

# MINNESOTA DEPARTMENT OF TRANSPORTATION

GRADING, BITUMINOUS SURFACING, NOISEWALL, LIGHTING,  
CONSTRUCTION PLAN FOR TMS, SIGNING AND BRIDGES 02003 & 02004

LOCATED ON T.H. 10 FROM 1700' EAST OF HANSON BLVD. TO 100' WEST OF EGRET BLVD. IN COON RAPIDS.

FED. PROJ. NO. STATE FUNDS

## GOVERNING SPECIFICATIONS

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION  
"STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

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X1-X49	CROSS SECTIONS

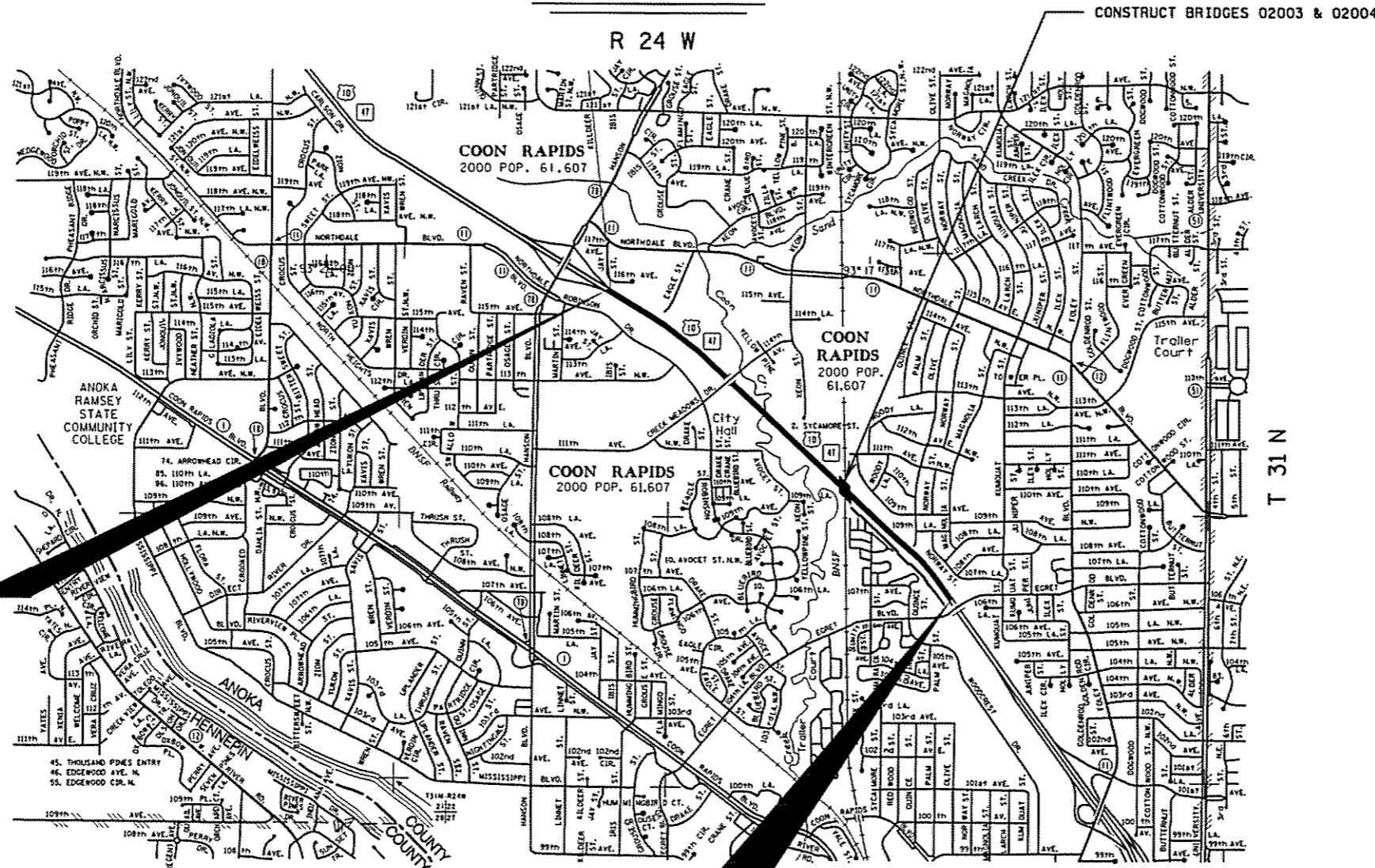
WARNING: THERE IS A 345KV TRANSMISSION CROSSING WITHIN THE PROJECT GRADING LIMITS.

STATE PROJ. NO. 0215-67 (TH 10)  
GROSS LENGTH 8,506.07 FEET 1.611 MILES  
BRIDGES-LENGTH 118.66 FEET 0.022 MILES  
EXCEPTIONS-LENGTH FEET MILES  
NET LENGTH 8,506.07 FEET 1.611 MILES  
REF. POINT 229+00.376 TO REF. POINT 231+00.032

NOTE: LENGTH OF PROJECT IS BASED ON EB10 ALIGNMENT.

EQUATIONS: WB10 STA. 387+51.29 = 387+32.76

### INDEX MAP



EB10 STA. 370+34  
BEGIN S.P. 0215-67

EB10 STA. 455+40  
END S.P. 0215-67

#### SCALES

PLAN	50'
PROFILE	50' HORIZ. 5' VERT.
INDEX MAP	1500'
GENERAL LAYOUT	250'

#### DESIGN DESIGNATION

Design ESALS = 9,754,000  
ADT (Current Year) 2006 = 93,000 Design Speed 70 MPH  
ADT (Future Year) 2027 = 136,420 Based on STOPPING sight Distance  
DHV (Design Hr. Vol.) = 6.610 Height of eye 3.5' Height of object 0.5'  
D (Directional Distr.) = % Shoulder design exception - 4' paved from:  
T (Heavy Commercial) = 4.3% EB10 STA. 375+13 TO STA. 407+05 LT  
WB10 STA. 375+53 TO STA. 412+45 RT

FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL

STATE PROJ. NO. CHARGE IDENTIFIER  
0215-67

PLAN REVISIONS		
DATE	SHEET NO.	APPROVED BY

PROJECT LOCATION  
COUNTY: ANOKA  
DISTRICT: METRO

STATE PROJ. NO. 0215-67 (TH 10 = 062) SHEET NO. 1 OF 222 SHEETS

THIS PLAN CONTAINS 272 SHEETS

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: PETER DAVICH LICENSE # 45053

DATE: 2/13/09 SIGNATURE: Peter Davich

DESIGN SQUAD R. PERRY, H. GRAY, L. REYES

RECOMMENDED FOR APPROVAL by Alex C. Ellis 2/13/09  
DISTRICT TRANSPORTATION ENGINEER

RECOMMENDED FOR APPROVAL Benjamin J. Smith 2/12/09  
DISTRICT MATERIALS ENGINEER

RECOMMENDED FOR APPROVAL Beth Huedel 2-13-09  
DISTRICT WATER RESOURCES/HYDRAULICS ENGINEER

RECOMMENDED FOR APPROVAL Michael P. Blum 2-13-09  
DISTRICT TRAFFIC ENGINEER

RECOMMENDED FOR APPROVAL Valerie K. Hueson 2-19-09  
STATE PRE-LETTING ENGINEER

OFFICE OF LAND MANAGEMENT APPROVAL [Signature] 7/22/09  
DIRECTOR, LAND MANAGEMENT

APPROVED 2/23/09 Robert Winter  
STATE DESIGN ENGINEER

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: LICENSE #

DATE: SIGNATURE:

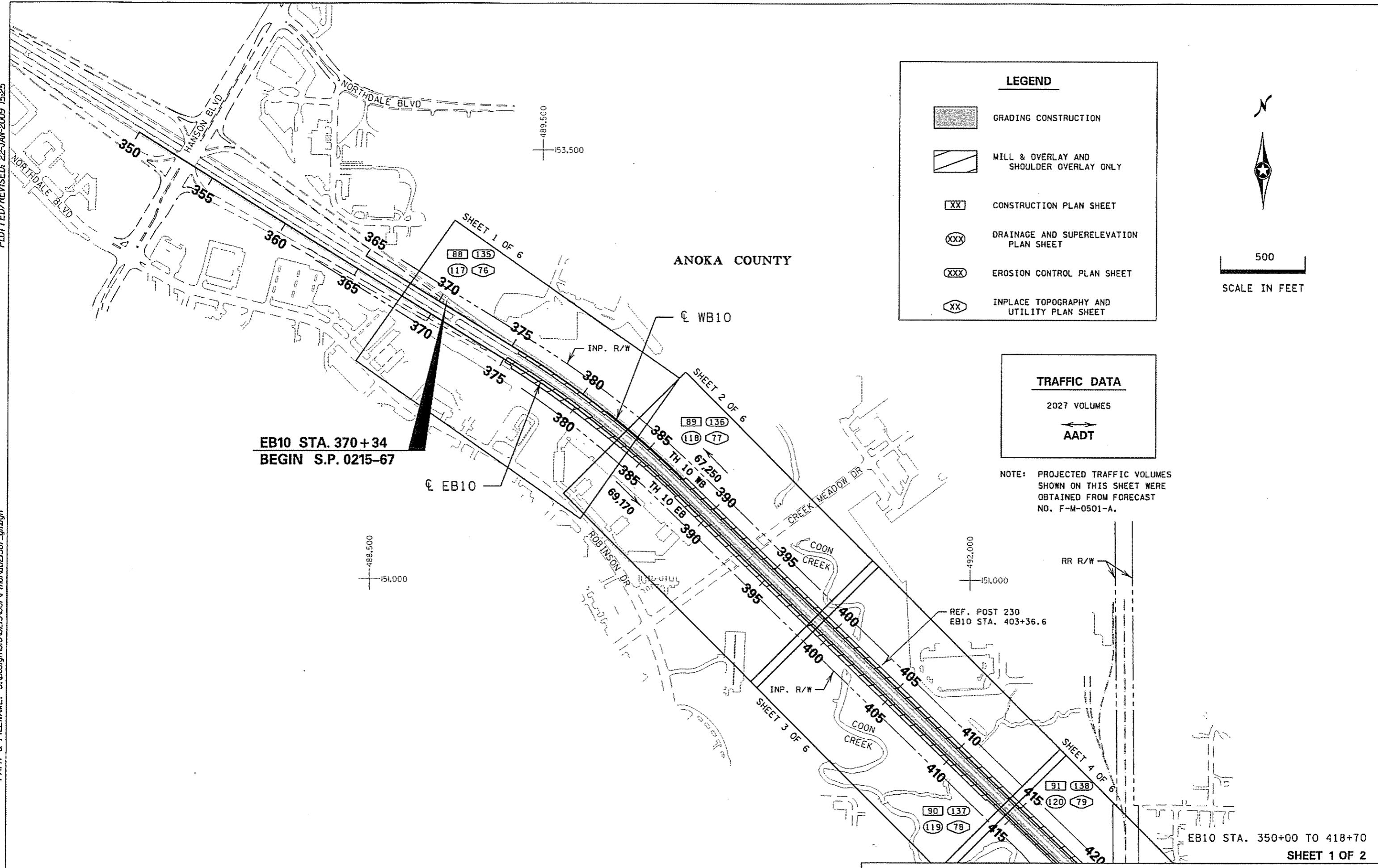
PLOTTED/REVISED: 11-FEB-2009 09:30

DISTRICT #: METRO  
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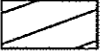




OR 2-25-09

PLOTTED/REVISED: 22-JAN-2009 15:25

DISTRICT #: METRO  
PLOT NAME: 67-gll  
PATH & FILENAME: S:\Design\010215067\Final\021567\_gll.dgn



**LEGEND**

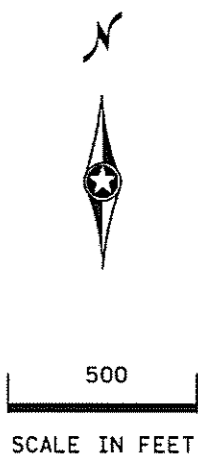
-  GRADING CONSTRUCTION
-  MILL & OVERLAY AND SHOULDER OVERLAY ONLY
-  CONSTRUCTION PLAN SHEET
-  DRAINAGE AND SUPERELEVATION PLAN SHEET
-  EROSION CONTROL PLAN SHEET
-  INPLACE TOPOGRAPHY AND UTILITY PLAN SHEET

**TRAFFIC DATA**

2027 VOLUMES

←→  
AADT

NOTE: PROJECTED TRAFFIC VOLUMES SHOWN ON THIS SHEET WERE OBTAINED FROM FORECAST NO. F-M-0501-A.



EB10 STA. 370+34  
BEGIN S.P. 0215-67

EB10 STA. 350+00 TO 418+70

SHEET 1 OF 2

**GENERAL LAYOUT**

PLOTTED/REVISED: 22-JAN-2009 15:25







DISTRICT #: METRO  
PLOT NAME: 67-g12  
PATH & FILENAME: S:\Design\01\0215\06\Final\021567\_g11.dgn

491,000  
149,000



500  
SCALE IN FEET

**LEGEND**

-  GRADING CONSTRUCTION
-  MILL & OVERLAY AND SHOULDER OVERLAY ONLY
-  CONSTRUCTION PLAN SHEET
-  DRAINAGE AND SUPERELEVATION PLAN SHEET
-  EROSION CONTROL PLAN SHEET
-  INPLACE TOPOGRAPHY AND UTILITY PLAN SHEET

**TRAFFIC DATA**

2027 VOLUMES

↔  
AADT

NOTE: PROJECTED TRAFFIC VOLUMES SHOWN ON THIS SHEET WERE OBTAINED FROM FORECAST NO. F-M-0501-A.

CONSTRUCT BRIDGE NOS. 02003 AND 02004.

ANOKA COUNTY

RR R/W

EB10 STA. 455+40  
END S.P. 0215-67

EB10 STA. 406+32 TO 460+42

SHEET 2 OF 2

**GENERAL LAYOUT**

PLOTTED/REVISED: 12-FEB-2009 09:53

DISTRICT #: METRO  
 PLOT NAME: 67\_eq1  
 PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_eq1.dgn

### STATEMENT OF ESTIMATED QUANTITIES

TAB	SHEET NO.	ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES
		2021.501	MOBILIZATION	LUMP SUM	1
		2031.501	FIELD OFFICE TYPE D	EACH	1
		2031.503	FIELD LABORATORY TYPE DX	EACH	1
		2051.501	MAINT AND RESTORATION OF HAUL ROADS	LUMP SUM	1
R,S	141,160	2102.502	PAVEMENT MARKING REMOVAL	LIN FT	27742
C	9	2104.501	REMOVE SEWER PIPE (STORM) (3) (P)	LIN FT	1070
C	9	2104.501	REMOVE CURB AND GUTTER (P)	LIN FT	1257
C	9	2104.501	REMOVE CHAIN LINK FENCE (P)	LIN FT	180
C	9	2104.501	REMOVE GUARD RAIL-PLATE BEAM (P)	LIN FT	2065
C	9	2104.505	REMOVE BITUMINOUS PAVEMENT (5) (P)	SQ YD	12736
C	9	2104.505	REMOVE BITUMINOUS SHOULDER PAVEMENT (6) (P)	SQ YD	5785
C	9	2104.509	REMOVE PIEZOMETER (P)	EACH	1
C	9	2104.509	REMOVE CONCRETE APRON (P)	EACH	13
C	9	2104.509	REMOVE METAL APRON (P)	EACH	2
C	9	2104.509	REMOVE ANCHORAGE ASSEMBLY-PLATE BEAM (P)	EACH	4
C	9	2104.509	REMOVE CASTING (P)	EACH	2
C	9	2104.509	REMOVE DRAINAGE STRUCTURE (P)	EACH	4
V	206	2104.509	REMOVE WOOD POLE (P)	EACH	1
T	177	2104.509	REMOVE MARKER (P)	EACH	6
T	177	2104.509	REMOVE SIGN TYPE A (P)	EACH	2
T	177	2104.509	REMOVE SIGN TYPE C (P)	EACH	4
T	177	2104.509	REMOVE SIGN TYPE OH (BRIDGE MOUNTED) (P)	EACH	1
T	177	2104.509	REMOVE SIGN PANEL TYPE OH (P)	EACH	1
C	9	2104.509	REMOVE ECCENTRIC LOADER BCT (P)	EACH	2
D	10	2104.511	SAWING CONCRETE PAVEMENT (FULL DEPTH) (7)	LIN FT	346
D	10	2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH) (5)	LIN FT	24481
A,B	7	2105.501	COMMON EXCAVATION (P)	CU YD	12751
A,B	7	2105.505	MUCK EXCAVATION (P)	CU YD	454
A,B	7	2105.507	SUBGRADE EXCAVATION (P)	CU YD	20603
A,B	7	2105.522	SELECT GRANULAR BORROW (CV) (P)	CU YD	20452
A,B	7	2105.522	SELECT GRANULAR BORROW MOD 10% (CV) (4) (P)	CU YD	12527
A,B	7	2105.523	COMMON BORROW (CV) (P)	CU YD	5268
A,B	7	2105.525	TOPSOIL BORROW (CV) (P)	CU YD	58
H	11	2105.550	SUBSOILING	ACRE	11
A,B	7	2105.607	TOPSOIL BORROW MODIFIED (CV)	CU YD	32
		2130.501	WATER (1)	M GALLONS	250
E	10	2211.503	AGGREGATE BASE (CV) CLASS 5 (P)	CU YD	8431
E	10	2221.503	AGGREGATE SHOULDERING (CV) CLASS 2 (P)	CU YD	1032
		2231.501	BITUMINOUS PATCHING MIXTURE (2)	TON	72
E	10	2232.501	MILL BITUMINOUS SURFACE (1.5")	SQ YD	27454
P	12	2301.553	BRIDGE APPROACH PANELS	SQ YD	1752
E	10	2360.501	TYPE SP 12.5 WEARING COURSE MIXTURE (5,H)	TON	15579
E	10	2360.502	TYPE SP 12.5 NON WEARING COURSE MIXTURE (5,B)	TON	10837
O	101-113	2422.603	CONCRETE POSTS 12"X18"	LIN FT	13800
O	101-113	2422.618	WOOD NOISE ATTENUATOR WALL	SQ FT	57802
O	101-113	2451.503	GRANULAR BACKFILL (CV) (P)	CU YD	71
A,B	7	2451.505	AGGREGATE BACKFILL (CV)	CU YD	20

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N	11	TRAFFIC BARRIER
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- ① TO BE USED AS DIRECTED BY THE ENGINEER FOR DUST CONTROL WITHIN THE PROJECT LIMITS.
- ② TO BE USED FOR PATCHING AS DIRECTED BY THE ENGINEER. THE MIXTURE SHALL MEET THE REQUIREMENTS OF THE PROPOSED BITUMINOUS WEAR COURSE.
- ③ APRON REMOVAL TABULATED SEPARATELY.
- ④ SEE SHEET NO. 33, NOTE 4 FOR MODIFICATION.
- ⑤ CONSISTS OF BITUMINOUS PAVEMENT APPROXIMATELY 10" THICK.
- ⑥ CONSISTS OF BITUMINOUS PAVEMENT APPROXIMATELY 8" THICK.
- ⑦ EXISTING BRIDGE DECK, MIN. 6.5" THICK.

### ESTIMATED QUANTITIES AND TABULATION INDEX

**STATEMENT OF ESTIMATED QUANTITIES**

TAB	SHEET NO.	ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES
K,L	122-125,12	2501.515	18" RC PIPE APRON	EACH	1
K,L	122-125,12	2501.515	24" RC PIPE APRON	EACH	4
K,L	122-125,12	2501.515	30" RC PIPE APRON	EACH	1
K,L	122-125,12	2501.569	18" RC SAFETY APRON	EACH	3
K,L	122-125,12	2503.541	12" RC PIPE SEWER DESIGN 3006 (1)	LIN FT	1925
K,L	122-125,12	2503.541	15" RC PIPE SEWER DESIGN 3006 (2)	LIN FT	282
K,L	122-125,12	2503.541	15" RC PIPE SEWER DESIGN 3006 CLASS III (3)	LIN FT	403
K,L	122-125,12	2503.541	18" RC PIPE SEWER DESIGN 3006	LIN FT	17
K,L	122-125,12	2503.541	18" RC PIPE SEWER DESIGN 3006 CLASS III (4)	LIN FT	421
K,L	122-125,12	2503.541	24" RC PIPE SEWER DESIGN 3006 CLASS III (5)	LIN FT	929
K,L	122-125,12	2503.541	30" RC PIPE SEWER DESIGN 3006 (6)	LIN FT	28
K,L	122-125,12	2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN A OR F	LIN FT	68
K,L	122-125,12	2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN C OR G	LIN FT	49
K,L	122-125,12	2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN 60-4020	LIN FT	8
K,L	122-125,12	2506.502	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL	EACH	1
K,L	122-125,12	2506.502	CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 1	EACH	4
K,L	122-125,12	2506.516	CASTING ASSEMBLY	EACH	23
K,L	122-125,12	2506.602	CONNECT INTO EXISTING DRAINAGE STRUCTURE	EACH	2
K,L	122-125,12	2506.602	CONNECT INTO EXISTING STORM SEWER	EACH	3
K,L	122-125,12	2511.501	RANDOM RIPRAP CLASS II	CU YD	24
K,L	122-125,12	2511.515	GEOTEXTILE FILTER TYPE III	SQ YD	31
O	101-113	2520.501	LEAN MIX BACKFILL (P)	CU YD	1210
F	11	2521.501	3" CONCRETE WALK	SQ FT	12
F	11	2531.501	CONCRETE CURB & GUTTER DESIGN SPECIAL (7)	LIN FT	70
F	11	2531.501	CONCRETE CURB & GUTTER DESIGN B424	LIN FT	1178
F	11	2531.501	CONCRETE CURB & GUTTER DESIGN D424	LIN FT	1607
F	11	2533.501	CONC MED BARRIER DES 8308 TYPE A	LIN FT	60
F	11	2533.501	CONC MED BARRIER DES 8308 TYPE A STEP	LIN FT	72
F	11	2533.501	CONC MED BARRIER DES 8308 TYPE AA STEP	LIN FT	114
R	141	2533.507	PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337 (8)	LIN FT	12482
R	141	2533.507	PORTABLE PRECAST CONCRETE BARRIER DESIGN 8337 - PINNED (8)	LIN FT	1784
R	141	2533.508	RELOCATE PORTABLE PRECAST CONC BARRIER DESIGN 8337	LIN FT	11592
U	170	2545.511	LIGHTING UNIT TYPE 6B-40	EACH	2
U	170	2545.511	LIGHTING UNIT TYPE 9-49	EACH	56
U	170	2545.514	UNDERPASS LIGHTING FIXTURE TYPE L	EACH	2
U	170	2545.515	LIGHT BASE DESIGN H	EACH	56
U	170	2545.521	1" RIGID STEEL CONDUIT	LIN FT	220
U	170	2545.523	3" NON-METALLIC CONDUIT (DIRECTIONAL BORE)	LIN FT	545
U	170	2545.531	UNDERGROUND WIRE 1 COND NO 10	LIN FT	660
U	170	2545.533	ARMORED CABLE 4 COND NO 4	LIN FT	18700
U	170	2545.541	SERVICE CABINET SECONDARY TYPE L1	EACH	2
U	170	2545.545	EQUIPMENT PAD B	EACH	2
U	170	2545.551	JUNCTION BOX	EACH	2
U	170	2545.553	HANDHOLE	EACH	5
U	170	2545.602	ELECTRICAL SERVICE	EACH	2
U	170	2545.603	0.75" LIQUIDTIGHT FLEXIBLE CONDUIT	LIN FT	10
V	206	2550.512	HANDHOLE TYPE-PVC METAL COVER	EACH	2
V	206	2550.516	BURIED CABLE SIGN	EACH	16
V	206	2550.523	2" NON-METALLIC CONDUIT	LIN FT	170
V	206	2550.532	LEAD-IN CABLE 2 CONDUCTOR NO 14	LIN FT	2350
V	206	2550.602	LOOP DETECTOR DESIGN PREFORMED	EACH	7
V	206	2550.602	LOOP DETECTOR DESIGN SAWCUT	EACH	17
V	206	2550.603	RELOCATE FIBER OPTIC CABLE	LIN FT	100
V	206	2550.603	2" BORED CONDUIT	LIN FT	150

- ① PLASTIC PIPE MAY BE USED AS AN ALTERNATE FOR 6 LIN. FT. OF PIPE. SEE DRAINAGE TABULATIONS ON SHEETS NO. 122-125 FOR LOCATIONS.
- ② PLASTIC PIPE MAY BE USED AS AN ALTERNATE FOR 282 LIN. FT. OF PIPE. SEE DRAINAGE TABULATIONS ON SHEETS NO. 122-125 FOR LOCATIONS.
- ③ PLASTIC PIPE MAY BE USED AS AN ALTERNATE FOR 403 LIN. FT. OF PIPE. SEE DRAINAGE TABULATIONS ON SHEETS NO. 122-125 FOR LOCATIONS.
- ④ PLASTIC PIPE MAY BE USED AS AN ALTERNATE FOR 403 LIN. FT. OF PIPE. SEE DRAINAGE TABULATIONS ON SHEETS NO. 122-125 FOR LOCATIONS.
- ⑤ PLASTIC PIPE MAY BE USED AS AN ALTERNATE FOR 174 LIN. FT. OF PIPE. SEE DRAINAGE TABULATIONS ON SHEETS NO. 122-125 FOR LOCATIONS.
- ⑥ PLASTIC PIPE MAY BE USED AS AN ALTERNATE FOR 55 LIN. FT. OF PIPE. SEE DRAINAGE TABULATIONS ON SHEETS NO. 122-125 FOR LOCATIONS.
- ⑦ SEE DETAIL ON SHEET NO. 53.
- ⑧ WILL REMAIN PROPERTY OF THE CONTRACTOR.

**ESTIMATED QUANTITIES**

PLOTTED/REVISED: 11-FEB-2009 08:52

DISTRICT #: METRO  
 PLOT NAME: 67\_eq2  
 PATH & FILENAME: S:\Design\010\0215\067\Final\021567\_eq1.dgn

PLOTTED/REVISED: 17-FEB-2009 08:43

DISTRICT #: METRO  
 IPLOT NAME: 67\_eq3  
 PATH & FILENAME: S:\Des\ign\010215067\Final\021567\_eq1.dgn

### STATEMENT OF ESTIMATED QUANTITIES

TAB	SHEET NO.	ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES
N	11	2554.501	TRAFFIC BARRIER DESIGN SPECIAL	LIN FT	75
N	11	2554.501	TRAFFIC BARRIER DESIGN BULLNOSE	LIN FT	201
N	11	2554.501	TRAFFIC BARRIER DESIGN B8338	LIN FT	2100
K,L	122-125,12	2554.509	GUIDE POST TYPE B	EACH	9
N	11	2554.521	ANCHORAGE ASSEMBLY-PLATE BEAM	EACH	3
N	11	2554.523	END TREATMENT-TANGENT TERMINAL	EACH	3
N	11	2554.602	T-BARRIER BRIDGE CONN DES 8318	EACH	3
R	141	2554.615	IMPACT ATTENUATOR	ASSEMBLY	6
N	11	2554.615	IMPACT ATTENUATOR NO 1	ASSEMBLY	1
R	141	2554.615	RELOCATE IMPACT ATTENUATOR	ASSEMBLY	2
Q	12	2557.501	WIRE FENCE DESIGN 60V-9322	LIN FT	190
Q	12	2557.522	METAL BRACE ASSEMBLY	EACH	4
R	141	2557.603	TEMPORARY GLARE SCREEN	LIN FT	1714
R	141	2563.601	TRAFFIC CONTROL	LUMP SUM	1
R	141	2563.602	RAISED PAVEMENT MARKER TEMPORARY	EACH	514
R	141	2563.602	MEDIAN BARRIER DELINEATOR	EACH	924
T	177	2564.511	CONCRETE FOOTINGS (TYPE OH SPREAD)	CU YD	12
T	177	2564.522	STRUCTURAL STEEL-POSTS FOR OH SIGNS (DESIGN B)	POUND	4448
T	177	2564.522	STRUCTURAL STEEL-TRUSSES FOR OH SIGNS (DESIGN B)	POUND	3998
T	177	2564.522	STRUCTURAL STEEL-TRUSSES FOR OH SIGNS BRIDGE MOUNTED	POUND	510
T	177	2564.522	STRUCTURAL STEEL-PANEL MOUNTING POSTS FOR OH SIGNS (DESIGN B)	POUND	372
T	177	2564.531	SIGN PANELS TYPE C	SQ FT	78
T	177	2564.531	SIGN PANELS TYPE OVERLAY	SQ FT	27
T	177	2564.531	SIGN PANELS TYPE OH	SQ FT	512
T	177	2564.551	REFERENCE POST MARKER	EACH	2
G	11	2573.502	SILT FENCE, TYPE HEAVY DUTY	LIN FT	1540
G	11	2573.502	SILT FENCE, TYPE MACHINE SLICED	LIN FT	10737
G	11	2573.512	TEMPORARY DITCH CHECK TYPE 3	LIN FT	350
G	11	2573.530	STORM DRAIN INLET PROTECTION	EACH	34
G,H	11	2575.501	SEEDING (P)	ACRE	11
H	11	2575.502	SEED MIXTURE 150 (P)	POUND	5
H	11	2575.502	SEED MIXTURE 250 (P)	POUND	717
K,L	122-125,12	2575.505	SODDING TYPE EROSION	SQ YD	72
H	11	2575.511	MULCH MATERIAL TYPE 1 (P)	TON	21
H	11	2575.519	DISK ANCHORING (P)	ACRE	9
G	11	2575.523	EROSION CONTROL BLANKETS CATEGORY 1 (P)	SQ YD	5000
H	11	2575.523	EROSION CONTROL BLANKETS CATEGORY 3 (P)	SQ YD	7929
G	11	2575.532	FERTILIZER TYPE 1 (P)	POUND	24
H	11	2575.532	FERTILIZER TYPE 3 (P)	POUND	3586
R	141	2580.601	INTERIM PAVEMENT MARKING	LUMP SUM	1
R	141	2581.603	REMOVABLE PREFORMED PLASTIC MASK (BLACK)	LIN FT	270
R	141	2582.502	4" SOLID LINE WHITE-PAINT	LIN FT	29305
R	141	2582.502	8" SOLID LINE WHITE-PAINT	LIN FT	1604
R	141	2582.502	4" BROKEN LINE WHITE-PAINT	LIN FT	6300
R	141	2582.502	4" SOLID LINE YELLOW-PAINT	LIN FT	36387
R	141	2582.502	4" SOLID LINE WHITE-POLY PREFORM	LIN FT	1350
S	160	2582.502	8" SOLID LINE WHITE-POLY PREFORM	LIN FT	799
S	160	2582.502	4" BROKEN LINE WHITE-POLY PREFORM	LIN FT	5020
S	160	2582.502	8" DOTTED LINE WHITE-POLY PREFORM	LIN FT	240
S	160	2582.502	8" SOLID LINE WHITE-POLY PREFORM (GROUND IN)	LIN FT	681
S	160	2582.502	4" BROKEN LINE WHITE-POLY PREFORM (GROUND IN)	LIN FT	250
S	160	2582.502	8" DOTTED LINE WHITE-POLY PREFORM (GROUND IN)	LIN FT	30
S	160	2582.502	4" SOLID LINE WHITE-EPOXY	LIN FT	13104
S	160	2582.502	4" SOLID LINE YELLOW-EPOXY	LIN FT	12804

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT.

### STANDARD PLATES ①

PLATE NO.	DESCRIPTION
3000L	REINFORCED CONCRETE PIPE (5 SHEETS)
3006G	GASKET JOINT FOR R.C. PIPE (2 SHEETS)
3007D	SHEAR REINFORCEMENT FOR PRECAST DRAINAGE STRUCTURES
3022C	PRECAST CONCRETE SAFETY APRON (3 SHEETS)
3100G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3133C	RIPRAP AT RCP OUTLETS
3145F	CONCRETE PIPE TIES
4000J	MANHOLE OR CATCH BASIN (MASONRY, FIELD CONSTRUCTED) - DESIGN A
4002F	MANHOLE OR CATCH BASIN (MASONRY, FIELD CONSTRUCTION) - DESIGN C
4005L	MANHOLE OR CATCH BASIN TYPE A & B CONE SECTIONS PRECAST - DESIGN F
4006L	MANHOLE OR CATCH BASIN PRECAST - DESIGNS G AND H
4010H	CONCRETE SHORT CONE & ADJUSTING RING (SECTIONAL CONCRETE)
4011E	PRECAST CONCRETE BASE
4020J	MANHOLE OR CATCH BASIN FOR USE WITH OR WITHOUT TRAFFIC LOADS (2 SHEETS)
4025B	DROP INLETS OR CATCH BASINS - DESIGN DI (CONCRETE & METAL)
4026A	CONCRETE ENCASED CONCRETE ADJUSTING RINGS
4101D	RING CASTING FOR MANHOLE OR CATCH BASIN
4110F	COVER CASTING FOR MANHOLE (FOR USE IN ALL TRAFFIC AREAS) * CASTING NO. 715 AND 716
4132F	CATCH BASIN FRAME CASTING (FOR SQUARE GRATE) - CASTING NO. 805
4143E	STOOL GRATE & CONCRETE FRAME (MEDIAN DRAINS) - CASTING NO. 731
4154B	CATCH BASIN GRATE CASTING - CASTING NO. 816
4180J	MANHOLE OR CATCH BASIN STEP
7100H	CONCRETE CURB AND GUTTER (DESIGN B AND DESIGN V)
7111J	INSTALLATION OF CATCH BASIN CASTINGS (CONCRETE CURB AND GUTTER)
8000I	STANDARD BARRICADES
8150C	INSTALLATION OF CULVERT MARKERS
8308A	REINFORCED CONCRETE MEDIAN BARRIER TYPE F (NON-GLARE SCREEN TYPE)
8318C	GUARDRAIL ANCHORAGE PLATE FOR BRIDGES AND BCT'S
8337B	TEMPORARY PORTABLE PRECAST CONCRETE BARRIER (TYPE "F") (2 SHEETS)
8338C	W-BEAM GUARDRAIL & END ANCHORAGES (STEEL POSTS) (4 SHEETS)
9102D	TURF ESTABLISHMENT AREAS (AT PIPE CULVERT ENDS)
9322K	CHAIN LINK FENCE (2 SHEETS)

- ① FOR ADDITIONAL STANDARD PLATES SEE SHEET NO. 170.
- ② IMPACT ATTENUATORS ARE TEMPORARY INSTALLATIONS.
- ③ IMPACT ATTENUATOR NO. 1 IS A PERMANENT INSTALLATION.

### ESTIMATED QUANTITIES AND STANDARD PLATES

DRAWN BY: HG      CHECKED BY: PAD      CERTIFIED BY: Peter Daniel LIC. NO. 45053 DATE 2/11/09      STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 6 OF 222 SHEETS

PLOTTED/REVISED: 12-FEB-2009 09:51

DISTRICT #: METRO  
 PLOT NAME: 021567\_1ba  
 PATH & FILENAME: S:\Design\01\021567\Final\021567\_1ba.dgn

A EARTHWORK TABULATION														
ALIGNMENT	LOCATION	EXCAVATION (EV)						EMBANKMENT (CV)						
		TOTAL	COMMON (1)			SUBGRADE	MUCK	SUITABLE GRADING (COMMON BORROW)	GRANULAR	SELECT GRANULAR	SELECT GRANULAR MODIFIED 10% (BRIDGE)	AGGREGATE BACKFILL (DITCH BLOCKS)	TOPSOIL	TOPSOIL BORROW MODIFIED (DITCH BLOCKS)
			INPLACE TOPSOIL (2)	SUITABLE GRADING (3)	RUBBLE (4)									
EB10 & WB10	STA. 370+35 - 445+70							5268				20	4405	32
EB10 & WB10	BRIDGE ABUTMENTS									4381	12527			
EB10 STAGE 1	STA. 375+14 - 441+00	8248	5646	1691	911	12769				10738				
EB10 STAGE 2 EB	STA. 375+14 - 435+93	1343	1056	113	174	2509				1659				
EB10 STAGE 2 WB	STA. 370+35 - 445+70	3160	1991	794	375	5325				3674				
NWALL1	STA. 66+00 - 69+25 =						233		207					
EB10	STA. 442+68 - 445+81													
NWALL1	STA. 75+00 - 78+81 =						221		196					
EB10	STA. 451+51 - 455+40													
PROJECT TOTALS		12751	8693	2598	1460	20603	454	5268	403	20452	12527	20	4405	32

B EARTHWORK BALANCE SUMMARY	
EXCAVATION (CU YD)	
COMMON EXCAVATION	12751 (EV) (1)
SUBGRADE EXCAVATION	20603 (EV)
MUCK EXCAVATION	454 (EV)
TOTAL EXCAVATION =	33354 (EV)
- TOPSOIL EXCAVATION	8693 (EV) (2)
- RUBBLE	1460 (EV) (4)
TOTAL EXCAVATION SUITABLE FOR EMBANKMENT =	23201 (EV) (3)
EMBANKMENT (CU YD)	
SELECT GRANULAR REQUIRED	20452 (CV)
SELECT GRANULAR AVAILABLE	0 (CV)
SELECT GRANULAR BORROW =	20452 (CV)
SELECT GRANULAR MODIFIED 10% REQUIRED	12527 (CV)
SELECT GRANULAR MODIFIED 10% AVAILABLE	0 (CV)
SELECT GRANULAR MODIFIED 10% BORROW =	12527 (CV)
SUITABLE GRADING MATERIAL REQUIRED	24602 (CV)
SUITABLE GRADING MATERIAL AVAILABLE	19334 (CV)
COMMON BORROW =	5268 (CV)
AGGREGATE BACKFILL REQUIRED	20 (CV)
AGGREGATE BACKFILL AVAILABLE	0 (CV)
AGGREGATE BACKFILL =	20 (CV)
TOPSOIL MODIFIED REQUIRED	32 (CV)
TOPSOIL MODIFIED AVAILABLE	0 (CV)
TOPSOIL BORROW MODIFIED =	32 (CV)
TOPSOIL REQUIRED	4405 (CV)
TOPSOIL AVAILABLE	4347 (CV)
TOPSOIL BORROW =	58 (CV) (5)

- NOTES:
- (1) INCLUDES ALL TOPSOIL EXCAVATION AND PAVEMENT 6" OR LESS IN DEPTH.
  - (2) CALCULATED AT AN AVERAGE DEPTH OF 0.5'.
  - (3) CONSISTS OF TOTAL EXCAVATION MINUS THE RUBBLE AND TOPSOIL QUANTITIES.
  - (4) CONSISTS OF BITUMINOUS SHOULDERS 6" OR LESS IN DEPTH.
  - (5) NO TOPSOIL SHALL BE REMOVED FROM THE PROJECT LIMITS. ALL TOPSOIL SHALL BE REUSED AND PLACED AS SLOPE DRESSING.

EARTHWORK TABULATION  
 EARTHWORK BALANCE SUMMARY

**TABULATIONS**

# SOILS AND CONSTRUCTION NOTES

1. US TH 10 PAVEMENT RATINGS:

REFERENCE POINTS (WB)	YEAR	PSR (RQI)	SR	REFERENCE POINTS (EB)	YEAR	PSR (RQI)	SR
229.000 - 230.000	2007	3.3	3.4	229.000 - 230.000	2007	3.1	3.4
230.000 - 230.433	2007	2.8	3.2	230.000 - 230.433	2007	3.3	3.5
230.433 - 231.000	2007	3.6	3.5	230.433 - 231.000	2007	3.3	3.5
231.000 - 232.000	2007	3.6	3.6	231.000 - 232.000	2007	3.5	3.5

PSR = PRESENT SERVICEABILITY RATING  
 RQI = RIDE QUALITY INDEX (PAVEMENT ROUGHNESS)  
 SR = SURFACE RATING (PAVEMENT DISTRESS)

2. TOP OF GRADING SUBGRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.
3. SUITABLE GRADING MATERIALS SHALL CONSIST OF ALL SOILS ENCOUNTERED EXCEPT TOPSOIL, DEBRIS, ORGANIC MATERIAL, AND OTHER UNSTABLE MATERIAL.
4. GRANULAR MATERIALS SHALL MEET THE REQUIREMENTS OF SPEC. 3149.2B1.
5. SELECT GRANULAR MATERIAL SHALL MEET REQUIREMENTS OF SPEC. 3149.2B2.
6. COMPACTION SUBCUT IS DEFINED AS SUITABLE GRADING MATERIAL EXCAVATED IN A SUBGRADE AND REUSED IN THE SUBGRADE AS DIRECTED BY THE ENGINEER TO ACHIEVE A UNIFORM MATERIAL LAYER IN THE ROADBED. WHEN THE SOILS ARE SO VARIED THAT SELECTION AND PLACEMENT OF UNIFORM SOILS IS NOT PRACTICAL, THE CONTRACTOR SHALL USE DISKS, PLOWS, GRADERS, OR OTHER EQUIPMENT TO BLEND AND MIX SUITABLE SOILS TO PRODUCE A UNIFORM SOIL TEXTURE, MOISTURE CONTENT, AND DENSITY.
7. LEAN MIX BACKFILL SHALL MEET THE REQUIREMENTS OF SPEC. 2520.
8. OBTAIN COMPACTION ON THE GRADING PORTION OF CONSTRUCTION IN ACCORDANCE WITH THE "SPECIFIED DENSITY METHOD" REQUIREMENTS.
9. OBTAIN COMPACTION ON 4 INCH OR GREATER AGGREGATE BASE LIFTS IN ACCORDANCE WITH THE "MODIFIED PENETRATION INDEX METHOD" REQUIREMENTS. THE TESTS SHALL BE PERFORMED IN ACCORDANCE WITH MNDOT SPEC. 2211.3C3. THIS WOULD INCLUDE ANY AREAS WHERE CRUSHED CONCRETE OR SALVAGED ASPHALT MAY BE USED FOR AGGREGATE BASE. FOR LIFTS OF LESS THAN 4 INCHES OBTAIN COMPACTION IN ACCORDANCE WITH QUALITY COMPACTION METHOD (MNDOT SPEC. 2211.3C2).
10. THE BOTTOM OF ALL SUBCUTS SHALL BE SHAPED AND COMPACTED BY THE "QUALITY COMPACTION METHOD".
11. STRIP ALL INPLACE TOPSOIL AND SLOPE DRESSING IN AREAS TO BE DISTURBED BY CONSTRUCTION AND REUSE AS SLOPE DRESSING. INPLACE TOPSOIL AND SLOPE DRESSING ENCOUNTERED IN THE AREAS OF PROPOSED CONSTRUCTION RANGED FROM 4.0 INCHES TO 12.0 INCHES DEEP WITH AN AVERAGE DEPTH OF 6 INCHES.
12. PROVIDE A SAWCUT WHERE PLACING NEW PAVEMENT NEXT TO INPLACE PAVEMENT TO ENSURE A UNIFORM JOINT.
13. ALL SALVAGED ROADWAY MATERIALS SUCH AS CONCRETE, BITUMINOUS, AND AGGREGATES MAY BE UTILIZED ACCORDING TO MN/DOT SPECIFICATIONS AND PROJECT SPECIAL PROVISIONS. MATERIALS NOT UTILIZED ON THIS PROJECT WILL BECOME THE PROPERTY OF THE CONTRACTOR AND DISPOSED OF OFF THE RIGHT OF WAY IN ACCORDANCE WITH MN/DOT SPECIFICATION 2104.3C3 AND AS AGREED UPON BY THE ENGINEER.
14. PROVIDE FOR 1.0 FOOT OF SELECT GRANULAR OVER A 1.0 FOOT COMPACTION SUBCUT FOR UNIFORMITY AND COMPACTION ON MAINLINE, INSIDE SHOULDER, AND RAMP WIDENING CONSTRUCTION, EXCEPT ON EASTBOUND AND WESTBOUND THIRD LANE CONSTRUCTION FROM STA.394 TO STA.397 PROVIDE FOR A 2.0 FOOT SUBGRADE BACK FILLED WITH SELECT GRANULAR.
15. TEST ROLLING WILL NOT BE REQUIRED.
16. IN THE PROPOSED CONSTRUCTION, THE CONTRACTOR SHOULD STRIVE TO SUBSTANTIALLY MATCH THE SOILS AND LAYERS INPLACE IN THE UPPER 4' OF THE ROADWAYS. GRANULAR BACKFILL SHALL NOT BE PERMITTED ADJACENT TO INPLACE NON-GRANULAR SOILS IN ORDER TO PREVENT AN ABRUPT SOILS DIFFERENTIAL.
17. IN ANY CASE WHERE GRANULAR EMBANKMENTS OR BACKFILL JOIN NON-GRANULAR SOIL EMBANKMENTS OR BACKFILL, PROVIDE A 1(V):20(H) TRANSITION TAPER BETWEEN THE CHANGES IN MATERIAL TO PREVENT AN ABRUPT SOILS DIFFERENTIAL. THE 1(V):20(H) TAPER SHALL BE CONSTRUCTED SO THAT THE GRANULAR BACKFILL MATERIAL OVERLAYS THE ADJACENT NON-GRANULAR SOIL BACKFILL.

18. WHERE CONNECTING NEW SURFACING ADJACENT TO ANY INPLACE PAVEMENTS TO BE WIDENED, CUT VERTICALLY TO THE BOTTOM OF THE INPLACE SURFACING OR TO THE BOTTOM OF THE NEW SURFACING DESIGN, WHICHEVER IS DEEPER, THEN AT A 2(V):1(H) SLOPE TO THE BOTTOM OF THE RECOMMENDED SUBGRADE EXCAVATION.
19. AS A PRECAUTIONARY MEASURE FROM A SOILS STANDPOINT, TRAFFIC LANES TO BE USED DURING CONSTRUCTION MUST BE DELINEATED TO KEEP VEHICLES A SAFE DISTANCE AWAY FROM THE ADJACENT EXCAVATION. THE DELINEATION SHOULD COINCIDE WITH POINTS ESTABLISHED BY PROJECTING 1(V):2(H) OR GREATER (FLATTER) SLOPE BETWEEN THE EDGE OF THE TRAFFIC SURFACE AND THE BOTTOM OF THE EXCAVATION.
20. THE CONTRACTOR MAY SUBSTITUTE, AT NO COST TO MN/DOT, THE AGGREGATE SHOULDERING CLASS 2 WITH AGGREGATE SHOULDERING CLASS 1 MODIFIED. THE AGGREGATE SHOULDERING CLASS 1 MODIFIED SHALL BE MODIFIED TO CONTAIN 40%-60% (BY WEIGHT) SALVAGED BITUMINOUS OR CONCRETE AGGREGATE. THE CRUSHED CONCRETE AND/OR BITUMINOUS SHALL BE BLENDED INTO A HOMOGENEOUS COMPOSITE MIXTURE. THE GRADATION OF THE COMPOSITE MIXTURE SHALL MEET THE GRADATION REQUIREMENTS OF THE CLASS 2 AGGREGATE, MN/DOT SPEC. 3138.
21. THE CONTRACTOR IS HEREBY REMINDED OF HIS RESPONSIBILITY UNDER STATE LAW TO CONTACT ALL UTILITIES THAT MAY HAVE FACILITIES IN THE AREA. CONTACT MUST BE MADE THROUGH GOPHER STATE ONE-CALL.
22. AFTER MILLING THE PAVEMENT TO THE REQUIRED DEPTH AND PRIOR TO OVERLAYING, AIR BLAST ANY DETERIORATED CRACKS AND JOINTS TO REMOVE LOOSE OR DETERIORATED BITUMINOUS SURFACING. THE AIR BLASTING SHALL BE DONE WITH HIGH-PRESSURE (100+ PSI) EQUIPMENT. REMOVAL OF AREAS THAT THE MILLING MACHINE WAS NOT ABLE TO GET TO, MAY REQUIRE THE USE OF A SMALL MILLING MACHINE OR HAND WORK, IN ADDITION TO HIGH PRESSURE AIR BLASTING AT SOME LOCATIONS AS DIRECTED BY THE ENGINEER. PAYMENT FOR THIS WORK SHALL BE MADE UNDER SPECIFICATION 2232.
23. DEPRESSIONS RESULTING AFTER AIR BLASTING, SWEEPING OR MILLING OPERATIONS, WHICH ARE GREATER THAN 2" IN DEPTH AND 4" IN WIDTH AND JOINTS AND CRACKS THAT ARE GREATER THAN 1.5" IN DEPTH AND WIDTH, SHALL BE PATCHED WITH BITUMINOUS PATCHING MIXTURE AS DIRECTED BY THE ENGINEER. PATCHING OF THESE AREAS SHALL BE DONE AHEAD OF THE PAVING OPERATION AND COMPACTED WITH A SMALL VIBRATORY OR PNEUMATIC ROLLER. DEPRESSIONS OF LESSER DIMENSIONS SHALL BE FILLED WITH THE WEAR COURSE MIXTURE. PAYMENT FOR THIS WORK SHALL BE MADE UNDER SPECIFICATION 2231.
24. THE CONTRACTOR SHALL PROVIDE OUTLET TRENCHES AND TAKE MEASURES NECESSARY, AS DIRECTED BY THE ENGINEER, TO ALLOW SURFACE DRAINAGE OF THE MILLED SURFACE. PAYMENT FOR MILLING AND PATCHING THE OUTLET TRENCHES SHALL BE MADE UNDER SPECIFICATION 2231.
25. THE TH 10 REHABILITATION AND NEW CONSTRUCTION WORK OF THE BITUMINOUS DRIVING LANES, SHALL COMPLY WITH THE PAVEMENT SMOOTHNESS SPECIFICATION - IRI EQUATION B. THE REMAINDER OF THE BITUMINOUS PAVING ASSOCIATED WITH THE PROJECT SHALL ONLY NEED TO MEET THE REQUIREMENTS OF 2360.7 B (SURFACE REQUIREMENTS).
26. ALL TRASH AND DEBRIS ENCOUNTERED WITHIN THE PROJECT LIMITS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE RECYCLED OR DISPOSED OF OUTSIDE THE RIGHT OF WAY IN ACCORDANCE WITH SPEC. 2104.3C. THIS WORK SHALL BE INCIDENTAL UNLESS OTHERWISE IDENTIFIED AS BID ITEM WORK.
27. WHEN REMOVING BITUMINOUS, FULL-DEPTH SAWCUTS SHOULD BE MADE PERPENDICULAR TO THE ROADWAY CENTERLINE AND ALONG EXISTING LONGITUDINAL PAVEMENT JOINTS.
28. SLOPE DRESSING IS DEFINED AS THE TOPSOIL OR OTHER SOIL PLACED DURING PRIOR CONSTRUCTION TO PROVIDE A MEDIUM FOR ESTABLISHING TURF.
29. THE TOP OF BACKSLOPES AND THE TOE OF FILL SLOPES SHALL BE ROUNDED TO NATURALIZE THE CONSTRUCTION AS SHOWN ON SHEET NO. 36. EVEN THOUGH THE CROSS SECTIONS SHOW NO SUCH ROUNDING.
30. DITCH BLOCK DETAIL AND PROPOSED LOCATIONS ARE PROVIDED ON SHEETS NO. 128, 118-119.
31. BITUMINOUS MILLINGS SHALL BE PLACED NEAR THE CREEK MEADOW DRIVE OVERPASS AND RAILROAD UNDERPASS AS NOTED IN THE CONSTRUCTION PLAN TO PREVENT THE GROWTH OF VEGETATION IN AREAS THAT ARE DIFFICULT TO ACCESS. THIS WORK SHALL BE CONSIDERED INCIDENTAL, AND MILLINGS NOT USED FOR THIS PURPOSE SHALL BECOME THE PROPERTY OF THE CONTRACTOR.

DISTRICT #: METRO  
 PLOT NAME: 67\_scn  
 PATH & FILENAME: S:\Design\0215\067\Final\021567\_scn.dgn  
 PLOTTED/REVISED: 11-FEB-2009 08:52



PLOTTED/REVISED: 12-FEB-2009 09:51

DISTRICT #: METRO  
 PLOT NAME: 67.tbl  
 PATH & FILENAME: S:\Design\01\0215\067\Final\021567.tbl.dgn

REMOVALS														
STATION TO STATION	LOCATION	REMOVE BITUMINOUS PAVEMENT ①	REMOVE BITUMINOUS SHOULDER PAVEMENT ②	REMOVE GUARD RAIL-PLATE BEAM	REMOVE ECCENTRIC LOADER BCT	REMOVE ANCHORAGE ASSEMBLY-PLATE BEAM	REMOVE CURB AND GUTTER	REMOVE CHAIN LINK FENCE	REMOVE SEWER PIPE (STORM)	REMOVE DRAINAGE STRUCTURE	REMOVE CONCRETE APRON	REMOVE METAL APRON	REMOVE CASTING	REMOVE PIEZOMETER ④
		SQ YD	SQ YD	LIN FT	EACH	EACH	LIN FT	LIN FT	LIN FT	EACH	EACH	EACH	EACH	EACH
<b>EB10</b>														
375+13 TO 423+53	0' LT TO 25' LT	663					28							
375+63 TO 387+83	12' RT TO 35' RT	693	154											
381+02	30' LT TO 44' LT								6		1			
390+93	34' LT										1			
392+25 TO 393+99	34' LT TO 50' LT			358		2								
401+68	42' LT												1	
410+75	42' LT												1	
412+94 TO 423+69	0' RT TO 27' RT	479	1023	1036	1		1026							
413+46 TO 413+97	20' RT TO 94' RT								129	2	2			
415+50 TO 423+11	31' LT TO 41' LT	③ 594												
421+75 TO 423+37	16' LT TO 67' LT			284		1								
422+43 TO 424+70	161' LT TO 89' RT								338		2			
423+19 TO 423+22	14' LT TO 115' RT								129		2			
423+40 TO 425+56	144' LT TO 79' RT								310		2			
424+53 TO 424+64	36' RT TO 92' RT								57		2	2		
424+55 TO 426+21	16' LT TO 66' LT			285		1								
425+12 TO 437+92	0' LT TO 35' LT	1068					45							
425+27 TO 435+93	0' RT TO 70' RT	1207	1000				15	98						
425+52 TO 436+00	28' LT TO 41' LT	③ 690												
434+91 TO 434+91	32' LT TO 42' LT								10		1			
452+53	104' RT													1
<b>WB10</b>														
370+34 TO 387+53	0' LT TO 46' LT	1061	1121											
375+53 TO 422+85	0' RT TO 27' RT	851					56							
415+70 TO 422+45	28' RT TO 41' RT	③ 399												
419+95 TO 422+71	0' LT TO 23' LT	377	227				28							
422+36 TO 422+37	14' RT TO 77' LT								91	2				
423+98 TO 445+70	90' LT TO 0' LT	1877	2260	102	1		44	82						
424+44 TO 437+43	0' RT TO 16' RT	1411					15							
424+86 TO 441+20	16' RT TO 41' RT	③ 1366												
<b>TOTALS</b>		<b>12736</b>	<b>5785</b>	<b>2065</b>	<b>2</b>	<b>4</b>	<b>1257</b>	<b>180</b>	<b>1070</b>	<b>4</b>	<b>13</b>	<b>2</b>	<b>2</b>	<b>1</b>

- ① CONSISTS OF BITUMINOUS PAVEMENT AN AVERAGE OF 10" THICK.
- ② CONSISTS OF BITUMINOUS PAVEMENT AN AVERAGE OF 8" THICK.
- ③ TEMPORARY WIDENING REMOVAL.
- ④ INCLUDES 22' OF PIPE CASING AND 3 GUARD POSTS.

REMOVALS

**TABULATIONS**

PLOTTED/REVISED: IFEB-2009 08:52

DISTRICT #: METRO  
 IPLOT NAME: 67\_1b2  
 PATH & FILENAME: S:\Design\010215\06\Final\021567\_1b1.dgn

E MILLING, AGGREGATE AND BITUMINOUS							
STATION TO STATION	LOCATION	MILL BITUMINOUS SURFACE 1.5" SQ YD	AGGREGATE SHOULDERING SPEC. 2221 CLASS 2 CU YD	AGGREGATE BASE SPEC. 2211 CLASS 5 CU YD	BITUMINOUS MIXTURES (7)(9) SPEC. 2360		REMARKS
					TYPE SP 12.5 WEARING (SPWB540H) TON	TYPE SP 12.5 NON WEARING (SPNWB530B) TON	
EB10							
375+13 TO 420+00	18' LT TO 24' RT	13330			2448		(1)
375+13 TO 423+11	12' LT TO 24' LT			667	1357	2458	(2)
375+13 TO 412+50	24' LT TO 34' LT		237	1462	472		(3)
375+13 TO 387+83	12' RT TO 30' RT		35	116	272	230	(4)
387+83 TO 413+22	14' RT TO 22' RT		71		191		(5)
412+50 TO 423+11	24' LT TO 39' LT			388	291		(6)
413+22 TO 423+11	12' RT TO 22' RT		1	387	200	163	(4)
415+50 TO 423+11	32' LT TO 41' LT			62	156		(8)
420+00 TO 420+52	12' LT TO 12' RT	139					(11)
420+00 TO 423+11	12' LT TO 12' RT				187	373	(12)
425+52 TO 430+75	12' LT TO 12' RT			155	315	571	(13)
425+52 TO 435+93	12' RT TO 22' RT		28	296	263	221	(4)
425+52 TO 437+33	32' LT TO 41' LT			129	212		(8)
425+52 TO 437+92	12' LT TO 39' LT		81	629	784	776	(2)(6)
430+75 TO 432+50	12' LT TO 12' RT				106	99	(12)
432+24 TO 432+50	12' LT TO 12' RT	68					(14)
432+50 TO 435+93	12' LT TO 12' RT	916			169		(1)
WB10							
370+34 TO 387+53	0' LT TO 42' LT		48		718	874	(4)(15)
375+53 TO 419+95	14' LT TO 18' RT	11800			2167		(1)
375+53 TO 422+45	12' RT TO 24' RT		292	651	1325	2401	(2)
375+53 TO 412+45	24' RT TO 28' RT			1447	412		(3)
387+53 TO 419+95	14' LT TO 22' LT		90		244		(5)
412+45 TO 422+45	24' RT TO 39' RT			383	147		(6)
413+45 TO 422+45	28' RT TO 41' RT			45	241		(8)
419+95 TO 421+62	12' LT TO 12' RT	194					(11)
419+95 TO 422+45	12' LT TO 12' RT				150	103	(12)
419+95 TO 421+40	12' LT TO 22' LT		6		37	26	(16)
421+40 TO 422+45	12' LT TO 22' LT			41	25	47	(4)
424+86 TO 431+00	22' LT TO 39' RT		54	755	810	1138	(2)(4)(13)
424+86 TO 441+20	16' RT TO 41' RT			251	625		(8)
431+00 TO 433+23	12' LT TO 12' RT				101	63	(12)
431+00 TO 437+43	12' RT TO 22' RT		48	276	182	176	(2)(6)
431+00 TO 445+70	6' LT TO 34' LT		41	291	818	1118	(4)(15)
432+39 TO 433+23	12' LT TO 12' RT	167					(14)
433+23 TO 437+43	12' LT TO 9' RT	840			154		(1)
<b>TOTALS</b>		<b>27454</b>	<b>1032</b>	<b>8431</b>	<b>15579</b>	<b>10837</b>	

- ① MILL & OVERLAY.
- ② INSIDE DRIVING LANE CONSTRUCTION.
- ③ INSIDE SHOULDER CONSTRUCTION (4" THICK).
- ④ OUTSIDE (BUS) SHOULDER CONSTRUCTION.
- ⑤ SHOULDER OVERLAY.
- ⑥ INSIDE SHOULDER CONSTRUCTION (5" THICK).
- ⑦ 1/4" EXTRA COMPUTED FOR FIRST LIFT.
- ⑧ TEMPORARY WIDENING.
- ⑨ TACK COAT SHALL BE CONSIDERED INCIDENTAL.

D SAWCUTS			
STATION TO STATION	LOCATION	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	SAWING CONCRETE PAVEMENT (FULL DEPTH)
		LIN FT	LIN FT
STAGE 1			
EB10			
375+13 TO 423+40	LT	4842	
423+40 TO 425+13	LT		173
425+13 TO 437+92	LT	1305	
WB10			
375+53 TO 422+84	RT	4761	
422+84 TO 424+58	RT		173
424+58 TO 441+20	RT	1680	
STAGE 2			
EB10			
374+28 TO 387+83	RT	1368	
413+22 TO 423+69	RT & LT	1081	
424+87 TO 435+93	LT & RT	1141	
WB10			
370+34 TO 387+53	LT	1783	
419+95 TO 423+12	LT & RT	209	
424+31 TO 445+70	RT & LT	2176	
STAGE 3			
EB10			
415+50 TO 423+11	LT	765	
425+52 TO 436+00	LT	1052	
WB10			
415+70 TO 422+45	RT	677	
424+86 TO 441+20	RT	1641	
<b>TOTALS</b>		<b>24481</b>	<b>346</b>

- ⑩ EXISTING BRIDGE DECK, MIN. 6.5" THICK.
- ⑪ TAPER MILLING FROM 1-1/2" TO 0".
- ⑫ MAINLINE VARIABLE DEPTH OVERLAY.
- ⑬ MAINLINE RECONSTRUCTION.
- ⑭ TAPER MILLING FROM 0" TO 1-1/2".
- ⑮ OUTSIDE DRIVING LANE CONSTRUCTION.
- ⑯ SHOULDER VARIABLE DEPTH OVERLAY.

SAWCUTS  
 MILLING, AGGREGATE AND BITUMINOUS

**TABULATIONS**

PLOTTED/REVISED: 17-FEB-2009 08:43

F CONCRETE CURB AND GUTTER, WALK AND MEDIAN BARRIER								
STATION TO STATION	LOCATION	CONCRETE CURB AND GUTTER DESIGN B424	CONCRETE CURB AND GUTTER DESIGN D424	CONCRETE CURB AND GUTTER DESIGN SPECIAL (7)	CONC. MEDIAN BARRIER DESIGN 8308 TYPE A	CONC. MEDIAN BARRIER DESIGN 8308 TYPE A STEPPED	CONC. MEDIAN BARRIER DESIGN 8308 TYPE A-A STEPPED	3" CONCRETE WALK
		LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	LIN FT	SQ FT
EB10								
407+05 TO 423+11	LT		1607					
413+42 TO 423+11	RT	911		56				
425+52 TO 425+89	RT	37						
425+52 TO 425+92	LT	40						
WB10								
422+01 TO 422+45	RT	44						
422+09 TO 422+45	LT	22		14				
422+45 TO 423+40	RT				30	36	57	6
424+56 TO 425+52	LT				30	36	57	6
425+86 TO 425+08	LT	22						
425+86 TO 425+87	RT	102						
<b>TOTALS</b>		<b>1178</b>	<b>1607</b>	<b>70</b>	<b>60</b>	<b>72</b>	<b>114</b>	<b>12</b>

N TRAFFIC BARRIER								
STATION TO STATION	LOCATION	TRAFFIC BARRIER DESIGN B8338	TRAFFIC BARRIER DESIGN BULLNOSE	TRAFFIC BARRIER DESIGN SPECIAL	ANCHORAGE ASSEMBLY-PLATE BEAM	END TREATMENT-TANGENT TERMINAL (1)	T-BARRIER BRIDGE CONNECTION DESIGN 8318	IMPACT ATTENUATOR NO. 1 (6)
		LIN FT	LIN FT	LIN FT	EACH	EACH	EACH	ASSEMBLY (6)
EB10								
392+09 TO 394+15	LT (MEDIAN)	225.0	201.0					
412+56 TO 424+06	RT	1075.0		25		1		
420+08 TO 422+83	LT	200.0		25		1		
425+25 TO 426+12	RT	100.0			1		1	
WB10								
420+58 TO 422+45	RT	187.5			1		1	
421+73 TO 422+72	LT	100.0			1		1	
423+91 TO 426+79	LT	212.5		25		1		
425+52 TO 426+02	RT							1
<b>TOTALS</b>		<b>2100.0</b>	<b>201.0</b>	<b>75</b>	<b>3</b>	<b>3</b>	<b>3</b>	<b>1</b>

G TEMPORARY TURF ESTABLISHMENT AND EROSION CONTROL									
STATION TO STATION	LOCATION	SILT FENCE TYPE MACHINE SLICED	SILT FENCE TYPE HEAVY DUTY	SEEDING (8)	SEED MIXTURE TYPE 150 (8,9)	FERTILIZER TYPE 1 (8,10)	EROSION CONTROL (8) BLANKETS CATEGORY 1	STORM DRAIN INLET PROTECTION	TEMPORARY DITCH CHECK TYPE 3
		LIN FT	LIN FT	ACRE	POUND	POUND	SQ YD	EACH	LIN FT
EB10									
375+13 TO 392+30	RT	1289						2	
377+00 TO 423+10	LT							13	140
400+00 TO 424+55	RT	1451	1082					10	
425+00 TO 426+90	RT		458					1	140
426+50 TO 437+50	LT							1	140
431+30 TO 436+20	RT	493							
448+40 TO 454+65	RT								70
VARIOUS LOCATIONS	LT & RT			0.06	2.4	12	2500		
WB10									
370+35 TO 412+50	LT	2820						3	
419+75 TO 423+40	LT & RT	323						4	
423+75 TO 445+70	LT	2286						1	
VARIOUS LOCATIONS	LT & RT			0.06	2.4	12	2500		
NWALL1									
50+00 TO 70+73	RT	2075							
<b>TOTALS</b>		<b>10737</b>	<b>1540</b>	<b>0.12</b>	<b>4.8</b>	<b>24</b>	<b>5000</b>	<b>34</b>	<b>350</b>

H PERMANENT TURF ESTABLISHMENT AND EROSION CONTROL								
STATION TO STATION	LOCATION	SEEDING (2)	SUBSOILING	SEED MIXTURE TYPE 250 (3)	FERTILIZER TYPE 3 (4)	MULCH MATERIAL TYPE 1 (5)	EROSION CONTROL BLANKETS CATEGORY 3	DISK ANCHORING
		ACRE	ACRE	POUND	POUND	TON	SQ YD	ACRE
EB10								
375+13 TO 400+60	RT	0.30	0.30	21	105	0.6	111	0.28
375+13 TO 420+50	LT	1.82	1.82	127	637	3.6		1.82
413+22 TO 424+68	RT	0.77	0.77	54	270	1.5	2798	0.19
425+00 TO 455+50	RT	4.45	4.45	312	1558	8.9	2110	4.01
426+28 TO 437+92	LT	0.67	0.67	47	235	1.3		0.67
WB10								
370+34 TO 392+19	LT	0.52	0.52	36	182	1.0	118	0.50
420+25 TO 423+03	LT	0.23	0.23	16	81	0.5	591	0.11
423+23 TO 445+70	LT	1.48	1.48	104	518	3.0	2201	1.03
<b>TOTALS</b>		<b>10.24</b>	<b>10.24</b>	<b>717</b>	<b>3586</b>	<b>20.4</b>	<b>7929</b>	<b>8.61</b>

- ① APPROVED TANGENT TERMINALS ARE ET-2000 PLUS AND SKT 350. FOR DETAILS SEE SHEETS NO. 51-52.
- ② SEED ALL DISTURBED AREAS. SEEDING COMPUTED AT 10% ABOVE ACTUAL ESTIMATED AREAS.
- ③ APPLY AT THE RATE OF 70 LBS/ACRE.
- ④ ANALYSIS 22-5-10. FERTILIZE WITH TYPE 3 FERTILIZER AT THE RATE OF 350 LBS/ACRE.
- ⑤ APPLY AT THE RATE OF 2 TONS/ACRE.

- ⑥ USE CAT SYSTEM.
- ⑦ FOR DETAIL SEE SHEET NO. 53.
- ⑧ FOR TEMPORARY USE AS DIRECTED BY THE ENGINEER.
- ⑨ APPLY AT THE RATE OF 40 LBS/ACRE.
- ⑩ ANALYSIS 10-10-20. FERTILIZE WITH TYPE 1 FERTILIZER AT THE RATE OF 100 LBS/ACRE.

CONCRETE CURB AND GUTTER, WALK AND MEDIAN BARRIER  
 TRAFFIC BARRIER  
 TEMPORARY TURF ESTABLISHMENT AND EROSION CONTROL  
 PERMANENT TURF ESTABLISHMENT AND EROSION CONTROL

**TABULATIONS**

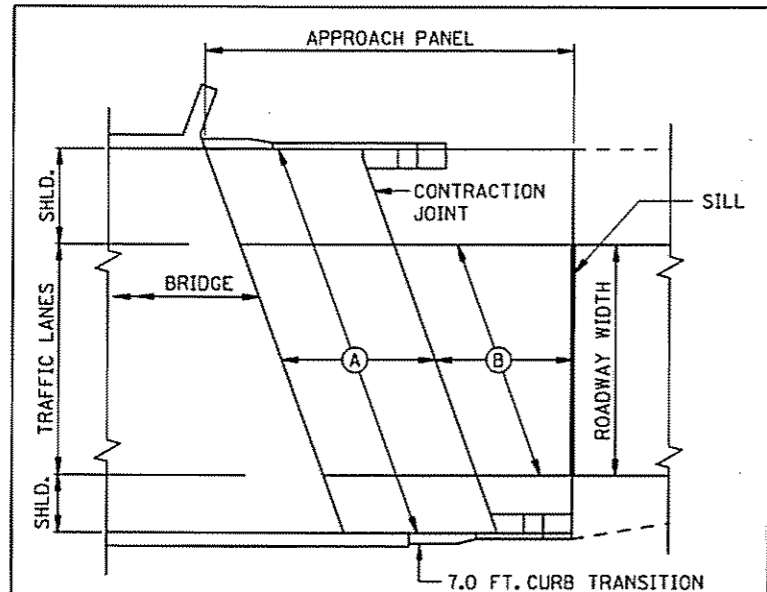
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 PLOT NAME: 67\_1b3  
 PATH & FILENAME: S:\Design\0215\067\Final\021567\_1b1.dgn

PLOTTED/REVISED: 11-FEB-2009 08:52

DISTRICT #: METRO  
 PLOT NAME: 67\_104  
 PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_1b1.dgn

P BRIDGE APPROACH PANELS		
LOCATION	OFFSET	BRIDGE APPROACH PANELS
		SQ YD
EB10		
423+11.42 TO 424+04.27	24.00 RT TO 40.63 LT	438
424+59.16 TO 425.52.01	24.00 RT TO 40.63 LT	438
WB10		
422+44.93 TO 423+37.78	40.63 RT TO 24.00 LT	438
423+92.67 TO 424+85.52	40.63 RT TO 24.00 LT	438
TOTALS		1752

Q FENCING			
STATION TO STATION	LOCATION	WIRE FENCE DESIGN	METAL BRACE ASSEMBLY
		60V-9322 LIN FT	EACH
EB10			
425+25 TO 426+25	26' RT TO 70' RT	110	2
WB10			
423+91 TO 423+98	26' LT TO 90' LT	80	2
TOTALS		190	4



**REINFORCING BAR REQUIREMENTS**

REBAR REQUIREMENTS FOR BRIDGE APPROACH PANELS	
(A) BRIDGE TO CONTRACTION JOINT	48.5 LB./SQ.YD. PLUS 3 EXTRA NO.16 BARS FOR EXPANSION JOINT. (IF NEEDED)
(B) CONTRACTION JOINT TO END OF APPROACH PANEL	30.8 LB./SQ.YD.
7.0 FT. CURB TRANSITION	20.1 LB./EACH
SILL (IF REQUIRED)	13.6 LB./LIN.FT.

ANY DOWEL BARS REQUIRED ARE NOT INCLUDED IN THE TABLE ABOVE. QUANTITIES LISTED ABOVE ARE FOR INFORMATIONAL PURPOSES. ANY ADDITIONAL MINOR ITEMS AND SLIGHT CHANGES IN QUANTITIES REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

L DRAINAGE SUMMARY							
ITEM DESCRIPTION	UNIT	SHEET NO.				PLASTIC ALT.	TOTAL
		122	123	124	125		
18" RC PIPE APRON	EACH				1		1
24" RC PIPE APRON	EACH				4		4
30" RC PIPE APRON	EACH			1			1
18" RC SAFETY APRON	EACH	3					3
12" RC PIPE SEWER DESIGN 3006	LIN FT	116	1308	501		6	1925
15" RC PIPE SEWER DESIGN 3006	LIN FT	282				282	282
15" RC PIPE SEWER DESIGN 3006 CLASS III	LIN FT			403		403	403
18" RC PIPE SEWER DESIGN 3006	LIN FT	17					17
18" RC PIPE SEWER DESIGN 3006 CLASS III	LIN FT			403	18	403	421
24" RC PIPE SEWER DESIGN 3006 CLASS III	LIN FT			174	755	174	929
30" RC PIPE SEWER DESIGN 3006	LIN FT			28			28
CONSTRUCT DRAINAGE STRUCTURE DESIGN A OR F	LIN FT		7.1	42.1	18.2		67.4
CONSTRUCT DRAINAGE STRUCTURE DESIGN C OR G	LIN FT	22.8	17.4	8.6			48.8
CONSTRUCT DRAINAGE STRUCTURE DESIGN 60-4020	LIN FT	7.2					7.2
CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL (1)	EACH			1			1
CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL I (2)	EACH		4				4
CASTING ASSEMBLY	EACH	7	9	6	1		23
CONNECT INTO EXISTING DRAINAGE STRUCTURE	EACH	1	1				2
CONNECT INTO EXISTING STORM SEWER	EACH	3					3
RANDOM RIPRAP CLASS II	CU YD			7.3	16.6		23.9
GEOTEXTILE FILTER TYPE III	SQ YD			22.2	8.4		30.6
GUIDE POST TYPE B	EACH	3		1	5		9
SODDING TYPE EROSION	SQ YD	36			36		72

(1) FOR DETAIL SEE SHEET NO. 126.  
 (2) FOR DETAIL SEE SHEET NO. 127.

M CASTING ASSEMBLY			
ASSEMBLY	ASSEMBLIES REQUIRED	CASTING NO.	STANDARD PLATE NO.
B-9	14	FRAME CASTING NO. 805	4132
		GRATE CASTING NO. 816	4154
A-7D	4	RING CASTING NO. 700-7	4101
		COVER CASTING NO. 715	4110
M-11	5	FRAME AND GRATE CASTING NO. 731	4143
<b>TOTAL</b>	<b>23</b>		

BRIDGE APPROACH PANELS  
 FENCING  
 DRAINAGE SUMMARY  
 CASTING ASSEMBLY

**TABULATIONS**

PLOTTED/REVISED: 17-FEB-2009 08:43

DISTRICT #: METRO  
 PLOT NAME: 67TBU  
 PATH & FILENAME: S:\Design\0102015\06\Final\021567.tbl.dgn

I UTILITIES TABULATION - POWER							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	ADJUST	RELOCATE	LEAVE AS IS	OWNER
377+19	EB10	201L	EP			X	CONNEXUS
377+19 - 380+99	EB10	201L - 353R	EDH			X	CONNEXUS
380+99	EB10	353R	EP			X	CONNEXUS
377+84	EB10	68R	EMTR			X	CONNEXUS
377+84 - 377+96	EB10	68R - 66R	ELIN			X	CONNEXUS
377+96 - 377+98	EB10	66R - 38R	ELIN			X	CONNEXUS
377+98 - 377+90	EB10	38R - 105L	ELIN			X	CONNEXUS
377+90 - 377+93	EB10	105L - 155L	ELIN			X	CONNEXUS
377+96 - 378+20	EB10	154L - 109L	ELIN			X	CONNEXUS
378+20 - 379+16	EB10	109L - 38R	ELIN			X	CONNEXUS
379+16 - 379+45	EB10	38R - 79R	ELIN			X	CONNEXUS
391+85 - 391+87	EB10	84R - 29R	ELIN			X	CONNEXUS
391+87 - 392+04	EB10	29R - 110L	ELIN			X	CONNEXUS
392+04 - 392+11	EB10	110L - 183L	ELIN			X	CONNEXUS
402+30	WB10	36L	EP			X	MNDOT
420+71	EB10	195L	ETOW			X	XCEL
420+71 - 424+55	EB10	195L - 197R	EOH (1)			X	XCEL
421+02	EB10	224L	ETOW			X	XCEL
421+02 - 424+78	EB10	224L - 159R	EOH (1)			X	XCEL

GENERAL NOTES:

- ALL UTILITY WORK SHOWN ON THESE SHEETS SHALL BE DONE BY OTHERS UNLESS NOTED.
- ALL RELOCATES AND ADJUSTMENTS SUBJECT TO MN/DOT RIGHT OF WAY.
- PRIOR TO ANY EXCAVATION WORK, THE CONTRACTOR IS HEREBY REMINDED OF HIS RESPONSIBILITY TO CONTACT ALL UTILITIES THAT MAY HAVE FACILITIES IN THE PROJECT AREA. CONTACT MUST BE MADE THROUGH GOPHER STATE ONE-CALL.
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

OWNERSHIP	
THE FOLLOWING LIST SHOWS THE UTILITY COMPANIES INVOLVED ON THIS PROJECT:	
ACCESS	= ACCESS COMMUNICATIONS, INCORPORATED
CONNEXUS	= CONNEXUS ENERGY
COONRPDS	= CITY OF COON RAPIDS
CTRPT	= CENTERPOINT ENERGY MINNESOTA GAS
MCES	= METROPOLITAN COUNCIL, ENVIRONMENTAL SERVICES
MNDOT	= MINNESOTA DEPARTMENT OF TRANSPORTATION
NNG	= NORTHERN NATURAL GAS COMPANY
XCEL	= XCEL ENERGY

I UTILITIES TABULATION - SANITARY SEWER							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	ADJUST	RELOCATE	LEAVE AS IS	OWNER
409+79	EB10	180L	SMH			X	MCES
409+79 - 410+07	EB10	180L - 169L	SLIN			X	MCES
410+07	EB10	169L	SMH			X	MCES
410+07 - 412+62	EB10	169L - 104R	SLIN			X	MCES
412+62	EB10	104R	SMH			X	MCES
434+62	EB10	261R	SMH			X	COONRPDS
435+07	EB10	218R	SMH			X	COONRPDS
437+43	EB10	224R	SMH			X	COONRPDS
438+15	EB10	218R	SMH			X	COONRPDS
439+24	EB10	217R	SMH			X	COONRPDS

UTILITY CODES	
APR	= APRON
CMP	= CORRUGATED METAL PIPE
CPED	= COMMUNICATIONS PEDESTAL
CPP	= CORRUGATED PLASTIC PIPE
CVLT	= COMMUNICATIONS VAULT
DI	= DROP INLET
EHH	= ELECTRIC HANDHOLE
ELIN	= ELECTRIC LINE
EMTR	= ELECTRIC METER
END	= PIPE END
EOH	= OVERHEAD ELECTRIC LINE
EP	= ELECTRIC POLE
EPED	= ELECTRIC PEDESTAL
ETOW	= ELECTRIC TOWER
FO	= FIBER OPTIC LINE
GLIN	= GAS LINE
HYD	= FIRE HYDRANT
RCP	= REINFORCED CONCRETE PIPE
RCPA	= REINFORCED CONCRETE PIPE ARCH
SLIN	= SANITARY LINE
SMH	= SANITARY MANHOLE
STLN	= STORM LINE
STMH	= STORM MANHOLE
TLIN	= TELEPHONE LINE
TPED	= TELEPHONE PEDESTAL
UTSW	= UNDERGROUND TRAFFIC SIGNAL WIRE
WLIN	= WATER LINE
WVLY	= WATER VALVE

I UTILITIES TABULATION - GAS							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	ADJUST	RELOCATE	LEAVE AS IS	OWNER
370+25 - 373+11	EB10	83R - 94L	GLIN			X	CTRPT
373+11 - 373+43	EB10	94L - 149L	GLIN			X	CTRPT
373+43 - 373+58	EB10	149L - 174L	GLIN			X	CTRPT
412+83 - 412+86	EB10	91R - 49R	GLIN			X	CTRPT
412+86 - 412+93	EB10	49R - 184L	GLIN			X	CTRPT
418+15 - 427+37	EB10	420L - 514R	GLIN			X	CTRPT
419+08 - 419+26	EB10	131R - 21R	GLIN			X	CTRPT
419+26 - 419+15	EB10	21R - 209L	GLIN			X	CTRPT
419+15 - 419+14	EB10	209L - 238L	GLIN			X	CTRPT
424+14 - 426+59	EB10	146L - 96R	GLIN			(2) X (3)	NNG
426+75 - 426+77	EB10	93R - 54R	GLIN			X	CTRPT
426+77 - 426+83	EB10	54R - 173L	GLIN			X	CTRPT

- (1) 345 KV TRANSMISSION LINE.
- (2) THE NNG GAS LINE WAS CONFIRMED TO CROSS THE ROADWAY AT A CONSTANT ELEVATION OF APPROXIMATELY 860' USING A RADIODETECTION LOCATOR. THIS SHOULD BE RE-VERIFIED BEFORE CONSTRUCTION.
- (3) NORTHERN NATURAL GAS MUST BE CONTACTED 48 HOURS IN ADVANCE OF ANY WORK AT 952-887-1777 BEFORE WORK IS PERFORMED WITHIN 25' OF THIS LINE SO THAT ONE OF THEIR FIELD AGENTS CAN BE PRESENT DURING CONSTRUCTION OPERATIONS IN THIS AREA.

POWER, SANITARY SEWER, GAS

PLOTTED/REVISED: 17-FEB-2009 08:44

DISTRICT #: METRO  
 IPLOT NAME: 67TBU2  
 PATH & FILENAME: S:\Design\0215\067\Final\021567\_1bu2.dgn

UTILITIES TABULATION - TMS							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	ADJUST	RELOCATE	LEAVE AS IS	OWNER
370+34 - 371+15	EB10	69R - 73R	FO			X	MNDOT
371+15 - 374+42	EB10	73R - 81R	FO			X	MNDOT
374+42 - 379+62	EB10	81R - 83R	FO			X	MNDOT
379+62 - 385+09	EB10	83R - 91R	FO			X	MNDOT
385+09 - 388+66	EB10	91R - 88R	FO			X	MNDOT
388+66 - 391+64	EB10	88R - 86R	FO			X	MNDOT
391+64 - 393+92	EB10	86R - 100R	FO			X	MNDOT
393+92 - 396+83	EB10	100R - 77R	FO			X	MNDOT
396+83 - 401+38	EB10	77R - 60R	FO			X	MNDOT
401+38 - 402+01	EB10	60R - 33R	FO			X	MNDOT
402+01 - 402+96	EB10	33R - 43R	FO			X	MNDOT
402+96 - 403+56	EB10	43R - 55R	FO			X	MNDOT
403+56 - 407+44	EB10	55R - 47R	FO			X	MNDOT
407+44 - 407+53	EB10	47R - 146L	FO	X (2)			MNDOT
407+53 - 407+13	EB10	146L - 162L	FO			X	MNDOT
377+81	EB10	69R	CPED			X	MNDOT
402+30 - 402+84	WB10	35L - 80L	FO			X	MNDOT
402+84 - 406+88	WB10	80L - 78L	FO			X	MNDOT
406+88	WB10	78L	EHH			X	MNDOT
406+88 - 406+97	WB10	78L - 80L	FO			X	MNDOT
406+97	WB10	80L	CPED			X	MNDOT
406+97 - 407+13	WB10	80L - 78L	FO			X	MNDOT
407+13	WB10	78L	CPED			X	MNDOT
407+13 - 409+49	WB10	78L - 71L	FO			X	MNDOT
409+49 - 412+53	WB10	71L - 64L	FO			X	MNDOT
412+53 - 412+90	WB10	64L - 62L	FO			X	MNDOT
412+90 - 417+56	WB10	62L - 70L	FO			X	MNDOT
417+56 - 421+54	WB10	70L - 55L	FO			X	MNDOT
421+54 - 421+91	WB10	55L - 59L	FO	(1) X (2)			MNDOT
421+91 - 424+09	WB10	59L - 75L	FO	(1) X (2)			MNDOT
424+09 - 425+97	WB10	75L - 78L	FO			X	MNDOT
425+97 - 426+94	WB10	78L - 81L	FO			X	MNDOT
426+94 - 428+55	WB10	81L - 82L	FO			X	MNDOT
428+55 - 428+69	WB10	82L - 140R	FO	X (2)			MNDOT
428+69 - 428+71	WB10	140R - 155R	FO			X	MNDOT
428+71	EB10	71R	CVLT			X	MNDOT
428+71 - 429+05	EB10	71R - 62R	FO			X	MNDOT
429+05	EB10	62R	EPED			X	MNDOT
429+05 - 429+37	EB10	62R - 44R	UTSW			X	MNDOT
429+37 - 429+33	EB10	44R - 119L	UTSW	X (2)			MNDOT
429+33	EB10	119L	EHH			X	MNDOT
429+33 - 429+35	EB10	119L - 167L	UTSW			X	MNDOT
428+71 - 428+87	EB10	71R - 73R	FO			X	MNDOT
428+87 - 429+17	EB10	73R - 73R	FO			X	MNDOT
429+17 - 429+65	EB10	73R - 68R	FO			X	MNDOT
429+65 - 430+18	EB10	68R - 68R	FO			X	MNDOT
430+18 - 430+63	EB10	68R - 68R	FO			X	MNDOT
430+63 - 431+21	EB10	68R - 71R	FO			X	MNDOT
431+21 - 431+80	EB10	71R - 74R	FO			X	MNDOT
431+80 - 432+41	EB10	74R - 78R	FO			X	MNDOT
432+41 - 432+59	EB10	78R - 82R	FO			X	MNDOT
432+59 - 433+07	EB10	82R - 83R	FO			X	MNDOT
433+07 - 433+54	EB10	83R - 87R	FO			X	MNDOT
433+54 - 433+90	EB10	87R - 89R	FO			X	MNDOT
433+90 - 434+39	EB10	89R - 86R	FO			X	MNDOT
434+39 - 434+90	EB10	86R - 83R	FO			X	MNDOT
434+90 - 435+37	EB10	83R - 80R	FO			X	MNDOT
435+37 - 435+67	EB10	80R - 77R	FO			X	MNDOT
435+67 - 435+80	EB10	77R - 76R	FO			X	MNDOT
435+80 - 436+24	EB10	76R - 78R	FO			X	MNDOT
436+24 - 436+65	EB10	78R - 79R	FO			X	MNDOT
436+65 - 437+02	EB10	79R - 82R	FO			X	MNDOT
437+02 - 437+43	EB10	82R - 81R	FO			X	MNDOT
437+43 - 437+97	EB10	81R - 82R	FO			X	MNDOT
437+97 - 438+31	EB10	82R - 82R	FO			X	MNDOT

- ① THE TMS FIBER SHOULD BE CAREFULLY LOCATED BEFORE CONSTRUCTION. IT WILL BE EXPOSED (ADJUSTED) DURING THE CONSTRUCTION OF THE WESTERN WINGWALL AND WILL BE PASSED THROUGH THE FUTURE WINGWALL IN A PROTECTIVE SLEEVE.
- ② ADJUST DONE BY CONTRACTOR.

UTILITIES TABULATION - TMS CONT.							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	ADJUST	RELOCATE	LEAVE AS IS	OWNER
438+31 - 438+86	EB10	82R - 83R	FO			X	MNDOT
438+86 - 439+25	EB10	83R - 84R	FO			X	MNDOT
439+25 - 439+62	EB10	84R - 77R	FO			X	MNDOT
439+62 - 439+70	EB10	77R - 74R	FO			X	MNDOT
439+70 - 439+93	EB10	74R - 65R	FO			X	MNDOT
439+93 - 440+60	EB10	65R - 61R	FO			X	MNDOT
440+60 - 441+20	EB10	61R - 59R	FO			X	MNDOT
441+20 - 441+80	EB10	59R - 57R	FO			X	MNDOT
441+80 - 442+44	EB10	57R - 58R	FO			X	MNDOT
442+44 - 442+93	EB10	58R - 63R	FO			X	MNDOT
442+93 - 443+26	EB10	63R - 72R	FO			X	MNDOT
443+26 - 443+80	EB10	72R - 79R	FO			X	MNDOT
443+80 - 444+21	EB10	79R - 80R	FO			X	MNDOT
444+21 - 444+70	EB10	80R - 79R	FO			X	MNDOT
444+70 - 445+26	EB10	79R - 82R	FO			X	MNDOT
445+26 - 445+65	EB10	82R - 84R	FO			X	MNDOT
445+65 - 445+94	EB10	84R - 87R	FO			X	MNDOT
445+94 - 446+63	EB10	87R - 89R	FO			X	MNDOT
446+63 - 447+28	EB10	89R - 70R	FO			X	MNDOT
447+28 - 447+51	EB10	70R - 64R	FO			X	MNDOT
447+51 - 447+77	EB10	64R - 60R	FO			X	MNDOT
447+77 - 448+15	EB10	60R - 57R	FO			X	MNDOT
448+15 - 448+28	EB10	57R - 57R	FO			X	MNDOT
448+28 - 448+50	EB10	57R - 59R	FO			X	MNDOT
448+50 - 448+85	EB10	59R - 59R	FO			X	MNDOT
448+85 - 449+31	EB10	59R - 58R	FO			X	MNDOT
449+31 - 449+82	EB10	58R - 54R	FO			X	MNDOT
449+82 - 450+42	EB10	54R - 53R	FO			X	MNDOT
450+42 - 450+85	EB10	53R - 55R	FO			X	MNDOT
450+85 - 451+29	EB10	55R - 55R	FO			X	MNDOT
451+29 - 451+64	EB10	55R - 57R	FO			X	MNDOT
451+64 - 451+98	EB10	57R - 54R	FO			X	MNDOT
451+98 - 452+50	EB10	54R - 53R	FO			X	MNDOT
452+50 - 453+04	EB10	53R - 55R	FO			X	MNDOT
453+04 - 453+58	EB10	55R - 57R	FO			X	MNDOT
453+58 - 454+16	EB10	57R - 61R	FO			X	MNDOT
454+16 - 454+51	EB10	61R - 63R	FO			X	MNDOT
454+51 - 455+06	EB10	63R - 62R	FO			X	MNDOT
455+06 - 455+44	EB10	62R - 59R	FO			X	MNDOT
455+44 - 455+90	EB10	59R - 52R	FO			X	MNDOT
428+71 - 428+80	EB10	71R - 78R	FO			X	MNDOT
428+80 - 429+01	EB10	78R - 82R	FO			X	MNDOT
429+01 - 429+48	EB10	82R - 85R	FO			X	MNDOT
429+48 - 429+79	EB10	85R - 86R	FO			X	MNDOT
429+79 - 430+14	EB10	86R - 89R	FO			X	MNDOT
430+14 - 430+61	EB10	89R - 89R	FO			X	MNDOT
430+61 - 431+10	EB10	89R - 88R	FO			X	MNDOT
431+10 - 431+48	EB10	88R - 88R	FO			X	MNDOT
431+48 - 431+83	EB10	88R - 90R	FO			X	MNDOT
431+83 - 432+14	EB10	90R - 91R	FO			X	MNDOT
432+14 - 432+35	EB10	91R - 91R	FO			X	MNDOT
432+35 - 432+75	EB10	91R - 92R	FO			X	MNDOT
432+75 - 433+10	EB10	92R - 92R	FO			X	MNDOT
433+10 - 433+65	EB10	92R - 95R	FO			X	MNDOT
433+65 - 434+14	EB10	95R - 95R	FO			X	MNDOT
434+14 - 434+47	EB10	95R - 95R	FO			X	MNDOT
434+47 - 434+76	EB10	95R - 93R	FO			X	MNDOT
434+76 - 435+36	EB10	93R - 91R	FO			X	MNDOT
435+36 - 435+64	EB10	91R - 91R	FO			X	MNDOT
435+64 - 435+92	EB10	91R - 91R	FO			X	MNDOT
435+92 - 436+24	EB10	91R - 93R	FO			X	MNDOT
436+24 - 436+55	EB10	93R - 93R	FO			X	MNDOT
436+55 - 436+91	EB10	93R - 93R	FO			X	MNDOT
436+91 - 437+46	EB10	93R - 94R	FO			X	MNDOT
437+46 - 437+85	EB10	94R - 94R	FO			X	MNDOT
437+85 - 438+21	EB10	94R - 95R	FO			X	MNDOT

TMS

**INPLACE UTILITY TABULATIONS (2 OF 4)**

PLOTTED/REVISED: 17-FEB-2009 08:44

DISTRICT #: METRO  
 IPLOT NAME: 67TBU3  
 PATH & FILENAME: S:\Design\010215\067\Final\021567\_tbu.dgn

UTILITIES TABULATION - TMS CONT.							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	ADJUST	RELOCATE	LEAVE AS IS	OWNER
438+21 - 438+53	EB10	95R - 95R	FO			X	MNDOT
438+53 - 438+83	EB10	95R - 94R	FO			X	MNDOT
438+83 - 439+32	EB10	94R - 92R	FO			X	MNDOT
439+32 - 439+73	EB10	92R - 80R	FO			X	MNDOT
439+73 - 440+06	EB10	80R - 80R	FO			X	MNDOT
440+06 - 440+66	EB10	80R - 80R	FO			X	MNDOT
440+66 - 440+86	EB10	80R - 72R	FO			X	MNDOT
440+86 - 441+23	EB10	72R - 59R	FO			X	MNDOT
441+23 - 441+53	EB10	59R - 57R	FO			X	MNDOT
441+53 - 441+78	EB10	57R - 64R	FO			X	MNDOT
441+78 - 442+19	EB10	64R - 77R	FO			X	MNDOT
442+19 - 442+50	EB10	77R - 81R	FO			X	MNDOT
442+50 - 443+01	EB10	81R - 82R	FO			X	MNDOT
443+01 - 443+42	EB10	82R - 87R	FO			X	MNDOT
443+42 - 443+75	EB10	87R - 90R	FO			X	MNDOT
443+75 - 444+84	EB10	90R - 92R	FO			X	MNDOT
444+84 - 445+38	EB10	92R - 92R	FO			X	MNDOT
445+38 - 445+89	EB10	92R - 96R	FO			X	MNDOT
445+89 - 446+64	EB10	96R - 97R	FO			X	MNDOT
446+64 - 447+20	EB10	97R - 97R	FO			X	MNDOT
447+20 - 447+41	EB10	97R - 96R	FO			X	MNDOT
447+41 - 448+08	EB10	96R - 85R	FO			X	MNDOT
448+08 - 448+37	EB10	85R - 80R	FO			X	MNDOT
448+37 - 448+89	EB10	80R - 69R	FO			X	MNDOT
448+89 - 449+40	EB10	69R - 59R	FO			X	MNDOT
449+40 - 449+98	EB10	59R - 55R	FO			X	MNDOT
449+98 - 450+30	EB10	55R - 54R	FO			X	MNDOT
450+30 - 450+85	EB10	54R - 56R	FO			X	MNDOT
450+85 - 451+29	EB10	56R - 56R	FO			X	MNDOT
451+29 - 451+87	EB10	56R - 58R	FO			X	MNDOT
451+87 - 452+55	EB10	58R - 56R	FO			X	MNDOT
452+55 - 453+24	EB10	56R - 58R	FO			X	MNDOT
453+24 - 455+07	EB10	58R - 62R	FO			X	MNDOT
407+13	WB10	75L	EHH			X	MNDOT
407+13 - 407+10	WB10	75L - 30L	UTSW			X	MNDOT
407+10	WB10	30L	EHH			X	MNDOT
407+10 - 407+04	WB10	30L - 113R	UTSW	X (2)			MNDOT
407+04	WB10	113R	EHH			X	MNDOT
407+03	WB10	29L	EHH			X	MNDOT
407+03 - 407+10	WB10	29L - 30L	UTSW			X	MNDOT
407+10 - 407+15	WB10	30L - 29L	UTSW			X	MNDOT
407+15	WB10	29L	EHH			X	MNDOT
407+13 - 407+31	WB10	75L - 78L	UTSW			X	MNDOT
407+31 - 407+31	WB10	78L - 82L	UTSW			X	MNDOT
407+31	WB10	82L	EMTR			X	MNDOT
425+17	WB10	29L	EP	(1) X (2)			MNDOT
425+17 - 425+20	WB10	29L - 31L	UTSW	(1) X (2)			MNDOT
425+20 - 426+09	WB10	31L - 63L	UTSW	(1) X (2)			MNDOT
426+09 - 426+94	WB10	63L - 85L	UTSW			X	MNDOT
426+94 - 429+35	WB10	85L - 83L	UTSW			X	MNDOT
429+35	WB10	83L	EHH			X	MNDOT
429+35 - 439+95	WB10	83L - 89L	UTSW			X	MNDOT
439+95	WB10	89L	EP			X	MNDOT
439+95	WB10	89L	EPEO			X	MNDOT
439+95 - 442+02	WB10	89L - 93L	UTSW			X	MNDOT
442+02	WB10	93L	EMTR			X	MNDOT
442+02 - 446+20	WB10	93L - 83L	UTSW			X	MNDOT
446+20	WB10	83L	EPEO			X	MNDOT
446+20 - 446+24	WB10	83L - 139R	UTSW			X	MNDOT
446+24 - 448+32	WB10	139R - 133R	UTSW			X	MNDOT
448+32	WB10	133R	EPEO			X	MNDOT
448+32 - 448+49	WB10	133R - 122R	UTSW			X	MNDOT

UTILITIES TABULATION - TMS CONT.							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	ADJUST	RELOCATE	LEAVE AS IS	OWNER
438+92 - 439+95	WB10	44R - 89L	UTSW	X (2)			MNDOT
439+95 - 439+96	WB10	89L - 109L	UTSW			X	MNDOT
439+96	WB10	109L	EP			X	MNDOT
446+20 - 446+32	WB10	83L - 56L	UTSW			X	MNDOT
446+32 - 446+54	WB10	56L - 44L	UTSW			X	MNDOT

UTILITIES TABULATION - WATER							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	ADJUST	RELOCATE	LEAVE AS IS	OWNER
370+63	EB10	108R	WVLV			X	COONRPDS
370+63 - 371+04	EB10	108R - 73R	WL IN			X	COONRPDS
371+04 - 371+64	EB10	73R - 74R	WL IN			X	COONRPDS
371+64 - 371+90	EB10	74R - 51R	WL IN			X	COONRPDS
371+90 - 371+94	EB10	51R - 132L	WL IN			X	COONRPDS
371+94 - 372+22	EB10	132L - 158L	WL IN			X	COONRPDS
372+22 - 373+26	EB10	158L - 159L	WL IN			X	COONRPDS
434+35	EB10	218R	HYD			X	COONRPDS
437+50	EB10	257R	HYD			X	COONRPDS
439+20	EB10	242R	HYD			X	COONRPDS

UTILITIES TABULATION - COMMUNICATIONS							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	ADJUST	RELOCATE	LEAVE AS IS	OWNER
391+93 - 392+04	EB10	80R - 21R	FO			X	ACCESS
392+04 - 392+15	EB10	21R - 108L	FO			X	ACCESS
392+15 - 392+29	EB10	108L - 183L	FO			X	ACCESS

- ① ADJUST TRAFFIC CAMERA. LOWER DURING CONSTRUCTION AND REPLACE AS DIRECTED BY THE ENGINEER.
- ② ADJUST DONE BY CONTRACTOR.

TMS, WATER, COMMUNICATIONS

PLOTTED/REVISED: 19-FEB-2009 12:43

DISTRICT: METRO  
 IPLOT NAME: 67TB04  
 PATH & FILENAME: S:\Design\0215067\Final\021567.tbl.dgn

J INPLACE DRAINAGE							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	LEAVE AS IS	ADJUST	REMOVE	OWNER
371+02	WB10	37R	APR	X			MNDOT
371+02 - 371+02	WB10	37R - 65L	STLN RCP	X			MNDOT
371+02	WB10	65L	APR	X			MNDOT
381+02	EB10	36L	APR			X (2)	MNDOT
381+02 - 381+01	EB10	36L - 45R	STLN RCP	X			MNDOT
381+01	EB10	45R	APR	X			MNDOT
390+93	EB10	26L	APR			X (2)	MNDOT
390+93 - 390+93	EB10	26L - 35R	STLN RCP	X			MNDOT
390+93	EB10	35R	APR	X			MNDOT
392+31	EB10	41R	APR	X			MNDOT
392+31 - 393+76	EB10	41R - 41R	STLN RCP	X			MNDOT
393+76	EB10	41R	APR	X			MNDOT
392+50	WB10	41L	APR	X			MNDOT
392+50 - 393+99	WB10	41L - 41L	STLN RCP	X			MNDOT
393+99	WB10	41L	APR	X			MNDOT
400+31	WB10	54L	APR	X			MNDOT
400+31 - 400+81	WB10	54L - 61L	STLN CMP	X			MNDOT
400+81	WB10	61L	STLN END	X			MNDOT
401+31	EB10	52R	APR	X			MNDOT
401+31 - 401+98	EB10	52R - 65R	STLN RCP	X			MNDOT
401+98	EB10	65R	APR	X			MNDOT
401+18	EB10	129L	STLN END	X			MNDOT
401+18 - 402+18	EB10	129L - 45R	STLN RCP	X			MNDOT
402+18	EB10	45R	STLN END	X			MNDOT
401+68	EB10	42L	DI		X (1)		MNDOT
410+73	EB10	173L	APR	X			MNDOT
410+73 - 410+75	EB10	173L - 42L	STLN RCPA	X			MNDOT
410+75	EB10	42L	DI		X (1)		MNDOT
410+75 - 410+78	EB10	42L - 81R	STLN RCPA	X			MNDOT
410+78	EB10	81R	APR	X			MNDOT
411+32	WB10	83L	APR	X			MNDOT
411+32 - 410+81	WB10	83L - 94L	STLN CMP	X			MNDOT
410+81	WB10	94L	APR	X			MNDOT
413+47	EB10	19R	CB			X (2)	MNDOT
413+47 - 413+49	EB10	19R - 84R	STLN CMP			X (2)	MNDOT
413+49	EB10	84R	APR			X (2)	MNDOT
413+97	EB10	19R	CB			X (2)	MNDOT
413+97 - 413+95	EB10	19R - 86R	STLN CPP			X (2)	MNDOT
413+95	EB10	86R	APR			X (2)	MNDOT
422+36	WB10	14R	CB			X (2)	MNDOT
422+36 - 422+37	WB10	14R - 14L	STLN RCP			X (2)	MNDOT
422+37	WB10	14L	CB			X (2)	MNDOT
422+37 - 422+37	WB10	14L - 77L	STLN CMP			X (2)	MNDOT
422+43	EB10	161L	APR			X (2)	MNDOT
422+43 - 424+70	EB10	161L - 89R	STLN RCP			X (2)	MNDOT
424+70	EB10	89R	APR			X (2)	MNDOT
423+19	EB10	14L	CB			X (2)	MNDOT
423+19 - 423+19	EB10	14L - 14R	STLN RCP			X (2)	MNDOT
423+19	EB10	14R	CB			X (2)	MNDOT
423+19 - 423+22	EB10	14R - 115R	STLN CMP			X (2)	MNDOT
423+40	EB10	144L	APR			X (2)	MNDOT
423+40 - 425+56	EB10	144L - 79R	STLN RCP			X (2)	MNDOT
425+56	EB10	79R	APR			X (2)	MNDOT

J INPLACE DRAINAGE CONT.							
STATION TO STATION	ROADWAY NAME	OFFSET TO OFFSET FT	ITEM INPLACE	LEAVE AS IS	ADJUST	REMOVE	OWNER
424+53	EB10	36R	APR			X (2)	MNDOT
424+53 - 424+64	EB10	36R - 92R	STLN CMP			X (2)	MNDOT
424+64	EB10	92R	APR			X (2)	MNDOT
434+91	EB10	38L	APR			X (2)	MNDOT
434+91 - 434+91	EB10	38L - 73R	STLN RCP	X			MNDOT
434+91	EB10	73R	APR	X			MNDOT
439+58	WB10	105L	DI	X			MNDOT
439+58 - 439+56	WB10	105L - 66L	STLN RCP	X			MNDOT
439+56	WB10	66L	APR	X			MNDOT
441+67	EB10	138L	APR	X			MNDOT
441+67 - 441+67	EB10	138L - 78R	STLN RCP	X			MNDOT
441+67	EB10	78R	APR	X			MNDOT
443+48	WB10	106L	DI	X			MNDOT
443+48 - 443+48	WB10	106L - 65L	STLN RCP	X			MNDOT
443+48	WB10	65L	APR	X			MNDOT
444+40	EB10	34L	CB	X			MNDOT
444+40 - 444+00	EB10	34L - 33L	STLN RCP	X			MNDOT
444+00	EB10	33L	CB	X			MNDOT
444+00 - 444+00	EB10	33L - 66R	STLN RCP	X			MNDOT
444+00	EB10	66R	APR	X			MNDOT
446+83	EB10	61L	CB	X			MNDOT
446+83 - 446+44	EB10	61L - 62L	STLN RCP	X			MNDOT
446+44	EB10	62L	CB	X			MNDOT
446+44 - 446+06	EB10	62L - 52L	STLN RCP	X			MNDOT
446+06	EB10	52L	DI	X			MNDOT
446+06 - 446+06	EB10	52L - 33L	STLN RCP	X			MNDOT
446+06	EB10	33L	CB	X			MNDOT
446+06 - 446+06	EB10	33L - 64R	STLN RCP	X			MNDOT
446+06	EB10	64R	APR	X			MNDOT
449+84	EB10	55L	CB	X			MNDOT
449+84 - 449+81	EB10	55L - 73R	STLN RCP	X			MNDOT
449+81	EB10	73R	APR	X			MNDOT
453+27	EB10	176L	APR	X			MNDOT
453+27 - 451+17	EB10	176L - 76R	STLN RCPA	X			MNDOT
451+17	EB10	76R	APR	X			MNDOT
451+79	WB10	75L	APR	X			MNDOT
451+79 - 453+53	WB10	75L - 70L	STLN RCP	X			MNDOT
453+53	WB10	70L	APR	X			MNDOT
453+21	EB10	44L	CB	X			MNDOT
453+21 - 453+22	EB10	44L - 34L	STLN RCP	X			MNDOT
453+22	EB10	34L	CB	X			MNDOT
453+22 - 453+22	EB10	34L - 75R	STLN RCP	X			MNDOT
453+22	EB10	75R	APR	X			MNDOT
453+22 - 454+83	EB10	34L - 34L	STLN RCP	X			MNDOT
454+83	EB10	34L	CB	X			MNDOT
457+45	EB10	46R	STMH	X			MNDOT
457+45 - 456+10	EB10	46R - 45R	STLN RCP	X			MNDOT
456+10 - 455+49	EB10	45R - 80R	STLN RCP	X			MNDOT
455+49	EB10	80R	APR	X			MNDOT
457+45 - 457+89	EB10	46R - 79R	STLN RCP	X			MNDOT
457+89	EB10	79R	APR	X			MNDOT

- ① ADJUST DONE BY CONTRACTOR.
- ② REMOVAL DONE BY CONTRACTOR.

INPLACE DRAINAGE

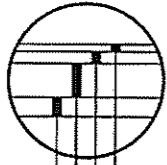
**INPLACE UTILITY TABULATIONS (4 OF 4)**



PLOTTED/REVISED: 22-JAN-2009 15:40

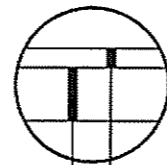
DISTRICT #: METRO  
PLOT NAME: 67.Jst  
PATH & FILENAME: S:\Design\01\0215\067\Final\021567.Jst.dgn

INSET A  
THIRD LANE AND  
RAMP CONSTRUCTION



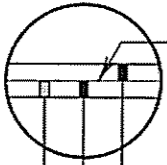
- 1.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 2.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 7" TYPE SP 12.5 NON WEARING COURSE MIXTURE (5,B) (SPNWB530B) - SPEC. 2360 ②
- 4" AGGREGATE BASE, CLASS 5 - SPEC. 2211

INSET E  
AGGREGATE  
SHOULDER CONSTRUCTION



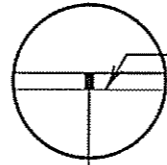
- 4" AGGREGATE SHOULDERING CLASS 2 - SPEC. 2221
- 11" AGGREGATE BASE, CLASS 5 - SPEC. 2211

INSET B  
MILL & OVERLAY ①



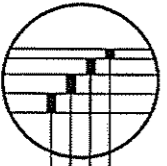
- INPLACE PAVEMENT
- 1.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 1.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 1.5" MILL

INSET F  
SHOULDER OVERLAY ①



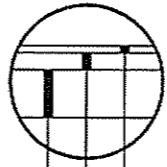
- INPLACE PAVEMENT
- 1.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360

INSET C  
OUTSIDE (BUS)  
SHOULDER CONSTRUCTION



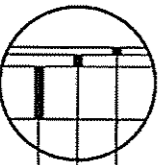
- 1.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 2.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 3" TYPE SP 12.5 NON WEARING COURSE MIXTURE (5,B) (SPNWB530B) - SPEC. 2360
- 3" AGGREGATE BASE, CLASS 5 - SPEC. 2211

INSET G  
TEMPORARY WIDENING AND  
ADJACENT INSIDE SHOULDERS



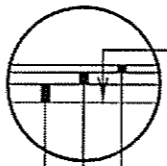
- 1.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 3.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 10" AGGREGATE BASE, CLASS 5 - SPEC. 2211

INSET D  
INSIDE PAVED  
SHOULDER CONSTRUCTION



- 1.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 2.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 11" AGGREGATE BASE, CLASS 5 - SPEC. 2211

INSET H  
VARIABLE OVERLAY



- INPLACE PAVEMENT
- 1.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- 2.5" TYPE SP 12.5 WEARING COURSE MIXTURE (5,H) (SPWEB540H) - SPEC. 2360
- VARIABLE DEPTH TYPE SP 12.5 NON WEARING COURSE MIXTURE (5,B) (SPNWB530B) - SPEC. 2360

- ① MILL & OVERLAY THRU LANE AND 2' OF SHOULDERS. OVERLAY ONLY ON OUTER 8' OF SHOULDERS.
- ② 7" NON WEARING COURSE IS TO BE LAID IN MULTIPLE LIFTS AS APPROVED BY THE ENGINEER.

DESIGN INSETS

SHEET 1 OF 12

TYPICAL SECTIONS - INSETS

DRAWN BY: HG

CHECKED BY: PAD

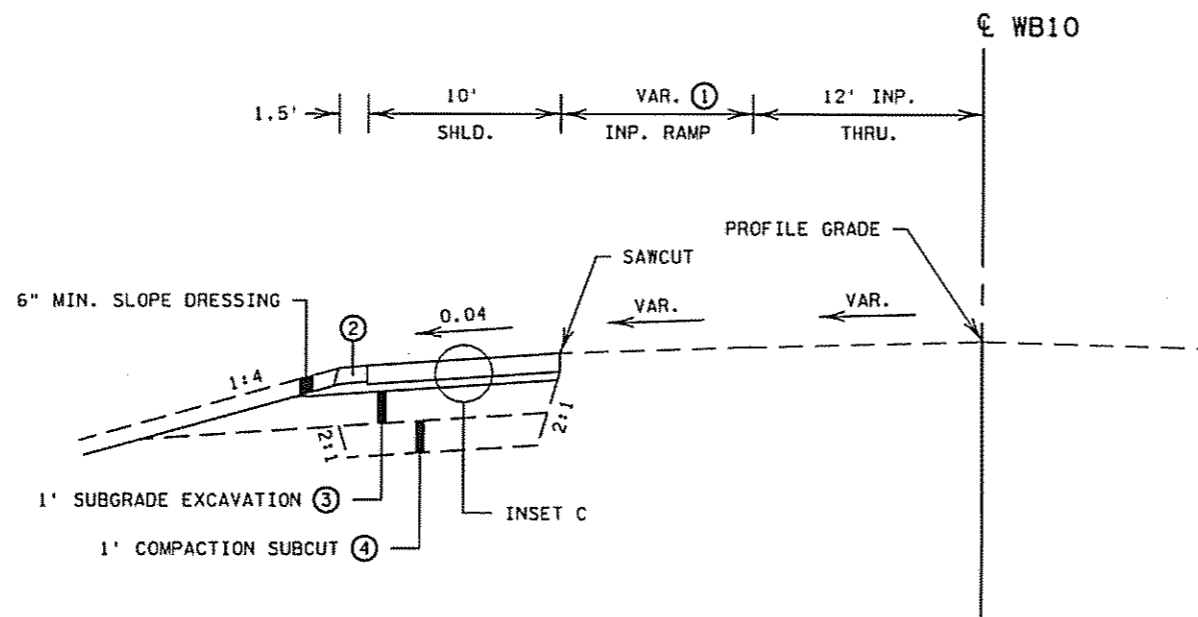
CERTIFIED BY *Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 17 OF 222 SHEETS

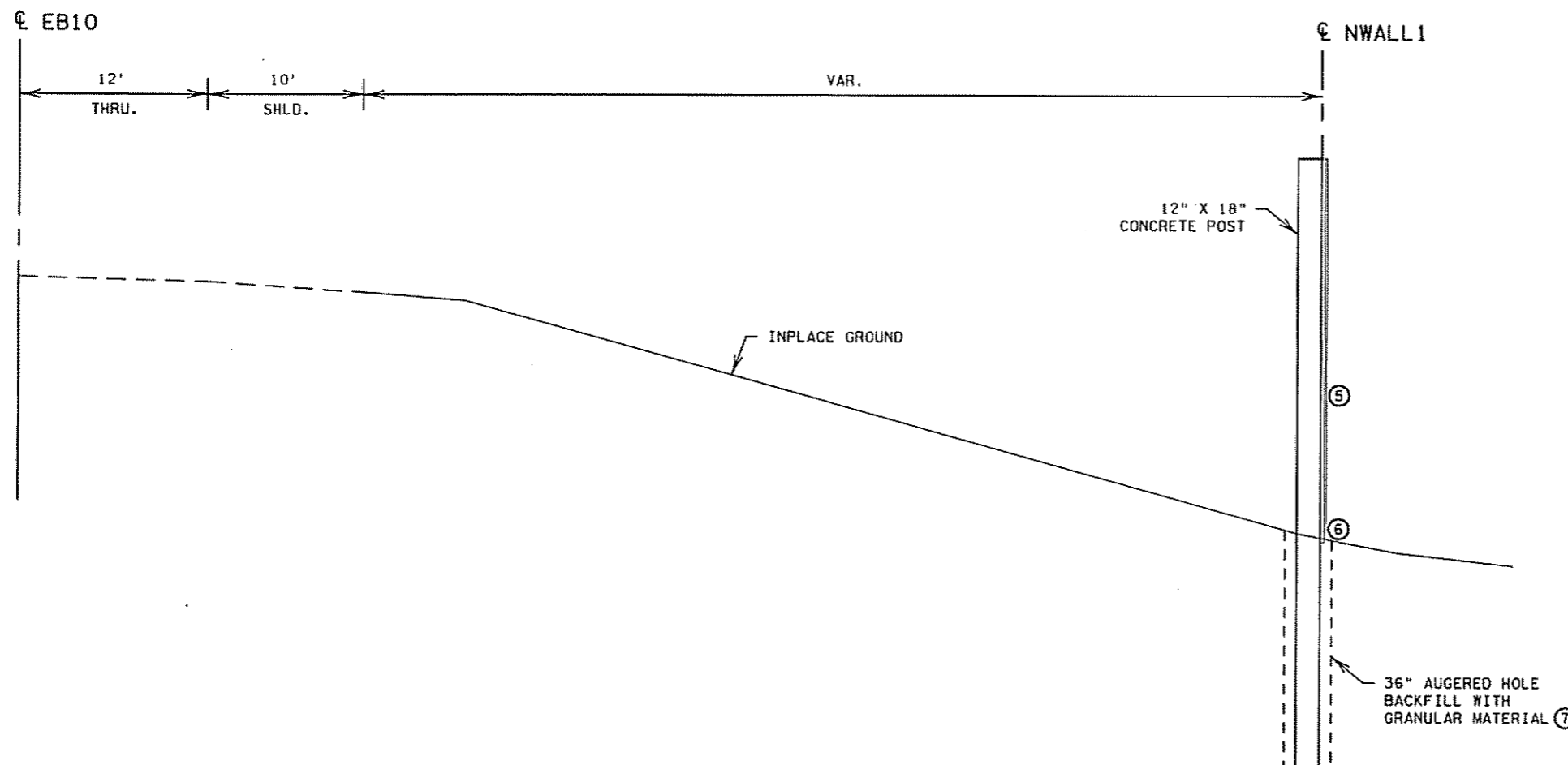
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### TYPICAL SECTION NO. 1 T.H. 10 W.B. STA. 370+34 TO STA. 375+53



- ① TAPERS FROM 36.43' TO 12' FROM WB10 STA. 370+34 TO 374+00. 12' FROM WB10 STA. 374+00 TO 375+53.
- ② VARIABLE DEPTH AGGREGATE SHOULDERING CLASS 2 - SPEC. 2221.
- ③ BACKFILL WITH SELECT GRANULAR MATERIAL.
- ④ PAID FOR AS SUBGRADE EXCAVATION. BACKFILL WITH SUITABLE GRADING MATERIAL.
- ⑤ PLACE THE WOOD PLANKING ON THE RESIDENTIAL SIDE OF THE WALL.
- ⑥ LEAVE SPACE AT THE BOTTOM TO ALLOW FOR DRAINAGE UNDER THE WALL.
- ⑦ IN LOCATIONS WHERE POST SPACING IS GREATER THAN 8' USE LEAN MIX BACKFILL.

### TYPICAL SECTION NO. 2 NWALL1 STA. 50+00 TO 78+81



**GENERAL NOTES:**

- FOR INSETS SEE SHEET NO. 17.
- ALL DIMENSIONS ARE IN FEET, UNLESS OTHERWISE NOTED.
- ALL CROSS SLOPES ARE FT. PER FT.
- THE TOP OF GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.
- UNLESS OTHERWISE INDICATED, THE GRADING GRADE AND BOTTOM OF SUBGRADE EXCAVATION WILL HAVE THE SAME SLOPE AS THE FINISHED ROAD SURFACE.
- MULTIPLE LIFTS OF BITUMINOUS PAVEMENT ARE NOT SHOWN ON THE TYPICAL SECTIONS FOR CLARITY. THEY ARE SHOWN ON THE INSETS.
- FOR DITCH WIDTH, SLOPE VARIATIONS AND INPLACE GROUND LINES, SEE CROSS SECTIONS.
- FOR LANE AND SHOULDER WIDTHS, MILL & OVERLAY AREAS, MEDIAN BARRIER LOCATIONS, GUARDRAIL LOCATIONS, AND CURB & GUTTER LOCATIONS, SEE CONSTRUCTION PLANS.
- USE 3" HORIZONTAL STEPPING ON BITUMINOUS LIFTS WHERE CURB & GUTTER IS NOT SPECIFIED.
- UNLESS OTHERWISE SPECIFIED, CLASS 5 AGGREGATE WILL EXTEND 1' BEYOND BACK OF CURB OR EDGE OF PAVEMENT.

DISTRICT #: METRO  
PLOT NAME: 67\_1s2  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_1s1.dgn

### TYPICAL SECTIONS

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CHECKED BY: PAD

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*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053

DATE 1/22/09

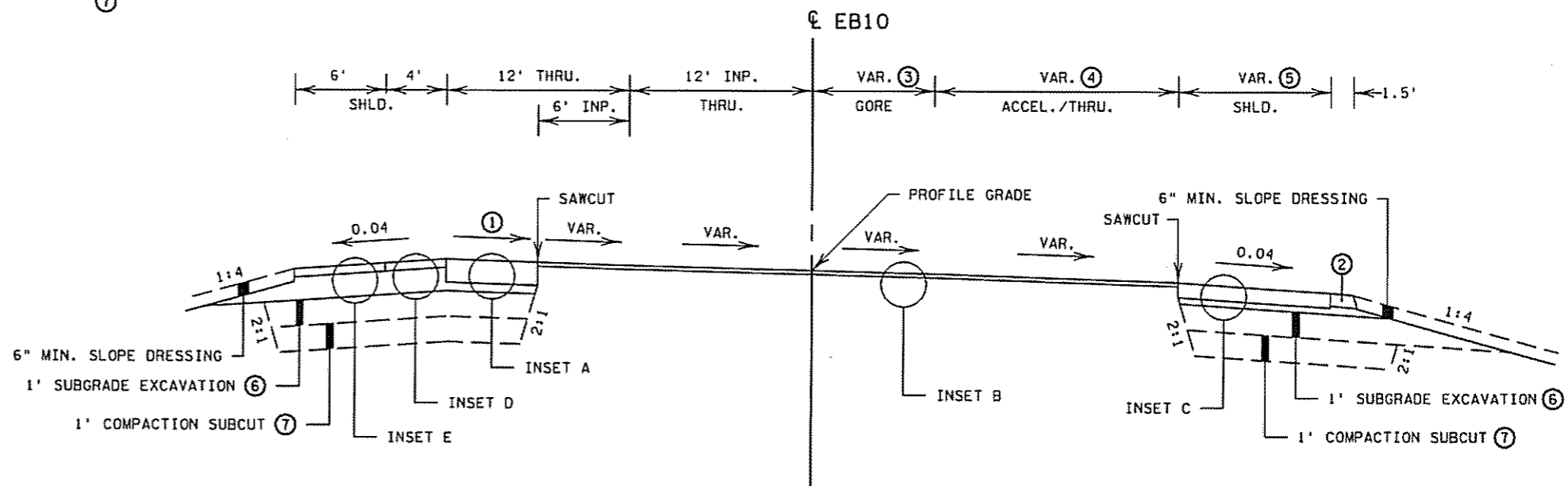
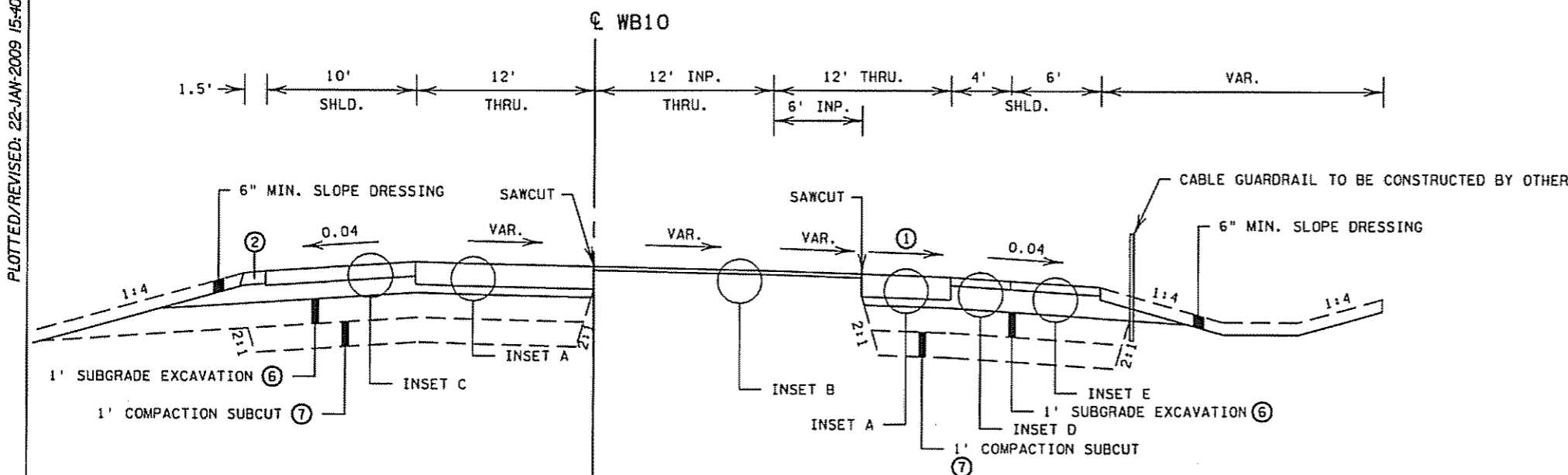
STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 18 OF 222 SHEETS

TYPICAL SECTION NO. 3

T.H. 10 E.B. STA. 375+13 TO STA. 381+13  
T.H. 10 W.B. STA. 375+53 TO STA. 381+75

- ① MATCH SLOPE OF ADJACENT INPLACE LANE.
- ② VARIABLE DEPTH AGGREGATE SHOULDERING CLASS 2 - SPEC. 2221.
- ③ VARIES FROM 8' TO 0' FROM STA. 375+13 TO STA. 379+13.
- ④ 16' FROM STA. 375+13 TO STA. 379+13, THEN TAPERS FROM 16' TO 12' FROM STA. 379+13 TO 381+13.
- ⑤ 6' FROM STA. 375+13 TO STA. 379+13, THEN VARIES FROM 6' TO 10' FROM STA. 379+13 TO STA. 381+13.
- ⑥ BACKFILL WITH SELECT GRANULAR MATERIAL.
- ⑦ PAID FOR AS SUBGRADE EXCAVATION. BACKFILL WITH SUITABLE GRADING MATERIAL.

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GENERAL NOTES:  
 FOR INSETS SEE SHEET NO. 17.  
 ALL DIMENSIONS ARE IN FEET, UNLESS OTHERWISE NOTED.  
 ALL CROSS SLOPES ARE FT. PER FT.  
 THE TOP OF GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.  
 UNLESS OTHERWISE INDICATED, THE GRADING GRADE AND BOTTOM OF SUBGRADE EXCAVATION WILL HAVE THE SAME SLOPE AS THE FINISHED ROAD SURFACE.  
 MULTIPLE LIFTS OF BITUMINOUS PAVEMENT ARE NOT SHOWN ON THE TYPICAL SECTIONS FOR CLARITY. THEY ARE SHOWN ON THE INSETS.  
 FOR DITCH WIDTH, SLOPE VARIATIONS AND INPLACE GROUND LINES, SEE CROSS SECTIONS.  
 FOR LANE AND SHOULDER WIDTHS, MILL & OVERLAY AREAS, MEDIAN BARRIER LOCATIONS, GUARDRAIL LOCATIONS, AND CURB & GUTTER LOCATIONS, SEE CONSTRUCTION PLANS.  
 USE 3" HORIZONTAL STEPPING ON BITUMINOUS LIFTS WHERE CURB & GUTTER IS NOT SPECIFIED.  
 UNLESS OTHERWISE SPECIFIED, CLASS 5 AGGREGATE WILL EXTEND 1' BEYOND BACK OF CURB OR EDGE OF PAVEMENT.

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TYPICAL SECTIONS

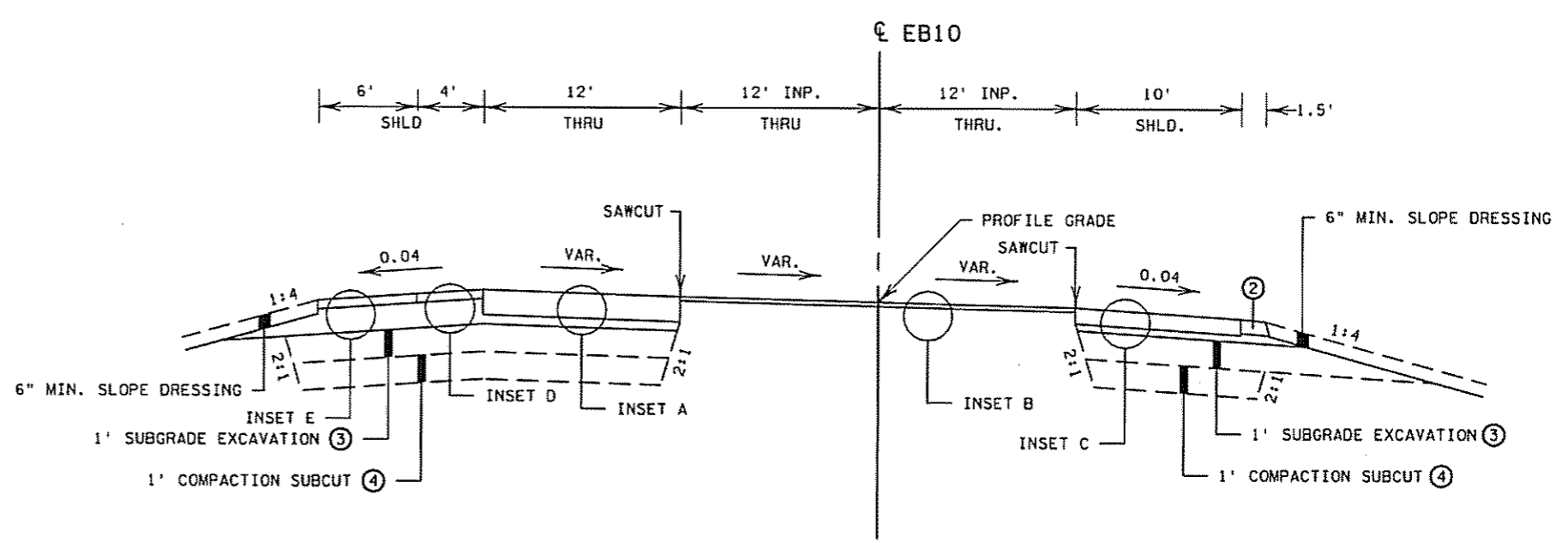
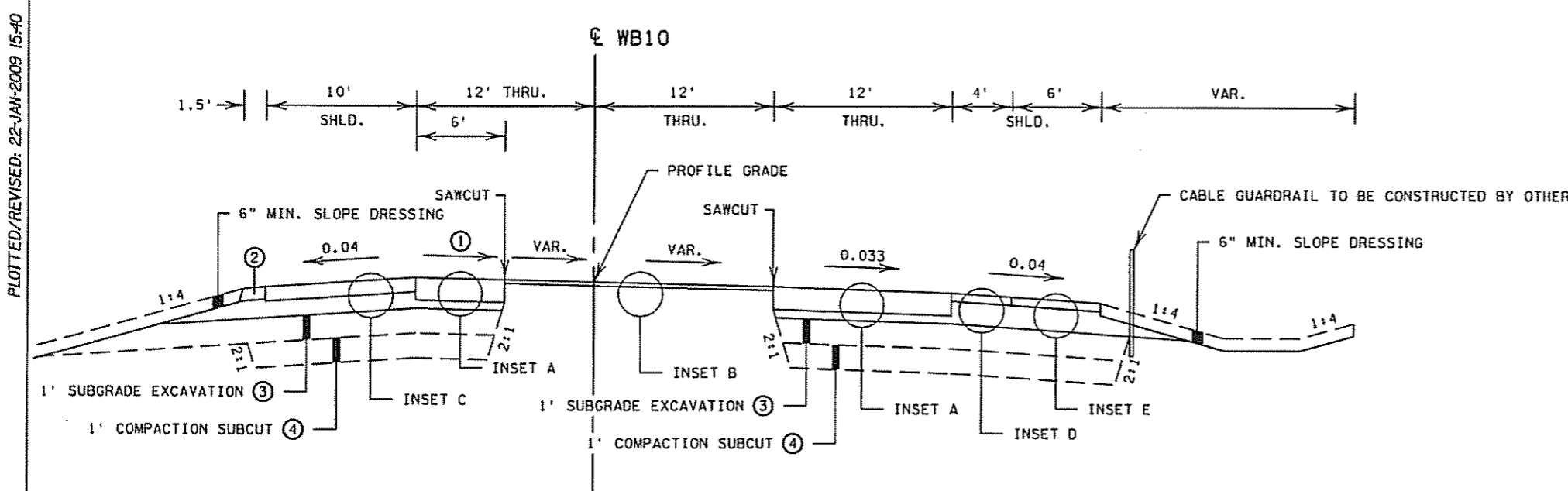
TYPICAL SECTION NO. 4

T.H. 10 E.B. STA. 381+13 TO STA. 387+83

T.H. 10 W.B. STA. 381+75 TO STA. 387+53

- ① MATCH SLOPE OF ADJACENT INPLACE LANE.
- ② VARIABLE DEPTH AGGREGATE SHOULDERING CLASS 2 - SPEC. 2221.
- ③ BACKFILL WITH SELECT GRANULAR MATERIAL.
- ④ PAID FOR AS SUBGRADE EXCAVATION. BACKFILL WITH SUITABLE GRADING MATERIAL.

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GENERAL NOTES:

FOR INSETS SEE SHEET NO. 17.

ALL DIMENSIONS ARE IN FEET, UNLESS OTHERWISE NOTED.

ALL CROSS SLOPES ARE FT. PER FT.

THE TOP OF GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.

UNLESS OTHERWISE INDICATED, THE GRADING GRADE AND BOTTOM OF SUBGRADE EXCAVATION WILL HAVE THE SAME SLOPE AS THE FINISHED ROAD SURFACE.

MULTIPLE LIFTS OF BITUMINOUS PAVEMENT ARE NOT SHOWN ON THE TYPICAL SECTIONS FOR CLARITY. THEY ARE SHOWN ON THE INSETS.

FOR DITCH WIDTH, SLOPE VARIATIONS AND INPLACE GROUND LINES, SEE CROSS SECTIONS.

FOR LANE AND SHOULDER WIDTHS, MILL & OVERLAY AREAS, MEDIAN BARRIER LOCATIONS, GUARDRAIL LOCATIONS, AND CURB & GUTTER LOCATIONS, SEE CONSTRUCTION PLANS.

USE 3" HORIZONTAL STEPPING ON BITUMINOUS LIFTS WHERE CURB & GUTTER IS NOT SPECIFIED.

UNLESS OTHERWISE SPECIFIED, CLASS 5 AGGREGATE WILL EXTEND 1' BEYOND BACK OF CURB OR EDGE OF PAVEMENT.

