

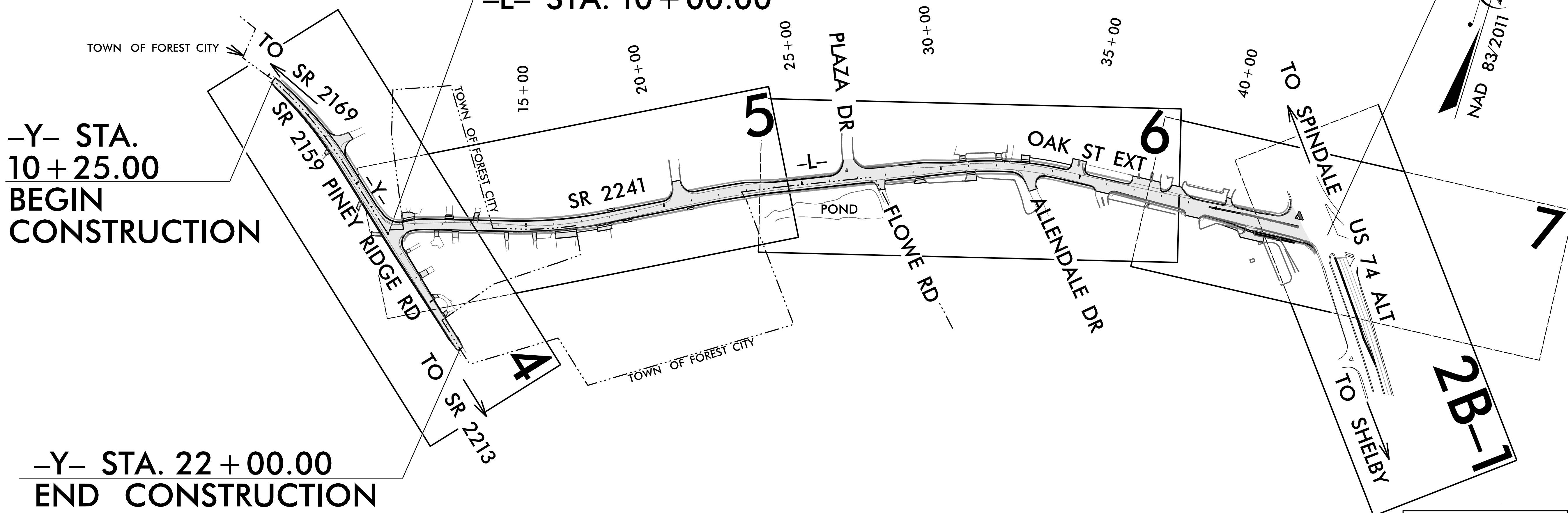
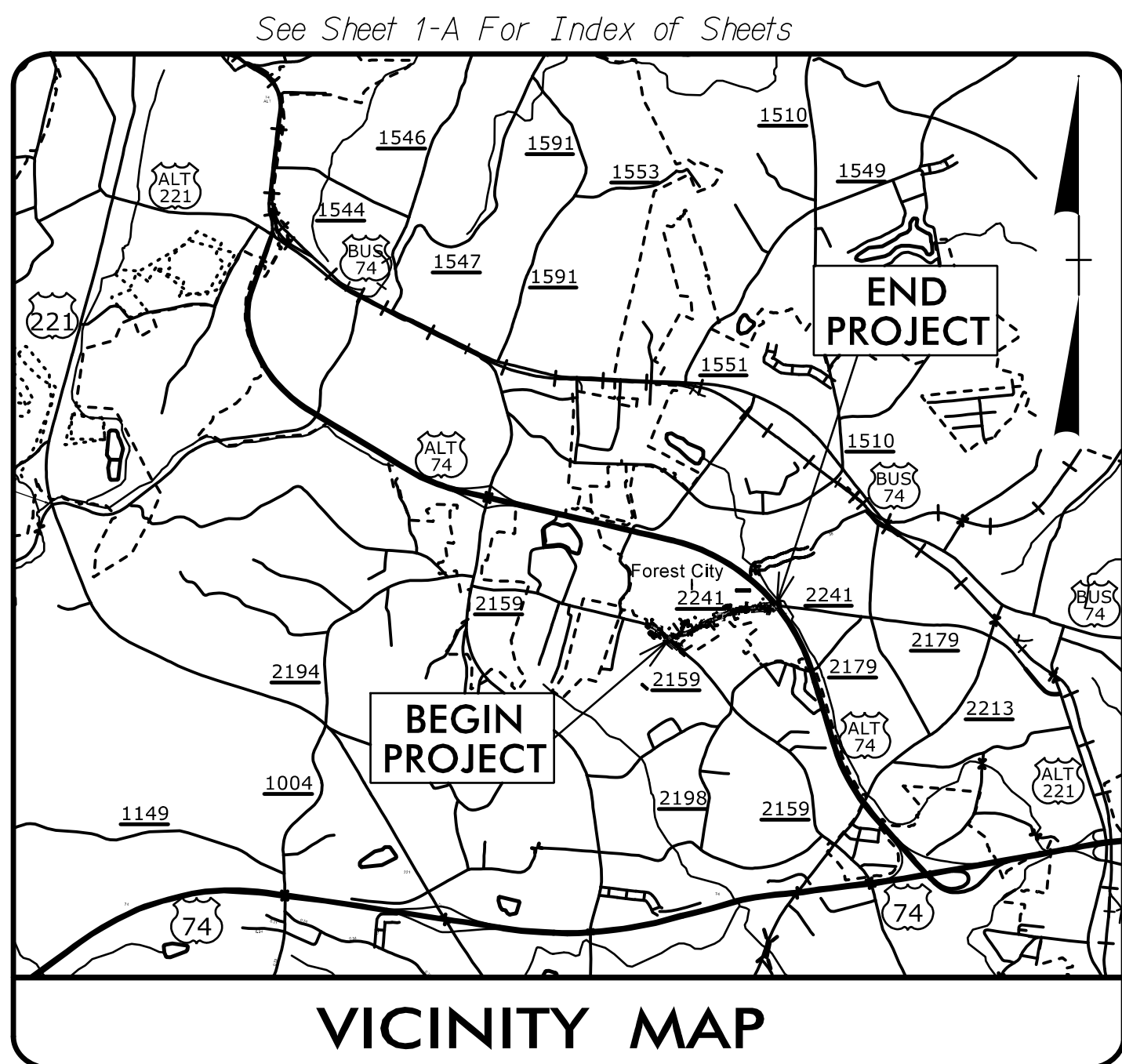
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**TIP PROJECT: U-5833**

**CONTRACT: C204228**



**-Y- STA. 10+25.00  
BEGIN  
CONSTRUCTION**

**-Y- STA. 22+00.00  
END  
CONSTRUCTION**

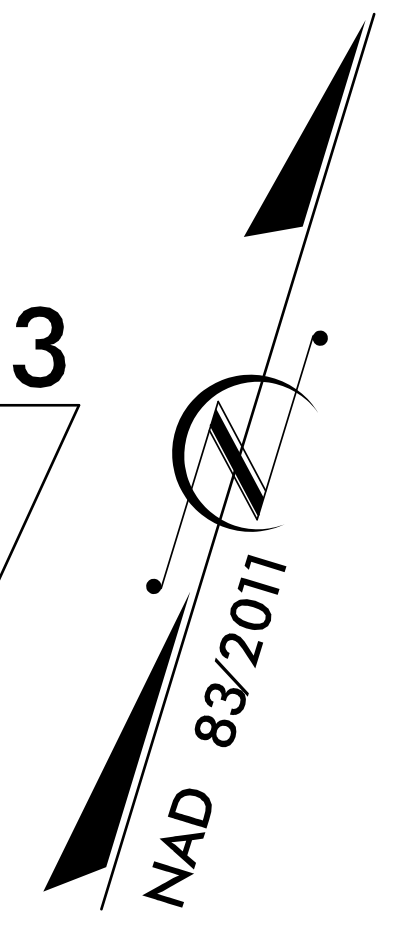
STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**RUTHERFORD COUNTY**

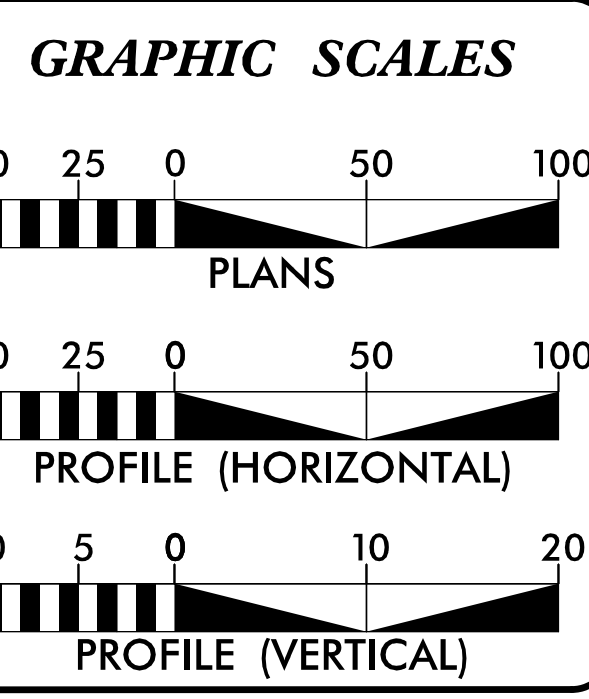
**LOCATION: WIDENING OF SR 2241 (OAK STREET EXTENSION) FROM  
SR 2159 (PINEY RIDGE ROAD) TO US 74 ALT**

**TYPE OF WORK: GRADING, DRAINAGE, PAVEMENT, CURB & GUTTER,  
SIGNALS, AND RETAINING WALL**

| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
|-----------------|-----------------------------|-------------|--------------|
| N.C.            | U-5833                      | 1           |              |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION |              |
| 50225.1.1       | N/A                         | P.E.        |              |
| 50225.2.1       | N/A                         | RW & UTIL.  |              |
| 50225.3.1       | N/A                         | CONST.      |              |



DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

|                     |        |
|---------------------|--------|
| ADT 2020 =          | 12400  |
| ADT 2040 =          | 16700  |
| K =                 | 9 %    |
| D =                 | 55 %   |
| T =                 | 3 % *  |
| V =                 | 40 MPH |
| * TTST = 1% DUAL 2% |        |
| FUNC CLASS =        |        |
| URBAN COLLECTOR     |        |
| REGIONAL TIER       |        |

**PROJECT LENGTH**

|                                   |   |             |
|-----------------------------------|---|-------------|
| LENGTH ROADWAY TIP PROJECT U-5833 | = | 0.646 MILES |
| TOTAL LENGTH TIP PROJECT U-5833   | = | 0.646 MILES |

**NCDOT CONTACT: LONNIE R. WATSON, PE**

|  |  |
|--|--|
| <p><b>PLANS PREPARED BY:</b></p> <p>TGS ENGINEERS<br/>804-C N. LAFAYETTE ST<br/>SHELBY, NC 28150<br/>PH (704) 476-0003<br/>CORP. LICENSE NO.: C-0275</p> | <p><b>PLANS PREPARED FOR:</b></p> <p>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION</p> <p>DIVISION 13<br/>55 Orange Street<br/>Asheville, NC 28601</p> |
| <p><b>RIGHT OF WAY DATE:</b></p> <p>JUNE 15, 2017</p>  | <p><b>JIMMY L. TERRY, PE</b><br/>PROJECT ENGINEER</p>  |
| <p><b>LETTING DATE:</b></p> <p>DECEMBER 18, 2018</p>   | <p><b>SANDRA G. MELVIN</b><br/>PROJECT DESIGN ENGINEER</p>   |

2018 STANDARD SPECIFICATIONS

**HYDRAULICS ENGINEER**

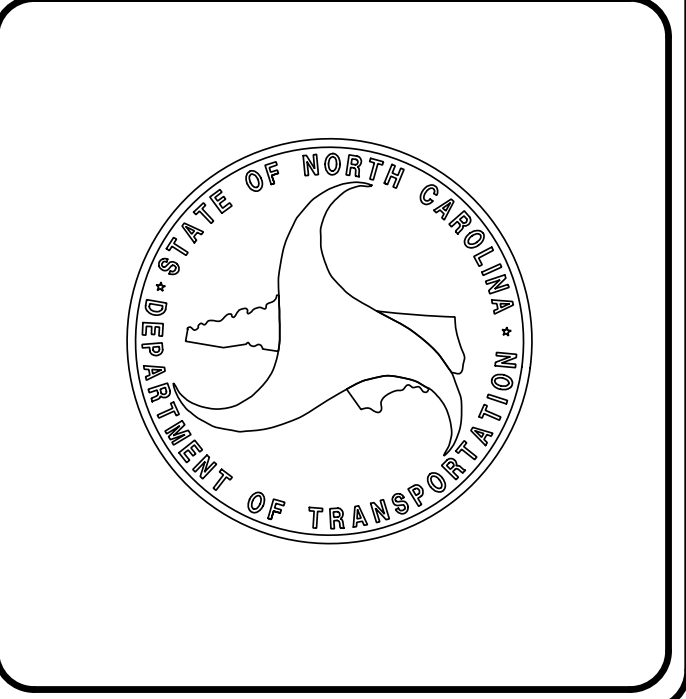
10/1/2018 9:03:17

DocuSigned by:  
**David B. Petty**  
P.E.

**ROADWAY DESIGN ENGINEER**

10/1/2018 8:59:38

DocuSigned by:  
**Jimmy L. Terry**  
P.E.



|  |                        |
|--|------------------------|
| PROJECT REFERENCE NO.<br><i>U-5833</i> | SHEET NO.<br><i>1A</i> |
| ROADWAY DESIGN ENGINEER                |                        |
|  |                        |

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

# INDEX OF SHEETS

| INDEX OF SHEETS      |  |
|----------------------|--|
| SHEET NUMBER         | SHEET  |
| 1                    | TITLE SHEET  |
| 1A                   | INDEX OF SHEETS, GENERAL NOTES, AND STANDARD DRAWINGS              |
| 1B                   | CONVENTIONAL SYMBOLS   |
| 1C-1 THRU 1C-4       | SURVEY CONTROL SHEETS  |
| 1D-1                 | CENTERLINE COORDINATE LIST   |
| 1E-1                 | RIGHT OF WAY & PERMANENT EASEMENT CONTROL SHEET                    |
| RW-1 THRU RW-7       | RIGHT OF WAY SHEETS (RW-2 THRU RW-3 ARE OMITTED)                   |
| 2A-1                 | PAVEMENT SCHEDULE AND TYPICAL SECTIONS                             |
| 2B-1                 | ROADWAY DETAIL- LENGHTEN EXISTING U2 74A NB LEFT-TURN LN           |
| 2B-2                 | ROADWAY DETAIL- ISLANDS AND CURB LAYOUT                            |
| 2B-3                 | ROADWAT DETAIL - ONSITE DETOURS                                    |
| 2C-1                 | SPECIAL DETAIL - PRECAST MANHOLE 7', 8' AND 9' DIAMETER            |
| 2C-2                 | SPECIAL DETAIL - MIN. DEPTH CONCRETE CATCH BASIN                   |
| 2C-3                 | CURB RAMP DETAIL - DIRECTIONAL RAMPS                               |
| 2C-4                 | CURB RAMP DETAIL - ISLAND RAMPS                                    |
| 2C-5                 | GUARDRAIL INSTALLATION - W BEAM RAIL SECTION                       |
| 2C-6                 | SPECIAL DETAIL - CONCERT EXIST. DI, CB, OTCB OR GI TO JUNCTION BOX |
| 2C-7                 | SPECIAL DETAIL - TEMPORARY 1" STEEL COVER OVER DRAINAGE DTRUCTURE  |
| 2G-1                 | GEOTECHNICAL DETAIL - RETAINING WALL ENVELOPE                      |
| 2G-2                 | GEOTECHNICAL DETAIL - PRECAST GRAVITY WALL WITHOUTR BACK SLOPE     |
| 2G-3                 | GEOTECHNICAL DETAIL - TEMPORARY SHORING                            |
| 3B-1                 | ROADWAY SUMMARIES  |
| 3D-1 THRU 3D-5       | DRAINAGE SUMMARIES   |
| 3G-1                 | GEOTECHNICAL SUMMARIES   |
| 3P-1                 | PARCEL INDEX SHEET   |
| 4 THRU 7             | PLAN AND PROFILE SHEET   |
| TMP-1 THRU TMP- 7    | TRAFFIC MANAGEMENT PLANS   |
| PMP-1 THRU PMP-4     | PAVEMENT MARKING PLANS   |
| EC-1 THRU EC-11      | EROSION CONTROL PLANS  |
| SIGN-1 THRU SIGN-5   | SIGNING PLANS  |
| SIG-1.0 THRU SIG-3.1 | SIGNAL PLANS   |
| UC-1 THRU UC-10      | UTILITIES CONSTRUCTION PLANS                                       |
| UO-1 THRU UO-5       | UTILITIES BY OTHERS  |
| X-1A                 | CROSS-SECTION SUMMARY SHEET  |
| X-1 THRU X-20        | CROSS-SECTIONS   |

# GENERAL NOTES

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

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

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

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

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

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

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

DRIVEWAYS:  
DRIVEWAYS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. 848.02 USING 3 FOOT RADII OR RADII AS SHOWN ON THE PLANS. LOCATIONS OF DRIVES WILL BE AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

STREET TURNOUT:  
STREET RETURNS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 848.04 USING THE RADII NOTED ON PLANS.

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".

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

UTILITIES:  
UTILITY OWNERS ON THIS PROJECT ARE PSNC, AT&T, DUKE ENERGY, NORTHLAND COMMUNICATIONS, AND TOWN OF FOREST CITY  
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 CONTRACT.

CURB RAMPS  
CURB RAMPS ARE SHOWN ON THE PLANS AT APPROXIMATE LOCATIONS. CONSTRUCT ALL CURB RAMPS ACCORDANCE WITH STD 848.05 and/or 848.06.

# STANDARD DRAWINGS

EFF. 01-16-2018  
REV.

2018 ROADWAY ENGLISH STANDARD DRAWINGS

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

| STD.NO.                                    | TITLE   |
|--|---|
| DIVISION 2 - EARTHWORK                     |   |
| 200.02                                     | Method of Clearing - Method II  |
| 225.02                                     | Guide for Grading Subgrade - Secondary and Local                              |
| 225.04                                     | Method of Obtaining Superelevation - Two Lane Pavement                        |
| 225.06                                     | Method of Grading Sight Distance at Intersections                             |
| DIVISION 3 - PIPE CULVERTS                 |   |
| 300.01                                     | Method of Pipe Installation   |
| 310.10                                     | Driveway Pipe Construction  |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS |   |
| 560.01                                     | Method of Shoulder Construction - High Side of Superelevated Curve - Method I |
| DIVISION 6 - ASPHALT BASES AND PAVEMENTS   |   |
| 654.01                                     | Pavement Repairs  |
| DIVISION 8 - INCIDENTALS                   |   |
| 806.01                                     | Concrete Right-of-Way Marker  |
| 806.02                                     | Granite Right-of-Way Marker   |
| 815.02                                     | Subsurface Drain  |
| 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                       |
| 840.22                                     | 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                          |
| 840.29                                     | Frames and Narrow Slot Flat Grates  |
| 840.31                                     | Concrete Junction Box - 12" thru 66" Pipe                                     |
| 840.32                                     | Brick Junction Box - 12" thru 66" Pipe  |
| 840.35                                     | Traffic Bearing Grated Drop Inlet - for Cast Iron Double Frame and Grates     |
| 840.45                                     | Precast Drainage Structure  |
| 840.46                                     | Traffic Bearing Precast Drainage Structure                                    |
| 840.66                                     | Drainage Structure Steps  |
| 840.71                                     | Concrete and Brick Pipe Plug  |
| 840.72                                     | Pipe Collar   |
| 846.01                                     | Concrete Curb, Gutter and Curb & Gutter                                       |
| 848.01                                     | Concrete Sidewalk   |
| 848.02                                     | Driveway Turnout - Radius Type  |
| 848.04                                     | Street Turnout  |
| 848.05                                     | Curb Ramp - Proposed Curb & Gutter  |
| 848.06                                     | Curb Ramp - Existing Curb & Gutter  |
| 850.01                                     | Concrete Paved Ditches  |
| 852.01                                     | Concrete Islands  |
| 852.06                                     | Method for Placement of Drop Inlets in Concrete Islands                       |
| 862.01                                     | Guardrail Placement   |
| 862.02                                     | Guardrail Installation (Special Detail for Sheet 6 of 8)                      |
| 866.01                                     | Chain Link Fence - 4', 5' and 6' High Fence                                   |
| 876.02                                     | Guide for Rip Rap at Pipe Outlets   |
| 876.04                                     | Drainage Ditches with Class 'B' Rip Rap                                       |

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

## BOUNDARIES AND PROPERTY:

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

## BUILDINGS AND OTHER CULTURE:

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

## HYDROLOGY:

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

## RAILROADS:

|                    |               |
|--------------------|---------------|
| Standard Gauge     | _____         |
| RR Signal Milepost | ○ MILEPOST 35 |
| Switch             | □ SWITCH      |
| RR Abandoned       | _____         |
| RR Dismantled      | _____         |

## RIGHT OF WAY & PROJECT CONTROL:

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

## ROADS AND RELATED FEATURES:

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

## VEGETATION:

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

Note: Not to Scale

\*S.U.E. = Subsurface Utility Engineering

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

## EXISTING STRUCTURES:

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

## UTILITIES:

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

## TELEPHONE:

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

## WATER:

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

## TV:

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

## GAS:

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

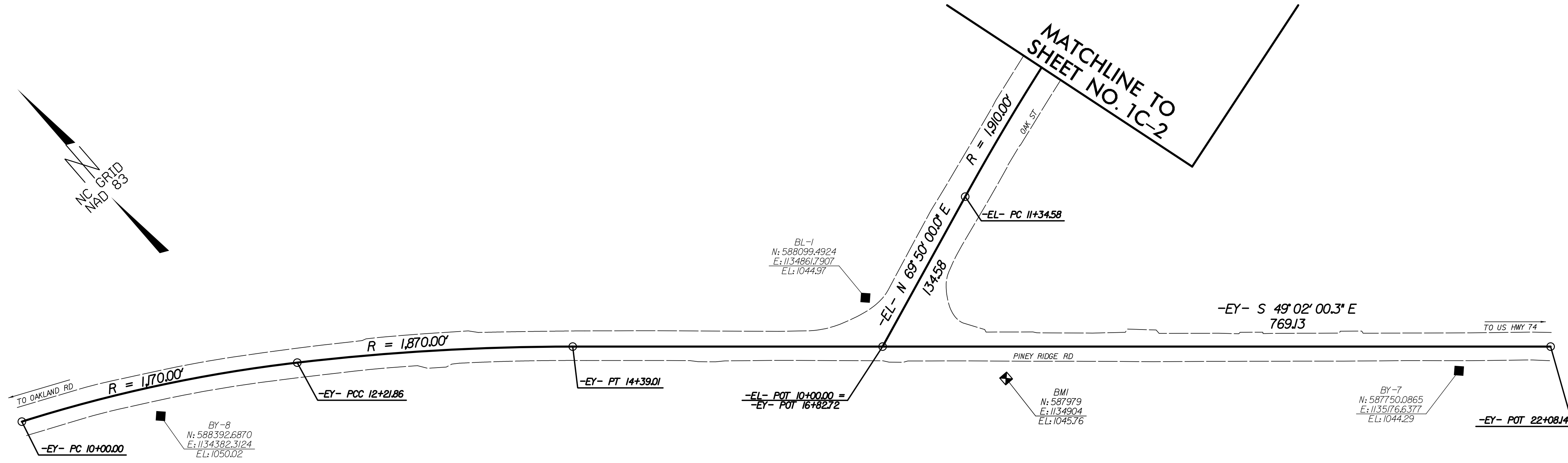
## SANITARY SEWER:

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

## MISCELLANEOUS:

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

# SURVEY CONTROL SHEET U-5833



## BASELINE

## EXISTING ALIGNMENTS

| BL POINT | DESC.      | NORTH       | EAST         | ELEVATION | L STATION | OFFSET   |
|----------|------------|-------------|--------------|-----------|-----------|----------|
| 1        | BL-1       | 588099.4924 | 1134861.7907 | 1044.97   | 10+33.36  | 33.76 LT |
| 2        | BL-2       | 588273.0156 | 1135462.6216 | 1030.60   | 16+50.79  | 4.99 LT  |
| 3        | BL-3       | 588739.9028 | 1136327.7721 | 1010.39   | 26+29.40  | 38.99 LT |
| 4        | BL-4       | 588967.2627 | 1137007.8684 | 994.97    | 33+42.71  | 18.11 LT |
| 5        | BL-5 RESET | 589020.3633 | 1137576.6808 | 977.95    | 39+12.45  | 26.98 LT |

| BY POINT | DESC. | NORTH       | EAST         | ELEVATION | Y STATION | OFFSET   |
|----------|-------|-------------|--------------|-----------|-----------|----------|
| 8        | BY-8  | 588392.6870 | 1134382.3124 | 1050.02   | 11+22.84  | 23.29 RT |
| E01      | BL-1  | 588099.4924 | 1134861.7907 | 1044.97   | 16+84.41  | 38.36 LT |
| 7        | BY-7  | 587750.0865 | 1135176.6377 | 1044.29   | 21+51.22  | 19.06 RT |

| BY1 POINT | DESC.       | NORTH       | EAST         | ELEVATION | L STATION | OFFSET    |
|-----------|-------------|-------------|--------------|-----------|-----------|-----------|
| E04       | BL-4        | 588967.2627 | 1137007.8684 | 994.97    | 33+42.71  | 18.11 LT  |
| 6         | BY1-6 RESET | 588701.5459 | 1137150.4184 | 994.30    | 34+64.87  | 261.14 RT |

.....  
 BM1 ELEVATION - 1045.76  
 N 587979 E 1134904  
 Y STATION 17+95.00 25 RIGHT  
 RR SPIKE IN BASE 10' OAK  
 .....

.....  
 BM2 ELEVATION - 1005.99  
 N 588563 E 1136344  
 L STATION 25+75.00 130 RIGHT  
 RR SPIKE IN BASE 12" TULIP POPLAR  
 .....

.....  
 BM3 ELEVATION - 981.12  
 N 588934 E 1137645  
 L STATION 39+74.00 63 RIGHT  
 CHISELED SQUARE IN CONC BASE LT POLE  
 .....

| TYPE | STATION  | EL          |              |
|------|----------|-------------|--------------|
|      |          | NORTH       | EAST         |
| POT  | 10+00.00 | 588061.6585 | 1134846.8605 |
| PC   | 11+34.58 | 588108.0557 | 1134973.1911 |
| PT   | 13+01.26 | 588158.6232 | 1135131.9588 |
| PC   | 14+74.34 | 588203.9061 | 1135299.0116 |
| PT   | 17+51.45 | 588307.9080 | 1135555.1374 |
| PC   | 21+26.37 | 588489.8614 | 1135882.9402 |
| PT   | 24+26.12 | 588621.3733 | 1136152.1498 |
| PC   | 30+66.34 | 588871.9238 | 1136741.3018 |
| PT   | 34+46.35 | 588960.4273 | 1137109.0746 |
| POT  | 44+02.78 | 589027.5251 | 1138063.1473 |

| TYPE | STATION  | EY          |              |
|------|----------|-------------|--------------|
|      |          | NORTH       | EAST         |
| PC   | 10+00.00 | 588460.9759 | 1134297.0037 |
| PCC  | 12+21.86 | 588353.9808 | 1134490.9770 |
| PT   | 14+39.01 | 588221.4431 | 1134662.8328 |
| POT  | 22+08.14 | 587717.1863 | 1135243.5975 |

| TYPE | STATION  | EY1         |              |
|------|----------|-------------|--------------|
|      |          | NORTH       | EAST         |
| POT  | 10+00.00 | 588941.0186 | 1136964.8747 |
| POT  | 13+10.81 | 588705.5455 | 1137167.7445 |

**DATUM DESCRIPTION**  
 THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "PANEL 6" (NCDOT PROJECT NO. 8-2890401; TIP NO. U-2711) WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 588350.0471(±) EASTING: 1141375.4174(±) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99983079 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "PANEL 6" TO -L- STATION 10+00.00 IS S 87°22'05.4" W 6522.63 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

**NOTES:**  
 ○ INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT SURVEYING AND SURVEYS UNIT.  
 PROJECT CONTROL ESTABLISHED USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM).

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:  
 U5833\_LS\_CONTROL.TXT

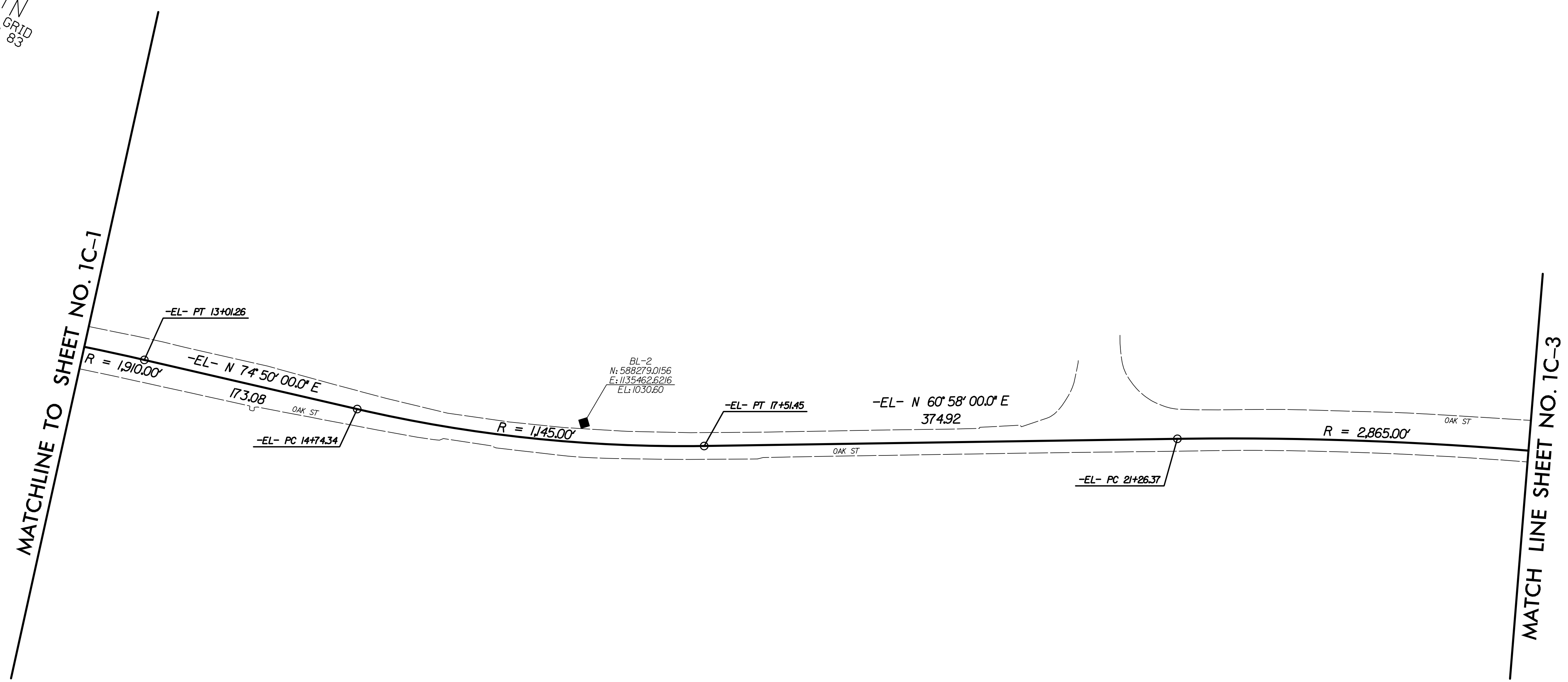
SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

NOTE: DRAWING NOT TO SCALE

6/2/2018

|                       |           |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| U-5833                | 1C-2      |
| Location and Surveys  |           |

# SURVEY CONTROL SHEET U-5833



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "PANEL 6"  
 (NCDOT PROJECT NO. 8.2890401; TIP NO. U-2711)  
 WITH NAD 83 STATE PLANE GRID COORDINATES OF  
 NORTHING: 588350.0471(±ft) EASTING: 1141375.4174(±ft)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99983079  
 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "PANEL 6" TO -L- STATION 10+00.00 IS  
 S 87°22'05.4" W 6522.63  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

**NOTES:**

- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.  
PROJECT CONTROL ESTABLISHED USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM).
- 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:  
U5833\_LS\_CONTROL.TXT
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

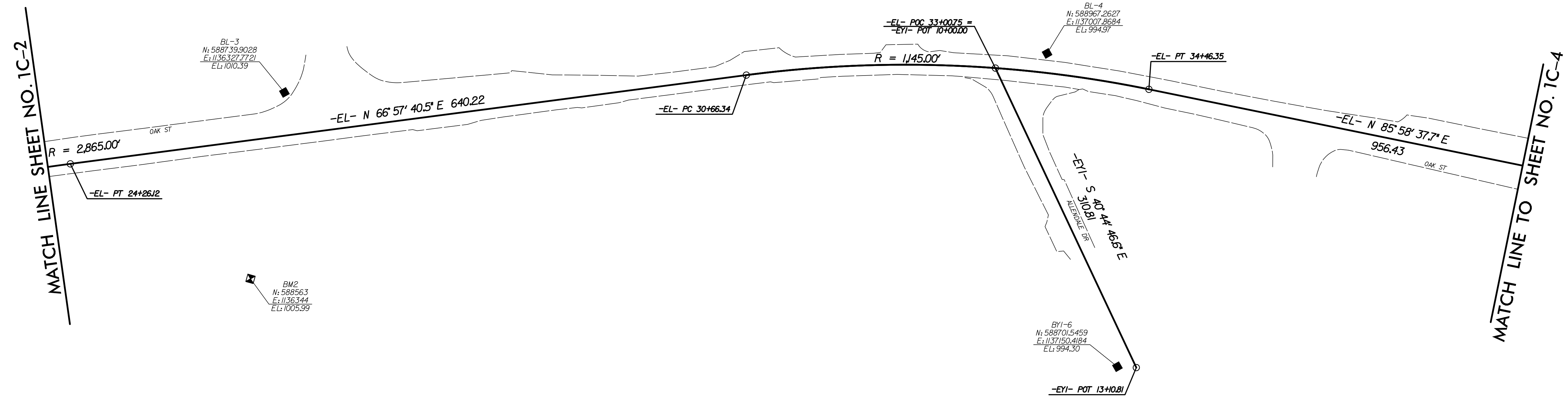
NOTE: DRAWING NOT TO SCALE

6/2/2018 8:41:00 AM U-5833-Roadway-Proj\U5833\_1S\_1c-2.dgn User: jsm1

6/2/2019

|                       |           |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| U-5833                | 1C-3      |
| Location and Surveys  |           |

# SURVEY CONTROL SHEET U-5833



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "PANEL 6" (NCDOT PROJECT NO. 8.2890401; TIP NO. U-2711) WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 588350.0471(±ft) EASTING: 1141375.4174(±ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99983079 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "PANEL 6" TO -L- STATION 10+00.00 IS S 87°22'05.4" W 6522.63 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

**NOTES:**

- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT. PROJECT CONTROL ESTABLISHED USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM).
- 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:  
U5833\_LS\_CONTROL.TXT
- SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.

