

See Sheet 1A For Index of Sheets
 See Sheet 1B For Conventional Plan Sheet Symbols
 See Sheet 1C-1 For Survey Control Sheet

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

BEAUFORT COUNTY

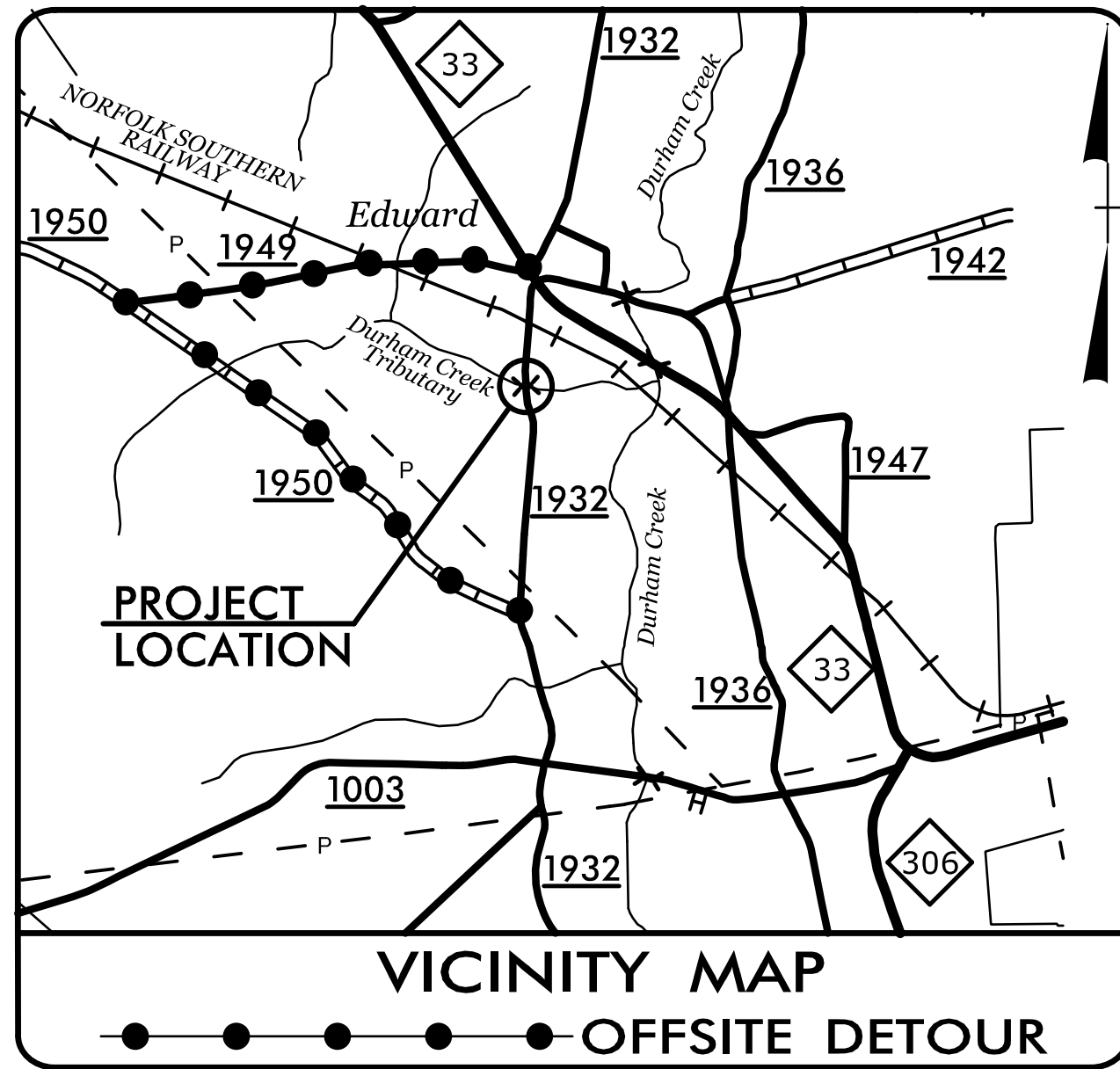
**LOCATION: REPLACE BRIDGE NO. 40 ON SR 1932
 OVER DURHAM CREEK TRIBUTARY**

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

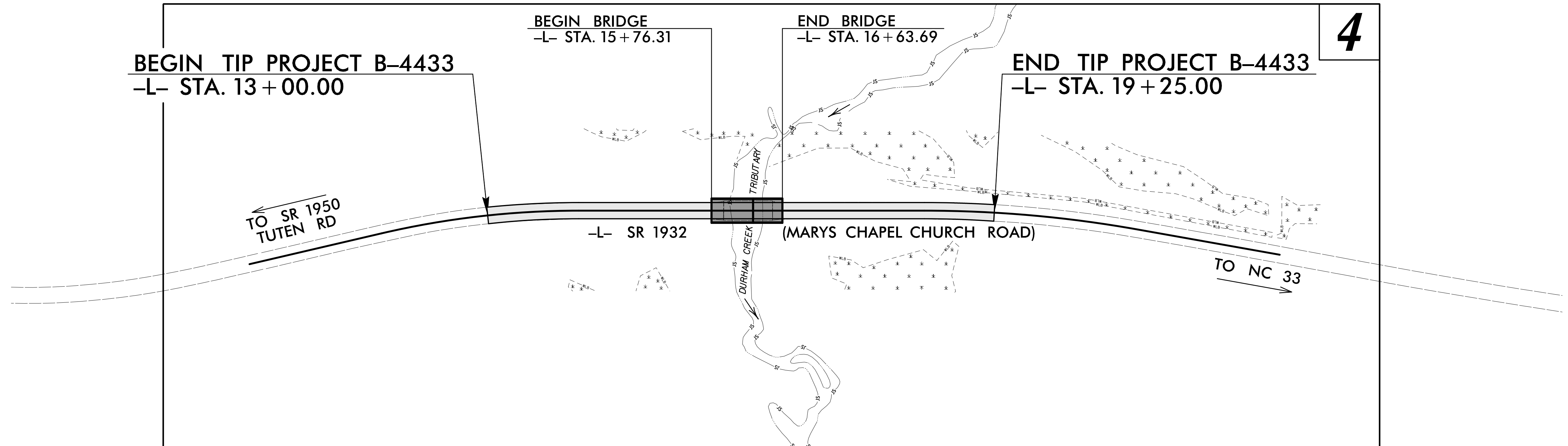
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C. | B-4433 | 1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 38362.1.4 | N/A | PE | |
| 38362.2.4 | N/A | RW & UTIL | |
| 38362.3.2 | N/A | CONST. | |
| | | | |
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| | | | |

TIP PROJECT: B-4433

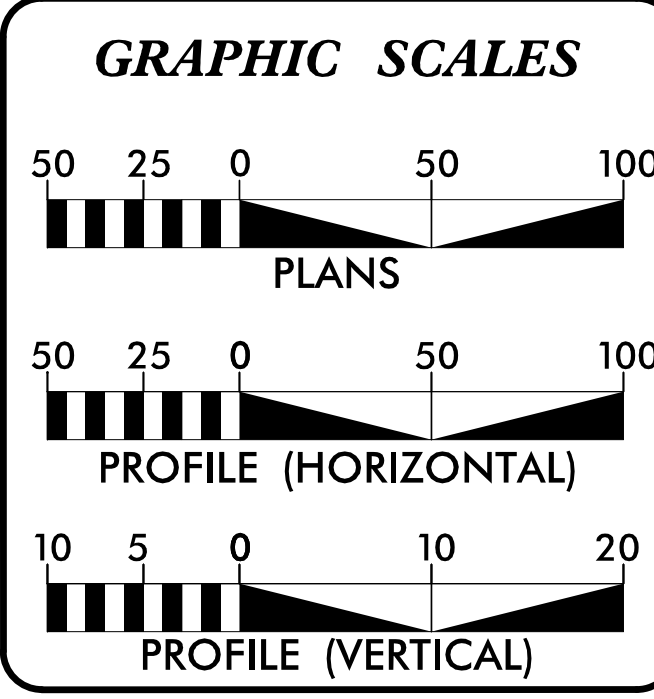
CONTRACT: DB00472



100% PLAN SUBMITTAL



DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED



DESIGN DATA

| | |
|------------|--------|
| ADT 2019 = | 440 |
| ADT 2039 = | 650 |
| V = | 60 MPH |
| TTST = | 6% |

FUNC CLASS =
 LOCAL RURAL
 SUB-REGIONAL TIER

PROJECT LENGTH

| | | |
|--------------------------------------|---|------------|
| LENGTH ROADWAY TIP PROJECT B-4433 | = | 0.101 mile |
| LENGTH STRUCTURES TIP PROJECT B-4433 | = | 0.017 mile |
| TOTAL LENGTH TIP PROJECT B-4433 | = | 0.118 mile |

Prepared For:
DIVISION OF HIGHWAYS
 1000 Birch Ridge Dr., Raleigh NC, 27610

By:
 TGS ENGINEERS
 706 HILLSBOROUGH ST SUITE 200 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
 SEPTEMBER 25, 2018

LETTING DATE:
 FEBRUARY 12, 2020

V. MARCUS LOWERY, PE
 PROJECT ENGINEER

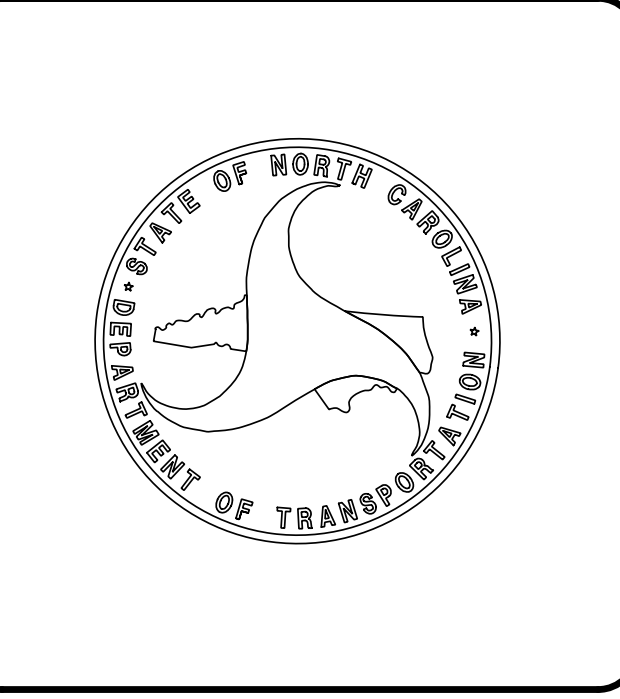
MICHAEL C. AMAN, P.E.
 NCDOT DIVISION 2 CONTACT

HYDRAULICS ENGINEER

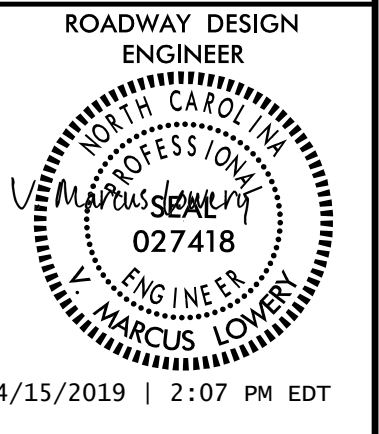
DocuSigned by:
 Benjamin J. Henegar
 1/16/2020 1:01 PM PST

ROADWAY DESIGN ENGINEER

DocuSigned by:
 V. Marcus Lowery
 1/16/2020 3:01 PM PST



| | |
|--|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| B-4433 | 1A |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | |



INDEX OF SHEETS

| SHEET NUMBER | SHEET |
|------------------|---|
| 1 | TITLE SHEET |
| 1A | INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS |
| 1B | CONVENTIONAL SYMBOLS |
| RW01 THRU RW04 | SURVEY CONTROL AND RIGHT-OF-WAY SHEETS |
| 2A-1 | PAVEMENT SCHEDULE, TYPICAL SECTIONS, DETAIL SHOWING METHOD OF WEDGING, DETAIL FOR SHOULDER BERM GUTTER, AND INCIDENTAL MILLING DETAIL |
| 3B-1 | SUMMARY OF EARTHWORK, PAVEMENT REMOVAL SUMMARY, SHOULDER BERM GUTTER SUMMARY, & GUARDRAIL SUMMARY |
| 3D-1 | DRAINAGE SUMMARY |
| 3G-1 | GEOTECHNICAL SUMMARY |
| 4 | PLAN / PROFILE SHEET |
| TMP-1 THRU TMP-3 | TRANSPORTATION MANAGEMENT PLANS |
| EC-1 THRU EC-5 | EROSION CONTROL PLANS |
| P-1 | PERMIT DRAWING |
| UC-1 THRU UC-4 | UTILITY CONSTRUCTION PLANS |
| UO-1 THRU UO-2 | UTILITIES BY OTHERS PLANS |
| X-1 THRU X-3 | CROSS SECTIONS |
| S-1 THRU S-20 | STRUCTURE PLANS |

GENERAL NOTES

GENERAL NOTES: 2018 SPECIFICATIONS EFFECTIVE: 01-16-2018
REVISED:

GRADE LINE:
GRADING AND SURFACING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. GRADE LINES MAY BE ADJUSTED AT THEIR BEGINNING AND ENDING AND AT STRUCTURES AS DIRECTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.

SUPERELEVATION:

ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 USING THE RATE OF SUPERELEVATION AND RUNOFF SHOWN ON THE PLANS. SUPERELEVATION IS TO BE REVOLVED ABOUT THE GRADE POINTS SHOWN ON THE TYPICAL SECTIONS.

SHOULDER CONSTRUCTION:

ASPHALT, EARTH, AND CONCRETE SHOULDER CONSTRUCTION ON THE HIGH SIDE OF SUPERELEVATED CURVES SHALL BE IN ACCORDANCE WITH STD. NO. 560.01

SUBSURFACE DRAINS:

SUBSURFACE DRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.02 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

THE GUARDRAIL LOCATIONS SHOWN ON THE PLANS MAY BE ADJUSTED DURING CONSTRUCTION AS DIRECTED BY THE ENGINEER. THE CONTRACTOR SHOULD CONSULT WITH THE ENGINEER PRIOR TO ORDERING GUARDRAIL MATERIAL.

SUBSURFACE PLANS:

STRUCTURE SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT.

END BENTS:

THE ENGINEER SHALL CHECK THE STRUCTURE END BENT PLANS, DETAILS, AND CROSS-SECTION PRIOR TO SETTING OF THE SLOPE STAKES FOR THE EMBANKMENT OR EXCAVATION APPROACHING A BRIDGE.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE

POWER — TIDELAND EMC

TELECOM — CENTURYLINK

WATER — BEAUFORT COUNTY WATER DEPARTMENT

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS, EXCEPT AS SHOWN ON THE PLANS.

RIGHT-OF-WAY MARKERS:

ALL RIGHT-OF-WAY MARKERS ON THIS PROJECT SHALL BE PLACED BY OTHERS.

STANDARD DRAWINGS

2018 ROADWAY ENGLISH STANDARD DRAWINGS EFF. 01-16-2018
REV.

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch – N. C. Department of Transportation – Raleigh, N. C., Dated January, 2018 are applicable to this project and by reference hereby are considered a part of these plans:

| STD. NO. | TITLE |
|--|---|
| DIVISION 2 – EARTHWORK | |
| 200.02 | Method of Clearing – Method II |
| 225.02 | Guide for Grading Subgrade – Secondary and Local |
| 225.04 | Method of Obtaining Superelevation – Two Lane Pavement |
| DIVISION 3 – PIPE CULVERTS | |
| 300.01 | Method of Pipe Installation |
| DIVISION 4 – MAJOR STRUCTURES | |
| 422.02 | Bridge Approach Fills – Type II Modified Approach Fill |
| DIVISION 5 – SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction – High Side of Superelevated Curve – Method I |
| DIVISION 8 – INCIDENTALS | |
| 815.02 | Subsurface Drain |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 840.25 | Anchorage for Frames – Brick or Concrete or Precast |
| 840.29 | Frames and Narrow Slot Flat Grates |
| 840.35 | Traffic Bearing Grated Drop Inlet – for Cast Iron Double Frame and Grates |
| 840.66 | Drainage Structure Steps |
| 846.01 | Concrete Curb, Gutter and Curb & Gutter |
| 846.04 | Drop Inlet Installation in Shoulder Berm Gutter |
| 862.01 | Guardrail Placement |
| 862.02 | Guardrail Installation |
| 862.03 | Structure Anchor Units |
| 876.02 | Guide for Rip Rap at Pipe Outlets |

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

12/2/2016

BOUNDARIES AND PROPERTY:

| | |
|---------------------------------------|--|
| State Line | |
| County Line | |
| Township Line | |
| City Line | |
| Reservation Line | |
| Property Line | |
| Existing Iron Pin | |
| Computed Property Corner | |
| Property Monument | |
| Parcel/Sequence Number | |
| Existing Fence Line | |
| Proposed Woven Wire Fence | |
| Proposed Chain Link Fence | |
| Proposed Barbed Wire Fence | |
| Existing Wetland Boundary | |
| Proposed Wetland Boundary | |
| Existing Endangered Animal Boundary | |
| Existing Endangered Plant Boundary | |
| Existing Historic Property Boundary | |
| Known Contamination Area: Soil | |
| Potential Contamination Area: Soil | |
| Known Contamination Area: Water | |
| Potential Contamination Area: Water | |
| Contaminated Site: Known or Potential | |

BUILDINGS AND OTHER CULTURE:

| | |
|-------------------------------|--|
| Gas Pump Vent or U/G Tank Cap | |
| Sign | |
| Well | |
| Small Mine | |
| Foundation | |
| Area Outline | |
| Cemetery | |
| Building | |
| School | |
| Church | |
| Dam | |

HYDROLOGY:

| | |
|------------------------------------|--|
| Stream or Body of Water | |
| Hydro, Pool or Reservoir | |
| Jurisdictional Stream | |
| Buffer Zone 1 | |
| Buffer Zone 2 | |
| Flow Arrow | |
| Disappearing Stream | |
| Spring | |
| Wetland | |
| Proposed Lateral, Tail, Head Ditch | |
| False Sump | |

RAILROADS:

| | |
|--------------------|--|
| Standard Gauge | |
| RR Signal Milepost | |
| Switch | |
| RR Abandoned | |
| RR Dismantled | |

RIGHT OF WAY & PROJECT CONTROL:

| | |
|---|--|
| Secondary Horiz and Vert Control Point | |
| Primary Horiz Control Point | |
| Primary Horiz and Vert Control Point | |
| Exist Permanent Easement Pin and Cap | |
| New Permanent Easement Pin and Cap | |
| Vertical Benchmark | |
| Existing Right of Way Marker | |
| Existing Right of Way Line | |
| New Right of Way Line | |
| New Right of Way Line with Pin and Cap | |
| New Right of Way Line with Concrete or Granite R/W Marker | |
| New Control of Access Line with Concrete CA Marker | |
| Existing Control of Access | |
| New Control of Access | |
| Existing Easement Line | |
| New Temporary Construction Easement | |
| New Temporary Drainage Easement | |
| New Permanent Drainage Easement | |
| New Permanent Drainage / Utility Easement | |
| New Permanent Utility Easement | |
| New Temporary Utility Easement | |
| New Aerial Utility Easement | |

ROADS AND RELATED FEATURES:

| | |
|----------------------------|--|
| Existing Edge of Pavement | |
| Existing Curb | |
| Proposed Slope Stakes Cut | |
| Proposed Slope Stakes Fill | |
| Proposed Curb Ramp | |
| Existing Metal Guardrail | |
| Proposed Guardrail | |
| Existing Cable Guiderail | |
| Proposed Cable Guiderail | |
| Equality Symbol | |
| Pavement Removal | |

VEGETATION:

| | |
|--------------|--|
| Single Tree | |
| Single Shrub | |

Note: Not to Scale *S.U.E. = *Subsurface Utility Engineering*

| | |
|------------|--|
| Hedge | |
| Woods Line | |
| Orchard | |
| Vineyard | |

EXISTING STRUCTURES:

| | |
|--|--|
| MAJOR: | |
| Bridge, Tunnel or Box Culvert | |
| Bridge Wing Wall, Head Wall and End Wall | |
| MINOR: | |
| Head and End Wall | |
| Pipe Culvert | |
| Footbridge | |
| Drainage Box: Catch Basin, DI or JB | |
| Paved Ditch Gutter | |
| Storm Sewer Manhole | |
| Storm Sewer | |

UTILITIES:

| | |
|--------------------------------|--|
| POWER: | |
| Existing Power Pole | |
| Proposed Power Pole | |
| Existing Joint Use Pole | |
| Proposed Joint Use Pole | |
| Power Manhole | |
| Power Line Tower | |
| Power Transformer | |
| U/G Power Cable Hand Hole | |
| H-Frame Pole | |
| U/G Power Line LOS B (S.U.E.*) | |
| U/G Power Line LOS C (S.U.E.*) | |
| U/G Power Line LOS D (S.U.E.*) | |

TELEPHONE:

| | |
|--|--|
| Existing Telephone Pole | |
| Proposed Telephone Pole | |
| Telephone Manhole | |
| Telephone Pedestal | |
| Telephone Cell Tower | |
| U/G Telephone Cable Hand Hole | |
| U/G Telephone Cable LOS B (S.U.E.*) | |
| U/G Telephone Cable LOS C (S.U.E.*) | |
| U/G Telephone Cable LOS D (S.U.E.*) | |
| U/G Telephone Conduit LOS B (S.U.E.*) | |
| U/G Telephone Conduit LOS C (S.U.E.*) | |
| U/G Telephone Conduit LOS D (S.U.E.*) | |
| U/G Fiber Optics Cable LOS B (S.U.E.*) | |
| U/G Fiber Optics Cable LOS C (S.U.E.*) | |
| U/G Fiber Optics Cable LOS D (S.U.E.*) | |

WATER:

| | |
|--------------------------------|--|
| Water Manhole | |
| Water Meter | |
| Water Valve | |
| Water Hydrant | |
| U/G Water Line LOS B (S.U.E.*) | |
| U/G Water Line LOS C (S.U.E.*) | |
| U/G Water Line LOS D (S.U.E.*) | |
| Above Ground Water Line | |

TV:

| | |
|---------------------------------------|--|
| TV Pedestal | |
| TV Tower | |
| U/G TV Cable Hand Hole | |
| U/G TV Cable LOS B (S.U.E.*) | |
| U/G TV Cable LOS C (S.U.E.*) | |
| U/G TV Cable LOS D (S.U.E.*) | |
| U/G Fiber Optic Cable LOS B (S.U.E.*) | |
| U/G Fiber Optic Cable LOS C (S.U.E.*) | |
| U/G Fiber Optic Cable LOS D (S.U.E.*) | |

GAS:

| | |
|------------------------------|--|
| Gas Valve | |
| Gas Meter | |
| U/G Gas Line LOS B (S.U.E.*) | |
| U/G Gas Line LOS C (S.U.E.*) | |
| U/G Gas Line LOS D (S.U.E.*) | |
| Above Ground Gas Line | |

SANITARY SEWER:

| | |
|-------------------------------------|--|
| Sanitary Sewer Manhole | |
| Sanitary Sewer Cleanout | |
| U/G Sanitary Sewer Line | |
| Above Ground Sanitary Sewer | |
| SS Forced Main Line LOS B (S.U.E.*) | |
| SS Forced Main Line LOS C (S.U.E.*) | |
| SS Forced Main Line LOS D (S.U.E.*) | |

MISCELLANEOUS:

| | |
|--|--|
| Utility Pole | |
| Utility Pole with Base | |
| Utility Located Object | |
| Utility Traffic Signal Box | |
| Utility Unknown U/G Line LOS B (S.U.E.*) | |
| U/G Tank; Water, Gas, Oil | |
| Underground Storage Tank, Approx. Loc. | |
| A/G Tank; Water, Gas, Oil | |
| Geoenvironmental Boring | |
| U/G Test Hole LOS A (S.U.E.*) | |
| Abandoned According to Utility Records | |
| End of Information | |

09/08/19

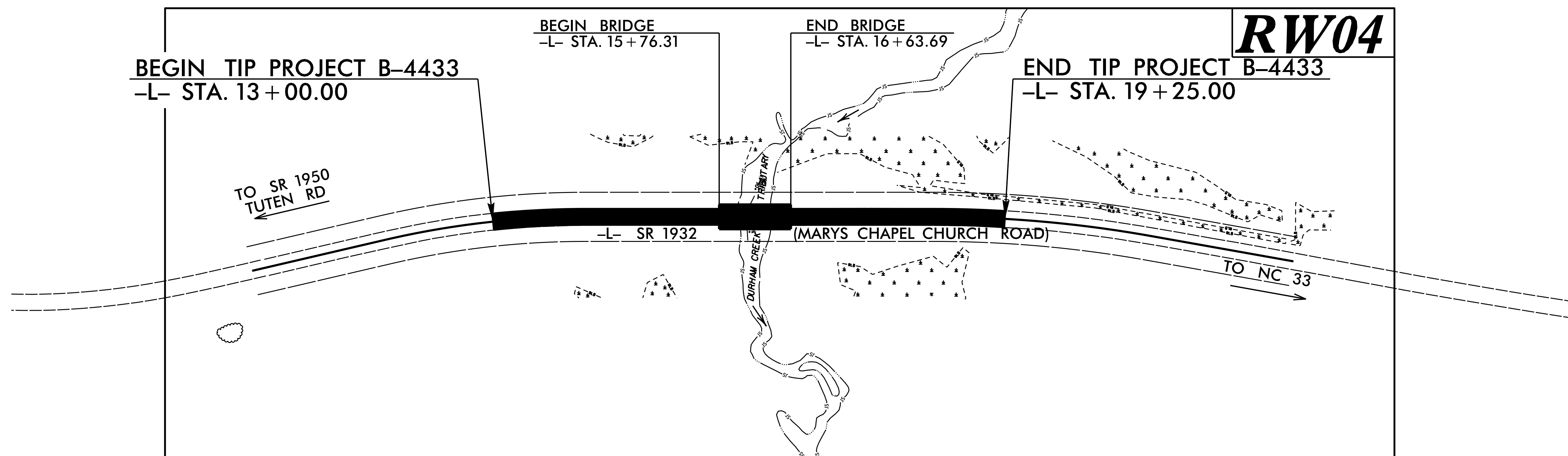
TIP PROJECT: B-4433

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C. | B-4433 | RW01 | |

SURVEY CONTROL, EXISTING CENTERLINES,
RIGHT OF WAY, EASEMENTS AND PROPERTY TIES

BEAUFORT COUNTY



GRAPHIC SCALE



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "B4433-p4" WITH NAD 83/NA 2011 STATE PLANE GRID COORDINATES OF NORTHING: 577685.725(ft) EASTING: 2631952.819(ft) ELEVATION: 17.19(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998772495

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "BL-3" TO -L- STATION 13+00.00 IS N 19-05'41" W 226.24(ft)

ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

Prepared In the Office of:

DIVISION OF HIGHWAYS
NEW BERN LOCATION & SURVEYS
2807 NEUSE BLVD SUITE #7
NEW BERN, NC 28562

2018 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
SEPT. 25, 2018

LETTING DATE:
AUG. 28, 2019

PROFESSIONAL LAND SURVEYOR

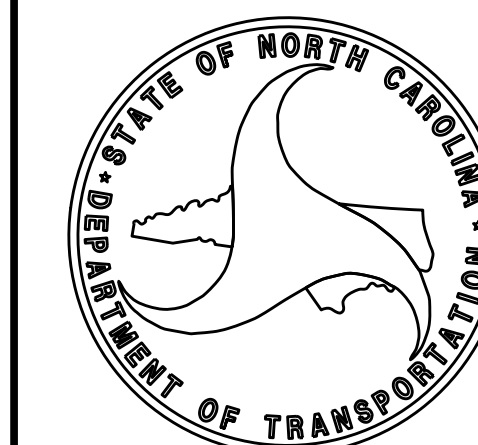


DocuSigned by:
R.J. Reigner

3/20/2019

SIGNATURE:

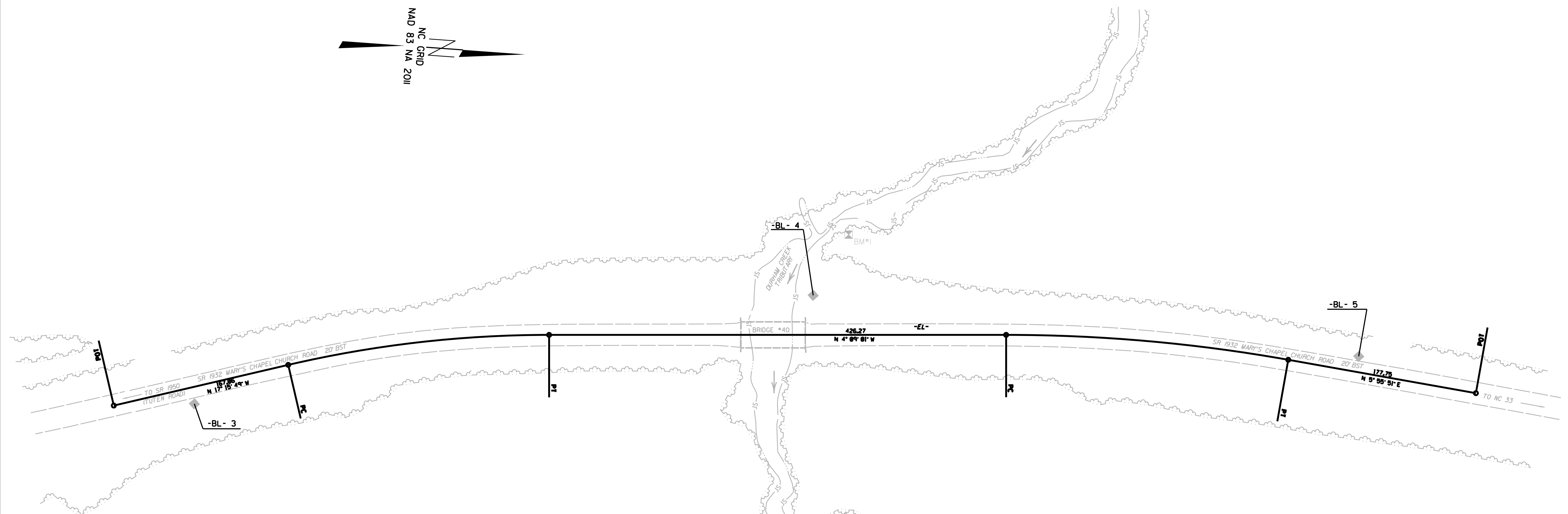
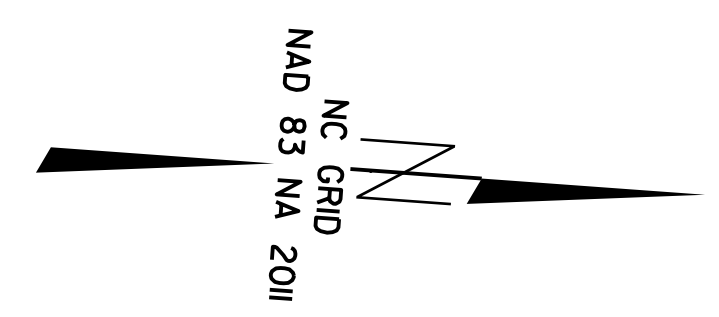
Date:



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\$\$\$\$\$USERNAME\$\$\$\$\$

SURVEY CONTROL SHEET B-4433

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION



BASELINE

| BL | POINT | DESC. | NORTH | EAST | ELEVATION |
|----|-------|-----------------|-------------|--------------|-----------|
| | GPS1 | NCDOT GPS B4433 | 576544.3179 | 2632153.9602 | 30.07 |
| | 3 | BL-3 | 577090.5980 | 2632077.0900 | 27.62 |
| | 4 | BL-4 | 577658.9710 | 2631934.4870 | 14.69 |
| | 5 | BL-5 | 578170.5490 | 2631954.3280 | 19.35 |

BENCHMARK

.....
 BM1 ELEVATION = 12.41
 N 577688 E 2631876
 RR SPIKE SET IN BASE OF 14" GUM TREE

EXISTING ALIGNMENT

| EL | POINT | N | E | BEARING | DIST | DELTA | D | L | T | R |
|----|-------|------------|-------------|-----------------|--------|-----------------|-------------|--------|--------|---------|
| | POT | 577015.788 | 2632004.152 | | | | | | | |
| | LINE | | | N 17°15'49.4" W | 167.06 | | | | | |
| | PC | 577175.319 | 2632034.575 | | | | | | | |
| | CURVE | | | N 10°42'25.1" W | 244.93 | 13°06'48.7"(RT) | 05°20'32.1" | 245.47 | 123.27 | 1072.50 |
| | PT | 577415.987 | 2631989.070 | | | | | | | |
| | LINE | | | N 04°09'00.8" W | 426.27 | | | | | |
| | PC | 577841.135 | 2631958.220 | | | | | | | |
| | CURVE | | | N 00°53'25.3" E | 264.16 | 10°04'52.2"(RT) | 03°48'41.3" | 264.50 | 132.59 | 1503.25 |
| | PT | 578105.259 | 2631962.325 | | | | | | | |
| | LINE | | | N 05°55'51.5" E | 177.75 | | | | | |
| | POT | 578282.060 | 2631980.692 | | | | | | | |

NOTES:

- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
- THE SURVEY CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

REVISIONS

6/2/09

02/06/2018 10:55:11 Sheet\B4433.LS.rw02c-1.dgn

| | |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| B-4433 | RW02D-1 |
| Location and Surveys | |

PROPOSED ALIGNMENT CONTROL SHEET B-4433

REVISIONS

6/2/99

| TYPE | STATION | NORTH | EAST |
|------|----------|-------------|--------------|
| POT | 10+00.00 | 577015.7878 | 2632084.1524 |
| PC | 11+67.06 | 577175.3188 | 2632034.5748 |
| PT | 14+12.52 | 577415.9866 | 2631989.0698 |
| PC | 18+38.79 | 577841.1354 | 2631958.2202 |
| PT | 21+03.29 | 578105.2589 | 2631962.3250 |
| POT | 22+81.04 | 578282.0596 | 2631980.6922 |

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. THE PROPOSED ALIGNMENT CONTROL DATA FOR THIS PROJECT HAS BEEN COMPILED FROM VARIOUS SOURCES. IF FURTHER INFORMATINO REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

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6/2/19

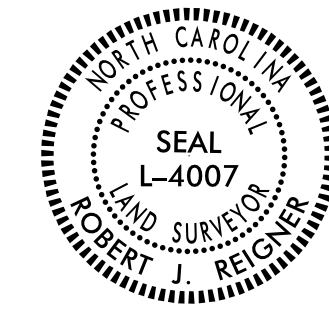
RIGHT OF WAY CONTROL SHEET B-4433

PROJECT REFERENCE NO. SHEET NO.

B-4433 RW03E-1

DIVISION 2 LOCATION & SURVEY

PROJECT SURVEYOR



I, Robert J. Reigner, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work item(s) (Base map Compilation, R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 1st day of October, 2018.

DocuSigned by:
R. J. Reigner

Professional Land Surveyor

L-4007
PLS #

Seal

| ROW MARKER PERMANENT EASEMENT - E | | | | |
|-----------------------------------|----------|--------|-------------|--------------|
| ALIGN | STATION | OFFSET | NORTH | EAST |
| L | 13+70.00 | -30.00 | 577370.2902 | 2631963.1755 |
| L | 13+70.00 | -41.00 | 577369.0598 | 2631952.2446 |
| L | 15+40.00 | -40.00 | 577540.2329 | 2631939.9491 |
| L | 15+40.00 | -30.00 | 577540.9566 | 2631949.9229 |
| L | 15+40.00 | 30.00 | 577545.2989 | 2632009.7655 |
| L | 15+40.00 | 45.00 | 577546.3845 | 2632024.7262 |
| L | 17+20.00 | -40.00 | 577719.7609 | 2631926.9222 |
| L | 17+20.00 | -30.00 | 577720.4846 | 2631936.8960 |
| L | 17+20.00 | 30.00 | 577724.8269 | 2631996.7386 |
| L | 17+20.00 | 45.00 | 577725.9125 | 2632011.6993 |
| L | 19+30.00 | -43.00 | 577931.7438 | 2631911.3852 |
| L | 19+30.00 | -30.00 | 577931.8967 | 2631924.3843 |

REVISIONS

6/2/19

NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

PROJECT SURVEYOR



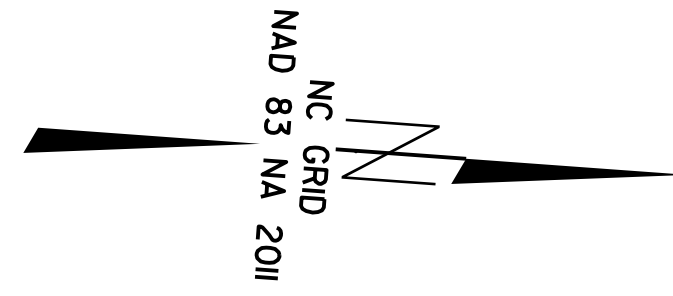
I, Robert J. Reigner, a Professional Land Surveyor in the state of North Carolina hereby certify to the best of my knowledge and belief that the following work (Items) (Base map Compilation, R/W Staking) performed under my responsible charge meet NCDOT Survey Standards as directed in the NCDOT Location & Surveys guidelines and procedures.

I further certify that the data compiled came from available surveys/mapping performed by others and provided to me by NCDOT and do not certify to the accuracy or quality of the individual data sources.

I further certify that the right of way and permanent easement points shown herein and outlined in the tables shown hereon (localized coordinates, station/offset) have been checked and are accurate representations of the right of way and permanent easement points depicted on the corresponding highway plans. I also certify that the right of way and permanent easement points shown herein have been field monumented under my supervision from existing survey control provided by others; that the depicted property data shown herein were surveyed by others; and these monuments denote the right of way and easement boundaries at the time of staking which may be subject to change due to right of way revisions (See deeds for final determination).

Witness my original signature, registration number and seal this 20th day of March, 2019.

DocuSigned by:
R. J. Reigner
Professional Land Surveyor L-4007
PLS # _____ Seal



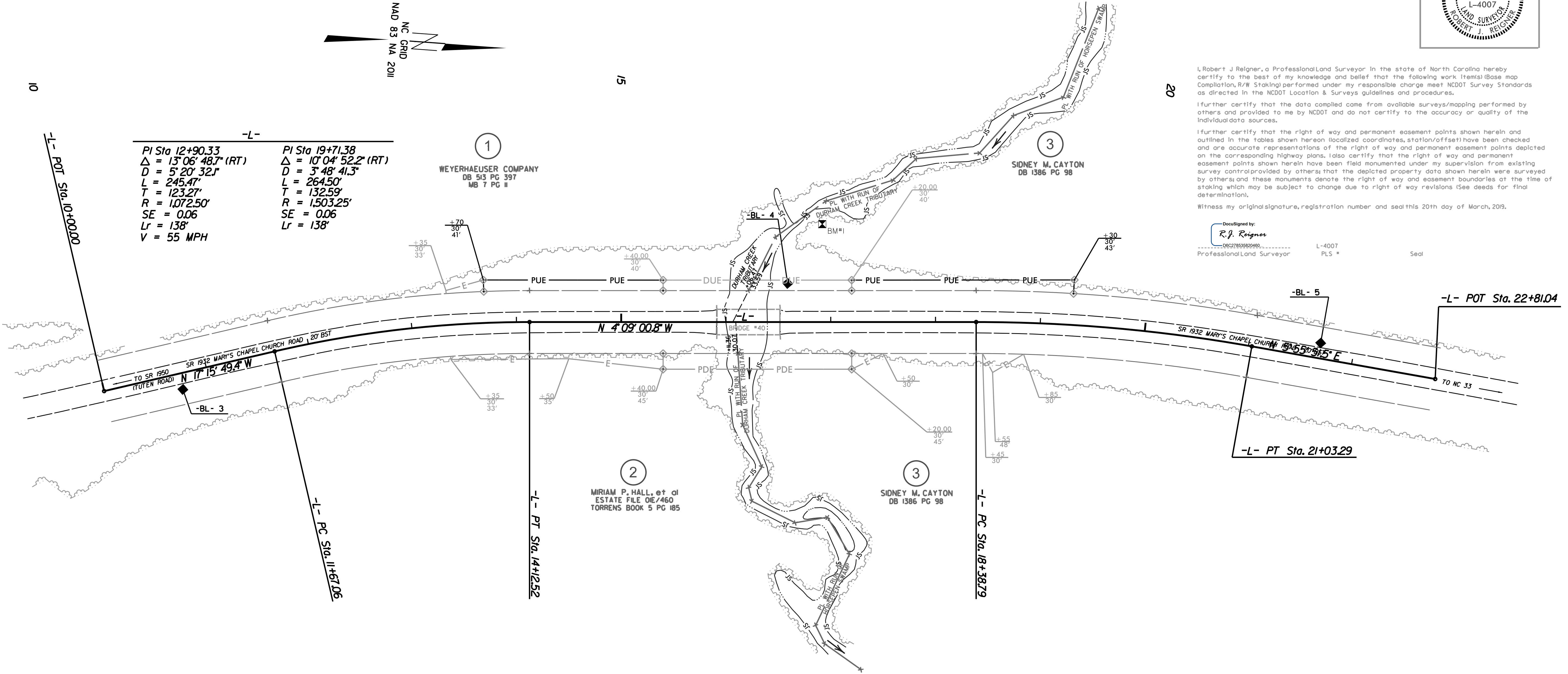
| | |
|---|--|
| <p>PI Sta 12+90.33 $\Delta = 13^{\circ} 06' 48.7''$ (RT) $D = 5' 20' 32.1''$ $L = 245.47'$ $T = 123.27'$ $R = 1,072.50'$ $SE = 0.06$ $Lr = 138'$ $V = 55$ MPH</p> | <p>PI Sta 19+71.38 $\Delta = 10^{\circ} 04' 52.2''$ (RT) $D = 3' 48' 41.3''$ $L = 264.50'$ $T = 132.59'$ $R = 1,503.25'$ $SE = 0.06$ $Lr = 138'$</p> |
|---|--|

1
WEYERHAEUSER COMPANY
DB 513 PG 397
MB 7 PG 11

2
MIRIAM P. HALL, et al
ESTATE FILE 01E/460
TORRENS BOOK 5 PG 185

3
SIDNEY M. CAYTON
DB 1386 PG 98

3
SIDNEY M. CAYTON
DB 1386 PG 98



REVISIONS

6/22/19

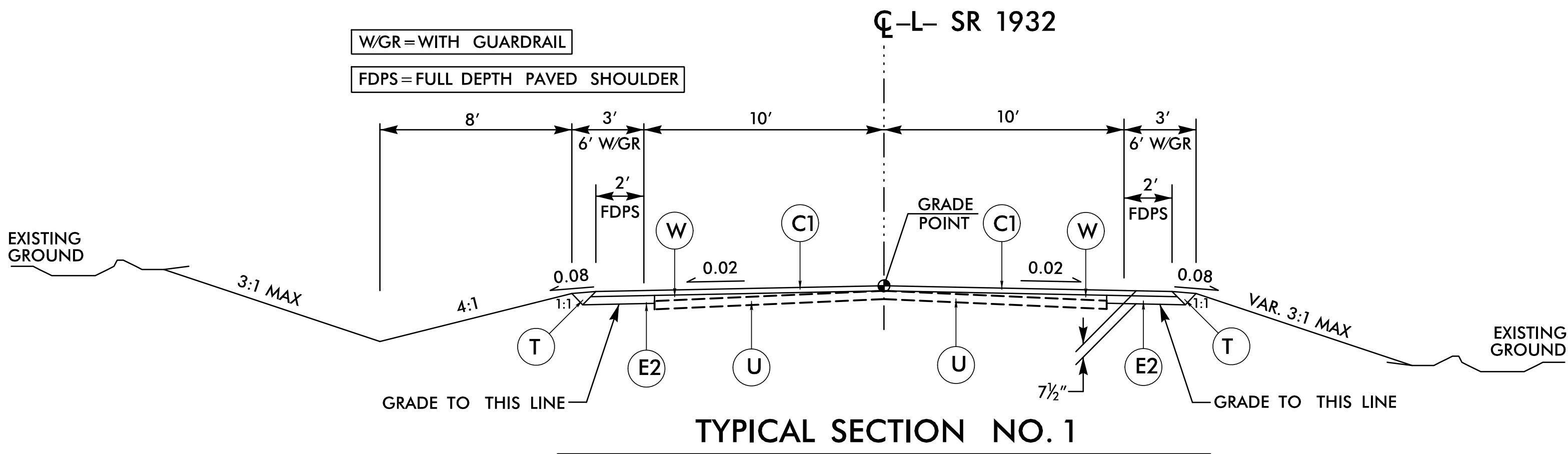
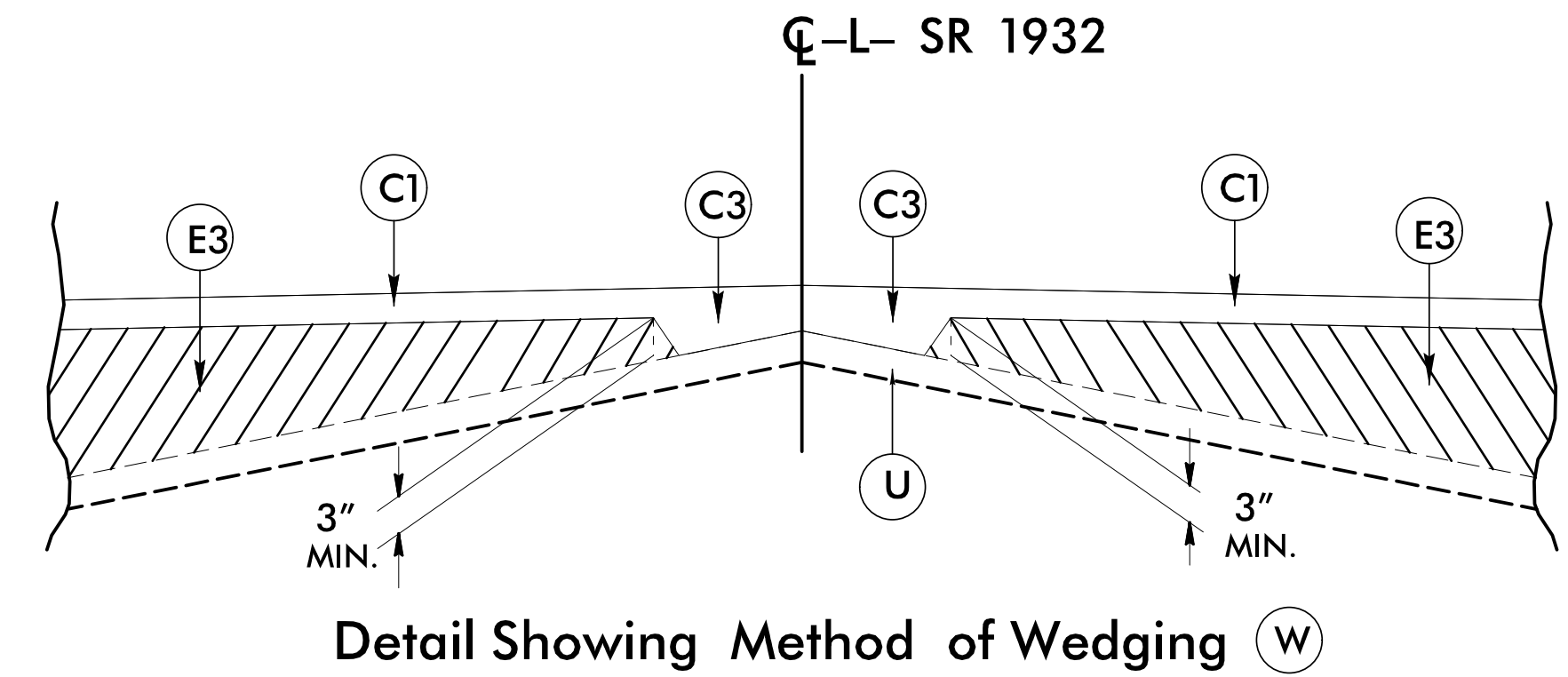
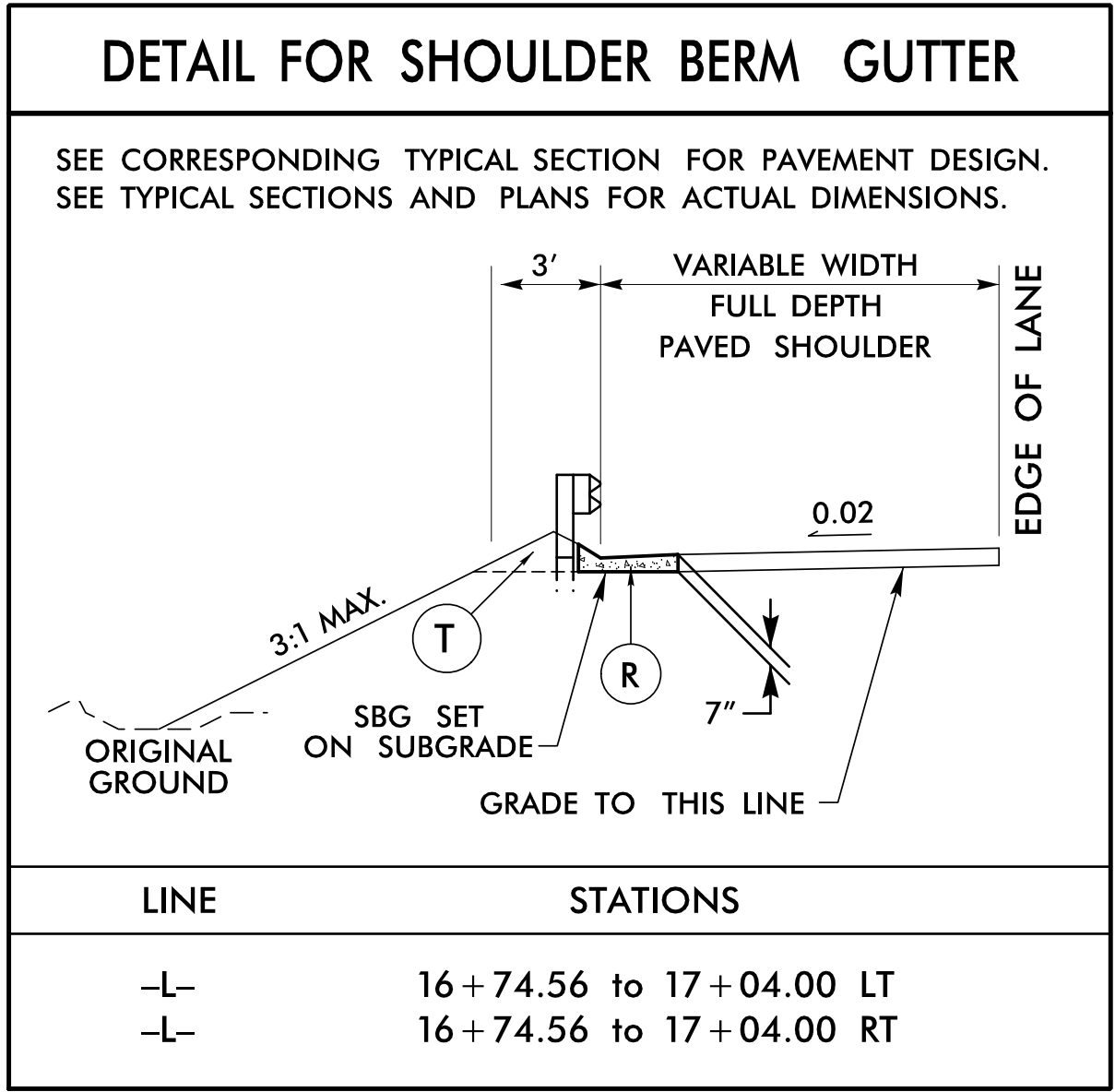
NOTES:

- IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.

5/14/19

| PAVEMENT SCHEDULE | |
|--|---|
| FINAL PAVEMENT DESIGN: FEBRUARY 28, 2018 | |
| C1 | PROP. APPROX. 1½" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. |
| C2 | PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| C3 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 1½" IN DEPTH OR GREATER THAN 2" IN DEPTH. |
| E1 | PROP. APPROX. 5" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD. |
| E2 | PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 342 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| E3 | PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5½" IN DEPTH. |
| R | CONCRETE SHOULDER BERM GUTTER |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| V1 | MILLING BITUMINOUS PAVEMENT (VAR. 0" - 1½" DEPTH - SEE DETAIL THIS SHEET) |
| W | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL) |

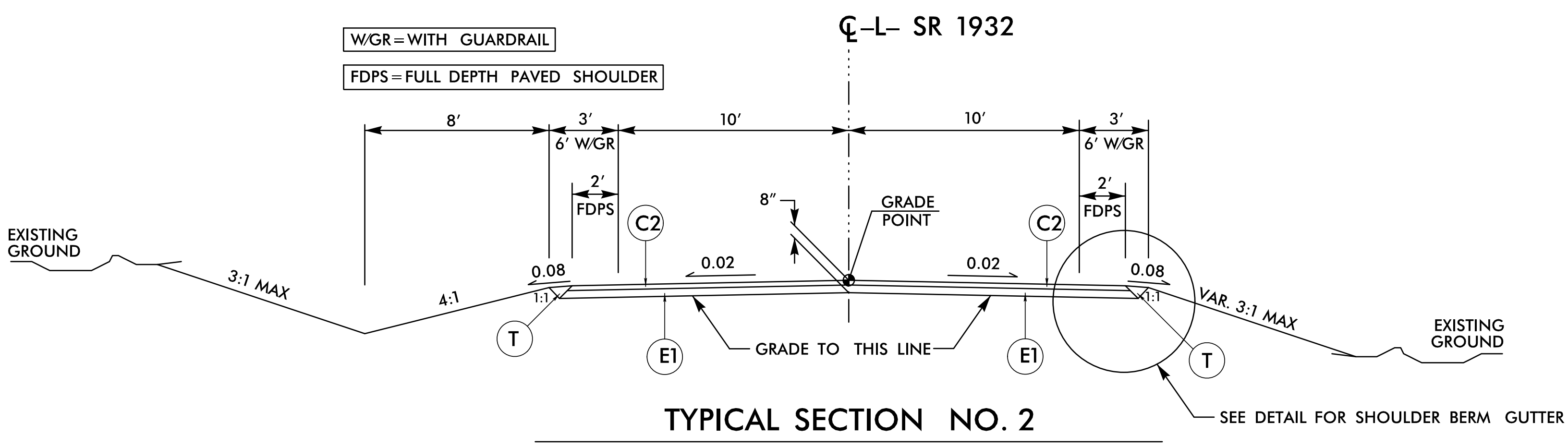
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



USE TYPICAL SECTION NO. 1 AS FOLLOWS:

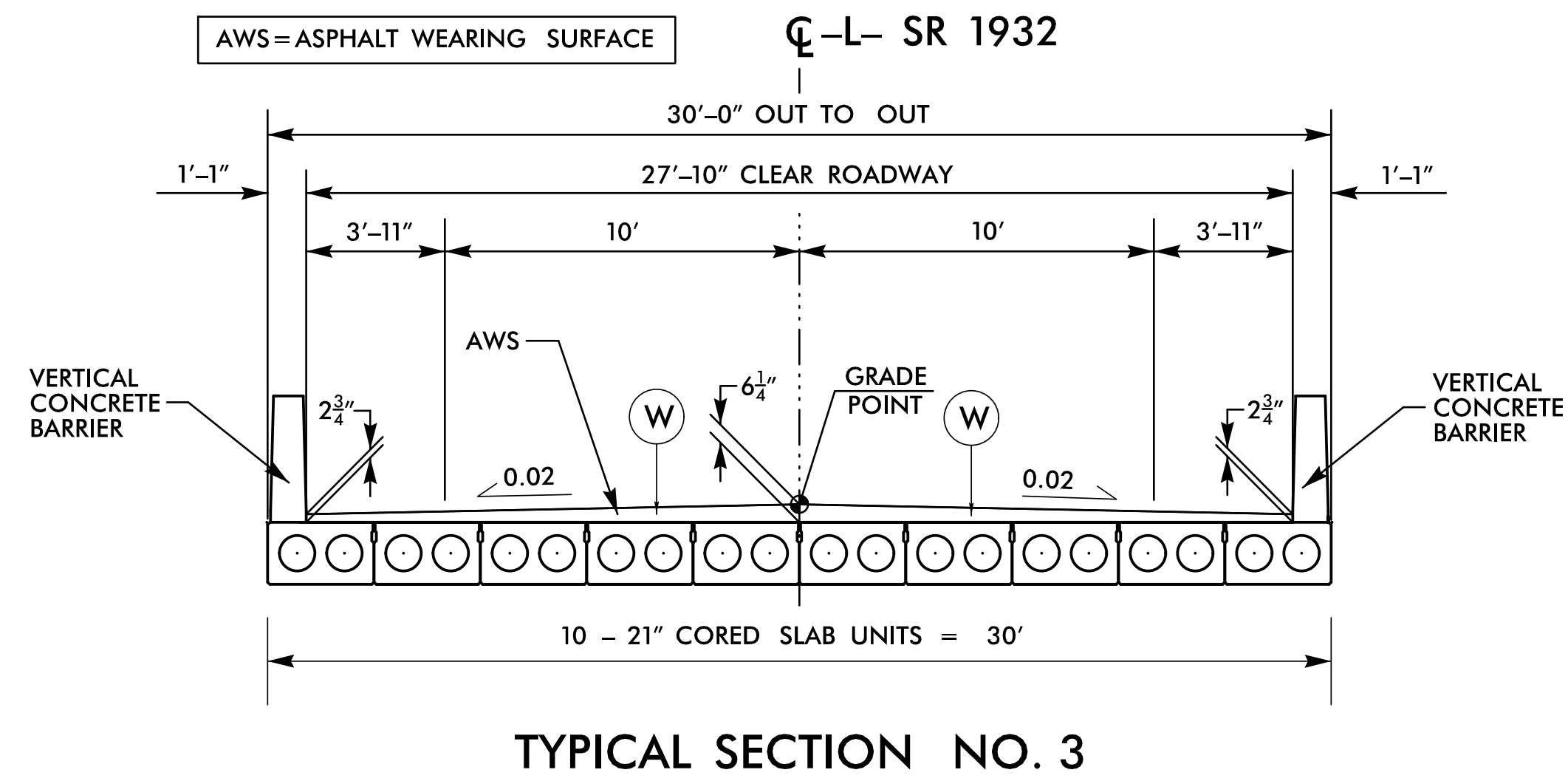
FROM -L- STA 13+00.00 TO STA 15+27.00
FROM -L- STA 17+12.00 TO STA 19+25.00

NOTE: TRANSITION FROM EXISTING PAVEMENT WIDTH TO TYPICAL SECTION NO. 1 -L- STA 13+00.00 TO STA 13+50.00
TRANSITION FROM TYPICAL SECTION NO. 1 TO EXISTING PAVEMENT WIDTH -L- STA 18+75.00 TO STA 19+25.00



USE TYPICAL SECTION NO. 2 AS FOLLOWS:

FROM -L- STA 15+27.00 TO STA 15+76.31 (BEGIN BRIDGE)
FROM -L- STA 16+63.69 (END BRIDGE) TO STA 17+12.00

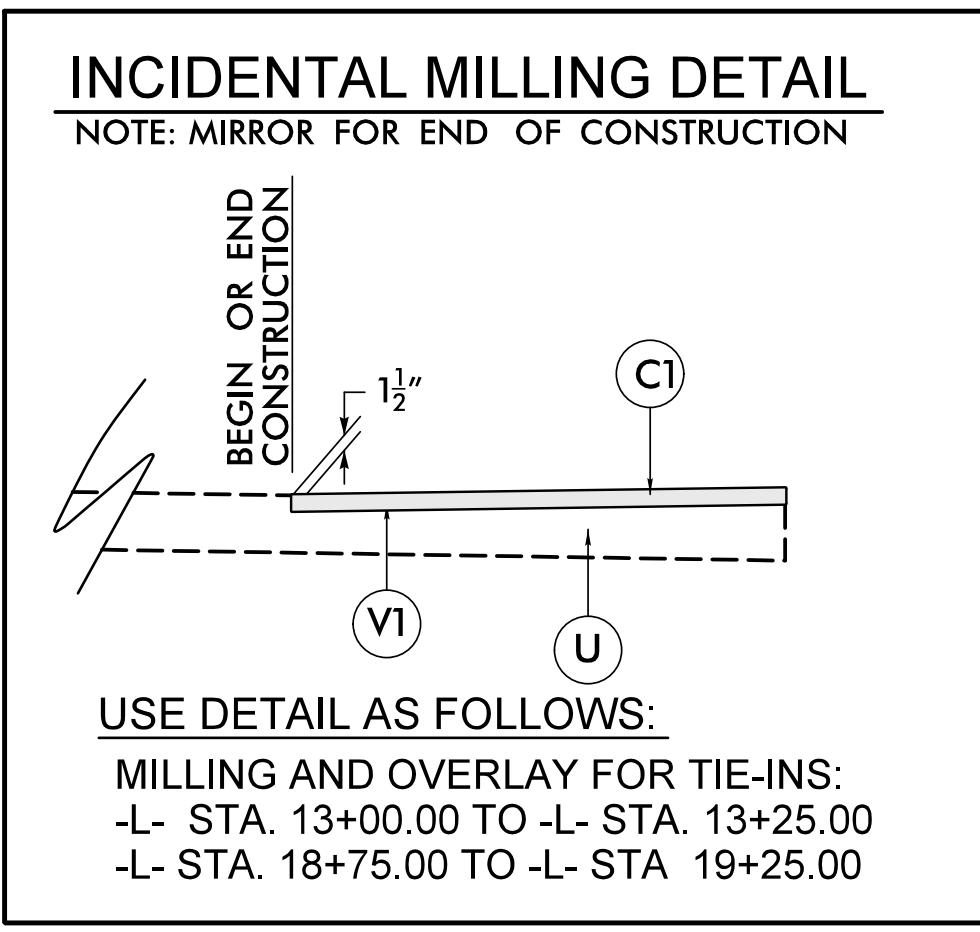


USE TYPICAL SECTION NO. 3 AS FOLLOWS:

FROM -L- STA 15+76.31 (BEGIN BRIDGE) TO STA 16+63.69 (END BRIDGE)

NOTE: SEE STRUCTURE PLANS FOR BRIDGE CONSTRUCTION DETAILS INCLUDING BARRIER RAIL HEIGHT AND ASPHALT THICKNESS DIMENSIONS

| | |
|---|-------------------|
| PROJECT REFERENCE NO. B-4433 | SHEET NO. 2A-1 |
| ROADWAY DESIGN ENGINEER | |
| | |
| 4/15/2019 2:07 PM EDT | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | |
| | |
| TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275 | |



X:\NCDOT\B4433\Roadway\ProJ\B4433_rdy_tjip.dgn
 4/15/2019 2:07 PM
 User: mlowrey

12/06/07

COMPUTED BY: VML DATE: 18 MARCH 2019
 CHECKED BY: ARM DATE: 18 MARCH 2019

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

PROJECT REFERENCE NO. SHEET NO.
 B-4433 3B-1

SUMMARY OF EARTHWORK
 IN CUBIC YARDS

| LOCATION | UNCLASSIFIED EXCAVATION | UNDERCUT | *EMBT + % | *BORROW | WASTE |
|---|-------------------------|----------|-----------|---------|-------|
| -L- 13+00.00 TO 15+76.31 (BEGIN BRIDGE) | 5 | | 324 | 319 | |
| -L- 16+63.69 (END BRIDGE) TO 19+25.00 | 18 | | 72 | 54 | |
| SUBTOTAL | 23 | | 395 | 372 | |
| MATERIAL FOR SHOULDER CONSTRUCTION | | | 18 | 18 | |
| LOSS DUE TO CLEARING & GRUBBING | | | | | |
| ADDITIONAL UNDERCUT | | | | | |
| SELECT GRANULAR MAT'L IN LIEU OF BORROW | | | | | |
| PROJECT TOTAL | 23 | | 413 | 390 | |
| EST. 5% TO REPLACE TOP SOIL ON BORROW PIT | | | | 20 | |
| GRAND TOTAL | 23 | | 413 | 410 | |
| SAY | 30 | | | 460 | |

PER GEOTECHNICAL RECOMMENDATIONS:
 ESTIMATED UNDERCUT = 300 CY (CONTINGENCY, AS DIRECTED BY THE ENGINEER)
 SELECT GRANULAR MATERIAL, CLASS III = 300 CY (CONTINGENCY, TO BE USED AS BACKFILL FOR UNDERCUT)
 GEOTEXTILE FOR SOIL STABILIZATION = 300 SY (CONTINGENCY, AS DIRECTED BY THE ENGINEER)

Earthwork quantities are calculated by the Roadway Design Unit. These earthwork quantities are based in part on subsurface data provided by the Geotechnical Engineering Unit.

Approximate quantities only. Clearing and Grubbing, Unclassified Excavation, Borrow Excavation, Fine Grading, and Removal of Existing Asphalt Pavement will be paid for at the contract lump sum price for "Grading".

PAVEMENT REMOVAL SUMMARY
 IN SQUARE YARDS

| SURVEY LINE | STATION | STATION | LOCATION LT/RT/CL | SY |
|-------------|---------|---------|-------------------|------|
| -L- | 13+00 | 14+33 | RT | 4.8 |
| -L- | 14+51 | 15+91 | LT | 2.4 |
| -L- | 15+72 | 15+91 | RT | 1.8 |
| -L- | 15+76 | 15+91 | CL | 32.7 |
| -L- | 16+52 | 16+64 | CL | 26.8 |
| -L- | 16+52 | 18+39 | LT | 5.7 |
| -L- | 16+52 | 19+25 | RT | 7.2 |
| TOTAL: | | | | 81.4 |
| SAY: | | | | 90 |

SHOULDER BERM GUTTER SUMMARY

| SURVEY LINE | STATION | STATION | LOCATION | LENGTH (LF) |
|-------------|----------|----------|----------|-------------|
| -L- | 16+74.56 | 17+04.00 | LT | 29.44 |
| -L- | 16+74.56 | 17+04.00 | RT | 29.44 |
| TOTAL: | | | | 58.88 |
| SAY: | | | | 59 |

GUARDRAIL SUMMARY

N = DISTANCE FROM EDGE OF LANE TO FACE OF GUARDRAIL.
 TOTAL SHOULDER WIDTH = DISTANCE FROM EDGE OF TRAVEL LANE TO SHOULDER BREAK POINT.
 FLARE LENGTH = DISTANCE FROM LAST SECTION OF PARALLEL GUARDRAIL TO END OF GUARDRAIL.
 W = TOTAL WIDTH OF FLARE FROM BEGINNING OF TAPER TO END OF GUARDRAIL.
 G = GATING IMPACT ATTENUATOR TYPE 350
 NG = NON-GATING IMPACT ATTENUATOR TYPE 350

| SURVEY LINE | BEG. STA. | END STA. | LOCATION | LENGTH | | | WARRANT POINT | | "N" DIST. FROM E.O.L. | TOTAL SHOUL. WIDTH | FLARE LENGTH | | W | | ANCHORS | | | | | | IMPACT ATTENUATOR TYPE 350 | | | SINGLE FACED GUARDRAIL | REMOVE EXISTING GUARDRAIL | REMOVE AND STOCKPILE EXISTING GUARDRAIL | REMARKS | | |
|----------------------|-----------|----------|----------|----------|-------------|--------------|--------------------------------------|--------------|-----------------------|--------------------|-----------------------------------|--------------|--------------|--------------|-----------------|-------|-------------------------------|----------|------|----|----------------------------|----|--|------------------------|---------------------------|---|---------|--|--|
| | | | | STRAIGHT | SHOP CURVED | DOUBLE FACED | APPROACH END | TRAILING END | | | APPROACH END | TRAILING END | APPROACH END | TRAILING END | TYPE GREU, TL-3 | CAT-1 | AT-1 | TYPE III | B-77 | EA | G | NG | | | | | | | |
| -L- | 14+95.06 | 15+76.31 | LT | 81.25' | | | | 14+95.06 | 3'-11" | 6' | | 50' | | 1' | 1 | | | | | | | | | | | | | | |
| -L- | 16+63.69 | 17+44.94 | LT | 81.25' | | | 17+44.94 | | 3'-11" | 6' | 50' | | 1' | | 1 | | | | | | | | | | | | | | |
| -L- | 14+95.06 | 15+76.31 | RT | 81.25' | | | 14+95.06 | | 3'-11" | 6' | 50' | | 1' | | 1 | | | | | | | | | | | | | | |
| -L- | 16+63.69 | 17+44.94 | RT | 81.25' | | | 17+44.94 | | 3'-11" | 6' | 50' | | 1' | | 1 | | | | | | | | | | | | | | |
| SUBTOTAL (LF) | | | | 325' | | | | | | | | | | | 4 | | | | | | | | | | | | | | |
| LESS ANCHORS (LF) | | | | 275' | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL GUARDRAIL (LF) | | | | 50' | | | | | | | | | | | | | | | | | | | | | | | | | |
| SAY GUARDRAIL (LF) | | | | 50' | | | ADDITIONAL GUARDRAIL POSTS: SAY 5 EA | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | TOTAL ANCHORS OR ATTENUATORS (EA) | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | ANCHOR UNIT LENGTH (LF) | | | | | | 50' 6.25' 6.25' 18.75' 18.75' | | | | | | | | | | | | |
| | | | | | | | | | | | DEDUCTION PER TYPE (LF) | | | | | | 200' | | | | | | | | | | | | |
| | | | | | | | | | | | TOTAL DEDUCTION (LF) | | | | | | 275.00' | | | | | | | | | | | | |

3/18/2019 10:44:33 AM Roadway\Proj\B4433_rdy.psh_3b-1.dgn
 User:lvartu

COMPUTED BY: Tyler C. Bottoms DATE: 7/3/18
 CHECKED BY: VML DATE: 3/18/2019

(5-15-18)

PROJECT NO. B-4433 SHEET NO. 3G-1

**STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS**

SUMMARY OF SUBSURFACE DRAINAGE

| LINE | Station | Station | Location LT/RT/CL | Drain Type* UD/BD/SD | LF |
|-------------|---------|---------|-------------------|----------------------|-----|
| | | | | | |
| CONTINGENCY | | | | SD | 200 |
| | | | | TOTAL LF: | 200 |

*UD = Underdrain
 *BD = Blind Drain
 *SD = Subsurface Drain

**SUMMARY OF GEOTEXTILE
 FOR PAVEMENT STABILIZATION**

| LINE | Station | Station | Geotextile for Pavement Stabilization SY | Class IV Subgrade Stabilization TONS |
|-------------|---------|---------|--|--------------------------------------|
| | | | | |
| CONTINGENCY | | | | |
| | | | TOTAL SY/TONS: | 0 0* |

*Total tons of "Class IV Subgrade Stabilization" is only the estimated quantity for pavement stabilization and may only represent a portion of the subgrade stabilization quantity shown in the Item Sheets of the Proposal.