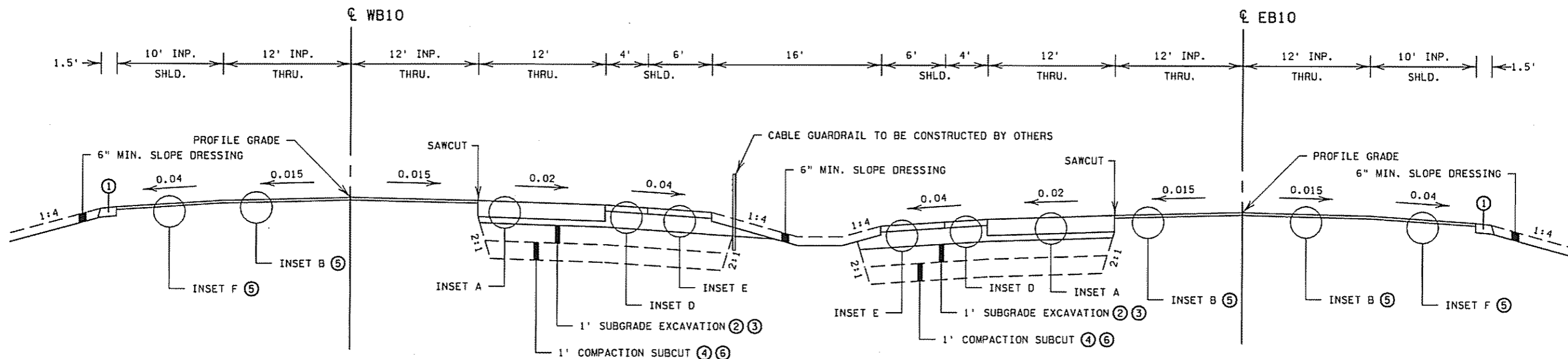
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TYPICAL SECTIONS

TYPICAL SECTION NO. 5

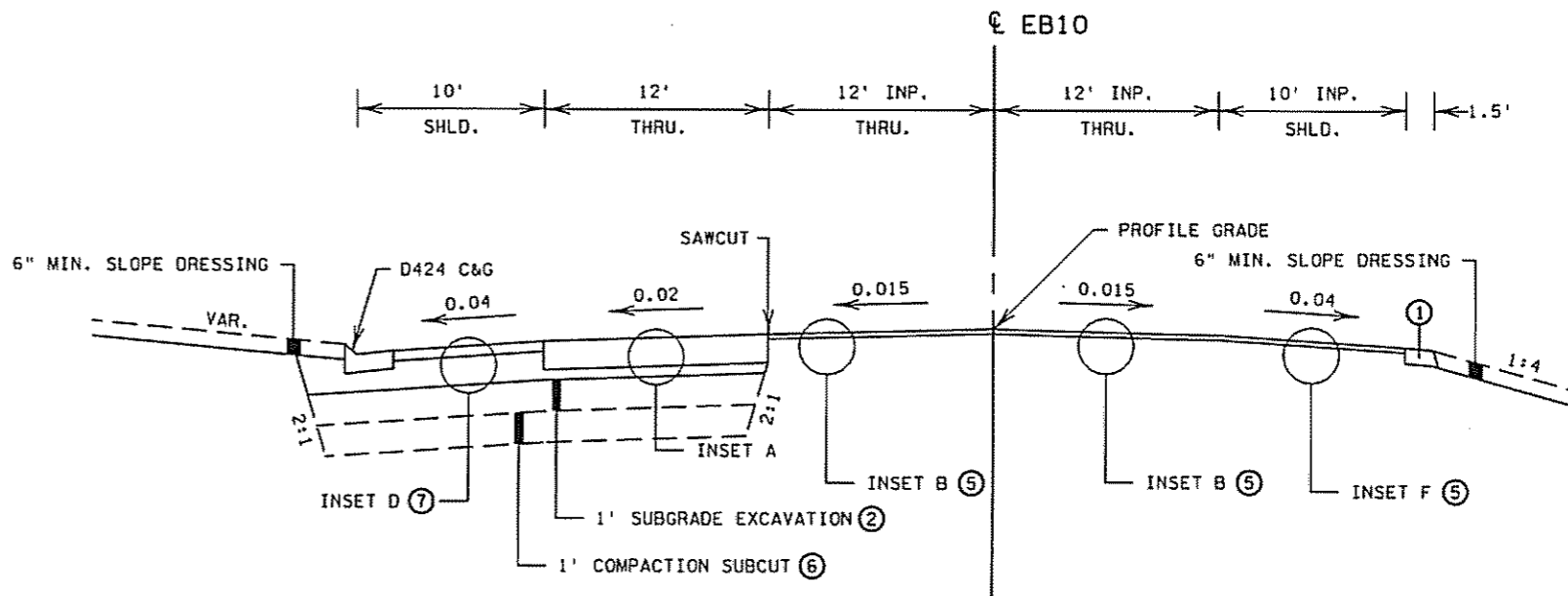
T.H. 10 E.B. STA. 387+83 TO STA. 407+05

T.H. 10 W.B. STA. 387+53 TO STA. 412+45



TYPICAL SECTION NO. 6

T.H. 10 E.B. STA. 407+05 TO STA. 413+22



GENERAL NOTES:

FOR INSETS SEE SHEET NO. 17.

ALL DIMENSIONS ARE IN FEET, UNLESS OTHERWISE NOTED.

ALL CROSS SLOPES ARE FT. PER FT.

THE TOP OF GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.

UNLESS OTHERWISE INDICATED, THE GRADING GRADE AND BOTTOM OF SUBGRADE EXCAVATION WILL HAVE THE SAME SLOPE AS THE FINISHED ROAD SURFACE.

MULTIPLE LIFTS OF BITUMINOUS PAVEMENT ARE NOT SHOWN ON THE TYPICAL SECTIONS FOR CLARITY. THEY ARE SHOWN ON THE INSETS.

FOR DITCH WIDTH, SLOPE VARIATIONS AND INPLACE GROUNDLINES, SEE CROSS SECTIONS.

FOR LANE AND SHOULDER WIDTHS, MILL & OVERLAY AREAS, MEDIAN BARRIER LOCATIONS, GUARDRAIL LOCATIONS, AND CURB & GUTTER LOCATIONS, SEE CONSTRUCTION PLANS.

USE 3" HORIZONTAL STEPPING ON BITUMINOUS LIFTS WHERE CURB & GUTTER IS NOT SPECIFIED.

UNLESS OTHERWISE SPECIFIED, CLASS 5 AGGREGATE WILL EXTEND 1' BEYOND BACK OF CURB OR EDGE OF PAVEMENT.

- ① VARIABLE DEPTH AGGREGATE SHOULDERING CLASS 2 - SPEC. 2221.
- ② BACKFILL WITH SELECT GRANULAR MATERIAL.
- ③ 2' FROM EB10 AND WB10 STA. 394+00 TO STA. 397+00.
- ④ 0' FROM EB10 AND WB10 STA. 394+00 TO STA. 397+00.
- ⑤ USE INSET B ON 12' THRU LANES AND 2' OF OUTSIDE SHOULDER (26' TOTAL MILLING WIDTH). USE INSET F ON OUTER 8' OF SHOULDER.
- ⑥ PAID FOR AS SUBGRADE EXCAVATION. BACKFILL WITH SUITABLE GRADING MATERIAL.
- ⑦ USE INSET G BEGINNING AT STA. 412+50.

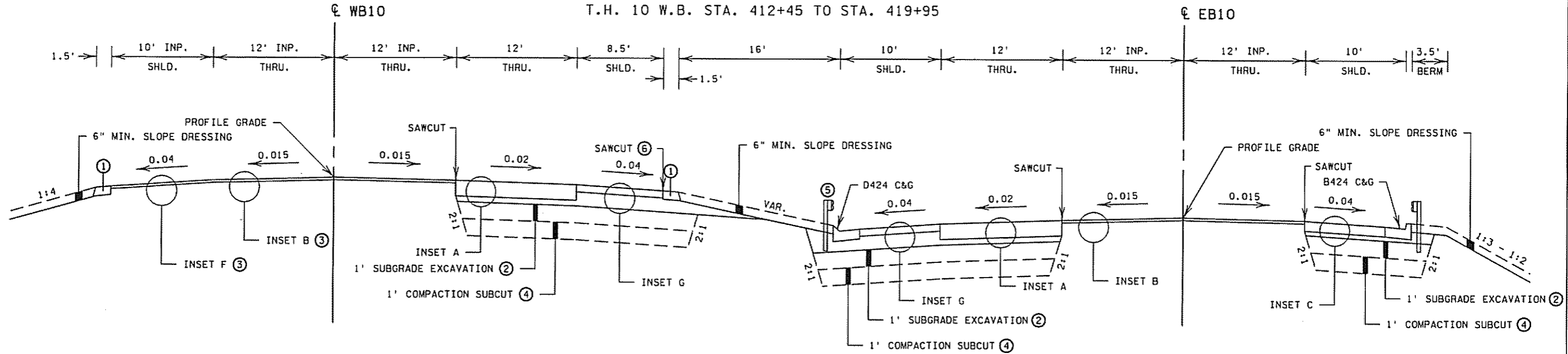
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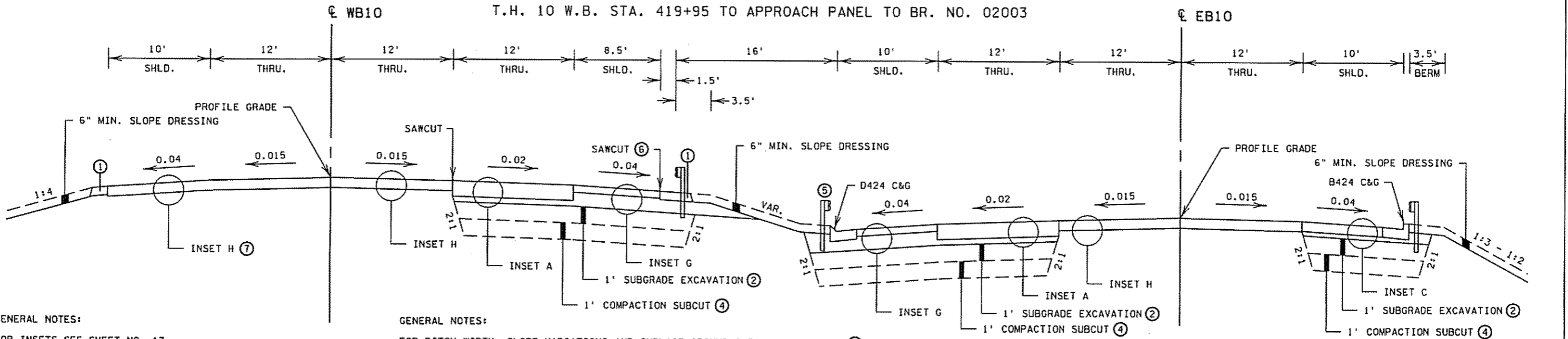
### TYPICAL SECTION NO. 7

T.H. 10 E.B. STA. 413+42 TO STA. 420+00  
T.H. 10 W.B. STA. 412+45 TO STA. 419+95



### TYPICAL SECTION NO. 8

T.H. 10 E.B. STA. 420+00 TO APPROACH PANEL TO BR. NO. 02004  
T.H. 10 W.B. STA. 419+95 TO APPROACH PANEL TO BR. NO. 02003



#### GENERAL NOTES:

FOR INSETS SEE SHEET NO. 17.  
 ALL DIMENSIONS ARE IN FEET, UNLESS OTHERWISE NOTED.  
 ALL CROSS SLOPES ARE FT. PER FT.  
 THE TOP OF GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.  
 UNLESS OTHERWISE INDICATED, THE GRADING GRADE AND BOTTOM OF SUBGRADE EXCAVATION WILL HAVE THE SAME SLOPE AS THE FINISHED ROAD SURFACE.  
 MULTIPLE LIFTS OF BITUMINOUS PAVEMENT ARE NOT SHOWN ON THE TYPICAL SECTIONS FOR CLARITY. THEY ARE SHOWN ON THE INSETS.

#### GENERAL NOTES:

FOR DITCH WIDTH, SLOPE VARIATIONS AND INPLACE GROUND LINES, SEE CROSS SECTIONS.  
 FOR LANE AND SHOULDER WIDTHS, MILL & OVERLAY AREAS, MEDIAN BARRIER LOCATIONS, GUARDRAIL LOCATIONS, AND CURB & GUTTER LOCATIONS, SEE CONSTRUCTION PLANS.  
 USE 3" HORIZONTAL STEPPING ON BITUMINOUS LIFTS WHERE CURB & GUTTER IS NOT SPECIFIED.  
 UNLESS OTHERWISE SPECIFIED, CLASS 5 AGGREGATE WILL EXTEND 1' BEYOND BACK OF CURB OR EDGE OF PAVEMENT.

- ① VARIABLE DEPTH AGGREGATE SHOULDERING CLASS 2 - SPEC. 2221.
- ② BACKFILL WITH SELECT GRANULAR MATERIAL.
- ③ USE INSET B ON 12' THRU LANES AND 2' OF OUTSIDE SHOULDER (26' TOTAL MILLING WIDTH). USE INSET F ON OUTER 8' OF SHOULDER.
- ④ PAID FOR AS SUBGRADE EXCAVATION. BACKFILL WITH SUITABLE GRADING MATERIAL.
- ⑤ GUARDRAIL IN THIS AREA EXTENDS FROM STATION 417+71 TO 422+83.
- ⑥ TEMPORARY WIDENING REMOVAL.
- ⑦ USE INSET C ON SHOULDER FROM STA. 421+40 TO 422+45.

### TYPICAL SECTIONS

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

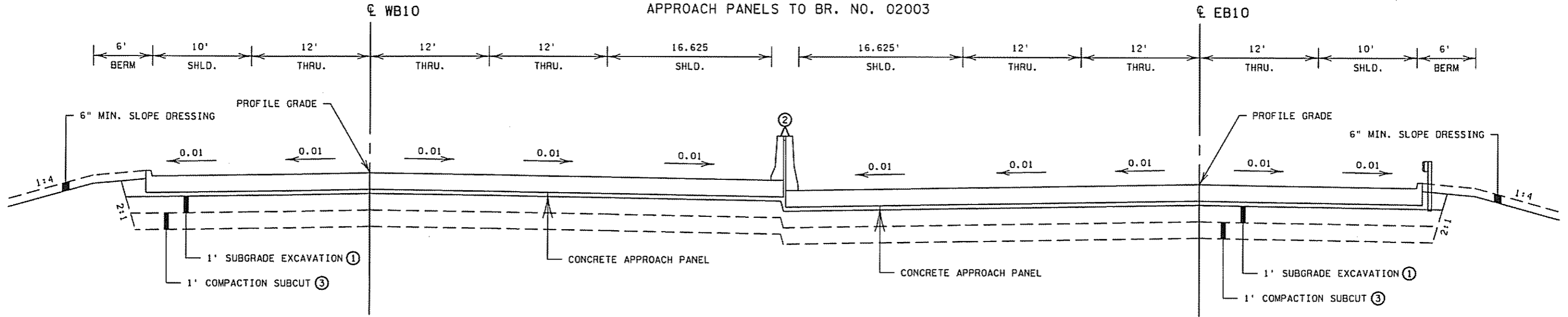
STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 22 OF 222 SHEETS

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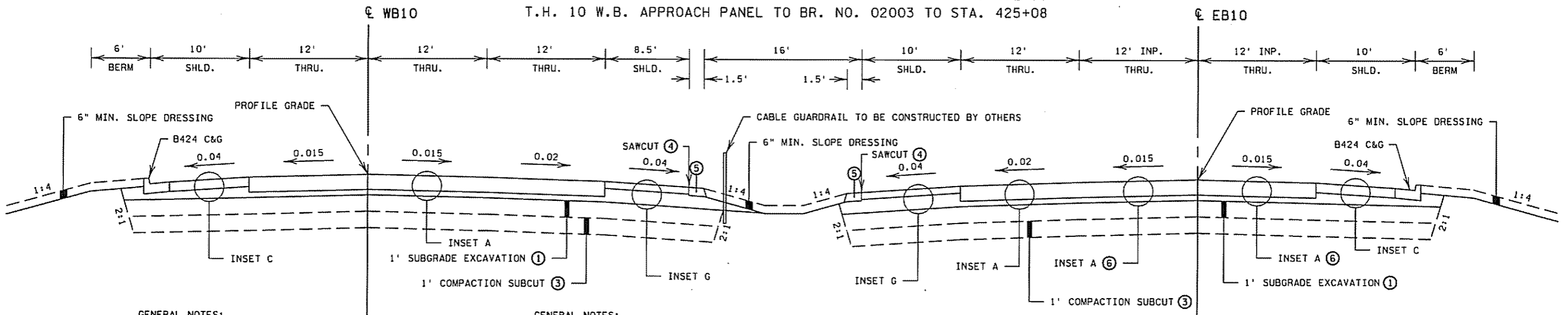
### TYPICAL SECTION NO. 9

APPROACH PANELS TO BR. NO. 02004  
APPROACH PANELS TO BR. NO. 02003



### TYPICAL SECTION NO. 10

T.H. 10 E.B. APPROACH PANEL TO BR. NO. 02004 TO STA. 432+50  
T.H. 10 W.B. APPROACH PANEL TO BR. NO. 02003 TO STA. 425+08



#### GENERAL NOTES:

- FOR INSETS SEE SHEET NO. 17.
- ALL DIMENSIONS ARE IN FEET, UNLESS OTHERWISE NOTED.
- ALL CROSS SLOPES ARE FT. PER FT.
- THE TOP OF GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.
- UNLESS OTHERWISE INDICATED, THE GRADING GRADE AND BOTTOM OF SUBGRADE EXCAVATION WILL HAVE THE SAME SLOPE AS THE FINISHED ROAD SURFACE.
- MULTIPLE LIFTS OF BITUMINOUS PAVEMENT ARE NOT SHOWN ON THE TYPICAL SECTIONS FOR CLARITY. THEY ARE SHOWN ON THE INSETS.

#### GENERAL NOTES:

- FOR DITCH WIDTH, SLOPE VARIATIONS AND INPLACE GROUND LINES, SEE CROSS SECTIONS.
- FOR LANE AND SHOULDER WIDTHS, MILL & OVERLAY AREAS, MEDIAN BARRIER LOCATIONS, GUARDRAIL LOCATIONS, AND CURB & GUTTER LOCATIONS, SEE CONSTRUCTION PLANS.
- USE 3" HORIZONTAL STEPPING ON BITUMINOUS LIFTS WHERE CURB & GUTTER IS NOT SPECIFIED.
- UNLESS OTHERWISE SPECIFIED, CLASS 5 AGGREGATE WILL EXTEND 1' BEYOND BACK OF CURB OR EDGE OF PAVEMENT.

- ① BACKFILL WITH SELECT GRANULAR MATERIAL.
- ② CONCRETE MEDIAN BARRIER DESIGN 8308 TYPE A-A STEPPED.
- ③ PAID FOR AS SUBGRADE EXCAVATION. BACKFILL WITH SUITABLE GRADING MATERIAL.
- ④ TEMPORARY WIDENING REMOVAL.
- ⑤ VARIABLE DEPTH AGGREGATE SHOULDERING CLASS 2 - SPEC. 2221.
- ⑥ INSET H FROM STA. 430+75 TO 432+50.

SHEET 7 OF 12

### TYPICAL SECTIONS

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 2/11/09

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 23 OF 222 SHEETS

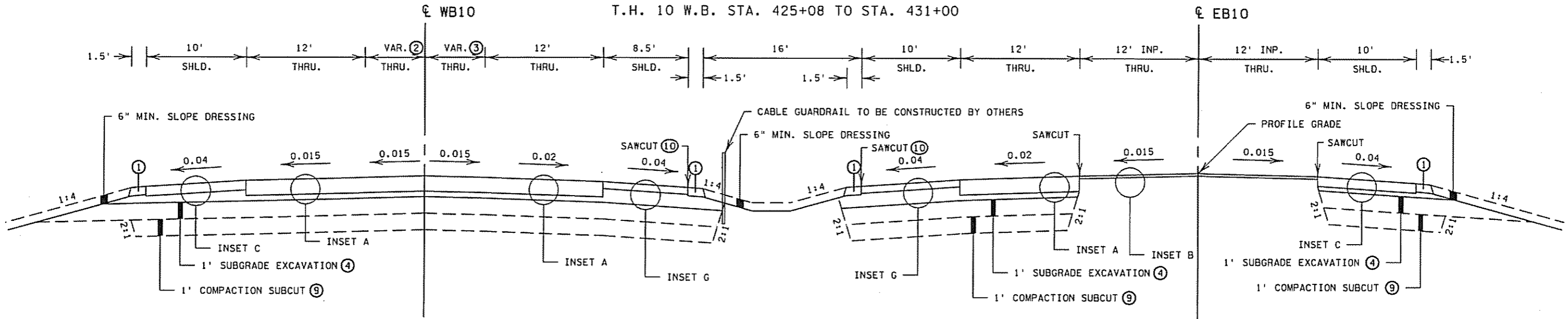
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DISTRICT #: METRO  
PLOT NAME: 67-158  
PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_1.sldgn

### TYPICAL SECTION NO. 11

T.H. 10 E.B. STA. 432+50 TO STA. 435+93  
T.H. 10 W.B. STA. 425+08 TO STA. 431+00



- ① VARIABLE DEPTH AGGREGATE SHOULDERING CLASS 2 - SPEC. 2221.
- ② 0' TO 8.7' FROM WB10 STA. 425+16 TO 433+23.
- ③ 12' TO 3.3' FROM WB10 STA. 425+16 TO 433+23.
- ④ BACKFILL WITH SELECT GRANULAR MATERIAL.
- ⑤ FOR SLOPE CORRECTION ACROSS MIDDLE LANE SEE CROSS SECTIONS.
- ⑥ MATCH SLOPE OF ADJACENT INPLACE LANE.
- ⑦ 8.7' TO 12' FROM WB10 STA. 433+23 TO 437+43.
- ⑧ 3.3' TO 0' FROM WB10 STA. 433+23 TO 437+43.
- ⑨ PAID FOR AS SUBGRADE EXCAVATION. BACKFILL WITH SUITABLE GRADING MATERIAL.
- ⑩ TEMPORARY WIDENING REMOVAL.
- ⑪ USE INSET H FROM STATION 431+00 TO 433+23.

#### GENERAL NOTES:

FOR INSETS SEE SHEET NO. 17.

ALL DIMENSIONS ARE IN FEET, UNLESS OTHERWISE NOTED.

ALL CROSS SLOPES ARE FT. PER FT.

THE TOP OF GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.

UNLESS OTHERWISE INDICATED, THE GRADING GRADE AND BOTTOM OF SUBGRADE EXCAVATION WILL HAVE THE SAME SLOPE AS THE FINISHED ROAD SURFACE.

MULTIPLE LIFTS OF BITUMINOUS PAVEMENT ARE NOT SHOWN ON THE TYPICAL SECTIONS FOR CLARITY. THEY ARE SHOWN ON THE INSETS.

FOR DITCH WIDTH, SLOPE VARIATIONS AND INPLACE GROUND LINES, SEE CROSS SECTIONS.

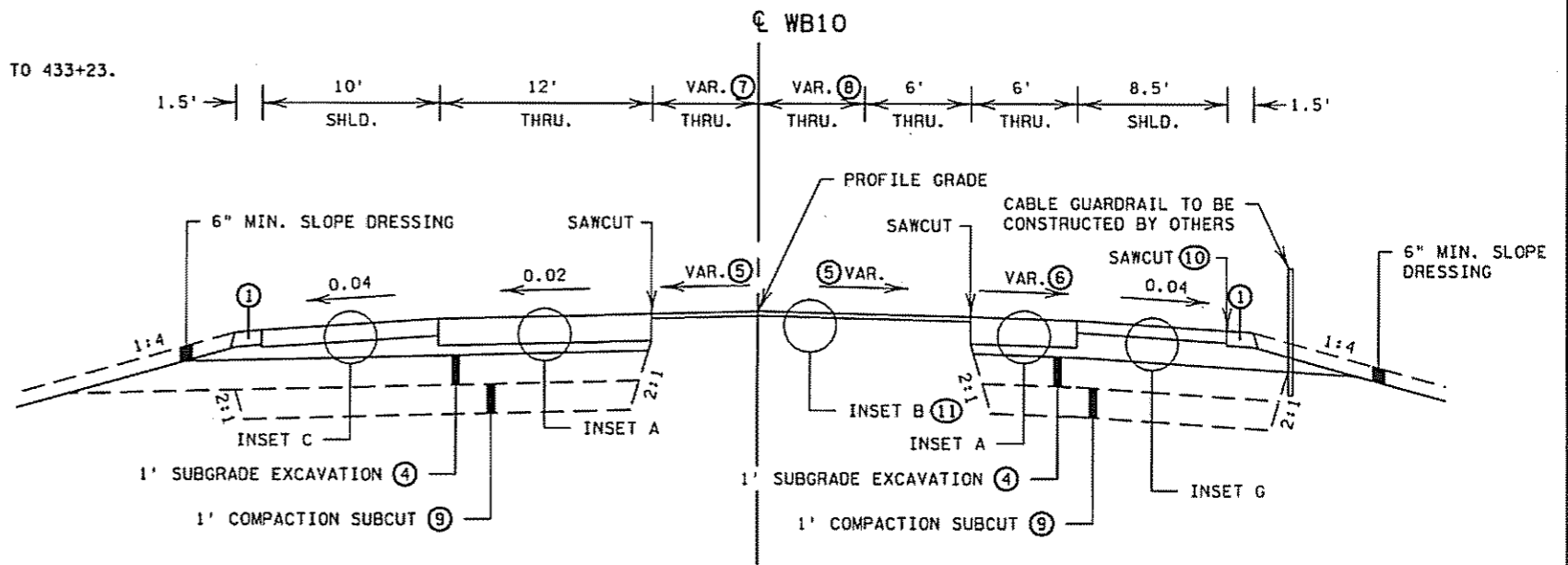
FOR LANE AND SHOULDER WIDTHS, MILL & OVERLAY AREAS, MEDIAN BARRIER LOCATIONS, GUARDRAIL LOCATIONS, AND CURB & GUTTER LOCATIONS, SEE CONSTRUCTION PLANS.

USE 3" HORIZONTAL STEPPING ON BITUMINOUS LIFTS WHERE CURB & GUTTER IS NOT SPECIFIED.

UNLESS OTHERWISE SPECIFIED, CLASS 5 AGGREGATE WILL EXTEND 1' BEYOND BACK OF CURB OR EDGE OF PAVEMENT.

### TYPICAL SECTION NO. 12

T.H. 10 W.B. STA. 431+00 TO STA. 437+43



### TYPICAL SECTIONS

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CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 2/11/09

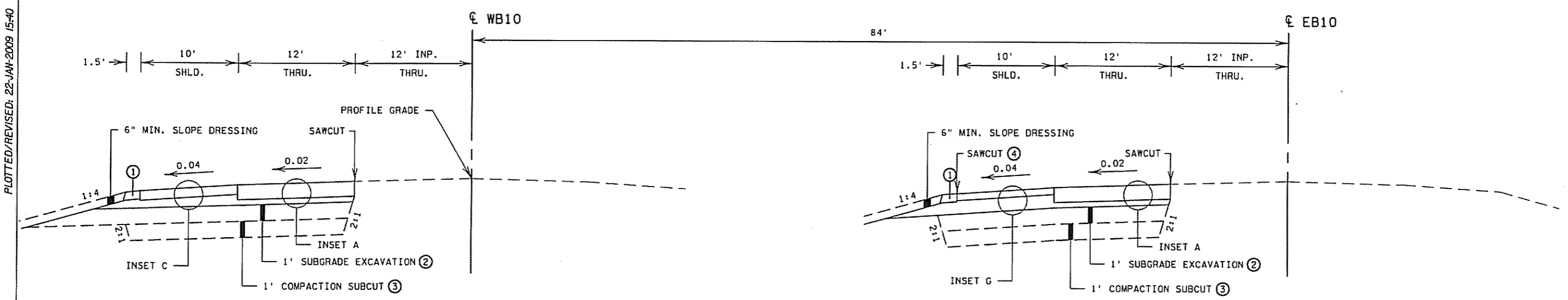
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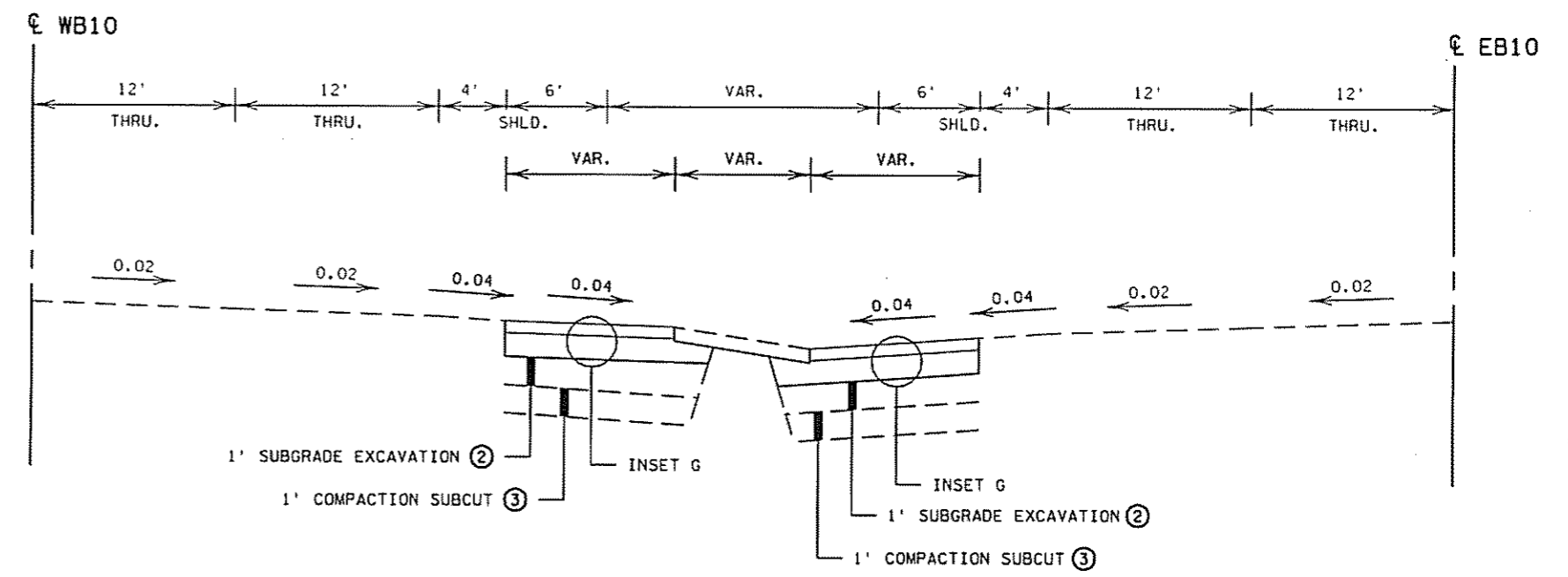
TYPICAL SECTION NO. 13

T.H. 10 E.B. STA. 435+93 TO STA. 437+07  
T.H. 10 W.B. STA. 437+43 TO STA. 445+70

PLOTTED/REVISED: 22-JAN-2009 15:40



TYPICAL SECTION NO. 14  
TEMPORARY WIDENING



GENERAL NOTES:  
FOR INSETS SEE SHEET NO. 17.  
ALL DIMENSIONS ARE IN FEET, UNLESS OTHERWISE NOTED.  
ALL CROSS SLOPES ARE FT. PER FT.  
THE TOP OF GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5 AGGREGATE BASE.  
UNLESS OTHERWISE INDICATED, THE GRADING GRADE AND BOTTOM OF SUBGRADE EXCAVATION WILL HAVE THE SAME SLOPE AS THE FINISHED ROAD SURFACE.  
MULTIPLE LIFTS OF BITUMINOUS PAVEMENT ARE NOT SHOWN ON THE TYPICAL SECTIONS FOR CLARITY. THEY ARE SHOWN ON THE INSETS.  
FOR DITCH WIDTH, SLOPE VARIATIONS AND INPLACE GROUND LINES, SEE CROSS SECTIONS.  
FOR LANE AND SHOULDER WIDTHS, MILL & OVERLAY AREAS, MEDIAN BARRIER LOCATIONS, GUARDRAIL LOCATIONS, AND CURB & GUTTER LOCATIONS, SEE CONSTRUCTION PLANS.  
USE 3" HORIZONTAL STEPPING ON BITUMINOUS LIFTS WHERE CURB & GUTTER IS NOT SPECIFIED.  
UNLESS OTHERWISE SPECIFIED, CLASS 5 AGGREGATE WILL EXTEND 1' BEYOND BACK OF CURB OR EDGE OF PAVEMENT.

- ① VARIABLE DEPTH AGGREGATE SHOULDERING CLASS 2 - SPEC. 2221.
- ② BACKFILL WITH SELECT GRANULAR MATERIAL.
- ③ PAID FOR AS SUBGRADE EXCAVATION. BACKFILL WITH SUITABLE GRADING MATERIAL.
- ④ TEMPORARY WIDENING REMOVAL.

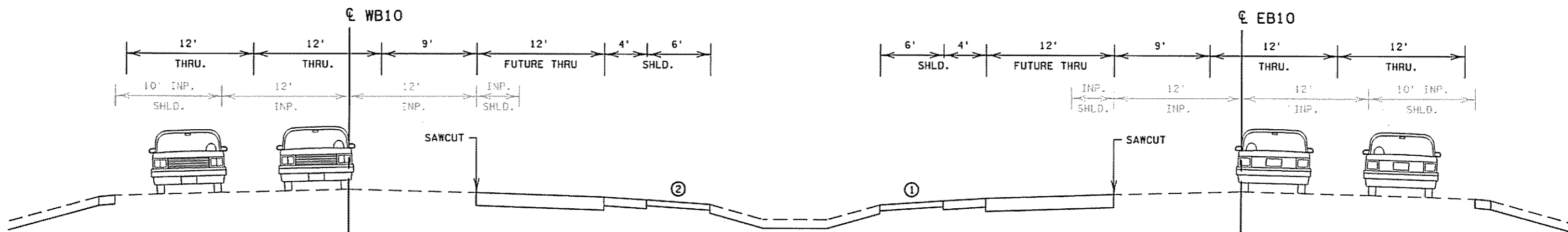
TYPICAL SECTIONS

DISTRICT #: METRO  
PLOT NAME: 67.Js9  
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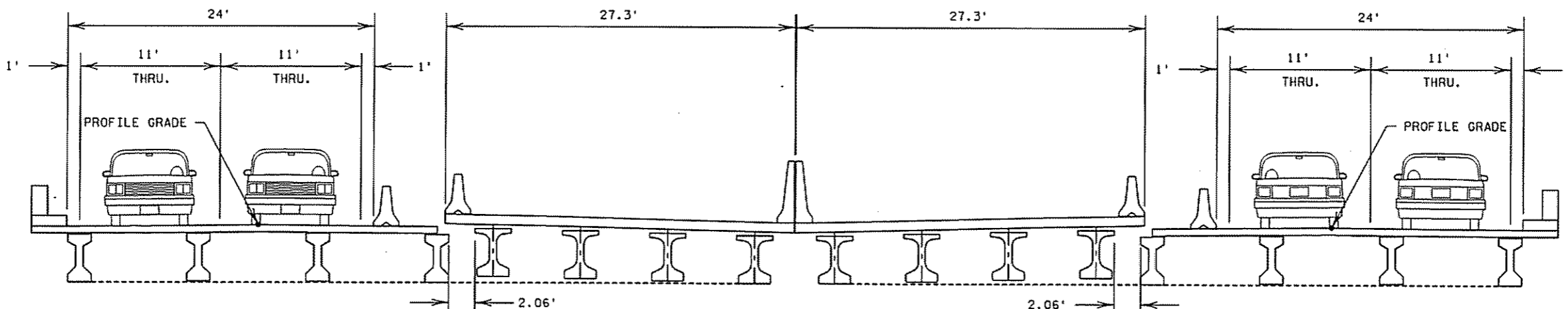
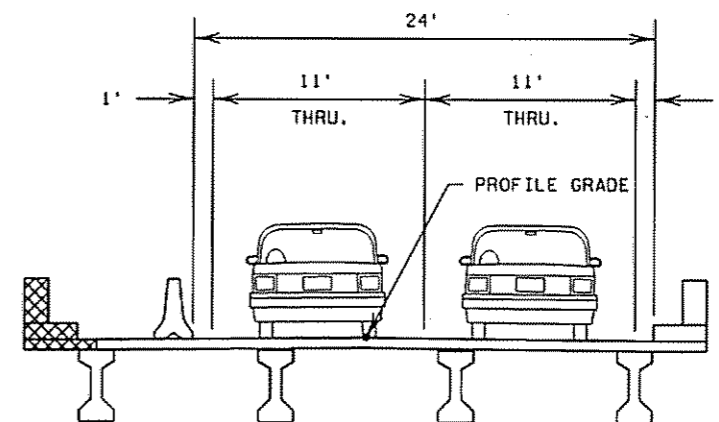
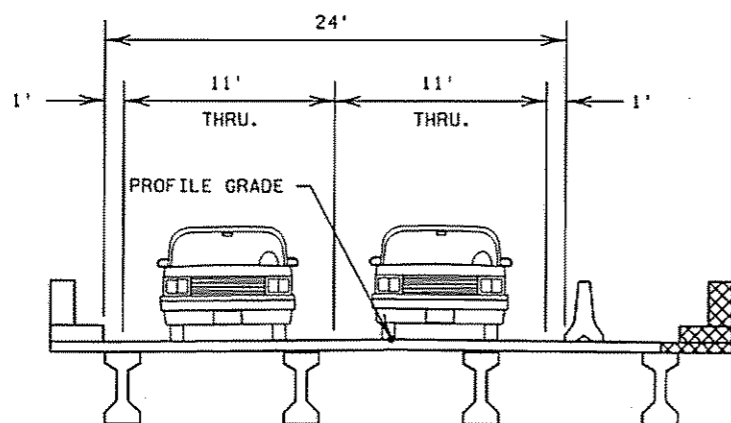
STAGE 1

- STAGE 1 CONSTRUCTION:
- MOVE EB AND WB TRAFFIC TO OUTSIDE SHOULDERS OF EXISTING ROADWAY.
  - REMOVE 3.75' OF INPLACE WB BRIDGE NO. 9721.
  - REMOVE 3.75' OF INPLACE EB BRIDGE NO. 9722.
  - CONSTRUCT INSIDE 27.3' OF WB BRIDGE NO. 02003.
  - CONSTRUCT INSIDE 27.3' OF EB BRIDGE NO. 02004.
  - CONSTRUCT EB AND WB ROADWAY WIDENING TO THE CENTER, EXCEPT FOR THE TOP 1-1/2" LIFT OF PAVEMENT.
  - CONSTRUCT TEMPORARY WIDENING.

PLOTTED/REVISED: 22-JAN-2009 15:40



- ① CONSTRUCT TEMPORARY WIDENING IN PLACE OF AGGREGATE SHOULDER ON EB10 FROM STATION 415+50 TO 437+33. SEE STAGING PLAN ON SHEETS NO. 55-59 AND TYPICAL SECTION NO. 14 ON SHEET NO. 25.
- ② CONSTRUCT TEMPORARY WIDENING IN PLACE OF AGGREGATE SHOULDER ON WB10 FROM STATION 413+45 TO 441+20. SEE STAGING PLAN ON SHEETS NO. 55-59 AND TYPICAL SECTION NO. 14 ON SHEET NO. 25.



STAGE 1  
SHEET 10 OF 12

TYPICAL SECTIONS - STAGING

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniels*  
LICENSED PROFESSIONAL ENGINEER

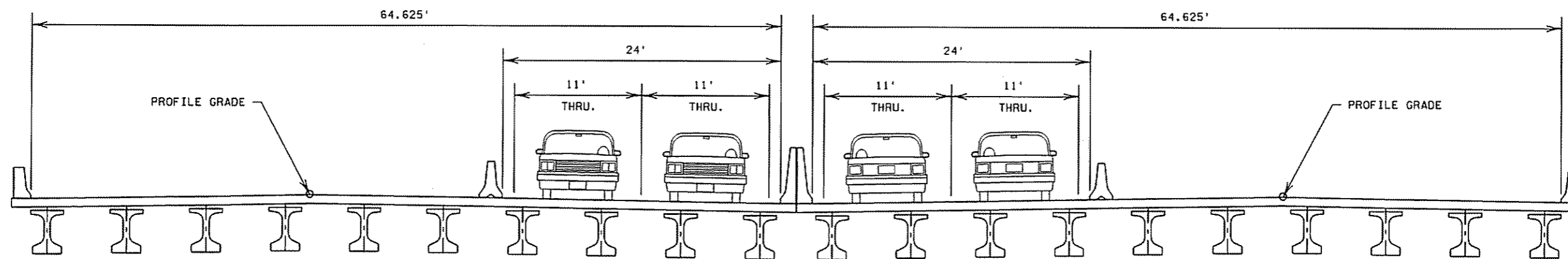
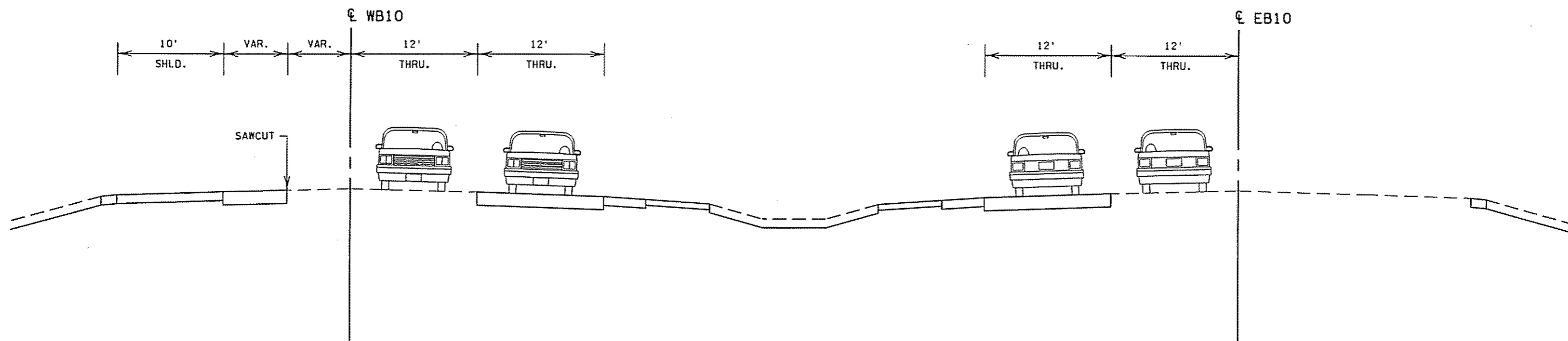
LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 26 OF 222 SHEETS

DISTRICT #: METRO  
PLOT NAME: 67\_1s10  
PATH & FILENAME: S:\Design\010215\067\Final\021567\_1s10.dgn

STAGE 2

- STAGE 2 CONSTRUCTION:
- MOVE EB AND WB TRAFFIC TO INSIDE NEW CONSTRUCTION AND TEMPORARY WIDENING.
  - REMOVE REMAINDER OF INPLACE WB BRIDGE NO. 9721.
  - REMOVE REMAINDER OF INPLACE EB BRIDGE NO. 9722.
  - CONSTRUCT REMAINDER OF WB BRIDGE NO. 02003.
  - CONSTRUCT REMAINDER OF EB BRIDGE NO. 02004.
  - CONSTRUCT EB AND WB ROADWAY WIDENING TO THE OUTSIDE, EXCEPT FOR THE TOP 1-1/2" LIFT OF PAVEMENT.



DISTRICT #: METRO  
 PLOT NAME: 67\_1s11  
 PATH & FILENAME: S:\Design\010215\067\Final\021567\_1s11.dgn

PLOTTED/REVISED: 22-JAN-2009 15:40

STAGE 2  
 SHEET 11 OF 12

TYPICAL SECTIONS - STAGING

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

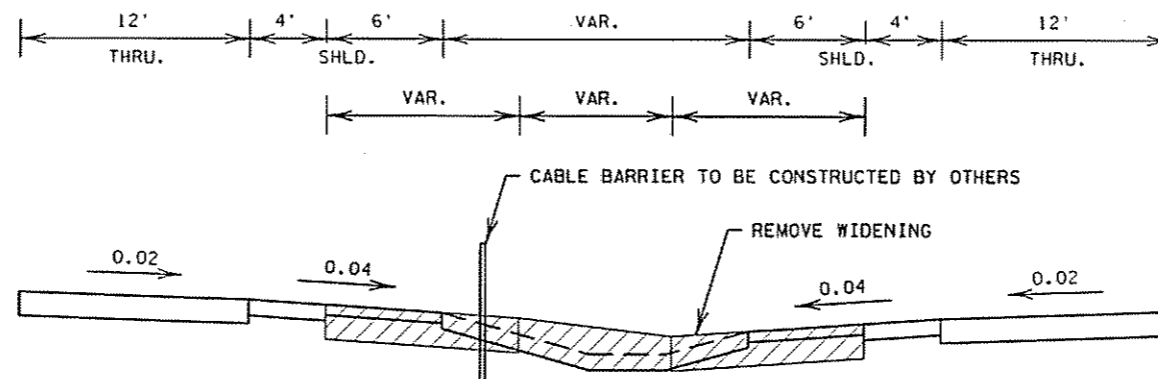
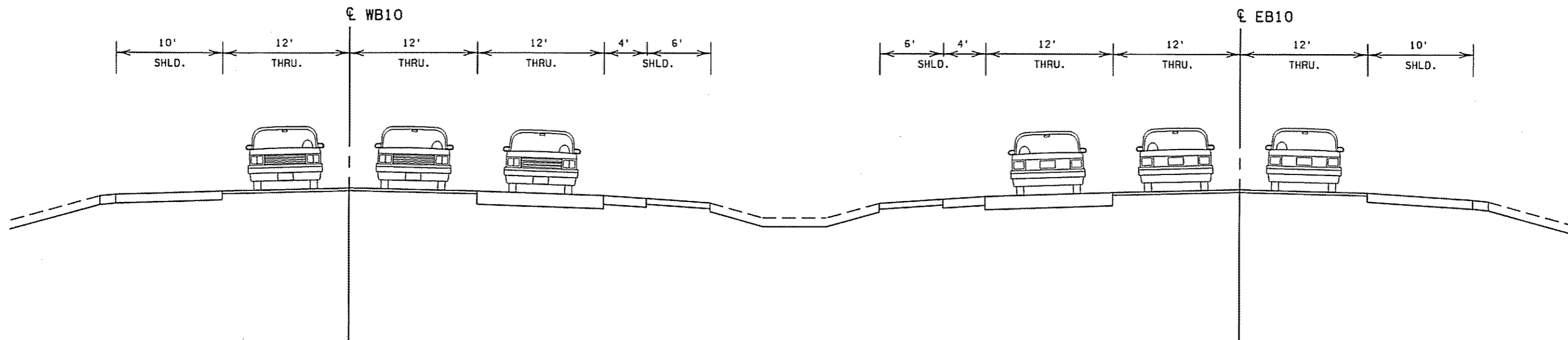
*Peter Daniel*  
 LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 27 OF 222 SHEETS

STAGE 3

- STAGE 3 CONSTRUCTION:
- ALL PERMANENT ROADWAYS FULLY OPEN TO TRAFFIC.
  - REMOVE TEMPORARY WIDENING AND CONSTRUCT CURB & GUTTER, AGGREGATE SHOULDERS AND DITCHES IN THOSE AREAS.
  - PERFORM MAINLINE MILL & OVERLAY AND SHOULDER OVERLAY UNDER THE DIRECTION OF THE ENGINEER.
  - CONSTRUCT PERMANENT TURF ESTABLISHMENT.



TYPICAL SECTIONS - STAGING

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

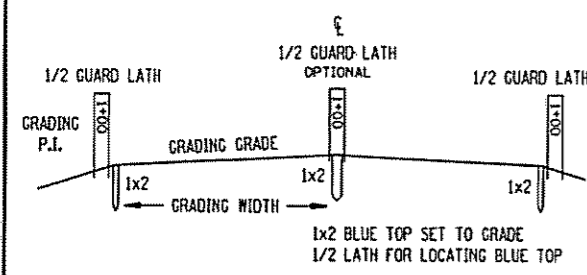
LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 28 OF 222 SHEETS

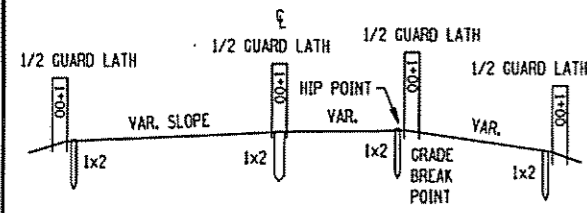
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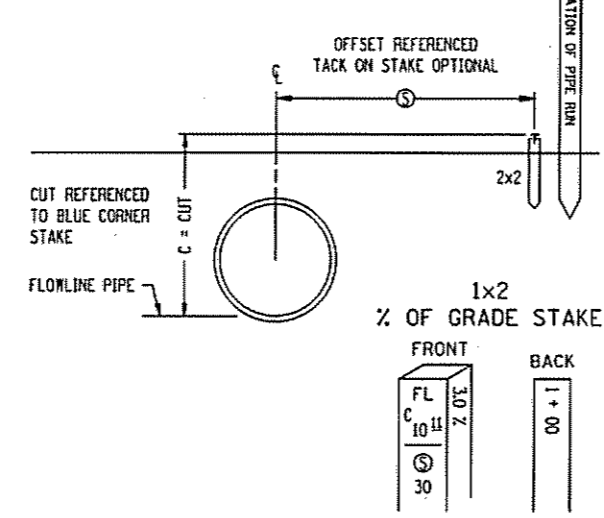
**BLUE TOPS**  
NORMAL SECTION



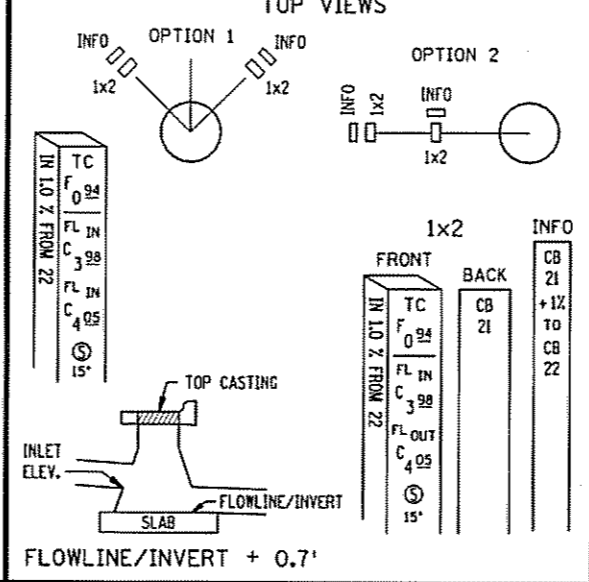
TRANSITION SECTION



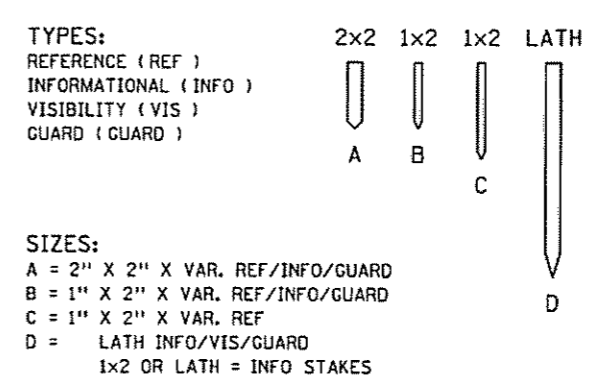
**PIPE STAKING**  
PROFILE VIEW  
CENTERLINE PIPE



**CATCH BASIN OR MANHOLE (CB/MH)**



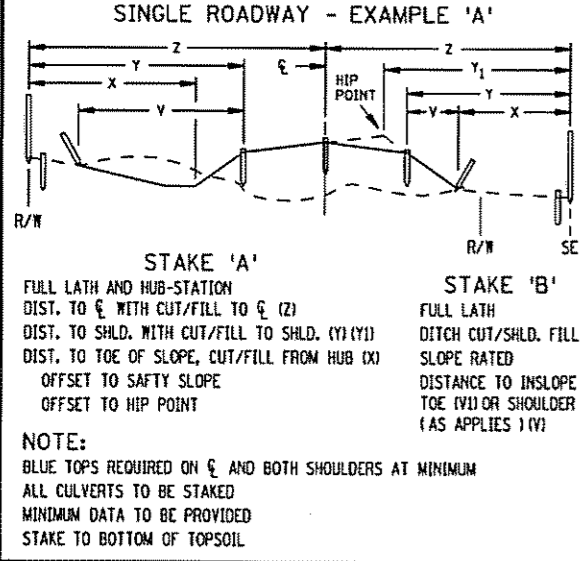
**STANDARD STAKES**



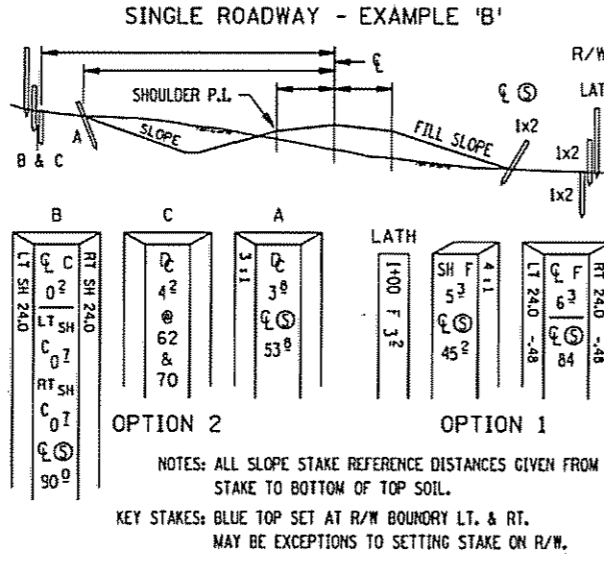
**ABBREVIATIONS**

- |                            |                          |
|----------------------------|--------------------------|
| BBL = BARREL (PIPE)        | HH = HANDHOLE            |
| B.C. = BACK CURB           | HP = HIP POINT           |
| C & G = CURB & GUTTER      | LT = LEFT                |
| C = CUT                    | MH = MANHOLE             |
| CAP = CORR. ALUM. PIPE     | NB = NORTHBOUND          |
| CB = CATCH BASIN           | ⊙ = OFFSET               |
| ℄ = CENTERLINE             | PAR = PARCEL             |
| CL & GR = CLEAR & GRUB     | % = PERCENT GRADE        |
| CMP = CORR. METAL PIPE     | P.E. = PERM. EASEMENT    |
| COR = CORNER               | RAD = RADIUS POINT       |
| CR = CROWN                 | RCP = REINF. CONC. PIPE  |
| CSP = CORR. STEEL PIPE     | RP = REFERENCE POINT     |
| ⊕ = DITCH CUT              | RSC = REINF. SECT. CONC. |
| D.E. = DRAINAGE EASEMENT   | RT = RIGHT               |
| DI = DROP INLET            | R/W = RIGHT OF WAY       |
| EB = EASTBOUND             | SB = SOUTHBOUND          |
| E.M. = EDGE BITUMINOUS MAT | SCP = SECT. CONC. PIPE   |
| E.S. = EDGE CONCRETE SLAB  | SH = SHOULDER            |
| F = FILL                   | TC = TOP CASTING         |
| FF = FRONT FACE            | OR TOP CURB              |
| FL = FLOW LINE             | T.E. = TEMP. EASEMENT    |
| FL IN = FLOWLINE INLET     | 3:1 = SLOPE (EXAMPLE)    |
| FL OUT = FLOWLINE OUTLET   | WB = WESTBOUND           |
| GR = GRADE                 | WP = WORKING POINTS      |
| GW = GRADING WIDTH         |                          |

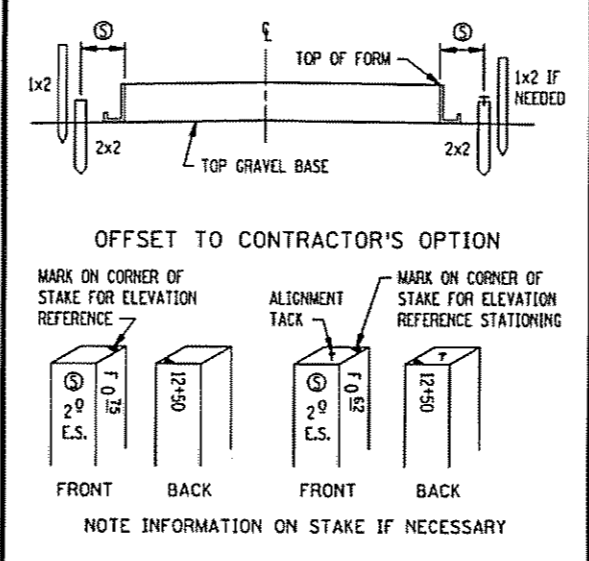
**SLOPE STAKES**



**SLOPE STAKES**



**CONCRETE PAVING STATIONARY FORM**



**RECOMMENDED STAKING INTERVALS**

FIGURE A

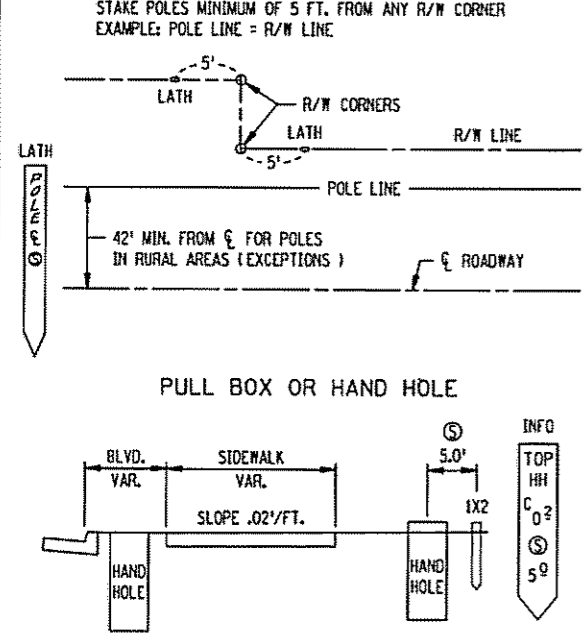
	SLOPE STAKES	SUB GRADE B.T.	CLASS MATERIAL B.T.	CONC PAVT	C & G	CL & GR LIMITS	MUCK EXC.	R/W	TEMP. EASE.
TANGENT	100	100	100	50	50	ALL CORNERS	100	ALL CORNERS	ALL CORNERS
HORIZ. CURVE									
0 - 3'	100	100	100	50	50	ALL CORNERS	100	ALL CORNERS	ALL CORNERS
OVER 3' -	100	50	50	25	25	ALL CORNERS	100	ALL CORNERS	ALL CORNERS
VERT. CURVE									
M' 100' CHORD	100	100	100	50	50				
0 - .25									
M' OVER .25	100	50	50	25	25				
TRAN.	50	50							

THE TOLERANCES ARE RELATIVE TO PROJECT DATUM

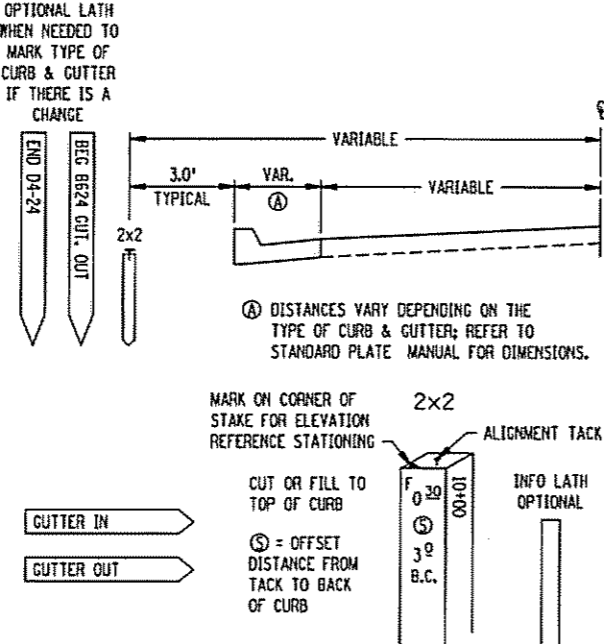
**STAKING TOLERANCES (FEET)**

	HORIZONTAL	VERTICAL
CONSTRUCTION LIMITS	± 1.5	
CLEARING & GRUBBING	2.0	
SLOPES STAKES	2.0	± 0.2
KEY STAKES	0.2	0.03
DRAINAGE STAKES	0.05	0.05
CURB & GUTTER	0.07	0.03
PAVING	0.05	0.03
ALIGNMENT	0.07	
UTILITY	0.10	0.05
STRUCTURAL	0.02	0.02
GUARD RAIL	0.5	
BUILDINGS	0.04	
O.H. SIGNS	0.05	0.05
MUCK EXCAVATION LIMITS	2.0	
R/W B-POINTS	0.10	
NOISE WALLS	1.0	0.5

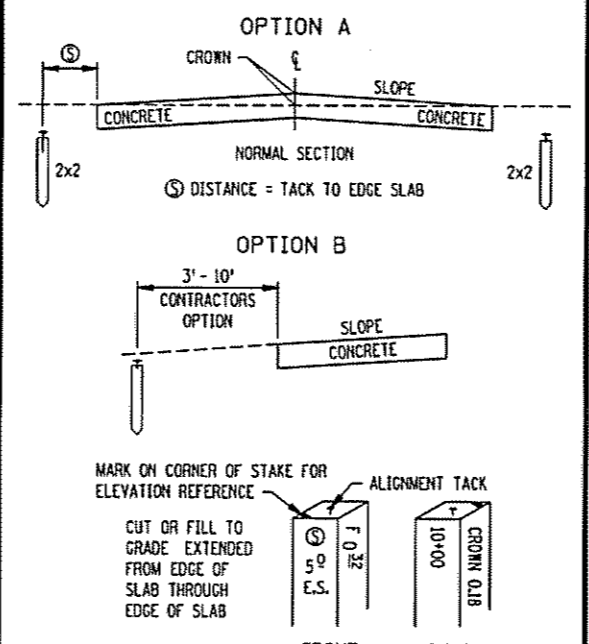
**UTILITY (UTIL)**



**CURB & GUTTER (CURB)**



**CONCRETE PAVING - SLIP FORM**



**DISCLAIMER**

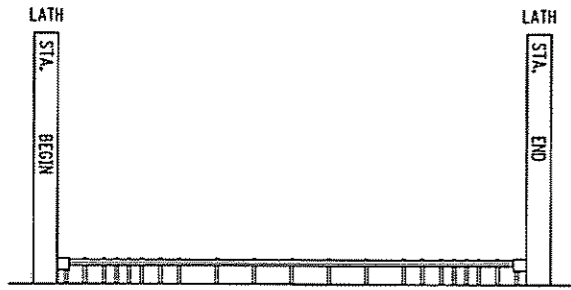
THESE STAKING INFORMATION SHEETS ARE FOR INFORMATION PURPOSES ONLY. STAKING PROCEDURES VARY AND MAY BE SUBJECT TO CHANGE DURING CONSTRUCTION BY CIRCUMSTANCES AND/OR AGREEMENTS BETWEEN SURVEY CREW AND CONTRACTOR.

STANDARD SHEET NO. 5-297.115 (1 OF 2)  
STANDARD APPROVED: DECEMBER 21, 1994

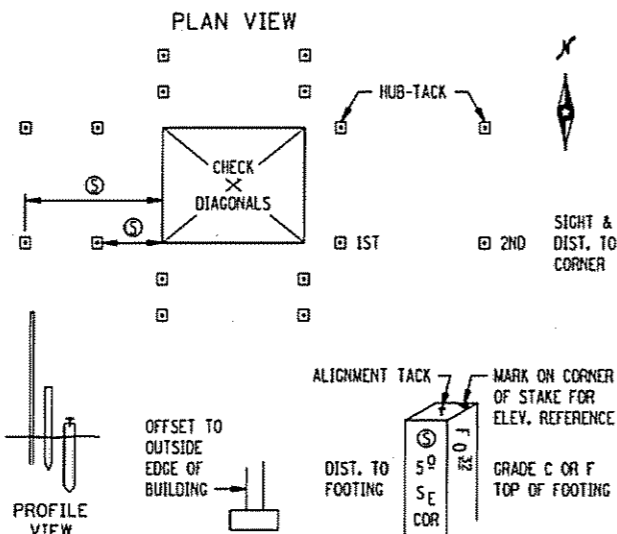
**STAKING INFORMATION SHEET**

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 PLOTTED/REVISED: 22-JAN-2009 15:41

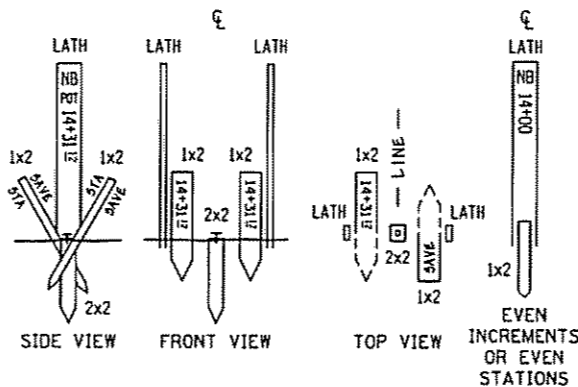
**GUARDRAIL ( GUARD )**



**BUILDING ( BUILD )  
FOUNDATION / FOOTING**

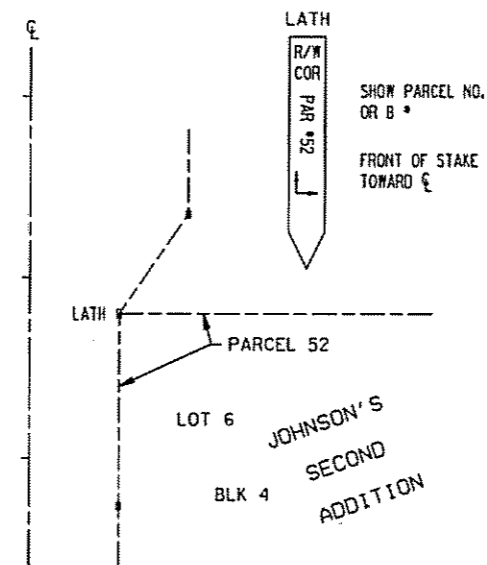


**ALIGNMENT POINTS ( ALIGN )**

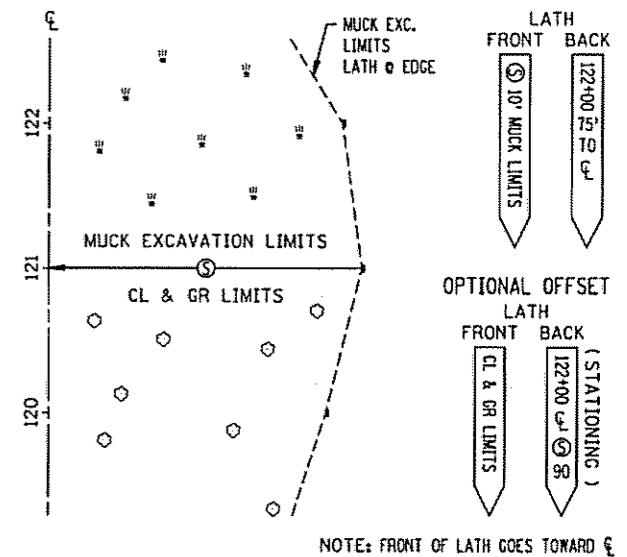


STAKE C = 2" X 2" HUB (LENGTH MAY VARY) SET AS TEMPORARY STAKE. MAY BE REPLACED BY W/OD MARKER AFTER CONSTRUCTION IS COMPLETED.  
SET AT GROUND LEVEL (TEMPORARY CONSTRUCTION STAKE).  
TACK SET AT ALIGNMENT POINTS.  
STAKE A = GUARD STAKES SET AT ANGLE IN GROUND 6" EACH SIDE OF STAKE D, WITH STATIONING READ WHEN LOOKING UP STATION.

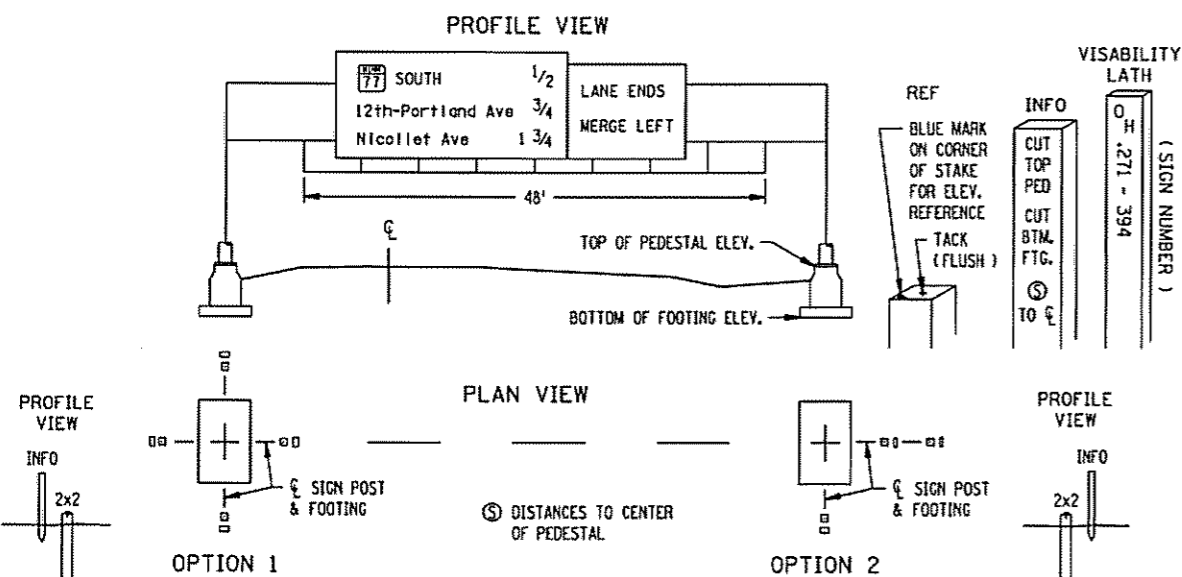
**R/W & TEMP. EASEMENT ( R/W )**



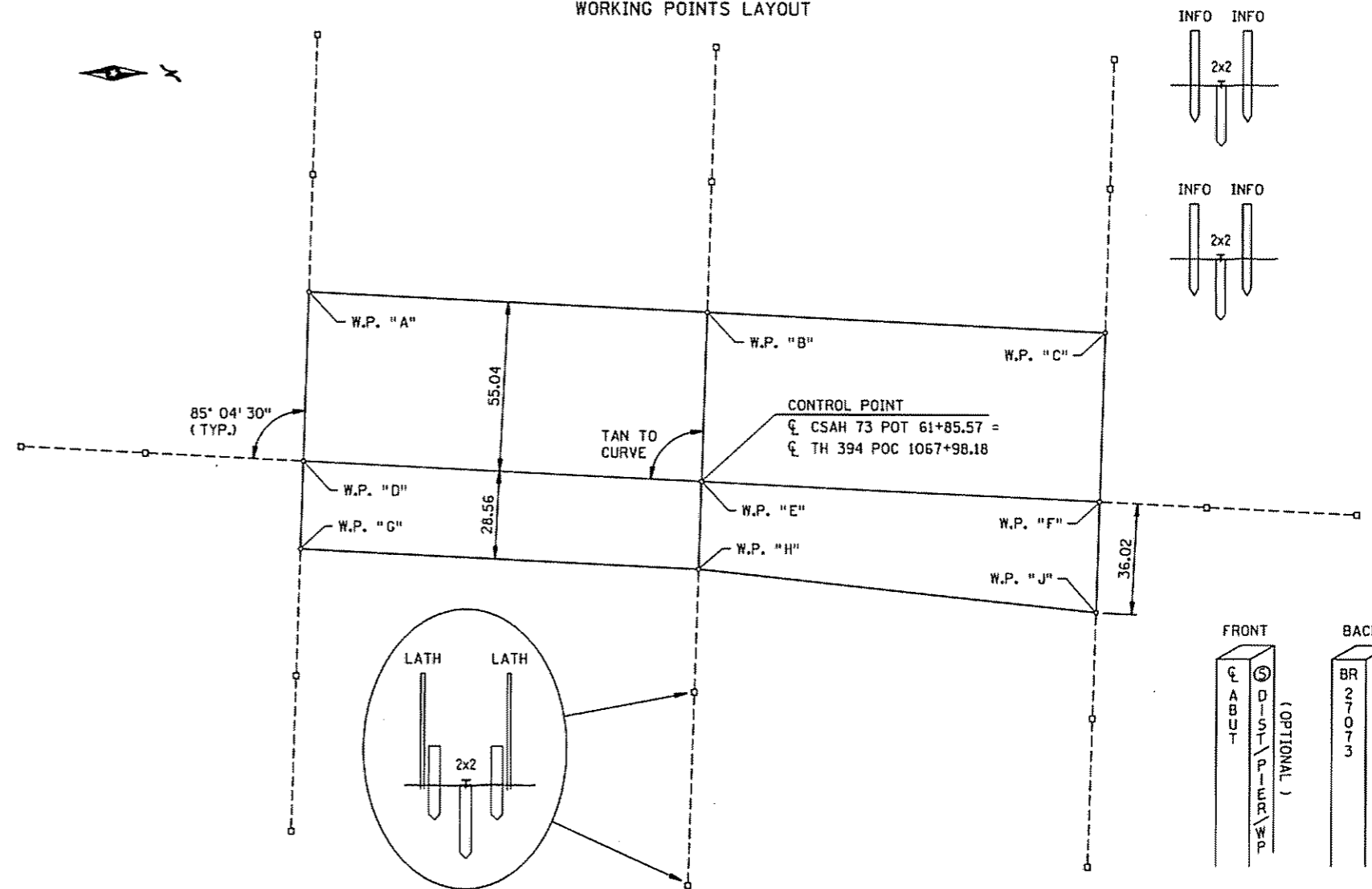
**CLEAR & GRUBBING LIMITS ( CLEAR )  
OR MUCK EXCAVATION LIMITS ( MUCK )**



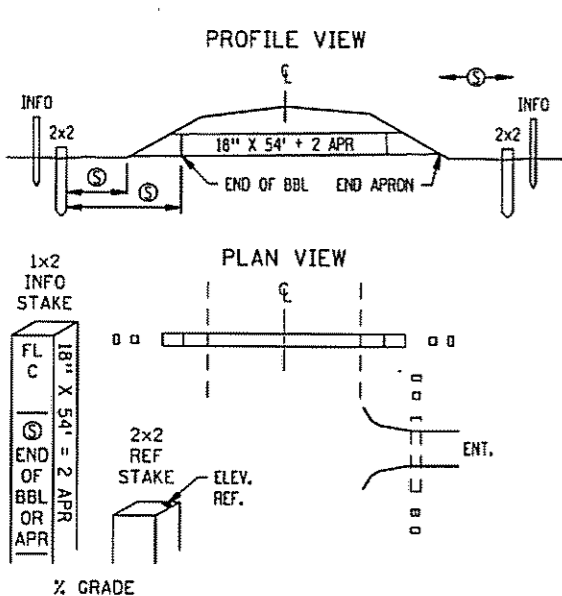
**OVERHEAD SIGNS ( SIGN )**



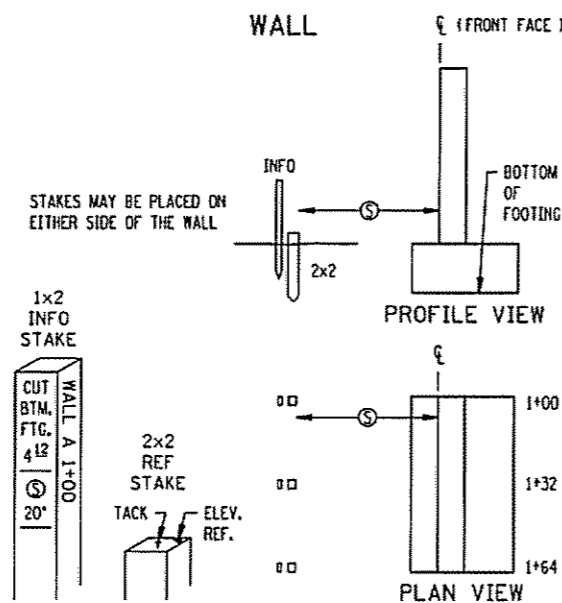
**BRIDGESTAKING ( BRIDGE )  
WORKING POINTS LAYOUT**



**CULVERT**



**WALL**



STANDARD SHEET NO.  
5-297.115 ( 2 OF 2 )  
STANDARD APPROVED  
DECEMBER 21, 1994

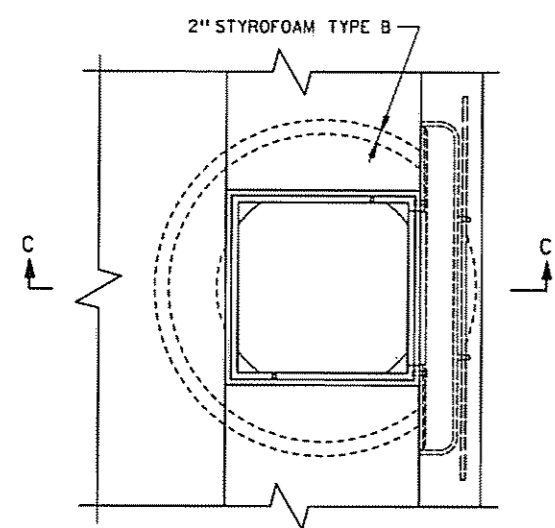
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STAKING INFORMATION SHEET

PLOTTED/REVISED: 22-JAN-2009 15:41

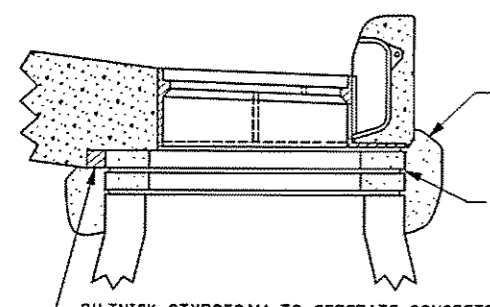
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@FILENAMES

**SUMMARY OF QUANTITIES FOR  
BRIDGE APPROACH PANEL**

CONCRETE MIX NO. 3X42	CU. YD.
REINFORCEMENT BARS	LBS.
CURB DESIGN B4 INTEGRANT	LIN. FT.
CURB DESIGN B424	LIN. FT.



PLAN VIEW OF C. B. CASTING

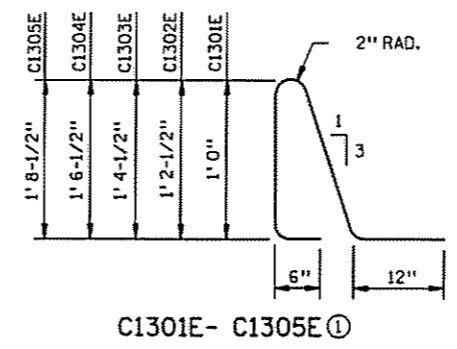


2" THICK STYROFOAM TO SEPERATE CONCRETE ADJUSTING RINGS FROM APPROACH SLAB, TO PREVENT MOVEMENT OF MANHOLE.

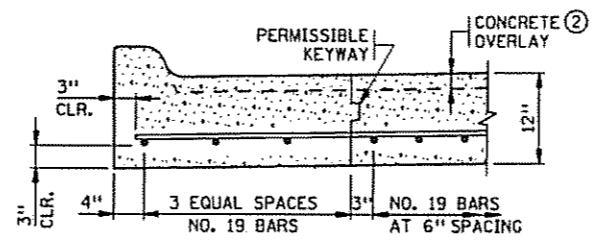
SECTION C-C  
( GRATE NOT SHOWN )

CONCRETE COLLAR TO ENCASE CASTING AND RINGS. CONCRETE CURB AND GUTTER MIX, OR MORTAR MIX. (SPEC. 2506.2B) SHALL BE USED FOR COLLAR

MORTAR BETWEEN CASTING, RINGS AND STRUCTURE EXCEPT AS SHOWN



C1301E- C1305E ①



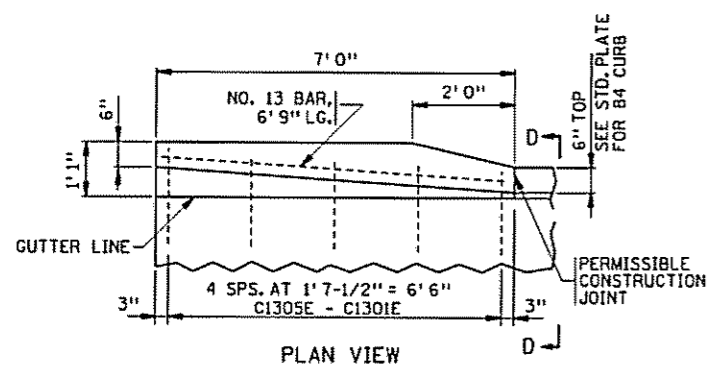
CURB DETAIL ②

( B4 INTEGRANT CURB OR B424 MODIFIED CURB AND GUTTER )

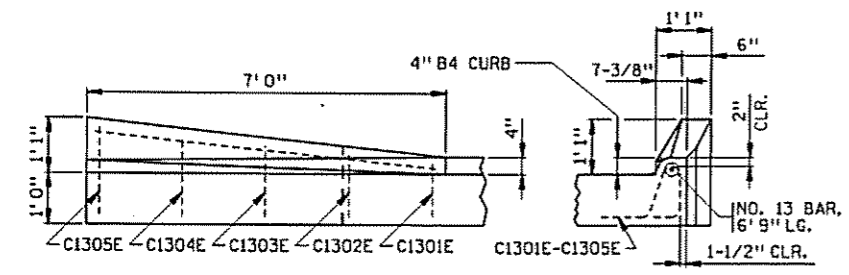
**NOTES:**

ALL REBARS ARE IN METRIC DESIGNATIONS

- ① ALL REINFORCEMENT IN APPROACH PANEL AND CURB SHALL BE GRADE 60 AND EPOXY COATED AS PER SPEC. 3301.
- ② APPROACH SLAB THICKNESS SHOWN INCLUDES ANY CONCRETE OVERLAY THAT MAY BE REQUIRED. SEE BRIDGE PLANS FOR REQUIREMENTS. CONCRETE OVERLAYS TO BE INCLUDED IN BRIDGE QUANTITIES AND DONE AT THE SAME TIME BY BRIDGE CONTRACTOR.
- ③ 2" NOMINAL DIA. THERMOPLASTIC PIPE, AS PER ASTM D1785M, SCHEDULE 40. SLOPE PIPE TO DITCH. FURNISHING AND INSTALLING DRAIN SYSTEM SHALL BE INCIDENTAL, WITH NO DIRECT PAYMENT. WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER SPEC. 3733. 1/8" PER 12" MINIMUM SLOPE.
- ④ BACKFILL WITH FINE AGGREGATE, SPEC. 3149, MODIFIED TO 0-3% PASSING A NO. 200 SIEVE.



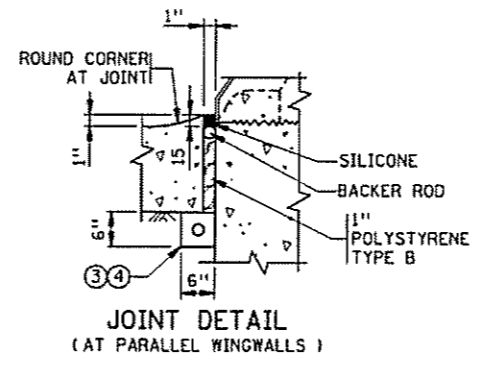
PLAN VIEW



INSIDE ELEVATION

SECTION D-D

CURB TRANSITION DETAILS ①



JOINT DETAIL  
( AT PARALLEL WINGWALLS )

DISTRICT: METRO  
 USER NAME: S:\24\0000\SPANDGN\0215067\Final\std\p\021567\_s224\_0000.spandgn  
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STANDARD SHEET NO. 5-297.224	TITLE: BRIDGE APPROACH PANEL BITUMINOUS MAINLINE ROADWAY ( MISCELLANEOUS DETAILS )
STANDARD APPROVED: NOVEMBER 9, 1999	
STATE PROJ. NO. 0215-67 ( TH 10 ) SHEET NO. 31 OF 222 SHEETS	

REVISION DATE  
2-7-2000

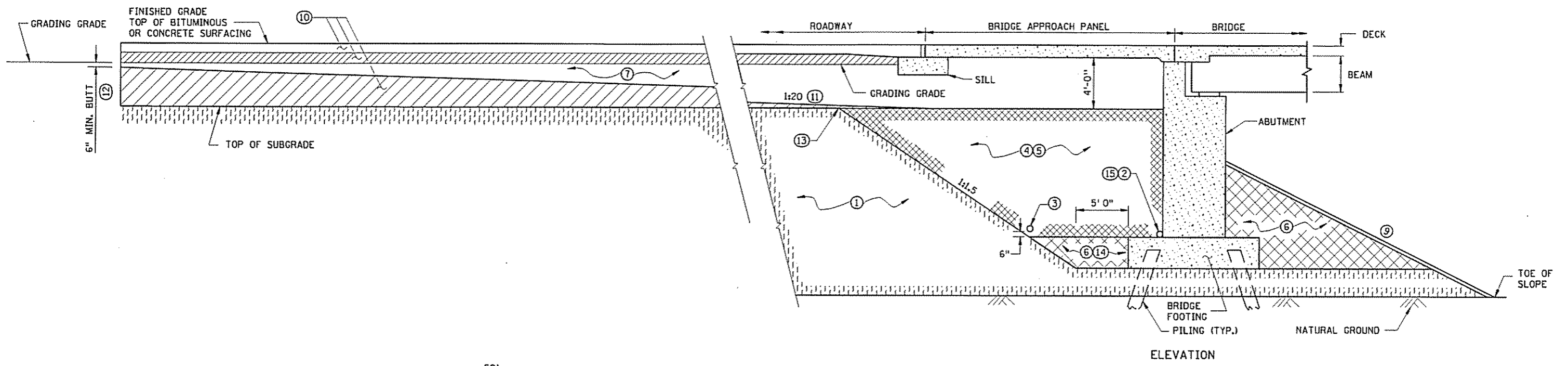




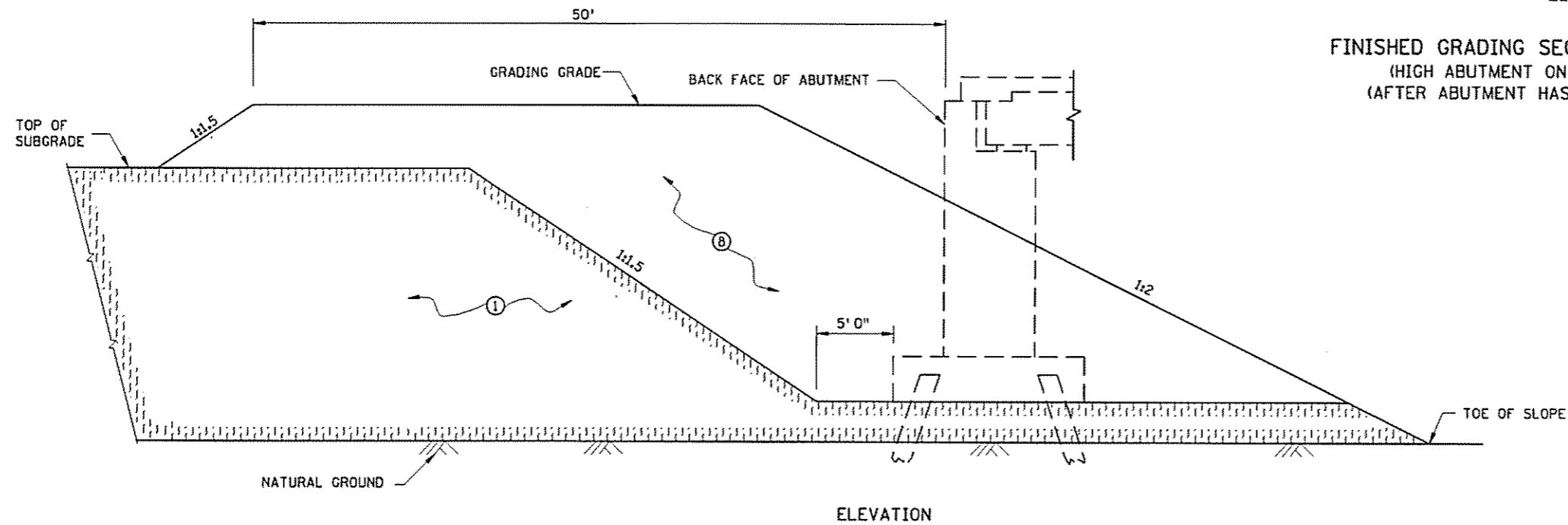
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DISTRICT: METRO USER NAME: S:\DESIGN\010215067\Final\sd\p\021567\_s233\_id08\_spp.dgn

FILE NAME: Q:\FILENAME



**ELEVATION**  
**FINISHED GRADING SECTION AT ABUTMENT**  
 (HIGH ABUTMENT ON PILING SHOWN)  
 (AFTER ABUTMENT HAS BEEN CONSTRUCTED)



**ELEVATION**  
**ROUGH GRADING SECTION AT ABUTMENT**  
 (PRIOR TO ABUTMENT CONSTRUCTION)

**NOTES:**

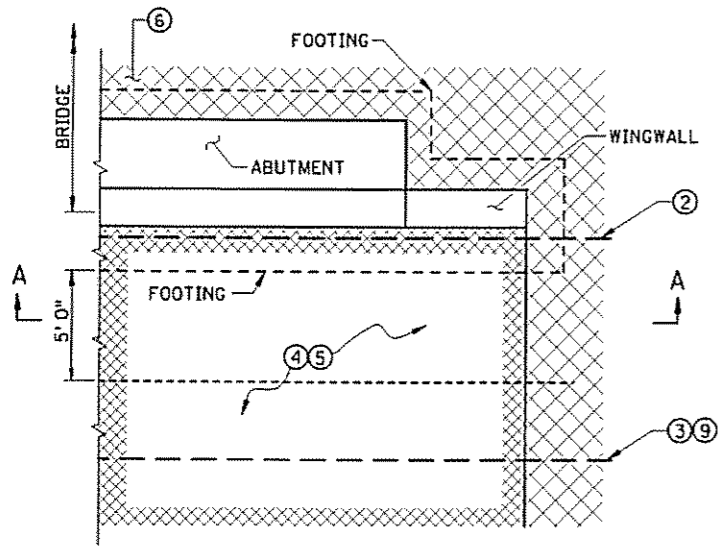
- ① NATURAL GROUND OR SUITABLE GRADING MATERIAL.
- ② SUBSURFACE PIPE DRAIN. SEE BRIDGE PLAN FOR STANDARD DETAIL B910 FOR DETAILS.
- ③ SUBSURFACE PIPE DRAIN. SEE GRADING PLAN FOR DETAILS. FURNISH AND INSTALL IF SHOWN IN GRADING PLAN.
- ④ SELECT GRANULAR MATERIAL MODIFIED 10% SHALL COMPLY WITH SPEC. 3149.2B2, MODIFIED TO 10% OR LESS PASSING THE NUMBER 200 SIEVE.
- ⑤ QUANTITY OF SELECT GRANULAR MATERIAL MODIFIED 10% IS BASED ON DIMENSIONS SHOWN AND PAYMENT IS BASED ON THIS QUANTITY. SEE GRADING PLAN FOR QUANTITY. Mn/DOT SPEC. 1903 SHALL NOT APPLY IF THE CONTRACTOR CHOOSES TO INCREASE DIMENSIONS IN ORDER TO FACILITATE CONSTRUCTION OPERATIONS AND ANY QUANTITY INCREASES SHALL BE CONSIDERED INCIDENTAL.
- ⑥ SUITABLE GRADING MATERIAL.
- ⑦ BACKFILL MATERIAL SHALL COMPLY WITH SPEC. 3149.2B2 (SELECT GRANULAR BORROW).
- ⑧ SURCHARGE MATERIAL SHALL BE PLACED DURING ROADWAY EMBANKMENT CONSTRUCTION. THIS SAME MATERIAL TO BE REMOVED AS STRUCTURE EXCAVATION JUST PRIOR TO THE ABUTMENT CONSTRUCTION (SEE BRIDGE PLAN FOR METHOD OF PAYMENT AND QUANTITIES). EXCAVATION LIMITS ARE SHOWN.
- ⑨ SEE BRIDGE PLANS FOR SLOPE AND SLOPE PROTECTION.
- ⑩ SEE GRADING PLANS FOR TYPE OF MATERIAL.
- ⑪ START 1:20 TAPER AT END OF APPROACH PANEL. 1:20 VARIES WHEN APPROACH PANEL IS SKEWED.
- ⑫ GRADING TO BE SQUARED OFF ON SKEWED BRIDGES.
- ⑬ TOP OF 1:1.5 SLOPE (FORMS A LINE PARALLEL TO END OF BRIDGE).
- ⑭ MATERIAL SHALL HAVE SUITABLE MOISTURE CONTENT DURING PLACEMENT AND SHALL BE COMPACTED PER SPEC. 2105. SELECT GRANULAR MATERIAL MODIFIED 10% MAY BE USED IN LIEU OF SUITABLE GRADING MATERIAL.
- ⑮ FURNISH AND INSTALL AT TOP OF BRIDGE FOOTING IF BRIDGE DETAIL B910 IS INCLUDED ON BRIDGE PLAN.

STANDARD SHEET NO. <b>5-297.233 (1 OF 2)</b>	TITLE: <b>BRIDGE APPROACH TREATMENT FOR ABUTMENT ON FOOTING</b>
STANDARD APPROVED: APRIL 11, 2008	
<b>STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 33 OF 222 SHEETS</b>	

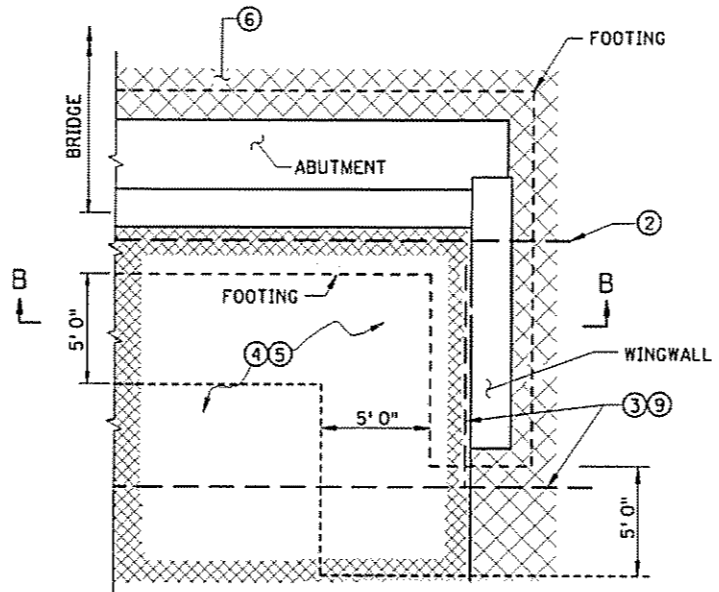
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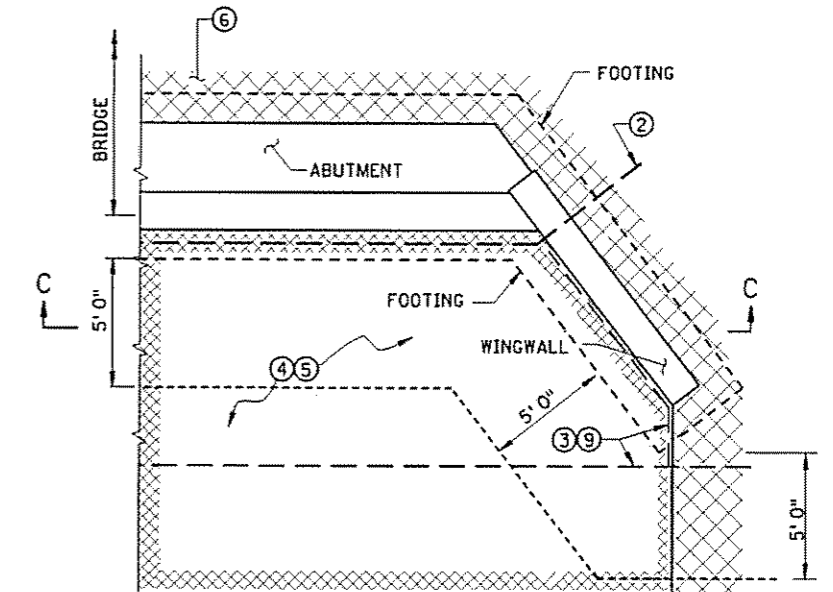
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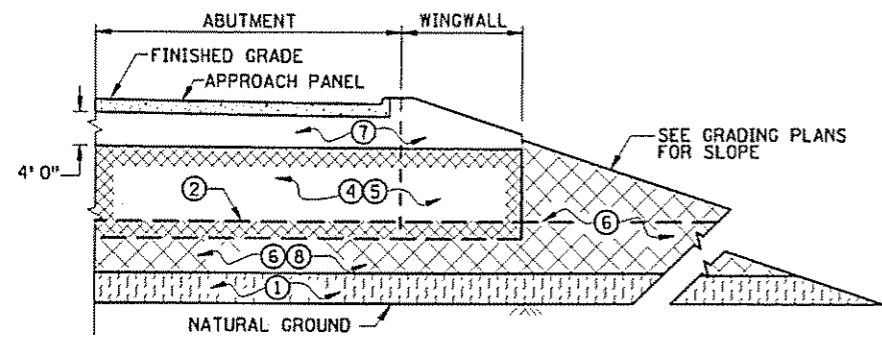
PARTIAL PLAN VIEW AT ABUTMENT  
(WINGWALL AT 180°) (FINISHED GRADING)



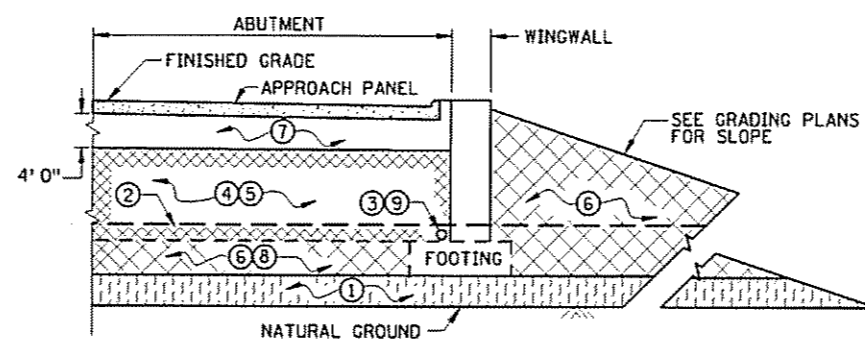
PARTIAL PLAN VIEW AT ABUTMENT  
(WINGWALL AT 90°) (FINISHED GRADING)



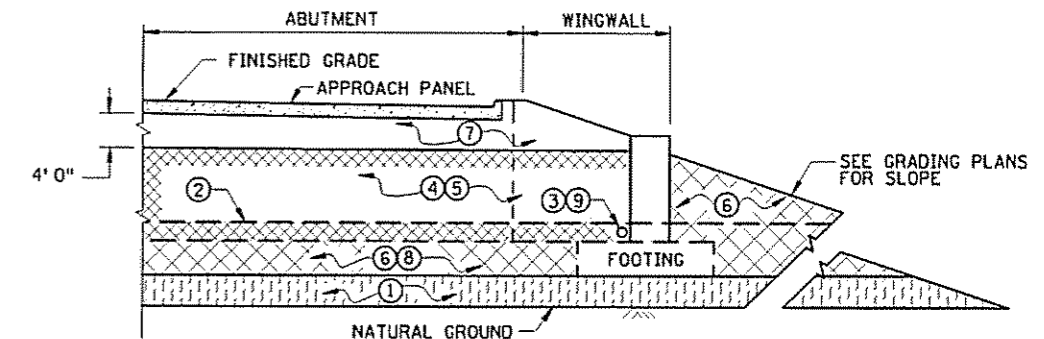
PARTIAL PLAN VIEW AT ABUTMENT  
(WINGWALL AT ANY OTHER ANGLE) (FINISHED GRADING)



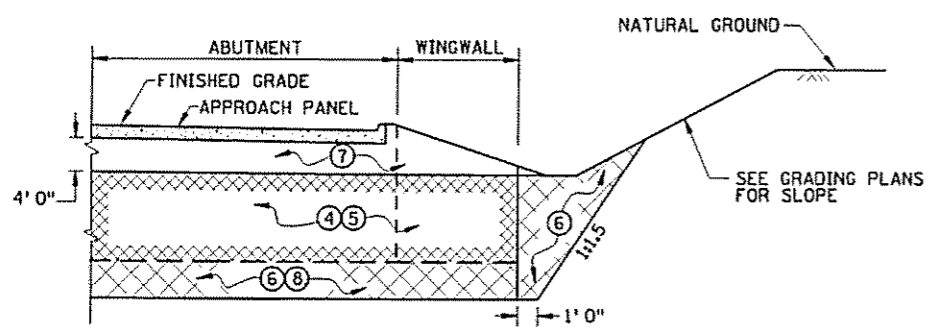
FINISHED GRADING SECTION A-A  
(FILL SECTION)  
(BRIDGE DETAIL B910 DRAIN NOT SHOWN)



FINISHED GRADING SECTION B-B  
(FILL SECTION)  
(BRIDGE DETAIL B910 DRAIN NOT SHOWN)



FINISHED GRADING SECTION C-C  
(FILL SECTION)  
(BRIDGE DETAIL B910 DRAIN NOT SHOWN)



FINISHED GRADING SECTION A-A  
(CUT SECTION)  
(BRIDGE DETAIL B910 DRAIN NOT SHOWN)

NOTES:

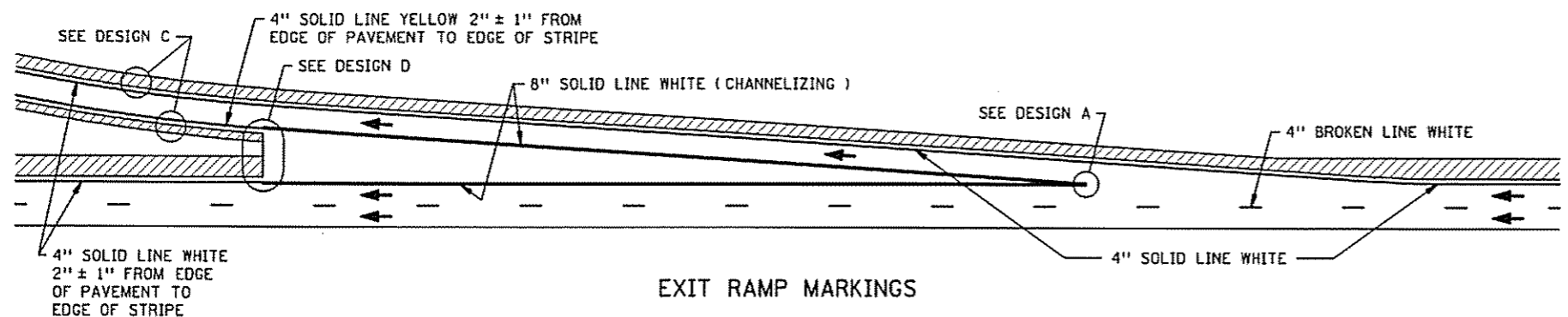
- ① NATURAL GROUND OR SUITABLE GRADING MATERIAL.
- ② SUBSURFACE PIPE DRAIN, SEE BRIDGE PLAN FOR STANDARD DETAIL B910 FOR DETAILS.
- ③ SUBSURFACE PIPE DRAIN. SEE GRADING PLAN FOR DETAILS. FURNISH AND INSTALL IF SHOWN IN GRADING PLAN.
- ④ SELECT GRANULAR MATERIAL MODIFIED 10% SHALL COMPLY WITH SPEC. 3149.2B2, MODIFIED TO 10% OR LESS PASSING THE NUMBER 200 SIEVE.
- ⑤ QUANTITY OF SELECT GRANULAR MATERIAL MODIFIED 10% IS BASED ON DIMENSIONS SHOWN AND PAYMENT IS BASED ON THIS QUANTITY. SEE GRADING PLAN FOR QUANTITY. Mn/DOT SPEC. 1903 SHALL NOT APPLY IF THE CONTRACTOR CHOOSES TO INCREASE DIMENSIONS IN ORDER TO FACILITATE CONSTRUCTION OPERATIONS AND ANY QUANTITY INCREASES SHALL BE CONSIDERED INCIDENTAL.
- ⑥ SUITABLE GRADING MATERIAL.
- ⑦ BACKFILL MATERIAL SHALL COMPLY WITH SPEC. 3149.2B2 (SELECT GRANULAR BORROW).
- ⑧ MATERIAL SHALL HAVE SUITABLE MOISTURE CONTENT DURING PLACEMENT AND SHALL BE COMPACTED PER SPEC. 2105. SELECT GRANULAR MATERIAL MODIFIED 10% MAY BE USED IN LIEU OF SUITABLE GRADING MATERIAL.
- ⑨ FURNISH AND INSTALL AT TOP OF BRIDGE FOOTING IF BRIDGE DETAIL B910 IS INCLUDED ON BRIDGE PLAN.

STANDARD SHEET NO. 5-297.233 (2 OF 2)	TITLE: BRIDGE APPROACH TREATMENT FOR ABUTMENT ON FOOTING
STANDARD APPROVED: APRIL 11, 2008	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 34 OF 222 SHEETS	

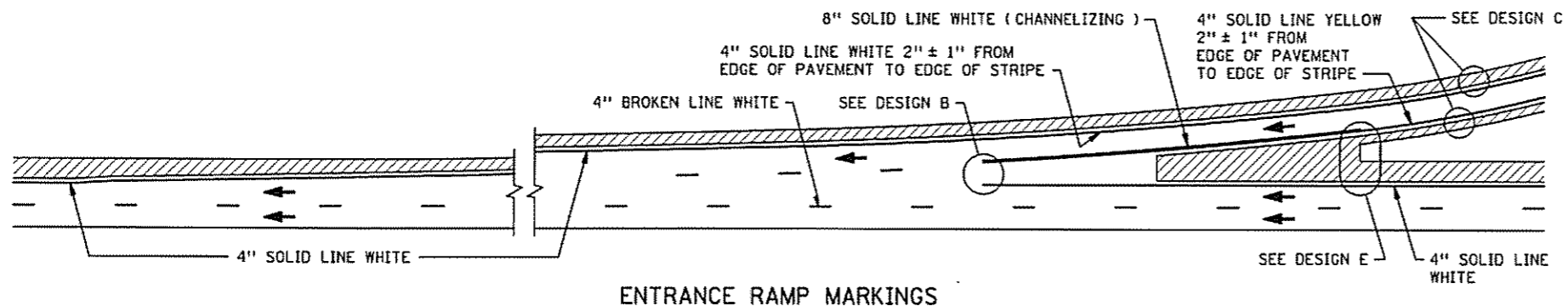
PLOTTED/REVISED: 22-JAN-2009 15:41

DISTRICT: METRO USER NAME: S:\DESIGN\010215\067\Final\stdpln\021567\_s341\_0c98\_s.pndgn

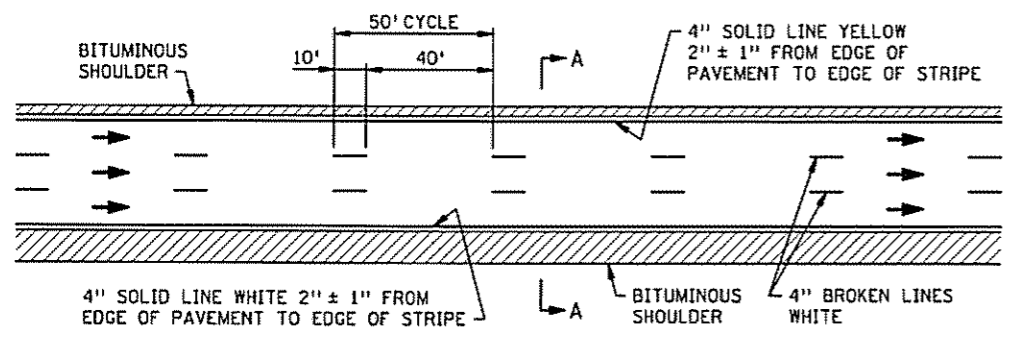
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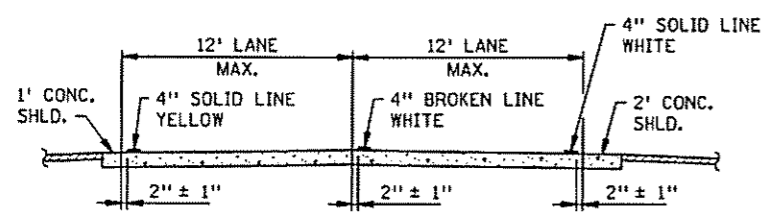
EXIT RAMP MARKINGS



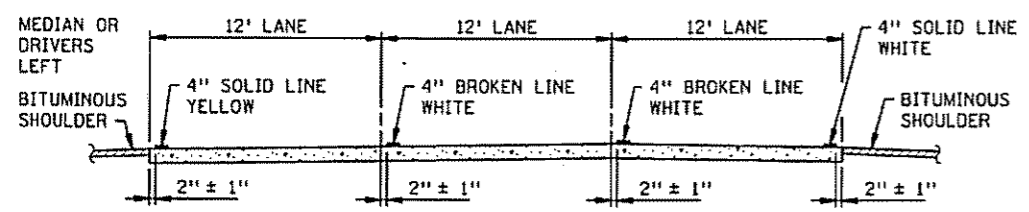
ENTRANCE RAMP MARKINGS



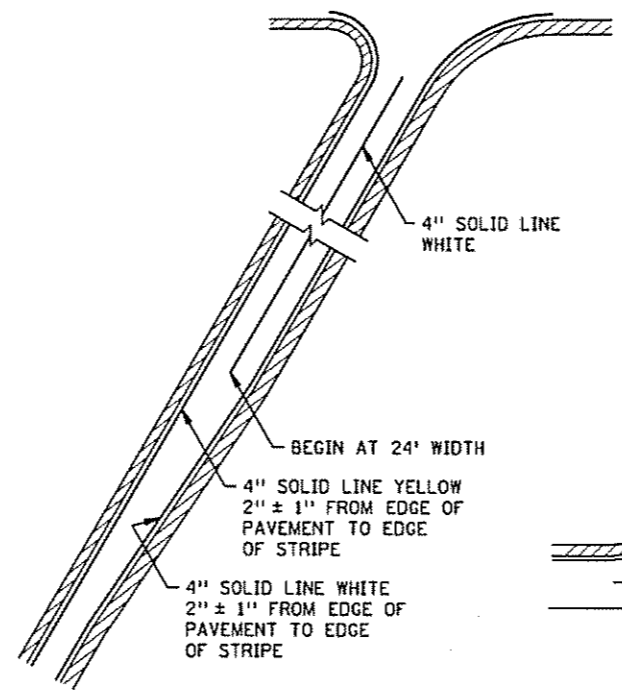
THROUGH LANE MARKINGS



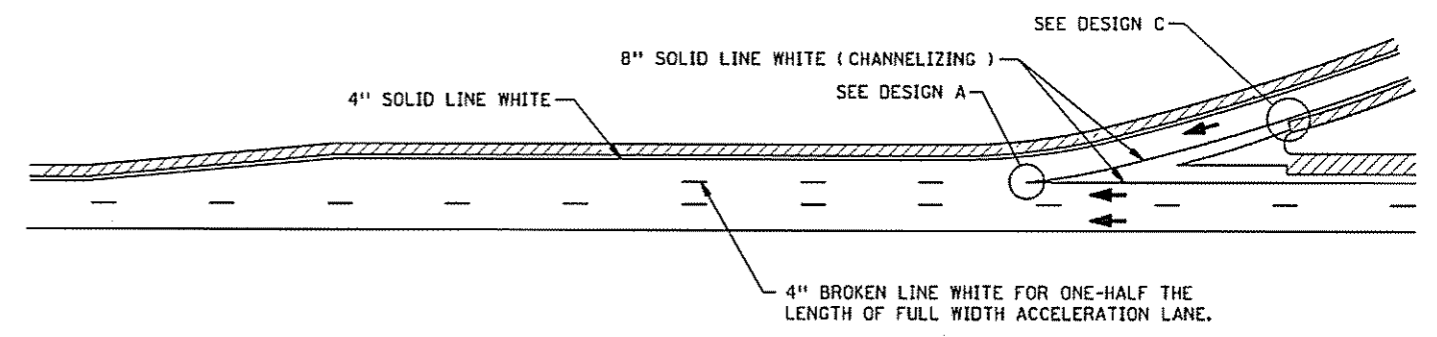
SECTION A-A (TWO LANES)



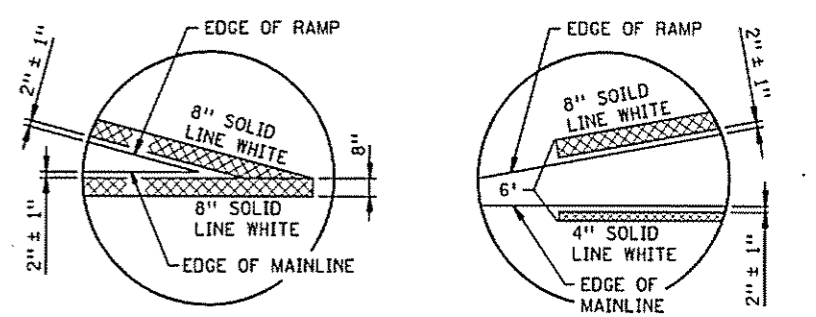
SECTION A-A (THREE LANES)



RAMP MARKINGS

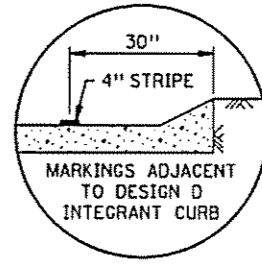


PARALLEL ACCELERATION LANE

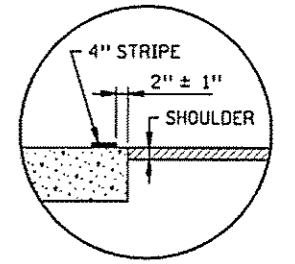


DESIGN A

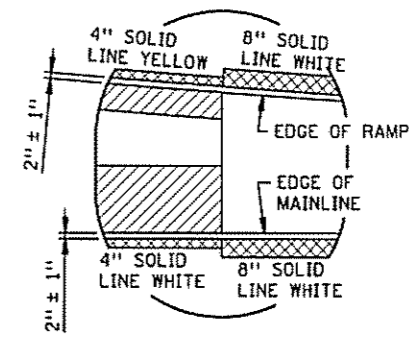
DESIGN B



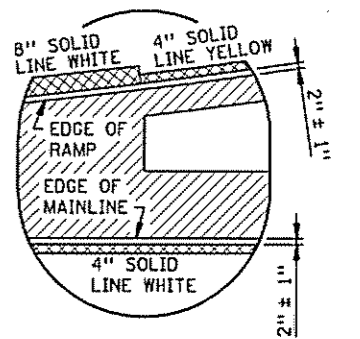
DESIGN C URBAN



DESIGN C RURAL



DESIGN D RURAL



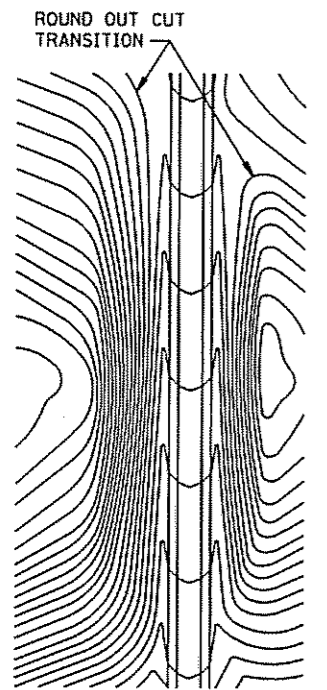
DESIGN E RURAL

NOTES:  
 [Hatched Box] DENOTES SHOULDER AREA.  
 [Cross-hatched Box] DENOTES SHOULDER AREA.

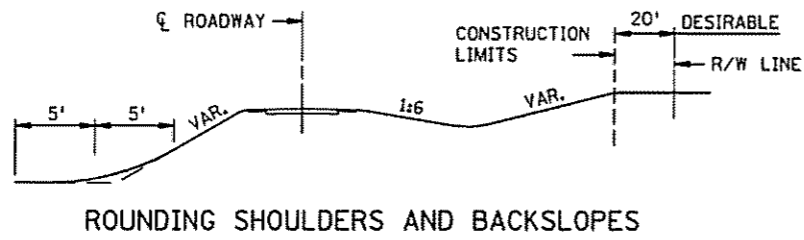
STANDARD SHEET NO. 5-297.341	TITLE: PAVEMENT MARKING DETAILS
STANDARD APPROVED: MARCH 12, 1998	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 35 OF 222 SHEETS	

PLOTTED/REVISED: 22-JAN-2009 15:41

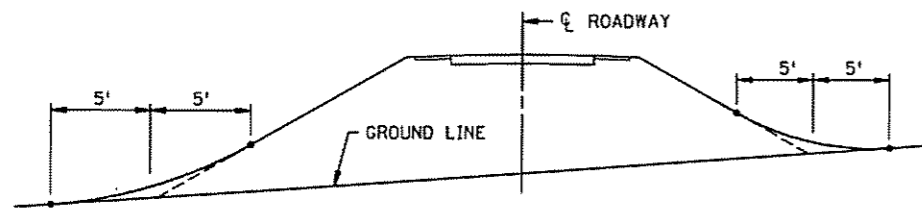
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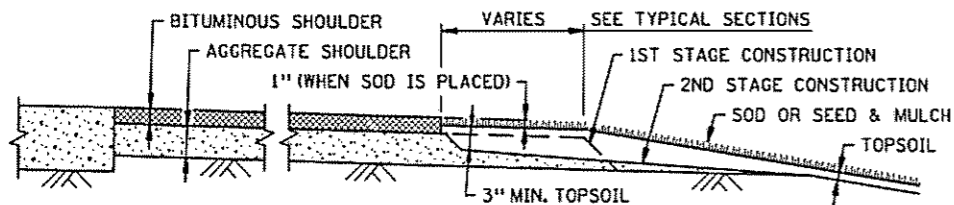
CONTOURING ROAD CUTS



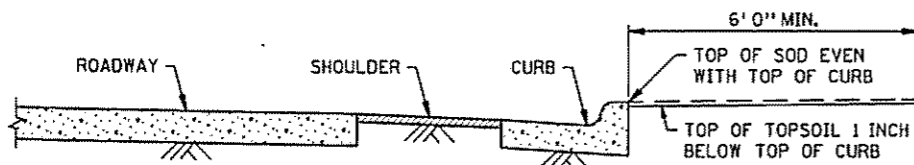
ROUNDING SHOULDERS AND BACKSLOPES



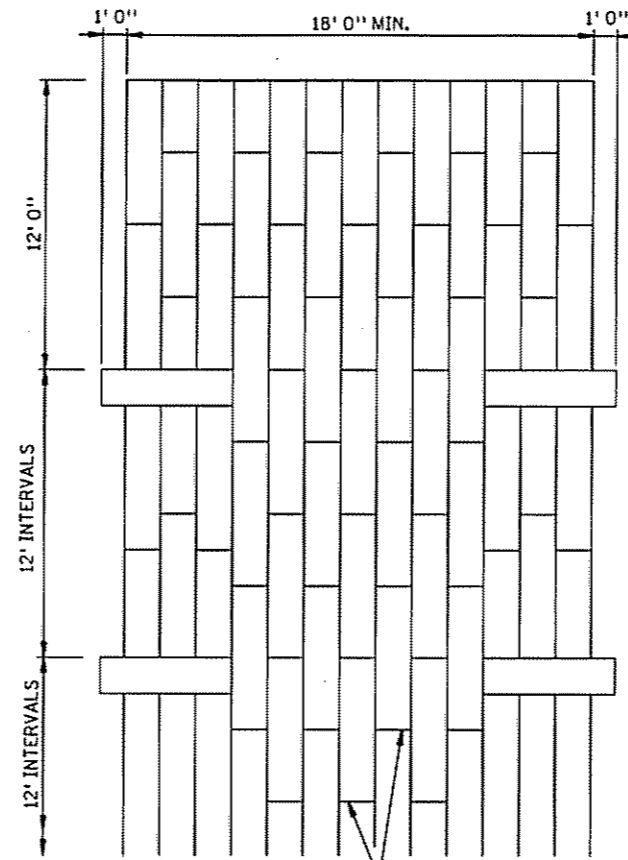
SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES



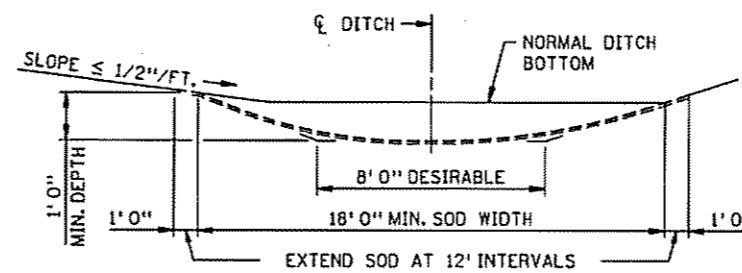
SHAPING AND TOPSOILING INSLOPES



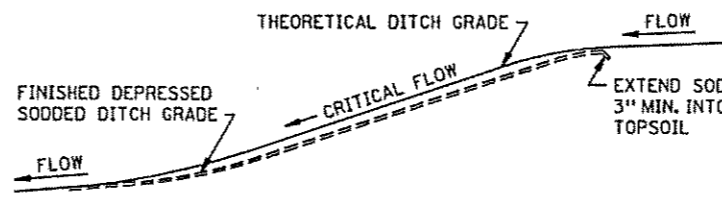
SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED



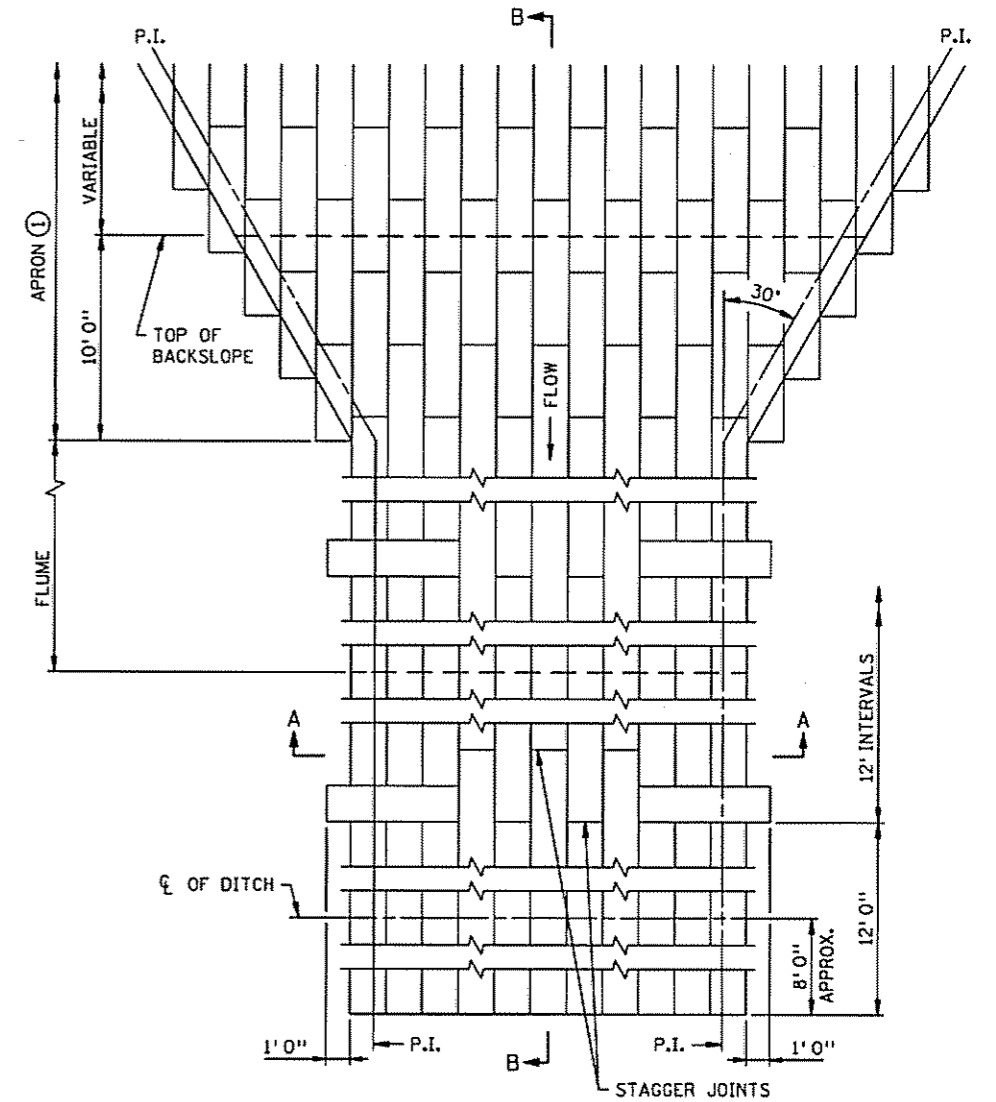
STAGGER JOINTS  
PLAN VIEW



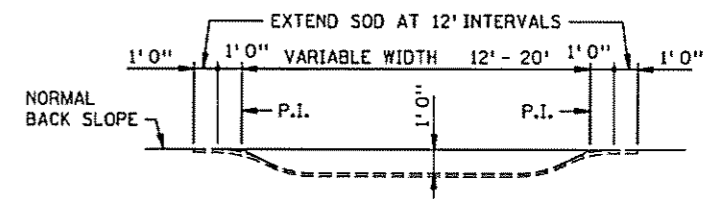
SODDED DITCH CROSS SECTION  
WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.),  
FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.



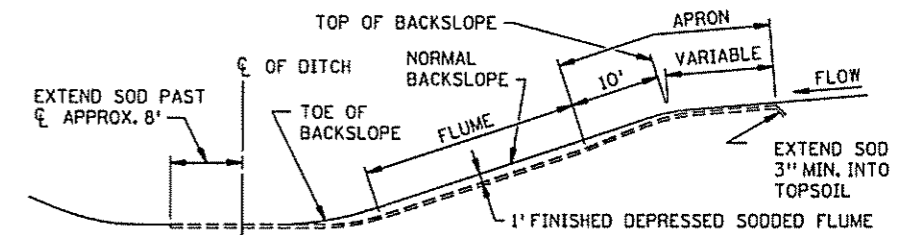
DITCH PROFILE  
SODDED DITCH DETAILS



PLAN VIEW



SECTION A-A



SECTION B-B  
SODDED FLUME DETAILS

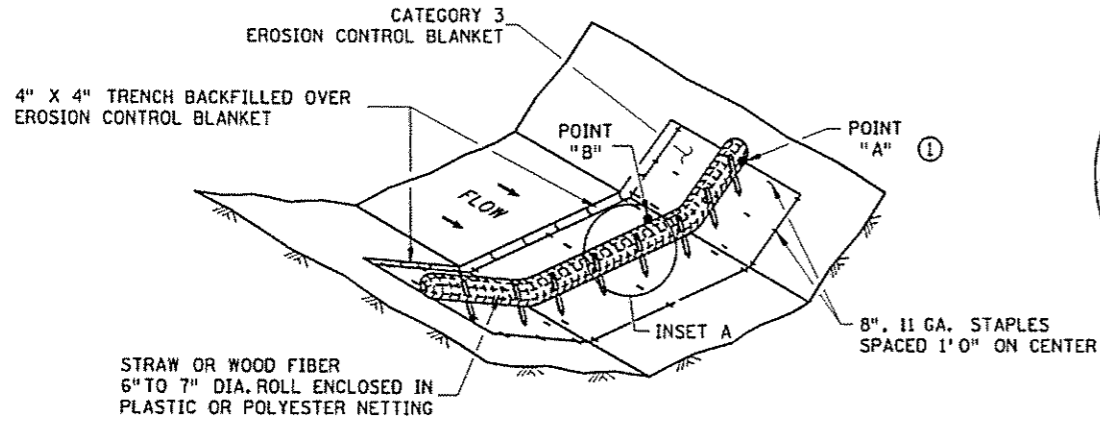
NOTES:  
SEE SPEC. 2575.3 FOR ADDITIONAL INFORMATION.  
① CONSTRUCT TAPER AS DIRECTED BY THE ENGINEER.

STANDARD SHEET NO. 5-297.404	TITLE: PERMANENT EROSION CONTROL ALONG ROADWAYS, DITCHES AND FLUMES
STANDARD APPROVED: NOVEMBER 20, 2002	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 36 OF 222 SHEETS	

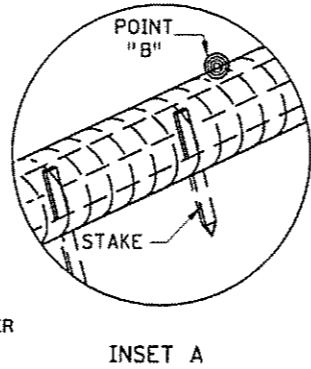
PLOTTED/REVISED: 22-JAN-2009 15:41

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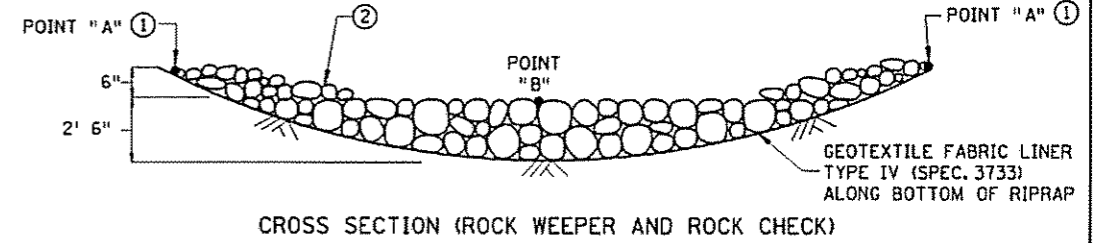
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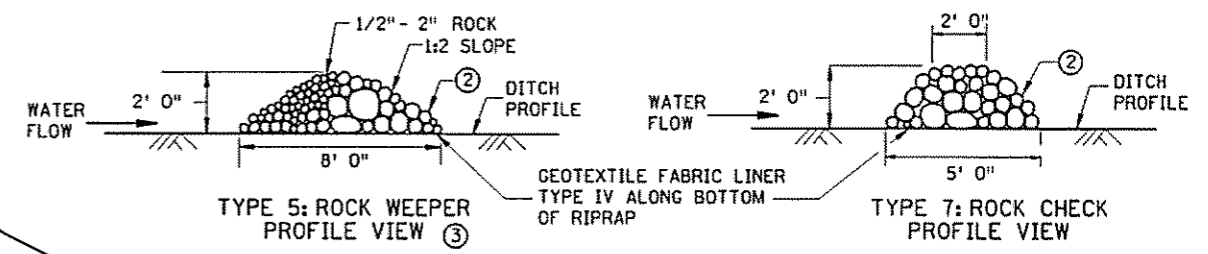
**TYPE 3: BIOROLL BLANKET SYSTEM DITCH CHECK**



**INSET A**

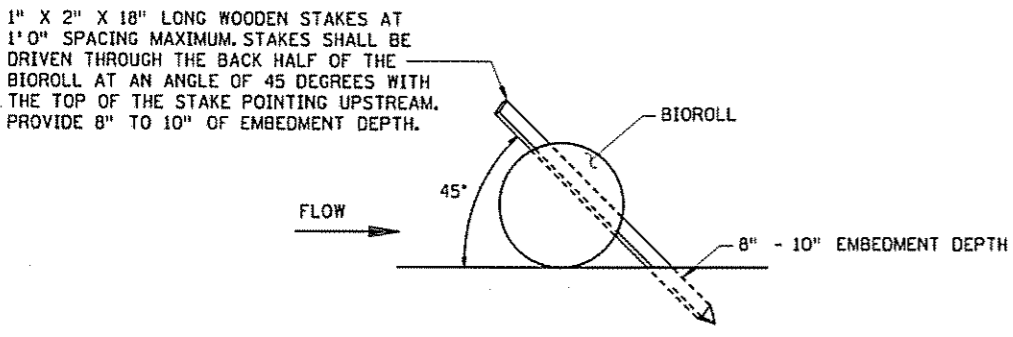


**CROSS SECTION (ROCK WEEPER AND ROCK CHECK)**

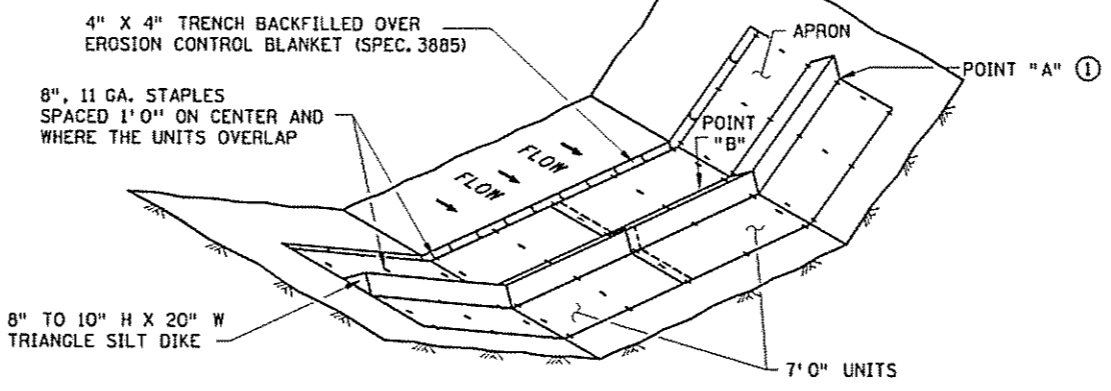


**TYPE 5: ROCK WEEPER PROFILE VIEW**      **TYPE 7: ROCK CHECK PROFILE VIEW**

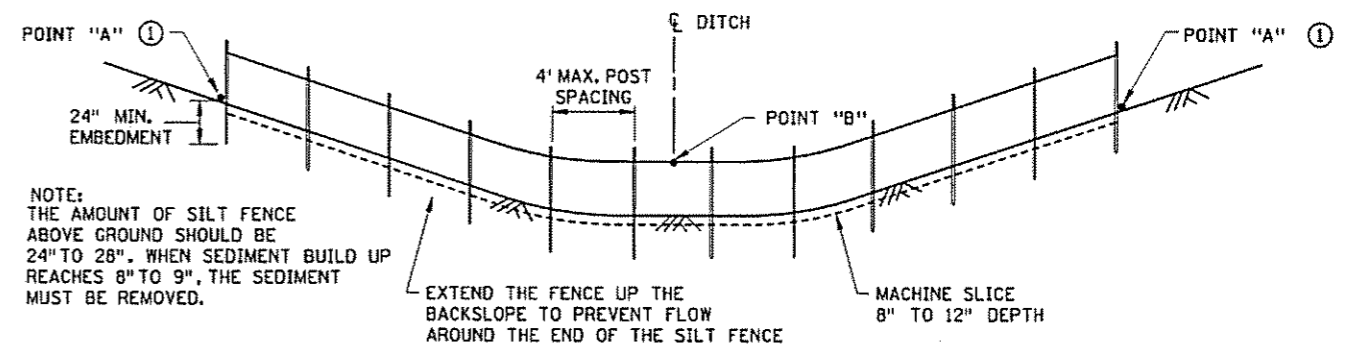
**TYPE 5: ROCK WEEPER AND TYPE 7: ROCK CHECK DITCH CHECKS**  
 USE ON ROUGH GRADED AREAS



**BIOROLL STAKING DETAIL**

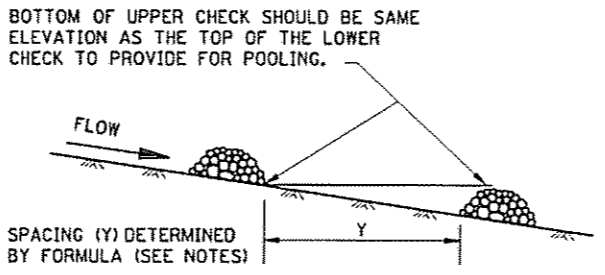


**TYPE 6: GEOTEXTILE TRIANGULAR DIKE DITCH CHECK**



**TYPE 1: SLICED IN SILT FENCE DITCH CHECK**

**NOTE:**  
 THE AMOUNT OF SILT FENCE ABOVE GROUND SHOULD BE 24" TO 28". WHEN SEDIMENT BUILD UP REACHES 8" TO 9", THE SEDIMENT MUST BE REMOVED.



