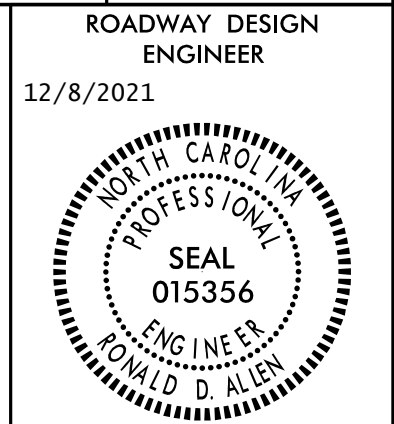


8/17/99
MS-DWG-202108157
05/20/16 09:46:09 NCDOT Division 13 Bridge Replacements E:\17BP.13.R.165_Burke.110155_B5670\Roadway\Proj\B5670_Rdwy_Index-1-A.dgn



Designed by: Ronald (Ron) D. Allen, P.E., P.M.
BSCDFCC20241930

| SHEET NUMBER | SHEET |
|--------------------|--|
| 1 | TITLE SHEET |
| 1A | INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS |
| 1B | CONVENTIONAL SYMBOLS |
| 2A-1 | TYPICAL SECTIONS, PAVEMENT SCHEDULE, WEDGING DETAIL, PROFILE KEY-IN DETAIL, AND GUARDRAIL INSET |
| 2C-1 | GUARDRAIL INSTALLATION DETAIL - TRAILING END UNIT ASSEMBLY A.T.-1 |
| 3B-1 | SUMMARY OF EARTHWORK, SUMMARY OF SHOULDER BERM GUTTER, SUMMARY OF PAVEMENT REMOVAL, SUMMARY OF DRAINAGE QUANTITIES, AND SUMMARY OF GUARDRAIL |
| 3C-1 | GEOTECHNICAL SUMMARY TABLE |
| 4 | PLAN SHEET |
| 5 | PROFILE SHEET |
| RW01 | TITLE SHEET FOR SURVEY & RW SHEETS |
| RW02C-1 TO RW02C-3 | SURVEY CONTROL SHEETS |
| RW02D-1 | PROPOSED ALIGNMENT CONTROL SHEET |
| RW03E-1 | PERMANENT EASEMENT CONTROL SHEET |
| RW04 | RIGHT OF WAY SHEET |
| TMP-1 TO TMP-4 | TRANSPORTATION MANAGEMENT PLANS (6 SHEETS TOTAL) |
| PMP-1 TO PMP-2 | PAVEMENT MARKING PLANS |
| EC-1 TO EC-5 | EROSION CONTROL PLANS |
| UO-1 TO UO-2 | UTILITIES BY OTHERS PLANS |
| UC-1 to UC-5 | UTILITY CONSTRUCTION PLANS (7 SHEETS TOTAL) |
| X-0 | CROSS SECTION SUMMARY SHEET |
| X-1 TO X-9 | -L- CROSS-SECTIONS |
| X-10 TO X-11 | -Y- CROSS-SECTIONS |
| C-1 TO C-5 | CULVERT PLANS |

GENERAL NOTES:

2018 SPECIFICATIONS
EFFECTIVE: 01-16-2018
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED 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 11.

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. 560.02

SIDE ROADS:

THE CONTRACTOR WILL BE REQUIRED TO DO ALL NECESSARY WORK TO PROVIDE SUITABLE CONNECTIONS WITH ALL ROADS, STREETS, AND DRIVES ENTERING THIS PROJECT. THIS WORK WILL BE PAID FOR AT THE CONTRACT UNIT PRICE FOR THE PARTICULAR ITEMS INVOLVED.

SUBSURFACE DRAINS:

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

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 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.

TEMPORARY SHORING:

SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC WILL BE PAID FOR AS "EXTRA WORK" IN ACCORDANCE WITH SECTION 104-7.

SUBSURFACE PLANS:

NO SUBSURFACE PLANS ARE AVAILABLE ON THIS PROJECT. THE CONTRACTOR SHOULD MAKE HIS OWN INVESTIGATION AS TO THE SUBSURFACE CONDITIONS.

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE RUTHERFORD EMC (POWER), CHARTER (CABLE), AND AT&T (TELEPHONE)

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.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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 11 |
| 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 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction - High Side of Superelevated Curve - Method 1 |
| DIVISION 8 - INCIDENTALS | |
| 815.02 | Subsurface Drain |
| 815.03 | Pipe Underdrain and Blind 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 |
| 840.46 | Traffic Bearing Precast Drainage Structure |
| 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 |
| 876.01 | Rip Rap in Channels |
| 876.02 | Guide for Rip Rap at Pipe Outlets |
| 876.04 | Drainage Ditches with Class "B" Rip Rap |

12/2/2016

STATE OF NORTH CAROLINA, DIVISION OF HIGHWAYS CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

| | |
|---------------------------------------|-----------|
| State Line | ----- |
| County Line | ----- |
| Township Line | ----- |
| City Line | ----- |
| Reservation Line | ----- |
| Property Line | ----- |
| Existing Iron Pin | ○ EIP |
| Computed Property Corner | ----- |
| Property Monument | □ ECM |
| Parcel/Sequence Number | ①23 |
| Existing Fence Line | -x-x-x- |
| Proposed Woven Wire Fence | ○ |
| Proposed Chain Link Fence | □ |
| Proposed Barbed Wire Fence | ◇ |
| Existing Wetland Boundary | ---WLB--- |
| Proposed Wetland Boundary | WLB |
| Existing Endangered Animal Boundary | ---EAB--- |
| Existing Endangered Plant Boundary | ---EPB--- |
| Existing Historic Property Boundary | ---HPB--- |
| Known Contamination Area: Soil | ☠-s-☠ |
| Potential Contamination Area: Soil | ☠-s-☠ |
| Known Contamination Area: Water | ☠-w-☠ |
| Potential Contamination Area: Water | ☠-w-☠ |
| Contaminated Site: Known or Potential | ☠? |

BUILDINGS AND OTHER CULTURE:

| | |
|-------------------------------|-----|
| Gas Pump Vent or U/G Tank Cap | ○ |
| Sign | ○ S |
| Well | ○ W |
| Small Mine | ✕ |
| Foundation | □ |
| Area Outline | □ |
| Cemetery | □ |
| Building | □ |
| School | □ |
| Church | □ |
| Dam | ▬ |

HYDROLOGY:

| | |
|------------------------------------|------------|
| Stream or Body of Water | ----- |
| Hydro, Pool or Reservoir | □ |
| Jurisdictional Stream | ---JS--- |
| Buffer Zone 1 | ---BZ 1--- |
| Buffer Zone 2 | ---BZ 2--- |
| Flow Arrow | ← |
| Disappearing Stream | → |
| Spring | ○ |
| Wetland | ▽ |
| Proposed Lateral, Tail, Head Ditch | ▬ |
| False Sump | ▽ |

RAILROADS:

| | |
|--------------------|---------------|
| Standard Gauge | ----- |
| RR Signal Milepost | ○ MILEPOST 35 |
| Switch | □ 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 | ○ R W |
| New Right of Way Line with Pin and Cap | ○ R W ◆ |
| New Right of Way Line with Concrete or Granite R/W Marker | ○ R W ◆ |
| New Control of Access Line with Concrete C/A Marker | ○ C/A |
| Existing Control of Access | ○ C/A |
| New Control of Access | ○ C/A |
| Existing Easement Line | ---E--- |
| New Temporary Construction Easement | ---E--- |
| New Temporary Drainage Easement | ---TDE--- |
| New Permanent Drainage Easement | ---PDE--- |
| New Permanent Drainage / Utility Easement | ---DUE--- |
| New Permanent Utility Easement | ---PUE--- |
| New Temporary Utility Easement | ---TUE--- |
| New Aerial Utility Easement | ---AUE--- |

ROADS AND RELATED FEATURES:

| | |
|----------------------------|----------|
| Existing Edge of Pavement | ----- |
| Existing Curb | ----- |
| Proposed Slope Stakes Cut | ---C--- |
| Proposed Slope Stakes Fill | ---F--- |
| Proposed Curb Ramp | ---CR--- |
| Existing Metal Guardrail | ---T--- |
| Proposed Guardrail | ---T--- |
| Existing Cable Guiderail | ---T--- |
| Proposed Cable Guiderail | ---T--- |
| Equality Symbol | ⊕ |
| Pavement Removal | ▨ |

VEGETATION:

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

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

| | |
|------------|------------|
| Hedge | ----- |
| Woods Line | ----- |
| Orchard | ☀ |
| Vineyard | □ Vineyard |

EXISTING STRUCTURES:

| | |
|--|------------------|
| MAJOR: | |
| Bridge, Tunnel or Box Culvert | ---CONC--- |
| Bridge Wing Wall, Head Wall and End Wall | ---CONC WW--- |
| MINOR: | |
| Head and End Wall | ---CONC HW--- |
| Pipe Culvert | ----- |
| Footbridge | ---FOOTBRIDGE--- |
| Drainage Box: Catch Basin, DI or JB | □ CB |
| Paved Ditch Gutter | ----- |
| Storm Sewer Manhole | ○ S |
| Storm Sewer | ---S--- |

UTILITIES:

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

TELEPHONE:

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

WATER:

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

TV:

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

GAS:

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

SANITARY SEWER:

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

MISCELLANEOUS:

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

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

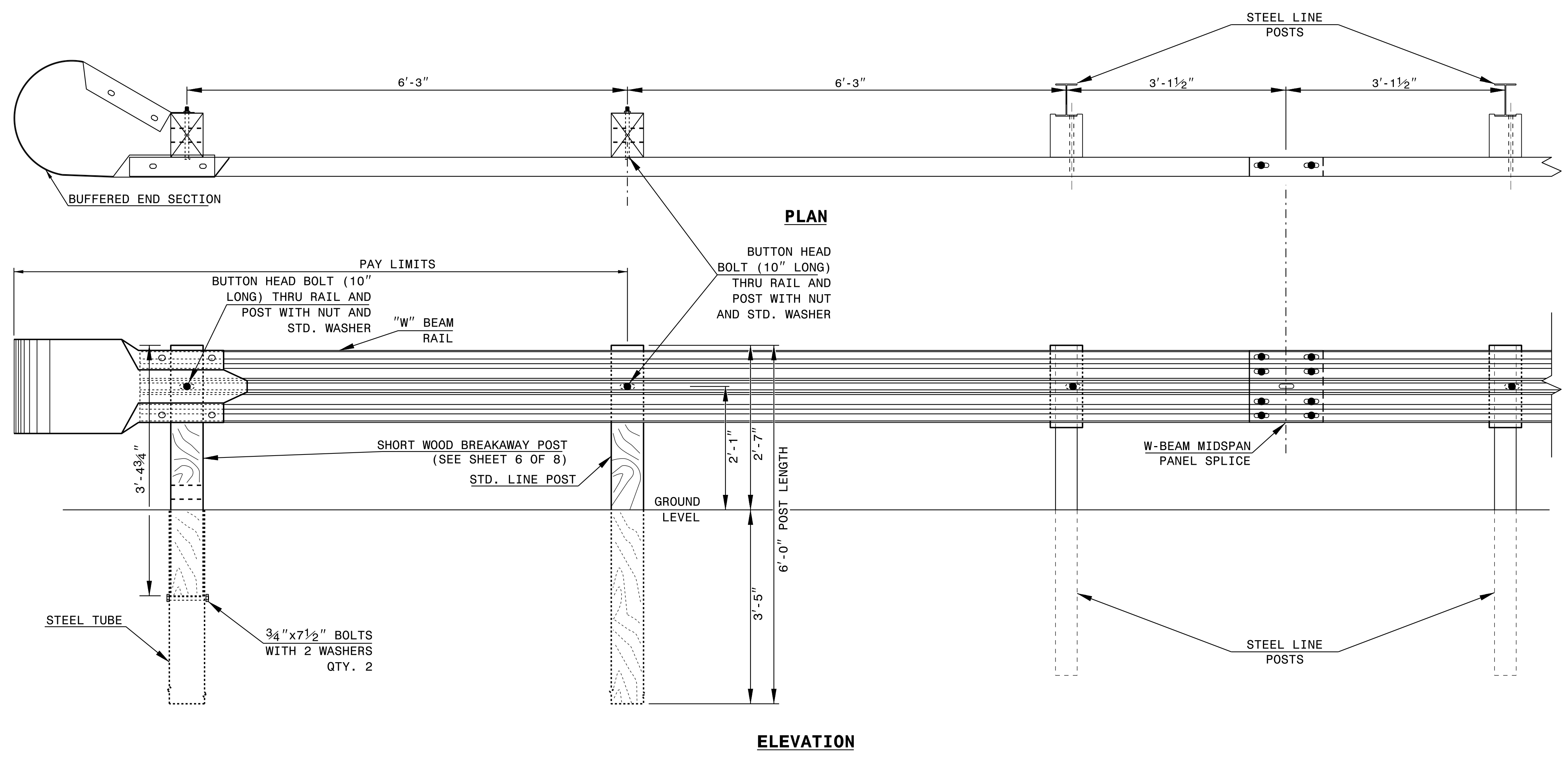
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF

STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

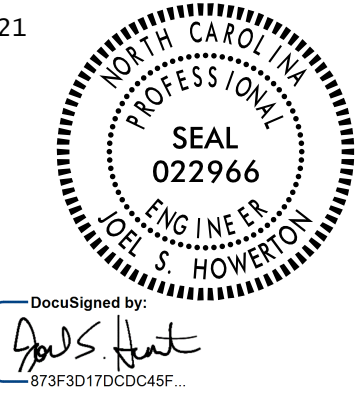
ROADWAY DETAIL DRAWING FOR
GUARDRAIL INSTALLATION

SHEET OF



TRAILING END UNIT ASSEMBLY
A.T. - 1 SYSTEM

12/9/2021



DocuSigned by:
J. S. Howerton
673F3D17DCDC45F

DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

**CONTRACTS STANDARDS
AND DEVELOPMENT UNIT**
Office 919-707-6950 FAX 919-250-4119

A.T. - 1 SYSTEM

ORIGINAL BY: _____ DATE: _____
MODIFIED BY: _____ DATE: _____
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

COMPUTED BY: DMM _____ DATE: 8/16/2021
 CHECKED BY: JCK _____ DATE: 8/16/2021

(12-17-19)

PROJECT NO.
17BP.13.R.165

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 | | | ASU 1 | 12 | 100 | 200 | 500 | | |
| | | | | | TOTAL CY/TONS/SY: | 100 | 200** | 500** | 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 HORIZONTAL DRAINS

| LINE | Approximate Station | Location LT/RT | Elevation Above or Below Grade (+/-) FT | Inclination Angle DEGREES | PVC Pipe Schedule 40/80 or NO PIPE | Horizontal Drain FT | Horizontal Drain W/O Pipe FT |
|-------------|---------------------|----------------|---|---------------------------|------------------------------------|---------------------|------------------------------|
| | | | | | | | |
| CONTINGENCY | | | | | | | |
| | | | | | | TOTAL FT: | 0 0 |

SUMMARY OF SETTLEMENT GAUGES

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

**SUMMARY OF SURCHARGES
 AND SURCHARGE WAITING PERIODS**

| LINE | Station | Station | Surcharge Height FT | MONTHS |
|------|---------|---------|---------------------|--------|
| | | | | |
| | | | | |

**SUMMARY OF EMBANKMENT
 WAITING PERIODS**

| LINE | Station | Station | MONTHS |
|------|---------|---------|--------|
| | | | |
| | | | |

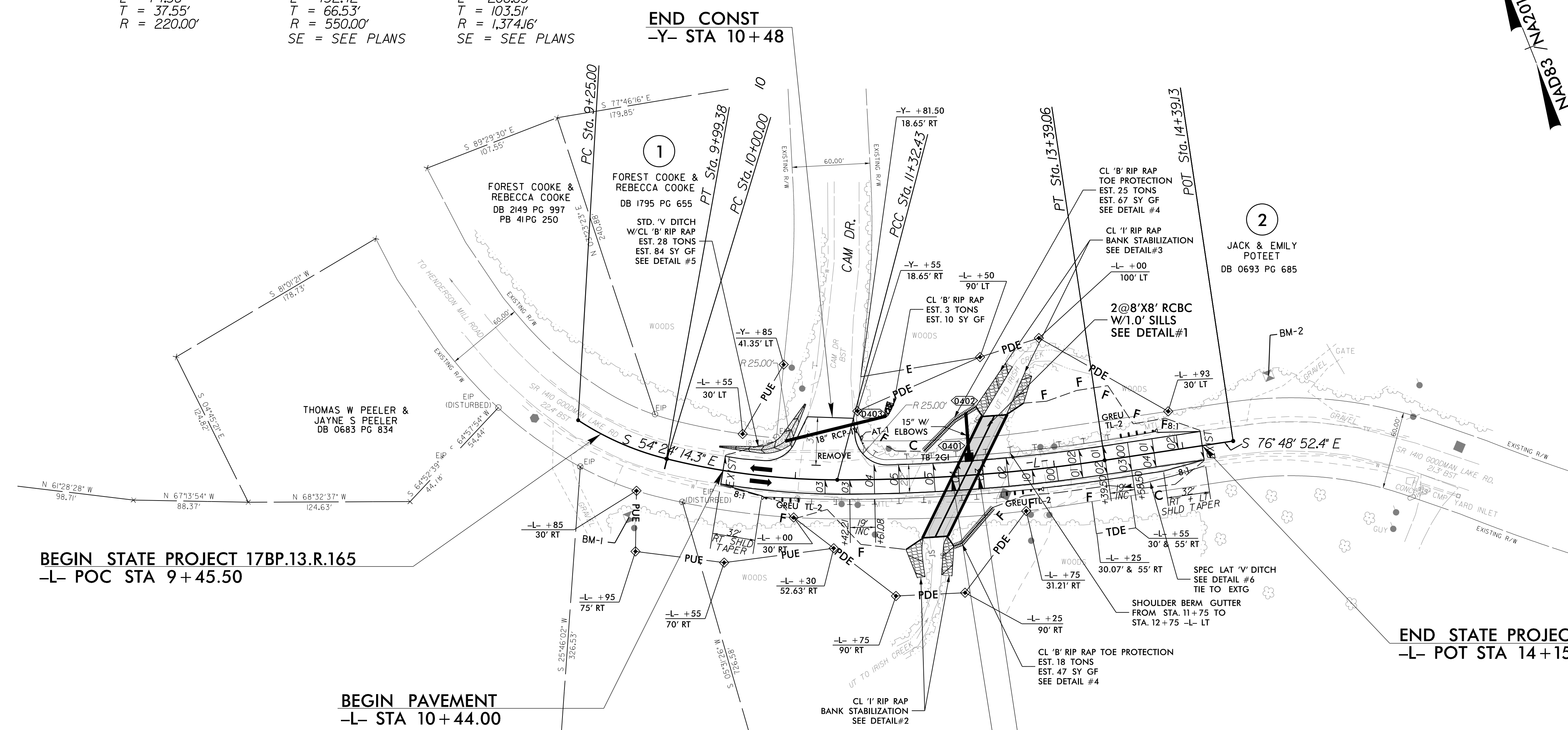
SUMMARY OF BRIDGE WAITING PERIODS

| Bridge Description | End Bent/ Bent No. | MONTHS |
|--------------------|--------------------|--------|
| | | |
| | | |

| | | | |
|--|--|----------------------------------|--|
| PROJECT REFERENCE NO. 17BP.13.R.165 | | SHEET NO. 4 | |
| RW SHEET NO. | | | |
| ROADWAY DESIGN ENGINEER 12/8/2021 | | HYDRAULICS ENGINEER 12/8/2021 | |
| | | | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | | | |
| | | | |

-L-

| | | |
|---|---|--|
| PI Sta 9+62.55 $\Delta = 19' 22" 12.2" (LT)$ $D = 26' 02" 36.7"$ $L = 74.38'$ $T = 37.55'$ $R = 220.00'$ | PI Sta 10+66.54 $\Delta = 13' 47" 41.8" (LT)$ $D = 10' 25" 02.7"$ $L = 132.42'$ $T = 66.53'$ $R = 550.00'$ SE = SEE PLANS | PI Sta 12+35.94 $\Delta = 8' 36" 56.3" (LT)$ $D = 4' 10" 10.2"$ $L = 206.63'$ $T = 103.51'$ $R = 1,374.16'$ SE = SEE PLANS |
|---|---|--|



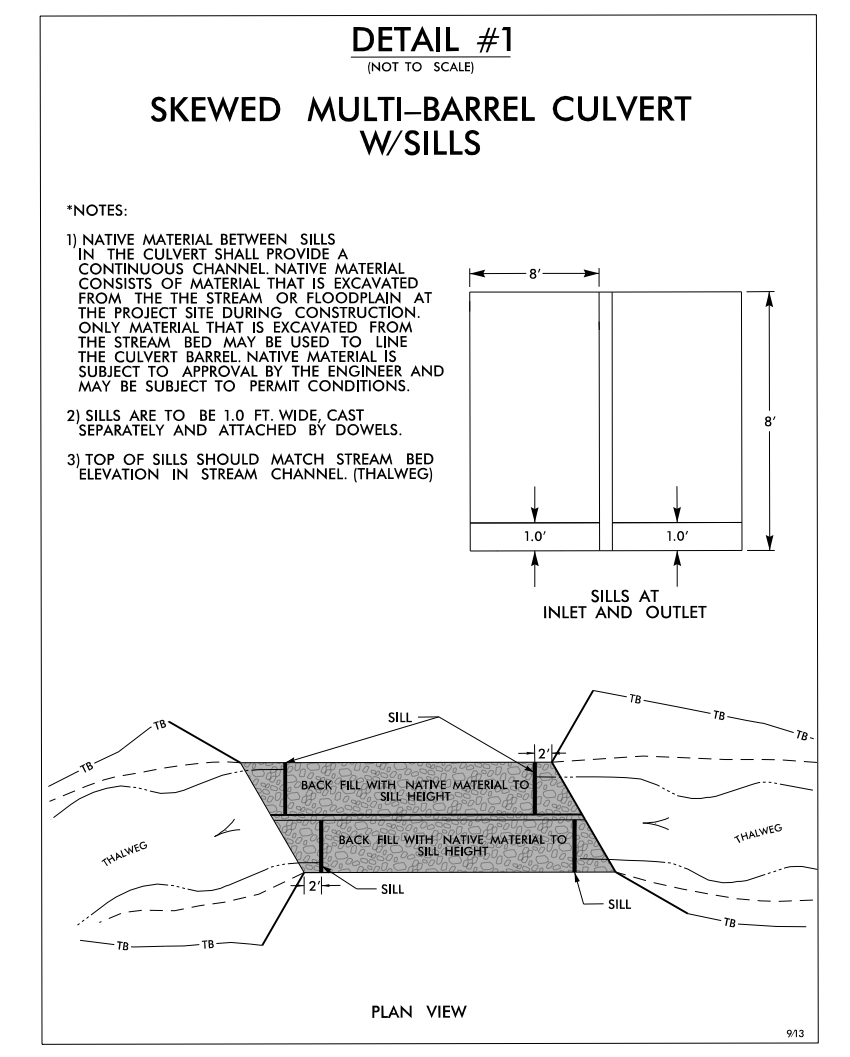
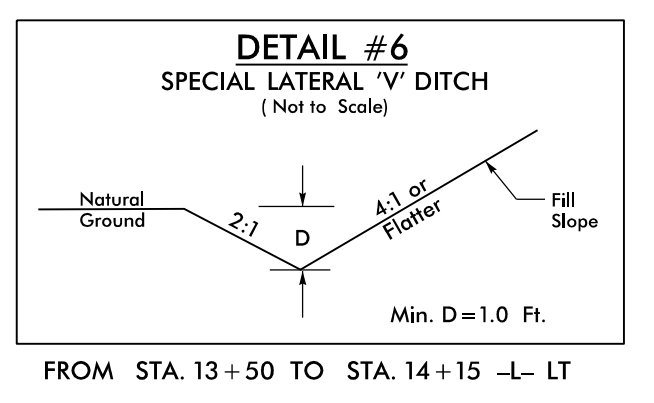
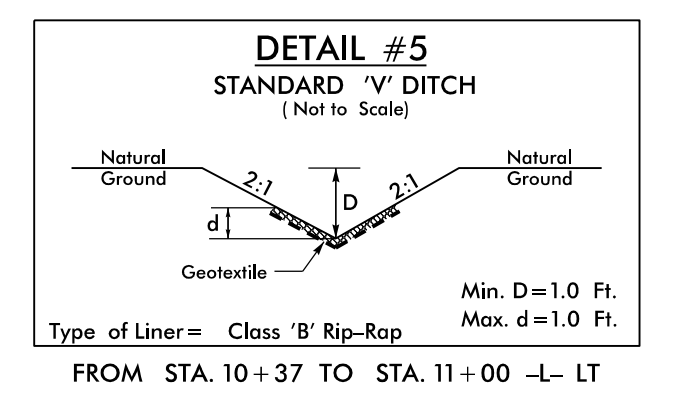
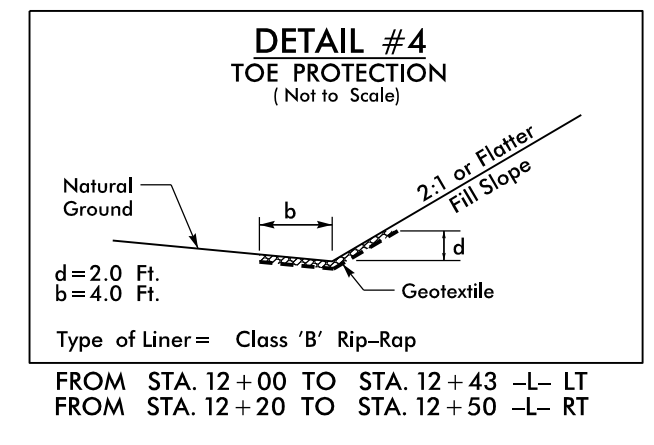
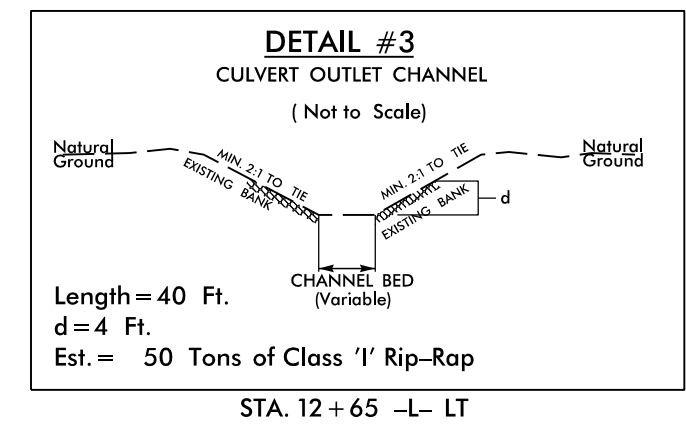
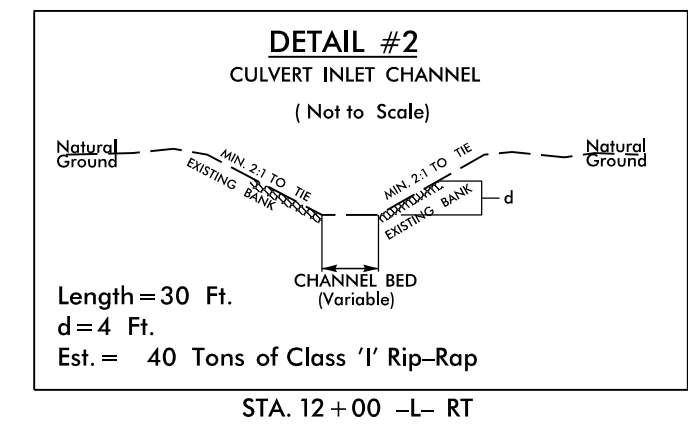
BEGIN STATE PROJECT 17BP.13.R.165
-L- POC STA 9 + 45.50

END STATE PROJECT 17BP.13.R.165
-L- POT STA 14 + 15.00

BEGIN PAVEMENT
-L- STA 10 + 44.00

END CULVERT
-L- STA. 12 + 41.42

BEGIN CULVERT
-L- STA. 12 + 20.63



FOR -L- PROFILE SEE SHEET 5
 FOR CULVERT PLANS, SEE SHEET C-1 THRU C-5

REVISIONS

8.17.99

5/28/20

| | |
|---|-------------------------------------|
| PROJECT REFERENCE NO. 17BP13.R165 | SHEET NO. 5 |
| ROADWAY DESIGN ENGINEER 12/8/2021 | HYDRAULICS ENGINEER 12/8/2021 |
| | |
| <p>RONALD D. ALLEN, P.E. JOSEPH G. DALTON, P.E.</p> <p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p> | |

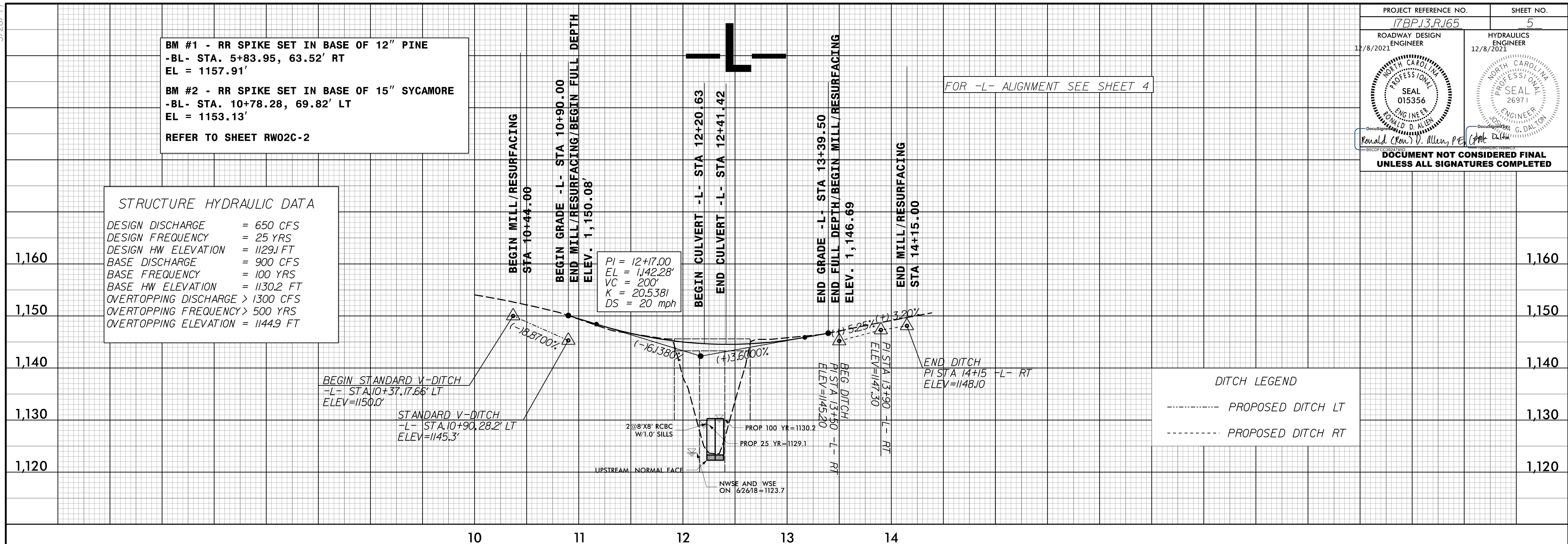
BM #1 - RR SPIKE SET IN BASE OF 12" PINE
 -BL- STA. 5+83.95, 63.52' RT
 EL = 1157.91'

BM #2 - RR SPIKE SET IN BASE OF 15" SYCAMORE
 -BL- STA. 10+78.28, 69.82' LT
 EL = 1153.13'

REFER TO SHEET RW02C-2

STRUCTURE HYDRAULIC DATA

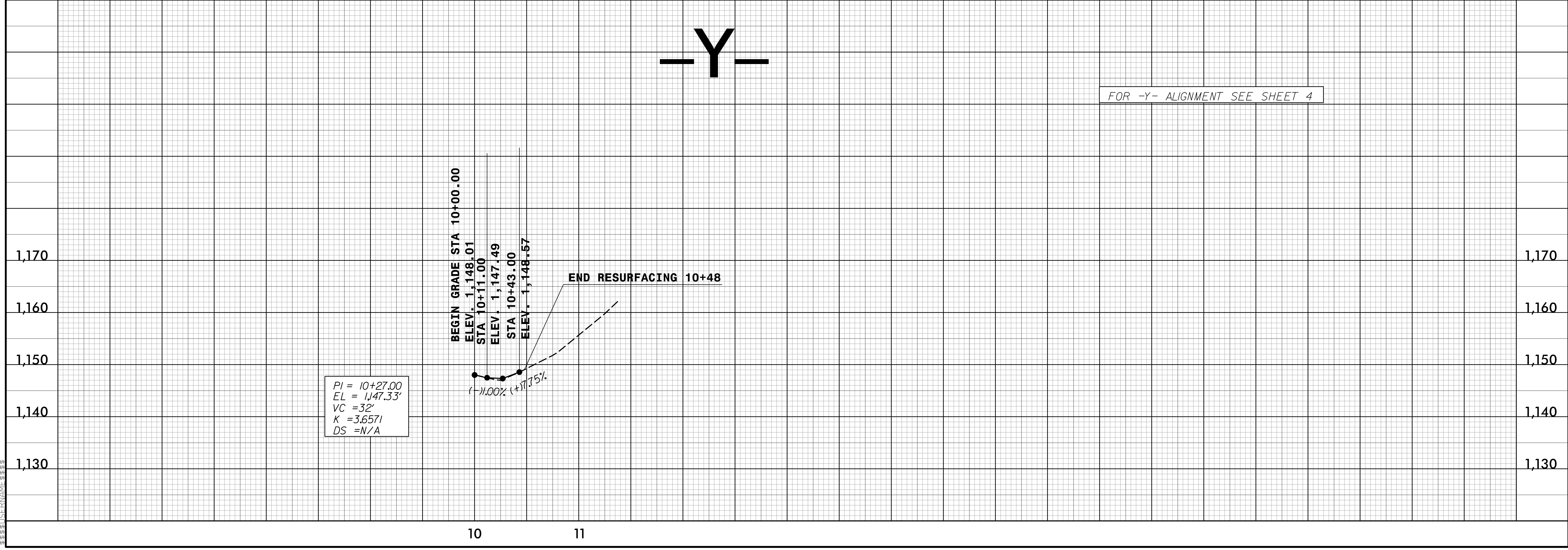
DESIGN DISCHARGE = 650 CFS
 DESIGN FREQUENCY = 25 YRS
 DESIGN HW ELEVATION = 1129J FT
 BASE DISCHARGE = 900 CFS
 BASE FREQUENCY = 100 YRS
 BASE HW ELEVATION = 1130.2 FT
 OVERTOPPING DISCHARGE > 1300 CFS
 OVERTOPPING FREQUENCY > 500 YRS
 OVERTOPPING ELEVATION = 1144.9 FT



DITCH LEGEND

----- PROPOSED DITCH LT
 ----- PROPOSED DITCH RT

08_DFC-20210814_09_NCDOT_Division 13 Bridge Replacements\17BP13.R165_Burke.110155_B5870\Roadway\Proj\B5870_Rdy_pfl.dgn

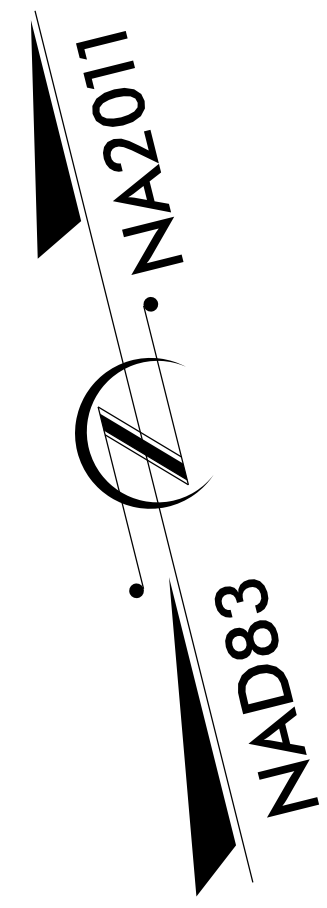
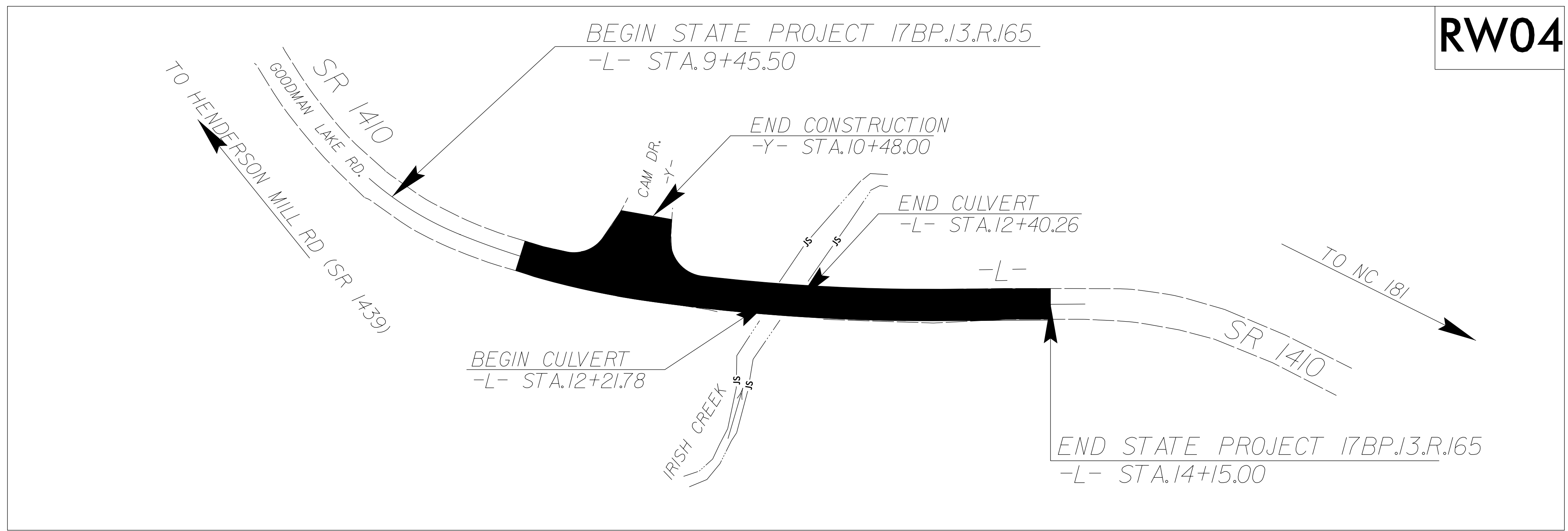


09/06/19

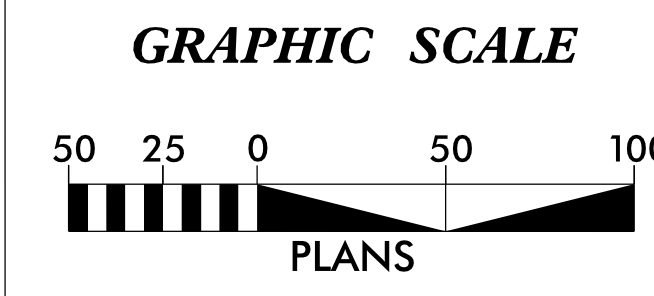
TIP PROJECT: 17BP.13.R.165

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-------|-----------------------------|-----------|--------------|
| N.C. | 17BP.13.R.165 | RW01 | XX |

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
 SURVEY CONTROL, EXISTING CENTERLINES,
 RIGHT OF WAY, EASEMENTS AND PROPERTY TIES
BURKE COUNTY

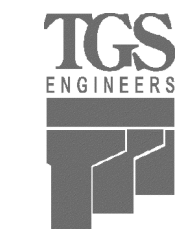


\$\$\$\$\$ SYSTEM \$\$\$\$\$\$
\$\$\$\$\$ DDN \$\$\$\$\$\$
\$\$\$\$\$ USERNAME \$\$\$\$\$\$



DATUM DESCRIPTION
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B5870-1" WITH NAD 83/NSRS 2011 STATE PLANE GRID COORDINATES OF NORTHING: 759,408.250(ft) EASTING: 1,180,530.829(ft) ELEVATION: 1,163.613(ft)
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.999868753
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "B5870-1" TO -L- STATION 9+45.50 IS S 13°12'31.1" E 468.98(ft)
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
 VERTICAL DATUM USED IS NAVD 88

Prepared in the Office of:




TGS ENGINEERS
 804-C N. LAFAYETTE ST
 SHELBY, NC 28150
 PH (704) 476-0003
 CORP. LICENSE NO.: C-0275

2018 STANDARD SPECIFICATIONS

| | |
|---------------------------------------|----------------------------------|
| RIGHT OF WAY DATE: 2/5/2021 | LETTING DATE: 6/2/2021 |
|---------------------------------------|----------------------------------|

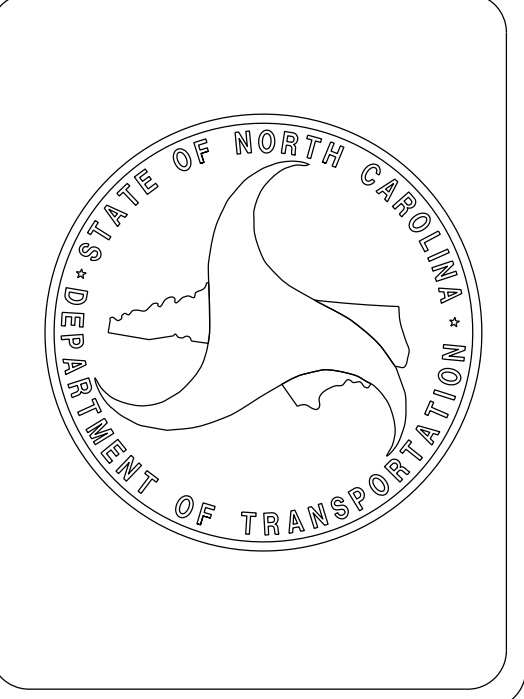
PROFESSIONAL LAND SURVEYOR



DocuSigned by:
 Matthew Cornwell
 EBD36F11473EA75...

