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SEE SHEET 1A FOR INDEX OF SHEETS
 SEE SHEET 1B FOR CONVENTIONAL SYMBOLS
 SEE SHEET 1C-1, 1C-2, AND 1C-3 FOR SURVEY CONTROL SHEETS

STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS

WATAUGA & ASHE COUNTIES

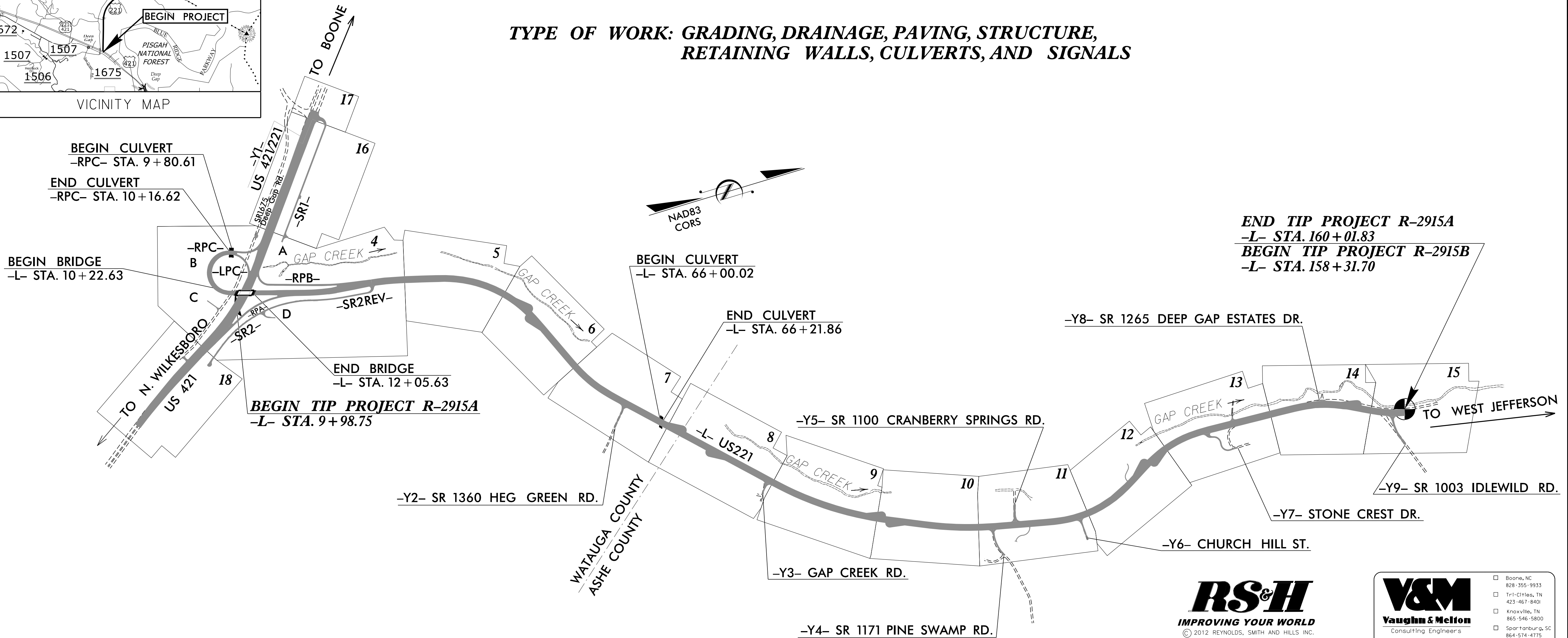
LOCATION: US 221 FROM US 421 IN WATAUGA COUNTY TO SR 1003 (IDLEWILD RD) IN ASHE COUNTY

TYPE OF WORK: GRADING, DRAINAGE, PAVING, STRUCTURE, RETAINING WALLS, CULVERTS, AND SIGNALS

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C. | R-2915A | 1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 34518.1.2 | STP-0221 (39) | P.E. | |
| 34518.2.FR1 | STP-0221 (39) | ROW | |
| 34518.2.FR1 | STP-0221 (39) | UTILITIES | |
| 34518.3.6 | | CONST. | |

TIP PROJECT: R-2915A

CONTRACT: C203593

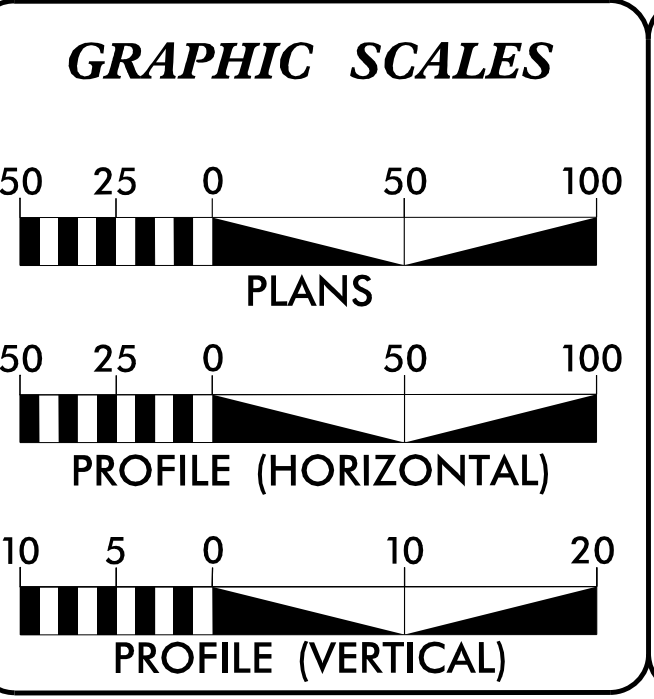


THIS IS A PARTIAL CONTROL OF ACCESS PROJECT WITH FULL CONTROL BEING LIMITED TO THE INTERCHANGE AT US 221 & US 421.

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 Raleigh, NC 919-977-9455
 Charlotte, NC 704-357-0488
 Atlanta, GA 770-427-3509
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DESIGN DATA

| | |
|-----------------------|-------------------------------|
| ADT 2015 = | 11970 |
| ADT 2035 = | 20400 |
| K = | 10 % |
| D = | 65 % |
| T = | 9 % |
| V = | 60 MPH |
| *(TTST 2% + DUALS 7%) | |
| FUNC CLASS = | RURAL ARTERIAL STATEWIDE TIER |

PROJECT LENGTH

| | | |
|---------------------------------------|---|-----------|
| LENGTH ROADWAY TIP PROJECT R-2915A | = | 2.802 MI. |
| LENGTH STRUCTURES TIP PROJECT R-2915A | = | 0.039 MI. |
| TOTAL LENGTH OF TIP PROJECT R-2915A | = | 2.841 MI. |

Prepared in the Office of:
VAUGHN & MELTON
 1318-F PATTON AVE.
 ASHEVILLE NC, 28806
 FOR NCDOT DIVISION OF HIGHWAYS

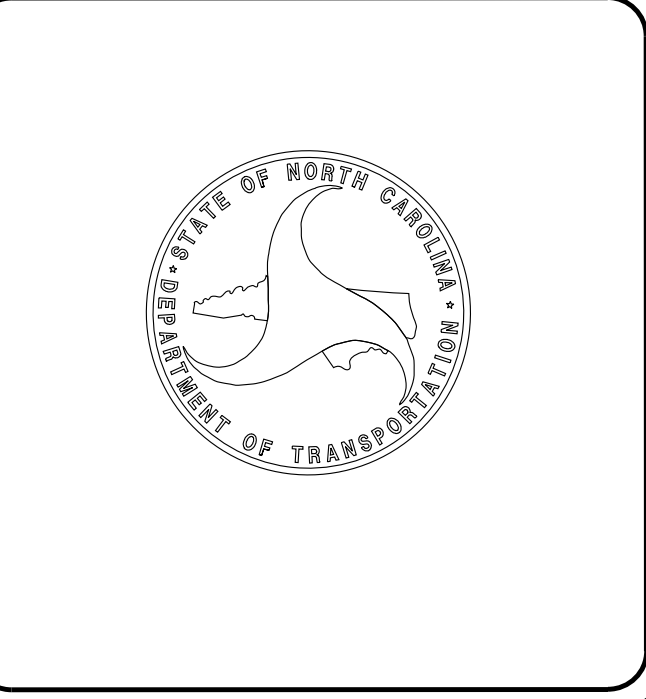
| | |
|--|---|
| 2012 STANDARD SPECIFICATIONS | REECE SCHULER, PE PROJECT ENGINEER |
| RIGHT OF WAY DATE: SEPTEMBER 30, 2013 | AARON CARVER, PE PROJECT DESIGN ENGINEER |
| LETTING DATE: SEPTEMBER 15, 2015 | NCDOT CONTACT: BRENDA MOORE, PE |

HYDRAULICS ENGINEER

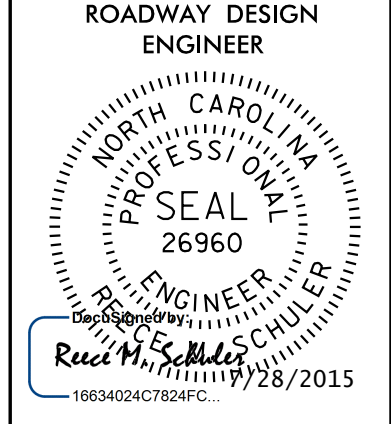
DocuSigned by:
 Will Weatherbee
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 SIGNATURE: P.E. 8/4/2015

ROADWAY DESIGN ENGINEER

DocuSigned by:
 Reece Schuler
 1683AD2C7284FC
 SIGNATURE: P.E. 8/16/2015



\$\$\$SYTIME\$\$\$\$
 \$\$\$DN\$\$\$\$
 \$\$\$USERNAME\$\$\$\$



2012 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, 2012 are applicable to this project and by reference hereby are considered a part of these plans:

| STD.NO. | TITLE |
|---|---|
| DIVISION 2 - EARTHWORK | |
| 200.03 | Method of Clearing - Method III |
| 225.01 | Guide for Grading Subgrade - Interstate and Freeway |
| 225.02 | Guide for Grading Subgrade - Secondary and Local |
| 225.03 | Deceleration and Acceleration Lanes |
| 225.04 | Method of Obtaining Superelevation - Two Lane Pavement |
| 225.05 | Method of Obtaining Superelevation - Divided Highways |
| 225.09 | Guide for Shoulder and Ditch Transition at Grade Separations |
| 240.01 | Guide for Berm Ditch Construction |
| DIVISION 3 - PIPE CULVERTS | |
| 300.01 | Method of Pipe Installation |
| 310.02 | Parallel Pipe End Section - Precast Concrete Section for 15" to 24" Pipe |
| 310.10 | Driveway Pipe Construction |
| DIVISION 4 - MAJOR STRUCTURES | |
| 422.10 | Reinforced Bridge Approach Fills |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction - High Side of Superelevated Curve - Method I |
| 560.02 | Method of Shoulder Construction - High Side of Superelevated Curve - Method II (Sheet 2 of 3 is no longer applicable) |
| DIVISION 6 - ASPHALT BASES AND PAVEMENTS | |
| 610.03 | Guide for Paving Shoulders Under Bridges - Method III |
| 654.01 | Pavement Repairs |
| DIVISION 8 - INCIDENTALS | |
| 815.02 | Subsurface Drain |
| 838.01 | Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew |
| 838.11 | Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew |
| 838.27 | Reinforced Concrete Endwall - for Single 60" Pipe 90 Skew |
| 838.33 | Reinforced Concrete Endwall - for Single 66" Pipe 90 Skew |
| 838.45 | Notes for Reinforced Concrete Endwall |
| 838.57 | Reinforced Brick Endwall - for Single 60" Pipe 90 Skew |
| 838.63 | Reinforced Brick Endwall - for Single 66" Pipe 90 Skew |
| 838.75 | Notes for Reinforced Brick Endwall - Std. Dwg 838.51 thru 838.70 |
| 838.80 | Precast Endwalls - 12" thru 72" Pipe 90 Skew |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 840.01 | Brick Catch Basin - 12" thru 54" Pipe |
| 840.02 | Concrete Catch Basin - 12" thru 54" Pipe |
| 840.03 | Frame, Grates and Hood - for Use on Standard Catch Basin |
| 840.14 | Concrete Drop Inlet - 12" thru 30" Pipe |
| 840.15 | Brick Drop Inlet - 12" thru 30" Pipe |
| 840.16 | Drop Inlet Frame and Grates - for use with Std. Dwg 840.14 and 840.15 |
| 840.17 | Concrete Grated Drop Inlet Type 'A' - 12" thru 72" Pipe |
| 840.18 | Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe |
| 840.19 | Concrete Grated Drop Inlet Type 'D' - 12" thru 36" Pipe |
| 840.20 | Frames and Wide Slot Flat Grates |
| 840.22 | Frames and Wide Slot Sag Grates |
| 840.24 | Frames and Narrow Slot Sag Grates |
| 840.25 | Anchorage for Frames - Brick or Concrete or Precast |
| 840.26 | Brick Grated Drop Inlet Type 'A' - 12" thru 72" Pipe |
| 840.27 | Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe |
| 840.28 | Brick Grated Drop Inlet Type 'D' - 12" thru 36" Pipe |
| 840.29 | Frames and Narrow Slot Flat Grates |
| 840.31 | Concrete Junction Box - 12" thru 66" Pipe |
| 840.32 | Brick Junction Box - 12" thru 66" Pipe |
| 840.34 | Traffic Bearing Junction Box - 42" and Under Pipe |
| 840.35 | Traffic Bearing Grated Drop Inlet |
| 840.45 | Precast Drainage Structure |
| 840.46 | Traffic Bearing Precast Drainage Structure |
| 840.54 | Manhole Frame and Cover |
| 840.66 | Drainage Structure Steps |
| 840.71 | Concrete and Brick Pipe Plug |
| 846.01 | Concrete Curb, Gutter and Curb & Gutter |
| 846.02 | Drop Inlet Installation in Expressway Gutter |
| 846.04 | Drop Inlet Installation in Shoulder Berm Gutter |
| 850.01 | Concrete Paved Ditches |
| 850.10 | Guide for Berm Drainage Outlet - 15" and 18" Pipe |
| 850.11 | Guide for Berm Drainage Outlet - 24" and 30" Pipe |
| 852.01 | Concrete Islands |
| 852.04 | Method for Placement of Drop Inlets in Grassed Median - Using 1'-6" Curb and Gutter |
| 852.06 | Method for Placement of Drop Inlets in Concrete Islands |
| 852.10 | Median Construction with Curb and Gutter |
| 854.02 | Double Faced Concrete Barrier - Types 'T', 'T1' and 'T2' |
| 854.05 | Concrete Median Transition Barrier |
| 857.01 | Precast Reinforced Concrete Barrier - 41" Single Faced |
| 862.01 | Guardrail Placement |
| 862.02 | Guardrail Installation |
| 862.04 | Anchoring End of Guardrail - B-77 and B-83 Anchor Units |
| 866.02 | Woven Wire Fence - with Wood Post |
| 866.03 | Woven Wire Fence - with Steel Post |
| 866.04 | Barbed Wire Fence with Wood Posts (2 - 7 Strands) |
| 876.01 | Rip Rap in Channels |
| 876.02 | Guide for Rip Rap at Pipe Outlets |
| 876.04 | Drainage Ditches with Class 'B' Rip Rap |

GENERAL NOTES: 2012 SPECIFICATIONS
 EFFECTIVE: 01-17-2012
 REVISED: 07-30-2012

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 III.

SUPERELEVATION:
 ALL CURVES ON THIS PROJECT SHALL BE SUPERELEVATED IN ACCORDANCE WITH STD. NO. 225.04 AND STD. NO. 225.05 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. 560.01 AND STD. 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.

BERM DITCHES:
 BERM DITCHES SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 240.01 AT LOCATIONS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

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

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

TEMPORARY SHORING:
 SHORING REQUIRED FOR THE MAINTENANCE OF TRAFFIC NOT SHOWN ON THE PLANS WILL BE PAID FOR AT THE CONTRACT PRICE FOR "TEMPORARY SHORING".

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

UTILITIES:
 UTILITY OWNERS ON THIS PROJECT ARE BLUE RIDGE ELECTRIC MEMBERSHIP CORP., AT&T, SKYLINE MEMBERSHIP CORP., AND FRONTIER NATURAL GAS.
 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.

ROCK:
 ROCK IS ANTICIPATED BETWEEN 24+50, 32+00 TO 34+00, 58+00 TO 60+00, 96+00 TO 98+50, 113+00 TO 114+50, AND 135+00 TO 151+50. BLASTING MAY BE REQUIRED FOR EXCAVATION ON THE PROJECT. SEE SECTION 220 OF THE STANDARD SPECIFICATIONS AND IF APPLICABLE, ROCK BLASTING PROVISION.

| SHEET NUMBER | SHEET |
|---------------------|--|
| 1 | TITLE SHEET |
| 1A | INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS |
| 1B | CONVENTIONAL PLAN SHEET SYMBOLS |
| 1C-1 thru 1C-5 | SURVEY CONTROL SHEETS |
| 2A-1 thru 2A-3 | PAVEMENT SCHEDULE, TYPICAL SECTIONS, WEDGING DETAILS |
| 2B-1 thru 2B-2 | INTERSECTION DETAILS |
| 2C-1 | 2'-9" CONCRETE CURB & GUTTER |
| 2C-2 | DETAIL OF 2'-9" TO FRAME AND GRATE |
| 2C-3 | DETAIL OF SHOULDER BERM GUTTER TO 2'-6" C&G TRANSITION SECTION |
| 2C-4 | STRUCTURE ANCHOR UNIT TYPE B-77 |
| 2C-5 | EXTRA DEPTH JUNCTION BOX 48" RCP-III |
| 2C-6 | MEDIAN HAZARD PROTECTION AND BARRIER TRANSITION |
| 2C-7 | CONCRETE MEDIAN DROP INLET TYPE 'A' EXTRA DEPTH OVER 12' TO 21' |
| 2C-8 | COAL COMBUSTION PRODUCT DETAIL |
| 2D-1 thru 2D-3 | DRAINAGE DETAILS |
| 2G-1 | STANDARD TEMPORARY SHORING DETAIL |
| 2G-2 thru 2G-4 | STANDARD TEMPORARY WALL DETAILS |
| 2H-1 | DETAIL OF TEMPORARY CONTAINMENT OF CONTAMINATED SOIL |
| 3B-1 | GUARDRAIL SUMMARY |
| 3B-2 | PAVEMENT REMOVAL SUMMARY, SHOULDER BERM GUTTER SUMMARY, EXPRESSWAY GUTTER SUMMARY, WOVEN WIRE FABRIC AND BARBED WIRE FENCE SUMMARIES |
| 3B-3 | SUMMARY OF EARTHWORK |
| 3D-1 thru 3D-11 | LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48 INCHES & OVER) |
| 3D-12 | LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 54 INCHES & OVER) |
| 3G-1 | SUMMARY OF SUBSURFACE DRAINAGE, SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION, AND SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION |
| 3P-1 | PARCEL INDEX SHEET |
| 4 thru 18 | PLAN SHEETS |
| 19 thru 43 | PROFILE SHEETS |
| TMP-1 thru TMP-92 | TRAFFIC MANAGEMENT PLANS |
| PMP-1 thru PMP-17 | PAVEMENT MARKING PLANS |
| EC-1 thru EC-33 | EROSION CONTROL PLANS |
| RF-1 | REFORESTATION PLANS |
| SIGN-1 thru SIGN-20 | SIGNING PLANS |
| SIG-1 thru SIG-5.3 | SIGNAL PLANS |
| UC-1 thru UC-23 | UTILITY CONSTRUCTION PLANS |
| UD-1 thru UD-14 | UTILITIES BY OTHERS PLANS |
| X-1A thru X-1D | CROSS-SECTION SUMMARY SHEET |
| X-1 thru X-277 | CROSS SECTIONS |
| W-1 thru W- | WALL PLANS |
| C-1 thru C-20 | CULVERT PLANS |
| S-1 thru S-31 | STRUCTURE PLANS |

11/28/2015 11:28:15 AM R-2915A 1A

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

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

BOUNDARIES AND PROPERTY:

| | |
|---------------------------------------|-----------------|
| State Line | ----- |
| County Line | ----- |
| Township Line | ----- |
| City Line | ----- |
| Reservation Line | ----- |
| Property Line | ----- |
| Existing Iron Pin | ○ EIP |
| 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 | ----- |
| Potential Contamination Area: Soil | ----- |
| Known Contamination Area: Water | ----- |
| Potential Contamination Area: Water | ----- |
| Contaminated Site: Known or Potential | ☠ ? |

BUILDINGS AND OTHER CULTURE:

| | |
|-------------------------------|-----|
| Gas Pump Vent or U/G Tank Cap | ○ |
| Sign | ○ 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:

| | |
|---|-----------|
| Baseline Control Point | ◆ |
| Existing Right of Way Marker | △ |
| Existing Right of Way Line | ----- |
| Proposed Right of Way Line | ---RW--- |
| Proposed Right of Way Line with Iron Pin and Cap Marker | ---RW---▲ |
| Proposed Right of Way Line with Concrete or Granite RW Marker | ---RW---▲ |
| Proposed Control of Access Line with Concrete C/A Marker | ---C/A--- |
| Existing Control of Access | ---C/A--- |
| Proposed Control of Access | ---C/A--- |
| Existing Easement Line | ---E--- |
| Proposed Temporary Construction Easement | E |
| Proposed Temporary Drainage Easement | TDE |
| Proposed Permanent Drainage Easement | PDE |
| Proposed Permanent Drainage / Utility Easement | DUE |
| Proposed Permanent Utility Easement | PUE |
| Proposed Temporary Utility Easement | TUE |
| Proposed Aerial Utility Easement | AUE |
| Proposed Permanent Easement with Iron Pin and Cap Marker | ◆ |

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 | ----- |
| Proposed Guardrail | ----- |
| Existing Cable Guiderail | ----- |
| Proposed Cable Guiderail | ----- |
| Equality Symbol | ⊕ |
| Pavement Removal | ▣ |

VEGETATION:

| | |
|--------------|-------|
| Single Tree | ☀ |
| Single Shrub | ☀ |
| 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 | ----- |
| 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.*) | ---TFD--- |
| U/G Fiber Optics Cable LOS C (S.U.E.*) | ---TFD--- |
| U/G Fiber Optics Cable LOS D (S.U.E.*) | ---TFD--- |

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--- |

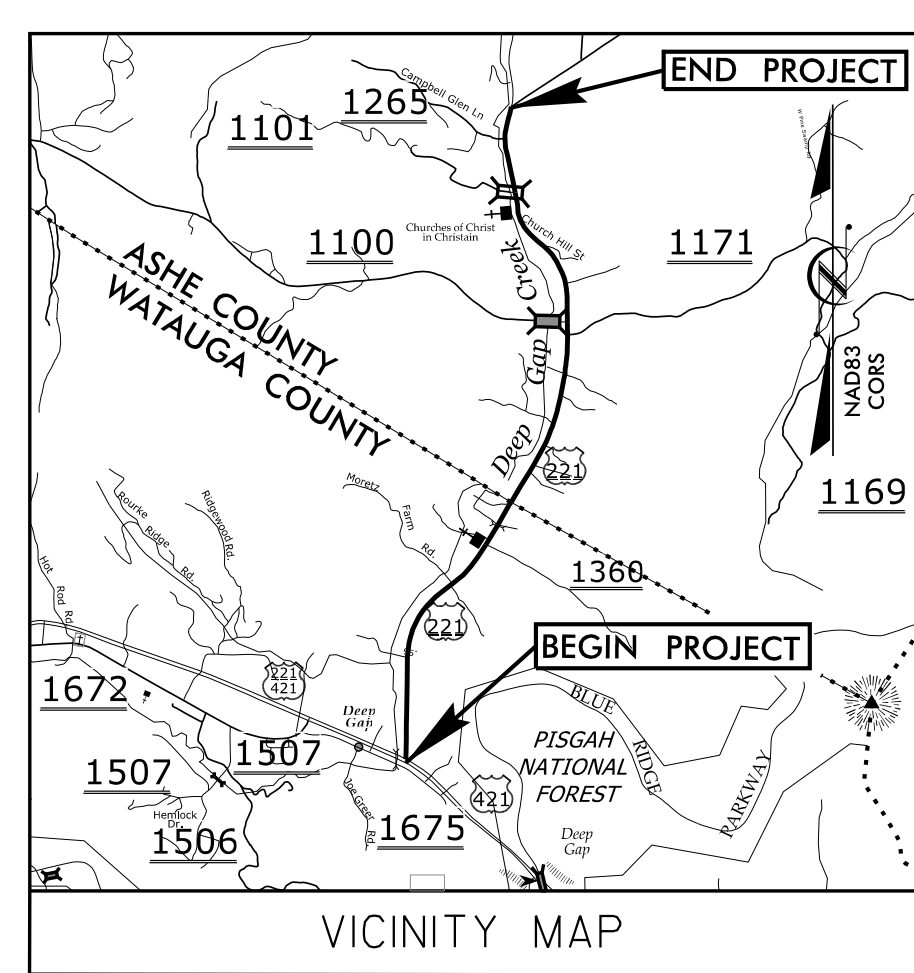
SANITARY SEWER:

| | |
|-------------------------------------|--------------------------|
| 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.*) | ---UTL--- |
| U/G Tank; Water, Gas, Oil | □ |
| Underground Storage Tank, Approx. Loc. | □ |
| A/G Tank; Water, Gas, Oil | □ |
| Geoenvironmental Boring | ⊕ |
| U/G Test Hole LOS A (S.U.E.*) | ○ |
| Abandoned According to Utility Records | AATUR |
| End of Information | E.O.I. |

SURVEY CONTROL SHEET R-2915A



| BL POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET | BY1 POINT | DESC. | NORTH | EAST | ELEVATION | Y2 STATION | OFFSET |
|----------|--------------|-------------|--------------|-----------|-----------|-----------|-----------|--------|-------------|--------------|-----------|------------|-----------|
| BL31 | | 914231.3163 | 1268081.4743 | 2986.36 | 18+88.74 | 112.22 LT | BY166 | BY1-66 | 918669.8295 | 1261677.3259 | 2985.67 | 15+58.66 | 7.62 LT |
| BL32 | BL-32 | 915056.9098 | 1268109.7839 | 2992.35 | 19+20.12 | 116.45 LT | BY167 | BY1-67 | 918407.4172 | 1262218.1671 | 3028.37 | 15+58.66 | 7.62 LT |
| BL33 | BL-33 | 916426.7594 | 1268096.2899 | 2984.52 | 32+94.80 | 40.21 LT | BY2 | | | | | | |
| BL34 | BL-34 | 917085.9249 | 1268255.2407 | 2976.26 | 39+70.30 | 0.26 RT | BY268 | BY2-68 | 922865.1325 | 1263389.3999 | 2940.63 | 10+09.31 | 21.49 RT |
| BL35 | BL-35 | 917895.0857 | 1261827.9966 | 2972.55 | 51+12.90 | 1.70 RT | BY269 | BY2-69 | 922916.6088 | 1263629.3149 | 2948.73 | 12+47.91 | 20.69 RT |
| BL36 | NCOS MON GAP | 918669.8295 | 1261677.3259 | 2985.67 | 61+33.00 | 42.02 LT | BY270 | BY2-70 | 923132.2208 | 1263891.8377 | 2968.15 | 15+82.72 | 11.27 LT |
| R29153 | GPS R2915-3 | 919149.7040 | 1261969.9680 | 2977.41 | 66+95.74 | 4.08 LT | BY271 | BY2-71 | 923286.9353 | 1264241.1875 | 2979.74 | 19+62.86 | 12.73 LT |
| R29154 | GPS R2915-4 | 920506.4880 | 1262832.0570 | 2957.01 | 83+02.90 | 0.82 RT | BY272 | BY2-72 | 923319.8897 | 1264699.2989 | 3007.14 | 19+62.86 | 12.73 LT |
| BL37 | BL-37 | 921144.0567 | 1263100.9761 | 2949.15 | 89+96.40 | 6.86 LT | BY3 | | | | | | |
| BL38 | BL-38 | 922126.6192 | 1263321.6829 | 2943.40 | 100+05.24 | 1.19 LT | BY373 | BY3-73 | 923173.4784 | 1262985.9563 | 2930.96 | 16+12.43 | 13.83 LT |
| BL39 | BL-39 | 922865.1325 | 1263389.3999 | 2948.63 | 107+47.13 | 9.35 RT | BY375 | BY3-75 | 922865.1325 | 1263389.3999 | 2948.63 | 16+12.43 | 13.83 LT |
| BL40 | BL-40 | 923786.4131 | 1263314.5824 | 2943.82 | 115+95.28 | 33.61 LT | BY4 | | | | | | |
| BL41 | BL-41 | 924139.0336 | 1263288.2637 | 2944.24 | 120+15.19 | 57.04 RT | BY476 | BY4-76 | 926950.2639 | 1261551.4117 | 2912.05 | 14+82.09 | 27.96 RT |
| BL42 | BL-42 | 924580.7753 | 1262992.2353 | 2929.67 | 125+28.47 | 69.59 RT | BY477 | BY4-77 | 926798.0827 | 1262069.3736 | 2909.03 | 14+82.09 | 27.96 RT |
| BL43 | BL-43 | 925044.2824 | 1262495.3746 | 2919.16 | 132+18.91 | 28.98 LT | BY5 | | | | | | |
| BL44 | BL-44 | 925745.5320 | 1262564.3667 | 2913.17 | 139+38.81 | 51.23 LT | BY578 | BY5-78 | 927532.5780 | 1262287.7910 | 2902.28 | 10+09.69 | 106.03 RT |
| BL45 | BL-45 | 926798.0827 | 1262069.3736 | 2909.03 | 149+97.33 | 68.46 LT | BY579 | BY5-79 | 926848.0446 | 1263048.0471 | 2928.92 | 10+09.69 | 106.03 RT |
| R29155 | GPS R2915-5 | 927532.5780 | 1262287.7910 | 2902.28 | 157+48.32 | 18.37 RT | | | | | | | |
| BL46 | BL-46 | 928402.6959 | 1262144.5944 | 2906.48 | 162+14.59 | 2906.48 | | | | | | | |
| BL47 | BL-47 | 929326.9840 | 1262283.2690 | 2910.77 | 169+00.00 | 2910.77 | | | | | | | |
| BL48 | BL-48 | 929833.8683 | 1262134.0936 | 2912.87 | 175+00.00 | 2912.87 | | | | | | | |
| BL49 | BL-49 | 930252.5771 | 1261808.4631 | 2904.69 | 180+00.00 | 2904.69 | | | | | | | |
| BL50 | BL-50 | 930785.0036 | 1261536.6732 | 2897.84 | 185+00.00 | 2897.84 | | | | | | | |
| BL51 | BL-51 | 931116.0346 | 1261433.0556 | 2890.72 | 190+00.00 | 2890.72 | | | | | | | |
| BL52 | BL-52 | 931641.1471 | 1261537.6793 | 2881.92 | 195+00.00 | 2881.92 | | | | | | | |
| BL53 | BL-53 | 932216.6929 | 1261999.6996 | 2876.74 | 200+00.00 | 2876.74 | | | | | | | |
| BL54 | BL-54 | 932765.6958 | 1262461.6863 | 2874.49 | 205+00.00 | 2874.49 | | | | | | | |
| BL55 | BL-55 | 933354.5662 | 1263268.6938 | 2871.17 | 210+00.00 | 2871.17 | | | | | | | |
| BL56 | BL-56 | 933897.1980 | 1263665.8128 | 2870.83 | 215+00.00 | 2870.83 | | | | | | | |
| BL57 | BL-57 | 934499.1246 | 1263792.5538 | 2870.93 | 220+00.00 | 2870.93 | | | | | | | |
| BL58 | BL-58 | 935748.1689 | 1263888.7456 | 2884.86 | 225+00.00 | 2884.86 | | | | | | | |
| BL59 | BL-59 | 936429.4463 | 1263916.1781 | 2937.49 | 230+00.00 | 2937.49 | | | | | | | |
| BL60 | BL-60 | 937238.1186 | 1264003.2714 | 3004.18 | 235+00.00 | 3004.18 | | | | | | | |

NC DOT STATION R2915-1
LOCALIZED PROJECT COORDINATES
 N = 916355.6590
 E = 1255522.7760

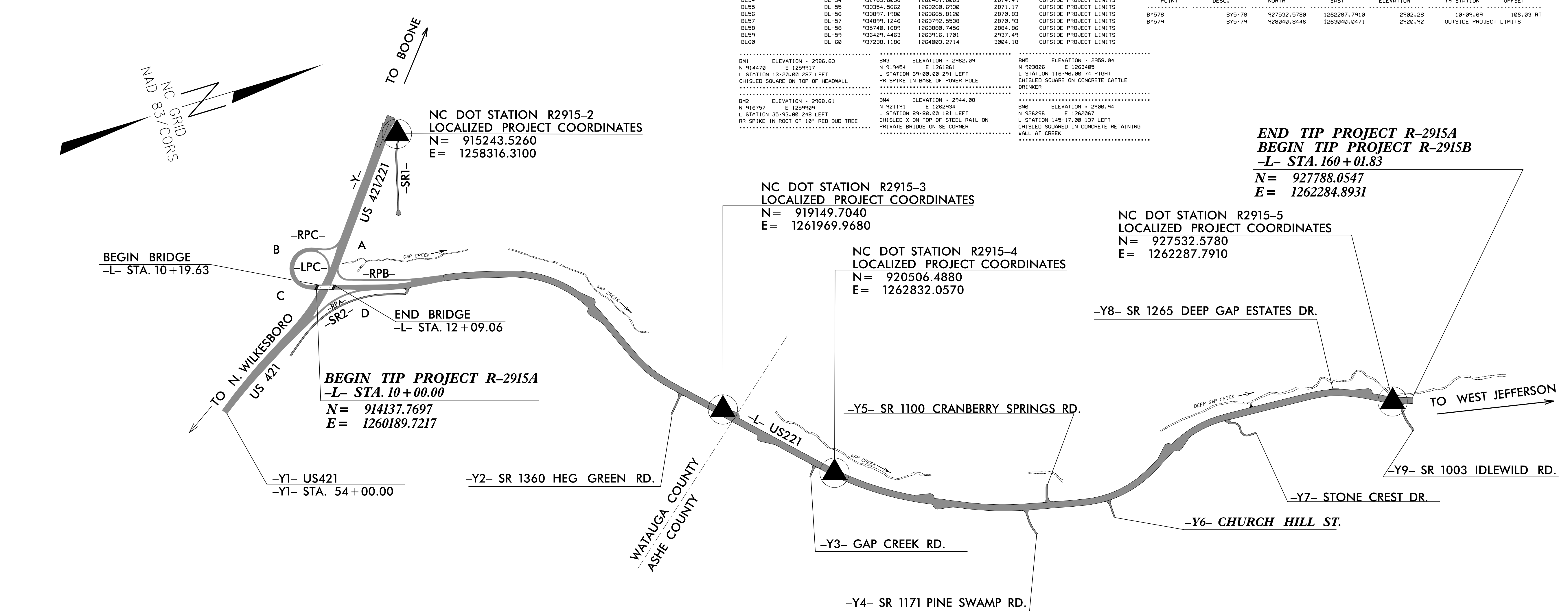
NC DOT STATION R2915-2
LOCALIZED PROJECT COORDINATES
 N = 915243.5260
 E = 1258316.3100

NC DOT STATION R2915-3
LOCALIZED PROJECT COORDINATES
 N = 919149.7040
 E = 1261969.9680

NC DOT STATION R2915-4
LOCALIZED PROJECT COORDINATES
 N = 920506.4880
 E = 1262832.0570

NC DOT STATION R2915-5
LOCALIZED PROJECT COORDINATES
 N = 927532.5780
 E = 1262287.7910

END TIP PROJECT R-2915A
BEGIN TIP PROJECT R-2915B
 -L- STA. 160 + 01.83
 N = 927788.0547
 E = 1262284.8931



DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2915-15"

WITH NAD 83/CORS STATE PLANE GRID COORDINATES OF
 NORTHING: 954880.7810(ft) EASTING: 1254012.2870(ft)
 ELEVATION: 3097.5210(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991292

THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2915-15" TO -L- STATION 10+00.00 IS
 S 08°37'17" E 41208.6602

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

NOTES:

- THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.
- THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/)
 THE FILES TO BE FOUND ARE AS FOLLOWS:
 R2915A_LS_GPSCALIBR.HTML
 R2915A_LS_WGS84.TXT
 R2915A_LS_LOCAL.TXT
 R2915A_LS_CONTROL.TXT
 THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
 PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
 SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

6/2/2019

SURVEY CONTROL SHEET R-2915A

GPS Calibration Report

Project : r2915abcde

| | | | |
|-------------------|---------------------|-------------|----------------------|
| TIP Number | r2915abcde | Date & Time | 8:15:20 AM 3/29/2010 |
| User name | rhwagoner | Zone | North Carolina 3200 |
| Coordinate System | US State Plane 1983 | | |
| Horizontal Datum | NAD 1983 (Comus) | | |
| Vertical Datum | | Geoid Model | G03NC |
| Coordinate Units | US survey feet | | |
| Distance Units | US survey feet | | |
| Height Units | US survey feet | | |

LOCAL SITE INFORMATION

| | |
|-------------------|-----|
| Localized around | |
| Latitude | N/A |
| Longitude | N/A |
| Site Scale Factor | N/A |
| Height | N/A |

The North Carolina Department of Transportation uses a **Localized Coordinate System** which is very similar to North Carolina Zone 3200 from which it is derived. **Please take care in utilizing these coordinates to eliminate confusion of the two systems.** This file is to aid in the use of Real Time Kinematic (RTK) GPS during construction layout.

Datum Transformation Parameters

Datum Transformation computation not requested

Updated Default Projection (Transverse Mercator) Definition

Updated default projection not requested

Horizontal Adjustment Parameters

| | |
|--|-----------------|
| Northing coordinate of rotation center | 947934.1223sft |
| Easting coordinate of rotation center | 1262471.3754sft |
| Rotation about the center point | 0°00'00" |
| Translation north | -0.6128sft |
| Translation east | 0.7058sft |
| Scale factor | 1.00008668 |

Vertical Adjustment Parameters

| | |
|-------------------------------------|-----------------|
| Northing coordinate of origin point | 916355.6589sft |
| Easting coordinate of origin point | 1255522.7706sft |
| Vertical separation at origin | 0.0728sft |
| Slope north | 2.018ppm |
| Slope east | -3.981ppm |

Geoid Model Definition

G03NC

Residual Differences Between GPS (WGS84) And Local Coordinates

| Summary | | | |
|-------------------|---------------|------------------------|----------------|
| | Maximum error | Root Mean Square error | Point |
| Horizontal | 0.037sft | 0.006 | R2915-23_WGS84 |
| Vertical | 0.080sft | 0.010 | R2915-23_WGS84 |
| Three-dimensional | 0.088sft | 0.011 | R2915-23_WGS84 |

| Point Residuals | | | | | |
|-------------------|------------------|-----------------------------------|-----------------|---------------------|-----------------|
| WGS84 Coordinates | | Calculated point FOR DISPLAY ONLY | | Local Coordinates | |
| Point | R2915-1_WGS84 | Northing | 916355.6589sft | Point R2915-1 Local | |
| Latitude | 36°14'30.16499"N | Easting | 1255522.7706sft | Northing | 916355.6590sft |
| Longitude | 81°31'28.80325"W | Elevation | 3142.3037sft | Easting | 1255522.7760sft |
| Height | 3038.5989sft | Horz error | 0.005sft | Elevation | 3142.2840sft |
| | | Vert error | 0.020sft | Utilized | Horz and Vert |
| | | 3D error | 0.020sft | Quality | Survey quality |
| Point | R2915-2_WGS84 | Northing | 915243.5295sft | Point R2915-2 Local | |
| Latitude | 36°14'19.87328"N | Easting | 1258316.3057sft | Northing | 915243.5260sft |
| Longitude | 81°30'54.37263"W | Elevation | 3035.6772sft | Easting | 1258316.3100sft |
| Height | 2931.8298sft | Horz error | 0.006sft | Elevation | 3035.6720sft |
| | | Vert error | 0.005sft | Utilized | Horz and Vert |
| | | 3D error | 0.008sft | Quality | Survey quality |
| Point | R2915-3_WGS84 | Northing | 919149.7074sft | Point R2915-3 Local | |
| Latitude | 36°14'59.39661"N | Easting | 1261969.9588sft | Northing | 919149.7040sft |
| Longitude | 81°30'10.99416"W | Elevation | 2977.4067sft | Easting | 1261969.9680sft |
| Height | 2873.5914sft | Horz error | 0.010sft | Elevation | 2977.4070sft |
| | | Vert error | 0.000sft | Utilized | Horz and Vert |
| | | 3D error | 0.010sft | Quality | Survey quality |
| Point | R2915-4_WGS84 | Northing | 920506.4892sft | Point R2915-4 Local | |
| Latitude | 36°15'13.02239"N | Easting | 1262832.0488sft | Northing | 920506.4880sft |
| Longitude | 81°30'00.89092"W | Elevation | 2956.9814sft | Easting | 1262832.0570sft |
| Height | 2853.1869sft | Horz error | 0.008sft | Elevation | 2956.9900sft |
| | | Vert error | 0.009sft | Utilized | Horz and Vert |
| | | 3D error | 0.012sft | Quality | Survey quality |
| Point | R2915-5_WGS84 | Northing | 927532.5716sft | Point R2915-5 Local | |
| Latitude | 36°16'22.33517"N | Easting | 1262287.7805sft | Northing | 927532.5780sft |
| Longitude | 81°30'09.69521"W | Elevation | 2902.2729sft | Easting | 1262287.7910sft |
| Height | 2798.7405sft | Horz error | 0.012sft | Elevation | 2902.2770sft |
| | | Vert error | 0.004sft | Utilized | Horz and Vert |
| | | 3D error | 0.013sft | Quality | Survey quality |
| Point | R2915-6_WGS84 | Northing | 929551.4461sft | Point R2915-6 Local | |
| Latitude | 36°16'43.05751"N | Easting | 1265372.0745sft | Northing | 929551.4520sft |

| | | | | | |
|-----------|------------------|------------|-----------------|----------------------|-----------------|
| Longitude | 81°29'32.66468"W | Elevation | 3037.6229sft | Easting | 1265372.0870sft |
| Height | 2934.0460sft | Horz error | 0.014sft | Elevation | 3037.6360sft |
| | | Vert error | 0.013sft | Utilized | Horz and Vert |
| | | 3D error | 0.019sft | Quality | Survey quality |
| Point | R2915-7_WGS84 | Northing | 934301.5436sft | Point R2915-7 Local | |
| Latitude | 36°17'29.48965"N | Easting | 1263283.7338sft | Northing | 934301.5570sft |
| Longitude | 81°29'59.61899"W | Elevation | 2870.4241sft | Easting | 1263283.7320sft |
| Height | 2767.0788sft | Horz error | 0.014sft | Elevation | 2870.4170sft |
| | | Vert error | 0.007sft | Utilized | Horz and Vert |
| | | 3D error | 0.015sft | Quality | Survey quality |
| Point | R2915-8_WGS84 | Northing | 935627.2416sft | Point R2915-8 Local | |
| Latitude | 36°17'42.92890"N | Easting | 1264633.5337sft | Northing | 935627.2530sft |
| Longitude | 81°29'43.54539"W | Elevation | 2872.3172sft | Easting | 1264633.5310sft |
| Height | 2768.9685sft | Horz error | 0.012sft | Elevation | 2872.3310sft |
| | | Vert error | 0.014sft | Utilized | Horz and Vert |
| | | 3D error | 0.018sft | Quality | Survey quality |
| Point | R2915-9_WGS84 | Northing | 940641.1693sft | Point R2915-9 Local | |
| Latitude | 36°18'31.45715"N | Easting | 1260499.6148sft | Northing | 940641.1850sft |
| Longitude | 81°30'35.56934"W | Elevation | 2893.9308sft | Easting | 1260499.6170sft |
| Height | 2790.8934sft | Horz error | 0.016sft | Elevation | 2893.9060sft |
| | | Vert error | 0.025sft | Utilized | Horz and Vert |
| | | 3D error | 0.029sft | Quality | Survey quality |
| Point | R2915-10_WGS84 | Northing | 941223.4149sft | Point R2915-10 Local | |
| Latitude | 36°18'37.24430"N | Easting | 1260628.2994sft | Northing | 941223.4310sft |
| Longitude | 81°30'34.17760"W | Elevation | 2992.8526sft | Easting | 1260628.3040sft |
| Height | 2889.8302sft | Horz error | 0.017sft | Elevation | 2992.8370sft |
| | | Vert error | 0.016sft | Utilized | Horz and Vert |
| | | 3D error | 0.023sft | Quality | Survey quality |
| Point | R2915-11_WGS84 | Northing | 946476.2925sft | Point R2915-11 Local | |
| Latitude | 36°19'28.64133"N | Easting | 1258539.4421sft | Northing | 946476.3110sft |
| Longitude | 81°31'01.31448"W | Elevation | 2961.5603sft | Easting | 1258539.4520sft |
| Height | 2858.7761sft | Horz error | 0.021sft | Elevation | 2961.5280sft |
| | | Vert error | 0.032sft | Utilized | Horz and Vert |
| | | 3D error | 0.039sft | Quality | Survey quality |
| Point | R2915-12_WGS84 | Northing | 947042.3574sft | Point R2915-12 Local | |
| Latitude | 36°19'34.13447"N | Easting | 1258133.1858sft | Northing | 947042.3510sft |
| Longitude | 81°31'06.45218"W | Elevation | 2976.4319sft | Easting | 1258133.1700sft |
| Height | 2873.6799sft | Horz error | 0.017sft | Elevation | 2976.4580sft |
| | | Vert error | 0.026sft | Utilized | Horz and Vert |
| | | 3D error | 0.031sft | Quality | Survey quality |
| Point | R2915-13_WGS84 | Northing | 951569.5121sft | Point R2915-13 Local | |
| Latitude | 36°20'18.04952"N | Easting | 1254826.4800sft | Northing | 951569.5120sft |
| Longitude | 81°31'48.25253"W | Elevation | 3052.2178sft | Easting | 1254826.4650sft |
| Height | 2949.7070sft | Horz error | 0.015sft | Elevation | 3052.2240sft |
| | | Vert error | 0.006sft | Utilized | Horz and Vert |
| | | 3D error | 0.016sft | Quality | Survey quality |
| Point | R2915-14_WGS84 | Northing | 952360.7067sft | Point R2915-14 Local | |
| Latitude | 36°20'25.72331"N | Easting | 1254245.9924sft | Northing | 952360.7080sft |

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2915-15" WITH NAD 83/CORS STATE PLANE GRID COORDINATES OF NORTHING: 954880.7810(++) EASTING: 1254012.2870(++) ELEVATION: 3097.5210(++) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991292 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2915-15" TO -L- STATION 10+00.00 IS S 08°37'17" E 41208.6602 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

- THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.
 - THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: [HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/) THE FILES TO BE FOUND ARE AS FOLLOWS:
R2915A_LS_GPSCALIB.HTML
R2915A_LS_WGS84.TXT
R2915A_LS_LOCAL.TXT
R2915A_LS_CONTROL.TXT
- THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- © INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

SURVEY CONTROL SHEET R-2915A

| | | | | | |
|------------------|------------------|-------------------|----------------|-----------------------------|----------------|
| Longitude | 81°31'55.59073"W | Elevation | 3078.5171sf | Easting | 1254245.9770sf |
| Height | 2976.0465sf | Horz error | 0.015sf | Elevation | 3078.5190sf |
| | | Vert error | 0.002sf | Utilized | Horz and Vert |
| | | 3D error | 0.016sf | Quality | Survey quality |
| Point | R2915-15 WGS84 | Northing | 954880.7882sf | Point R2915-15 Local | |
| Latitude | 36°20'50.57260"N | Easting | 1254012.3126sf | Northing | 954880.7810sf |
| Longitude | 81°31'59.23136"W | Elevation | 3097.5370sf | Easting | 1254012.2870sf |
| Height | 2995.1423sf | Horz error | 0.027sf | Elevation | 3097.5210sf |
| | | Vert error | 0.016sf | Utilized | Horz and Vert |
| | | 3D error | 0.031sf | Quality | Survey quality |
| Point | R2915-16 WGS84 | Northing | 955689.2599sf | Point R2915-16 Local | |
| Latitude | 36°20'58.40190"N | Easting | 1253372.2604sf | Northing | 955689.2700sf |
| Longitude | 81°32'07.30385"W | Elevation | 3139.7336sf | Easting | 1253372.2370sf |
| Height | 3037.3781sf | Horz error | 0.025sf | Elevation | 3139.6930sf |
| | | Vert error | 0.041sf | Utilized | Horz and Vert |
| | | 3D error | 0.048sf | Quality | Survey quality |
| Point | R2915-17 WGS84 | Northing | 960732.3214sf | Point R2915-17 Local | |
| Latitude | 36°21'50.14423"N | Easting | 1260924.8880sf | Northing | 960732.3040sf |
| Longitude | 81°30'36.58112"W | Elevation | 3355.9956sf | Easting | 1260924.8760sf |
| Height | 3253.5217sf | Horz error | 0.021sf | Elevation | 3356.0160sf |
| | | Vert error | 0.020sf | Utilized | Horz and Vert |
| | | 3D error | 0.029sf | Quality | Survey quality |
| Point | R2915-18 WGS84 | Northing | 959689.5169sf | Point R2915-18 Local | |
| Latitude | 36°21'39.95242"N | Easting | 1261385.6028sf | Northing | 959689.4970sf |
| Longitude | 81°30'30.62882"W | Elevation | 3396.5313sf | Easting | 1261385.5910sf |
| Height | 3294.0193sf | Horz error | 0.023sf | Elevation | 3396.5580sf |
| | | Vert error | 0.027sf | Utilized | Horz and Vert |
| | | 3D error | 0.035sf | Quality | Survey quality |
| Point | R2915-19 WGS84 | Northing | 967060.7220sf | Point R2915-19 Local | |
| Latitude | 36°22'54.39872"N | Easting | 1267779.1405sf | Northing | 967060.7040sf |
| Longitude | 81°29'14.75578"W | Elevation | 3005.2191sf | Easting | 1267779.1370sf |
| Height | 2902.6651sf | Horz error | 0.018sf | Elevation | 3005.2590sf |
| | | Vert error | 0.040sf | Utilized | Horz and Vert |
| | | 3D error | 0.044sf | Quality | Survey quality |
| Point | R2915-20 WGS84 | Northing | 966821.8373sf | Point R2915-20 Local | |
| Latitude | 36°22'52.19547"N | Easting | 1268416.6439sf | Northing | 966821.8150sf |
| Longitude | 81°29'06.89021"W | Elevation | 3001.8897sf | Easting | 1268416.6390sf |
| Height | 2899.3121sf | Horz error | 0.023sf | Elevation | 3001.9300sf |
| | | Vert error | 0.040sf | Utilized | Horz and Vert |
| | | 3D error | 0.046sf | Quality | Survey quality |
| Point | R2915-21 WGS84 | Northing | 972084.6876sf | Point R2915-21 Local | |
| Latitude | 36°23'44.52005"N | Easting | 1269660.6108sf | Northing | 972084.6700sf |
| Longitude | 81°28'53.29316"W | Elevation | 3132.4940sf | Easting | 1269660.6140sf |
| Height | 3029.9808sf | Horz error | 0.018sf | Elevation | 3132.5390sf |
| | | Vert error | 0.045sf | Utilized | Horz and Vert |
| | | 3D error | 0.048sf | Quality | Survey quality |
| Point | R2915-22 WGS84 | Northing | 973156.5253sf | Point R2915-22 Local | |
| Latitude | 36°23'55.25041"N | Easting | 1270213.4941sf | Northing | 973156.5140sf |

| | | | | | |
|------------------|------------------|-------------------|----------------|-----------------------------|----------------|
| Longitude | 81°28'46.86125"W | Elevation | 3163.2767sf | Easting | 1270213.5010sf |
| Height | 3060.7659sf | Horz error | 0.013sf | Elevation | 3163.3260sf |
| | | Vert error | 0.049sf | Utilized | Horz and Vert |
| | | 3D error | 0.051sf | Quality | Survey quality |
| Point | R2915-23 WGS84 | Northing | 981712.8608sf | Point R2915-23 Local | |
| Latitude | 36°25'21.32188"N | Easting | 1276325.1593sf | Northing | 981712.8790sf |
| Longitude | 81°27'34.73217"W | Elevation | 2903.7232sf | Easting | 1276325.1910sf |
| Height | 2801.1821sf | Horz error | 0.037sf | Elevation | 2903.6430sf |
| | | Vert error | 0.080sf | Utilized | Horz and Vert |
| | | 3D error | 0.088sf | Quality | Survey quality |
| Point | R2915-24 WGS84 | Northing | 980994.0668sf | Point R2915-24 Local | |
| Latitude | 36°25'14.17430"N | Easting | 1276148.6155sf | Northing | 980994.0780sf |
| Longitude | 81°27'36.67335"W | Elevation | 2878.9461sf | Easting | 1276148.6390sf |
| Height | 2776.3983sf | Horz error | 0.026sf | Elevation | 2878.8920sf |
| | | Vert error | 0.054sf | Utilized | Horz and Vert |
| | | 3D error | 0.060sf | Quality | Survey quality |

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2915-15" WITH NAD 83/CORS STATE PLANE GRID COORDINATES OF NORTHING: 954880.7810(±) EASTING: 1254012.2870(±) ELEVATION: 3097.5210(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991292 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2915-15" TO -L- STATION 10+00.00 IS S 08°37'17" E 41208.6602 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

NOTES:

- THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN (HIGH ACCURACY REFERENCE NETWORK) NAD 83/95 ADJUSTMENT. THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION. IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED, ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS, OR BIASES.
 - THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: [HTTPS://CONNECT.NCDOT.GOV/RESOURCES/LOCATION/](https://connect.ncdot.gov/resources/location/) THE FILES TO BE FOUND ARE AS FOLLOWS:
R2915A_LS_GPSALIB.HTML
R2915A_LS_WGS84.TXT
R2915A_LS_LOCAL.TXT
R2915A_LS_CONTROL.TXT
- THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

NOTE: DRAWING NOT TO SCALE

6/2/2019

SURVEY CONTROL SHEET R2915A

| PROJECT REFERENCE NO. | SHEET NO. |
|-----------------------|-----------|
| R-2915A | 1C-4 |
| Location and Surveys | |

| ROW MARKER IRON PIN AND CAP-E | | | | | |
|-------------------------------|-----------|---------|-------------|--------------|--|
| ALIGN | STATION | OFFSET | NORTH | EAST | |
| L | 19-50.97 | 73.00 | 915089.0267 | 1260299.4827 | |
| L | 21-50.00 | 75.00 | 915294.0003 | 1260289.2001 | |
| L | 24-11.43 | 75.00 | 915557.1075 | 1260253.3550 | |
| L | 25-50.00 | 265.00 | 915719.2845 | 1260421.1394 | |
| L | 25-50.00 | 75.00 | 915693.0104 | 1260232.9648 | |
| L | 27-27.07 | -85.00 | 915852.0920 | 1260054.3115 | |
| L | 27-65.00 | 188.00 | 915907.7854 | 1260324.9275 | |
| L | 28-04.84 | -85.00 | 915932.5578 | 1260049.4959 | |
| L | 30-00.00 | 165.00 | 916129.6234 | 1260291.2040 | |
| L | 30-74.84 | -85.00 | 916207.4382 | 1260045.2230 | |
| L | 31-00.00 | 200.00 | 916228.3594 | 1260333.5653 | |
| L | 32-61.10 | -85.00 | 916393.6800 | 1260050.9899 | |
| L | 32-61.10 | 232.22 | 916388.9678 | 1260368.1759 | |
| L | 33-65.00 | 310.00 | 916488.0009 | 1260447.8249 | |
| L | 35-09.00 | 328.00 | 916613.0285 | 1260472.1380 | |
| L | 35-85.10 | -85.00 | 916726.8245 | 1260068.9937 | |
| L | 35-85.10 | 100.00 | 916702.7427 | 1260252.4196 | |
| L | 41-40.00 | -100.00 | 917207.7987 | 1260244.8163 | |
| L | 41-40.00 | -85.00 | 917280.2556 | 1260257.7816 | |
| L | 43-38.00 | -100.00 | 917463.0241 | 1260364.0877 | |
| L | 45-25.57 | 100.00 | 917468.1527 | 1260637.8081 | |
| L | 45-25.57 | -150.00 | 917647.8967 | 1260464.0493 | |
| L | 46-28.00 | -99.16 | 917678.7193 | 1260573.4607 | |
| L | 46-30.00 | 150.00 | 917495.9301 | 1260743.0591 | |
| L | 48-49.57 | -100.00 | 917825.9369 | 1260757.0293 | |
| L | 48-49.57 | 85.00 | 917678.9728 | 1260869.3972 | |
| L | 52-24.59 | -100.00 | 918053.7154 | 1261054.9804 | |
| L | 52-24.59 | 85.00 | 917906.7489 | 1261167.3151 | |
| L | 53-60.00 | 95.00 | 917982.8275 | 1261281.8560 | |
| L | 55-48.59 | -100.00 | 918252.5247 | 1261296.7527 | |
| L | 56-00.00 | 185.00 | 918086.6240 | 1261534.3935 | |
| L | 56-57.00 | 119.00 | 918163.6226 | 1261522.8542 | |
| L | 57-00.00 | 100.00 | 918219.5173 | 1261951.8859 | |
| L | 57-86.26 | -100.00 | 918417.5298 | 1261444.6621 | |
| L | 58-34.00 | 218.00 | 918268.2384 | 1261729.7070 | |
| L | 59-63.00 | -100.00 | 918555.9905 | 1261540.0235 | |
| L | 59-63.00 | -72.12 | 918541.0395 | 1261563.5608 | |
| L | 60-00.00 | 245.00 | 918404.3754 | 1261852.1951 | |
| L | 61-10.26 | -80.00 | 918669.2076 | 1261633.0624 | |
| L | 61-10.26 | -72.84 | 918665.5041 | 1261639.1906 | |
| L | 66-76.00 | -80.00 | 919153.4018 | 1261925.6738 | |
| L | 68-95.00 | -140.00 | 919371.8670 | 1261987.5928 | |
| L | 69-60.00 | -85.00 | 919399.0507 | 1262068.2839 | |
| L | 69-60.00 | -72.87 | 919392.7753 | 1262078.6681 | |
| L | 71-50.00 | 100.00 | 919465.9782 | 1262324.8881 | |
| L | 72-79.33 | 165.00 | 919543.0093 | 1262447.4770 | |
| L | 74-79.00 | 100.00 | 919747.5545 | 1262495.0521 | |
| L | 78-67.25 | -85.00 | 920175.5262 | 1262537.5286 | |
| L | 78-67.25 | -73.03 | 920169.3367 | 1262547.7683 | |
| L | 80-00.00 | -85.00 | 920209.1399 | 1262606.1884 | |
| L | 80-18.07 | 100.00 | 920208.9225 | 1262773.8690 | |
| L | 80-24.03 | -72.82 | 920307.6844 | 1262631.6296 | |
| L | 81-84.34 | 100.00 | 920352.8700 | 1262859.9613 | |
| L | 81-87.10 | 108.52 | 920351.0047 | 1262868.7417 | |
| L | 82-45.03 | -73.91 | 920491.8542 | 1262740.4665 | |
| L | 83-71.52 | 106.95 | 920517.4309 | 1262959.1624 | |
| L | 83-71.52 | 100.00 | 920520.6507 | 1262953.0085 | |
| L | 84-86.00 | 100.00 | 920625.5496 | 1263005.9815 | |
| L | 87-68.00 | 150.00 | 920871.8736 | 1263169.0274 | |
| L | 88-10.00 | 125.00 | 920921.5032 | 1263161.5782 | |
| L | 88-35.00 | 115.00 | 920949.1610 | 1263161.4053 | |
| L | 89-00.00 | 100.00 | 921017.0689 | 1263170.3592 | |
| L | 89-80.00 | -75.93 | 921150.3937 | 1263030.3155 | |
| L | 89-80.00 | -100.00 | 921158.0193 | 1263007.4839 | |
| L | 93-10.00 | -100.00 | 921466.8325 | 1263095.9620 | |
| L | 94-19.83 | 100.00 | 921530.0870 | 1263315.1730 | |
| L | 94-80.00 | -140.00 | 921636.4930 | 1263091.8507 | |
| L | 94-85.00 | 99.56 | 921595.4701 | 1263327.9257 | |
| L | 95-30.00 | 210.00 | 921620.0040 | 1263445.0436 | |
| L | 95-70.00 | -76.03 | 921711.7390 | 1263371.1387 | |
| L | 96-50.00 | 220.00 | 921737.6825 | 1263476.6922 | |
| L | 97-50.00 | 180.00 | 921843.1969 | 1263455.0888 | |
| L | 98-00.00 | 180.00 | 921892.4020 | 1263463.9691 | |
| L | 98-76.15 | -71.58 | 922012.0238 | 1263229.9126 | |
| L | 99-25.00 | 100.00 | 922029.7676 | 1263407.4441 | |
| L | 100-92.15 | 100.00 | 922197.2049 | 1263435.6078 | |
| L | 100-92.15 | -70.83 | 922222.8907 | 1263266.7176 | |
| L | 105-82.35 | -73.24 | 922800.0931 | 1263307.4080 | |
| L | 105-82.35 | 100.00 | 922800.3750 | 1263480.6443 | |
| L | 107-44.82 | 100.00 | 922864.2155 | 1263480.8760 | |
| L | 109-49.00 | 130.00 | 923070.6198 | 1263504.7297 | |
| L | 109-95.00 | 190.00 | 923118.3694 | 1263563.3469 | |
| L | 110-06.17 | 122.57 | 923127.5419 | 1263495.6153 | |
| L | 110-45.00 | 220.00 | 923169.2325 | 1263591.8591 | |
| L | 112-32.00 | 125.00 | 923353.3492 | 1263491.3851 | |
| L | 112-98.00 | 140.00 | 923419.7629 | 1263504.4320 | |
| L | 114-05.00 | 143.00 | 923527.9035 | 1263504.0276 | |
| L | 114-11.23 | -73.38 | 923525.9859 | 1263287.5603 | |
| L | 115-25.00 | 95.00 | 923649.6741 | 1263449.3508 | |
| L | 115-52.00 | -100.00 | 923661.0543 | 1263252.7218 | |
| L | 115-56.25 | -73.38 | 923666.7631 | 1263278.9250 | |
| L | 116-47.36 | 100.00 | 923779.0435 | 1263439.9255 | |
| L | 116-47.36 | -100.00 | 923748.9012 | 1263242.2100 | |
| L | 117-45.00 | 100.00 | 923882.1551 | 1263420.3078 | |
| L | 118-45.00 | 100.00 | 923985.9715 | 1263392.4331 | |
| L | 123-23.66 | -100.00 | 924317.4474 | 1262998.1016 | |
| L | 123-23.66 | 100.00 | 924440.0396 | 1263156.1243 | |

| ROW MARKER IRON PIN AND CAP-E | | | | | |
|-------------------------------|-----------|---------|-------------|--------------|--|
| ALIGN | STATION | OFFSET | NORTH | EAST | |
| L | 126-47.66 | -100.00 | 924547.1852 | 1262707.5693 | |
| L | 126-47.66 | 100.00 | 924688.0694 | 1262929.5257 | |
| L | 128-00.00 | -150.00 | 924623.9525 | 1262642.9406 | |
| L | 128-10.00 | 100.00 | 924802.2472 | 1262818.4756 | |
| L | 128-05.00 | -100.00 | 924724.0004 | 1262619.6731 | |
| L | 129-57.00 | 265.00 | 925009.6596 | 1262856.6469 | |
| L | 129-71.66 | -100.00 | 924795.2179 | 1262560.9679 | |
| L | 130-92.00 | -100.00 | 924900.8935 | 1262486.3892 | |
| L | 130-92.00 | -85.00 | 924908.9794 | 1262495.0232 | |
| L | 131-48.00 | 298.00 | 925122.3332 | 1262747.1122 | |
| L | 133-25.00 | 219.00 | 925245.1173 | 1262665.0112 | |
| L | 134-25.52 | -95.00 | 925228.5847 | 1262347.0190 | |
| L | 135-03.00 | 285.00 | 925383.5390 | 1262603.1827 | |
| L | 136-41.00 | 147.00 | 925494.2864 | 1262517.0697 | |
| L | 137-49.52 | -85.00 | 925553.2970 | 1262268.2533 | |
| L | 137-85.34 | 100.00 | 925624.5911 | 1262442.6818 | |
| L | 138-78.00 | 147.00 | 925724.6481 | 1262470.6623 | |
| L | 138-78.00 | 100.00 | 925715.4605 | 1262424.5691 | |
| L | 141-04.00 | 280.00 | 925972.2870 | 1262556.9176 | |
| L | 141-46.00 | 289.00 | 926015.2361 | 1262597.5338 | |
| L | 143-06.00 | 299.00 | 926174.1041 | 1262536.0638 | |
| L | 143-06.00 | 346.00 | 926183.2917 | 1262582.1570 | |
| L | 145-20.00 | 144.00 | 926353.6758 | 1262342.2211 | |
| L | 145-66.53 | -85.00 | 926354.5440 | 1262108.5431 | |
| L | 146-57.00 | 240.00 | 926504.6168 | 1262410.3040 | |
| L | 147-94.00 | 263.00 | 926630.8927 | 1262412.4627 | |
| L | 148-90.53 | -85.00 | 926684.6420 | 1262056.7873 | |
| L | 149-46.34 | 259.37 | 926755.2798 | 1262397.7689 | |
| L | 149-95.88 | -85.00 | 926796.6271 | 1262052.8283 | |
| L | 150-52.20 | -85.00 | 926856.6023 | 1262054.3562 | |
| L | 150-95.00 | 295.00 | 926875.2027 | 1262396.1507 | |
| L | 151-49.01 | -85.00 | 926959.1374 | 1262062.6809 | |
| L | 152-35.00 | -85.00 | 927048.8801 | 1262076.3410 | |
| L | 152-57.00 | 171.00 | 927023.8861 | 1262332.0214 | |
| L | 153-30.00 | 155.00 | 927093.7418 | 1262330.8897 | |
| L | 153-85.00 | 100.00 | 927157.7790 | 1262288.3467 | |
| L | 154-30.00 | -150.00 | 927260.0444 | 1262055.8115 | |
| L | 155-30.00 | -85.00 | 927341.6537 | 1262142.7091 | |
| L | 157-47.54 | 96.97 | 927519.7741 | 1262365.3144 | |
| L | 157-96.80 | -85.00 | 927593.6015 | 1262191.8497 | |
| L | 158-65.00 | -52.44 | 927654.8662 | 1262230.3018 | |
| L | 158-65.00 | -85.00 | 927657.0813 | 1262197.8144 | |
| L | 158-95.00 | -52.43 | 927726.4892 | 1262231.9416 | |
| L | 158-95.00 | -85.00 | 927685.1182 | 1262199.4087 | |
| L | 159-50.00 | 100.00 | 927735.8120 | 1262385.6861 | |
| L | 160-01.03 | 100.00 | 927791.5343 | 1262384.8326 | |
| L | 160-01.03 | -85.00 | 927785.0970 | 1262199.9446 | |

| ROW MARKER IRON PIN AND CAP-E | | | | | |
|-------------------------------|----------|--------|-------------|--------------|--|
| ALIGN | STATION | OFFSET | NORTH | EAST | |
| RPA | 5-00.00 | 50.00 | 913839.8966 | 1260050.6977 | |
| RPA | 9-15.69 | 80.00 | 914160.5851 | 1260574.7202 | |
| RPA | 11-07.69 | 50.00 | 914294.2853 | 1260455.6361 | |
| RPA | 16-08.65 | 50.00 | 914734.0716 | 1260297.1328 | |

| ROW MARKER IRON PIN AND CAP-E | | | | | |
|-------------------------------|----------|--------|-------------|--------------|--|
| ALIGN | STATION | OFFSET | NORTH | EAST | |
| RPC | 9-27.99 | 115.00 | 914203.5507 | 1259600.9631 | |
| RPC | 10-72.99 | 115.00 | 914025.3083 | 1259592.5593 | |
| RPC | 16-53.76 | 115.00 | 913867.4381 | 1260240.1927 | |
| RPC | 16-94.57 | 122.31 | 913915.8008 | 1260277.4039 | |

| ROW MARKER IRON PIN AND CAP-E | | | | | |
|-------------------------------|----------|--------|-------------|--------------|--|
| ALIGN | STATION | OFFSET | NORTH | EAST | |
| SR1 | 11-49.52 | -22.50 | 915306.5800 | 1258210.9204 | |
| SR1 | 12-23.07 | -22.50 | 915311.0830 | 1258301.7557 | |
| SR1 | 26-70.00 | 17.98 | 914697.0282 | 1259612.5500 | |
| SR1 | 26-70.00 | -22.50 | 914734.1557 | 1259628.6923 | |

| ROW MARKER IRON PIN AND CAP-E | | | | | |
|-------------------------------|----------|--------|-------------|--------------|--|
| ALIGN | STATION | OFFSET | NORTH | EAST | |
| SR2 | 13-71.78 | -30.00 | 915000.4869 | 1260350.1504 | |
| SR2 | 25-84.53 | -30.00 | 913963.9770 | 1260834.1501 | |
| SR2 | 27-85.81 | -30.00 | 913838.2713 | 1260991.3410 | |

| ROW MARKER IRON PIN AND CAP-E | | | | | |
|-------------------------------|---------|--------|-------|------|--|
| ALIGN | STATION | OFFSET | NORTH | EAST | |
| SR2REV | 12-82.5 | | | | |