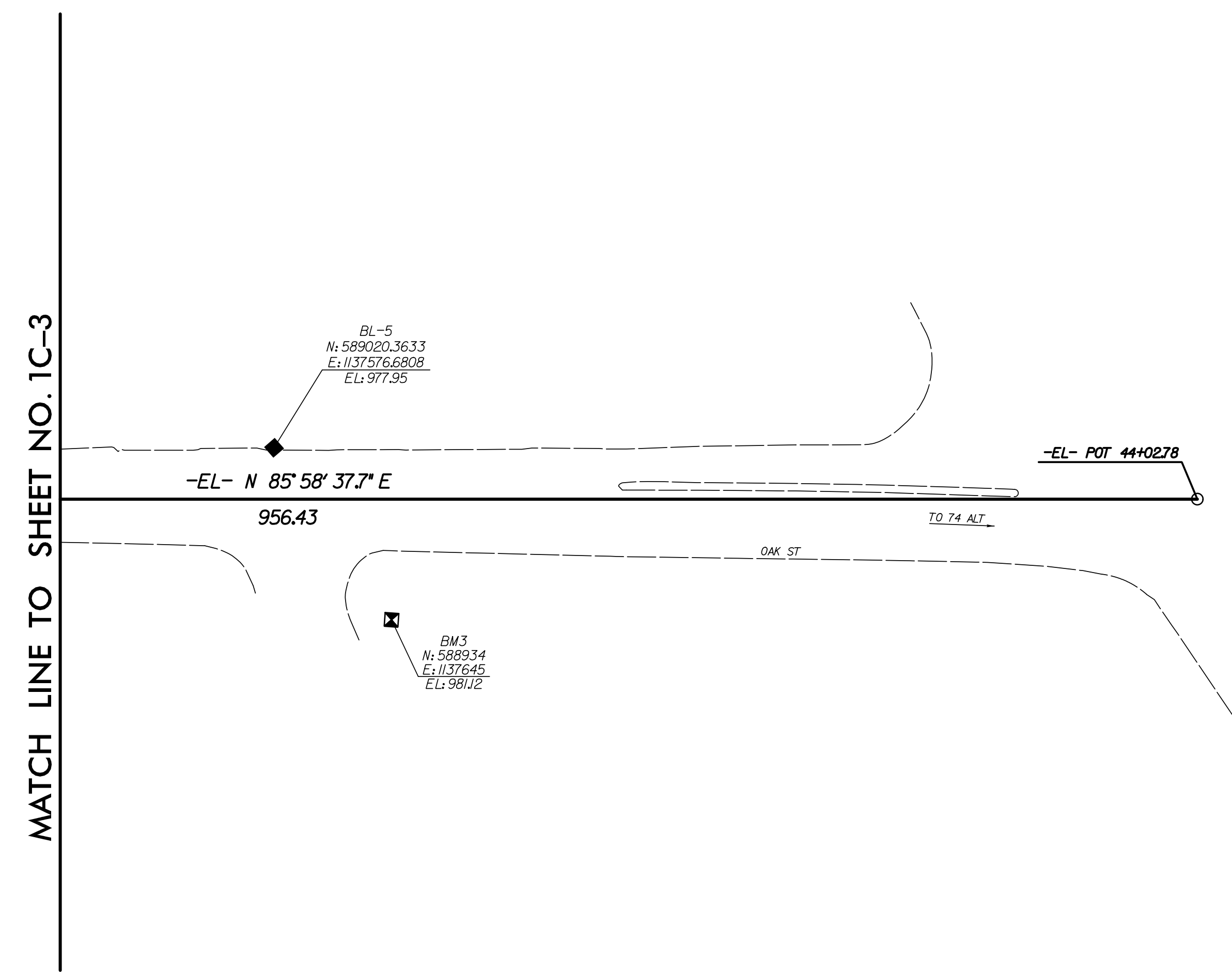
NOTE: DRAWING NOT TO SCALE

6/2/2019 8:47:00 AM U-5833-Roadway-Proj\U5833\_LS\_1c-3.dgn User:smel

6/2/09

|                       |           |
|-----------------------|-----------|
| PROJECT REFERENCE NO. | SHEET NO. |
| U-5833                | 1C-4      |
| Location and Surveys  |           |

# SURVEY CONTROL SHEET U-5833



**DATUM DESCRIPTION**

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "PANEL 6" (NCDOT PROJECT NO. 8.2890401; TIP NO. U-2711) WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 588350.0471(ft) EASTING: 1141375.4174(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99983079 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "PANEL 6" TO -L- STATION 10+00.00 IS S 87°22'05.4" W 6522.63 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES VERTICAL DATUM USED IS NAVD 88

**NOTES:**

- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT. PROJECT CONTROL ESTABLISHED USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM).
- 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:  
U5833\_LS\_CONTROL.TXT
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NOTE: DRAWING NOT TO SCALE

6/2/09 U-5833-Roadway-Proj\U5833.LS.1c-4.dgn



# PROPOSED ALIGNMENT SHEET U-5833

| TYPE | STATION  | L           |              |
|------|----------|-------------|--------------|
|      |          | NORTH       | EAST         |
| PC   | 10+00.00 | 588050.5397 | 1134859.6663 |
| PT   | 11+40.54 | 588123.6329 | 1134977.5352 |
| PC   | 14+43.74 | 588205.6794 | 1135269.4291 |
| PT   | 17+91.90 | 588335.4712 | 1135591.7509 |
| PC   | 21+57.69 | 588508.1394 | 1135914.2173 |
| PT   | 24+19.98 | 588621.6959 | 1136150.5653 |
| PC   | 30+45.93 | 588867.8576 | 1136726.0731 |
| PT   | 34+41.68 | 588960.4192 | 1137108.9593 |
| POT  | 43+98.22 | 589027.5251 | 1138063.1473 |

| TYPE | STATION  | Y           |              |
|------|----------|-------------|--------------|
|      |          | NORTH       | EAST         |
| PC   | 10+00.00 | 588467.0058 | 1134283.1019 |
| PT   | 14+18.87 | 588244.6210 | 1134636.1382 |
| POT  | 22+23.35 | 587717.1863 | 1135243.5975 |

## DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "PANEL 6"  
 (NCDOT PROJECT NO. 8.2890401; TIP NO. U-2711)  
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 NORTHING: 588350.0471(ft) EASTING: 1141375.4174(ft)  
 THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT  
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 THE N.C. LAMBERT GRID BEARING AND  
 LOCALIZED HORIZONTAL GROUND DISTANCE FROM  
 "PANEL 6" TO -L- STATION 10+00.00 IS  
 S 87°22'05.4" W 6522.63  
 ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES  
 VERTICAL DATUM USED IS NAVD 88

## NOTES:

- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL AND VERTICAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.  
 PROJECT CONTROL ESTABLISHED USING GNSS (GLOBAL NAVIGATION SATELLITE SYSTEM).

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:  
 U5833\_LS\_CONTROL.TXT

SITE CALIBRATION INFORMATION HAS NOT BEEN PROVIDED FOR THIS PROJECT. IF FURTHER INFORMATION IS NEEDED, PLEASE CONTACT THE LOCATION AND SURVEYS UNIT.



09/22/17

**TIP PROJECT: U-5833**

**CONTRACT:**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

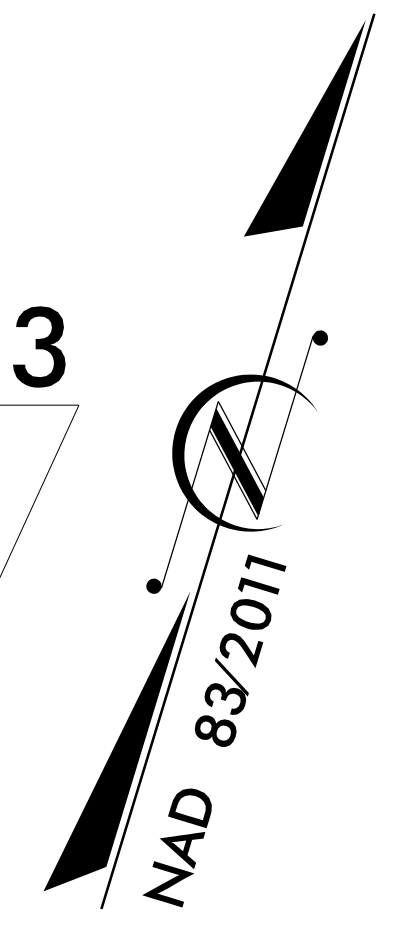
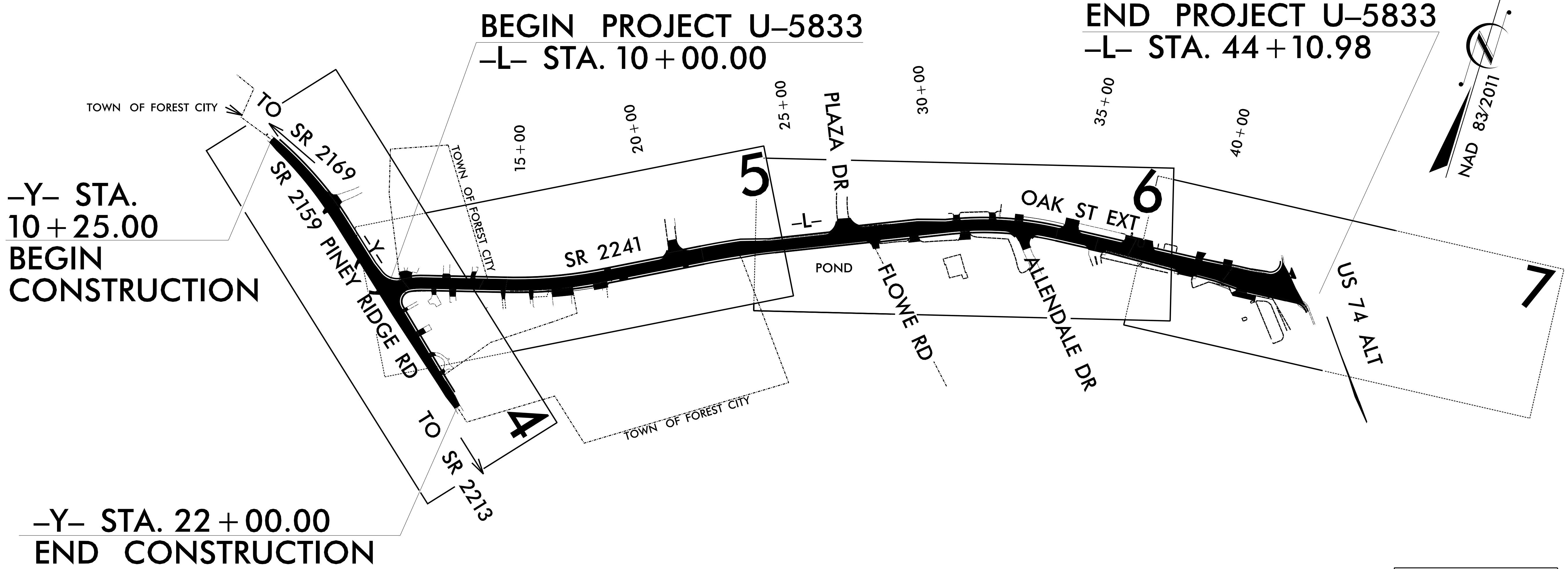
RIGHT OF WAY, EASEMENTS,  
AND PROPERTY TIES

**RUTHERFORD COUNTY**

**LOCATION: WIDENING OF SR 2241 (OAK STREET EXTENSION) FROM  
SR 2159 (PINEY RIDGE ROAD) TO US 74 ALT**

**TYPE OF WORK: GRADING, DRAINAGE, PAVEMENT, CURB & GUTTER,  
AND SIGNALS**

|                 |                             |             |              |
|-----------------|-----------------------------|-------------|--------------|
| STATE           | STATE PROJECT REFERENCE NO. | SHEET NO.   | TOTAL SHEETS |
| N.C.            | <b>U-5833</b>               | RW-1        |              |
| STATE PROJ. NO. | F.A. PROJ. NO.              | DESCRIPTION |              |
| 50225.1.1       | N/A                         | P.E.        |              |
| 50225.2.1       | N/A                         | RW & UTIL.  |              |
|                 |                             |             |              |
|                 |                             |             |              |
|                 |                             |             |              |

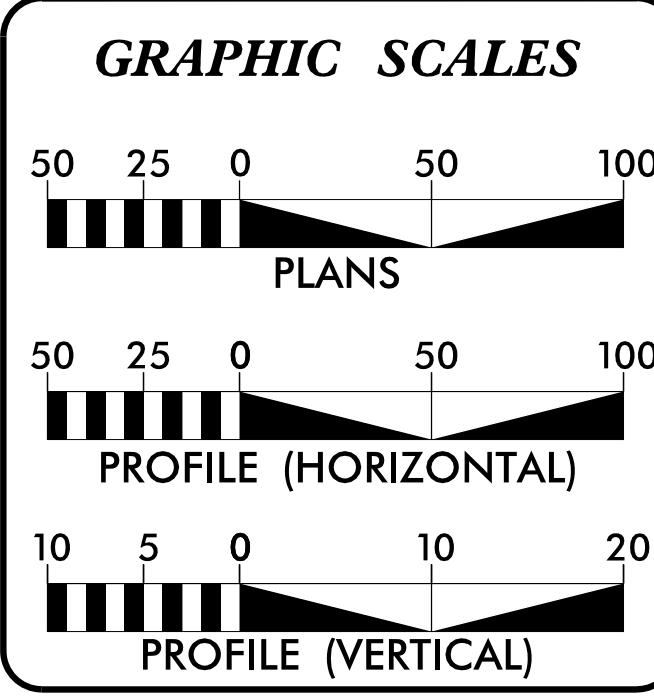


**-Y- STA. 10+25.00  
BEGIN  
CONSTRUCTION**

**-Y- STA. 22+00.00  
END  
CONSTRUCTION**

CLEARING ON THIS PROJECT SHALL BE PERFORMED TO THE LIMITS ESTABLISHED BY METHOD II.  
A PORTION OF THIS PROJECT IS WITHIN THE MUNICIPAL BOUNDARIES OF THE TOWN OF FOREST CITY.

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



**DESIGN DATA**

|                     |                               |
|---------------------|-------------------------------|
| ADT 2020 =          | 12400                         |
| ADT 2040 =          | 16700                         |
| K =                 | 9 %                           |
| D =                 | 55 %                          |
| T =                 | 3 % *                         |
| V =                 | 40 MPH                        |
| * TTST = 1% DUAL 2% |                               |
| FUNC CLASS =        | URBAN COLLECTOR REGIONAL TIER |

**PROJECT LENGTH**

|                                   |   |             |
|-----------------------------------|---|-------------|
| LENGTH ROADWAY TIP PROJECT U-5833 | = | 0.646 MILES |
| TOTAL LENGTH TIP PROJECT U-5833   | = | 0.646 MILES |

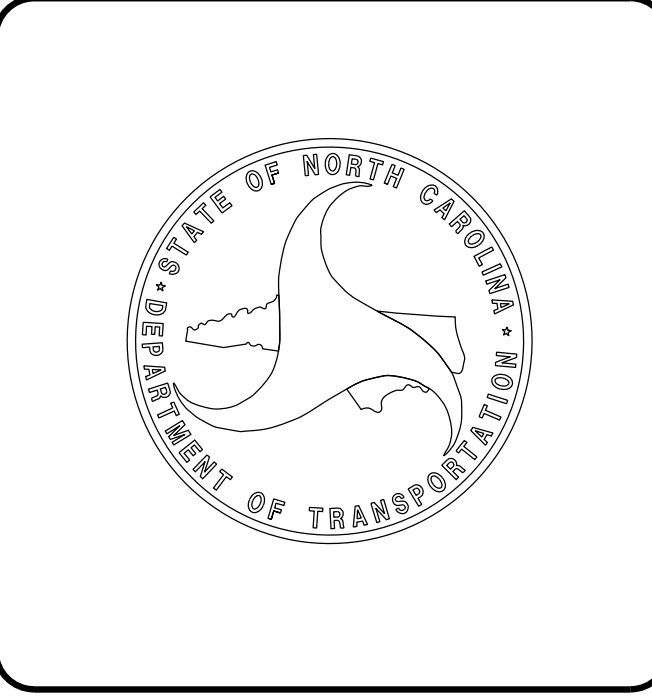
**NCDOT CONTACT: COLE HOOD, PE**

|   |   |
|---|---|
| <b>PLANS PREPARED BY:</b><br>TGS ENGINEERS<br>804-C N. LAFAYETTE ST<br>SHELBY, NC 28150<br>PH (704) 476-0003<br>CORP. LICENSE NO.: C-0275 | <b>PLANS PREPARED FOR:</b><br>NORTH CAROLINA DEPARTMENT OF TRANSPORTATION<br>DIVISION 13<br>55 Orange Street<br>Asheville, NC 28801 |
| <b>RIGHT OF WAY DATE:</b><br>JUNE 15, 2017  | <b>JIMMY L. TERRY, PE</b><br>PROJECT ENGINEER   |
| <b>LETTING DATE:</b>  | <b>SANDRA G. MELVIN</b><br>PROJECT DESIGN ENGINEER  |
| 2012 STANDARD SPECIFICATIONS  |   |

**PROFESSIONAL LAND SURVEYOR**

Matthew T. Cornwell  
Digitally signed by Matthew T. Cornwell  
DN: cn=Matthew T. Cornwell, o=TGS Engineers, ou=Location & Surveys, email=mcornwell@tgsengineers.com, c=US  
Date: 2017.09.22 13:11:34 -0400

SIGNATURE:





\$\$\$\$\$\$ SYSTEM \$\$\$\$\$\$ DGN \$\$\$\$\$\$ USERNAME \$\$\$\$\$\$

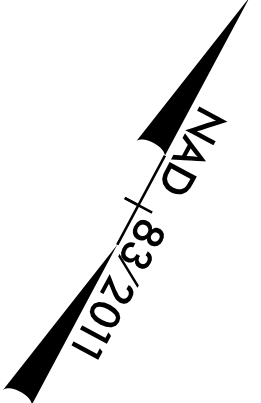


9/22/17

-L- CURVE DATA

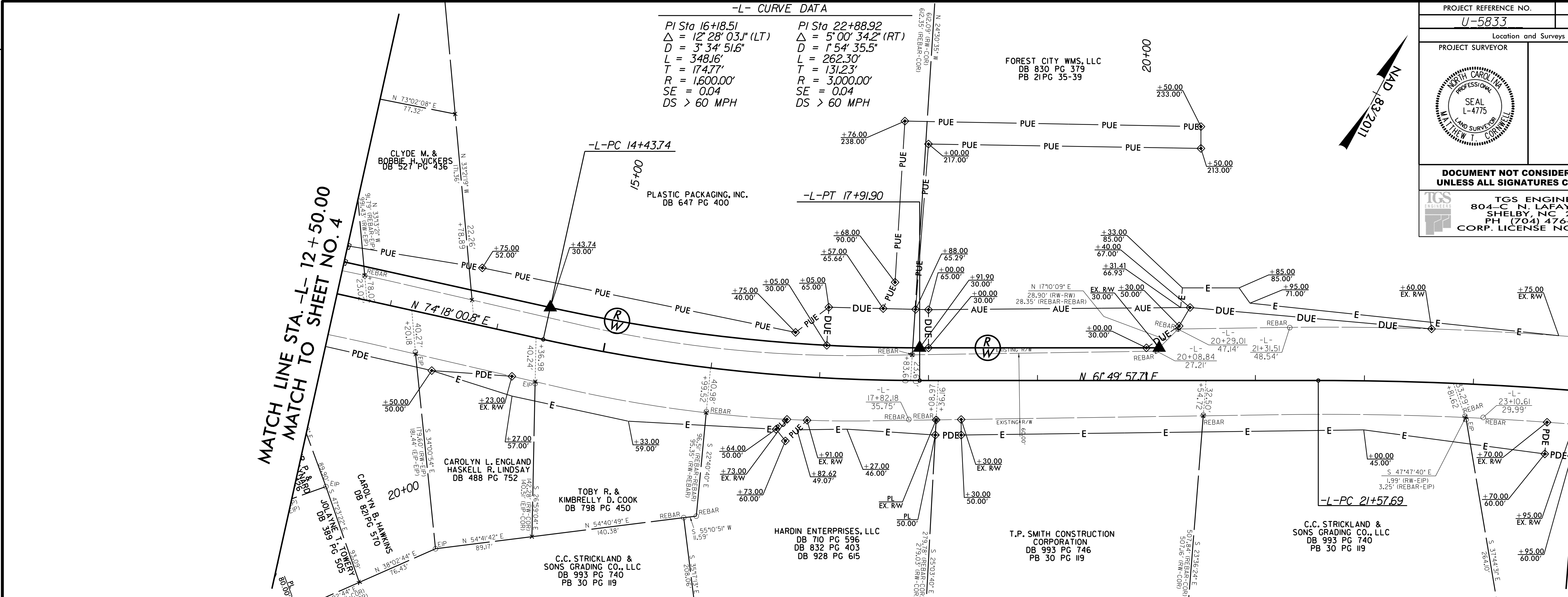
|                                       |                                      |
|---------------------------------------|--------------------------------------|
| PI Sta 16+18.51                       | PI Sta 22+88.92                      |
| $\Delta = 12^{\circ} 28' 03.1''$ (LT) | $\Delta = 5^{\circ} 00' 34.2''$ (RT) |
| D = 3' 34' 51.6"                      | D = 1' 54' 35.5"                     |
| L = 348J6'                            | L = 262.30'                          |
| T = 174.77'                           | T = 131.23'                          |
| R = 1,600.00'                         | R = 3,000.00'                        |
| SE = 0.04                             | SE = 0.04                            |
| DS > 60 MPH                           | DS > 60 MPH                          |

|   |                          |
|---|--------------------------|
| PROJECT REFERENCE NO.<br><b>U-5833</b>  | SHEET NO.<br><b>RW-5</b> |
| Location and Surveys  |                          |
| PROJECT SURVEYOR  |                          |
|    |                          |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED  |                          |
|  <b>TGS ENGINEERS</b><br>804-C N. LAFAYETTE ST<br>SHELBY, NC 28150<br>PH (704) 476-0003<br>CORP. LICENSE NO.: C-0275 |                          |



MATCH LINE STA. -L- 12+50.00  
MATCH TO SHEET NO. 4

MATCH LINE STA. -L- 24+00.00  
MATCH TO SHEET NO. 6



REVISIONS

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

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

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

Witness my original signature, registration number and seal this day 9/22/2017

**Matthew T. Cornwell**

Digitally signed by Matthew T. Cornwell  
 DN: cn=Matthew T. Cornwell, o=TGS  
 Engineers, ou=Location & Surveys,  
 email=mcornwell@tgsengineers.com, c=US  
 Date: 2017.09.22 13:17:29 -0400

Professional Land Surveyor



L-4775  
PLS #

NOTES:

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

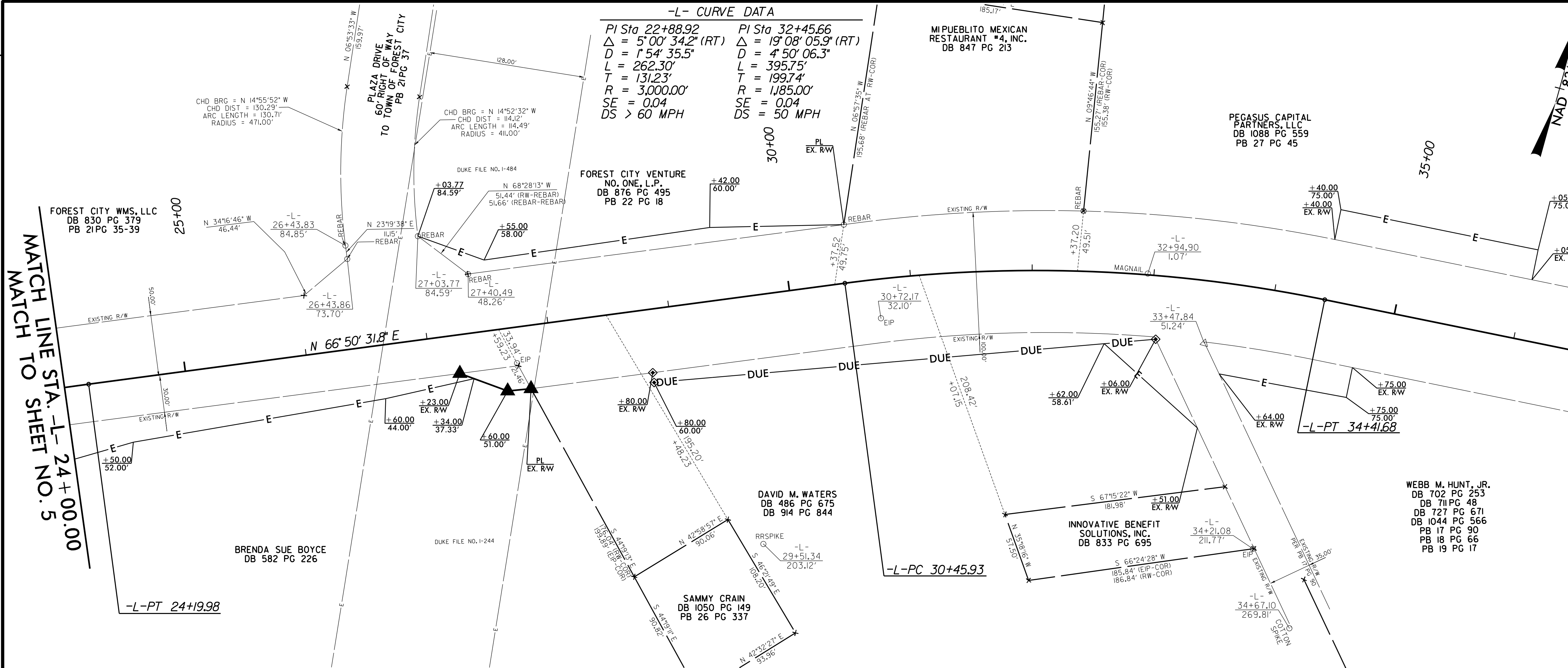
9/22/17

9/22/2017

|   |                          |
|---|--------------------------|
| PROJECT REFERENCE NO.<br><b>U-5833</b>  | SHEET NO.<br><b>RW-6</b> |
| Location and Surveys  |                          |
| PROJECT SURVEYOR  |                          |
|    |                          |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED  |                          |
|  <b>TGS ENGINEERS</b><br>804-C N. LAFAYETTE ST<br>SHELBY, NC 28150<br>PH (704) 476-0003<br>CORP. LICENSE NO.: C-0275 |                          |

**-L- CURVE DATA**

|                                    |                                     |
|------------------------------------|-------------------------------------|
| PI Sta 22+88.92                    | PI Sta 32+45.66                     |
| $\Delta = 5^{\circ}00'34.2''$ (RT) | $\Delta = 19^{\circ}08'05.9''$ (RT) |
| D = 154' 35.5"                     | D = 450' 06.3"                      |
| L = 262.30'                        | L = 395.75'                         |
| T = 131.23'                        | T = 199.74'                         |
| R = 3,000.00'                      | R = 1,185.00'                       |
| SE = 0.04                          | SE = 0.04                           |
| DS > 60 MPH                        | DS = 50 MPH                         |



MATCH LINE STA. -L- 24+00.00  
MATCH TO SHEET NO. 5

MATCH LINE STA. -L- 38+00.00  
MATCH TO SHEET NO. 7

REVISIONS

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

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

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

Witness my original signature, registration number and seal this day 9/22/2017

**Matthew T. Cornwell**  
Professional Land Surveyor

Digitally signed by Matthew T. Cornwell  
DN: cn=Matthew T. Cornwell, o=TGS  
Engineers, ou=Location & Surveys,  
email=mcornwell@tgsengineers.com, c=US  
Date: 2017.09.22 13:18:28 -0400

L-4775  
PLS #

**NOTES:**

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

SYSTEM GENERATED FROM THE SURVEY CONTROL PROVIDED BY OTHERS. THIS PLAN IS NOT TO BE USED FOR CONSTRUCTION WITHOUT THE SURVEY CONTROL PROVIDED BY OTHERS.

