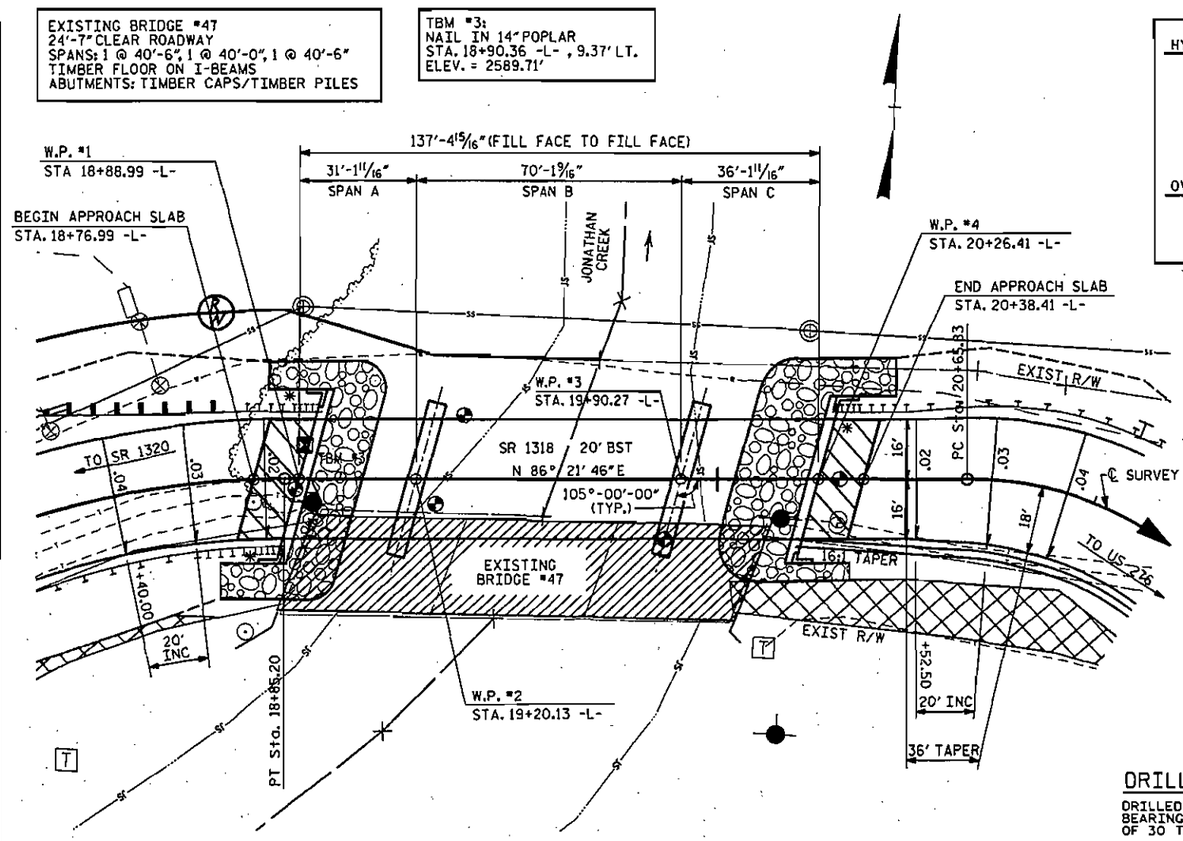
HAYWOOD COUNTY (BRIDGE #47) 14B.204414.3

EXISTING BRIDGE #47
24'-7" CLEAR ROADWAY
SPANS: 1 @ 40'-6", 1 @ 40'-0", 1 @ 40'-6"
TIMBER FLOOR ON I-BEAMS
ABUTMENTS: TIMBER CAPS/TIMBER PILES

TBM #3:
NAIL IN 14" POPLAR
STA. 18+90.36 -L- , 9.37' LT.
ELEV. = 2589.71'

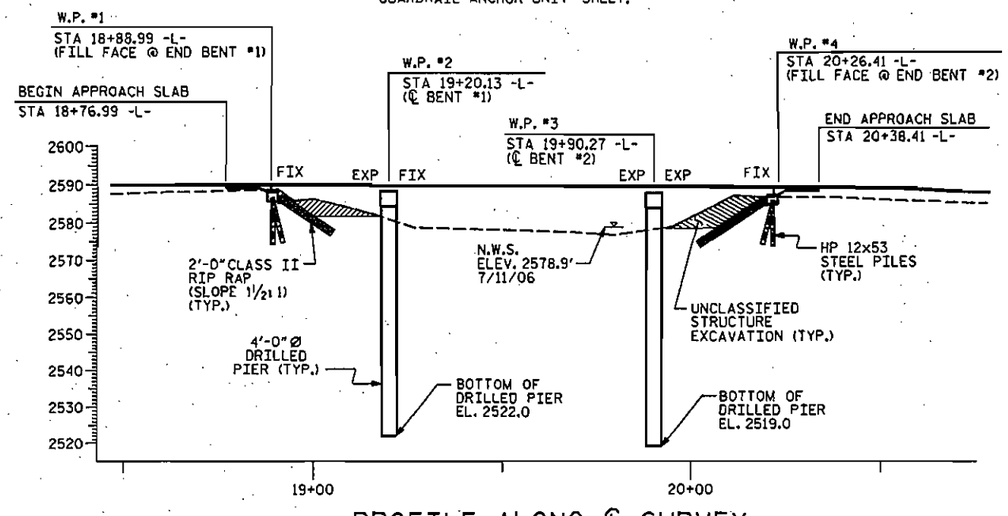


PLAN

SCALE : 1"=20'

● DENOTES GEO-TECH BORE HOLE LOCATIONS.

✱ DENOTES GUARDRAIL CONNECTION REQ'D., SEE "GUARDRAIL ANCHOR UNIT" SHEET.



PROFILE ALONG ℄ SURVEY

SCALE : 1"=20'

HYDRAULIC DATA:

DESIGN DISCHARGE -	3420 CFS
FREQUENCY OF DESIGN FLOOD -	10 YEAR
DESIGN HIGH WATER ELEVATION -	2585.4
DRAINAGE AREA -	48.0 SQ. MI.
BASIC DISCHARGE (Q 100) -	5720 CFS
BASIC HIGH WATER ELEVATION -	2587.75

OVERTOPPING FLOOD DATA:

OVERTOPPING DISCHARGE -	3500 CFS
FREQUENCY OF OVERTOPPING FLOOD -	10+ YEAR
OVERTOPPING FLOOD ELEVATION -	2585.6

HORIZONTAL CURVE DATA

PI STA. 17+99.86 -L-
Δ = 46° 07' 43.0" (RT)
D= 25°27'53.2"
L = 181.15'
T = 95.81'
R = 225.00'

PI STA. 21+82.40 -L-
Δ = 104° 39' 28.3" (RT)
D= 63°39'43.1"
L = 164.40'
T = 116.57'
R = 90.00'

NOTES

FOR EROSION CONTROL MEASURES, SEE EROSION CONTROL PLANS.

FOR CRANE SAFETY, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION OF SUPERSTRUCTURE, SEE SPECIAL PROVISIONS.

FOR CONSTRUCTION OF SUBSTRUCTURE, SEE SPECIAL PROVISIONS.

FOR PRESTRESSED CONCRETE MEMBERS, SEE SPECIAL PROVISIONS.

REMOVAL OF THE EXISTING BRIDGE SHALL BE PERFORMED SO AS NOT TO ALLOW DEBRIS TO FALL INTO THE WATER. THE CONTRACTOR SHALL REMOVE THE BRIDGE AND SUBMIT PLANS FOR THE DEMOLITION IN ACCORDANCE WITH ARTICLE 402-2 OF THE STANDARD SPECIFICATIONS.

THE SUBSTRUCTURE OF THE EXISTING BRIDGE INDICATED ON THE PLANS IS FROM THE BEST INFORMATION AVAILABLE. SINCE THIS INFORMATION IS SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR, THE CONTRACTOR SHALL HAVE NO CLAIM WHATSOEVER AGAINST THE DEPARTMENT OF TRANSPORTATION FOR ANY DELAYS OR ADDITIONAL COST INCURRED BASED ON DIFFERENCES BETWEEN THE EXISTING BRIDGE SUBSTRUCTURE SHOWN ON THE PLANS AND THE ACTUAL CONDITIONS AT THE PROJECT SITE. CUTTING OFF THE EXISTING PILES BELOW THE PROPOSED CAP ELEVATIONS WILL BE REQUIRED.

THIS BRIDGE HAS BEEN DESIGNED IN ACCORDANCE WITH THE REQUIREMENTS OF THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FOR SEISMIC PERFORMANCE ZONE 1.

IN AS MUCH AS THE PAINT SYSTEM ON THE EXISTING STRUCTURAL STEEL CONTAINS LEAD, THE CONTRACTOR'S ATTENTION IS DIRECTED TO ARTICLE 107-1 OF THE STANDARD SPECIFICATIONS. ANY COSTS RESULTING FROM COMPLIANCE WITH APPLICABLE STATE OR FEDERAL REGULATIONS PERTAINING TO HANDLING OF MATERIALS CONTAINING LEAD BASED PAINT SHALL BE INCLUDED IN THE BID PRICE FOR "REMOVAL OF EXISTING STRUCTURE AT STATION 19+57.70".

THE QUANTITY OF RIP RAP TO BE PAID FOR WILL BE THE ACTUAL NUMBER OF TONS OF EACH CLASS OF RIP RAP WHICH HAS BEEN INCORPORATED INTO THE COMPLETED AND ACCEPTED WORK. THE RIP RAP WILL BE MEASURED BY BEING WEIGHED IN TRUCKS ON CERTIFIED PLATFORM SCALES OR OTHER CERTIFIED WEIGHING DEVICES. THE QUANTITY OF RIP RAP WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER TON.

DRIVE PILES AT END BENTS NO. 1 AND NO. 2 TO A ULTIMATE RESISTANCE OF 200 TONS PER PILE.

THE FACTORED RESISTANCE FOR PILES AT END BENTS NO.1 AND NO.2 IS 80 TONS PER PILE AND REQUIRES A MINIMUM OF 5 PILES PER BENT. THE FACTORED RESISTANCE IS EQUAL TO THE ULTIMATE RESISTANCE TIMES A RESISTANCE FACTOR OF 0.4.

THE SCOUR CRITICAL ELEVATION FOR BENTS NO. 1 AND NO. 2 IS ELEVATION 2,567 FT. SCOUR CRITICAL ELEVATIONS ARE USED TO MONITOR POSSIBLE SCOUR PROBLEMS DURING THE LIFE OF THE STRUCTURE.

PLAIN RIP RAP CLASS II (2'-0" THICK) & FILTER FABRIC.

END BENT #1	115 TONS &	127 SY FILTER FABRIC
END BENT #2	133 TONS &	148 SY FILTER FABRIC
TOTAL	248 TONS &	275 SY FILTER FABRIC

DRILLED PIER NOTES

DRILLED PIERS AT BENTS NO. 1 AND NO.2 ARE DESIGNED FOR BOTH SKIN FRICTION AND END BEARING. CHECK FIELD CONDITIONS FOR THE REQUIRED ULTIMATE END BEARING RESISTANCE OF 30 TSF.

DRILLED PIERS AT BENTS NO. 1 AND NO. 2 ARE DESIGNED FOR A FACTOREO LOAD OF 350 TONS EACH AT THE TOP OF THE COLUMN.

PERMANENT STEEL CASING IS REQUIRED FOR DRILLED PIERS AT BENTS NO. 1 AND NO. 2. DO NOT EXTEND CASING BELOW ELEVATIONS 2,548 FT. AND 2,558 FT., RESPECTIVELY WITHOUT PRIOR APPROVAL FROM THE ENGINEER.

INSTALL DRILLED PIERS AT BENTS NO. 1 AND NO. 2 THAT EXTEND TO ELEVATIONS NO HIGHER THAN 2,522 AND 2,519 FT., RESPECTIVELY, AND SATISFY THE REQUIRED ULTIMATE RESISTANCE AND HAVE MINIMUM PENETRATIONS OF 6FT. AND 2 FT. INTO WEATHERED ROCK, RESPECTIVELY.

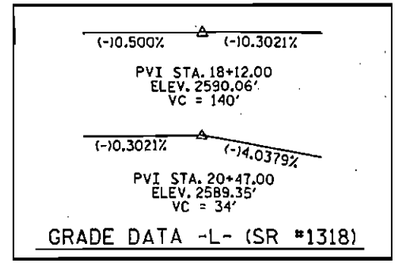
SID INSPECTIONS MAY BE REQUIRED TO INSPECT THE BOTTOM CLEANLINESS OF THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE NEED FOR SID INSPECTIONS.

CSL TUBES AND TESTING ARE REQUIRED FOR THE DRILLED PIERS. THE ENGINEER WILL DETERMINE THE LOCATIONS OF CSL TESTING. SEE CROSSHOLE SONIC LOGGING SPECIAL PROVISION.

FOR DRILLED PIERS, SEE DRILLED PIER SPECIAL PROVISION.

PILE EXCAVATION MAY BE REQUIRED TO INSTALL PILES AT END BENTS NO. 1 AND 2. IF REQUIRED, EXCAVATE HOLES TO ELEVATION 2574 FT. SEE PILE EXCAVATION SPECIAL PROVISIONS.

STEEL PILE POINTS (WITH TEETH) ARE REQUIRED FOR STEEL PILES AT END BENTS NO. 1 AND NO. 2.



GRADE DATA -L- (SR #1318)

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID A. SIMPSON
6-1-09

PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES
5520 Dillard Drive
Suite 120
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com

LICENSURE NO. C-2521

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

GENERAL DRAWING
(BRIDGE ON SR 1318 OVER JONATHAN CREEK)

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	1
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : J. R. SEALEY DATE : 5/09
CHECKED BY : M. A. AVERETTE DATE : 5/09

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PROJECT REFERENCE	SHEET NO.
14B.204414.3	2

ROADWAY DESIGN ENGINEER

NORTH CAROLINA PROFESSIONAL SEAL 27804 ENGINEER

HYDRAULICS ENGINEER

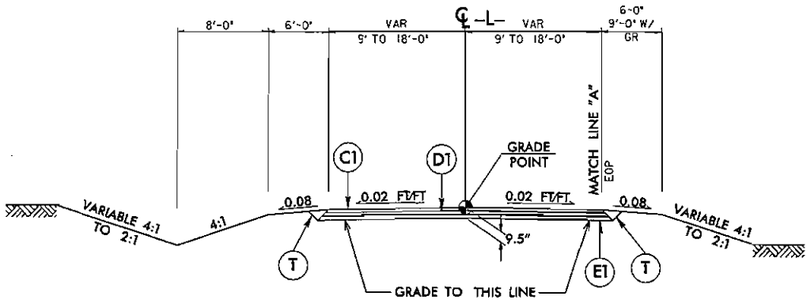
GE LICENSE # C-2487

Prepared in the Office of: GIBSON ENGINEERS, PC

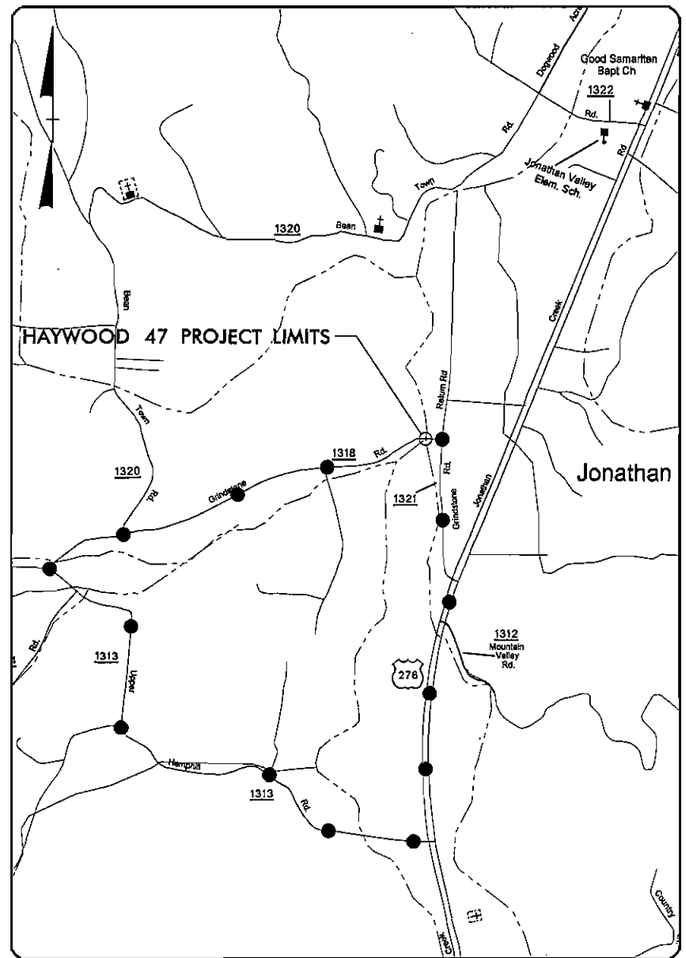
HAYWOOD COUNTY (BRIDGE #47) 14B.204414.3

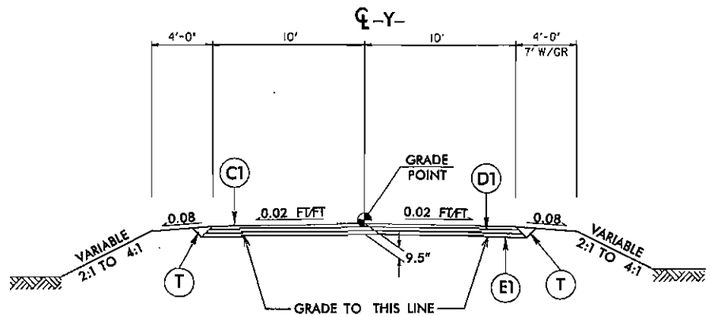
DESIGN DATA

ADT 2002 = 960
ADT 2025 = 1920
V = 45 MPH
*DESIGN EXCEPTION:
Min. Horizontal Curve Radius
Sag Vertical Curve
Crest Vertical Curve



TYPICAL SECTION NO. 1



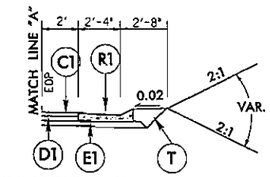


TYPICAL SECTION NO. 2

USE TYPICAL SECTION NO. 1:

-L- STA 14+50.00 TO 18+88.99 (BEG. BRIDGE)
-L- STA 20+26.41 (END BRIDGE) TO 24+00.00

NOTE: FOR VARIABLE SLOPES SEE CROSS SECTIONS
NOTE: SEE PLANS FOR TAPERS
NOTE: SEE STRUCTURE PLANS FOR PAVING ACROSS STRUCTURE



USE IN CONJUNCTION WITH TYPICAL NO. 1:

-L- STA 20+26.41 (END BRIDGE) TO STA. 22+20.00 (RT. SIDE)

USE TYPICAL SECTION NO. 2:

-Y- STA 10+18.69 TO 11+25.00

PAVEMENT SCHEDULE	
C1	PROP. APPROX. 3" ASPHALT CONCRETE SURFACE COURSE, TYPE SF9.5A, AT AN AVERAGE RATE OF 165 LBS. PER SQ. YD. IN EACH OF TWO LAYERS.
D1	PROP. APPROX. 2½" ASPHALT CONCRETE INTERMEDIATE COURSE, TYPE I19.0B, AT AN AVERAGE RATE OF 285 LBS. PER SQ. YD.
E1	PROP. APPROX. 4" ASPHALT CONCRETE BASE COURSE, TYPE B25.0B, AT AN AVERAGE RATE OF 456 LBS. PER SQ. YD.
R1	SHOULDER BERM GUTTER
T	EARTH MATERIAL.

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

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PROJECT REFERENCE	SHEET NO.
148.204414.3	3
ROADWAY DESIGN ENGINEER	HYDRAULICS ENGINEER

Prepared in the Office of: GIBSON ENGINEERS, PC

GRAPHIC SCALE 25' 0 25' 50'

DESIGN DATA

ADT 2002 ≈ 960

ADT 2025 = 1920

V = 45 MPH

*DESIGN EXCEPTION:

Min. Horizontal Curve Radius
Sag Vertical Curve
Crest Vertical Curve

APPROXIMATE GUARDRAIL LENGTH				
STATION	LOCATION	STATION	LOCATION	LENGTH
-L- 1692.84 +/-	RT	-L- 1886.59 +/-	RT	193.75'
-L- 1814.98 +/-	LT	-L- 1896.23 +/-	LT	81.25'
-L- 21+31.23 +/-	LT	-L- 20+49.98 +/-	LT	81.25'
		SUBTOTAL		356.25'
		ANCHOR DEDUCTIONS		162.50'
		TOTAL		193.75'
		SAY		212.5'

ANCHOR DEDUCTIONS		
GRAU-350	2 X 50'	100'
TYPE B-77	3 X 18.75'	56.25
AT-1	1 X 6.25'	6.25'
TOTAL ANCHOR DEDUCTIONS		162.50'

APPROXIMATE GUARDRAIL LENGTH				
STATION	LOCATION	STATION	LOCATION	LENGTH
-L- 20+49.98 +/-	LT	SHOP CURVED		50'
		SHOP CURVED TOTAL		50'
		SAY		50'

GENERAL NOTES:

2006 SPECIFICATIONS
EFFECTIVE: 07-18-06
REVISED: 09-12-08

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.

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:

ANY RELOCATION OF EXISTING UTILITIES WILL BE ACCOMPLISHED BY OTHERS.

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

2006 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 July 18, 2006 are applicable to this project and by reference hereby are considered o 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'
310.03	Cross Pipe End Section - Precast Concrete Section for 18" to 30" Pipe
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 8 - INCIDENTALS	
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
840.46	Traffic Bearing Precast Drainage Structure
840.54	Manhole Frame and Cover
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

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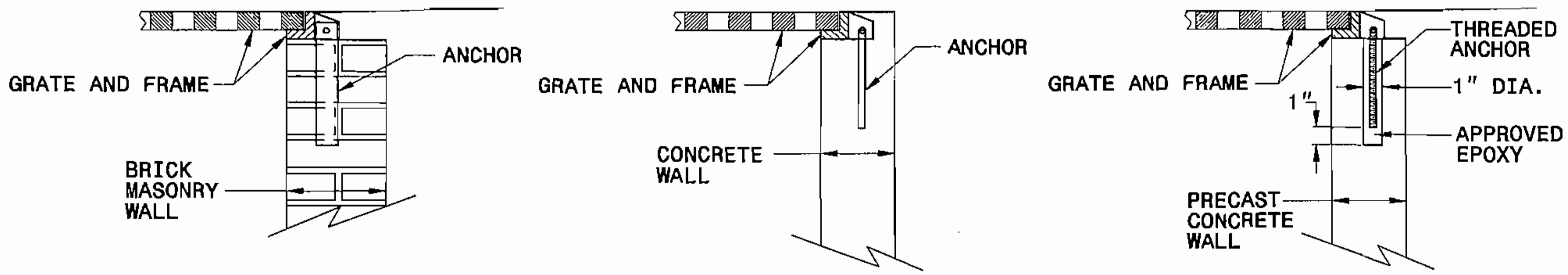
STATE OF NORTH CAROLINA
DEPT. OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

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



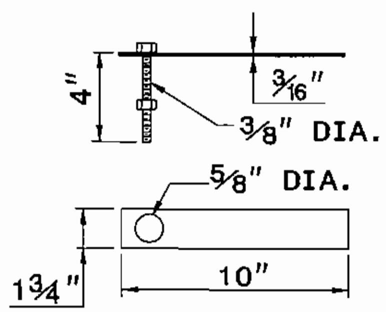
BRICK MASONRY CONSTRUCTION

CONCRETE CONSTRUCTION

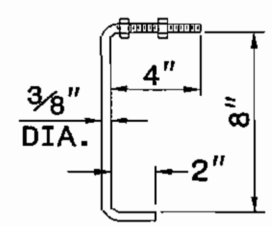
PRECAST CONCRETE CONSTRUCTION

DETAIL SHOWING ANCHORAGE OF FRAME FOR GRATED DROP INLET

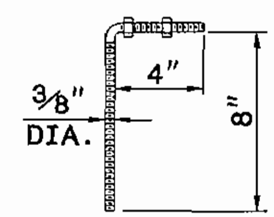
NOTE:
CONSTRUCT GRATED DROP INLET TO COINCIDE WITH NORMAL OR SUPERELEVATED SHOULDER OR PAVEMENT SLOPE.



