. | 3'-2" | 15 |
| K6 | 7 | 4 | | 3'-4" | 16 |
| K11 | 18 | 4 | STR. | 8" | 8 |
| S1 | 23 | 4 | 2 | 3'-8" | 56 |
| V1 | 30 | 6 | STR. | 2'-2" | 98 |
| V2 | 8 | 6 | STR. | 4'-0" | 48 |
| V3 | 12 | 6 | 3 | 6'-4" | 114 |
| V6 | 33 | 6 | STR. | 6'-4" | 314 |
| ABUTMENT 1 - PHASE II | | | | | |
| MARK | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 8 | 4 | STR. | 22'-10" | 122 |
| D1 | 12 | 4 | STR. | 2'-3" | 18 |
| D2 | 92 | 4 | 1 | 3'-8" | 225 |
| H1 | 8 | 4 | 1 | 27'-11" | 149 |
| H2 | 6 | 4 | STR. | 27'-3" | 109 |
| K4 | 50 | 4 | 1 | 2'-4" | 78 |
| K7 | 8 | 4 | 1 | 18'-4" | 98 |
| K8 | 2 | 4 | 1 | 3'-7" | 5 |
| K9 | 2 | 4 | 1 | 4'-5" | 6 |
| K10 | 10 | 4 | 4 | 5'-10" | 39 |
| K11 | 15 | 4 | STR. | 8" | 7 |
| S2 | 21 | 4 | 2 | 2'-8" | 37 |
| V1 | 6 | 6 | STR. | 2'-2" | 20 |
| V3 | 10 | 6 | 3 | 6'-4" | 95 |
| V4 | 22 | 6 | STR. | 3'-10" | 127 |
| V5 | 36 | 6 | STR. | 5'-9" | 311 |
| V6 | 25 | 6 | STR. | 6'-4" | 238 |

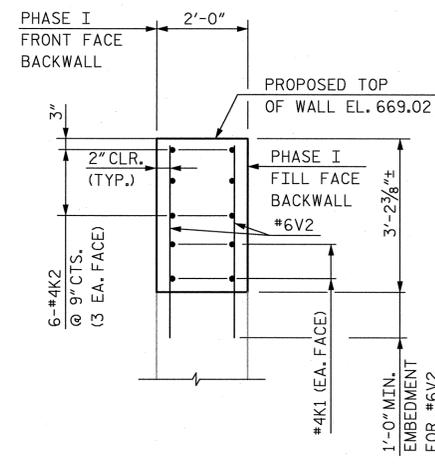
| QUANTITIES | | |
|----------------------|------|-------|
| ITEM | | TOTAL |
| REINFORCING STEEL | | |
| PHASE I | LBS | 899 |
| PHASE II | LBS | 1,684 |
| CLASS AA CONCRETE: | | |
| PHASE I | C.Y. | 4.6 |
| PHASE II | C.Y. | 11.1 |
| EPOXY MORTAR REPAIRS | | |
| PHASE I | S.F. | 194.6 |



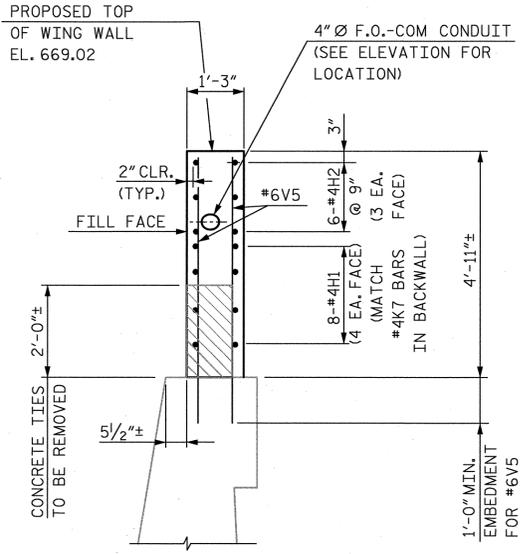
SECTION D-D



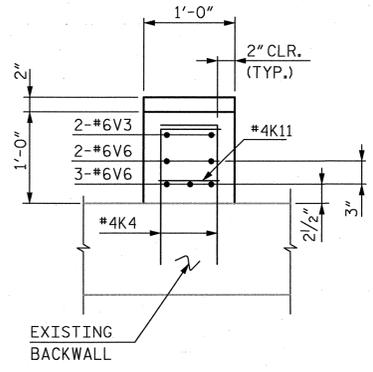
SECTION E-E



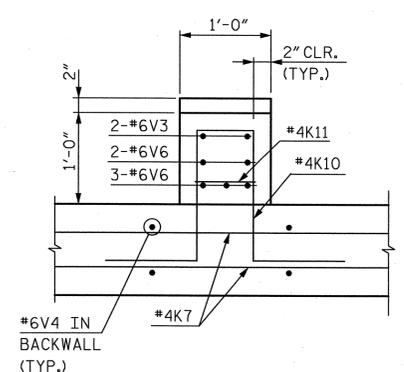
SECTION F-F



SECTION G-G



SECTION H-H



SECTION I-I

NOTE: REMOVE CONCRETE CAP TO LIMITS OF MILLING SHOWN AND REPAIR WITH EPOXY MORTAR.



PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

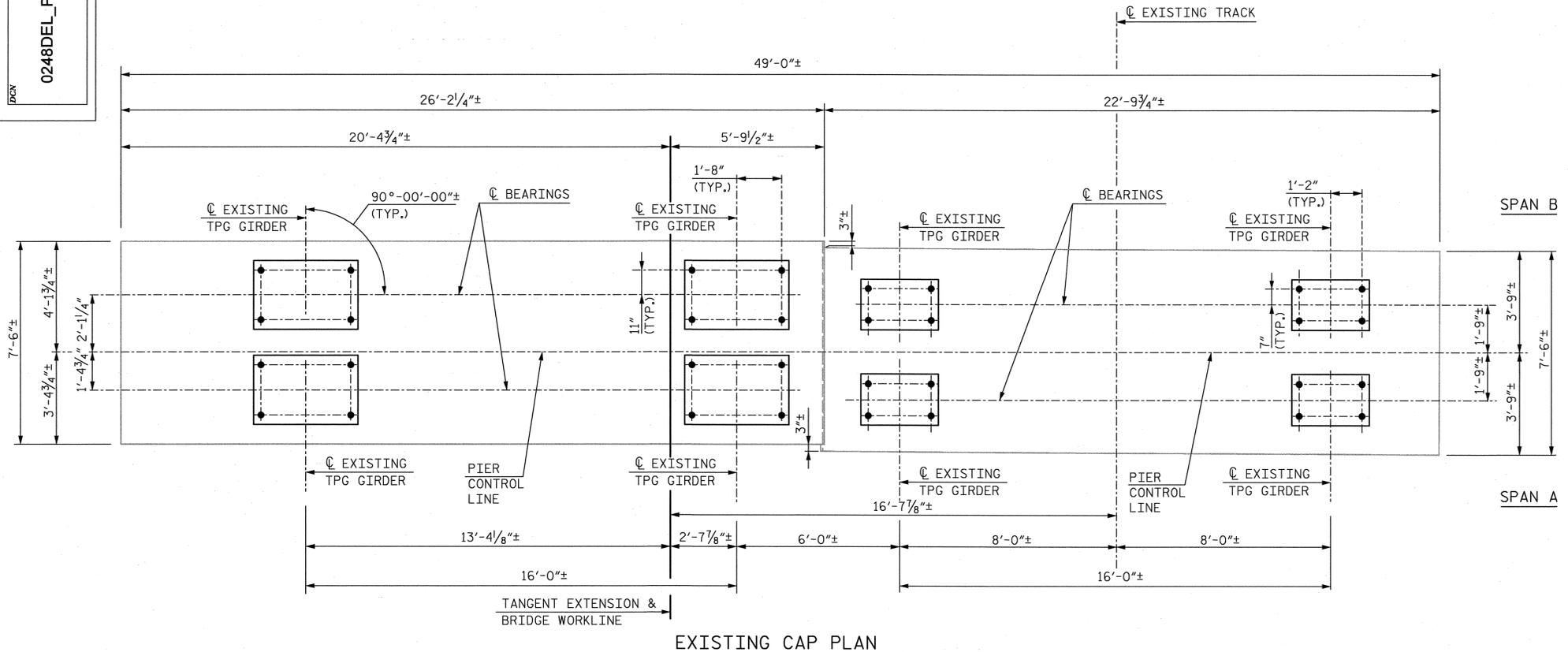
SUBSTRUCTURE

ABUTMENT 1

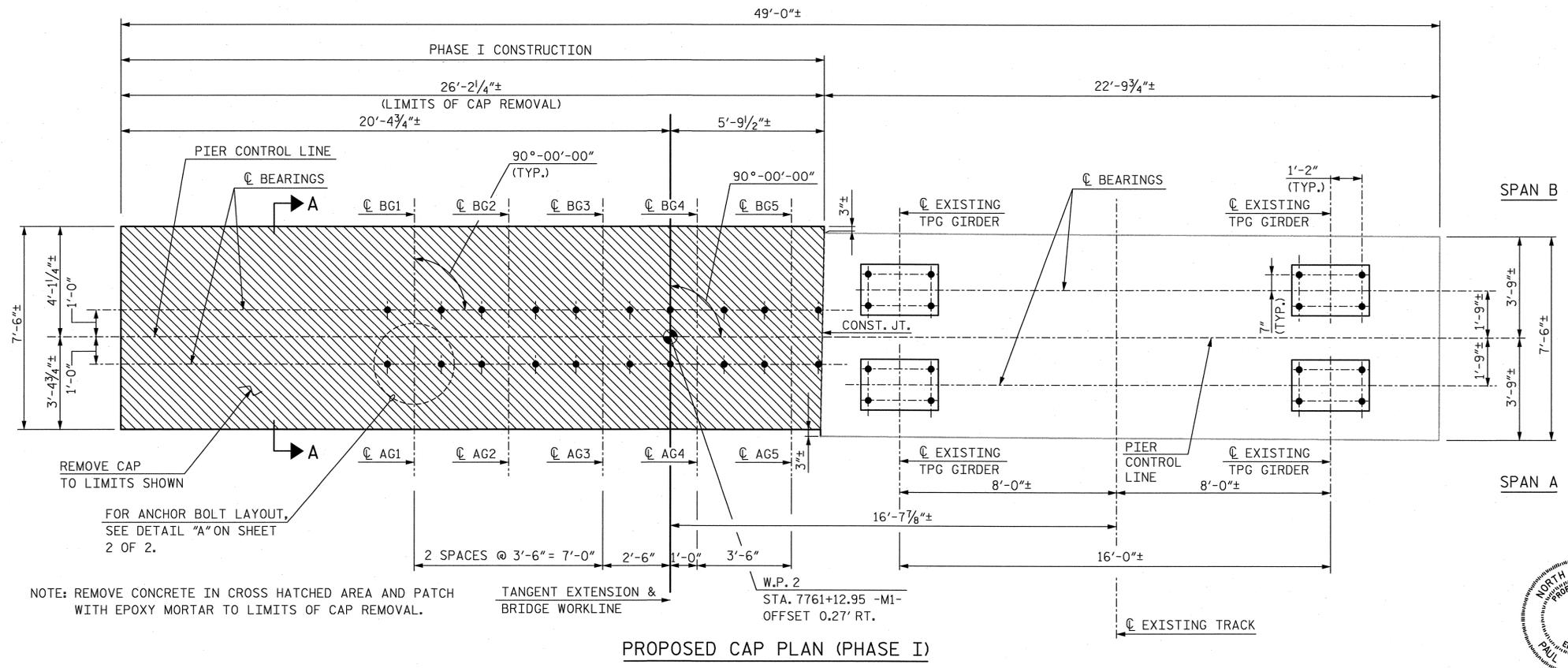
| HNTB | | HNTB NORTH CAROLINA, P.C. | |
|---------------------|------------|--|------------|
| License No. C-1554 | | 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | CHECKED BY: D. HAWKINS | DATE: 3/13 |
| DWG. NO. 21 | | REVISIONS | |
| NO. | BY: | DATE: | NO. |
| 1 | | | 3 |
| 2 | | | 4 |

| SHEET NO. | |
|-----------|------------------|
| S-57 | TOTAL SHEETS: 64 |

DCN
0248DEL_P10C1



EXISTING CAP PLAN



PROPOSED CAP PLAN (PHASE I)

NOTES:
ALL DIMENSIONS SHOWN ARE PARALLEL OR NORMAL TO C PIER OR PIER CONTROL LINE UNLESS NOTED.
FOR EPOXY MORTAR REPAIRS, SEE SPECIAL PROVISIONS.
FOR ADHESIVELY ANCHORED DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

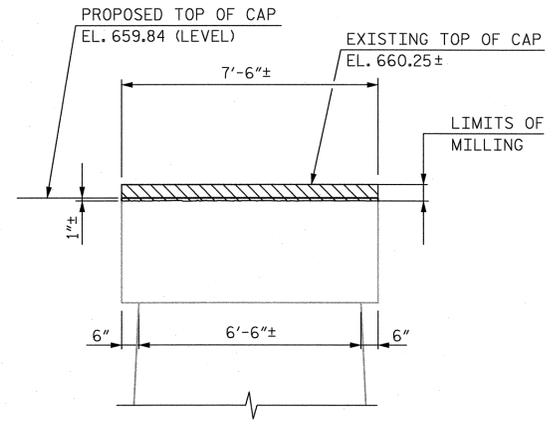
THE CONTRACTOR SHALL USE AN ADHESIVE ANCHOR SYSTEM FOR THE #4D1 AND #4D2 BARS. NO FIELD TESTING IS REQUIRED. THE YIELD LOAD OF THE #4D BARS IS 12.0 KIPS. ADHESIVE ANCHOR SYSTEM SHALL DEVELOP 125% OF THE YIELD LOAD OF THE BAR. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

EXISTING CAP ELEVATIONS SHOWN ON THIS SHEET WERE GENERATED FROM EXISTING BRIDGE PLANS AND NCDOT SURVEY DATA. PRIOR TO THE START OF CONSTRUCTION, THE CONTRACTOR SHALL FIELD VERIFY EXISTING TOP OF CAP ELEVATIONS AND GEOMETRY.