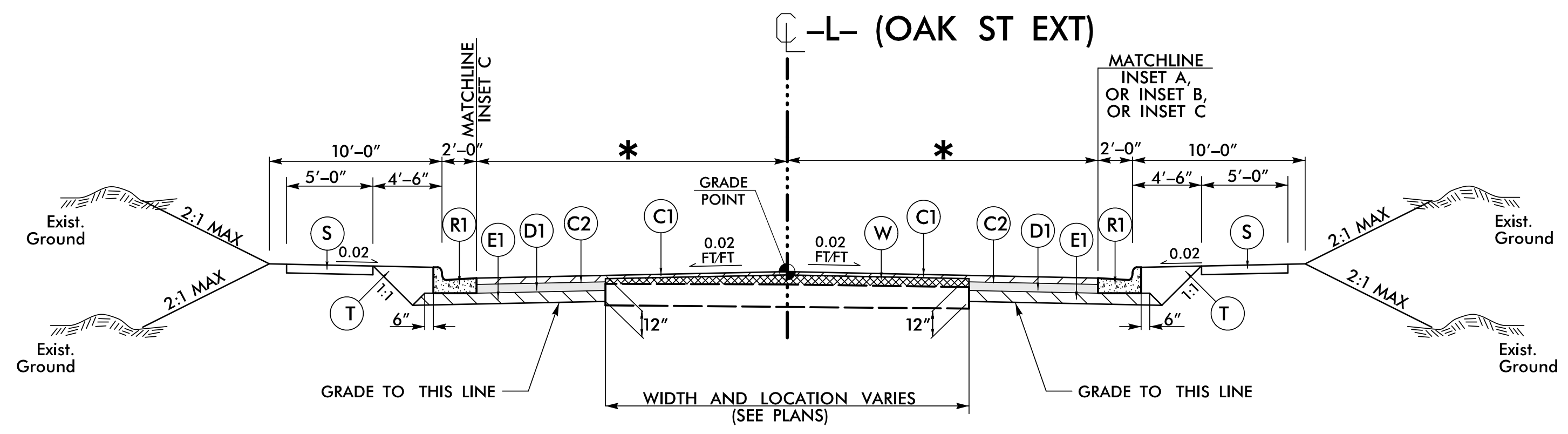
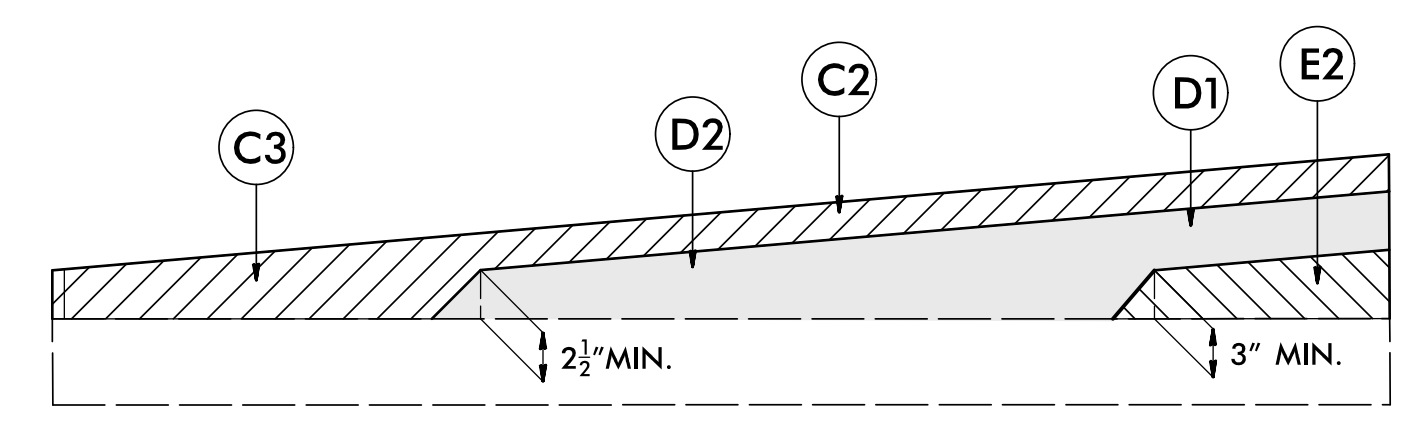
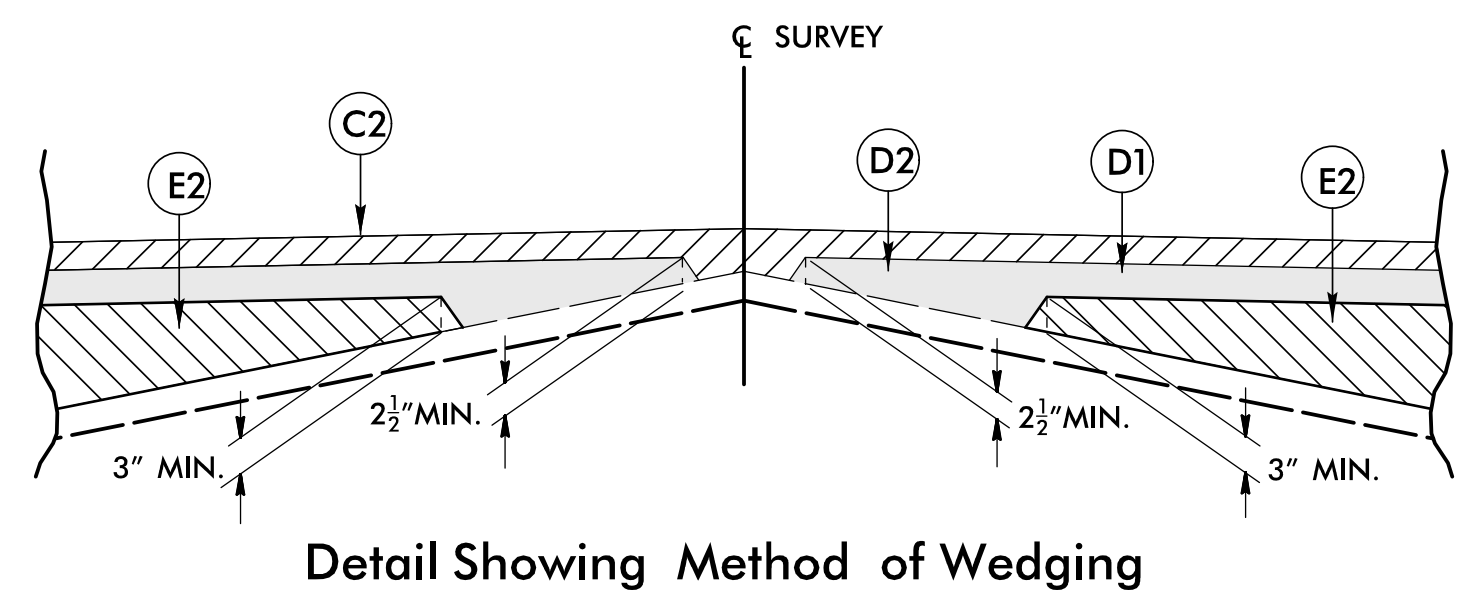
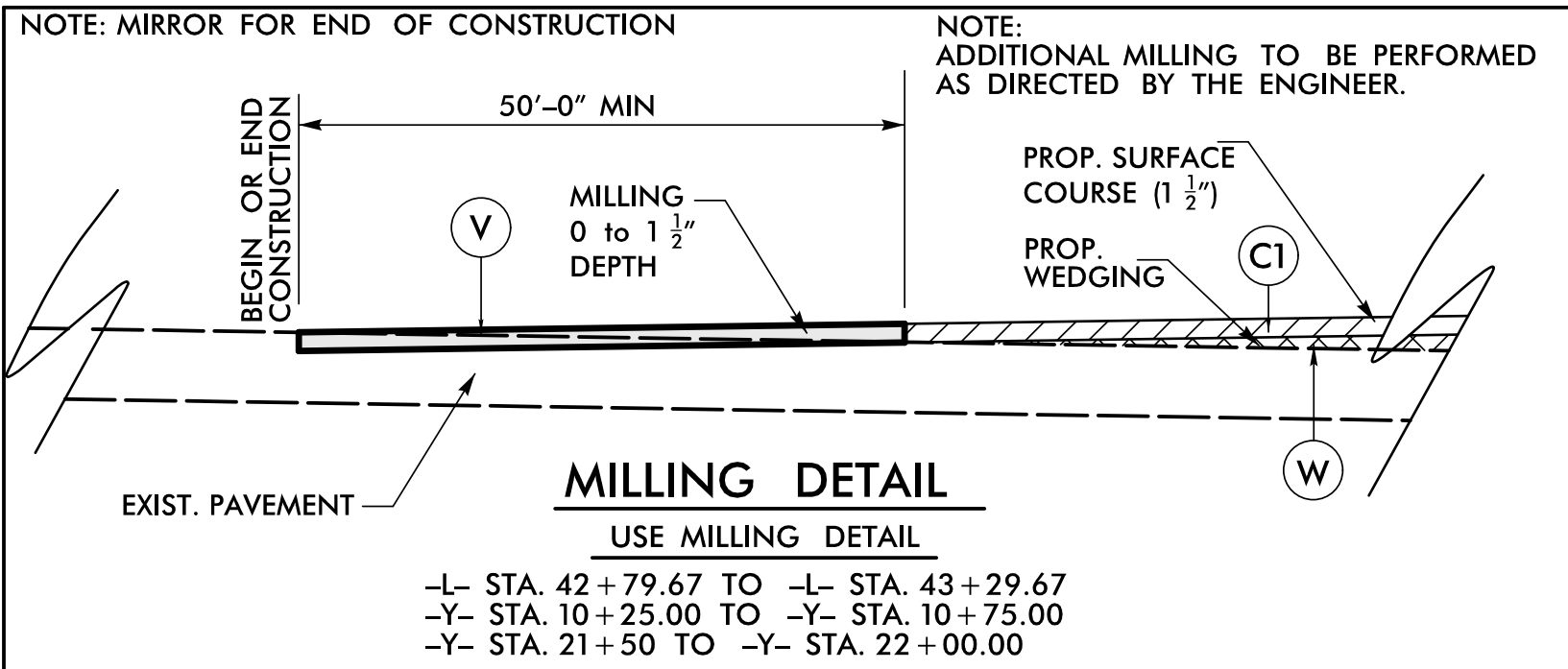


6/2/99

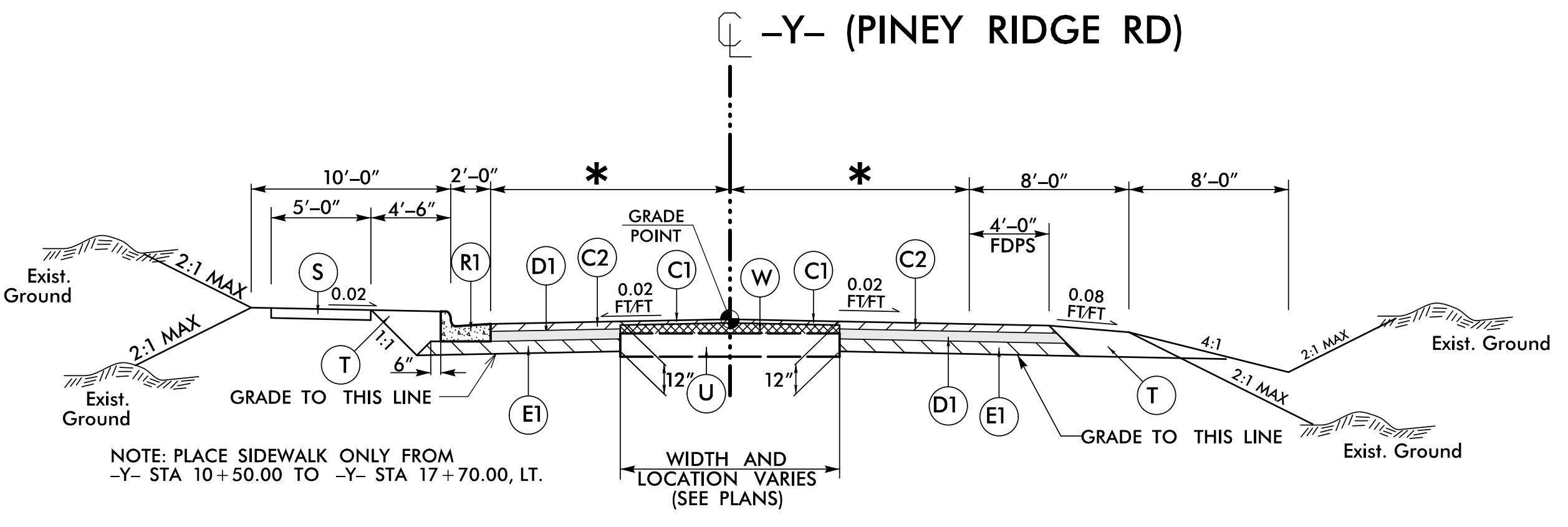
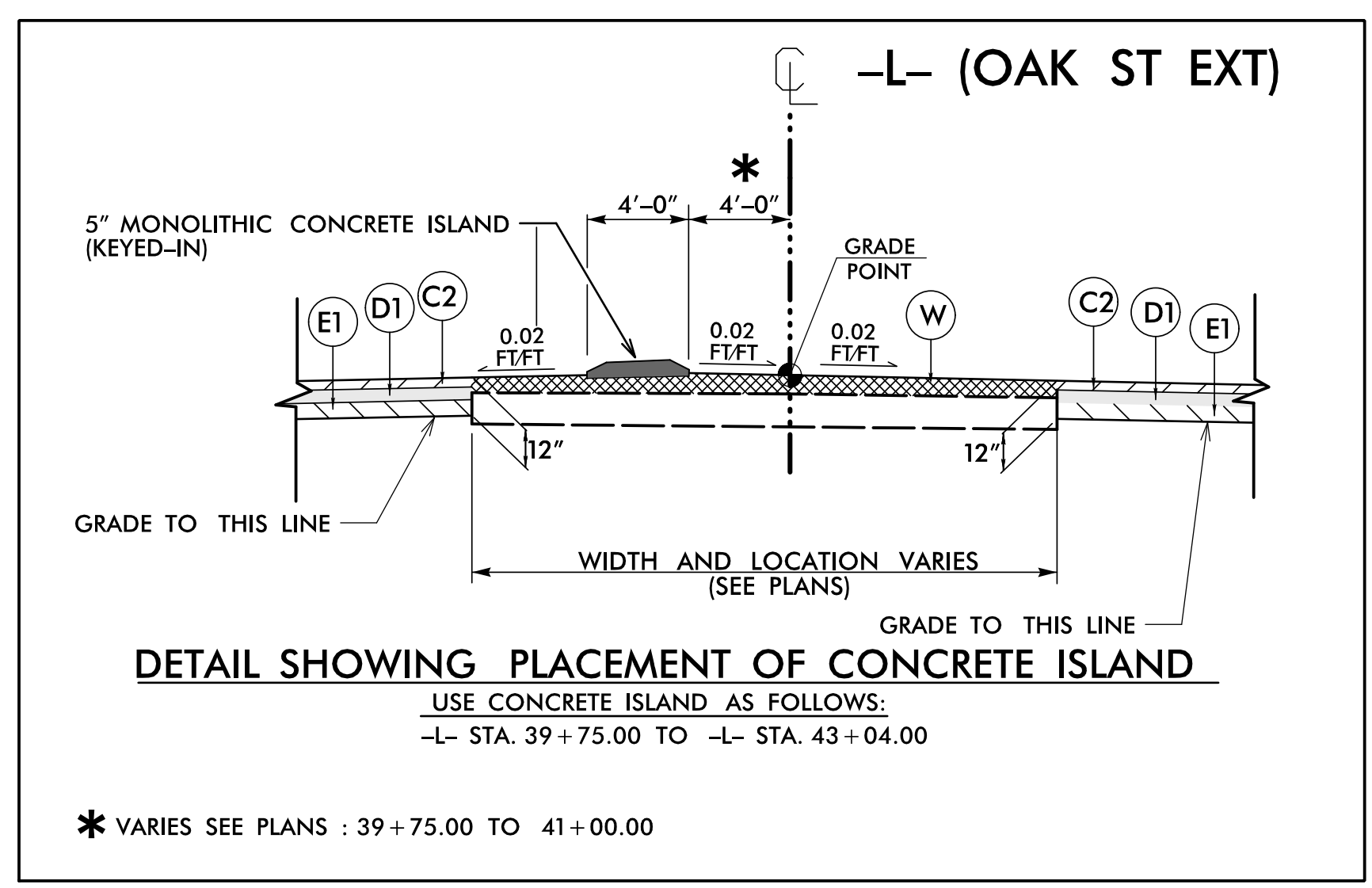
# PAVEMENT SCHEDULE

|    |  |
|----|--|
| C1 | PROP. APPROX. 1 1/2" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 168 LBS. PER SQ. YD.   |
| 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. VAR. DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5C, AT AN AVERAGE RATE OF 112 LBS. PER SQ. YD. PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 2" IN DEPTH.                                       |
| D1 | PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.   |
| D2 | PROP. VAR. DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0C, 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" ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.   |
| E2 | PROP. VAR. DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0C, AT AN AVERAGE RATE OF 114 LBS. PER SQ. YD. PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3" IN DEPTH OR GREATER THAN 5 1/2" IN DEPTH.         |
| R1 | 2'-6" CONCRETE CURB AND GUTTER.  |
| R2 | 8" X 12" CONCRETE CURB.  |
| S  | CONCRETE SIDEWALK  |
| T  | EARTH MATERIAL.  |
| U  | EXISTING PAVEMENT.   |
| V  | MILLING EXISTING PAVEMENT, SEE THIS SHEET FOR DETAIL   |
| W  | WEDGING EXISTING PAVEMENT, SEE THIS SHEET FOR DETAILS  |

PAVEMENT EDGE SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.



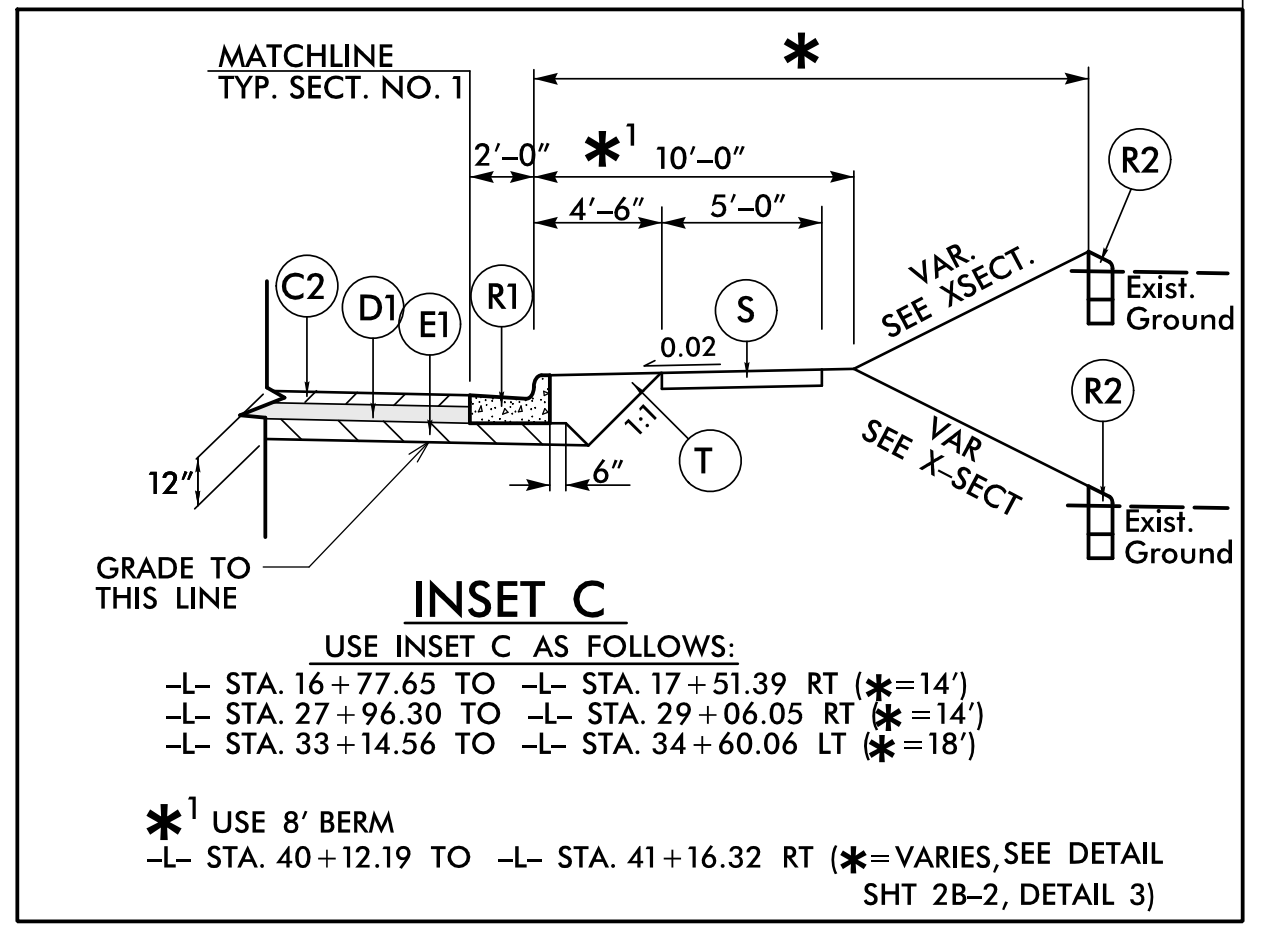
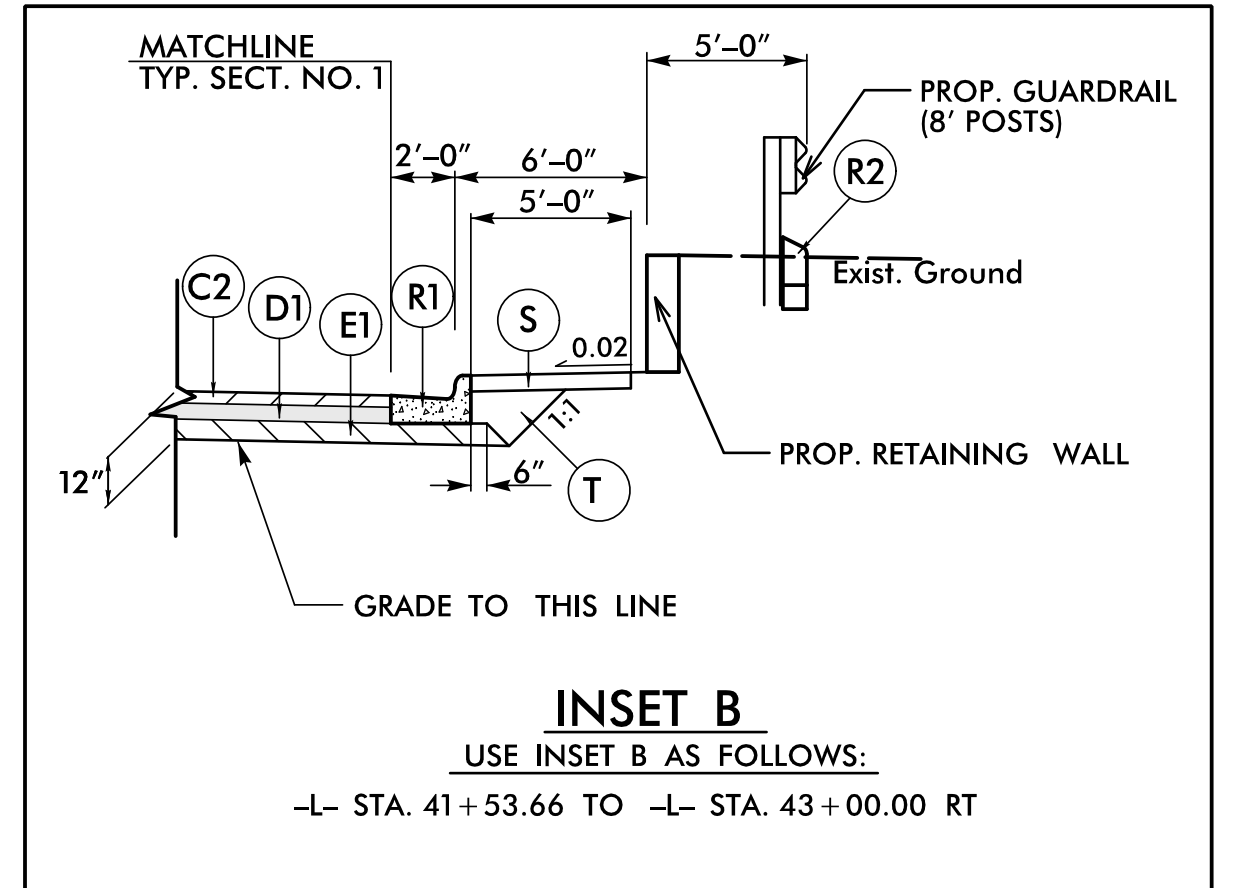
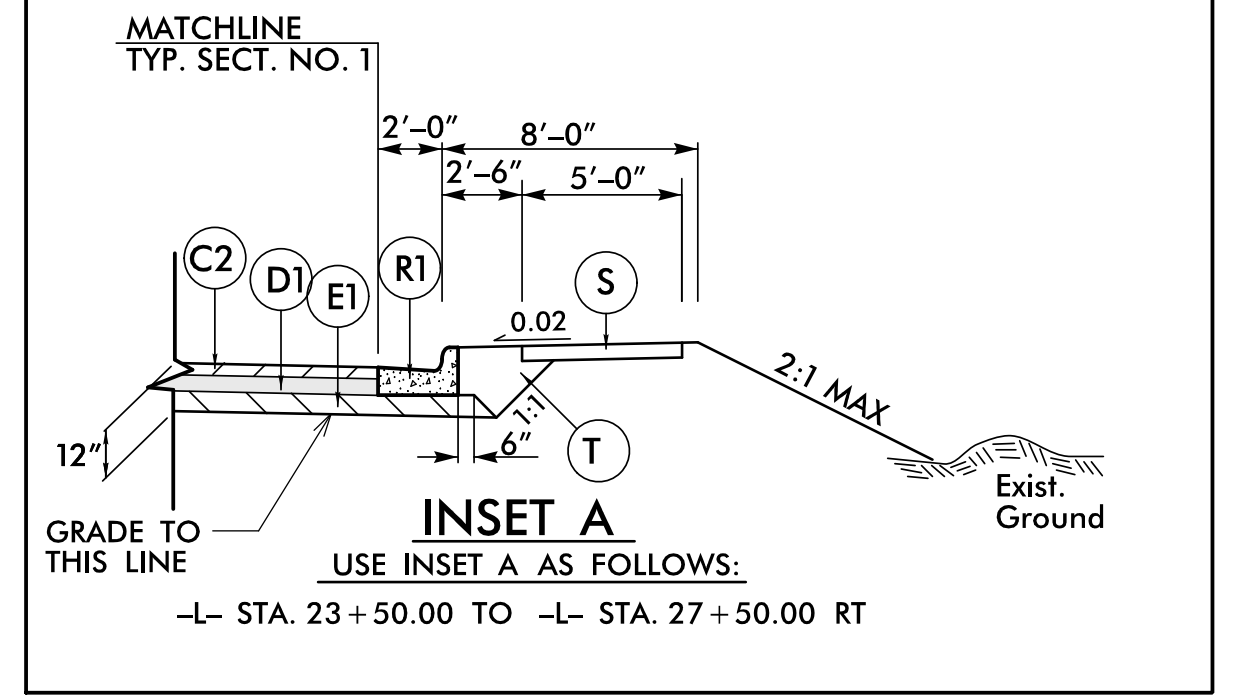
| *                | STA. TO STA.   |
|------------------|--|
| 18'-0"           | -L- STA. 10+18.03 TO -L- STA. 21+21.08 LT<br>-L- STA. 10+18.03 TO -L- STA. 36+33.00 RT<br>-L- STA. 24+00.00 TO -L- STA. 27+50.32 LT<br>-L- STA. 30+40.00 TO -L- STA. 36+33.00 LT |
| 30'-0"           | -L- STA. 21+21.08 TO -L- STA. 23+00.00 LT<br>-L- STA. 27+50.32 TO -L- STA. 29+40.00 LT   |
| 18'-0" TO 30'-0" | -L- STA. 23+00.00 TO -L- STA. 24+00.00 LT<br>-L- STA. 29+40.00 TO -L- STA. 30+40.00 LT   |
| 18'-0" TO 22'-0" | -L- STA. 36+33.00 TO -L- STA. 41+00.00 LT  |
| 22'-0" TO 26'-0" | -L- STA. 41+00.00 TO -L- STA. 43+29.67 LT  |
| 18'-0" TO 33'-1" | -L- STA. 36+33.00 TO -L- STA. 40+35.00 RT  |
| 33'-1" TO 46'-0" | -L- STA. 40+35.00 TO -L- STA. 41+35.00 RT  |
| 46'-0"           | -L- STA. 41+35.00 TO -L- STA. 43+29.67 RT  |



| *                | STA. TO STA.                           |
|------------------|--|
| 12'-0" TO 18'-0" | -Y- STA. 10+50.00 TO -Y- STA. 13+50.00 |
| 18'-0"           | -Y- STA. 13+50.00 TO -Y- STA. 17+95.00 |
| 18'-0" TO 12'-0" | -Y- STA. 17+95.00 TO -Y- STA. 21+45.00 |

NOTE: TRANSITION BETWEEN TYP. SECT. NO. 2 AND EXISTING AS FOLLOWS:  
-Y- STA. 10+25.00 TO -Y- STA. 10+50.00  
-Y- STA. 21+45.00 TO -Y- STA. 22+00.00

|   |                          |
|---|--------------------------|
| PROJECT REFERENCE NO.<br><b>U-5833</b>  | SHEET NO.<br><b>2A-1</b> |
| ROADWAY DESIGN ENGINEER<br>   | PAVEMENT DESIGN ENGINEER |
| <b>DOCUMENT NOT CONSIDERED FINAL<br/>UNLESS ALL SIGNATURES COMPLETED</b>  |                          |
| <br><b>TGS ENGINEERS</b><br>804-C N. LAFAYETTE ST<br>SHELBY, NC 28150<br>PH (704) 476-0003<br>CORP. LICENSE NO.: C-0275 |                          |



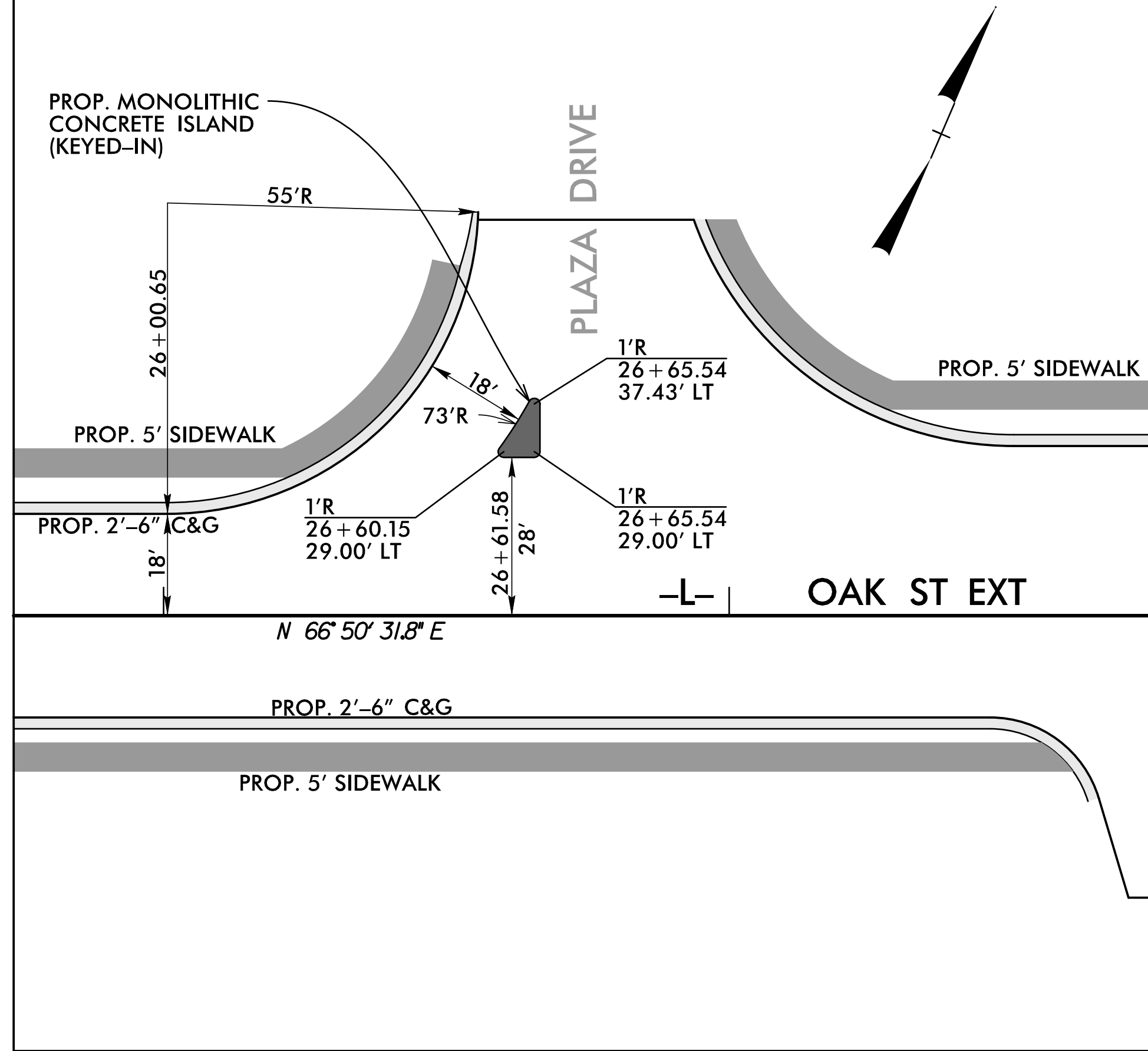
6/2/2008 U-5833 Roadway\Proj\U-5833.Rdy\_tjup.dgn  
 User:same1.vrn



