TIP NO.	SHEET NO.
B-2532	SIGN-1

CONTRACT NO.: C201581 T.I.P.: B-2532

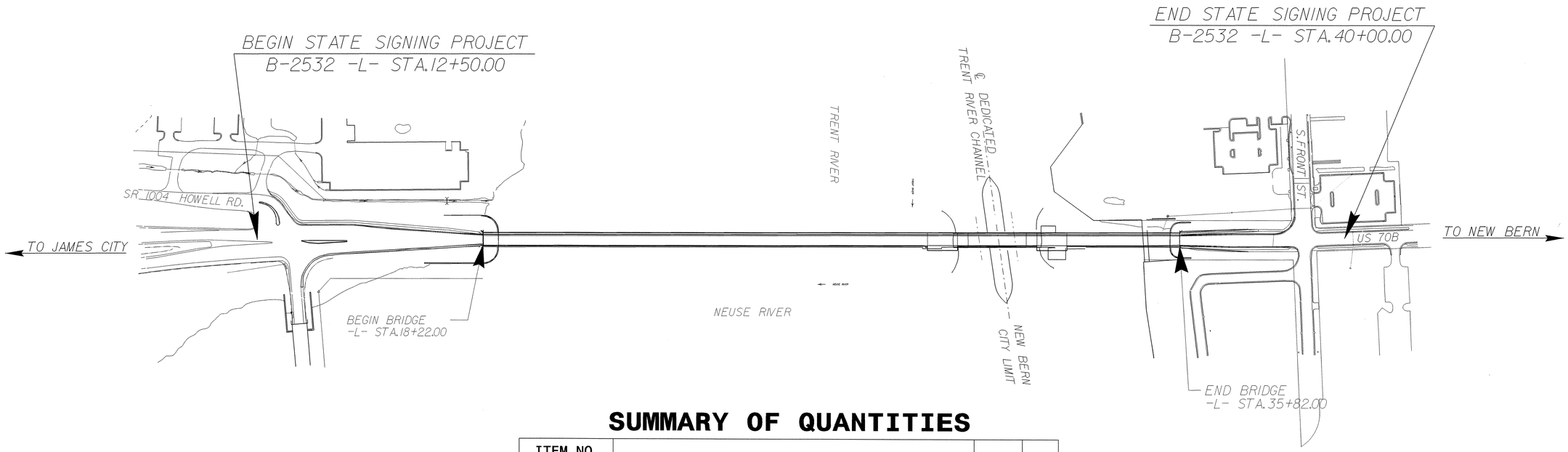
STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

SIGNING PLANS

CRAVEN COUNTY

LOCATION: BRIDGE NO. 60 OVER TRENT RIVER ON US 70B

NCGRID
NAD 83



SUMMARY OF QUANTITIES

ITEM NO. DESC. NO.	ITEM NO. SECT. NO.	ITEM DESCRIPTION	QUANTITY	UNIT
4025000000	901	CONTRACTOR FURNISHED, TYPE A SIGN	51	S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE D SIGN	53.67	S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE E SIGN	149.75	S.F.
4025000000	901	CONTRACTOR FURNISHED, TYPE F SIGN	16	S.F.
4048000000	902	REINFORCED CONCRETE SIGN FOUNDATION	1	C.Y.
4060000000	903	SUPPORTS, BREAKWAY STEEL BEAM	417	L.B.
4072000000	903	SUPPORTS, 3-LB STEEL U-CHANNEL	279	L.F.
4082000000	903	SUPPORTS, WOOD	104	L.F.
4096000000	904	SIGN ERECTION, TYPE D	5	EA.
4102000000	904	SIGN ERECTION, TYPE E	25	EA.
4108000000	904	SIGN ERECTION, TYPE F	2	EA.
4110000000	904	SIGN ERECTION, TYPE A (GROUND MOUNTED)	1	EA.
4116100000	904	SIGN ERECTION, RELOCATE SIGN TYPE D	1	EA.
4141000000	907	DISPOSAL OF SUPPORT, WOOD	1	EA.
4155000000	907	DISPOSAL OF SIGN SYSTEM, U-CHANNEL	2	EA.
4158000000	907	DISPOSAL OF SIGN SYSTEM, WOOD	21	EA.
4237000000	907	DISPOSAL OF SIGN, TYPE E	1	EA.
S	SP	ERECT BRIDGE MOUNTED OUTRIGGER SIGN SUPPORT ASSY FOR TYPE E SIGN	3	EA.

ROADWAY STANDARD DRAWINGS
APPLICABLE TO THESE SIGNING PLANS
901.10 901.50 901.70 903.20 904.10 904.50

INDEX

PLAN PREPARED BY: N.C.D.O.T. SIGNING SECTION

R. W. KING, P.E. — SIGNING ENGINEER
A. I. ALQUDWAH, P.E. — SIGNING PROJECT ENGINEER
D. M. EATON — SIGNING PROJECT DESIGN ENGINEER
R. R. HENNEIN — SIGNING DESIGNER

SEAL

SIGN NO.	SIGN TYPE	SIGN SIZE (in.) w x h	ROADWAY STATION	NO. OF SUP.	BEAM SECTION	SUPPORT TYPE BA or S	ATTACH METHOD	MOUNTING METHOD	HORIZ. CLR.* (ft.)	LENGTH (ft) SNS HT H	LENGTH (ft) MTG HT C	LENGTH (ft) EMBED-MENT	LEFT SUPPORT (ft) S	LEFT SUPPORT (ft) L	LEFT SUPPORT (ft) TOTAL LENGTH	RIGHT SUPPORT (ft) S	RIGHT SUPPORT (ft) L	RIGHT SUPPORT (ft) TOTAL LENGTH	FOOTING DIAMETER (ft.)	FOOTING DEPTH (ft.)	B/A SUPPORT WEIGHTS (lbs.)	REINF. FTGS. (c.y.)	FIELD VERIFIED SEE NOTE 2 (mm/dd/yy)
101	A	102 X 72	37+50	2	W6x9	BA	N/A	N/A	18.00	6.00	7.00	4.5	1.90	14.90	19.40	2.37	15.37	19.87	1.5	5	416.55	0.6545	

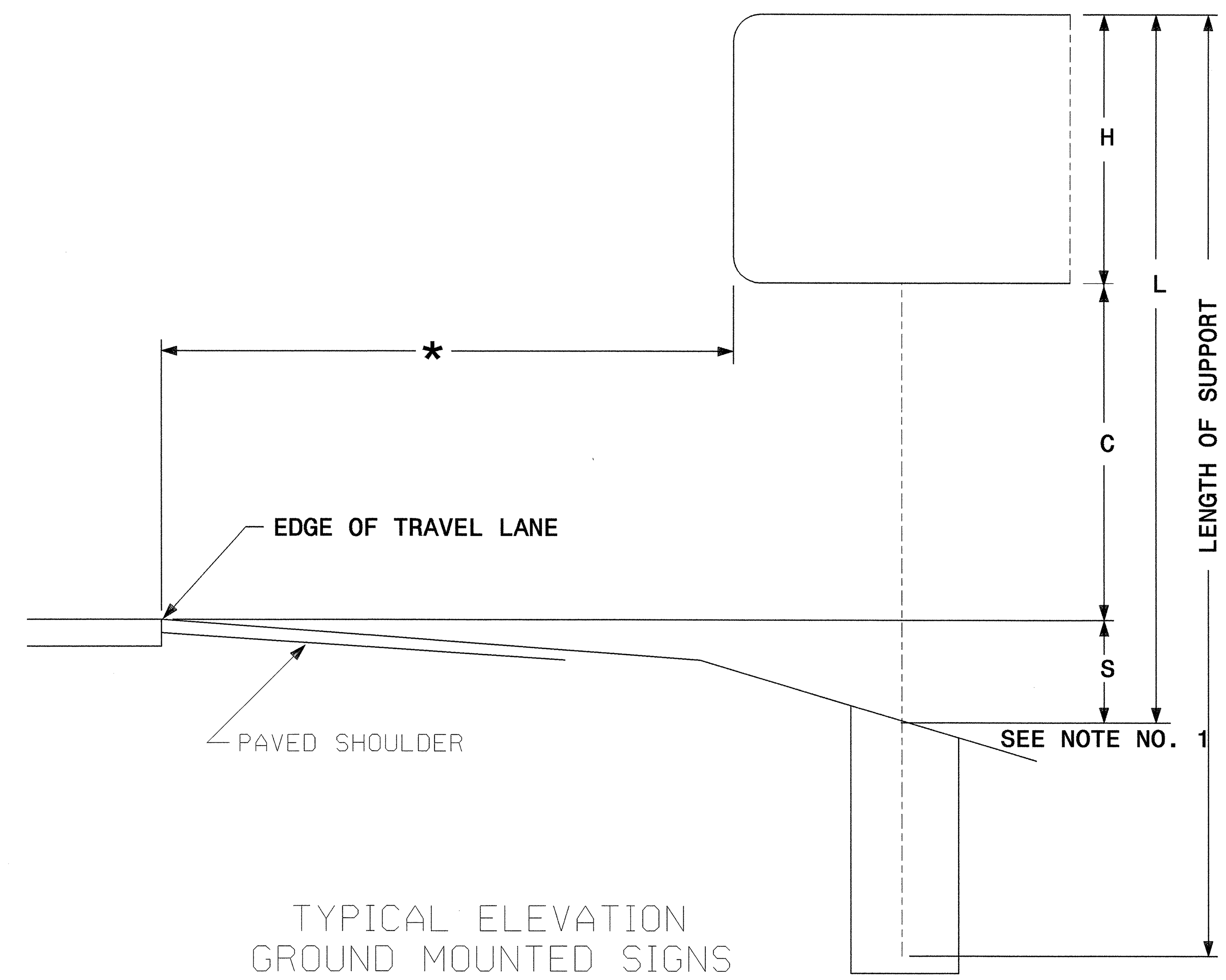
	B/A SUPPORT WEIGHTS	REINF. FTGS.
TOTAL	425.10	0.6545
USE:	417	1

NOTES

1. DIMENSION "S" REPRESENTS AN INCREASE (+), OR A DECREASE (-) IN POLE LENGTH, RELATIVE TO THE ELEVATION OF THE EDGE OF PAVEMENT.

