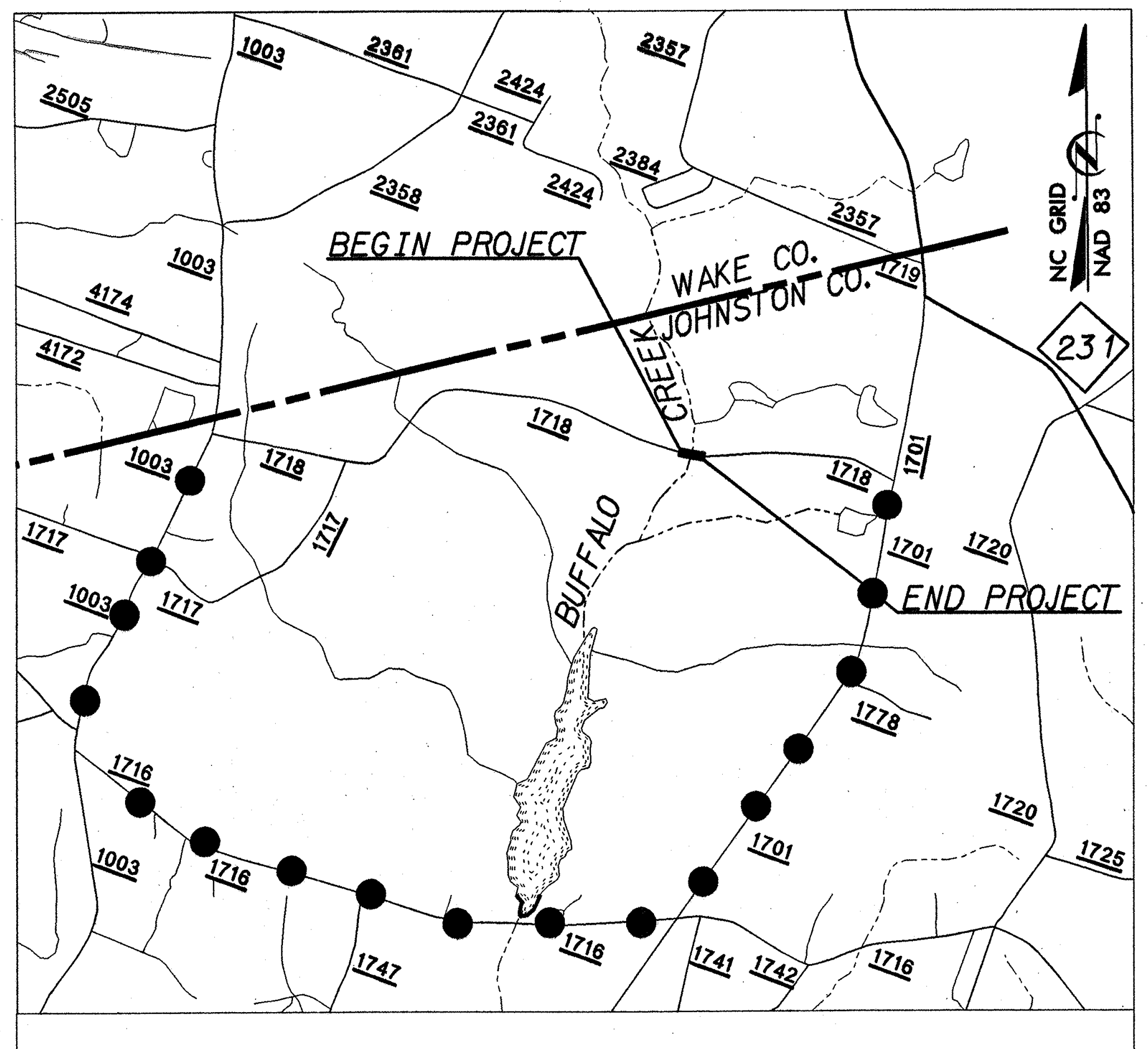
09/08/99

$$$$SYSTIME$$$$$
$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$
$$$USERNAME$$$$

# CONTRACT: C201636 TIP PROJECT: B-3672

See Sheet 1-A For Index of Sheets
See Sheet 1-B For Conventional Symbols



## VICINITY MAP

DETOUR —●—●—●—●—

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

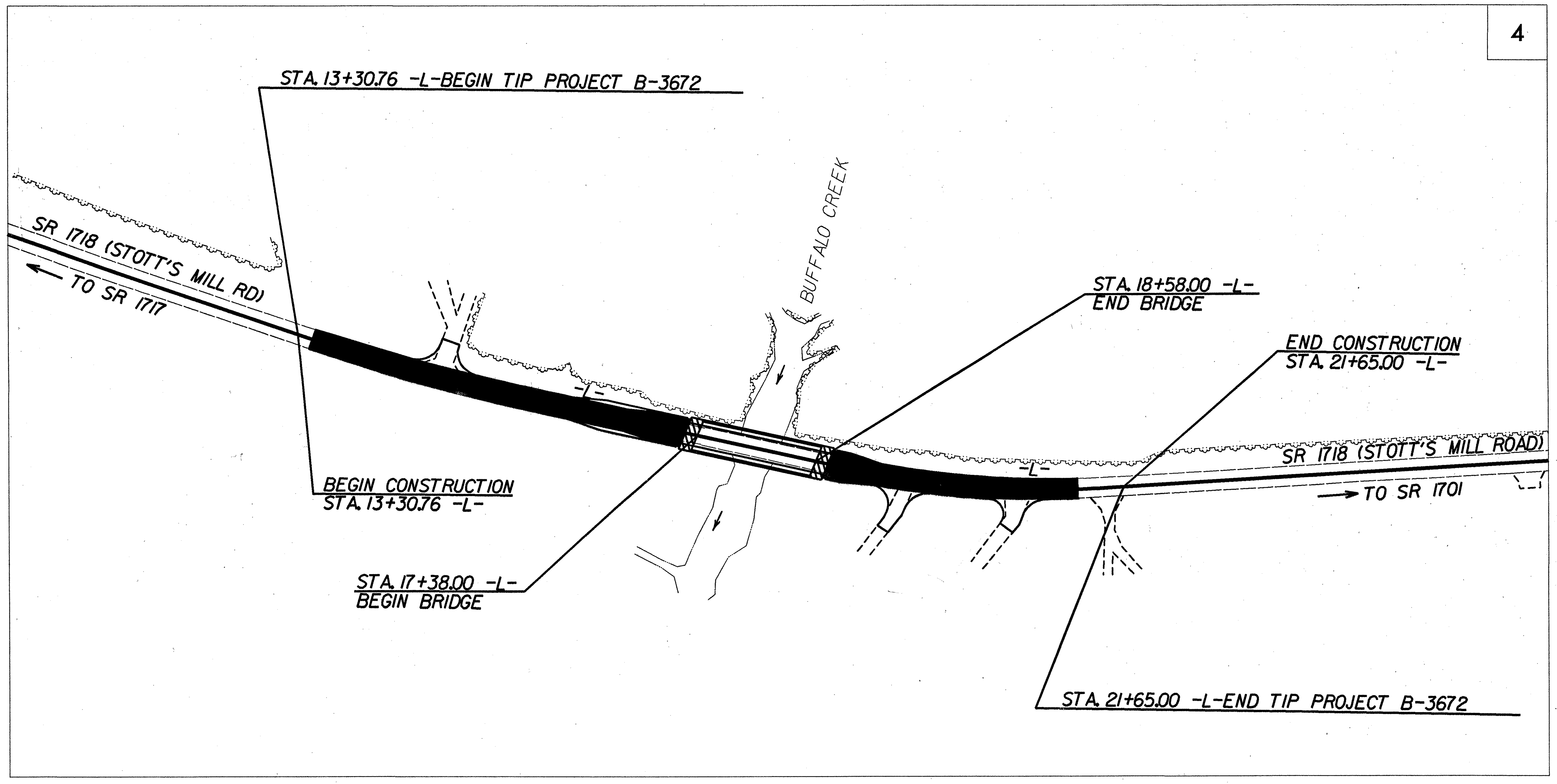
# *JOHNSTON COUNTY*

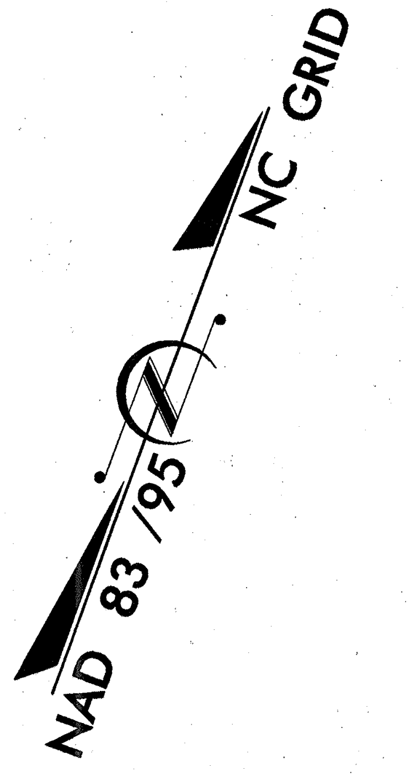
***LOCATION: BRIDGE NO. 415 OVER BUFFALO CREEK***
***ON SR 1718 (STOTT'S MILL ROAD)***

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

| STATE | STATE PROJECT REFERENCE NO. | SHEET NO. | TOTAL SHEETS |
|---|---|---|---|
| N.C. | B-3672 | 1 | |

| WBS NO. | F. A. PROJ. NO. | DESCRIPTION |
|---|---|---|
| 33216.1.1 | BRZ-1718 (4) | PE |
| 33216.2.1 | BRZ-1718 (4) | R/W, UTIL. |
| 33216.3.1 | BRZ-1718 (5) | CONSTRUCTION |
| | | |
| | | |
| | | |
| | | |
| | | |