SURVEY CONTROL SHEET R-2915A

| L | | | |
|------|-----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 9+96.75 | 914134.5228 | 1260189.5799 |
| TS | 16+80.97 | 914818.0953 | 1260219.4253 |
| SC | 19+50.97 | 915087.9752 | 1260225.9902 |
| CS | 21+41.43 | 915278.0933 | 1260215.4892 |
| SRS | 24+11.43 | 915545.6085 | 1260179.2417 |
| SC | 26+81.43 | 915813.1237 | 1260142.9943 |
| CS | 28+04.84 | 915936.2188 | 1260134.4170 |
| ST | 30+74.84 | 916206.1759 | 1260133.2137 |
| TS | 32+61.10 | 916392.4173 | 1260135.9805 |
| SC | 35+85.10 | 916715.7626 | 1260153.2708 |
| CS | 45+25.57 | 917540.0503 | 1260568.3046 |
| ST | 48+49.57 | 917746.4955 | 1260817.7670 |
| TS | 52+24.59 | 917974.2740 | 1261115.6881 |
| SC | 55+48.59 | 918180.0931 | 1261365.6995 |
| CS | 57+86.26 | 918356.8843 | 1261524.1738 |
| ST | 61+10.26 | 918627.8303 | 1261701.5308 |
| TS | 80+29.03 | 920270.0209 | 1262693.9502 |
| SC | 82+45.03 | 920455.9263 | 1262803.9132 |
| CS | 94+19.83 | 921550.6297 | 1263217.3057 |
| ST | 96+35.83 | 921762.8161 | 1263257.6740 |
| TS | 98+76.15 | 921999.3129 | 1263300.3560 |
| SC | 100+92.15 | 922212.2188 | 1263336.7413 |
| CS | 106+82.35 | 922800.2123 | 1263380.6445 |
| ST | 108+98.35 | 923016.1608 | 1263376.2800 |
| TS | 113+23.36 | 923440.9796 | 1263363.7450 |
| SC | 116+47.36 | 923763.9709 | 1263341.0680 |
| CS | 123+23.66 | 924378.7435 | 1263077.1129 |
| SRS | 126+47.66 | 924617.6288 | 1262858.5461 |
| SC | 129+71.66 | 924856.5140 | 1262639.9792 |
| CS | 134+25.52 | 925255.2060 | 1262427.7425 |
| ST | 137+49.52 | 925569.9153 | 1262351.6130 |
| TS | 145+66.53 | 926371.1594 | 1262191.9034 |
| SC | 148+90.53 | 926691.0063 | 1262141.5487 |
| CS | 151+48.88 | 926948.8826 | 1262147.2690 |
| SRS | 154+72.88 | 927266.1820 | 1262211.7570 |
| SC | 157+96.88 | 927583.4815 | 1262276.2450 |
| CS | 160+01.83 | 927788.0547 | 1262284.8931 |
| ST | 163+25.83 | 928109.6646 | 1262247.4144 |
| POT | 164+13.07 | 928195.8370 | 1262233.8078 |

| LPC | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| CS | 5+00.00 | 914266.3785 | 1260102.1447 |
| SC | 6+20.00 | 914309.3602 | 1259990.5822 |
| CS | 16+57.49 | 914018.0813 | 1260165.1730 |
| ST | 17+77.49 | 914136.6663 | 1260180.9152 |
| POT | 17+78.98 | 914138.1513 | 1260180.9800 |

| RPA | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 5+00.00 | 913806.6777 | 1260813.5278 |
| TS | 9+15.69 | 914117.3665 | 1260537.3502 |
| SC | 11+07.69 | 914265.1893 | 1260414.9738 |
| CS | 16+08.65 | 914730.5412 | 1260247.2576 |
| ST | 18+00.65 | 914922.4462 | 1260247.1936 |

| RPB | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| PC | 5+00.00 | 914423.1657 | 1259930.3752 |
| PT | 7+57.64 | 914538.1369 | 1260117.6462 |
| TS | 12+40.48 | 915020.1491 | 1260146.0551 |
| SC | 13+73.48 | 915152.9706 | 1260152.8857 |
| CS | 16+36.13 | 915415.5239 | 1260150.7951 |
| ST | 17+69.13 | 915548.2198 | 1260141.8504 |
| POT | 19+60.25 | 915738.8080 | 1260127.5687 |

| RPC | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| TS | 5+00.00 | 914520.7173 | 1259530.4582 |
| SC | 6+45.00 | 914448.7302 | 1259655.4833 |
| CS | 7+82.99 | 914329.8710 | 1259720.8126 |
| SRS | 9+27.99 | 914185.7374 | 1259714.5751 |
| SC | 10+72.99 | 914041.5366 | 1259706.4085 |
| CS | 17+21.84 | 913994.4222 | 1260177.9367 |
| ST | 18+66.84 | 914137.3880 | 1260198.4634 |

| SR1 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 915159.6528 | 1258148.6823 |
| PC | 10+97.41 | 915248.9813 | 1258187.5207 |
| PT | 12+23.07 | 915290.4489 | 1258292.7843 |
| POT | 26+73.26 | 914712.2234 | 1259622.7068 |

| SR2 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 915274.6781 | 1260215.8157 |
| PC | 10+66.74 | 915279.9936 | 1260282.3432 |
| PT | 11+33.66 | 915239.2202 | 1260325.5189 |
| PC | 13+71.78 | 915001.1623 | 1260320.1580 |
| PT | 25+84.53 | 913940.5475 | 1260815.4136 |
| POT | 28+57.05 | 913770.3467 | 1261028.2441 |

| SR2REV | | | |
|--------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 915753.3013 | 1260149.4805 |
| PC | 10+42.92 | 915758.3965 | 1260192.0968 |
| PT | 11+44.01 | 915702.5781 | 1260264.2254 |
| PC | 14+07.52 | 915441.4530 | 1260299.5839 |
| PT | 17+96.35 | 915053.6268 | 1260321.3394 |

| Y1 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 915217.5097 | 1258015.6111 |
| TS | 30+49.21 | 914400.4399 | 1259894.8767 |
| SC | 32+49.21 | 914318.0407 | 1260077.0952 |
| CS | 39+33.18 | 913931.5125 | 1260638.2996 |
| ST | 41+33.18 | 913790.6432 | 1260780.2470 |
| PC | 47+19.28 | 913371.7807 | 1261190.2068 |
| PT | 53+88.93 | 912921.5403 | 1261685.3864 |
| POT | 59+99.16 | 912537.9933 | 1262160.0140 |

| Y2 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 918655.3619 | 1261718.1689 |
| PC | 10+39.50 | 918634.9319 | 1261751.9752 |
| PT | 10+94.26 | 918608.0033 | 1261799.6515 |
| PC | 12+75.12 | 918523.7326 | 1261959.6760 |
| PT | 13+47.13 | 918492.1947 | 1262024.4016 |
| PC | 14+45.15 | 918452.0421 | 1262113.8121 |
| PT | 15+85.03 | 918387.1236 | 1262237.6277 |
| POT | 16+49.58 | 918353.7344 | 1262292.8607 |

| Y3 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 920286.2996 | 1262703.7862 |
| PC | 11+01.20 | 920233.9757 | 1262790.4118 |
| PT | 11+71.92 | 920204.8514 | 1262854.6762 |
| PC | 12+33.72 | 920186.1389 | 1262913.5709 |
| PT | 12+66.12 | 920178.0127 | 1262944.9188 |
| POT | 12+70.03 | 920177.2367 | 1262948.7542 |

| Y4 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 922886.4343 | 1263379.6725 |
| PC | 10+39.68 | 922887.2054 | 1263419.3420 |
| PT | 13+77.41 | 923006.1441 | 1263728.1788 |
| PC | 14+27.06 | 923038.7266 | 1263765.6453 |
| PT | 15+77.48 | 923119.7918 | 1263891.7305 |
| PC | 19+04.41 | 923255.1896 | 1264189.3082 |
| PT | 19+23.96 | 923262.6715 | 1264207.3614 |
| PC | 19+26.96 | 923263.7263 | 1264210.1740 |
| PT | 20+44.54 | 923286.3615 | 1264325.0134 |
| PC | 21+23.98 | 923288.7794 | 1264404.4195 |
| PT | 21+40.09 | 923289.6090 | 1264420.5063 |
| POT | 22+56.87 | 923298.0815 | 1264536.9768 |

| Y5 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 923192.3014 | 1262373.7609 |
| PC | 14+43.87 | 923168.1321 | 1262816.9747 |
| PT | 16+85.03 | 923156.4529 | 1263057.8456 |
| POT | 20+00.00 | 923143.0958 | 1263372.5346 |

| Y6 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 923910.5155 | 1263310.1955 |
| PC | 11+48.09 | 923949.1536 | 1263453.1559 |
| PT | 12+05.28 | 923965.0968 | 1263508.0756 |
| POT | 12+93.32 | 923991.2081 | 1263592.1585 |

| Y7 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| POT | 10+00.00 | 925432.0305 | 1262380.1984 |
| PC | 10+40.17 | 925440.7870 | 1262419.4013 |
| PT | 11+06.85 | 925488.7099 | 1262458.4941 |
| PC | 11+47.55 | 925529.4073 | 1262459.2062 |
| PT | 12+60.31 | 925607.9401 | 1262527.1924 |
| PC | 12+88.59 | 925612.4796 | 1262555.1071 |
| PT | 14+24.70 | 925714.0948 | 1262620.1545 |
| PC | 16+03.83 | 925886.6938 | 1262572.2429 |
| PT | 18+02.45 | 926083.1540 | 1262569.0750 |
| PC | 19+10.92 | 926188.5515 | 1262594.7028 |
| PRC | 21+57.21 | 926424.9522 | 1262663.4856 |
| PT | 23+71.26 | 926635.7719 | 1262691.7268 |
| POT | 24+55.06 | 926719.4170 | 1262686.5824 |

| Y8 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| PC | 10+00.00 | 926932.3437 | 1261602.7492 |
| PT | 10+41.44 | 926918.1136 | 1261641.6410 |
| PC | 11+64.72 | 926883.3759 | 1261759.9198 |
| PT | 11+78.45 | 926879.6655 | 1261773.1370 |
| PC | 13+48.78 | 926835.5962 | 1261937.6711 |
| PT | 13+92.00 | 926829.2130 | 1261980.3256 |
| POT | 15+50.00 | 926823.6222 | 1262138.2257 |

| Y9 | | | |
|------|----------|-------------|--------------|
| TYPE | STATION | NORTH | EAST |
| PC | 10+00.00 | 927638.9745 | 1262281.7196 |
| PT | 13+09.68 | 927718.7893 | 1262575.5152 |
| POT | 18+17.44 | 927998.9750 | 1262998.9801 |

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "R2915-15" WITH NAD 83/CORS STATE PLANE GRID COORDINATES OF NORTHING: 954880.7810(ft) EASTING: 1254012.2870(ft) ELEVATION: 3097.5210(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99991292 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "R2915-15" TO L- STATION 10+00.00 IS S 08°37'17" E 41208.6602 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

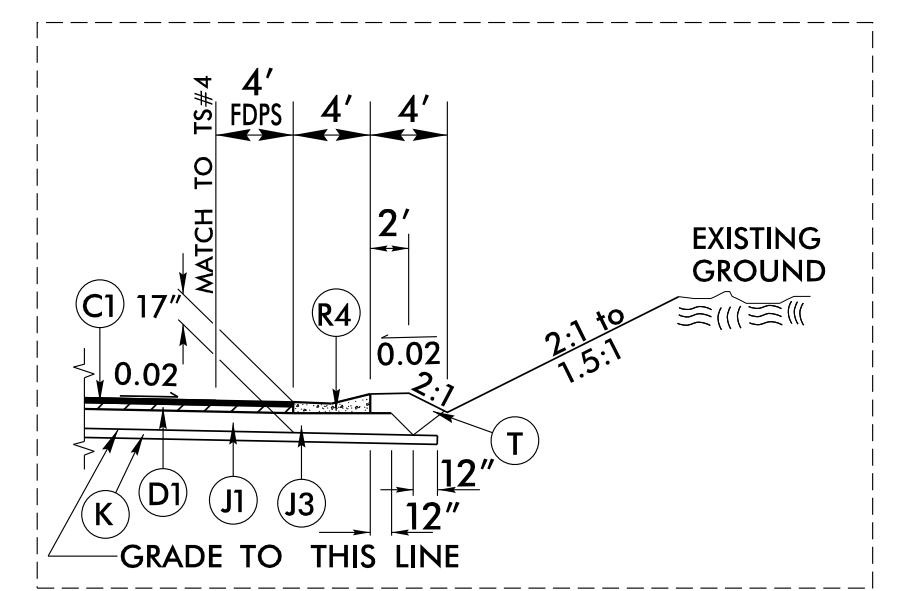
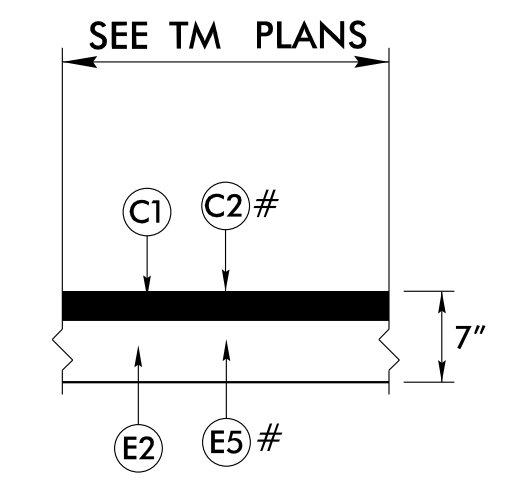
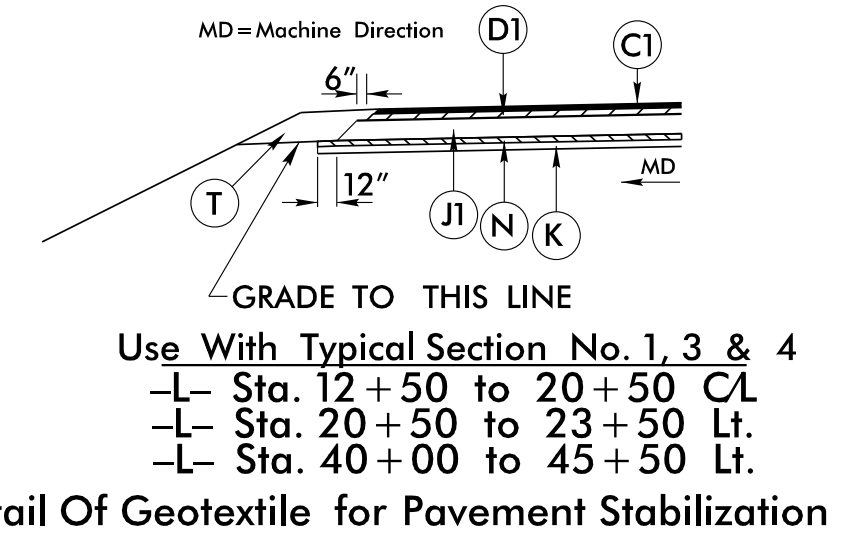
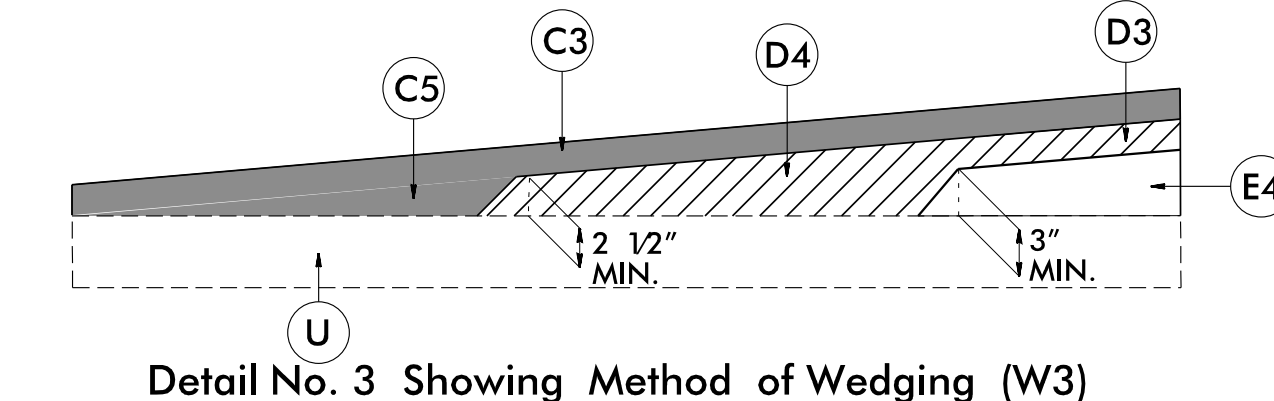
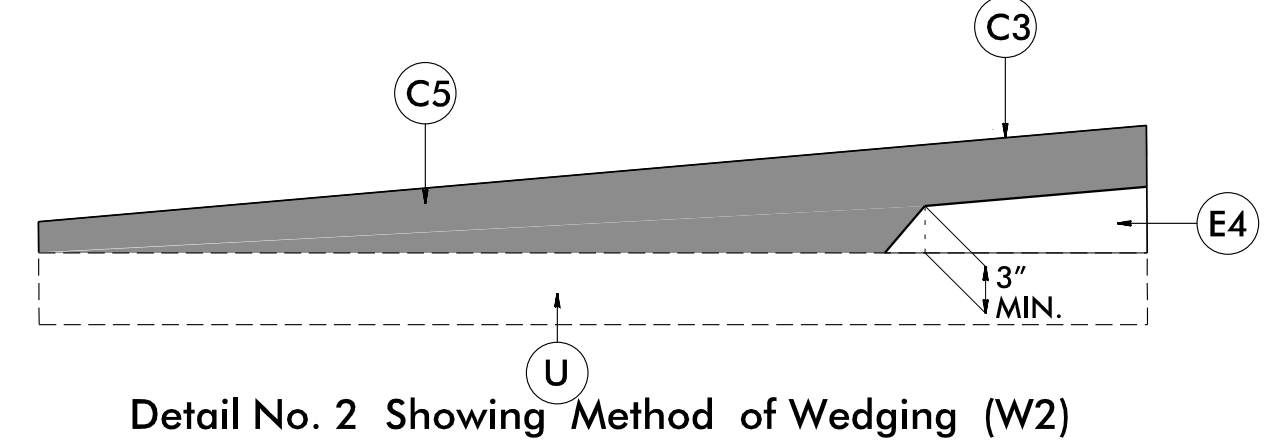
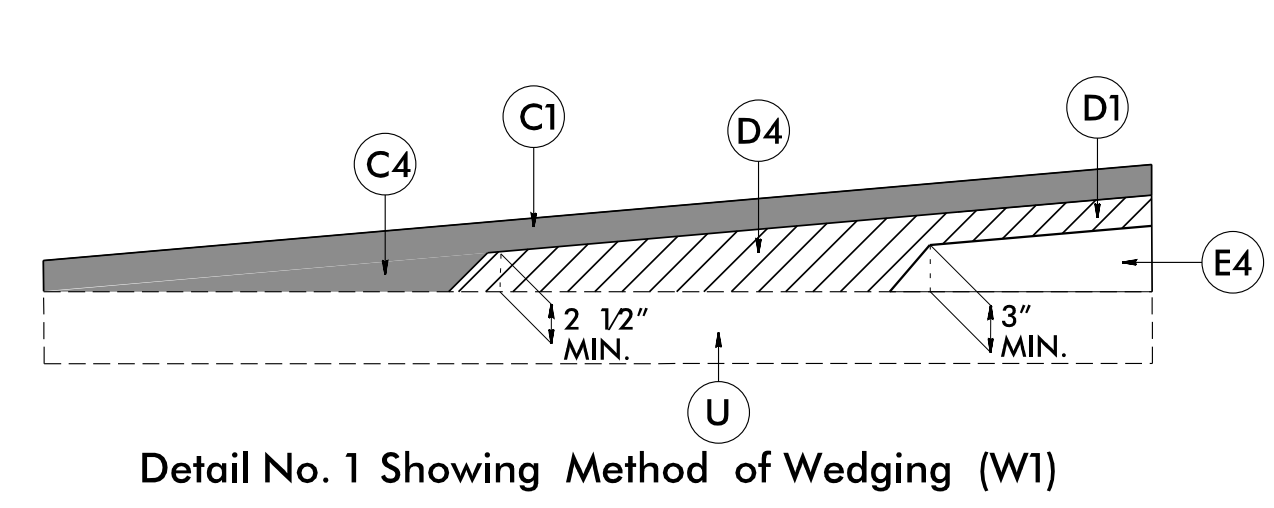
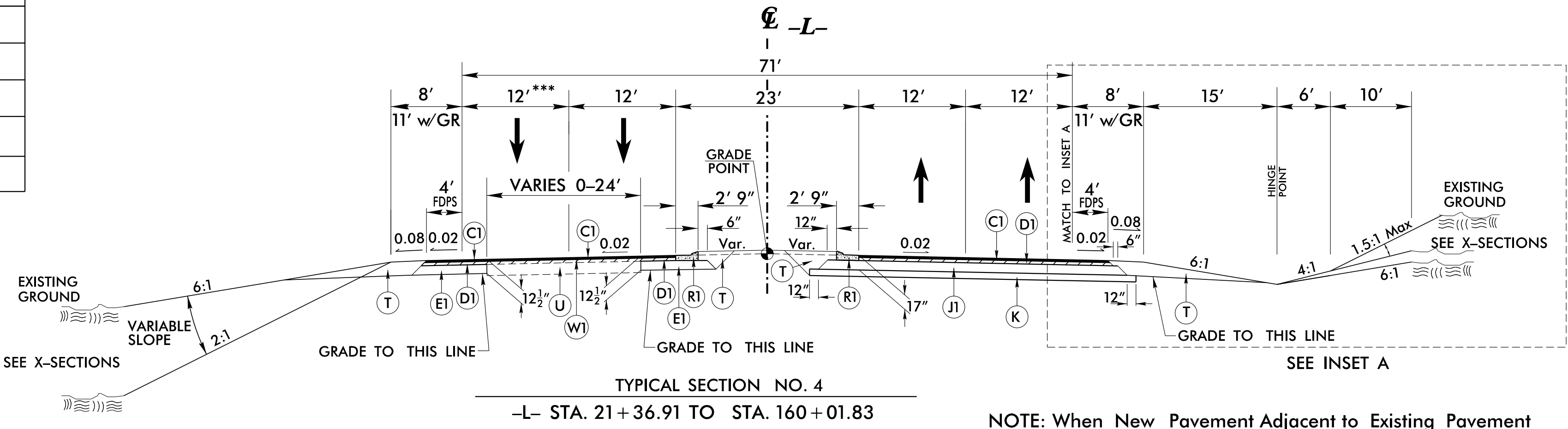
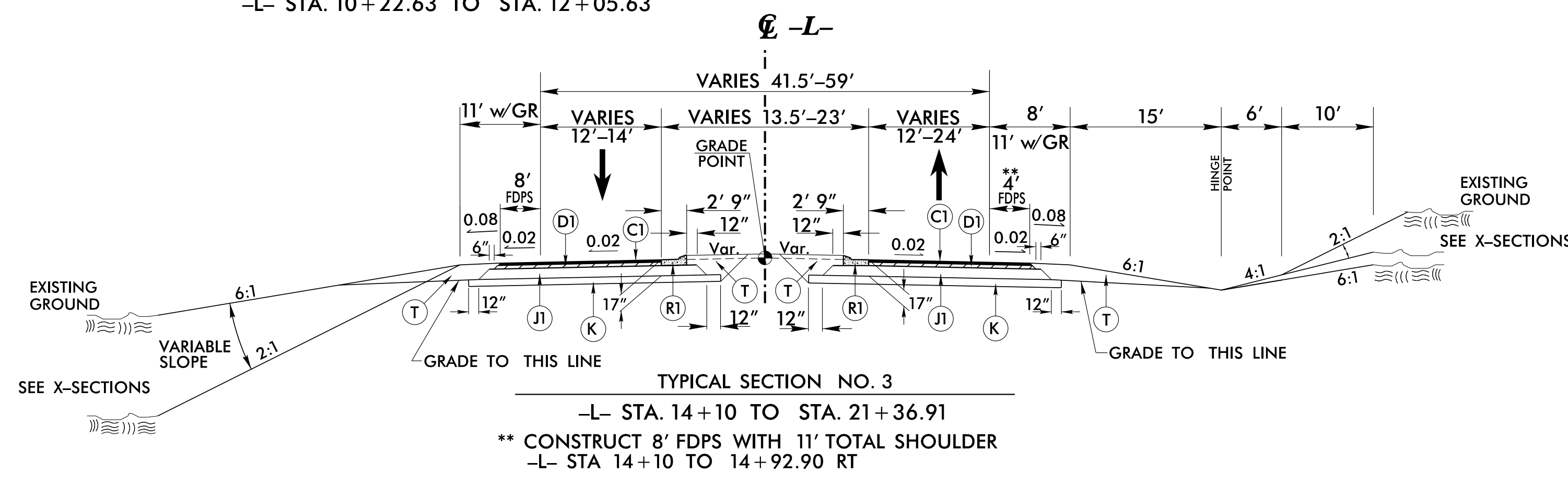
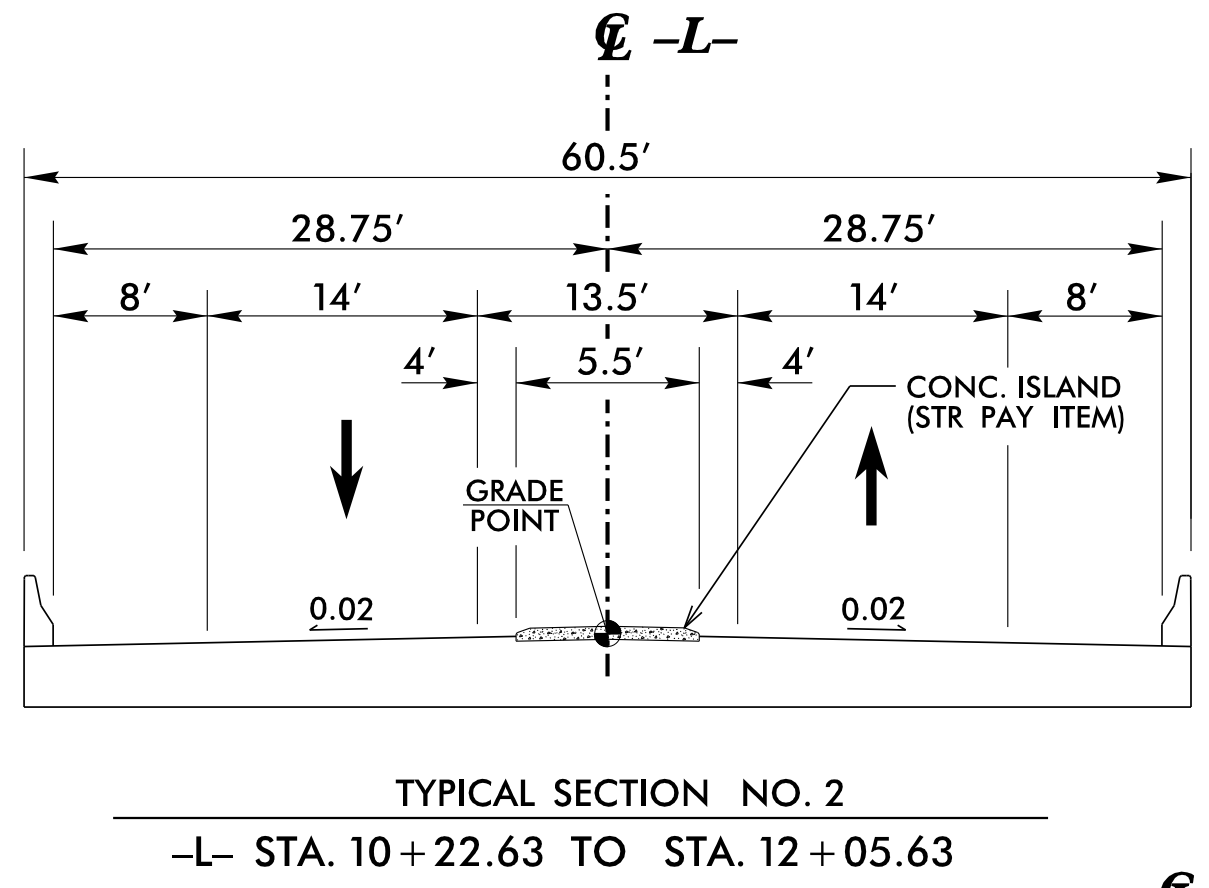
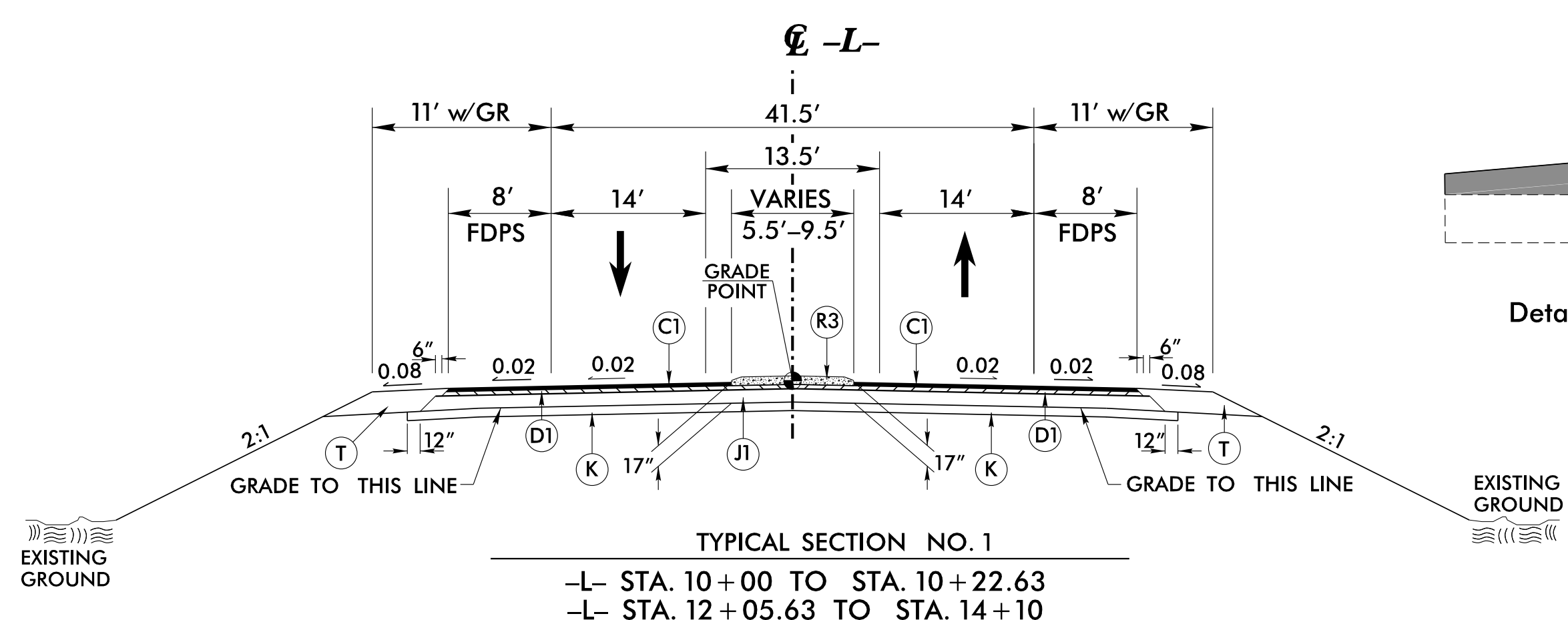
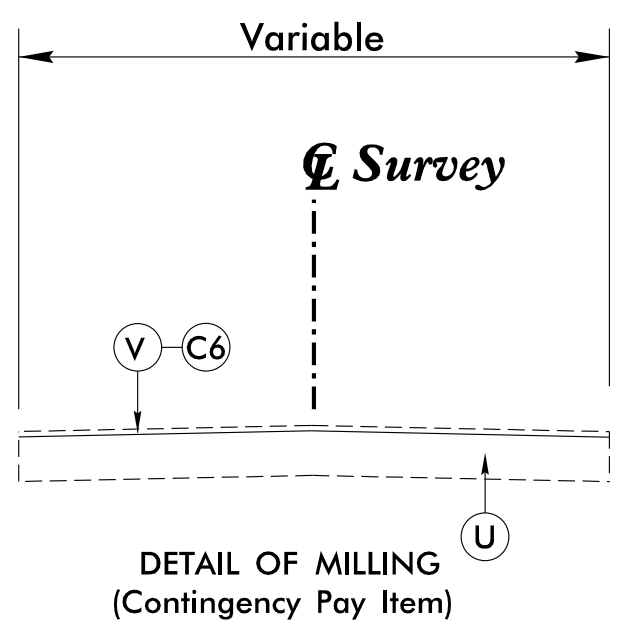
NOTES:

- THE SITE CALIBRATION SHOWN IS BASED UPON A NETWORK TIED TO THE HARN HIGH ACCURACY REFERENCE NETWORK AND 4354 ADJUSTMENT THIS CALIBRATION WILL ALLOW THE END USER TO WORK WITHIN THE SAME COORDINATE SYSTEM WHEN USING RTK (REAL TIME KINEMATIC) GPS AND A LOCAL BASE STATION IF ANOTHER SYSTEM SUCH AS VRS (VIRTUAL REFERENCE STATION) IS USED. ADDITIONAL FIELD TIES MAY BE NEEDED TO REDUCE POSSIBLE ERRORS OR BIASES.
 - THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT: [HTTP://WWW.NCDOT.ORG/DOH/CONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.ncdot.org/DOH/CONSTRUCT/HIGHWAY/LOCATION/PROJECT/) THE FILES TO BE FOUND ARE AS FOLLOWS:
R2915_IS_GPCALIBR.HTML
R2915_IS_WGS84.TXT
R2915_IS_LOCAL.TXT
R2915_IS_CONTROL.TXT
- THE WGS84 AND LOCAL FILES ARE COMMA DELIMITED AND CAN BE USED TO REPRODUCE THE SITE CALIBRATION FOR THE END USER'S GPS EQUIPMENT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.
- © INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
SEE GPS CALIBRATION SHEET FOR HORIZONTAL AND VERTICAL COORDINATE VALUES.

6/2/99

| PAVEMENT DESIGN | |
|-----------------|--|
| C1 | PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| C2 | PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| C3 | PROP. APPROX. 2 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. IN EACH OF TWO LAYERS. |
| C4 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH. |
| C5 | PROP. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1.5" IN DEPTH. |
| C6 | PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD. |
| C7 | PROP. APPROX. 1 1/4" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS. PER SQ. YD. |
| D1 | PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. |
| D2 | PROP. APPROX. 4 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 513 LBS. PER SQ. YD. |
| D3 | PROP. APPROX. 2 1/2" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD. |
| D4 | PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2 1/2" IN DEPTH OR GREATER THAN 4" IN DEPTH. |
| E1 | PROP. APPROX. 5 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD. |
| E2 | PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. |
| E3 | PROP. APPROX. 5 1/2" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 627 LBS. PER SQ. YD. |
| E4 | PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH. |
| E5 | PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. |
| J1 | 10" AGGREGATE BASE COURSE |
| J2 | 8" AGGREGATE BASE COURSE |
| J3 | VARIABLE DEPTH AGGREGATE BASE COURSE |
| K | BASE TO BE TREATED WITH LIME TO A DEPTH OF 8", AT A RATE OF 20 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER -OR- BASE TO BE TREATED WITH CEMENT TO A DEPTH OF 7", AT A RATE OF 55 LBS. PER SQ. YD. AS DIRECTED BY THE ENGINEER |
| N | GEOTEXTILE FOR PAVEMENT STABILIZATION |
| P | PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD. |
| R1 | 2'-9" MOUNTABLE CURB & GUTTER |
| R2 | 2'-6" CURB & GUTTER |
| R3 | 5" MONOLITHIC CONCRETE ISLAND (KEYED-IN) |
| R4 | CONCRETE EXPRESSWAY GUTTER |
| R5 | DOUBLE FACED CONCRETE BARRIER, TYPE T |
| R6 | DOUBLE FACED CONCRETE BARRIER, TYPE T1 |
| R7 | DOUBLE FACED CONCRETE BARRIER, TYPE T2 |
| R8 | SINGLE FACED CONCRETE BARRIER |
| T | EARTH MATERIAL. |
| U | EXISTING PAVEMENT |
| V | MILLING OF EXISTING ASPHALT PAVEMENT, 1.5" IN DEPTH |
| W1 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL NO. 1) |
| W2 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL NO. 2) |
| W3 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL NO. 3) |

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



NOTE: When New Pavement Adjacent to Existing Pavement is 6' or Greater, Use (J1) in Lieu of (E1)
NOTE: Reverse Typical Section No. 4 When Widening Existing Pavement on Right Side of -L-

| | |
|---|--------------------------|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 2A-1 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |
| | |
| 7/24/2015 | 7/24/2015 |

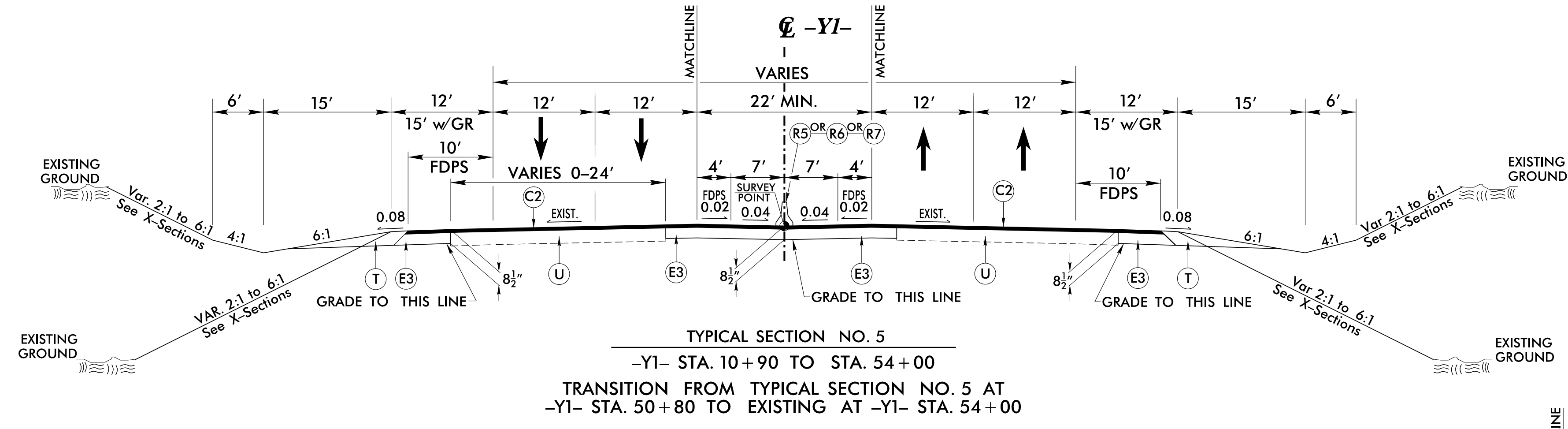
V&M
Vaughan & Melton
Consulting Engineers
Asheville, North Carolina
828-253-2796

- Boone, NC 828-355-9333
- Ft. Mitchell, TN 423-461-9801
- Knoxville, TN 865-946-1800
- Sparksburg, MD 864-574-4175
- Chattanooga, TN 423-974-9650
- Wadesboro, NC 704-248-6600
- Asheville, NC 828-253-2796
- Chapel Hill, NC 919-977-9455
- Winston-Salem, NC 703-351-0488
- Charlotte, NC 704-627-3509

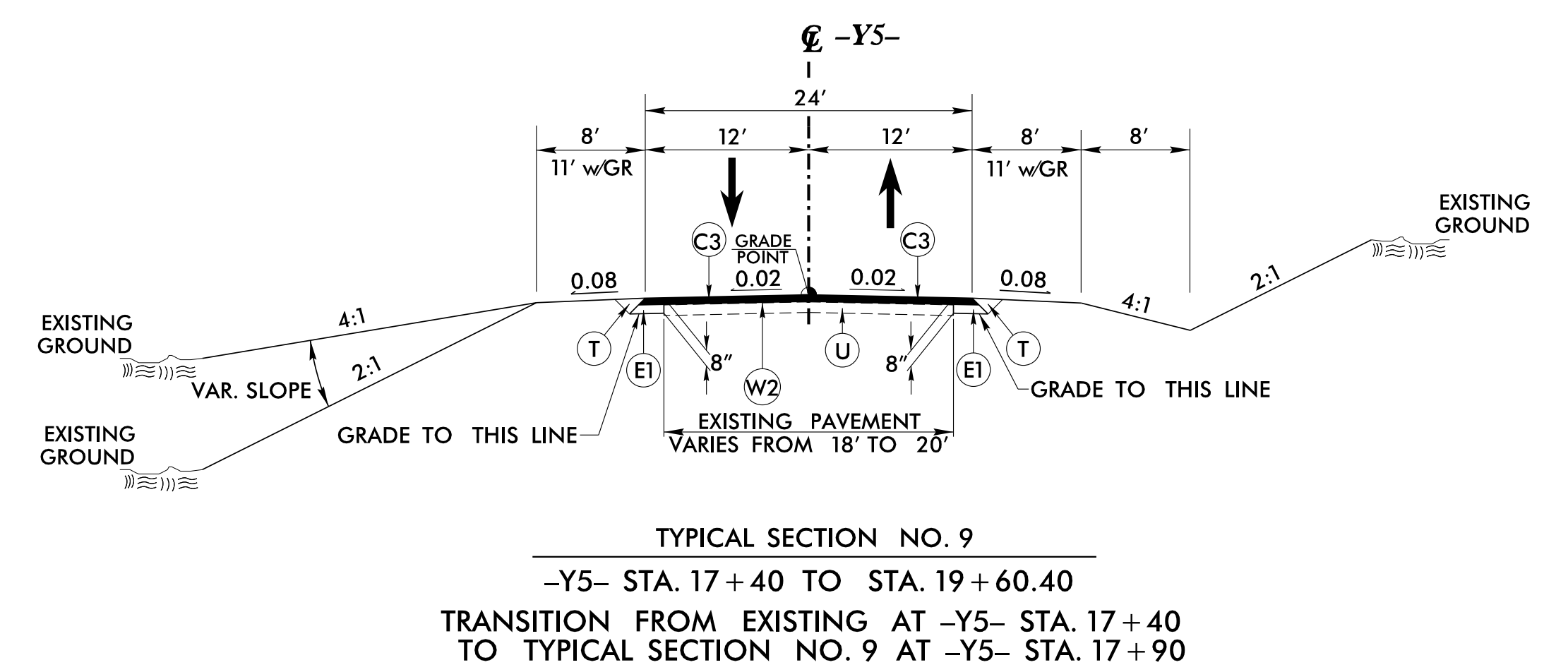
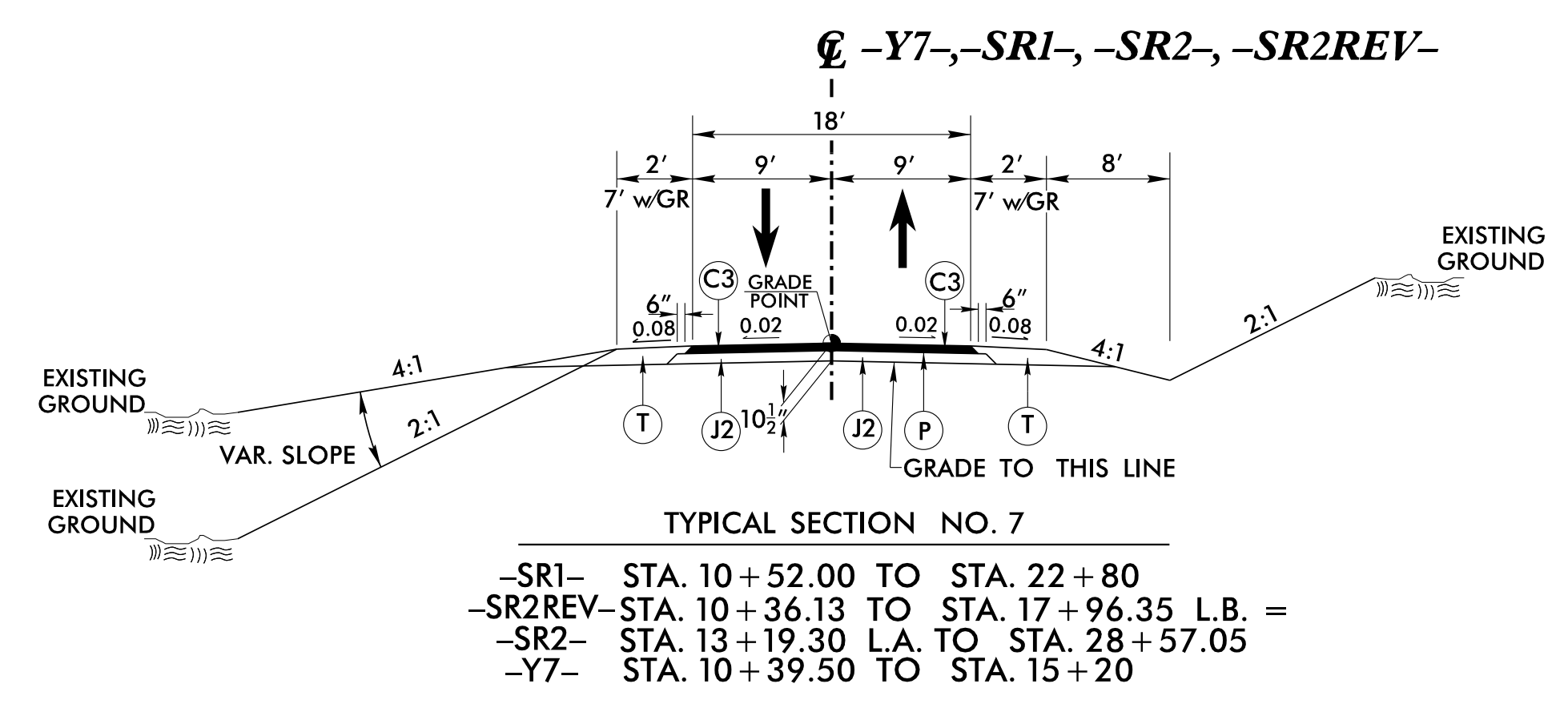
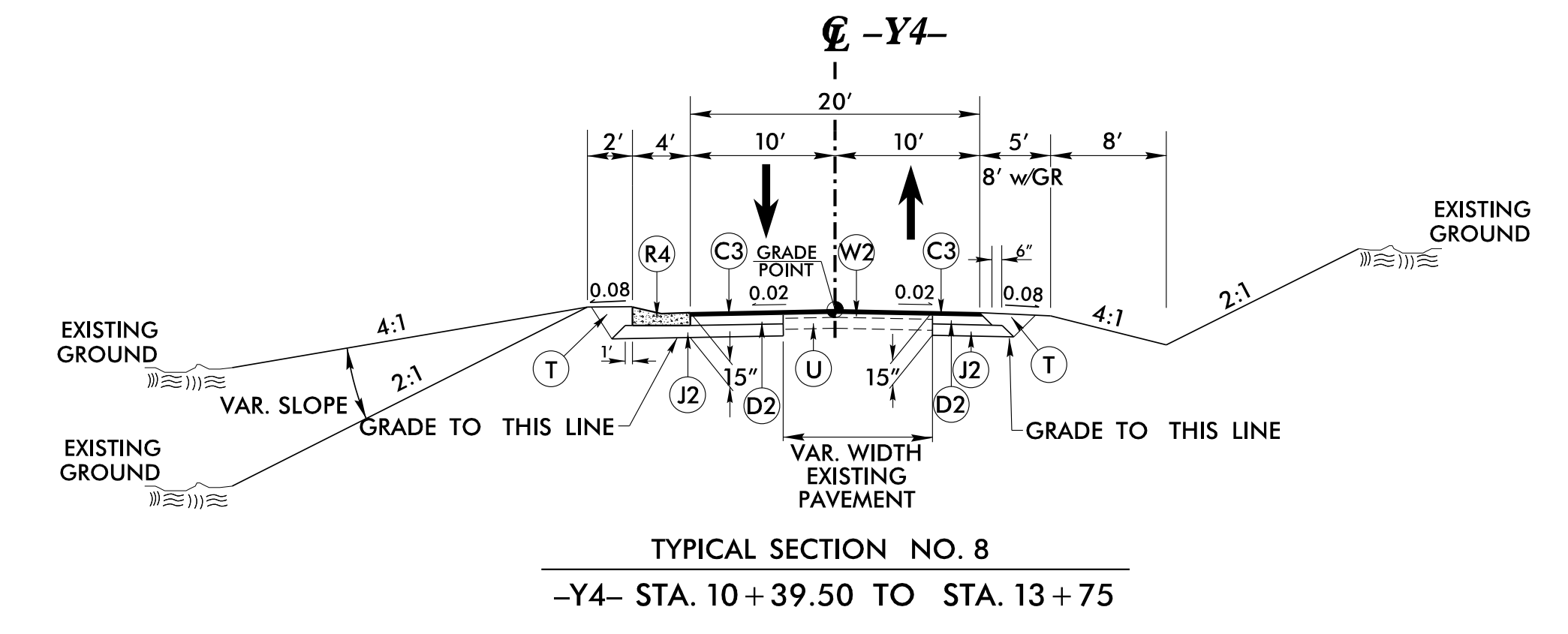
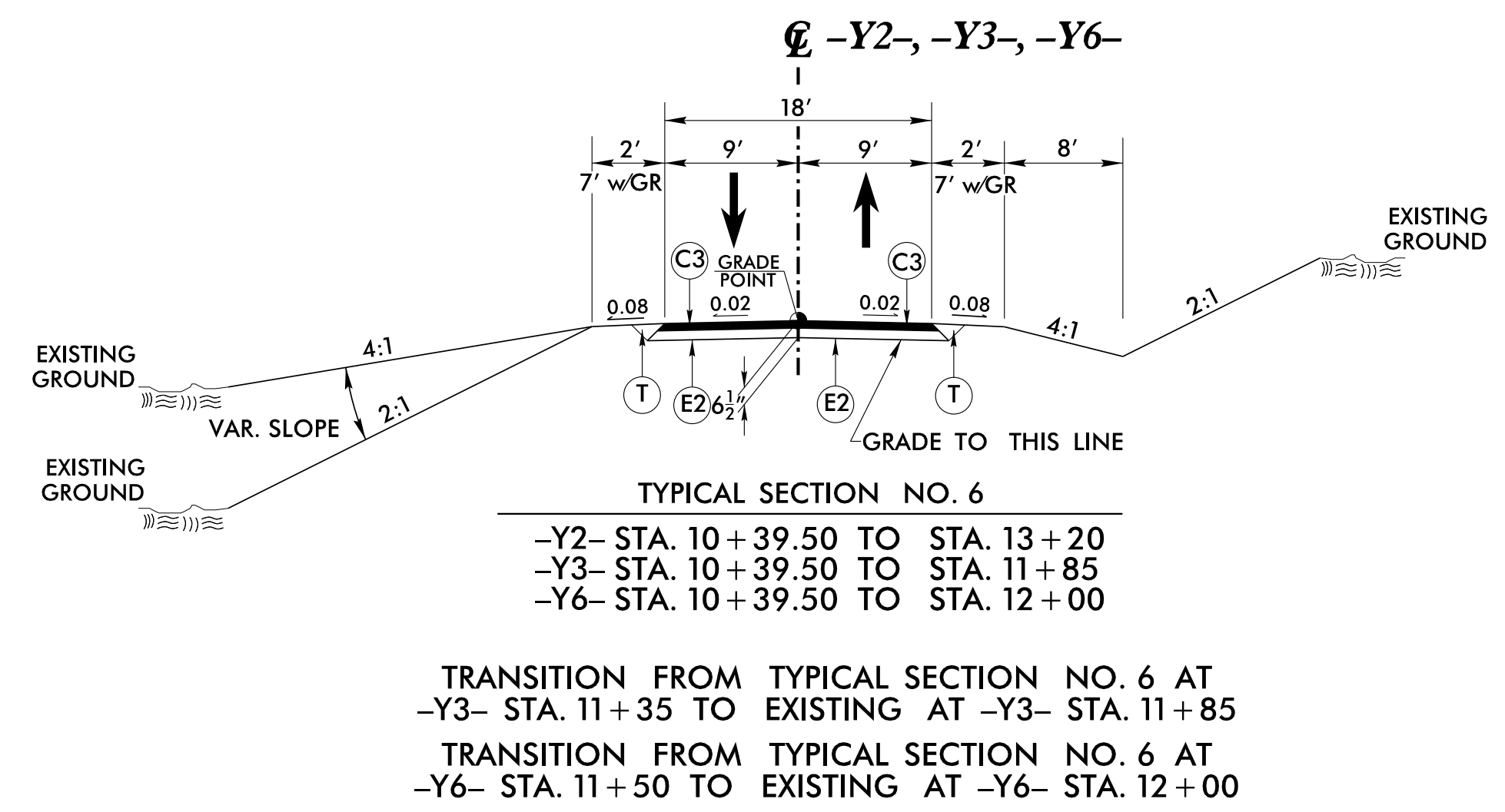
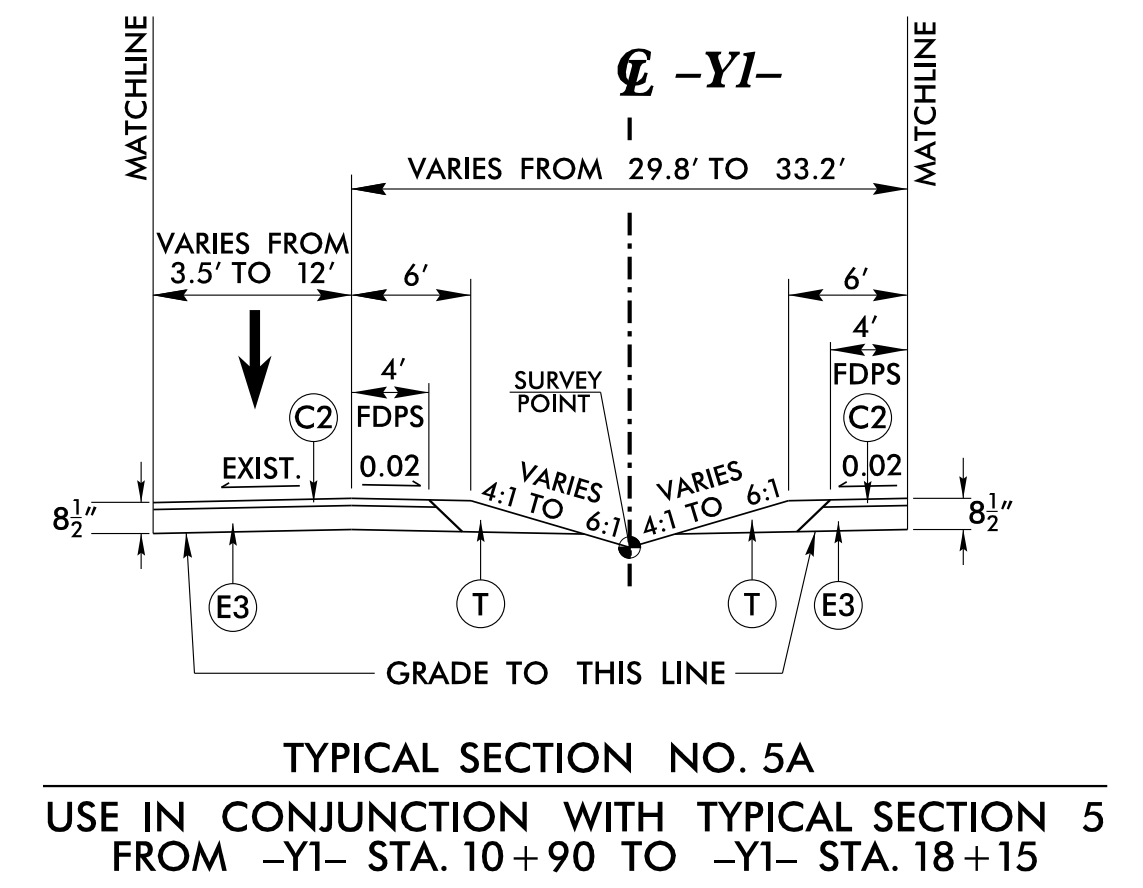
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| PAVEMENT DESIGN | |
|-----------------|--|
| C1 | 3" S9.5B |
| C2 | 3" S9.5C |
| C3 | 2 1/2" SF9.5A |
| C4 | VAR. S9.5B |
| C5 | VAR. SF9.5A |
| C6 | 1 1/2" SF9.5A |
| C7 | 1 1/4" SF9.5A |
| D1 | 4" I19.0B |
| D2 | 4 1/2" I19.0B |
| D3 | 2 1/2" I19.0B |
| D4 | VAR. I19.0B |
| E1 | 5 1/2" B25.0B |
| E2 | 4" B25.0B |
| E3 | 5 1/2" B25.0C |
| E4 | VAR. B25.0B |
| E5 | 4" B25.0C |
| J1 | 10" ABC |
| J2 | 8" ABC |
| J3 | VAR. DEPTH ABC |
| K | LIME OR CEMENT STABILIZATION |
| N | GEOTEXTILE FOR PAVEMENT STABILIZATION |
| P | PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD. |
| R1 | 2'-9" MOUNTABLE CURB & GUTTER |
| R2 | 2'-6" CONCRETE CURB AND GUTTER. |
| R3 | 5" MONOLITHIC CONCRETE ISLAND (KEYED-IN) |
| R4 | CONCRETE EXPRESSWAY GUTTER |
| R5 | DOUBLE FACED CONCRETE BARRIER, TYPE T |
| R6 | DOUBLE FACED CONCRETE BARRIER, TYPE T1 |
| R7 | DOUBLE FACED CONCRETE BARRIER, TYPE T2 |
| R8 | SINGLE FACED CONCRETE BARRIER |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| V | 1 1/2" ASPHALT MILLING |
| W1 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL NO. 1) |
| W2 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL NO. 2) |
| W3 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL NO. 3) |

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

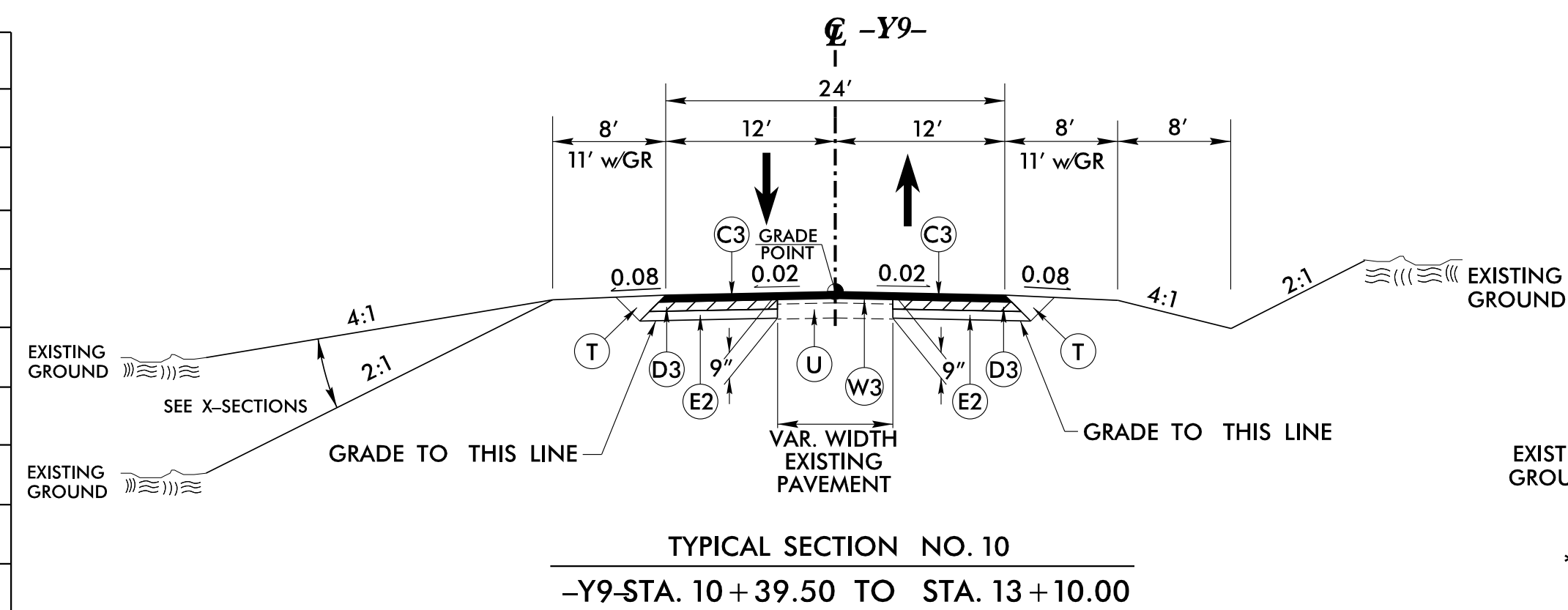


- (R5) USE DOUBLE FACED CONCRETE BARRIER TYPE T FROM:
-Y1- STA. 19+50 TO -Y1- STA. 23+50
- (R6) USE DOUBLE FACED CONCRETE BARRIER TYPE T1 FROM:
-Y1- STA. 18+46.71 TO -Y1- STA. 19+50
-Y1- STA. 23+50 TO Begin Transition Station
-Y1- STA. 40+50 TO -Y1- STA. 50+80
- (R7) USE DOUBLE FACED CONCRETE BARRIER TYPE T2 FROM:
End Transition Station TO -Y1- STA. 40+50

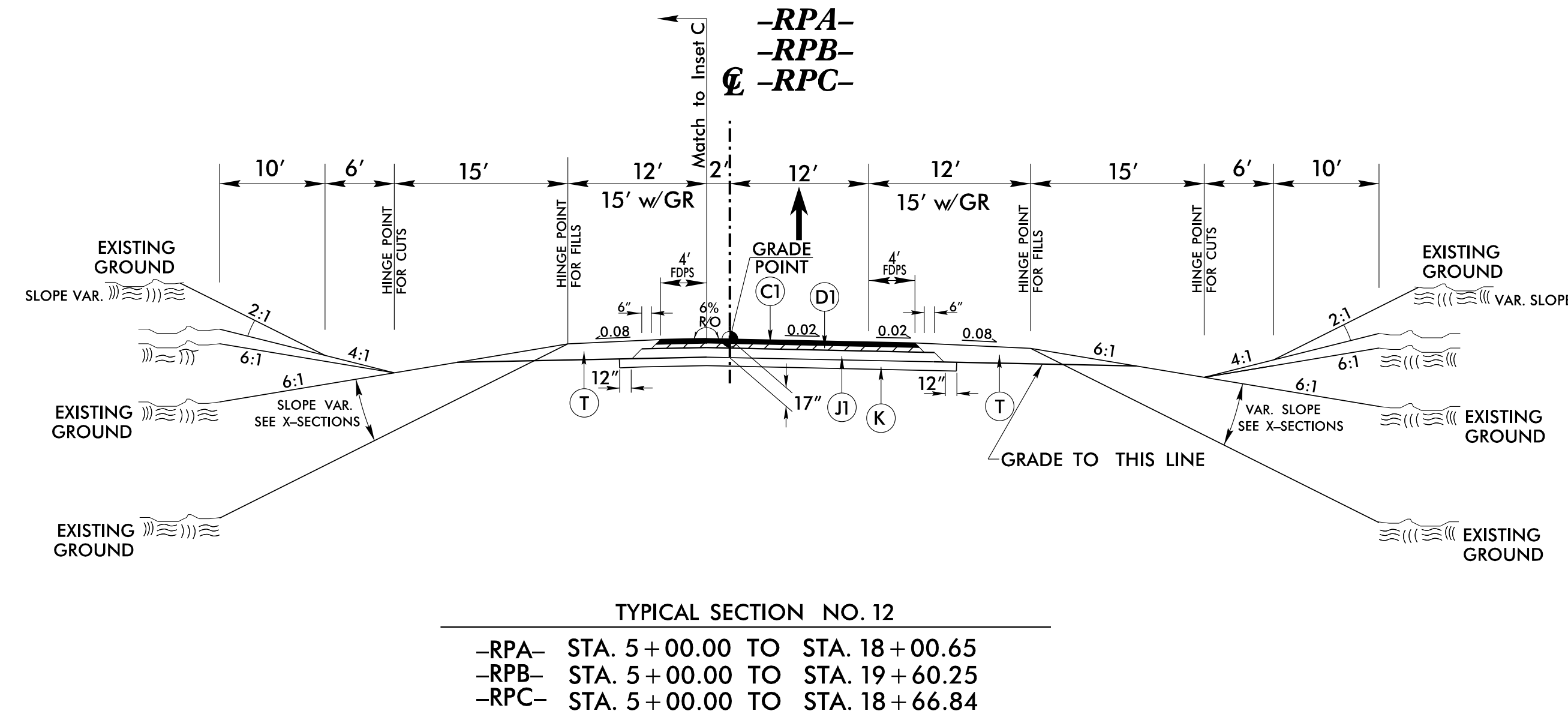
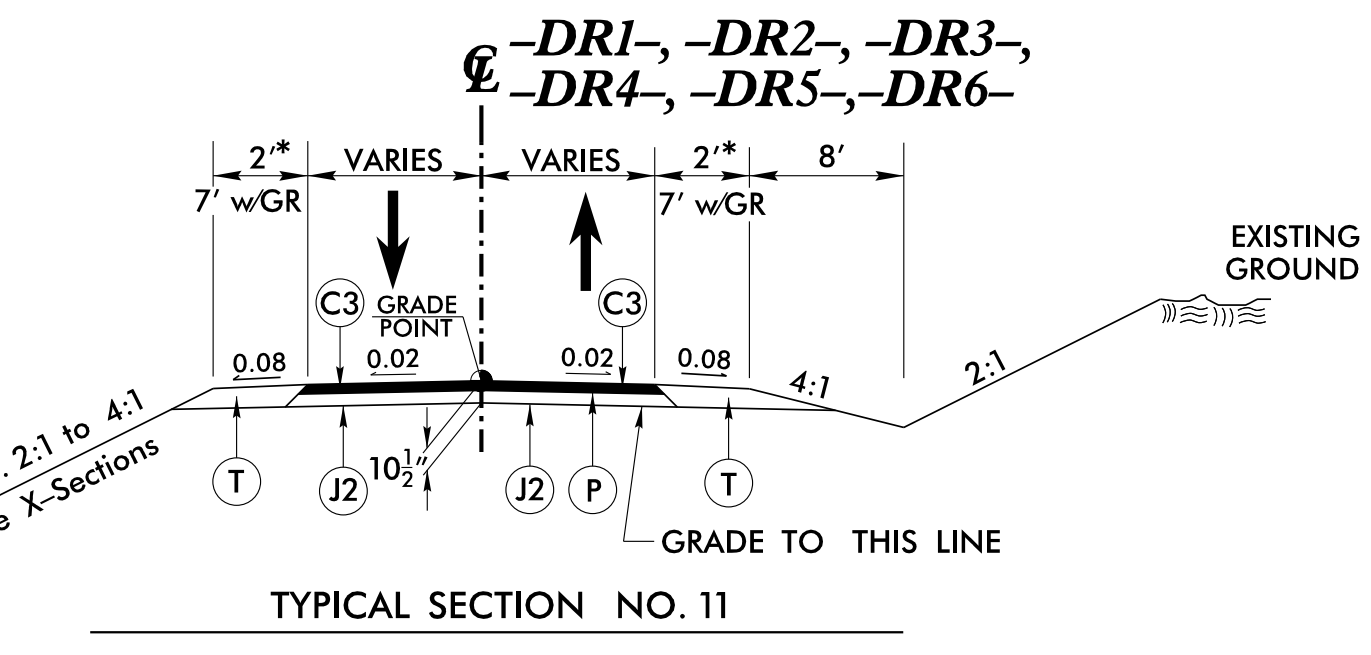


| PAVEMENT DESIGN | |
|-----------------|--|
| C1 | 3" S9.5B |
| C2 | 3" S9.5C |
| C3 | 2 1/2" SF9.5A |
| C4 | VAR. S9.5B |
| C5 | VAR. SF9.5A |
| C6 | 1 1/2" SF9.5A |
| D1 | 4" I19.0B |
| D2 | 4" I19.0C |
| D3 | 2 1/2" I19.0B |
| D4 | VAR. I19.0B |
| E1 | 5 1/2" B25.0B |
| E2 | 4" B25.0B |
| E3 | 5 1/2" B25.0C |
| E4 | VAR. B25.0B |
| J1 | 10" ABC |
| J2 | 8" ABC |
| J3 | VAR. DEPTH ABC |
| K | LIME OR CEMENT STABILIZATION |
| N | GEOTEXTILE FOR PAVEMENT STABILIZATION |
| P | PRIME COAT AT THE RATE OF .35 GAL. PER SQ. YD. |
| R1 | 2'-9" MOUNTABLE CURB & GUTTER |
| R2 | 2'-6" CONCRETE CURB AND GUTTER. |
| R3 | 5" MONOLITHIC CONCRETE ISLAND (KEYED-IN) |
| R4 | CONCRETE EXPRESSWAY GUTTER |
| R5 | DOUBLE FACED CONCRETE BARRIER, TYPE T |
| R6 | DOUBLE FACED CONCRETE BARRIER, TYPE T1 |
| R7 | DOUBLE FACED CONCRETE BARRIER, TYPE T2 |
| R8 | SINGLE FACED CONCRETE BARRIER |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| V | 1 1/2" ASPHALT MILLING |
| W1 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL NO. 1) |
| W2 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL NO. 2) |
| W3 | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL NO. 3) |