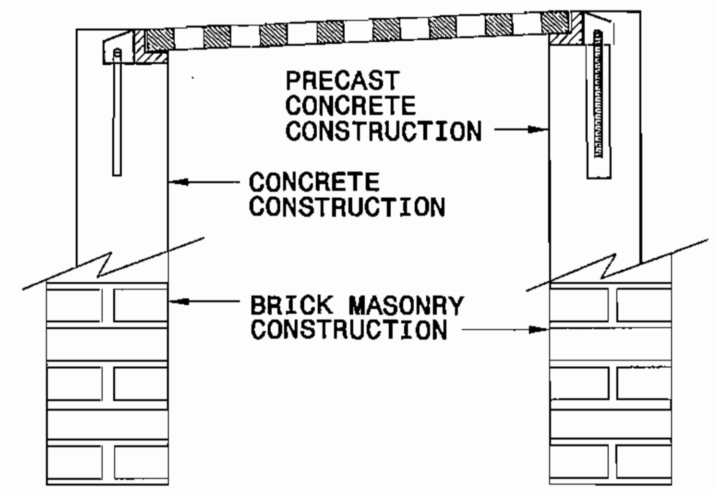
MASONRY ANCHOR
3⁄8" DIA. BOLT WITH PLATE



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

SHEET 1 OF 1
840D25

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

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.:

27-SEP-2006 08:59
S:\Contracts\Contracts\Special Details\ericward\stds\06 Stds to Special Details\84D25 Anchorage for Frames\0840d25.dgn
ericward AT PS222213

PROJECT REFERENCE	SHEET NO.
148.204414.3	5

ROADWAY DESIGN — HYDRAULICS

GE LICENSE # C-2487 — NCDOT

Prepared in the Office of: GIBSON ENGINEERS, PC

VERTICAL SCALE — HORIZONTAL SCALE

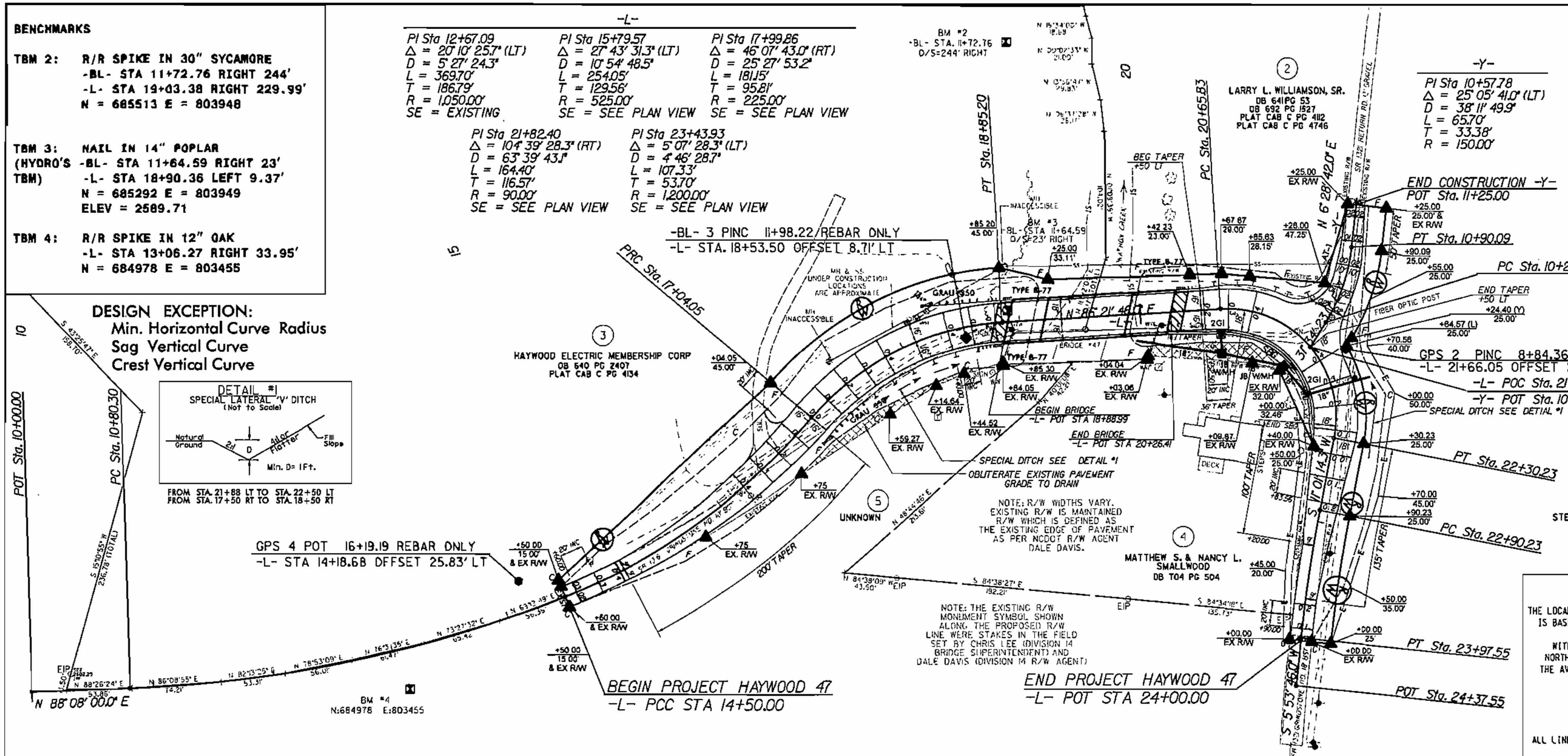
BENCHMARKS

TBM 2: R/R SPIKE IN 30" SYCAMORE
-BL- STA 11+72.76 RIGHT 244'
-L- STA 19+03.38 RIGHT 229.99'
N = 685513 E = 803948

TBM 3: (HYDRO'S TBM) NAIL IN 14" POPLAR
-BL- STA 11+64.59 RIGHT 23'
-L- STA 18+90.36 LEFT 9.37'
N = 685292 E = 803949
ELEV = 2589.71

TBM 4: R/R SPIKE IN 12" OAK
-L- STA 13+06.27 RIGHT 33.95'
N = 684978 E = 803455

DESIGN EXCEPTION:
Min. Horizontal Curve Radius
Sag Vertical Curve
Crest Vertical Curve



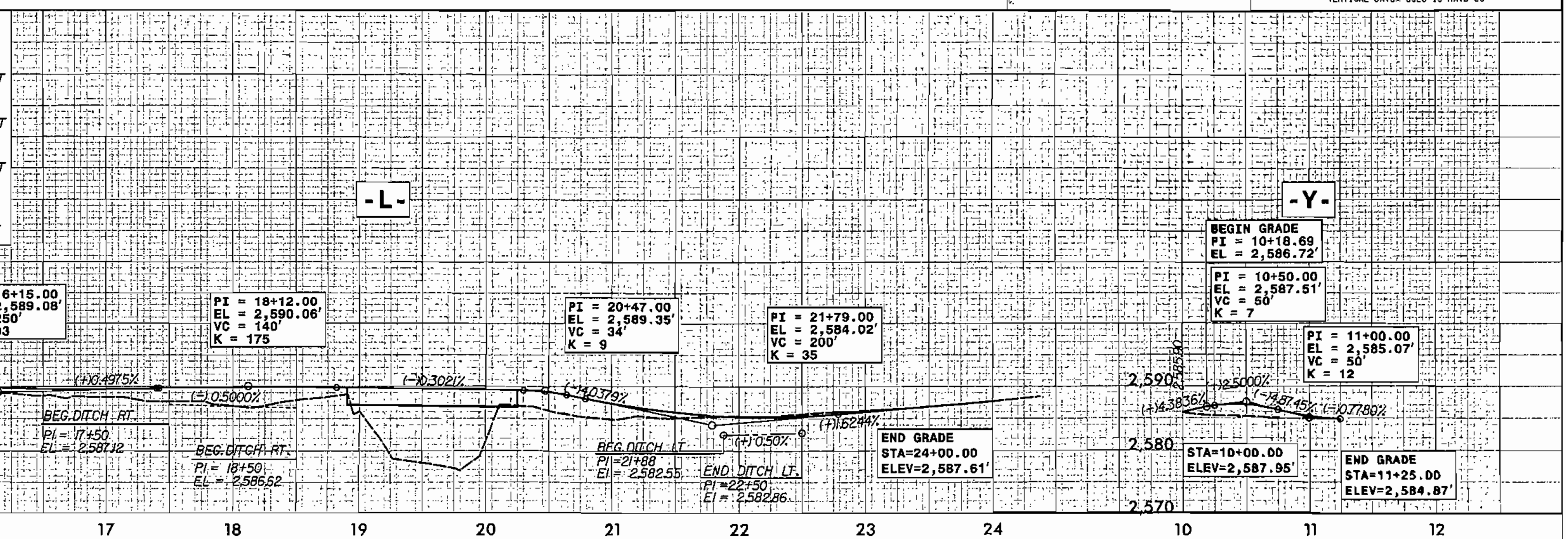
-L-
PI Sta 12+67.09 Δ = 20° 10' 25.7" (LT) D = 5° 27' 24.3" L = 369.70' T = 186.79' R = 1,050.00' SE = EXISTING
PI Sta 15+79.57 Δ = 27° 43' 31.3" (LT) D = 10° 54' 48.5" L = 254.05' T = 129.56' R = 525.00' SE = SEE PLAN VIEW
PI Sta 17+99.86 Δ = 46° 07' 43.0" (RT) D = 25° 27' 53.2" L = 181.15' T = 95.81' R = 225.00' SE = SEE PLAN VIEW
PI Sta 21+82.40 Δ = 104° 39' 28.3" (RT) D = 63° 39' 43.1" L = 164.40' T = 116.57' R = 90.00' SE = SEE PLAN VIEW
PI Sta 23+43.93 Δ = 5° 07' 28.3" (LT) D = 4° 46' 28.7" L = 107.33' T = 53.70' R = 1,200.00' SE = SEE PLAN VIEW
-Y-
PI Sta 10+57.78 Δ = 25° 05' 41.0" (LT) D = 38° 11' 49.9" L = 65.70' T = 33.38' R = 150.00'
DETAIL #1 SPECIAL LATERAL 'V' DITCH (Not to Scale)
FROM STA. 21+88 LT TO STA. 22+50 LT
FROM STA. 17+50 RT TO STA. 18+50 RT
-BL- 3 PINC 11+98.22 REBAR ONLY
-L- STA. 18+53.50 OFFSET 8.71' LT
GPS 4 POT 16+19.19 REBAR ONLY
-L- STA 14+18.68 OFFSET 25.83' LT
GPS 2 PINC 8+84.36 REBAR ONLY
-L- 21+66.05 OFFSET 23.11' LT
-L- POC Sta. 21+50.00
-Y- POT Sta. 10+00.00
END CONSTRUCTION -Y-
POT Sta. 11+25.00
PT Sta. 10+90.09
PC Sta. 10+24.40
PT Sta. 22+30.23
PC Sta. 22+90.23
PT Sta. 23+97.55
POT Sta. 24+37.55
PRC Sta. 17+04.05
PT Sta. 18+85.20
PC Sta. 20+65.83
POT Sta. 10+00.00
PC Sta. 10+80.30
BEGIN PROJECT HAYWOOD 47
-L- PCC STA 14+50.00
END PROJECT HAYWOOD 47
-L- POT STA 24+00.00
BEGIN BRIDGE -L- POT STA 18+88.99
END BRIDGE -L- POT STA 20+26.41
SPECIAL DITCH SEE DETAIL #1
OBLITERATE EXISTING PAVEMENT GRADE TO DRAIN
NOTE: R/W WIDTHS VARY. EXISTING R/W IS MAINTAINED R/W WHICH IS DEFINED AS THE EXISTING EDGE OF PAVEMENT AS PER NCDOT R/W AGENT DALE DAVIS.
NOTE: THE EXISTING R/W MONUMENT SYMBOL SHOWN ALONG THE PROPOSED R/W LINE WERE STAKES IN THE FIELD SET BY CHRIS LEE (DIVISION 14 BRIDGE SUPERINTENDENT) AND DALE DAVIS (DIVISION 14 R/W AGENT)
HAYWOOD ELECTRIC MEMBERSHIP CORP DB 640 PG 2407 PLAT CAB C PG 4134
LARRY L. WILLIAMSON, SR. DB 641 PG 53 DB 692 PG 1527 PLAT CAB C PG 4112 PLAT CAB C PG 4746
MATTHEW S. & NANCY L. SMALLWOOD DB 704 PG 504
STEVEN M. ROSS, ET UX, ET AL DB 484 PG 1786
UNKNOWN
BM #2 -BL- STA. 11+72.76 O/S=244' RIGHT
BM #4 N:684978 E:803455
PAVEMENT REMOVAL
NAD 83

DATUM DESCRIPTION

THE LOCALIZED COORDINATE SYSTEM DEVELOPED FOR THIS PROJECT IS BASED ON THE STATE PLANE COORDINATES ESTABLISHED BY NCGS FOR MONUMENT "GPS-1"
WITH NAD 1983/95 STATE PLANE GRID COORDINATES OF NORTHING: 684877.013(ft) EASTING: 804198.917(ft)
THE AVERAGE COMBINED GRID FACTOR USED ON THIS PROJECT (GROUND TO GRID) IS: 0.99976845
THE N.C. LAMBERT GRID BEARING AND LOCALIZED HORIZONTAL GROUND DISTANCE FROM "GPS-1" TO -L- STATION 14+50.00 IS N 73° 49' 40.8" W DISTANCE 641.12'
ALL LINEAR DIMENSIONS ARE LOCALIZED HORIZONTAL DISTANCES
VERTICAL DATUM USED IS NAVD 88

BRIDGE HYDRAULIC DATA

DESIGN DISCHARGE	= 3420 CFS
DESIGN FREQUENCY	= 10 YRS
DESIGN HW ELEVATION	= 2585.4 FT
BASE DISCHARGE	= 5720 CFS
BASE FREQUENCY	= 100 YRS
BASE HW ELEVATION	= 2587.75 FT
OVERTOPPING DISCHARGE	= 3500 CFS
OVERTOPPING FREQUENCY	= 10+ YRS
OVERTOPPING ELEVATION	= 2585.6 FT
DATE OF SURVEY	= 7/11/06
W.S. ELEVATION AT DATE OF SURVEY	= 2578.9 FT



-L-
-Y-
BEGIN GRADE STA=14+50.00 ELEV=2,592.26'
PI = 16+15.00 EL = 2,589.08' VC = 250' K = 103
PI = 18+12.00 EL = 2,590.06' VC = 140' K = 175
PI = 20+47.00 EL = 2,589.35' VC = 34' K = 9
PI = 21+79.00 EL = 2,584.02' VC = 200' K = 35
END GRADE STA=24+00.00 ELEV=2,587.61'
BEG. DITCH RT. PI = 17+50 EL = 2,587.12
BEG. DITCH RT. PI = 18+50 EL = 2,586.62
BEG. DITCH LT. PI = 21+88 EL = 2,582.55
END DITCH LT. PI = 22+50 EL = 2,582.86
(-)1.9273%
(+)0.4975%
(-)0.5000%
(-)0.3021%
(+)4.0379%
(+)0.50%
(+)1.6244%
BEGIN GRADE PI = 10+18.69 EL = 2,586.72'
PI = 10+50.00 EL = 2,587.51' VC = 50' K = 7
PI = 11+00.00 EL = 2,585.07' VC = 50' K = 12
STA=10+00.00 ELEV=2,587.95'
END GRADE STA=11+25.00 ELEV=2,584.87'
(+)4.3836%
(+)2.5000%
(-)4.8745%
(-)0.7780%
2,600
2,590
2,580
2,570
14 15 16 17 18 19 20 21 22 23 24
10 11 12

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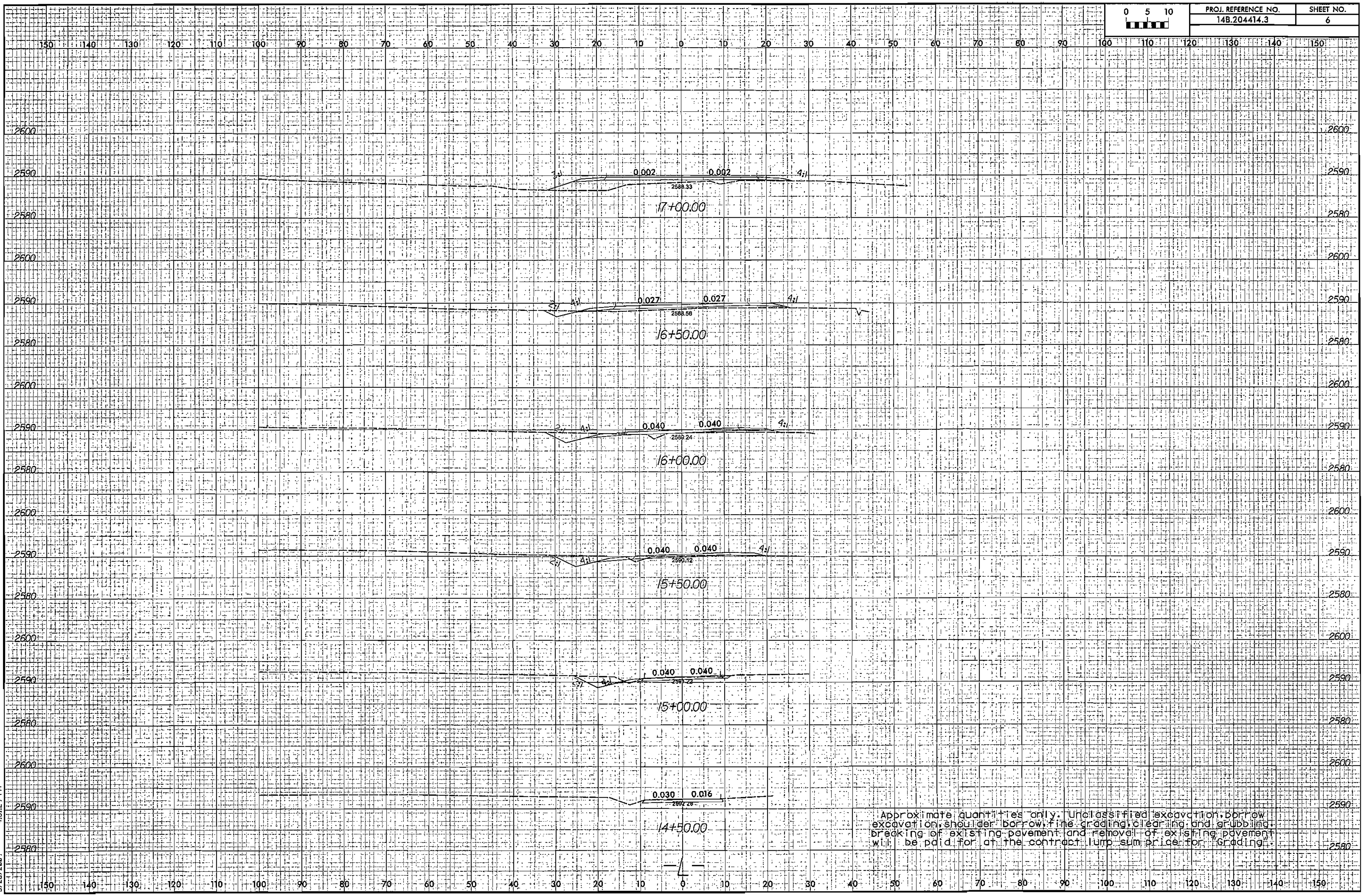
PROJ. REFERENCE NO.	SHEET NO.
14B.204414.3	6



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

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PROJ. REFERENCE NO.	SHEET NO.
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2600
2590
2580

0.020 0.020
2581.58
20+00.00

0.020 0.020
19+50.00

0.020 0.020
2585.08
19+00.00

2:1 0.035 0.035 4:1
2587.79
18+50.00

2:1 0.040 0.040 4:1
2588.84
18+00.00

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17+50.00

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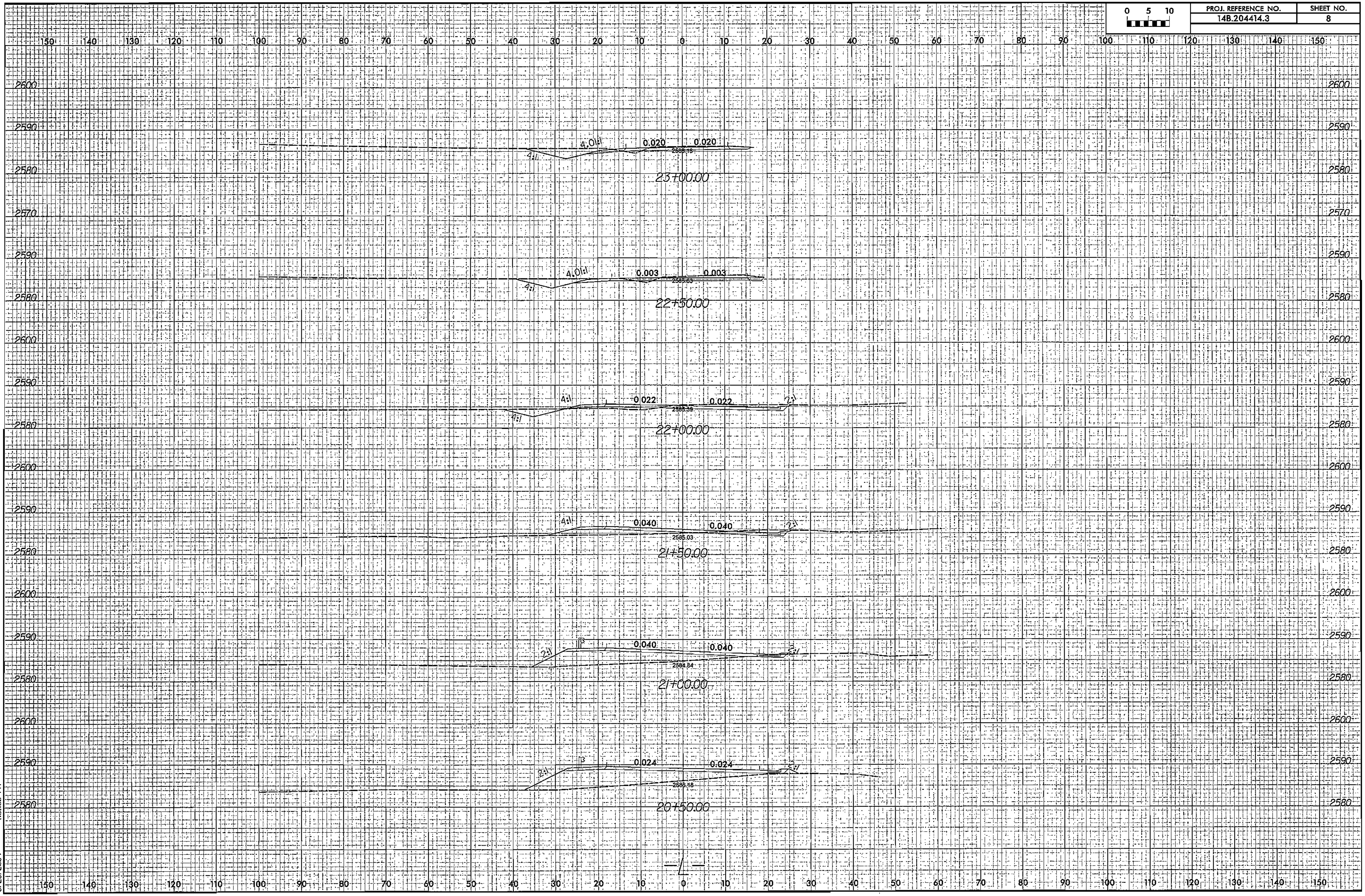

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2600
2590
2580

0.024 0.007
2587.81
24+00.00

4:1
4:OH
0.020 0.020
2585.78
23+50.00

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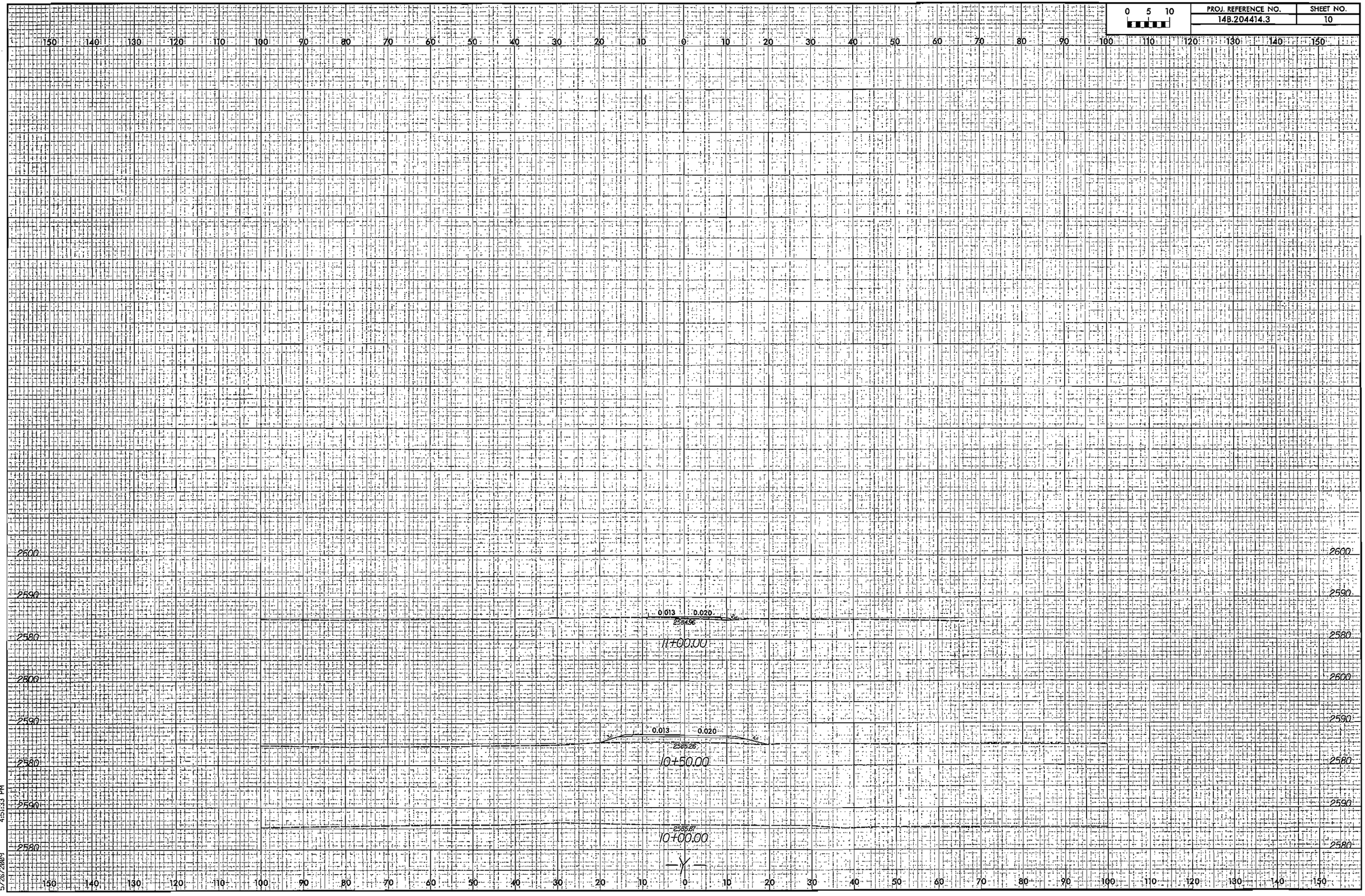