** DESIGN EXCEPTION FOR MIN. HORIZONTAL CURVE RADIUS, SAG VERTICAL CURVE K VALUES, VERTICAL SSD, AND SUPERELEVATION.
NCDOT CONTACT: MS. CATHY S. HOUSER, PE, PROJECT ENGINEER

## GRAPHIC SCALES

50 25 0 50 100
PLANS

50 25 0 50 100
PROFILE (HORIZONTAL)

10 5 0 10 20
PROFILE (VERTICAL)

## DESIGN DATA

ADT 2007 = 430 VPD
ADT 2027 = 730 VPD
DHV = 12%
D = 60%
T = 4% *
V = 60 MPH **
* TTST 1% + DUAL 3%

## PROJECT LENGTH

LENGTH ROADWAY TIP PROJECT B-3672 = 0.135 MILE
LENGTH STRUCTURE TIP PROJECT B-3672 = 0.023 MILE
TOTAL LENGTH OF TIP PROJECT B-3672 = 0.158 MILE

*Prepared for NCDOT In the Office of:*

KCI Associates
of North Carolina, P.A.
RALEIGH OFFICE
ENGINEERS ● PLANNERS ● ECOLOGISTS

SUITE 220, LANDMARK CENTER II
4601 SIX FORKS RD.
RALEIGH, N.C. 27609-5210
(919) 783-9214

***2006 STANDARD SPECIFICATIONS & GENERAL NOTES***

***RIGHT OF WAY DATE:***
MARCH 29, 2006

***LETTING DATE:***
MARCH 20, 2007

MICHELLE R. BRAME, P.E
***PROJECT ENGINEER***

KEVIN SU, E.I.
***PROJECT DESIGN ENGINEER***

***HYDRAULICS ENGINEER***

Audrey B. Burnette 1/4/07
SEAL 023090 AUDREY B. BURNETTE
P.E.
***SIGNATURE:***

***ROADWAY DESIGN ENGINEER***

Michelle R Brame 1/4/07
SEAL 22761 MICHELLE R. BRAME
P.E.
***SIGNATURE:***

***DIVISION OF HIGHWAYS***
***STATE OF NORTH CAROLINA***

Art McMillan
P.E.
***STATE HIGHWAY DESIGN ENGINEER*** ***DATE***

5/28/99

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

KCI Associates
of North Carolina, P.A.
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RALEIGH, N.C. 27609-5210
(919) 783-9214

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 1-A |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | |

Michelle R Brame 1/4/07
SEAL 22761
MICHELLE R. BRAME

## INDEX OF SHEETS

## GENERAL NOTES:

2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED:

GRADING AND SURFACING OR RESURFACING AND WIDENING:

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

CLEARING:

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

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.

DRIVEWAYS:

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

GUARDRAIL:

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

SUBSURFACE PLANS:

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 PROGRESS ENERGY AND BELL SOUTH.

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.

EFF. 07-18-06

## 2006 ROADWAY STANDARD DRAWINGS

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 | |
| 200.03 | Method of Clearing - Method III |
| 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 |
| 840.00 | Concrete Base Pad for Drainage Structures |
| 840.18 | Concrete Grated Drop Inlet Type 'B' - 12" thru 36" Pipe |
| 840.27 | Brick Grated Drop Inlet Type 'B' - 12" thru 36" Pipe |
| 840.29 | Frames and Narrow Slot Flat Grates |
| 840.45 | Precast Drainage Structure |
| 846.04 | Drop Inlet Installation in Shoulder Berm Gutter |
| 848.02 | Driveway Turnout - Radius Type |
| 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 |
| 876.02 | Guide for Rip Rap at Pipe Outlets |
| 876.04 | Drainage Ditches with Class 'B' Rip Rap |

3/15/06

***Note: Not to Scale***

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

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

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4601 SIX FORKS RD.
RALEIGH, N.C. 27609-5210
(919) 783-9214

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 1-B |

# CONVENTIONAL PLAN SHEET SYMBOLS

## *BOUNDARIES AND PROPERTY:*

| | |
|---|---|
| State Line | ━ - - - ━ - - - |
| County Line | — - - — - - |
| Township Line | — - - — |
| City Line | — - — - |
| Reservation Line | — · — · — |
| Property Line | —— —— |
| Existing Iron Pin | ⊙ EIP |
| Property Corner | —— ——× |
| Property Monument | ⊡ ECM |
| Parcel/Sequence Number | ⑫③ |
| Existing Fence Line | —×——×——×— |
| 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 —— |

## *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 | ○~~~ |
| Swamp Marsh | ⚘ |
| Proposed Lateral, Tail, Head Ditch | ⋙ ← FLOW |
| False Sump | ◁▷ |

## *RAILROADS:*

| | |
|---|---|
| Standard Gauge | ┼┼┼┼┼ CSX TRANSPORTATION |
| RR Signal Milepost | ⊙ MILEPOST 35 |
| Switch | ▭ SWITCH |
| RR Abandoned | —+— —+— |
| RR Dismantled | — — — — |

## *RIGHT OF WAY:*

| | |
|---|---|
| Baseline Control Point | ◆ |
| Existing Right of Way Marker | △ |
| Existing Right of Way Line | —— —— |
| Proposed Right of Way Line | ━Ⓡ━ (R/W) |
| Proposed Right of Way Line with Iron Pin and Cap Marker | ━(R/W)━▲━ |
| Proposed Right of Way Line with Concrete or Granite Marker | ━●▲━(R/W)━ |
| Existing Control of Access | — (C/A) — |
| Proposed Control of Access | ━(C/A)━ |
| Existing Easement Line | —— E —— |
| Proposed Temporary Construction Easement | —— E —— |
| Proposed Temporary Drainage Easement | —— TDE —— |
| Proposed Permanent Drainage Easement | —— PDE —— |
| Proposed Permanent Utility Easement | —— PUE —— |

## *ROADS AND RELATED FEATURES:*

| | |
|---|---|
| Existing Edge of Pavement | — — — — |
| Existing Curb | ━ ━ ━ ━ |
| Proposed Slope Stakes Cut | — — — C — — — |
| Proposed Slope Stakes Fill | — — — F — — — |
| Proposed Wheel Chair Ramp | (WCR) |
| Proposed Wheel Chair Ramp Curb Cut | (WCC) |
| Curb Cut for Future Wheel Chair Ramp | (CCFR) |
| Existing Metal Guardrail | —T—T—T— |
| Proposed Guardrail | —T—T—T—T— |
| Existing Cable Guiderail | —▯—▯—▯— |
| Proposed Cable Guiderail | —▯—▯—▯—▯— |
| Equality Symbol | ◕ |
| Pavement Removal | ⊠⊠⊠⊠ |

## *VEGETATION:*

| | |
|---|---|
| Single Tree | ✿ |
| Single Shrub | ✿ |
| Hedge | ﹏﹏﹏ |
| Woods Line | ⌒⌒⌒ |
| Orchard | ✿ ✿ ✿ ✿ |
| Vineyard | Vineyard |

## *EXISTING STRUCTURES:*

MAJOR:

| | |
|---|---|
| Bridge, Tunnel or Box Culvert | CONC |
| Bridge Wing Wall, Head Wall and End Wall | ) CONC WW ( |

MINOR:

| | |
|---|---|
| Head and End Wall | CONC HW |
| Pipe Culvert | ═══ |
| Footbridge | >- - - - -< |
| Drainage Box: Catch Basin, DI or JB | □ CB |
| Paved Ditch Gutter | — — — — |
| Storm Sewer Manhole | Ⓢ |
| Storm Sewer | —— S —— |

## *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 | HH |
| H-Frame Pole | ●—● |
| Recorded U/G Power Line | —— P —— |
| Designated U/G Power Line (S.U.E.*) | - - - P - - - |

TELEPHONE:

| | |
|---|---|
| Existing Telephone Pole | -●- |
| Proposed Telephone Pole | -○- |
| Telephone Manhole | Ⓣ |
| Telephone Booth | ☎ |
| Telephone Pedestal | T |
| Telephone Cell Tower | ● |
| U/G Telephone Cable Hand Hole | HH |
| Recorded U/G Telephone Cable | —— T —— |
| Designated U/G Telephone Cable (S.U.E.*) | - - - T - - - |
| Recorded U/G Telephone Conduit | —— TC —— |
| Designated U/G Telephone Conduit (S.U.E.*) | - - - TC - - - |
| Recorded U/G Fiber Optics Cable | —— T FO —— |
| Designated U/G Fiber Optics Cable (S.U.E.*) | - - - T FO - - - |

WATER:

| | |
|---|---|
| Water Manhole | Ⓦ |
| Water Meter | ⬭ |
| Water Valve | ⊗ |
| Water Hydrant | ⊙ |
| Recorded U/G Water Line | —— W —— |
| Designated U/G Water Line (S.U.E.*) | - - - W - - - |
| Above Ground Water Line | A/G Water |

TV:

| | |
|---|---|
| TV Satellite Dish | ⋉ |
| TV Pedestal | C |
| TV Tower | ⊗ |
| U/G TV Cable Hand Hole | HH |
| Recorded U/G TV Cable | —— TV —— |
| Designated U/G TV Cable (S.U.E.*) | - - - TV - - - |
| Recorded U/G Fiber Optic Cable | —— TV FO —— |
| Designated U/G Fiber Optic Cable (S.U.E.*) | - - - TV FO - - - |

GAS:

| | |
|---|---|
| Gas Valve | ◇ |
| Gas Meter | ◈ |
| Recorded U/G Gas Line | —— G —— |
| Designated U/G Gas Line (S.U.E.*) | - - - G - - - |
| Above Ground Gas Line | A/G Gas |