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

| LINE | Station | Station | Aggregate Type* ASU(1/2)/AST | Aggregate Thickness INCHES [8" for ASU(2)] | Shallow Undercut CY | Class IV Subgrade Stabilization TONS | Geotextile for Soil Stabilization SY | Stabilizer Aggregate TONS | Class IV Aggregate Stabilization TONS |
|-------------|---------|---------|------------------------------|--|--------------------------|--------------------------------------|--------------------------------------|---------------------------|---------------------------------------|
| | | | | | | | | | |
| CONTINGENCY | | | | | | | | | |
| | | | | | TOTAL CY/TONS/SY: | 0 | 0** | 0** | 0 0 |

*ASU(1/2) = Aggregate Subgrade (Type 1 or 2)
 *AST = Aggregate Stabilization
 **Total tons of "Class IV Subgrade Stabilization" and total square yards of "Geotextile for Soil Stabilization" are only the estimated quantities for ASU(1/2)/AST and may only represent a portion of the subgrade stabilization and geotextile quantities shown in the Item Sheets of the Proposal.

SUMMARY OF ROCK PLATING

| LINE | Beginning Slope (H:V) | Approx. Station | Ending Slope (H:V) | Approx. Station | Location LT/RT | Rock Plating Detail No. 1/2/3/4 | Riprap Class* 1/2/B | Rock Plating SY |
|------|-----------------------|-----------------|--------------------|-----------------|----------------|---------------------------------|---------------------|-----------------|
| | | | | | | | | |
| | | | | | | | TOTAL SY: | 0 |

*Use Class 1, 2 or B riprap if riprap class is not shown for rock plating location.

SUMMARY OF REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL

| LINE | Beginning Slope/ RSS (H:V) | Approx. Station | Ending Slope/ RSS (H:V) | Approx. Station | Location LT/RT | Reinforced Soil Slope (RSS) SY | Geocells SY | Coir Fiber Mat SY | Matting for Erosion Control SY |
|------|----------------------------|-----------------|-------------------------|-----------------|----------------|--------------------------------|-------------|-------------------|--------------------------------|
| | | | | | | | | | |
| | | | | | | TOTAL SY: | 0 | 0 | 0* 0** |

*Total square yards of "Coir Fiber Mat" is only the estimated quantity for slopes steeper than 2:1 (H:V) and may only represent a portion of the coir fiber mat quantity shown in the Item Sheets of the Proposal.
 **Total square yards of "Matting for Erosion Control" is only the estimated quantity for RSS and may only represent a portion of the matting quantity shown in the Item Sheets of the Proposal.

SUMMARY OF PRE-SPLITTING OF ROCK

| LINE | Beginning Rock Cut Slope (H:V) | Approx. Station | Ending Rock Cut Slope (H:V) | Approx. Station | Location LT/RT | Pre-splitting of Rock SY | |
|------|--------------------------------|-----------------|-----------------------------|-----------------|----------------|--------------------------|---|
| | | | | | | | |
| | | | | | | TOTAL SY: | 0 |

**SUMMARY OF SURCHARGES
 AND SURCHARGE WAITING PERIODS**

| LINE | Station | Station | Surcharge Height FT | MONTHS | |
|------|---------|---------|---------------------|----------------------|---|
| | | | | | |
| | | | | TOTAL MONTHS: | 0 |

**SUMMARY OF EMBANKMENT
 WAITING PERIODS**

| LINE | Station | Station | MONTHS | |
|------|---------|---------|----------------------|---|
| | | | | |
| | | | TOTAL MONTHS: | 0 |

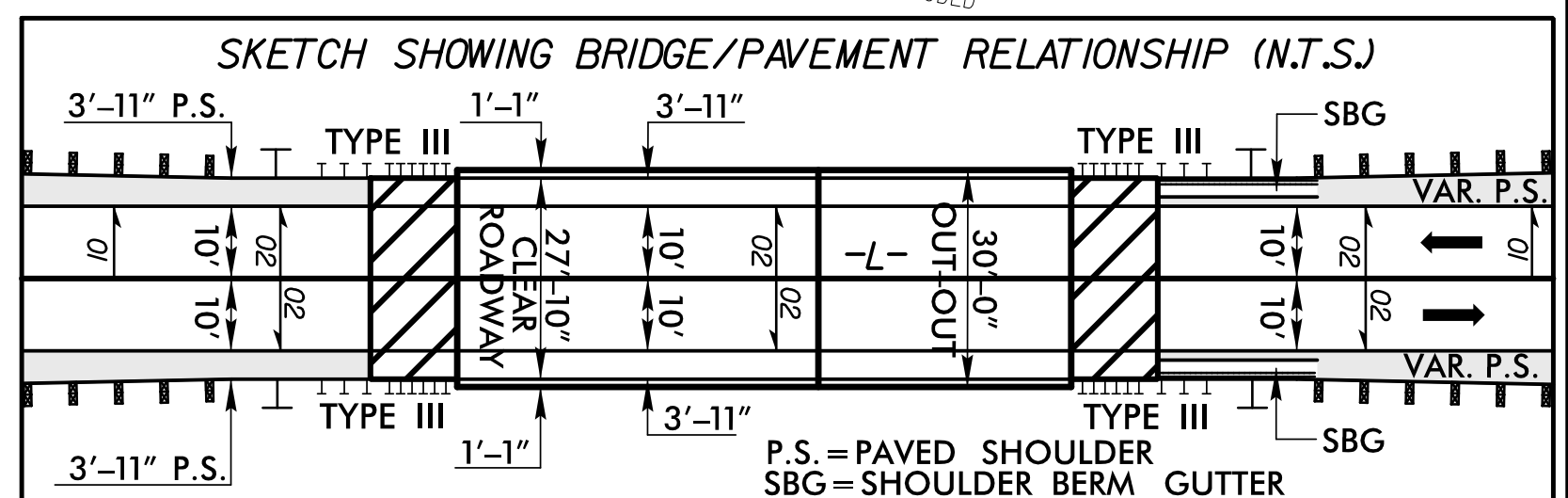
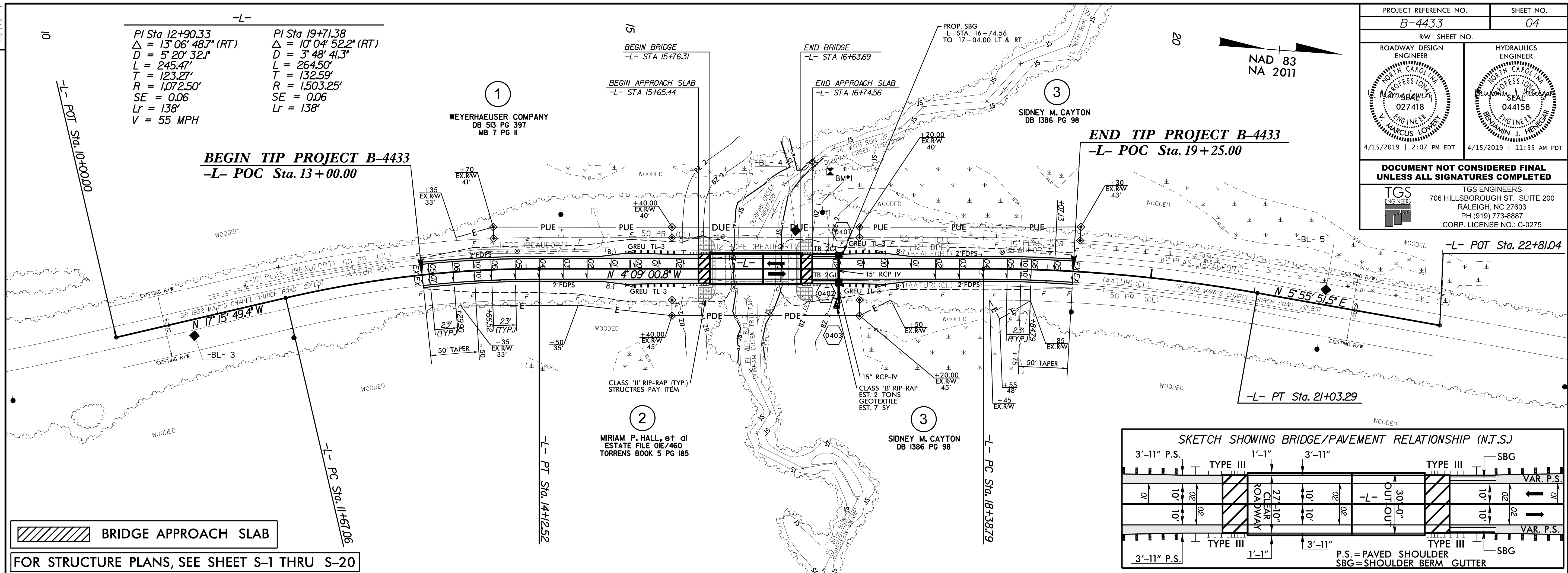
**SUMMARY OF
 SETTLEMENT GAUGES**

| Gauge No. | LINE and Station | Offset | |
|-----------|------------------|-----------------------------|-----------------|
| | | Distance FT | Direction LT/RT |
| | | | |
| | | TOTAL GAUGES (EACH): | |

SUMMARY OF BRIDGE WAITING PERIODS

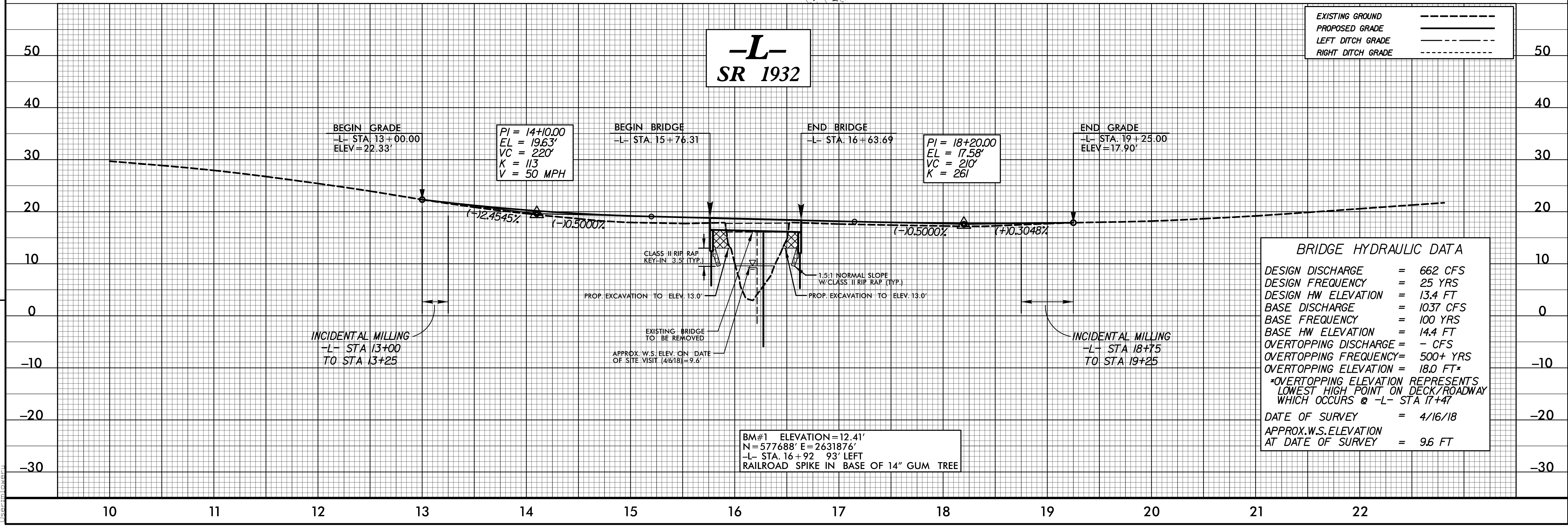
| Bridge Description | End Bent/ Bent No. | MONTHS | |
|--------------------|--------------------|----------------------|---|
| | | | |
| | | TOTAL MONTHS: | 0 |

| | | | |
|---|--|---|--|
| PROJECT REFERENCE NO. B-4433 | | SHEET NO. 04 | |
| ROADWAY DESIGN ENGINEER MARCUS LOWERY 027418 | | HYDRAULICS ENGINEER MARCUS LOWERY 044158 | |
| 4/15/2019 2:07 PM EDT | | 4/15/2019 11:55 AM PDT | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | | | |
| TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275 | | TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275 | |



BRIDGE APPROACH SLAB

FOR STRUCTURE PLANS, SEE SHEET S-1 THRU S-20

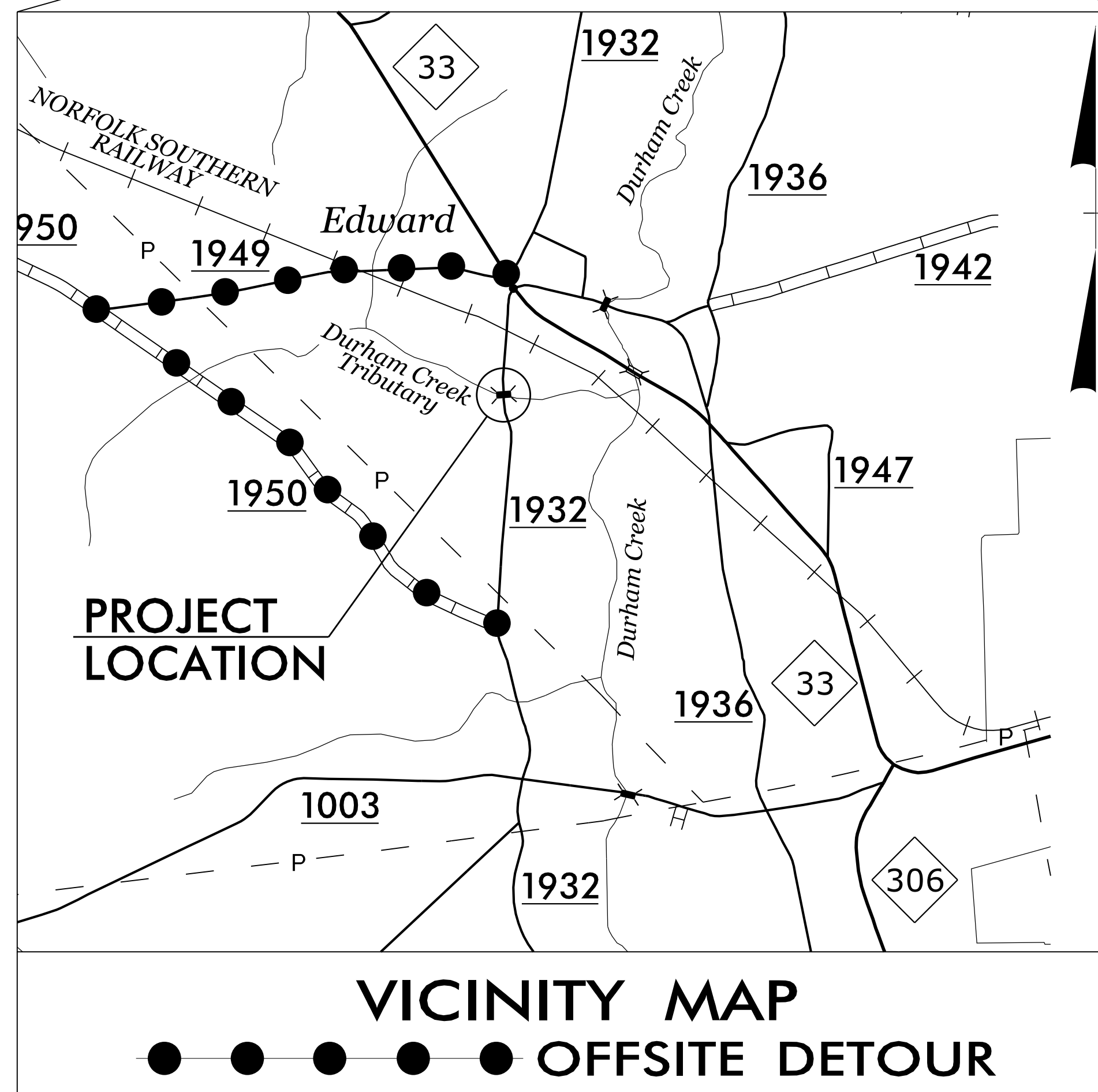
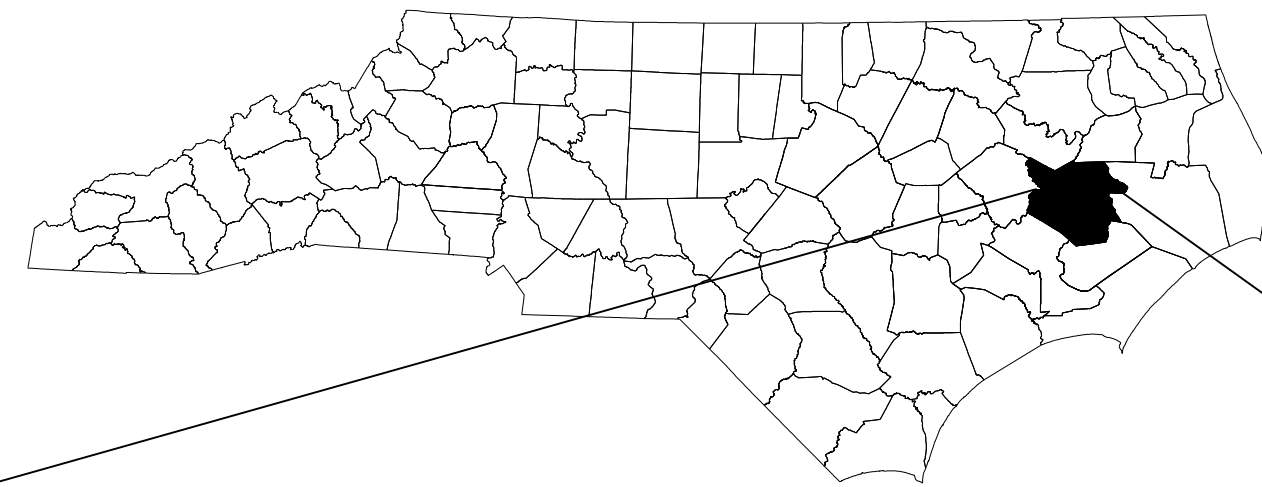


REVISIONS
 4/15/2019 B-4433-Roadway-Proj-Nb4433_rdl.psh_04.dgn
 User: mlowery

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

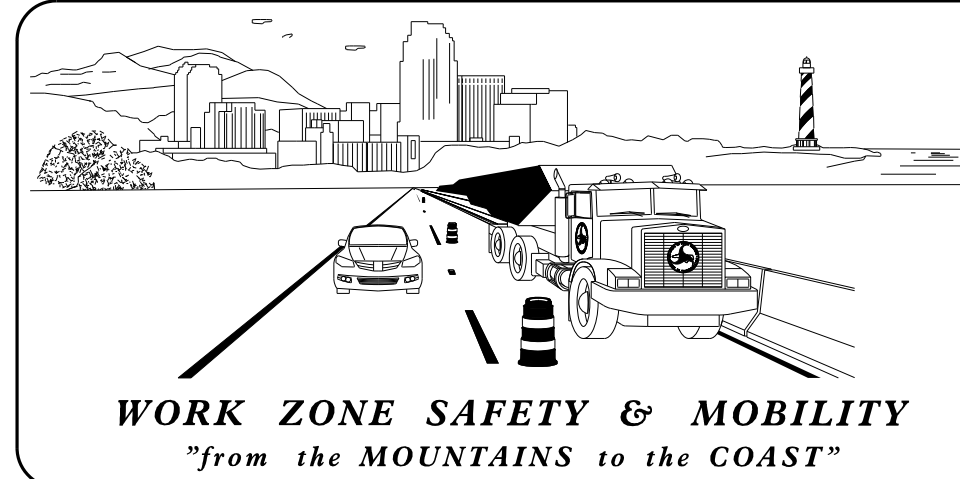
TRANSPORTATION MANAGEMENT PLAN

**BEAUFORT COUNTY
BRIDGE #060040**



● ● ● ● ● OFFSITE DETOUR

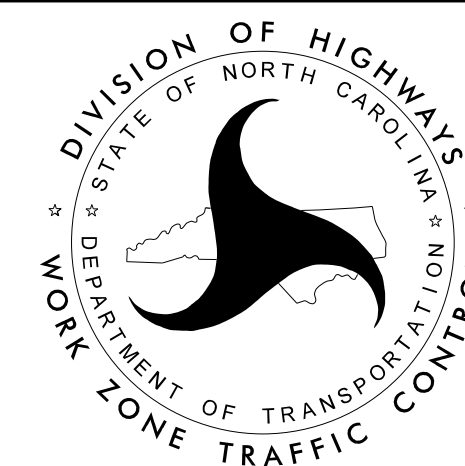
NCDOT CONTACT INFORMATION:
Phone: 252 439 2847 Fax: 252 208 7862
HEATHER LANE, PE
Assistant Division Construction Engineer



PLAN PREPARED FOR N.C.D.O.T. BY:

TGS ENGINEERS
706 HILLSBOROUGH ST.
SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO. : C-0275

TOMMY REGISTER, PE PROJECT ENGINEER
PAUL SCHULKEN, EI DESIGN ENGINEER



INDEX OF SHEETS

| SHEET NO. | TITLE |
|-----------|--|
| TMP-1 | TITLE SHEET, VICINITY MAP, INDEX OF SHEETS, LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS, AND LEGEND |
| TMP-2 | PHASING, GENERAL NOTES, AND DETOUR |
| TMP-3 | GENERAL NOTES AND PHASING PLAN |

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS SHOWN IN "ROADWAY STANDARD DRAWINGS" - PROJECT SERVICES UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C., DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

| STD. NO. | TITLE |
|----------|--|
| 1101.01 | WORK ZONE ADVANCE WARNING SIGNS |
| 1101.03 | TEMPORARY ROAD CLOSURES |
| 1101.11 | TRAFFIC CONTROL DESIGN TABLES |
| 1110.01 | STATIONARY WORK ZONE SIGNS |
| 1110.02 | PORTABLE WORK ZONE SIGNS |
| 1145.01 | BARRICADES |
| 1165.01 | WORK VEHICLE LIGHTING SYSTEMS AND TMA DELINEATION |
| 1261.01 | GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING |
| 1261.02 | GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING |
| 1262.01 | GUARDRAIL END DELINEATION |