**DITCH CHECK SPACING** ④

**NOTES:**  
 SEE SPECS. 2573, 3601, 3733, 3885, 3886 & 3889.  
 APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:  
 APPROXIMATE SPACING OF DITCH CHECKS (FT.) =  $Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\% \text{ CHANNEL SLOPE}} \times 100$

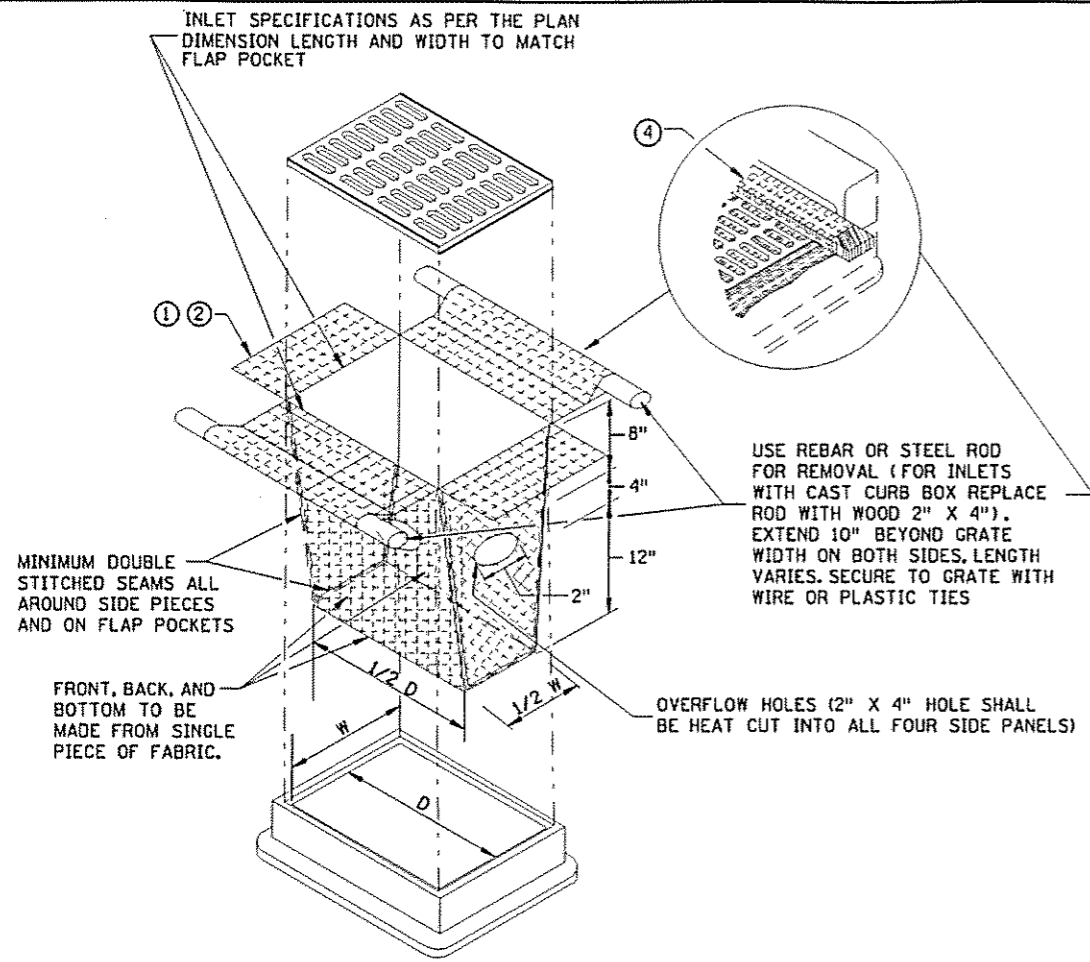
- ① POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.
- ② CLASS I - IV RIPRAP (SPEC. 3601) WITH GEOTEXTILE FABRIC LINER, TYPE IV (SPEC. 3733).
- ③ THE ROCK WEEPER FILTERS SEDIMENT OUT OF THE WATER BETTER THAN THE OTHER DITCH CHECKS. THE ROCK WEEPER COULD BE USED AS A PERMANENT WATER FILTERING FEATURE.
- ④ PERMANENT ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE WILL NEED TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

GENERAL DESIGN GUIDELINES						
DITCH CHECK TYPE	SILT FENCE	BIOROLL	BIOROLL BLANKET	TRIANGULAR DIKE	ROCK WEEPER	ROCK CHECK
STORM FREQUENCY:	2 YR. - 24 HR.	2 YR. - 24 HR.	2 YR. - 24 HR.	2 YR. - 24 HR.	5 YR. - 24 HR.	5 YR. - 24 HR.
MAX. FLOW VELOCITY:	< 1 FT./SECOND	1.5 FT./SECOND	4.5 FT./SECOND	1.5 FT./SECOND	12 FT./SECOND	12 FT./SECOND
MAX. DITCH GRADE:	0% - 0.5%	1.5% - 3%	1.5% - 3%	1.5% - 2.0%	3% - 5%	3% - 5%
MAX. DRAINAGE AREA:	1 ACRE	2 ACRE	2 ACRE	4 ACRE	4+ ACRE	4+ ACRE

PLOTTED/REVISED: 22-JAN-2009 15:41

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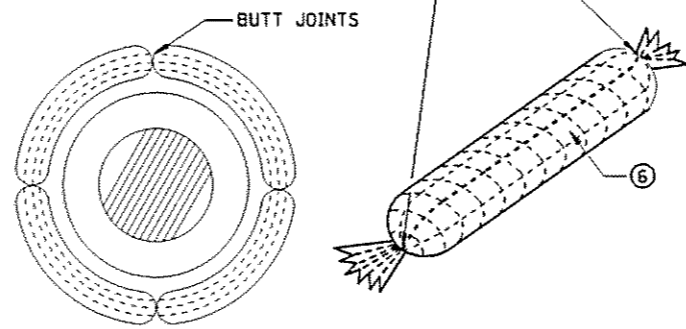
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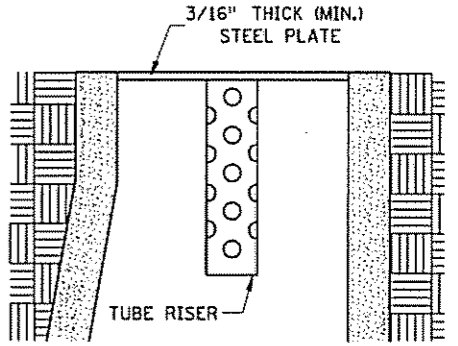
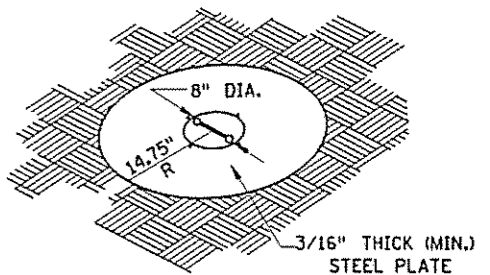
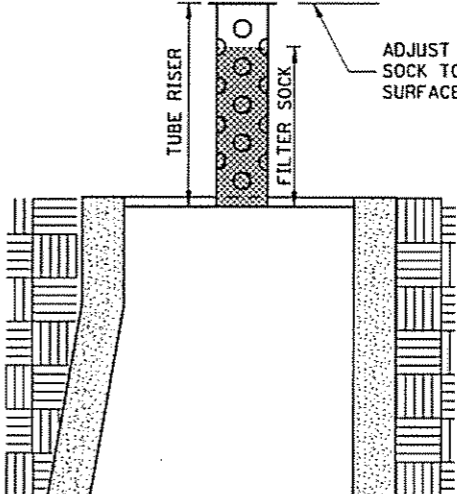
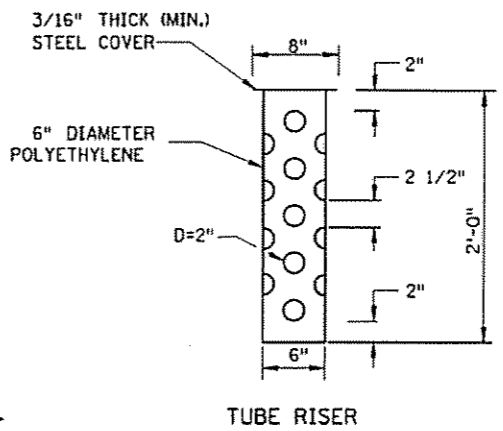
**FILTER BAG INSERT ③**

(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX)

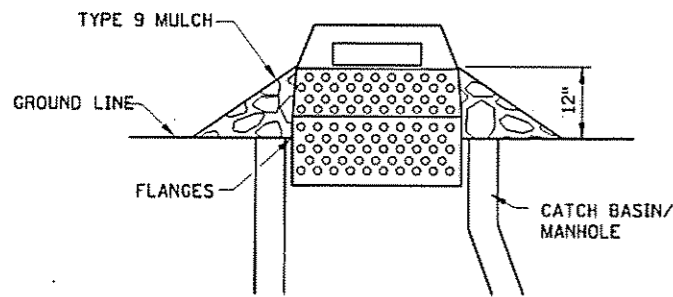
ENDS SECURELY CLOSED TO PREVENT LOSS OF OPEN GRADED AGGREGATE FILL. SECURED WITH 50 PSI. ZIP TIE.



**ROCK LOG/COMPOST LOG**

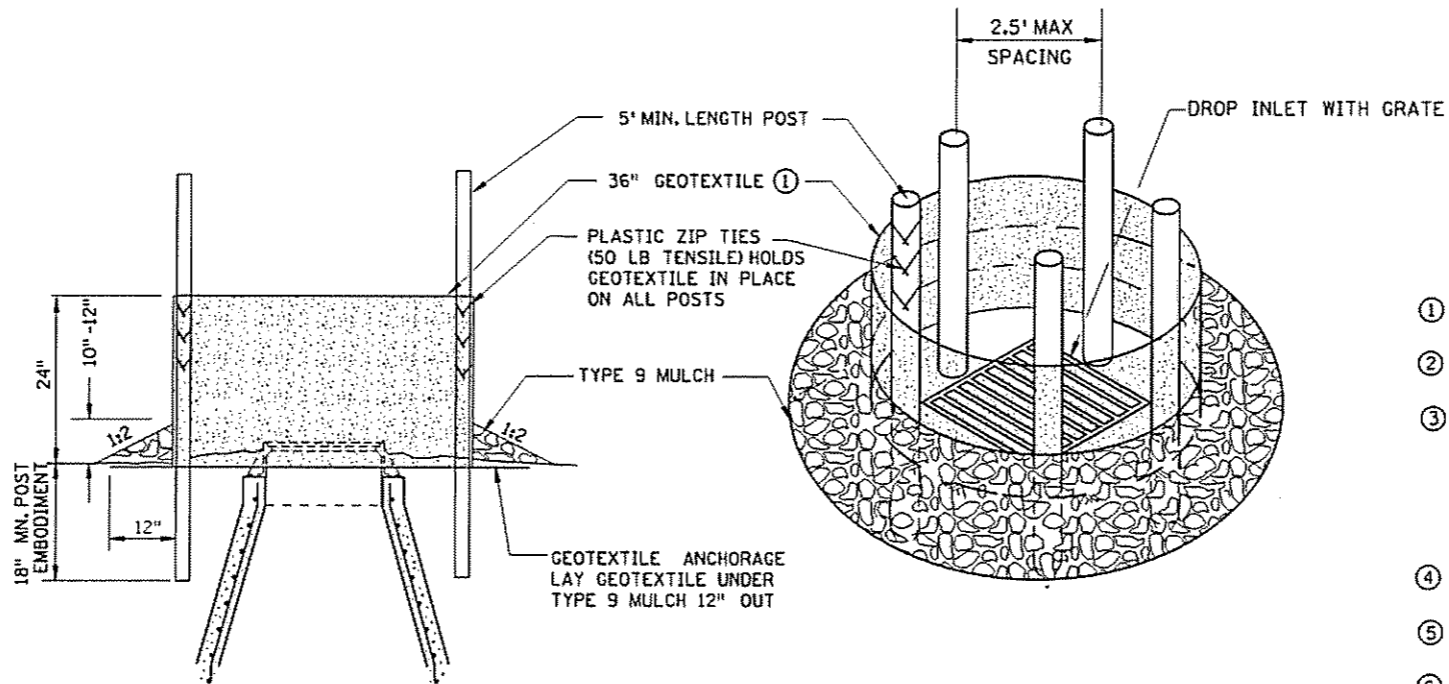


**POP-UP HEAD**



**SEDIMENT CONTROL INLET HAT**

NOTE: THE SEDIMENT CONTROL BARRIER SHALL BE A METAL OR PLASTIC/POLYETHYLENE RISER SIZED TO FIT INSIDE THE CATCH BASIN/MANHOLE; HAVE PERFORATIONS TO ALLOW FOR WATER INFILTRATION; HAVE AN OVERFLOW OPENING, FLANGES AND A LID/COVER.



**SILT FENCE RING AND ROCK FILTER BERM**  
USE WHERE INLET DRAINS IN AN AREA WITH SLOPES AT 1:3 OR LESS

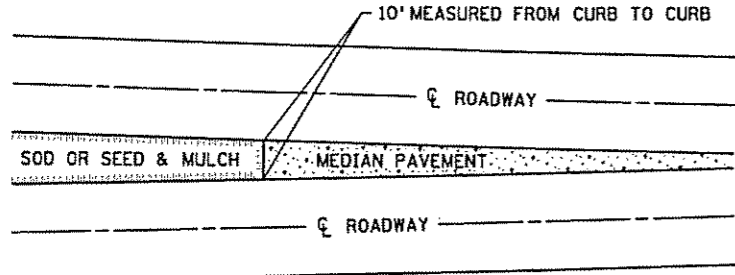
**NOTES:**

- SEE SPECS. 2573, 3137, 3886 & 3891.
- MANUFACTURED ALTERNATIVES LISTED ON Mn/DOT'S APPROVED PRODUCTS LIST MAY BE SUBSTITUTED.
- ① ALL GEOTEXTILE USED FOR INLET PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3886.
- ② FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED SHALL EXTEND A MINIMUM OF 10 INCHES AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
- ③ INSTALLATION NOTES: DO NOT INSTALL FILTER BAG INSERT IN INLETS SHALLOWER THAN 30 INCHES, MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE OF 3 INCHES BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES. WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3 INCH SIDE CLEARANCE.
- ④ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2 INCH X 4 INCH OR USE A ROCK SOCK OR SAND BAGS IN PLACE OF THE FLAP POCKETS.
- ⑤ SOCK HEIGHT MUST NOT BE SO HIGH AS TO SLOW DOWN WATER FILTRATION TO CAUSE FLOODING OF THE ROADWAY.
- ⑥ GEOTEXTILE SOCK BETWEEN 4-10 FEET LONG AND 4-6 INCH DIAMETER. SEAM TO BE JOINED BY TWO ROWS OF STITCHING WITH A PLASTIC MESH BACKING OR PROVIDE A HEAT BONDED SEAM (OR APPROVED EQUIVALENT). FILL ROCK LOG WITH OPEN GRADED AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF COARSE AGGREGATE CONFORMING TO SPEC. 3137 TABLE 3137-1; CA-3 GRADATION.

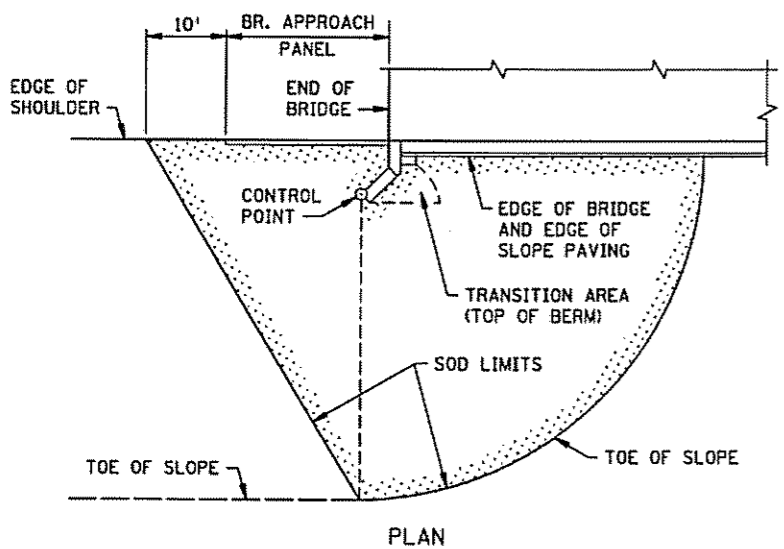
STANDARD SHEET NO. 297.405 (4 OF 4)	TITLE: TEMPORARY SEDIMENT CONTROL STORM DRAIN INLET PROTECTION
STANDARD APPROVED: SEPTEMBER 27, 2006	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 38 OF 222 SHEETS	

PLOTTED/REVISED: 22-JAN-2009 15:42

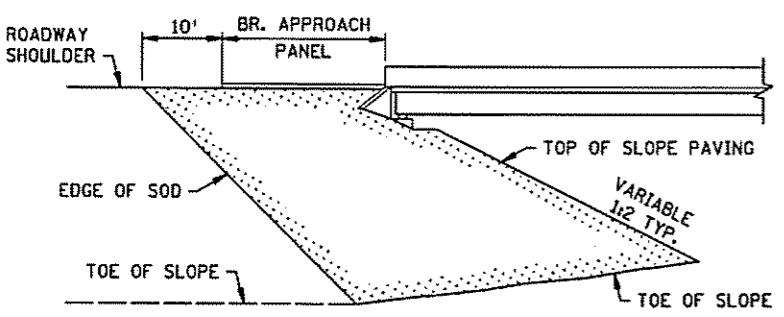
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SODDING LIMITS AT GORE AREA

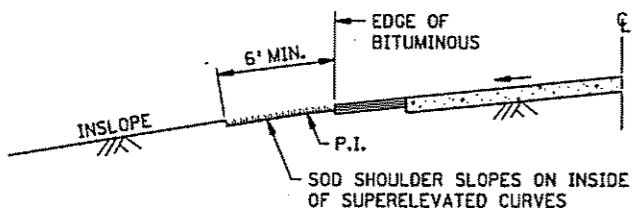


PLAN

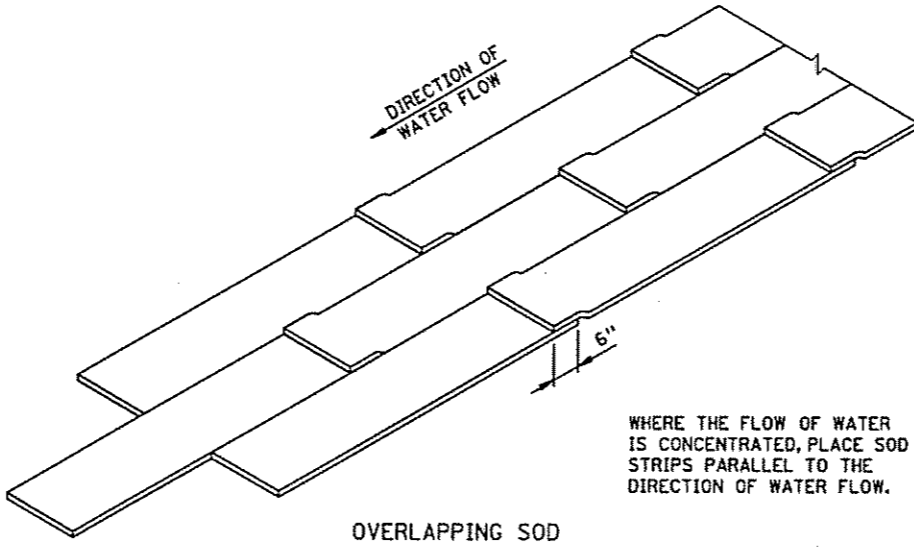


ELEVATION

SODDING LIMITS AT BRIDGE APPROACH FILLS

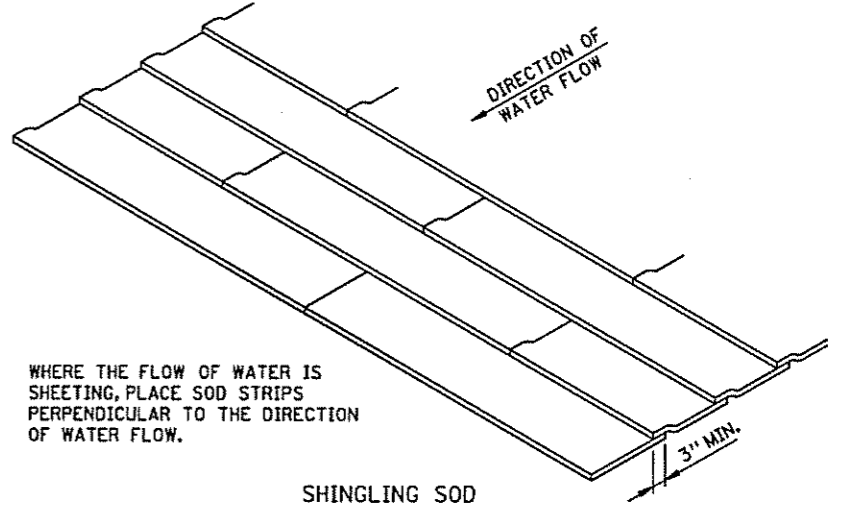


SODDING INSLOPES OF SUPERELEVATED CURVES



OVERLAPPING SOD

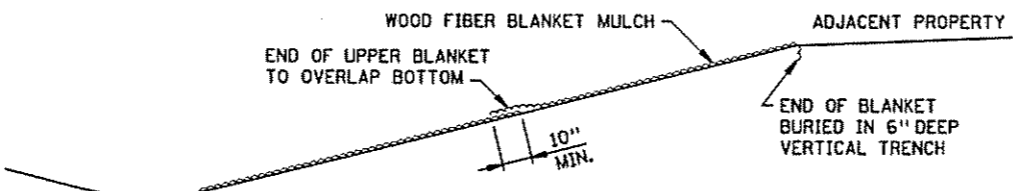
WHERE THE FLOW OF WATER IS CONCENTRATED, PLACE SOD STRIPS PARALLEL TO THE DIRECTION OF WATER FLOW.



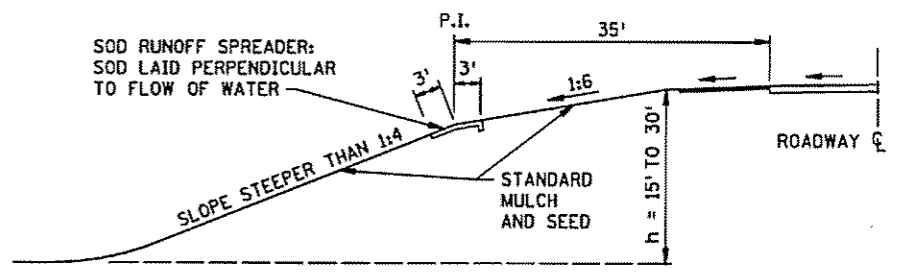
SHINGLING SOD

WHERE THE FLOW OF WATER IS SHEETING, PLACE SOD STRIPS PERPENDICULAR TO THE DIRECTION OF WATER FLOW.

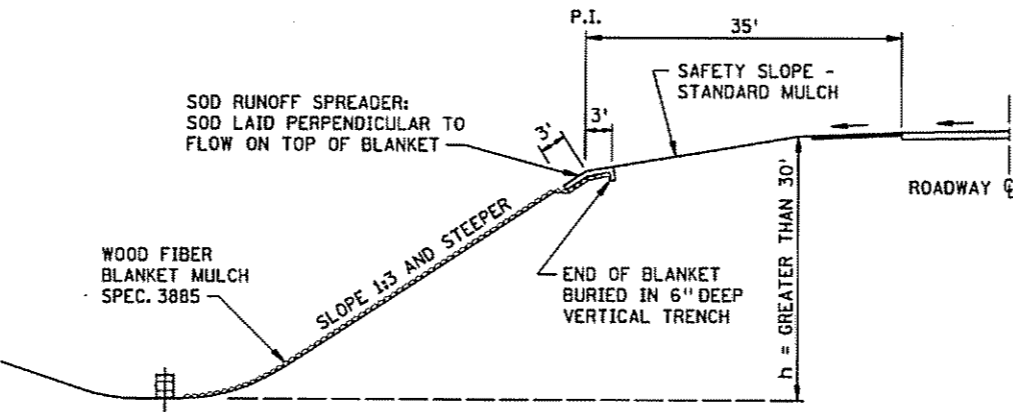
SPECIAL SOD PLACEMENT TECHNIQUES



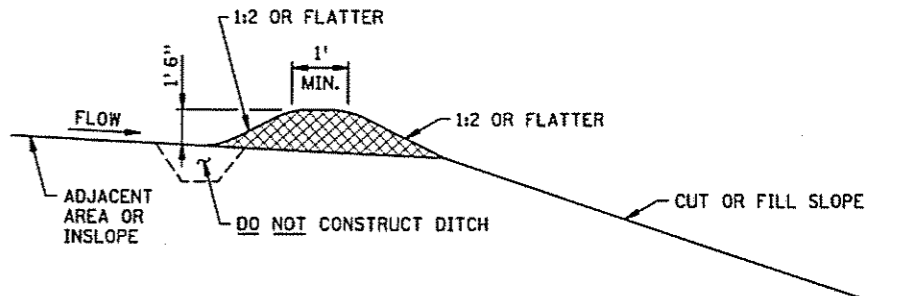
WOOD FIBER BLANKET INSTALLATION ON A CUT SLOPE



BROKEN-BACK SAFETY FILL SLOPE



WOOD FIBER BLANKET INSTALLATION ON AN INSLOPE (WHEN REQUIRED)



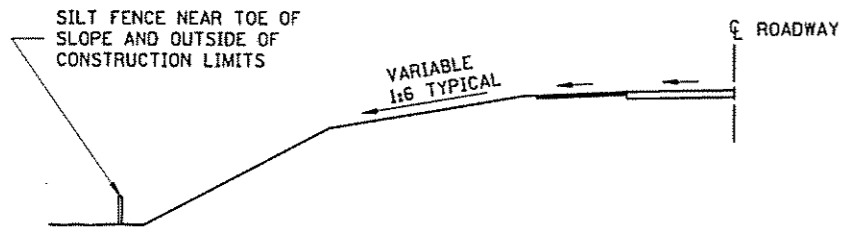
PERMANENT SLOPE PROTECTION DIKE

STANDARD SHEET NO. 5-297.406	TITLE: PERMANENT EROSION CONTROL ALONG ROADWAYS AND AT GORE AREAS & BRIDGE APPROACH FILLS
STANDARD APPROVED: JANUARY 31, 1985	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 39 OF 222 SHEETS	

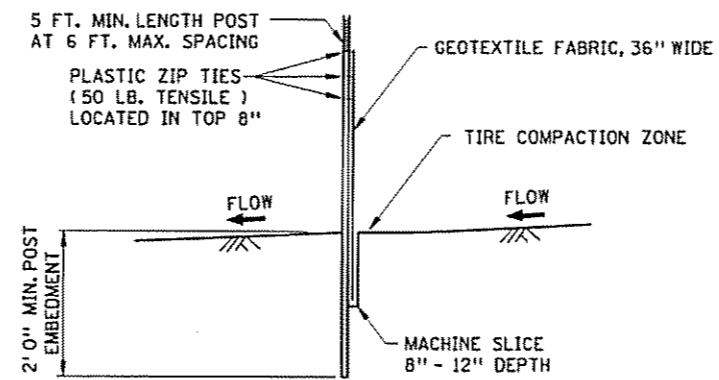
REVISION DATE  
10-26-2000

PLOTTED/REVISED: 22-JAN-2009 15:42

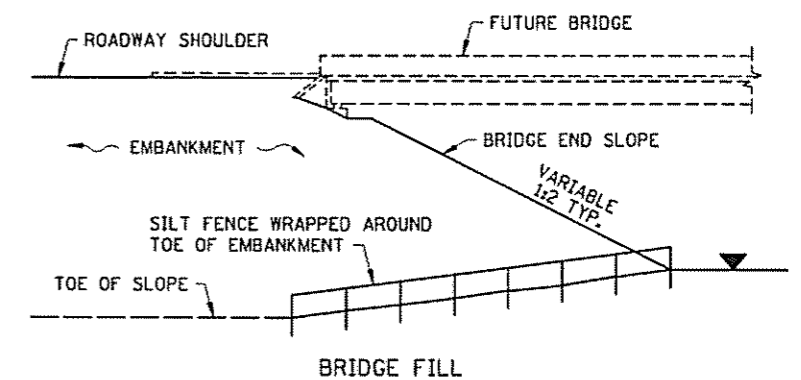
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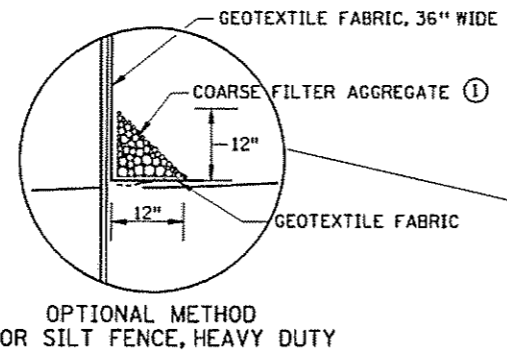
LOCATION OF SILT FENCE AT TOE OF ROADWAY EMBANKMENT



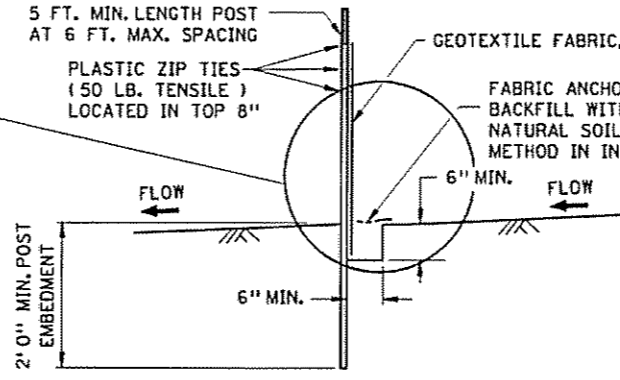
SILT FENCE, MACHINE SLICED  
DESIGN GUIDELINES:  
TO PROTECT AREAS FROM SHEET FLOW.  
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



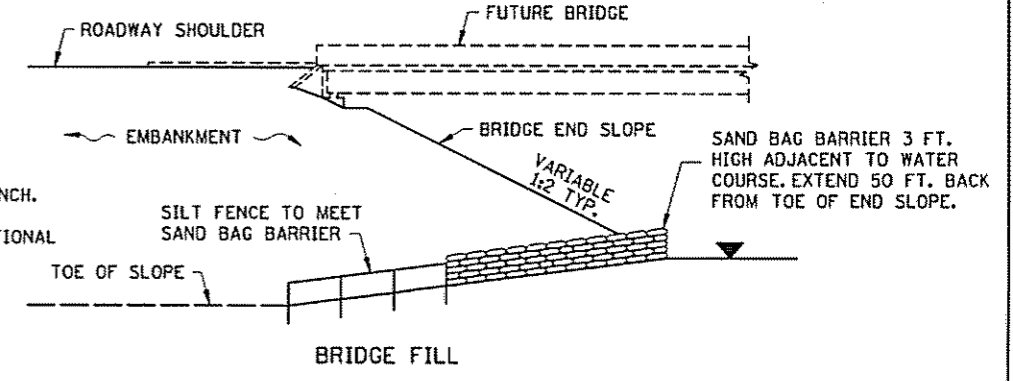
DESIGN GUIDELINES:  
WATER COURSE FLOW VELOCITY: STAGNANT  
CONTRIBUTING SLOPE AREA: 1/2 ACRE



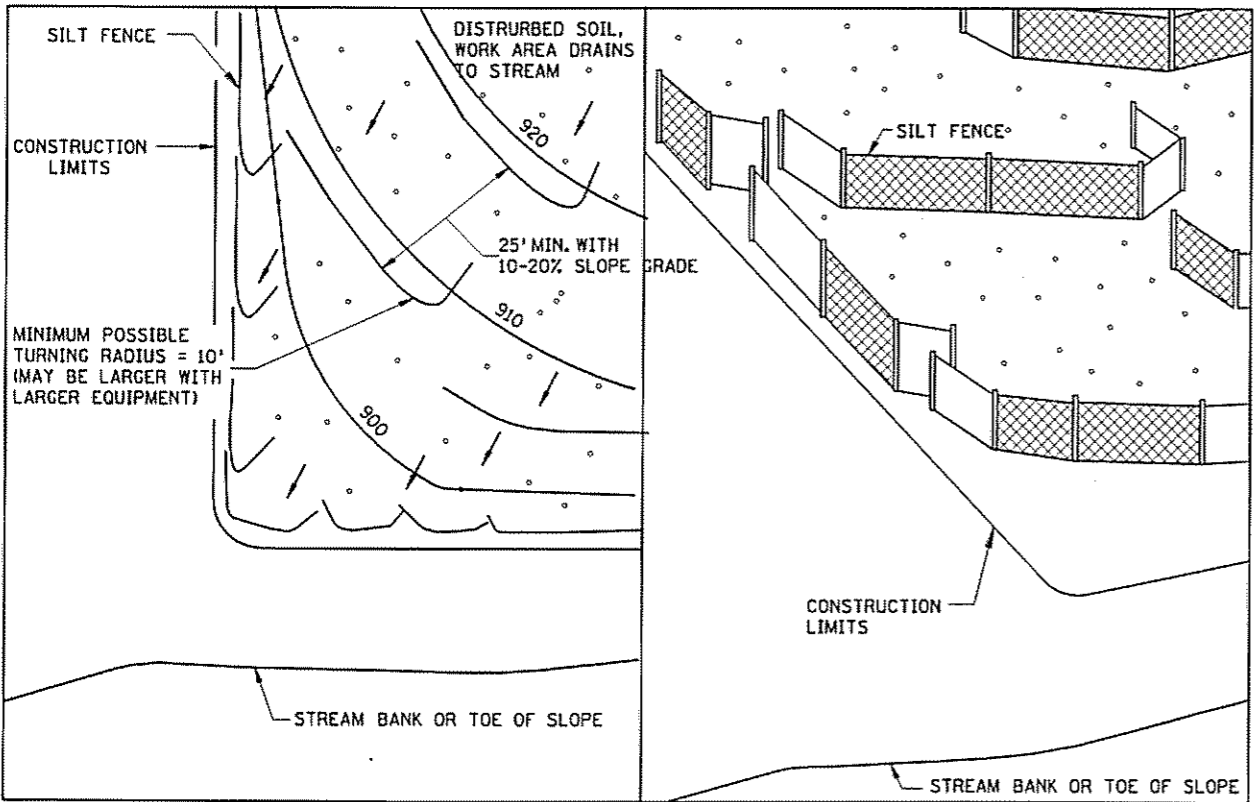
OPTIONAL METHOD FOR SILT FENCE, HEAVY DUTY



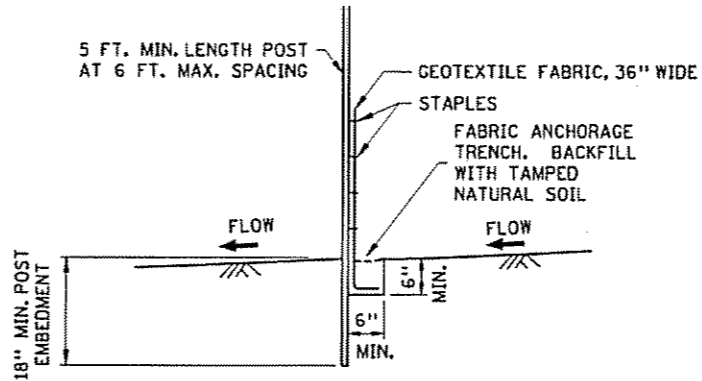
SILT FENCE, HEAVY DUTY (HAND INSTALLED)  
DESIGN GUIDELINES:  
TO PROTECT AREAS FROM SHEET FLOW.  
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



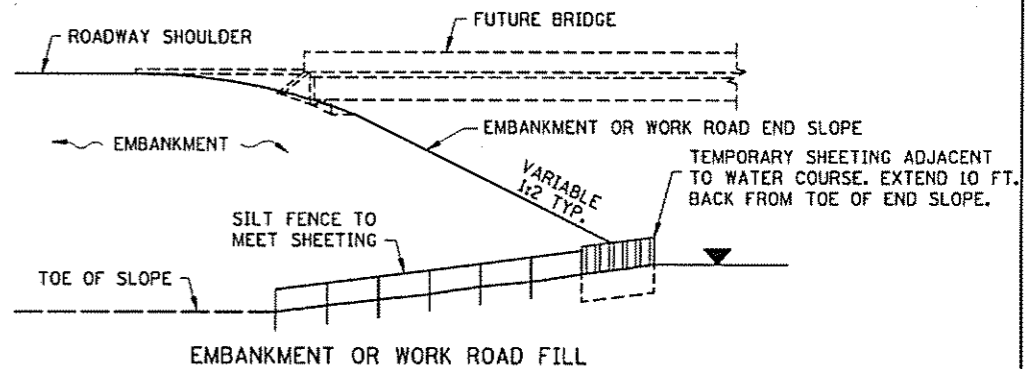
DESIGN GUIDELINES:  
WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC.  
CONTRIBUTING SLOPE AREA: 1 ACRE



SILT FENCE, J-HOOK INSTALLATION



SILT FENCE, PREASSEMBLED  
DESIGN GUIDELINES:  
TO PROTECT AREAS FROM SHEET FLOW.  
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



DESIGN GUIDELINES:  
WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC.  
CONTRIBUTING SLOPE AREA: 3 ACRES  
SILT FENCE AT BRIDGE EMBANKMENT ADJACENT TO WATER

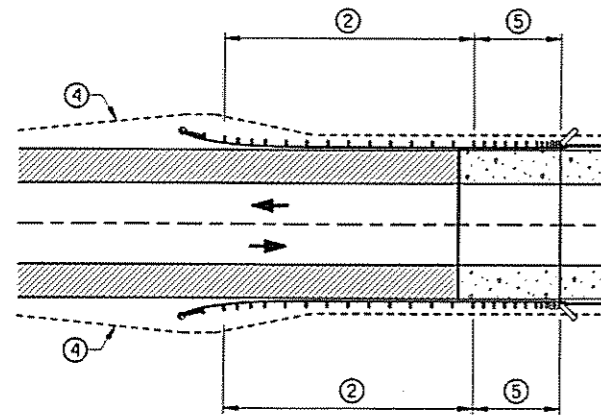
NOTES:  
SEE SPECS. 2573, 3149 & 3886.  
① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.

STANDARD SHEET NO. 5-297.408 (1 OF 2)	TITLE: TEMPORARY SEDIMENT CONTROL SILT FENCE
STANDARD APPROVED: SEPTEMBER 27, 2006	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 40 OF 222 SHEETS	

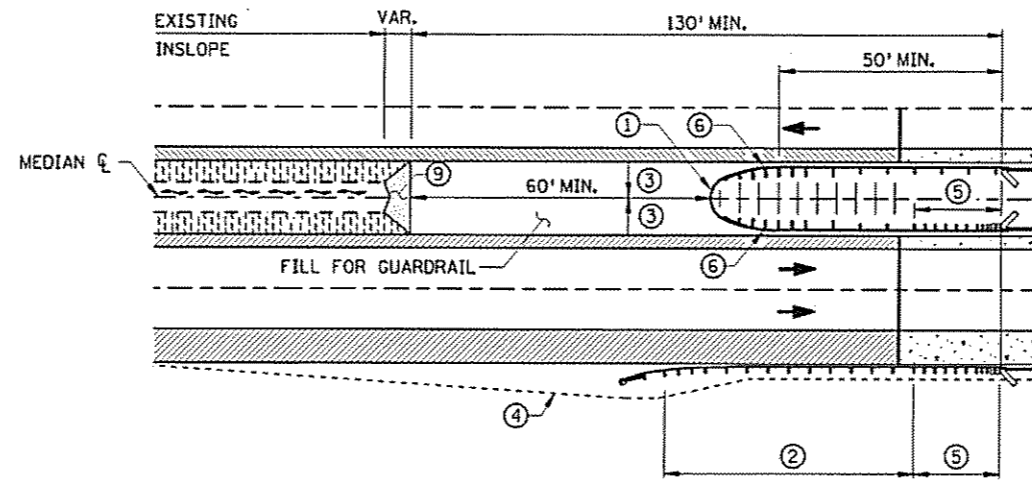




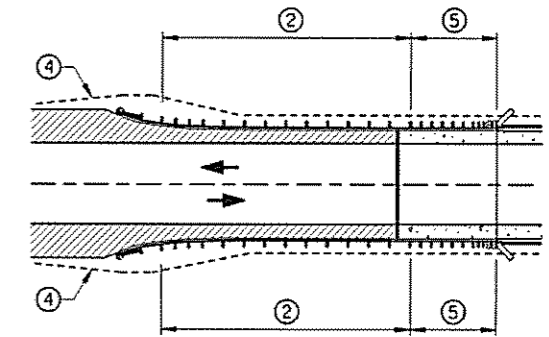
PLOTTED/REVISED: 23-JAN-2009 12:26



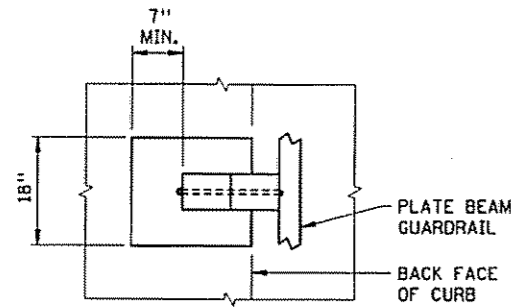
TWO - WAY BRIDGE  
WITH FULL SHOULDERS



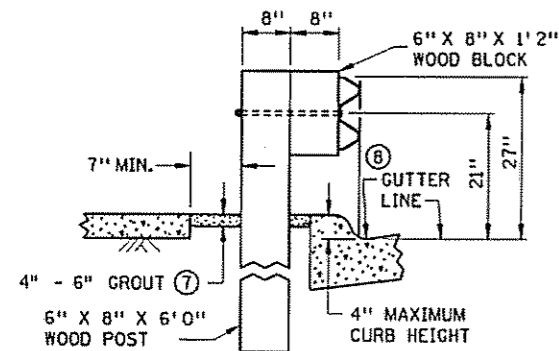
ONE - WAY BRIDGE  
WITH FULL RIGHT SHOULDER  
(FOR 14' 2-1/2" THRIE BEAM BULLNOSE)



TWO - WAY BRIDGE  
WITHOUT FULL SHOULDERS

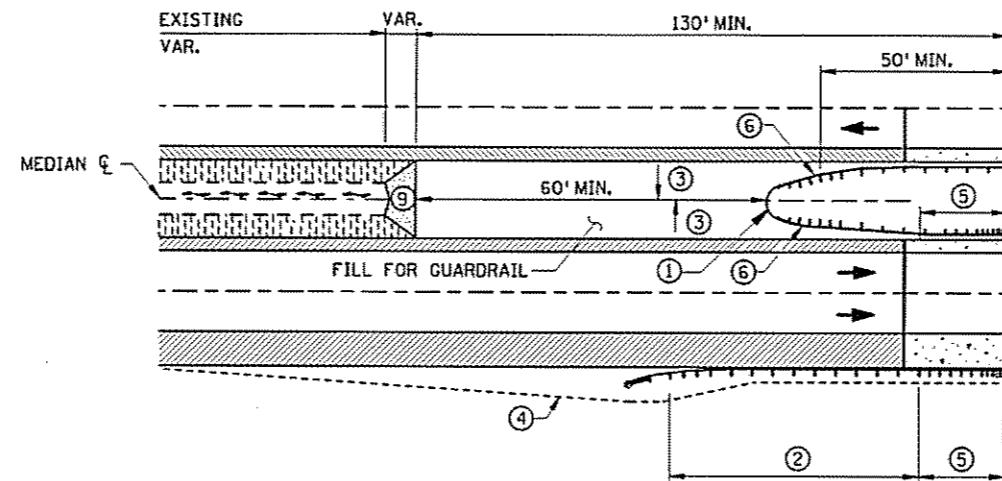


PLAN VIEW



ELEVATION

TYPICAL SECTION AT POST  
SET IN CONCRETE



ONE - WAY BRIDGE  
WITH FULL RIGHT SHOULDER  
(FOR MEDIANS WIDER THAN 14' 2-1/2" THRIE BEAM BULLNOSE)

**NOTES:**

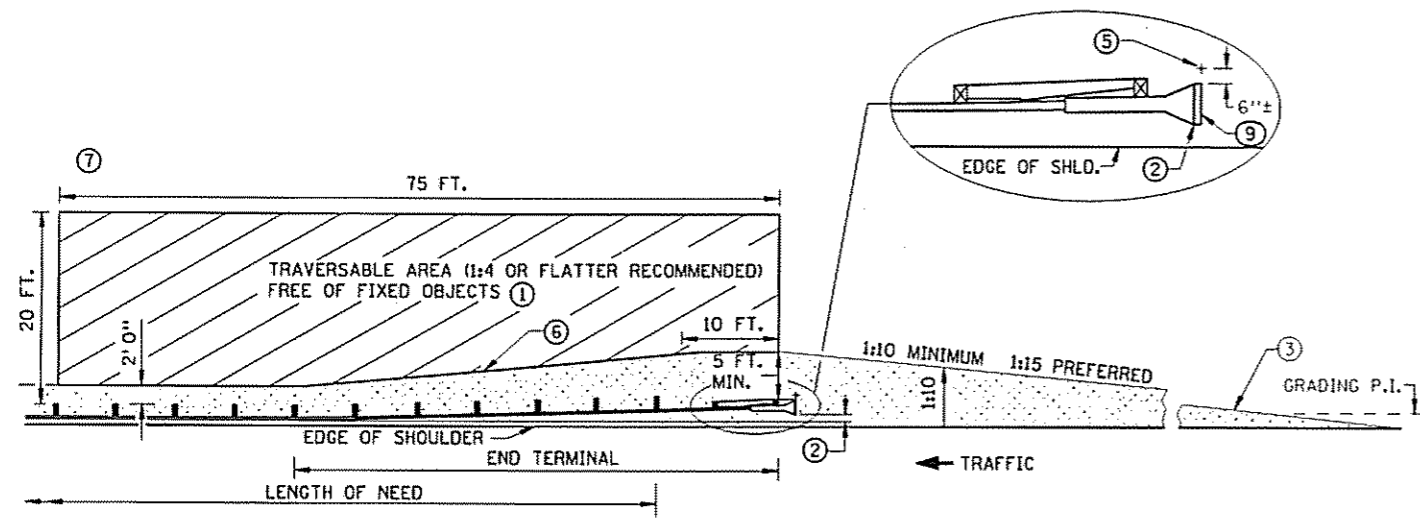
- ALL GUARDRAIL POSTS SHALL BE 6 FT. 3 IN. CENTER TO CENTER (DESIGN B), EXCEPT WHERE NOTED.
- THE LATEST APPROVED VERSION OF STANDARD PLATES SHOWN OR AS INDICATED IN THE PLANS SHALL APPLY.
- ① THRIE BEAM BULLNOSE, SEE SHEETS NO. 44-45 FOR DETAILS.
- ② FOR THE REQUIRED LENGTH SEE ROAD DESIGN MANUAL CHAPTER 10.
- ③ 0.04 FT./FT. CROSS SLOPE TYPICAL, 0.10 FT./FT. CROSS SLOPE MAXIMUM.
- ④ 1:10 OR FLATTER SLOPE P.I.. APPROACH GRADING VARIES WITH TERMINAL TYPE.
- ⑤ PLATE BEAM GUARDRAIL ATTACHMENTS TO FIXED OBJECTS REQUIRE AN APPROVED TRANSITION SECTION.
- ⑥ FOR MEDIANS WIDER THAN THE 14 FT. 2-1/2 IN., BEFORE TAPERING THE APPROACH SIDE TAPER THE OPPOSING SIDE AS SHOWN ON THE BULLNOSE DESIGN DETAIL. APPROACH TAPER SHOULD NOT EXCEED 1:25 IF THE BARRIER IS WITHIN THE SHY LINE OR 1:15 IF IT IS OUTSIDE.
- ⑦ TWO-SACK GROUT MIX (BY VOLUME: 1 PART CEMENT, 14 PARTS SAND, 5 PARTS WATER).
- ⑧ PLACE FRONT FACE OF W-BEAM DIRECTLY ABOVE FRONT FACE OF CURB.
- ⑨ 1:10 SLOPE OR FLATTER.

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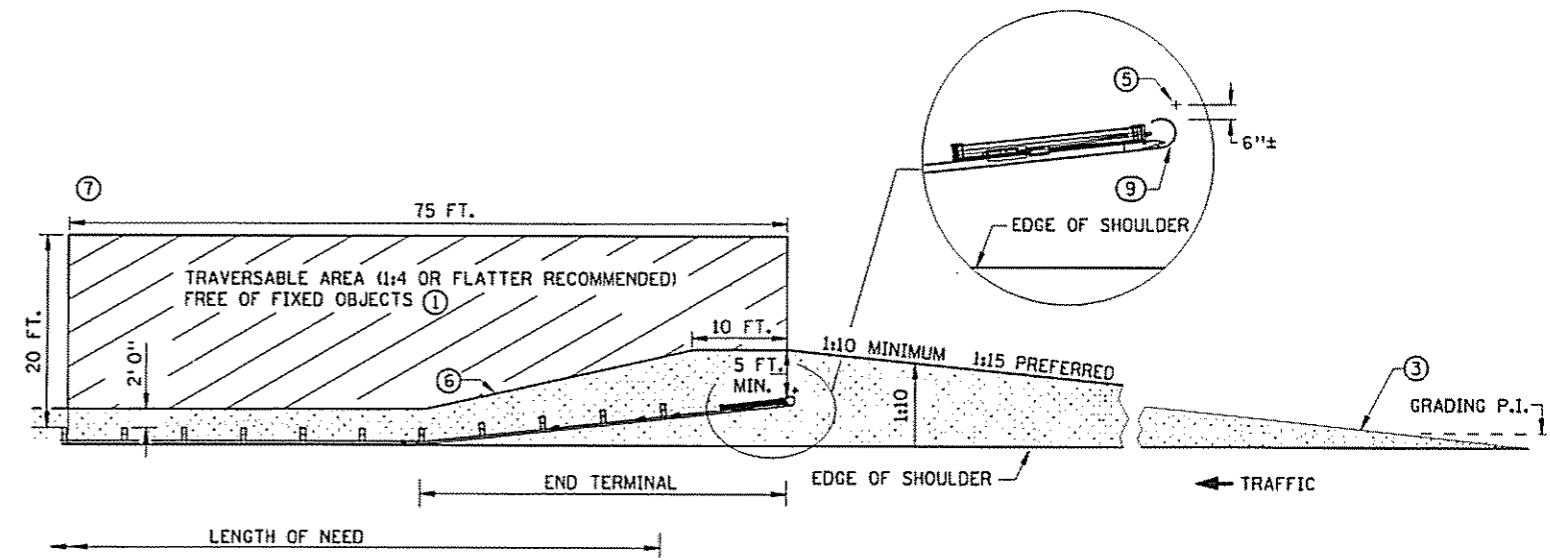
STANDARD SHEET NO. 5-297.601 ( 2 OF 3 )	TITLE: GUARDRAIL INSTALLATIONS AT MEDIANS AND END TREATMENTS
STANDARD APPROVED: AUGUST 17, 2005	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 42 OF 222 SHEETS	

PLOTTED/REVISED: 23-JAN-2009 12:26

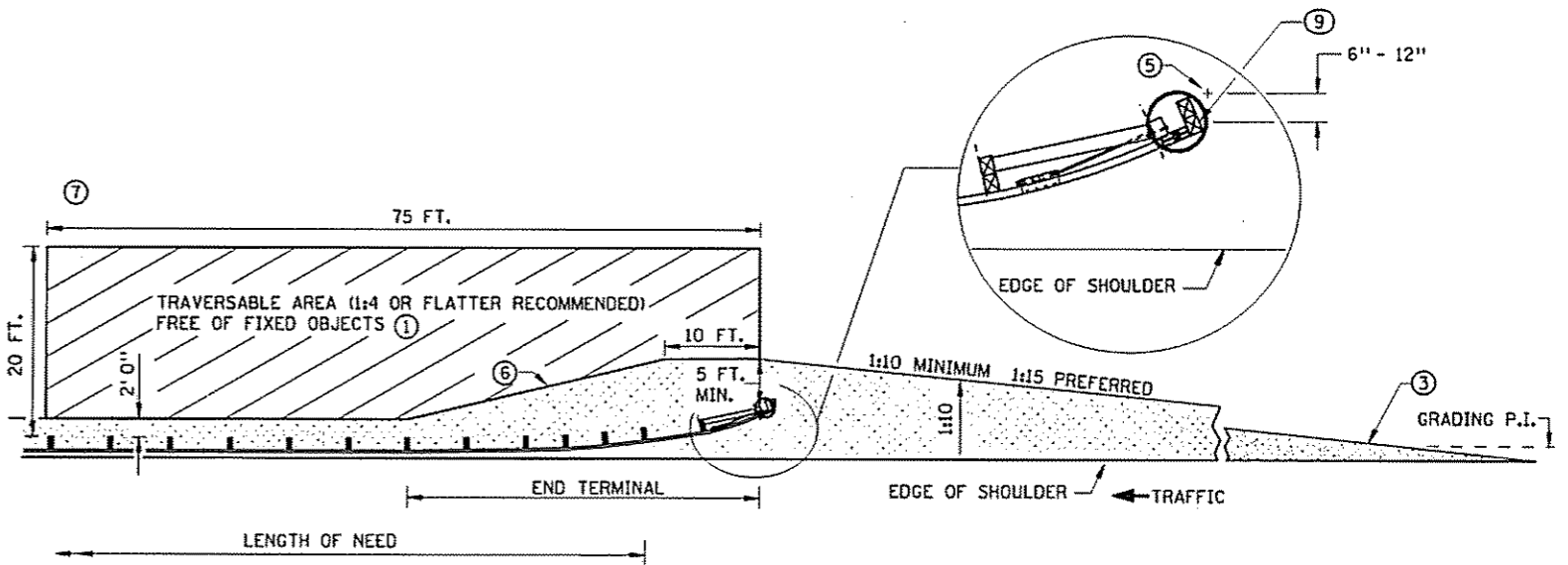
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PLAN VIEW  
 (PROPRIETARY TANGENT TERMINAL SHOWN AS EXAMPLE)



PLAN VIEW ⑧  
 (PROPRIETARY FLARED TERMINAL SHOWN AS EXAMPLE)



PLAN VIEW ④ ⑧  
 (ELT)

**NOTES:**

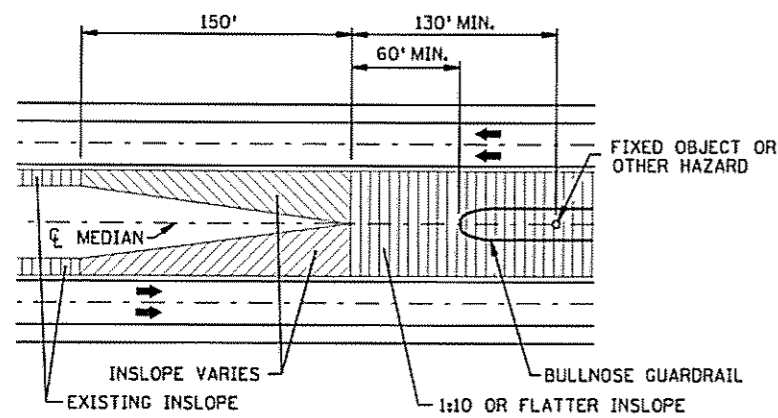
- ALL CROSS SLOPES ARE IN FOOT/FOOT UNLESS OTHERWISE NOTED.
- ALL GUARDRAIL POSTS SHALL BE 6 FT. 3 IN. CENTER TO CENTER (DESIGN B), EXCEPT WHERE NOTED.
- CHANGES (TO SUBJECTS COVERED BY THIS SHEET) INDICATED IN THE PLANS OR ON PLATES WITH MORE RECENT APPROVAL DATES SHALL APPLY.
- GRADING AND DRAINAGE HARDWARE ARE NOT INCIDENTAL TO GUARDRAIL INSTALLATION.
- ① SLOPES BETWEEN 1:3 AND 1:4 PERMITTED WHEN 1:4 OR FLATTER IS NOT POSSIBLE. FOR SLOPES STEEPER THAN 1:3 THE AREA IMMEDIATELY BEHIND AND BEYOND THE END TERMINAL SHOULD, AT LEAST, BE SIMILAR IN CROSS SECTION TO THE UNSHIELDED ROADSIDE AREA UPSTREAM OF THE END TERMINAL.
- ② THE LAST 50 FT. OF TANGENT TERMINALS CAN BE FLARED AT 1:50 TAPER.
- ③ WHEN GRADING PLATFORMS ARE BUILT, THEY MUST BE SMOOTHLY TRANSITIONED TO EXISTING SIDE SLOPE SO THE ENTIRE ROADSIDE APPROACH TO THE BARRIER REMAINS TRAVERSABLE, AS WELL AS THE AREA IMMEDIATELY BEHIND IT.

- ④ SEE STANDARD PLATE 8329.
- ⑤ SNOWPLOW MARKER (X4-5) WITH A 2 LB./FT. DELINEATOR POST 8 FT. LONG (SPEC. 3401) DRIVEN INTO THE GROUND, EXTEND 3 FT. ABOVE TERMINAL. THE MARKER IS INCIDENTAL FOR WHICH NO DIRECT PAYMENT WILL BE MADE. MARK BOTH THE BEGINNING AND END OF PLATE BEAM GUARDRAIL INSTALLATION.
- ⑥ 1:10 OR FLATTER SLOPE P.I..
- ⑦ GRADUALLY BLEND SLOPE FROM TRAVERSABLE AREA TO STEEP EXISTING SLOPE (WHEN SLOPE IS STEEPER THAN 1:6).
- ⑧ IF THE TERRAIN BEYOND THE TERMINAL END AND IMMEDIATELY BEHIND THE BARRIER IS NOT SAFELY TRAVERSABLE, A TANGENT (ENERGY- ABSORBING) TERMINAL SHALL BE USED.

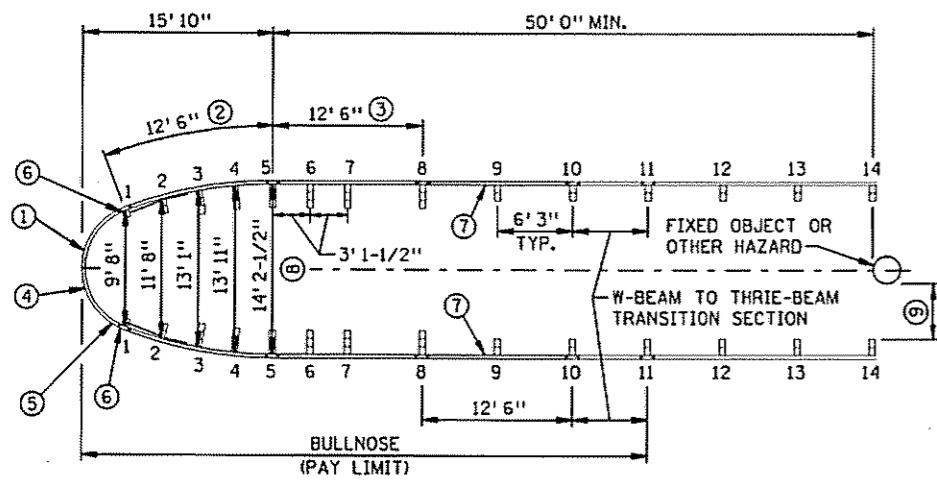
- ⑨ MARK THE APPROACH END OF PLATE BEAM GUARDRAIL INSTALLATIONS WITH A STRIPED OBJECT MARKER SIZED TO FIT THE END TERMINAL, HAVING ALTERNATING BLACK AND REFLECTIVE YELLOW (WIDE ANGLE PRISMATIC RETROREFLECTIVE SHEETING). STRIPES SHALL SLOPE DOWNWARD AT A 45 DEGREE ANGLE TOWARD THE SIDE ON WHICH TRAFFIC PASSES. FOR FLAT END TREATMENTS THE OBJECT MARKER SHALL FIT INSIDE THE RECESSED AREA. FOR ROUNDED END TREATMENTS THE OBJECT MARKER SHALL WRAP AROUND THE CIRCULAR END AND BE MOUNTED SO THE TOP OF THE OBJECT MARKER LINES UP WITH THE TOP OF THE END TREATMENT.

STANDARD SHEET NO. 5-297.601 (3 OF 3)	TITLE: GUARDRAIL INSTALLATIONS AT MEDIANS & END TREATMENTS (FOR NEW CONSTRUCTION AND RETROFITS WITHOUT SITE RESTRICTIONS)
STANDARD APPROVED: AUGUST 17, 2005	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 43 OF 222 SHEETS	

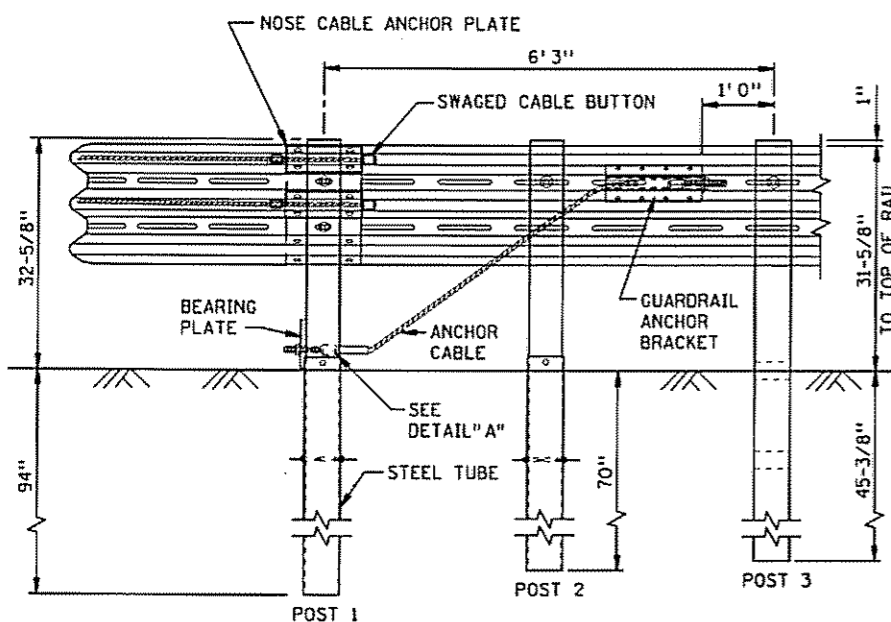
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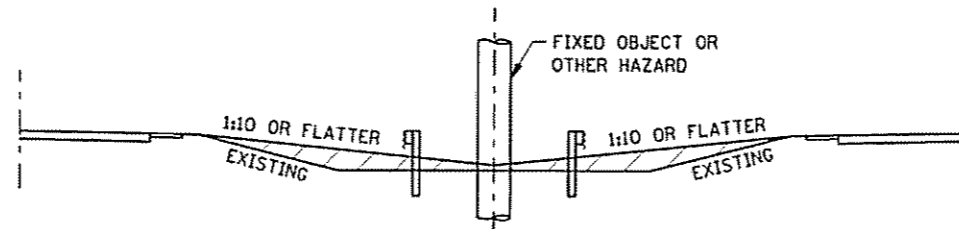
GRADING AT BULLNOSE (DEPRESSED MEDIAN)



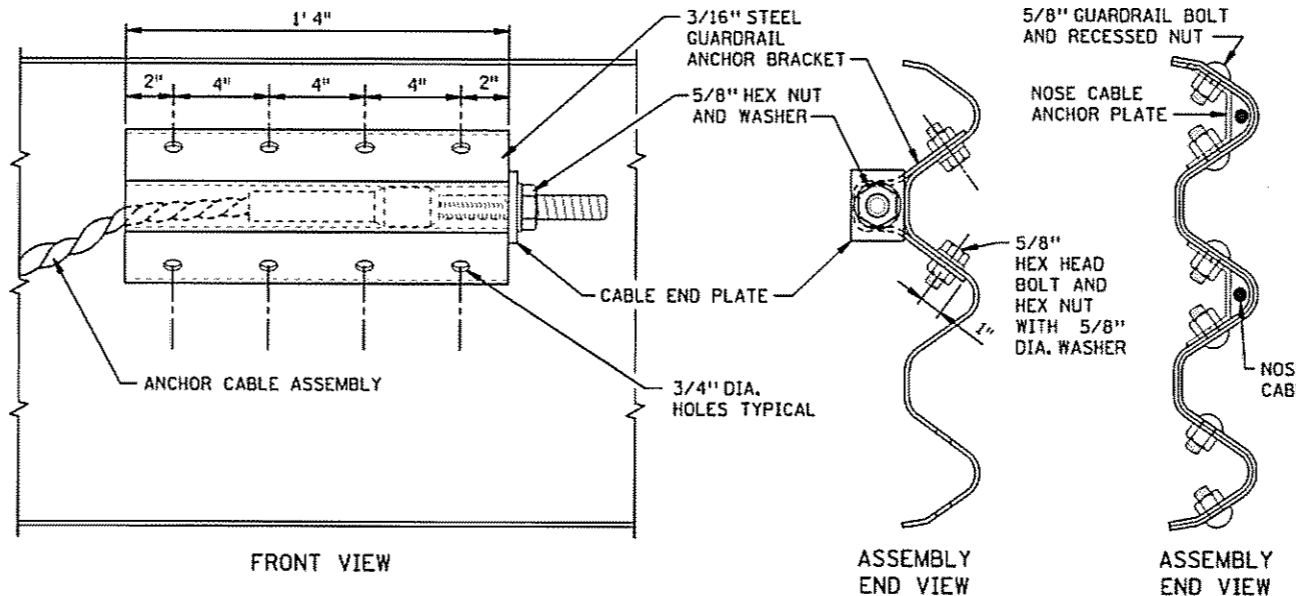
PLAN VIEW DETAILS OF BULLNOSE



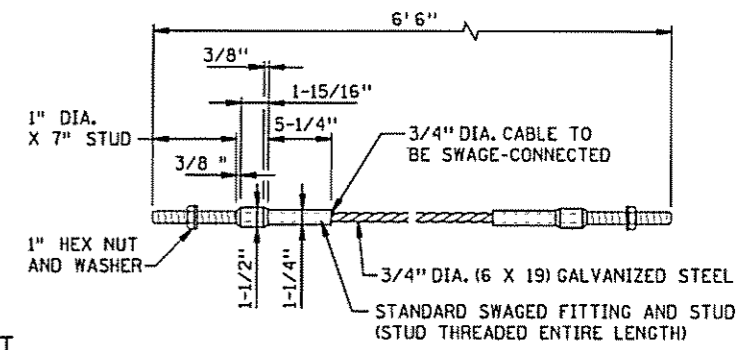
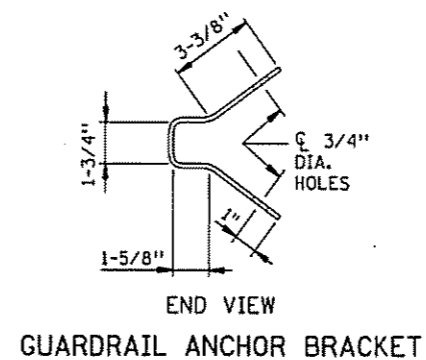
ELEVATION BULL NOSE ASSEMBLY



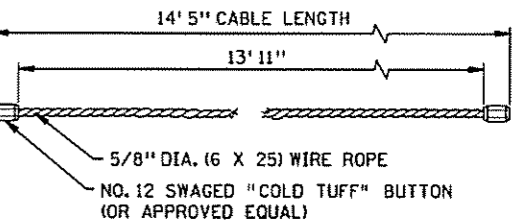
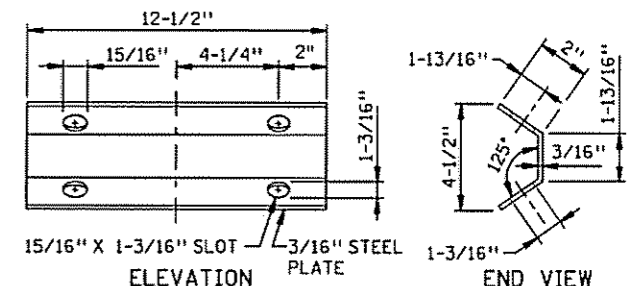
MEDIAN GRADING SECTION (AT FIXED OBJECT)



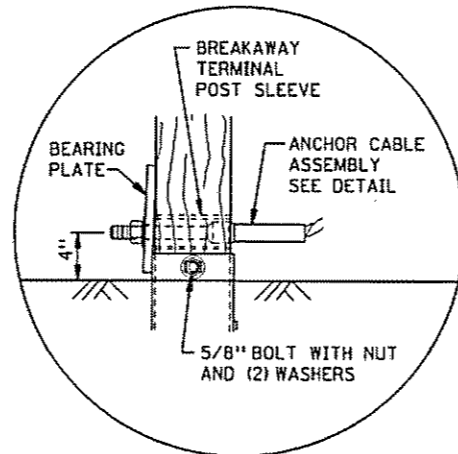
GUARDRAIL ANCHOR BRACKET DETAILS



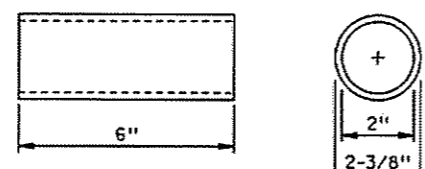
ANCHOR CABLE ASSEMBLY DETAILS



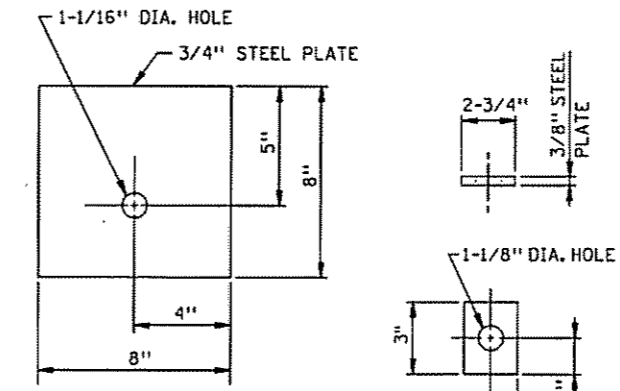
NOSE CABLE



DETAIL "A"



BREAKAWAY TERMINAL POST SLEEVE



BEARING PLATE

CABLE END PLATE

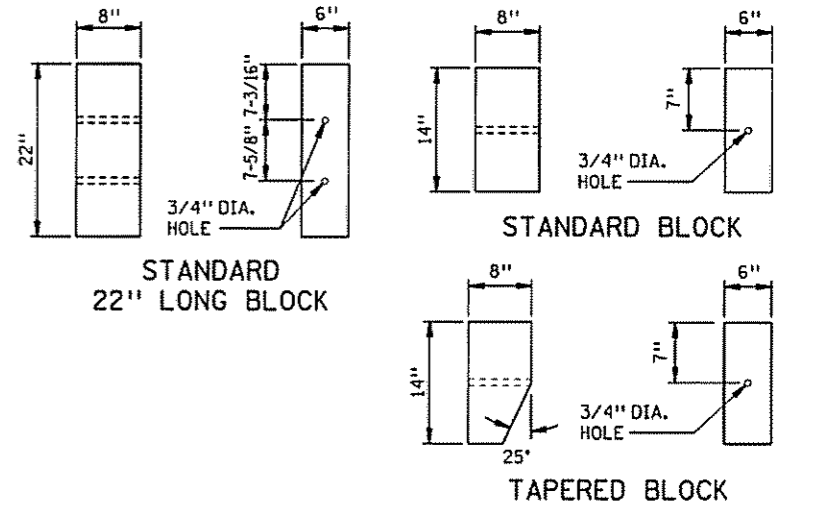
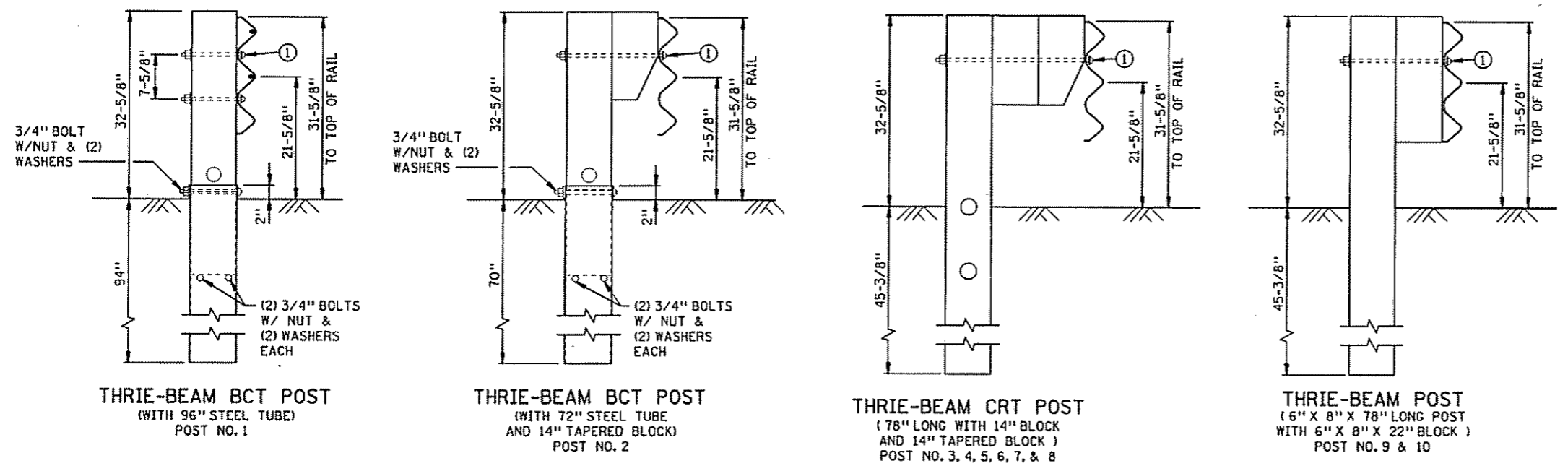
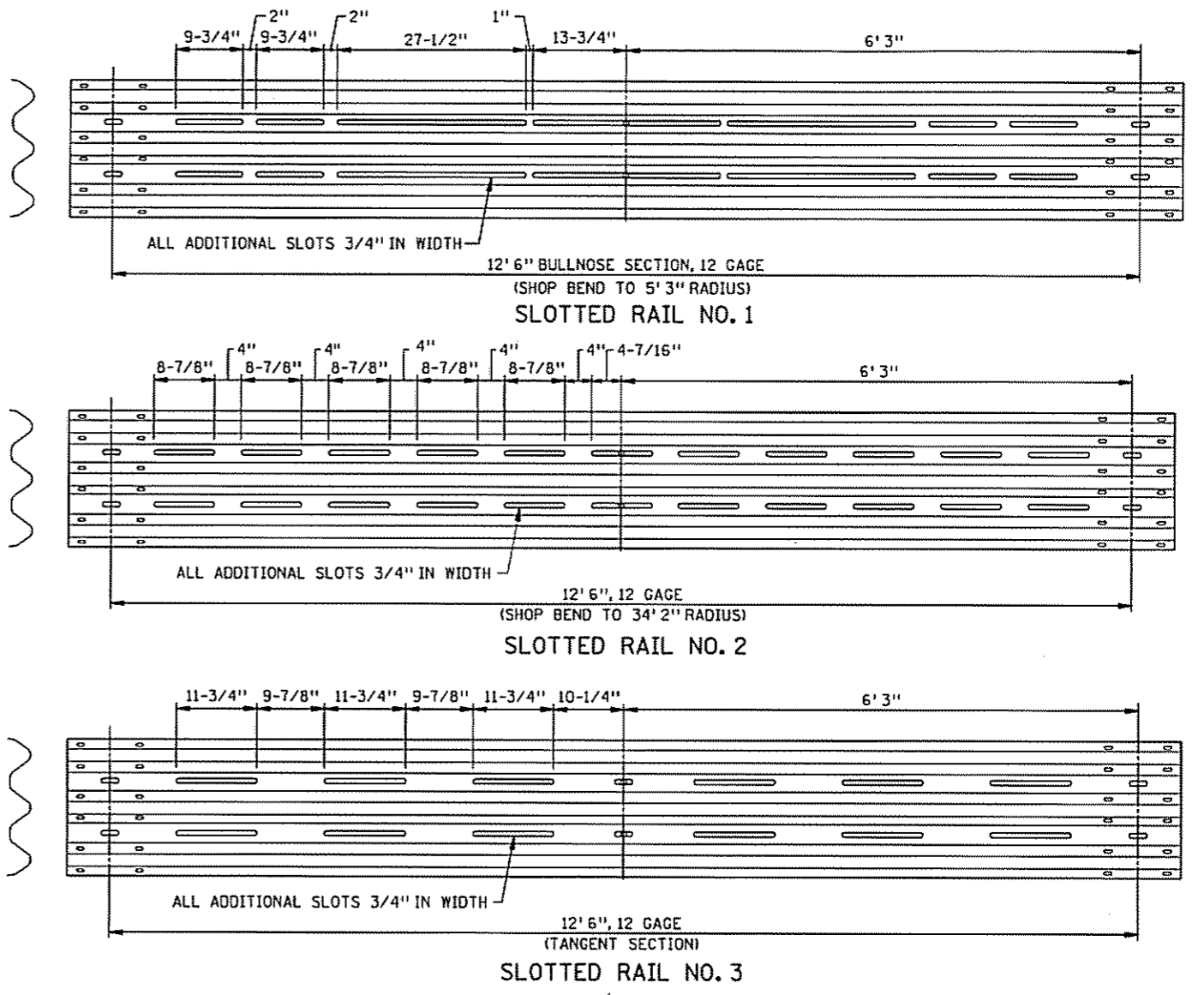
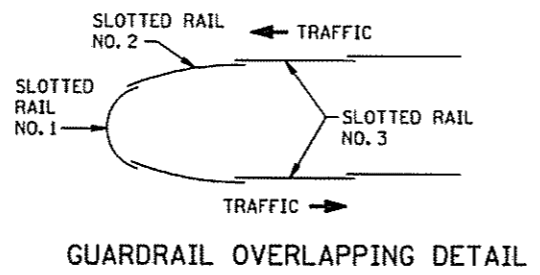
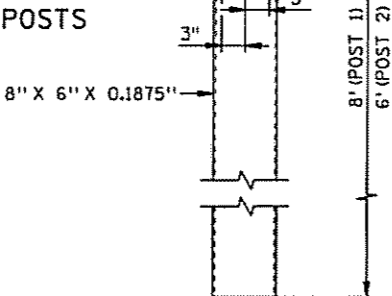
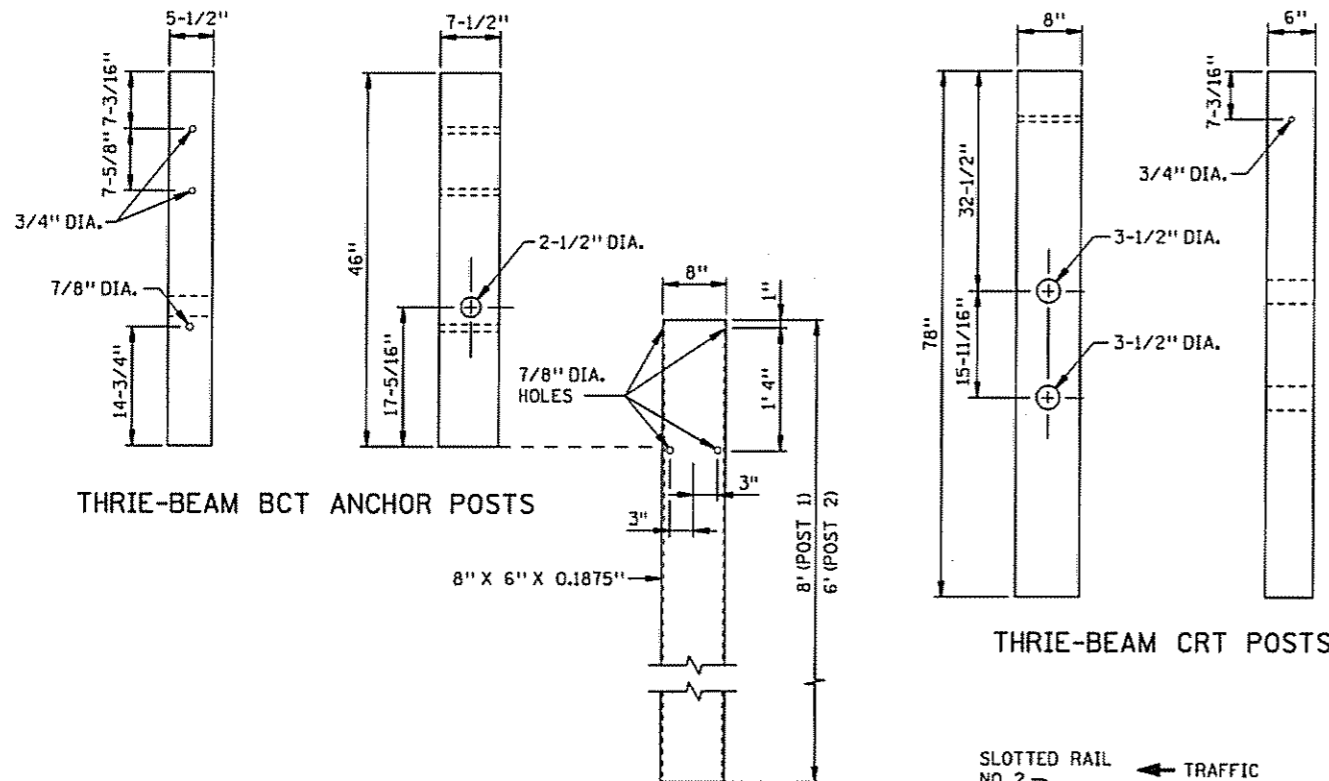
NOTES:

- OTHER ANCHOR CABLE ASSEMBLIES HAVING 40,000 LBS. MIN. BREAKING STRENGTH MAY BE USED.
- ALTERNATE HARDWARE DESIGNS WILL BE CONSIDERED FOR APPROVAL PROVIDED THEIR CONNECTION DETAILS, FOR THE PURPOSE OF MAINTENANCE SUBSTITUTIONS, ARE COMPATIBLE WITH THE DETAILS OF THIS STANDARD AND THEIR OPERATING CHARACTERISTICS ARE SIMILAR TO THOSE OF THE HARDWARE SHOWN IN THIS STANDARD.
- BOLTS AND ALL NECESSARY HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.
- SEE "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE" FOR ADDITIONAL HARDWARE INFORMATION. THE MN/DOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION SHALL GOVERN.
- ① SLOTTED RAIL NO. 1, 12' 6", SHOP BEND TO R=5' 3"
- ② SLOTTED RAIL NO. 2, 12' 6", SHOP BEND TO R=34' 2"
- ③ SLOTTED RAIL NO. 3, 12' 6", TANGENT
- ④ U-BOLT CABLE CLIPS (3 PER CABLE) SPACED OUT ON NOSE, TO HOLD CABLE TO BACKSIDE OF THE RAIL.
- ⑤ NOSE CABLE W/SWAGED END BUTTONS
- ⑥ NOSE CABLE ANCHOR PLATE (BACKSIDE OF SPLICE).
- ⑦ THRIE-BEAM GUARDRAIL, 12' 6".
- ⑧ MEASUREMENTS ARE FROM BACK OF RAIL TO BACK OF RAIL. FOR GUARDRAIL LAPPING DETAIL, SEE SHEET 2 OF 2.
- ⑨ MINIMUM DESIGN DEFLECTION FOR BARRIER USED.

STANDARD SHEET NO. 5-297.611 (1 OF 3)	THRIE BEAM BULLNOSE GUARDRAIL FOR MEDIANS (14' 2-1/2" WIDTH)
STANDARD APPROVED: AUGUST 20, 2001	
REVISION DATE 7-11-02	STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 44 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:26

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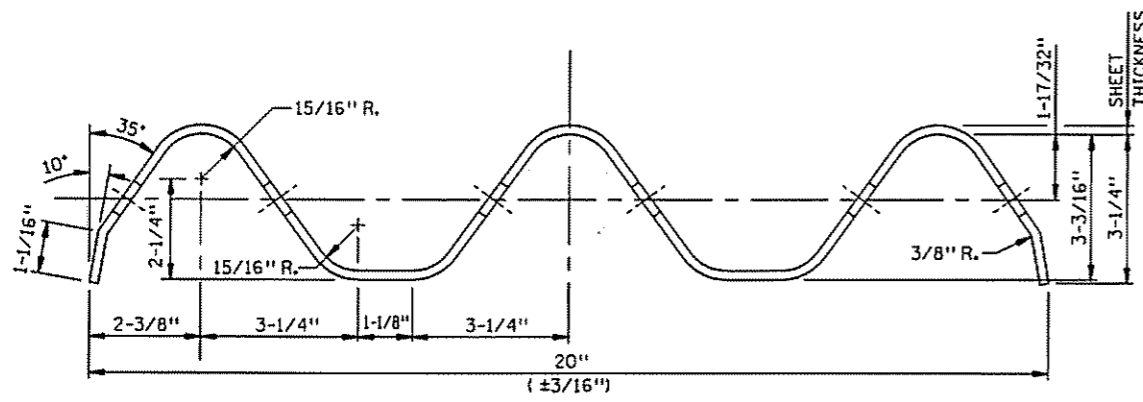
**NOTES:**

① 5/8" DIA. BUTTON HEAD BOLT X LENGTH AS REQUIRED, SECURED WITH WASHER AND HEX NUT.

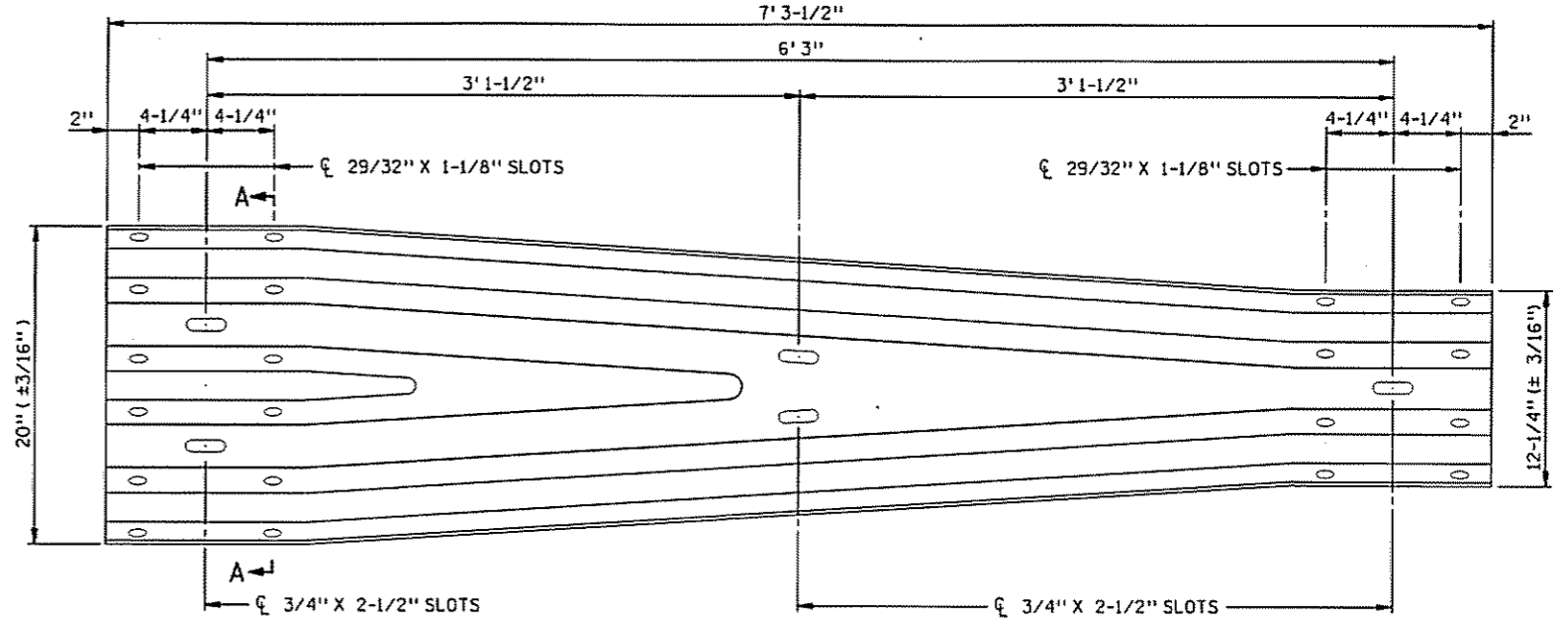
STANDARD SHEET NO. 5-297.611 (2 OF 3)	TITLE: THRIE BEAM BULLNOSE GUARDRAIL FOR MEDIANS (14' 2-1/2" WIDTH)
STANDARD APPROVED: AUGUST 20, 2001	
REVISION DATE 7-11-2002	STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 45 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:26

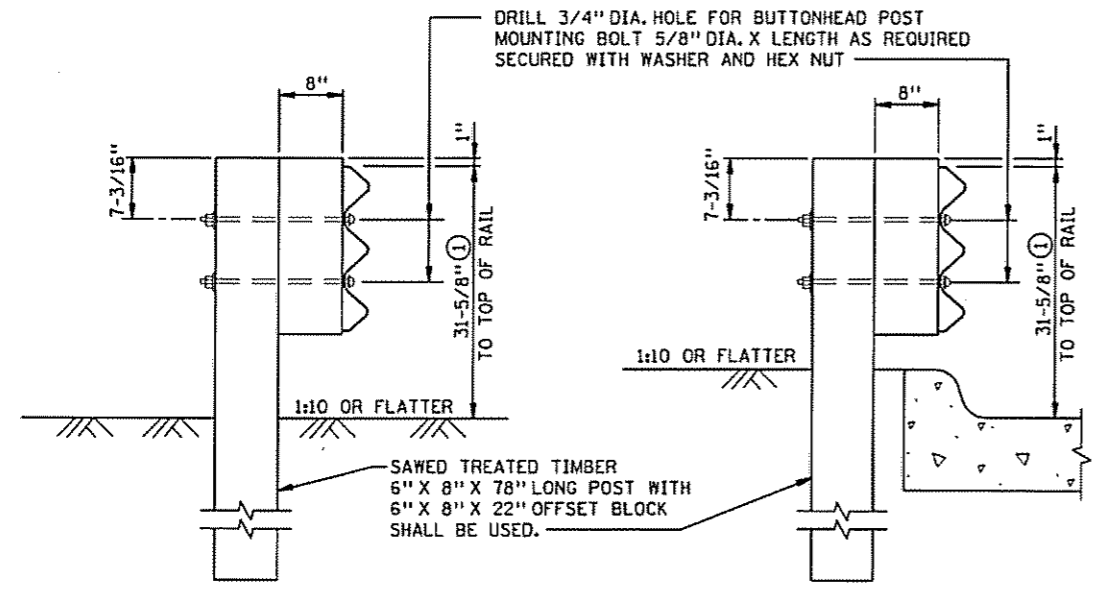
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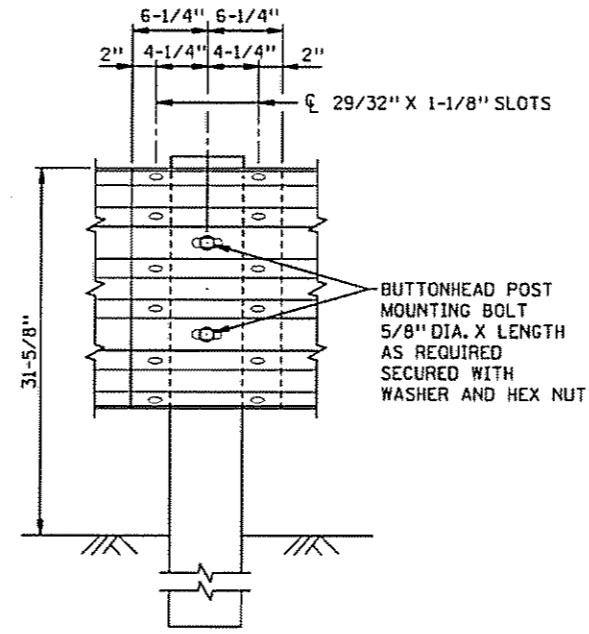
SECTION A-A



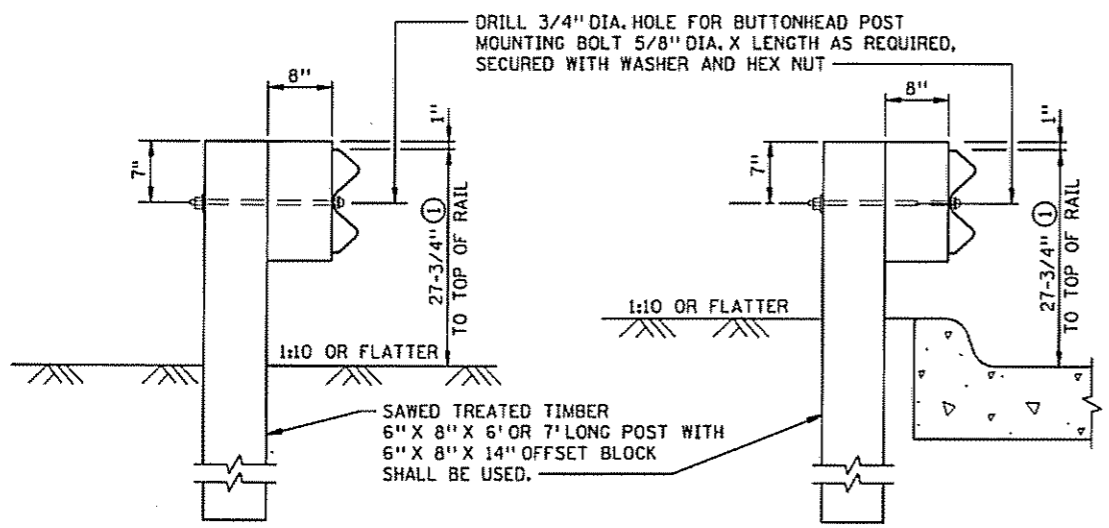
DETAILS OF W-BEAM TO THRIE BEAM TRANSITION SECTION



THRIE-BEAM AND POST ASSEMBLY



RAIL ELEMENT SPLICING AND POST MOUNTING DETAIL



W-BEAM AND POST ASSEMBLY

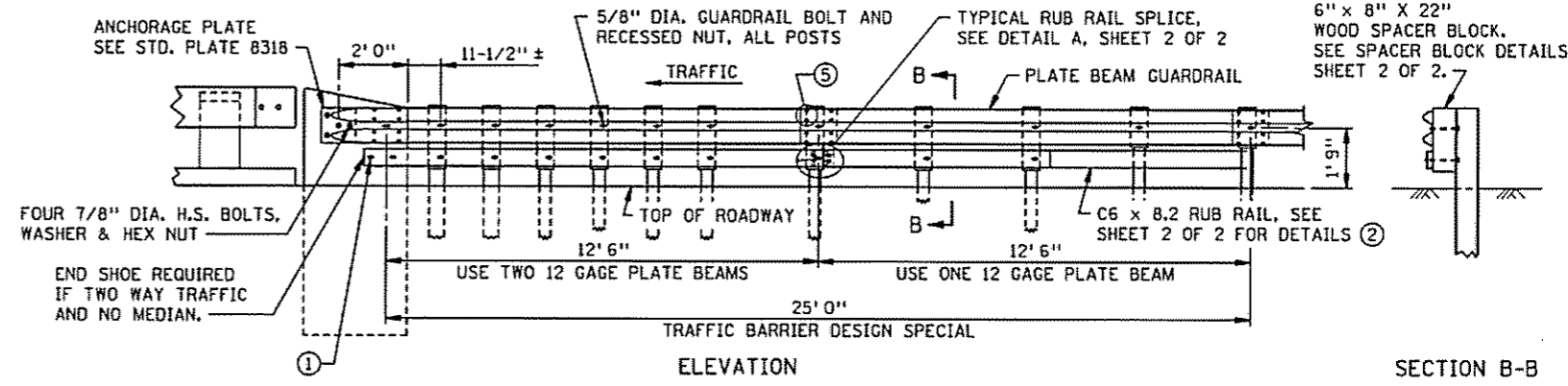
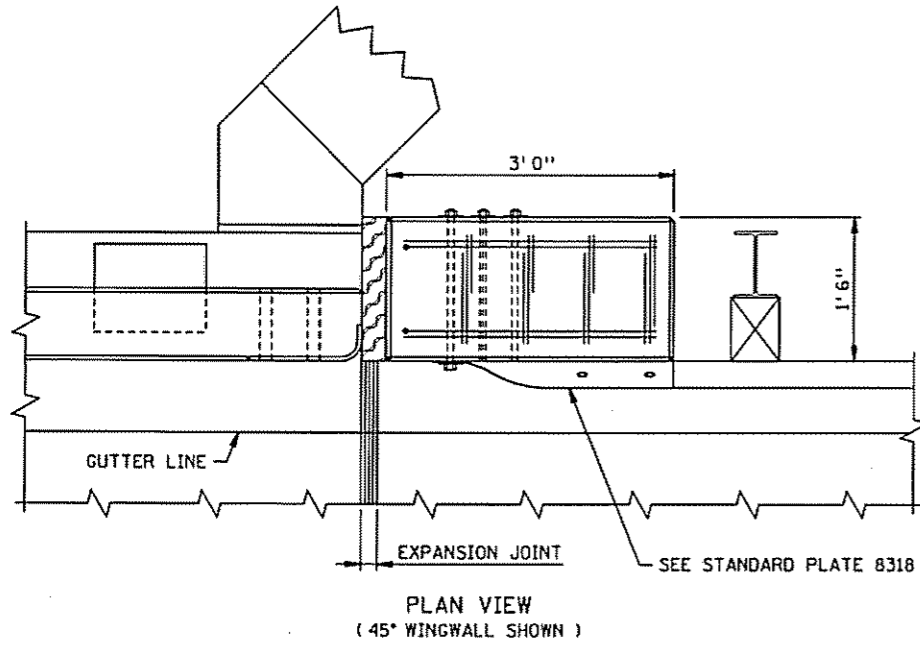
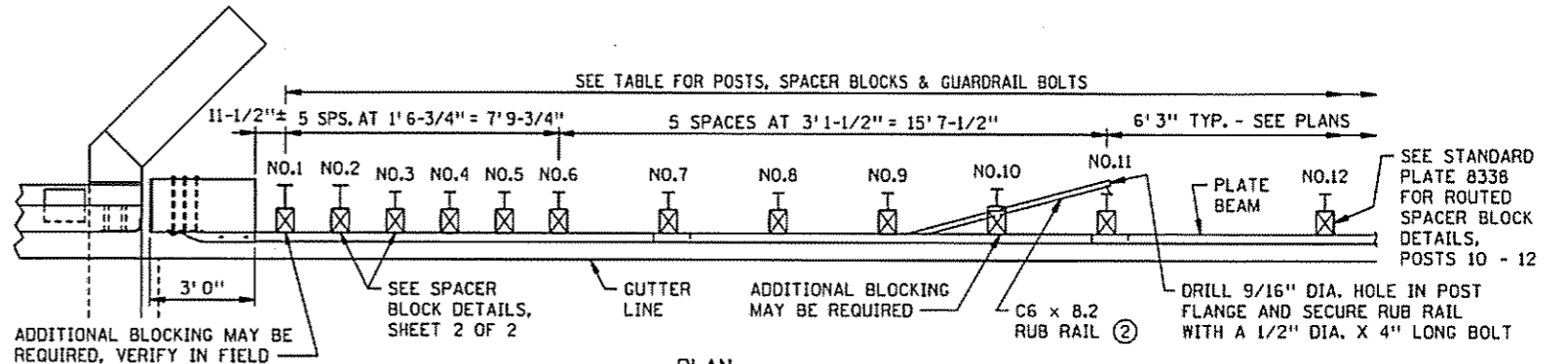
**NOTES:**

- NOT NCHRP-350 APPROVED.
- IN LOCATIONS WITH CURB THE FACE OF THE GUARDRAIL SHALL BE LOCATED AT THE FACE OF THE CURB. THE HEIGHT OF THE GUARDRAIL SHALL BE MEASURED FROM THE GUTTER TO THE TOP OF THE RAIL.
- BOLTS AND ALL NECESSARY HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A 153.
- SEE "A GUIDE TO STANDARDIZED HIGHWAY BARRIER RAIL HARDWARE" FOR ADDITIONAL HARDWARE INFORMATION. THE MN/DOT STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION SHALL GOVERN.
- ① DIFFERENCE IN HEIGHT BETWEEN THE TRANSITION AND INPLACE OR STANDARD W-BEAM RAIL SHALL BE MADE UP IN THE FIRST FULL W-BEAM RAIL SECTION FOLLOWING THE TRANSITION.

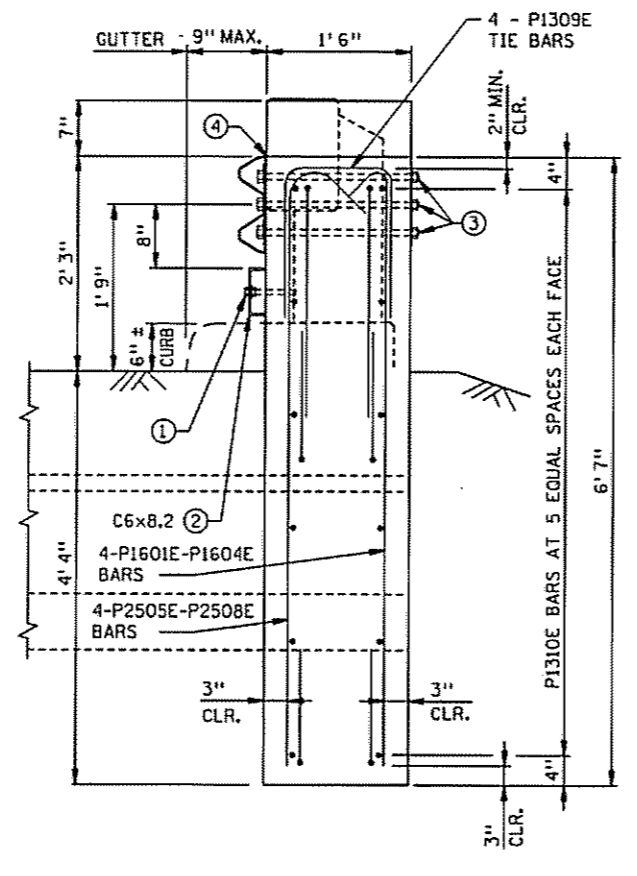
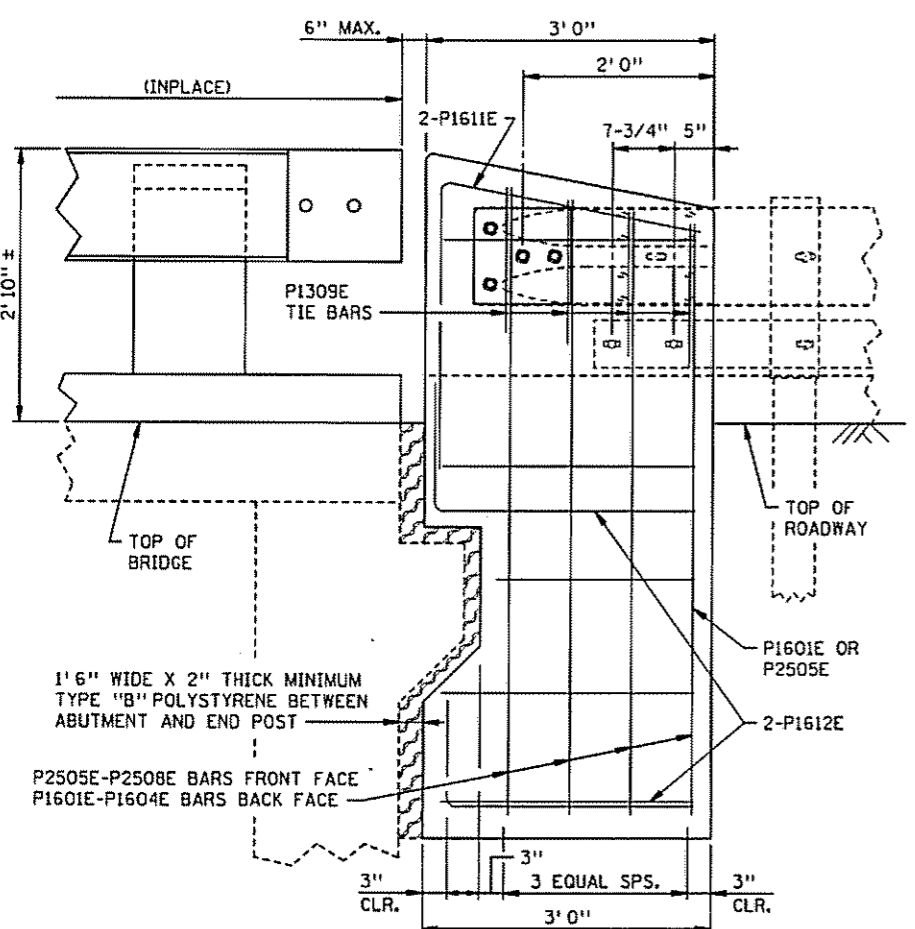
STANDARD SHEET NO. 5-297.614	TITLE: W-BEAM TO THRIE BEAM TRANSITION
STANDARD APPROVED: AUGUST 20, 2001	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 46 OF 222 SHEETS	

**POST, SPACER BLOCK & BOLT TABLE**

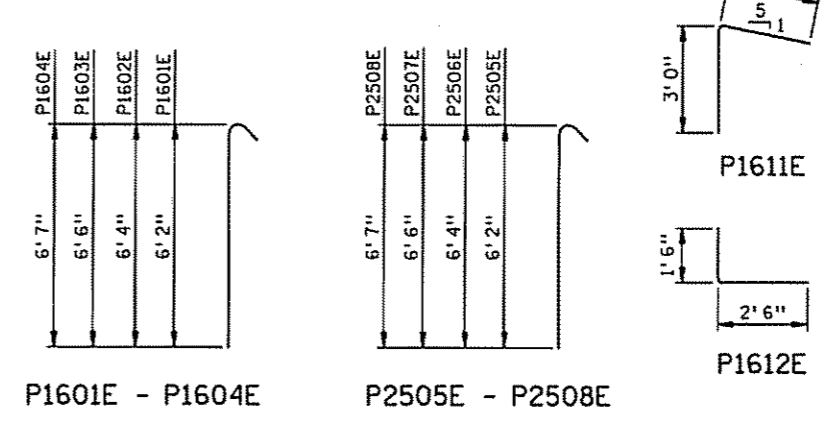
DESCRIPTION	POST NO.	SIZE
POST	1 & 2	W8 X 21 X 8' 0" MIN. LONG
	3 - 12	W6 X 9 X 6' 0" MIN. LONG
SPACER BLOCK	1 - 9	6" X 8" X 22"
	10 - 12	6" X 8" X 14"
GUARDRAIL BOLT & RECESSED NUT	1 - 12	5/8" DIA. X 10" - GUARDRAIL
	1 - 9	5/8" DIA. X 12" - RUB RAIL



**GENERAL ASSEMBLY DETAILS**



END POST REINFORCEMENT				
BAR NO.	LENGTH	SHAPE	LOCATION	
P1601E	1 6'8"	BENT	VERTICAL - OUTSIDE FACE	
P1602E	1 6'9"	BENT	VERTICAL - OUTSIDE FACE	
P1603E	1 6'11"	BENT	VERTICAL - OUTSIDE FACE	
P1604E	1 7'0"	BENT	VERTICAL - OUTSIDE FACE	
P2505E	1 7'1"	BENT	VERTICAL - INSIDE FACE	
P2506E	1 7'2"	BENT	VERTICAL - INSIDE FACE	
P2507E	1 7'4"	BENT	VERTICAL - INSIDE FACE	
P2508E	1 7'5"	BENT	VERTICAL - INSIDE FACE	
P1309E	4 4'0"	BENT	TOP - TIE BAR	
P1310E	12 2'8"	STRAIGHT	HORIZONTAL	
P1611E	2 5'7"	BENT	TOP	
P1612E	4 4'0"	BENT	BOTTOM & MIDDLE	



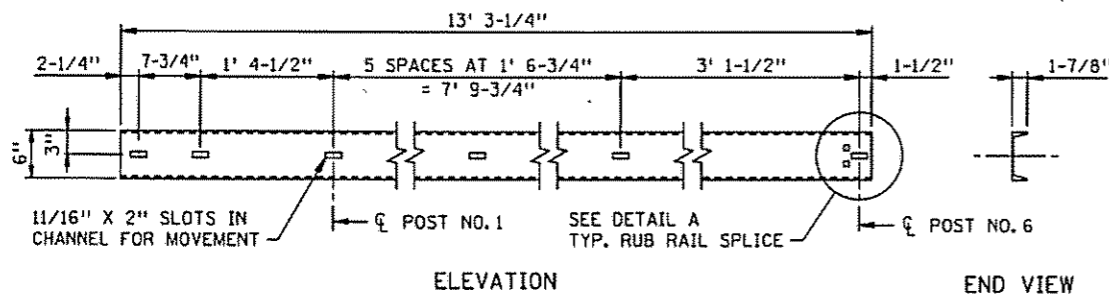
- NOTES:**
- ALL REBARS ARE IN METRIC DESIGNATIONS
  - CONSTRUCT AS PER SPEC. 2401.
  - REINFORCEMENT TO BE SPEC. 3301, GRADE 60 AND SHALL BE EPOXY COATED.
  - C.I.P. CONCRETE SHALL BE 3X46.
  - SOIL COMPACTION AT END POST AS PER SPEC. 2451.
  - GUARDRAIL CONNECTION SHALL BE THE SAME AS REQUIRED ON BRIDGE RAILINGS. SEE BRIDGE DETAILS MANUAL FOR ADDITIONAL INFORMATION.
  - 5/8" DIA. BOLTS WITH APPROVED CONCRETE ANCHORS EMBEDDED 5" IN END POST. LOCATE CONCRETE ANCHORS TO MISS BRIDGE REINFORCEMENT
  - RUB RAIL SHALL BE USED WHEN THERE IS NO CURBING ON APPROACH PANEL.
  - 7/8" DIA. H.S. BOLT OR EQUAL THREADED ROD, 3" X 2" X 1/4" PLATE WASHER AND HEX NUT (4 REQUIRED).
  - TIMBER BLOCKING MAY BE REQUIRED BEHIND GUARDRAIL CONNECTION AND RUB RAIL DEPENDING ON CURB WIDTH.
  - 5/8" DIA. X 1-1/4" LONG GUARDRAIL BOLTS AND NUTS TYPICAL AT SPLICES.
  - CUT IN FIELD AS NECESSARY.

**TRAFFIC BARRIER DESIGN SPECIAL**

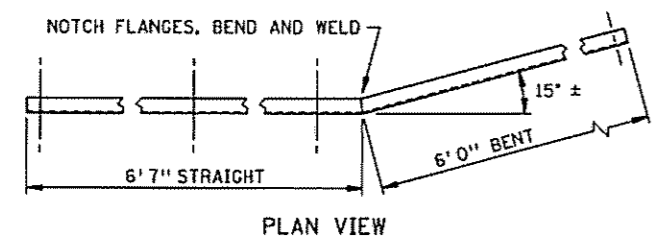
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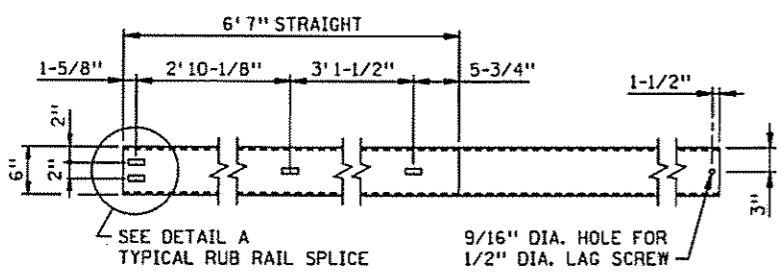
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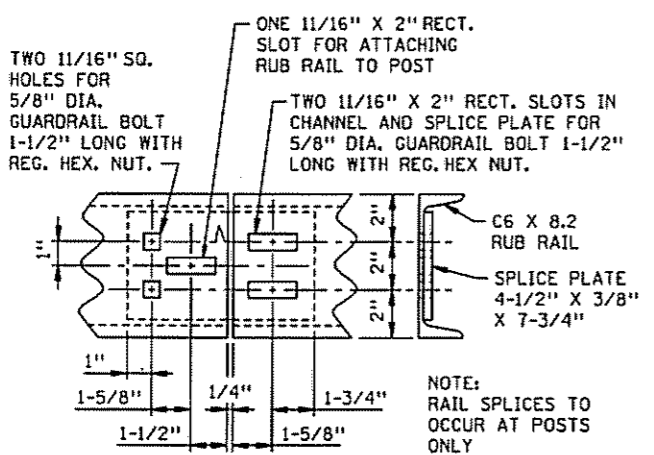
**RUB RAIL STRAIGHT SECTION**  
NON-STANDARD RUB RAIL LENGTH



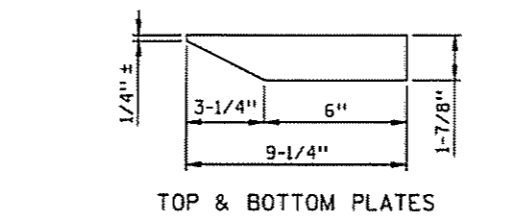
PLAN VIEW



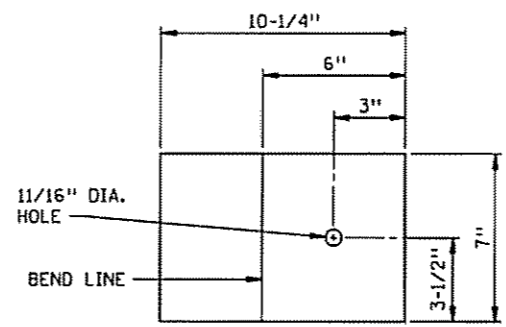
**RUB RAIL BENT SECTION**  
NON-STANDARD RUB RAIL LENGTH



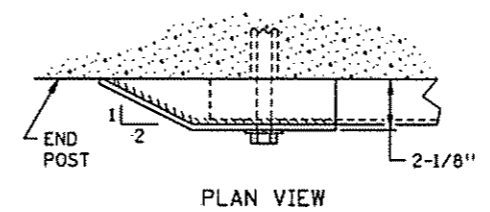
**DETAIL A**  
TYPICAL RUB RAIL SPLICE



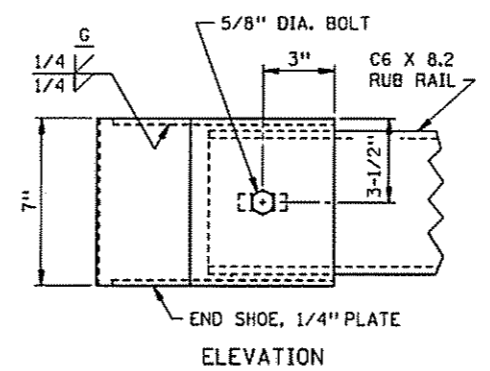
TOP & BOTTOM PLATES



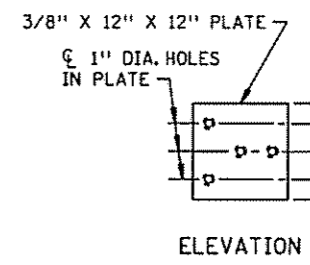
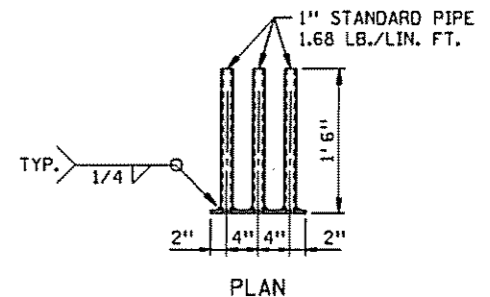
FRONT PLATE  
END SHOE PLATE DETAILS  
(1/4" PLATE)



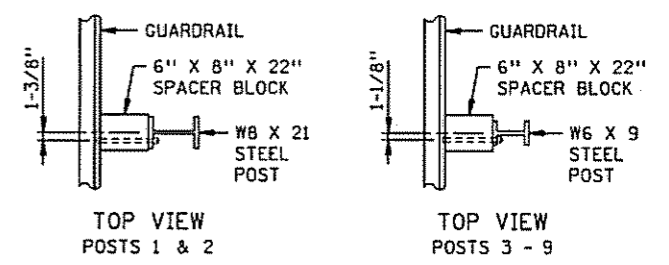
PLAN VIEW



**RUB RAIL END SHOE ASSEMBLY**  
(USE IF TWO WAY TRAFFIC WITH NO MEDIAN)

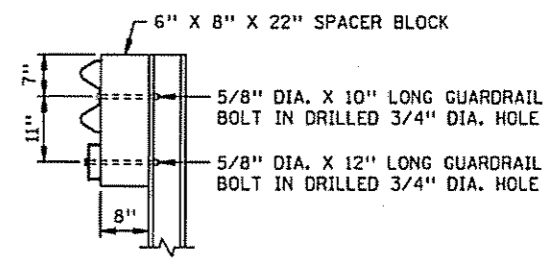


GUARDRAIL CONNECTION DETAIL



TOP VIEW  
POSTS 1 & 2

TOP VIEW  
POSTS 3 - 9



END VIEW

**SPACER BLOCK DETAILS**  
POSTS 1 - 9

- NOTES:**
- GALVANIZE ALL HARDWARE PER SPEC. 3392.
  - USE END SHOE ON RUB RAIL IF TWO WAY TRAFFIC WITH NO MEDIAN. RUB RAIL IS C6 x 8.2
  - STRUCTURAL STEEL PER SPEC. 3306 UNLESS OTHERWISE NOTED.
  - ALL SLOTTED HOLES ARE 11/16" x 2".
  - ALL SQUARE HOLES ARE 11/16".
  - GALVANIZE STRUCTURAL SHAPES PER SPEC. 3394 AFTER FABRICATION UNLESS OTHERWISE NOTED.
  - ① VERIFY DIMENSION IN FIELD.

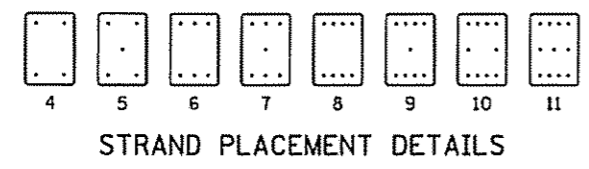
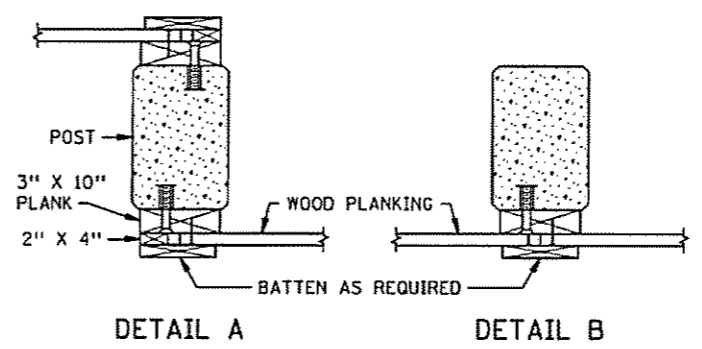
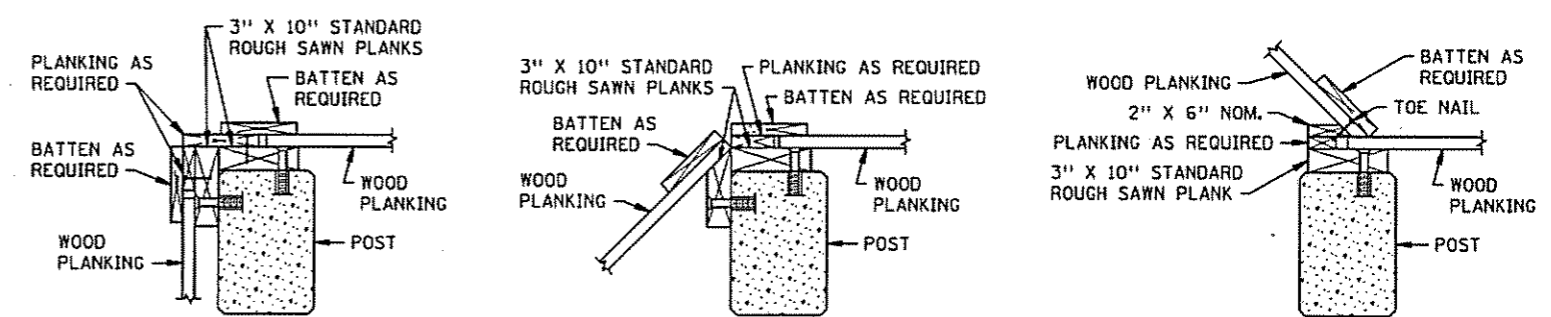
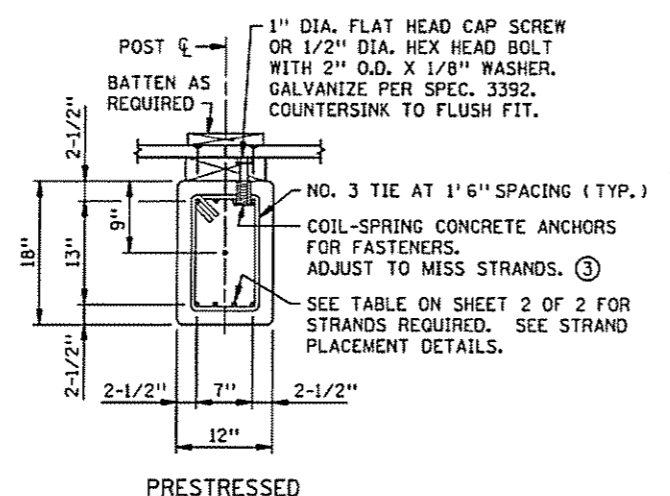
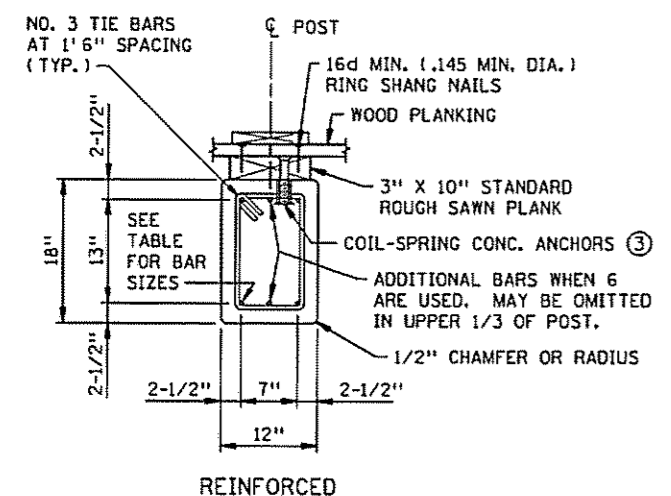
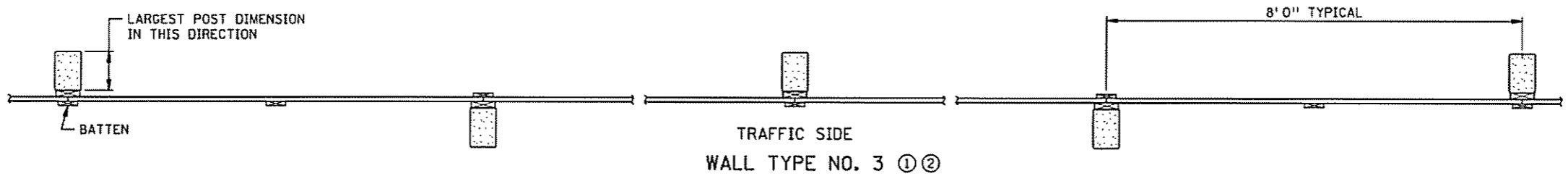
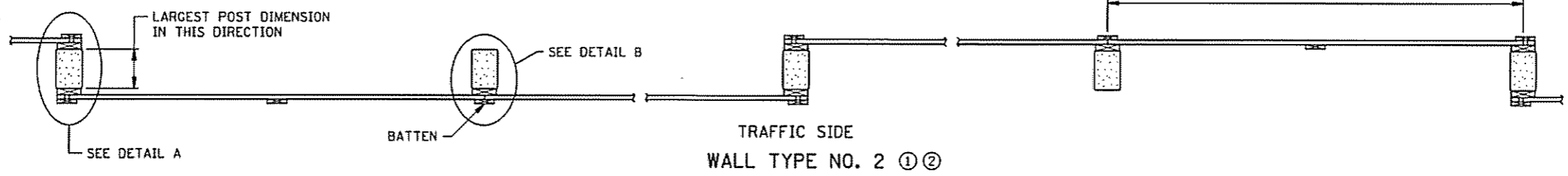
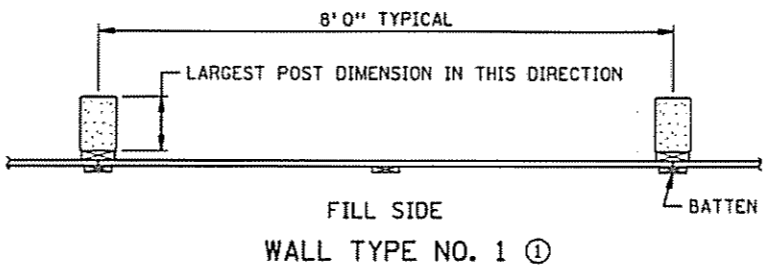
**TRAFFIC BARRIER DESIGN SPECIAL**

STANDARD SHEET NO. 5-297.619 (2 OF 2)	NEW W-BEAM TRANSITION TO ONE LINE RAIL BRIDGES WITH NEW END POST & WITH OR WITHOUT APPROACH CURB (STEEL POST)
STANDARD APPROVED MAY 8, 2002	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 48 OF 222 SHEETS	



PLOTTED/REVISED: 23-JAN-2009 12:26

DISTRICT #: METRO 4  
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- NOTES:**
- ① SEE SHEET(S) 96-114 FOR WALL TYPE REQUIRED.
  - ② TYPE NO. 2 AND 3 SHALL BE USED IN NON-FILL CONDITIONS ONLY.
  - ③ SPACE AT 4' 0" ON ALTERNATE SIDES OF POST & ULTIMATE PULL-OUT 2.25K PER ANCHOR.