REMOVE EXISTING ANCHOR BOLTS TO A MINIMUM DEPTH OF 3" BELOW PROPOSED TOP OF CAP PRIOR TO PLACEMENT OF EPOXY MORTAR OR CLASS AA CONCRETE.

DENOTES CONCRETE MILLING OF BENT CAP FOR PLACEMENT OF NEW BEARINGS.

FOR SEQUENCE OF CONSTRUCTION, SEE "CONSTRUCTION SEQUENCE" SHEETS.



SECTION A-A

PROJECT NO. C-4901A
DAVIDSON COUNTY
STATION: 7761+14.08 -M1-
MILE POST: 313.40
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE
PIER 1

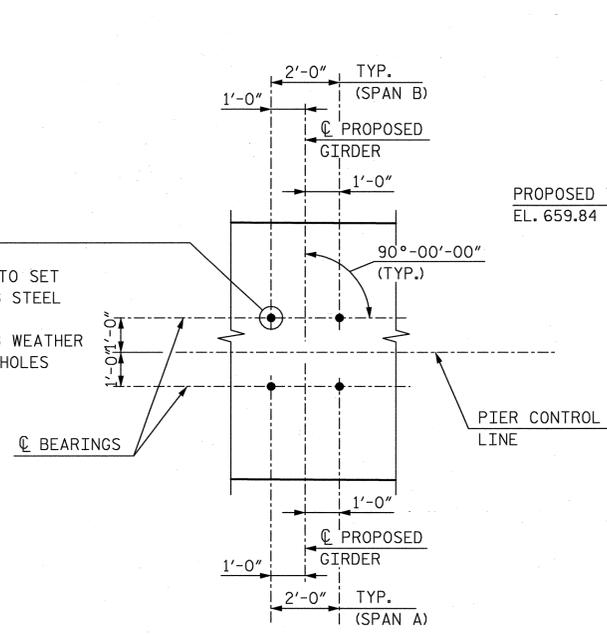
PAUL J. BARBER
ENGINEER
12916

DAVID W. HAWKINS
ENGINEER
27812

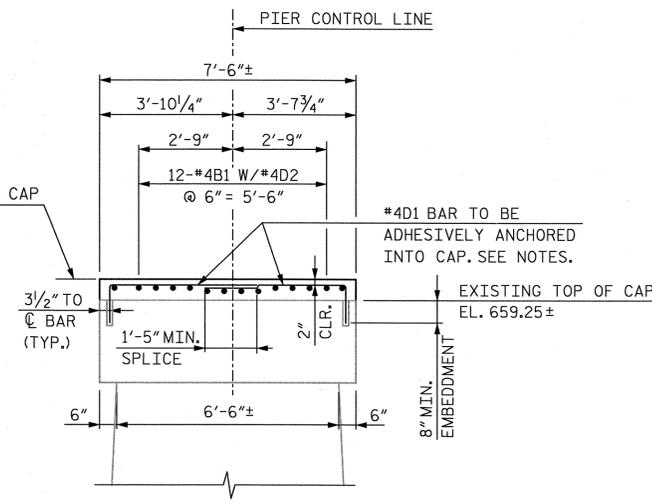
| | | | | |
|---|------------|-----------|-----|------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | SHEET NO. |
| DRAWN BY: M. WRIGHT | DATE: 2/13 | NO.: | BY: | DATE: |
| CHECKED BY: D. HAWKINS | DATE: 2/13 | 1 | 3 | |
| | | 2 | 4 | |
| DWG. NO. 22 | | | | TOTAL SHEETS: 64 |
| | | | | S-58 |

0248DEL_P10C1

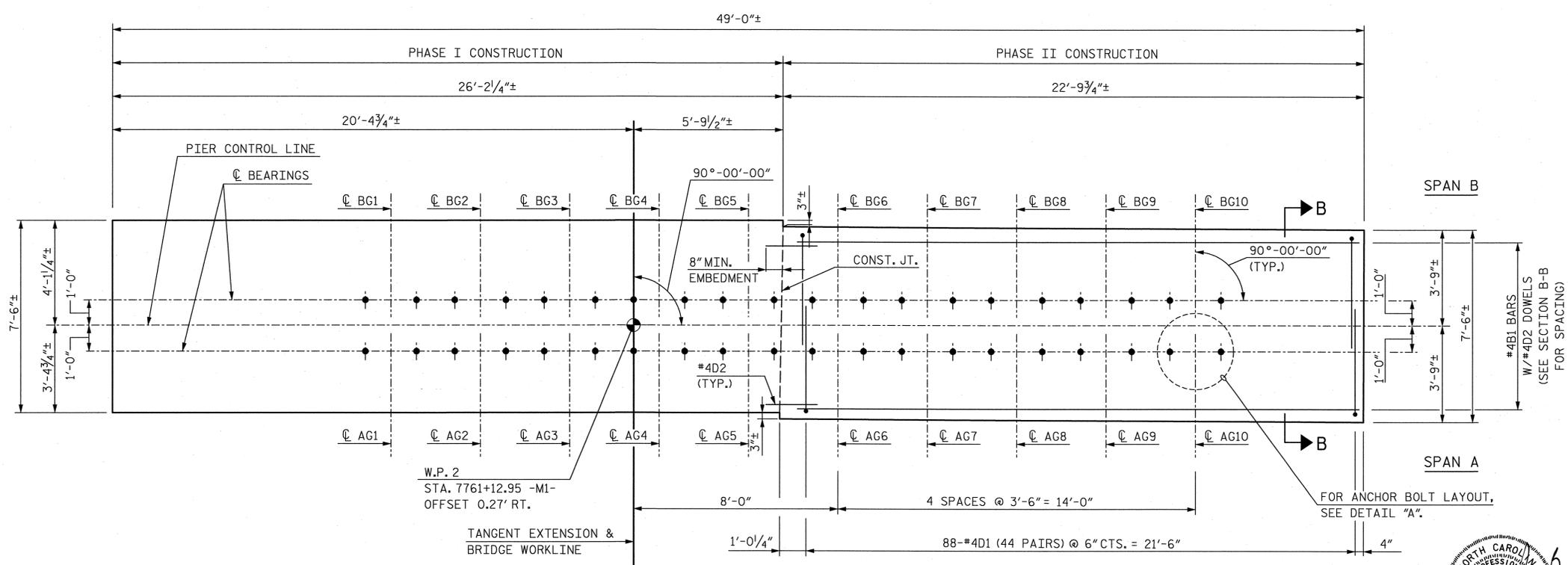
DRILLED HOLES FOR ANCHOR BOLTS (TYP.) CARE SHALL BE TAKEN TO SET PHASE II REINFORCING STEEL SO AS TO CLEAR HOLE LOCATION. IF FREEZING WEATHER IS ENCOUNTERED, FILL HOLES WITH ANTIFREEZE AND SAWDUST.