LEGEND

GENERAL

- ➔ DIRECTION OF TRAFFIC FLOW
- ➔ DIRECTION OF PEDESTRIAN TRAFFIC FLOW
- EXIST. PVMT.
- ➔ NORTH ARROW
- PROPOSED PVMT.
- ~~~~~ TEMP. SHORING (LOCATION PURPOSES ONLY)
- WORK AREA

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- ▬ BARRICADE (TYPE III)

TEMPORARY SIGNING

- ◁ PORTABLE SIGN
- ├ STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

APPROVED: _____
DATE: _____

SEAL



4/15/2019 | 2:23 PM PDT

3/18/2019 X:\NCDOT\B-4433\TrafficControl\TCP\B4433_TC_TMP_01TSH.dgn User: pschulken

GENERAL NOTES

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRABLE OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

THE FOLLOWING GENERAL NOTES APPLY AT ALL TIMES FOR THE DURATION OF THE CONSTRUCTION PROJECT EXCEPT WHEN OTHERWISE NOTED IN THE PLAN OR DIRECTED BY THE ENGINEER.

LANE AND SHOULDER CLOSURE REQUIREMENTS

- A) REMOVE LANE CLOSURE DEVICES FROM THE LANE WHEN WORK IS NOT BEING PERFORMED BEHIND THE LANE CLOSURE OR WHEN A LANE CLOSURE IS NO LONGER NEEDED OR AS DIRECTED BY THE ENGINEER.

TRAFFIC PATTERN ALTERATIONS

- B) NOTIFY THE ENGINEER TWENTY ONE (21) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.

SIGNING

- C) INSTALL ADVANCE WORK ZONE WARNING SIGNS WHEN WORK IS WITHIN 40 FT FROM THE EDGE OF TRAVEL LANE AND NO MORE THAN THREE (3) DAYS PRIOR TO THE BEGINNING OF CONSTRUCTION.
- D) PROVIDE SIGNING AND DEVICES REQUIRED TO CLOSE THE ROAD ACCORDING TO THE ROADWAY STANDARD DRAWINGS AND TRAFFIC CONTROL PLANS.

PROVIDE SIGNING REQUIRED FOR THE OFF-SITE DETOUR ROUTE AS SHOWN IN THE TRAFFIC CONTROL PLANS.

- E) COVER OR REMOVE ALL SIGNS AND DEVICES REQUIRED TO CLOSE THE ROAD WHEN ROAD CLOSURE IS NOT IN OPERATION.

COVER OR REMOVE ALL SIGNS REQUIRED FOR THE OFF-SITE DETOUR WHEN THE DETOUR IS NOT IN OPERATION.

- F) ENSURE ALL NECESSARY SIGNING IS IN PLACE PRIOR TO ALTERING ANY TRAFFIC PATTERN.

TRAFFIC CONTROL DEVICES

- G) PLACE TYPE III BARRICADES, WITH "ROAD CLOSED" SIGN R11-2 ATTACHED, OF SUFFICIENT LENGTH TO CLOSE ENTIRE ROADWAY.

PAVEMENT MARKINGS AND MARKERS

- H) INSTALL PAVEMENT MARKINGS ON THE FINAL SURFACE AS FOLLOWS:

| ROAD NAME | MARKING | MARKERS |
|-----------------------------------|---------|---------|
| SR 1932 (MARY'S CHAPEL CHURCH RD) | PAINT | RAISED |

- I) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- J) REMOVE ANY CONFLICTING MARKINGS OR MARKERS BEFORE SHIFTING TRAFFIC TO A NEW PATTERN.
- K) PASSING ZONE WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.
- L) STATE FORCES WILL INSTALL AND MAINTAIN THE PROJECT DETOUR AND TYPE III BARRICADES AT THE PROJECT LIMITS. STATE FORCES WILL INSTALL MARKINGS AND MARKERS ON THE FINISHED PROJECT. CONTACT JEFF DUNNING AT 252-830-3493 TWO WEEKS PRIOR TO CLOSING THE ROAD FOR DETOUR INSTALLATION.

PHASING

STEP 1: INSTALL ALL DETOUR ROUTE SIGNS USING RSD 1101.01 AND AS SHOWN.

STEP 2: INSTALL TYPE III BARRICADES AND SIGNS, AND CLOSE SR 1932 (MARY'S CHAPEL CHURCH RD) TO TRAFFIC USING RSD 1101.03 (SHEET 1 OF 9) AND AS SHOWN.

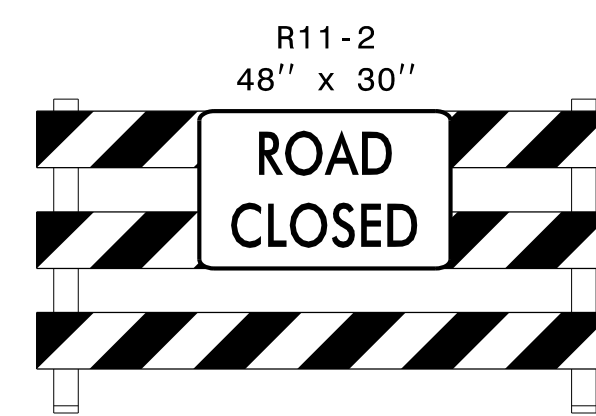
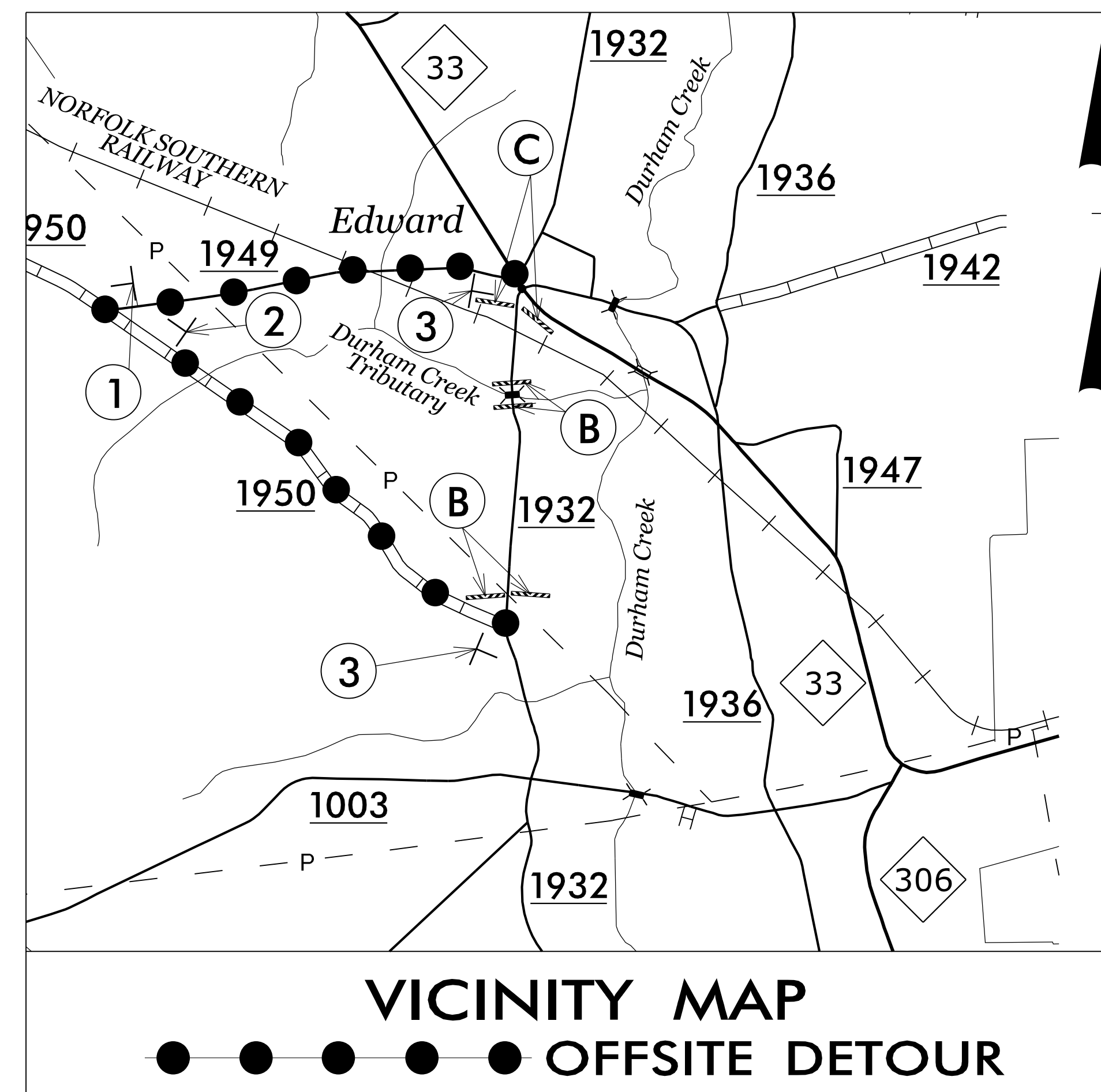
PLACE TRAFFIC ON DETOUR.

STEP 3: DEMOLISH AND REMOVE THE EXISTING BRIDGE OVER DURHAM CREEK TRIBUTARY.

CONSTRUCT THE NEW BRIDGE OVER DURHAM CREEK TRIBUTARY FROM -L- STA. 15+76.31 TO 16+63.69.

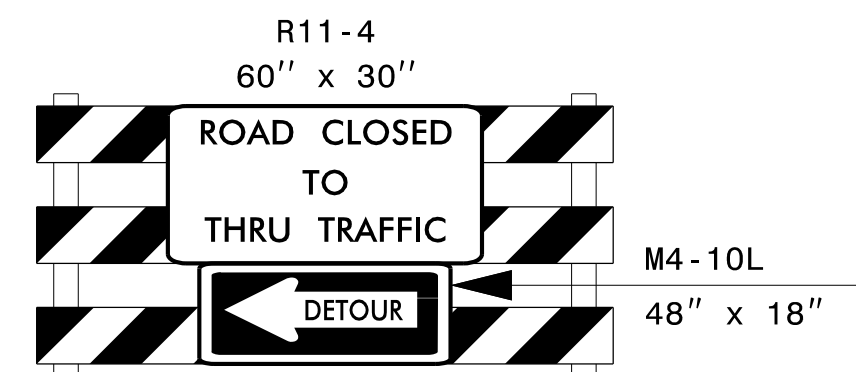
CONSTRUCT THE ROADWAY ON SR 1932 (MARY'S CHAPEL CHURCH RD) FROM -L- STA. 13+00.00 TO -L- STA. 15+76.31 (BEGIN BRIDGE) AND FROM -L- STA. 16+63.69 (END BRIDGE) TO 19+25.00 UP TO AND INCLUDING THE FINAL LAYER OF SURFACE COURSE.

STEP 4: UPON COMPLETION OF BRIDGE, APPROACHES, AND ROADWAY, PLACE FINAL PAVEMENT MARKINGS AND MARKERS IN ACCORDANCE WITH RSD 1205.01, 1205.02, 1205.12, 1250.01, AND 1251.01. REMOVE BARRICADES, SIGNS, AND ALL OTHER TRAFFIC CONTROL DEVICES AND OPEN SR 1932 (MARY'S CHAPEL CHURCH RD) TO TRAFFIC IN FINAL PATTERN.



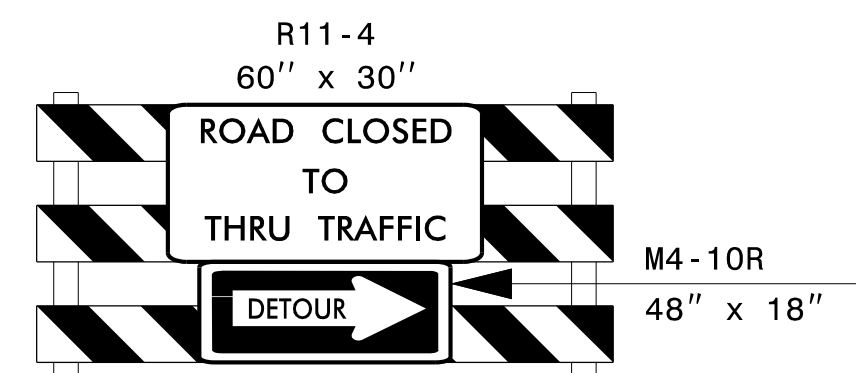
TYPE III BARRICADE

A



TYPE III BARRICADE

B



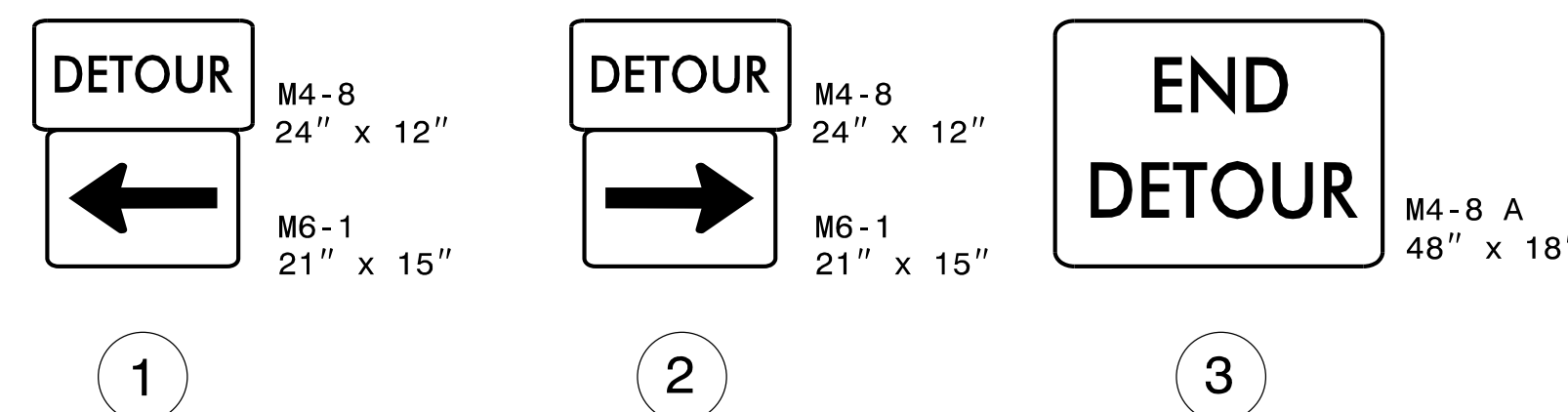
TYPE III BARRICADE

C

VICINITY MAP OFFSITE DETOUR

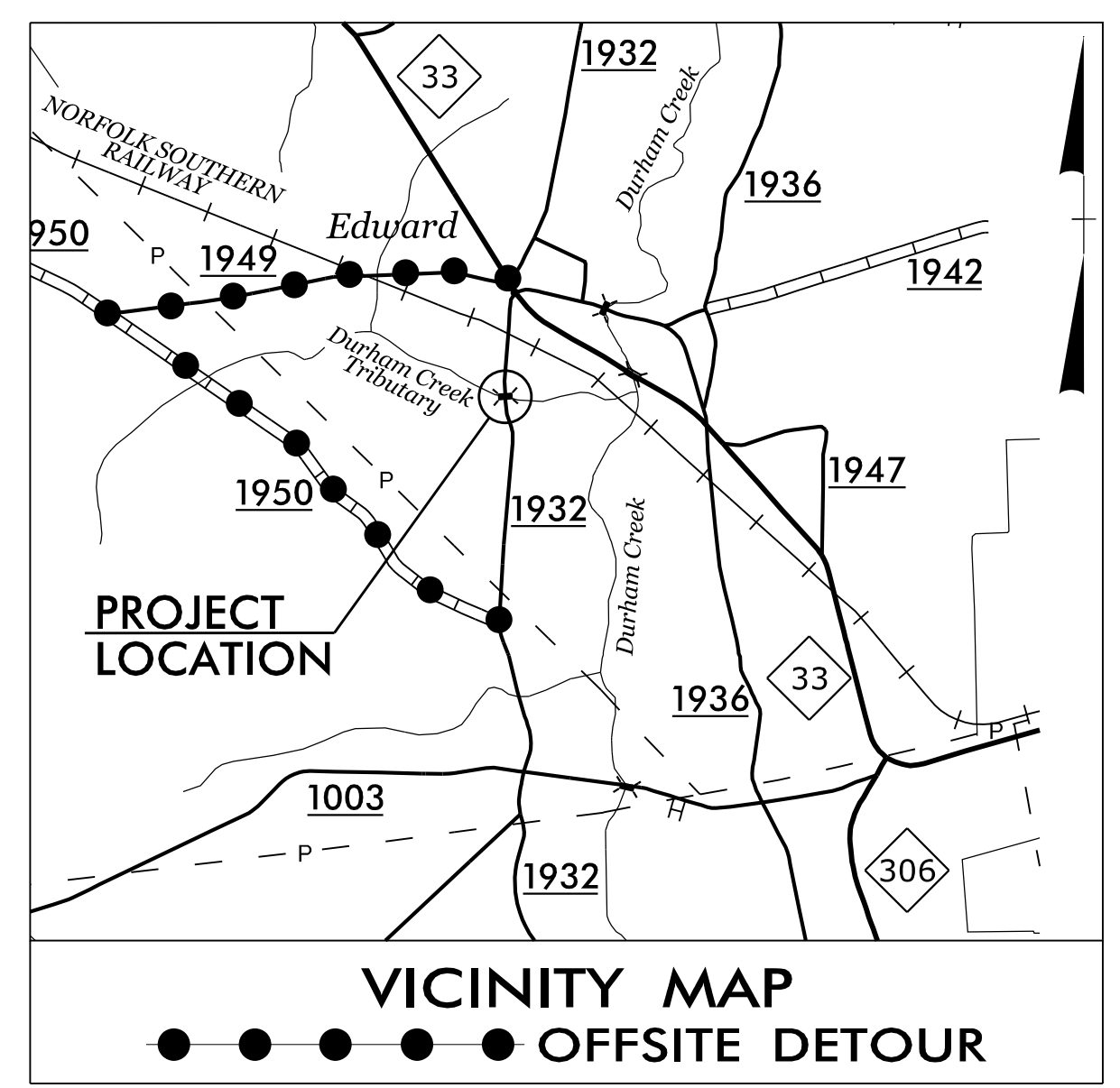
ESTIMATED ADDITIONAL SIGNS REQUIRED PER RSD 1101.03.

SEE RSD FOR SIGN PLACEMENT AND SIGN WORDING REQUIREMENTS.
 - W20-3 (19 EACH)
 - SP-4 (3 EACH)



| | | | |
|--|--|--|---|
| APPROVED: _____ | | | <h2>GENERAL NOTES, PHASING, AND DETOUR</h2> |
| DATE: _____ | | | |
| <p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> | | | |

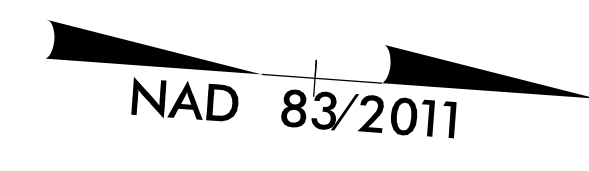
| | |
|--|-----------|
| PROJ. REFERENCE NO. | SHEET NO. |
| B-4433 | TMP-3 |
| TGS ENGINEERS 706 HILLSBOROUGH ST. SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO. : C-0275 | |



15

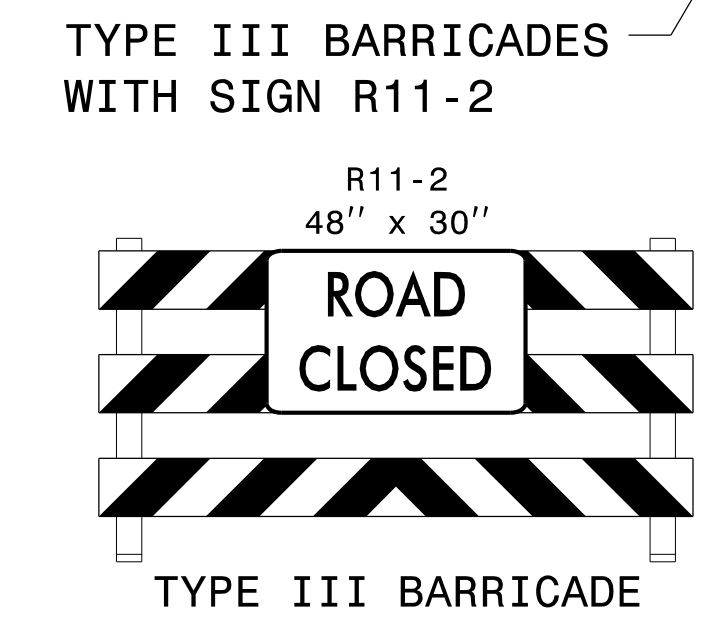
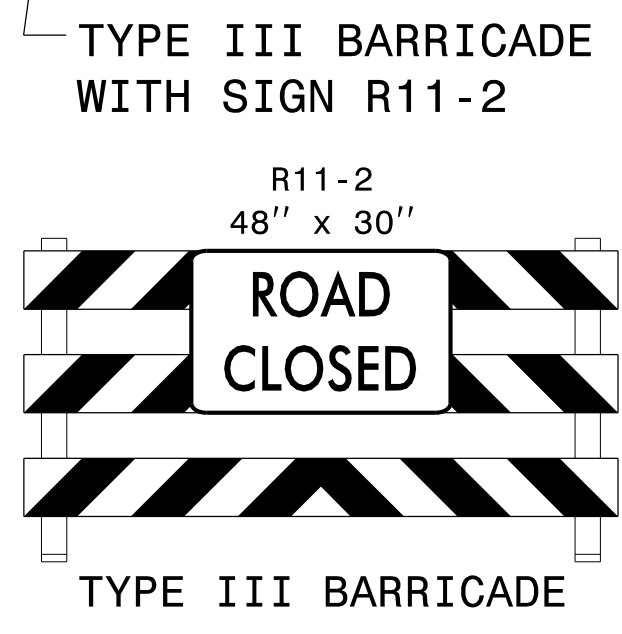
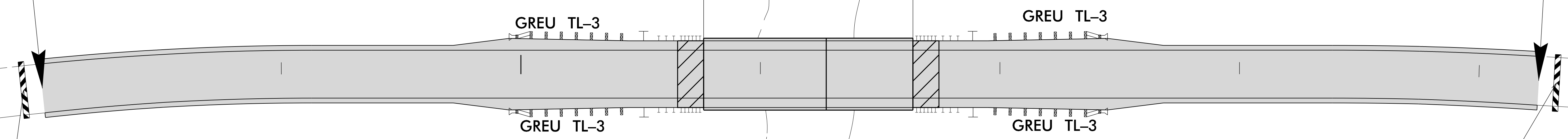
BEGIN BRIDGE
-L- STA 15+76.31

END BRIDGE
-L- STA 16+63.69



BEGIN TIP PROJECT B-4433
-L- POC Sta. 13 + 00.00

END TIP PROJECT B-4433
-L- POC Sta. 19 + 25.00



GENERAL NOTES

IMPLEMENT TRAFFIC CONTROL IN ACCORDANCE WITH THE ROADWAY STANDARD DRAWINGS LISTED ON TMP-1.

CHANGES MAY BE REQUIRED WHEN PHYSICAL DIMENSIONS IN THE DETAIL DRAWINGS, STANDARD DETAILS, AND ROADWAY DETAILS ARE NOT ATTAINABLE TO MEET FIELD CONDITIONS OR RESULT IN DUPLICATE OR UNDESIRED OVERLAPPING OF DEVICES. MODIFICATION MAY INCLUDE: MOVING, SUPPLEMENTING, COVERING, OR REMOVAL OF DEVICES AS DIRECTED BY THE ENGINEER.

STATE FORCES WILL INSTALL AND MAINTAIN THE PROJECT DETOUR AND THE TYPE III BARRICADES AT THE PROJECT LIMITS. STATE FORCES WILL INSTALL PAINT AND MARKERS ON THE FINISHED PROJECT. CONTACT JEFF DUNNING AT 252-830-3493 TWO WEEKS PRIOR TO CLOSING THE ROAD FOR THE DETOUR INSTALLATION.

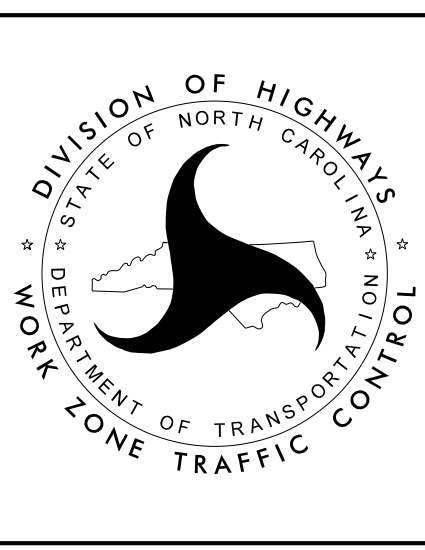
APPROVED: _____

DATE: _____

SEAL

4/15/2019 1:15 PM PDT

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**



**GENERAL NOTES
AND PHASING PLAN**

3/18/2019
 User: jpschulken
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TIP PROJECT: B-4433

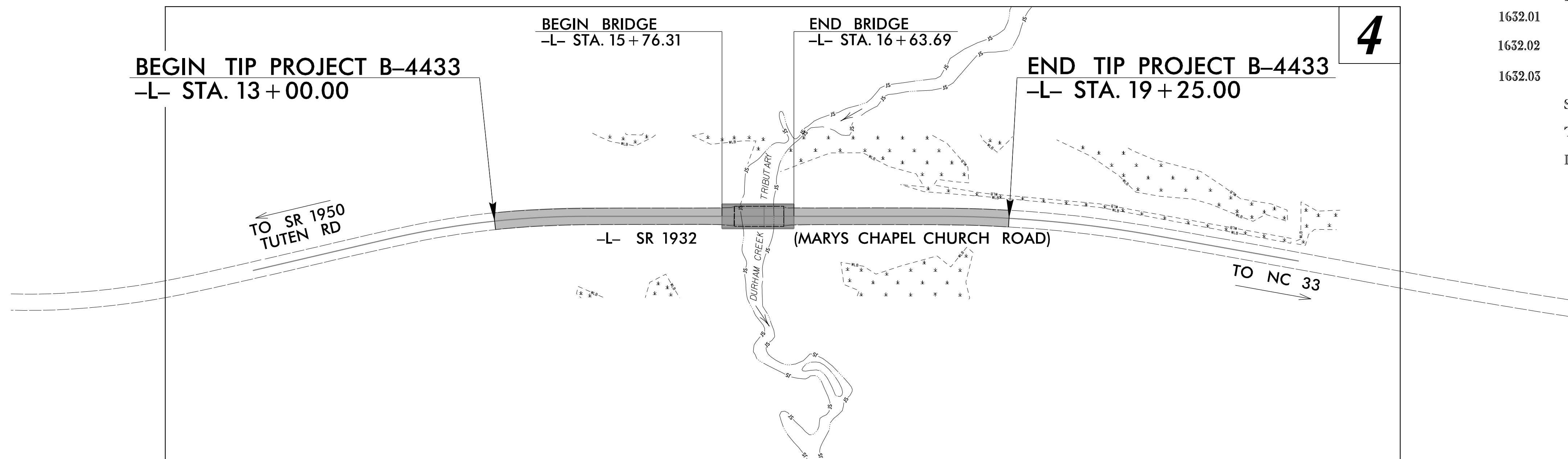
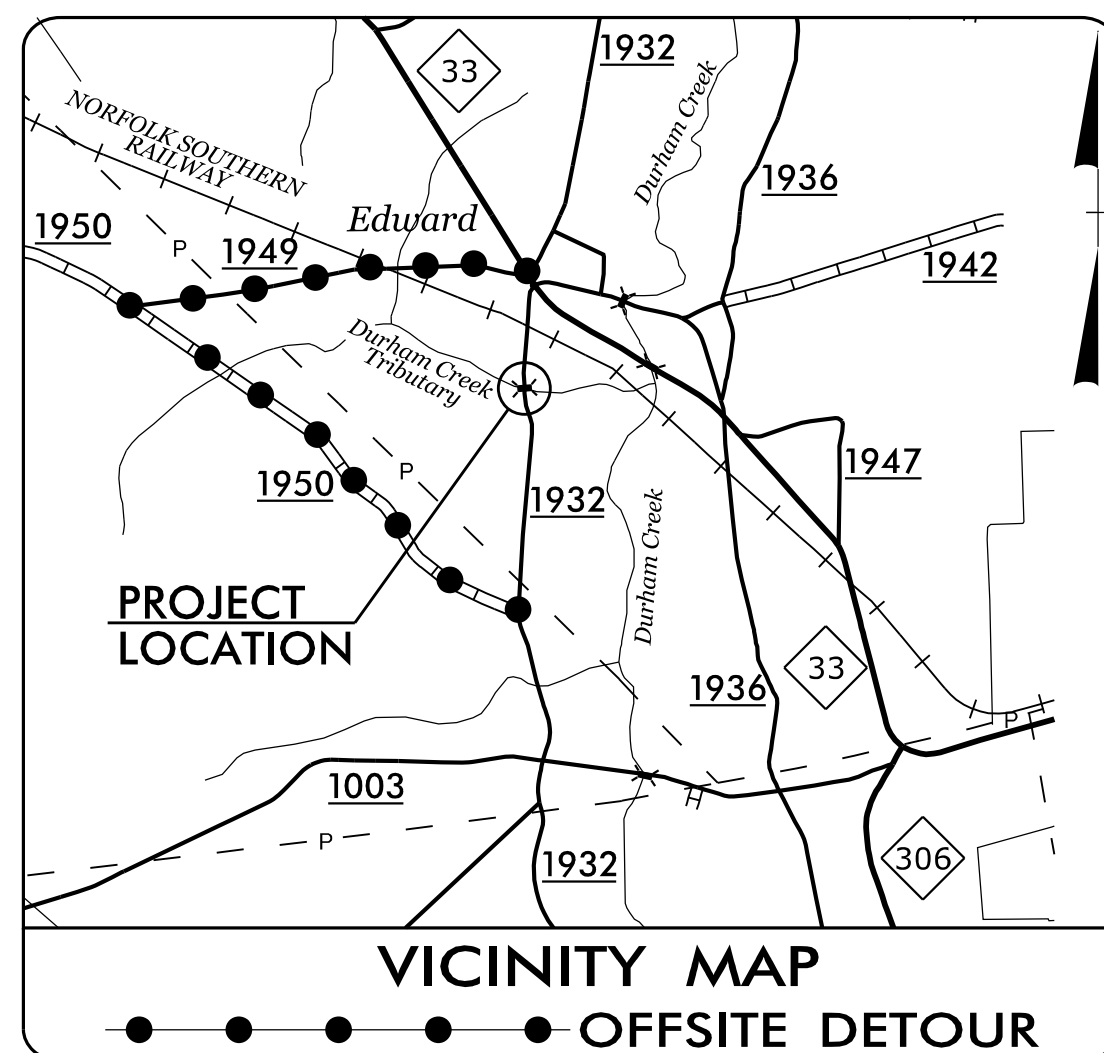
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS
PLAN FOR PROPOSED
HIGHWAY EROSION CONTROL

BEAUFORT COUNTY

**LOCATION: REPLACE BRIDGE NO. 40 ON SR 1932
OVER DURHAM CREEK TRIBUTARY**

TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE

See Sheet 1A For Index of Sheets
See Sheet 1B For Conventional Plan Sheet Symbols
See Sheet 1C-1 For Survey Control Sheet



CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.
THIS PROJECT IS NOT WITHIN ANY MUNICIPAL BOUNDARIES.

| | | | |
|-----------------|-----------------------------|-------------|--------------|
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
| N.C. | B-4433 | EC-1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| | | | |
| | | | |

EROSION AND SEDIMENT CONTROL MEASURES

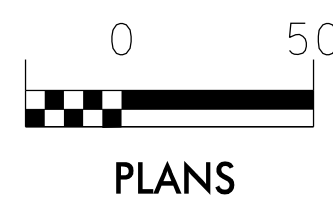
| Std. # | Description | Symbol |
|---------|--|--------|
| 1650.03 | Temporary Silt Ditch | TD |
| 1650.05 | Temporary Diversion | TD |
| 1605.01 | Temporary Silt Fence | |
| 1606.01 | Special Sediment Control Fence | △△△ |
| 1622.01 | Temporary Berms and Slope Drains | — |
| 1650.02 | Silt Basin Type B | ▨ |
| 1633.01 | Temporary Rock Silt Check Type-A | ▨ |
| | Temporary Rock Silt Check Type-A with Matting and Polyacrylamide (PAM) | ▨ |
| 1633.02 | Temporary Rock Silt Check Type-B | ▨ |
| | Wattle / Coir Fiber Wattle | — |
| | Wattle / Coir Fiber Wattle with Polyacrylamide (PAM) | — |
| 1634.01 | Temporary Rock Sediment Dam Type-A | ▨ |
| 1634.02 | Temporary Rock Sediment Dam Type-B | ▨ |
| 1655.01 | Rock Pipe Inlet Sediment Trap Type-A | ⊓ |
| 1655.02 | Rock Pipe Inlet Sediment Trap Type-B | ⊓ |
| 1630.04 | Stilling Basin | ▭ |
| 1650.06 | Special Stilling Basin | ▭ |
| | Rock Inlet Sediment Trap: | |
| 1632.01 | Type A | A |
| 1632.02 | Type B | B |
| 1632.03 | Type C | C |
| | Skimmer Basin | ▭ |
| | Tiered Skimmer Basin | ▭ |
| | Infiltration Basin | ▭ |

**THIS PROJECT CONTAINS
EROSION CONTROL PLANS
FOR CLEARING AND
GRUBBING PHASE OF
CONSTRUCTION.**

**ENVIRONMENTALLY
SENSITIVE AREA(S) EXIST
ON THIS PROJECT**
*Refer To E. C. Special Provisions
for Special Considerations.*

**THIS PROJECT HAS
BEEN DESIGNED TO
SENSITIVE WATERSHED
STANDARDS.**

GRAPHIC SCALE



PLANS

THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE REGULATIONS SET FORTH BY THE NCG-010000 GENERAL CONSTRUCTION PERMIT EFFECTIVE APRIL 1, 2019 AND ISSUED BY THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY / DIVISION OF ENERGY, MINERAL, AND LAND RESOURCES.

Prepared in the Office of:



TGS ENGINEERS
706 HILLSBOROUGH ST
SUITE 200
RALEIGH, NC 27603

PH (919) 773-8887
CORP. LICENSE NO.:
C-0275

Designed by:

BRIANA CAMP, EI
NAME

4041
LEVEL III CERTIFICATION NO.

Reviewed in the Office of:

ROADSIDE ENVIRONMENTAL UNIT

2815 Rouse Road Extension
Kinston, NC 28504

2018 STANDARD SPECIFICATIONS

Reviewed by:

JUSTIN DAVIS

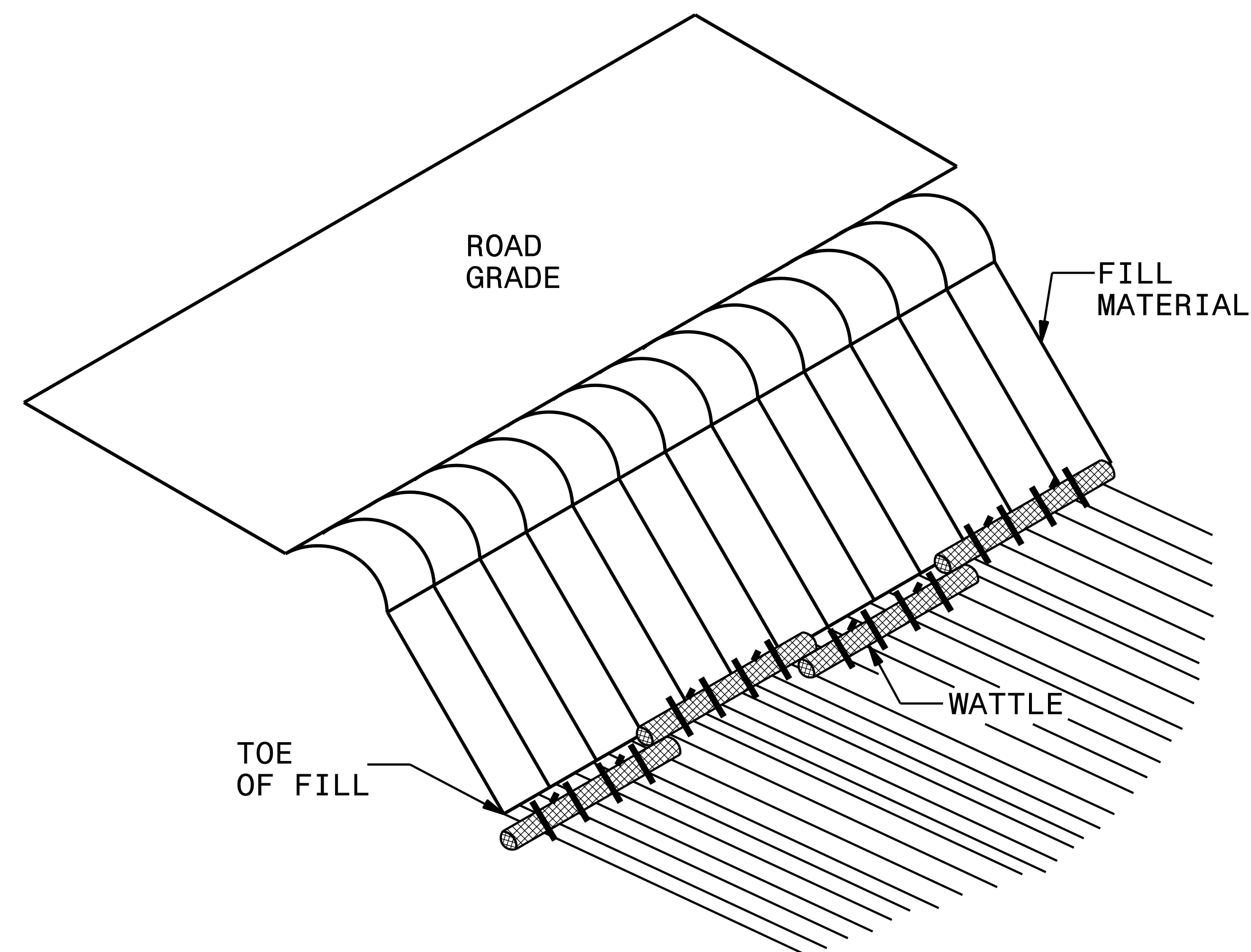
Roadway Standard Drawings

The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

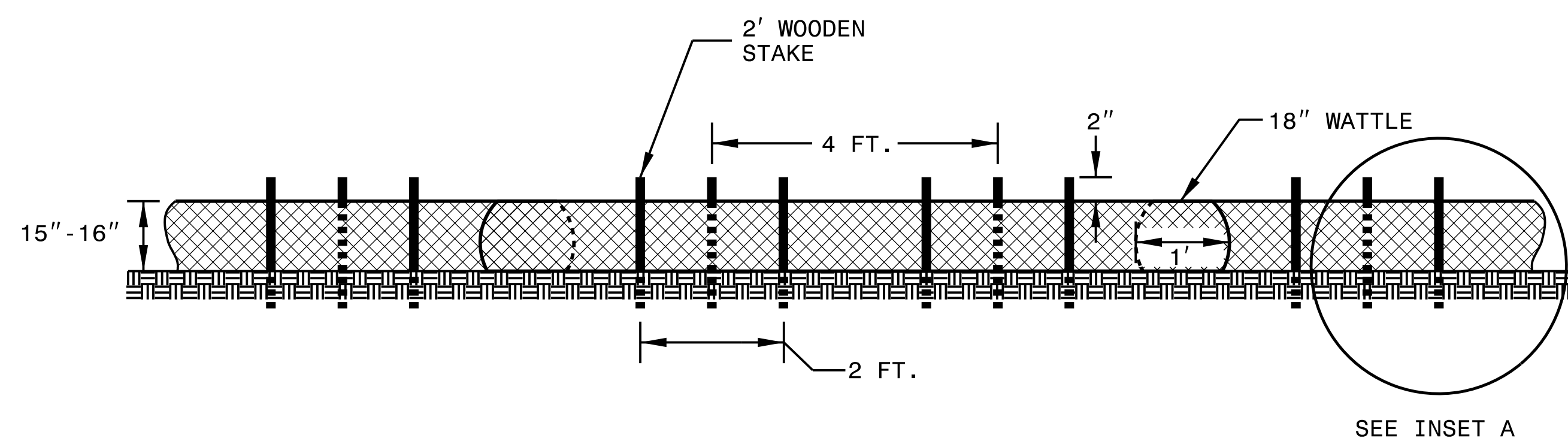
| | |
|--|--|
| 1604.01 Railroad Erosion Control Detail | 1632.01 Rock Inlet Sediment Trap Type A |
| 1605.01 Temporary Silt Fence | 1632.02 Rock Inlet Sediment Trap Type 3 |
| 1606.01 Special Sediment Control Fence | 1632.03 Rock Inlet Sediment Trap Type C |
| 1607.01 Gravel Construction Entrance | 1633.01 Temporary Rock Silt Check Type A |
| 1622.01 Temporary Berms and Slope Drains | 1633.02 Temporary Rock Silt Check Type 3 |
| 1630.01 Riser Basin | 1634.01 Temporary Rock Sediment Dam Type A |
| 1630.02 Silt Basin Type 3 | 1634.02 Temporary Rock Sediment Dam Type 3 |
| 1630.03 Temporary Silt Ditch | 1635.01 Rock Pipe Inlet Sediment Trap Type A |
| 1630.04 Stilling Basin | 1635.02 Rock Pipe Inlet Sediment Trap Type 3 |
| 1630.05 Temporary Diversion | 1640.01 Coir Fiber Jaffle |
| 1630.06 Special Stilling Basin | 1645.01 Temporary Stream Crossing |
| 1631.01 Matting Installation | |

| | |
|--|---------------------------|
| PROJECT REFERENCE NO. <i>B-4433</i> | SHEET NO. <i>EC-2A</i> |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

COIR FIBER WATTLE BARRIER DETAIL



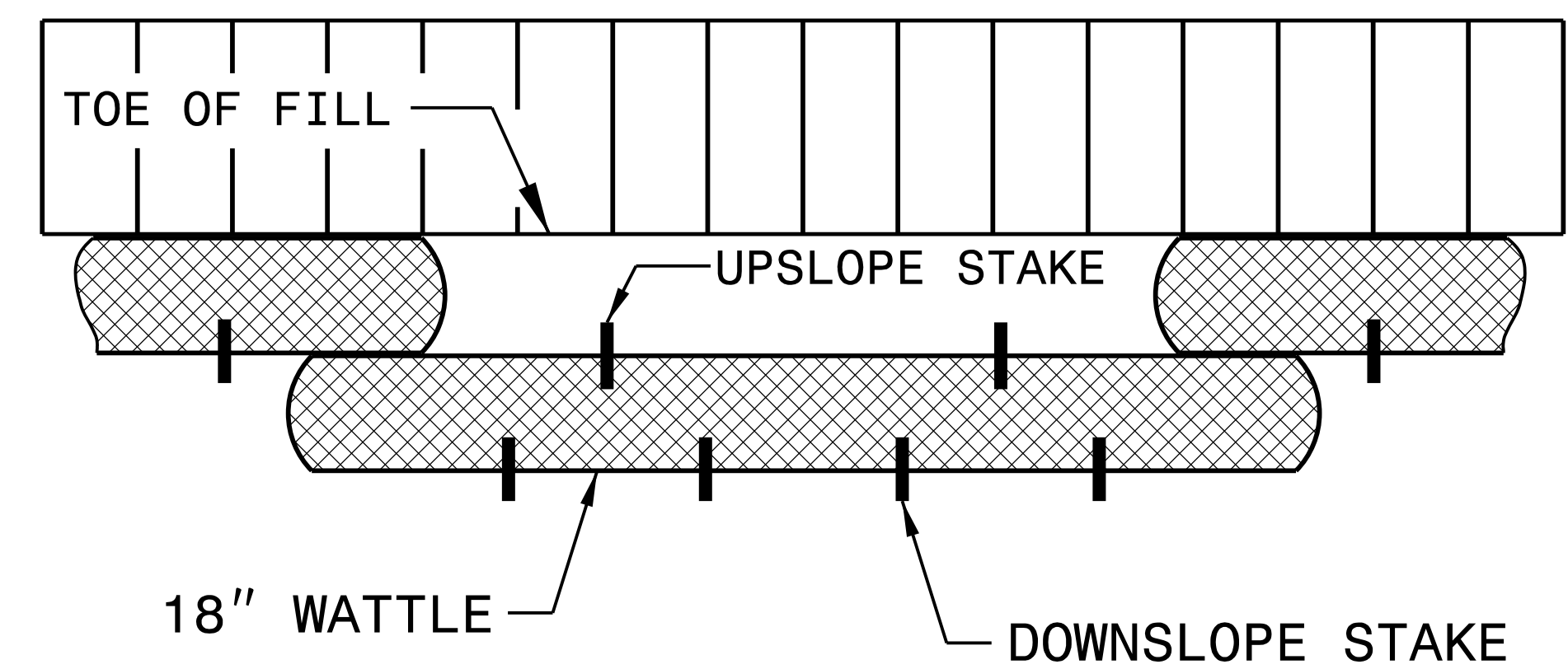
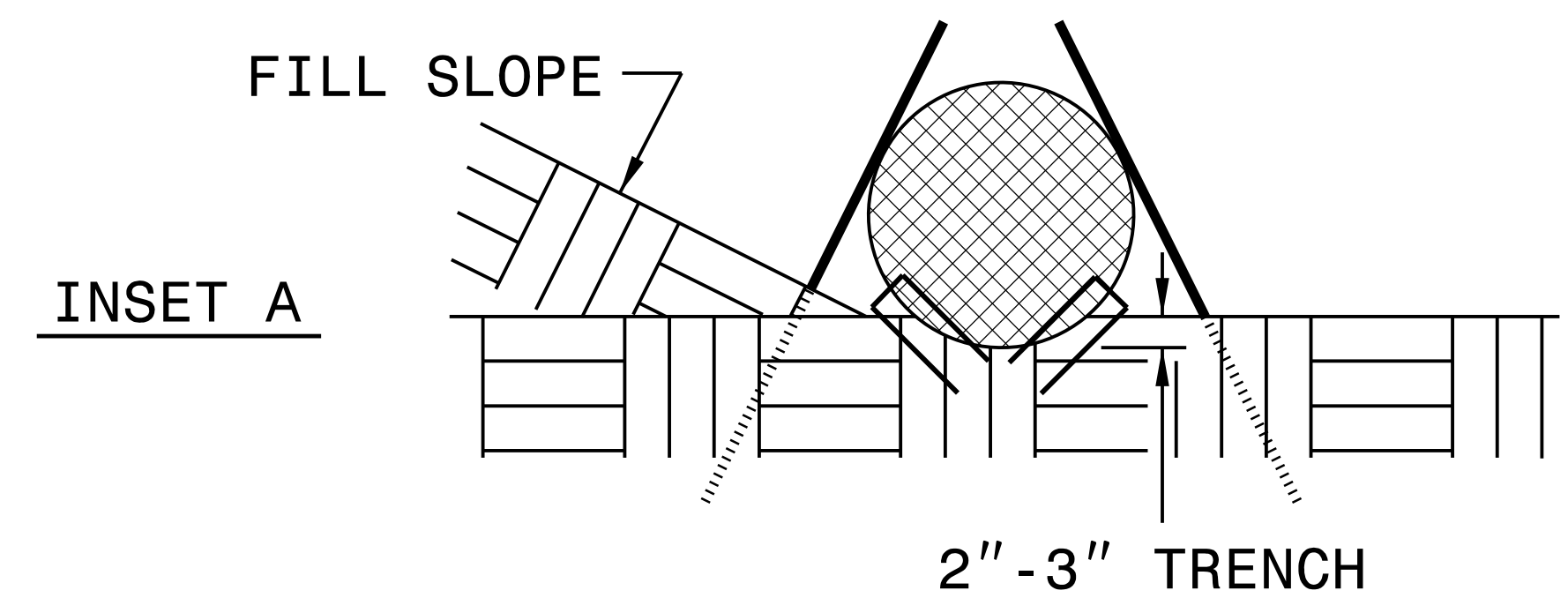
ISOMETRIC VIEW



FRONT VIEW

NOTES:

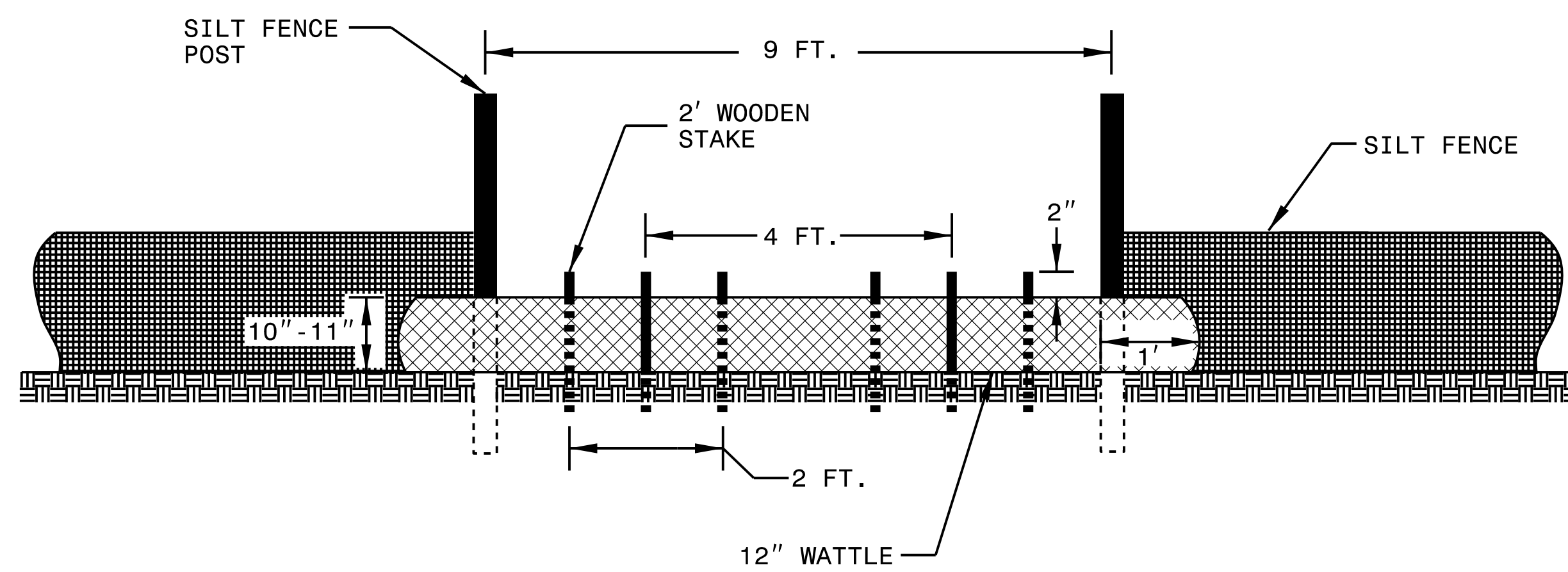
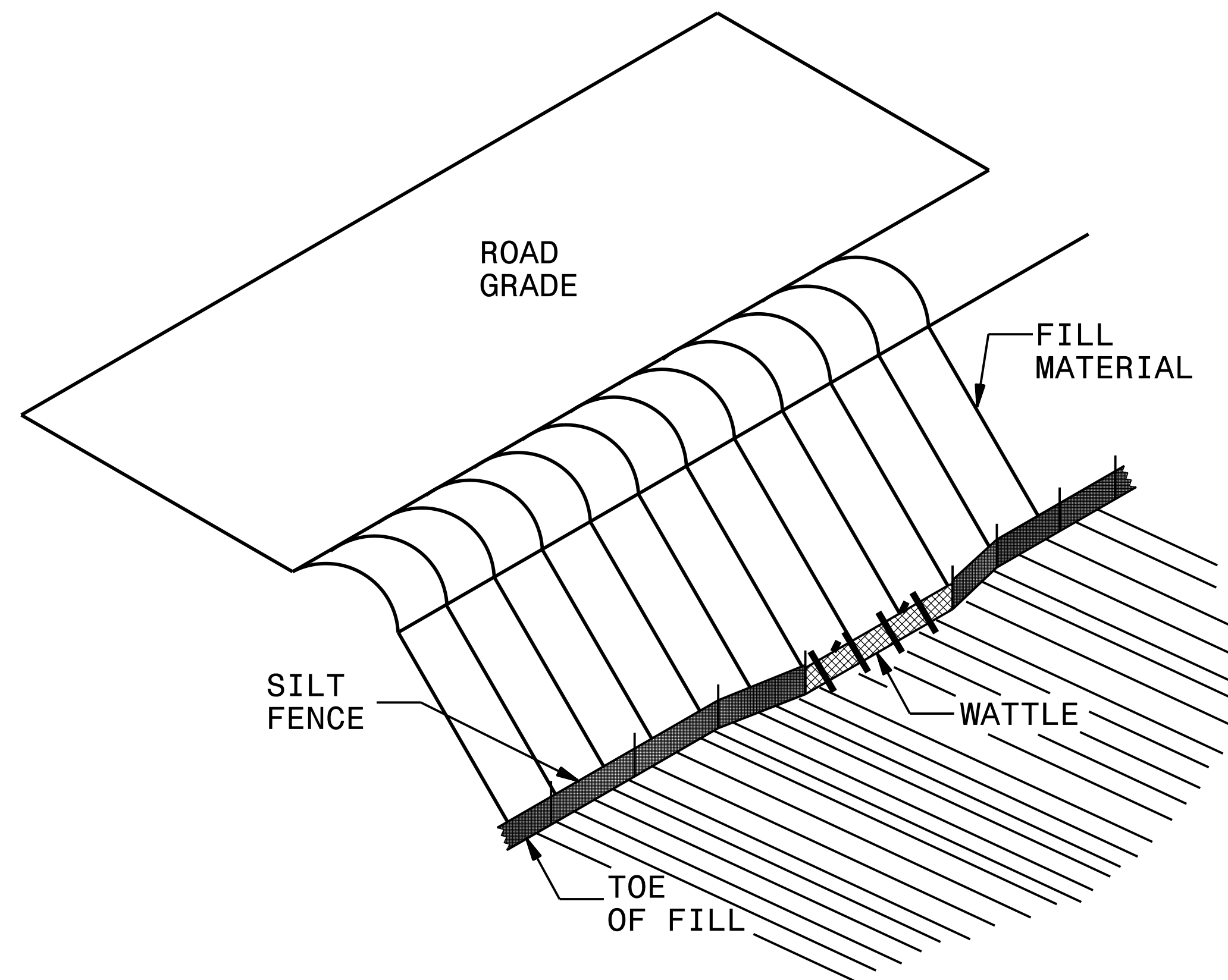
- USE MINIMUM 18 IN. NOMINAL DIAMETER COIR FIBER (COCONUT) WATTLE AND LENGTH OF 10 FT.
- EXCAVATE A 2 TO 3 INCH TRENCH FOR WATTLE TO BE PLACED.
- DO NOT PLACE WATTLES ON TOE OF SLOPE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.
- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- FOR BREAKS ALONG LARGE SLOPES, USE MAXIMUM SPACING OF 25 FT.



TOP VIEW

SILT FENCE COIR FIBER WATTLE BREAK DETAIL

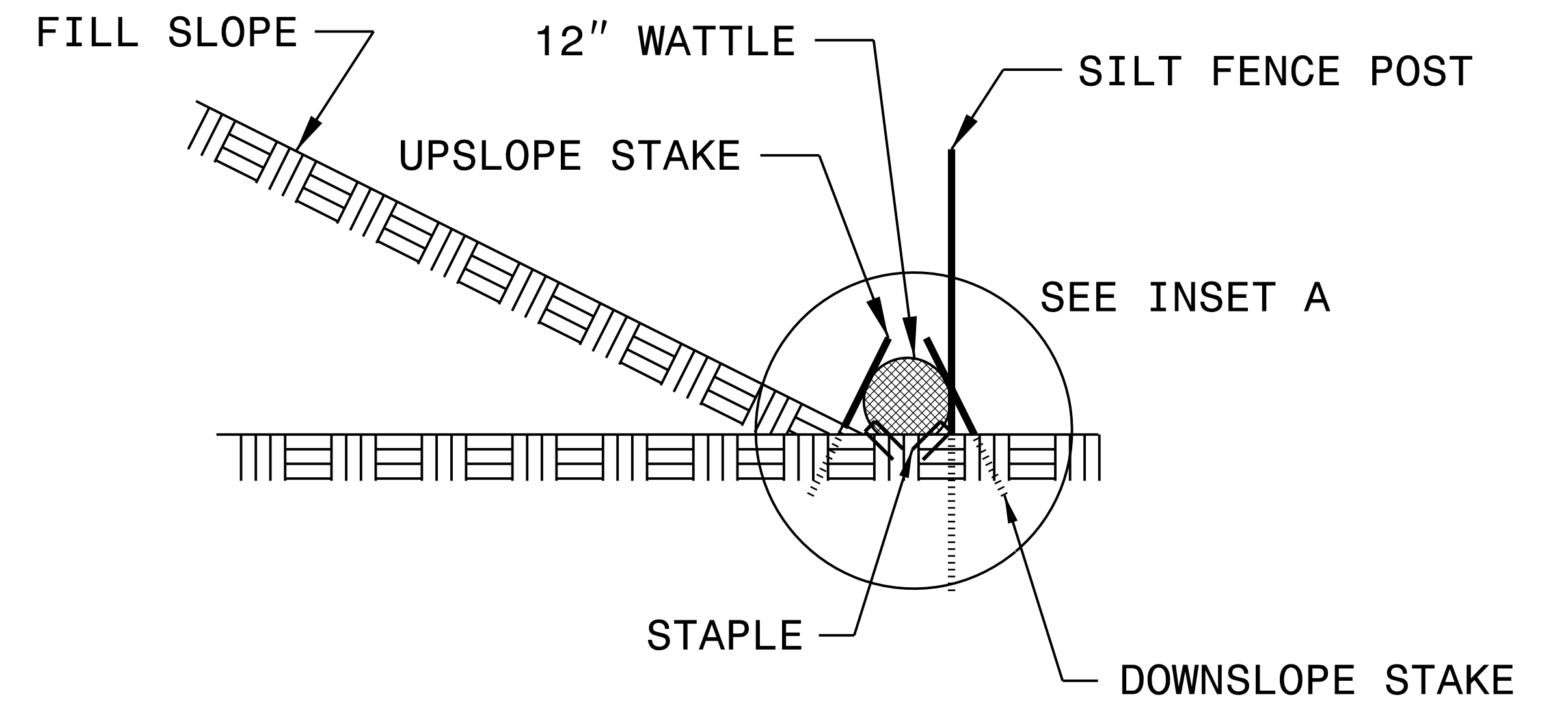
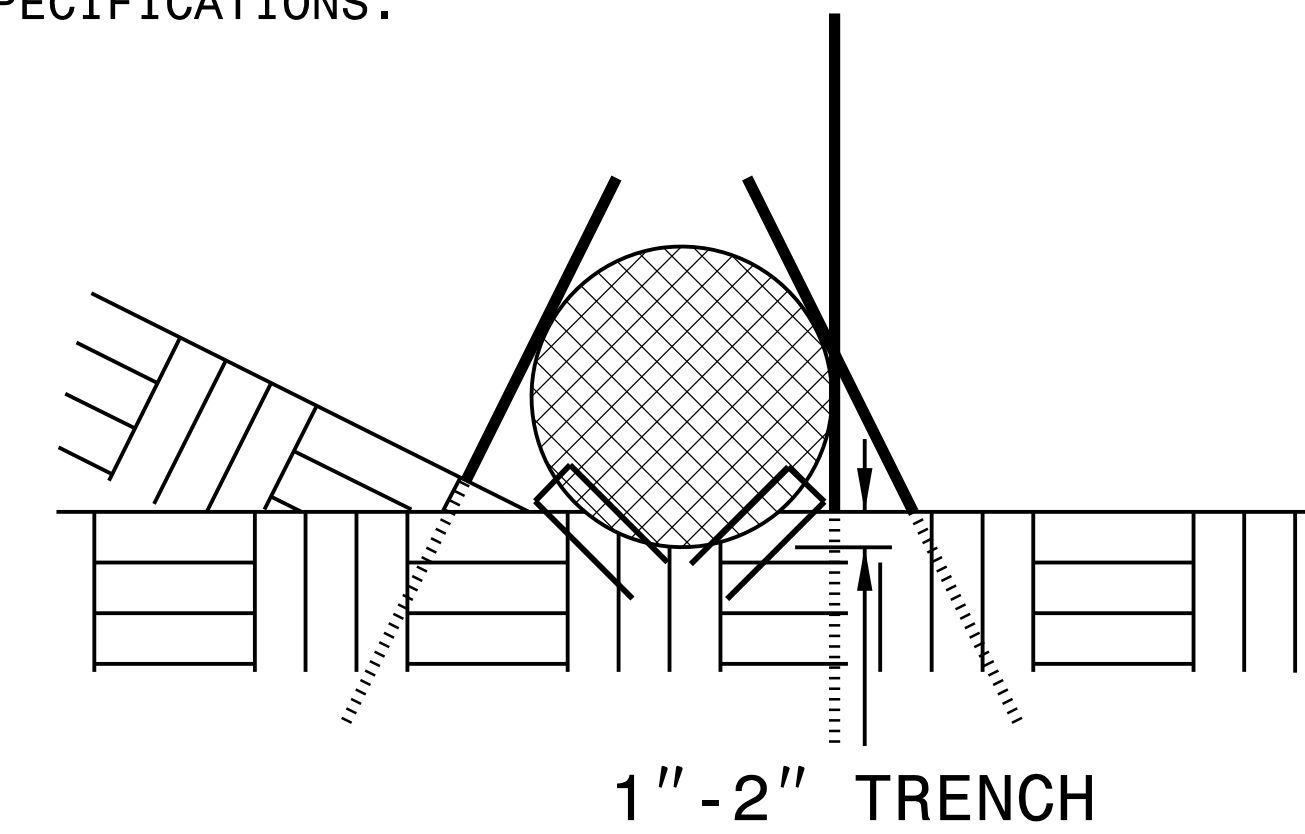
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| PROJECT REFERENCE NO. <i>B-4433</i> | SHEET NO. <i>EC-2B</i> |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |



NOTES:

- USE MINIMUM 12 IN. DIAMETER COIR FIBER (COCONUT FIBER) WATTLE AND LENGTH OF 10 FT.
- EXCAVATE A 1 TO 2 INCH TRENCH FOR WATTLE TO BE PLACED.
- DO NOT PLACE WATTLE ON TOE OF SLOPE.
- USE 2 FT. WOODEN STAKES WITH A 2 IN. BY 2 IN. NOMINAL CROSS SECTION.
- INSTALL A MINIMUM OF 2 UPSLOPE STAKES AND 4 DOWNSLOPE STAKES AT AN ANGLE TO WEDGE WATTLE TO GROUND.
- PROVIDE STAPLES MADE OF 0.125 IN. DIAMETER STEEL WIRE FORMED INTO A U SHAPE NOT LESS THAN 12" IN LENGTH.
- INSTALL STAPLES APPROXIMATELY EVERY 1 LINEAR FOOT ON BOTH SIDES OF WATTLE AND AT EACH END TO SECURE IT TO THE SOIL.
- WATTLE INSTALLATION CAN BE ON OUTSIDE OF THE SILT FENCE AS DIRECTED.
- INSTALL TEMPORARY SILT FENCE IN ACCORDANCE WITH SECTION 1605 OF THE STANDARD SPECIFICATIONS.

INSET A



DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

| | |
|--|--------------------------|
| PROJECT REFERENCE NO. <i>B-4433</i> | SHEET NO. <i>EC-3</i> |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

SOIL STABILIZATION TIMEFRAMES

| <i>SITE DESCRIPTION</i> | <i>STABILIZATION TIME</i> | <i>TIMEFRAME EXCEPTIONS</i> |
|--|---------------------------|--|
| PERIMETER DIKES, SWALES, DITCHES AND SLOPES | 7 DAYS | NONE |
| HIGH QUALITY WATER (HQW) ZONES | 7 DAYS | NONE |
| SLOPES STEEPER THAN 3:1 | 7 DAYS | IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN 2:1, 14 DAYS ARE ALLOWED. |
| SLOPES 3:1 OR FLATTER | 14 DAYS | 7 DAYS FOR SLOPES GREATER THAN 50' IN LENGTH. |
| ALL OTHER AREAS WITH SLOPES FLATTER THAN 4:1 | 14 DAYS | NONE, EXCEPT FOR PERIMETERS AND HQW ZONES. |

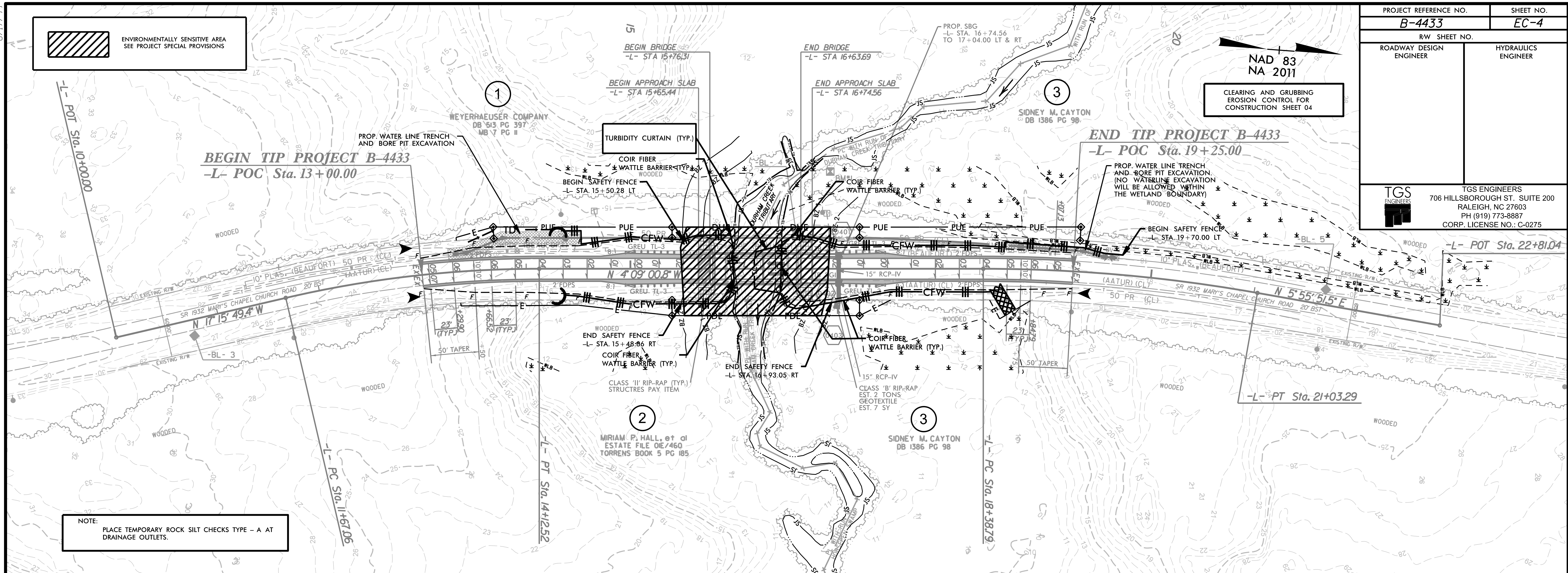
SOIL STABILIZATION SUMMARY SHEET

MATTING FOR EROSION CONTROL

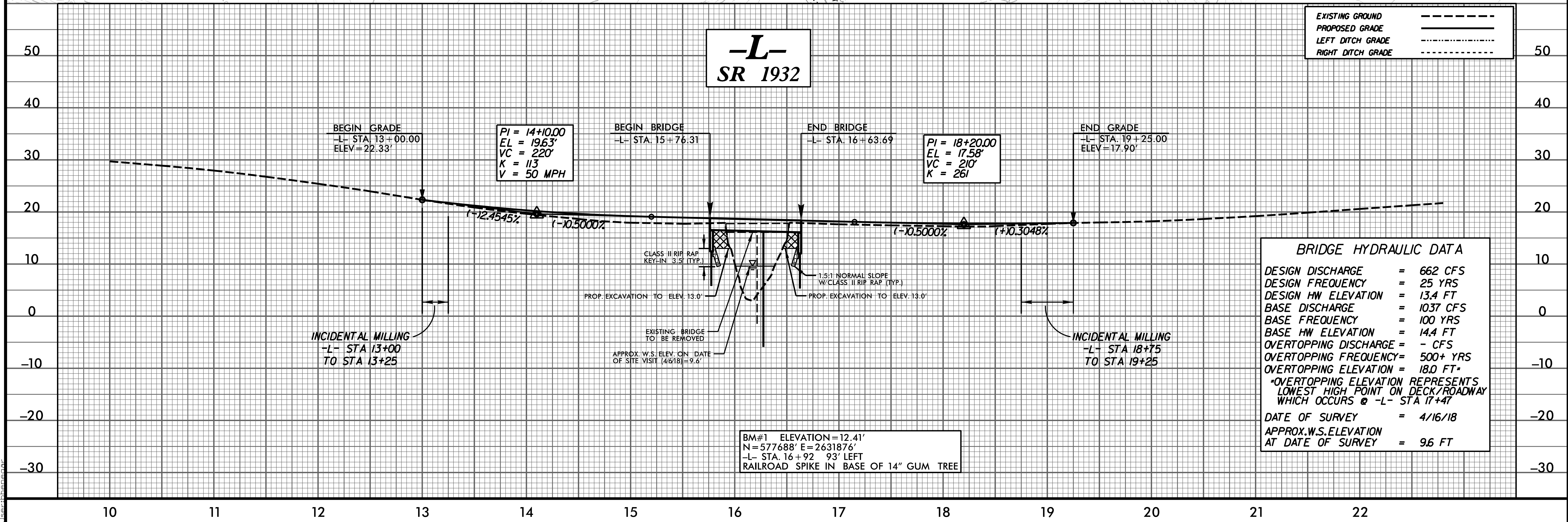
| <i>CONST SHEET NO.</i> | <i>LINE</i> | <i>FROM STATION</i> | <i>TO STATION</i> | <i>SIDE</i> | <i>ESTIMATE (SY)</i> |
|------------------------|--|---------------------|-------------------|-----------------|----------------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | <i>SUBTOTAL</i> | 0 |
| | <i>MISCELLANEOUS MATTING TO BE INSTALLED AS DIRECTED BY THE ENGINEER</i> | | | | 1,375 |
| | | | | <i>TOTAL</i> | 1,375 |
| | | | | <i>SAY</i> | 1,400 |

 ENVIRONMENTALLY SENSITIVE AREA
SEE PROJECT SPECIAL PROVISIONS

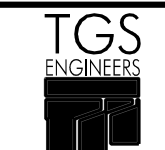
NAD 83
NA 2011
CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04



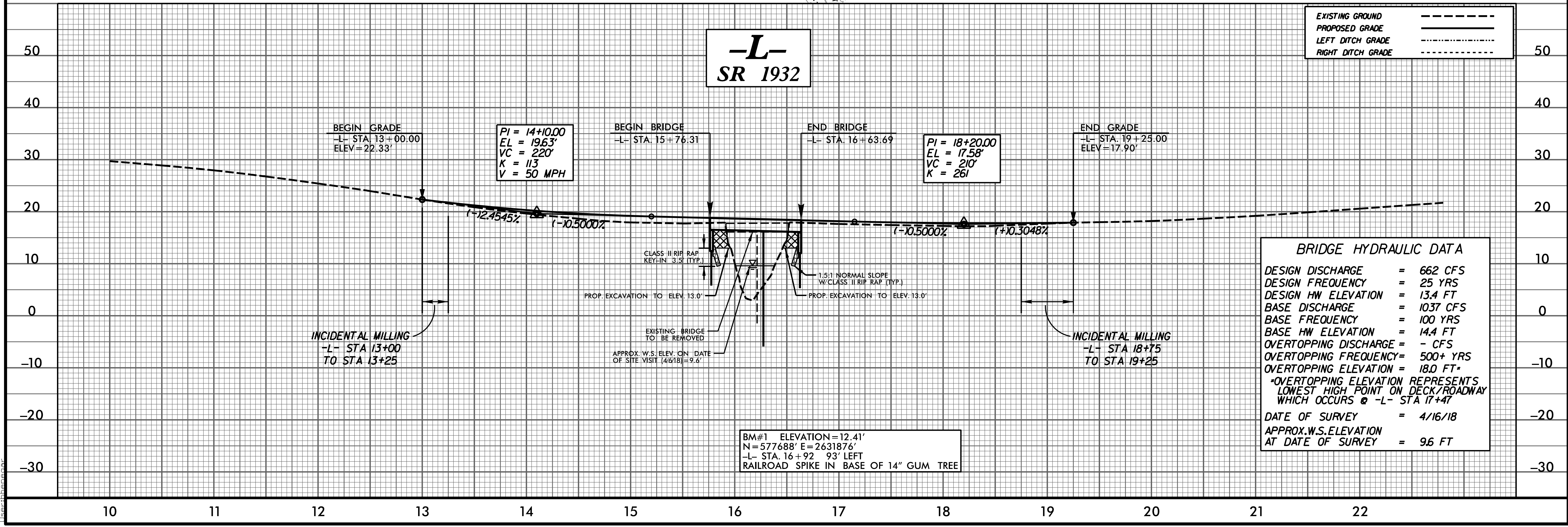
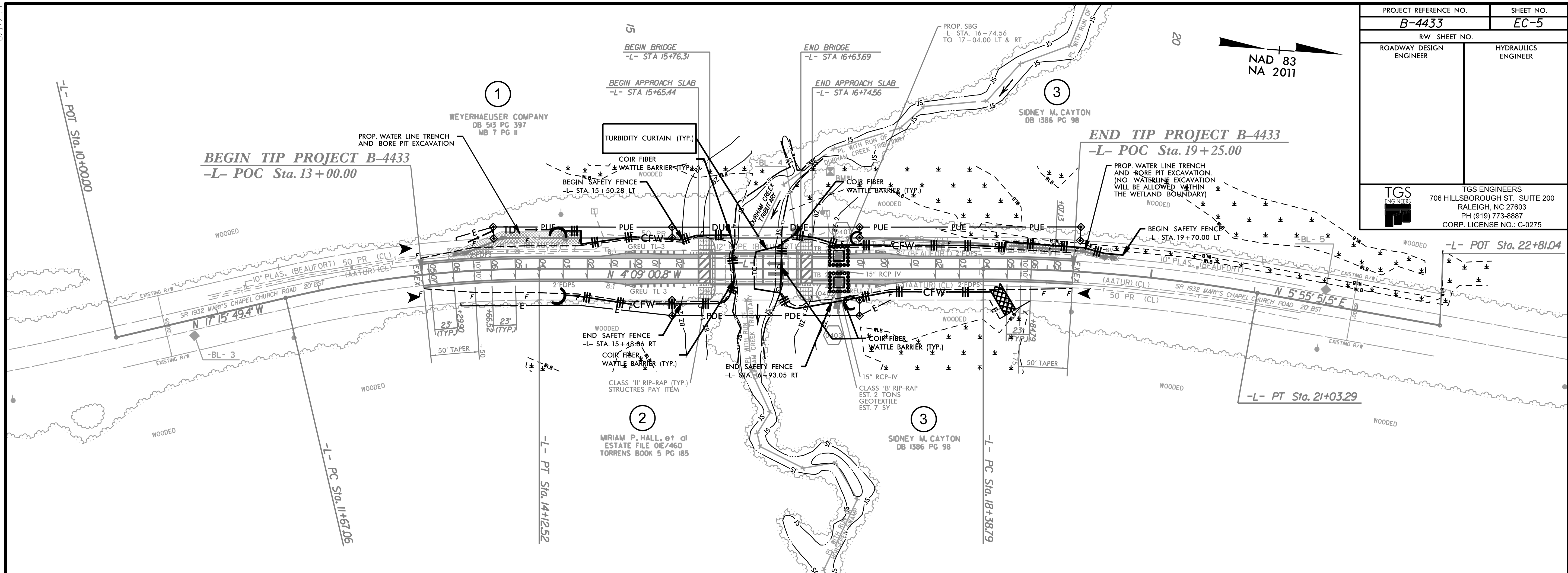
NOTE:
PLACE TEMPORARY ROCK SILT CHECKS TYPE - A AT DRAINAGE OUTLETS.



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| PROJECT REFERENCE NO. B-4433 | SHEET NO. EC-5 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