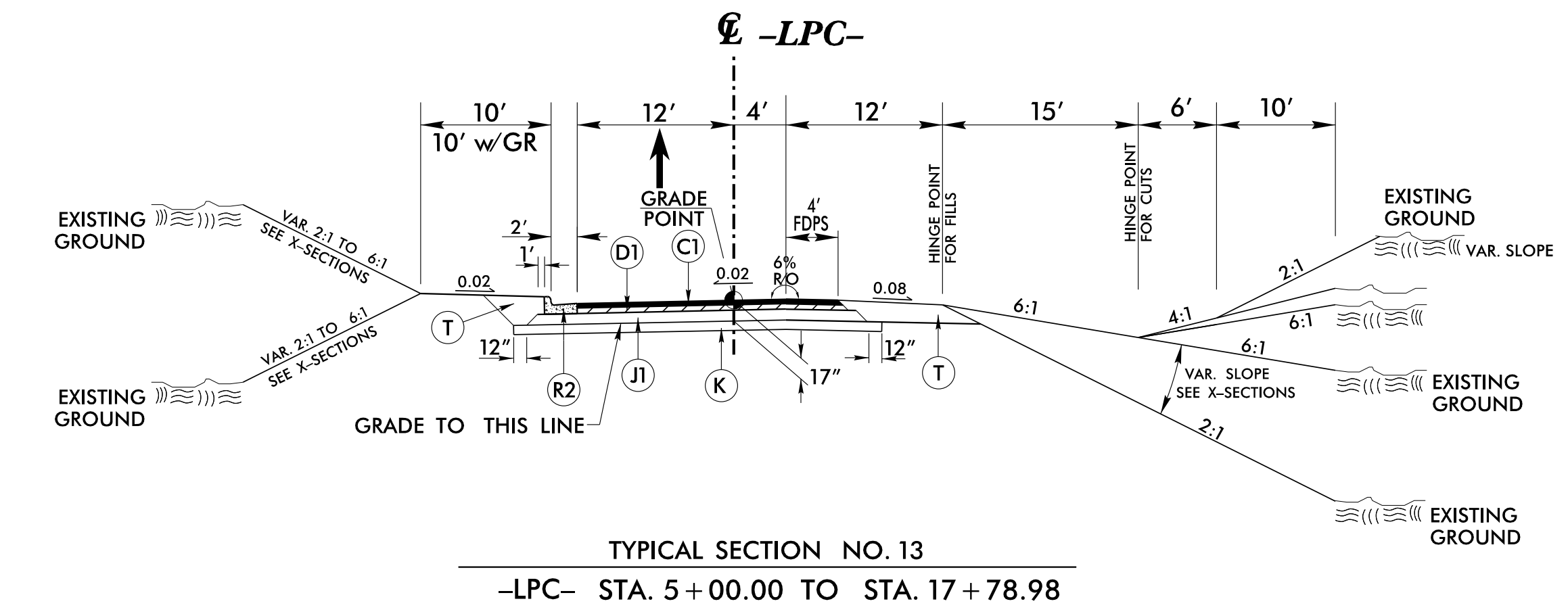
NOTE: PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



*NOTE: 2' SHOULDER WIDTH FROM -DR5- STA. 10+05 TO STA. 10+25 AND FROM -DR5- STA. 11+50 TO 11+79.20
 7' SHOULDER WIDTH AT CREEK CROSSING FROM -DR5- STA. 10+75 TO STA. 11+00
 TAPER SHOULDER WIDTH FROM -DR5- STA. 10+25 TO STA. 10+75 AND FROM -DR5- STA. 11+00 TO 11+50



NOTE: PAVEMENT STABILIZATION GEOTEXTILE (N) NOT REQUIRED ON -RPB-

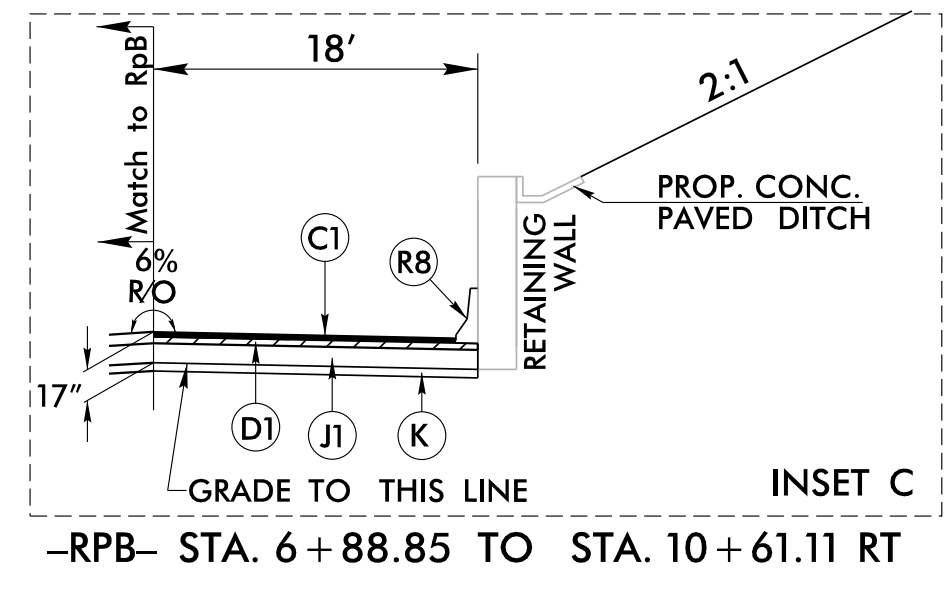
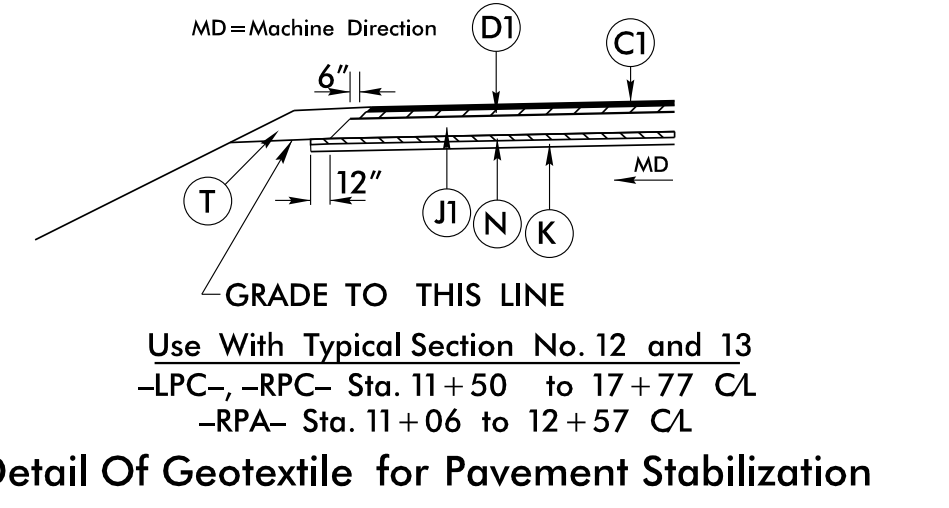


| | |
|--|--|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 2A-3 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER Seal 26960 | PAVEMENT DESIGN ENGINEER Seal 031484 |
| NORTH CAROLINA PROFESSIONAL SEAL 7/24/2015 REC. S. SCHULTE 186340240784FC | |

V&M
 Vaughn & Melton
 Consulting Engineers

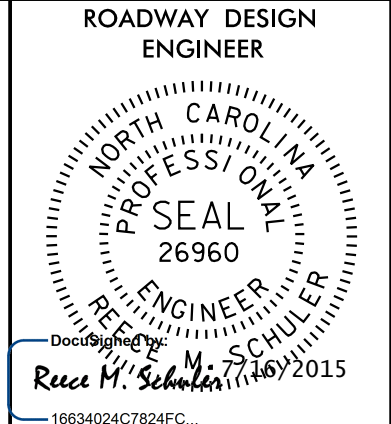
Asheville, NC
 828-255-2796

Boone, NC 828-355-9933
 Charlotte, NC 704-381-0888
 Durham, NC 919-286-7500
 Fayetteville, NC 910-437-7600
 Hickory, NC 704-321-7500
 Raleigh, NC 919-877-9455
 Winston-Salem, NC 703-752-3509



INTERSECTION DETAILS US 221 (-L-)

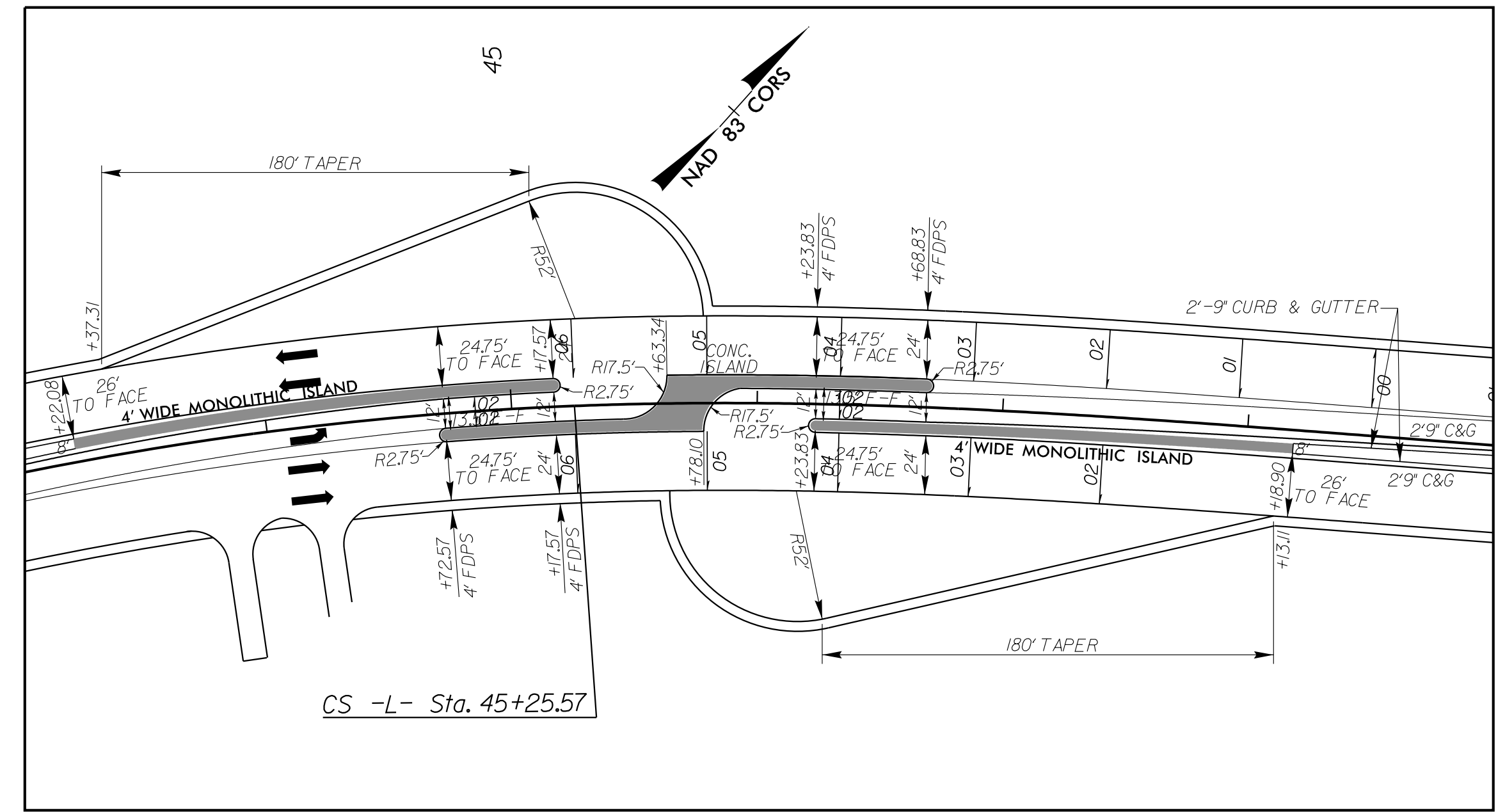
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| PROJECT REFERENCE NO. <i>R-2915A</i> | SHEET NO. <i>2B-1</i> |
| RW SHEET NO. | |



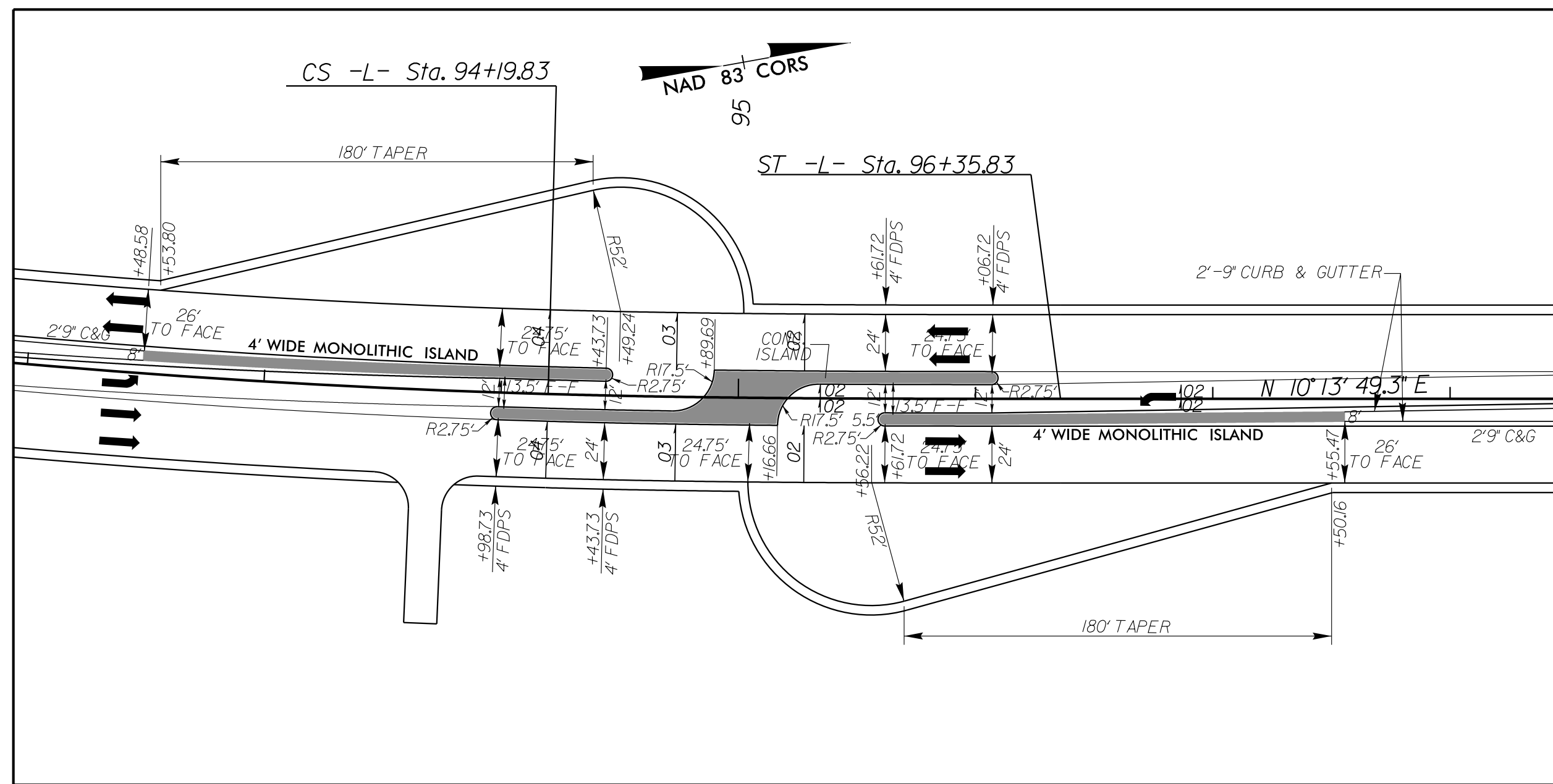
V&M
Vaughn & Melton
Consulting Engineers
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828-253-0796

Boone, NC 828-255-9933
Tri-Cities, TN 423-467-8401
Knoxville, TN 865-546-5800
Spartanburg, SC 864-574-4775
Charleston, SC 843-974-5650
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Raleigh, NC 919-977-9455
Charlotte, NC 704-357-0488
Atlanta, GA 770-487-1909

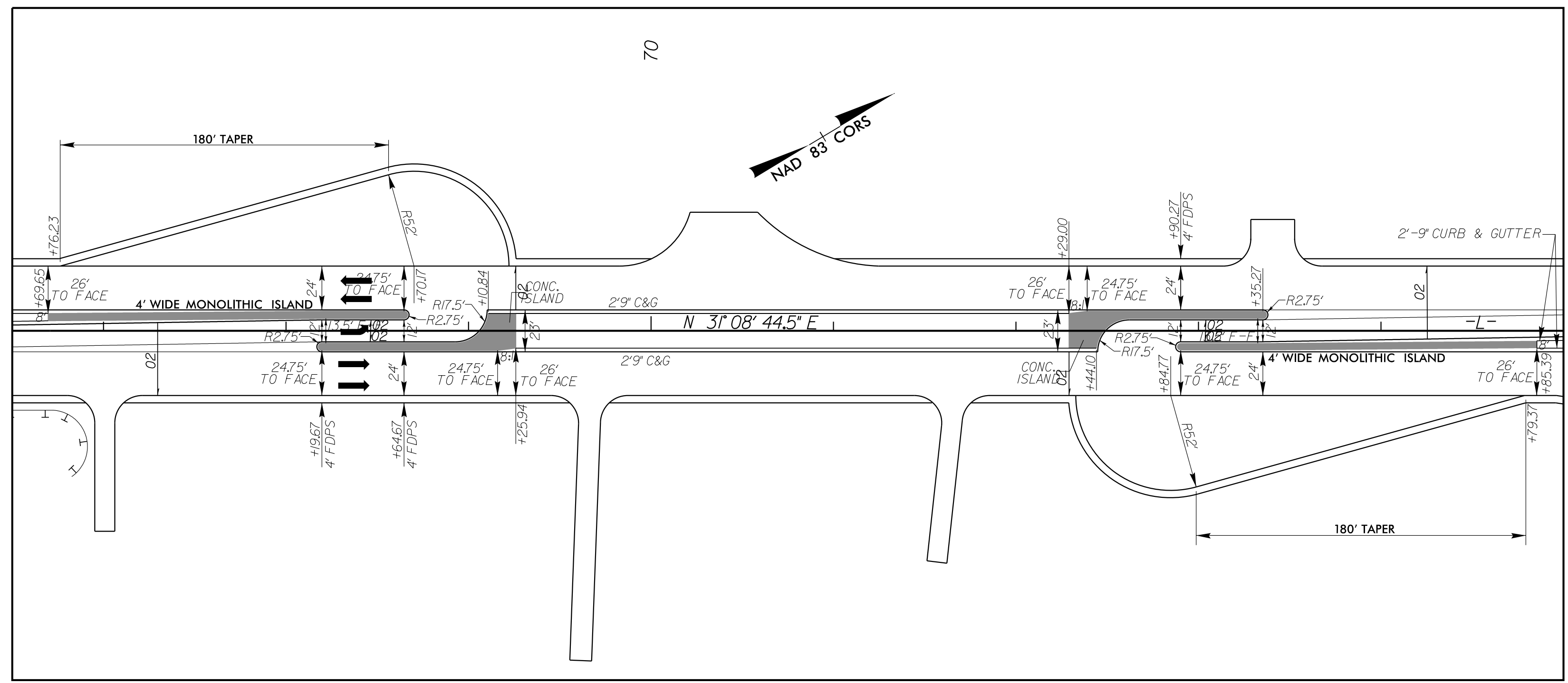
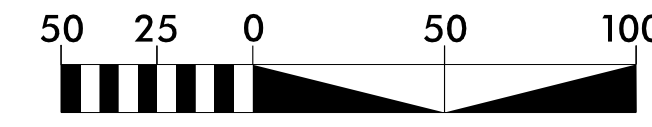
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-L- STA. 43+00 TO STA. 49+00
INTERSECTION DETAIL SHOWN FROM PLAN SHEET 6



-L- STA. 92+00 TO STA. 98+50
INTERSECTION DETAIL SHOWN FROM PLAN SHEETS 9 & 10



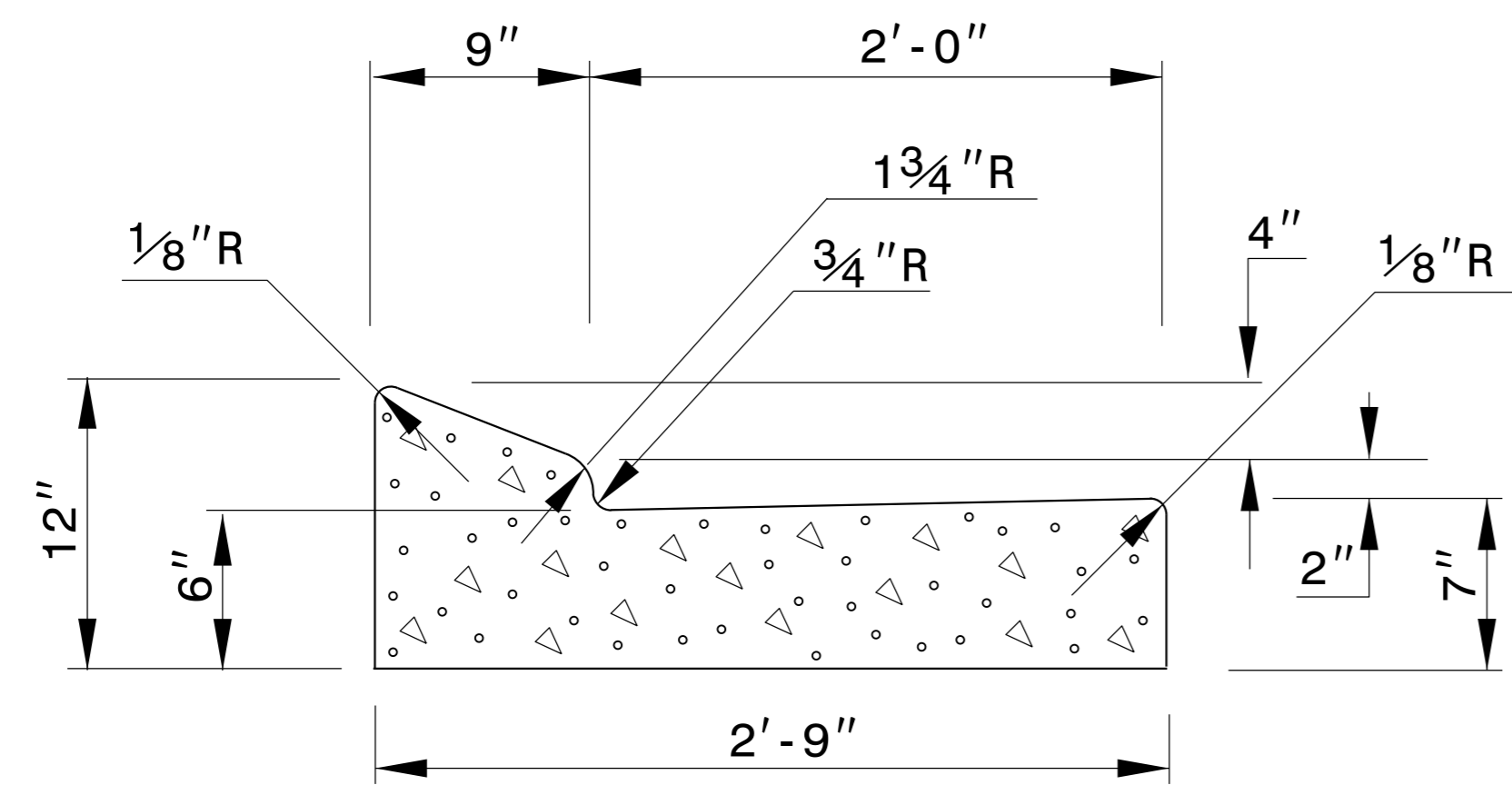
-L- STA. 66+50 TO STA. 75+00
INTERSECTION DETAIL SHOWN FROM PLAN SHEETS 7 & 8

NOTE: ALL RADII ARE MEASURED AT EDGE OF TRAVEL LANE

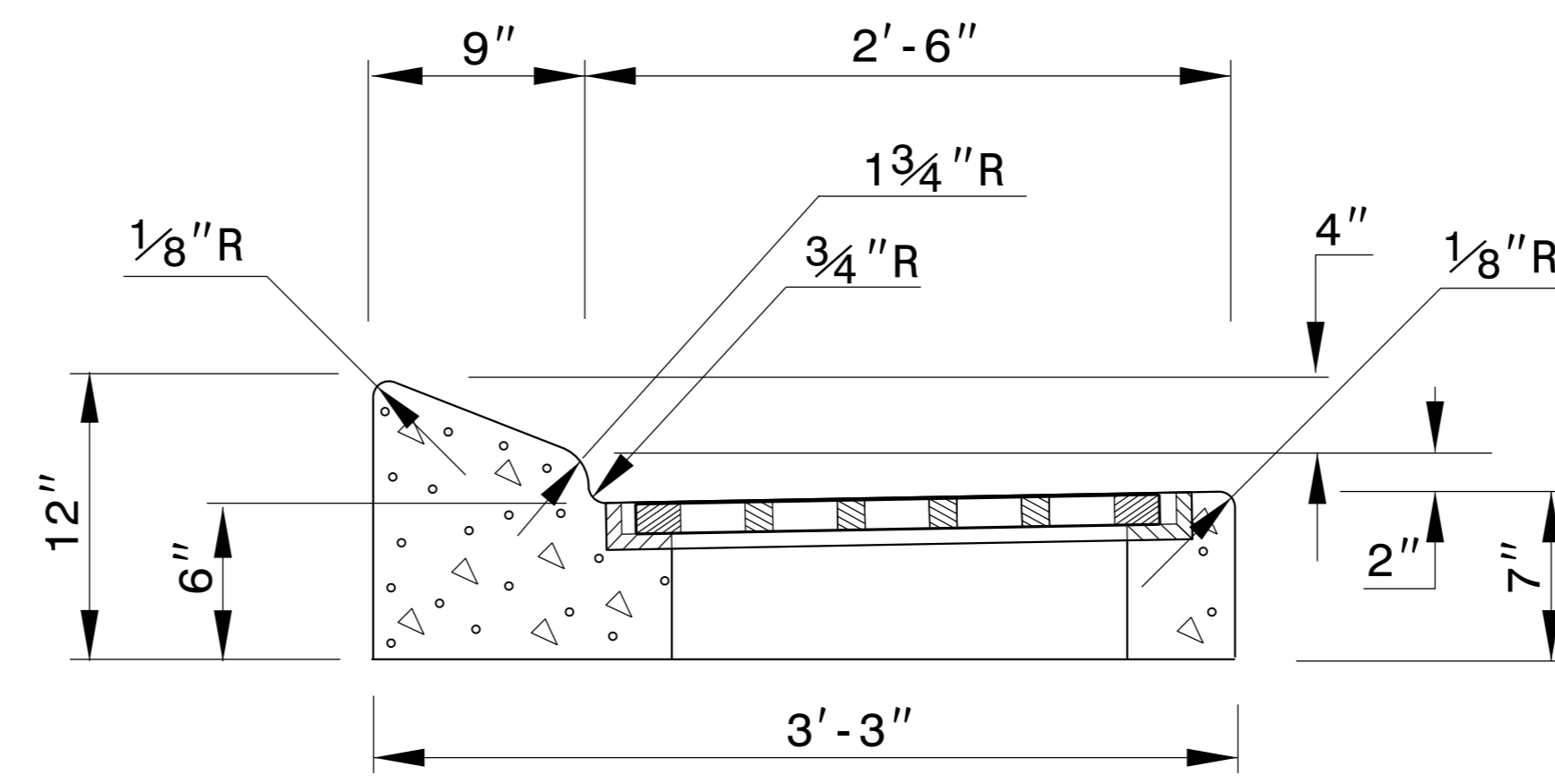
5" MONOLITHIC CONCRETE ISLAND (KEYED IN)

\$DATE\$

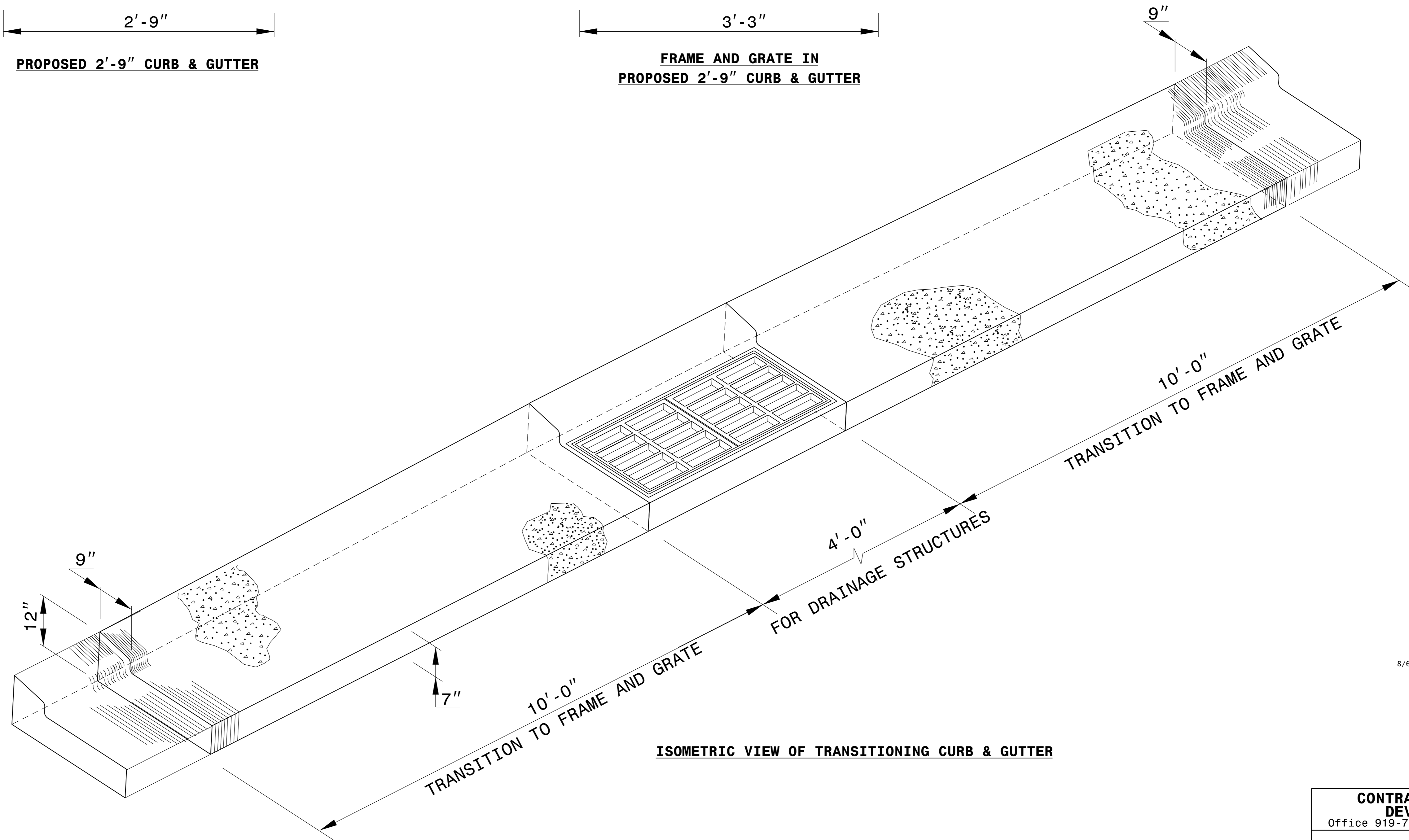
\$FILE\$



PROPOSED 2'-9" CURB & GUTTER

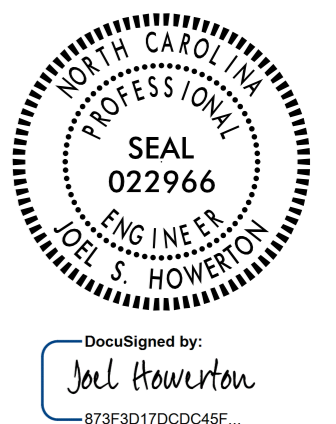


FRAME AND GRATE IN PROPOSED 2'-9" CURB & GUTTER



ISOMETRIC VIEW OF TRANSITIONING CURB & GUTTER

8/6/2015

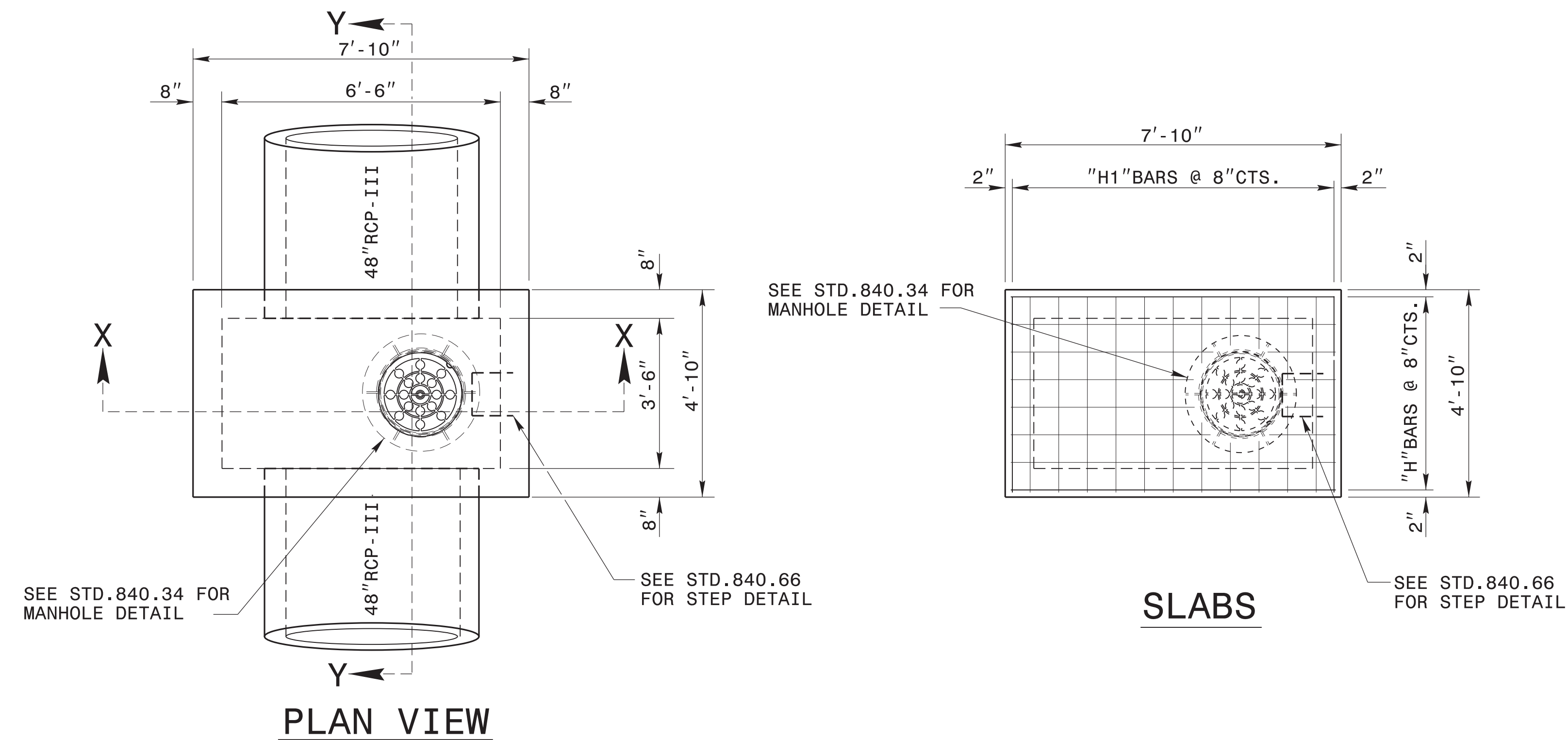


Designed by:
Joel Howerton

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

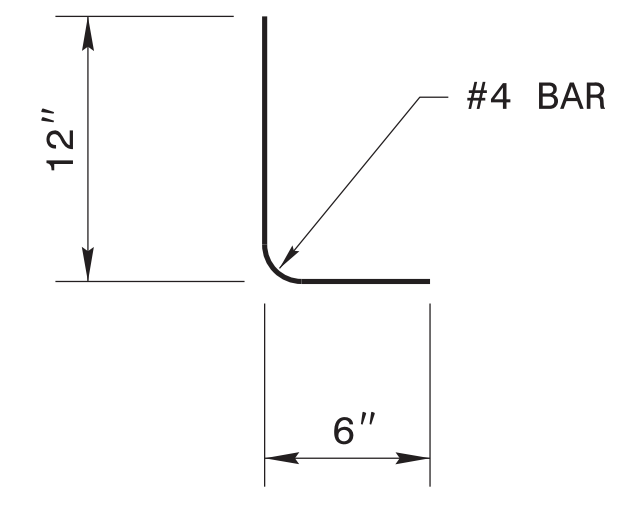
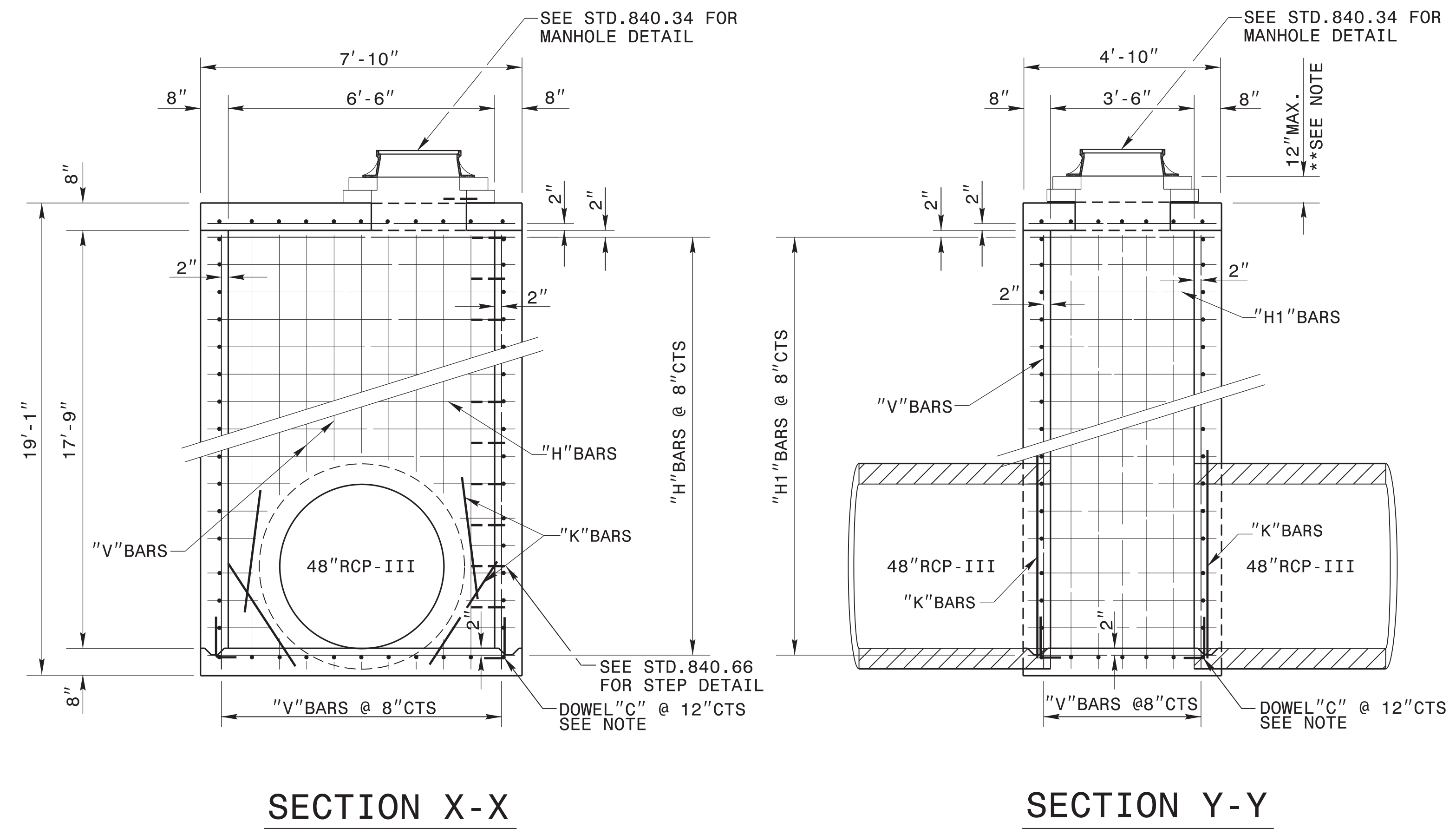
DETAIL OF 2'-9" TO FRAME AND GRATE

ORIGINAL BY: _____ DATE: _____
 MODIFIED BY: _____ DATE: _____
 CHECKED BY: _____ DATE: _____
 FILE SPEC.: kkempf/english/curb_gutter_transition.dgn



GENERAL NOTES:

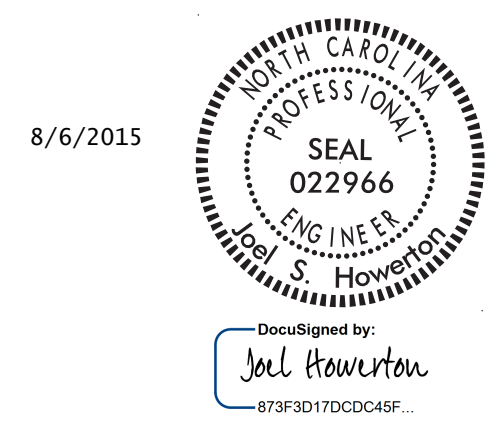
- THE BASE SLAB TO BE CONSTRUCTED BY FORMING.
- SEE STD. DWG. 840.00 FOR CONSTRUCTION OF BASE SLAB
- CLASS 'B' CONCRETE TO BE USED THROUGHOUT.
- CONSTRUCTION OPTIONS: MONOLITHIC POUR; 2" KEYWAY OR #4 BAR DOWELS AT 12" CENTERS AS DIRECTED BY THE ENGINEER.
- REINFORCING STEEL TO BE CUT, BENT OR RELOCATED TO POSITION PIPE AS DIRECTED BY THE ENGINEER.
- ALL EXPOSED CORNERS TO BE CHAMFERED 1".
- SEE STD. DRAWING 840.34 FOR CONSTRUCTION OF RISER AND MANHOLE.
- JUNCTION BOXES OVER 3'-6" IN DEPTH WITH MANHOLES WILL REQUIRE STEPS TO BE PLACED ON 12" CTRS. REFERENCE STD. NO. 840.66.
- MAINTAIN 2" MINIMUM CONCRETE COVERAGE ON ALL STEEL.



BILL OF MATERIAL

| CODE | BAR# | LENGTH | LBS/FT. | QTY. | LBS |
|--------------------------|------|--------|---------|------|--------------|
| H | 4 | 7'-6" | 0.668 | 66 | 331 |
| H1 | 4 | 4'-6" | 0.668 | 74 | 223 |
| V | 4 | 18'-1" | 0.668 | 32 | 387 |
| K | 4 | 3'-0" | 0.668 | 8 | 16 |
| C | 4 | 1'-6" | 0.668 | 20 | 20 |
| TOTAL WEIGHT STEEL | | | | | 977 |
| MASONRY QUANTITIES | | | | | |
| CLASS "B" CONCRETE | | | | | 11.8 CU.YDS. |
| PIPE DEDUCTIONS | | | | | |
| 2-48" RCP-III | | | | | -1 CU.YD. |
| TOTAL CLASS "B" CONCRETE | | | | | 10.8 CU.YDS. |

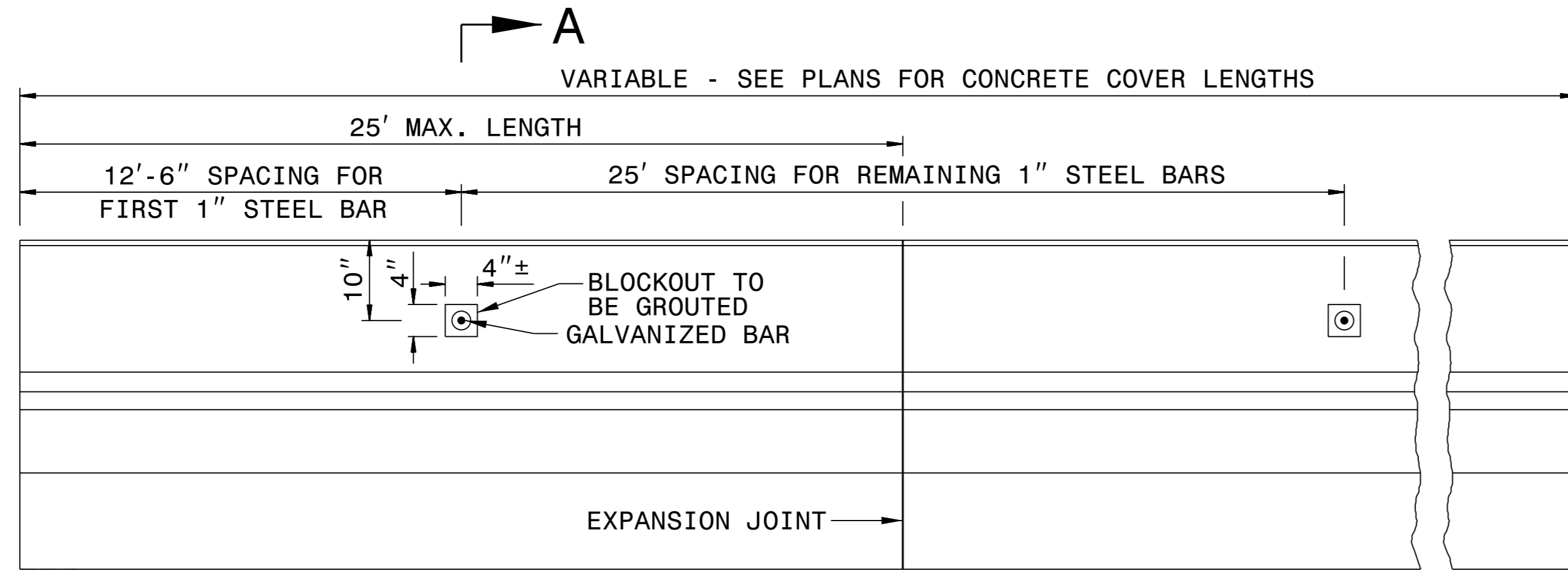
** 0.30 CU.YD. PER FOOT OF RISER HEIGHT.



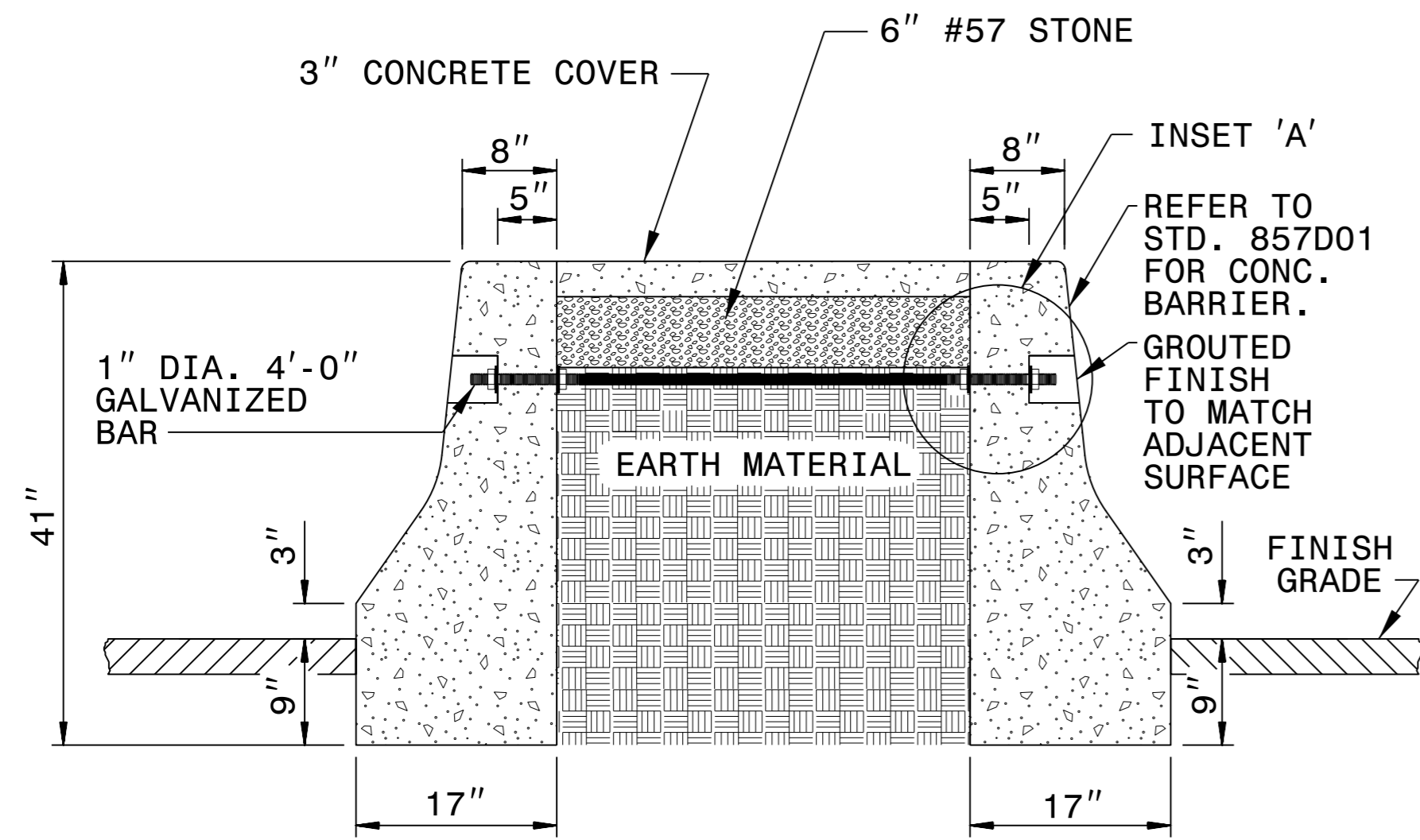
**CONTRACT STANDARDS & DEVELOPMENT UNIT
STANDARDS AND SPECIAL DESIGN**
Office 919-707-6900 FAX 919-250-4119

**EXTRA DEPTH JUNCTION BOX
48" RCP-III**

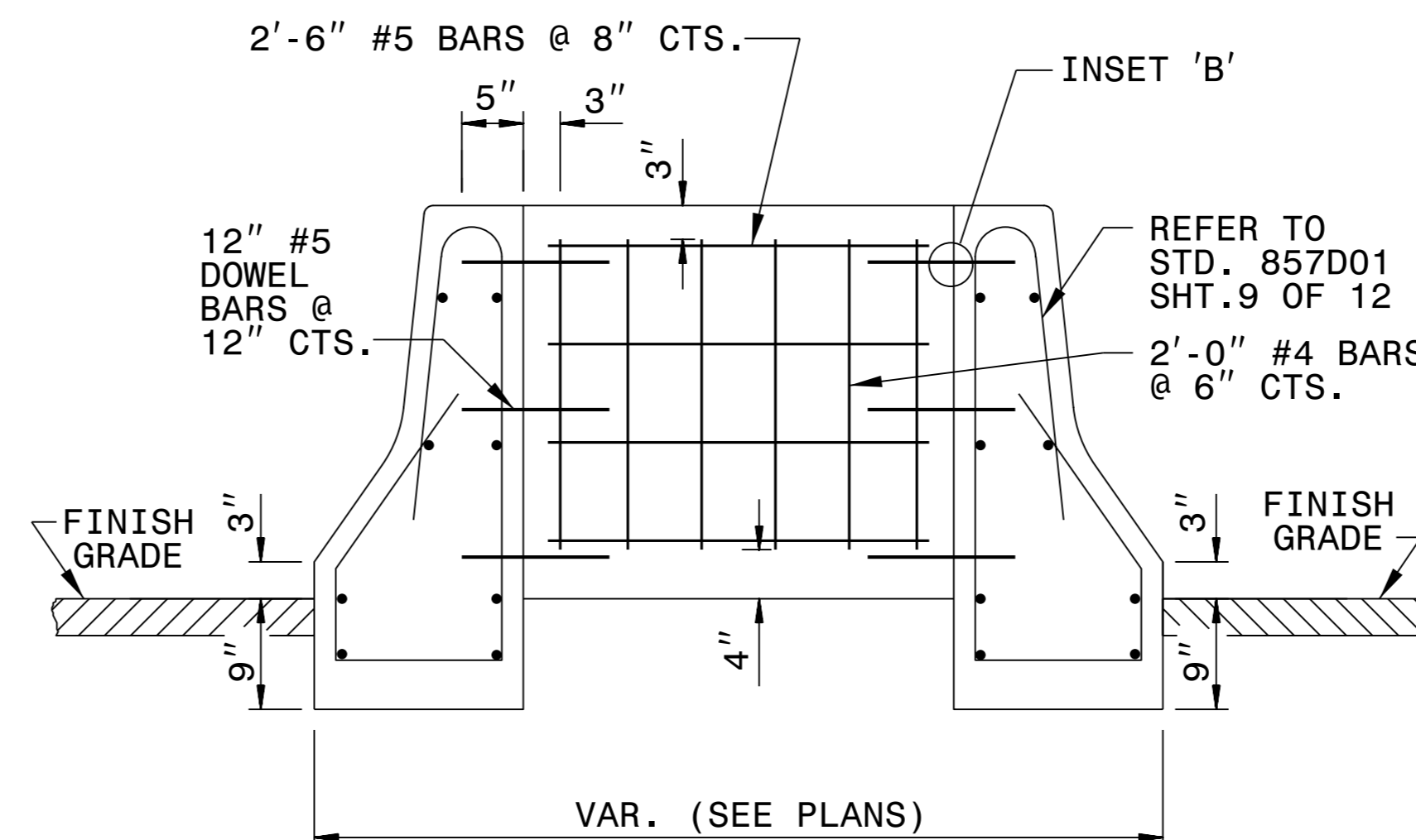
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 MODIFIED BY: DATE:
 CHECKED BY: DATE:
 FILE SPEC.: details/rnbritt/english/rura1/r2915a_extra_depth_jb.dgn



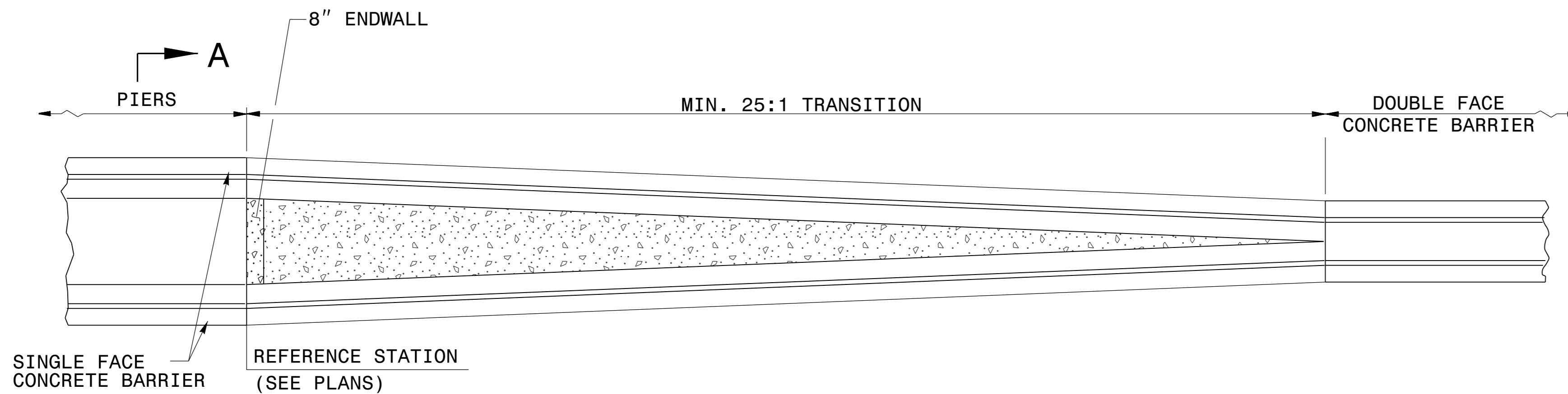
ELEVATION



SECTION 'A-A'



ENDWALL



TRANSITION FROM SINGLE FACE RAIL TO DOUBLE FACE CONCRETE MEDIAN BARRIER

GENERAL NOTES:

USE CLASS 'AA' CONCRETE TO CONSTRUCT CONCRETE BARRIER TRANSITION.

USE CLASS 'B' CONCRETE TO CONSTRUCT CONCRETE COVER.

SEAL ALL EXPANSION JOINTS WITH JOINT FILLER (SEE SECTION 1028 OF THE SPECIFICATIONS).

SUBMIT ALTERNATIVE METHODS FOR STEEL FABRICATION FOR REVIEW.

REFER TO PLANS AND TYPICAL SECTION FOR CONCRETE COVER LOCATIONS.

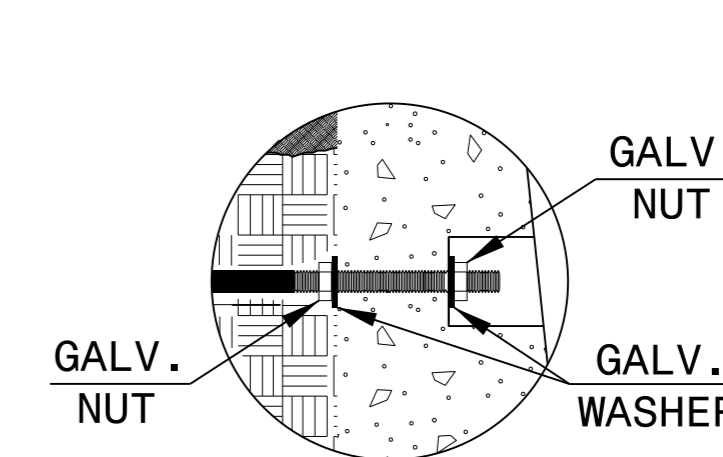
USE AN APPROVED BONDING SYSTEM IN ACCORDANCE WITH SECTION 1081-1, TYPE 3A OF THE STANDARD SPECIFICATIONS.

DRILL ANCHOR HOLES WITH A PNEUMATIC DRILL UNLESS OTHERWISE APPROVED BY THE ENGINEER.

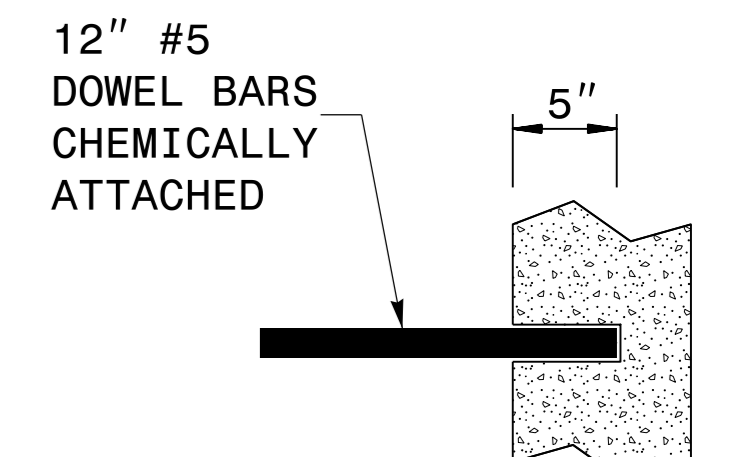
DRILL ANCHOR HOLES IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

REMOVE ALL DEBRIS, CHIPS, DUST, GREASE, OIL AND OTHER FOREIGN MATTER FROM THE ANCHOR HOLES PRIOR TO THE APPLICATION OF THE ADHEIVE BONDING SYSTEM.

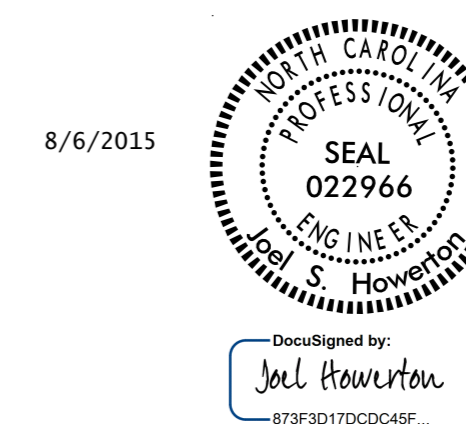
BARRIER TRANSITION LOCATED AS FIELD CONDITIONS DICTATE AND AS DIRECTED BY THE ENGINEER.