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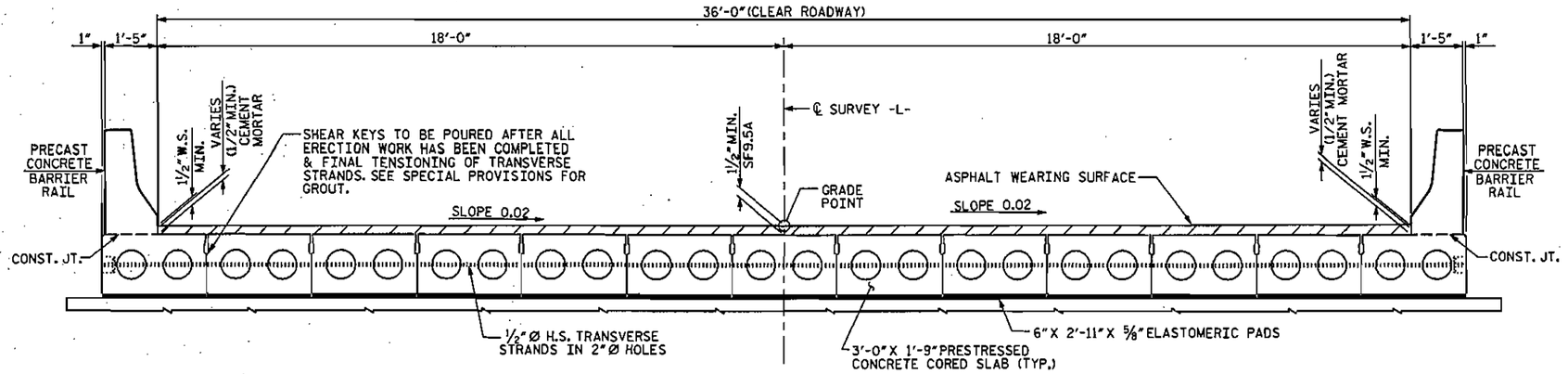
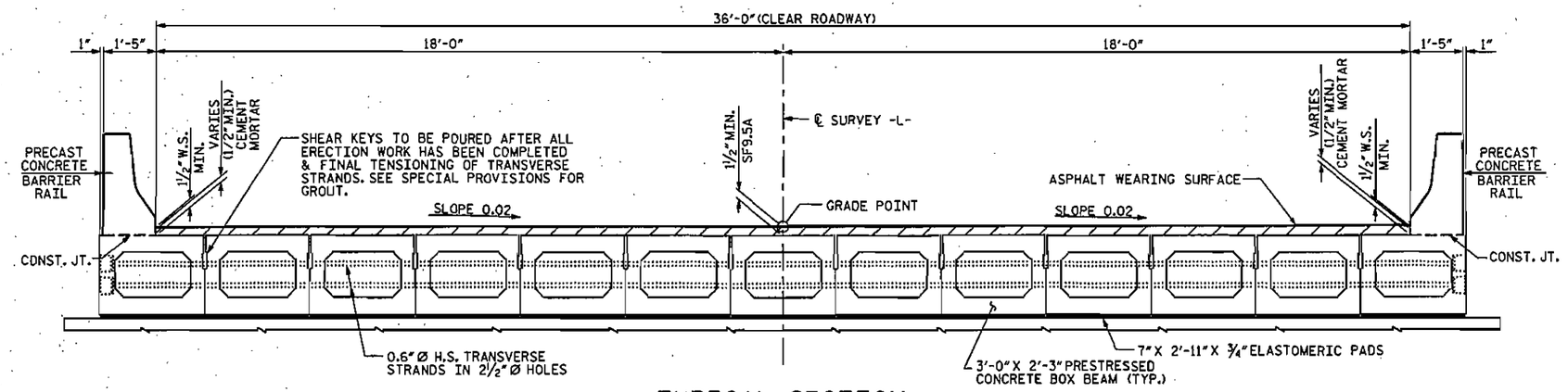


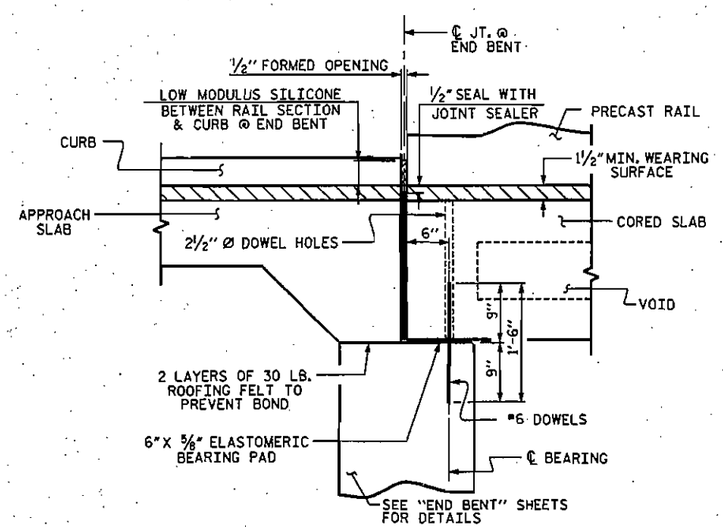
TYPICAL SECTION

(SPANS A, C)

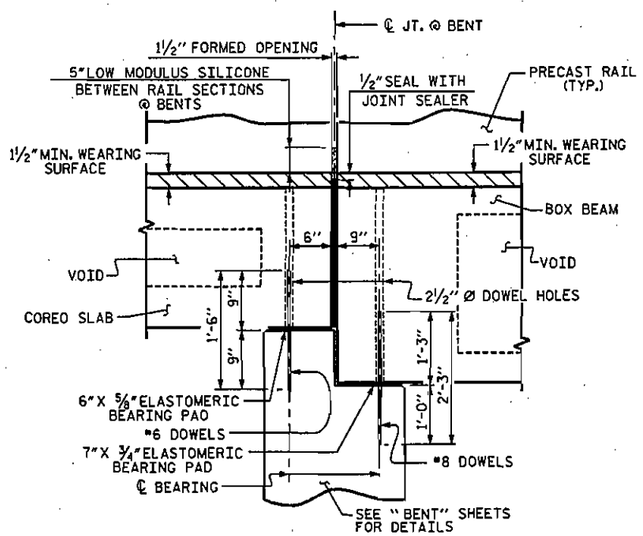


TYPICAL SECTION

(SPAN B)



SECTION AT END BENT



SECTION AT BENT

GENERAL NOTES

ASSUMED LIVE LOAD = HL 93 OR ALTERNATE LOADING.

STRUCTURAL STEEL ITEMS SHALL BE OF A GRADE CONFORMING TO EITHER ASTM A36 OR A373, EXCEPT HIGH STRENGTH BOLTS. HIGH STRENGTH BOLTS SHALL BE ASTM A325. ALL STRUCTURAL STEEL SHALL BE GALVANIZED AS PER THE SPECIFICATION.

ALL MATERIAL AND WORKMANSHIP SHALL COMPLY WITH THE APPLICABLE REQUIREMENTS OF THE STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES OF THE NC DEPARTMENT OF TRANSPORTATION DATED JULY 2006 AND WITH THE SPECIAL PROVISIONS.

UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾".

FOR ELASTOMERIC BEARINGS, SEE SPECIAL PROVISIONS.

EXPANSION JOINT MATERIAL SHALL MEET THE REQUIREMENTS OF AASHTO SPECIFICATIONS M153 TYPE I, II, OR III.

JOINT SEALER SHALL BE LOW MODULUS SILICONE SEALANT. SEE SECTION 1028-4 OF THE STANDARD SPECIFICATIONS.

BOX BEAM NOTES

CONCRETE = f'c - 6000psi 70' SPAN ONLY (MIN. COMP. STRENGTH @ 28 DAYS).
f'ci - 5000psi 70' SPAN ONLY (MIN. COMP. STRENGTH @ TRANSFER OF STRESSING FORCE).

ALL PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE BOX BEAM SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE BOX BEAMS.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH NON-SHRINK GROUT. THE 2½" Ø DOWEL HOLES AT EXPANSION ENDS OF BOX BEAM SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1½" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE BOX BEAM UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 5000 PSI.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE BOX BEAM UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO BOX BEAM UNIT ENDS.

THE LOCATION OF THE VOID DRAINS MAY BE SHIFTED SLIGHTLY WHERE NECESSARY TO CLEAR PRESTRESSING STRANDS OR TRANSVERSE REINFORCING STEEL.

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID A. SIMPSON 6-1-09

PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES
5520 Dillard Drive, Suite 120
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

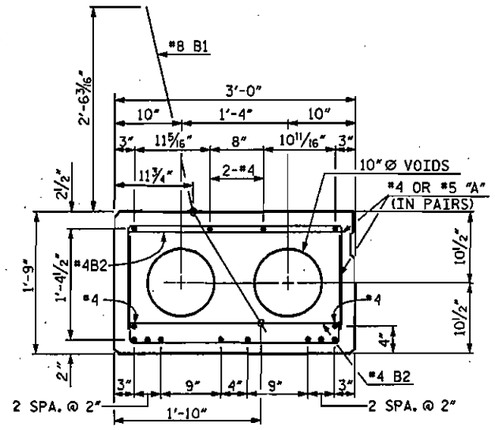
TYPICAL SECTIONS AND DETAILS

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	11
1			3			TOTAL SHEETS
2			4			35

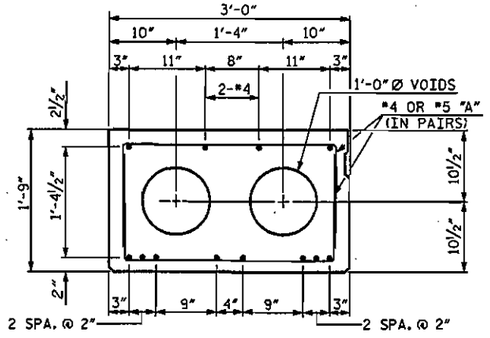
DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

6/1/2009 11:26:05 AM g:\projects\bmu\haywood 47\drawings\HAY47_sd_ts_01.dgn



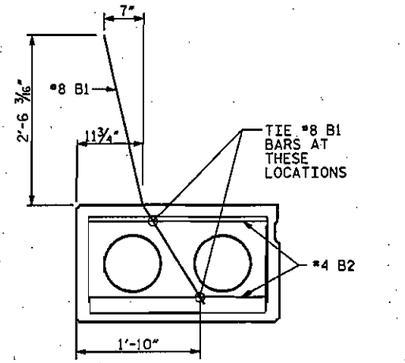
35' SPAN

10 - 0.6" Ø H.S. STRANDS
EXTERIOR SLAB SECTIONS

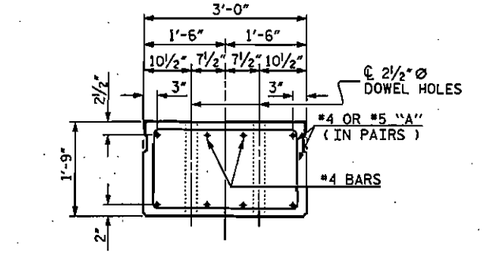


35' SPAN

10 - 0.6" Ø H.S. STRANDS
INTERIOR SLAB SECTIONS



TIE LOCATION FOR #8B1



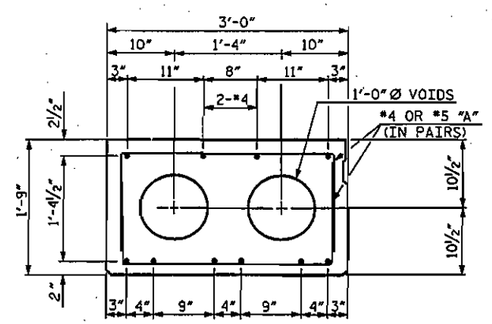
THE 2½" Ø DOWEL HOLES AT EXPANSION ENDS OF SLAB SECTIONS SHALL BE FILLED WITH LOW MODULUS SILICONE MATERIAL TO 1½" ABOVE TOP OF DOWELS AND THEN FILLED WITH GROUT, SEE SPECIAL PROVISIONS.

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF SLAB SECTIONS SHALL BE FILLED WITH GROUT, SEE SPECIAL PROVISIONS.

SLAB END ELEVATION

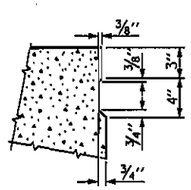
30' SPAN

8 - 0.6" Ø H.S. STRANDS
EXTERIOR SLAB SECTIONS



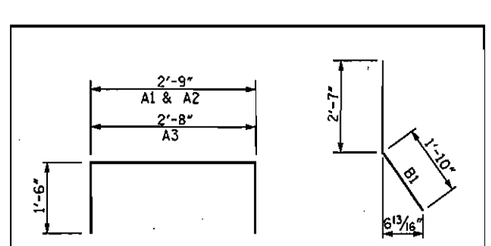
30' SPAN

8 - 0.6" Ø H.S. STRANDS
INTERIOR SLAB SECTIONS



SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE OF EXTERIOR CORED SLAB

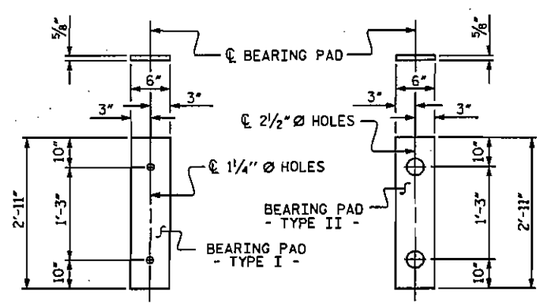


REINFORCING BAR TYPES

BAR DIMENSIONS ARE OUT TO OUT

INTERIOR SLAB UNIT	30'	35'
CAMBER (SLAB UNIT ALONE IN PLACE)	1/4" (UP)	9/16" (UP)
DEFLECTION (SUPERIMPOSED DEAD LOAD)	* 1/16" (DOWN)	* 1/16" (DOWN)
FINAL DEFLECTION	3/16" (UP)	1/2" (UP)
* INCLUDES FUTURE WEARING SURFACE		

EXTERIOR SLAB UNIT	30'	35'
CAMBER (SLAB UNIT ALONE IN PLACE)	1/4" (UP)	1/2" (UP)
DEFLECTION (SUPERIMPOSED DEAD LOAD)	* 1/16" (DOWN)	* 1/16" (DOWN)
FINAL DEFLECTION	3/16" (UP)	7/16" (UP)
* INCLUDES FUTURE WEARING SURFACE		



FIXED END
(TYPE I - 26 REQ'D)

EXPANSION END
(TYPE II - 26 REQ'D)

ELASTOMERIC BEARING DETAILS

CORED SLAB NOTES

CONCRETE = f'c - 5000psi 30' SPAN & 35' SPAN (MIN. COMP. STRENGTH @ 28 DAYS).
f'ci - 4000psi 30' SPAN & 35' SPAN (MIN. COMP. STRENGTH @ TRANSFER OF STRESSING FORCE).

SIZE	TYPE	AREA	ULTIMATE STR.	APPLIED FORCE
0.6" Ø	HIGH STR.	0.217 SQ. IN. PER STRAND	58,590 LBS. PER STRAND	43,940 LBS. PER STRAND

ALL PRESTRESING STRANDS SHALL BE 7-WIRE LOW RELAXATION GRADE 270 STRANDS AND SHALL CONFORM TO AASHTO M203 EXCEPT FOR SAMPLING REQUIREMENTS WHICH SHALL BE IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS.

ALL REINFORCING STEEL CAST WITH THE CORED SLAB SECTIONS SHALL BE GRADE 60 AND SHALL BE INCLUDED IN THE UNIT PRICE BID FOR PRESTRESSED CONCRETE CORED SLAB.

RECESSES FOR TRANSVERSE STRANDS SHALL BE GROUTED AFTER THE TENSIONING OF THE STRANDS.

THE 2½" Ø DOWEL HOLES AT FIXED ENDS OF CORED SLAB SECTIONS SHALL BE FILLED WITH GROUT. THE 2½" Ø DOWEL HOLES AT EXPANSION ENDS OF CORED SLAB SECTIONS SHALL BE FILLED WITH JOINT SEALER MATERIAL TO 1½" ABOVE THE TOP OF DOWELS AND THEN FILLED WITH GROUT.

THE JOINT SEALER MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF TYPE SL LOW MODULUS SILICONE SEALANT. THE 2" Ø BACKER ROD SHALL CONFORM TO THE REQUIREMENTS OF TYPE M BOND BREAKER. SEE SECTION 1028 OF THE STANDARD SPECIFICATIONS.

WHEN CORED SLABS ARE CAST, A POSITIVE HOLD-DOWN SYSTEM SHALL BE EMPLOYED TO PREVENT VOIDS FROM RISING OR MOVING SIDEWAYS. THIS SYSTEM SHALL BE DESIGNED TO BE LEFT IN PLACE UNTIL THE CONCRETE HAS REACHED RELEASE STRENGTH, AT LEAST THREE WEEKS PRIOR TO CASTING CORED SLABS, THE CONTRACTOR SHALL SUBMIT TO THE ENGINEER FOR REVIEW AND COMMENT, DETAILED DRAWINGS OF THE PROPOSED HOLD-DOWN SYSTEM. IN ADDITION TO STRUCTURAL DETAILS, LOCATION AND SPACING OF THE HOLD-DOWNS SHALL BE INDICATED.

THE TRANSFER OF LOAD FROM THE ANCHORAGES TO THE CORED SLAB UNIT SHALL BE DONE WHEN THE CONCRETE HAS REACHED A COMPRESSIVE STRENGTH OF NOT LESS THAN 4000 PSI.

PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH THE CORED SLAB UNIT ENDS.

APPLY EPOXY PROTECTIVE COATING TO CORED SLAB UNIT ENDS.

PLANS PREPARED BY:
SIMPSON ENGINEERING & ASSOCIATES
5520 Dillard Drive
Suite 120
Cary, NC 27518
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LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DANIEL A. SIMPSON 6-1-09

WBS NO. 14B.204414.3
HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CORED SLAB DETAILS 30' & 35' SPAN

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	12
1			3			TOTAL SHEETS
2			4			35

DRAWN BY: J. SIMPSON DATE: 4/09
CHECKED BY: J. A. BATTS DATE: 5/09

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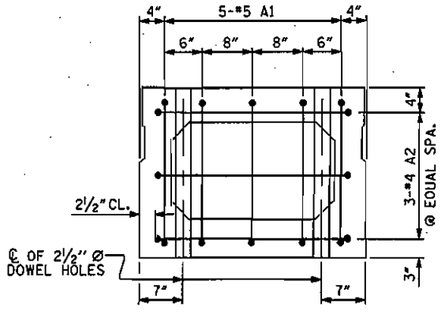
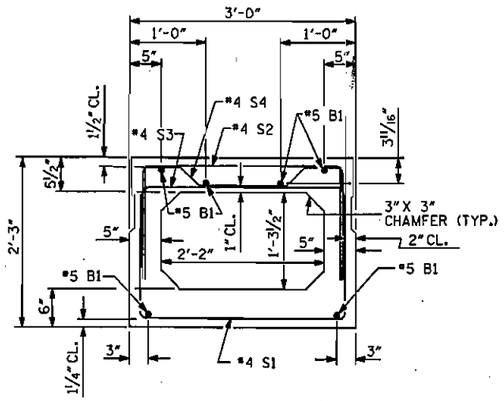


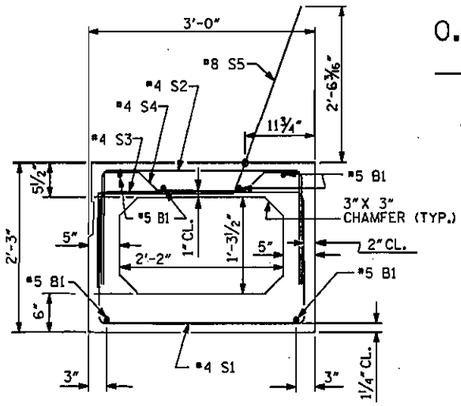
END ELEVATION

SHOWING PLACEMENT OF #5 & #4 "A" BARS AND LOCATION OF DOWEL HOLES. (INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION. STRAND LAYOUT NOT SHOWN.)



INTERIOR BOX BEAM SECTION

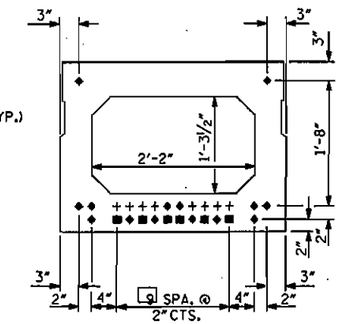
(STRAND LAYOUT NOT SHOWN)



EXTERIOR BOX BEAM SECTION

(STRAND LAYOUT NOT SHOWN)

0.6" Ø LOW RELAXATION STRAND LAYOUT



TYPICAL STRAND LOCATION

(20 STRANDS REQUIRED)

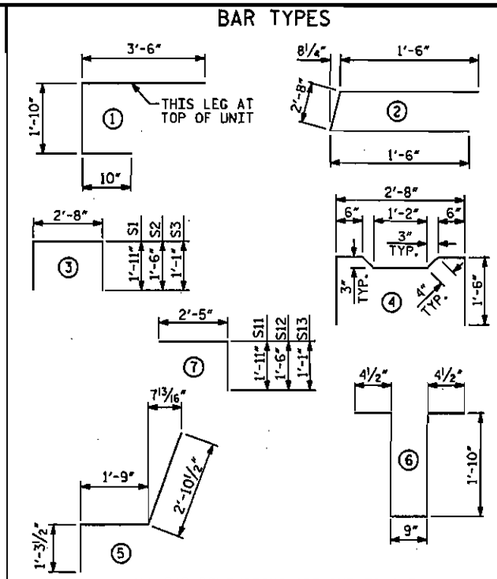
(INTERIOR BOX BEAM SECTION SHOWN-EXTERIOR SECTION SIMILAR EXCEPT SHEAR KEY LOCATION)

DEBONDING LEGEND

- ● FULLY BONDED STRANDS
- ▣ STRANDS DEBONDED FOR 4'-0" FROM END OF GIRDER

GRADE 270 STRANDS	0.6" Ø L.R.
AREA (SQUARE INCHES)	0.217
ULTIMATE STRENGTH (LBS. PER STRAND)	58,600
APPLIED PRESTRESS (LBS. PER STRAND)	43,950

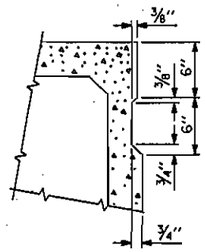
BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

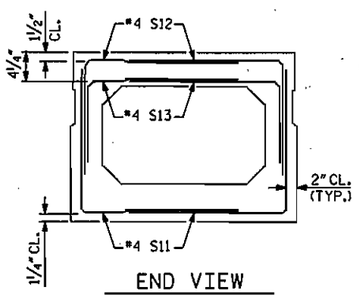
BILL OF MATERIAL FOR ONE BOX BEAM SECTION

BAR	NUMBER	SIZE	TYPE	EXTERIOR UNIT LENGTH	EXTERIOR UNIT WEIGHT	INTERIOR UNIT LENGTH	INTERIOR UNIT WEIGHT
A1	10	#5	1	6'-2"	64	6'-2"	64
A2	22	#4	2	5'-8"	83	5'-8"	83
B1	18	#5	STR	24'-8"	463	24'-8"	463
K1	12	#4	6	5'-2"	41	5'-2"	41
K2	24	#4	STR	2'-6"	40	2'-6"	40
S1	56	#4	3	6'-6"	243	6'-6"	243
S2	56	#4	3	5'-8"	212	5'-8"	212
S3	97	#4	3	4'-10"	313	4'-10"	313
S4	41	#4	4	5'-10"	160	5'-10"	160
S11	12	#4	7	4'-4"	35	4'-4"	35
S12	12	#4	7	3'-11"	31	3'-11"	31
S13	12	#4	7	3'-6"	28	3'-6"	28
S5	55	#8	5	5'-11"	869	--	--
REINFORCING STEEL					2582 LBS.		1713 LBS.
6000 P.S.I. CONCRETE					11.4 CU. YDS.		11.4 CU. YDS.
0.6" Ø L.R. STRANDS					No. 20		No. 20



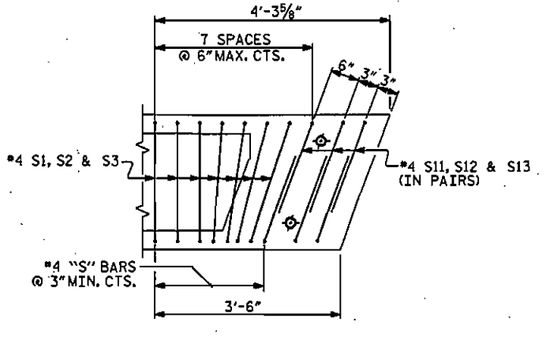
SHEAR KEY DETAIL

NOTE: OMIT SHEAR KEY ON OUTSIDE FACE OF EXTERIOR BOX BEAMS.