DETAIL A



SECTION B-B

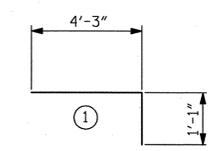


PROPOSED CAP PLAN (PHASE II)

BILL OF REINFORCING

| PIER 1 | | | | | |
|--------|-----|------|------|--------|--------|
| MARK | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 14 | 4 | STR. | 22'-6" | 210 |
| D1 | 88 | 4 | 1 | 5'-4" | 314 |
| D2 | 14 | 4 | STR. | 2'-0" | 19 |
| | | | | | |
| | | | | | |

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

QUANTITIES

| ITEM | TOTAL |
|----------------------|------------|
| REINFORCING STEEL | |
| PHASE II | LBS 543 |
| CLASS AA CONCRETE: | |
| PHASE II | C.Y. 3.7 |
| EPOXY MORTAR REPAIRS | |
| PHASE I | S.F. 195.9 |

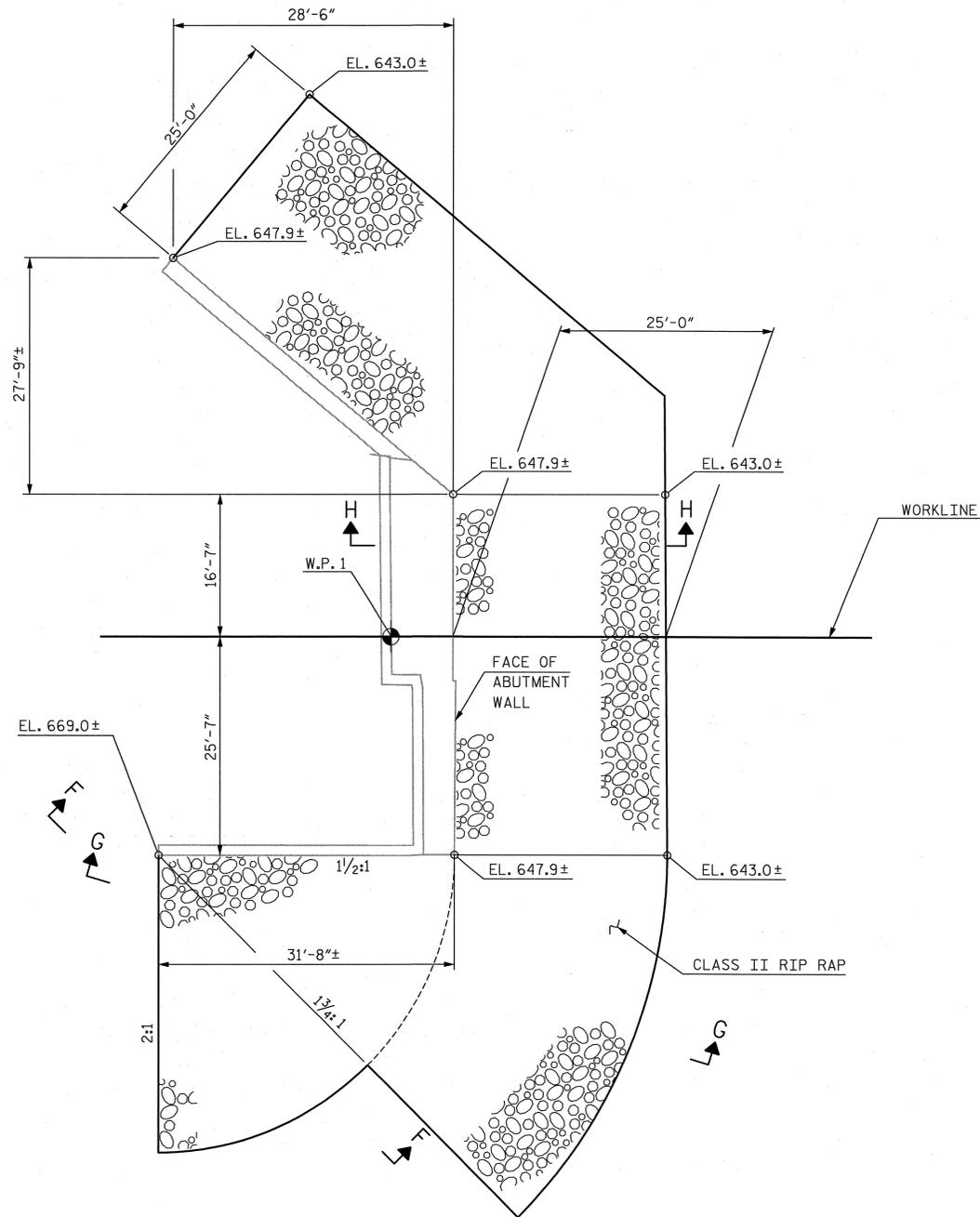
PROJECT NO. C-4901A
 DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40
 SHEET 2 OF 2

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 PIER 1

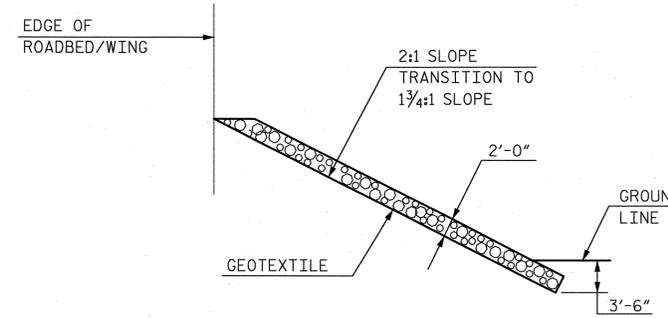


HNTB HNTB NORTH CAROLINA, P.C.
 License No. C-1554
 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609
 DRAWN BY M. WRIGHT DATE 2/13
 CHECKED BY D. HAWKINS DATE 2/13
 DWG. NO. 23

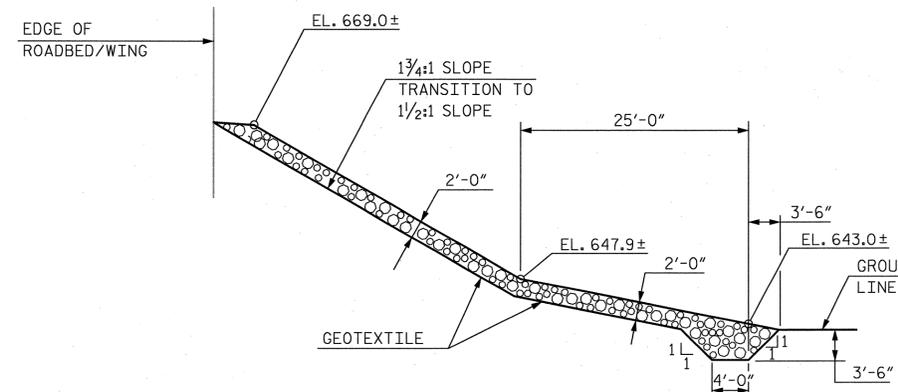
| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-------------------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | S-59 TOTAL SHEETS 64 |
| 2 | | | 4 | | | |