SANITARY SEWER:

| | |
|---|---|
| Sanitary Sewer Manhole | ⊕ |
| Sanitary Sewer Cleanout | ⊕ |
| U/G Sanitary Sewer Line | —— SS —— |
| Above Ground Sanitary Sewer | A/G Sanitary Sewer |
| Recorded SS Forced Main Line | —— FSS —— |
| Designated SS Forced Main Line (S.U.E.*) | - - - FSS - - - |

MISCELLANEOUS:

| | |
|---|---|
| Utility Pole | ● |
| Utility Pole with Base | ⊡ |
| Utility Located Object | ⊙ |
| Utility Traffic Signal Box | S |
| Utility Unknown U/G Line | —— ?UTL —— |
| U/G Tank; Water, Gas, Oil | ▭ |
| A/G Tank; Water, Gas, Oil | ▭ |
| U/G Test Hole (S.U.E.*) | ⊗ |
| Abandoned According to Utility Records | AATUR |
| End of Information | E.O.I. |

| WBS REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 1C |
| Location and Surveys | |

# SURVEY CONTROL SHEET B-3672

## CONTROL DATA

| BL POINT | DESC. | NORTH | EAST | ELEVATION | B3672L STATION | OFFSET |
|---|---|---|---|---|---|---|
| 5 | GPS B3672-1 | 728625.4650 | 2189027.5080 | 271.89 | OUTSIDE PROJECT LIMITS | |
| 1 | BL-1 | 728634.6300 | 2189478.4420 | 262.31 | 13+89.70 | 13.81 RT |
| 2 | BL-2 | 728692.9150 | 2189944.1020 | 254.63 | 18+57.95 | 12.79 RT |
| 3 | BL-3 | 728817.3780 | 2190339.3130 | 272.26 | 22+70.77 | 14.30 RT |
| 4 | BL-4 | 728975.0520 | 2190695.5180 | 293.93 | 26+60.31 | 14.46 RT |

## BENCHMARK DATA

*************************************

BM#1 ELEVATION = 284.35
N 728600 E 2189103
B3672L STATION 10+14 40 RIGHT
"BENCHLITE" NAIL SET IN 18" OAK

*************************************

*************************************

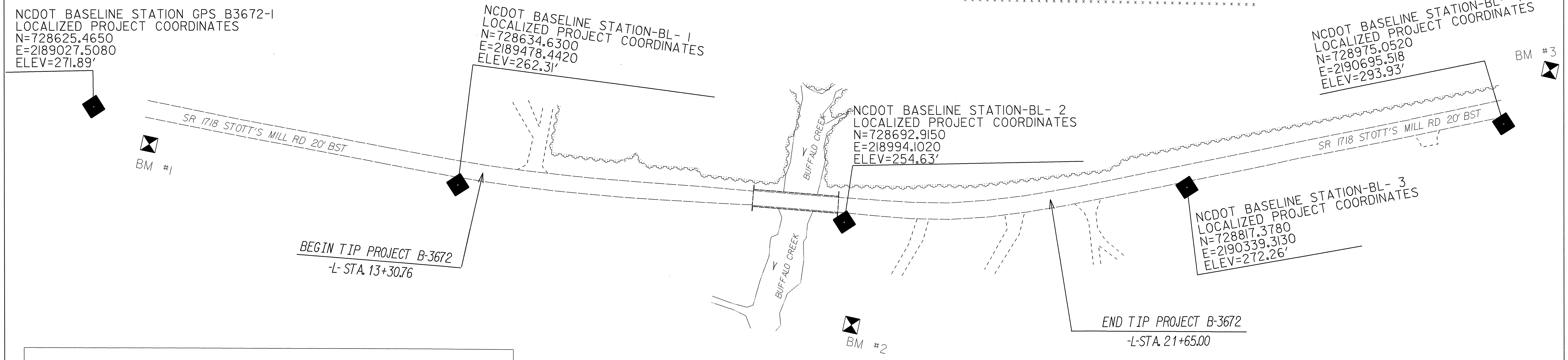
BM#2 ELEVATION = 255.55
N 728566 E 2189978
B3672L STATION 18+74 143 RIGHT
"BENCHLITE" NAIL SET IN 10" OAK

*************************************

*************************************

BM#3 ELEVATION = 301.03
N 729046 E 2190738
OUT OF PROJECT LIMITS
"BENCHLITE" NAIL SET IN 10" PINE

*************************************



## DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCDOT FOR MONUMENT "B3672-1"

WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF

NORTHING: 728,625.47(ft) EASTING: 2,189,027.51(ft)

THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT

(GROUND TO GRID) IS: 0.99990271

THE N.C. LAMBERT GRID BEARING AND

LOCALIZED HORIZONTAL GROUND DISTANCE FROM

"B3672-1" TO -L- PC STA 13+30.76
N° 86' 57" 08" 391.89'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES

VERTICAL DATUM USED IS NAVD 88

**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**
**FILE : B3672_LS_CONTROL_061207.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.**
**CONTROL NETWORK FOR B3672 ESTABLISHED USING STATIC GPS FROM NCGS HARN MONUMENTATION.**

**NOTE: DRAWING NOT TO SCALE**

8/17/99

REVISIONS

**KCI Associates of North Carolina, P.A.**
RALEIGH OFFICE
ENGINEERS ● PLANNERS ● ECOLOGISTS

SUITE 220, LANDMARK CENTER II
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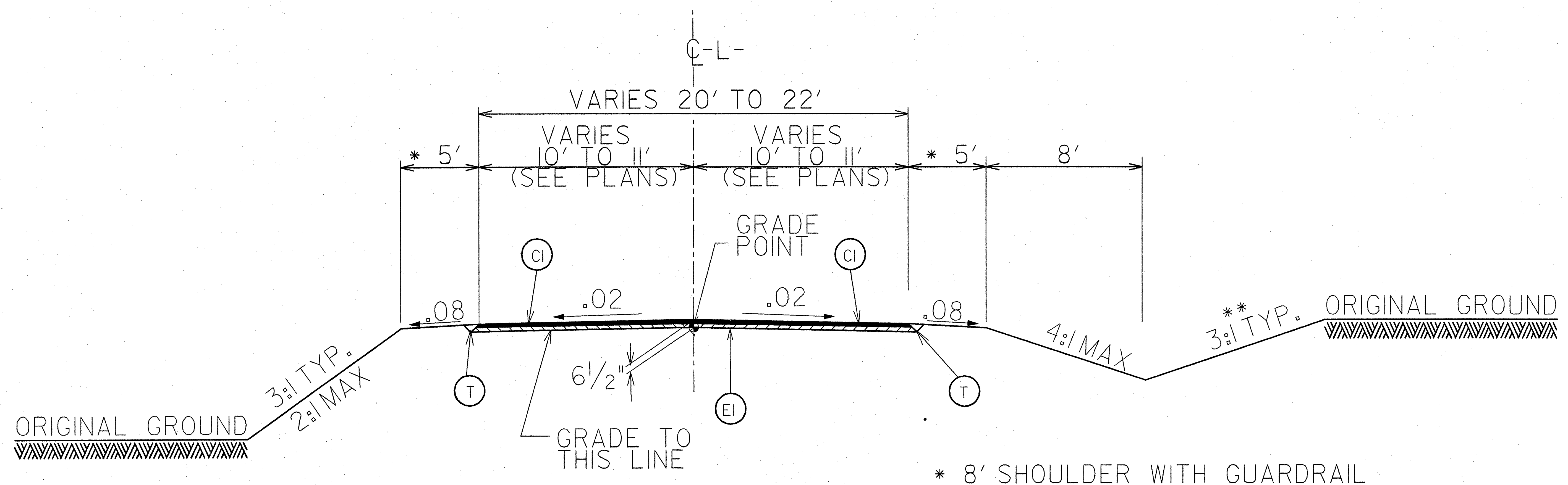
(919) 783-9214

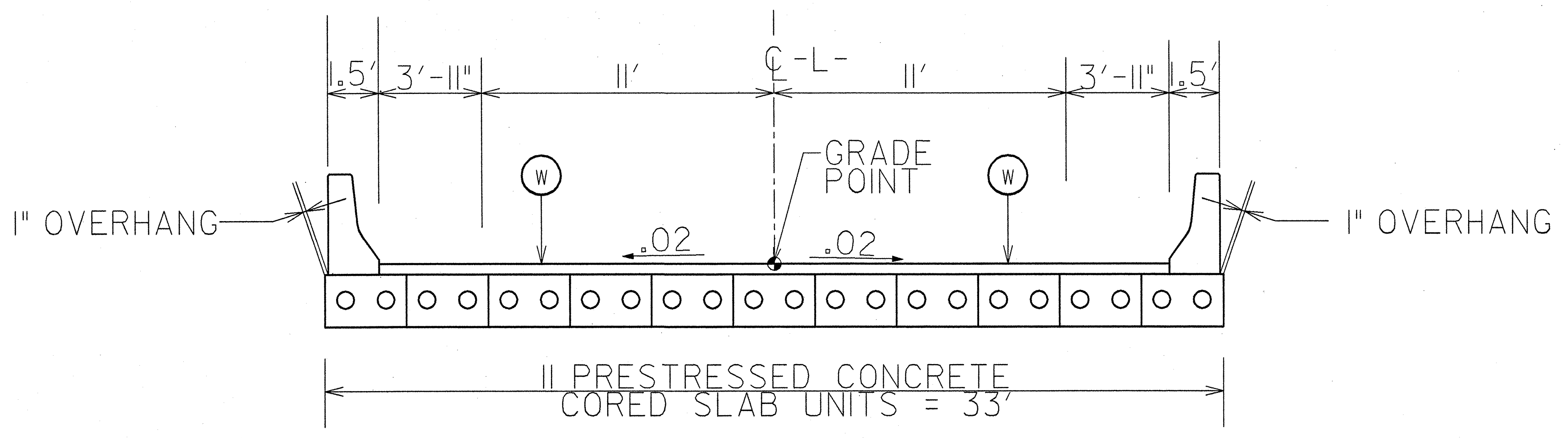
| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 2 |
| R/W SHEET NO. | |
| ROADWAY DESIGN ENGINEER | PAVEMENT DESIGN ENGINEER |
| SEAL 22701 MICHELLE R. BRAME 1/4/07 | SEAL 22896 CLARK S. MORRISON 1-4-07 |



* 8' SHOULDER WITH GUARDRAIL
** 2.5:1 SLOPE AT STA. 21+00 RT.