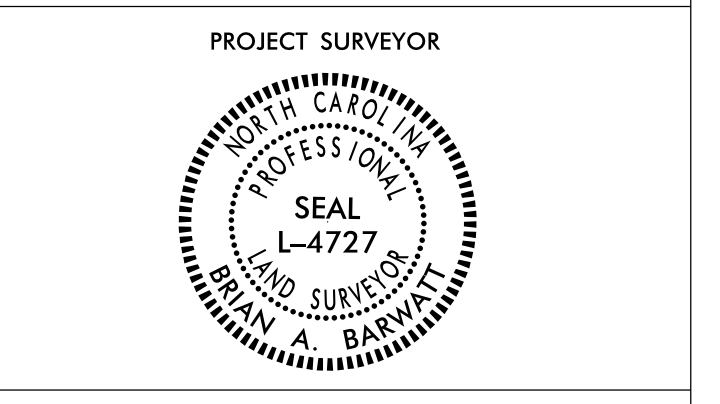
3/11/2021

SIGNATURE: _____ Date: _____



Location and Surveys

LOCATION & SURVEYS
DIVISION 13

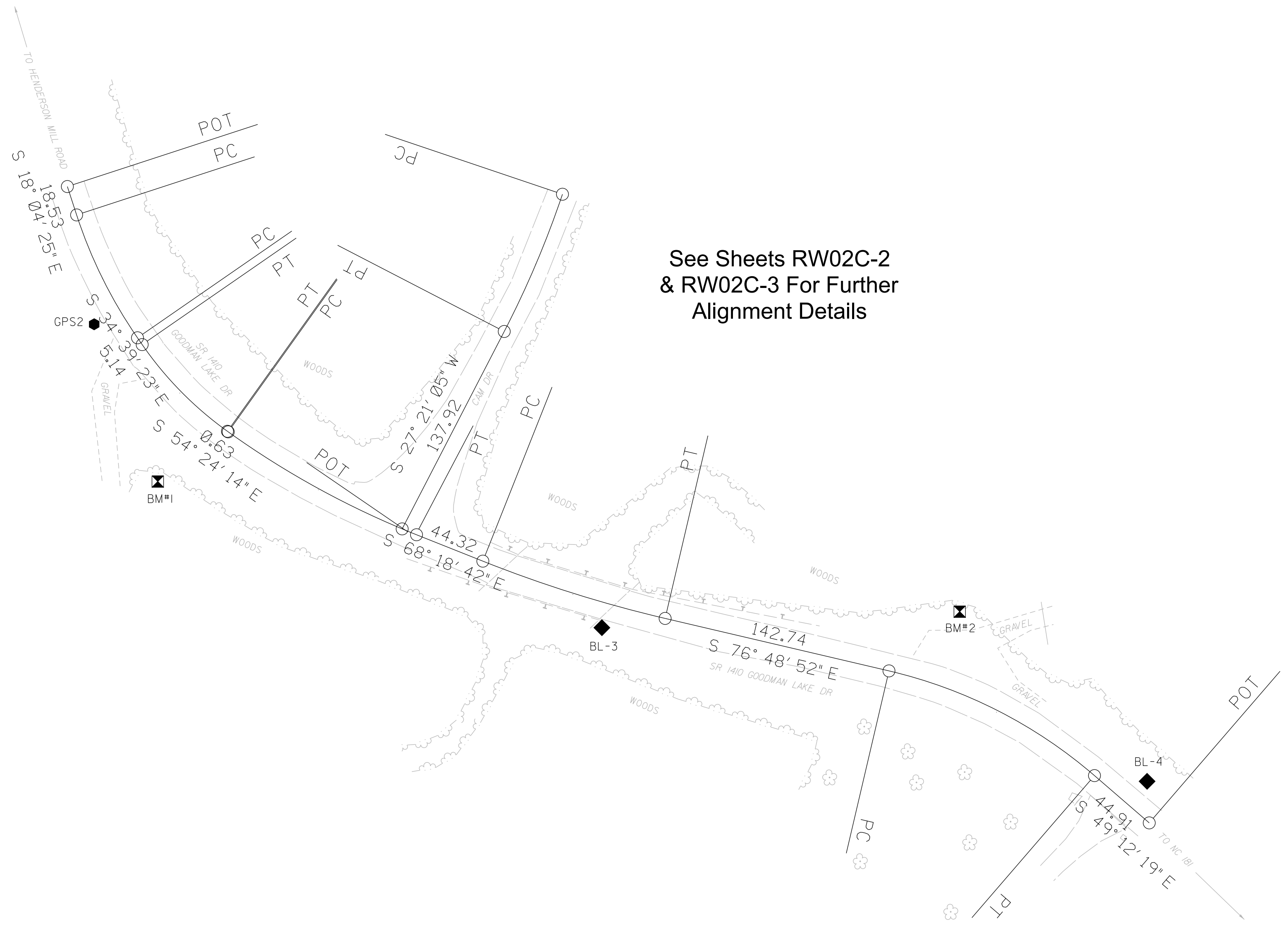


DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

GPS1



See Sheets RW02C-2
& RW02C-3 For Further
Alignment Details

I, Brian Barwatt, PLS, certify that the Project Control was (performed/verified) under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
 Type of GPS field procedure: VRS
 Dates of survey: 5/11/2021
 Datum/Epoch: NAD 83/NA 2011
 Published/Fixed-control used: N/A
 Localized around: GPS-1 (B-5870-1)
 Northing: 759408.250
 Easting: 1180530.829
 Combined grid factor: 0.999868753
 Geoid model: Geoid 12BNC
 Units: English

I also certify that the baseline control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and vertical accuracy to Class A. Field work was performed from April to May 2021, and all coordinates are based on NAD 83 /2011 and all elevations are based on NAVD 88; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 7th day of June, 2021.

DocuSigned by:

 Brian Barwatt
 Professional Land Surveyor L-4727

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. 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


6/2/21
 07-JUN-2021 11:37
 C:\Sulva\Consul\ents\Checked Work\RW Sheets\B5870 AVL L&S\B5870.LS-rw02c-1.dgn
 bobbarwatt AT LS-317902

REVISIONS

07-JUN-2021 11:38
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bobbarwatt AT LS-317902

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

| | |
|---|----------------------|
| PROJECT REFERENCE NO. 17BP.13.R.165 | SHEET NO. RW02C-2 |
| Location and Surveys | |
| LOCATION & SURVEYS DIVISION 13 | |
| PROJECT SURVEYOR | |
|  | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | |

BASELINE

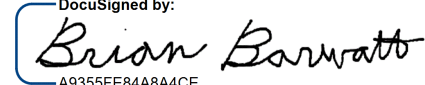
| BL | POINT | DESC. | NORTH | EAST | ELEVATION |
|------|-------|---------|-------------|--------------|-----------|
| GPS1 | | B5870-1 | 759408.2500 | 1180530.8290 | 1163.61 |
| GPS2 | | B5870-2 | 758981.7090 | 1180594.8180 | 1155.26 |
| 3 | | BL-3 | 758793.4080 | 1180909.9860 | 1144.71 |
| 4 | | BL-4 | 758698.0730 | 1181248.4490 | 1157.23 |

I, Brian Barwatt, PLS, certify that the Project Control was (performed/verified) under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
Type of GPS field procedure: VRS
Dates of survey: 5/11/2021
Datum/Epoch: NAD 83/NA 2011
Published/Fixed-control used: N/A
Localized around: GPS-1 (B-5870-1)
Northing: 759408.250
Easting: 1180530.829
Combined grid factor: 0.999868753
Geoid model: Geoid 12BNC
Units: English

I also certify that the baseline control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and vertical accuracy to Class A. Field work was performed from April to May 2021, and all coordinates are based on NAD 83 /2011 and all elevations are based on NAVD 88; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 7th day of June, 2021.

DocuSigned by:

Professional Land Surveyor L-4727

BENCHMARKS

 BM1 ELEVATION = 1157.95
 N 758884 E 1180634
 RR SPIKE IN BASE OF 12 INCH PINE

 BM2 ELEVATION = 1153.13
 N 758803 E 1181132
 RR SPIKE IN BASE OF 15 INCH SYCAMORE

NOTES:


1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. 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

07-JUN-2021 11:39
 C:\Sylvia\Consultants\Checked Work\RW Sheets\B5870 AVL L&S\B5870.LS.rw02c-3.dgn
 bobbarwatt AT LS-317902

SURVEY CONTROL SHEET

W/ EXISTING CENTERLINE ALIGNMENTS PRIOR TO CONSTRUCTION

| | |
|---|----------------------|
| PROJECT REFERENCE NO. 17BP.13.R.165 | SHEET NO. RW02C-3 |
| Location and Surveys | |
| LOCATION & SURVEYS DIVISION 13 | |
| PROJECT SURVEYOR | |
|  | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | |

-EL-

| EL POINT | N | E | BEARING | DIST | DELTA | D | L | T | R |
|-------------|------------|-------------|-----------------|--------|-----------------|-------------|--------|-------|--------|
| POT | 759067.159 | 1180578.173 | | | | | | | |
| LINE | | | S 18°04'25.2" E | 18.53 | | | | | |
| PC | 759049.543 | 1180583.922 | | | | | | | |
| CURVE | | | S 26°21'53.9" E | 85.08 | 16°34'57.4"(LT) | 19°25'20.3" | 85.38 | 42.99 | 295.00 |
| PT | 758973.311 | 1180621.705 | | | | | | | |
| LINE | | | S 34°39'22.6" E | 5.14 | | | | | |
| PC | 758969.083 | 1180624.628 | | | | | | | |
| CURVE | | | S 44°31'48.4" E | 75.45 | 19°44'51.7"(LT) | 26°02'36.7" | 75.83 | 38.29 | 220.00 |
| PT | 758915.296 | 1180677.541 | | | | | | | |
| LINE | | | S 54°24'14.2" E | 0.63 | | | | | |
| PC | 758914.930 | 1180678.051 | | | | | | | |
| CURVE | | | S 61°21'28.3" E | 133.18 | 13°54'28.1"(LT) | 10°25'02.7" | 133.51 | 67.08 | 550.00 |
| PT | 758851.093 | 1180794.932 | | | | | | | |
| LINE | | | S 68°18'42.3" E | 44.32 | | | | | |
| PC | 758834.716 | 1180836.110 | | | | | | | |
| CURVE | | | S 72°33'47.3" E | 118.61 | 08°30'10.1"(LT) | 07°09'43.1" | 118.72 | 59.47 | 800.00 |
| PT | 758799.173 | 1180949.272 | | | | | | | |
| LINE | | | S 76°48'52.4" E | 142.74 | | | | | |
| PC | 758766.615 | 1181088.246 | | | | | | | |
| CURVE | | | S 63°00'35.6" E | 143.17 | 27°36'33.7"(RT) | 19°05'54.9" | 144.56 | 73.71 | 300.00 |
| PT | 758701.640 | 1181215.820 | | | | | | | |
| LINE | | | S 49°12'18.7" E | 44.91 | | | | | |
| POT | 758672.299 | 1181249.818 | | | | | | | |

-EY-

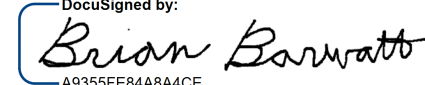
| EY POINT | N | E | BEARING | DIST | DELTA | D | L | T | R |
|-------------|------------|-------------|-----------------|--------|-----------------|-------------|-------|-------|--------|
| PC | 759062.385 | 1180885.542 | | | | | | | |
| CURVE | | | S 23°00'08.1" W | 92.52 | 08°41'53.8"(RT) | 09°23'33.9" | 92.61 | 46.39 | 610.00 |
| PT | 758977.223 | 1180849.390 | | | | | | | |
| LINE | | | S 27°21'05.0" W | 137.92 | | | | | |
| POT | 758854.726 | 1180786.025 | | | | | | | |

I, Brian Barwatt, PLS, certify that the Project Control was (performed/verified) under my supervision from an actual GPS survey made under my supervision and the following information was used to perform the survey:

Class of survey: AA
 Type of GPS field procedure: VRS
 Dates of survey: 5/11/2021
 Datum/Epoch: NAD 83/NA 2011
 Published/Fixed-control used: N/A
 Localized around: GPS-1 (B-5870-1)
 Northing: 759408.250
 Easting: 1180530.829
 Combined grid factor: 0.999868753
 Geoid model: Geoid 12BNC
 Units: English

I also certify that the baseline control for this project was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:20,000 (Class AA) and vertical accuracy to Class A. Field work was performed from April to May 2021, and all coordinates are based on NAD 83 /2011 and all elevations are based on NAVD 88; That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

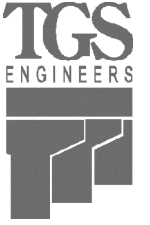

This 7th day of June, 2021.

DocuSigned by:

 Professional Land Surveyor L-4727

NOTES:

1. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
2. 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.

PERMANENT EASEMENT CONTROL SHEET

| | |
|---|-----------------------------|
| PROJECT REFERENCE NO. 17BP.13.R.165 | SHEET NO. RW03E-1 |
| Location and Surveys | |
|  <div style="display: inline-block; vertical-align: middle; margin-left: 10px;"> TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275 </div> | |
| PROJECT SURVEYOR | |
|  <div style="display: inline-block; vertical-align: middle; margin-left: 20px;"> Digitally signed by: <i>Matthew Cornwell</i> <small>EBD06F11473E475...</small> 8/4/2021 </div> | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | |

I, Matthew T. Cornwell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed on 3/5/2021 and 8/2/2021, and all coordinates are based on NAD83/2011. That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 4th day of August, 2021.


 8/4/2021

Professional Land Surveyor L-4775

ROW MARKER PERMANENT EASEMENT

| ALIGN | STATION | OFFSET | NORTH | EAST |
|-------|----------|---------|-------------|--------------|
| L | 9+85.00 | 30.00 | 758900.8370 | 1180647.1152 |
| L | 9+95.00 | 75.00 | 758857.7723 | 1180629.1489 |
| L | 10+55.00 | -30.00 | 758911.2213 | 1180739.2353 |
| L | 10+55.00 | 70.00 | 758824.5028 | 1180689.4367 |
| L | 11+00.60 | 30.00 | 758836.9999 | 1180751.9981 |
| L | 11+30.00 | 52.63 | 758803.6231 | 1180771.9154 |
| L | 11+75.00 | 90.00 | 758751.7380 | 1180802.8772 |
| L | 12+25.00 | 90.00 | 758734.4089 | 1180853.2517 |
| L | 12+50.00 | -90.00 | 758898.6623 | 1180930.9894 |
| L | 12+75.00 | 31.21 | 758775.4750 | 1180920.2820 |
| L | 13+00.00 | -100.00 | 758895.5640 | 1180978.4911 |
| L | 13+93.00 | -30.00 | 758806.3450 | 1181050.1794 |

ROW MARKER PERMANENT EASEMENT

| ALIGN | STATION | OFFSET | NORTH | EAST |
|-------|----------|--------|-------------|--------------|
| Y | 10+55.00 | 18.65 | 758895.0070 | 1180827.8625 |
| Y | 10+85.00 | -41.35 | 758949.2200 | 1180788.3536 |

REVISIONS



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 02-AUG-2021 13:22
 Matthew T. Cornwell

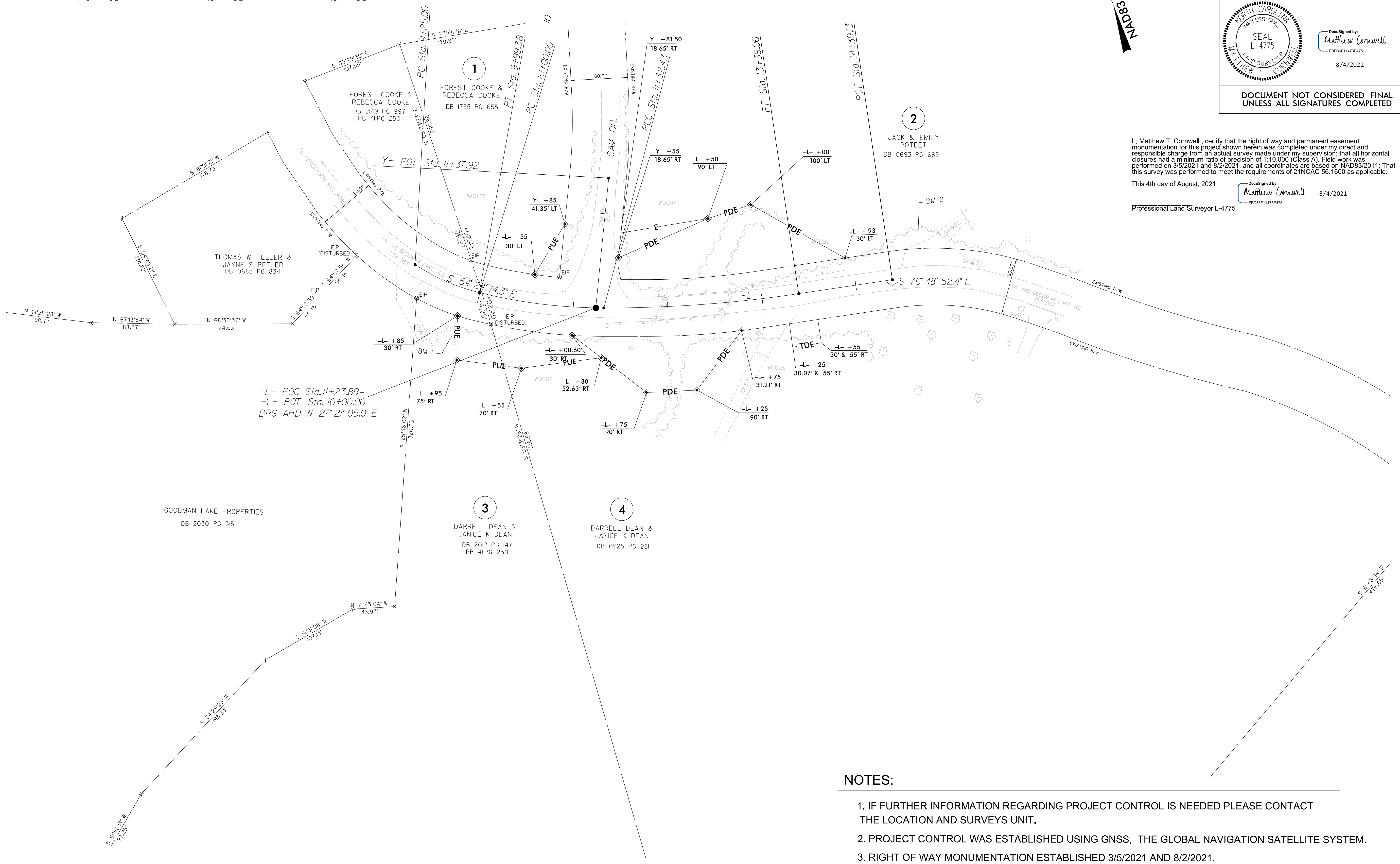
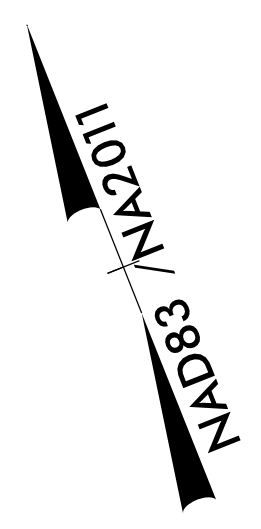
NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 3/5/2021 AND 8/2/2021.

-L-

| | | |
|--|--|---|
| PI Sta 9+62.55 Δ = 19° 22' 12.2" (LT) D = 26° 02' 36.7" L = 74.38' T = 37.55' R = 220.00' SE = .05 RO = 95' | PI Sta 10+66.54 Δ = 13° 47' 41.8" (LT) D = 10° 25' 02.7" L = 132.42' T = 66.53' R = 550.00' SE = .05 RO = 95' | PI Sta 12+35.94 Δ = 8° 36' 56.3" (LT) D = 4° 10' 10.2" L = 206.63' T = 103.51' R = 1,374.16' SE = .05 RO = 95' |
|--|--|---|

| | |
|---|-------------------|
| PROJECT REFERENCE NO. 17BP.13.R.165 | SHEET NO. RW04 |
| Location and Surveys | |
|  TGS ENGINEERS 804-C N. LAFAYETTE ST SHELBY, NC 28150 PH (704) 476-0003 CORP. LICENSE NO.: C-0275 | |
| PROJECT SURVEYOR | |
|  Documented by: Matthew Cornwell EBO38F11473E475 8/4/2021 | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | |



I, Matthew T. Cornwell, certify that the right of way and permanent easement monumentation for this project shown herein was completed under my direct and responsible charge from an actual survey made under my supervision; that all horizontal closures had a minimum ratio of precision of 1:10,000 (Class A). Field work was performed on 3/5/2021 and 8/2/2021, and all coordinates are based on NAD83/2011. That this survey was performed to meet the requirements of 21NCAC 56.1600 as applicable.

This 4th day of August, 2021.

Documented by:
Matthew Cornwell 8/4/2021
 Professional Land Surveyor L-4775
 EBO38F11473E475

REVISIONS

02-AUG-2021 13:25
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 Matthew T. Cornwell

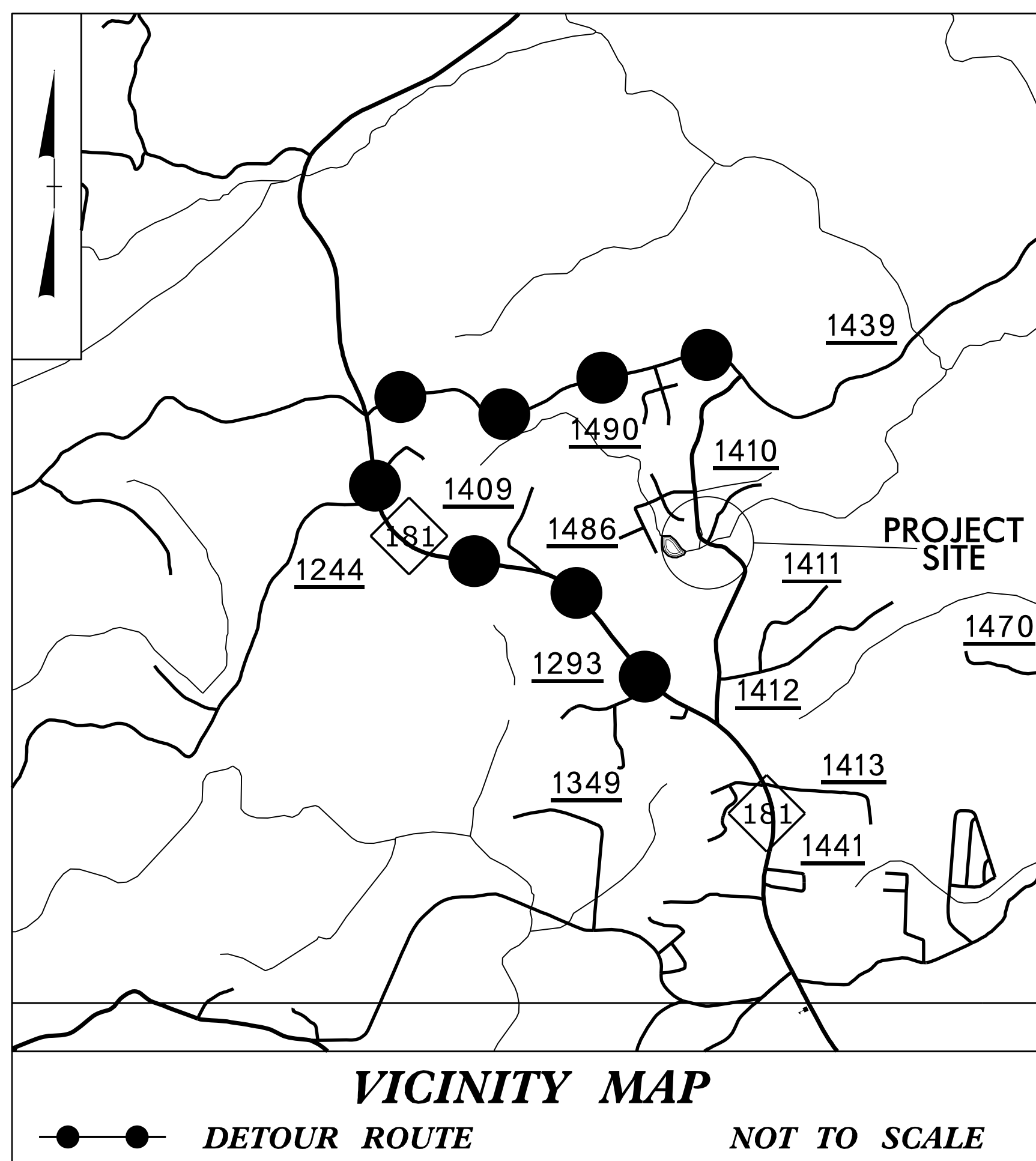
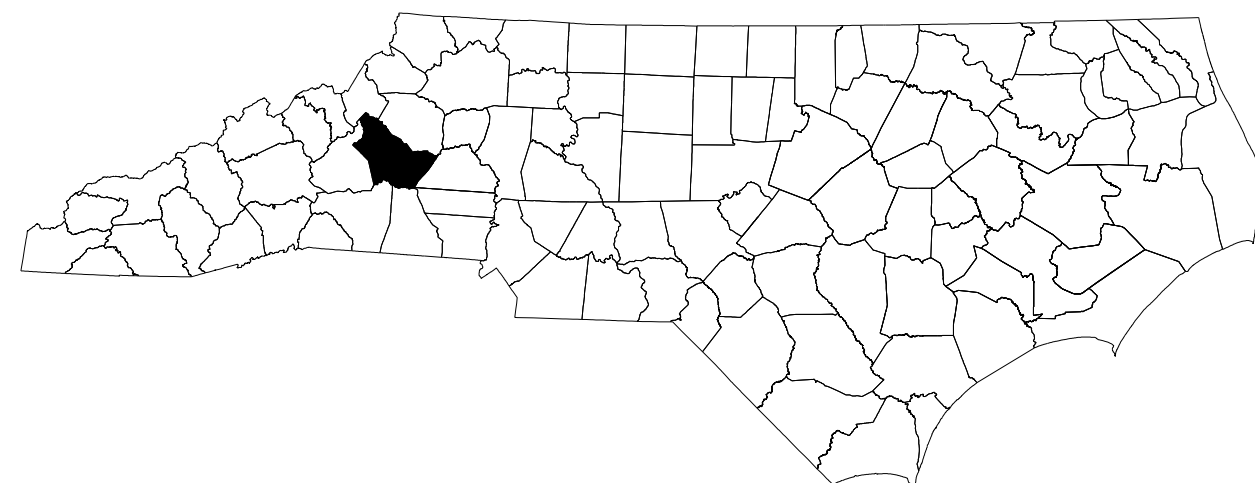
NOTES:

1. IF FURTHER INFORMATION REGARDING PROJECT CONTROL IS NEEDED PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
2. PROJECT CONTROL WAS ESTABLISHED USING GNSS, THE GLOBAL NAVIGATION SATELLITE SYSTEM.
3. RIGHT OF WAY MONUMENTATION ESTABLISHED 3/5/2021 AND 8/2/2021.

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

TRANSPORTATION MANAGEMENT PLAN

BURKE COUNTY



| INDEX OF SHEETS | |
|------------------------|--|
| <u>SHEET NO.</u> | <u>TITLE</u> |
| TMP-1 | TITLE SHEET, VICINITY MAP, AND INDEX OF SHEETS |
| TMP-1A | LIST OF APPLICABLE ROADWAY STANDARD DRAWINGS AND LEGEND |
| TMP-1B | TRANSPORTATION OPERATIONS PLAN: (MANAGEMENT STRATEGIES, GENERAL NOTES, LOCAL NOTES, AND TEMPORARY TRAFFIC CONTROL PHASING) |
| TMP-2 | SPECIAL SIGN DESIGN |
| TMP-3 | OFFSITE DETOUR |
| TMP-4 | OFFSITE DETOUR (INSET A) |

SHEET NO.
TMP-1

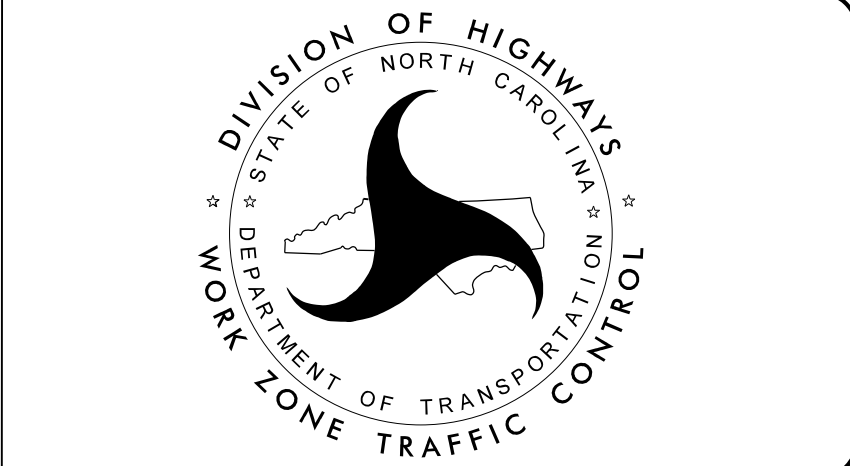
PROJECT: 17BP.13.R.165 CONTRACT: DM00326

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



PLANS PREPARED BY:
 RONALD D. ALLEN, P.E.
 KCI ROADWAY PROJECT MANAGER
 TYLER KRAUSS, P.E.
 KCI DESIGN ENGINEER

NCDOT CONTACTS:
 D.A. PARKER, P.E.
 PROJECT ENGINEER
 KARMEN DAIS
 PROJECT DESIGN ENGINEER



KCI ASSOCIATES OF N.C.
 CIVIL ENGINEERS
 ENVIRONMENTAL - CEI
 LAND SURVEYING
 SUBSURFACE UTILITY ENGINEERING
 4505 FALLS OF NEUSE ROAD
 SUITE 400
 RALEIGH, NORTH CAROLINA 27609
 (919) 783-9214
 WWW.KCI.COM

APPROVED: *Ronald (Ron) D. Allen, P.E., CPM*
 DATE: 12/8/2021
 SEAL

I6-SEP-2021 10:28
 M:\2016\221601946.09 NCDOT Division 13 Bridge Replacements\E_17BP.13.R.165_Burke_IL0155_B5870_TrafficControl\TCP_B5870_TC_TMP_01.dgn
 \$\$\$USERNAME\$\$\$

ROADWAY STANDARD DRAWINGS

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - 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 |
| 1101.02 | TEMPORARY LANE CLOSURES |
| 1101.03 | TEMPORARY ROAD CLOSURES |
| 1101.04 | TEMPORARY SHOULDER CLOSURES |
| 1101.05 | WORK ZONE VEHICLE ACCESSES |
| 1101.11 | TRAFFIC CONTROL DESIGN TABLES |
| 1110.01 | STATIONARY WORK ZONE SIGNS |
| 1130.01 | DRUMS |
| 1135.01 | CONES |
| 1145.01 | BARRICADES |
| 1150.01 | FLAGGING DEVICES |

LEGEND

GENERAL

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

WORK AREA

REMOVAL

USER DEFINED (IF NEEDED)

USER DEFINED (IF NEEDED)

SIGNALS

- EXISTING
- PROPOSED
- TEMPORARY

PAVEMENT MARKINGS

- EXISTING LINES
- TEMPORARY LINES

TRAFFIC CONTROL DEVICES

- BARRICADE (TYPE III)
- CONE
- DRUM
- SKINNY DRUM
- TUBULAR MARKER
- TEMPORARY CRASH CUSHION
- FLASHING ARROW BOARD
- FLAGGER
- LAW ENFORCEMENT
- TRUCK MOUNTED ATTENUATOR (TMA)
- CHANGEABLE MESSAGE SIGN

TEMPORARY SIGNING

- PORTABLE SIGN
- STATIONARY SIGN
- STATIONARY OR PORTABLE SIGN

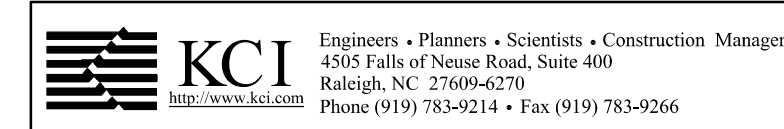
PAVEMENT MARKERS

- CRYSTAL/CRYSTAL
- CRYSTAL/RED
- YELLOW/YELLOW

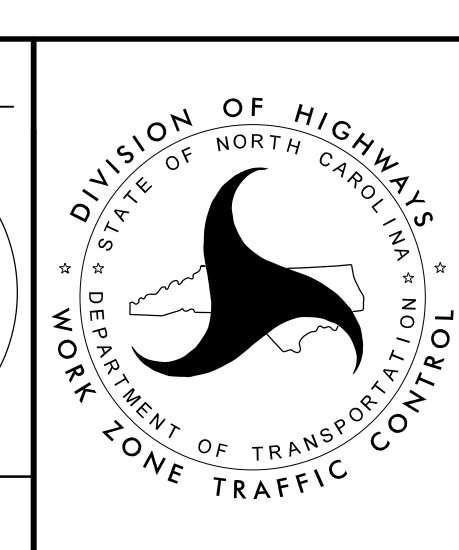
PAVEMENT MARKING SYMBOLS

- PAVEMENT MARKING SYMBOLS

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APPROVED:
 DATE: 12/8/2021
 SEAL



ROADWAY STANDARD DRAWINGS & LEGEND

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

| | |
|---------------------|-----------|
| PROJ. REFERENCE NO. | SHEET NO. |
| 17BP.13.R.165 | TMP-1B |

MANAGEMENT STRATEGIES

1. CLOSE SR 1410 (GOODMAN LAKE ROAD) AND DETOUR TRAFFIC OFF-SITE VIA HWY 181, SR 1439, AND SR 1410.
2. LOCAL ACCESS TO ALL RESIDENCES AND BUSINESSES WILL BE MAINTAINED BETWEEN CLOSURE POINTS AT ALL TIMES DURING CONSTRUCTION.

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.

TRAFFIC PATTERN ALTERATIONS

- A) NOTIFY THE ENGINEER, COUNTY EMS, AND COUNTY SCHOOL OFFICIALS THIRTY (30) CALENDAR DAYS PRIOR TO ANY TRAFFIC PATTERN ALTERATION.
- B) NOTIFY THE ENGINEER FIFTEEN (15) DAYS PRIOR TO INSTALLATION OF A LANE CLOSURE AND SUBMIT DETAILS FOR APPROVAL BY THE ENGINEER.
- C) AS APPROVED BY THE ENGINEER, LANE CLOSURES WILL BE ALLOWED FOR GEOTECHNICAL BORINGS AND THE RELOCATION OF UTILITIES PRIOR TO THE ROAD CLOSURE.

SIGNING

- 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

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

PAVEMENT MARKINGS AND MARKERS

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

| BRIDGE # | MARKING | MARKER |
|----------|---------|--------|
| 155 | PAINT | NONE |

- O) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.

PHASING

NOTE: BEFORE BEGINNING CONSTRUCTION THE CONTRACTOR SHALL PLACE ADVANCE WORK ZONE WARNING SIGNS ALONG GOODMAN LAKE RD., (SEE RSD 1101.01, SHEET 3 OF 3)

STEP 1) USING ROADWAY STD. DRAWING 1101.03, SHEET 1 OF 9, CLOSE GOODMAN LAKE ROAD (SR 1410) AND DETOUR TRAFFIC OFF-SITE AS SHOWN ON TMP-3.

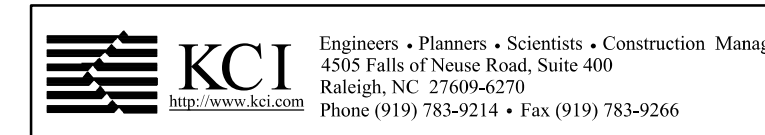
STEP 2) REMOVE THE EXISTING STRUCTURE.

STEP 3) CONSTRUCT THE PROPOSED STRUCTURE AND ROADWAY.

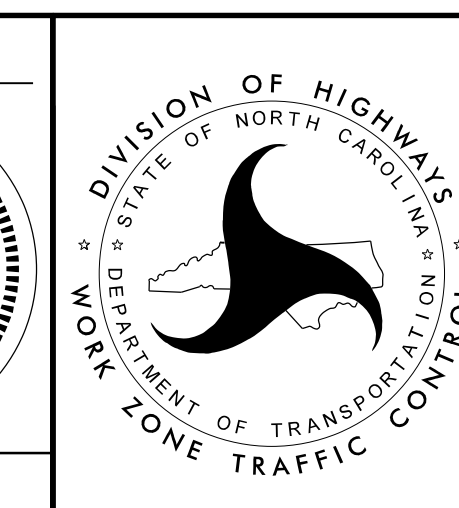
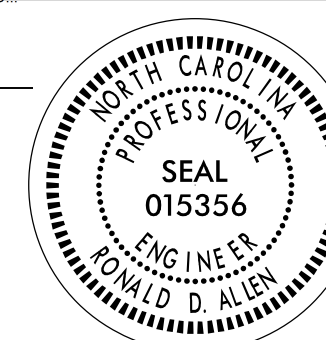
STEP 4) PLACE FINAL PAVEMENT MARKINGS AND MARKERS ACCORDING TO THE FINAL PAVEMENT MARKING PLANS.

STEP 5) REMOVE ALL WORK ZONE TRAFFIC CONTROL DEVICES AND SIGNING. OPEN GOODMAN LAKE ROAD (SR 1410) AND PLACE TRAFFIC ONTO THE FINAL PATTERN.

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



DocuSigned by:
Ronald (Ron) D. Allen, P.E., CPM
 APPROVED: _____
 DATE: 12/8/2021
 SEAL



**TRANSPORTATION
 OPERATIONS
 PLAN**

| | |
|---------------------|-----------|
| PROJ. REFERENCE NO. | SHEET NO. |
| 17BP.13.R.165 | TMP-2 |

SP-1

| <p>SIGN NUMBER: SP-1 TYPE: D QUANTITY: 1 SIGN WIDTH: 3'-0" HEIGHT: 2'-0" TOTAL AREA: 6.0 Sq.Ft. BORDER TYPE: RECESSED RECESS: 0.38" WIDTH: 0.63" RADII: 1.50" NO. Z BARS: N/A LENGTH: N/A</p> | <p>BACKG COLOR: Fluorescent Orange COPY COLOR: Black</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>SYMBOL</th> <th>X</th> <th>Y</th> <th>WID</th> <th>HT</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>MAT'L: 0.080" ALUMINUM</p> | SYMBOL | X | Y | WID | HT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | <p>DESIGN BY: GS PROJECT ID: B-155</p> <p>CHECKED BY: DIV: 13</p> <p>DATE: July 22, 2019</p> <div style="text-align: center;"> </div> <p style="text-align: center;">Spacing Factor is 1 unless specified otherwise</p> |
|--|--|--------|-----|----|-----|----|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|--|
| SYMBOL | X | Y | WID | HT | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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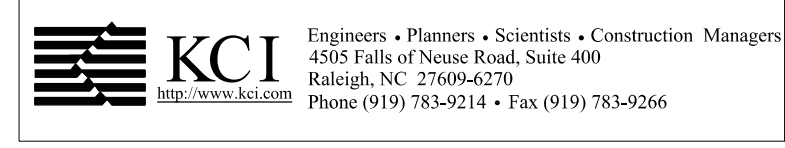
LETTER POSITIONS

Letter spacings are to start of next letter

| | G | O | O | D | M | A | N | | | | | | | | | | | | | Series/Size Text Length |
|--|------|------|------|------|------|------|------|------|------|--|--|--|--|--|--|--|--|--|--|----------------------------|
| | 5.19 | 3.58 | 3.73 | 3.73 | 3.79 | 4.08 | 3.97 | 2.47 | 5.19 | | | | | | | | | | | C 2000 25.35 |
| | | L | A | K | E | | R | D | | | | | | | | | | | | C 2000 19.36 |
| | 6.27 | 2.78 | 3.97 | 3.58 | 2.50 | 4.10 | 3.79 | 2.74 | 6.27 | | | | | | | | | | | |

FILENAME: B-155 DETOUR SIGN FACE LAYOUT **NORTH CAROLINA D.O.T. SIGN DETAIL**

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APPROVED: Ronald (Ron) D. Allen, P.E., CPM
BSC OF CC 3924750

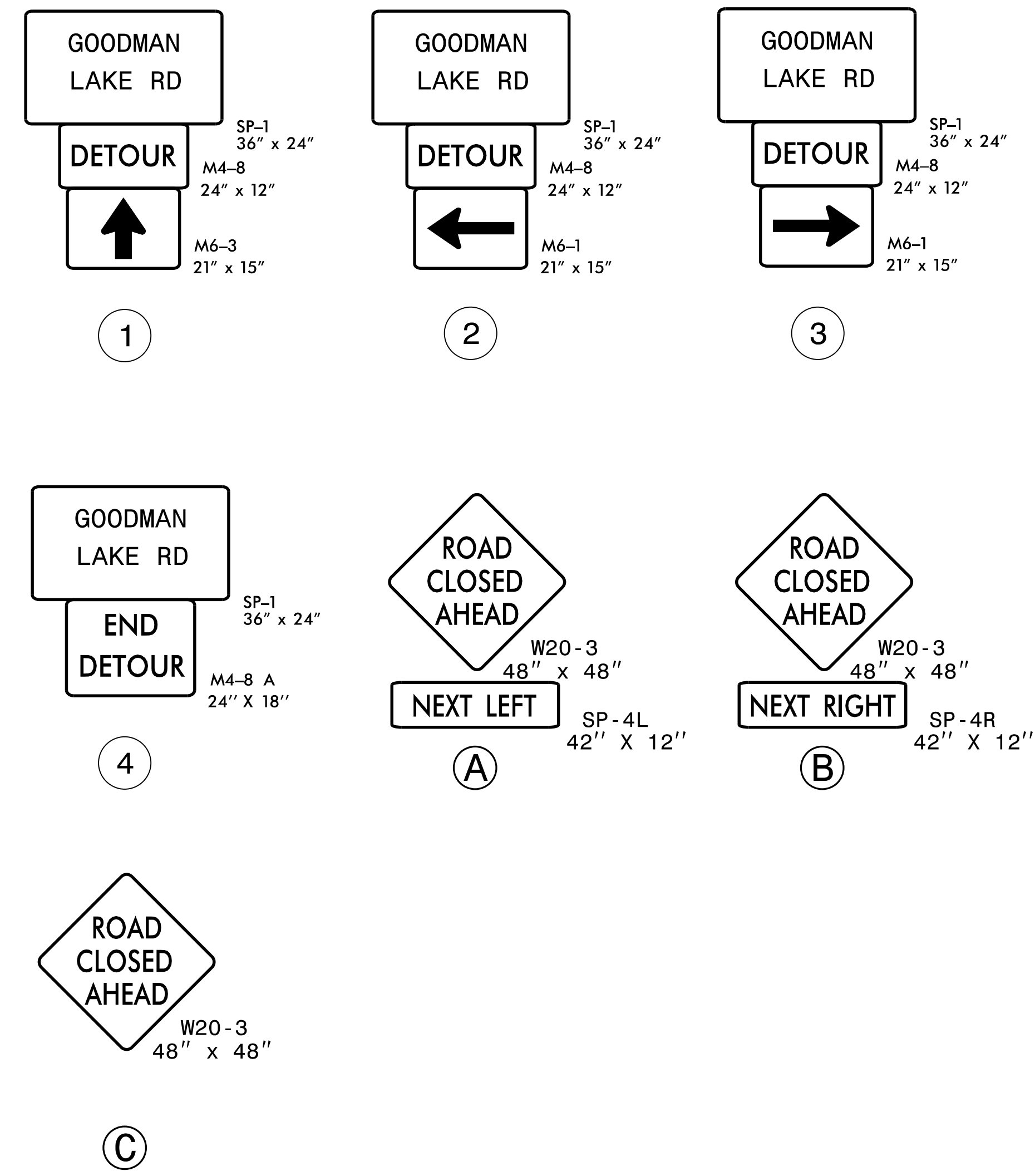
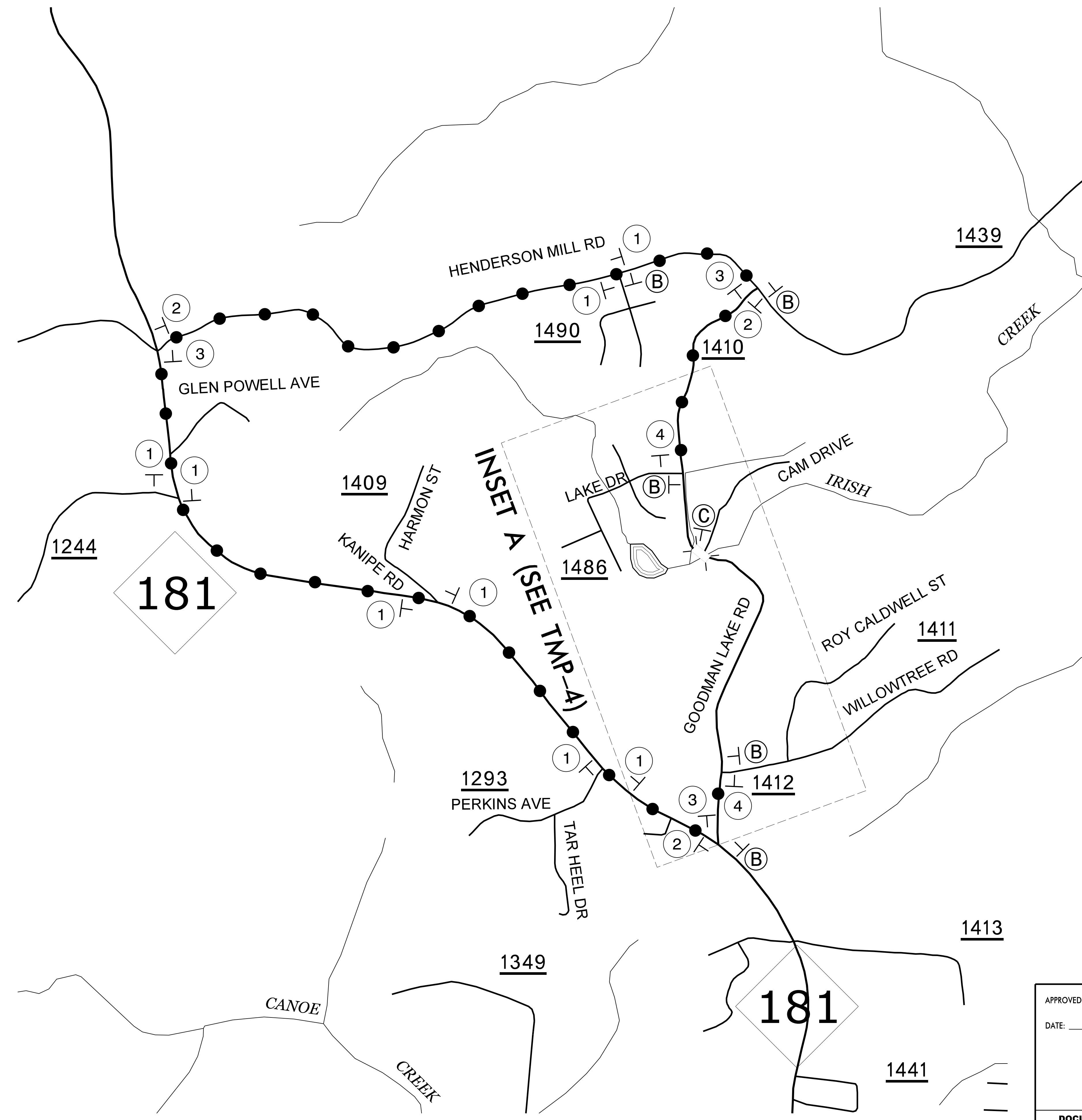
DATE: 12/8/2021

SEAL

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UNLESS ALL SIGNATURES COMPLETED**



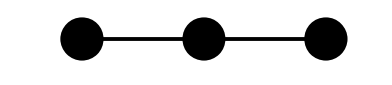
SPECIAL SIGN
DESIGN



NOTES:

1. REFER TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR APPLICABLE NOTES.
2. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS NECESSARY OR AS DIRECTED BY THE ENGINEER.
3. SEE SHEET TMP-2 FOR THE SPECIAL SIGN DESIGN
4. ALL DETOUR SIGN LOCATIONS ARE APPROXIMATE.