PLAN
ABUTMENT 1

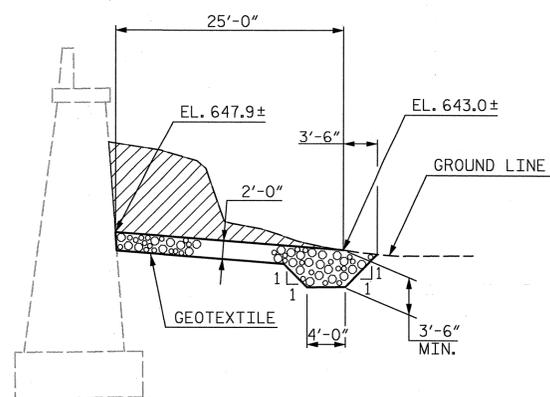


SECTION F-F



SECTION G-G

| ESTIMATED QUANTITIES | | |
|----------------------------------|--------------------------------------|----------------------------|
| BRIDGE @ STA. 7761+14.08 -M1- | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE |
| | TONS | SQUARE YARDS |
| ABUTMENT 1 | 557 | 619 |

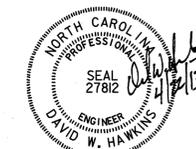


SECTION H-H

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7761+14.08 -M1-
 MILE POST: 313.40

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

RIP RAP
 DETAILS



| | | | | | |
|---|------------|-----------|-----|-------|--------------------------|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | REVISIONS | | | SHEET NO. S-62 |
| DRAWN BY: J. BAYNE | DATE: 2/13 | NO.: | BY: | DATE: | TOTAL SHEETS |
| CHECKED BY: P. BARBER | DATE: 2/13 | 1 | 3 | | 62 |
| | | 2 | 4 | | |

GENERAL NOTES

ASSUMED LIVE LOAD = AREMA E80 OR ALTERNATE LIVE LOAD.

FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

PROPOSED HEADWALL EXTENSION HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE CURRENT EDITION OF "AREMA'S MANUAL FOR RAILWAY ENGINEERING, VOL. 2, STRUCTURES".

ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES", JANUARY 2012 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION (HEREIN CALLED STANDARD SPECIFICATIONS), EXCEPT AS NOTED HEREIN, ELSEWHERE IN THE PLANS, OR IN THE SPECIAL PROVISIONS.

ALL CONCRETE SHALL BE 4500 PSI CLASS AA CONCRETE WITH NO. 57 OR 67 COARSE AGGREGATE AND SHALL BE AIR ENTRAINED. MINIMUM CEMENT CONTENT FOR CUBIC YARD OF CONCRETE SHALL BE 6.5 BAGS. NO SUBSTITUTION OF FLYASH, BLAST FURNACE SLAG OR OTHER MATERIAL WILL BE PERMITTED IN MEETING THIS MINIMUM CEMENT REQUIREMENT. CHAMFER ALL EXPOSED EDGES AND CORNERS EXCEPT AS NOTED. THE USE OF GROUND GRANULATED BLAST FURNACE SLAG IS NOT PERMITTED IN THIS STRUCTURE.

REINFORCING STEEL SHALL BE ASTM DESIGNATION A615, GRADE 60. ALL DIMENSIONS RELATING TO BAR SPACING ARE TO BAR CENTERS UNLESS NOTED. FABRICATION TO BE IN ACCORDANCE WITH THE CURRENT ACI "MANUAL OF STANDARD PRACTICE", A.C.I. 315-80.

CONTROL OF WORK: ALL WORK INVOLVED IN THE CONSTRUCTION OF THE RAILWAY STRUCTURE SHALL BE PERFORMED UNDER THE SUPERVISION OF, AND SATISFACTORY TO THE ENGINEER AND/OR NORFOLK SOUTHERN RAILWAY. ALL METHODS OF HANDLING WORK AFFECTING THE SAFETY OF RAIL OPERATIONS MUST BE APPROVED BY THE RAILWAY ENGINEER BEFORE PROCEEDING WITH THAT PORTION OF THE WORK. RAIL TRAFFIC SHALL, AT ALL TIMES, BE MAINTAINED AND PROTECTED. THE CONTRACTOR SHALL NOT AT ANY TIME DELAY OR INTERFERE WITH RAIL OPERATIONS.

TRACKWORK SHALL BE CONSTRUCTED BY OTHERS. TRACKWORK SHALL INCLUDE BALLAST, TIES, RAILS AND OTHER TRACK MATERIAL.

THESE DRAWINGS HAVE BEEN PREPARED BASED ON THE BEST INFORMATION AVAILABLE. ACTUAL FIELD CONDITIONS MAY REQUIRE MODIFICATIONS IN CONSTRUCTION DETAILS AND QUANTITIES. THE CONTRACTOR IS RESPONSIBLE FOR THE VERIFICATION OF ALL DETAILS INCLUDING GEOMETRY AND ELEVATIONS PRIOR TO THE FABRICATION OR INSTALLATION OF ANY MATERIAL. THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER, OR AUTHORIZED REPRESENTATIVE, COPIES OF FIELD SURVEYS AND VERIFICATIONS FOR INCLUSION INTO THE CONSTRUCTION RECORDS FOR THE PROJECT.

THE CONTRACTOR SHALL USE AN ADHESIVE ANCHOR SYSTEM FOR THE #6 "D" BARS IN THE HEADWALL EXTENSION. NO FIELD TESTING IS REQUIRED. THE YIELD LOAD OF THE #6 "D" BARS IS 26.4 KIPS. ADHESIVE ANCHOR SYSTEM SHALL DEVELOP 125% OF THE YIELD LOAD OF THE BAR. FOR ADHESIVELY ANCHORED ANCHOR BOLTS OR DOWELS, SEE SECTION 420-13 OF THE STANDARD SPECIFICATIONS.

THE TOP SURFACE OF EXISTING HEADWALL SHALL BE FREE OF DEBRIS AND UNSOUND CONCRETE PRIOR TO PLACEMENT OF HEADWALL EXTENSION.

THE TOP SURFACE OF EXISTING HEADWALL SHALL BE ROUGHENED TO 1/4" AMPLITUDE PRIOR TO PLACEMENT OF HEADWALL EXTENSION.

THE CONTRACTOR SHALL PROVIDE INDEPENDENT ASSURANCE SAMPLES OF REINFORCING STEEL AS FOLLOWS: FOR PROJECTS REQUIRING UP TO 400 TONS OF REINFORCING STEEL, ONE 30 INCH SAMPLE OF EACH SIZE BAR USED, AND FOR PROJECTS REQUIRING OVER 400 TONS OF REINFORCING STEEL, TWO 30 INCH SAMPLES OF EACH SIZE BAR USED. THE BARS FROM WHICH THE SAMPLES ARE TAKEN MUST THEN BE SPLICED WITH REPLACEMENT BARS OF THE SIZE AND LENGTH OF THE SAMPLE, PLUS A MINIMUM LAP SPLICE OF THIRTY BAR DIAMETERS. PAYMENT FOR THE SAMPLES OF REINFORCING STEEL SHALL BE CONSIDERED INCIDENTAL TO VARIOUS PAY ITEMS.