|  TGS ENGINEERS 706 HILLSBOROUGH ST., SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275 | |

NAD 83
NA 2011



8/17/19
 4/25/2018
 X:\Projects\B-4433\Environmental\Design\B-4433.ec.psh_04.dgn
 11:52:00 AM

SIDNEY M. CAYTON
 DB I386 PG 98

NAD 83
 NA 2011

LEGEND

- DENOTES MECHANIZED CLEARING
- ALLOWABLE IMPACTS ZONE 1
- ALLOWABLE IMPACTS ZONE 2

Q2

PERMANENT WETLAND IMPACTS = 0.0 Ac / 0 SF
 MECHANIZED CLEARING IN WETLANDS = 0.0 Ac / 0 SF
 PERMANENT STREAM IMPACTS = 0 LF
 TEMPORARY STREAM IMPACTS = 0 LF
 BUFFER ZONE 1 IMPACTS = 225 SF
 BUFFER ZONE 2 IMPACTS = 140 SF

Q1

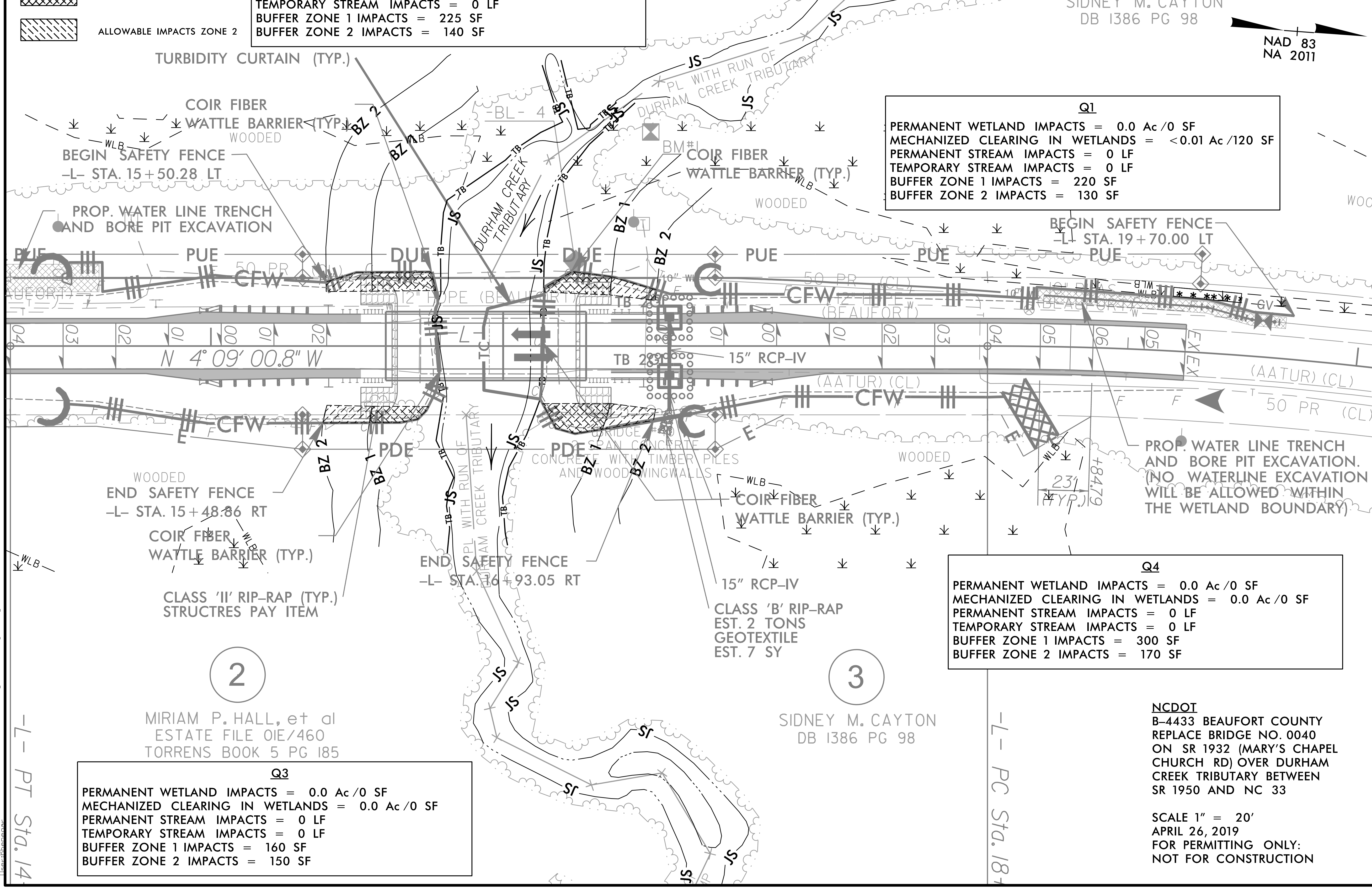
PERMANENT WETLAND IMPACTS = 0.0 Ac / 0 SF
 MECHANIZED CLEARING IN WETLANDS = <0.01 Ac / 120 SF
 PERMANENT STREAM IMPACTS = 0 LF
 TEMPORARY STREAM IMPACTS = 0 LF
 BUFFER ZONE 1 IMPACTS = 220 SF
 BUFFER ZONE 2 IMPACTS = 130 SF

Q4

PERMANENT WETLAND IMPACTS = 0.0 Ac / 0 SF
 MECHANIZED CLEARING IN WETLANDS = 0.0 Ac / 0 SF
 PERMANENT STREAM IMPACTS = 0 LF
 TEMPORARY STREAM IMPACTS = 0 LF
 BUFFER ZONE 1 IMPACTS = 300 SF
 BUFFER ZONE 2 IMPACTS = 170 SF

Q3

PERMANENT WETLAND IMPACTS = 0.0 Ac / 0 SF
 MECHANIZED CLEARING IN WETLANDS = 0.0 Ac / 0 SF
 PERMANENT STREAM IMPACTS = 0 LF
 TEMPORARY STREAM IMPACTS = 0 LF
 BUFFER ZONE 1 IMPACTS = 160 SF
 BUFFER ZONE 2 IMPACTS = 150 SF



MIRIAM P. HALL, et al
 ESTATE FILE OIE/460
 TORRENS BOOK 5 PG 185

SIDNEY M. CAYTON
 DB I386 PG 98

NCDOT
 B-4433 BEAUFORT COUNTY
 REPLACE BRIDGE NO. 0040
 ON SR 1932 (MARY'S CHAPEL
 CHURCH RD) OVER DURHAM
 CREEK TRIBUTARY BETWEEN
 SR 1950 AND NC 33

SCALE 1" = 20'
 APRIL 26, 2019
 FOR PERMITTING ONLY:
 NOT FOR CONSTRUCTION

5/14/2019 11:47:53 AM P:\PERMITS-Environmental\Drawings\B-4433_Hyd.P1.dgn

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TIP PROJECT: B-4433

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

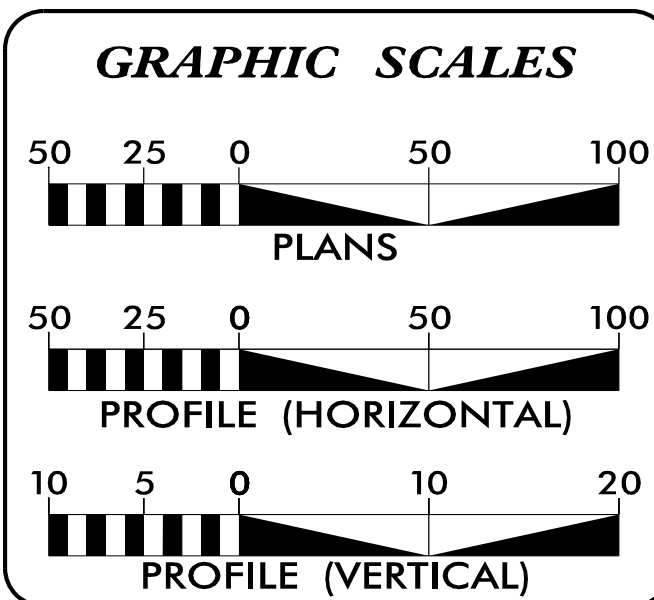
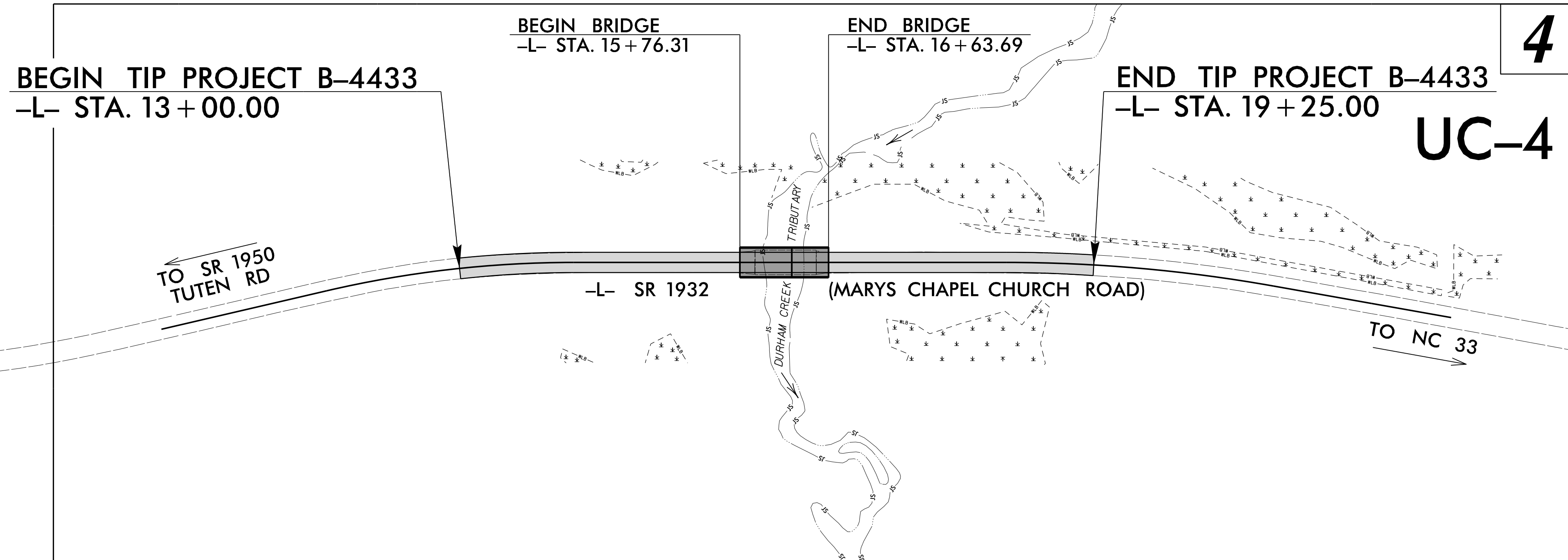
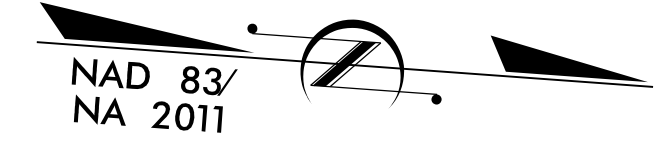
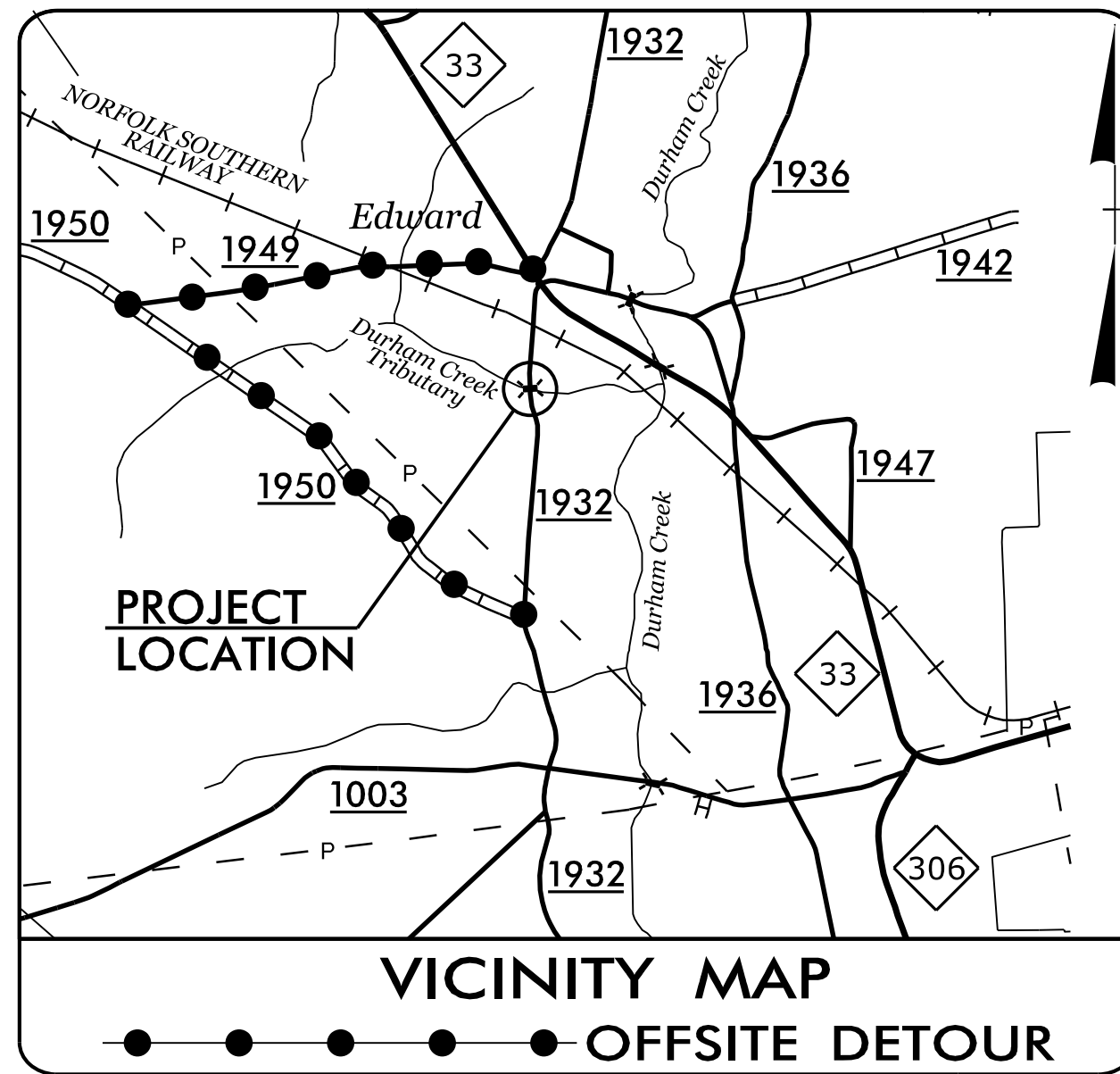
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| T.I.P. NO. | SHEET NO. |
| B-4433 | UC-1 |

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

2018 STANDARD SPECIFICATIONS

**UTILITY CONSTRUCTION PLANS
BEAUFORT COUNTY**

**LOCATION: REPLACE BRIDGE NO. 40 ON SR 1932
OVER DURHAM CREEK TRIBUTARY**
TYPE OF WORK: GRADING, DRAINAGE, PAVING, AND STRUCTURE



INDEX OF SHEETS

| SHEET NO. | DESCRIPTION |
|----------------|----------------------------|
| UC-1 | TITLE SHEET |
| UC-2 | UTILITY SYMBOLOGY |
| UC-3 | NOTES |
| UC-3A TO UC-3B | DETAILS |
| UC-4 | UTILITY CONSTRUCTION SHEET |

WATER AND SEWER OWNERS ON PROJECT

(A) WATER - BEAUFORT COUNTY

PREPARED IN THE OFFICE OF:

License No. C-2639
401 Harrison Oaks Blvd., Suite 145 Cary, NC 27513
Ph. (919) 653-0001

Clint L. Stevens, P.E. UTILITIES PROJECT MANAGER
Corey D. Bousquet, P.E. UTILITIES PROJECT ENGINEER
Jordan K. Chapman UTILITIES PROJECT DESIGNER

SEAL

4/18/2019

DIVISION OF HIGHWAYS UTILITIES UNIT
1555 MAIL SERVICES CENTER
RALEIGH NC 27699-1555
PHONE (919) 707-6690
FAX (919) 250-4151

Preston Hunter, P.E. DIVISION CONTACT #1
Cadmus Capehart, P.E. DIVISION CONTACT #2
Sarah Lentine, P.E. DIVISION CONTACT #3
David Kramer DIVISION CONTACT #4

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS



UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

| | |
|---------------------------------------|--------|
| Water Line (Sized as Shown) | |
| 11 1/4 Degree Bend | |
| 22 1/2 Degree Bend | |
| 45 Degree Bend | |
| 90 Degree Bend | |
| Plug | |
| Tee | |
| Cross | |
| Reducer | |
| Gate Valve | |
| Butterfly Valve | |
| Tapping Valve | |
| Line Stop | |
| Line Stop with Bypass | |
| Blow Off | |
| Fire Hydrant | |
| Relocate Fire Hydrant | |
| Remove Fire Hydrant | REM FH |
| Water Meter | |
| Relocate Water Meter | |
| Remove Water Meter | REM WM |
| Water Pump Station | |
| RPZ Backflow Preventer | |
| DCV Backflow Preventer | |
| Relocate RPZ Backflow Preventer | |
| Relocate DCV Backflow Preventer | |

PROPOSED SEWER SYMBOLS

| | |
|--|--|
| Gravity Sewer Line (Sized as Shown) | |
| Force Main Sewer Line (Sized as Shown) | |
| Manhole (Sized per Note) | |
| Sewer Pump Station | |

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

| | |
|--|--|
| Power Pole | |
| Telephone Pole | |
| Joint Use Pole | |
| Telephone Pedestal | |
| Utility Line by Others (Type as Shown) | |
| Trenchless Installation | |
| Encasement by Open Cut | |
| Encasement | |

| | |
|-------------------------|--|
| Thrust Block | |
| Air Release Valve | |
| Utility Vault | |
| Concrete Pier | |
| Steel Pier | |
| Plan Note | |
| Pay Item Note | |

NOTE
PAY ITEM


EXISTING UTILITIES SYMBOLS

| | | | |
|--|--------|---|--|
| Power Pole | | *Underground Power Line | |
| Telephone Pole | | *Underground Telephone Cable | |
| Joint Use Pole | | *Underground Telephone Conduit | |
| Utility Pole | | *Underground Fiber Optics Telephone Cable | |
| Utility Pole with Base | | *Underground TV Cable | |
| H-Frame Pole | | *Underground Fiber Optics TV Cable | |
| Power Transmission Line Tower | | *Underground Gas Pipeline | |
| Water Manhole | | Aboveground Gas Pipeline | |
| Power Manhole | | *Underground Water Line | |
| Telephone Manhole | | Aboveground Water Line | |
| Sanitary Sewer Manhole | | *Underground Gravity Sanitary Sewer Line | |
| Hand Hole for Cable | | Aboveground Gravity Sanitary Sewer Line | |
| Power Transformer | | *Underground SS Forced Main Line | |
| Telephone Pedestal | | Underground Unknown Utility Line | |
| CATV Pedestal | | SUE Test Hole | |
| Gas Valve | | Water Meter | |
| Gas Meter | | Water Valve | |
| Located Miscellaneous Utility Object | | Fire Hydrant | |
| Abandoned According to Utility Records | AATUR | Sanitary Sewer Cleanout | |
| End of Information | E.O.I. | | |

*For Existing Utilities
Utility Line Drawn from Record (Type as Shown)
Designated Utility Line (Type as Shown)

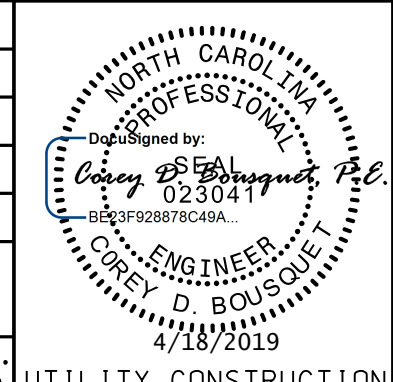
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UTILITY CONSTRUCTION



7520 E. Independence Blvd., Suite 230 Charlotte, NC 28227
License No. C-2639

**DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED**

| | |
|---|--|
| PROJECT REFERENCE NO. B-4433 | SHEET NO. UC-3 |
| DESIGNED BY: JKC |  |
| DRAWN BY: JKC | |
| CHECKED BY: RBW | |
| APPROVED BY: CDB | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | |

GENERAL NOTES:

1. THE PROPOSED UTILITY CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE NC DEPARTMENT OF TRANSPORTATION'S "STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES" DATED JANUARY 2018.
2. THE EXISTING UTILITIES BELONG TO BEAUFORT COUNTY. THE CONTACT FOR THE COUNTY IS:

ERICK JENNINGS
WATER SYSTEMS MANAGER
PH: 252-975-0720
3. ALL WATER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY, DIVISION OF WATER RESOURCES, PUBLIC WATER SUPPLY SECTION. ALL SEWER LINES TO BE INSTALLED WITHIN COMPLIANCE OF THE RULES AND REGULATIONS OF THE NORTH CAROLINA DEPARTMENT OF ENVIRONMENT QUALITY, DIVISION OF WATER RESOURCES, WATER QUALITY SECTION. PERFORM ALL WORK IN ACCORDANCE WITH THE APPLICABLE PLUMBING CODES.
4. THE UTILITY OWNER OWNS THE EXISTING UTILITY FACILITIES AND WILL OWN THE NEW UTILITY FACILITIES AFTER ACCEPTANCE BY THE DEPARTMENT. THE DEPARTMENT OWNS THE CONSTRUCTION CONTRACT AND HAS ADMINISTRATIVE AUTHORITY. COMMUNICATIONS AND DECISIONS BETWEEN THE CONTRACTOR AND UTILITY OWNER ARE NOT BINDING UPON THE DEPARTMENT OR THIS CONTRACT UNLESS AUTHORIZED BY THE ENGINEER. AGREEMENTS BETWEEN THE UTILITY OWNER AND CONTRACTOR FOR THE WORK THAT IS NOT PART OF THIS CONTRACT OR IS SECONDARY TO THIS CONTRACT ARE ALLOWED, BUT ARE NOT BINDING UPON THE DEPARTMENT.
5. PROVIDE ACCESS FOR THE DEPARTMENT PERSONNEL AND THE OWNER'S REPRESENTATIVES TO ALL PHASES OF CONSTRUCTION. NOTIFY DEPARTMENT PERSONNEL AND THE UTILITY OWNER TWO WEEKS PRIOR TO COMMENCEMENT OF ANY WORK AND ONE WEEK PRIOR TO SERVICE INTERRUPTION. KEEP UTILITY OWNERS' REPRESENTATIVES INFORMED OF WORK PROGRESS AND PROVIDE OPPORTUNITY FOR INSPECTION OF CONSTRUCTION AND TESTING.

6. THE PLANS DEPICT THE BEST AVAILABLE INFORMATION FOR THE LOCATION, SIZE, AND TYPE OF MATERIAL FOR ALL EXISTING UTILITIES. MAKE INVESTIGATIONS FOR DETERMINING THE EXACT LOCATION, SIZE, AND TYPE MATERIAL OF THE EXISTING FACILITIES AS NECESSARY FOR THE CONSTRUCTION OF THE PROPOSED UTILITIES AND FOR AVOIDING DAMAGE TO EXISTING FACILITIES. REPAIR ANY DAMAGE INCURRED TO EXISTING FACILITIES TO THE ORIGINAL OR BETTER CONDITION AT NO ADDITIONAL COST TO THE DEPARTMENT.
7. MAKE FINAL CONNECTIONS OF THE NEW WORK TO THE EXISTING SYSTEM WHERE INDICATED ON THE PLANS, AS REQUIRED TO FIT THE ACTUAL CONDITIONS, OR AS DIRECTED.
8. MAKE CONNECTIONS BETWEEN EXISTING AND PROPOSED UTILITIES AT TIMES MOST CONVENIENT TO THE PUBLIC, WITHOUT ENDANGERING THE UTILITY SERVICE, AND IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS. MAKE CONNECTIONS ON WEEKENDS, AT NIGHT, AND ON HOLIDAYS IF NECESSARY.
9. ALL UTILITY MATERIALS SHALL BE APPROVED PRIOR TO DELIVERY TO THE PROJECT. SEE 1500-7, " SUBMITTALS AND RECORDS" IN SECTION 1500 OF THE STANDARD SPECIFICATIONS.

NOTES TO THE CONTRACTOR:

1. BEAUFORT COUNTY SHALL OPEN AND CLOSE ALL VALVES.
2. BEAUFORT COUNTY MUST BE PRESENT DURING THE BORE SETUP AND OPERATION, PRESSURE AND LEAKAGE TEST, CHLORINATION TEST, AND FLUSHING.
3. CERTIFIED BACTERIOLOGICAL AND CONTAMINANT TEST SHALL BE PERFORMED BY BEAUFORT COUNTY. IF THE SAMPLE FAILS RECHLORINATE THE WATER LINE AS STATED IN THE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
4. USE # 12 AWG SOLID-COPPER WIRE WITH BLUE INSULATION FOR TRACER WIRE. SEE TRACER WIRE DETAIL FOR LOCATION AND PLACEMENT ON SHEET UC-3A AND UC-3B. BEAUFORT COUNTY SHALL CONDUCT THE CONTINUITY TEST ONCE THE TRACER WIRES ARE INSTALLED.
5. PROVIDE TWO COPIES OF THE AS-BUILT PLANS FOR THE WATER LINE INSTALLED TO BEAUFORT COUNTY AND TWO COPIES TO ENGINEER.

THE AS-BUILT PLANS SHALL INCLUDE:
SIZE AND TYPE OF PIPE
BORE LOG FOR THE HDD
GPS LOCATION OF ALL FITTINGS AND VALVES
COORDINATES OF UTILITY CONTROLS
VERTICAL AND HORZITAL LOCATIONS OF THE PIPING
6. USE GRIPRING OR APPROVED EQUAL FOR RESTRAINING THE DI WATER PIPE AND FITTINGS
7. USE A MINIMUM 2" BLOWOFF TO FLUSH OUT THE PROPOSED WATER MAIN.

UTILITY CONSTRUCTION

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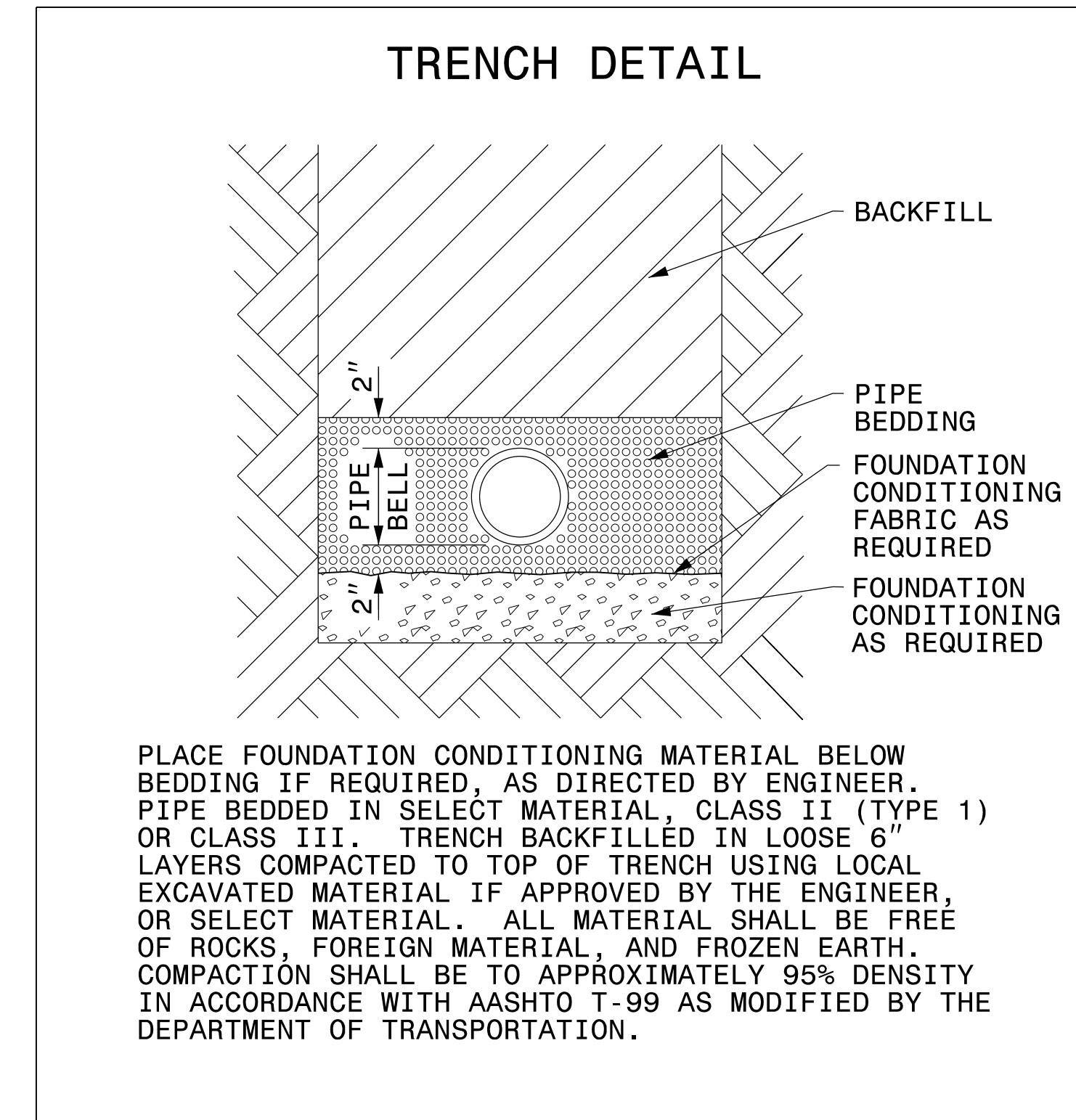


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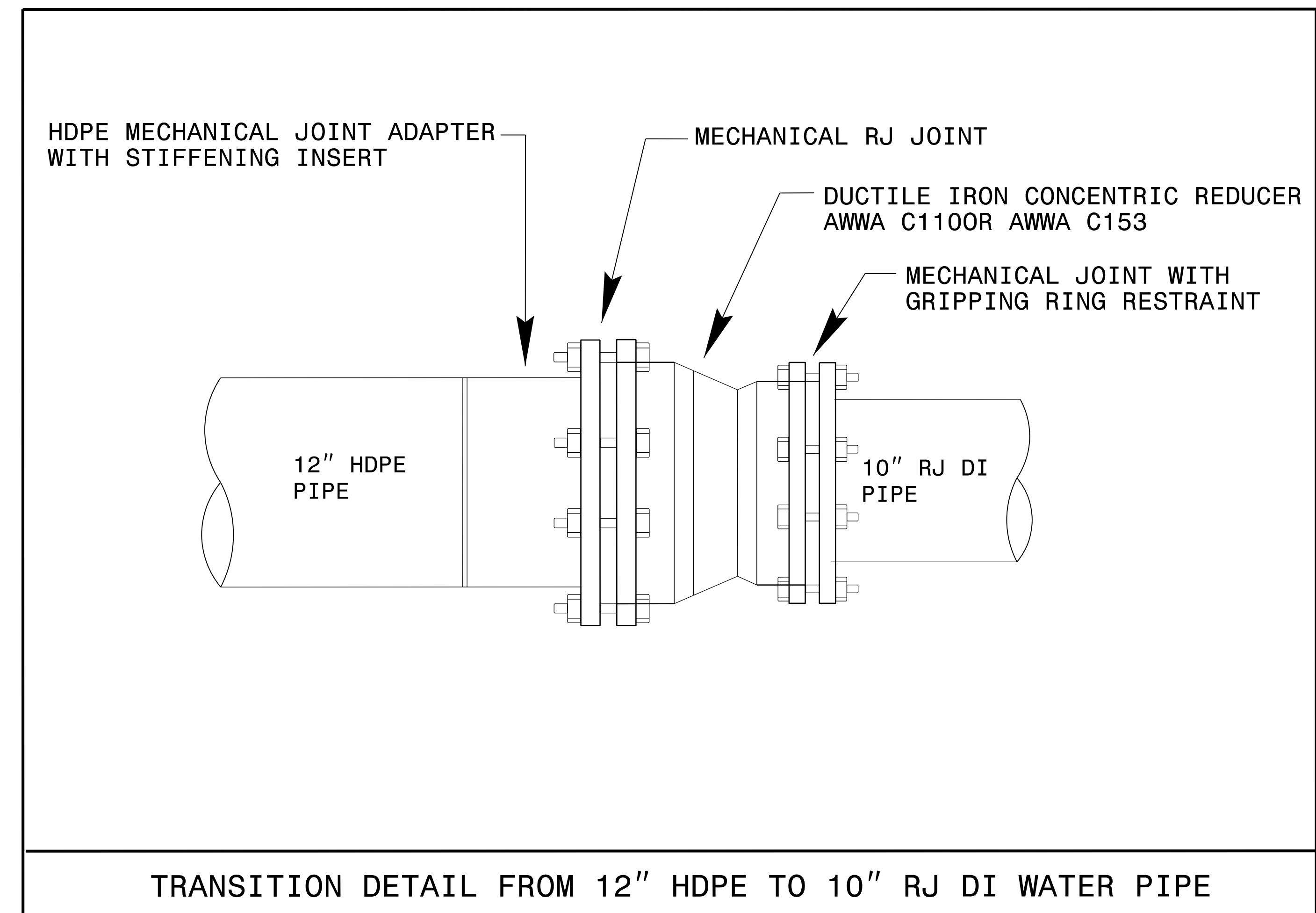
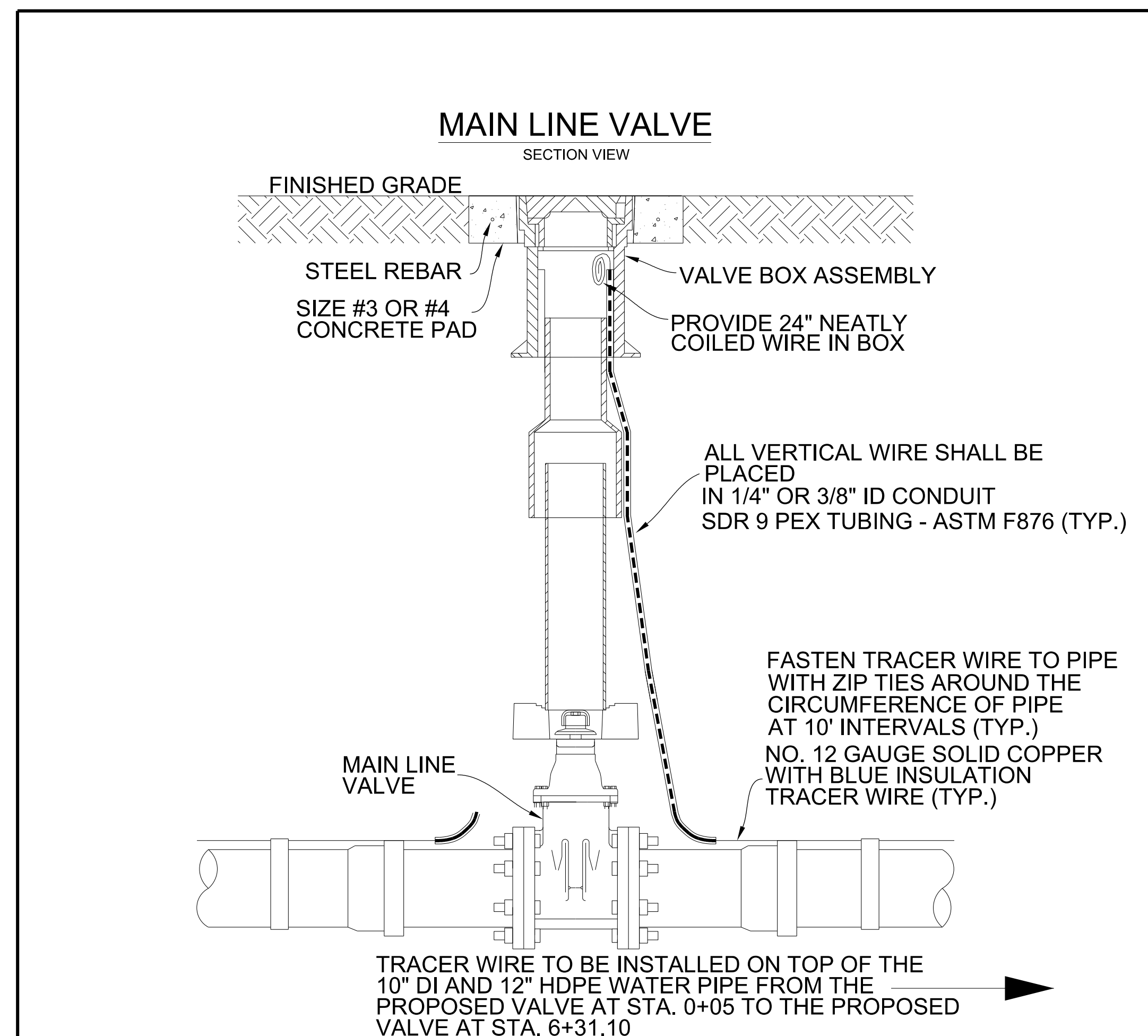
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| DESIGNED BY: JKC | |
| DRAWN BY: JKC | |
| CHECKED BY: RBW | |
| APPROVED BY: CDB | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| UTILITY CONSTRUCTION PLANS ONLY | |

PROJECT TYPICAL DETAILS

| NOMINAL PIPE SIZE (INCHES) | TRENCH WIDTH (INCHES) | NOMINAL PIPE SIZE (INCHES) | TRENCH WIDTH (INCHES) |
|----------------------------|-----------------------|----------------------------|-----------------------|
| 4 | 28 | 20 | 44 |
| 6 | 30 | 24 | 48 |
| 8 | 32 | 30 | 54 |
| 10 | 34 | 36 | 60 |
| 12 | 36 | 42 | 66 |
| 14 | 38 | 48 | 72 |
| 16 | 40 | 54 | 78 |
| 18 | 42 | | |



UTILITY CONSTRUCTION



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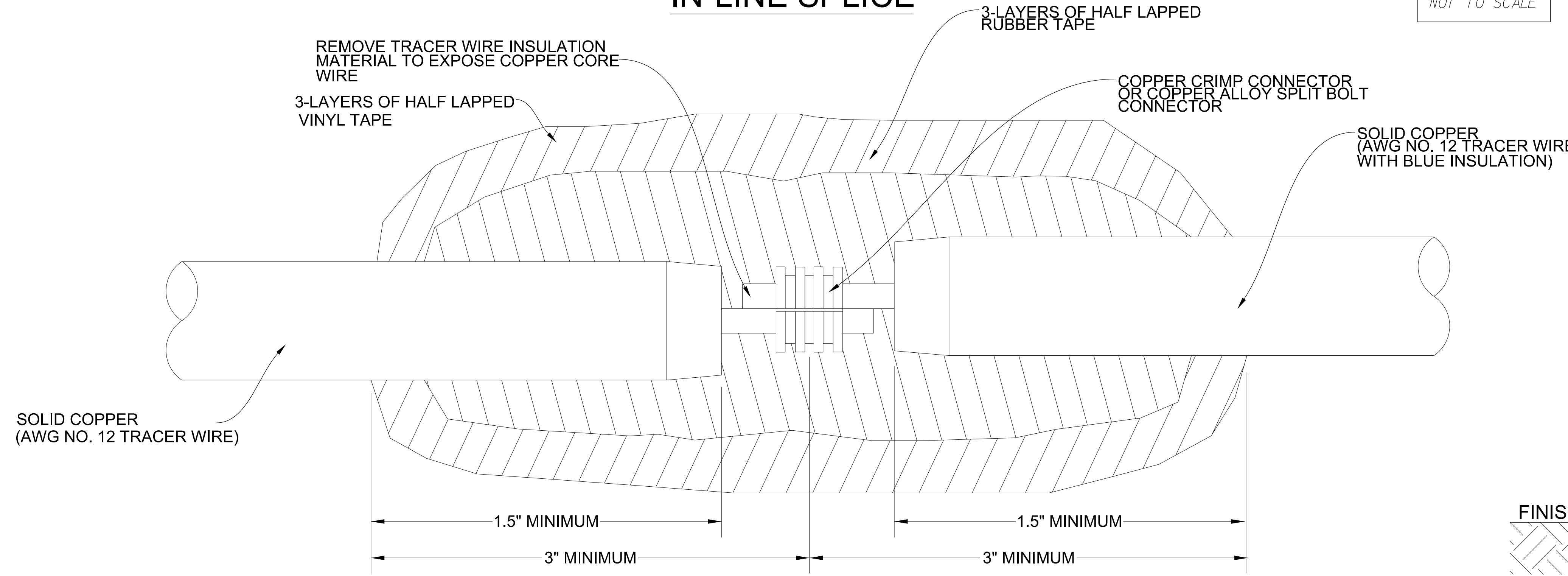
IN-LINE SPLICE

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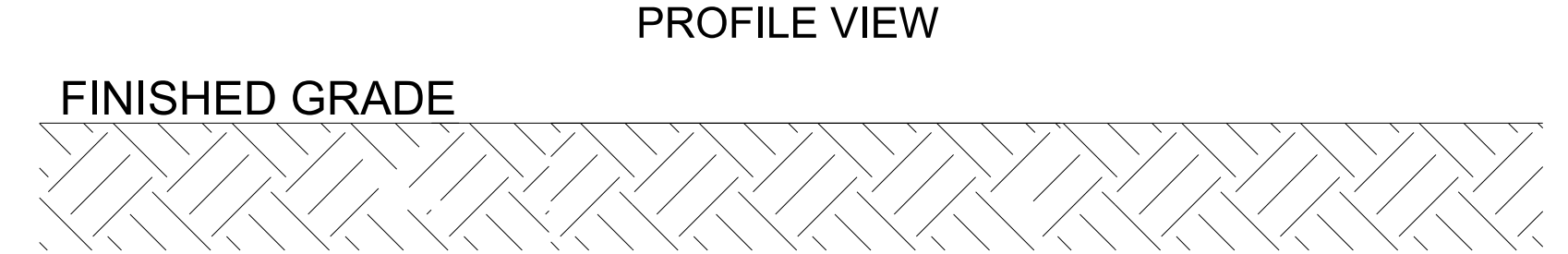
HINDE ENGINEERING
 License No. C-2639
 401 Harrison Oaks Blvd., Suite 145 Cary, NC 27513

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| | |
|---|---------------------------|
| PROJECT REFERENCE NO. B-4433 | SHEET NO. UC-3B |
| DESIGNED BY: JKC | |
| DRAWN BY: JKC | |
| CHECKED BY: RBW | |
| APPROVED BY: CDB | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| UTILITY CONSTRUCTION PLANS ONLY | |

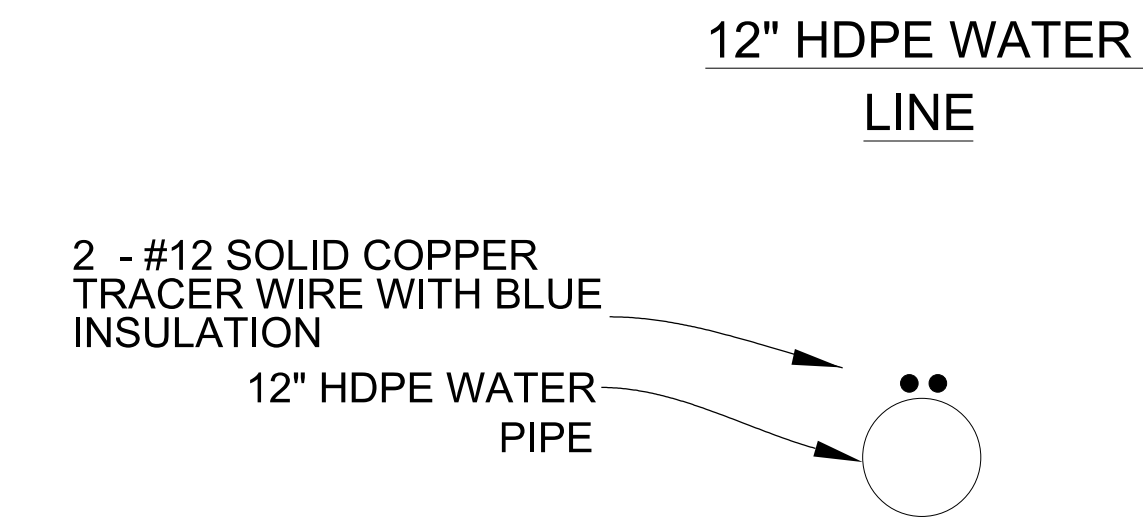


BORE DETAIL



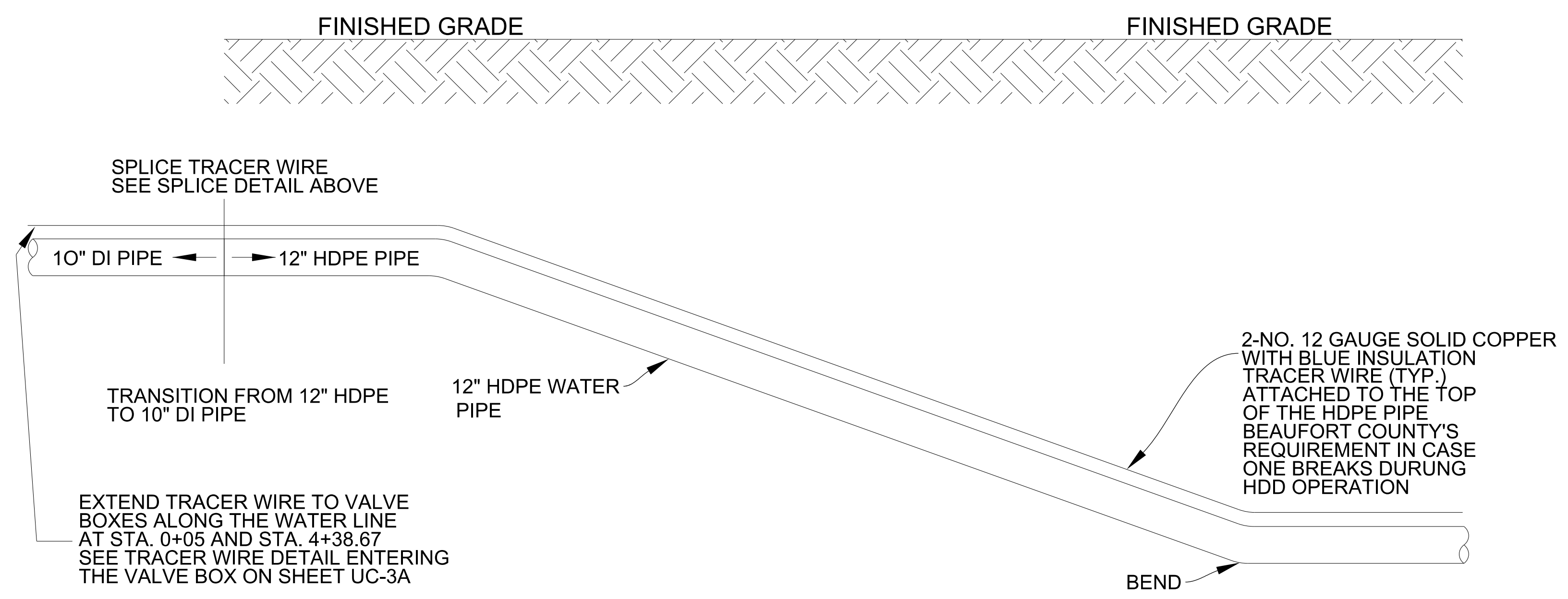
NOTES:

1. IN LINE SPLICES SHALL BE LIMITED TO THE GREATEST EXTENT POSSIBLE. TRACER WIRE SHALL BE AS CONTINUOUS AS POSSIBLE WITHOUT SPLICES.
2. INLINE SPLICES SHALL INCLUDE 3 FEET OF SLACK WIRE ON EACH SIDE OF EACH SPLICE.

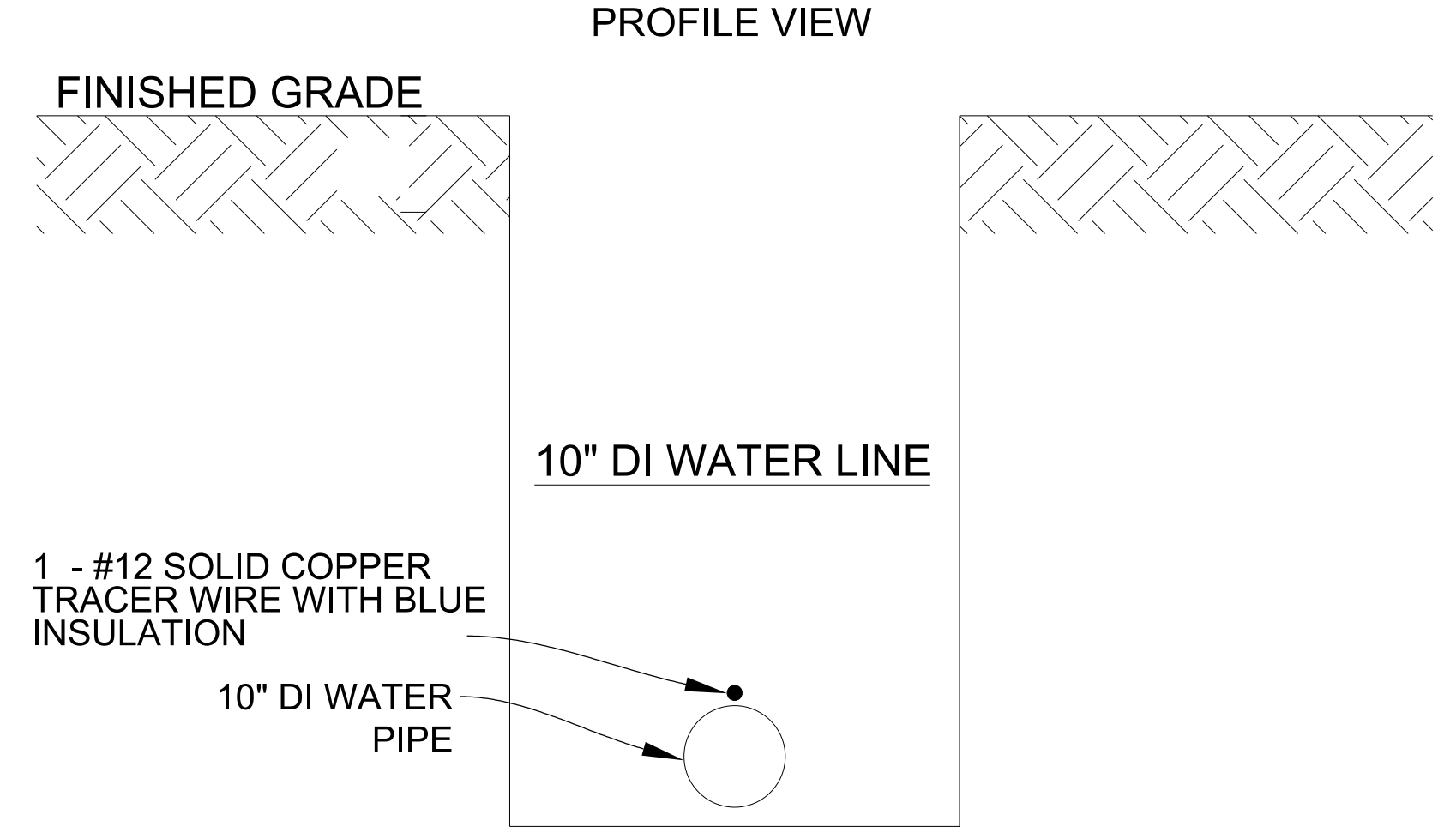


TRACER WIRE FOR WATER MAIN

SECTION VIEW



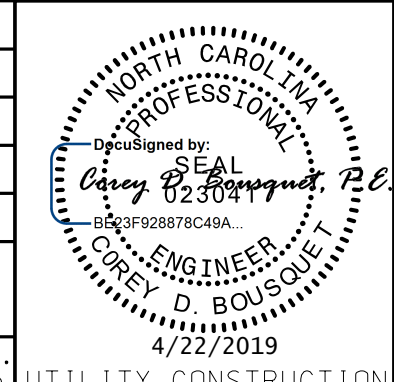
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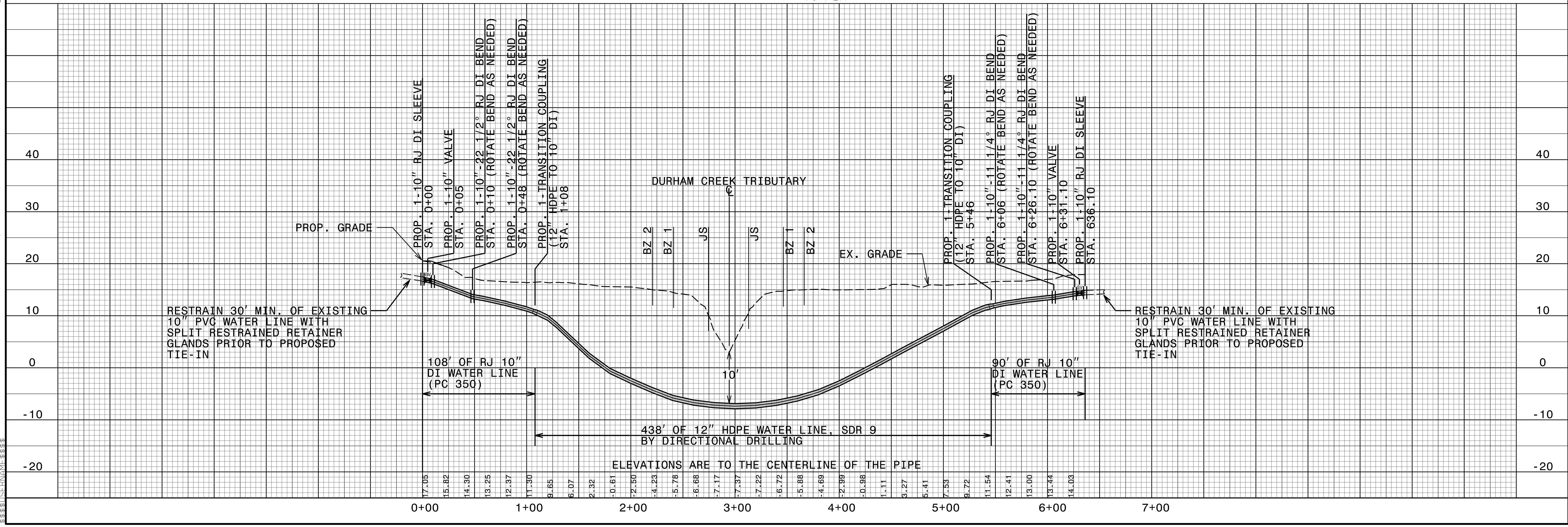
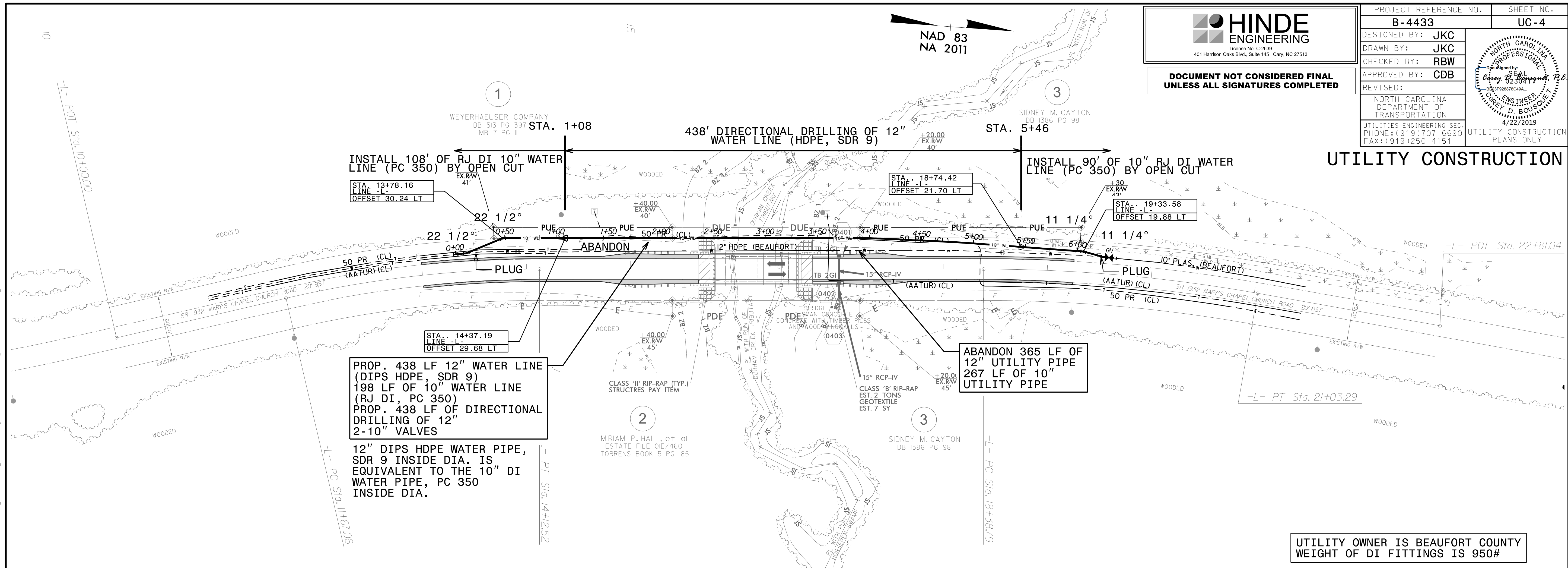


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 401 Harrison Oaks Blvd., Suite 145 Cary, NC 27513

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| DESIGNED BY: JKC |  |
| DRAWN BY: JKC | |
| CHECKED BY: RBW | |
| APPROVED BY: CDB | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| UTILITY CONSTRUCTION PLANS ONLY | |



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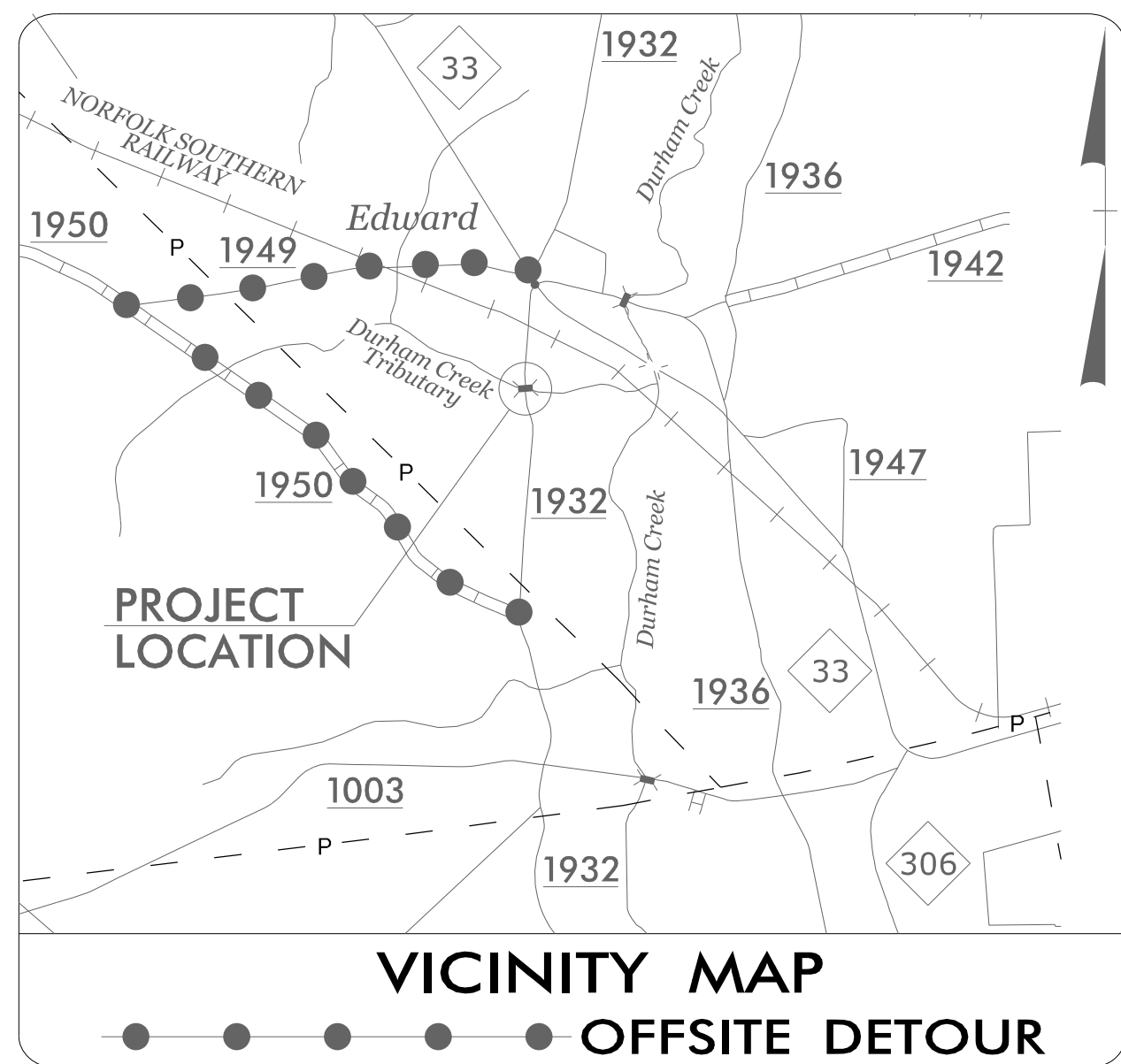
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TIP PROJECT: B-4433

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

| | |
|---------------|-------------|
| T.I.P. NO. | SHEET NO. |
| B-4433 | UO-1 |

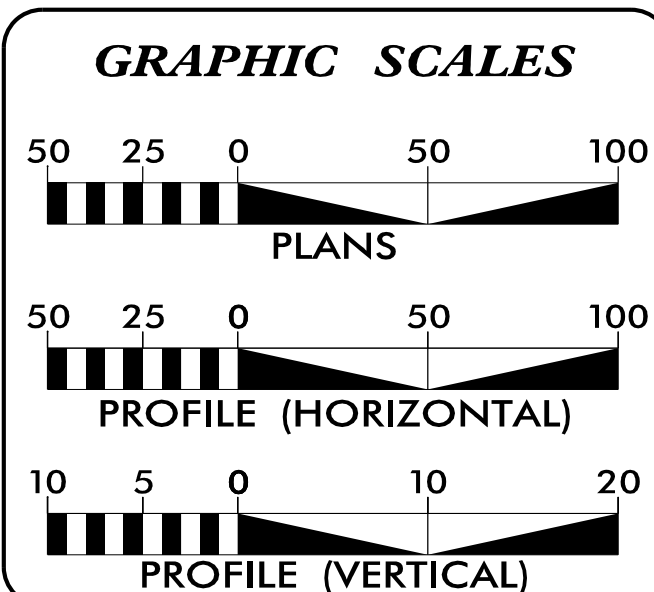
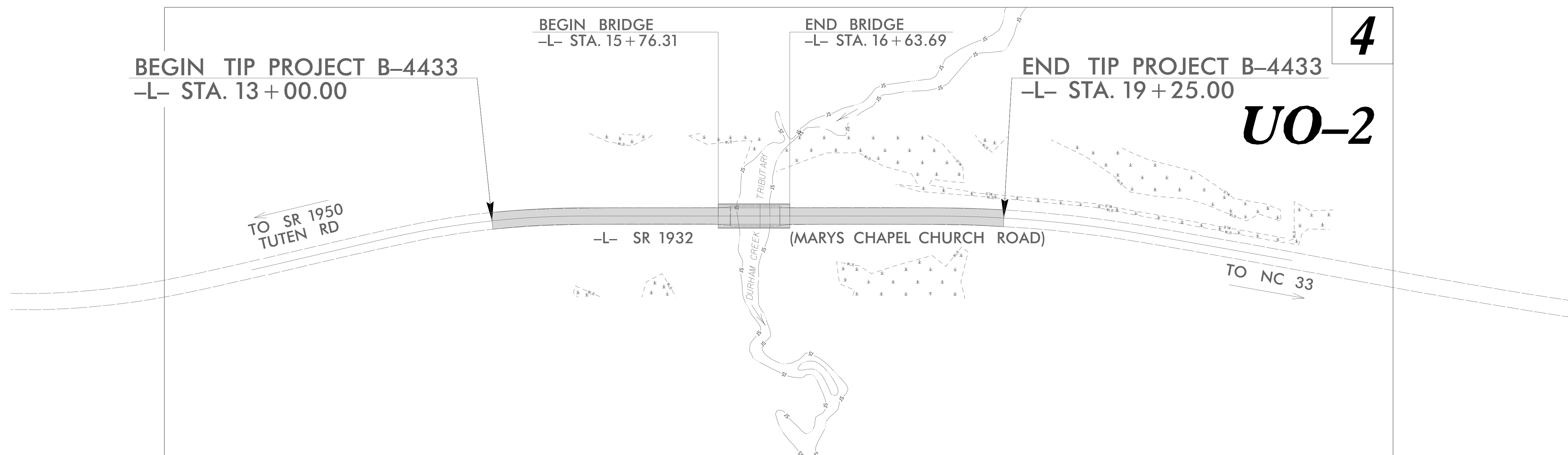
NOTE:
 ALL UTILITY WORK SHOWN ON THIS SHEET IS DONE BY OTHERS.
 NO PAYMENT WILL BE MADE TO THE CONTRACTOR FOR UTILITY WORK SHOWN ON THIS SHEET.



**UTILITIES BY OTHERS PLANS
BEAUFORT COUNTY**

**LOCATION: REPLACE BRIDGE NO. 40 ON SR 1932
OVER DURHAM CREEK TRIBUTARY**

TYPE OF WORK: POWER DISTRIBUTION & TELECOM



INDEX OF SHEETS

| SHEET NO. | DESCRIPTION |
|-----------|----------------|
| UO-1 | TITLE SHEET |
| UO-2 | UBO PLAN SHEET |

UTILITY OWNERS WITH CONFLICTS

(A) TELECOM - CENTURYLINK

PREPARED IN THE OFFICE OF:

License No. C-2639
 401 Harrison Oaks Blvd., Suite 145 Cary, NC 27513
 (919)-653-0001

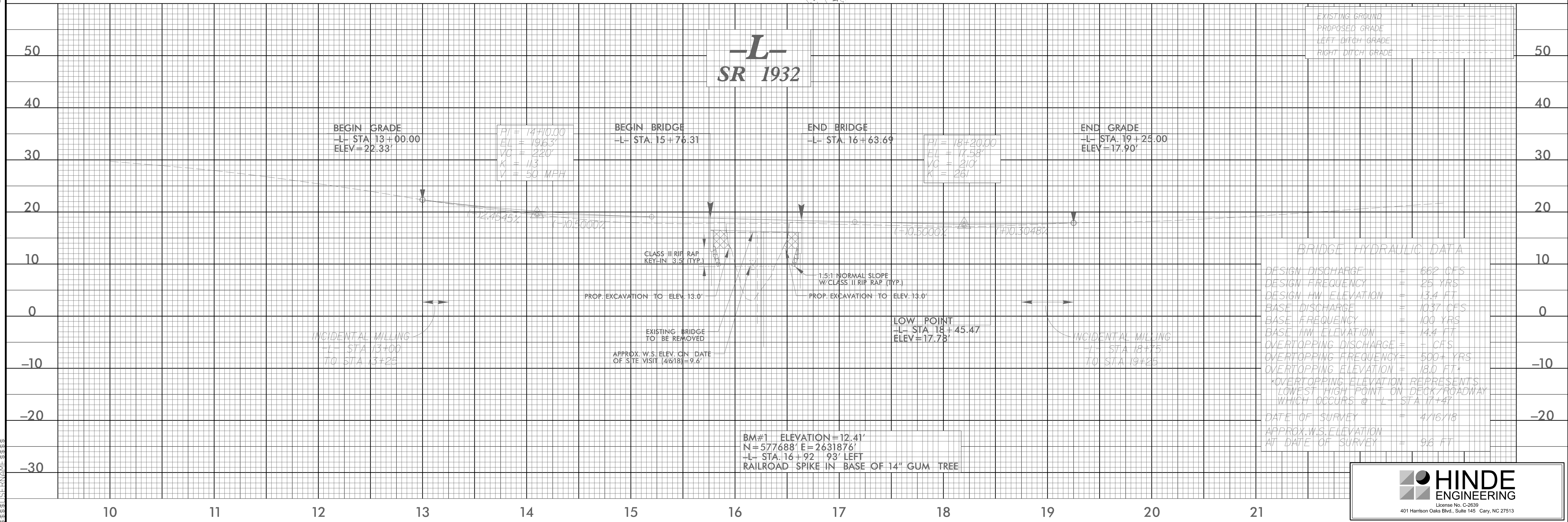