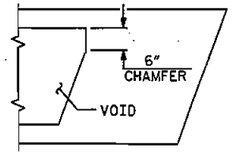
END VIEW

(SHOWING #4 "S" BARS IN END OF BEAM)



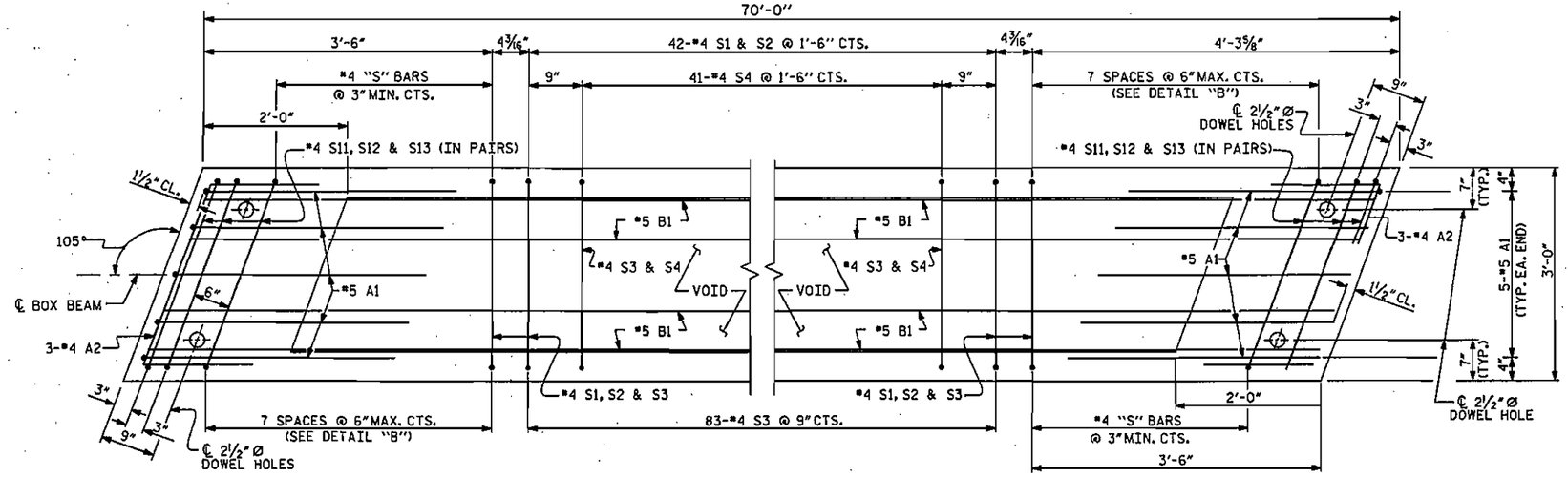
DETAIL "B"

INTERIOR UNIT SHOWN, EXTERIOR UNIT SIMILAR EXCEPT ADD #8 S5 BARS. "B" BARS AND "A" BARS NOT SHOWN.



CHAMFER DETAIL

SHOWING 6" VOID CHAMFER



PLAN OF BOX BEAM

INTERIOR UNIT SHOWN, EXTERIOR UNIT SIMILAR EXCEPT ADD #8 S5 BARS.
FOR LOCATIONS OF #8 G5 BARS AND DIAPHRAGMS, SEE "PRESTRESSED CONCRETE BOX BEAM - 70' SPAN" SHEET.
FOR REINFORCING STEEL IN DIAPHRAGMS, SEE DIAPHRAGM DETAILS ON SHEET 2 OF 2.

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID A. SIMPSON
6-1-09

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LICENSURE NO. C-2521

WBS NO. 14B.204414.3
HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47
SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

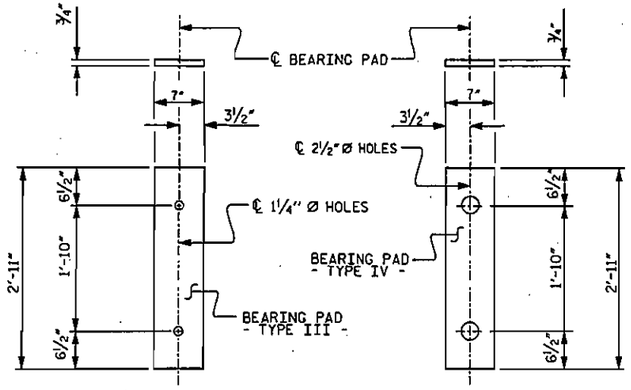
3'-0" X 2'-3" PRESTRESED CONCRETE BOX BEAM UNIT 70' SPAN

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	13
1			3			TOTAL SHEETS
2			4			35

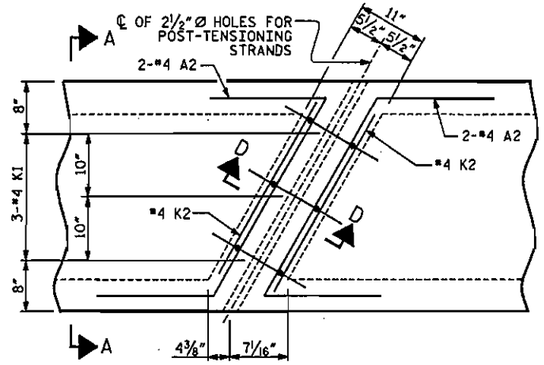
DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

6/1/2009 11:53:20 AM g:\projects\bmu\haywood 47\drawings\HAY47_sd_bbd2_01.dgn

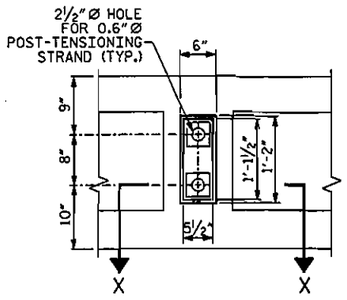


FIXED END
(TYPE III - 13 REQ'D)

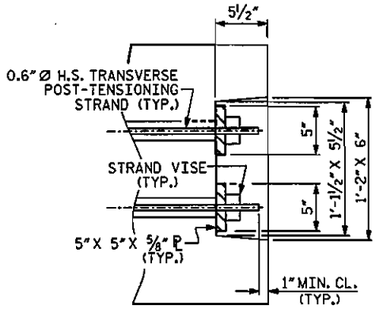
EXPANSION END
(TYPE IV - 13 REQ'D)



PLAN

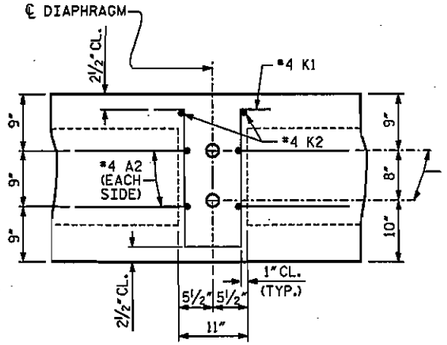


VIEW Y-Y
SHOWING ELEVATION VIEW OF GROUTED RECESS

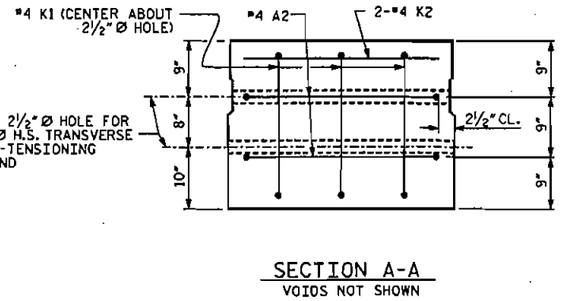


DETAIL "C"

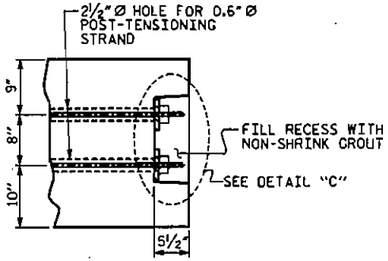
ELASTOMERIC BEARING DETAILS



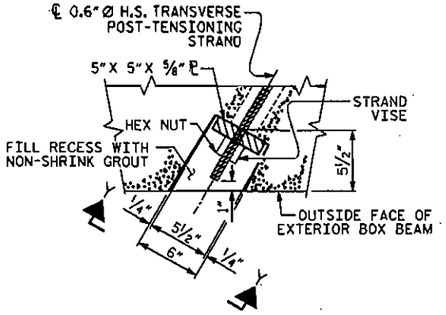
SECTION D-D



SECTION A-A
VOIDS NOT SHOWN



PART SECTION AT RECESS

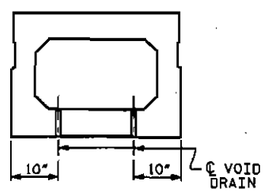


SECTION X-X
SHOWING PLAN VIEW OF GROUTED RECESS

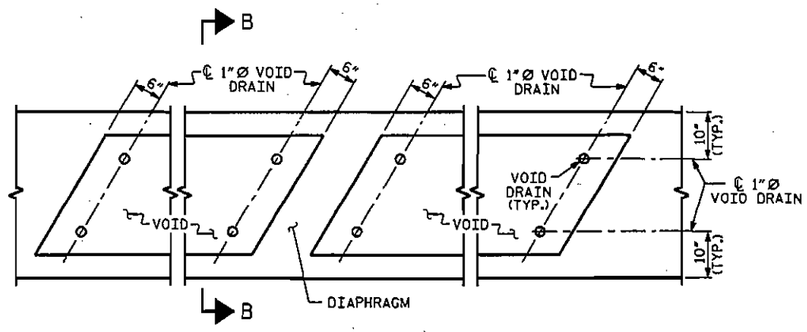
GROUTED RECESS DETAIL AT END OF POST-TENSIONED STRANDS OF EXTERIOR BOX BEAM

DOUBLE DIAPHRAGM DETAILS

#4 "S" BARS NOT SHOWN. #4 "S" BARS MAY BE SHIFTED SLIGHTLY TO CLEAR 2" Ø HOLE.



SECTION B-B



PART PLAN

VOID DRAIN DETAILS

(DIMENSIONS SHOWN ARE TYPICAL FOR EACH VOID)

DEAD LOAD DEFLECTION AND CAMBER		
	3'-0"x 2'-3" (SPAN B)	
	0.6"Ø L.R. STRAND	
	EXTERIOR	INTERIOR
CAMBER (BEAM ALONE IN PLACE)	2¼" (UP)	2¼" (UP)
DEFLECTION DUE TO SUPERIMPOSED DEAD LOAD **	9/16" (DOWN)	9/16" (DOWN)
FINAL CAMBER	1 11/16" (UP)	1 11/16" (UP)

** INCLUDES FUTURE WEARING SURFACE

WBS NO. 14B.204414.3
HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47 SHEET 2 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

3'-0"X 2'-3" PRESTRESSED CONCRETE BOX BEAM UNIT 70' SPAN

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	14
1			3			TOTAL SHEETS
2			4			35

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON 6-1-09

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DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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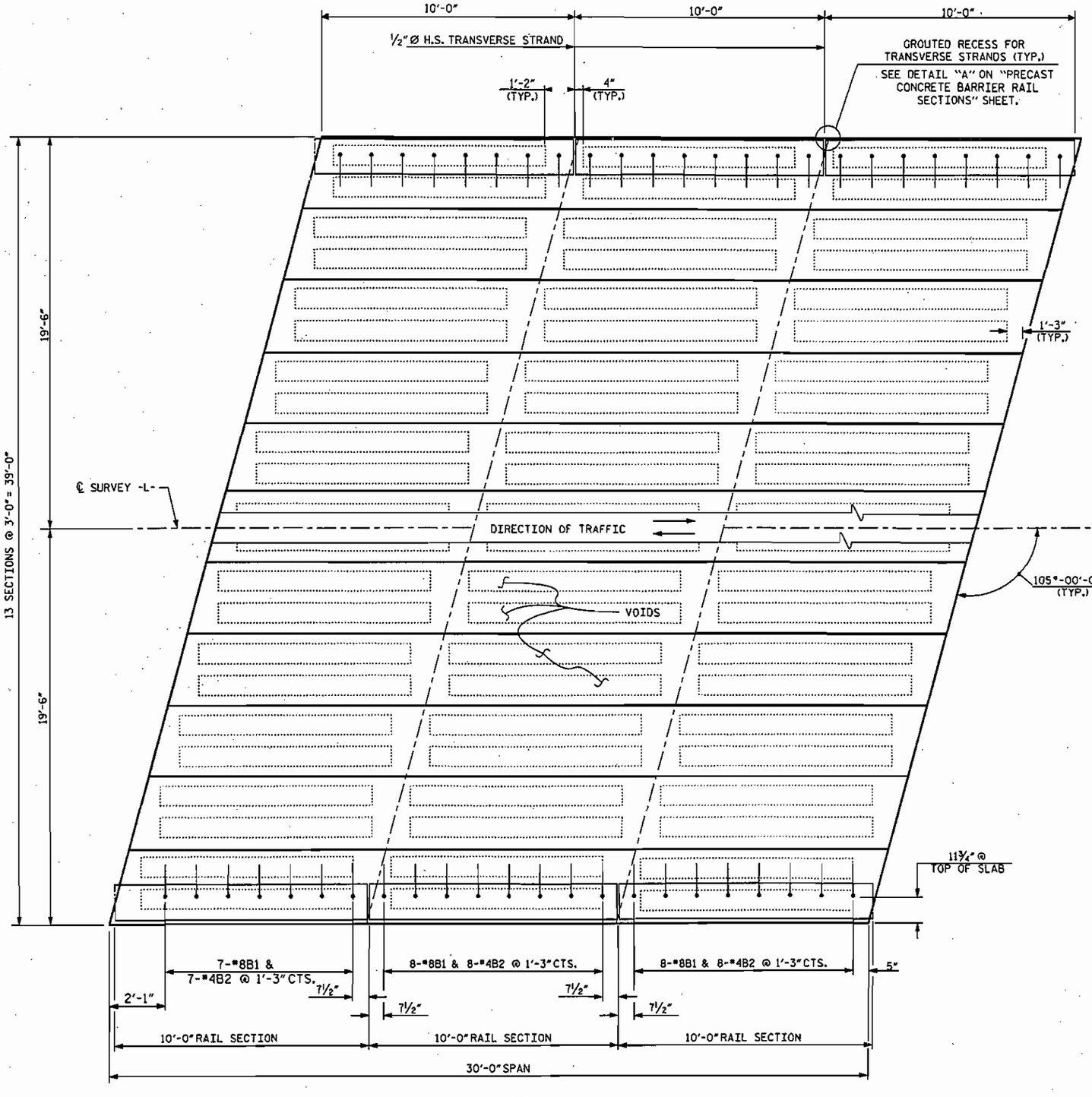
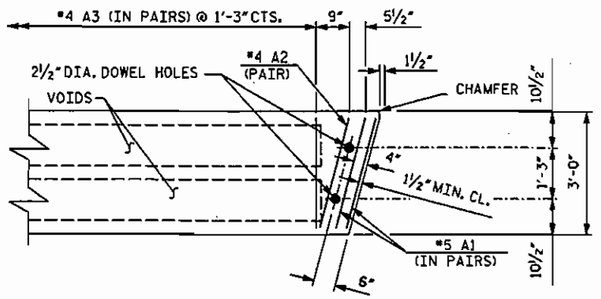


PLAN OF SPAN



PART PLAN - SLAB SECTION

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CORED SLAB 30' SPAN

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	15
1			3			TOTAL SHEETS
2			4			35

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID A. SIMPSON
6-1-09

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DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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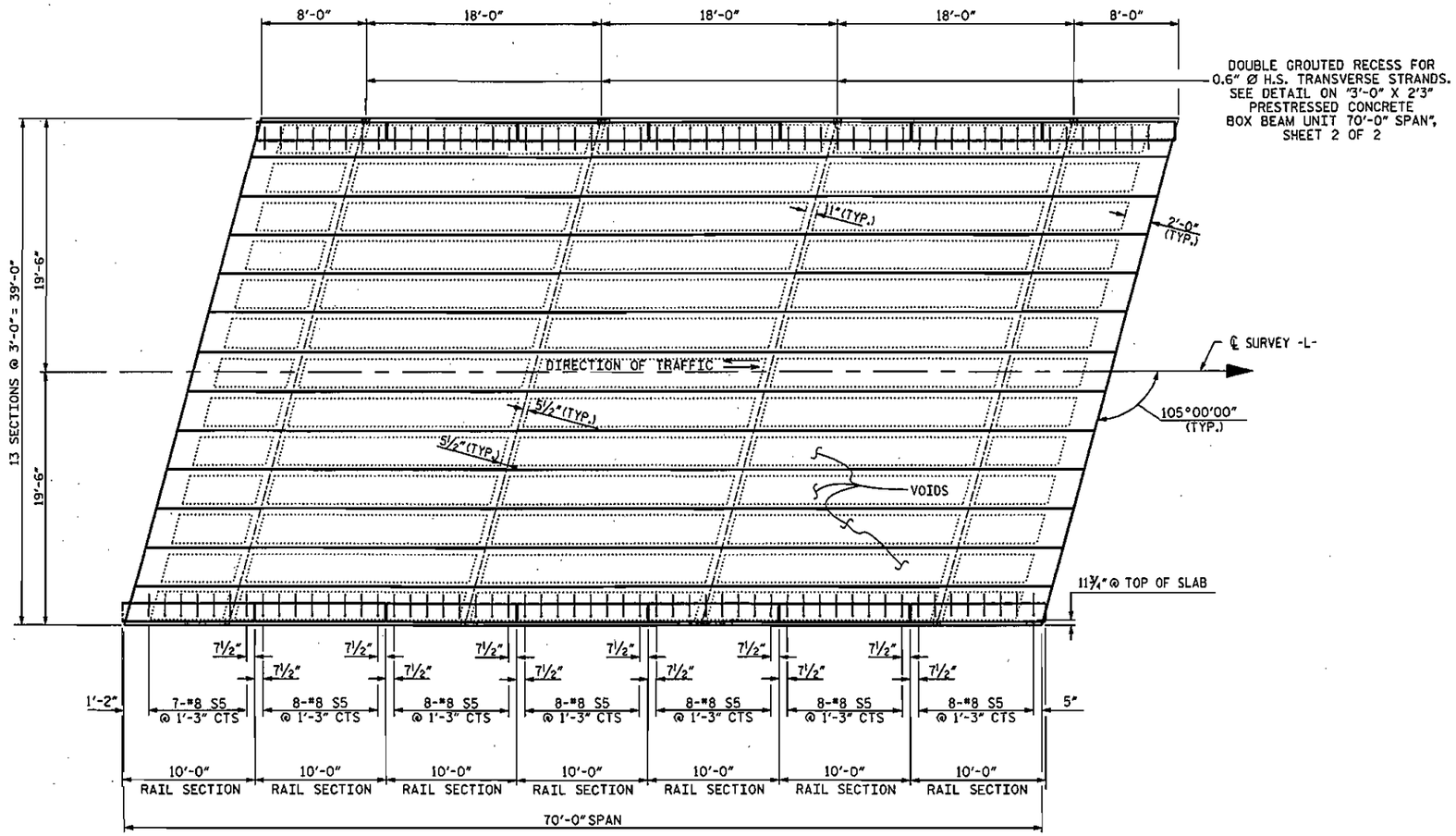

PLAN OF SPAN

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CONCRETE BOX BEAM 70' SPAN

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	16
1			3			TOTAL SHEETS
2			4			35

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NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. GREEN
6-1-09

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CHECKED BY : J. A. BATTS DATE : 5/09

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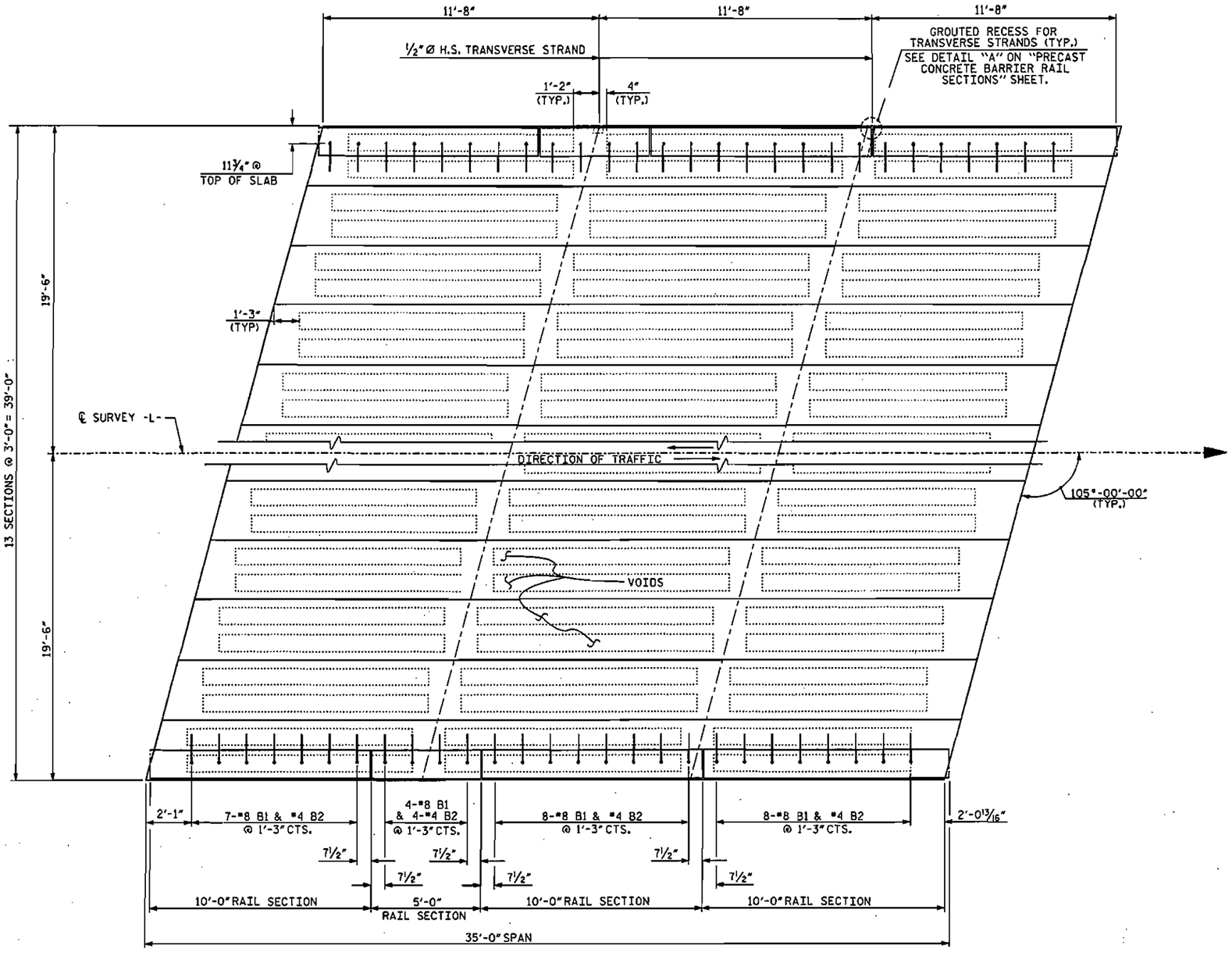
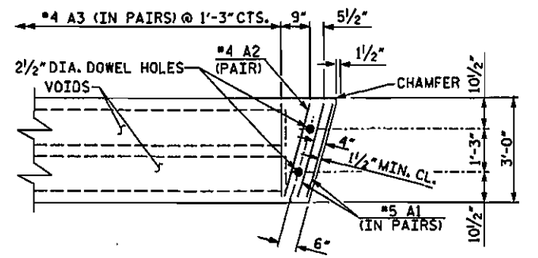


PLAN OF SPAN



PART PLAN - SLAB SECTION

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRESTRESSED CORED SLAB

35' SPAN

36' CLEAR ROADWAY - 105° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID A. SIMPSON
6-1-09

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LICENSURE NO. C-2521

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	17
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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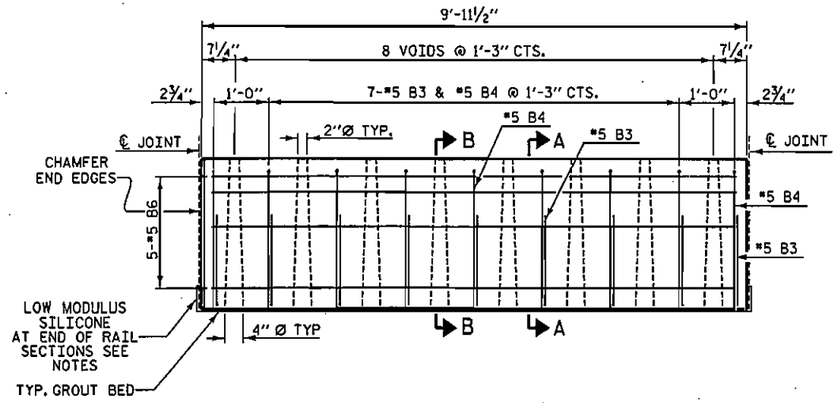
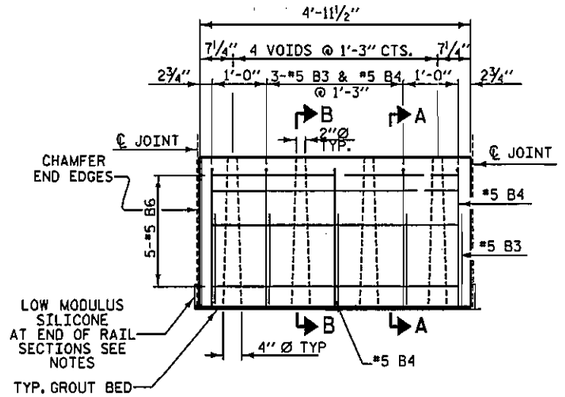


TYPICAL 10'-0" PRECAST UNIT



TYPICAL 5'-0" PRECAST UNIT

NOTES

EACH PRECAST RAIL UNIT SHALL BE CAST WITH CLASS AA CONCRETE.