## *TYPICAL SECTION NO.1*

-L- STA. 13+45.00 TO STA. 17+38.00 (BEGIN BRIDGE)
-L- STA. 18+58.00 (END BRIDGE) TO STA. 21+20.00



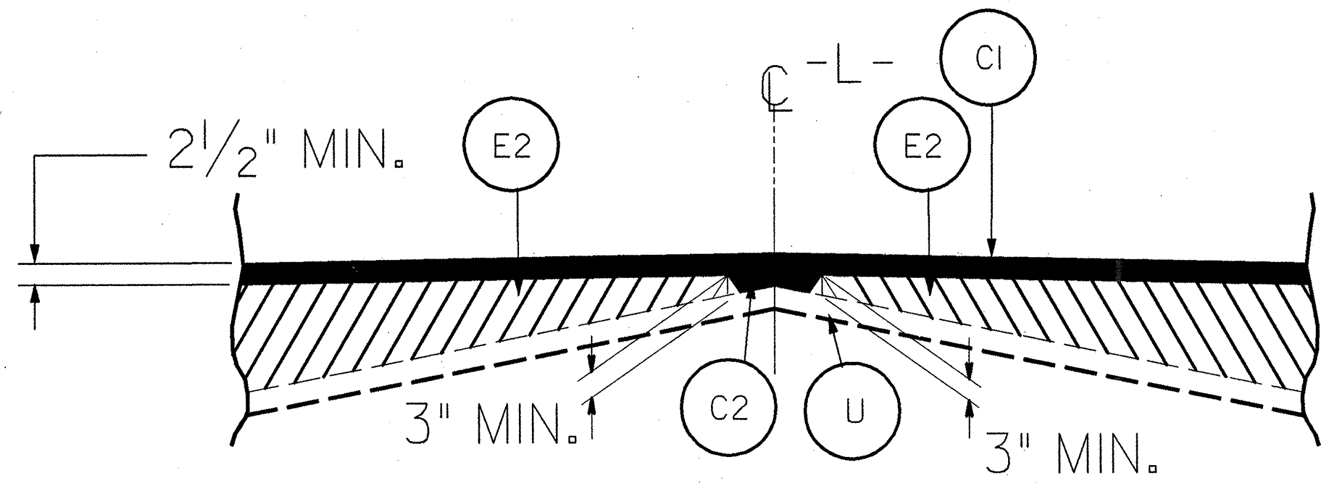
## *TYPICAL SECTION NO.2*

-L- STA. 17+38.00 TO STA. 18+58.00

## PAVEMENT SCHEDULE

| CODE | DESCRIPTION |
|---|---|
| C1 | PROP. APPROX. 2 1/2" ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 137.5 LBS PER SQ. YARD IN EACH OF TWO LAYERS. |
| C2 | PROP. VAR. DEPTH ASPHALT CONC. SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 110 LBS PER SQ. YARD PER 1" DEPTH. TO BE PLACED IN LAYERS NOT TO EXCEED 1-1/2" IN DEPTH. |
| E1 | PROP. APPROX. 4" ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS PER SQ. YARD. |
| E2 | PROP. VAR. DEPTH ASPHALT CONC. BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 114 LBS PER SQ. YARD PER 1" DEPTH. TO BE PLACED IN LAYERS NOT GREATER THAN 5 1/2" IN DEPTH OR LESS THAN 3" IN DEPTH. |
| T | EARTH MATERIAL. |
| U | EXISTING PAVEMENT. |
| W | VAR. DEPTH ASPHALT PAVEMENT. (SEE WEDGING DETAIL) |

USE 1:1 PAVEMENT EDGE SLOPES UNLESS OTHERWISE NOTED



## *WEDGING DETAIL*

WEDGE AS REQUIRED TO ACHIEVE
DESIRED CROSS SLOPE AS DIRECTED
BY ENGINEER

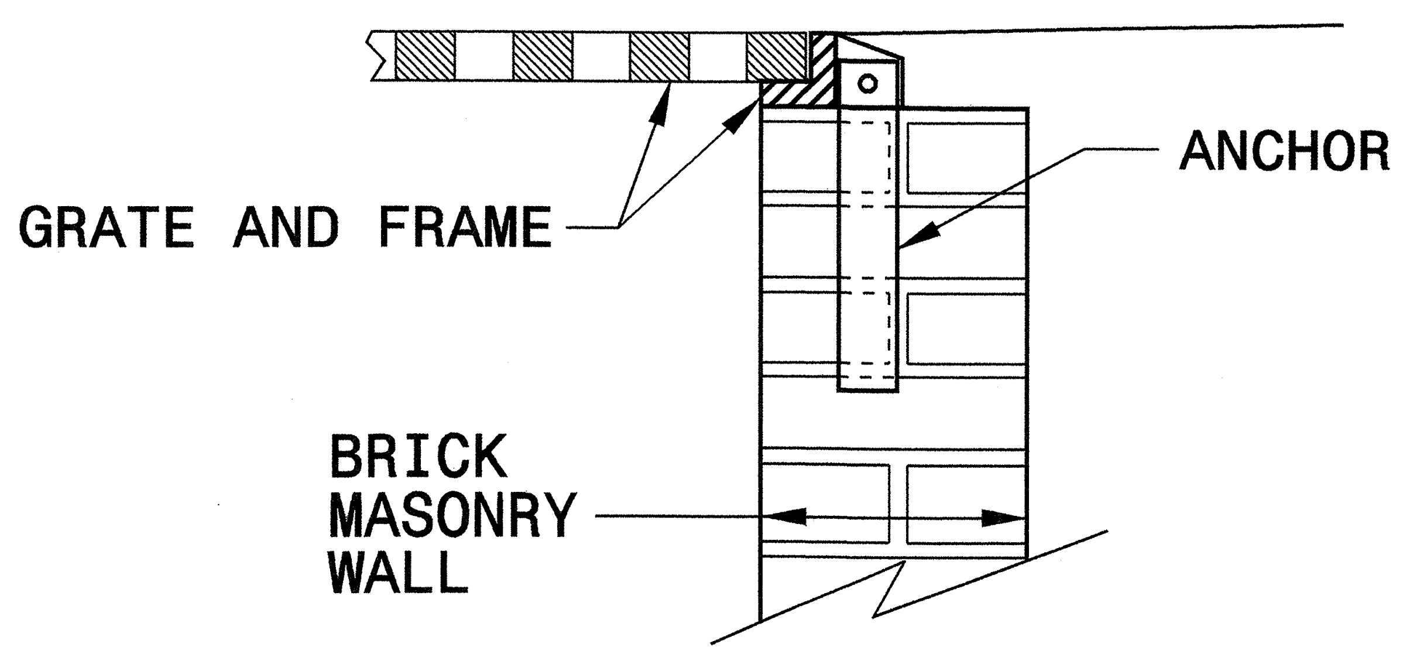
$$$$$$$$SYSTIME$$$$
$$$$$$$$$$$$$$$DGN$$$$$$$$$$$$$$$$$$$$$$$$$$$$
$$$$$$USERNAME$$$$

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 2-A |

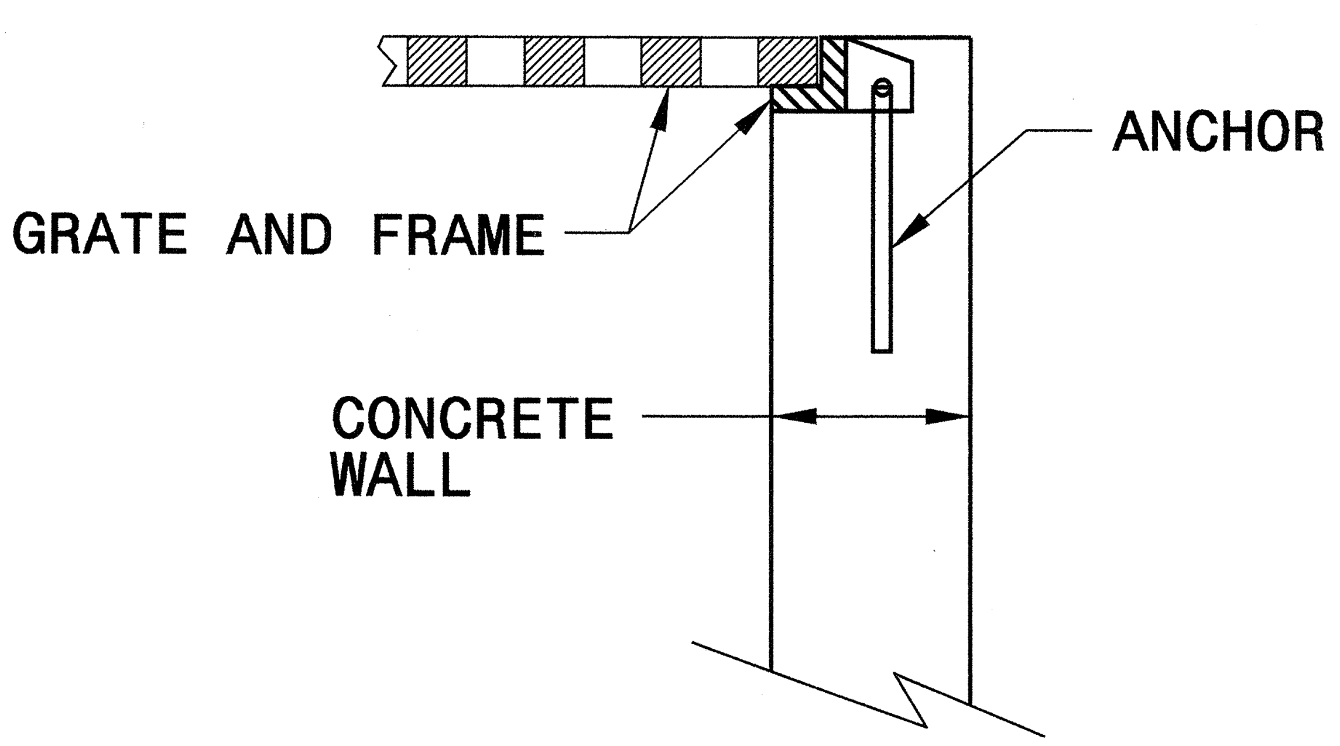
STATE OF
NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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

