

| | | | |
|-----------------|-----------------------------|----------------|--------------|
| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
| N.C. | B-4189 | 1 | |
| STATE PROJ. NO. | F.A. PROJ. NO. | DESCRIPTION | |
| 33536.1.1 | BRSTP-226 (8) | PE | |
| 33536.2.1 | BRSTP-226 (8) | RW & UTILITIES | |
| 33536.3.1 | BRSTP-226 (8) | CONSTRUCTION | |
| | | | |
| | | | |

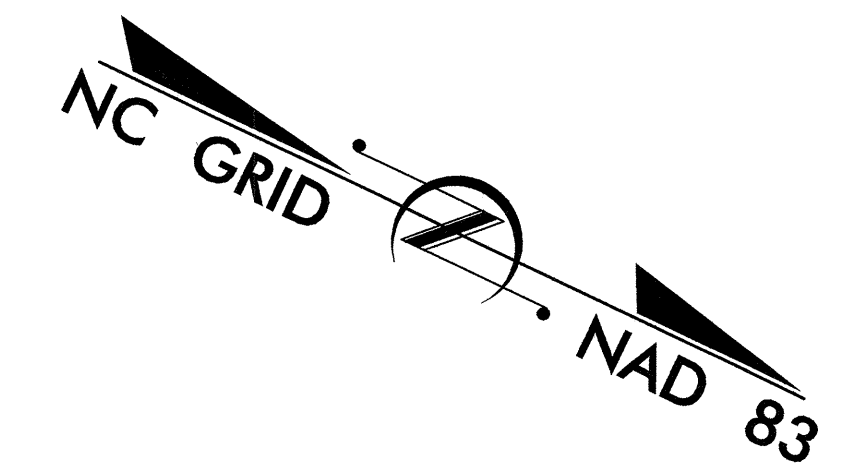
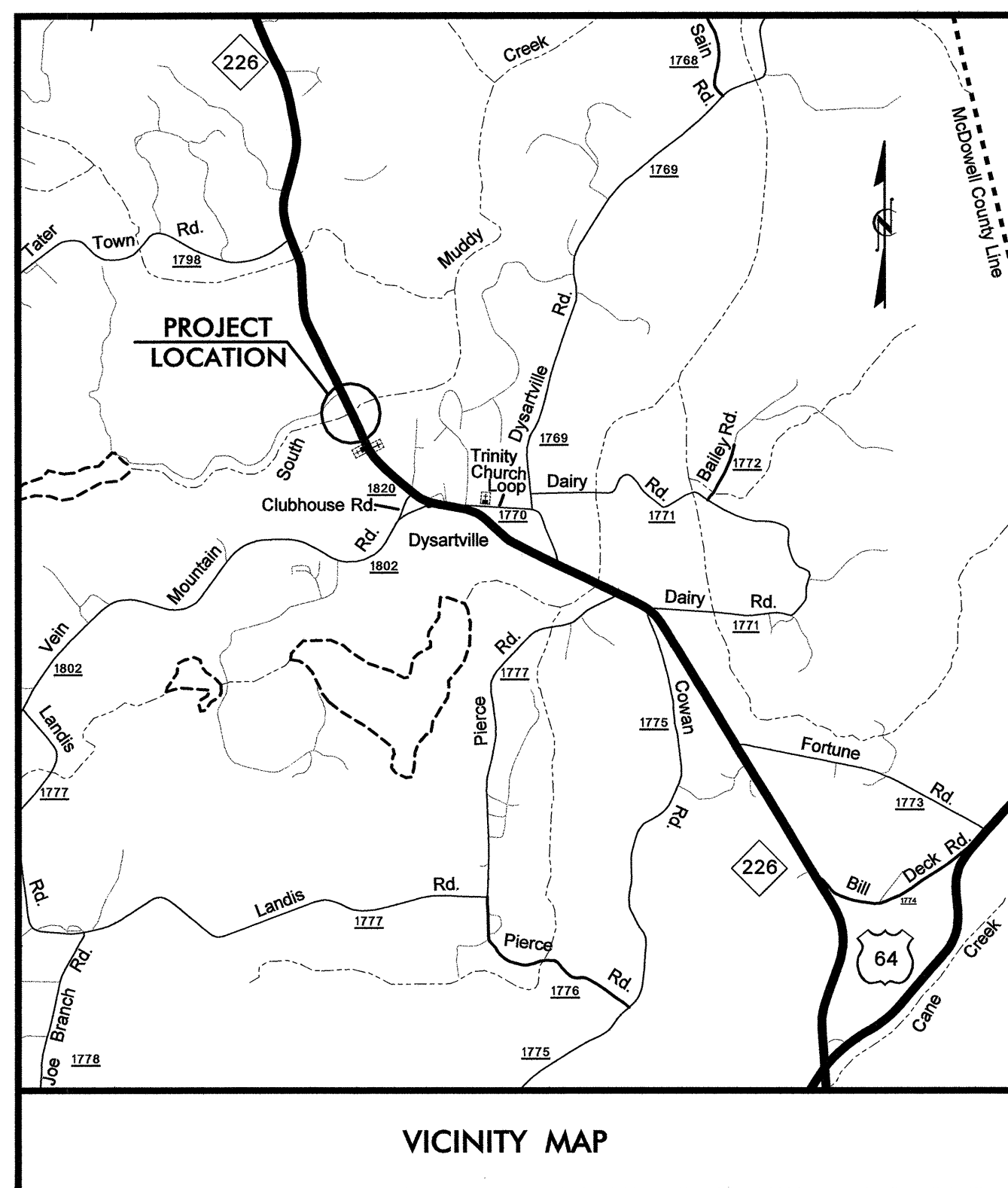
See Sheet 1-A For Index of Sheets
See Sheet 1-B For Symbology

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

MCDOWELL COUNTY

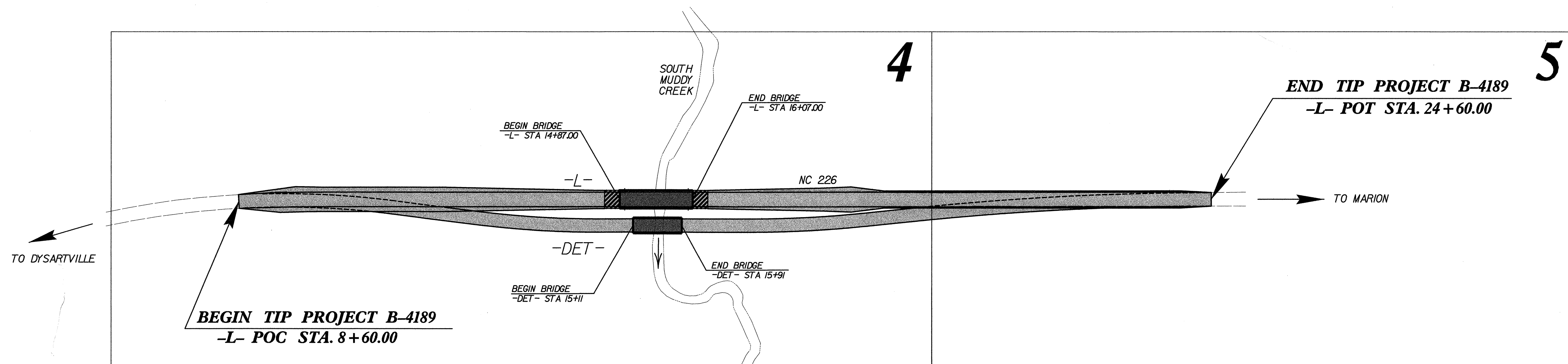
**LOCATION: BRIDGE NO. 49 OVER SOUTH MUDDY CREEK
ON NC 226.**

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

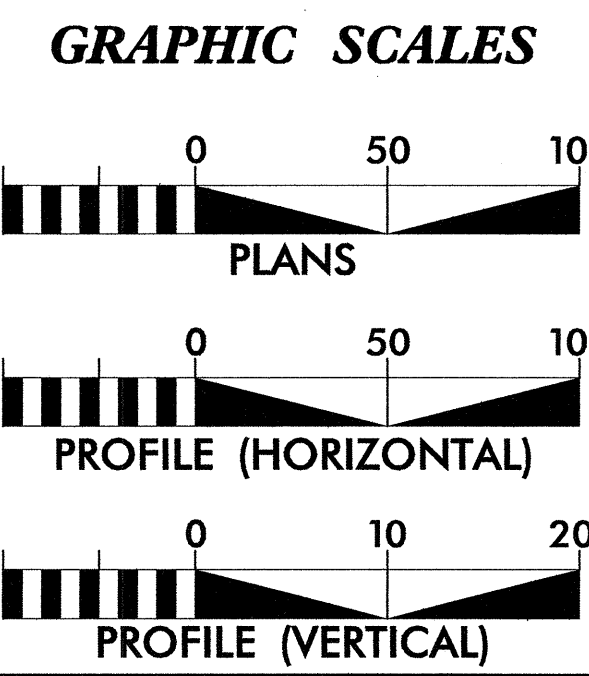


TIP PROJECT: B-4189

CONTRACT: C201805



NCDOT CONTACT:
MR. DOUG TAYLOR, PE
ENGINEERING COORDINATION SECTION ENGINEER
ROADWAY DESIGN UNIT



DESIGN DATA

| | |
|------------|--------|
| ADT 2008 = | 2,870 |
| ADT 2028 = | 4,080 |
| DHV = | 10 % |
| D = | 60 % |
| T = | 8 % * |
| V = | 60 MPH |

* (TTST 3% + DUAL 5%)
FUNCT CLASS=RURAL MAJOR COLLECTOR

PROJECT LENGTH

| | | |
|--|----------|-------------------|
| LENGTH ROADWAY TIP PROJECT B-4189 | = | 0.280 mile |
| LENGTH STRUCTURE TIP PROJECT B-4189 | = | 0.023 mile |
| TOTAL LENGTH TIP PROJECT B-4189 | = | 0.303 mile |

Prepared for:
DIVISION OF HIGHWAYS
1000 Birch Ridge Dr., Raleigh NC, 27610
By:
MA ENGINEERING CONSULTANTS, INC.
598 E. CHATHAM STREET, SUITE 137
CARY, NORTH CAROLINA 27511
(919) 270-0220

2006 STANDARD SPECIFICATIONS

RIGHT OF WAY DATE:
OCTOBER 30, 2006

LETTING DATE:
MARCH 18, 2008

BURKE EVANS, PE
PROJECT ENGINEER

K. S. HUTCHENS
PROJECT DESIGN ENGINEER

HYDRAULICS ENGINEER

Roger S. Weadon 12/21/07 P.E.
SIGNATURE: _____

ROADWAY DESIGN ENGINEER

David Burke Evans 12/21/07 P.E.
SIGNATURE: _____

DIVISION OF HIGHWAYS
STATE OF NORTH CAROLINA

David Burke Evans P.E.
STATE HIGHWAY DESIGN ENGINEER

12/21/2007 8:41:28 AM F:\p01\dwg\Proj\B4189_rdy_tsh.dgn

| | |
|---|------------------|
| PROJECT REFERENCE NO. B-4189 | SHEET NO. 1-A |
| | |
| | |
| 598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221 | |

GENERAL NOTES: 2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 07-18-06

GRADING AND SURFACING OR RESURFACING AND WIDENING:

THE GRADE LINES SHOWN DENOTE THE FINISHED ELEVATION OF THE PROPOSED SURFACING AT GRADE POINTS SHOWN ON THE TYPICAL SECTIONS. WHERE NO GRADE LINES ARE SHOWN, THE PROFILES SHOWN DENOTE THE TOP ELEVATION OF THE EXISTING PAVEMENT ALONG THE CENTER LINE OF SURVEY ON WHICH THE PROPOSED RESURFACING WILL BE PLACED. GRADE LINES MAY BE ADJUSTED BY THE ENGINEER IN ORDER TO SECURE A PROPER TIE-IN.

CLEARING:

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

UNDERDRAINS:

UNDERDRAINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STD. NO. 815.03 AT LOCATIONS DIRECTED BY THE ENGINEER.

GUARDRAIL:

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

TEMPORARY SHORING:

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

SUBSURFACE PLANS:

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

END BENTS:

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

UTILITIES:

UTILITY OWNERS ON THIS PROJECT ARE
Telephone - Verizon
Power - Rutherford Electric Membership Corp. (REMC)

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

RIGHT-OF-WAY MARKERS:

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

2006 ROADWAY ENGLISH STANDARD DRAWINGS

EFF. 07-18-06
REV. 01-02-07

The following Roadway Standards as appear in "Roadway Standard Drawings" Highway Design Branch - N. C. Department of Transportation - Raleigh, N. C., Dated July 18, 2006 are applicable to this project and by reference hereby are considered a part of these plans:

| STD. NO. | TITLE |
|--|--|
| DIVISION 2 - EARTHWORK | |
| 200.02 | Method of Clearing - Method II |
| 225.02 | Guide for Grading Subgrade - Secondary and Local |
| 225.04 | Method of Obtaining Superelevation - Two Lane Pavement |
| DIVISION 3 - PIPE CULVERTS | |
| 300.01 | Method of Pipe Installation - Method 'A' |
| 310.10 | Driveway Pipe Construction |
| DIVISION 4 - MAJOR STRUCTURES | |
| 422.10 | Reinforced Bridge Approach Fills |
| DIVISION 5 - SUBGRADE, BASES AND SHOULDERS | |
| 560.01 | Method of Shoulder Construction - High Side of Superelevated Curve - Method I |
| 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 |
| 815.03 | Pipe Underdrain and Blind Drain |
| 838.01 | Concrete Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew |
| 838.11 | Brick Endwall for Single and Double Pipe Culverts - 15" thru 48" Pipe 90 Skew |
| 838.80 | Precast Endwalls - 12" thru 72" Pipe 90 Skew |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 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 |
| 846.01 | Concrete Curb, Gutter and Curb & Gutter |
| 846.04 | Drop Inlet Installation in Shoulder Berm Gutter |
| 862.01 | Guardrail Placement |
| 862.02 | Guardrail Installation |
| 862.03 | Structure Anchor Units |
| 862.04 | Anchoring End of Guardrail - B-77 and B-83 Anchor Units |
| 876.01 | Rip Rap in Channels |
| 876.02 | Guide for Rip Rap at Pipe Outlets |
| 876.04 | Drainage Ditches with Class 'B' Rip Rap |

INDEX OF SHEETS

| SHEET NUMBER | SHEET |
|--------------------|---|
| 1 | TITLE SHEET |
| 1-A | INDEX OF SHEETS, GENERAL NOTES, AND LIST OF STANDARD DRAWINGS |
| 1-B | CONVENTIONAL SYMBOLS |
| 1-C | SURVEY CONTROL SHEET |
| 2 | PAVEMENT SCHEDULE, TYPICAL SECTIONS, AND WEDGING DETAILS |
| 2-A THRU 2-B | DETOUR PLAN AND PROFILE |
| 2-C | DETAIL OF ANCHORAGE FOR FRAMES - BRICK OR CONCRETE |
| 3 | SUMMARY OF QUANTITIES |
| 3-A | SUMMARIES OF EARTHWORK AND PAVEMENT REMOVAL |
| 3-B | SUMMARIES OF DRAINAGE AND GUARDRAIL |
| 4 THRU 5 | PLAN AND PROFILE SHEET |
| TCP-1 THRU TCP-5 | TRAFFIC CONTROL PLANS |
| EC-1 THRU EC-9 | EROSION CONTROL PLANS |
| RF-1 | REFORESTATION DETAIL PLANS |
| SIGN-1 THRU SIGN-3 | SIGNING PLANS |
| X-1 | CROSS-SECTION SUMMARY |
| X-2 THRU X-11 | CROSS-SECTIONS |
| S-1 THRU S-21 | STRUCTURE PLANS |

Note: Not to Scale

*S.U.E. = Subsurface Utility Engineering

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

CONVENTIONAL PLAN SHEET SYMBOLS

BOUNDARIES AND PROPERTY:

Table listing symbols for boundaries and property: State Line, County Line, Township Line, City Line, Reservation Line, Property Line, Existing Iron Pin, Property Corner, Property Monument, Parcel/Sequence Number, Existing Fence Line, Proposed Woven Wire Fence, Proposed Chain Link Fence, Proposed Barbed Wire Fence, Existing Wetland Boundary, Proposed Wetland Boundary, Existing Endangered Animal Boundary, Existing Endangered Plant Boundary.