RAIL TO BE FLUSH WITH CORED SLAB OR BOX BEAM UNITS AT EACH END OF SPAN.

GROUT SHALL BE 5" ABOVE GROUT BED BETWEEN RAIL SECTIONS EXCEPT AT END BENTS WHERE LOW MODULUS SILICONE SHALL BE SUBSTITUTED IN PLACE OF GROUT.

EACH PRECAST RAIL UNIT SHALL BE SUPPLIED WITH LIFTING DEVICE(S). NO CABLES ARE TO BE WRAPPED AROUND THE RAIL UNITS FOR LIFTING.

THE EXPANSION JOINT SEALER SHALL BE LOW MODULUS SILICONE SEALANT. SEE SECTION 1028-4 OF THE STANDARD SPECIFICATIONS.

CONCRETE CHAMFERS:
UNLESS OTHERWISE NOTED ON THE PLANS, ALL EXPOSED CORNERS ON STRUCTURES SHALL BE CHAMFERED ¾" WITH THE FOLLOWING EXCEPTIONS: TOP CORNERS OF CURBS MAY BE ROUNDED TO 1½" RADIUS WHICH IS BUILT INTO CURB FORMS; CORNERS OF TRANSVERSE FLOOR EXPANSION JOINTS SHALL BE ROUNDED WITH A ¼" FINISHING TOOL UNLESS OTHERWISE REQUIRED ON PLANS; AND CORNERS OF EXPANSION JOINTS IN THE ROADWAY FACES AND TOPS OF CURBS AND SIDEWALKS SHALL BE ROUNDED TO A ¼" RADIUS WITH A FINISHING STONE OR TOOL UNLESS OTHERWISE ON PLANS.

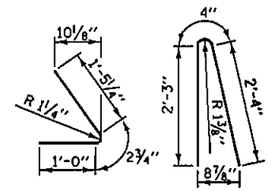
BILL OF MATERIAL FOR ONE 10'-0" RAIL SECTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	9	#5	1	2'-8"	25
B4	9	#5	2	4'-11"	46
B6	5	#5	STR	9'-7"	50
REINFORCING STEEL LBS. =					121
CLASS AA CONCRETE CU. YDS. =					1.0

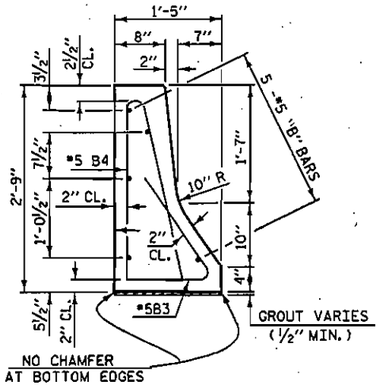
BILL OF MATERIAL FOR ONE 5'-0" RAIL SECTION

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B3	5	#5	1	2'-8"	14
B4	5	#5	2	4'-11"	26
B6	3	#5	STR	4'-7"	24
REINFORCING STEEL LBS. =					64
CLASS AA CONCRETE CU. YDS. =					0.5

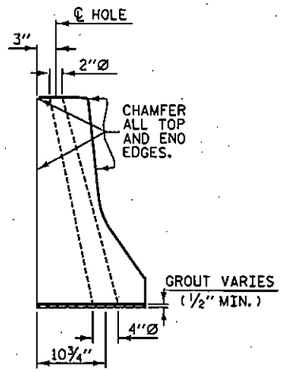
BAR TYPES



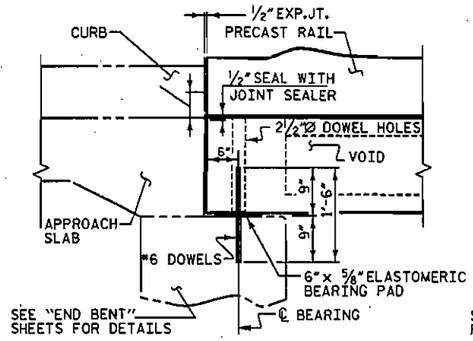
ALL BAR DIMENSIONS ARE OUT TO OUT



SECTION A-A

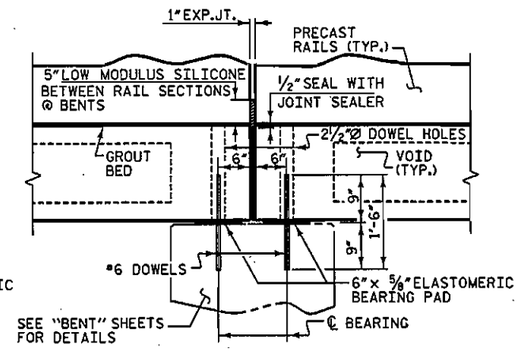


SECTION B-B



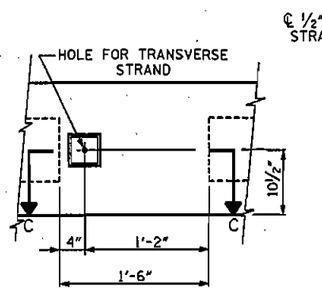
ELEVATION

SECTION AT END BENT

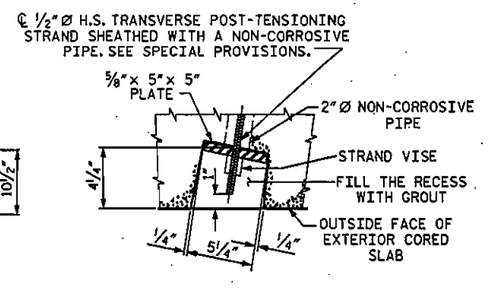


ELEVATION

SECTION AT BENT

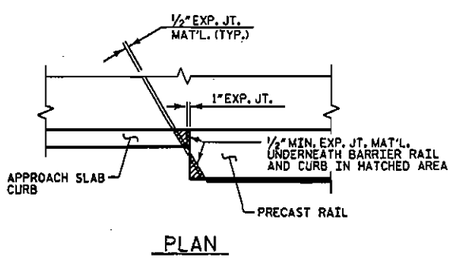


ELEVATION

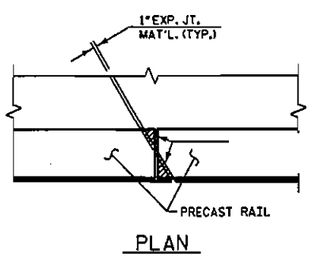


SECTION C-C

DETAIL A
GROUTED RECESS AT END OF POST-TENSIONED STRAND CORED SLAB



PLAN



PLAN

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HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

PRECAST CONCRETE BARRIER RAIL SECTIONS 30', 35', & 70' SPANS

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	18
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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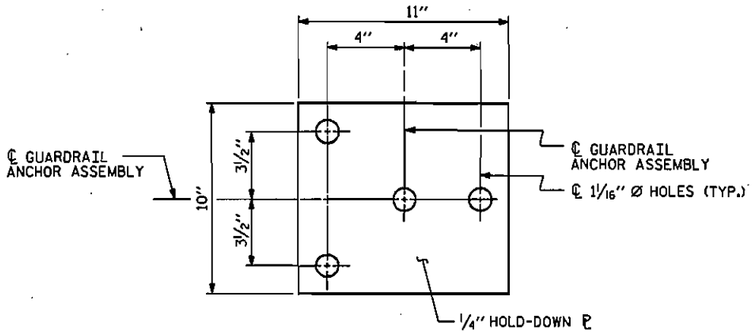
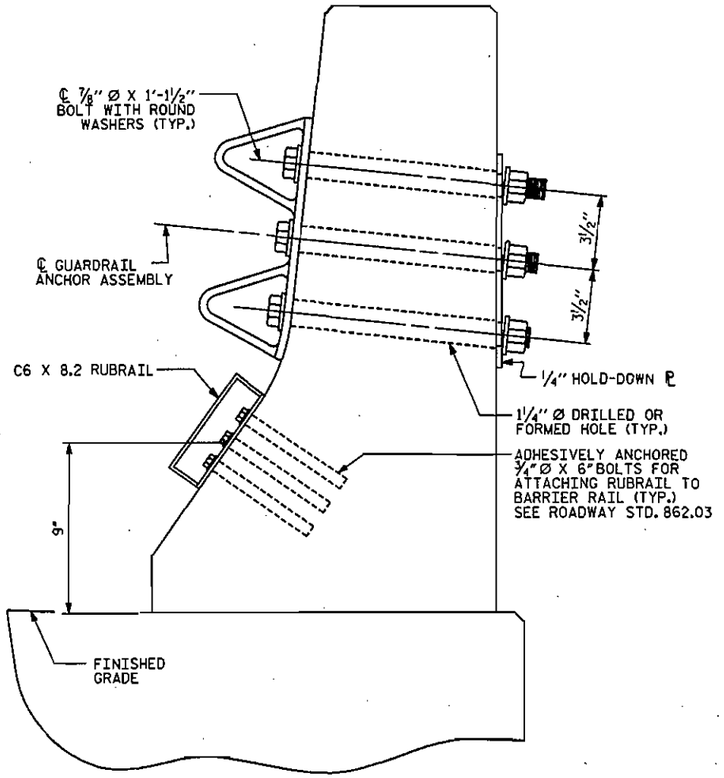
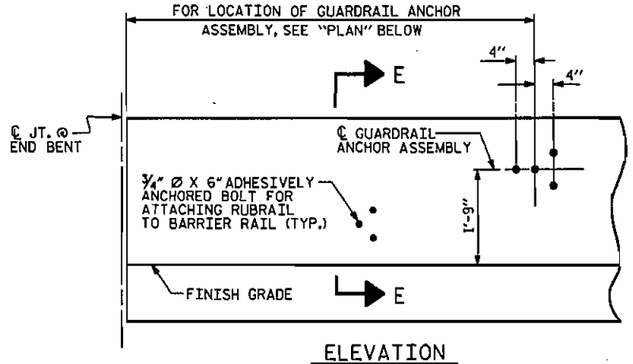


PLAN



SECTION E-E

GUARDRAIL ANCHOR ASSEMBLY DETAILS



ELEVATION

FOR LOCATION OF RUBRAIL, SEE ROADWAY STD. 862.03

NOTES

THE GUARDRAIL ANCHOR ASSEMBLY SHALL CONSIST OF A ¼" HOLD DOWN PLATE AND 4 - ⅞" Ø BOLTS WITH NUTS AND WASHERS, RUBRAIL, AND ADHESIVELY ANCHORED BOLTS.

THE HOLD-DOWN PLATE SHALL CONFORM TO AASHTO M270 GRADE 36. AFTER FABRICATION, THE HOLD-DOWN PLATE SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH AASHTO M111.

BOLTS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A307 AND NUTS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M291. BOLTS, NUTS AND WASHERS SHALL BE GALVANIZED. (AT THE CONTRACTOR'S OPTION, STAINLESS STEEL BOLTS, NUTS AND WASHERS MAY BE USED AS AN ALTERNATE FOR THE ⅞" Ø GALVANIZED BOLTS, NUTS AND WASHERS. THEY SHALL CONFORM TO OR EXCEED THE MECHANICAL REQUIREMENTS OF ASTM A307. THE USE OF THIS ALTERNATE SHALL BE APPROVED BY THE ENGINEER.)

THE GUARDRAIL ANCHOR ASSEMBLY IS REQUIRED AT ALL POINTS WHERE APPROACH GUARDRAIL IS TO BE ATTACHED TO THE END OF BARRIER RAIL. FOR POINTS OF ATTACHMENT, SEE SKETCH.

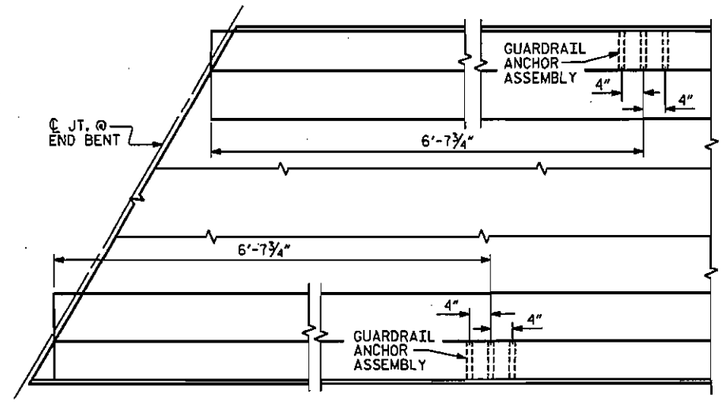
AFTER INSTALLATION, THE EXPOSED THREAD OF THE BOLT SHALL BE BURRED WITH A SHARP POINTED TOOL.

THE COST OF THE GUARDRAIL ANCHOR ASSEMBLY SHALL BE INCLUDED IN THE UNIT CONTRACT PRICE BID FOR CONCRETE BARRIER RAIL.

THE 1 ¼" Ø HOLES SHALL BE FORMED OR DRILLED WITH A CORE BIT. IMPACT TOOLS WILL NOT BE PERMITTED. ANY CONCRETE DAMAGED BY THIS WORK SHALL BE REPAIRED TO THE SATISFACTION OF THE ENGINEER.

THE C6 X 8.2 RUBRAIL IS TO BE ADHESIVELY ANCHORED TO THE RAIL USING THREE ¾" Ø X 6" BOLTS WITH WASHERS. SEE ROADWAY STANDARD 862.03 FOR DETAILS AND LOCATION OF THE RUBRAIL.

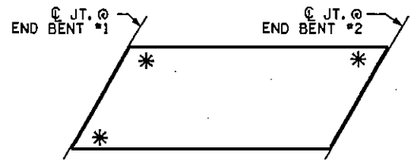
FOR ADDITIONAL GUARDRAIL INFORMATION, SEE "GUARDRAIL ANCHOR UNIT" SHEET.



PLAN

LOCATION OF ANCHORS FOR GUARDRAIL

END BENT "1 SHOWN, END BENT "2 SIMILAR.



SKETCH SHOWING POINTS OF ATTACHMENTS

✳ DENOTES GUARDRAIL ANCHOR ASSEMBLY

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON JR.

6-1-09

PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES

8520 Dillard Drive
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Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com

LICENSURE NO. C-2521

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

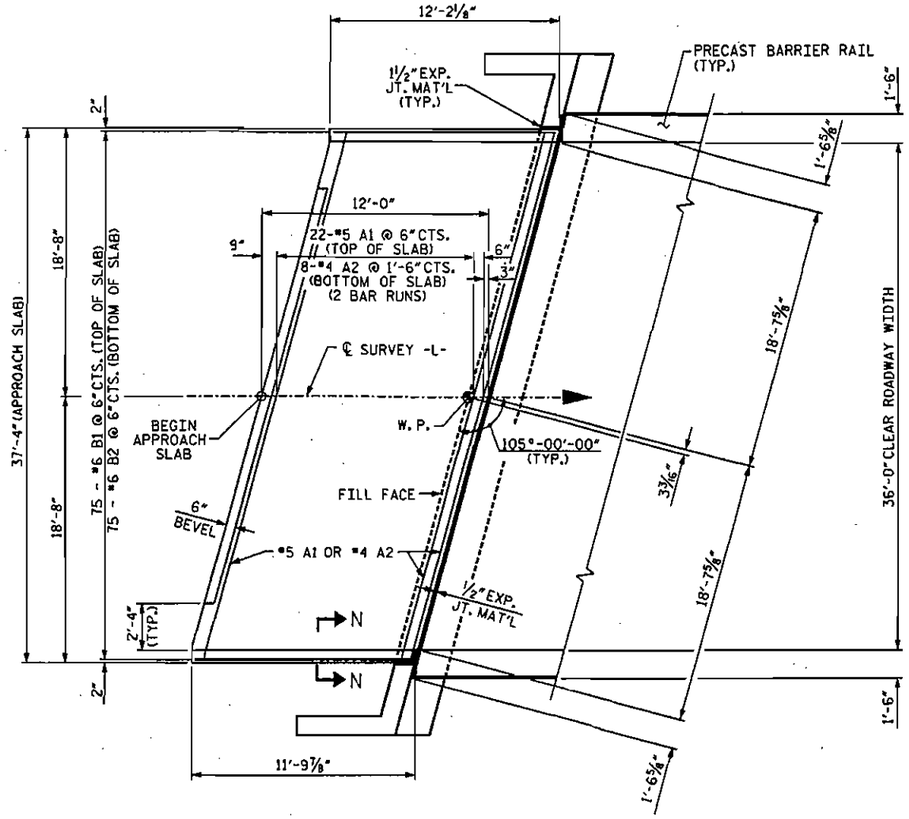
GUARDRAIL ANCHORAGE FOR BARRIER RAIL

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	19
1			3			TOTAL SHEETS
2			4			35

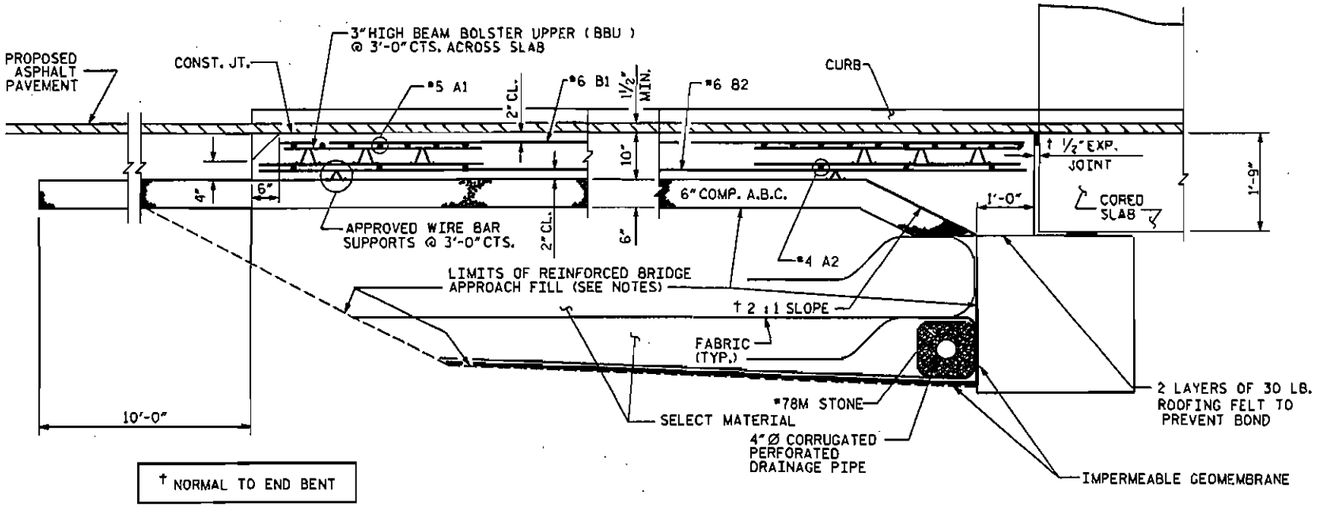
DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

6/1/2009 12:39:20 PM g:\projects\bmu\haywood 47\drawings\HAY47_sd_gr_01.dgn



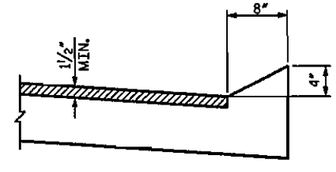
PLAN OF APPROACH SLAB

BEGIN APPRDACH SLAB SHOWN
END APPRDACH SLAB SIMILAR

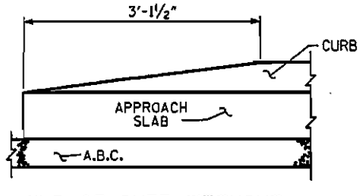


† NORMAL TO END BENT

SECTION THRU SLAB



SECTION N-N



END OF CURB WITHOUT SHOULDER BERM GUTTER

CURB DETAILS

NOTES

THE COST OF THE CURB ON THE APPROACH SLAB SHALL BE INCLUDED IN THE LUMP SUM CONTRACT PRICE BID FOR BRIDGE APPROACH SLABS.

THE COST OF THE REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SHALL BE INCLUDED IN THE LUMP SUM CONTRACT BID PRICE FOR BRIDGE APPROACH SLABS.

FOR REINFORCED BRIDGE APPROACH FILL INCLUDING FABRIC, IMPERMEABLE GEOMEMBRANE, 4" Ø DRAINAGE PIPE, #78M STONE, AND SELECT MATERIAL, SEE STANDARD DRAWING 422.10.

TEMPORARY DRAINAGE AND TEMPORARY BERM AND SLOPE DRAINS WILL BE PAID FOR UNDER THE LUMP SUM PRICE FOR BRIDGE APPROACH SLAB.

AREA BETWEEN THE WINGWALL AND APPROACH SLAB SHALL BE GRADED TO DRAIN THE WATER AWAY FROM THE FILL FACE OF THE BRIDGE AND SHALL BE PAVED.

THE 6" COMP. A.B.C. SHALL EXTEND 10'-0" BEYOND THE END OF THE APPROACH SLAB AND 1'-0" OUTSIDE OF EACH EDGE OF SLAB.

THE CONTRACTOR MAY USE 4" TYPE B-25.0B ASPHALT CONCRETE BASE COURSE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE BASE COURSE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIOTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB.

THE CONTRACTOR MAY USE 5" CLASS "A" CONCRETE BASE IN LIEU OF 6" COMP. A.B.C. IF THIS OPTION IS USED, THE CONCRETE BASE SHALL EXTEND 1'-0" BEYOND THE END OF THE APPROACH SLAB AND THE WIDTH SHALL BE THE SAME AS THAT OF THE APPROACH SLAB. THE CONCRETE SHALL BE FINISHED TO A SMOOTH SURFACE AND A LAYER OF 30 LB ROOFING FELT SHALL BE PLACED BETWEEN THE CONCRETE BASE AND THE APPROACH SLAB TO PREVENT BOND. THE APPROACH SLAB SHALL NOT BE CAST UNTIL THE CONCRETE BASE HAS REACHED AN AGE OF THREE CURING DAYS.

FOR JOINT DETAILS, SEE "PRESTRESSED CONCRETE CORED SLAB UNIT" SHEETS.

THE JOINT AT THE END BENT SHALL BE SEALED AS SOON AS PRACTICAL AFTER THE CONSTRUCTION OF THE APPROACH SLABS.

APPROACH SLAB GROOVING IS NOT REQUIRED.