2. FIELD VERIFICATIONS SHALL BE REQUIRED FOR ALL SUPPORTS, SEE (*) ARTICLE 903-3. FABRICATORS SHALL BE AISC CERTIFIED IN CATEGORY 1, SEE (*) ARTICLE 1072-1. (*) = N.C.D.O.T. STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES

3. PLAN LOCATIONS FOR EXISTING UTILITIES ARE BASED ON THE BEST AVAILABLE INFORMATION AND, THEREFORE MAY NOT BE PRECISELY ACCURATE. THEREFORE, IT IS INCUMBENT UPON THE CONTRACTOR TO DETERMINE THE EXACT LOCATION OF UTILITIES BEFORE BEGINNING WORK IN A LOCATION.



TYPICAL ELEVATION
GROUND MOUNTED SIGNS

N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
TRAFFIC ENGINEERING BRANCH
SIGNING DEPARTMENT

SIGN NUMBER: 101
TYPE: A
QUANTITY: 1

SIGN WIDTH: 102"
HEIGHT: 72"
TOTAL AREA: 51.0 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0"
WIDTH: 0.75"
RADII: 9"

NO. Z BARS: 2
LENGTH: 94.0

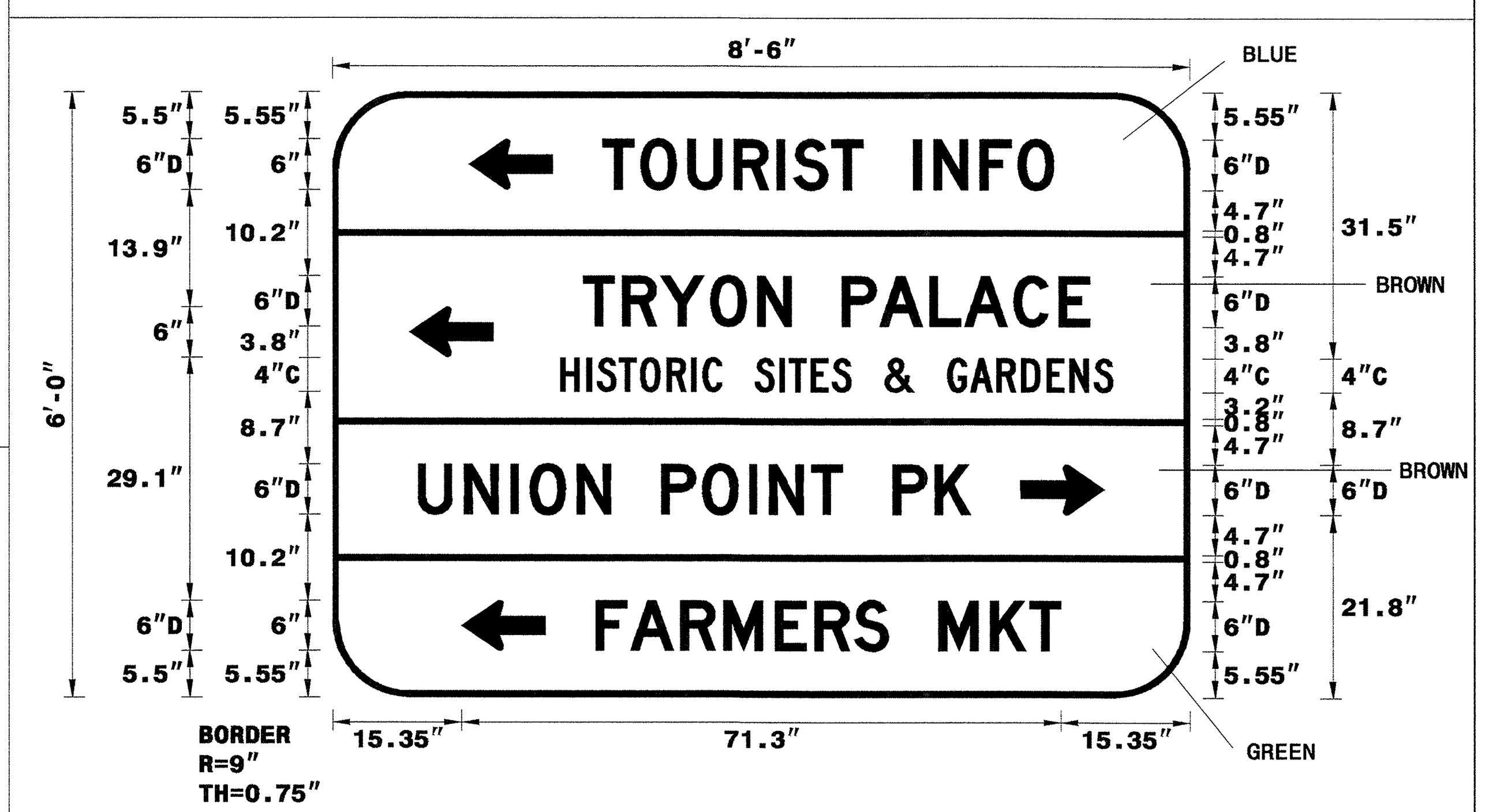
BACKG COLOR: Green/Brown/Blue
COPY COLOR: White

SYMBOL	X	Y	WID	HT
ARUP	16.2	60.5	6	10
ARUP	9.1	40.6	6	10
ARUP	81.9	21.7	6	10
ARUP	15.3	5.5	6	10

MAT'L: 0.125" (3.2 mm) ALUMINUM

USE NOTES:
1. Legend and border shall be direct applied Type III reflective sheeting.
2. Background shall be Type III reflective sheeting.

DESIGN BY: R. HENNEIN
PROJECT ID: B-2532
CHECKED BY:
DIV: 2
STD #: N/A
DATE: Oct 03,2006



LETTER POSITIONS

Letter spacings are to start of next letter

																											Series/Size Text Length
	T	O	U	R	I	S	T		I	N	F	O															D 2000
32.2	4.5	5.6	5.5	5.1	2	4.6	3.7	6	2.4	5.5	4.5	4.3	16.2														53.6
	T	R	Y	O	N		P	A	L	A	C	E															D 2000
29.8	4.6	4.6	5.9	5.6	4.1	6	4.4	6	4.1	5.9	5.4	3.7	11.9														60.3
	H	I	S	T	O	R	I	C		S	I	T	E	S		&		G	A	R	D	E	N	S			C 2000
27.1	3.1	1.2	2.6	2.5	3.2	2.9	1.4	2.2	4	2.9	1.1	2.6	2.5	2.2	4	3.5	4	2.7	3.1	2.9	3	2.7	2.9	2.2	9.1		65.7
	U	N	I	O	N		P	O	I	N	T		P	K													D 2000
10.1	5.5	5.5	2.3	5.6	4.1	6	4.9	5.6	2.4	5	3.7	6	5	4.2	26.2												65.7
	F	A	R	M	E	R	S		M	K	T																D 2000
31.3	4.1	6	5.1	6.1	4.7	4.7	4.1	6	6.1	4.7	3.7	15.3															55.3

Spacing Factor is 1 unless specified otherwise

FILENAME: signdesign

NORTH CAROLINA D.O.T. SIGN DETAIL

SEAL

10/4/06
NORTH CAROLINA PROFESSIONAL SEAL 028387 ENGINEER

SUPPORT CHART & SIGN DESIGN

TIP NO.	SHEET NO.
B-2532	SIGN-3

N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
TRAFFIC ENGINEERING BRANCH
SIGNING DEPARTMENT

SIGN NUMBER: 301, 304
TYPE: D
QUANTITY: 2

BACKG COLOR: Green
COPY COLOR: White

DESIGN BY: R. HENNEIN
PROJECT ID: B-2532
CHECKED BY:
DIV: 2
STD #: N/A
DATE: Sep 25,2006

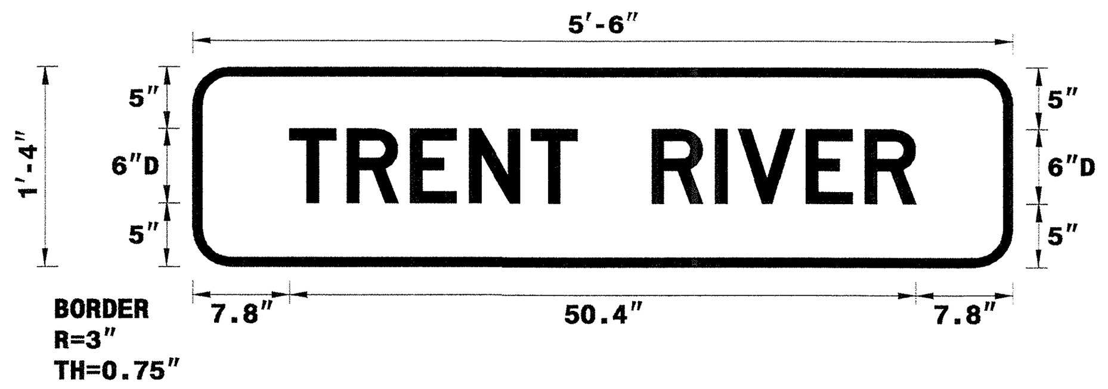
SIGN WIDTH: 66"
HEIGHT: 16"
TOTAL AREA: 7.3 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0"
WIDTH: 0.75"
RADII: 3"

NO. Z BARS:
LENGTH:

SYMBOL	X	Y	WID	HT

MAT'L: 0.125" (3.2 mm) ALUMINUM



BORDER
R=3"
TH=0.75"

MOUNT ON TWO WOOD POSTS

USE NOTES:
1. Legend and border shall be direct applied Type III reflective sheeting.
2. Background shall be Type III reflective sheeting.