BUILDINGS AND OTHER CULTURE:

Table listing symbols for buildings and other culture: Gas Pump Vent or U/G Tank Cap, Sign, Well, Small Mine, Foundation, Area Outline, Cemetery, Building, School, Church, Dam.

HYDROLOGY:

Table listing symbols for hydrology: Stream or Body of Water, Hydro, Pool or Reservoir, Jurisdictional Stream, Buffer Zone 1, Buffer Zone 2, Flow Arrow, Disappearing Stream, Spring, Wetland, Proposed Lateral, Tail, Head Ditch, False Sump.

RAILROADS:

Table listing symbols for railroads: Standard Gauge, RR Signal Milepost, Switch, RR Abandoned, RR Dismantled.

RIGHT OF WAY:

Table listing symbols for right of way: Baseline Control Point, Existing Right of Way Marker, Existing Right of Way Line, Proposed Right of Way Line, Proposed Right of Way Line with Iron Pin and Cap Marker, Proposed Right of Way Line with Concrete or Granite Marker, Existing Control of Access, Proposed Control of Access, Existing Easement Line, Proposed Temporary Construction Easement, Proposed Temporary Drainage Easement, Proposed Permanent Drainage Easement, Proposed Permanent Utility Easement.

ROADS AND RELATED FEATURES:

Table listing symbols for roads and related features: Existing Edge of Pavement, Existing Curb, Proposed Slope Stakes Cut, Proposed Slope Stakes Fill, Proposed Wheel Chair Ramp, Proposed Wheel Chair Ramp Curb Cut, Curb Cut for Future Wheel Chair Ramp, Existing Metal Guardrail, Proposed Guardrail, Existing Cable Guiderail, Proposed Cable Guiderail, Equality Symbol, Pavement Removal.

VEGETATION:

Table listing symbols for vegetation: Single Tree, Single Shrub, Hedge, Woods Line, Orchard, Vineyard.

EXISTING STRUCTURES:

Table listing symbols for 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:

Table listing symbols for 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, Recorded U/G Power Line, Designated U/G Power Line (S.U.E.*); TELEPHONE: Existing Telephone Pole, Proposed Telephone Pole, Telephone Manhole, Telephone Booth, Telephone Pedestal, Telephone Cell Tower, U/G Telephone Cable Hand Hole, Recorded U/G Telephone Cable, Designated U/G Telephone Cable (S.U.E.*), Recorded U/G Telephone Conduit, Designated U/G Telephone Conduit (S.U.E.*), Recorded U/G Fiber Optics Cable, Designated U/G Fiber Optics Cable (S.U.E.*).

WATER:

Table listing symbols for water: Water Manhole, Water Meter, Water Valve, Water Hydrant, Recorded U/G Water Line, Designated U/G Water Line (S.U.E.*), Above Ground Water Line.

TV:

Table listing symbols for TV: TV Satellite Dish, TV Pedestal, TV Tower, U/G TV Cable Hand Hole, Recorded U/G TV Cable, Designated U/G TV Cable (S.U.E.*), Recorded U/G Fiber Optic Cable, Designated U/G Fiber Optic Cable (S.U.E.*).

GAS:

Table listing symbols for gas: Gas Valve, Gas Meter, Recorded U/G Gas Line, Designated U/G Gas Line (S.U.E.*), Above Ground Gas Line.

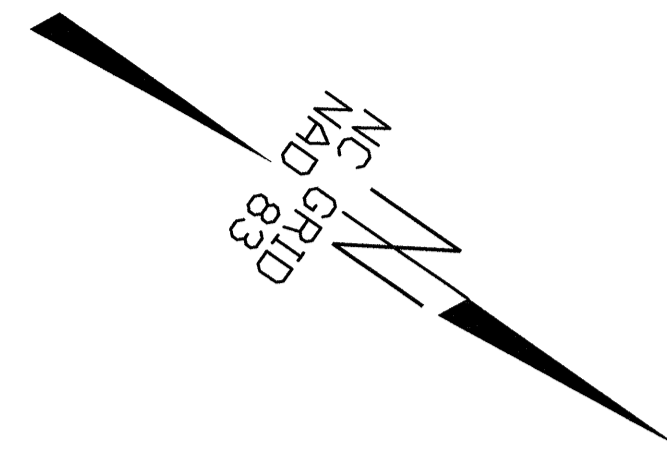
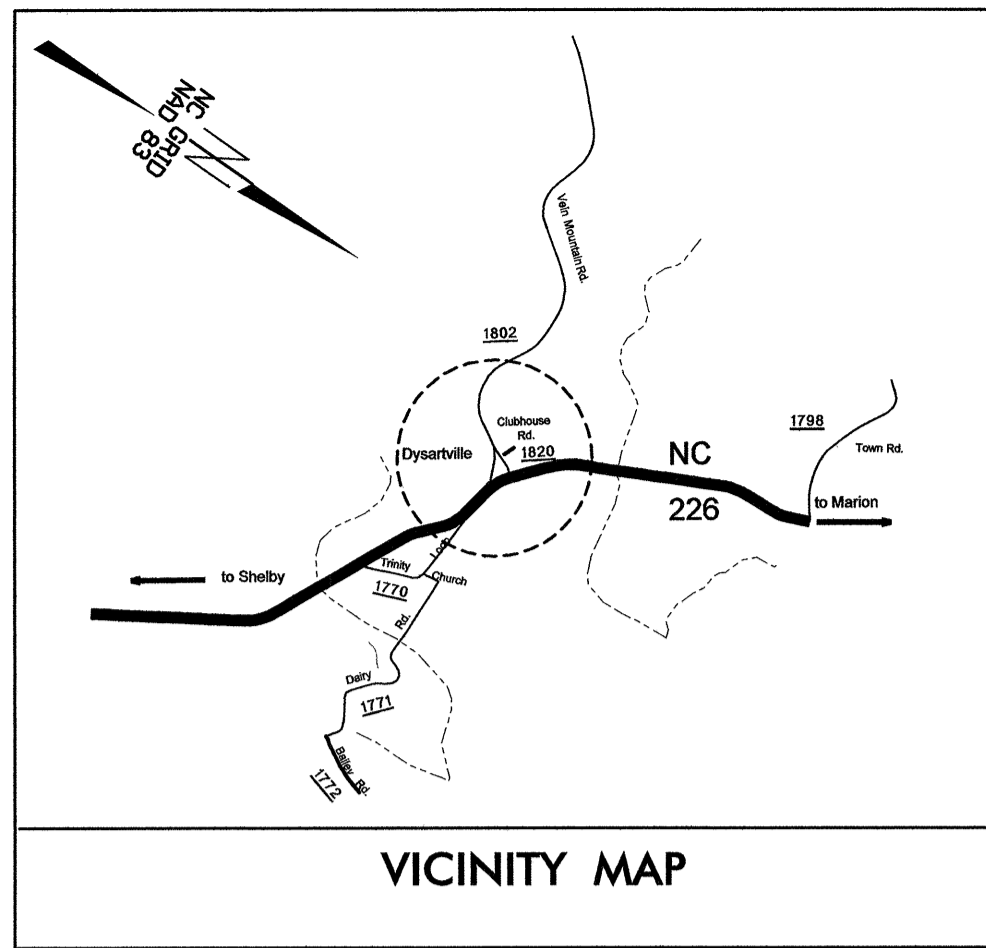
SANITARY SEWER:

Table listing symbols for sanitary sewer: Sanitary Sewer Manhole, Sanitary Sewer Cleanout, U/G Sanitary Sewer Line, Above Ground Sanitary Sewer, Recorded SS Forced Main Line, Designated SS Forced Main Line (S.U.E.*).

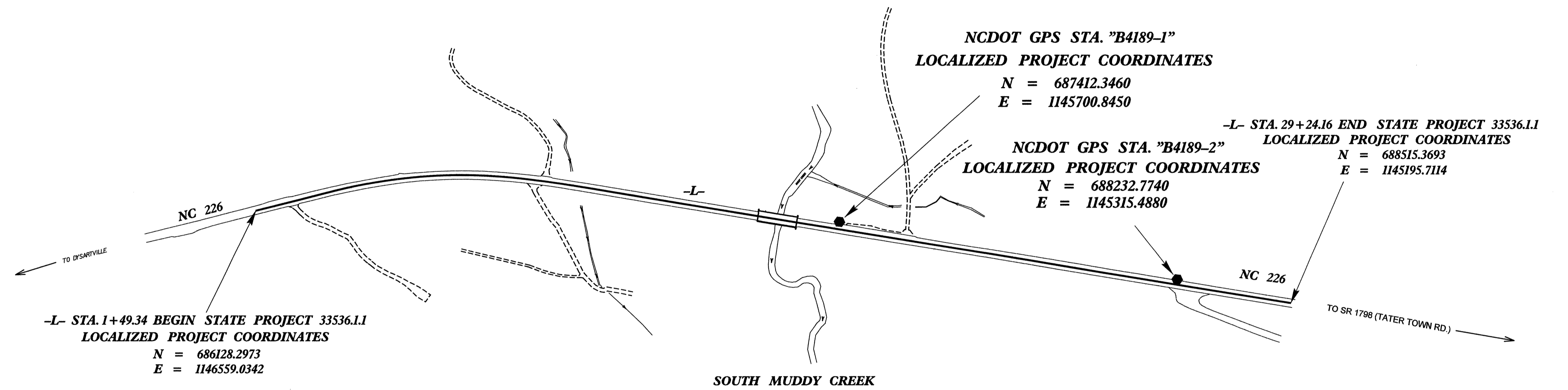
MISCELLANEOUS:

Table listing symbols for miscellaneous: Utility Pole, Utility Pole with Base, Utility Located Object, Utility Traffic Signal Box, Utility Unknown U/G Line, U/G Tank; Water, Gas, Oil, A/G Tank; Water, Gas, Oil, U/G Test Hole (S.U.E.*), Abandoned According to Utility Records, End of Information.

SURVEY CONTROL SHEET B-4189



| BL POINT | DESC. | NORTH | EAST | ELEVATION | L STATION | OFFSET |
|----------|---------|-------------|--------------|-----------|------------------------|----------|
| 1 | BL-1 | 685910.3900 | 1146852.1860 | 1250.78 | OUTSIDE PROJECT LIMITS | |
| 2 | BL-2 | 686197.2220 | 1146441.9360 | 1225.29 | 2+82.88 | 25.11 LT |
| 3 | BL-3 | 686735.0980 | 1146027.1850 | 1173.88 | 9+59.61 | 17.43 LT |
| GPS1 | B4189-1 | 687412.3460 | 1145700.8450 | 1168.20 | 17+11.13 | 19.67 LT |
| GPS2 | B4189-2 | 688232.7740 | 1145315.4880 | 1230.14 | 26+17.53 | 13.74 LT |



| | |
|-------------------|---------------------|
| BM1 | ELEVATION = 1253.43 |
| N 685779 | E 1146763 |
| L STATION 1+49 | |
| S 30° 16' 55.3" E | DIST 404.49 |
| BM2 | ELEVATION = 1163.26 |
| N 687407 | E 1145606 |
| L STATION 17+47 | 108 LEFT |
| BM3 | ELEVATION = 1238.18 |
| N 688177 | E 1145252 |
| L STATION 25+95 | 95 LEFT |

NOTES:

1. THE CONTROL DATA FOR THIS PROJECT CAN BE FOUND ELECTRONICALLY BY SELECTING PROJECT CONTROL DATA AT:
[HTTP://WWW.DOH.DOT.STATE.NC.US/PRECONSTRUCT/HIGHWAY/LOCATION/PROJECT/](http://www.doh.dot.state.nc.us/preconstruct/highway/location/project/)

THE FILES TO BE FOUND ARE AS FOLLOWS:
B4189_LS_CONTROL_061030.TXT

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

- INDICATES GEODETIC CONTROL MONUMENTS USED OR SET FOR HORIZONTAL PROJECT CONTROL BY THE NCDOT LOCATION AND SURVEYS UNIT.
PROJECT CONTROL ESTABLISHED USING GLOBAL POSITIONING SYSTEM.
NETWORK ESTABLISHED FROM NGS ONLINE POSITIONING SERVICE (OPUS)

DATUM DESCRIPTION

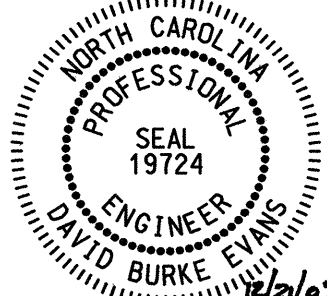


THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "GPS B4189-1" WITH NAD 83 STATE PLANE GRID COORDINATES OF NORTHING: 687412.346(ft) EASTING: 1145700.845(ft) THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.9998905 THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS B4189-1" TO -L- STATION 1+49.34 IS S 33 - 45 - 24 E 1544.43'