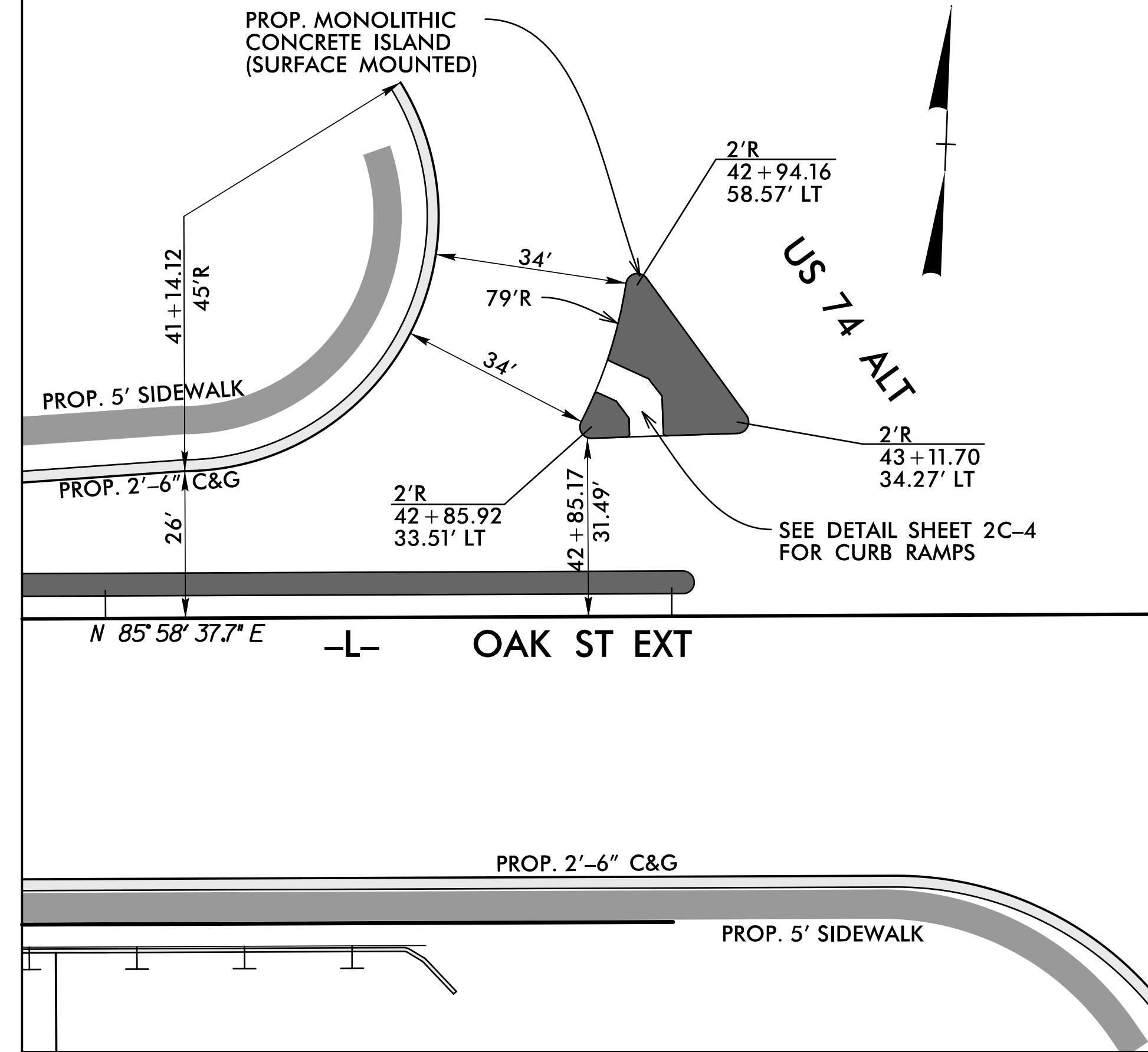


8/17/99

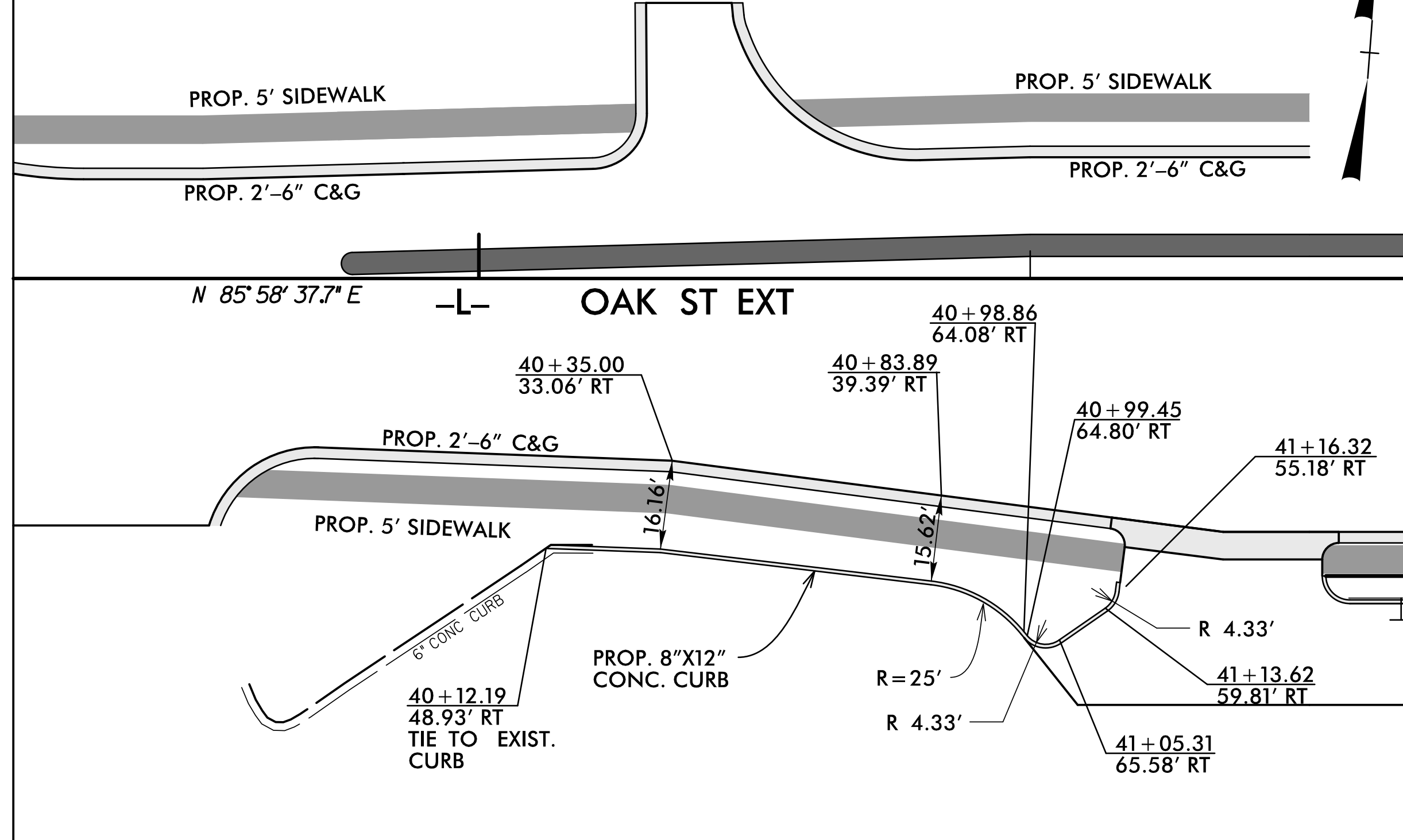
### DETAIL 1: ISLAND AT PLAZA DRIVE



### DETAIL 2: ISLAND AT US 74 ALT



### DETAIL 3: 8"x12" CONC. CURB LAYOUT -L- STA 40+12.19 TO 41+16.32 RT

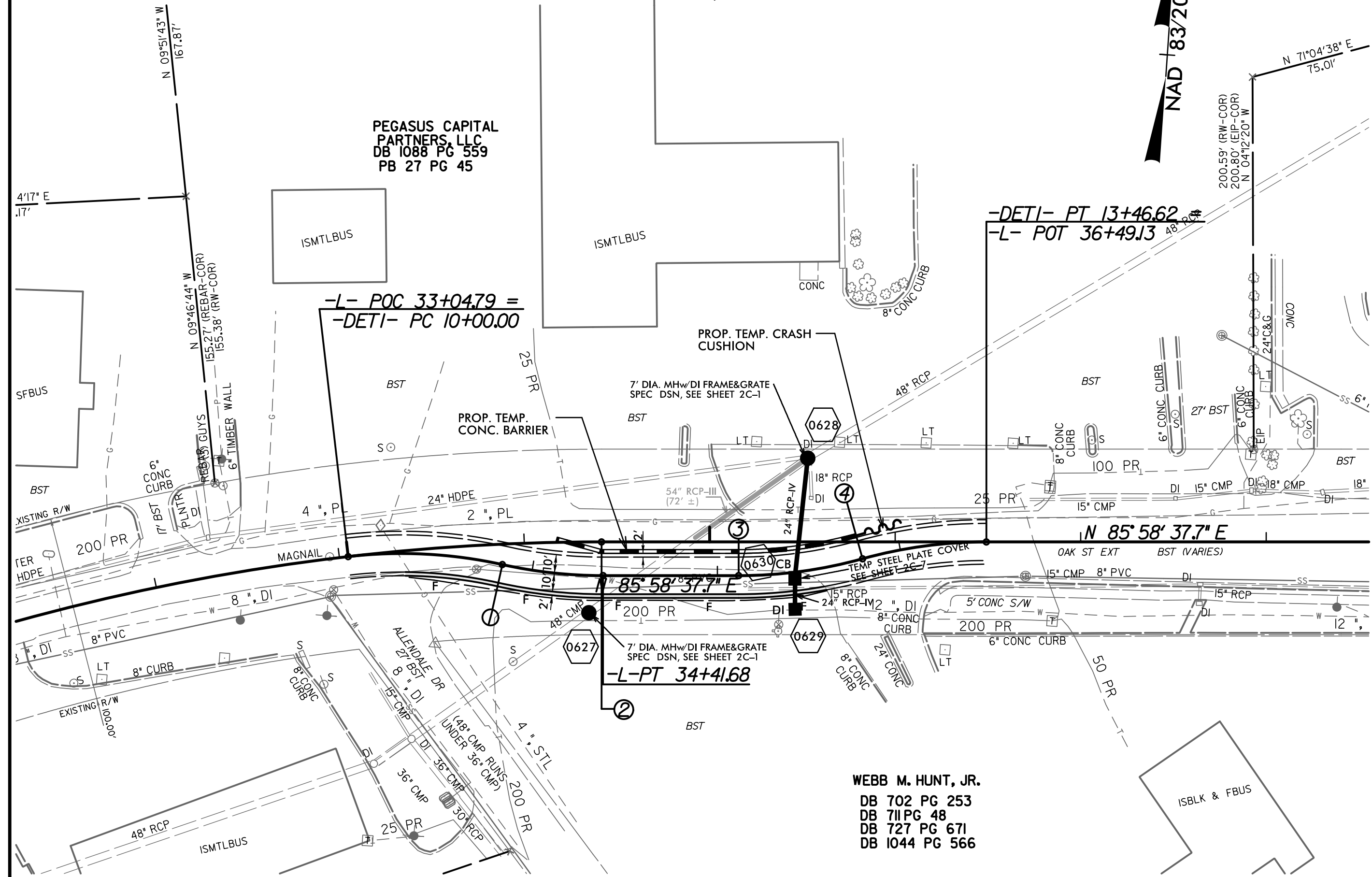


|  |                   |
|--|-------------------|
| PROJECT REFERENCE NO.<br>U-5833  | SHEET NO.<br>2B-2 |
| RW SHEET NO.   |                   |
| ROADWAY DESIGN ENGINEER  |                   |
|  |                   |
| 6/28/2018 8:07:00 AM PDT   |                   |
| <p><b>DOCUMENT NOT CONSIDERED FINAL<br/>UNLESS ALL SIGNATURES COMPLETED</b></p>  |                   |
|  |                   |
| <p>TGS ENGINEERS<br/>804-C N. LAFAYETTE ST<br/>SHELBY, NC 28150<br/>PH: (704) 476-0003<br/>CORP. LICENSE NO.: C-0275</p> |                   |

REVISIONS

6/27/2018 U-5833\Roadway\Proj\U-5833\_Rdy\_Det\1\_Sht\_2B-2\Island and Curb Details.dgn

# DETOUR -DET1-



**-L- CURVE DATA**

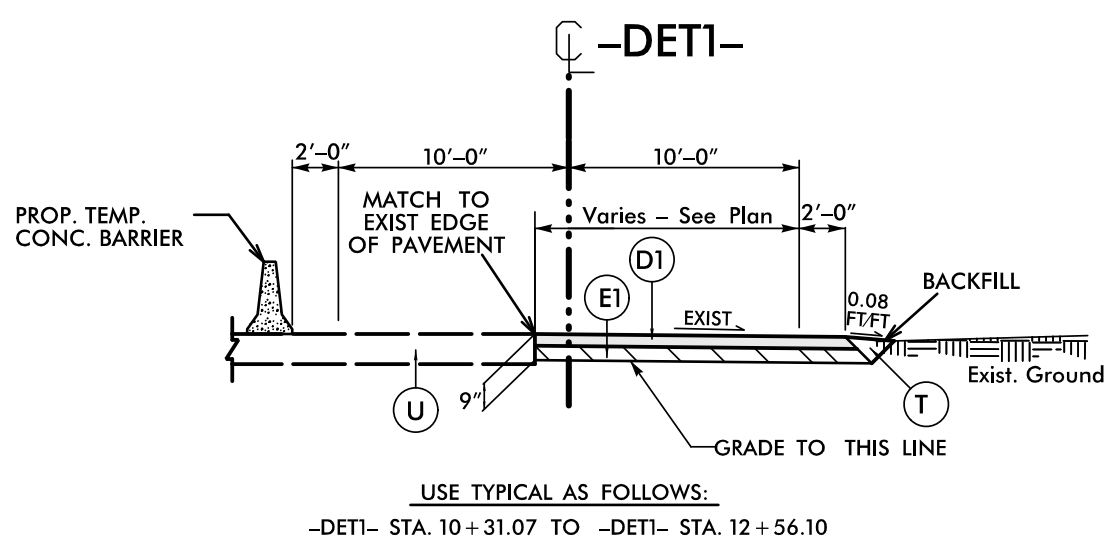
|                                       |
|---------------------------------------|
| PI Sta 32+45.66                       |
| $\Delta = 19^{\circ} 08' 05.9''$ (RT) |
| D = 4' 50' 06.3"                      |
| L = 395.75'                           |
| T = 199.74'                           |
| R = 1,185.00'                         |

**-DET1- CURVE DATA**

|                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| PI Sta 10+42.20                       | PI Sta 11+11.08                       | PI Sta 12+45.44                       | PI Sta 13+30.03                       |
| $\Delta = 19^{\circ} 09' 38.6''$ (RT) | $\Delta = 12^{\circ} 32' 30.9''$ (LT) | $\Delta = 15^{\circ} 29' 26.5''$ (LT) | $\Delta = 15^{\circ} 29' 26.5''$ (RT) |
| D = 22' 55' 05.9"                     | D = 22' 55' 05.9"                     | D = 22' 55' 05.9"                     | D = 22' 55' 05.9"                     |
| L = 83.60'                            | L = 54.72'                            | L = 67.59'                            | L = 67.59'                            |
| T = 42.20'                            | T = 27.47'                            | T = 34.00'                            | T = 34.00'                            |
| R = 250.00'                           | R = 250.00'                           | R = 250.00'                           | R = 250.00'                           |

- ① -DET1- PRC 10+83.60
- ② -DET1- PT 11+38.33
- ③ -DET1- PC 12+11.44
- ④ -DET1- PRC 12+79.03

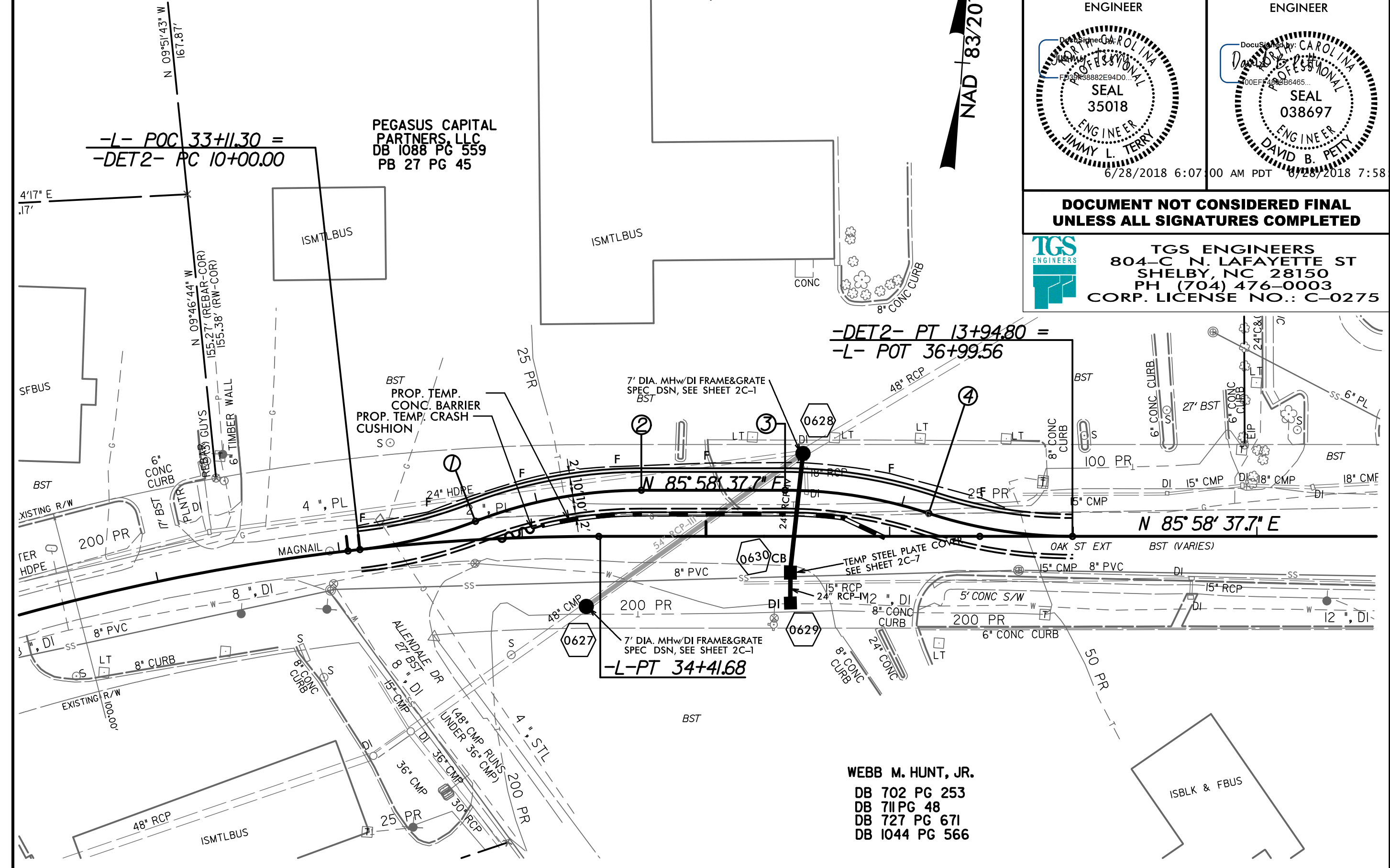
**NOTE: SEE SHEET TMP-2 FOR CONSTRUCTION SEQUENCE.**



**PAVEMENT SCHEDULE**

|    |  |
|----|--|
| D1 | PROP. APPROX. 4" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE 119.0C, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD. |
| E1 | PROP. APPROX. 6" ASPHALT CONCRETE BASE COURSE, TYPE 825.0C, AT AN AVERAGE RATE OF 570 LBS. PER SQ. YD.         |
| T  | EARTH MATERIAL.  |
| U  | EXISTING PAVEMENT.   |

# DETOUR -DET2-



**-L- CURVE DATA**

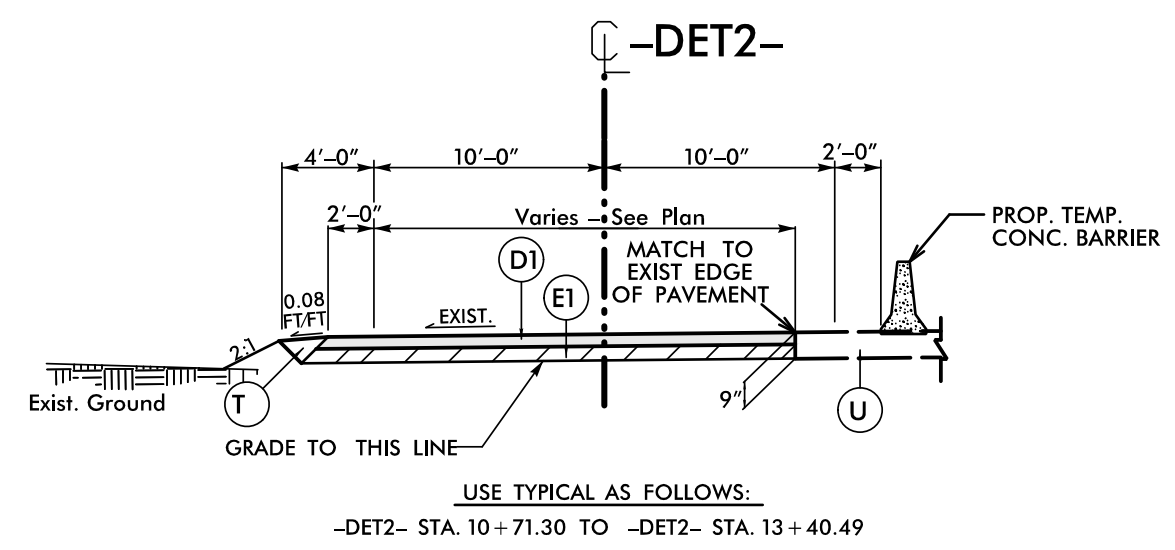
|                                       |
|---------------------------------------|
| PI Sta 32+45.66                       |
| $\Delta = 19^{\circ} 08' 05.9''$ (RT) |
| D = 4' 50' 06.3"                      |
| L = 395.75'                           |
| T = 199.74'                           |
| R = 1,185.00'                         |

**-DET2- CURVE DATA**

|                                       |                                       |                                       |                                       |
|---------------------------------------|---------------------------------------|---------------------------------------|---------------------------------------|
| PI Sta 10+32.66                       | PI Sta 11+17.00                       | PI Sta 12+75.76                       | PI Sta 13+55.35                       |
| $\Delta = 14^{\circ} 53' 03.9''$ (LT) | $\Delta = 21^{\circ} 11' 17.1''$ (RT) | $\Delta = 18^{\circ} 14' 25.7''$ (RT) | $\Delta = 18^{\circ} 14' 25.7''$ (LT) |
| D = 22' 55' 05.9"                     | D = 22' 55' 05.9"                     | D = 22' 55' 05.9"                     | D = 22' 55' 05.9"                     |
| L = 64.95'                            | L = 92.45'                            | L = 79.59'                            | L = 79.59'                            |
| T = 32.66'                            | T = 46.76'                            | T = 40.13'                            | T = 40.13'                            |
| R = 250.00'                           | R = 250.00'                           | R = 250.00'                           | R = 250.00'                           |

- ① -DET2- PRC 10+64.95
- ② -DET2- PT 11+57.40
- ③ -DET2- PC 12+35.62
- ④ -DET2- PRC 13+15.21

**NOTE: SEE SHEET TMP-2 FOR CONSTRUCTION SEQUENCE.**



|   |                     |
|---|---------------------|
| PROJECT REFERENCE NO.<br>U-5833   | SHEET NO.<br>2B-3   |
| ROADWAY DESIGN ENGINEER   | HYDRAULICS ENGINEER |
|   |                     |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED  |                     |
| TGS ENGINEERS<br>804-C N. LAFAYETTE ST<br>SHELBY, NC 28150<br>PH: (704) 476-0003<br>CORP. LICENSE NO.: C-0275 |                     |

8/17/19  
 REVISIONS  
 6/28/2018 U-5833\Roadway\Proj\U-5833\_Rdy\_Det1\_Sht\_2B-3(Onsite Detours).dgn  
 L:\Users\mld



10-AUG-2017 10:41  
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 jhowerton AT CSD-292595

5/14/99

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

**ENGLISH DETAIL DRAWING FOR  
MINIMUM DEPTH  
CONCRETE CATCH BASIN  
12" THRU 84" PIPE**

SHEET 1 OF 2  
**840D02**

SHEET 1 OF 2  
**840D02**

**GENERAL NOTES:**

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12 CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.

CONSTRUCT WITH PIPE CROWNS MATCHING.

CHAMFER ALL EXPOSED CORNERS 1".

\*\* FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.

**SECTION X-X**

**SECTION Y-Y**

**SECTION Z-Z**

**SECTION J-J**

**SECTION M-M**

**PLAN**

**PLAN**

**DETAIL SHOWING METHOD OF RISER CONSTRUCTION**

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

**ENGLISH DETAIL DRAWING FOR  
MINIMUM DEPTH  
CONCRETE CATCH BASIN  
12" THRU 84" PIPE**

SHEET 1 OF 2  
**840D02**

SHEET 2 OF 2  
**840D02**

**GENERAL NOTES:**

USE CLASS "B" CONCRETE THROUGHOUT.

PROVIDE ALL CATCH BASINS OVER 3'-6" IN DEPTH WITH STEPS 12" ON CENTER. USE STEPS WHICH COMPLY WITH STD. DRAWING 840.66.

OPTIONAL CONSTRUCTION - MONOLITHIC POUR, 2" KEYWAY, OR #4 BAR DOWELS AT 12 CENTERS AS DIRECTED BY THE ENGINEER.

USE FORMS FOR THE CONSTRUCTION OF THE BOTTOM SLAB.

IF REINFORCED CONCRETE PIPE IS SET IN BOTTOM SLAB OF BOX, ADD TO SLAB AS SHOWN ON STD. NO. 840.00.

USE TYPE "E", "F" AND "G" GRATES UNLESS OTHERWISE INDICATED.

FOR 8'-0" IN HEIGHT OR LESS USE 6" WALLS AND BOTTOM SLAB. OVER 8'-0" TO 16'-0" IN HEIGHT USE 8" WALLS AND BOTTOM SLAB. ADJUST QUANTITIES ACCORDINGLY.

CONSTRUCT WITH PIPE CROWNS MATCHING.

CHAMFER ALL EXPOSED CORNERS 1".

\*\* FOR STRUCTURES WITH PIPE LARGER THAN 54", MAKE THE TOP SLAB 8" THICK.

**SECTION S-S**

**SECTION R-R**

**PLAN OF TOP SLAB**

**DOWEL**

**ELEVATION**

**ELEVATION**

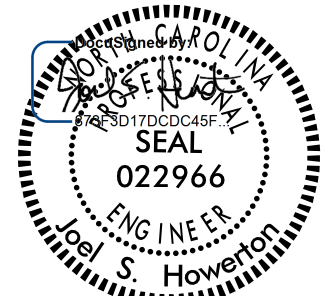
**\* RISER HAS .228 CUBIC YARDS OF CONCRETE PER FOOT HEIGHT**

| PIPE D. | DIMENSIONS OF BOX AND PIPE |       |             | COVER DIMENSION |        |        | MINIMUM DIMENSIONS AND QUANTITIES FOR CONCRETE CATCH BASIN (BASED ON MIN. HEIGHT, H, WITH NO RISER) * |                |             | DEDUCTIONS |          |             |                                  |       |       |
|---------|----------------------------|-------|-------------|-----------------|--------|--------|---|----------------|-------------|------------|----------|-------------|----------------------------------|-------|-------|
|         | SPAN                       | WIDTH | MIN. HEIGHT | E               | F      | H      | BAR-S-U NO.   | BAR-S-V LENGTH | BAR-S-W NO. | TOTAL LBS. | TOP SLAB | BOTTOM SLAB | TOT. CONC. FOR MINIMUM HEIGHT, H | C. M. | R. C. |
| 12"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 2'-0"  | 2'-3"  | ..  | ..             | ..          | ..         | 0.235    | 0.772       | 0.015                            | 0.026 | 0.026 |
| 15"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 2'-3"  | 2'-6"  | ..  | ..             | ..          | ..         | 0.235    | 0.829       | 0.023                            | 0.036 | 0.049 |
| 18"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 2'-6"  | 3'-1"  | ..  | ..             | ..          | ..         | 0.235    | 0.887       | 0.033                            | 0.049 | 0.085 |
| 24"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 3'-1"  | 3'-10" | ..  | ..             | ..          | ..         | 0.235    | 1.001       | 0.059                            | 0.127 | 0.178 |
| 30"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 3'-4"  | 3'-10" | ..  | ..             | ..          | ..         | 0.235    | 1.114       | 0.092                            | 0.127 | 0.178 |
| 36"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 3'-10" | 4'-6"  | ..  | ..             | ..          | ..         | 0.235    | 1.228       | 0.132                            | 0.178 | 0.243 |
| 42"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 4'-5"  | 4'-11" | ..  | ..             | ..          | ..         | 0.235    | 1.342       | 0.173                            | 0.180 | 0.243 |
| 48"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 5'-0"  | 5'-6"  | ..  | ..             | ..          | ..         | 0.235    | 1.456       | 0.214                            | 0.235 | 0.317 |
| 54"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 5'-7"  | 6'-0"  | ..  | ..             | ..          | ..         | 0.235    | 1.570       | 0.255                            | 0.287 | 0.401 |
| 60"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 6'-3"  | 6'-6"  | ..  | ..             | ..          | ..         | 0.235    | 1.684       | 0.296                            | 0.363 | 0.546 |
| 66"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 6'-11" | 6'-6"  | ..  | ..             | ..          | ..         | 0.235    | 1.798       | 0.337                            | 0.440 | 0.655 |
| 72"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 7'-6"  | 7'-6"  | ..  | ..             | ..          | ..         | 0.235    | 1.912       | 0.378                            | 0.524 | 0.774 |
| 78"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 8'-1"  | 8'-6"  | ..  | ..             | ..          | ..         | 0.235    | 2.026       | 0.419                            | 0.615 | 0.893 |
| 84"     | 3'-0"                      | 2'-2" | 2'-0"       | ..              | 8'-9"  | 8'-6"  | ..  | ..             | ..          | ..         | 0.235    | 2.140       | 0.460                            | 0.713 | 1.010 |