STANDARD SHEET NO. 5-297.661 (1 OF 2)	TITLE: WOOD PLANKING NOISE BARRIER WITH CONCRETE POSTS
STANDARD APPROVED: JANUARY 4, 1994	
STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 49 OF 222 SHEETS	

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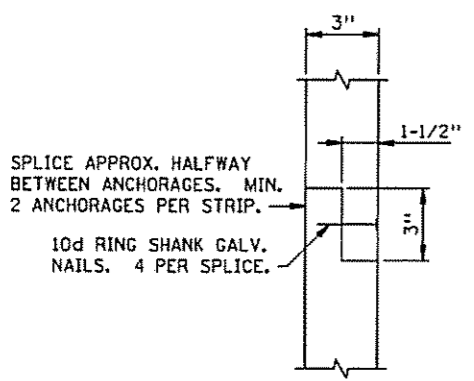
FILL HEIGHT W = 0' TO 1'

"H" WALL HEIGHT (FT.)	POST SPACING (FT.)	POST SIZE (IN.)	REINF. BARS	PRE-STRESSED STRANDS	POST EMBEDMENT			
					LEVEL GROUND	2:1 SLOPE	3:1 SLOPE	4:1 SLOPE
5	8	12 X 18	4 NO. 4	4	5' 0"	8' 0"	7' 0"	6' 0"
6	8	12 X 18	4 NO. 4	4	6' 0"	9' 0"	8' 0"	7' 0"
7	8	12 X 18	4 NO. 4	4	6' 0"	9' 0"	8' 0"	8' 0"
8	8	12 X 18	4 NO. 4	4	7' 0"	10' 0"	9' 0"	8' 0"
9	8	12 X 18	4 NO. 4	4	7' 0"	11' 0"	10' 0"	9' 0"
10	8	12 X 18	4 NO. 4	4	8' 0"	11' 0"	10' 0"	9' 0"
11	8	12 X 18	4 NO. 5	4	8' 0"	12' 0"	11' 0"	10' 0"
12	8	12 X 18	4 NO. 5	4	8' 0"	12' 0"	11' 0"	10' 0"
13	8	12 X 18	4 NO. 5	4	9' 0"	13' 0"	11' 0"	10' 0"
14	8	12 X 18	4 NO. 5	4	9' 0"	13' 0"	11' 0"	10' 0"
15	8	12 X 18	6 NO. 5	4	9' 0"	13' 0"	11' 0"	11' 0"
16	8	12 X 18	6 NO. 5	4	9' 0"	14' 0"	12' 0"	11' 0"
17	8	12 X 18	6 NO. 5	4	10' 0"	14' 0"	12' 0"	11' 0"
18	8	12 X 18	6 NO. 6	4	10' 0"	15' 0"	13' 0"	12' 0"
19	8	12 X 18	6 NO. 6	5	10' 0"	15' 0"	13' 0"	12' 0"
20	8	12 X 18	6 NO. 6	5	10' 0"	15' 0"	13' 0"	12' 0"
21	8	12 X 18	6 NO. 6	6	11' 0"	16' 0"	14' 0"	13' 0"
22	8	12 X 18	6 NO. 7	6	11' 0"	16' 0"	14' 0"	13' 0"
23	8	12 X 18	6 NO. 7	7	11' 0"	17' 0"	14' 0"	13' 0"
24	8	12 X 18	6 NO. 7	8	11' 0"	17' 0"	15' 0"	14' 0"
25	8	12 X 18	6 NO. 7	9	12' 0"	17' 0"	15' 0"	14' 0"

**DESIGN CRITERIA:**  
 $\phi = 30'$  (GRANULAR)  
 WIND LOAD = 23 P.S.F.  
 $f_b = 4000$  P.S.I. CONCRETE POSTS.  
 $f_b = 1400$  P.S.I. WOOD PLANKING.  
 $f_b = 1200$  P.S.I. ALL OTHER WOOD MEMBERS.  
 STRESS LEVEL SYMBOL  
 PER AITC-117-(LATEST ADDITION):  
 24F = 2400 PSI ALLOWABLE BENDING STRESS  
 20F = 2000 PSI ALLOWABLE BENDING STRESS

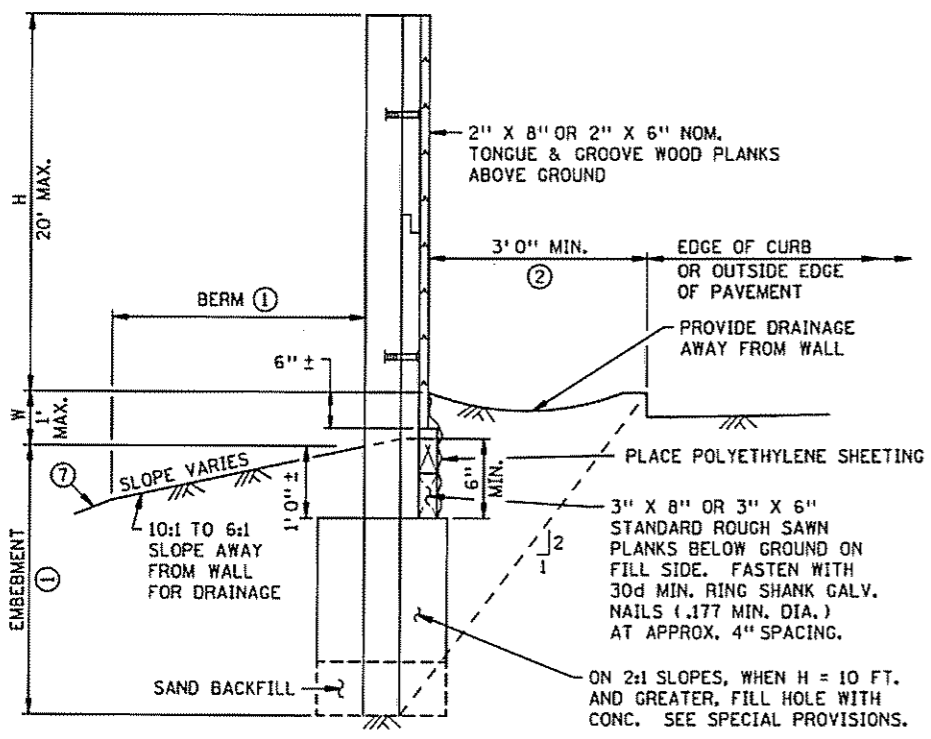
POST DESIGN CRITERIA

NO. OF STRANDS	F'ci (6)	F'c (5)
6 OR LESS	4000 PSI	5500 PSI
7 OR MORE	4000 PSI	6000 PSI

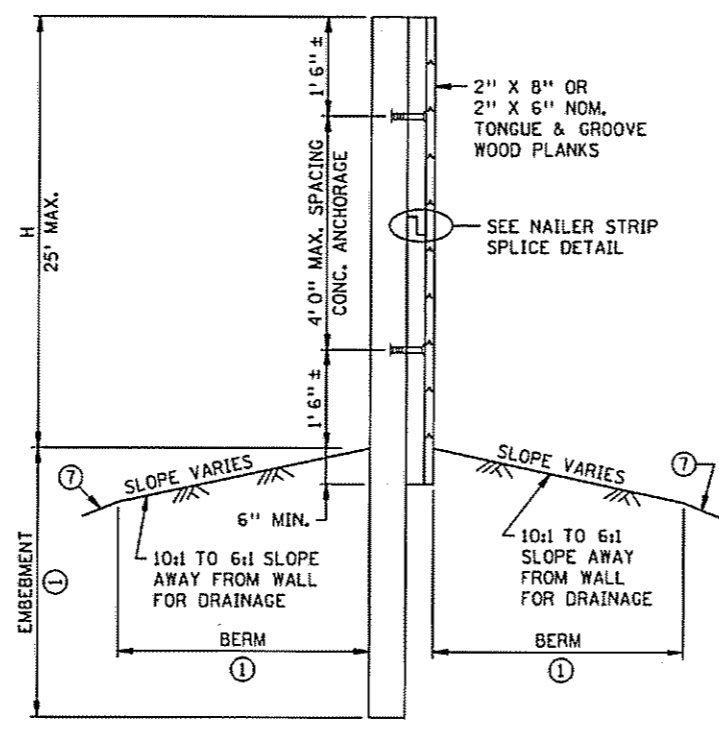


NAILER STRIP SPLICE DETAIL

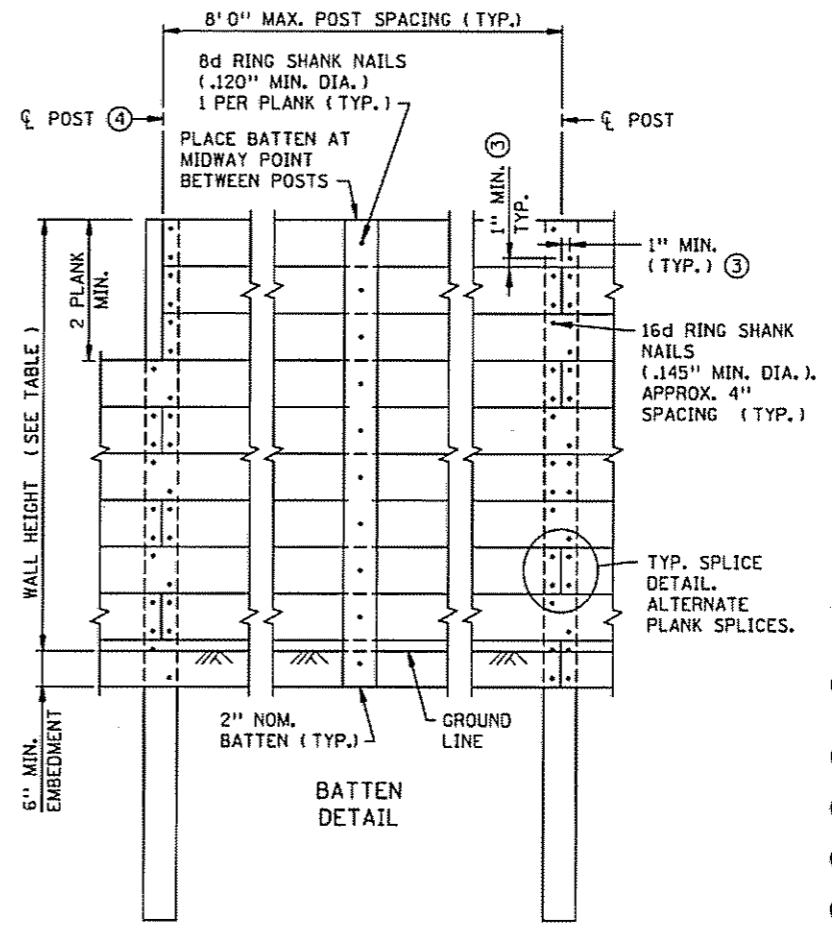
**NOTES:**  
 EMBEDMENT LENGTH IS BASED ON THE WATER TABLE BEING BELOW THE EMBEDMENT DEPTH OTHER CONDITIONS REQUIRE A SPECIAL DESIGN.  
 FOR SLOPES BETWEEN THOSE SHOWN, USE THE EMBEDMENTS FOR THE STEEPER SLOPE OR USE INTERPOLATION.  
 FOR SLOPES 6:1 OR FLATTER, USE LEVEL GROUND EMBEDMENT.  
 THE FINISHED WIDE FACE DIMENSION FOR THE ROUGH SAWN 3" PLANKS SHALL BE THE SAME AS THE FINISHED WIDE FACE DIMENSION FOR THE 2" PLANKS.  
 GALVANIZE NAILS PER SPEC. 3392. NAILING REQUIREMENTS SHOWN ARE BASED ON FULL HEAD NAILS AND ENTIRE LENGTH OF SHANK BEING DEFORMED. SEE SPECIAL PROVISIONS FOR POWER NAILS ALTERNATE.  
 SOIL TESTS AT 200 FT. INTERVALS SHALL BE REQUIRED AT EACH SITE LOCATION AND THE RESULTS REVIEWED BY THE SOILS ENGINEER FOR RECOMMENDATIONS.  
 SOIL TREATMENT AND BACKFILL SHALL CONFORM TO SPEC. 245i.  
 SEE SPEC. 2554 FOR ADDITIONAL CONST. INFORMATION, UNLESS OTHERWISE NOTED.  
 CONCRETE POSTS WITH THE SAME TOTAL LENGTH SHALL USE THE LARGEST NUMBER OF PRESTRESSED STRANDS REQUIRED FOR THAT POST LENGTH.  
 PRESTRESSED STEEL STRANDS ARE 1/2" DIA. (AREA = 0.153 SQ. IN.), MIN. OF 2 SPACES, 270 KIP ULTIMATE STRENGTH. INITIAL PRESTRESS EQUALS 28,900 LBS./STRAND.  
 STEEL STRANDS PER SPEC. 3348 AND PAINT THE EXPOSED ENDS OF THE STRANDS WITH AN APPROVED GRAY EPOXY.  
 ALL REINF. BARS SHALL BE EPOXY COATED GRADE 60 PER SPEC. 3301 AND HAVE A MIN. 2" CLEAR UNLESS OTHERWISE NOTED.



SECTION AT POST WITH EARTH FILL



SECTION AT POST WITHOUT EARTH FILL



FRONT ELEVATION POST BATTENS NOT SHOWN

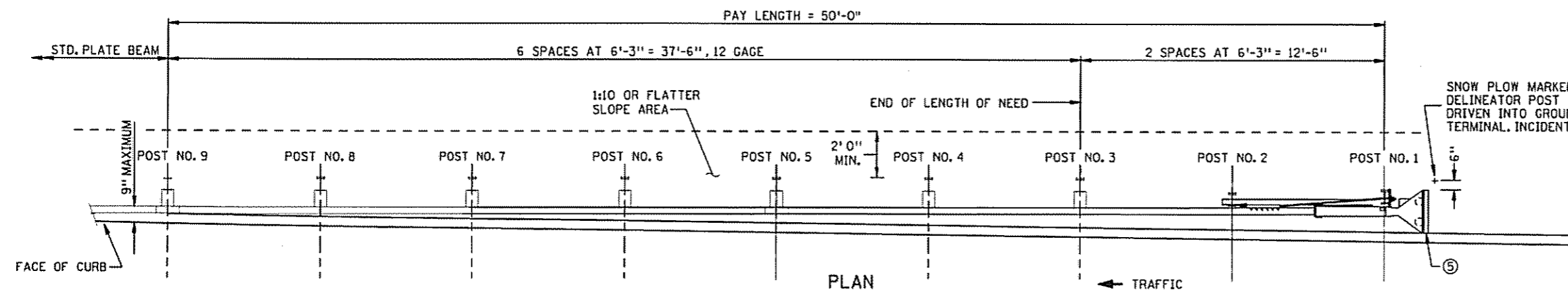
- ① EMBEDMENT DEPTHS IN THE TABLES ARE BASED ON A 3 FT. MIN. BERM IN FRONT OF THE WALL.
- ② WHEN THE CURB LINE IS CLOSER THAN 2:1 SLOPE, A SPECIAL DESIGN IS REQUIRED.
- ③ 1" MIN. DISTANCE FROM EDGE OR END OF PLANK.
- ④ USE THE POST SIZE AND EMBEDMENT FOR THE HIGHER WALL SECTION AT THE STEP.
- ⑤ MINIMUM CONCRETE STRENGTH AT THE TIME OF PRESTRESS TRANSFER.
- ⑥ MIN. CONCRETE STRENGTH THE POST CAN BE TRANSPORTED AND INSTALLED. THE CONCRETE SHALL BE PER SPEC. 246L.4A4b.
- ⑦ SEE POST EMBEDMENT TABLES.

STANDARD SHEET NO. 5-297.661 (2 OF 2)	TITLE: WOOD PLANKING NOISE BARRIER WITH CONCRETE POSTS
STANDARD APPROVED: JANUARY 4, 1994	
REVISION DATE 4-1-99	STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 50 OF 222 SHEETS

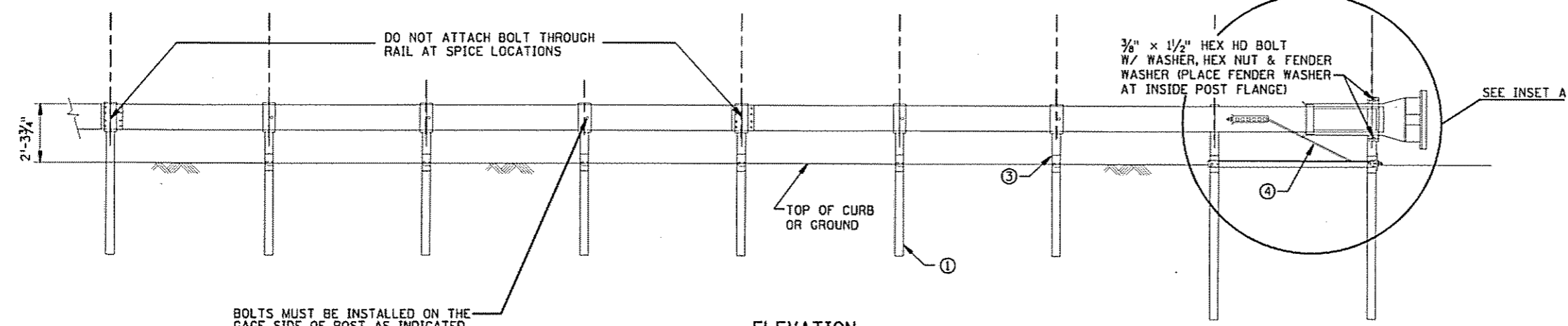
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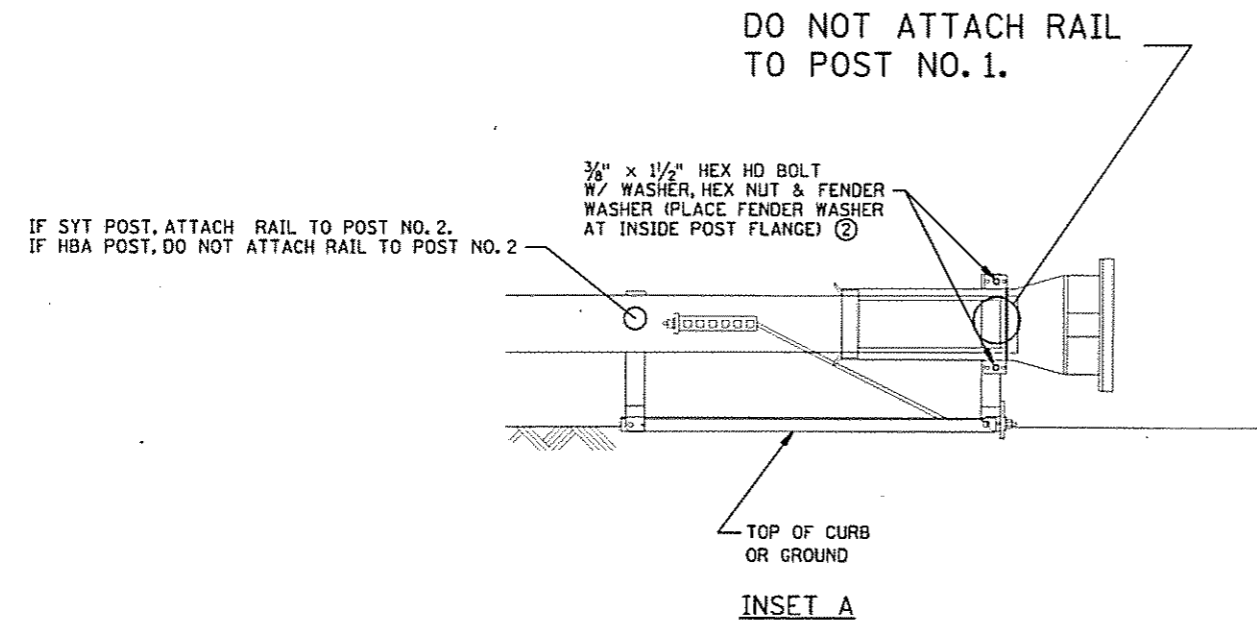
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PLAN



ELEVATION



INSET A

**NOTES:**  
THIS DRAWING IS FOR INFORMATION ONLY. CONTACT THE MANUFACTURER FOR INSTALLATION INSTRUCTIONS DURING THE CONSTRUCTION PHASE.

THIS IS A PROPRIETARY ITEM AS PER SPEC. 1703.

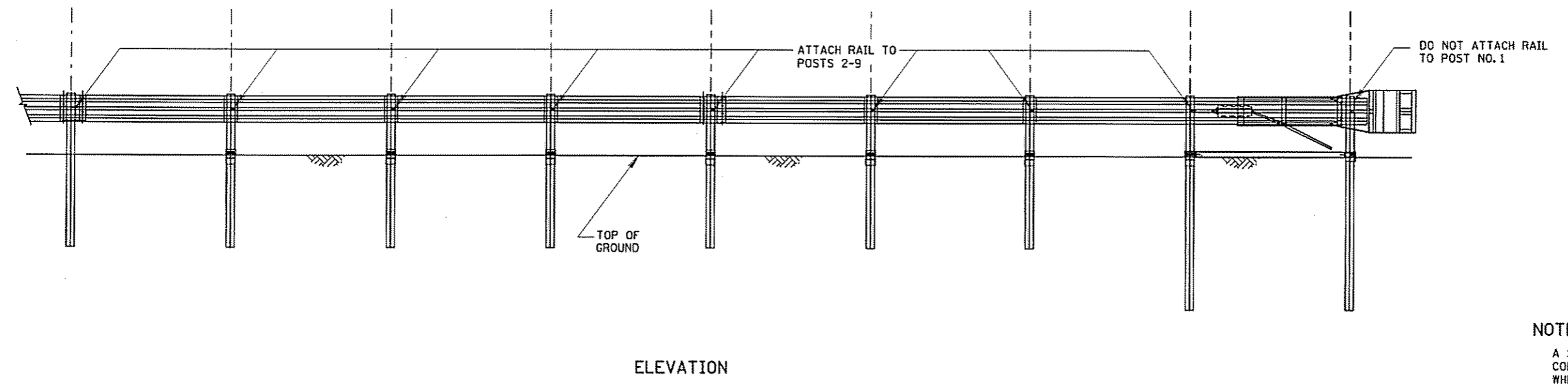
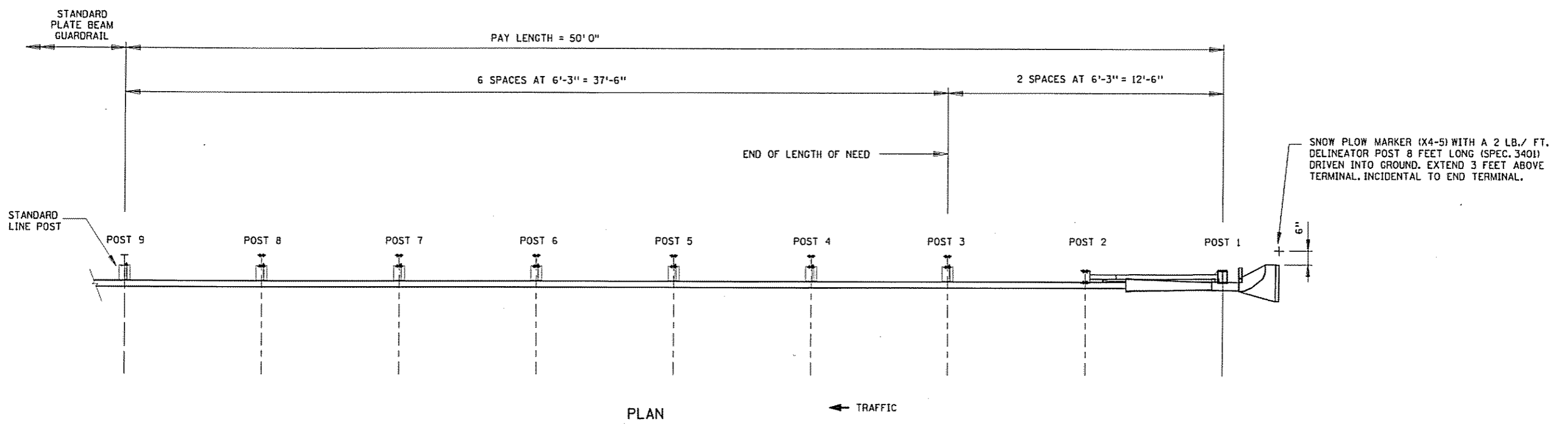
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- NOTES:**
- ① HINGED BREAKAWAY (HBA) POSTS OR STEEL YIELDING TERMINAL (SYT) POSTS ARE REQUIRED WITH THE ET-2000 AND ET-2000 PLUS.
  - ② ALL BOLTS, NUTS, CABLE ASSEMBLIES, CABLE ANCHORS AND BEARING PLATES SHALL BE GALVANIZED.
  - ③ THE NON-BREAKAWAY SECTION OF THE HBA OR SYT POSTS SHALL NOT EXTEND MORE THAN 4" ABOVE THE FINISHED GROUND LINE.
  - ④ THE BREAKAWAY CABLE ASSEMBLY MUST BE TAUT UPON COMPLETION OF INSTALLATION. PREVENT CABLE FROM TWISTING DURING INSTALLATION.
  - ⑤ EXTRUDER HEAD OFFSETS UP TO 2" MAX. ARE ALLOWABLE USING A STRAIGHT TAPER BETWEEN POSTS 1 AND 9. SET EXTRUDER HEAD A MAX. OF 9" BEHIND FACE OF CURB.

ET-2000 END TREATMENT (STEEL POSTS)  
( ENGLISH )

REFERENCE DATE  
6-28-04

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**NOTES:**

A SPECIAL SITE EVALUATION SHOULD BE CONSIDERED PRIOR TO USING THE SKT WHERE THERE IS LESS THAN 25' BETWEEN THE OUTLET SIDE OF THE SKT AND ANY ADJACENT DRIVING LANE.

POSTS 2-9 HAVE RAIL ATTACHED WITH BOLT, WASHER, AND NUT.

THIS DRAWING IS TO BE USED ONLY FOR PICTORIAL REPRESENTATION. DESIGN CHANGES ARE NOT ALWAYS SHOWN.

CONTACT MANUFACTURER FOR INSTALLATION INSTRUCTIONS.

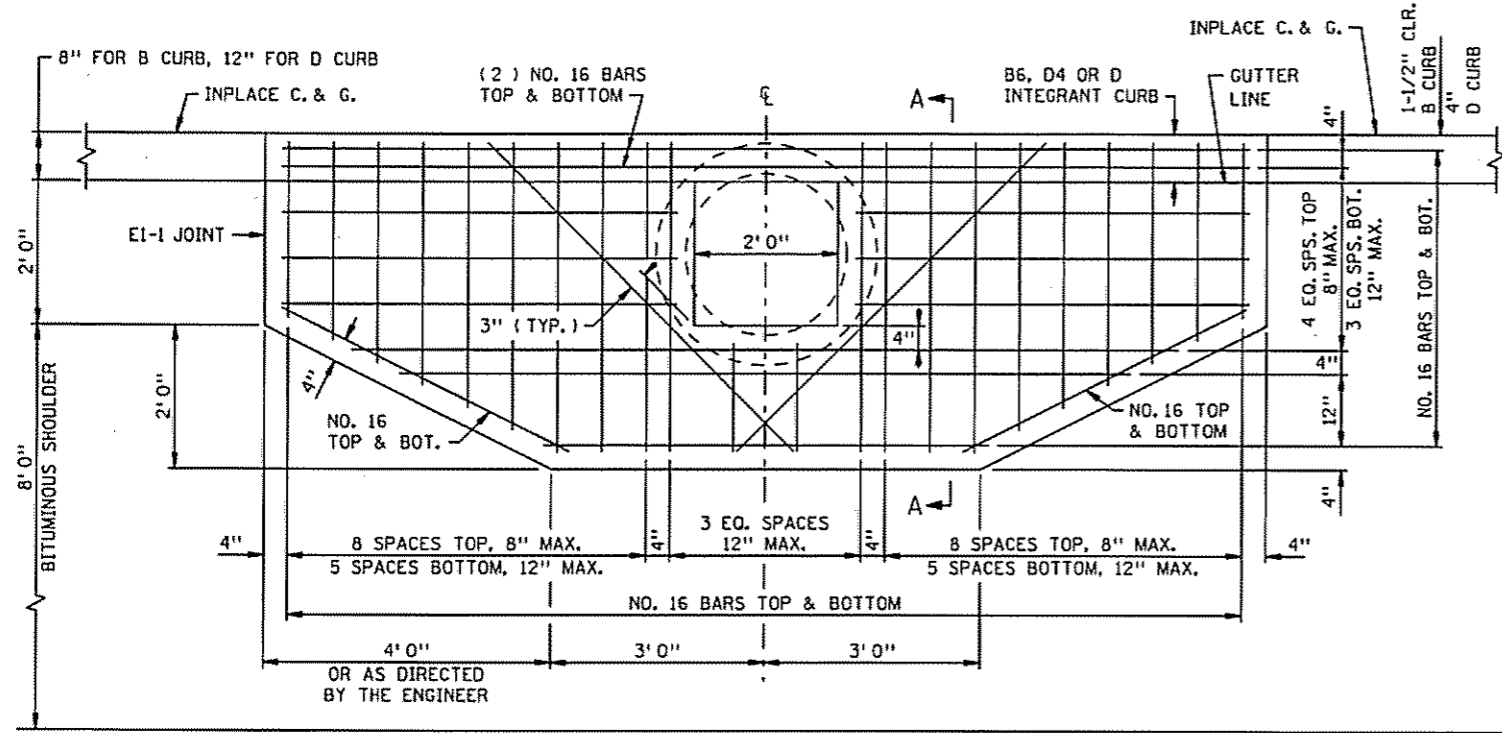
THIS IS A PROPRIETARY ITEM AS PER SPEC. 1703.

REFERENCE DATE 8-1-03	SKT-350 END TREATMENT (STEEL BOLTED HINGED POSTS) ( ENGLISH )	
	STATE PROJ. NO. 0215-67 (TH 10 )	SHEET NO. 52 OF 222 SHEETS

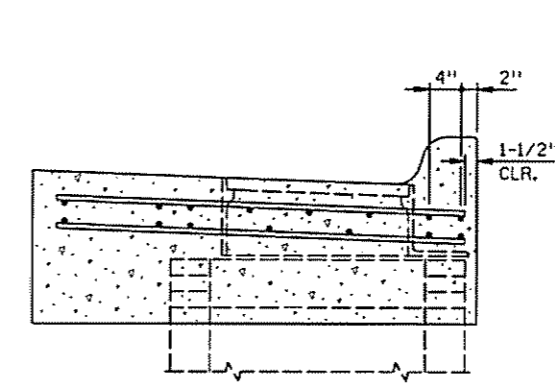
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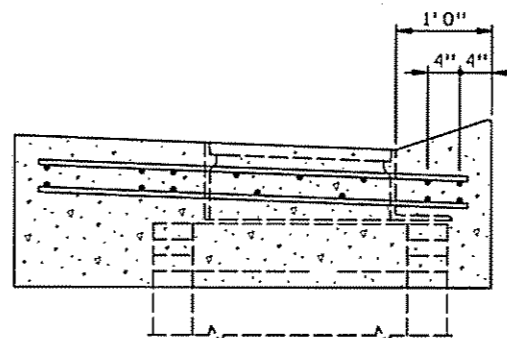
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INPLACE MAINLINE TRAFFIC  
PLAN VIEW



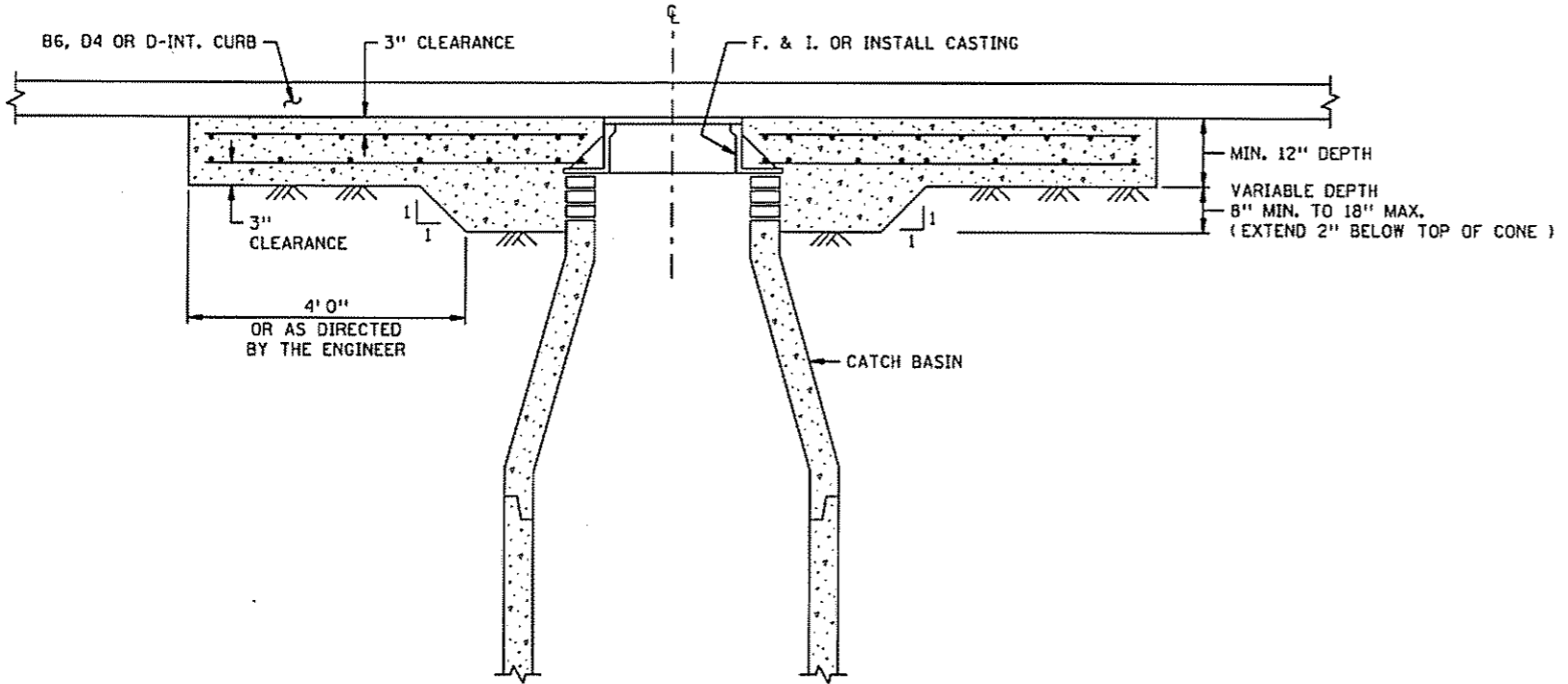
SECTION A-A  
DESIGN B CURB SHOWN



SECTION A-A  
DESIGN D CURB SHOWN

**INCIDENTAL WORK**

SAWING AROUND PERIMETER  
REMOVING PAVEMENT AND ADJUSTING RINGS  
REINFORCING BARS  
ADJUSTING RINGS  
CONCRETE



PROFILE VIEW

**NOTES:**

ALL REBARS ARE IN METRIC DESIGNATIONS

NO SUMP REQUIRED.

REINFORCEMENT BARS SHALL BE GRADE 60, EPOXY COATED.

MAINTAIN 3" COVER AT ENDS OF BARS, EXCEPT AS NOTED.

USE 3A32 H. E. TYPE CONCRETE.

REPLACE CURB & GUTTER TO NEAREST JOINT. LENGTH WILL VARY DEPENDING ON JOINT LOCATION.

EXCAVATED INPLACE GRANULAR MATERIALS MAY BE USED AS BACKFILL.

DAMAGE DONE TO SURROUNDING PAVEMENT WILL BE REPAIRED AT CONTRACTOR'S EXPENSE.

REINFORCED CURB & GUTTER AT DRAINAGE STRUCTURES FOR BITUMINOUS SHOULDERS USED BY BUSES

CERTIFIED BY *Peter Danich* 45053 1/22/09  
LICENSED PROFESSIONAL ENGINEER LIC NO. DATE

REFERENCE DATE 6-11-2001

STATE PROJ. NO. 0215-67 (TH 10 ) SHEET NO. 53 OF 222 SHEETS

PLATE BEAM AND TENSION CABLE ANCHOR BLOCKS

⊕ WB10

421

← 12'

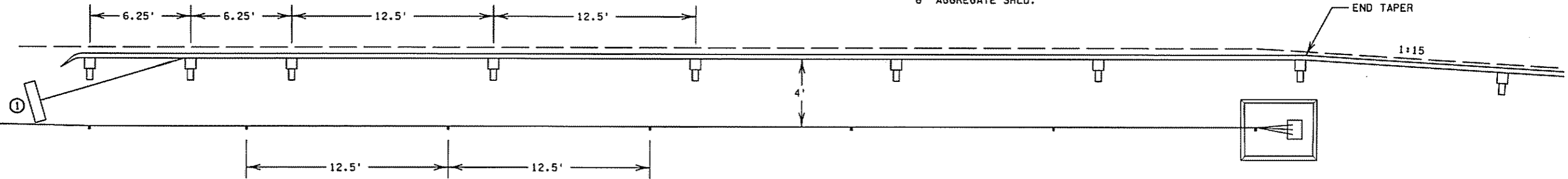
← 12'

4' PAVED SHLD.

6' AGGREGATE SHLD.

END TAPER

1:15



TOP VIEW

① ANCHOR BLOCKS ARE TO BE PLACED SO THEY DO NOT INTERFERE WITH THE ADJACENT GUARDRAIL POSTS.

GUARDRAIL TRANSITION DETAIL

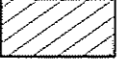
GUARDRAIL DETAILS


DISTRICT #: METRO  
 PLOT NAME: 67-guardrail.dwg  
 PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_dtl.dgn  
 PLOTTED/REVISED: 11-FEB-2009 08:53


PLOTTED/REVISED: 23-JAN-2009 12:10

- STAGE 1 CONSTRUCTION:**
- MOVE EB AND WB TRAFFIC TO OUTSIDE SHOULDERS OF EXISTING ROADWAY.
  - REMOVE 3.75' OF INPLACE WB BRIDGE NO. 9721.
  - REMOVE 3.75' OF INPLACE EB BRIDGE NO. 9722.
  - CONSTRUCT INSIDE 27.3' OF WB BRIDGE NO. 02003.
  - CONSTRUCT INSIDE 27.3' OF EB BRIDGE NO. 02004.
  - CONSTRUCT EB AND WB ROADWAY WIDENING TO THE CENTER, EXCEPT FOR THE TOP 1-1/2" LIFT OF PAVEMENT.
  - CONSTRUCT TEMPORARY WIDENING.

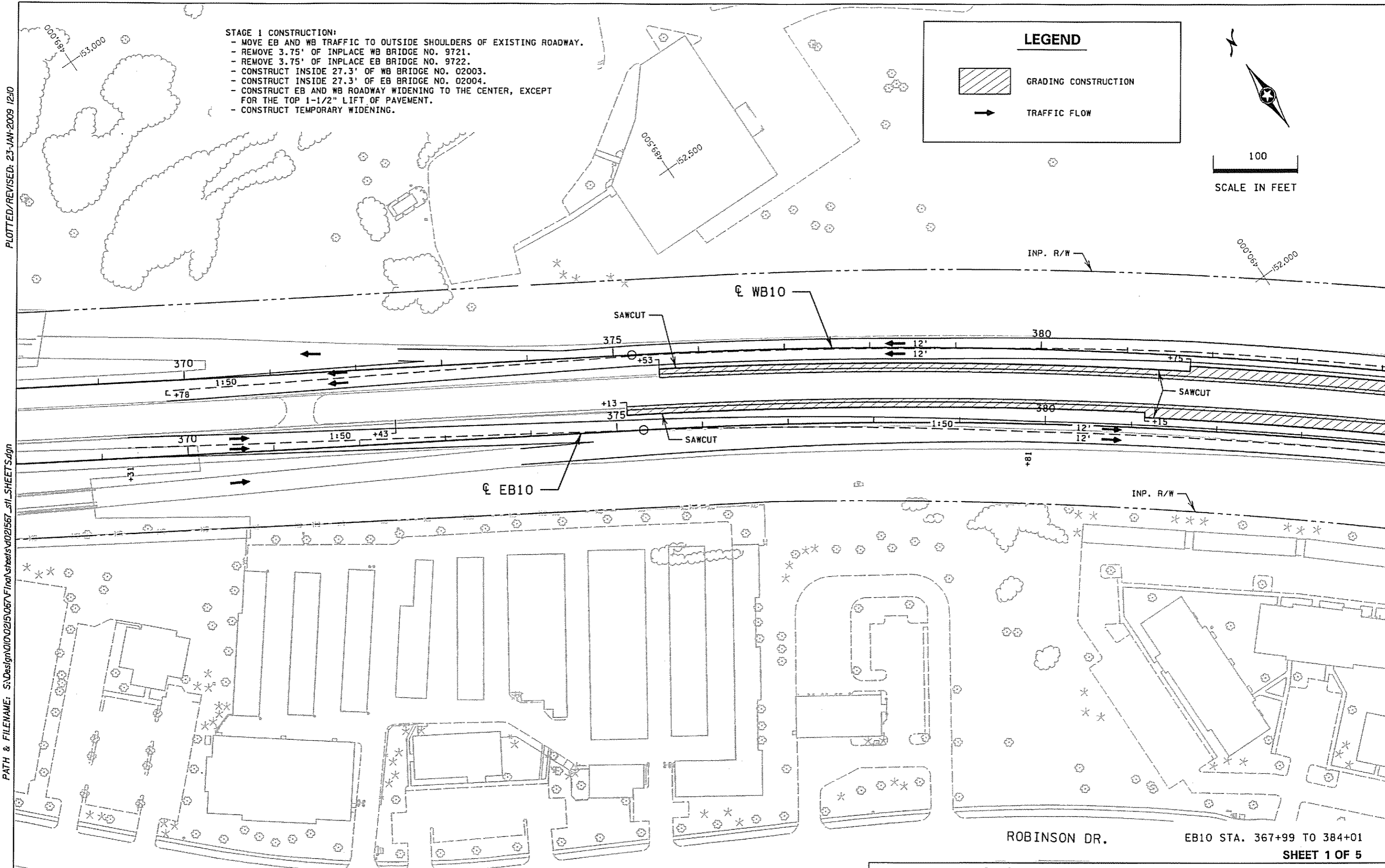
**LEGEND**

 GRADING CONSTRUCTION

 TRAFFIC FLOW



100  
SCALE IN FEET



DISTRICT #: METRO  
PLOT NAME: 021567\_stagel  
PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_s11\_SHEETS.dgn

ROBINSON DR.

EB10 STA. 367+99 TO 384+01

SHEET 1 OF 5

**SUGGESTED STAGING PLAN - STAGE 1**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER


LIC. NO. 45053 DATE 1/22/09


STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 55 OF 222 SHEETS

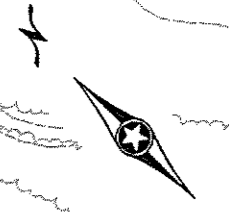
PLOTTED/REVISED: 23-JAN-2009 12:40

DISTRICT #: METRO  
PLOT NAME: 021567\_stagel\_2  
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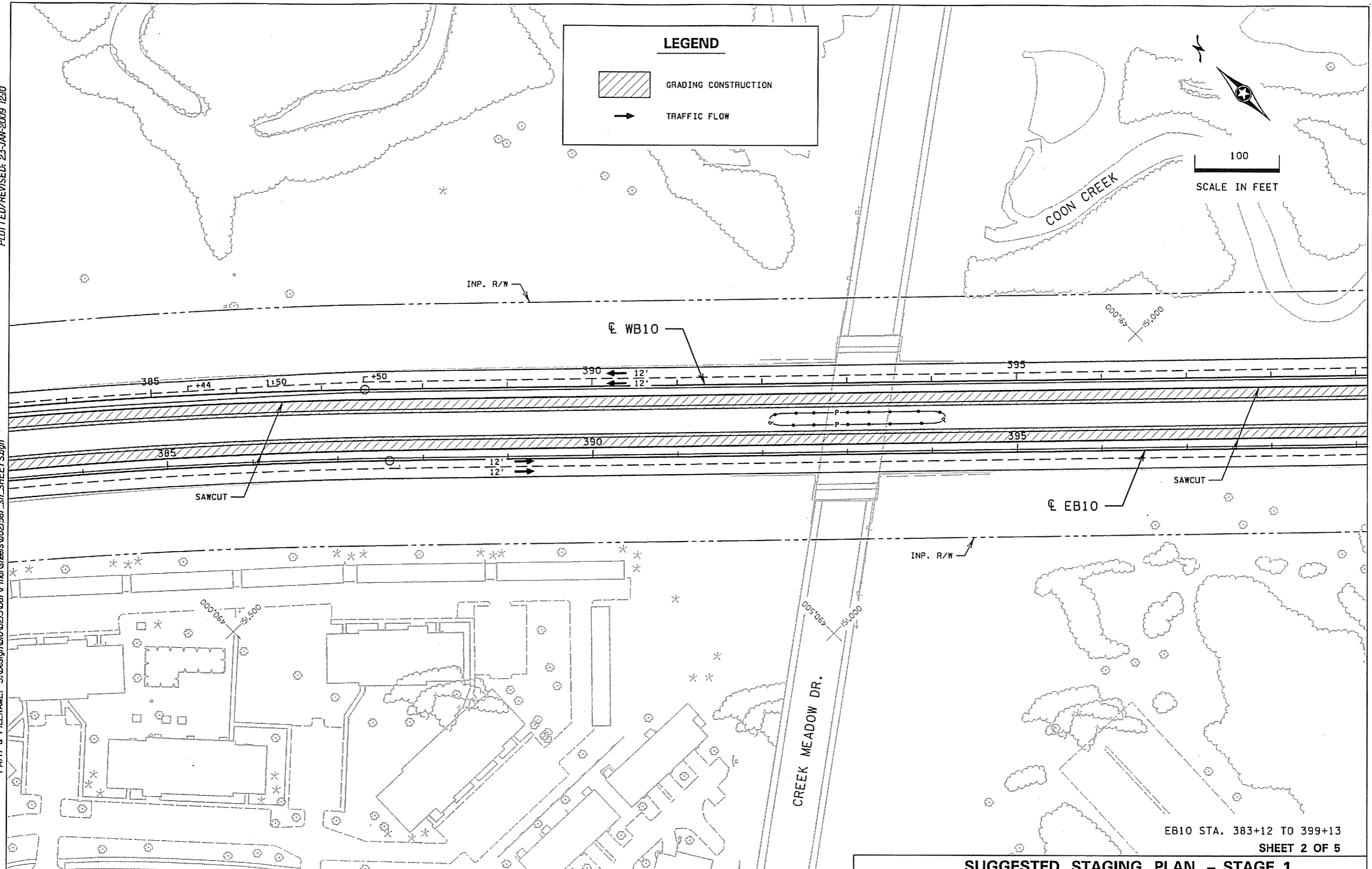
**LEGEND**

 GRADING CONSTRUCTION

 TRAFFIC FLOW



100  
SCALE IN FEET



EB10 STA. 383+12 TO 399+13

SHEET 2 OF 5

**SUGGESTED STAGING PLAN - STAGE 1**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

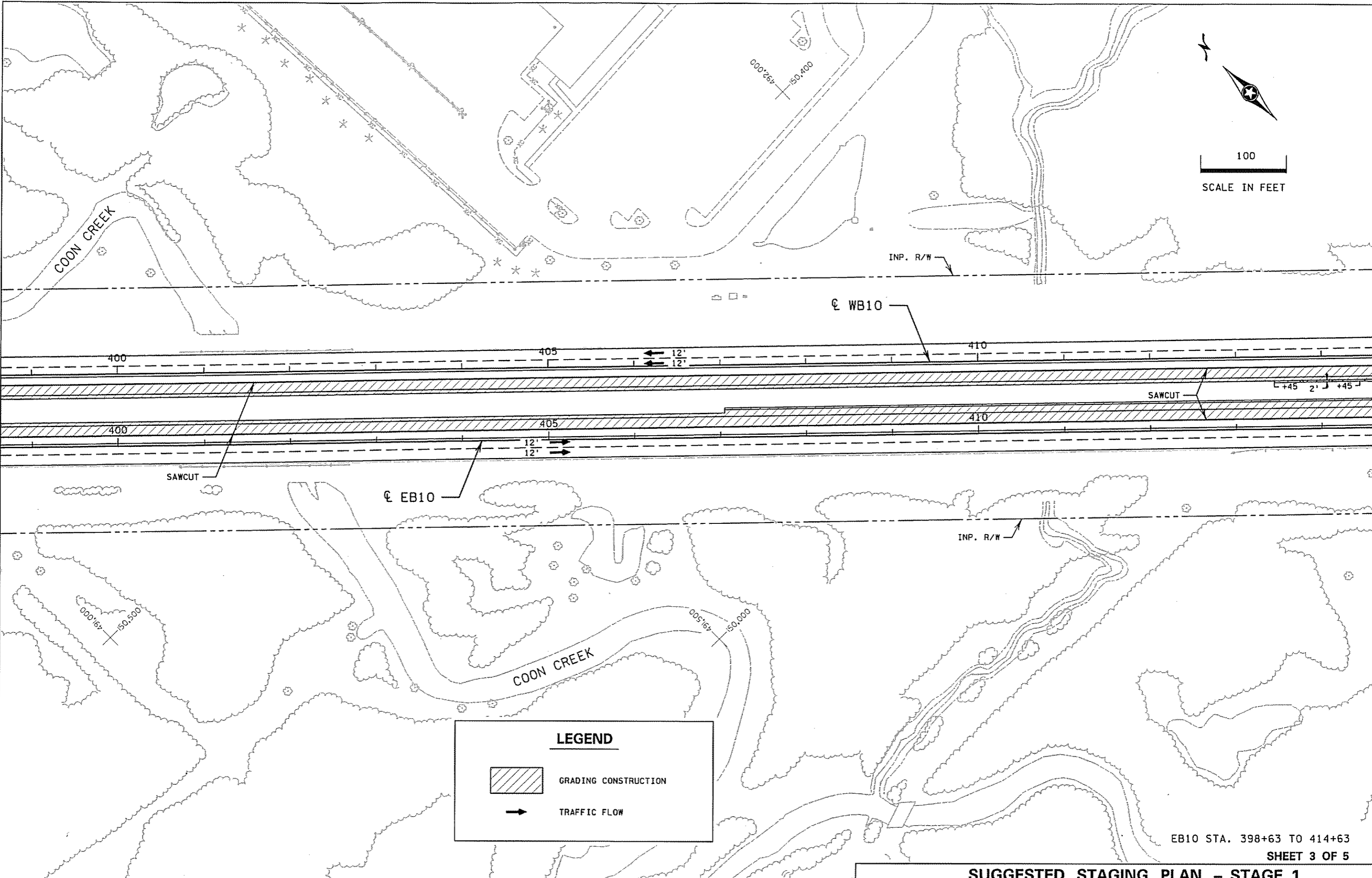
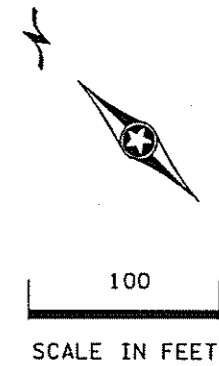
LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 56 OF 222 SHEETS



PLOTTED/REVISED: 23-JAN-2009 12:40

DISTRICT #: METRO  
PLOT NAME: 021567\_stage1\_3  
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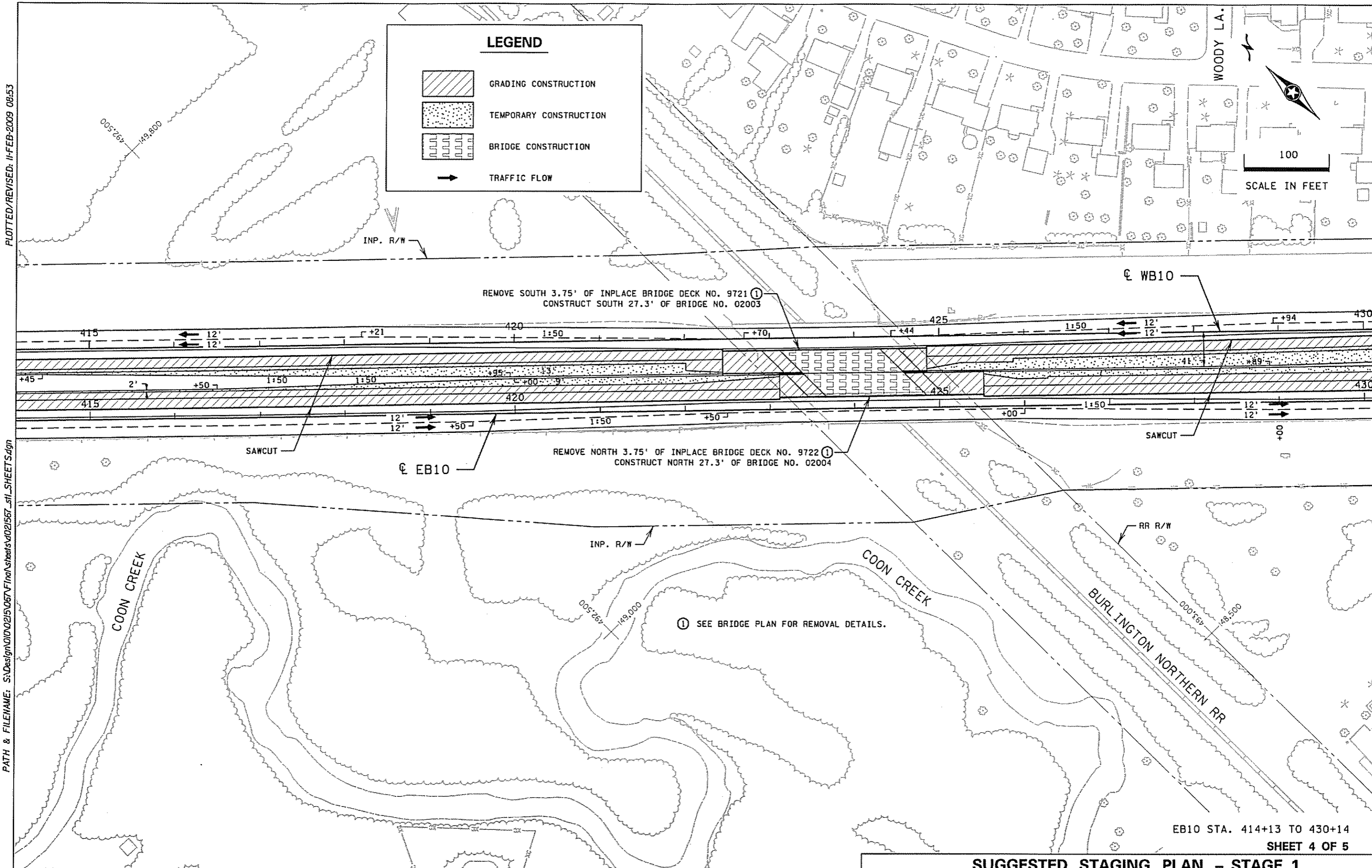


EB10 STA. 398+63 TO 414+63  
SHEET 3 OF 5


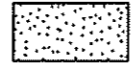
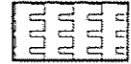

**SUGGESTED STAGING PLAN - STAGE 1**

PLOTTED/REVISED: 11-FEB-2009 08:53

DISTRICT #: METRO  
PLOT NAME: 021567\_stage1\_4  
PATH & FILENAME: S:\Design\021567\In\Sheets\021567\_sl1\_SHEETS.dgn



**LEGEND**

-  GRADING CONSTRUCTION
-  TEMPORARY CONSTRUCTION
-  BRIDGE CONSTRUCTION
-  TRAFFIC FLOW

100  
SCALE IN FEET

REMOVE SOUTH 3.75' OF INPLACE BRIDGE DECK NO. 9721  
CONSTRUCT SOUTH 27.3' OF BRIDGE NO. 02003

REMOVE NORTH 3.75' OF INPLACE BRIDGE DECK NO. 9722  
CONSTRUCT NORTH 27.3' OF BRIDGE NO. 02004

① SEE BRIDGE PLAN FOR REMOVAL DETAILS.

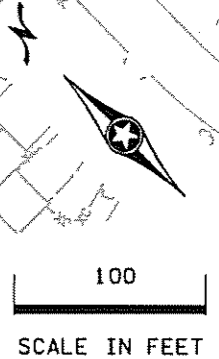
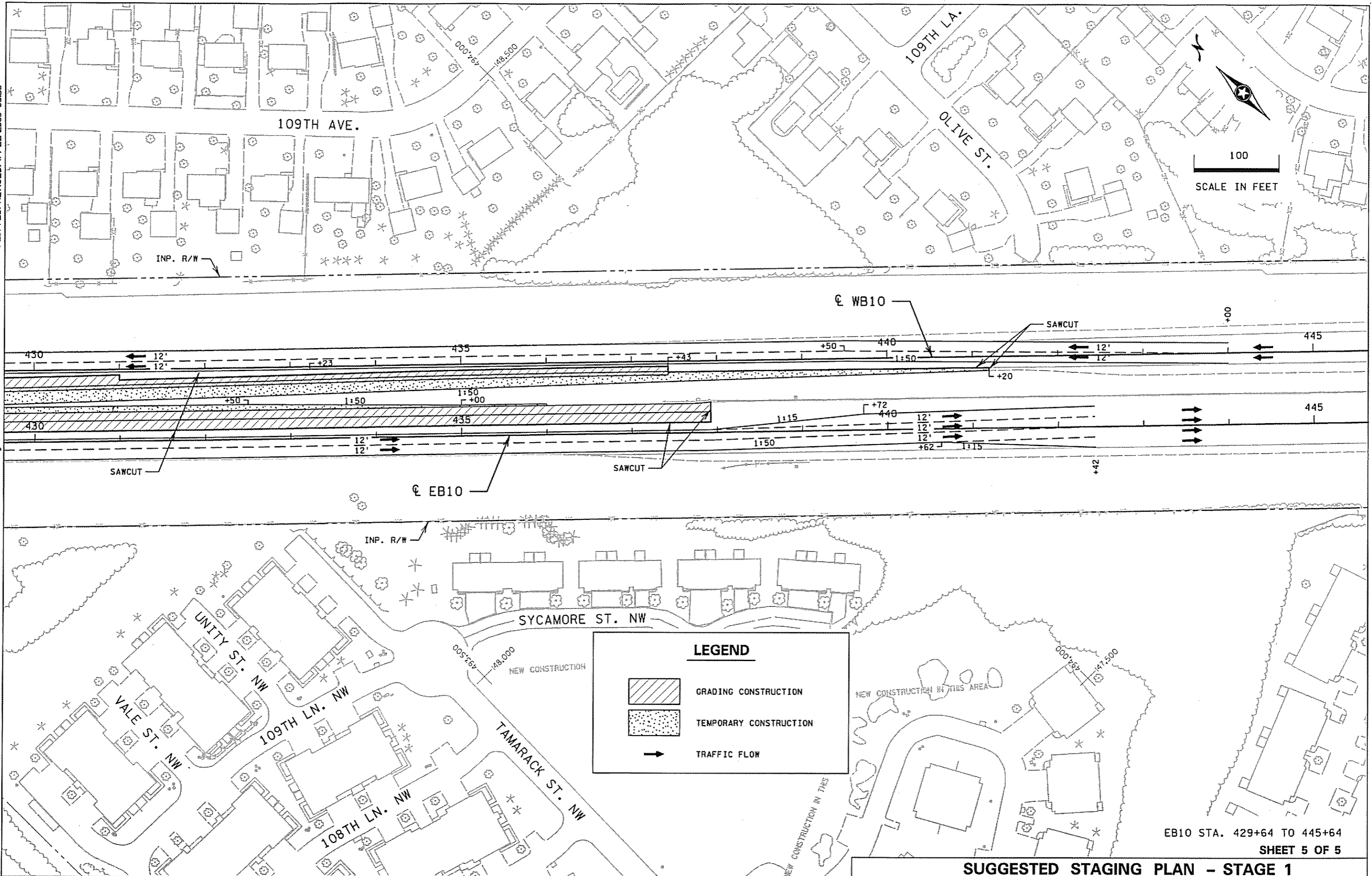
EB10 STA. 414+13 TO 430+14

SHEET 4 OF 5

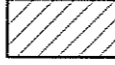


**SUGGESTED STAGING PLAN - STAGE 1**

PLOTTED/REVISED: 11-FEB-2009 08:53

DISTRICT #: METRO  
PLOT NAME: 021567\_stg01\_5  
PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_s11\_SHEETS.dgn



**LEGEND**

-  GRADING CONSTRUCTION
-  TEMPORARY CONSTRUCTION
-  TRAFFIC FLOW


EB10 STA. 429+64 TO 445+64  
SHEET 5 OF 5


**SUGGESTED STAGING PLAN - STAGE 1**


PLOTTED/REVISED: 23-JAN-2009 12:10

- STAGE 2 CONSTRUCTION:**
- MOVE EB AND WB TRAFFIC TO INSIDE NEW CONSTRUCTION.
  - REMOVE REMAINDER OF INPLACE WB BRIDGE NO. 9721.
  - REMOVE REMAINDER OF INPLACE EB BRIDGE NO. 9722.
  - CONSTRUCT REMAINDER OF WB BRIDGE NO. 02003.
  - CONSTRUCT REMAINDER OF EB BRIDGE NO. 02004.
  - CONSTRUCT EB AND WB ROADWAY WIDENING TO THE OUTSIDE, EXCEPT FOR THE TOP 1-1/2" LIFT OF PAVEMENT.
  - CONSTRUCT NOISEWALL.

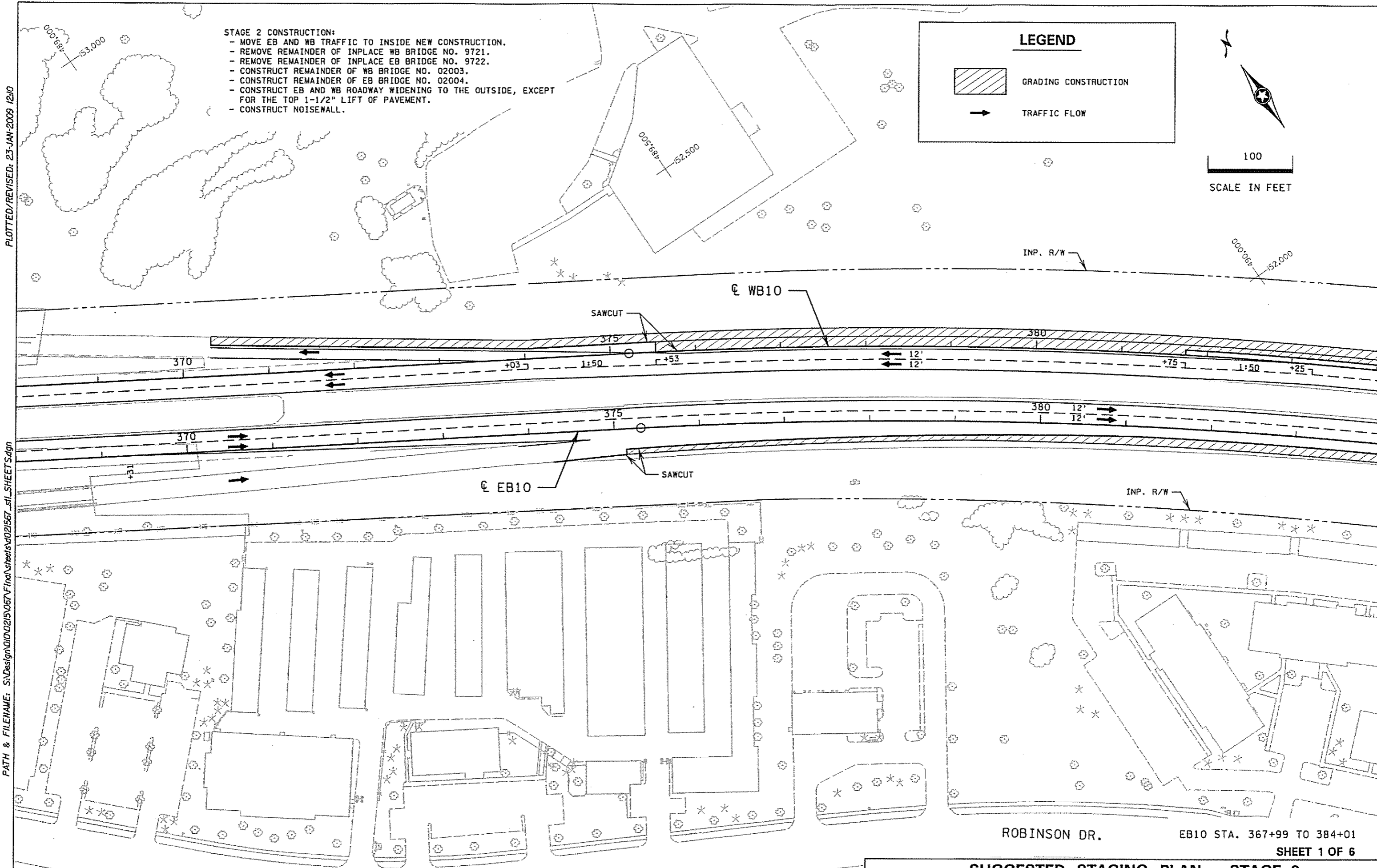
**LEGEND**

 GRADING CONSTRUCTION

 TRAFFIC FLOW



100  
SCALE IN FEET



DISTRICT #: METRO  
PLOT NAME: 021567\_stage2  
PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_sl\_SHEETS.dgn

ROBINSON DR. EB10 STA. 367+99 TO 384+01

SHEET 1 OF 6

**SUGGESTED STAGING PLAN - STAGE 2**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER


LIC. NO. 45053 DATE 1/22/09


STATE PROJ. NO. 0215-67 (T.H.10) SHEET NO. 60 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:10

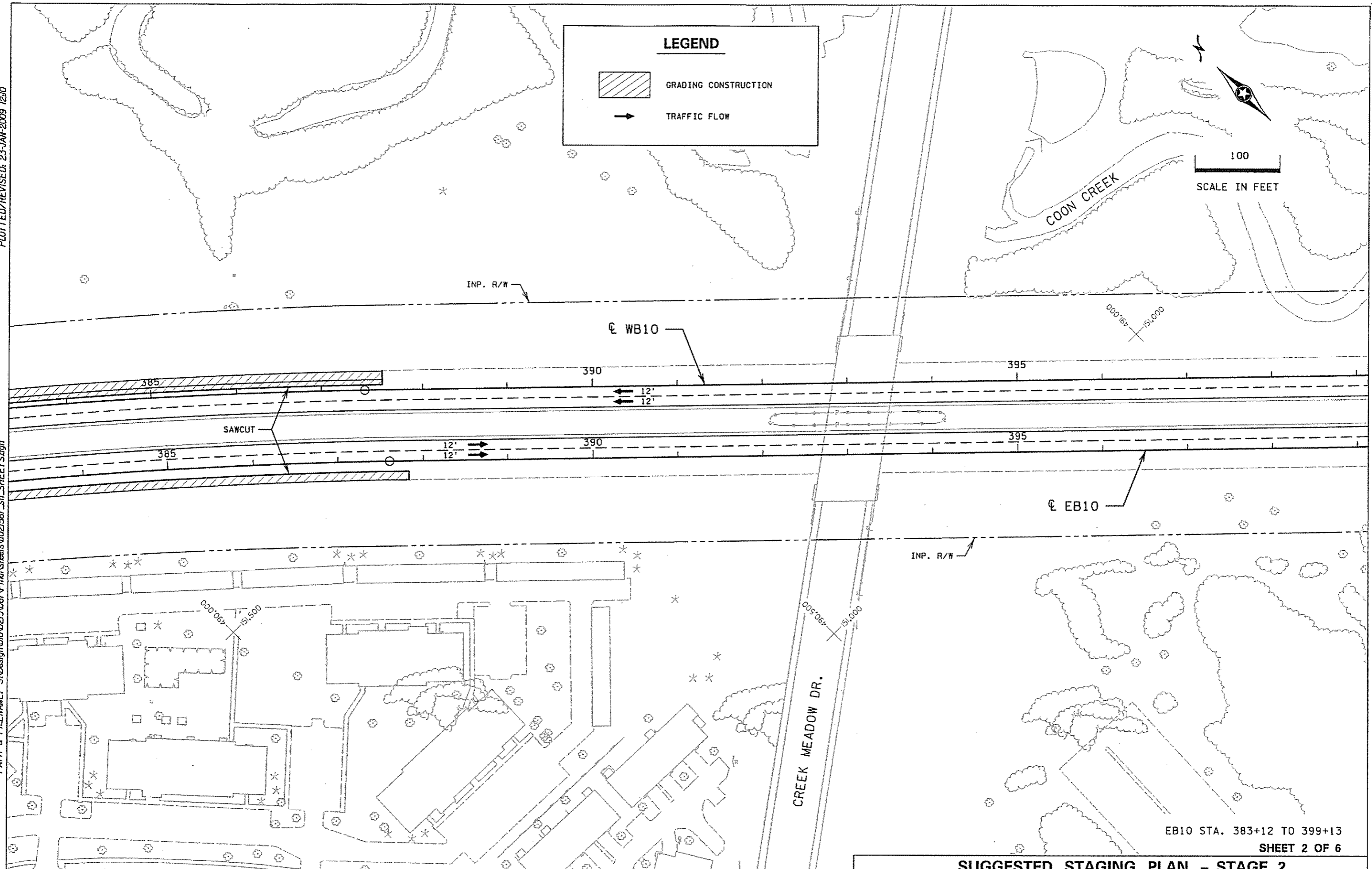
DISTRICT #: METRO  
PLOT NAME: 021567\_stage2\_2  
PATH & FILENAME: S:\Design\021506\Final\Sheet\021567\_s11\_SHEETS.dgn

**LEGEND**

 GRADING CONSTRUCTION

 TRAFFIC FLOW

100  
SCALE IN FEET



EB10 STA. 383+12 TO 399+13

SHEET 2 OF 6

**SUGGESTED STAGING PLAN - STAGE 2**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

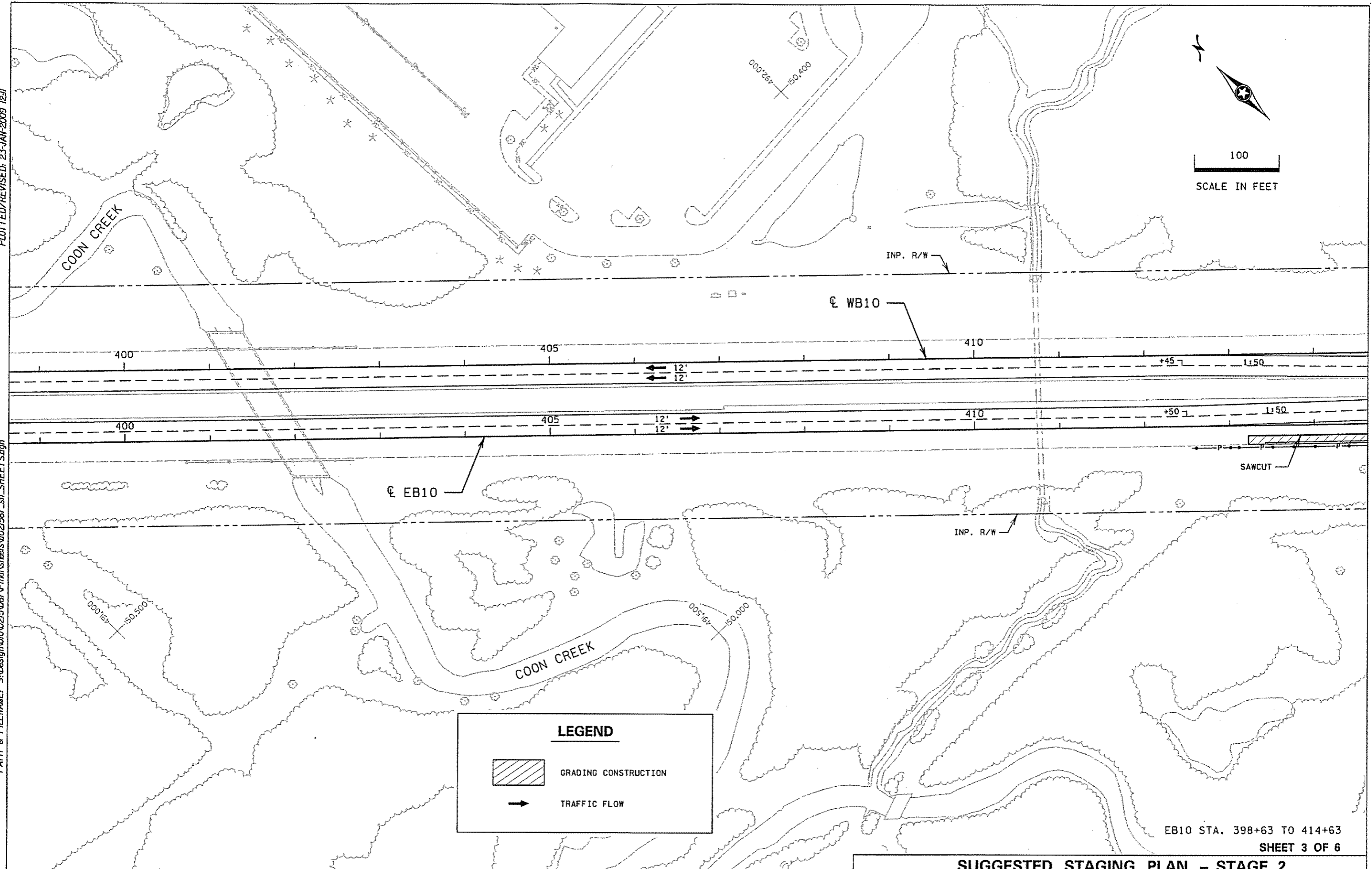
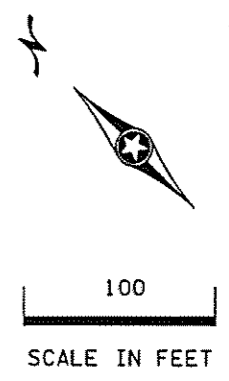
*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

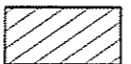
STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 61 OF 222 SHEETS


PLOTTED/REVISED: 23-JAN-2009 12:11

DISTRICT #: METRO  
PLOT NAME: 021567\_stage2\_3  
PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_sht\_3\_SHEETS.dgn



**LEGEND**

 GRADING CONSTRUCTION

 TRAFFIC FLOW

EB10 STA. 398+63 TO 414+63  
SHEET 3 OF 6

**SUGGESTED STAGING PLAN - STAGE 2**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY *Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 62 OF 222 SHEETS

PLOTTED/REVISED: 11-FEB-2009 08:53

DISTRICT #: METRO  
PLOT NAME: 021567\_stage2\_4  
PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_s11\_SHEETS.dgn

DRAWN BY: HG

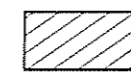
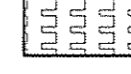

CHECKED BY: PAD

CERTIFIED BY *Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

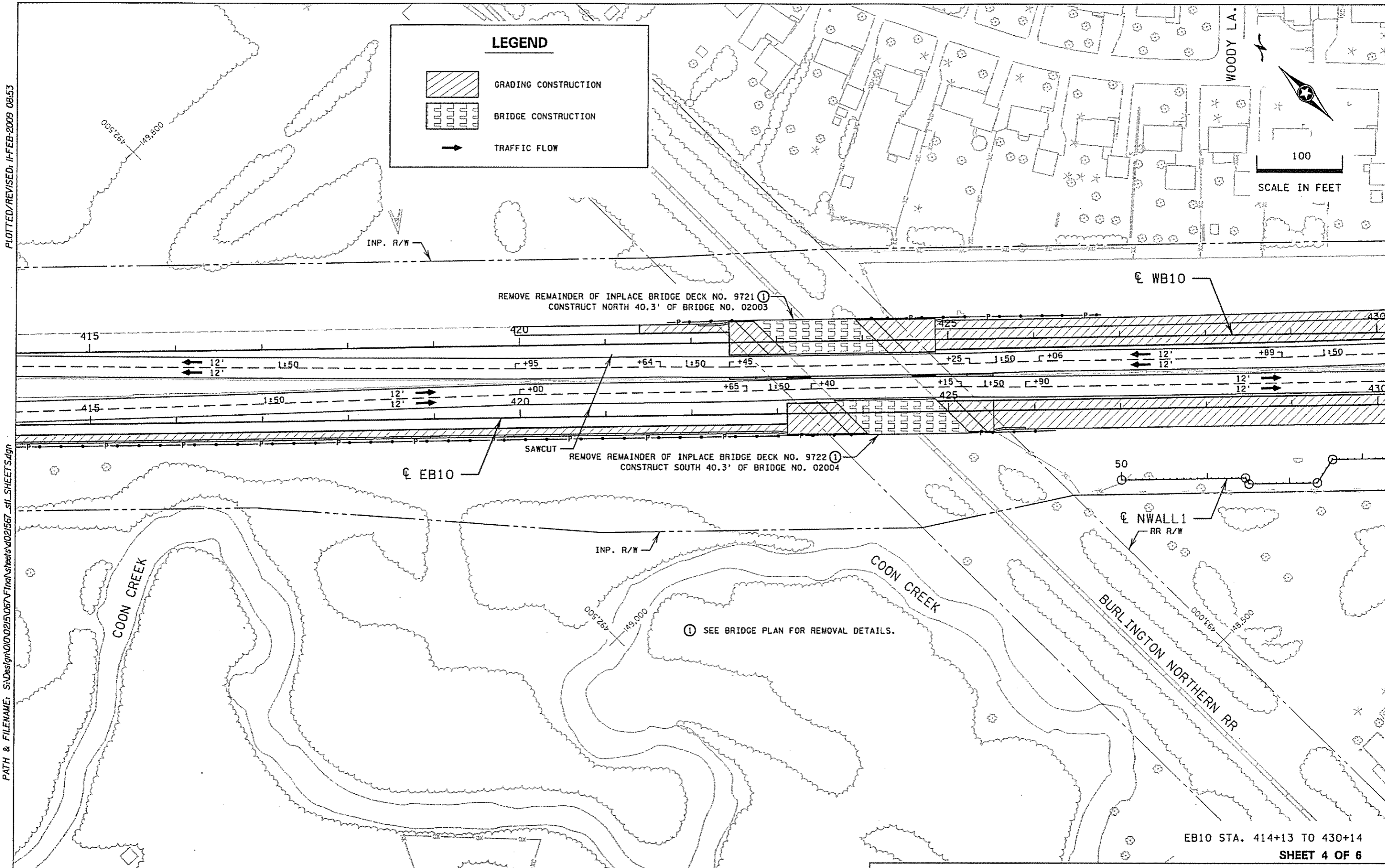
LIC. NO. 45053 DATE 2/11/09

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 63 OF 222 SHEETS

### LEGEND

-  GRADING CONSTRUCTION
-  BRIDGE CONSTRUCTION
-  TRAFFIC FLOW

100  
SCALE IN FEET



REMOVE REMAINDER OF INPLACE BRIDGE DECK NO. 9721  
CONSTRUCT NORTH 40.3' OF BRIDGE NO. 02003

EB10

REMOVE REMAINDER OF INPLACE BRIDGE DECK NO. 9722  
CONSTRUCT SOUTH 40.3' OF BRIDGE NO. 02004

① SEE BRIDGE PLAN FOR REMOVAL DETAILS.

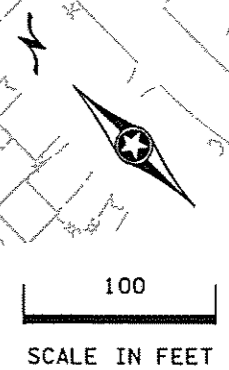
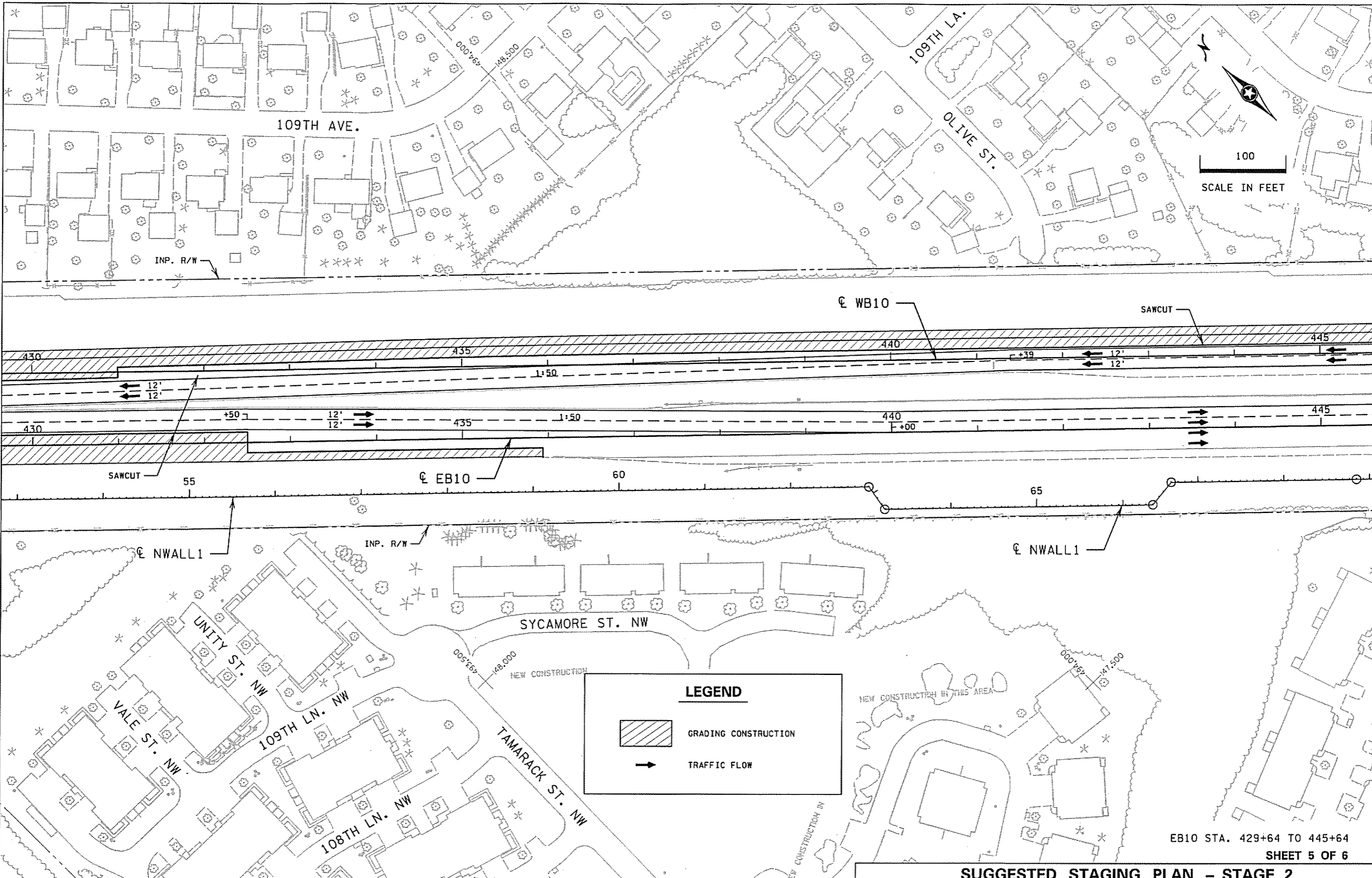
EB10 STA. 414+13 TO 430+14

SHEET 4 OF 6

### SUGGESTED STAGING PLAN - STAGE 2

PLOTTED/REVISED: 23-JAN-2009 12:11

DISTRICT #: METRO  
PLOT NAME: 021567\_stage2\_5  
PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_sht\_5\_SHEETS.dgn



**LEGEND**

- GRADING CONSTRUCTION
- TRAFFIC FLOW

EB10 STA. 429+64 TO 445+64  
SHEET 5 OF 6

**SUGGESTED STAGING PLAN - STAGE 2**  
STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 64 OF 222 SHEETS

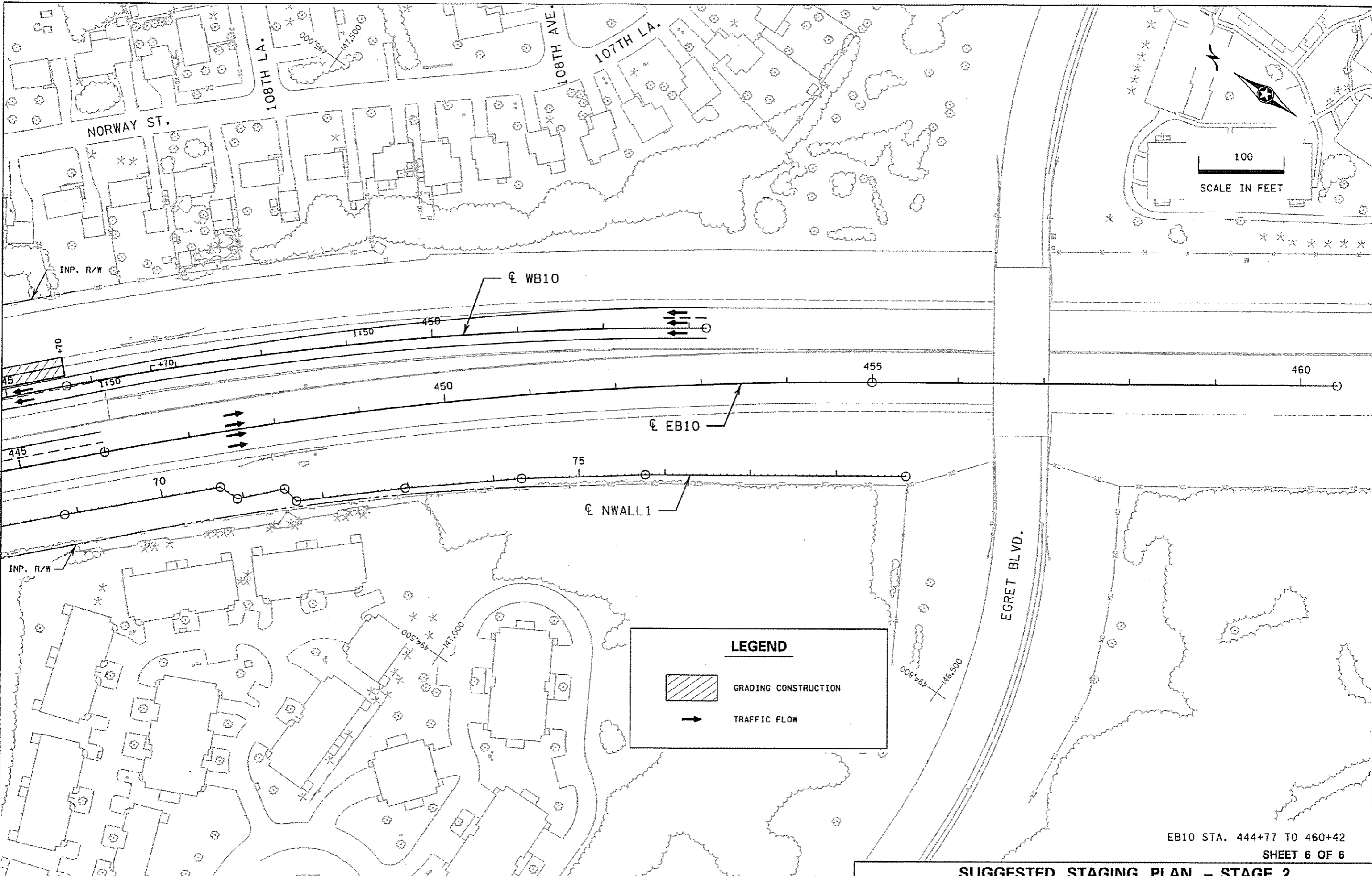
DRAWN BY: HG    CHECKED BY: PAD    CERTIFIED BY: *Peter Danich* LIC. NO. 45053    DATE 1/22/09



PLOTTED/REVISED: 23-JAN-2009 12:11

PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_sht\_sheets.dgn

DISTRICT #: METRO  
IFLOT NAME: 021567\_stage2\_6





EB10 STA. 444+77 TO 460+42  
SHEET 6 OF 6


**SUGGESTED STAGING PLAN - STAGE 2**

PLOTTED/REVISED: 23-JAN-2009 12:41

- STAGE 3 CONSTRUCTION:**
- ALL PERMANENT ROADWAYS ARE FULLY OPEN TO TRAFFIC.
  - REMOVE TEMPORARY WIDENING AND CONSTRUCT CURB & GUTTER, AGGREGATE SHOULDERS AND DITCHES IN THOSE AREAS.
  - PERFORM MAINLINE MILL & OVERLAY AND SHOULDER OVERLAY UNDER THE DIRECTION OF THE ENGINEER.
  - LAY FINAL LIFT OF ASPHALT FOR NEW CONSTRUCTION.
  - CONSTRUCT PERMANENT TURF ESTABLISHMENT.

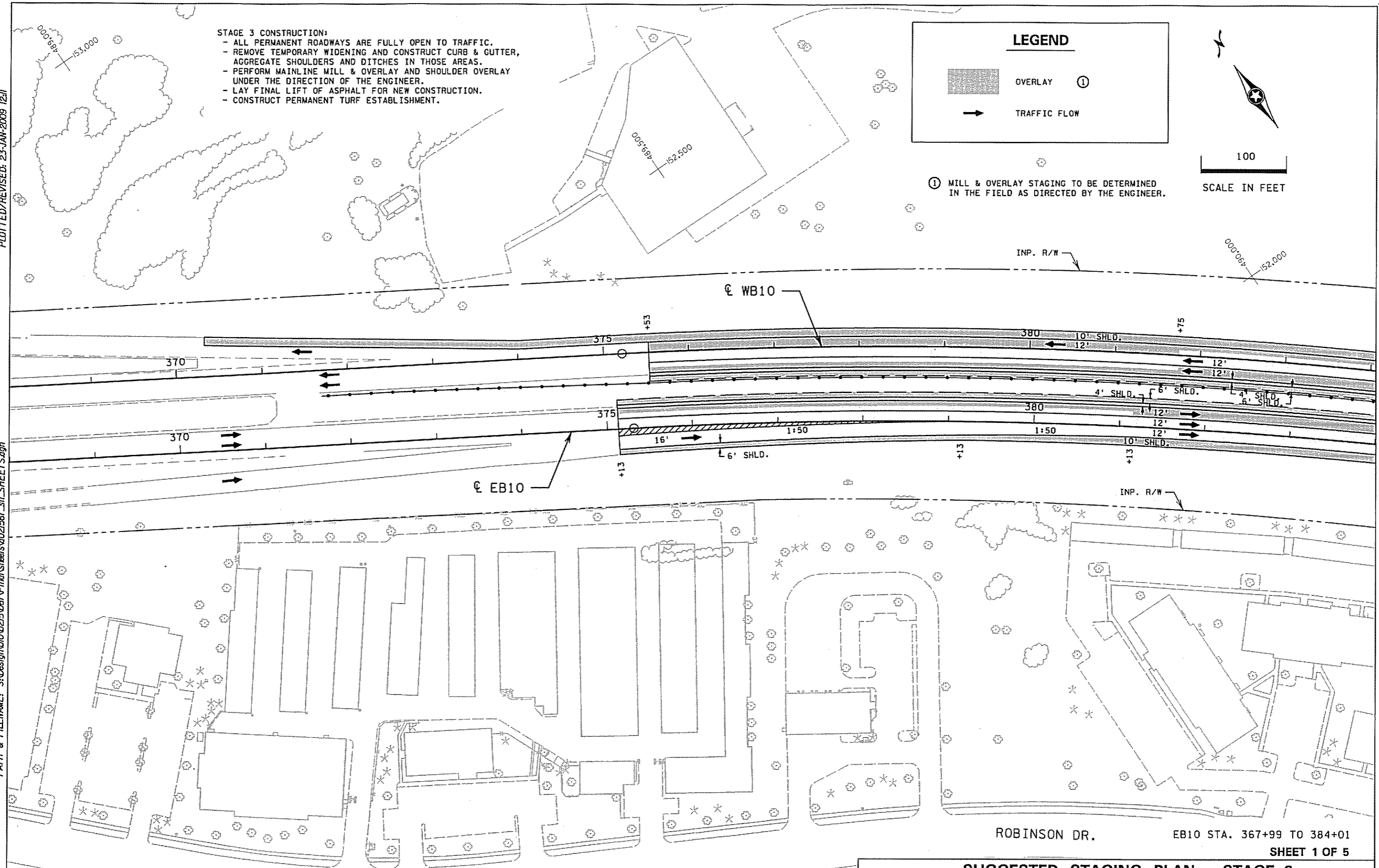
**LEGEND**

 OVERLAY ①  
 TRAFFIC FLOW



100  
SCALE IN FEET

① MILL & OVERLAY STAGING TO BE DETERMINED IN THE FIELD AS DIRECTED BY THE ENGINEER.



DISTRICT #: METRO  
 PLOT NAME: 021567\_stage3.J  
 PATH & FILENAME: S:\Design\021567\Final\Sheet\021567\_s1\_sheets.dgn

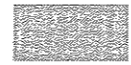
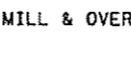

ROBINSON DR. EB10 STA. 367+99 TO 384+01  
SHEET 1 OF 5

**SUGGESTED STAGING PLAN - STAGE 3**

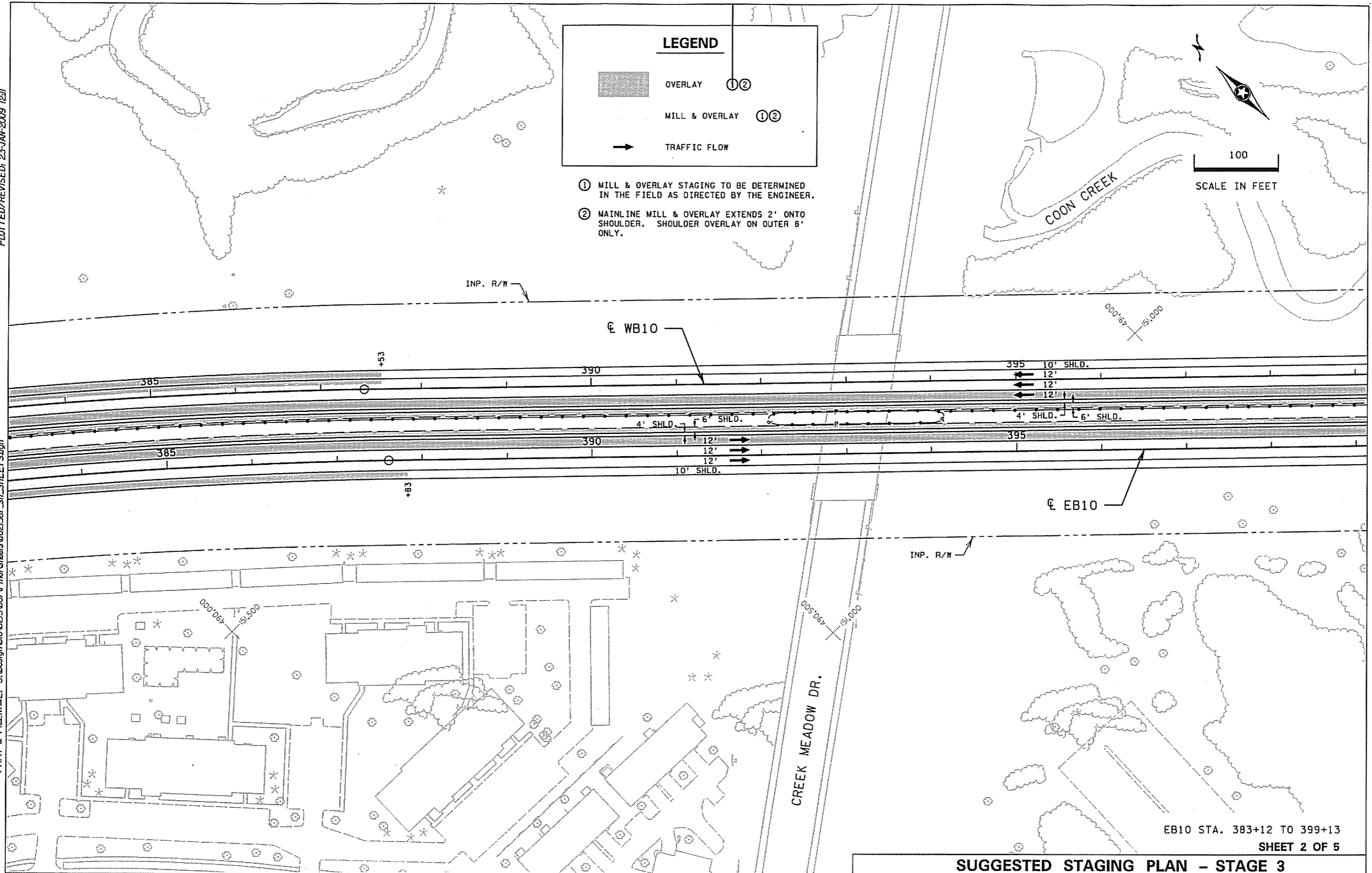
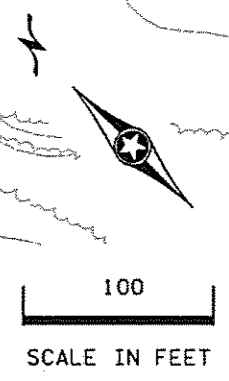
PLOTTED/REVISED: 23-JAN-2009 12:11

DISTRICT #: METRO  
PLOT NAME: 021567\_stage3\_2  
PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_sl\_SHEETS.dgn

**LEGEND**

-  OVERLAY ①②
-  MILL & OVERLAY ①②
-  TRAFFIC FLOW

- ① MILL & OVERLAY STAGING TO BE DETERMINED IN THE FIELD AS DIRECTED BY THE ENGINEER.
- ② MAINLINE MILL & OVERLAY EXTENDS 2' ONTO SHOULDER. SHOULDER OVERLAY ON OUTER 8' ONLY.



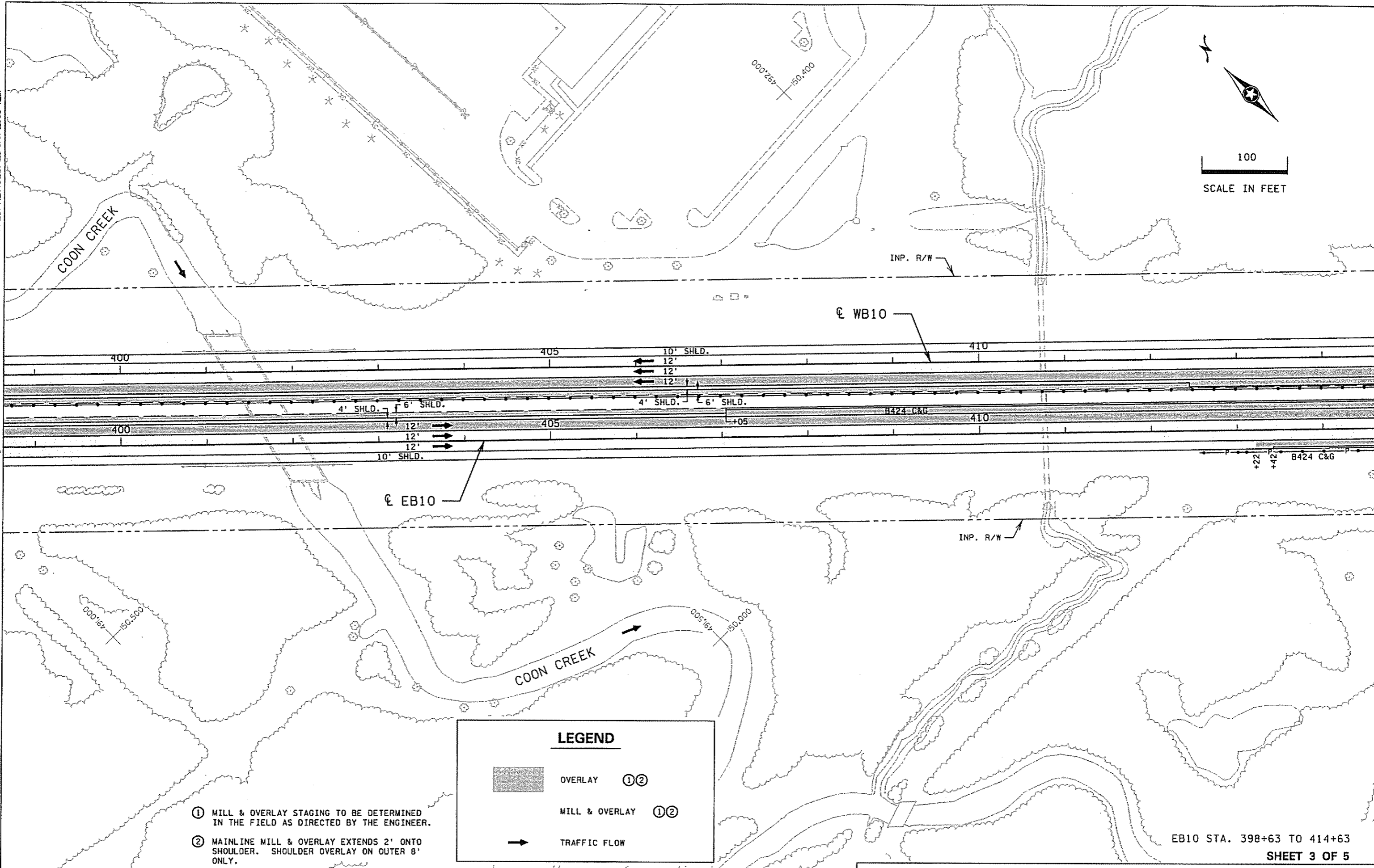
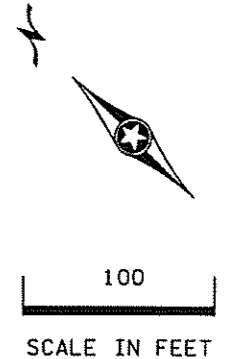
EB10 STA. 383+12 TO 399+13  
SHEET 2 OF 5

**SUGGESTED STAGING PLAN - STAGE 3**  
STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 67 OF 222 SHEETS

DRAWN BY: HG      CHECKED BY: PAD      CERTIFIED BY: *Peter Daniel* LIC. NO. 45053 DATE 1/22/09




PLOTTED/REVISED: 23-JAN-2009 12:11

DISTRICT #: METRO  
PLOT NAME: 021567\_stage3\_3  
PATH & FILENAME: S:\Design\021567\Final\sheet\021567\_sht\_sheets.dgn



- ① MILL & OVERLAY STAGING TO BE DETERMINED IN THE FIELD AS DIRECTED BY THE ENGINEER.
- ② MAINLINE MILL & OVERLAY EXTENDS 2' ONTO SHOULDER. SHOULDER OVERLAY ON OUTER 8' ONLY.

**LEGEND**

	OVERLAY	①②
	MILL & OVERLAY	①②
	TRAFFIC FLOW	

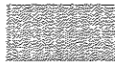

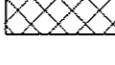

EB10 STA. 398+63 TO 414+63  
SHEET 3 OF 5


**SUGGESTED STAGING PLAN - STAGE 3**

PLOTTED/REVISED: 23-JAN-2009 12:11

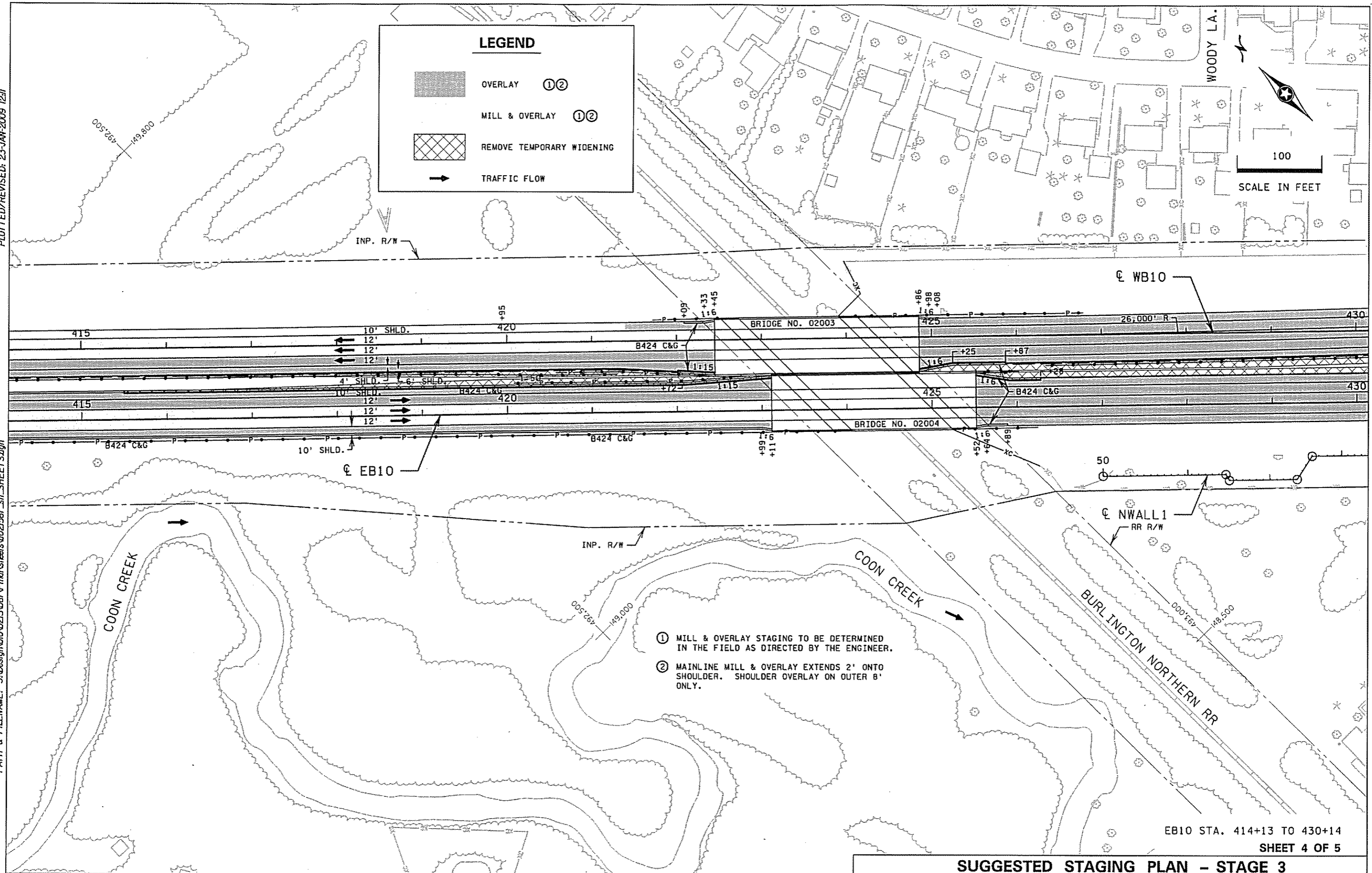
DISTRICT: METRO  
PLOT NAME: 021567\_stage3\_4  
PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_s11\_SHEETS.dgn

**LEGEND**

-  OVERLAY ①②
-  MILL & OVERLAY ①②
-  REMOVE TEMPORARY WIDENING
-  TRAFFIC FLOW



100  
SCALE IN FEET



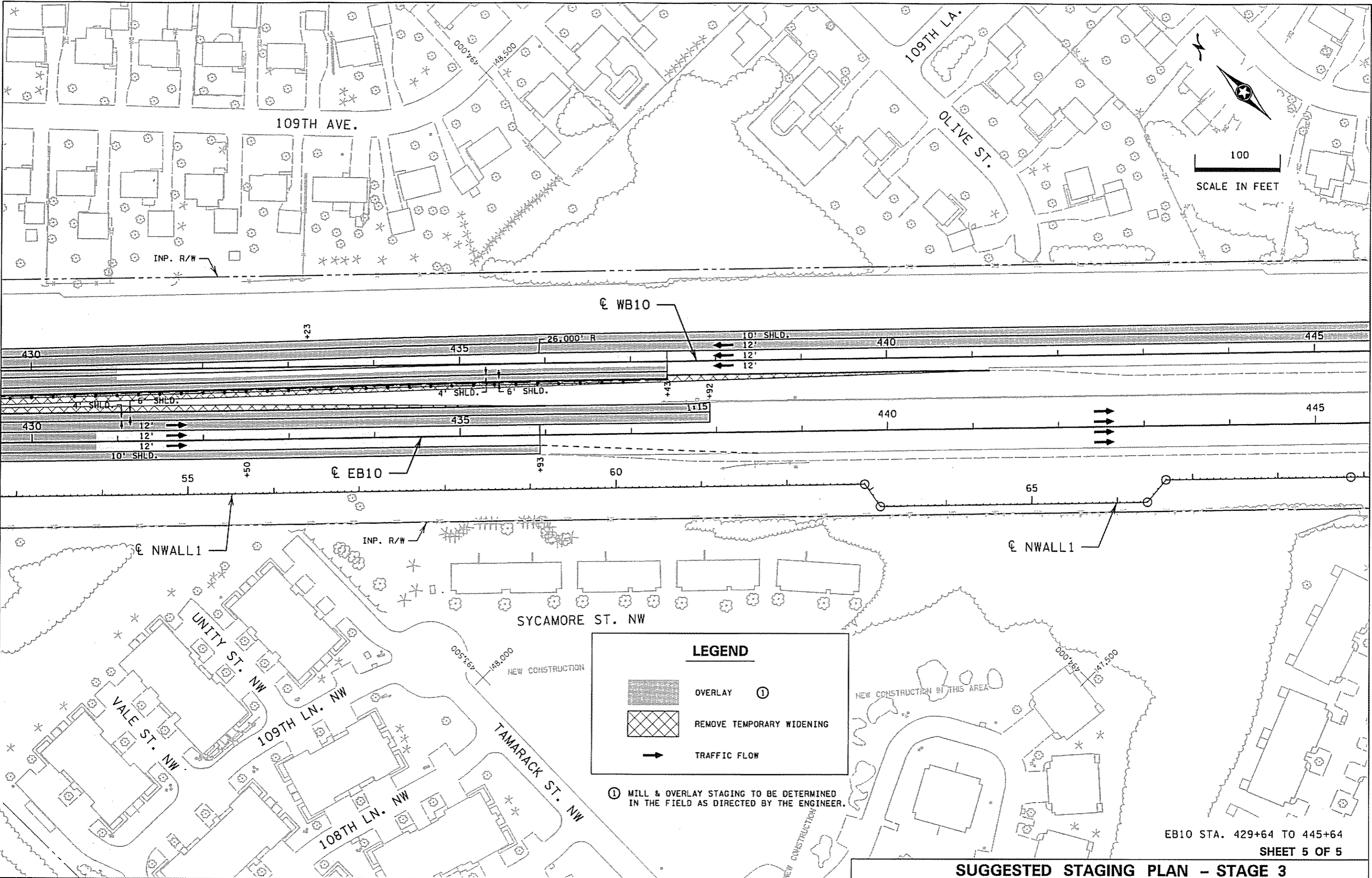
- ① MILL & OVERLAY STAGING TO BE DETERMINED IN THE FIELD AS DIRECTED BY THE ENGINEER.
- ② MAINLINE MILL & OVERLAY EXTENDS 2' ONTO SHOULDER. SHOULDER OVERLAY ON OUTER 8' ONLY.

EB10 STA. 414+13 TO 430+14  
SHEET 4 OF 5

**SUGGESTED STAGING PLAN - STAGE 3**

PLOTTED/REVISED: 23-JAN-2009 12:11

DISTRICT #: METRO  
PLOT NAME: 021567\_stage3\_5  
PATH & FILENAME: S:\Design\021567\Final\Sheets\021567\_sht\_5\_SHEETS.dgn

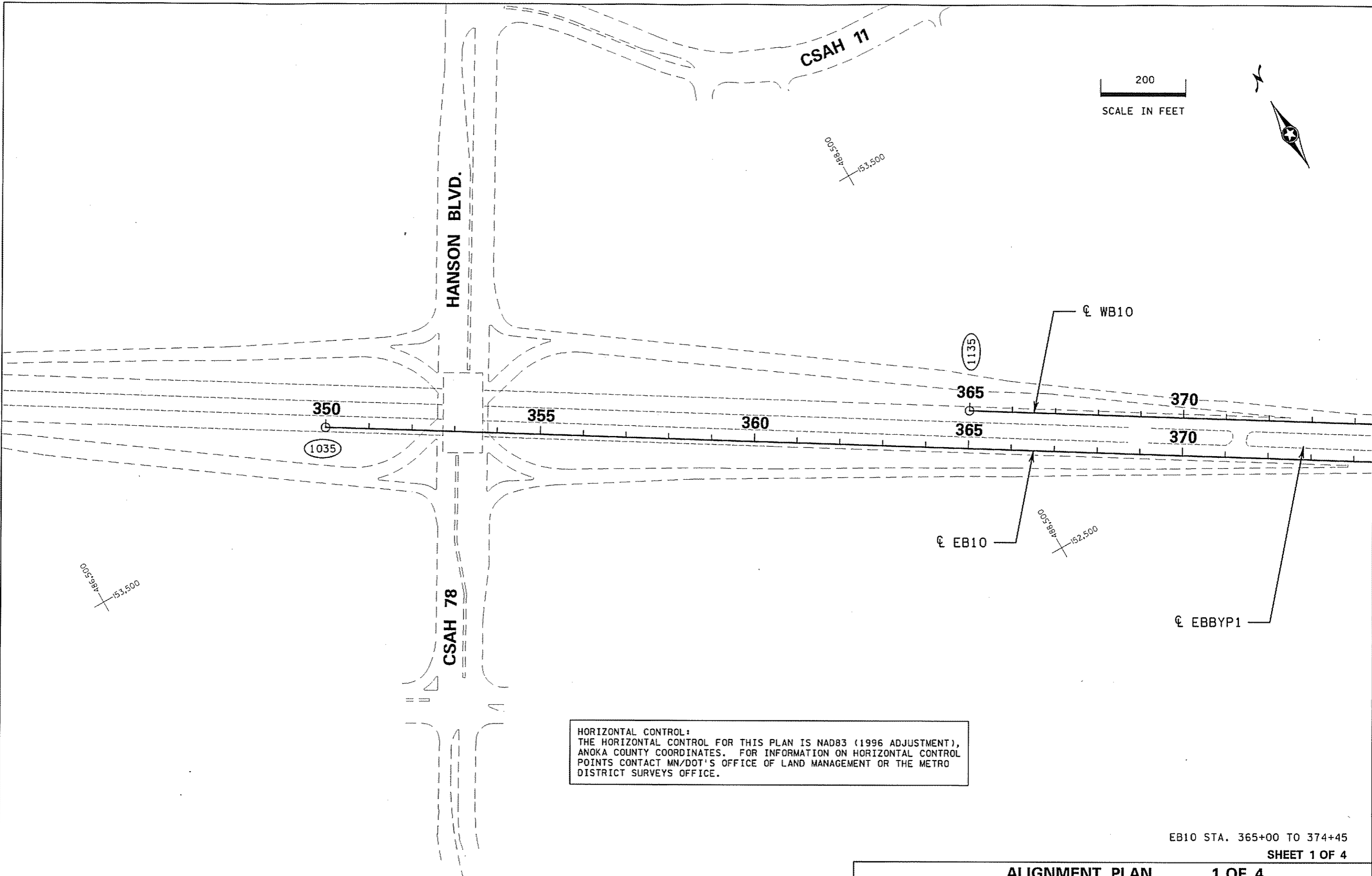


EB10 STA. 429+64 TO 445+64  
SHEET 5 OF 5

**SUGGESTED STAGING PLAN - STAGE 3**

PLOTTED/REVISED: 23-JAN-2009 12:13

DISTRICT #: METRO  
PLOT NAME: 67.dwg  
PATH & FILENAME: S:\Design\0215\067\In\021567.dwg



HORIZONTAL CONTROL:  
 THE HORIZONTAL CONTROL FOR THIS PLAN IS NAD83 (1996 ADJUSTMENT),  
 ANOKA COUNTY COORDINATES. FOR INFORMATION ON HORIZONTAL CONTROL  
 POINTS CONTACT MN/DOT'S OFFICE OF LAND MANAGEMENT OR THE METRO  
 DISTRICT SURVEYS OFFICE.

EB10 STA. 365+00 TO 374+45

SHEET 1 OF 4

**ALIGNMENT PLAN 1 OF 4**

PLOTTED/REVISED: 23-JAN-2009 12:13

DISTRICT #: METRO  
PLOT NAME: 67\_a12  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_al1.dgn

200  
SCALE IN FEET

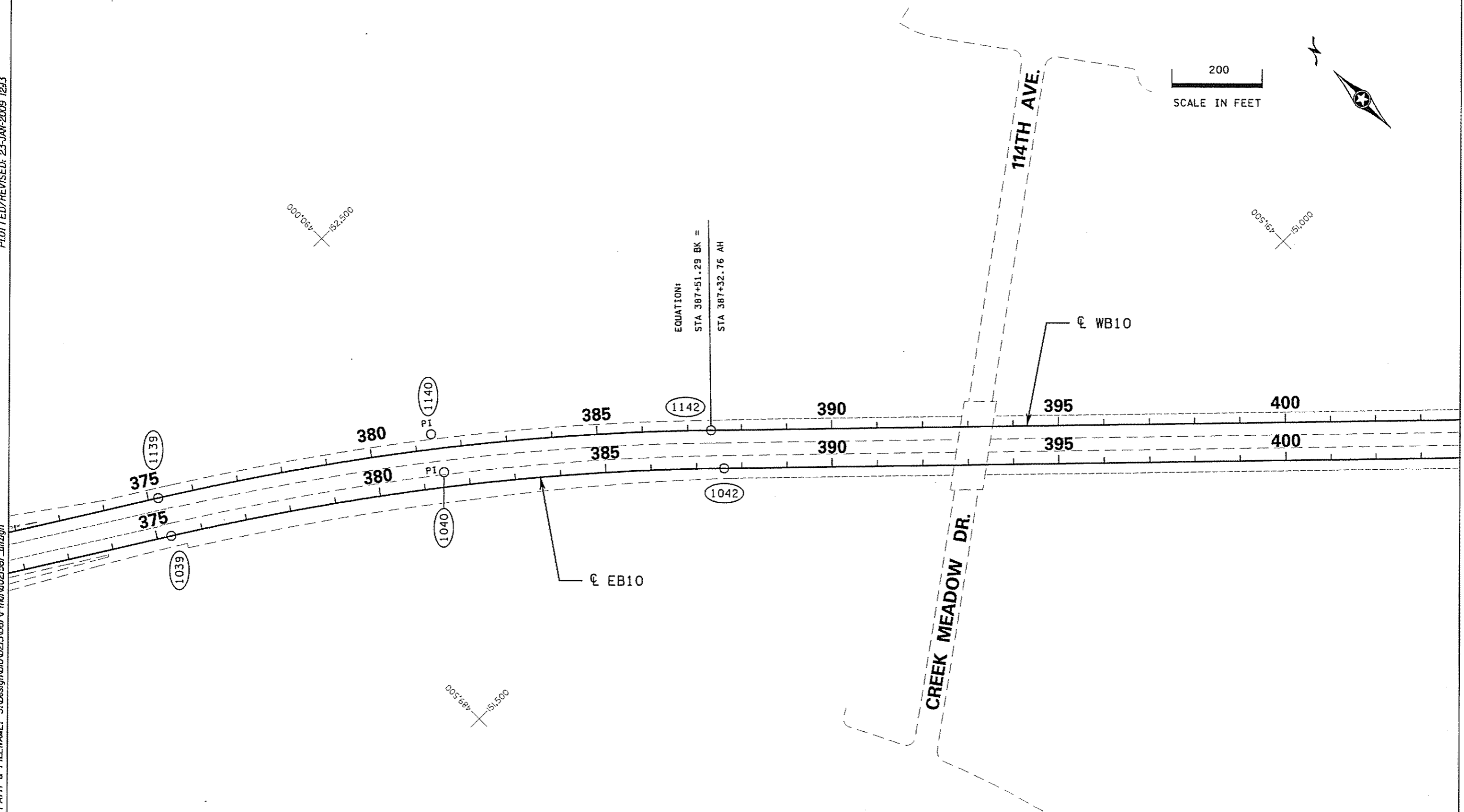


000°06' 152.500

00°51' 151.000

005°58' 151.500

EQUATION:  
STA 387+51.29 BK =  
STA 387+32.76 AH



EB10 STA. 371+63 TO 403+85

SHEET 2 OF 4

**ALIGNMENT PLAN 2 OF 4**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 72 OF 222 SHEETS



PLOTTED/REVISED: 23-JAN-2009 12:13

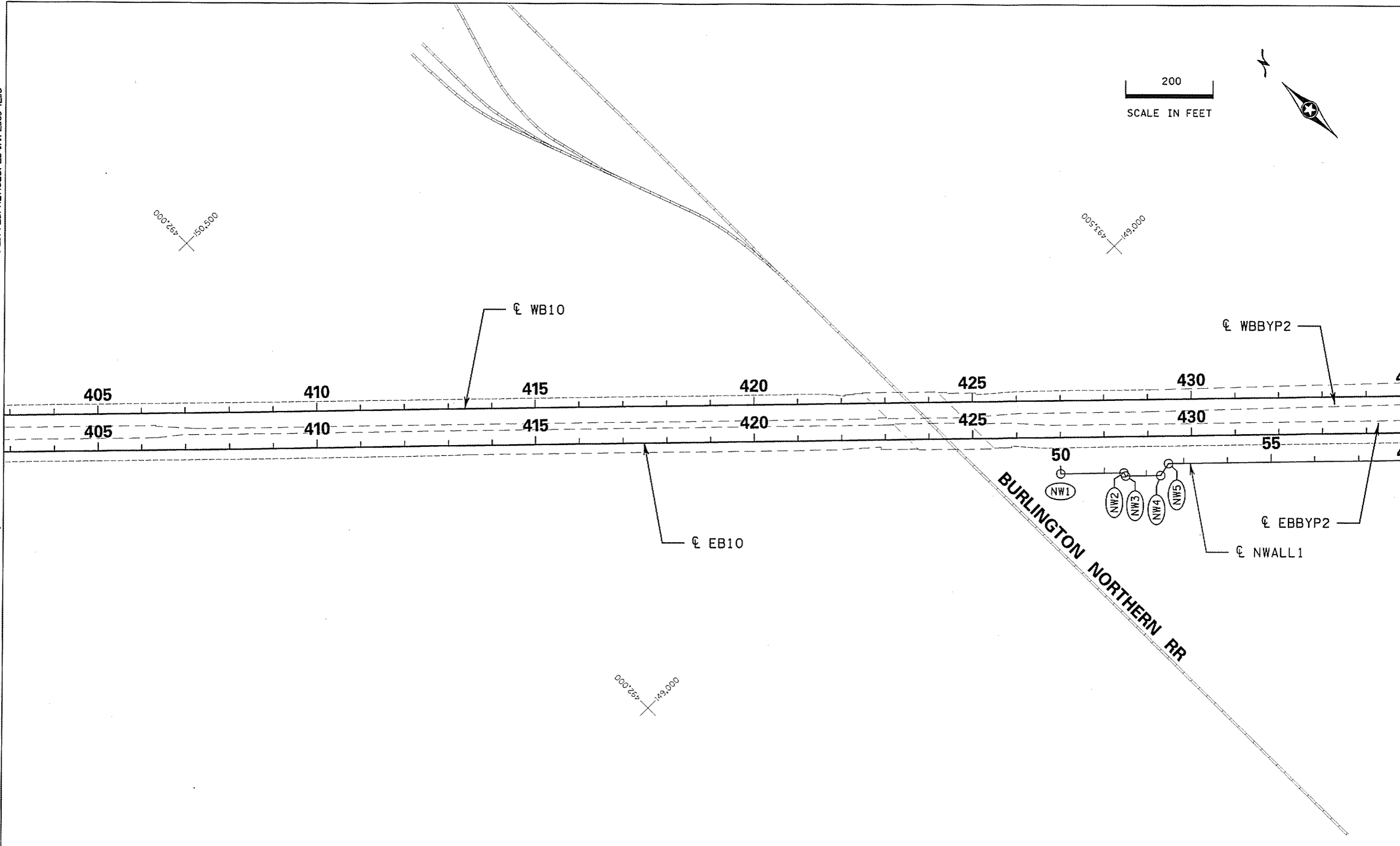
DISTRICT #: METRO  
PLOT NAME: 67\_d13  
PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_all.dgn

200  
SCALE IN FEET



492,000  
150,500

493,500  
149,000



492,000  
149,000

EB10 STA. 402+85 TO 434+85

SHEET 3 OF 4

**ALIGNMENT PLAN 3 OF 4**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Danisch*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 73 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:13

005'50" / 148.500

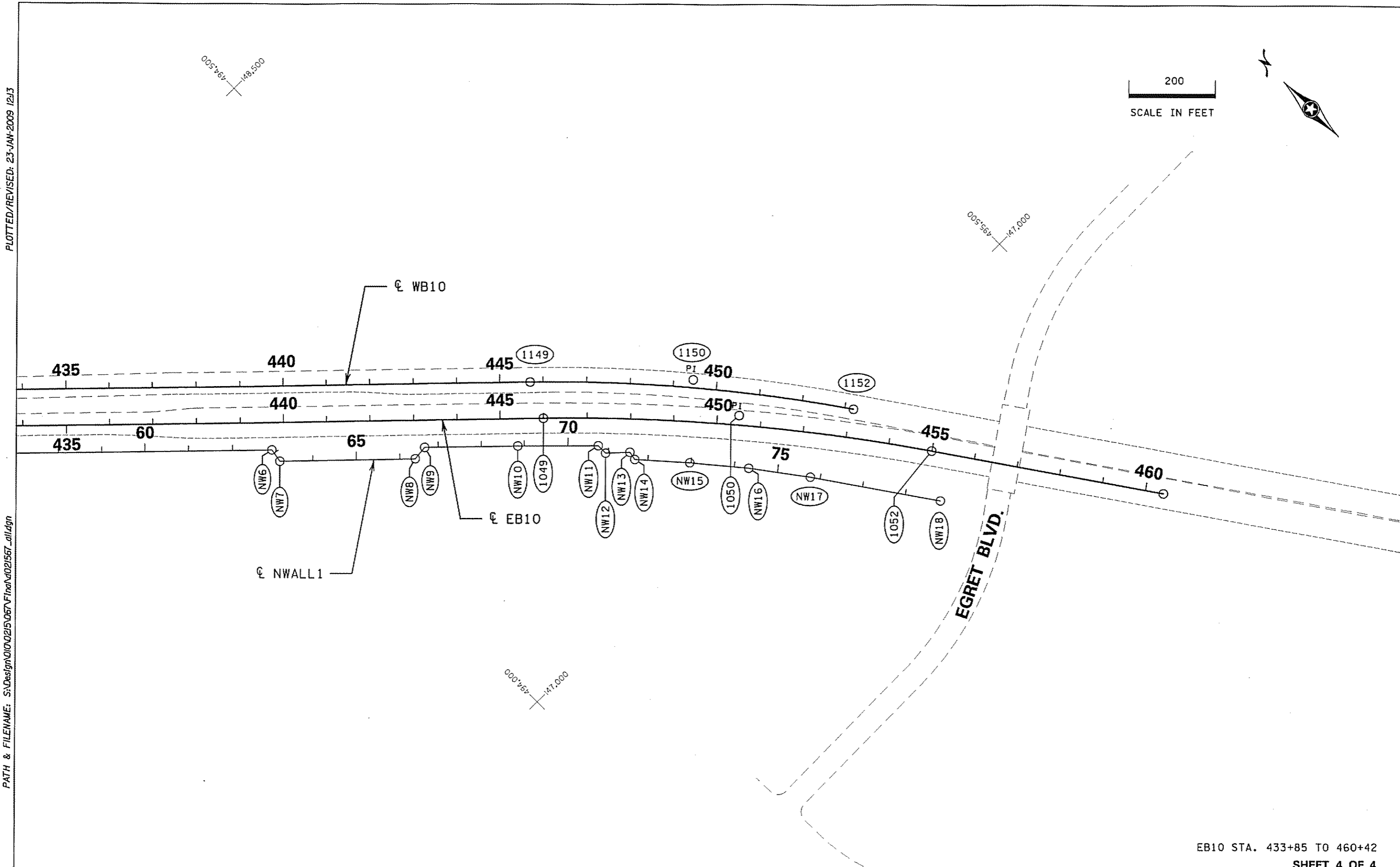
200  
SCALE IN FEET



005'50" / 147.000

000'15" / 47.000

DISTRICT #: METRO  
PLOT NAME: 67\_d14  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_d14.dgn



EB10 STA. 433+85 TO 460+42

SHEET 4 OF 4

**ALIGNMENT PLAN 4 OF 4**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 74 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:13

DISTRICT #: METRO  
 PLOT NAME: 67.dwg  
 PATH & FILENAME: S:\Design\0215\06\Final\021567.dwg

ALIGNMENT TABULATION										
POINT NUMBER	POINT	STATION	CIRCULAR CURVE DATA					COORDINATES		AZIMUTH
			DELTA	DEGREE	RADIUS	TANGENT	LENGTH	X	Y	
			SPIRAL CURVE DATA							
ANGLE (θs)	DEGREE	ST	LT	LS						
EB10										
1035	POT	350+00.000						487,150.7504	153,598.0343	
1039	PC	375+31.267						489,303.7029	152,266.8281	S 58° 16' 14.92" E
1040	PI	381+48.301	12° 17' 35.86" RT	1° 00' 00.00"	5,729.578'	617.034'	1,229.330'	489,828.5168	151,942.3270	PI
	CC							486,290.4892	147,393.5739	
1042	PT	387+60.597						490,272.2055	151,513.5252	S 45° 58' 39.06" E
1049	PC	445+99.754						494,470.9513	147,455.6581	S 45° 58' 39.06" E
1050	PI	450+51.023	11° 15' 00.82" RT	1° 15' 01.91"	4,581.717'	451.269'	899.636'	494,795.4440	147,142.0530	PI
	CC							491,286.9300	144,161.0958	
1052	PT	454+99.390						495,052.5189	146,771.1673	S 34° 43' 38.24" E
		EQU. ↓								
1055	POT	458+00.000						495,361.6964	146,325.1123	
WB10										
1135	POT	365+00.000						488,472.8450	152,884.0246	
1139	PC	375+21.958						489,342.0642	152,346.5720	S 58° 16' 14.92" E
1140	PI	381+38.991	12° 17' 35.86" RT	1° 00' 00.00"	5,729.578'	617.034'	1,229.330'	489,866.8781	152,022.0709	PI
	CC							486,328.8504	147,473.3178	
	PT	387+51.287 =								
1142	POT	387+32.764						490,310.5667	151,593.2691	S 45° 58' 39.06" E
	PC	445+70.470						494,508.2694	147,536.4101	S 45° 58' 39.06" E
1150	PI	449+46.530	11° 15' 00.82" RT	1° 30' 02.26"	3,818.123'	376.060'	749.702'	494,778.6818	147,275.0708	PI
	CC							491,854.9007	144,790.9232	
	PT	453+20.172 =								
1152	POT	450+63.190						494,992.9123	146,965.9973	S 34° 43' 38.24" E
NWALL1										
NW1	POT	50+00.000						493,047.2208	148,716.1915	
NW2	POT	51+44.500						493,151.1260	148,615.7726	
NW3	POT	51+52.500						493,149.0459	148,608.0477	
NW4	POT	52+32.500						493,206.5713	148,552.4525	
NW5	POT	52+65.021						493,238.3696	148,559.2700	
NW6	POT	62+91.021						493,976.1325	147,846.2609	
NW7	POT	63+23.021						493,970.8697	147,814.6967	
NW8	POT	66+35.021						494,195.5331	147,598.2010	
NW9	POT	66+68.863						494,229.2037	147,601.6000	
NW10	POT	68+84.863						494,384.5627	147,451.5347	
NW11	POT	70+68.857						494,515.3463	147,322.1145	
NW12	POT	70+92.857						494,515.5159	147,298.1151	
NW13	POT	71+48.857						494,556.5835	147,260.0436	
NW14	POT	71+68.857						494,552.9608	147,240.3744	
NW15	POT	72+96.857						494,638.2910	147,144.9660	
NW16	POT	74+32.857						494,725.4361	147,040.5547	
NW17	POT	75+76.857						494,812.0041	146,925.4809	
NW18	POT	78+81.357						494,985.8650	146,675.4956	

EB10, WB10, NWALL1

**ALIGNMENT TABULATION**

PLOTTED/REVISED: 23-JAN-2009 12:14

DISTRICT #: METRO  
PLOT NAME: 67.jp  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_1p.dgn

**NOTE:**

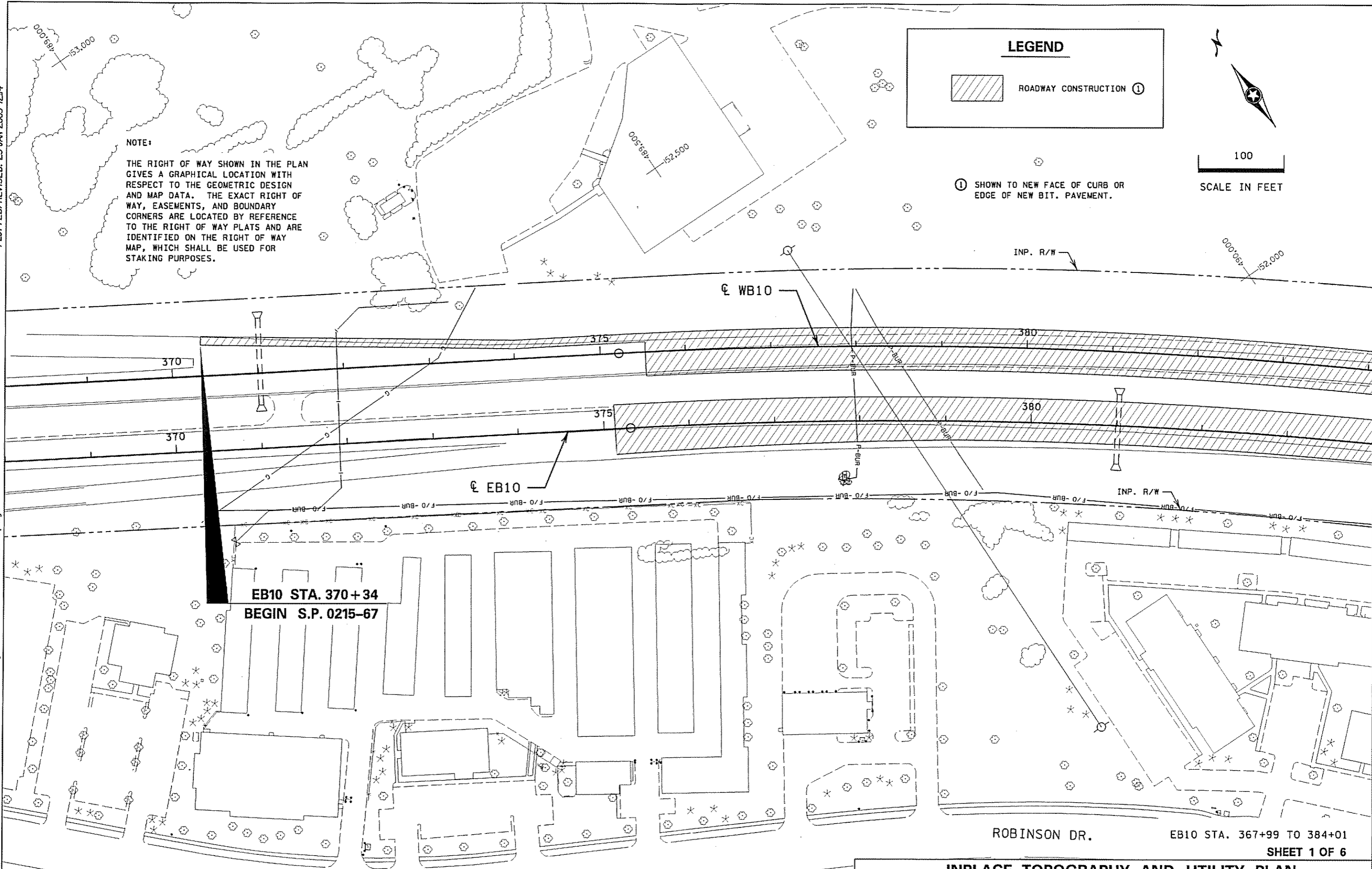
THE RIGHT OF WAY SHOWN IN THE PLAN GIVES A GRAPHICAL LOCATION WITH RESPECT TO THE GEOMETRIC DESIGN AND MAP DATA. THE EXACT RIGHT OF WAY, EASEMENTS, AND BOUNDARY CORNERS ARE LOCATED BY REFERENCE TO THE RIGHT OF WAY PLATS AND ARE IDENTIFIED ON THE RIGHT OF WAY MAP, WHICH SHALL BE USED FOR STAKING PURPOSES.

**LEGEND**

ROADWAY CONSTRUCTION ①

SCALE IN FEET

① SHOWN TO NEW FACE OF CURB OR EDGE OF NEW BIT. PAVEMENT.