BILL OF MATERIAL
FOR ONE APPROACH SLAB (2 REQUIRED)

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
* A1	23	5	STR	38'-3"	918
A2	18	4	STR	20'-1"	241
* B1	75	6	STR	11'-2"	1258
B2	75	6	STR	11'-8"	1314
REINFORCING STEEL				LBS.	1,555
* EPOXY COATED REINFORCING STEEL				LBS.	2,176
CLASS "A" CONCRETE				C.Y.	16.3

WBS NO. 14B.204414.3
HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

APPROACH SLAB

36' CLEAR ROADWAY - 105° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON
6-1-09

PLANS PREPARED BY:
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LICENSURE NO. C-2521

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	20
1			3			TOTAL SHEETS
2			4			35

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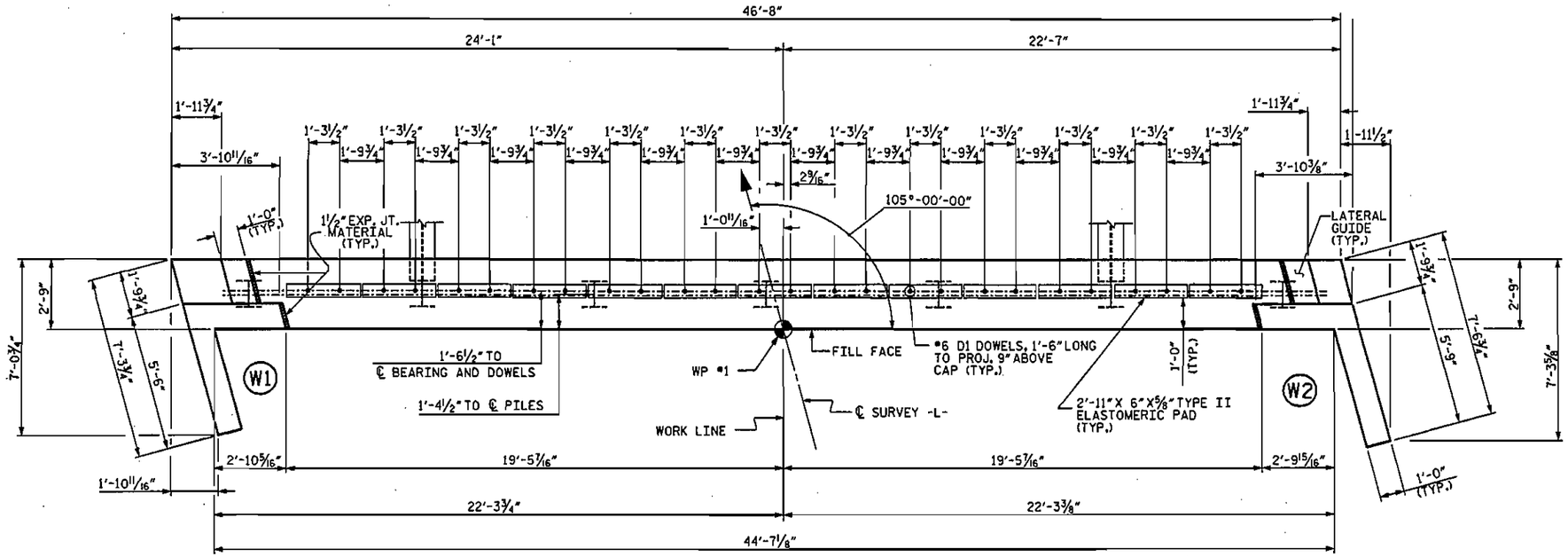
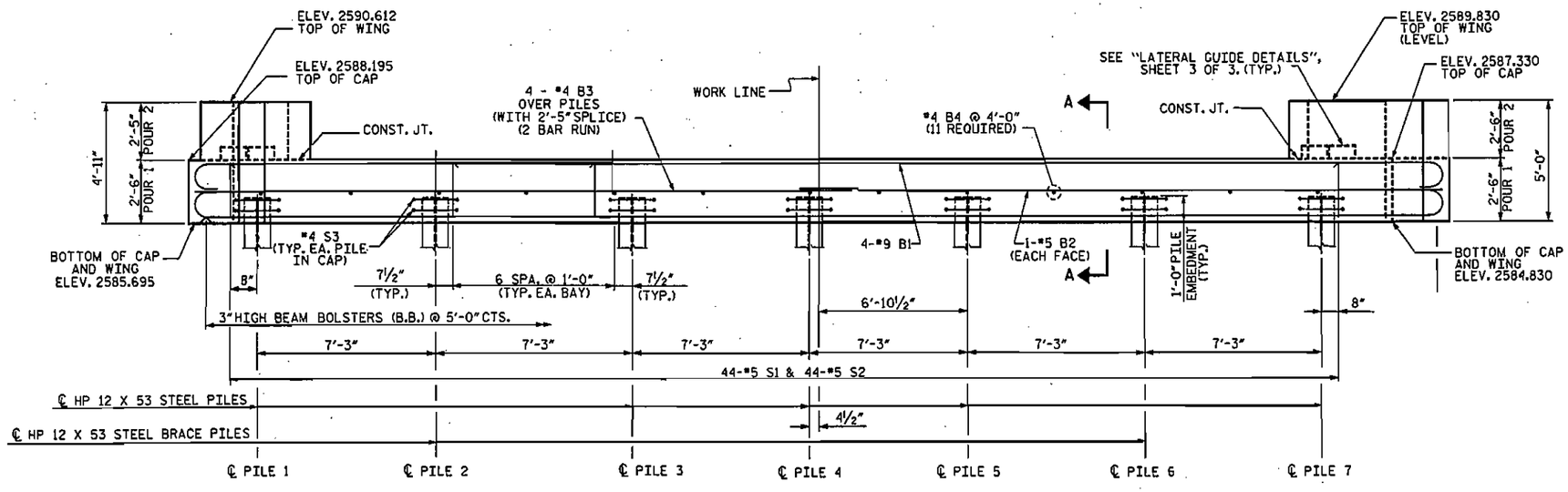


PLAN



ELEVATION

NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6 D1 DOWELS.

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
1	2586.659
2	2586.525
3	2586.390
4	2586.256
5	2586.121
6	2586.987
7	2585.852

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47 SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

END BENT #1

36' CLEAR ROADWAY - 105° SKEW

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER JAMES A. BATTS, JR. 6-1-09

PLANS PREPARED BY:
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LICENSURE NO. C-2521

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	21
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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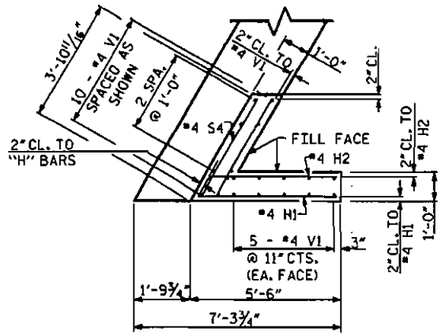
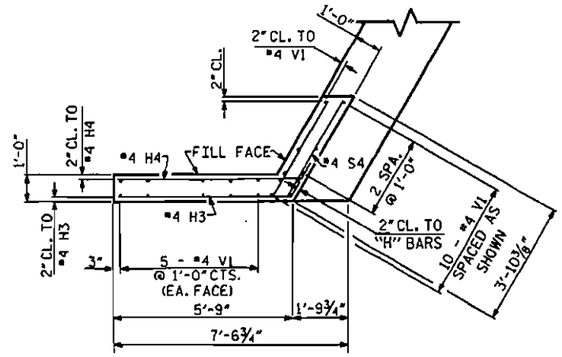
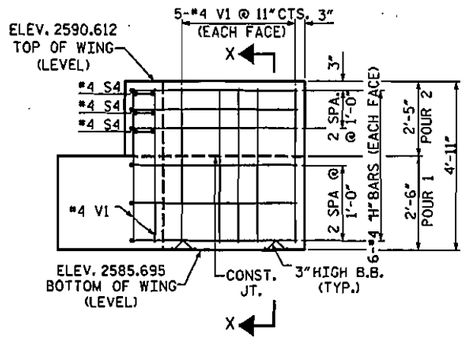


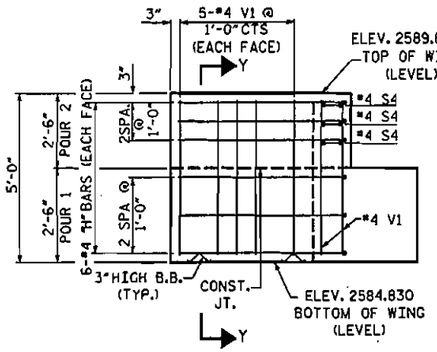
(W1) PLAN OF LEFT WING



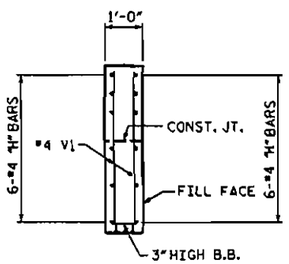
(W2) PLAN OF RIGHT WING



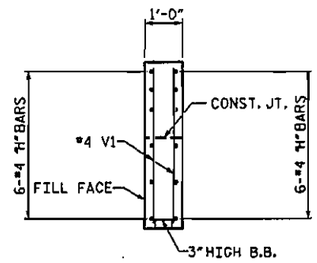
(W1) ELEVATION OF LEFT WING



(W2) ELEVATION OF RIGHT WING



SECTION X-X



SECTION Y-Y

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NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON
6-1-09

WBS NO. 14B.204414.3
HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47 SHEET 2 OF 3

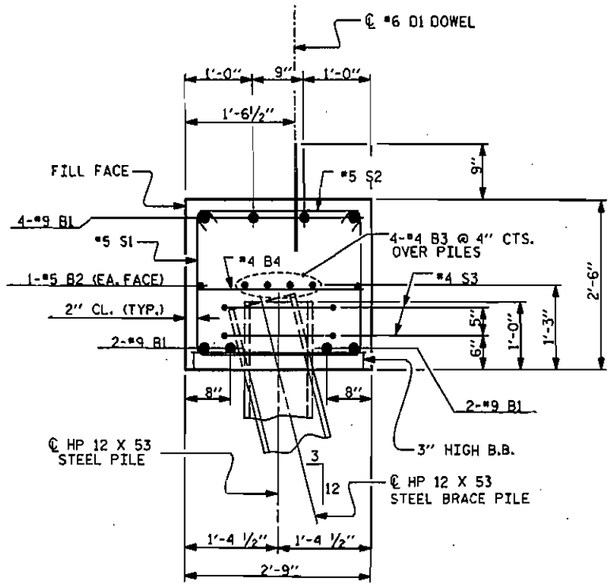
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

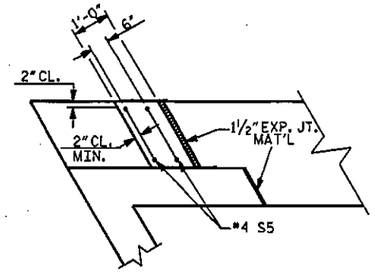
END BENT #1

36' CLEAR ROADWAY - 105° SKEW

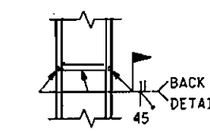
REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	22
1			3			TOTAL SHEETS
2			4			35



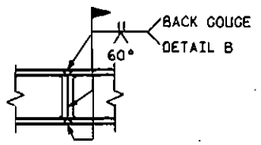
SECTION A-A



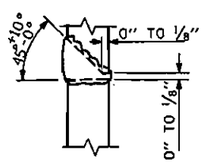
PLAN



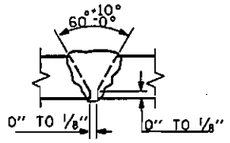
*PILE VERTICAL



*PILE HORIZONTAL OR VERTICAL



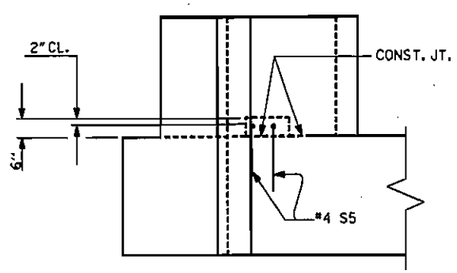
DETAIL A



DETAIL B

PILE SPLICE DETAILS

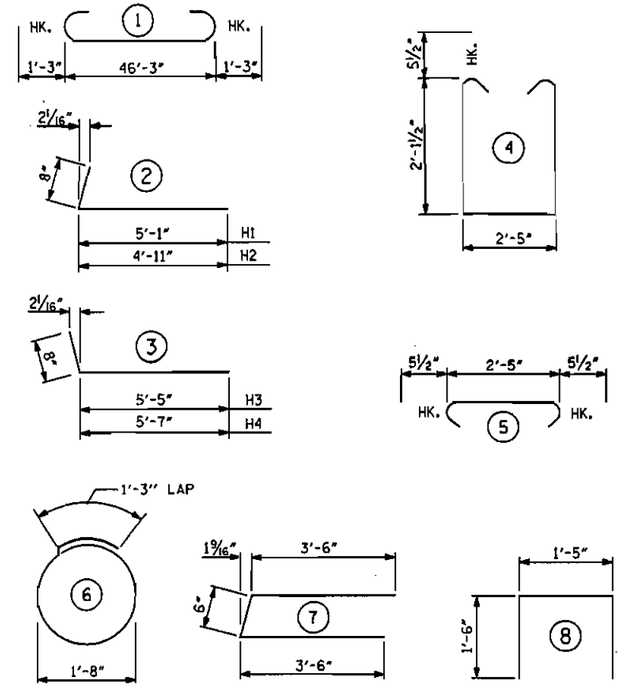
*POSITION OF PILE DURING WELDING.



ELEVATION

LATERAL GUIDE DETAILS

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	48'-9"	1326
B2	2	5	STR	46'-3"	96
B3	8	4	STR	24'-5"	130
B4	11	4	STR	2'-5"	18
D1	26	6	STR	1'-6"	59
H1	6	4	2	5'-9"	23
H2	6	4	2	5'-7"	22
H3	6	4	3	6'-1"	24
H4	6	4	3	6'-3"	25
S1	44	5	4	7'-7"	348
S2	44	5	5	3'-4"	153
S3	14	4	6	6'-6"	61
S4	6	4	7	7'-6"	30
S5	4	4	8	4'-5"	12
V1	40	4	STR	4'-7"	122

TOTAL REINFORCING STEEL 2449 LBS.

CLASS "A" CONCRETE BREAKDOWN

POUR 1	12.7 CU. YDS.
POUR 2	1.6 CU. YDS.
TOTAL	14.3 CU. YDS.

HP 12 X 53 STEEL PILES

7 PILES REQUIRED	277 LIN. FT.

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DRAWN BY : J. SIMPSON DATE : 4/09
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NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON, JR. 6-1-09

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HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47 SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #1

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	23
1			3			TOTAL SHEETS
2			4			35

NOTES:

STIRRUPS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6 D1 OR #8 D2 DOWELS.

HOOKS ON "M" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEM FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

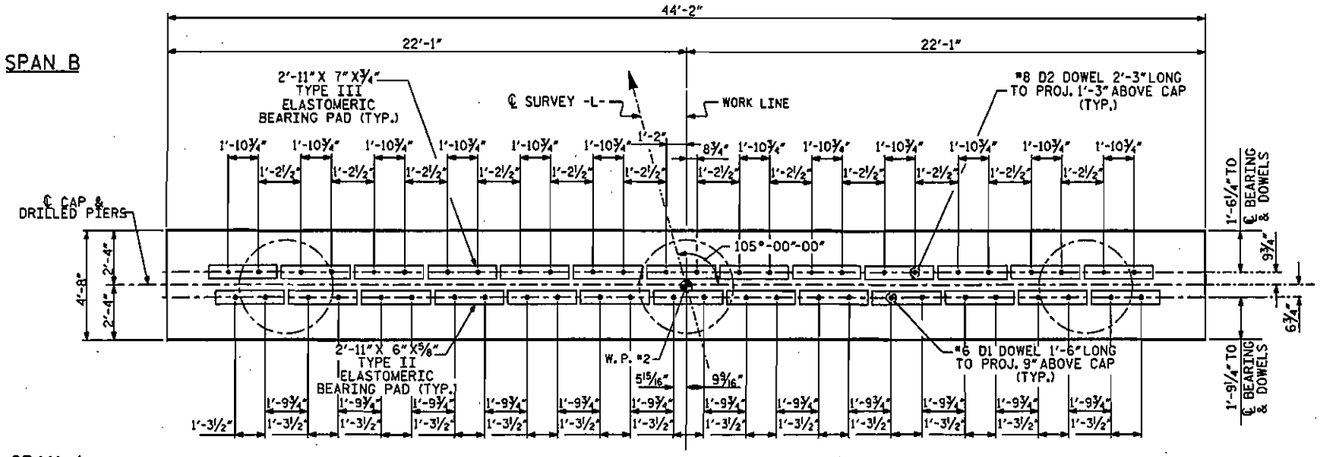
FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

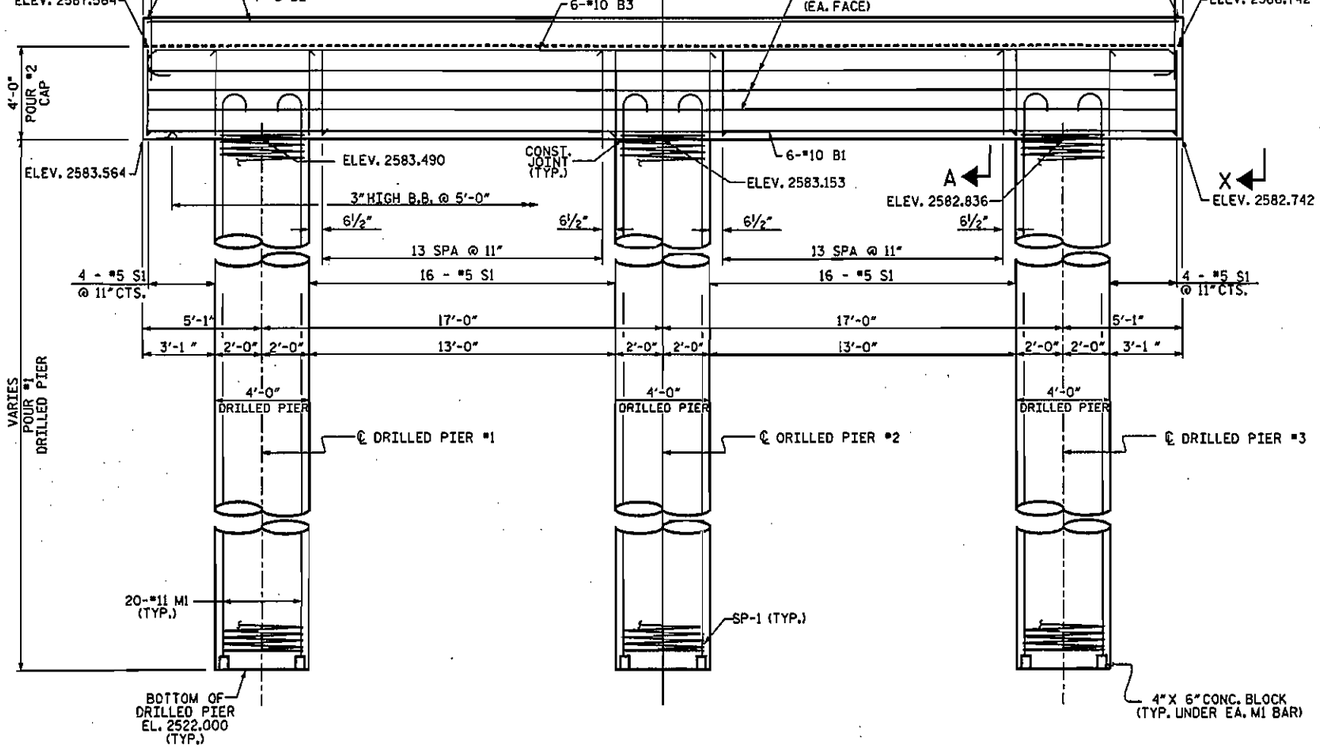
INVERT ALTERNATE STIRRUPS.

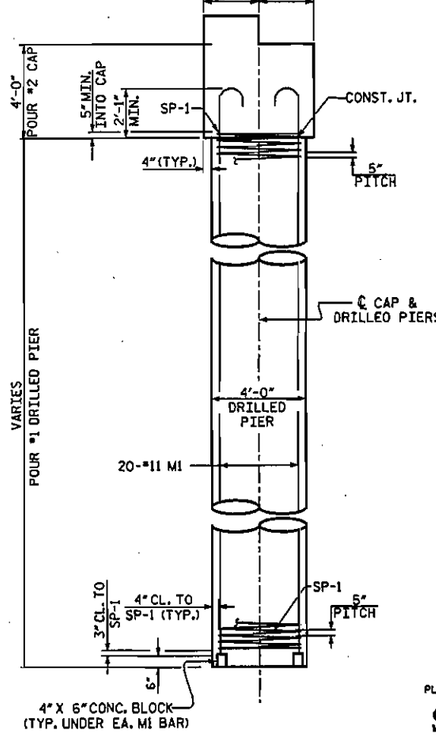
NO SEPARATE PAYMENT SHALL BE MADE FOR ANY ADDITIONAL STEEL REQUIRED IN CONSTRUCTION OF THE DRILLED PIER AS THIS IS CONSIDERED INCIDENTAL TO THE LINEAR FOOT PRICE FOR DRILLED PIER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIER IS DETAILED WITH THREE FEET OF EXTRA LENGTH.

FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISIONS FOR DRILLED PIERS.







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WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47

SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT #1

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	24
1			3			TOTAL SHEETS
2			4			35

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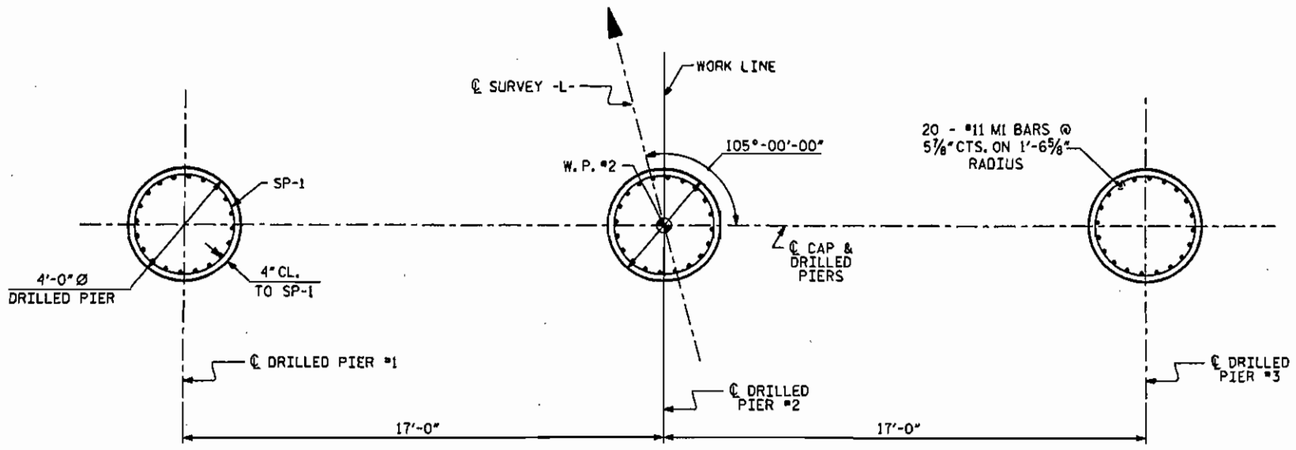
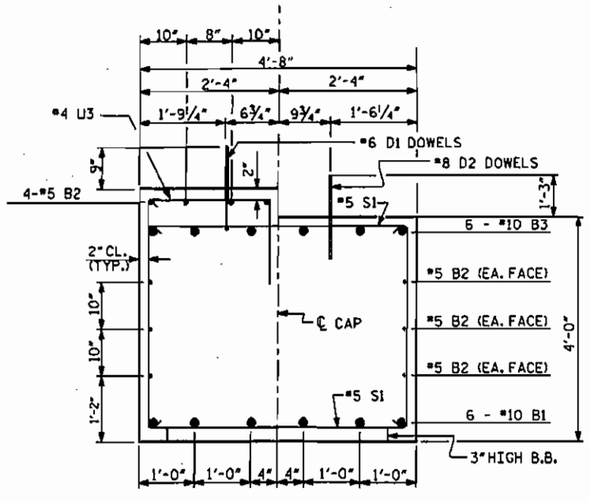
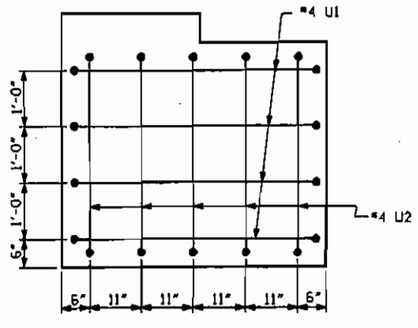


PLAN OF DRILLED PIERS

NOTE: REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS.