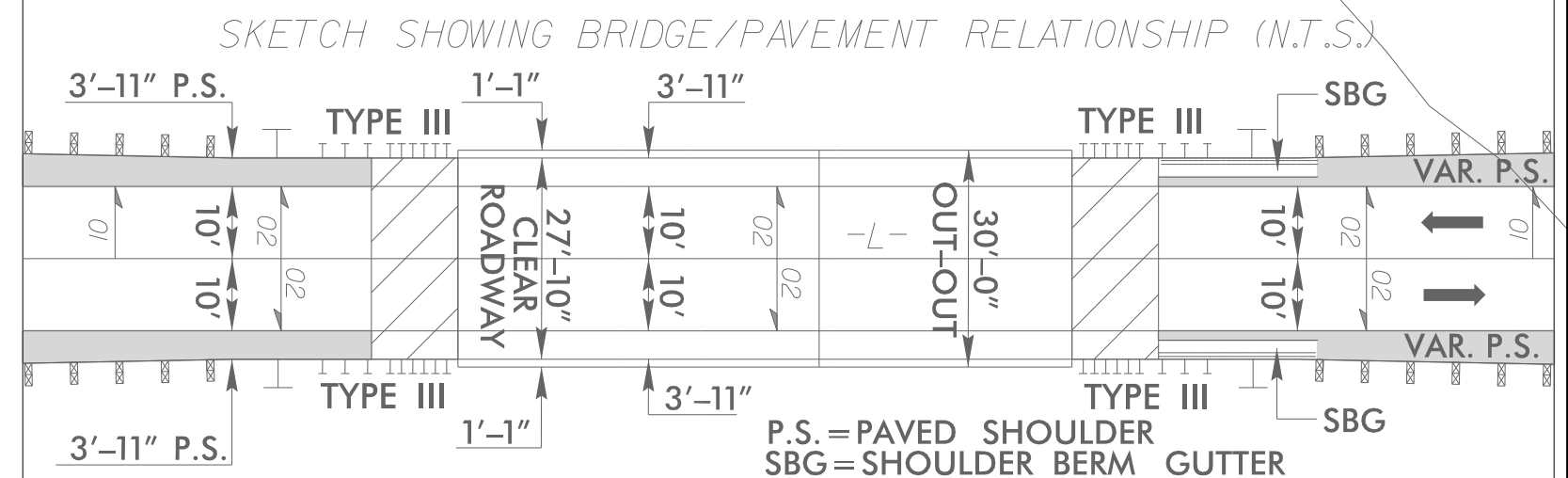
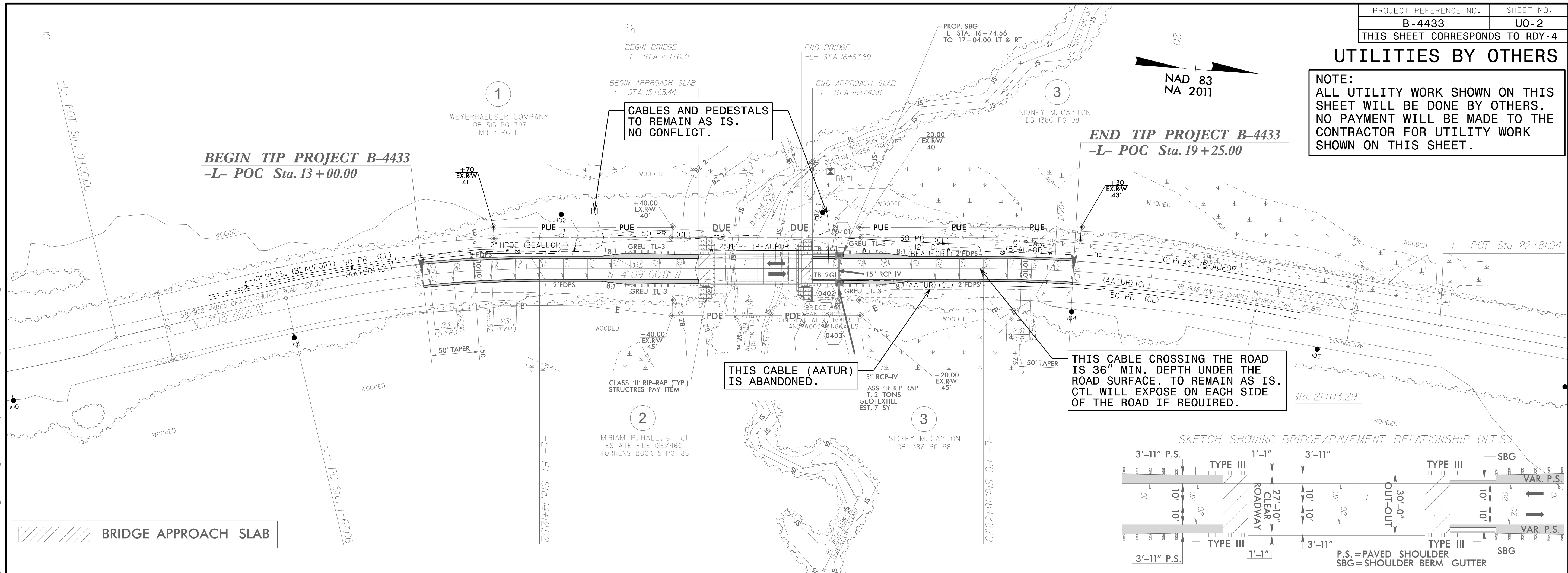
| | |
|--------------------------|--------------------------------------|
| <u>Michael E. Davis</u> | UTILITY COORDINATION PROJECT MANAGER |
| <u>Harris S. Winters</u> | PROJECT UTILITY COORDINATOR |
| <u>James N. Arnold</u> | PROJECT UTILITY DESIGNER |

**DIVISION OF HIGHWAYS
UTILITIES UNIT**
 1555 MAIL SERVICES CENTER
 RALEIGH NC 27699-1555
 PHONE (919) 707-6690
 FAX (919) 250-4151

| | |
|---------------------------|---------------------|
| <u>Heather Lane, P.E.</u> | DIVISION CONTACT #1 |
| <u>David Kramer</u> | DIVISION CONTACT #2 |
| _____ | DIVISION CONTACT #3 |
| _____ | DIVISION CONTACT #4 |

UTILITIES BY OTHERS

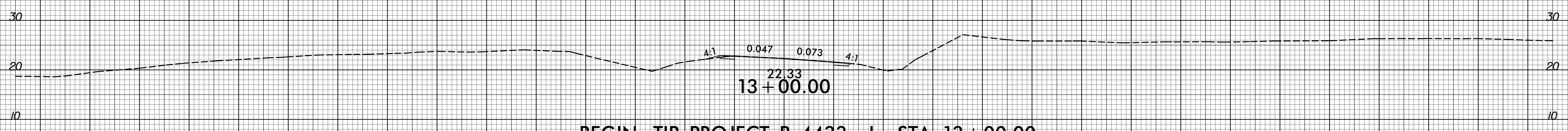
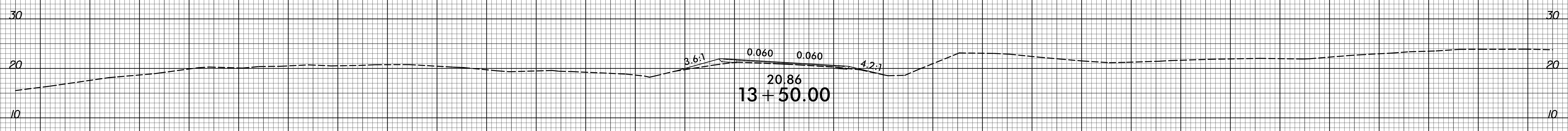
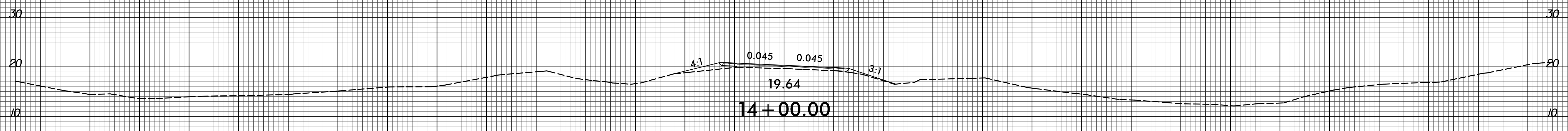
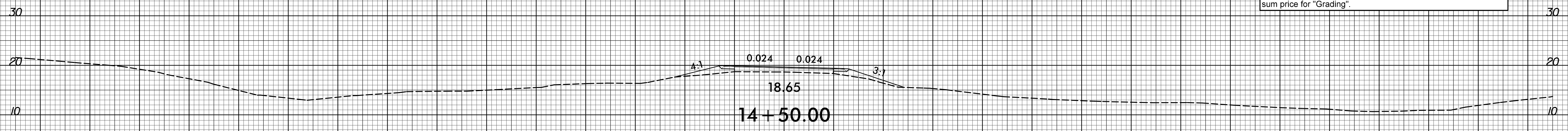
NOTE:
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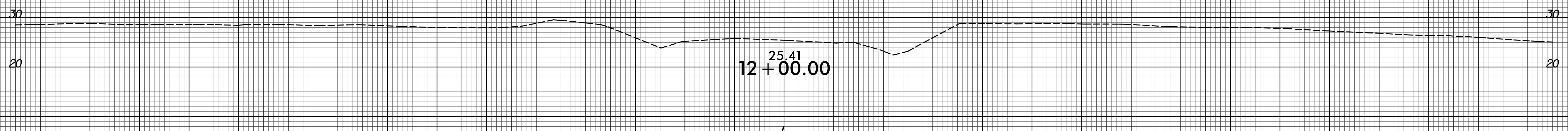
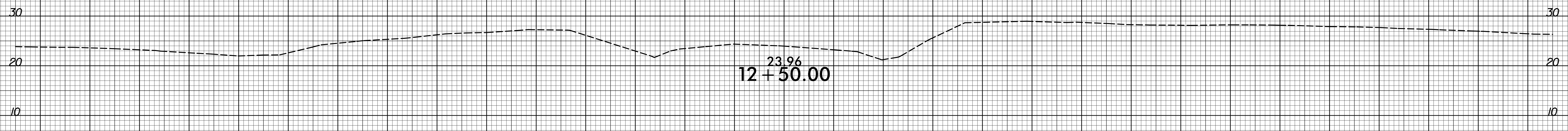
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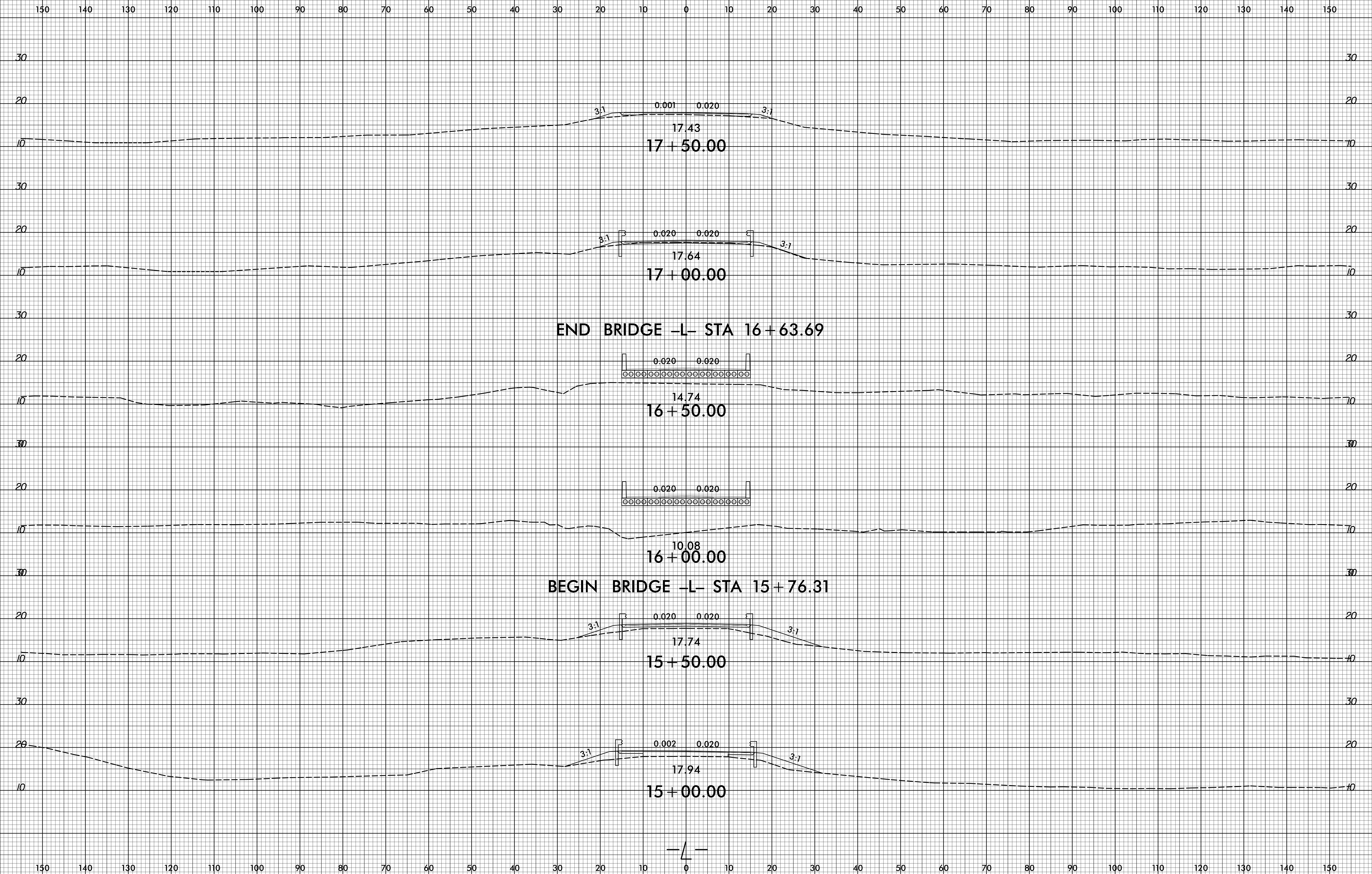
150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150

Approximate quantities only. Clearing and Grubbing, Unclassified Excavation, Borrow Excavation, Fine Grading, and Removal of Existing Asphalt Pavement will be paid for at the contract lump sum price for "Grading".

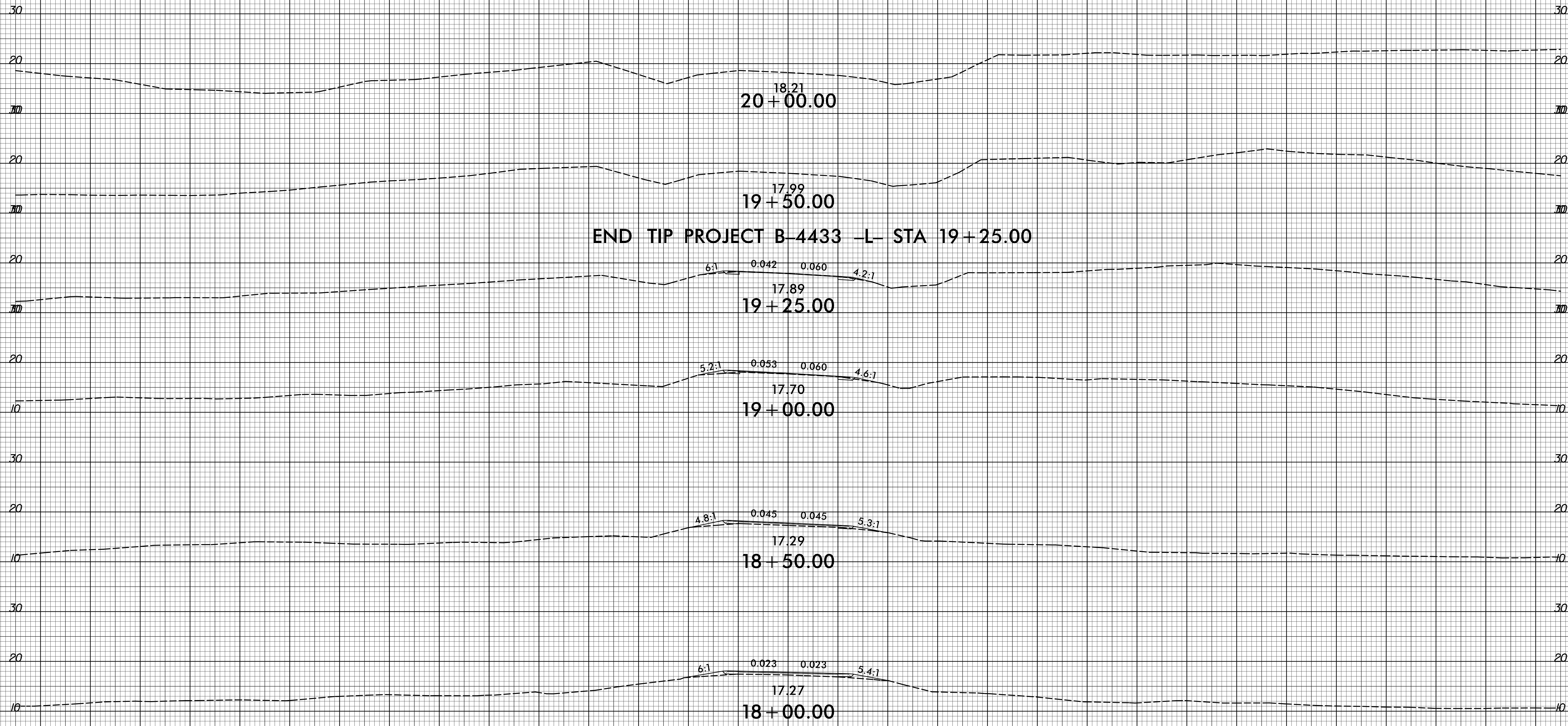


BEGIN TIP PROJECT B-4433 -L- STA 13+00.00





150 140 130 120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150



END TIP PROJECT B-4433 -L- STA 19+25.00

18.21
20+00.00

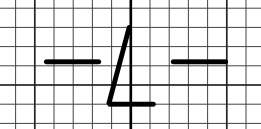
17.99
19+50.00

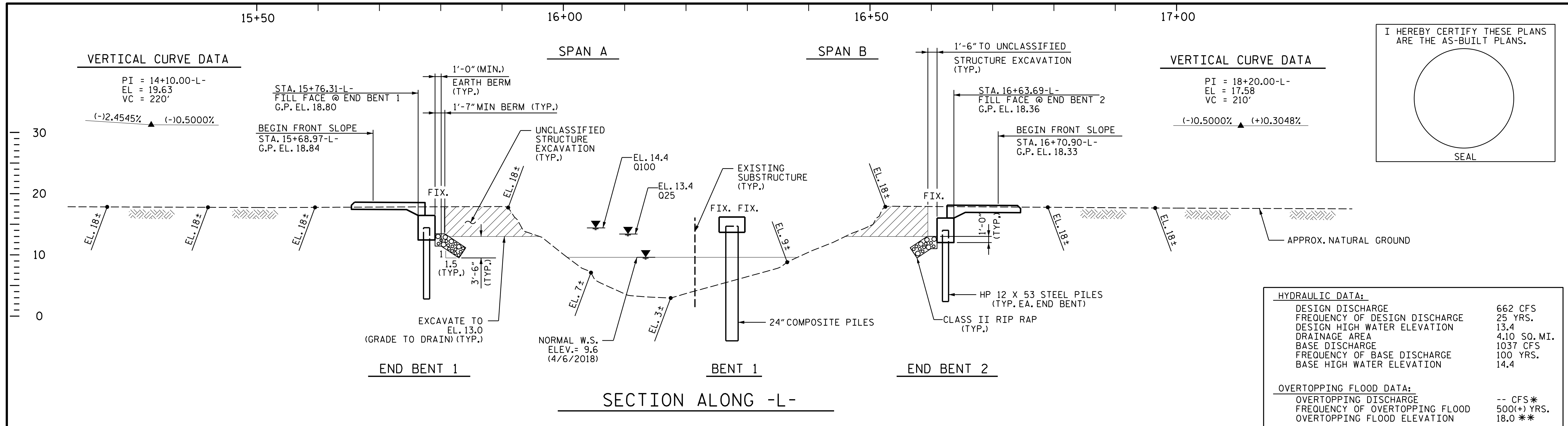
17.89
19+25.00

17.70
19+00.00

17.29
18+50.00

17.27
18+00.00





I HEREBY CERTIFY THESE PLANS ARE THE AS-BUILT PLANS.

SEAL

HYDRAULIC DATA:

| | |
|-------------------------------|--------------|
| DESIGN DISCHARGE | 662 CFS |
| FREQUENCY OF DESIGN DISCHARGE | 25 YRS. |
| DESIGN HIGH WATER ELEVATION | 13.4 |
| DRAINAGE AREA | 4.10 SQ. MI. |
| BASE DISCHARGE | 1037 CFS |
| FREQUENCY OF BASE DISCHARGE | 100 YRS. |
| BASE HIGH WATER ELEVATION | 14.4 |

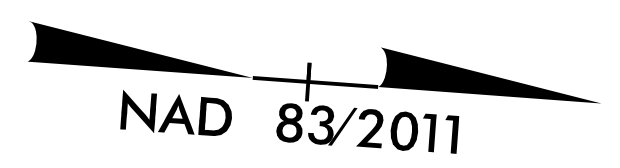
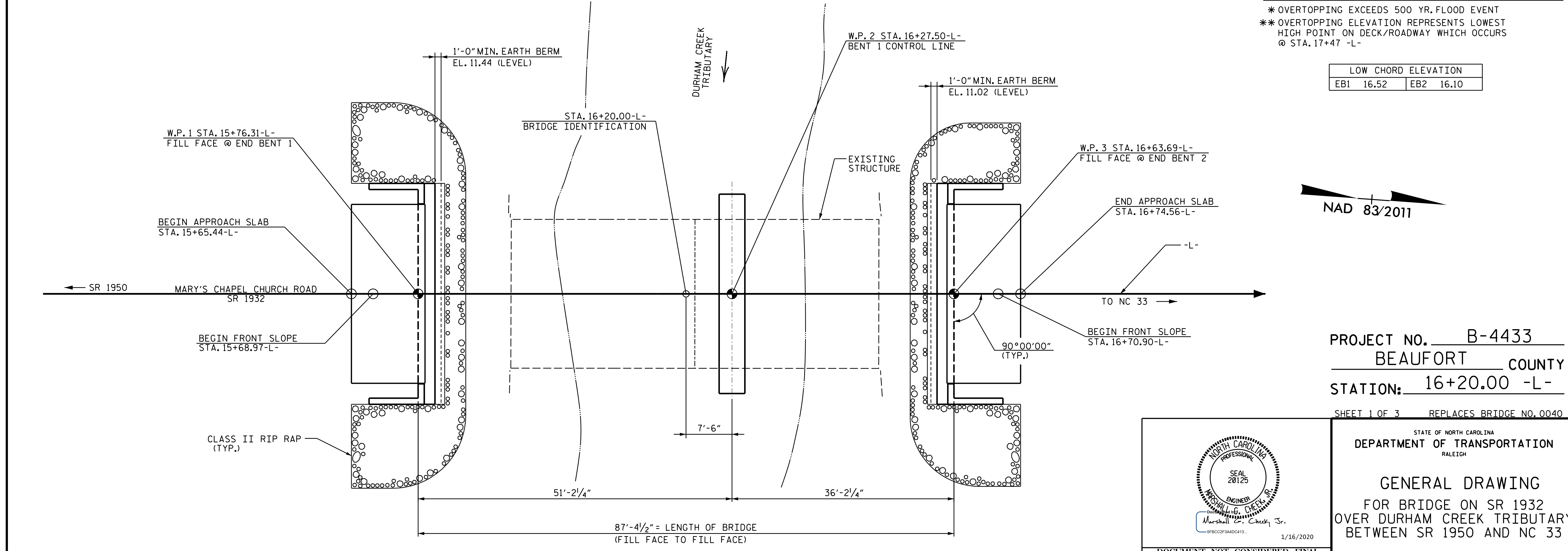
OVERTOPPING FLOOD DATA:

| | |
|--------------------------------|-------------|
| OVERTOPPING DISCHARGE | -- CFS* |
| FREQUENCY OF OVERTOPPING FLOOD | 500(+) YRS. |
| OVERTOPPING FLOOD ELEVATION | 18.0** |

* OVERTOPPING EXCEEDS 500 YR. FLOOD EVENT
 ** OVERTOPPING ELEVATION REPRESENTS LOWEST HIGH POINT ON DECK/ROADWAY WHICH OCCURS @ STA. 17+47 -L-

LOW CHORD ELEVATION

| | | | |
|-----|-------|-----|-------|
| EB1 | 16.52 | EB2 | 16.10 |
|-----|-------|-----|-------|



PROJECT NO. B-4433
 BEAUFORT COUNTY
 STATION: 16+20.00 -L-
 SHEET 1 OF 3 REPLACES BRIDGE NO. 0040

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1932
 OVER DURHAM CREEK TRIBUTARY
 BETWEEN SR 1950 AND NC 33

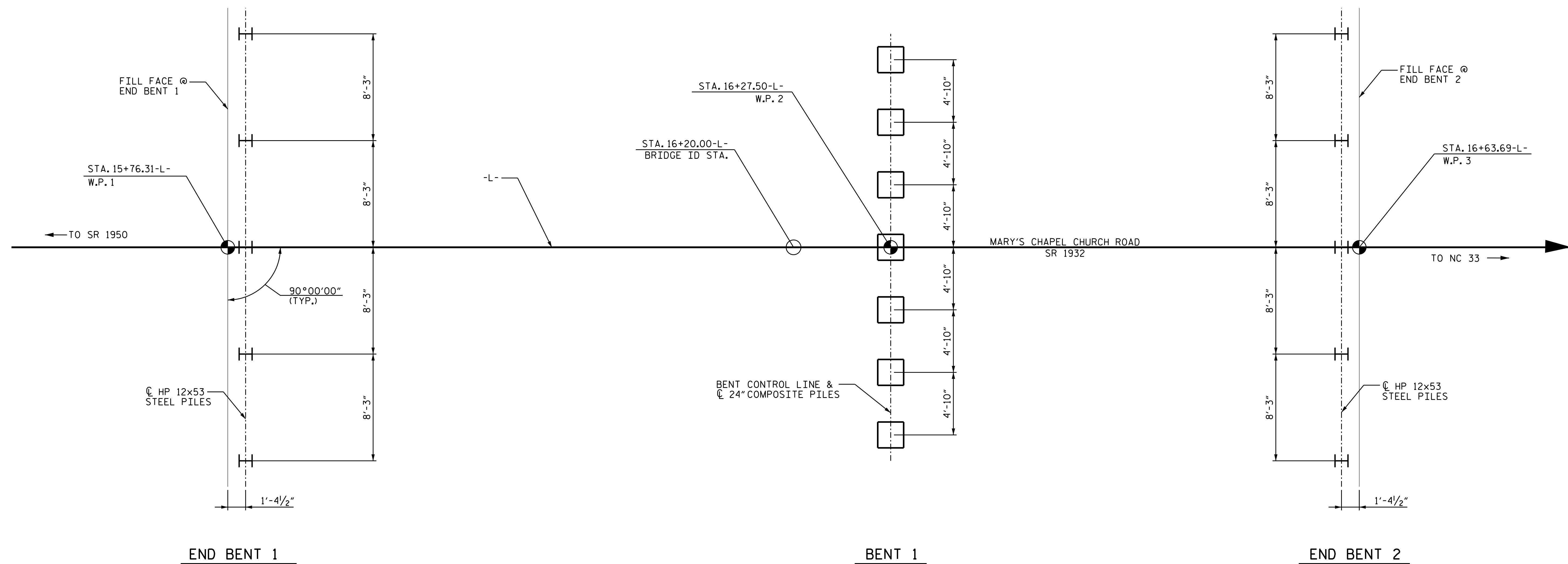
1/16/2020

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

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

DRAWN BY : TBE DATE : 10/18
 CHECKED BY : MGC DATE : 02/19



FOUNDATION LAYOUT PLAN

ALL END BENT PILES ARE HP 12x53 STEEL PILES. ALL BENT PILES ARE 24" COMPOSITE PILES. DIMENSIONS LOCATING PILES ARE SHOWN TO THE CENTERLINE OF PILES. ORIENT PILES AS SHOWN.

FOUNDATION RECOMMENDATION NOTES

FOR PILES, SEE SECTION 450 OF THE STANDARD SPECIFICATIONS.

PILES AT END BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 81 TONS PER PILE.

PILES AT END BENT NO.2 ARE DESIGNED FOR A FACTORED RESISTANCE OF 66 TONS PER PILE.

PILES AT BENT NO.1 ARE DESIGNED FOR A FACTORED RESISTANCE OF 105 TONS PER PILE.

DRIVE PILES AT END BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 135 TONS PER PILE.

DRIVE PILES AT END BENT NO.2 TO A REQUIRED DRIVING RESISTANCE OF 110 TONS PER PILE.

DRIVE PILES AT BENT NO.1 TO A REQUIRED DRIVING RESISTANCE OF 200 TONS PER PILE. THIS REQUIRED DRIVING RESISTANCE INCLUDES ADDITIONAL RESISTANCE FOR SCOUR.

INSTALL PRESTRESSED CONCRETE AND STEEL H-PILES SECTIONS OF COMPOSITE PILES AT BENT NO.1 TO TIP ELEVATION NO HIGHER THAN -6.0 FT AND -26.0 FT, RESPECTIVELY.

THE SCOUR CRITICAL ELEVATIONS FOR BENT NO.1 ARE ELEVATION -8.0 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-

SHEET 2 OF 3

DRAWN BY : TBE DATE : 10/18
 CHECKED BY : MGC DATE : 02/19

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

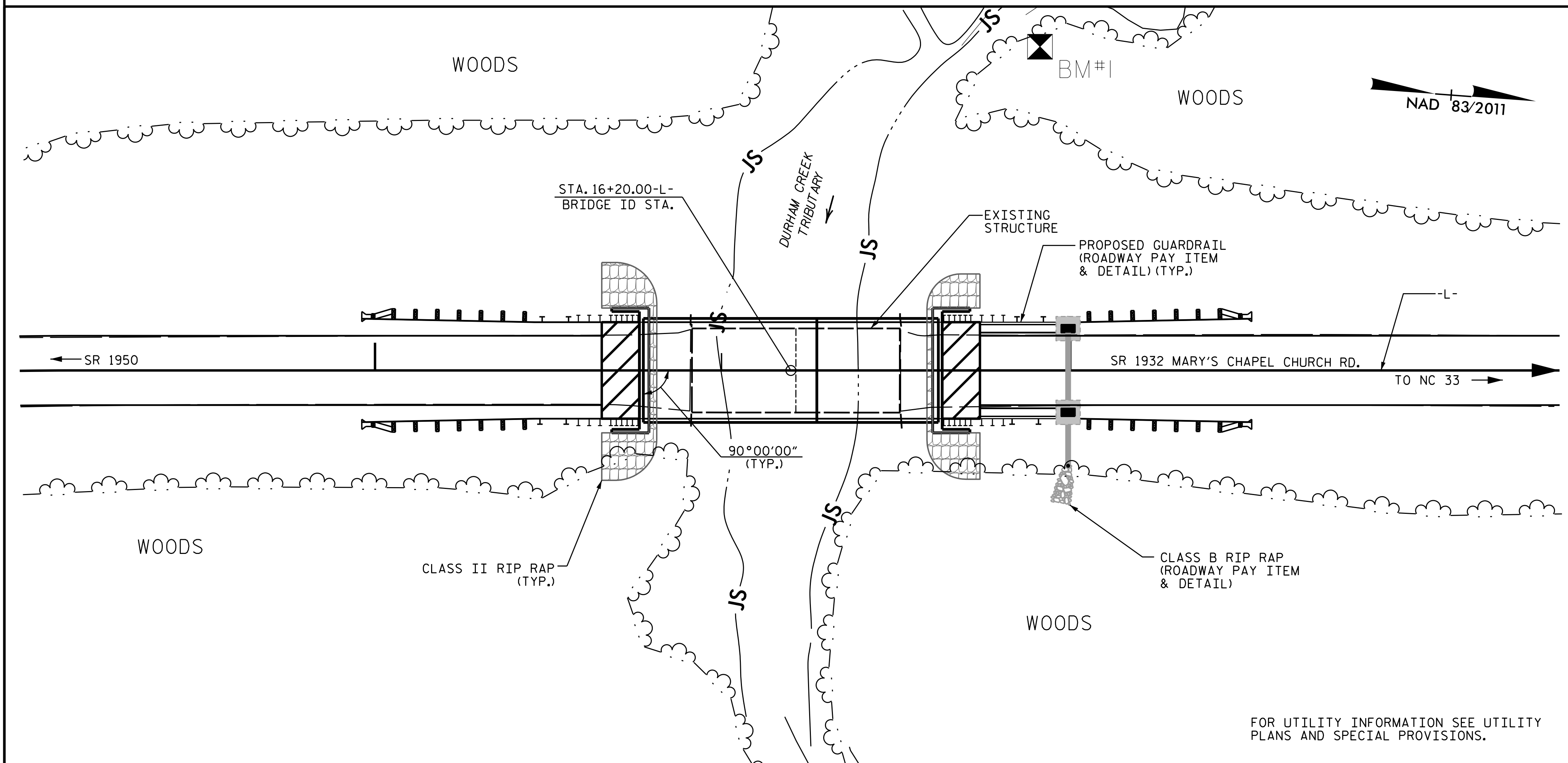
TGS ENGINEERS
 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1932
 OVER DURHAM CREEK TRIBUTARY
 BETWEEN SR 1950 AND NC 33

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

BENCH MARK #1: RAILROAD SPIKE IN 14" GUM TREE, 93' LT. OF STA. 16+92 -L-, ELEV.= 12.41 (NAVD 88)



LOCATION SKETCH

NOTES

- ASSUMED LIVE LOAD = HL-93 OR ALTERNATE LOADING.
- FOR OTHER DESIGN DATA AND GENERAL NOTES, SEE SHEET SN (S-21).
- FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.
- THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
- THE EXISTING STRUCTURE CONSISTING OF 2 SPANS (1 @ 30'-3", 1 @ 30'-5") PRESTRESSED CONCRETE CHANNELS, PPC CAPS ON TIMBER PILES, SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY POSTED BELOW THE LEGAL LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE FURTHER DETERIORATE, THIS LOAD LIMITATION MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.
- REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.
- THE MATERIAL SHOWN IN THE CROSS-HATCHED AREA SHALL BE EXCAVATED FOR A DISTANCE OF 25 FEET LEFT AND 30 FEET RIGHT OF THE CENTERLINE OF THE BRIDGE AS DIRECTED BY THE ENGINEER. THIS WORK WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR UNCLASSIFIED STRUCTURE EXCAVATION, SEE SECTION 412 OF THE STANDARD SPECIFICATIONS.
- THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. 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.
- ASPHALT WEARING SURFACE IS INCLUDED IN ROADWAY QUANTITIES ON ROADWAY PLANS.
- THIS STRUCTURE HAS BEEN DESIGNED IN ACCORDANCE WITH HEC 18, "EVALUATING SCOUR AT BRIDGES".
- FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.
- THIS BRIDGE IS LOCATED IN SEISMIC ZONE 1.
- FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.
- FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.
- FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.
- FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.
- PILE DRIVING EQUIPMENT SETUP FOR 24" PRESTRESSED CONCRETE PILES INCLUDES ENTIRE COMPOSITE PILE. SEE "24" PRESTRESSED CONCRETE COMPOSITE PILE" SHEET.
- FOR FIBER OPTIC CONDUIT SYSTEM, SEE SPECIAL PROVISIONS.
- THIS BRIDGE SHALL BE CONSTRUCTED USING TOP-DOWN CONSTRUCTION METHODS. THE USE OF A TEMPORARY CAUSEWAY OR WORK BRIDGE IS NOT PERMITTED.

TOTAL BILL OF MATERIAL

| | REMOVAL OF EXISTING STRUCTURE | ASBESTOS ASSESSMENT | UNCLASSIFIED STRUCTURE EXCAVATION | CLASS "A" CONCRETE | BRIDGE APPROACH SLABS | REINFORCING STEEL | PILE DRIVING EQUIPMENT SETUP FOR 24" PRESTRESSED CONCRETE PILES | PILE DRIVING EQUIPMENT SETUP FOR HP 12x53 STEEL PILES | 24" PRESTRESSED CONCRETE PILES | HP 12x53 STEEL PILES | PILE REDRIVES | VERTICAL CONCRETE BARRIER RAIL | | |
|----------------|-------------------------------|---------------------|-----------------------------------|--------------------|-----------------------|-------------------|---|---|--------------------------------|----------------------|---------------|--------------------------------|------|----------|
| | LUMP SUM | LUMP SUM | LUMP SUM | C.Y. | LUMP SUM | LBS. | EACH | EACH | NO. | LIN. FT. | NO. | LIN. FT. | EACH | LIN. FT. |
| SUPERSTRUCTURE | | | | | | | | | | | | 170.26 | | |
| END BENT 1 | | | | 20.0 | | 2,449 | | 5 | | 5 | 300 | 3 | | |
| BENT 1 | | | | 11.5 | | 1,880 | 7 | | 7 | 210 | 7 | 140 | 4 | |
| END BENT 2 | | | | 20.0 | | 2,449 | | 5 | | 5 | 275 | 3 | | |
| TOTALS | LUMP SUM | LUMP SUM | LUMP SUM | 51.5 | LUMP SUM | 6,778 | 7 | 10 | 7 | 210 | 17 | 715 | 10 | 170.26 |

| | RIP RAP CLASS II (2'-0" THK.) | GEOTEXTILE FOR DRAINAGE | ELASTOMERIC BEARINGS | 3'-0" x 1'-9" PRESTRESSED CONCRETE CORED SLABS | FIBER OPTIC CONDUIT SYSTEM |
|----------------|-------------------------------|-------------------------|----------------------|--|----------------------------|
| | TONS | SO. YDS. | LUMP SUM | NO. | LIN. FT. |
| SUPERSTRUCTURE | | | | 20 | 850.00 |
| END BENT 1 | 90 | 100 | | | |
| BENT 1 | | | | | |
| END BENT 2 | 80 | 90 | | | |
| TOTALS | 170 | 190 | LUMP SUM | 20 | 850.00 |

DRAWN BY : TBE DATE : 10/18
 CHECKED BY : MGC DATE : 02/19

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-

SHEET 3 OF 3

Marshall G. Cheek Jr.
 1/16/2020

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

GENERAL DRAWING
 FOR BRIDGE ON SR 1932
 OVER DURHAM CREEK TRIBUTARY
 BETWEEN SR 1950 AND NC 33

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

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

| LEVEL | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING | MINIMUM RATING FACTORS (RF) | TONS = W X RF | STRENGTH I LIMIT STATE | | | | | | | | | | SERVICE III LIMIT STATE | | | | | COMMENT NUMBER | | | |
|--------------------------|------------|----------------------|----------------------------|-----------------------------------|---------------|------------------------|------------------------------|---------------|------|-----------------|---|------------------------------|---------------|------|-----------------|---|---------------------|------------------------------|---------------|------|----------------|-----------------|---|--|
| | | | | | | MOMENT | | | | | SHEAR | | | | | MOMENT | | | | | | | | |
| | | | | | | LIVELOAD FACTORS | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | LIVELOAD FACTORS | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD RATING | HL-93(InV) | N/A | 1 | 1.394 | -- | 1.75 | 0.276 | 1.57 | 50' | EL | 24.5 | 0.531 | 1.39 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.44 | 50' | EL | 24.5 | | |
| | HL-93(OPr) | N/A | -- | 1.807 | -- | 1.35 | 0.276 | 2.03 | 50' | EL | 24.5 | 0.531 | 1.81 | 50' | EL | 2.45 | N/A | -- | -- | -- | -- | -- | | |
| | HS-20(InV) | 36.000 | 2 | 1.667 | 60.007 | 1.75 | 0.276 | 1.95 | 50' | EL | 24.5 | 0.531 | 1.67 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.79 | 50' | EL | 24.5 | | |
| | HS-20(OPr) | 36.000 | -- | 2.161 | 77.787 | 1.35 | 0.276 | 2.52 | 50' | EL | 24.5 | 0.531 | 2.16 | 50' | EL | 2.45 | N/A | -- | -- | -- | -- | -- | | |
| LEGAL LOAD RATING | SV | SNSH | 13.500 | -- | 3.635 | 49.079 | 1.4 | 0.276 | 4.95 | 50' | EL | 24.5 | 0.531 | 4.7 | 50' | EL | 2.45 | 0.80 | 0.276 | 3.64 | 50' | EL | 24.5 | |
| | | SNGARBS2 | 20.000 | -- | 2.871 | 57.42 | 1.4 | 0.276 | 3.91 | 50' | EL | 24.5 | 0.531 | 3.42 | 50' | EL | 2.45 | 0.80 | 0.276 | 2.87 | 50' | EL | 24.5 | |
| | | SNAGRIS2 | 22.000 | -- | 2.778 | 61.109 | 1.4 | 0.276 | 3.78 | 50' | EL | 19.6 | 0.531 | 3.21 | 50' | EL | 2.45 | 0.80 | 0.276 | 2.78 | 50' | EL | 24.5 | |
| | | SNCOTTS3 | 27.250 | -- | 1.814 | 49.418 | 1.4 | 0.276 | 2.47 | 50' | EL | 24.5 | 0.531 | 2.36 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.81 | 50' | EL | 24.5 | |
| | | SNAGGRS4 | 34.925 | -- | 1.577 | 55.063 | 1.4 | 0.276 | 2.15 | 50' | EL | 24.5 | 0.531 | 2.01 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.58 | 50' | EL | 24.5 | |
| | | SNS5A | 35.550 | -- | 1.537 | 54.657 | 1.4 | 0.276 | 2.09 | 50' | EL | 24.5 | 0.531 | 2.07 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.54 | 50' | EL | 24.5 | |
| | | SNS6A | 39.950 | -- | 1.438 | 57.43 | 1.4 | 0.276 | 1.96 | 50' | EL | 24.5 | 0.531 | 1.91 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.44 | 50' | EL | 24.5 | |
| | SNS7B | 42.000 | -- | 1.370 | 57.54 | 1.4 | 0.276 | 1.87 | 50' | EL | 24.5 | 0.531 | 1.91 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.37 | 50' | EL | 24.5 | | |
| | TTST | TNAGRIT3 | 33.000 | -- | 1.761 | 58.118 | 1.4 | 0.276 | 2.4 | 50' | EL | 24.5 | 0.531 | 2.25 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.76 | 50' | EL | 24.5 | |
| | | TNT4A | 33.075 | -- | 1.777 | 58.759 | 1.4 | 0.276 | 2.42 | 50' | EL | 24.5 | 0.531 | 2.17 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.78 | 50' | EL | 24.5 | |
| | | TNT6A | 41.600 | -- | 1.480 | 61.558 | 1.4 | 0.276 | 2.01 | 50' | EL | 24.5 | 0.531 | 2.08 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.48 | 50' | EL | 24.5 | |
| | | TNT7A | 42.000 | -- | 1.502 | 63.087 | 1.4 | 0.276 | 2.05 | 50' | EL | 24.5 | 0.531 | 1.94 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.50 | 50' | EL | 24.5 | |
| | | TNT7B | 42.000 | -- | 1.566 | 65.773 | 1.4 | 0.276 | 2.13 | 50' | EL | 24.5 | 0.531 | 1.84 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.57 | 50' | EL | 24.5 | |
| | | TNAGRIT4 | 43.000 | -- | 1.486 | 63.902 | 1.4 | 0.276 | 2.02 | 50' | EL | 24.5 | 0.531 | 1.77 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.49 | 50' | EL | 24.5 | |
| TNAGT5A | | 45.000 | -- | 1.388 | 62.47 | 1.4 | 0.276 | 1.89 | 50' | EL | 24.5 | 0.531 | 1.8 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.39 | 50' | EL | 24.5 | | |
| TNAGT5B | 45.000 | 3 | 1.360 | 61.206 | 1.4 | 0.276 | 1.85 | 50' | EL | 24.5 | 0.531 | 1.68 | 50' | EL | 2.45 | 0.80 | 0.276 | 1.36 | 50' | EL | 24.5 | | | |

LOAD FACTORS:

| DESIGN LOAD RATING FACTORS | LIMIT STATE | γ_{DC} | γ_{DW} |
|-------------------------------------|-------------|---------------|---------------|
| | STRENGTH I | 1.25 | 1.50 |
| | SERVICE III | 1.00 | 1.00 |

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

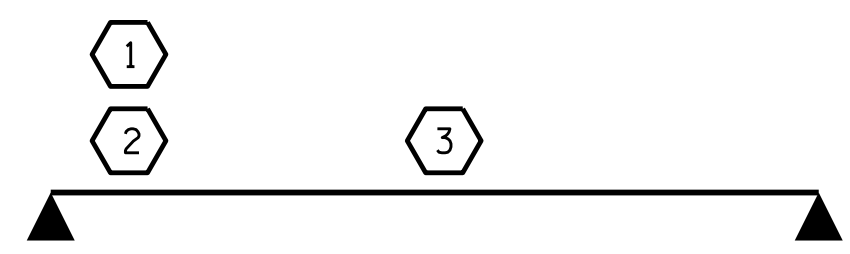
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY
FOR SPAN 'A'

PROJECT NO. B-4433