DETOUR ROUTE



OFFSITE DETOUR ROUTE

16-SEP-2021 10:51
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APPROVED: *Ronald (Ron) D. Allen, P.E., CPM*
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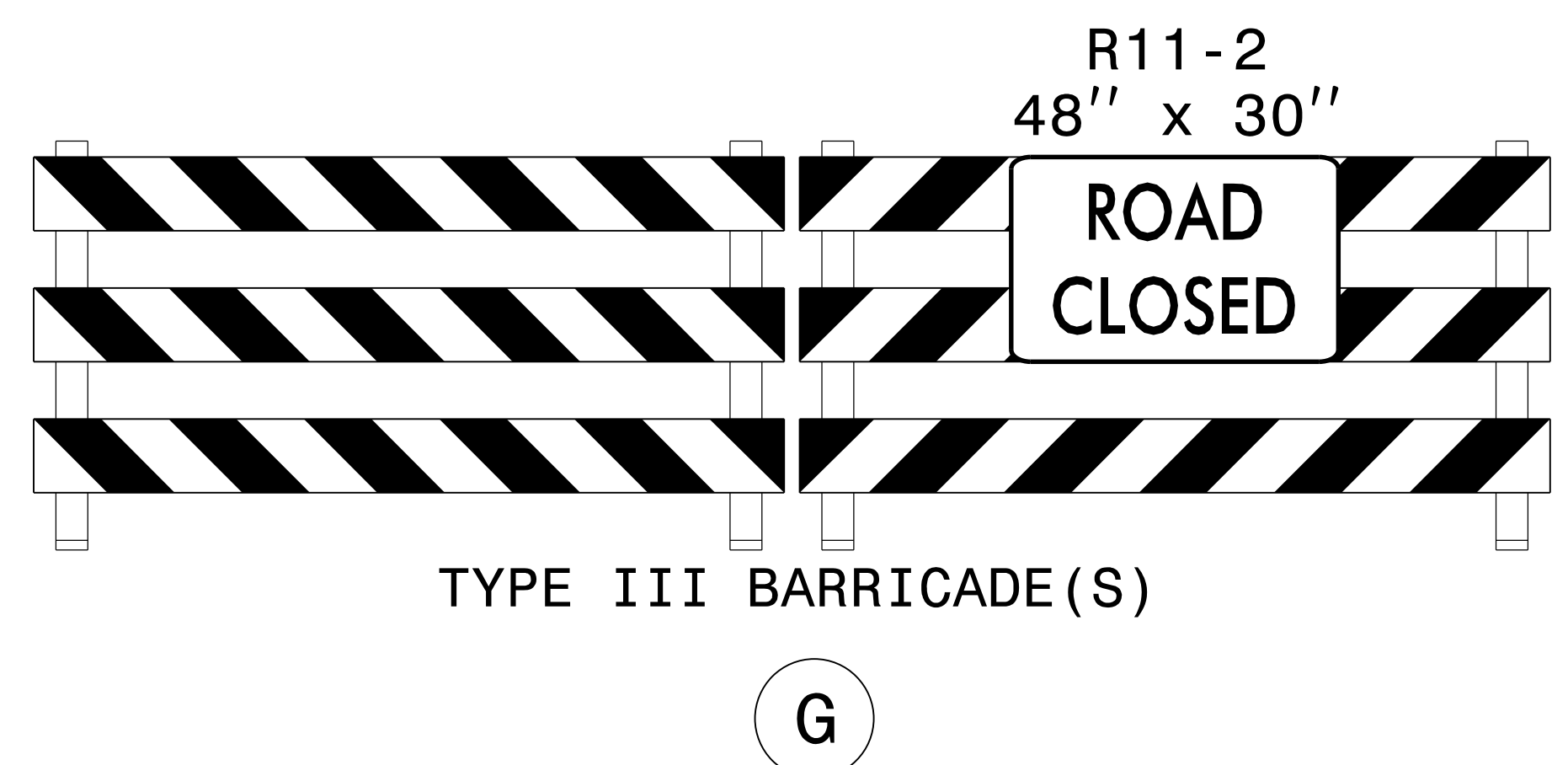
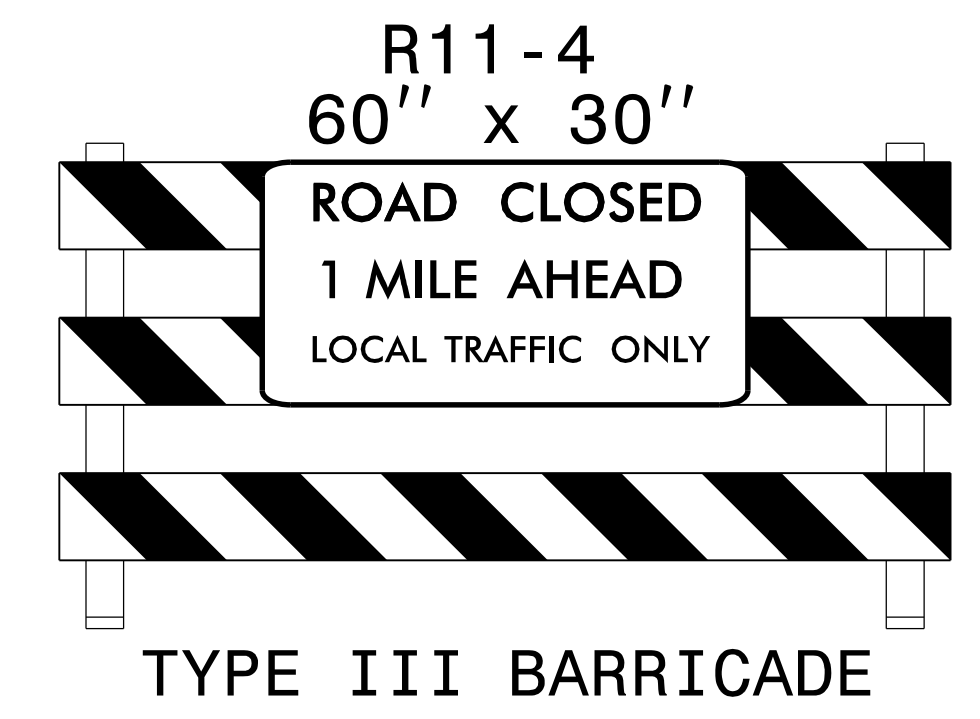
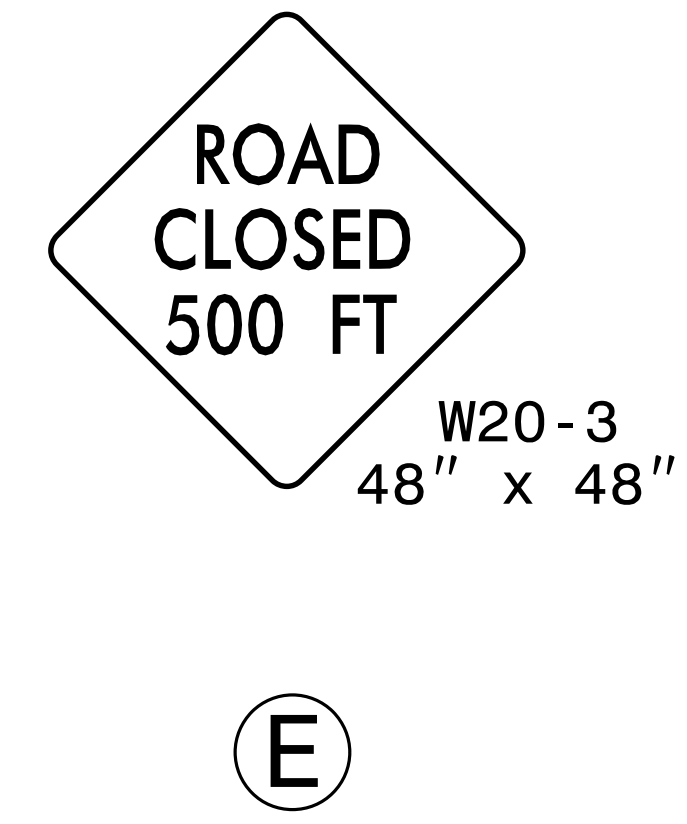
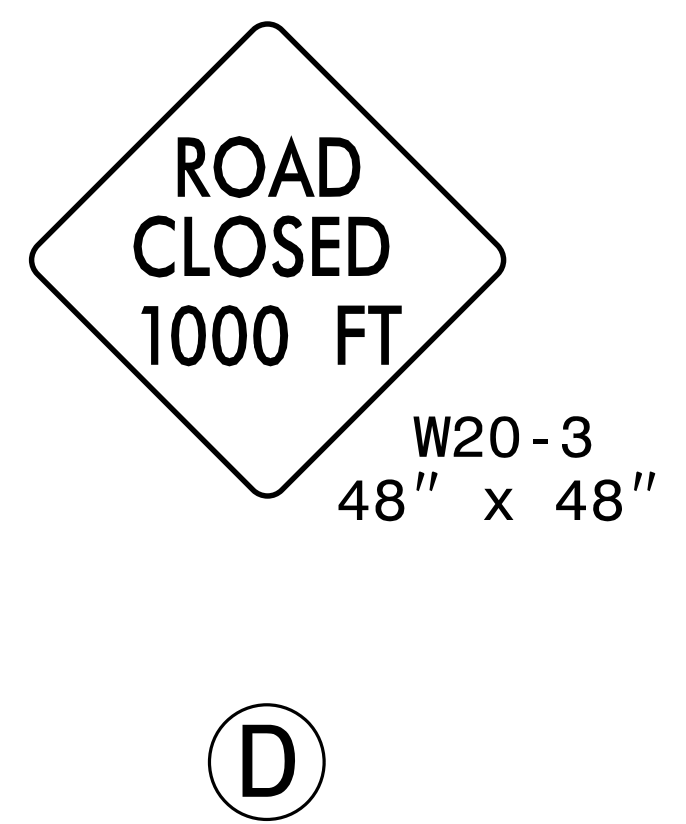
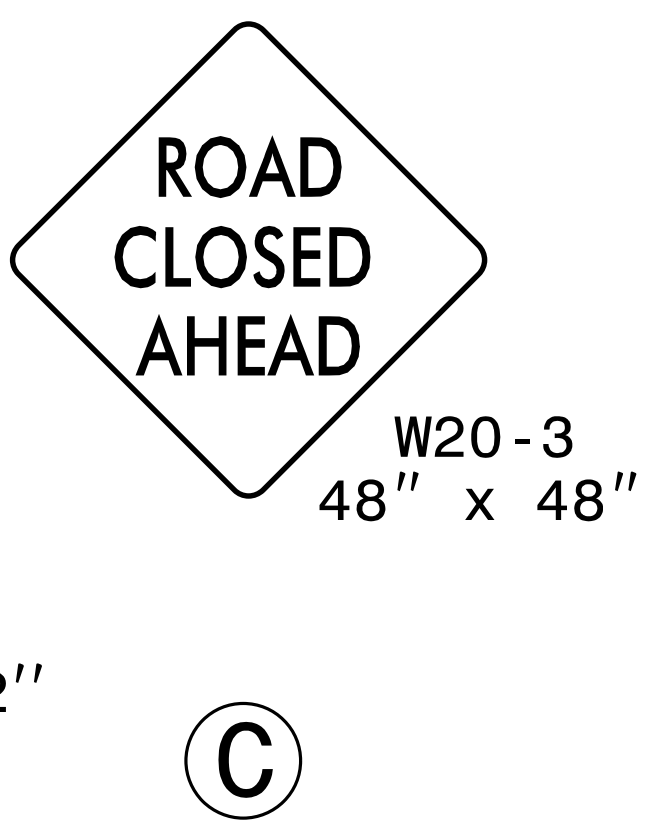
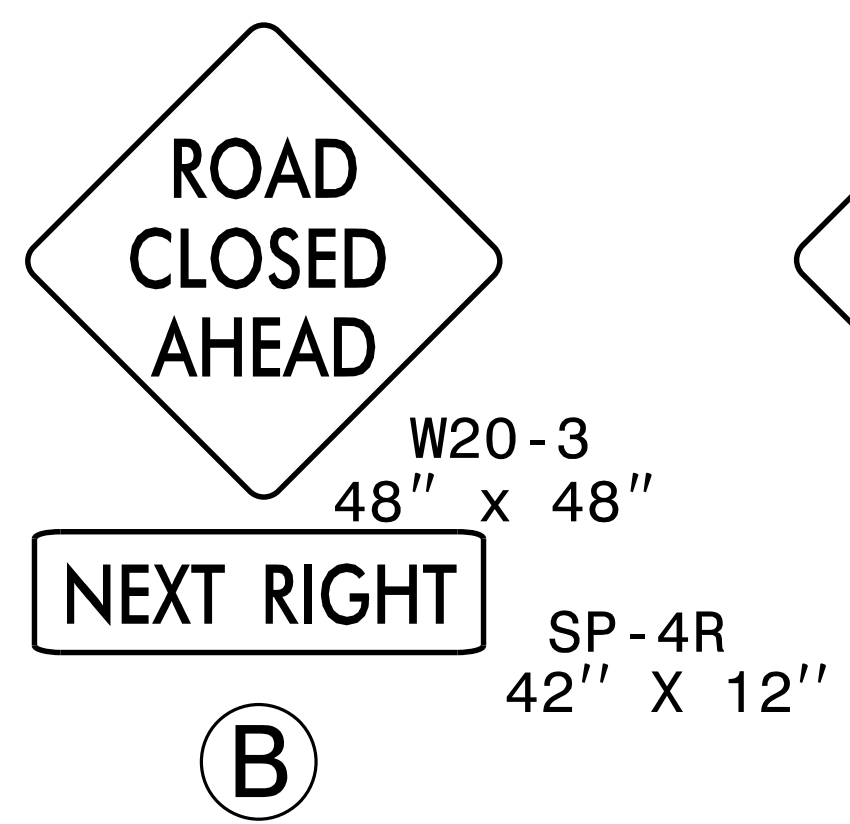
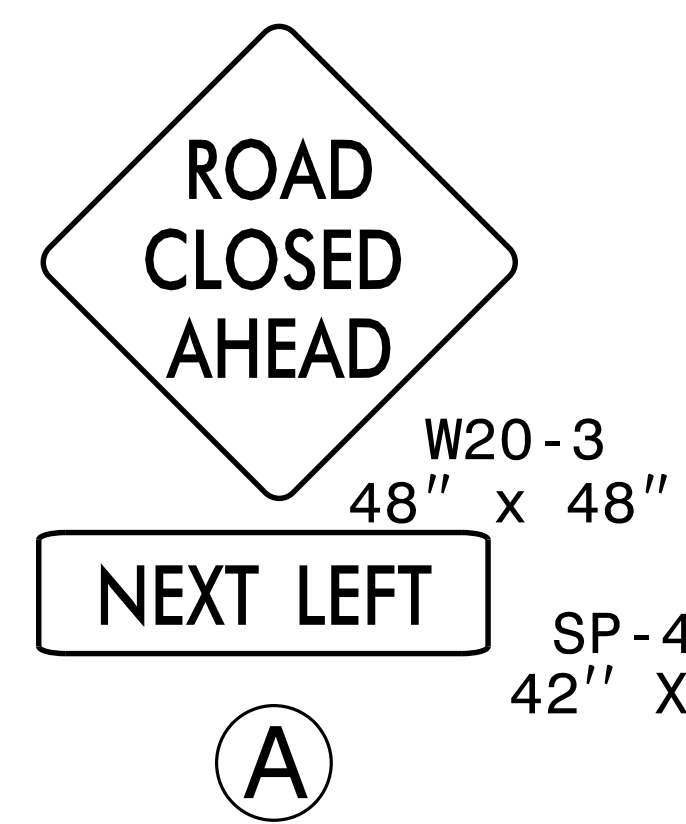
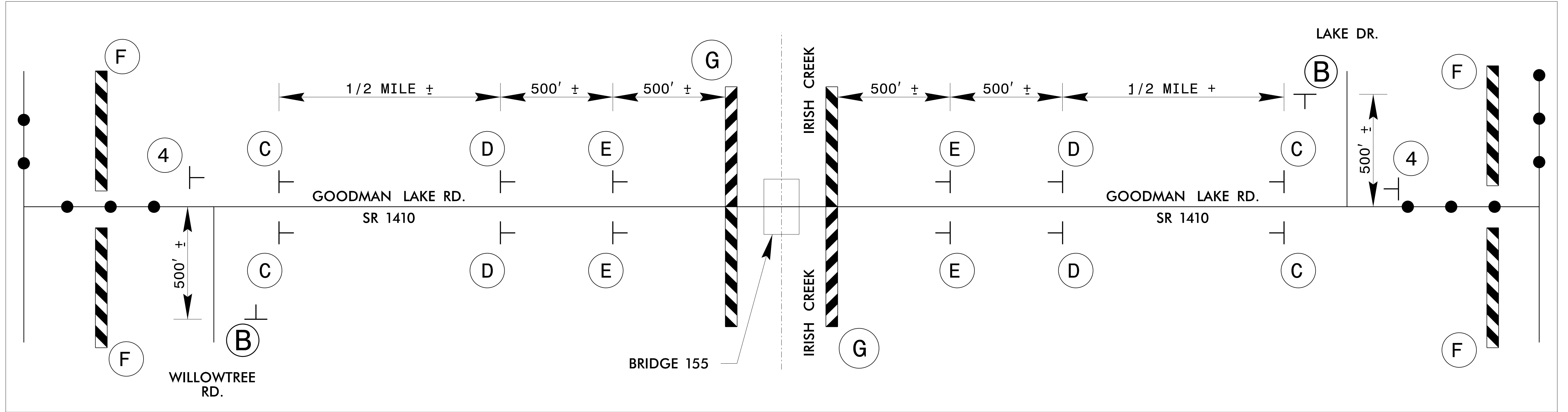
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SEAL

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UNLESS ALL SIGNATURES COMPLETED**

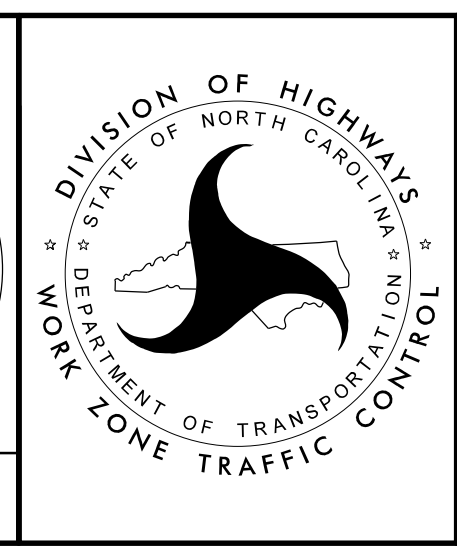
KCI Engineers • Planners • Scientists • Construction Managers
 4505 Falls of Neuse Road, Suite 400
 Raleigh, NC 27609-6270
 Phone (919) 783-9214 • Fax (919) 783-9266

INSET A



- NOTES:**
1. REFER TO ROADWAY STANDARD DRAWING 1101.03, SHEET 1 OF 9 FOR APPLICABLE NOTES.
 2. ALL SIGN SPACING DIMENSIONS ARE APPROXIMATE. FIELD ADJUST AS NECESSARY OR AS DIRECTED BY THE ENGINEER.
 3. SEE SHEET TMP-2 FOR THE SPECIAL SIGN DESIGN
 4. ALL DETOUR SIGN LOCATIONS ARE APPROXIMATE.

APPROVED: *Ronald D. Allen, P.E., CPM*
 DATE: 12/8/2021
 SEAL
 NORTH CAROLINA PROFESSIONAL ENGINEER
 SEAL 015356
 RONALD D. ALLEN



OFFSITE DETOUR ROUTE

16-SEP-2021 10:52
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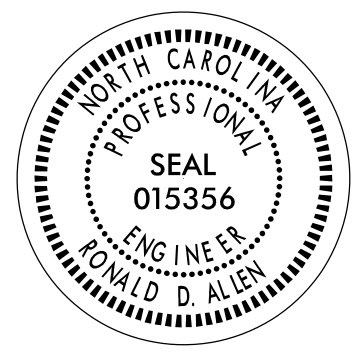

PROJECT: 17BP.13.R.165

CONTRACT: DM00326

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

PAVEMENT MARKING PLAN

BURKE COUNTY

| | |
|---|---------------------------|
| PROJECT REFERENCE NO. <i>17BP.13.R.165</i> | SHEET NO. <i>PMP-1</i> |
| APPROVED: <i>Ronald (Ron) D. Allen, PE, CPM</i> <small>0009F0098460</small> | |
| DATE: 12/8/2021 | |
| SEAL:  | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | |
|  <small>Engineers • Planners • Scientists • Construction Managers 4505 Falls of Neuse Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214 • Fax (919) 783-9266</small> | |

ROADWAY STANDARD DRAWING

THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" - 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 |
|----------|--|
| 1205.01 | PAVEMENT MARKINGS - LINE TYPES AND OFFSETS |
| 1205.02 | PAVEMENT MARKINGS - TWO-LANE AND MULTILANE ROADWAYS |
| 1261.01 | GUARDRAIL AND BARRIER DELINEATORS - INSTALLATION SPACING |
| 1261.02 | GUARDRAIL AND BARRIER DELINEATORS - TYPES AND MOUNTING |
| 1262.01 | GUARDRAIL END DELINEATION |

GENERAL NOTES

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.

- A) INSTALL PAVEMENT MARKINGS AND PAVEMENT MARKERS ON THE FINAL SURFACE AS FOLLOWS:

| BRIDGE # | MARKING | MARKER |
|------------|---------|--------|
| No. 110155 | PAINT | NONE |
- B) TIE PROPOSED PAVEMENT MARKING LINES TO EXISTING PAVEMENT MARKING LINES.
- C) REMOVE/REPLACE ANY CONFLICTING/DAMAGED PAVEMENT MARKINGS AND MARKERS.
- D) PASSING ZONES WILL BE DETERMINED IN THE FIELD AND MUST BE APPROVED BY THE ENGINEER.

PAVEMENT MARKING SCHEDULE

| SYMB | DESCRIPTION |
|------|---------------------------------------|
| P1 | PAINT (4") WHITE EDGELINE |
| P5 | PAINT (4") 2'-6'/SP WHITE MINISKIP |
| P13 | PAINT (4") YELLOW DOUBLE CENTER |


INDEX

| SHEET NO. | DESCRIPTION |
|-----------|--|
| PMP-1 | PAVEMENT MARKING PLAN TITLE AND SCHEDULE SHEET |
| PMP-2 | PAVEMENT MARKING DETAIL |

| | |
|-------------------------|---|
| PLAN SUBMITTED TO: | |
| KELVIN L. JORDAN | SIGNING & DELINEATION REGIONAL ENGINEER |
| RENEE B. ROACH, PE, CPM | STATE SIGNING & DELINEATION ENGINEER |





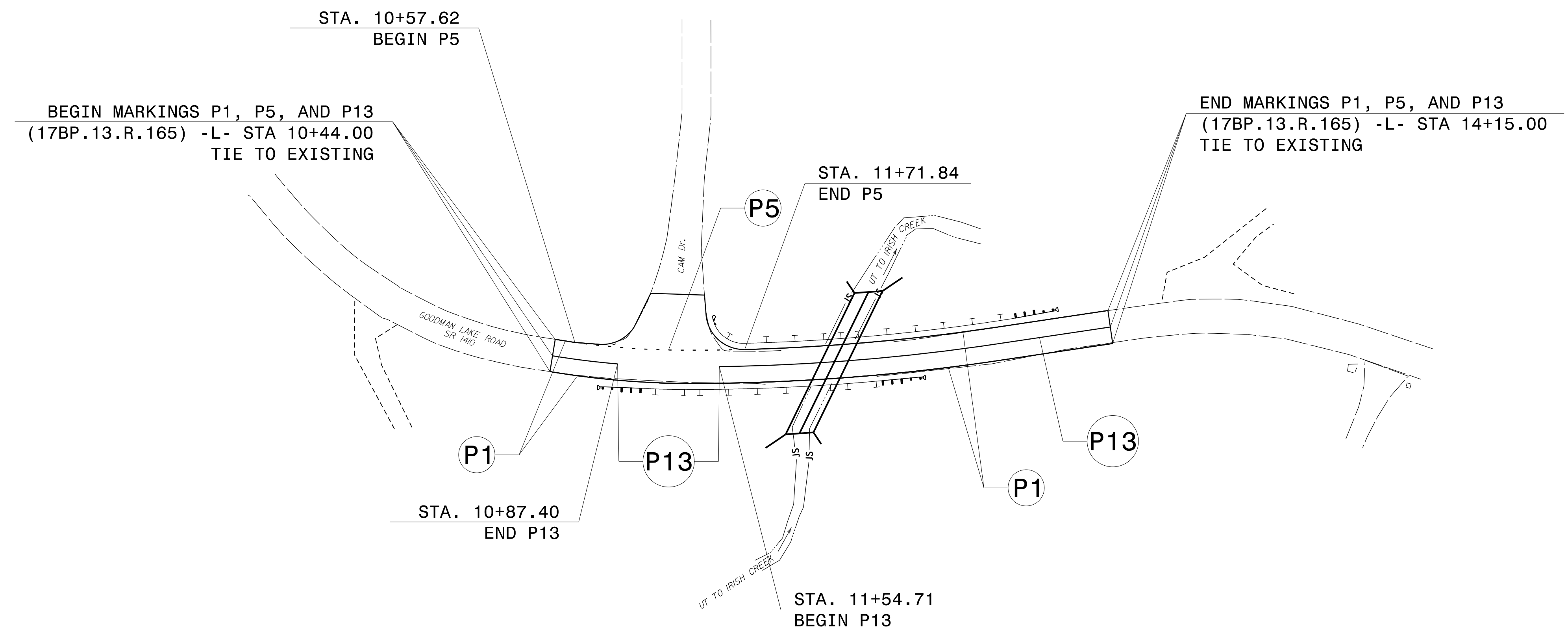
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|--------------------|-------------------------|
| PLANS PREPARED BY: | |
| RON ALLEN, PE | PROJECT ENGINEER |
| TYLER KRAUSS, PE | PROJECT DESIGN ENGINEER |






CIVIL ENGINEERS
ENVIRONMENTAL - CEI
LAND SURVEYING
SUBSURFACE UTILITY
ENGINEERING

4505 FALLS OF NEUSE ROAD
SUITE 400
RALEIGH, NORTH CAROLINA 27609
(919) 783-9214
WWW.KCI.COM

| | |
|---|--------------------|
| PROJECT REFERENCE NO. 17BP.13.R.165 | SHEET NO. PMP-2 |
| APPROVED: Ronald (Ron) D. Allen, P.E., CPM | |
| DATE: 12/8/2021 | |
| SEAL:  | |
| DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED | |
|  KCI Engineers • Planners • Scientists • Construction Managers <small>4545 Falls of Noe Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 783-9214 • Fax (919) 783-9266</small> | |

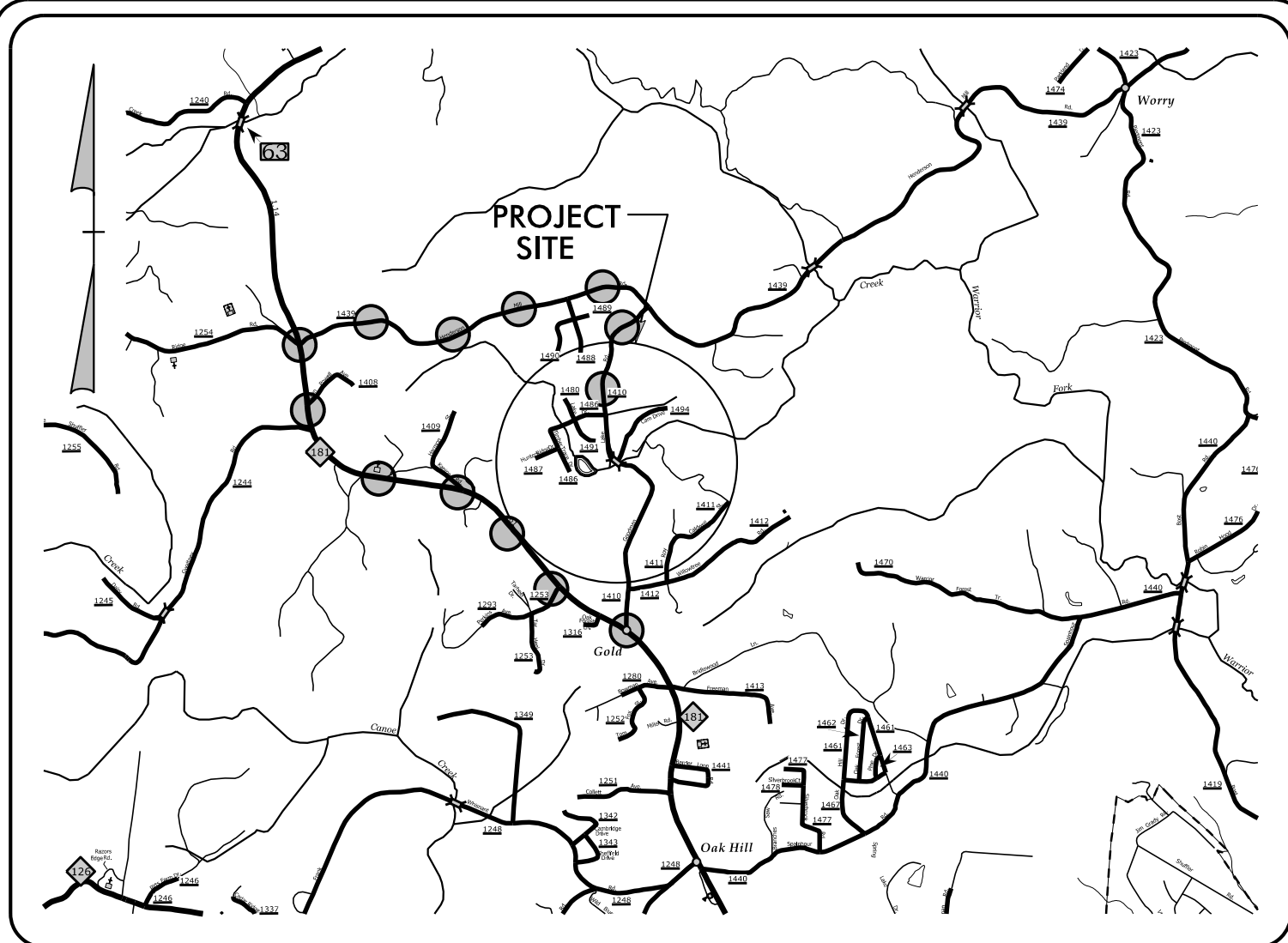


| PAVEMENT MARKING LEGEND | |
|---|------------------------------|
|  | WHITE EDGELINE (4") |
|  | 2'-6"/SP WHITE MINISKIP (4") |
|  | YELLOW DOUBLE CENTER (4") |

PAVEMENT MARKING DETAIL

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PROJECT: 17BP.13.R.165

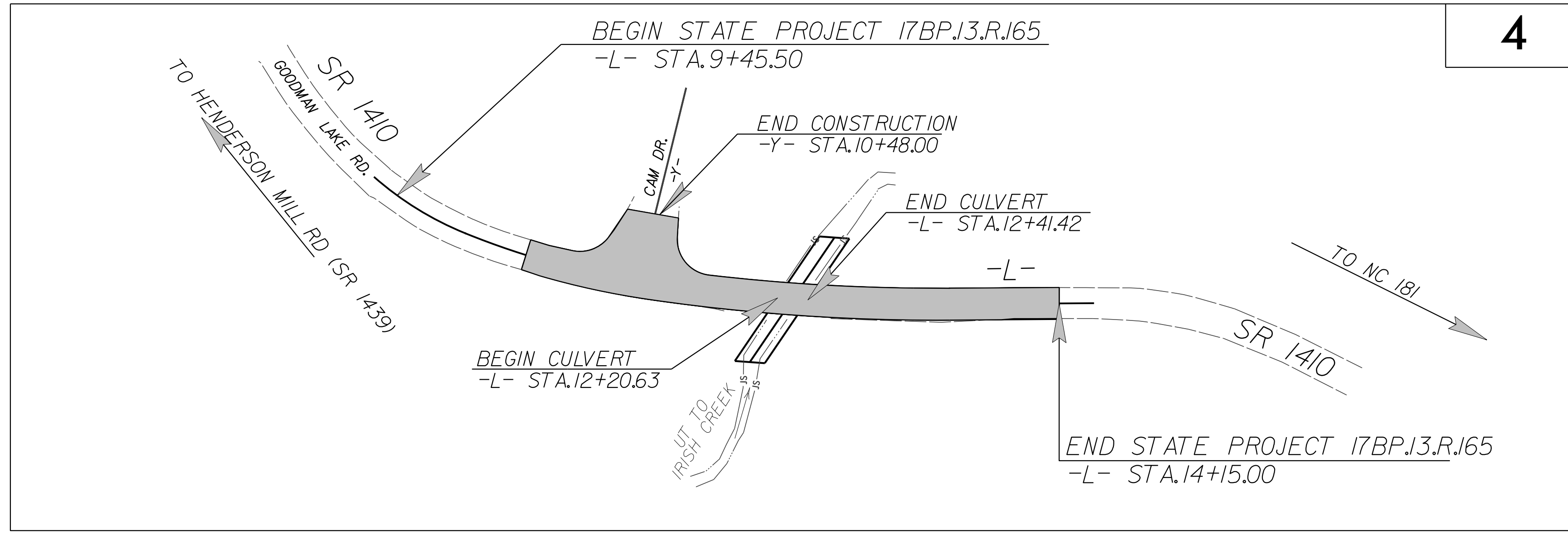


VICINITY MAP
 NOT TO SCALE
 DETOUR ROUTE

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

LOCATION: REPLACE BRIDGE NO. 155 OVER IRISH CREEK ON SR 1410 (GOODMAN LAKE RD.)

TYPE OF WORK: GRADING, PAVING, DRAINAGE AND STRUCTURE



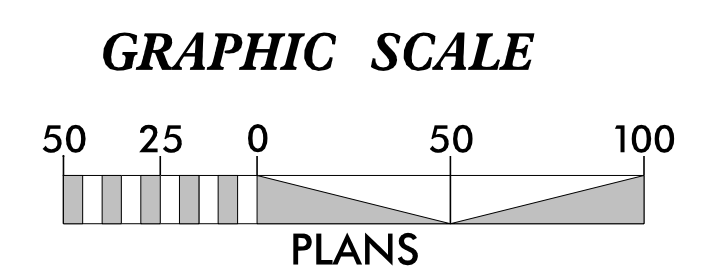
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| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 17BP.13.PE.165 | | P.E. | |
| 17BP.13.ROW.165 | | R/W | |
| 17BP.13.R.165 | | CONST. | |

EROSION AND SEDIMENT CONTROL MEASURES

| Std. # | Description | Symbol |
|---------|--|-------------|
| 1630.03 | Temporary Silt Ditch | no |
| 1630.05 | Temporary Diversion | TD |
| 1605.01 | Temporary Silt Fence | III III III |
| 1606.01 | Special Sediment Control Fence | ▲▲▲▲▲ |
| 1622.01 | Temporary Berms and Slope Drains | — |
| 1630.02 | 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 | W |
| | Wattle / Coir Fiber Wattle with Polyacrylamide (PAM) | W |
| 1634.01 | Temporary Rock Sediment Dam Type-A | ▨ |
| 1634.02 | Temporary Rock Sediment Dam Type-B | ▨ |
| 1635.01 | Rock Pipe Inlet Sediment Trap Type-A | ⊓ |
| 1635.02 | Rock Pipe Inlet Sediment Trap Type-B | ⊓ |
| 1630.04 | Stilling Basin | ▭ |
| 1630.06 | 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.



THESE EROSION AND SEDIMENT CONTROL PLANS COMPLY WITH THE APPLICABLE 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 WATER RESOURCES.

Prepared in the Office of:
SUNGATE DESIGN GROUP, P.A.

905 JONES FRANKLIN ROAD
 RALEIGH, NORTH CAROLINA 27606
 TEL (919) 859-2243
 ENG FIRM LICENSE NO. C-890

Designed by:
MATTHEW C. EDWARDS, PE 3992
 NAME LEVEL III CERTIFICATION NO.