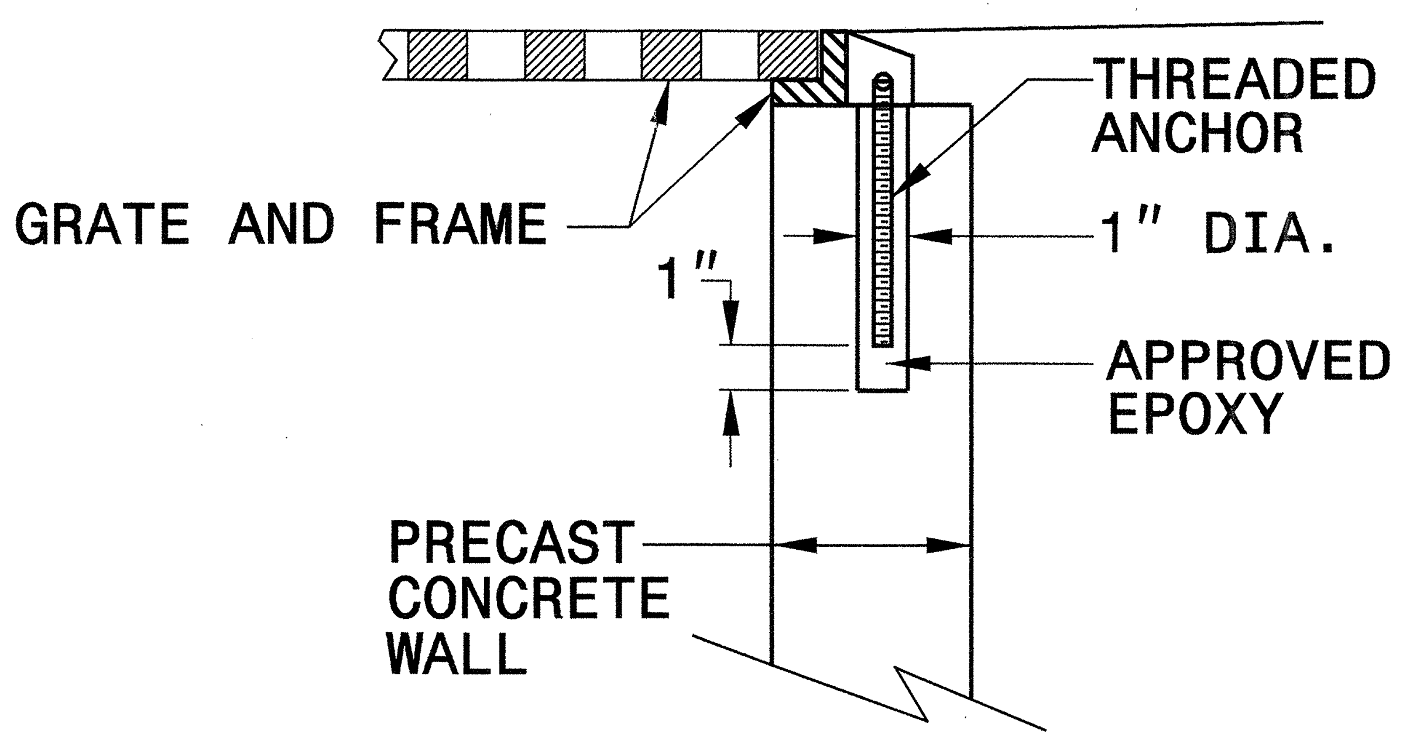
SHEET 1 OF 1
**840D25**



### BRICK MASONRY CONSTRUCTION



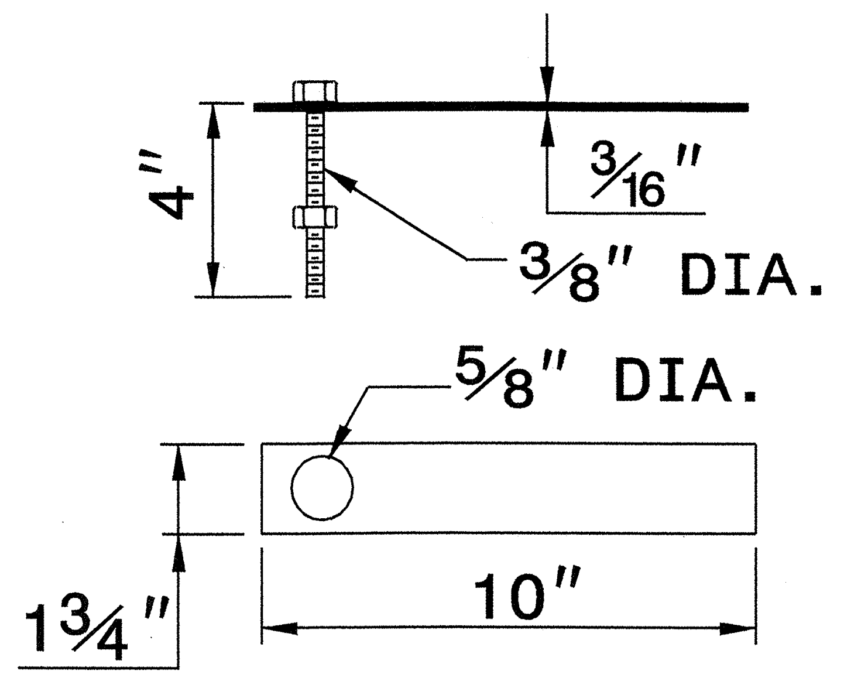
### CONCRETE CONSTRUCTION



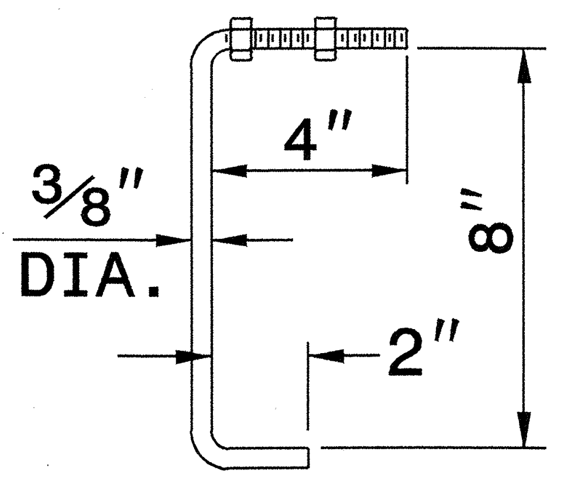
### PRECAST CONCRETE CONSTRUCTION

## DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

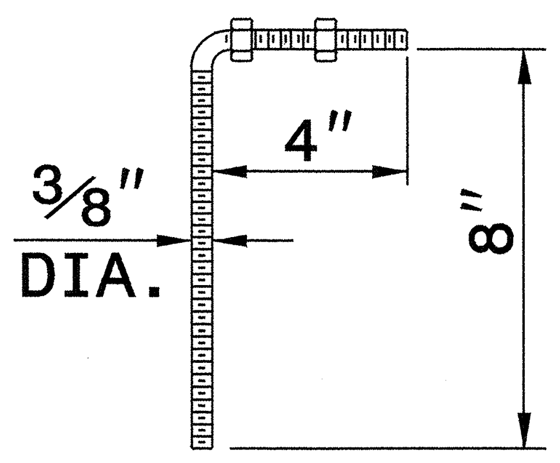
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