LETTER POSITIONS

Letter spacings are to start of next letter

													Series/Size Text Length
	T	R	E	N	T		R	I	V	E	R		D 2000
7.8	4.6	5.1	4.7	5	3.7	6	5.1	1.9	5.5	4.7	4.1	7.8	50.4

Spacing Factor is 1 unless specified otherwise

FILENAME: signdesign

NORTH CAROLINA D.O.T. SIGN DETAIL

N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
TRAFFIC ENGINEERING BRANCH
SIGNING DEPARTMENT

SIGN NUMBER: 302, 305
TYPE: D
QUANTITY: 2

BACKG COLOR: Green
COPY COLOR: White

DESIGN BY: R. HENNEIN
PROJECT ID: B-2532
CHECKED BY:
DIV: 2
STD #: N/A
DATE: Oct 04,2006

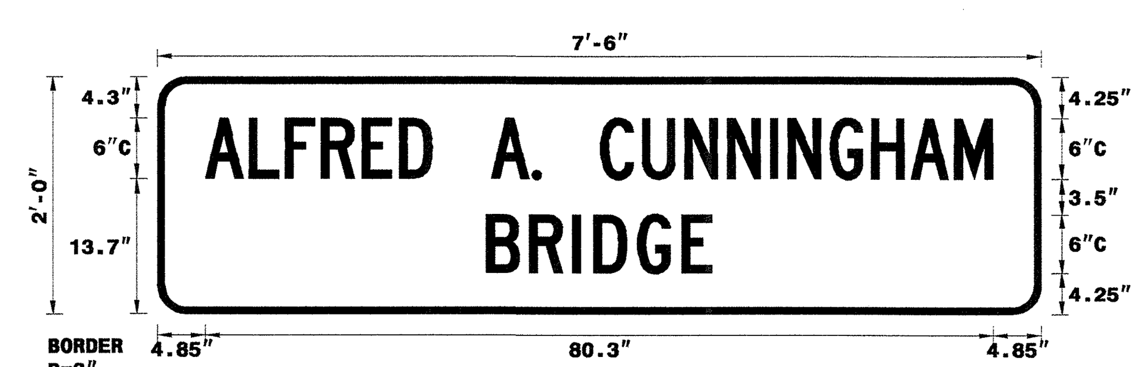
SIGN WIDTH: 90"
HEIGHT: 24"
TOTAL AREA: 15.0 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0"
WIDTH: 0.75"
RADII: 3"

NO. Z BARS:
LENGTH:

SYMBOL	X	Y	WID	HT

MAT'L: 0.125" (3.2 mm) ALUMINUM



BORDER
R=3"
TH=0.75"

MOUNT UNDER SIGN 301
IN 1 INSTALLATION

MOUNT UNDER SIGN 304
IN 1 INSTALLATION

USE NOTES:
1. Legend and border shall be direct applied Type III reflective sheeting.
2. Background shall be Type III reflective sheeting.

LETTER POSITIONS

Letter spacings are to start of next letter

																					Series/Size Text Length
	A	L	F	R	E	D		A	.		C	U	N	N	I	N	G	H	A	M	C 2000
4.9	4.5	3.7	3.7	4.1	3.8	3.4	6	4.2	1	6	4.3	4.3	4.3	4.3	1.8	4.3	4.3	4	4.5	4	80.3
	B	R	I	D	G	E															C 2000
33.5	4.4	4.4	2.2	4.4	4.6	3.1	33.5														23

(The last value of the ALFRED row, 4.9, follows the M column.)

Spacing Factor is 1 unless specified otherwise

FILENAME: signdesign

NORTH CAROLINA D.O.T. SIGN DETAIL

N. C. DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
TRAFFIC ENGINEERING BRANCH
SIGNING DEPARTMENT

SIGN NUMBER: 303
TYPE: D
QUANTITY: 1

BACKG COLOR: Green
COPY COLOR: White

DESIGN BY: R. HENNEIN
PROJECT ID: B-2532
CHECKED BY:
DIV: 2
STD #: N/A
DATE: Sep 26,2006

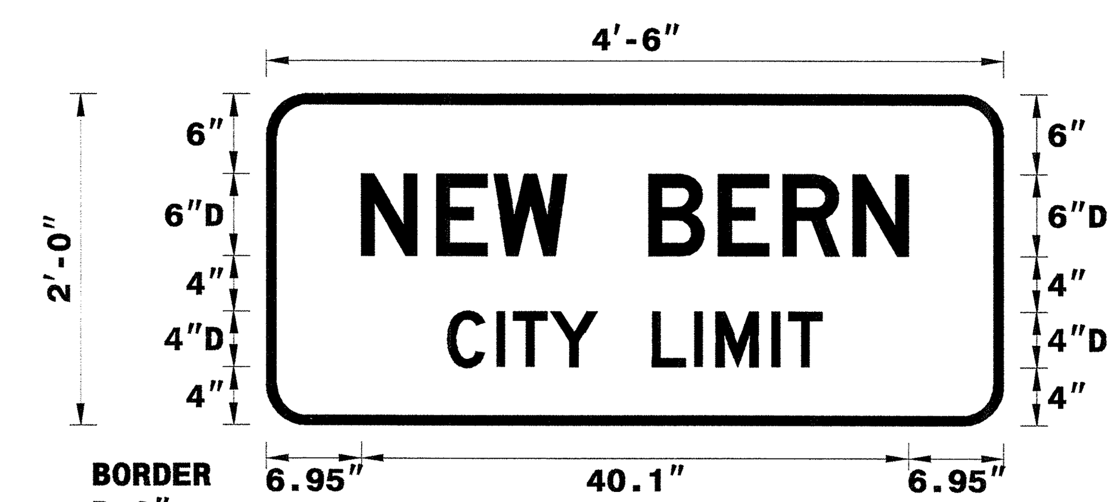
SIGN WIDTH: 54"
HEIGHT: 24"
TOTAL AREA: 9.0 Sq.Ft.

BORDER TYPE: FLUSH
RECESS: 0"
WIDTH: 0.75"
RADII: 3"

NO. Z BARS:
LENGTH:

SYMBOL	X	Y	WID	HT

MAT'L: 0.125" (3.2 mm) ALUMINUM



BORDER
R=3"
TH=0.75"

MOUNT ON TWO WOOD POSTS

USE NOTES:
1. Legend and border shall be direct applied Type III reflective sheeting.
2. Background shall be Type III reflective sheeting.

LETTER POSITIONS

Letter spacings are to start of next letter

												Series/Size Text Length
	N	E	W		B	E	R	N				D 2000
7	5.5	4.2	5.3	6	5.1	4.7	5.1	4.1	7			40.1
	C	I	T	Y		L	I	M	I	T		D 2000
13.3	3.6	1.2	2.7	3.4	4	3.1	1.6	4.1	1.2	2.5	13.3	27.5

Spacing Factor is 1 unless specified otherwise

FILENAME: signdesign

NORTH CAROLINA D.O.T. SIGN DETAIL

SEAL

SIGN DESIGNS

TECC221660 10/10/2006 b-2532 meaton TECC-Oce34bond

TIP NO.	SHEET NO.
B-2532	SIGN-4

(403) QUANTITY REQ'D _1_

24 X 30
R2-1

MOUNT BELOW SIGN 458
IN 1 INSTALLATION

(451) QUANTITY REQ'D _1_

48 X 36
R2-80

TWO "U" POSTS PER SIGN

(466) QUANTITY REQ'D _1_

24 X 24
R3-2

MOUNT BACK TO BACK WITH SIGN 416
IN 1 INSTALLATION

(501)

(502)

1 - 24" X 12"

1 - 24" X 12"

1 - 24" X 24"

ONE "U" POST PER SIGN

(404) QUANTITY REQ'D _2_

24 X 30
R2-1

ONE "U" POST PER SIGN

(456) QUANTITY REQ'D _1_

36 X 36
W6-3

ONE "U" POST PER SIGN

(467) QUANTITY REQ'D _2_

36 X 36
W3-4

ONE "U" POST PER SIGN

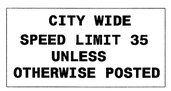
OURIGGER MOUNTED IN 1 INSTALLATION

(416) QUANTITY REQ'D _4_

24 X 30
R4-7

ONE "U" POST PER SIGN

(458) QUANTITY REQ'D _1_



60 X 36
R2-27

MOUNT BELOW SIGN 303
IN 1 INSTALLATION

(468) QUANTITY REQ'D _2_

30 X 24
W16-13

MOUNT BELOW SIGN 467
IN 2 INSTALLATION

(417) QUANTITY REQ'D _4_

18 X 18
W23-15

MOUNT BELOW SIGN 416
IN 4 INSTALLATIONS

(464) QUANTITY REQ'D _1_

30 X 36
R16-1

MOUNT BELOW SIGN 458
IN 1 INSTALLATION

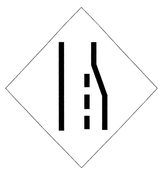
(469) QUANTITY REQ'D _2_

36 X 36
W3-6

ONE "U" POST PER SIGN

OURIGGER MOUNTED IN 1 INSTALLATION

(439) QUANTITY REQ'D _1_



36 X 36
W19-10(R)

ONE "U" POST PER SIGN

(465) QUANTITY REQ'D _2_

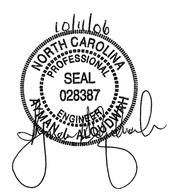
24 X 36
R10-6

ONE "U" POST PER SIGN

OURIGGER MOUNTED IN 1 INSTALLATION

NOTE: THIS DRAWING IS DIMENSIONED IN INCHES UNLESS OTHERWISE DEPICTED WITHIN THE DRAWING.