Roadway Standard Drawings

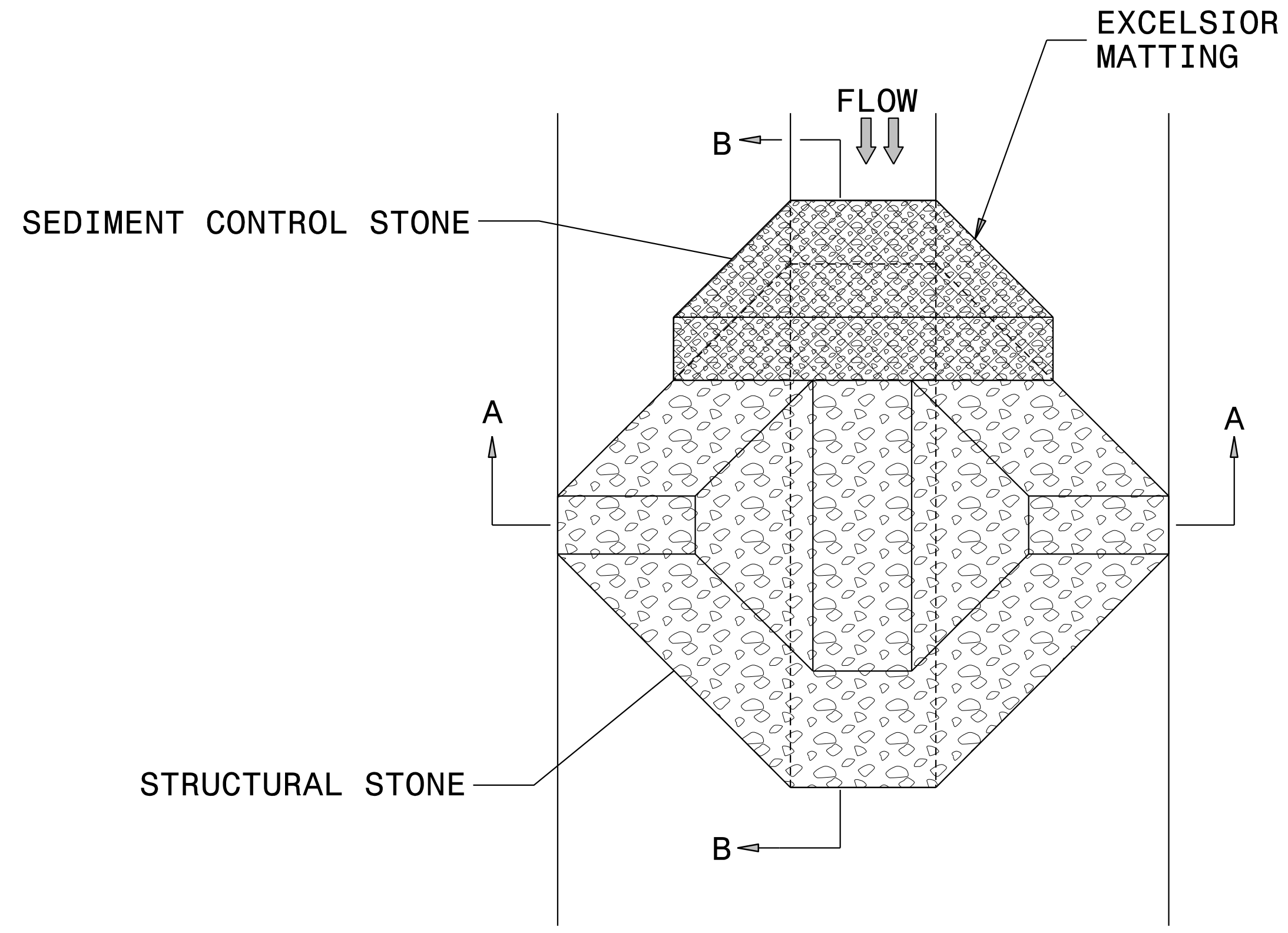
The following roadway english standards as appear in "Roadway Standard Drawings"- Roadway Design Unit - N. C. Department of Transportation - Raleigh, N. C., dated January 2018 and the latest revision thereto are applicable to this project and by reference hereby are considered a part of these plans.

| | |
|--|--|
| 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 B |
| 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 B |
| 1630.01 Riser Basin | 1634.01 Temporary Rock Sediment Dam Type A |
| 1630.02 Silt Basin Type B | 1634.02 Temporary Rock Sediment Dam Type B |
| 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 B |
| 1630.05 Temporary Diversion | 1640.01 Coir Fiber Baffle |
| 1630.06 Special Stilling Basin | 1645.01 Temporary Stream Crossing |
| 1631.01 Matting Installation | |

8/19/2021 EC-den-psh_01.dgn

| | |
|--|---------------------|
| PROJECT REFERENCE NO. 17BP.13.R.165 | SHEET NO. EC-2 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

TEMPORARY ROCK SILT CHECK TYPE 'A' WITH EXCELSIOR MATTING AND POLYACRYLAMIDE (PAM)



PLAN

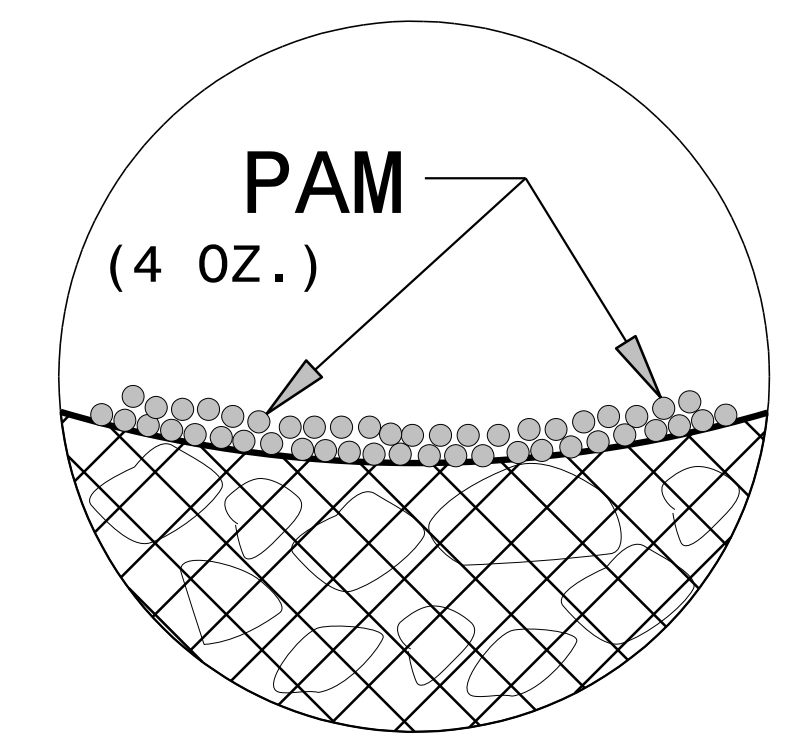
NOTES:

INSTALL TEMPORARY ROCK SILT CHECK TYPE A IN ACCORDANCE WITH ROADWAY STANDARD DRAWING NO. 1633.01.

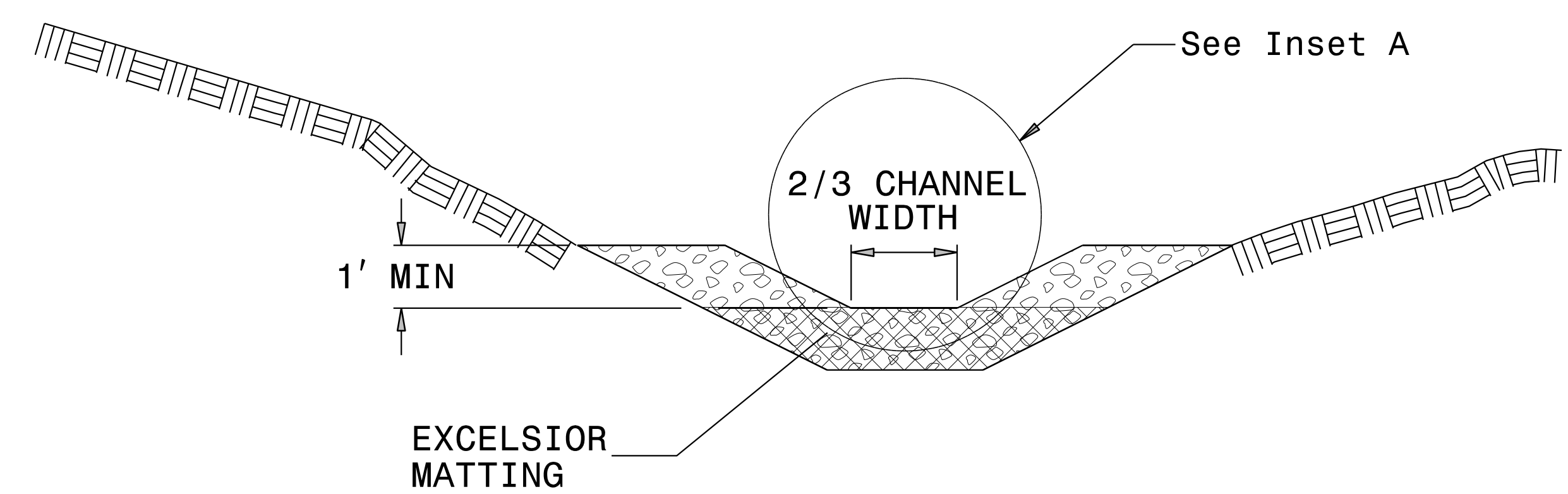
USE EXCELSIOR FOR MATTING MATERIAL AND ANCHOR MATTING SECTION AT TOP AND BOTTOM WITH CLASS B STONE.

PRIOR TO POLYACRYLAMIDE (PAM) APPLICATION, OBTAIN A SOIL SAMPLE FROM PROJECT LOCATION, AND FROM OFFSITE MATERIAL, AND ANALYZE FOR APPROPRIATE PAM FLOCCULANT TO BE APPLIED TO EACH ROCK SILT CHECK.

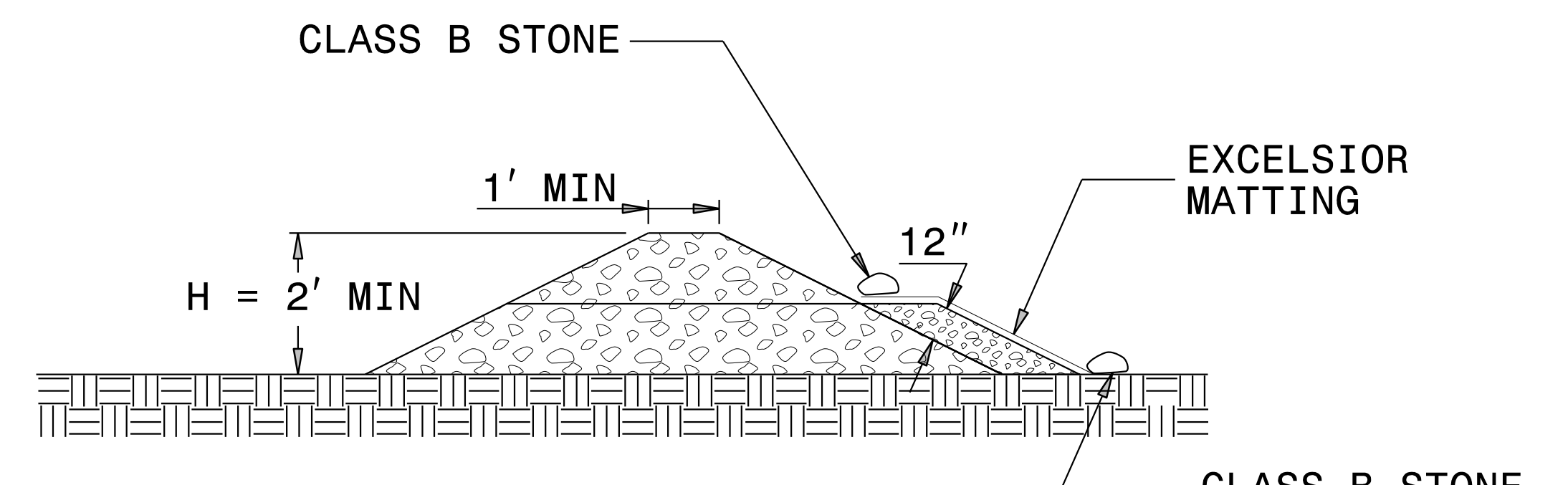
INITIALLY APPLY 4 OUNCES OF POLYACRYLAMIDE (PAM) TO TOP OF MATTING SECTION AND AFTER EVERY RAINFALL EVENT THAT EQUALS OR EXCEEDS 0.50 INCHES.



INSET A



SECTION A-A



SECTION B-B

NOT TO SCALE

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

| | |
|---|--------------------------|
| PROJECT REFERENCE NO. <i>17BPJ3.RJ65</i> | SHEET NO. <i>EC-3</i> |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

SOIL STABILIZATION TIMEFRAMES

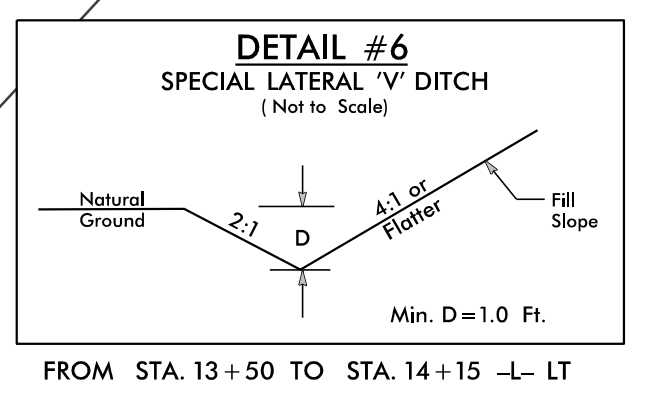
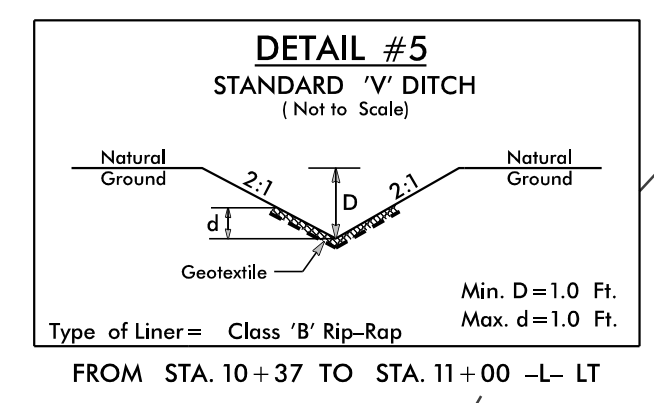
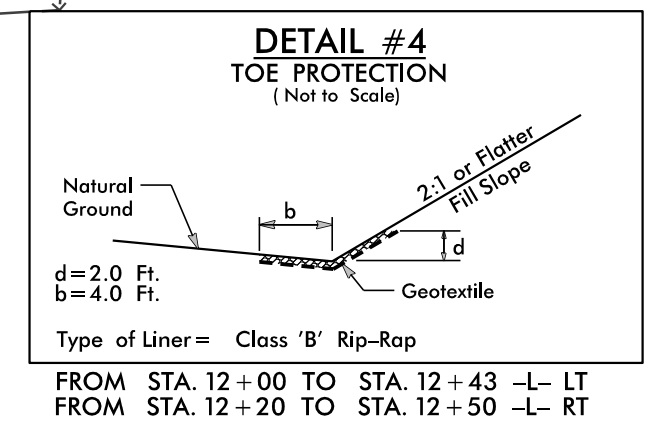
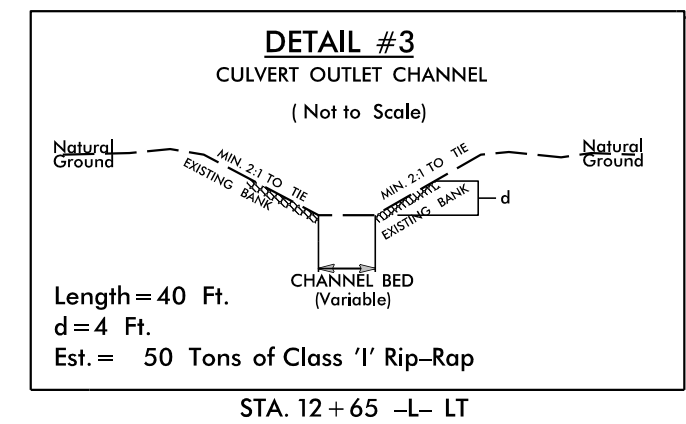
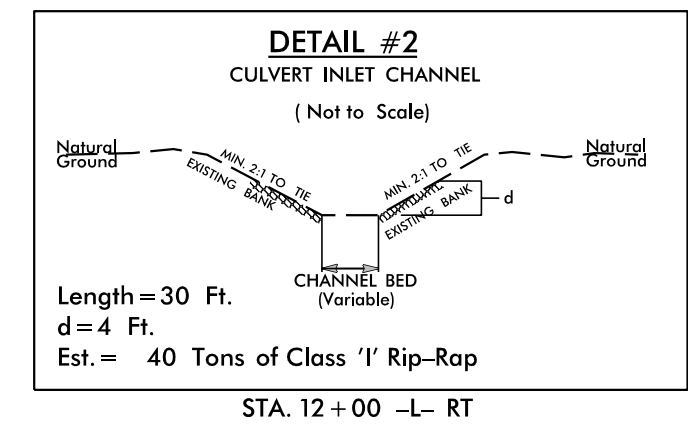
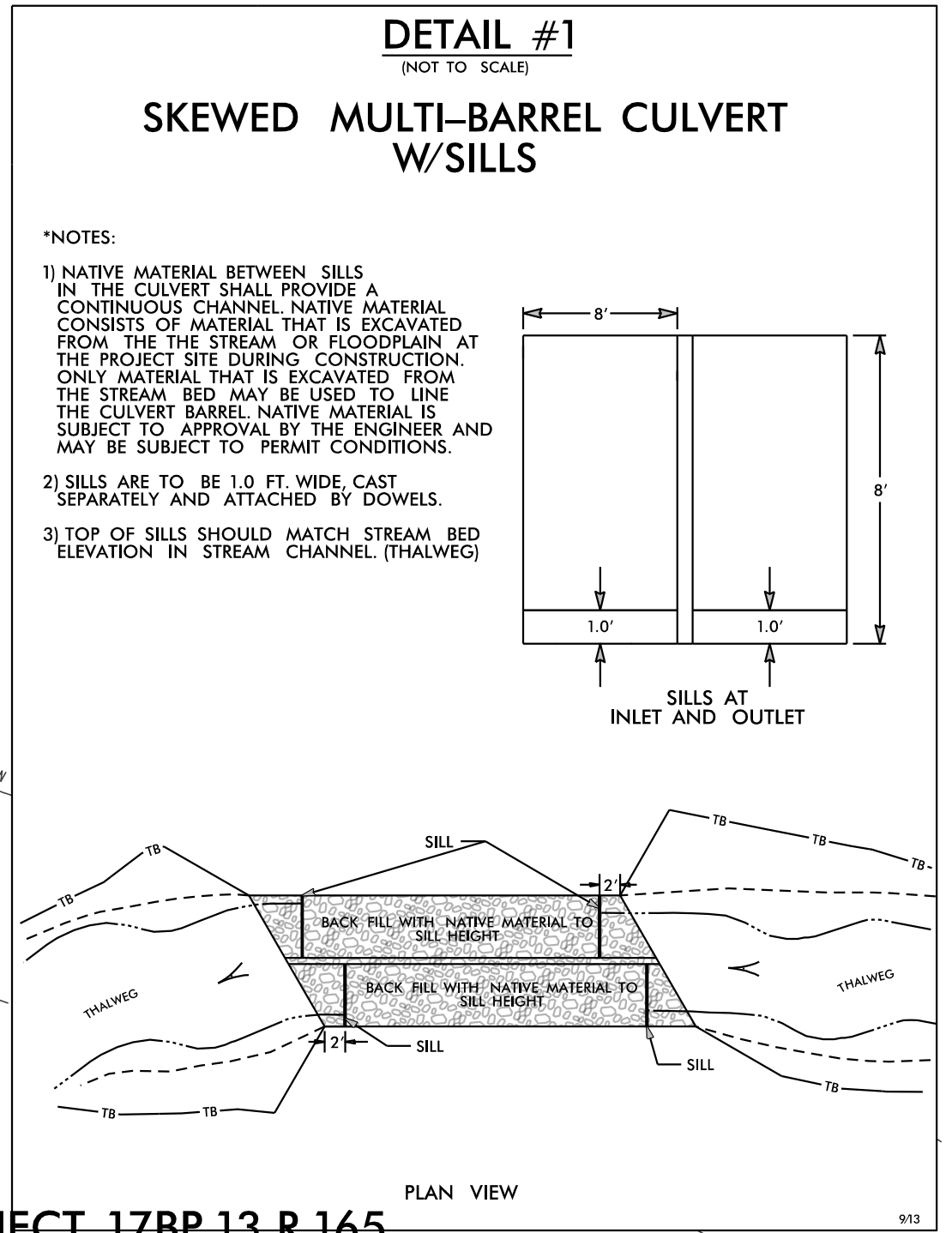
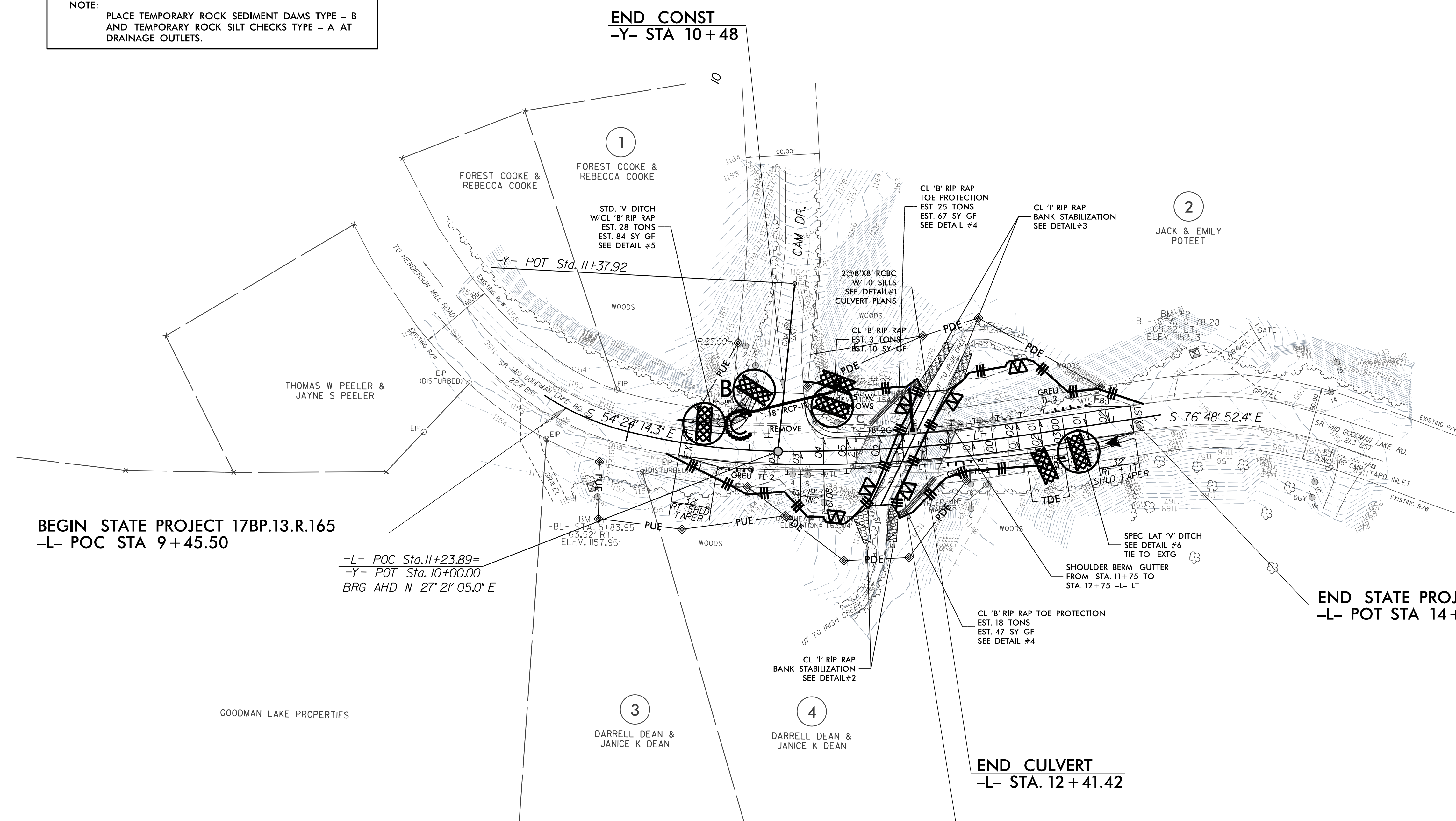
| <i>SITE DESCRIPTION</i> | <i>STABILIZATION TIME</i> | <i>TIMEFRAME EXCEPTIONS</i> |
|--|---------------------------|--|
| PERIMETER DIKES, SWALES, DITCHES AND SLOPES | 7 DAYS | NONE |
| HIGH QUALITY WATER (HQW) ZONES | 7 DAYS | NONE |
| SLOPES STEEPER THAN 3:1 | 7 DAYS | IF SLOPES ARE 10' OR LESS IN 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. |

| | |
|-------------------------|---------------------|
| PROJECT REFERENCE NO. | SHEET NO. |
| 17.BP.13.R.165 | EC-04/CONST.04 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NOTE:
UTILIZE SPECIAL STILLING BASIN(S)
AS STILLING BASIN WHERE APPLICABLE.

NOTE:
PLACE TEMPORARY ROCK SEDIMENT DAMS TYPE - B
AND TEMPORARY ROCK SILT CHECKS TYPE - A AT
DRAINAGE OUTLETS.

CLEARING AND GRUBBING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04



FOR -L- PROFILE SEE SHEET 5
FOR CULVERT PLANS, SEE SHEET C-1 THRU C-5

| | |
|--|------------------------------|
| PROJECT REFERENCE NO. 17BP.13.R.165 | SHEET NO. EC-04A/CONST.04 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

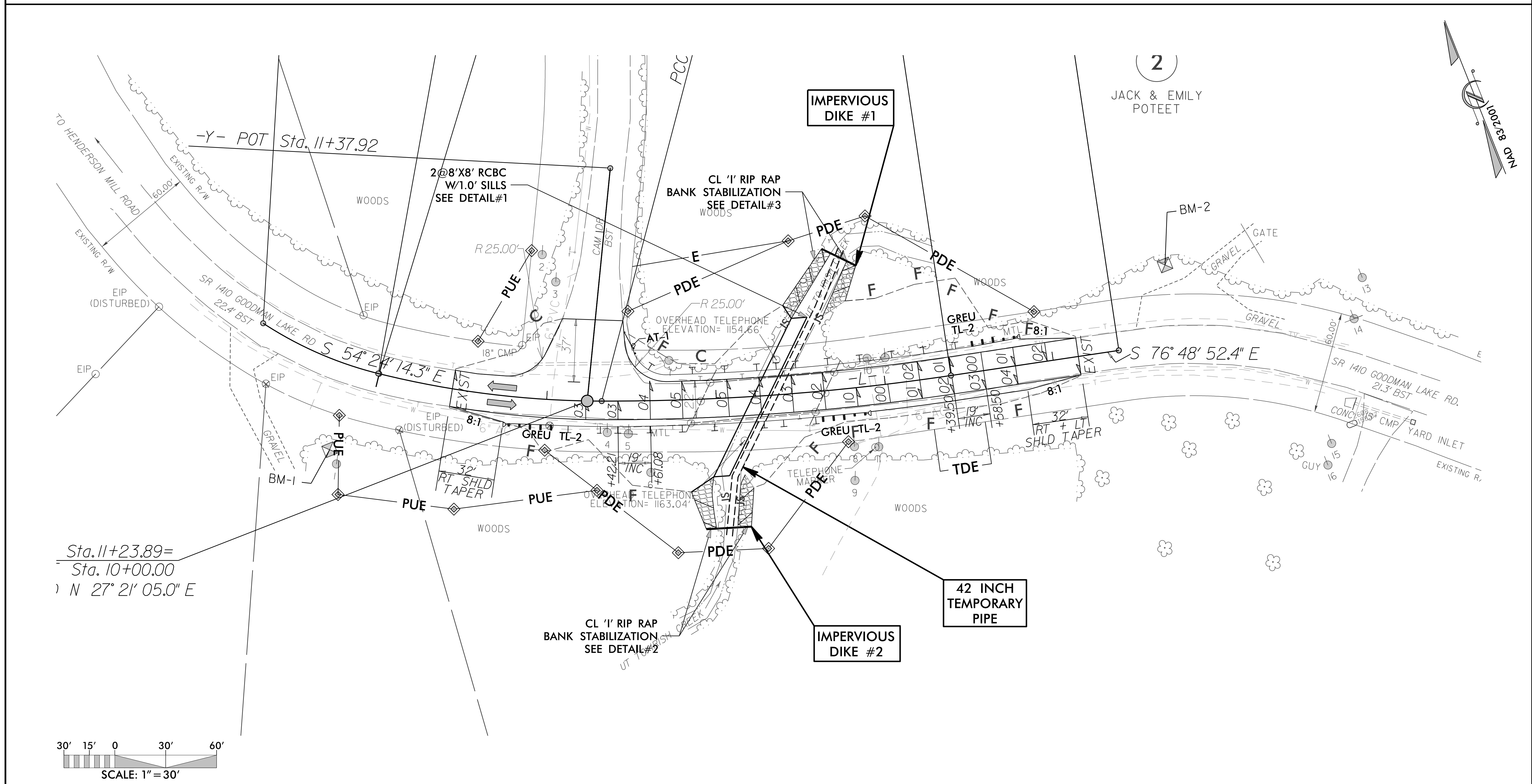
2@8'X8' CULVERT CONSTRUCTION SEQUENCE

STA. 12 + 31 -L- UT TO IRISH CREEK

PHASE I

- 1.) UTILIZE SPECIAL STILLING BASIN(S) AS NEEDED THROUGHOUT CULVERT CONSTRUCTION.
- 2.) INSTALL 42" TEMPORARY PIPE AND IMPERVIOUS DIKES #1 AND #2.
- 3.) DEWATER CONSTRUCTION AREA, UTILIZING SPECIAL STILLING BASIN(S) FOR PUMPED EFFLUENT.
- 4.) REMOVE EXISTING BRIDGE.
- 5.) CONSTRUCT UPSTREAM CL '1' RIP RAP BANK STABILIZATION, WESTERN 8'X8' RCBC BARREL W/1.0' SILLS, AND DOWNSTREAM CL '1' RIP RAP BANK STABILIZATION.
- 6.) EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES.

- 7.) REMOVE IMPERVIOUS DIKES AND TEMPORARY 42" PIPE.
- 8.) DIVERT FLOW THROUGH WESTERN 8'X8' RCBC BARREL W/1.0' SILLS.



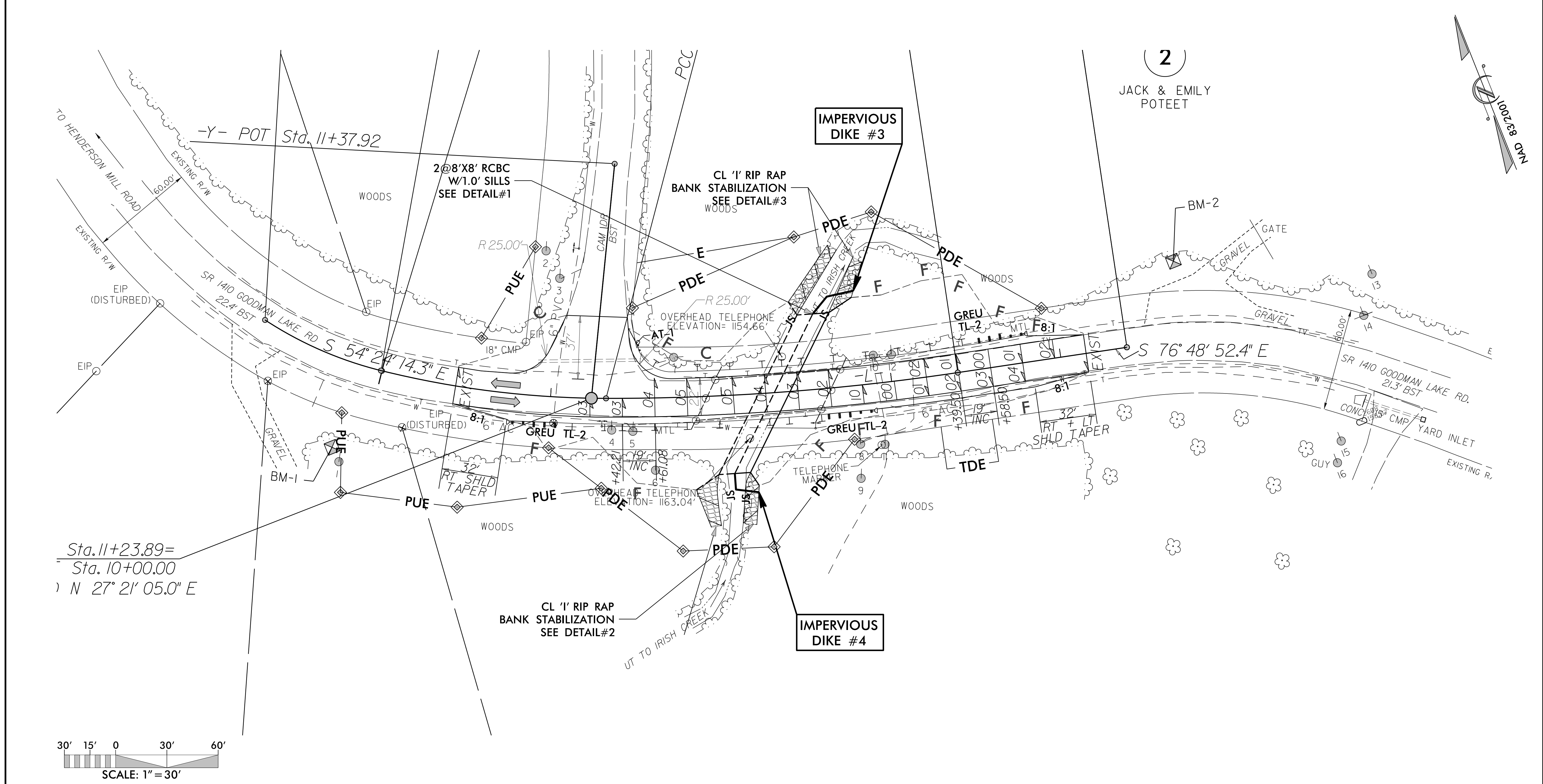
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|--|------------------------------|
| PROJECT REFERENCE NO. 17BP.13.R.165 | SHEET NO. EC-04B/CONST.04 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

2@8'X8' CULVERT CONSTRUCTION SEQUENCE

STA. 12 + 31 -L- UT TO IRISH CREEK

PHASE II

- 1.) INSTALL IMPERVIOUS DIKES #3 AND #4.
- 2.) DEWATER CONSTRUCTION AREA, UTILIZING SPECIAL STILLING BASIN(S) FOR PUMPED EFFLUENT.
- 3.) CONSTRUCT REMAINING PORTION OF 2@8'X8' RCBC W/1.0' SILLS.
- 4.) EXCAVATE ANY ACCUMULATED SILT AND DEWATER BEFORE REMOVAL OF IMPERVIOUS DIKES.
- 5.) REMOVE ANY REMAINING SPECIAL STILLING BASIN(S), AND IMPERVIOUS DIKES AND DIVERT FLOW THROUGH 2@8'X8' RCBC W/1.0' SILLS.
- 6.) COMPLETE ROADWAY.

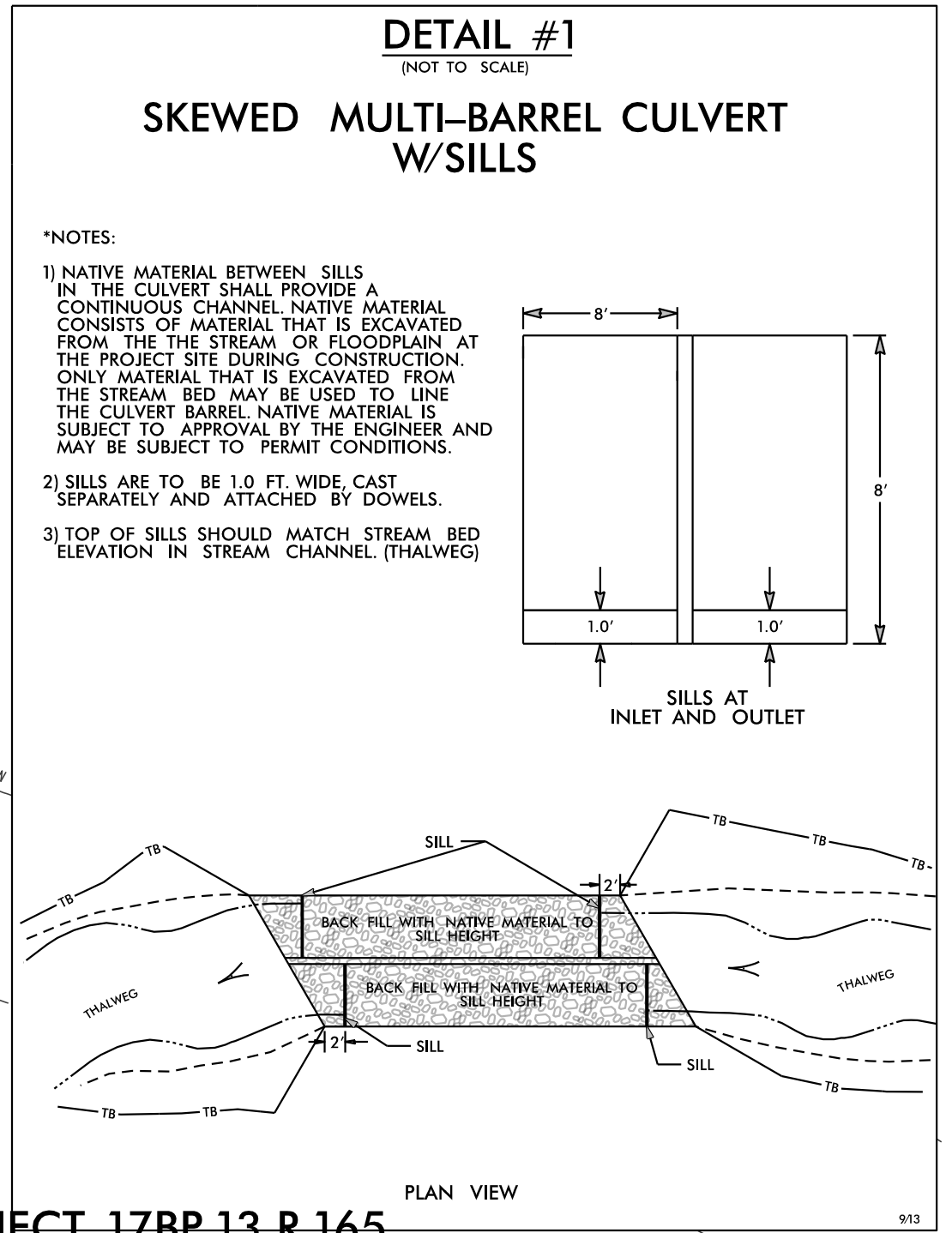
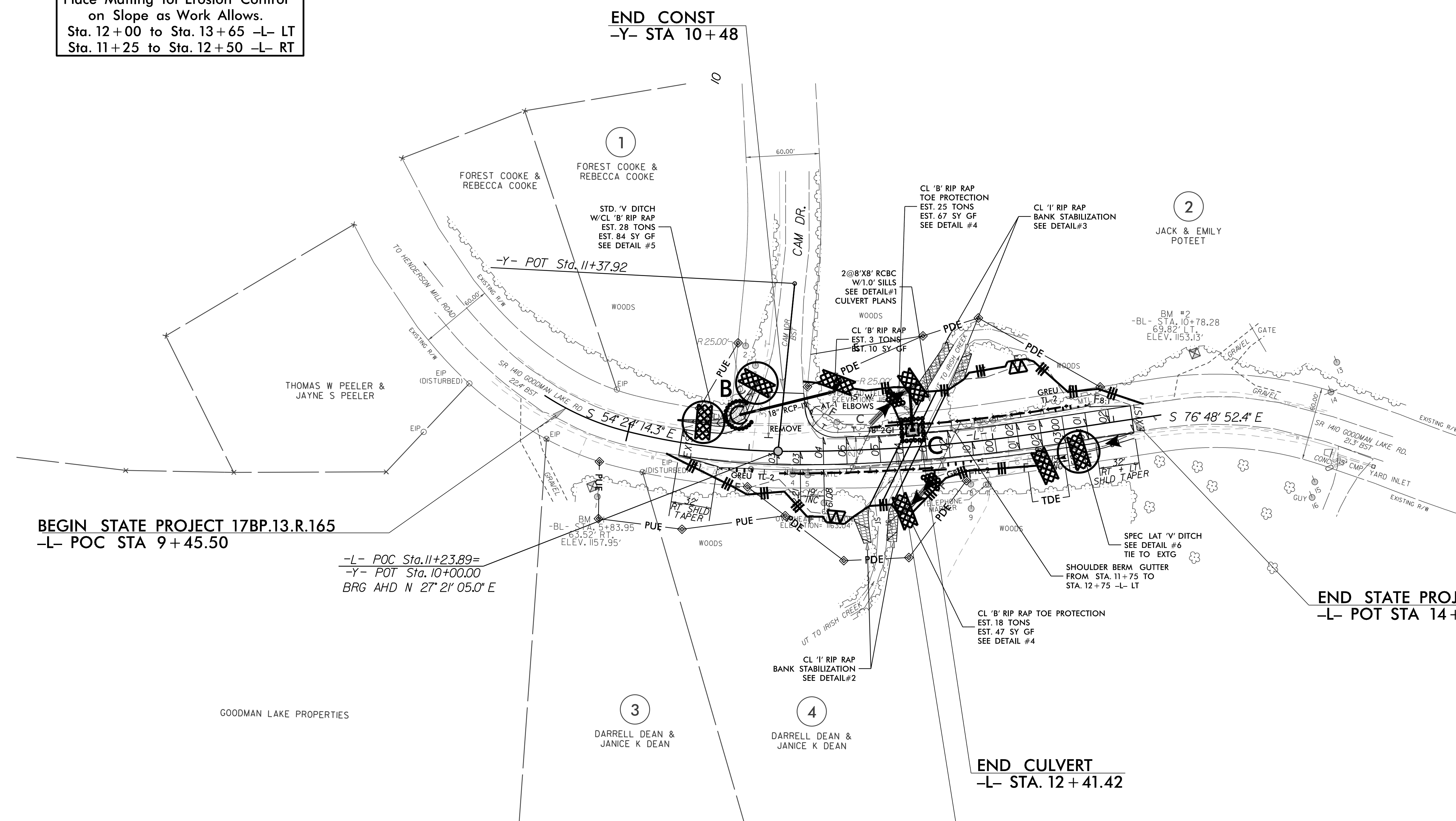


| | |
|-------------------------|---------------------|
| PROJECT REFERENCE NO. | SHEET NO. |
| 17.BP.13.R.165 | EC-05/CONST.04 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |

NOTE:
UTILIZE SPECIAL STILLING BASIN(S)
AS STILLING BASIN WHERE APPLICABLE.