FOR PORTLAND CEMENT, SEE SPECIAL PROVISIONS.

FOR FINE AND COARSE AGGREGATE, SEE SPECIAL PROVISIONS.

FOR RAILROAD TRACKWORK, SEE RAILROAD TRACKWORK PLANS.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

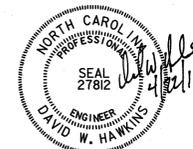
FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

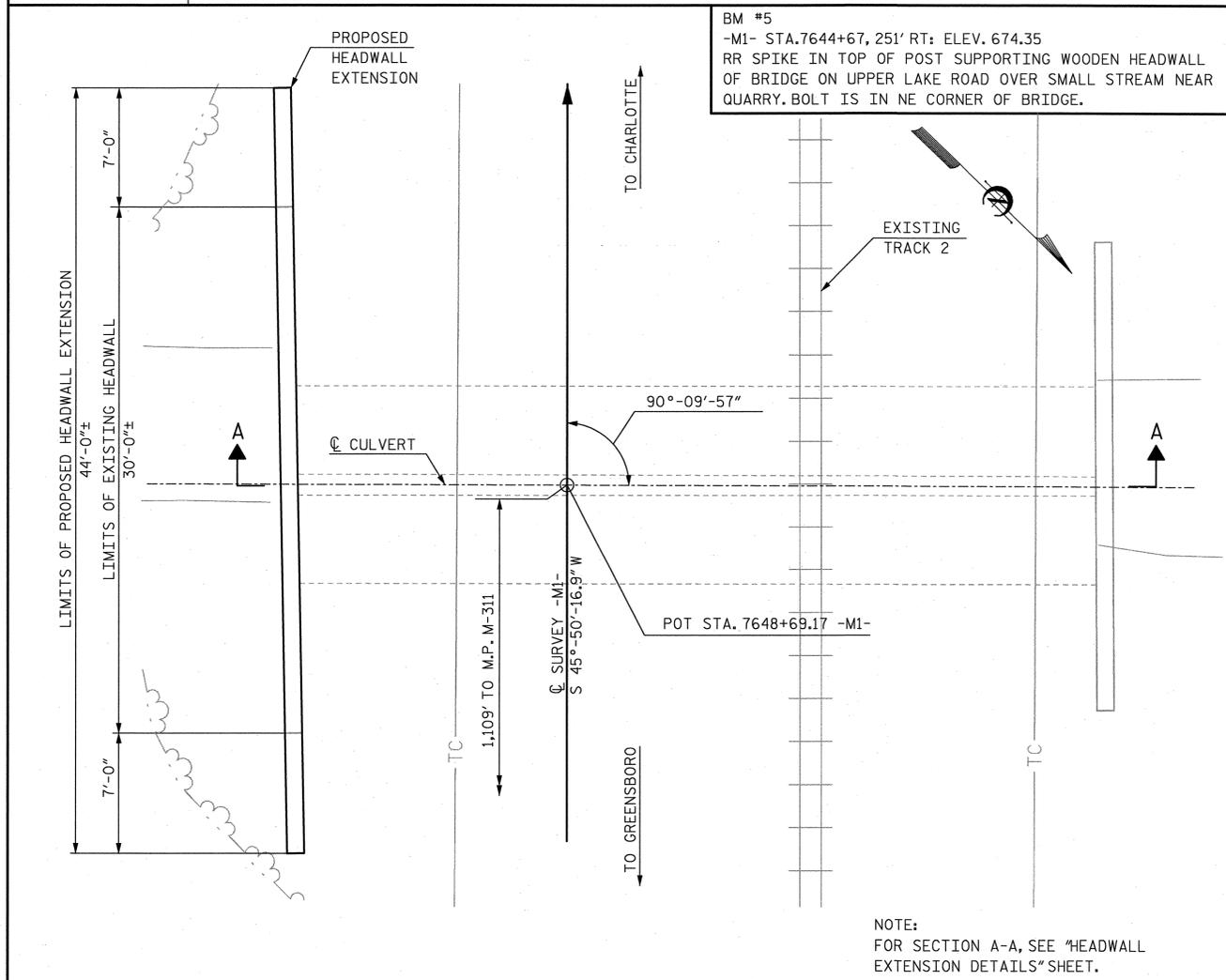
| QUANTITIES | | |
|--------------------|------|-------|
| HEADWALL EXTENSION | | |
| ITEM | | TOTAL |
| REINFORCING STEEL | LBS | 1,162 |
| CLASS AA CONCRETE: | C.Y. | 5.7 |

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7648+69.17 -M1-
 MILE POST: 311.21



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
GENERAL DRAWING
 LOCATION SKETCH,
 GENERAL NOTES AND
 BILL OF MATERIAL

| | | | | | | | |
|---|--|-----|-----|-------|-----|-----|--|
| HNTB HNTB NORTH CAROLINA, P.C. License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | REVISIONS | | | | | | SHEET NO. S-63 TOTAL SHEETS 64 |
| | DRAWN BY <u>J. BAYNE</u> DATE <u>2/13</u> CHECKED BY <u>D. HAWKINS</u> DATE <u>2/13</u> DWG. NO. <u>1</u> | NO. | BY: | DATE: | NO. | BY: | |
| | 1 | | | 3 | | | |
| | 2 | | | 4 | | | |

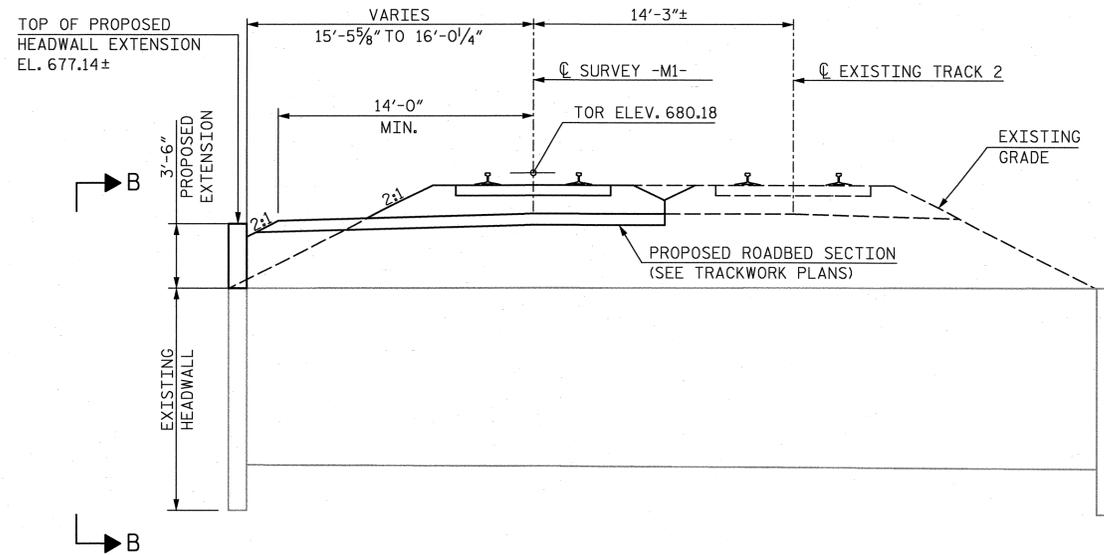


LOCATION SKETCH FOR UTILITY INFORMATION, SEE UTILITY PLANS AND SPECIAL PROVISIONS.