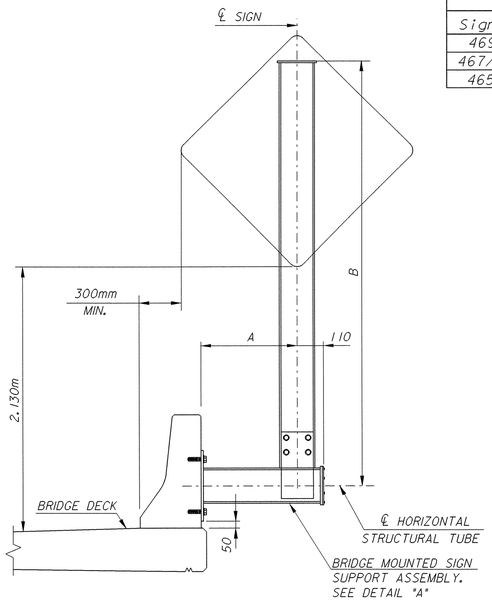
SEAL



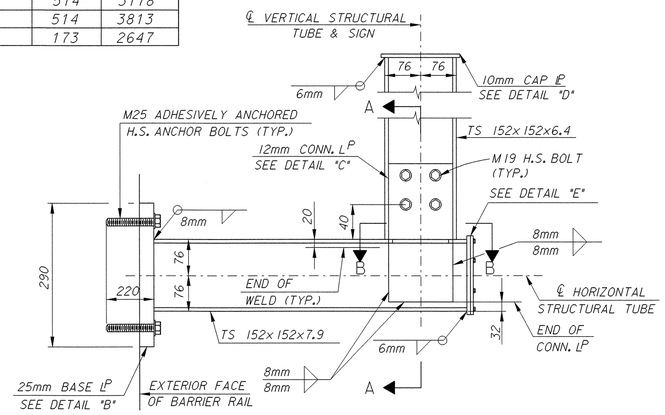
TYPE "E" SIGNS
&
TYPE "F" SIGNS

TIP NO.	SHEET NO.
B-2532	SIGN-5

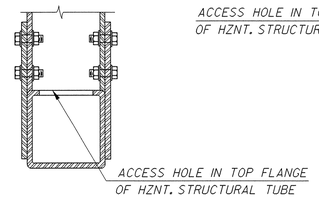
TABLE OF VARIABLES				
Sign #	Sheet #	Station	A(mm)	B(mm)
469	7	22+50 L	514	3178
467/468	7	24+50 L	514	3813
465	7	27+15 L	173	2647



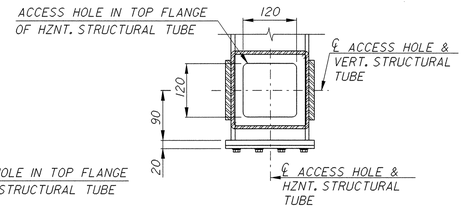
TYPE E & F SIGNS MOUNTED ON BARRIER RAIL



DETAIL "A"



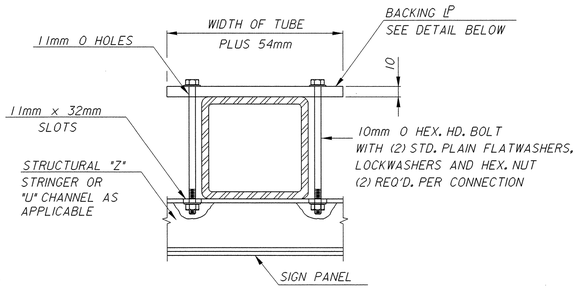
SECTION A-A



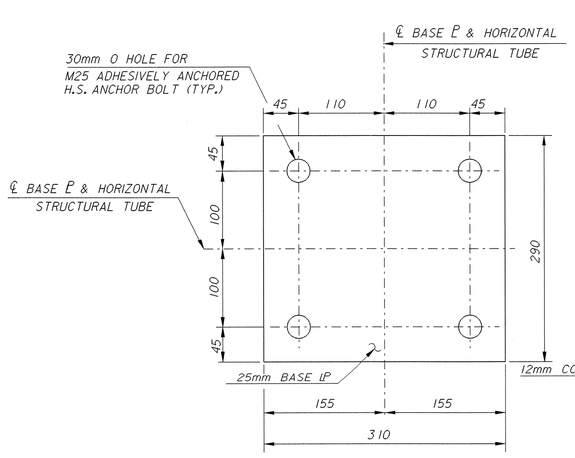
SECTION B-B

NOTES:

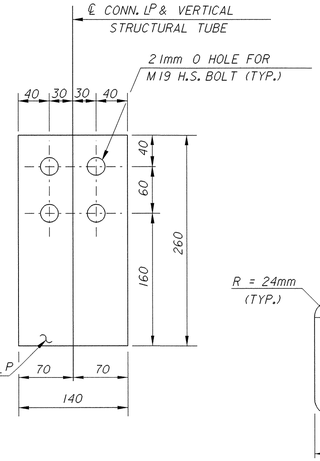
1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS NOTED.
2. INFORMATION ON THIS DRAWING IS GIVEN PRIMARILY FOR STRUCTURAL FABRICATION AND ERECTION OF NON-STANDARD BRIDGE MOUNTED SIGN SUPPORT ASSEMBLIES. ANY ADDITIONAL SIGN INFORMATION REQUIRED SHALL BE FOUND ELSEWHERE IN THE SIGNING PLANS.
3. FOR BRIDGE MOUNTED SIGN SUPPORT ASSEMBLY, SEE SPECIAL PROVISIONS.
4. STRUCTURAL STEEL TUBES SHALL BE ASTM A618M STEEL WITH A MINIMUM YIELD STRENGTH OF 345 MPa AND A MINIMUM ULTIMATE TENSILE STRENGTH OF 483MPa.
5. STRUCTURAL STEEL, EXCEPT AS NOTED ABOVE, SHALL BE ASTM A572M GRADE 50.
6. ALL BOLTS IN VERTICAL AND HORIZONTAL STRUCTURAL STEEL TUBE CONNECTIONS SHALL BE M19 (GALVANIZED) HIGH STRENGTH BOLTS CONFORMING TO ASTM A325M-TYPE 1.
7. ALL FAYING SURFACES IN ABOVE CONNECTIONS SHALL HAVE CLASS A SURFACE CONDITIONS.
8. FOR (GALVANIZED) HIGH STRENGTH BOLTS, NUTS & WASHERS, SEE SPECIAL PROVISIONS.
9. FOR ADHESIVELY ANCHORED ANCHOR BOLTS, SEE SPECIAL PROVISIONS.
10. ALL ANCHOR BOLTS SHALL BE M25 (GALVANIZED) HIGH STRENGTH BOLTS CONFORMING TO ASTM A325M-TYPE 1. MAXIMUM EMBEDMENT SHALL BE 220mm AS SHOWN IN DETAIL "A". MINIMUM TENSILE CAPACITY SHALL BE 50kN.
11. FOR THERMAL SPRAYED COATING (METALLIZATION), SEE SPECIAL PROVISIONS.



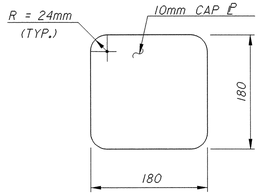
HOLLOW TUBE SUPPORT MOUNTING DETAILS



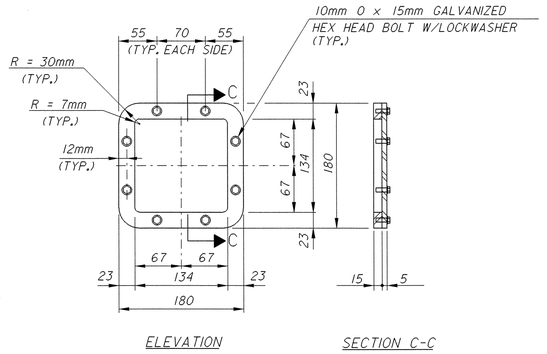
DETAIL "B"



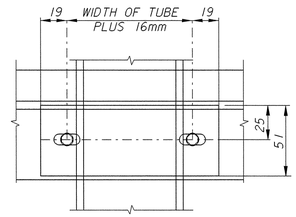
DETAIL "C"



DETAIL "D"

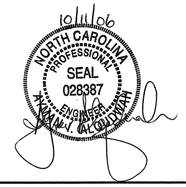


DETAIL "E"