Place Matting for Erosion Control
on Slope as Work Allows.
Sta. 12+00 to Sta. 13+65 -L- LT
Sta. 11+25 to Sta. 12+50 -L- RT

FINAL GRADING
EROSION CONTROL FOR
CONSTRUCTION SHEET 04



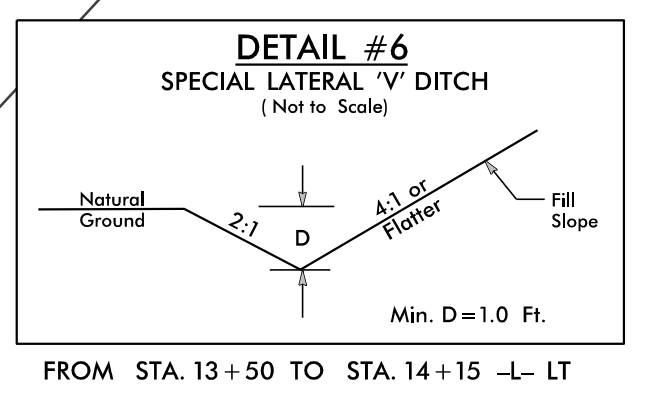
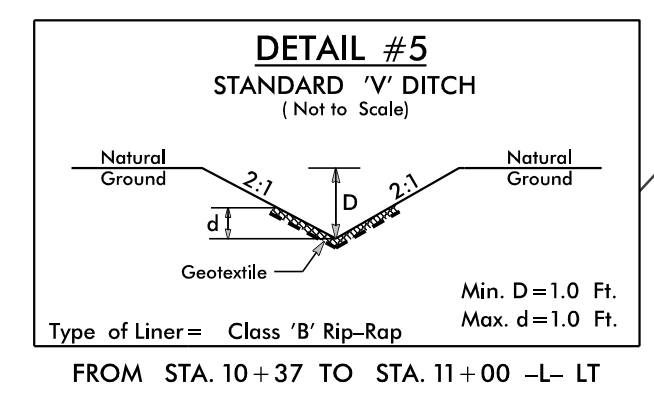
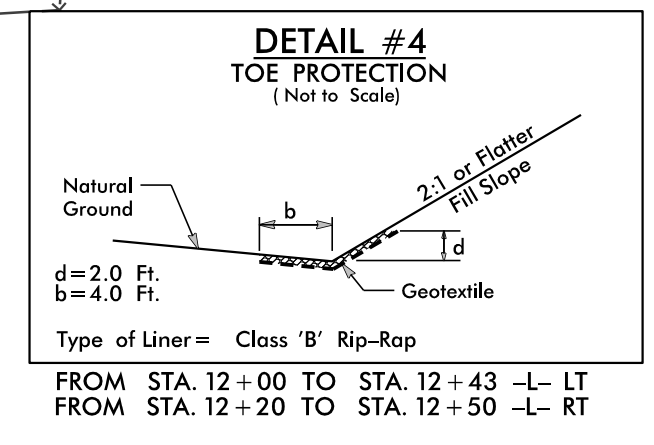
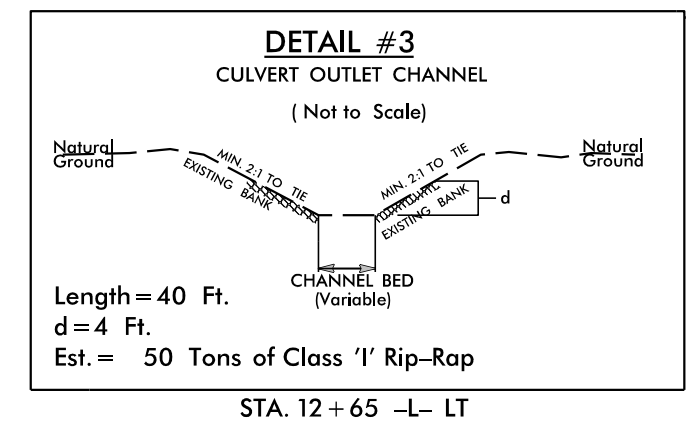
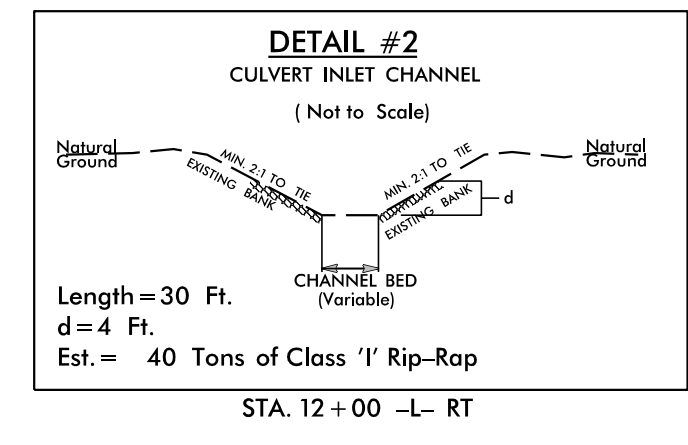
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-L- POC STA 9+45.50

-L- POC Sta. 11+23.89=
-Y- POT Sta. 10+00.00
BRG AHD N 27° 21' 05.0\"/>

END STATE PROJECT 17BP.13.R.165
-L- POT STA 14+15.00

END CULVERT
-L- STA. 12+41.42

BEGIN CULVERT
-L- STA. 12+20.63

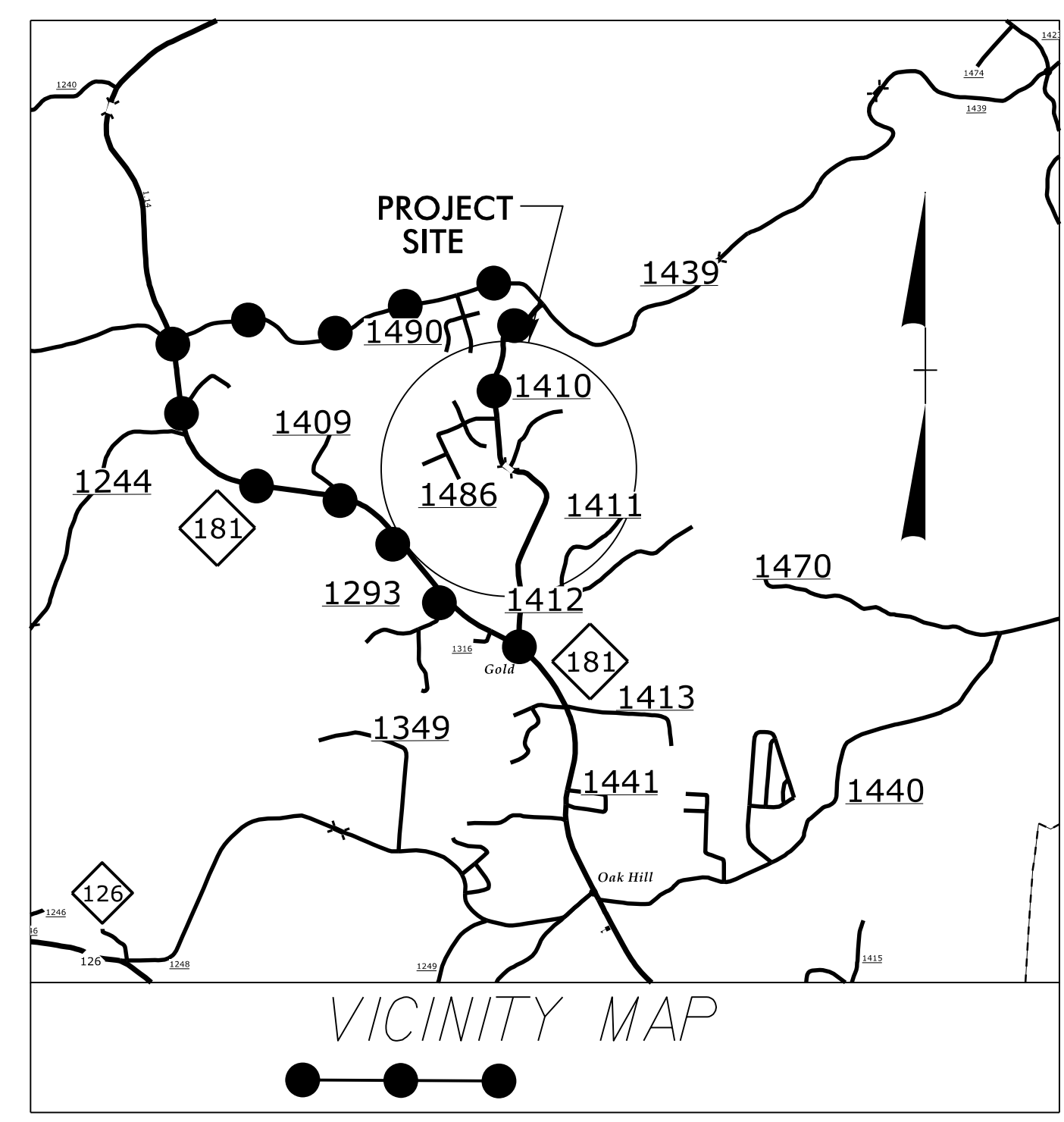


FOR -L- PROFILE SEE SHEET 5
FOR CULVERT PLANS, SEE SHEET C-1 THRU C-5

09/08/99

19-AUG-2021 09:55
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\$\$\$\$\$SERNAME\$\$\$\$\$

STATE PROJECT: 17BP.13.R.165



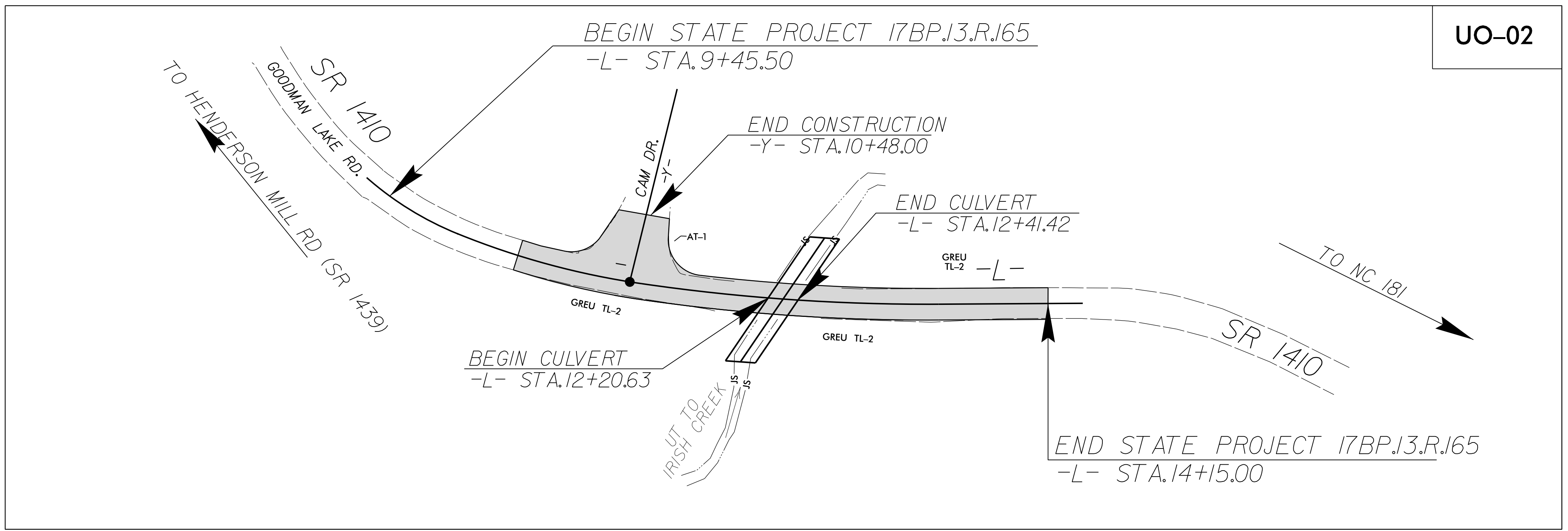
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

**UTILITIES BY OTHERS PLANS
BURKE COUNTY**

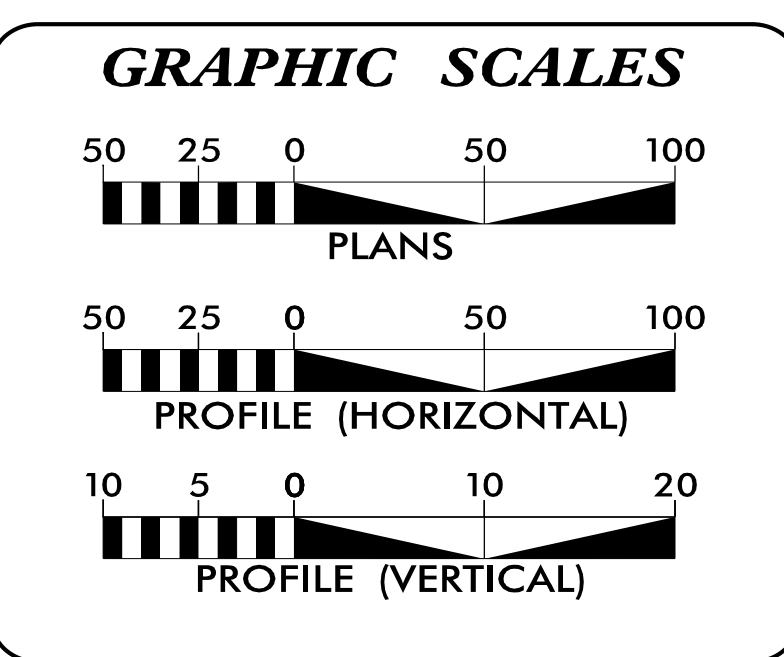
LOCATION: REPLACE BRIDGE NO. 155 OVER IRISH CREEK ON SR 1410 (GOODMAN LAKE RD.)
TYPE OF WORK: GRADING, PAVING, DRAINAGE, AND CULVERT

| | |
|---------------|-----------|
| T.I.P. NO. | SHEET NO. |
| 17BP.13.R.165 | UO-1 |

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



1102011
NAD83



INDEX OF SHEETS

| SHEET NO.: | DESCRIPTION: |
|------------|----------------|
| UO-1 | TITLE SHEET |
| UO-02 | UBO PLAN SHEET |

UTILITY OWNERS WITH CONFLICTS

(A) POWER - RUTHERFORD EMC
(B) CABLE TV - CHARTER
(C) TELEPHONE - AT&T

PREPARED IN THE OFFICE OF:

KCI
KCI Associates of N.C., P.A.
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214
Fax (919) 783-9266

JOHN FAISON UTILITY PROJECT MANAGER
DANIEL ALLEN PROJECT UTILITY DESIGNER

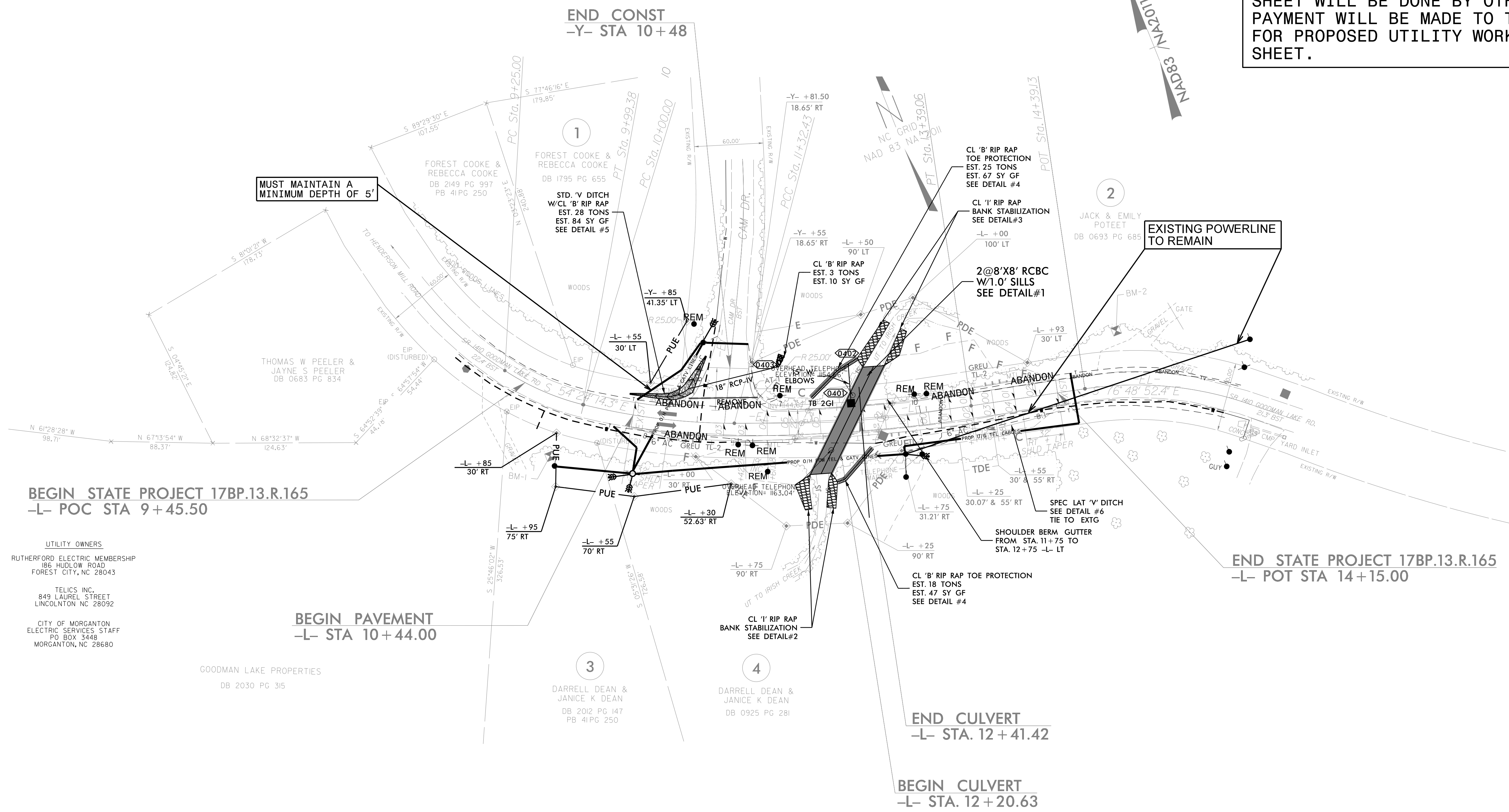
**DIVISION OF HIGHWAYS
DIVISION 13**

55 Orange Street
Asheville, NC 28801

MIKE CALLOWAY DIVISION CONTACT #1
XXXX DIVISION CONTACT #2
XXXX DIVISION CONTACT #3
XXXX DIVISION CONTACT #4

UTILITIES BY OTHERS

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



UTILITY OWNERS
 RUTHERFORD ELECTRIC MEMBERSHIP
 186 HUDLOW ROAD
 FOREST CITY, NC 28043
 TELICS INC.
 849 LAUREL STREET
 LINCOLNTON NC 28092
 CITY OF MORGANTON
 ELECTRIC SERVICES STAFF
 PO BOX 3448
 MORGANTON, NC 28680

GOODMAN LAKE PROPERTIES
 DB 2030 PG 315

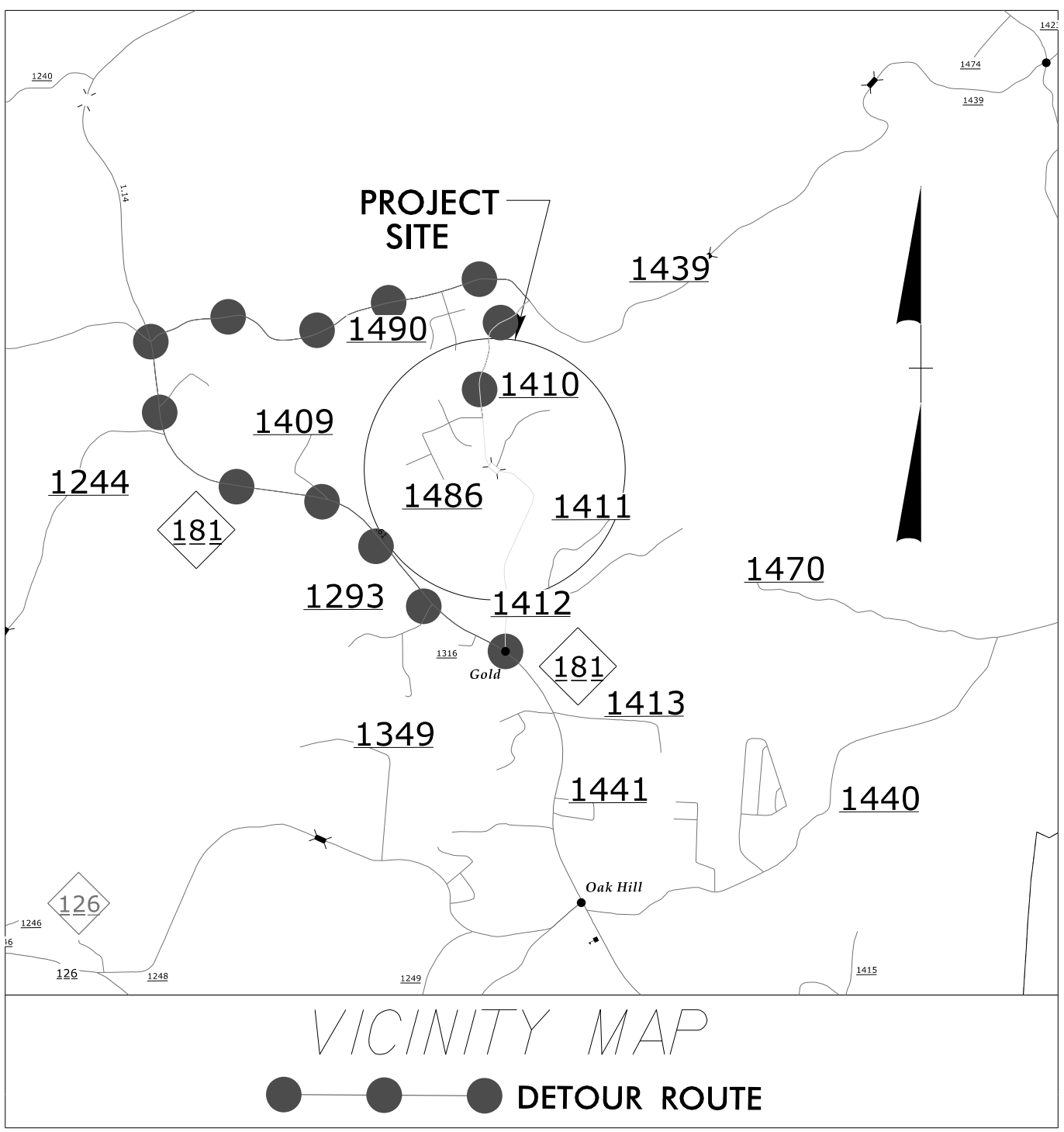
3
 DARRELL DEAN &
 JANICE K DEAN
 DB 2012 PG 147
 PB 41PG 250

4
 DARRELL DEAN &
 JANICE K DEAN
 DB 0925 PG 281

08-DEC-2021 09:54
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| | |
|---------------|-----------|
| T.I.P. NO. | SHEET NO. |
| 17BP.13.R.165 | UC-1 |

TIP PROJECT: 17BP.13.R.165

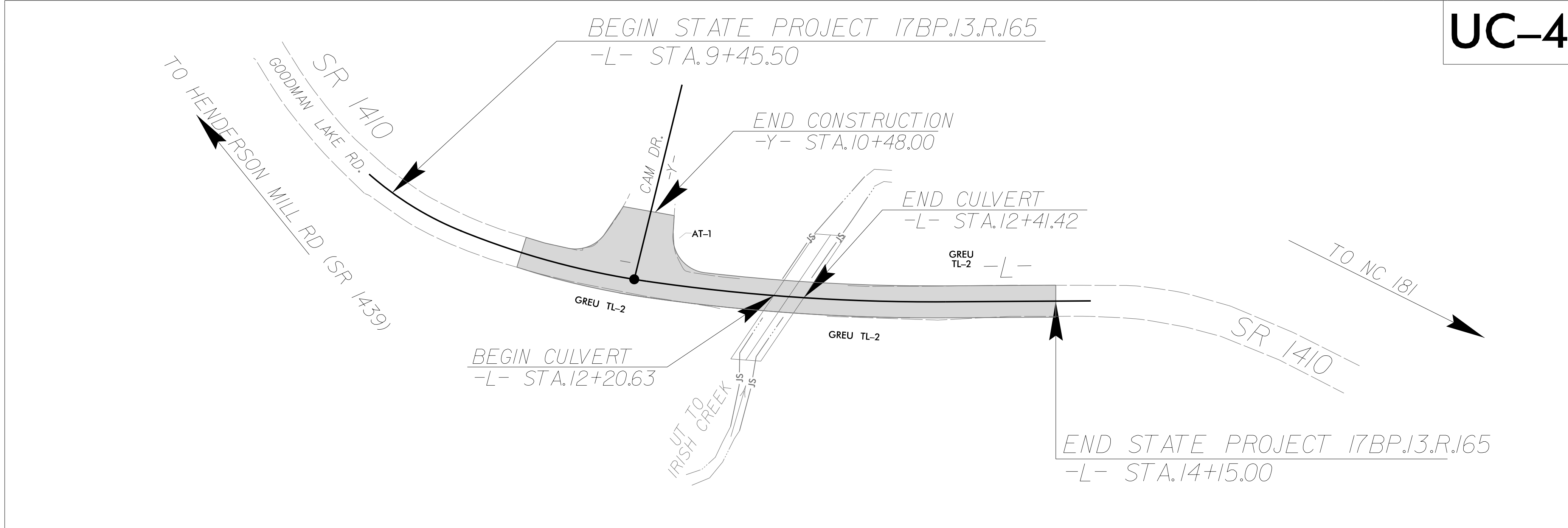


STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITY CONSTRUCTION PLANS BURKE COUNTY

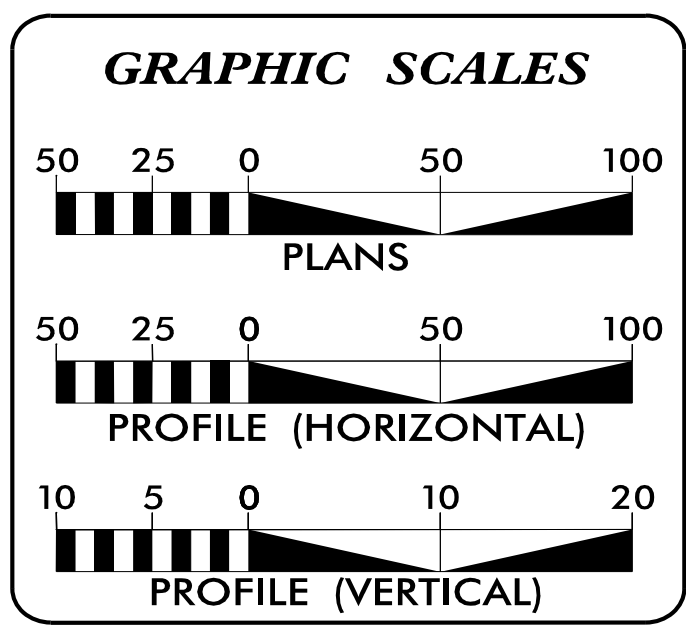
**LOCATION: BRIDGE NO. 155 OVER IRISH CREEK
ON SR 1410 (GOODMAN LAKE RD.)**

TYPE OF WORK: WATERLINE RELOCATION



UC-4

DOCUMENT NOT CONSIDERED FINAL
UNTIL ALL SIGNATURES ARE COMPLETED




| SHEET NO.: | DESCRIPTION: |
|------------|-------------------|
| UC-1 | TITLE SHEET |
| UC-2 | UTILITY SYMBOLOGY |
| UC-3 | NOTES |
| UC-3A,B | DETAILS |
| UC-4 | PLAN |
| UC-5 | PROFILE |

**WATER OWNER
ON PROJECT**

CITY OF MORGANTON UTILITIES
305 E UNION ST #A100
MORGANTON, NC 28655

PREPARED IN THE OFFICE OF




KCI
Engineers • Planners • Scientists • Construction Managers
4505 Falls of Neuse Road, Suite 400
Raleigh, NC 27609
Phone (919) 783-9214 • Fax (919) 783-9266
License No. C-764

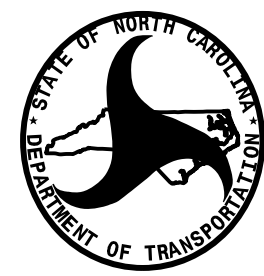
| | |
|----------------------------|------------------|
| <u>DINKISSA KEREYU, PE</u> | PROJECT ENGINEER |
| <u>MARCO MENENDEZ, PE</u> | PROJECT MANAGER |
| <u>CHARLES SHEARON</u> | PROJECT DESIGNER |

SEAL

12/9/2021



Marco Menendez
Professional Engineer
032322
03/23/22



HIGHWAY DIVISION 13
55 ORANGE STREET
ASHEVILLE NC 28801
PHONE (828) 250-3000
FAX (828) 251-6394

| | |
|------------------------------|--------------------------------|
| <u>RANDY J. MCKINNEY, PE</u> | DIVISION CONSTRUCTION ENGINEER |
| <u>R. KEITH RADCLIFF</u> | SENIOR UTILITY COORDINATOR |
| <u>JOHN D. METCALF</u> | DIVISION UTILITY COORDINATOR |

19-AUG-2021 09:06
M:\2016\1221601946_09 NCDOT Division 13 Bridge Replacements\17BP.13.R.165_Burke_10155_B5870\Water and Wastewater\B5870_ut_tsh_UC01_psh.dgn
\$\$\$\$\$SERVNAME\$\$\$\$\$

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

UTILITIES PLAN SHEET SYMBOLS

PROPOSED WATER SYMBOLS

Table listing proposed water symbols including Water Line (Sized as Shown), various Degree Bends (11 1/4, 22 1/2, 45, 90), 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, Water Meter, Relocate Water Meter, Remove Water Meter, Water Pump Station, RPZ Backflow Preventer, DCV Backflow Preventer, Relocate RPZ Backflow Preventer, Relocate DCV Backflow Preventer.

PROPOSED MISCELLANEOUS UTILITIES SYMBOLS

Table listing proposed miscellaneous utilities symbols including Power Pole, Telephone Pole, Joint Use Pole, Telephone Pedestal, Utility Line by Others (Type as Shown), Trenchless Installation, Encasement by Open Cut, Encasement.

Table listing miscellaneous utilities symbols including Thrust Block, Air Release Valve, Utility Vault, Concrete Pier, Steel Pier, Plan Note, Pay Item Note.

EXISTING UTILITIES SYMBOLS

Table listing existing utilities symbols including Power Pole, Telephone Pole, Joint Use Pole, Utility Pole, Utility Pole with Base, H-Frame Pole, Power Transmission Line Tower, Water Manhole, Power Manhole, Telephone Manhole, Sanitary Sewer Manhole, Hand Hole for Cable, Power Transformer, Telephone Pedestal, CATV Pedestal, Gas Valve, Gas Meter, Located Miscellaneous Utility Object, Abandoned According to Utility Records (AATUR), End of Information (E.O.I.), and various underground and aboveground lines (Power, Telephone, Fiber Optics, TV, Gas, Water, Gravity Sanitary Sewer, SS Forced Main).

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

5/14/99
29-001-2018 10:55
p:\placemc\2018 10:55\10155_165_Burke.110155_B5870\Water and Wastewater\B5870_ut_sew_rdy_UC02_psh.dgn

5/14/2021

UTILITY CONSTRUCTION

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 CITY OF MORGANTON PUBLIC UTILITIES.
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.

PROJECT SPECIFIC NOTES:

1. ALL PROPOSED WATER LINE SHALL BE PRESSURE CLASS 350 DIP.
2. ALL PIPE JOINTS AT FITTINGS SHALL BE RESTRAINED WITH THRUST BLOCKING. ADDITIONALLY ALL PIPE JOINTS SHALL BE RESTRAINED JOINTS.
3. CONTRACTOR SHALL COORDINATE WITH THE CITY OF MORGANTON PUBLIC UTILITIES FOR SHUTDOWN OF EXISTING WATER LINE.
4. CONTRACTOR SHALL REMOVE EXISTING 6" WATER LINE AS NECESSARY TO MAKE CONNECTION WITH THE NEW WATER LINE.
5. CONTRACTOR SHALL FOLLOW ALL SPECIAL PROVISIONS ASSOCIATED WITH HANDLING OF EXISTING ASBESTOS CEMENT PIPE AND PROPOSED CONSTRUCTION METHODS.
6. CONTRACTOR SHALL USE HYMAX 2 COUPLING OR EQUAL TO CONNECT WITH EXISTING AC LINE.

| | |
|---|--------------------------|
| PROJECT REFERENCE NO. 17BP13R165 | SHEET NO. UC-3 |
| DESIGNED BY: DK | |
| DRAWN BY: CS | |
| CHECKED BY: MM | |
| APPROVED BY: | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| KCI <small>Engineers • Planners • Scientists • Construction Managers</small> 4500 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764 | |

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

19-AUC-2021-0121-165-Burke-110155-B5870-Water and Wastewater-B5870-ut.notes-UC03_psh.dgn

UTILITY CONSTRUCTION

| | |
|---|---------------------------|
| PROJECT REFERENCE NO. 17BP.13.R.153 | SHEET NO. UC-3A |
| DESIGNED BY: <i>DK</i> | 12/9/2021 |
| DRAWN BY: <i>CS</i> | |
| CHECKED BY: <i>MM</i> | |
| APPROVED BY: | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SEC. PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| Engineers • Planners • Scientists • Construction Managers 4509 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764 | |

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

SECTION

NOT TO SCALE

| CITY OF MORGANTON NORTH CAROLINA | FIRE HYDRANT ROD TYPE INSTALLATION | STD. NO. | DATE |
|-------------------------------------|------------------------------------|--------------|--------|
| | | 102 | 3-7-11 |
| | | SHEET 1 OF 1 | |

CITY OF MORGANTON

NOTES: ALL CONCRETE SHOWN IS TO BE 3000 P.S.I.
 MAINTAIN A 3FT. UNOBSTRUCTED RADIUS AROUND FIRE HYDRANT PER FIRE CODE.
 ALL FITTING SHALL BE SECURED WITH MEGALUGS AND RETAINER GLANDS
 3/4" RODS GALVANIZED
 3/4" EYE BOLTS, NUTS & WASHERS
 3/4" RODS GALVANIZED
 3/4" ROD CONNECTORS IF NEEDED

NOTES: WITH THE ENGINEERS APPROVAL THE HYDRANT VALVE MAY BE CONNECTED DIRECTLY TO THE HYDRANT TEE.

NOTES: FIRE HYDRANTS SHALL BE ONE OF THE FOLLOWING THREE TYPES WITH THE 4 1/2" PUMPER NOZZLES BEING NATIONAL STANDARD PIPE THREADS AND 2 (TWO) 2 1/2" HOSE NOZZLES BEING NATIONAL STANDARD THREADS. ALL HYDRANTS SHALL OPEN IN A CLOCKWISE DIRECTION.
 A) CENTURION, MANUFACTURED BY MUELLER COMPANY
 B) SUPER CENTURION, MANUFACTURED BY MULLER COMPANY
 C) GUARDIAN, MANUFACTURED BY KENNEDY VALVE COMPANY

THRUST BLOCK FOR TEES

THRUST BLOCK FOR BENDS

THRUST BLOCK FOR PIPE CAP

NOT TO SCALE

| CITY OF MORGANTON NORTH CAROLINA | THRUST BLOCK FOR WATER MAINS (150 PSI WORKING PRESSURE) | STD. NO. | DATE |
|-------------------------------------|---|--------------|--------|
| | | 104.1 | 3-7-11 |
| | | SHEET 1 OF 2 | |

CITY OF MORGANTON

NOTES:
 1. DEAD MAN RESTRAINED W/ 2-3/4" ALL THREAD
 RODS 3" TO 8" AND 4-3/4" ALL THREAD RODS 12" TO 16"

| SIZE | 11 1/4° BEND | 22 1/2° BEND | 45° BEND | 90° BEND | TEE | CAP |
|------|--------------|--------------|----------|----------|-----|-----|
| 6 | 12 | 12 | 12 | 16 | 16 | 14 |
| 8 | 12 | 12 | 16 | 22 | 22 | 18 |
| 10 | 12 | 14 | 20 | 28 | 28 | 22 |
| 12 | 12 | 18 | 24 | 32 | 32 | 28 |
| 14 | 14 | 20 | 28 | 38 | 38 | 32 |
| 16 | 16 | 22 | 32 | 42 | 42 | 36 |
| 18 | 18 | 28 | 36 | 48 | 48 | 40 |
| 20 | 20 | 28 | 40 | 52 | 52 | 44 |
| 24 | 24 | 34 | 46 | 64 | 64 | 54 |
| 30 | 30 | 42 | 58 | 78 | 78 | 66 |
| 36 | 36 | 50 | 70 | 94 | 94 | 80 |
| 42 | 40 | 58 | 80 | 108 | 108 | 90 |
| 48 | 46 | 66 | 90 | 124 | 124 | 104 |

THRUST BLOCK DIMENSION "A"
 (DIMENSION "A" IN INCHES)
 4,000 P.S.I. CONCRETE

NOT TO SCALE

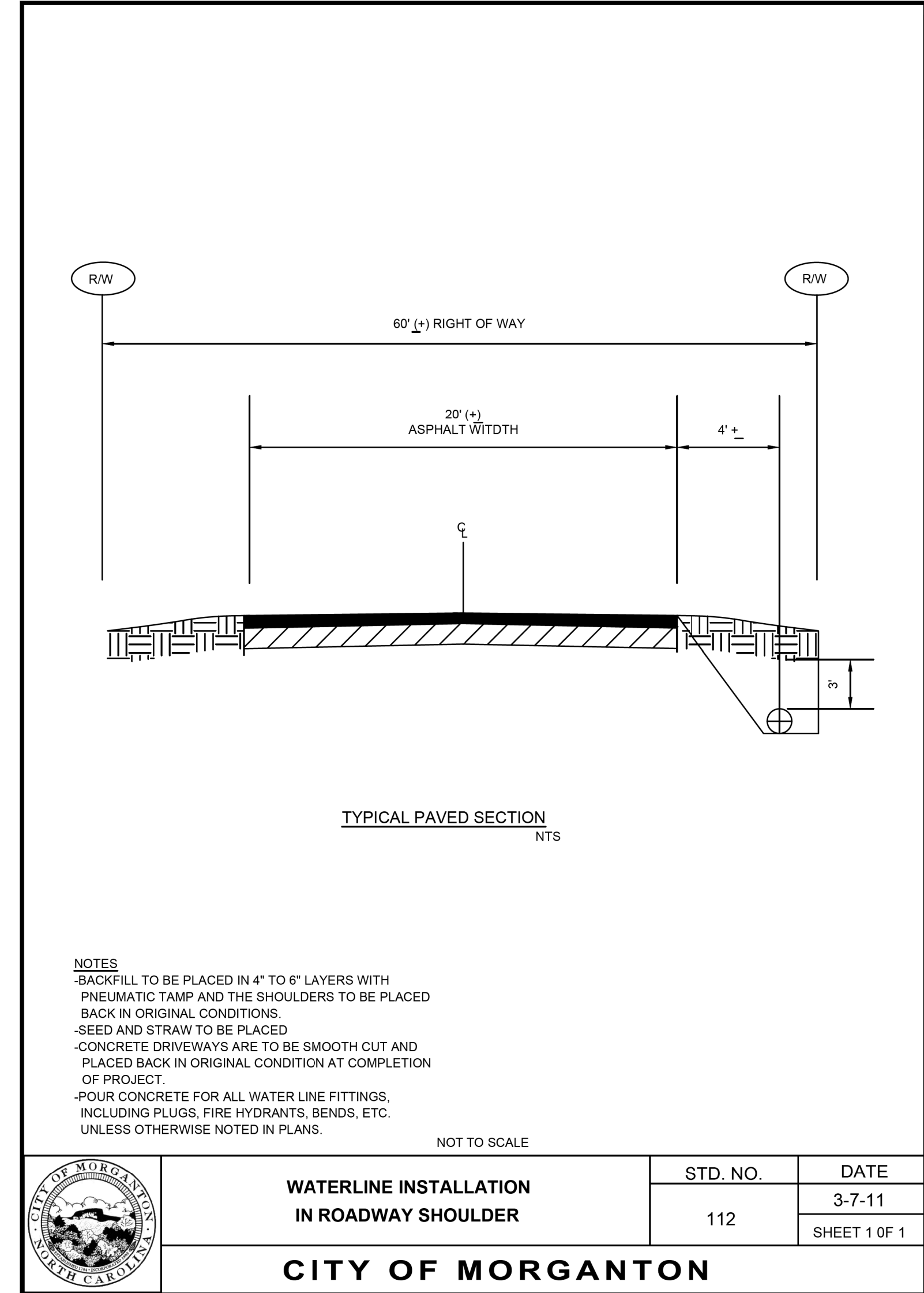
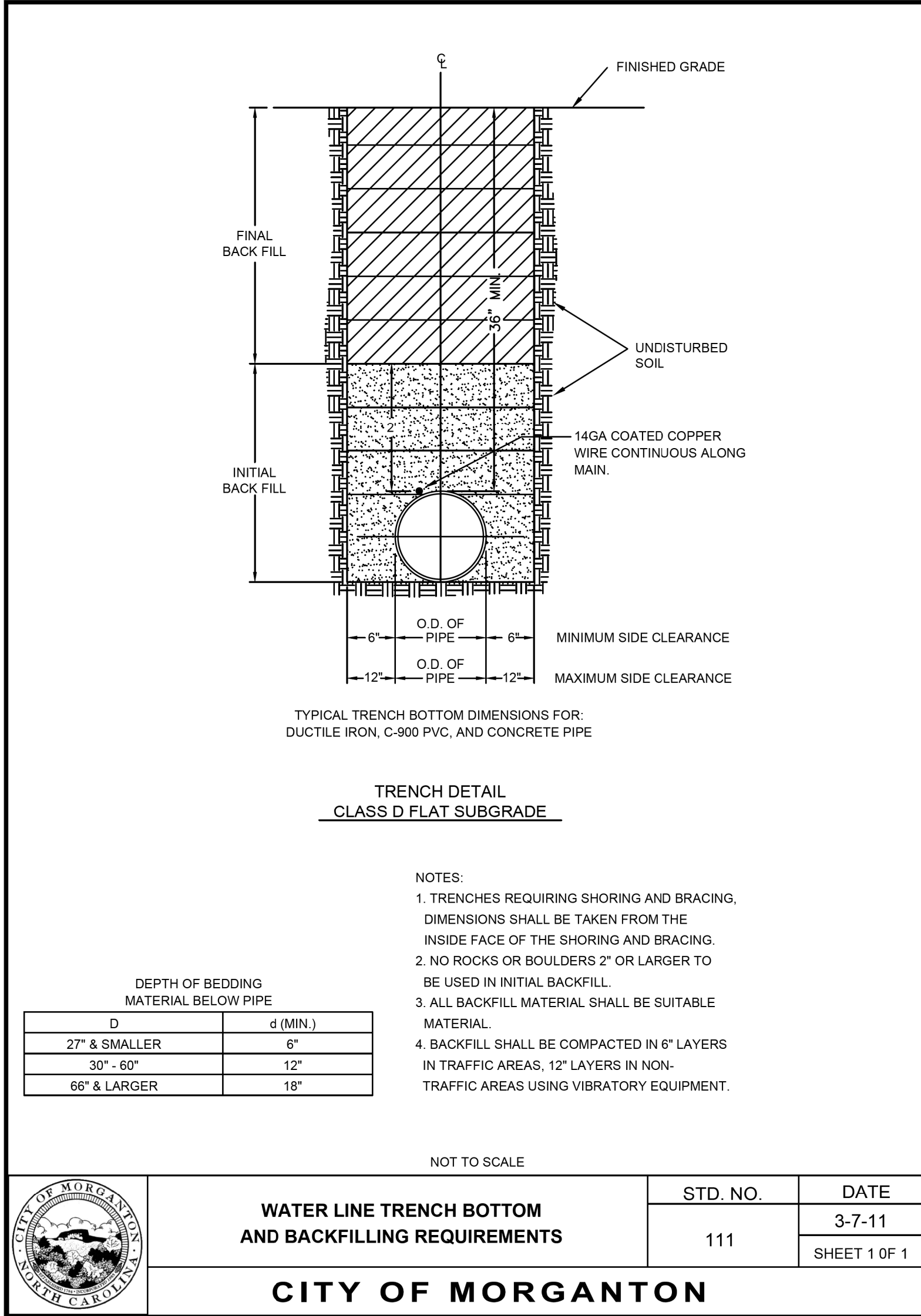
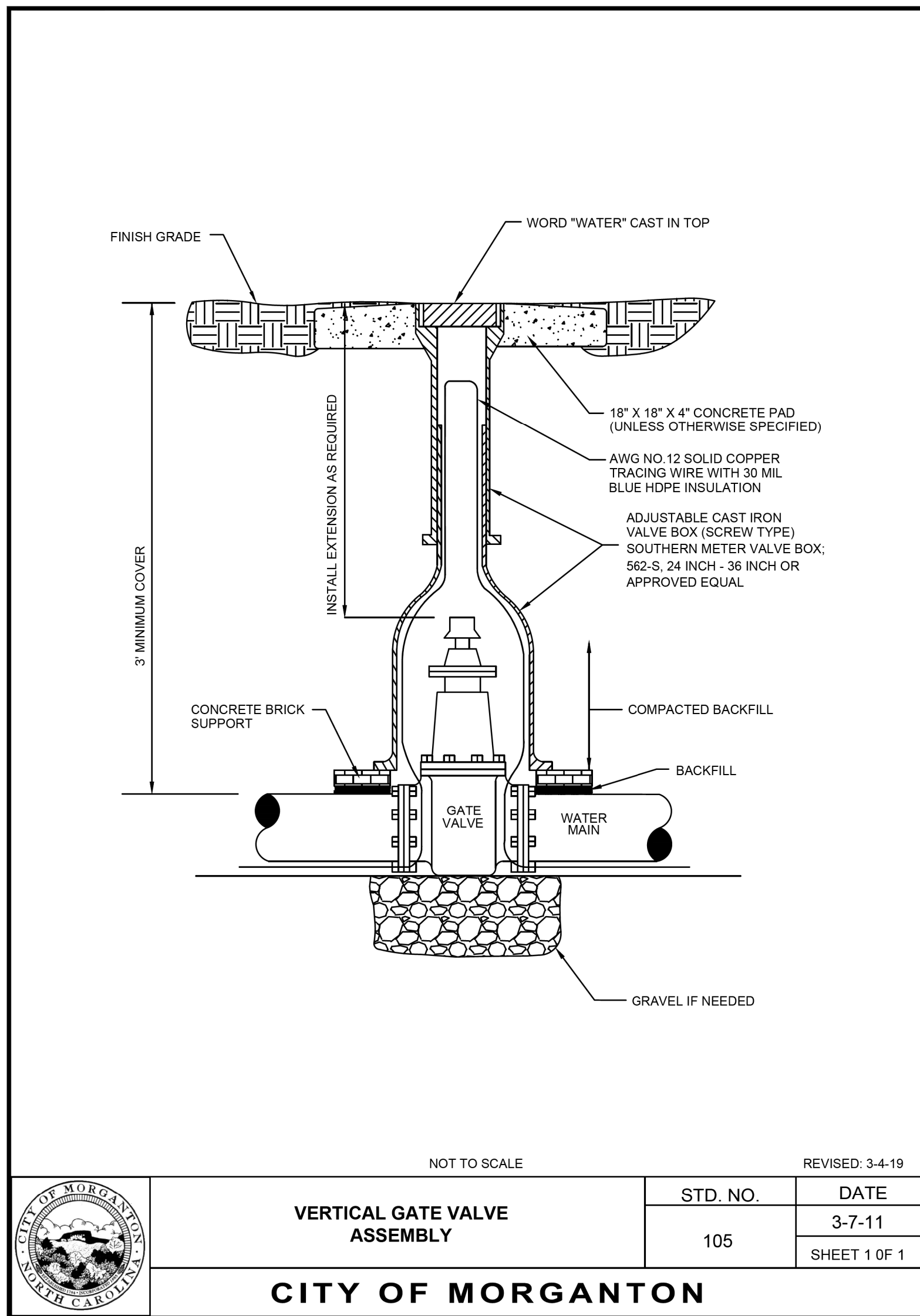
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|-------------------------------------|------------------------------|--------------|--------|
| | | 104.2 | 3-7-11 |
| | | SHEET 2 OF 2 | |