INSET 'A'



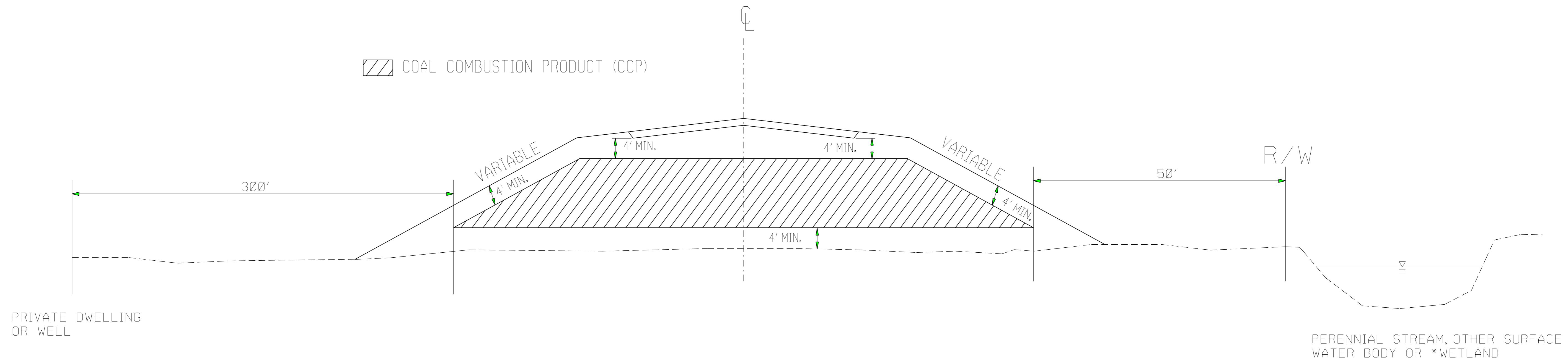
INSET 'B'



| | |
|---|---------------|
| CONTRACT STANDARDS AND DEVELOPMENT UNIT | |
| Office 919-707-6950 FAX 919-250-4119 | |
| MEDIAN HAZARD PROTECTION AND BARRIER TRANSITION | |
| ORIGINAL BY: T.S. Spell | DATE: 2-14-00 |
| MODIFIED BY: | DATE: |
| CHECKED BY: | DATE: |
| FILE SPEC.: ericward\usr\details\stand\transbarrier.dgn | |

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COAL COMBUSTION PRODUCT PLACEMENT



PLACE CCP IN HATCHED AREA IN ACCORDANCE WITH THE PROJECT SPECIAL PROVISIONS

PLACE CCP A MINIMUM OF 5' ABOVE SEASONAL HIGH GROUND WATER

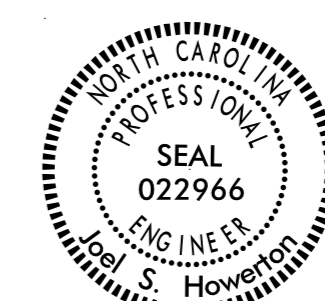
PLACE AT LOCATIONS AS APPROVED BY THE ENGINEER

PLACE SOIL BORROW MATERIAL ON THE OUTSIDE OF CCP AS EACH LIFT OF CCP IS PLACED

*(OBTAIN PERMISSION FROM ARMY CORPS OF ENGINEERS)

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8/6/2015



DocuSigned by:
Joel Howerton
873F3D17DC0C45F...

| | |
|--|---------------|
| CONTRACT STANDARDS AND DEVELOPMENT UNIT | |
| Office 919-707-6950 FAX 919-250-4119 | |
| COAL COMBUSTION PRODUCT PLACEMENT DETAIL | |
| ORIGINAL BY: J.S.H. | DATE: 3/16/15 |
| MODIFIED BY: | DATE: |
| CHECKED BY: | DATE: |
| FILE SPEC.: joel/coal combustion material detail.dgn | |

DRAINAGE DETAILS

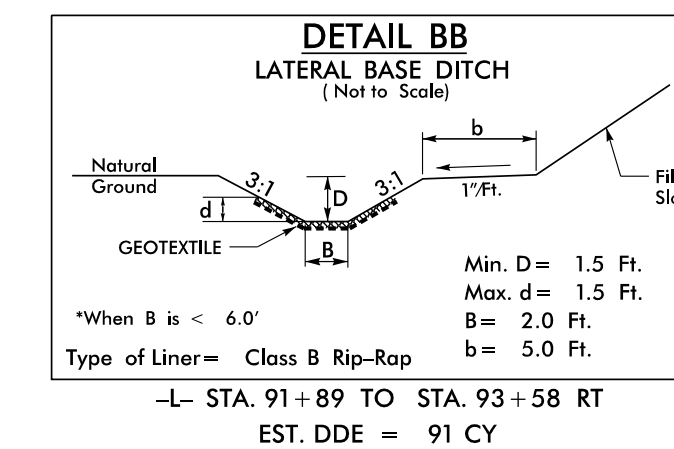
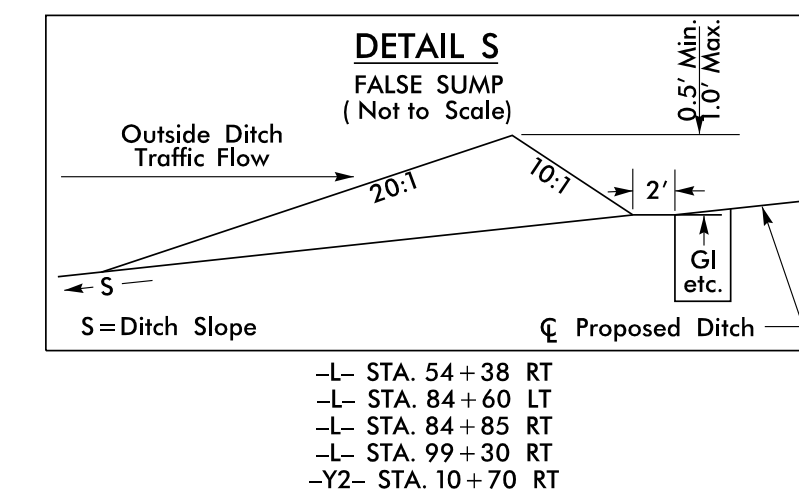
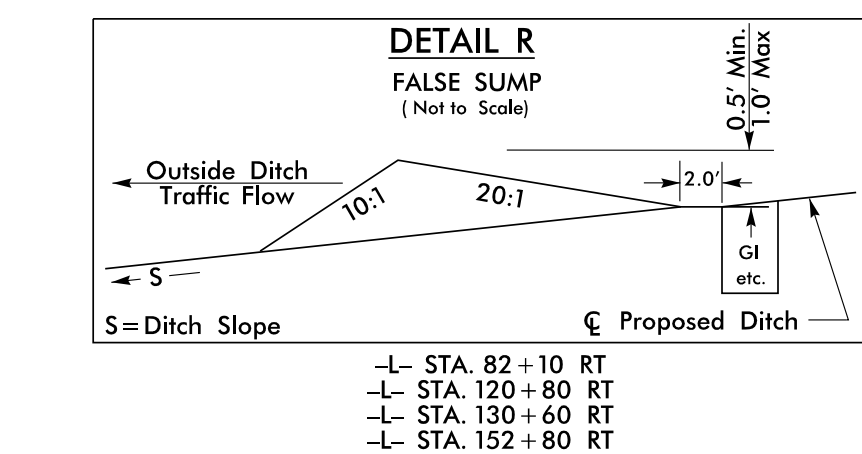
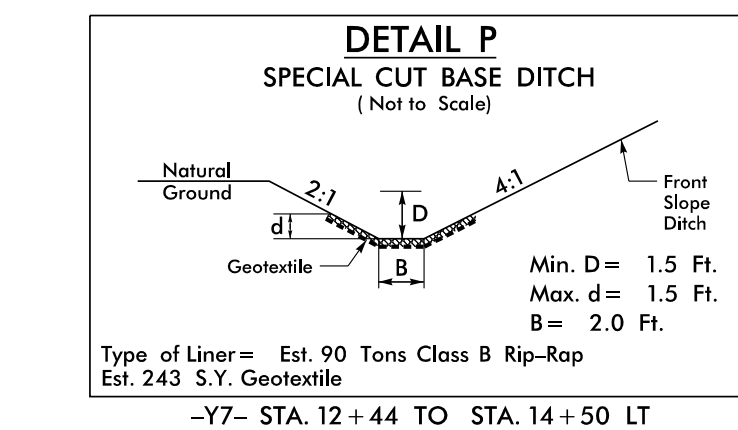
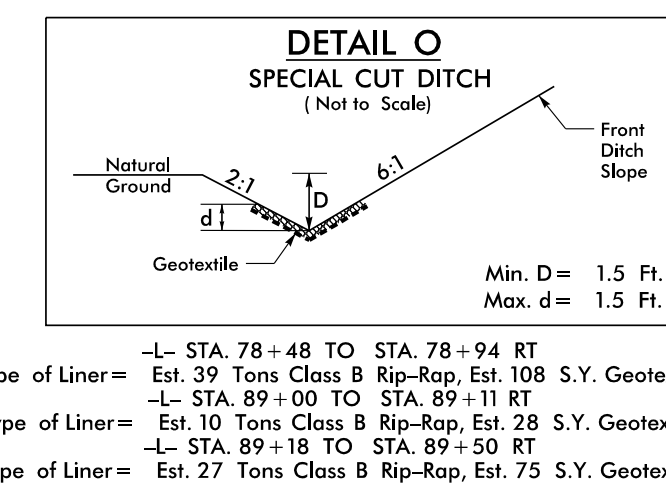
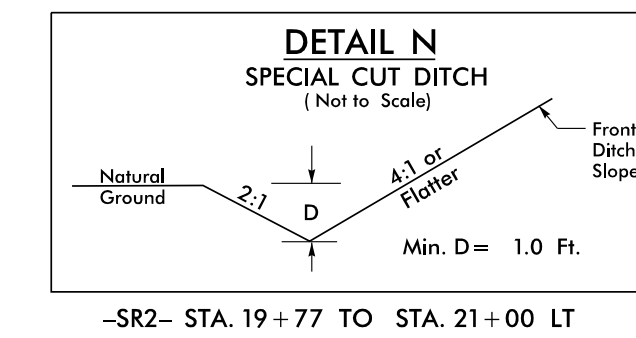
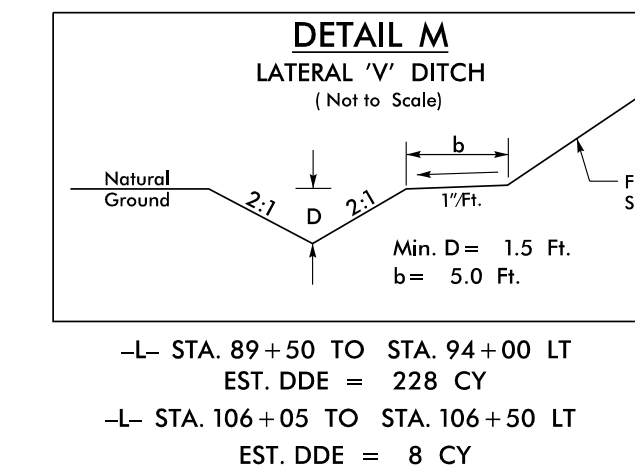
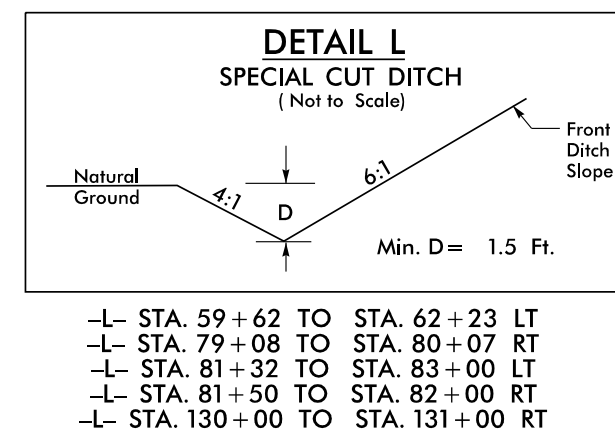
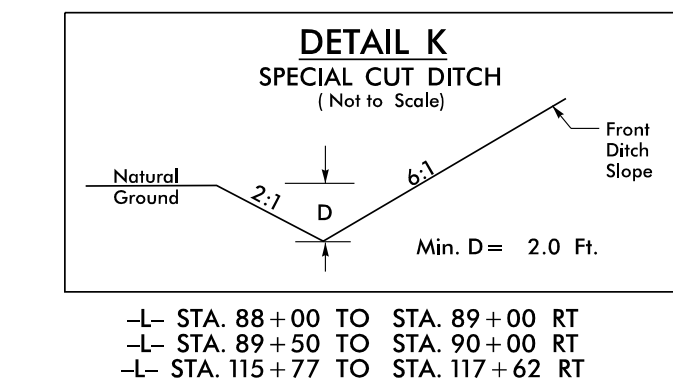
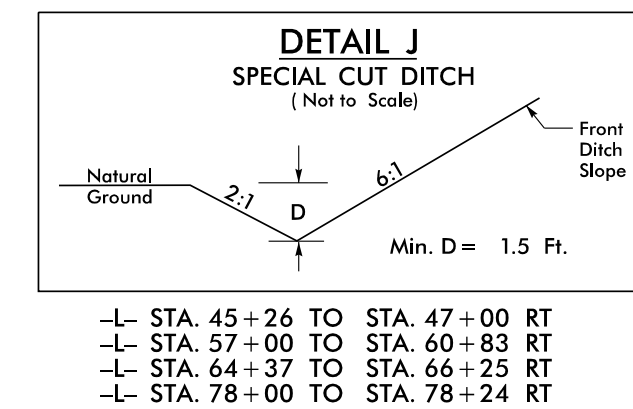
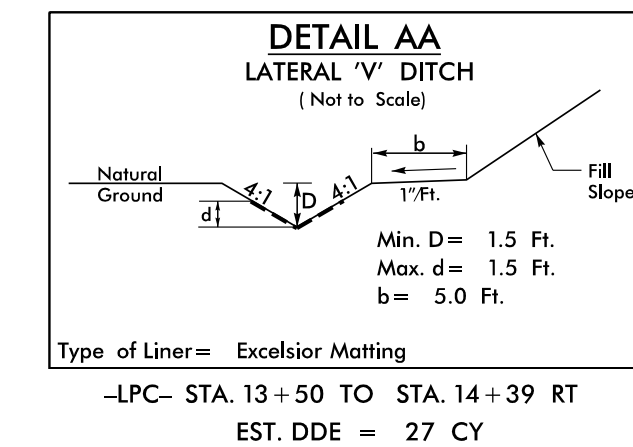
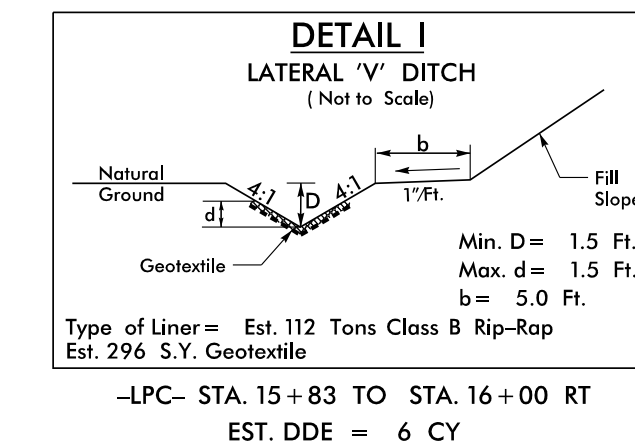
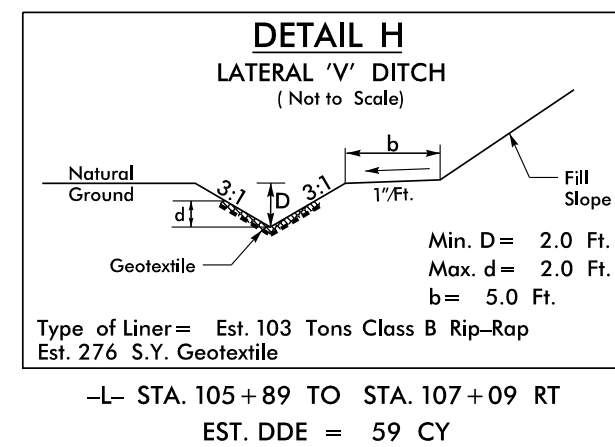
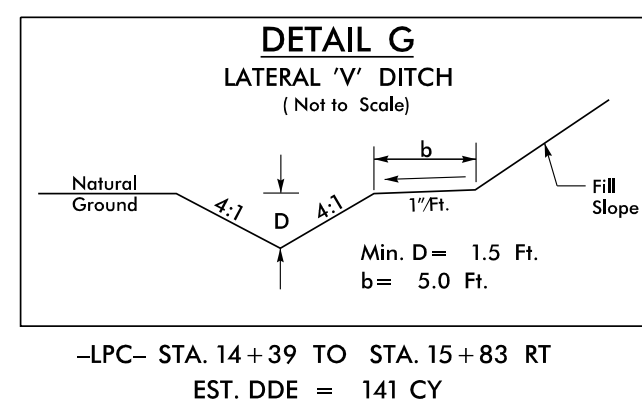
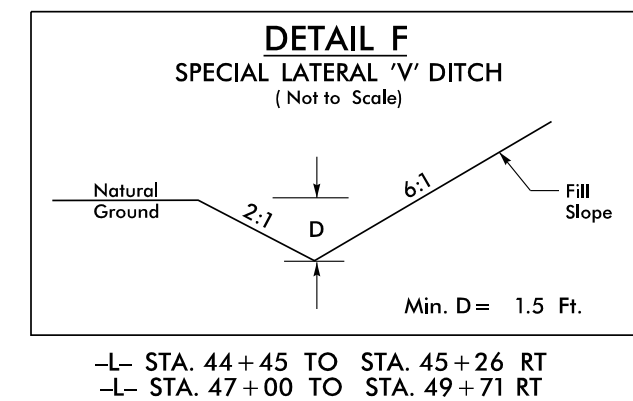
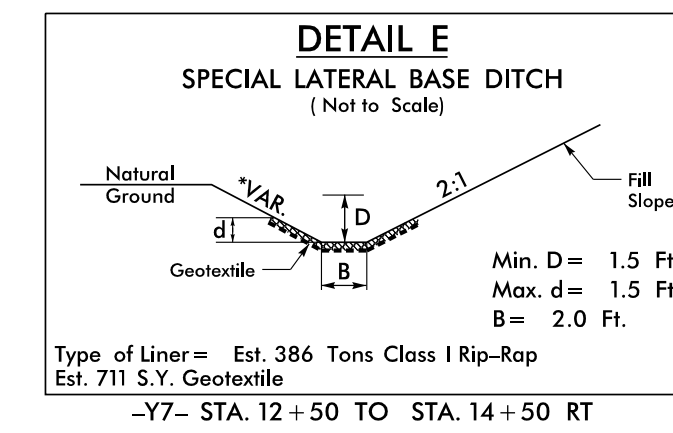
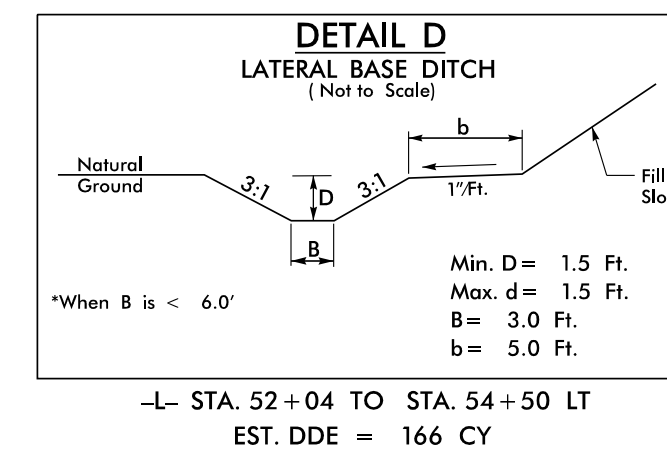
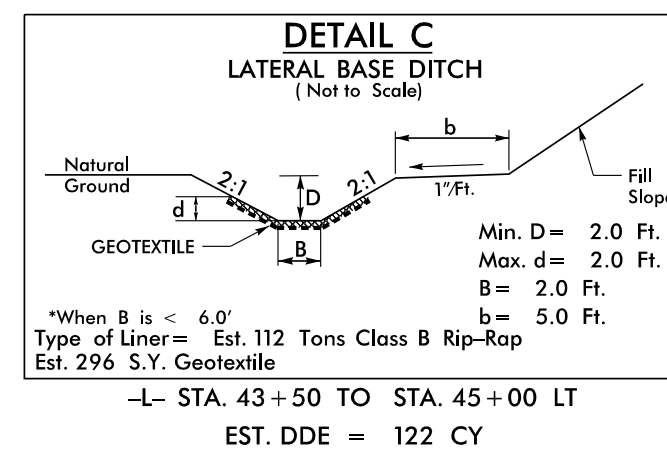
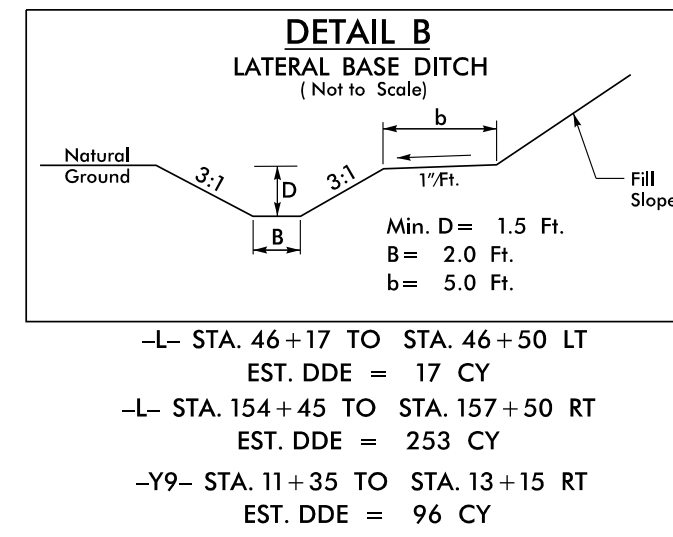
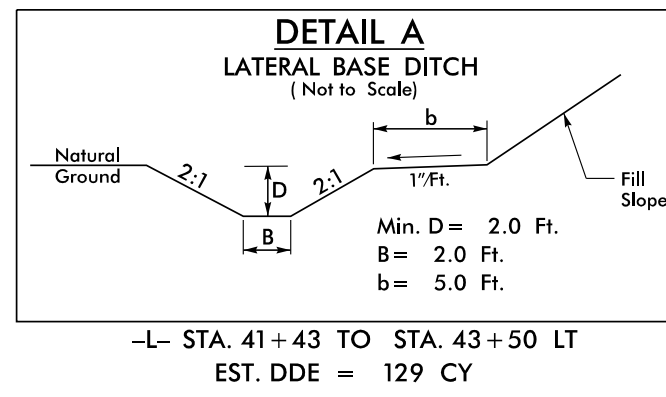
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| RW SHEET NO. | |
| HYDRAULICS ENGINEER | |
| | |

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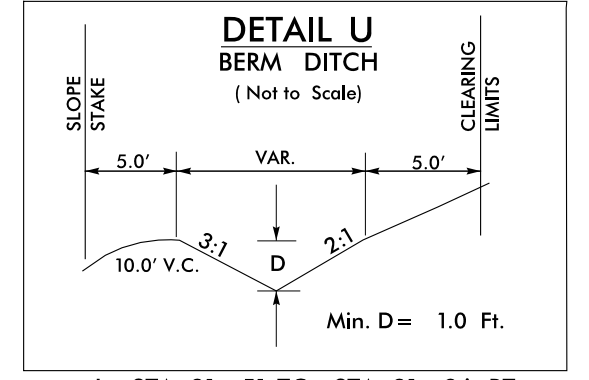
V&M
Vaughan & Melton
Consulting Engineers
Asheville, NC
North Carolina
828-253-2796

| | |
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| <input type="checkbox"/> Tri-Cities, TN | <input type="checkbox"/> 423-487-8900 |
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| <input type="checkbox"/> Raleigh, NC | <input type="checkbox"/> 919-977-9455 |
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| <input type="checkbox"/> Atlanta, GA | <input type="checkbox"/> 770-427-2909 |

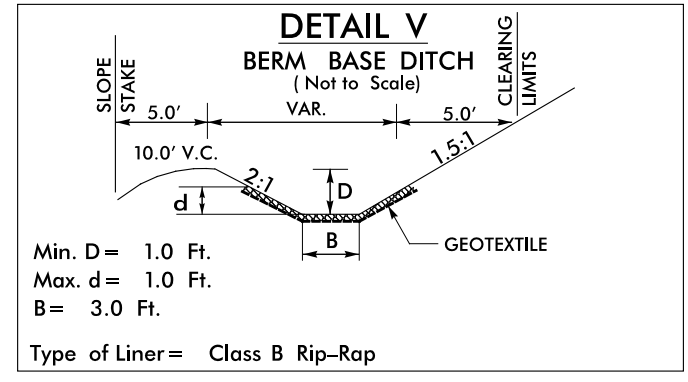
NC License No. F-0493



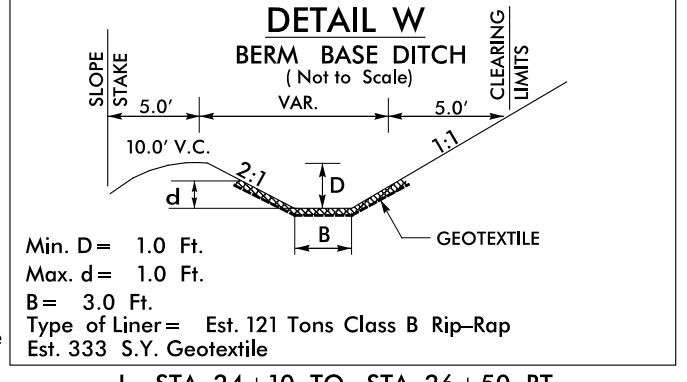
DRAINAGE DETAILS



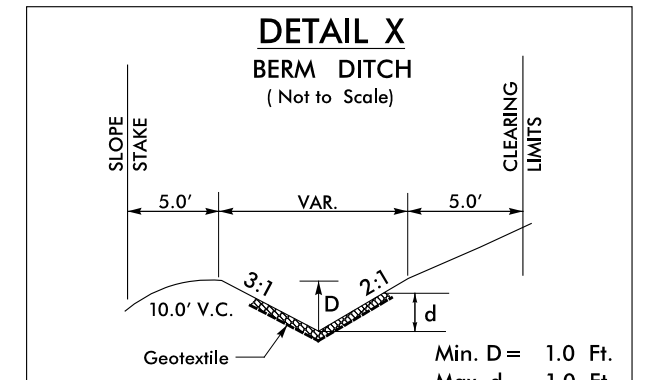
Min. D = 1.0 Ft.
-L- STA. 31+51 TO STA. 31+96 RT
-L- STA. 37+26 TO STA. 37+67 RT



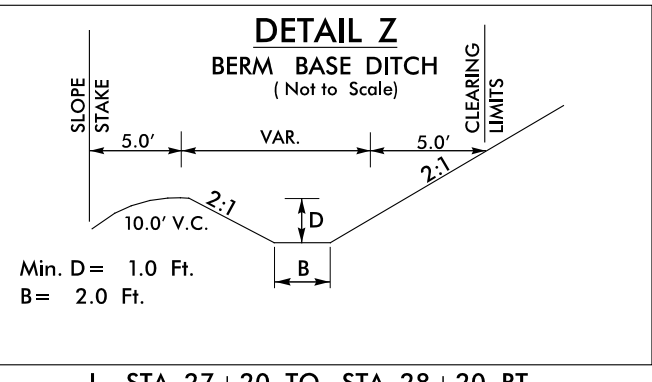
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 3.0 Ft.
Type of Liner = Class B Rip-Rap
-L- STA. 21+95 TO STA. 23+78 RT
Est. 58 Tons Class B Rip-Rap, Est. 161 S.Y. Geotextile
-L- STA. 32+00 TO STA. 33+98 RT
Est. 92 Tons Class B Rip-Rap, Est. 256 S.Y. Geotextile
-L- STA. 54+51 TO STA. 58+97 RT
Est. 208 Tons Class B Rip-Rap, Est. 576 S.Y. Geotextile
-L- STA. 141+48 TO STA. 142+49 RT
Est. 38 Tons Class B Rip-Rap, Est. 105 S.Y. Geotextile



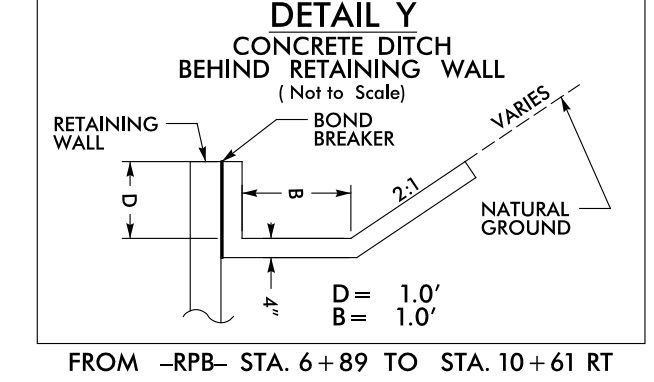
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 3.0 Ft.
Type of Liner = Est. 121 Tons Class B Rip-Rap
Est. 333 S.Y. Geotextile
-L- STA. 24+10 TO STA. 26+50 RT



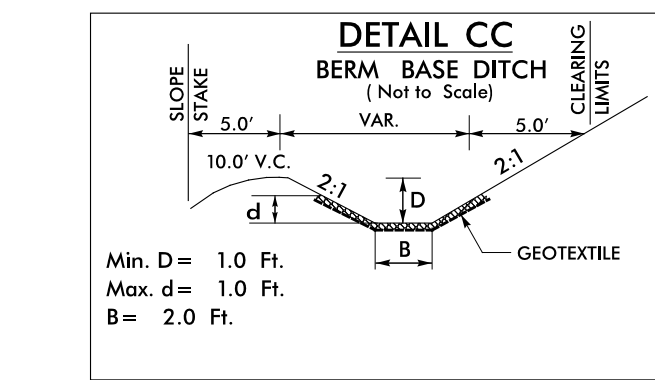
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
Type of Liner = Est. 124 Tons Class B Rip-Rap
Est. 372 S.Y. Geotextile
-L- STA. 84+97 TO STA. 87+85 RT



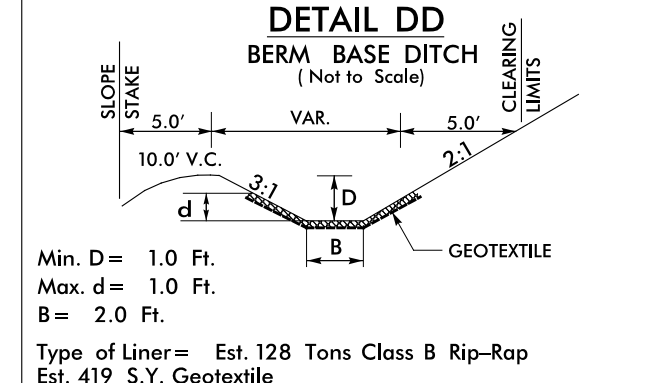
Min. D = 1.0 Ft.
B = 2.0 Ft.
-L- STA. 27+20 TO STA. 28+20 RT
-L- STA. 37+73 TO STA. 42+95 RT
-L- STA. 54+04 TO STA. 54+48 RT
-L- STA. 71+61 TO STA. 71+98 RT
-L- STA. 129+72 TO STA. 130+17 RT
-L- STA. 132+98 TO STA. 133+50 RT
-L- STA. 137+97 TO STA. 138+88 RT



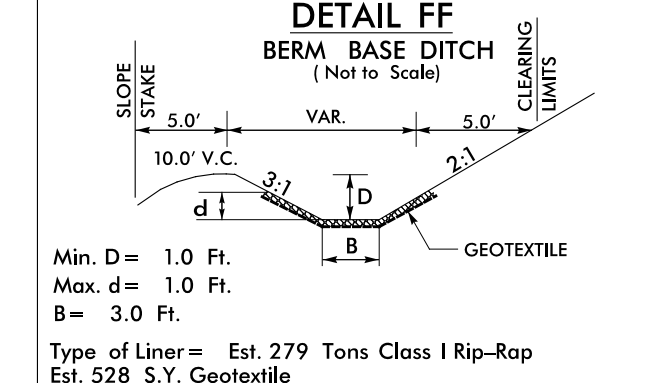
D = 1.0'
B = 1.0'
FROM -RPB- STA. 6+89 TO STA. 10+61 RT



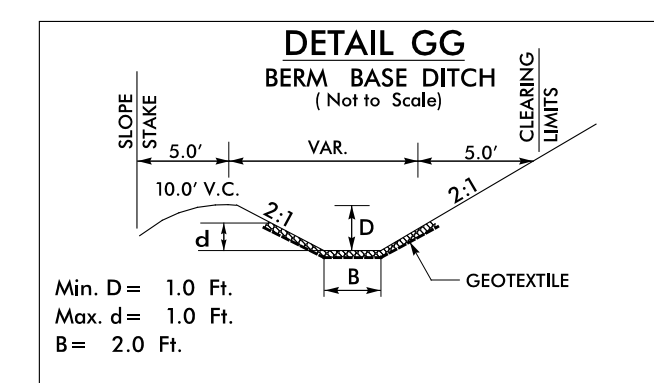
Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
-L- STA. 59+02 TO STA. 60+67 RT
Est. 74 Tons Class B Rip-Rap, Est. 209 S.Y. Geotextile
-Y2- STA. 10+20 TO 12+50 RT
Type of Liner = Est. 49 Tons Class B Rip-Rap, Est. 137 S.Y. Geotextile
-L- STA. 71+98 TO STA. 72+50 RT
Type of Liner = Est. 31 Tons Class B Rip-Rap, Est. 89 S.Y. Geotextile
-L- STA. 103+51 TO STA. 105+89 RT
Type of Liner = Est. 108 Tons Class B Rip-Rap, Est. 307 S.Y. Geotextile
-L- STA. 108+23 TO STA. 113+33 RT
Type of Liner = Est. 89 Tons Class B Rip-Rap, Est. 251 S.Y. Geotextile
-L- STA. 130+17 TO STA. 132+98 RT
Type of Liner = Est. 147 Tons Class B Rip-Rap, Est. 418 S.Y. Geotextile
-L- STA. 133+50 TO STA. 136+28 RT
Type of Liner = Est. 113 Tons Class B Rip-Rap, Est. 319 S.Y. Geotextile
-L- STA. 138+93 TO STA. 141+48 RT
Type of Liner = Est. 132 Tons Class B Rip-Rap, Est. 373 S.Y. Geotextile
-L- STA. 142+51 TO STA. 145+00 RT
Type of Liner = Est. 140 Tons Class B Rip-Rap, Est. 397 S.Y. Geotextile
-Y4- STA. 11+00 TO STA. 13+50 LT
Type of Liner = Est. 80 Tons Class B Rip-Rap, Est. 226 S.Y. Geotextile



Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
Type of Liner = Est. 128 Tons Class B Rip-Rap
Est. 419 S.Y. Geotextile
-L- STA. 28+44 TO STA. 31+31 RT

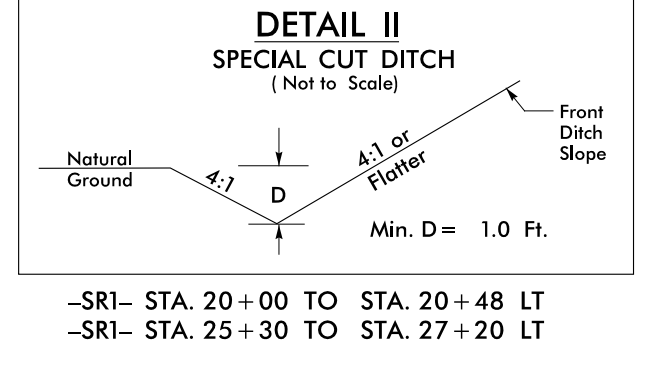


Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 3.0 Ft.
Type of Liner = Est. 279 Tons Class I Rip-Rap
Est. 528 S.Y. Geotextile
-L- STA. 72+50 TO STA. 75+17 RT

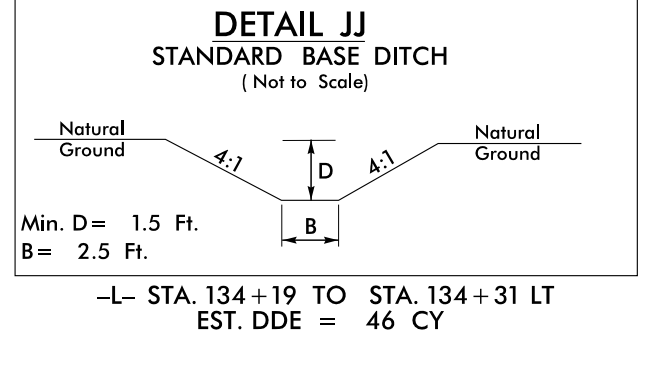


Min. D = 1.0 Ft.
Max. d = 1.0 Ft.
B = 2.0 Ft.
-L- STA. 145+02 TO STA. 148+81 RT
Type of Liner = Est. 315 Tons Class I Rip-Rap, Est. 607 S.Y. Geotextile
-L- STA. 151+08 TO STA. 153+73 RT
Type of Liner = Est. 233 Tons Class I Rip-Rap, Est. 449 S.Y. Geotextile

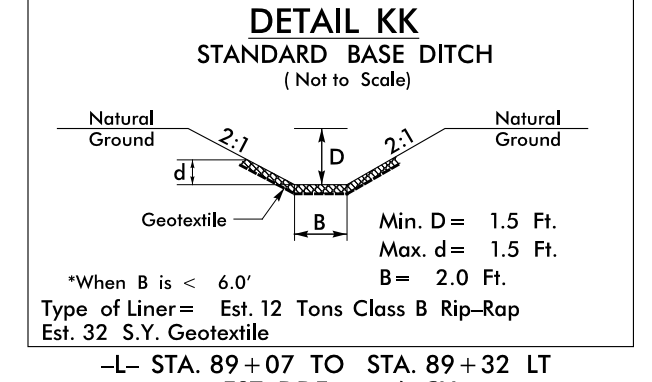
Type of Liner = Est. 31 Tons Class B Rip-Rap, Est. 89 S.Y. Geotextile
-L- STA. 103+51 TO STA. 105+89 RT
Type of Liner = Est. 108 Tons Class B Rip-Rap, Est. 307 S.Y. Geotextile
-L- STA. 108+23 TO STA. 113+33 RT
Type of Liner = Est. 89 Tons Class B Rip-Rap, Est. 251 S.Y. Geotextile
-L- STA. 130+17 TO STA. 132+98 RT
Type of Liner = Est. 147 Tons Class B Rip-Rap, Est. 418 S.Y. Geotextile
-L- STA. 133+50 TO STA. 136+28 RT
Type of Liner = Est. 113 Tons Class B Rip-Rap, Est. 319 S.Y. Geotextile
-L- STA. 138+93 TO STA. 141+48 RT
Type of Liner = Est. 132 Tons Class B Rip-Rap, Est. 373 S.Y. Geotextile
-L- STA. 142+51 TO STA. 145+00 RT
Type of Liner = Est. 140 Tons Class B Rip-Rap, Est. 397 S.Y. Geotextile
-Y4- STA. 11+00 TO STA. 13+50 LT
Type of Liner = Est. 80 Tons Class B Rip-Rap, Est. 226 S.Y. Geotextile



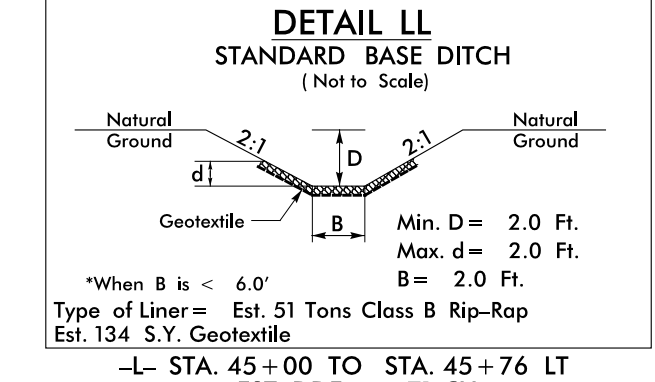
Min. D = 1.0 Ft.
-SR1- STA. 20+00 TO STA. 20+48 LT
-SR1- STA. 25+30 TO STA. 27+20 LT



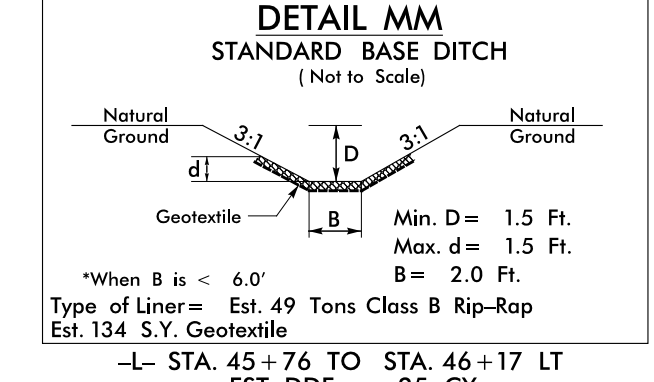
Min. D = 1.5 Ft.
B = 2.5 Ft.
-L- STA. 134+19 TO STA. 134+31 LT
EST. DDE = 46 CY



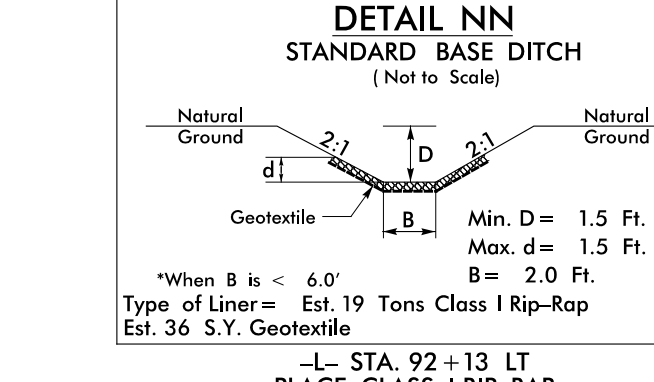
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2.0 Ft.
Type of Liner = Est. 12 Tons Class B Rip-Rap
Est. 32 S.Y. Geotextile
-L- STA. 89+07 TO STA. 89+32 LT
EST. DDE = 6 CY



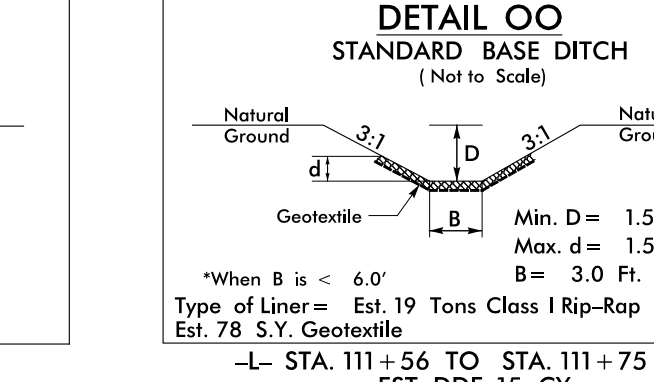
Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 2.0 Ft.
Type of Liner = Est. 51 Tons Class B Rip-Rap
Est. 134 S.Y. Geotextile
-L- STA. 45+00 TO STA. 45+76 LT
EST. DDE = 71 CY



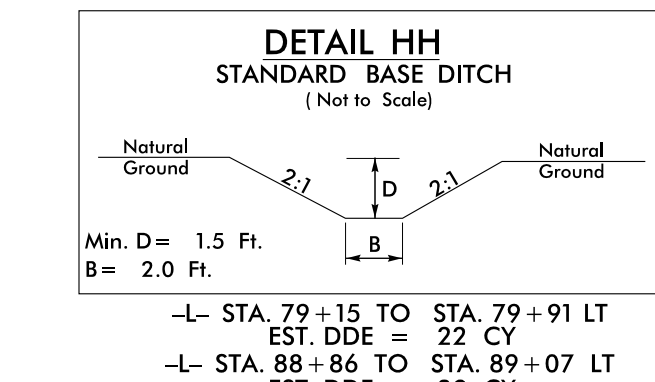
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2.0 Ft.
Type of Liner = Est. 49 Tons Class B Rip-Rap
Est. 134 S.Y. Geotextile
-L- STA. 45+76 TO STA. 46+17 LT
EST. DDE = 25 CY



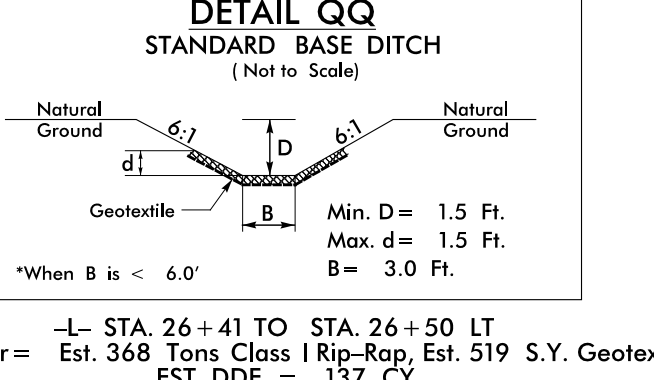
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 2.0 Ft.
Type of Liner = Est. 19 Tons Class I Rip-Rap
Est. 36 S.Y. Geotextile
-L- STA. 92+13 LT
PLACE CLASS I RIP RAP
IN LAST 20' OF DITCH
EST. DDE = 6 CY



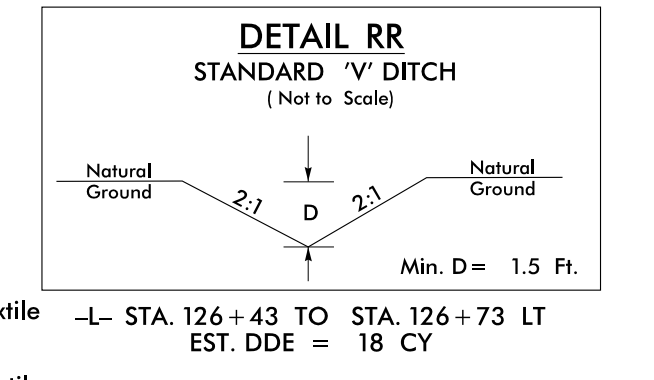
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 3.0 Ft.
Type of Liner = Est. 19 Tons Class I Rip-Rap
Est. 36 S.Y. Geotextile
-L- STA. 111+56 TO STA. 111+75 LT
EST. DDE 15 CY



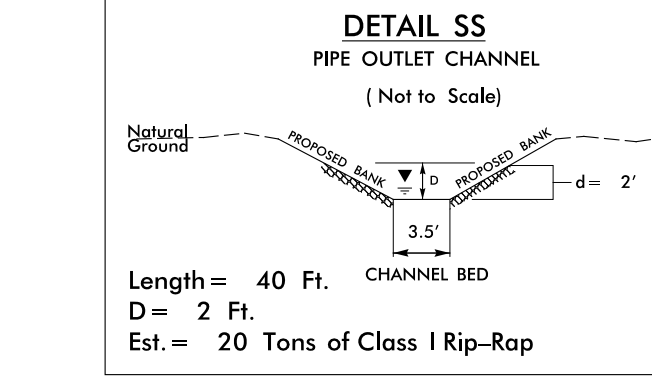
Min. D = 1.5 Ft.
B = 2.0 Ft.
-L- STA. 79+15 TO STA. 79+91 LT
EST. DDE = 22 CY
-L- STA. 88+86 TO STA. 89+07 LT
EST. DDE = 29 CY
-L- STA. 92+13 TO STA. 92+17 LT
EST. DDE = 44 CY



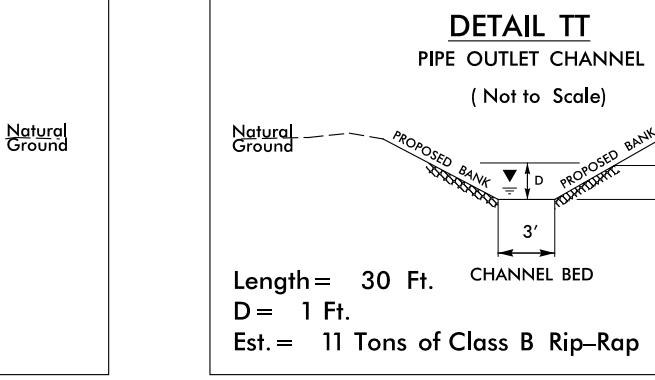
Min. D = 1.5 Ft.
Max. d = 1.5 Ft.
B = 3.0 Ft.
Type of Liner = -L- STA. 26+41 TO STA. 26+50 LT
Est. 368 Tons Class I Rip-Rap, Est. 519 S.Y. Geotextile
EST. DDE = 137 CY
Type of Liner = -L- STA. 33+00 TO STA. 33+48 LT
Est. 454 Tons Class I Rip-Rap, Est. 640 S.Y. Geotextile
EST. DDE = 176 CY



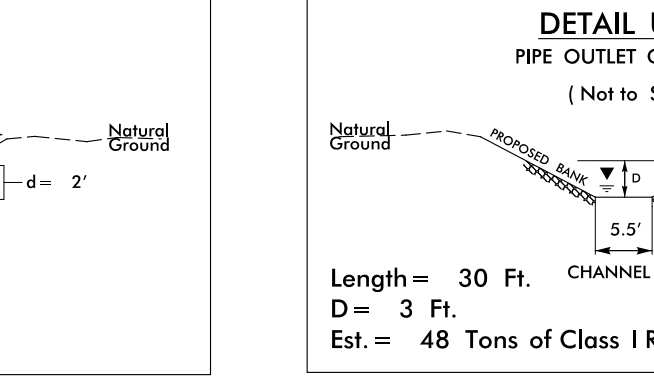
Min. D = 1.5 Ft.
-L- STA. 126+43 TO STA. 126+73 LT
EST. DDE = 18 CY



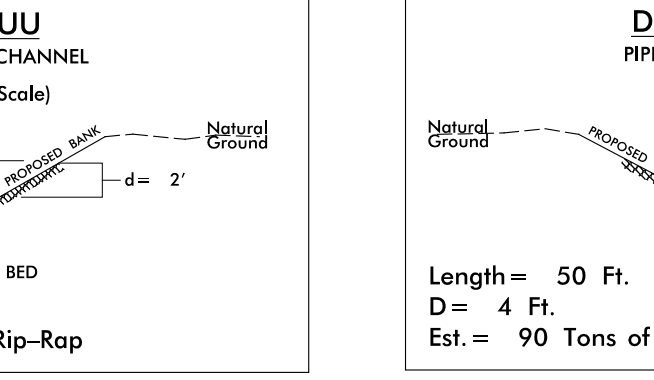
Length = 40 Ft.
D = 2 Ft.
Est. = 20 Tons of Class I Rip-Rap
-L- STA. 75+70 LT
EST. DDE = 14 CY



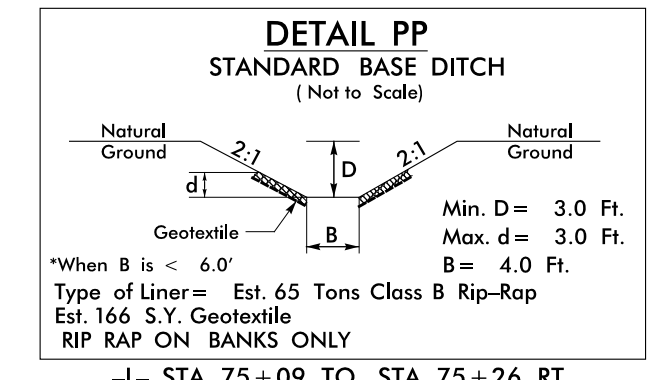
Length = 30 Ft.
D = 1 Ft.
Est. = 11 Tons of Class B Rip-Rap
-L- STA. 15+20 LT EST. DDE = 10 CY
-L- STA. 89+18 LT EST. DDE = 10 CY
-L- STA. 115+50 LT EST. DDE = 10 CY
-L- STA. 129+45 LT EST. DDE = 10 CY



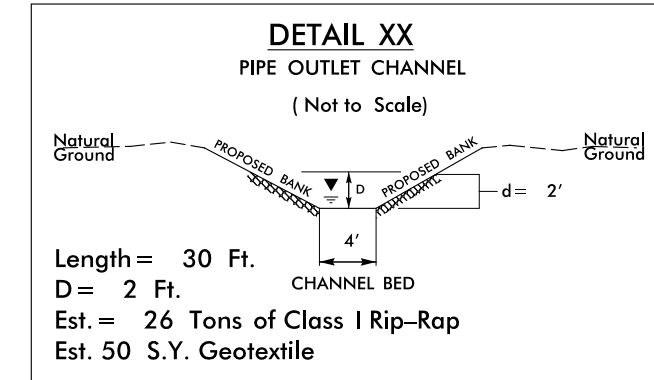
Length = 30 Ft.
D = 3 Ft.
Est. = 48 Tons of Class I Rip-Rap
-L- STA. 52+02 LT EST. DDE = 17 CY
-L- STA. 107+00 LT EST. DDE = 17 CY



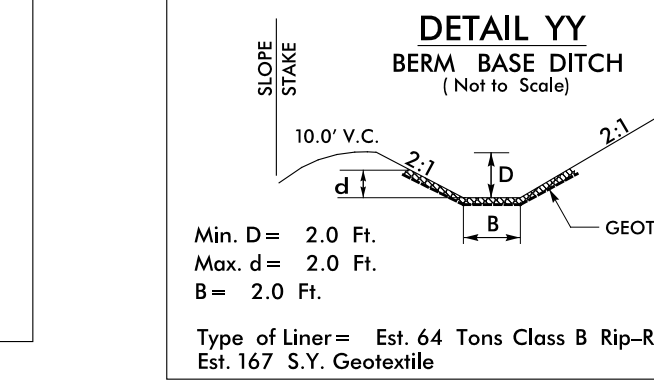
Length = 50 Ft.
D = 4 Ft.
Est. = 90 Tons of Class I Rip-Rap
-L- STA. 99+61 RT EST. DDE = 39 CY
-L- STA. 99+76 LT EST. DDE = 39 CY



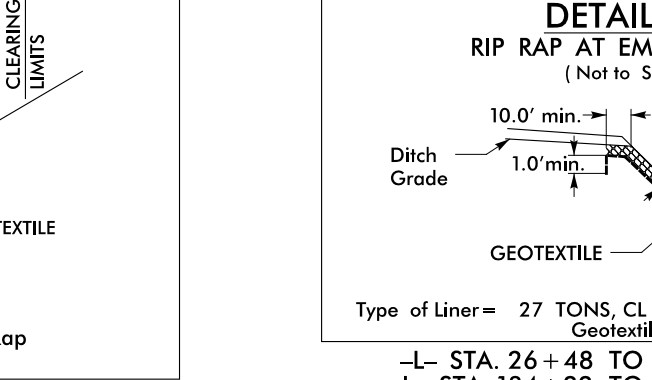
Min. D = 3.0 Ft.
Max. d = 3.0 Ft.
B = 4.0 Ft.
Type of Liner = Est. 65 Tons Class B Rip-Rap
Est. 166 S.Y. Geotextile
RIP RAP ON BANKS ONLY
-L- STA. 75+09 TO STA. 75+26 RT
EST. DDE = 86 CY



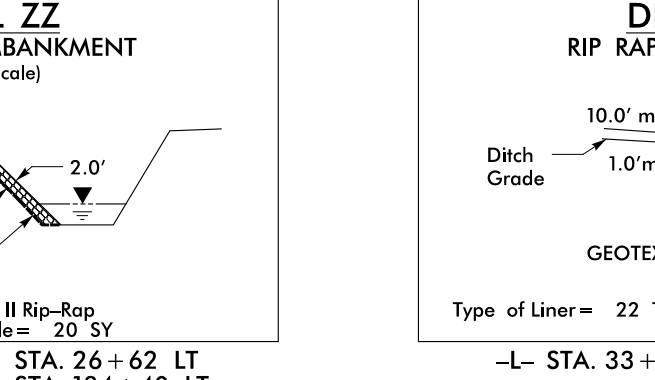
Length = 30 Ft.
D = 2 Ft.
Est. = 26 Tons of Class I Rip-Rap
Est. 50 S.Y. Geotextile
-L- STA. 79+85 LT



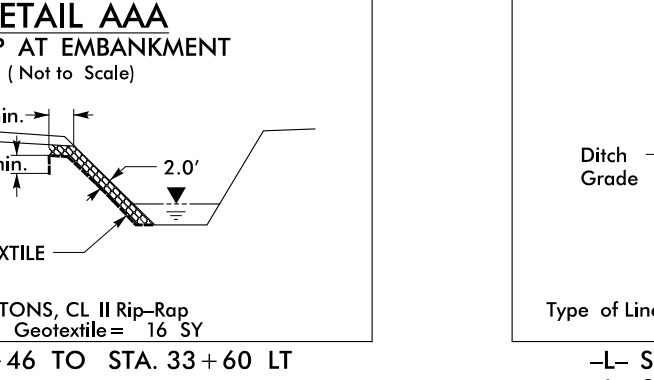
Min. D = 2.0 Ft.
Max. d = 2.0 Ft.
B = 2.0 Ft.
Type of Liner = Est. 64 Tons Class B Rip-Rap
Est. 167 S.Y. Geotextile
-Y7- STA. 11+02 TO STA. 12+49 RT



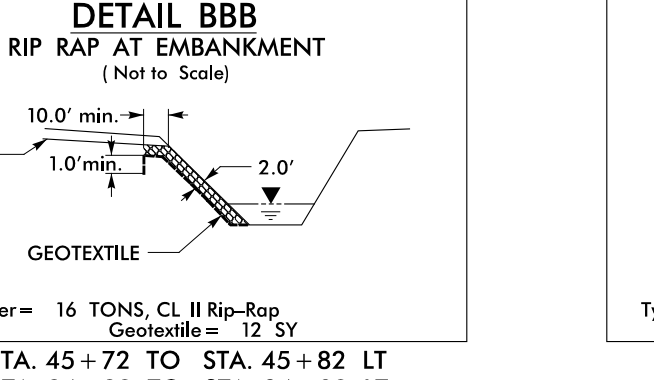
Type of Liner = 27 TONS, CL II Rip-Rap
Geotextile = 20 SY
-L- STA. 26+48 TO STA. 26+62 LT
-L- STA. 134+22 TO STA. 134+40 LT



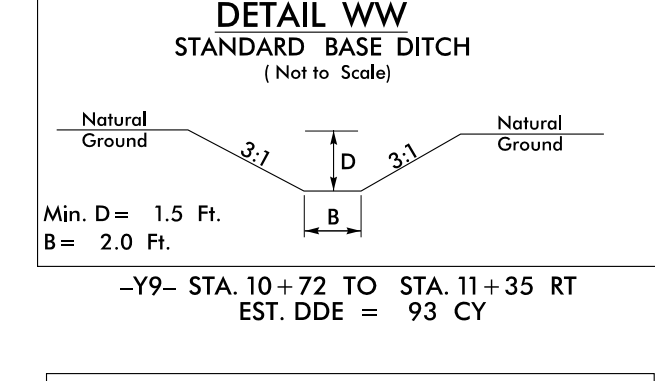
Type of Liner = 22 TONS, CL II Rip-Rap
Geotextile = 16 SY
-L- STA. 33+46 TO STA. 33+60 LT



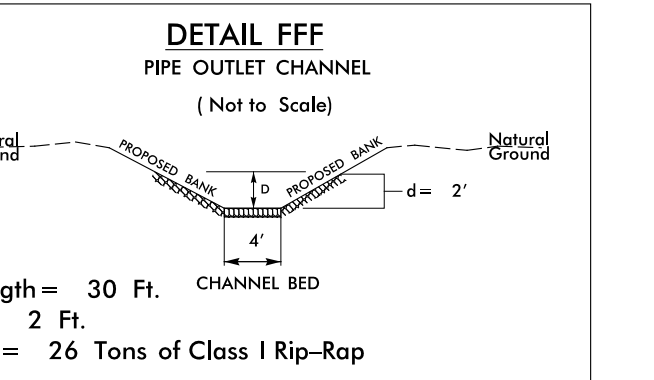
Type of Liner = 16 TONS, CL II Rip-Rap
Geotextile = 12 SY
-L- STA. 45+72 TO STA. 45+82 LT
-L- STA. 84+80 TO STA. 84+90 LT
-L- STA. 89+31 TO STA. 89+37 LT
-L- STA. 92+05 TO STA. 92+08 LT



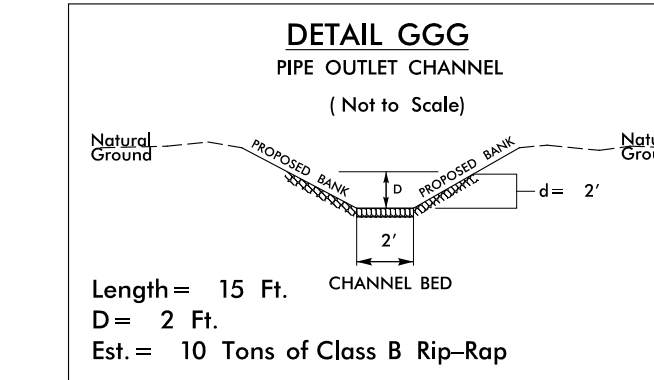
Type of Liner = 10 TONS, CL I Rip-Rap
Geotextile = 10 SY
-L- STA. 13+33 TO STA. 13+53 LT



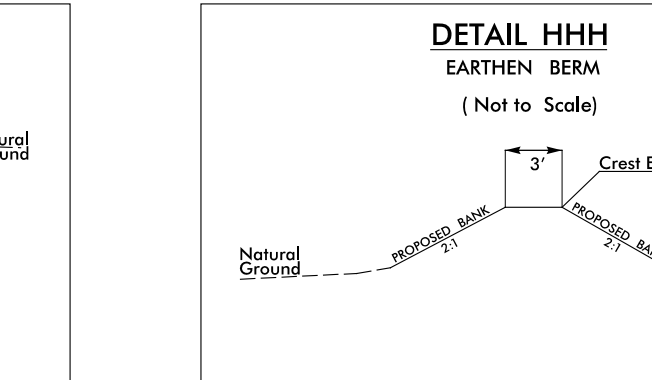
Min. D = 1.5 Ft.
B = 2.0 Ft.
-Y9- STA. 10+72 TO STA. 11+35 RT
EST. DDE = 93 CY



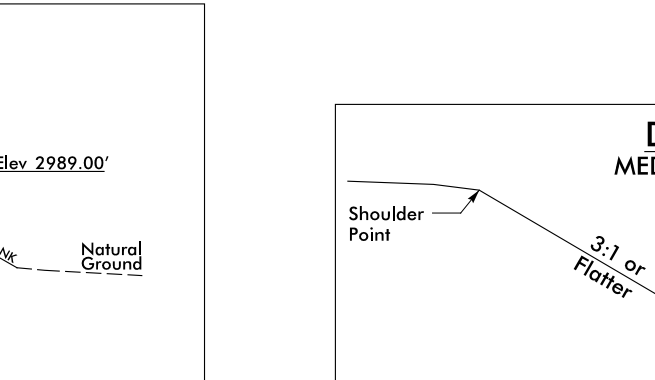
Length = 30 Ft.
D = 2 Ft.
Est. = 26 Tons of Class I Rip-Rap
-L- STA. 120+75 LT
EST. DDE = 38 CY



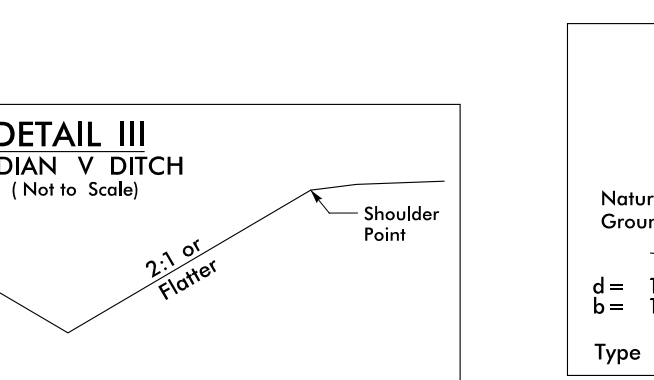
Length = 15 Ft.
D = 2 Ft.
Est. = 10 Tons of Class B Rip-Rap
-L- STA. 124+07 LT
EST. DDE = 5 CY



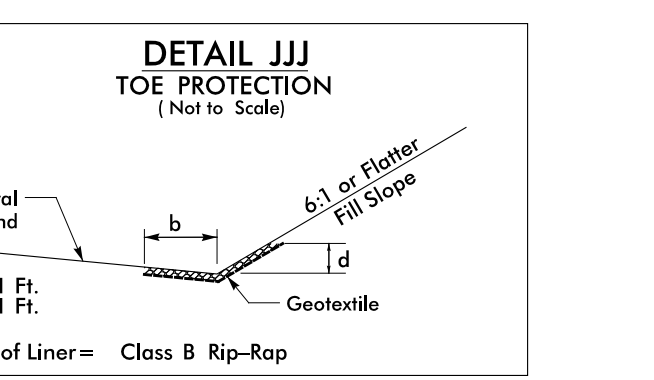
Crest Elev. 2989.00'
-RPC- STA. 8+25 TO 8+70 RT



-L- STA. 17+00 TO STA. 20+50 RT
-RPA- STA. 10+75 TO STA. 14+88 RT



Type of Liner = Class B Rip-Rap
FROM -Y1- STA. 51+11 TO STA. 53+53 (LT)



Type of Liner = Class B Rip-Rap
FROM -LPC- STA. 11+16 TO STA. 12+80 (RT)
FROM -LPC- STA. 12+86 TO STA. 13+46 (RT)


FILED \$ DATE \$

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Asheville, NC
919-971-9455

Seal: NORTH CAROLINA PROFESSIONAL SEAL 036188
8/10/2015

DRAINAGE DETAILS

| | |
|---|-------------------|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 2D-3 |
| RW SHEET NO. | |
| HYDRAULICS ENGINEER | |
|  | |
| 7/23/2015 | |



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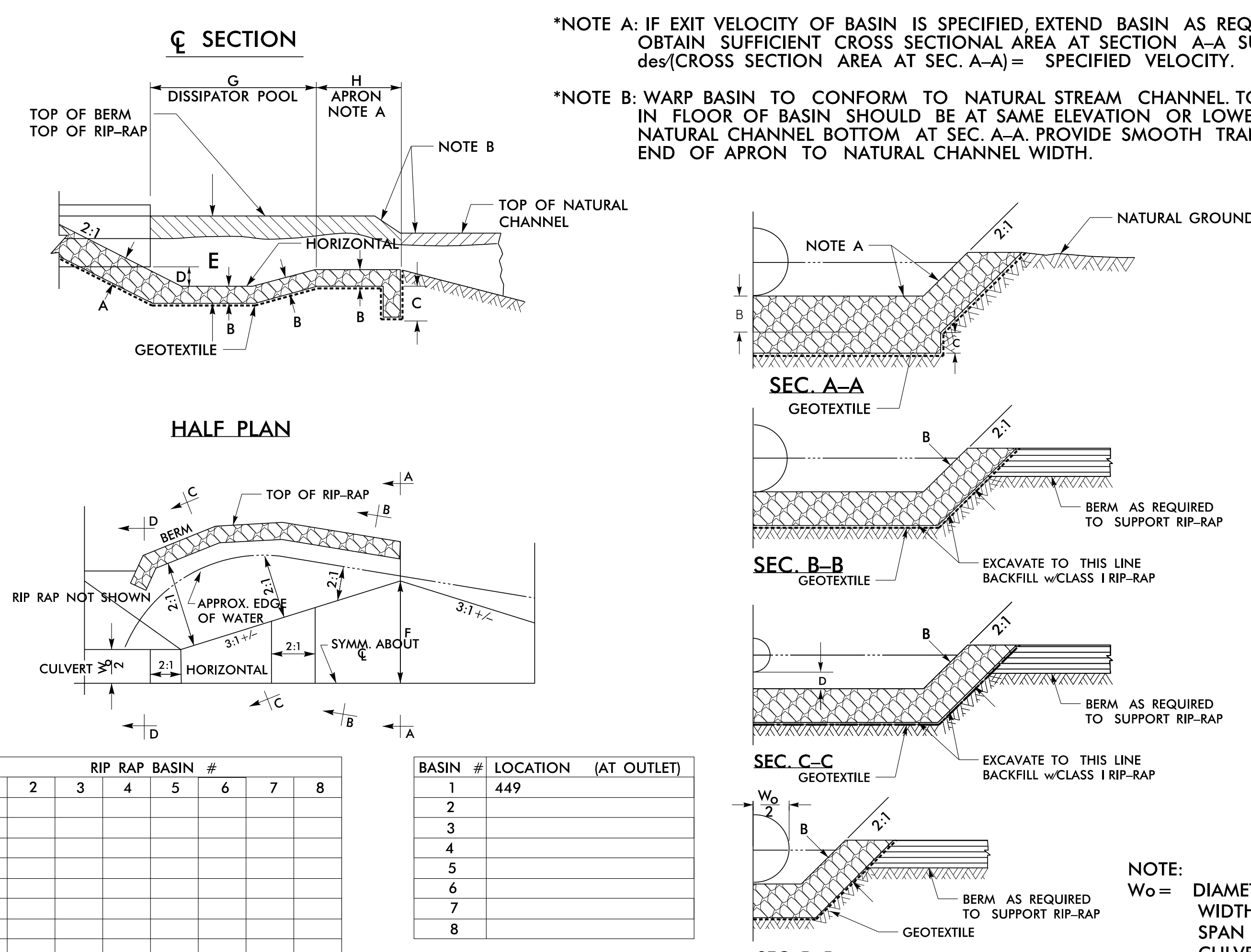
Boone, NC 828-250-9933
Tri-Cities, TN 423-467-8902
Knoxville, TN 865-546-5800
Spartanburg, SC 864-534-4715
Charleston, SC 803-974-5650
Wadesboro, NC 704-248-6600
Charlotte, NC 704-267-0488
Atlanta, GA 770-427-2609

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DETAIL Q RIP-RAPPED ENERGY DISSIPATOR BASIN

***NOTE A:** IF EXIT VELOCITY OF BASIN IS SPECIFIED, EXTEND BASIN AS REQUIRED TO OBTAIN SUFFICIENT CROSS SECTIONAL AREA AT SECTION A-A SUCH THAT $Q_{des} / (CROSS\ SECTIONAL\ AREA\ AT\ SEC.\ A-A) = SPECIFIED\ VELOCITY$.