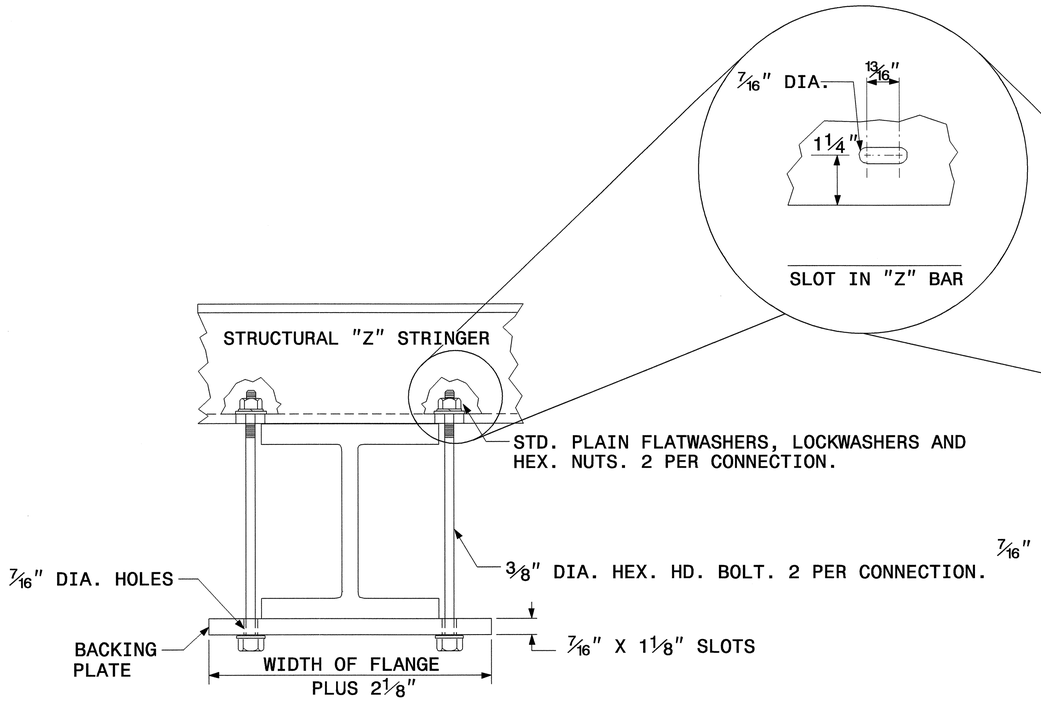
BACKING PLATE DETAIL

SEAL

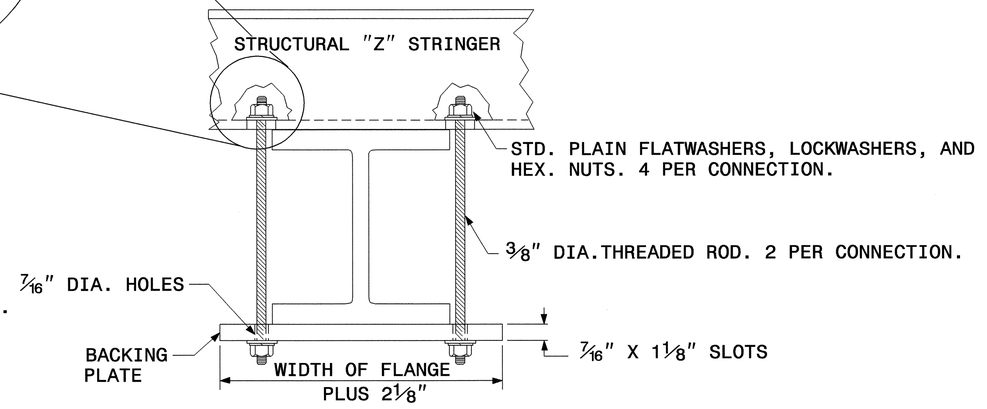


BRIDGE MOUNTED SUPPORT ASSEMBLY OUTRIGGER DETAIL

TIP NO.	SHEET NO.
B-2532	SIGN-6

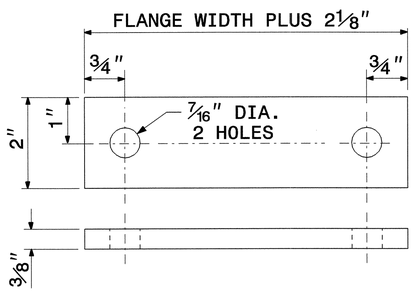


SUPPORT MOUNTING DETAIL



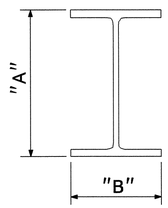
ALTERNATIVE SUPPORT MOUNTING DETAIL

BACKING PLATE DETAIL



1. THE SUPPORT MOUNTING DETAIL SHOWS A "W" OR "S" BEAM. THIS DETAIL IS ALSO USED FOR MOUNTING SIGNS TO WOOD OR SQUARE TUBE SUPPORTS.
2. USE GALVANIZED STEEL FOR BACKING PLATES AND MOUNTING BOLTS IN ACCORDANCE WITH ASTM A123.
3. SEE NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES FOR TYPE OF MATERIAL TO BE USED FOR SIGN HANGER ASSEMBLIES AND SUPPORTS.
4. USE GALVANIZED STEEL FOR MOUNTING BOTS AND THREADED RODS IN COMPLIANCE WITH ASTM A307 AND ASTM A153.

SIGN SUPPORTS SECTION DIMENSIONS

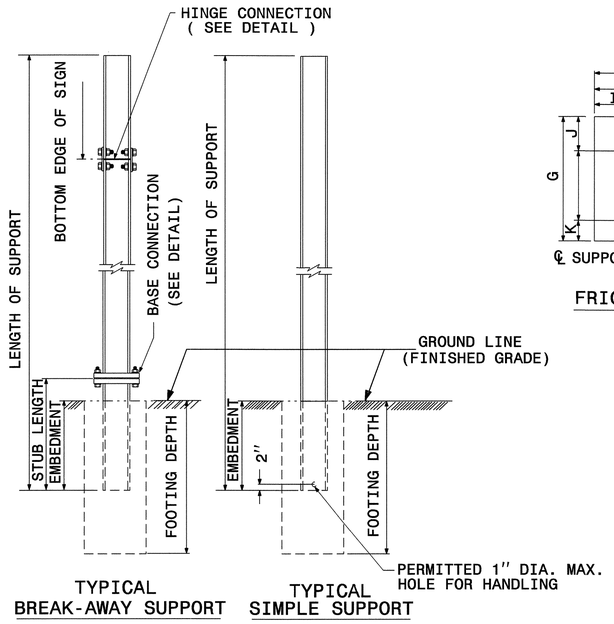


SECTION	A	B
S3 X 5.7	3"	2 3/8"
S4 X 7.7	4"	2 5/8"
W6 X 9	6"	4"
W6 X 12	6"	4"
W6 X 16	6 1/4"	4"
W8 X 18	8 1/8"	5 1/4"
W8 X 21	8 1/4"	5 1/4"
W10 X 22	10 1/8"	5 3/4"
W10 X 26	10 3/8"	5 3/4"
W12 X 26	12 1/4"	6 1/2"
W14 X 30	13 7/8"	6 3/4"
W16 X 31	15 7/8"	5 1/2"
W18 X 35	17 3/4"	6"
W18 X 40	17 7/8"	6"
W21 X 44	20 5/8"	6 1/2"

SEAL

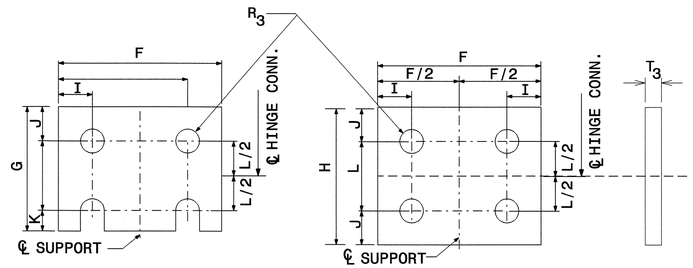
SIGN MOUNTING DETAILS

TIP NO.	SHEET NO.
B-2532	SIGN-7



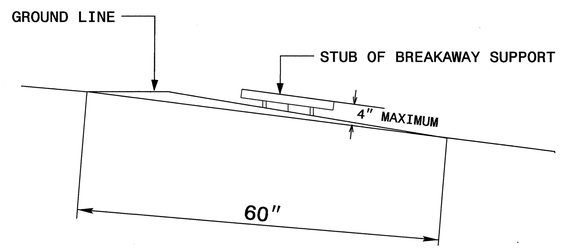
TYPICAL BREAK-AWAY SUPPORT

TYPICAL SIMPLE SUPPORT

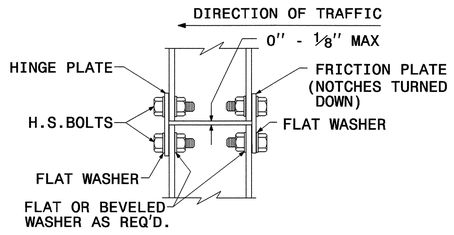


FRICTION ℄ DETAIL

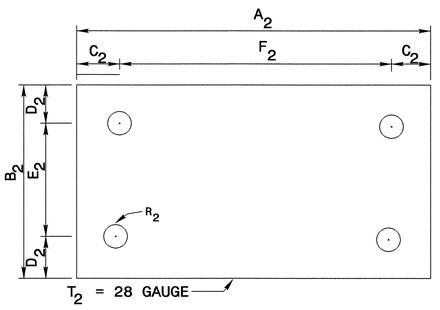
HINGE ℄ DETAIL



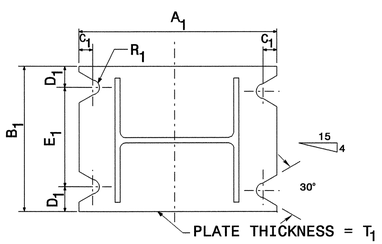
STUB HEIGHT REQUIREMENTS



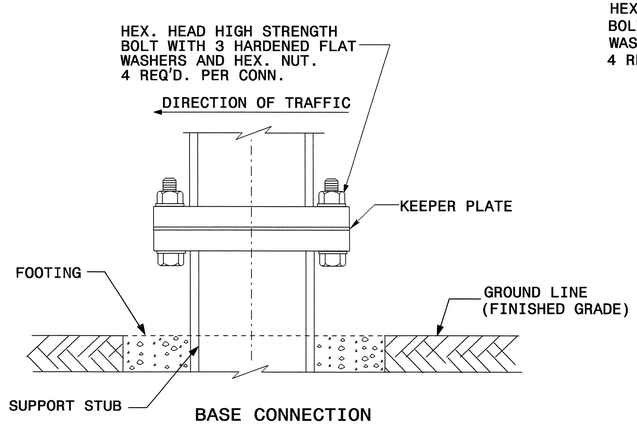
HINGE CONNECTION



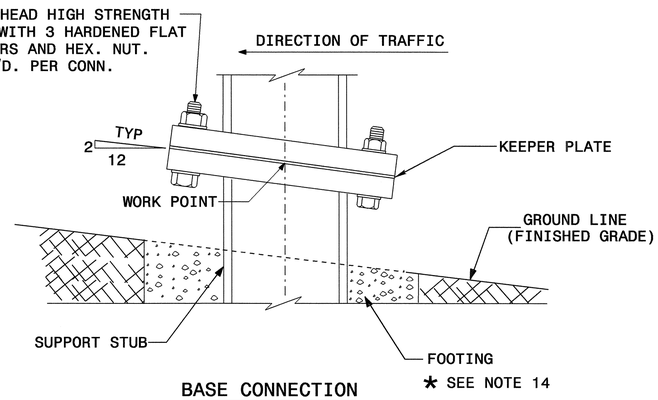
KEEPER PLATE



SLIP BASE PLATE



BASE CONNECTION



BASE CONNECTION

SEE SHEET SIGN-8 FOR DIMENSIONS.
SEE SHEET SIGN-9 FOR NOTES.