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

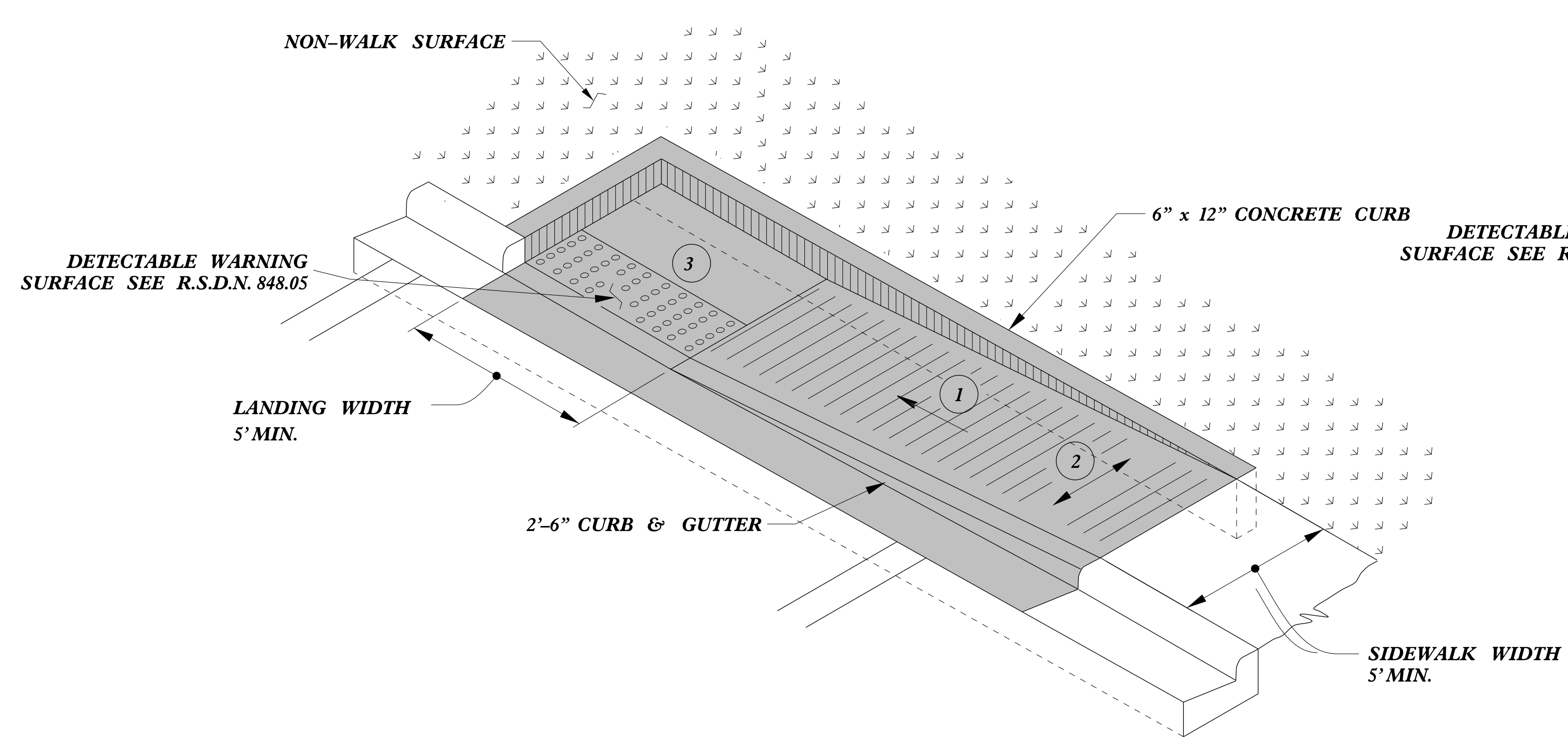
SEE PLATE FOR TITLE

ORIGINAL BY: 2002 Std.840.01 DATE: \_\_\_\_\_  
 MODIFIED BY: E.E. WARD DATE: 3-1-02  
 CHECKED BY: \_\_\_\_\_ DATE: \_\_\_\_\_  
 FILE SPEC.: s:Special Details/jhowerton/840d02.dgn

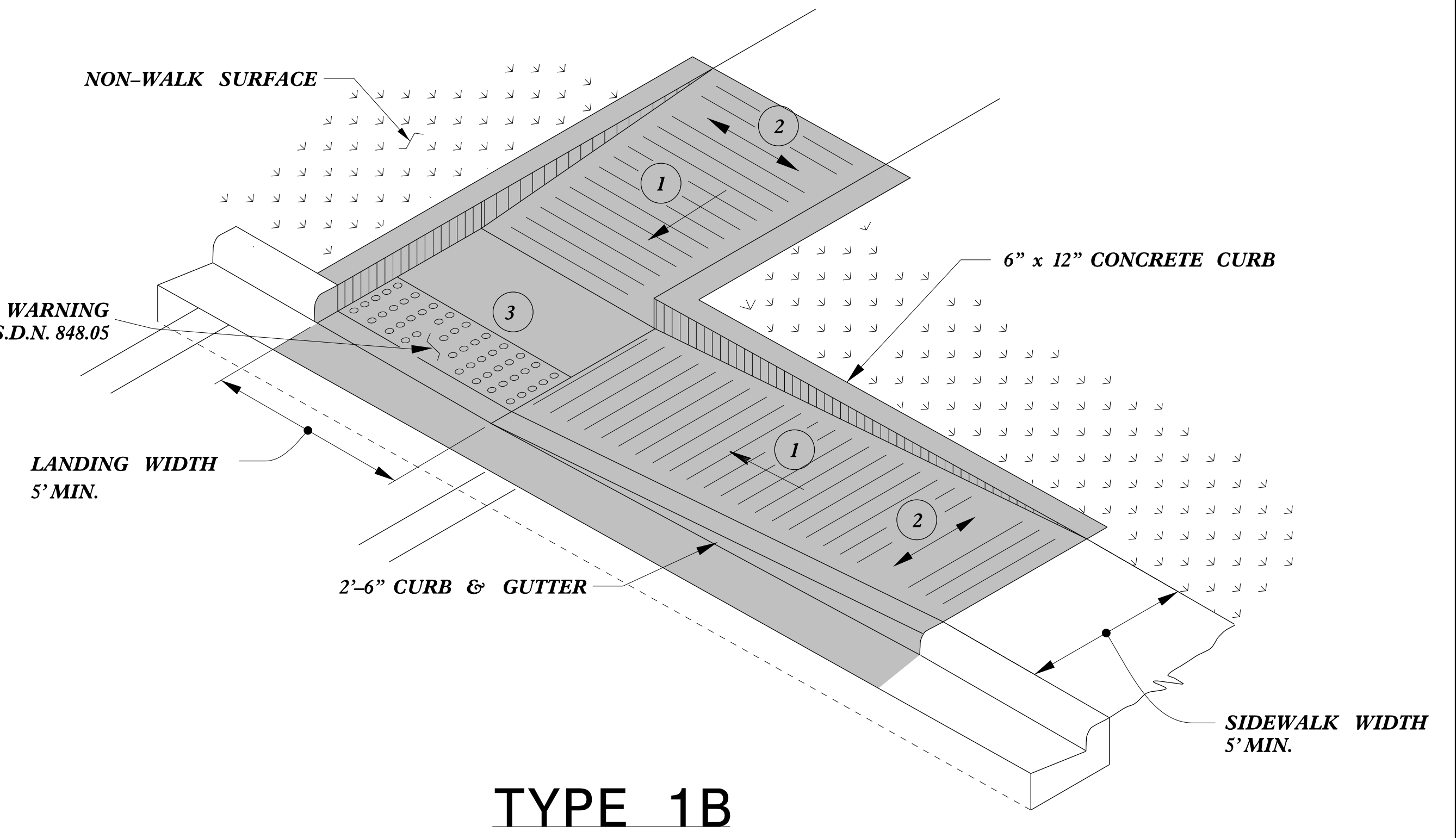


6/28/2018 9:11:06 AM EDT

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



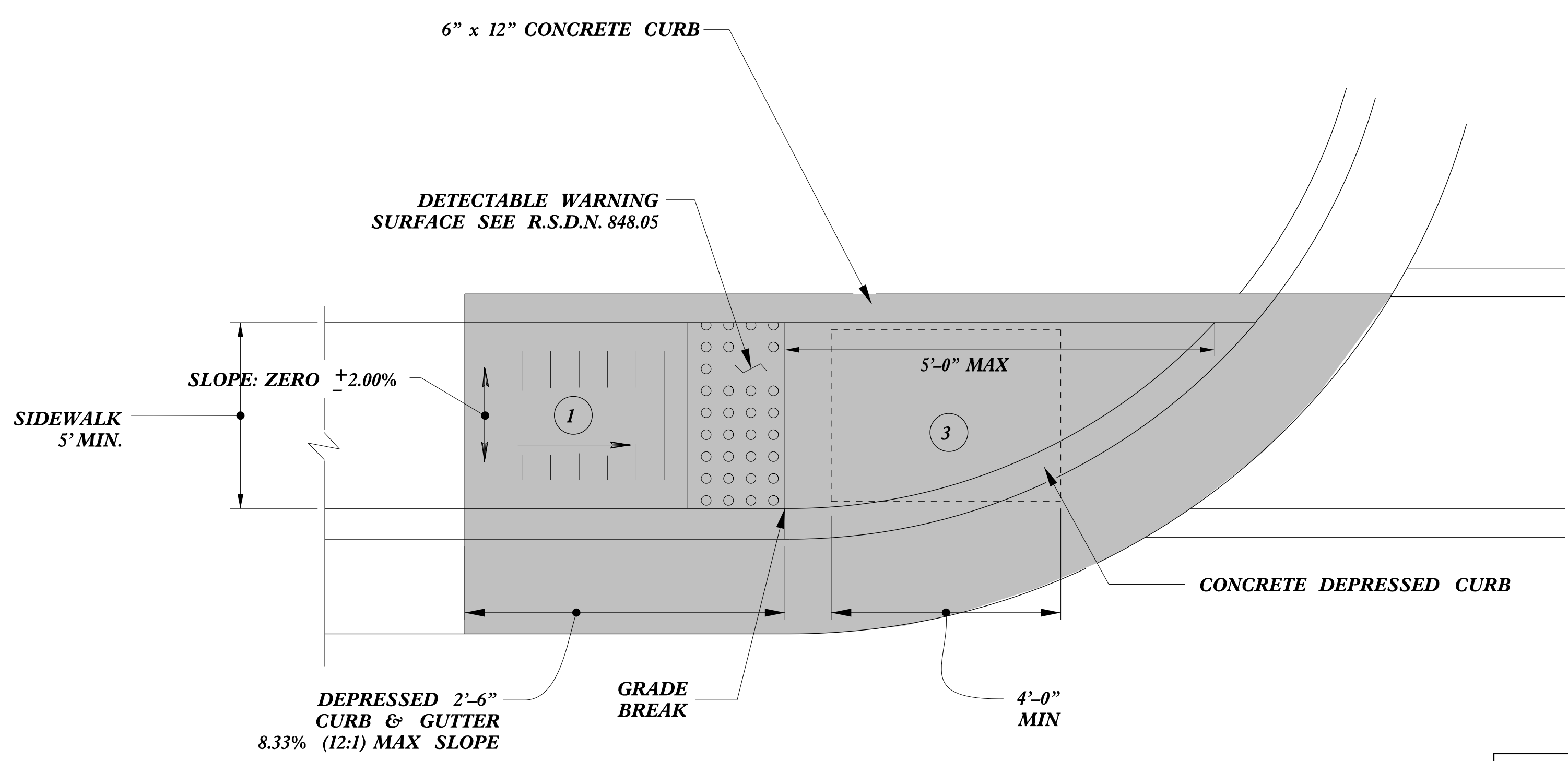
**TYPE 1A**



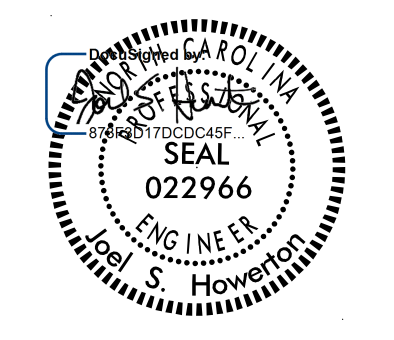
**TYPE 1B**

PAY LIMITS FOR 1 CURB RAMP

- 1 8.33% (12:1) MAX RAMP SLOPE
- 2 CROSS SLOPE: 2.00%
- 3 CURB RAMPS REQUIRE A (4'-0") MINIMUM LANDING WITH A MAXIMUM CROSS SLOPE AND LONGITUDINAL SLOPE OF 2.00% WHERE PEDESTRIANS PERFORM TURNING MANEUVERS. SLOPE TO DRAIN TO CURB.



**TYPE 1**




6/28/2018 9:11:06 AM EDT

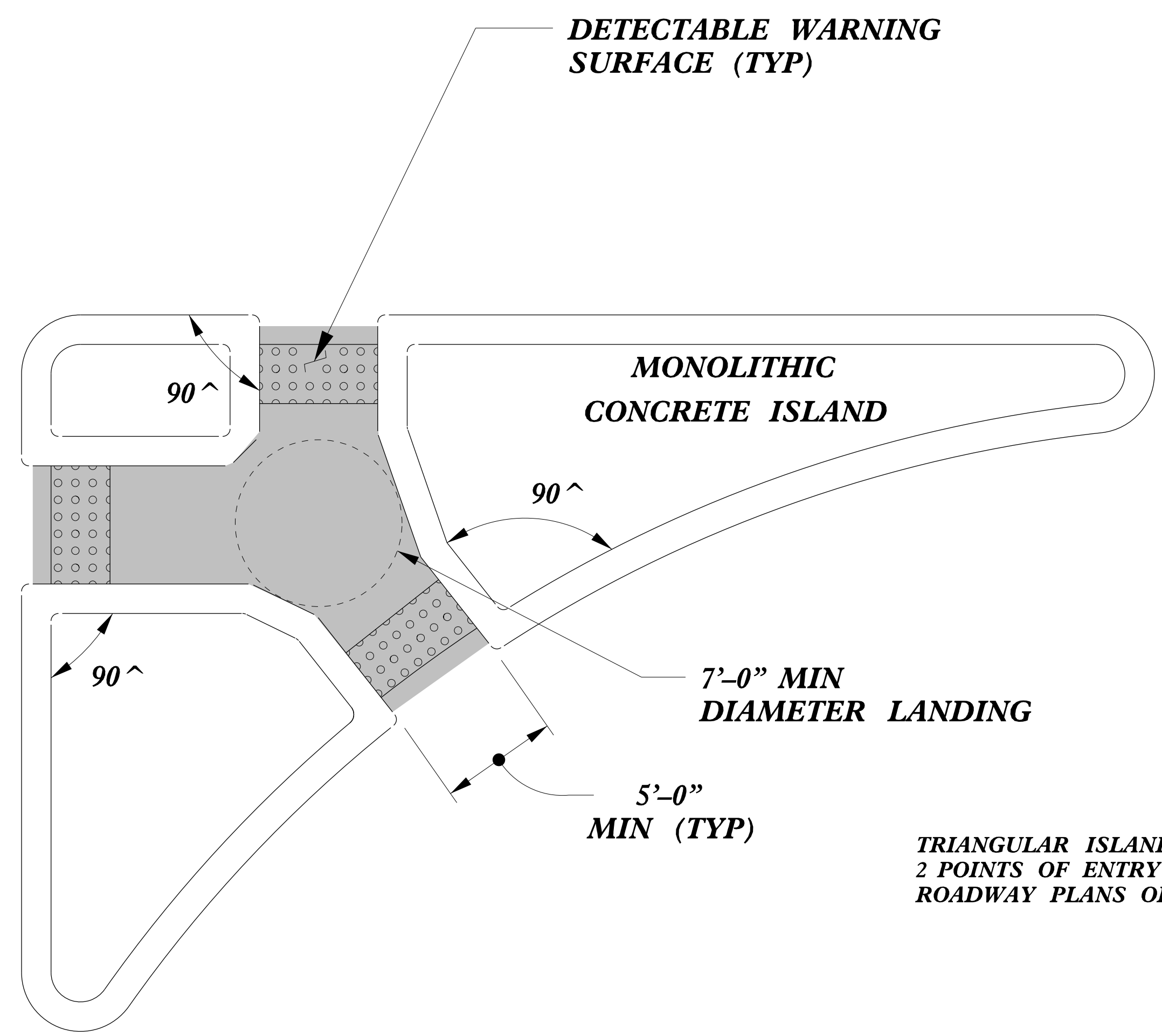
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

|   |                  |
|---|------------------|
| <b>CONTRACT STANDARDS AND DEVELOPMENT UNIT</b>    |                  |
| Office 919-707-6950                               | FAX 919-250-4119 |
| <b>CURB RAMPS</b>                                 |                  |
| Directional Ramps                                 |                  |
| ORIGINAL BY: J.S. HOWERTON                        | DATE: 7/7/11     |
| MODIFIED BY:                                      | DATE:            |
| CHECKED BY:                                       | DATE:            |
| FILE SPEC.: stds/2012CurbRamp/CurbRampDetails.dgn |                  |

REFER TO ROADWAY STANDARD DRAWING NUMBER 848.05 SHEET 3 OF 3 FOR ALL RAMP NOTES

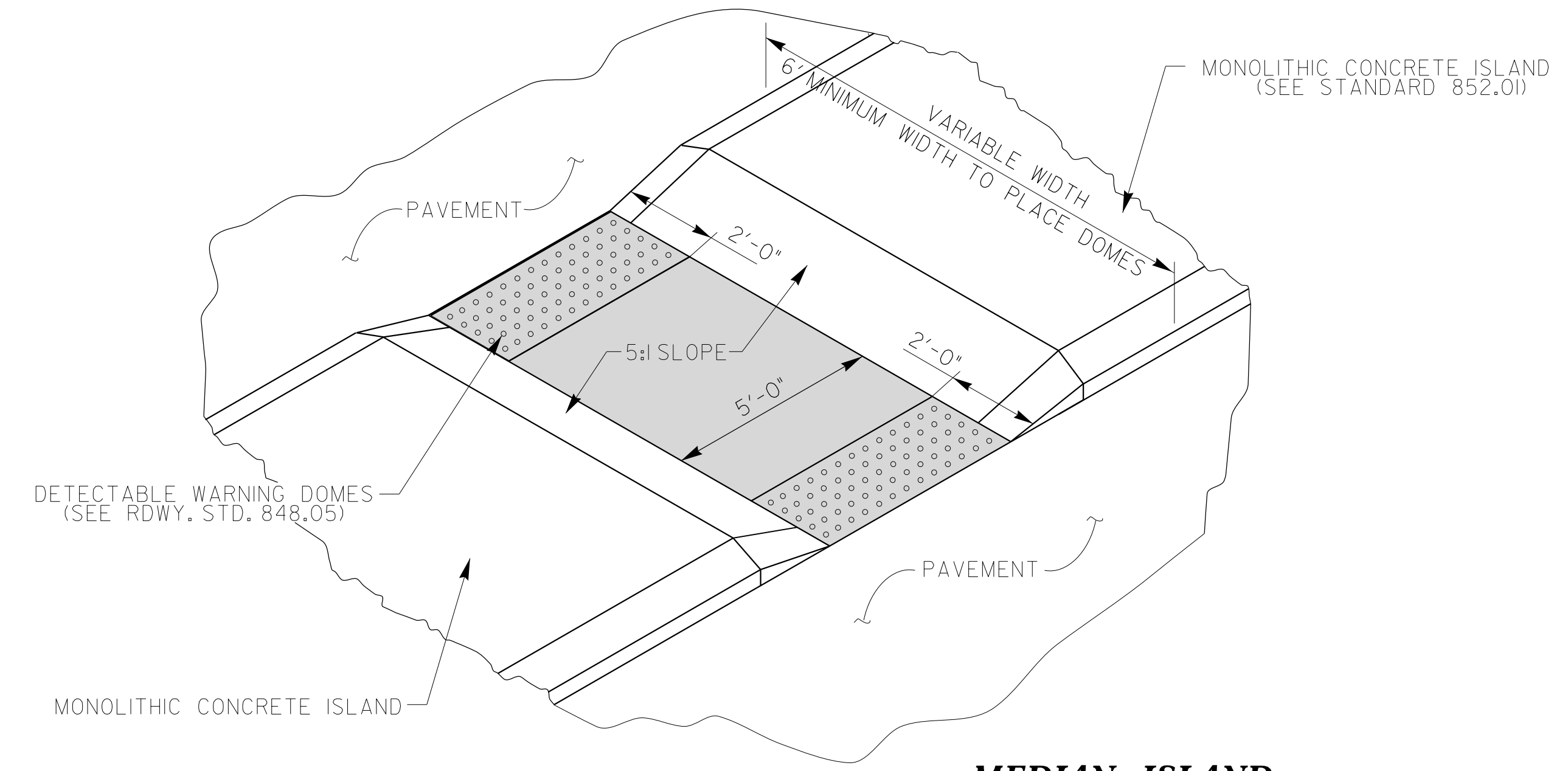
5/14/99  
C:\TEMP\DESIGN\2012\20120628\20120628.dwg

 PAY LIMITS FOR 2 OR 3 CURB RAMPS  
(CALCULATE BASED ON NUMBER OF  
SETS OF TRUNCATED DOMES)

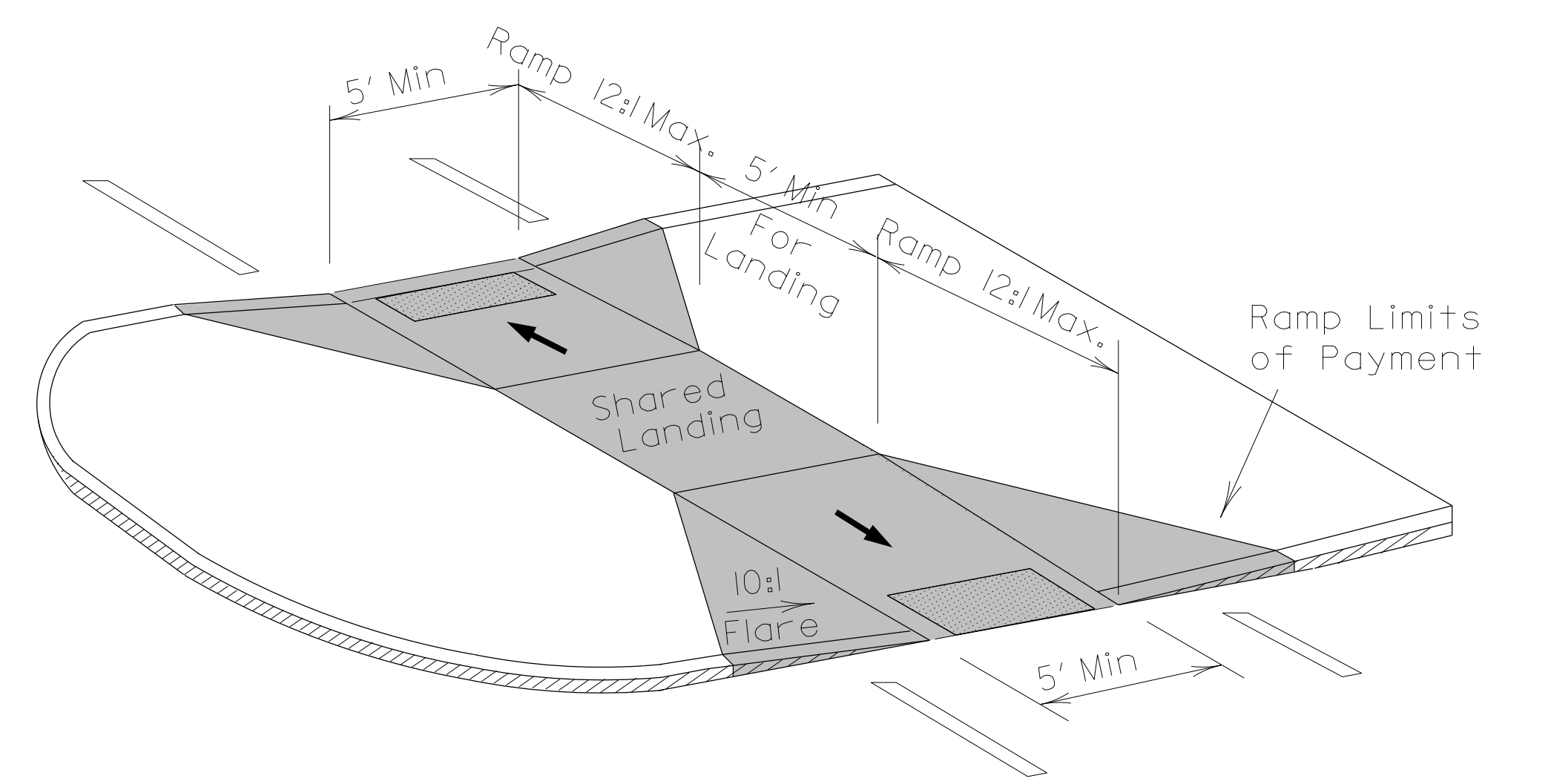


TRIANGULAR ISLANDS MAY BE CONSTRUCTED WITH ONLY  
2 POINTS OF ENTRY AND EXIT AS SHOWN IN THE  
ROADWAY PLANS OR AS DIRECTED BY THE ENGINEER.

**TRIANGULAR ISLAND  
WITH CUT THROUGH**



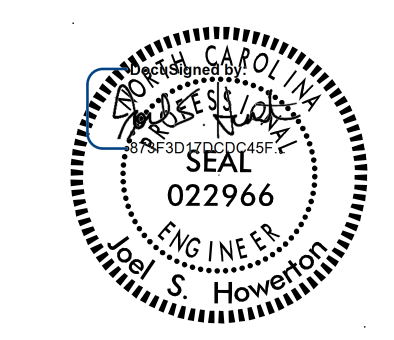
**MEDIAN ISLAND  
WITH CUT THROUGH**



**MEDIAN ISLAND  
CURB RAMPS**

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

|  |              |
|--|--------------|
| <b>CONTRACT STANDARDS<br/>AND DEVELOPMENT UNIT</b> |              |
| Office 919-707-6950 FAX 919-250-4119               |              |
| <b>CURB RAMPS</b>                                  |              |
| Median or Turn Lane Islands                        |              |
| ORIGINAL BY: J.S. HOWERTON                         | DATE: 7/7/11 |
| MODIFIED BY:                                       | DATE:        |
| CHECKED BY:  | DATE:        |
| FILE SPEC: .stds/2012CurbRamp/CurbRampDetails.dgn  |              |



6/28/2018 9:11:06 AM EDT

5/14/99  
SYTIME  
C:\STANDARD\CONSTRUCTION\USPERMANE\JUSPERMANE.DWG

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

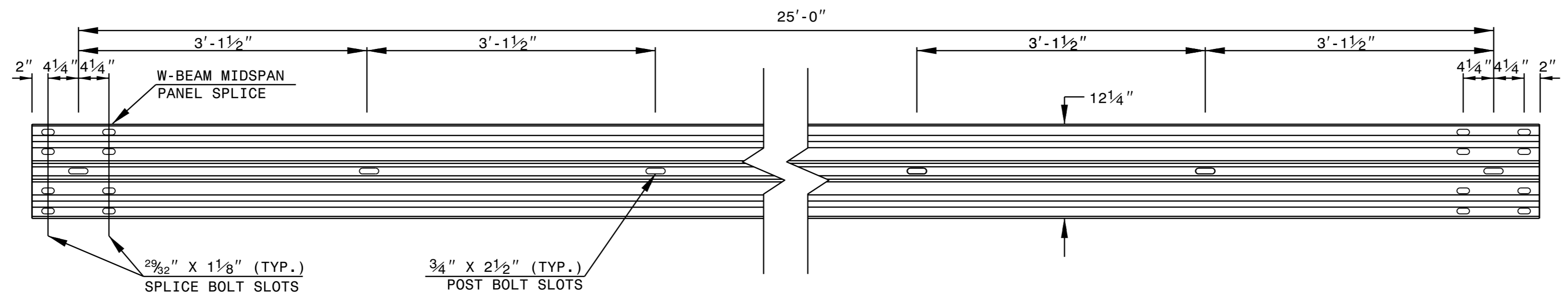
ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

SHEET 6 OF 8  
**862D02**

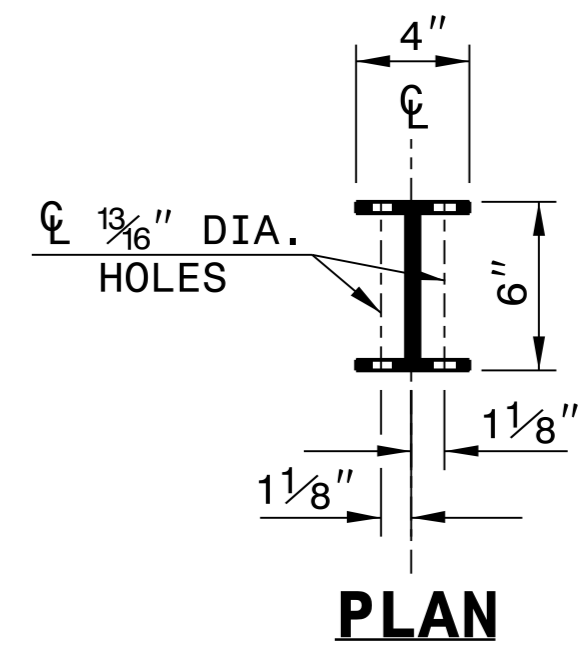
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