CITY OF MORGANTON

UTILITY CONSTRUCTION

| | |
|---|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| 17BP13.R.153 | UC-3B |
| DESIGNED BY: DK | 12/9/2021 |
| DRAWN BY: CS | |
| CHECKED BY: MM | |
| APPROVED BY: | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION | |
| UTILITIES ENGINEERING SECTION | |
| PHONE: (919) 707-6690 | |
| FAX: (919) 250-4151 | |

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED

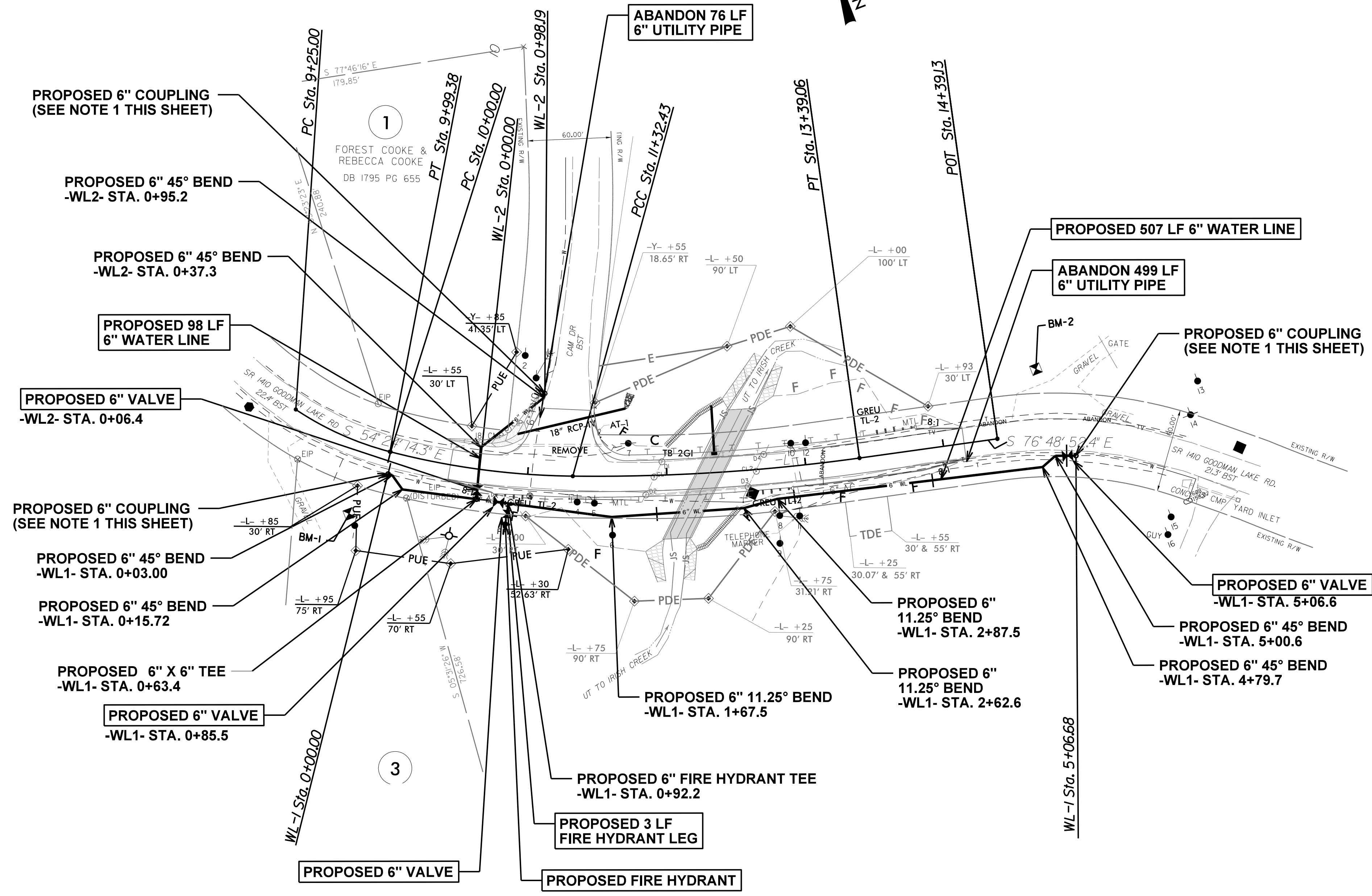


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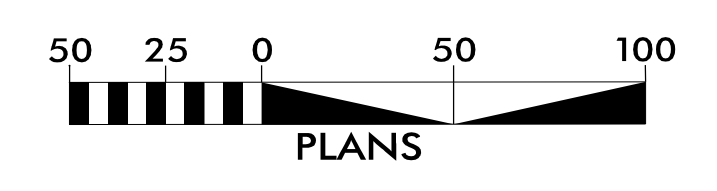
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| | |
|--|--------------------------|
| PROJECT REFERENCE NO. 17BP13.R165 | SHEET NO. UC-4 |
| DESIGNED BY: DK | 12/9/2021 |
| DRAWN BY: CS | |
| CHECKED BY: MM | |
| APPROVED BY: | |
| REVISED: | |
| | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| | |

UTILITY CONSTRUCTION
DOCUMENT NOT CONSIDERED FINAL
UNLESS ALL SIGNATURES COMPLETED



- NOTES:**
- CONTRACTOR SHALL USE HYMAX 2 COUPLING OR EQUAL TO CONNECT WITH EXISTING AC LINE.



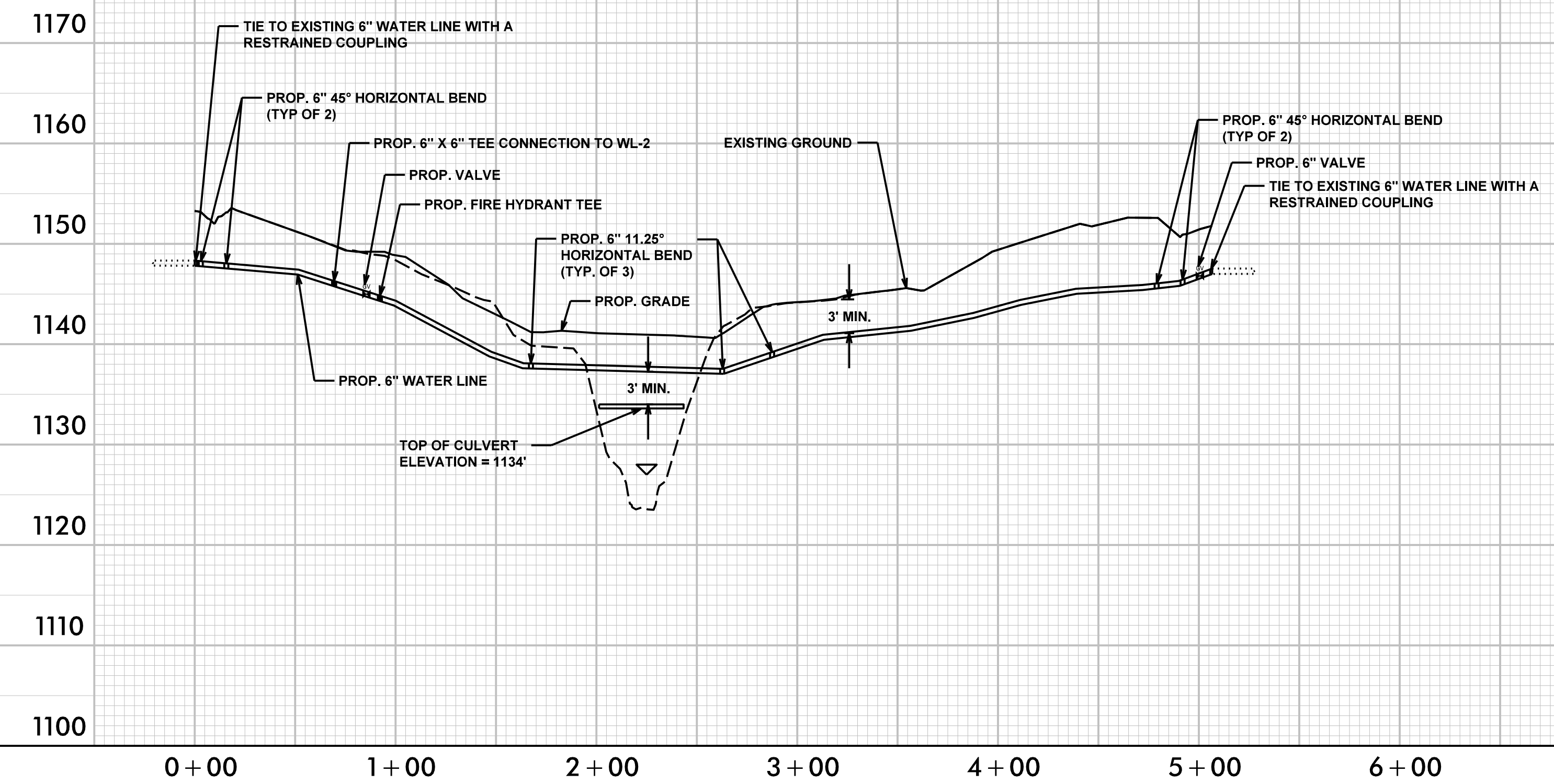
PROPOSED 1,120 POUNDS OF DUCTILE IRON WATER PIPE FITTINGS

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-WL-1-

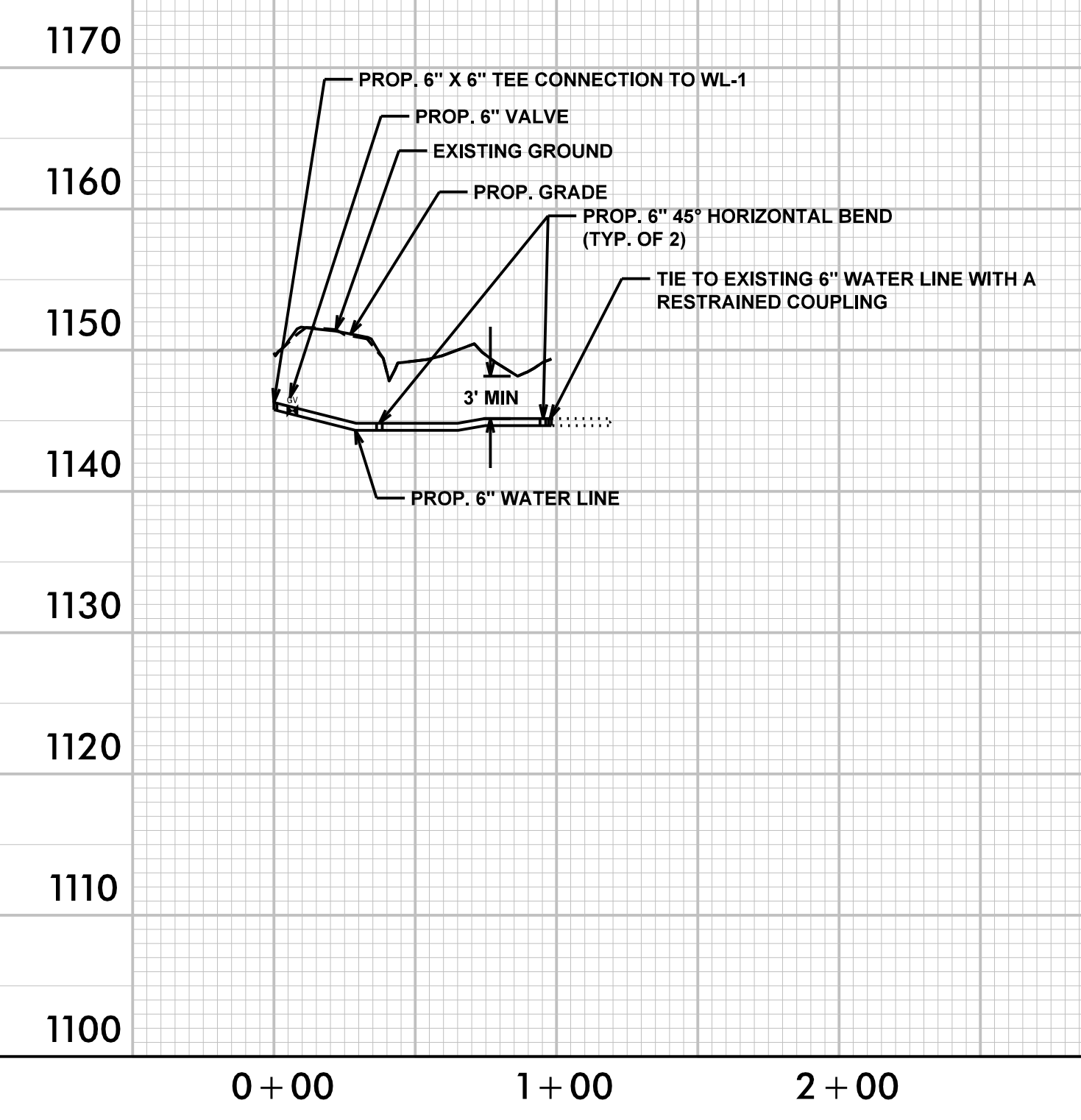


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|---|--------------------------|
| PROJECT REFERENCE NO. <i>17BP.13.R.165</i> | SHEET NO. <i>UC-5</i> |
| DESIGNED BY: <i>DK</i> | 11/9/2021 |
| DRAWN BY: <i>CS</i> | |
| CHECKED BY: <i>MM</i> | |
| APPROVED BY: | |
| REVISED: | |
| NORTH CAROLINA DEPARTMENT OF TRANSPORTATION | |
| UTILITIES ENGINEERING SECTION PHONE: (919) 707-6690 FAX: (919) 250-4151 | |
| Engineers • Planners • Scientists • Construction Managers 4504 Falls of Neuse Road, Suite 400 Raleigh, NC 27609 Phone (919) 783-9214 • Fax (919) 783-9266 License No. C-764 | |

UTILITY CONSTRUCTION

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

-WL-2-



5/9/06

COMPUTED BY: T. KRAUSS DATE: 9/15/21
CHECKED BY: R. ALLEN DATE: 9/16/21

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

| | |
|----------------------------|------------------|
| PROJ. REFERENCE NO. | SHEET NO. |
| 17BP.13.R.165 | X-0 |

BRIDGE 110155

Approximate quantities only. Unclassified excavation, fine grading, clearing and grubbing, and removal of existing pavement will be paid for at the contract lump sum price for "Grading".

CROSS-SECTION SUMMARY

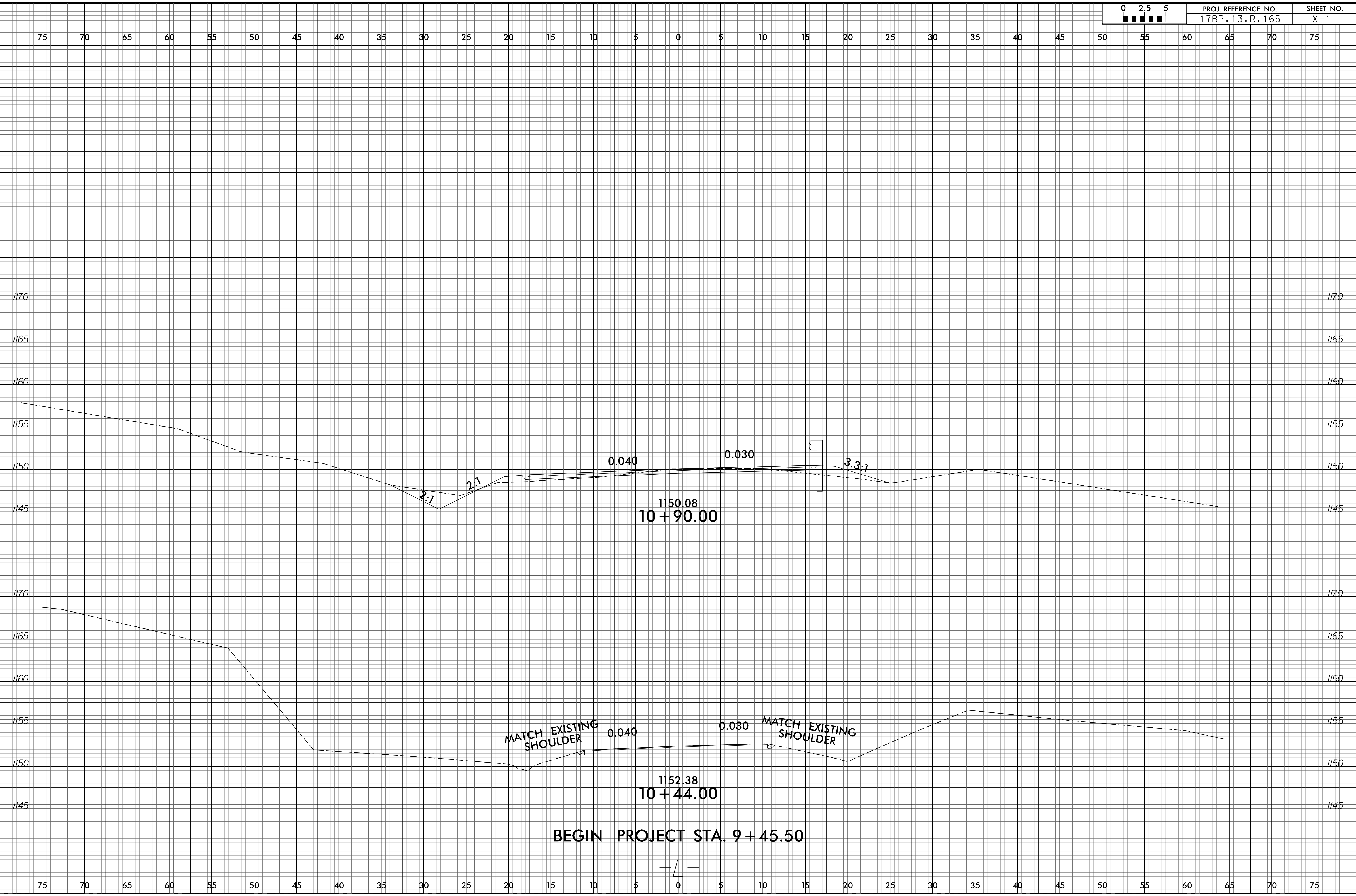
NOTE: EMBANKMENT COLUMN DOES NOT INCLUDE BACKFILL FOR UNDERCUT

| Station | Uncl. Exc. | Embt | Station | Uncl. Exc. | Embt |
|----------|------------|-----------|----------|------------|-----------|
| L | (cu. yd.) | (cu. yd.) | Y | (cu. yd.) | (cu. yd.) |
| 10+44.00 | 0 | 0 | 10+11.00 | 0 | 0 |
| 10+90.00 | 14 | 9 | 10+25.00 | 5 | 4 |
| 11+00.00 | 4 | 4 | 10+43.00 | 6 | 5 |
| 11+25.00 | 6 | 12 | | | |
| 11+50.00 | 6 | 19 | | | |
| 11+75.00 | 11 | 43 | | | |
| 12+00.00 | 8 | 263 | | | |
| 12+25.00 | 0 | 683 | | | |
| 12+50.00 | 0 | 686 | | | |
| 12+75.00 | 14 | 306 | | | |
| 13+00.00 | 27 | 115 | | | |
| 13+25.00 | 21 | 93 | | | |
| 13+39.50 | 9 | 45 | | | |
| 13+65.00 | 9 | 34 | | | |
| 13+90.00 | 5 | 4 | | | |
| 14+15.00 | 3 | 1 | | | |

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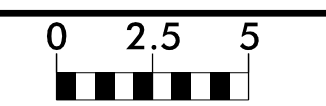
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| | 17BP.13.R.165 | X-1 |

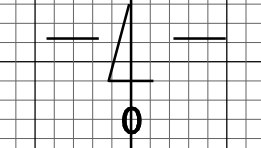
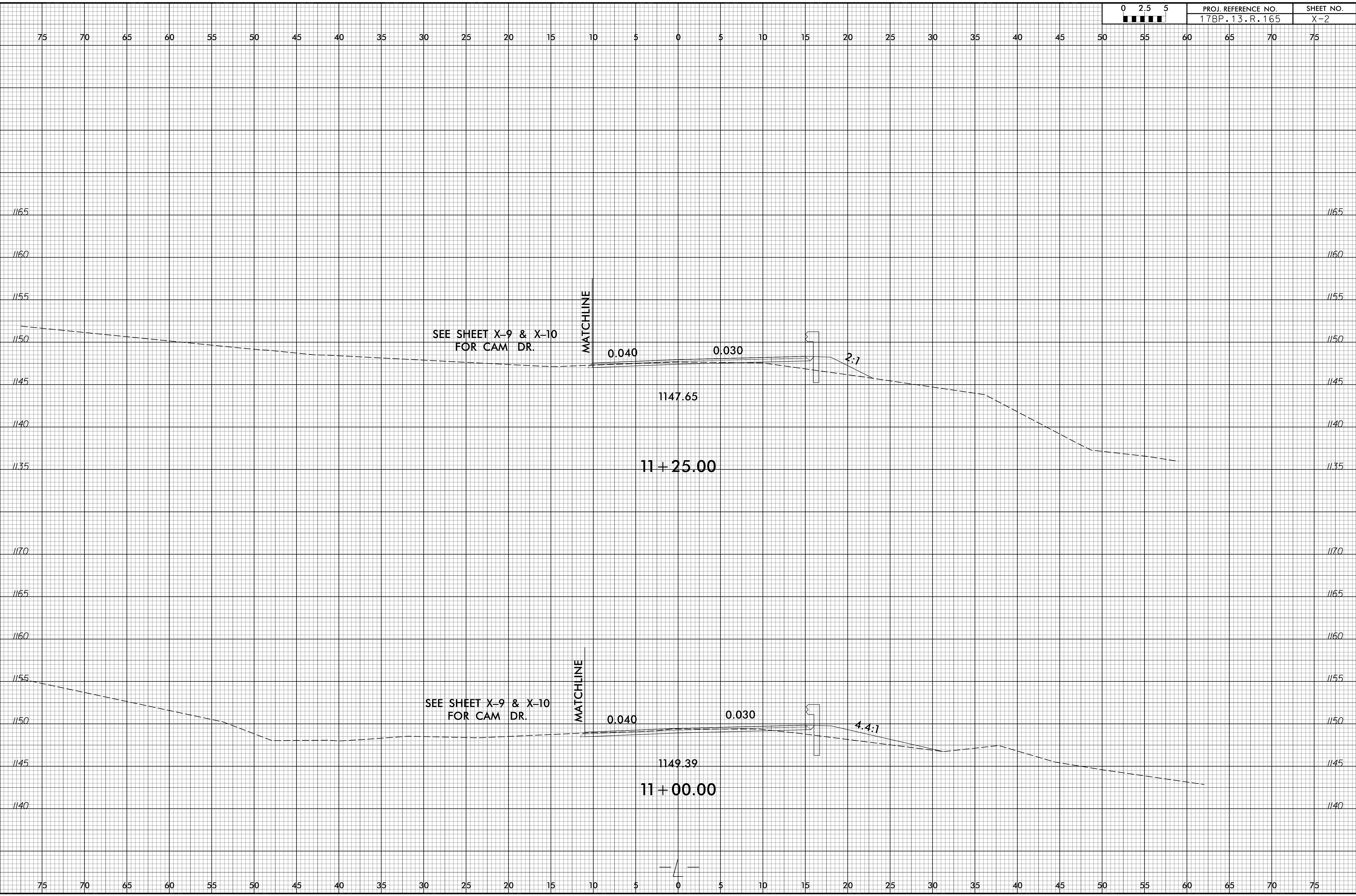


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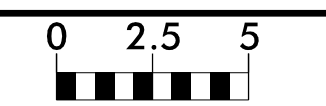
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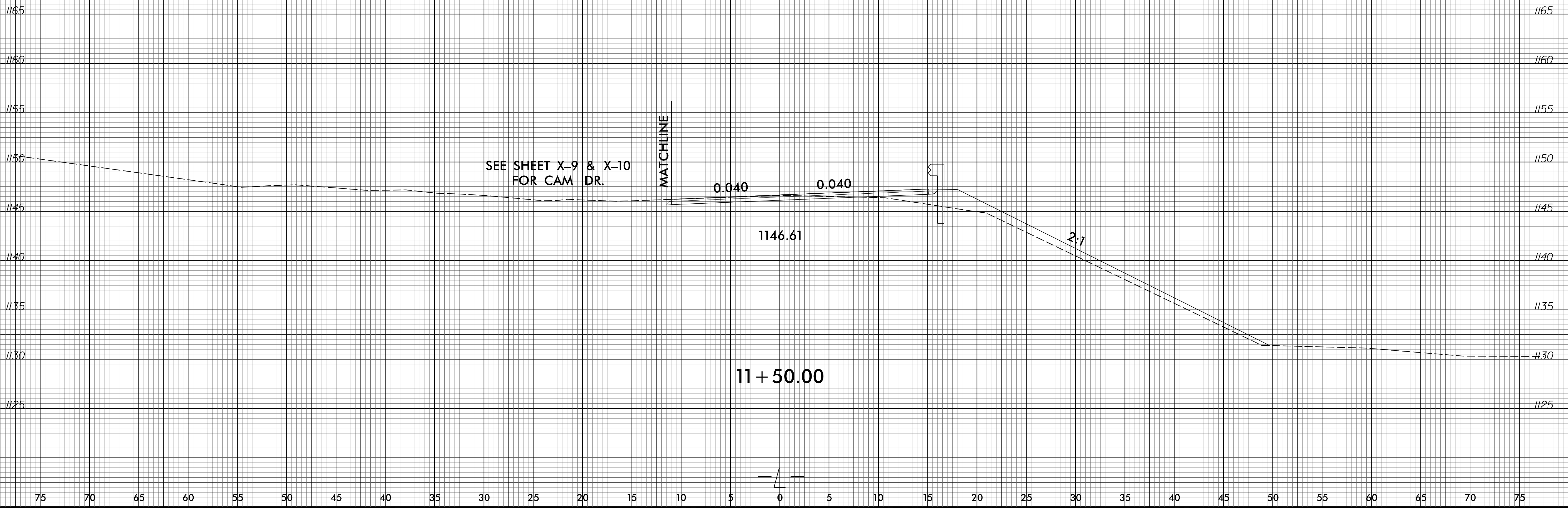
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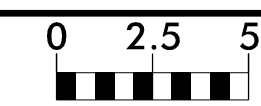
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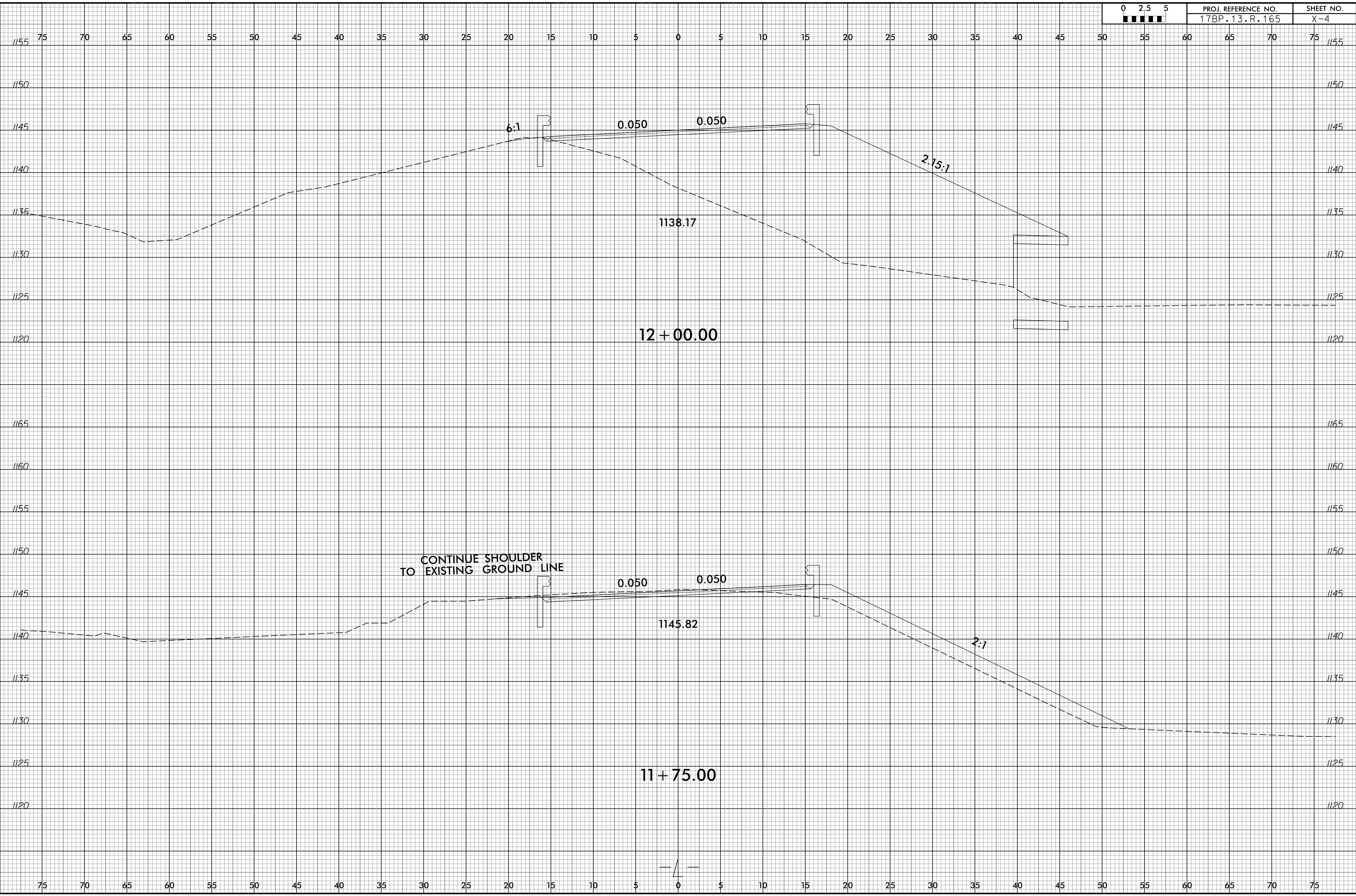


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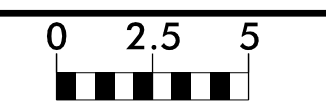


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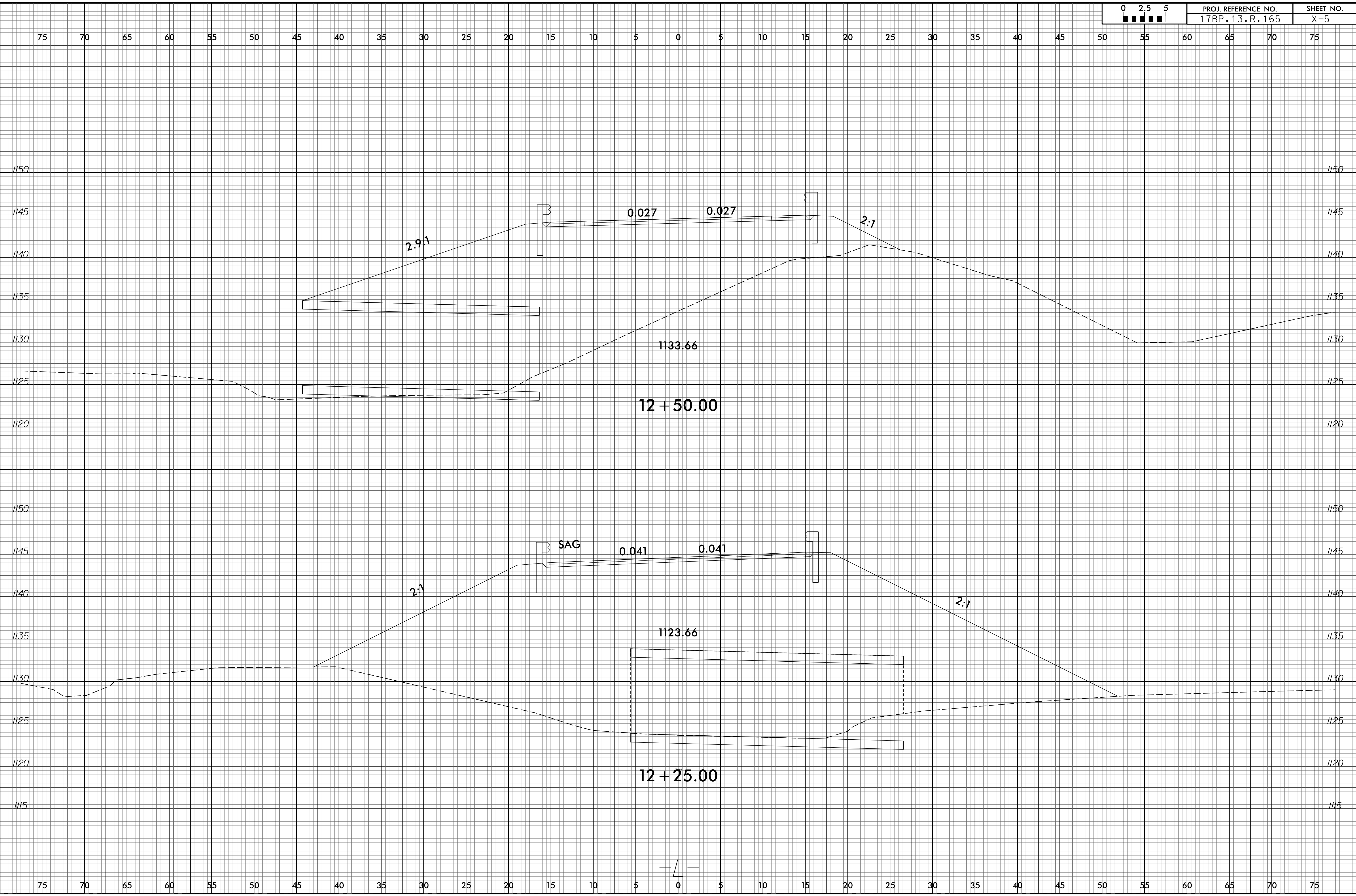