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

NOTE: DRAWING NOT TO SCALE

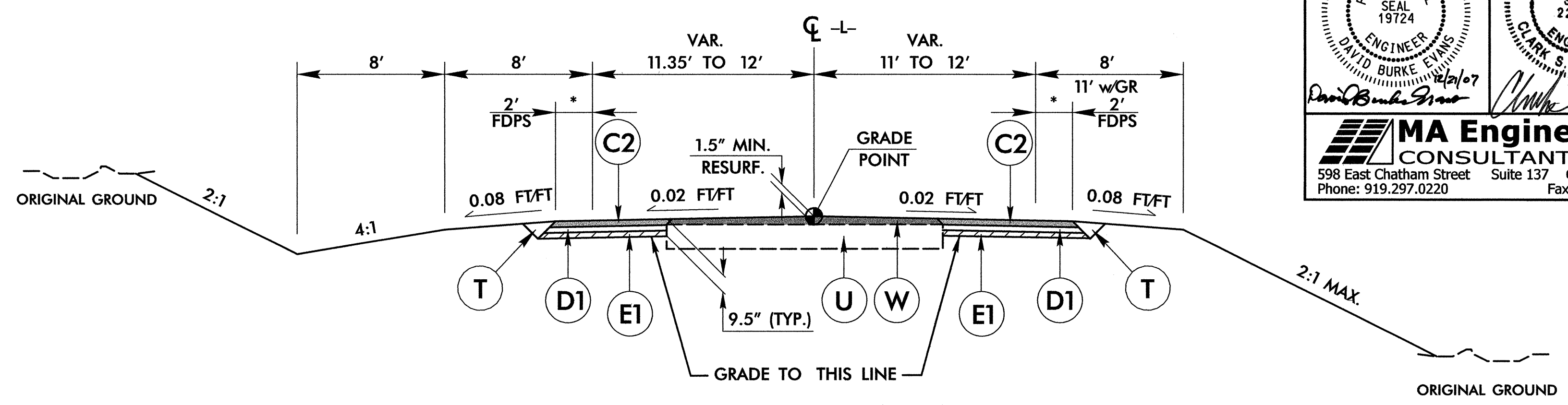
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| | |
|---|--|
| PROJECT REFERENCE NO. B-4189 | SHEET NO. 2 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER DAVID BURKE, EIT 12/21/07 | PAVEMENT DESIGN ENGINEER CLARK S. MORRIS, EIT 12/21/08 |
|   | |
|  | |
| 598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221 | |

| PAVEMENT SCHEDULE | |
|-------------------|--|
| C1 | PROP. APPROX. 1.5" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS PER SQUARE YARD. |
| C2 | PROP. APPROX. 3.0" ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 168 LBS PER SQUARE YARD IN TWO LAYERS. |
| C3 | PROP. VARIABLE DEPTH ASPHALT CONCRETE SURFACE COURSE, TYPE S9.5B, AT AN AVERAGE RATE OF 112 LBS PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 1.5" OR GREATER THAN 2.0" IN DEPTH. |
| D1 | PROP. APPROX. 2.5" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS PER SQUARE YARD. |
| D2 | PROP. VARIABLE DEPTH ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 114 LBS PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 2.5" OR GREATER THAN 4.0" IN DEPTH. |
| E1 | PROP. APPROX. 4.0" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS PER SQUARE YARD. |
| E2 | PROP. VARIABLE DEPTH ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS PER SQUARE YARD PER 1" DEPTH, TO BE PLACED IN LAYERS NOT LESS THAN 3.0" OR GREATER THAN 5.5" IN DEPTH. |
| J | PROP. 8" AGGREGATE BASE COURSE |
| P | PRIME COAT (AT THE RATE OF 0.35 GAL. PER SQUARE YARD) |
| T | EARTH MATERIAL |
| U | EXISTING PAVEMENT |
| W | VARIABLE DEPTH ASPHALT PAVEMENT (SEE WEDGING DETAIL THIS SHEET) |

PAVEMENT EDGE SLOPES AND TRENCH SLOPES ARE 1:1 UNLESS SHOWN OTHERWISE.

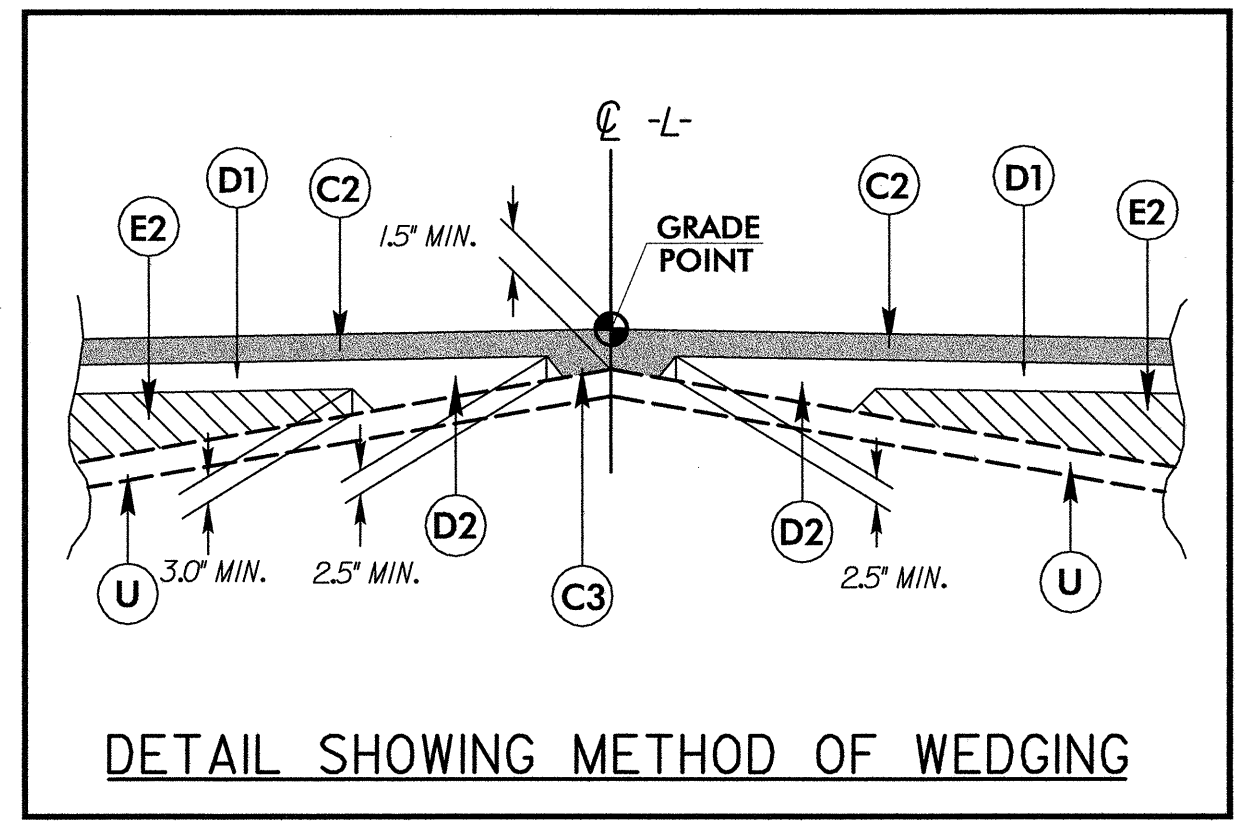


TYPICAL SECTION NO. 1

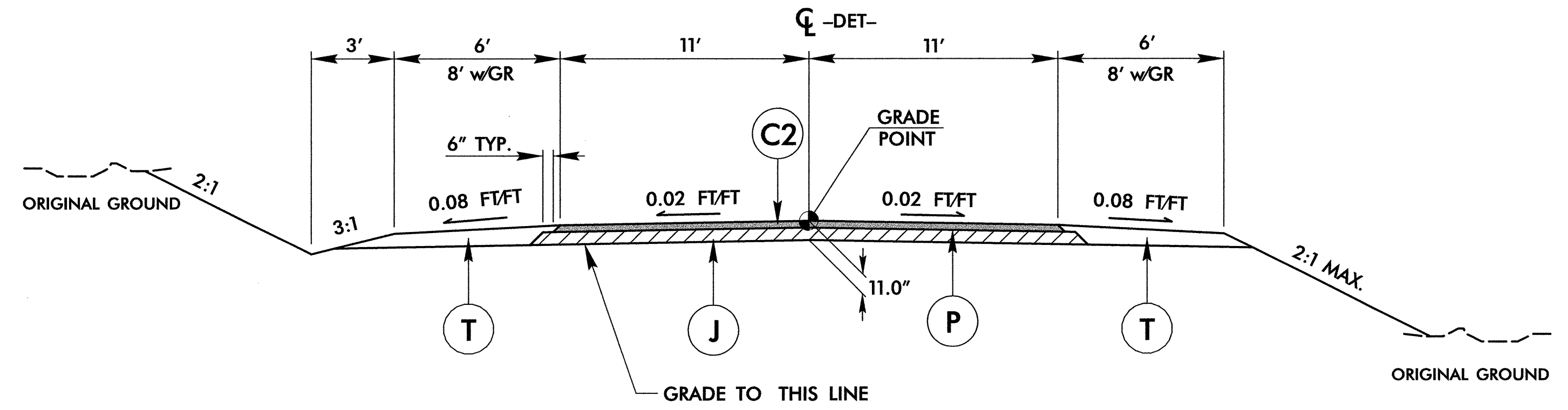
FROM -L- STA. 13+75.00 TO STA. 14+87.00 (BEGIN BRIDGE)
 FROM -L- STA. 16+07.00 (END BRIDGE) TO STA. 17+60.00

WIDEN USING TYPICAL SECTION #1 AND RESURFACE USING (C1) :
 FROM -L- STA. 8+60.00 TO 13+75.00
 FROM -L- STA. 17+60.00 TO 24+60.00

* - USE VARIABLE WIDTH, FULL DEPTH PAVED SHOULDER BETWEEN EDGE OF TRAVEL LANE AND GUARDRAIL AS SHOWN ON PLANS.



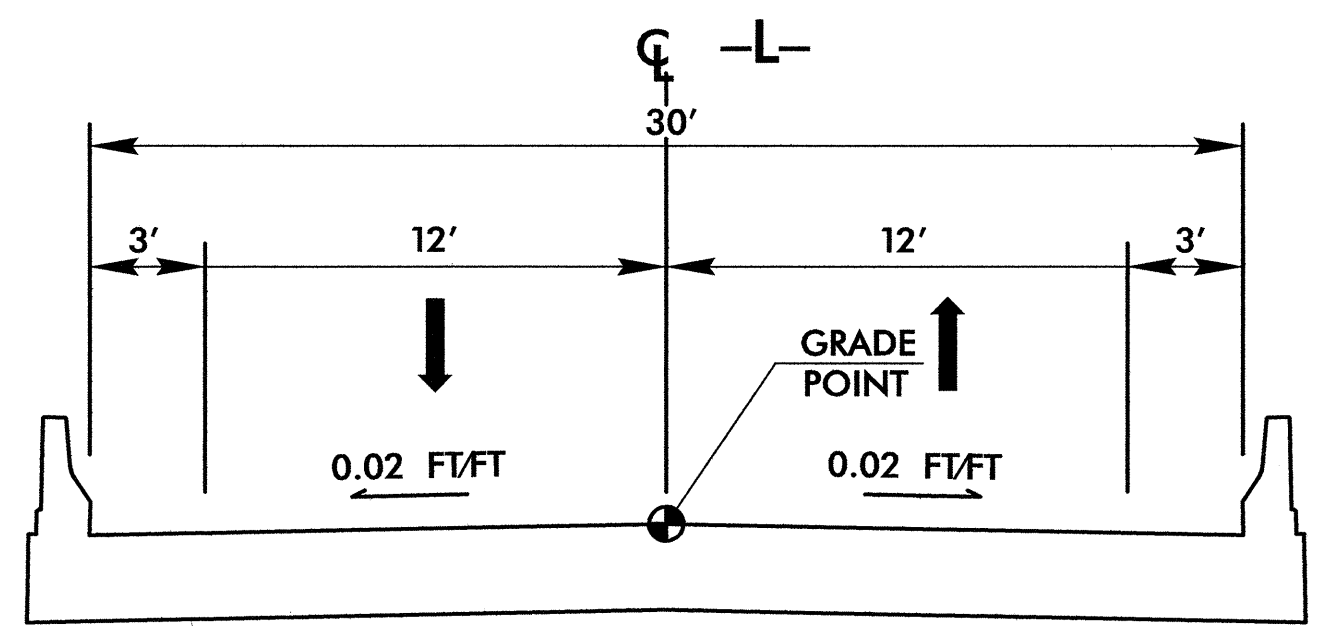
DETAIL SHOWING METHOD OF WEDGING



TYPICAL SECTION NO. 2

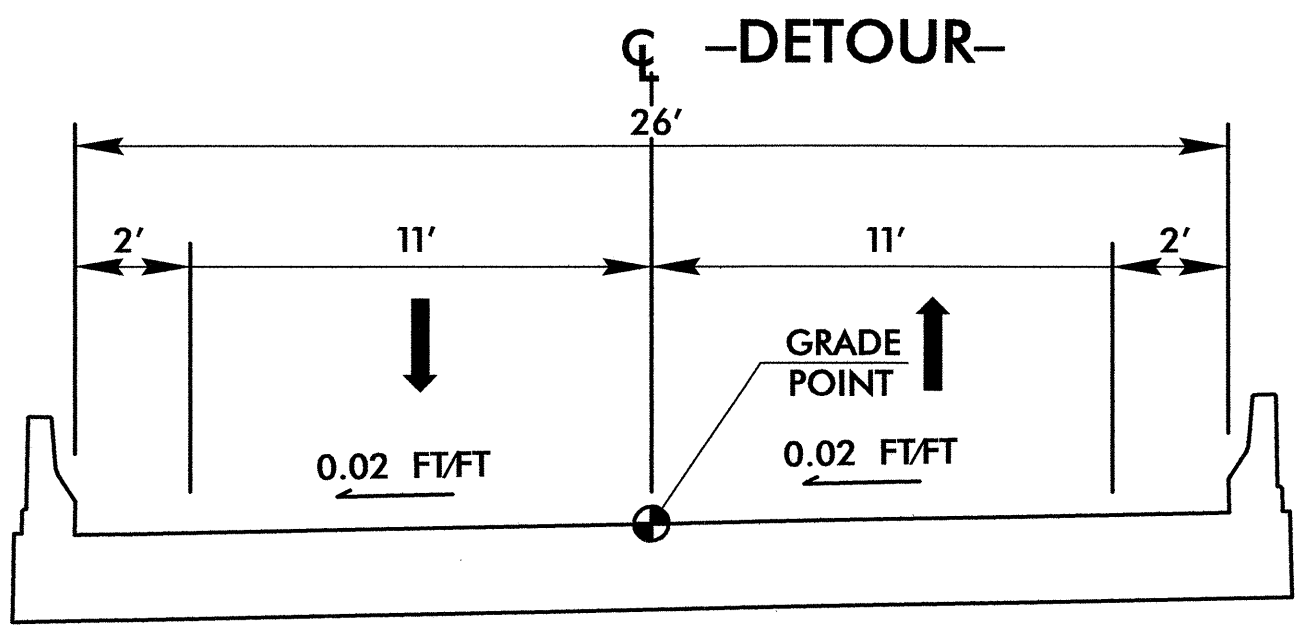
FROM -DET- STA. 10+79.38 TO STA. 10+99.21 (WIDEN USING EX. EOP & SUPERELEVATION)
 FROM -DET- STA. 10+99.21 TO STA. 15+11 (BEGIN BRIDGE) (USING GRADE POINT)
 FROM -DET- STA. 15+91 (END BRIDGE) TO STA. 21+38.45 (USING GRADE POINT)
 FROM -DET- STA. 21+38.45 TO STA. 22+89.71 (WIDEN EX. EOP & SUPERELEVATION)

NOTE: USING -L- PAVEMENT DESIGN (SEE TYP. SEC. #1), WIDEN TO LENGTH AND WIDTH SHOWN ON PLANSHEETS 2-A AND 2-B:
 FROM -L- STA. 8+60.00 TO STA. 10+99.21 (WIDEN USING EX. EOP & SUPERELEVATION)
 FROM -L- STA. 10+99.21 TO STA. 12+00 (USING GRADE POINT)
 FROM -L- STA. 19+97.980 TO STA. 21+38.45 (USING GRADE POINT)
 FROM -L- STA. 21+38.45 TO STA. 24+60.00 (WIDEN USING EX. EOP & SUPERELEVATION)
 (THIS WIDENING WILL BE USED FOR THE DETOUR AND THE PROPOSED -L- PAVED SHOULDER.)