BEAUFORT COUNTY
STATION: 16+20.00 -L-

| | |
|-----------------------|--------------|
| ASSEMBLED BY : TBE | DATE : 10/18 |
| CHECKED BY : MCC | DATE : 02/19 |
| DRAWN BY : CVC 6/10 | |
| CHECKED BY : DNS 6/10 | |

Marshall G. Check, Jr.
9/16/2019

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
50' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | | | | | |
|---|-----|-------|-----|-----|--|
| TGS ENGINEERS | | | | | |
| 706 HILLSBOROUGH STREET SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275 | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | | SHEET NO. S-4 TOTAL SHEETS 21 |

LOAD AND RESISTANCE FACTOR RATING (LRFD) SUMMARY FOR PRESTRESSED CONCRETE GIRDERS

| LEVEL | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING | MINIMUM RATING FACTORS (RF) | TONS = W X RF | STRENGTH I LIMIT STATE | | | | | | | | | | SERVICE III LIMIT STATE | | | | | COMMENT NUMBER | | | |
|--------------------------|------------|----------------------|----------------------------|-----------------------------------|---------------|------------------------|------------------------------|---------------|------|-----------------|---|------------------------------|---------------|------|-----------------|---|---------------------|------------------------------|---------------|------|----------------|-----------------|---|--|
| | | | | | | MOMENT | | | | | SHEAR | | | | | MOMENT | | | | | | | | |
| | | | | | | LIVELOAD FACTORS | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | LIVELOAD FACTORS | DISTRIBUTION FACTORS (DF) | RATING FACTOR | SPAN | | GIRDER LOCATION | DISTANCE FROM LEFT END OF SPAN (ft) | |
| DESIGN LOAD RATING | HL-93(InV) | N/A | 1 | 1.032 | -- | 1.75 | 0.28 | 1.36 | 35' | EL | 17 | 0.561 | 1.03 | 35' | EL | 17 | 0.80 | 0.28 | 1.05 | 35' | EL | 17 | | |
| | HL-93(Opr) | N/A | -- | 1.338 | -- | 1.35 | 0.28 | 1.77 | 35' | EL | 17 | 0.561 | 1.34 | 35' | EL | 1.7 | N/A | -- | -- | -- | -- | -- | | |
| | HS-20(InV) | 36.000 | 2 | 1.189 | 42.810 | 1.75 | 0.28 | 1.79 | 35' | EL | 13.6 | 0.561 | 1.19 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.39 | 35' | EL | 17 | | |
| | HS-20(Opr) | 36.000 | -- | 1.542 | 55.494 | 1.35 | 0.28 | 2.32 | 35' | EL | 13.6 | 0.561 | 1.54 | 35' | EL | 1.7 | N/A | -- | -- | -- | -- | -- | | |
| LEGAL LOAD RATING | SV | SNSH | 13.500 | -- | 2.400 | 32.402 | 1.4 | 0.28 | 3.89 | 35' | EL | 17 | 0.561 | 3.06 | 35' | EL | 1.7 | 0.80 | 0.28 | 2.40 | 35' | EL | 17 | |
| | | SNGARBS2 | 20.000 | -- | 2.052 | 41.044 | 1.4 | 0.28 | 3.29 | 35' | EL | 13.6 | 0.561 | 2.32 | 35' | EL | 1.7 | 0.80 | 0.28 | 2.05 | 35' | EL | 13.6 | |
| | | SNAGRIS2 | 22.000 | -- | 2.053 | 45.174 | 1.4 | 0.28 | 3.26 | 35' | EL | 13.6 | 0.561 | 2.21 | 35' | EL | 1.7 | 0.80 | 0.28 | 2.05 | 35' | EL | 13.6 | |
| | | SNCOTTS3 | 27.250 | -- | 1.202 | 32.744 | 1.4 | 0.28 | 1.95 | 35' | EL | 17 | 0.561 | 1.54 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.20 | 35' | EL | 17 | |
| | | SNAGGRS4 | 34.925 | -- | 1.111 | 38.816 | 1.4 | 0.28 | 1.8 | 35' | EL | 17 | 0.561 | 1.38 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.11 | 35' | EL | 17 | |
| | | SNS5A | 35.550 | -- | 1.079 | 38.354 | 1.4 | 0.28 | 1.75 | 35' | EL | 17 | 0.561 | 1.46 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.08 | 35' | EL | 17 | |
| | | SNS6A | 39.950 | -- | 1.041 | 41.601 | 1.4 | 0.28 | 1.69 | 35' | EL | 17 | 0.561 | 1.37 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.04 | 35' | EL | 17 | |
| | SNS7B | 42.000 | 3 | 1.000 | 41.734 | 1.4 | 0.28 | 1.61 | 35' | EL | 17 | 0.561 | 1.4 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.00 | 35' | EL | 17 | | |
| | TTST | TNAGRIT3 | 33.000 | -- | 1.286 | 42.439 | 1.4 | 0.28 | 2.08 | 35' | EL | 17 | 0.561 | 1.6 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.29 | 35' | EL | 17 | |
| | | TNT4A | 33.075 | -- | 1.285 | 42.512 | 1.4 | 0.28 | 2.08 | 35' | EL | 17 | 0.561 | 1.51 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.29 | 35' | EL | 17 | |
| | | TNT6A | 41.600 | -- | 1.126 | 46.84 | 1.4 | 0.28 | 1.82 | 35' | EL | 17 | 0.561 | 1.48 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.13 | 35' | EL | 17 | |
| | | TNT7A | 42.000 | -- | 1.163 | 48.833 | 1.4 | 0.28 | 1.89 | 35' | EL | 17 | 0.561 | 1.37 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.16 | 35' | EL | 17 | |
| | | TNT7B | 42.000 | -- | 1.144 | 48.061 | 1.4 | 0.28 | 1.85 | 35' | EL | 17 | 0.561 | 1.33 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.14 | 35' | EL | 17 | |
| | | TNAGRIT4 | 43.000 | -- | 1.158 | 49.810 | 1.4 | 0.28 | 1.86 | 35' | EL | 13.6 | 0.561 | 1.28 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.16 | 35' | EL | 17 | |
| TNAGT5A | | 45.000 | -- | 1.068 | 48.071 | 1.4 | 0.28 | 1.73 | 35' | EL | 17 | 0.561 | 1.35 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.07 | 35' | EL | 17 | | |
| TNAGT5B | 45.000 | -- | 1.031 | 46.373 | 1.4 | 0.28 | 1.67 | 35' | EL | 17 | 0.561 | 1.21 | 35' | EL | 1.7 | 0.80 | 0.28 | 1.03 | 35' | EL | 17 | | | |

LOAD FACTORS:

| DESIGN LOAD RATING FACTORS | LIMIT STATE | γ_{DC} | γ_{DW} |
|-------------------------------------|-------------|---------------|---------------|
| | STRENGTH I | 1.25 | 1.50 |
| | SERVICE III | 1.00 | 1.00 |

NOTES:

MINIMUM RATING FACTORS ARE BASED ON THE STRENGTH I AND SERVICE III LIMIT STATES.
ALLOWABLE STRESSES FOR SERVICE III LIMIT STATE ARE AS REQUIRED FOR DESIGN.

CONTROLLING LOAD RATING

1 DESIGN LOAD RATING (HL-93)

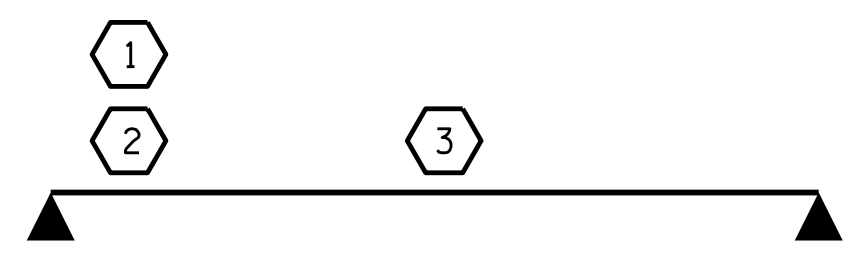
2 DESIGN LOAD RATING (HS-20)

3 LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE

GIRDER LOCATION

I - INTERIOR GIRDER
EL - EXTERIOR LEFT GIRDER
ER - EXTERIOR RIGHT GIRDER



LRFR SUMMARY
FOR SPAN 'B'

PROJECT NO. B-4433
BEAUFORT COUNTY
STATION: 16+20.00 -L-



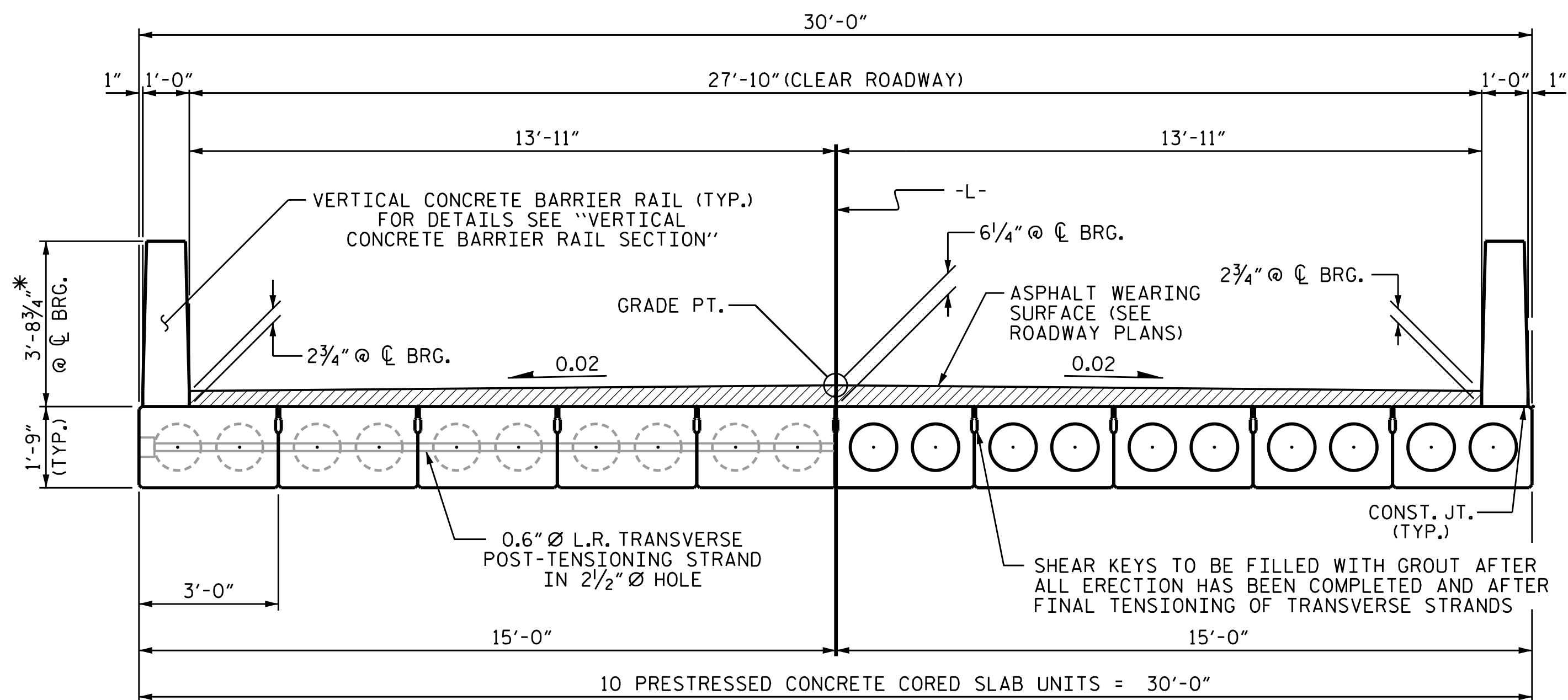
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
LRFR SUMMARY FOR
35' CORED SLAB UNIT
90° SKEW
(NON-INTERSTATE TRAFFIC)

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
706 HILLSBOROUGH STREET
SUITE 200
RALEIGH, NC 27603
PH (919) 773-8887
CORP. LICENSE NO.: C-0275

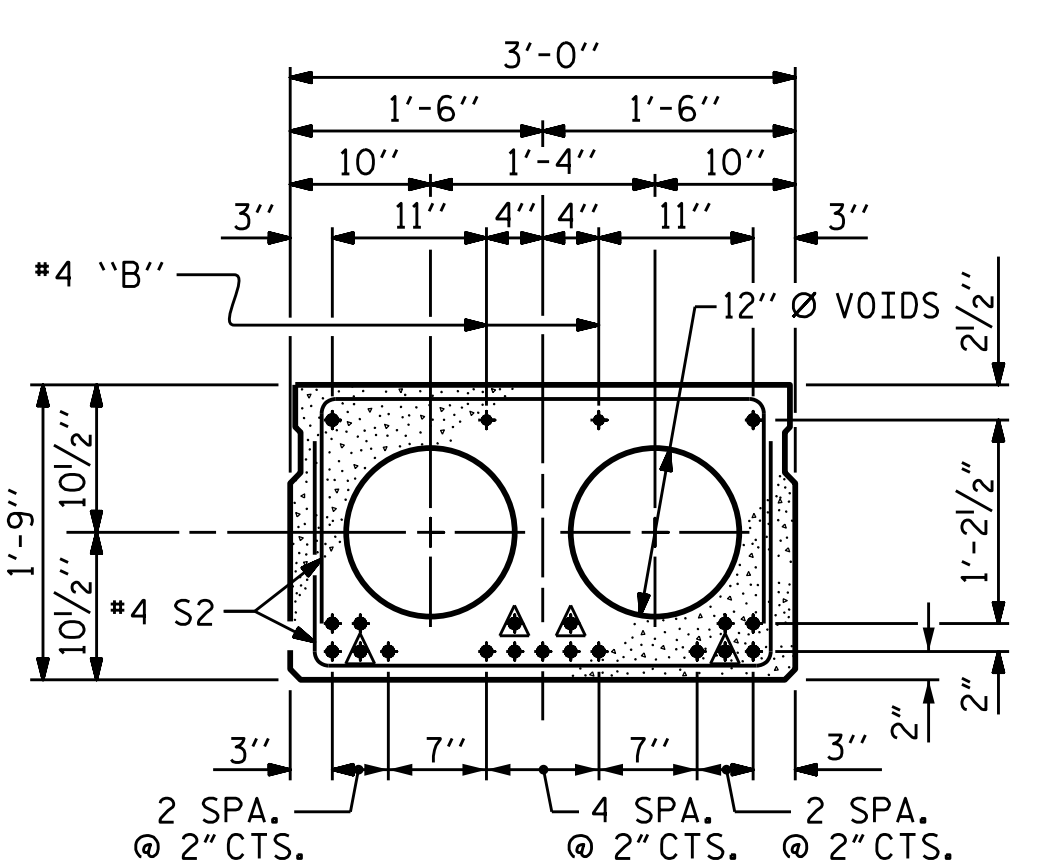
| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-5 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 21 |

| | |
|-----------------------|--------------|
| ASSEMBLED BY : TBE | DATE : 10/18 |
| CHECKED BY : MGC | DATE : 02/19 |
| DRAWN BY : CVC 6/10 | |
| CHECKED BY : DNS 6/10 | |



TYPICAL SECTION

* - THE MAXIMUM BARRIER RAIL HEIGHT AND ASPHALT THICKNESS IS SHOWN. THE HEIGHT OF THE BARRIER RAIL AND ASPHALT THICKNESS VARIES WHILE THE TOP OF THE BARRIER RAIL FOLLOWS THE PROFILE OF THE CUTTERLINE. FOR RAIL HEIGHT DETAILS AND ASPHALT THICKNESS SEE THE "VERTICAL CONCRETE BARRIER RAIL SECTION" DETAIL.

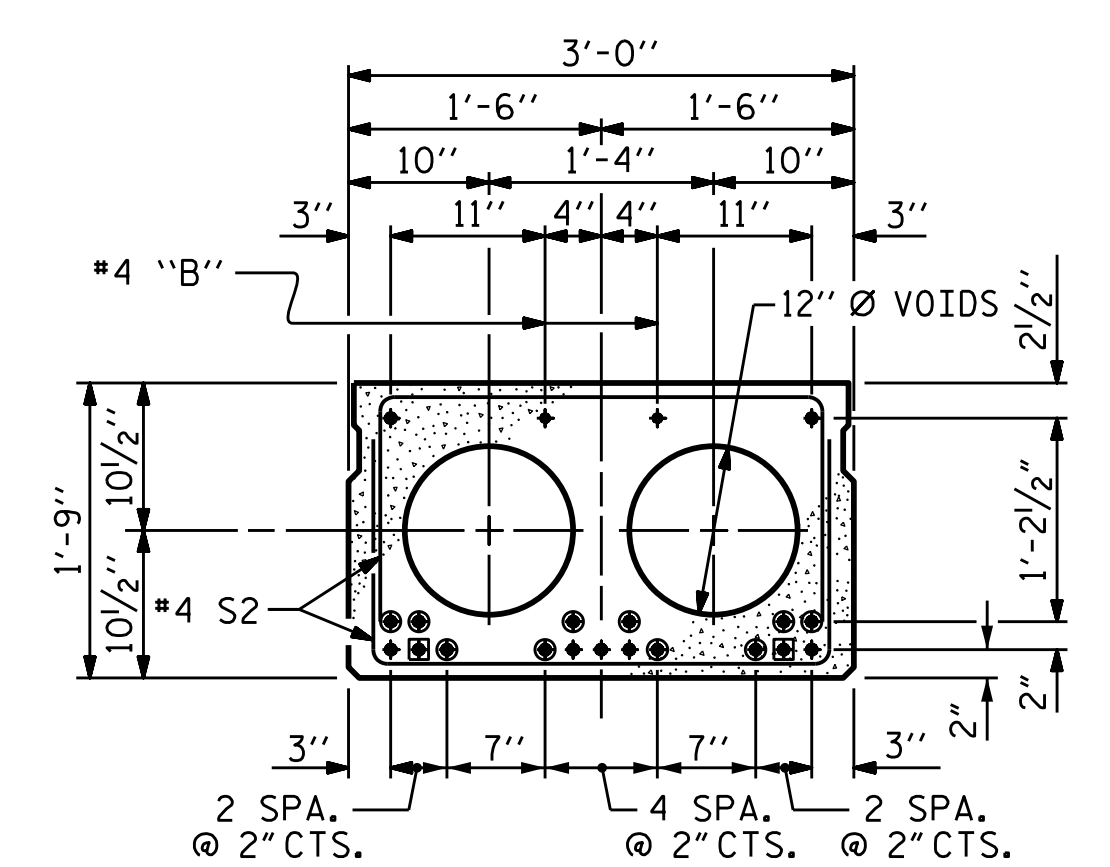


INTERIOR SLAB SECTION (50' UNIT)
(19 STRANDS REQUIRED)

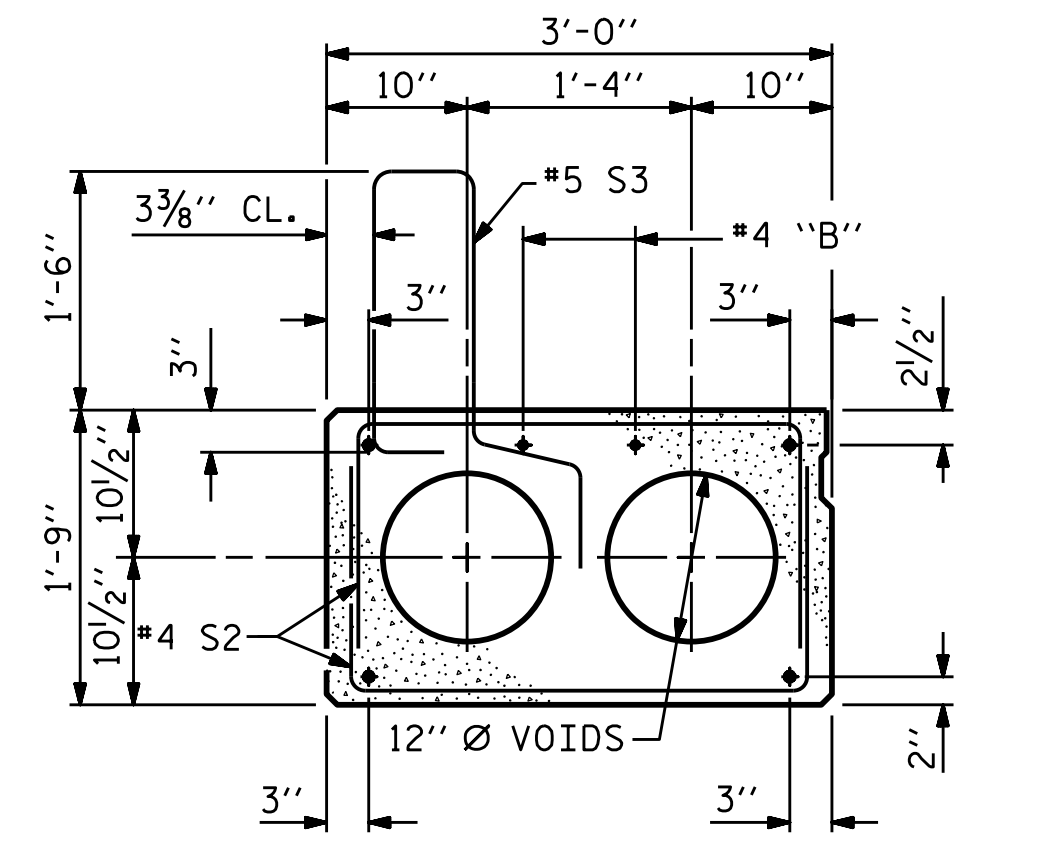
0.6" Ø LOW RELAXATION STRAND LAYOUT

- ▲ BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 6'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- BOND SHALL BE BROKEN ON THESE STRANDS FOR A DISTANCE OF 2'-0" FROM END OF CORED SLAB UNIT. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.
- OPTIONAL FULL LENGTH DEBONDED STRANDS. THESE STRANDS ARE NOT REQUIRED. IF THE FABRICATOR CHOOSES TO INCLUDE THESE STRANDS IN THE CORED SLAB UNIT, THE STRANDS SHALL BE DEBONDED FOR THE FULL LENGTH OF THE UNIT AT NO ADDITIONAL COST. SEE STANDARD SPECIFICATIONS, ARTICLE 1078-7.

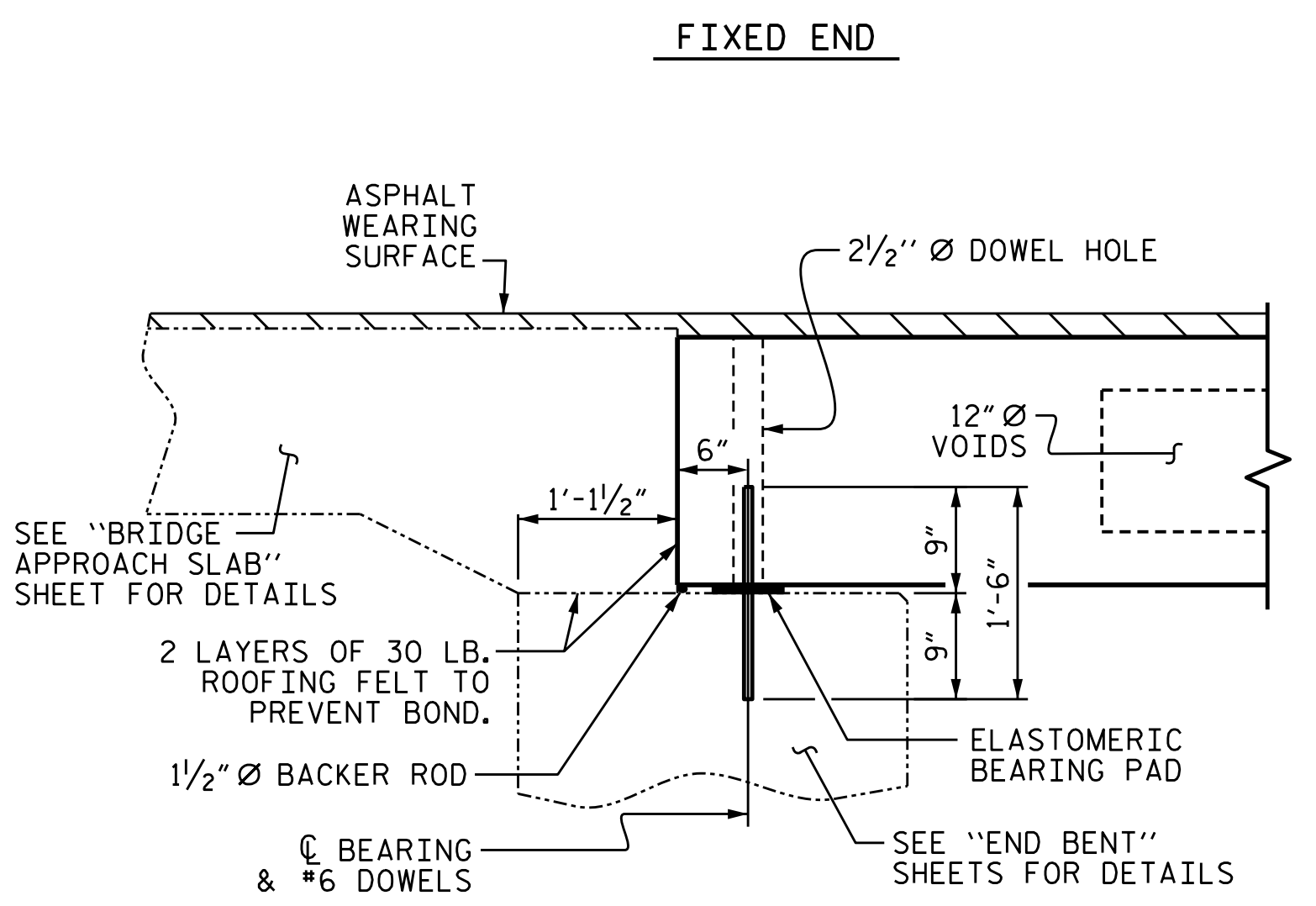
DEBONDING LEGEND



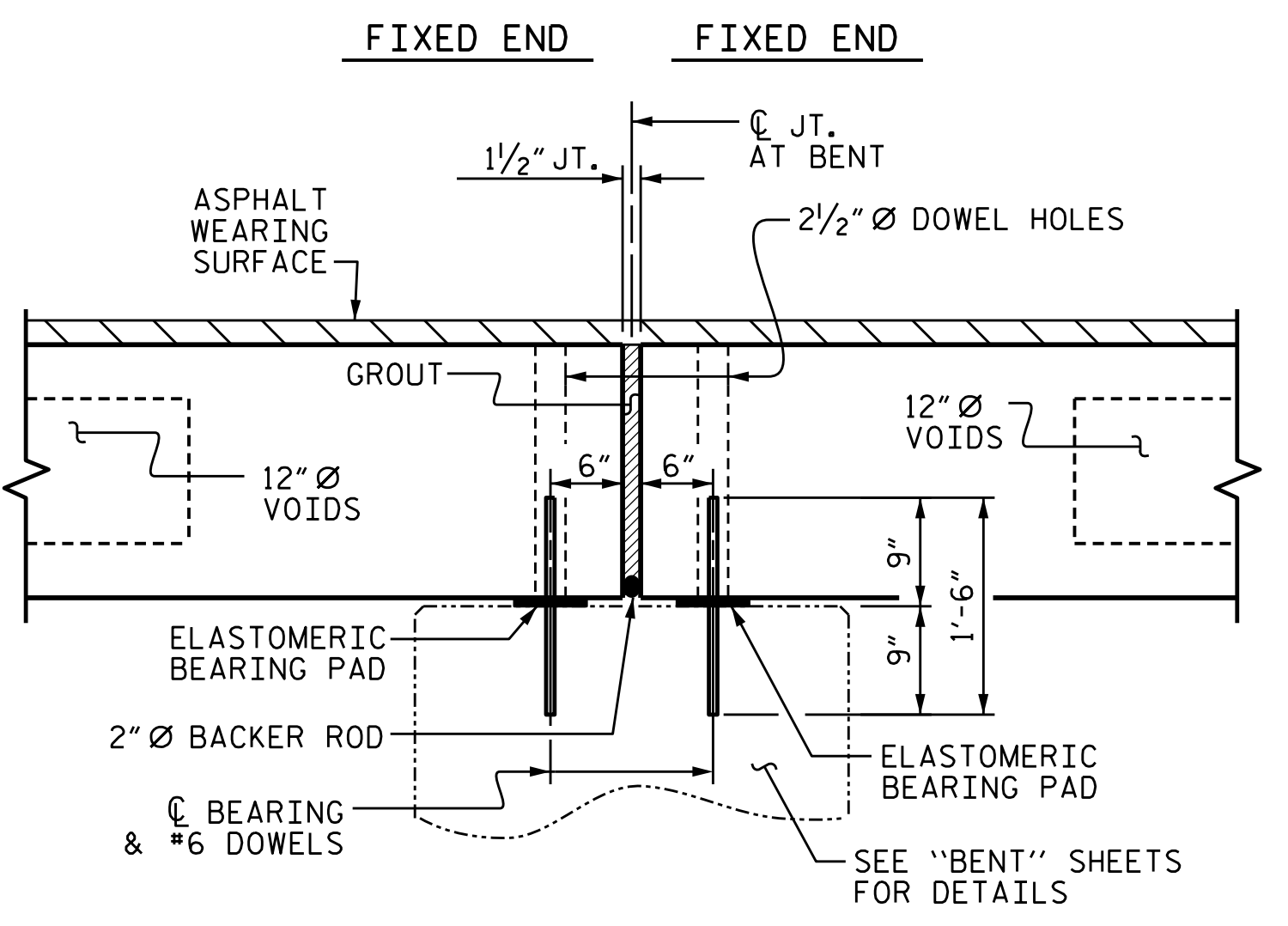
INTERIOR SLAB SECTION (35' UNIT)
(9 STRANDS REQUIRED)



EXT. SLAB SECTION
(FOR PRESTRESSED STRAND LAYOUT, SEE INTERIOR SLAB SECTION.)

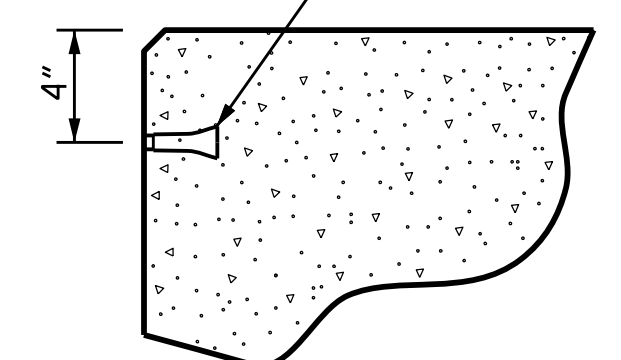


SECTION AT END BENT

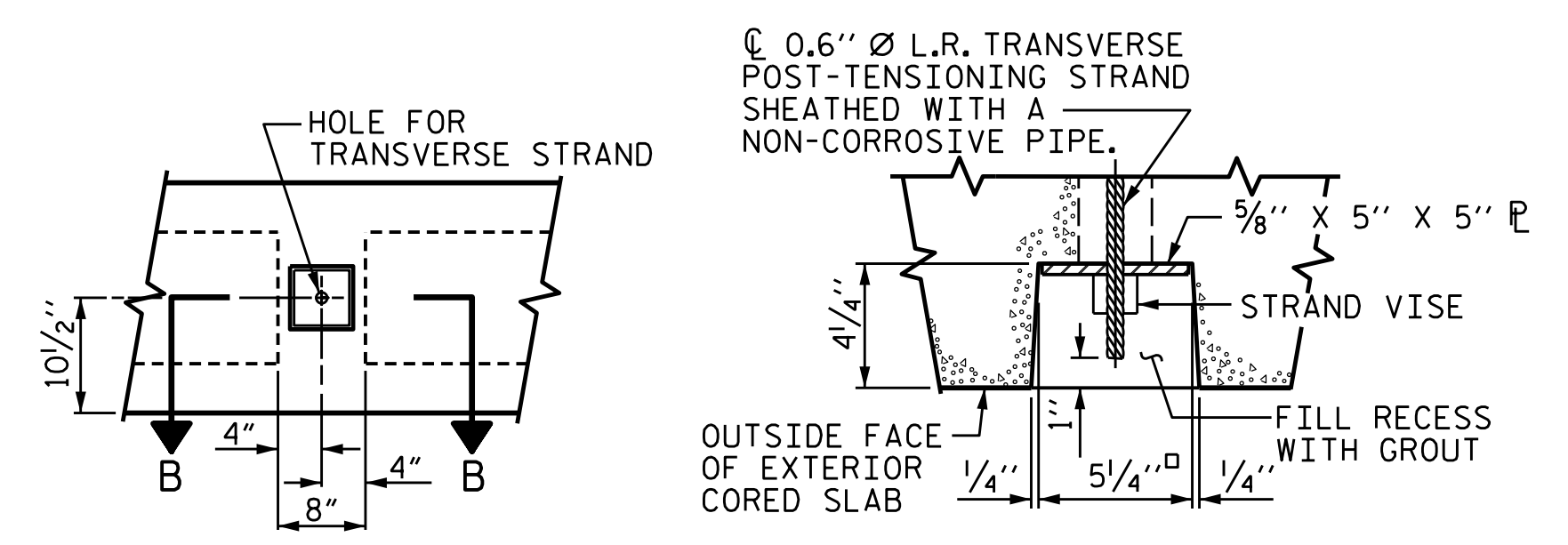


SECTION AT BENT

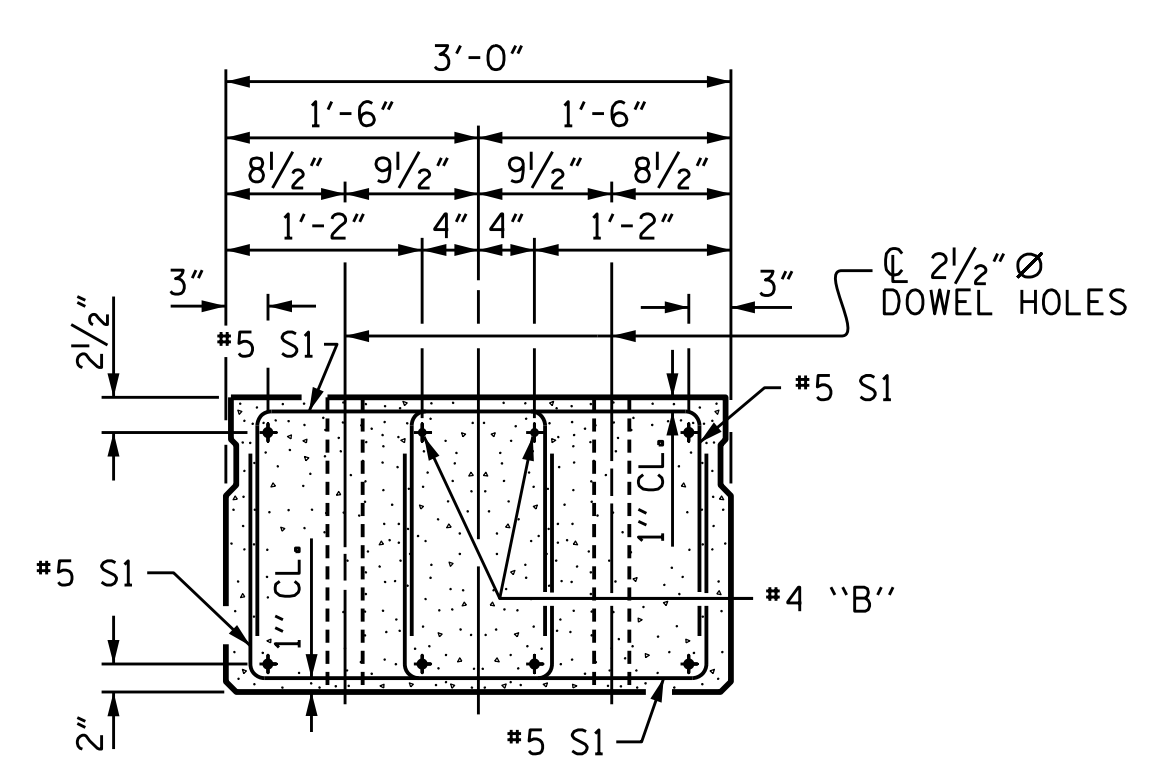
PERMITTED THREADED INSERT CAST IN OUTSIDE FACE OF EXTERIOR UNIT AND RECESSED 3/8" SIZE TO BE DETERMINED BY CONTRACTOR.



THREADED INSERT DETAIL

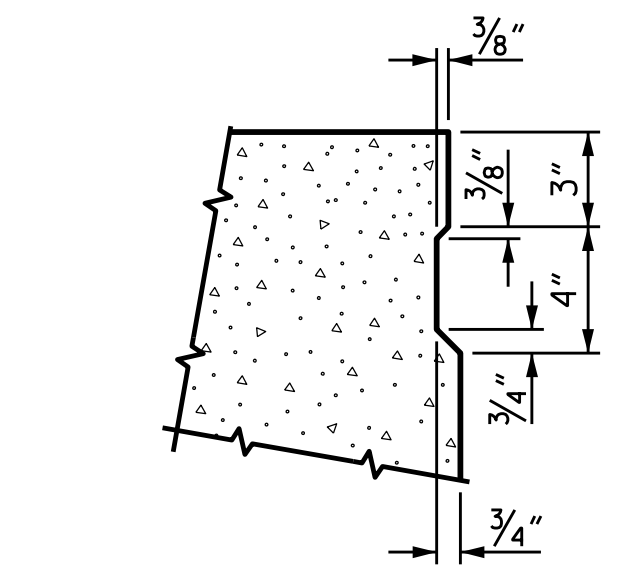


ELEVATION VIEW SECTION B-B
GROUTED RECESS AT END OF POST-TENSIONED STRAND OF CORED SLABS



END ELEVATION

SHOWING PLACEMENT OF DOUBLE STIRRUPS AND LOCATION OF DOWEL HOLES. (STRAND LAYOUT NOT SHOWN.) INTERIOR SLAB UNIT SHOWN-EXTERIOR SLAB UNIT SIMILAR EXCEPT SHEAR KEY LOCATION.



SHEAR KEY DETAIL
NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR CORED SLABS.

PROJECT NO. B-4433
BEAUFORT COUNTY
STATION: 16+20.00 -L-

SHEET 1 OF 5

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
STANDARD
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW

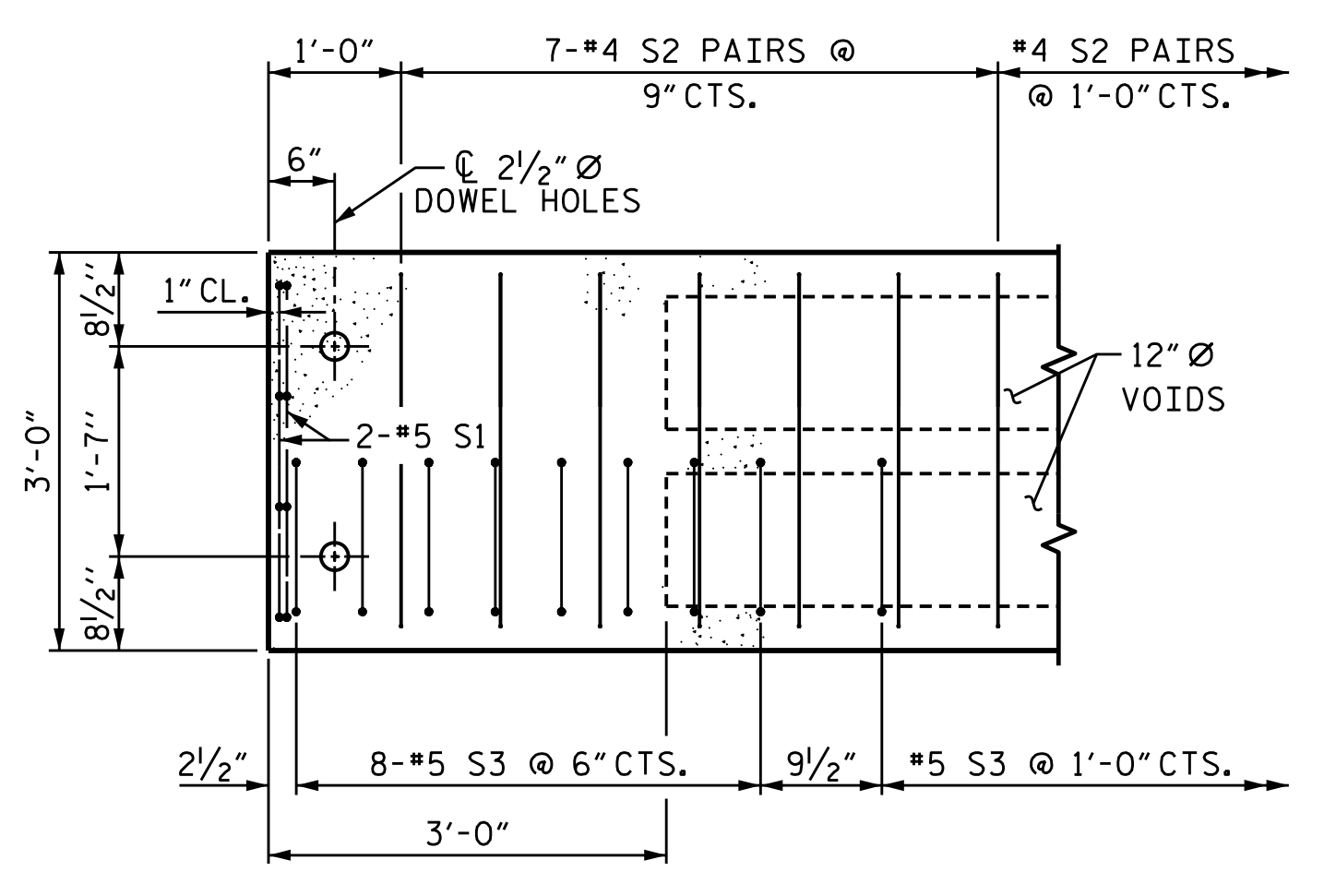
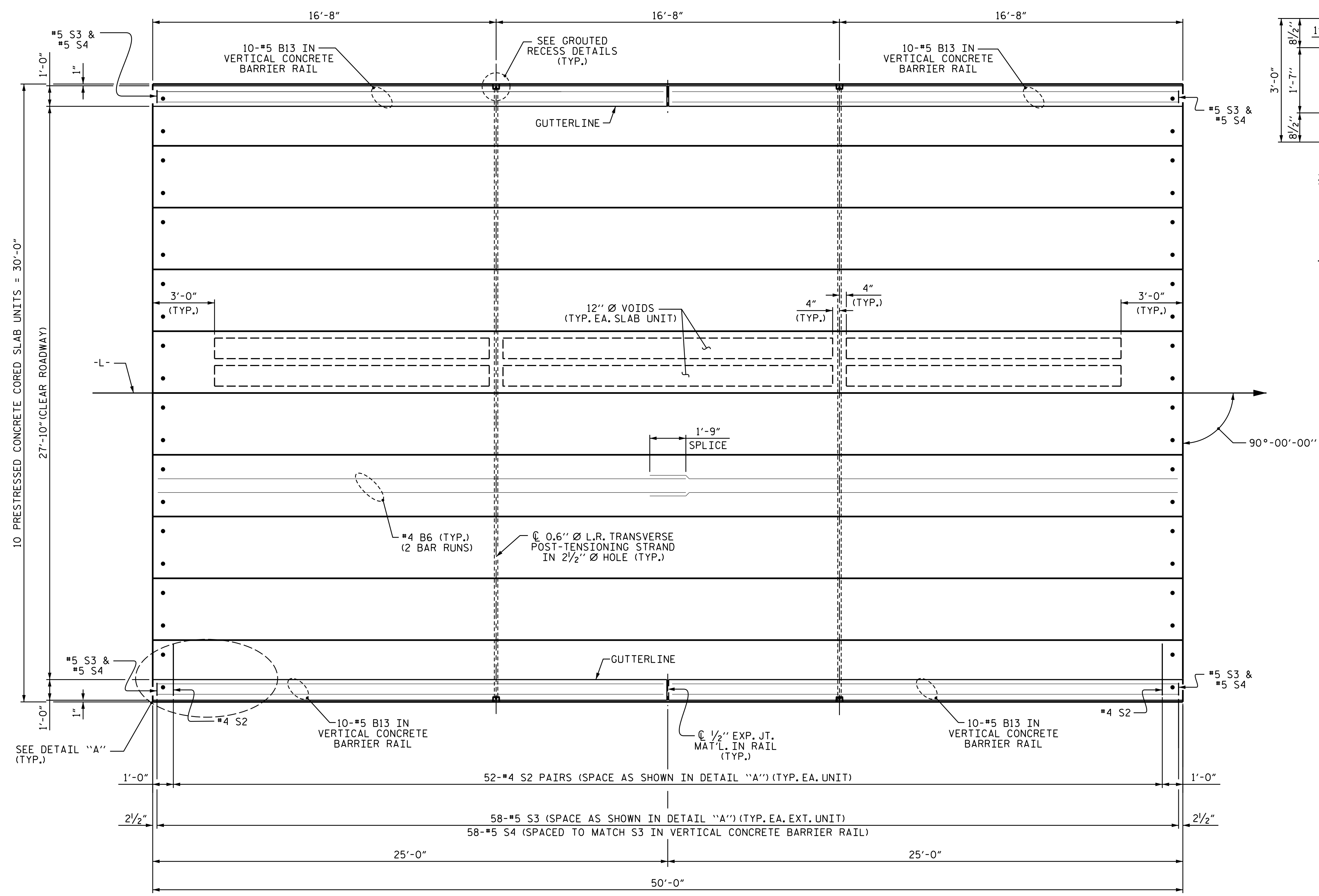
9/16/2019
MARSHALL G. CHECK, JR.
ENGINEER

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

706 HILLSBOROUGH STREET SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-6 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 21 |

| | | | |
|----------------|-----|--------|-------|
| ASSEMBLED BY : | TBE | DATE : | 10/18 |
| CHECKED BY : | MGC | DATE : | 02/19 |
| DRAWN BY : | CVC | 6/10 | |
| CHECKED BY : | DNS | 6/10 | |



DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

Marshall G. Cheek Jr.
 9/16/2019
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 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
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 CORP. LICENSE NO.: C-0275

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-

SHEET 2 OF 5

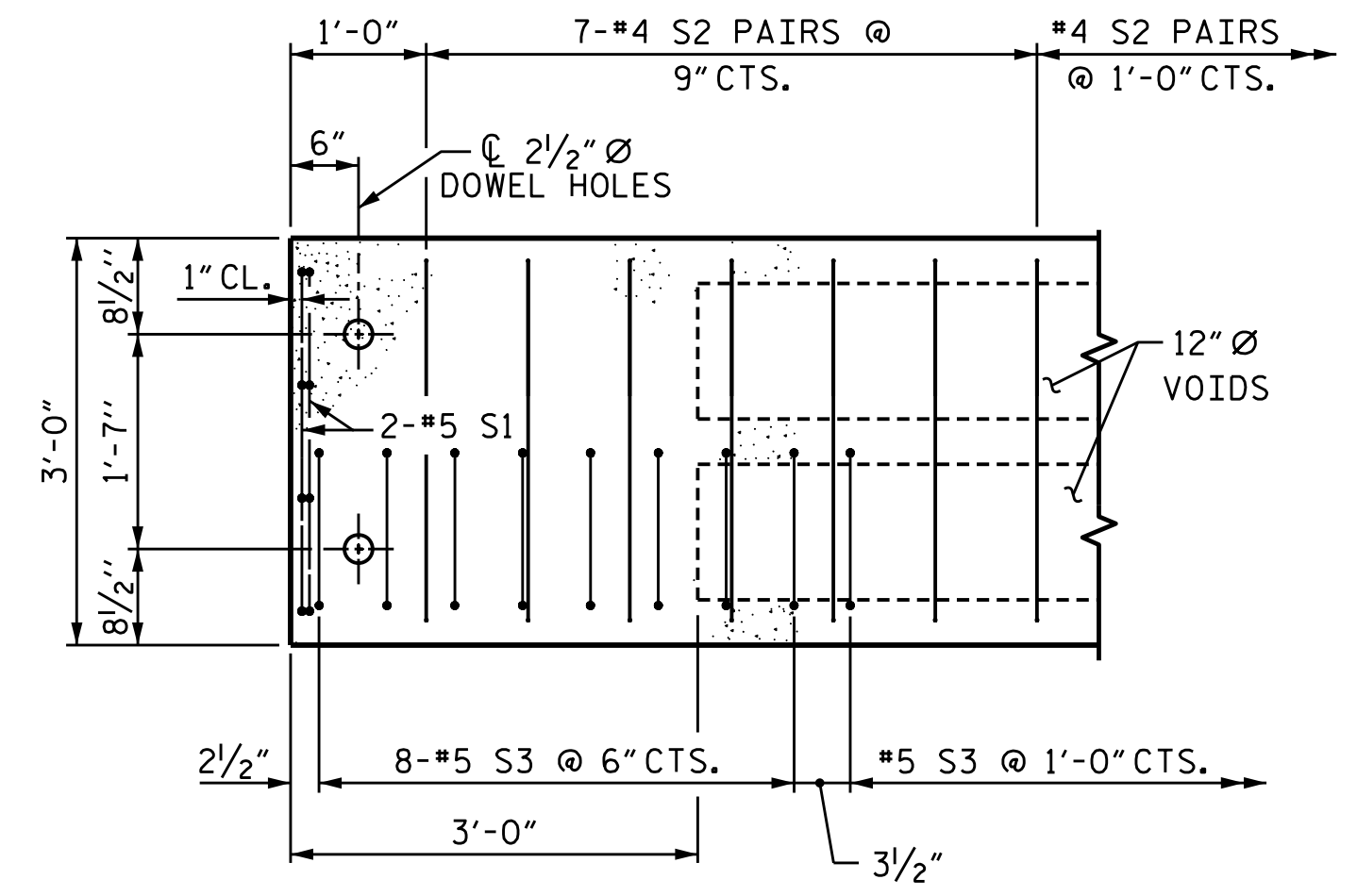
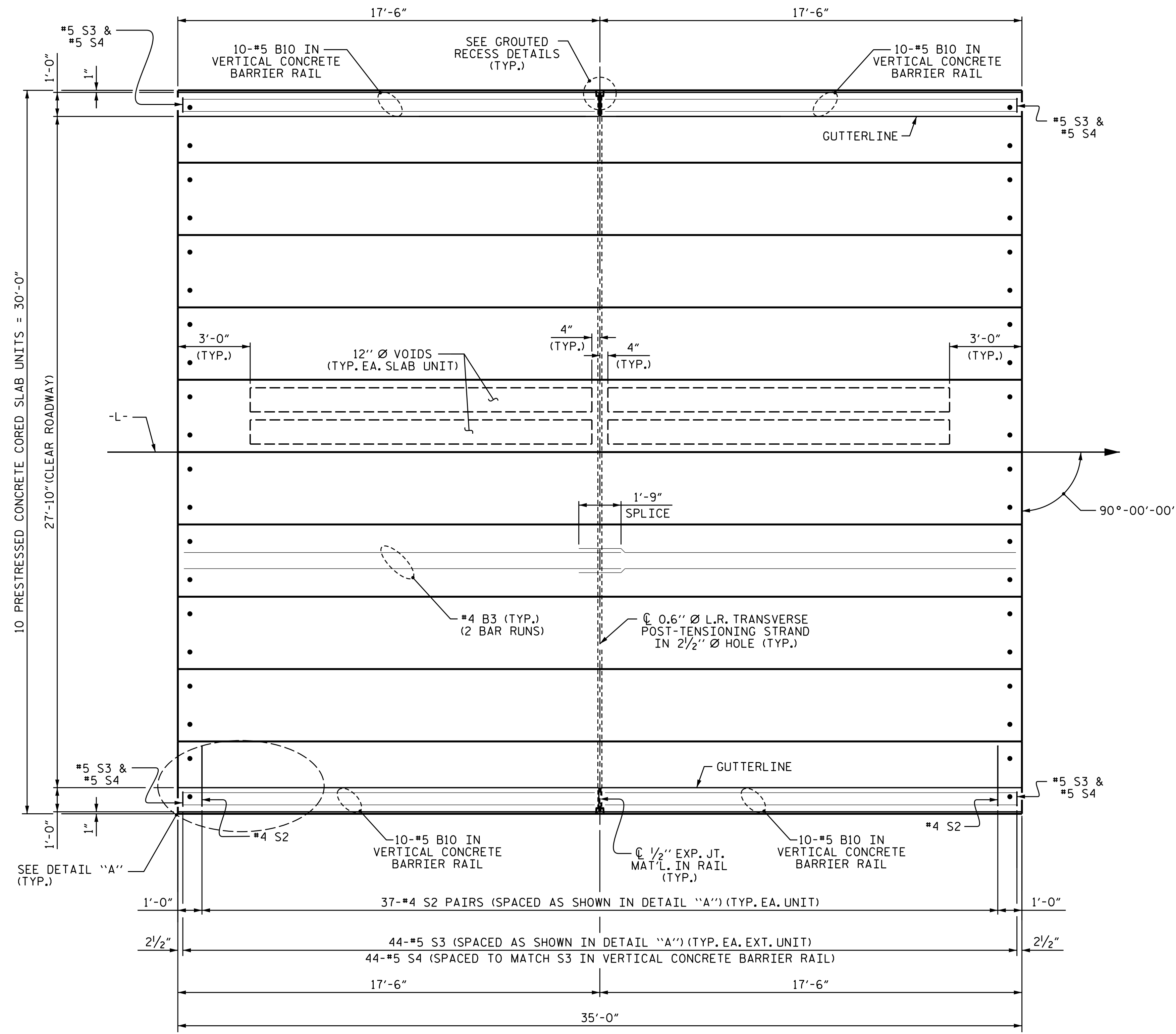
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
PLAN OF 50' UNIT
27'-10" CLEAR ROADWAY
90° SKEW

| | | | |
|----------------|----------|--------------|---------|
| ASSEMBLED BY : | TBE | DATE : | 10/18 |
| CHECKED BY : | MGC | DATE : | 11/18 |
| DRAWN BY : | DGE 3/09 | REV. 12/5/11 | MAA/AAC |
| CHECKED BY : | BCH 3/09 | REV. 8/14 | MAA/TMG |

8/29/2019
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| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-7 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 21 |

STD. NO. 21" PCS_30_90S_50L



DETAIL "A"
 (TYPICAL EACH END OF UNIT)
 NOTE: EXTERIOR UNIT SHOWN - INTERIOR UNIT SIMILAR EXCEPT OMIT #5 S3 BARS.

PLAN OF UNIT

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-
 SHEET 3 OF 5



9/16/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
PLAN OF 35' UNIT
27'-10" CLEAR ROADWAY
90° SKEW

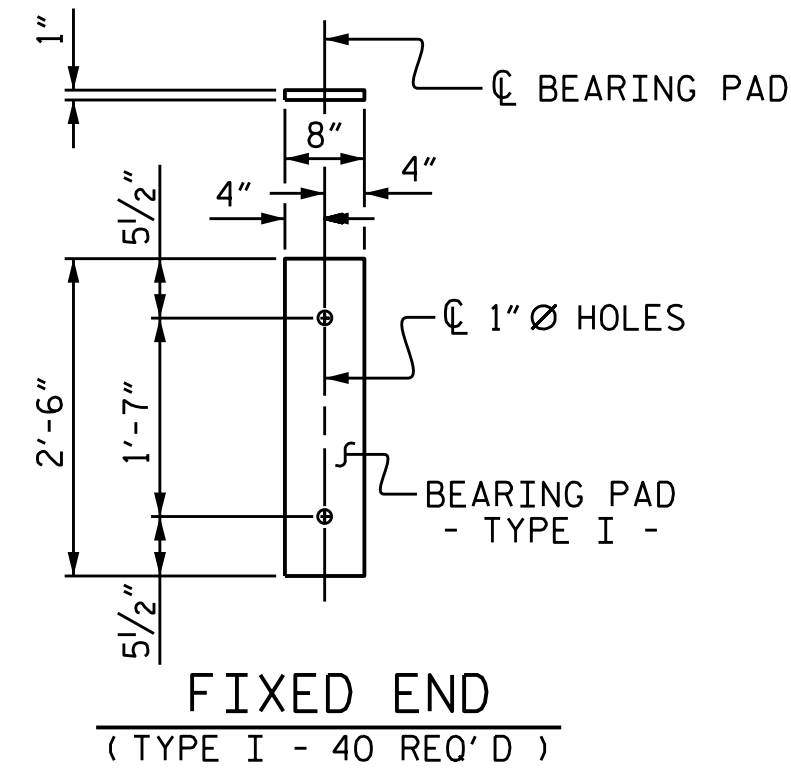
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| ASSEMBLED BY : | TBE | DATE : | 10/18 |
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| DRAWN BY : | DGE 3/09 | REV. 12/5/11 | MAA/AAC |
| CHECKED BY : | BCH 3/09 | REV. 8/14 | MAA/TMG |

8/29/2019
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 User:zsmith

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 CORP. LICENSE NO.: C-0275

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-8 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 21 |

STD. NO. 21" PCS_30_90S_35L



ELASTOMERIC BEARING DETAILS

ELASTOMER IN ALL BEARINGS SHALL BE 50 DUROMETER HARDNESS.

| BILL OF MATERIAL FOR ONE 35' CORED SLAB UNIT | | | | | | | |
|--|--------|------|------|---------------|--------|---------------|--------|
| | | | | EXTERIOR UNIT | | INTERIOR UNIT | |
| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT | LENGTH | WEIGHT |
| B3 | 4 | #4 | STR | 18'-3" | 49 | 18'-3" | 49 |
| S1 | 8 | #5 | 3 | 4'-3" | 35 | 4'-3" | 35 |
| S2 | 74 | #4 | 3 | 5'-4" | 264 | 5'-4" | 264 |
| * S3 | 44 | #5 | 1 | 5'-10" | 268 | | |
| REINFORCING STEEL | | | | LBS. | 348 | | 348 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | 268 | | |
| 5000 P.S.I. CONCRETE | | | | CU. YDS. | 5.1 | | 5.1 |
| 0.6" Ø L.R. STRANDS | | | | No. | 9 | | 9 |

| BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL | | | | | | |
|---|---------------------------------|-----------|------|---------|--------|--------|
| BAR | BARS PER PAIR OF EXTERIOR UNITS | TOTAL NO. | SIZE | TYPE | LENGTH | WEIGHT |
| 35' UNIT | | | | | | |
| *B10 | 40 | 40 | #5 | STR | 17'-1" | 713 |
| * S4 | 88 | 88 | #5 | 2 | 7'-2" | 658 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | | 1371 |
| CLASS AA CONCRETE | | | | CU.YDS. | | 9.0 |
| TOTAL VERTICAL CONCRETE BARRIER RAIL | | | | LN.FT. | | 70.13 |

| BILL OF MATERIAL FOR VERTICAL CONCRETE BARRIER RAIL | | | | | | |
|---|---------------------------------|-----------|------|---------|--------|--------|
| BAR | BARS PER PAIR OF EXTERIOR UNITS | TOTAL NO. | SIZE | TYPE | LENGTH | WEIGHT |
| 50' UNIT | | | | | | |
| *B13 | 40 | 40 | #5 | STR | 24'-7" | 1026 |
| * S4 | 116 | 116 | #5 | 2 | 7'-2" | 867 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | | 1893 |
| CLASS AA CONCRETE | | | | CU.YDS. | | 12.8 |
| TOTAL VERTICAL CONCRETE BARRIER RAIL | | | | LN.FT. | | 100.13 |

| BILL OF MATERIAL FOR ONE 50' CORED SLAB UNIT | | | | | | | |
|--|--------|------|------|---------------|--------|---------------|--------|
| | | | | EXTERIOR UNIT | | INTERIOR UNIT | |
| BAR | NUMBER | SIZE | TYPE | LENGTH | WEIGHT | LENGTH | WEIGHT |
| B6 | 4 | #4 | STR | 25'-9" | 69 | 25'-9" | 69 |
| S1 | 8 | #5 | 3 | 4'-3" | 35 | 4'-3" | 35 |
| S2 | 104 | #4 | 3 | 5'-4" | 371 | 5'-4" | 371 |
| * S3 | 58 | #5 | 1 | 5'-10" | 353 | | |
| REINFORCING STEEL | | | | LBS. | 475 | | 475 |
| * EPOXY COATED REINFORCING STEEL | | | | LBS. | 353 | | |
| 6500 P.S.I. CONCRETE | | | | CU. YDS. | 7.1 | | 7.1 |
| 0.6" Ø L.R. STRANDS | | | | No. | 19 | | 19 |

NOTES

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLABS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2 1/2" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT.