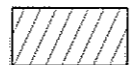


**INPLACE TOPOGRAPHY AND UTILITY PLAN**


PLOTTED/REVISED: 23-JAN-2009 12:14

DISTRICT #: METRO  
IPLOT NAME: 67.Jp2  
PATH & FILENAME: S:\Design\0215\067\Final\021567.Jpl.dgn

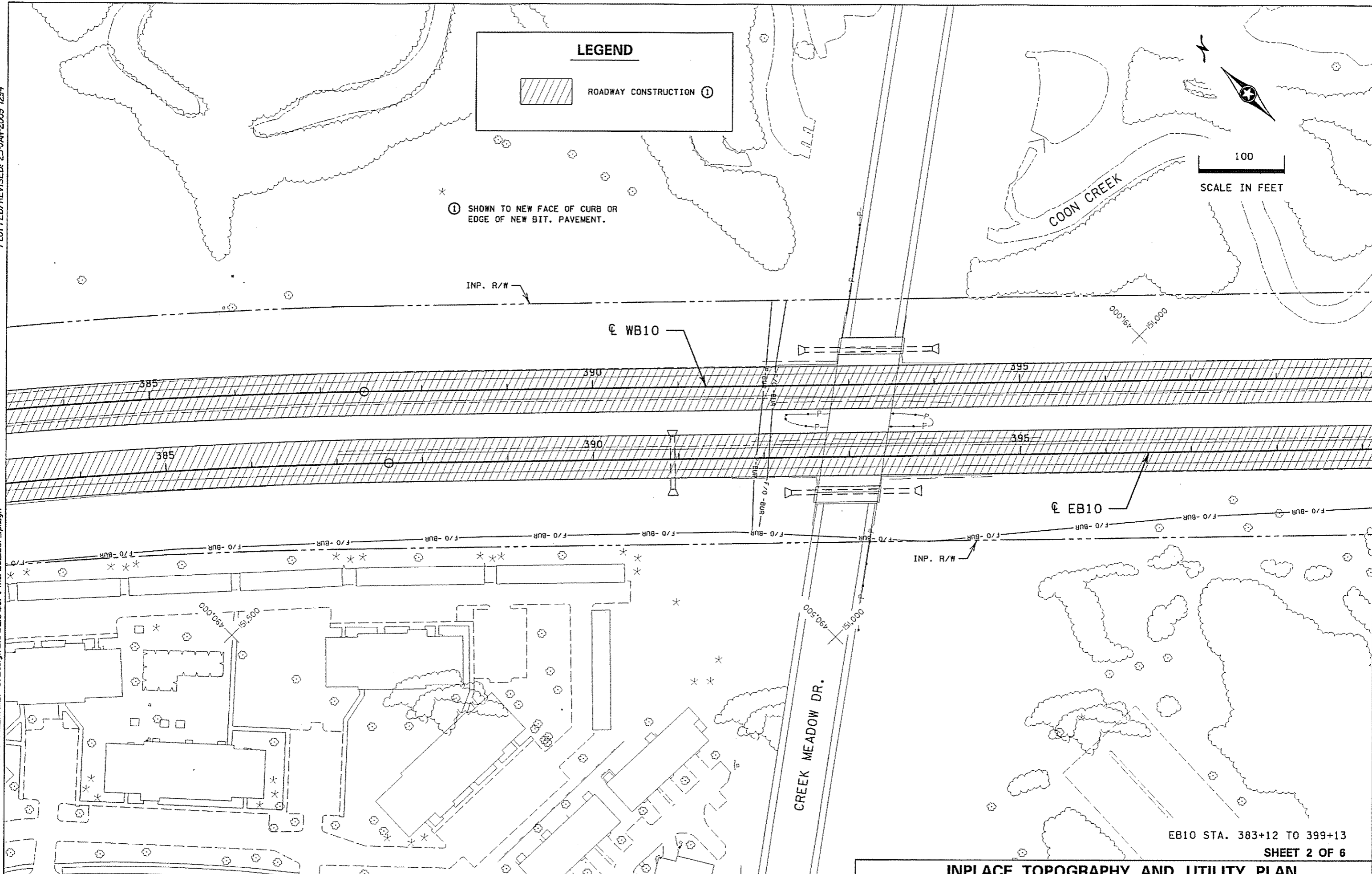
**LEGEND**

 ROADWAY CONSTRUCTION ①

① SHOWN TO NEW FACE OF CURB OR  
EDGE OF NEW BIT. PAVEMENT.



100  
SCALE IN FEET



EB10 STA. 383+12 TO 399+13  
SHEET 2 OF 6

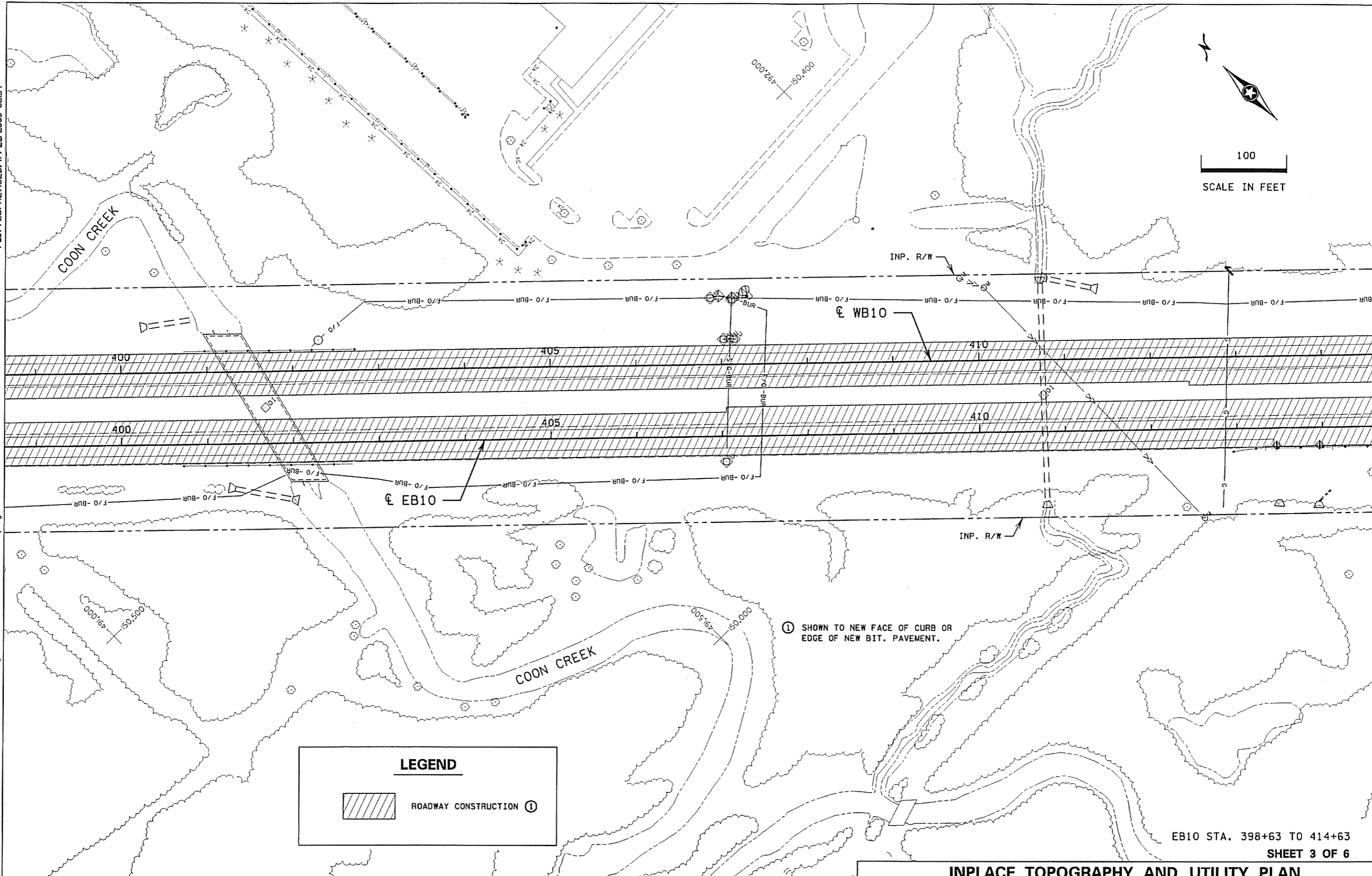
**INPLACE TOPOGRAPHY AND UTILITY PLAN**

PLOTTED/REVISED: 11-FEB-2009 08:54

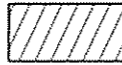
DISTRICT #: METRO  
PLOT NAME: 67\_1p3  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_1p1.dgn



100  
SCALE IN FEET



**LEGEND**

 ROADWAY CONSTRUCTION ①

① SHOWN TO NEW FACE OF CURB OR  
EDGE OF NEW BIT. PAVEMENT.

EB10 STA. 398+63 TO 414+63

SHEET 3 OF 6

**INPLACE TOPOGRAPHY AND UTILITY PLAN**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

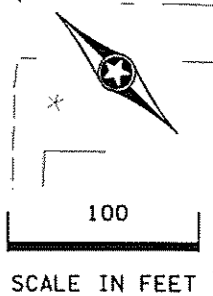
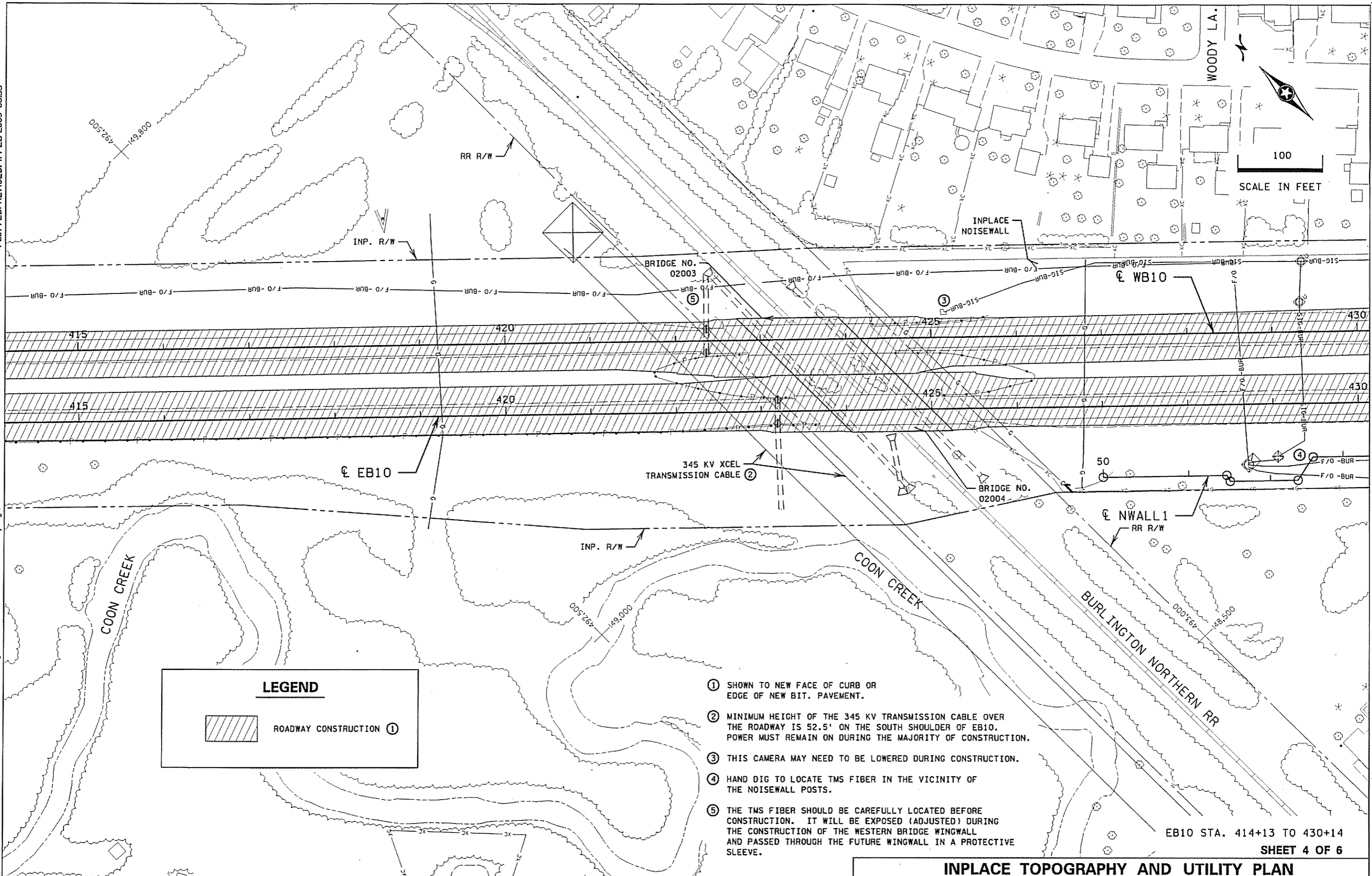
*Peter Danisch*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 2/11/09


STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 78 OF 222 SHEETS

PLOTTED/REVISED: 11-FEB-2009 08:55

DISTRICT #: METRO  
PLOT NAME: 67-104  
PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_1pl.dgn



**LEGEND**

 ROADWAY CONSTRUCTION ①

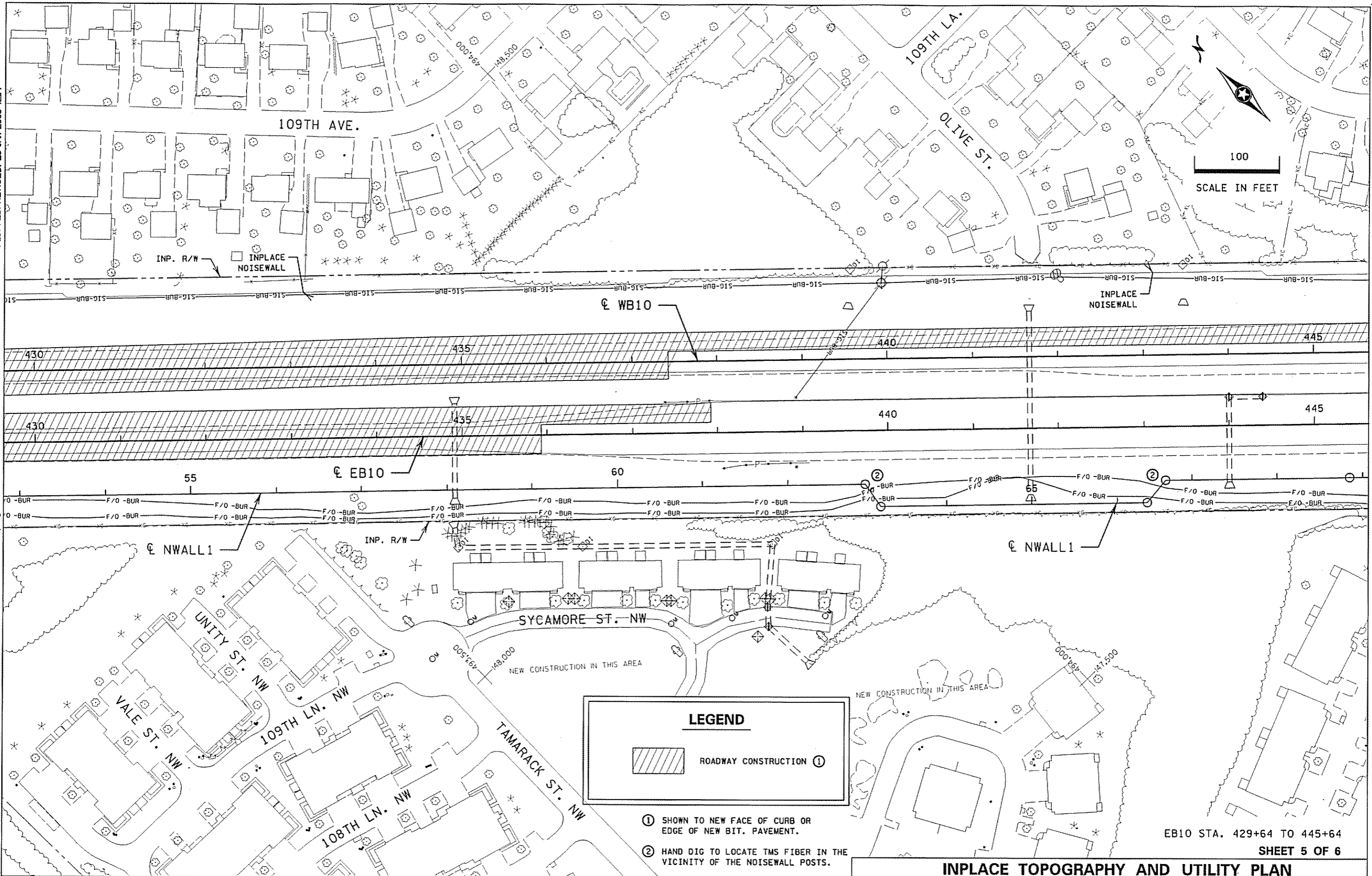
- ① SHOWN TO NEW FACE OF CURB OR EDGE OF NEW BIT. PAVEMENT.
- ② MINIMUM HEIGHT OF THE 345 KV TRANSMISSION CABLE OVER THE ROADWAY IS 52.5' ON THE SOUTH SHOULDER OF EB10. POWER MUST REMAIN ON DURING THE MAJORITY OF CONSTRUCTION.
- ③ THIS CAMERA MAY NEED TO BE LOWERED DURING CONSTRUCTION.
- ④ HAND DIG TO LOCATE TMS FIBER IN THE VICINITY OF THE NOISEWALL POSTS.
- ⑤ THE TMS FIBER SHOULD BE CAREFULLY LOCATED BEFORE CONSTRUCTION. IT WILL BE EXPOSED (ADJUSTED) DURING THE CONSTRUCTION OF THE WESTERN BRIDGE WINGWALL AND PASSED THROUGH THE FUTURE WINGWALL IN A PROTECTIVE SLEEVE.

EB10 STA. 414+13 TO 430+14  
SHEET 4 OF 6

**INPLACE TOPOGRAPHY AND UTILITY PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:14

DISTRICT #: METRO  
PLOT NAME: 67\_1ps  
PATH & FILENAME: S:\Design\01021506\Fire\021567\_1pl.dgn



**LEGEND**

ROADWAY CONSTRUCTION ①

- ① SHOWN TO NEW FACE OF CURB OR EDGE OF NEW BIT. PAVEMENT.
- ② HAND DIG TO LOCATE TMS FIBER IN THE VICINITY OF THE NOISEWALL POSTS.

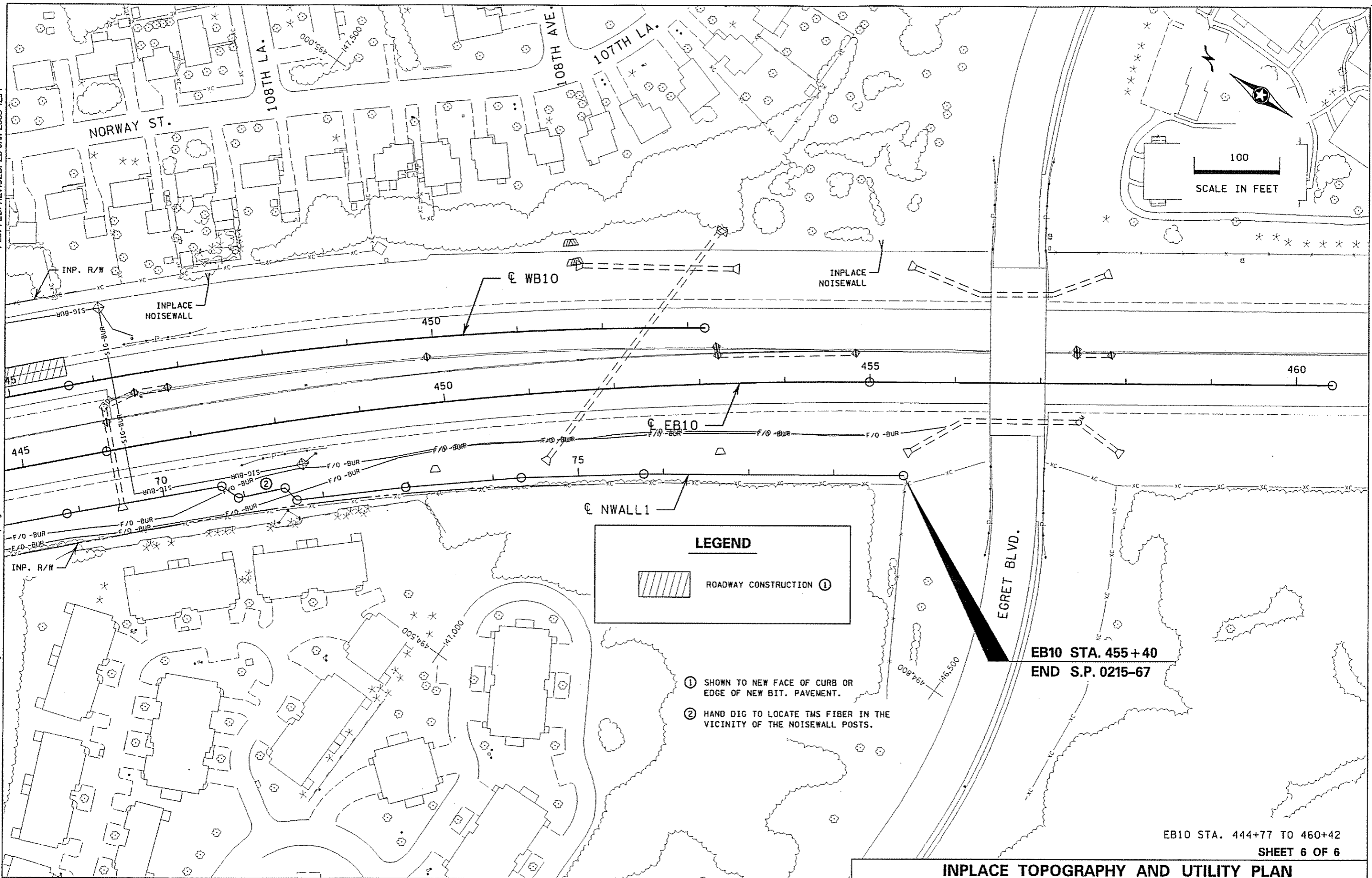
EB10 STA. 429+64 TO 445+64  
SHEET 5 OF 6

**INPLACE TOPOGRAPHY AND UTILITY PLAN**




PLOTTED/REVISED: 23-JAN-2009 12:14

DISTRICT #: METRO  
PLOT NAME: 67\_1p6  
PATH & FILENAME: S:\Design\0215\067\Fix\021567\_1p6.dgn



**LEGEND**

 ROADWAY CONSTRUCTION ①

- ① SHOWN TO NEW FACE OF CURB OR EDGE OF NEW BIT. PAVEMENT.
- ② HAND DIG TO LOCATE TMS FIBER IN THE VICINITY OF THE NOISEWALL POSTS.

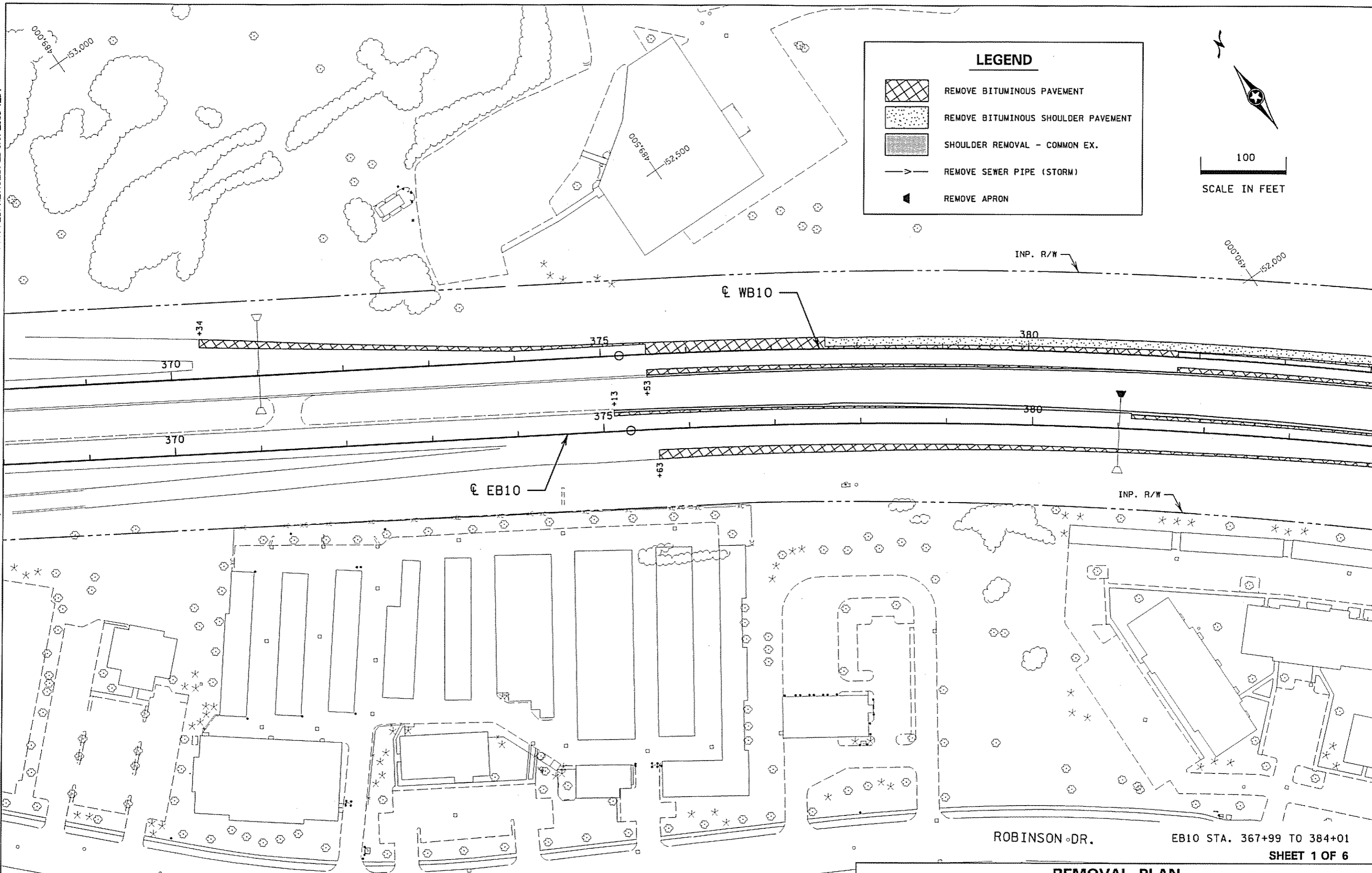
**EB10 STA. 455+40  
END S.P. 0215-67**

EB10 STA. 444+77 TO 460+42  
SHEET 6 OF 6

**INPLACE TOPOGRAPHY AND UTILITY PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:14

DISTRICT #: METRO  
PLOT NAME: 67\_rem1  
PATH & FILENAME: S:\Design\0215\067\rem\021567\_rem.dgn








ROBINSON DR. EB10 STA. 367+99 TO 384+01  
SHEET 1 OF 6

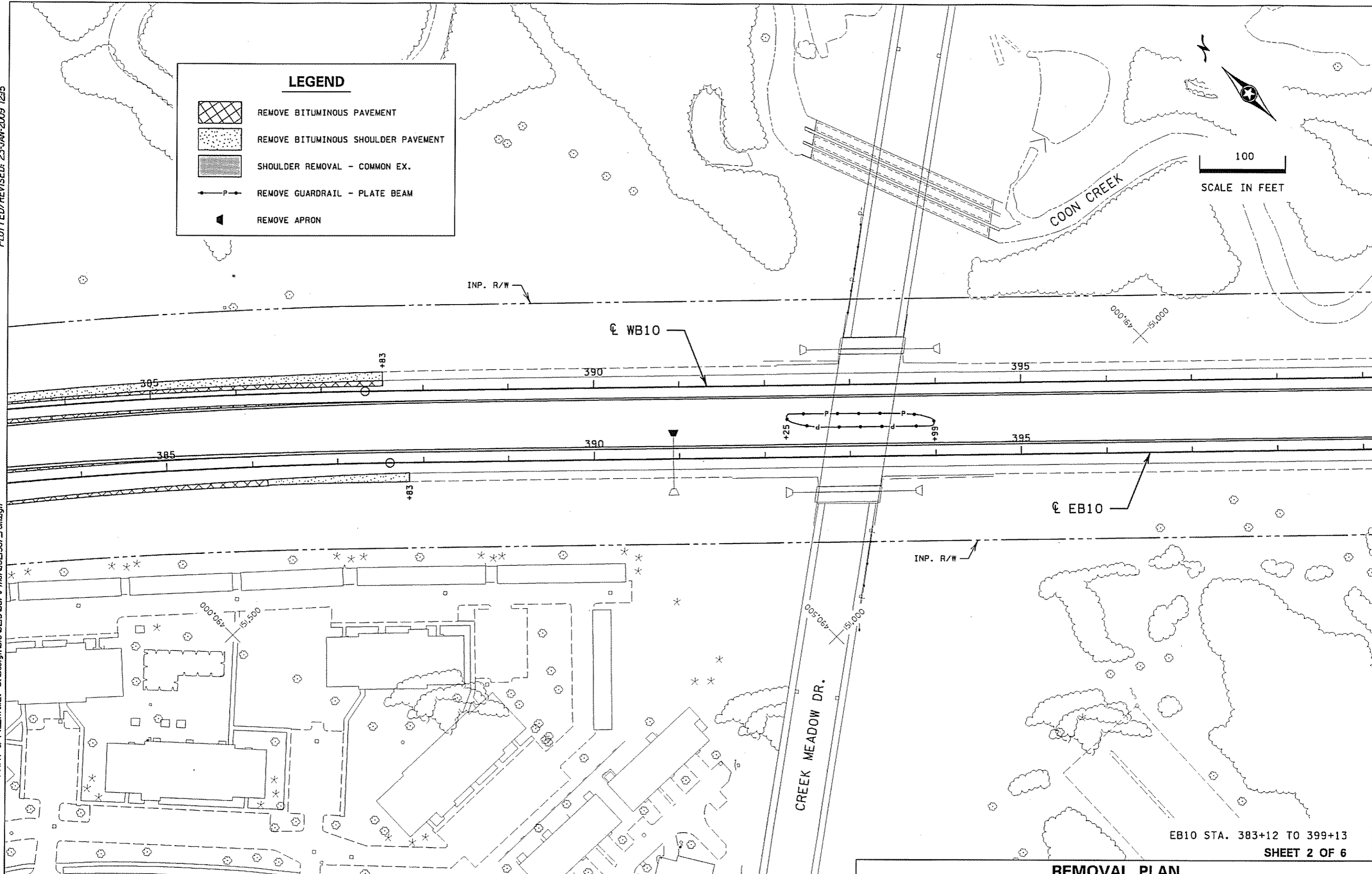
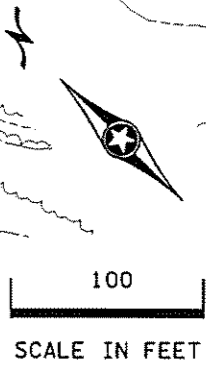
**REMOVAL PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:15

DISTRICT #: METRO  
PLOT NAME: 67\_rem2  
PATH & FILENAME: S:\Design\010215067\Final\021567\_rem.dgn

**LEGEND**

-  REMOVE BITUMINOUS PAVEMENT
-  REMOVE BITUMINOUS SHOULDER PAVEMENT
-  SHOULDER REMOVAL - COMMON EX.
-  REMOVE GUARDRAIL - PLATE BEAM
-  REMOVE APRON



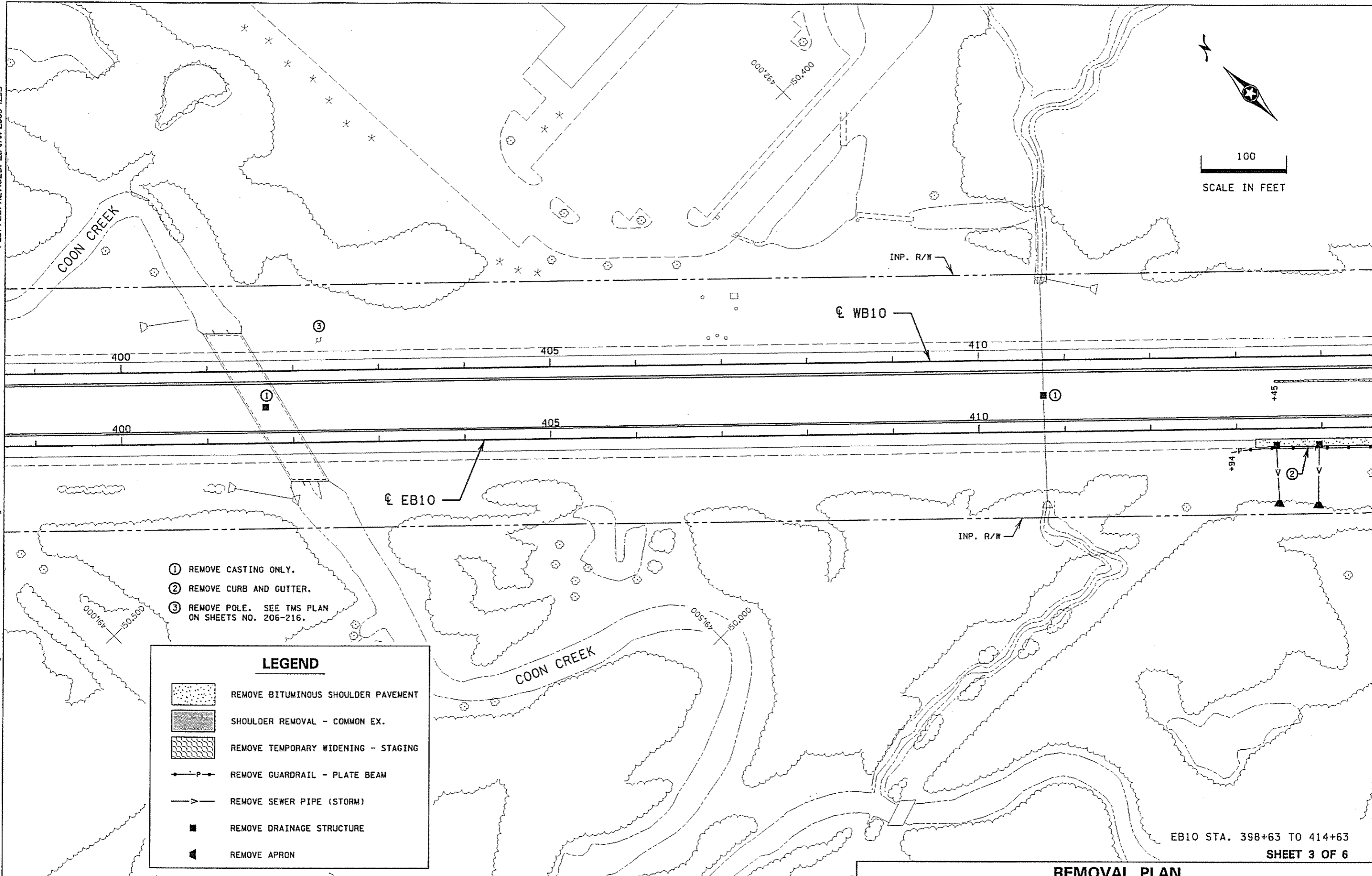
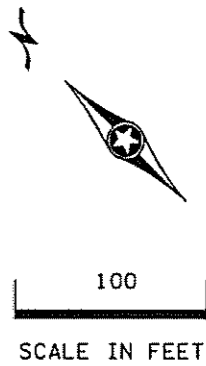
EB10 STA. 383+12 TO 399+13

SHEET 2 OF 6

**REMOVAL PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:15

DISTRICT #: METRO  
PLOT NAME: 67\_rem3  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_rem.dgn



- ① REMOVE CASTING ONLY.
- ② REMOVE CURB AND GUTTER.
- ③ REMOVE POLE. SEE TMS PLAN ON SHEETS NO. 206-216.

**LEGEND**

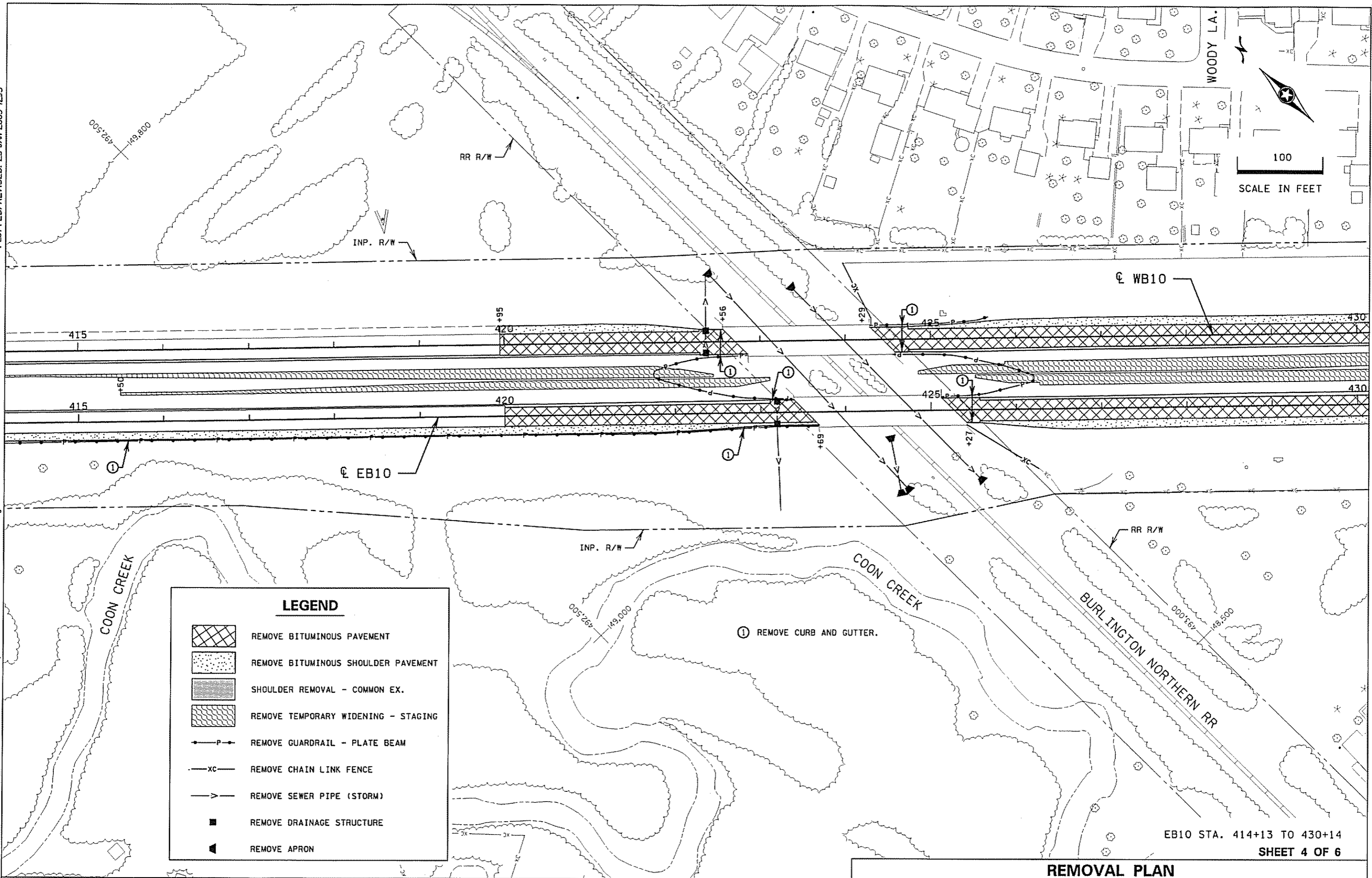
- REMOVE BITUMINOUS SHOULDER PAVEMENT
- SHOULDER REMOVAL - COMMON EX.
- REMOVE TEMPORARY WIDENING - STAGING
- REMOVE GUARDRAIL - PLATE BEAM
- REMOVE SEWER PIPE (STORM)
- REMOVE DRAINAGE STRUCTURE
- REMOVE APRON

EB10 STA. 398+63 TO 414+63  
SHEET 3 OF 6

**REMOVAL PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:5

DISTRICT #: METRO  
PLOT NAME: 67\_rpm4  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_rem.dgn



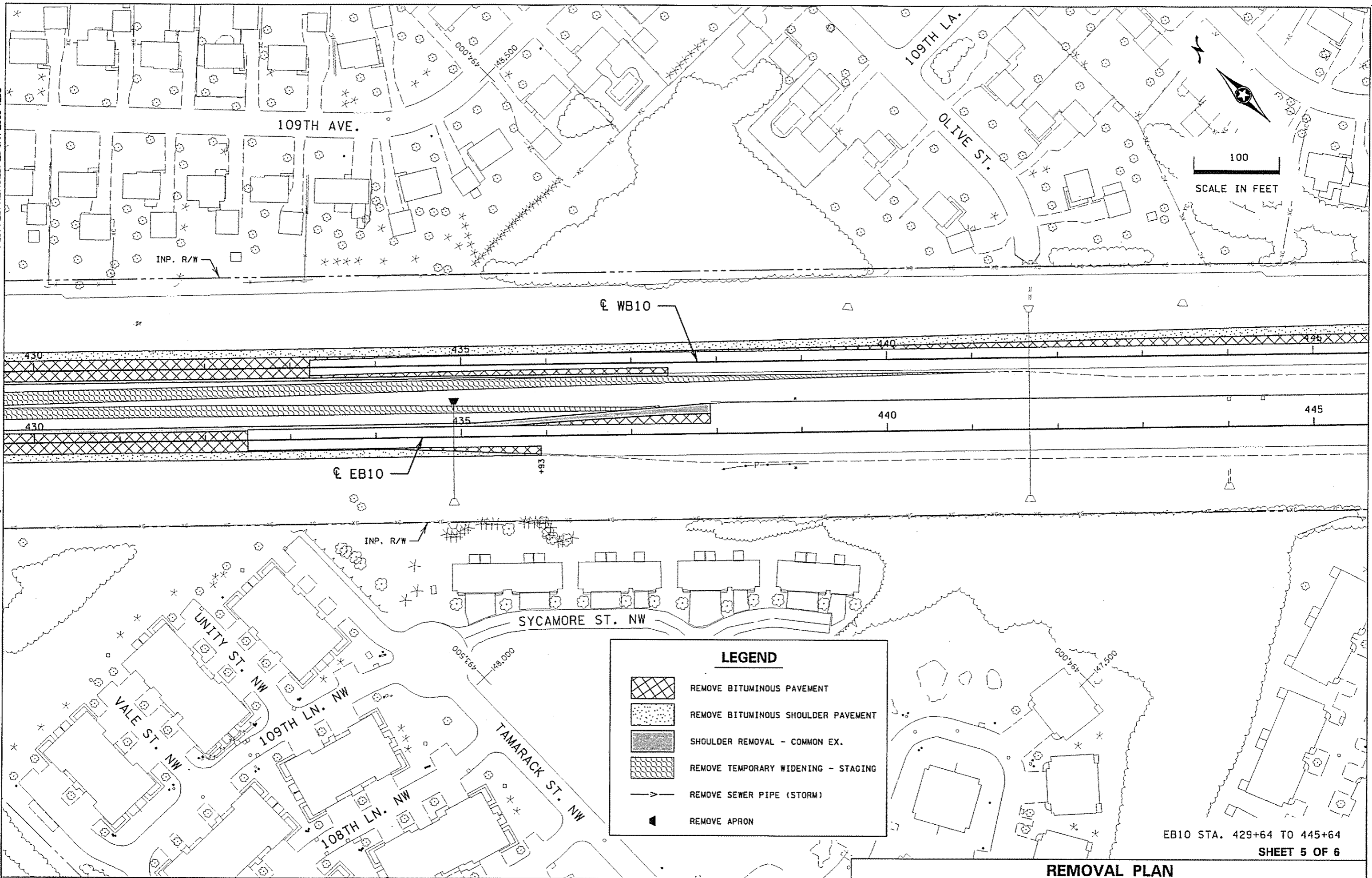
LEGEND	
	REMOVE BITUMINOUS PAVEMENT
	REMOVE BITUMINOUS SHOULDER PAVEMENT
	SHOULDER REMOVAL - COMMON EX.
	REMOVE TEMPORARY WIDENING - STAGING
	REMOVE GUARDRAIL - PLATE BEAM
	REMOVE CHAIN LINK FENCE
	REMOVE SEWER PIPE (STORM)
	REMOVE DRAINAGE STRUCTURE
	REMOVE APRON
	REMOVE CURB AND GUTTER.

EB10 STA. 414+13 TO 430+14  
SHEET 4 OF 6



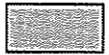
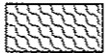
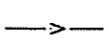

**REMOVAL PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:15

DISTRICT #: METRO  
PLOT NAME: 67\_rem5  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_rem.dgn



**LEGEND**

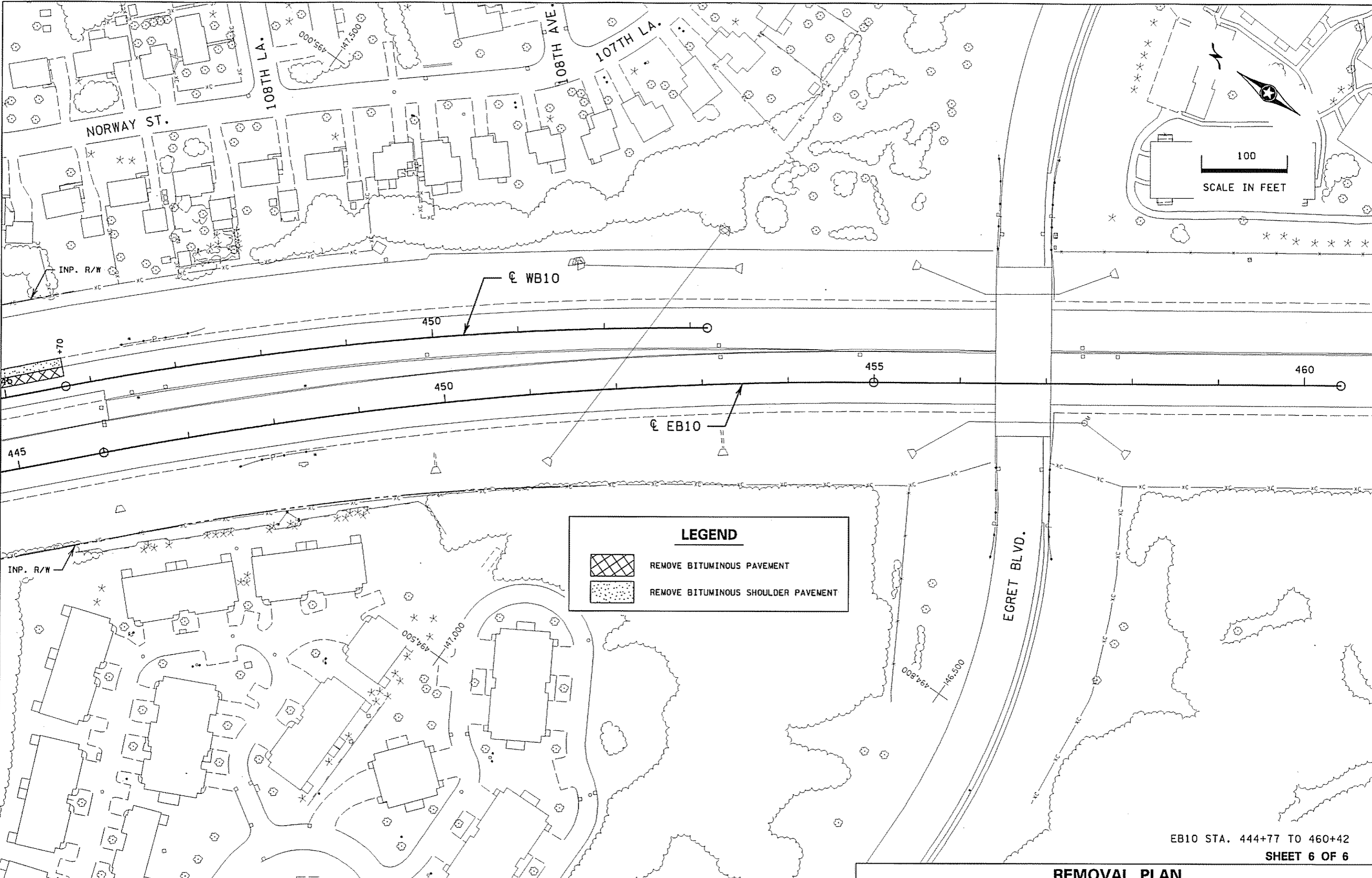
-  REMOVE BITUMINOUS PAVEMENT
-  REMOVE BITUMINOUS SHOULDER PAVEMENT
-  SHOULDER REMOVAL - COMMON EX.
-  REMOVE TEMPORARY WIDENING - STAGING
-  REMOVE SEWER PIPE (STORM)
-  REMOVE APRON

EB10 STA. 429+64 TO 445+64  
SHEET 5 OF 6



**REMOVAL PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:45

DISTRICT #: METRO  
PLOT NAME: 67\_rem6  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_rem.dgn



**LEGEND**

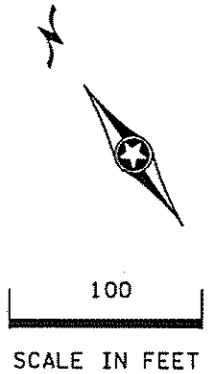
	REMOVE BITUMINOUS PAVEMENT
	REMOVE BITUMINOUS SHOULDER PAVEMENT

EB10 STA. 444+77 TO 460+42  
SHEET 6 OF 6

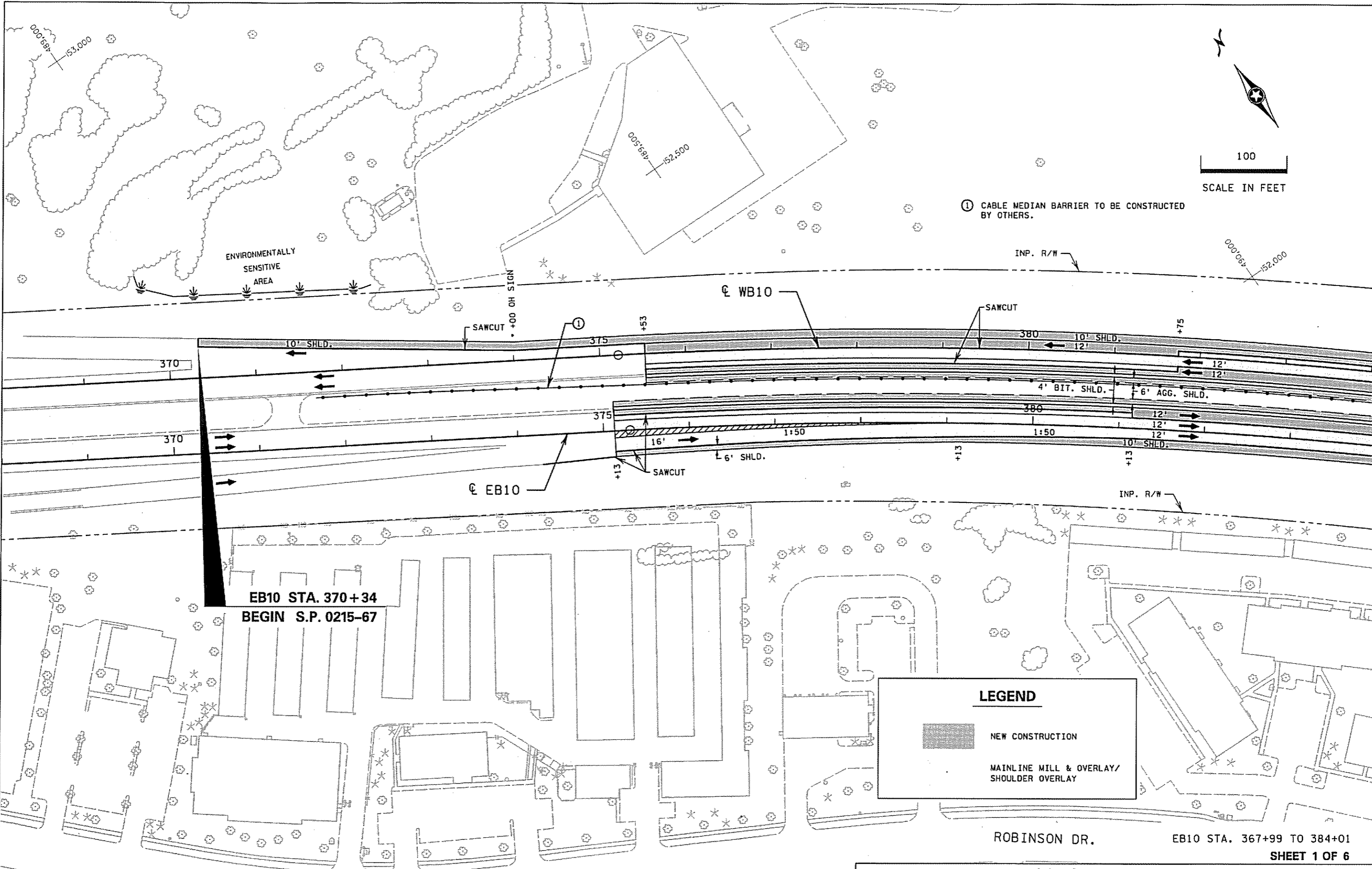
**REMOVAL PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:45

DISTRICT #: METRO  
PLOT NAME: 67\_cpl  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_cpl.dgn



① CABLE MEDIAN BARRIER TO BE CONSTRUCTED BY OTHERS.



EB10 STA. 370+34  
BEGIN S.P. 0215-67

**LEGEND**

- NEW CONSTRUCTION
- MAINLINE MILL & OVERLAY/  
SHOULDER OVERLAY

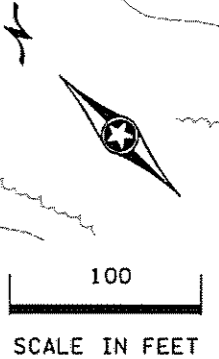
ROBINSON DR. EB10 STA. 367+99 TO 384+01  
SHEET 1 OF 6

**CONSTRUCTION PLAN**

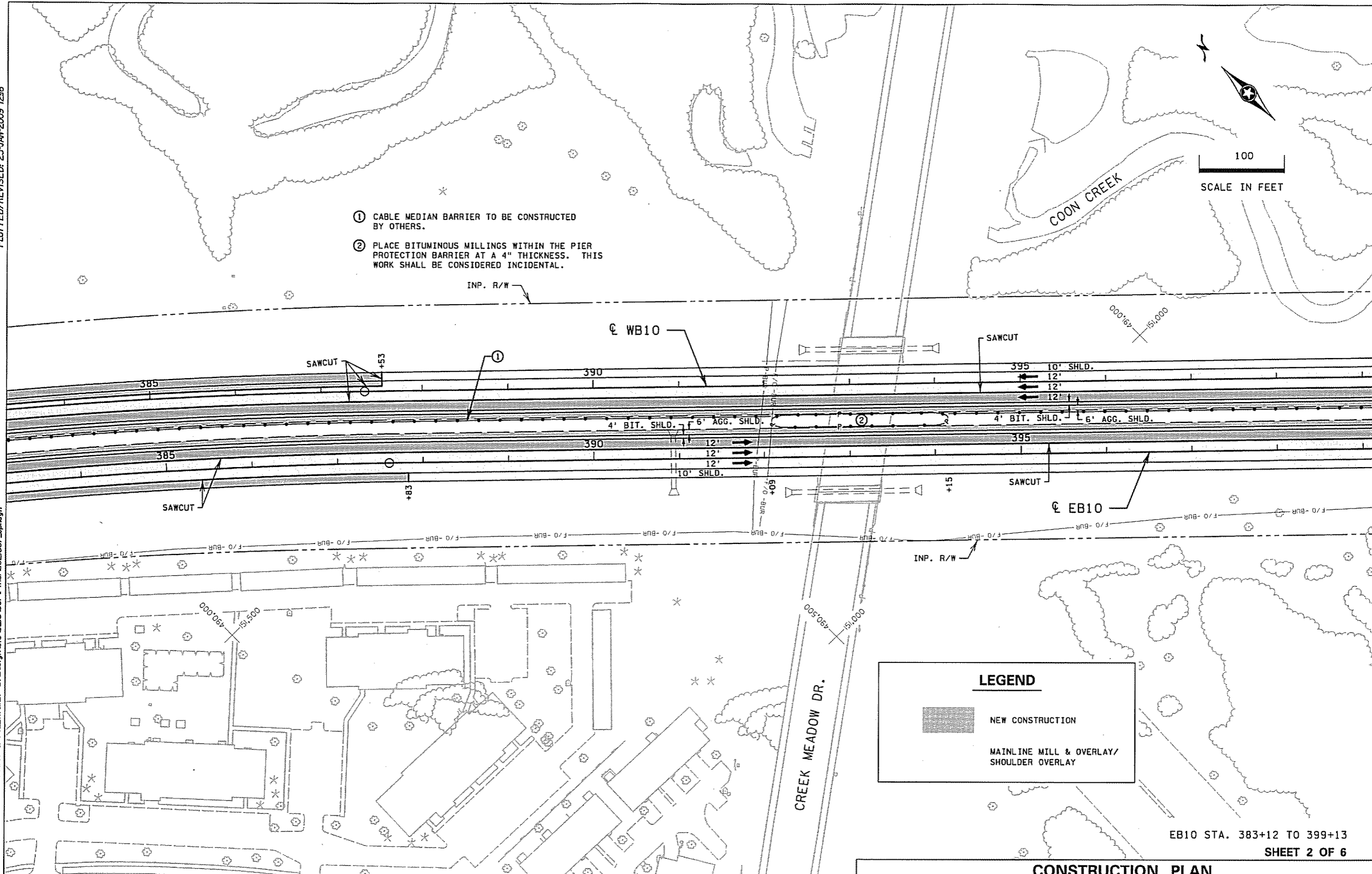


PLOTTED/REVISED: 23-JAN-2009 12:16

DISTRICT: METRO  
IFLOT NAME: 67\_cp2  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_cp1.dgn



- ① CABLE MEDIAN BARRIER TO BE CONSTRUCTED BY OTHERS.
- ② PLACE BITUMINOUS MILLINGS WITHIN THE PIER PROTECTION BARRIER AT A 4" THICKNESS. THIS WORK SHALL BE CONSIDERED INCIDENTAL.



**LEGEND**

- NEW CONSTRUCTION
- MAINLINE MILL & OVERLAY/  
SHOULDER OVERLAY

EB10 STA. 383+12 TO 399+13  
SHEET 2 OF 6

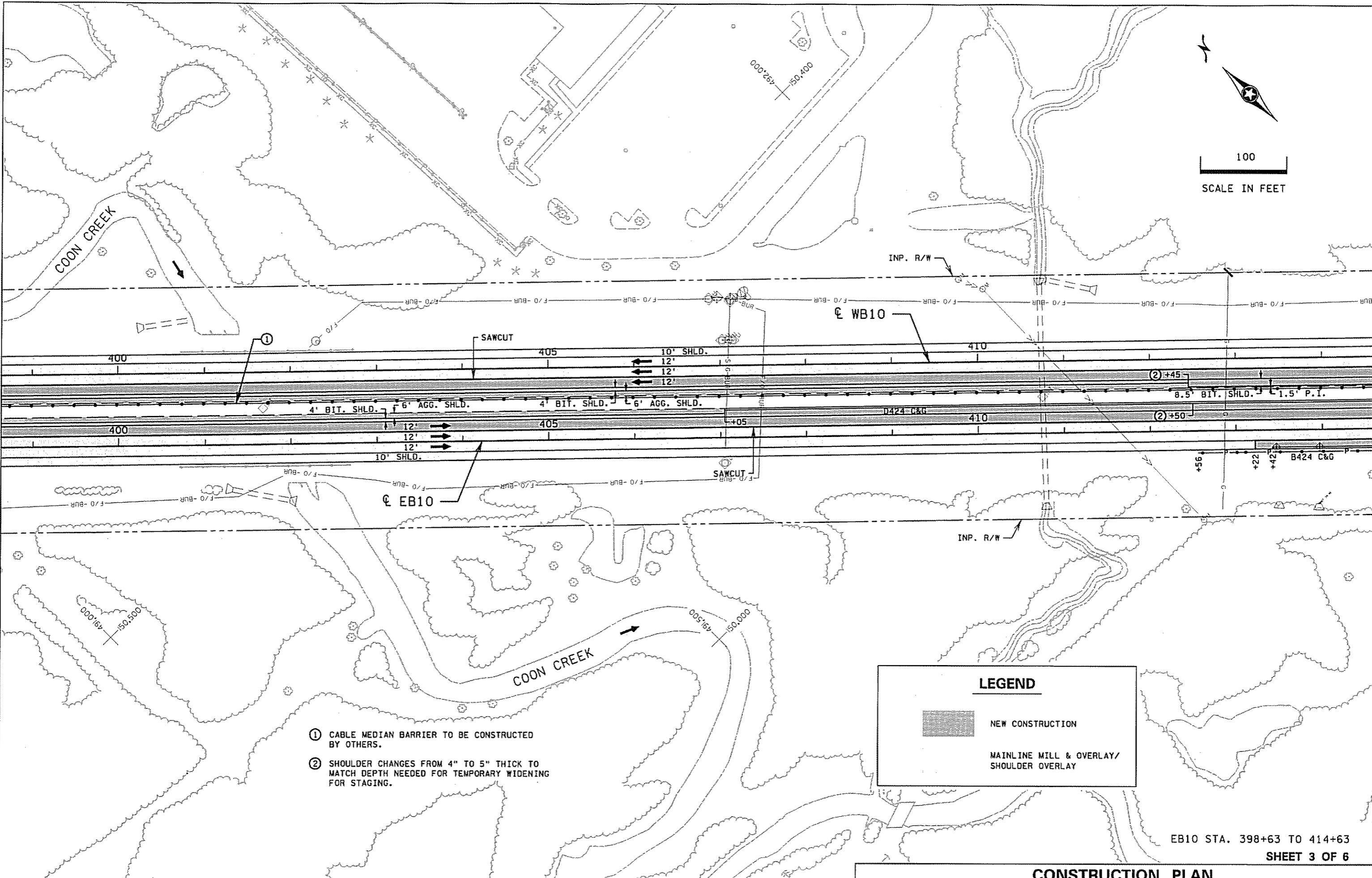
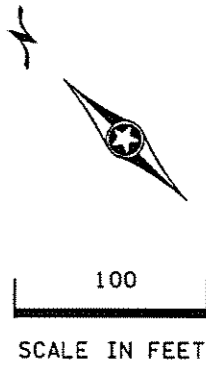
**CONSTRUCTION PLAN**  
STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 89 OF 222 SHEETS

DRAWN BY: HG      CHECKED BY: PAD      CERTIFIED BY: Peter Danial LIC. NO. 45053      DATE 1/22/09

LICENSED PROFESSIONAL ENGINEER



PLOTTED/REVISED: 23-JAN-2009 12:16

DISTRICT #: METRO  
PLOT NAME: 67\_cp3  
PATH & FILENAME: S:\Design\0215\067\In\021567\_cpl.dgn



- ① CABLE MEDIAN BARRIER TO BE CONSTRUCTED BY OTHERS.
- ② SHOULDER CHANGES FROM 4" TO 5" THICK TO MATCH DEPTH NEEDED FOR TEMPORARY WIDENING FOR STAGING.

**LEGEND**

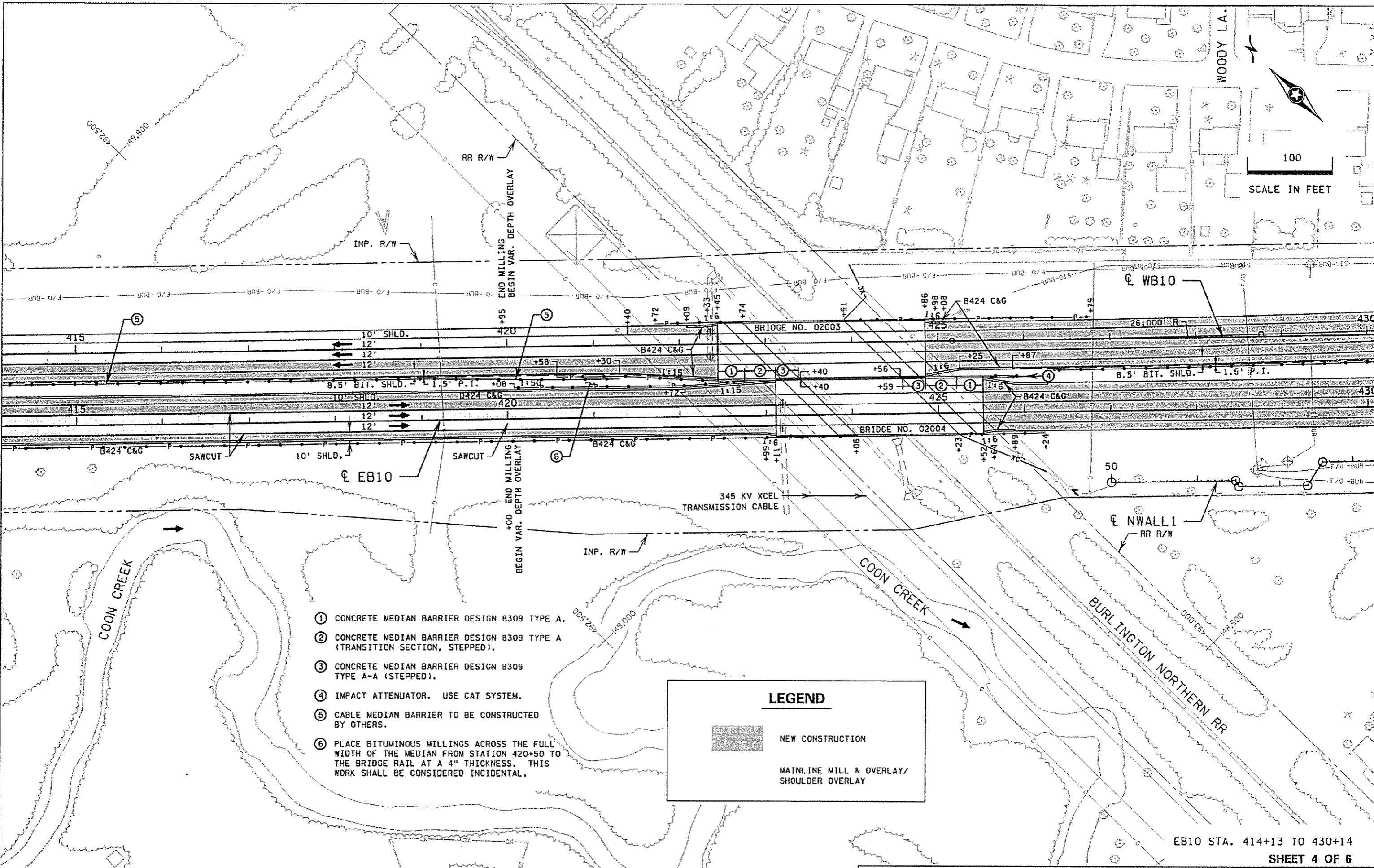
-  NEW CONSTRUCTION
-  MAINLINE MILL & OVERLAY/  
SHOULDER OVERLAY

EB10 STA. 398+63 TO 414+63  
SHEET 3 OF 6

**CONSTRUCTION PLAN**

PLOTTED/REVISED: 12-FEB-2009 09:52

DISTRICT #: METRO  
PLOT NAME: 67\_cpl4  
PATH & FILENAME: S:\Design\010215067\Firm\021567\_cpl.dgn



- ① CONCRETE MEDIAN BARRIER DESIGN 8309 TYPE A.
- ② CONCRETE MEDIAN BARRIER DESIGN 8309 TYPE A (TRANSITION SECTION, STEPPED).
- ③ CONCRETE MEDIAN BARRIER DESIGN 8309 TYPE A-A (STEPPED).
- ④ IMPACT ATTENUATOR. USE CAT SYSTEM.
- ⑤ CABLE MEDIAN BARRIER TO BE CONSTRUCTED BY OTHERS.
- ⑥ PLACE BITUMINOUS MILLINGS ACROSS THE FULL WIDTH OF THE MEDIAN FROM STATION 420+50 TO THE BRIDGE RAIL AT A 4" THICKNESS. THIS WORK SHALL BE CONSIDERED INCIDENTAL.

**LEGEND**

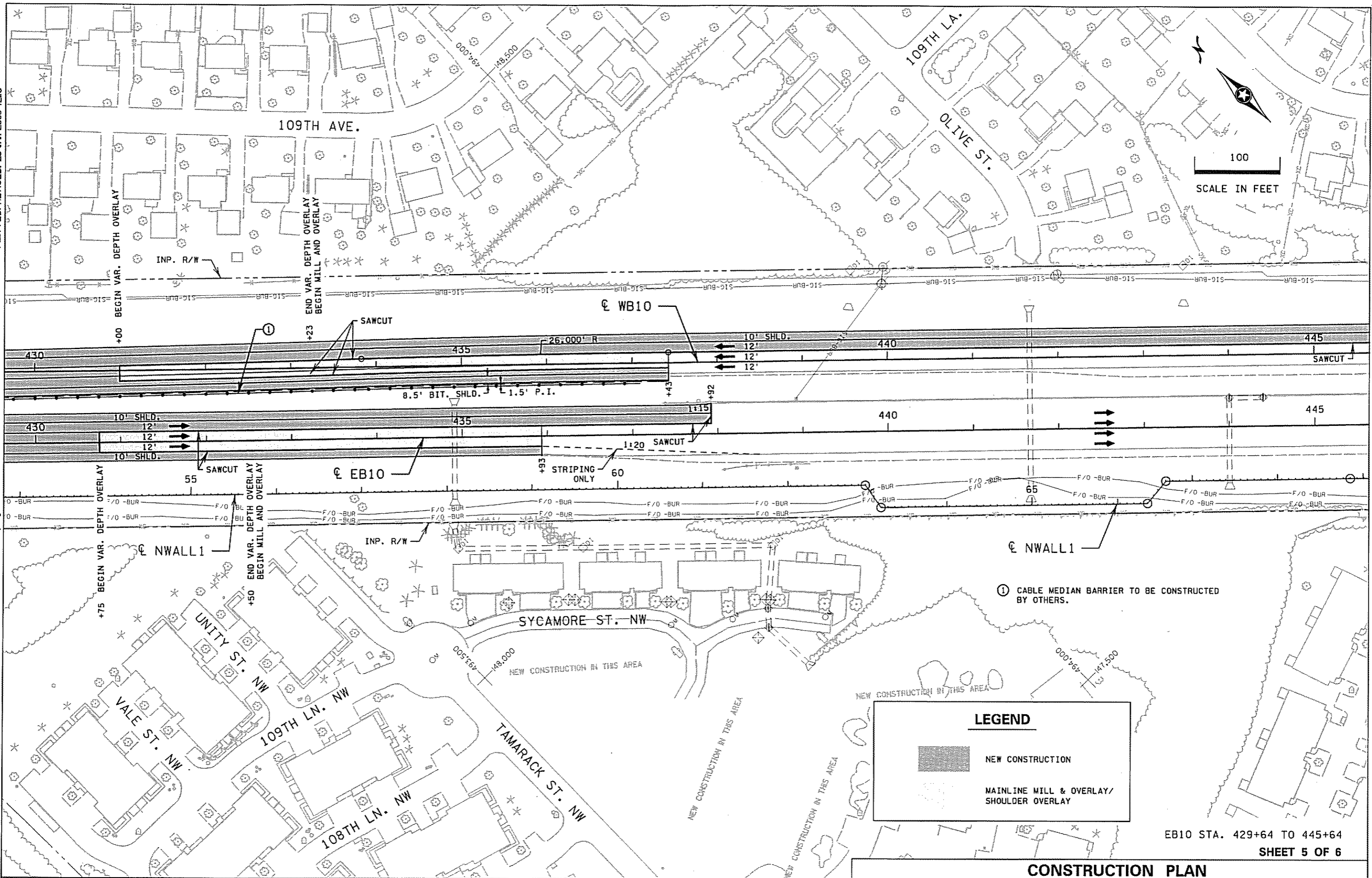
	NEW CONSTRUCTION
	MAINLINE MILL & OVERLAY/ SHOULDER OVERLAY

EB10 STA. 414+13 TO 430+14  
SHEET 4 OF 6

**CONSTRUCTION PLAN**



PLOTTED/REVISED: 23-JAN-2009 12:46

DISTRICT #: METRO  
PLOT NAME: 67\_pp5  
PATH & FILENAME: S:\Design\010215\067\Final\021567\_cpl.dgn



① CABLE MEDIAN BARRIER TO BE CONSTRUCTED BY OTHERS.

**LEGEND**

-  NEW CONSTRUCTION
-  MAINLINE MILL & OVERLAY/  
SHOULDER OVERLAY

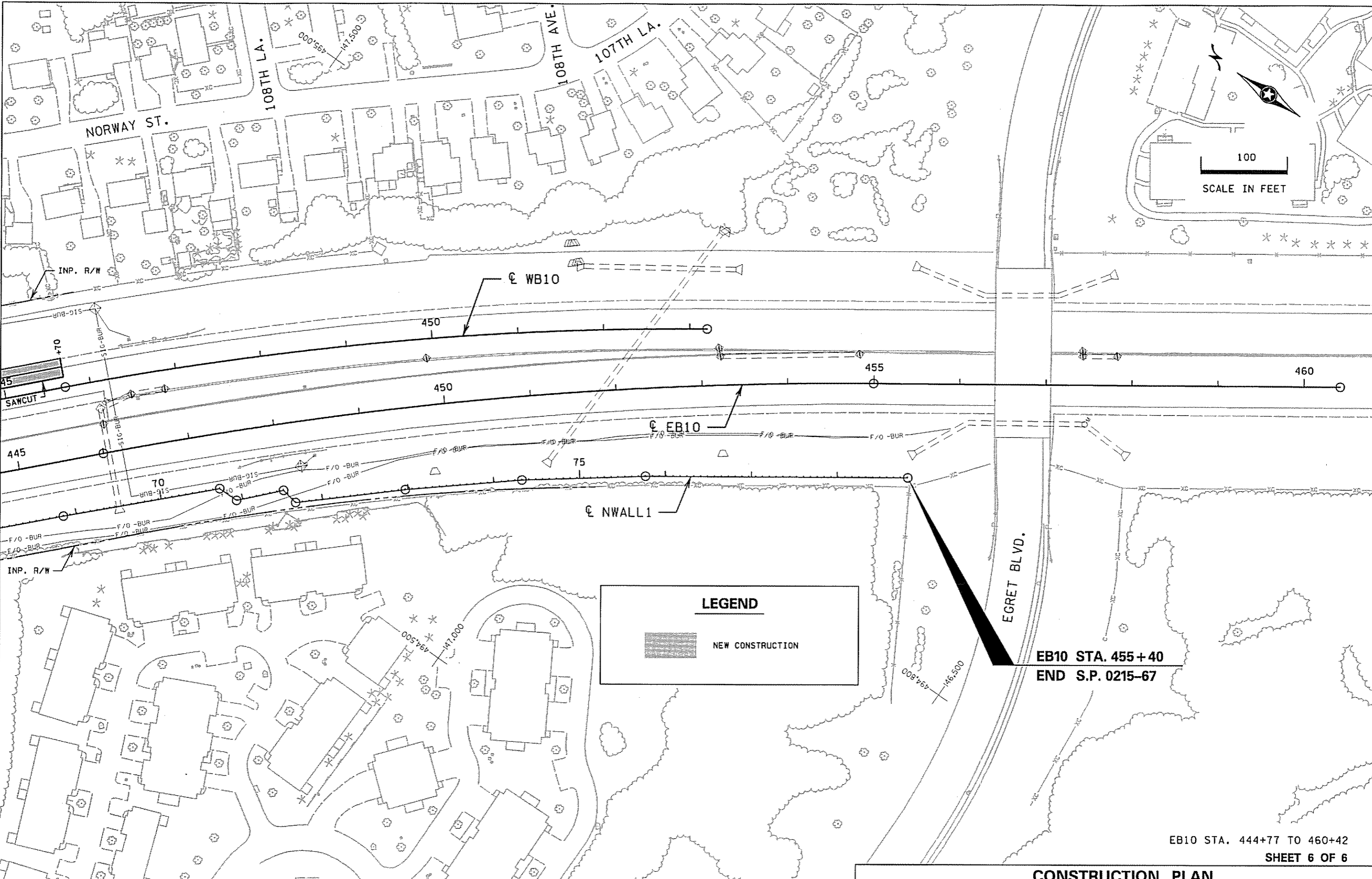
EB10 STA. 429+64 TO 445+64

SHEET 5 OF 6

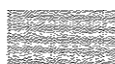
**CONSTRUCTION PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:16

DISTRICT #: METRO  
PLOT NAME: 67\_op6  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_cpl.dgn



**LEGEND**

 NEW CONSTRUCTION

**EB10 STA. 455+40  
END S.P. 0215-67**

EB10 STA. 444+77 TO 460+42  
SHEET 6 OF 6

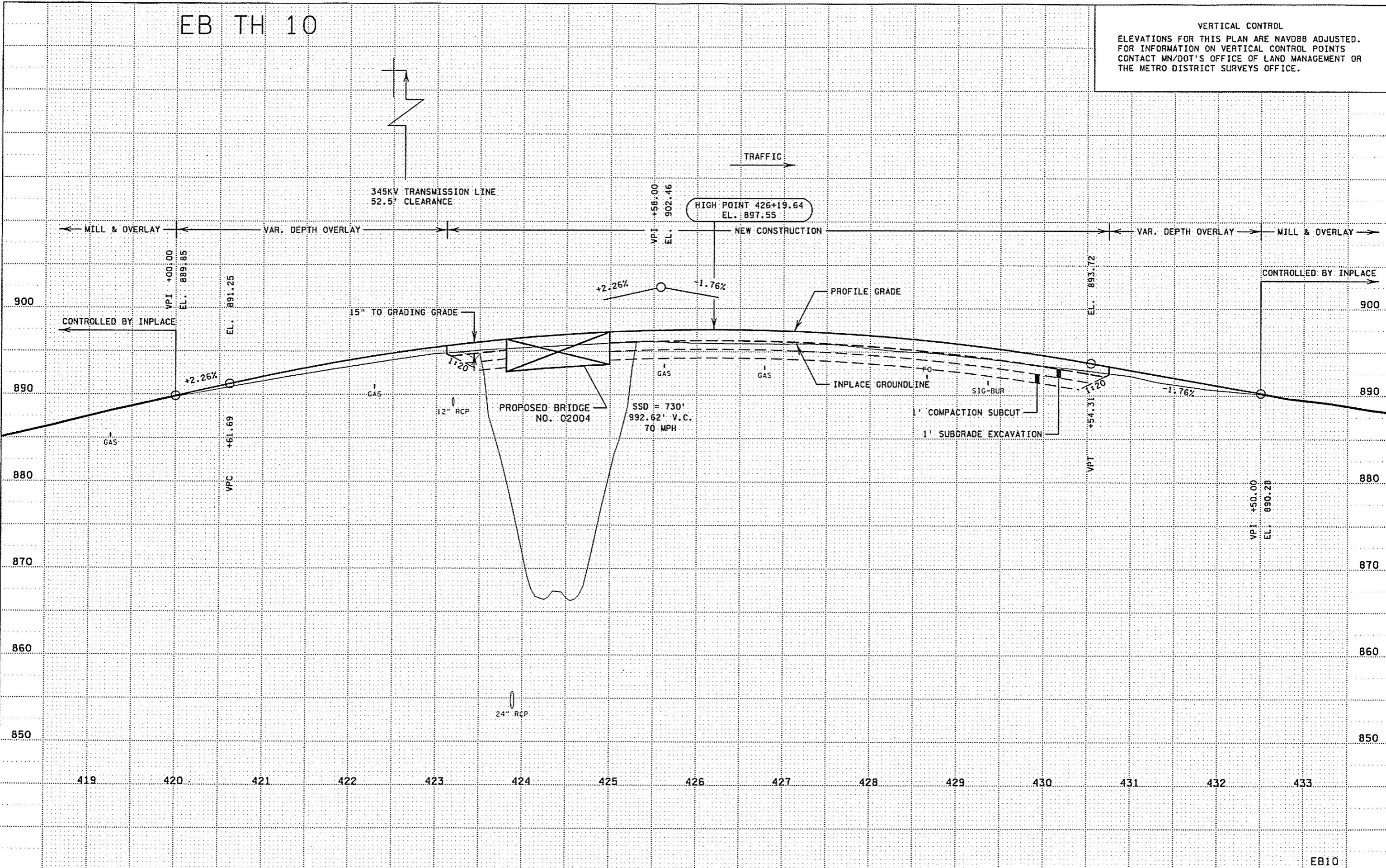
**CONSTRUCTION PLAN**

# EB TH 10

VERTICAL CONTROL  
 ELEVATIONS FOR THIS PLAN ARE NAVD88 ADJUSTED.  
 FOR INFORMATION ON VERTICAL CONTROL POINTS  
 CONTACT MN/DOT'S OFFICE OF LAND MANAGEMENT OR  
 THE METRO DISTRICT SURVEYS OFFICE.

PLOTTED/REVISED: 23-JAN-2009 12:16

DISTRICT #: METRO  
 PLOT NAME: 67\_ab10.pr2  
 PATH & FILENAME: S:\Design\0215\067\In\021567\_pr2.dgn

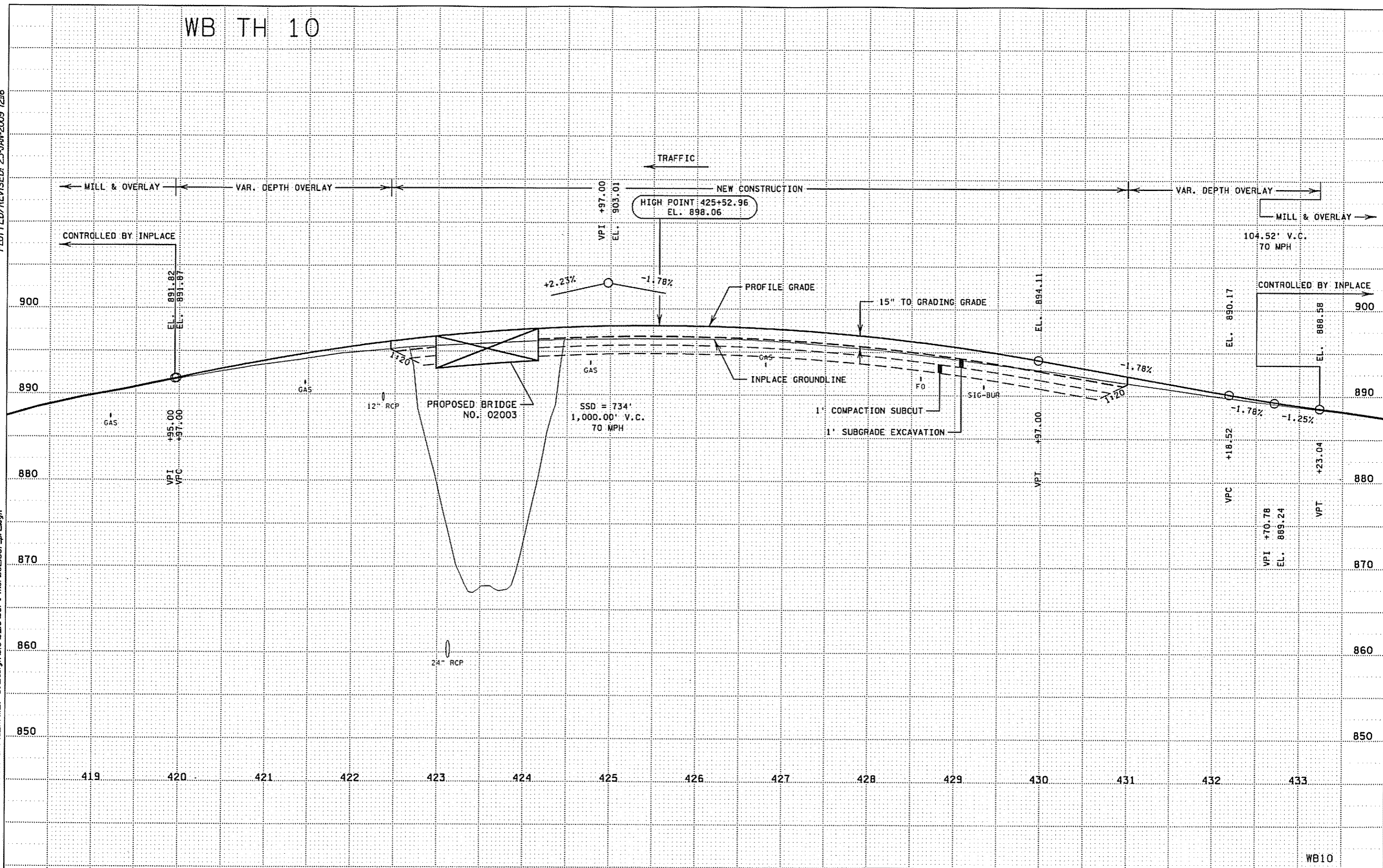


## PROFILES

# WB TH 10

PLOTTED/REVISED: 23-JAN-2009 12:16

DISTRICT #: METRO  
 IPLOT NAME: 67\_WB10\_pr2  
 PATH & FILENAME: S:\Design\01\0215\067\T\m\021567\_pr2.dgn



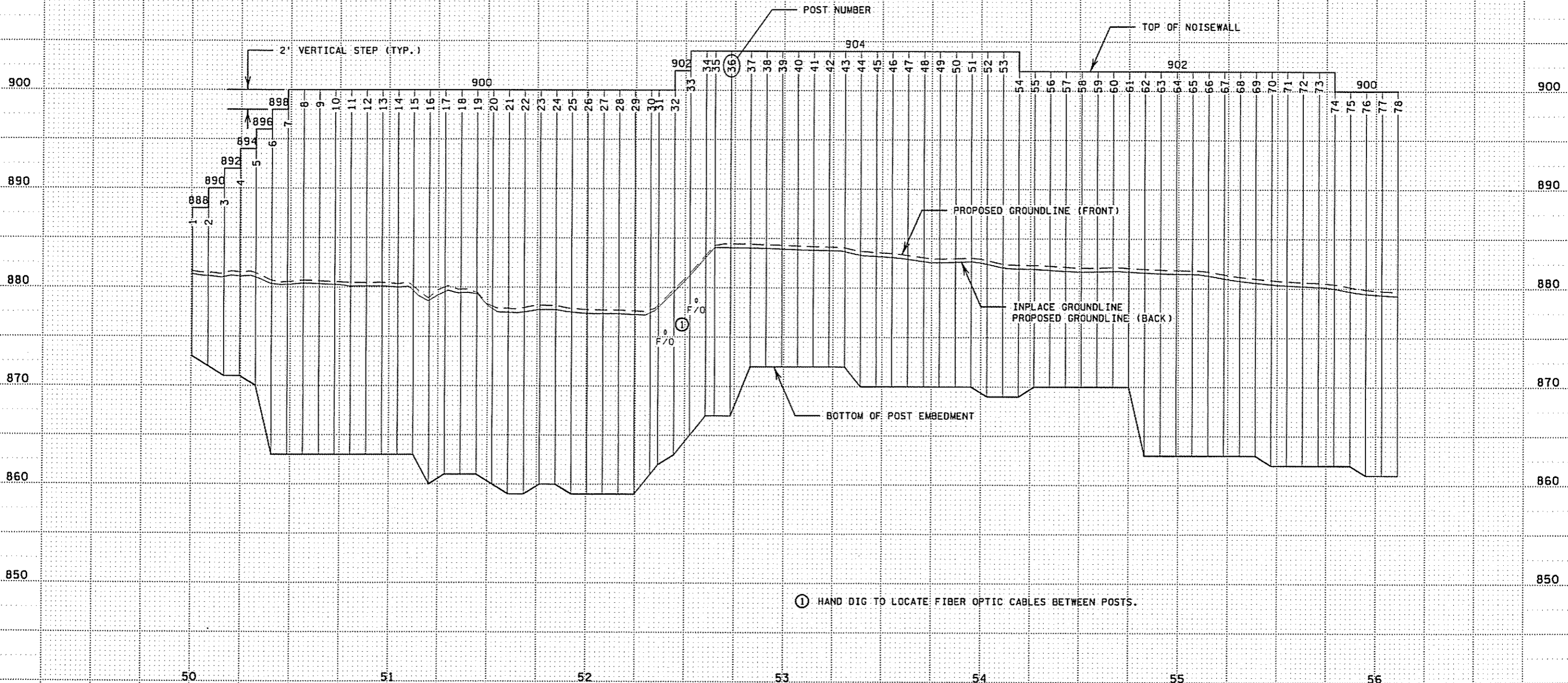
WB10

## PROFILES

PLOTTED/REVISED: 23-JAN-2009 12:16

GENERAL NOTES:

- WOOD PLANKING NOISE BARRIER TYPE 1. FOR DETAILS SEE SHEETS NO. 49, 50, 114.
- PLACE THE WALL PLANKING ON THE RESIDENTIAL SIDE OF THE WALL.
- MATCH STAIN COLOR OF EXISTING WALL ON NORTH SIDE OF THE HIGHWAY.
- "FRONT" DENOTES THE HIGHWAY SIDE OF THE WALL AND "BACK" DENOTES THE RESIDENTIAL SIDE OF THE WALL.
- LEAVE AN APPROX. 4" SPACE BETWEEN THE BOTTOM PLANK AND THE GROUND TO ALLOW FOR DRAINAGE UNDER THE WALL.



DISTRICT #: METRO  
PLOT NAME: 67\_dwl  
PATH & FILENAME: S:\Design\0215\06\Final\021567\_dwl.dgn

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY Peter Daniel  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

NOISE WALL PROFILE - NWall1 STA. 50+00 TO 56+11.02

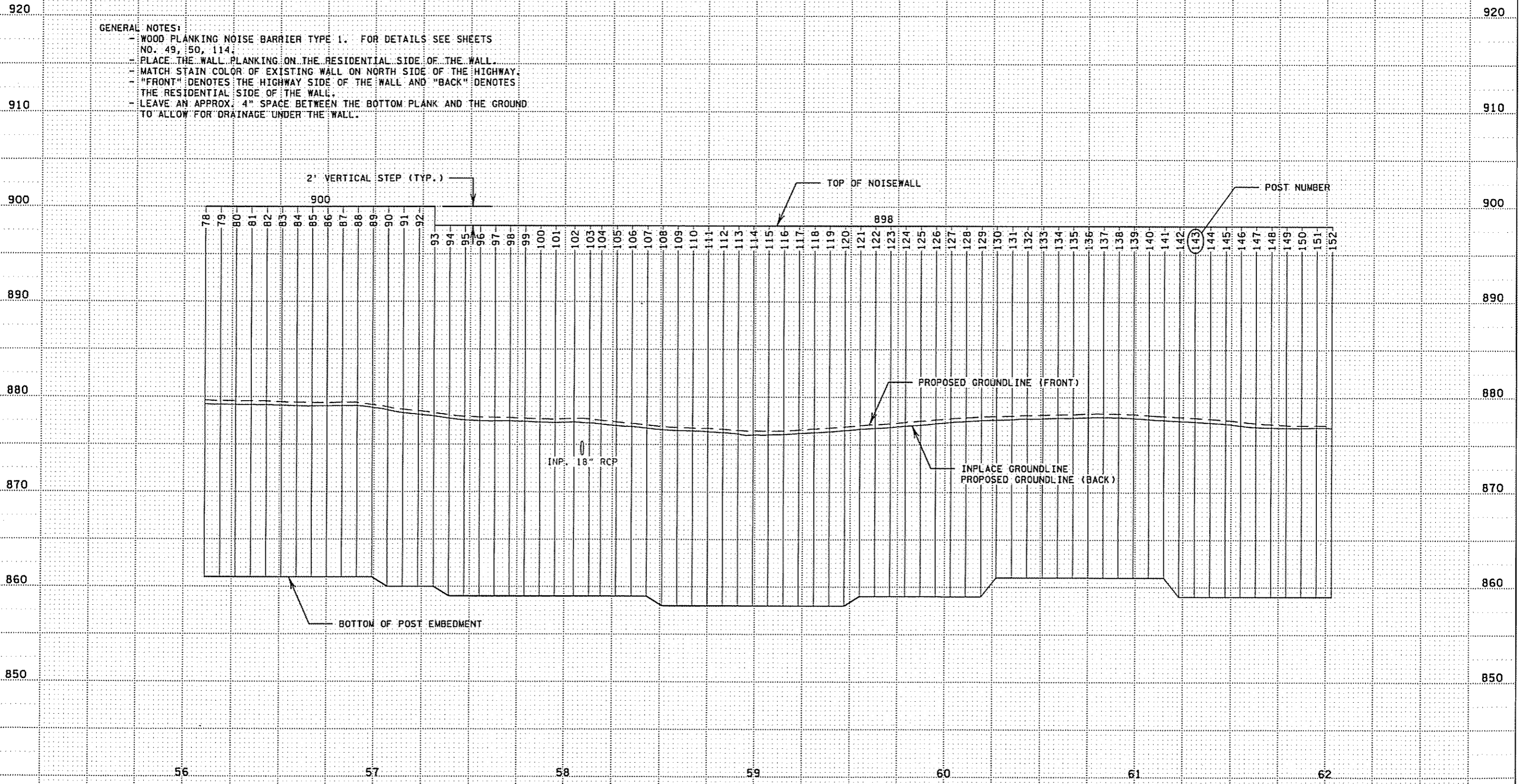
STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 96 OF 222 SHEETS



PLOTTED/REVISED: 23-JAN-2009 12:16

GENERAL NOTES:

- WOOD PLANKING NOISE BARRIER TYPE 1. FOR DETAILS SEE SHEETS NO. 49, 50, 114.
- PLACE THE WALL PLANKING ON THE RESIDENTIAL SIDE OF THE WALL.
- MATCH STAIN COLOR OF EXISTING WALL ON NORTH SIDE OF THE HIGHWAY.
- "FRONT" DENOTES THE HIGHWAY SIDE OF THE WALL AND "BACK" DENOTES THE RESIDENTIAL SIDE OF THE WALL.
- LEAVE AN APPROX. 4" SPACE BETWEEN THE BOTTOM PLANK AND THE GROUND TO ALLOW FOR DRAINAGE UNDER THE WALL.



DISTRICT \*: METRO  
PLOT NAME: 67\_nw1.2  
PATH & FILENAME: S:\Design\01\0215\067\In\021567\_nw1.dgn

DRAWN BY: HG

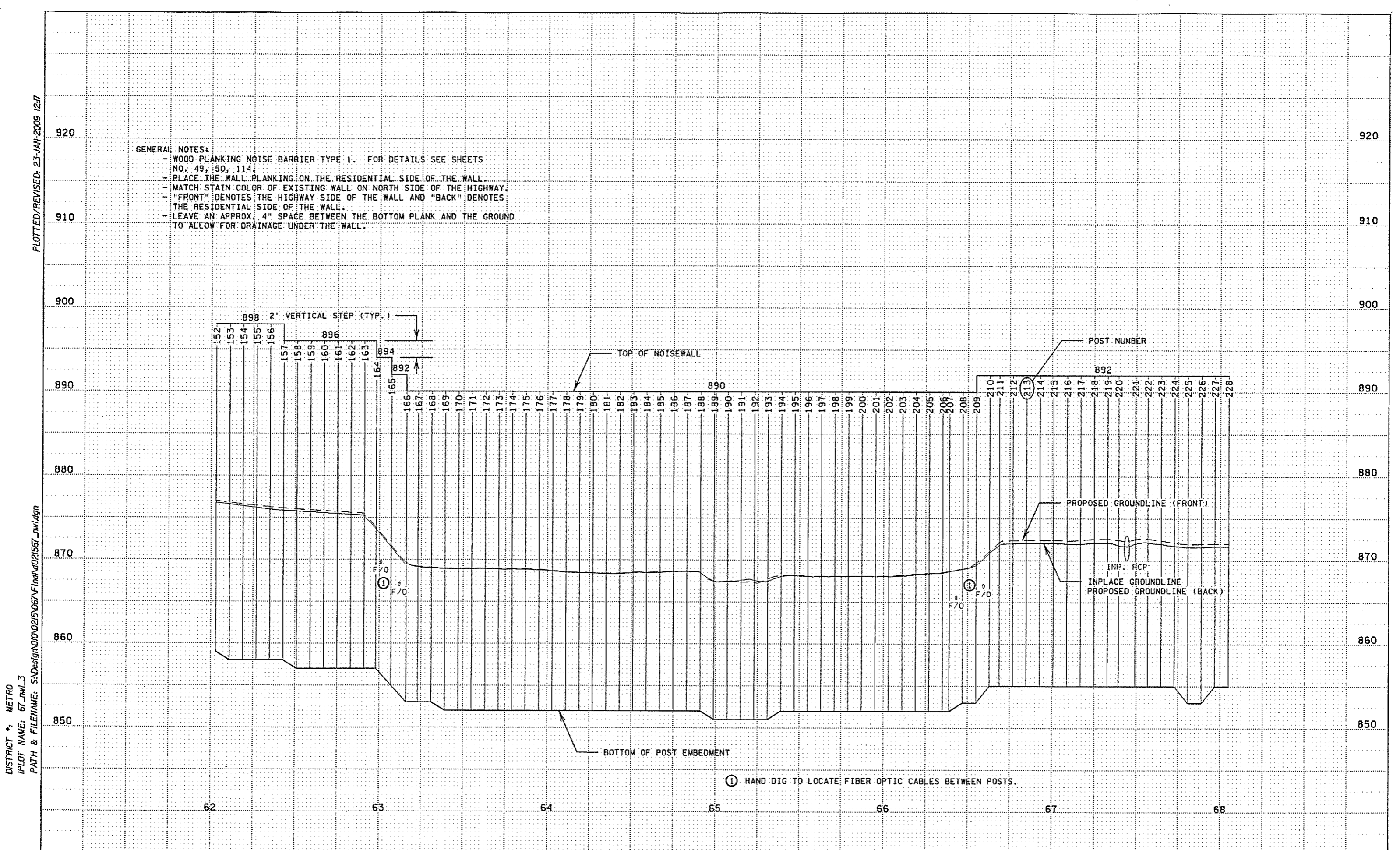
CHECKED BY: PAD

CERTIFIED BY Peter Daniel  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

NOISE WALL PROFILE - NWall1 STA. 56+11.02 TO 62+03.02

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 97 OF 222 SHEETS



GENERAL NOTES:  
 - WOOD PLANKING NOISE BARRIER TYPE 1. FOR DETAILS SEE SHEETS NO. 49, 50, 114.  
 - PLACE THE WALL PLANKING ON THE RESIDENTIAL SIDE OF THE WALL.  
 - MATCH STAIN COLOR OF EXISTING WALL ON NORTH SIDE OF THE HIGHWAY.  
 - "FRONT" DENOTES THE HIGHWAY SIDE OF THE WALL AND "BACK" DENOTES THE RESIDENTIAL SIDE OF THE WALL.  
 - LEAVE AN APPROX. 4" SPACE BETWEEN THE BOTTOM PLANK AND THE GROUND TO ALLOW FOR DRAINAGE UNDER THE WALL.

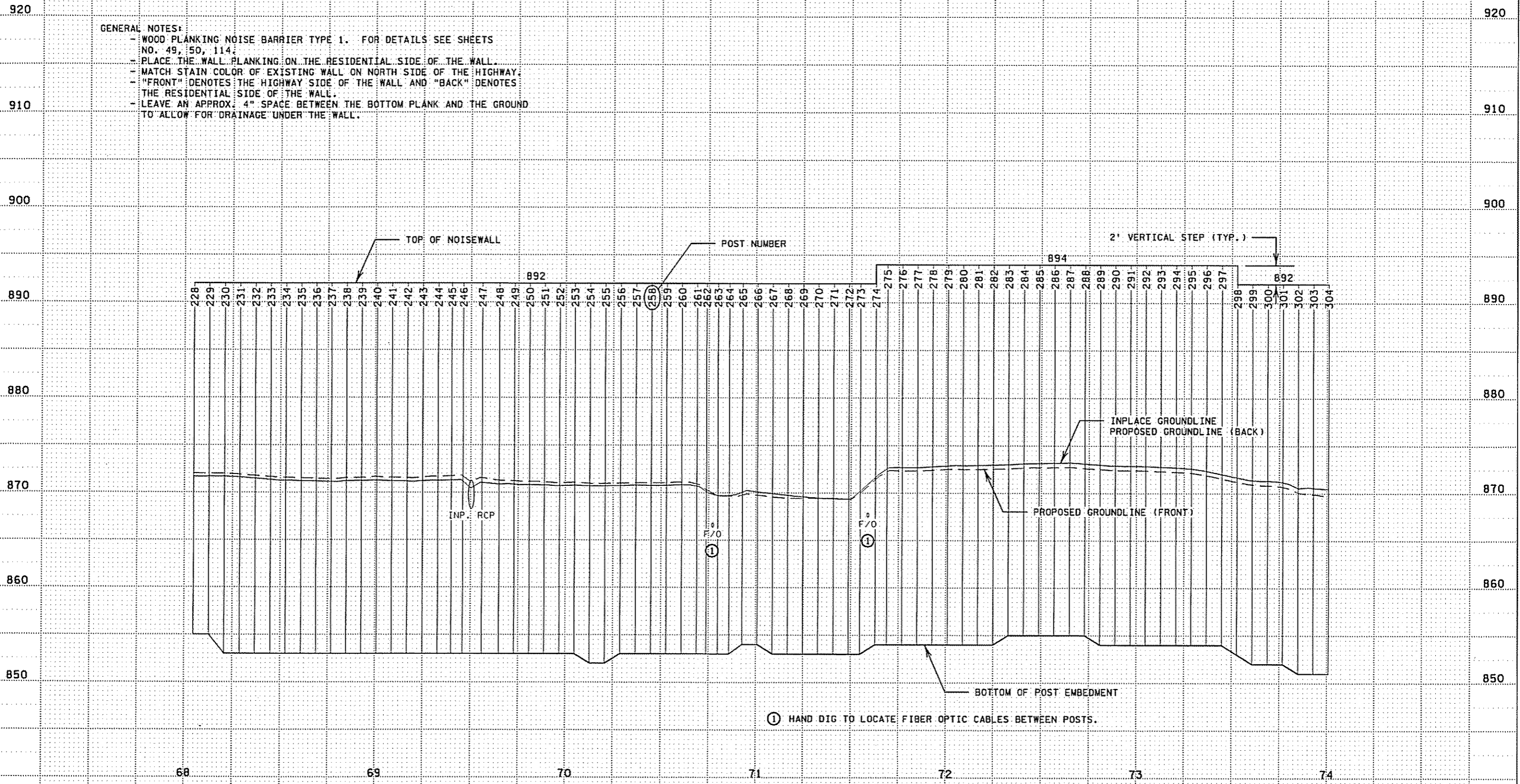
DISTRICT #: METRO  
 PLOT NAME: 67\_nwl\_3  
 PATH & FILENAME: S:\Design\0215\067\In\021567\_nwl.dgn  
 PLOTTED/REVISED: 23-JAN-2009 12:17

PLOTTED/REVISED: 23-JAN-2009 12:47

GENERAL NOTES:

- WOOD PLANKING NOISE BARRIER TYPE 1. FOR DETAILS SEE SHEETS NO. 49, 50, 114.
- PLACE THE WALL PLANKING ON THE RESIDENTIAL SIDE OF THE WALL.
- MATCH STAIN COLOR OF EXISTING WALL ON NORTH SIDE OF THE HIGHWAY.
- "FRONT" DENOTES THE HIGHWAY SIDE OF THE WALL AND "BACK" DENOTES THE RESIDENTIAL SIDE OF THE WALL.
- LEAVE AN APPROX. 4" SPACE BETWEEN THE BOTTOM PLANK AND THE GROUND TO ALLOW FOR DRAINAGE UNDER THE WALL.

DISTRICT #: METRO  
PLOT NAME: 67\_nwl\_4  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_nwl.dgn



**NOISE WALL PROFILE - NWall1 STA. 68+04.86 TO 74+00.86**

DRAWN BY: HG

CHECKED BY: PAD

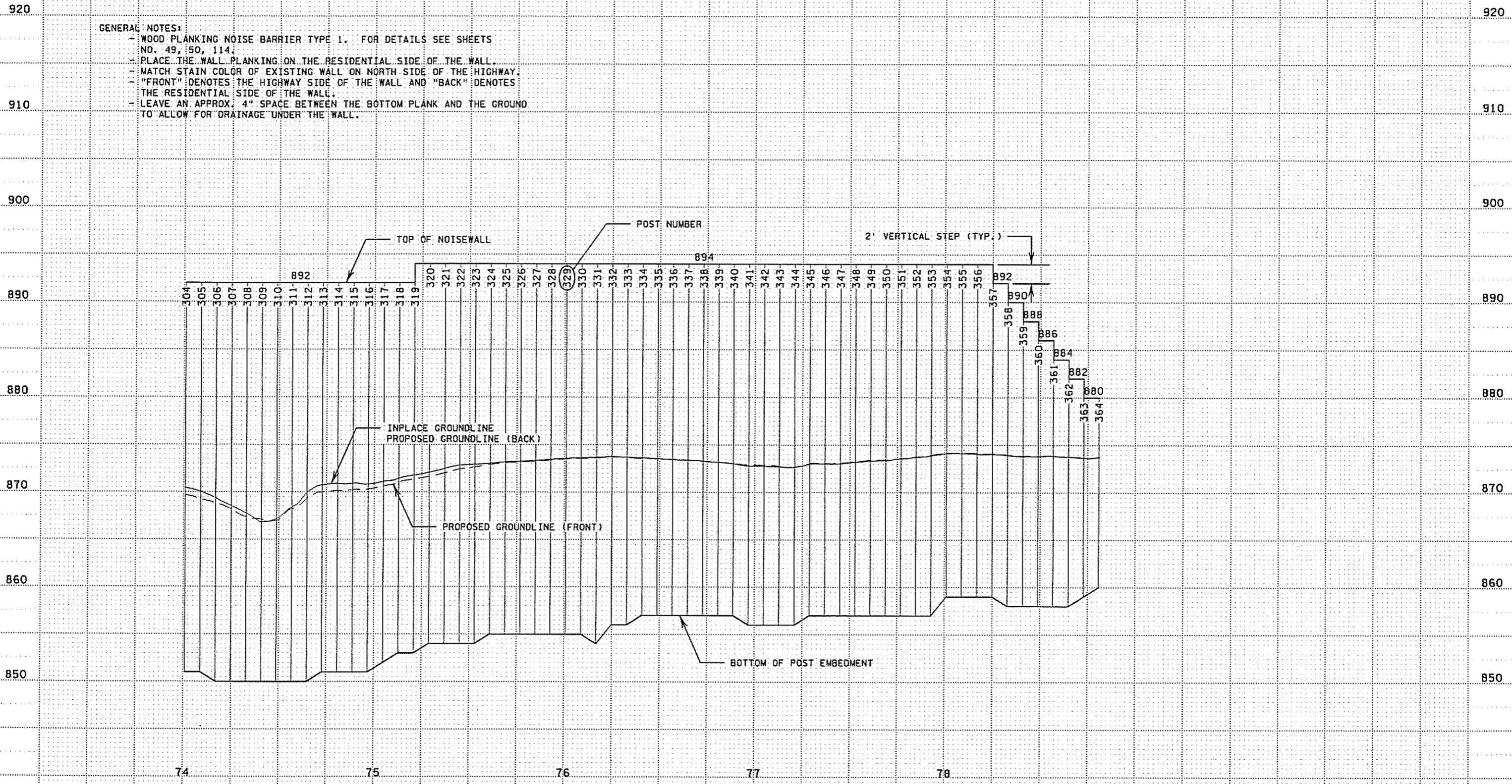
CERTIFIED BY *Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 99 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
PLOT NAME: 67\_nwl\_5  
PATH & FILENAME: S:\Design\0215\06\Final\021567\_nwl.dgn



GENERAL NOTES:  
 - WOOD PLANKING NOISE BARRIER TYPE 1. FOR DETAILS SEE SHEETS NO. 49, 50, 114.  
 - PLACE THE WALL PLANKING ON THE RESIDENTIAL SIDE OF THE WALL.  
 - MATCH STAIN COLOR OF EXISTING WALL ON NORTH SIDE OF THE HIGHWAY.  
 - "FRONT" DENOTES THE HIGHWAY SIDE OF THE WALL AND "BACK" DENOTES THE RESIDENTIAL SIDE OF THE WALL.  
 - LEAVE AN APPROX. 4" SPACE BETWEEN THE BOTTOM PLANK AND THE GROUND TO ALLOW FOR DRAINAGE UNDER THE WALL.

**NOISE WALL PROFILE - NWALL1 STA. 74+00.86 TO 78+81.36**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY Peter Danial  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 100 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IFLOT NAME: 67NW1.TBI  
 PATH & FILENAME: S:\Design\010\0215\067\Final\NWALL1.TBldgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.
		LEFT ④	RIGHT ⑤														
		1	50+00.50														
2	50+08.50	881.47	881.14	1:4	890	881.80	65.57	65.57	890	8.53	0	18	9.47	872	1.9		2
3	50+16.50	881.43	881.04	1:4	892	881.87	81.01	81.01	892	10.57	0	21	10.43	871	2.1		3
4	50+24.50	881.54	881.11	1:4	894	881.87	97.01	97.01	894	12.46	0	23	10.54	871	2.1		4
5	50+32.50	881.41	881.00	1:4	896	881.74	114.05	114.05	896	14.59	0	26	11.41	870	2.3		5
6	50+40.50	880.70	880.33	1:4	898	881.03	135.73	135.73	898	17.30	0	35	17.70	863		3.6	6
7	50+48.50	880.56	880.27	1:4	900	881.01	151.89	151.89	900	19.44	0	37	17.56	863		3.6	7
8	50+56.50	880.68	880.38	1:4	900	881.01	151.89	151.89	900	19.32	0	37	17.68	863		3.6	8
9	50+64.50	880.64	880.33	1:4	900	880.97	152.21	152.21	900	19.36	0	37	17.64	863		3.6	9
10	50+72.50	880.57	880.26	1:4	900	880.90	152.77	152.77	900	19.43	0	37	17.57	863		3.6	10
11	50+80.50	880.47	880.11	1:4	900	880.80	153.57	153.57	900	19.53	0	37	17.47	863		3.5	11
12	50+88.50	880.47	880.11	1:4	900	880.80	153.57	153.57	900	19.53	0	37	17.47	863		3.5	12
13	50+96.50	880.46	880.11	1:4	900	880.79	153.65	153.65	900	19.54	0	37	17.46	863		3.5	13
14	51+04.50	880.35	880.01	1:4	900	880.68	154.53	154.53	900	19.65	0	37	17.35	863		3.5	14
15	51+12.50	880.09	879.63	1:4	900	880.42	156.61	156.61	900	19.91	0	37	17.09	863		3.4	15
16	51+20.50	878.98	878.67	1:4	900	880.36	157.09	157.09	900	21.02	0	40	18.98	860		3.9	16
17	51+28.50	880.03	879.54	1:4	900	880.36	157.09	157.09	900	19.97	0	39	19.03	861		3.8	17
18	51+36.50	879.80	879.43	1:4	900	880.13	158.93	158.93	900	20.20	0	39	18.80	861		3.8	18
19	51+44.50	879.47	879.32	1:4	900	879.80	161.57	161.57	900	20.53	0	39	18.47	861		3.8	19
20	51+52.50	878.08	877.84	1:4	900	878.41	172.69	172.69	900	21.92	0	40	18.08	860		3.7	20
21	51+60.50	877.85	877.46	1:4	900	878.28	173.73	173.73	900	22.15	0	41	18.85	859		3.8	21
22	51+68.50	877.95	877.51	1:4	900	878.52	171.81	171.81	900	22.05	0	41	18.95	859		3.8	22
23	51+76.50	878.19	877.74	1:4	900	878.52	171.81	171.81	900	21.81	0	40	18.19	860		3.7	23
24	51+84.50	878.16	877.74	1:4	900	878.49	172.05	172.05	900	21.84	0	40	18.16	860		3.7	24
25	51+92.50	877.88	877.50	1:4	900	878.21	174.29	174.29	900	22.12	0	41	18.88	859		3.8	25
26	52+00.50	877.75	877.36	1:4	900	878.08	175.33	175.33	900	22.25	0	41	18.75	859		3.8	26
27	52+08.50	877.73	877.35	1:4	900	878.06	175.49	175.49	900	22.27	0	41	18.73	859		3.8	27
28	52+16.50	877.70	877.33	1:4	900	878.03	175.73	175.73	900	22.30	0	41	18.70	859		3.8	28
29	52+24.50	877.63	877.26	1:4	900	878.08	175.33	175.33	900	22.37	0	41	18.63	859		3.8	29
30	52+32.50	877.75	877.45	1:10	900	878.55	85.79	85.79	900	22.25	0	39	16.75	861		3.4	30
SUBTOTALS FROM THIS SHEET							4381.18	4381.18				1074			10.0	91.6	

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
- ② COMPUTED USING A 36" DIAMETER HOLE AND DEDUCTING FOR A 12" X 18" POST.
- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

PLOTTED/REVISED: 23-JAN-2009 12:47

DISTRICT #: METRO  
 IPLOT NAME: 67NW1.TB2  
 PATH & FILENAME: S:\Des\ign\01\0215\067\Final\NWALL1.TB1.dgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.	
		LEFT ④	RIGHT ⑤															
31	52+36.50	878.22	878.00	1:10	900	880.15	158.77	158.77	900	21.78	0	38	16.22	862		3.3	31	
32	52+44.50	879.82	879.59	1:10	902	881.80	161.57	161.57	902	22.18	0	39	16.82	863		3.4	32	
33	52+52.50	881.47	881.23	1:10	904	883.61	163.09	163.09	904	22.53	0	39	16.47	865		3.3	33	
34	52+60.50	883.28	883.05	1:10	904	884.60	87.67	87.67	904	20.72	0	37	16.28	867		3.3	34	
35	52+65.02	884.27	884.06	1:10	904	884.78	153.73	153.73	904	19.73	0	37	17.27	867		3.5	35	
36	52+73.02	884.45	884.06	1:4	904	884.78	192.17	192.17	904	19.55	0	37	17.45	867		3.5	36	
37	52+83.02	884.41	884.02	1:4	904	884.74	154.05	154.05	904	19.59	0	32	12.41	872		2.5	37	
38	52+91.02	884.38	883.99	1:4	904	884.71	154.29	154.29	904	19.62	0	32	12.38	872	2.5		38	
39	52+99.02	884.32	883.93	1:4	904	884.65	154.77	154.77	904	19.68	0	32	12.32	872	2.5		39	
40	53+07.02	884.25	883.87	1:4	904	884.58	155.33	155.33	904	19.75	0	32	12.25	872	2.4		40	
41	53+15.02	884.18	883.82	1:4	904	884.51	155.89	155.89	904	19.82	0	32	12.18	872	2.4		41	
42	53+23.02	884.16	883.79	1:4	904	884.49	156.05	156.05	904	19.84	0	32	12.16	872	2.4		42	
43	53+31.02	884.06	883.69	1:4	904	884.39	156.85	156.85	904	19.94	0	32	12.06	872	2.4		43	
44	53+39.02	883.73	883.32	1:4	904	884.06	159.49	159.49	904	20.27	0	34	13.73	870	2.7		44	
45	53+47.02	883.61	883.20	1:4	904	883.94	160.45	160.45	904	20.39	0	34	13.61	870	2.7		45	
46	53+55.02	883.52	883.10	1:4	904	883.85	161.17	161.17	904	20.48	0	34	13.52	870	2.7		46	
47	53+63.02	883.31	882.92	1:4	904	883.64	162.85	162.85	904	20.69	0	34	13.31	870	2.7		47	
48	53+71.02	883.09	882.69	1:4	904	883.42	164.61	164.61	904	20.91	0	34	13.09	870	2.6		48	
49	53+79.02	882.96	882.58	1:4	904	883.33	165.33	165.33	904	21.04	0	34	12.96	870	2.6		49	
50	53+87.02	883.00	882.63	1:4	904	883.39	164.85	164.85	904	21.00	0	34	13.00	870	2.6		50	
51	53+95.02	883.06	882.68	1:4	904	883.39	164.85	164.85	904	20.94	0	34	13.06	870	2.6		51	
52	54+03.02	882.81	882.44	1:4	904	883.14	166.85	166.85	904	21.19	0	35	13.81	869	2.8		52	
53	54+11.02	882.47	882.09	1:4	904	882.80	169.57	169.57	904	21.53	0	35	13.47	869	2.7		53	
54	54+19.02	882.36	881.97	1:4	902	882.69	154.45	154.45	904	21.64	0	35	13.36	869	2.7		54	
55	54+27.02	882.33	881.93	1:4	902	882.66	154.69	154.69	902	19.67	0	32	12.33	870	2.5		55	
56	54+35.02	882.25	881.84	1:4	902	882.58	155.33	155.33	902	19.75	0	32	12.25	870	2.4		56	
57	54+43.02	882.15	881.74	1:4	902	882.48	156.13	156.13	902	19.85	0	32	12.15	870	2.4		57	
58	54+51.02	882.06	881.67	1:4	902	882.42	156.61	156.61	902	19.94	0	32	12.06	870	2.4		58	
59	54+59.02	882.09	881.70	1:4	902	882.44	156.45	156.45	902	19.91	0	32	12.09	870	2.4		59	
60	54+67.02	882.11	881.72	1:4	902	882.44	156.45	156.45	902	19.89	0	32	12.11	870	2.4		60	
SUBTOTALS FROM THIS SHEET							4734.46	4734.46				1020			58.6	22.9		
SUBTOTALS							9115.64	9115.64				2094			68.7	114.5		

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
- ② COMPUTED USING A 36" DIAMETER HOLE AND DEDUCTING FOR A 12" X 18" POST.
- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY Peter Daniel  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO.102 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IPLOT NAME: 67NW1\_TB3  
 PATH & FILENAME: S:\Design\010215\067\Final\NWALL1\_TB.dgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.
		LEFT ④	RIGHT ⑤														
		61	54+75.02														
62	54+83.02	881.96	881.59	1:4	902	882.29	157.65	157.65	902	20.04	0	39	18.96	863		3.8	62
63	54+91.02	881.88	881.51	1:4	902	882.21	158.29	158.29	902	20.12	0	39	18.88	863		3.8	63
64	54+99.02	881.84	881.48	1:4	902	882.17	158.61	158.61	902	20.16	0	39	18.84	863		3.8	64
65	55+07.02	881.81	881.45	1:4	902	882.14	158.85	158.85	902	20.19	0	39	18.81	863		3.8	65
66	55+15.02	881.69	881.29	1:4	902	882.02	159.81	159.81	902	20.31	0	39	18.69	863		3.8	66
67	55+23.02	881.42	881.01	1:4	902	881.75	161.97	161.97	902	20.58	0	39	18.42	863		3.7	67
68	55+31.02	881.16	880.75	1:4	902	881.49	164.05	164.05	902	20.84	0	39	18.16	863		3.7	68
69	55+39.02	881.00	880.59	1:4	902	881.33	165.33	165.33	902	21.00	0	39	18.00	863		3.6	69
70	55+47.02	880.84	880.43	1:4	902	881.17	166.61	166.61	902	21.16	0	40	18.84	862		3.8	70
71	55+55.02	880.71	880.31	1:4	902	881.04	167.65	167.65	902	21.29	0	40	18.71	862		3.8	71
72	55+63.02	880.64	880.24	1:4	902	880.97	168.21	168.21	902	21.36	0	40	18.64	862		3.8	72
73	55+71.02	880.56	880.16	1:4	902	880.89	168.85	168.85	902	21.44	0	40	18.56	862		3.7	73
74	55+79.02	880.42	879.99	1:4	900	880.75	153.97	153.97	900	21.58	0	40	18.42	862		3.7	74
75	55+87.02	880.14	879.69	1:4	900	880.47	156.21	156.21	900	19.86	0	38	18.14	862		3.6	75
76	55+95.02	879.89	879.46	1:4	900	880.22	158.21	158.21	900	20.11	0	39	18.89	861		3.8	76
77	56+03.02	879.77	879.34	1:4	900	880.10	159.17	159.17	900	20.23	0	39	18.77	861		3.8	77
78	56+11.02	879.66	879.23	1:4	900	879.99	160.05	160.05	900	20.34	0	39	18.66	861		3.8	78
79	56+19.02	879.60	879.19	1:4	900	879.93	160.53	160.53	900	20.40	0	39	18.60	861		3.8	79
80	56+27.02	879.59	879.18	1:4	900	879.92	160.61	160.61	900	20.41	0	39	18.59	861		3.7	80
81	56+35.02	879.57	879.16	1:4	900	879.90	160.77	160.77	900	20.43	0	39	18.57	861		3.7	81
82	56+43.02	879.53	879.14	1:4	900	879.86	161.09	161.09	900	20.47	0	39	18.53	861		3.7	82
83	56+51.02	879.47	879.10	1:4	900	879.80	161.57	161.57	900	20.53	0	39	18.47	861		3.7	83
84	56+59.02	879.43	879.05	1:4	900	879.76	161.89	161.89	900	20.57	0	39	18.43	861		3.7	84
85	56+67.02	879.39	879.03	1:4	900	879.73	162.13	162.13	900	20.60	0	39	18.40	861		3.7	85
86	56+75.02	879.40	879.05	1:4	900	879.74	162.05	162.05	900	20.59	0	39	18.41	861		3.7	86
87	56+83.02	879.41	879.07	1:4	900	879.74	162.05	162.05	900	20.60	0	39	18.40	861		3.7	87
88	56+91.02	879.40	879.07	1:4	900	879.73	162.13	162.13	900	20.82	0	39	18.18	861		3.7	88
89	56+99.02	879.18	878.88	1:4	900	879.51	163.89	163.89	900	21.07	0	40	18.93	860		3.8	89
90	57+07.02	878.93	878.62	1:4	900	879.26	165.89	165.89									90
SUBTOTALS FROM THIS SHEET							4845.21	4845.21				1168			2.4	108.7	
SUBTOTALS							13960.85	13960.85				3262			71.1	223.2	

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
- ② COMPUTED USING A 36" DIAMETER HOLE AND DEDUCTING FOR A 12" X 18" POST.
- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IPLOT NAME: 67NWLLTB4  
 PATH & FILENAME: S:\Des\gn\0100215\06\Fix\NWALL1.TBldgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.	
		LEFT ④	RIGHT ⑤															
		④	⑤															
91	57+15.02	878.70	878.32	1:4	900	879.03	167.73	167.73	900	21.30	0	40	18.70	860		3.8	91	
92	57+23.02	878.54	878.16	1:4	900	878.87	169.01	169.01	900	21.46	0	40	18.54	860		3.7	92	
93	57+31.02	878.34	877.98	1:4	898	878.67	154.61	154.61	898	21.66	0	40	18.34	860		3.7	93	
94	57+39.02	878.10	877.75	1:4	898	878.43	156.53	156.53	898	19.90	0	39	19.10	859		3.9	94	
95	57+47.02	877.94	877.57	1:4	898	878.27	157.81	157.81	898	20.06	0	39	18.94	859		3.8	95	
96	57+55.02	877.88	877.49	1:4	898	878.21	158.29	158.29	898	20.12	0	39	18.88	859		3.8	96	
97	57+63.02	877.84	877.46	1:4	898	878.17	158.61	158.61	898	20.16	0	39	18.84	859		3.8	97	
98	57+71.02	877.83	877.47	1:4	898	878.16	158.69	158.69	898	20.17	0	39	18.83	859		3.8	98	
99	57+79.02	877.77	877.42	1:4	898	878.10	159.17	159.17	898	20.23	0	39	18.77	859		3.8	99	
100	57+87.02	877.70	877.35	1:4	898	878.03	159.73	159.73	898	20.30	0	39	18.70	859		3.8	100	
101	57+95.02	877.66	877.30	1:4	898	878.08	199.17	199.17	898	20.34	0	39	18.66	859		3.8	101	
102	58+05.02	877.75	877.38	1:4	898	878.08	159.33	159.33	898	20.25	0	39	18.75	859		3.8	102	
103	58+13.02	877.68	877.27	1:4	898	878.01	119.92	119.92	898	20.32	0	39	18.68	859		3.8	103	
104	58+19.02	877.56	877.16	1:4	898	877.89	160.85	160.85	898	20.44	0	39	18.56	859		3.7	104	
105	58+27.02	877.38	876.99	1:4	898	877.71	162.29	162.29	898	20.62	0	39	18.38	859		3.7	105	
106	58+35.02	877.24	876.90	1:4	898	877.57	163.41	163.41	898	20.76	0	39	18.24	859		3.7	106	
107	58+43.02	877.06	876.73	1:4	898	877.39	164.85	164.85	898	20.94	0	39	18.06	859		3.7	107	
108	58+51.02	876.90	876.57	1:4	898	877.23	166.13	166.13	898	21.10	0	40	18.90	858		3.8	108	
109	58+59.02	876.81	876.48	1:4	898	877.14	166.85	166.85	898	21.19	0	40	18.81	858		3.8	109	
110	58+67.02	876.76	876.44	1:4	898	877.09	167.25	167.25	898	21.24	0	40	18.76	858		3.8	110	
111	58+75.02	876.72	876.37	1:4	898	877.05	167.57	167.57	898	21.28	0	40	18.72	858		3.8	111	
112	58+83.02	876.62	876.27	1:4	898	876.95	168.37	168.37	898	21.38	0	40	18.62	858		3.8	112	
113	58+91.02	876.53	876.13	1:4	898	876.86	169.09	169.09	898	21.47	0	40	18.53	858		3.7	113	
114	58+99.02	876.46	876.02	1:4	898	876.79	169.65	169.65	898	21.54	0	40	18.46	858		3.7	114	
115	59+07.02	876.43	876.03	1:4	898	876.78	169.73	169.73	898	21.57	0	40	18.43	858		3.7	115	
116	59+15.02	876.45	876.08	1:4	898	876.90	168.77	168.77	898	21.55	0	40	18.45	858		3.7	116	
117	59+23.02	876.57	876.19	1:4	898	877.00	167.97	167.97	898	21.43	0	40	18.57	858		3.8	117	
118	59+31.02	876.67	876.27	1:4	898	877.10	167.17	167.17	898	21.33	0	40	18.67	858		3.8	118	
119	59+39.02	876.77	876.37	1:4	898	877.22	166.21	166.21	898	21.23	0	40	18.77	858		3.8	119	
120	59+47.02	876.89	876.50	1:4	898	877.36	165.09	165.09	898	21.11	0	40	18.89	858		3.8	120	
SUBTOTALS FROM THIS SHEET							4909.95	4909.95							0.0	113.1		
SUBTOTALS							18870.80	18870.80					1186			71.1	336.3	

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
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- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

DRAWN BY: HG      CHECKED BY: PAD      CERTIFIED BY: Peter Daniel LIC. NO. 45053      DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 104 OF 222 SHEETS



PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IPLOT NAME: 67NW1.TB5  
 PATH & FILENAME: S:\Design\01\0215\067\Final\NWALL1.TB.dgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.	
		LEFT ④	RIGHT ⑤															
		121	59+55.02															877.03
122	59+63.02	877.13	876.74	1:4	898	877.56	163.49	163.49	898	20.87	0	39	18.13	859		3.7	122	
123	59+71.02	877.23	876.83	1:4	898	877.71	162.29	162.29	898	20.77	0	39	18.23	859		3.7	123	
124	59+79.02	877.38	876.98	1:4	898	877.83	161.33	161.33	898	20.62	0	39	18.38	859		3.7	124	
125	59+87.02	877.50	877.10	1:4	898	877.97	160.21	160.21	898	20.50	0	39	18.50	859		3.7	125	
126	59+95.02	877.64	877.24	1:4	898	878.11	159.09	159.09	898	20.36	0	39	18.64	859		3.8	126	
127	60+03.02	877.78	877.38	1:4	898	878.20	158.37	158.37	898	20.22	0	39	18.78	859		3.8	127	
128	60+11.02	877.87	877.48	1:4	898	878.31	157.49	157.49	898	20.13	0	39	18.87	859		3.8	128	
129	60+19.02	877.98	877.59	1:4	898	878.35	157.17	157.17	898	20.02	0	39	18.98	859		3.8	129	
130	60+27.02	878.02	877.64	1:4	898	878.38	156.93	156.93	898	19.98	0	37	17.02	861		3.4	130	
131	60+35.02	878.05	877.68	1:4	898	878.46	156.29	156.29	898	19.95	0	37	17.05	861		3.4	131	
132	60+43.02	878.13	877.76	1:4	898	878.50	155.97	155.97	898	19.87	0	37	17.13	861		3.5	132	
133	60+51.02	878.17	877.79	1:4	898	878.54	155.65	155.65	898	19.83	0	37	17.17	861		3.5	133	
134	60+59.02	878.21	877.84	1:4	898	878.57	155.41	155.41	898	19.79	0	37	17.21	861		3.5	134	
135	60+67.02	878.24	877.85	1:4	898	878.62	155.01	155.01	898	19.76	0	37	17.24	861		3.5	135	
136	60+75.02	878.29	877.91	1:4	898	878.64	154.85	154.85	898	19.71	0	37	17.29	861		3.5	136	
137	60+83.02	878.31	877.92	1:4	898	878.64	154.85	154.85	898	19.69	0	37	17.31	861		3.5	137	
138	60+91.02	878.29	877.90	1:4	898	878.62	155.01	155.01	898	19.71	0	37	17.29	861		3.5	138	
139	60+99.02	878.24	877.83	1:4	898	878.57	155.41	155.41	898	19.76	0	37	17.24	861		3.5	139	
140	61+07.02	878.13	877.71	1:4	898	878.46	156.29	156.29	898	19.87	0	37	17.13	861		3.4	140	
141	61+15.02	878.02	877.62	1:4	898	878.35	157.17	157.17	898	19.98	0	37	17.02	861		3.4	141	
142	61+23.02	877.94	877.53	1:4	898	878.27	157.81	157.81	898	20.06	0	39	18.94	859		3.8	142	
143	61+31.02	877.86	877.45	1:4	898	878.19	158.45	158.45	898	20.14	0	39	18.86	859		3.8	143	
144	61+39.02	877.76	877.35	1:4	898	878.09	159.25	159.25	898	20.24	0	39	18.76	859		3.8	144	
145	61+47.02	877.65	877.24	1:4	898	877.98	160.13	160.13	898	20.35	0	39	18.65	859		3.8	145	
146	61+55.02	877.48	877.07	1:4	898	877.81	161.49	161.49	898	20.52	0	39	18.48	859		3.7	146	
147	61+63.02	877.32	876.91	1:4	898	877.65	162.77	162.77	898	20.68	0	39	18.32	859		3.7	147	
148	61+71.02	877.21	876.86	1:4	898	877.54	163.65	163.65	898	20.79	0	39	18.21	859		3.7	148	
149	61+79.02	877.12	876.82	1:4	898	877.45	164.37	164.37	898	20.88	0	39	18.12	859		3.7	149	
150	61+87.02	877.08	876.82	1:4	898	877.42	164.61	164.61	898	20.92	0	39	18.08	859		3.7	150	
SUBTOTALS FROM THIS SHEET							4765.21	4765.21				1146			0.0	108.8		
SUBTOTALS							23636.01	23636.01					5594			71.1	445.1	

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
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- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IPLOT NAME: 67NW1.TB6  
 PATH & FILENAME: S:\Design\010215\067\In\NWALL1.TB6.dgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.	
		LEFT ④	RIGHT ⑤															
		151	61+95.02															877.09
152	62+03.02	877.00	876.80	1:4	898	877.33	165.33	165.33	898	21.00	0	39	18.00	859		3.7	152	
153	62+11.02	876.80	876.60	1:4	898	877.13	166.93	166.93	898	21.20	0	40	18.80	858		3.8	153	
154	62+19.02	876.61	876.39	1:4	898	876.94	168.45	168.45	898	21.39	0	40	18.61	858		3.8	154	
155	62+27.02	876.44	876.19	1:4	898	876.77	169.81	169.81	898	21.56	0	40	18.44	858		3.8	155	
156	62+35.02	876.28	875.99	1:4	898	876.61	171.09	171.09	898	21.72	0	40	18.28	858		3.7	156	
157	62+43.02	876.14	875.85	1:4	898	876.47	156.21	156.21	898	21.86	0	40	18.14	858		3.7	157	
158	62+51.02	876.02	875.76	1:4	896	876.35	157.17	157.17	896	19.98	0	39	19.02	857		3.9	158	
159	62+59.02	875.91	875.67	1:4	896	876.24	158.05	158.05	896	20.09	0	39	18.91	857		3.9	159	
160	62+67.02	875.82	875.57	1:4	896	876.15	158.77	158.77	896	20.18	0	39	18.82	857		3.8	160	
161	62+75.02	875.72	875.47	1:4	896	876.05	159.57	159.57	896	20.28	0	39	18.72	857		3.8	161	
162	62+83.02	875.62	875.37	1:4	896	875.95	160.37	160.37	896	20.38	0	39	18.62	857		3.8	162	
163	62+91.02	875.33	875.09	1:4	896	875.66	142.36	142.36	896	20.67	0	39	18.33	857		3.7	163	
164	62+98.02	873.86	873.65	1:10	894	874.19	178.26	178.26	894	22.14	0	39	16.86	857		3.4	164	
165	63+07.02	871.71	871.51	1:10	892	872.04	179.61	179.61	892	22.29	0	39	16.71	855		3.4	165	
166	63+16.02	869.69	869.52	1:10	890	870.02	139.84	139.84	890	22.31	0	39	16.69	853		3.4	166	
167	63+23.02	869.20	869.14	1:10	890	869.53	163.73	163.73	890	20.80	0	37	16.20	853		3.3	167	
168	63+31.02	869.08	869.01	1:10	890	869.41	164.69	164.69	890	20.92	0	37	16.08	853		3.3	168	
169	63+39.02	868.99	868.92	1:10	890	869.32	165.41	165.41	890	21.01	0	38	16.99	852		3.5	169	
170	63+47.02	868.95	868.88	1:10	890	869.30	165.57	165.57	890	21.05	0	38	16.95	852		3.5	170	
171	63+55.02	868.97	868.90	1:10	890	869.30	165.57	165.57	890	21.03	0	38	16.97	852		3.5	171	
172	63+63.02	868.96	868.91	1:10	890	869.29	165.65	165.65	890	21.04	0	38	16.96	852		3.5	172	
173	63+71.02	868.92	868.87	1:10	890	869.26	165.89	165.89	890	21.08	0	38	16.92	852		3.5	173	
174	63+79.02	868.93	868.87	1:10	890	869.26	165.89	165.89	890	21.07	0	38	16.93	852		3.5	174	
175	63+87.02	868.91	868.83	1:10	890	869.24	166.05	166.05	890	21.09	0	38	16.91	852		3.5	175	
176	63+95.02	868.85	868.78	1:10	890	869.18	166.53	166.53	890	21.15	0	38	16.85	852		3.5	176	
177	64+03.02	868.73	868.66	1:10	890	869.06	167.49	167.49	890	21.27	0	38	16.73	852		3.4	177	
178	64+11.02	868.57	868.52	1:10	890	868.90	168.77	168.77	890	21.43	0	38	16.57	852		3.4	178	
179	64+19.02	868.50	868.48	1:10	890	868.83	169.33	169.33	890	21.50	0	38	16.50	852		3.4	179	
180	64+27.02	868.47	868.43	1:10	890	868.80	169.57	169.57	890	21.53	0	38	16.47	852		3.4	180	
SUBTOTALS FROM THIS SHEET							4926.66	4926.66							0.0	107.3		
SUBTOTALS							28562.66	28562.66								71.1	552.4	