TYPICAL SECTION ON STRUCTURE

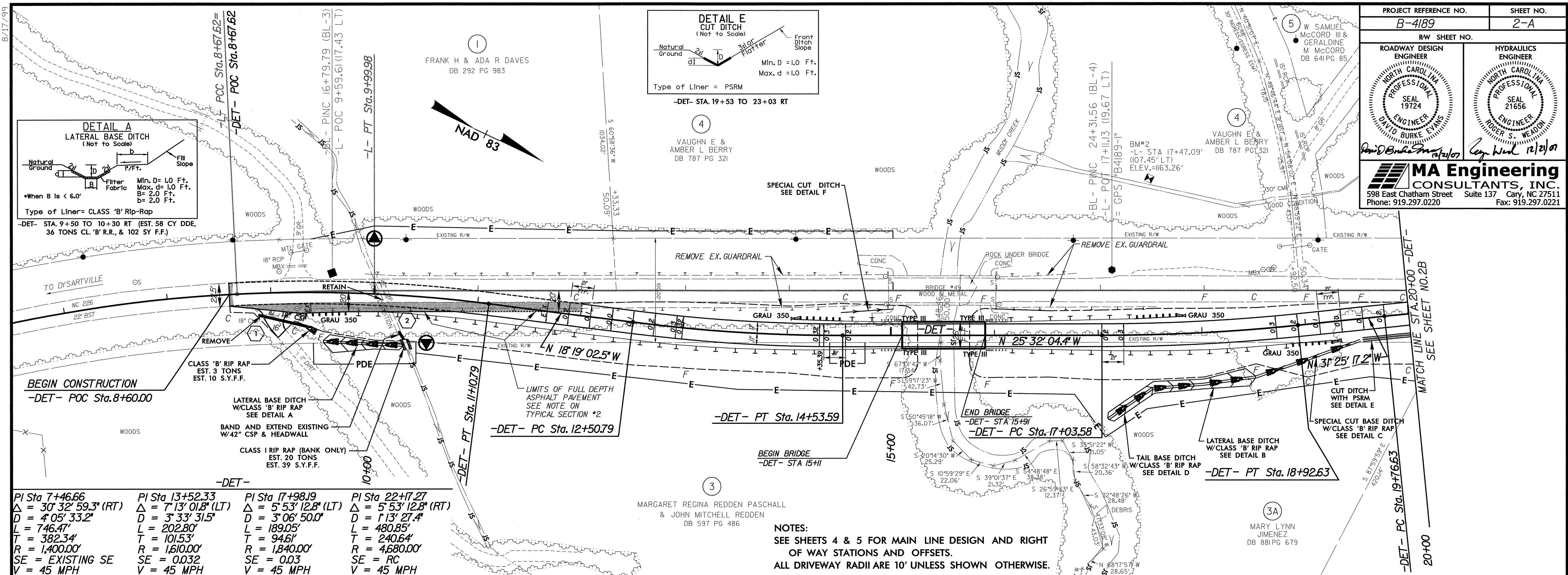
FROM -L- STA. 14+87.00 TO STA. 16+07.00



TYPICAL SECTION ON STRUCTURE

FROM -DET- STA. 15+11 TO STA. 15+91

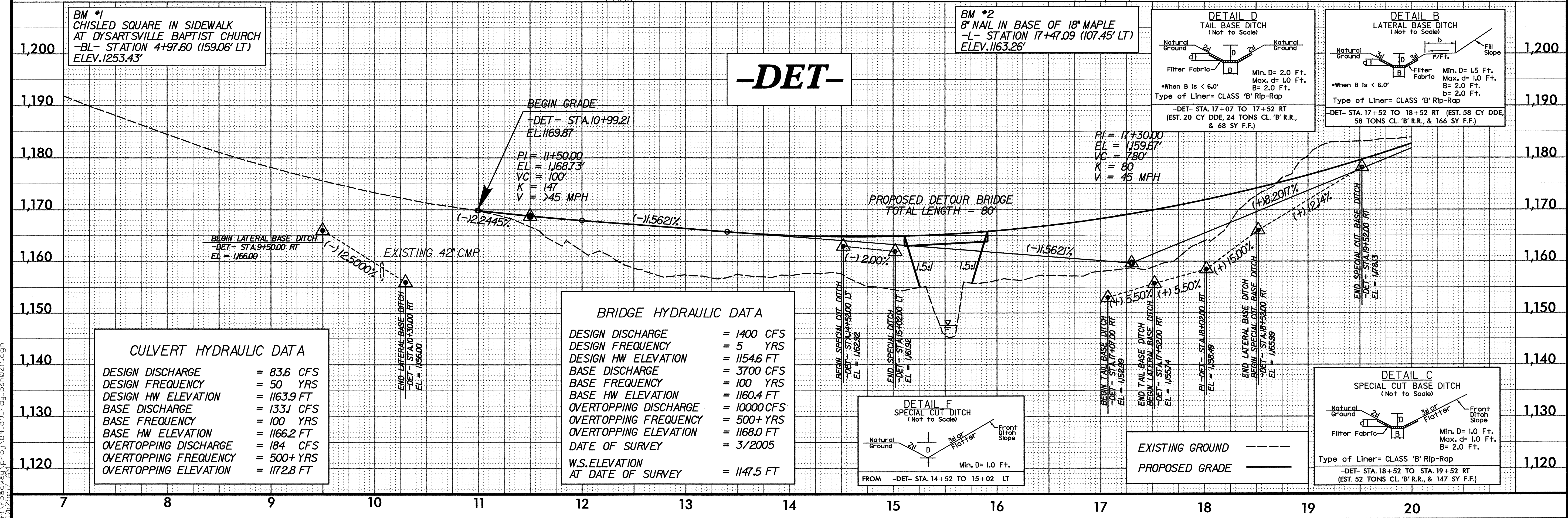
| | |
|--|---|
| PROJECT REFERENCE NO. B-4189 | SHEET NO. 2-A |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER DAVID BURKE EWING PROFESSIONAL SEAL 19724 | HYDRAULICS ENGINEER JOHN S. WEDDIN PROFESSIONAL SEAL 21656 |
| MA Engineering CONSULTANTS, INC. 598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221 | |



| | | | |
|---|--|--|---|
| PI Sta 7+46.66 $\Delta = 30' 32'' 59.3''$ (RT) $D = 4' 05'' 33.2''$ $L = 746.47'$ $T = 382.34'$ $R = 1,400.00'$ $SE = \text{EXISTING SE}$ $V = 45 \text{ MPH}$ | PI Sta 13+52.33 $\Delta = 7' 13'' 01.8''$ (LT) $D = 3' 33'' 31.5''$ $L = 202.80'$ $T = 101.53'$ $R = 1,610.00'$ $SE = 0.032$ $V = 45 \text{ MPH}$ | PI Sta 17+98.19 $\Delta = 5' 53'' 12.8''$ (LT) $D = 3' 06'' 50.0''$ $L = 189.05'$ $T = 94.61'$ $R = 1,840.00'$ $SE = 0.03$ $V = 45 \text{ MPH}$ | PI Sta 22+17.27 $\Delta = 5' 53'' 12.8''$ (RT) $D = 1' 13'' 27.4''$ $L = 480.85'$ $T = 240.64'$ $R = 4,680.00'$ $SE = RC$ $V = 45 \text{ MPH}$ |
|---|--|--|---|

MARGARET REGINA REDDEN PASCHALL
& JOHN MITCHELL REDDEN
DB 597 PG 486

NOTES:
SEE SHEETS 4 & 5 FOR MAIN LINE DESIGN AND RIGHT OF WAY STATIONS AND OFFSETS.
ALL DRIVEWAY RADII ARE 10' UNLESS SHOWN OTHERWISE.



CULVERT HYDRAULIC DATA

| | |
|-----------------------|-------------|
| DESIGN DISCHARGE | = 83.6 CFS |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN HW ELEVATION | = 1163.9 FT |
| BASE DISCHARGE | = 133.1 CFS |
| BASE FREQUENCY | = 100 YRS |
| BASE HW ELEVATION | = 1166.2 FT |
| OVERTOPPING DISCHARGE | = 184 CFS |
| OVERTOPPING FREQUENCY | = 500+ YRS |
| OVERTOPPING ELEVATION | = 1172.8 FT |

BRIDGE HYDRAULIC DATA

| | |
|----------------------------------|-------------|
| DESIGN DISCHARGE | = 1400 CFS |
| DESIGN FREQUENCY | = 5 YRS |
| DESIGN HW ELEVATION | = 1154.6 FT |
| BASE DISCHARGE | = 3700 CFS |
| BASE FREQUENCY | = 100 YRS |
| BASE HW ELEVATION | = 1160.4 FT |
| OVERTOPPING DISCHARGE | = 10000 CFS |
| OVERTOPPING FREQUENCY | = 500+ YRS |
| OVERTOPPING ELEVATION | = 1168.0 FT |
| DATE OF SURVEY | = 3/2005 |
| W.S. ELEVATION AT DATE OF SURVEY | = 1147.5 FT |

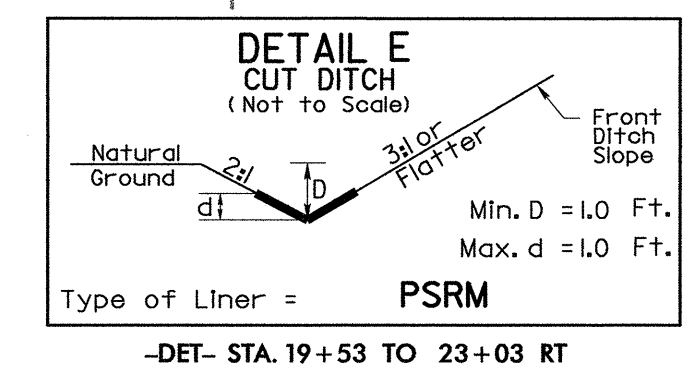
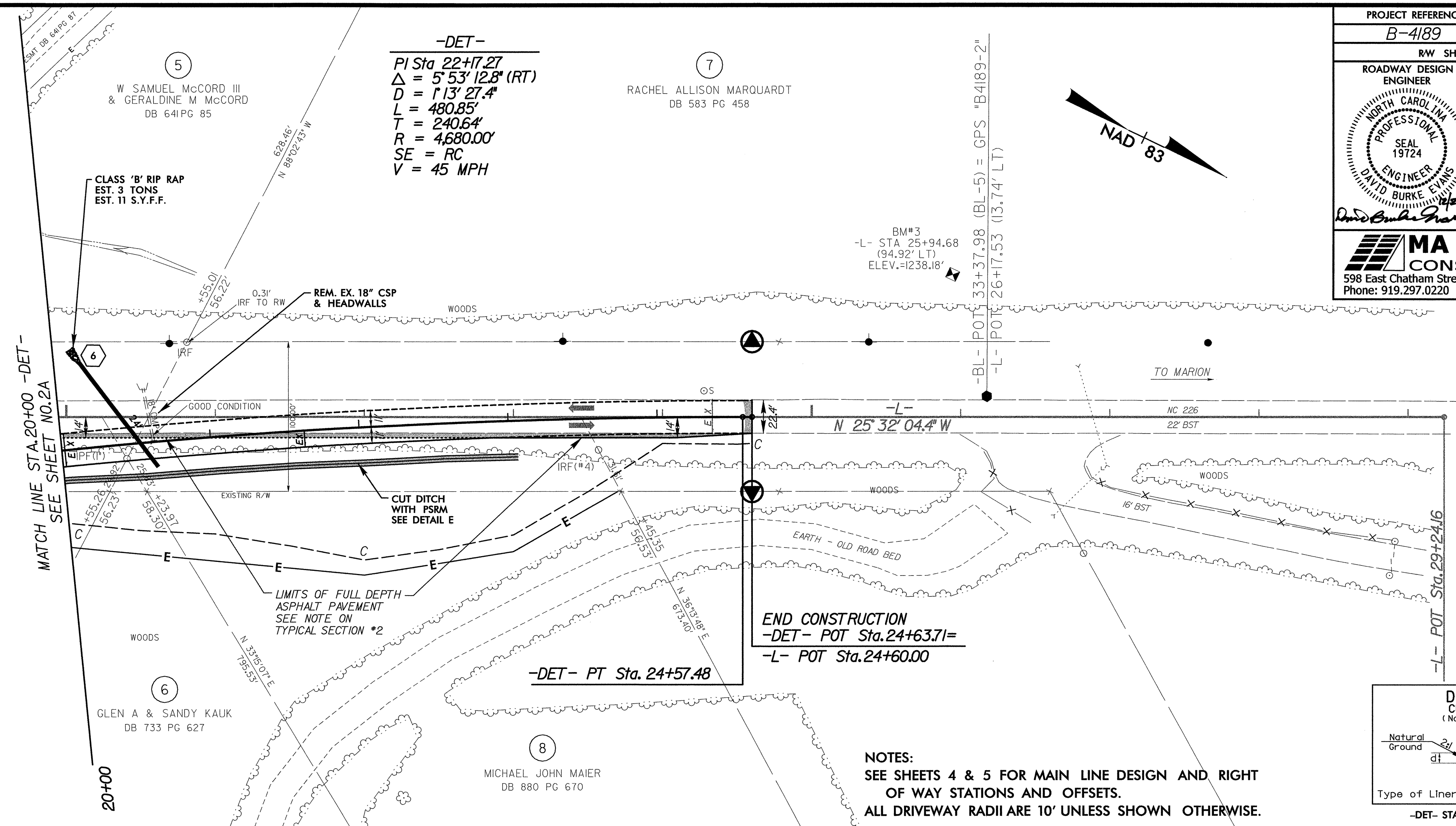
EXISTING GROUND -----
PROPOSED GRADE -----