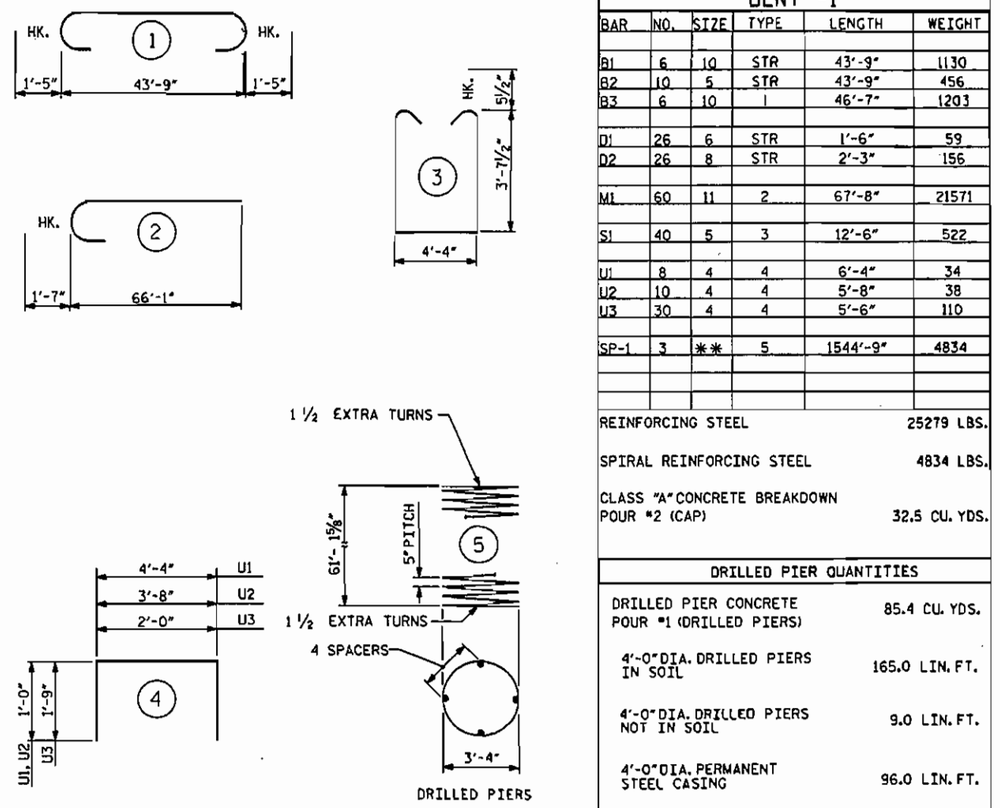
SECTION A-A



VIEW X-X

NOTE: TYPICAL FOR EACH END OF CAP

BAR TYPES



DRILLED PIERS

ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT #1

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	10	STR	43'-9"	1130
B2	10	5	STR	43'-9"	456
B3	6	10	1	46'-7"	1203
D1	26	6	STR	1'-6"	59
D2	26	8	STR	2'-3"	156
MI	60	11	2	67'-8"	21571
S1	40	5	3	12'-6"	522
U1	8	4	4	6'-4"	34
U2	10	4	4	5'-8"	38
U3	30	4	4	5'-6"	110
SP-1	3	**	5	1544'-9"	4834

REINFORCING STEEL	25279 LBS.
SPIRAL REINFORCING STEEL	4834 LBS.
CLASS "A" CONCRETE BREAKDOWN POUR #2 (CAP)	32.5 CU. YDS.

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	85.4 CU. YDS.
4'-0" DIA. DRILLED PIERS IN SOIL	165.0 LIN. FT.
4'-0" DIA. DRILLED PIERS NOT IN SOIL	9.0 LIN. FT.
4'-0" DIA. PERMANENT STEEL CASING	96.0 LIN. FT.

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47 SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 19851 ENGINEER DAVID R. SIMPSON JR.
6-1-09

PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES
5520 Dillard Drive
Suite 120
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com

LICENSURE NO. C-2521

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT #1

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	25
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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NOTES:

STIRRUPS IN THE CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6 D1 OR #8 D2 DOWELS.

HOOKS ON "W" BARS MAY BE TURNED AS NECESSARY FOR PLACING REINFORCING STEEL.

ALL STEEL IN THE DRILLED PIERS IS INCLUDED IN THE PAY ITEM FOR "REINFORCING STEEL" AND "SPIRAL COLUMN REINFORCING STEEL".

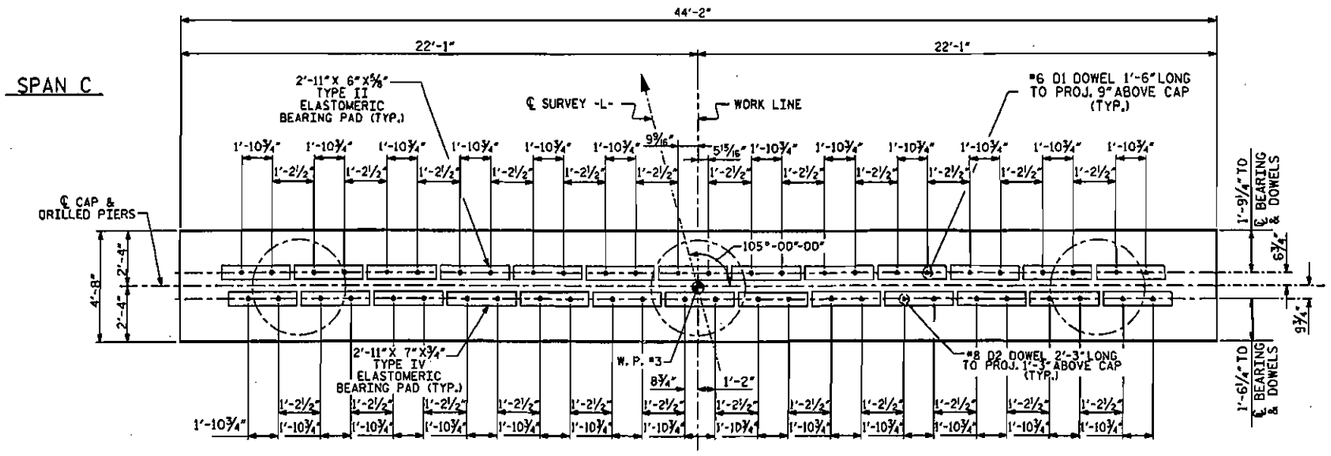
FOR DRILLED PIERS, SEE SPECIAL PROVISIONS.

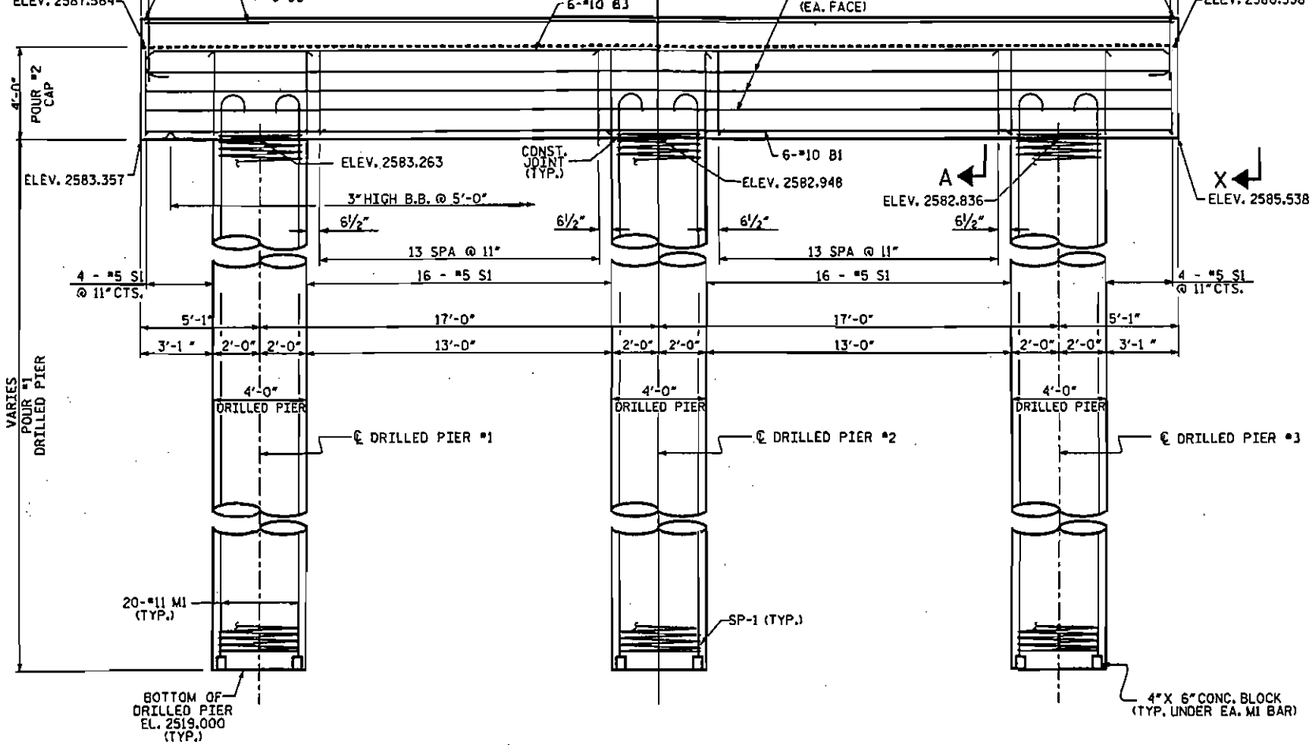
INVERT ALTERNATE STIRRUPS.

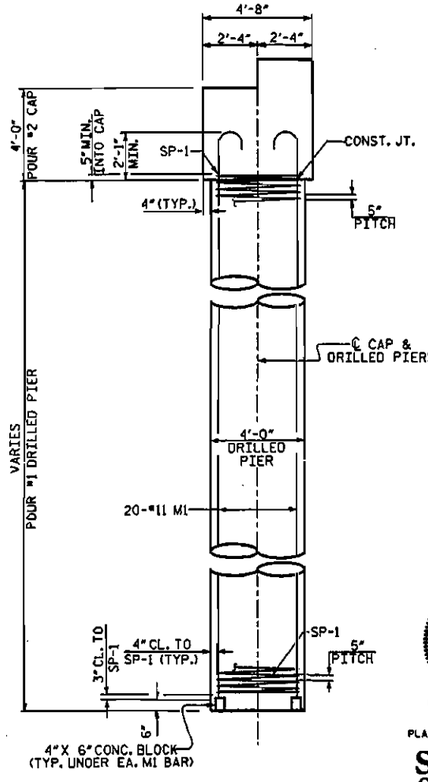
NO SEPARATE PAYMENT SHALL BE MADE FOR ANY ADDITIONAL STEEL REQUIRED IN CONSTRUCTION OF THE DRILLED PIER AS THIS IS CONSIDERED INCIDENTAL TO THE LINEAR FOOT PRICE FOR DRILLED PIER.

THE CONTRACTOR'S ATTENTION IS CALLED TO THE FACT THAT THE LONGITUDINAL REINFORCEMENT FOR THE DRILLED PIER IS DETAILED WITH THREE FEET OF EXTRA LENGTH.

FOR PERMANENT STEEL CASING, SEE SPECIAL PROVISIONS FOR DRILLED PIERS.







PLANS PREPARED BY:
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Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID B. SIMPSON 6-1-09

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47 SHEET 1 OF 2

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

BENT #2

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	26
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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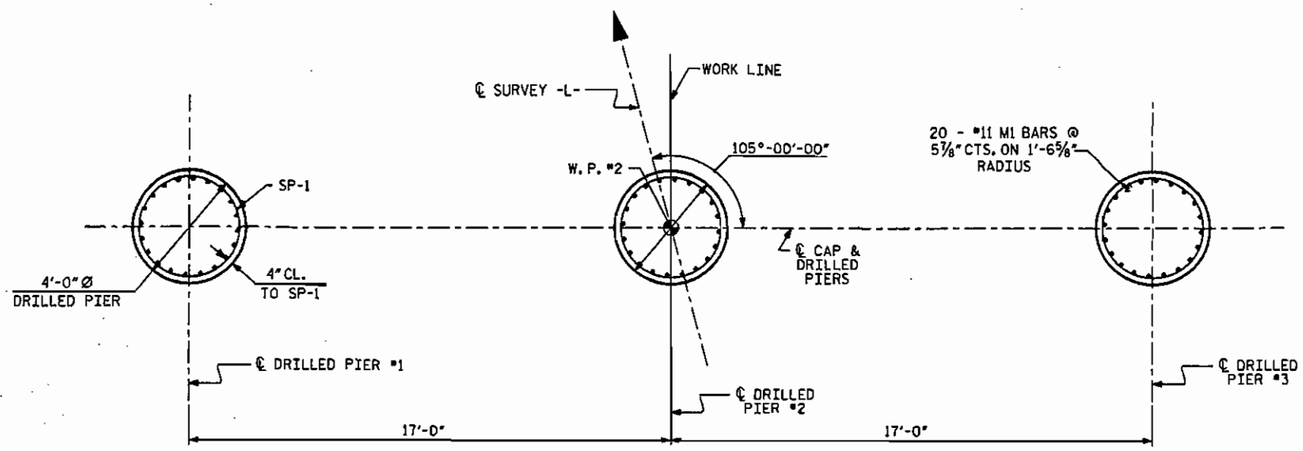
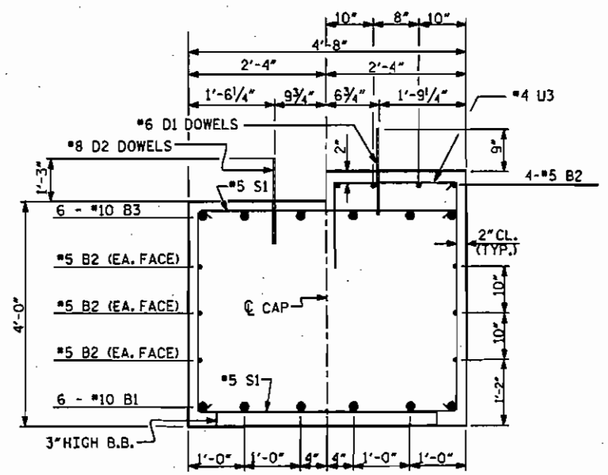
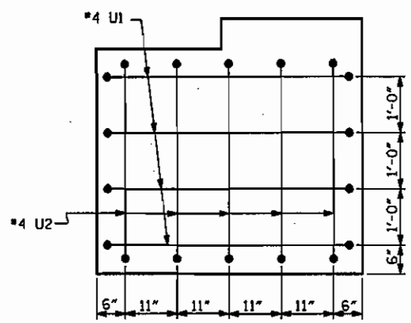


PLAN OF DRILLED PIERS

NOTE: REINFORCING STEEL AND DIMENSIONS ARE TYPICAL FOR ALL DRILLED PIERS.



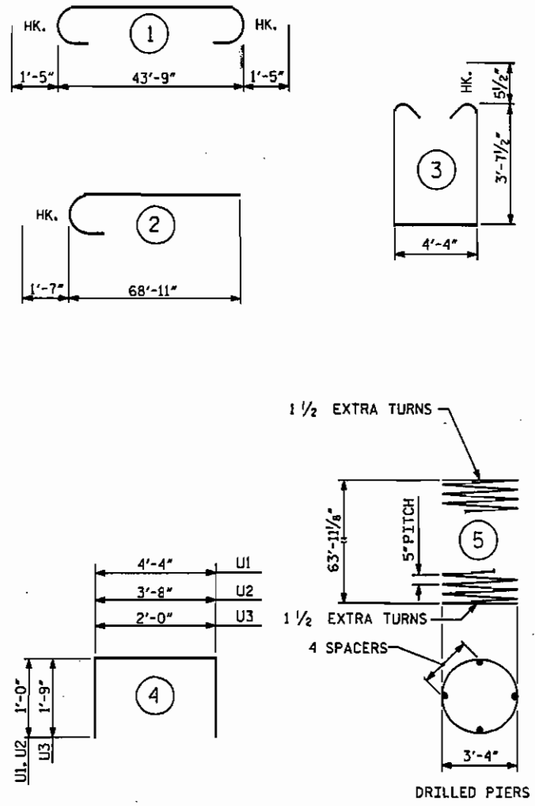
SECTION A-A



VIEW X-X

NOTE: TYPICAL FOR EACH END OF CAP

BAR TYPES



ALL BAR DIMENSIONS ARE OUT TO OUT

BILL OF MATERIAL

BENT #2

BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	6	10	STR	43'-9"	1130
B2	10	5	STR	43'-9"	456
B3	6	10	1	46'-7"	1203
D1	26	6	STR	1'-6"	59
D2	26	8	STR	2'-3"	156
M1	60	11	2	70'-6"	22474
S1	40	5	3	12'-6"	522
U1	8	4	4	6'-4"	34
U2	10	4	4	5'-8"	38
U3	30	4	4	5'-6"	110
SP-1	3	**	5	1613'-11"	5050

REINFORCING STEEL	26182 LBS.
SPIRAL REINFORCING STEEL	5050 LBS.
CLASS "A" CONCRETE BREAKDOWN POUR #2 (CAP)	32.5 CU. YDS.

DRILLED PIER QUANTITIES

DRILLED PIER CONCRETE POUR #1 (DRILLED PIERS)	89.3 CU. YDS.
4'-0" DIA. DRILLED PIERS IN SOIL	177.0 LIN. FT.
4'-0" DIA. DRILLED PIERS NOT IN SOIL	3.0 LIN. FT.
4'-0" DIA. PERMANENT STEEL CASING	63.0 LIN. FT.

** THE SP-1 SPIRAL REINFORCING STEEL SHALL BE W31 OR D-31 COLD DRAWN WIRE OR #5 PLAIN OR DEFORMED BAR.

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47 SHEET 2 OF 2

NORTH CAROLINA PROFESSIONAL SEAL 19631 ENGINEER DAVID B. SIMPSON
6-1-09

PLANS PREPARED BY:

SIMPSON ENGINEERS & ASSOCIATES
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www.simpsonengr.com

LICENSURE NO. C-2521

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH
SUBSTRUCTURE

BENT #2

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	27
1			3			TOTAL SHEETS
2			4			35

DRAWN BY: J. SIMPSON DATE: 4/09
CHECKED BY: J. A. BATTS DATE: 5/09

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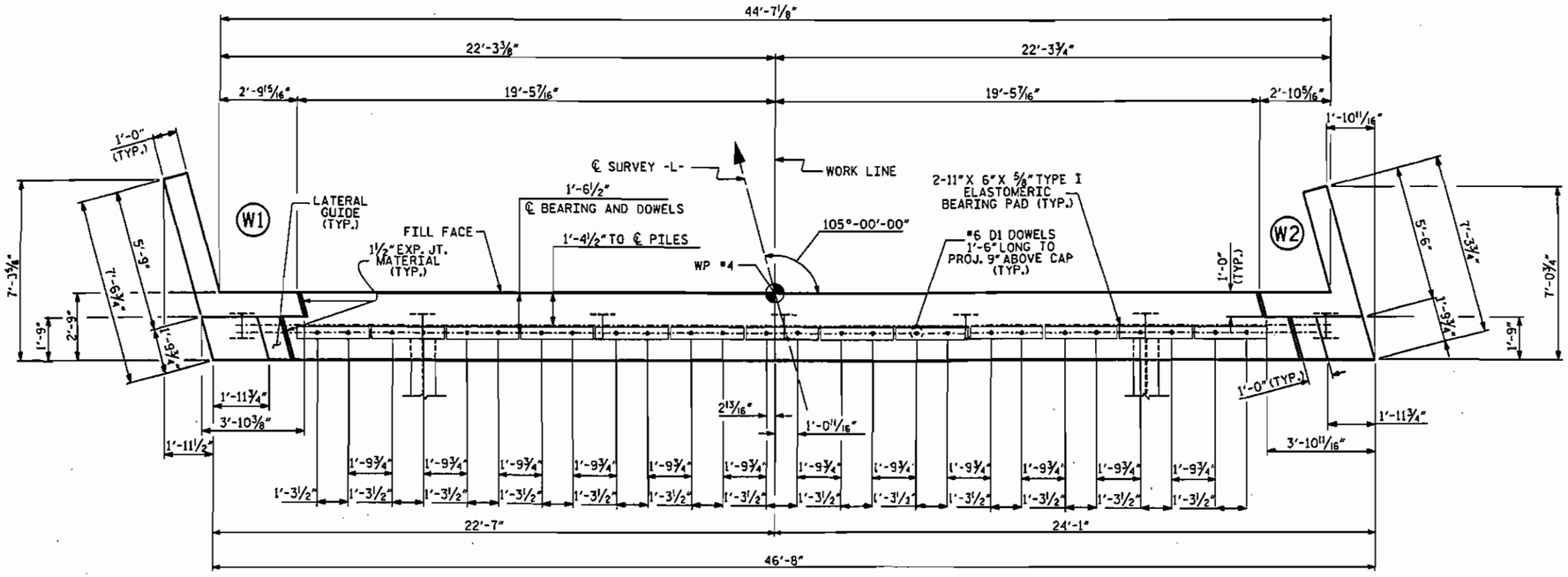
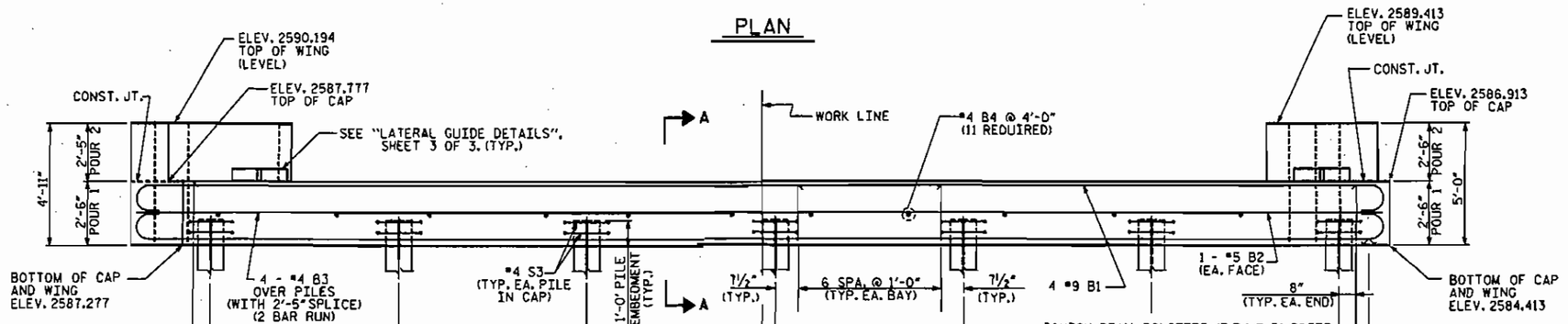


NOTES

STIRRUPS IN CAP MAY BE SHIFTED AS NECESSARY TO CLEAR #6 D1 DOWELS.