ROADWAY DETAIL DRAWING FOR  
**GUARDRAIL INSTALLATION**

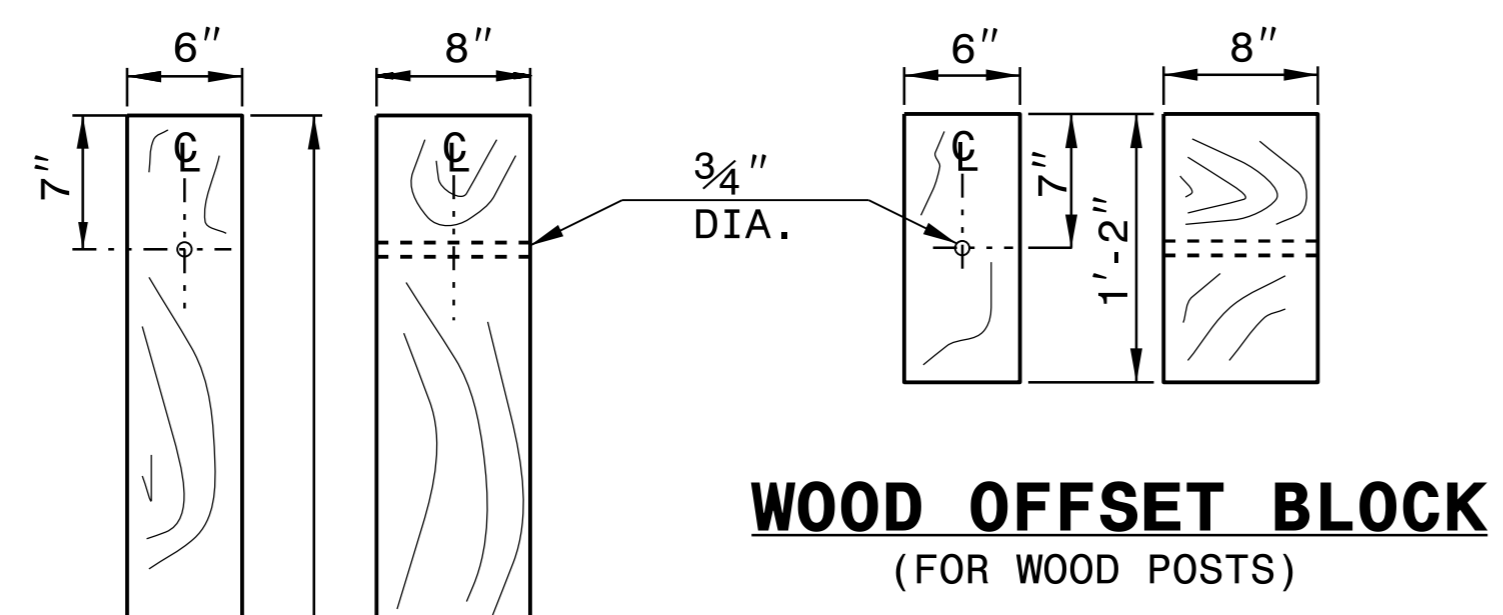
SHEET 6 OF 8  
**862D02**



**STANDARD W-BEAM GUARDRAIL**



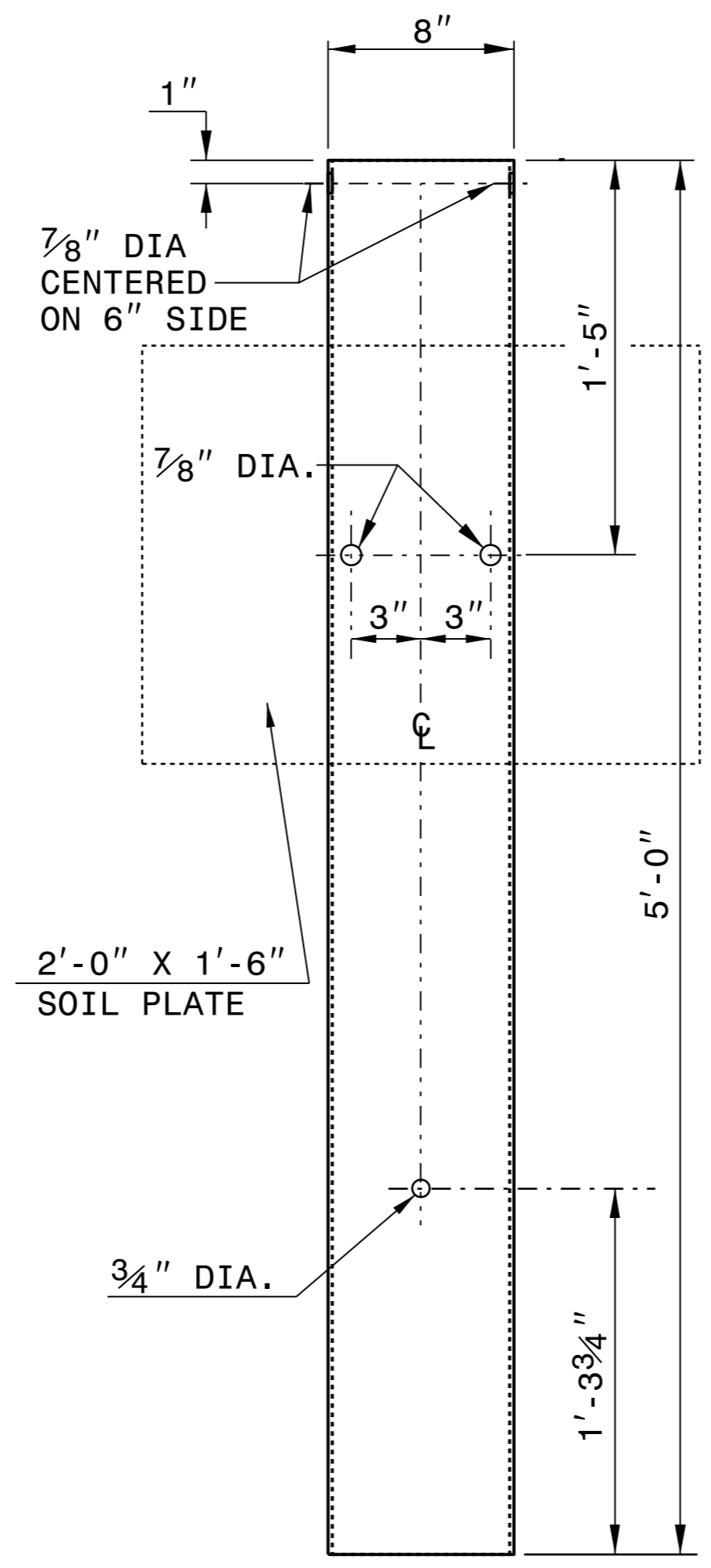
**PLAN**



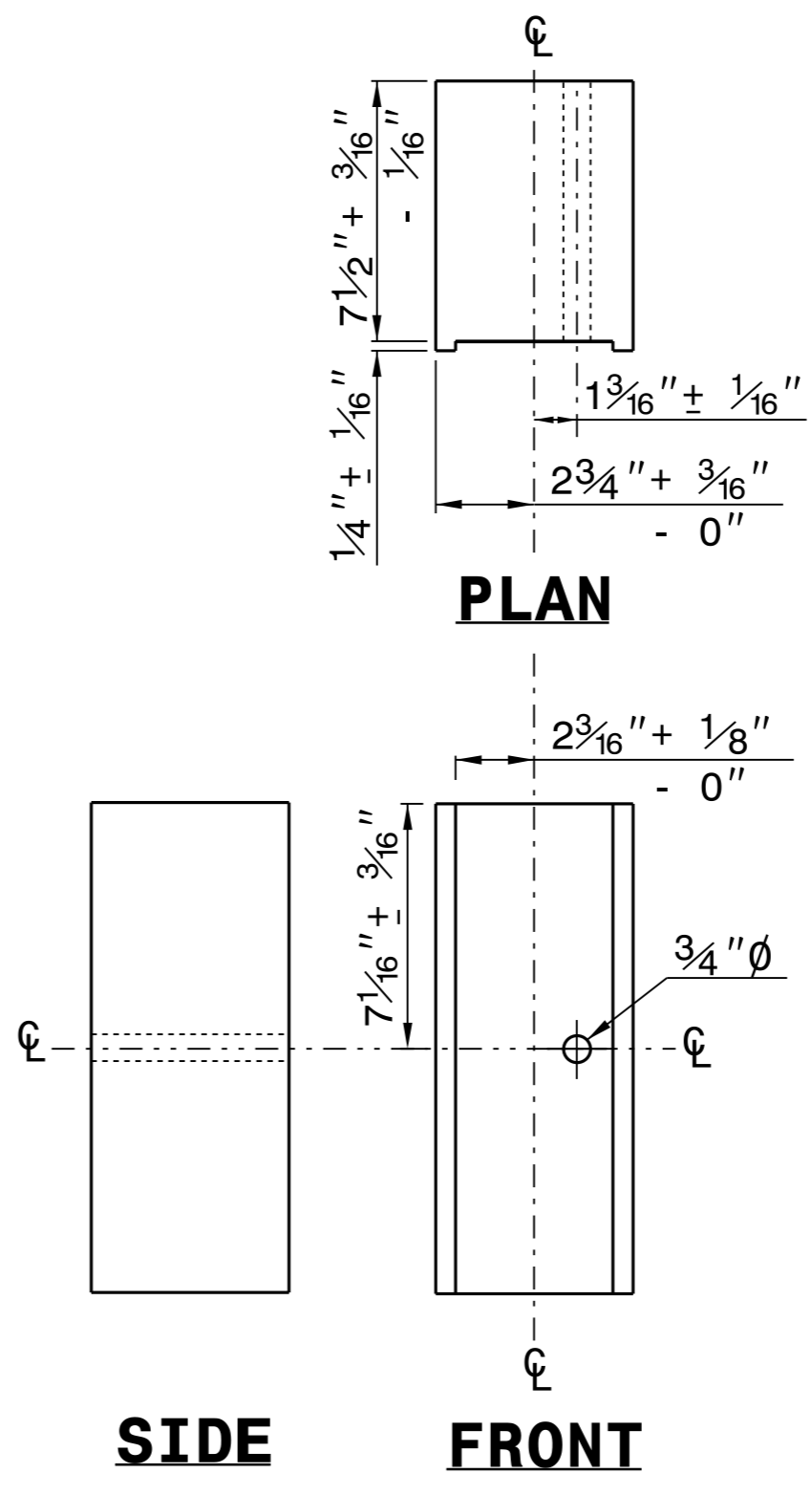
**WOOD OFFSET BLOCK  
(FOR WOOD POSTS)**

**STANDARD  
LINE POST**

**SHORT WOOD  
BREAKAWAY POST**



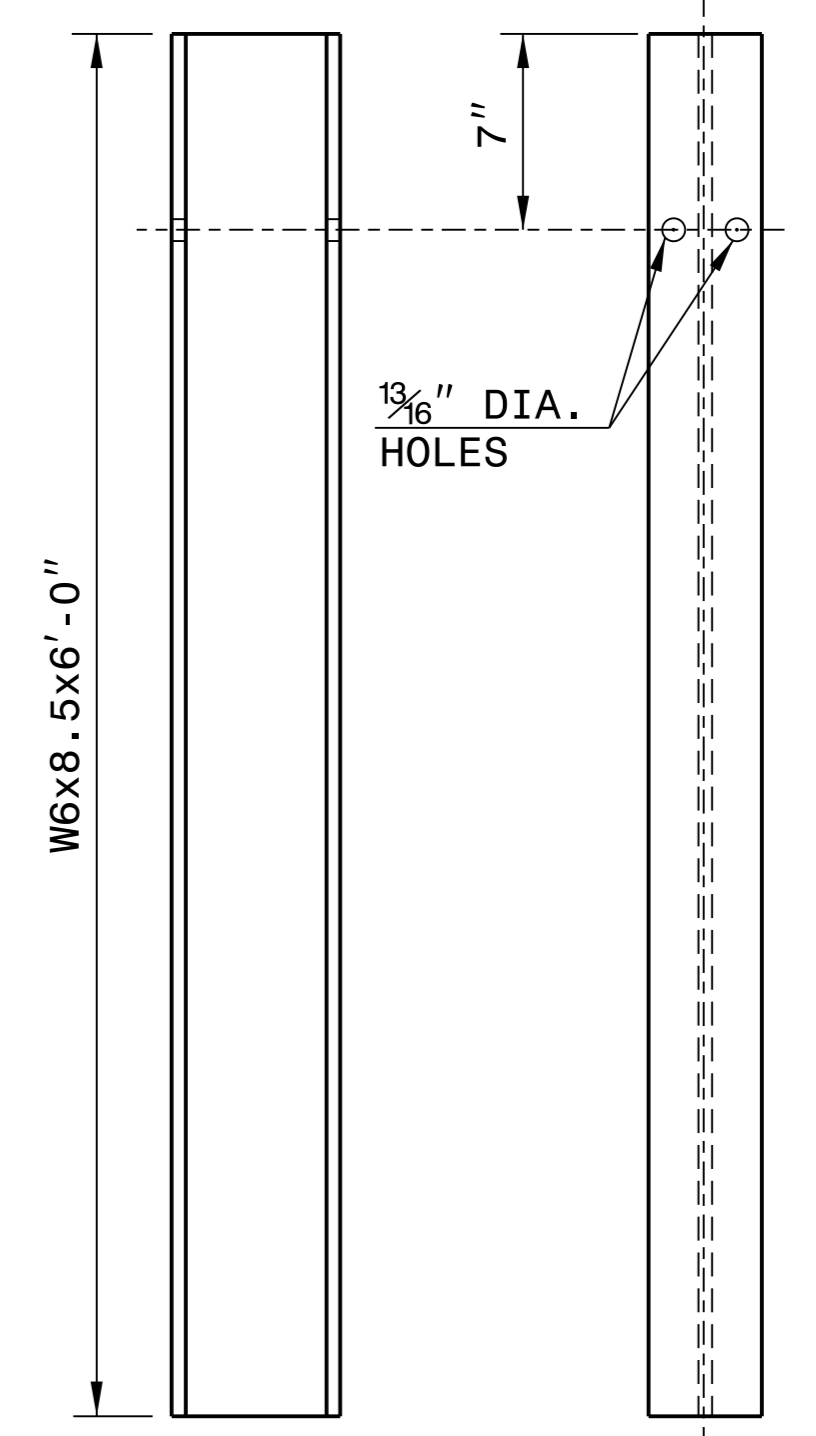
**STEEL TUBE  
TS 6"x8"x0.1875"**



**SIDE**

**FRONT**

**ROUTED  
OFFSET BLOCK**

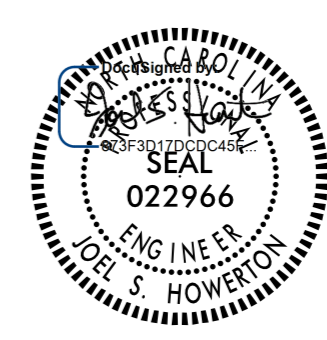


**SIDE**

**FRONT**

**"W6" STEEL POST**

**SYSTEM PARTS**



6/28/2018 9:11:06 AM EST

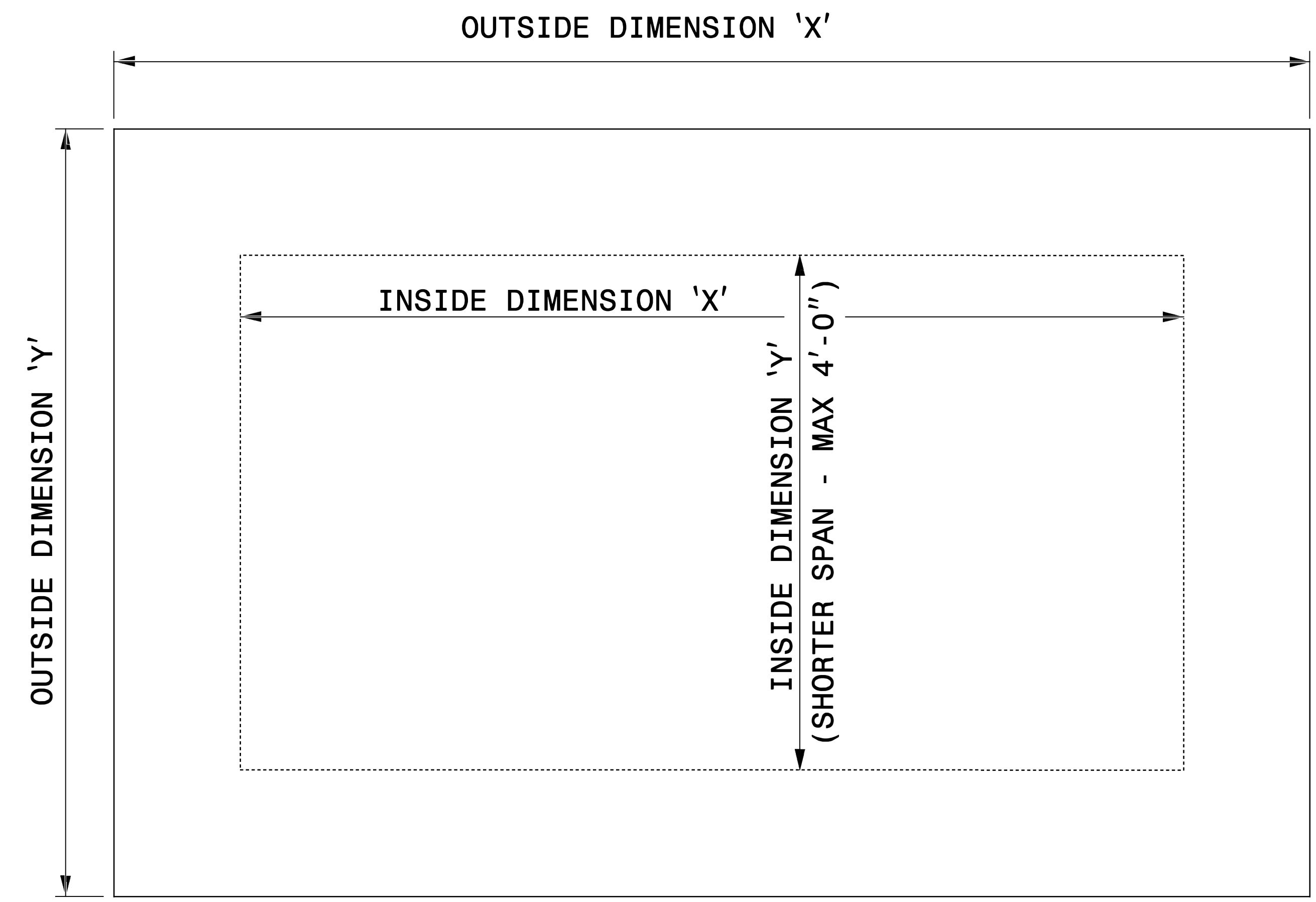
**CONTRACTS STANDARDS  
AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

**SEE TITLE BLOCK**

|                          |                |
|--------------------------|----------------|
| ORIGINAL BY: J. HOWERTON | DATE: 3-7-2018 |
| MODIFIED BY:             | DATE:          |
| CHECKED BY:              | DATE:          |
| FILE SPEC.:              |                |

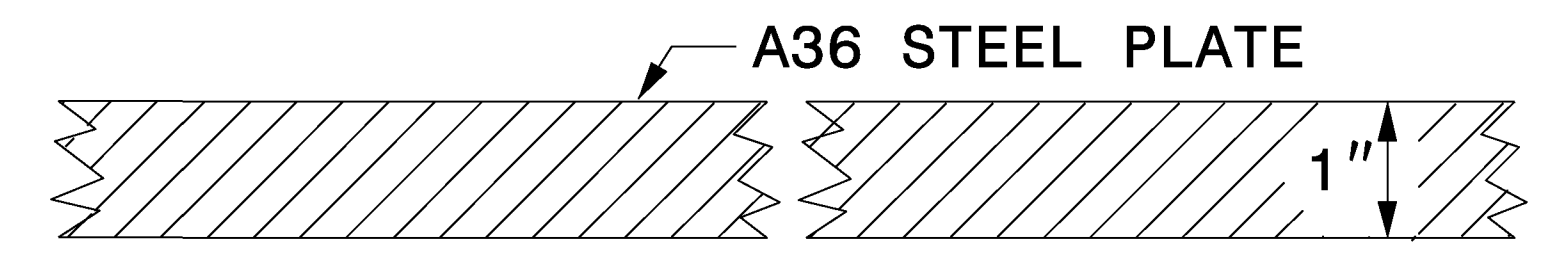






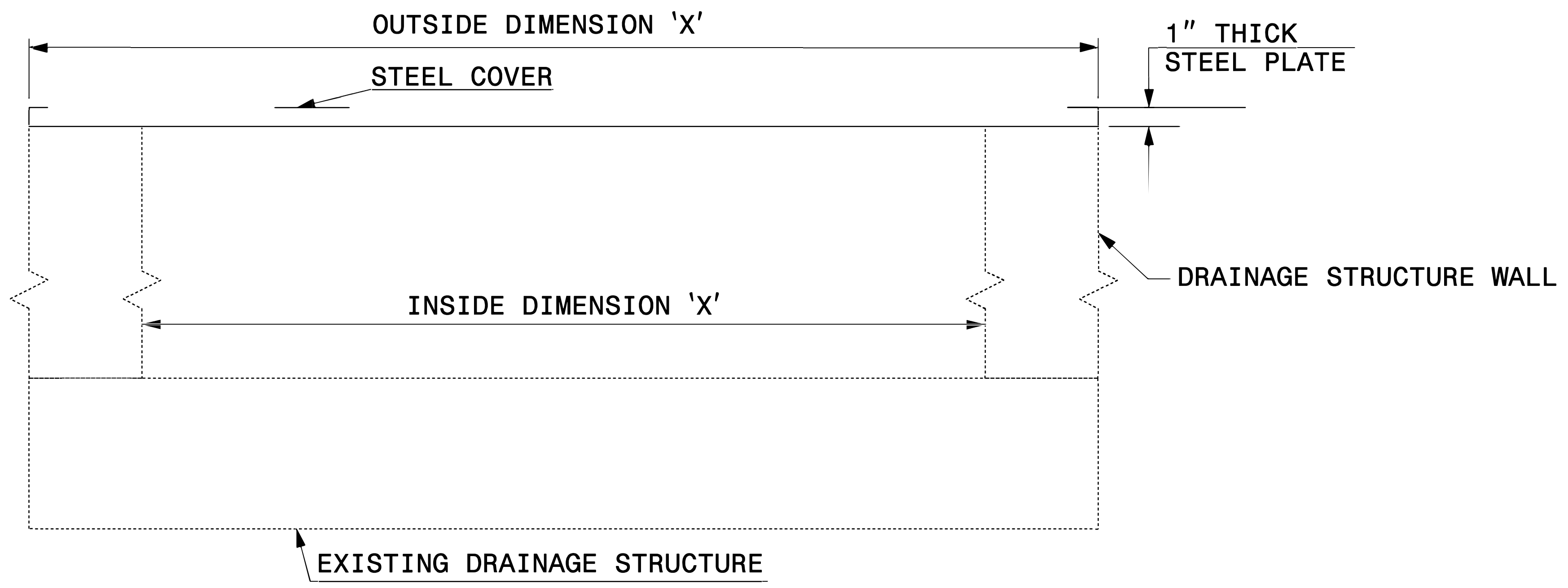
**GENERAL NOTES:**

- USE GRADE A36 STEEL
- STEEL COVERS ARE FOR TEMPORARY USE DURING PHASE CONSTRUCTION.
- FILL SHALL BE PLACED DIRECTLY OVER THE STEEL PLATES.
- SEE ROADWAY PLANS AND PROVISIONS FOR LOCATIONS
- QUANTITIES TO BE PAID FOR AT THE UNIT PRICE BID PER EACH.

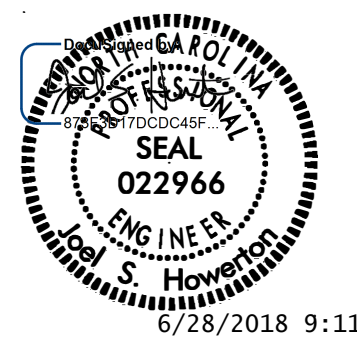


**SECTION VIEW OF STEEL TOP PLATE**

**PLAN VIEWS**



**ELEVATION VIEWS**



6/28/2018 9:11:06 AM EDT

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED

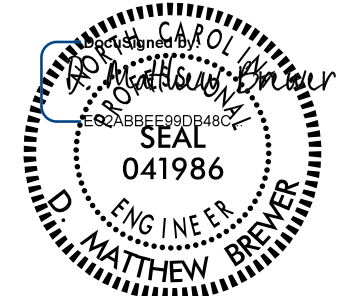
**CONTRACT STANDARDS AND DEVELOPMENT UNIT**  
Office 919-707-6950 FAX 919-250-4119

**DETAIL OF TEMPORARY 1" STEEL COVER OVER DRAINAGE STRUCTURE**

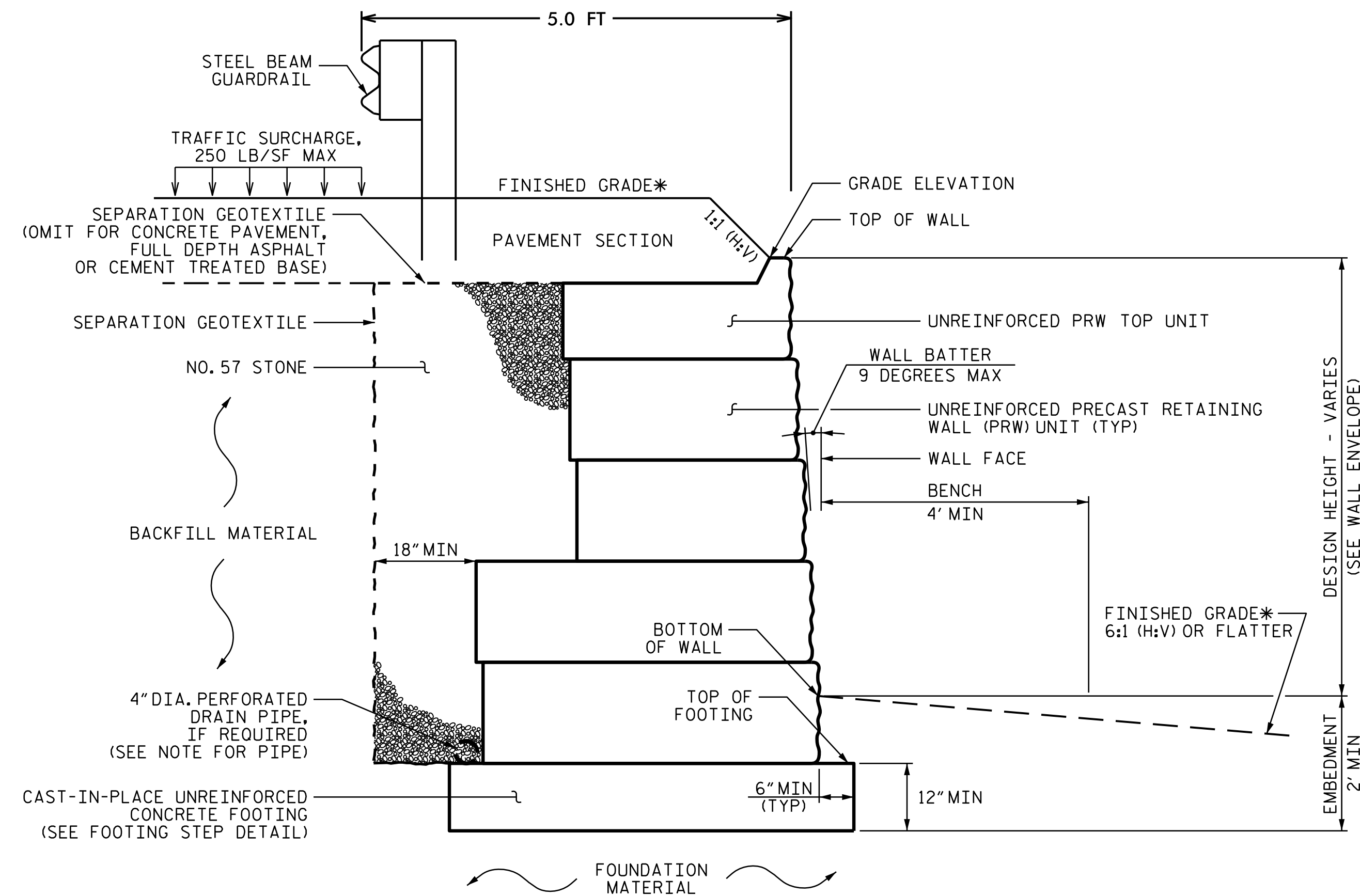
ORIGINAL BY: E.E. WARD DATE: 2-2-98  
 MODIFIED BY: DATE:  
 CHECKED BY: DATE:  
 FILE SPEC.: eric:/usr/details/metric/stand/st1cvr2.dgn

SCHEMATIC DEVELOPMENT AND DESIGN



|   |                            |
|---|----------------------------|
| GEOTECHNICAL ENGINEER<br><br>6/28/2018 7:28:57 AM PDT<br>SIGNATURE DATE | ENGINEER<br>SIGNATURE DATE |
| <b>DOCUMENT NOT CONSIDERED FINAL<br/>UNLESS ALL SIGNATURES COMPLETED</b>  |                            |

**SHEET 2G-2**



**PRECAST GRAVITY WALL WITH TOP PRW UNIT - TYPICAL SECTION**

\*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

**NOTES:**

- FOR PRECAST GRAVITY RETAINING WALLS, SEE PRECAST GRAVITY RETAINING WALLS PROVISION.
- FOR STEEL BEAM GUARDRAIL, SEE ROADWAY PLANS AND SECTION 862 OF THE STANDARD SPECIFICATIONS.
- A DRAIN PIPE IS REQUIRED FOR RETAINING WALL NO. 1.
- BEFORE BEGINNING PRECAST GRAVITY WALL DESIGN FOR RETAINING WALL NO. 1, SURVEY WALL LOCATION AND SUBMIT A REVISED WALL PROFILE VIEW (WALL ENVELOPE) FOR REVIEW. DO NOT START WALL DESIGN OR CONSTRUCTION UNTIL THE REVISED WALL ENVELOPE IS ACCEPTED.
- DESIGN RETAINING WALL NO. 1 FOR WALL HEIGHTS EQUAL TO THE DESIGN HEIGHT PLUS DEPTH TO TOP OF FOOTING (DIFFERENCE BETWEEN GRADE ELEVATION AND TOP OF FOOTING ELEVATION).

- DESIGN RETAINING WALL NO. 1 FOR THE FOLLOWING:
- 1) MAXIMUM FACTORED VERTICAL PRESSURE ON FOUNDATION MATERIAL = 2000 LB/SF
  - 2) MINIMUM EMBEDMENT DEPTH = 2 FT
  - 3) IN-SITU ASSUMED MATERIAL PARAMETERS:

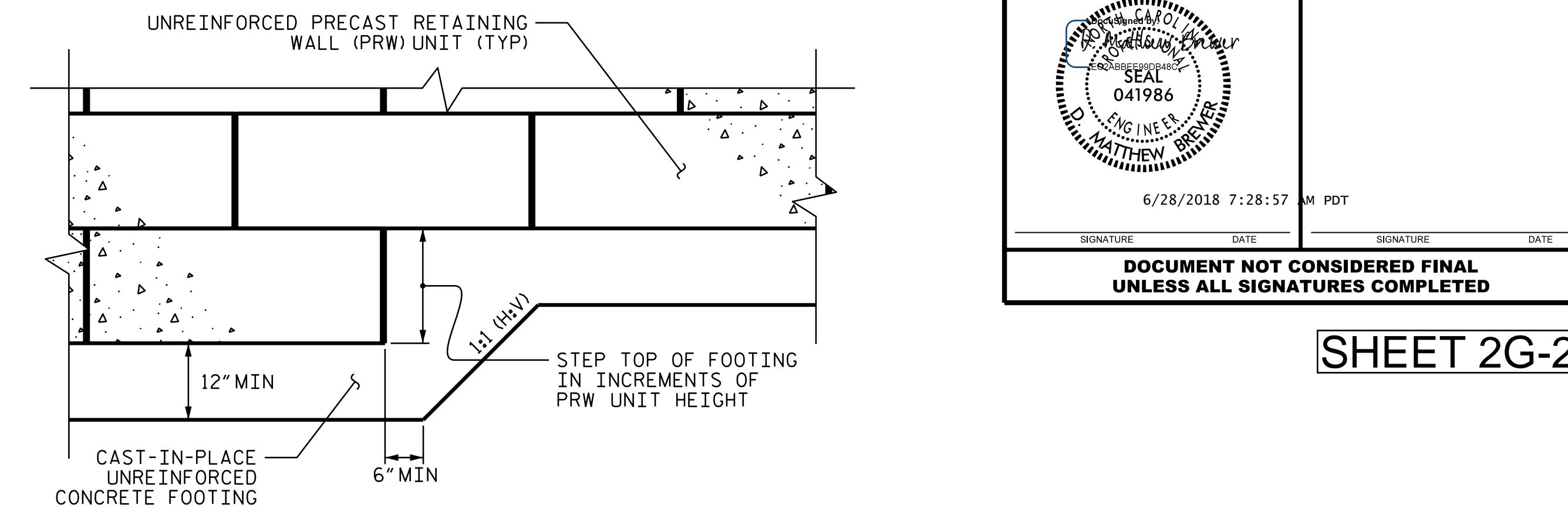
| MATERIAL TYPE | UNIT WEIGHT (γ) LB/CF | FRICTION ANGLE (φ) DEGREES | COHESION (c) LB/SF |
|---------------|-----------------------|----------------------------|--------------------|
| BACKFILL      | 120                   | 30                         | 0                  |
| FOUNDATION    | 120                   | 30                         | 0                  |

DESIGN RETAINING WALL NO. 1 FOR A LIVE LOAD (TRAFFIC) SURCHARGE. IF PRESENT, DESIGN RETAINING WALL NO. 1 FOR DRAINAGE PIPES THAT EXTEND THROUGH OR UNDER THE WALL, WHERE APPLICABLE. DO NOT PLACE CONCRETE FOR FOOTINGS FOR RETAINING WALL NO. 1 UNTIL EXCAVATION DIMENSIONS AND FOUNDATION MATERIAL ARE APPROVED.

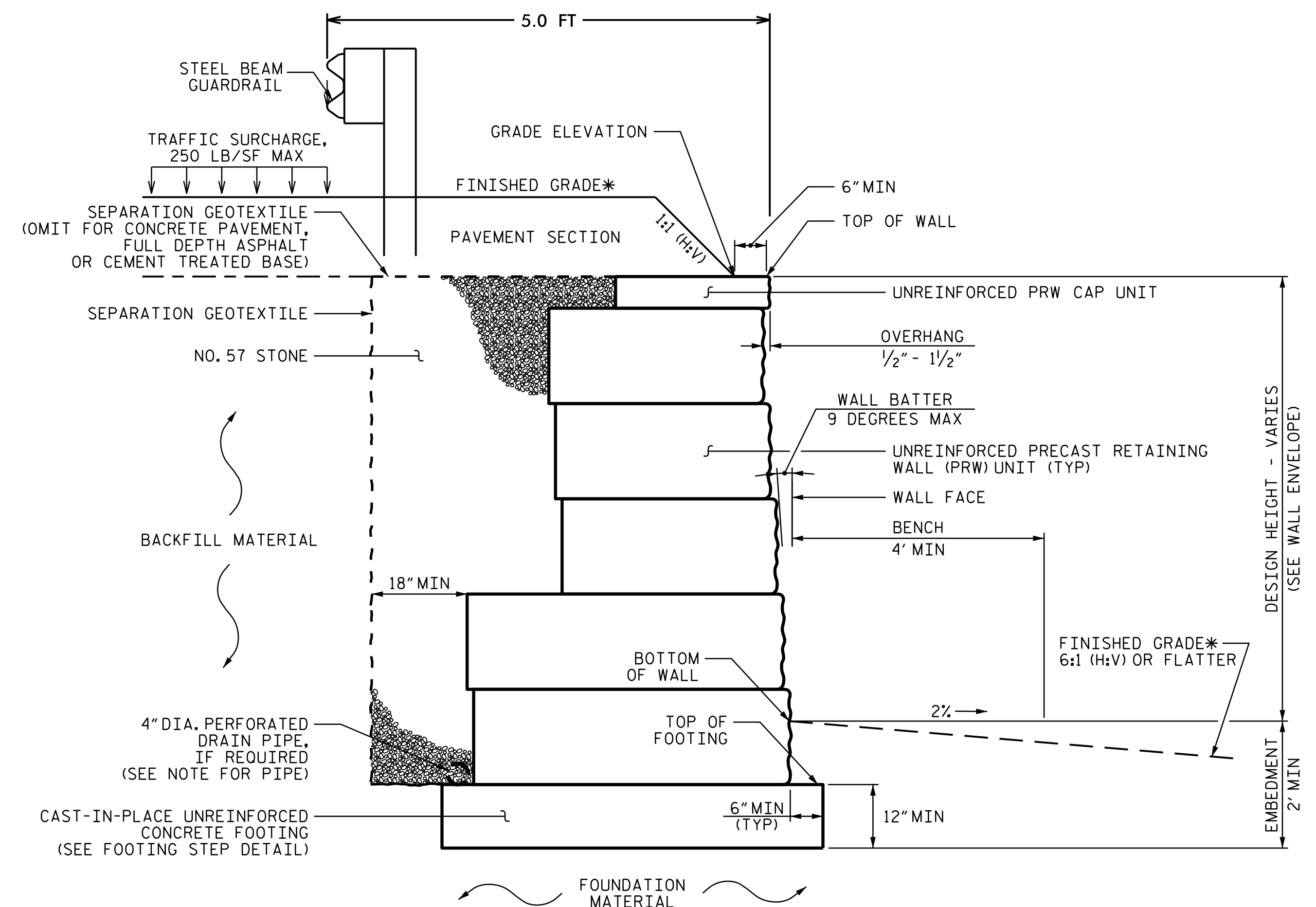
\*TEMPORARY SHORING\* MAY BE REQUIRED FOR RETAINING WALL NO. 1 IN ACCORDANCE WITH THE TEMPORARY SHORING PROVISION. SEE ROADWAY PLANS.

AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING FOR TEMPORARY SHORING FROM STATION 41+53.66 TO STATION 42+60. SEE STANDARD DRAWING NO. 1801.01 FOR STANDARD TEMPORARY SHORING.

AT THE CONTRACTOR'S OPTION, \*TEMPORARY SHORING FOR WALL CONSTRUCTION\* MAY BE USED TO CONSTRUCT RETAINING WALL NO. 1. SEE PRECAST GRAVITY RETAINING WALLS PROVISION FOR TEMPORARY SHORING FOR WALL CONSTRUCTION.



**FOOTING STEP DETAIL**



**PRECAST GRAVITY WALL WITH CAP PRW UNIT - TYPICAL SECTION**


\*SEE ROADWAY PLANS FOR FINISHED GRADE DETAILS.

PROJECT NO.: U-5833

RUTHERFORD COUNTY

STATION: 41+53.66 TO 43+00 -L-

*Prepared in the Office of:*




**ECS SOUTHEAST, LLP**  
 1812 CENTER PARK DRIVE, SUITE D  
 CHARLOTTE, NC 28217  
 (704) 525-5152 [PHONE]  
 (704) 357-0023 [FAX]  
 NC REGISTERED ENGINEERING FIRM # F-1078

**STD CELL Wall\_PrecastGravity\_noSlope**

**PRECAST GRAVITY WALL WITHOUT BACK SLOPE - TYPICALS NOTES & FOOTING STEP DETAIL**

DATE: 10/4/17

|  |  |  |
|--|--|--|
| <b>PROJECT REFERENCE NO.</b><br>U-5833   |  | <b>SHEET NO.</b><br>2G-3   |
| GEOTECHNICAL ENGINEER<br><br>ENGINEER |  | ENGINEER<br>DATE: 6/28/2018 7:28:57 AM PDT<br>SIGNATURE: _____ DATE: _____ |
| <b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b>   |  |  |

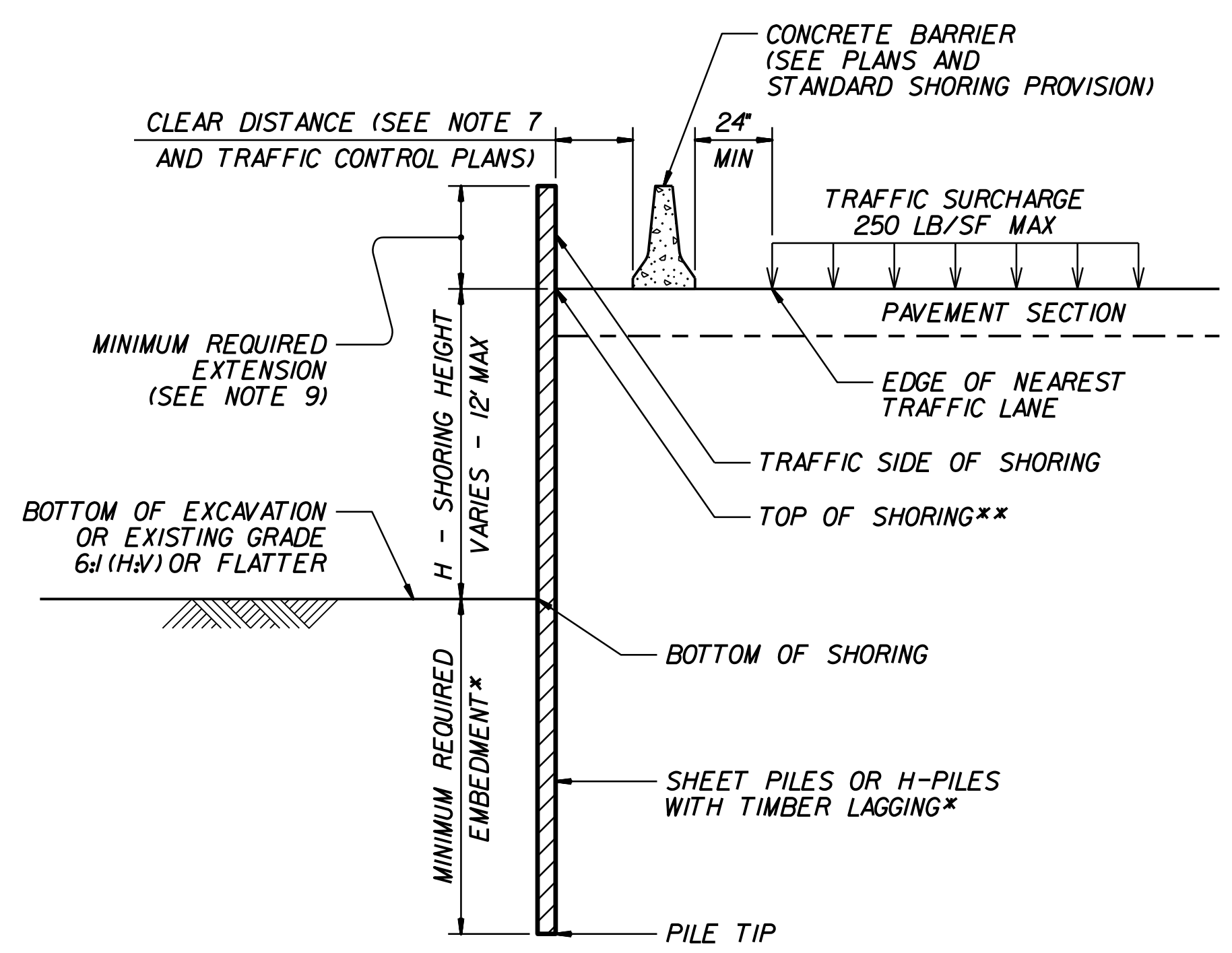
| GROUNDWATER CONDITION (SEE NOTE 6)                           | H SHORING HEIGHT (FT) | SLOPE OR SURCHARGE CASE WITH NO TRAFFIC IMPACT |  |  |          |          |                                 | SURCHARGE CASE WITH TRAFFIC IMPACT                     |  |          |          |  |  |
|--|-----------------------|--|--|--|----------|----------|---------------------------------|--|--|----------|----------|--|--|
|  |                       | SHEET PILES                                    |  | H-PILES WITH TIMBER LAGGING                    |          |          | SHEET PILES                     |  | H-PILES WITH TIMBER LAGGING                    |          |          |  |  |
|  |                       | MINIMUM REQUIRED EMBEDMENT (FT)                | MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /FT) | MINIMUM REQUIRED EMBEDMENT* (FT) (SEE NOTE 10) |          |          | MINIMUM REQUIRED EMBEDMENT (FT) | MINIMUM REQUIRED SECTION MODULUS (IN <sup>3</sup> /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     |  |  |

**NOTES:**

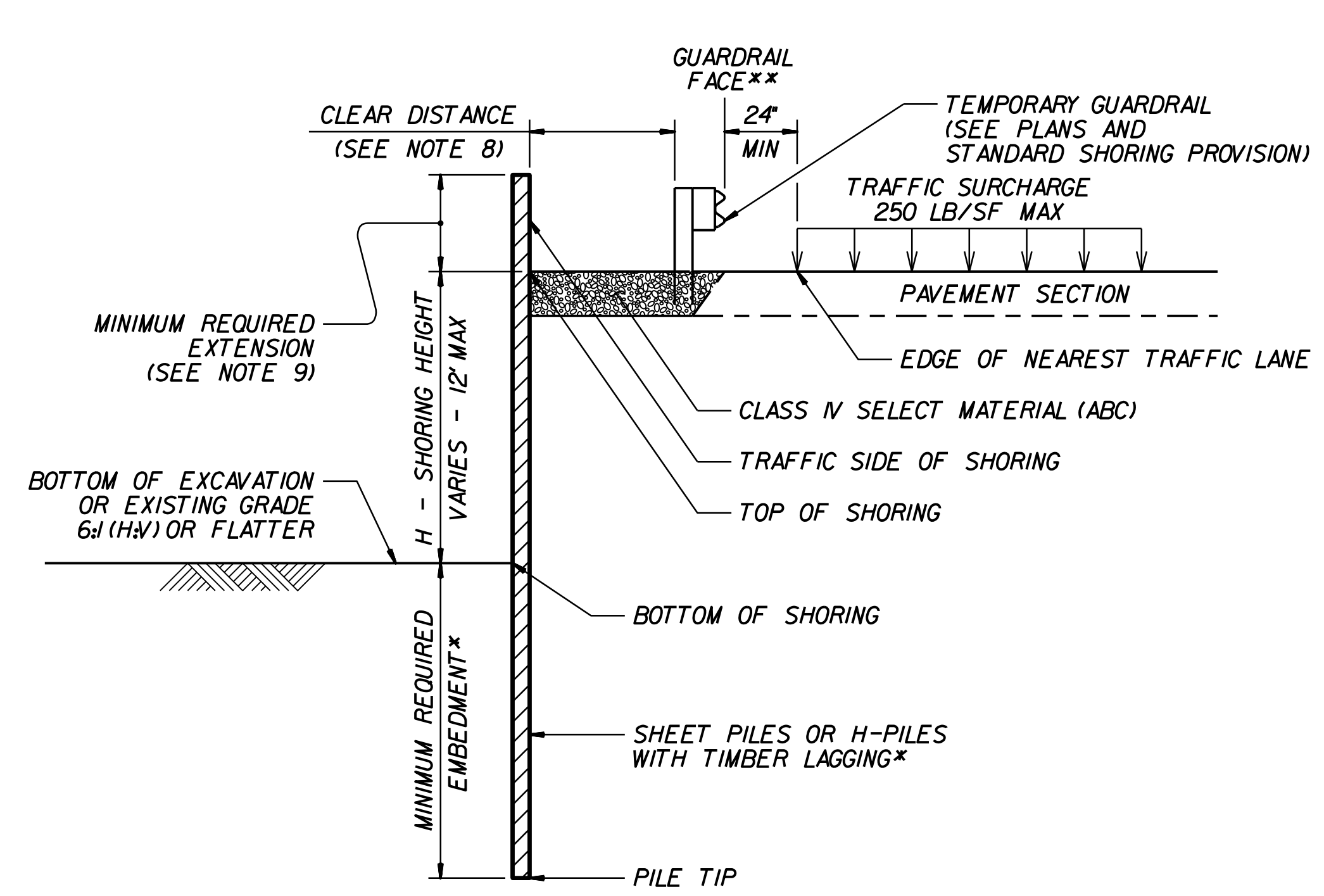
- AT THE CONTRACTOR'S OPTION, USE STANDARD TEMPORARY SHORING AS NOTED IN THE PLANS.
- FOR STANDARD TEMPORARY SHORING, SEE STANDARD SHORING PROVISION.
- STANDARD TEMPORARY SHORING IS BASED ON THE FOLLOWING IN-SITU ASSUMED SOIL PARAMETERS:  
UNIT WEIGHT,  $\gamma = 120$  LB/CF  
FRICTION ANGLE,  $\phi = 30$  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](http://connect.ncdot.gov/resources/Geological/Pages/Geotech_Forms_Details.aspx)
- CONTACT THE ENGINEER IF PILES DO NOT ATTAIN THE MINIMUM REQUIRED EMBEDMENT.

**MINIMUM REQUIRED EMBEDMENT AND SECTION MODULUS**

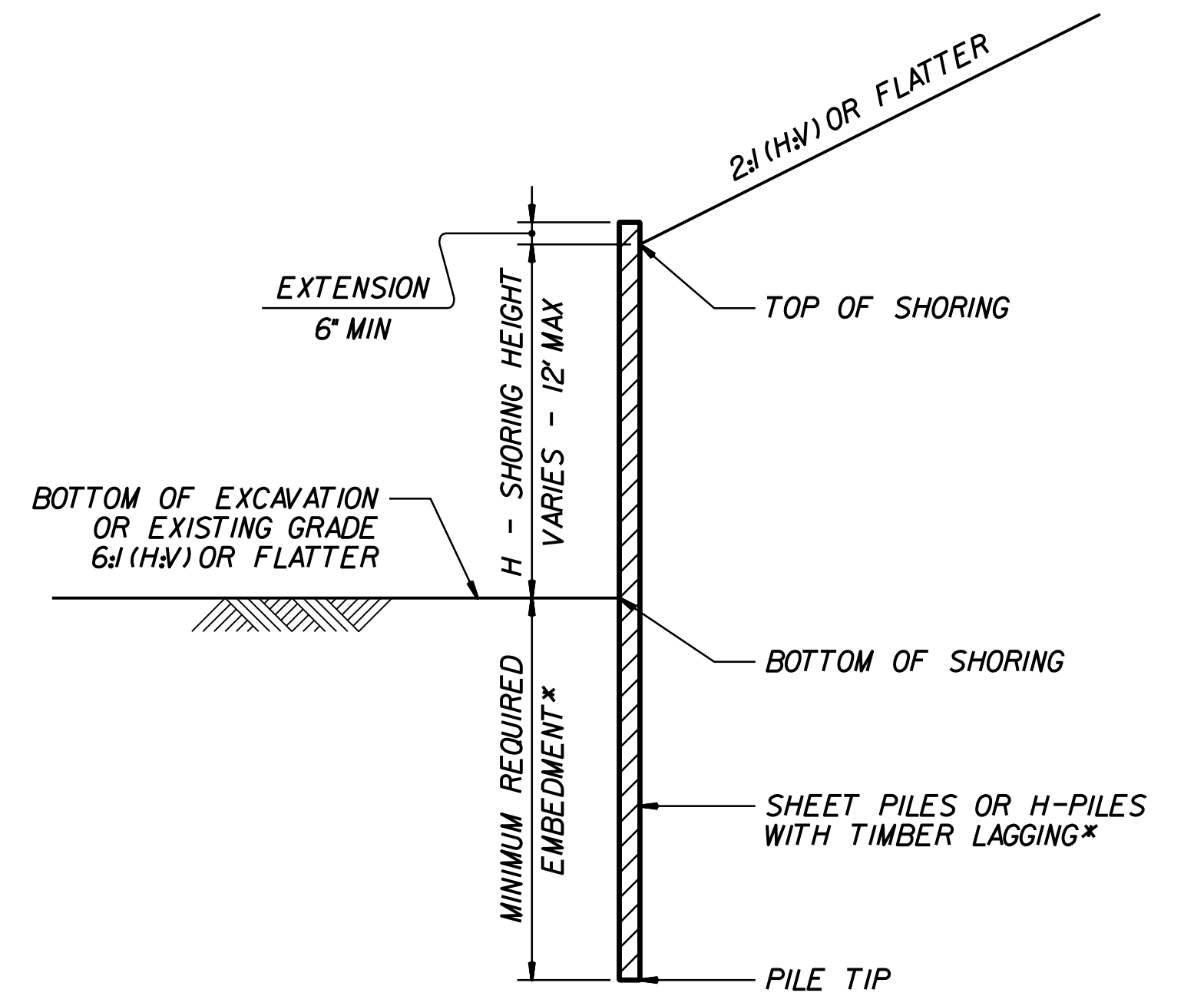
\*DO NOT USE H-PILES WITH TIMBER LAGGING FOR GROUNDWATER CONDITION, SHORING HEIGHT AND H-PILE SIZE SHOWN IF MINIMUM REQUIRED EMBEDMENT IS "--".



**CONCRETE BARRIER**  
\*\*TOP OF SHORING = EDGE OF PAVEMENT

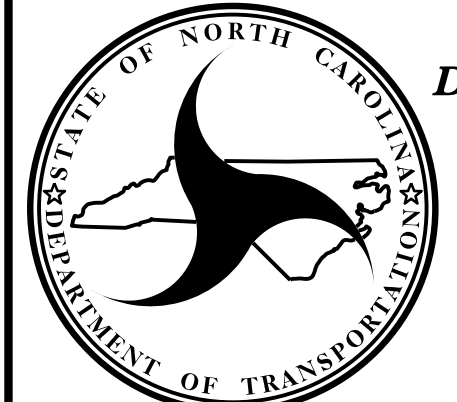


**TEMPORARY GUARDRAIL**  
\*\*GUARDRAIL FACE = EDGE OF PAVEMENT



**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**  
DATE: 11-19-13















COMPUTED BY: M. Brewer DATE: 10/2/17  
 CHECKED BY: M. Walko DATE: 10/4/17

(2-16-16)

PROJECT NO. U-5833 SHEET NO. 3G-1

**STATE OF NORTH CAROLINA  
 DIVISION OF HIGHWAYS**

**SUMMARY OF SUBSURFACE DRAINAGE**

| LINE        | Station | Station | Location LT/RT/CL | Drain Type* UD/BD/SD | LF  |
|-------------|---------|---------|-------------------|----------------------|-----|
|             |         |         |                   |                      |     |
| CONTINGENCY |         |         |                   | SD                   | 500 |
|             |         |         |                   | TOTAL LF:            | 500 |

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

**SUMMARY OF GEOTEXTILE FOR PAVEMENT STABILIZATION**

| LINE        | Station | Station | SY |
|-------------|---------|---------|----|
|             |         |         |    |
| CONTINGENCY |         |         |    |
| TOTAL SY:   |         |         | 0  |

**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                     | 12                         | 500                 | 950                                  | 1500                                 |                           |                                       |
|             |         |         | TOTAL CY/TONS/SY:       |                            | 500                 | 950                                  | 1500                                 | 0                         | 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 REINFORCED SOIL SLOPES AND SLOPE EROSION CONTROL**

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

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

**SUMMARY OF ROCK PLATING**

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

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

**SUMMARY OF PRE-SPLITTING OF ROCK**

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

**SUMMARY OF SURCHARGES AND SURCHARGE WAITING PERIODS**

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

**SUMMARY OF SETTLEMENT GAUGES**

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

**SUMMARY OF EMBANKMENT WAITING PERIODS**

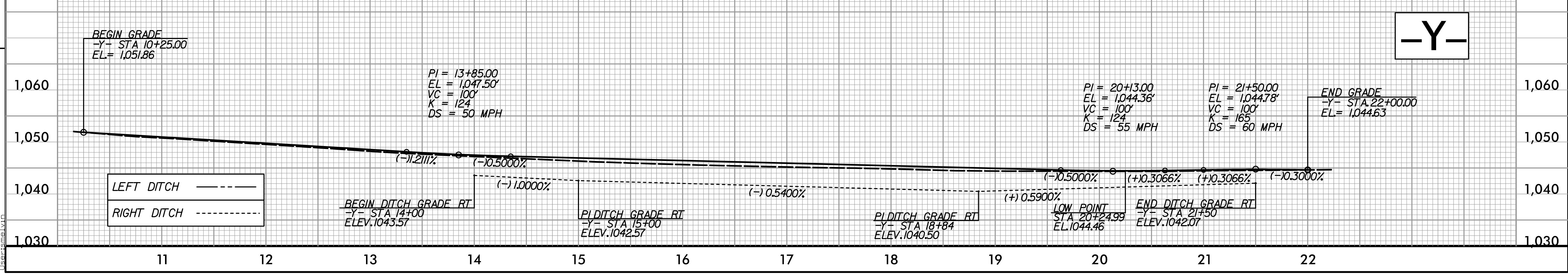
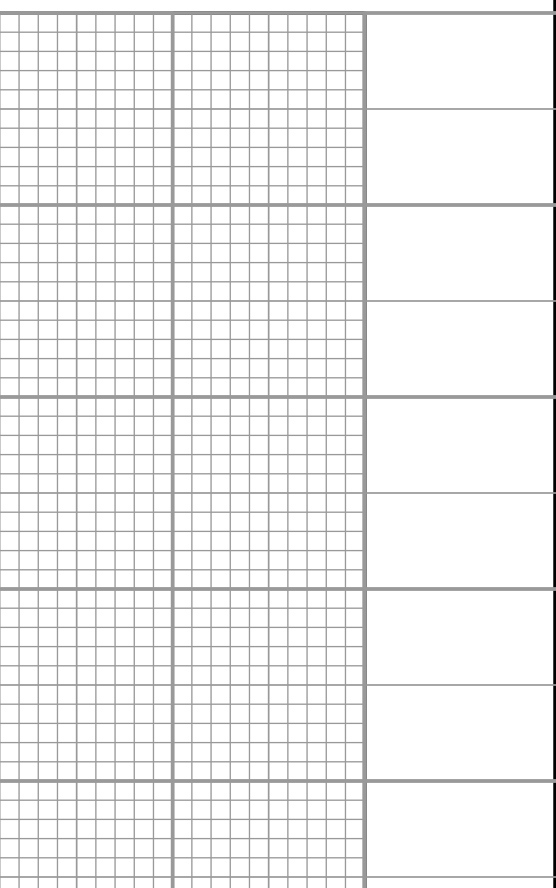
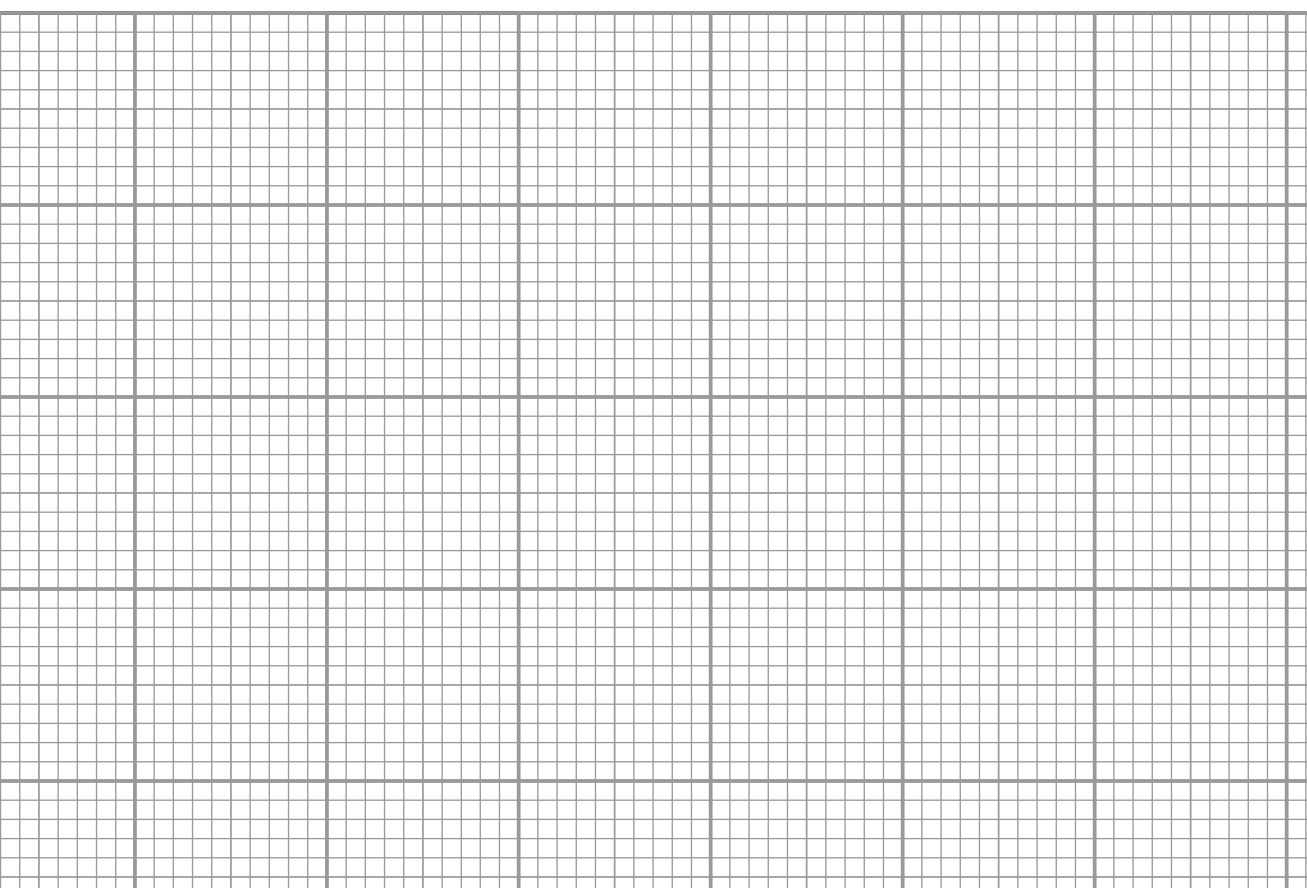
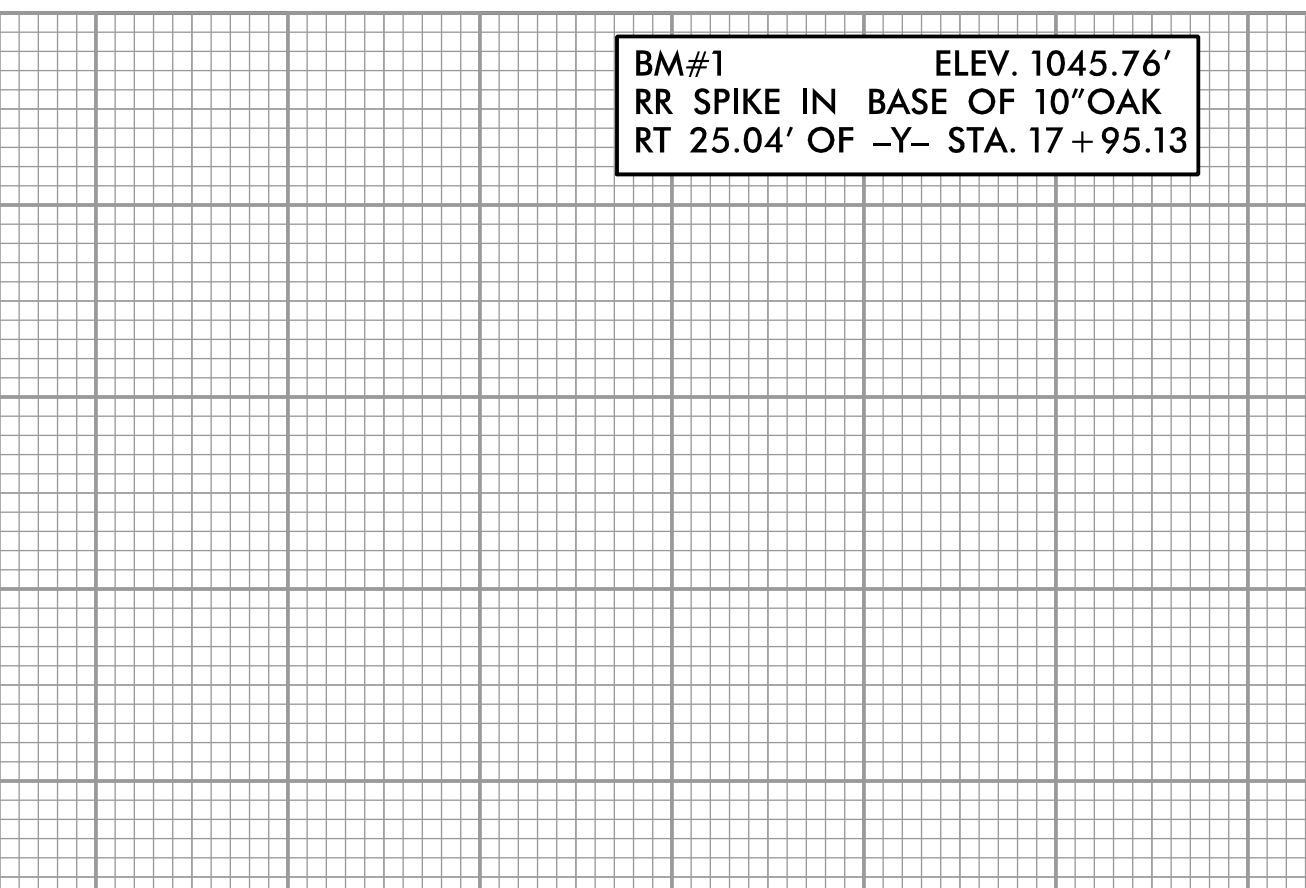
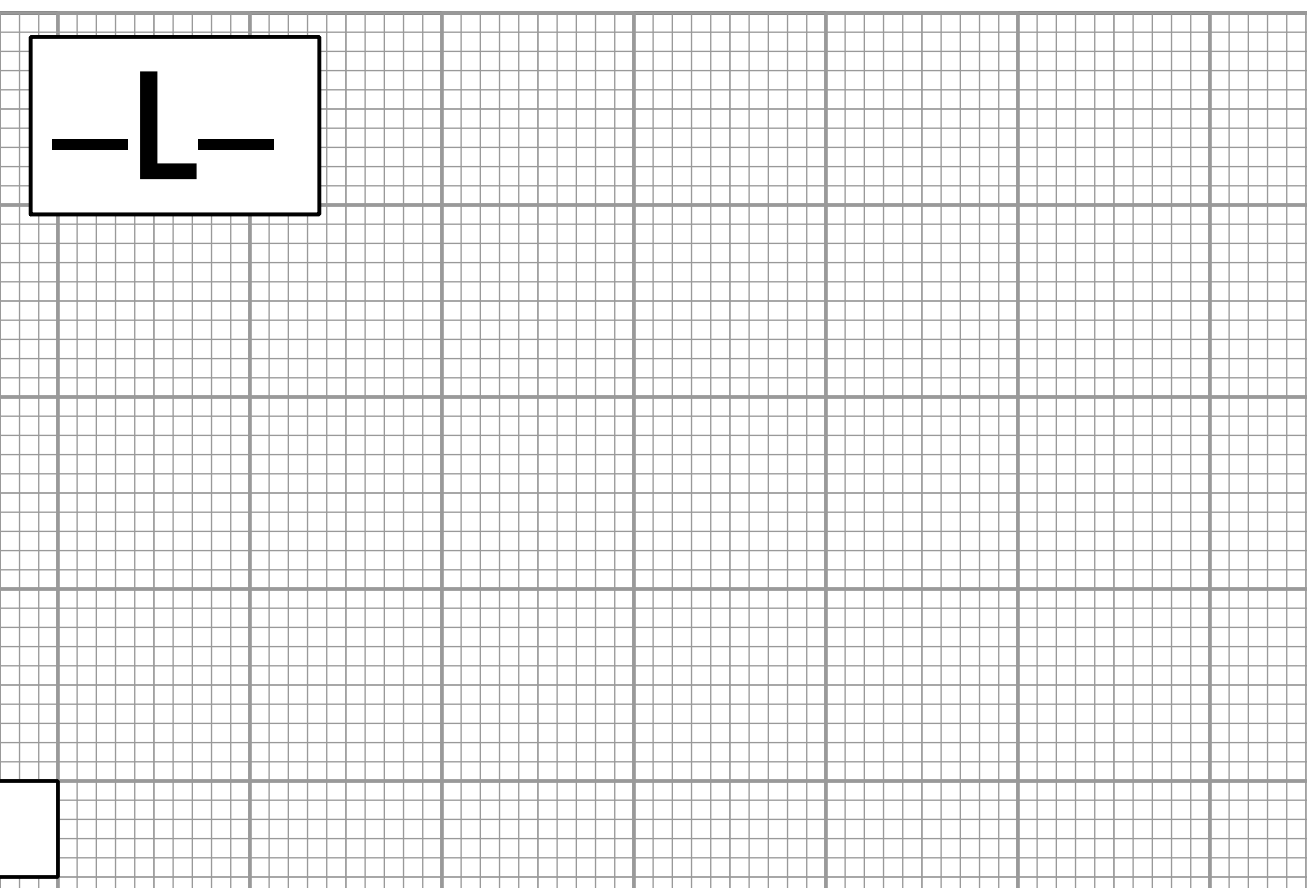
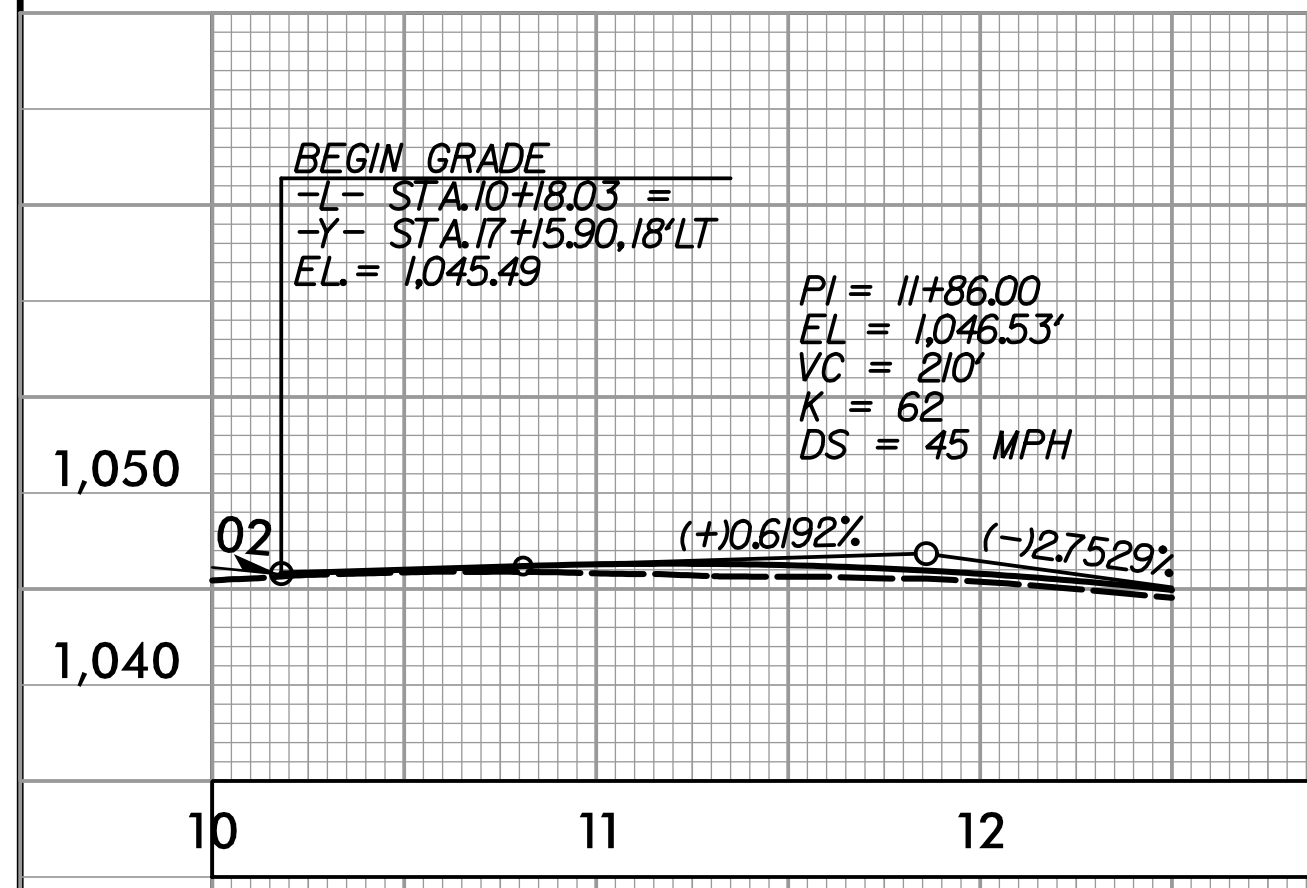
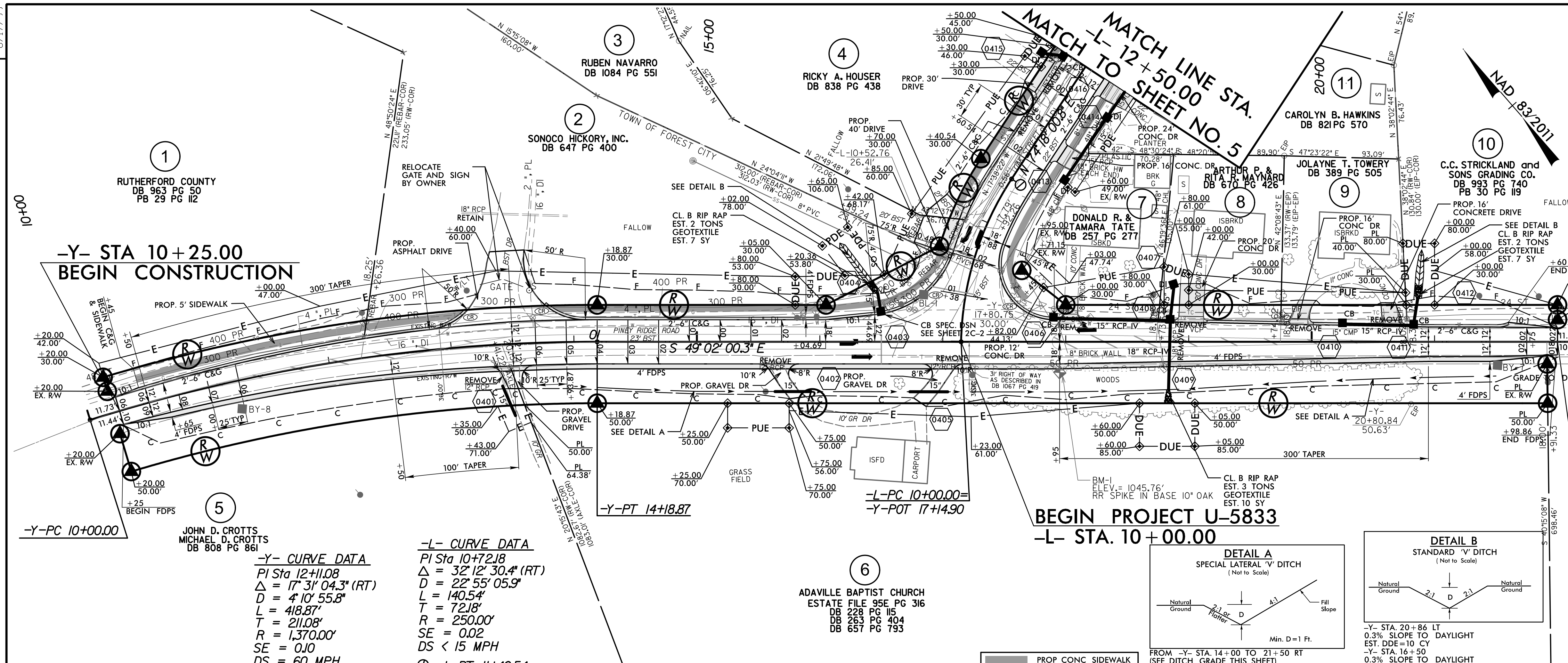
| LINE | Station | Station | MONTHS |
|------|---------|---------|--------|
|      |         |         |        |
|      |         |         |        |