THE BACKER RODS SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, AN INTERNAL HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDWAYS. AT LEAST SIX WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

ALL REINFORCING STEEL IN THE VERTICAL CONCRETE BARRIER RAIL SHALL BE EPOXY COATED.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

GROOVED CONTRACTION JOINTS, 1/2" IN DEPTH, SHALL BE TOOLED IN ALL EXPOSED FACES OF THE BARRIER RAIL AND IN ACCORDANCE WITH ARTICLE 825-10(B) OF THE STANDARD SPECIFICATIONS. A CONTRACTION JOINT SHALL BE LOCATED AT EACH THIRD POINT BETWEEN BARRIER RAIL EXPANSION JOINTS. ONLY ONE CONTRACTION JOINT IS REQUIRED AT MIDPOINT OF BARRIER RAIL SEGMENTS LESS THAN 20 FEET IN LENGTH AND NO CONTRACTION JOINTS ARE REQUIRED FOR THOSE SEGMENTS LESS THAN 10 FEET IN LENGTH.

FLAME CUTTING OF THE TRANSVERSE POST-TENSIONING STRAND IS NOT ALLOWED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN THE REQUIRED STRENGTH SHOWN IN THE "CONCRETE RELEASE STRENGTH" TABLE.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

THE PERMITTED THREADED INSERTS ARE DETAILED AS AN OPTION FOR THE CONTRACTOR TO ATTACH FALSEWORK AND FORMWORK DURING CONSTRUCTION.

THE PERMITTED THREADED INSERTS IN THE EXTERIOR UNITS SHALL BE SIZED BY THE CONTRACTOR, SPACED AT 4'-0" CENTERS AND GALVANIZED IN ACCORDANCE WITH SECTION 1076 OF THE STANDARD SPECIFICATIONS. STAINLESS STEEL THREADED INSERTS MAY BE USED AS AN ALTERNATE.

THE PERMITTED THREADED INSERTS SHALL BE GROUTED BY THE CONTRACTOR IMMEDIATELY FOLLOWING REMOVAL OF THE FALSEWORK.

THE COST OF THE PERMITTED THREADED INSERTS SHALL BE INCLUDED IN THE PRICE BID FOR THE PRECAST UNITS.

| CORED SLABS REQUIRED | | | |
|----------------------|--------|--------|--------------|
| 35' UNIT | NUMBER | LENGTH | TOTAL LENGTH |
| EXTERIOR C.S. | 2 | 35'-0" | 70'-0" |
| INTERIOR C.S. | 8 | 35'-0" | 280'-0" |
| TOTAL | 10 | | 350'-0" |

| CORED SLABS REQUIRED | | | |
|----------------------|--------|--------|--------------|
| 50' UNIT | NUMBER | LENGTH | TOTAL LENGTH |
| EXTERIOR C.S. | 2 | 50'-0" | 100'-0" |
| INTERIOR C.S. | 8 | 50'-0" | 400'-0" |
| TOTAL | 10 | | 500'-0" |

| GRADE 270 STRANDS | |
|--------------------------------------|-------------|
| | 0.6" Ø L.R. |
| AREA (SQUARE INCHES) | 0.217 |
| ULTIMATE STRENGTH (LBS. PER STRAND) | 58,600 |
| APPLIED PRESTRESS (LBS. PER STRAND) | 43,950 |

| DEAD LOAD DEFLECTION AND CAMBER | |
|--|--------------------|
| | 3'-0" x 1'-9" |
| 35' CORED SLAB UNIT | 0.6" Ø L.R. STRAND |
| CAMBER (SLAB ALONE IN PLACE) | 1/4" ↑ |
| DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** | 1/8" ↓ |
| FINAL CAMBER | 1/8" ↑ |

** INCLUDES FUTURE WEARING SURFACE

| DEAD LOAD DEFLECTION AND CAMBER | |
|--|--------------------|
| | 3'-0" x 1'-9" |
| 50' CORED SLAB UNIT | 0.6" Ø L.R. STRAND |
| CAMBER (SLAB ALONE IN PLACE) | 1/2" ↑ |
| DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD** | 3/8" ↓ |
| FINAL CAMBER | 1/8" ↑ |

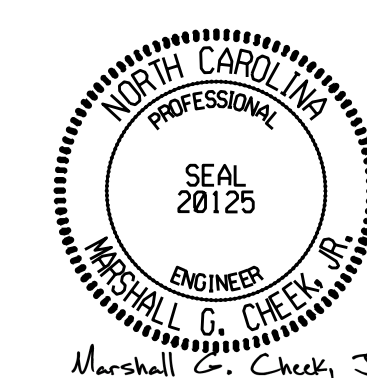
** INCLUDES FUTURE WEARING SURFACE

| CONCRETE RELEASE STRENGTH | |
|---------------------------|------|
| UNIT | PSI |
| 35' UNITS | 4000 |
| 50' UNITS | 4900 |

| GUTTERLINE ASPHALT THICKNESS & RAIL HEIGHT | | |
|--|---------------------------|-------------|
| | ASPHALT OVERLAY THICKNESS | RAIL HEIGHT |
| | @ MID-SPAN | @ MID-SPAN |
| 35' UNITS | 2 5/8" | 3'-8 5/8" |
| 50' UNITS | 1 5/8" | 3'-7 5/8" |

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-

SHEET 4 OF 5

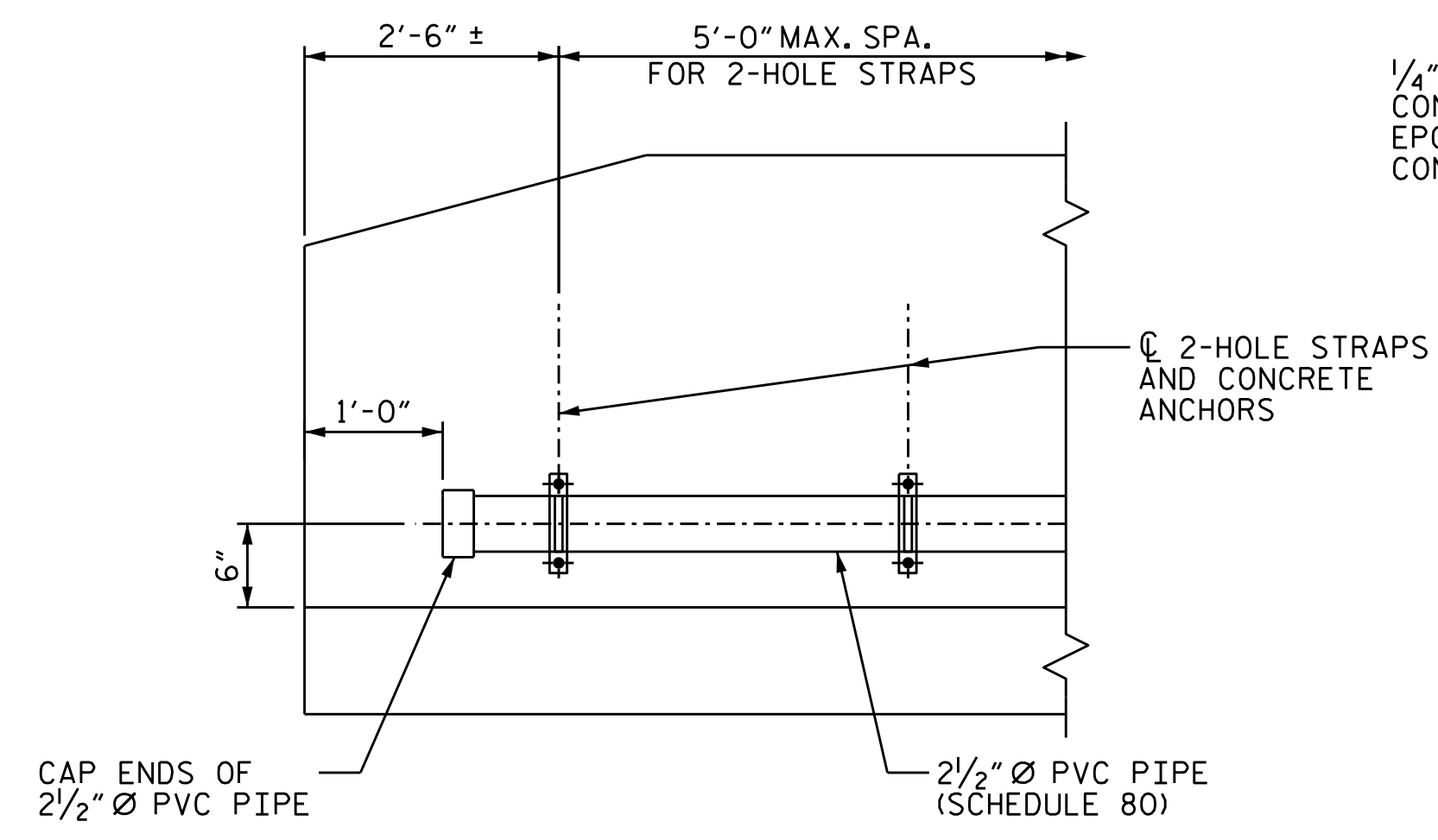


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 3'-0" X 1'-9"
 PRESTRESSED CONCRETE
 CORED SLAB UNIT
 90° SKEW

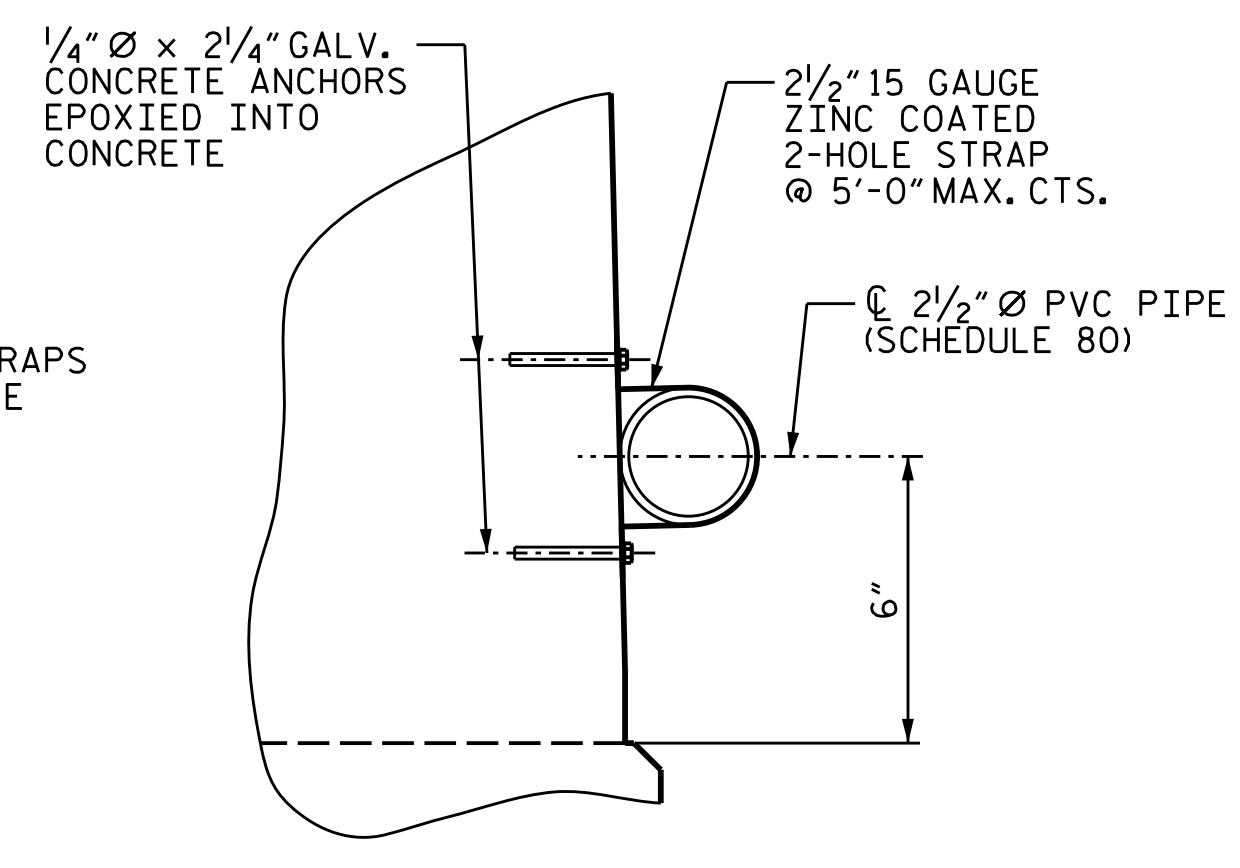
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|----------------|----------|-----------|---------|
| ASSEMBLED BY : | TBE | DATE : | 10/18 |
| CHECKED BY : | MGC | DATE : | 02/19 |
| DRAWN BY : | DGE 5/09 | REV. 5/18 | MAA/THC |
| CHECKED BY : | BCH 6/09 | | |

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 SUITE 200
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 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

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| NO. | BY: | DATE: | NO. | BY: | DATE: | S-9 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 21 |



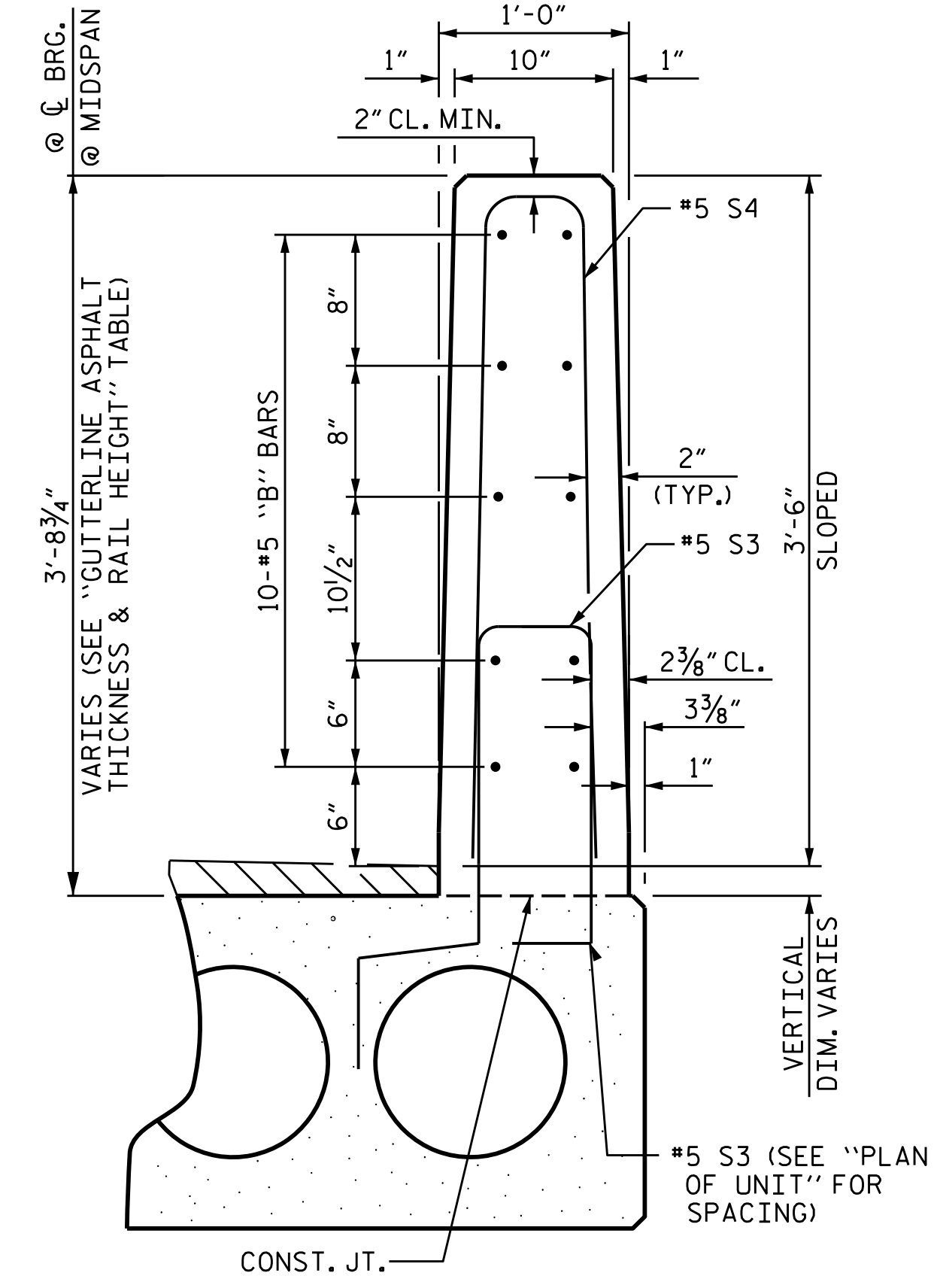
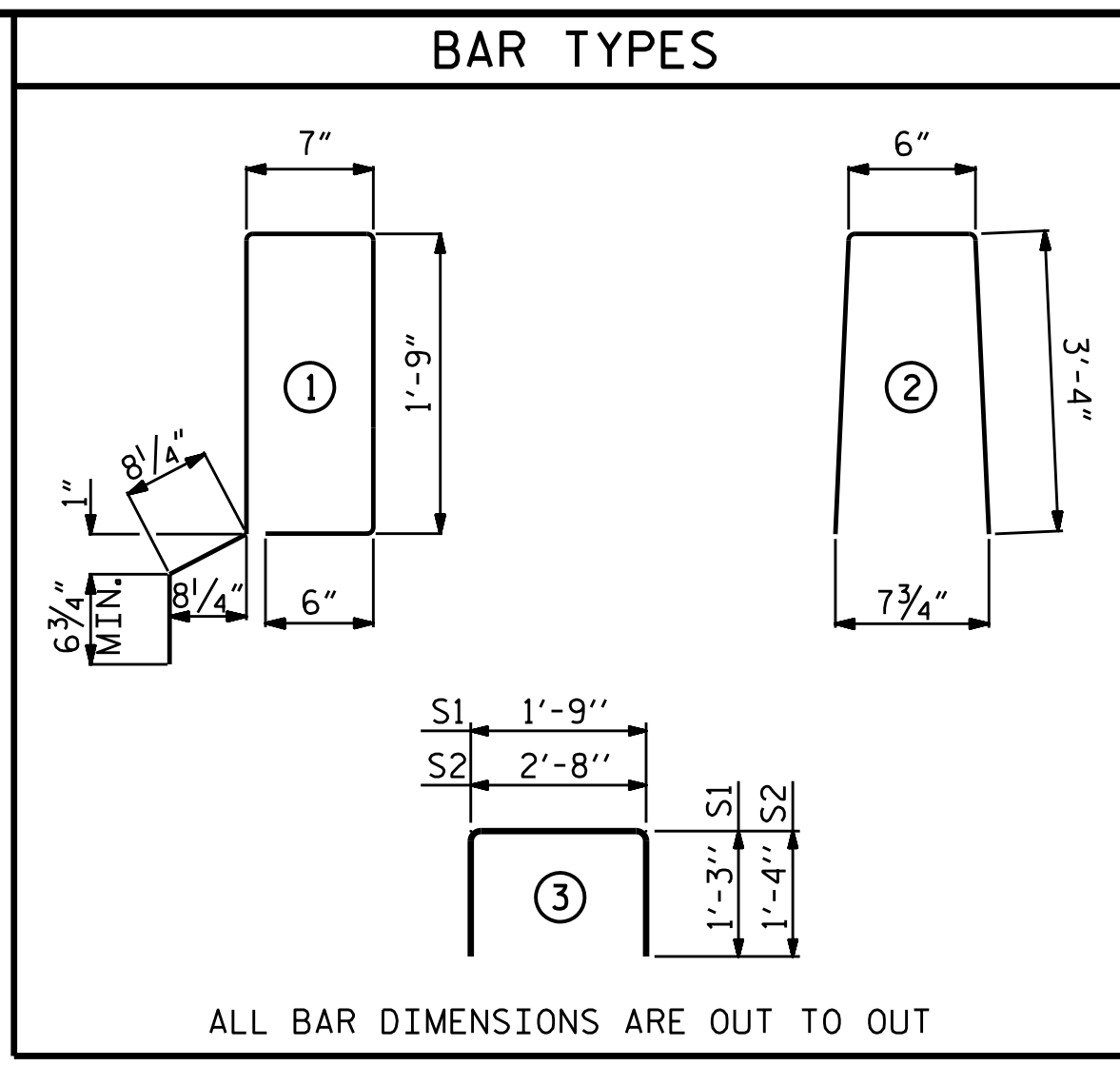
ELEVATION



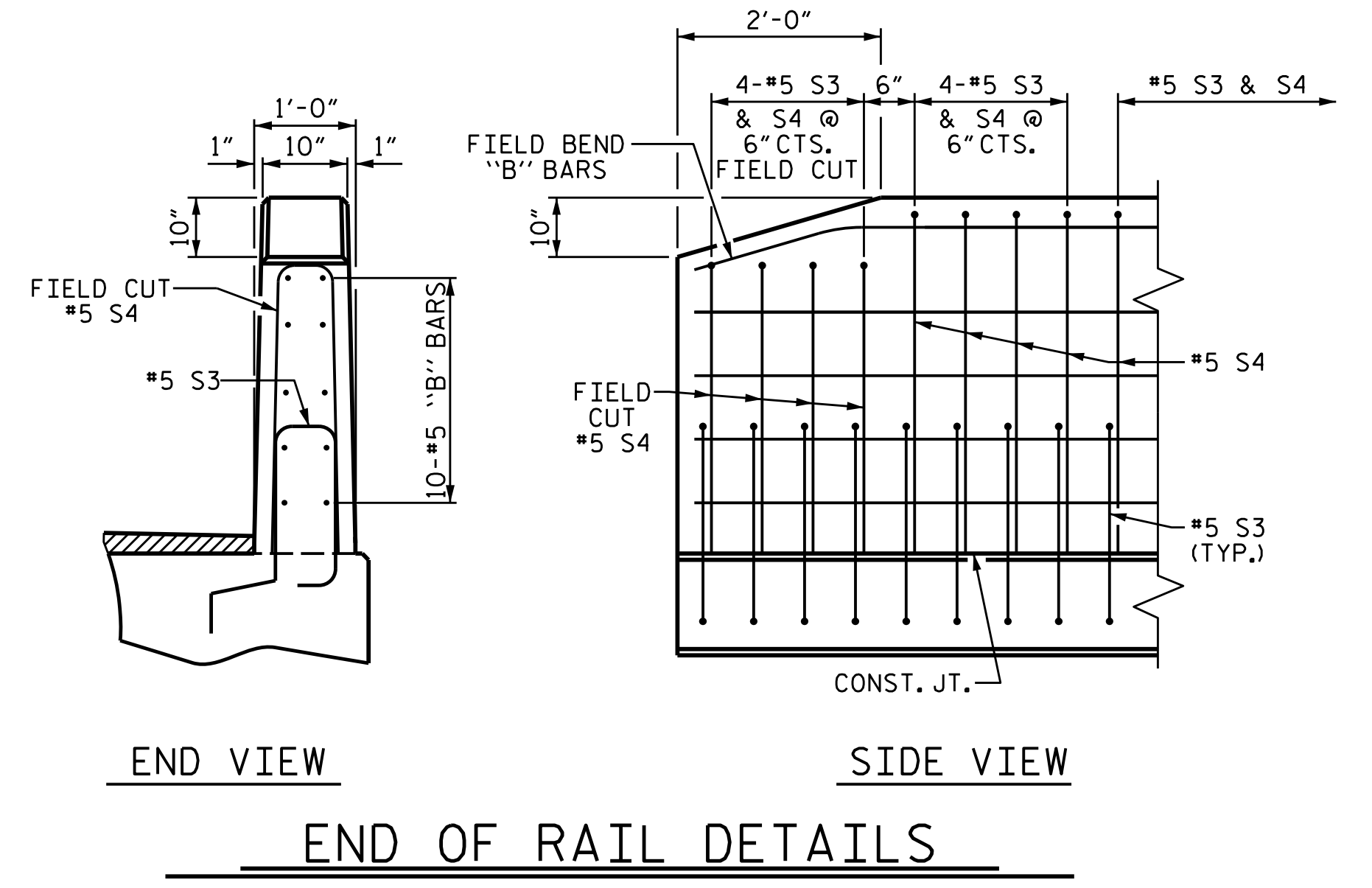
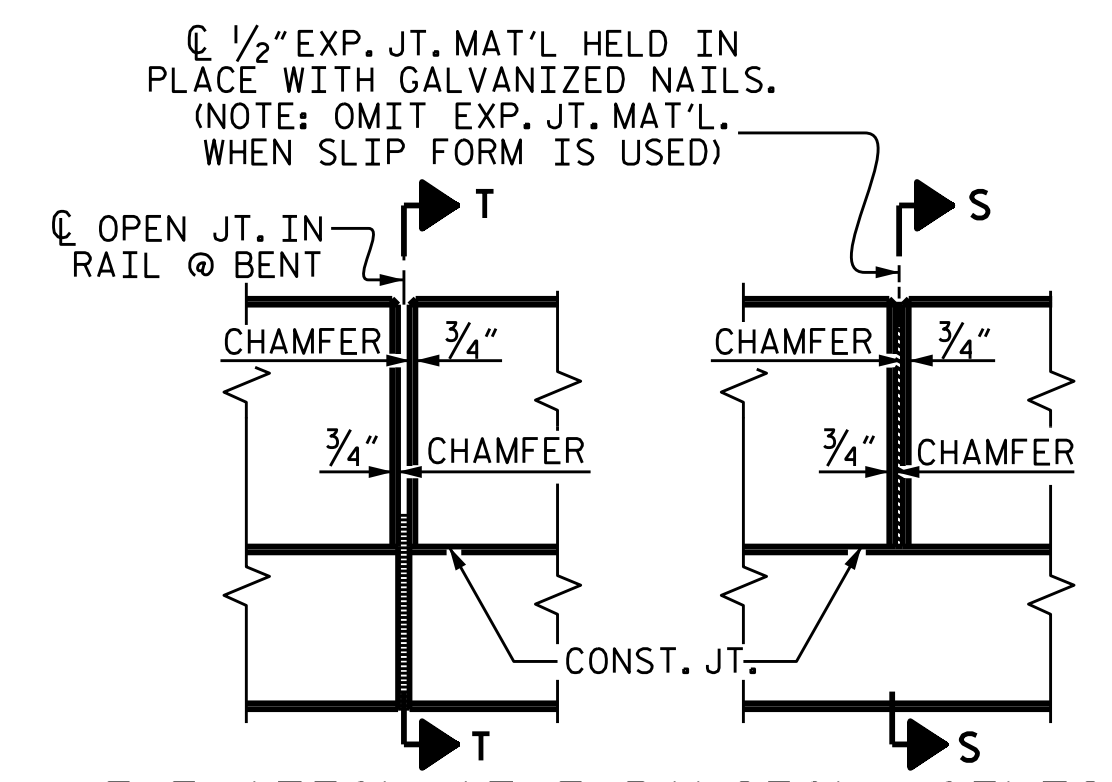
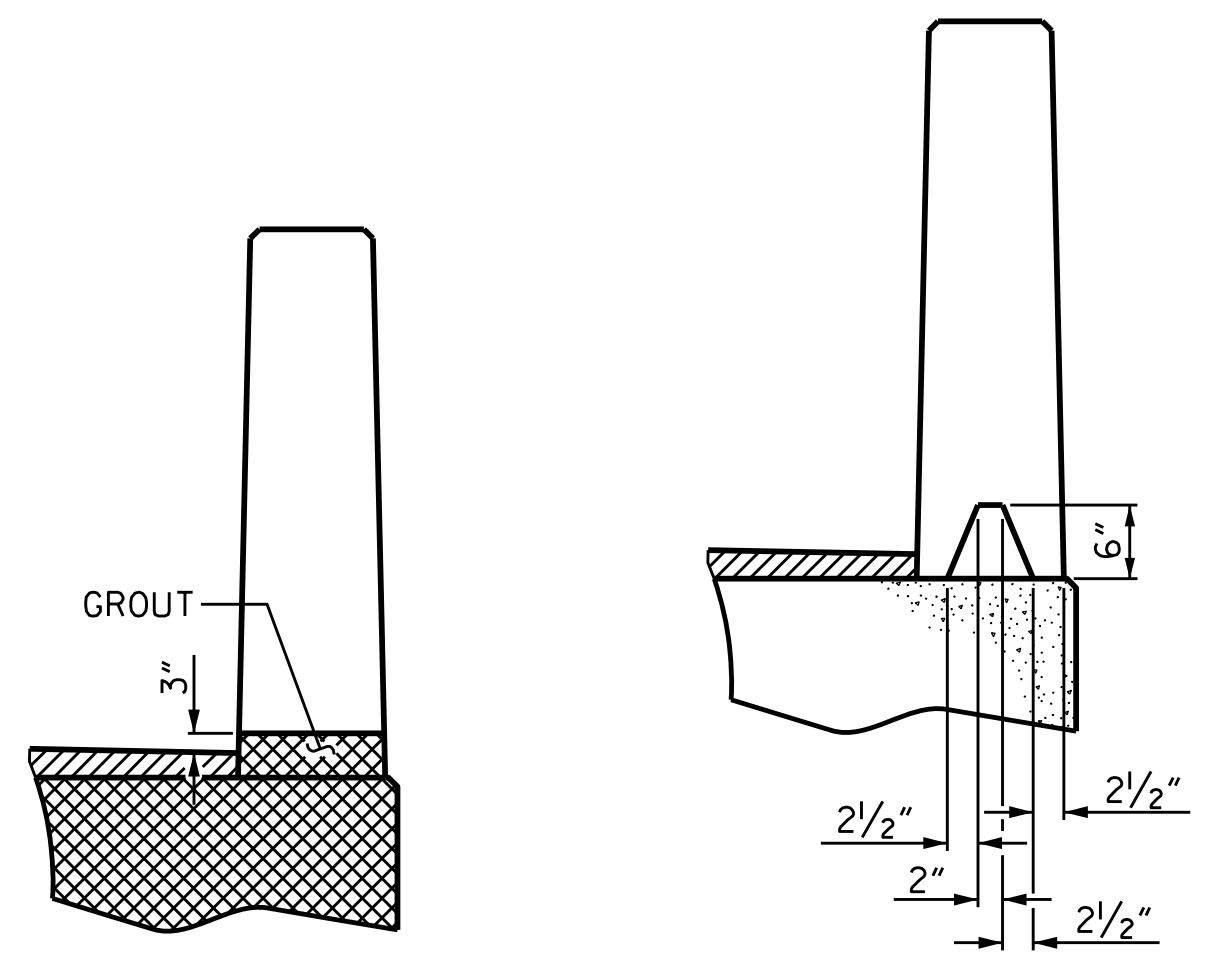
SECTION

FIBER OPTIC CONDUIT SYSTEM DETAILS

2 1/2" Ø SCHEDULE 80 PVC PIPE ATTACHED TO THE BACK OF BOTH RAILS FOR FUTURE FIBER OPTIC CABLE.



VERTICAL CONCRETE BARRIER RAIL SECTION



| | | | |
|----------------|----------|-----------|---------|
| ASSEMBLED BY : | TBE | DATE : | 10/18 |
| CHECKED BY : | MGC | DATE : | 02/19 |
| DRAWN BY : | DGE 5/09 | REV. 5/18 | MAA/THC |
| CHECKED BY : | BCH 6/09 | | |

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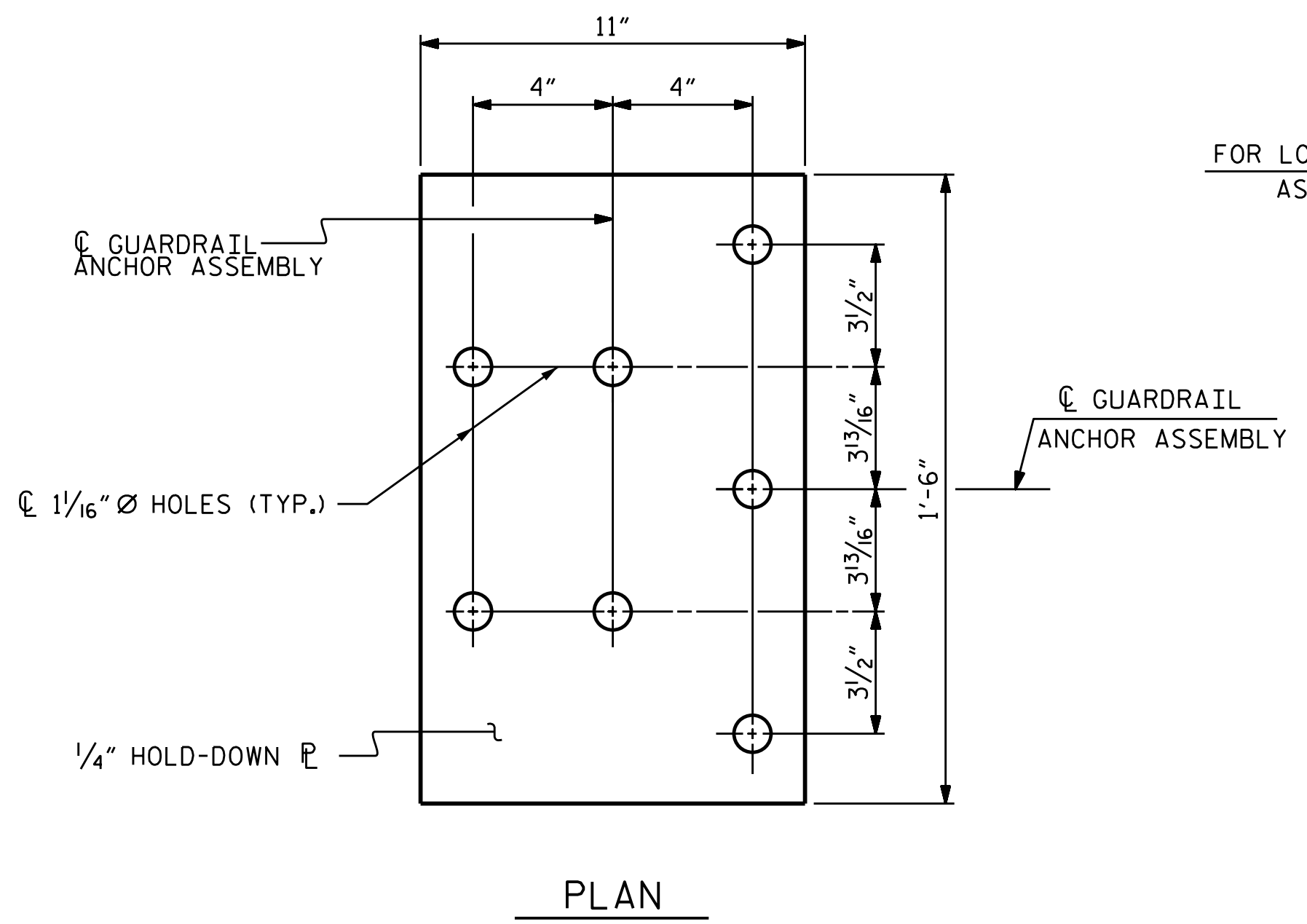
PROJECT NO. B-4433
BEAUFORT COUNTY
STATION: 16+20.00 -L-

SHEET 5 OF 5

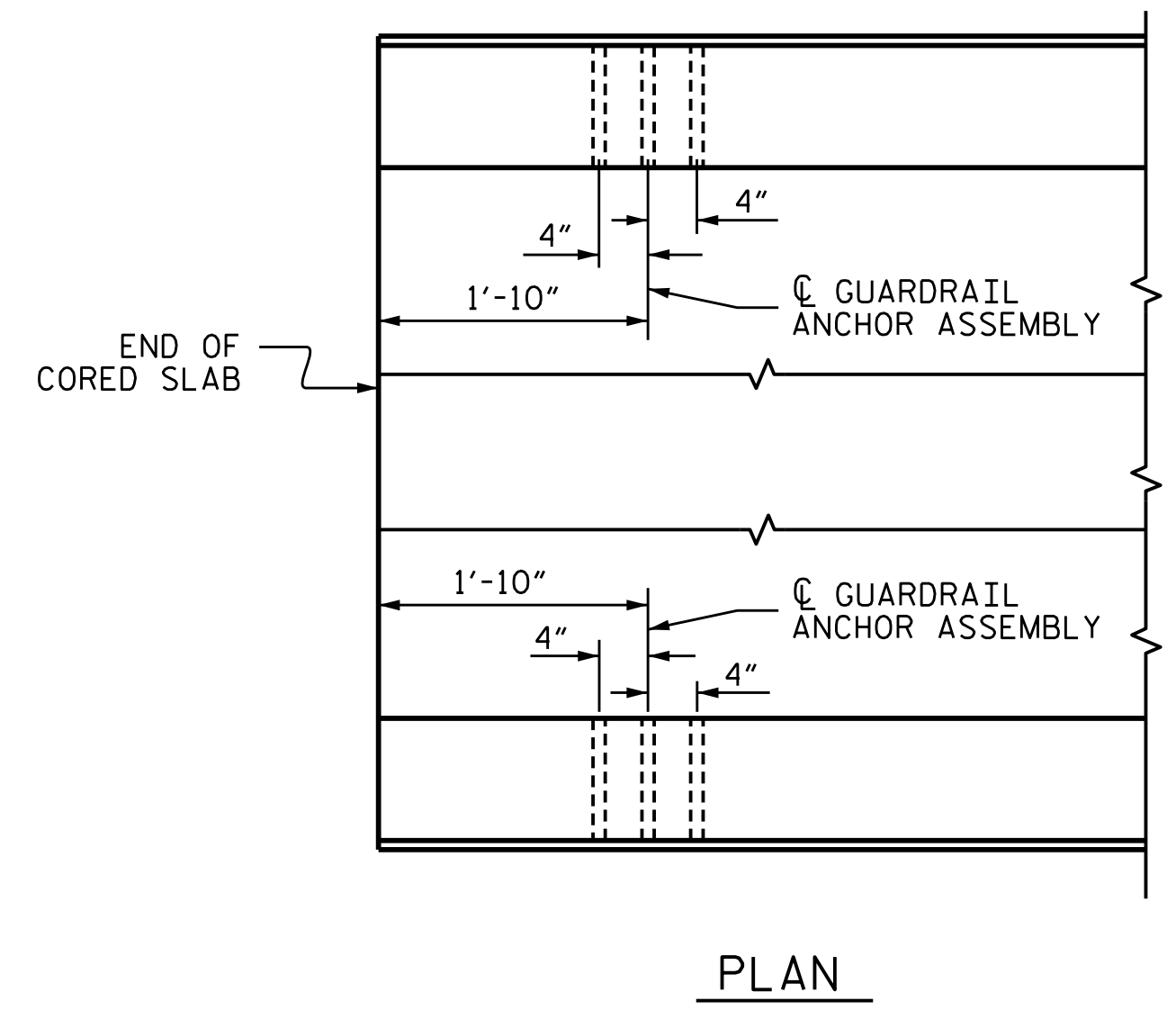
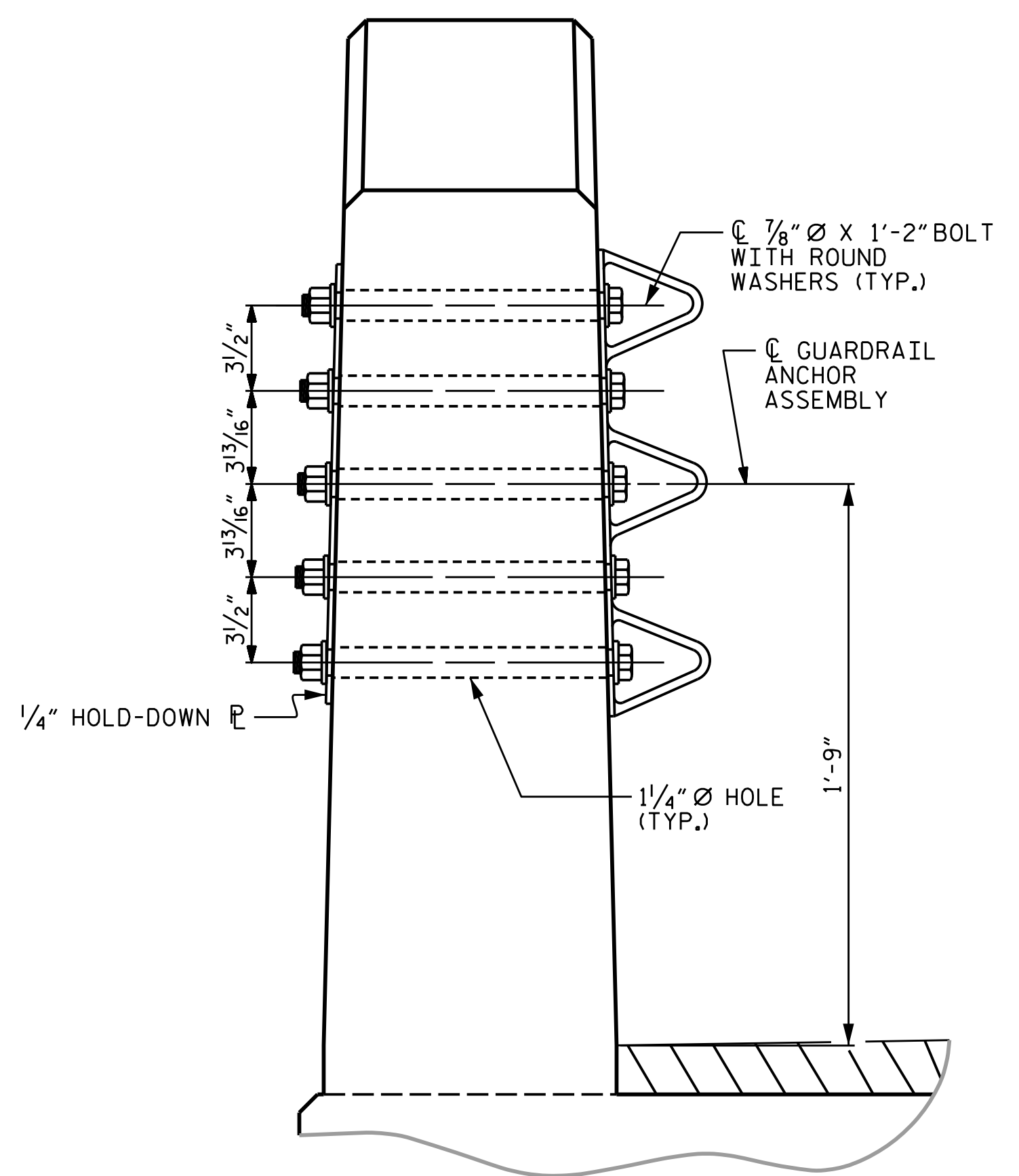
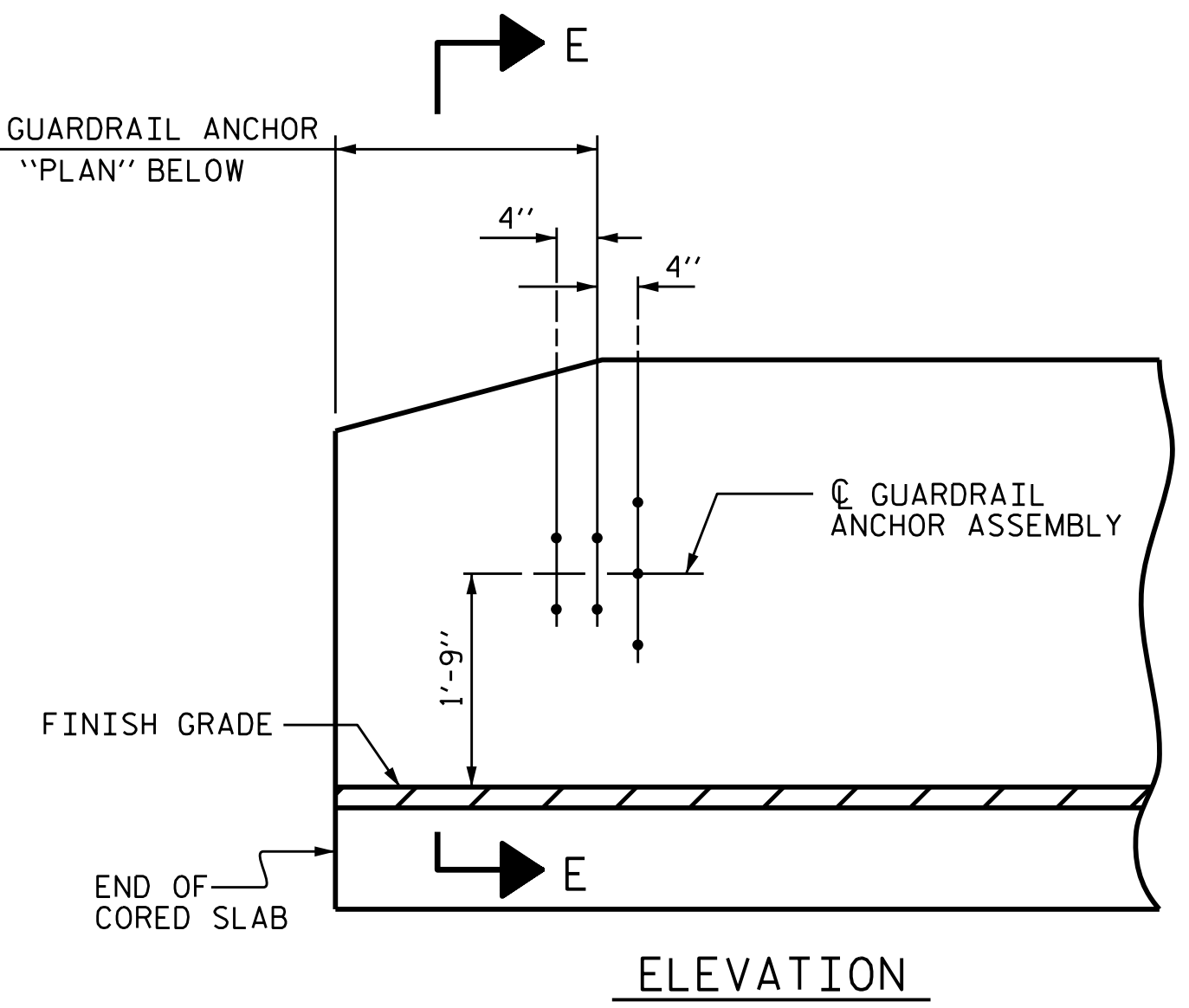
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STANDARD
3'-0" X 1'-9"
PRESTRESSED CONCRETE
CORED SLAB UNIT
90° SKEW

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-10 |
| 1 | | | 3 | | | TOTAL SHEETS 21 |
| 2 | | | 4 | | | |



FOR LOCATION OF GUARDRAIL ANCHOR ASSEMBLY, SEE "PLAN" BELOW



LOCATION OF ANCHORS FOR GUARDRAIL

END BENT #1 SHOWN, END BENT #2 SIMILAR.

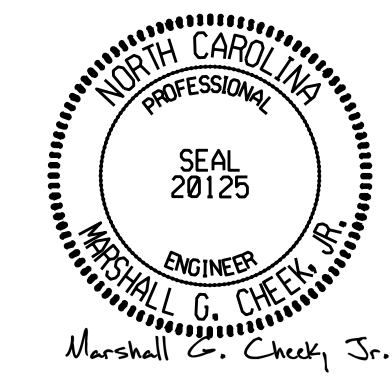


* DENOTES GUARDRAIL ANCHOR ASSEMBLY

NOTES

- THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A 1/4" HOLD DOWN PLATE AND 7 - 7/8" Ø BOLTS WITH NUTS AND WASHERS.
- THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.
- BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE 7/8" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)
- THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.
- AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.
- THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR VERTICAL CONCRETE BARRIER RAIL.
- THE VERTICAL REINFORCING BARS MAY BE SHIFTED SLIGHTLY IN THE VERTICAL CONCRETE BARRIER RAIL TO CLEAR ASSEMBLY BOLTS.
- THE 1 1/4" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 GUARDRAIL ANCHORAGE
 DETAILS
 FOR VERTICAL CONCRETE
 BARRIER RAIL

| | | | |
|----------------|-----|------------|---------|
| ASSEMBLED BY : | TBE | DATE : | 10/18 |
| CHECKED BY : | MGC | DATE : | 02/19 |
| DRAWN BY : | MAA | REV. 1/15 | MAA/TMG |
| CHECKED BY : | CM | REV. 12/17 | MAA/THC |
| | | REV. 5/18 | MAA/THC |

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| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-11 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 21 |

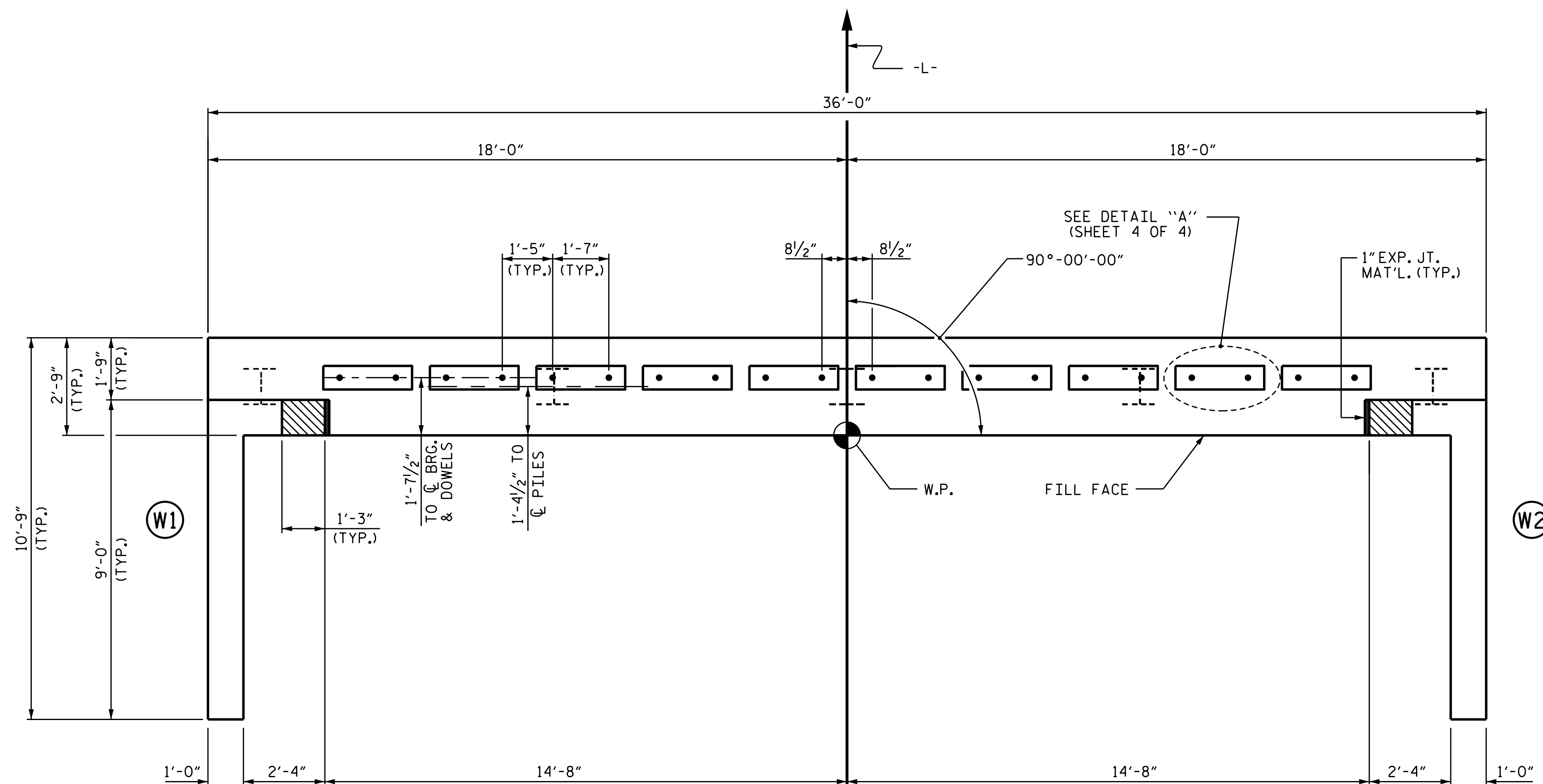
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

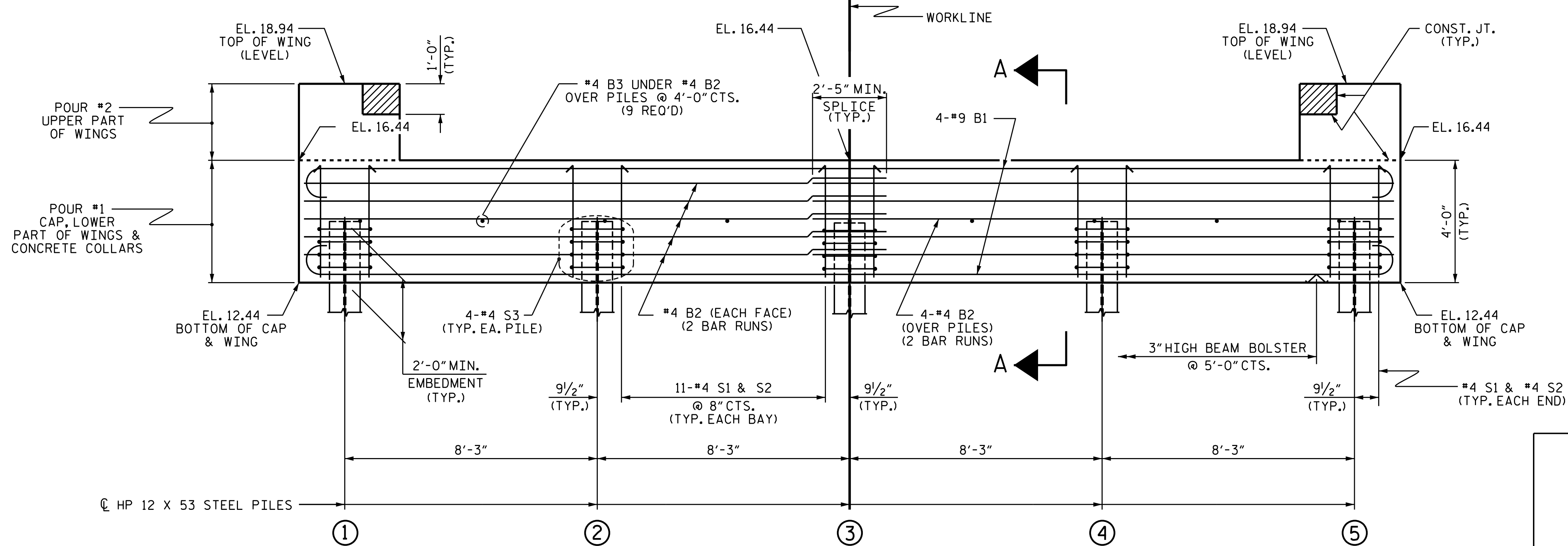
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN

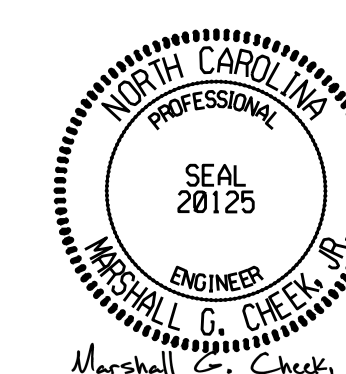


ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-

SHEET 1 OF 4



9/16/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 1

| | | | |
|----------------|-----------|-----------|---------|
| ASSEMBLED BY : | TBE | DATE : | 10/18 |
| CHECKED BY : | MGC | DATE : | 02/19 |
| DRAWN BY : | WJH 12/11 | REV. 4/15 | MAA/TMG |
| CHECKED BY : | AAC 12/11 | | |

8/29/2019
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| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |
| 1 | | | 3 | | | 21 |
| 2 | | | 4 | | | 21 |

STD. NO. EB_30_90S4

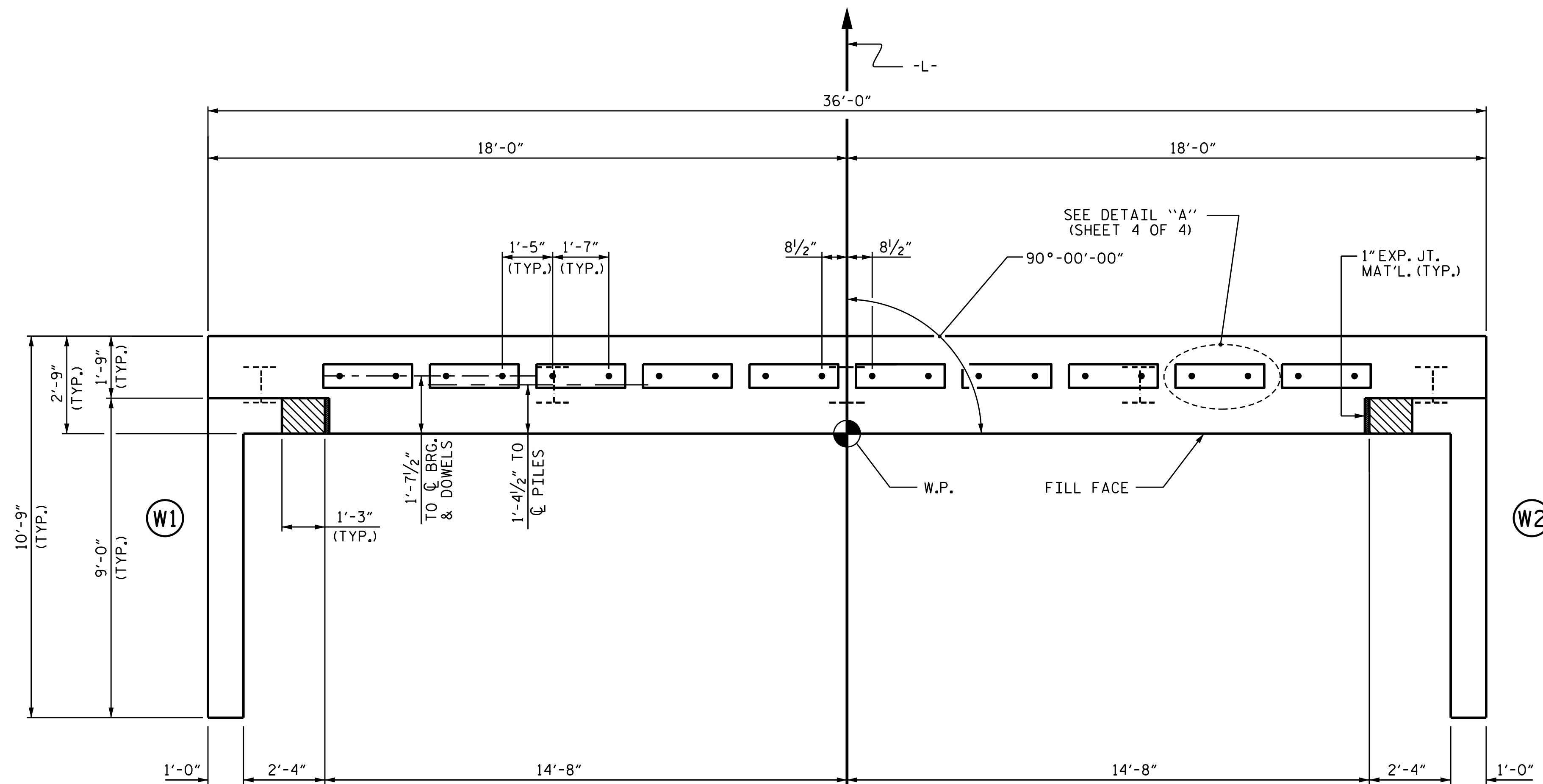
NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.

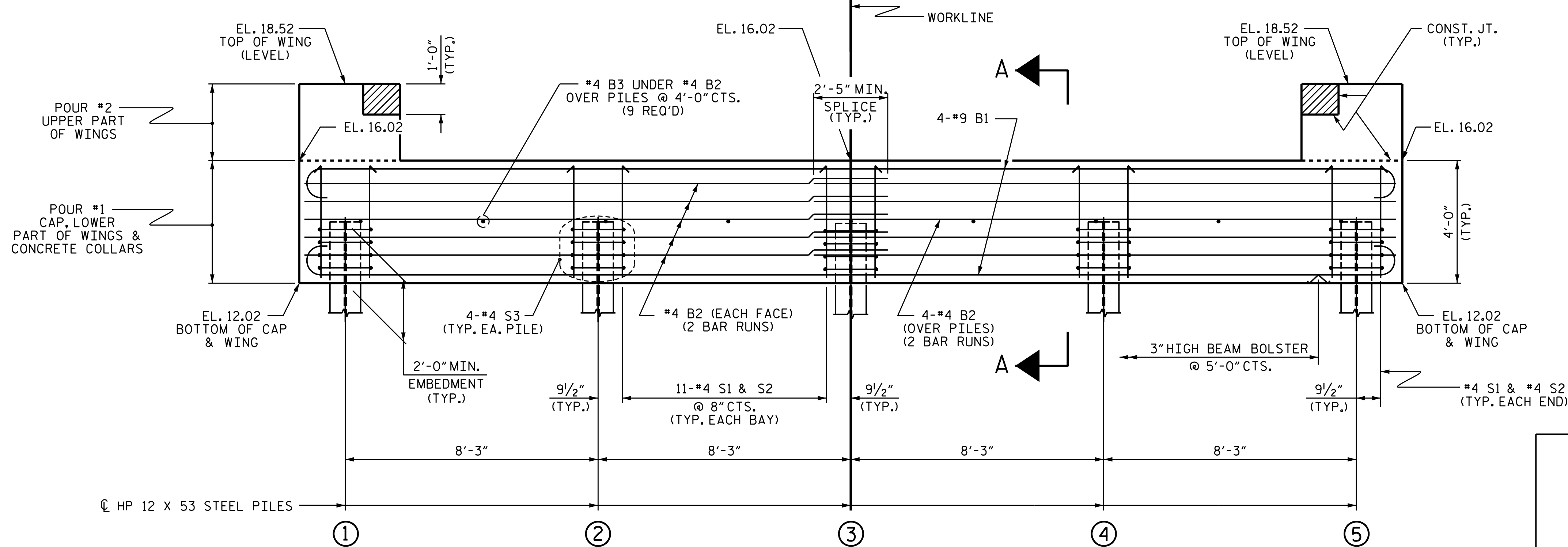
THE CONCRETE IN THE SHADED AREA OF THE WING SHALL BE POURED AFTER THE VERTICAL CONCRETE BARRIER RAIL IS CAST IF SLIP FORMING IS USED.

FOR PILE SPLICE DETAILS, SEE SHEET 4 OF 4.

FOR WING DETAILS, SEE SHEET 3 OF 4.



PLAN



ELEVATION

WINGS NOT SHOWN FOR CLARITY.
 FOR SECTION A-A, SEE SHEET 4 OF 4.
 CONCRETE COLLARS FOR STEEL PILES NOT SHOWN IN PLAN AND ELEVATION VIEWS FOR CLARITY.
 SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL", SHEET 4 OF 4.

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-

SHEET 2 OF 4



9/16/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT No. 2

| | |
|------------------------|--------------|
| ASSEMBLED BY : TBE | DATE : 10/18 |
| CHECKED BY : MGC | DATE : 02/19 |
| DRAWN BY : WJH 12/11 | REV. 4/15 |
| CHECKED BY : AAC 12/11 | MAA/TMG |

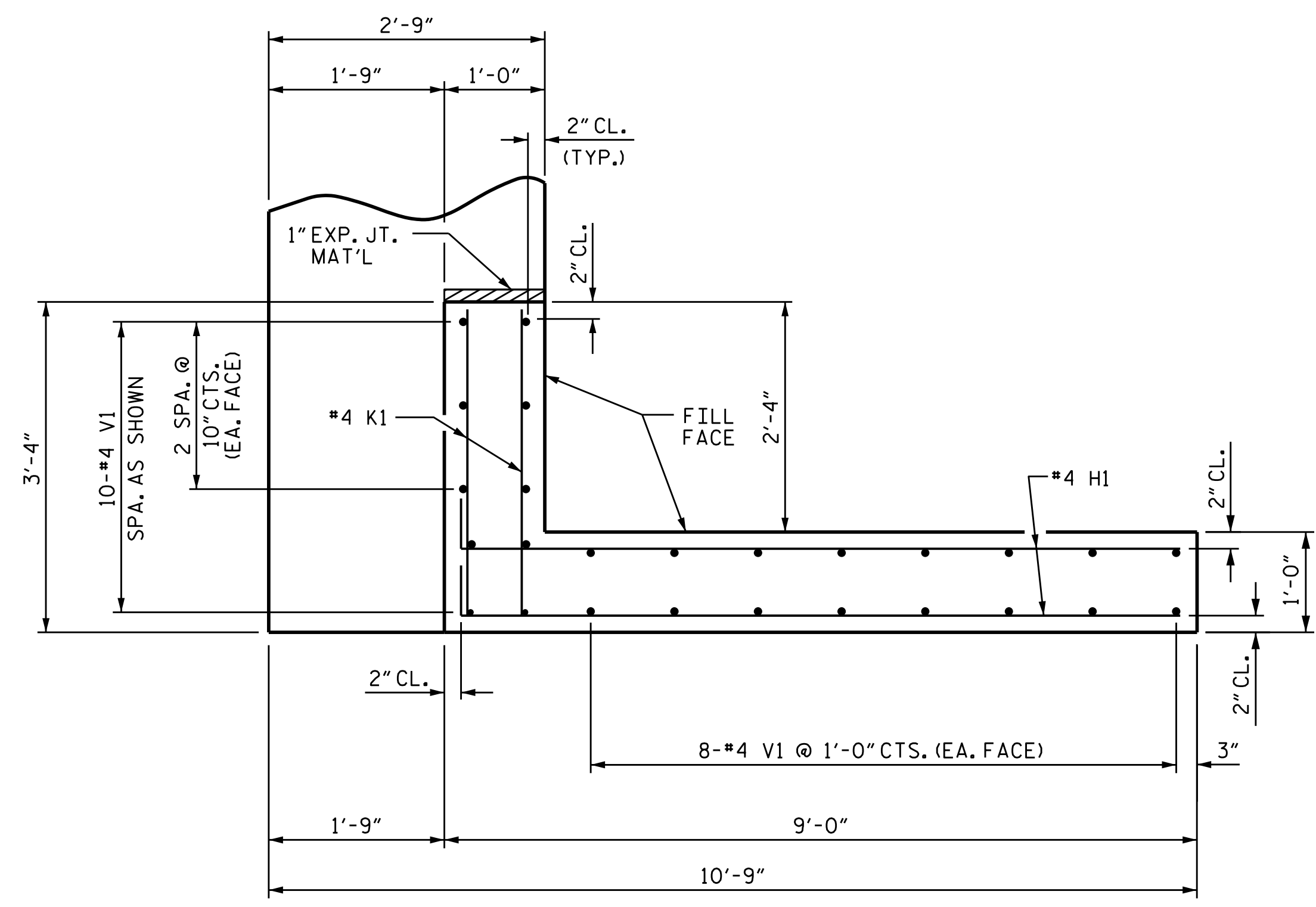
8/29/2019
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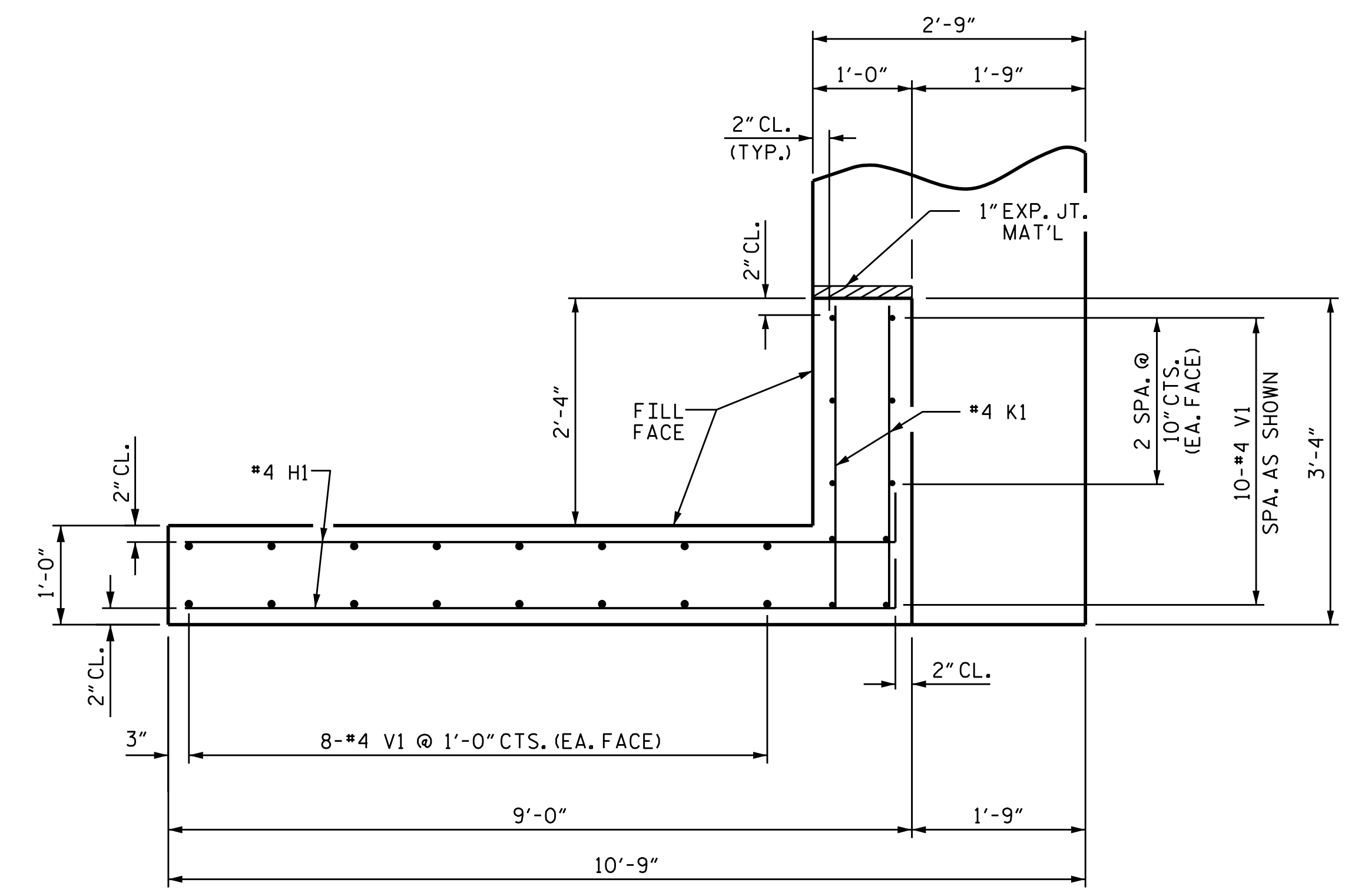
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| NO. | BY: | DATE: | NO. | BY: | DATE: | TOTAL SHEETS |
| 1 | | | 3 | | | 21 |
| 2 | | | 4 | | | 21 |

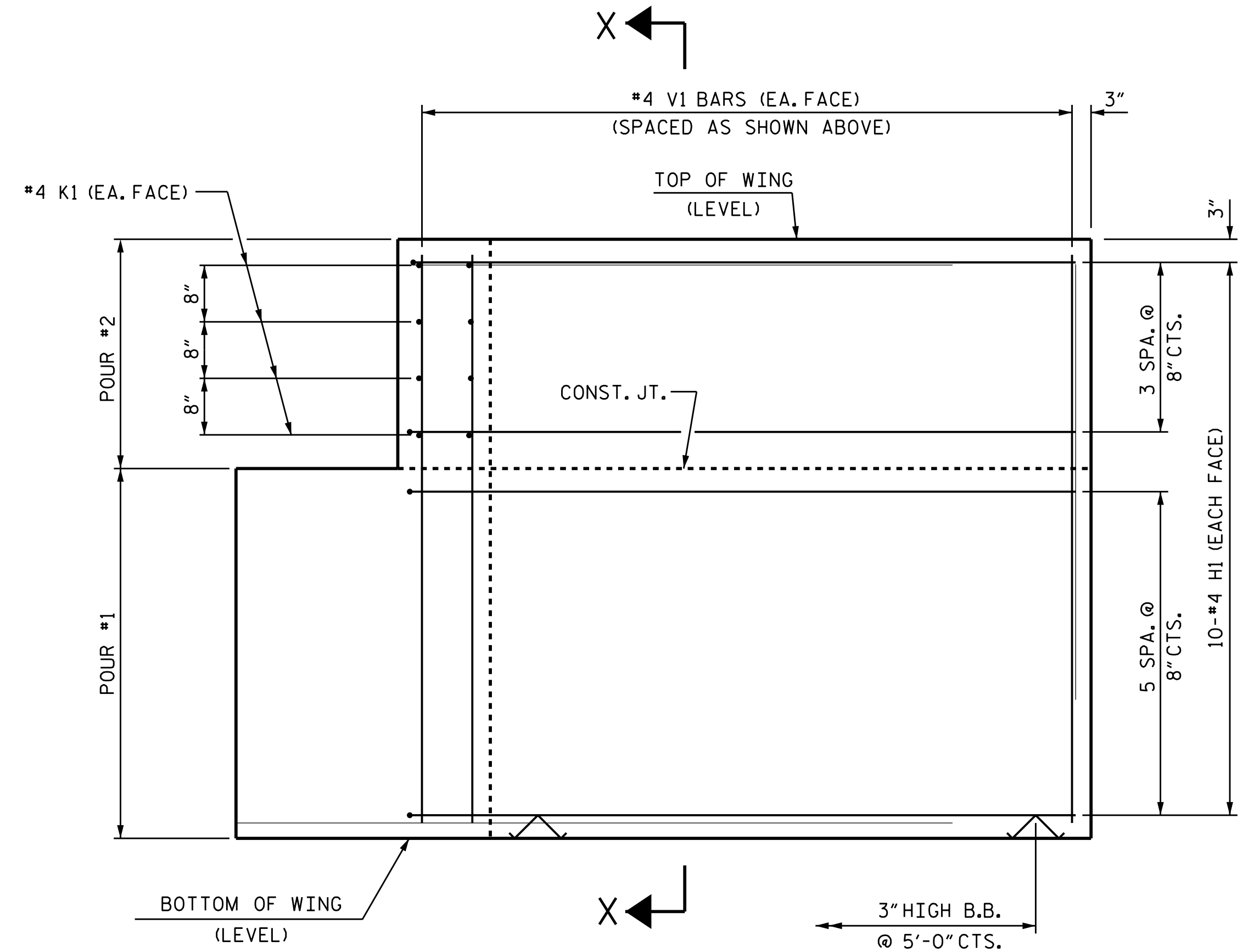
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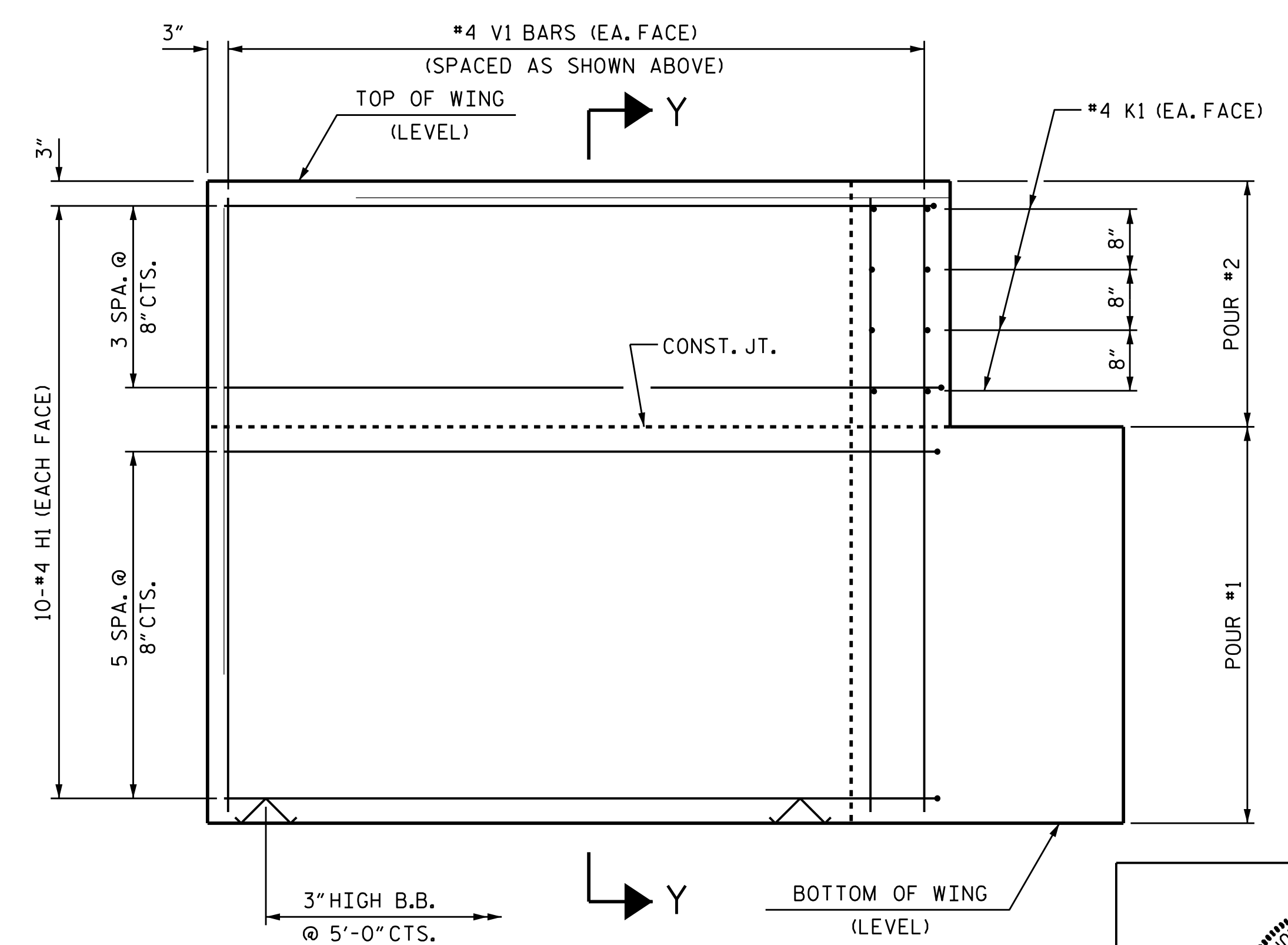
PLAN OF WING (W1)



PLAN OF WING (W2)

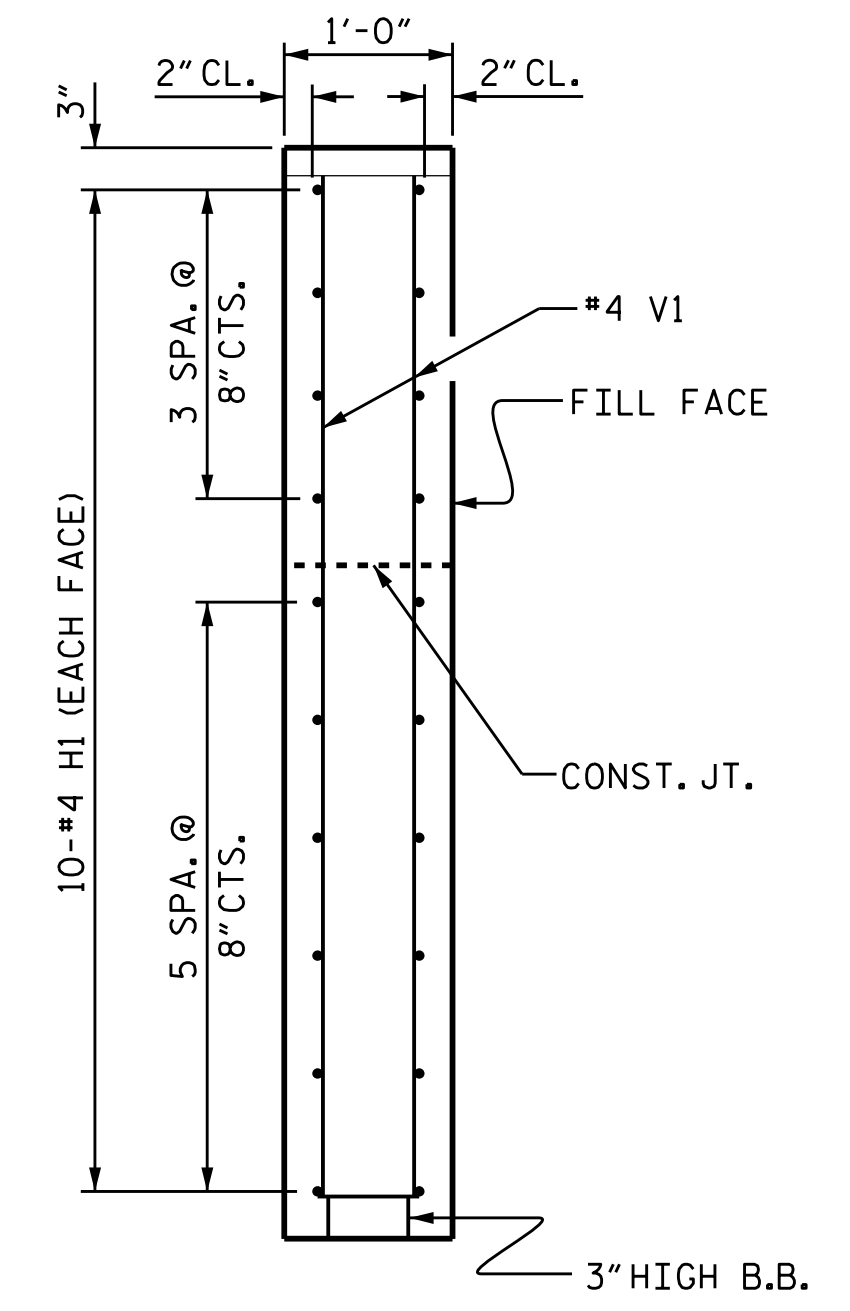


ELEVATION OF WING (W1)

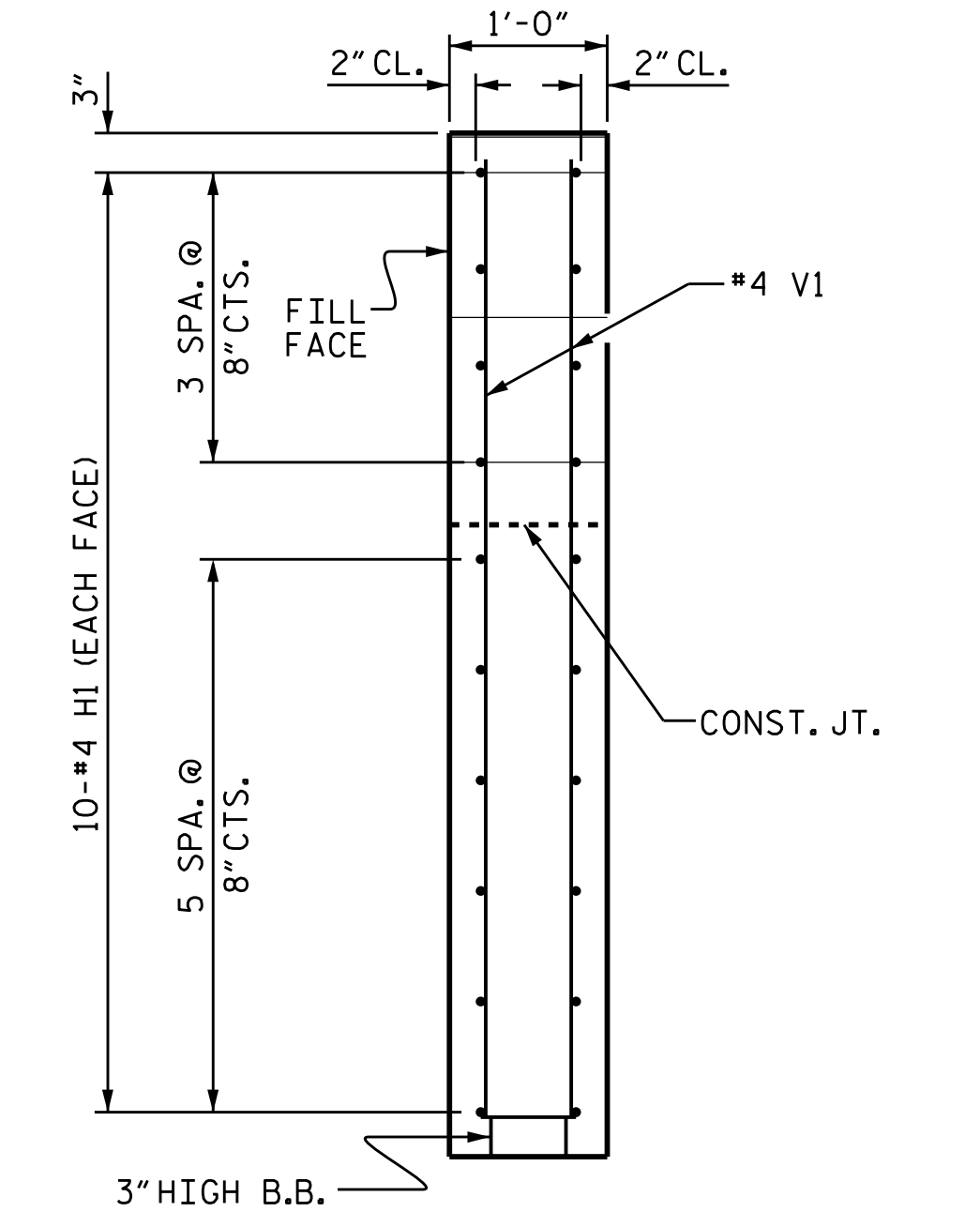


ELEVATION OF WING (W2)

WING DETAILS



SECTION X-X



SECTION Y-Y

PROJECT NO. B-4433
 BEAUFORT COUNTY
 STATION: 16+20.00 -L-

SHEET 3 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

SUBSTRUCTURE
 END BENT
 WING DETAILS

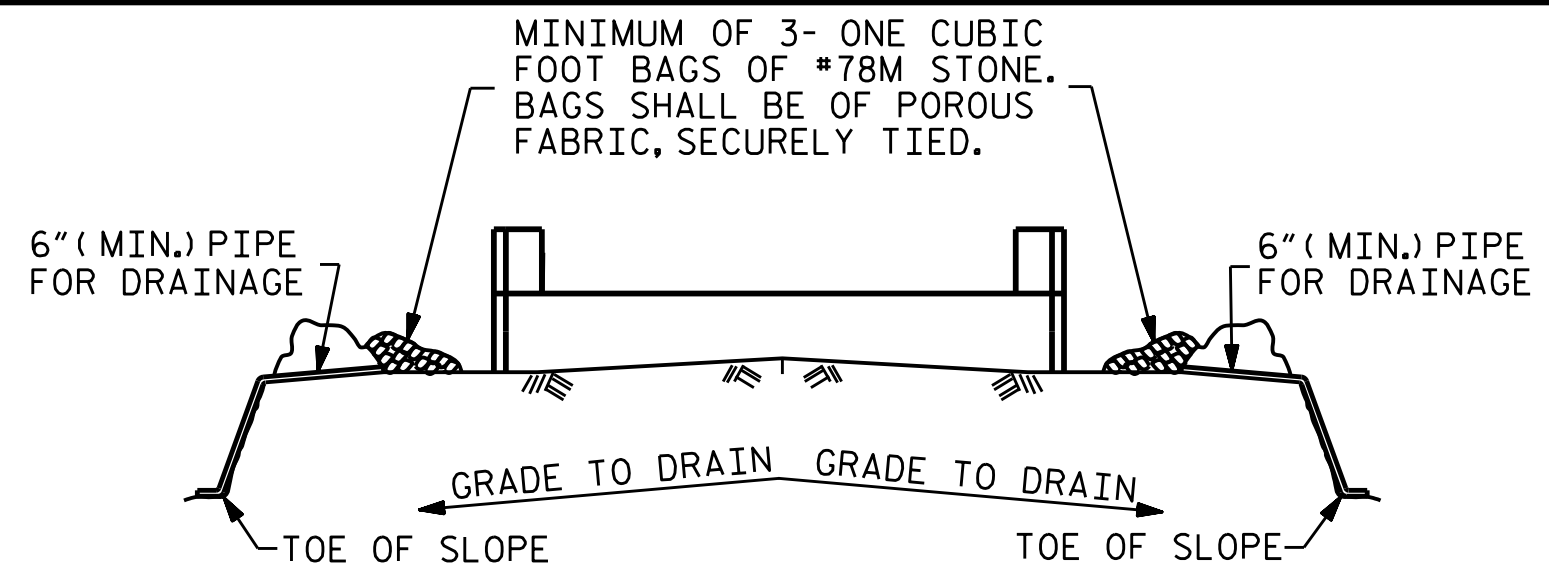
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| NO. | BY: | DATE: | NO. | BY: | DATE: | S-14 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 21 |

| | | | |
|----------------|-----|--------|-----------|
| ASSEMBLED BY : | TBE | DATE : | 10/18 |
| CHECKED BY : | MGC | DATE : | 02/19 |
| DRAWN BY : | WJH | 12/11 | REV. 4/15 |
| CHECKED BY : | AAC | 12/11 | MAA/TMG |

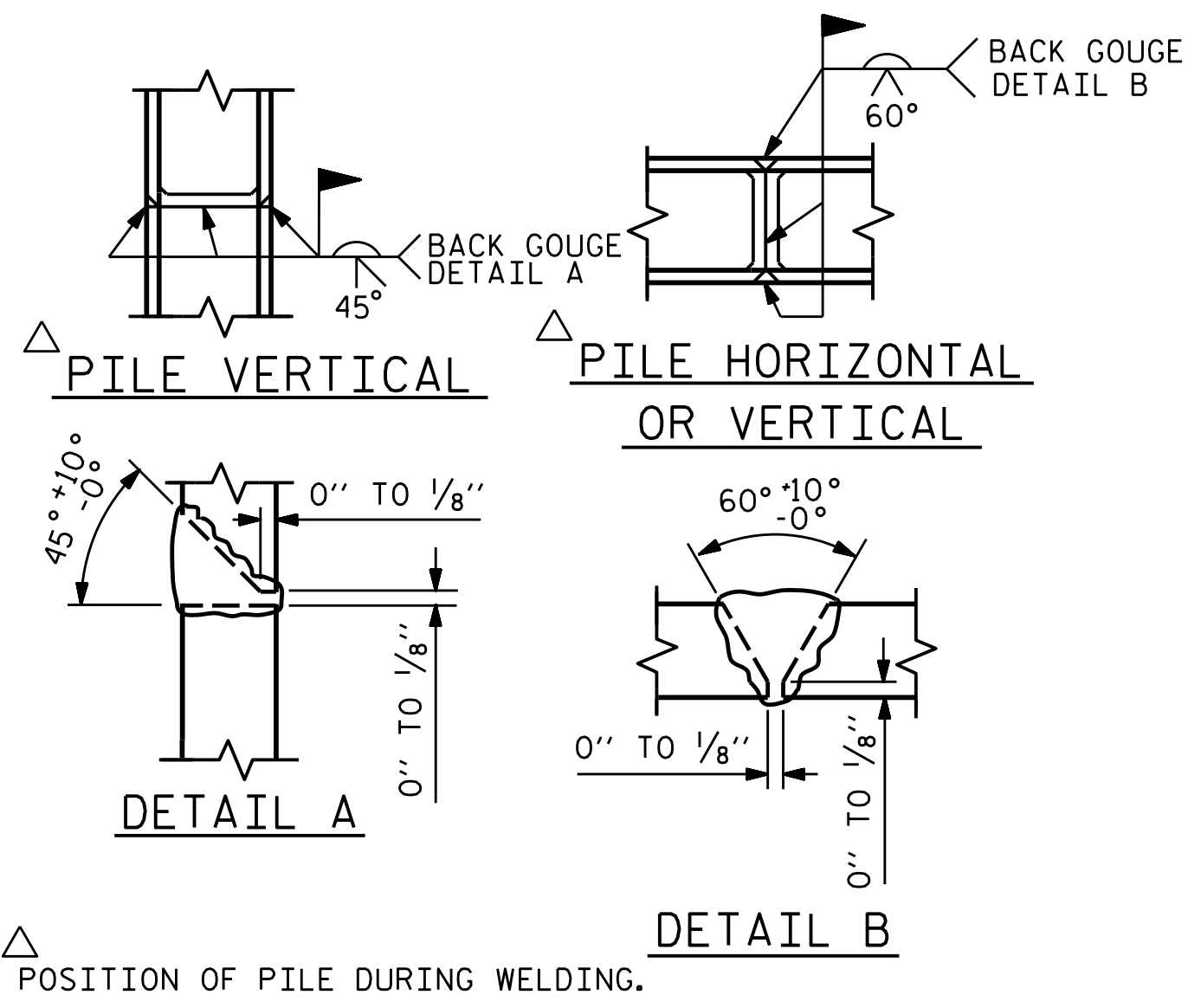


BAGGED STONE AND PIPE SHALL BE PLACED IMMEDIATELY AFTER COMPLETION OF END BENT EXCAVATION. PIPE MAY BE EITHER CONCRETE, CORRUGATED STEEL, CORRUGATED ALUMINUM ALLOY, OR CORRUGATED PLASTIC. PERFORATED PIPE WILL NOT BE ALLOWED.

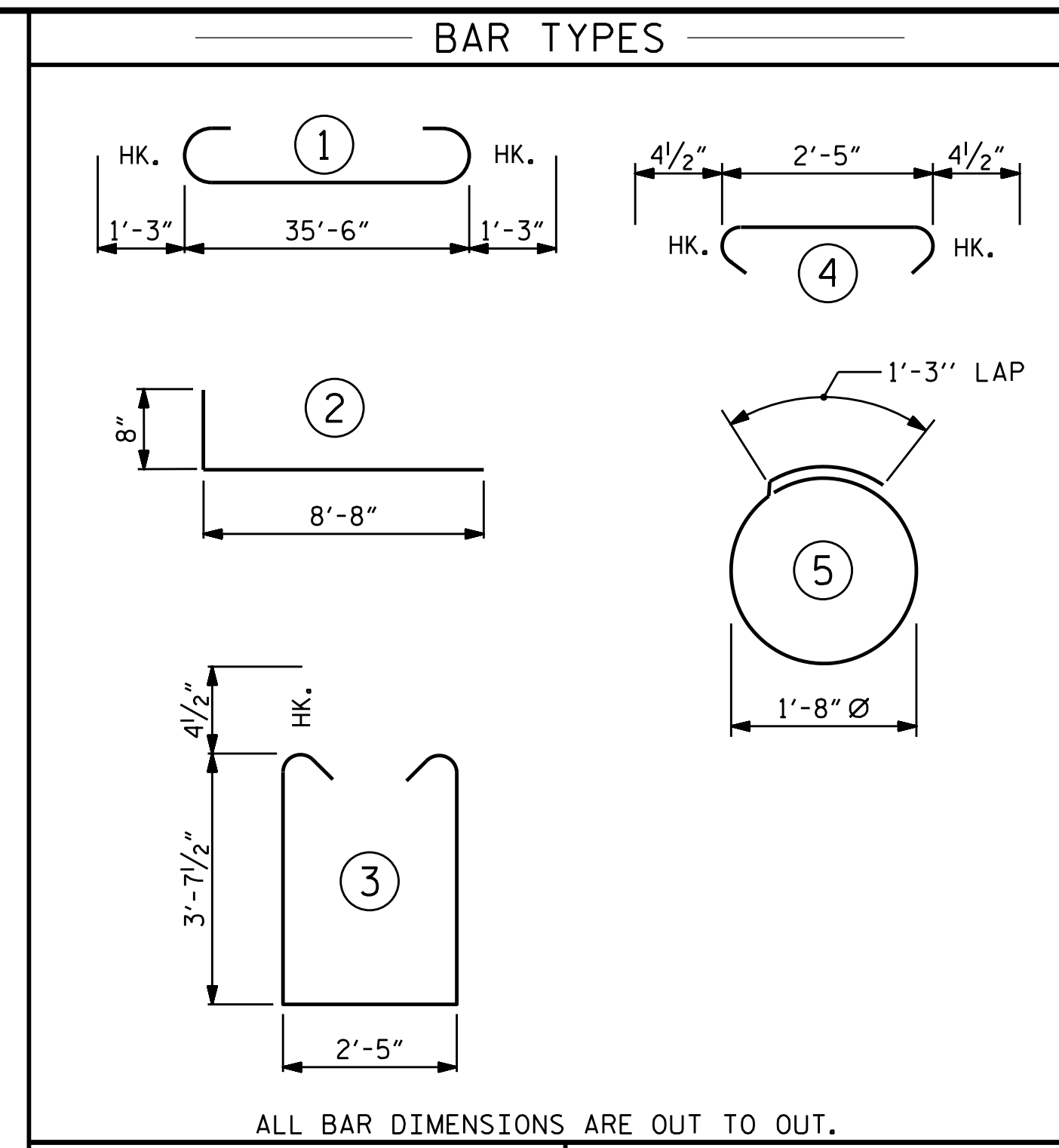
BAGGED STONE SHALL REMAIN IN PLACE UNTIL THE ENGINEER DIRECTS THAT IT BE REMOVED. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SILT ACCUMULATIONS AT BAGGED STONE WHEN SO DIRECTED BY THE ENGINEER. BAGS SHALL BE REMOVED AND REPLACED WHENEVER THE ENGINEER DETERMINES THAT THEY HAVE DETERIORATED AND LOST THEIR EFFECTIVENESS.

NO SEPARATE PAYMENT WILL BE MADE FOR THIS WORK AND THE ENTIRE COST OF THIS WORK SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR THE SEVERAL PAY ITEMS.

TEMPORARY DRAINAGE AT END BENT

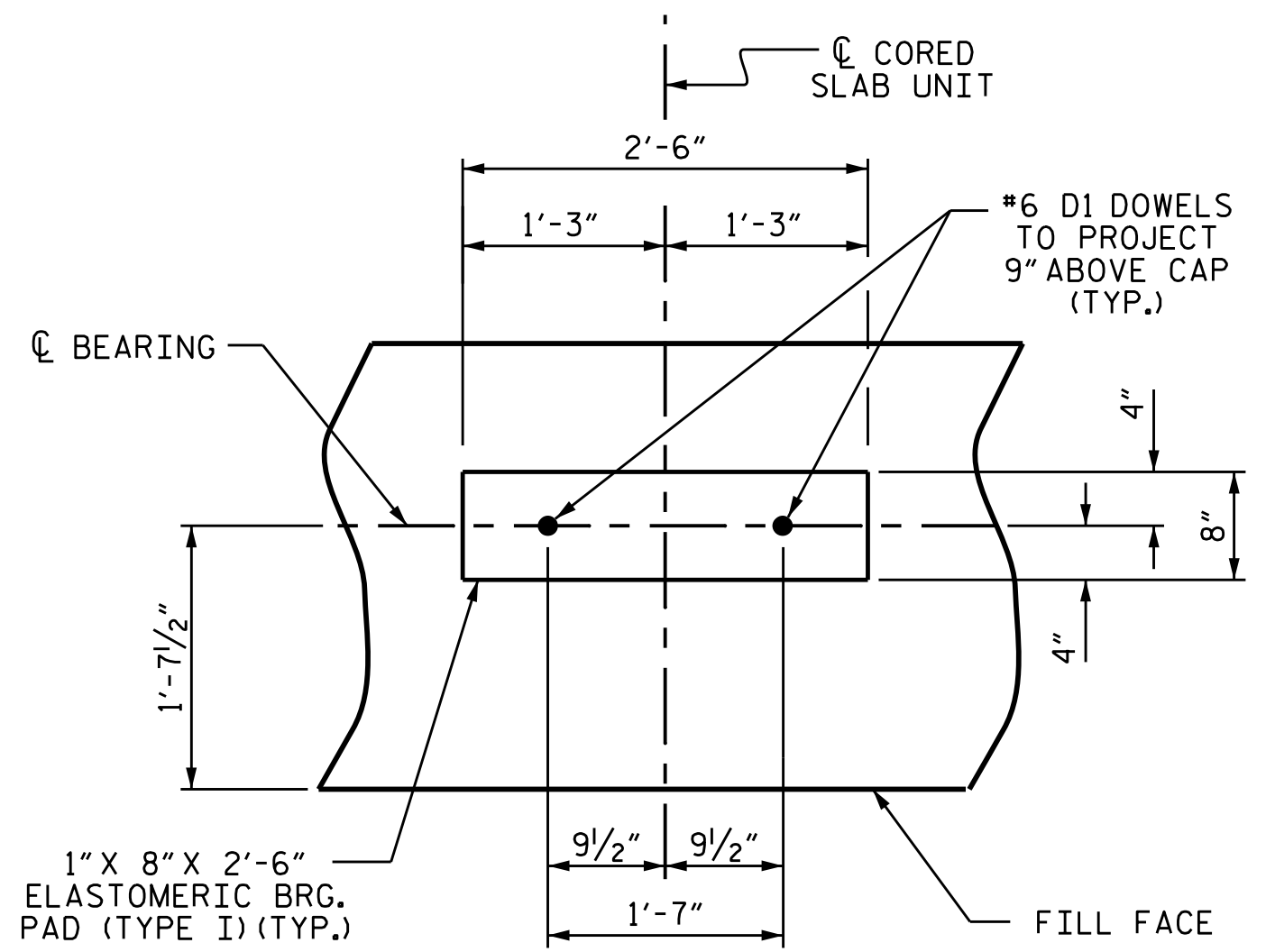


PILE SPLICE DETAILS

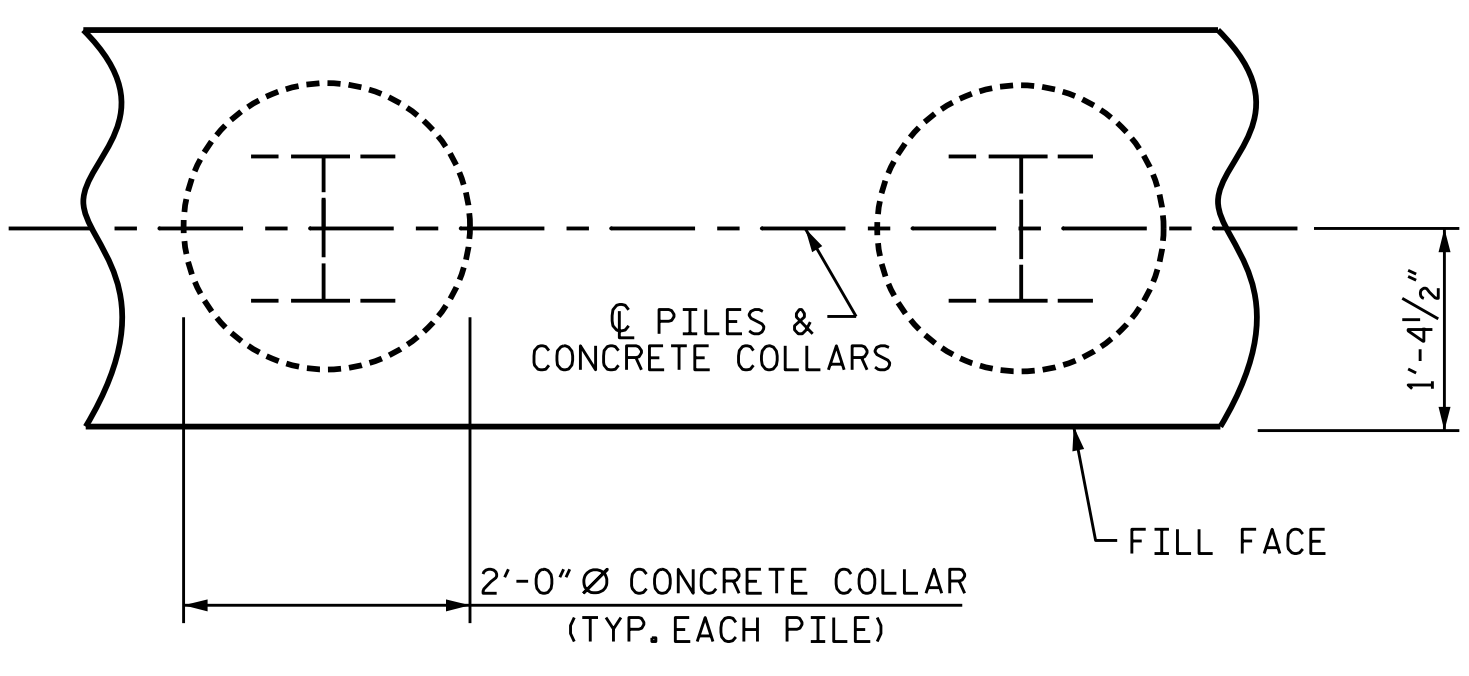


| BILL OF MATERIAL FOR ONE END BENT | | | | | |
|---|-----|------|------|--------|-----------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 8 | #9 | | 38'-0" | 1034 |
| B2 | 28 | #4 | STR | 19'-1" | 357 |
| B3 | 9 | #4 | STR | 2'-5" | 15 |
| D1 | 20 | #6 | STR | 1'-6" | 45 |
| H1 | 40 | #4 | | 9'-4" | 249 |
| K1 | 16 | #4 | STR | 2'-11" | 31 |
| S1 | 46 | #4 | | 10'-5" | 320 |
| S2 | 46 | #4 | | 3'-2" | 97 |
| S3 | 20 | #4 | | 6'-6" | 87 |
| V1 | 52 | #4 | STR | 6'-2" | 214 |
| REINFORCING STEEL (FOR ONE END BENT) | | | | | 2449 LBS. |
| CLASS A CONCRETE BREAKDOWN (FOR ONE END BENT) | | | | | |
| POUR #1 CAP, LOWER PART OF WINGS & COLLARS | | | | | 17.9 C.Y. |
| POUR #2 UPPER PART OF WINGS | | | | | 2.1 C.Y. |
| TOTAL CLASS A CONCRETE | | | | | 20.0 C.Y. |

| END BENT No. 1 | END BENT No. 2 |
|--|--|
| HP 12 X 53 STEEL PILES NO: 5 LIN. FT.= 300 | HP 12 X 53 STEEL PILES NO: 5 LIN. FT.= 275 |
| PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 5 | PILE DRIVING EQUIPMENT SETUP FOR HP 12 X 53 STEEL PILES NO: 5 |
| PILE REDRIVES NO: 3 | PILE REDRIVES NO: 3 |

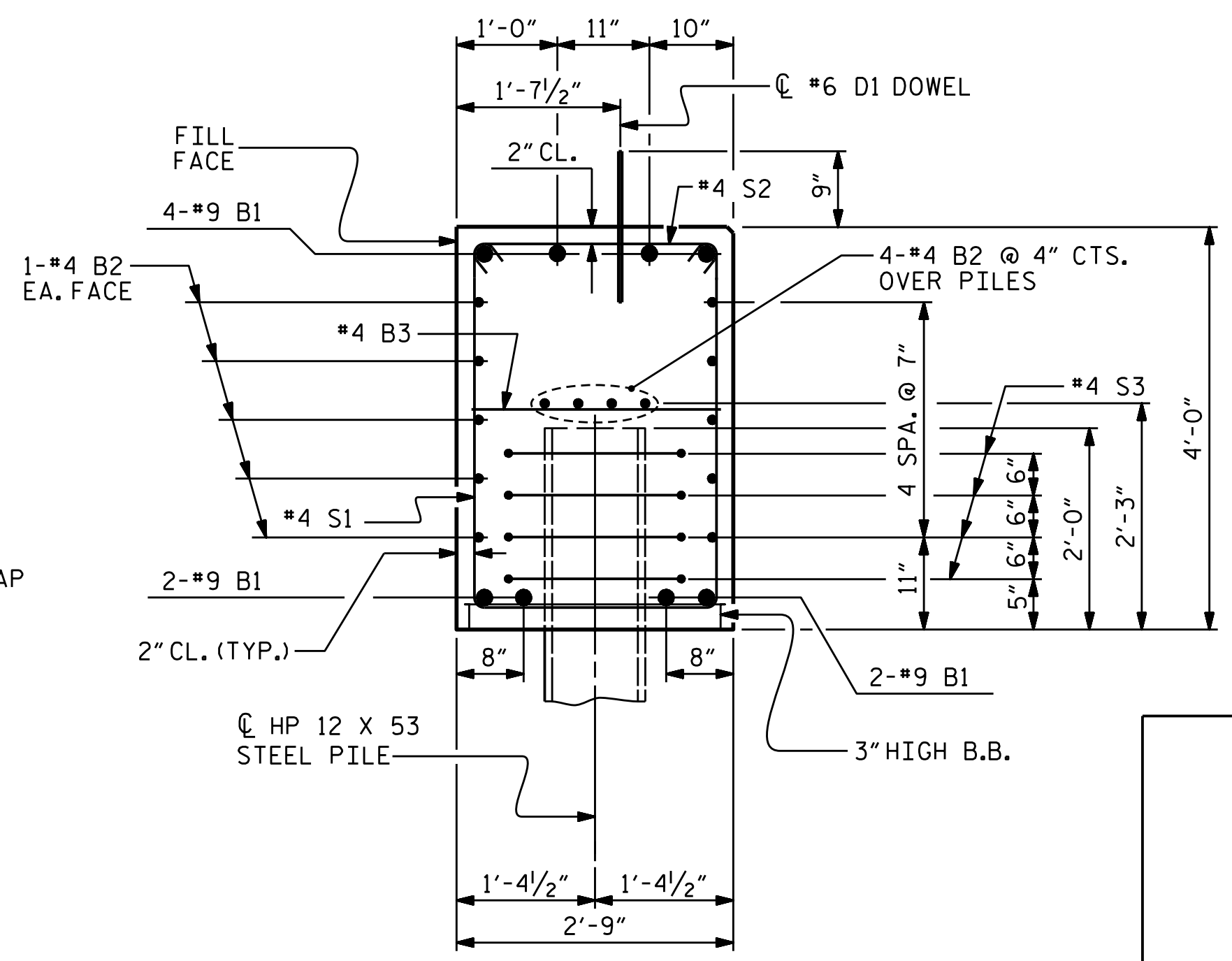
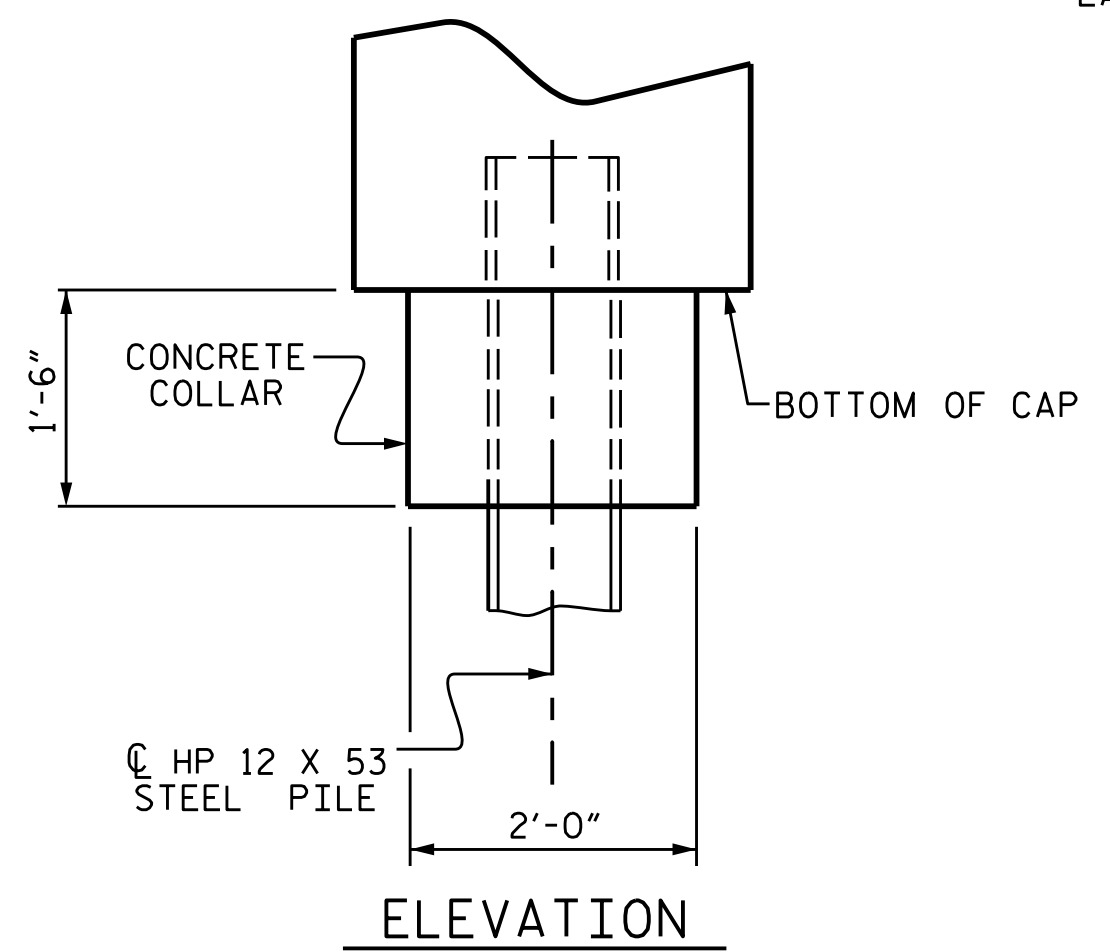


(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



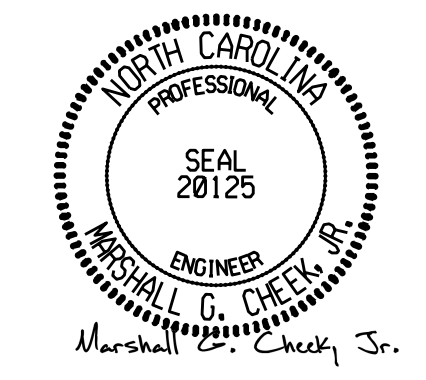
CORROSION PROTECTION FOR STEEL PILES DETAIL

(END BENT No. 1 SHOWN, END BENT No. 2 SIMILAR BY ROTATION)



(CONCRETE COLLAR NOT SHOWN FOR CLARITY. SEE "CORROSION PROTECTION FOR STEEL PILES DETAIL.")

PROJECT NO. B-4433
 BEAUFORT COUNTY
 STATION: 16+20.00 -L-
 SHEET 4 OF 4



STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 END BENT No. 1 & 2
 DETAILS

| | |
|------------------------|--------------|
| ASSEMBLED BY : TBE | DATE : 10/18 |
| CHECKED BY : MGC | DATE : 02/19 |
| DRAWN BY : WJH 12/11 | REV. 4/17 |
| CHECKED BY : AAC 12/11 | MAA/THC |

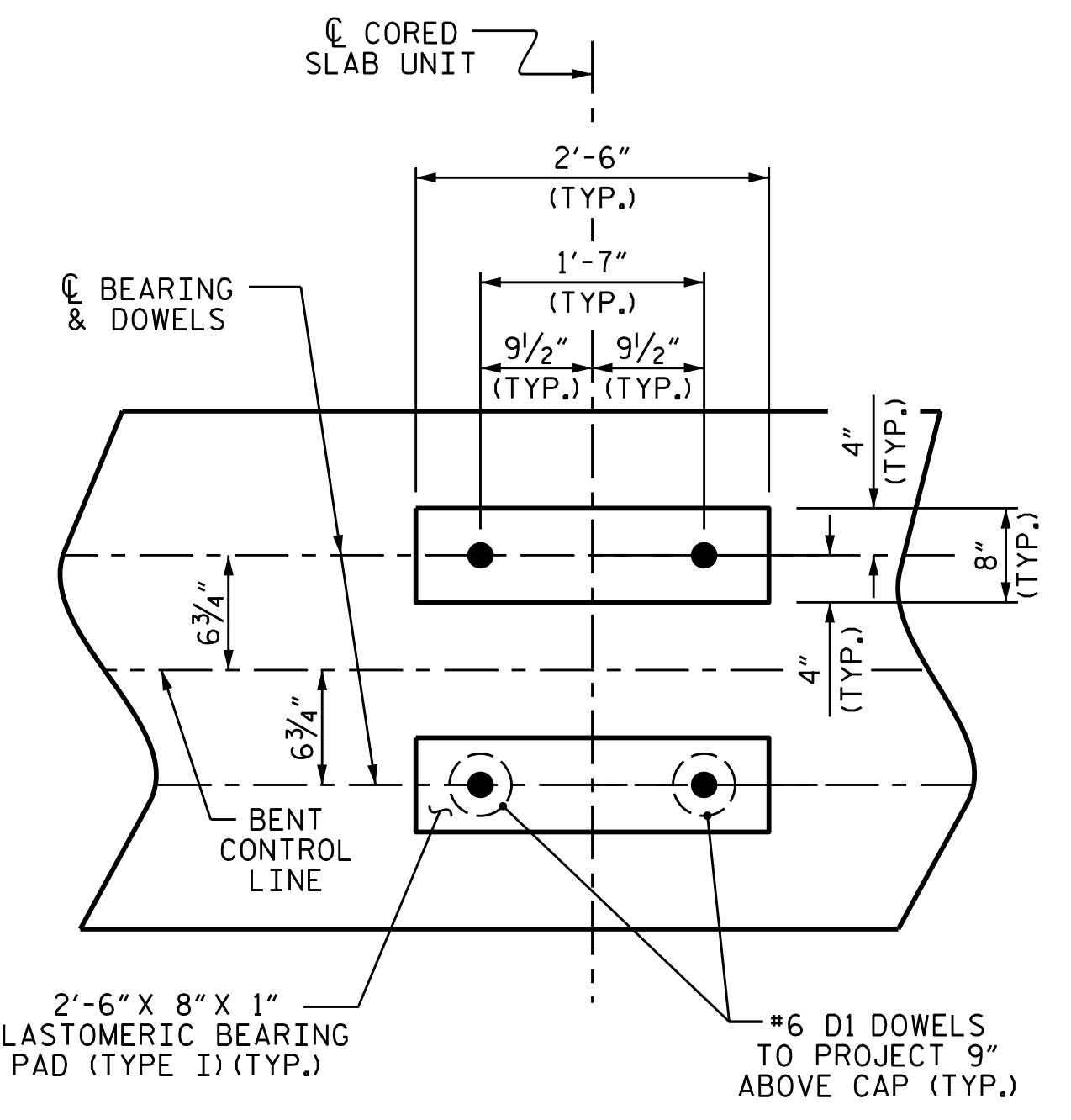
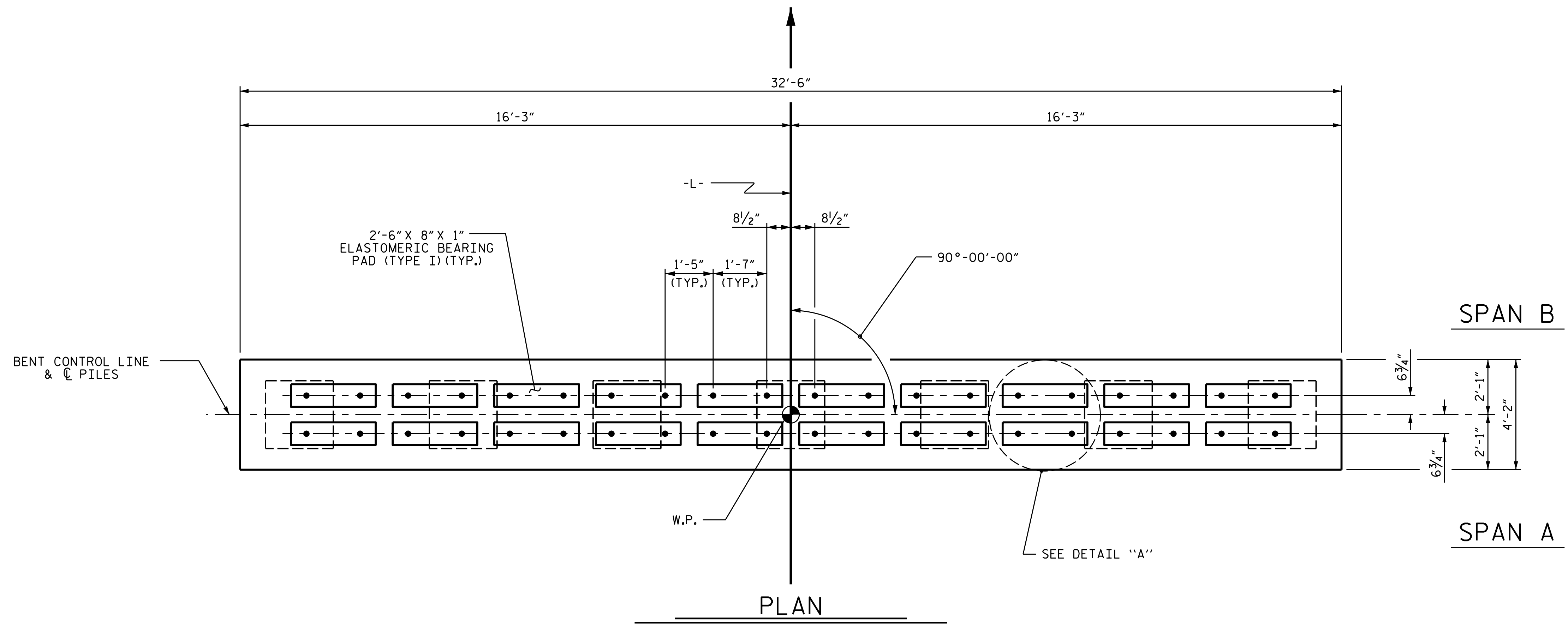
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TGS ENGINEERS
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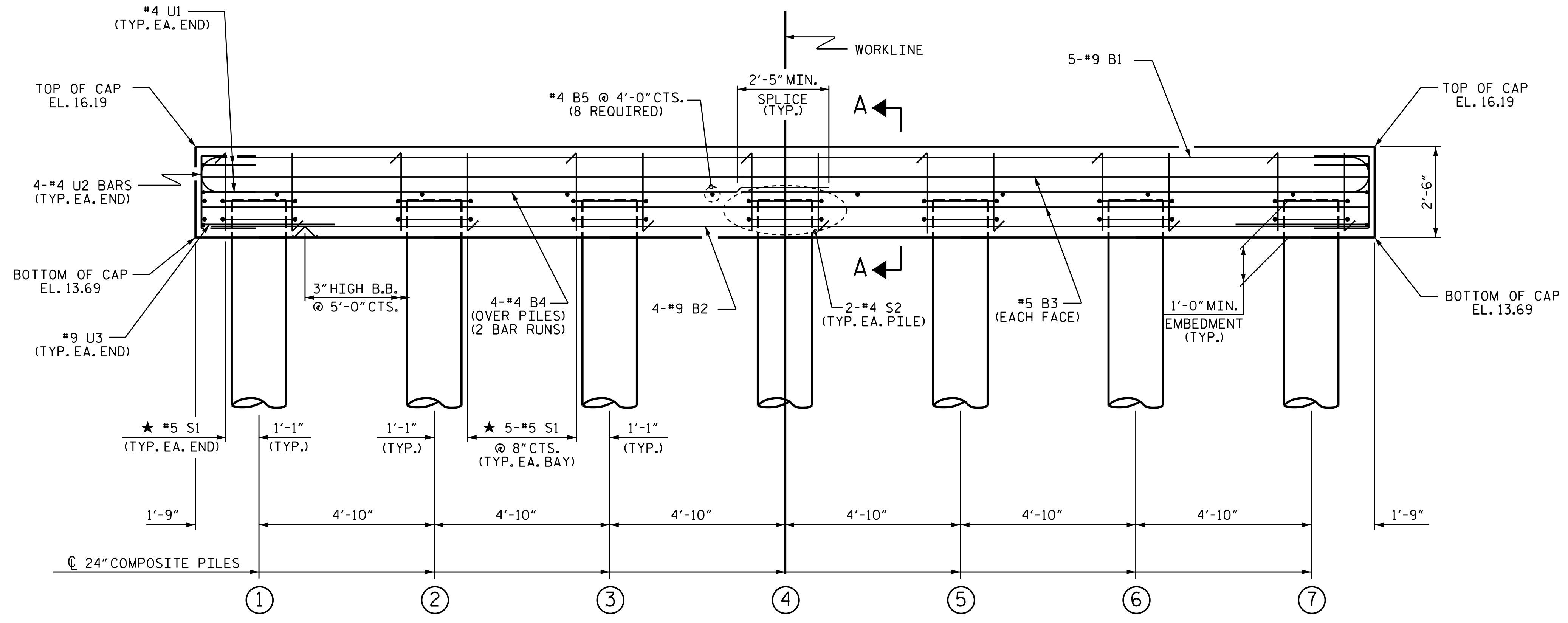
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|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-15 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 21 |

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR DOWELS.
 ★ INVERT ALTERNATE STIRRUPS.
 FOR 24" COMPOSITE PILES, SEE "24" PRESTRESSED CONCRETE COMPOSITE PILE" SHEET.



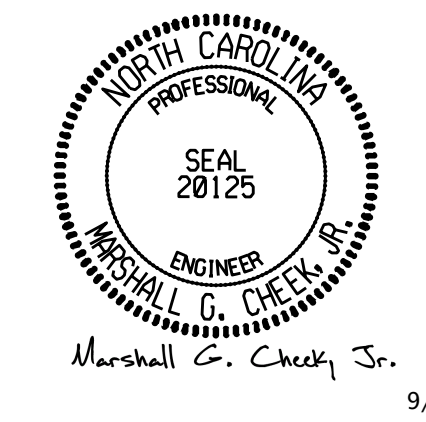
DETAIL "A"
 (DIMENSIONS ARE TYPICAL EACH BEARING)



ELEVATION

FOR SECTION A-A, SEE SHEET 2 OF 2

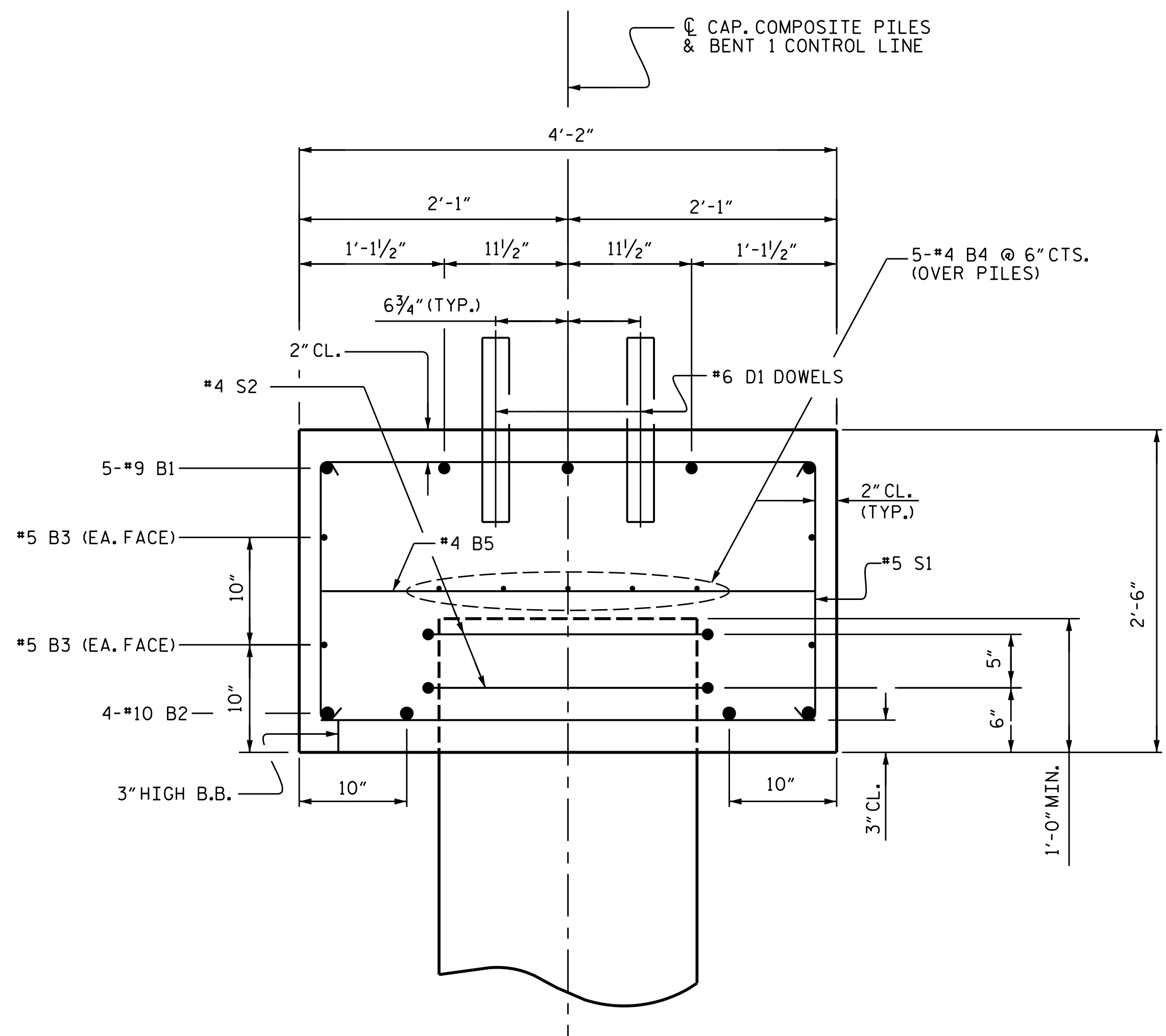
PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-
 SHEET 1 OF 2



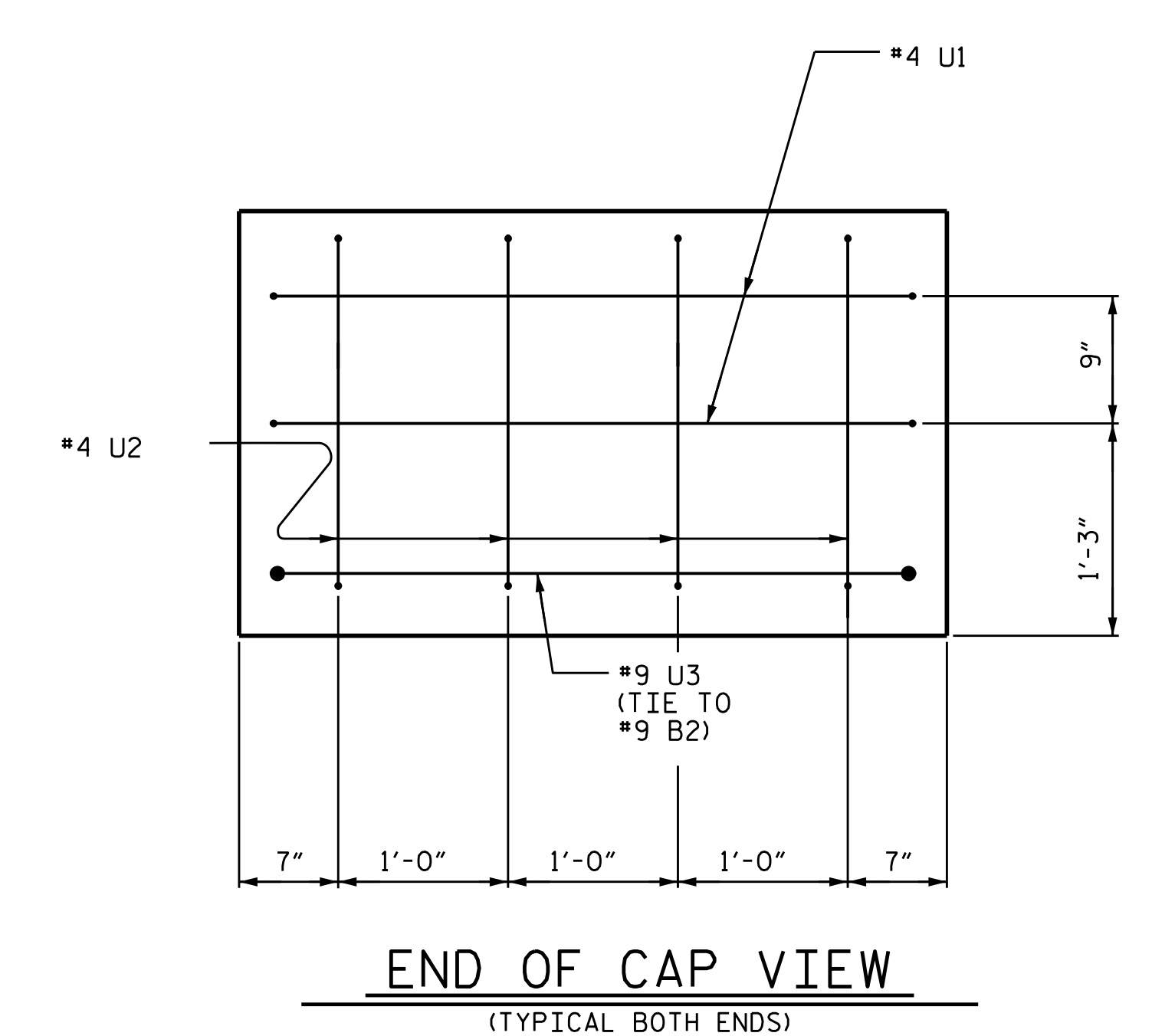
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 SUBSTRUCTURE
 BENT No. 1

| | | | | | | | | | | | | |
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| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | | | | | | REVISIONS | | | SHEET NO. | | | |