TOP OF PILE ELEVATIONS	
PILE	ELEVATION
1	2586.673
2	2586.539
3	2586.404
4	2586.270
5	2586.135
6	2586.001
7	2585.867

PLAN



ELEVATION

PLANS PREPARED BY:

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LICENSURE NO. C-2521

NORTH CAROLINA PROFESSIONAL SEAL 19031 ENGINEER DAVID R. BATTS
6-1-09

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47 SHEET 1 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	28
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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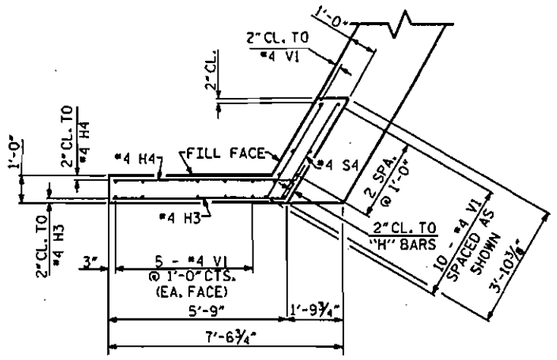
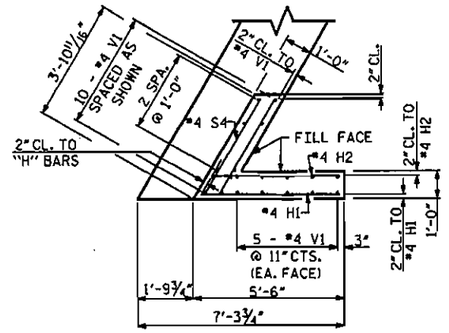
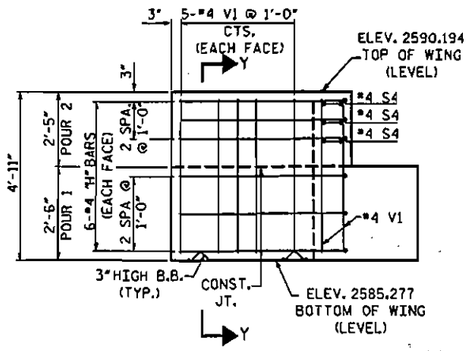


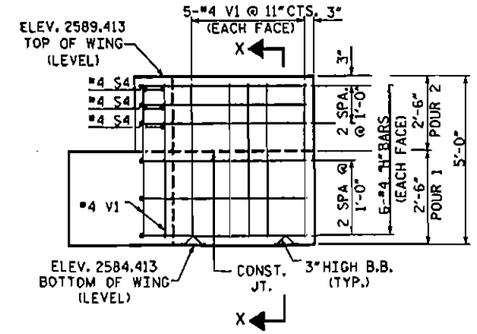
(W1) PLAN OF LEFT WING



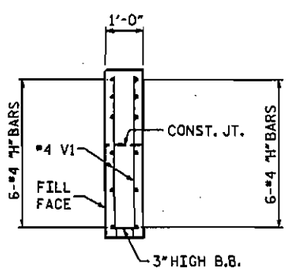
(W2) PLAN OF RIGHT WING



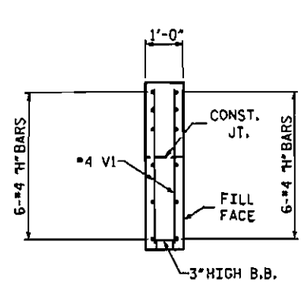
(W1) ELEVATION OF LEFT WING



(W2) ELEVATION OF RIGHT WING



SECTION Y-Y



SECTION X-X

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DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

WBS NO. 14B.204414.3
HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47 SHEET 2 OF 3

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID A. SIMPSON JR. 6-1-09

PLANS PREPARED BY:
SIMPSON ENGINEERS & ASSOCIATES
5520 Dillard Drive
Suite 120
Cary, NC 27518
(919) 852-0468
(919) 852-0598 (Fax)
www.simpsonengr.com
LICENSURE NO. C-2521

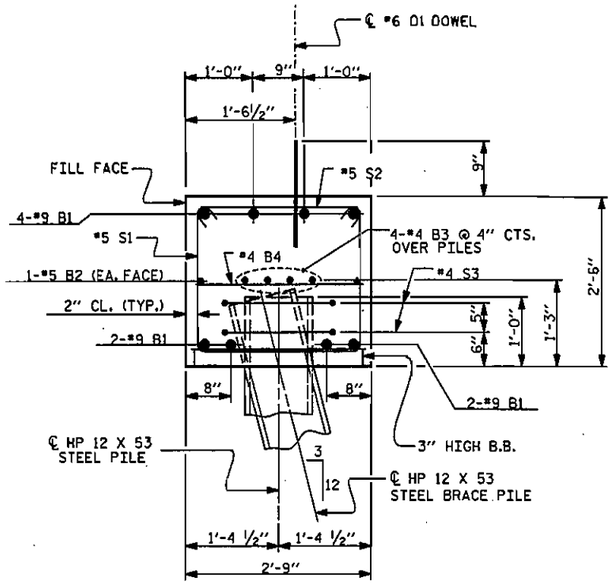
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

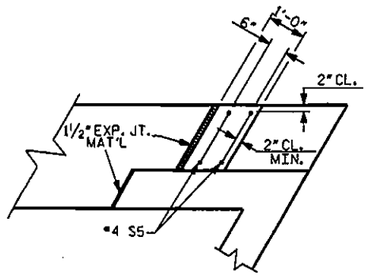
END BENT #2

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	29
1			3			TOTAL SHEETS
2			4			35

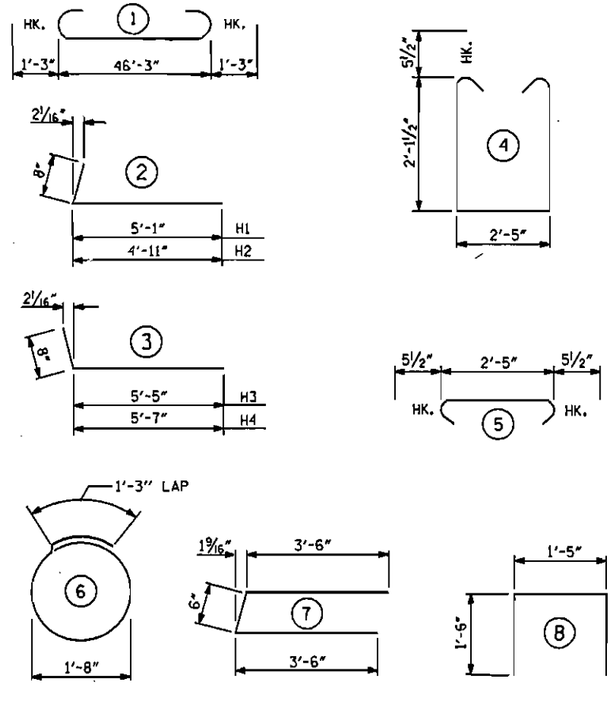


SECTION A-A



PLAN

BAR TYPES



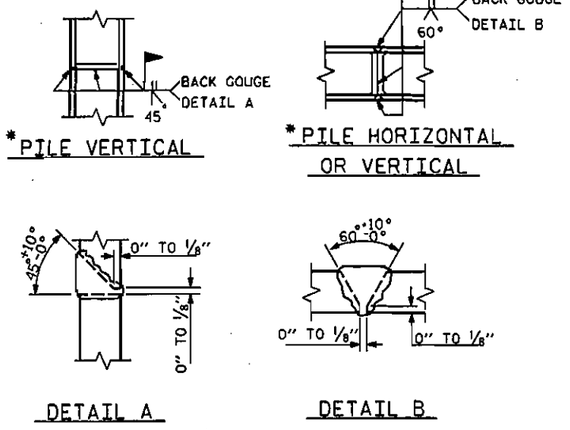
ALL BAR DIMENSIONS ARE OUT TO OUT.

BILL OF MATERIAL

END BENT #2

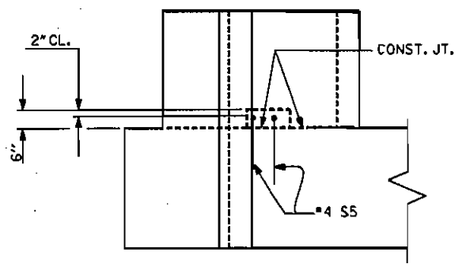
BAR	NO.	SIZE	TYPE	LENGTH	WEIGHT
B1	8	9	1	48'-9"	1326
B2	2	5	STR	46'-3"	96
B3	8	4	STR	24'-5"	130
B4	11	4	STR	2'-5"	18
D1	26	6	STR	1'-6"	59
H1	6	4	2	5'-9"	23
H2	6	4	2	5'-7"	22
H3	6	4	3	6'-1"	24
H4	6	4	3	6'-3"	25
S1	44	5	4	7'-7"	348
S2	44	5	5	3'-4"	153
S3	14	4	6	6'-6"	61
S4	6	4	7	7'-6"	30
S5	4	4	8	4'-5"	12
V1	40	4	STR	4'-7"	122

TOTAL REINFORCING STEEL	2449	LBS.
CLASS "A" CONCRETE BREAKDOWN		
POUR 1	12.7	CU. YDS.
POUR 2	1.6	CU. YDS.
TOTAL	14.3	CU. YDS.
HP 12 X 53 STEEL PILES		
7 PILES REQUIRED	348	LIN. FT.



PILE SPLICE DETAILS

*POSITION OF PILE DURING WELDING.



ELEVATION

LATERAL GUIDE DETAILS

WBS NO. 14B.204414.3

HAYWOOD COUNTY

STATION: 19+57.70 -L-

REPLACES BRIDGE NO. 47 SHEET 3 OF 3

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

SUBSTRUCTURE

END BENT #2

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	30
1			3			TOTAL SHEETS
2			4			35

NORTH CAROLINA PROFESSIONAL SEAL 19831 ENGINEER DAVID A. SIMPSON
6-1-09

PLANS PREPARED BY:

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www.simpsoneng.com
LICENSURE NO. C-2521

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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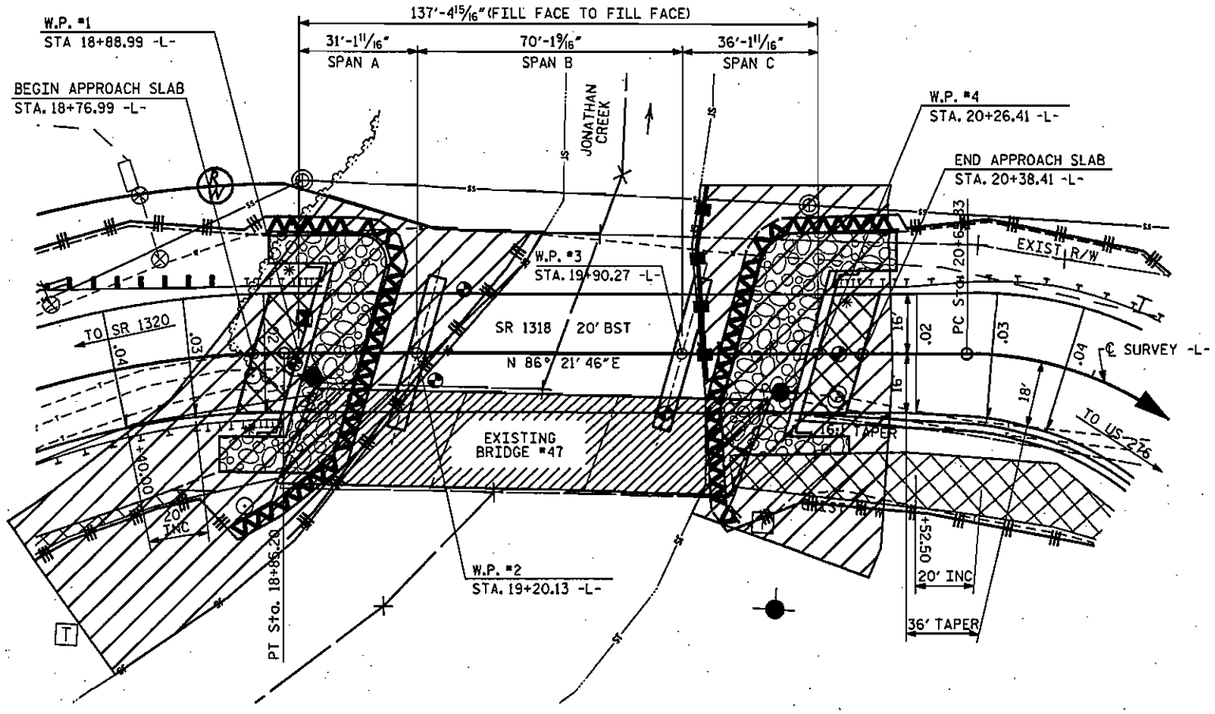
EROSION CONTROL PLAN



ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2006 STANDARD SPECIFICATIONS

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

Std. #	Description	Symbol
1605.01	Temporary Silt Fence	
1606.01	Special Sediment Control Fence	
1630.06	Special Stilling Basin	

ENVIRONMENTALLY SENSITIVE AREA
PLEASE SEE NOTE

WBS NO. 14B.204414.3
HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL

36' CLEAR ROADWAY - 105° SKEW

PLANS PREPARED BY:
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LICENSURE NO. C-2521

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	31
1			3			TOTAL SHEETS
2			4			35

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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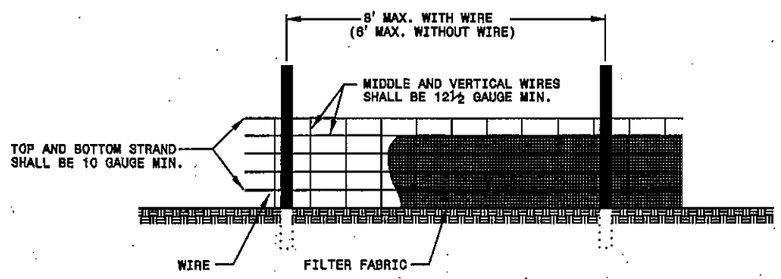
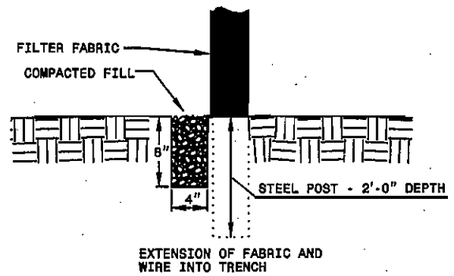
EROSION CONTROL PLAN

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

ENGLISH STANDARD DRAWING FOR
TEMPORARY SILT FENCE



NOTES
USE WIRE A MINIMUM OF 32" IN WIDTH AND WITH A MINIMUM OF 6 LINE WIRES WITH 12" STAY SPACING.
USE FILTER FABRIC A MINIMUM OF 36" IN WIDTH AND FASTEN ADEQUATELY TO THE WIRE AS DIRECTED BY THE ENGINEER.
PROVIDE 5'-0" STEEL POST OF THE SELF-FASTENER ANGLE STEEL TYPE.



SHEET 1 OF 1
1605.01

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

ENGLISH STANDARD DRAWING FOR
TEMPORARY SILT FENCE

SHEET 1 OF 1
1605.01

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
RALEIGH, N.C.

2006 STANDARD SPECIFICATIONS

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

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LICENSURE NO. C-2521

WBS NO. 14B.204414.3
HAYWOOD COUNTY
STATION: 19+57.70 -L-
REPLACES BRIDGE NO. 47

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	32
1			3			TOTAL SHEETS
2			4			35

6/1/2009 11:51:02 AM g:\projects\bmu\haywood 47\drawings\Haywood #47_EC.dgn

EROSION CONTROL PLAN

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

ENGLISH STANDARD DRAWING FOR
SPECIAL SEDIMENT CONTROL FENCE

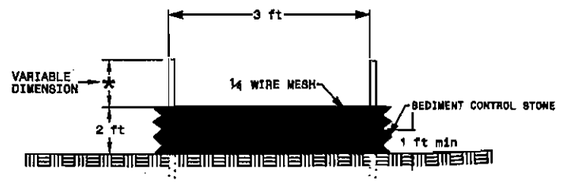
GENERAL NOTES:

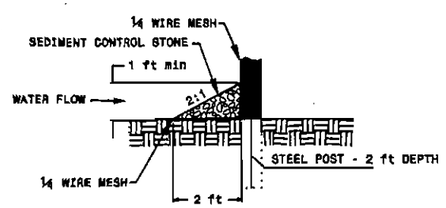
USE NO. 5 OR NO. 57 STONE FOR SEDIMENT CONTROL STONE.

USE HARDWARE CLOTH 24 GAUGE WIRE MESH WITH 1/4 INCH MESH OPENINGS.

INSTALL 5 FT. SELF FASTENER ANGLE STEEL POST 2 FT. DEEP MINIMUM.

SPACE POST A MAXIMUM OF 3 FT.





SHEET 1 OF 1
1606.01

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

ENGLISH STANDARD DRAWING FOR
SPECIAL SEDIMENT CONTROL FENCE

SHEET 1 OF 1
1606.01

Special Sediment Control Fence:

Description:

The work covered by this section consists of the construction, maintenance, and removal of special sediment control fence. Place special sediment control fence as shown on the plans or as directed by the Engineer.

Materials:

(A) Posts:

Steel posts shall be at least 5 feet in length, approximately 1 3/8 inches wide measured parallel to the fence, and have a minimum weight of 1.25 lb/ft of length. The post shall be equipped with an anchor plate having a minimum area of 14.0 square inches, and shall have a means of retaining wire in the desired position without displacement.

(B) 1/4 inch Hardware Cloth:

Hardware cloth shall have 1/4 inch openings constructed from #24 gauge wire. Install hardware cloth according to the detail shown on the plans.

(C) Sediment Control Stone:

Sediment control stone shall meet the requirements of Section 1005. Install stone according to the detail shown on the plans.

Maintenance and Removal:

The Contractor shall maintain the special sediment control fence until the project is accepted or until the fence is removed, and shall remove and dispose of silt accumulations at the fence when so directed by the Engineer in accordance with Section 1630.

The quantity of posts, sediment control stone and hardware cloth as measured above will be paid for at the contract price for "Lump Sum for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limited to, furnishing all materials, installation, and removal and disposal of silt accumulations and materials.

ROADSIDE ENVIRONMENTAL UNIT
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
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2006 STANDARD SPECIFICATIONS

NOTES: ANY DEVIATION FROM OPTIONS GIVEN WILL REQUIRE PRIOR APPROVAL BY ENGINEER.

ADDITIONAL EROSION CONTROL DEVICES MAY NEED TO BE INSTALLED AS DIRECTED BY THE ENGINEER.

DRAWN BY : J. SIMPSON DATE : 4/09
CHECKED BY : J. A. BATTS DATE : 5/09

PLANS PREPARED BY:
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LICENSURE NO. C-2521

WBS NO. 14B.204414.3
HAYWOOD COUNTY
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REPLACES BRIDGE NO. 47

STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION
RALEIGH

EROSION CONTROL

36' CLEAR ROADWAY - 105° SKEW

REVISIONS						SHEET NO.
NO.	BY:	DATE:	NO.	BY:	DATE:	33
1			3			TOTAL SHEETS
2			4			35

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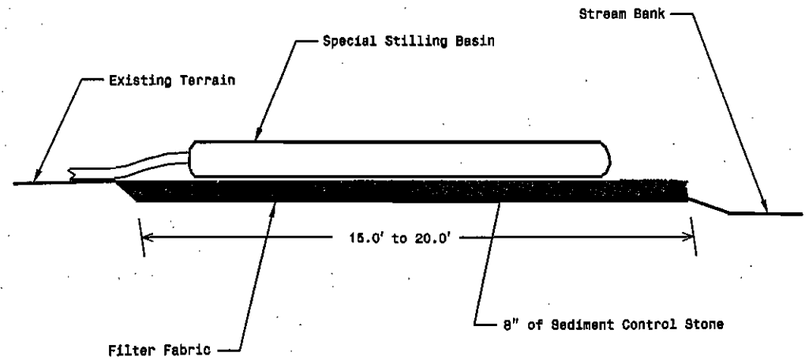
EROSION CONTROL PLAN

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

Z-08

ENGLISH STANDARD DRAWING FOR

SPECIAL STILLING BASIN



Note: Provide Stabilized Outlet to Streambank

Not To Scale

SHEET 1 OF 1
1630.06

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

Z-08

ENGLISH STANDARD DRAWING FOR

SPECIAL STILLING BASIN

SHEET 1 OF 1
1630.06

SPECIAL STILLING BASIN:

Description

This work consists of furnishing, placing, and removing special stilling basin(s) as directed. The special stilling basin shall be used to filter pumped water during construction of drilled piers, footing excavation, and/or culvert construction. The special stilling basin shall also be used for sediment storage at the outlet of temporary slope drain pipe(s).

Materials

Refer to Division 10

Item	Section
Filter Fabric for Drainage, Type 2	1056
Sediment Control Stone	1005

The filter fabric and sediment control stone shall be clean and shall not contain debris.

The special stilling basin shall be a water permeable fabric bag that traps sand, silt, and fines as sediment-laden water is pumped into it, or as runoff flows into it through the temporary slope drain pipe(s).

The special stilling basin shall be a bag constructed to a minimum size of 10' x 15' made from a nonwoven fabric. It shall have a sewn-in 8" (maximum) spout for receiving pump discharge. The bag seams shall be sewn with a double needle machine using a high strength thread. The seams shall have a minimum wide width strength as follows:

Test Method	Minimum Specifications
ASTM D-4884	60 lb/in

The fabric used to construct the bag shall be stabilized to provide resistance to ultra-violet degradation and meet the following specifications for flow rates, strength, and permeability:

Property	Test Method	Minimum Specifications
Weight	ASTM D-3776	8.0 oz/yd
Grab tensile	ASTM D-4632	200.0 lb
Puncture	ASTM D-4833	130.0 lb
Flow rate	ASTM D-4491	80.0 gal/min/sf
Permittivity	ASTM D-4491	1.2 1/sec
UV Resistance	ASTM D-4355	70.0%

Construction Methods

The Contractor shall install the special stilling basin(s), filter fabric, and stone in accordance with Standard Drawing No. 1630.06 and at locations on the plans and as directed.

The special stilling basin(s) shall be constructed such that it is portable and can be used adjacent to each drilled pier, footing, and/or culvert. Temporary slope drain pipe(s) shall be attached to the special stilling basin(s) so that the runoff in the slope drain pipe(s) flows directly into the special stilling basin(s). The special stilling basin(s) shall be placed so the incoming water flows into and through the bag without causing erosion. The neck or spout of the bag shall be tied off tightly to stop the water from flowing out of the bag without going through the walls. If applicable, the neck or spout of the silt bag shall be cut to allow for a slope drain pipe to be inserted into the special stilling basin, and tied off tightly to stop the water from flowing out of the bag.

The special stilling basin(s) shall be replaced and disposed of when it is ½ full of sediment or when it is impractical for the bag to filter the sediment out at a reasonable flow rate. Prior approval from the Engineer shall be received before removal and replacement.

The Contractor shall be responsible for providing a sufficient quantity of bags to contain silt from pumped effluent during construction of drilled piers, footing excavation, and/or culvert construction. A sufficient quantity of special stilling basins shall be provided to contain sediment from temporary slope drain runoff.

The quantity of sediment control stone, filter fabric for drainage, and special stilling basin(s) as measured above will be paid for at contract price for "Lump Sum for Erosion Control". Such price and payment will be full compensation for all work covered by this provision, including but not limited to, furnishing all materials, placing and maintaining the special stilling basin(s), and removal and disposal of silt accumulations and bag.

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EROSION CONTROL PLAN

Environmentally Sensitive Areas:

This project is located in an "Environmentally Sensitive Area." This designation requires special procedures to be used for clearing and grubbing, temporary stream crossings, and grading operations within the area identified on the plans. This also requires special procedures to be used for seeding and mulching and staged seeding within the project.

Clearing and Grubbing:

In areas identified on the erosion control plans as "Environmentally Sensitive Areas", the Contractor may perform clearing operations, but not grubbing operations until immediately prior to beginning grading operations as described in Section 200, Article 200-1, in the Standard Specifications. The "Environmentally Sensitive Area" shall be defined as a 50 foot buffer zone on both sides of the stream (or depression), measured from top of streambank, (or center of depression). Only clearing operations (not grubbing) shall be allowed in this buffer zone until immediately prior to beginning grading operations. Erosion control devices shall be installed immediately following the clearing operation.

Grading:

Once grading operations begin in identified "Environmentally Sensitive Areas", work will progress in a continuous manner until complete. All construction within these areas must progress in a continuous manner such that each phase is complete and areas permanently stabilized prior to beginning of next phase. Failure on the part of the Contractor to complete any phase of construction in a continuous manner in "Environmentally Sensitive Areas" as specified will be just cause for the Engineer to direct the suspension of work in accordance with Section 108-7 of the Standard Specifications.

Temporary Stream Crossings:

Any crossing of streams within the limits of this project must be accomplished in accordance with Section 107-13(b) of the Standard Specifications.

Seeding and Mulching:

Seeding and mulching shall be performed in accordance with Section 1660 of the Standard Specifications and vegetative cover sufficient to restrain erosion shall be installed immediately following grade establishment.

Seeding and mulching shall be performed on the areas disturbed by construction immediately following final grade establishment. No appreciable time shall lapse into the contract time without stabilization of slopes, ditches and other areas within the "Environmentally Sensitive Areas" as indicated on the erosion control plans.

Stage Seeding:

The work covered by this section shall consist of the establishment of a vegetative cover on cut and fill slopes as grading progresses. Seeding and mulching shall be done in stages on cut and fill slopes which are greater than 20 feet in height measured along the slope, or greater than 2 acres in area. Each stage shall not exceed the limits stated above.

All work described above will be paid for at the contract price for "Lump Sum for Erosion Control" established in the contract for the work involved. Additional payments will not be made for the requirements of this section as the cost for this work should be included in the contract price for "Lump Sum for Erosion Control" for the work involved.

SAFETY FENCE:

Description

Safety Fence shall consist of furnishing, installing and maintaining polyethylene or polypropylene fence along the outside riparian buffer, wetland, or water boundary located within the construction corridor to mark the areas that have been approved to infringe within the buffer, wetland or water. The fence shall be installed prior to any land disturbing activities.

Materials

Polyethylene or polypropylene fence shall be a highly visible preconstructed safety fence approved by the Engineer. The fence material shall have an ultraviolet coating.

Either wood posts or steel posts may be used. Wood posts shall be hardwood with a wedge or pencil tip at one end, and shall be at least 5 ft. in length with a minimum nominal 2" x 2" cross section. Steel posts shall be at least 5 ft. in length, and have a minimum weight of 0.85 lb/ft. of length.

Construction Methods

No additional clearing and grubbing is anticipated for the installation of this fence; however, if any clearing and grubbing is required, it will be the minimum required for the installation of the safety fence. Such clearing shall include satisfactory removal and disposal of all trees, brush, stumps and other objectionable material.

The fence shall be erected to conform to the general contour of the ground. When determined necessary, minor grading along the fence line shall be performed to meet this requirement provided no obstructions to proper drainage are created.

Posts shall be set and maintained in a vertical position and may be hand set or set with a post driver. If hand set, all backfill material shall be thoroughly tamped. Wood posts may be sharpened to a dull point if power driven. Posts damaged by power driving shall be removed and replaced prior to final acceptance. The tops of all wood posts shall be cut at a 30-degree angle. The wood posts may, at the option of the Contractor, be cut at this angle either before or after the posts are erected.

The fence fabric shall be attached to the wood posts with one 2" galvanized wire staple across each cable or to the steel posts with wire or other acceptable means.

The Contractor shall be required to maintain the safety fence in a satisfactory condition for the duration of the project as determined by the Engineer.

Measurement and Payment

Safety Fence will be paid for at the contract price for "Lump Sum for Erosion Control". Such payment will be full compensation including but not limited to clearing and grading, furnishing and installing fence fabric with necessary posts and post bracing, staples, tie wires, tools, equipment and incidentals necessary to complete this work.

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