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
- ② COMPUTED USING A 36" DIAMETER HOLE AND DEDUCTING FOR A 12" X 18" POST.
- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IPLOT NAME: 67NW1.TBT  
 PATH & FILENAME: S:\Des\gn\0215\067\In\NWALL1.TBldgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT)	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.	
		LEFT ④	RIGHT ⑤															
		③	③															
181	64+35.02	868.40	868.36	1:10	890	868.75	169.97	169.97	890	21.60	0	38	16.40	852		3.4	181	
182	64+43.02	868.42	868.37	1:10	890	868.86	169.09	169.09	890	21.58	0	38	16.42	852		3.4	182	
183	64+51.02	868.53	868.48	1:10	890	868.87	169.01	169.01	890	21.47	0	38	16.53	852		3.4	183	
184	64+59.02	868.54	868.47	1:10	890	868.92	168.61	168.61	890	21.46	0	38	16.54	852		3.4	184	
185	64+67.02	868.59	868.52	1:10	890	869.02	167.81	167.81	890	21.41	0	38	16.59	852		3.4	185	
186	64+75.02	868.69	868.63	1:10	890	869.02	167.81	167.81	890	21.31	0	38	16.69	852		3.4	186	
187	64+83.02	868.69	868.63	1:10	890	869.02	167.81	167.81	890	21.31	0	38	16.69	852		3.4	187	
188	64+91.02	868.49	868.46	1:10	890	868.82	169.41	169.41	890	21.51	0	38	16.49	852		3.4	188	
189	64+99.02	867.48	867.49	1:10	890	867.82	177.41	177.41	890	22.51	0	39	16.49	851		3.4	189	
190	65+07.02	867.49	867.45	1:10	890	867.92	176.61	176.61	890	22.51	0	39	16.49	851		3.4	190	
191	65+15.02	867.37	867.59	1:10	890	867.92	176.61	176.61	890	22.41	0	39	16.59	851		3.4	191	
192	65+23.02	867.33	867.59	1:10	890	868.07	175.41	175.41	890	22.41	0	39	16.59	851		3.4	192	
193	65+31.02	867.74	867.49	1:10	890	868.50	171.97	171.97	890	22.26	0	39	16.74	851		3.4	193	
194	65+39.02	868.17	868.05	1:10	890	868.55	171.57	171.57	890	21.83	0	38	16.17	852		3.3	194	
195	65+47.02	868.22	868.15	1:10	890	868.55	171.57	171.57	890	21.78	0	38	16.22	852		3.3	195	
196	65+55.02	868.11	868.04	1:10	890	868.44	172.45	172.45	890	21.89	0	38	16.11	852		3.3	196	
197	65+63.02	868.10	868.03	1:10	890	868.44	172.45	172.45	890	21.90	0	38	16.10	852		3.3	197	
198	65+71.02	868.11	868.04	1:10	890	868.44	172.45	172.45	890	21.89	0	38	16.11	852		3.3	198	
199	65+79.02	868.11	868.06	1:10	890	868.45	172.37	172.37	890	21.89	0	38	16.11	852		3.3	199	
200	65+87.02	868.12	868.08	1:10	890	868.48	172.13	172.13	890	21.88	0	38	16.12	852		3.3	200	
201	65+95.02	868.15	868.06	1:10	890	868.48	172.13	172.13	890	21.85	0	38	16.15	852		3.3	201	
202	66+03.02	868.15	868.05	1:10	890	868.54	171.65	171.65	890	21.85	0	38	16.15	852		3.3	202	
203	66+11.02	868.21	868.12	1:10	890	868.70	170.37	170.37	890	21.79	0	38	16.21	852		3.3	203	
204	66+19.02	868.37	868.28	1:10	890	868.81	169.49	169.49	890	21.63	0	38	16.37	852		3.4	204	
205	66+27.02	868.48	868.40	1:10	890	868.89	168.85	168.85	890	21.52	0	38	16.48	852		3.4	205	
206	66+35.02	868.56	868.49	1:10	890	869.04	83.83	83.83	890	21.44	0	38	16.56	852		3.4	206	
207	66+39.02	868.71	868.66	1:10	890	869.33	165.33	165.33	890	21.29	0	38	16.71	852		3.4	207	
208	66+47.02	869.00	868.95	1:10	890	869.96	160.29	160.29	890	21.00	0	37	16.00	853		3.3	208	
209	66+55.02	869.63	869.39	1:10	892	871.42	164.61	164.61	892	22.37	0	39	16.63	853		3.4	209	
210	66+63.02	871.09	870.86	1:10	892	872.47	114.04	114.04	892	20.91	0	37	16.09	855		3.3	210	
SUBTOTALS FROM THIS SHEET							4973.20	4973.20				1144			0.0	100.8		
SUBTOTALS							33535.87	33535.87					7897			71.1	653.2	

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
- ② COMPUTED USING A 36" DIAMETER HOLE AND DEDUCTING FOR A 12" X 18" POST.
- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IPLOT NAME: 67NWLLTB8  
 PATH & FILENAME: S:\Design\010215\067\Final\NWALL1.TBldgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.	
		LEFT ④	RIGHT ⑤															
211	66+68.86	872.14	871.80	1:10	892	872.72	154.21	154.21	892	19.86	0	37	17.14	855		3.5	211	
212	66+76.86	872.39	872.02	1:4	892	872.77	153.81	153.81	892	19.61	0	37	17.39	855		3.5	212	
213	66+84.86	872.44	872.06	1:4	892	872.77	153.81	153.81	892	19.56	0	37	17.44	855		3.5	213	
214	66+92.86	872.43	872.05	1:4	892	872.76	153.89	153.89	892	19.57	0	37	17.43	855		3.5	214	
215	67+00.86	872.42	872.04	1:4	892	872.75	153.97	153.97	892	19.58	0	37	17.42	855		3.5	215	
216	67+08.86	872.36	871.97	1:4	892	872.75	153.97	153.97	892	19.64	0	37	17.36	855		3.5	216	
217	67+16.86	872.42	871.96	1:4	892	872.90	152.77	152.77	892	19.58	0	37	17.42	855		3.5	217	
218	67+24.86	872.57	872.10	1:4	892	872.91	152.69	152.69	892	19.43	0	37	17.57	855		3.5	218	
219	67+32.86	872.58	872.10	1:4	892	872.91	124.06	124.06	892	19.42	0	37	17.58	855		3.5	219	
220	67+39.36	872.44	871.81	1:4	892	872.89	191.07	191.07	892	19.56	0	37	17.44	855		3.5	220	
221	67+49.36	872.56	872.01	1:4	892	872.94	142.93	142.93	892	19.44	0	37	17.56	855		3.5	221	
222	67+56.86	872.61	872.16	1:4	892	872.94	152.45	152.45	892	19.39	0	37	17.61	855		3.5	222	
223	67+64.86	872.40	871.99	1:4	892	872.73	154.13	154.13	892	19.60	0	37	17.40	855		3.5	223	
224	67+72.86	872.13	871.74	1:4	892	872.46	156.29	156.29	892	19.87	0	37	17.13	855		3.5	224	
225	67+80.86	871.98	871.60	1:4	892	872.31	157.49	157.49	892	20.02	0	39	18.98	853		3.8	225	
226	67+88.86	871.98	871.61	1:4	892	872.35	157.17	157.17	892	20.02	0	39	18.98	853		3.8	226	
227	67+96.86	872.02	871.67	1:4	892	872.35	157.17	157.17	892	19.98	0	37	17.02	855		3.4	227	
228	68+04.86	872.00	871.66	1:4	892	872.33	157.33	157.33	892	20.00	0	37	17.00	855		3.4	228	
229	68+12.86	872.00	871.67	1:4	892	872.33	157.33	157.33	892	20.00	0	37	17.00	855		3.4	229	
230	68+20.86	871.99	871.67	1:4	892	872.32	157.41	157.41	892	20.01	0	39	18.99	853		3.9	230	
231	68+28.86	871.90	871.60	1:4	892	872.23	158.13	158.13	892	20.10	0	39	18.90	853		3.8	231	
232	68+36.86	871.78	871.48	1:4	892	872.11	159.09	159.09	892	20.22	0	39	18.78	853		3.8	232	
233	68+44.86	871.65	871.35	1:4	892	871.98	160.13	160.13	892	20.35	0	39	18.65	853		3.8	233	
234	68+52.86	871.57	871.26	1:4	892	871.90	160.77	160.77	892	20.43	0	39	18.57	853		3.8	234	
235	68+60.86	871.54	871.23	1:4	892	871.87	161.01	161.01	892	20.46	0	39	18.54	853		3.8	235	
236	68+68.86	871.49	871.18	1:4	892	871.82	161.41	161.41	892	20.51	0	39	18.49	853		3.7	236	
237	68+76.86	871.46	871.14	1:4	892	871.89	160.85	160.85	892	20.54	0	39	18.46	853		3.7	237	
238	68+84.86	871.56	871.22	1:4	892	871.92	160.61	160.61	892	20.44	0	39	18.56	853		3.8	238	
239	68+92.86	871.59	871.25	1:4	892	871.98	160.13	160.13	892	20.41	0	39	18.59	853		3.8	239	
240	69+00.86	871.65	871.28	1:4	892	871.98	160.13	160.13	892	20.35	0	39	18.65	853		3.8	240	
SUBTOTALS FROM THIS SHEET							4696.30	4696.30				1136			0.0	108.6		
SUBTOTALS							38232.17	38232.17					9033			71.1	761.9	

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
- ② COMPUTED USING A 36" DIAMETER HOLE AND DEDUCTING FOR A 12" X 18" POST.
- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

PLOTTED/REVISED: 23-JAN-2009 12:47

DISTRICT #: METRO  
 IPLOT NAME: 67NW1.TB9  
 PATH & FILENAME: S:\Design\010215\067\Final\NWALL1.TB1.dgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.
		LEFT ④	RIGHT ⑤														
241	69+08.86	871.59	871.22	1:4	892	871.92	160.61	160.61	892	20.41	0	39	18.59	853		3.8	241
242	69+16.86	871.56	871.18	1:4	892	871.95	160.37	160.37	892	20.44	0	39	18.56	853		3.7	242
243	69+24.86	871.62	871.22	1:4	892	872.02	159.81	159.81	892	20.38	0	39	18.62	853		3.8	243
244	69+32.86	871.69	871.26	1:4	892	872.08	139.42	139.42	892	20.31	0	39	18.69	853		3.8	244
245	69+39.86	871.75	871.30	1:4	892	872.08	119.50	119.50	892	20.25	0	39	18.75	853		3.8	245
246	69+45.86	871.70	871.17	1:4	892	872.03	199.67	199.67	892	20.30	0	39	18.70	853		3.7	246
247	69+55.86	871.54	871.03	1:4	892	871.87	181.14	181.14	892	20.46	0	39	18.54	853		3.7	247
248	69+64.86	871.26	870.87	1:4	892	871.59	163.25	163.25	892	20.74	0	39	18.26	853		3.7	248
249	69+72.86	871.23	870.86	1:4	892	871.56	163.49	163.49	892	20.77	0	39	18.23	853		3.7	249
250	69+80.86	871.16	870.81	1:4	892	871.49	164.05	164.05	892	20.84	0	39	18.16	853		3.7	250
251	69+88.86	871.12	870.79	1:4	892	871.45	164.37	164.37	892	20.88	0	39	18.12	853		3.7	251
252	69+96.86	871.03	870.73	1:4	892	871.40	164.77	164.77	892	20.97	0	39	18.03	853		3.7	252
253	70+04.86	871.07	870.76	1:4	892	871.40	164.77	164.77	892	20.93	0	39	18.07	853		3.7	253
254	70+12.86	870.98	870.70	1:4	892	871.31	165.49	165.49	892	21.02	0	40	18.98	852		3.9	254
255	70+20.86	870.98	870.71	1:4	892	871.34	165.25	165.25	892	21.02	0	40	18.98	852		3.9	255
256	70+28.86	871.01	870.74	1:4	892	871.37	165.01	165.01	892	20.99	0	39	18.01	853		3.7	256
257	70+36.86	871.04	870.77	1:4	892	871.37	165.01	165.01	892	20.96	0	39	18.04	853		3.7	257
258	70+44.86	871.04	870.77	1:4	892	871.40	164.77	164.77	892	20.96	0	39	18.04	853		3.7	258
259	70+52.86	871.07	870.78	1:4	892	871.45	164.37	164.37	892	20.93	0	39	18.07	853		3.7	259
260	70+60.86	871.12	870.83	1:4	892	871.45	164.37	164.37	892	20.88	0	39	18.12	853		3.7	260
261	70+68.86	870.92	870.70	1:4	892	871.25	103.73	103.73	892	21.08	0	39	17.92	853		3.7	261
262	70+73.86	870.33	870.12	1:10	892	870.66	128.02	128.02	892	21.67	0	39	17.33	853		3.5	262
263	70+79.86	869.70	869.70	1:10	892	870.04	131.74	131.74	892	22.30	0	39	16.70	853		3.4	263
264	70+85.86	869.68	869.71	1:10	892	870.42	151.04	151.04	892	22.29	0	39	16.71	853		3.4	264
265	70+92.86	869.78	870.09	1:10	892	870.42	172.61	172.61	892	21.91	0	38	16.09	854		3.3	265
266	71+00.86	869.76	870.09	1:10	892	870.42	172.61	172.61	892	21.91	0	38	16.09	854		3.3	266
267	71+08.86	869.59	869.92	1:10	892	870.25	173.97	173.97	892	22.08	0	39	16.92	853		3.4	267
268	71+16.86	869.46	869.75	1:10	892	870.08	175.33	175.33	892	22.25	0	39	16.75	853		3.4	268
269	71+24.86	869.45	869.59	1:10	892	869.92	176.61	176.61	892	22.41	0	39	16.59	853		3.4	269
270	71+32.86	869.45	869.46	1:10	892	869.79	177.65	177.65	892	22.54	0	39	16.46	853		3.4	270
SUBTOTALS FROM THIS SHEET							4822.87	4822.87				1170			0.0	108.5	
SUBTOTALS							43055.05	43055.05				10203			71.1	870.4	

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
- ② COMPUTED USING A 36" DIAMETER HOLE AND DEDUCTING FOR A 12" X 18" POST.
- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY Peter Daniel  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO.109 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IPLOT NAME: 67NWLLTB10  
 PATH & FILENAME: S:\Design\0100215\06\Final\NWALL1\_TB1.dgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.
		LEFT ④	RIGHT ⑤														
		④	⑤														
271	71+40.86	869.42	869.42	1:10	892	869.75	177.97	177.97	892	22.58	0	39	16.42	853		3.4	271
272	71+48.86	869.35	869.36	1:10	892	870.53	128.80	128.80	892	22.64	0	39	16.36	853		3.4	272
273	71+54.86	869.99	870.20	1:10	892	871.97	160.21	160.21	892	21.80	0	39	17.20	853		3.5	273
274	71+62.86	871.43	871.64	1:10	894	872.87	126.76	126.76	894	22.36	0	40	17.64	854		3.6	274
275	71+68.86	872.25	872.54	1:4	894	873.04	167.65	167.65	894	21.46	0	40	18.54	854		3.8	275
276	71+76.86	872.36	872.71	1:4	894	873.04	167.65	167.65	894	21.29	0	40	18.71	854		3.8	276
277	71+84.86	872.35	872.69	1:4	894	873.11	167.09	167.09	894	21.31	0	40	18.69	854		3.8	277
278	71+92.86	872.43	872.78	1:4	894	873.21	166.29	166.29	894	21.22	0	40	18.78	854		3.8	278
279	72+00.86	872.52	872.88	1:4	894	873.24	166.05	166.05	894	21.12	0	40	18.88	854		3.8	279
280	72+08.86	872.51	872.91	1:4	894	873.27	165.81	165.81	894	21.09	0	40	18.91	854		3.8	280
281	72+16.86	872.54	872.94	1:4	894	873.30	165.57	165.57	894	21.06	0	40	18.94	854		3.8	281
282	72+24.86	872.56	872.97	1:4	894	873.36	165.09	165.09	894	21.03	0	40	18.97	854		3.8	282
283	72+32.86	872.61	873.03	1:4	894	873.44	164.45	164.45	894	20.97	0	39	18.03	855		3.6	283
284	72+40.86	872.69	873.11	1:4	894	873.48	164.13	164.13	894	20.89	0	39	18.11	855		3.6	284
285	72+48.86	872.70	873.15	1:4	894	873.52	163.81	163.81	894	20.85	0	39	18.15	855		3.7	285
286	72+56.86	872.73	873.19	1:4	894	873.55	163.57	163.57	894	20.81	0	39	18.19	855		3.7	286
287	72+64.86	872.75	873.22	1:4	894	873.55	163.57	163.57	894	20.78	0	39	18.22	855		3.7	287
288	72+72.86	872.65	873.11	1:4	894	873.44	164.45	164.45	894	20.89	0	39	18.11	855		3.6	288
289	72+80.86	872.54	872.99	1:4	894	873.32	165.41	165.41	894	21.01	0	40	18.99	854		3.8	289
290	72+88.86	872.44	872.91	1:4	894	873.24	166.05	166.05	894	21.09	0	40	18.91	854		3.8	290
291	72+96.86	872.41	872.88	1:4	894	873.21	166.29	166.29	894	21.12	0	40	18.88	854		3.8	291
292	73+04.86	872.39	872.86	1:4	894	873.19	166.45	166.45	894	21.14	0	40	18.86	854		3.8	292
293	73+12.86	872.31	872.79	1:4	894	873.12	167.01	167.01	894	21.21	0	40	18.79	854		3.8	293
294	73+20.86	872.25	872.72	1:4	894	873.05	167.57	167.57	894	21.28	0	40	18.72	854		3.8	294
295	73+28.86	872.15	872.60	1:4	894	872.93	168.53	168.53	894	21.40	0	40	18.60	854		3.7	295
296	73+36.86	871.90	872.36	1:4	894	872.69	170.45	170.45	894	21.64	0	40	18.36	854		3.7	296
297	73+44.86	871.56	872.02	1:4	894	872.35	173.17	173.17	894	21.98	0	40	18.02	854		3.6	297
298	73+52.86	871.22	871.67	1:4	892	872.00	159.97	159.97	892	22.33	0	41	18.67	853		3.8	298
299	73+60.86	870.93	871.38	1:3	892	871.71	162.29	162.29	892	20.62	0	40	19.38	852		3.9	299
300	73+68.86	870.84	871.32	1:3	892	871.65	162.77	162.77	892	20.68	0	40	19.32	852		3.9	300
SUBTOTALS FROM THIS SHEET							4904.98	4904.98				1192			0.0	111.5	
SUBTOTALS							47960.03	47960.03				11395			71.1	981.9	

- ① 1:10 SLOPES ARE USED FOR CALCULATING QUANTITIES ON SLOPES OF 1:6 OR FLATTER.
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- ③ PLANKING SHALL BE PLACED ON THE RESIDENTIAL SIDE OF THE WALL.
- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

DRAWN BY: HG      CHECKED BY: PAD      CERTIFIED BY: Peter Daniel LIC. NO. 45053      DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 110 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IPLOT NAME: 67rml.tbl  
 PATH & FILENAME: S:\Design\0215\067\Final\NWALL1.TBldgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.	
		LEFT ④	RIGHT ⑤															
301	73+76.86	870.68	871.16	1:3	892	871.49	164.05	164.05	892	20.84	0	40	19.16	852		3.9	301	
302	73+84.86	870.08	870.58	1:3	892	870.92	168.61	168.61	892	21.42	0	41	19.58	851		3.9	302	
303	73+92.86	869.90	870.59	1:3	892	870.92	168.61	168.61	892	21.41	0	41	19.59	851		3.9	303	
304	74+00.86	869.69	870.45	1:3	892	870.78	169.73	169.73	892	21.55	0	41	19.45	851		3.9	304	
305	74+08.86	869.27	870.02	1:3	892	870.35	173.17	173.17	892	21.98	0	41	19.02	851		3.8	305	
306	74+16.86	868.83	869.34	1:3	892	869.67	178.61	178.61	892	22.66	0	42	19.34	850		3.9	306	
307	74+24.86	868.20	868.54	1:4	892	868.87	185.01	185.01	892	23.46	0	42	18.54	850		3.8	307	
308	74+32.86	867.37	867.73	1:10	892	868.06	191.49	191.49	892	24.27	0	42	17.73	850		3.6	308	
309	74+40.86	867.09	866.85	1:10	892	867.51	195.89	195.89	892	24.91	0	42	17.09	850		3.5	309	
310	74+48.86	867.00	867.18	1:10	892	868.71	186.29	186.29	892	24.82	0	42	17.18	850		3.5	310	
311	74+56.86	868.22	868.38	1:10	892	870.30	173.57	173.57	892	23.62	0	42	18.38	850		3.8	311	
312	74+64.86	869.32	869.97	1:3	892	871.06	167.49	167.49	892	22.03	0	42	19.97	850		4.0	312	
313	74+72.86	870.00	870.73	1:3	892	871.22	166.21	166.21	892	21.27	0	41	19.73	851		3.9	313	
314	74+80.86	870.13	870.89	1:3	892	871.25	165.97	165.97	892	21.11	0	41	19.89	851		3.9	314	
315	74+88.86	870.24	870.92	1:3	892	871.25	165.97	165.97	892	21.08	0	41	19.92	851		4.0	315	
316	74+96.86	870.29	870.83	1:3	892	871.44	164.45	164.45	892	21.17	0	41	19.83	851		4.0	316	
317	75+04.86	870.64	871.11	1:3	892	871.76	161.89	161.89	892	20.89	0	40	19.11	852		3.8	317	
318	75+12.86	871.01	871.43	1:4	892	872.10	159.17	159.17	892	20.57	0	39	18.43	853		3.7	318	
319	75+20.86	871.37	871.77	1:4	894	872.40	172.77	172.77	894	22.23	0	41	18.77	853		3.8	319	
320	75+28.86	871.67	872.07	1:4	894	872.79	169.65	169.65	894	21.93	0	40	18.07	854		3.6	320	
321	75+36.86	872.01	872.46	1:4	894	873.17	166.61	166.61	894	21.54	0	40	18.46	854		3.7	321	
322	75+44.86	872.44	872.84	1:4	894	873.23	166.13	166.13	894	21.16	0	40	18.84	854		3.8	322	
323	75+52.86	872.65	872.90	1:4	894	873.36	165.09	165.09	894	21.10	0	40	18.90	854		3.8	323	
324	75+60.86	872.91	873.03	1:4	894	873.51	163.89	163.89	894	20.97	0	39	18.03	855		3.7	324	
325	75+68.86	873.08	873.18	1:4	894	873.58	163.33	163.33	894	20.82	0	39	18.18	855		3.7	325	
326	75+76.86	873.16	873.25	1:4	894	873.67	162.61	162.61	894	20.75	0	39	18.25	855		3.7	326	
327	75+84.86	873.25	873.34	1:4	894	873.78	161.73	161.73	894	20.66	0	39	18.34	855		3.8	327	
328	75+92.86	873.37	873.45	1:4	894	873.90	160.77	160.77	894	20.55	0	39	18.45	855		3.8	328	
329	76+00.86	873.50	873.57	1:4	894	873.97	160.21	160.21	894	20.43	0	39	18.57	855		3.8	329	
330	76+08.86	873.57	873.64	1:4	894	874.01	159.89	159.89	894	20.36	0	39	18.64	855		3.8	330	
SUBTOTALS FROM THIS SHEET							5078.97	5078.97				1215			0.0	113.8		
SUBTOTALS							53038.99	53038.99					12610			71.1	1095.7	

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- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY Peter Daniel  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 111 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT: METRO  
 IPLOT NAME: 67nwl.tbl2  
 PATH & FILENAME: S:\Design\010215\067\Final\NWALL1.tbl.dgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.
		LEFT ④	RIGHT ⑤														
331	76+16.86	873.64	873.68	1:4	894	874.09	159.25	159.25	894	20.32	0	39	18.68	854		4.1	331
332	76+24.86	873.73	873.76	1:10	894	874.09	159.25	159.25	894	20.24	0	37	16.76	856		3.7	332
333	76+32.86	873.66	873.69	1:10	894	874.02	159.81	159.81	894	20.31	0	37	16.69	856		3.6	333
334	76+40.86	873.56	873.62	1:10	894	873.95	160.37	160.37	894	20.38	0	37	16.62	857		3.4	334
335	76+48.86	873.53	873.55	1:10	894	873.88	160.93	160.93	894	20.45	0	37	16.55	857		3.4	335
336	76+56.86	873.48	873.44	1:10	894	873.81	161.49	161.49	894	20.52	0	37	16.48	857		3.4	336
337	76+64.86	873.41	873.38	1:10	894	873.74	162.05	162.05	894	20.59	0	37	16.41	857		3.4	337
338	76+72.86	873.28	873.30	1:10	894	873.63	162.93	162.93	894	20.70	0	37	16.30	857		3.4	338
339	76+80.86	873.16	873.17	1:10	894	873.50	163.97	163.97	894	20.83	0	37	16.17	857		3.3	339
340	76+88.86	873.05	873.02	1:10	894	873.38	164.93	164.93	894	20.95	0	37	16.05	857		3.3	340
341	76+96.86	872.90	872.79	1:10	894	873.23	166.13	166.13	894	21.10	0	38	16.90	856		3.5	341
342	77+04.86	872.87	872.76	1:10	894	873.20	166.37	166.37	894	21.13	0	38	16.87	856		3.5	342
343	77+12.86	872.76	872.69	1:10	894	873.09	167.25	167.25	894	21.24	0	38	16.76	856		3.4	343
344	77+20.86	872.68	872.66	1:10	894	873.38	164.93	164.93	894	21.32	0	38	16.68	856		3.4	344
345	77+28.86	873.05	872.99	1:10	894	873.41	164.69	164.69	894	20.95	0	37	16.05	857		3.3	345
346	77+36.86	873.08	873.01	1:10	894	873.44	164.45	164.45	894	20.92	0	37	16.08	857		3.3	346
347	77+44.86	873.11	873.03	1:10	894	873.60	163.17	163.17	894	20.89	0	37	16.11	857		3.3	347
348	77+52.86	873.27	873.19	1:10	894	873.73	162.13	162.13	894	20.73	0	37	16.27	857		3.3	348
349	77+60.86	873.40	873.33	1:10	894	873.76	161.89	161.89	894	20.60	0	37	16.40	857		3.4	349
350	77+68.86	873.43	873.36	1:10	894	873.92	160.61	160.61	894	20.57	0	37	16.43	857		3.4	350
351	77+76.86	873.59	873.58	1:10	894	874.09	159.25	159.25	894	20.41	0	37	16.59	857		3.4	351
352	77+84.86	873.76	873.73	1:10	894	874.28	157.73	157.73	894	20.24	0	37	16.76	857		3.5	352
353	77+92.86	873.95	873.88	1:10	894	874.52	155.81	155.81	894	20.05	0	37	16.95	857		3.5	353
354	78+00.86	874.19	874.11	1:10	894	874.53	155.73	155.73	894	19.81	0	35	15.19	859		3.1	354
355	78+08.86	874.20	874.13	1:10	894	874.53	155.73	155.73	894	19.80	0	35	15.20	859		3.1	355
356	78+16.86	874.13	874.06	1:10	894	874.46	156.29	156.29	894	19.87	0	35	15.13	859		3.1	356
357	78+24.86	874.10	874.04	1:10	894	874.43	140.53	140.53	894	19.90	0	35	15.10	859		3.1	357
358	78+32.86	873.99	873.93	1:10	890	874.32	125.41	125.41	892	18.01	0	34	15.99	858		3.3	358
359	78+40.86	873.87	873.80	1:10	888	874.20	110.37	110.37	890	16.13	0	32	15.87	858		3.3	359
360	78+48.86	873.86	873.80	1:10					888	14.14	0	30	15.86	858		3.3	360
SUBTOTALS FROM THIS SHEET							4573.55	4573.55				1093			0.0	101.3	
SUBTOTALS							57612.55	57612.55				13703			71.1	1197.0	

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- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

**NOISE WALL TABULATIONS - NWALL1**



PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
 IPLOT NAME: 67nw1.tbl3  
 PATH & FILENAME: S:\Design\0100215067\Final\NWALL1\_TBldgn

POST NO.	WALL STATION	GROUND ELEV.		SLOPE ① (V:H)	TOP OF WALL ELEV.	LOWER ELEV. OF BOTTOM PLANK	2" PLANKING (SQ FT)	TOTAL PLANKING AREA (SQ FT) ③	TOP OF POST ELEV.	WALL HEIGHT H (FT)	FILL HEIGHT W (FT)	POST LENGTH (FT)	POST EMBEDMENT (FT)	BOTTOM OF POST ELEV.	GRANULAR BACKFILL (CV) ② (CU YD)	LEAN MIX BACKFILL ② (CU YD)	POST NO.	
		LEFT ④	RIGHT ⑤															
361	78+56.86	873.88	873.86	1:4	884	874.21	78.29	78.29	886	12.12	0	28	15.88	858		3.3	361	
362	78+64.86	873.74	873.77	1:4	882	874.10	63.17	63.17	884	10.23	0	26	15.77	858		3.2	362	
363	78+72.86	873.64	873.66	1:4	880	874.08	47.33	47.33	882	8.34	0	23	14.66	859		3.0	363	
364	78+80.86	873.72	873.75	1:4					880	6.25	0	20	13.75	860		2.8	364	
SUBTOTALS FROM THIS SHEET							188.80	188.80				97			0.0	12.4		
TOTALS							57801.35	57801.35				13800				71.1	1209.4	

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- ④ HIGHWAY SIDE.
- ⑤ RESIDENTIAL SIDE.

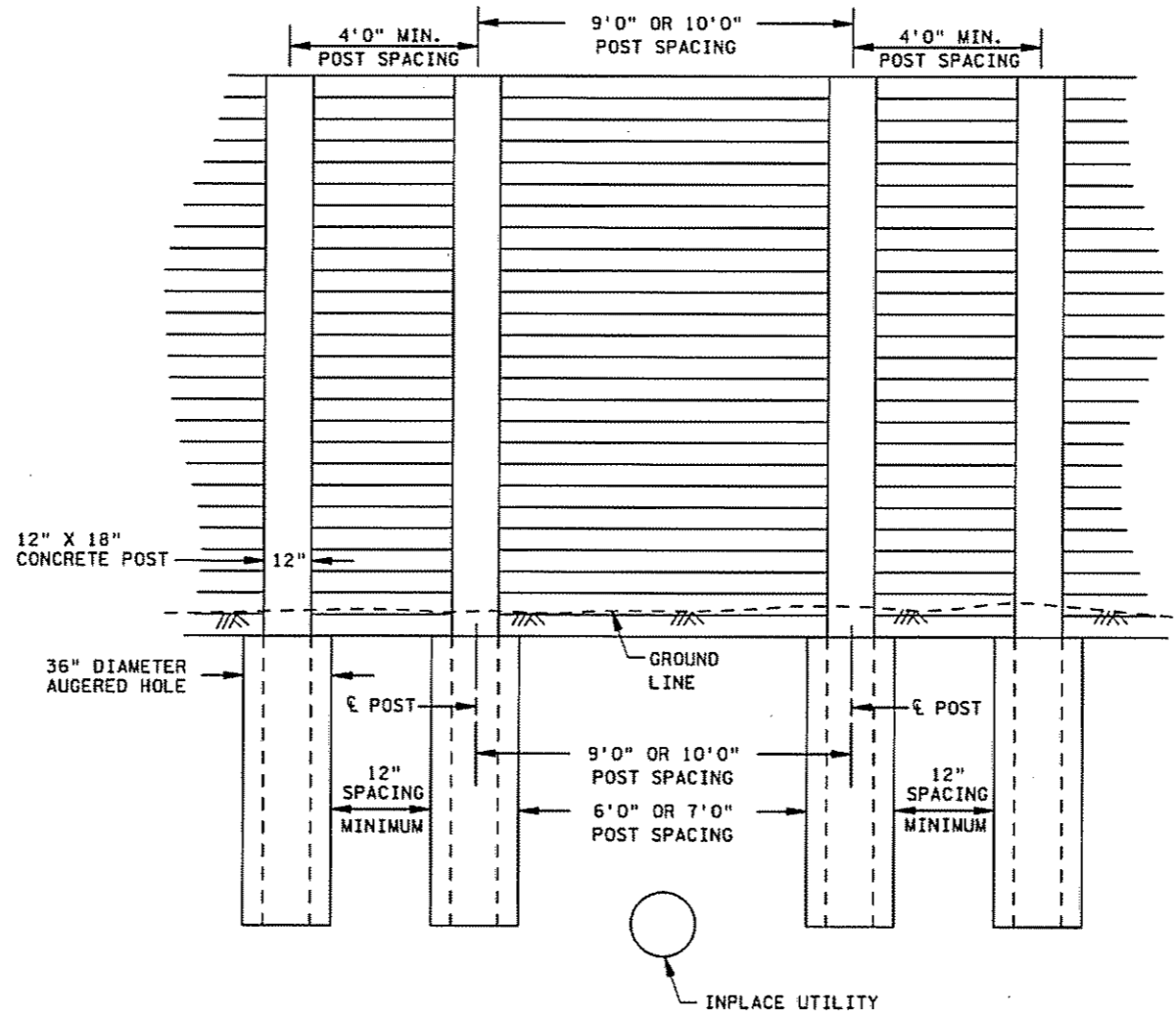
**NOISE WALL TABULATIONS - NWALL1**

DRAWN BY: HG      CHECKED BY: PAD      CERTIFIED BY: Peter Daniel LIC. NO. 45053      DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 113 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
PLOT NAME: 67NWL.DD2  
PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_dtl.dgn



POST LOCATIONS FOR UTILITY CROSSINGS

POST LOCATIONS FOR UTILITY CROSSINGS

**NOISE WALL DETAILS**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 114 OF 222 SHEETS

**WATER RESOURCES NOTES**

These notes are intended to give information about critical features and elevations for the drainage on this project. A control is the elevation of a place or feature which determines how low a storm drain must or can be or how high the water can get in a pond.

1. The stormwater management system described in this letter has been designed to be consistent with the following plans: construction plans, watershed district, city, county, best management plans

2. The following special structures are included in this project:

Structure No.	Location	Description
5201	EB TH 10 STA 410+00.00	DEBRIS, OIL, AND WATER SEPARATOR
5800	WB TH 10 STA 386+77.42	INFILTRATION DRAIN
5801	WB TH 10 STA 391+70.00	INFILTRATION DRAIN
5802	EB TH 10 STA 391+30.00	INFILTRATION DRAIN
5803	EB TH 10 STA 400+20.00	INFILTRATION DRAIN

3. Filtration Ditch Checks are located in the ditches at the following locations:

Ditch Check	Location	Invert Elevation
*1	WB TH 10 STA 387+19.00	857.5'
*2	WB TH 10 STA 392+09.00	855.7'
*3	EB TH 10 STA 391+74.00	855.7'
*4	EB TH 10 STA 400+50.00	854.0'

The following construction permits apply: NPDES, COON CREEK WATERSHED DISTRICT. Please read the permit applications and the permits for any special conditions.

**STORM WATER POLLUTION PREVENTION PLAN NARRATIVE**

**PROJECT DESCRIPTION/LOCATION**

SP 0215-67 IS LOCATED ON TH 10, FROM 100 FT W OF EGRET BLVD TO 1700 FT E OF HANSON BLVD IN COON RAPIDS

**THE PROJECT INCLUDES:**

- \* ADD 3RD LANE
- \* REPLACE BRIDGES 9721 AND 9722
- \* NOISEWALL & GUARDRAIL
- \* DRAINAGE IMPROVEMENTS

**SITE MAPS**

IN ADDITION TO WHAT IS LOCATED WITHIN THIS PLAN, EXISTING AND PROPOSED SITE MAPS HAVE BEEN CREATED IN ARCMAP AND ARE KEPT ON FILE WITH MN/DOT METRO WATER RESOURCES AND WITH CONSTRUCTION RESIDENT ENGINEER. THE SITE MAPS ARE ROLL MAPS THAT SHOW THE PROJECT LIMITS, ALIGNMENT, SOIL TYPES, EXISTING AND PROPOSED CONTOURS, DRAINAGE AREAS, STORM SEWER LOCATIONS, FLOW ARROWS, AND IMPERVIOUS SURFACES. WETLANDS ARE ALSO SHOWN ON THE SITE MAPS. STAGING, TURF ESTABLISHMENT AND EROSION CONTROL ITEMS ARE NOT PLOTTED ON THE ROLL MAPS, BUT CAN BE FOUND WITHIN THIS PLAN.

PLEASE CONTACT THE WATER RESOURCES PROJECT MANAGER, BRIAN KELLY, (651) 234-7536, WITH ANY QUESTIONS REGARDING THE SITE MAPS.

**ENVIRONMENTALLY SENSITIVE AREAS**

THERE ARE NO WETLANDS IMPACTS FOR THE PROJECT

**OUTSTANDING RESOURCE VALUE WATERS (ORVWs)**

THERE ARE NO OUTSTANDING RESOURCE VALUE WATERS WITHIN THE PROJECT LIMITS.

**CALCAREOUS FENS**

THERE ARE NO CALCAREOUS FENS WITHIN THE PROJECT LIMITS.

**TOTAL MAXIMUM DAILY LOAD (TMDL) WATERS**

COON CREEK IS AN IMPAIRED WATER (TMDL). THE IMPAIRMENT IS INVERTEBRATE IBI RESULTING IN LOW AQUATIC LIFE.

**LAND FEATURE CHANGES**

- TOTAL PROJECT AREA: 26.2 ACRES
- TOTAL EXISTING IMPERVIOUS SURFACE AREA: 11.2 ACRES
- TOTAL EXISTING PERVIOUS SURFACE AREA: 15.0 ACRES
- TOTAL PROPOSED IMPERVIOUS SURFACE AREA: 16.9 ACRES
- TOTAL PROPOSED PERVIOUS SURFACE AREA: 9.3 ACRES
- TOTAL PROPOSED NEW IMPERVIOUS SURFACE AREA: 5.7 ACRES

**TIMING OF BMP INSTALLATION**

THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs SHALL BE INSTALLED AS NECESSARY TO MINIMIZE EROSION FROM DISTURBED SURFACES AND CAPTURE SEDIMENT ONSITE, AND SHALL MEET THE NPDES PERMIT PART IV CONSTRUCTION ACTIVITY REQUIREMENTS.

**DRAINAGE COMPUTATIONS**

COMPUTATIONS ARE KEPT ON FILE WITH MN/DOT METRO WATER RESOURCES. CHANGES MADE IN THE FIELD SHOULD BE DISCUSSED WITH THE WATER RESOURCES PROJECT MANAGER AND NOTED IN THE CONTRACTOR'S CONSTRUCTION LOG.

**DEWATERING/BASIN DRAINING**

TEMPORARY DEWATERING WELLS MAY BE REQUIRED FOR THE ROADWAY CONSTRUCTION AND UTILITY WORK. THEREFORE IT IS POSSIBLE THAT A PERMIT FOR THE TEMPORARY APPROPRIATION OF WATERS OF THE STATE, NON-IRRIGATION FROM MNDNR WILL BE REQUIRED FOR THIS PROJECT. THE CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING THIS PERMIT. ALL TEMPORARY DEWATERING SHALL BE DISCHARGED TO AN APPROVED LOCATION FOR TREATMENT PRIOR TO DISCHARGE TO THE RECEIVING WATER. THE CONTRACTOR IS REQUIRED TO SUBMIT SITE PLANS TO MN/DOT ENGINEER FOR APPROVAL PRIOR TO COMMENCING WORK ACCORDING TO SPEC 1717.2E.

ALL CONSTRUCTION DEWATERING SHALL BE DISCHARGED TO AN APPROVED LOCATION FOR TREATMENT PRIOR TO DISCHARGE TO THE RECEIVING WATER.

**PROJECT CONTACTS**

THE PROJECT ENGINEER AND CONTRACTOR ARE RESPONSIBLE FOR IMPLEMENTATION OF THE SWPPP AND INSTALLATION, INSPECTION AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs BEFORE AND DURING CONSTRUCTION. MN/DOT METRO DISTRICT STAFF AND MEMBERS OF MN/DOT'S OFFICE OF ENVIRONMENTAL SERVICES ARE ALSO AVAILABLE FOR ASSISTANCE. MN/DOT METRO MAINTENANCE IS RESPONSIBLE FOR LONG TERM OPERATION AND MAINTENANCE OF THE PERMANENT STORM WATER MANAGEMENT SYSTEM.

MN/DOT PROJECT ENGINEER	MN/DOT RESIDENT ENGINEER	METRO DISTRICT MAINTENANCE CONTACT
PETER DAVICH 1500 W. CTY RD. B-2 ROSEVILLE, MN 55113 651-234-7617	DAN PENN 2055 N LILAC DRIVE GOLDEN VALLEY, MN 55422 651-366-5147	JEFF CASSIDY 1530 TH 10 SPRING LAKE PARK, MN 55432 763-785-5684

MPCA 24 HOUR EMERGENCY NOTIFICATION: 651-649-5451  
800-422-0798

**CONSTRUCTION NOTES**

CONSTRUCTION SHALL BE GOVERNED BY THE MN/DOT SPEC BOOK (2005 EDITION) AND BY THE PROJECT SPECIAL PROVISIONS. THE CONTRACTOR SHALL KEEP AN INSPECTION AND MAINTENANCE LOG AS REQUIRED BY THE NPDES GENERAL STORMWATER PERMIT.

**LOCATION OF SWPPP REQUIREMENTS IN PROJECT PLAN**

DESCRIPTION	TITLE	LOCATION
TEMPORARY EROSION CONTROL MEASURES	EROSION CONTROL PLAN, DRAINAGE AND EROSION CONTROL NOTES AND DETAILS	SHEETS NO. 135-139A, 126-128
PERMANENT EROSION CONTROL MEASURES	EROSION CONTROL AND TURF ESTABLISHMENT PLANS DRAINAGE DETAILS	SHEETS NO. 129-139A, 126-128
DIRECTION OF FLOW	EROSION CONTROL PLANS, DRAINAGE AND SUPERELEVATION PLANS	SHEETS NO. 117-121, 135-139A
FINAL STABILIZATION	EROSION CONTROL AND TURF ESTABLISHMENT PLANS DRAINAGE DETAILS	SHEETS NO. 129-139A, 126-128
SOILS AND CONSTRUCTION NOTES	STANDARD PLATES AND SOILS & CONSTRUCTION NOTES	SHEETS NO. 6, 8
DRAINAGE STRUCTURES	DRAINAGE DETAILS	SHEETS NO. 126-127
DRAINAGE TABULATION	DRAINAGE PROFILES AND TAB.	SHEETS NO. 122-125
STORM SEWER PROFILE SHEETS	DRAINAGE PROFILES AND TABULATIONS	SHEETS NO. 122-125
STORM SEWER TABULATION	DRAINAGE PROFILES AND TABULATIONS	SHEETS NO. 122-125
EROSION CONTROL DETAILS	EROSION CONTROL PLAN, DRAINAGE AND EROSION CONTROL NOTES AND DETAILS	SHEETS NO. 135-139A, 126-128
EROSION CONTROL TABULATION	MISCELLANEOUS TABULATIONS	SHEET NO. 11
TURF ESTABLISHMENT TABULATION	MISCELLANEOUS TABULATIONS	SHEET NO. 11

**WATER RESOURCES NOTES AND STORM WATER POLLUTION PREVENTION PLAN NARRATIVE**

DISTRICT #: METRO  
 PLOT NAME: 67\_WRENOTES  
 PATH & FILENAME: S:\Design\010215\067\Final\drainage\0215-67\_WRENOTES\_SWPPP.dgn  
 PLOTTED/REVISED: 11-FEB-2009 08:55

**STORM WATER POLLUTION PREVENTION PLAN NARRATIVE  
CONSTRUCTION ACTIVITY REQUIREMENTS**

1. THE CONTRACTOR WILL NEED TO IDENTIFY A MN/DOT CERTIFIED EROSION CONTROL SUPERVISOR IN GOOD STANDING WHO WILL BE KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BEST MANAGEMENT PRACTICES.
2. THE EROSION CONTROL SUPERVISOR WILL WORK WITH THE PROJECT ENGINEER TO OVERSEE THE IMPLEMENTATION OF THE SWPPP, AND THE INSTALLATION, INSPECTION, AND MAINTENANCE OF THE EROSION PREVENTION AND SEDIMENT CONTROL BMPs BEFORE AND DURING CONSTRUCTION.
3. THE GENERAL CONTRACTOR IS RESPONSIBLE TO COMPLY WITH ALL ASPECTS OF THE NPDES CONSTRUCTION STORMWATER PERMIT.
4. THE CONTRACTOR WILL DEVELOP A CHAIN OF COMMAND WITH ALL OPERATORS ON THE SITE TO ENSURE THAT THE SWPPP WILL BE IMPLEMENTED AND STAY IN EFFECT UNTIL THE CONSTRUCTION PROJECT IS COMPLETE, THE ENTIRE SITE HAS UNDERGONE FINAL STABILIZATION, AND A NOTICE OF TERMINATION (NOT) HAS BEEN SUBMITTED TO THE MPCA.
5. THE CONTRACTOR WILL PREPARE A WRITTEN, NOT ORAL, WEEKLY SCHEDULE OF PROPOSED EROSION CONTROL ACTIVITIES FOR THE PROJECT ENGINEERS APPROVAL AS PER MN/DOT SPEC. 1717.2D.
6. THE CONTRACTOR WILL PREPARE AND SUBMIT A SITE PLAN FOR THE ENGINEERS APPROVAL AS PER MN/DOT SPEC. 1717.2E FOR WORK IN CRITICAL AREAS, FOR WORK IN AREAS IDENTIFIED ON THE PLAN SITE AS "SITE PLAN REQUIREMENT AREA", OR AS REQUESTED BY THE ENGINEER. THE CONTRACTOR SHALL ALLOW FOR 7 CALENDAR DAYS REVIEW.
7. ALL EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO ANY REMOVAL WORK AND/OR DISTURBING ACTIVITIES AND SHALL BE MAINTAINED UNTIL THE POTENTIAL FOR EROSION HAS BEEN ELIMINATED.
8. IN ACCORDANCE WITH SPEC 1717.2A2, ALL EXPOSED SOIL AREAS WITH A CONTINUOUS POSITIVE SLOPE WITHIN 200 LINEAL FEET OF A SURFACE WATER, MUST HAVE TEMPORARY EROSION PROTECTION OR PERMANENT COVER FOR THE EXPOSED SOIL AREAS YEAR ROUND ACCORDING TO THE FOLLOWING TABLE OF SLOPES AND TIME FRAMES. RAPID STABILIZATION METHOD 2 OR 3 WILL BE USED TO PROVIDE TEMPORARY COVER IN THESE AREAS AND IS IDENTIFIED ON THE PLAN.
  - A. SLOPES STEEPER THAN 3:1 MUST BE STABILIZED WITHIN 7 DAYS
  - B. SLOPES BETWEEN 3:1 AND 10:1 MUST BE STABILIZED WITHIN 14 DAYS
  - C. SLOPES FLATTER THAN 10:1 MUST BE STABILIZED WITH 21 DAYS.
  - D. IN SOME INSTANCES THIS MAY REQUIRE STABILIZATION TO OCCUR MORE THAN ONCE DURING ROUGH GRADING.
9. THE NORMAL WETTED PERIMETER OF ANY TEMPORARY OR PERMANENT DRAINAGE DITCH THAT DRAINS WATER FROM THE CONSTRUCTION SITE, OR DIVERTS WATER AROUND THE CONSTRUCTION SITE, MUST BE STABILIZED WITHIN 200 LINEAL FEET FROM THE PROPERTY EDGE OR POINT OF DISCHARGE TO ANY SURFACE WATER WITHIN 24 HOURS OF CONNECTION TO A SURFACE WATER ACCORDING TO SPEC 1717.2A2. RAPID STABILIZATION METHOD 4 WILL BE USED TO STABILIZE THESE AREAS.
10. OUTLETS INTO SURFACE WATERS SHALL BE STABILIZED WITH ENERGY DISSIPATION WITHIN 24 HOURS.
11. DITCHES AND EXPOSED SOILS MUST BE KEPT IN A SMOOTH ROUGH GRADED CONDITION IN ORDER TO BE ABLE TO APPLY EROSION CONTROL MULCHES AND BLANKETS.
12. ALL EXPOSED SOIL AREAS WILL BE STABILIZED PRIOR TO THE ONSET OF WINTER. ANY WORK STILL BEING PERFORMED WILL BE SNOW MULCHED, SEEDED, OR BLANKETED.
13. SEDIMENT CONTROL DEVICES MUST BE ESTABLISHED ON ALL DOWN GRADIENT PERIMETERS BEFORE ANY UP GRADIENT LAND DISTURBING ACTIVITIES BEGIN.
  - A. SILT FENCE SHALL BE LOCATED ON THE CONTOUR TO CAPTURE OVERLAND, LOW-VELOCITY SHEET FLOWS DOWN GRADIENT OF ALL EXPOSED SOILS AND PRIOR TO DISCHARGING TO SURFACE WATERS WITH THE SILT FENCE J-HOOKED AT A MAXIMUM OF 100 FOOT INTERVALS AND SHALL CONTAIN NO MORE THAN 1/4 ACRE OF DRAINAGE AREA.
  - B. DITCH CHECKS WILL BE INSTALLED AS INDICATED ON THE PLANS DURING ALL PHASES OF CONSTRUCTION.
    1. TEMPORARY DITCH CHECKS WILL CONSIST OF USING ROCK DITCH CHECKS AND ROCK WEEPERS IN FRONT OF CULVERT INLETS. IN LIEU OF REMOVING TEMPORARY DITCH CHECKS, THE ROCK MAY BE PUSHED INTO THE GROUND.
    2. BIOLOGS WILL BE INSTALLED DURING PERMANENT TURF ESTABLISHMENT AT THE INTERVALS IDENTIFIED IN THE PLAN.
  - C. SEDIMENT DAMAGE FROM STOCKPILES WILL BE MINIMIZED BY PLACING A ROW OF SILT FENCE 5 FEET FROM THE TOE.
14. STREET SURFACES SHALL BE SWEEPED WITHIN 24 HOURS OF DISCOVERY OF SEDIMENT OR TRACKING. STREET SWEEPING SHALL BE BY VACUUM AND PICK-UP BROOM SWEEPERS ONLY. NO OPEN BROOM SWEEPERS ALLOW. THIS WORK IS INCIDENTAL.
15. STORM SEWER INLETS WILL BE PROTECTED AT ALL TIMES WITH THE APPROPRIATE INLET PROTECTION FOR EACH SPECIFIC PHASE OF CONSTRUCTION.
16. THE CONTRACTOR WILL COMPLY WITH THE REQUIREMENTS REGARDING POLLUTION PREVENTION MANAGEMENT DURING CONSTRUCTION, WHICH WILL INCLUDE, BUT NOT LIMITED TO, PROVIDING:
  - A. CONCRETE WASHOUT AREAS. AREAS MUST BE AT LEAST 200' FROM SITE PLAN REQUIREMENT AREAS OR ENVIRONMENTALLY SENSITIVE AREAS. A PRE-APPROVED ENGINEERED COLLECTION SYSTEM CAN ALSO BE USED.
  - B. SOLID WASTE COLLECTION AND REMOVAL
  - C. SECONDARY CONTAINMENT
  - D. HAZARDOUS WASTE STORAGE CONTAINERS AND SPILL KITS
17. IF SEDIMENT DEPOSITS IN A WATER OF THE STATE, THE MATERIAL MUST BE REMOVED WITHIN 7 DAYS.
18. BASIN DRAINING ACTIVITIES OF TURBID OR SEDIMENT LADEN WATER WILL BE DISCHARGED TO TEMPORARY SEDIMENT BASINS WHENEVER POSSIBLE. IN THE EVENT THAT IT IS NOT POSSIBLE TO DISCHARGE THE SEDIMENT LADEN WATER TO A TEMPORARY SEDIMENT BASIN THE WATER MUST BE TREATED SO THAT IT DOES NOT ADVERSELY AFFECT RECEIVING WATERS OR DOWNSTREAM LANDOWNERS.
19. THE CONTRACTOR WILL PROVIDE AN EROSION CONTROL SUPERVISOR WHO WILL ROUTINELY INSPECT THE ENTIRE CONSTRUCTION SITE ONCE EVERY SEVEN DAYS DURING ACTIVE CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 0.5 INCHES IN 24 HOURS. ALL INSPECTIONS AND MAINTENANCE CONDUCTED DURING CONSTRUCTION MUST BE RECORDED IN WRITING AND THESE RECORDS MUST BE RETAINED WITH THE SWPPP. RECORDS OF EACH INSPECTION AND MAINTENANCE ACTIVITY SHALL INCLUDE:
  - A. DATE AND TIME OF INSPECTIONS;
  - B. NAME OF PERSONS CONDUCTING INSPECTIONS;
  - C. FINDINGS OF INSPECTIONS, INCLUDING RECOMMENDATIONS FOR CORRECTIVE ACTIONS;
  - D. CORRECTIVE ACTIONS TAKEN INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES;
  - E. DATE AND AMOUNT OF ALL RAINFALL EVENTS GREATER THAN 0.5 INCH IN 24 HOURS;
  - F. DOCUMENTS AND CHANGES MADE TO THE SWPPP.
20. THE EROSION CONTROL SUPERVISOR WILL INSPECT ALL EROSION PREVENTION AND SEDIMENT CONTROL BMPs TO ENSURE INTEGRITY AND EFFECTIVENESS AND COMPLY WITH THE FOLLOWING INSPECTION AND MAINTENANCE REQUIREMENTS:
  - A. SILT FENCE REPAIRS SHOULD BE MADE WHEN IT BECOMES NON-FUNCTIONAL OR SEDIMENT REACHES 1/3 THE HEIGHT OF THE FENCE WITHIN 24 HOURS OF DISCOVERY
  - B. INLET PROTECTION DEVICES SHOULD BE REPAIRED WHEN THEY BECOME NON-FUNCTIONAL OR SEDIMENT REACHES 1/3 THE HEIGHT AND/OR DEPTH OF THE DEVICE
  - C. TEMPORARY SEDIMENT BASIN MUST BE HAVE THE SEDIMENT REMOVED ONCE THE SEDIMENT HAS REACHED 1/2 THE STORAGE VOLUME WITHIN 72 HOURS OF DISCOVERY
  - D. TRACKED SEDIMENT MUST BE REMOVED WITHIN 24 HOURS OF DISCOVERY OF OFF SITE TRACKING ONTO PAVED SURFACES.
  - E. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL BMPs UNTIL WORK HAS BEEN COMPLETED, SITE HAS GONE UNDER FINAL STABILIZATION, AND THE NOTICE OF TERMINATION HAS BEEN SUBMITTED TO THE MPCA IN ACCORDANCE WITH PART II.B.5 OF THE CONSTRUCTION GENERAL PERMIT.
21. BURNING OF TREES, BRUSH, OR OTHER VEGETATED MATERIAL IS NOT ALLOWED WITHIN PROJECT BOUNDARY.
22. TYPE 5 MULCH (SLASH MULCH) WILL BE USED FOR CONSTRUCTION ENTRANCES IN LIEU OF CRUSHED ROCK.
23. TILLING FOR BEDS OR TREE HOLES ON SLOPES OF 3 TO 1 OR GREATER MUST BE PLANTED AND MULCHED WITH WOODCHIP WITHIN 7 DAYS OR STRAW MULCHED UNTIL PLANTING OPERATIONS CAN BE COMPLETED.
24. DITCH GRADES MUST BE PROTECTED. ANY FINAL GRADED DITCH BOTTOMS DISTURBED DURING OPERATIONS MUST BE RESTORED TO PRE-EXISTING CONDITIONS WITHIN 3 DAYS.
25. CATCH BASINS SHALL BE PROTECTED FROM SEDIMENT USING COMPOST FILTER LOGS, ROCK LOGS, OR SEDIMENT BAGS.
26. BIOLOGS SHALL BE INSTALLED, AS NEEDED, TO TRAP SEDIMENT ON THE LOWER EDGE OF BEDS OR TREE HOLES. TYPICALLY THIS WILL BE NECESSARY WHEN PLANT INSTALLATIONS ARE ON SLOPES OR ABOVE WATERS OF THE STATE. BIOLOGS WILL BE LEFT TO PHOTO DEGRADE.
27. CHEMICAL SPILLS OF ANY KIND (OIL, FUEL, FERTILIZER, ETC.) MUST BE CLEANED UP AND REMOVED FROM THE SITE IMMEDIATELY. THE CONTRACTOR MUST HAVE A SPILL KIT ON SITE AT ALL TIMES.
28. ANY SUBSURFACE DRAINAGE TILES ENCOUNTERED DURING CONSTRUCTION SHALL BE REPAIRED, REPLACED OR REROUTED, AND CONNECTED TO THE EXISTING TILE OR DRAINAGE SYSTEM TO ENSURE THAT EXISTING UPLAND DRAINAGE IS PERPETUATED. THIS SHOULD BE DONE TO THE APPROVAL AND SATISFACTION OF THE ENGINEER.
29. THE CONTRACTOR MUST USE METHODS AND OPERATIONAL PROCEDURES THAT PREVENT DISCHARGE OR PLACEMENT OF BITUMINOUS GRINDINGS, CUTTINGS, MILLINGS, AND OTHER BITUMINOUS WASTES FROM AREAS OF EXISTING OR FUTURE VEGETATED SOILS, AND ALL WATER CONVEYANCE SYSTEMS, INCLUDING INLETS.
30. IT IS THE DESIGNER'S INTENT THAT THE CONTRACTOR INSTALL PERMANENT EROSION CONTROL BEFORE PUTTING IT IN ACTIVE SERVICE TO THE MAXIMUM EXTENT PRACTICABLE.

PLOTTED/REVISED: 11-FEB-2009 08:55

DISTRICT #: METRO  
PLOT NAME: 67\_SWPPP  
PATH & FILENAME: S:\Des\ign\010215\067\Final\drainage\0215-67\_WRENOTES\_SWPPP.dgn

**STORM WATER POLLUTION PREVENTION PLAN NARRATIVE**

DRAWN BY: BDF

CHECKED BY: BTK

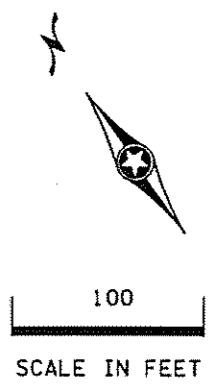
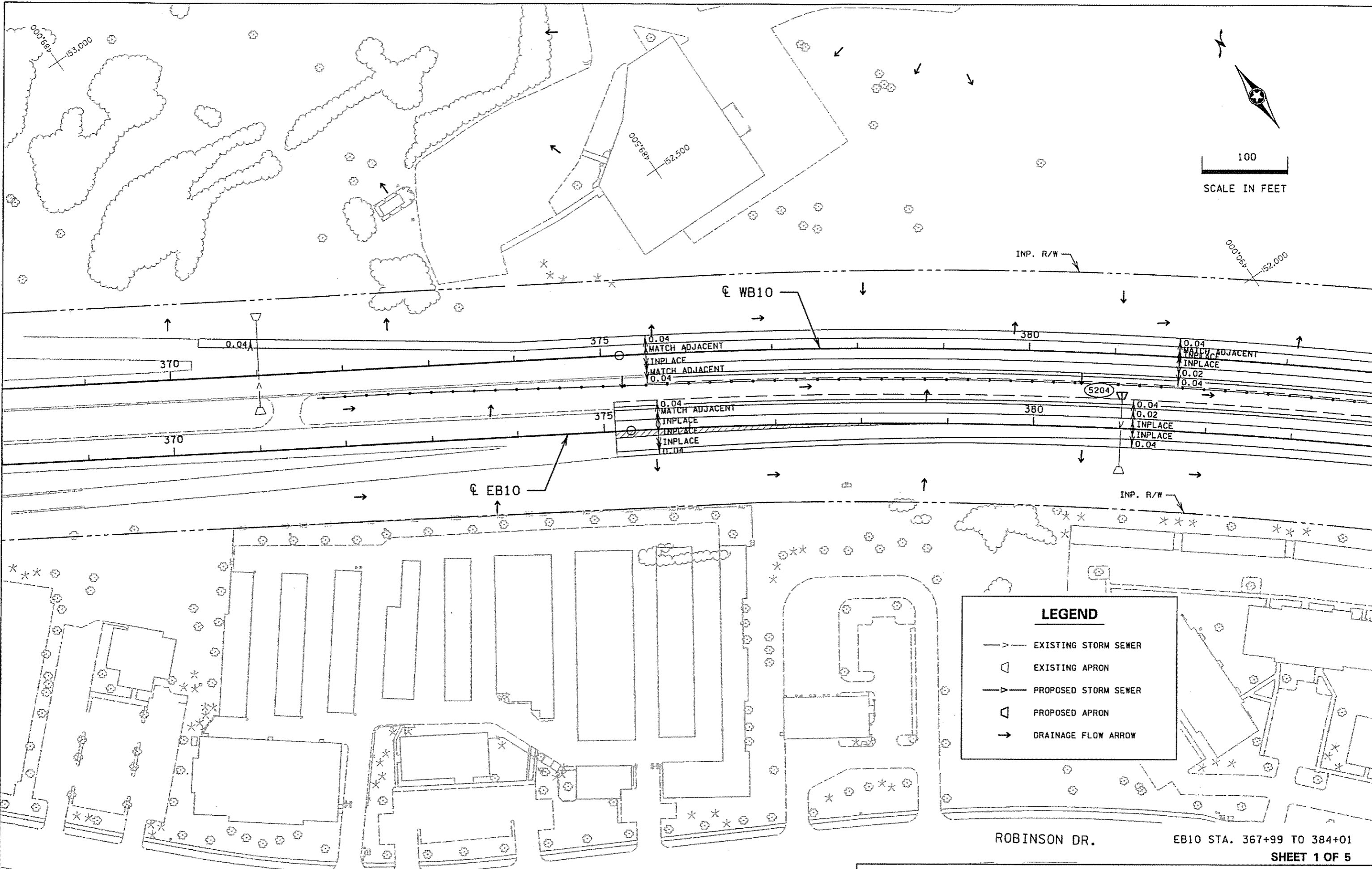
CERTIFIED BY Beth Alexander  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 25963 DATE 2-13-09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 116 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
PLOT NAME: 67.drl  
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**LEGEND**

- > — EXISTING STORM SEWER
- ◁ EXISTING APRON
- > — PROPOSED STORM SEWER
- ◁ PROPOSED APRON
- DRAINAGE FLOW ARROW

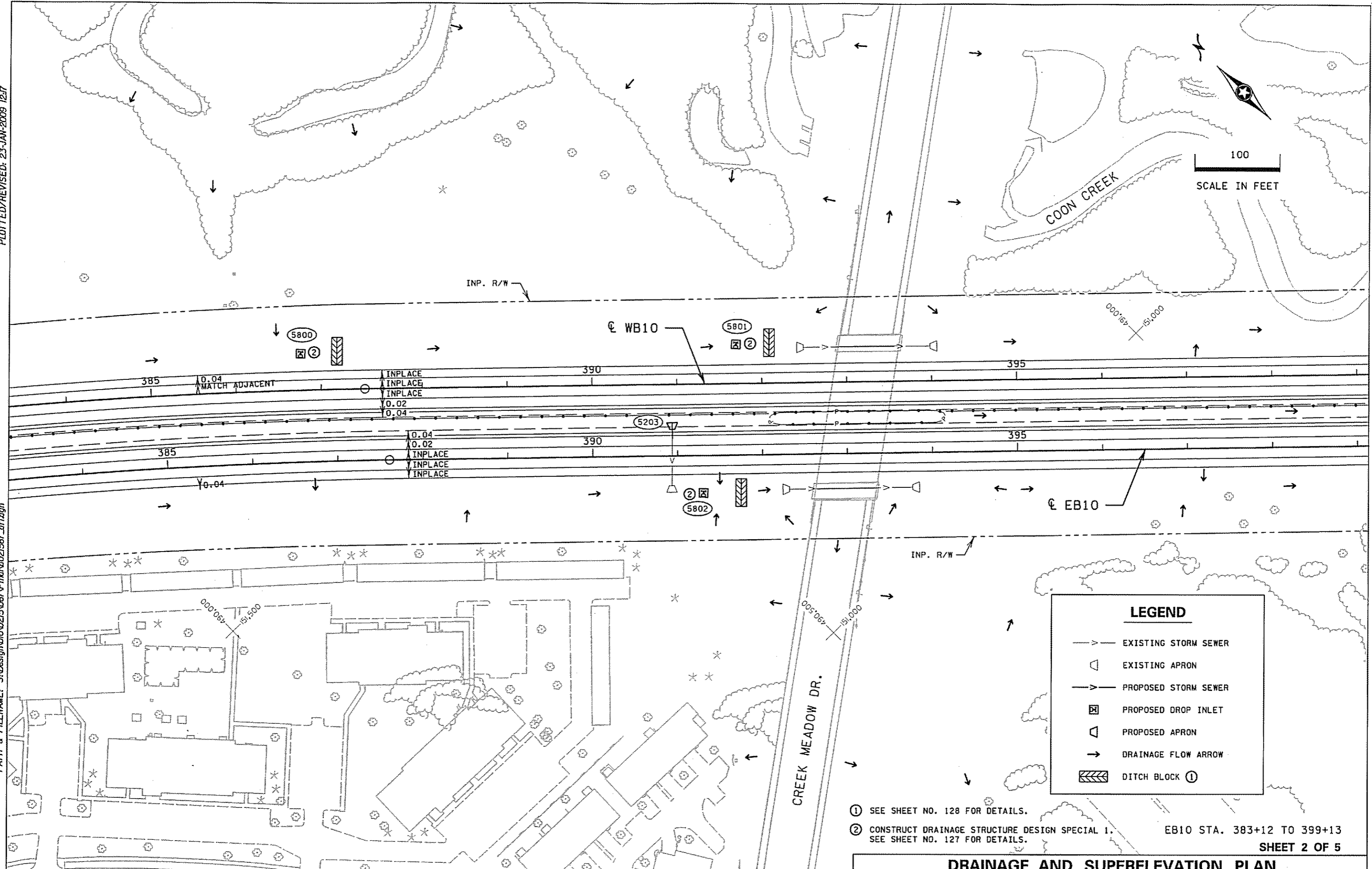
ROBINSON DR. EB10 STA. 367+99 TO 384+01  
SHEET 1 OF 5

**DRAINAGE AND SUPERELEVATION PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:17

DISTRICT #: METRO  
PLOT NAME: 67\_dr2  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_dr1.dgn

100  
SCALE IN FEET



**LEGEND**

- EXISTING STORM SEWER
- EXISTING APRON
- PROPOSED STORM SEWER
- PROPOSED DROP INLET
- PROPOSED APRON
- DRAINAGE FLOW ARROW
- DITCH BLOCK ①

① SEE SHEET NO. 128 FOR DETAILS.

② CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 1. SEE SHEET NO. 127 FOR DETAILS.

EB10 STA. 383+12 TO 399+13

SHEET 2 OF 5

**DRAINAGE AND SUPERELEVATION PLAN**

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY

*Peter Daniel*  
LICENSED PROFESSIONAL ENGINEER

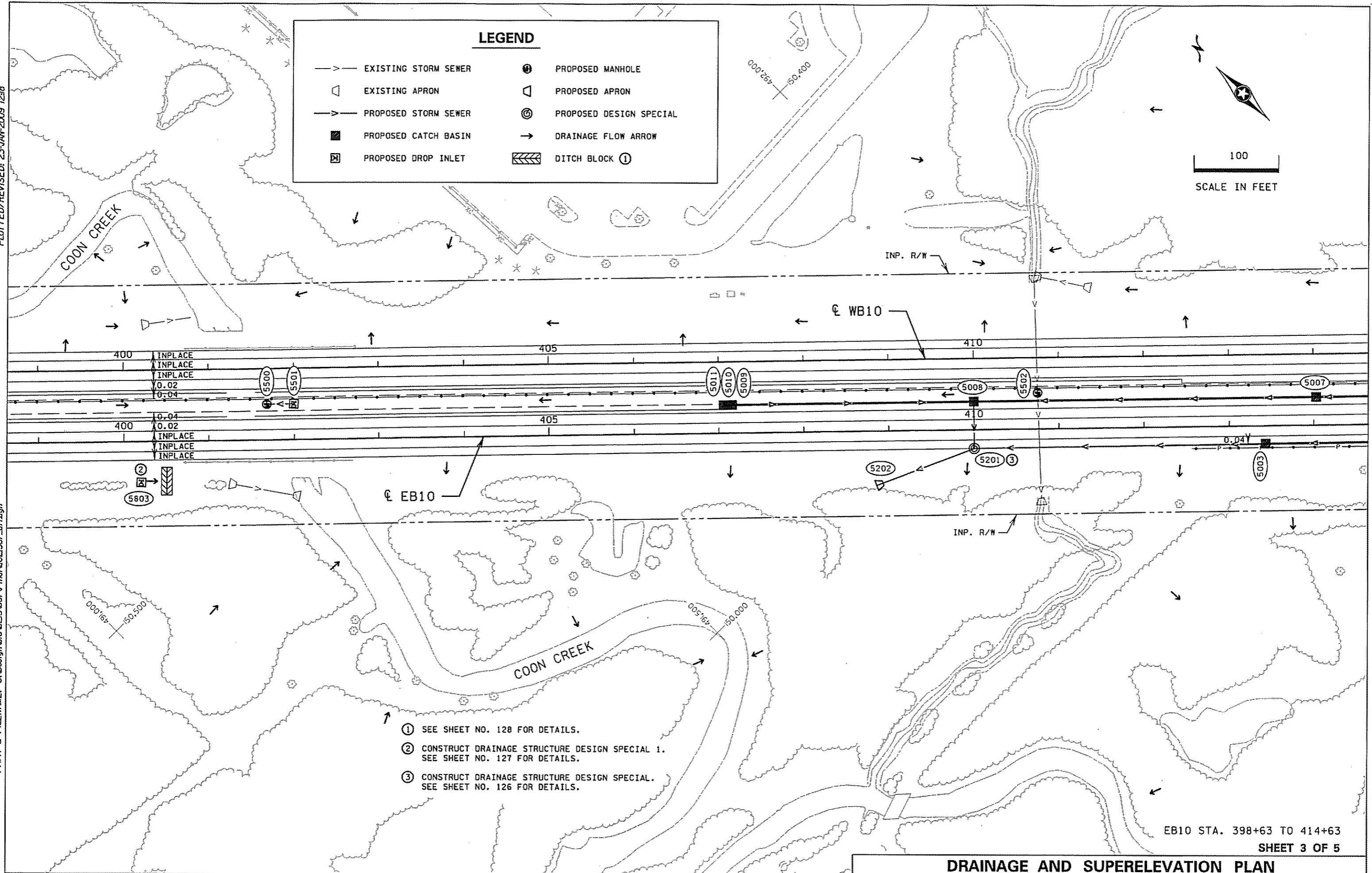
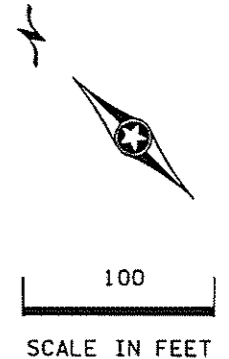
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STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 118 OF 222 SHEETS

PLOTTED/REVISED: 23-JAN-2009 12:18

DISTRICT #: METRO  
PLOT NAME: 67\_dr3  
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LEGEND			
	EXISTING STORM SEWER		PROPOSED MANHOLE
	EXISTING APRON		PROPOSED APRON
	PROPOSED STORM SEWER		PROPOSED DESIGN SPECIAL
	PROPOSED CATCH BASIN		DRAINAGE FLOW ARROW
	PROPOSED DROP INLET		DITCH BLOCK ①



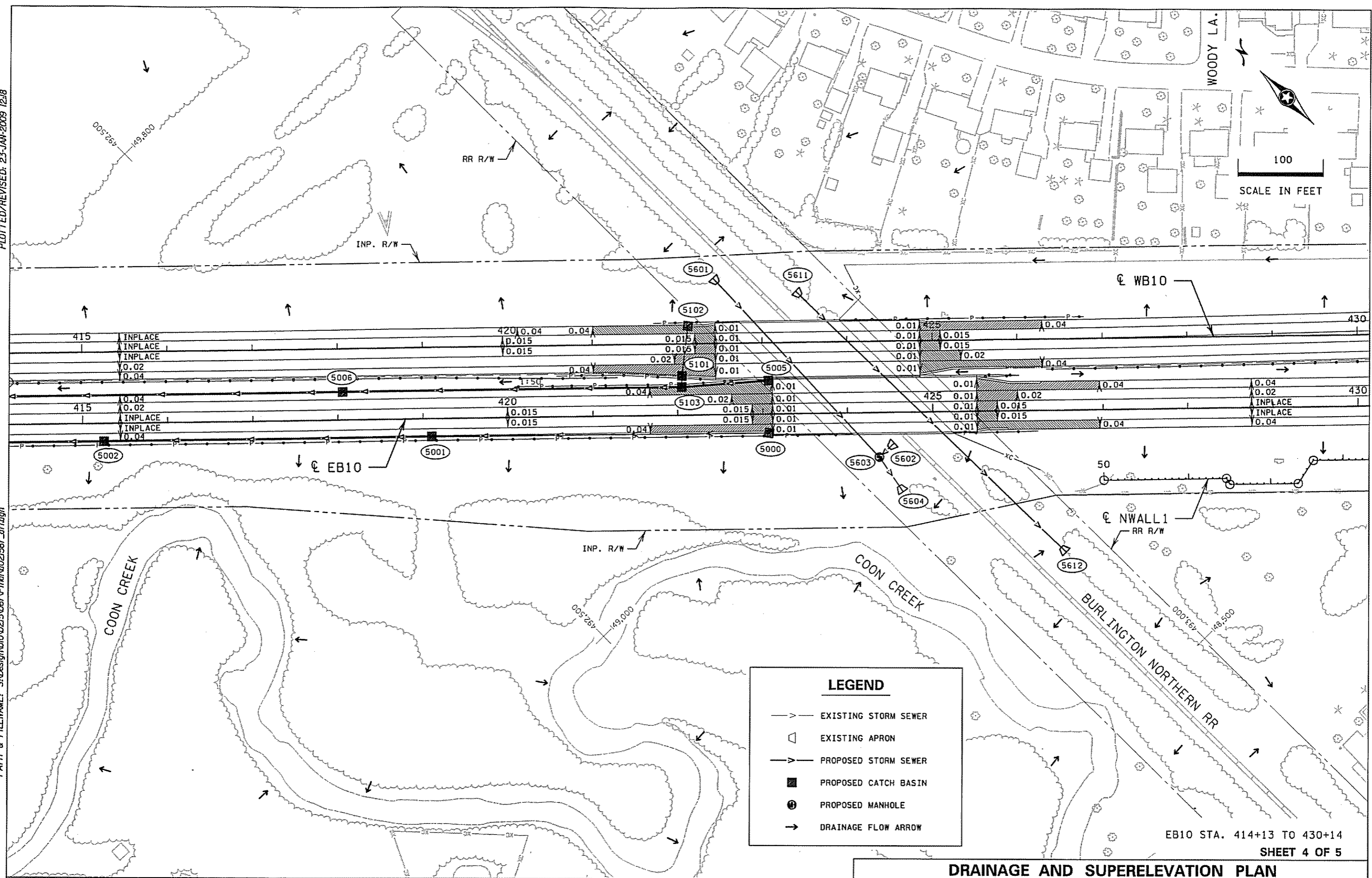
- ① SEE SHEET NO. 128 FOR DETAILS.
- ② CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL 1. SEE SHEET NO. 127 FOR DETAILS.
- ③ CONSTRUCT DRAINAGE STRUCTURE DESIGN SPECIAL. SEE SHEET NO. 126 FOR DETAILS.

EB10 STA. 398+63 TO 414+63  
SHEET 3 OF 5

**DRAINAGE AND SUPERELEVATION PLAN**

PLOTTED/REVISED: 23-JAN-2009 12:18

DISTRICT #: METRO  
PLOT NAME: 67\_dr4  
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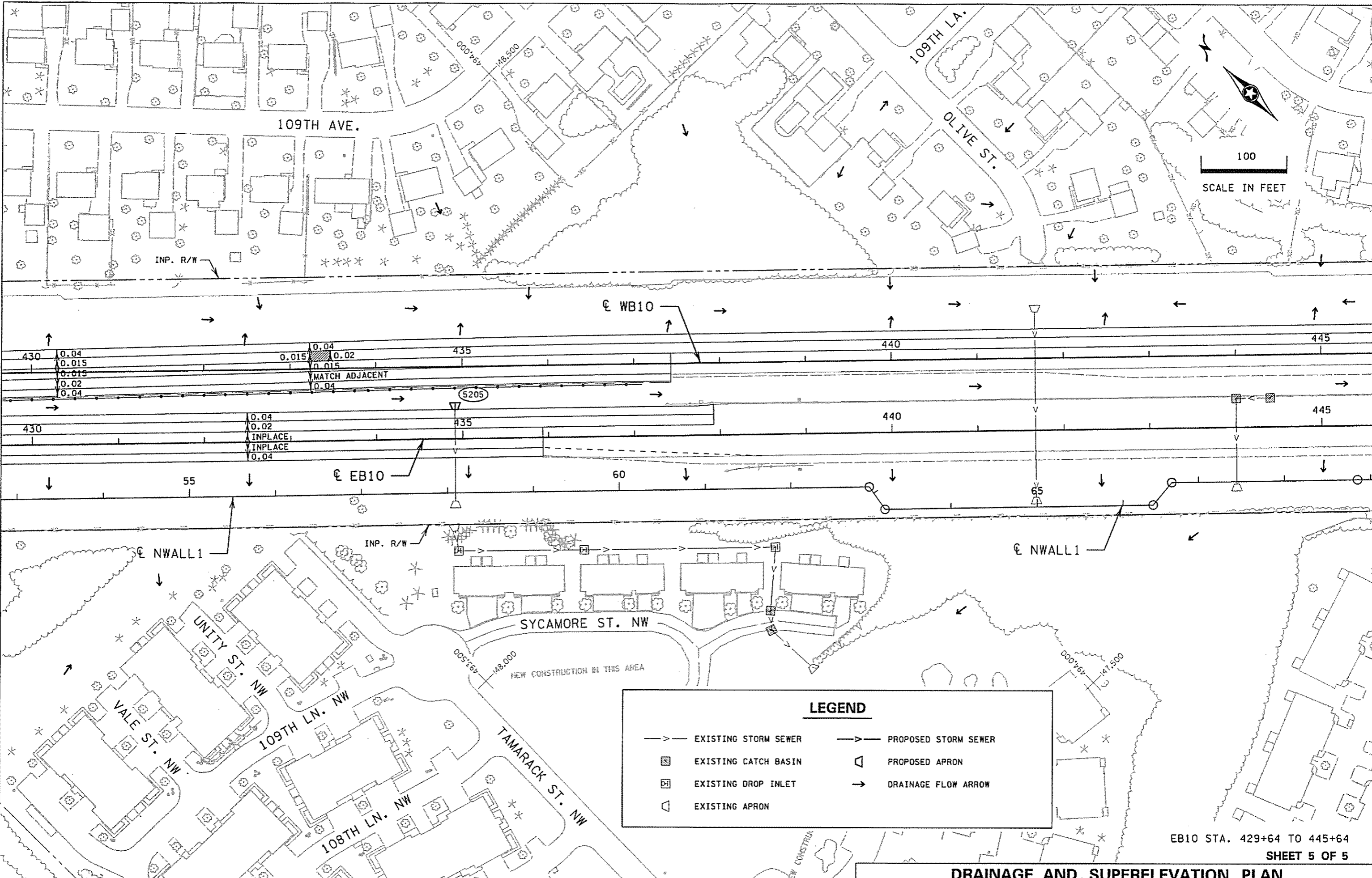
EB10 STA. 414+13 TO 430+14  
SHEET 4 OF 5

**DRAINAGE AND SUPERELEVATION PLAN**



PLOTTED/REVISED: 23-JAN-2009 12:18

DISTRICT #: METRO  
PLOT NAME: 67\_dr5  
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EB10 STA. 429+64 TO 445+64  
SHEET 5 OF 5

**DRAINAGE AND SUPERELEVATION PLAN**

K

DRAINAGE TABULATION (THIS SHEET ONLY)

Table with columns: STRUCTURE NO., STRUCTURE LOCATION, DRAINAGE STRUCTURES, TOP OF CASTING ELEV., OUTLET ELEV., INLET ELEV., 12" RCP CL II, 15" RCP CL II, 18" RCP CL II, PLASTIC OPTION, APRON, APRON TYPE, SOD TYPE EROSION, GUIDE POSTS TYPE B, REMARKS.

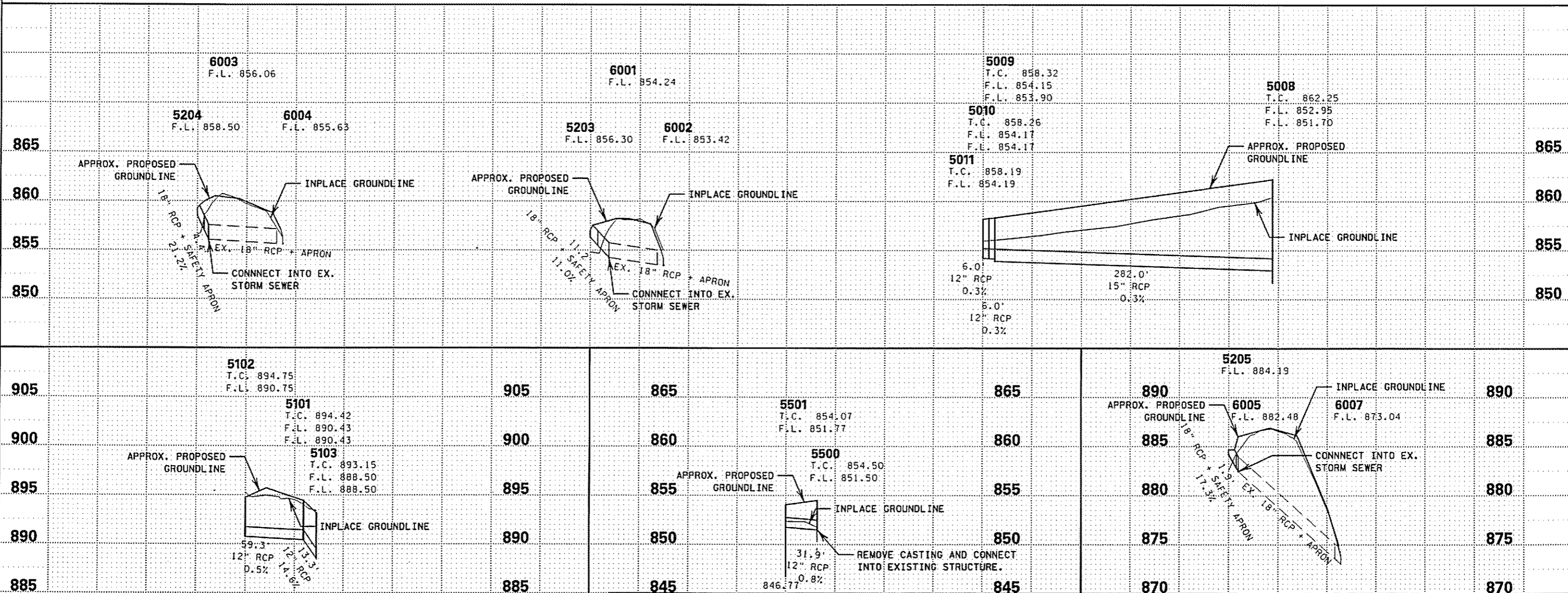
NOTES: - STATION AND OFFSET ARE AT CENTER OF STRUCTURE UNLESS OTHERWISE NOTED. - FLOWLINE (F.L.) ELEVATIONS ARE AT CENTER OF STRUCTURE ON PROFILES, EDGE OF STRUCTURE ON TABULATIONS, OR END OF APRON.

- 1 FOR CASTING ASSEMBLY KEY & SUMMARY, SEE SHEET NO. 12.
2 INLET ELEVATION AT DOWN-STREAM STRUCTURE.
3 CP/PVC DENOTES CORRUGATED PLASTIC OR POLY VINYL CHLORIDE. THE PVC PIPE MEETING ASTM F794 & F949 ARE ACCEPTABLE ALTERNATIVES. POST-INSTALLATION MANDREL TESTING OF ALL PLASTIC PIPE SHALL BE PERFORMED BY THE CONTRACTOR.
4 TIE LAST 3 JOINTS AT APRON END (INCIDENTAL).

- 5 CENTER OF CASTING.
6 CENTER OF STRUCTURE.
7 INCLUDES ONE LONG RADIUS BEND AT 6003.
8 INCLUDES ONE LONG RADIUS BEND AT 6001.
9 INCLUDES ONE SHORT RADIUS GASKETED BEND AT 6005.

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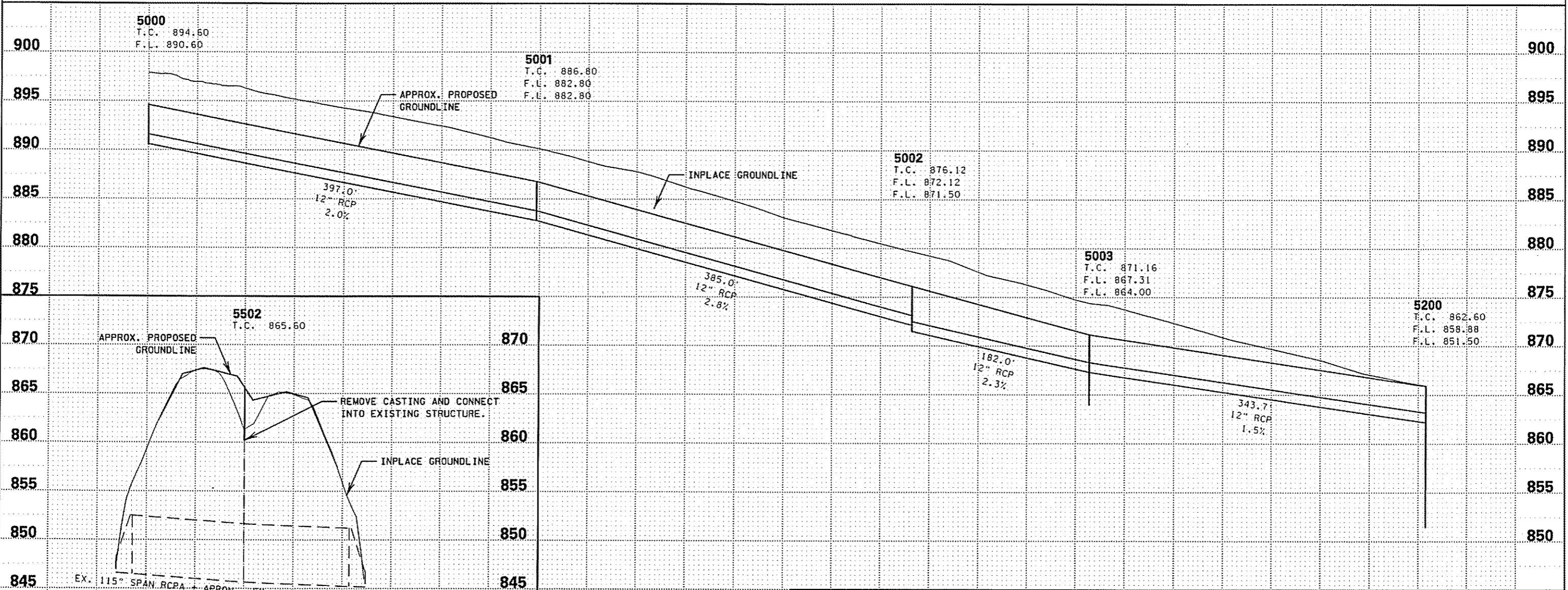
5204 5203 5011 5010 5009 5102 5101 5501 5500 5205 DRAINAGE TABULATION AND PROFILES

PLOTTED/REVISED: 11-FEB-2009 08:55

STRUCTURE NO.		STRUCTURE LOCATION			DRAINAGE STRUCTURES							TOP OF CASTING ELEV.	OUTLET ELEV.	INLET ELEV. (2)	12" RCP CL II LIN FT	PLASTIC OPTION (3)	REMARKS
FLOWS FROM	FLOWS TO	ALIGN.	STATION	OFFSET	TYPE	PAY HEIGHT			CASTING ASSEMBLY TYPE (1)	CONE TYPE	STEPS REQ'D						
						C OR G LIN FT	A OR F LIN FT	SPECIAL 1 (4) EACH									
5000	5001	EB10	423+07.00	22.3' RT	CB	4.0			B-9			894.60	890.56	882.84	397		
5001	5002	EB10	419+10.00	21.0' RT	CB	4.0			B-9			886.80	882.74	872.17	385		
5002	5003	EB10	415+25.00	21.0' RT	CB	4.6			B-9			876.12	871.45	867.36	182		
5003	5200	EB10	413+43.00	21.0' RT	CB		7.1		B-9	A	YES	871.16	863.97	858.88	344		
5502		EB10	410+75.31	42.4' LT	MH	4.8			A-7D			865.60					
5800		WB10	386+76.85	43.1' LT	CB			1	M-11			856.14					
5801		WB10	391+70.00	46.0' LT	CB			1	M-11			854.23					
5802		EB10	391+30.00	44.0' RT	CB			1	M-11			854.26					
5803		EB10	400+20.00	48.0' RT	CB			1	M-11			851.45					
<b>TOTALS</b>						<b>17.4</b>	<b>7.1</b>	<b>4</b>	<b>9</b>					<b>1308</b>			

NOTES: - STATION AND OFFSET ARE AT CENTER OF STRUCTURE UNLESS OTHERWISE NOTED.  
 - FLOWLINE (F.L.) ELEVATIONS ARE AT CENTER OF STRUCTURE ON PROFILES, EDGE OF STRUCTURE ON TABULATIONS, OR END OF APRON.  
 - ALL CONCRETE PIPE SEWER IS DESIGN 3006 GASKET JOINT PIPE.  
 - TOP OF CATCH BASIN CASTING ELEVATIONS COMPUTED USING A SUMP OF 0.1 FT.  
 - MANHOLE REQUIRES NO SUMP.

- ① FOR CASTING ASSEMBLY KEY & SUMMARY, SEE SHEET NO. 12.
- ② INLET ELEVATION AT DOWN-STREAM STRUCTURE.
- ③ CP/PVC DENOTES CORRUGATED PLASTIC OR POLY VINYL CHLORIDE. THE PVC PIPE MEETING ASTM F794 & F949 ARE ACCEPTABLE ALTERNATIVES. POST-INSTALLATION MANDREL TESTING OF ALL PLASTIC PIPE SHALL BE PERFORMED BY THE CONTRACTOR.
- ④ SEE SHEET NO. 127 FOR DESIGN SPECIAL 1 STRUCTURE AND CASTING DETAIL.



DISTRICT #: METRO  
 PLOT NAME: 67\_d12  
 PATH & FILENAME: S:\Design\0215\067\Final\021567\_d11.dgn

5000 5001 5002 5003 5502

**DRAINAGE TABULATION AND PROFILES**

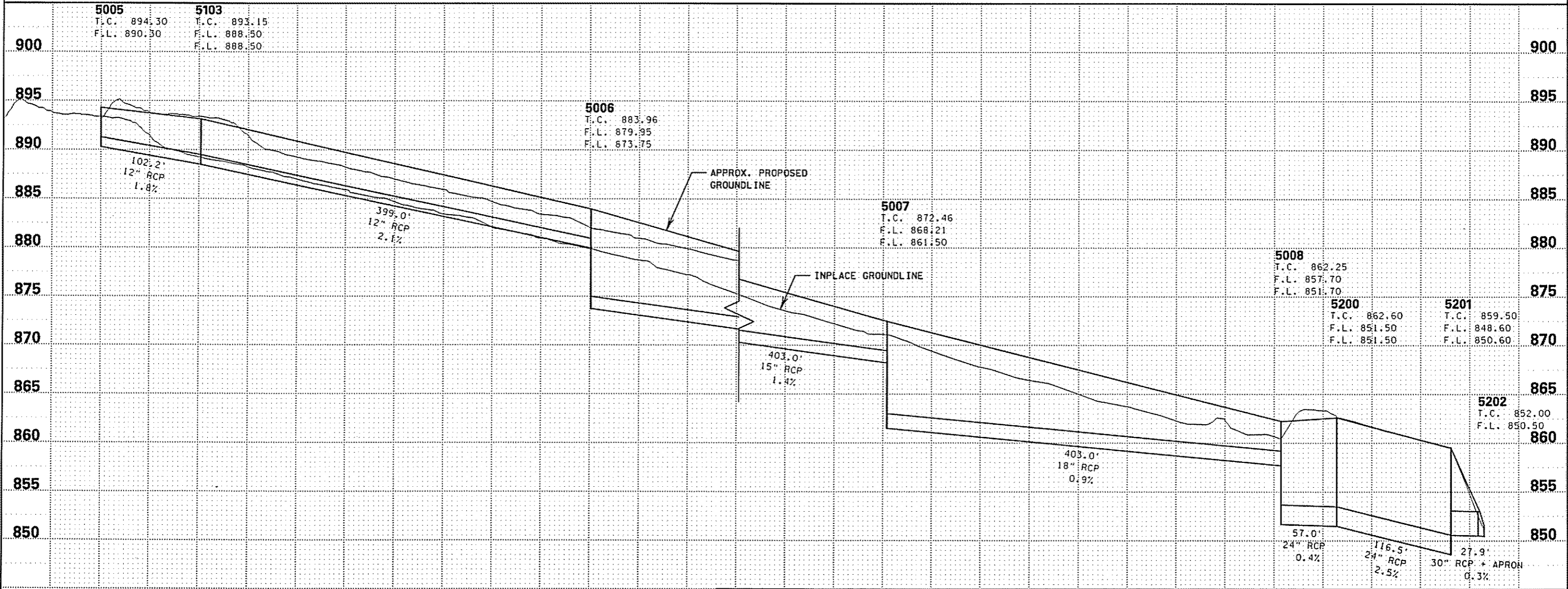
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STRUCTURE NO.		STRUCTURE LOCATION			DRAINAGE STRUCTURES							12" RCP	15" RCP	18" RCP	24" RCP	30" RCP	PLASTIC OPTION	APRON	APRON TYPE	RIPRAP CLASS II	GEOTEXTILE FILTER TYPE III	GUIDE POSTS TYPE B	REMARKS		
FLOWS FROM	FLOWS TO	ALIGN.	STATION	OFFSET	TYPE	PAY HEIGHT			CASTING ASSEMBLY TYPE ①	CONE TYPE	STEPS REQ'D	TOP OF CASTING ELEV.	OUTLET ELEV.	INLET ELEV. ②	CL II LIN FT	CL III LIN FT	CL III LIN FT	CL III LIN FT	CL II LIN FT	③	EACH	CU YD	SQ YD	EACH	
						C OR G LIN FT	A OR F LIN FT	SPECIAL ⑤ EACH																	
5005	5103	EB10	423+07.00	38.9' LT	CB	4.0			B-9			894.30	890.27	888.54	102										
5103	5006	EB10	422+05.00	33.0' LT	CB	4.6			B-9			893.15	888.46	879.99	399										
5006	5007	EB10	418+06.00	37.8' LT	CB		10.2		B-9	A	YES	883.96	873.72	868.24		403			PVC						
5007	5008	EB10	414+03.00	33.0' LT	CB		10.9		B-9	A	YES	872.46	861.48	857.72			403		PVC						
5008	5200	EB10	410+00.00	33.0' LT	CB		10.5		B-9	A	YES	862.25	851.69	851.50			57		CP/PVC						
5200	5201	EB10	409+99.30	24.0' RT	MH		10.5		A-7D	A	YES	862.60	851.50	848.60			117		CP/PVC						
5201	5202	EB10	408+82.92	30.0' RT	MH			1				859.50	850.60	850.50				28							
5202		EB10	408+85.00	64.0' RT									850.50							1	RC APRON	7.3	22.2	1	④
<b>TOTALS</b>						<b>8.6</b>	<b>42.1</b>	<b>1</b>	<b>6</b>						<b>501</b>	<b>403</b>	<b>403</b>	<b>174</b>	<b>28</b>	<b>1</b>		<b>7.3</b>	<b>22.2</b>	<b>1</b>	

NOTES: - STATION AND OFFSET ARE AT CENTER OF STRUCTURE UNLESS OTHERWISE NOTED.  
 - FLOWLINE (F.L.) ELEVATIONS ARE AT CENTER OF STRUCTURE ON PROFILES, EDGE OF STRUCTURE ON TABULATIONS, OR END OF APRON.  
 - ALL CONCRETE PIPE SEWER IS DESIGN 3006 GASKET JOINT PIPE.  
 - TOP OF CATCH BASIN CASTING ELEVATIONS COMPUTED USING A SUMP OF 0.1 FT.  
 - MANHOLE REQUIRES NO SUMP.

- ① FOR CASTING ASSEMBLY KEY & SUMMARY, SEE SHEET NO. 12.
- ② INLET ELEVATION AT DOWN-STREAM STRUCTURE.
- ③ CP/PVC DENOTES CORRUGATED PLASTIC OR POLY VINYL CHLORIDE. THE PVC PIPE MEETING ASTM F794 & F949 ARE ACCEPTABLE ALTERNATIVES. POST-INSTALLATION MANDREL TESTING OF ALL PLASTIC PIPE SHALL BE PERFORMED BY THE CONTRACTOR.
- ④ TIE LAST 3 JOINTS AT APRON END (INCIDENTAL).

⑤ SEE SHEET NO. 126 FOR DESIGN SPECIAL STRUCTURE AND CASTING DETAIL.



5005 5103 5006 5007 5008 5201 5202

**DRAINAGE TABULATION AND PROFILES**

DISTRICT #: METRO  
 PLOT NAME: 67\_d13  
 PATH & FILENAME: S:\Design\0215\06\Final\021567\_d11.dgn

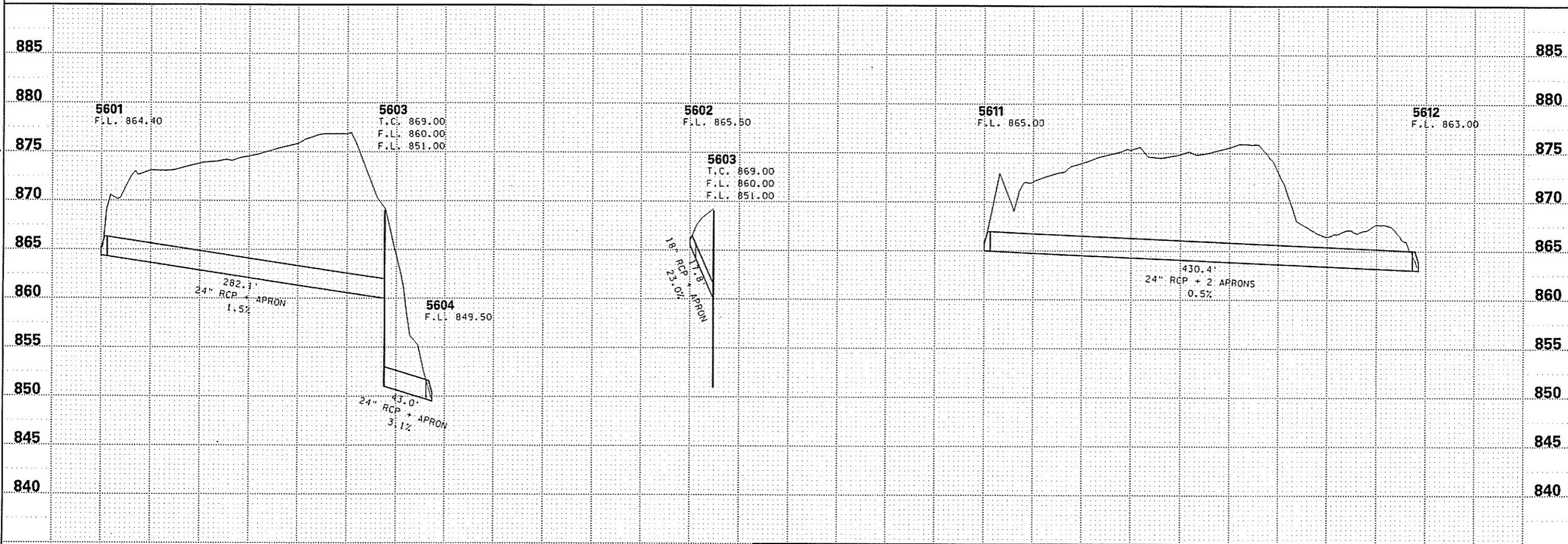
PLOTTED/REVISED: 23-JAN-2009 12:18

STRUCTURE NO.		STRUCTURE LOCATION			DRAINAGE STRUCTURES					TOP OF CASTING ELEV.	OUTLET ELEV.	INLET ELEV. ②	18" RCP CL III LIN FT	24" RCP CL III LIN FT	PLASTIC OPTION ③	APRON EACH	APRON TYPE	RIPRAP CLASS II CU YD	GEOTEXTILE FILTER TYPE III SQ YD	SOD TYPE EROSION SQ YD	GUIDE POSTS TYPE B EACH	REMARKS
FROM	TO	ALIGN.	STATION	OFFSET	TYPE	PAY HEIGHT A OR F LIN FT	CASTING ASSEMBLY TYPE ①	CONE TYPE	STEPS REQ'D													
5601	5603	WB10	422+42.93	76.9' LT						866.40	864.40	860.03				1	RC APRON			13	1	④
5603	5604	WB10	424+36.70	136.5' RT	MH	18.2	A-7D	A	YES	869.00	850.94	849.50		43								④
5604		WB10	424+64.10	177.3' RT							849.50					1	RC APRON	8.3	4.2		1	
5602	5603	WB10	424+54.25	120.2' RT						850.00	865.50	860.46	18			1	RC APRON			10	1	④
5611	5612	WB10	423+40.13	60.2' LT						866.40	865.00	863.00		430		1	RC APRON			13	1	④
5612		WB10	426+54.78	251.0' RT							863.00					1	RC APRON	8.3	4.2		1	
<b>TOTALS</b>													<b>18</b>	<b>755</b>		<b>5</b>		<b>16.6</b>	<b>8.4</b>	<b>36</b>	<b>5</b>	

NOTES: - STATION AND OFFSET ARE AT CENTER OF STRUCTURE UNLESS OTHERWISE NOTED.  
 - FLOWLINE (F.L.) ELEVATIONS ARE AT CENTER OF STRUCTURE ON PROFILES, EDGE OF STRUCTURE ON TABULATIONS, OR END OF APRON.  
 - ALL CONCRETE PIPE SEWER IS DESIGN 3006 GASKET JOINT PIPE.  
 - TOP OF CATCH BASIN CASTING ELEVATIONS COMPUTED USING A SUMP OF 0.1 FT.  
 - MANHOLE REQUIRES NO SUMP.

- ① FOR CASTING ASSEMBLY KEY & SUMMARY, SEE SHEET NO. 12.
- ② INLET ELEVATION AT DOWN-STREAM STRUCTURE.
- ③ CP/PVC DENOTES CORRUGATED PLASTIC OR POLY VINYL CHLORIDE. THE PVC PIPE MEETING ASTM F794 & F949 ARE ACCEPTABLE ALTERNATIVES. POST-INSTALLATION MANDREL TESTING OF ALL PLASTIC PIPE SHALL BE PERFORMED BY THE CONTRACTOR.
- ④ TIE ALL JOINTS.

DISTRICT #: METRO  
 IPLOT NAME: 67.dwg  
 PATH & FILENAME: S:\Design\010\0215\067\Final\021567.dwg

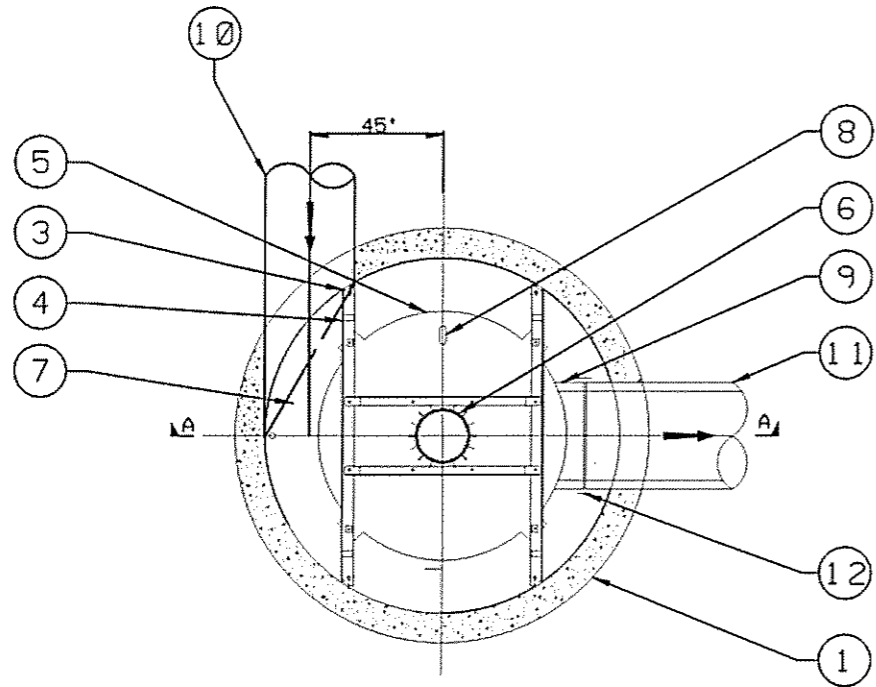


5601 5603 5604 5602 5611 5612

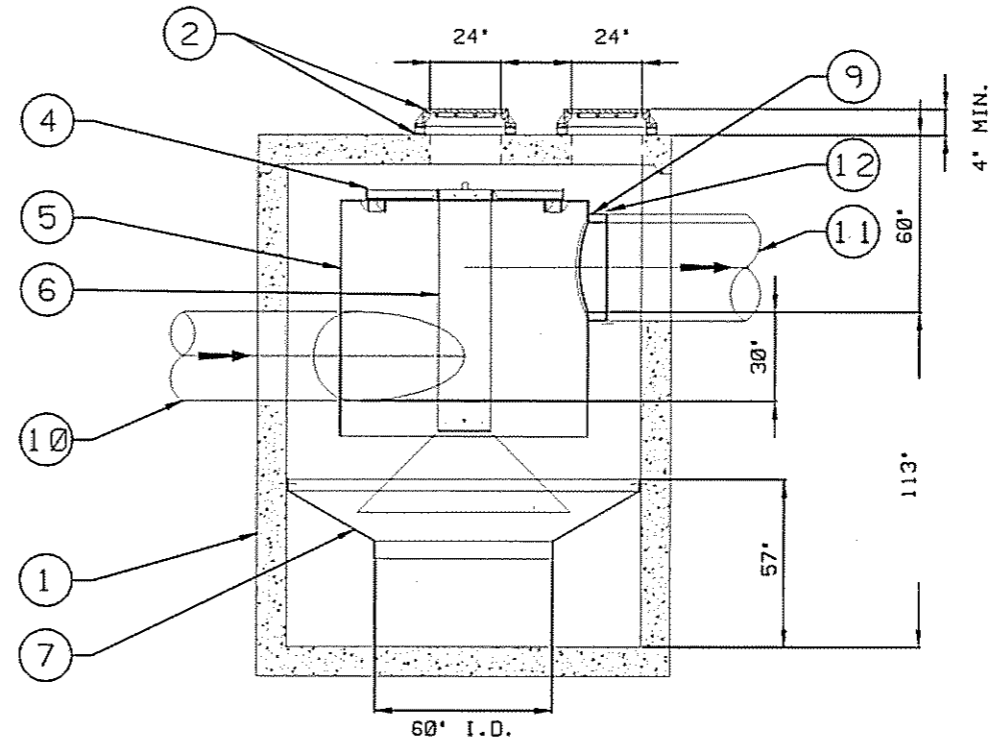
**DRAINAGE TABULATION AND PROFILES**

PLOTTED/REVISED: 11-FEB-2009 08:55

DISTRICT #: METRO  
 PLOT NAME: 67\_dtl  
 PATH & FILENAME: S:\Design\0215\06\Final\Drainage\021567\_drain\_detail.dgn



PLAN VIEW



SECTION A-A

PARTS LIST		
ITEM	SIZE	DESCRIPTION
1	120 IN.	I.D. CONCRETE MANHOLE
2	24 IN.	MANHOLE LIDS, FRAMES & COVERS
3		LEDGER ANGLE (TYP.)
4		SUPPORT FRAME
5		DIP PLATE
6		CENTER SHAFT & CONE
7		BENCHING SKIRT
8		FLOATABLES LID W/ VENT
9	30 IN.	OUTLET PIPE STUB
10	24 IN.	INLET PIPE
11	30 IN.	OUTLET PIPE
12		PIPE COUPLING

EQUIPMENT PERFORMANCE

THE STORMWATER TREATMENT UNIT SHALL ADHERE TO THE HYDRAULIC PARAMETERS GIVEN IN THE CHART BELOW AND PROVIDE THE REMOVAL EFFICIENCIES AND STORAGE CAPACITIES AS FOLLOWS:

1. PERFORMANCE OBJECTIVES: THE UNIT SHALL BE CAPABLE OF TREATING THE PEAK FLOW RATE LISTED BELOW.
2. PEAK TREATMENT FLOW: 25.0 CFS
3. DEPTH OF FLOW IN OVERFLOW PIPE AT 25.0 CFS: 22 IN.
4. ESTIMATED HEADLOSS\* AT 25.0 CFS: 10 IN.
5. SEDIMENT STORAGE CAPACITY: 8.70 CU. YD.
6. OIL STORAGE CAPACITY: 1050 GAL.
7. SEDIMENT SHALL BE STORED IN A ZONE THAT IS ISOLATED FROM THE MAIN FLOW PATH AND PROTECTED FROM REINTRAINMENT BY A BENCHING SKIRT.

\*HEADLOSS IS DEFINED AS THE DIFFERENCE BETWEEN STATIC WATER LEVEL AT THE INLET OF THE DOWNSTREAM DEFENDER TO THE FREE WATER SURFACE IN THE OVERFLOW PIPE, ASSUMING FREE DISCHARGE.

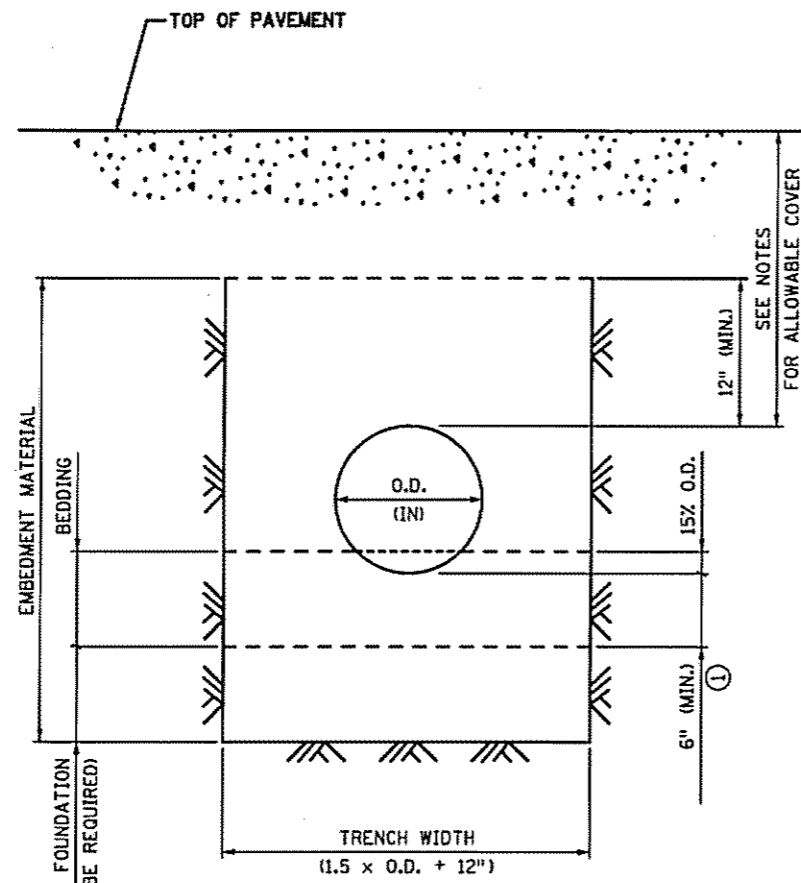
DIMENSIONS ARE GENERAL AND INTENDED FOR GUIDANCE ONLY. THE ORIENTATION OF THE INLET PIPE AND OVERFLOW PIPE CAN BE ADJUSTED TO SITE REQUIREMENTS. SEE SITE PLAN FOR ORIENTATION.

DESIGN SPECIAL STRUCTURE  
 (5201) DETAILS

**DRAINAGE DETAILS**

PLOTTED/REVISED: 23-JAN-2009 12:18

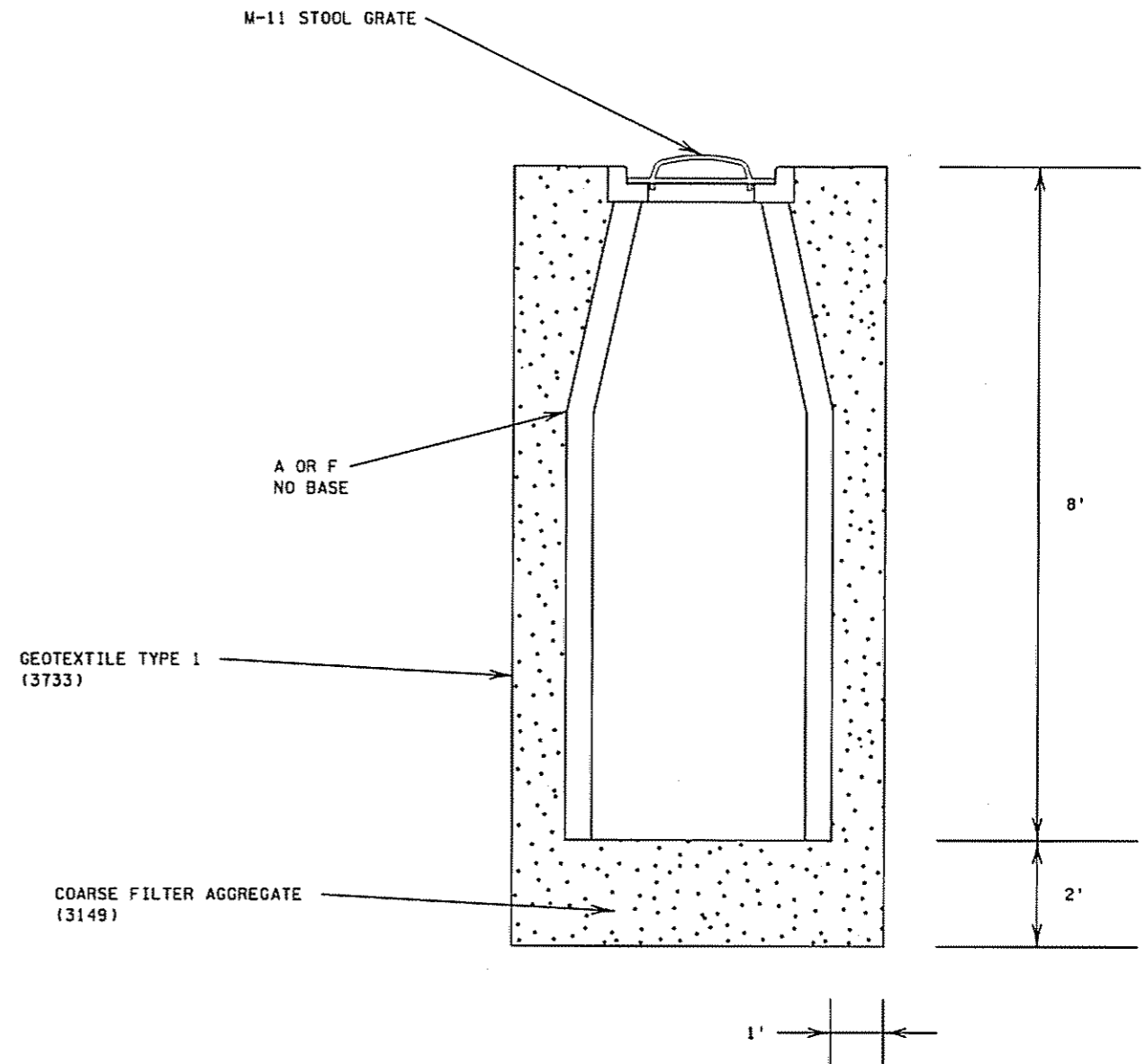
DISTRICT #: METRO  
 PLOT NAME: 67\_dtd  
 PATH & FILENAME: S:\Design\01\0215\067\Final\drain\drain\_dtd.dgn



MAXIMUM COVER (FT)		
NOMINAL PIPE DIAMETER	CP PIPE (AASHTO M294)	PVC PIPE (ASTM F794)
12"	20	40
15"	20	40
18"	20	40
21"	—	40
24"	15	20
30"	15	20
36"	15	20

**NOTES:**  
 MAXIMUM NOMINAL PIPE DIAMETER IS 36".  
 EMBEDMENT MATERIAL PER Mn/DOT SPEC. 3149.2D MODIFIED TO 100% PASSING THE 1" SIEVE.  
 CONSTRUCTION REQUIREMENTS PER Mn/DOT SPEC. 2451 MODIFIED SO THAT EMBEDMENT MATERIAL IS COMPACTED IN UNIFORM LAYERS 8" OR LESS IN THICKNESS, LOOSE MEASUREMENT TO 95% STANDARD PROCTOR DENSITY.  
 BEDDING SHALL BE CLASS B PER Mn/DOT SPEC. 2451.3.  
 MINIMUM COVER SHALL BE 24" FROM TOP OF PAVEMENT OR 12" FROM TOP OF GRADING GRADE WHICHEVER IS GREATER.  
 ① THE ZONE IMMEDIATELY BENEATH THE PIPE WHICH SHALL ONLY BE COMPACTED SUFFICIENTLY TO PROVIDE UNIFORM SUPPORT.

**PLASTIC PIPE  
 INSTALLATION REQUIREMENTS  
 FOR STORM SEWER ONLY**



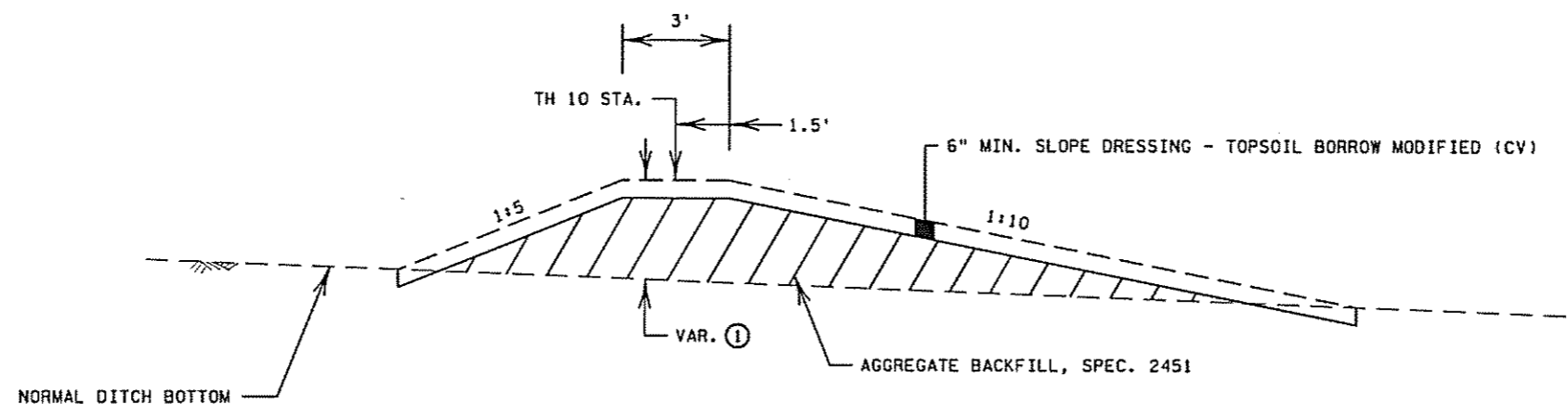
**DESIGN SPECIAL 1  
 (STRUCTURES 5800, 5801, 5802, 5803)**

**PLASTIC PIPE  
 DESIGN SPECIAL 1 STRUCTURE DETAIL**

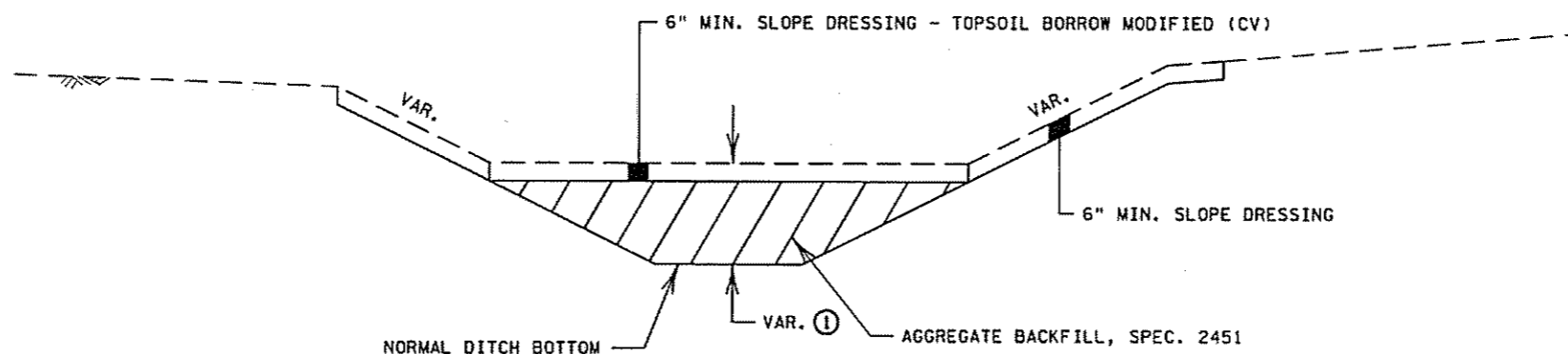
**DRAINAGE DETAILS**

PLOTTED/REVISED: 23-JAN-2009 12:18

DISTRICT #: METRO  
PLOT NAME: 67\_dd3  
PATH & FILENAME: S:\Design\0100215067\Final\drainage\021567\_drain\_detail.dgn



PROFILE



CROSS SECTION

- ① TOP OF DITCH BLOCK ELEVATIONS:
- WB10 STA. 387+19 LT 857.50
- WB10 STA. 392+09 LT 855.70
- EB10 STA. 391+74 RT 855.70
- EB10 STA. 400+50 RT 854.00

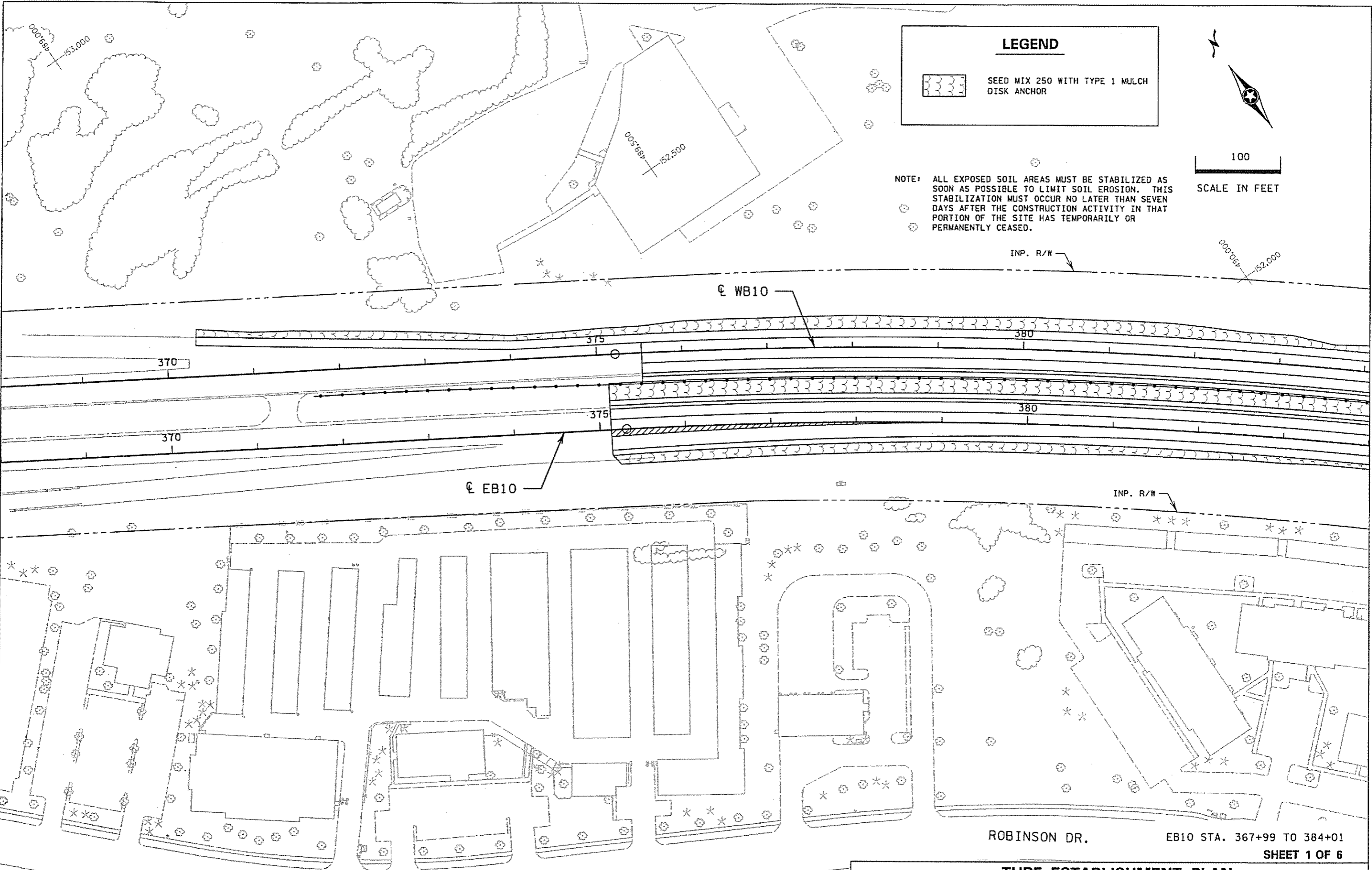
DITCH BLOCK DETAIL

DRAINAGE DETAILS



PLOTTED/REVISED: 26-JAN-2009 14:09

DISTRICT #: METRO  
PLOT NAME: 67.tbl  
PATH & FILENAME: S:\Design\0215\067\Final\021567.tbl.dgn



**LEGEND**

SEED MIX 250 WITH TYPE 1 MULCH

DISK ANCHOR

NOTE: ALL EXPOSED SOIL AREAS MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION. THIS STABILIZATION MUST OCCUR NO LATER THAN SEVEN DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.

100  
SCALE IN FEET

ROBINSON DR.