**SUMMARY OF BRIDGE WAITING PERIODS**


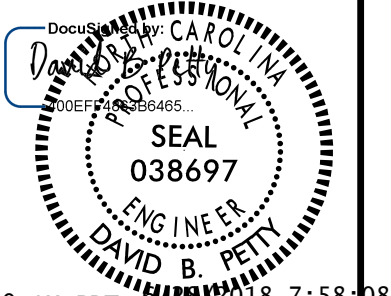

| Bridge Description | End Bent/ Bent No. | MONTHS |
|--------------------|--------------------|--------|
|                    |                    |        |
|                    |                    |        |

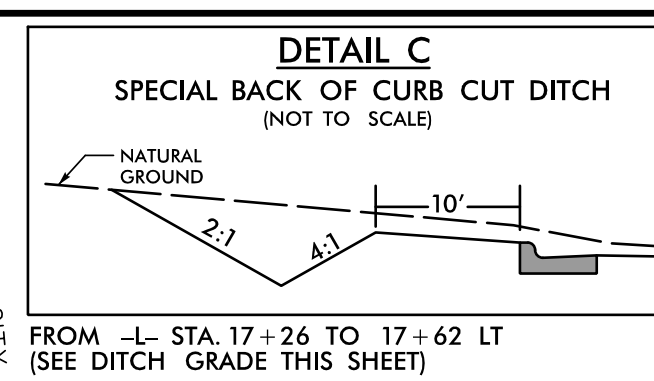


|   |                       |
|---|-----------------------|
| PROJECT REFERENCE NO.<br><b>U-5833</b>  | SHEET NO.<br><b>4</b> |
| ROADWAY DESIGN ENGINEER   | HYDRAULICS ENGINEER   |
|   |                       |
| DOCUMENT NOT CONSIDERED FINAL<br>UNLESS ALL SIGNATURES COMPLETED  |                       |
| <b>TGS ENGINEERS</b><br>804-C N. LAFAYETTE ST<br>SHELBY, NC 28150<br>PH (704) 476-0003<br>CORP. LICENSE NO.: C-0275 |                       |



8/17/2018 U-5833-Roadway-Proj-U-5833-Rdy\_psh\_04.dgn  
 8/28/2018 U-5833-Roadway-Proj-U-5833-Rdy\_psh\_04.dgn  
 9/11/2018 U-5833-Roadway-Proj-U-5833-Rdy\_psh\_04.dgn

|  |  |   |  |
|--|--|---|--|
| PROJECT REFERENCE NO.<br><b>U-5833</b>   |  | SHEET NO.<br><b>5</b>   |  |
| ROADWAY DESIGN ENGINEER  |  | HYDRAULICS ENGINEER   |  |
|   |  |  |  |
| <p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p>  <p><b>TGS ENGINEERS</b><br/>804 C N. LAFAYETTE ST<br/>SHELBY, NC 28150<br/>PH (704) 476-0003<br/>CORP. LICENSE NO.: C-0275</p> |  |   |  |

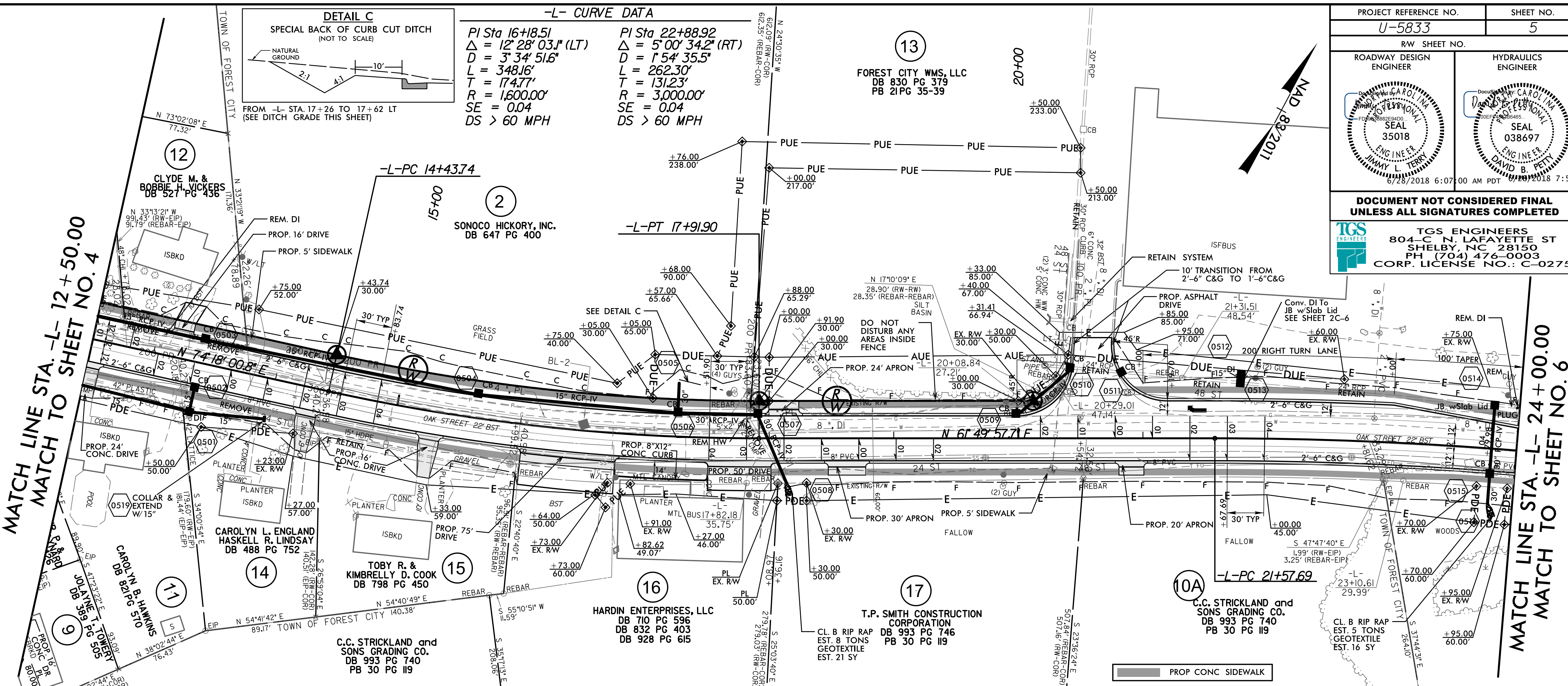


**-L- CURVE DATA**

|  |   |
|--|---|
| <b>PI Sta 16+18.51</b><br>$\Delta = 12' 28" 03.1" (LT)$<br>$D = 3' 34' 51.6"$<br>$L = 348.16'$<br>$T = 174.77'$<br>$R = 1,600.00'$<br>$SE = 0.04$<br>$DS > 60 MPH$ | <b>PI Sta 22+88.92</b><br>$\Delta = 5' 00' 34.2" (RT)$<br>$D = 1' 54' 35.5"$<br>$L = 262.30'$<br>$T = 131.23'$<br>$R = 3,000.00'$<br>$SE = 0.04$<br>$DS > 60 MPH$ |
|--|---|

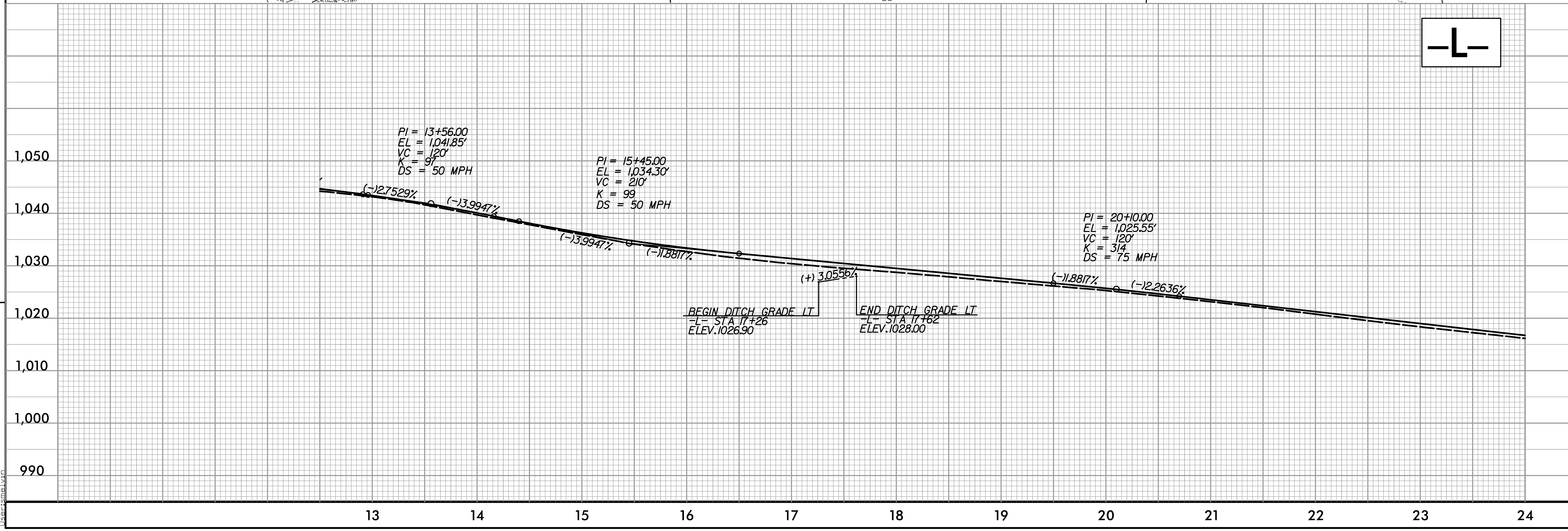
MATCH LINE STA. -L- 12+50.00  
MATCH TO SHEET NO. 4

MATCH LINE STA. -L- 24+00.00  
MATCH TO SHEET NO. 6



REVISIONS

6/28/2018 U-5833\Roadway\Proj\U-5833\_Rdy\_psh\_05.dgn  
licetame.lrn



**PEAK HOUR TRAFFIC VOLUMES**  
(Vehicles per Hour)

|           |           |             |
|-----------|-----------|-------------|
| 102 (164) | 175 (227) | 247 (283)   |
| 119 (185) | 197 (236) | 278 (319)   |
| 92 (181)  | 151 (165) | 216 (236)   |
| 104 (133) | 216 (236) | 2016 (2040) |

XX 000 AM (PM) PEAK HOURS 2016 2040

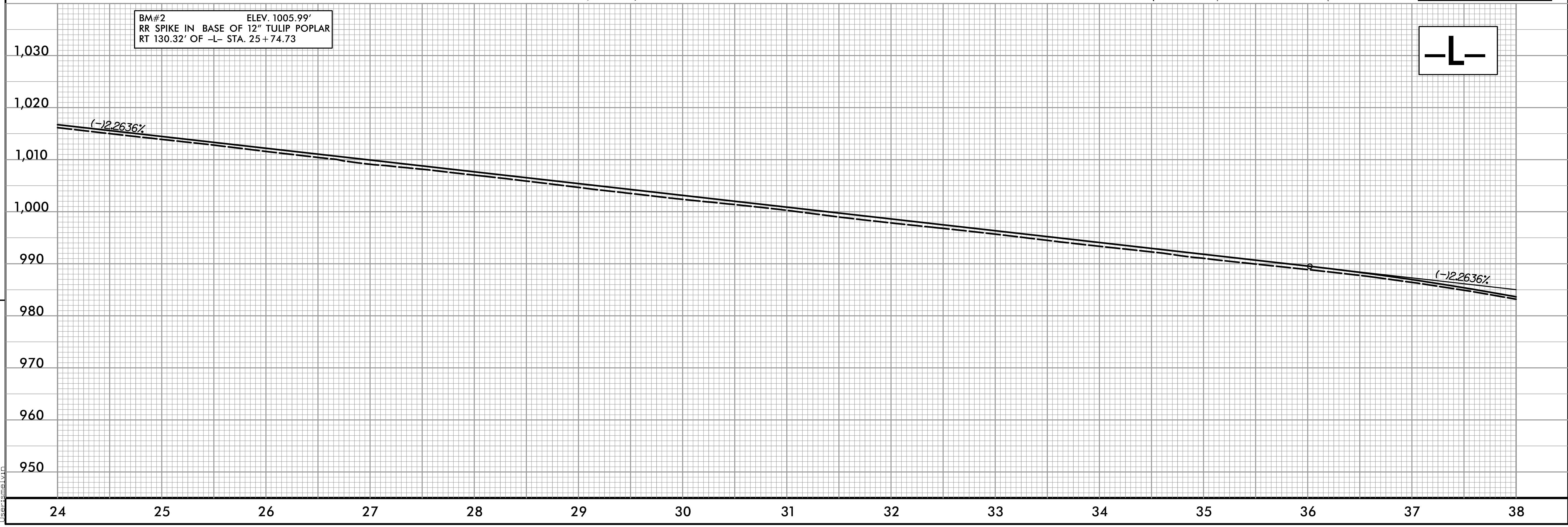
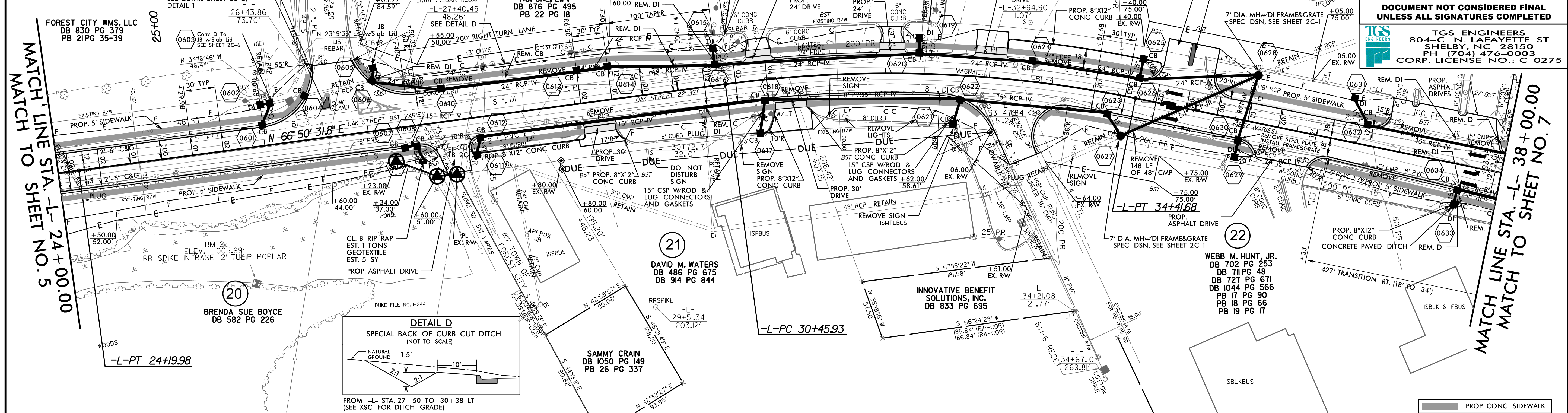
**-L- CURVE DATA**

|                                     |                                      |
|-------------------------------------|--------------------------------------|
| PI Sta 22+88.92                     | PI Sta 32+45.66                      |
| $\Delta = 5^{\circ} 00' 34.2" (RT)$ | $\Delta = 19^{\circ} 08' 05.9" (RT)$ |
| $D = 1^{\circ} 54' 35.5"$           | $D = 4^{\circ} 50' 06.3"$            |
| $L = 262.30'$                       | $L = 395.75'$                        |
| $T = 131.23'$                       | $T = 199.74'$                        |
| $R = 3,000.00'$                     | $R = 1,185.00'$                      |
| $SE = 0.04$                         | $SE = 0.04$                          |
| $DS > 60 \text{ MPH}$               | $DS = 50 \text{ MPH}$                |

|  |                          |
|--|--------------------------|
| PROJECT REFERENCE NO.<br><b>U-5833</b> | SHEET NO.<br><b>6</b>    |
| ROADWAY DESIGN ENGINEER                | HYDRAULICS ENGINEER      |
|  |                          |
| 6/28/2018 6:07:00 AM PDT               | 6/28/2018 7:58:38 AM PDT |

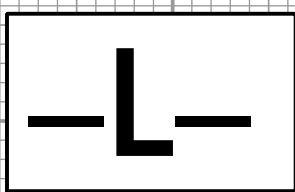
**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

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



REVISIONS

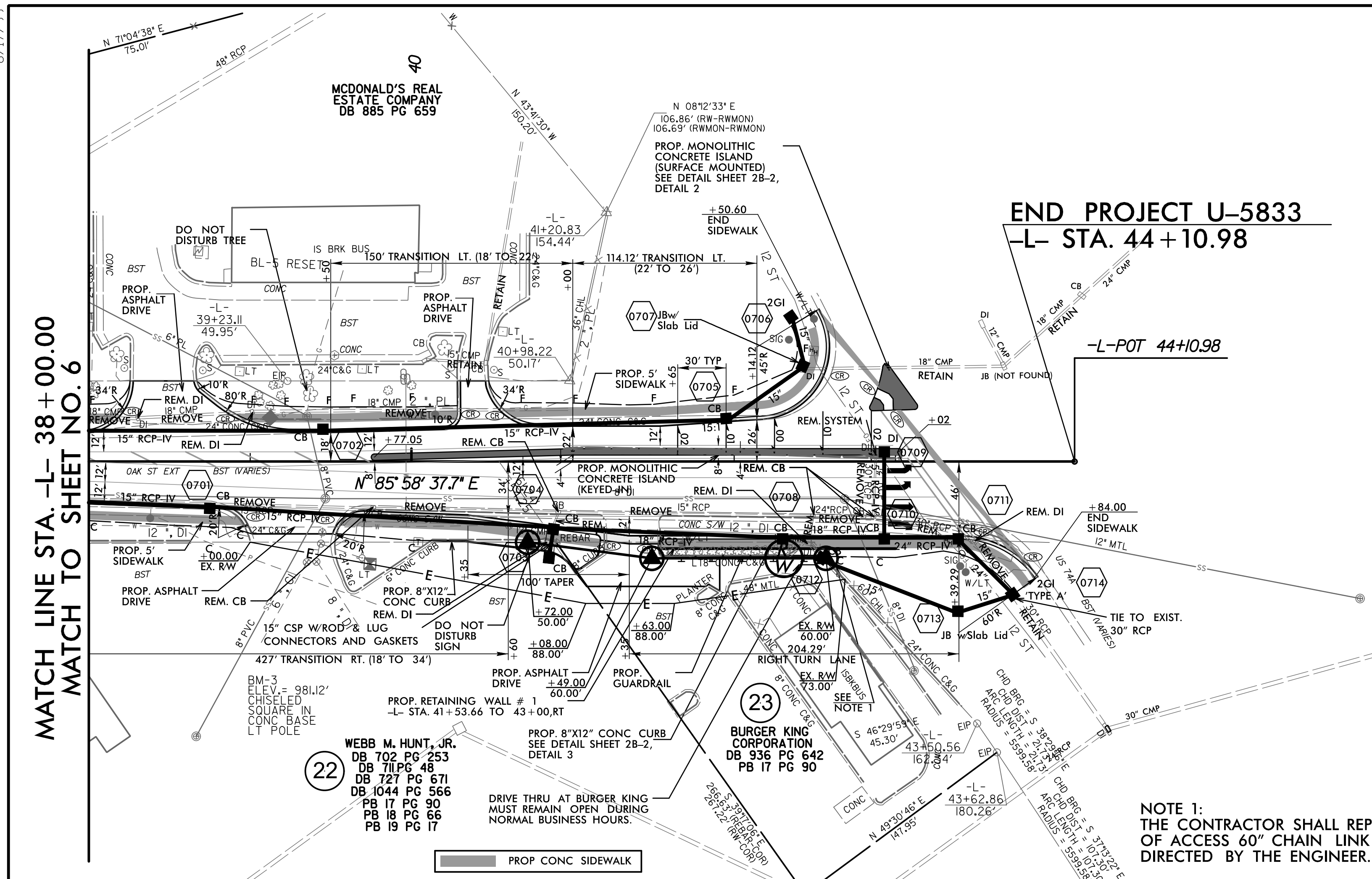
6/28/2018 U-5833\Roadway\Proj\U-5833\_Rdy\_psh\_06.dgn





|  |  |                       |  |
|--|--|-----------------------|--|
| PROJECT REFERENCE NO.<br><b>U-5833</b>   |  | SHEET NO.<br><b>7</b> |  |
| RW SHEET NO.   |  |                       |  |
| ROADWAY DESIGN ENGINEER  |  | HYDRAULICS ENGINEER   |  |
|  |  |                       |  |
| <p><b>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</b></p>  |  |                       |  |
|  |  |                       |  |
| <p>TGS ENGINEERS<br/>804-C N. LAFAYETTE ST<br/>SHELBY, NC 28150<br/>PH: (704) 476-0003<br/>CORP. LICENSE NO.: C-0275</p> |  |                       |  |

NAD '83/2011



MATCH LINE STA. -L- 38+00.00  
MATCH TO SHEET NO. 6

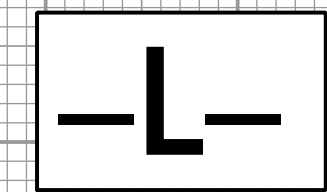
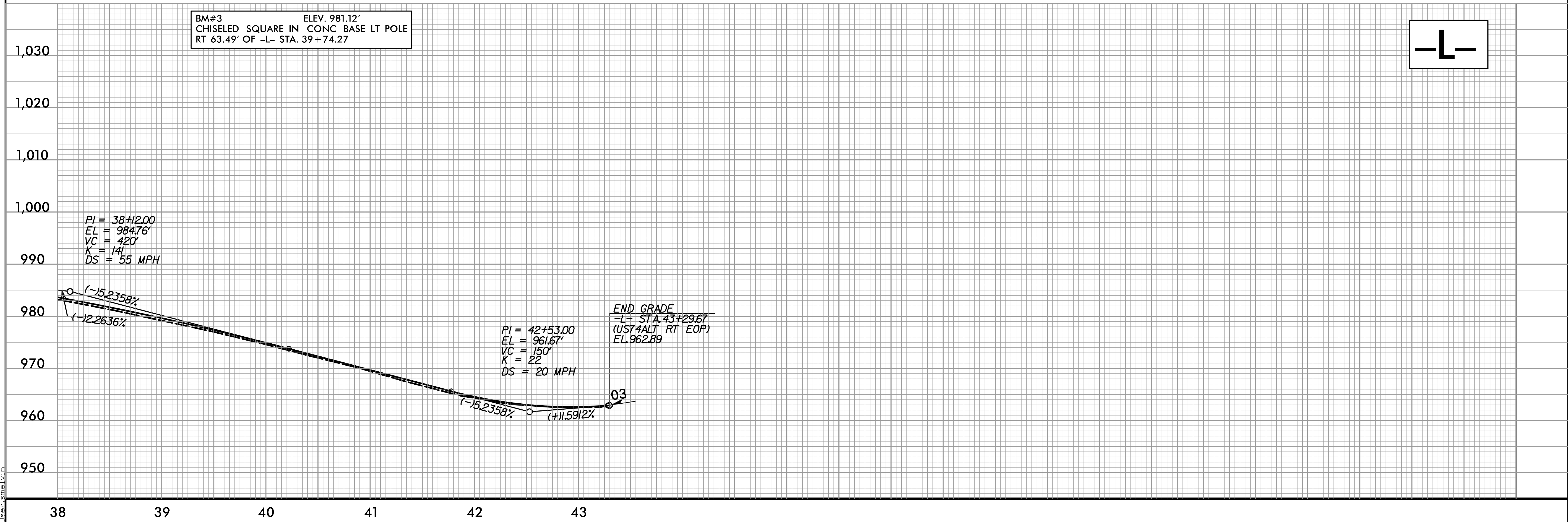
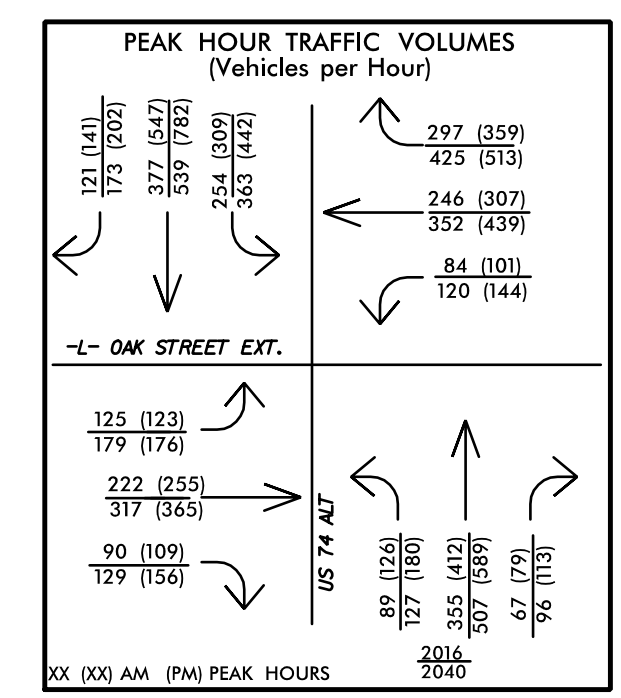
**END PROJECT U-5833**  
**-L- STA. 44+10.98**

**-L-POT 44+10.98**

**WEBB M. HUNT, JR.**  
DB 702 PG 253  
DB 716 PG 48  
DB 727 PG 671  
DB 1044 PG 566  
PB 17 PG 90  
PB 18 PG 66  
PB 19 PG 17

**BURGER KING CORPORATION**  
DB 936 PG 642  
PB 17 PG 90

**NOTE 1:**  
THE CONTRACTOR SHALL REPLACE CONTROL OF ACCESS 60' CHAIN LINK FENCE AS DIRECTED BY THE ENGINEER.



6/28/2018 U-5833\Roadway\Proj\U-5833\_Rdy\_psh\_07.dgn