***NOTE B:** WARP BASIN TO CONFORM TO NATURAL STREAM CHANNEL. TOP OF RIP-RAP IN FLOOR OF BASIN SHOULD BE AT SAME ELEVATION OR LOWER THAN NATURAL CHANNEL BOTTOM AT SEC. A-A. PROVIDE SMOOTH TRANSITION FROM END OF APRON TO NATURAL CHANNEL WIDTH.



| DIM. | RIP RAP BASIN # | | | | | | | |
|------|-----------------|---|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
| A | 3.0' | | | | | | | |
| B | 2.5' | | | | | | | |
| C | 2.0' | | | | | | | |
| D | 2.5' | | | | | | | |
| E | 8.0' | | | | | | | |
| F | 12.0' | | | | | | | |
| G | 18.0' | | | | | | | |
| H | 9.0' | | | | | | | |

| BASIN # | LOCATION (AT OUTLET) |
|---------|----------------------|
| 1 | 449 |
| 2 | |
| 3 | |
| 4 | |
| 5 | |
| 6 | |
| 7 | |
| 8 | |

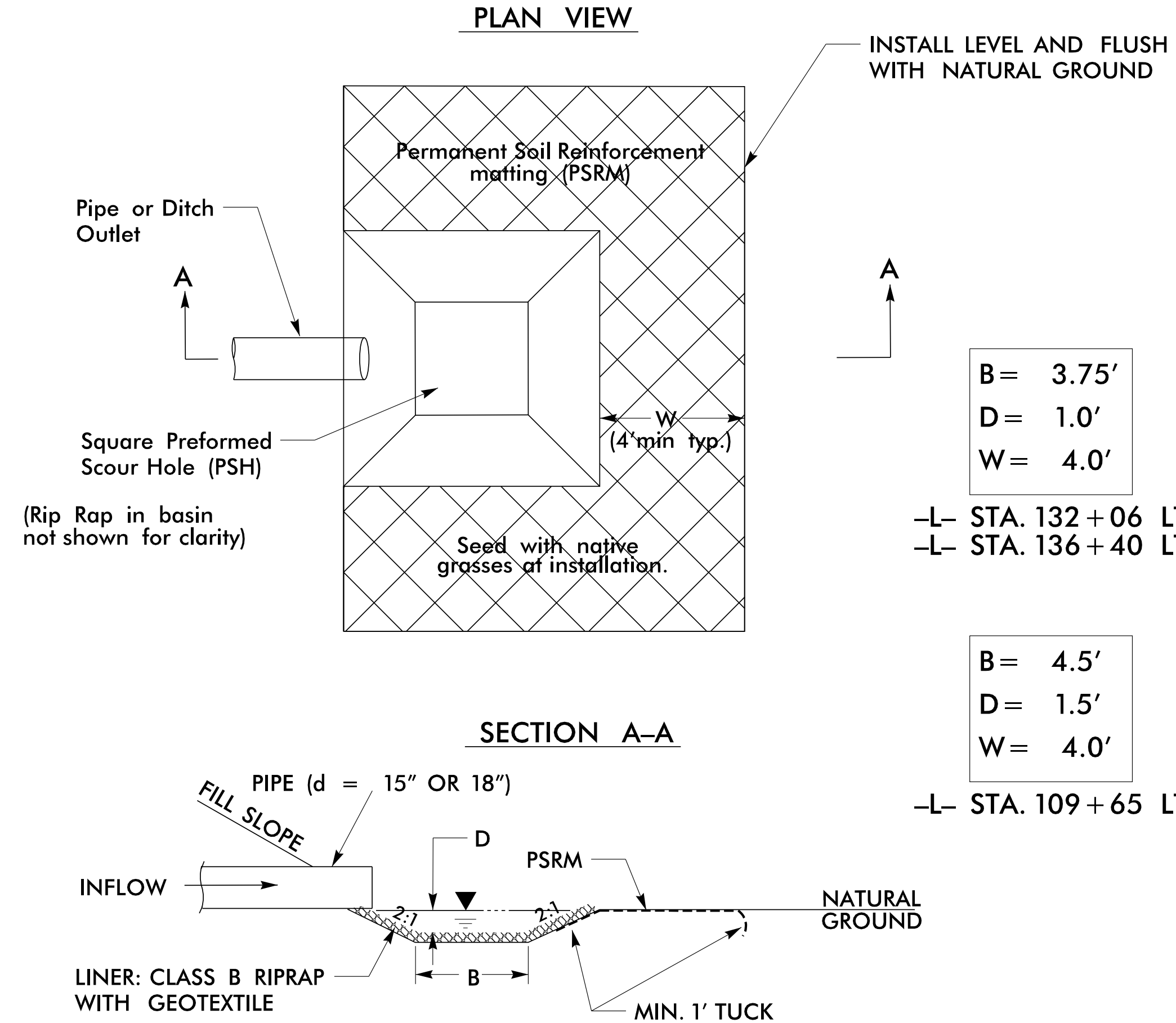
*ALL DIMENSIONS APPROXIMATE IN FEET

-L- STA. 13+20 TO STA. 13+54 LT
Type of Liner = Est. 275 Tons Class I Rip-Rap
Est. 200 S.Y. Geotextile

DETAIL T PREFORMED SCOUR HOLE

*NOT TO SCALE

PLAN VIEW



INSTALL LEVEL AND FLUSH WITH NATURAL GROUND

Pipe or Ditch Outlet

Square Preformed Scour Hole (PSH)

(Rip Rap in basin not shown for clarity)

Permanent Soil Reinforcement matting (PSRM)

Seed with native grasses at installation.

SECTION A-A

PIPE (d = 15" OR 18")

INFLOW

NATURAL GROUND

MIN. 1' TUCK

LINER: CLASS B RIPRAP WITH GEOTEXTILE

B = 3.75'

D = 1.0'

W = 4.0'

-L- STA. 132+06 LT
-L- STA. 136+40 LT

B = 4.5'

D = 1.5'

W = 4.0'

-L- STA. 109+65 LT

505

3/08

\$DATE\$

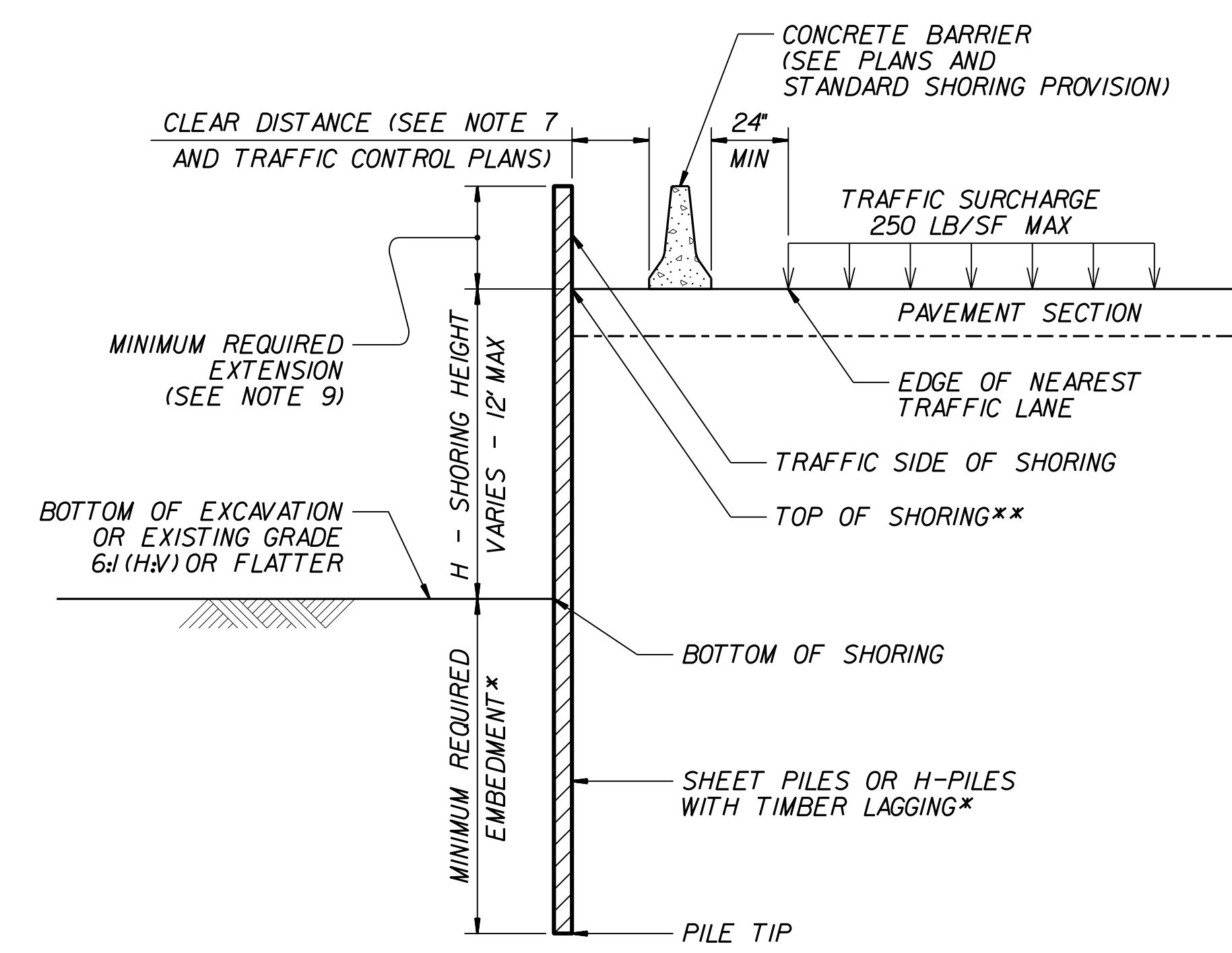
| GROUNDWATER CONDITION (SEE NOTE 6) | H SHORING HEIGHT (FT) | SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT | | | | | | SURCHARGE CASE WITH TRAFFIC IMPACT | | | | | |
|--|-----------------------|--|--|--|----------|----------|---------------------------------|--|--|-----------------------------|----------|--|--|
| | | SHEET PILES | | H-PILES WITH TIMBER LAGGING | | | | SHEET PILES | | H-PILES WITH TIMBER LAGGING | | | |
| | | MINIMUM REQUIRED EMBEDMENT (FT) | MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT) | MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10) | | | MINIMUM REQUIRED EMBEDMENT (FT) | MINIMUM REQUIRED SECTION MODULUS (IN ³ /FT) | MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10) | | | | |
| | | | | HP 10x42 | HP 12x53 | HP 14x73 | | | HP 10x42 | HP 12x53 | HP 14x73 | | |
| GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP | < 6 | 11.5 | 4.5 | 11.5 | 11.5 | 11.5 | 16.0 | 12.0 | 13.0 | 13.0 | 13.0 | | |
| | 7 | 13.0 | 7.0 | 13.0 | 13.0 | 13.0 | 17.0 | 14.5 | 14.5 | 14.5 | 14.5 | | |
| | 8 | 15.0 | 10.0 | -- | 15.0 | 15.0 | 18.0 | 17.0 | -- | 15.5 | 15.5 | | |
| | 9 | 17.0 | 14.0 | -- | 17.0 | 17.0 | 19.0 | 20.0 | -- | 17.0 | 17.0 | | |
| | 10 | 18.5 | 19.5 | -- | -- | 18.5 | 20.0 | 23.5 | -- | -- | 18.5 | | |
| | 11 | 20.5 | 26.0 | -- | -- | -- | 21.0 | 28.0 | -- | -- | 20.0 | | |
| 12 | 22.5 | 33.0 | -- | -- | -- | 22.0 | 33.0 | -- | -- | 21.5 | | | |
| GROUNDWATER ELEVATION BELOW PILE TIP | < 6 | 7.5 | 3.0 | 8.0 | 8.0 | 8.0 | 11.0 | 10.0 | 9.5 | 9.5 | 9.5 | | |
| | 7 | 8.5 | 4.5 | 9.5 | 9.5 | 9.5 | 12.0 | 12.0 | 10.5 | 10.5 | 10.5 | | |
| | 8 | 10.0 | 6.5 | 10.5 | 10.5 | 10.5 | 12.5 | 14.0 | 11.5 | 11.5 | 11.5 | | |
| | 9 | 11.0 | 9.5 | -- | 12.0 | 12.0 | 13.5 | 16.5 | -- | 12.5 | 12.5 | | |
| | 10 | 12.5 | 13.0 | -- | -- | 13.5 | 14.0 | 19.5 | -- | 13.5 | 13.5 | | |
| | 11 | 13.5 | 17.0 | -- | -- | 14.5 | 15.0 | 22.5 | -- | -- | 14.5 | | |
| 12 | 15.0 | 21.5 | -- | -- | 16.0 | 16.0 | 25.5 | -- | -- | 15.5 | | | |

MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS

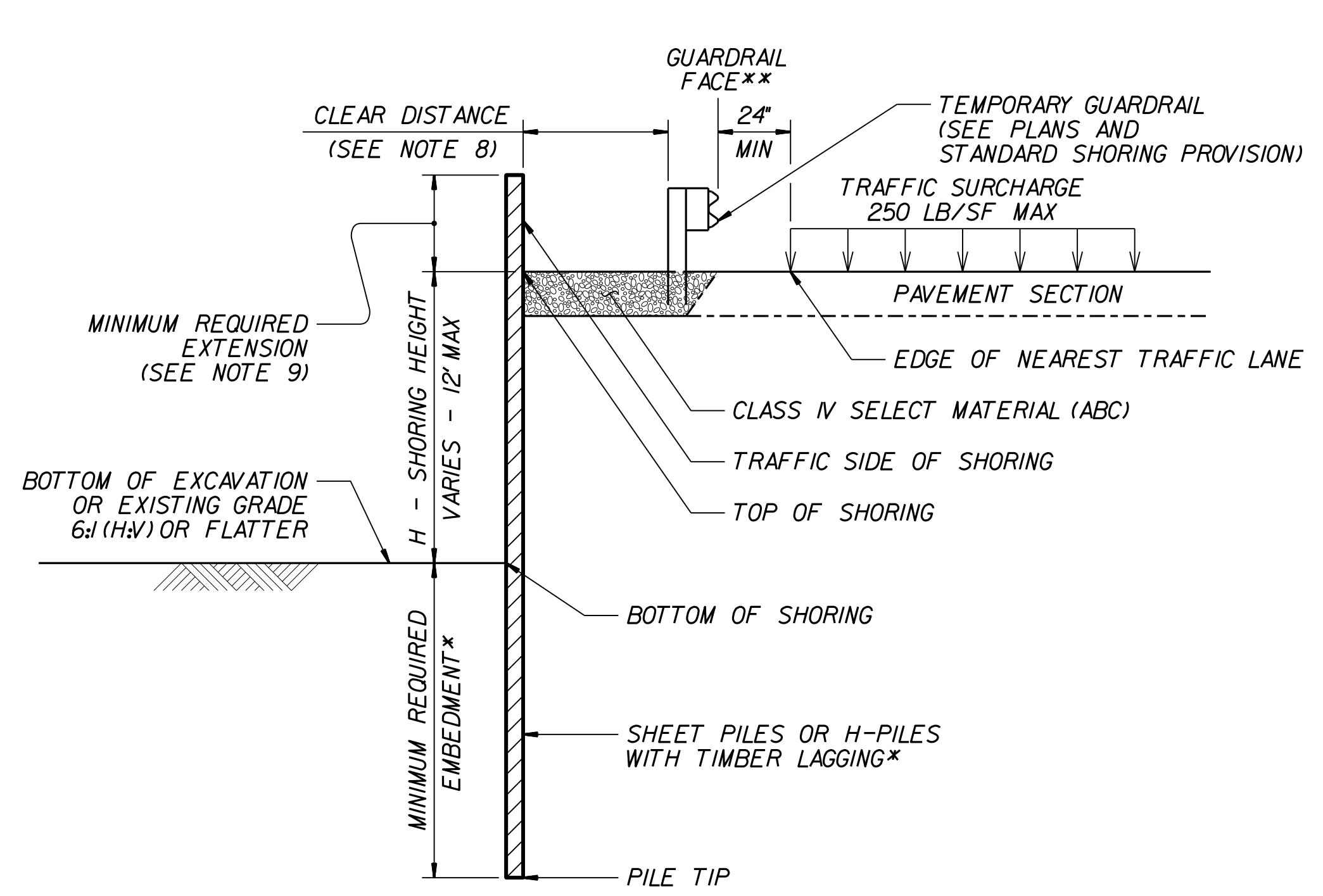
*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".

NOTES:

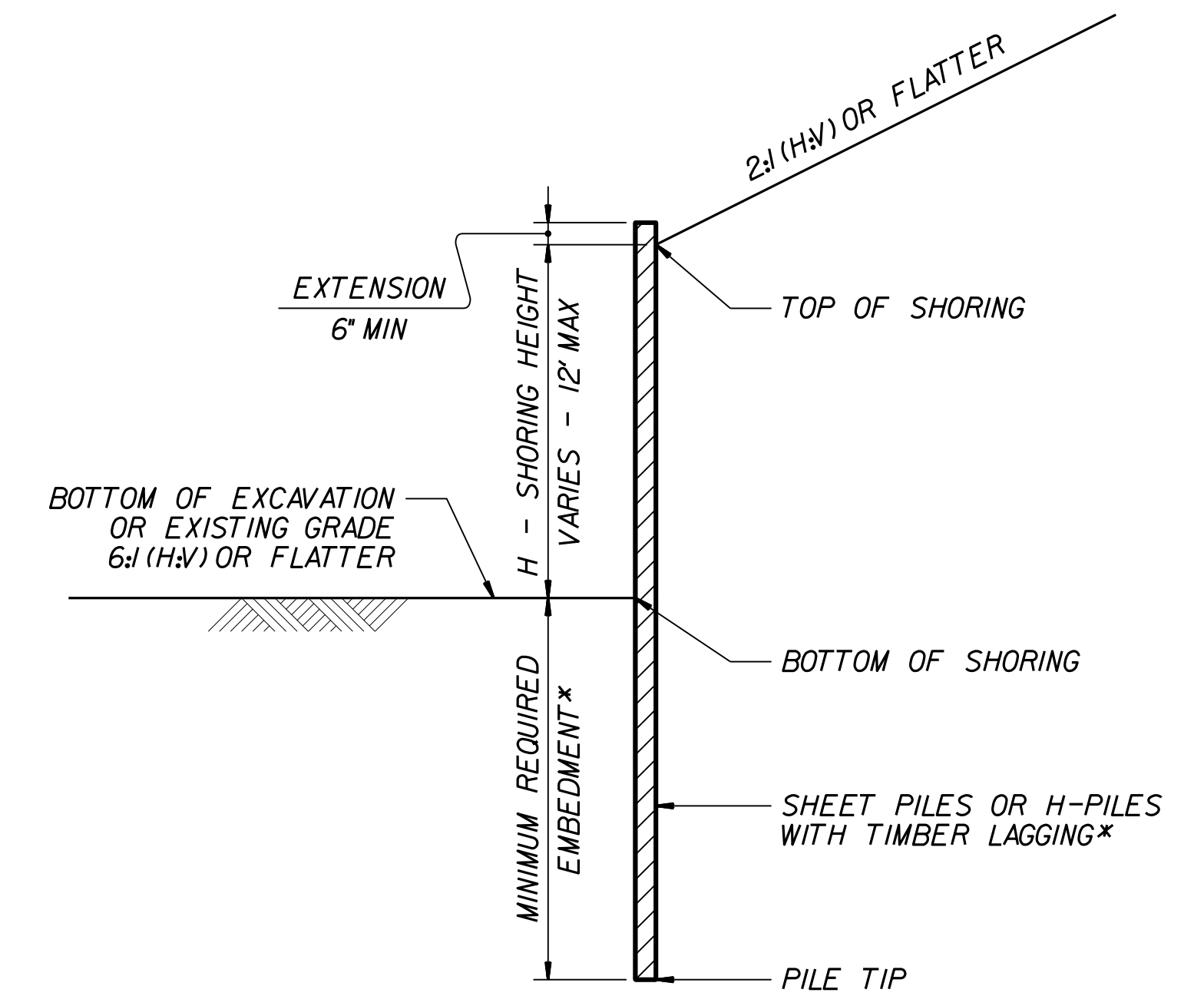
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ LB/CF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ LB/SF
- DO NOT USE STANDARD TEMPORARY SHORING IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
- DO NOT USE STANDARD TEMPORARY SHORING WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS WITHIN THE EMBEDMENT DEPTH.
- USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, USE "GROUNDWATER ELEVATION BETWEEN BOTTOM OF SHORING AND PILE TIP" FOR GROUNDWATER CONDITION. DO NOT USE STANDARD TEMPORARY SHORING IF GROUNDWATER IS ABOVE BOTTOM OF SHORING.
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN THE MINIMUM REQUIRED FOR CONCRETE BARRIER, SET BARRIER NEXT TO AND UP AGAINST TRAFFIC SIDE OF PILES AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- AT THE CONTRACTOR'S OPTION OR IF AVAILABLE CLEAR DISTANCE IS LESS THAN 4' FOR TEMPORARY GUARDRAIL, ATTACH GUARDRAIL TO TRAFFIC SIDE OF PILES AS SHOWN IN THE PLANS AND USE "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EXTENSION IS 6' FOR "SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT" AND 32' FOR "SURCHARGE CASE WITH TRAFFIC IMPACT".
- MINIMUM REQUIRED EMBEDMENT FOR H-PILES WITH TIMBER LAGGING IS BASED ON DRIVEN H-PILES AT MAXIMUM 6' SPACING. AT THE CONTRACTOR'S OPTION, EMBEDMENT DEPTHS MAY BE REDUCED BY 25% FOR DRILLED-IN H-PILES.
- SUBMIT A "STANDARD TEMPORARY SHORING SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY SHORING CONSTRUCTION. UP TO 3 SHORING LOCATIONS MAY BE INCLUDED ON EACH FORM. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM:
connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.



CONCRETE BARRIER
**TOP OF SHORING =
EDGE OF PAVEMENT



TEMPORARY GUARDRAIL
**GUARDRAIL FACE =
EDGE OF PAVEMENT



STANDARD TEMPORARY SHORING
(SLOPE CASE)
*SEE TABLE ABOVE.

STANDARD TEMPORARY SHORING
(SURCHARGE CASE)
*SEE TABLE ABOVE.

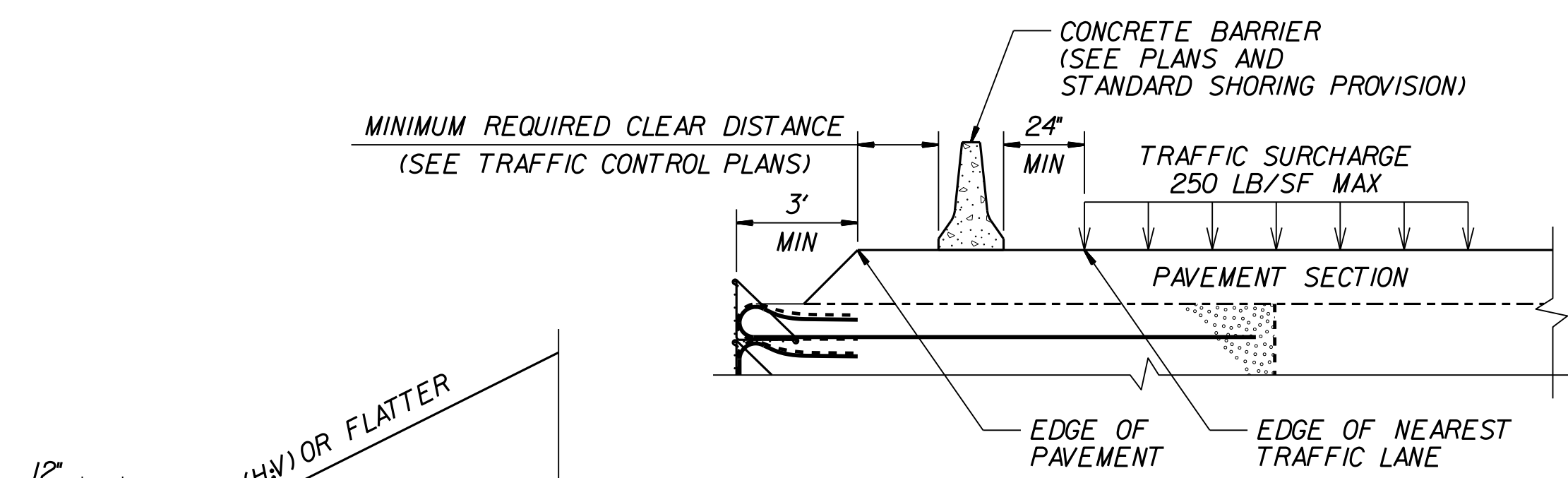


NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

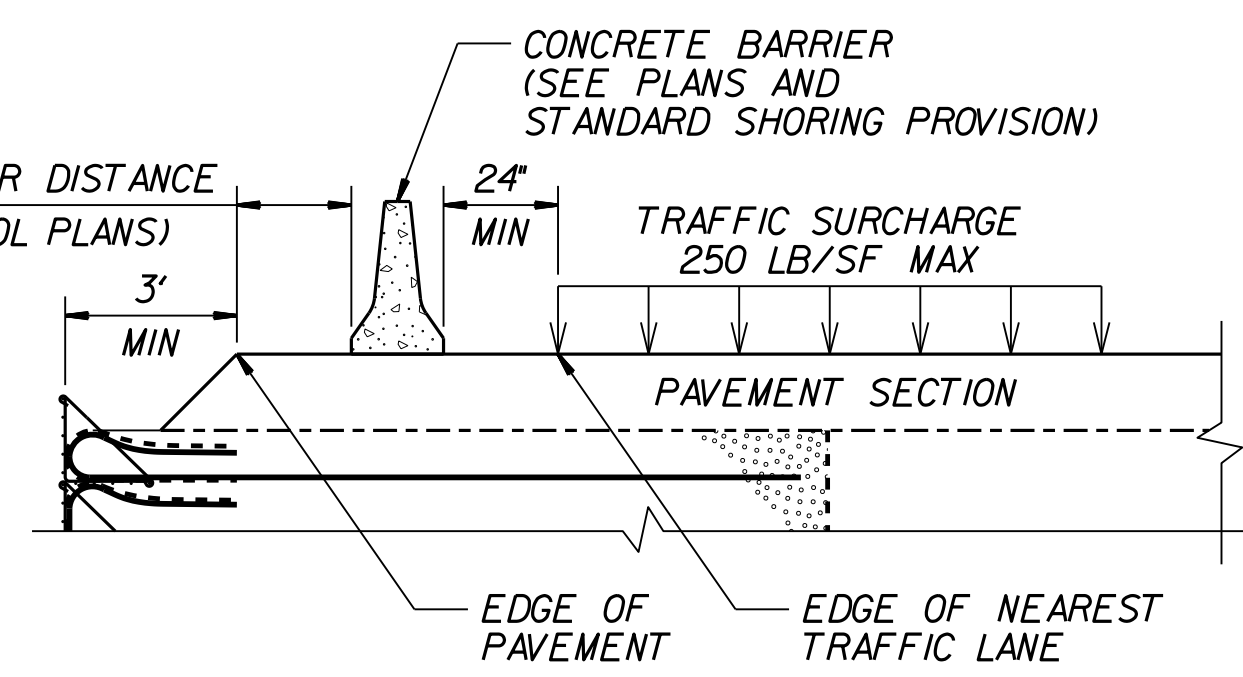
**GEOTECHNICAL
ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.01

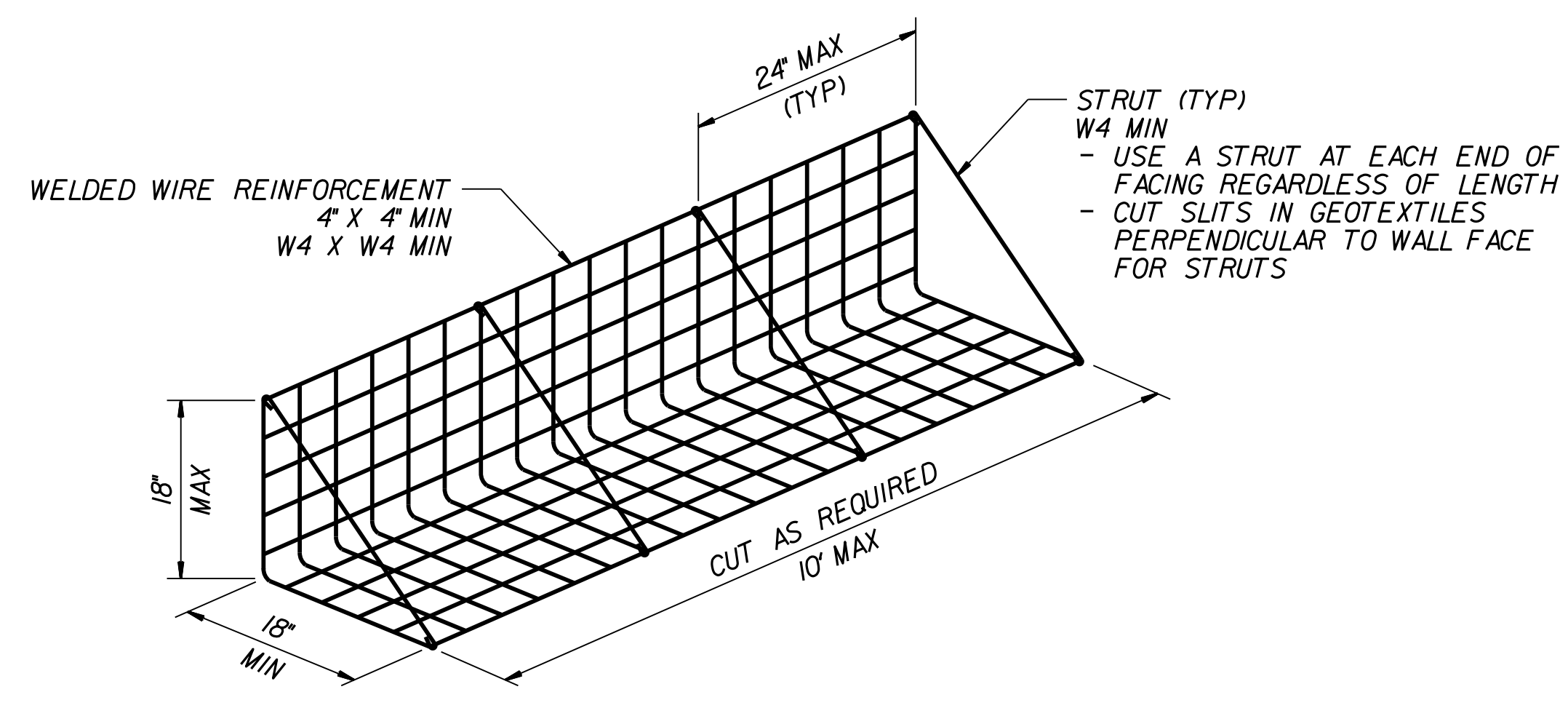
STANDARD
TEMPORARY SHORING



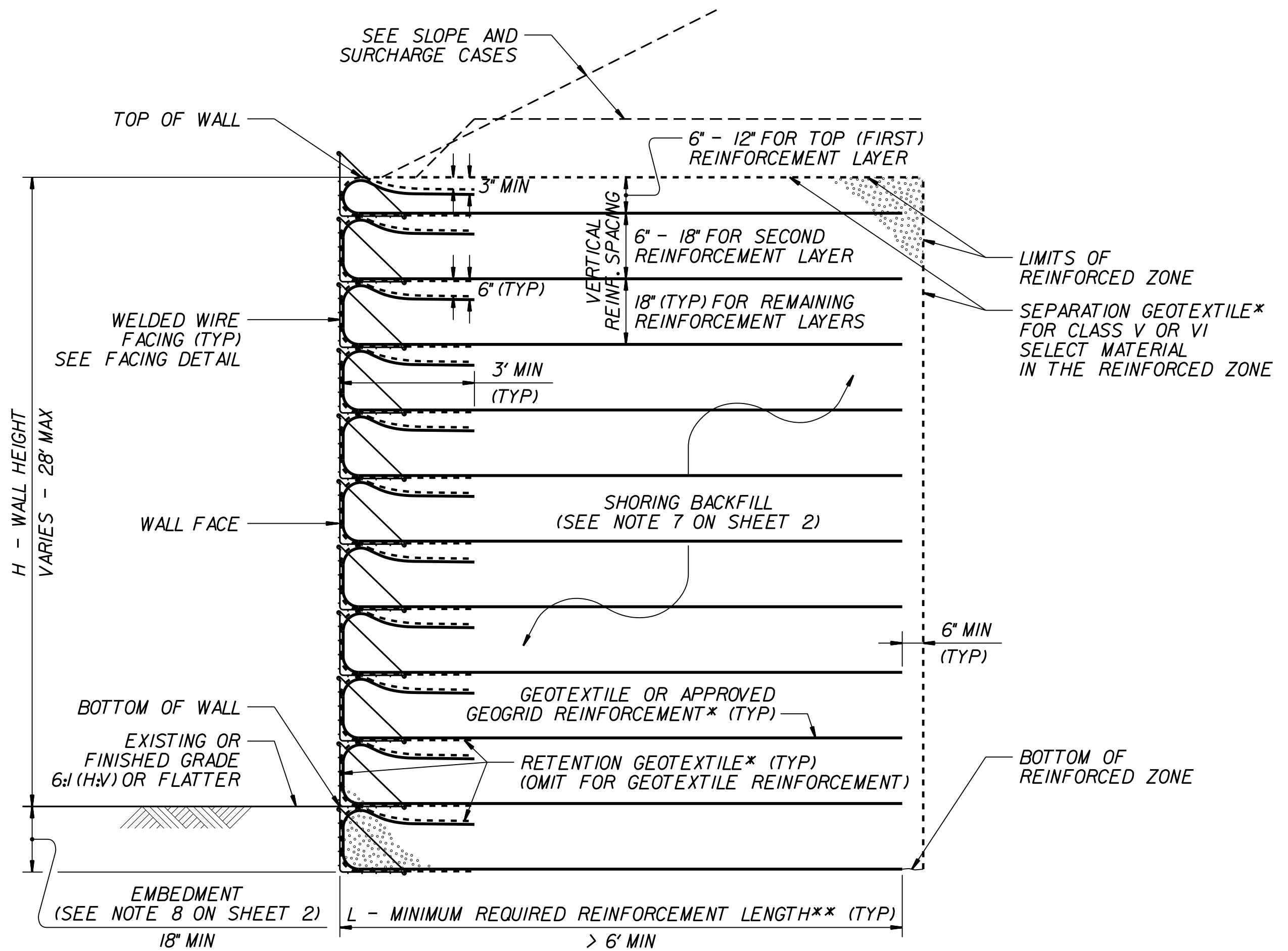
SLOPE CASE



SURCHARGE CASE

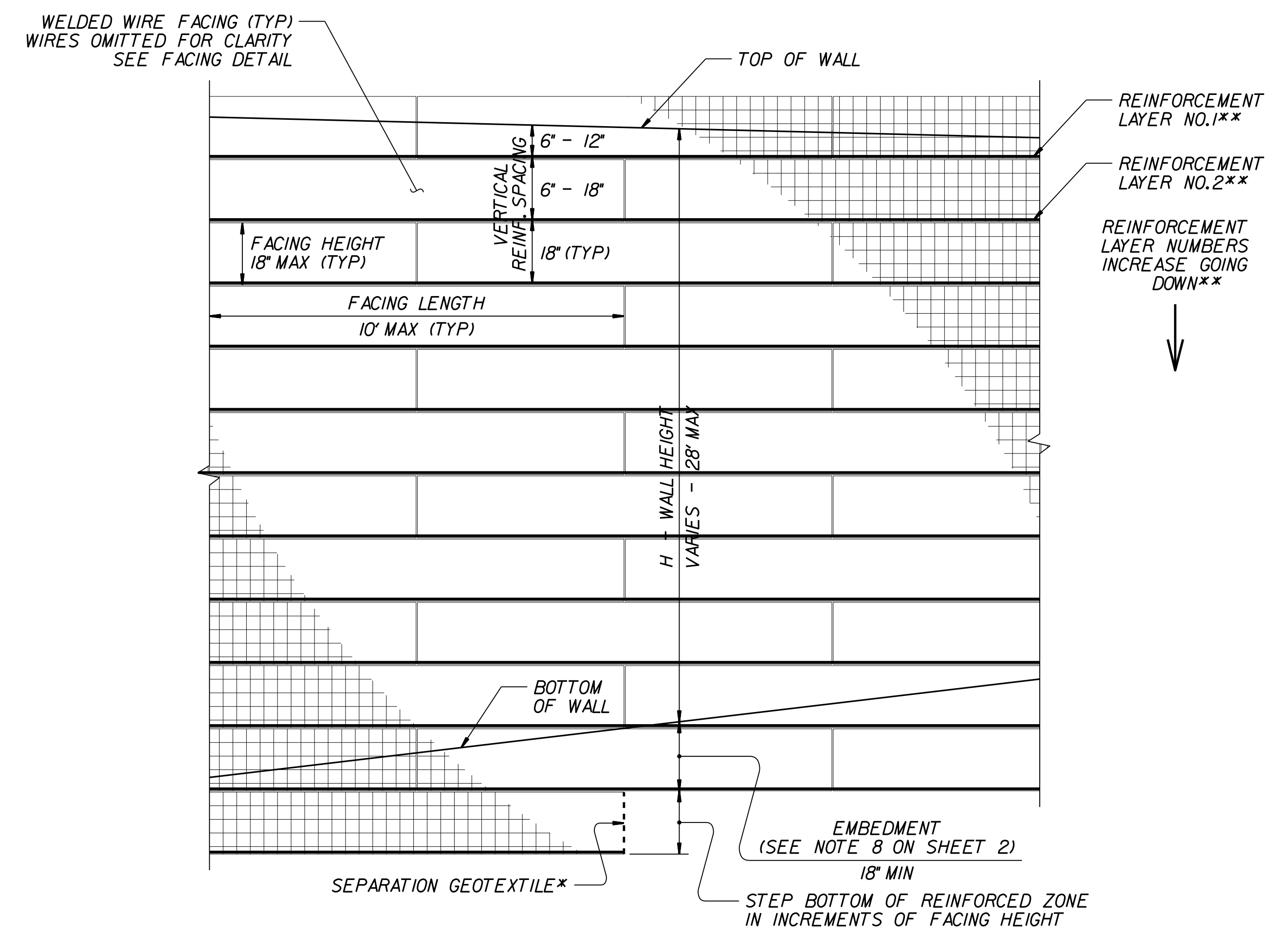


FACING DETAIL



STANDARD TEMPORARY WALL

(FOR STANDARD TEMPORARY WALLS ON STRUCTURES, SEE TEMPORARY WALL ON STRUCTURE DETAIL ON SHEET 2.)
 *SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.



STANDARD TEMPORARY WALL - PARTIAL ELEVATION

*SEE GEOSYNTHETIC PLACEMENT DETAILS ON SHEET 2.
 **SEE REINFORCEMENT TABLES ON SHEET 3.

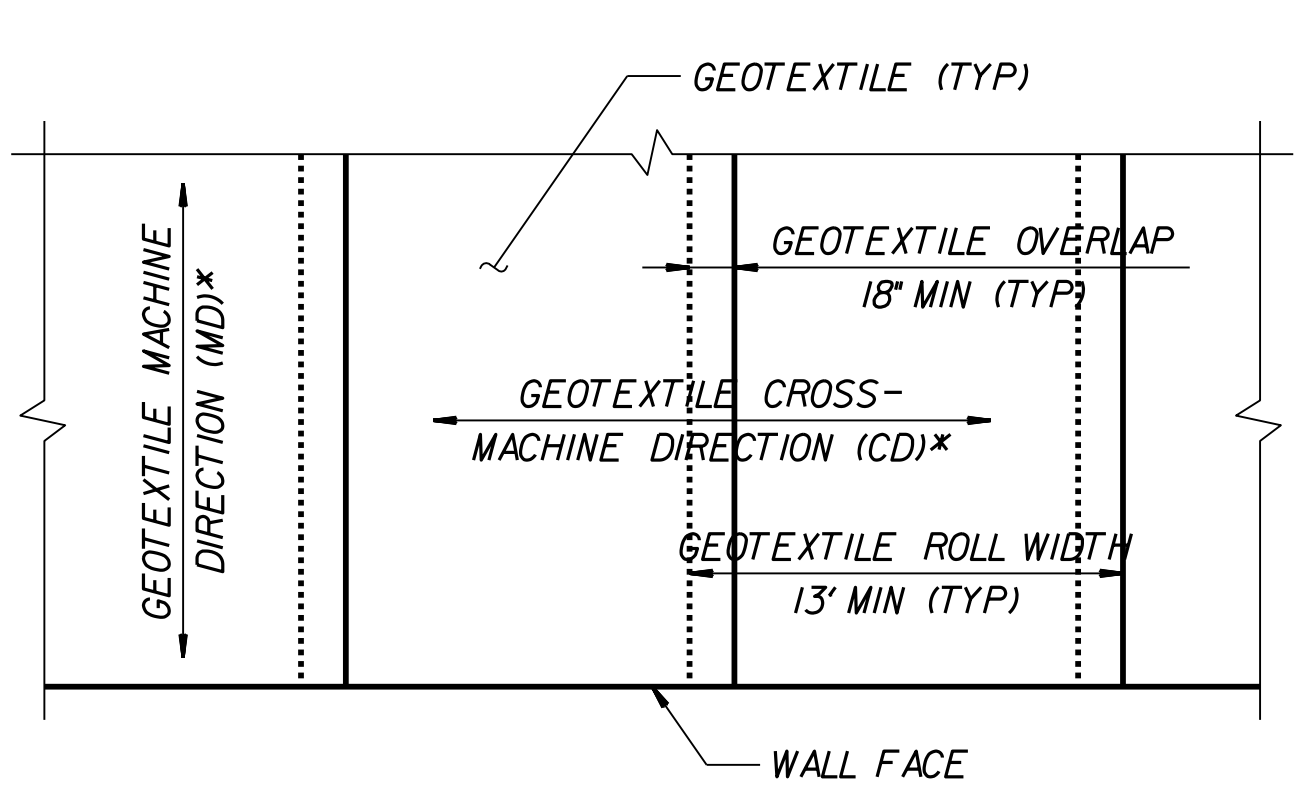


NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

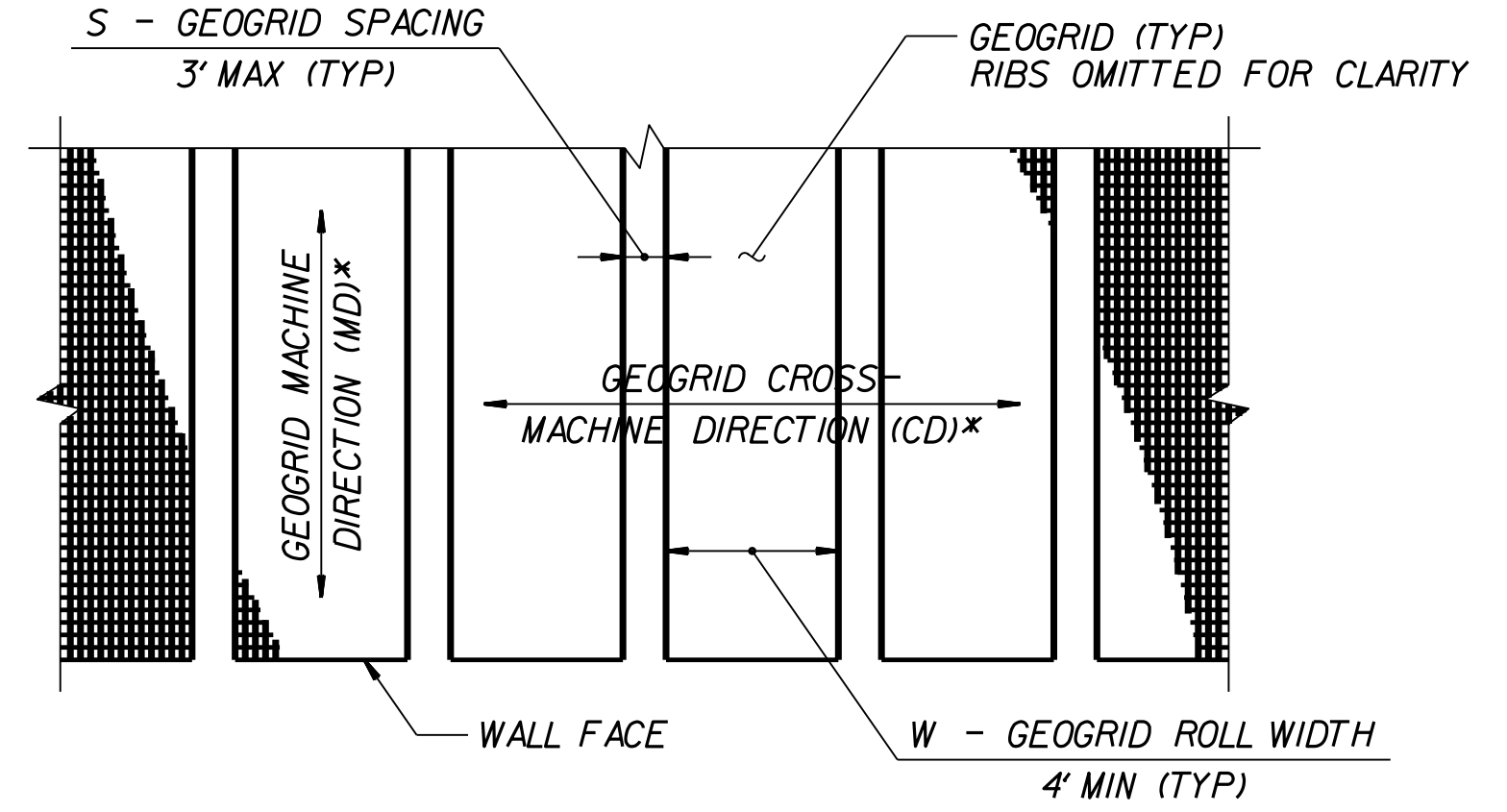
**GEOTECHNICAL
 ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02

STANDARD
 TEMPORARY WALL
 SHEET 1 OF 3

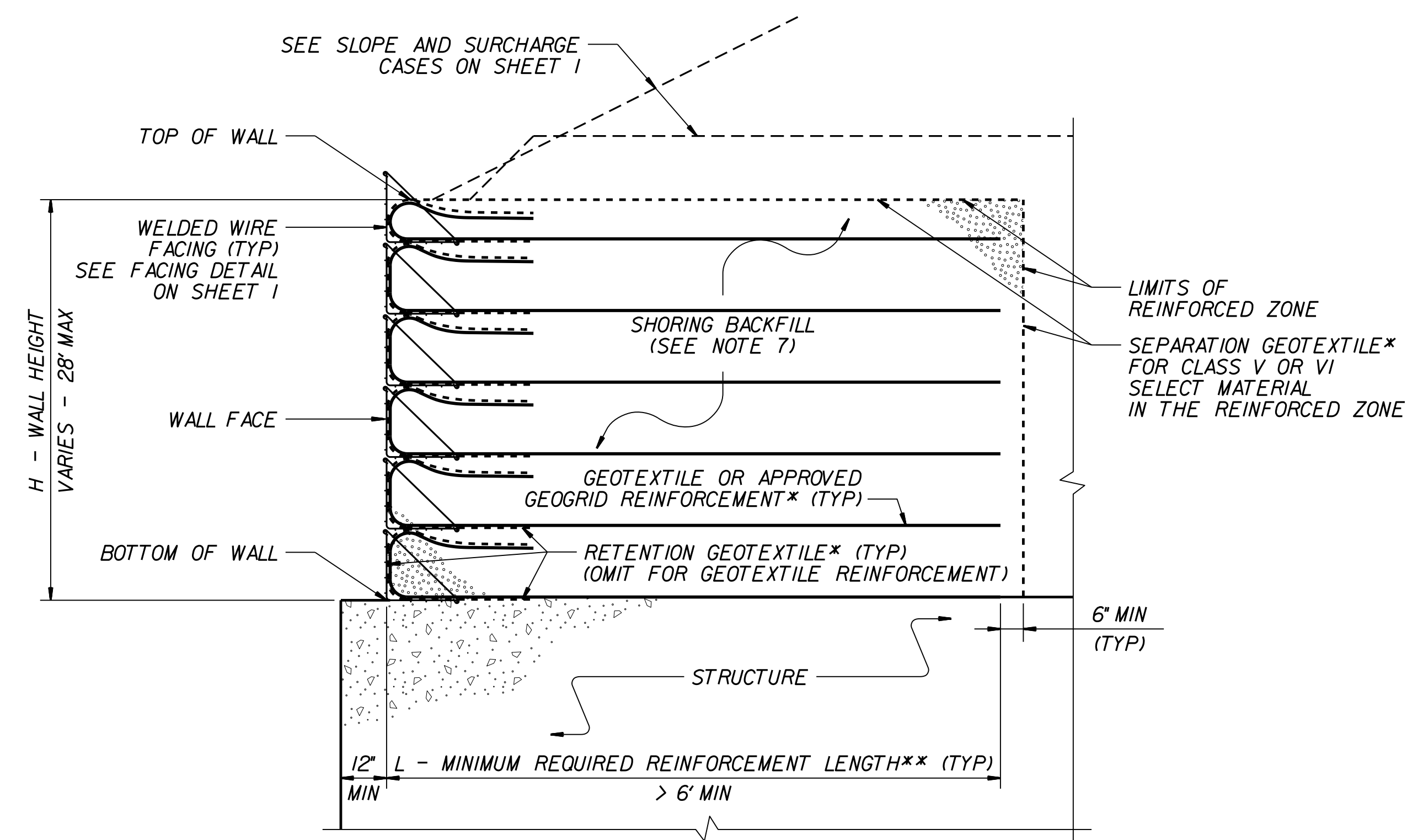


GEOTEXTILE PLACEMENT
(100% COVERAGE MIN FOR GEOTEXTILE REINFORCEMENT)



GEOGRID PLACEMENT
(80% COVERAGE MIN FOR GEOGRID REINFORCEMENT - $\frac{W}{W+S} \times 100 \geq 80\%$, SEE NOTE 11)

GEOSYNTHETIC PLACEMENT DETAILS
(PLAN VIEW)
*SEE NOTE 12.



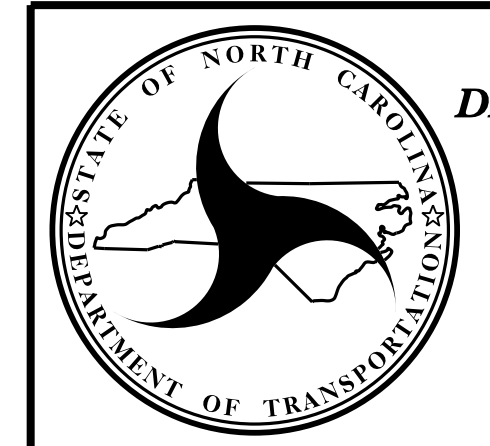
TEMPORARY WALL ON STRUCTURE DETAIL
*SEE GEOSYNTHETIC PLACEMENT DETAILS.
**SEE REINFORCEMENT TABLES ON SHEET 3.

NOTES:

1. AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY WALLS AS NOTED IN THE PLANS.
2. FOR STANDARD TEMPORARY WALLS, SEE STANDARD SHORING PROVISION.
3. STANDARD TEMPORARY WALLS ARE BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:
UNIT WEIGHT, $\gamma = 120$ LB/CF
FRICTION ANGLE, $\phi = 30$ DEGREES
COHESION, $c = 0$ LB/SF
4. DO NOT USE STANDARD TEMPORARY WALLS IF ASSUMED SOIL PARAMETERS ARE NOT APPLICABLE.
5. DO NOT USE STANDARD TEMPORARY WALLS WHEN VERY LOOSE OR SOFT SOIL OR MUCK IS BELOW TEMPORARY WALLS.
6. USE GROUNDWATER ELEVATION NOTED IN THE PLANS. IF NO GROUNDWATER ELEVATION IS SHOWN IN THE PLANS, ASSUME GROUNDWATER DEPTH IS LESS THAN 7' BELOW BOTTOM OF REINFORCED ZONE. DO NOT USE STANDARD TEMPORARY WALLS IF GROUNDWATER IS ABOVE BOTTOM OF REINFORCED ZONE.
7. DO NOT USE A-2-4 SOIL FOR STANDARD TEMPORARY WALLS AROUND CULVERTS OR IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS FOR SLOPE CASES. DO NOT USE CLASS VI SELECT MATERIAL IN THE REINFORCED ZONE OF STANDARD TEMPORARY WALLS WITH GEOTEXTILE REINFORCEMENT.
8. EMBEDMENT IS NOT REQUIRED FOR STANDARD TEMPORARY WALLS ON STRUCTURES OR ROCK AS DETERMINED BY THE ENGINEER.
9. DO NOT USE MORE THAN 4 DIFFERENT REINFORCEMENT STRENGTHS FOR EACH STANDARD TEMPORARY WALL.
10. GEOGRIDS ARE TYPICALLY APPROVED FOR ULTIMATE TENSILE STRENGTHS IN THE MACHINE DIRECTION (MD) AND CROSS-MACHINE DIRECTION (CD) OR SHORT-TERM DESIGN STRENGTHS FOR A 3-YEAR DESIGN LIFE IN THE MD BASED ON MATERIAL TYPE. THE LIST OF APPROVED GEOGRIDS WITH DESIGN STRENGTHS IS AVAILABLE FROM: connect.ncdot.gov/resources/Materials/Pages/SoilsLaboratory.aspx
DEFINE MATERIAL TYPE FROM THE WEBSITE ABOVE FOR SHORING BACKFILL AS FOLLOWS:

| MATERIAL TYPE | SHORING BACKFILL |
|------------------|---|
| BORROW | A-2-4 SOIL |
| FINE AGGREGATE | CLASS II, TYPE I OR CLASS III SELECT MATERIAL |
| COARSE AGGREGATE | CLASS V OR VI SELECT MATERIAL |

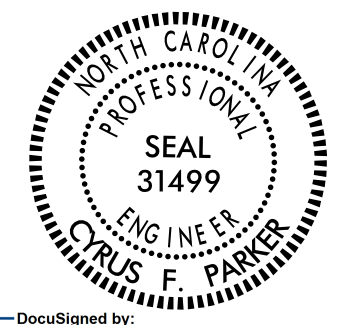
- IF THE WEBSITE DOES NOT LIST A SHORT-TERM DESIGN STRENGTH FOR AN APPROVED GEOGRID, USE A SHORT-TERM DESIGN STRENGTH EQUAL TO THE ULTIMATE TENSILE STRENGTH DIVIDED BY 3.5 FOR THE GEOGRID REINFORCEMENT.
11. FOR GEOGRID REINFORCEMENT WITH LESS THAN 100% COVERAGE, STAGGER REINFORCEMENT SO GEOGRIDS ARE CENTERED OVER GAPS IN THE REINFORCEMENT LAYER BELOW.
 12. AT THE CONTRACTOR'S OPTION, REINFORCEMENT MAY BE INSTALLED WITH THE MD PARALLEL TO THE WALL FACE IF BOTH OF THE FOLLOWING CONDITIONS OCCUR:
- W (REINFORCEMENT ROLL WIDTH) \geq (MINIMUM REQUIRED REINFORCEMENT LENGTH) + 4.5' AND
- REINFORCEMENT STRENGTH IN CD \geq MINIMUM REQUIRED REINFORCEMENT STRENGTH IN MD.
 13. SUBMIT A "STANDARD TEMPORARY WALL SELECTION FORM" AT LEAST 7 DAYS BEFORE STARTING TEMPORARY WALL CONSTRUCTION. STANDARD SHORING SELECTION FORMS ARE AVAILABLE FROM: connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx
 14. DO NOT PLACE SHORING BACKFILL OR REINFORCEMENT UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.
 15. FOR STANDARD TEMPORARY WALLS WITH PILE FOUNDATIONS IN THE REINFORCED ZONE, DRIVE PILES THROUGH REINFORCEMENT AFTER CONSTRUCTING TEMPORARY WALLS.
 16. DO NOT SPLICE OR OVERLAP REINFORCEMENT SO SEAMS ARE PARALLEL TO THE WALL FACE.
 17. CONTACT THE ENGINEER WHEN EXISTING OR FUTURE OBSTRUCTIONS SUCH AS FOUNDATIONS, PAVEMENTS, PIPES, INLETS OR UTILITIES WILL INTERFERE WITH REINFORCEMENT.
 18. FOR STANDARD TEMPORARY WALLS WITH INTERIOR ANGLES LESS THAN 90 DEGREES, WRAP GEOSYNTHETICS AT ACUTE CORNERS AS DIRECTED BY THE ENGINEER.
 19. FOR STANDARD TEMPORARY WALLS WITH TOP OF WALL WITHIN 5' OF FINISHED GRADE, REMOVE TOP FACING AND INCORPORATE TOP REINFORCEMENT LAYER INTO FILL WHEN PLACING FILL IN FRONT OF WALL.



NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**GEOTECHNICAL
ENGINEERING UNIT**

STANDARD DETAIL NO. 1801.02

STANDARD
TEMPORARY WALL
SHEET 2 OF 3

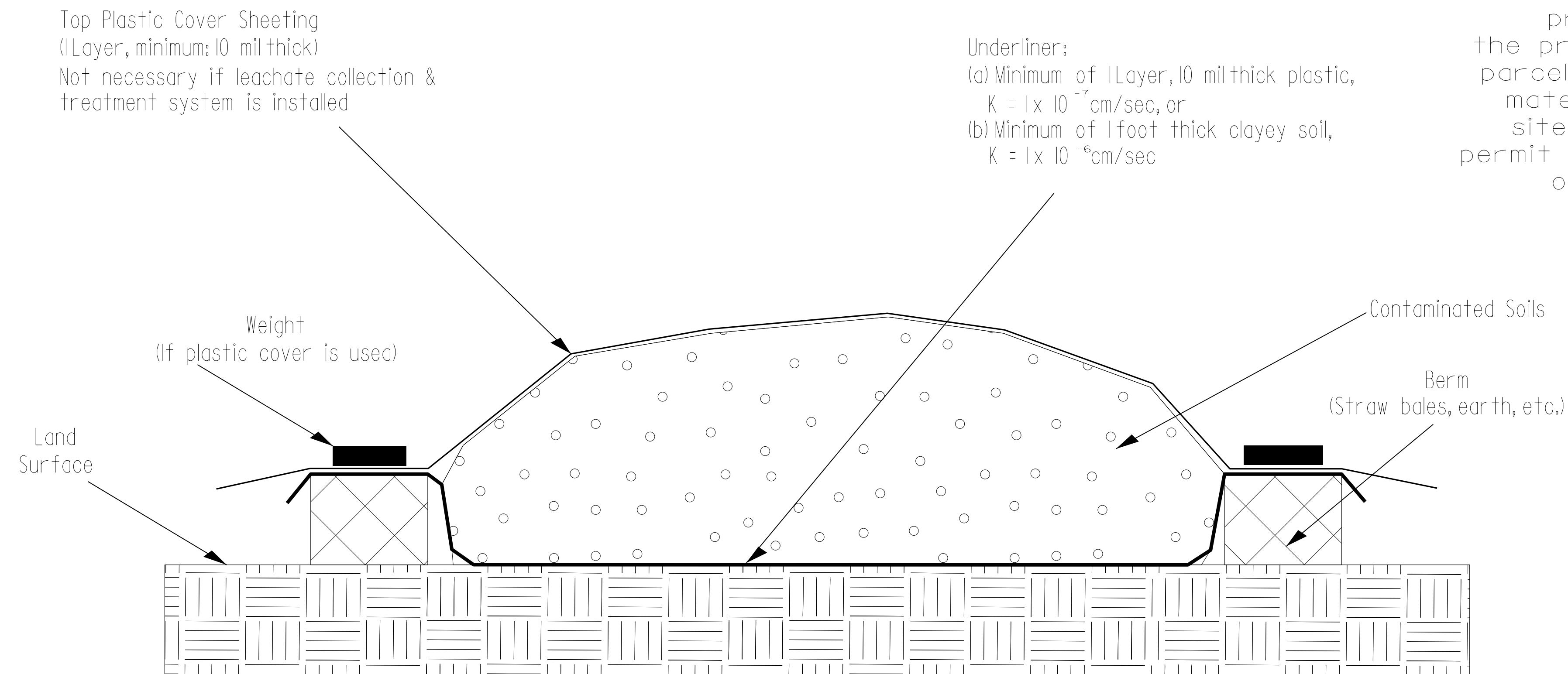


DocuSigned by:
Cyrus Parker 7/13/2015

SIGNATURE DATE SIGNATURE DATE

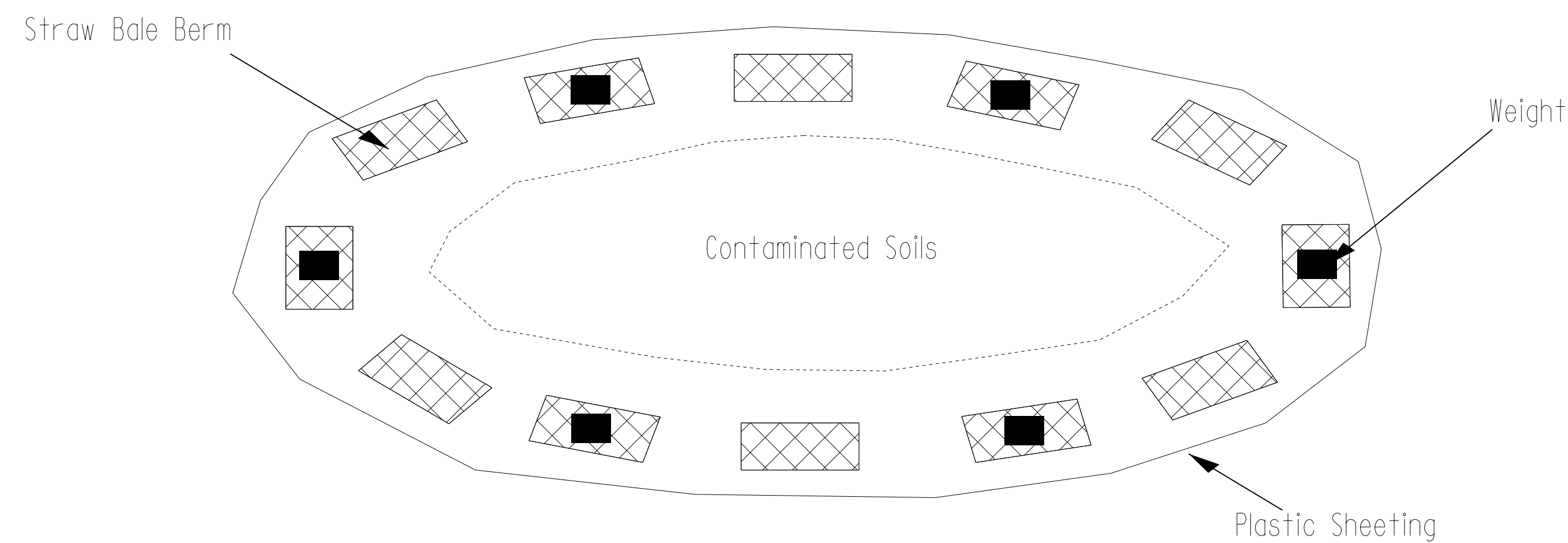
Detail for Temporary Containment of Contaminated Soil

Cross-Section View



NOTE:
The Contractor shall stockpile all contaminated soil excavated from a property in a location within the property boundaries of the source parcel. If the volume of contaminated material exceeds available space on site, the Contractor shall obtain a permit from the NCDENR UST Section for off-site temporary storage.

Map View



GEOTECHNICAL ENGINEERING UNIT

- EASTERN REGIONAL OFFICE
- WESTERN REGIONAL OFFICE
- CONTRACT OFFICE

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

STOCKPILE CONTAINMENT DETAIL

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

| | |
|--------------|-------|
| PREPARED BY: | DATE: |
| REVIEWED BY: | DATE: |



STATE OF NORTH CAROLINA
 DIVISION OF HIGHWAYS
SUMMARY OF EARTHWORK
 IN CUBIC YARDS

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

Quantities are approximate only. The Resident Engineer will re-cross-section the work accurately when the project is staked out. These cross-section notes will be used in computing the final quantities for which the contractor will be paid.

| STATION to STATION | | UNCLASSIFIED | UNDERCUT | EMBANK. +% | BORROW | WASTE |
|------------------------------|------------------------|----------------|----------|----------------|---------------|----------------|
| PHASE 1 | | | | | | |
| -L- 10+00 | 10+22.63 (BEG. BRIDGE) | | | 5,870 | 5,870 | |
| -LPC- 6+89.67 | 9+25 | 1,188 | | 810 | | 378 |
| -RPC- 7+29.19 | 9+28 | 2,153 | | 569 | | 1,584 |
| -LPC/RPC- 9+41.74 | 17+62.20 | | | 81,993 | 81,993 | |
| -SR2- 13+19.30 | 28+57.05 | 6,240 | | 4,365 | | 1,875 |
| -DR4- 10+50 | 11+85.00 | 1,070 | | | | 1,070 |
| -DR5- 10+25 | 11+79.20 | 316 | | 138 | | 178 |
| -L-(LT) 28+00 | 35+00 | 293 | | 749 | 456 | |
| -L-(LT) 35+00 | 60+00 | 126 | | 36,013 | 35,887 | |
| -L-(RT) 60+00 | 90+00 | 45,559 | | 3,488 | | 42,071 |
| -Y2- 10+50 | 13+20 | 5,725 | | 3 | | 5,722 |
| -Y3- 10+50 | 11+85 | 781 | | | | 781 |
| -L-(RT) 90+00 | 114+00 | 75,185 | | 3,453 | | 71,733 |
| -Y4- 10+50 | 13+75 | 1,362 | | 250 | | 1,112 |
| -DR2- 10+50 | 13+00 | 2,016 | | 1,156 | | 860 |
| -L-(LT) 114+00 | 135+00 | 3,864 | | 22,317 | 18,453 | |
| -DR3- 10+00 | 12+22.20 | 6 | | 949 | 943 | |
| -L-(RT) 135+00 | 138+50 | 4,426 | | 123 | | 4,303 |
| -Y7- 10+50 | 15+20 | 2,152 | | 2,069 | | 83 |
| -L-(RT) 141+00 | 156+00 | 180,859 | | 2,113 | | 178,746 |
| -Y9- 10+50 | 13+10 | 2 | | 2,453 | 2,451 | |
| -L-(RT) 158+00 | 160+00 | | | 1,010 | 1,010 | |
| -SR1- 11+00 | 28+30 | 2,777 | | 1,242 | | 1,535 |
| PHASE 1 SUBTOTALS | | 336,100 | | 171,133 | 147,063 | 312,030 |
| ROCK WASTE TO REPLACE BORROW | | | | -30,619 | -111,195 | -80,576 |
| WASTE TO REPLACE BORROW | | | | | -35,868 | -35,868 |
| PHASE 1 TOTALS | | 336,100 | | 140,514 | | 195,586 |
| PHASE 2 | | | | | | |
| -L- (LT) 12+50 | 28+00 | 1,204 | | 87,583 | 86,379 | |
| -L-(RT) 12+50 | 28+00 | 28,456 | | 51,195 | 22,739 | |
| -RPA- 8.87.20 | 15+06.30 | 254 | | 29,848 | 29,594 | |
| -SR2Rev- 11+49.23 | 17+96.35 | 55,676 | | 128 | | 55,548 |
| -L-(RT) 28+00 | 35+00 | 55,351 | | 68 | | 55,284 |
| -L-(RT) 35+00 | 60+00 | 33,233 | | 3,311 | | 29,922 |
| -L-(RT) 114+00 | 135+00 | 71,916 | | 2,862 | | 69,054 |
| -Y6- 10+50 | 12+00 | 2,510 | | | | 2,510 |
| -L-(RT) 138+50 | 141+00 | 17,651 | | 34 | | 17,617 |
| -L-(RT) 156+00 | 158+00 | | | 2,172 | 2,172 | |
| PHASE 2 SUBTOTALS | | 266,251 | | 177,201 | 140,884 | 229,934 |
| ROCK WASTE TO REPLACE BORROW | | | | -1,809 | -6,569 | -4,760 |
| WASTE TO REPLACE BORROW | | | | | -134,315 | -134,315 |
| PHASE 2 TOTALS | | 266,251 | | 175,392 | | 90,859 |
| PHASE 3 | | | | | | |
| -Y1- 11+00 | 40+50 | 3,199 | | 2,723 | | 476 |
| -Y1- 40+50 | 54+00 | 601 | | 1,213 | 612 | |
| -L- (LT) 60+00 | 90+00 | 1,940 | | 3,696 | 1,756 | |
| -DR6- 10+50 | 11+89.50 | 41 | | 3 | | 38 |
| -L-(LT) 90+00 | 114+00 | 1,114 | | 11,564 | 10,450 | |
| -Y5- 17+50 | 19+64.41 | 6 | | 1,496 | 1,490 | |
| -L-(LT) 135+00 | 138+50 | 5 | | 951 | 946 | |
| -L- (LT) 138+50 | 141+00 | 25 | | 437 | 412 | |
| -L-(LT) 141+00 | 156+00 | 3,579 | | 4,133 | 554 | |
| -Y8- 15+00 | 15+14.5 | 59 | | | | 59 |
| -L-(LT) 156+00 | 158+00 | 69 | | 228 | 159 | |
| -L-(LT) 158+00 | 160+00 | 59 | | 110 | 51 | |
| PHASE 3 SUBTOTALS | | 10,697 | | 26,554 | 16,430 | 573 |
| ROCK WASTE TO REPLACE BORROW | | | | | -573 | -573 |
| WASTE TO REPLACE BORROW | | | | | -573 | -573 |
| PHASE 3 TOTALS | | 10,697 | | 26,554 | 15,857 | |

| STATION to STATION | UNCLASSIFIED | UNDERCUT | EMBANK. +% | BORROW | WASTE |
|--|--------------|----------|------------|--------|---------|
| PROJECT SUBTOTALS (PHASE 1 - PHASE 3) | | | | | |
| ESTIMATED LOSS DUE TO CLEARING & GRUBBING | 613,048 | | 342,460 | 15,857 | 286,445 |
| SHOULDER MATERIAL | -20,000 | | 13,191 | 13,191 | -20,000 |
| PROJECT TOTALS (CUBIC YARDS) | | | | | |
| ESTIMATED 5% FOR REPLACE TOPSOIL ON BORROW PITS | 593,048 | | 355,651 | 29,048 | 266,445 |
| GRAND TOTALS (CUBIC YARDS) | | | | | |
| | 593,048 | | 355,651 | 30,500 | 266,445 |
| SAY VALUES (CUBIC YARDS) | | | | | |
| | 593,100 | | | 30,600 | |
| ESTIMATED DRAINAGE DITCH EXCAVATION = 2340 | | | | | |
| ESTIMATED PAVEMENT STRUCTURE VOLUME: 26033 CUBIC YARDS | | | | | |

COMPUTED BY: JKC DATE: 7/8/13
 CHECKED BY: KNH DATE: 6/4/15

(4-21-15)

PROJECT NO. SHEET NO.
 R-2915A 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 | 1000 |
| | | | | TOTAL LF: | 1000 |

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

**SUMMARY OF GEOTEXTILE
 FOR PAVEMENT STABILIZATION**

| LINE | Station | Station | SY |
|--------------|---------|------------------|-------|
| -L- | 12+50 | 20+50 | 4,524 |
| -L- | 20+50 | 23+50 | 923 |
| -L- | 40+00 | 45+50 | 2,166 |
| -LPC-, -RPC- | 11+50 | 17+77 | 1,533 |
| -RPA- | 11+06 | 12+57 | 570 |
| | | TOTAL SY: | 9,716 |

SUMMARY OF AGGREGATE SUBGRADE/STABILIZATION

| LINE | Station | Station | Aggregate Type ASU/AST | Aggregate Thickness INCHES | Shallow Undercut CY | Class IV Subgrade Stabilization TONS | Geotextile for Soil Stabilization SY | Stabilizer Aggregate TONS | Class IV Aggregate Stabilization TONS |
|------|---------|---------|--------------------------|----------------------------|---------------------|--------------------------------------|--------------------------------------|---------------------------|---------------------------------------|
| | | | | | | | | | |
| | | | | | | | | | |
| | | | CONTINGENCY | ASU | 500 | 200 | 1200 | 250 | |
| | | | TOTAL CY/TONS/SY: | | 500 | 200 | 1200* | 250 | 0 |

ASU = Aggregate Subgrade, AST = Aggregate Stabilization

*Total square yards of Geotextile for Soil Stabilization is only the estimated quantity for ASU/AST and may only represent a portion of the geotextile quantity shown in the Item Sheets of the Proposal.