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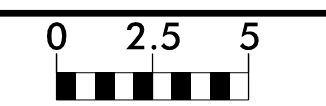
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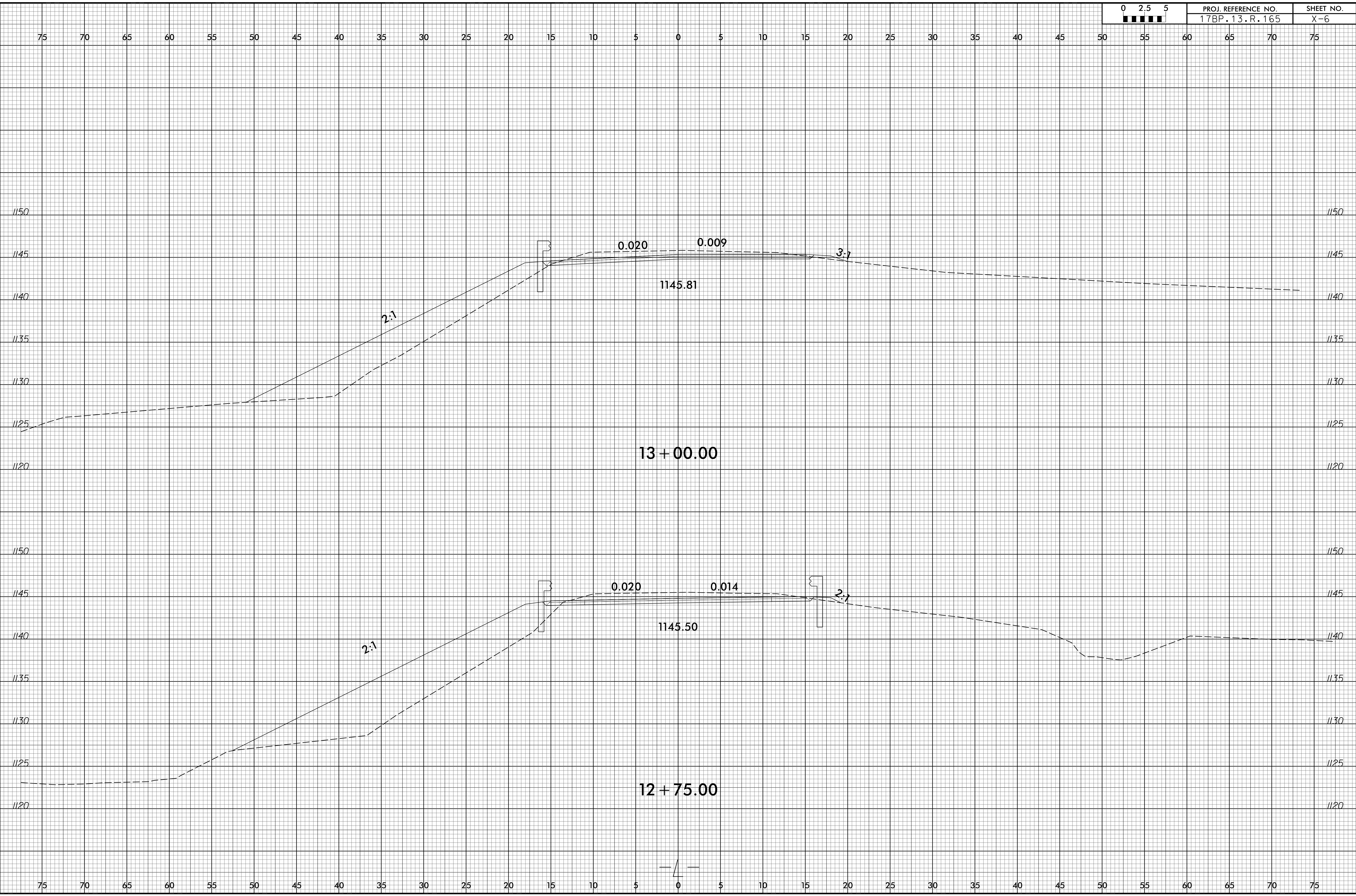
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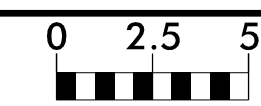
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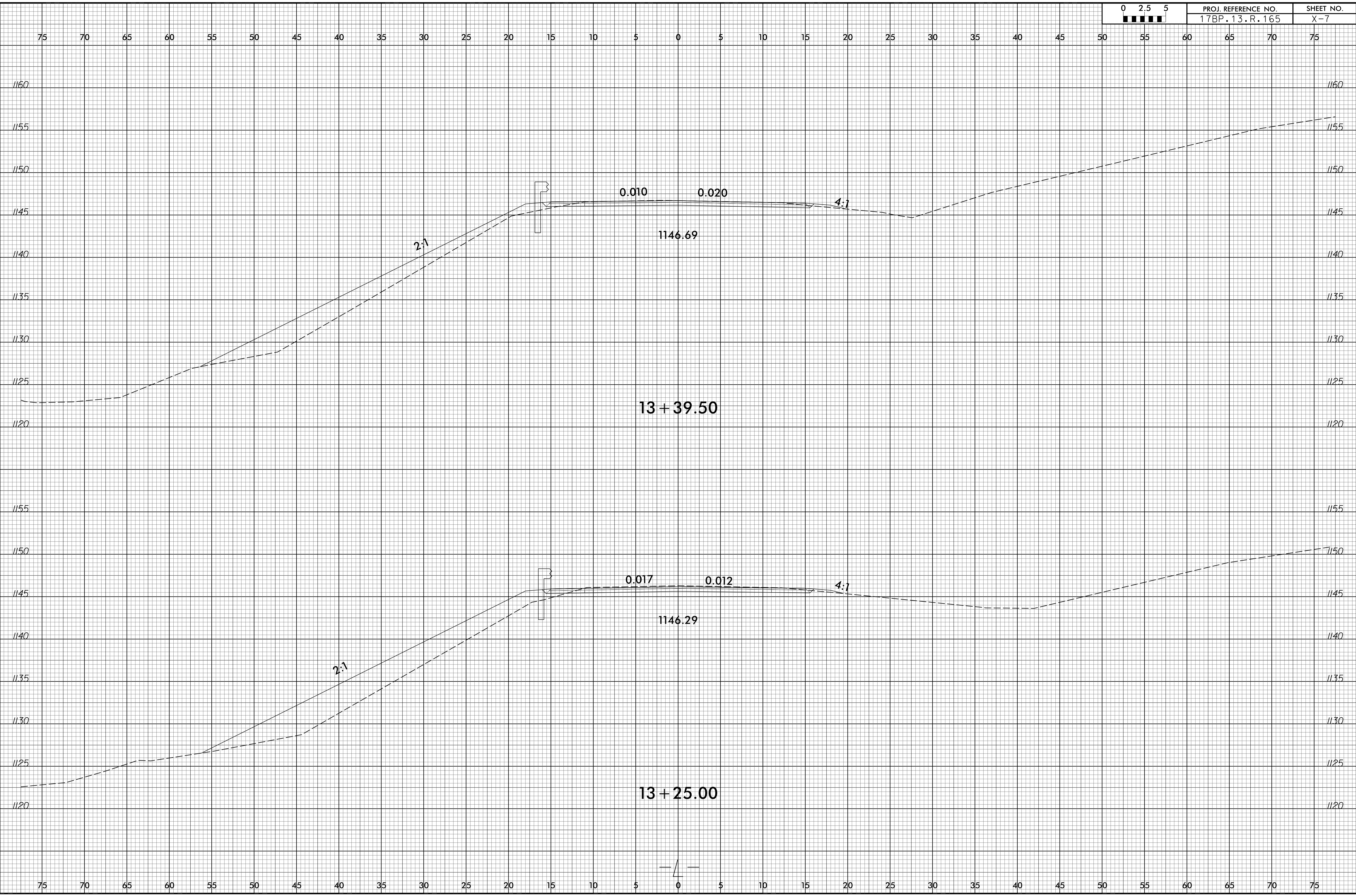
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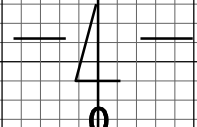
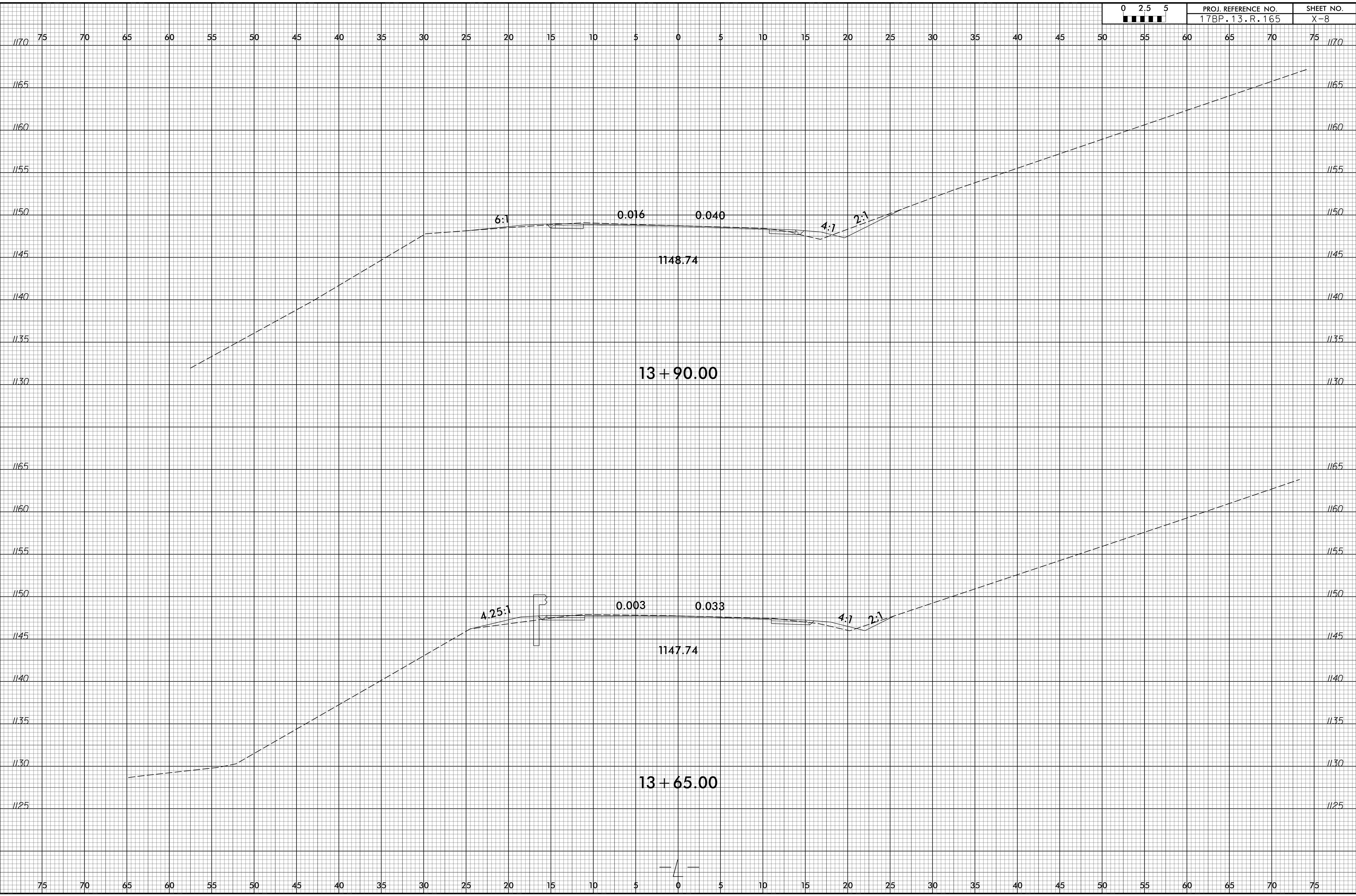


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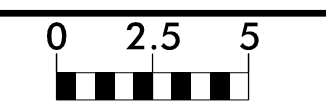


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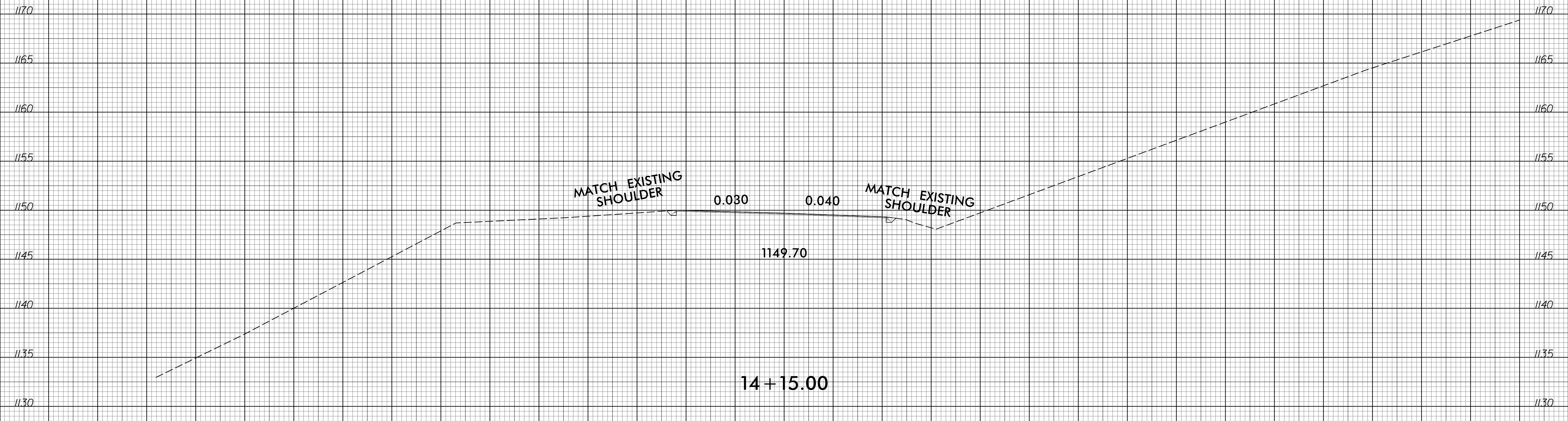
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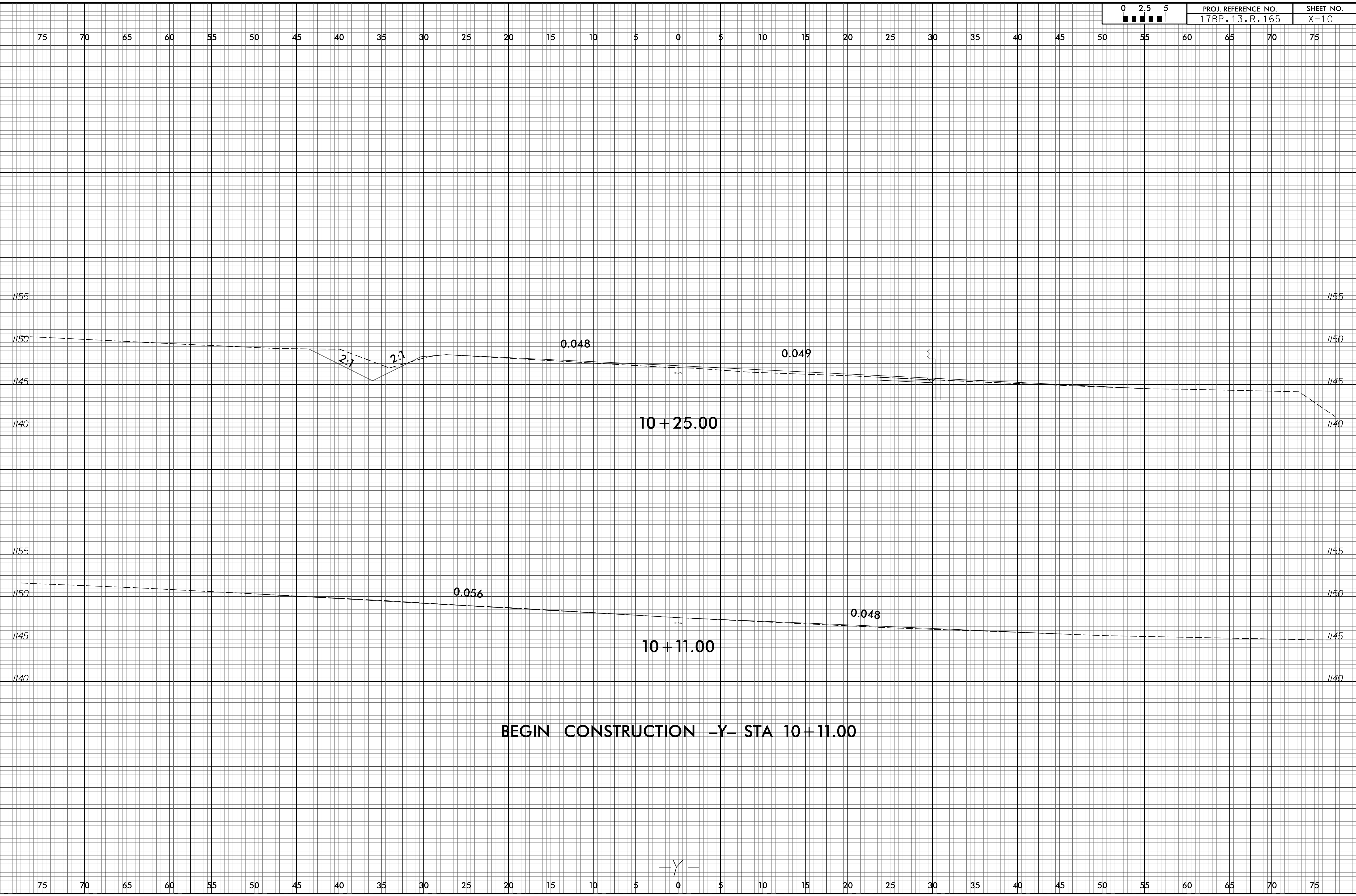


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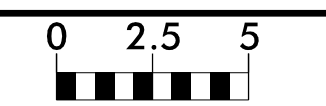
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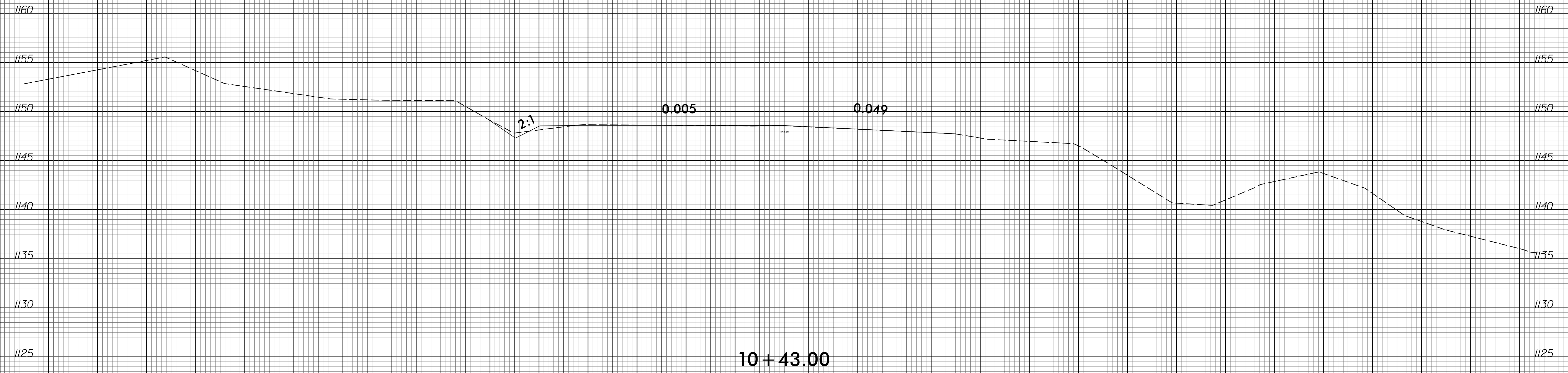
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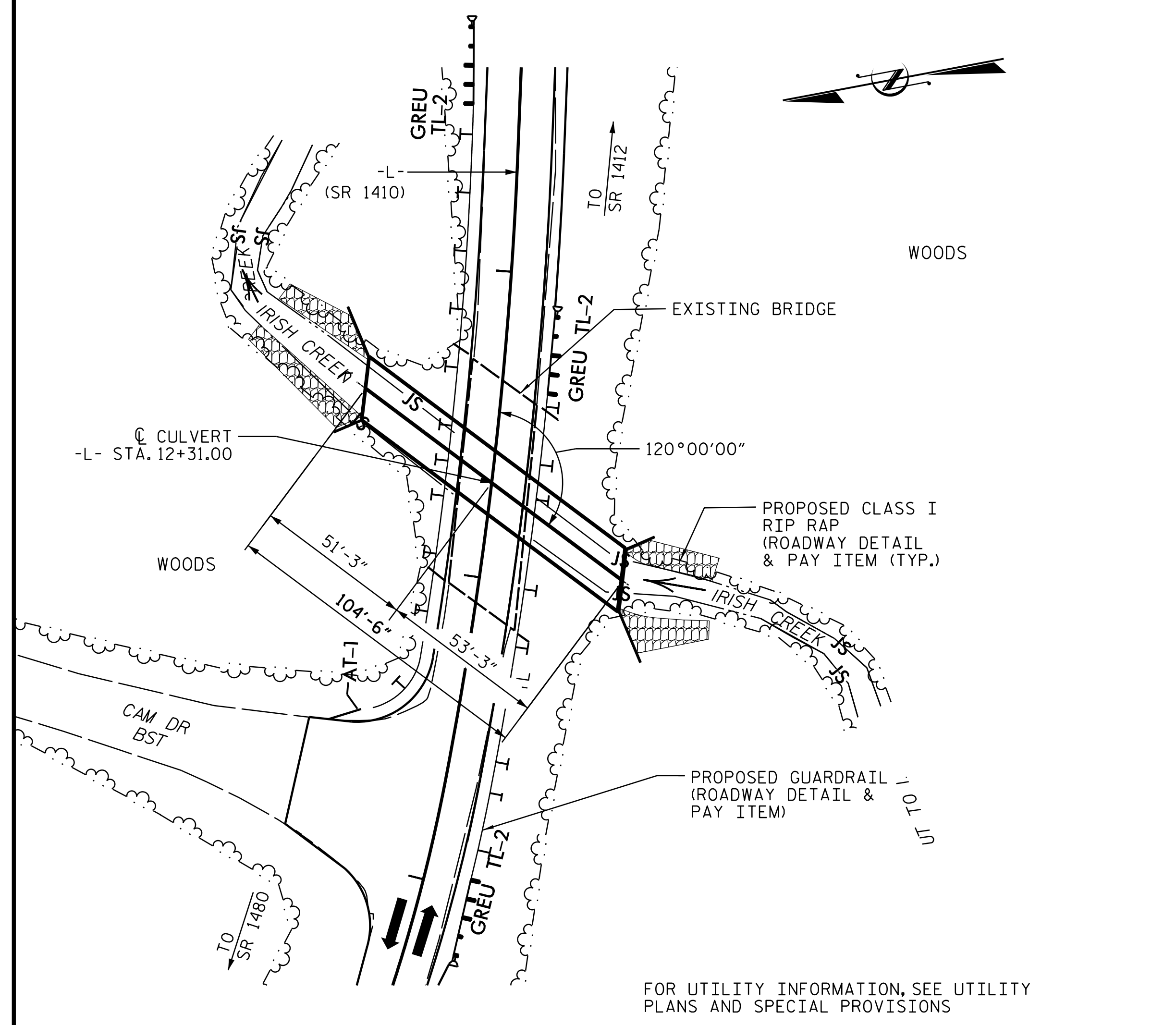


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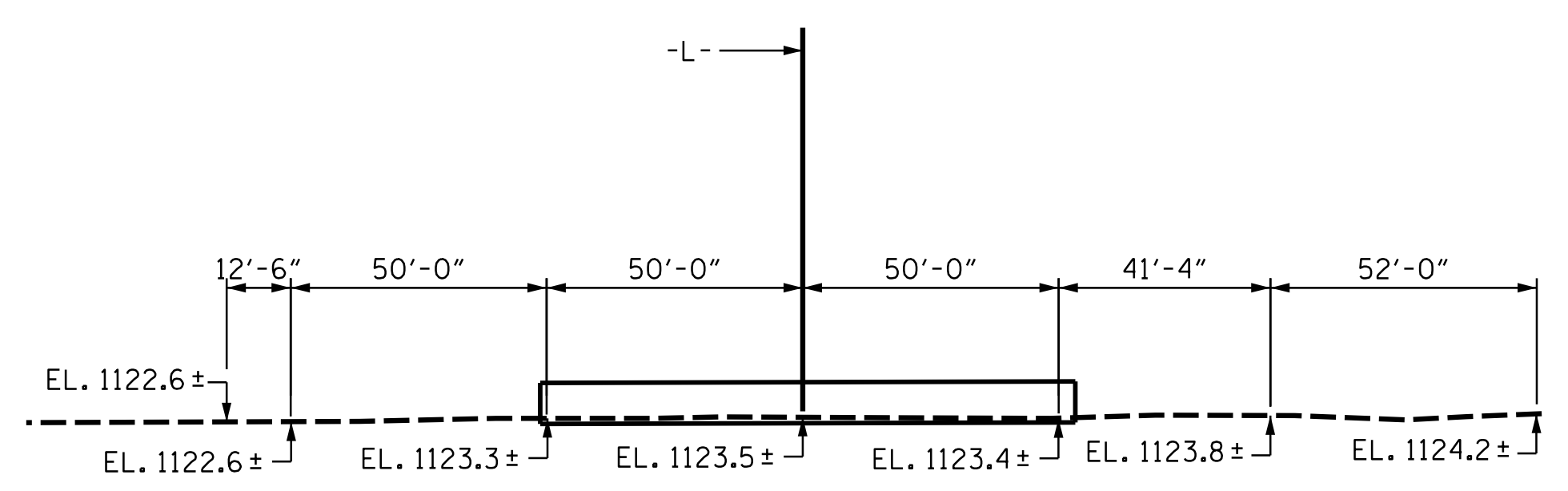
-Y-

BENCH MARK: BM #2 RR SPIKE IN 15" SYCAMORE, STA 14+68.8 -L-, 47.5' LT EL. 1153.13 NAVD 88



LOCATION SKETCH

GRADE POINT ELEVATION AT STATION 12+31.00 -L- = 1144.58
 BED ELEVATION AT STATION 12+31.00 -L- = 1122.35
 ROADWAY SLOPES 2:1

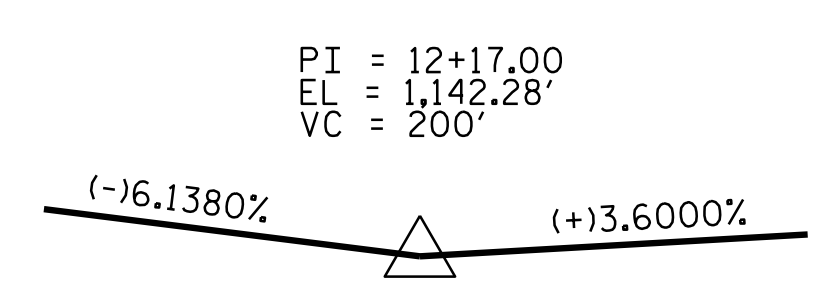


PROFILE ALONG CULVERT

| HYDRAULIC DATA | | |
|---------------------|----------|-----|
| DESIGN DISCHARGE | = 650 | CFS |
| DESIGN FREQUENCY | = 25 | YRS |
| DESIGN HW ELEVATION | = 1129.1 | FT |
| DRAINAGE AREA | = 802 | AC |
| BASE DISCHARGE | = 900 | CFS |
| BASE FREQUENCY | = 100 | YRS |
| BASE HW ELEVATION | = 1130.2 | FT |

| OVERTOPPING FLOOD DATA | | |
|------------------------|----------|-----|
| OVERTOPPING DISCHARGE | >1300 | CFS |
| OVERTOPPING FREQUENCY | >500 | YRS |
| OVERTOPPING ELEVATION | = 1144.9 | FT |

| TOTAL STRUCTURE QUANTITIES | | |
|---|-------|------------------|
| CLASS A CONCRETE | | |
| BARREL @ | 2.045 | CY/FT 213.7 C.Y. |
| WING ETC. | | 29.6 C.Y. |
| TOTAL | | 243.3 C.Y. |
| REINFORCING STEEL | | |
| BARREL | 26629 | LBS. |
| WINGS ETC. | 1661 | LBS. |
| TOTAL | 28290 | LBS. |
| FOUNDATION CONDITIONING MATERIAL | | |
| TOTAL | 162 | TONS |
| CULVERT EXCAVATION, | | LUMP SUM |
| REMOVAL OF EXISTING, STRUCTURE AT STA. 12+31.00 -L- | | LUMP SUM |
| ASBESTOS ASSESSMENT, | | LUMP SUM |



VERTICAL CURVE DATA

FOR CULVERT EXCAVATION, SEE SECTION 414 OF THE STANDARD SPECIFICATIONS.

THE REINFORCED CONCRETE BOX CULVERT SHALL BE PLACED ON THE STANDARD 1.0 FOOT BLANKET OF FOUNDATION CONDITIONING MATERIAL SEE SECTION 414 OF THE STANDARD SPECIFICATIONS.

UNDERCUT SOFT/VERY LOOSE SOILS THAT MAY BE ENCOUNTERED BENEATH THE BOTTOM OF THE FOUNDATIONS. BACKFILL UNDERCUT AREAS WITH FOUNDATION CONDITIONING MATERIAL.

NOTES

ASSUMED LIVE LOAD -----HL-93 OR ALTERNATE LOADING.

DESIGN FILL-----15.1' MAX., 13.7' MIN.

FOR OTHER DESIGN DATA AND NOTES SEE STANDARD NOTE SHEET.

3" Ø WEEP HOLES INDICATED TO BE IN ACCORDANCE WITH THE SPECIFICATIONS.

CONCRETE IN CULVERTS TO BE POURED IN THE FOLLOWING ORDER:

1. WING FOOTINGS AND FLOOR SLAB INCLUDING 4" OF ALL VERTICAL WALLS.
 2. THE REMAINING PORTIONS OF THE WALLS AND WINGS FULL HEIGHT FOLLOWED BY ROOF SLAB AND HEADWALLS.
- THE RESIDENT ENGINEER SHALL CHECK THE LENGTH OF CULVERT BEFORE STAKING IT OUT TO MAKE CERTAIN THAT IT WILL PROPERLY TAKE CARE OF THE FILL.

DIMENSIONS FOR WING LAYOUT AS WELL AS ADDITIONAL REINFORCING STEEL EMBEDDED IN BARREL ARE SHOWN ON WING SHEET.

STEEL IN THE BOTTOM SLAB MAY BE SPLICED AT THE PERMITTED CONSTRUCTION JOINT AT THE CONTRACTOR'S OPTION. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

TRANSVERSE CONSTRUCTION JOINTS SHALL BE USED IN THE BARREL, SPACED TO LIMIT THE POURS TO A MAXIMUM OF 70 FT. LOCATION OF JOINTS SHALL BE SUBJECT TO APPROVAL OF THE ENGINEER.

AT THE CONTRACTOR'S OPTION, HE MAY SPLICE THE VERTICAL REINFORCING STEEL IN THE INTERIOR FACE OF EXTERIOR WALL ABOVE LOWER WALL CONSTRUCTION JOINT. THE SPLICE LENGTH SHALL BE AS PROVIDED IN THE SPLICE LENGTH CHART SHOWN ON THE PLANS. EXTRA WEIGHT OF STEEL DUE TO THE SPLICES SHALL BE PAID FOR BY THE CONTRACTOR.

AT THE CONTRACTOR'S OPTION HE MAY SUBMIT, TO THE ENGINEER FOR APPROVAL, DESIGN AND DETAIL DRAWINGS FOR A PRECAST REINFORCED CONCRETE BOX CULVERT IN LIEU OF THE CAST-IN-PLACE CULVERT SHOWN ON THE PLANS. THE DESIGN SHALL PROVIDE THE SAME SIZE AND NUMBER OF BARRELS AS USED ON THE CAST-IN-PLACE DESIGN. FOR OPTIONAL PRECAST REINFORCED CONCRETE BOX CULVERT, SEE SPECIAL PROVISIONS.

FOR CULVERT DIVERSION DETAILS AND PAY ITEM, SEE EROSION CONTROL PLANS.

THE EXISTING STRUCTURE CONSISTING OF 1 @ 25'-4", 1 @ 24'-2", 1 @ 25'-4" STEEL I-BEAMS WITH 24'-2" CLEAR ROADWAY STEEL PLANK FLOOR ON TIMBER ABUTMENTS AND TIMBER BENTS ON CONCRETE SILLS AND LOCATED AT THE PROPOSED STRUCTURE SHALL BE REMOVED. THE EXISTING BRIDGE IS PRESENTLY NOT POSTED FOR LOAD LIMIT. SHOULD THE STRUCTURAL INTEGRITY OF THE BRIDGE DETERIORATE DURING CONSTRUCTION OF THE PROPOSED STRUCTURE, A LOAD LIMIT MAY BE POSTED AND MAY BE REDUCED AS FOUND NECESSARY DURING THE LIFE OF THE PROJECT.

FOR SUBMITTAL OF WORKING DRAWINGS, SEE SPECIAL PROVISIONS.

FOR GROUT FOR STRUCTURES, SEE SPECIAL PROVISIONS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED IN A MANNER THAT PREVENTS DEBRIS FROM FALLING INTO THE WATER. THE CONTRACTOR SHALL SUBMIT DEMOLITION PLANS FOR REVIEW AND REMOVE THE BRIDGE IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

INASMUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 12+31 -L-."

FOR ASBESTOS ASSESSMENT FOR BRIDGE DEMOLITION AND RENOVATION ACTIVITIES, SEE SPECIAL PROVISIONS.

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR FALSEWORK AND FORMWORK, SEE SPECIAL PROVISIONS.

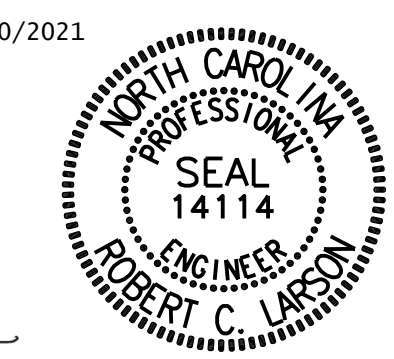
PROJECT NO. 17BP.13.R.165
BURKE COUNTY
 STATION: 12+31.00 -L-

REPLACES BRIDGE NO. 110155

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

DOUBLE 8 FT. X 8 FT.
 CONCRETE BOX CULVERT
 120° SKEW

12/10/2021



DocuSigned by:
 R. Larson
 DEB3CE4580049B

KCI JOB No: 221601946.09E

| | |
|--|--------------------|
| DESIGN ENGINEER OF RECORD: R. C. LARSON | DATE : 12/21 |
| DRAWN BY : A. K. ALLANKI | DATE : 04/10/19 |
| CHECKED BY : R. C. LARSON | DATE : 02/25/20 |

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ENGINEERS & PLANNERS & SCIENTISTS & CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764

KCI Associates
 of North Carolina, P.A.
 4505 Falls of House Road, Suite 400 Raleigh, NC 27609-6270 Phone (919) 785-5204

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

C-1
 TOTAL SHEETS 5

LOAD AND RESISTANCE FACTOR RATING (LRFR) SUMMARY FOR REINFORCED CONCRETE BOX CULVERTS

| LEVEL | VEHICLE | WEIGHT (W) (TONS) | CONTROLLING LOAD RATING # | MINIMUM RATING FACTORS (RF) | TONS = W x RF | STRENGTH I LIMIT STATE | | | | | | | | COMMENT NUMBER | | |
|--------------------------|--------------------------------------|----------------------|---------------------------------|-----------------------------------|---------------|---|---------------|----------|--------------|--|---------------|----------|--------------|----------------|--|--|
| | | | | | | MOMENT | | | | SHEAR | | | | | | |
| | | | | | | LIVE-LOAD FACTORS (γ _{LL}) | RATING FACTOR | BOX NO. | ELEMENT TYPE | DISTANCE FROM LEFT END OF ELEMENT (ft) | RATING FACTOR | BOX NO. | ELEMENT TYPE | | DISTANCE FROM LEFT END OF ELEMENT (ft) | |
| DESIGN LOAD RATING | HL-93 (INVENTORY) | N/A | ① | 1.42 | -- | 1.75 | 1.42 | 1 | TOP SLAB | 4.0 | 1.85 | 1 | TOP SLAB | 8.0 | | |
| | HL-93 (OPERATING) | N/A | | 1.84 | -- | 1.35 | 1.84 | 1 | TOP SLAB | 4.0 | 2.40 | 1 | TOP SLAB | 8.0 | | |
| | HS-20 (INVENTORY) | 36.000 | ② | 1.71 | 61.5 | 1.75 | 1.71 | 1 | TOP SLAB | 4.0 | 2.24 | 1 | TOP SLAB | 8.0 | | |
| | HS-20 (OPERATING) | 36.000 | | 2.21 | 79.5 | 1.35 | 2.21 | 1 | TOP SLAB | 4.0 | 2.91 | 1 | TOP SLAB | 8.0 | | |
| LEGAL LOAD RATING | SINGLE VEHICLE (SV) | SNSH | 13.500 | | 6.96 | 93.9 | 1.40 | 6.96 | 1 | TOP SLAB | 4.0 | 8.94 | 1 | TOP SLAB | 8.0 | |
| | | SNGARBS2 | 20.000 | | 4.89 | 97.8 | 1.40 | 4.89 | 1 | TOP SLAB | 4.0 | 6.34 | 1 | TOP SLAB | 8.0 | |
| | | SNAGRIS2 | 22.000 | | 4.51 | 99.2 | 1.40 | 4.51 | 1 | TOP SLAB | 4.0 | 5.87 | 1 | TOP SLAB | 8.0 | |
| | | SNCOTTS3 | 27.250 | | 3.36 | 91.5 | 1.40 | 3.36 | 1 | TOP SLAB | 4.0 | 4.15 | 1 | TOP SLAB | 8.0 | |
| | | SNAGGRS4 | 34.925 | | 3.04 | 106.1 | 1.40 | 3.04 | 1 | TOP SLAB | 4.0 | 3.79 | 1 | TOP SLAB | 8.0 | |
| | | SNS5A | 35.550 | | 2.95 | 104.8 | 1.40 | 2.95 | 1 | TOP SLAB | 4.0 | 3.68 | 1 | TOP SLAB | 8.0 | |
| | | SNS6A | 39.950 | | 2.72 | 108.6 | 1.40 | 2.72 | 1 | TOP SLAB | 4.0 | 3.47 | 1 | TOP SLAB | 8.0 | |
| | | SNS7B | 42.000 | | 2.69 | 112.9 | 1.40 | 2.69 | 1 | TOP SLAB | 4.0 | 3.33 | 1 | TOP SLAB | 8.0 | |
| | TRUCK TRACTOR SEMI-TRAILER (TTST) | TNAGRIT3 | 33.000 | | 3.89 | 128.3 | 1.40 | 3.89 | 1 | TOP SLAB | 4.0 | 4.75 | 1 | TOP SLAB | 8.0 | |
| | | TNT4A | 33.075 | | 3.36 | 111.1 | 1.40 | 3.36 | 1 | TOP SLAB | 4.0 | 4.17 | 1 | TOP SLAB | 8.0 | |
| | | TNT6A | 41.600 | | 3.17 | 131.8 | 1.40 | 3.17 | 1 | TOP SLAB | 4.0 | 3.88 | 1 | TOP SLAB | 8.0 | |
| | | TNT7A | 42.000 | | 3.19 | 133.9 | 1.40 | 3.19 | 1 | TOP SLAB | 4.0 | 3.90 | 1 | TOP SLAB | 8.0 | |
| | | TNT7B | 42.000 | | 2.98 | 125.1 | 1.40 | 2.98 | 1 | TOP SLAB | 4.0 | 3.76 | 1 | TOP SLAB | 8.0 | |
| | | TNAGRIT4 | 43.000 | | 2.85 | 122.5 | 1.40 | 2.85 | 1 | TOP SLAB | 4.0 | 3.54 | 1 | TOP SLAB | 8.0 | |
| TNAGT5A | 45.000 | | 2.85 | 128.2 | 1.40 | 2.85 | 1 | TOP SLAB | 4.0 | 3.48 | 1 | TOP SLAB | 8.0 | | | |
| TNAGT5B | 45.000 | | ③ | 2.50 | 112.5 | 1.40 | 2.50 | 1 | TOP SLAB | 4.0 | 3.27 | 1 | TOP SLAB | 8.0 | | |

LOAD FACTORS:

DESIGN LOAD RATING FACTORS

| LOAD TYPE | MAX FACTOR | MIN FACTOR |
|-----------|------------|------------|
| DC | 1.25 | 0.90 |
| DW | 1.50 | 0.65 |
| EV | 1.30 | 0.90 |
| EH | 1.35 | 0.90 |
| ES | 1.35 | 0.90 |
| LS | 1.75 | -- |
| WA | 1.00 | -- |

NOTE:

RATING FACTORS ARE BASED ON THE STRENGTH I LIMIT STATE.