| TGS ENGINEERS 706 HILLSBOROUGH STREET SUITE 200 RALEIGH, NC 27603 PH (919) 773-8887 CORP. LICENSE NO.: C-0275 | | | | | | NO. | BY: | DATE: | NO. | BY: | DATE: | S-16 |
| | | | | | | 1 | | | 3 | | | TOTAL SHEETS |
| | | | | | | 2 | | | 4 | | | 21 |

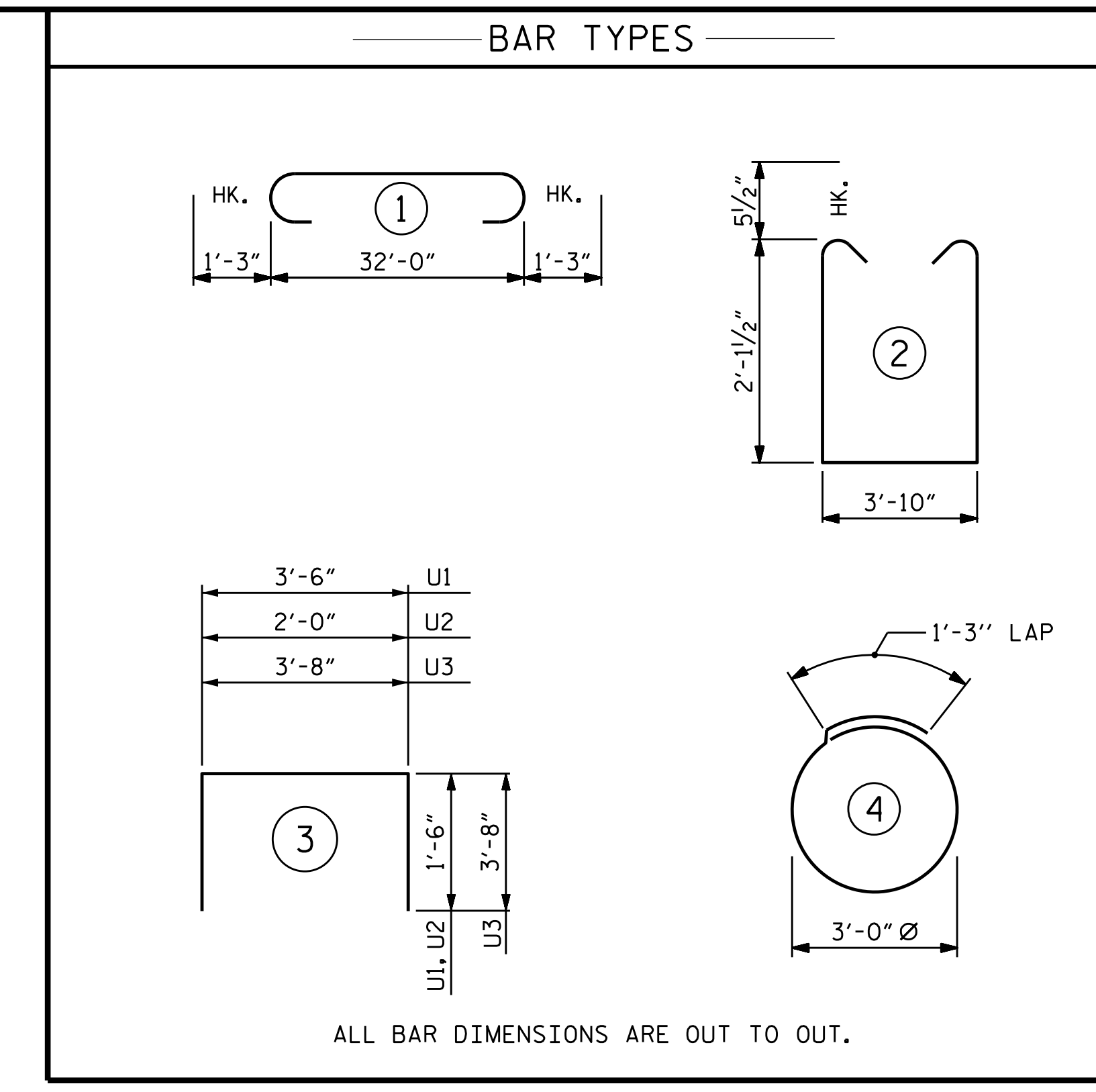
ASSEMBLED BY : TBE DATE : 10/18
 CHECKED BY : MCC DATE : 11/18



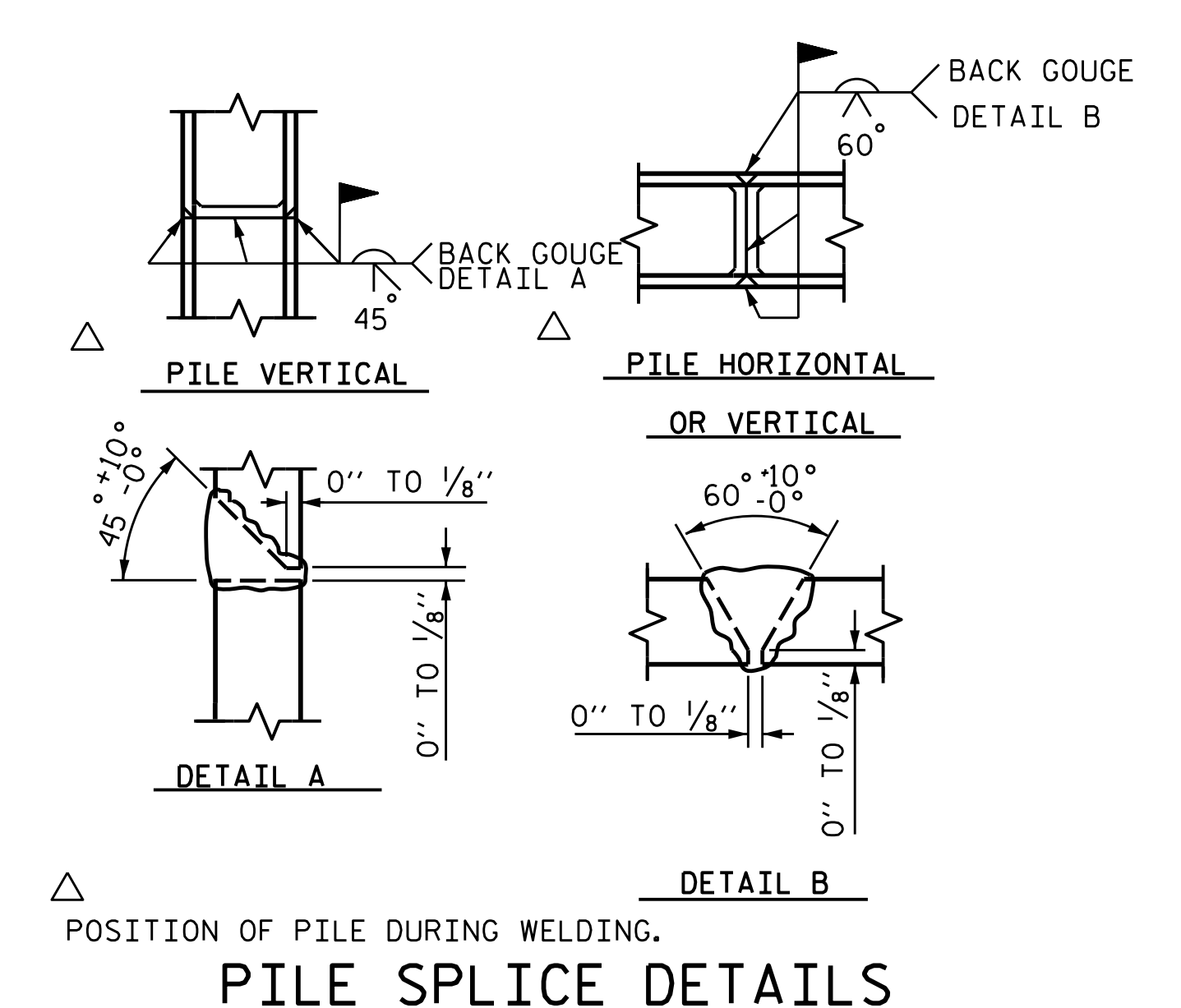
SECTION A-A



END OF CAP VIEW
(TYPICAL BOTH ENDS)



| BILL OF MATERIAL | | | | | |
|---|-----|------|------|--------|-----------|
| FOR BENT NO. 1 | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| B1 | 5 | #9 | 1 | 34'-6" | 587 |
| B2 | 4 | #9 | STR | 32'-2" | 437 |
| B3 | 4 | #5 | STR | 32'-2" | 134 |
| B4 | 8 | #4 | STR | 17'-4" | 93 |
| B5 | 8 | #4 | STR | 3'-10" | 20 |
| | | | | | |
| D1 | 40 | #6 | STR | 1'-6" | 90 |
| | | | | | |
| S1 | 32 | #5 | 2 | 9'-0" | 300 |
| S2 | 14 | #4 | 4 | 10'-8" | 100 |
| | | | | | |
| U1 | 4 | #4 | 3 | 6'-6" | 17 |
| U2 | 8 | #4 | 3 | 5'-0" | 27 |
| U3 | 2 | #9 | 3 | 11'-0" | 75 |
| | | | | | |
| REINFORCING STEEL | | | | | 1880 LBS |
| * CLASS A CONCRETE | | | | | |
| TOTAL | | | | | 11.5 C.Y. |
| 24" COMPOSITE PILES | | | | | |
| 24" PRESTRESSED CONCRETE PILES | | | | | |
| No. 7 | | | | 210 | LIN. FT. |
| HP 12 x 53 STEEL PILES | | | | | |
| No. 7 | | | | 140 | LIN. FT. |
| PILE DRIVING EQUIPMENT SETUP FOR 24" PRESTRESSED CONCRETE PILES | | | | | |
| | | | | | NO: 7 EA. |
| PILE REDRIVES | | | | | NO: 4 EA. |



REINFORCING STEEL 1880 LBS
 * CLASS A CONCRETE
 TOTAL 11.5 C.Y.
 24" COMPOSITE PILES
 24" PRESTRESSED CONCRETE PILES
 No. 7 210 LIN. FT.
 HP 12 x 53 STEEL PILES
 No. 7 140 LIN. FT.
 PILE DRIVING EQUIPMENT SETUP FOR 24" PRESTRESSED CONCRETE PILES
 NO: 7 EA.
 PILE REDRIVES NO: 4 EA.
 * CONCRETE DISPLACED BY THE 24" PRESTRESSED CONCRETE PILES HAS BEEN DEDUCTED FROM THE CONCRETE QUANTITY

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-
 SHEET 2 OF 2

9/16/2019
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TGS ENGINEERS
 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

| STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH | | | | | |
|--|-----|-------|-----|-----|-------|
| SUBSTRUCTURE BENT No. 1 | | | | | |
| REVISIONS | | | | | |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |

| | |
|--------------------|--------------|
| ASSEMBLED BY : STM | DATE : 02/19 |
| CHECKED BY : MGC | DATE : 02/19 |

| | |
|-------------|--|
| 8/29/2019 | X:\NCDOT\B-4433\Structures\90\DCN\401.035.B-4433.SMU.B02.dgn |
| User:ZSmith | |

| | |
|--------------|------|
| SHEET NO. | S-17 |
| TOTAL SHEETS | 21 |

ASSEMBLED BY : STM DATE : 02/19
 CHECKED BY : MGC DATE : 02/19

NOTES

PRESTRESSED CONCRETE STRENGTH : $f'_c = 7,500$ PSI
 BUILD-UP CONCRETE STRENGTH : $f'_c = 7,500$ PSI
 STRAND DATA:

| SIZE | GRADE | AREA | ULTIMATE STRENGTH PER STRAND | APPLIED PRESTRESS FORCE PER STRAND |
|------|----------|-------|------------------------------|------------------------------------|
| 1/2" | 270 L.R. | 0.153 | 41,300* | 30,980* |
| 0.6" | 270 L.R. | 0.217 | 58,600* | 43,940* |

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW-RELAXATION GRADE 270 STRANDS CONFORMING TO AASHTO M203. STRAND SAMPLING REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

AT THE CONTRACTOR'S OPTION, 1/2" OR 0.6" STRANDS MAY BE USED IN THE STRAND CONFIGURATION SHOWN IN THE TYPICAL SECTION DETAIL. MIXING OF STRAND SIZE IS NOT ALLOWED.

THE SLIP-FORM METHOD OF CASTING PILES WILL NOT BE PERMITTED.

TRANSFER THE LOAD FROM THE ANCHORAGES TO THE PILE AFTER THE CONCRETE HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI.

IF STRAND STRESS IS RELIEVED BY BURNING, THE STRANDS SHALL BE BURNED IN OPPOSITE PAIRS AS INDICATED IN THE TYPICAL PATTERN SHOWN FOR ANY NUMBER OF STRANDS, BURN IN OPPOSITE PAIRS AND SYMMETRICALLY ABOUT BOTH THE VERTICAL AND HORIZONTAL AXES, STRANDS 1-1 SHALL BE BURNED BEFORE 2-2, ETC. NOT MORE THAN 4 STRANDS, SAY 5-5 AND 6-6, MAY BE BURNED AT ANY ONE SECTION BEFORE THESE SAME PAIRS OF STRANDS ARE BURNED AT BOTH ENDS OF THE BED AND BETWEEN EACH PAIR OF PILES IN THE BED.

PROPOSED DEVICES FOR LIFTING PILES, RECESS DETAILS, AND PATCHING MATERIAL SHALL BE DETAILED IN SHOP DRAWINGS. AFTER ATTACHMENTS HAVE BEEN REMOVED, OPENINGS SHALL BE REPAIRED SUCH THAT THE APPEARANCE OF THE PILE IS UNIFORM.

WHERE CAST-IN-PLACE LIFTING DEVICES ARE NOT USED, PICK-UP POINTS ARE TO BE INDICATED WITH A 2" WIDE BLACK MARK.

DRIVE PILES USING A METHOD APPROVED BY THE ENGINEER, WHEREBY THE HEAD OF THE PILE IS NOT DAMAGED.

DRIVING OF THE BUILT-UP PILE WILL NOT BE PERMITTED UNTIL THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF 5,000 PSI AND UNTIL A PERIOD OF SEVEN DAYS HAS ELAPSED SINCE CASTING OF THE BUILD-UP.

DOWEL INSTALLATION FOR OPTIONAL BUILD-UP

GROUT COMPRESSIVE STRENGTH: $f'_c = 5,000$ PSI

BEFORE DRILLING DOWEL HOLES, REMOVE THE UPPER 3" OF CONCRETE FROM THE TOP OF THE PILE WITHOUT DAMAGE TO THE REINFORCING STEEL. THE REMOVAL PLANE SHOULD BE NORMAL TO THE EDGE OF THE PILE.

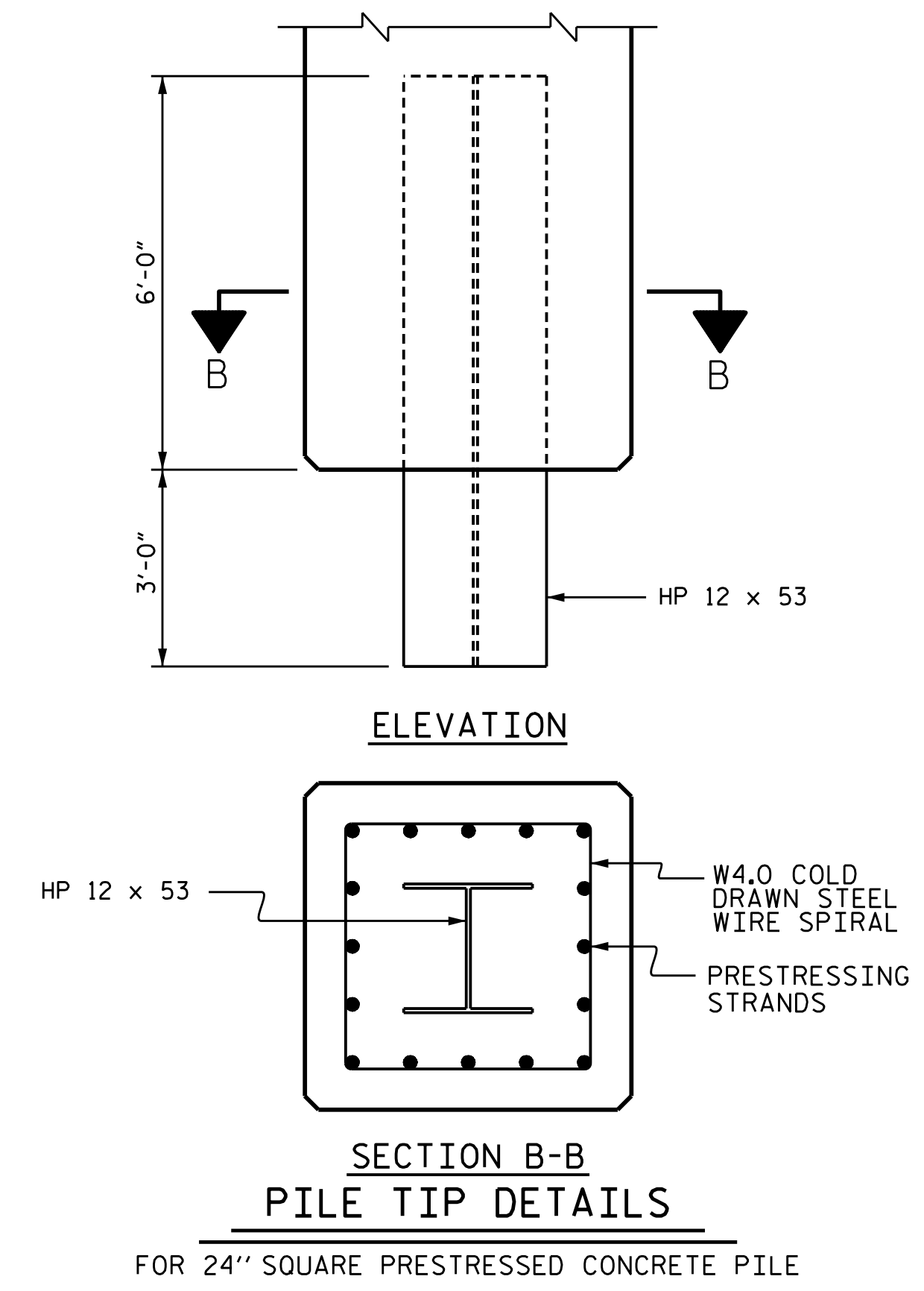
DOWEL HOLES SHALL BE POSITIONED TO MAINTAIN 1/2" CLEAR TO ALL EXISTING PRESTRESSING STRANDS IN THE CONCRETE PILE.

FIELD DRILLED HOLES SHALL BE CLEAN AND FREE OF ANY OBSTRUCTIONS BEFORE GROUTING OF DOWELS. DOWEL BARS SHALL BE INSTALLED AND GROUTED WITH AN APPROVED NON-SHRINK GROUT.

THE SPIRAL REINFORCING IN ALL BUILD-UPS SHALL BE W4.0 COLD DRAWN WIRE WHICH SHALL BE SECURED TO THE LONGITUDINAL REINFORCEMENT TO MAINTAIN PITCH.

THE SPIRAL REINFORCING IN THE BUILD-UP AND THE PRESTRESSED CONCRETE PILE SHALL BE SPLICED BY OVERLAPPING A MIN. OF ONE TURN.

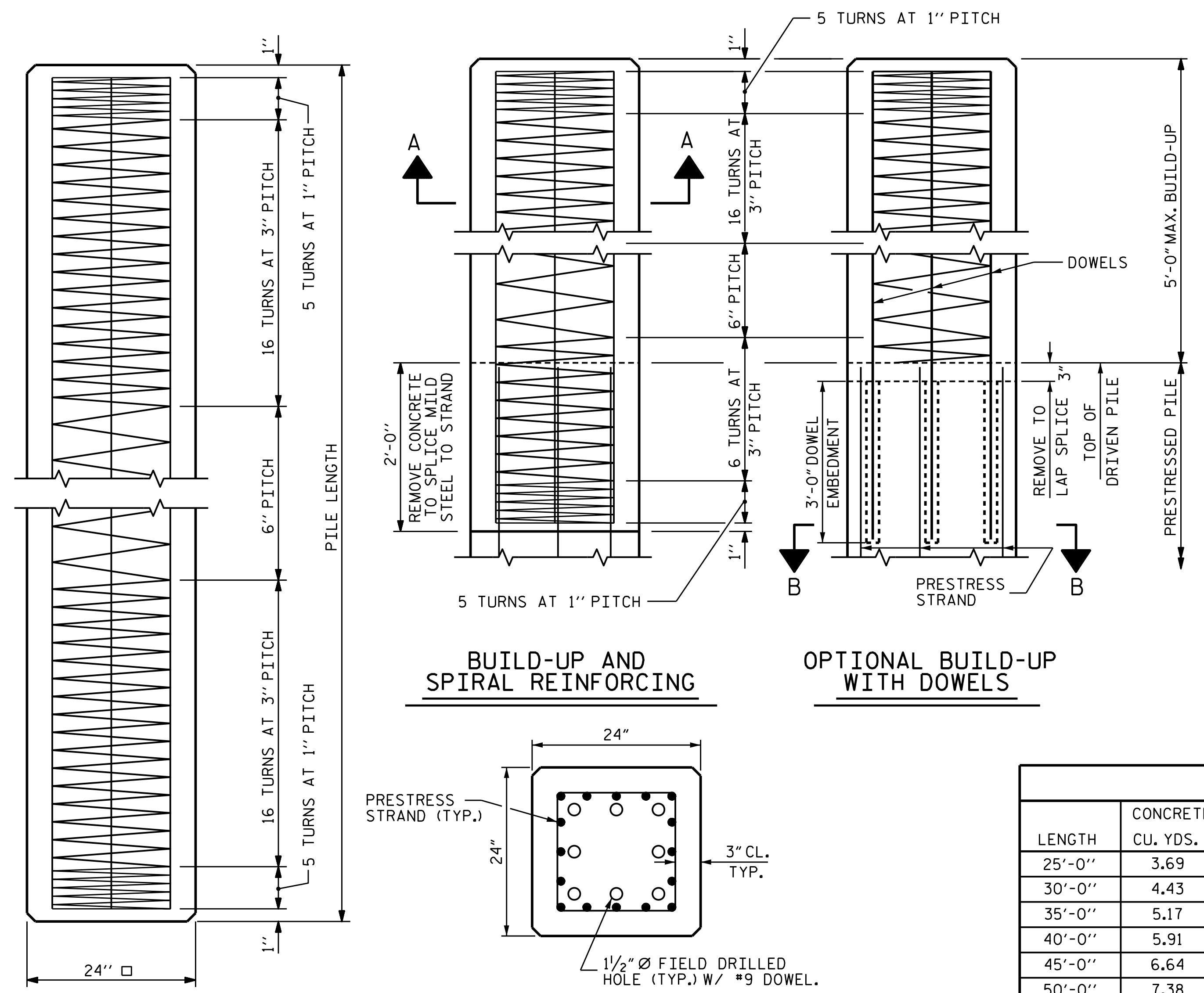
PROJECT NO. **B-4433**
 BEAUFORT COUNTY
 STATION: **16+20.00 -L-**



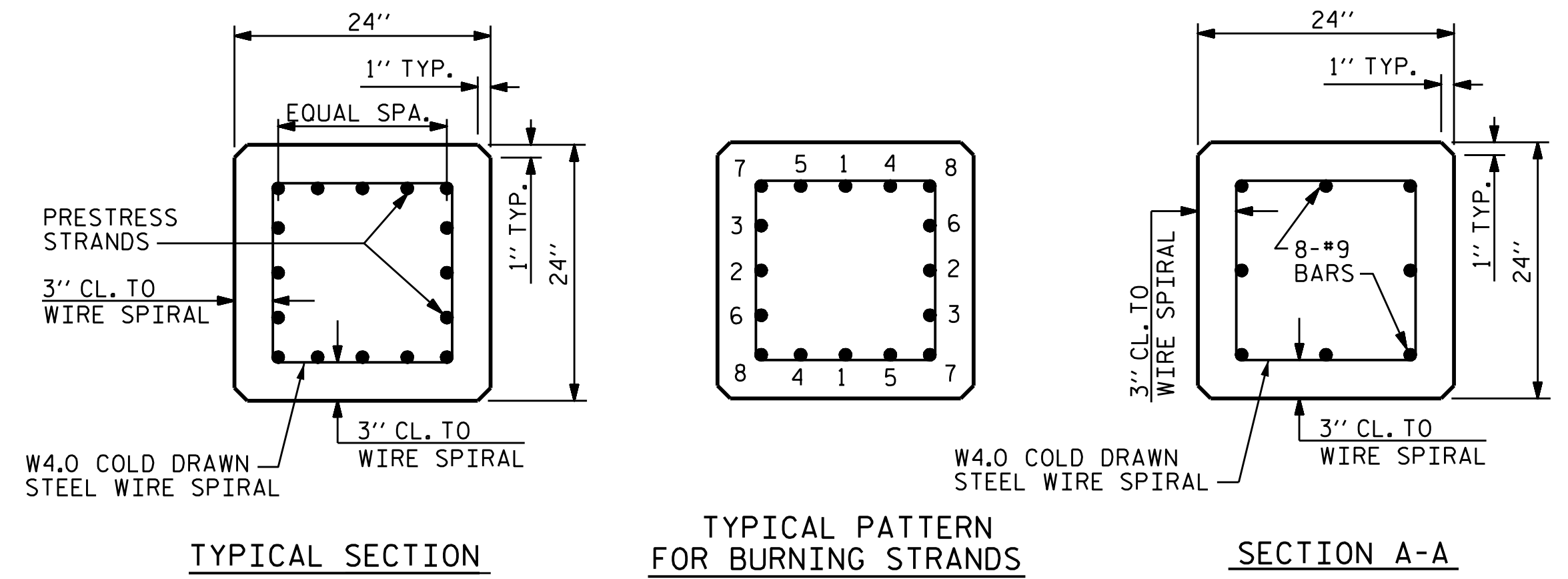
FOR 24" SQUARE PRESTRESSED CONCRETE PILE

QUANTITIES FOR ONE 24" SQUARE PILE

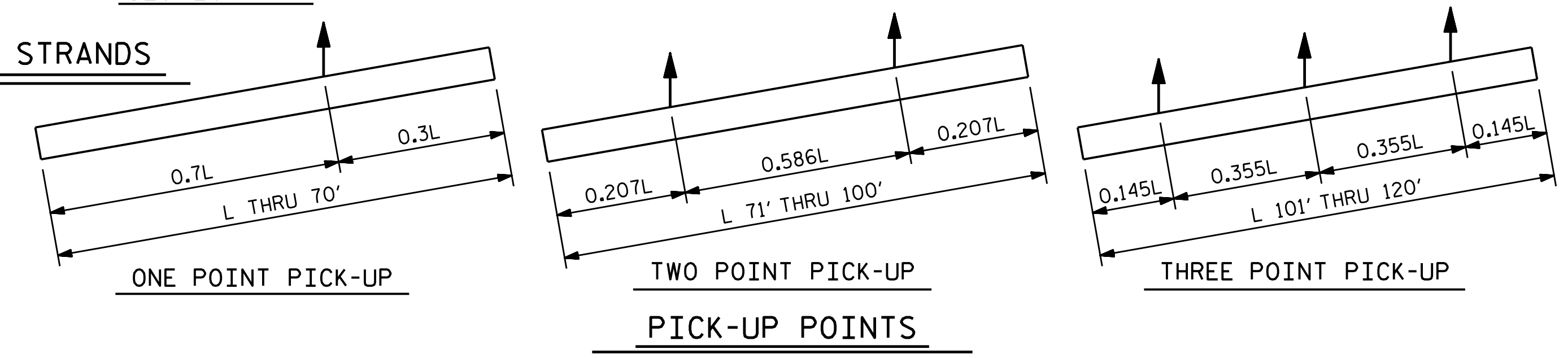
| LENGTH | CONCRETE CU. YDS. | PILE WT. TONS | ONE POINT PICK-UP | | TWO POINT PICK-UP | | THREE POINT PICK-UP | |
|---------|-------------------|---------------|-------------------|--------|-------------------|---------|---------------------|------------|
| | | | 0.3L | 0.7L | 0.207L | 0.586L | 0.145L | 0.355L |
| 25'-0" | 3.69 | 7.47 | 7'-6" | 17'-6" | | | | |
| 30'-0" | 4.43 | 8.97 | 9'-0" | 21'-0" | | | | |
| 35'-0" | 5.17 | 10.46 | 10'-6" | 24'-6" | | | | |
| 40'-0" | 5.91 | 11.96 | 12'-0" | 28'-0" | | | | |
| 45'-0" | 6.64 | 13.45 | 13'-6" | 31'-6" | | | | |
| 50'-0" | 7.38 | 14.95 | 15'-0" | 35'-0" | | | | |
| 55'-0" | 8.12 | 16.44 | 16'-6" | 38'-6" | | | | |
| 60'-0" | 8.86 | 17.94 | 18'-0" | 42'-0" | | | | |
| 65'-0" | 9.60 | 19.43 | 19'-6" | 45'-6" | | | | |
| 70'-0" | 10.33 | 20.93 | 21'-0" | 49'-0" | | | | |
| 75'-0" | 11.07 | 22.42 | | | 15'-6 1/2" | 43'-11" | | |
| 80'-0" | 11.81 | 23.92 | | | 16'-6 1/2" | 46'-11" | | |
| 85'-0" | 12.55 | 25.41 | | | 17'-7" | 49'-10" | | |
| 90'-0" | 13.29 | 26.91 | | | 18'-7 1/2" | 52'-9" | | |
| 95'-0" | 14.03 | 28.40 | | | 19'-8" | 55'-8" | | |
| 100'-0" | 14.76 | 29.90 | | | 20'-8 1/2" | 58'-7" | | |
| 105'-0" | 15.50 | 31.39 | | | | | 15'-3" | 37'-3" |
| 110'-0" | 16.24 | 32.89 | | | | | 15'-11 1/2" | 39'-0 1/2" |
| 115'-0" | 16.98 | 34.38 | | | | | 16'-8" | 40'-10" |
| 120'-0" | 17.72 | 35.87 | | | | | 17'-5" | 42'-7" |



SECTION "B-B"
 (AT THE CONTRACTOR'S OPTION, PILE BUILD-UP MAY BE CONSTRUCTED WITH DOWELS.)



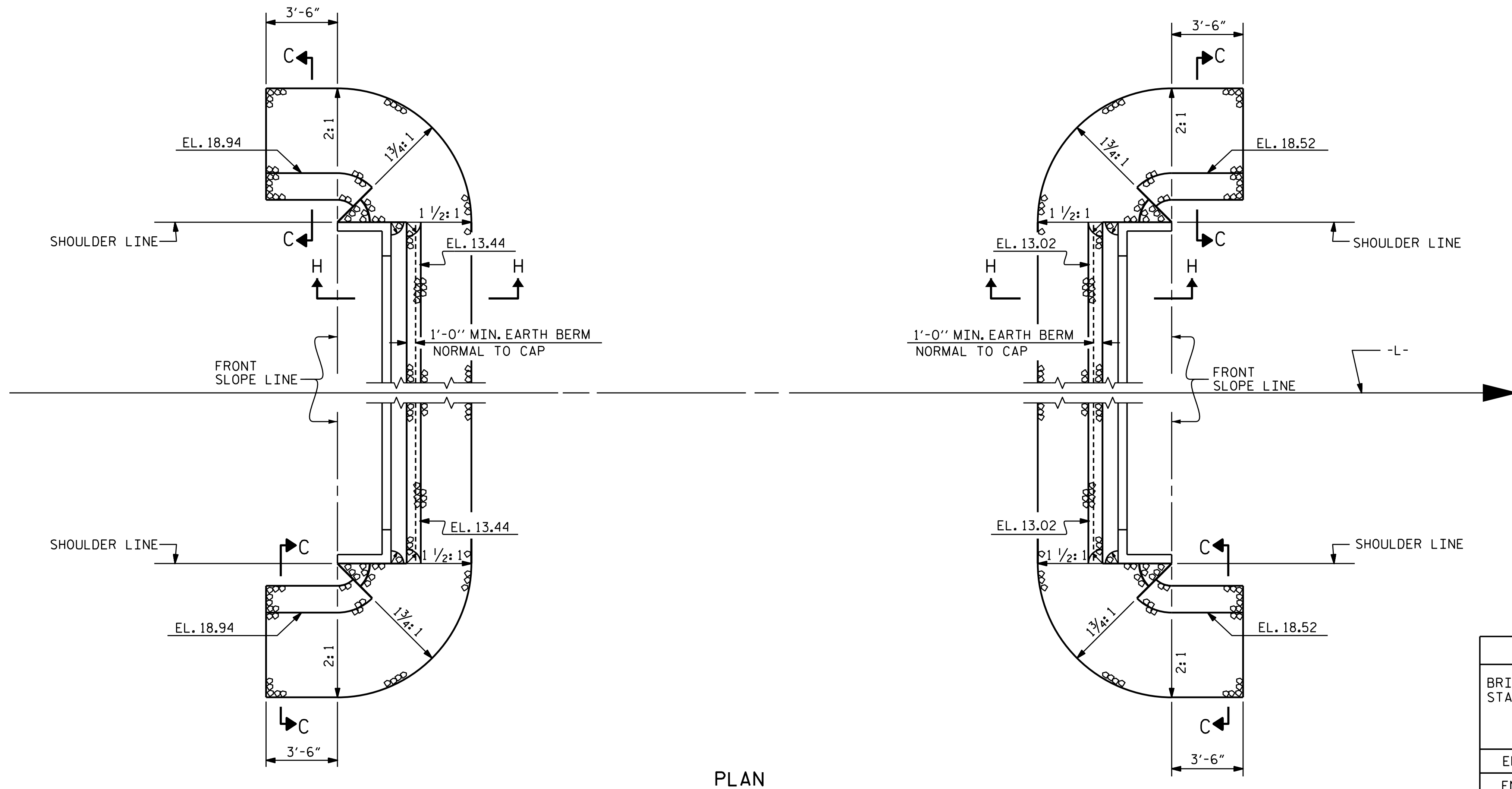
1/2" OR 0.6" Ø GRADE 270 L.R. PRESTRESS STRANDS



| | |
|-----------------------|---------------|
| ASSEMBLED BY : STM | DATE : 02/19 |
| CHECKED BY : MGC | DATE : 02/19 |
| DRAWN BY : WJH 1/89 | REV. 10/11/11 |
| CHECKED BY : CRK 3/89 | REV. 12/14 |
| | REV. 12/17 |

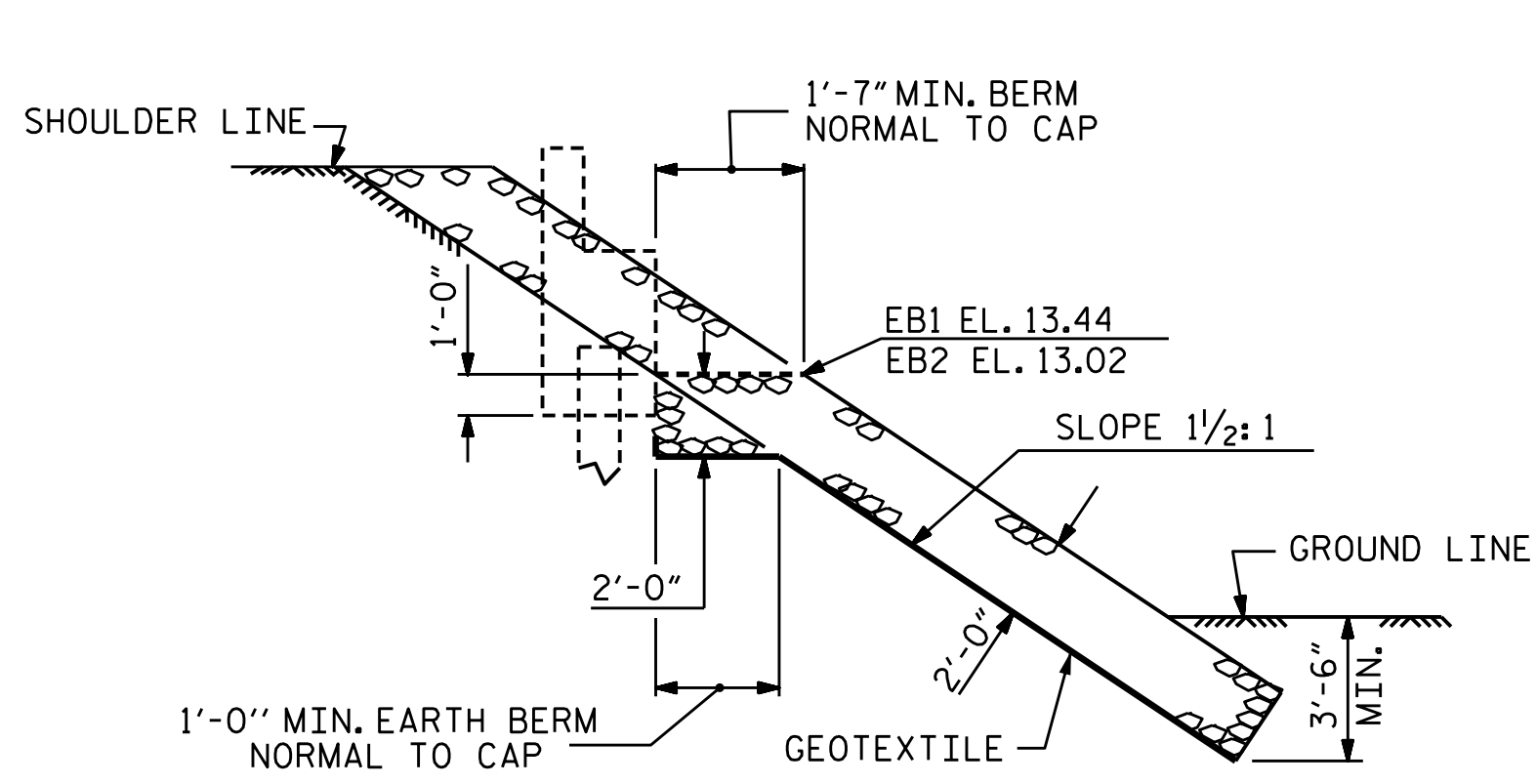
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
24" PRESTRESSED CONCRETE COMPOSITE PILE

| REVISIONS | | | | | | SHEET NO. S-18 |
|-----------|-----|-------|-----|-----|-------|--------------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | TOTAL SHEETS 21 |
| 2 | | | 4 | | | |

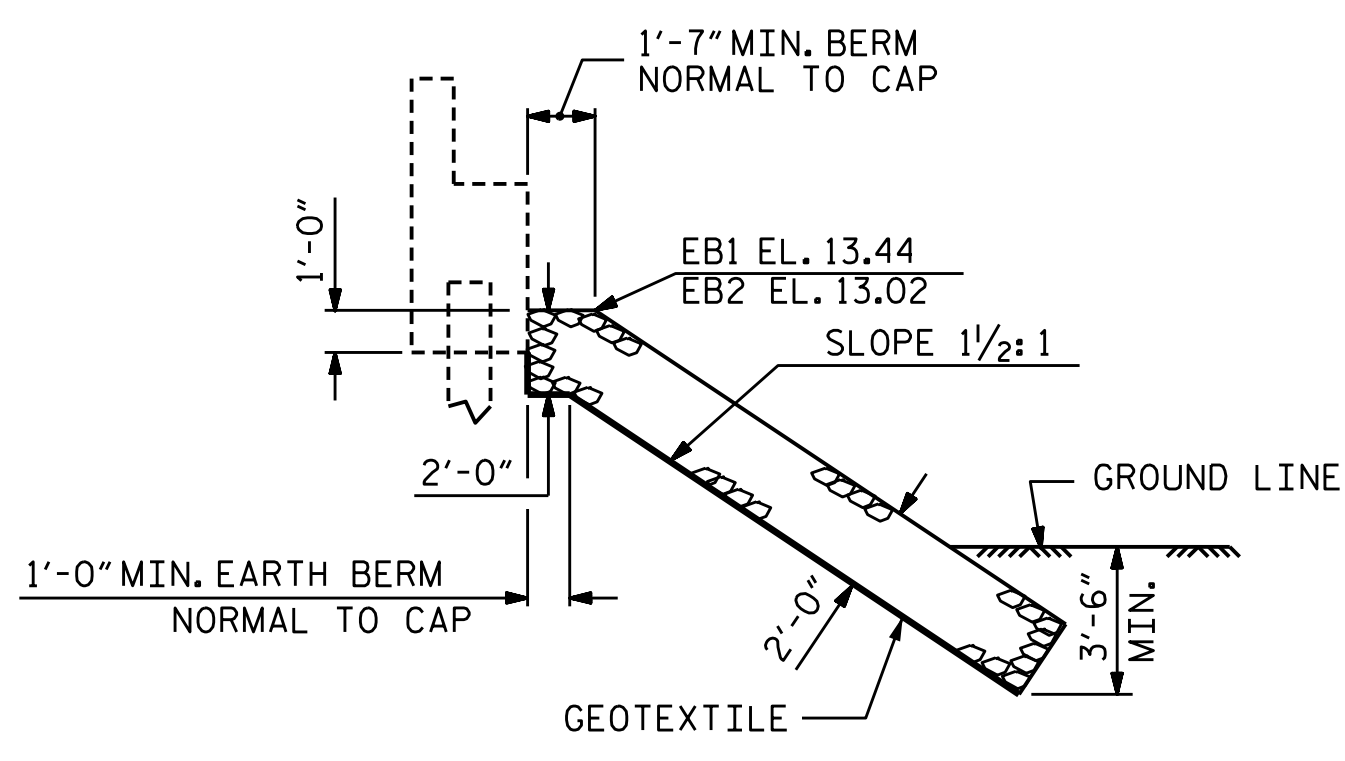


PLAN

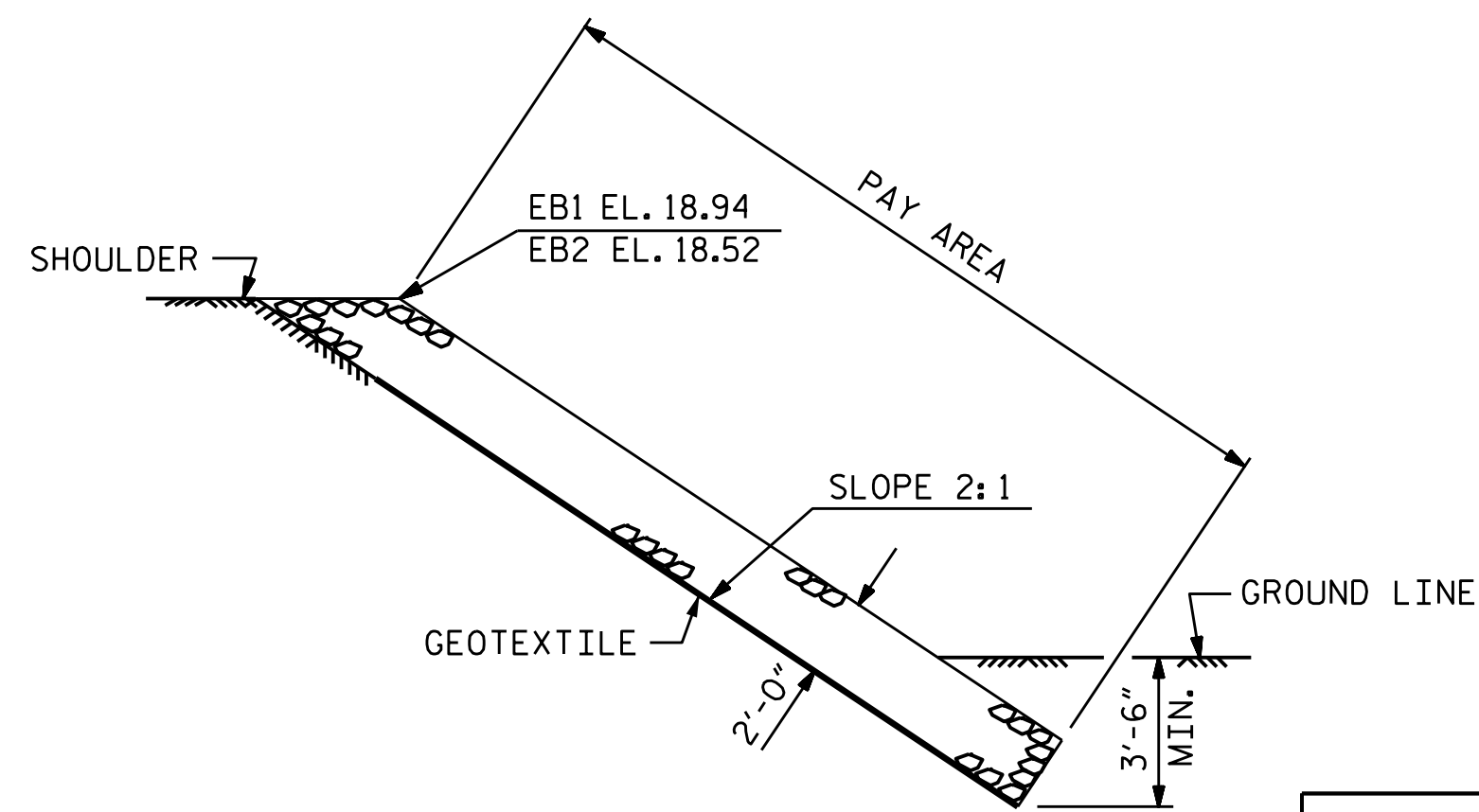
| ESTIMATED QUANTITIES | | |
|-------------------------------|--------------------------------------|----------------------------|
| BRIDGE @ STA. 16+20.00 -L- | RIP RAP CLASS II (2'-0" THICK) | GEOTEXTILE FOR DRAINAGE |
| | TONS | SQUARE YARDS |
| END BENT 1 | 90 | 100 |
| END BENT 2 | 80 | 90 |



SECTION H-H

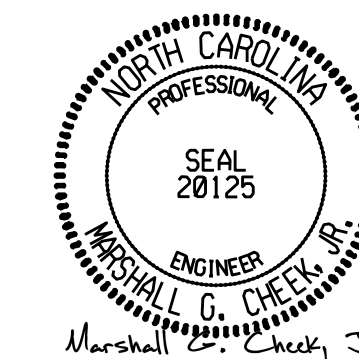


SECTION C-C
BERM RIP RAPPED



SECTION C-C

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-



9/16/2019

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 RIP RAP DETAILS

DRAWN BY : STM DATE : 10/18
 CHECKED BY : MCC DATE : 02/19

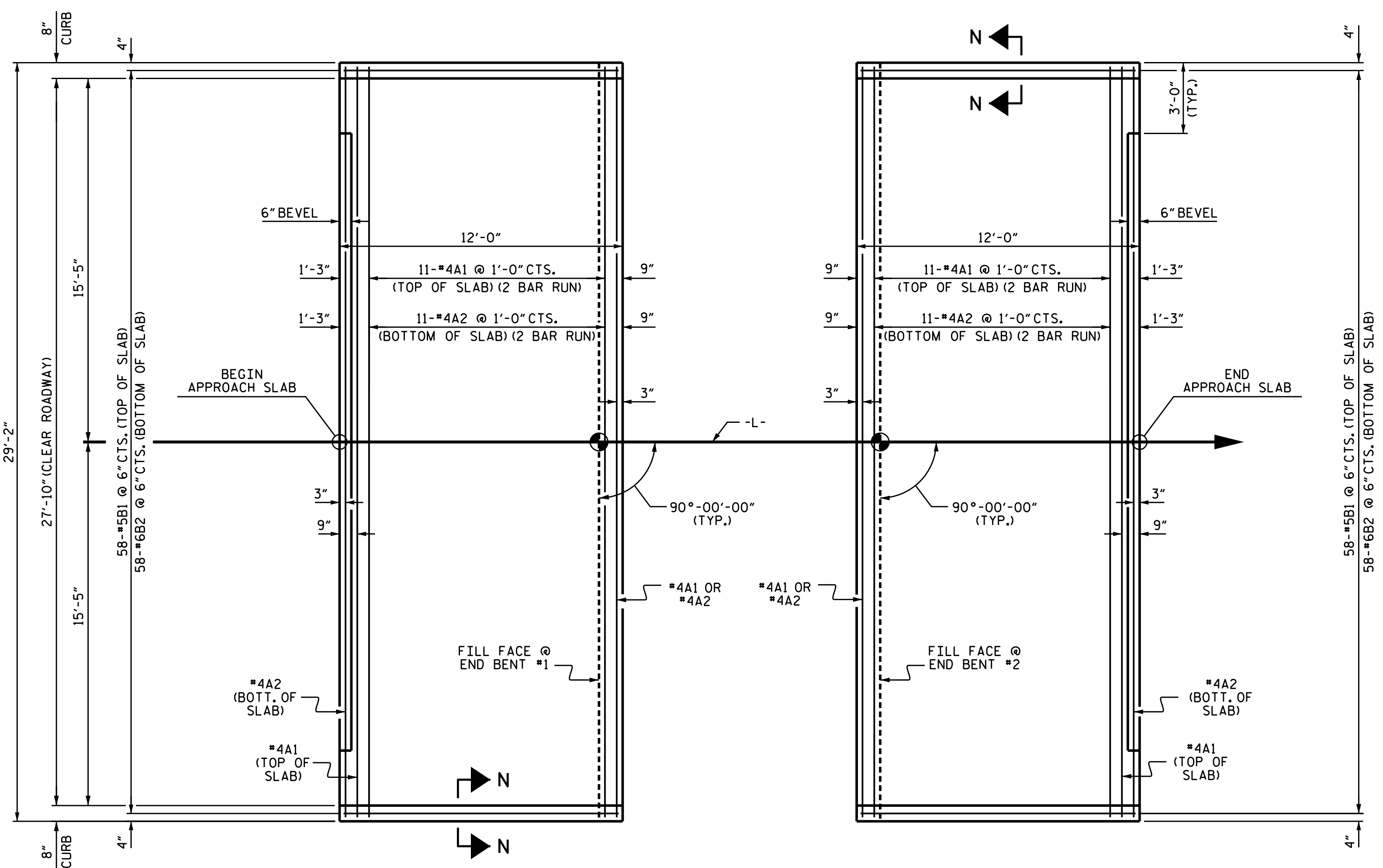
8/29/2019
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 User:z5mith

DOCUMENT NOT CONSIDERED FINAL
 UNLESS ALL SIGNATURES COMPLETED

TGS ENGINEERS
 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|--------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | S-19 |
| 1 | | | 3 | | | TOTAL SHEETS |
| 2 | | | 4 | | | 21 |

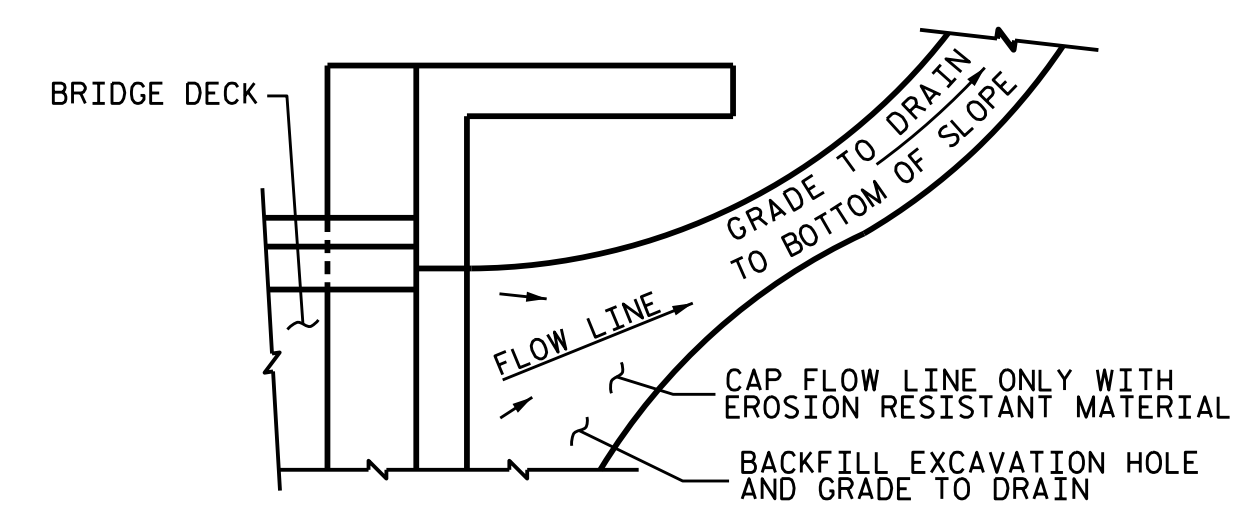
STD. NO. RR1



PLAN @ END BENT #1 **PLAN @ END BENT #2**
 DIMENSIONS SHOWN ARE TYPICAL FOR BOTH APPROACH SLABS

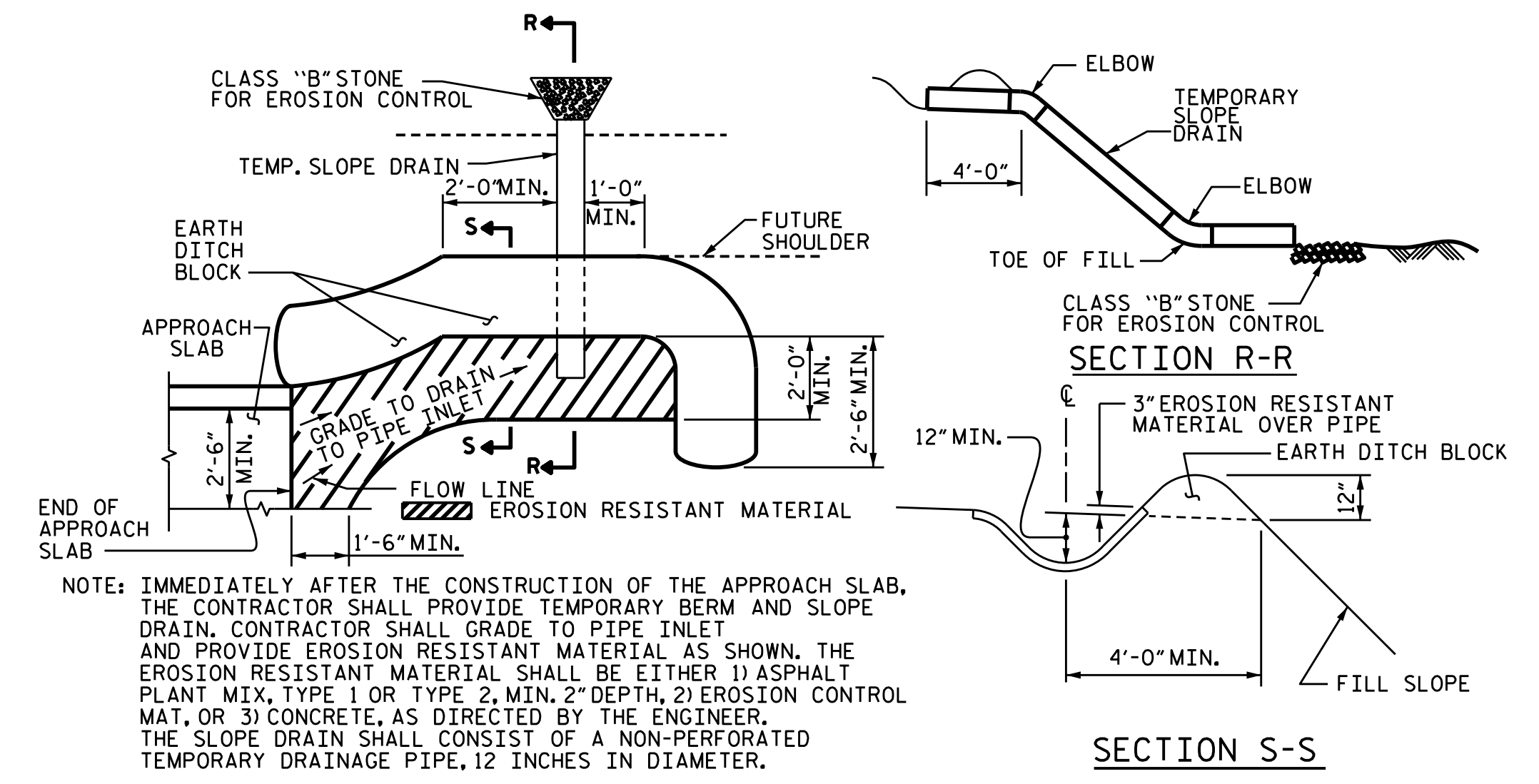
NOTES

FOR BRIDGE APPROACH FILL INCLUDING GEOTEXTILE, 4" Ø DRAINAGE PIPE, AND SELECT MATERIAL BACKFILL, SEE ROADWAY PLANS.
 GEOTEXTILE SHALL BE TYPE I IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS SECTION 1056.
 SELECT MATERIAL BACKFILL (CLASS V OR CLASS VI) SHALL BE IN ACCORDANCE WITH STANDARD SPECIFICATIONS SECTION 1016.
 SELECT MATERIAL BACKFILL IS TO BE CONTINUOUS ALONG FILL FACE OF BACKWALL FROM OUTSIDE EDGE TO OUTSIDE EDGE OF APPROACH SLAB.
 FOR THE 4" Ø DRAINAGE PIPE OUTLET(S), SEE ROADWAY STANDARD DRAWINGS.
 AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED. SEE ROADWAY PLANS.
 APPROACH SLAB GROOVING IS NOT REQUIRED.



NOTE: IF THE APPROACH SLAB IS NOT CONSTRUCTED IMMEDIATELY AFTER THE BACKFILLING OF THE END BENT EXCAVATION, GRADE TO DRAIN TO THE BOTTOM OF THE SLOPE AND PROVIDE EROSION RESISTANT MATERIAL, SUCH AS FIBERGLASS ROVING OR AS DIRECTED BY THE ENGINEER TO PREVENT SOIL EROSION AND TO PROTECT THE AREA ADJACENT TO THE STRUCTURE. THE CONTRACTOR WILL BE REQUIRED TO REMOVE THESE MATERIALS PRIOR TO CONSTRUCTION OF THE APPROACH SLAB.

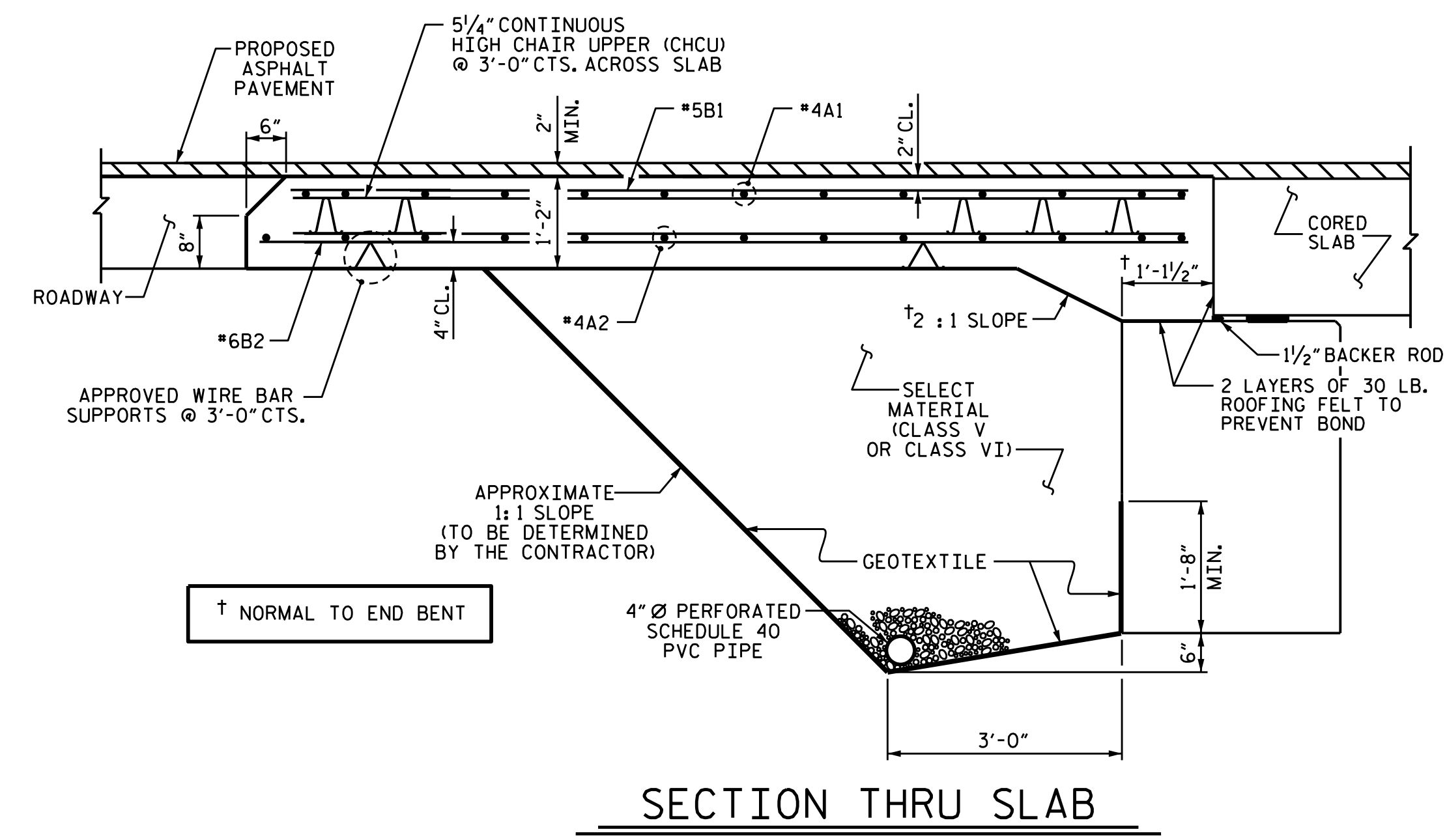
TEMPORARY DRAINAGE DETAIL



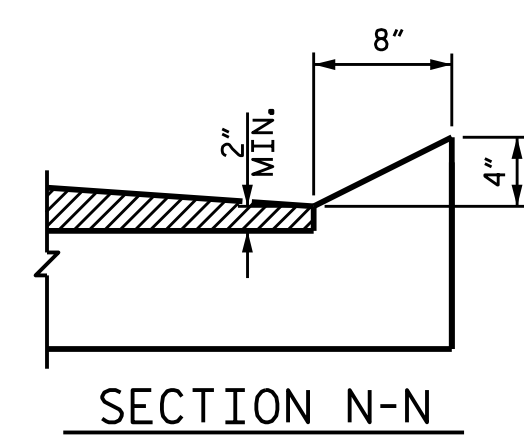
NOTE: IMMEDIATELY AFTER THE CONSTRUCTION OF THE APPROACH SLAB, THE CONTRACTOR SHALL PROVIDE TEMPORARY BERM AND SLOPE DRAIN. CONTRACTOR SHALL GRADE TO PIPE INLET AND PROVIDE EROSION RESISTANT MATERIAL AS SHOWN. THE EROSION RESISTANT MATERIAL SHALL BE EITHER 1) ASPHALT PLANT MIX, TYPE 1 OR TYPE 2, MIN. 2" DEPTH, 2) EROSION CONTROL MAT, OR 3) CONCRETE, AS DIRECTED BY THE ENGINEER. THE SLOPE DRAIN SHALL CONSIST OF A NON-PERFORATED TEMPORARY DRAINAGE PIPE, 12 INCHES IN DIAMETER.

TEMPORARY BERM AND SLOPE DRAIN DETAILS
 (TO BE USED WHEN SHOULDER BERM GUTTER IS REQUIRED)

| SPLICE LENGTHS | | |
|----------------|--------------|----------|
| BAR SIZE | EPOXY COATED | UNCOATED |
| #4 | 2'-0" | 1'-9" |
| #5 | 2'-6" | 2'-2" |
| #6 | 3'-10" | 2'-7" |



SECTION THRU SLAB
 (TYPE II - MODIFIED APPROACH FILL)



SECTION N-N CURB DETAILS

| BILL OF MATERIAL | | | | | | |
|----------------------------------|-----|------|------|---------|--------|------|
| APPROACH SLAB AT EB #1 | | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | |
| *A1 | 13 | #4 | STR | 28'-10" | 250 | |
| A2 | 13 | #4 | STR | 28'-10" | 250 | |
| *B1 | 58 | #5 | STR | 11'-2" | 676 | |
| B2 | 58 | #6 | STR | 11'-8" | 1016 | |
| REINFORCING STEEL | | | | | LBS. | 1266 |
| * EPOXY COATED REINFORCING STEEL | | | | | LBS. | 926 |
| CLASS AA CONCRETE | | | | | C. Y. | 16.7 |
| APPROACH SLAB AT EB #2 | | | | | | |
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT | |
| *A1 | 13 | #4 | STR | 28'-10" | 250 | |
| A2 | 13 | #4 | STR | 28'-10" | 250 | |
| *B1 | 58 | #5 | STR | 11'-2" | 676 | |
| B2 | 58 | #6 | STR | 11'-8" | 1016 | |
| REINFORCING STEEL | | | | | LBS. | 1266 |
| * EPOXY COATED REINFORCING STEEL | | | | | LBS. | 926 |
| CLASS AA CONCRETE | | | | | C. Y. | 16.7 |

| | |
|-------------------------|--------------|
| ASSEMBLED BY : TBE | DATE : 10/18 |
| CHECKED BY : MGC | DATE : 11/18 |
| DRAWN BY : SHS/MAA 5-09 | REV. 12-17 |
| CHECKED BY : BCH 5-09 | MAA/THC |

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD
 BRIDGE APPROACH SLAB
 FOR PRESTRESSED CONCRETE
 CORED SLAB UNIT
 (SUB-REGIONAL TIER)
 90° SKEW

9/16/2019

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

TCS ENGINEERS
 706 HILLSBOROUGH STREET
 SUITE 200
 RALEIGH, NC 27603
 PH (919) 773-8887
 CORP. LICENSE NO.: C-0275

| REVISIONS | | | | | | SHEET NO. |
|-----------|-----|-------|-----|-----|-------|-----------------|
| NO. | BY: | DATE: | NO. | BY: | DATE: | |
| 1 | | | 3 | | | S-20 |
| 2 | | | 4 | | | TOTAL SHEETS 21 |

STANDARD NOTES

DESIGN 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 2018 "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 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.

PROJECT NO. B-4433
BEAUFORT COUNTY
 STATION: 16+20.00 -L-

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| STATE OF NORTH CAROLINA | | | | | |
| DEPARTMENT OF TRANSPORTATION | | | | | |
| RALEIGH | | | | | |
| STANDARD NOTES | | | | | |
| REVISIONS | | | | | SHEET NO. |
| NO. | BY: | DATE: | NO. | BY: | DATE: |
| 1 | | | 3 | | |
| 2 | | | 4 | | |
| | | | | | TOTAL SHEETS |
| | | | | | 21 |

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