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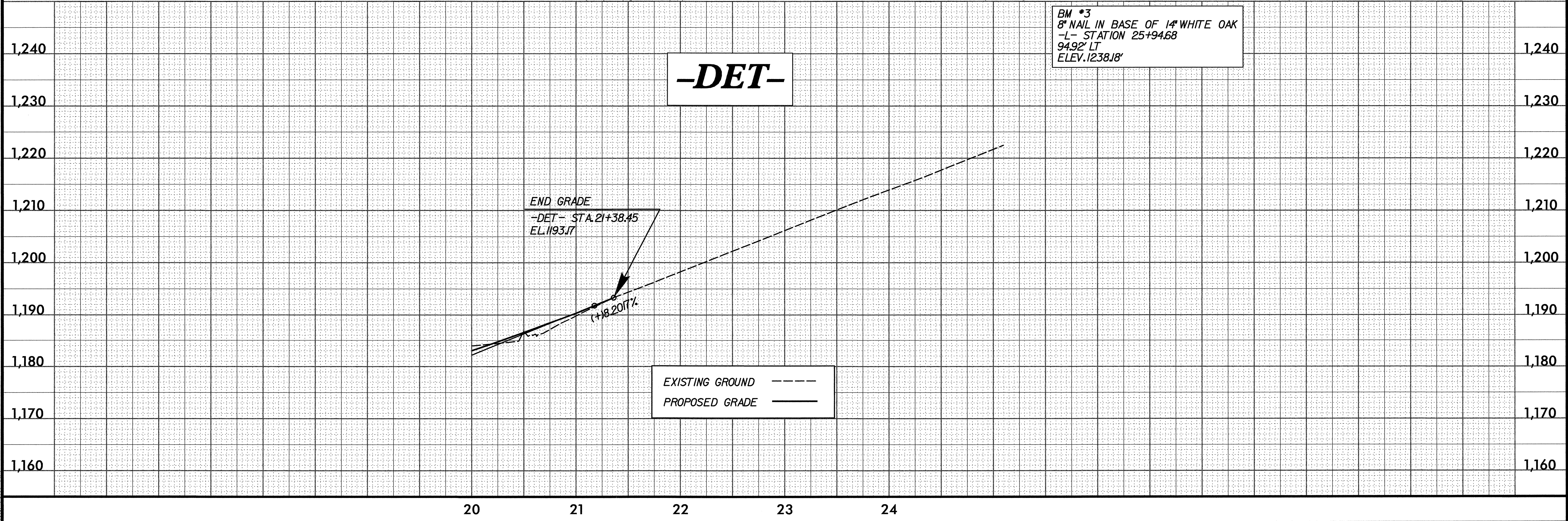
8/17/99

12/21/2007
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| | |
|--|---|
| PROJECT REFERENCE NO. B-4189 | SHEET NO. 2-B |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 19724 DAVID BURKE 12/1/07 | HYDRAULICS ENGINEER NORTH CAROLINA PROFESSIONAL SEAL 21656 POKER S. WEDDIN 12/1/07 |
| MA Engineering CONSULTANTS, INC. 598 East Chatham Street Cary, NC 27511 Phone: 919.297.0220 Suite 137 Fax: 919.297.0221 | |

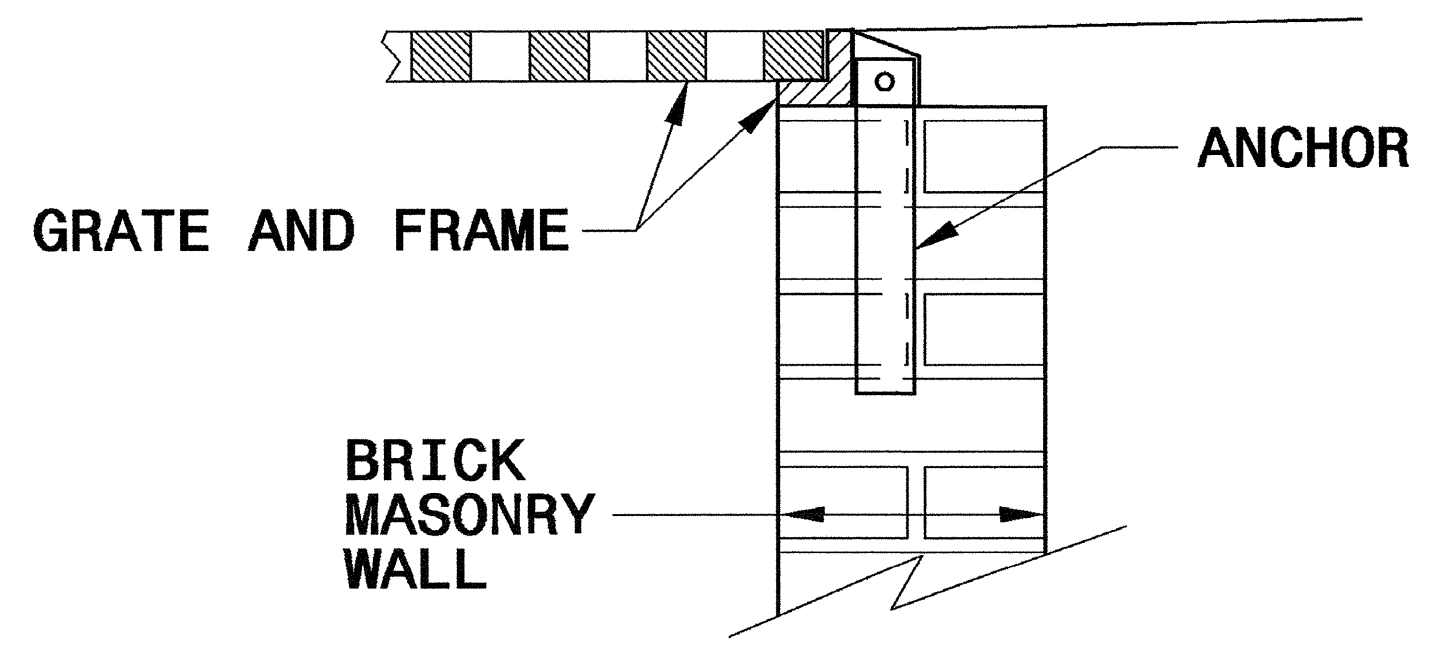


NOTES:
 SEE SHEETS 4 & 5 FOR MAIN LINE DESIGN AND RIGHT OF WAY STATIONS AND OFFSETS.
 ALL DRIVEWAY RADII ARE 10' UNLESS SHOWN OTHERWISE.

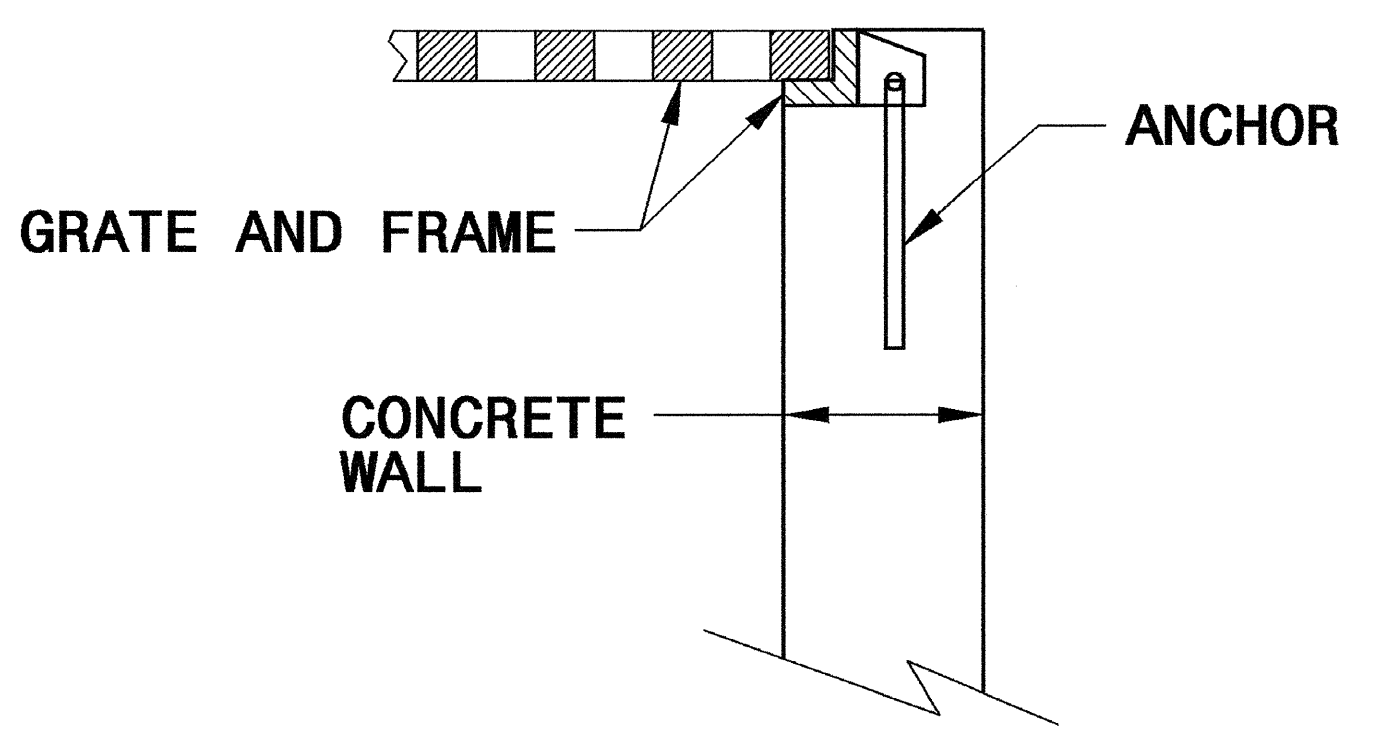


STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

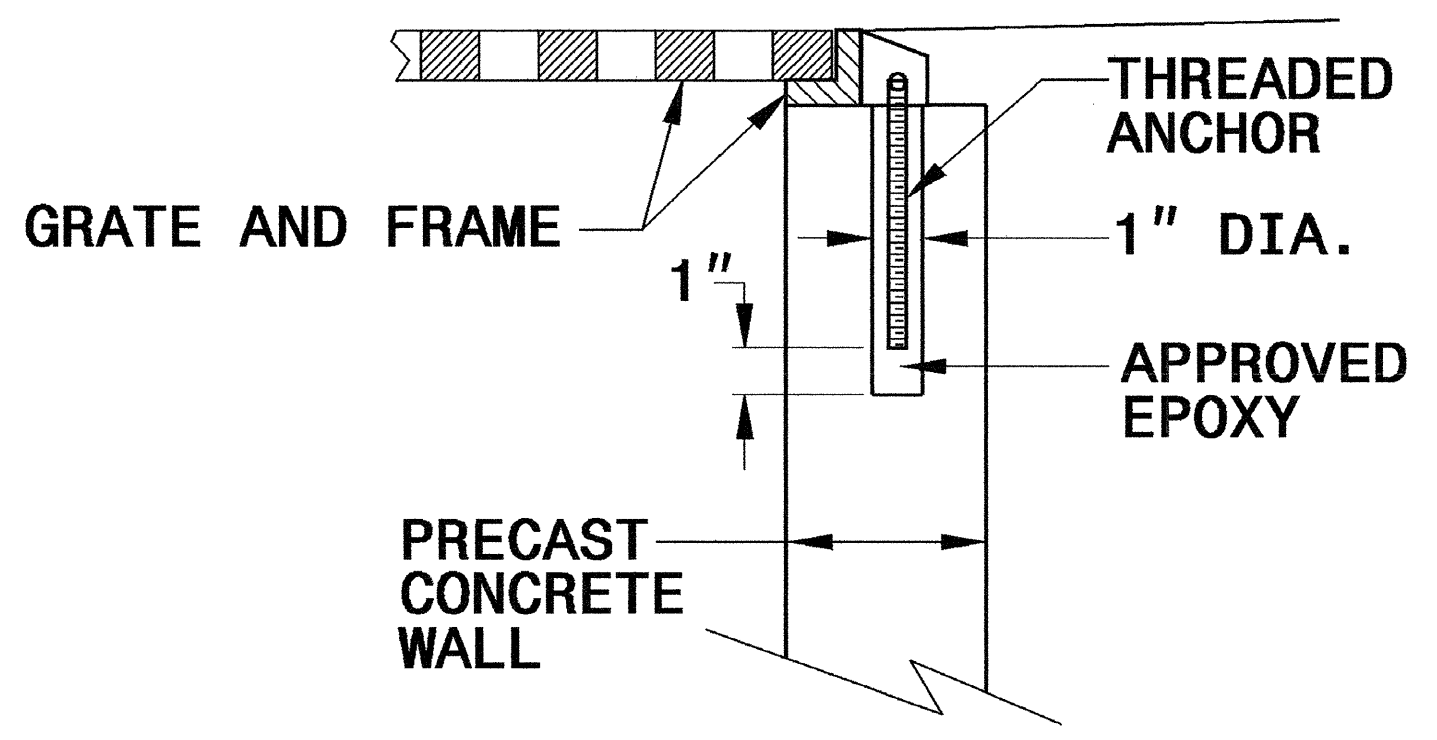
ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE



BRICK MASONRY CONSTRUCTION



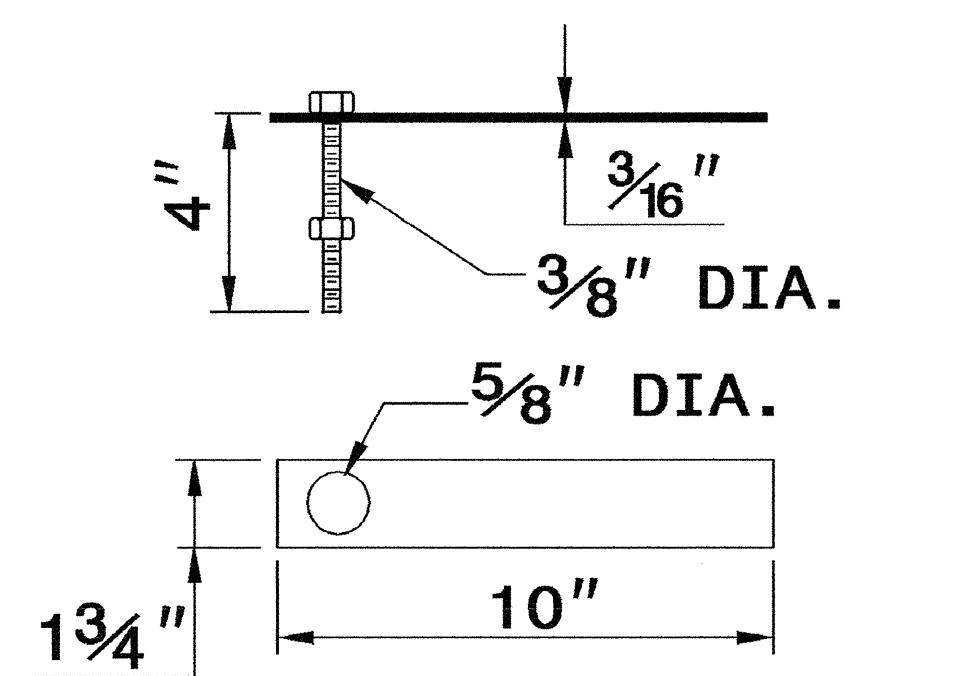
CONCRETE CONSTRUCTION



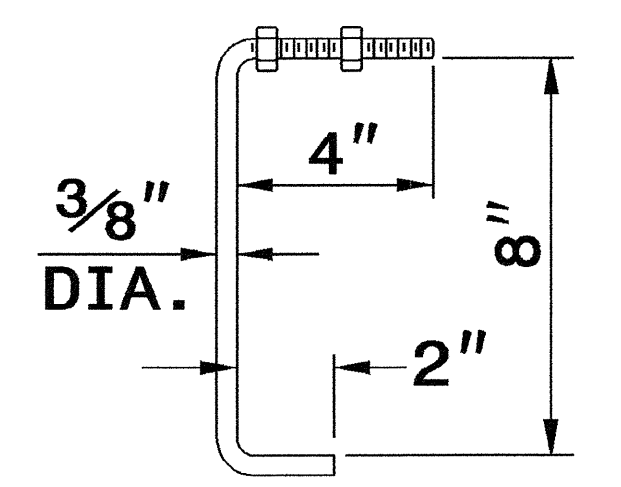
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