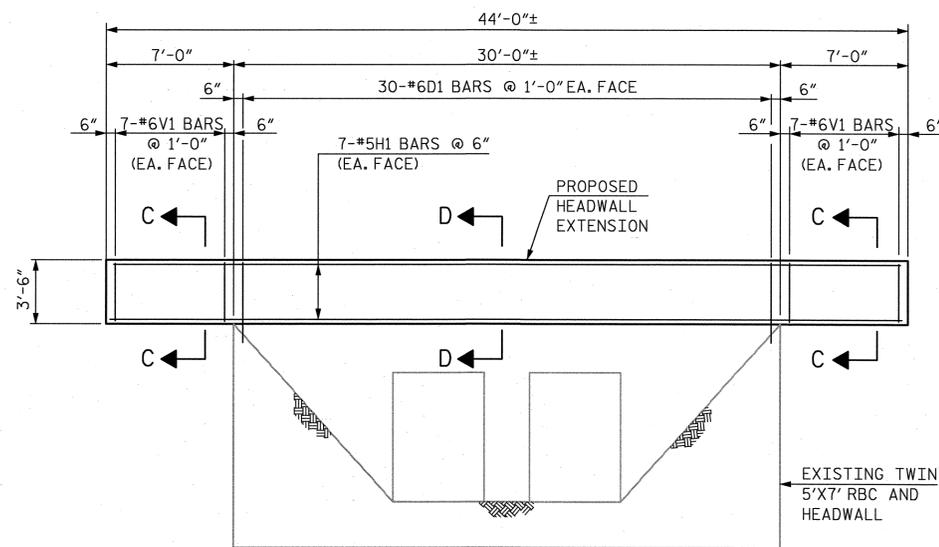
BM #5
 -M1- STA. 7644+67, 251' RT: ELEV. 674.35
 RR SPIKE IN TOP OF POST SUPPORTING WOODEN HEADWALL OF BRIDGE ON UPPER LAKE ROAD OVER SMALL STREAM NEAR QUARRY. BOLT IS IN NE CORNER OF BRIDGE.

NOTE:
 FOR SECTION A-A, SEE "HEADWALL EXTENSION DETAILS" SHEET.

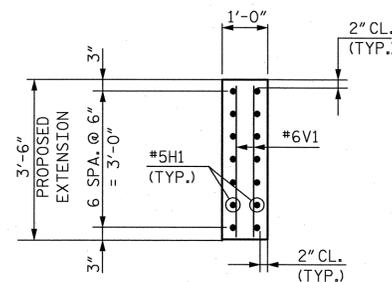
0248DEL_P10C1



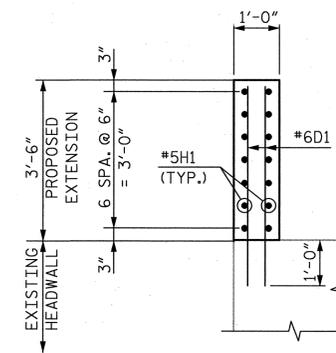
SECTION A-A



VIEW B-B



SECTION C-C



SECTION D-D

| BILL OF MATERIAL | | | | | |
|--------------------|-----|------|------|--------|--------|
| HEADWALL EXTENSION | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| D1 | 60 | 6 | STR | 4'-4" | 391 |
| H1 | 14 | 5 | STR | 43'-8" | 638 |
| V1 | 28 | 6 | STR | 3'-2" | 133 |
| TOTAL | | | | | 1,162 |

PROJECT NO. C-4901A
DAVIDSON COUNTY
 STATION: 7648+69.17 -M1-
 MILE POST: 311.21



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 HEADWALL EXTENSION
 DETAILS

| HNTB | | HNTB NORTH CAROLINA, P.C. | | REVISIONS | | | SHEET NO. |
|------------------------|--|--|--|-----------|-----|-------|------------------|
| License No. C-1554 | | 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609 | | NO. | BY: | DATE: | S-64 |
| DRAWN BY: J. BAYNE | | DATE: 2/13 | | 1 | | | TOTAL SHEETS: 64 |
| CHECKED BY: D. HAWKINS | | DATE: 2/13 | | 2 | | | |
| | | DWG. NO. 2 | | 3 | | | |
| | | | | 4 | | | |

STANDARD NOTESDESIGN DATA:

| | | |
|---|-------|----------------------------------|
| SPECIFICATIONS | ----- | A.A.S.H.T.O. (CURRENT) |
| LIVE LOAD | ----- | SEE PLANS |
| IMPACT ALLOWANCE | ----- | SEE A.A.S.H.T.O. |
| STRESS IN EXTREME FIBER OF | | |
| STRUCTURAL STEEL - AASHTO M270 GRADE 36 | - | 20,000 LBS. PER SQ. IN. |
| - AASHTO M270 GRADE 50W | - | 27,000 LBS. PER SQ. IN. |
| - AASHTO M270 GRADE 50 | - | 27,000 LBS. PER SQ. IN. |
| REINFORCING STEEL IN TENSION | | |
| GRADE 60 | -- | 24,000 LBS. PER SQ. IN. |
| CONCRETE IN COMPRESSION | ----- | 1,200 LBS. PER SQ. IN. |
| CONCRETE IN SHEAR | ----- | SEE A.A.S.H.T.O. |
| STRUCTURAL TIMBER - TREATED OR | | |
| UNTREATED - EXTREME FIBER STRESS | ----- | 1,800 LBS. PER SQ. IN. |
| COMPRESSION PERPENDICULAR TO GRAIN OF TIMBER | ----- | 375 LBS. PER SQ. IN. |
| EQUIVALENT FLUID PRESSURE OF EARTH | ----- | 30 LBS. PER CU. FT. (MINIMUM) |

MATERIAL AND WORKMANSHIP:

EXCEPT AS MAY OTHERWISE BE SPECIFIED ON PLANS OR IN THE SPECIAL PROVISIONS, ALL MATERIAL AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE 2012 "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" OF THE N. C. DEPARTMENT OF TRANSPORTATION.

STEEL SHEET PILING FOR PERMANENT OR TEMPORARY APPLICATIONS SHALL BE HOT ROLLED.

CONCRETE:

UNLESS OTHERWISE REQUIRED ON PLANS, CLASS A CONCRETE SHALL BE USED FOR ALL PORTIONS OF ALL STRUCTURES WITH THE EXCEPTION THAT: CLASS AA CONCRETE SHALL BE USED IN BRIDGE SUPERSTRUCTURES, ABUTMENT BACKWALLS, AND APPROACH SLABS; AND CLASS B CONCRETE SHALL BE USED FOR SLOPE PROTECTION AND RIP RAP.

CONCRETE CHAMFERS:

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED 3/4" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1-1/2" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A 1/4" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A 1/4" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE REQUIRED ON PLANS.