**SUMMARY OF
 BRIDGE WAITING PERIODS**

| Bridge Description | End Bent/ Bent No. | MONTHS |
|--------------------------------------|--------------------|--------|
| Bridge No. 386 on US 221 over US 421 | EB1 | 2 |
| | EB2 | 2 |

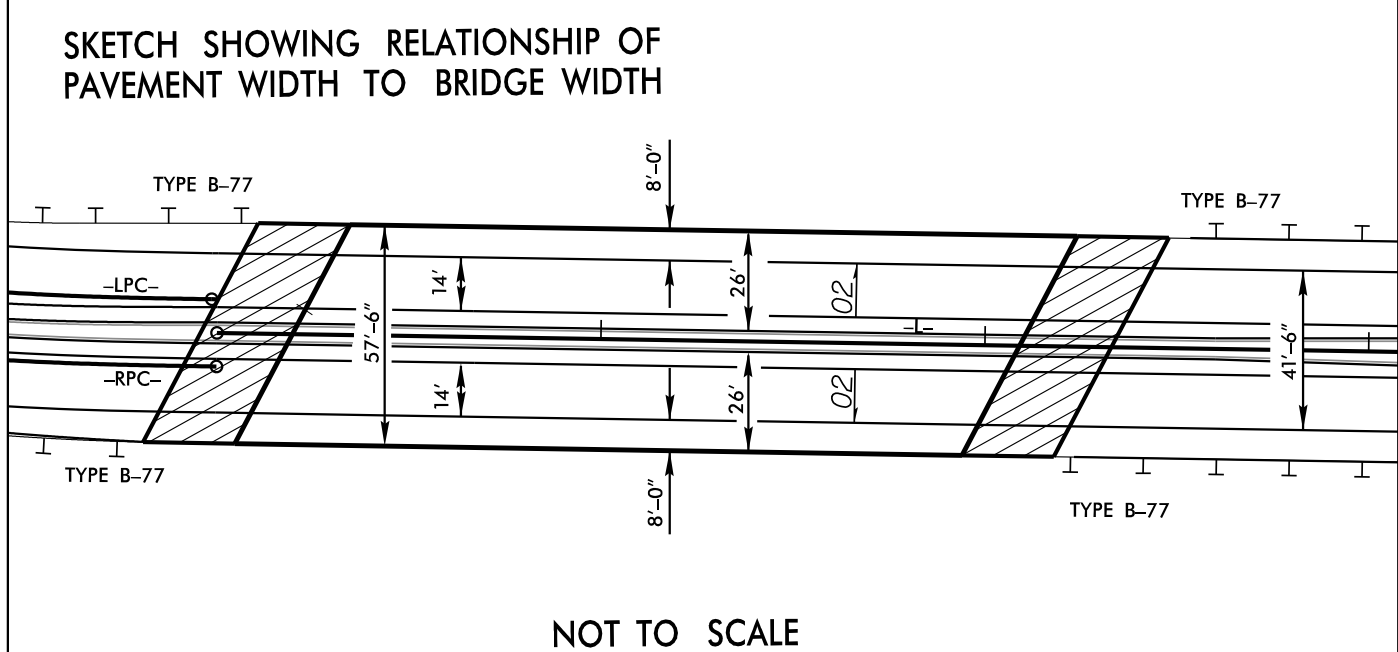
**STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS**

PARCEL INDEX SHEET

| PARCEL No. | SHEET No. | PROPERTY OWNER NAME |
|------------|-----------|---|
| 1 | 16, 17 | HIGH COUNTRY COMMERCIAL PROPERTY, LLC |
| 1A | 16, 17 | VENTURE PROPERTIES VII, LLC |
| 2 | 16 | MAURICE J. YATES |
| 3 | 16 | DEEP GAP ASSOC., LLC |
| 4 | 4, 16 | JOYCE ANN M. BOWMAN |
| 5 | 4 | TERRANCE JONES |
| 6 | 4 | MARY SUE PAYNE |
| 7 | 4 | SHELTER CONCEPTS INC. |
| 8 | 4 | COLYARD OIL COMPANY |
| 9 | 4 | JACK S. WELLBORN |
| 10 | 4 | FRONTIER NATURAL GAS COMPANY, LLC |
| 11 | 4 | WILLIAM KYLE MCNEIL |
| 12 | 4 | ERNEST J. BUCHACHER |
| 13 | 4 | HAROLD CHARLES STYLE |
| 14 | 4, 18 | JAMES BARRY GREEN |
| 15 | 18 | JAMES E. GREEN |
| 16 | 4 | JAN WELLBORN & DARIN RAY CHURCH |
| 17 | 4 | JAN WELLBORN |
| 18 | 4 | JAN RUTH WELLBORN & CHARLES RAY BLACKBURN |
| 19 | 16 | JOHNNY H. ANDERSON |
| 20 | 4 | JAN RUTH WELLBORN ROARK & PATRICA LYNN CHURCH |
| 21 | 4 | JACK WELBORN |
| 21A | 4, 5 | JACK WELBORN |
| 22 | 4 | PHIL WELLBORN |
| 23 | 4 | HAROLD E. STEELMAN JR. |
| 24 | 4 | MARTIN L. BLEVINS |
| 25 | 4 | DEBORAH R. WELLBORN |
| 26 | 4, 5 | DOROTHY BLEVINS HEIRS |
| 27 | 5 | MORETZ IV, LLC |
| 29 | 5 | RAYMOND R. SHOOK JR., ET AL |
| 30 | 6 | TERRY VANDYKE |
| 31 | 5, 6 | WILLIAM G. MORETZ |
| 32 | 6 | WILLIAM G. MORETZ |
| 33 | 5, 6 | WILLIAM G. MORETZ |
| 34 | 6, 7 | MORETZ IV, LLC |
| 35 | 6, 7 | MORETZ IV, LLC |
| 36 | 7 | JACK WELLBORN, CARL CHEEK, & COY HOLLAR TRUSTEES OF GAP CREEK BAPTIST CHURCH |
| 37 | 7 | AURELIA S. LEONARD |
| 38 | 7, 8 | BONITA G. STEWART |
| 39 | 7 | RALPH WILLIAM DAVIS |
| 40 | 7, 8 | MAURICE J. YATES |
| 41 | 7, 8 | JAMES LEONARD GREER |
| 42 | 8 | CHERIE HAMPTON SMITH & JOHNNY C. HAMPTON |
| 43 | 8 | BENJAMIN A. SMITH |
| 44 | 8 | GAP CREEK CEMETARY |
| 45 | 8 | CASEY JAMES CARROLL |
| 47 | 8 | ROBERT PAUL SHEETS |
| 48 | 8 | TIMOTHY A. MILLER |
| 49 | 8 | CAROL G. FAIRCHILD |
| 50 | 8 | SAFE HAVEN SELF STORAGE |
| 51 | 8 | DARRYL L. VAUGHN |
| 52 | 8 | CASEY J. CARROLL |
| 53 | 8 | SOM & DEVI R. DUTT |
| 54 | 8 | DONALD LEE MILLER |
| 55 | 8, 9 | CASEY JAMES CARROLL |
| 56 | 8, 9 | KAREN PHILLIPS CHURCH |
| 57 | 8, 9 | DAVID MATTHEW HAMILTON, ET AL |
| 58 | 9 | APRIL M. HOLDAWAY |
| 59 | 9 | EMMANUEL BAPTIST CHURCH |

| PARCEL No. | SHEET No. | PROPERTY OWNER NAME |
|------------|-----------|---|
| 60 | 9 | SAMUEL B. CHURCH |
| 61 | 9 | SAMUEL B. CHURCH |
| 62 | 9 | NELL HUBBARD DOMECK |
| 63 | 9 | KERMIT LEE MILLER |
| 64 | 9 | KERMIT LEE MILLER |
| 65 | 9, 10 | JAMES DALE MILLER HEIRS |
| 66 | 9, 10 | JAMES DALE MILLER HEIRS |
| 67 | 10, 11 | JAMES CLINE CHURCH |
| 68 | 10 | WILLIAMS J. EVANS |
| 68A | 10 | HEATHER N. GIBSON, ET AL |
| 68B | 10 | ROBERT W. WAGONER |
| 68C | 10 | AMY BELLUCCI |
| 68D | 10 | MIDLAND IRS, INC |
| 68E | 10, 11 | KERMIT L. MILLER |
| 68F | 10, 11 | PREMIER LAND LIQUIDATORS, LLC |
| 68G | 11 | RONALD PAUL PEDEMONTE |
| 70 | 11 | NORMAN CHEEK HEIRS |
| 71 | 11 | TALMADGE N. RITCHIE |
| 72 | 11 | BERNARD A. MILLER |
| 73 | 11 | DAVID K. KING |
| 74 | 11 | IAN NATHANIEL CHEEK |
| 75 | 11, 12 | WAYNE A. PATRICK |
| 76 | 11, 12 | J. CURTIS CHEEK |
| 77 | 11, 12 | RONALD D. CHEEK |
| 78 | 12 | MARTHA B. BLACKBURN |
| 78A | 12 | SETH RYAN OSBORNE |
| 79 | 12, 13 | DONALD E. BLACKBURN |
| 80 | 12, 13 | ROCK GAP LIMITED PARTNERSHIP |
| 81 | 13 | CLAUDE W. SLUDER & MARY NELL WATSON |
| 82 | 13 | CHURCHES OF CHRIST IN CHRISTIAN |
| 83 | 13 | ARLETTE E. HEMPEN & JOYCE A. CHASTANG |
| 84 | 13 | ALEXIS ALBA |
| 85 | 13 | MATHEW D. STEVENS |
| 86 | 13 | FS HOLDING, LTD. & BAXTER NORRIS CONSTRUCTION |
| 87 | 13, 14 | GENE E. PHILLIPS |
| 88 | 13, 14 | STEVEN MARK COX |
| 89 | 13, 14 | LARRY KEITH BLACKBURN |
| 90 | 14 | JAMES T. CADE |
| 91 | 14 | FS HOLDING, LTD. & BAXTER NORRIS CONSTRUCTION |
| 92 | 14 | MICHAEL DAVID CAMERON |
| 93 | 14 | UNKNOWN OWNER |
| 94 | 14, 15 | JOHN YATES |
| 95 | 14, 15 | RAY T. SMITH, ET AL |

| | |
|---------|--------|
| 20,110 | 12,600 |
| 33,400 | 20,600 |
| US 421 | |
| -Y1- | |
| 9750 | 12,110 |
| 16600 | 20,400 |
| | -L- |
| 2230 | US 221 |
| 3800 | |
| YR 2015 | 12,600 |
| YR 2035 | 20,600 |



| | | | |
|--|---------------------|-----------|---|
| PROJECT REFERENCE NO. | R-2915A | SHEET NO. | 4 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER | | |
| | | | |
| R. Schuller, P.E. 8/10/2015 Will Weatherstone, P.E. 6/10/2015 | | | |

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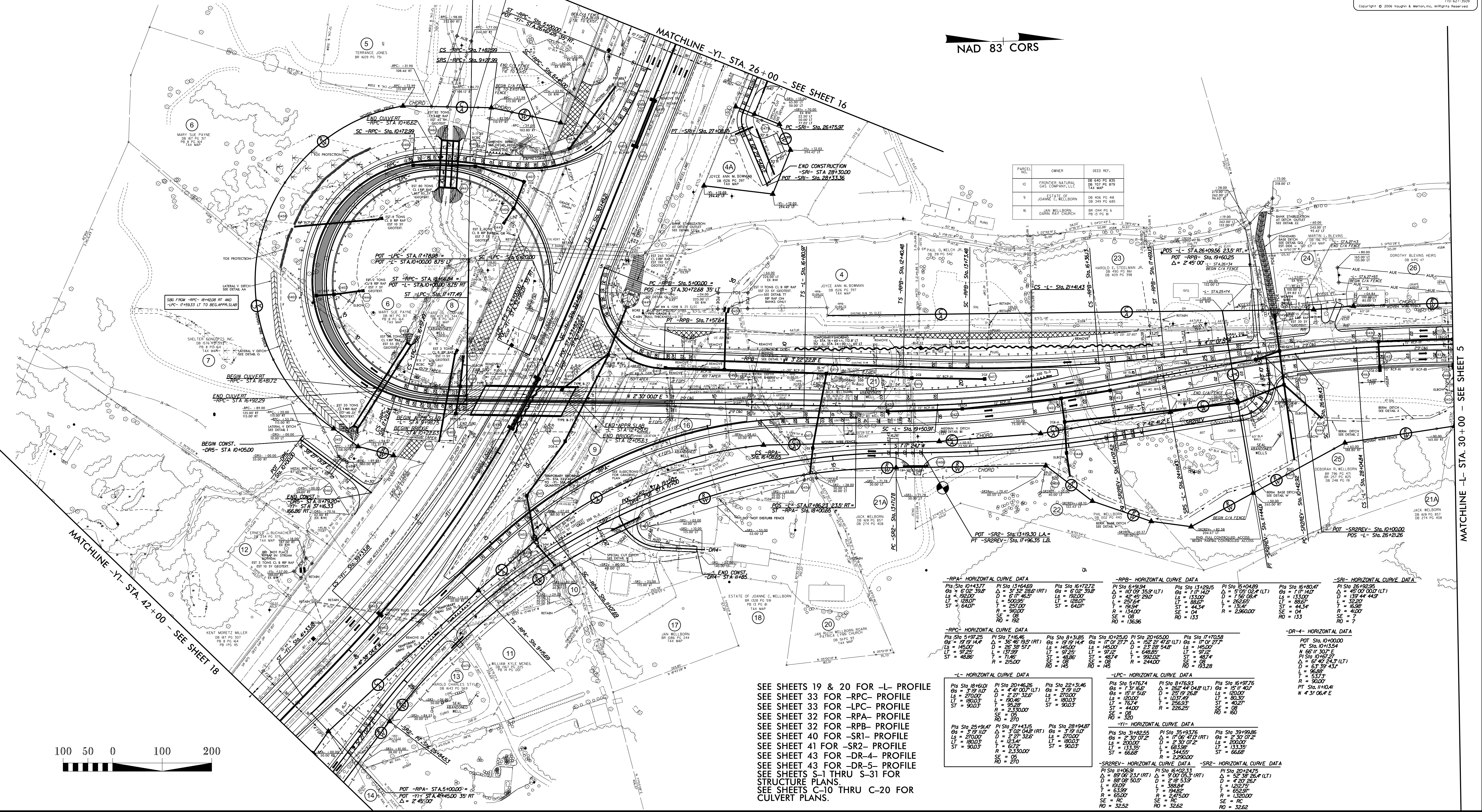
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Atlanta, GA 770-527-5009

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Knoxville, TN 865-546-5800
Spartanburg, SC 864-534-4875
Charleston, SC 803-748-6400
Wilmington, NC 919-777-9455
Fayetteville, NC 910-437-5009

REVISIONS

BEGIN TIP PROJECT R-2915A
-L- POT STA. 9+98.75



| PARCEL NO. | OWNER | DEED REF. |
|------------|-----------------------------------|-------------------------------------|
| 10 | FRONTIER NATURAL GAS COMPANY, LLC | DB 447 PG 835 DB 102 PG 876 TAX MAP |
| 9 | JOANNE C. WELBORN | DB 405 PG 48 DB 348 PG 665 |
| 16 | JAN WELBORN DARRIN RAY CHURCH | DB 144 PG 48 DB 13 PG 8 |

| -RPA- HORIZONTAL CURVE DATA | | | |
|-----------------------------|------------------------|-----------------|------------------|
| Pi Sta 10+43.77 | Pi Sta 13+64.69 | Pi Sta 16+72.72 | Pi Sta 19+80.47 |
| Ch = 270.00 | Ch = 37.32 295.00 (RT) | Ch = 192.00 | Ch = 171.00 (LT) |
| Ls = 192.00 | Ls = 61.77 46.5 | Ls = 192.00 | Ls = 131.00 |
| T = 120.00 | T = 207.00 | T = 207.00 | T = 86.57 |
| ST = 64.00 | ST = 90.00 | ST = 64.00 | ST = 44.34 |
| R = 90.00 | R = 90.00 | R = 14.00 | R = 2.96000 |
| SE = 08 | SE = 08 | SE = 04 | SE = 08 |
| RO = 192 | RO = 192 | RO = 133 | RO = 5 |

| -RPB- HORIZONTAL CURVE DATA | | | |
|-----------------------------|------------------------|-----------------|------------------|
| Pi Sta 10+43.77 | Pi Sta 13+64.69 | Pi Sta 16+72.72 | Pi Sta 19+80.47 |
| Ch = 270.00 | Ch = 37.32 295.00 (RT) | Ch = 192.00 | Ch = 171.00 (LT) |
| Ls = 192.00 | Ls = 61.77 46.5 | Ls = 192.00 | Ls = 131.00 |
| T = 120.00 | T = 207.00 | T = 207.00 | T = 86.57 |
| ST = 64.00 | ST = 90.00 | ST = 64.00 | ST = 44.34 |
| R = 90.00 | R = 90.00 | R = 14.00 | R = 2.96000 |
| SE = 08 | SE = 08 | SE = 04 | SE = 08 |
| RO = 192 | RO = 192 | RO = 133 | RO = 5 |

| -SR1- HORIZONTAL CURVE DATA | | | |
|-----------------------------|------------------------|-----------------|------------------|
| Pi Sta 10+43.77 | Pi Sta 13+64.69 | Pi Sta 16+72.72 | Pi Sta 19+80.47 |
| Ch = 270.00 | Ch = 37.32 295.00 (RT) | Ch = 192.00 | Ch = 171.00 (LT) |
| Ls = 192.00 | Ls = 61.77 46.5 | Ls = 192.00 | Ls = 131.00 |
| T = 120.00 | T = 207.00 | T = 207.00 | T = 86.57 |
| ST = 64.00 | ST = 90.00 | ST = 64.00 | ST = 44.34 |
| R = 90.00 | R = 90.00 | R = 14.00 | R = 2.96000 |
| SE = 08 | SE = 08 | SE = 04 | SE = 08 |
| RO = 192 | RO = 192 | RO = 133 | RO = 5 |

| -L- HORIZONTAL CURVE DATA | | | |
|---------------------------|------------------|------------------|------------------|
| Pi Sta 16+46.00 | Pi Sta 20+46.26 | Pi Sta 22+31.46 | Pi Sta 25+49.47 |
| Ch = 319.11 (LT) | Ch = 414.00 (LT) | Ch = 319.11 (LT) | Ch = 319.11 (LT) |
| Ls = 270.00 | Ls = 271.32 325 | Ls = 180.00 | Ls = 180.00 |
| T = 180.00 | T = 180.00 | T = 180.00 | T = 180.00 |
| ST = 90.00 | ST = 2,330.00 | ST = 90.00 | ST = 90.00 |
| R = 90.00 | R = 270 | R = 90 | R = 90 |

| -Y1- HORIZONTAL CURVE DATA | | | |
|----------------------------|------------------|------------------|------------------|
| Pi Sta 25+49.47 | Pi Sta 27+43.15 | Pi Sta 28+49.47 | Pi Sta 30+00.00 |
| Ch = 319.11 (LT) | Ch = 319.11 (LT) | Ch = 319.11 (LT) | Ch = 319.11 (LT) |
| Ls = 270.00 | Ls = 271.32 325 | Ls = 180.00 | Ls = 180.00 |
| T = 180.00 | T = 180.00 | T = 180.00 | T = 180.00 |
| ST = 90.00 | ST = 2,330.00 | ST = 90.00 | ST = 90.00 |
| R = 90.00 | R = 270 | R = 90 | R = 90 |

| -SR2REV- HORIZONTAL CURVE DATA | | | |
|--------------------------------|---------------------|---------------------|---------------------|
| Pi Sta 11+06.91 | Pi Sta 16+02.33 | Pi Sta 20+24.75 | Pi Sta 25+49.47 |
| Ch = 89.06 231 (RT) | Ch = 89.06 231 (RT) | Ch = 89.06 231 (RT) | Ch = 89.06 231 (RT) |
| Ls = 200.00 | Ls = 200.00 | Ls = 200.00 | Ls = 200.00 |
| T = 100.00 | T = 100.00 | T = 100.00 | T = 100.00 |
| ST = 66.68 | ST = 66.68 | ST = 66.68 | ST = 66.68 |
| R = 66.68 | R = 66.68 | R = 66.68 | R = 66.68 |

SEE SHEETS 19 & 20 FOR -L- PROFILE
SEE SHEET 33 FOR -RPC- PROFILE
SEE SHEET 33 FOR -LPC- PROFILE
SEE SHEET 32 FOR -RPA- PROFILE
SEE SHEET 32 FOR -RPB- PROFILE
SEE SHEET 40 FOR -SR1- PROFILE
SEE SHEET 41 FOR -SR2- PROFILE
SEE SHEET 43 FOR -DR4- PROFILE
SEE SHEET 43 FOR -DR5- PROFILE
SEE SHEETS S-1 THRU S-31 FOR STRUCTURE PLANS.
SEE SHEETS C-10 THRU C-20 FOR CULVERT PLANS.



FILED \$
DATE \$

MATCHLINE -Y1- STA. 42+00 - SEE SHEET 18

MATCHLINE -L- STA. 30+00 - SEE SHEET 5

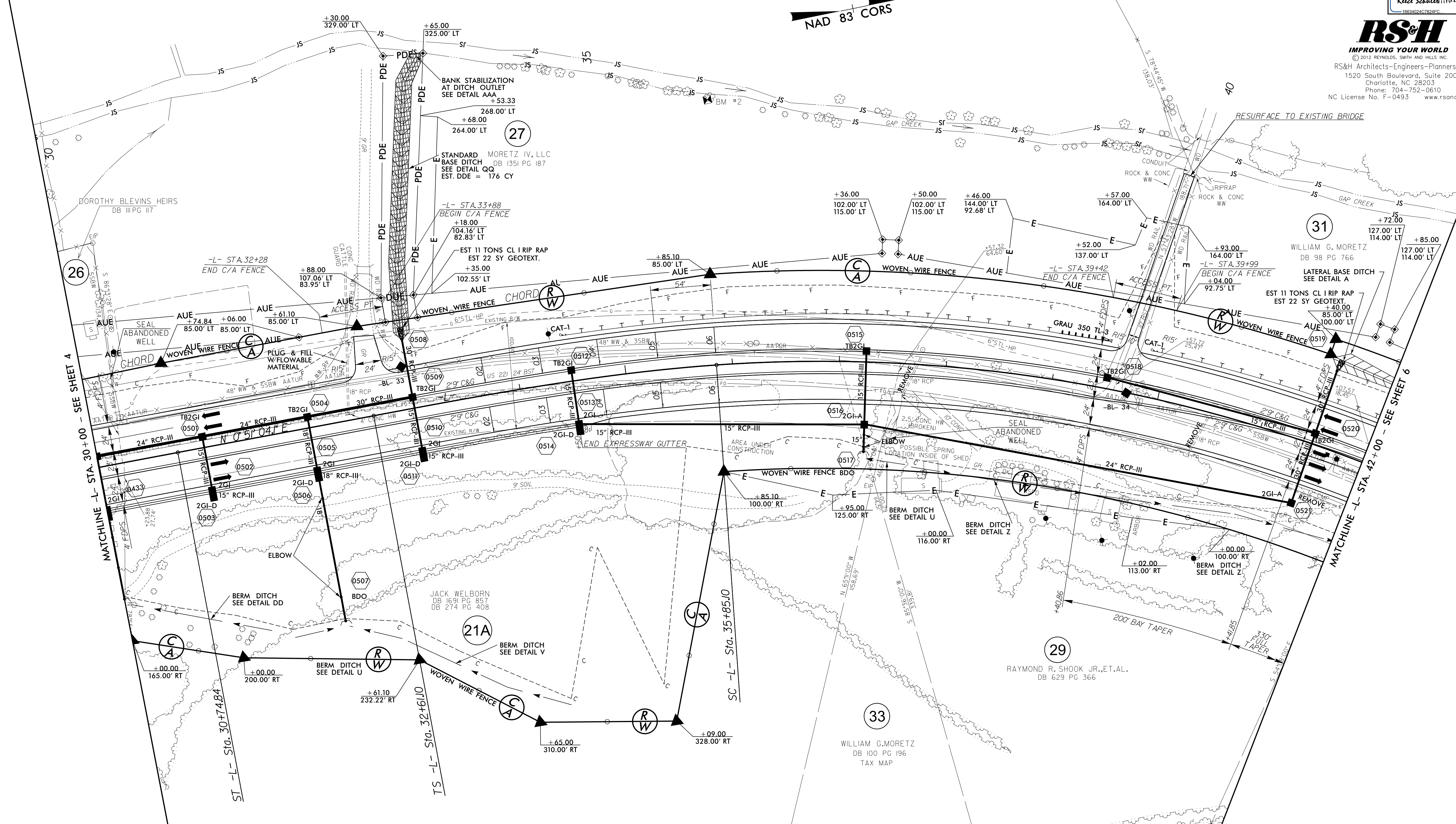
| | |
|----------------------------------|-------------------------------|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 5 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| | |
| Reed Schuler, P.E. (09/2015) | W. L. Weather, P.E. (07/2015) |

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Spartanburg, SC



NAD 83 CORS

REVISIONS

\$FILE\$
\$DATE\$

-L- HORIZONTAL CURVE DATA

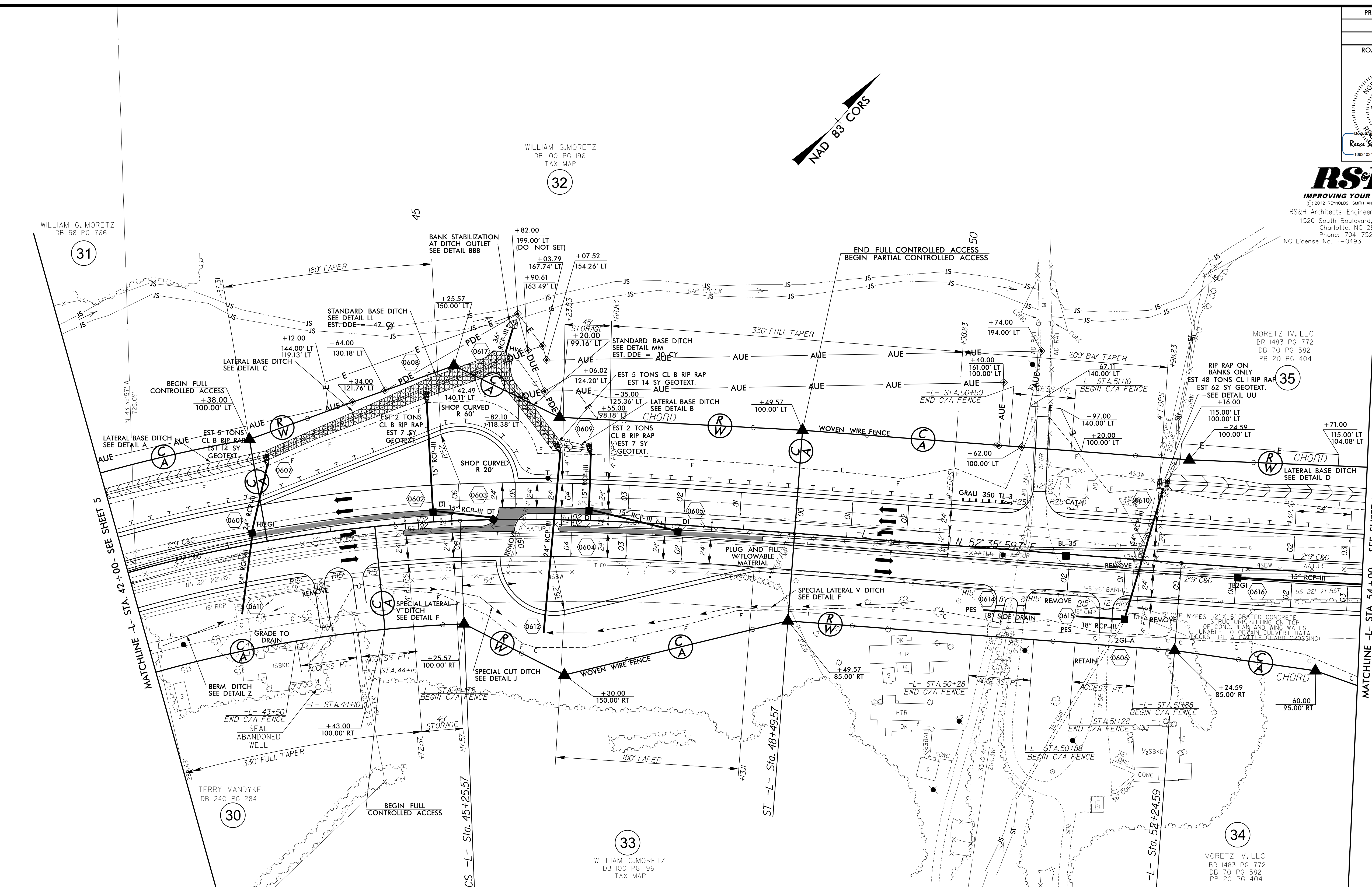
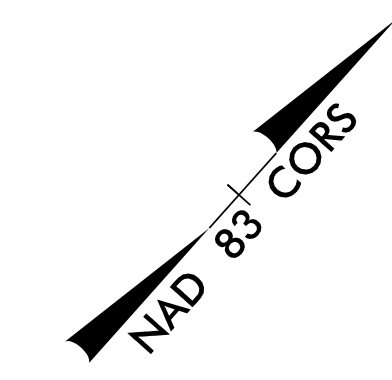
| | | | | |
|--------------------------------------|-----------------------------------|-----------------------------------|---------------------------------------|-----------------------------------|
| PI Sta 27+43.15 | PIs Sta 28+94.87 | PIs Sta 34+77.26 | PI Sta 40+73.85 | PIs Sta 46+33.70 |
| $\Delta = 3^{\circ} 02' 04.8''$ (RT) | $\Theta_s = 3^{\circ} 19' 11.0''$ | $\Theta_s = 6^{\circ} 37' 47.8''$ | $\Delta = 38^{\circ} 29' 20.0''$ (RT) | $\Theta_s = 6^{\circ} 37' 47.8''$ |
| $D = 2^{\circ} 27' 32.6''$ | $L_s = 270.00'$ | $L_s = 324.00'$ | $D = 4^{\circ} 05' 33.2''$ | $L_s = 324.00'$ |
| $L = 123.41'$ | $LT = 180.03'$ | $LT = 216.15'$ | $L = 940.46'$ | $LT = 216.15'$ |
| $T = 61.72'$ | $ST = 90.03'$ | $ST = 108.14'$ | $T = 488.75'$ | $ST = 108.14'$ |
| $R = 2,330.00'$ | | | $R = 1,400.00'$ | |
| $SE = 0.06$ | | | $S = 0.06$ | |
| $RO = 216$ | | | | |

SEE SHEET 21 FOR -L- PROFILE

| | | | |
|----------------------------------|--|--|--|
| PROJECT REFERENCE NO. R-2915A | | SHEET NO. 6 | |
| RW SHEET NO. | | HYDRAULICS ENGINEER | |
| ROADWAY DESIGN ENGINEER | | WILLIAM WEATHERS SEAL 036188 NORTH CAROLINA PROFESSIONAL ENGINEER 18654024CT82015 | |

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-L- HORIZONTAL CURVE DATA

| | | |
|---|--|---|
| Pls Sta 34+77.26 Os = 6° 37' 47.8" Ls = 324.00' LT = 216.15' ST = 108.14' | Pls Sta 40+73.85 Δ = 38° 29' 20.0" (RT) D = 4° 05' 33.2" L = 940.46' T = 488.75' R = 1,400.00' SE = 06 RO = 324 | Pls Sta 46+33.70 Os = 6° 37' 47.8" Ls = 324.00' LT = 216.15' ST = 108.14' |
| Pls Sta 54+40.72 Os = 6° 11' 16.6" Ls = 324.00' LT = 216.13' ST = 108.12' | Pls Sta 56+67.67 Δ = 9° 04' 42.1" (LT) D = 3° 49' 11.0" L = 237.67' T = 119.08' R = 1,500.00' SE = 06 RO = 237.67 | Pls Sta 58+94.38 Os = 6° 11' 16.6" Ls = 324.00' LT = 216.13' ST = 108.12' |

SEE SHEET 22 FOR -L- PROFILE
SEE SHEET 2B-1 FOR MEDIAN CROSSOVER DETAIL

REVISIONS

\$DATE\$
\$FILE\$

| | | | |
|----------------------------------|--|----------------------|--|
| PROJECT REFERENCE NO. R-2915A | | SHEET NO. 7 | |
| RW SHEET NO. | | HYDRAULICS ENGINEER | |
| ROADWAY DESIGN ENGINEER | | SEAL 036188 | |
| | | | |
| R. Schuller 11/23/2015 | | W. Weather 7/23/2015 | |

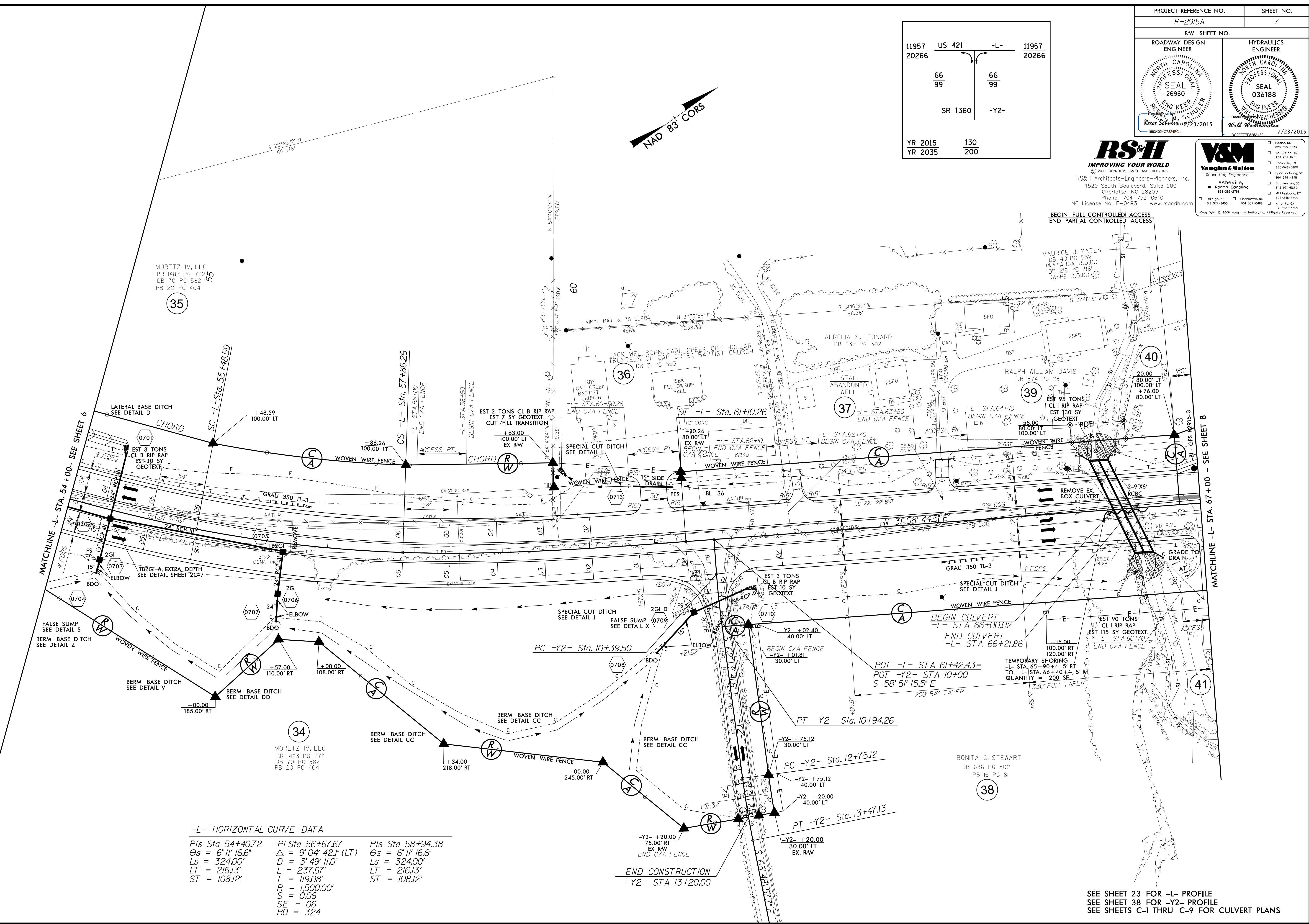
| | | | |
|---------|---------|------|-------|
| 11957 | US 421 | -L- | 11957 |
| 20266 | | | 20266 |
| 66 | | 66 | |
| 99 | | 99 | |
| | SR 1360 | -Y2- | |
| YR 2015 | 130 | | |
| YR 2035 | 200 | | |

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\$DATES\$



-L- HORIZONTAL CURVE DATA

| | | |
|-----------------------------|--------------------------------|-----------------------------|
| PIs Sta 54+40.72 | PIs Sta 56+67.67 | PIs Sta 58+94.38 |
| $\Delta s = 6' 11'' 16.6''$ | $\Delta = 9' 04'' 42.1''$ (LT) | $\Delta s = 6' 11'' 16.6''$ |
| $Ls = 324.00'$ | $L = 237.67'$ | $Ls = 324.00'$ |
| $LT = 216.13'$ | $T = 119.08'$ | $LT = 216.13'$ |
| $ST = 108.12'$ | | $ST = 108.12'$ |
| $R = 1,500.00'$ | | |
| $S = 0.06$ | | |
| $SE = 06$ | | |
| $RO = 324$ | | |

SEE SHEET 23 FOR -L- PROFILE
 SEE SHEET 38 FOR -Y2- PROFILE
 SEE SHEETS C-1 THRU C-9 FOR CULVERT PLANS

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Knoxville, TN 865-546-5800
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-DR6- CURVE DATA
 PI Sta 10+71.28
 $\Delta = 85^{\circ} 30' 49.8''$ (RT)
 D = 190' 59" 09.4"
 L = 44.77'
 T = 27.74'
 R = 30.00'

BANK STABILIZATION AT DITCH OUTFALL SEE DETAIL BBB RIP RAP ON BANKS ONLY

STANDARD BASE DITCH SEE DETAIL KK

BANK STABILIZATION AT DITCH OUTFALL SEE DETAIL BBB RIP RAP ON BANKS ONLY

BANK STABILIZATION AT DITCH OUTFALL SEE DETAIL BBB RIP RAP ON BANKS ONLY

STANDARD BASE DITCH SEE DETAIL HH

BEGIN CONSTRUCTION
 -DR6- POT Sta. 10+30.00
 -DR6- POT Sta. 10+00.00

-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- STA. 88+58
 BEGIN C/A FENCE

-L- STA. 89+20
 BEGIN C/A FENCE

-L- STA. 89+80
 END C/A FENCE

-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- STA. 88+58
 BEGIN C/A FENCE

-L- STA. 89+20
 BEGIN C/A FENCE

-L- STA. 89+80
 END C/A FENCE

-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- STA. 88+58
 BEGIN C/A FENCE

-L- STA. 89+20
 BEGIN C/A FENCE

-L- STA. 89+80
 END C/A FENCE

-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- STA. 88+58
 BEGIN C/A FENCE

-L- STA. 89+20
 BEGIN C/A FENCE

-L- STA. 89+80
 END C/A FENCE

-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- STA. 88+58
 BEGIN C/A FENCE

-L- STA. 89+20
 BEGIN C/A FENCE

-L- STA. 89+80
 END C/A FENCE

-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- STA. 88+58
 BEGIN C/A FENCE

-L- STA. 89+20
 BEGIN C/A FENCE

-L- STA. 89+80
 END C/A FENCE

-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- STA. 88+58
 BEGIN C/A FENCE

-L- STA. 89+20
 BEGIN C/A FENCE

-L- STA. 89+80
 END C/A FENCE

-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- STA. 88+58
 BEGIN C/A FENCE

-L- STA. 89+20
 BEGIN C/A FENCE

-L- STA. 89+80
 END C/A FENCE

-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- STA. 88+58
 BEGIN C/A FENCE

-L- STA. 89+20
 BEGIN C/A FENCE

-L- STA. 89+80
 END C/A FENCE

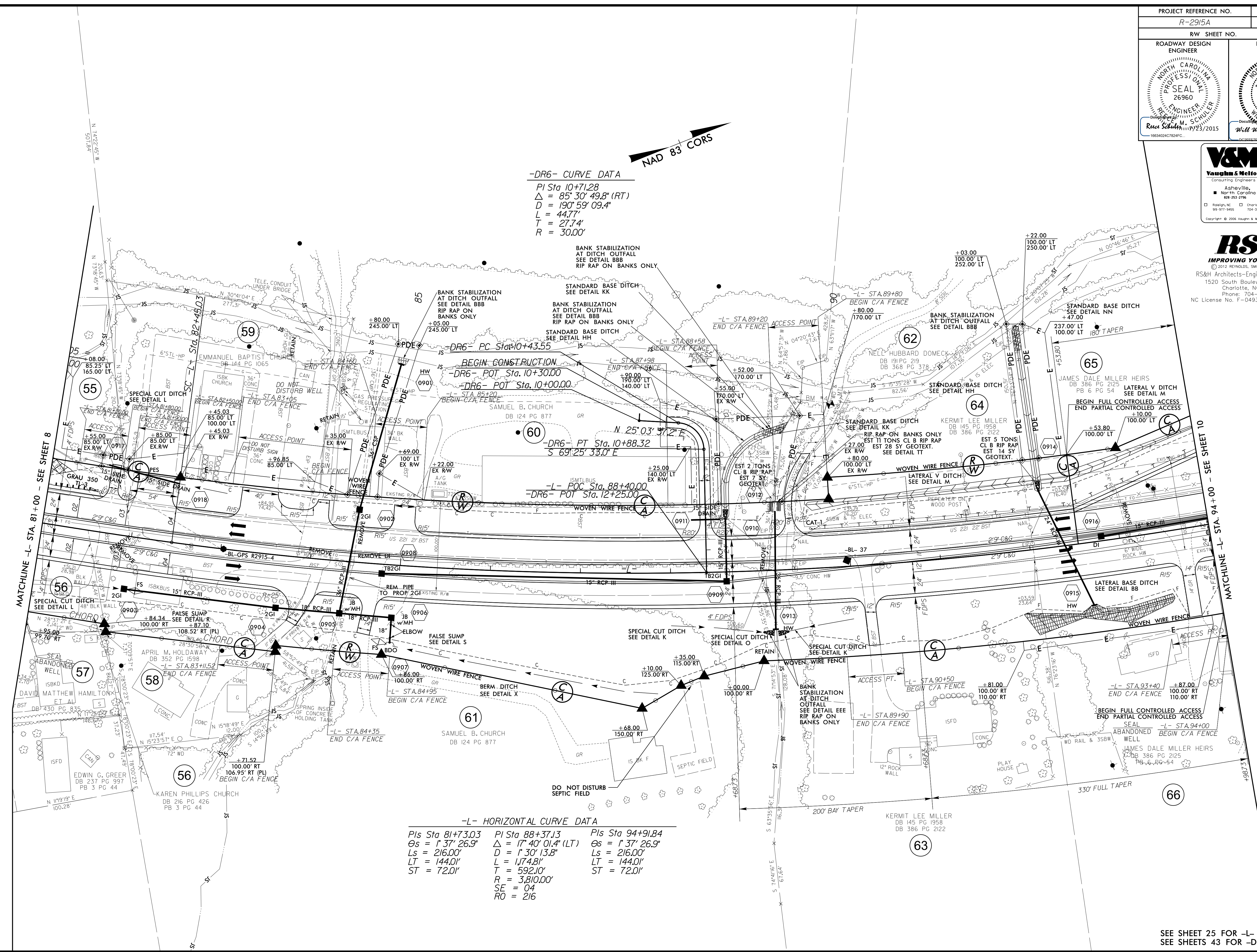
-L- STA. 88+58
 END C/A FENCE

-L- STA. 89+20
 END C/A FENCE

-L- STA. 89+80
 BEGIN C/A FENCE

-L- HORIZONTAL CURVE DATA

| | | |
|-----------------------------------|---------------------------------------|-----------------------------------|
| Pls Sta 81+73.03 | PI Sta 88+37.13 | Pls Sta 94+91.84 |
| $\Delta s = 1^{\circ} 37' 26.9''$ | $\Delta = 17^{\circ} 40' 01.4''$ (LT) | $\Delta s = 1^{\circ} 37' 26.9''$ |
| Ls = 216.00' | D = 1' 30' 13.8" | Ls = 216.00' |
| LT = 144.01' | L = 1,174.81' | LT = 144.01' |
| ST = 72.01' | T = 592.10' | ST = 72.01' |
| | R = 3,810.00' | |
| | SE = 04 | |
| | RO = 216 | |



REVISIONS

\$FILE\$
\$DATE\$

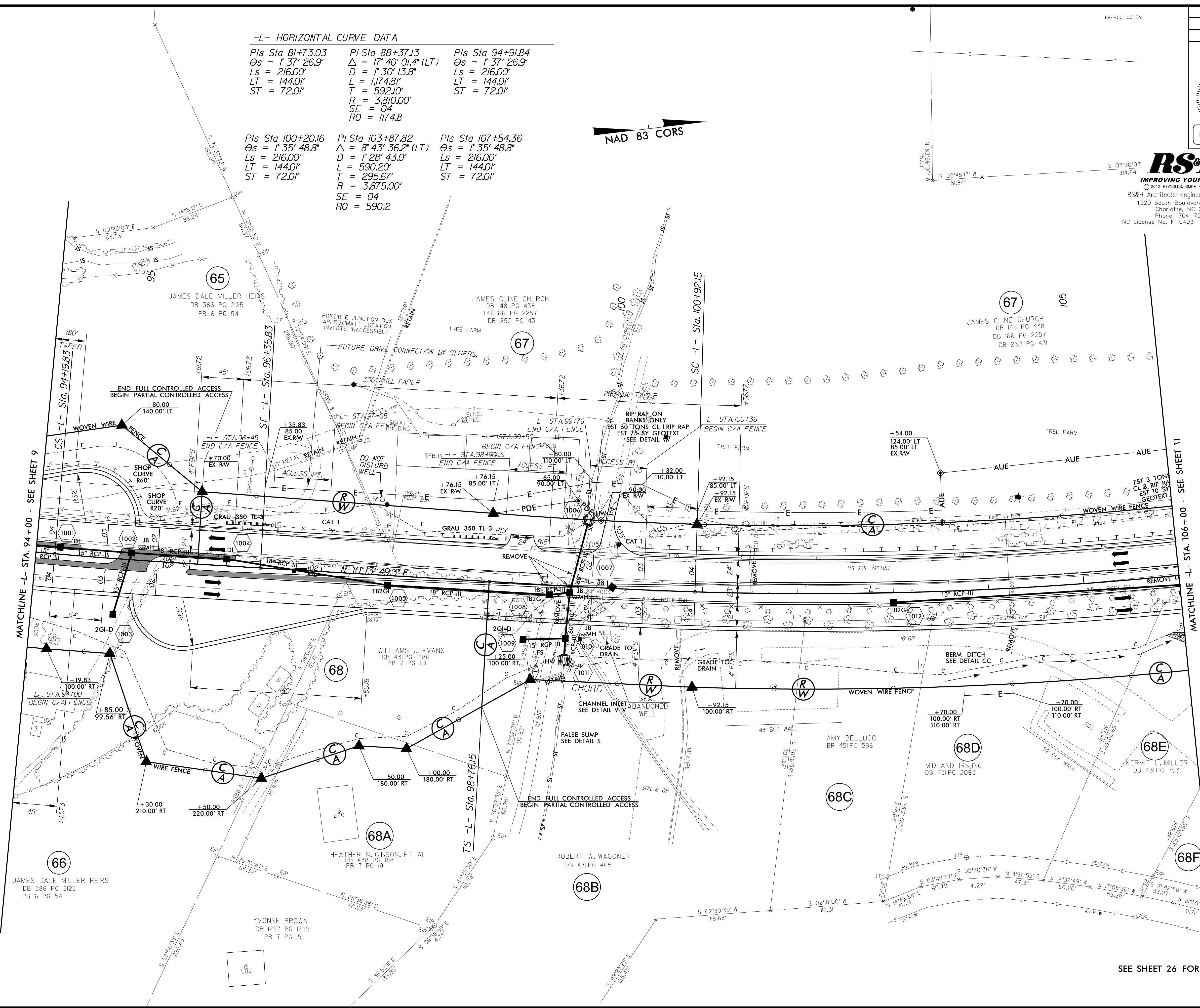
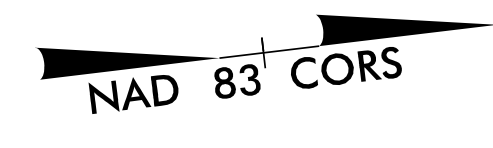
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| PROJECT REFERENCE NO. R-2915A | | SHEET NO. 10 | |
| RW SHEET NO. | | | |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
| | | | |

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-L- HORIZONTAL CURVE DATA

| | | |
|---|--|---|
| Pls Sta 81+73.03 Os = 1° 37' 26.9" Ls = 216.00' LT = 144.01' ST = 72.01' | Pls Sta 88+37.13 Δ = 17° 40' 01.4" (LT) D = 1° 30' 13.8" L = 1,74.81' T = 592.10' R = 3,810.00' SE = 04 RO = 1174.8 | Pls Sta 94+91.84 Os = 1° 37' 26.9" Ls = 216.00' LT = 144.01' ST = 72.01' |
| Pls Sta 100+20.16 Os = 1° 35' 48.8" Ls = 216.00' LT = 144.01' ST = 72.01' | Pls Sta 103+87.82 Δ = 8° 43' 36.2" (LT) D = 1° 28' 43.0" L = 590.20' T = 295.67' R = 3,875.00' SE = 04 RO = 590.2 | Pls Sta 107+54.36 Os = 1° 35' 48.8" Ls = 216.00' LT = 144.01' ST = 72.01' |



MATCHLINE -L- STA. 94+00 - SEE SHEET 9

MATCHLINE -L- STA. 106+00 - SEE SHEET 11

SEE SHEET 26 FOR -L- PROFILE

REVISIONS

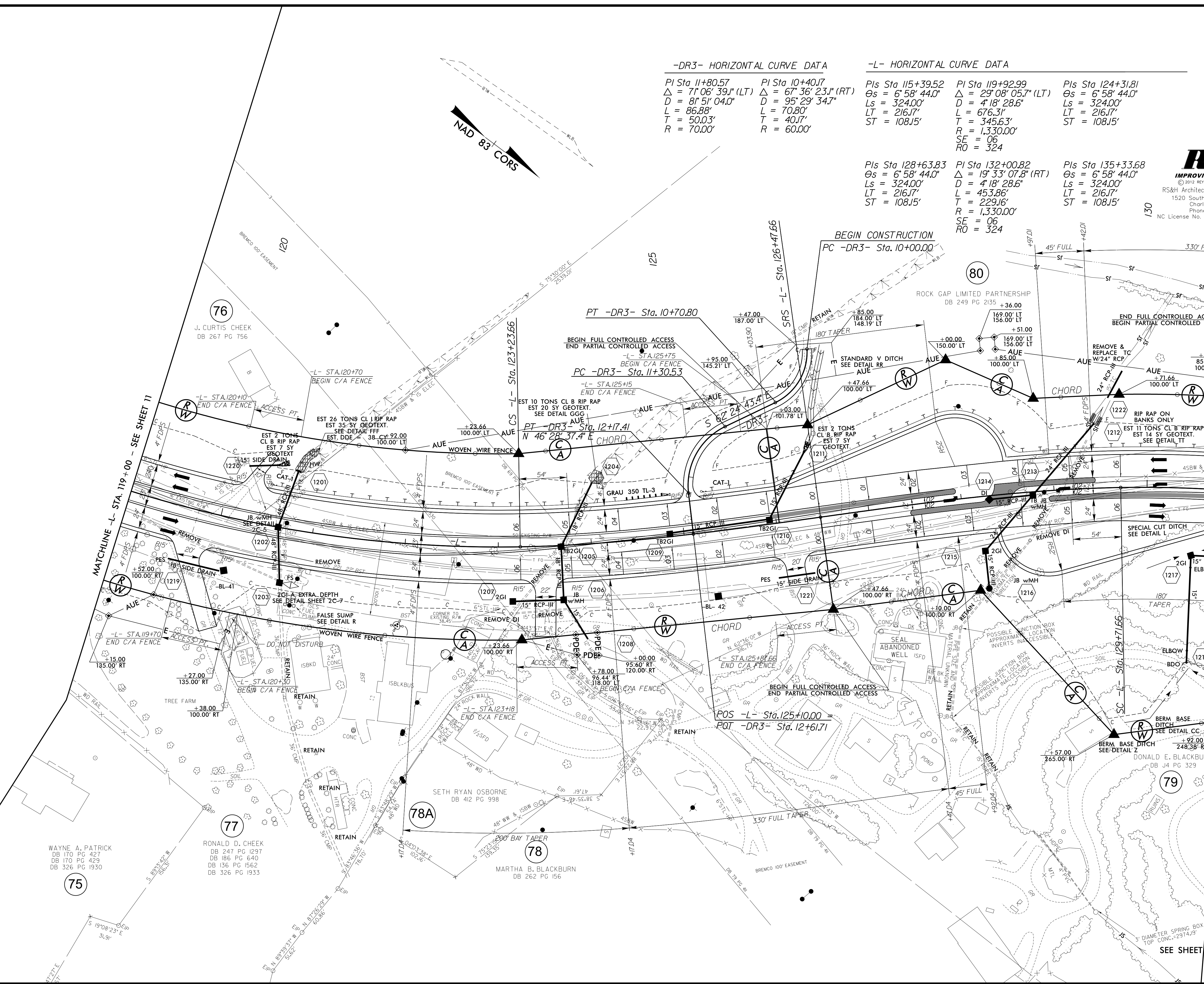
FILE\$
DATE\$

| | |
|----------------------------------|---------------------|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 12 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| | |

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828-253-2796

| -DR3- HORIZONTAL CURVE DATA | | -L- HORIZONTAL CURVE DATA | | |
|------------------------------------|------------------------------------|------------------------------|------------------------------------|------------------------------|
| PI Sta 11+80.57 | PI Sta 10+40.17 | PIs Sta 115+39.52 | PI Sta 119+92.99 | PIs Sta 124+31.81 |
| $\Delta = 71^{\circ}06'39.1"$ (LT) | $\Delta = 67^{\circ}36'23.1"$ (RT) | $\Delta = 6^{\circ}58'44.0"$ | $\Delta = 29^{\circ}08'05.7"$ (LT) | $\Delta = 6^{\circ}58'44.0"$ |
| D = 81'51'04.0" | D = 95'29'34.7" | Ls = 324.00' | D = 4'18'28.6" | Ls = 324.00' |
| L = 86.88' | L = 70.80' | LT = 216.17' | L = 676.31' | LT = 216.17' |
| T = 50.03' | T = 40.17' | ST = 108.15' | T = 345.63' | ST = 108.15' |
| R = 70.00' | R = 60.00' | | R = 1,330.00' | |
| | | | SE = 06 | |
| | | | RO = 324 | |



REVISIONS

\$FILE\$
\$DATE\$

75 WAYNE A. PATRICK
DB 170 PG 427
DB 170 PG 429
DB 326 PG 1930

77 RONALD D. CHEEK
DB 247 PG 1297
DB 186 PG 640
DB 136 PG 1562
DB 326 PG 1933

78 MARTHA B. BLACKBURN
DB 262 PG 156

79 DONALD E. BLACKBURN
DB J4 PG 329

SEE SHEET 28-2 FOR MEDIAN CROSSOVER DETAIL

SEE SHEET 28 FOR -L- PROFILE
SEE SHEET 43 FOR -DR3- PROFILE

| | |
|--|---|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 13 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 26960 Rosa Schiller, P.E. 1/23/2015 | HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 036188 Will Weatherstone 7/23/2015 |

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-L- HORIZONTAL CURVE DATA

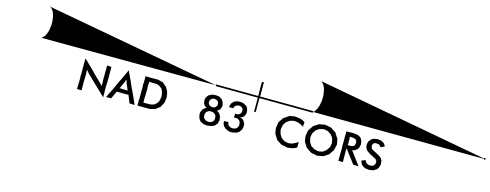
| | | |
|--|--|--|
| PIs Sta 128+63.83 Os = 6° 58' 44.0" Ls = 324.00' LT = 216.17' ST = 108.15' | PI Sta 132+00.82 Δ = 19° 33' 07.8" (RT) D = 4' 18" 28.6" L = 453.86' T = 229.16' R = 1,330.00' SE = 06 RO = 324 | PIs Sta 135+33.68 Os = 6° 58' 44.0" Ls = 324.00' LT = 216.17' ST = 108.15' |
|--|--|--|

-Y7- HORIZONTAL CURVE DATA

| | | |
|---|---|---|
| PI Sta 10+79.52 Δ = 76° 24' 23.8" (LT) D = 114° 35' 29.6" L = 66.68' T = 39.35' R = 50.00' SE = 06 RO = 64.2 | PI Sta 12+15.23 Δ = 79° 45' 39.9" (RT) D = 70° 44' 07.9" L = 112.76' T = 67.68' R = 81.00' SE = 06 RO = 64.2 | PI Sta 13+78.99 Δ = 96° 16' 39.0" (LT) D = 70° 44' 07.9" L = 136.11' T = 90.40' R = 81.00' SE = 06 RO = 64.2 |
|---|---|---|

-DRI- HORIZONTAL CURVE DATA

| |
|--|
| PI Sta 10+80.99 Δ = 7° 21' 18.9" (LT) D = 4° 32' 50.2" L = 161.75' T = 80.99' R = 1,260.00' |
|--|



80
ROCK GAP LIMITED PARTNERSHIP
DB 249 PG 2135

83
ARLETTE E. HEMPEN
JOYCE A. CHASTANG
DB 221 PG 1532
DB 265 PG 1061

82
CHURCHES OF CHRIST IN CHRISTIAN
DB V5 PG 80

89
LARRY KEITH BLACKBURN
DB 138 PG 1218
DB 201 PG 2420
DB 124 PG 356
DB 124 PG 357
DB V5 PG 24

86
FS HOLDING, LTD. & BAXTER NORRIS CONSTRUCTION
DB 242 PG 2234
PB 6 PG 64

87
GENE E. PHILLIPS
DB 164 PG 876
PB 6 PG 64

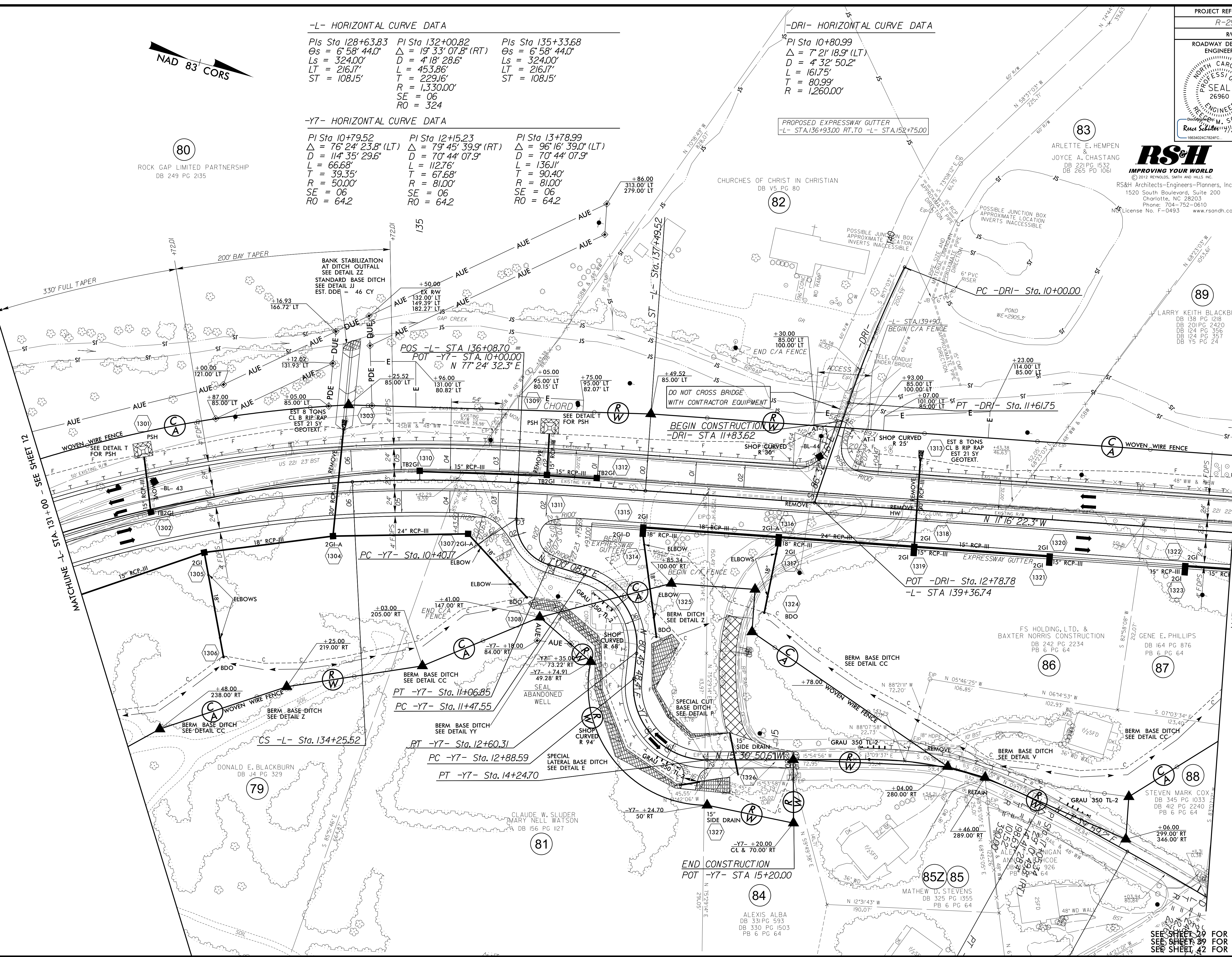
79
DONALD E. BLACKBURN
DB J4 PG 329

81
CLAUDE W. SLUDER
MARY NELL WATSON
DB 156 PG 1127

84
ALEXIS ALBA
DB 331 PG 593
DB 330 PG 1503
PB 6 PG 64

88
STEVEN MARK COX
DB 345 PG 1033
DB 412 PG 2240
PB 6 PG 64

85
MATHEW J. STEVENS
DB 325 PG 1355
PB 6 PG 64



REVISIONS

SEE SHEET 12
MATCHLINE -L- STA 131+00 - SEE SHEET 12

SEE SHEET 14
MATCHLINE -L- STA 144+00 - SEE SHEET 14

SEE SHEET 29 FOR -L- PROFILE
SEE SHEET 39 FOR -Y7- PROFILE
SEE SHEET 42 FOR -DRI- PROFILE

\$FILES\$
\$DATES\$

| | | | |
|----------------------------------|--|---------------------|--|
| PROJECT REFERENCE NO. R-2915A | | SHEET NO. 14 | |
| RW SHEET NO. | | HYDRAULICS ENGINEER | |
| ROADWAY DESIGN ENGINEER | | SEAL 26960 | |
| | | | |

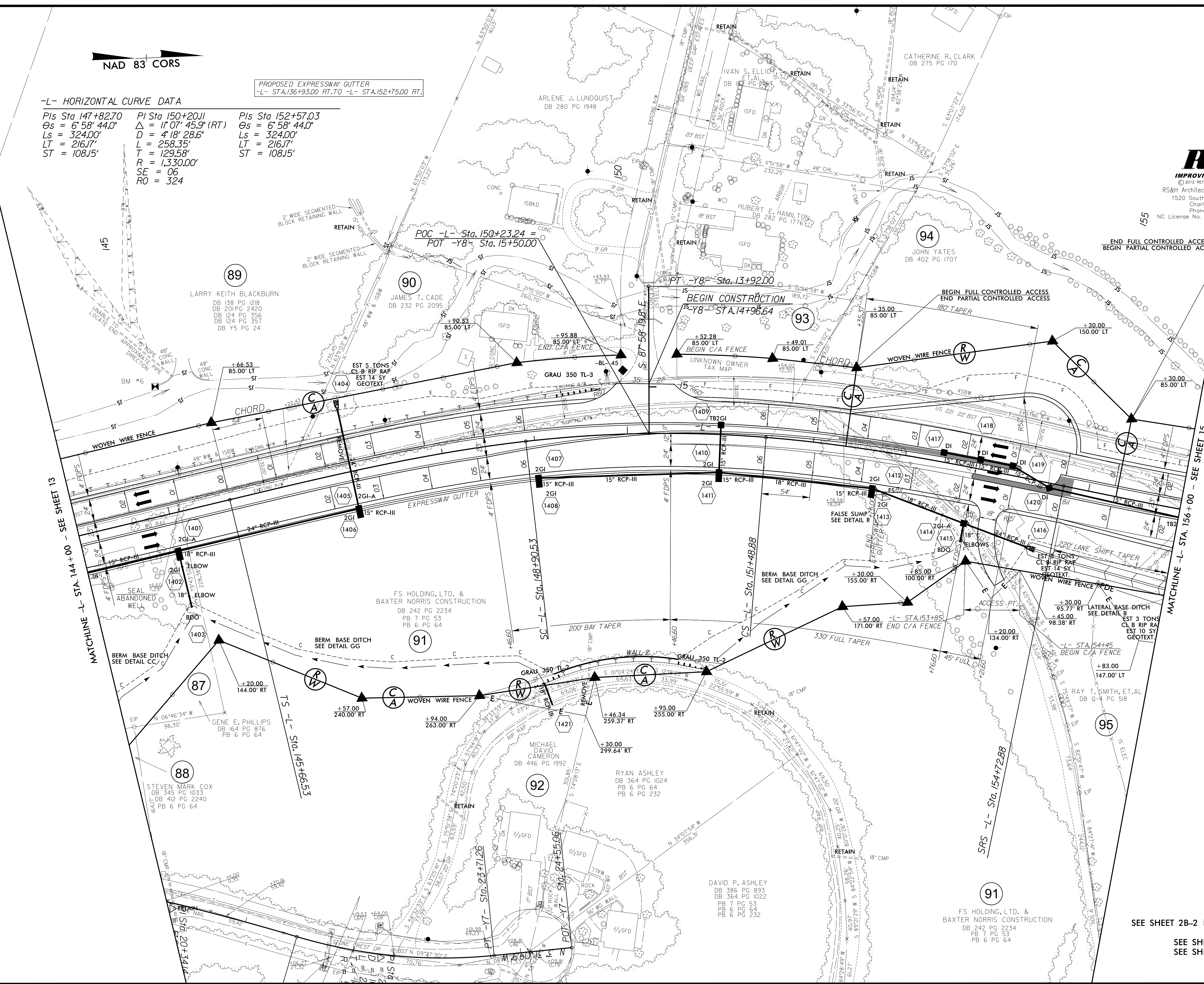
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-L- HORIZONTAL CURVE DATA

| | | |
|---------------------------------|-------------------------------------|---------------------------------|
| PIs Sta 147+82.70 | PI Sta 150+20.11 | PIs Sta 152+57.03 |
| $\Theta_s = 6^\circ 58' 44.0''$ | $\Delta = 11^\circ 07' 45.9''$ (RT) | $\Theta_s = 6^\circ 58' 44.0''$ |
| $L_s = 324.00'$ | $D = 4' 18'' 28.6''$ | $L_s = 324.00'$ |
| $LT = 216.17'$ | $L = 258.35'$ | $LT = 216.17'$ |
| $ST = 108.15'$ | $R = 1,330.00'$ | $ST = 108.15'$ |
| | $SE = 06$ | |
| | $RO = 324$ | |

PROPOSED EXPRESSWAY GUTTER
 -L- STA.136+93.00 RT. TO -L- STA.152+75.00 RT.