SEAL

10/11/06
NORTH CAROLINA PROFESSIONAL SEAL 028387 ENGINEER JOHN L. ALGUINTH

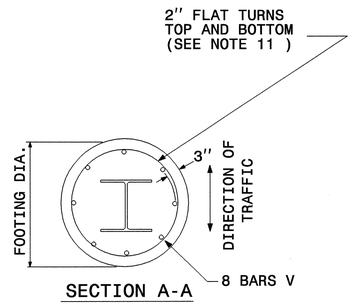
GROUND MOUNTED SIGN SUPPORT

TIP NO.	SHEET NO.
B-2532	SIGN-8

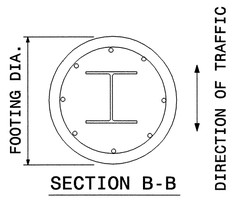
	SLIP BASE PLATE DATA								KEEPER PLATE DATA							HINGE CONNECTION DATA										BREAK AWAY SUPPORT WEIGHT CONSTANT LBS.
BEAM SHAPE	BOLT SIZE	A_1	B_1	C_1	D_1	E_1	T_1	R_1	A_2	B_2	C_2	D_2	E_2	R_2	T_2	BOLT SIZE	F	G	H	I	J	K	L	R_3	T_3	
S3X5.7	½"DIA.X 3"	7"	4"	1"	¾"	2½"	1"	9/32"	7"	4"	1"	¾"	2½"	9/32"	28 GAUGE	½"DIA.X1¼"	2¼"	3½"	4"	½"	1"	½"	2"	9/32"	⅜"	18
S4X7.7	½"DIA.X 3"	8"	4"	1"	¾"	2½"	1"	9/32"	8"	4"	1"	¾"	2½"	9/32"	28 GAUGE	½"DIA.X1¼"	2⅝"	3½"	4"	½"	1"	½"	2"	9/32"	⅜"	20
W6X9	½"DIA.X 3"	10"	5"	1"	¾"	3½"	1"	9/32"	10"	5"	1"	¾"	3½"	9/32"	28 GAUGE	½"DIA.X1¼"	4"	3½"	4"	¾"	1"	½"	2"	9/32"	⅜"	32
W6X12	⅝"DIA.X3¾"	10"	5"	1¼"	⅞"	3¼"	1¼"	11/32"	10"	5"	1¼"	⅞"	3¼"	11/32"	28 GAUGE	⅝"DIA.X2¼"	4"	4"	4½"	¾"	1⅛"	⅝"	2¼"	11/32"	⅜"	39
W6X16	⅝"DIA.X3¾"	10"	6"	1¼"	⅞"	4¼"	1¼"	11/32"	10"	6"	1¼"	⅞"	4¼"	11/32"	28 GAUGE	⅝"DIA.X2½"	4"	4"	4½"	¾"	1⅛"	⅝"	2¼"	11/32"	½"	47
W8X18	⅝"DIA.X 4¼"	12½"	6"	1¼"	⅞"	4¼"	1½"	11/32"	12½"	6"	1¼"	⅞"	4¼"	11/32"	28 GAUGE	⅝"DIA.X2½"	5¼"	4"	4½"	1"	1⅛"	⅝"	2¼"	11/32"	½"	70
W8X21	¾"DIA.X 4¼"	12½"	6"	1½"	1"	4"	1½"	13/32"	12½"	6"	1½"	1"	4"	13/32"	28 GAUGE	¾"DIA.X2¾"	5¼"	6"	7"	1"	1¾"	¾"	3½"	13/32"	½"	73
W10X22	¾"DIA.X 4¼"	16"	8"	1½"	1"	6"	1½"	13/32"	16"	8"	1½"	1"	6"	13/32"	28 GAUGE	¾"DIA.X2¾"	5¾"	6"	7"	1"	1¾"	¾"	3½"	13/32"	½"	119
W10X26	¾"DIA.X4¾"	16"	8"	1½"	1"	6"	1¾"	13/32"	16"	8"	1½"	1"	6"	13/32"	28 GAUGE	¾"DIA.X2¾"	5¾"	6"	7"	1"	1¾"	¾"	3½"	13/32"	⅝"	140
W12X26	¾"DIA.X4¾"	18"	9"	1½"	1"	7"	1¾"	13/32"	18"	9"	1½"	1"	7"	13/32"	28 GAUGE	¾"DIA.X2¾"	6½"	6"	7"	1"	1¾"	¾"	3½"	13/32"	⅝"	176
W14X30	1"DIA.X 5"	21"	9"	2"	1½"	6"	1¾"	17/32"	21"	9"	2"	1½"	6"	17/32"	28 GAUGE	1"DIA.X3"	6¾"	7"	8"	1¼"	2"	1"	4"	17/32"	⅝"	205
W16X31	1"DIA.X 5"	23"	9"	2"	1½"	6"	1¾"	17/32"	23"	9"	2"	1½"	6"	17/32"	28 GAUGE	1"DIA.X3¼"	5½"	7"	8"	1¼"	2"	1"	4"	17/32"	¾"	223
W18X35	1"DIA.X 5"	25"	9"	2"	1½"	6"	1¾"	17/32"	25"	9"	2"	1½"	6"	17/32"	28 GAUGE	1"DIA.X3¼"	6"	7"	8"	1¼"	2"	1"	4"	17/32"	¾"	243
W18X40	1"DIA.X5½"	25"	9"	2"	1½"	6"	2"	17/32"	25"	9"	2"	1½"	6"	17/32"	28 GAUGE	1"DIA.X3¾"	6"	7"	8"	1¼"	2"	1"	4"	17/32"	⅞"	278
W21X44	1"DIA.X5½"	28"	9"	2"	1½"	6"	2"	17/32"	28"	9"	2"	1½"	6"	17/32"	28 GAUGE	1"DIA.X3¾"	6½"	7"	8"	1¼"	2"	1"	4"	17/32"	⅞"	310

FOUNDATION DATA *		
FOOTING DIAMETER	REINFORCEMENT	SPIRAL BAR
1'	8 # 4 BARS	#3 BAR, 3" PITCH
1' 6"	8 # 6 BARS	#3 BAR, 3" PITCH
2'	8 # 7 BARS	#3 BAR, 3" PITCH
2' 6"	8 # 9 BARS	#3 BAR, 3" PITCH
3'	8 # 11 BARS	#3 BAR, 3" PITCH
3' 6"	8 # 12 BARS	#3 BAR, 3" PITCH
4'	8 # 14 BARS	#3 BAR, 3" PITCH

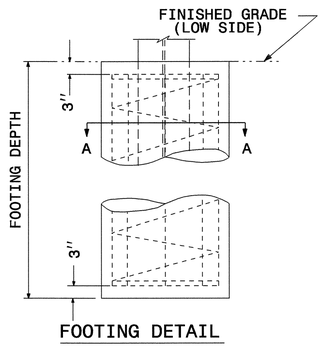
* FOUNDATION DIMENSIONS ARE SHOWN IN PLANS



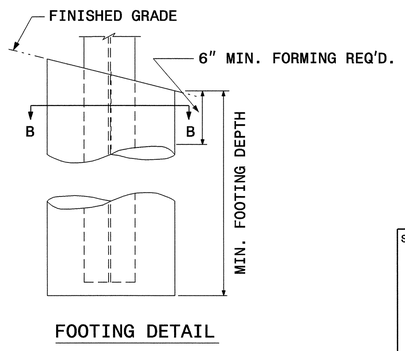
SECTION A-A



SECTION B-B



FOOTING DETAIL



FOOTING DETAIL

SEE SHEET SIGN-9 FOR NOTES.

SEAL

10/11/06
NORTH CAROLINA PROFESSIONAL SEAL 028387 ENGINEER AYMAN A. ALGHONAIM

GROUND MOUNTED SIGN SUPPORT

TIP NO.	SHEET NO.
B-2532	SIGN-9

NOTES:

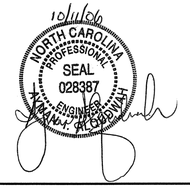
1. DESIGN CONFORMS WITH THE SPECIFICATIONS FOR THE DESIGN AND CONSTRUCTION OF STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS - A.A.S.H.T.O.
2. USE MATERIALS, FABRICATE AND ERECT SIGNS AND SUPPORTS THAT CONFORM TO THE NORTH CAROLINA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
3. USE HIGH STRENGTH BOLTS, NUTS AND WASHERS THAT CONFORM TO A.S.T.M. A-325 AND THAT ARE GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-153.
4. USE BACKING PLATES, SLIP BASE PLATES, FRICTION PLATES, AND HINGE PLATES THAT CONFORM TO A.S.T.M. A-36 AND THAT ARE GALVANIZED IN ACCORDANCE WITH A.S.T.M. A-123 PRIOR TO GALVANIZING, GRIND SMOOTH ANY METAL PROJECTION BEYOND THE PLATE FACE. KEEPER PLATES AHALL BE MANUFACTURED FROM 28 GAUGE SHEET STEEL THAT CONFORMS TO A.S.T.M. A-36 AND IS GALVAVIZED IN ACCORDANCE WITH A.S.T.M. A-123
5. ASSEMBLE HINGE CONNECTIONS IN THE SHOP. SHOP TIGHTEN BOLTS BY USE OF EITHER A CALIBRATED POWER WRENCH OR A MANUAL TORQUE WRENCH. TIGHTEN EACH HINGE CONNECTION BOLT TO 1/3 PAST SNUG.
6. BASE PLATES DETAILS ARE FOR INSTALLATIONS ON THE RIGHT SHOULDER AND IN GORE AREAS.
7. ASSEMBLE UPPER SUPPORT TO STUB AS SHOWN IN DETAIL. SLIP BASE PLATES SHALL BE FILLET WELDED ONTO POSTS ALL AROUND THE STRUCTURAL SHAPE SO AS TO INSURE NO LOSS OF STRENGTH. ASSEMBLE IN EITHER SHOP OR FIELD. 28 GAUGE KEEPER PLATE IS PLACED BETWEEN SLIP BASE PLATES TO PREVENT BOLT SLIPPING. TIGHTEN BOLTS TO THE FOLLOWING PRESCRIBED TORQUE:

BOLT DIAMETER	TORQUE (LB. FT.)
½"	9
⅝"	22
¾"	37
1"	48

COMPLETELY ASSEMBLE B/A POSTS PRIOR TO ERECTION. B/A POST TO BE SET IN ONE PIECE. AFTER SUPPORT HAS BEEN ERECTED AND THE CONCRETE FOOTINGS HAS CURED AT LEAST 48 HRS., CLEAN CONCRETE FROM BASE CONNECTION BOLTS THEN LOOSEN AND RETIGHTEN EACH BOLT IN A SYSTEMATIC ORDER TO THE PRESCRIBED TORQUE. DO NOT OVERTIGHTEN. BURR ALL BOLT THREADS OF BASE CONNECTIONS TO PREVENT LOOSENING.