DOWELS:

DOWELS WHEN INDICATED ON PLANS AS FOR CULVERT EXTENSIONS, SHALL BE EMBEDDED AT LEAST 12" INTO THE OLD CONCRETE AND GROUTED INTO PLACE WITH 1:2 CEMENT MORTAR.

ALLOWANCE FOR DEAD LOAD DEFLECTION, SETTLEMENT, ETC. IN CASTING SUPERSTRUCTURES:

BRIDGES SHALL BE BUILT ON THE GRADE OR VERTICAL CURVE SHOWN ON PLANS. SLABS, CURBS AND PARAPETS SHALL CONFORM TO THE GRADE OR CURVE.
ALL DIMENSIONS WHICH ARE GIVEN IN SECTION AND ARE AFFECTED BY DEAD LOAD DEFLECTIONS ARE DIMENSIONS AT CENTER LINE OF BEARING UNLESS OTHERWISE NOTED ON PLANS. IN SETTING FORMS FOR STEEL BEAM BRIDGES AND PRESTRESSED CONCRETE GIRDER BRIDGES, ADJUSTMENTS SHALL BE MADE DUE TO THE DEAD LOAD DEFLECTIONS FOR THE ELEVATIONS SHOWN. WHERE BLOCKS ARE SHOWN OVER BEAMS FOR BUILDING UP TO THE SLAB, THE VERTICAL DIMENSIONS OF THE BLOCKS SHALL BE ADJUSTED BETWEEN BEARINGS TO COMPENSATE FOR DEAD LOAD DEFLECTIONS, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER. WHERE BOTTOM OF SLAB IS IN LINE WITH BOTTOM OF TOP FLANGES, DEPTH OF SLAB BETWEEN BEARINGS SHALL BE ADJUSTED TO COMPENSATE FOR DEAD LOAD DEFLECTION, VERTICAL CURVE ORDINATE, AND ACTUAL BEAM CAMBER.

IN SETTING FALSEWORK AND FORMS FOR REINFORCED CONCRETE SPANS, AN ALLOWANCE SHALL BE MADE FOR DEAD LOAD DEFLECTIONS, SETTLEMENT OF FALSEWORK, AND PERMANENT CAMBER WHICH SHALL BE PROVIDED FOR IN ADDITION TO THE ELEVATIONS SHOWN. AFTER REMOVAL OF THE FALSEWORK, THE FINISHED STRUCTURES SHALL CONFORM TO THE PROFILE AND ELEVATIONS SHOWN ON THE PLANS AND CONSTRUCTION ELEVATIONS FURNISHED BY THE ENGINEER.

DETAILED DRAWINGS FOR FALSEWORK OR FORMS FOR BRIDGE SUPERSTRUCTURE AND ANY STRUCTURE OR PARTS OF A STRUCTURE AS NOTED ON THE PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL BEFORE CONSTRUCTION OF THE FALSEWORK OR FORMS IS STARTED.

REINFORCING STEEL:

ALL REINFORCING STEEL SHALL BE DEFORMED. DIMENSIONS RELATIVE TO PLACEMENT OF REINFORCING ARE TO CENTERS OF BARS UNLESS OTHERWISE INDICATED IN THE PLANS. DIMENSIONS ON BAR DETAILS ARE TO CENTERS OF BARS OR ARE OUT TO OUT AS INDICATED ON PLANS.

WIRE BAR SUPPORTS SHALL BE PROVIDED FOR REINFORCING STEEL WHERE INDICATED ON THE PLANS. WHEN BAR SUPPORT PIECES ARE PLACED IN CONTINUOUS LINES, THEY SHALL BE SO PLACED THAT THE ENDS OF THE SUPPORTING WIRES SHALL BE LAPPED TO LOCK LEGS ON ADJOINING PIECES.

STRUCTURAL STEEL:

AT THE CONTRACTOR'S OPTION, HE MAY SUBSTITUTE 7/8" Ø SHEAR STUDS FOR THE 3/4" Ø STUDS SPECIFIED ON THE PLANS. THIS SUBSTITUTION SHALL BE MADE AT THE RATE OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS, AND STUD SPACING CHANGES SHALL BE MADE AS NECESSARY TO PROVIDE THE SAME EQUIVALENT NUMBER OF 7/8" Ø STUDS ALONG THE BEAM AS SHOWN FOR 3/4" Ø STUDS BASED ON THE RATIO OF 3 - 7/8" Ø STUDS FOR 4 - 3/4" Ø STUDS. STUDS OF THE LENGTH SPECIFIED ON THE PLANS MUST BE PROVIDED. THE MAXIMUM SPACING SHALL BE 2'-0".

EXCEPT AT THE INTERIOR SUPPORTS OF CONTINUOUS BEAMS WHERE THE COVER PLATE IS IN CONTACT WITH BEARING PLATE, THE CONTRACTOR MAY, AT HIS OPTION, SUBSTITUTE FOR THE COVER PLATES DESIGNATED ON THE PLANS COVER PLATES OF THE EQUIVALENT AREA PROVIDED THESE PLATES ARE AT LEAST 5/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

WITH THE SOLE EXCEPTION OF EDGES AT SURFACES WHICH BEAR ON OTHER SURFACES, ALL SHARP EDGES AND ENDS OF SHAPES AND PLATES SHALL BE SLIGHTLY ROUNDED BY SUITABLE MEANS TO A RADIUS OF APPROXIMATELY 1/16 INCH OR EQUIVALENT FLAT SURFACE AT A SUITABLE ANGLE PRIOR TO PAINTING, GALVANIZING, OR METALLIZING.

HANDRAILS AND POSTS:

METAL STANDARDS AND FACES OF THE CONCRETE END POSTS FOR THE METAL RAIL SHALL BE SET NORMAL TO THE GRADE OF THE CURB, UNLESS OTHERWISE SHOWN ON PLANS. THE METAL RAIL AND TOPS OF CONCRETE POSTS USED WITH THE ALUMINUM RAIL SHALL BE BUILT PARALLEL TO THE GRADE OF THE CURB.

METAL HANDRAILS SHALL BE IN ACCORDANCE WITH THE PLANS. RAILS SHALL BE AS MANUFACTURED FOR BRIDGE RAILING. CASTINGS SHALL BE OF A UNIFORM APPEARANCE. FINIS AND OTHER DEFORMATIONS RESULTING FROM CASTING OR OTHERWISE SHALL BE REMOVED IN A MANNER SO THAT A UNIFORM COLORING OF THE COMPLETED CASTING SHALL BE OBTAINED. CASTINGS WITH DISCOLORATIONS OR OF NON-UNIFORM COLORING WILL NOT BE ACCEPTED. CERTIFIED MILL REPORTS ARE REQUIRED FOR METAL RAILS AND POSTS.

SPECIAL NOTES:

GENERALLY, IN CASE OF DISCREPANCY, THIS STANDARD SHEET OF NOTES SHALL GOVERN OVER THE SPECIFICATIONS, BUT THE REMAINDER OF THE PLANS SHALL GOVERN OVER NOTES HEREON, AND SPECIAL PROVISIONS SHALL GOVERN OVER ALL. SEE SPECIFICATIONS ARTICLE 105-4.

ENGLISH

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