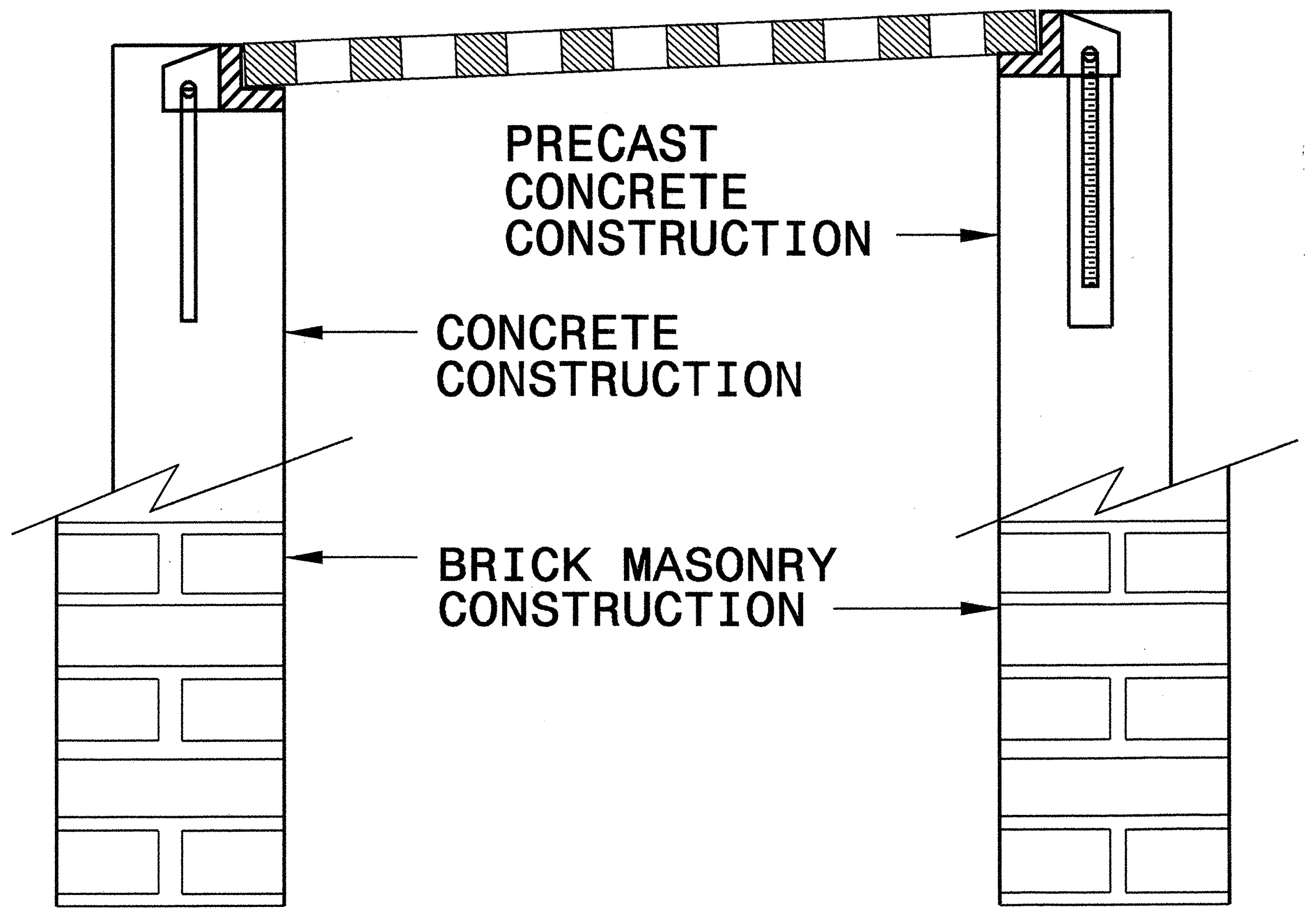
**MASONRY ANCHOR**
3/8″ DIA. BOLT WITH PLATE



**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

SHEET 1 OF 1
**840D25**

SEAL 022966
JOEL S. HOWERTON
1/8/06

**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: Joel S. Howert DATE: 9/27/06
FILE SPEC.:

27-SEP-2006 09:01
S:\Contracts\Contracts\Special Details\ericward\stds\06' Stds to Special Details\84025 Anchorage for Frames\0840d25.dgn
ericward AT PS22293

5/28/99

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 3 |

# STATE OF NORTH CAROLINA
# DIVISION OF HIGHWAYS

KCI Associates
of North Carolina, P.A.
RALEIGH OFFICE
ENGINEERS ● PLANNERS ● ECOLOGISTS

SUITE 220, LANDMARK CENTER II
4601 SIX FORKS RD.
RALEIGH, N.C. 27609-5210
(919) 783-9214

# SUMMARY OF QUANTITIES

### STATE OF NORTH CAROLINA
### DIVISION OF HIGHWAYS
### ROADWAY SUMMARY OF QUANTITIES FOR CONTRACT - C201636

| ItemNumber | Sec # | Quantity | Unit | Description |
|---|---|---|---|---|
| 0000100000-N | 800 | Lump Sum | | MOBILIZATION |
| 0029000000-N | SP | Lump Sum | | REINFORCED BRIDGE APPROACH FILL, STATION ************ (17+98.00) |
| 0050000000-E | 226 | 1 | ACR | SUPPLEMENTARY CLEARING & GRUBBING |
| 0057000000-E | 226 | 50 | CY | UNDERCUT EXCAVATION |
| 0063000000-N | SP | Lump Sum | | GRADING |
| 0106000000-E | 230 | 3,770 | CY | BORROW EXCAVATION |
| 0134000000-E | 240 | 250 | CY | DRAINAGE DITCH EXCAVATION |
| 0318000000-E | 300 | 20 | TON | FOUNDATION CONDITIONING MATERIAL, MINOR STRS |
| 0343000000-E | 310 | 56 | LF | 15" SIDE DRAIN PIPE |
| 0344000000-E | 310 | 40 | LF | 18" SIDE DRAIN PIPE |
| 0366000000-E | 310 | 32 | LF | 15" RC PIPE CULVERTS, CLASS III |
| 0708000000-E | 310 | 56 | LF | 15" BIT COAT CS PIPE CULVERTS, TYPE B 0.064" THICK |
| 0806000000-E | 310 | 2 | EA | 15" BIT COAT CS PIPE ELBOWS, TYPE B 0.064" THICK |
| 0995000000-E | 340 | 68 | LF | PIPE REMOVAL |
| 1220000000-E | 545 | 50 | TON | INCIDENTAL STONE BASE |
| 1489000000-E | 610 | 405 | TON | ASPHALT CONC BASE COURSE, TYPE B25.0B |
| 1525000000-E | 610 | 310 | TON | ASPHALT CONC SURFACE COURSE, TYPE SF9.5A |
| 1560000000-E | 620 | 40 | TON | ASPHALT BINDER FOR PLANT MIX, GRADE PG 64-22 |
| 2000000000-N | 806 | 14 | EA | RIGHT OF WAY MARKERS |
| 2286000000-N | 840 | 2 | EA | MASONRY DRAINAGE STRUCTURES |
| 2367000000-N | 840 | 2 | EA | FRAME WITH TWO GRATES, STD 840.29 |
| 2556000000-E | 846 | 188 | LF | SHOULDER BERM GUTTER |
| 3030000000-E | 862 | 600 | LF | STEEL BM GUARDRAIL |
| 3045000000-E | 862 | 50 | LF | STEEL BM GUARDRAIL, SHOP CURVED |
| 3150000000-N | 862 | 5 | EA | ADDITIONAL GUARDRAIL POSTS |
| 3195000000-N | 862 | 1 | EA | GUARDRAIL ANCHOR UNITS, TYPE AT-1 |
| 3270000000-N | SP | 3 | EA | GUARDRAIL ANCHOR UNITS, TYPE 350 |
| 3317000000-N | 862 | 4 | EA | GUARDRAIL ANCHOR UNITS, TYPE B-77 |
| 3649000000-E | 876 | 55 | TON | RIP RAP, CLASS B |
| 3656000000-E | 876 | 445 | SY | FILTER FABRIC FOR DRAINAGE |
| 3659000000-N | SP | 4 | EA | PREFORMED SCOUR HOLES WITH LEVEL SPREADER APRON |
| 4400000000-E | 1110 | 459 | SF | WORK ZONE SIGNS (STATIONARY) |
| 4410000000-E | 1110 | 119 | SF | WORK ZONE SIGNS (BARRICADE MOUNTED) |
| 4430000000-N | 1130 | 15 | EA | DRUMS |
| 4435000000-N | 1135 | 15 | EA | CONES |
| 4445000000-E | 1145 | 96 | LF | BARRICADES (TYPE III) |
| 4810000000-E | 1205 | 6,680 | LF | PAINT PAVEMENT MARKING LINES (4") |
| 4900000000-N | 1251 | 19 | EA | PERMANENT RAISED PAVEMENT MARKERS |
| 6000000000-E | 1605 | 550 | LF | TEMPORARY SILT FENCE |
| 6006000000-E | 1610 | 150 | TON | STONE FOR EROSION CONTROL, CLASS A |
| 6009000000-E | 1610 | 180 | TON | STONE FOR EROSION CONTROL, CLASS B |
| 6012000000-E | 1610 | 60 | TON | SEDIMENT CONTROL STONE |
| 6015000000-E | 1615 | 0.5 | ACR | TEMPORARY MULCHING |
| 6018000000-E | 1620 | 50 | LB | SEED FOR TEMPORARY SEEDING |
| 6021000000-E | 1620 | 0.25 | TON | FERTILIZER FOR TEMPORARY SEEDING |
| 6024000000-E | 1622 | 60 | LF | TEMPORARY SLOPE DRAINS |
| 6027000000-N | 1622 | 2 | EA | INLET PROTECTION AT TEMPORARY SLOPE DRAINS |
| 6029000000-E | SP | 175 | LF | SAFETY FENCE |
| 6030000000-E | 1630 | 560 | CY | SILT EXCAVATION |
| 6036000000-E | 1631 | 675 | SY | MATTING FOR EROSION CONTROL |
| 6038000000-E | SP | 400 | SY | PERMANENT SOIL REINFORCEMENT MAT |
| 6042000000-E | 1632 | 40 | LF | 1/4" HARDWARE CLOTH |
| 6071030000-E | SP | 150 | LF | COIR FIBER BAFFLES |
| 6084000000-E | 1660 | 0.5 | ACR | SEEDING & MULCHING |
| 6087000000-E | 1660 | 0.5 | ACR | MOWING |
| 6090000000-E | 1661 | 50 | LB | SEED FOR REPAIR SEEDING |
| 6093000000-E | 1661 | 0.25 | TON | FERTILIZER FOR REPAIR SEEDING |
| 6096000000-E | 1662 | 50 | LB | SEED FOR SUPPLEMENTAL SEEDING |
| 6108000000-E | 1665 | 0.5 | TON | FERTILIZER TOPDRESSING |
| 6114000000-N | SP | 2 | HR | SPECIALIZED HAND MOWING |
| 6117000000-N | SP | 8 | EA | RESPONSE FOR EROSION CONTROL |
| 6123000000-E | 1670 | 0.1 | ACR | REFORESTATION |