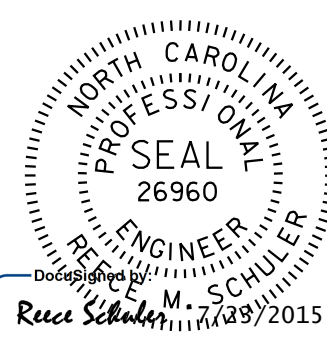

MATCHLINE -L- STA. 144+00 - SEE SHEET 13

MATCHLINE -L- STA. 156+00 - SEE SHEET 15

SEE SHEET 2B-2 FOR MEDIAN CROSSOVER DETAIL
 SEE SHEET 30 FOR -L- PROFILE
 SEE SHEET 39 FOR -Y8- PROFILE

REVISIONS

\$DATE\$
\$FILE\$

| | | | |
|---|--|---|--|
| PROJECT REFERENCE NO. R-2915A | | SHEET NO. 15 | |
| RW SHEET NO. | | | |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
|  | |  | |
| R. M. Schuler, P.E. 7/23/2015 | | Will Weatherize, P.E. 7/23/2015 | |

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| | | | |
|---------|---------|------|-------|
| 10206 | US 221 | -L- | 12024 |
| 17376 | | | 20188 |
| 175 | 1994 | | |
| 395 | 3206 | | |
| | SR 1003 | -Y9- | |
| YR 2015 | 130 | | |
| YR 2035 | 200 | | |

NAD 83 CORS

-Y8- HORIZONTAL CURVE DATA

PI Sta 11+73.32
 $\Delta = 37^{\circ} 21' 26.0''$ (LT)
 $D = 28^{\circ} 38' 52.4''$
 $L = 130.40'$
 $T = 67.61'$
 $R = 200.00'$

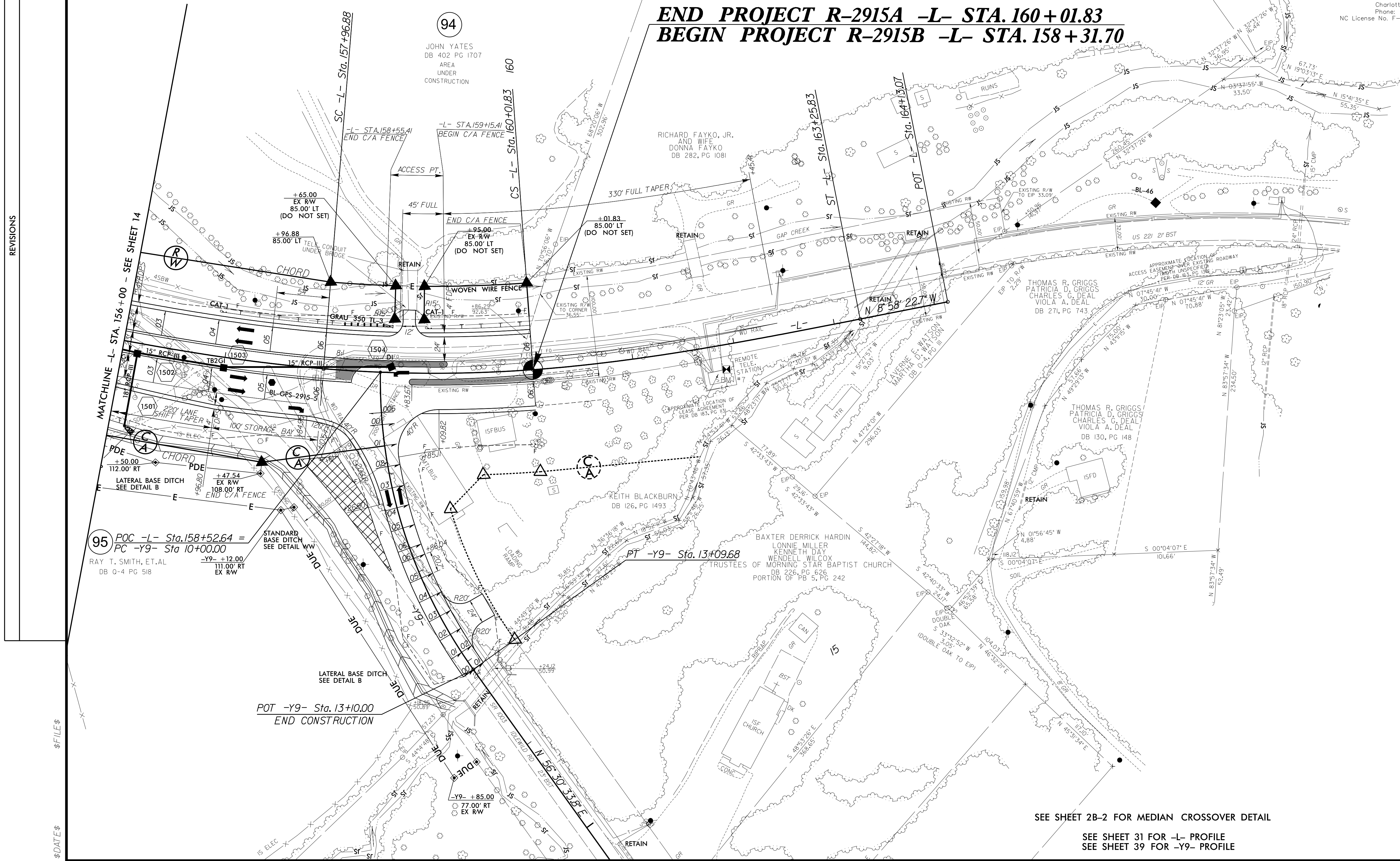
-Y9- HORIZONTAL CURVE DATA

PI Sta 11+60.32
 $\Delta = 36^{\circ} 35' 02.5''$ (LT)
 $D = 1^{\circ} 48' 48.8''$
 $L = 309.68'$
 $T = 160.32'$
 $R = 485.00'$
 $SE = 06'$
 $RO = 124.08'$

-L- HORIZONTAL CURVE DATA

PIs Sta 156+89.04 PI Sta 158+99.56 PIs Sta 161+09.99
 $\Theta s = 6^{\circ} 58' 44.0''$ $\Delta = 8^{\circ} 49' 46.3''$ (LT) $\Theta s = 6^{\circ} 58' 44.0''$
 $Ls = 324.00'$ $D = 4^{\circ} 18' 28.6''$ $Ls = 324.00'$
 $LT = 216.17'$ $L = 204.96'$ $LT = 216.17'$
 $ST = 108.15'$ $T = 102.68'$ $ST = 108.15'$
 $R = 1,330.00'$
 $SE = 06'$
 $RO = 204.95'$

END PROJECT R-2915A -L- STA. 160+01.83
BEGIN PROJECT R-2915B -L- STA. 158+31.70



REVISIONS

\$FILES\$
\$DATES\$

SEE SHEET 2B-2 FOR MEDIAN CROSSOVER DETAIL

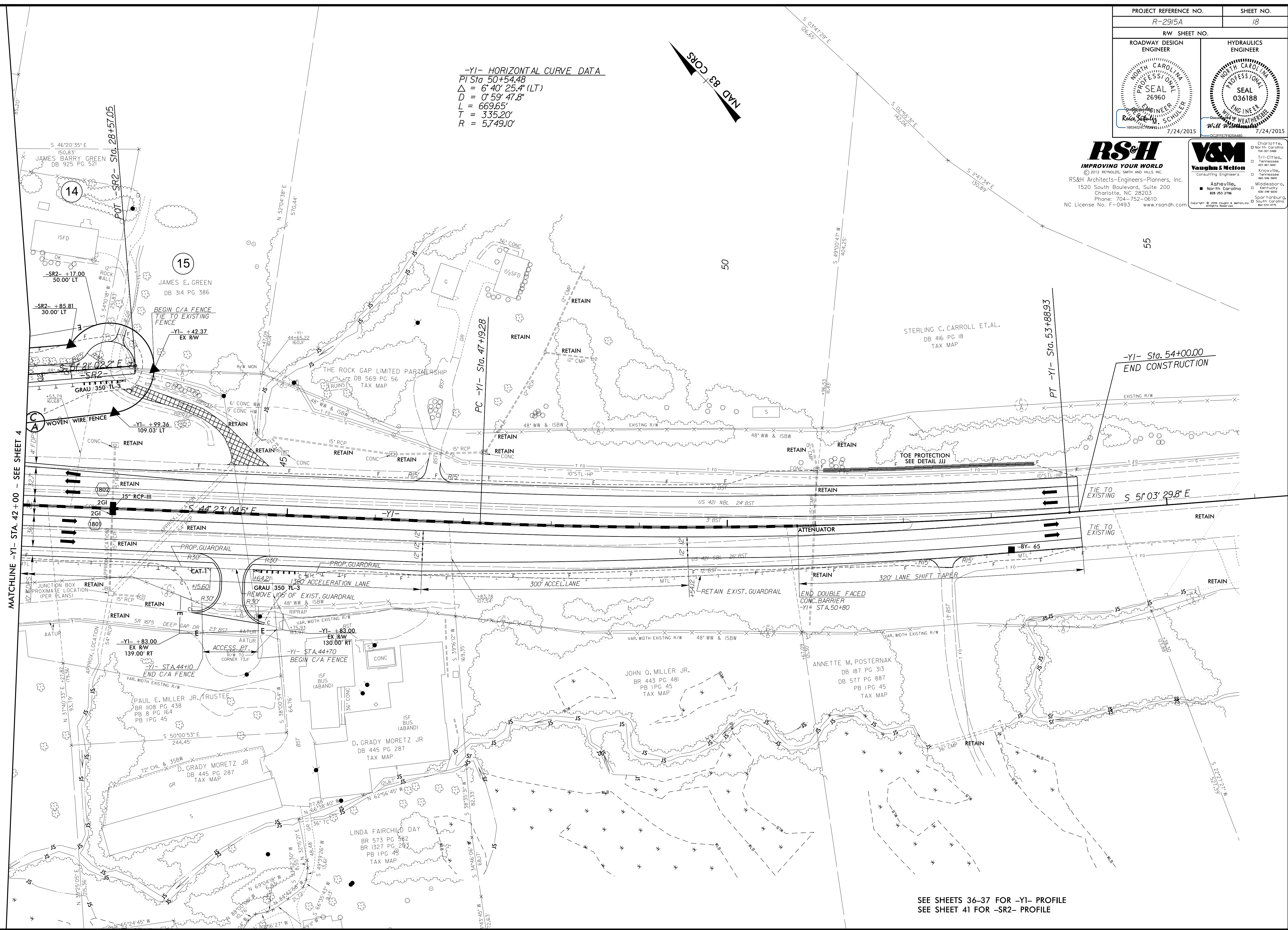
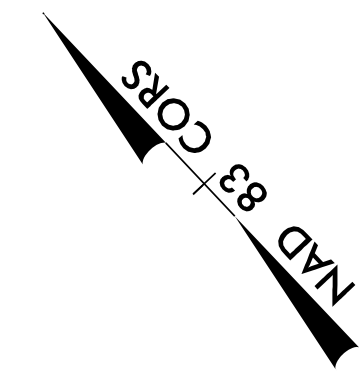
SEE SHEET 31 FOR -L- PROFILE
SEE SHEET 39 FOR -Y9- PROFILE

| | | | |
|----------------------------------|--|---------------------|--|
| PROJECT REFERENCE NO. R-2915A | | SHEET NO. 18 | |
| RW SHEET NO. | | | |
| ROADWAY DESIGN ENGINEER | | HYDRAULICS ENGINEER | |
| | | | |

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 South Carolina 864-514-4775

-Y1- HORIZONTAL CURVE DATA
 PI Sta 50+54.48
 $\Delta = 6^{\circ} 40' 25.4" (LT)$
 $D = 0^{\circ} 59' 47.8"$
 $L = 669.65'$
 $T = 335.20'$
 $R = 5,749.10'$



REVISIONS

MATCHLINE -Y1- STA. 42+00 - SEE SHEET 4

\$FILES\$
 \$DATES\$

SEE SHEETS 36-37 FOR -Y1- PROFILE
 SEE SHEET 41 FOR -SR2- PROFILE

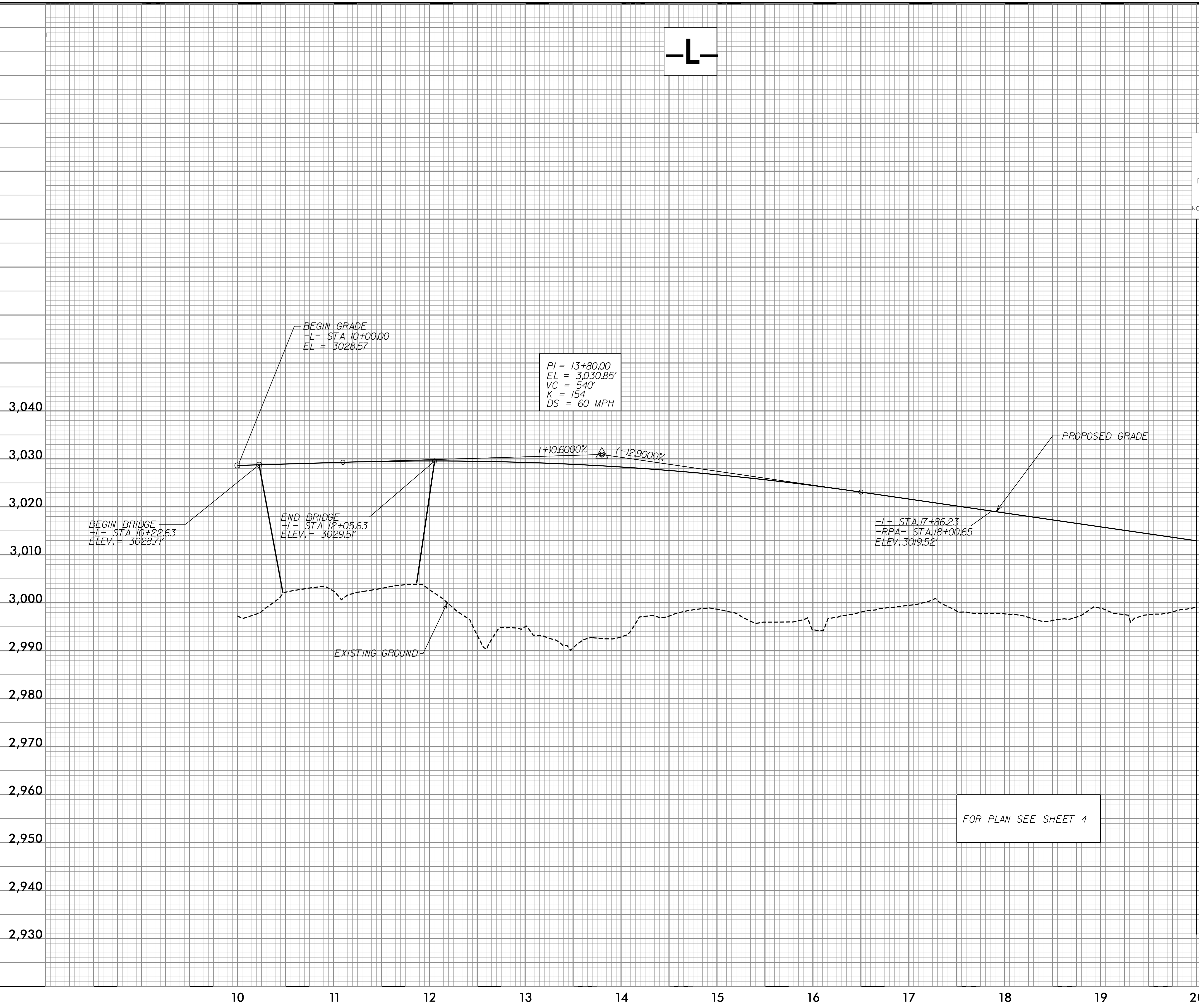
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| PROJECT REFERENCE NO. R-2915A | SHEET NO. 19 |
| ROADWAY DESIGN ENGINEER ROBERT M. SCHULIER Professional Seal: SEAL 26960 Date: 7/23/2015 | HYDRAULICS ENGINEER WILL WEATHERS Professional Seal: SEAL 036188 Date: 7/23/2015 |

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-L-

5/14/09



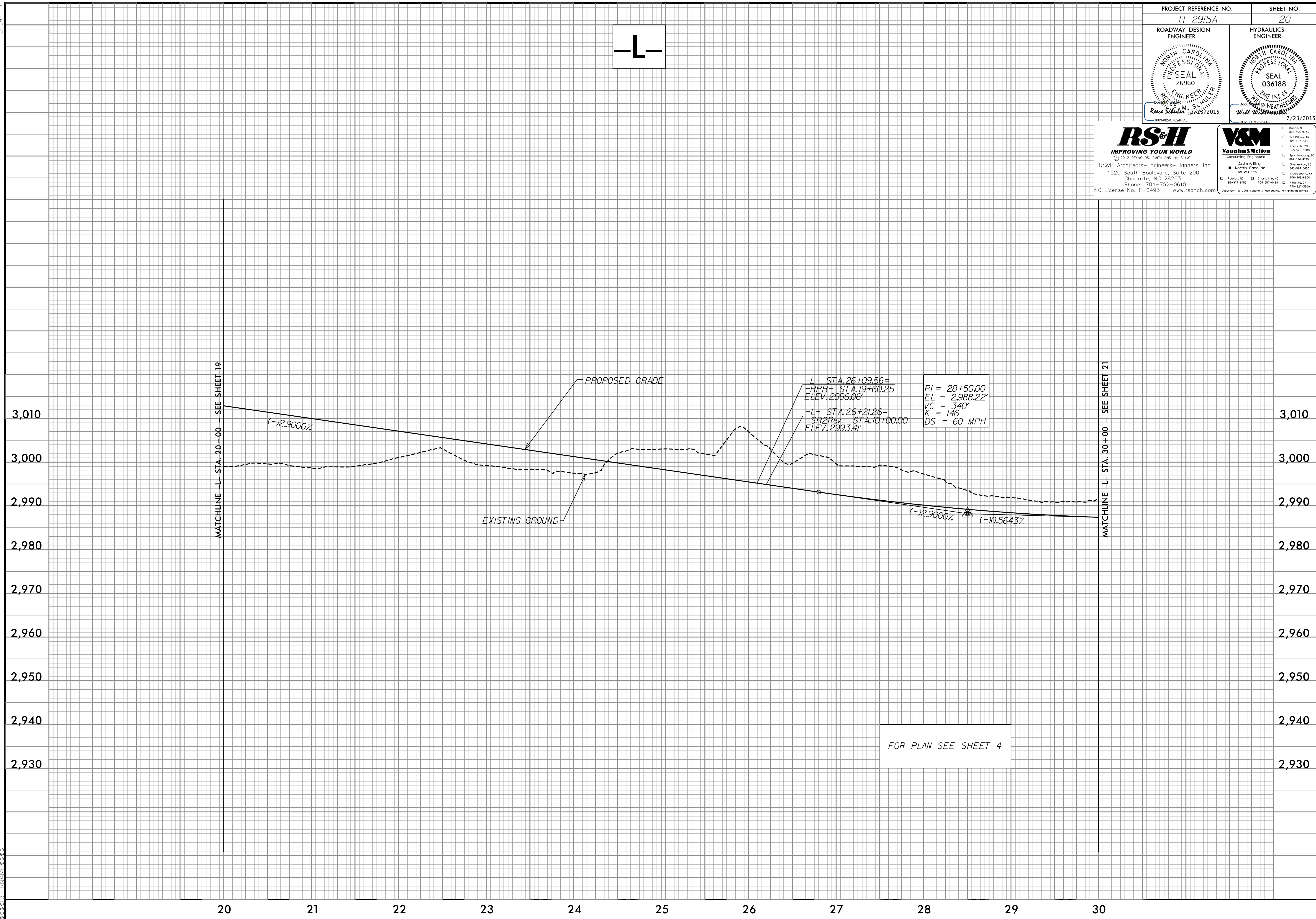
5/14/09

| | |
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| PROJECT REFERENCE NO. R-2915A | SHEET NO. 20 |
| ROADWAY DESIGN ENGINEER RUSS SCHULTZ Professional Seal SEAL 26960 7/23/2015 | HYDRAULICS ENGINEER WILL WEATHERS Professional Seal SEAL 036188 7/23/2015 |

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-L-



5/14/99

MATCHLINE -L- STA. 20+00 - SEE SHEET 19

MATCHLINE -L- STA. 30+00 - SEE SHEET 21

| | |
|--|--|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 22 |
| ROADWAY DESIGN ENGINEER Russ Schuler Professional Seal No. 26960 Exp. 7/23/2015 | HYDRAULICS ENGINEER Will Weathers Professional Seal No. 036188 Exp. 7/23/2015 |

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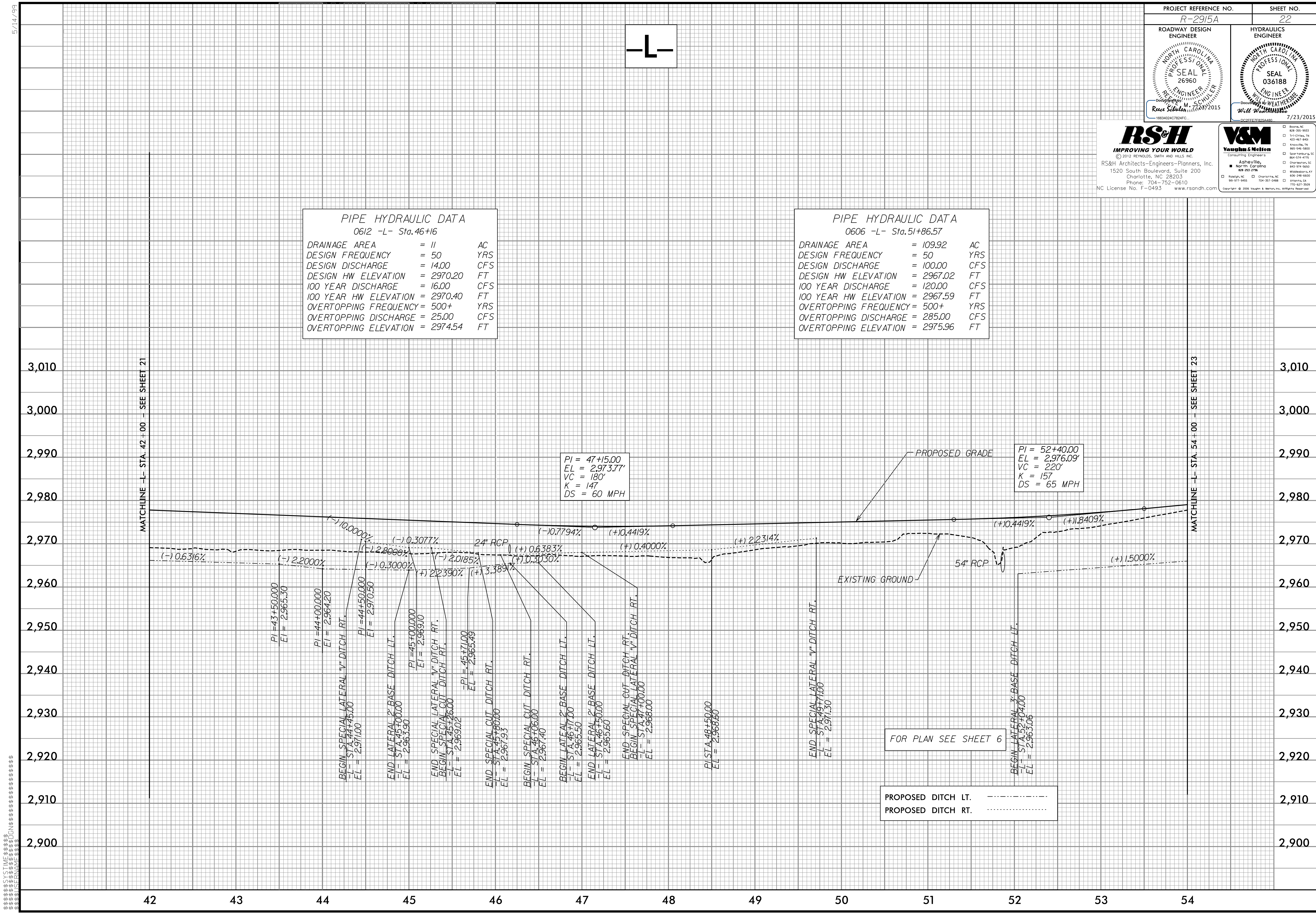
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PIPE HYDRAULIC DATA
0612 -L- Sta. 46+16

| | | |
|-----------------------|-----------|-----|
| DRAINAGE AREA | = 11 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 14.00 | CFS |
| DESIGN HW ELEVATION | = 2970.20 | FT |
| 100 YEAR DISCHARGE | = 16.00 | CFS |
| 100 YEAR HW ELEVATION | = 2970.40 | FT |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING DISCHARGE | = 25.00 | CFS |
| OVERTOPPING ELEVATION | = 2974.54 | FT |

PIPE HYDRAULIC DATA
0606 -L- Sta. 51+86.57

| | | |
|-----------------------|-----------|-----|
| DRAINAGE AREA | = 109.92 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 100.00 | CFS |
| DESIGN HW ELEVATION | = 2967.02 | FT |
| 100 YEAR DISCHARGE | = 120.00 | CFS |
| 100 YEAR HW ELEVATION | = 2967.59 | FT |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING DISCHARGE | = 285.00 | CFS |
| OVERTOPPING ELEVATION | = 2975.96 | FT |



MATCHLINE -L- STA. 42+00 - SEE SHEET 21

MATCHLINE -L- STA. 54+00 - SEE SHEET 23

PI = 47+15.00
EL = 2,973.77'
VC = 180'
K = 147
DS = 60 MPH

PI = 52+40.00
EL = 2,976.09'
VC = 220'
K = 157
DS = 65 MPH

FOR PLAN SEE SHEET 6

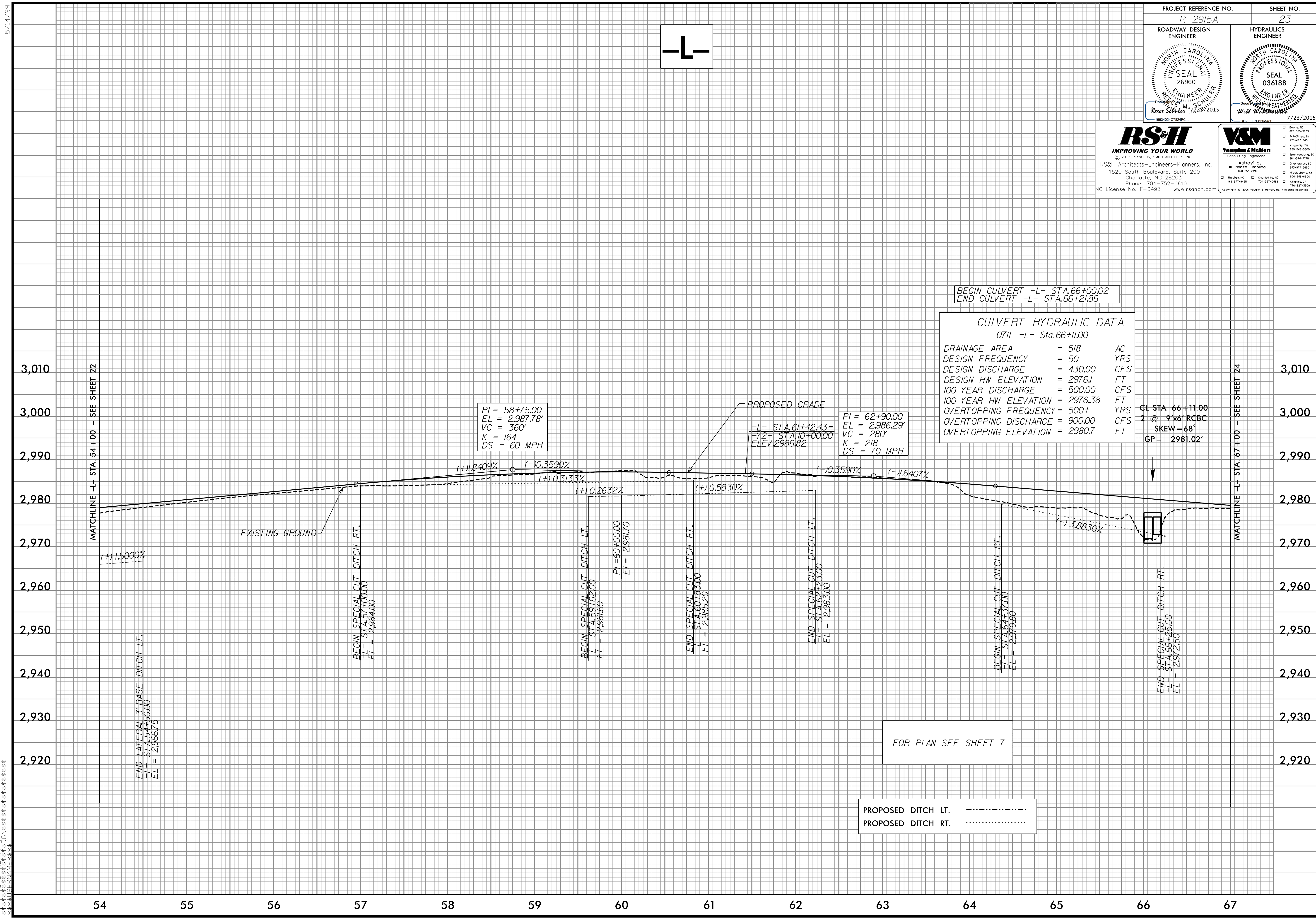
PROPOSED DITCH LT. - - - - -
PROPOSED DITCH RT.

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 12/14/15 10:58:58 AM
 jwheeler
 12/14/15 10:58:58 AM
 jwheeler

| | |
|--|---|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 23 |
| ROADWAY DESIGN ENGINEER Reese Schuler Professional Seal 26960 | HYDRAULICS ENGINEER Will Weathers Professional Seal 036188 |

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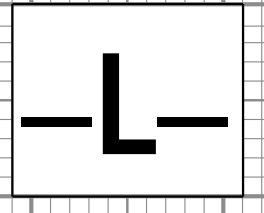
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5/14/99

MATCHLINE -L- STA. 54+00 - SEE SHEET 22

MATCHLINE -L- STA. 67+00 - SEE SHEET 24



PI = 58+75.00
EL = 2987.78'
VC = 360'
K = 164
DS = 60 MPH

PI = 62+90.00
EL = 2986.29'
VC = 280'
K = 218
DS = 70 MPH

END LATERAL 3' BASE DITCH LT.
-L- STA. 54+50.00
EL = 2966.75

BEGIN SPECIAL CUT DITCH RT.
-L- STA. 57+00.00
EL = 2984.00

BEGIN SPECIAL CUT DITCH LT.
-L- STA. 60+00.00
EL = 2981.60

PI = 60+00.00
EL = 2981.70

END SPECIAL CUT DITCH RT.
-L- STA. 60+33.00
EL = 2985.20

END SPECIAL CUT DITCH LT.
-L- STA. 62+33.00
EL = 2983.00

BEGIN SPECIAL CUT DITCH RT.
-L- STA. 64+37.00
EL = 2979.80

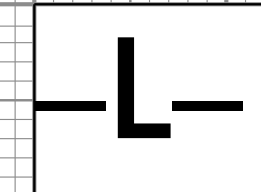
END SPECIAL CUT DITCH RT.
-L- STA. 66+25.00
EL = 2972.50

54 55 56 57 58 59 60 61 62 63 64 65 66 67

| | |
|---|------------------------|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 24 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| | |

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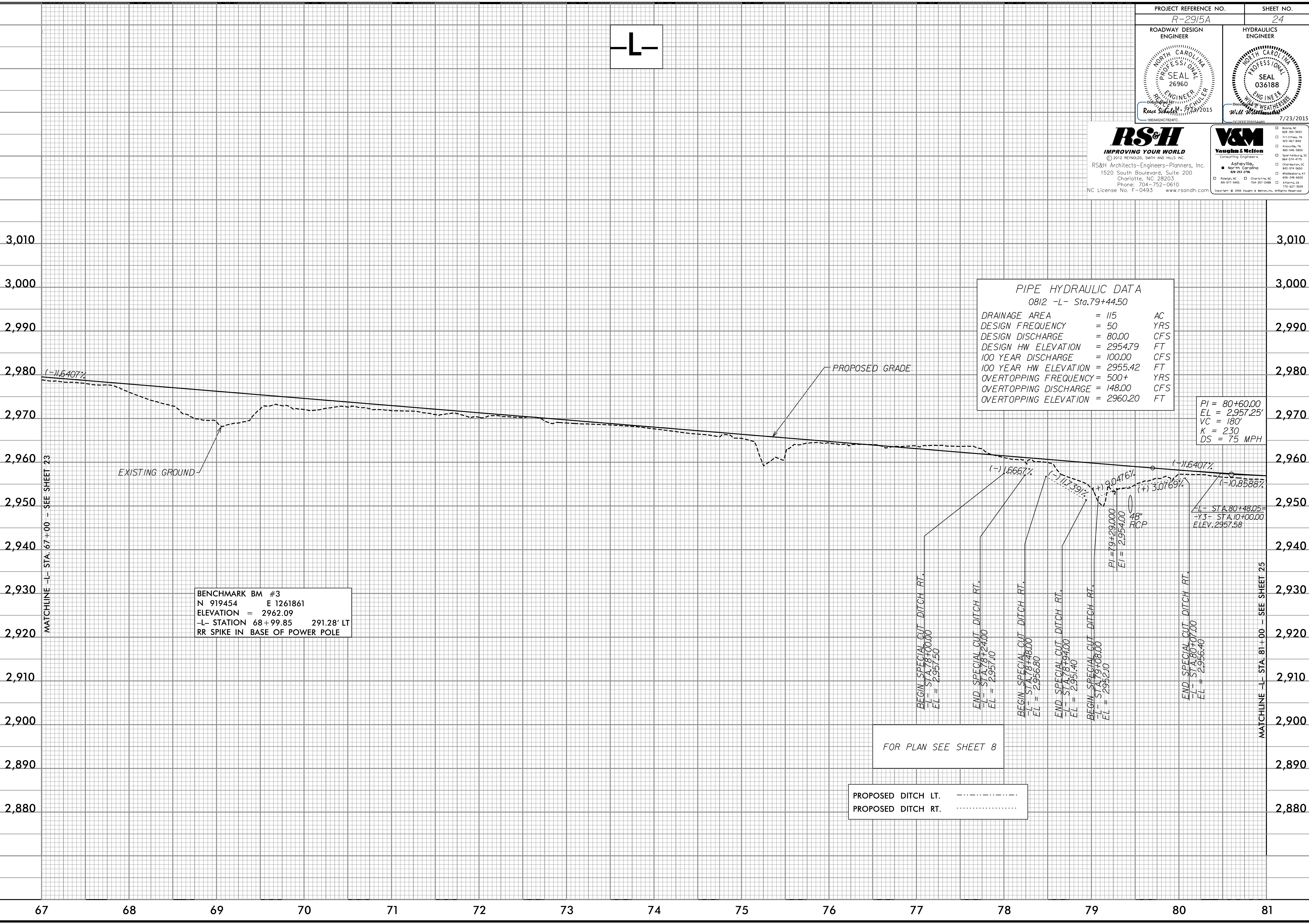
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PIPE HYDRAULIC DATA
0812 -L- Sta.79+44.50

| | | |
|-----------------------|-----------|-----|
| DRAINAGE AREA | = 115 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 80.00 | CFS |
| DESIGN HW ELEVATION | = 2954.79 | FT |
| 100 YEAR DISCHARGE | = 100.00 | CFS |
| 100 YEAR HW ELEVATION | = 2955.42 | FT |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING DISCHARGE | = 148.00 | CFS |
| OVERTOPPING ELEVATION | = 2960.20 | FT |

PI = 80+60.00
EL = 2957.25'
VC = 180'
K = 230
DS = 75 MPH



BENCHMARK BM #3
N 919454 E 1261861
ELEVATION = 2962.09
-L- STATION 68+99.85 291.28' LT
RR SPIKE IN BASE OF POWER POLE

- BEGIN SPECIAL CUT DITCH RT.
-L- STA. 77+24.00
EL = 2957.50
- END SPECIAL CUT DITCH RT.
-L- STA. 78+24.00
EL = 2957.10
- BEGIN SPECIAL CUT DITCH RT.
-L- STA. 78+48.00
EL = 2956.80
- END SPECIAL CUT DITCH RT.
-L- STA. 78+94.00
EL = 2956.40
- BEGIN SPECIAL CUT DITCH RT.
-L- STA. 79+08.00
EL = 2952.10
- END SPECIAL CUT DITCH RT.
-L- STA. 80+07.00
EL = 2956.40

FOR PLAN SEE SHEET 8

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

5/14/09

| | |
|--|--|
| PROJECT REFERENCE NO. <i>R-2915A</i> | SHEET NO. <i>26</i> |
| ROADWAY DESIGN ENGINEER <i>Russ Schuler</i> 10/23/2015 | HYDRAULICS ENGINEER <i>Will Weathers</i> 7/23/2015 |

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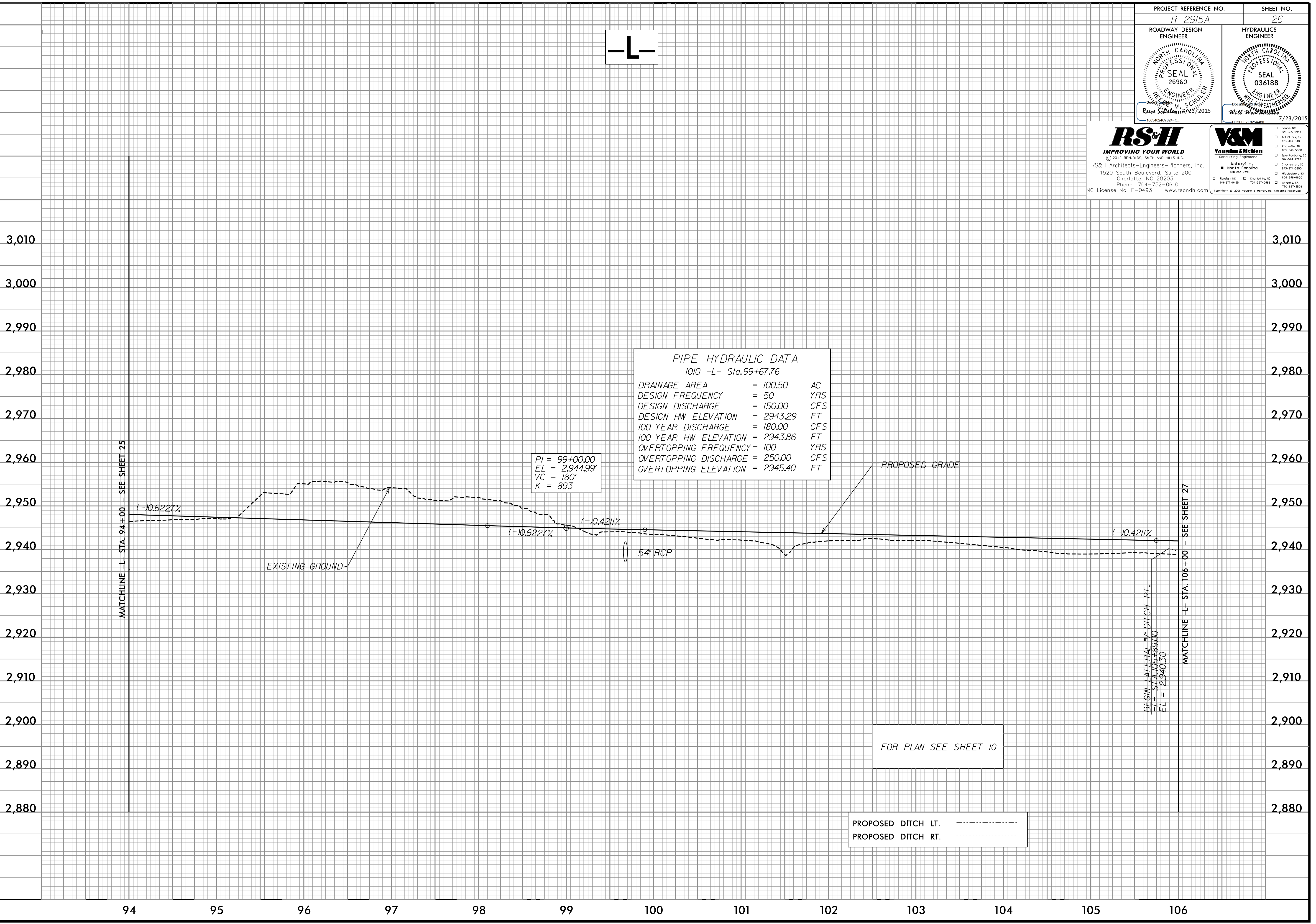
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-L-

PIPE HYDRAULIC DATA
1010 -L- Sta. 99+67.76

| | | |
|-----------------------|-----------|-----|
| DRAINAGE AREA | = 100.50 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 150.00 | CFS |
| DESIGN HW ELEVATION | = 2943.29 | FT |
| 100 YEAR DISCHARGE | = 180.00 | CFS |
| 100 YEAR HW ELEVATION | = 2943.86 | FT |
| OVERTOPPING FREQUENCY | = 100 | YRS |
| OVERTOPPING DISCHARGE | = 250.00 | CFS |
| OVERTOPPING ELEVATION | = 2945.40 | FT |

PI = 99+00.00
EL = 2,944.99'
VC = 180'
K = 89.5



MATCHLINE -L- STA. 94+00 - SEE SHEET 25

BEGIN LATERAL "M" DITCH RT.
L = STA. 103+89.00
EL = 2940.50

MATCHLINE -L- STA. 106+00 - SEE SHEET 27

FOR PLAN SEE SHEET 10

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

5/14/99

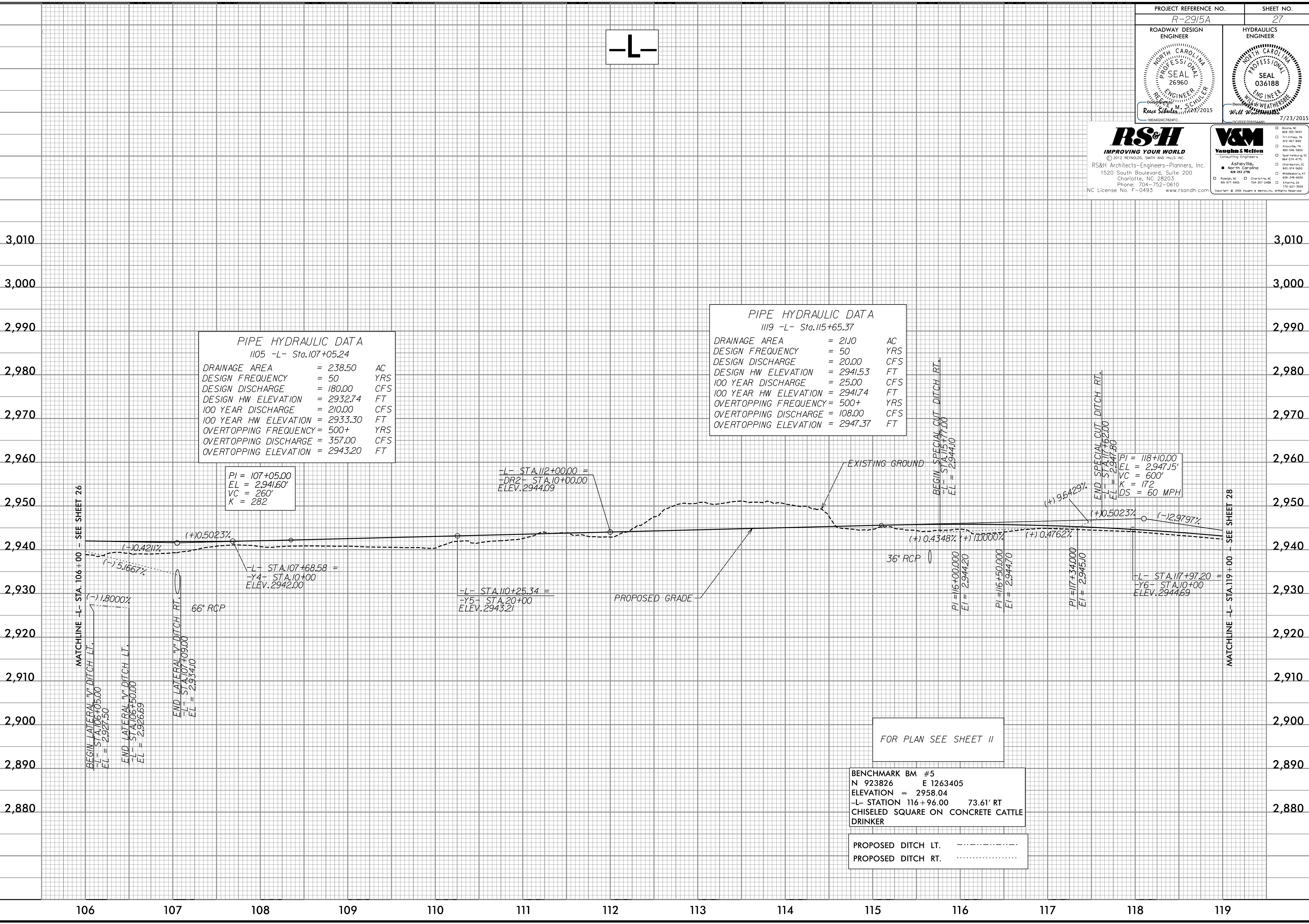
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|---|---|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 27 |
| ROADWAY DESIGN ENGINEER RUSS SCHULTE Professional Seal No. 26960 Exp. 07/23/2015 | HYDRAULICS ENGINEER WILL WEATHERS Professional Seal No. 036188 Exp. 07/23/2015 |

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PIPE HYDRAULIC DATA
1105 -L- Sta.107+05.24

| | | |
|-----------------------|-----------|-----|
| DRAINAGE AREA | = 238.50 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 180.00 | CFS |
| DESIGN HW ELEVATION | = 2932.74 | FT |
| 100 YEAR DISCHARGE | = 210.00 | CFS |
| 100 YEAR HW ELEVATION | = 2933.30 | FT |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING DISCHARGE | = 357.00 | CFS |
| OVERTOPPING ELEVATION | = 2943.20 | FT |

PIPE HYDRAULIC DATA
1119 -L- Sta.115+65.37

| | | |
|-----------------------|-----------|-----|
| DRAINAGE AREA | = 2110 | AC |
| DESIGN FREQUENCY | = 50 | YRS |
| DESIGN DISCHARGE | = 20.00 | CFS |
| DESIGN HW ELEVATION | = 2941.53 | FT |
| 100 YEAR DISCHARGE | = 25.00 | CFS |
| 100 YEAR HW ELEVATION | = 2941.74 | FT |
| OVERTOPPING FREQUENCY | = 500+ | YRS |
| OVERTOPPING DISCHARGE | = 108.00 | CFS |
| OVERTOPPING ELEVATION | = 2947.37 | FT |

PI = 107+05.00
EL = 2,941.60'
VC = 260'
K = 282

+L- STA.112+00.00 =
+DR2- STA.10+00.00
ELEV. 2944.09

-L- STA.107+68.58 =
-Y4- STA.10+00
ELEV. 2942.00

-L- STA.110+25.34 =
-Y5- STA.20+00
ELEV. 2943.21

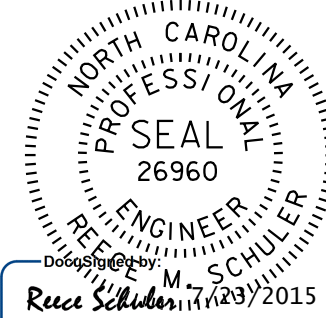
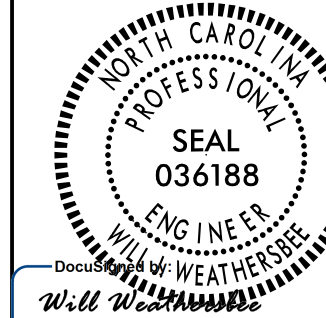
PI = 118+10.00
EL = 2,947.15'
VC = 600'
K = 172
DS = 60 MPH

+L- STA.117+97.20 =
+Y6- STA.10+00
ELEV. 2944.69

FOR PLAN SEE SHEET 11

BENCHMARK BM #5
N 923826 E 1263405
ELEVATION = 2958.04
-L- STATION 116+96.00 73.61' RT
CHISELED SQUARE ON CONCRETE CATTLE
DRINKER

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

| | |
|---|---|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 28 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
|  |  |
| R. Schuler | Will Weathers |
| 7/23/2015 | 7/23/2015 |

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119 120 121 122 123 124 125 126 127 128 129 130 131
 2,850 2,860 2,870 2,880 2,890 2,900 2,910 2,920 2,930 2,940 2,950 2,960 2,970 2,980 2,990

-L-

MATCHLINE -L- STA. 119+00 - SEE SHEET 27
 PI = 118+10.00
 EL = 2,947.15'
 VC = 600'
 K = 172
 DS = 60 MPH

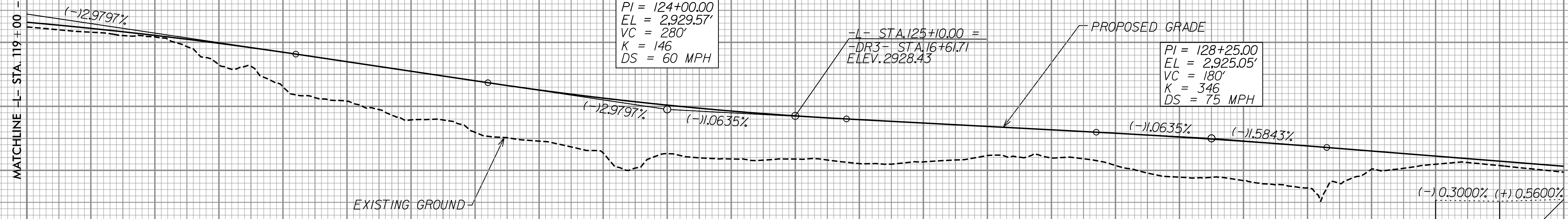
PI = 124+00.00
 EL = 2,929.57'
 VC = 280'
 K = 146
 DS = 60 MPH

PI = 128+25.00
 EL = 2,925.05'
 VC = 180'
 K = 346
 DS = 75 MPH

-L- STA. 125+10.00 =
 -DR3- STA. 16+61.71
 ELEV. 2928.43

EXISTING GROUND

PROPOSED GRADE



BEGIN SPECIAL CUT DITCH -RT-
 -L- STA. 130+00.00
 EL = 2,915.37

PI = 130+50.00
 EL = 2,915.22

END SPECIAL CUT DITCH -RT-
 -L- STA. 131+00.00
 EL = 2,915.50

119 120 121 122 123 124 125 126 127 128 129 130 131

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

FOR PLAN SEE SHEET 12

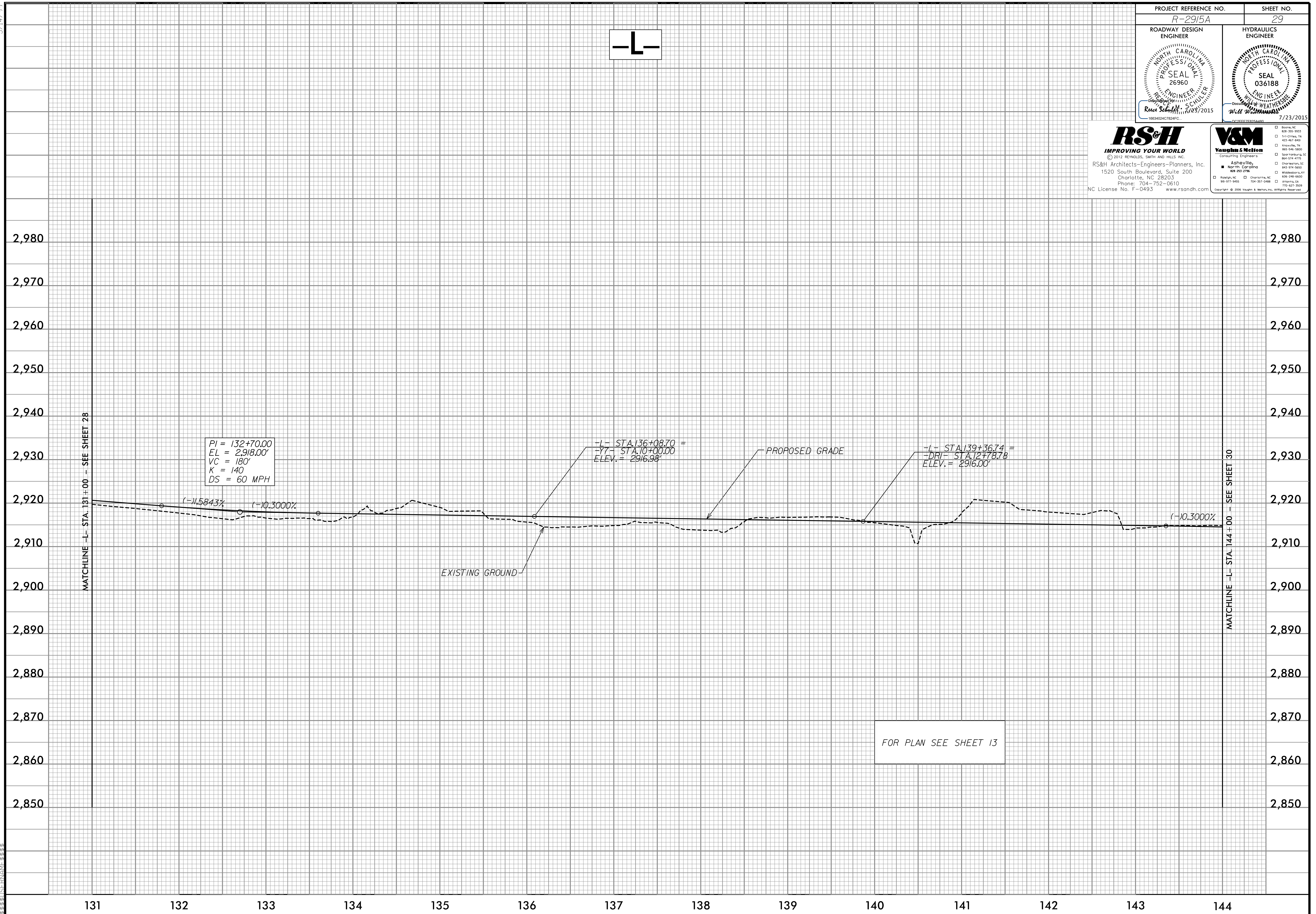
MATCHLINE -L- STA. 131+00 - SEE SHEET 29

| | |
|---|--|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 29 |
| ROADWAY DESIGN ENGINEER Ruel Smith, P.E. Professional Seal: SEAL 26960, ENGINEER, NORTH CAROLINA PROFESSIONAL SEAL 26960, Ruel Smith, P.E., 08/23/2015 | HYDRAULICS ENGINEER Will Weathers, P.E. Professional Seal: SEAL 036188, ENGINEER, NORTH CAROLINA PROFESSIONAL SEAL 036188, Will Weathers, P.E., 7/23/2015 |

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-L-



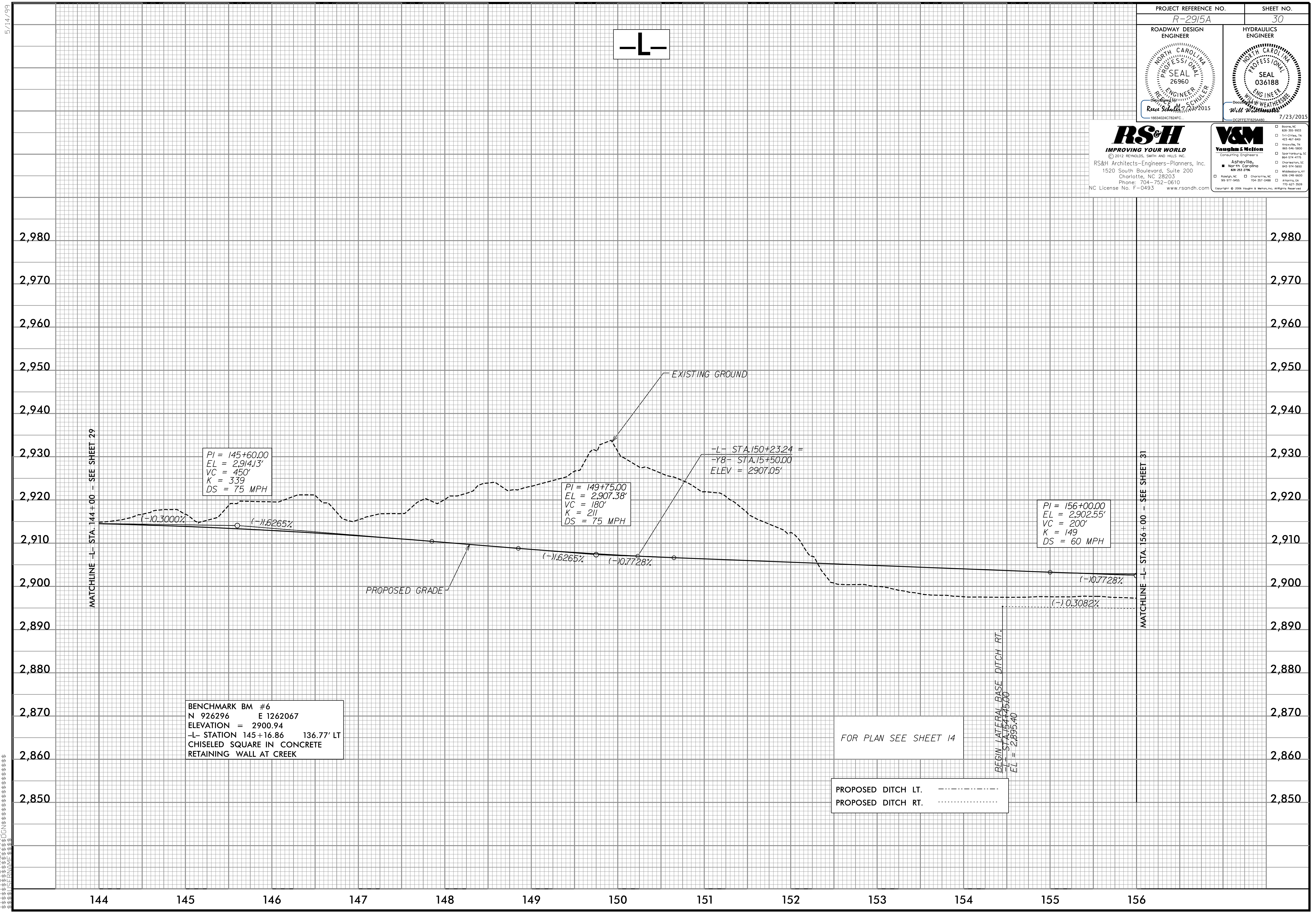
FOR PLAN SEE SHEET 13

5/14/99
131 132 133 134 135 136 137 138 139 140 141 142 143 144

| | |
|--|---|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 30 |
| ROADWAY DESIGN ENGINEER Reese Schmitt Professional Seal 26960 | HYDRAULICS ENGINEER Will Weathers Professional Seal 036188 |
| 7/23/2015 | |

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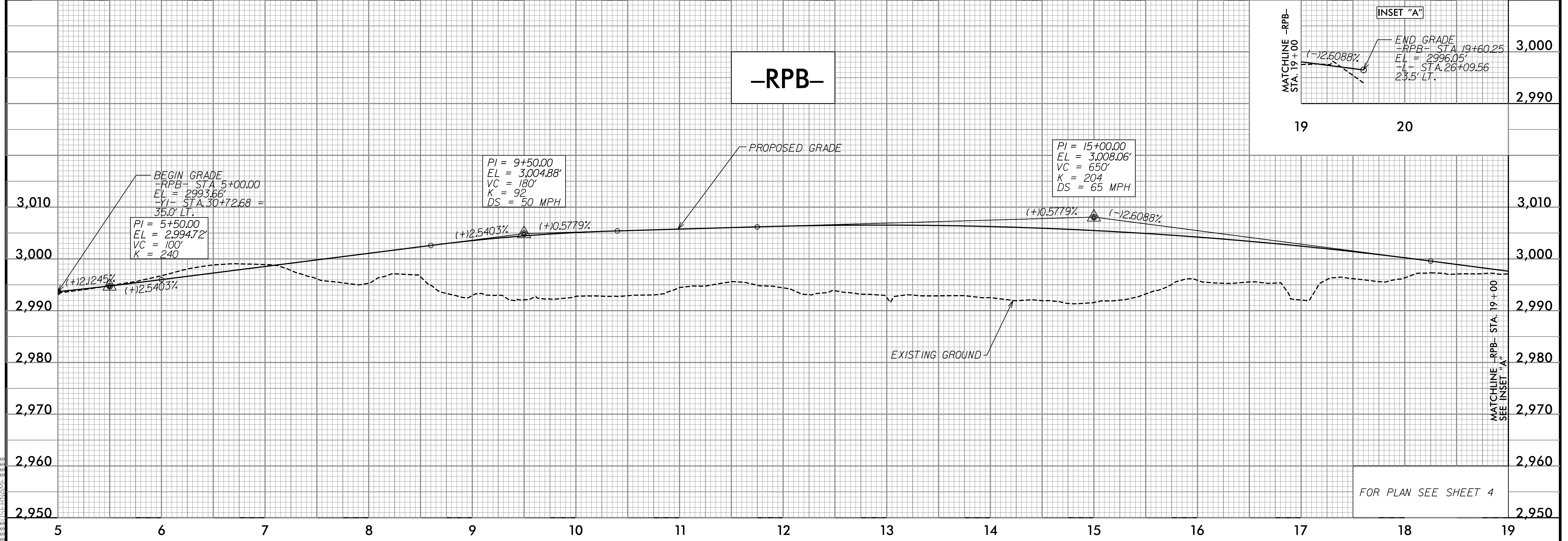
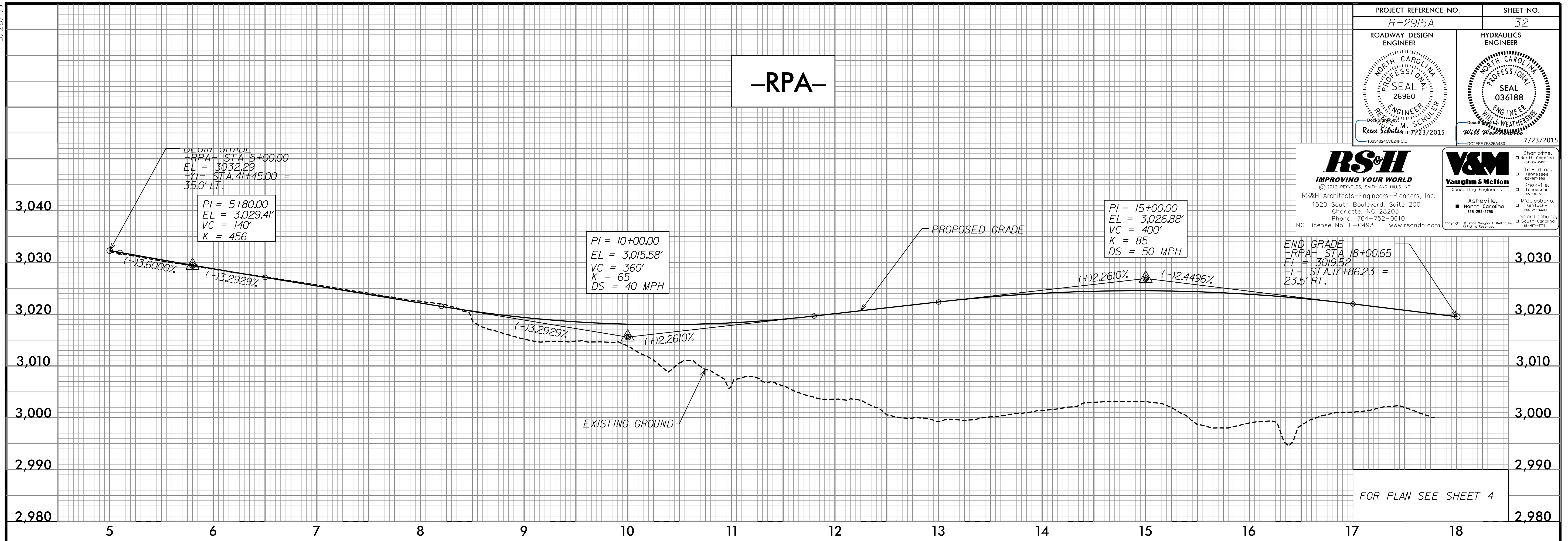
144 145 146 147 148 149 150 151 152 153 154 155 156

2,980 2,970 2,960 2,950 2,940 2,930 2,920 2,910 2,900 2,890 2,880 2,870 2,860 2,850

| | |
|---|------------------------|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 32 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| | |

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Kentucky
404-248-8000
Spartanburg, SC
South Carolina
864-524-4775



INSET "A"

MATCHLINE -RPB- STA. 19+00

END GRADE
-RPB- STA 19+60.25
EL = 2,996.05'
-L- STA.26+09.56 = 23.5' LT.