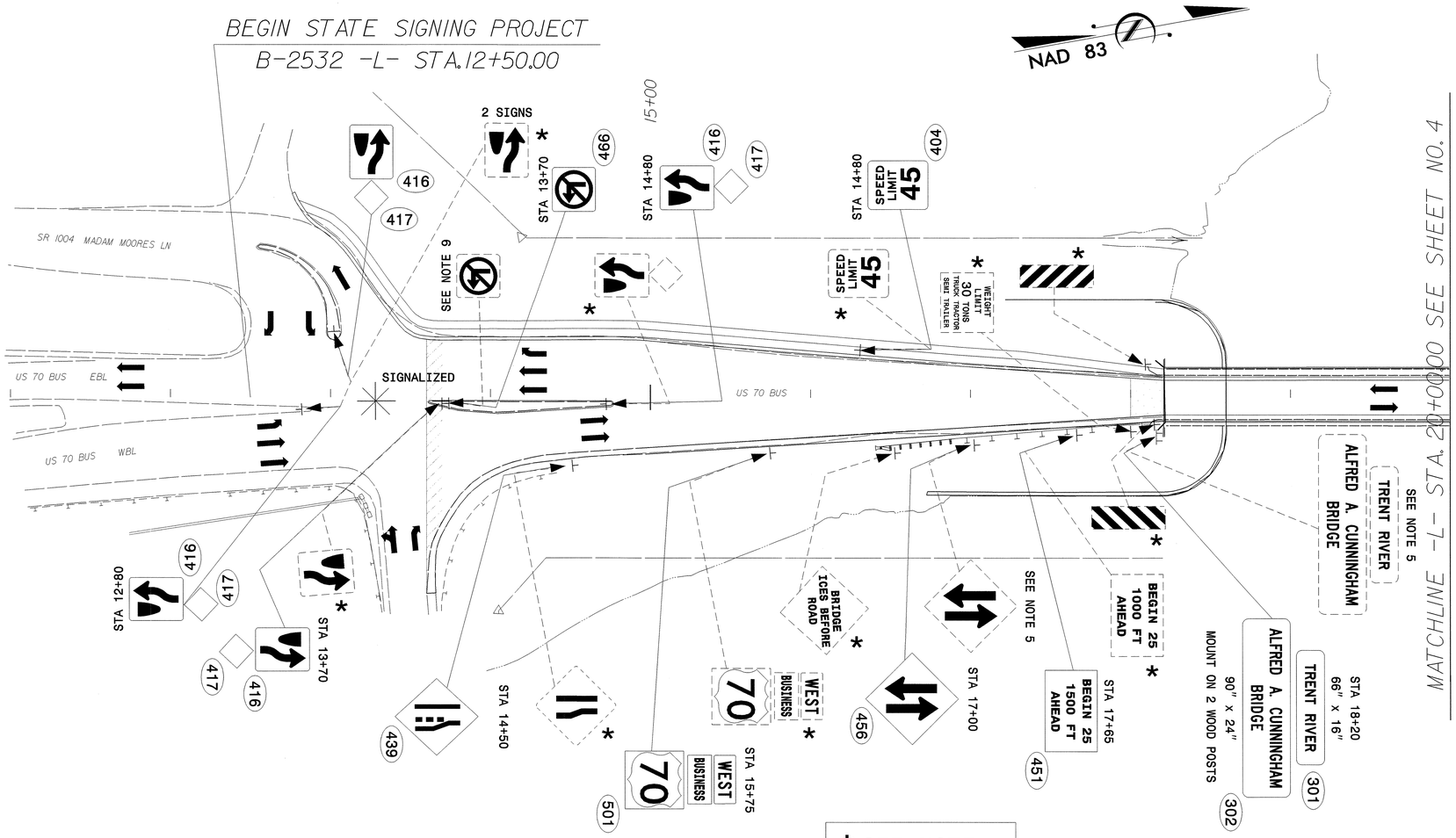
8. USE REINFORCED FOOTINGS WITH DIMENSIONS AS SHOWN IN PLANS. WHERE SOLID ROCK IS ENCOUNTERED, THE ENGINEER DIRECTS WHETHER TO PLACE THE FOOTING AT THE PRESCRIBED DEPTH OR EXTEND IT AT LEAST TWO FEET INTO THE ROCK. CONSTRUCT ALL FOOTINGS OF CLASS A CONCRETE.
9. FORM TOP 6" OF FOOTINGS. ENGINEER APPROVES THE METHOD USED.
10. THE FINAL FLAT TURN OF SPIRAL OR HOOPS NO. 3 OR LARGER PLACED 3" FROM TOP AND BOTTOM OF FOOTING MAY BE WELDED TO VERTICAL REINFORCING BARS. NO OTHER WELDING WILL BE PERMITTED.
11. ELIMINATE HINGE CONNECTION FOR ALL SINGLE SUPPORT SIGNS.
12. DETAIL IS FOR ONE DIRECTION BREAKAWAY. WHEN PLANS REQUIRE A TWO DIRECTION BREAKAWAY, TWO FRICTION PLATES SHALL BE USED IN LIEU OF ONE FRICTION PLATE AND ONE HINGE PLATE.
13. SHAPE THE TOPS OF THE FOOTINGS TO CONFORM WITH FINISHED GROUND ELEVATIONS SUCH THAT WATER WILL NOT COLLECT AGAINST THE SUPPORTS.
14. IF THE GROUNDWATER IS ENCOUNTERED AT AN DEPTH SHALLOWER THAN 7 FEET, THE SIGN FOUNDATION MUST BE REDESIGNED BASED UPON THE ACTUAL FIELD CONDITIONS. THE FOUNDATION DESIGN DOES NOT APPLY TO VERY SOFT OR LOOSE SOIL, MUCK, WEATHERED ROCK, OR HARD ROCK.

SEAL



GROUND MOUNTED SIGN SUPPORT

TIP NO.	SHEET NO.
B-2532	SIGN-10



WARNING SIGNS PLACEMENT CHART

POSTED OR 85TH PERCENTILE SPEED MPH (KMH)	MUTCD DISTANCE FT (M)	SUGGESTED LOCATION FT (M)	SUGGESTED MAXIMUM FT (M)
30 (50)	450 (140)	475 (145)	575 (175)
35 (55)	550 (170)	575 (175)	675 (205)
40 (65)	650 (200)	675 (205)	775 (235)
45 (70)	750 (230)	775 (235)	875 (270)
50 (80)	850 (260)	875 (270)	975 (300)
55 (90)	950 (290)	975 (300)	1075 (330)
60 (95)	1100 (335)	1125 (345)	1225 (375)
65 (105)	1200 (365)	1225 (375)	1325 (405)
70 (115)	1250 (380)	1275 (390)	1375 (420)

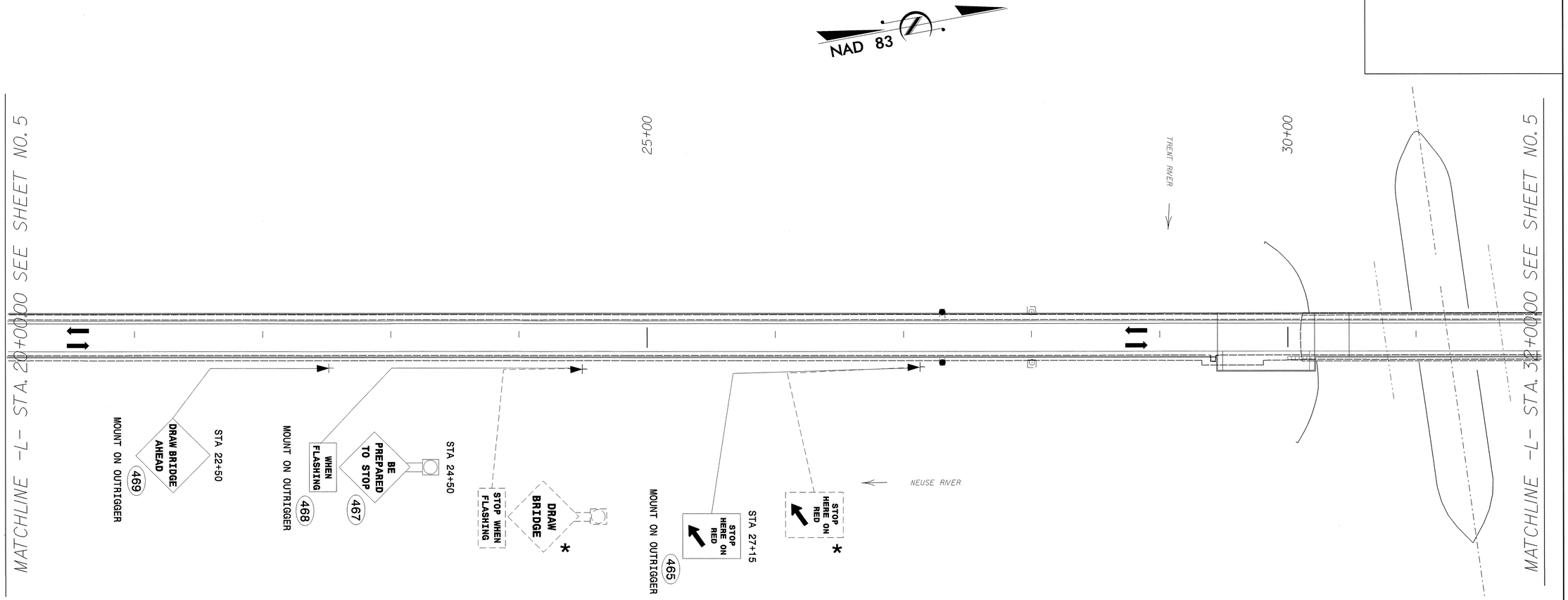
1. SEE ROADWAY STANDARD NO. 904.50 FOR MOUNTING OF TYPE 'D', 'E', AND 'F' SIGNS ON 'U' CHANNEL POSTS.
2. SEE CHART FOR PLACEMENT OF WARNING SIGNS. DISTANCES SHOWN IN MINIMUM ROAD COLUMNS ARE FOR LEVEL ROADWAYS. MAKE CORRECTIONS FOR GRADES. IF 48-INCH (1219 MM) SIGNS ARE USED, THE LEGIBILITY DISTANCE MAY BE INCREASED TO 200 FEET (61 M). THIS WOULD ALLOW REDUCING THE CHART SPECIFIED DISTANCE BY 75 FEET (23 M).
3. IF THE BRIDGE IS OVER A MAJOR STREAM OR RIVER, A SIGN FOR THE NAME OF THE STREAM OR RIVER SHOULD BE INSTALLED AT EACH APPROACH. THESE DESIGNS WILL BE COMPLETED BY THE SIGNING SECTION UPON REQUEST.
4. SIGNS FURNISHED BY CONTRACTOR. BACKGROUND SHEETING SHALL BE TYPE III REFLECTIVE SHEETING.
5. DISPOSAL OF SIGN SYSTEM, U-CHANNEL.
6. SIGN ERECTION, RELOCATE SIGN TYPE D.
7. DISPOSAL OF SIGN SYSTEM, WOOD.
8. DISPOSAL OF SUPPORT, WOOD.
9. DISPOSAL OF SIGN, TYPE E.