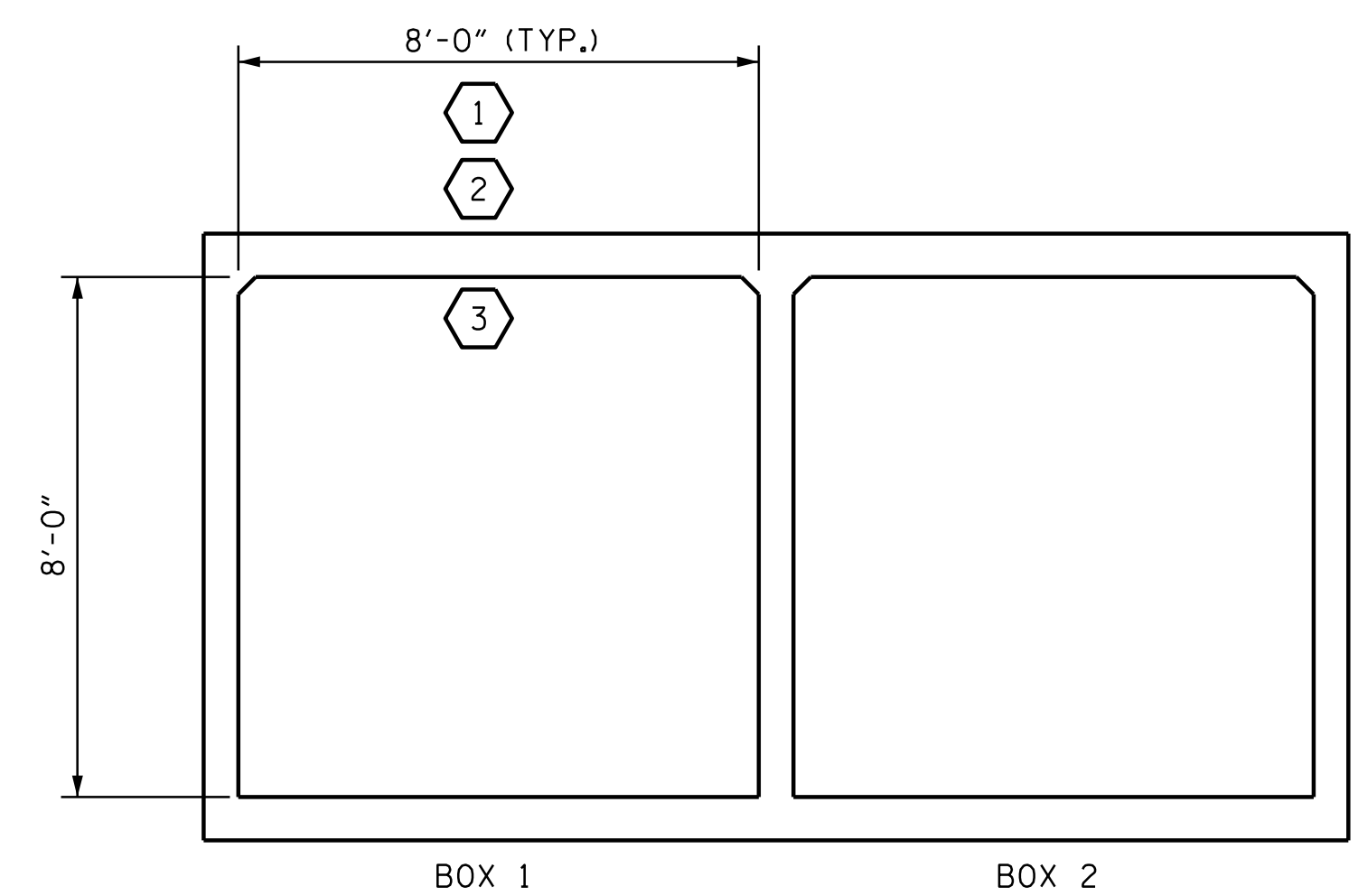
CONTROLLING LOAD RATING

① DESIGN LOAD RATING (HL-93)

② DESIGN LOAD RATING (HS-20)

③ LEGAL LOAD RATING **

** SEE CHART FOR VEHICLE TYPE



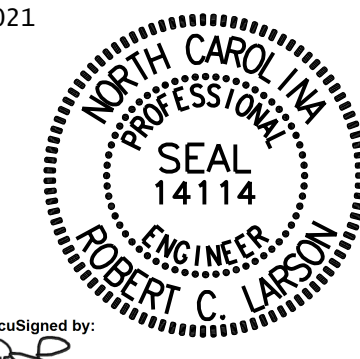
LRFR SUMMARY
(LOOKING DOWNSTREAM)

PROJECT NO. 17BP.13.R.165
BURKE COUNTY
 STATION: 12+31.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH

STANDARD
 LRFR SUMMARY FOR
 REINFORCED CONCRETE
 BOX CULVERTS
 (NON-INTERSTATE TRAFFIC)

12/10/2021



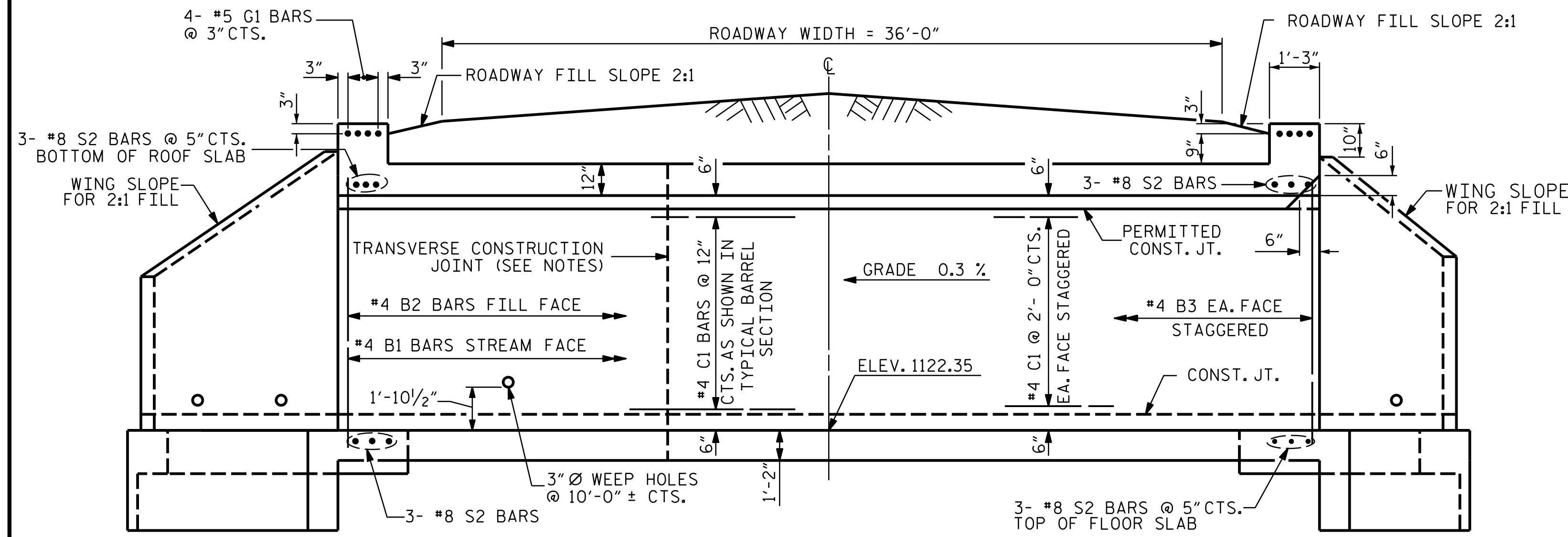
| | | | |
|---|------|----------------|---------|
| DESIGN ENGINEER OF RECORD: R. C. LARSON | | DATE: 12/21 | |
| ASSEMBLED BY: A. K. ALLANKI | | DATE: 03/02/20 | |
| CHECKED BY: GM | | DATE: 03/10/20 | |
| DRAWN BY: WMC | 7/11 | REV. 10/1/11 | MAA/GM |
| CHECKED BY: GM | 7/11 | REV. 12/17 | MAA/THC |

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UNLESS ALL SIGNATURES COMPLETED**

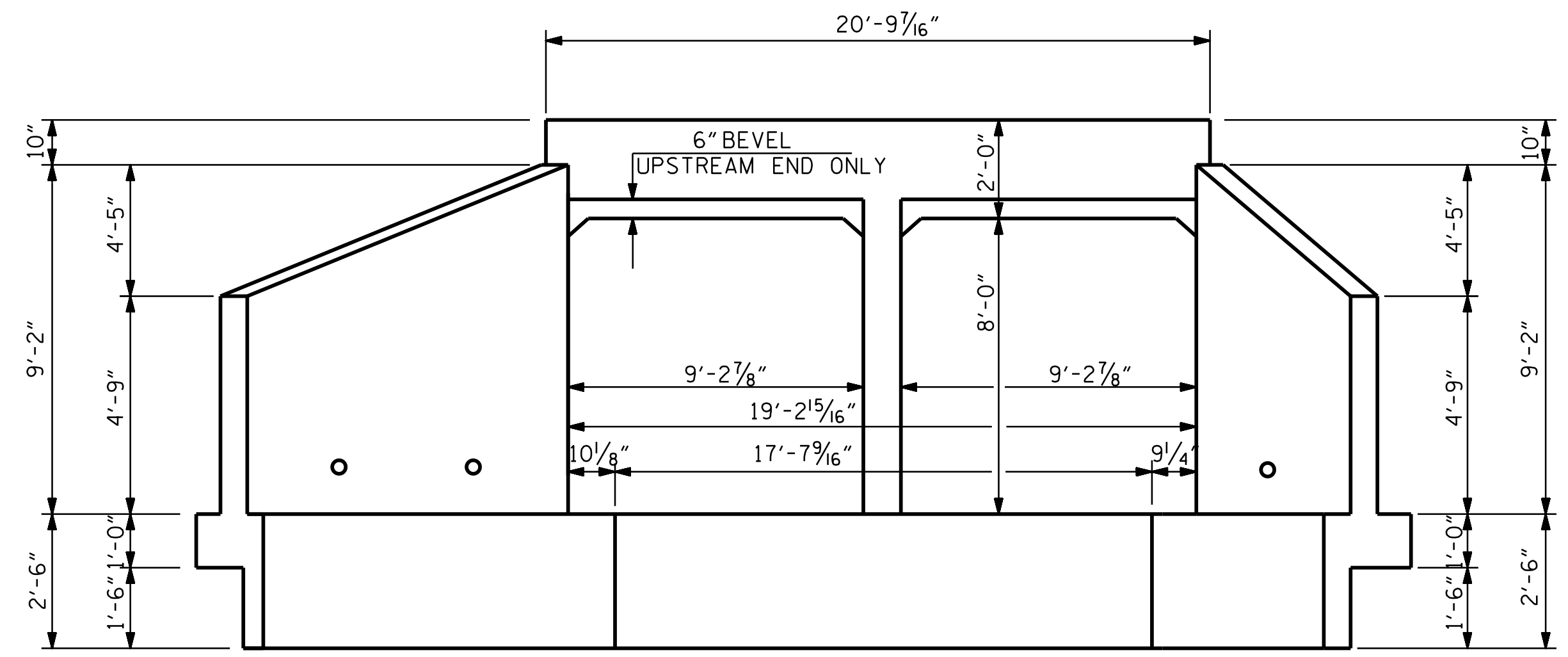
ENGINEERS & PLANNERS & SCIENTISTS & CONSTRUCTION MANAGERS LICENSE NUMBER: C-0764
KCI Associates
 of North Carolina, P.A.
1505 Falls of Neuse Road, Suite 400, Raleigh, NC 27609-1270 Phone 919-783-9241

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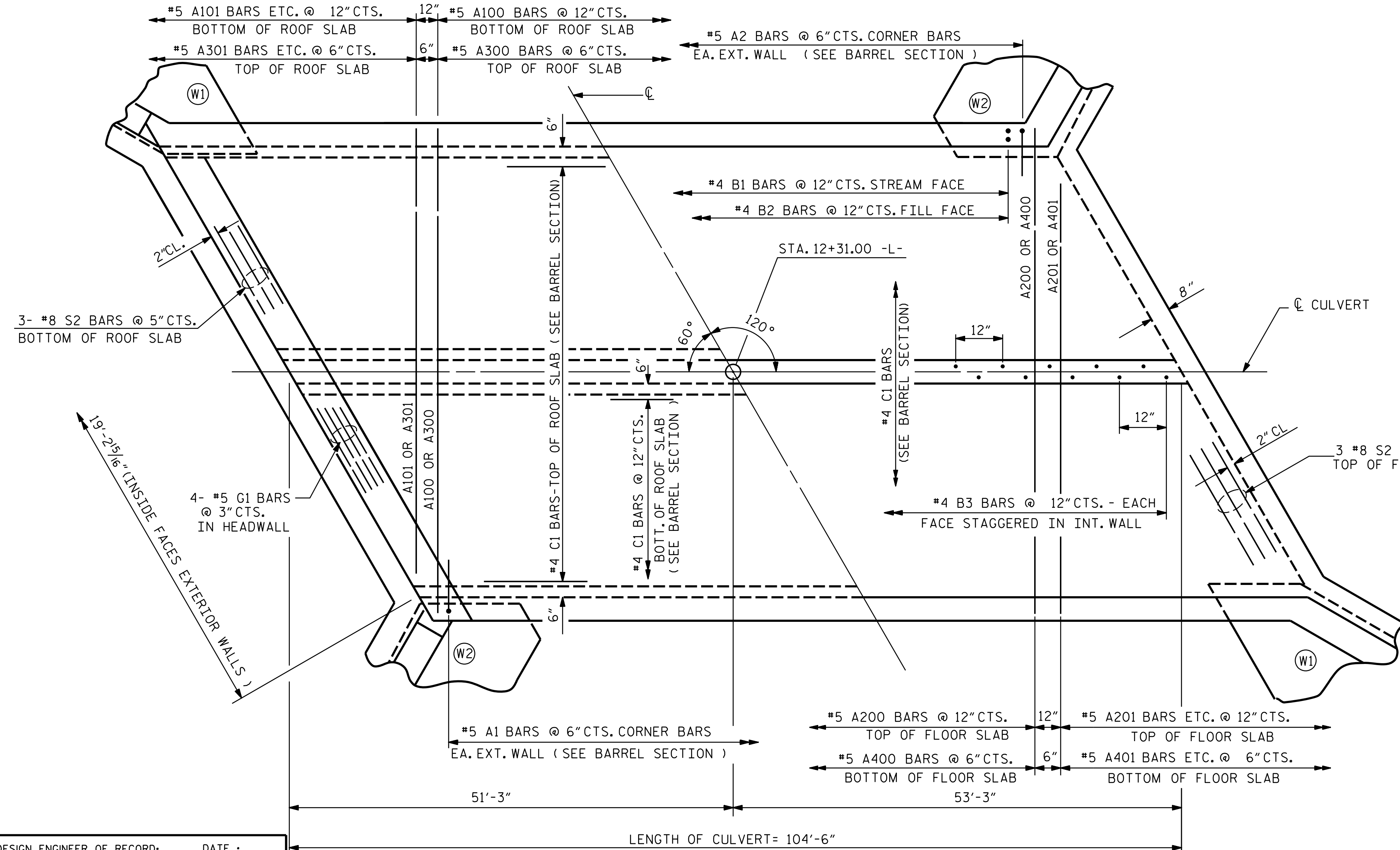
STD. NO. LRFR5



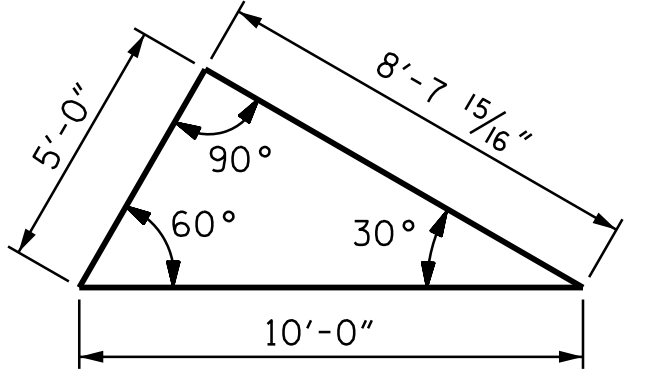
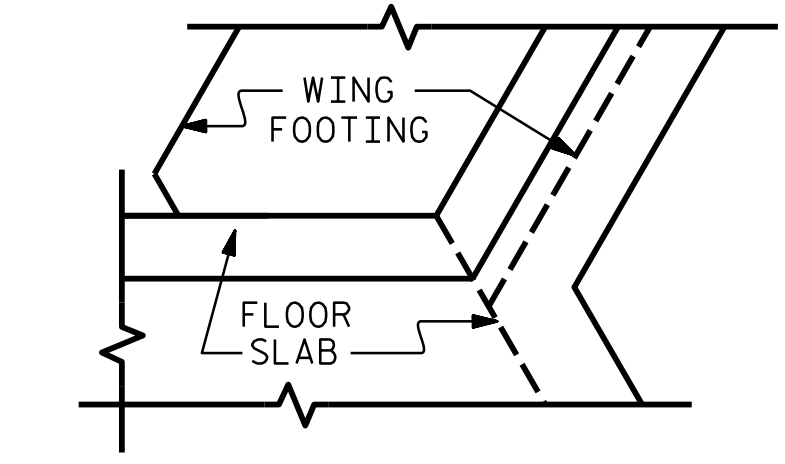
EXTERIOR WALL **INTERIOR WALL**
CULVERT SECTION NORMAL TO ROADWAY



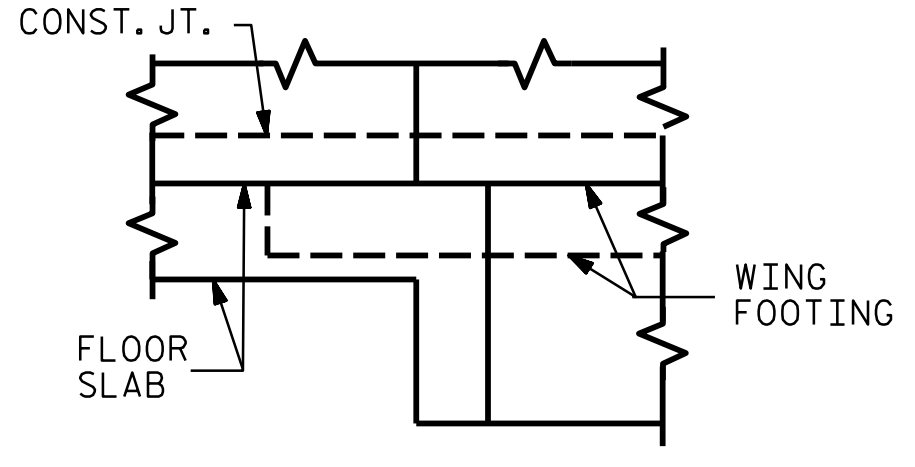
END ELEVATION NORMAL TO SKEW



PART PLAN - ROOF SLAB **PART PLAN - FLOOR SLAB**



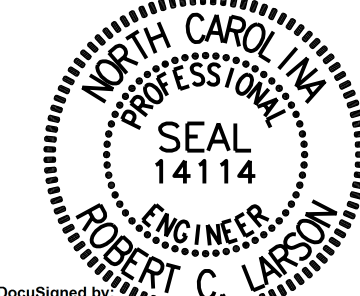
SKEW TRIANGLE



CONNECTION OF WING FOOTING AND FLOOR SLAB WHEN SLAB IS THICKER THAN FOOTING

PROJECT NO. 17BP.13.R.165
BURKE COUNTY
STATION: 12+31.00 -L-

12/10/2021



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
BARREL STANDARD
DOUBLE 8 FT. X 8 FT.
CONCRETE BOX CULVERT
120° SKEW

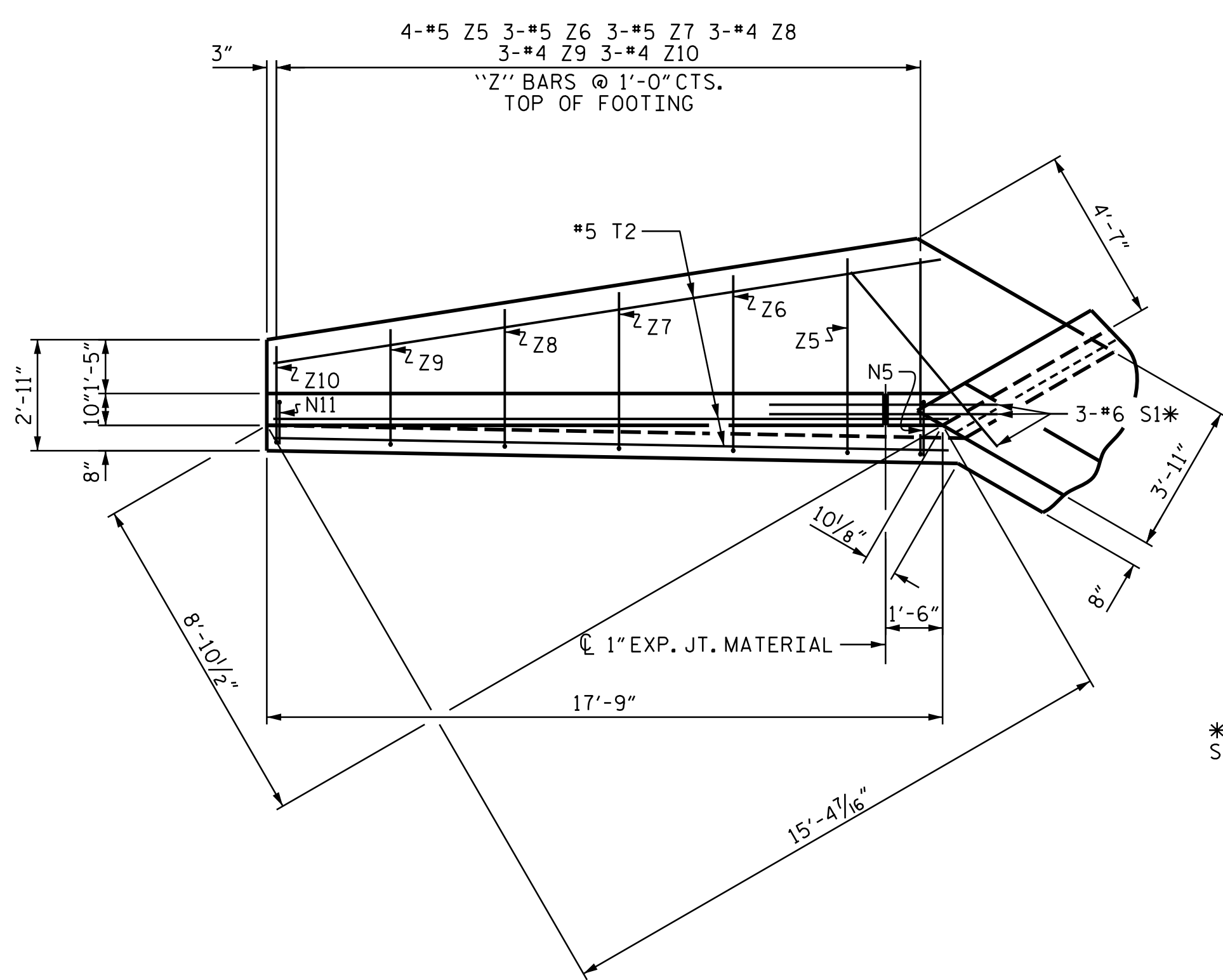
| | |
|--|-------------------|
| DESIGN ENGINEER OF RECORD: R. C. LARSON | DATE: 12/21 |
| ASSEMBLED BY: A. K. ALLANKI | DATE: 04/17/19 |
| CHECKED BY: R. C. LARSON | DATE: 02/27/20 |
| DRAWN BY: SAT 8/30 | REV. 6/19 MAA/THC |
| CHECKED BY: ELR 8/30 | |

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UNLESS ALL SIGNATURES COMPLETED**

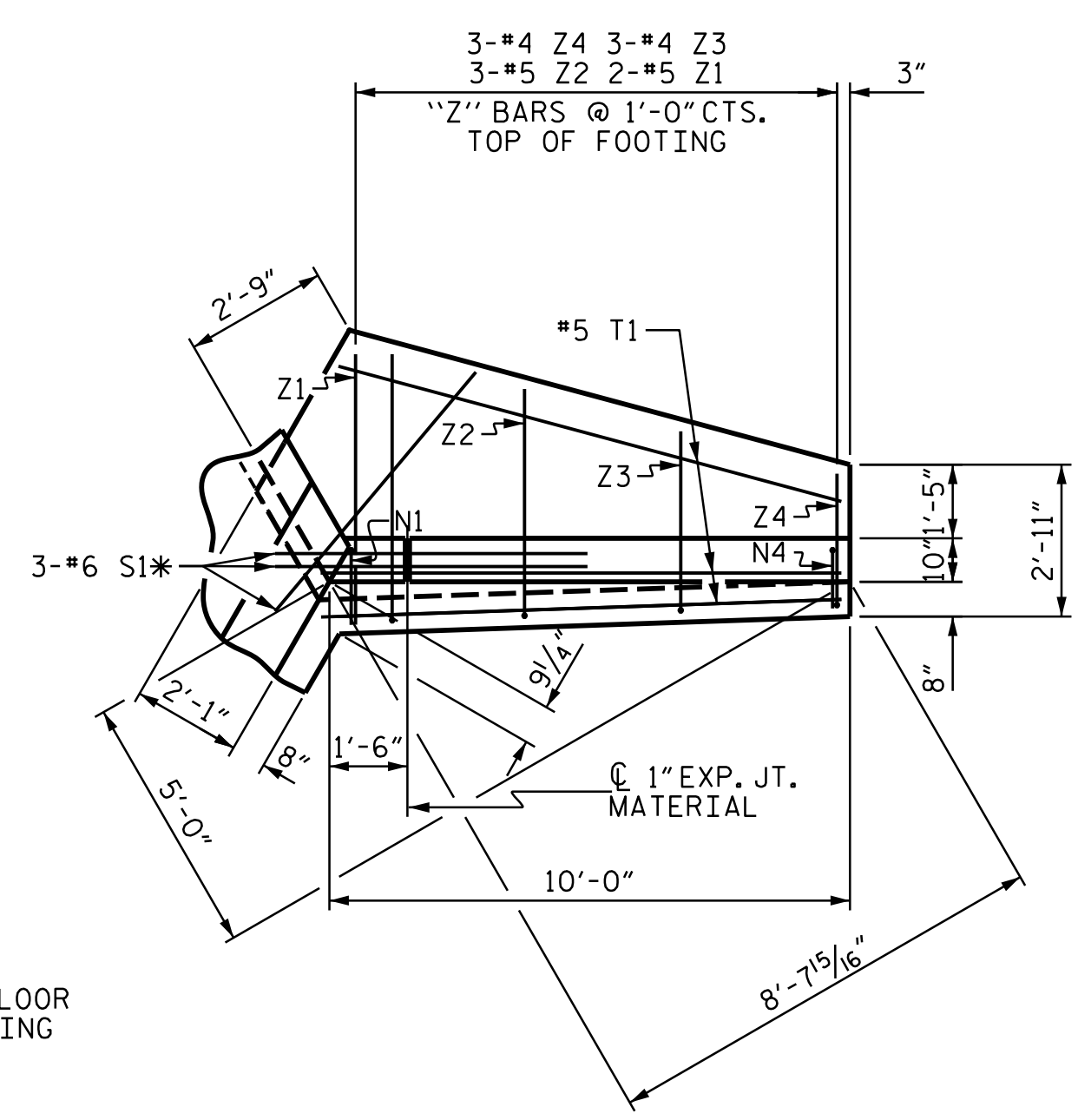
KCI Associates
of North Carolina, P.A.
1505 Falls of Neuse Road, Suite 400, Raleigh, NC 27609-1270 Phone 919-783-8201

| REVISIONS | | | | | | SHEET NO. |
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STD. NO. CB120_2

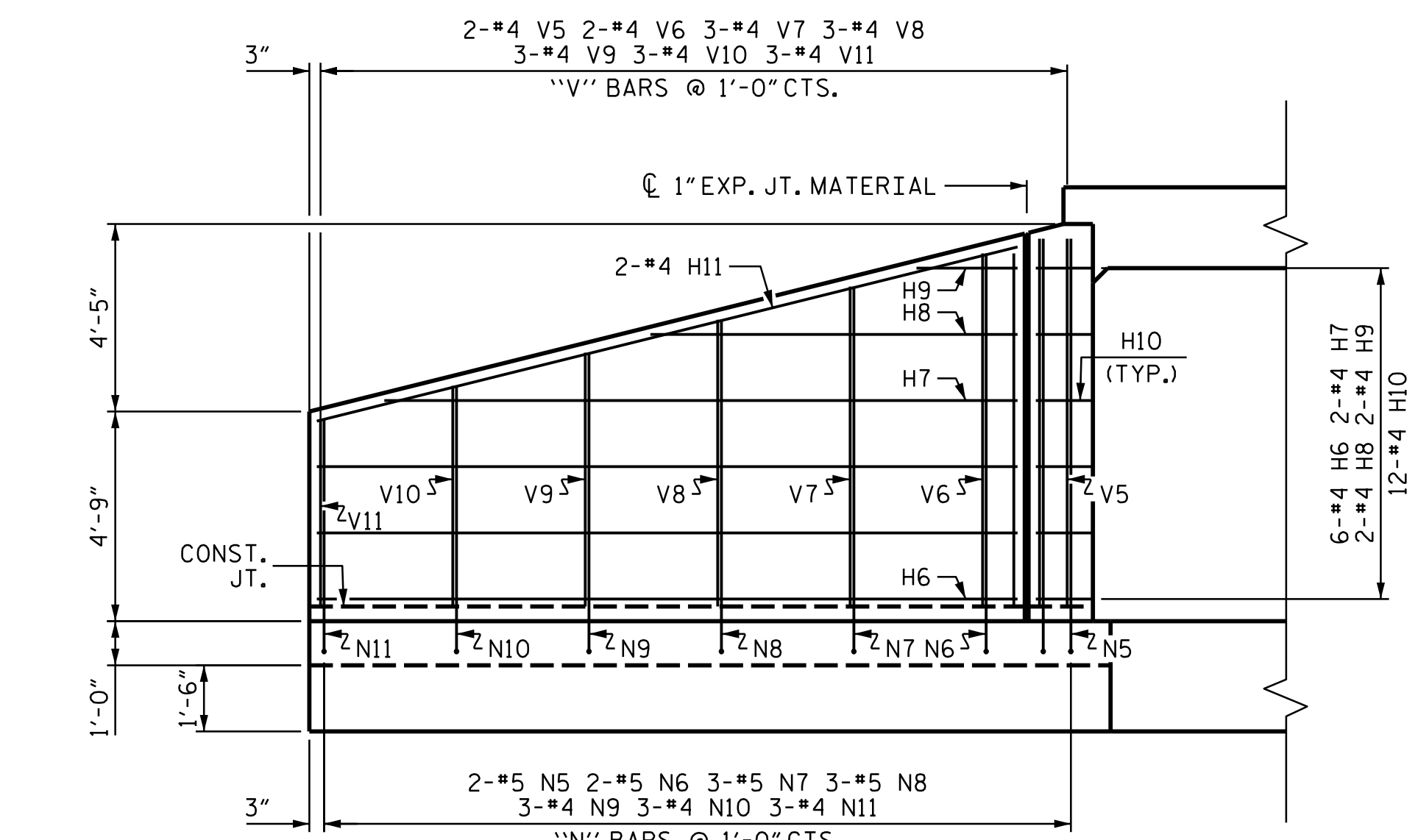


PLAN W1

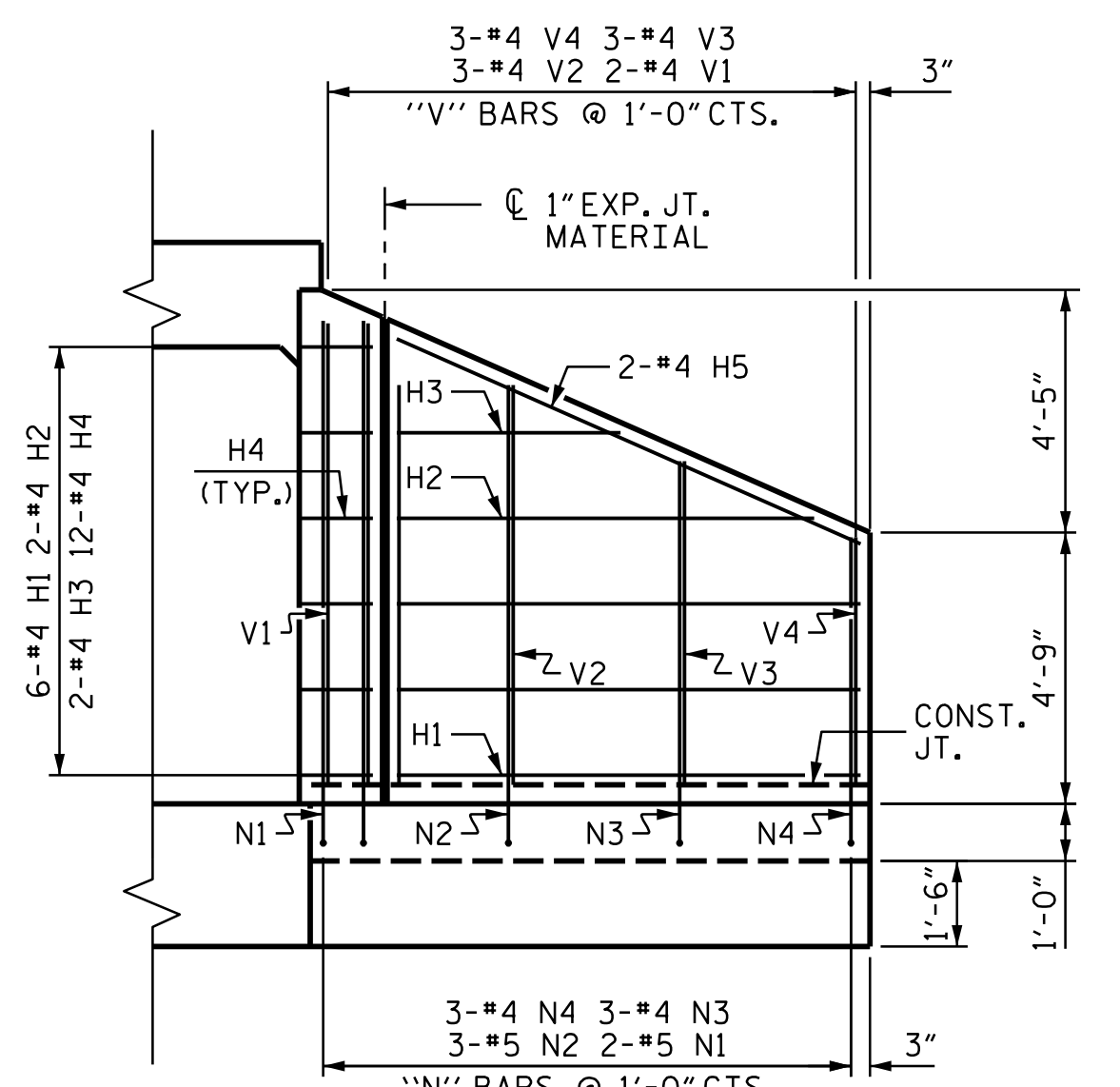


PLAN W2

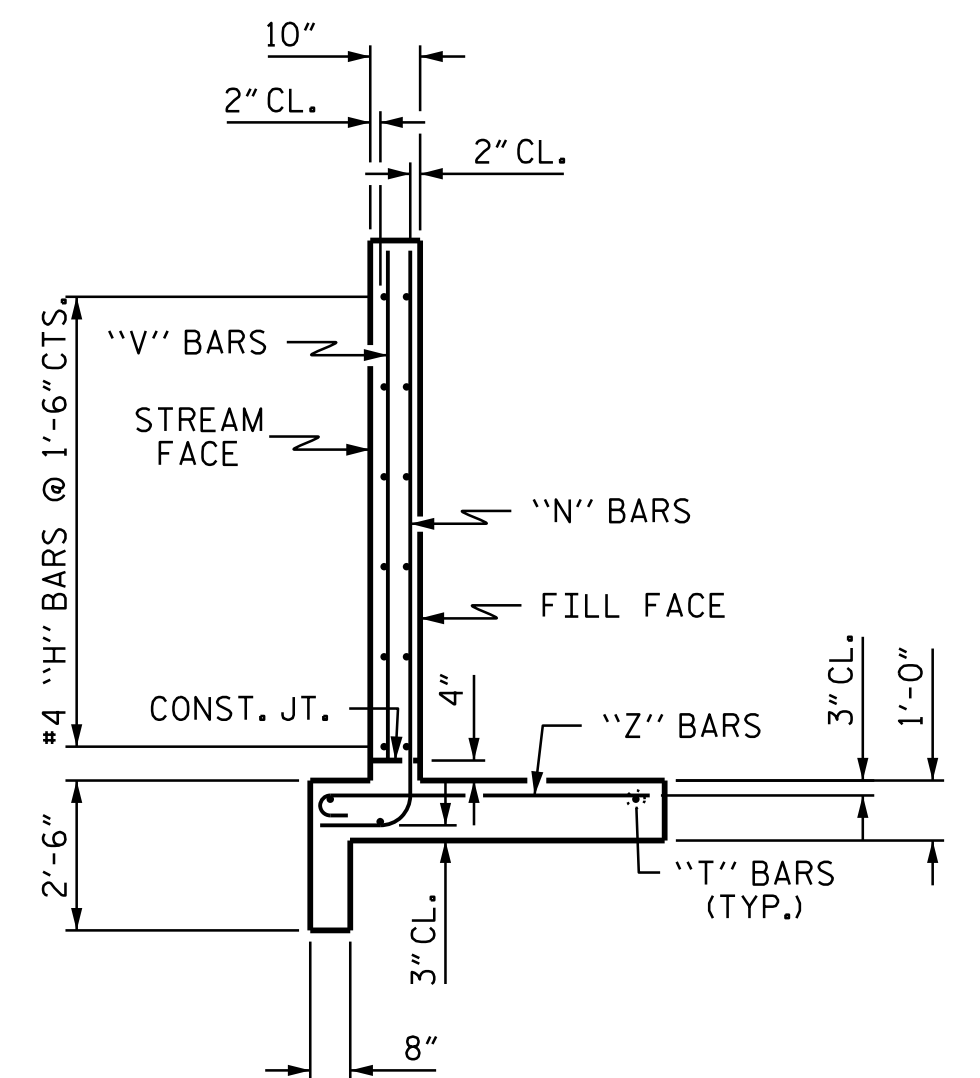
A 3 FOOT STRIP OF FILTER FABRIC SHALL BE ATTACHED TO THE FILL FACE OF THE WING COVERING THE ENTIRE LENGTH OF THE EXPANSION JOINT.



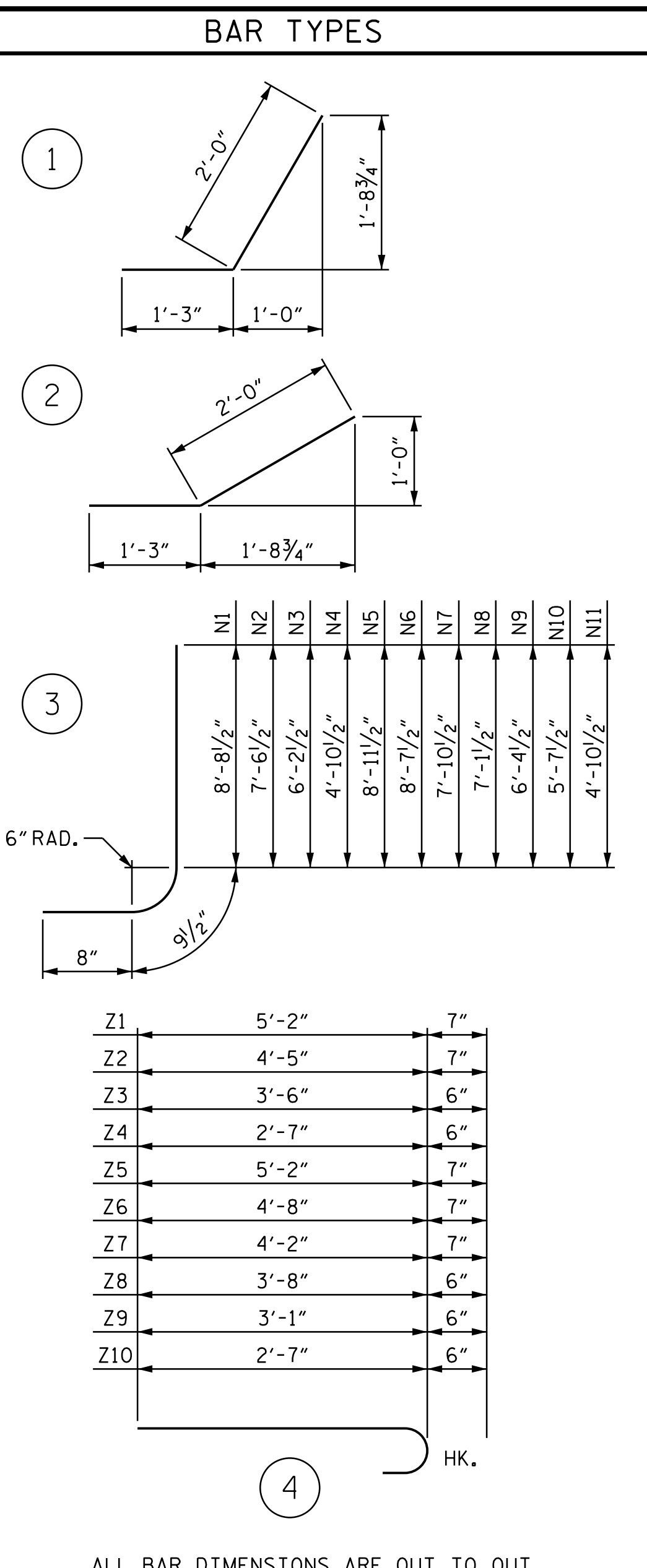
ELEVATION W1



ELEVATION W2



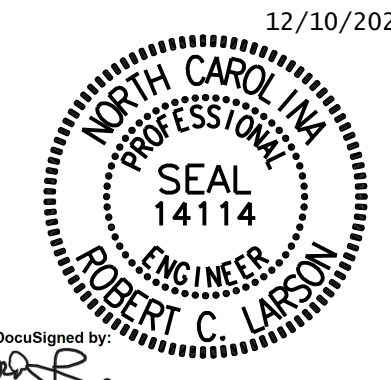
TYPICAL WING SECTION



| BILL OF MATERIAL | | | | | |
|-------------------------------|-----|------|------|---------|----------|
| BAR | NO. | SIZE | TYPE | LENGTH | WEIGHT |
| H1 | 12 | #4 | STR | 8'-1" | 65 |
| H2 | 4 | #4 | STR | 7'-3" | 19 |
| H3 | 4 | #4 | STR | 3'-11" | 10 |
| H4 | 24 | #4 | 1 | 3'-3" | 52 |
| H5 | 4 | #4 | STR | 8'-10" | 24 |
| H6 | 12 | #4 | STR | 15'-10" | 127 |
| H7 | 4 | #4 | STR | 14'-4" | 38 |
| H8 | 4 | #4 | STR | 8'-3" | 22 |
| H9 | 4 | #4 | STR | 2'-3" | 6 |
| H10 | 24 | #4 | 2 | 3'-3" | 52 |
| H11 | 4 | #4 | STR | 16'-4" | 44 |
| N1 | 4 | #5 | 3 | 10'-2" | 42 |
| N2 | 6 | #5 | 3 | 9'-0" | 56 |
| N3 | 6 | #4 | 3 | 7'-8" | 31 |
| N4 | 6 | #4 | 3 | 6'-4" | 25 |
| N5 | 4 | #5 | 3 | 10'-5" | 43 |
| N6 | 4 | #5 | 3 | 10'-1" | 42 |
| N7 | 6 | #5 | 3 | 9'-4" | 58 |
| N8 | 6 | #5 | 3 | 8'-7" | 54 |
| N9 | 6 | #4 | 3 | 7'-10" | 31 |
| N10 | 6 | #4 | 3 | 7'-1" | 28 |
| N11 | 6 | #4 | 3 | 6'-4" | 25 |
| S1 | 12 | #6 | STR | 6'-0" | 108 |
| T1 | 6 | #5 | STR | 10'-0" | 63 |
| T2 | 6 | #5 | STR | 17'-9" | 111 |
| V1 | 4 | #4 | STR | 8'-1" | 22 |
| V2 | 6 | #4 | STR | 7'-0" | 28 |
| V3 | 6 | #4 | STR | 5'-8" | 23 |
| V4 | 6 | #4 | STR | 4'-4" | 17 |
| V5 | 4 | #4 | STR | 8'-4" | 21 |
| V6 | 4 | #4 | STR | 8'-0" | 22 |
| V7 | 6 | #4 | STR | 7'-3" | 29 |
| V8 | 6 | #4 | STR | 6'-6" | 26 |
| V9 | 6 | #4 | STR | 5'-9" | 23 |
| V10 | 6 | #4 | STR | 5'-0" | 20 |
| V11 | 6 | #4 | STR | 4'-3" | 17 |
| Z1 | 4 | #5 | 4 | 5'-9" | 24 |
| Z2 | 6 | #5 | 4 | 5'-0" | 31 |
| Z3 | 6 | #4 | 4 | 4'-0" | 16 |
| Z4 | 6 | #4 | 4 | 3'-1" | 12 |
| Z5 | 8 | #5 | 4 | 5'-9" | 48 |
| Z6 | 6 | #5 | 4 | 5'-3" | 33 |
| Z7 | 6 | #5 | 4 | 4'-9" | 30 |
| Z8 | 6 | #4 | 4 | 4'-2" | 17 |
| Z9 | 6 | #4 | 4 | 3'-7" | 14 |
| Z10 | 6 | #4 | 4 | 3'-1" | 12 |
| REINFORCING STEEL FOR 4 WINGS | | | | | 1661 LBS |
| CLASS A CONCRETE | | | | | |
| 4 WINGS | | | | | 24.3 CY |
| 2 HEADWALLS | | | | | 1.9 CY |
| 2 END CURTAIN WALLS | | | | | 2.2 CY |
| 4 SILLS | | | | | 1.2 CY |
| TOTAL | | | | | 29.6 CY |

PROJECT NO. 17BP.13.R.165
 BURKE COUNTY
 STATION: 12+31.00 -L-

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 STANDARD WINGS
 FOR
 CONCRETE BOX CULVERT
 H = 8'-0" SLOPE = 2:1
 120° SKEW



| | | | |
|----------------|--------------|--------|-----------|
| ASSEMBLED BY : | R. C. LARSON | DATE : | 02/26/20 |
| CHECKED BY : | A.K. ALLANKI | DATE : | 02/26/20 |
| DRAWN BY : | CCJ | 11/99 | REV. 6/19 |
| CHECKED BY : | RWW | 03/00 | MAA/THC |

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| REVISIONS | | | | | | SHEET NO. | |
| | | | | | | C-5 | |
| | | | | | | TOTAL SHEETS | |
| | | | | | | 5 | |

STD. NO. CW12008

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. |
| | - - | 27,000 LBS. PER SQ. IN. |
| | - - | 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 1/2" 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 3/16" IN THICKNESS AND DO NOT EXCEED A WIDTH EQUAL TO THE FLANGE WIDTH LESS 2" OR A THICKNESS EQUAL TO 2 TIMES THE FLANGE THICKNESS. THE SIZE OF FILLET WELDS SHALL CONFORM TO THE REQUIREMENTS OF THE CURRENT ANSI/AASHTO/AWS "BRIDGE WELDING CODE". ELECTROSLAG WELDING WILL NOT BE PERMITTED.

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

HANDRAILS AND POSTS:

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

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

SPECIAL NOTES:

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

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