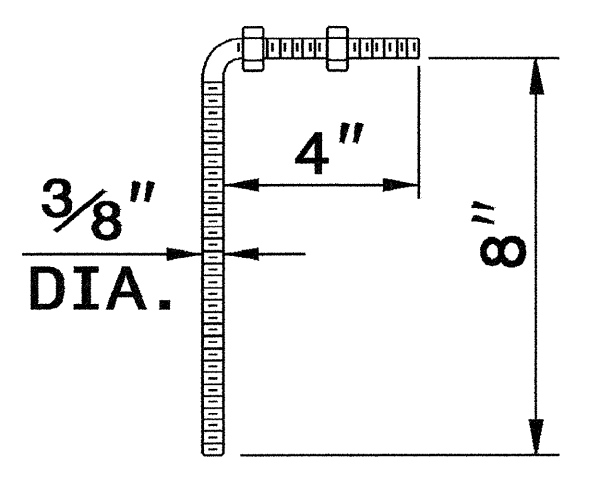
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



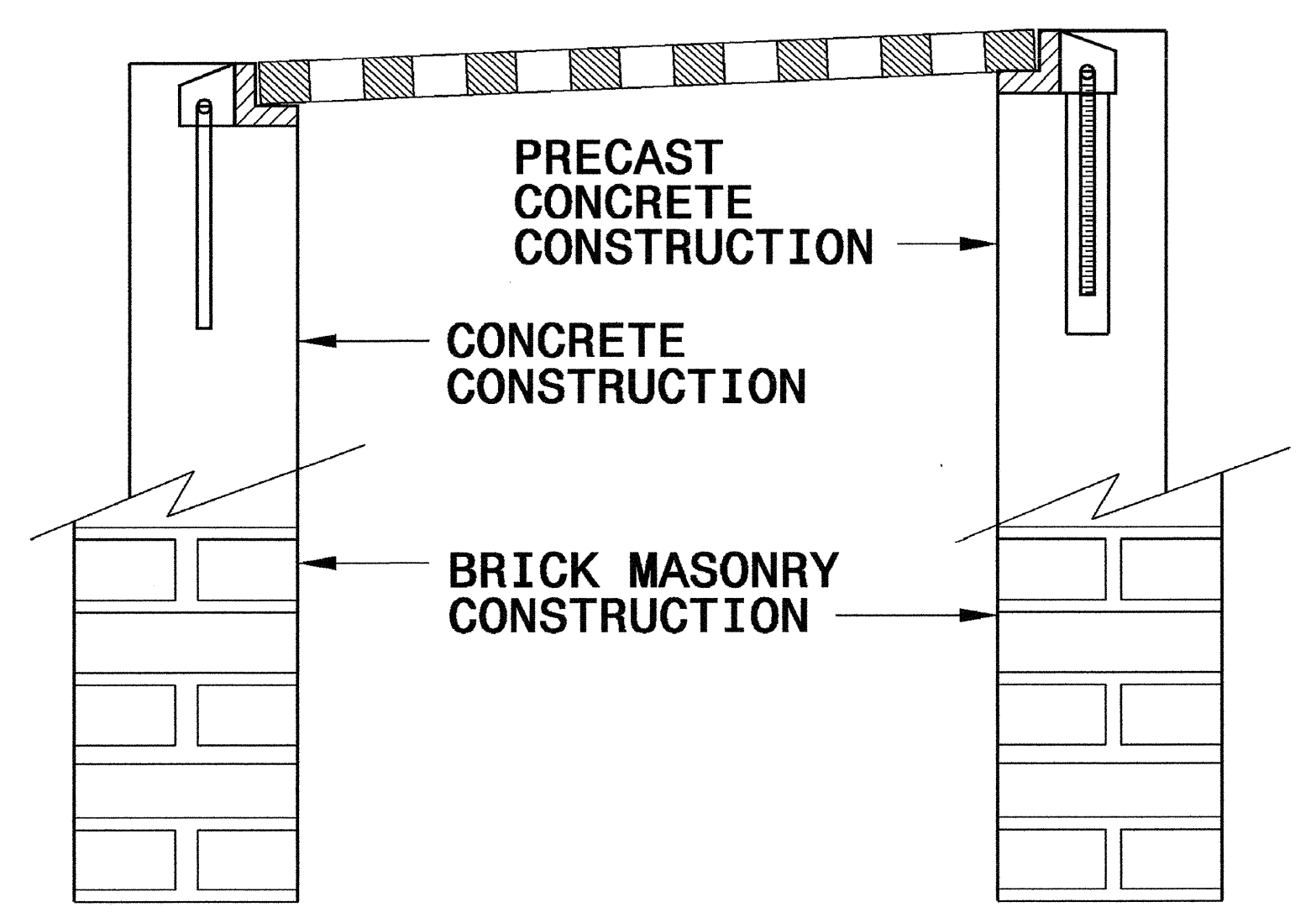
MASONRY ANCHOR
3/8" DIA. BOLT WITH PLATE



CONCRETE ANCHOR
3/8" DIA. BENT BAR



PRECAST CONCRETE ANCHOR
3/8" DIA. BENT BAR

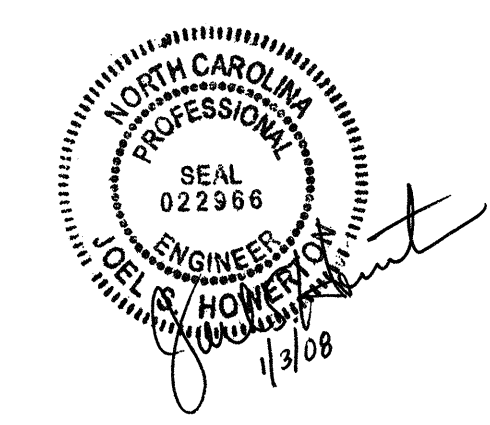


FRAME AND GRATE INSTALLATION FOR NORMAL CROWN AND SUPERELEVATED SECTIONS

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

ENGLISH DETAIL DRAWING FOR
ANCHORAGE FOR FRAMES
BRICK/CONCRETE/PRECAST CONCRETE

27-SEP-2006 08:59 s:\Contractors\Special Details\enward\stds\06\Std to Special Details\840D25 Anchorage for Frames\0840d25.dgn



**PROJECT SERVICES UNIT
STANDARDS AND SPECIAL DESIGN**
Office 919-250-4128 FAX 919-250-4119

SEE PLATE FOR TITLE

ORIGINAL BY: 2006 STD 840.25 DATE: 07/18/06
MODIFIED BY: E.E. WARD DATE: 9/25/06
CHECKED BY: _____ DATE: _____
FILE SPEC.: _____

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF QUANTITIES

| STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201805 | | | | | | | | | | | | | | |
|---|-------|----------|------|---|--------------|-------|----------|------|--|--------------|-------|----------|------|---|
| ItemNumber | Sec # | Quantity | Unit | Description | ItemNumber | Sec # | Quantity | Unit | Description | ItemNumber | Sec # | Quantity | Unit | Description |
| 0000100000-N | 800 | Lump Sum | | MOBILIZATION | 1519000000-E | 610 | 1,020 | TON | ASPHALT CONC SURFACE COURSE, TYPE S9.5B | 3656000000-E | 876 | 1,210 | SY | FILTER FABRIC FOR DRAINAGE |
| 0022000000-E | 225 | 13,700 | CY | UNCLASSIFIED EXCAVATION | 1560000000-E | 620 | 100 | TON | ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22 | 3659000000-N | SP | 1 | EA | PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ***** (15+47.00) | 1693000000-E | 654 | 25 | TON | ASPHALT PLANT MIX, PAVEMENT REPAIR | 4025000000-E | 901 | 6.25 | SF | CONTRACTOR FURNISHED, TYPE *** SIGN (E) |
| 0050000000-E | 226 | 1 | ACR | SUPPLEMENTARY CLEARING & GRUB-BING | 2000000000-N | 806 | 4 | EA | RIGHT OF WAY MARKERS | 4072000000-E | 903 | 14 | LF | SUPPORTS, 3-LB STEEL U-CHANNEL |
| 0057000000-E | 226 | 50 | CY | UNDERCUT EXCAVATION | 2022000000-E | 815 | 45 | CY | SUBDRAIN EXCAVATION | 4102000000-N | 904 | 1 | EA | SIGN ERECTION, TYPE E |
| 0063000000-N | SP | Lump Sum | | GRADING | 2033000000-E | 815 | 35 | CY | SUBDRAIN FINE AGGREGATE | 4155000000-N | 907 | 5 | EA | DISPOSAL OF SIGN SYSTEM, U-CHANNEL |
| 0080000000-E | SP | 400 | TON | CLASS IV SUBGRADE STABILIZATION | 2044000000-E | 815 | 200 | LF | 6" PERFORATED SUBDRAIN PIPE | 4400000000-E | 1110 | 88 | SF | WORK ZONE SIGNS (STATIONARY) |
| 0134000000-E | 240 | 140 | CY | DRAINAGE DITCH EXCAVATION | 2055000000-E | 815 | 6 | EA | 6" SUBDRAIN PIPE WYES, TEES, & ELBOWS | 4400000000-E | 1110 | 88 | SF | WORK ZONE SIGNS (PORTABLE) |
| 0195000000-E | 265 | 400 | CY | SELECT GRANULAR MATERIAL | 2066000000-N | 815 | 1 | EA | CONCRETE PAD FOR SUBDRAIN PIPE OUTLET | 4410000000-E | 1110 | 36 | SF | WORK ZONE SIGNS (BARRICADE MOUNTED) |
| 0196000000-E | 270 | 400 | SY | FABRIC FOR SOIL STABILIZATION | 2077000000-E | 815 | 6 | LF | 6" OUTLET PIPE (SUBDRAINS) | 4430000000-N | 1130 | 37 | EA | DRUMS |
| 0318000000-E | 300 | 40 | TON | FOUNDATION CONDITIONING MATERIAL, MINOR STRS | 2209000000-E | 838 | 7.6 | CY | ENDWALLS | 4445000000-E | 1145 | 32 | LF | BARRICADES (TYPE III) |
| 0366000000-E | 310 | 28 | LF | 15" RC PIPE CULVERTS, CLASS III | 2286000000-N | 840 | 3 | EA | MASONRY DRAINAGE STRUCTURES | 4455000000-N | 1150 | 240 | MD | FLAGGER |
| 0378000000-E | 310 | 88 | LF | 24" RC PIPE CULVERTS, CLASS III | 2308000000-E | 840 | 0.3 | LF | MASONRY DRAINAGE STRUCTURES | 4650000000-N | 1251 | 80 | EA | TEMPORARY RAISED PAVEMENT MARKERS |
| 0708000000-E | 310 | 116 | LF | 15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK | 2367000000-N | 840 | 2 | EA | FRAME WITH TWO GRATES, STD 840.29 | 4810000000-E | 1205 | 12,773 | LF | PAINT PAVEMENT MARKING LINES (4") |
| 0714000000-E | 310 | 48 | LF | 18" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK | 2556000000-E | 846 | 52 | LF | SHOULDER BERM GUTTER | 4847000000-E | 1205 | 6,401 | LF | POLYUREA PAVEMENT MARKING LINES (4", *****), (STANDARD GLASS BEADS) |
| 0738000000-E | 310 | 20 | LF | 42" BIT COAT CS PIPE CULVERTS, TYPE B 0.109" THICK | 3030000000-E | 862 | 1,350 | LF | STEEL BM GUARDRAIL | 4850000000-E | 1205 | 2,100 | LF | REMOVAL OF PAVEMENT MARKING LINES (4") |
| 0806000000-E | 310 | 1 | EA | 15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK | 3150000000-N | 862 | 20 | EA | ADDITIONAL GUARDRAIL POSTS | 4905000000-N | 1253 | 20 | EA | SNOWPLOWABLE PAVEMENT MARKERS |
| 0995000000-E | 340 | 90 | LF | PIPE REMOVAL | 3270000000-N | SP | 4 | EA | GUARDRAIL ANCHOR UNITS, TYPE 350 | 6000000000-E | 1605 | 2,370 | LF | TEMPORARY SILT FENCE |
| 1121000000-E | 520 | 1,113 | TON | AGGREGATE BASE COURSE | 3317000000-N | 862 | 4 | EA | GUARDRAIL ANCHOR UNITS, TYPE B-77 | 6006000000-E | 1610 | 105 | TON | STONE FOR EROSION CONTROL, CLASS A |
| 1220000000-E | 545 | 25 | TON | INCIDENTAL STONE BASE | 3360000000-E | 863 | 1,281 | LF | REMOVE EXISTING GUARDRAIL | 6009000000-E | 1610 | 650 | TON | STONE FOR EROSION CONTROL, CLASS B |
| 1275000000-E | 600 | 820 | GAL | PRIME COAT | 3380000000-E | 862 | 950 | LF | TEMPORARY STEEL BM GUARDRAIL | 6012000000-E | 1610 | 205 | TON | SEDIMENT CONTROL STONE |
| 1489000000-E | 610 | 452 | TON | ASPHALT CONC BASE COURSE, TYPE B25.0B | 3387000000-N | 862 | 4 | EA | GUARDRAIL ANCHOR UNITS, TYPE ***** TEMPORARY (III) | 6015000000-E | 1615 | 6.5 | ACR | TEMPORARY MULCHING |
| 1498000000-E | 610 | 320 | TON | ASPHALT CONC INTERMEDIATE COURSE, TYPE 119.0B | 3389100000-N | SP | 4 | EA | GUARDRAIL ANCHOR UNITS, TYPE 350 TEMPORARY | 6018000000-E | 1620 | 250 | LB | SEED FOR TEMPORARY SEEDING |
| | | | | | 3628000000-E | 876 | 20 | TON | RIP RAP, CLASS 1 | 6021000000-E | 1620 | 1 | TON | FERTILIZER FOR TEMPORARY SEEDING |
| | | | | | 3649000000-E | 876 | 360 | TON | RIP RAP, CLASS B | 6024000000-E | 1622 | 420 | LF | TEMPORARY SLOPE DRAINS |
| | | | | | | | | | | 6027000000-N | 1622 | 7 | EA | INLET PROTECTION AT TEMPORARY SLOPE DRAINS |
| | | | | | | | | | | 6029000000-E | SP | 300 | LF | SAFETY FENCE |
| | | | | | | | | | | 6030000000-E | 1630 | 2,100 | CY | SILT EXCAVATION |
| | | | | | | | | | | 6036000000-E | 1631 | 1,100 | SY | MATting FOR EROSION CONTROL |
| | | | | | | | | | | 6038000000-E | SP | 320 | SY | PERMANENT SOIL REINFORCEMENT MAT |
| | | | | | | | | | | 6042000000-E | 1632 | 40 | LF | 1/4" HARDWARE CLOTH |
| | | | | | | | | | | 6071030000-E | SP | 550 | LF | COIR FIBER BAFFLES |
| | | | | | | | | | | 6084000000-E | 1660 | 7.5 | ACR | SEEDING & MULCHING |
| | | | | | | | | | | 6087000000-E | 1660 | 4 | ACR | MOWING |
| | | | | | | | | | | 6090000000-E | 1661 | 100 | LB | SEED FOR REPAIR SEEDING |
| | | | | | | | | | | 6093000000-E | 1661 | 0.25 | TON | FERTILIZER FOR REPAIR SEEDING |
| | | | | | | | | | | 6096000000-E | 1662 | 175 | LB | SEED FOR SUPPLEMENTAL SEEDING |
| | | | | | | | | | | 6108000000-E | 1665 | 5.5 | TON | FERTILIZER TOPDRESSING |
| | | | | | | | | | | 6114000000-N | SP | 6 | HR | SPECIALIZED HAND MOWING |
| | | | | | | | | | | 6117000000-N | SP | 27 | EA | RESPONSE FOR EROSION CONTROL |
| | | | | | | | | | | 6123000000-E | 1670 | 0.75 | ACR | REFORESTATION |