6/21/00

COMPUTED BY: MRB DATE: 12-7-05
CHECKED BY: A. BURNETTE DATE: 12-7-05

STATE OF NORTH CAROLINA
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(919) 783-9214

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 3-A |

## LIST OF PIPES, ENDWALLS, ETC. (FOR PIPES 48″ & UNDER)

| STATION | LOCATION (LT,RT, OR CL) | STRUCTURE NO. | | TOP ELEVATION | INVERT ELEVATION | INVERT ELEVATION | SLOPE CRITICAL | CLASS III R.C. PIPE (UNLESS NOTED OTHERWISE) | | | | | | | | BITUMINOUS COATED C.S. PIPE TYPE B (UNLESS NOTED OTHRWISE) | | | | | | | | CLASS III R.C. PIPE OR C.S. PIPE OR TYPE IR ALUMINIZED OR HDPE PIPE, TYPE S OR D | | | | | | | | 15″ SIDE DRAIN PIPE | 18″ SIDE DRAIN PIPE | 24″ SIDE DRAIN PIPE |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SIZE | | | | | | | | 12″ | 15″ | 18″ | 24″ | 30″ | 36″ | 42″ | 48″ | 12″ | 15″ | 18″ | 24″ | 30″ | 36″ | 42″ | 48″ | 12″ | 15″ | 18″ | 24″ | 30″ | 36″ | 42″ | 48″ | | | |
| THICKNESS OR GAUGE | | FROM | TO | | | | | | | | | | | | | .064 | .064 | .064 | .064 | .079 | .079 | .109 | .109 | | | | | | | | | | | |
| –L– 14+61 | LT | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 40 | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| –L– 16+43 | LT | 2 | | 259.15 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 2 | 3 | | 256.40 | 256.08 | NO | | 32 | | | | | | | | | | | | | | | | | | | | | | | | | |
| –L– 16+43 | RT | 3 | | 259.33 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 3 | OUT | | 256.08 | 247.50 | NO | | | | | | | | | | 56 | | | | | | | | | | | | | | | | | |
| –L– 19+29 | RT | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 28 | | |
| –L– 20+57 | RT | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 28 | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL | | | | | | | | | 32 | | | | | | | | 56 | | | | | | | | | | | | | | | 56 | 40 | |

| STATION | LOCATION (LT,RT, OR CL) | STRUCTURE NO. FROM | STRUCTURE NO. TO | ENDWALLS STD. 838.01, STD. 838.11 OR STD. 838.80 (UNLESS NOTED OTHERWISE) CU. YDS. R.C.P. | C.S.P. | QUANTITIES FOR DRAINAGE STRUCTURES PER EACH (0′ THRU 5.0′) | * TOTAL L.F. FOR PAY QUANTITY SHALL BE COL. 'A' + (1.3 X COL.'B') LIN. *FT. A 5.0′ THRU 10.0′ | B 10.0′ AND ABOVE | C.B. STD. 840.01 OR STD. 840.02 | FRAME, GRATES AND HOOD STANDARD 840.03 TYPE OF GRATE E | F | G | | D.I. STD. 840.14 OR STD. 840.15 | D.I. FRAME & GRATE STD. 840.16 | G.D.I. TYPE "A" STD. 840.17 OR 840.26 | G.D.I. TYPE "B" STD. 840.18 OR 840.27 | G.D.I. TYPE "D" STD. 840.19 OR 840.28 | G.D.I. FRAME WITH GRATE STD. 840.22 | G.D.I. FRAME WITH TWO GRATES STD. 840.22 | G.D.I. (N.S.) FRAME WITH GRATE STD. 840.24 | G.D.I. (N.S.) FRAME WITH TWO GRATES STD. 840.24 | J.B. STD. 840.31 OR 840.32 | G.D.I. (N.S.) FRAME WITH TWO FLAT GRATES STD. 840.29 | | | | | | | 15″ CORR. STEEL ELBOWS | CONC. COLLARS CL. "B" C.Y. STD 840.72 | CONC. & BRICK PIPE PLUG, C.Y. STD. 840.71 | PIPE REMOVAL LIN.FT. | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| –L– 14+61 | LT | 1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 25 | REMOVE 18″ RCP |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| –L– 16+43 | LT | 2 | | | | 1 | | | | | | | | | | | 1 | | | | | | | 1 | | | | | | | | | | | |
| | | 2 | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| –L– 16+43 | RT | 3 | | | | 1 | | | | | | | | | | | 1 | | | | | | | 1 | | | | | | | | | | | |
| | | 3 | OUT | | | | | | | | | | | | | | | | | | | | | | | | | | | | 2 | | | | |
| –L– 19+29 | RT | 4 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 22 | REMOVE 18″ PLASTIC |
| –L– 20+57 | RT | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | 21 | REMOVE 15″ PLASTIC |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL | | | | | | 2 | | | | | | | | | | | 2 | | | | | | | 2 | | | | | | | 2 | | | 68 | |

ABBREVIATIONS

| | |
|---|---|
| C.B. | CATCH BASIN |
| N.D.I. | NARROW DROP INLET |
| D.I. | DROP INLET |
| G.D.I. | GRATED DROP INLET |
| G.D.I. (N.S.) | GRATED DROP INLET (NARROW SLOT) |
| J.B. | JUNCTION BOX |
| M.H. | MANHOLE |
| T.B.D.I. | TRAFFIC BEARING DROP INLET |
| T.B.J.B. | TRAFFIC BEARING JUNCTION BOX |

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

## GUARDRAIL SUMMARY

| SURVEY LINE | BEG. STA. | END STA. | LOCATION | LENGTH | | | WARRANT POINT | | "N" DIST. FROM E.O.L. | TOTAL SHOUL. WIDTH | FLARE LENGTH | | W | | ANCHORS | | | | | | | | | IMPACT ATTENUATOR TYPE 350 | | | SINGLE FACED GUARDRAIL | REMOVE EXISTING GUARDRAIL | REMOVE AND STOCKPILE EXISTING GUARDRAIL | REMARKS |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | STRAIGHT | SHOP CURVED | DOUBLE FACED | APPROACH END | TRAILING END | | | APPROACH END | TRAILING END | APPROACH END | TRAILING END | B-77 | III | GRAU 350 | M-350 | XIII | CAT-1 | VI MOD | BIC | AT-1 | EA | G | NG | | | | |
| –L– | 15+83.00 | 17+41.00 | LT | 162.5 | | | | 16+26.00 | 5′ | 8′ | | 50′ | | 1′ | 1 | | 1 | | | | | | | | | | | | | |
| –L– | 14+45.00 | 17+35.00 | RT | 300 | | | 14+45.00 | | 5′ | 8′ | 50′ | | 1′ | | 1 | | 1 | | | | | | | | | | | | | |
| –L– | 18+61.00 | 21+51.00 | LT | 300 | | | 21+51.00 | | 5′ | 8′ | 50′ | | 1′ | | 1 | | 1 | | | | | | | | | | | | | |
| –L– | 18+55.00 | 19+34.00 | RT | 62.5 | 50 | | | 19+34.00 | 5′ | 8′ | | 6.25′ | | 4′ | 1 | | | | | | | | 1 | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SUBTOTAL –L– | | | | 825 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | |
| LESS ANCHOR DEDUCTIONS | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| GRAU-350 (3 @ 50′) | | | | –150 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| B-77 (4 @ 18.75′) | | | | –75 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| AT-1 (1 @ 6.25′) | | | | –6.25 | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| TOTAL | | | | 593.75 | 50 | | | | | | | | | | 4 | | 3 | | | | | | 1 | | | | | | | |
| SAY | | | | 600 | 50 | | | | | | | | | | | | | | | | | | | | | | | | | |
| ADDITIONAL GUARDRAIL POSTS....5 EACH | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

$$$$SYSTIME$$$$ $$$$USERNAME$$$$ $$$$DGN$$$$

8/17/99

REVISIONS

KCI Associates
of North Carolina, P.A.
RALEIGH OFFICE
ENGINEERS ● PLANNERS ● ECOLOGISTS

SUITE 220, LANDMARK CENTER II
4601 SIX FORKS RD.
RALEIGH, N.C. 27609-5210
(919) 783-9214

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 3-B |
| R/W SHEET NO. | |

# SUMMARY OF EARTHWORK

## IN CUBIC YARDS

| LOCATION | UNCLASSIFIED EXCAVATION | UNDERCUT | EMBT+% | BORROW | WASTE |
|---|---|---|---|---|---|
| -L- LINE | | | | | |
| STA. 13+45.00 TO STA. 17+38.00 | 289 | | 2149 | 1860 | 0 |
| | | | | | |
| -L LINE | | | | | |
| STA. 18+58.00 TO STA. 21+20.00 | 573 | | 2295 | 1722 | 0 |
| | | | | | |
| PROJECT SUBTOTAL | 862 | | 4444 | 3582 | 0 |
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| EST. 5% TO REPL. TOPSOIL ON BORROW PITS | | | | 179 | |
| GRAND TOTAL | 862... SAY 870 | | 4444 | 3761...SAY 3770 | 0 |

ESTIMATED UNDERCUT EXCAVATION = 50 C.Y.