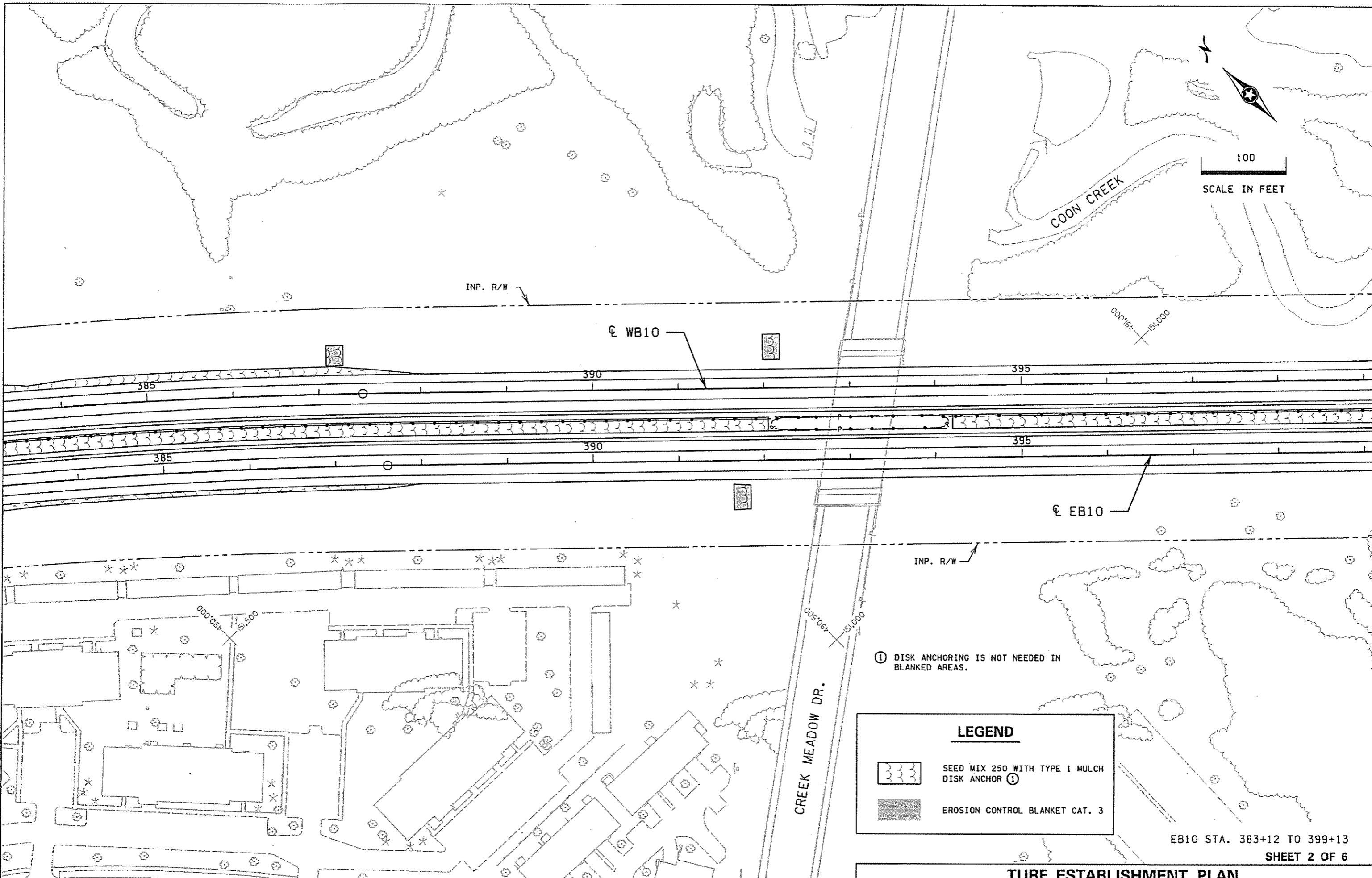
EB10 STA. 367+99 TO 384+01

SHEET 1 OF 6

**TURF ESTABLISHMENT PLAN**

PLOTTED/REVISED: 26-JAN-2009 14:09

DISTRICT #: METRO  
PLOT NAME: 67\_1a2  
PATH & FILENAME: S:\Design\010215\067\Final\021567\_1a2.dgn



**LEGEND**

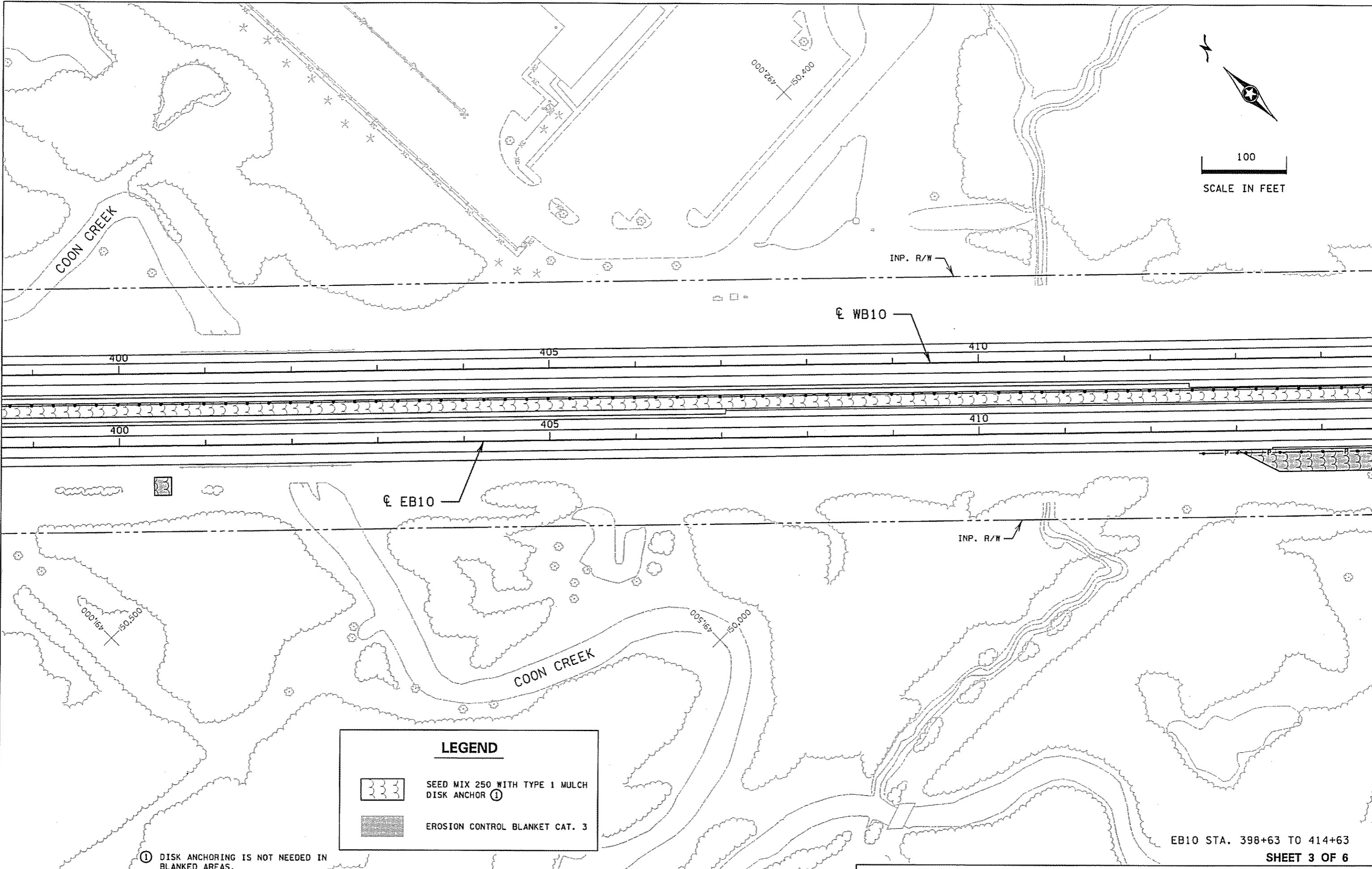
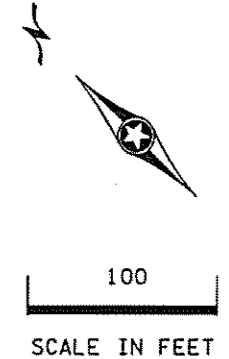
	SEED MIX 250 WITH TYPE 1 MULCH DISK ANCHOR ①
	EROSION CONTROL BLANKET CAT. 3

EB10 STA. 383+12 TO 399+13  
SHEET 2 OF 6

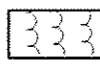

**TURF ESTABLISHMENT PLAN**

PLOTTED/REVISED: 26-JAN-2009 10:55

DISTRICT #: METRO  
PLOT NAME: 67\_163  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_163.dgn



**LEGEND**

	SEED MIX 250 WITH TYPE 1 MULCH DISK ANCHOR ①
	EROSION CONTROL BLANKET CAT. 3

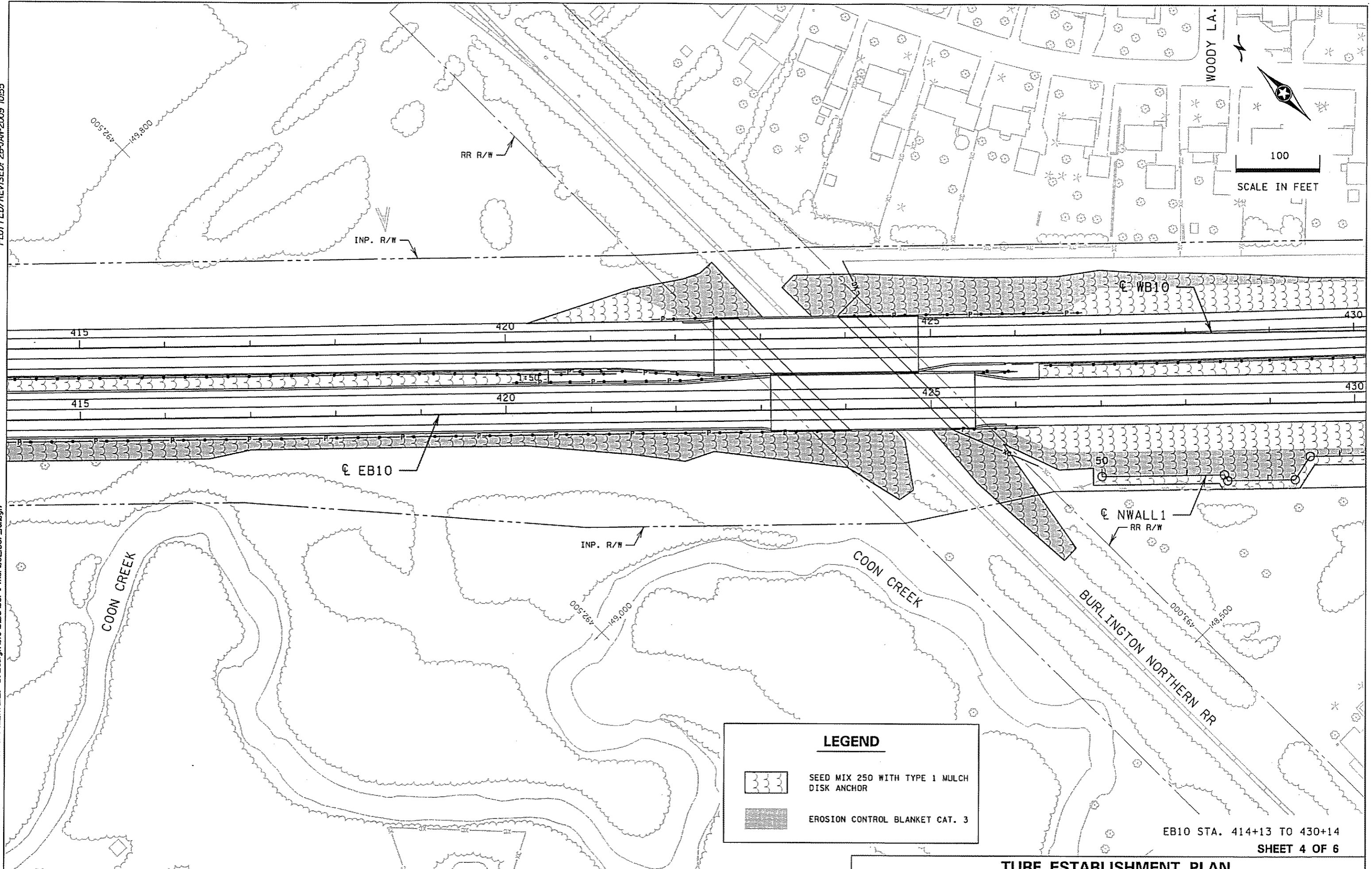
① DISK ANCHORING IS NOT NEEDED IN BLANKED AREAS.

EB10 STA. 398+63 TO 414+63  
SHEET 3 OF 6

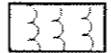

**TURF ESTABLISHMENT PLAN**

PLOTTED/REVISED: 25-JAN-2009 10:55

DISTRICT \*: METRO  
PLOT NAME: 67\_104  
PATH & FILENAME: S:\Design\0215\0215\067\Final\021567\_104.dgn



**LEGEND**

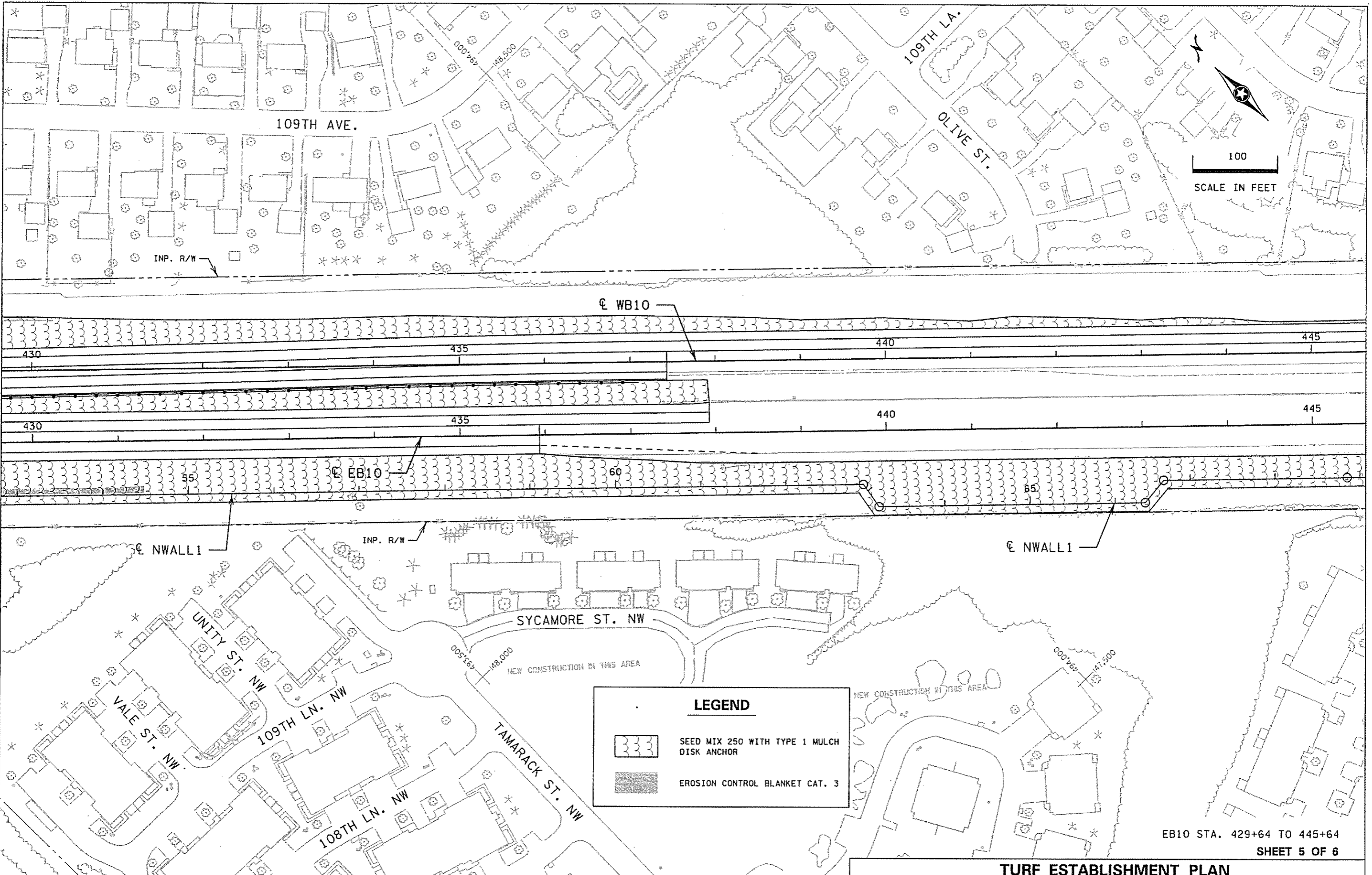
	SEED MIX 250 WITH TYPE 1 MULCH DISK ANCHOR
	EROSION CONTROL BLANKET CAT. 3

EB10 STA. 414+13 TO 430+14  
SHEET 4 OF 6

**TURF ESTABLISHMENT PLAN**

PLOTTED/REVISED: 26-JAN-2009 10:55

DISTRICT #: METRO  
PLOT NAME: 67\_1e5  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_1e5.dgn

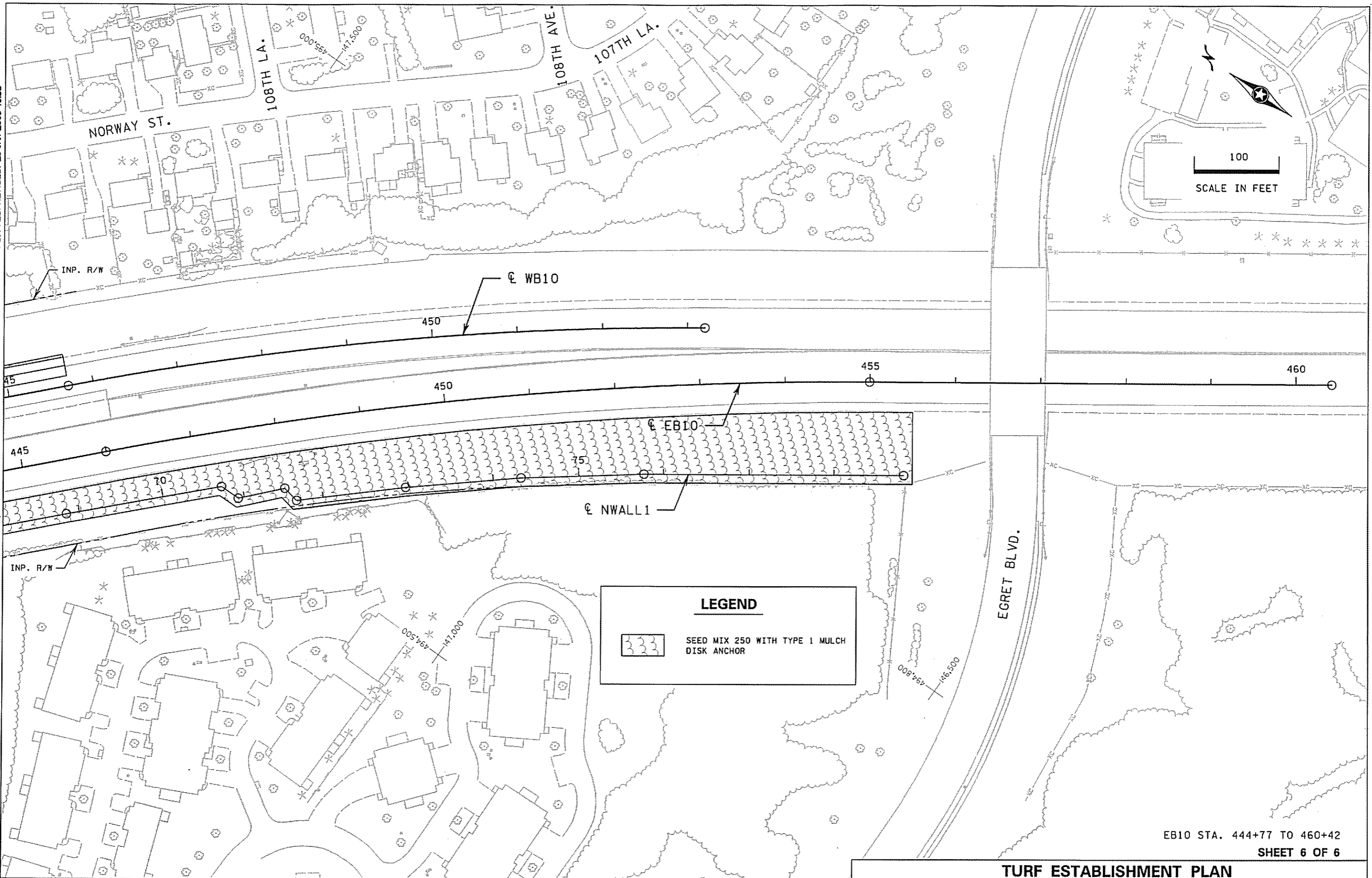


EB10 STA. 429+64 TO 445+64  
SHEET 5 OF 6

**TURF ESTABLISHMENT PLAN**

PLOTTED/REVISED: 26-JAN-2009 10:55

DISTRICT #: METRO  
PLOT NAME: 67\_106  
PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_106.dgn



EB10 STA. 444+77 TO 460+42

SHEET 6 OF 6

### TURF ESTABLISHMENT PLAN

DRAWN BY: HG

CHECKED BY: PAD

CERTIFIED BY *Peter Danial*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 134 OF 222 SHEETS

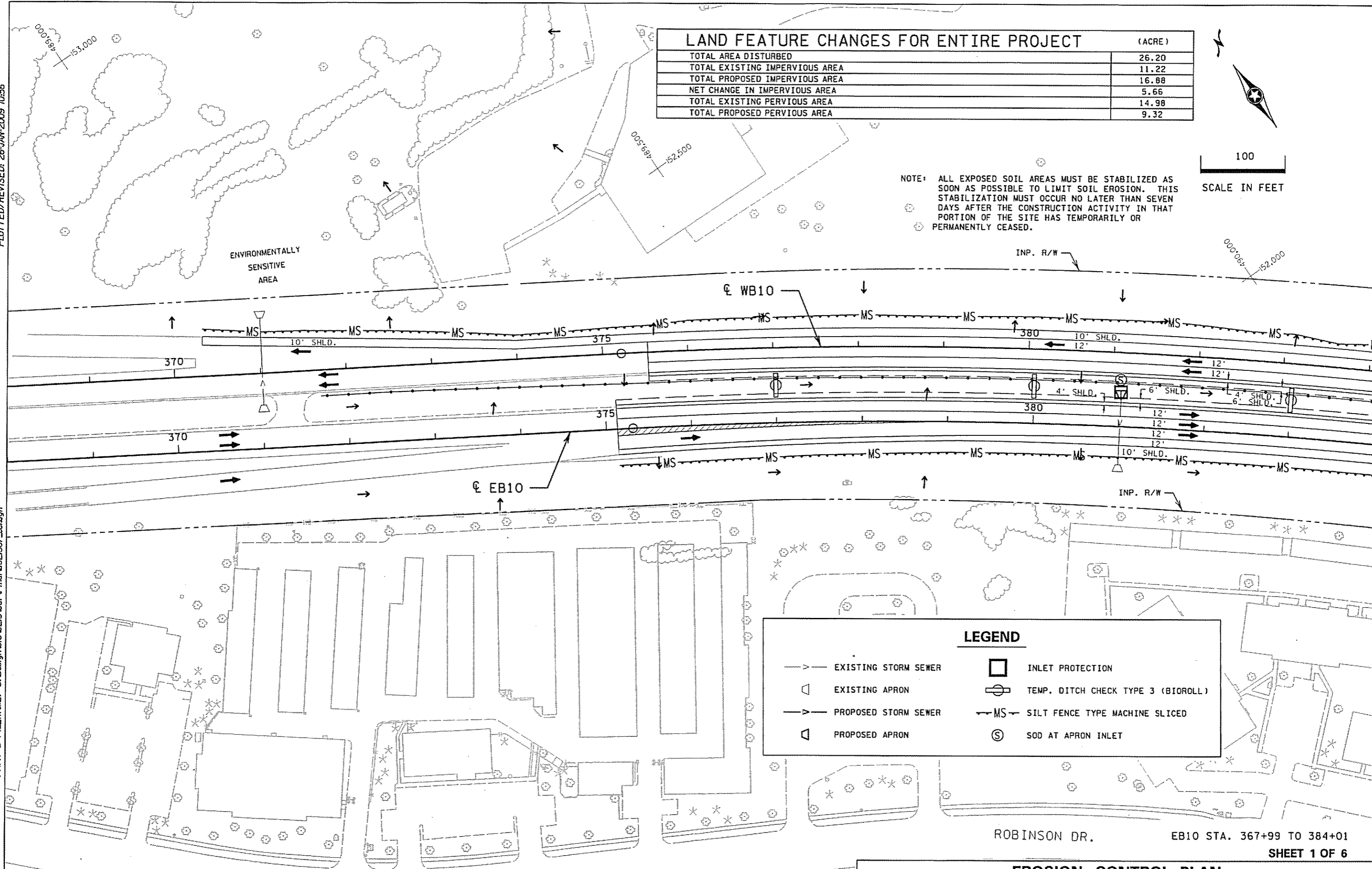
PLOTTED/REVISED: 26-JAN-2009 10:56

DISTRICT #: METRO  
PLOT NAME: 67\_ecl  
PATH & FILENAME: S:\Design\010215\067\Final\021567\_ecl.dgn

LAND FEATURE CHANGES FOR ENTIRE PROJECT		(ACRE)
TOTAL AREA DISTURBED		26.20
TOTAL EXISTING IMPERVIOUS AREA		11.22
TOTAL PROPOSED IMPERVIOUS AREA		16.88
NET CHANGE IN IMPERVIOUS AREA		5.66
TOTAL EXISTING PERVIOUS AREA		14.98
TOTAL PROPOSED PERVIOUS AREA		9.32



NOTE: ALL EXPOSED SOIL AREAS MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT SOIL EROSION. THIS STABILIZATION MUST OCCUR NO LATER THAN SEVEN DAYS AFTER THE CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.



LEGEND	
	EXISTING STORM SEWER
	EXISTING APRON
	PROPOSED STORM SEWER
	PROPOSED APRON
	INLET PROTECTION
	TEMP. DITCH CHECK TYPE 3 (BIOROLL)
	MS SILT FENCE TYPE MACHINE SLICED
	SOD AT APRON INLET

ROBINSON DR. EB10 STA. 367+99 TO 384+01  
SHEET 1 OF 6

**EROSION CONTROL PLAN**

PLOTTED/REVISED: 26-JAN-2009 10:56

DISTRICT: METRO  
PLOT NAME: 67\_ec2  
PATH & FILENAME: S:\Design\010215\067\Final\021567\_ec1.dgn

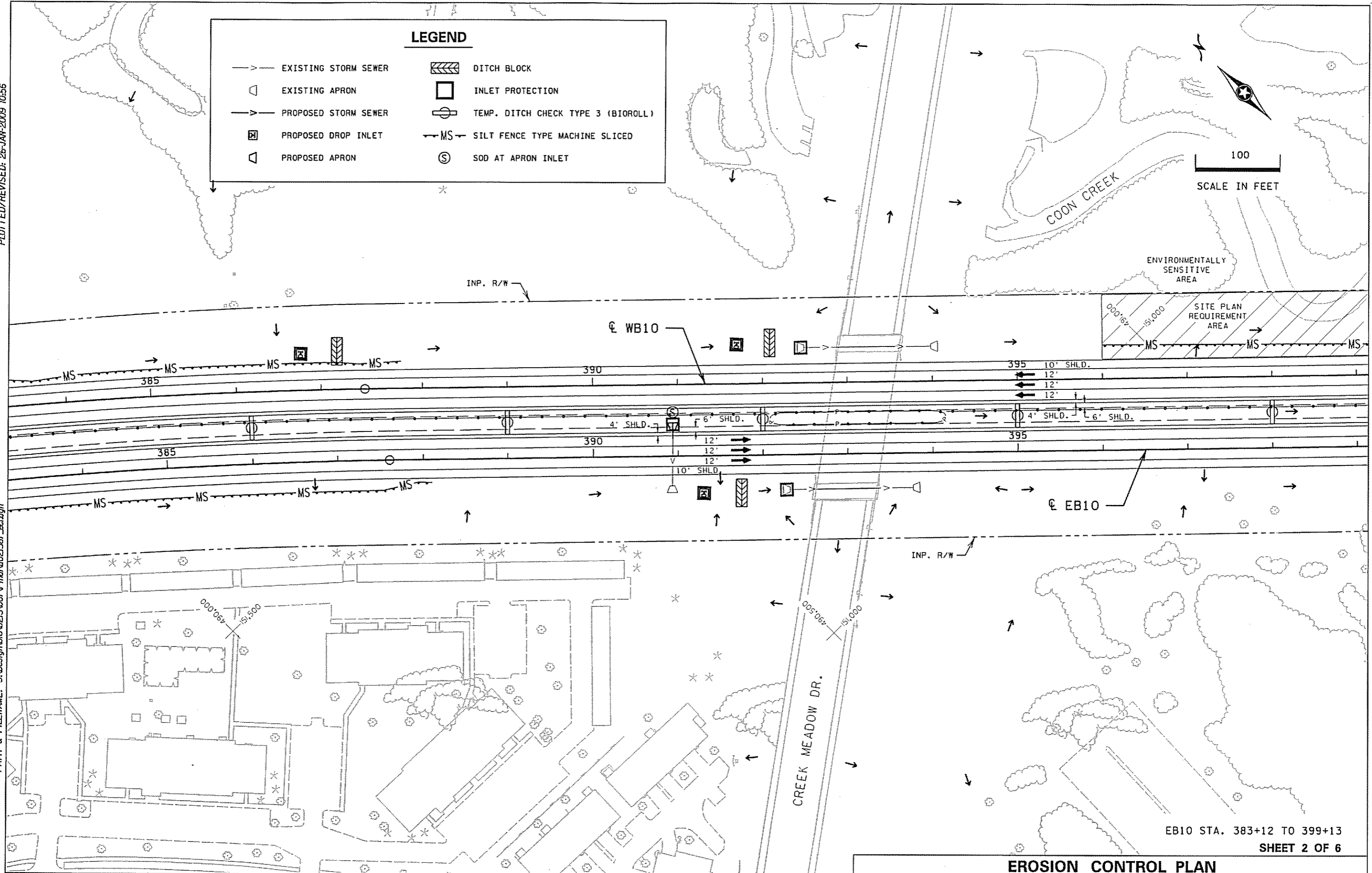
**LEGEND**

	EXISTING STORM SEWER		DITCH BLOCK
	EXISTING APRON		INLET PROTECTION
	PROPOSED STORM SEWER		TEMP. DITCH CHECK TYPE 3 (BIOROLL)
	PROPOSED DROP INLET		MS SILT FENCE TYPE MACHINE SLICED
	PROPOSED APRON		SOD AT APRON INLET

100  
SCALE IN FEET

ENVIRONMENTALLY SENSITIVE AREA

SITE PLAN REQUIREMENT AREA



EB10 STA. 383+12 TO 399+13  
SHEET 2 OF 6

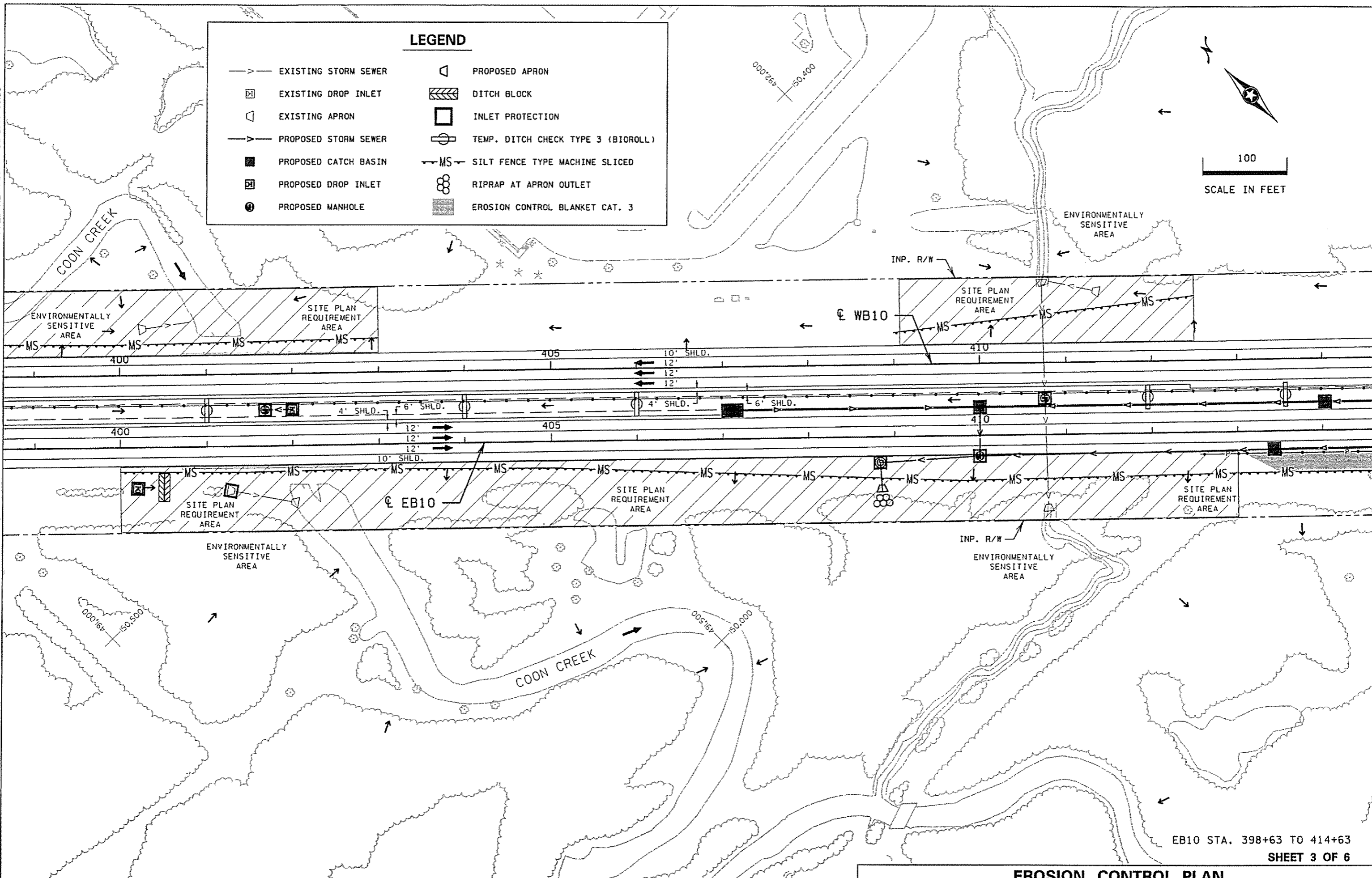
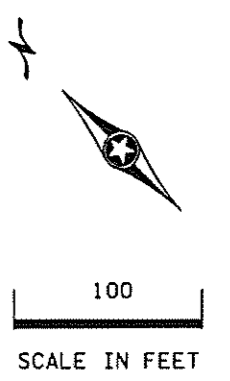
**EROSION CONTROL PLAN**



PLOTTED/REVISED: 11-FEB-2009 08:55

DISTRICT #: METRO  
PLOT NAME: 67-6c3  
PATH & FILENAME: S:\Design\010215\067\Firm\021567\_ecl.dgn

LEGEND			
	EXISTING STORM SEWER		PROPOSED APRON
	EXISTING DROP INLET		DITCH BLOCK
	EXISTING APRON		INLET PROTECTION
	PROPOSED STORM SEWER		TEMP. DITCH CHECK TYPE 3 (BIOROLL)
	PROPOSED CATCH BASIN		SILT FENCE TYPE MACHINE SLICED
	PROPOSED DROP INLET		RIPRAP AT APRON OUTLET
	PROPOSED MANHOLE		EROSION CONTROL BLANKET CAT. 3

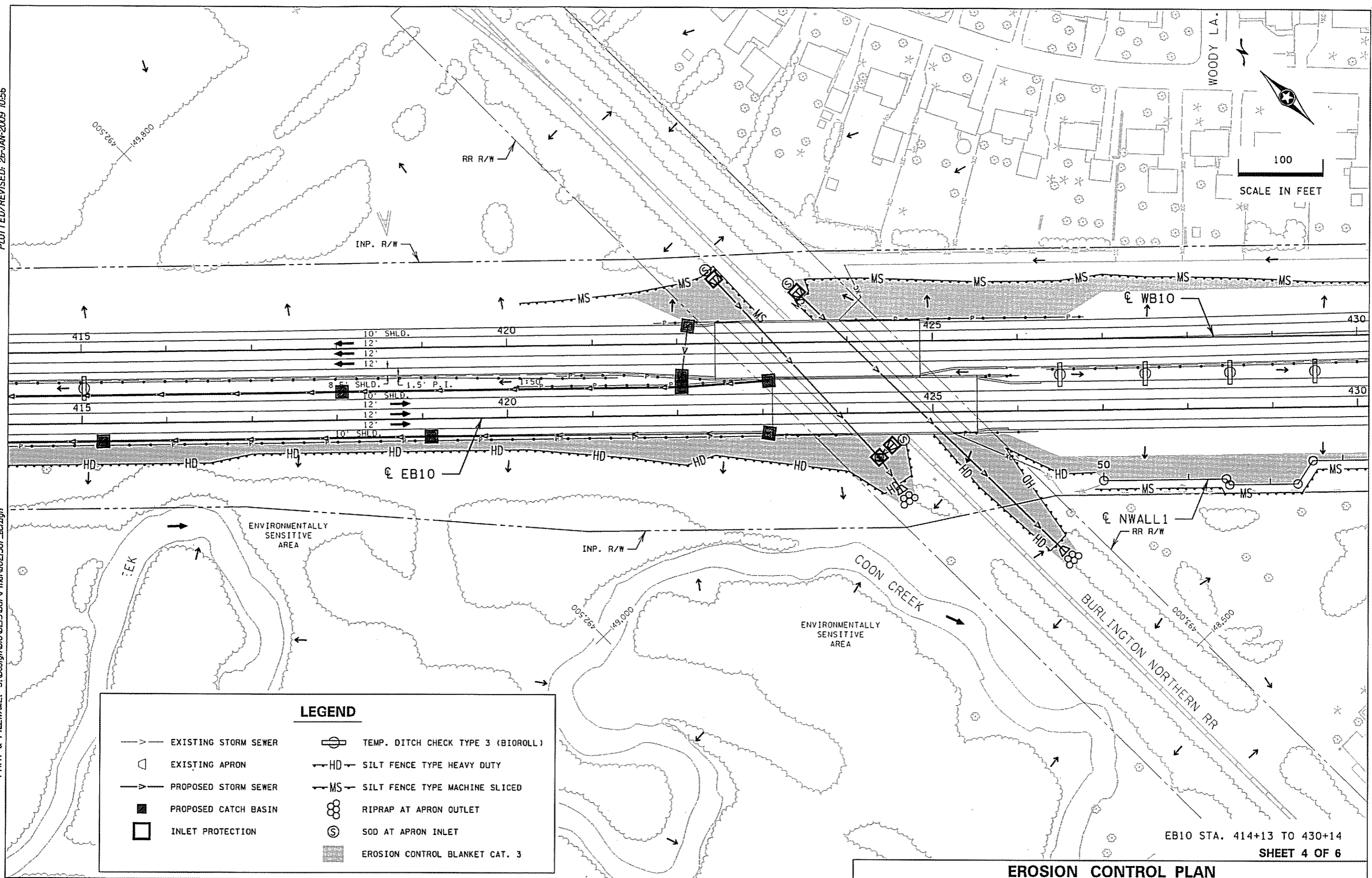


EB10 STA. 398+63 TO 414+63  
SHEET 3 OF 6

**EROSION CONTROL PLAN**

PLOTTED/REVISED: 26-JAN-2009 10:56

DISTRICT #: METRO  
PLOT NAME: 67\_b04  
PATH & FILENAME: S:\Design\010215067\Final\021567\_b04.dgn



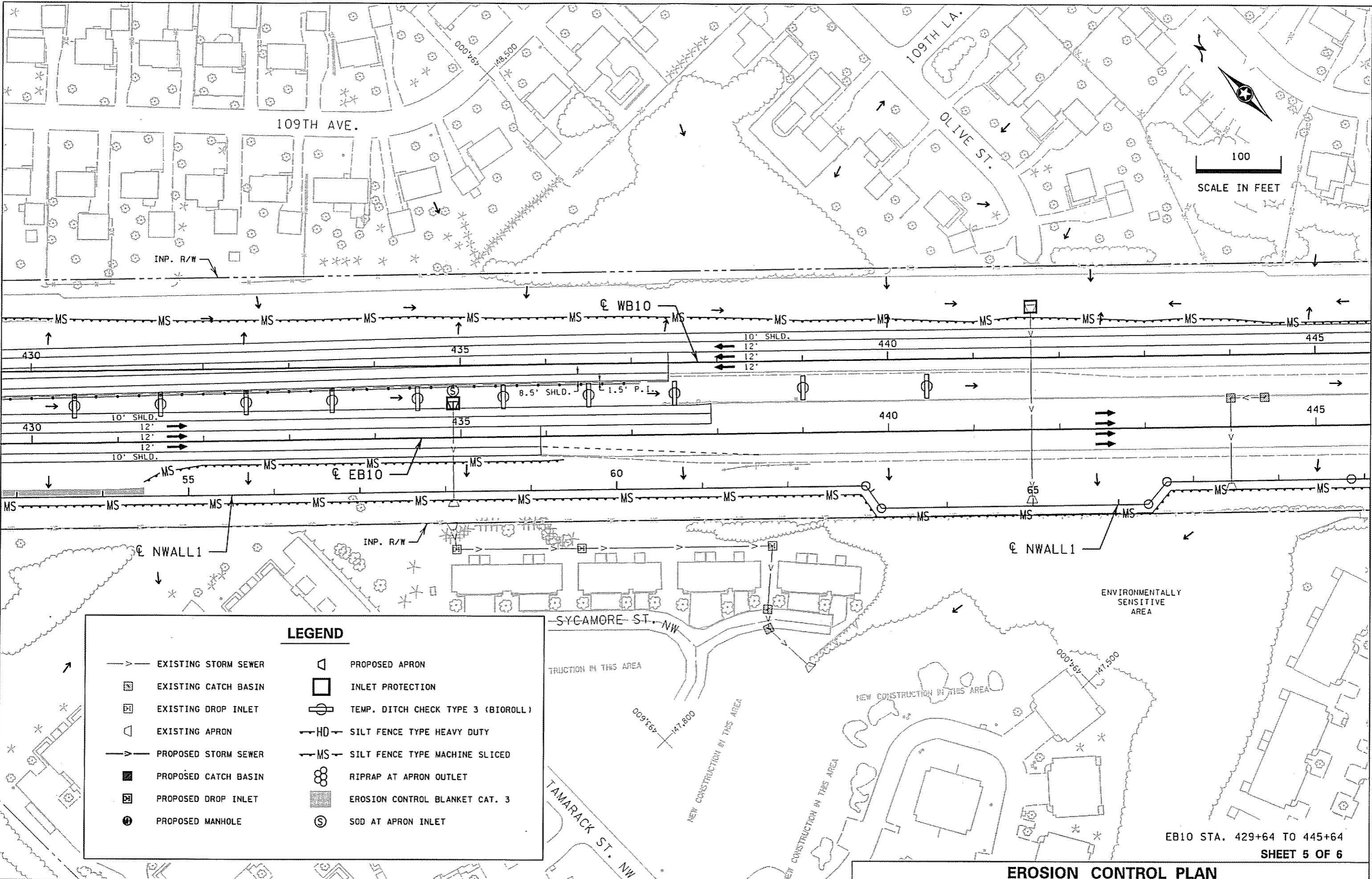
LEGEND	
	EXISTING STORM SEWER
	EXISTING APRON
	PROPOSED STORM SEWER
	PROPOSED CATCH BASIN
	INLET PROTECTION
	TEMP. DITCH CHECK TYPE 3 (BIOROLL)
	HD - SILT FENCE TYPE HEAVY DUTY
	MS - SILT FENCE TYPE MACHINE SLICED
	RIPRAP AT APRON OUTLET
	SOD AT APRON INLET
	EROSION CONTROL BLANKET CAT. 3

EB10 STA. 414+13 TO 430+14  
SHEET 4 OF 6

### EROSION CONTROL PLAN

PLOTTED/REVISED: 26-JAN-2009 10:56

DISTRICT #: METRO  
PLOT NAME: 67\_6c5  
PATH & FILENAME: S:\Design\0215\067\Final\021567\_ecl.dgn



**LEGEND**

- |  |                      |  |                                    |
|--|----------------------|--|------------------------------------|
|  | EXISTING STORM SEWER |  | PROPOSED APRON                     |
|  | EXISTING CATCH BASIN |  | INLET PROTECTION                   |
|  | EXISTING DROP INLET  |  | TEMP. DITCH CHECK TYPE 3 (BIOROLL) |
|  | EXISTING APRON       |  | HD SILT FENCE TYPE HEAVY DUTY      |
|  | PROPOSED STORM SEWER |  | MS SILT FENCE TYPE MACHINE SLICED  |
|  | PROPOSED CATCH BASIN |  | RIPRAP AT APRON OUTLET             |
|  | PROPOSED DROP INLET  |  | EROSION CONTROL BLANKET CAT. 3     |
|  | PROPOSED MANHOLE     |  | SOD AT APRON INLET                 |

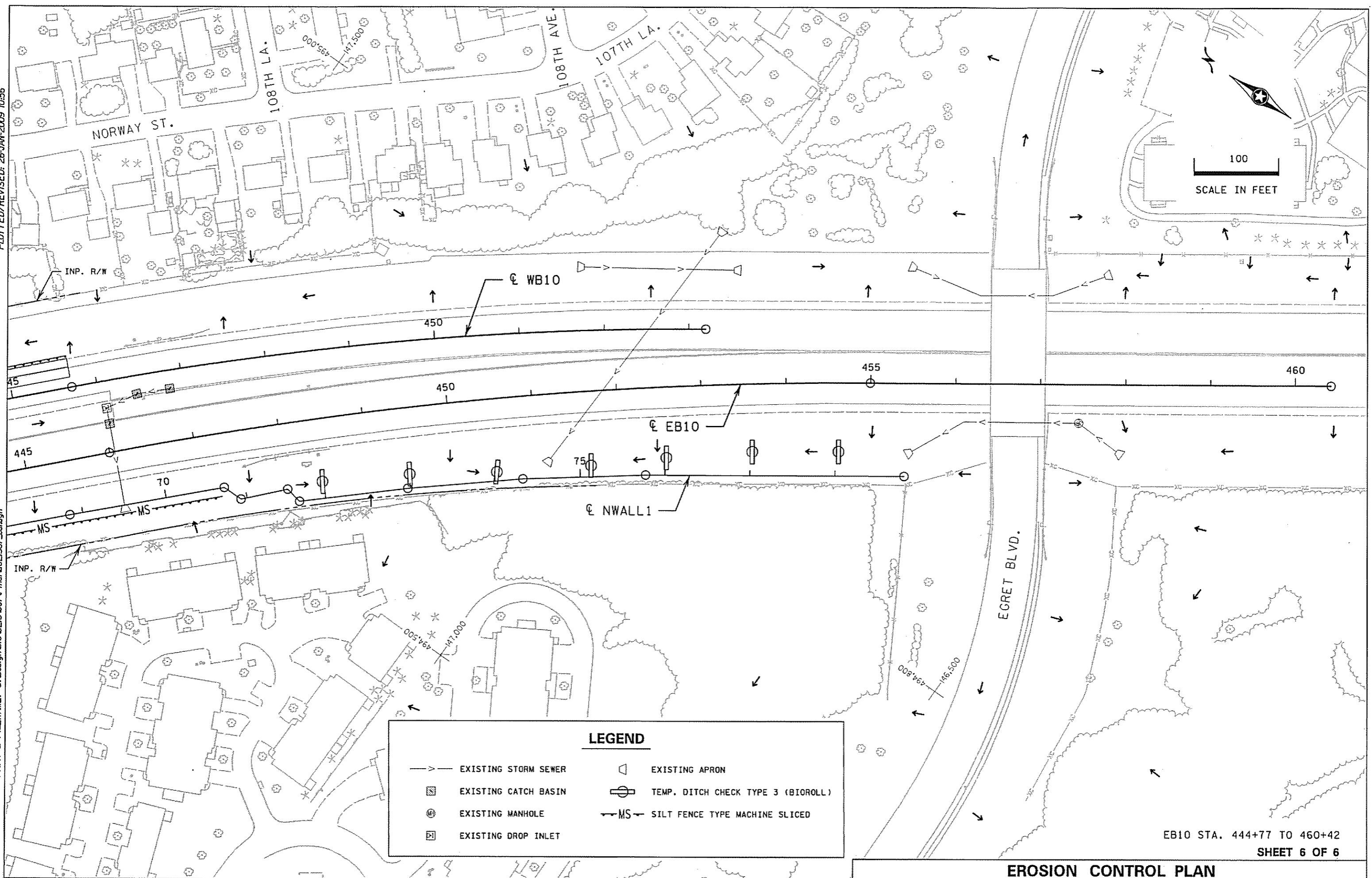
EB10 STA. 429+64 TO 445+64  
SHEET 5 OF 6

**EROSION CONTROL PLAN**

PLOTTED/REVISED: 26-JAN-2009 10:56

PATH & FILENAME: S:\Design\010215\067\Final\021567\_ecl.dgn

DISTRICT #: METRO  
IFLOT NAME: 67\_006



LEGEND	
	EXISTING STORM SEWER
	EXISTING CATCH BASIN
	EXISTING MANHOLE
	EXISTING DROP INLET
	EXISTING APRON
	TEMP. DITCH CHECK TYPE 3 (BIOROLL)
	SILT FENCE TYPE MACHINE SLICED

EB10 STA. 444+77 TO 460+42  
SHEET 6 OF 6

**EROSION CONTROL PLAN**

**NOTES & GUIDELINES**

**GENERAL INFORMATION:**

1. THE CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN THE DEVICES IN THIS TRAFFIC CONTROL PLAN UNLESS OTHERWISE NOTED.
2. FIELD CONDITIONS MAY REQUIRE MODIFICATIONS OF THIS LAYOUT AS DEEMED NECESSARY BY THE ENGINEER.
3. ALL DISTANCES ARE APPROXIMATE.
4. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY WORK AREAS NEAR TRAFFIC IN ACCORDANCE WITH THE MNMUTCD.

**SIGNING:**

1. ALL TRAFFIC CONTROL DEVICES, INCLUDING OVERHEAD SIGNS ON ROADS OPEN TO TRAFFIC THAT ARE NOT CONSISTANT WITH TRAFFIC OPERATION SHALL BE COVERED, REMOVED OR REVISED AS DIRECTED BY THE ENGINEER.
2. WHEN SIGNS ARE INSTALLED, THEY SHALL BE MOUNTED ON POSTS DRIVEN INTO THE GROUND AT THE PROPER HEIGHT AND LATERAL OFFSET AS DETAILED IN THE MNMUTCD. IF THIS IS NOT POSSIBLE THEY WILL BE MOUNTED ON PORTABLE SUPPORTS AS APPROVED BY THE ENGINEER. WHEN THE SIGNS ARE REMOVED THE SIGN POSTS SHALL ALSO BE REMOVED AS SOON AS POSSIBLE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY EXTRA SIGNING NEEDED TO FACILITATE TRAFFIC SWITCHES OR FOR TRANSITIONING TRAFFIC FROM ONE STAGE TO ANOTHER.
4. ALL ORANGE SIGNS SHALL BE MADE OF "HIGH PERFORMANCE FLUORESCENT SIGN SHEETING" OR AN APPROVED SUBSTITUTE.
5. LONGITUDINAL DROPOFFS SHALL BE SIGNED AS SHOWN IN THE "TEMPORARY TRAFFIC CONTROL ZONE LAYOUTS" FIELD MANUAL UNLESS OTHERWISE SPECIFIED IN THESE PLANS.
6. THE CONTRACTOR SHALL COORDINATE THE INSTALLATION OF THE FINAL SIGNS TO ASSURE THAT THE FINAL SIGNS ARE INSTALLED AS NEEDED, OR PROVIDE TEMPORARY SIGNING AT THEIR EXPENSE UNTIL THE FINAL SIGNING IS INSTALLED.

**PAVEMENT MARKING:**

1. OBLITERATE ANY CONFLICTING PAVEMENT MARKINGS AS DIRECTED BY THE ENGINEER.
2. PAINT, POLYMER LANE TAPE AND/OR TRPM'S ARE ACCEPTABLE TEMPORARY STRIPING ALTERNATIVES ACCORDING TO ACTUAL CONDITIONS ENCOUNTERED AS DIRECTED BY THE ENGINEER. GENERALLY, ONLY PAINT WILL BE USED BEFORE MAY 1ST OR WHEN THE OTHER MANUFACTURERS' SPECIFICATIONS CAN NOT BE MET.
3. TRPM'S (TEMPORARY RAISED PAVEMENT MARKERS) SHOULD BE USED TO SUPPLEMENT THE LONG TERM (MORE THAN 3 DAYS) EDGELINES ON ALL TRANSITION AREAS WHEN THE CONDITIONS ARE WITHIN THE MANUFACTURERS' SPECIFICATIONS.
4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE LOCATION AND INSTALLATION OF TEMPORARY AND FINAL STRIPING. MN/DOT TRAFFIC PERSONNEL WILL ASSIST IN THE SPOTTING OF TRANSITION AREAS, GORES AND TAPERS.

**BARRIER & DELINEATION:**










1. TOP MOUNTED BARRIER DELINEATORS WILL HAVE A MINIMUM OF 24 SQ. IN. OF REFLECTIVE SURFACE AREA AND BE PLACED AT 30' SPACES ON TOP OF THE BARRIER WHEN THE BARRIER IS WITHIN 10' OF TRAFFIC UNLESS OTHERWISE NOTED OR AS DIRECTED BY THE ENGINEER. IF THE TRAFFIC ENGINEER REQUIRES SIDE MOUNTED BARRIER DELINEATORS, THEY WILL HAVE A MINIMUM OF 12 SQ. IN. OF REFLECTIVE SURFACE AREA AND BE PLACED AT 30' SPACES. IF A SMALLER APPROVED BARRIER DELINEATOR IS USED IT SHALL BE AT ONE HALF THE SPACING AND ONE HALF THE BID PRICE.

**CONSTRUCTION INFORMATION SIGNING:**

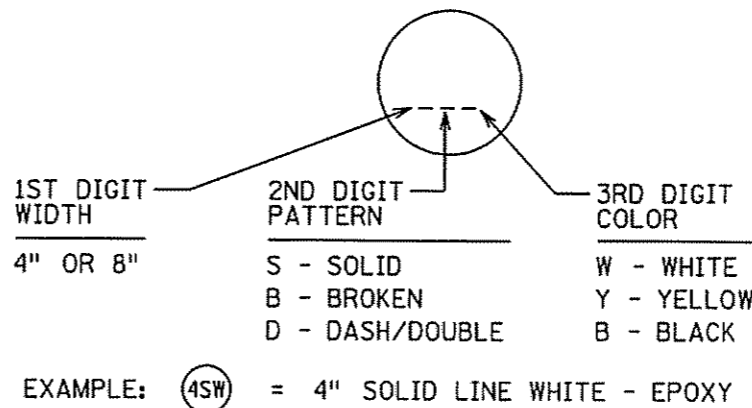
1. THE CONTRACTOR SHALL USE CONSTRUCTION INFORMATION SIGNING AS SHOWN IN THE PLAN AND WHICH ARE TO BE USED AS FOLLOWS:  
 G20-X1 CLOSURE NOTICE SIGNS PAIRED WITH G20-X3 WORK ENDS SIGNS TO DISPLAY THE CORRECT START DATE AND AN ESTIMATED FINISH DATE AS APPROVED BY THE PROJECT ENGINEER.  
 G20-X2 WORK ZONE ADVANCE NOTICE SIGNS WITH THE CORRECT STARTING DATE DISPLAYED BEFORE WORK BEGINS. ONCE WORK BEGINS, THE START DATE LEGEND SHALL BE COVERED BY THE SUGGESTED PLAQUE CONTAINED IN THIS PLAN. IF NO ALTERNATE MESSAGE IS SUGGESTED OR IF DIRECTED BY THE PROJECT ENGINEER, THE CORRECT ESTIMATED FINISH DATE, MONTH, OR SEASON SHALL BE DISPLAYED.  
 CONSTRUCTION INFORMATION SIGNING NOT VISIBLE TO THE MOTORING PUBLIC ONCE WORK BEGINS WILL BE MOVED BY THE CONTRACTOR TO A SITE IN ADVANCE OF THE WORK ZONE OR CLOSURE AS DIRECTED BY THE PLAN OR PROJECT ENGINEER.

**TRAFFIC CONTROL DEVICES & SYMBOLS LEGEND**

**SYMBOL DESCRIPTION**

-  AREA CLOSED TO TRAFFIC / WORK AREA
-  TRAFFIC CONTROL SIGN
-  TYPE III BARRICADE = 
-  DRUM-LIKE CHANNELIZER = 
-  TYPE A FLASHING WARNING LIGHT
-  FLASHING ARROW BOARD TYPE C =   
(4' X 8' UNLESS OTHERWISE NOTED).
- SOLID LINE PAVEMENT MARKING WITH TEMPORARY RAISED PAVEMENT MARKERS AT 10' SPACES
- ==== CONCRETE BARRIER WITH DELINEATORS AT 30' SPACES
- ==== IMPACT ATTENUATOR

**STRIPING KEY**

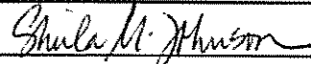


**INDEX**

**TRAFFIC CONTROL SHEET NO. DESCRIPTIONS**

140	TITLE SHEET
141	PAY ITEM TABULATION SHEET
142	TRAFFIC CONTROL TABULATION SHEET
143	ADVANCED SIGNING
144-150	STAGE ONE
151-156	STAGE TWO
157	SPECIAL SIGN DETAILS
158	INTERM PAVEMENT MARKING
159	TYPICALS

I HEREBY CERTIFY THAT SHEETS 140 THROUGH 159 OF THIS PLAN WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA

  
 SHEILA JOHNSON  
 DATE 1/6/09 LIC. NO. 26804  
 DESIGNER SCOTT MEIER

---

TITLE: TRAFFIC CONTROL TITLE SHEET

---

STATE PROJ. NO. 0215-67 (TH 10) SHEET NO 140 OF 222 SHEETS

DISTRICT : METRO  
 PLOT NAME: T021567\_TYP  
 PATH & FILENAME: S:\TRAFFIC\TC\_Signing\01021567\T021567\_TYP.dgn  
 PLOTTED/REVISED: 1/7/2009

### TRAFFIC CONTROL TABULATION

ITEM	UNIT	STAGE 1	STAGE 2	STAGE 3	TOTAL
PAVEMENT MARKING REMOVAL	LIN FT	20324	13878		27282
CONCRETE MEDIAN BARRIER DESIGN 8337	LIN FT	12482			12482
PORTABLE PREC CON BAR DES 8337-PINNED	LIN FT	792	992		1784
RELOCATE CONCRETE MEDIAN BARRIER	LIN FT		11592		11592
IMPACT ATTENUATOR	ASSEMBLY	2	4		6
RELOCATE IMPACT ATTENUATOR	ASSEMBLY		2		2
TEMPORARY GLARE SCREEN	LIN FT		1714		1714
TRAFFIC CONTROL	LUMP SUM	0.5	0.4	0.1	1
(1)(2) RAISED PAVEMENT MARKER TEMPORARY	EACH	193	320		514
(3) MEDIAN BARRIER DELINEATOR	EACH	416	508		924
REMOVABLE PREFORMED PLASTIC MASK (BLACK)	LIN FT		270		270
4" SOLID LINE WHITE-PAINT	LIN FT	14297	15008		29305
8" SOLID LINE WHITE-PAINT	LIN FT	767	837		1604
4" BROKEN LINE WHITE-PAINT	LIN FT	2984	3316		6300
4" SOLID LINE YELLOW-PAINT	LIN FT	20930	15457		36387
INTERIM PAVEMENT MARKING	LUMP SUM			1	1
4" SOLID LINE WHITE-POLY PREFORM	LIN FT		1350		1350

- (1) ONE WAY MARKER
- (2) 198 YELLOW, 315 WHITE
- (3) 812 WHITE, 112 YELLOW

#### PAY ITEM TABULATION CHART

DRAWN BY: SNM

CHECKED BY: KF




CERTIFIED BY


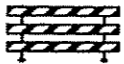

*Shirley A. Johnson*  
LICENSED PROFESSIONAL ENGINEER







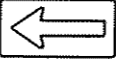
LIC. NO. 26804 DATE 1/6/2009


STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 141 OF 222 SHEETS

**TRAFFIC CONTROL TABULATION SHEET**

<b>"R" SERIES</b>			
SIGN	SIGN NO.	COLOR	SIZE
	R4-X7PB	BLACK ON WHITE	42" x 12"
	R4-X7PE	BLACK ON WHITE	42" x 12"
	R4-X7	BLACK ON WHITE	42" x 48"

<b>DEVICES</b>			
ITEM	SIGN NO.	COLOR	SIZE
	DLC		
	TYPE III		
ARROW BOARD	TYPE C		4' X 8'
	ATTSFB65		

<b>"W" SERIES</b>			
SIGN	SIGN NO.	COLOR	SIZE
	W20-1	BLACK ON ORANGE	48" x 48"
	W21-X1	BLACK ON ORANGE	48" x 48"
	W1-4bL	BLACK ON YELLOW	48" X 48"
	W1-4bR	BLACK ON ORANGE	48" X 48"
	W9-1	BLACK ON ORANGE	48" X 48"
	W20-X3L	BLACK ON ORANGE	48" X 48"
	W1-6L	BLACK ON ORANGE	48" X 24"

<b>"G" SERIES</b>			
SIGN	SIGN NO.	COLOR	SIZE
	G20-2a	BLACK ON ORANGE	48" X 24"

PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
 PLOT NAME: T021567\_TYP3  
 PATH & FILENAME: S:\TRAFFIC\TC Signing\010\021567\TC\T021567\_TYP.dgn

**TRAFFIC CONTROL TABULATION CHART**

DRAWN BY: SNM

CHECKED BY: KF

CERTIFIED BY

*Sheila A. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

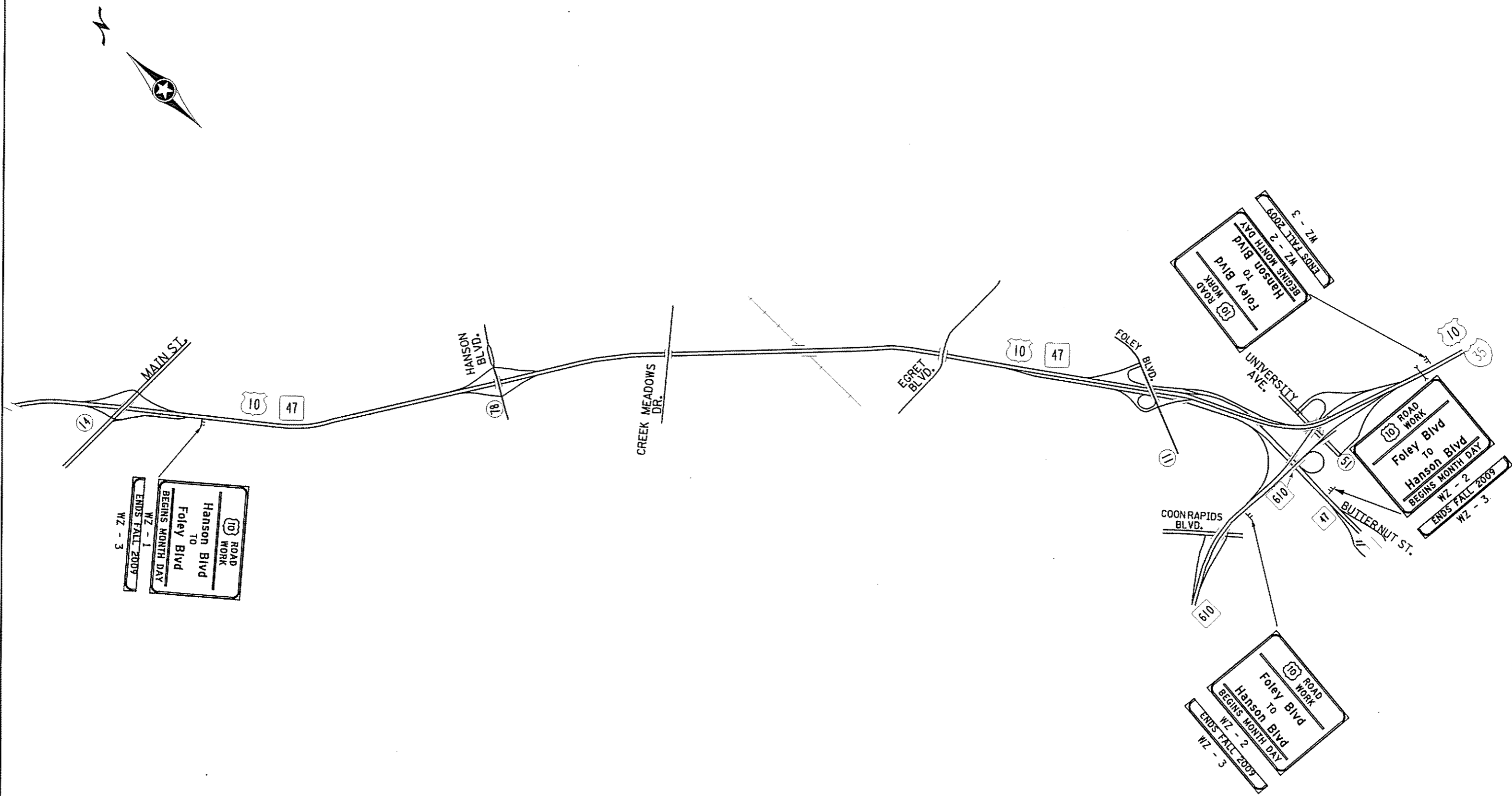
DATE 1/6/2009

STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 142

OF 222 SHEETS

DISTRICT #: METRO  
 IPLOT NAME: T021567\_TYP6  
 PATH & FILENAME: S:\TRAFFIC\TC\_Signing\010\021567\TYP\TYP.dgn  
 PLOTTED/REVISED: 1/6/2009



NOTE: FURNISH AND INSTALL WZ-1 AND WZ-2 SIGNS  
 7 DAYS IN ADVANCE OF THE START OF PROJECT  
 FURNISH AND INSTALL WZ-3 PANEL UPON START OF PROJECT

ADVANCED SIGNING



PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
PLOT NAME: 021567\_jc12  
PATH & FILENAME: SATRAFF\TC\_Signing\010\021567\TC\_021567\_jc1.dgn

HANSON BLVD.

CSAH 78

JAY ST.

116TH AVE.

END ROAD WORK

BEGIN SHOULDER AUTHORIZED BUSES ONLY

WB TH 10

365

355

360

EB TH 10

365

END SHOULDER AUTHORIZED BUSES ONLY

ROAD WORK AHEAD

ADVANCED SIGNING ON SB TH 10

NO SHOULDER

ROAD WORK AHEAD

NO SHOULDER

ROAD WORK AHEAD

ROBINSON DR.

100

SCALE IN FEET

STAGE ONE

DRAWN BY: SNM

CHECKED BY: KF

CERTIFIED BY

*Shirley A. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/6/2009

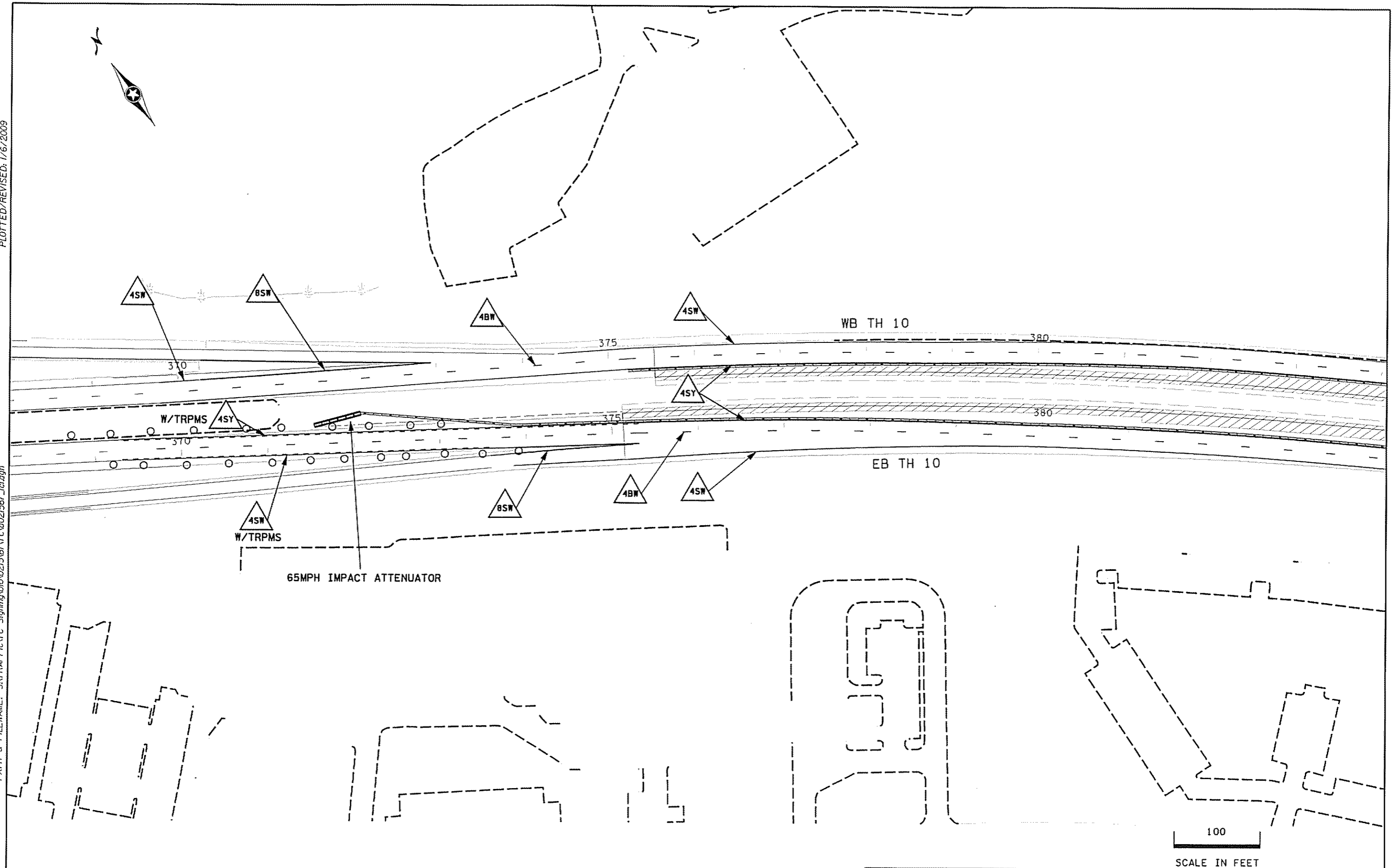
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SHEET NO. 144

OF 222 SHEETS

PLOTTED/REVISED: 1/6/2009

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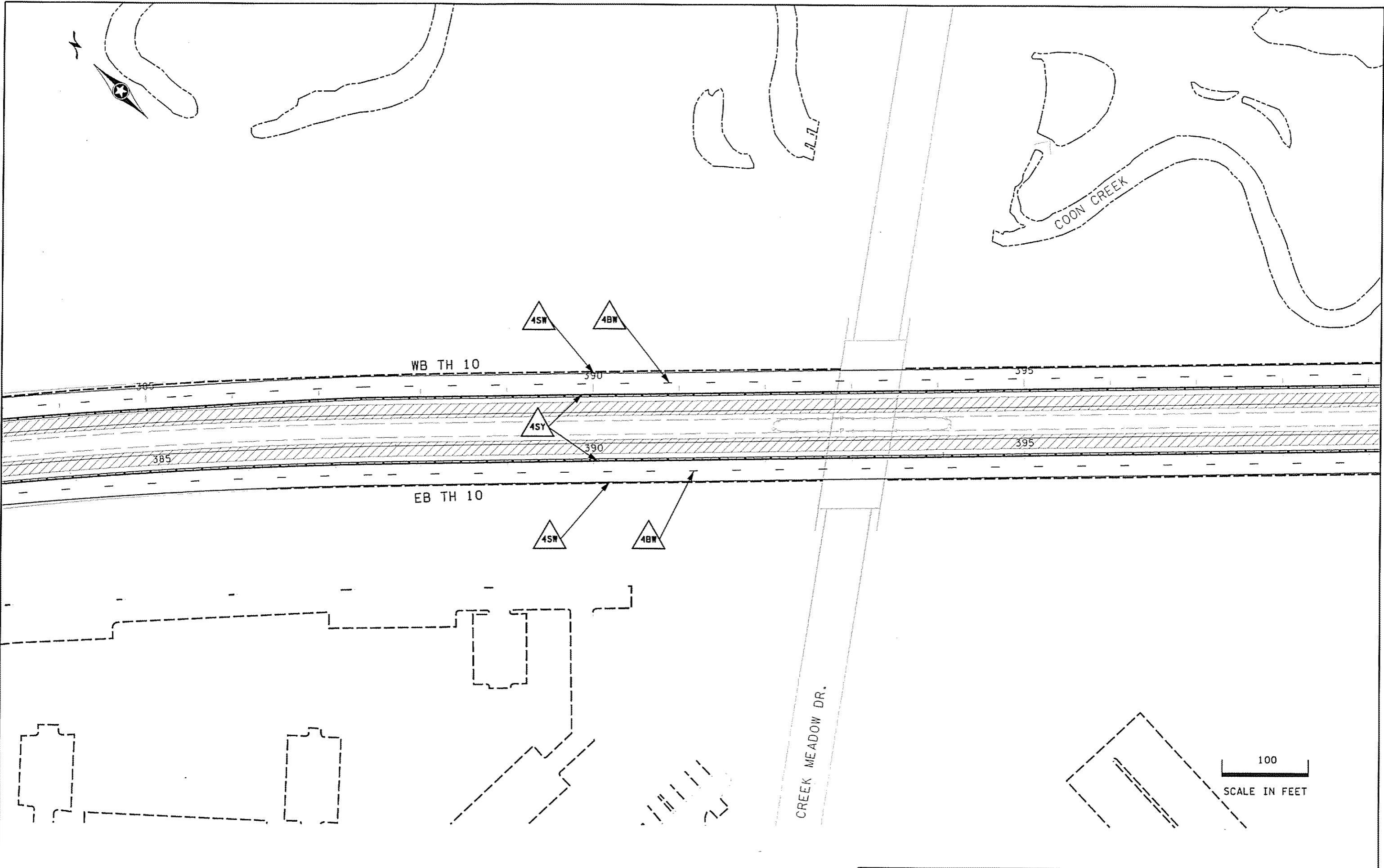


100  
SCALE IN FEET

**STAGE ONE**

PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
PLOT NAME: d021567\_jcl4  
PATH & FILENAME: S:\TRAFFIC\TC Signing\010\021567\TC\021567\_jcl.dgn



**STAGE ONE**

DRAWN BY: SNM

CHECKED BY: KF

CERTIFIED BY

*Shirley H. Huson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/6/2009

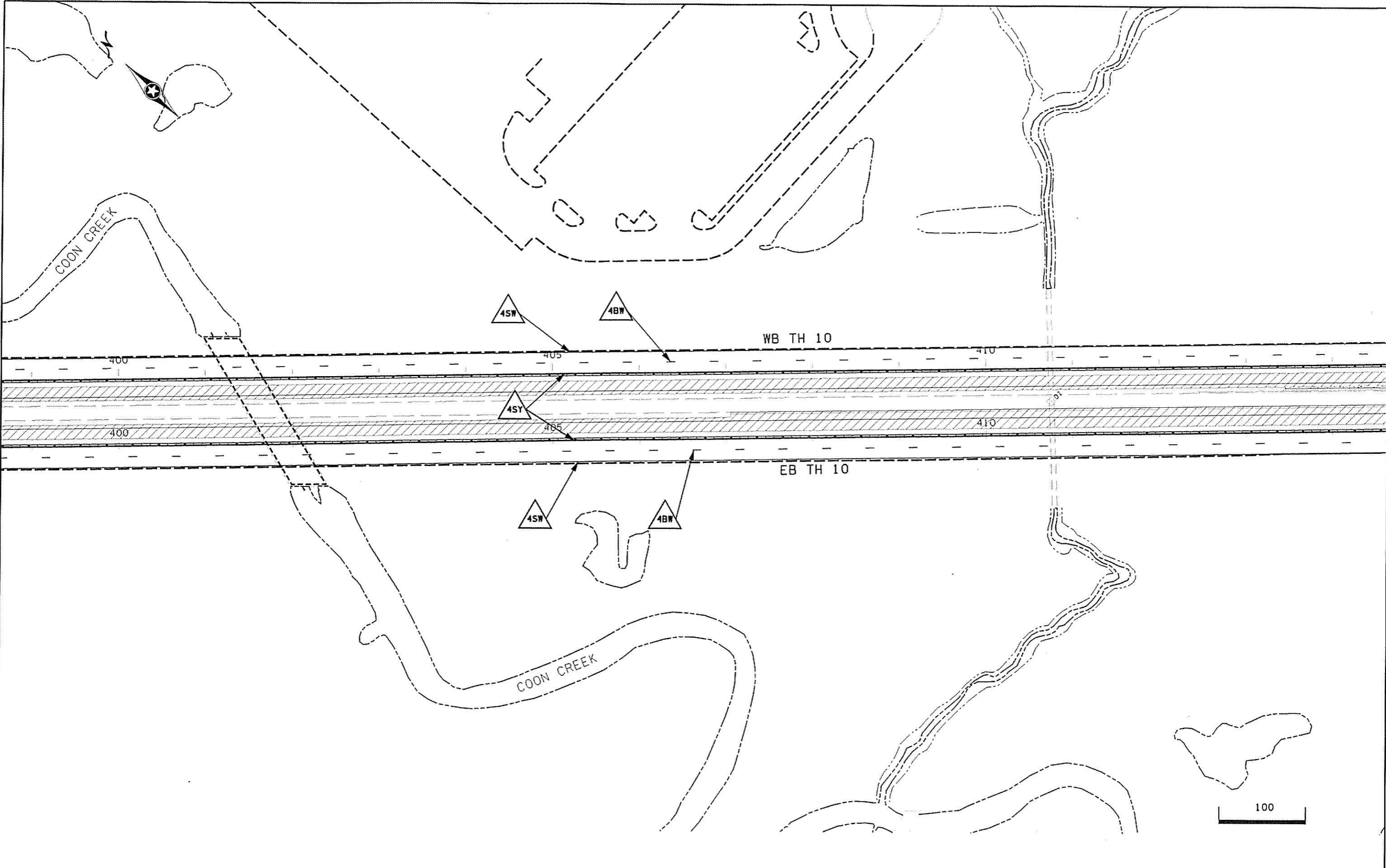
STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 146

OF 222 SHEETS

PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
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PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
I/PLOT NAME: 021567\_1c16  
PATH & FILENAME: SATRAFFICTC\_Signing\010\021567\ATC\021567\_1c1.dgn



WOODY LA.

CONCRETE MEDIAN  
BARRIER PINNED

WB TH 10

EB TH 10

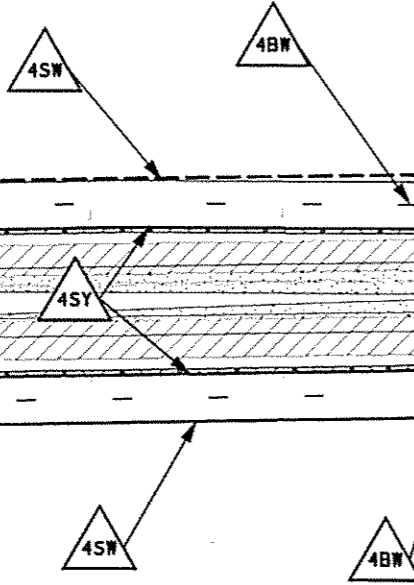
CONCRETE MEDIAN  
BARRIER PINNED

BURLINGTON NORTHERN RR

COON CREEK

COON CREEK

100  
SCALE IN FEET



DRAWN BY: SNM

CHECKED BY: KF

CERTIFIED BY

*Shirley A. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/6/2009

STAGE ONE

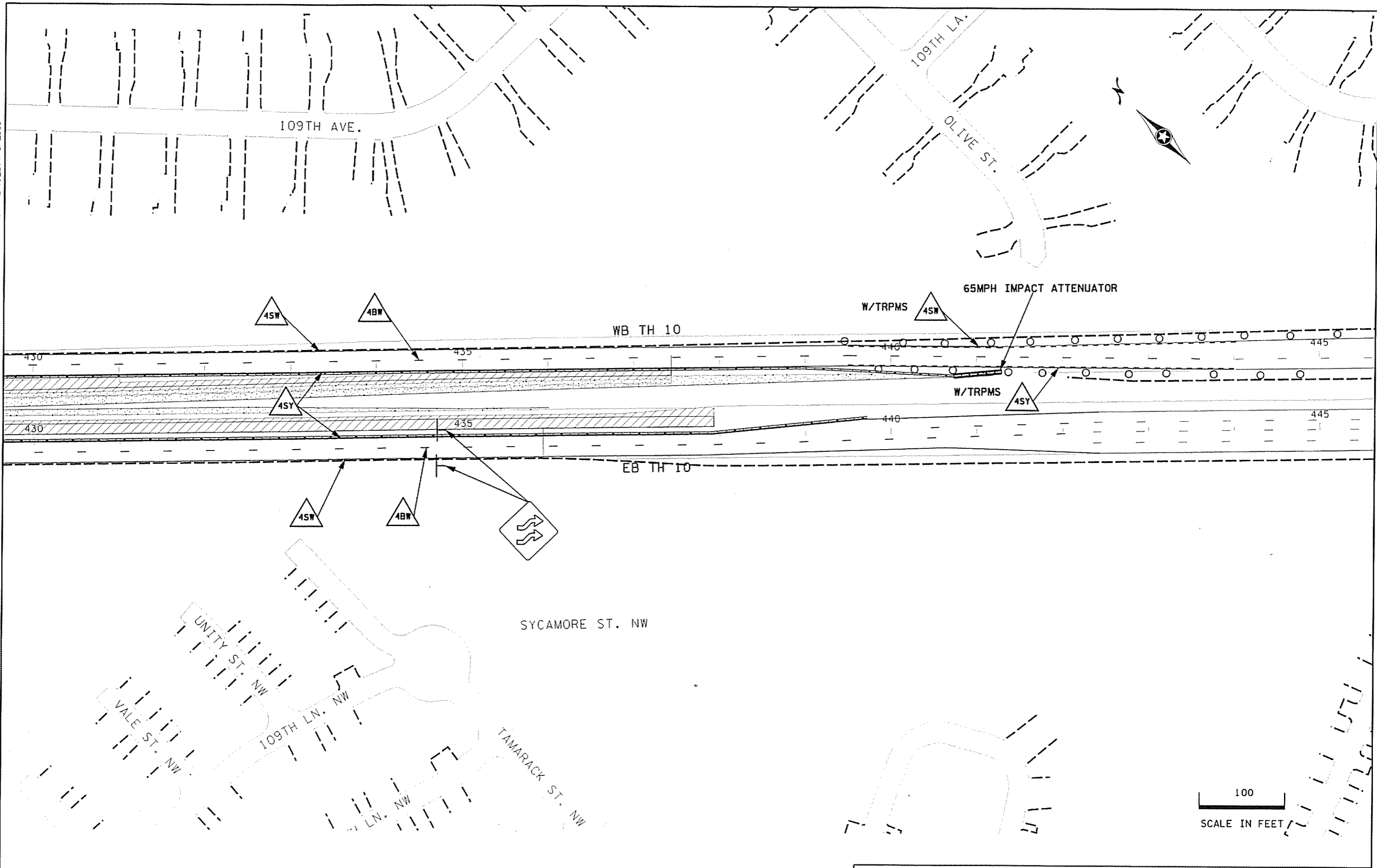
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SHEET NO. 148

OF 222 SHEETS

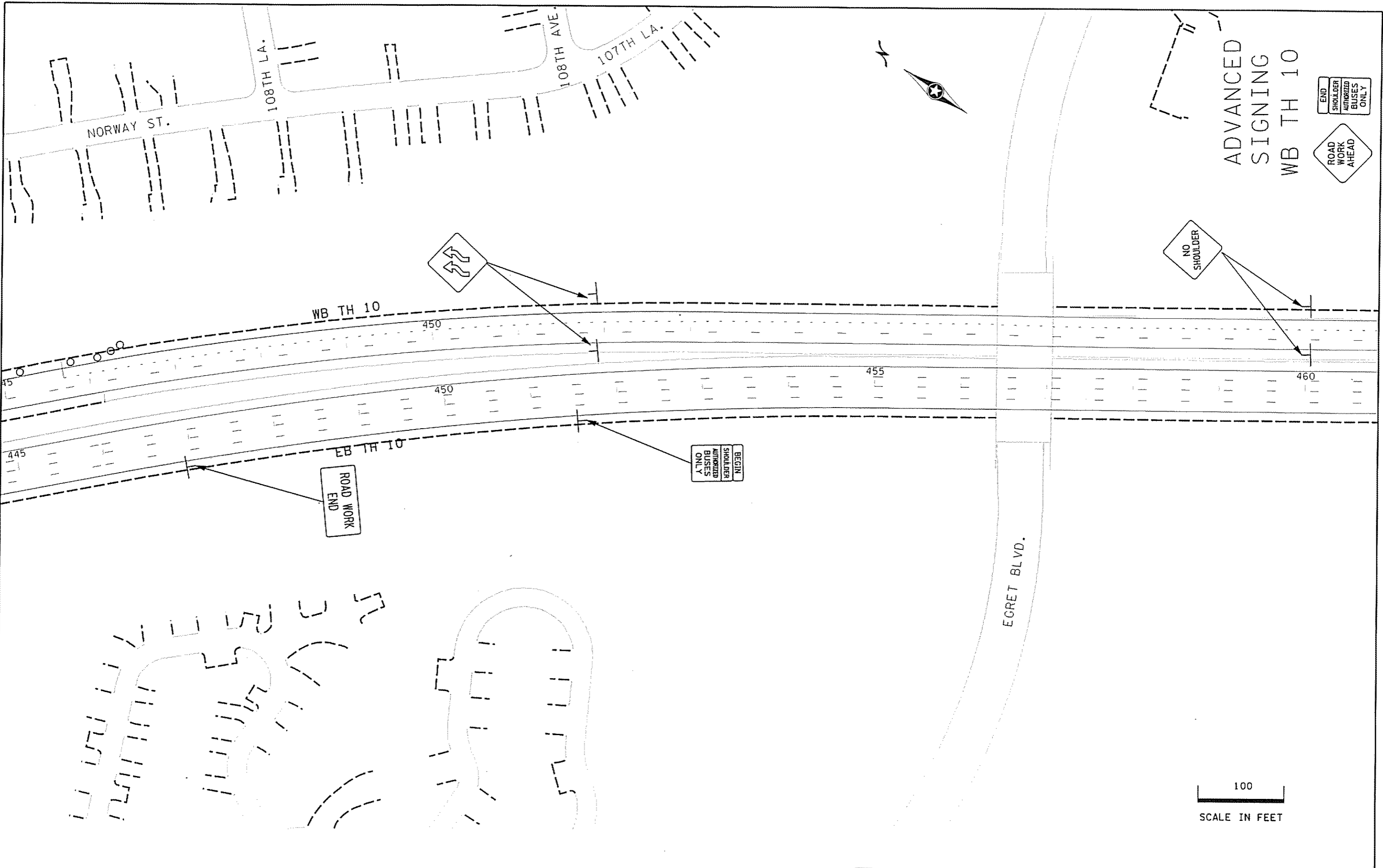
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PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
PLOT NAME: 0021567-1c18  
PATH & FILENAME: SATRAFF/IC/TC/Signing/010/021567/TC/0021567-1c18.dgn



ADVANCED  
SIGNING  
WB TH 10

END  
SHOULDER  
AUTHORIZED  
BUSES  
ONLY

ROAD  
WORK  
AHEAD

NO  
SHOULDER

BEGIN  
SHOULDER  
AUTHORIZED  
BUSES  
ONLY

ROAD  
WORK  
END

EGRET BLVD.

100  
SCALE IN FEET

STAGE ONE

DRAWN BY: SNM

CHECKED BY: KF

CERTIFIED BY

*Shirley A. Huson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/6/2009

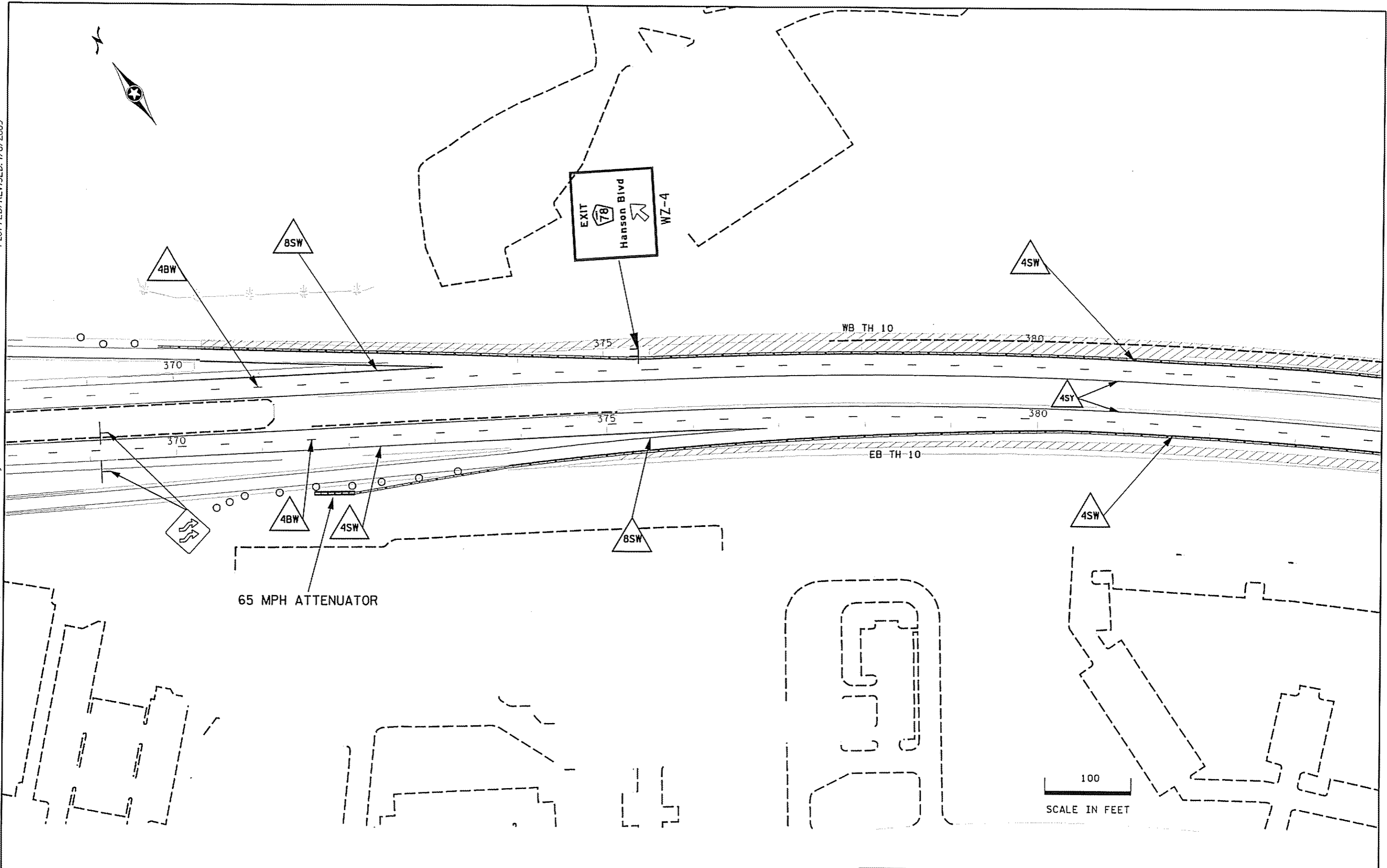
STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 150

OF 222 SHEETS

PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
I PLOT NAME: 021567\_1c22  
PATH & FILENAME: SATRAFFIC\TC Signing\010\021567\TC\021567\_1c2.dgn



**STAGE 2**

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*Shirley A. Huson*  
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LIC. NO. 26804

DATE 1/6/2009

STATE PROJ. NO. 0215-67 (TH 10)

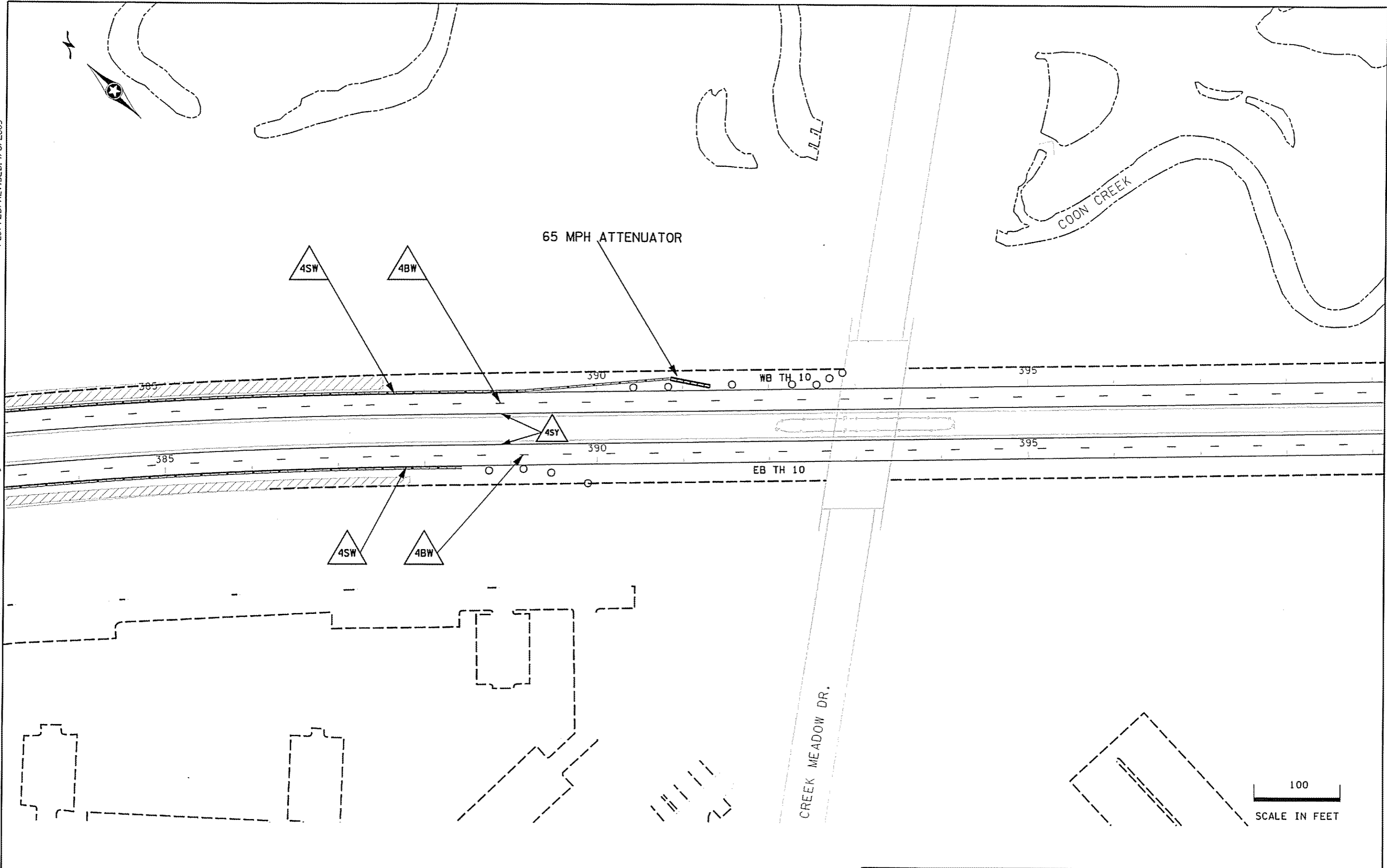
SHEET NO. 151

OF 222 SHEETS



PLOTTED/REVISED: 1/6/2009

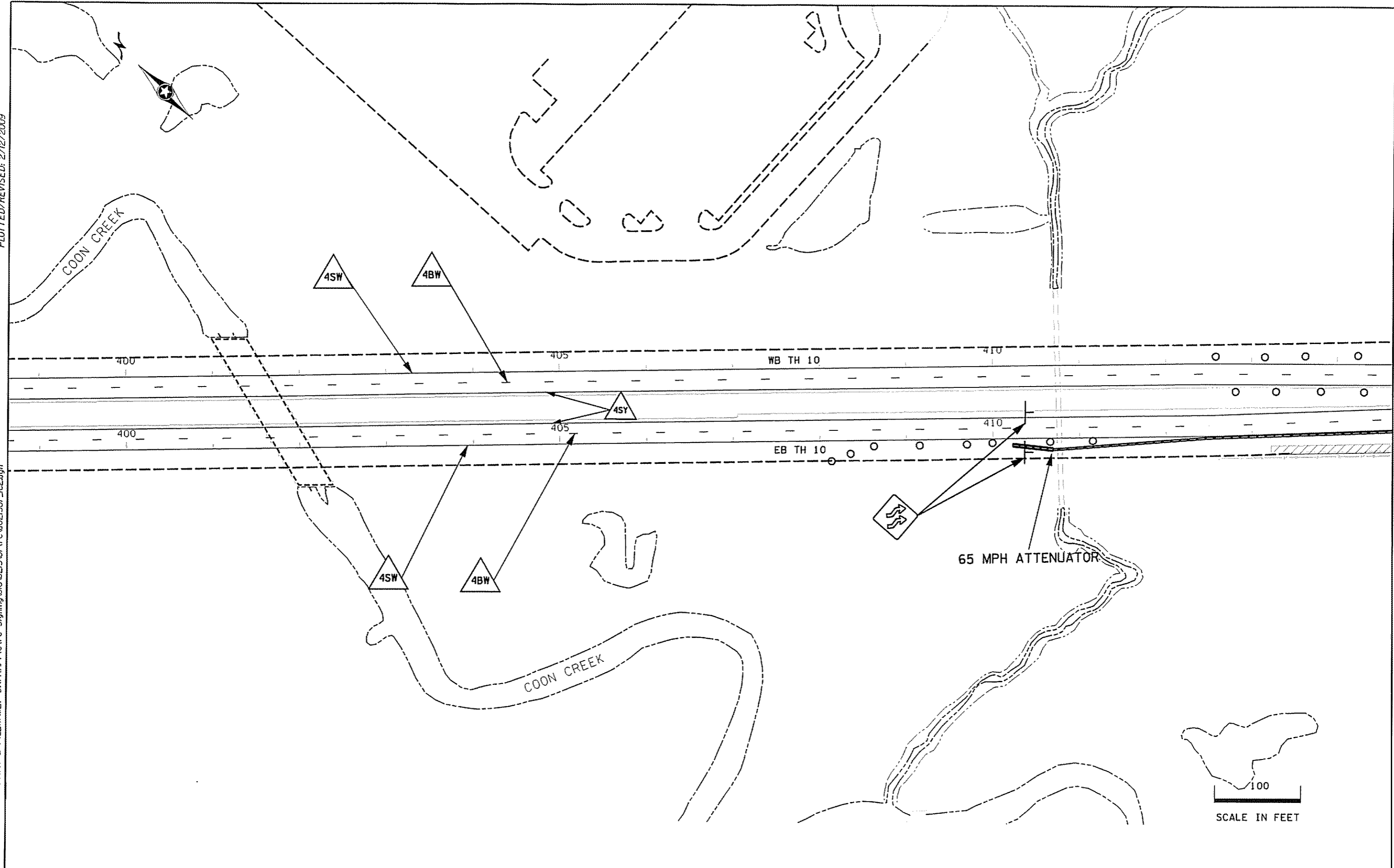
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PLOT NAME: 021567\_Jc23  
PATH & FILENAME: SATRAFFICTC Signing\010\021567\TC\021567\_Jc2.dgn



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						STATE PROJ. NO. 0215-67 (TH 10)		SHEET NO. 152		OF 222 SHEETS	

PLOTTED/REVISED: 2/12/2009

DISTRICT #: METRO  
PLOT NAME: 0021567\_1c26  
PATH & FILENAME: S:\TRAFFIC\TC\_Signing\010\021567\TC\021567\_1c2.dgn



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CERTIFIED BY

*Paula M. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

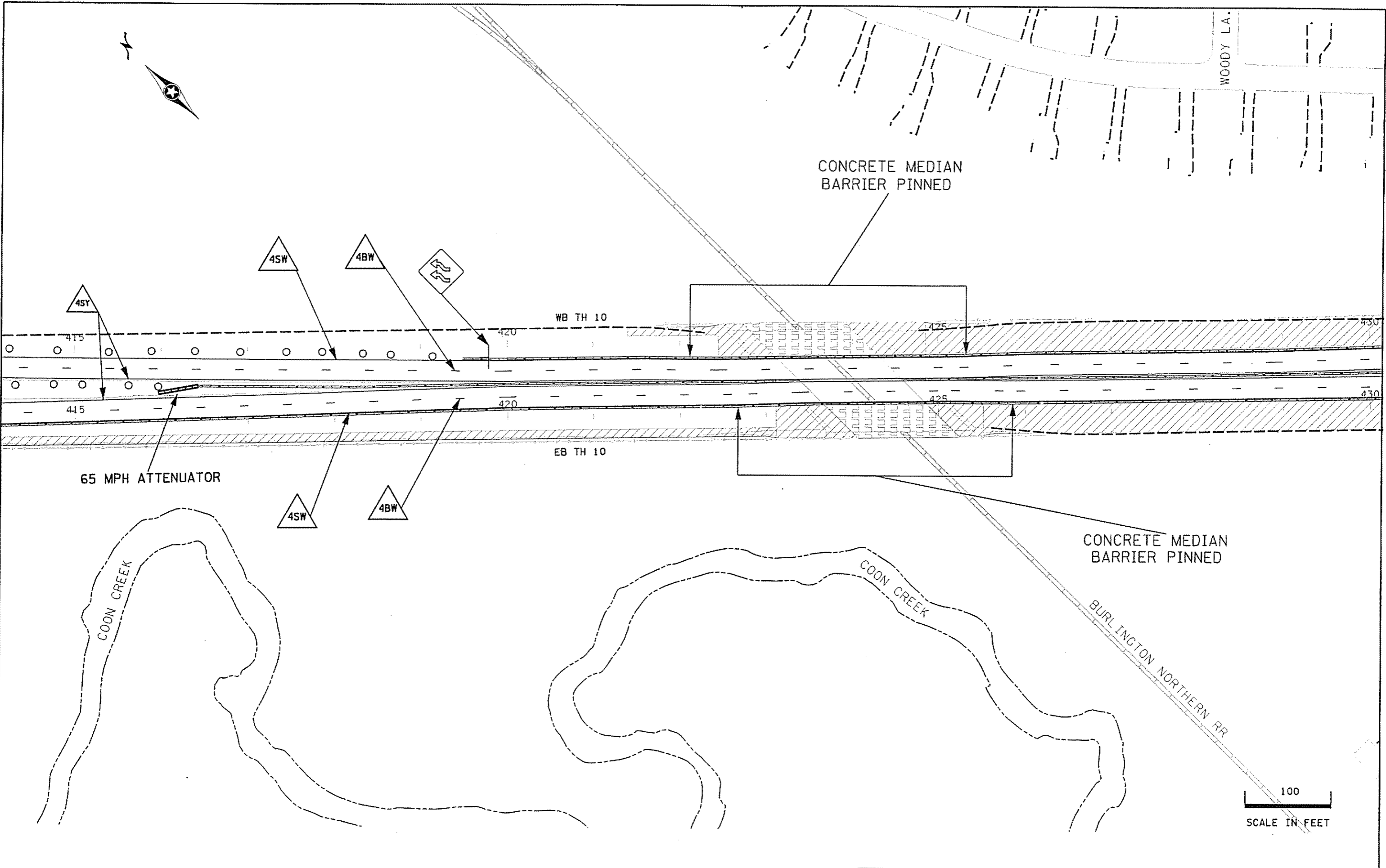
DATE 2/12/2009

**STAGE 2**

STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 153 OF 222 SHEETS

PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
I/PLOT NAME: 021567\_1c24  
PATH & FILENAME: S:\TRAFFIC\TC\_Signing\010\021567\TC\_021567\_1c2.dgn



**STAGE 2**

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LIC. NO. 26804

DATE 1/6/2009

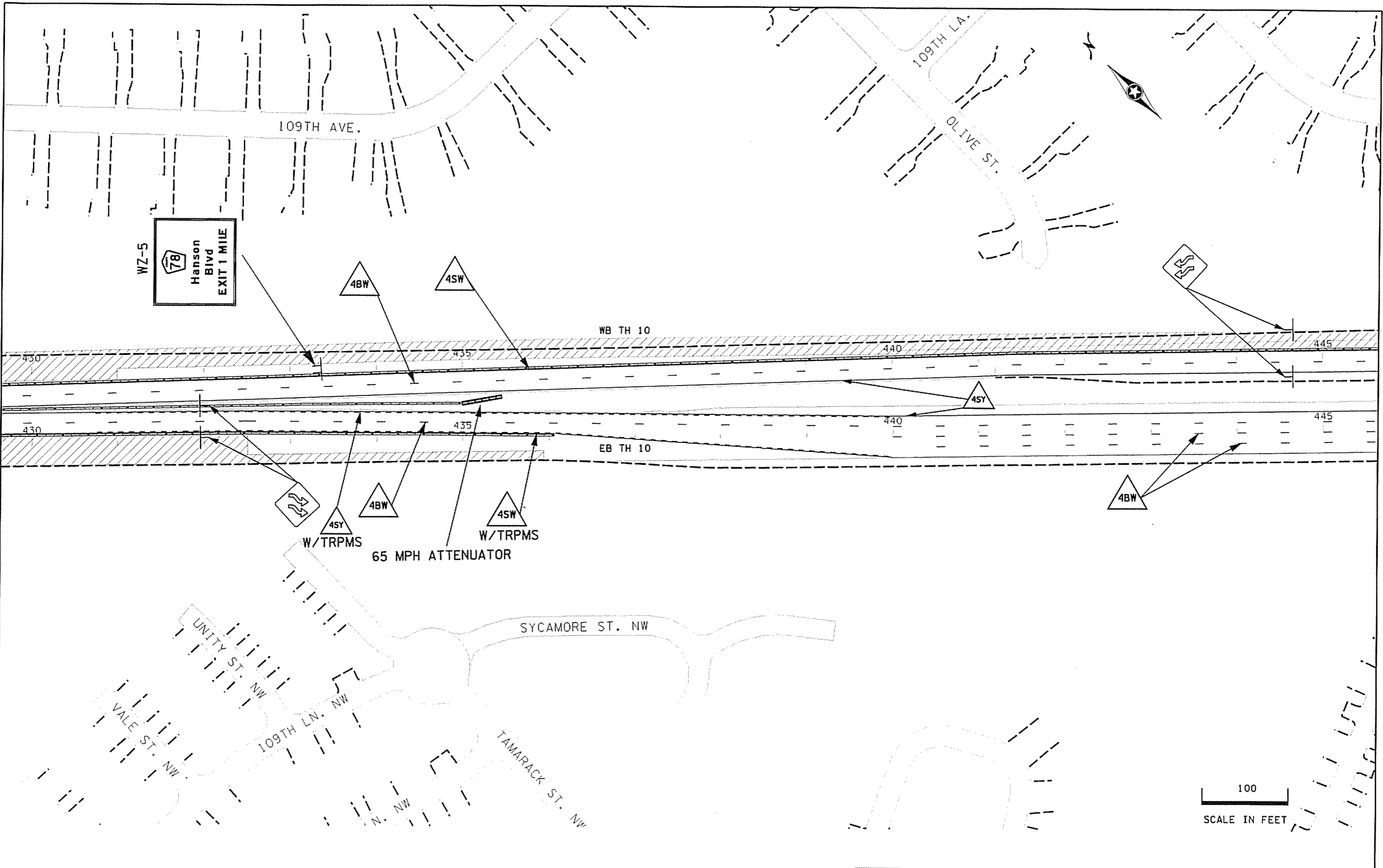
STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 154

OF 222 SHEETS

PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
PLOT NAME: 021567-1c27  
PATH & FILENAME: S:\TRAFFIC\TC Signing\010\021567\TC\021567-1c2.dgn



DRAWN BY: SNM

CHECKED BY: KF

CERTIFIED BY

*Paul H. Huson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/6/2009

**STAGE 2**

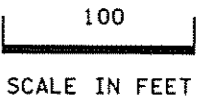
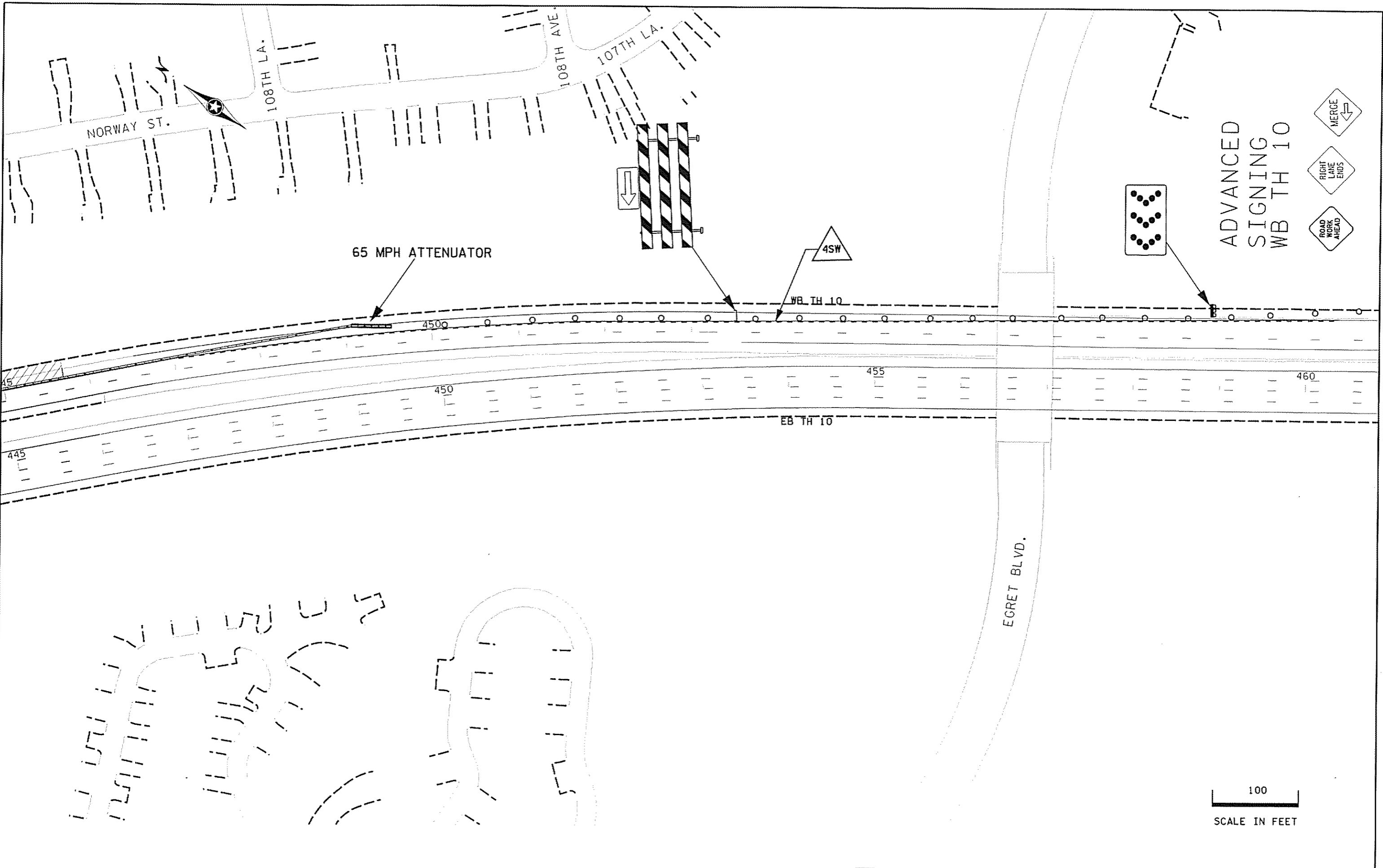
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SHEET NO. 155

OF 222 SHEETS

PLOTTED/REVISED: 1/6/2009

DISTRICT #: METRO  
I/PLOT NAME: 0021567-Jc25  
PATH & FILENAME: S:\TRAFFIC\TC Signing\010\021567\TC\0021567-Jc2.dgn



**STAGE 2**

DRAWN BY: SNM

CHECKED BY: KF

CERTIFIED BY

*Paul H. Huser*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

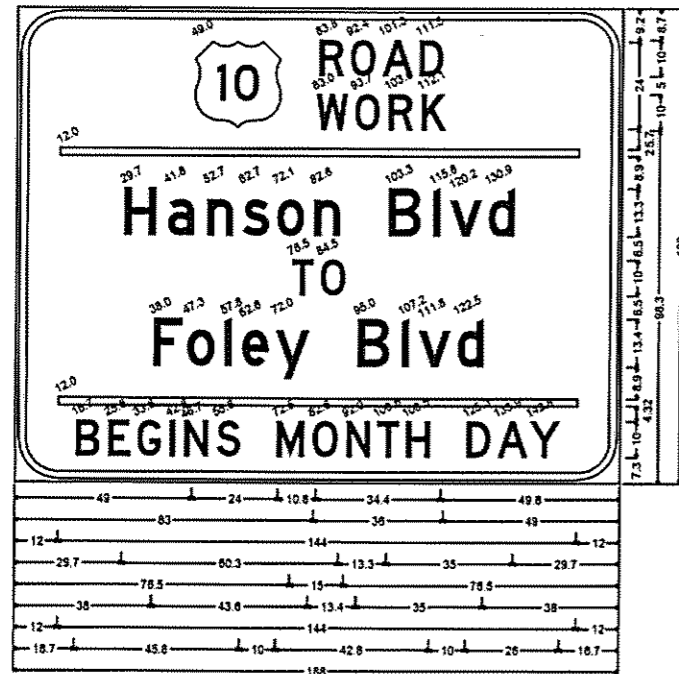
DATE 1/6/2009

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SHEET NO. 156

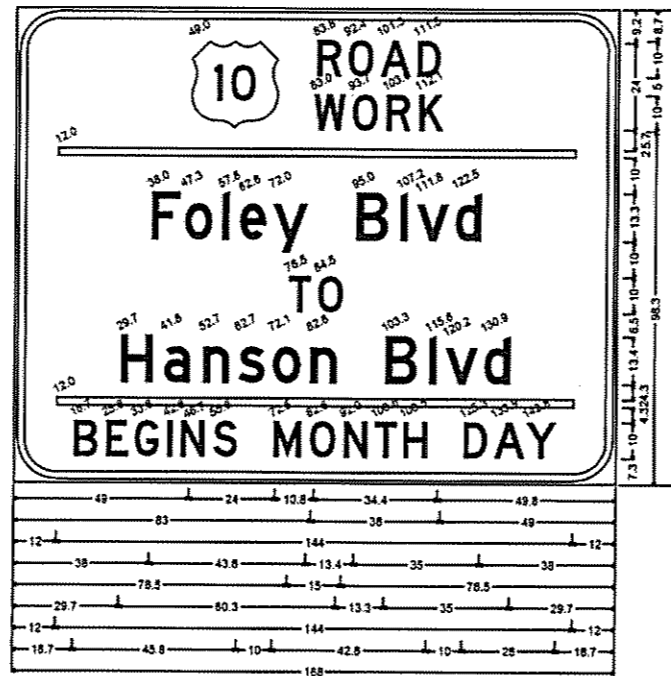
OF 222 SHEETS

SPECIAL SIGN DETAILS



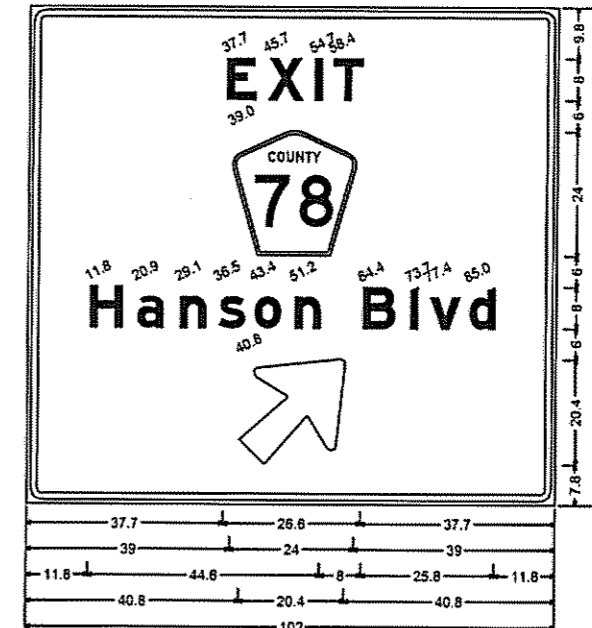
WZ-1: 12.0" Radius, 2.0" Border, 1.0" Indent, Black on Orange;  
[ROAD] D; [WORK] D; [Hanson Blvd] D; [TO] D; [Foley Blvd] D; [BEGINS MONTH DAY] D;

MAKE 1



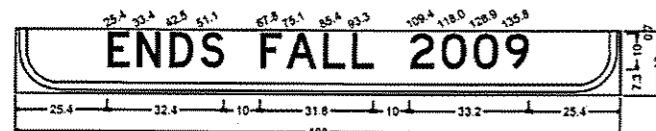
WZ-2: 12.0" Radius, 2.0" Border, 1.0" Indent, Black on Orange;  
[ROAD] D; [WORK] D; [Foley Blvd] D; [TO] D; [Hanson Blvd] D; [BEGINS MONTH DAY] D;

MAKE 3



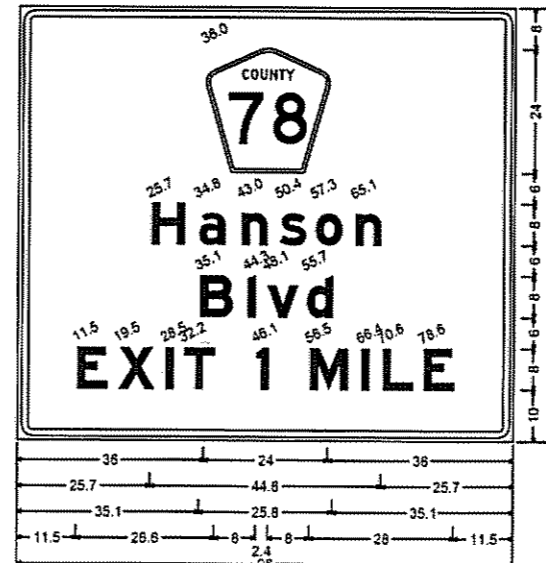
WZ-4: 3.0" Radius, 1.3" Border, 0.8" Indent, Black on Orange;  
[EXIT] E Mod; [Hanson Blvd] E Mod; Arrow B - 25.0" 45°;

MAKE 1



WZ-3: 12.0" Radius, 2.0" Border, 1.0" Indent, Black on Orange;  
[ENDS FALL 2009] D;

MAKE 4



WZ-5: 3.0" Radius, 1.3" Border, 0.8" Indent, Black on Orange;  
[Hanson] E Mod; [Blvd] E Mod; [EXIT 1 MILE] E Mod;

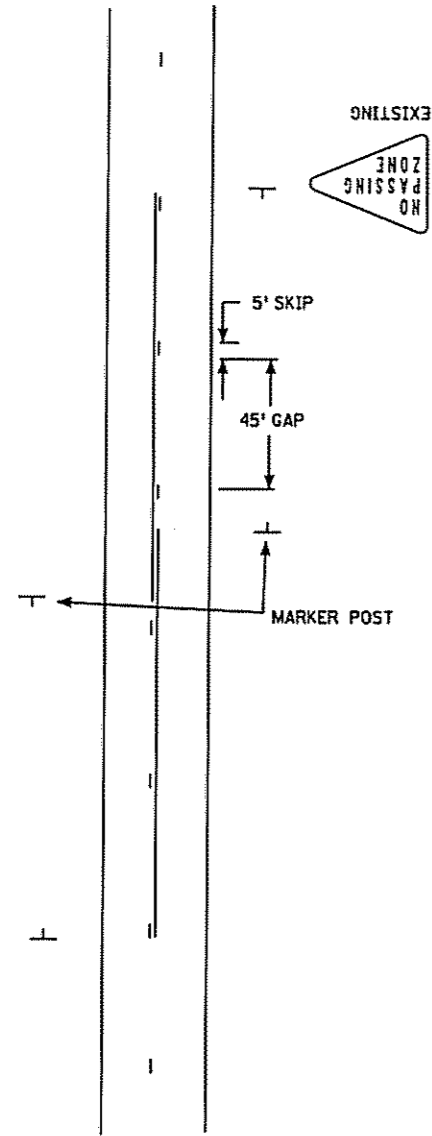
MAKE 1

PLOTTED/REVISED: 1/6/2009

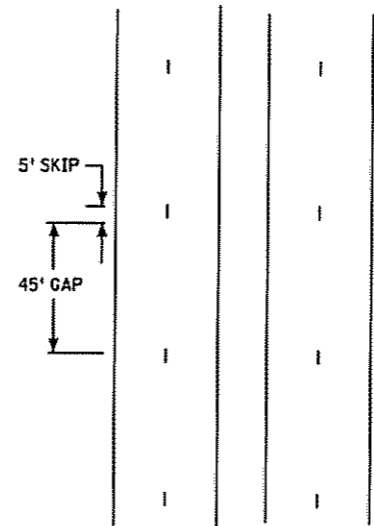
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PLOT NAME: T021567\_TYP4  
PATH & FILENAME: SATRAFF\IC\TC Signing\0101021567\TC\T021567\_TYP.dgn

**INTERIM PAVEMENT MARKING**

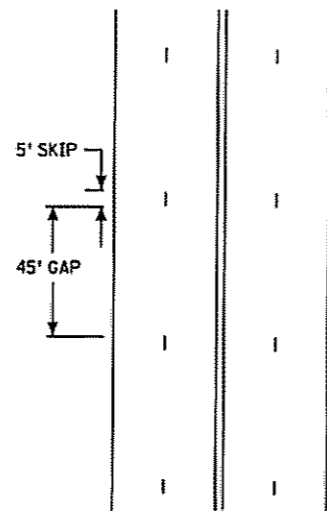
**TWO LANE, TWO WAY**



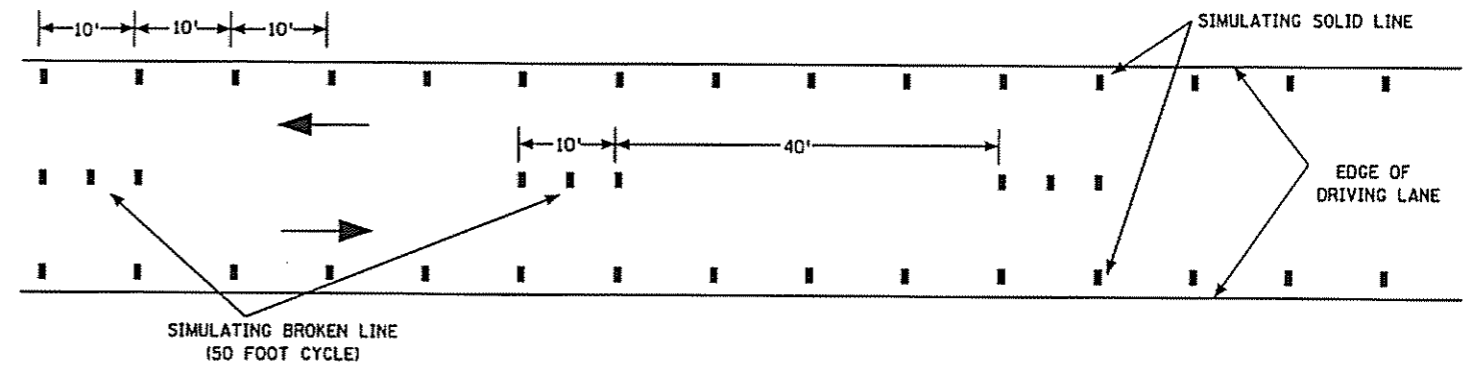
**MULTI-LANE, DIVIDED**



**MULTI-LANE, UNDIVIDED**



**SIMULATING A SOLID LINE AND A BROKEN LINE (50 FOOT CYCLE) WITH TRPM'S**



**USING TRPM'S AS INTERIM PAVEMENT MARKING**

WHEN TRPM'S ARE USED TO SIMULATE A LINE THE FOLLOWING GUIDELINE APPLIES:

SKIP STRIPE - USES 3 TRPM'S PER 10' SKIP STRIPE ON 5' CENTERS WITH A 40' GAP

SOLID LINE - USES TRPM'S ON 10' CENTERS ON TANGENTS, FLATTER GRADES AND CURVES UNDER 6 DEGREES. FOR CURVES OVER 6 DEGREES AND STEEP GRADES, THIS SPACING SHALL BE REDUCED TO 5' CENTERS.

**GENERAL NOTES:**

SEE SPECIAL PROVISIONS FOR INTERIM PAVEMENT MARKING GUIDELINES

THESE INTERIM PAVEMENT MARKING GUIDELINES APPLY TO ALL TEMPORARY TRAFFIC CONTROL ZONES OF AT LEAST 300' IN LENGTH ON TANGENT AND 50' ON CURVES OF 6 DEGREES OR GREATER.

- FOR ALL PROJECTS GREATER THAN 1.25 MILES IN LENGTH, INTERIM SKIP STRIPE PAVEMENT MARKINGS SHALL USE THE SAME CYCLE LENGTH AS FINAL PAVEMENT MARKINGS (50') AND SHALL BE A MINIMUM OF 5' LENGTH.
- ON PROJECTS GREATER THAN 300' IN LENGTH, BUT LESS THAN 1.25 MILES IN LENGTH, THE INTERIM MARKING SHALL MATCH THE CYCLE LENGTH AT EITHER END OF THE PROJECT. THE INTERIM STRIPE SHALL BE 5' IN LENGTH.

ALL INTERIM MARKINGS SHALL BE INSTALLED PRIOR TO REMOVING LANE CLOSURE OR OPENING THE ROADWAY TO TRAFFIC.

**GENERAL NOTES (CONTINUED):**

FINAL MARKINGS AND ALL OTHER PAVEMENT MARKINGS INCLUDING EDGELINES, CHANNELIZING LINES, LANE REDUCTION TRANSITIONS, GORE MARKINGS AND OTHER LONGITUDINAL MARKINGS AND THE VARIOUS NON-LONGITUDINAL MARKINGS (STOP LINES, RAIL ROAD CROSSINGS, CROSSWALKS, WORDS, SYMBOLS, ETC) SHOULD BE INSTALLED WITHIN 14 CALENDAR DAYS.

NOTE: WHEN FINAL MARKINGS ARE TO BE EPOXY AND PAINT IS USED FOR INTERIM SOLID LINES, A 10 MIL THICK LAYER APPLICATION OF A WATER-BASED TRAFFIC MARKING PAINT SHALL BE USED. WITH A 10 MIL LAYER OF PAINT APPLIED, BEADS SHOULD BE APPLIED AT A RATE OF 6 LBS/GAL. REMOVAL OF THE 10 MIL LAYER OF PAINT IS NOT REQUIRED PRIOR TO PLACING THE EPOXY.

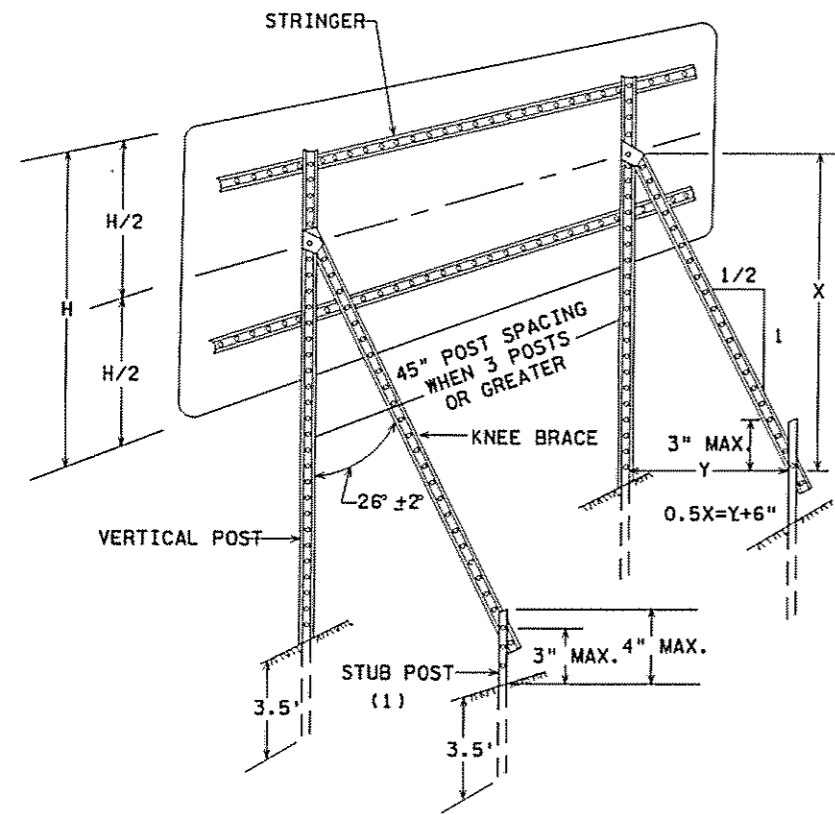
**INTERIM PAVEMENT MARKING**

PLOTTED/REVISED: 1/6/2009

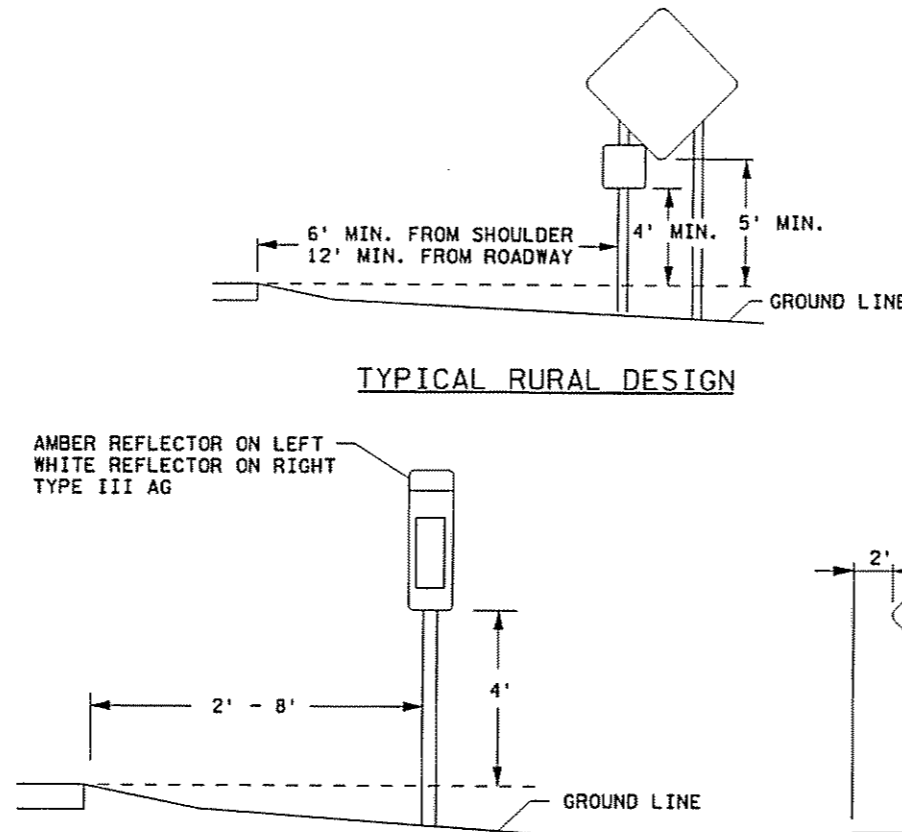
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 I/PLOT NAME: T021567\_TYP5  
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**SIGN DATA**

SIGNS TO BE INSTALLED ON DRIVEN U-POSTS SHALL BE INSTALLED IN ACCORDANCE WITH TABLE 1 OR TABLE 2 BELOW. SIGN PANELS SHALL BE INSTALLED ON SIGN STRUCTURES TO MEET THE MINIMUM 5 FEET DEPICTED ON THE TYPICAL RURAL DESIGN DETAIL, THE 7 FEET DEPICTED ON THE TYPICAL URBAN DESIGN DETAIL, OR MINIMUM 7 AND 9 FEET DEPICTED ON THE TYPICAL MOUNTING DETAIL ON THIS SHEET.



**TYPICAL "A-FRAME" INSTALLATION  
 TYPE "D" SIGNS**



**TYPICAL RURAL DESIGN**

**DELINEATION MOUNTING**

**TYPICAL URBAN DESIGN**

**TABLE 1  
 STANDARD CONSTRUCTION SIGNS IN MN/DOT STANDARD SIGNS MANUAL**

PANEL SIZE (IN.)	POSTS			
	NO. & TYPE	SPACING (IN.)	KNEE BRACES QUANT.	LENGTH (FT.)
24 x 24	2-U	18	0	13
30 x 24	2-U	18	0	13
36 x 30	2-U	24	0	13
36 x 36	2-U	18	0	14
42 x 36	2-U	30	0	14
48 x 48	2-U	30	0	15
60 x 60	2-U	42	1	16
72 x 72	2-U	42	2	17
96 x 54	2-U	54	2	16
168 x 132	4-U	48	4	20

**GENERAL NOTES:**  
 1. POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.  
 2. SEE STANDARD SIGNS MANUAL FOR PUNCHING HOLES.

**TABLE 2**

**SPECIAL DESIGN CONSTRUCTION SIGNS**

PANEL SIZE		POSTS			
LENGTH (IN.)	HEIGHT (IN.)	NO. & TYPE	SPACING (IN.)	KNEE BRACES QUANT.	LENGTH (FT.)
54 - 96	78	2-U	42	2	20
102 - 138	78	3-U	45	3	20
144 - 180	78	4-U	45	4	20

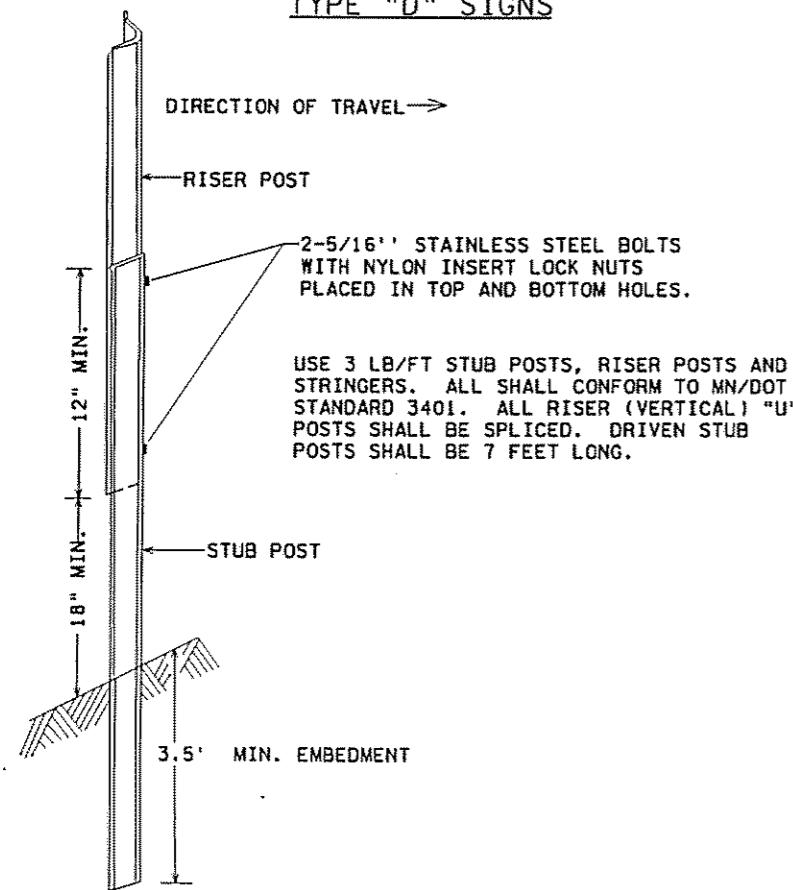
**DESIGNER NOTE:**  
 INCLUDE SPECIAL SIGN DETAILS IN THE TRAFFIC CONTROL PLAN IN TABLE TWO.

**NOTES:**

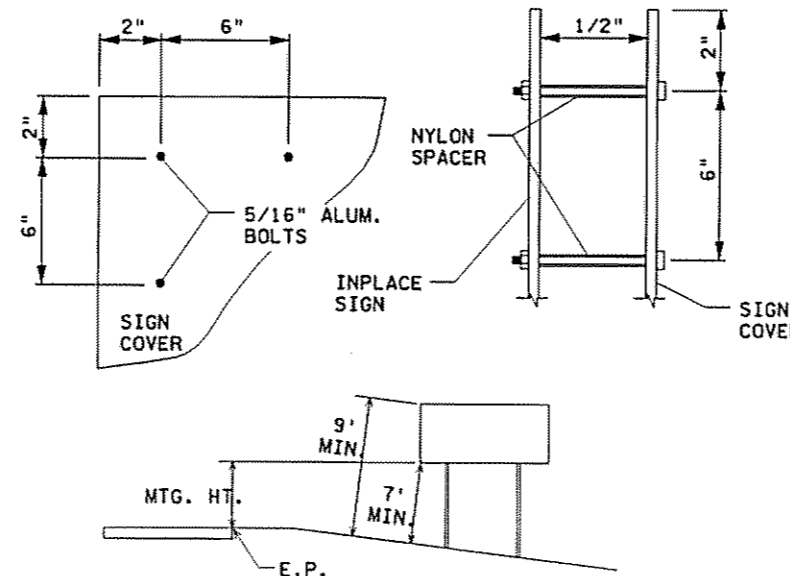
FOR TEMPORARY CONSTRUCTION SIGN FRAMING, THE CONTRACTOR MAY USE GRADE 5 ZINC PLATED BOLTS FOR ALL BOLTED CONNECTIONS, EXCEPT FOR THE KNEE BRACE CONNECTION TO THE REAR STUB POST, WHICH SHALL UTILIZE A 5/16 INCH STAINLESS STEEL BOLT AND NYLON INSERT LOCK NUT. ADDITIONAL SIGN FRAMING DETAILS CAN BE FOUND IN THE TRAFFIC ENGINEERING MANUAL PART 6.