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

SUMMARY OF PAVEMENT REMOVAL
IN SQUARE YARDS

| LOCATION | ASPHALT REMOVAL | ASPHALT BREAK-UP | CONCRETE REMOVAL | CONCRETE BREAK-UP |
|---------------------------|-----------------|------------------|------------------|-------------------|
| -DET- STA. 10+79 TO 12+00 | 97 | | | |
| -DET- STA. 12+00 TO 15+11 | 760 | | | |
| -DET- STA. 15+91 TO 20+00 | 1000 | | | |
| -DET- STA. 20+00 TO 22+90 | 259 | | | |
| -L- STA. 14+50 TO 14+96 | 115 | | | |
| -L- STA. 15+99 TO 16+44 | 110 | | | |
| GRAND TOTAL | 2,341 | | | |
| SAY | 2,350 | | | |

SUMMARY OF EARTHWORK
IN CUBIC YARDS

| LOCATION | UNCLASSIFIED EXCAVATION | UNDERCUT | EMBT + % | BORROW | WASTE |
|--|-------------------------|----------|----------|--------|--------|
| PHASE 1 | | | | | |
| -DET- 8+60 TO 15+24 (BEGIN BRIDGE) | 97 | | 6,418 | 6,321 | |
| -DET- 15+74 (END BRIDGE) TO 24+64 | 7,081 | | 4,676 | | 2,405 |
| SUBTOTAL | 7,178 | | 11,094 | 6,321 | 2,405 |
| WASTE TO REPLACE BORROW | | | | -2,405 | -2,405 |
| EST. SHOULDER MATERIAL | | | 564 | 564 | |
| TOTAL (PHASE 1) | 7,178 | | 11,658 | 4,480 | 0 |
| PHASE 2 | | | | | |
| -L- (LT.) 8+60 TO 15+00 (BEGIN BRIDGE) | 70 | | 2,314 | 2,244 | |
| -L- (LT.) 15+90 (END BRIDGE) TO 24+50 | 124 | | 357 | 233 | |
| TOTAL EARTHWORK (PHASE 2) | 194 | | 2,671 | 2,477 | |
| PHASE 3 | | | | | |
| -L- (RT.) 11+00 TO 15+00 (BEGIN BRIDGE) | 12 | | 279 | 267 | |
| -L- (RT.) 15+90 (END BRIDGE) TO 23+50 | 324 | | 148 | | 176 |
| -DET- REMOVAL 10+00 TO 15+24 (BEGIN BRIDGE) | 2,822 | | | | 2,822 |
| -DET- REMOVAL 15+74 (END BRIDGE) TO 18+50 | 3,227 | | | | 3,227 |
| SUBTOTAL | 6,385 | | 427 | 267 | 6,225 |
| WASTE TO REPLACE BORROW | | | | -267 | -267 |
| TOTAL (PHASE 3) | 6,385 | | 427 | 0 | 5,958 |
| TOTAL (ALL PHASES) | 13,757 | | 14,756 | 6,957 | 5,958 |
| EST. LOSS DUE TO CLEARING AND GRUBBING | -150 | | | 150 | |
| PROJECT TOTAL | 13,607 | | 14,756 | 7,107 | 5,958 |
| EST. 5% TO REPLACE TOPSOIL ON BORROW PIT | | | | 355 | |
| GRAND TOTAL | 13,607 | | 14,756 | 7,462 | 5,958 |
| SAY | 13,700 | | 14,800 | 7,500 | 6,000 |
| SELECT GRANULAR MATERIAL (CL II or III) = 400 CY GRADE POINTS UNDERCUT = 50 CY CLASS IV SUBGRADE STABILIZATION = 400 TONS (CONTINGENCY ITEMS PER 'GEOTECHNICAL REPORT - DESIGN AND CONSTRUCTION RECOMMENDATIONS' LETTER DATED JANUARY 31, 2007) | | | | | |

APPROXIMATE QUANTITIES ONLY. CLEARING AND GRUBBING, UNCLASSIFIED EXCAVATION, BORROW EXCAVATION, FINE GRADING, AND REMOVAL OF EXISTING PAVEMENT WILL BE PAID FOR AT THE CONTRACT LUMP SUM PRICE FOR "GRADING".

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

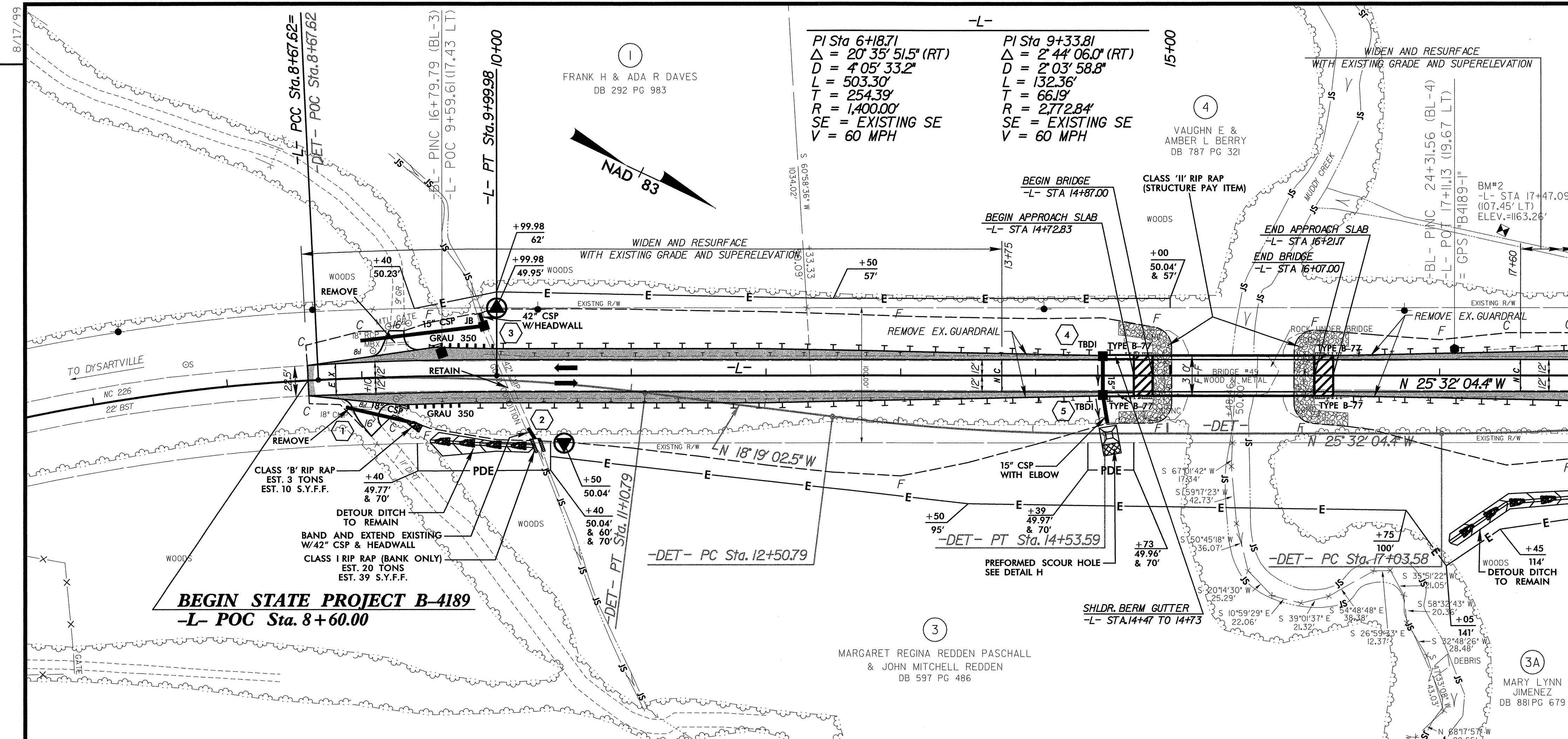
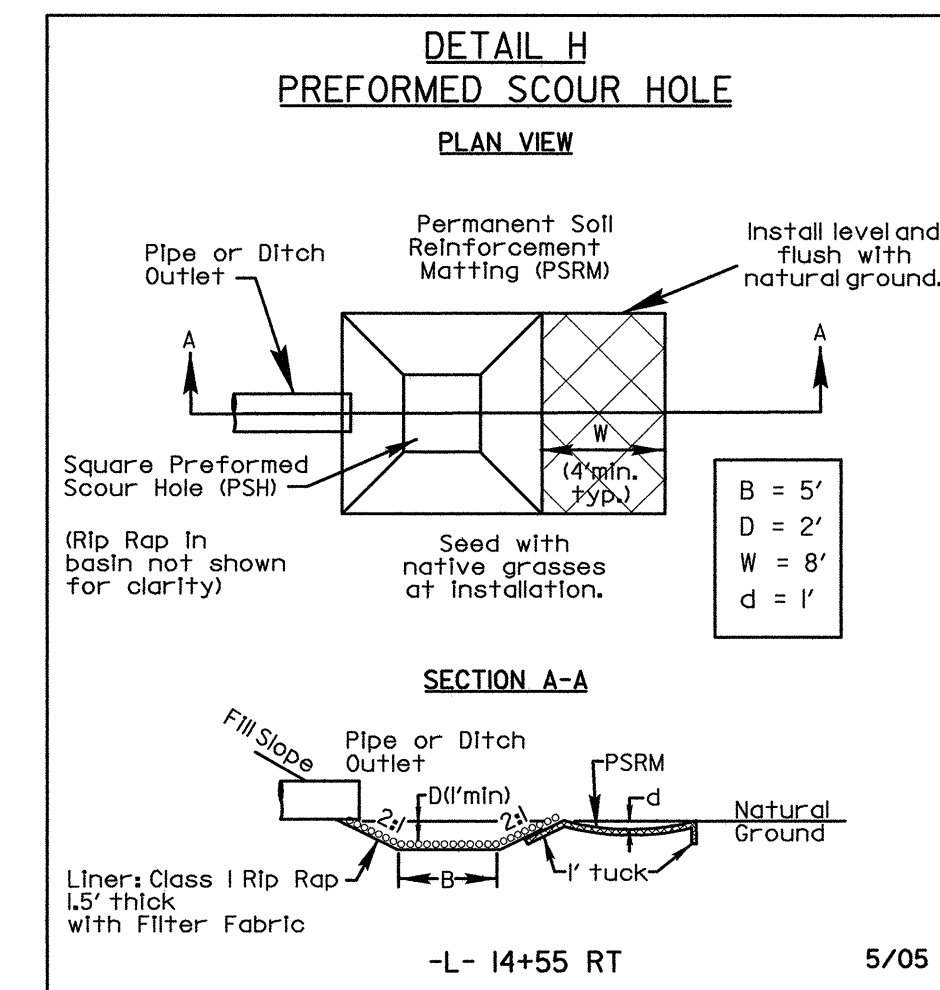
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| | |
|--|-------------------------|
| PROJECT REFERENCE NO. B-4189 | SHEET NO. 4 |
| RW SHEET NO. | |
| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
| MA Engineering CONSULTANTS, INC. 598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221 | |

NOTES:
SEE SHEETS 2A & 2B FOR DETOUR DESIGN.
ALL DRIVEWAY RADII ARE 10' UNLESS SHOWN OTHERWISE.

FOR STRUCTURE PLANS, SEE SHEETS S-1 THRU S-21



BM #1
CHISLED SQUARE IN SIDEWALK
AT DYSARTSVILLE BAPTIST CHURCH
-BL- STATION 4+97.60 (159.06' LT)
ELEV. 1253.43'