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

# SUMMARY OF PAVEMENT REMOVAL

| LOCATION | SY |
|---|---|
| -L- LINE | |
| STA. 13+45.00 TO STA. 15+50.00 LT. & RT. | 451 |
| | |
| -L LINE | |
| STA. 20+00.00 TO STA. 21+20.00 LT. &RT. | 269 |
| | |
| | |
| | |
| | |
| | |
| | |
| TOTAL | 720 |
| SAY | 725 |

# SUMMARY OF BREAKING OF EXISTING PAVEMENT

| LOCATION | SY |
|---|---|
| -L- LINE | |
| STA. 15+50.00 TO STA. 17+44.00 LT. & RT. | 417 |
| | |
| -L LINE | |
| STA. 18+47.00 TO STA. 20+00.00 LT. &RT. | 328 |
| | |
| | |
| | |
| | |
| | |
| | |
| TOTAL | 745 |
| SAY | 750 |

8/17/99

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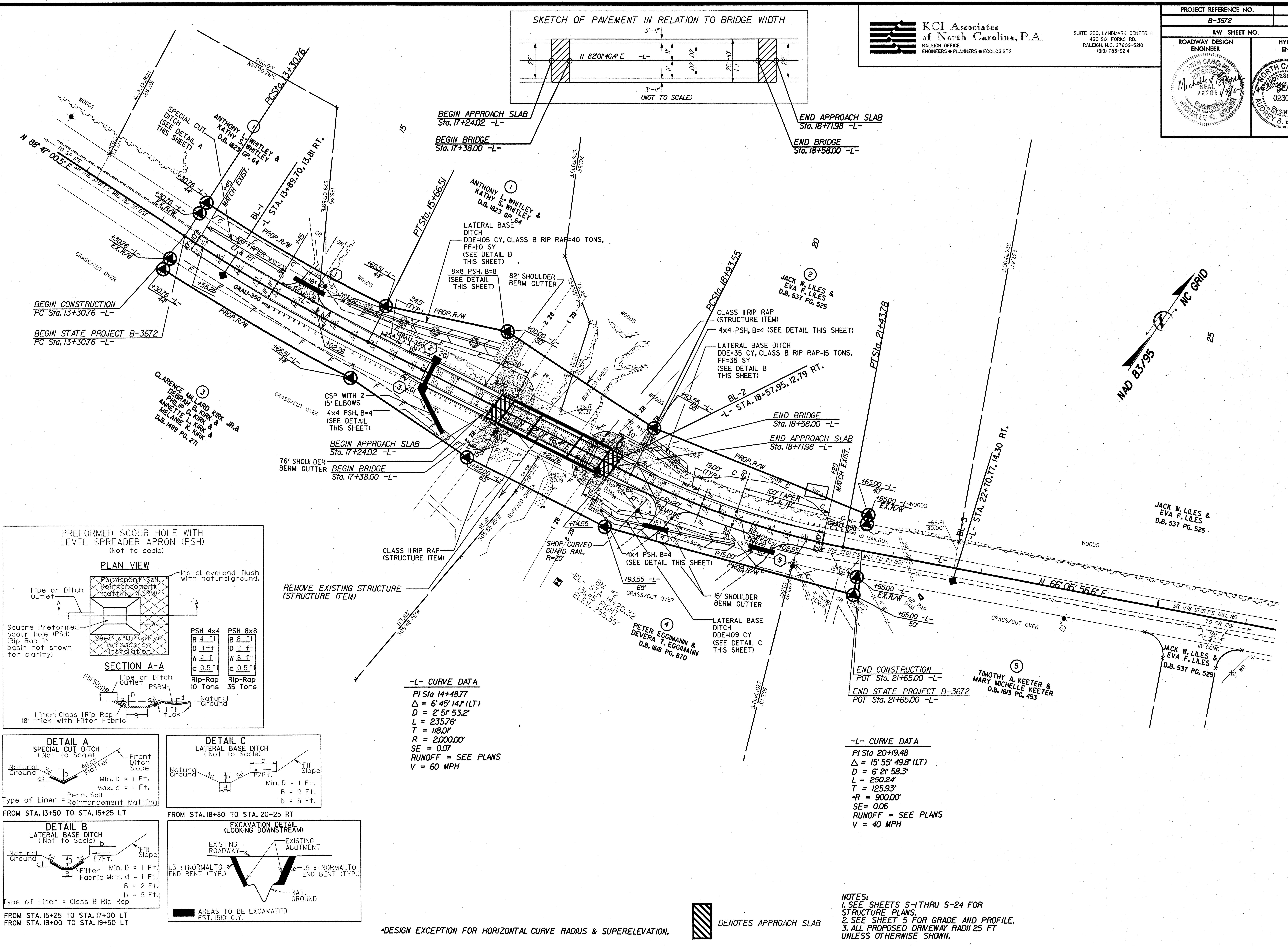
(919) 783-9214

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 4 |
| R/W SHEET NO. | |

| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
|---|---|
| Michelle R. Brame<br>SEAL 22761<br>1/4/07 | Audrey B. Burnette<br>SEAL 023090<br>1/4/07 |



-L- CURVE DATA
PI Sta 14+48.77
$\Delta$ = 6° 45' 14.1" (LT)
D = 2° 51' 53.2"
L = 235.76'
T = 118.01'
R = 2,000.00'
SE = 0.07
RUNOFF = SEE PLANS
V = 60 MPH

-L- CURVE DATA
PI Sta 20+19.48
$\Delta$ = 15° 55' 49.8" (LT)
D = 6° 21' 58.3"
L = 250.24'
T = 125.93'
*R = 900.00'
SE= 0.06
RUNOFF = SEE PLANS
V = 40 MPH

▨ DENOTES APPROACH SLAB

*DESIGN EXCEPTION FOR HORIZONTAL CURVE RADIUS & SUPERELEVATION.

NOTES:
1. SEE SHEETS S-1 THRU S-24 FOR STRUCTURE PLANS.
2. SEE SHEET 5 FOR GRADE AND PROFILE.
3. ALL PROPOSED DRIVEWAY RADII 25 FT UNLESS OTHERWISE SHOWN.

$$$$SYSTIME$$$$
$$$$USERNAME$$$$
$$$$DGN$$$$$$$$$$$$$$$$$$$$$

BM#1 = "BENCHLITE" NAIL SET IN 18" OAK, 27.3' RT OF -L- CL STA 5+75.33 (-L- STA.10+14.38), ELEV.=277.43', N 728599 E 2189103

BM#2 = "BENCHLITE" NAIL SET IN 10" OAK, 131.45' RT OF -L- CL STA 14+20.32 (-L- STA.18+74.41), ELEV.=255.55', N 728566 E 2189979

BM#3 = "BENCHLITE" NAIL SET IN 10" PINE, BEYOND CL, ELEV.=301.03', N 729046 E 2190738

**KCI Associates of North Carolina, P.A.**
RALEIGH OFFICE
ENGINEERS ● PLANNERS ● ECOLOGISTS

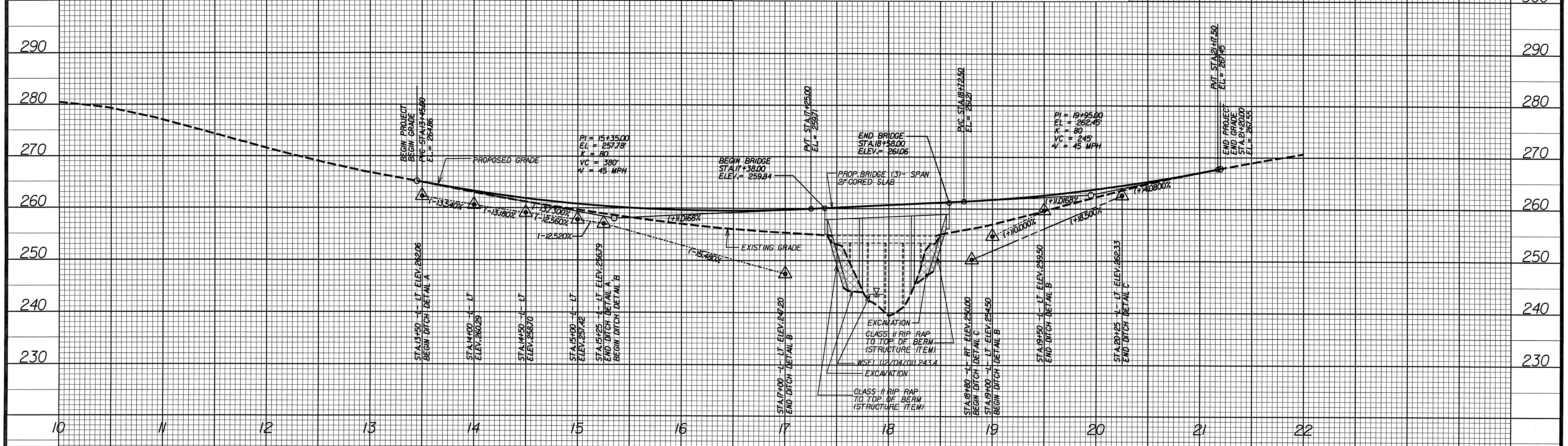
SUITE 220, LANDMARK CENTER II
4601 SIX FORKS RD.
RALEIGH, N.C. 27609-5210
(919) 783-9214

| PROJECT REFERENCE NO. | SHEET NO. |
|---|---|
| B-3672 | 5 |
| R/W SHEET NO. | |

| ROADWAY DESIGN ENGINEER | HYDRAULICS ENGINEER |
|---|---|
| SEAL 22761<br>MICHELLE R. BRAME<br>Michelle R. Brame 1/4/07 | SEAL 023090<br>AUDREY B. BURNETTE<br>Audrey B. Burnette<br>1/4/07 |

## HYDRAULIC & OVERTOPPING DATA

DESIGN DISCHARGE = 3900 cfs
DESIGN FREQUENCY = 25 yrs.
DESIGN HIGH WATER ELEV. = 253.2 ft
BASE DISCHARGE = 5100 cfs
BASE FREQUENCY = 100 yrs
BASIC HIGH WATER ELEV. = 255.0 ft
OVERTOPPING DISCHARGE = 7350+ cfs
FREQUENCY OF OVERTOPPING FLOOD = >500+ yr
OVERTOPPING FLOOD ELEV. = 259.3 ft



FOR -L- PLAN, SEE SHEET 4

SEE SHEETS S-1 THRU S-24 FOR STRUCTURE PLANS

-L-

* DESIGN EXCEPTION FOR SAG VERTICAL CURVE AND VERTICAL SSD.