SEAL

10/11/06
NORTH CAROLINA PROFESSIONAL SEAL 028387 ENGINEER WILLIAM L. MEATON

EXISTING/PROPOSED ROADWAY
US 70B
STA 10+00 TO 20+00

TIP NO.	SHEET NO.
B-2532	SIGN-11



*SEE NOTE 7

WARNING SIGNS PLACEMENT CHART

POSTED OR 85TH PERCENTILE SPEED MPH (KMH)	MUTCD DISTANCE FT (M)	SUGGESTED LOCATION FT (M)	SUGGESTED MAXIMUM FT (M)
30 (50)	450 (140)	475 (145)	575 (175)
35 (55)	550 (170)	575 (175)	675 (205)
40 (65)	650 (200)	675 (205)	775 (235)
45 (70)	750 (230)	775 (235)	875 (270)
50 (80)	850 (260)	875 (270)	975 (300)
55 (90)	950 (290)	975 (300)	1075 (330)
60 (95)	1100 (335)	1125 (345)	1225 (375)
65 (105)	1200 (365)	1225 (375)	1325 (405)
70 (115)	1250 (380)	1275 (390)	1375 (420)

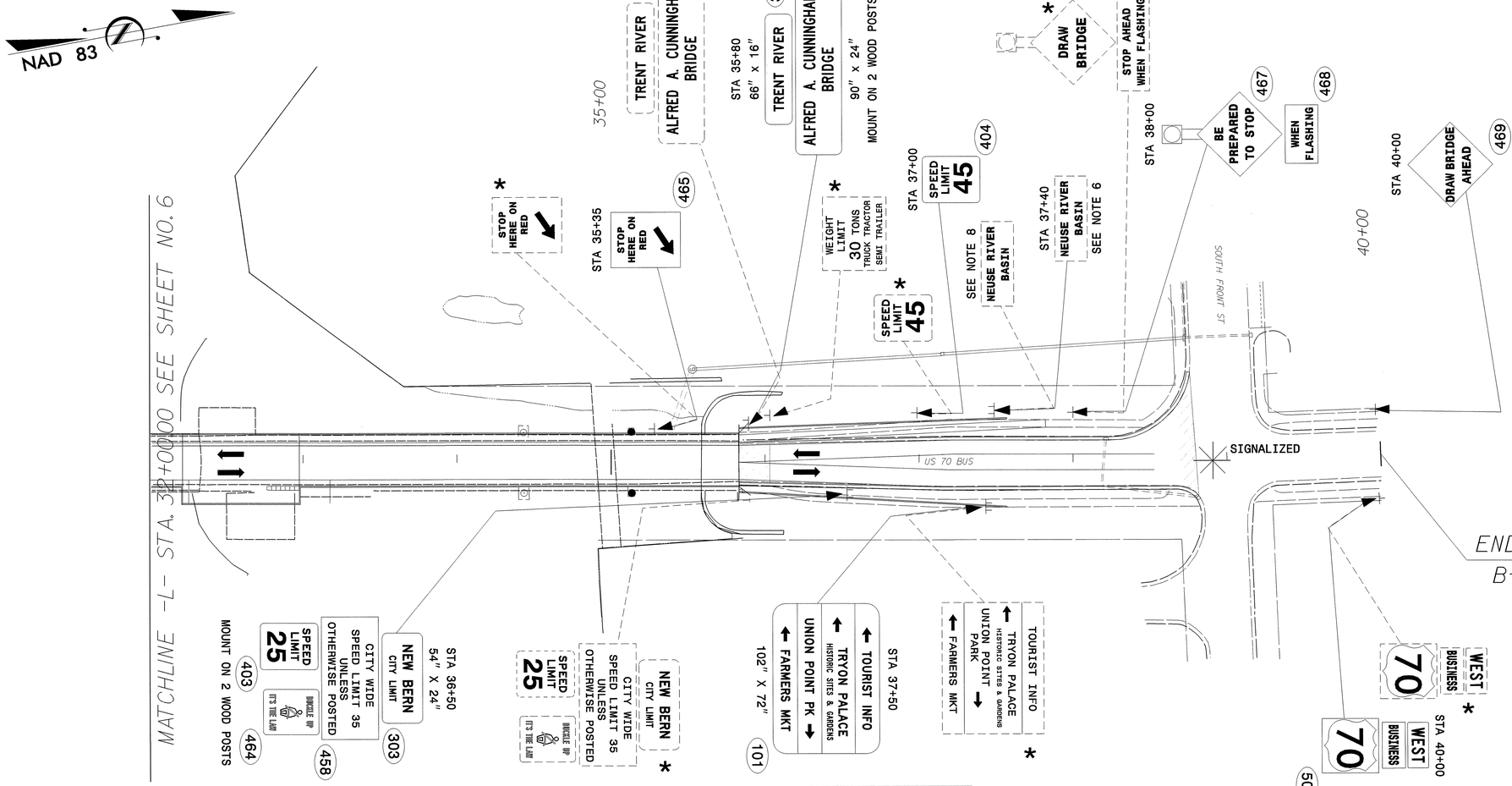
1. SEE ROADWAY STANDARD NO. 904.50 FOR MOUNTING OF TYPE 'D', 'E', AND 'F' SIGNS ON 'U' CHANNEL POSTS.
2. SEE CHART FOR PLACEMENT OF WARNING SIGNS. DISTANCES SHOWN IN MINIMUM ROAD COLUMNS ARE FOR LEVEL ROADWAYS. MAKE CORRECTIONS FOR GRADES. IF 48-INCH (1219 MM) SIGNS ARE USED, THE LEGIBILITY DISTANCE MAY BE INCREASED TO 200 FEET (61 M). THIS WOULD ALLOW REDUCING THE CHART SPECIFIED DISTANCE BY 75 FEET (23 M).
3. IF THE BRIDGE IS OVER A MAJOR STREAM OR RIVER, A SIGN FOR THE NAME OF THE STREAM OR RIVER SHOULD BE INSTALLED AT EACH APPROACH. THESE DESIGNS WILL BE COMPLETED BY THE SIGNING SECTION UPON REQUEST.
4. SIGNS FURNISHED BY CONTRACTOR. BACKGROUND SHEETING SHALL BE TYPE III REFLECTIVE SHEETING.
5. DISPOSAL OF SIGN SYSTEM, U-CHANNEL.
6. SIGN ERECTION, RELOCATE SIGN TYPE D.
7. DISPOSAL OF SIGN SYSTEM, WOOD.
8. DISPOSAL OF SUPPORT, WOOD.
9. DISPOSAL OF SIGN, TYPE E.

SEAL

10/10/06
NORTH CAROLINA PROFESSIONAL SEAL 028387 ENGINEER ANKUR J. PALGUTWAR

EXISTING/PROPOSED ROADWAY
US 70B
STA 20+00 TO 32+00

TIP NO.	SHEET NO.
B-2532	SIGN-12



*SEE NOTE 7

WARNING SIGNS PLACEMENT CHART

POSTED OR 85TH PERCENTILE SPEED MPH (KMH)	MUTCD DISTANCE FT (M)	SUGGESTED LOCATION FT (M)	SUGGESTED MAXIMUM FT (M)
30 (50)	450 (140)	475 (145)	575 (175)
35 (55)	550 (170)	575 (175)	675 (205)
40 (65)	650 (200)	675 (205)	775 (235)
45 (70)	750 (230)	775 (235)	875 (270)
50 (80)	850 (260)	875 (270)	975 (300)
55 (90)	950 (290)	975 (300)	1075 (330)
60 (95)	1100 (335)	1125 (345)	1225 (375)
65 (105)	1200 (365)	1225 (375)	1325 (405)
70 (115)	1250 (380)	1275 (390)	1375 (420)

1. SEE ROADWAY STANDARD NO. 904.50 FOR MOUNTING OF TYPE 'D', 'E', AND 'F' SIGNS ON 'U' CHANNEL POSTS.
2. SEE CHART FOR PLACEMENT OF WARNING SIGNS. DISTANCES SHOWN IN MINIMUM ROAD COLUMNS ARE FOR LEVEL ROADWAYS. MAKE CORRECTIONS FOR GRADES. IF 48-INCH (1219 MM) SIGNS ARE USED, THE LEGIBILITY DISTANCE MAY BE INCREASED TO 200 FEET (61 M). THIS WOULD ALLOW REDUCING THE CHART SPECIFIED DISTANCE BY 75 FEET (23 M).
3. IF THE BRIDGE IS OVER A MAJOR STREAM OR RIVER, A SIGN FOR THE NAME OF THE STREAM OR RIVER SHOULD BE INSTALLED AT EACH APPROACH. THESE DESIGNS WILL BE COMPLETED BY THE SIGNING SECTION UPON REQUEST.
4. SIGNS FURNISHED BY CONTRACTOR. BACKGROUND SHEETING SHALL BE TYPE III REFLECTIVE SHEETING.
5. DISPOSAL OF SIGN SYSTEM, U-CHANNEL.
6. SIGN ERECTION, RELOCATE SIGN TYPE D.
7. DISPOSAL OF SIGN SYSTEM, WOOD.
8. DISPOSAL OF SUPPORT, WOOD.
9. DISPOSAL OF SIGN, TYPE E.

SEAL

NORTH CAROLINA PROFESSIONAL SEAL 028387 ENGINEER KWAME J. AGYAPONG

EXISTING/PROPOSED ROADWAY
US 70B
STA 32+00 TO 40+00