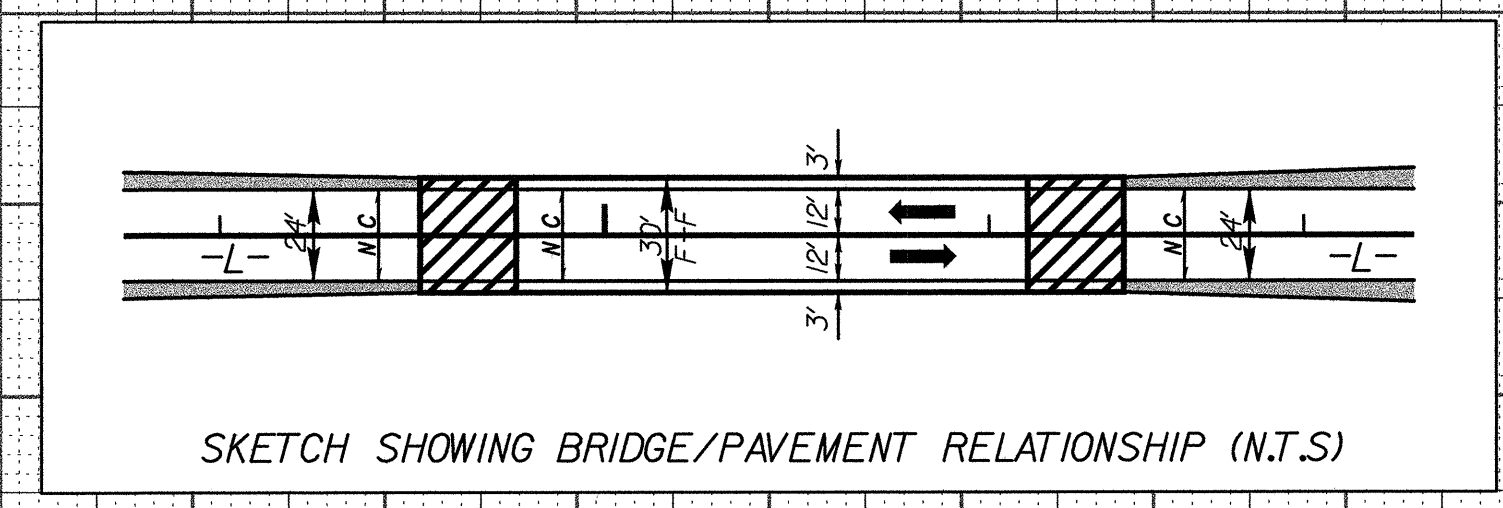
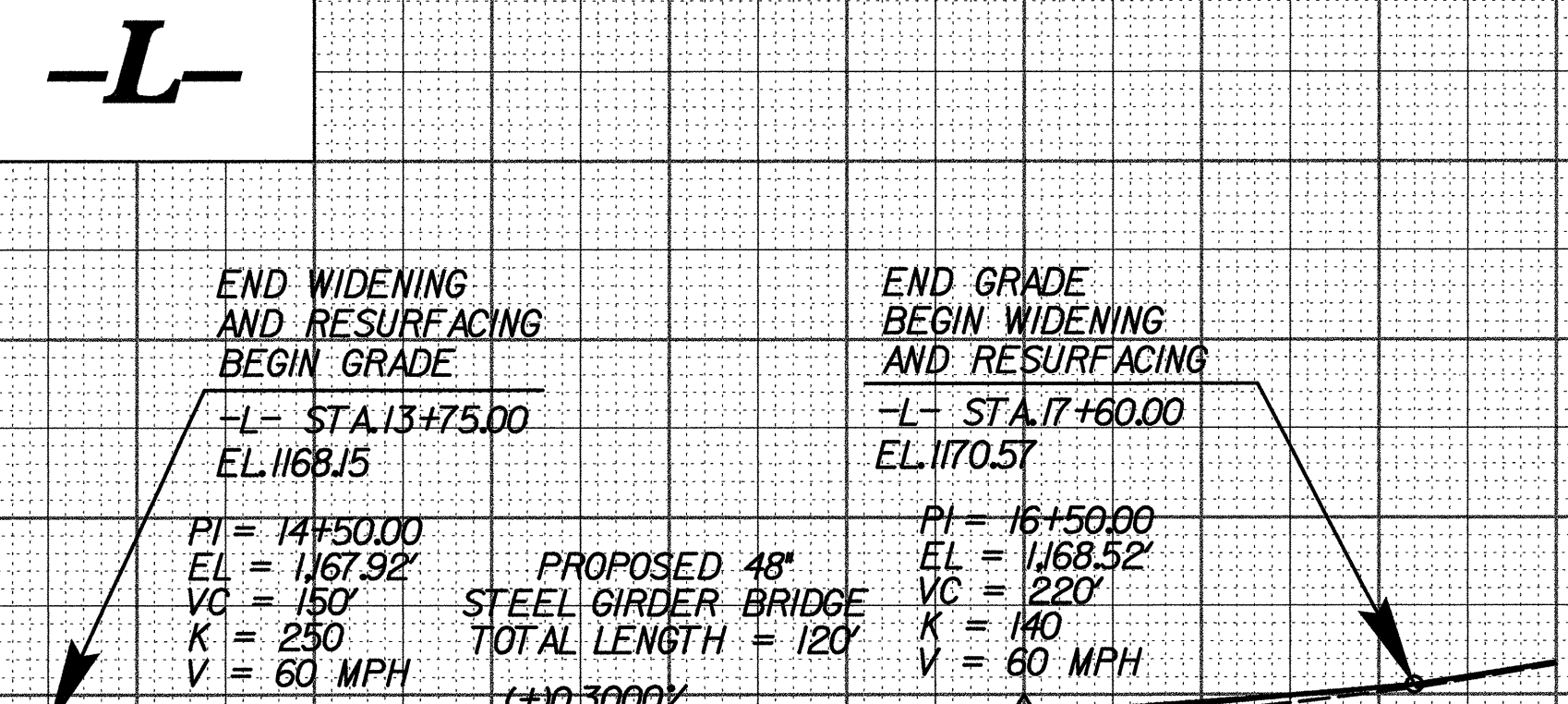
BM #2
8" NAIL IN BASE OF 18" MAPLE
-L- STATION 17+47.09 (107.45' LT)
ELEV. 1163.26'

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE = 2500 CFS
DESIGN FREQUENCY = 25 YRS
DESIGN HW ELEVATION = 1157.5 FT
BASE DISCHARGE = 3700 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 1159.4 FT
OVERTOPPING DISCHARGE = 10000 CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 1168.0 FT
DATE OF SURVEY = 3/2005
W.S. ELEVATION AT DATE OF SURVEY = 1147.5 FT

CULVERT HYDRAULIC DATA

DESIGN DISCHARGE = 83.6 CFS
DESIGN FREQUENCY = 50 YRS
DESIGN HW ELEVATION = 1163.9 FT
BASE DISCHARGE = 1331 CFS
BASE FREQUENCY = 100 YRS
BASE HW ELEVATION = 1166.2 FT
OVERTOPPING DISCHARGE = 184 CFS
OVERTOPPING FREQUENCY = 500+ YRS
OVERTOPPING ELEVATION = 1172.8 FT

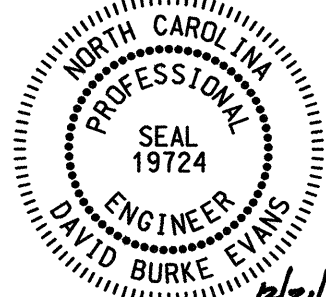
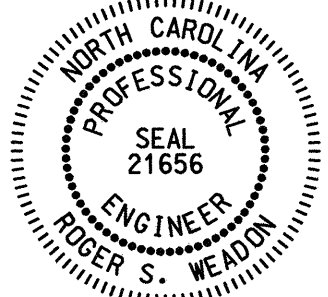



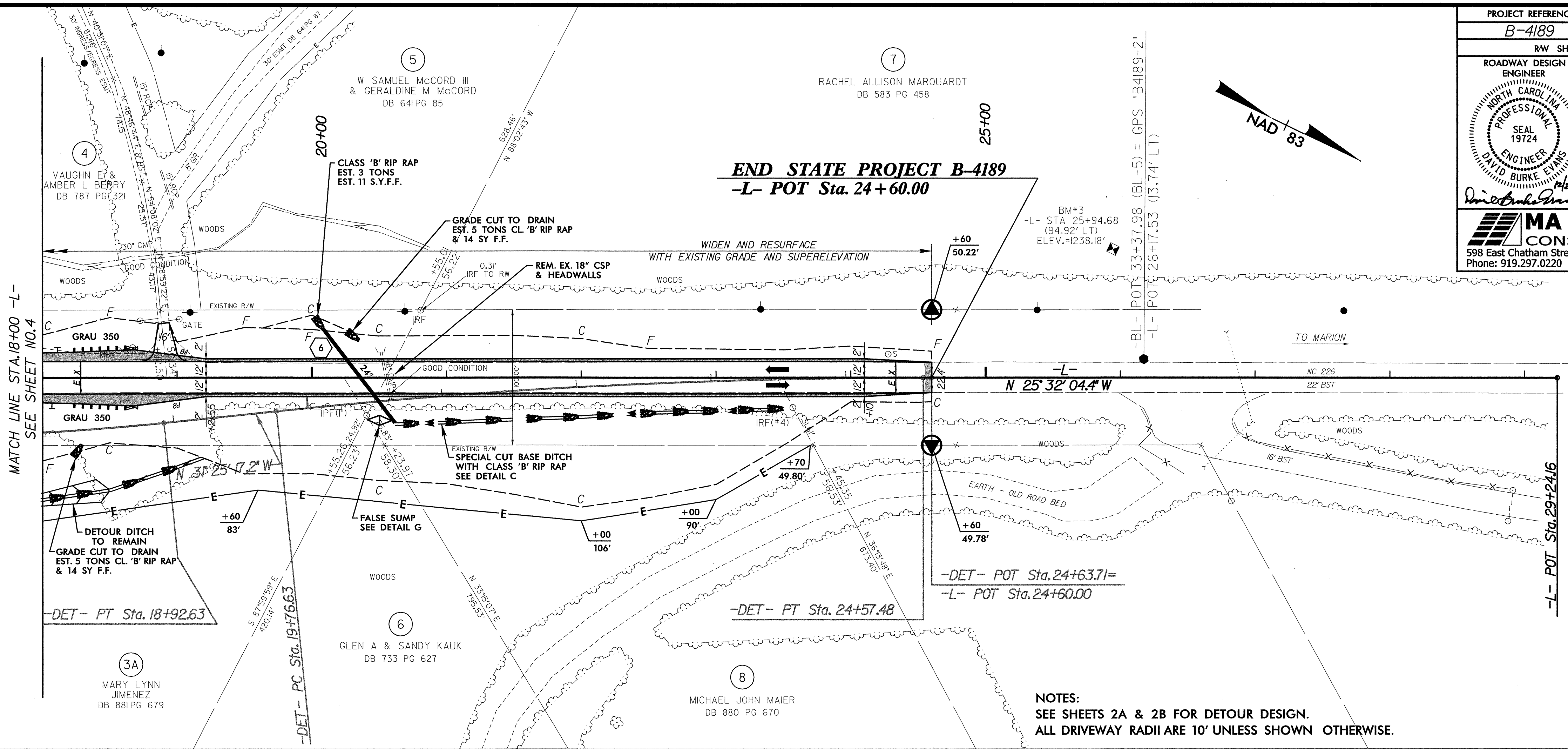
EXISTING GROUND - - - -
PROPOSED GRADE - - - -

REVISIONS

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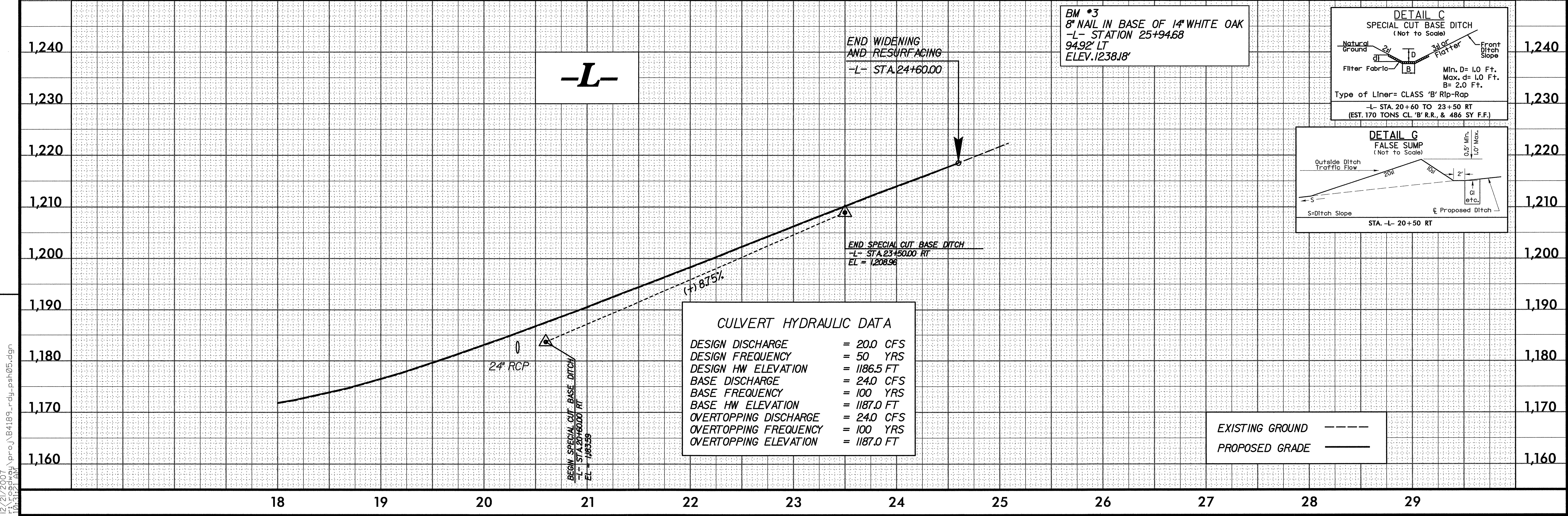
8/17/99

| | | | |
|---|--|--|--|
| PROJECT REFERENCE NO. B-4189 | | SHEET NO. 5 | |
| RW SHEET NO. | | | |
| ROADWAY DESIGN ENGINEER DAVID BURKE EVANS | | HYDRAULICS ENGINEER ROGER S. WEDDIN | |
|  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 19724 DAVID BURKE EVANS | |  NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 21656 ROGER S. WEDDIN | |
|  MA Engineering CONSULTANTS, INC. 598 East Chatham Street Suite 137 Cary, NC 27511 Phone: 919.297.0220 Fax: 919.297.0221 | | | |

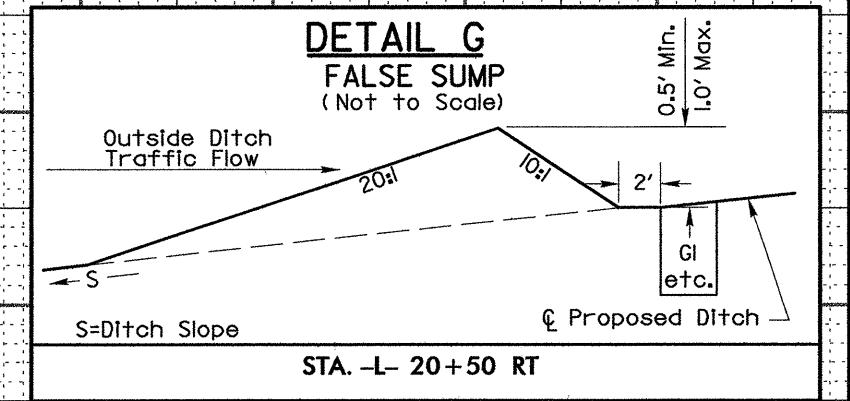
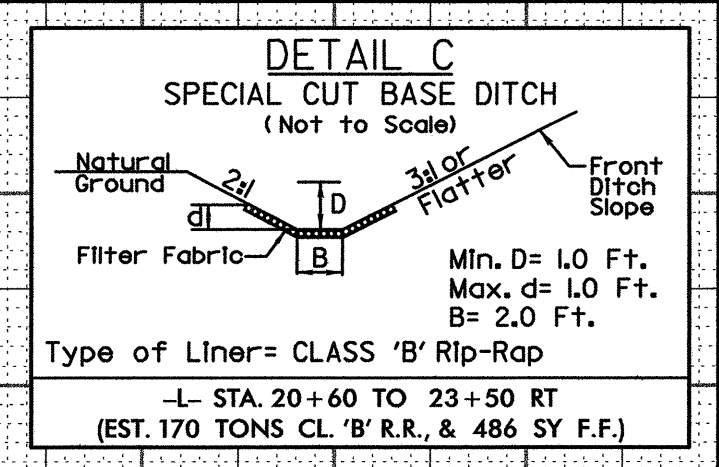


REVISIONS

NOTES:
SEE SHEETS 2A & 2B FOR DETOUR DESIGN.
ALL DRIVEWAY RADII ARE 10' UNLESS SHOWN OTHERWISE.



BM *3
8" NAIL IN BASE OF 14" WHITE OAK
-L- STATION 25+94.68
94.92' LT
ELEV. 1238.18'



CULVERT HYDRAULIC DATA

| | |
|-----------------------|-------------|
| DESIGN DISCHARGE | = 20.0 CFS |
| DESIGN FREQUENCY | = 50 YRS |
| DESIGN HW ELEVATION | = 1186.5 FT |
| BASE DISCHARGE | = 24.0 CFS |
| BASE FREQUENCY | = 100 YRS |
| BASE HW ELEVATION | = 1187.0 FT |
| OVERTOPPING DISCHARGE | = 24.0 CFS |
| OVERTOPPING FREQUENCY | = 100 YRS |
| OVERTOPPING ELEVATION | = 1187.0 FT |

EXISTING GROUND -----
PROPOSED GRADE _____

12/21/2007
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