Grades: (-)12.6088%

5/28/19

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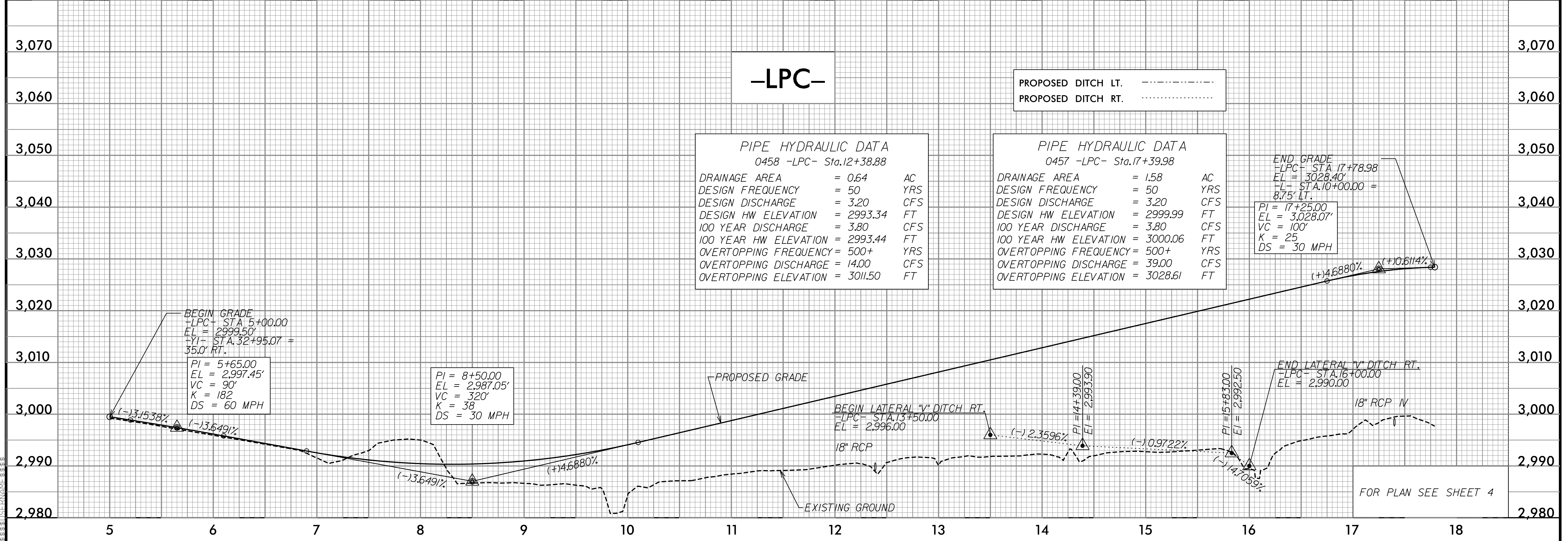
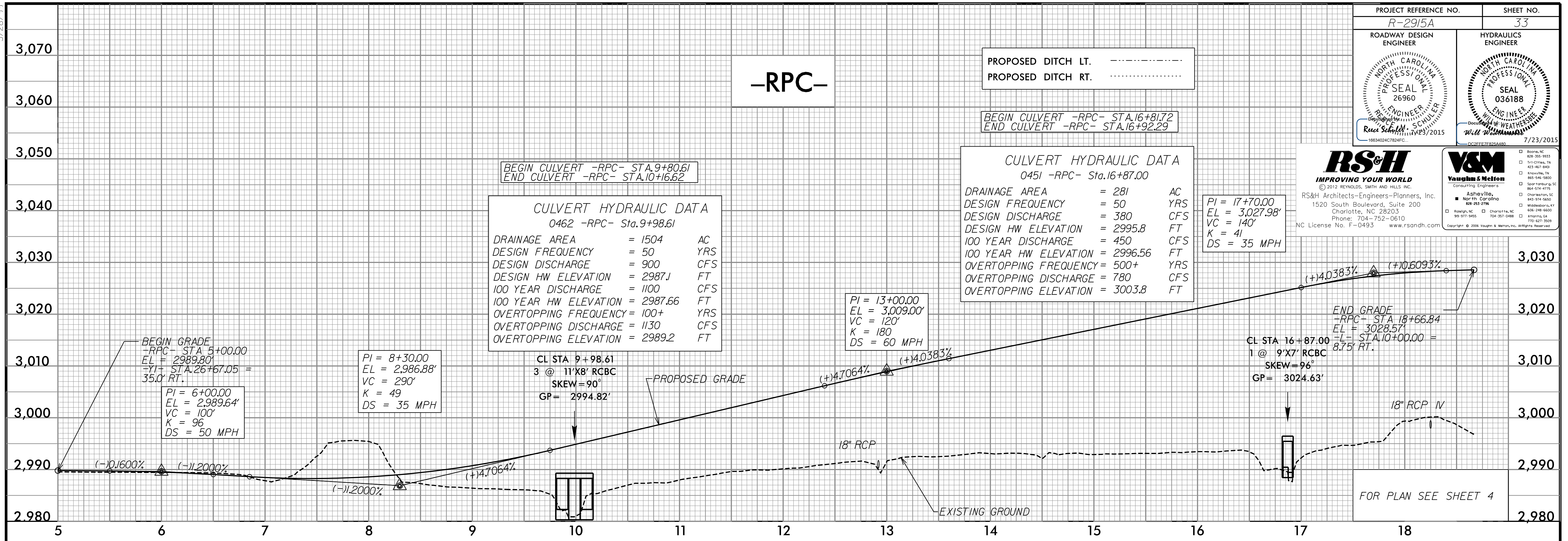
2,980
2,990
3,000
3,010
3,020
3,030
3,040

2,950
2,960
2,970
2,980
2,990
3,000
3,010

| | |
|--|---|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 33 |
| ROADWAY DESIGN ENGINEER Rui Schmitt, P.E. SEAL 26960 DATE: 7/23/2015 | HYDRAULICS ENGINEER Will Weathers, P.E. SEAL 036188 DATE: 7/23/2015 |

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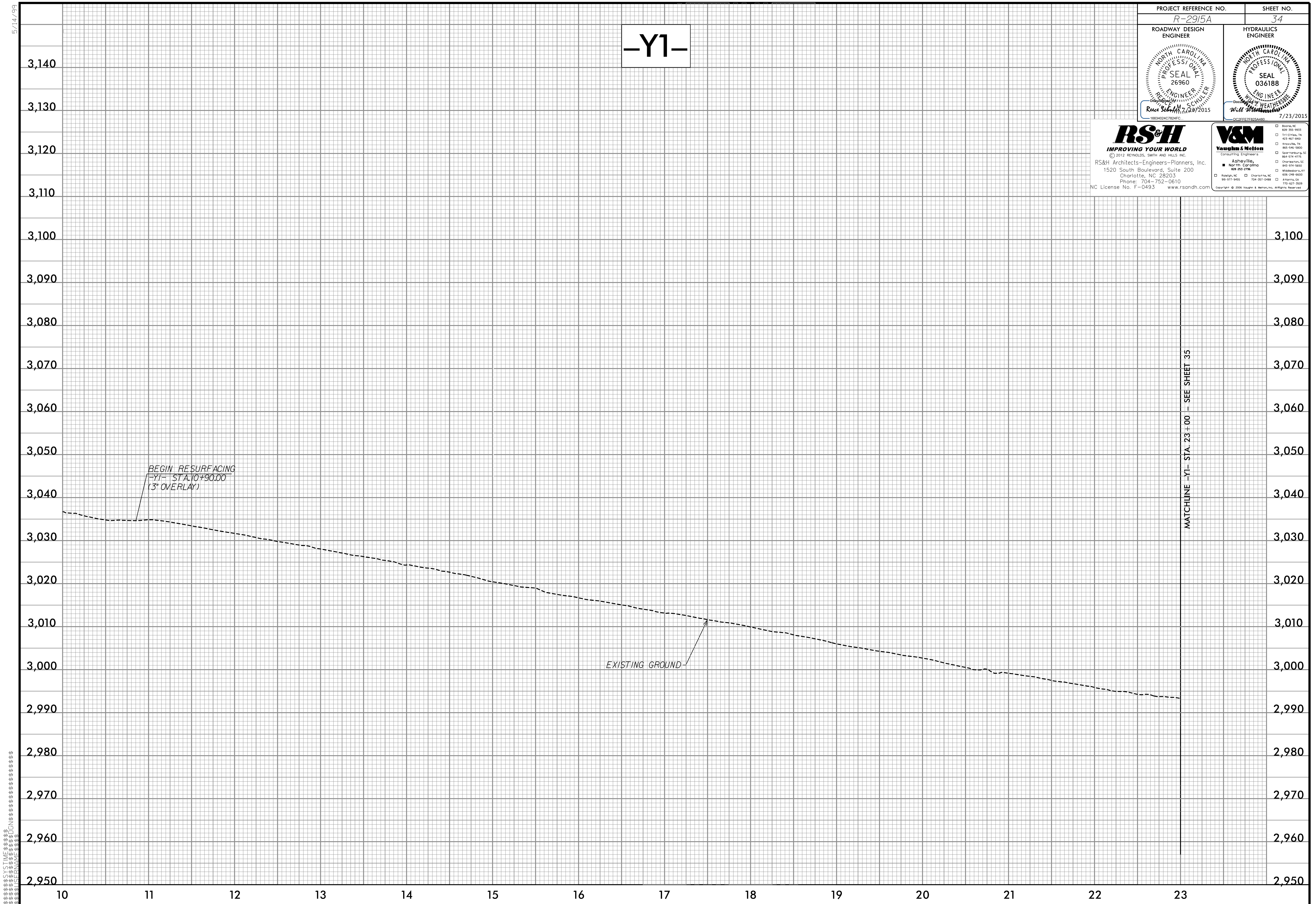


| | |
|---|------------------------|
| PROJECT REFERENCE NO. <i>R-2915A</i> | SHEET NO. <i>34</i> |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| | |

-Y1-

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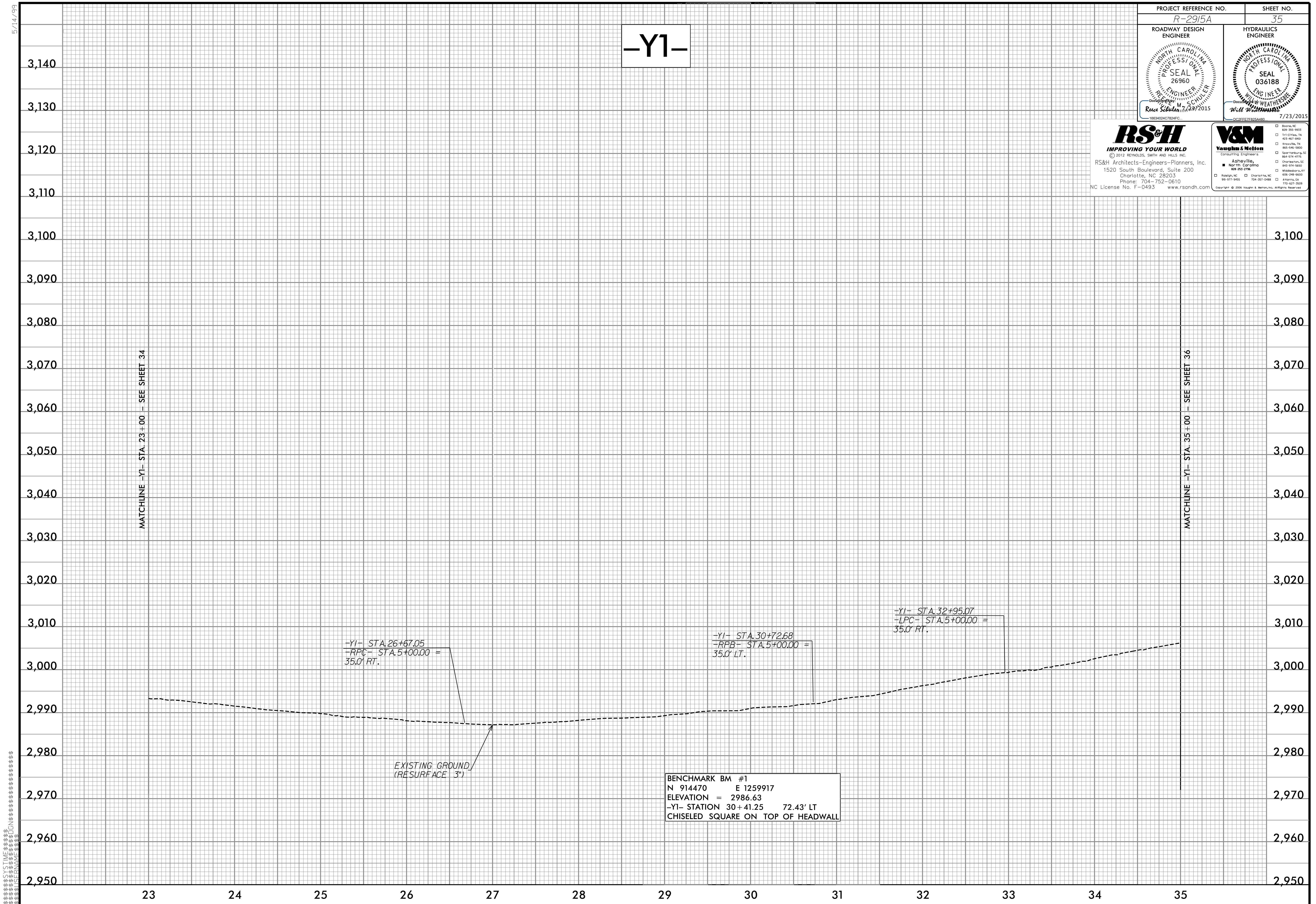
MATCHLINE -Y1- STA. 23+00 - SEE SHEET 35

| | |
|--|---|
| PROJECT REFERENCE NO. <i>R-2915A</i> | SHEET NO. <i>35</i> |
| ROADWAY DESIGN ENGINEER <i>Reet Schuler, M.S., P.E.</i> | HYDRAULICS ENGINEER <i>Will Weathers, P.E.</i> |
| | |

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-Y1-



5/14/99

2950
2960
2970
2980
2990
3000
3010
3020
3030
3040
3050
3060
3070
3080
3090
3100
3110
3120
3130
3140

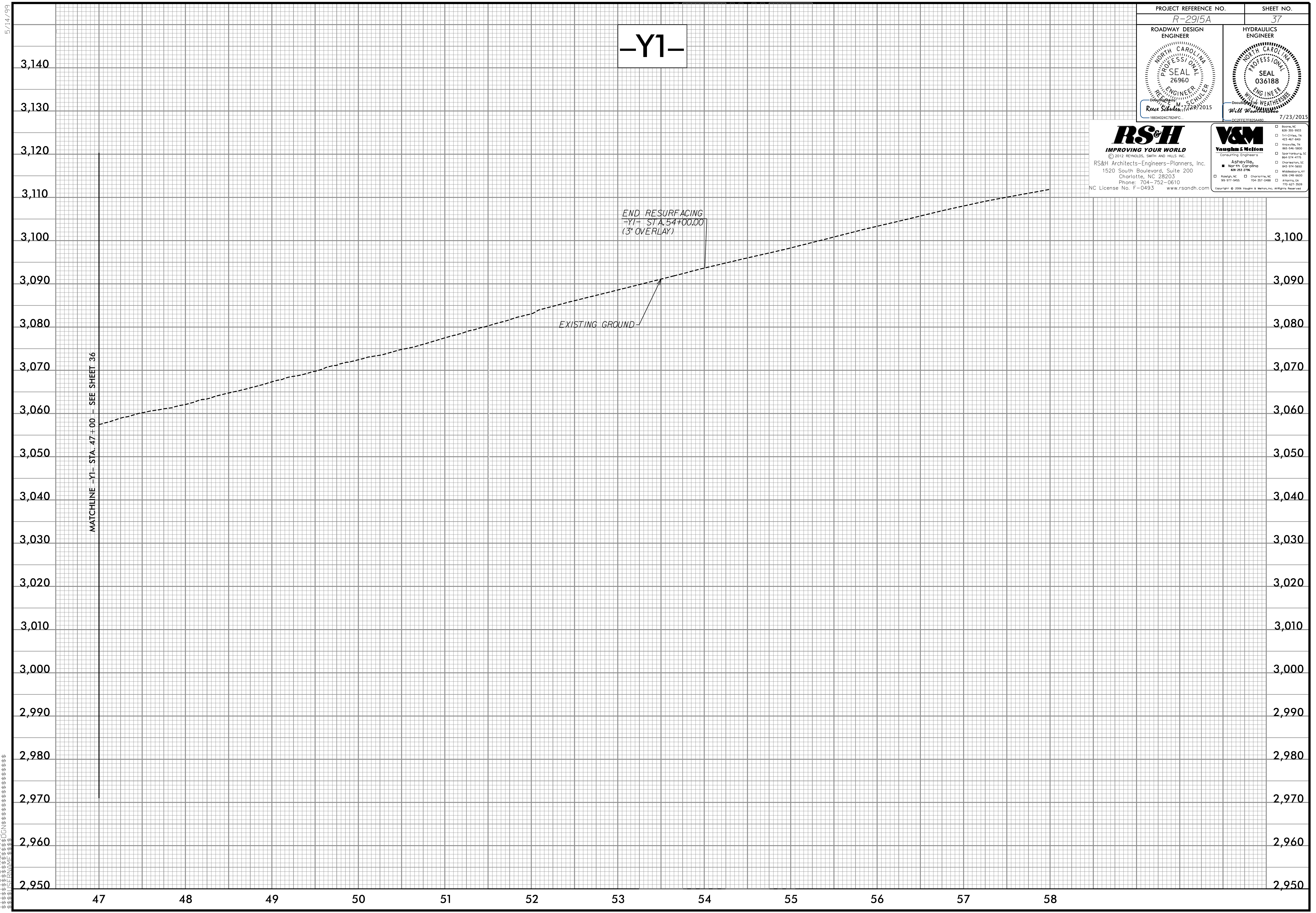
2950
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2990
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3010
3020
3030
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3050
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3070
3080
3090
3100
3110
3120
3130
3140

| | |
|--|---|
| PROJECT REFERENCE NO. <i>R-2915A</i> | SHEET NO. <i>37</i> |
| ROADWAY DESIGN ENGINEER SEAL 26960 <i>Rene Schuler</i> 7/23/2015 | HYDRAULICS ENGINEER SEAL 036188 <i>Will Weatherse</i> 7/23/2015 |

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-Y1-



MATCHLINE -Y1- STA. 47+00 - SEE SHEET 36

EXISTING GROUND

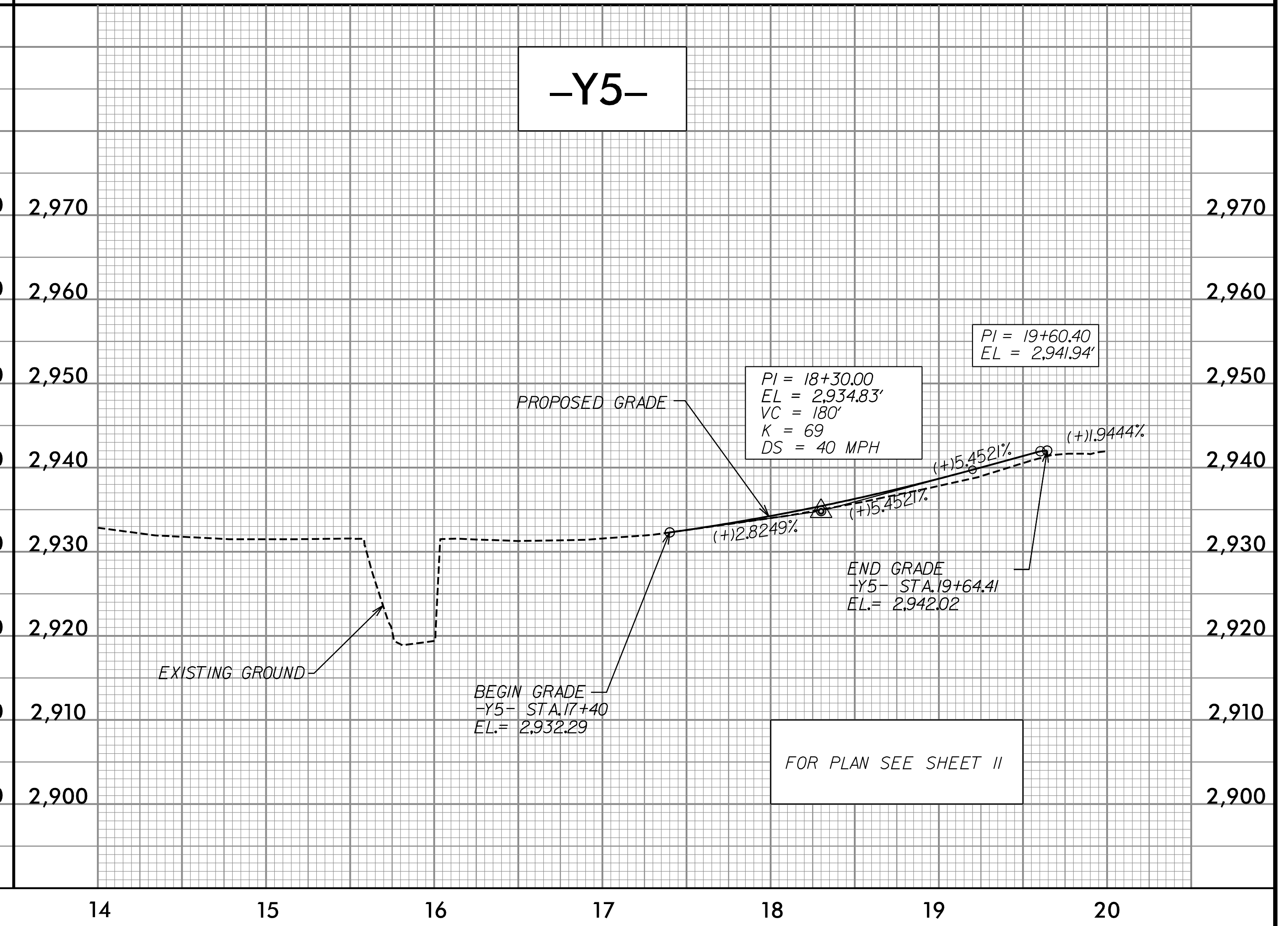
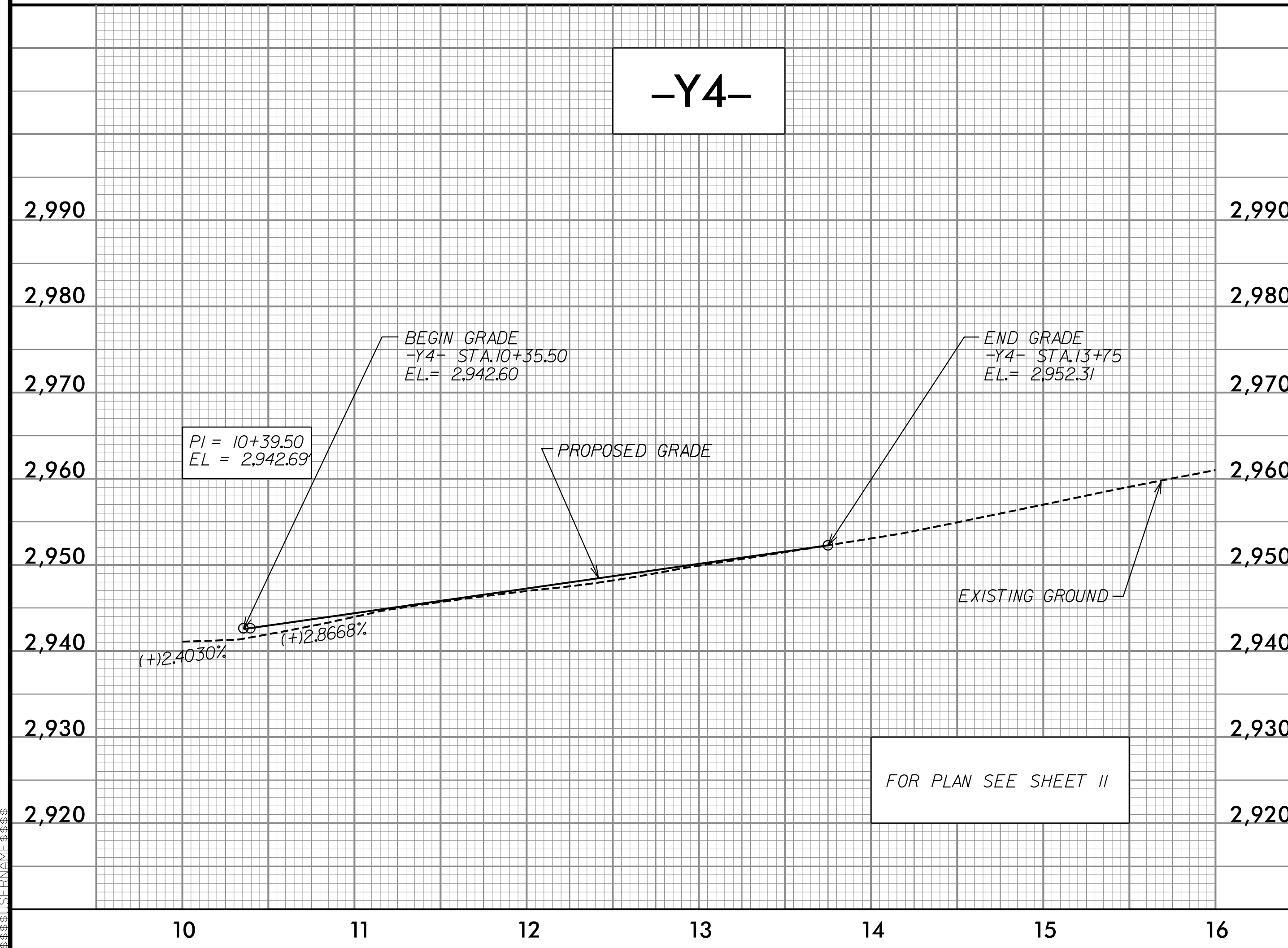
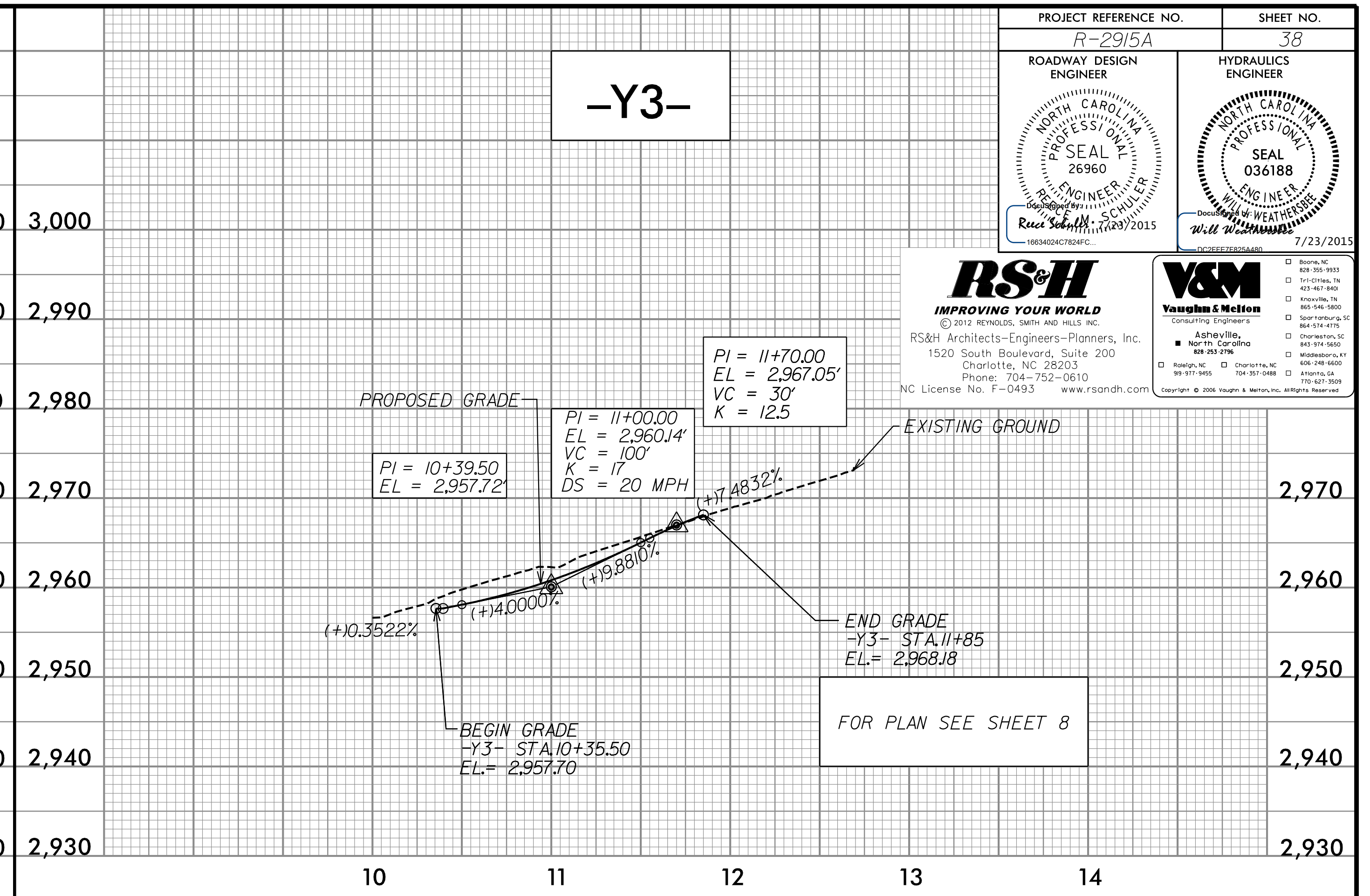
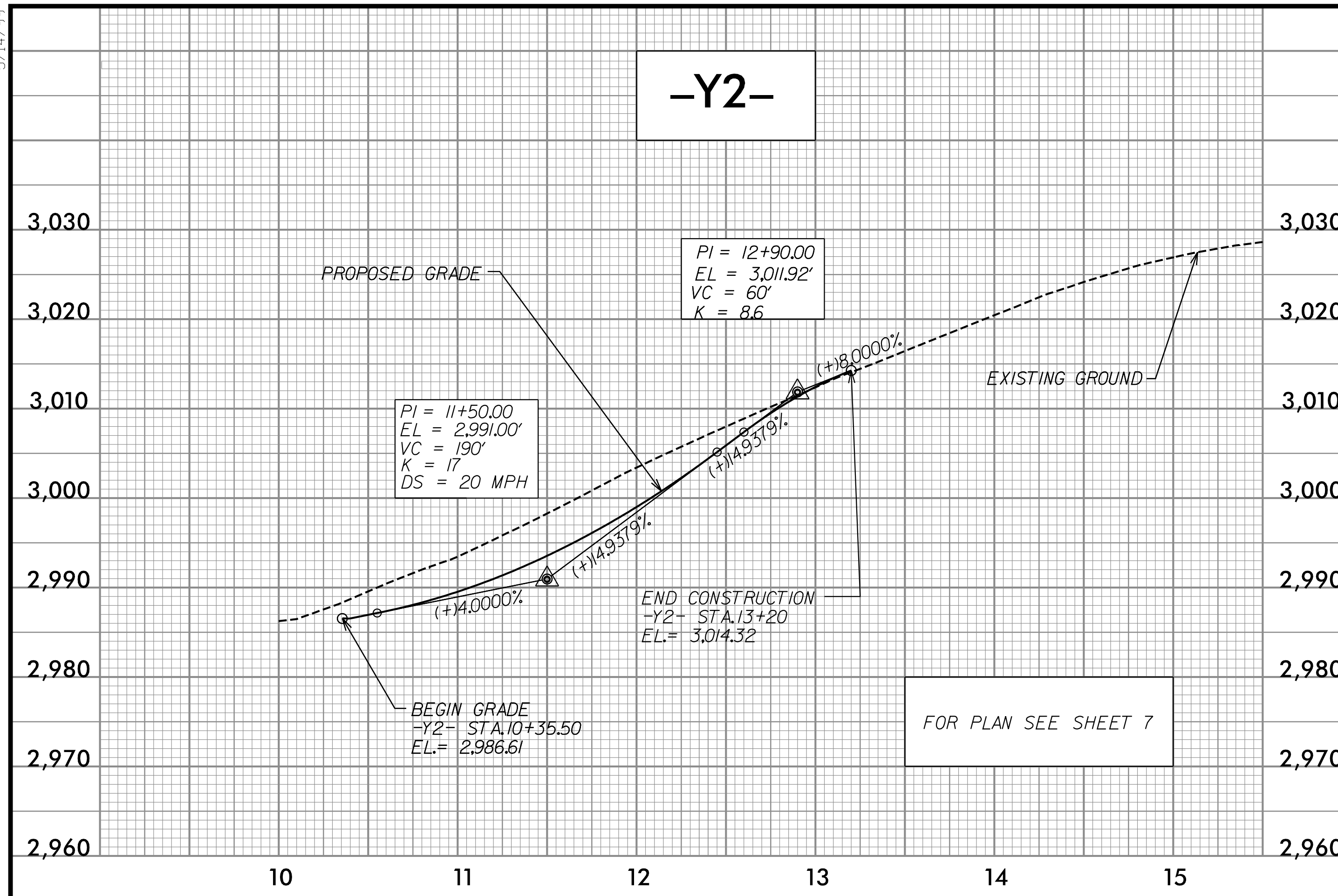
END RESURFACING
-Y1- STA. 54+00.00
(3" OVERLAY)

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| | |
|---|--|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 38 |
| ROADWAY DESIGN ENGINEER REYNOLDS, SMITH AND HILLS | HYDRAULICS ENGINEER WILLIAM WEATHERS |
| | |
| 7/23/2015 | |

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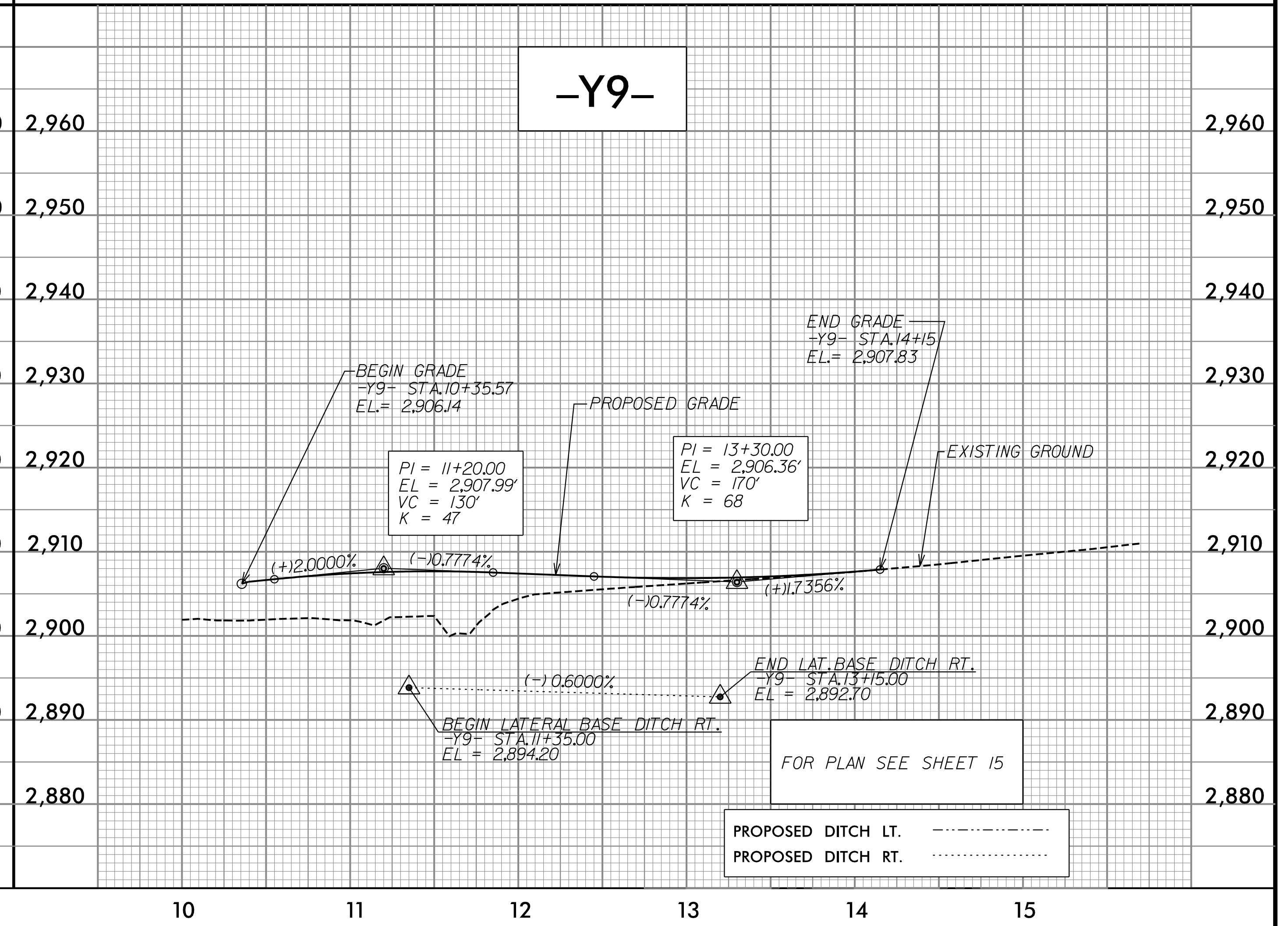
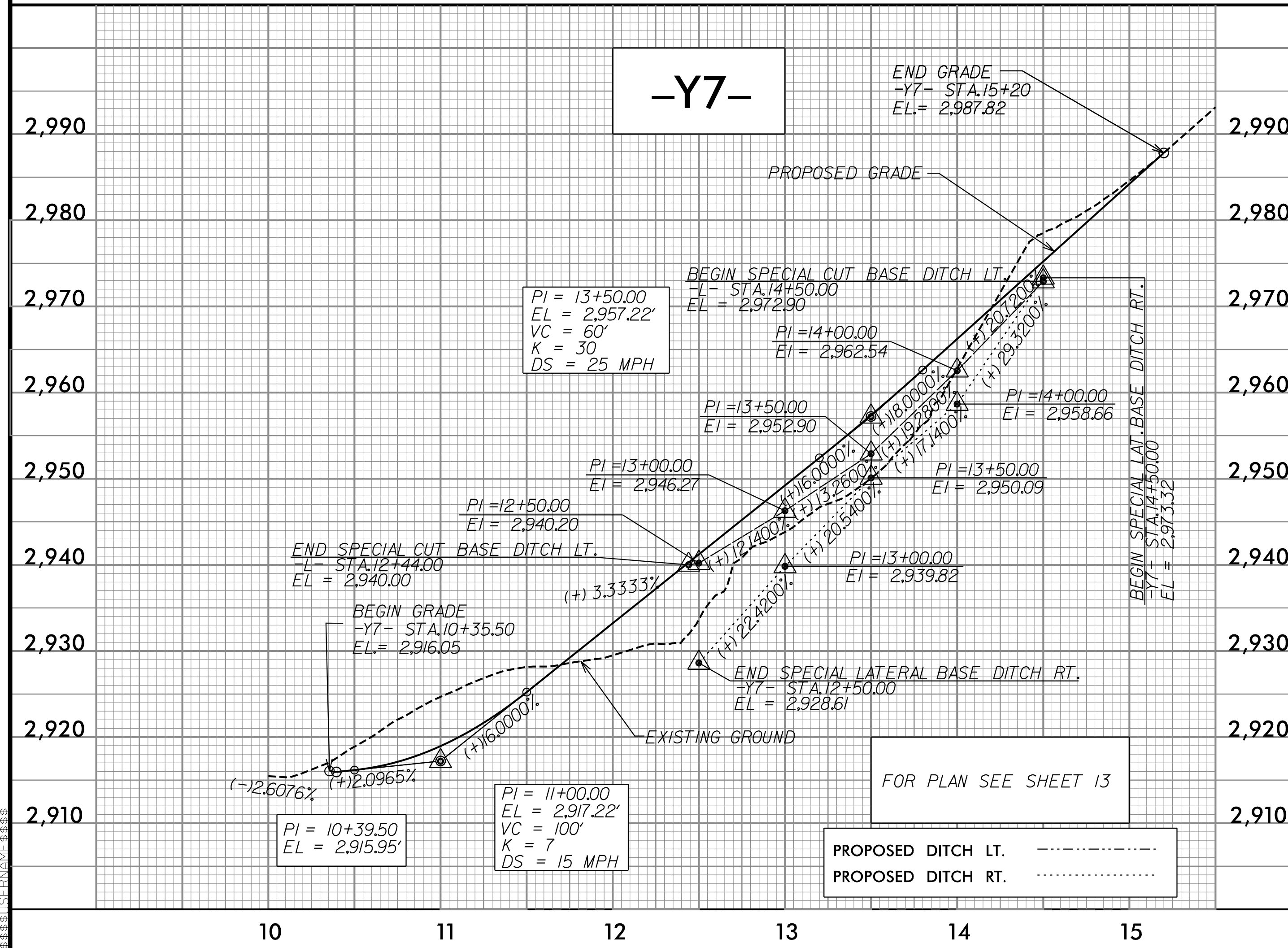
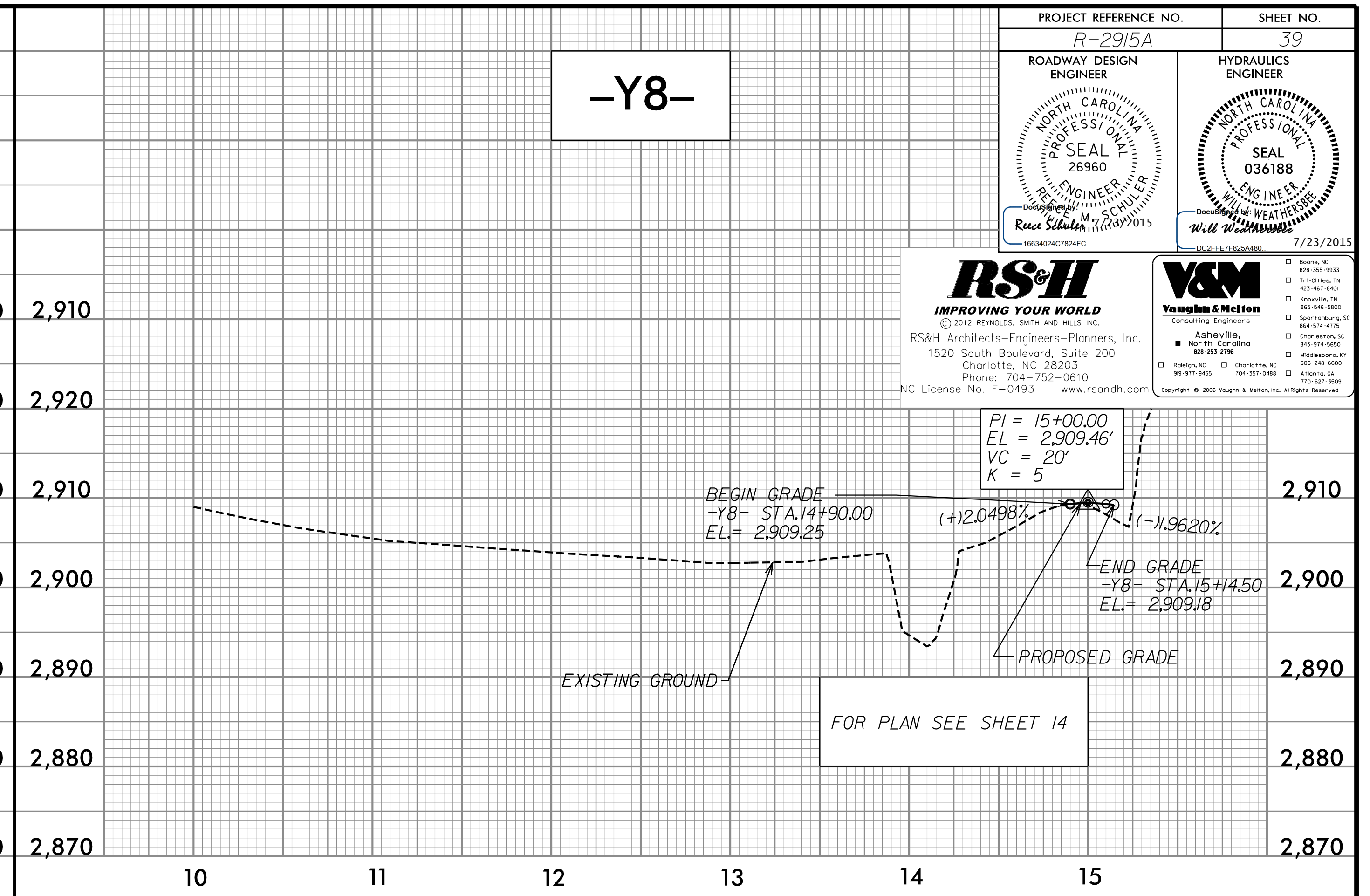
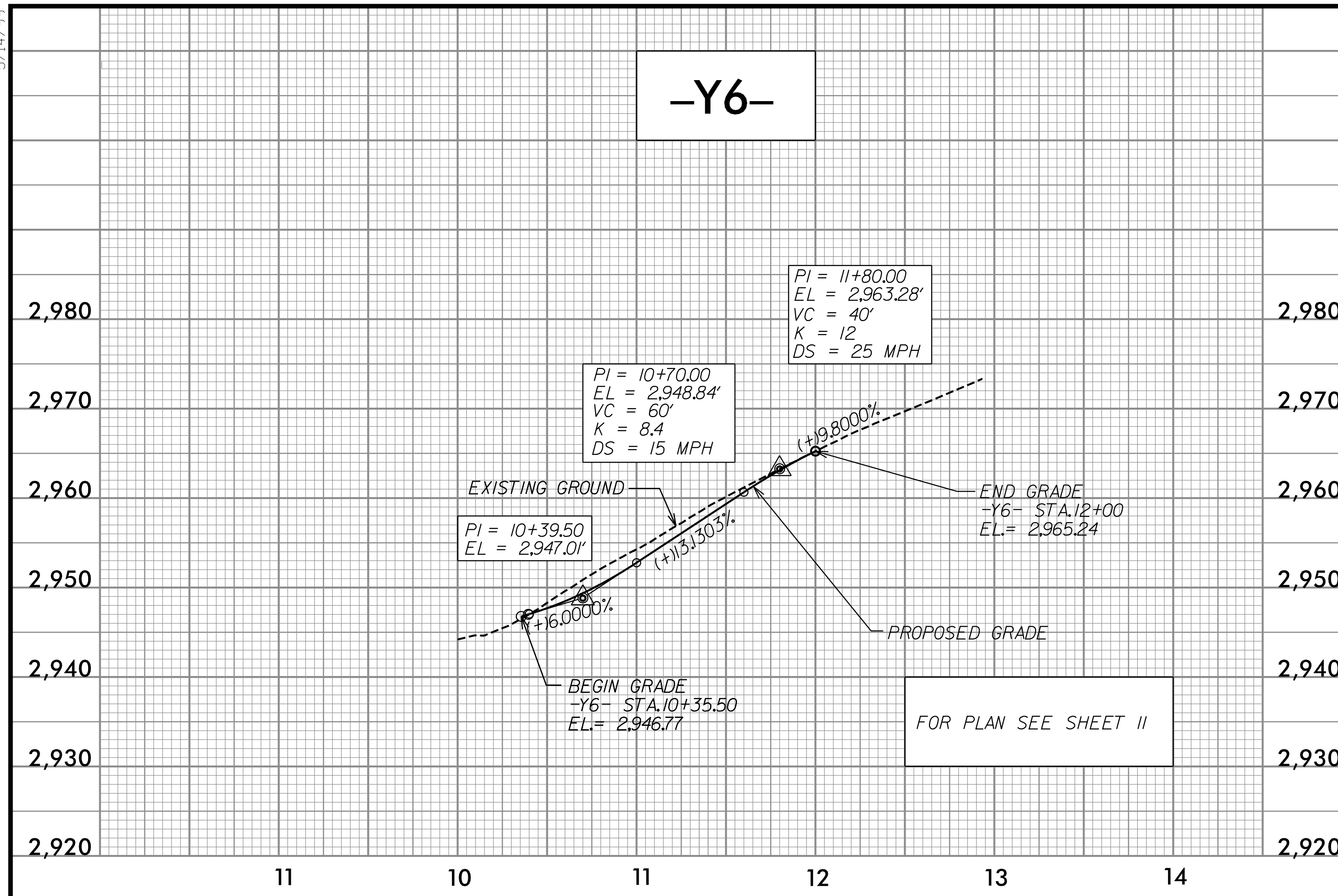
5/14/99

5/14/99

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|---|--|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 39 |
| ROADWAY DESIGN ENGINEER Russ Schuler Professional Seal SEAL 26960 2015 | HYDRAULICS ENGINEER Will Woodhouse Professional Seal SEAL 036188 2015 |

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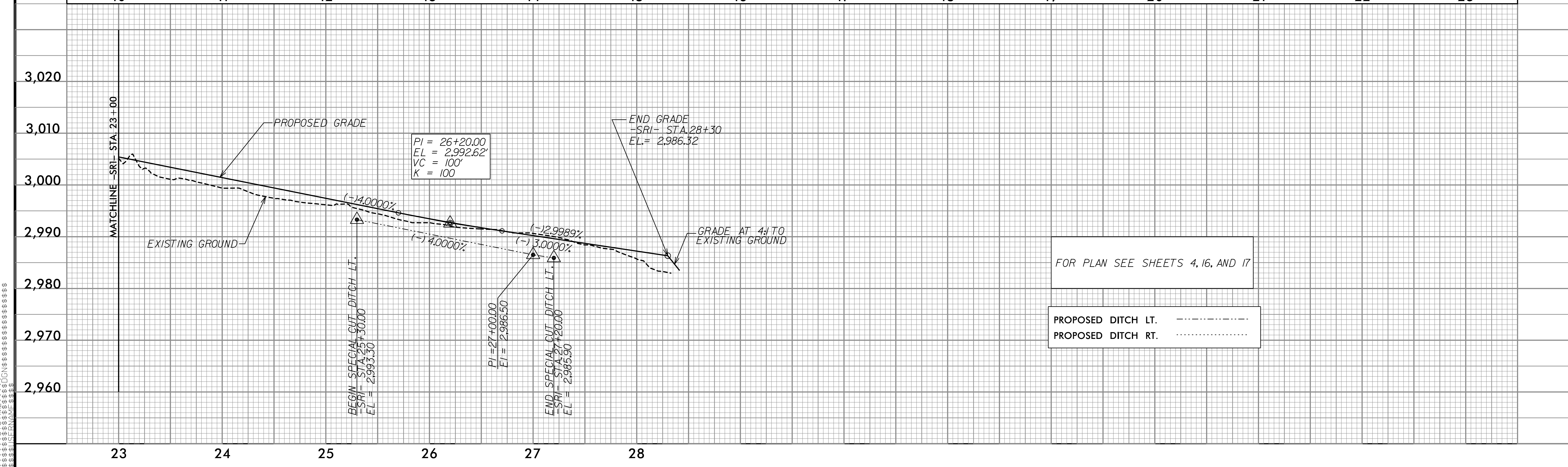
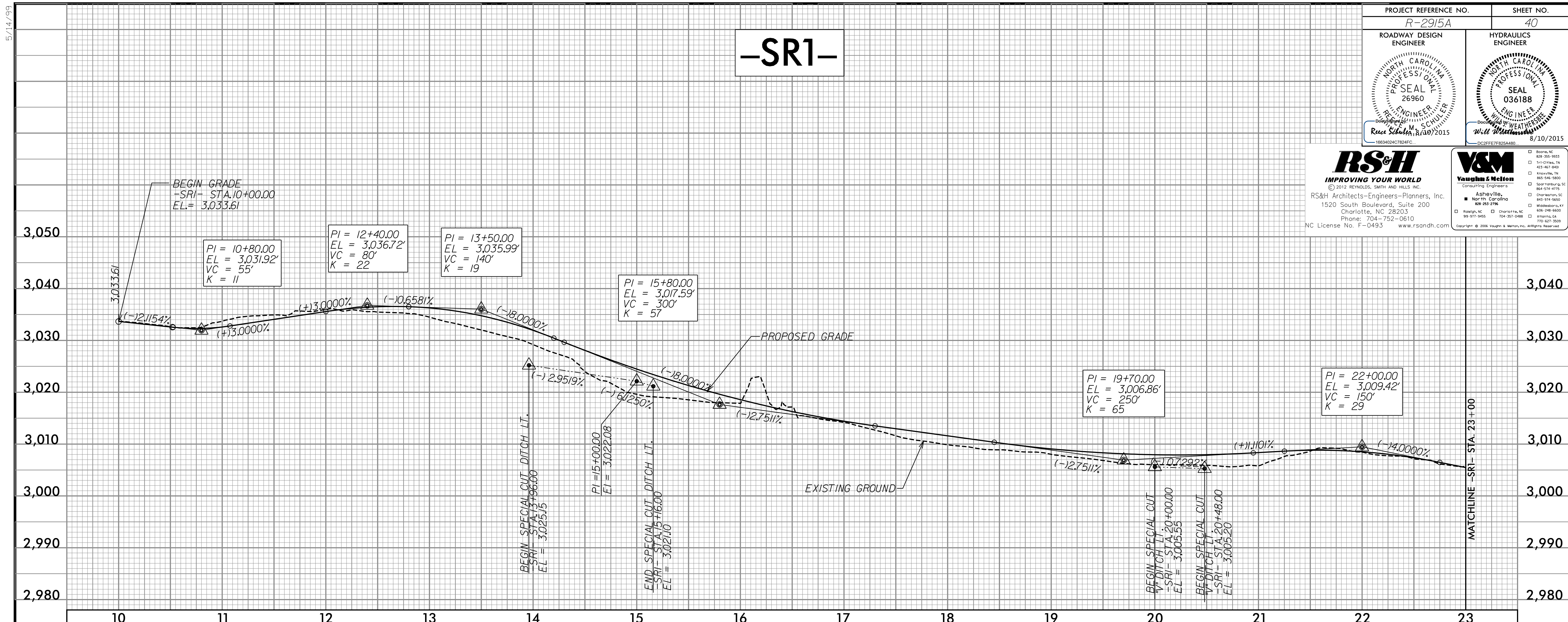
5/14/99

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|---|---|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 40 |
| ROADWAY DESIGN ENGINEER REYNOLDS, SMITH AND HILLS | HYDRAULICS ENGINEER WILL WEATHERS |
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919-977-9455 704-357-0488
170-421-1929

-SR1-



FOR PLAN SEE SHEETS 4, 16, AND 17

PROPOSED DITCH LT. - - - - -

PROPOSED DITCH RT.

5/14/99

MATCHLINE -SR1- STA. 10+00

MATCHLINE -SR1- STA. 23+00

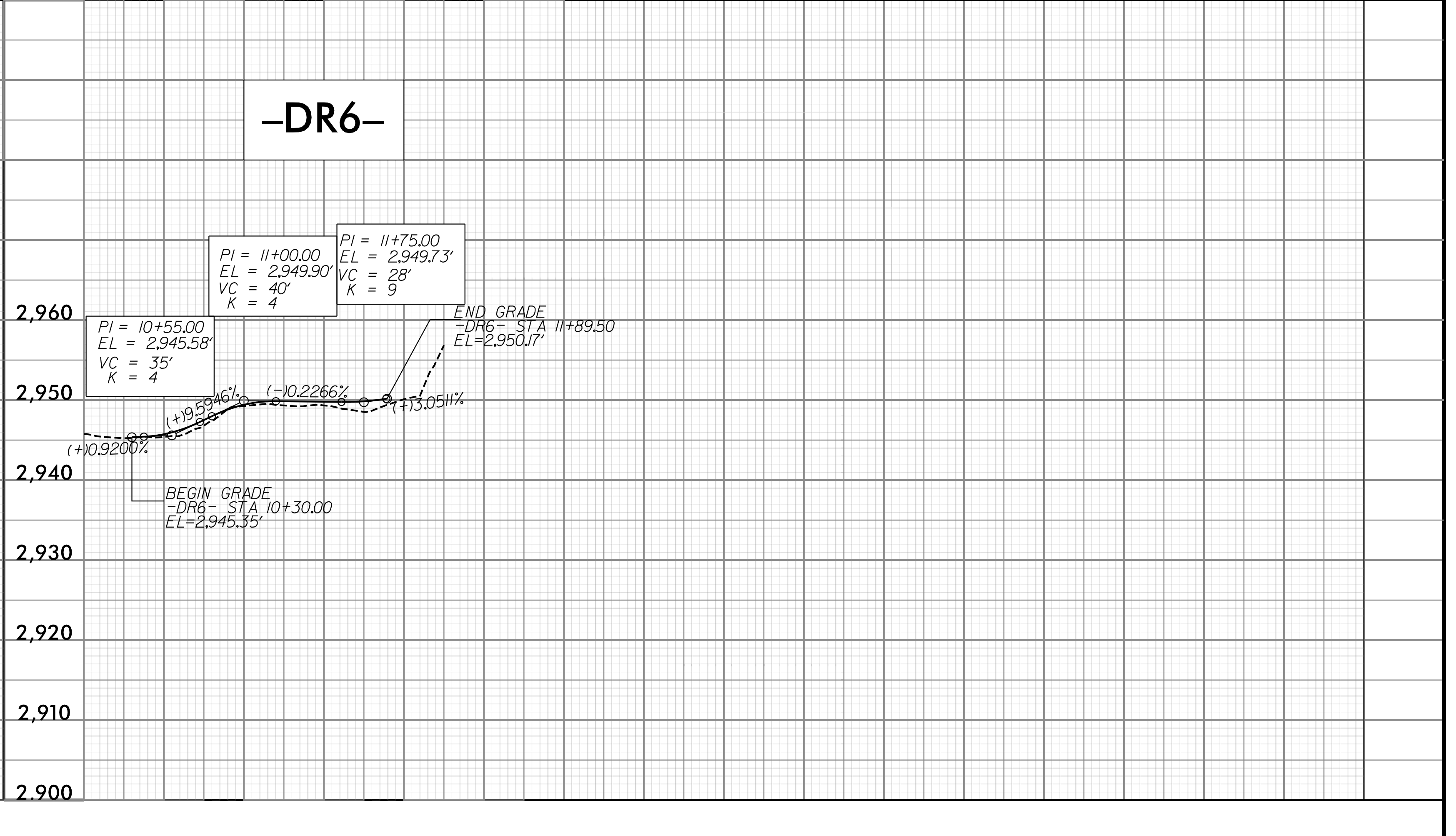
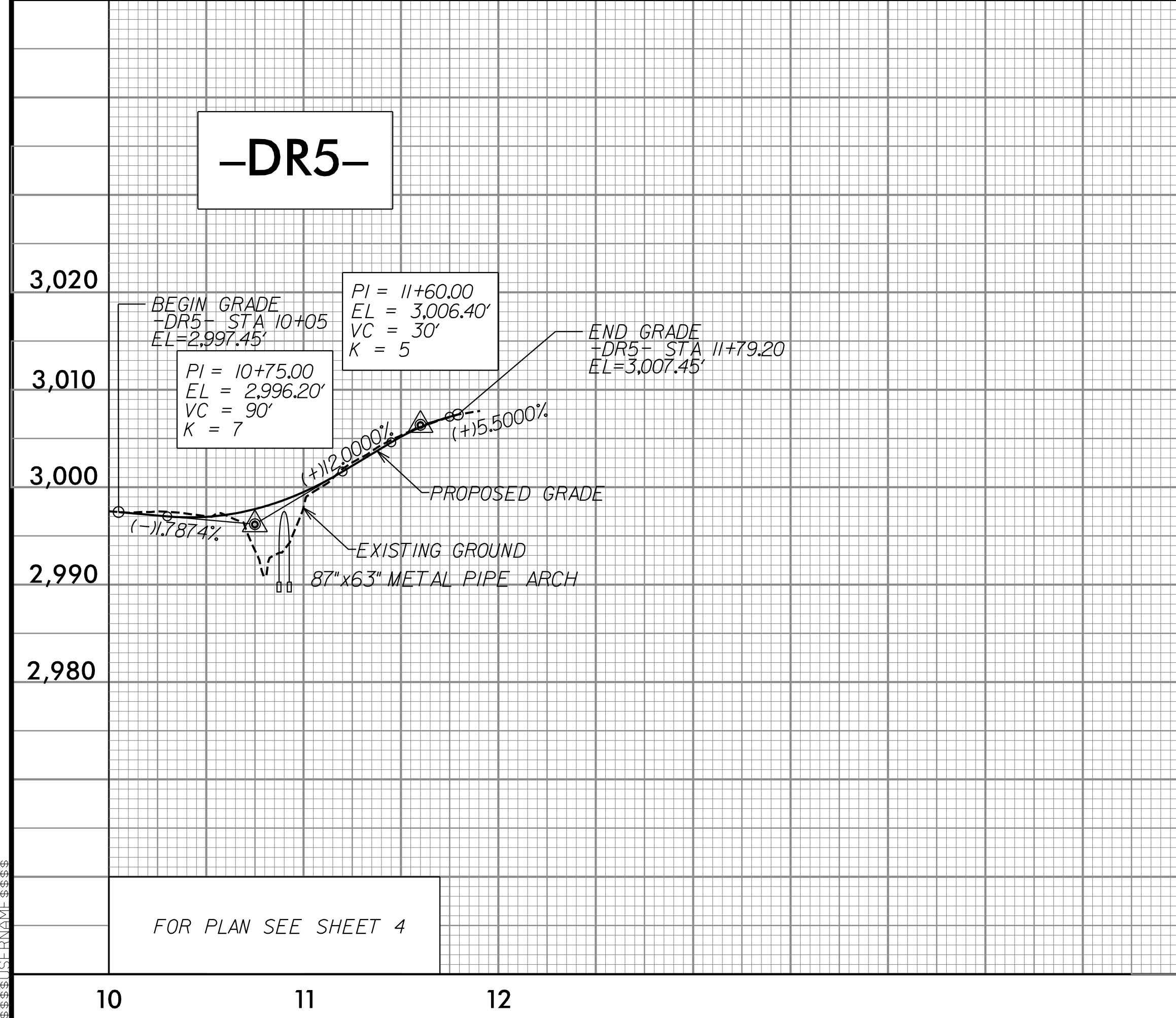
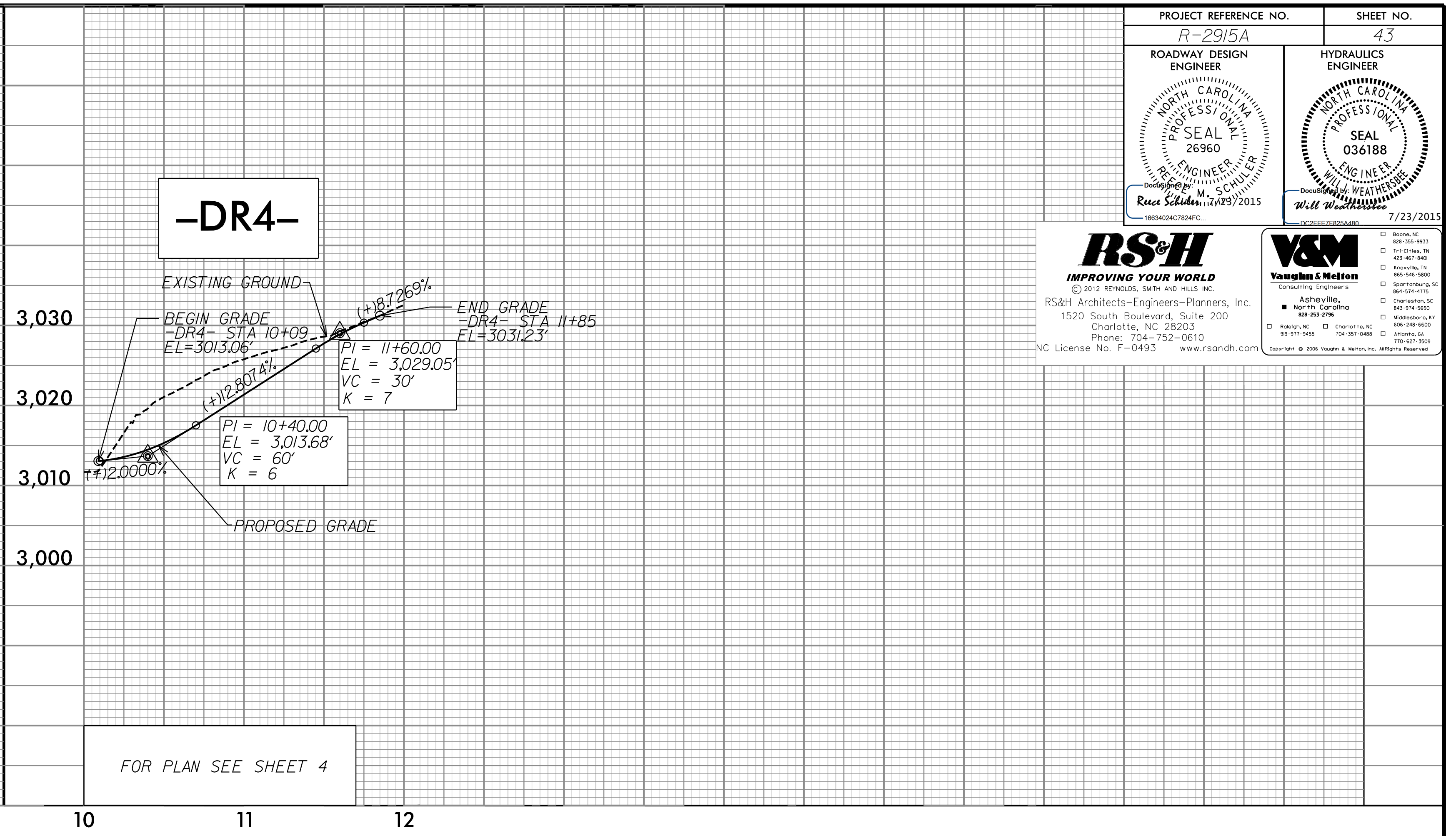
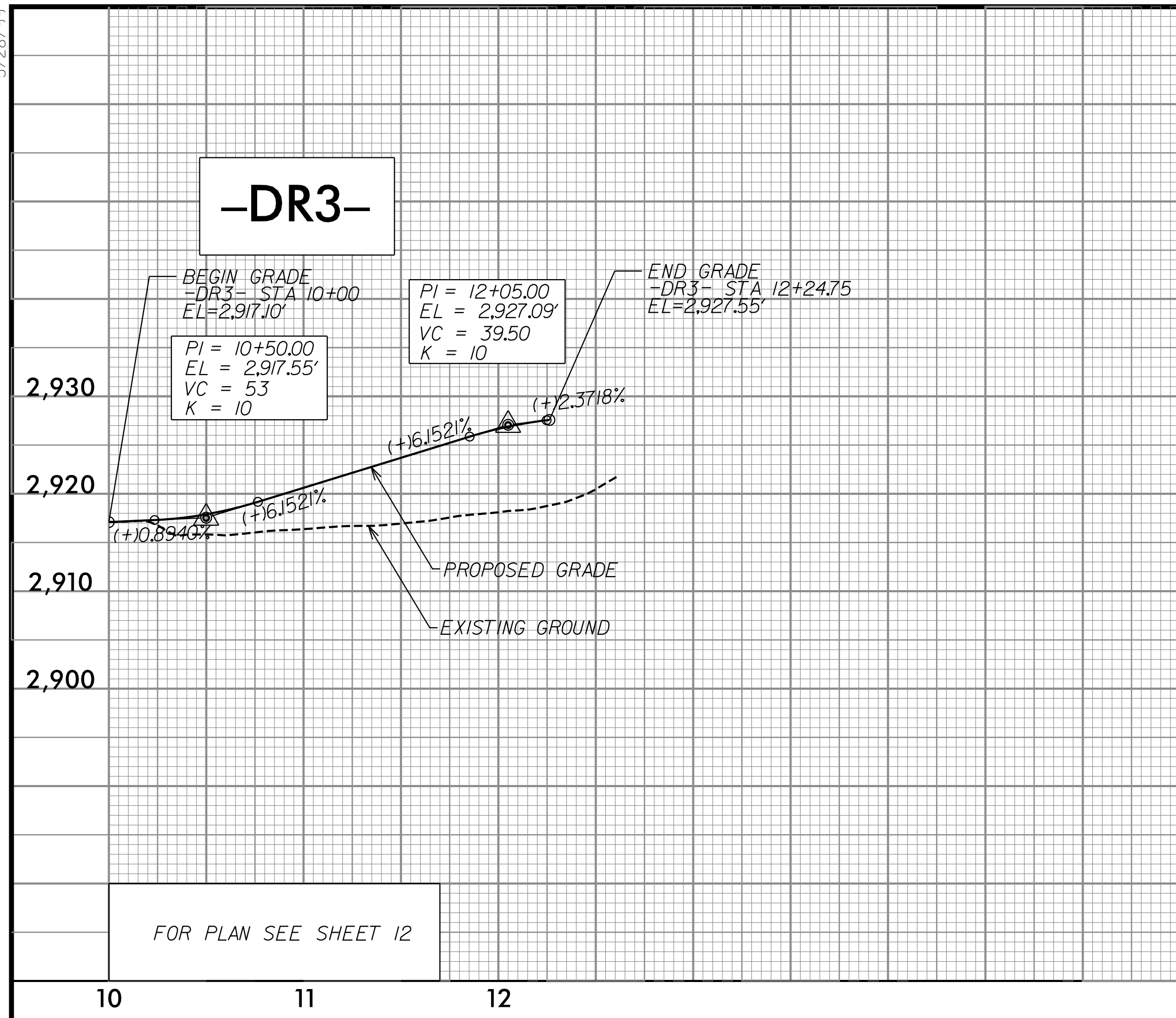
MATCHLINE -SR1- STA. 23+00

MATCHLINE -SR1- STA. 28+30

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|----------------------------------|---------------------|
| PROJECT REFERENCE NO. R-2915A | SHEET NO. 43 |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
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5/28/15

10 11 12

2,900 2,910 2,920 2,930

3,000 3,010 3,020

2,980 2,990 3,000 3,010 3,020

2,930 2,940 2,950 2,960

2,900 2,910 2,920 2,930 2,940 2,950 2,960