IF THE CONTRACTOR ELECTS TO USE SOME OTHER TYPE OF SIGN SUPPORT (OTHER THAN U-CHANNEL SIGN POSTS) FOR MOUNTING CONSTRUCTION SIGNS, DETAILS OF THE PROPOSED SIGN STRUCTURE SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO ORDERING THE SIGN STRUCTURE COMPONENTS. ANY SIGN STRUCTURE TO BE SUBMITTED TO THE ENGINEER SHALL BE AN FHWA ACCEPTED BREAKAWAY SIGN SUPPORT. SIGN STRUCTURE SHALL ALSO BE APPROVED FOR 90 MPH WIND LOAD.

SIGNS SHOWN TO BE COVERED SHALL BE COVERED WITH THE SAME COLOR AS THE SIGN BACKGROUND. THE CONTRACTOR SHALL INSTALL COVERS OR ADDITIONAL SIGNS USING A MINIMUM 1/2" NYLON SPACER BETWEEN THE INPLACE SIGN AND THE COVERING MATERIAL. HOLES WILL BE DRILLED IN THE COVER AND THE INPLACE SIGN AND SHALL BE INSTALLED IN ACCORDANCE TO THE SIGN PANEL DETAIL. SPACERS ARE REQUIRED. MID-PANEL SPACING SHALL BE NO GREATER THAN 24".



**"U" POST SPLICE**



**TYPICAL MOUNTING**

(1) OFFSET STUB POST 1' TOWARD ROADWAY RELATIVE TO VERTICAL POST.

**TYPICAL TEMPORARY SIGN FRAMING AND INSTALLATION DETAILS**



# PERMANENT PAVEMENT MARKING PLAN

## NOTES & GUIDELINES

### GENERAL INFORMATION:

THE ENGINEER'S INVOLVEMENT IN THE APPLICATION OF THE MATERIAL SHALL BE LIMITED TO FIELD CONSULTATION AND INSPECTION. THE CONTRACTOR WILL PLACE NECESSARY 'SPOTTING' AT APPROPRIATE POINTS TO PROVIDE HORIZONTAL CONTROL FOR STRIPING AND TO DETERMINE NECESSARY STARTING AND CUTOFF POINTS. LONGITUDINAL JOINTS, PAVEMENT EDGES AND EXISTING MARKINGS MAY SERVE AS HORIZONTAL CONTROL WHEN SO DIRECTED.

EDGE LINES AND LANE LINES ARE TO BE BROKEN ONLY AT INTERSECTIONS WITH PUBLIC ROADS AND AT PRIVATE ENTRANCES IF THEY ARE CONTROLLED BY A YIELD SIGN, STOP SIGN OR TRAFFIC SIGNAL. THE BREAK POINT IS TO BE AT THE START OF THE RADIUS FOR THE INTERSECTION OR AT MARKED STOP LINES OR CROSSWALKS.

A TOLERANCE OF 1/4 INCH UNDER OR 1/4 INCH OVER THE SPECIFIED WIDTH WILL BE ALLOWED FOR STRIPING PROVIDED THE VARIATION IS GRADUAL AND DOES NOT DETRACT FROM THE GENERAL APPEARANCE. BROKEN LINE SEGMENTS MAY VARY UP TO ONE-HALF FOOT FROM THE SPECIFIED LENGTHS PROVIDED THE OVER AND UNDER VARIATIONS ARE REASONABLY COMPENSATORY. ALIGNMENT DEVIATIONS FROM THE CONTROL GUIDE SHALL NOT EXCEED 1 INCH. MATERIAL SHALL NOT BE APPLIED OVER LONGITUDINAL JOINTS. ESTABLISHMENT OF APPLICATION TOLERANCES SHALL NOT RELIEVE THE CONTRACTOR OF THEIR RESPONSIBILITY TO COMPLY AS CLOSELY AS PRACTICABLE WITH THE PLANNED DIMENSIONS.

### EPOXY:

THE ROAD SURFACE SHALL BE CLEANED AT THE DIRECTION OF THE ENGINEER JUST PRIOR TO APPLICATION. PAVEMENT CLEANING SHALL CONSIST OF AT LEAST BRUSHING WITH A ROTARY BROOM (NON-METALLIC) OR AS RECOMMENDED BY THE MATERIAL MANUFACTURER AND ACCEPTABLE TO THE ENGINEER. NEW PORTLAND CEMENT CONCRETE SURFACES SHALL BE SANDBLAST CLEANED TO REMOVE ANY SURFACE TREATMENTS AND/OR LAITANCE.

THE EPOXY MARKING APPLICATION SHALL IMMEDIATELY FOLLOW THE PAVEMENT CLEANING. GLASS BEADS SHALL BE APPLIED IMMEDIATELY AFTER APPLICATION OF THE EPOXY RESIN LINE TO PROVIDE AN IMMEDIATE NO-TRACK SYSTEM.

FOR 15 MIL APPLICATIONS, GLASS BEADS SHALL BE APPLIED AT A RATE OF AT LEAST 25 LB/GAL. THE 'NO-TRACKING' CONDITION SHALL BE DETERMINED ON AN APPLICATION OF SPECIFIED THICKNESS TO THE PAVEMENT AND COVERED WITH GLASS BEADS AT THE RATE OF AT LEAST 25 LB/GAL.

OPERATIONS SHALL BE CONDUCTED ONLY WHEN THE ROAD PAVEMENT SURFACE TEMPERATURES ARE 50 DEGREES °F OR GREATER.

PERMANENT PAVEMENT MARKINGS SHALL NOT BE PLACED OVER TEMPORARY TAPE MARKINGS.

### POLY PREFORM INLAY APPLICATION:

MAT TEMPERATURE SHALL BE CHECKED USING A THERMOMETER TO MAKE SURE THE INLAY IS BEING DONE IN THE PROPER TEMPERATURE RANGE. THE TEMPERATURE SHOULD MEASURE BETWEEN 150° F (ASPHALT FIRM ENOUGH TO WALK ON) AND 120° F. APPLICATION BELOW 120° F MAY NOT GET A PROPER INLAY. INLAYS ARE NOT RECOMMENDED AFTER SEPTEMBER 15th AS THE ASPHALT COOLS TOO FAST AT THIS TIME OF THE YEAR.

NO PRIMERS ARE USED FOR INLAY APPLICATION. DO NOT INSTALL LANE LINES ON AN ASPHALT SEAM. ROLLING OF ALL THE MARKINGS SHOULD BE LENGTHWISE IN THE DIRECTION THEY WERE LAID. FOR CROSSWALKS AND STOP BARS, INITIAL TAMPING WITH THE TAMPING CART IS RECOMMENDED USING ONLY 100 LBS. OF WEIGHT.

USE COMPACTION ROLLER TO EMBED (INLAY) MARKINGS INTO PAVEMENT SURFACE. USE MINIMUM SPEED AND WATER ON ROLLER. DO NOT USE VIBRATOR. IF MARKING BUCKLES OR DISTORTS SEVERELY IN FRONT OF ROLLER, MAT TEMPERATURE OR ROLLER SPEED MAY BE TOO HIGH.

### POLY PREFORM GROOVED APPLICATION:

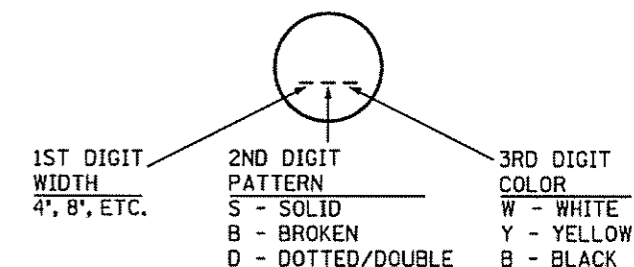
CONCRETE PAVEMENT SURFACES AND BITUMINOUS PAVEMENT SURFACES WHERE PAVEMENT MARKINGS CANNOT BE INLAID IN THE HOT MAT, SHALL BE GROOVED FOR THE INSTALLATION OF DURABLE REFLECTORIZED PAVEMENT MARKINGS. SEE SPECIAL PROVISIONS.

## PERMANENT PAVEMENT MARKING PLAN INDEX

160 PERM PAVEMENT MARKING TITLE AND TABULATION  
 161-166 DETAILS  
 167-169 TYPICALS

### STRIPING KEY

CIRCLE - EPOXY     SQUARE - POLY PREFORM



EXAMPLE: = 4" SOLID LINE WHITE - EPOXY

## PERMANENT PAVEMENT MARKING TABULATION

ITEM	UNIT	TOTAL
PAVEMENT MARKING REMOVAL	LIN FT	460
8" SOLID LINE WHITE-POLY PREF	LIN FT	799
4" BROKEN LINE WHITE-POLY PREF	LIN FT	5020
8" DOTTED LINE WHITE-POLY PREF	LIN FT	240
8" SOLID LINE WHITE-POLY PREF (GR IN)	LIN FT	681
4" BROKEN LINE WHITE-POLY PREF (GR IN)	LIN FT	250
8" DOTTED LINE WHITE-POLY PREF (GR IN)	LIN FT	30
4" SOLID LINE WHITE-EPOXY	LIN FT	13104
4" SOLID LINE YELLOW-EPOXY	LIN FT	12804

I HEREBY CERTIFY THAT SHEETS 160 THROUGH 222 OF THIS PLAN WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: SHEILA JOHNSON     LICENSE # 26804  
 DATE: 1/21/09     SIGNATURE: *Sheila M. Johnson*  
 DESIGNER SCOTT MEIER

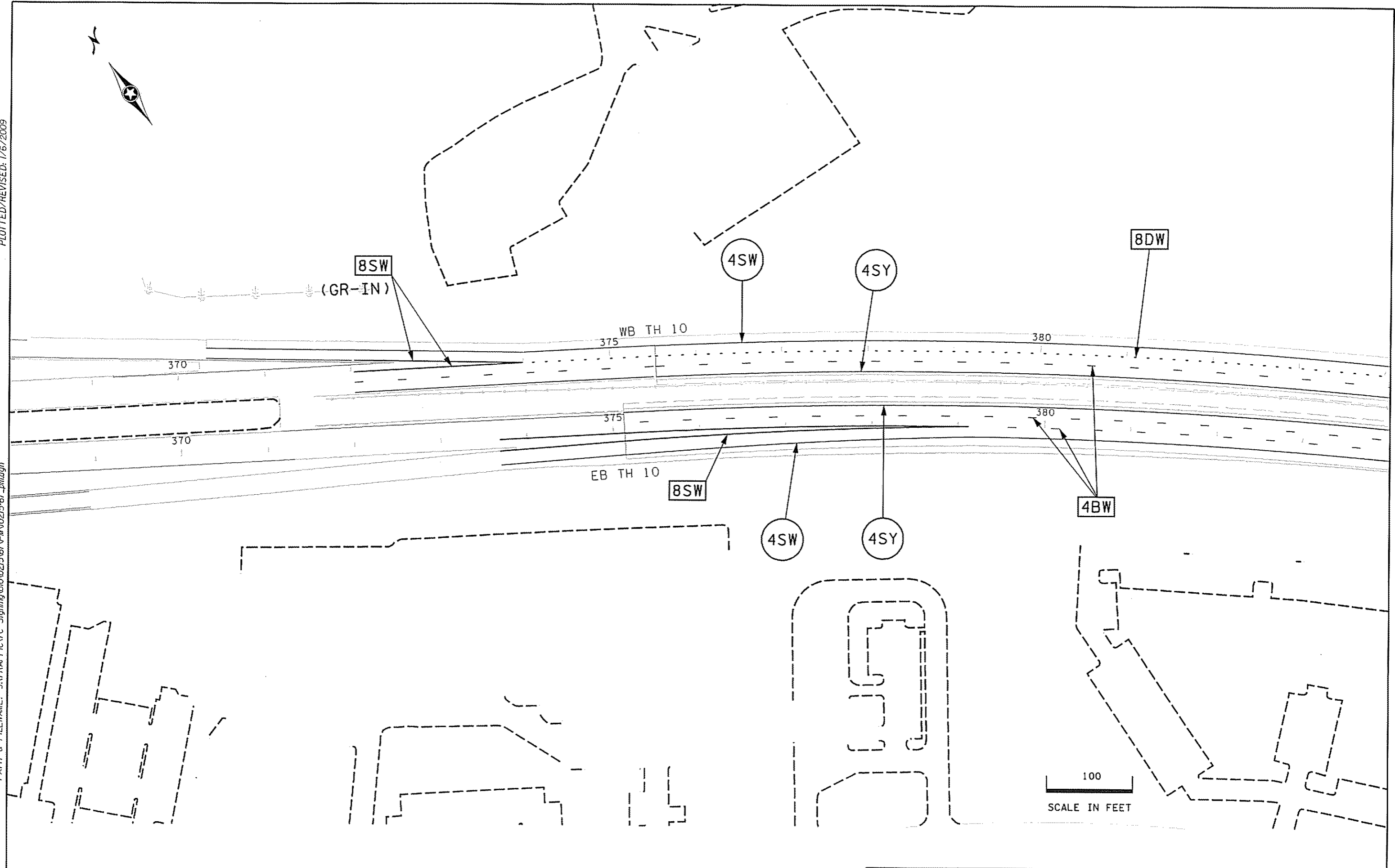
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PLOTTED/REVISED: 1/6/2009



COON CREEK

8DW

4SY

4SW

4BW

WB TH 10

385

390

395

385

390

395

EB TH 10

4SY

4SW

4BW

CREEK MEADOW DR.

100

SCALE IN FEET

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**PERMANENT PAVEMENT MARKINGS DETAILS**

DRAWN BY: SNM

CHECKED BY: KF

CERTIFIED BY

*Shirley A. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/6/2009

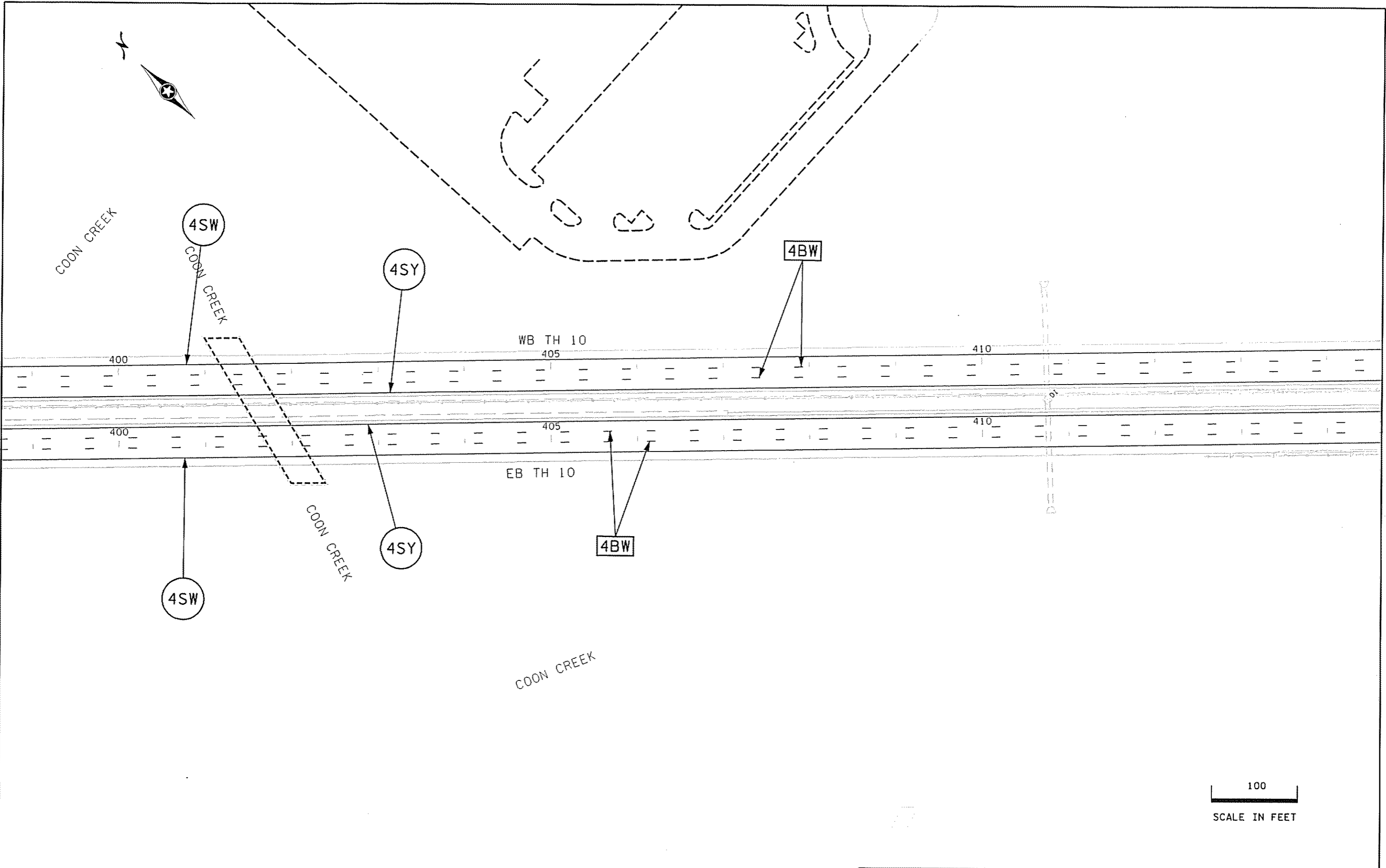
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SHEET NO. 162

OF 222 SHEETS

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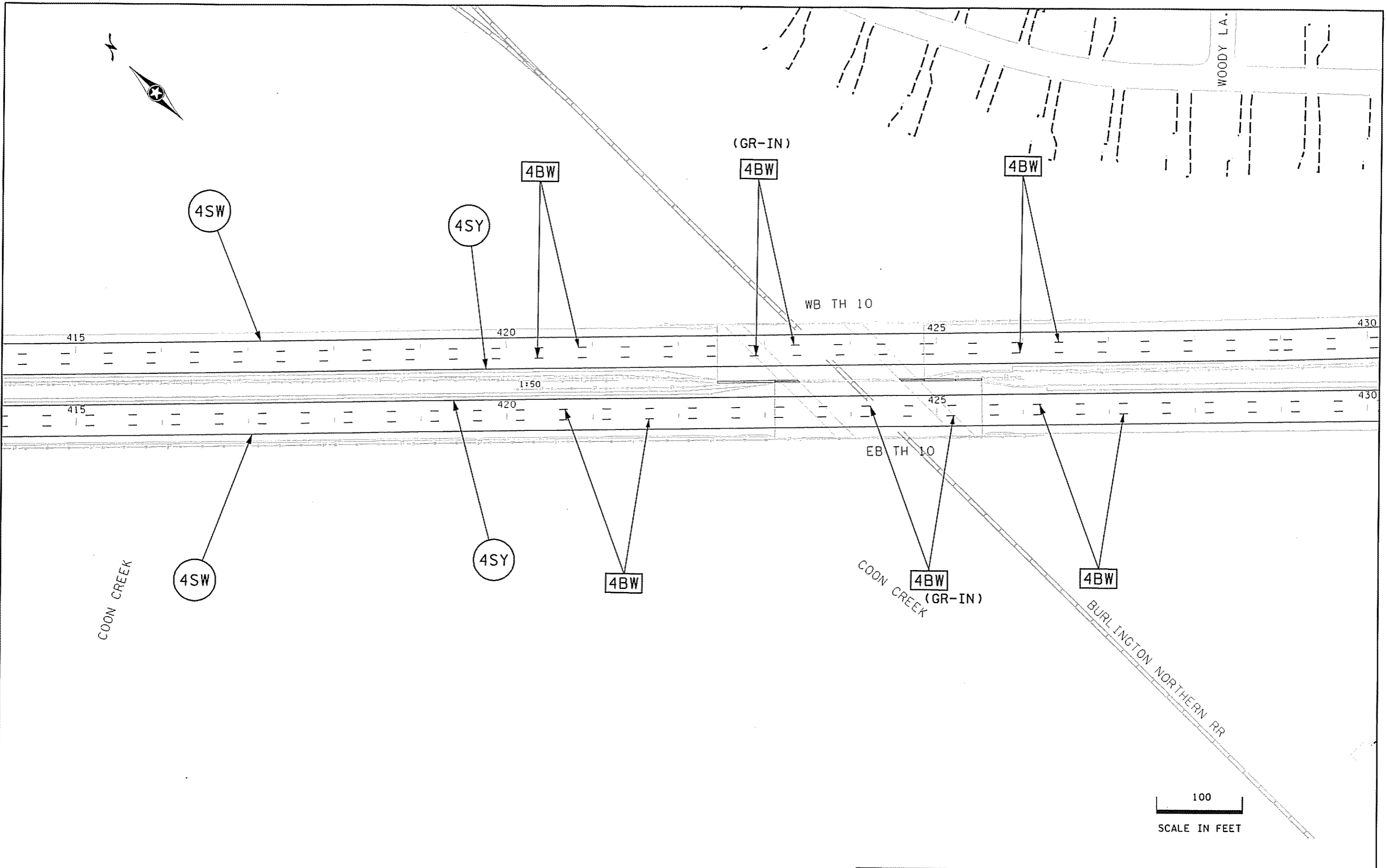
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SCALE IN FEET

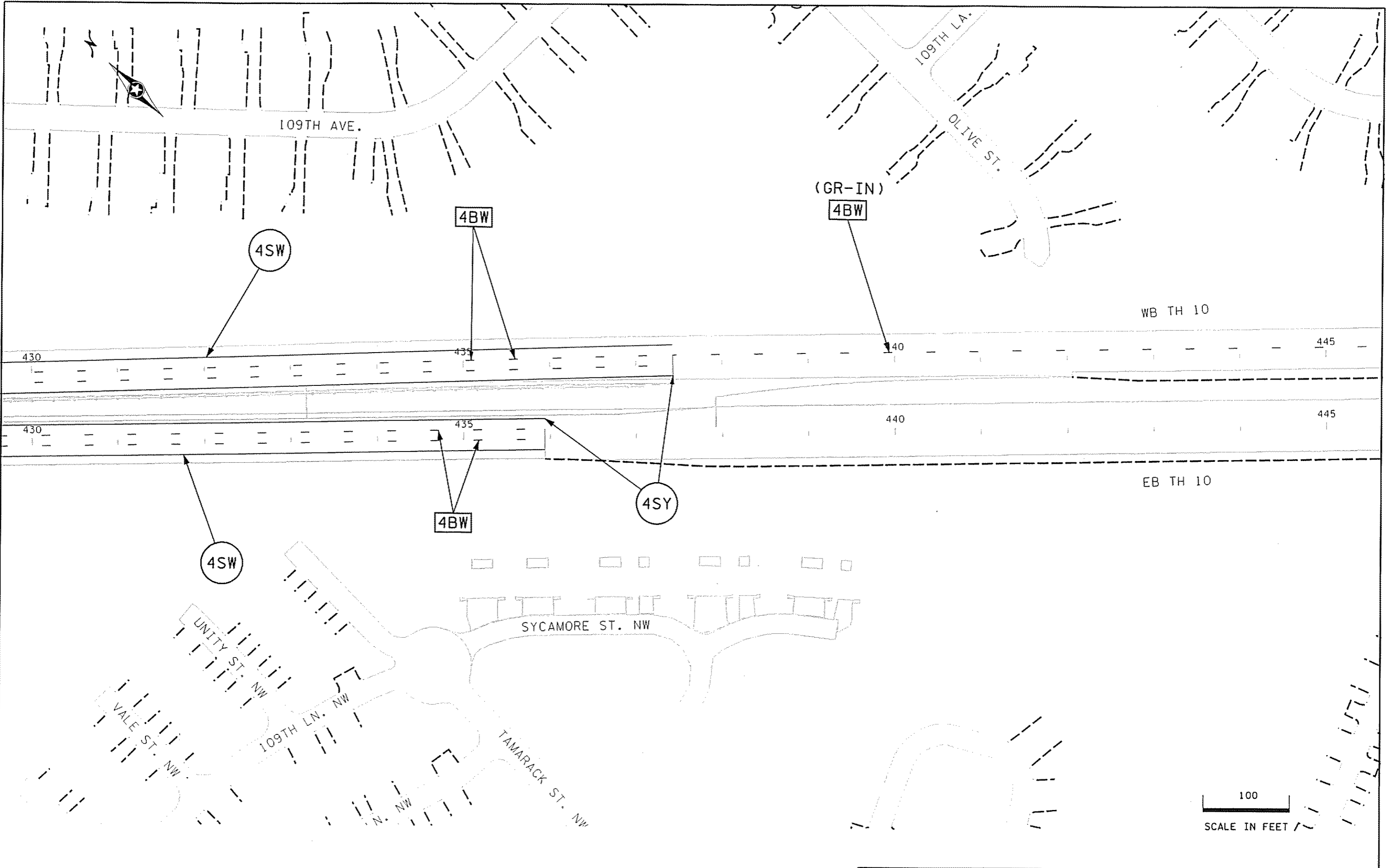
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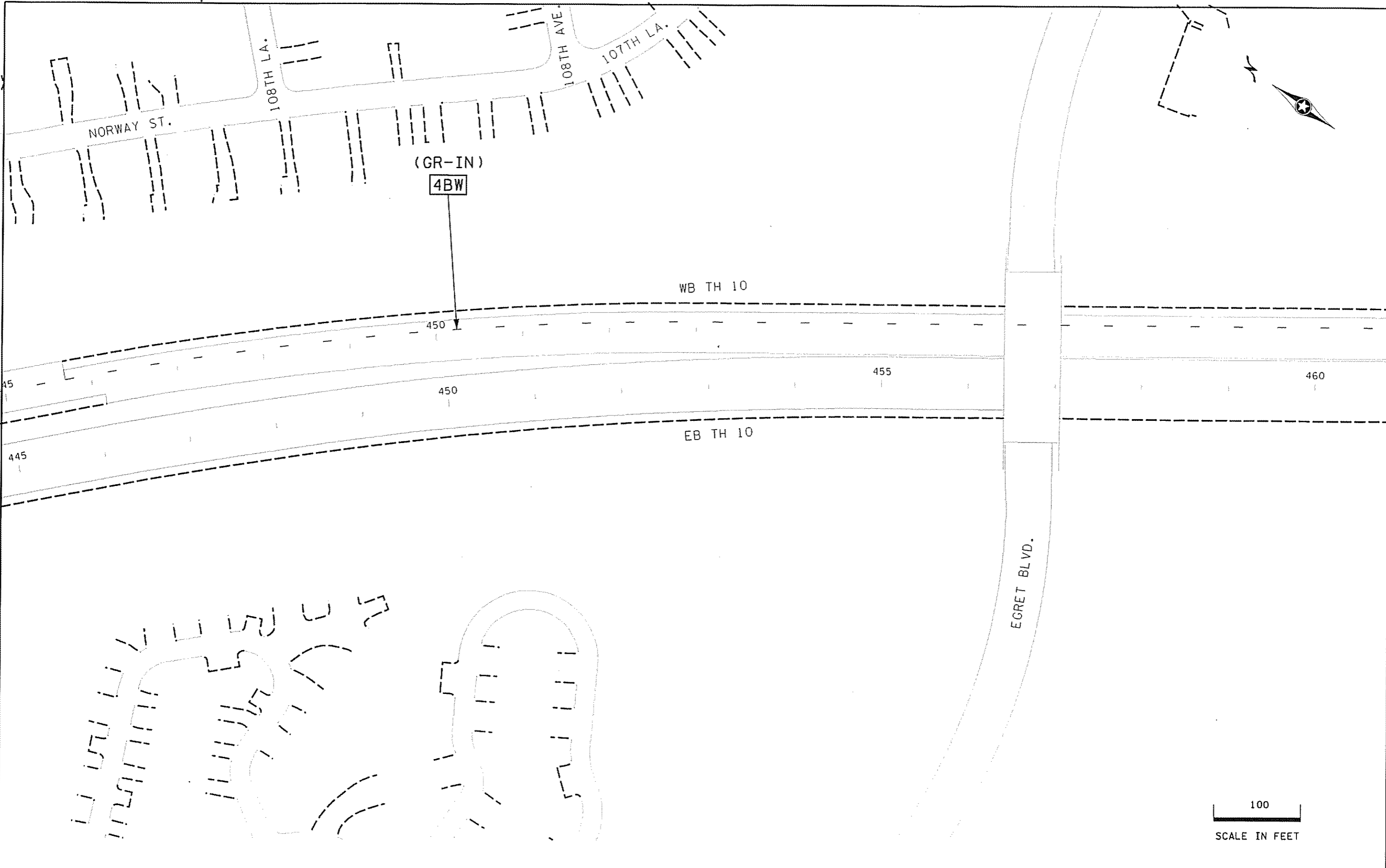
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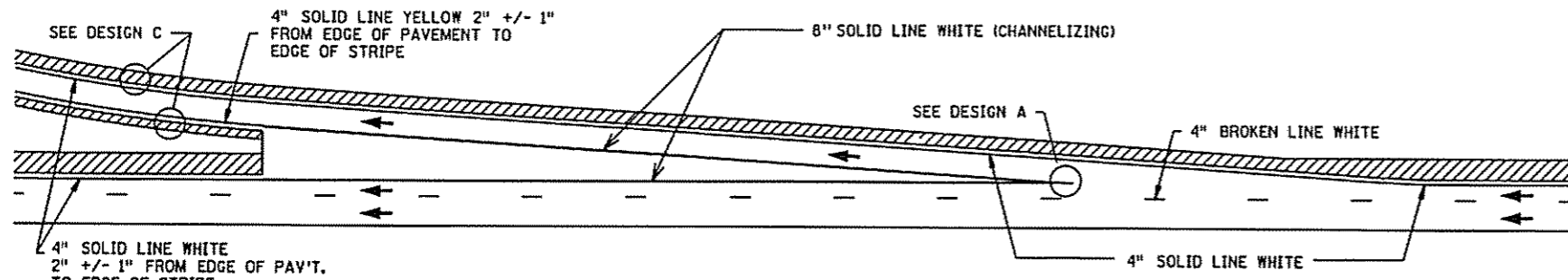
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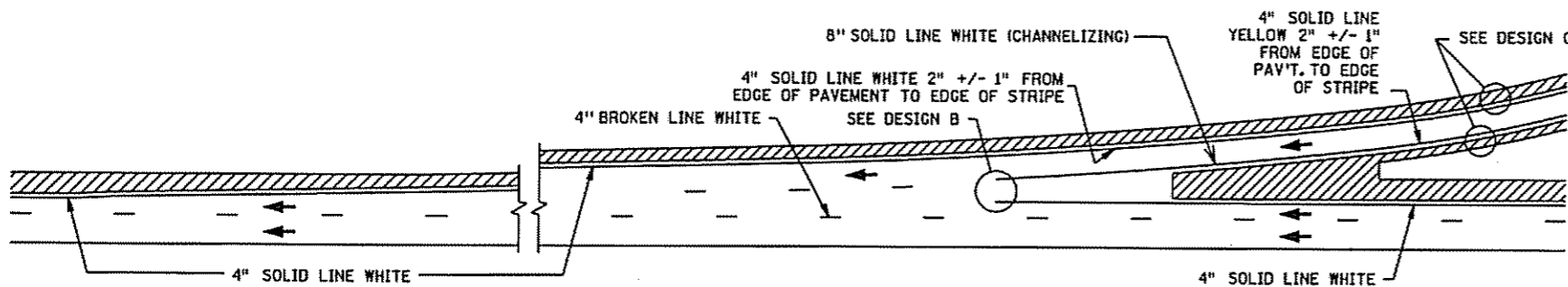


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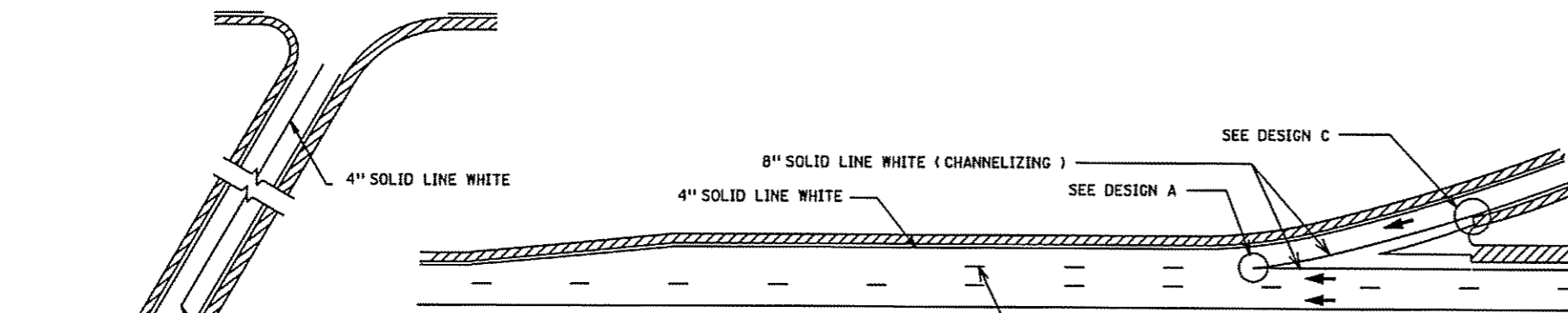
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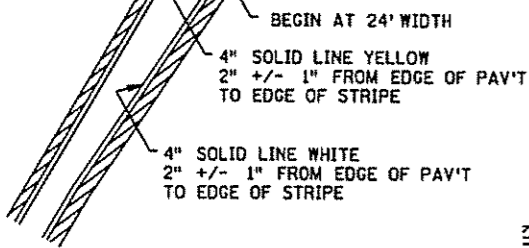
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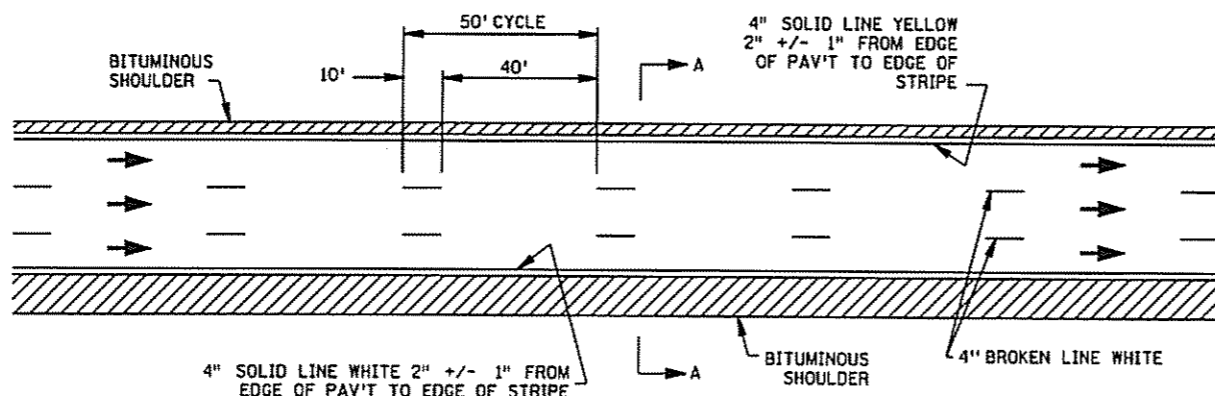
**TAPERED ACCELERATION LANE**



**PARALLEL ACCELERATION LANE**



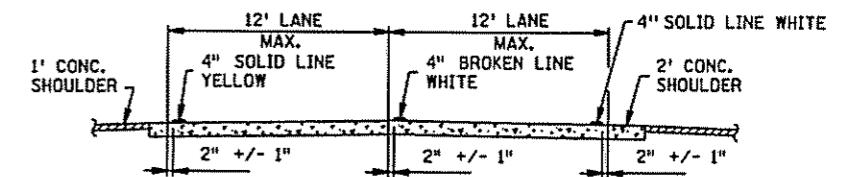
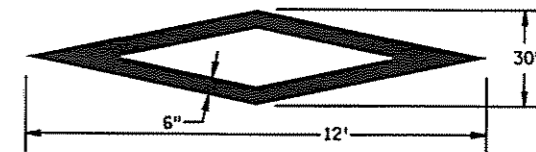
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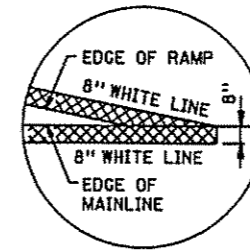
**THROUGH LANE MARKINGS**



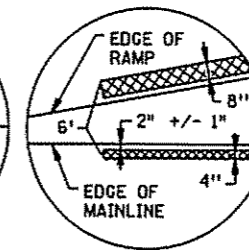
**WHITE HOV PAVEMENT MARKER**



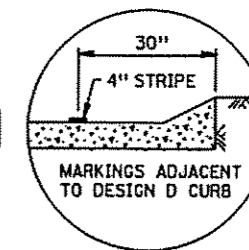
**SECTION A-A (TWO LANES)**



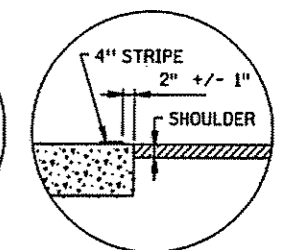
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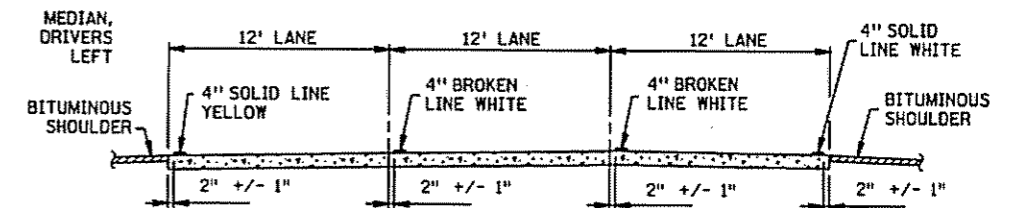
**DESIGN B**



**DESIGN C URBAN**



**DESIGN C RURAL**



**SECTION A-A (THREE LANES)**

**PAVEMENT MARKING TYPICALS**

REVISED: 02-JAN-2004

CERTIFIED BY

*Shirley M. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/6/2009

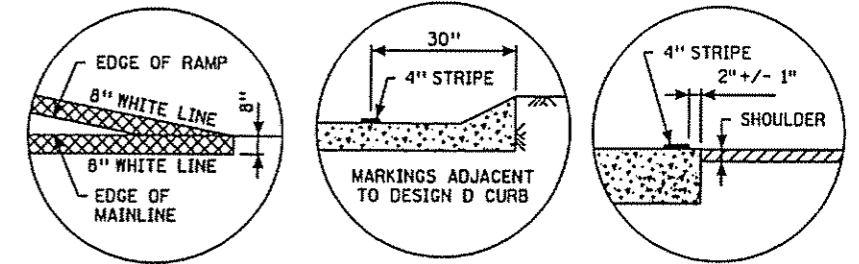
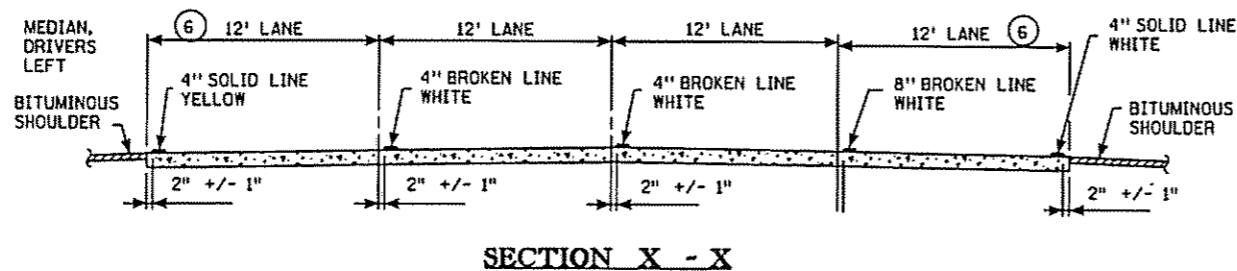
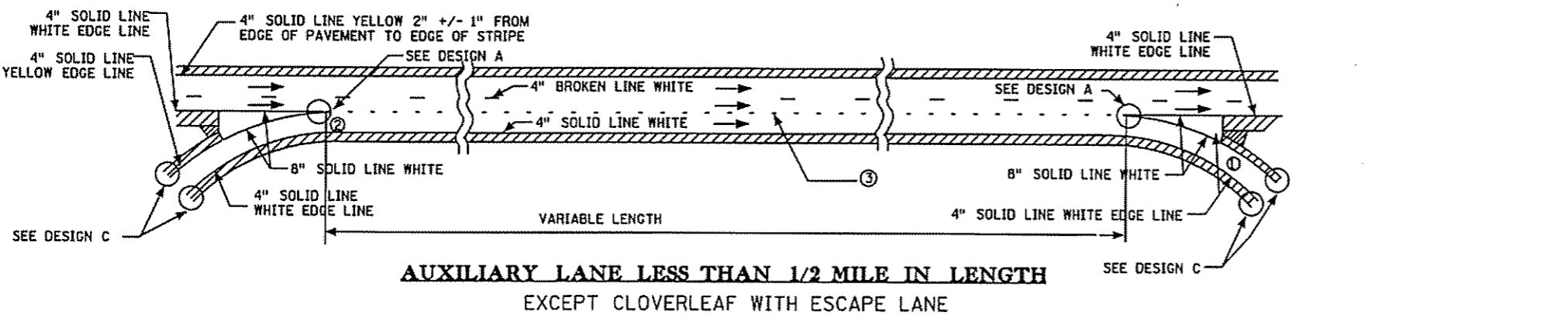
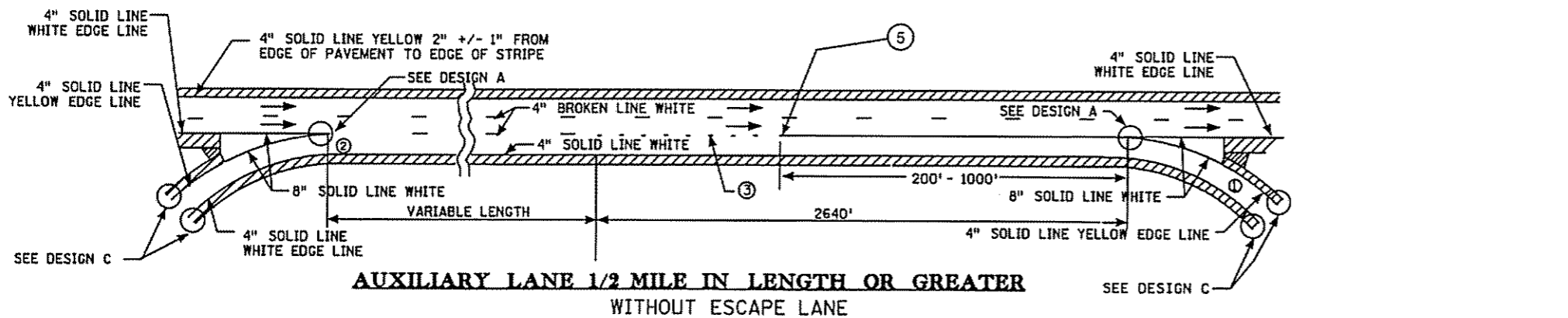
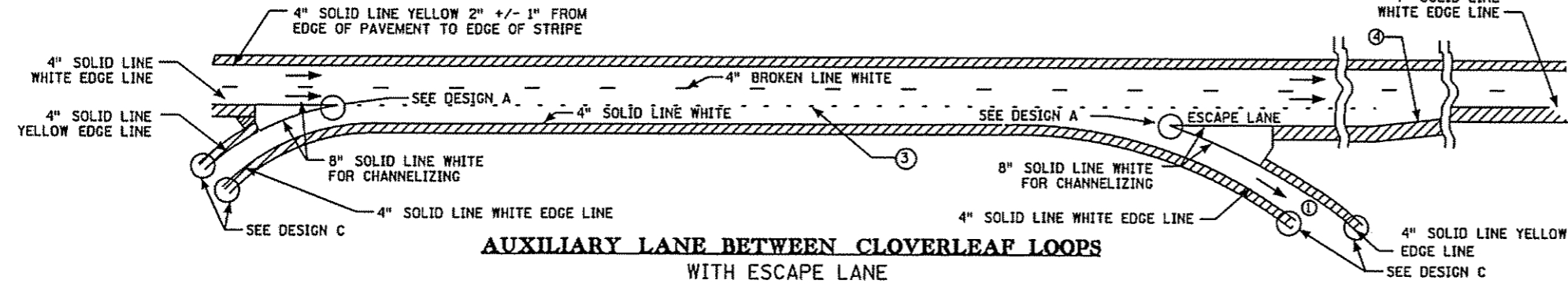
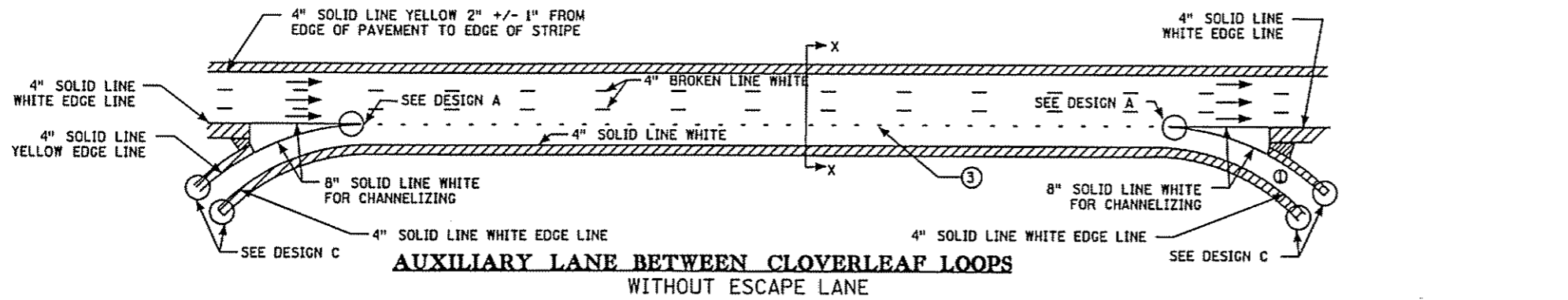
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SHEET NO. 167 OF 222 SHEETS



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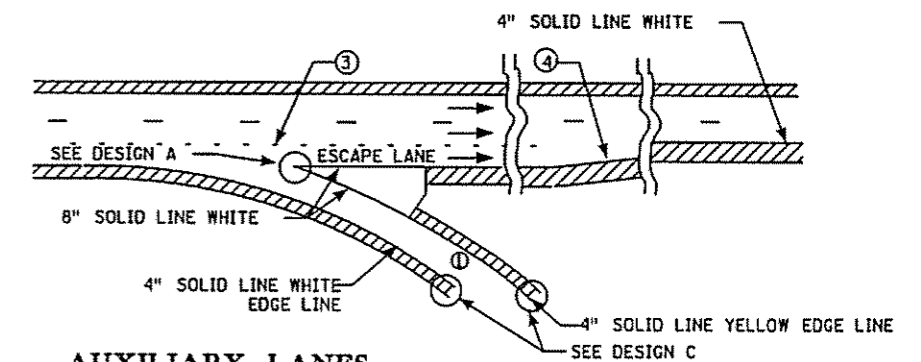
**DESIGN C  
URBAN**

**DESIGN C  
RURAL**

**NOTES:**

- ① EXTEND 8" SOLID LINE WHITE 50' MIN. BEYOND GORE AREA TO COMPENSATE FOR SHARP CURVATURE.
- ② EXTEND 8" SOLID LINE WHITE FOR 200' TO 300' AT DISCRETION OF DISTRICT TRAFFIC ENGINEER. ON CURVATURE OR FOR OTHER SITUATIONS WHERE NEEDED FOR BETTER DELINEATION.
- ③ 8" DOTTED LINE WHITE 3' LONG WITH 12' GAPS AS DETAILED IN FIGURE 3-11d OF THE MMUTCD.
- ④ EXTEND 8" SOLID LINE WHITE ENTIRE LENGTH OF THE ESCAPE LANE AND TO THE END OF THE TAPER. PICK UP THE NORMAL 4 IN. SOLID LINE WHITE BEYOND TAPER. TAPER MUST BE AT LEAST 50:1
- ⑤ EXTEND 8" SOLID LINE WHITE 200' TO 1000' FROM INTERSECTION OF GORE STRIPES, DEPENDING ON LENGTH OF LANE BEING DROPPED, AS DETERMINED BY DISTRICT TRAFFIC ENGINEER.
- ⑥ ON PAVEMENTS OVER 24' WIDE (I.E. 27') EDGE LINES WILL BE PLACED SO LANES ARE A MAXIMUM OF 12' WIDE.

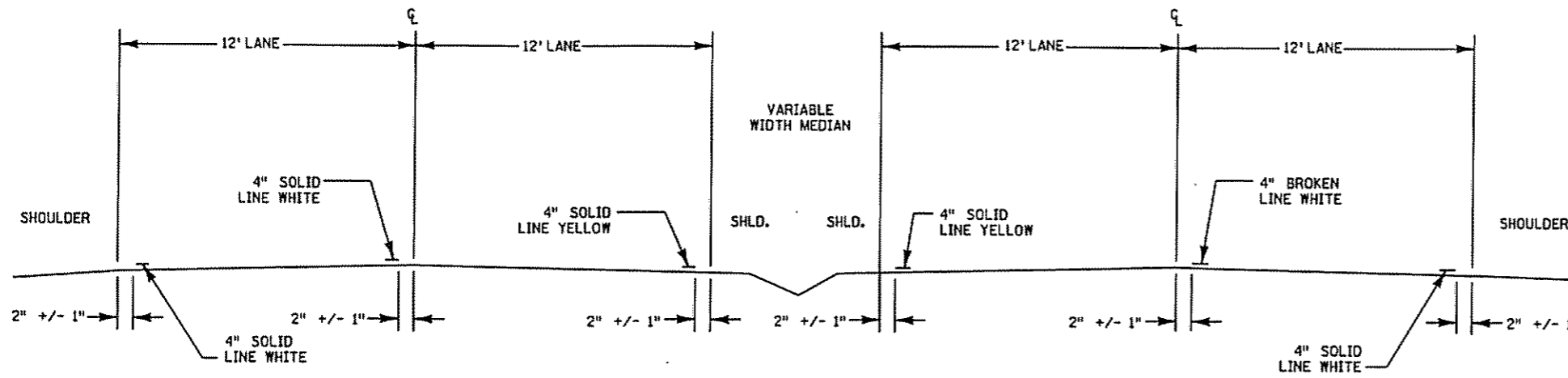
DENOTES SHOULDER AREA



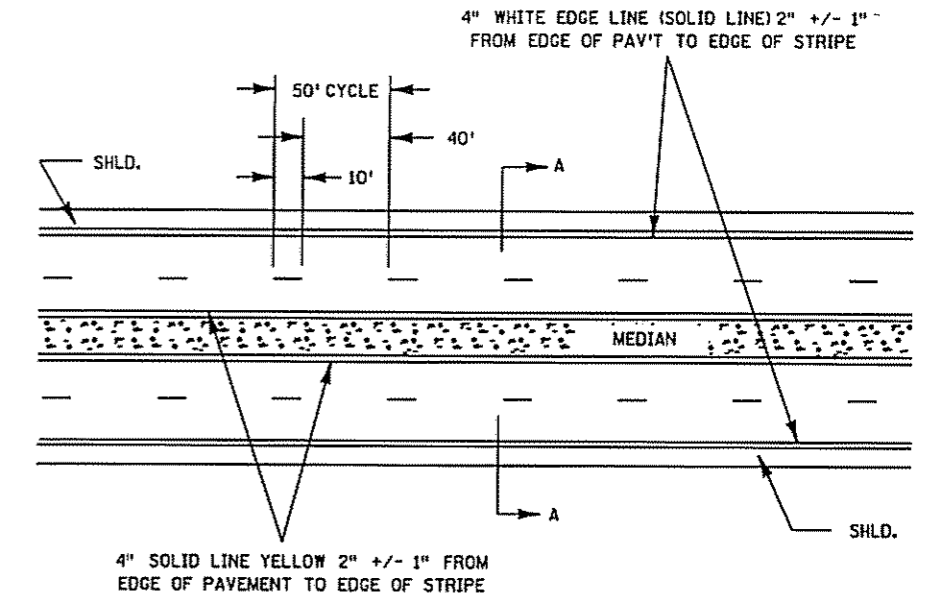
**PAVEMENT MARKING TYPICALS**

PLOTTED/REVISED: 1/6/2009

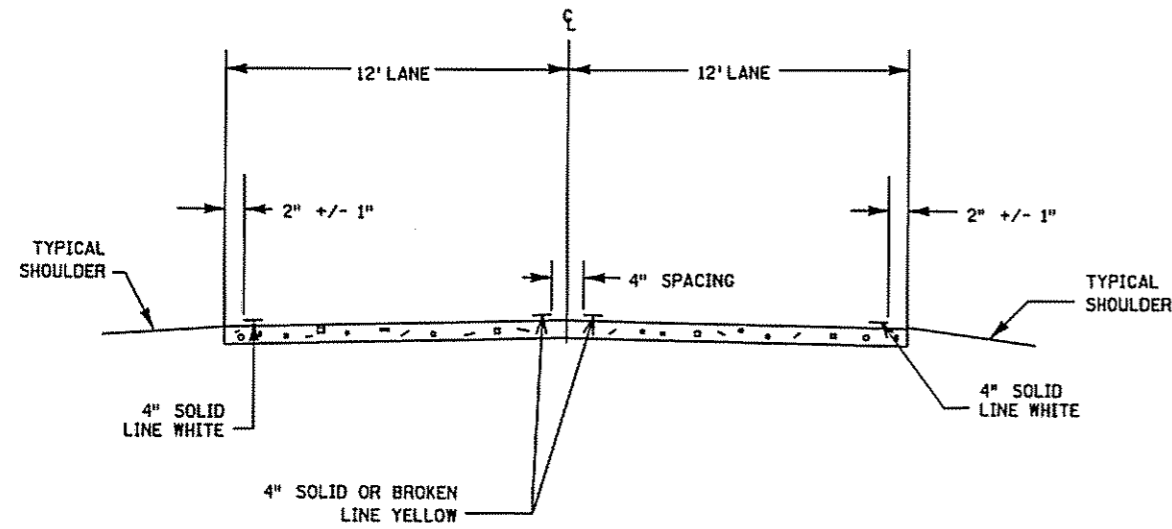
DISTRICT #: METRO  
PLOT NAME: 10215-67\_pm\_jsh3  
PATH & FILENAME: S:\TRAFFIC\TC\_Signing\01021567\PM\10215-67\_pm\_jsh.dgn



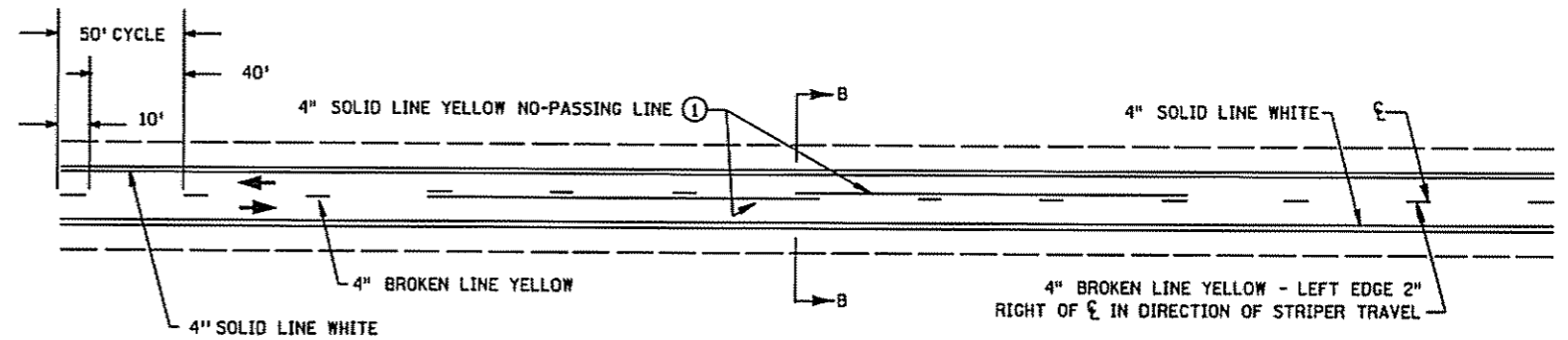
SECTION A-A  
FOUR LANES



TYPICAL 4-LANE DIVIDED LANE MARKINGS

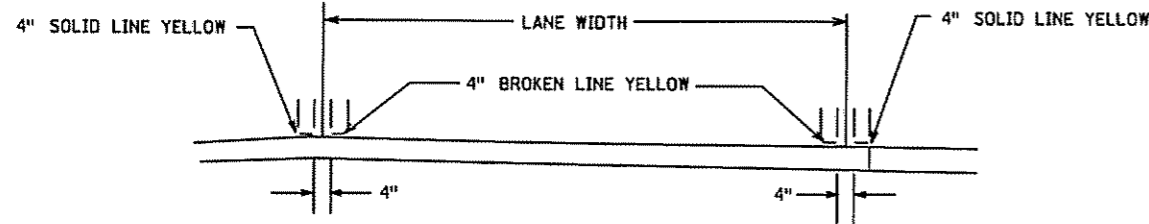


SECTION B-B

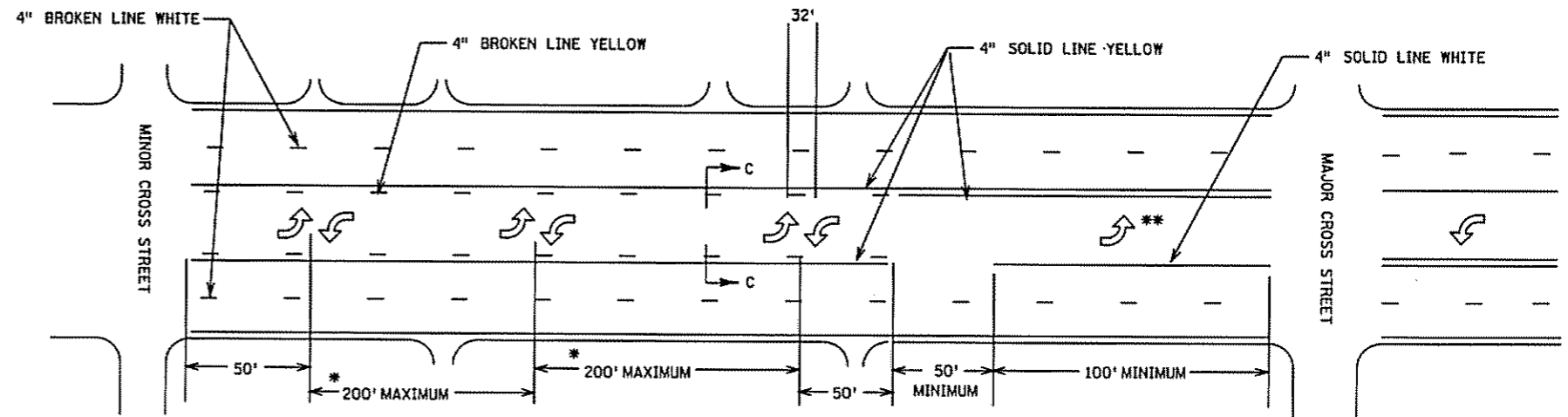


TWO LANE-TWO WAY TRAFFIC MARKINGS

① CONTACT TRAFFIC ENGINEER FOR NO PASSING ZONE SURVEY.



SECTION C-C  
TWO WAY LEFT TURN LANE



TWO WAY LEFT TURN LANE

\* THESE DISTANCES SHOULD BE EQUAL. THE ARROWS ARE PLACED TO SHOW THE OPERATION AND DO NOT HAVE TO LINE UP WITH ANY OF THE DRIVEWAYS.

\*\* SEE "TYPICAL MESSAGE PLACEMENT FOR TURN LANES" FOR NUMBER AND PLACEMENT OF ARROWS.

PAVEMENT MARKING TYPICALS

REVISED: 02-JAN-2004

CERTIFIED BY

*Shirley H. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/6/2009

STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 169 OF 169 SHEETS

PLOTTED/REVISED: 1/21/2009

DISTRICT #: METRO  
 PLOT NAME: 10215-67\_101-2  
 PATH & FILENAME: S:\TRAFFIC\LIGHTING\Plans\10215-67\10215-67\_101-2.dgn

TAB U	TABULATION OF LIGHTING QUANTITIES	S.P. 0215-67
		ESTIMATED QUANTITIES
ITEM	UNIT	TOTAL
LIGHTING UNIT TYPE 9-49	EACH	56
LIGHTING UNIT TYPE 6B-40	EACH	2
UNDERPASS LIGHTING UNIT TYPE L	EACH	2
LIGHT BASE DESIGN H	EACH	56
1" RIGID STEEL CONDUIT	LIN. FT.	220
3" NON-METALLIC CONDUIT (DIRECTIONAL BORE)	LIN. FT.	545
UNDERGROUND WIRE 1 COND NO 10	LIN. FT.	660
ARMORED CABLE 4 COND NO 4	LIN. FT.	18700
SERVICE CABINET SECONDARY TYPE L1	EACH	2
EQUIPMENT PAD B	EACH	2
JUNCTION BOX	EACH	2
HANDHOLE	EACH	5
ELECTRICAL SERVICE	EACH	2
.75" LIQUIDTIGHT FLEXIBLE CONDUIT	LIN. FT.	10

THE FOLLOWING STANDARD PLATES APPROVED BY THE DEPT.OF TRANSPORTATION AND THE FEDERAL HIGHWAY ADMINISTRATION SHALL APPLY ON THIS PROJECT.

STANDARD PLATES	
PLATE NO.	DESCRIPTION
8106B	EQUIPMENT PAD B
8114A	P.V.C. HANDHOLE/PULLBOX
8128B	LIGHT BASE DESIGN H

I HEREBY CERTIFY THAT SHEETS 170 TO 176 HAVE BEEN PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

  
 MICHAEL GERBENSKY  
 DATE 1-21-09 LIC. NO. 19863

BY	DATE	REVISIONS

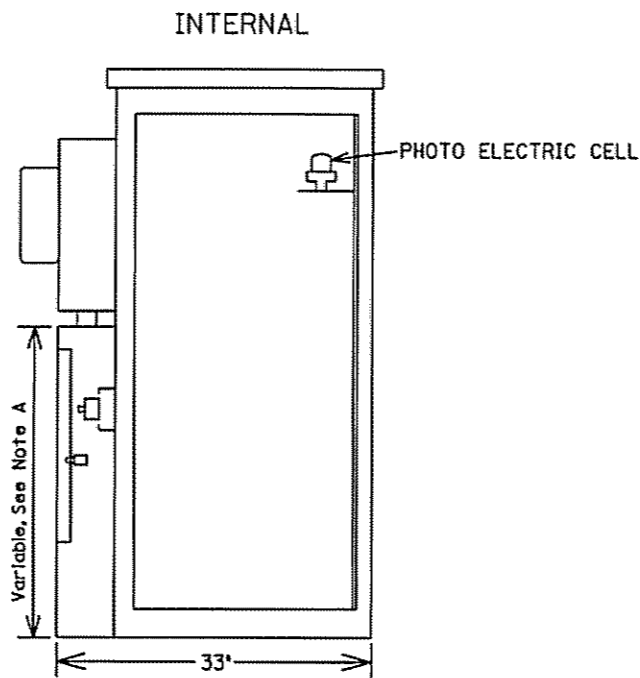
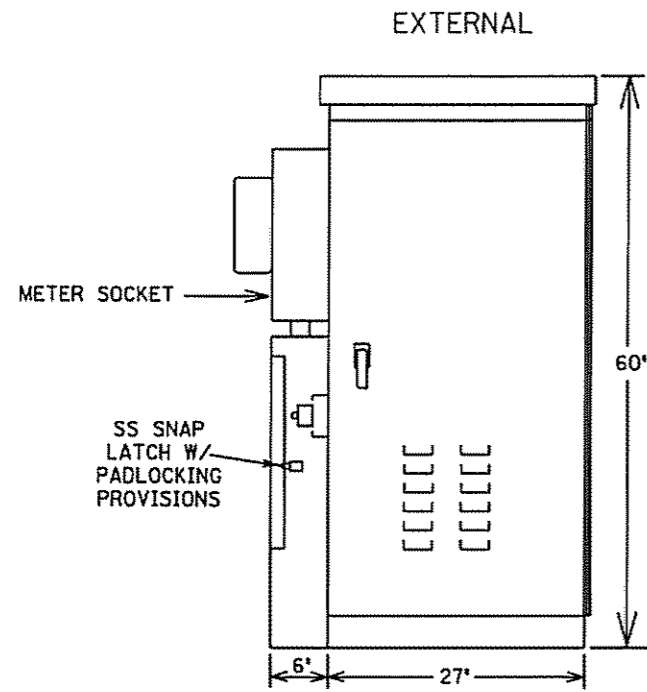
DRAWN BY: NS      CKD BY: GB      DATE:     

**LIGHTING QUANTITIES**

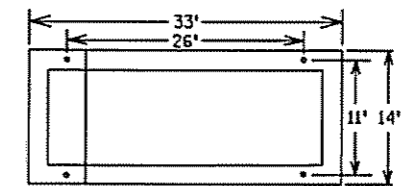
STATE PROJ.NO.0215-67 (T.H.10)      SHEET NO.170 OF 222 SHEETS

PLOTTED/REVISED: 1/20/2009

DISTRICT #: METRO  
 IPLOT NAME: 10215-67\_cabinet  
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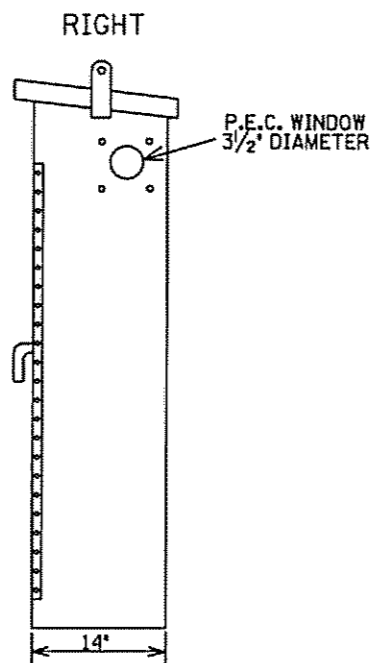
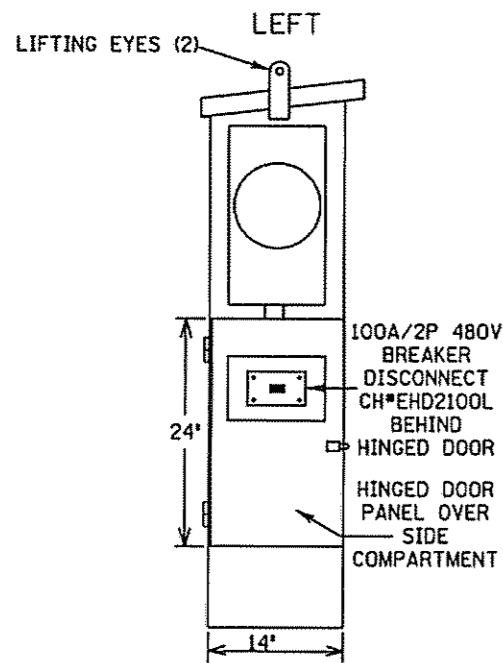


PAD MOUNTING PATTERN

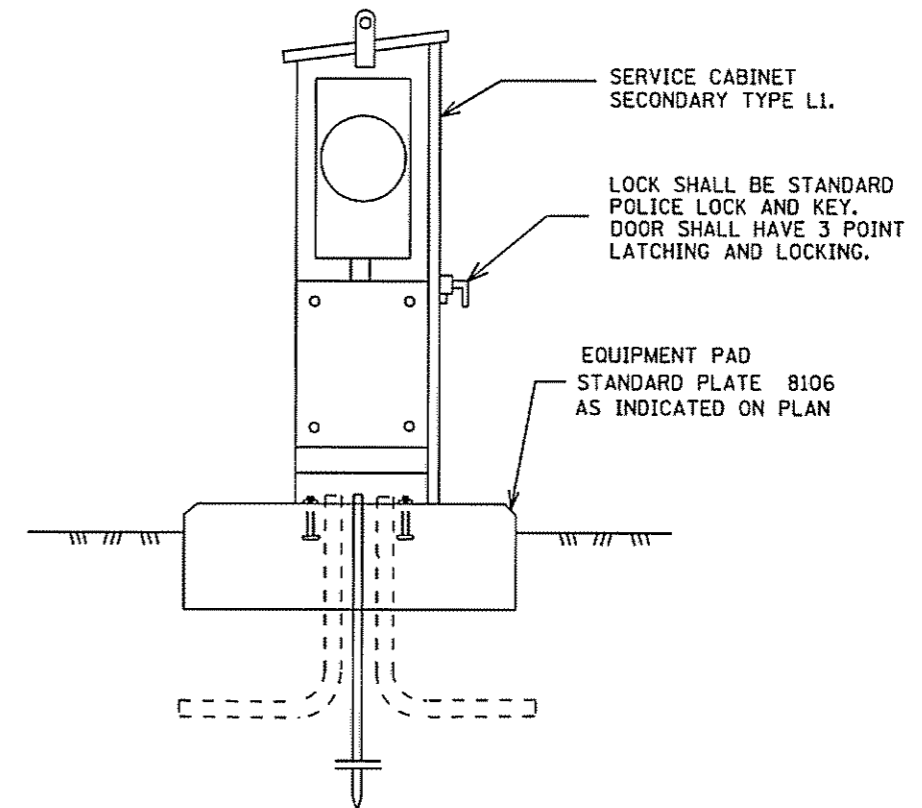
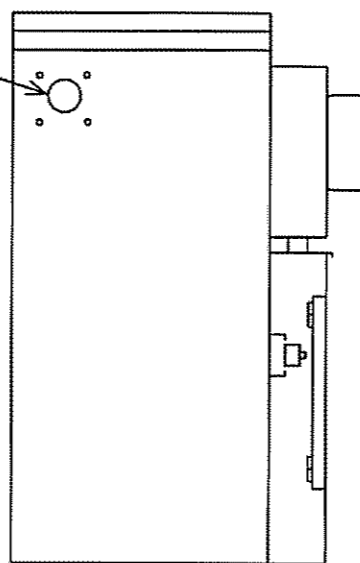


Note A: Height of compartment is approximately 33".  
 May vary depending upon size of meter socket.

SIDE VIEWS



BACK VIEW



LIGHTING SERVICE CABINET  
 SERVICE CABINET SECONDARY TYPE L1  
 240/480 VOLT

BY	DATE	REVISIONS

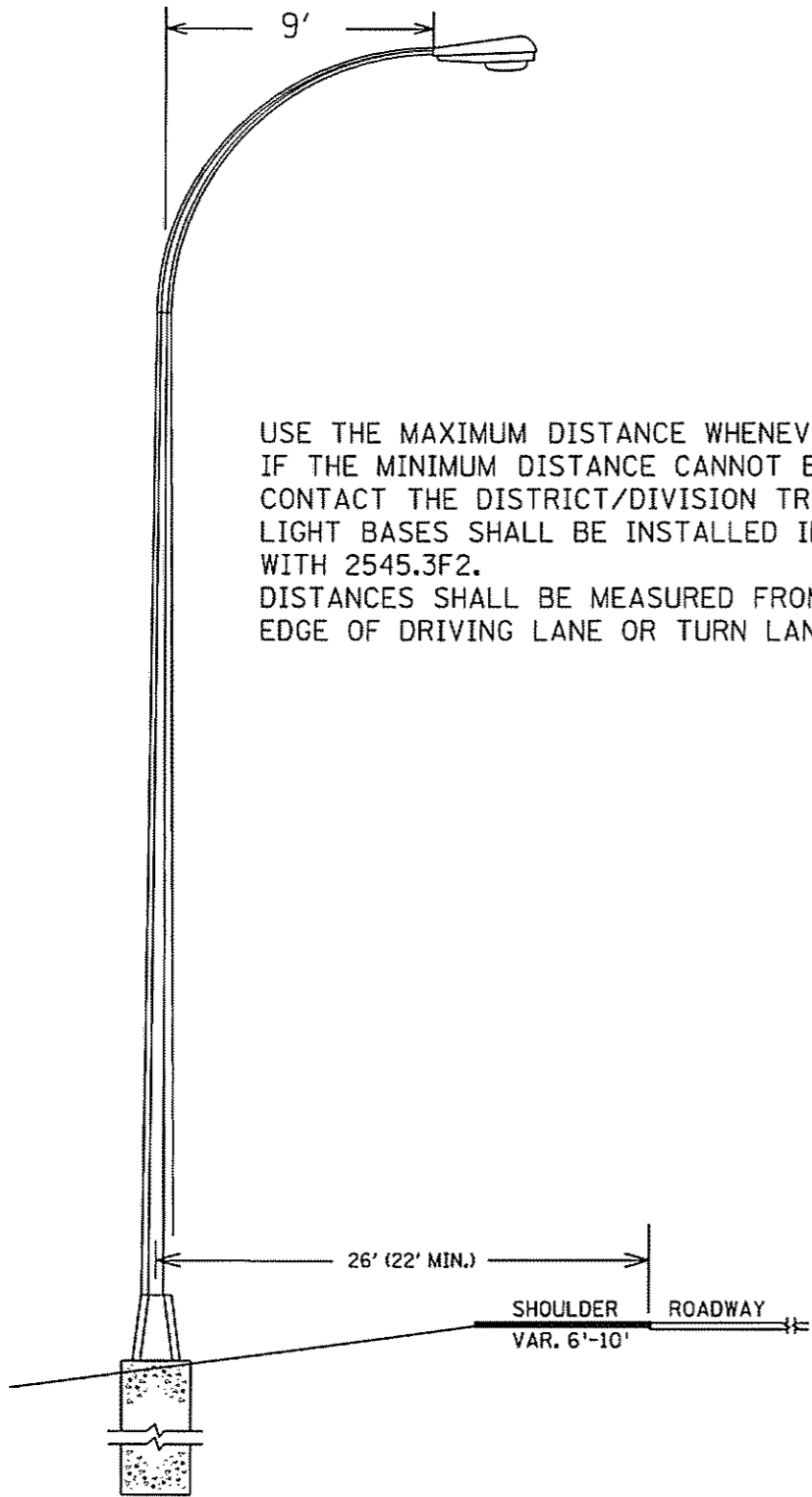
CERTIFIED BY *Michael P. Gulbrunsky* LIC. NO. 19863 DATE: 1/21/09  
LICENSED PROFESSIONAL ENGINEER

**LIGHTING DETAILS**

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 171 OF 222 SHEETS

PLOTTED/REVISED: 1/20/2009

DISTRICT #: METRO  
 IPLOT NAME: 10215-67\_9-49  
 PATH & FILENAME: S:\TRAFFIC\LIGHTING\PLANS\010215\0215-67\0215-67\_101-2.dgn

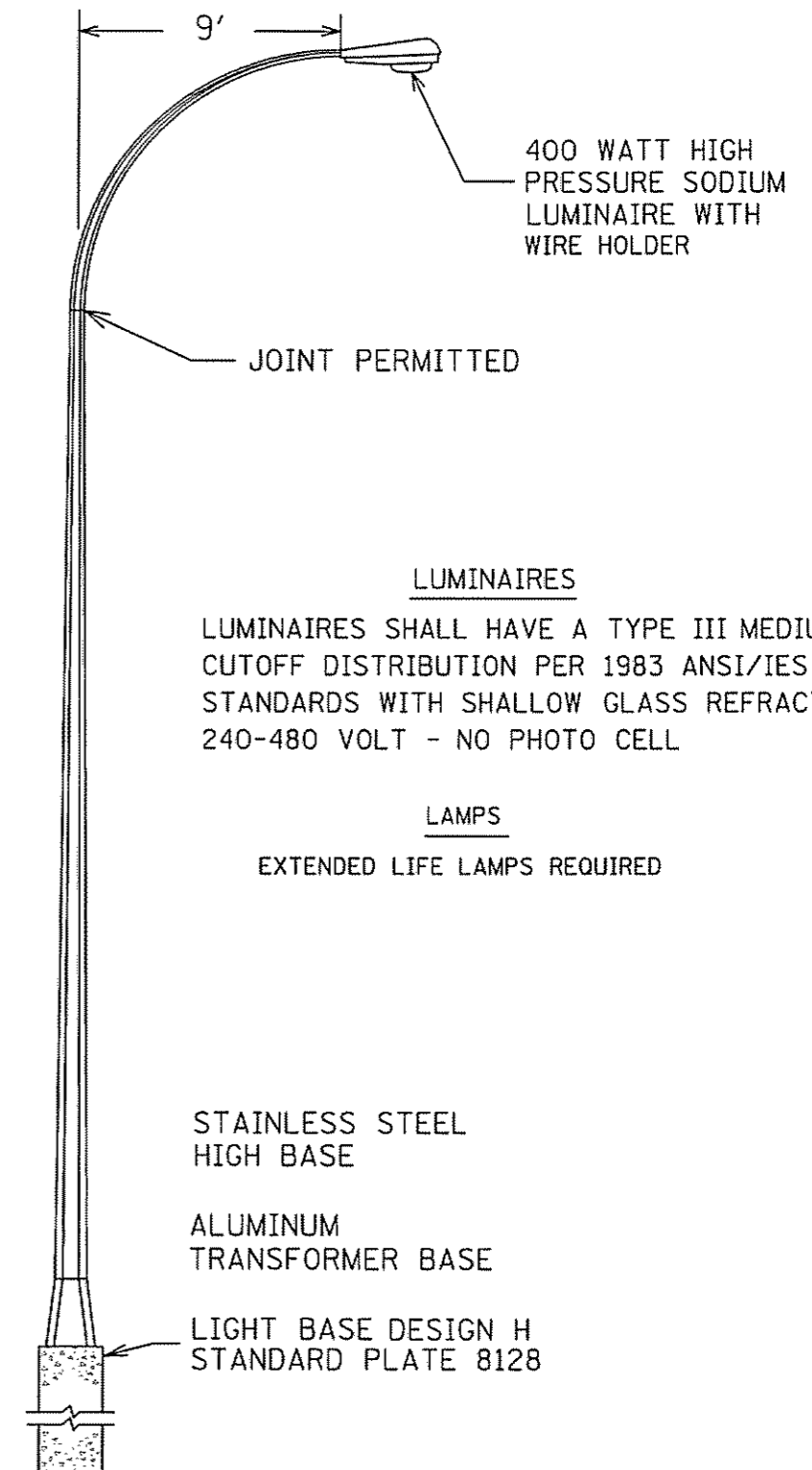


USE THE MAXIMUM DISTANCE WHENEVER POSSIBLE,  
 IF THE MINIMUM DISTANCE CANNOT BE OBTAINED  
 CONTACT THE DISTRICT/DIVISION TRAFFIC ENGINEER  
 LIGHT BASES SHALL BE INSTALLED IN ACCORDANCE  
 WITH 2545.3F2.  
 DISTANCES SHALL BE MEASURED FROM THE  
 EDGE OF DRIVING LANE OR TURN LANE.

PLACEMENT OF LIGHTING UNIT TYPE 9-49

RADIUS CHART (ENGLISH)

MAST ARM LENGTH	RADIUS
6	5
9	8
12	10



LUMINAIRES  
 LUMINAIRES SHALL HAVE A TYPE III MEDIUM  
 CUTOFF DISTRIBUTION PER 1983 ANSI/IES  
 STANDARDS WITH SHALLOW GLASS REFRACTOR  
 240-480 VOLT - NO PHOTO CELL

LAMPS  
 EXTENDED LIFE LAMPS REQUIRED

LIGHTING UNIT TYPE 9-49  
 (BREAKAWAY)

BY	DATE	REVISIONS

DRAWN BY: NS    CKD BY: GB    DATE:   

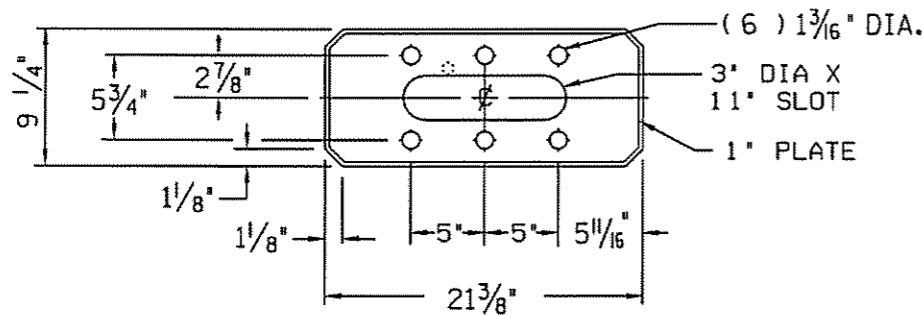
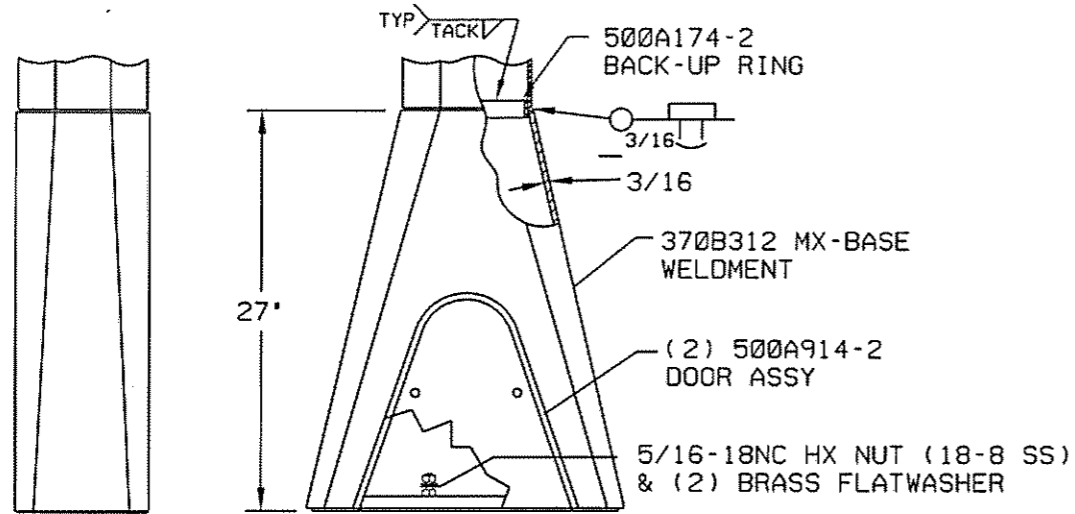
CERTIFIED BY *Michael P. Gubensky* LIC. NO. 19863 DATE: 1/21/09  
LICENSED PROFESSIONAL ENGINEER

**LIGHTING DETAILS**

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 172 OF 222 SHEETS

PLOTTED/REVISED: 1/20/2009

DISTRICT #: METRO  
 IPLOT NAME: 10215-67\_Jol-2  
 PATH & FILENAME: S:\TRAFFIC\LIGHTING\0215-67\0215-67\_Jol-2.ltr.dgn



BASE PLATE DETAIL FOR BRIDGE POLES AND  
 MEDIAN BARRIER POLES WITH 6 ANCHOR BOLTS

NOTES:

1. SKIRT MATERIAL-HIGH STRENGTH LOW ALLOY STEEL  
 50,000 PSI MIN YIELD PER ASTM A607 (A606 IF SELF  
 WEATHERING) BASE PLATE MATERIAL 36,000 PSI MIN  
 YIELD PER ASTM A36 (A588 IF SELF WEATHERING)
2. FINISH-TO MATCH POLE

( 2 DOOR )

ITEM NO	PART NO	DESCRIPTION
1	370B312-1	SKIRT WELDMENT 3/16X9.6DAC (6 BOLT)
2	370B313-1	(2) SKIRT HALF 3/16X9.6DAC (WITH DOOR)
3	500A914-2	DOOR ASSY

RADIUS CHART (ENGLISH)

MAST ARM LENGTH	RADIUS
6	5
9	8
12	10

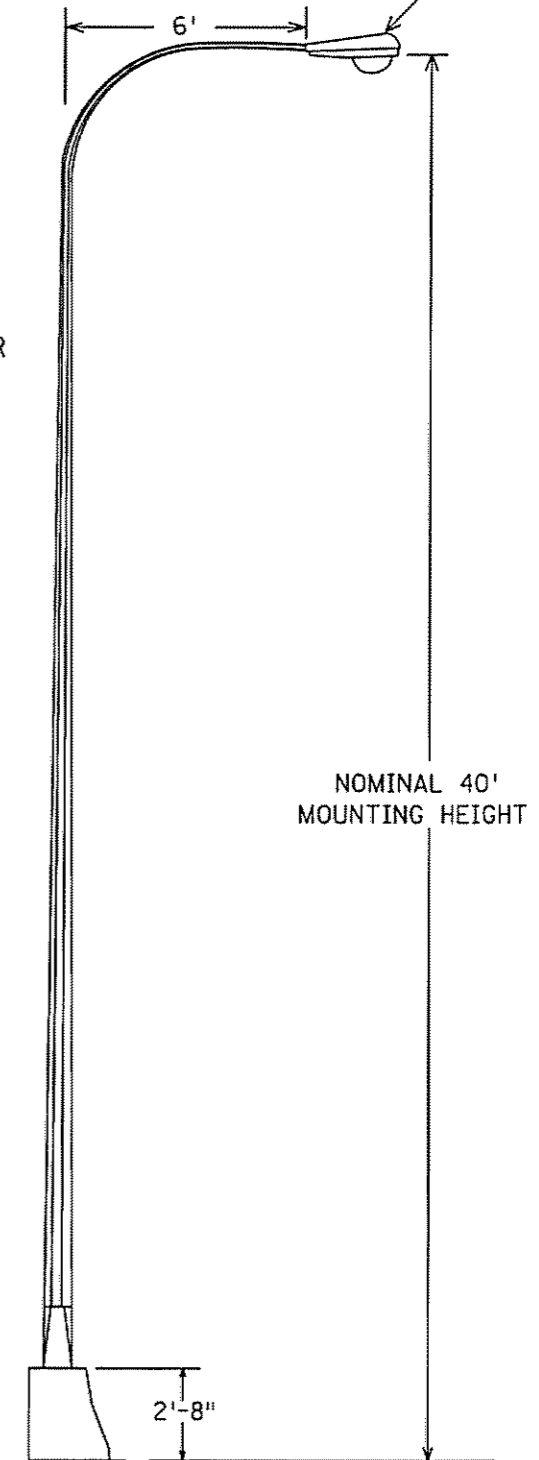
LUMINAIRES

LUMINAIRES SHALL HAVE A TYPE III MEDIUM  
 CUTOFF DISTRIBUTION PER 1983 ANSI/IES  
 STANDARDS WITH SHALLOW GLASS REFRACTOR  
 240-480 VOLT - NO PHOTO CELL

LAMPS

EXTENDED LIFE LAMPS REQUIRED

250 WATT HIGH PRESSURE SODIUM  
 LUMINAIRE WITH WIRE HOLDER



LIGHTING UNIT TYPE 6B-40

BY	DATE	REVISIONS

DRAWN BY: NS CKD BY: GB DATE: \_\_\_\_\_

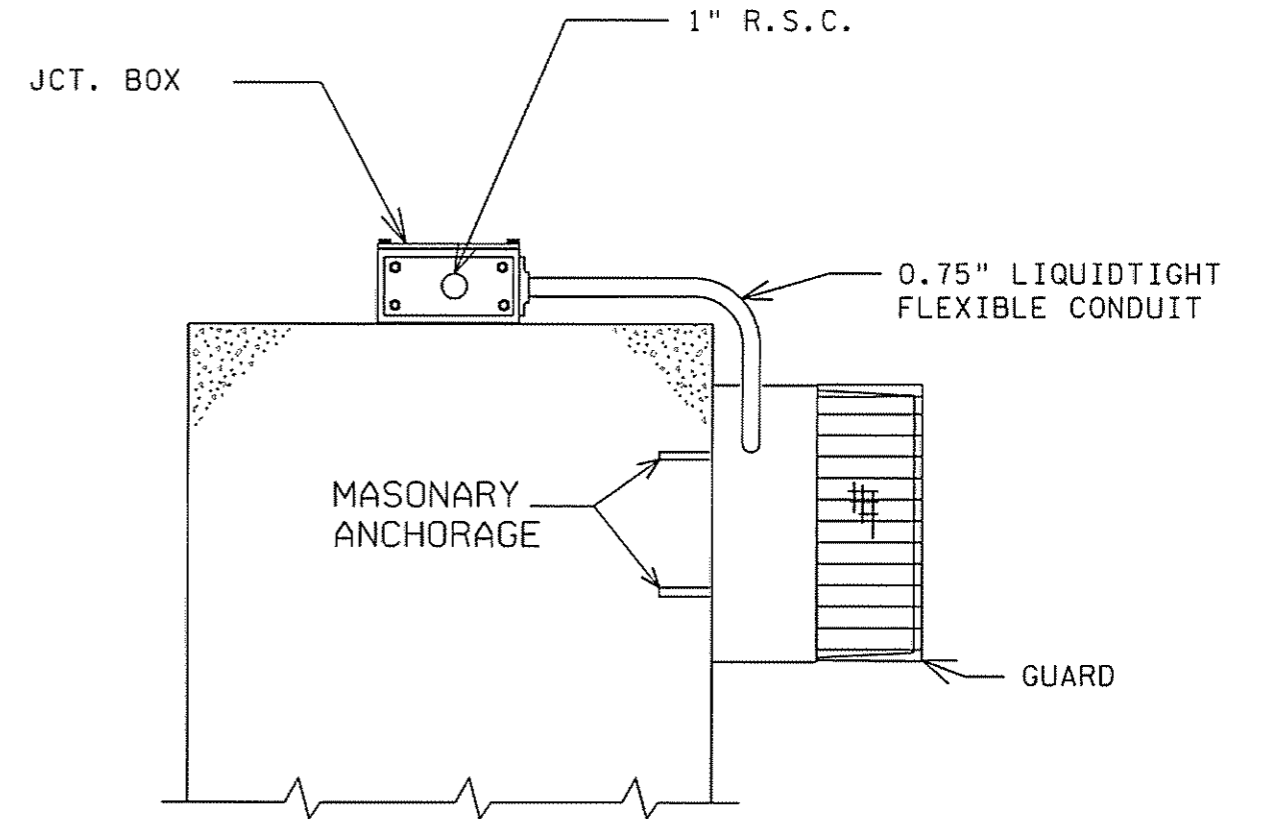
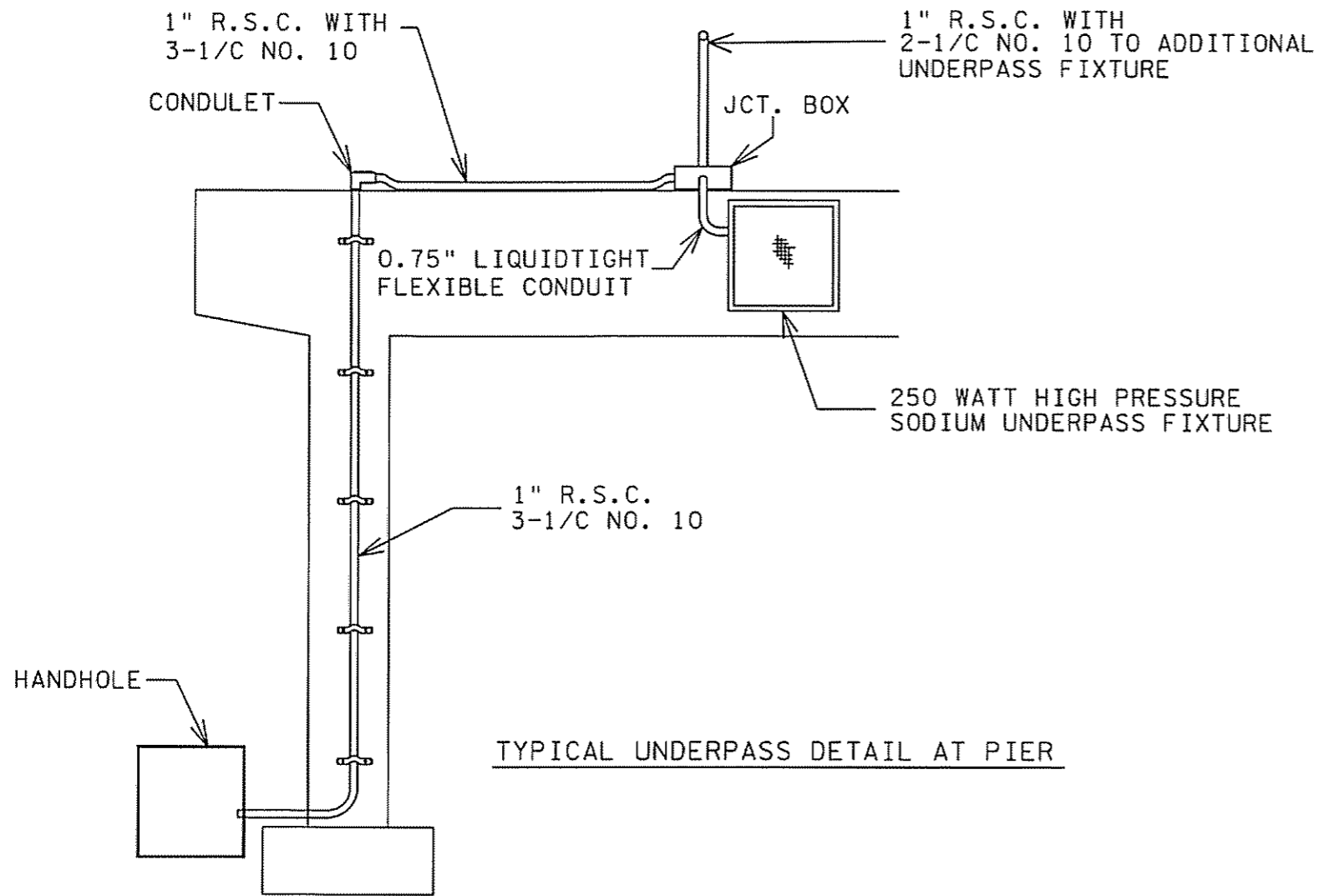
CERTIFIED BY *Michael P. Lubensky* LIC. NO. 19863 DATE: 1/21/09  
LICENSED PROFESSIONAL ENGINEER

**LIGHTING DETAILS**

STATE PROJ. NO. 0215-67 (T.H.10) SHEET NO. 173 OF 222 SHEETS

PLOTTED/REVISED: 1/20/2009

DISTRICT #: METRO  
 IPLOT NAME: 10215-67\_underpass  
 PATH & FILENAME: S:\TRAFFIC\LIGHTING\plans\1010215\0215-67\10215-67\_101-2.dgn



UNDERPASS LIGHTING FIXTURE TYPE L

250 WATT HGH PRESSURE SODIUM LUMINAIRE 240/480 VOLT

LAMPS

EXTENDED LIFE LAMPS REQUIRED

1. THE JUNCTION BOXES SHALL BE 8-1/2" L. X 8-1/2" W. X 4" D. WITH REMOVABLE HUB PLATES AND MOUNTING LUGS
2. FASTEN RIGID STEEL CONDUIT WITH CABLE CLAMPS ABOUT 5'-0" ON CENTER.
3. FASTEN CLAMPS AND JUNCTION BOXES TO CONCRETE WITH MASONRY ANCHORAGES OR POWER ACTIVATED STUDS.

BY	DATE	REVISIONS











DRAWN BY: NS      CKD BY: GB      DATE:     

CERTIFIED BY *Michael P. Lubensky* LIC. NO. 19863 DATE: 1/21/09  
LICENSED PROFESSIONAL ENGINEER

**LIGHTING DETAILS**

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 174 OF 222 SHEETS

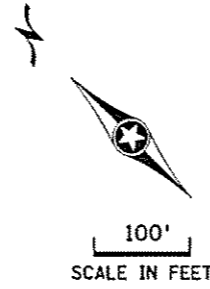
**LEGEND**

-  INPLACE LIGHTING UNIT
-  INPLACE UNDERPASS FIXTURE 250 WATT
-  UNDERPASS FIXTURE 250 WATT
-  HIGH PRESSURE SODIUM LIGHTING UNIT
-  PAD MOUNTED SOURCE OF POWER 240/480 VOLT
-  ARMORED CABLE 4 CONDUCTOR NO. 4
-  INPLACE ARMORED CABLE
-  3" NON-METALLIC CONDUIT (DIRECTIONAL BORE) UNLESS NOTED OTHERWISE
-  HANDHOLE
-  GROUND ROD (25 OHMS OR LESS)

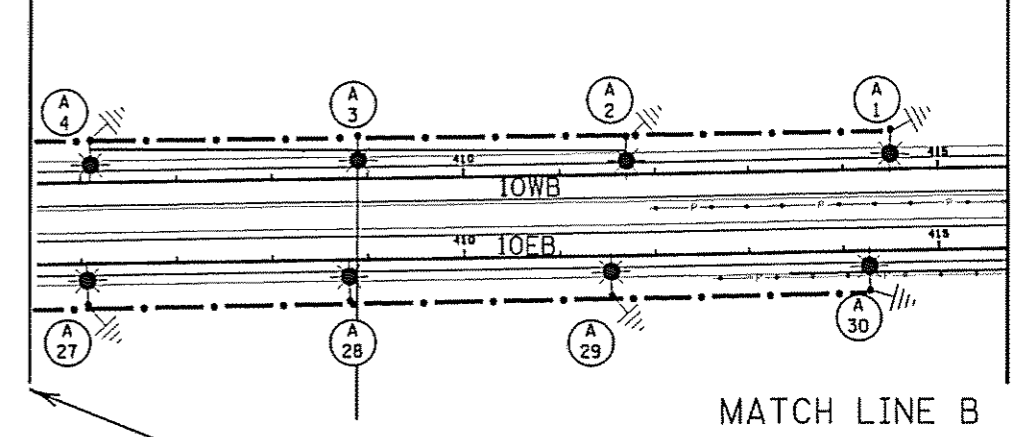
**FEEDPOINT F4A**

**LIGHTING STANDARDS AND BASES**

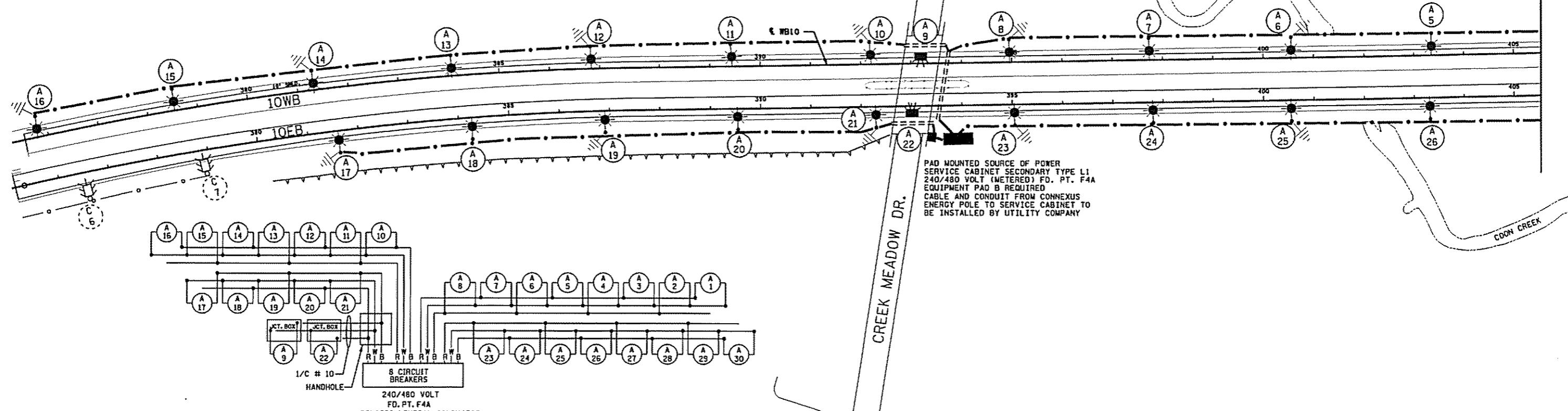
NO.	STA.	LT.	RT.	LOCATION	TYPE	WATTAGE
1	414+50			TH10WB	9-49	400
2	411+70					
3	408+90					
4	406+10					
5	403+35					
6	400+55					
7	397+75					
8	394+95				9-49	400
9	393+20				L	250
10	392+20				9-49	400
11	389+40					
12	386+85					
13	384+10					
14	381+30					
15	378+60					
16	375+80			TH10WB		
17	381+60			TH10EB		
18	384+25					
19	386+90					
20	389+55					
21	392+30				9-49	400
22	393+00				L	250
23	395+05				9-49	400
24	397+80					
25	400+55					
26	403+30					
27	406+20					
28	408+80					
29	411+55					
30	414+25			TH10EB	9-49	400



**MATCH LINE A**



**MATCH LINE A**



**FEEDPOINT F4A**

BY	DATE	REVISIONS	FEEDPOINT: F4A	LOCATION: TH10 & CREEK MEADOW DR.	<b>LIGHTING PLAN</b>
			METER ADDRESS:		
DRAWN BY: NS	CKD BY: GB	DATE:	CERTIFIED BY: <i>Michael P. Gibesky</i>	LIC. NO. 19863	DATE: 1/21/09
			STATE PROJ. NO. 0215-67 (T.H. 10)		SHEET NO. 175 OF 222 SHEETS

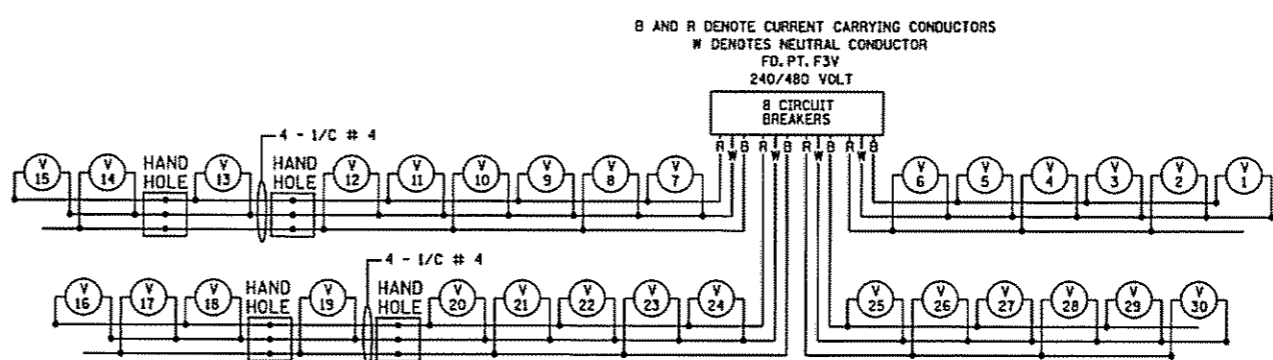
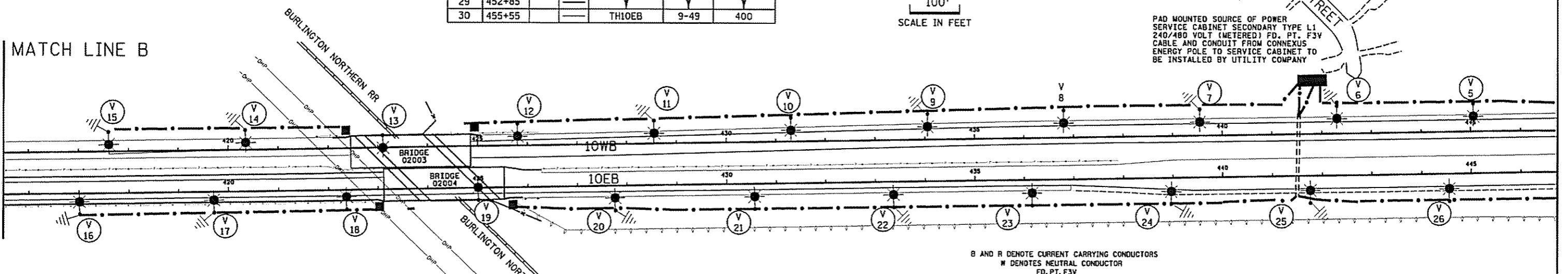
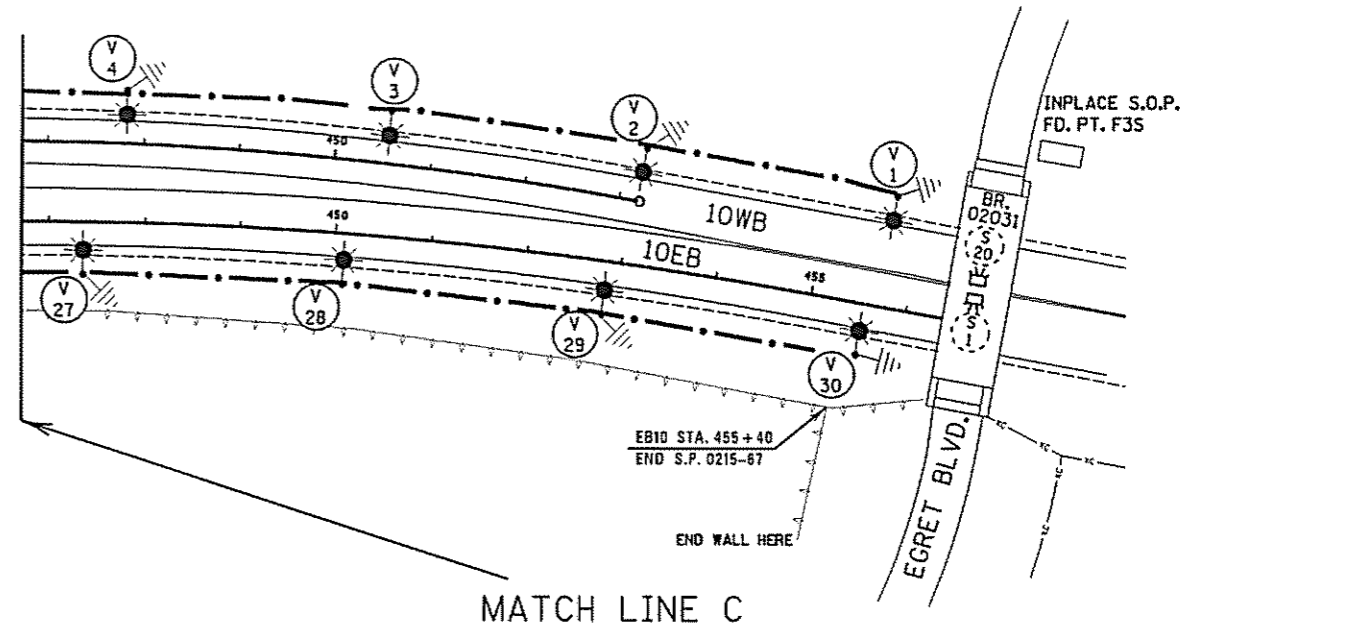
DISTRICT #: METRO  
 PLOT NAME: 10215-67\_101  
 PATH & FILENAME: S:\TRAFFIC\LIGHTING\Plans\010215\0215-67\10215-67\_101-2.ltr.dgn  
 PLOTTED/REVISED: 1/20/2009



SEE LEGEND SHEET 175

FEEDPOINT F3V

LIGHTING STANDARDS AND BASES						
NO.	STA.	LT.	RT.	LOCATION	TYPE	WATTAGE
1	455+70			TH10WB	9-49	400
2	453+20					
3	450+55					
4	447+80					
5	445+05					
6	442+20					
7	439+55					
8	436+80					
9	434+05					
10	431+30					
11	428+55					
12	425+80				9-49	400
13	423+10				6B-40	250
14	420+35				9-49	400
15	417+60			TH10WB		
16	417+00			TH10EB		
17	419+70					
18	422+35				9-49	400
19	425+00				6B-40	250
20	427+75				9-49	400
21	430+55					
22	433+35					
23	436+15					
24	438+95					
25	441+75					
26	444+55					
27	447+35					
28	450+10					
29	452+85					
30	455+55			TH10EB	9-49	400



FEEDPOINT F3V

LIGHTING PLAN

BY	DATE	REVISIONS	FEEDPOINT: F3V	LOCATION: TH10 & OLIVE STREET	
			METER ADDRESS:		
DRAWN BY: NS			CERTIFIED BY: <i>Michael P. Dubinsky</i>		STATE PROJ. NO. 0215-67 (T.H. 10)
CKD BY: GB			LIC. NO. 19863		SHEET NO. 176 OF 222 SHEETS
DATE:			DATE: 11/21/09		

DISTRICT #: METRO  
 IPLOT NAME: 10215-67\_102  
 PATH & FILENAME: S:\TRAFFIC\LIGHTING\Plans\10215-67\10215-67\_102-2.lit.dgn  
 PLOTTED/REVISED: 1/20/2009

# INDEX

SHEET NO.	DESCRIPTION
177	SIGN QUANTITIES
178-180	TABULATIONS
181-187	ROADWAY LAYOUTS
188	SIGN PANEL LAYOUT
189-204	DETAILS
205	X-SECTION

PERMANENT SIGNING TABULATION					
TAB	SHEET NO	ITEM NO	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES
TD	178	2104.509/00180	REMOVE MARKER	EACH	6
TA	178	2104.509/00201	REMOVE SIGN TYPE A	EACH	2
-	-	2104.509/00203	REMOVE SIGN TYPE C	EACH	4
TG	180	2104.509/00208	REMOVE SIGN TYPE OH (BRIDGE MOUNTED)	EACH	1
TI	180	2104.509/00500	REMOVE SIGN PANEL TYPE OH	EACH	1
TF	179	2564.511/00010	CONCRETE FOOTINGS (TYPE OH SPREAD)	CU YD	11.3
TF	179	2564.522/00122	STRUCT STEEL-POSTS FOR OH SIGNS (B)	POUND	4448
TF	179	2564.522/00222	STRUCT STEEL-TRUSSES FOR OH SIGNS (B)	POUND	3998
TJ	180	2564.522/00225	STR STEEL-TRUSSES FOR OH SIGNS BR MTD	POUND	510
TF-TK	179	2564.522/00522	STR STEEL-PANEL MT PST FOR OH SIGNS (B)	POUND	372
TB	178	2564.531/00130	SIGN PANELS TYPE C	SQ FT	78
TC	178	2564.531/00189	SIGN PANELS TYPE OVERLAY	SQ FT	27
TH	180	2564.531/00190	SIGN PANELS TYPE OH	SQ FT	512
TE	178	2564.551/00010	REFERENCE POST MARKER	EACH	2

I HEREBY CERTIFY THAT SHEETS 177-205 WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: SHEILA M. JOHNSON LICENSE # 26804  
 DATE: 2/6/2009 SIGNATURE: *Sheila M. Johnson*  
 DESIGN SQUAD LONNY CARPENTER

## SIGN QUANTITIES

PLOTTED/REVISED: 2/6/2009

TA		REMOVE SIGN TYPE A					
SIGN NO	LOCATION	PANEL SIZE		POSTS			
		EXTRUDED TYPE	FLAT SHEET	SIZE		L1	L2
				BREAK-AWAY	NON BREAK-AWAY		
INCH		FEET		FEET			
A-101	375+00 WB	186 x 120	x	W 6 x 20	x	19.5	17.5
A-102	404+15 WB	186 x 102	x	W 8 x 24	x	14.0	15.0

TD		REMOVE DELINEATORS & MARKERS	
CODE NO	QTY	LOCATION	
X4-4L	1	BRIDGE APPROACH	
X4-4R	1	BRIDGE APPROACH	
X4-4L	1	BRIDGE APPROACH	
X4-4R	1	BRIDGE APPROACH	
D10-3	2	REF.PT 230	
<b>TOTAL</b>	<b>6</b>		

TB		SIGN PANELS TYPE C								
SIGN NO	QTY	POSTS			MTG HT (1)	PANEL			CODE NO	PANEL LEGEND
		NO & TYPE	KNEE BRACES QTY	LEN FEET		SIZE INCH	AREA SQ FT	TOTAL AREA SQ FT		
C-1	1	1U	1	15	7	24 x 12	2.00	2.00	M3-2m	EAST
							36 x 36	9.00	9.00	M1-4
C-2	1	1U		15	7	24 x 12	2.00	2.00	M3-3m	SOUTH
						36 x 36	9.00	9.00	M1-5a	TH 47
C-3	2	2U	1	16	7	48 x 60	20.00	40.00	R2-1	65
C-4	1	2U	1	15	7	48 x 48	16.00	16.00	W4-3R	ADDED LANE
<b>TOTAL</b>								<b>78.00</b>		

TE		REFERENCE POST MARKER (1)(2)		
CODE NO	QTY	SIZE		LEGEND
		INCH		
D10-2	2	12	48	MILE 230
<b>TOTAL</b>	<b>2</b>			

**SPECIFIC NOTES:**

- (1) MOUNTING HEIGHT IS MINIMUM. SEE SHEET NO. 192 FOR TYPICAL MOUNTING.
- (2) FOR PUNCHING AND MOUNTING DETAILS, SEE SHEET NO. 193.

**SPECIFIC NOTES:**

- (1) SEE STANDARD SIGNS MANUAL FOR REFERENCE POST MARKER.
- (2) ATTACH TO 3 LB POST (MNDOT 3401).

**GENERAL NOTES:**

- 1. POST LENGTHS ARE APPROXIMATE AND INCLUDE EMBEDMENT, BUT DO NOT INCLUDE ADDITIONAL LENGTH REQUIRED FOR SPLICE.
- 2. SEE SHEETS 191 TO 193 FOR STRUCTURAL DETAILS.
- 3. SEE STANDARD SIGNS MANUAL FOR PUNCHING CODE AND DETAILED DRAWINGS OF TYPE C SIGN PANELS.

**GENERAL NOTES:**

- 1. SEE ROADWAY LAYOUTS FOR DELINEATOR AND MARKER LOCATIONS.
- 2. FOR DELINEATOR AND MARKER PLACEMENT DETAIL, SEE SHEET 190.

TC		SIGN PANELS TYPE OVERLAY				
CODE NO.	QUANTITY	SIZE		AREA SQ FT	TOTAL SQ FT	LEGEND
		INCH				
M1-6	3	36	36	9.00	27.00	CSAH 78
<b>TOTAL</b>					<b>27.00</b>	

A SIGN TABULATION  
C SIGN TABULATION  
DELINLEATORS & MARKERS  
OVERLAYS

**SIGNING PLAN**

DRAWN BY: LPC

CHECKED BY:

CERTIFIED BY

*Shula Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 2/6/2009

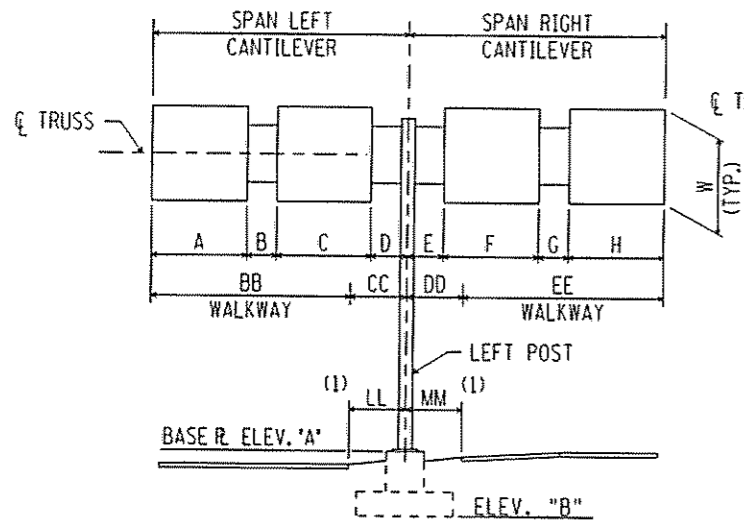
STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 178

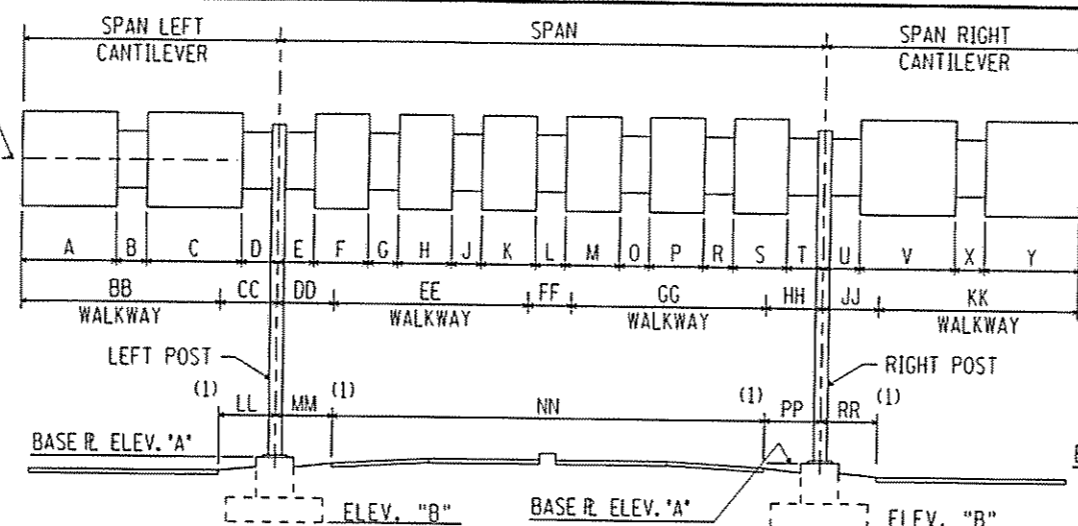
OF 222 SHEETS

DISTRICT: METRO  
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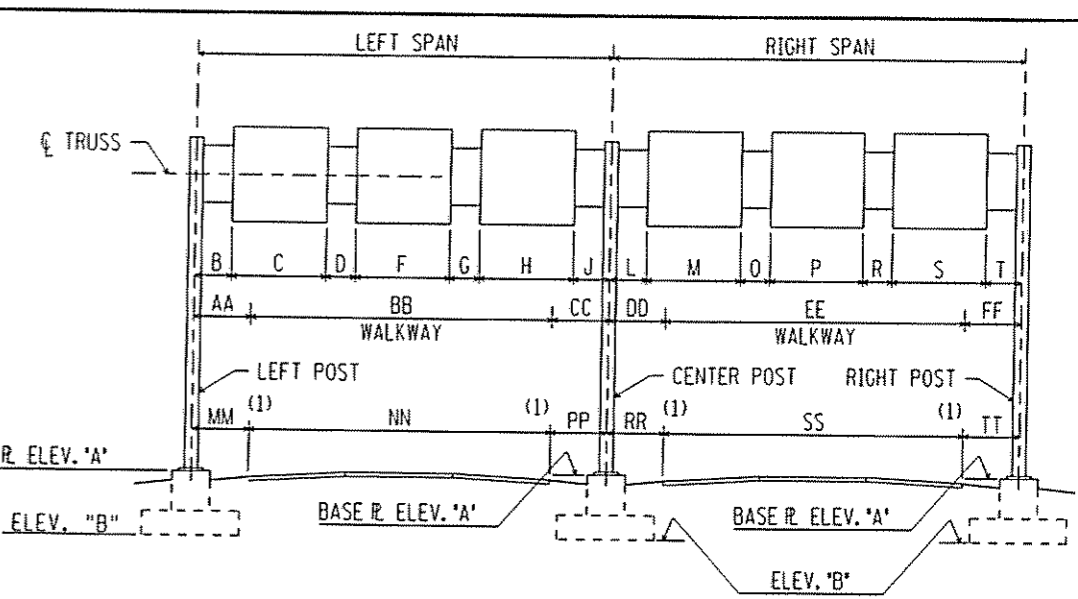
PLOTTED/REVISED: 1/5/2009



**BRIDGE TYPE BC**  
BUTTERFLY AND CANTILEVER SPANS



**BRIDGE TYPE S**  
SIMPLE SPAN WITH CANTILEVERS



**BRIDGE TYPE C**  
CONTINUOUS SPANS

**OVERHEAD SIGN STRUCTURES**

SIGN NO.	STATION	BRIDGE TYPE	TRUSS TYPE	SPAN LENGTHS		LEFT POST		TYPE
				LEFT CANT.	LOW STEEL ELEVATION SEE ST-1	ELEVATION (1)		
						A	B	
OH 90-10	374+00		A	32'-6"	118.67	98.85	92.27	4E

TK PANEL MOUNTING POSTS (W6x12)					
SIGN NO.	TRUSS DEPTH (IN.)	CHORD ANGLES (IN.)	NO. OF POSTS	LENGTH APPROX. (IN.)	WEIGHT (LBS.)
OH 55-10	72	6x6x1/2	3	148	498
<b>TOTAL</b>					<b>498</b>

**TF TABULATION OF OVERHEAD SIGN STRUCTURE QUANTITIES (2)**

SIGN NO.	OH 90-10	TOTALS
STRUCT. STEEL POSTS	LBS 4448	4448
STRUCT. STEEL TRUSSES	LBS 3998	3998
STRUCT. STEEL PANEL MTG. POSTS	LBS 372	372
CONCRETE FOOTINGS (SPREAD)	CU YD 11.3	11.3

**GENERAL NOTES:**

1. THE SUBSCRIPT E ON THE POST TYPE DENOTES THE POST WHICH HAS THE HAND HOLE AND PROVISIONS FOR GROUNDING, I.E. POST TYPE 3E.
2. TABULATED ELEVATIONS AND DIMENSIONS ARE APPROXIMATE ONLY. FABRICATION DEPENDENT ON THESE ELEVATIONS AND DIMENSIONS SHALL NOT BE STARTED UNTIL THE ENGINEER HAS MADE FINAL DETERMINATION OF THEM IN THE FIELD.
3. LEFT AND RIGHT DESIGNATIONS ARE SHOWN LOOKING IN DIRECTION OF TRAFFIC FLOW.
4. SEE SHEET 195 TO 204 FOR DETAILS.
5. SEE SHEET 205 FOR CROSS SECTIONS.

**SPECIFIC NOTES:**

- (1) MEASURED FROM EDGE OF SHOULDER OR FACE OF CURB.
- (2) CENTER LINE ELEVATION = 100.00.
- (3) BASED ON TABULATED ELEVATIONS AND DIMENSIONS. REVISE IF NECESSARY USING QUANTITY TABLES ON ST-2.

OH SIGN TABULATION (DESIGN B)

**SIGNING PLAN**

DRAWN BY: LPC

CHECKED BY:

CERTIFIED BY

*Shirley A. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804 DATE 1/5/2009

STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 179 OF 222 SHEETS

DISTRICT: METRO  
PLOT NAME: 1021567\_jplcals-ps\_OHETABI  
PATH & FILENAME: S:\TRAFFIC\TC Signing\010\021567\PS\021567\_jplcals-ps\_OHE.dgn

PLOTTED/REVISED: 1/5/2009

DISTRICT #: METRO  
 PLOT NAME: 1021567\_ttypicals-ps\_dhtab2  
 PATH & FILENAME: S:\TRAFFIC\Signing\1010021567\PSV021567\_ttypicals-ps\_OHE.dgn

TG REMOVE SIGN TYPE OH					
SIGN NO.	LOCATION	TYPE	POST TYPE	SPAN	REMARKS
58-10	BR# 02031-TH10WB	BRIDGE MOUNTED		11'-0"	SEE SPECIAL PROVISIONS

TH SIGN PANELS TYPE OH SEE SHEET 188 FOR PANELS								
SIGN NO.	LOCATION	PANEL		PANEL		PANEL		TOTAL AREA (SQ. FT.)
		SIZE (IN.)	AREA (SQ. FT.)	SIZE (IN.)	AREA (SQ. FT.)	SIZE (IN.)	AREA (SQ. FT.)	
OH 90-10	374+00 WB	216 x 114	171.00					171.00
OH 91-10	BR 02562	186 x 120	155.00					155.00
OH 55-10	446+50 WB	186 x 144	186.00					186.00
TOTAL								512.00

TI REMOVE SIGN PANEL TYPE OH					
SIGN NO.	LOCATION	PANEL SIZE (IN.)	PANEL SIZE (IN.)	PANEL SIZE (IN.)	TOTAL PANELS
OH 55-10	446+50 TH10 WB	138 x 84			1
TOTAL					1

TJ BRIDGE MOUNTED SIGN TRUSSES		
SIGN NO.	BRIDGE NO.	POUNDS
OH 91-10	02262	510
TOTAL		510

OH SIGN IDENTIFICATION PLATE		
SIGN NO.	LOCATION	IDENTIFICATION PLATE NO.
(1) OH 90-10	374+00 WB	90-10
(2) OH 91-10	BRIDGE MOUNTED	90-11

**SPECIFIC NOTES:**

- (1) PAID FOR UNDER STRUCTURAL STEEL- POSTS FOR OH SIGNS (DESIGN B).
- (2) PAID FOR UNDER STRUCTURAL STEEL- TRUSSES FOR SIGNS (BRIDGE MOUNTED).

OH SIGN TABULATION

**SIGNING PLAN**

DRAWN BY: LPC

CHECKED BY:

CERTIFIED BY

*Shirley A. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/5/2009

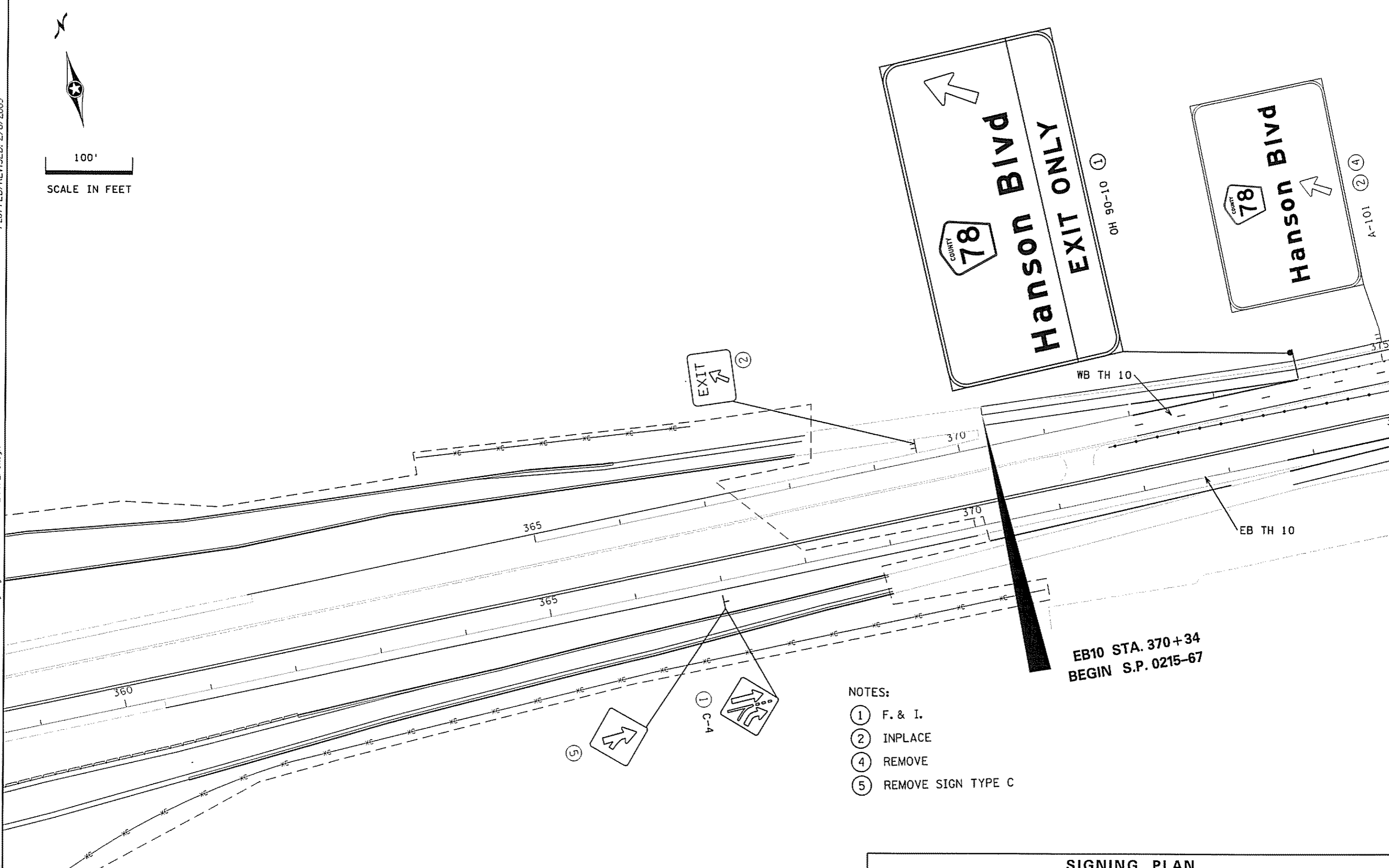
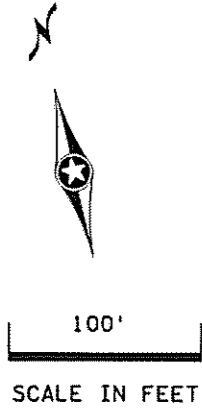
STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 180

OF 222 SHEETS

PLOTTED/REVISED: 2/6/2009

DISTRICT #: METRO  
PLOT NAME: 1021567\_P5ISHI  
PATH & FILENAME: SATRAFFICTC Signing\010\021567\PSV021567\_P5I.dgn



EB10 STA. 370+34  
BEGIN S.P. 0215-67

NOTES:

- ① F. & I.
- ② INPLACE
- ④ REMOVE
- ⑤ REMOVE SIGN TYPE C

DRAWN BY: LPC

CHECKED BY:

CERTIFIED BY

*Richard J. ...*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 2/6/2009

SIGNING PLAN

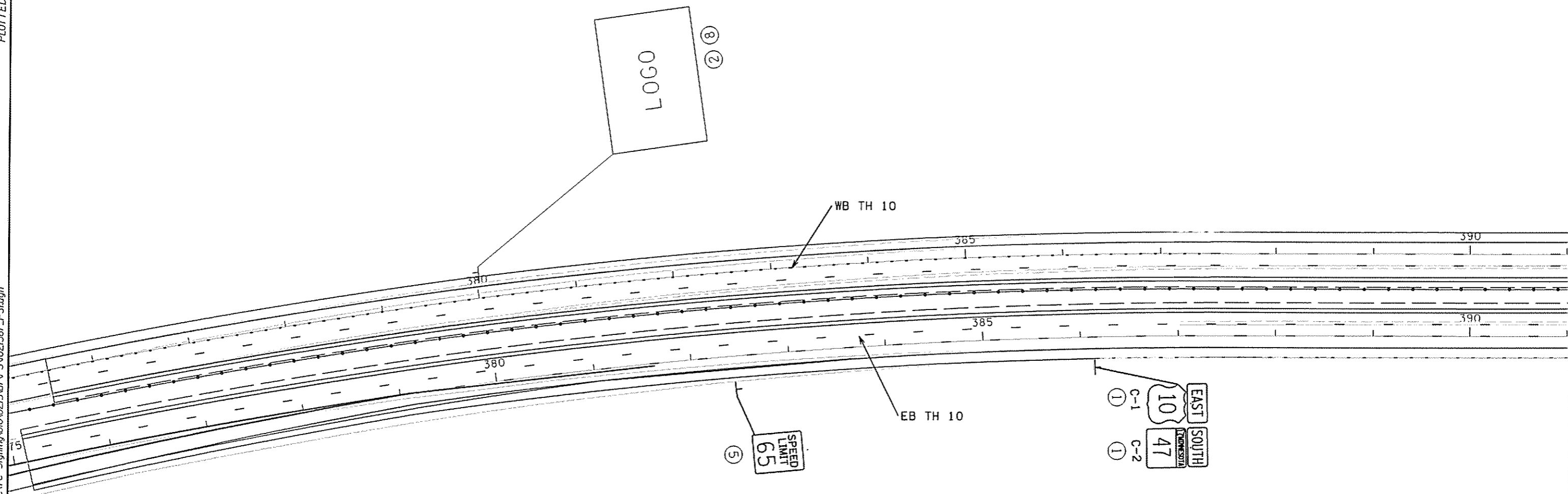
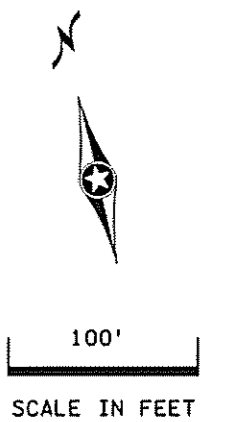
STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 181

OF 222 SHEETS

PLOTTED/REVISED: 2/6/2009

DISTRICT #: METRO  
I/PLOT NAME: 1021567\_P5ISH2  
PATH & FILENAME: S:\TRAFFIC\TC Signing\01021567\PSV\021567\_P5I.dgn



NOTES:

- (1) F. & I.
- (2) INPLACE
- (5) REMOVE SIGN TYPE C
- (8) SALVAGE BY OTHERS SEE SPECIAL PROVISIONS

DRAWN BY: LPC

CHECKED BY:

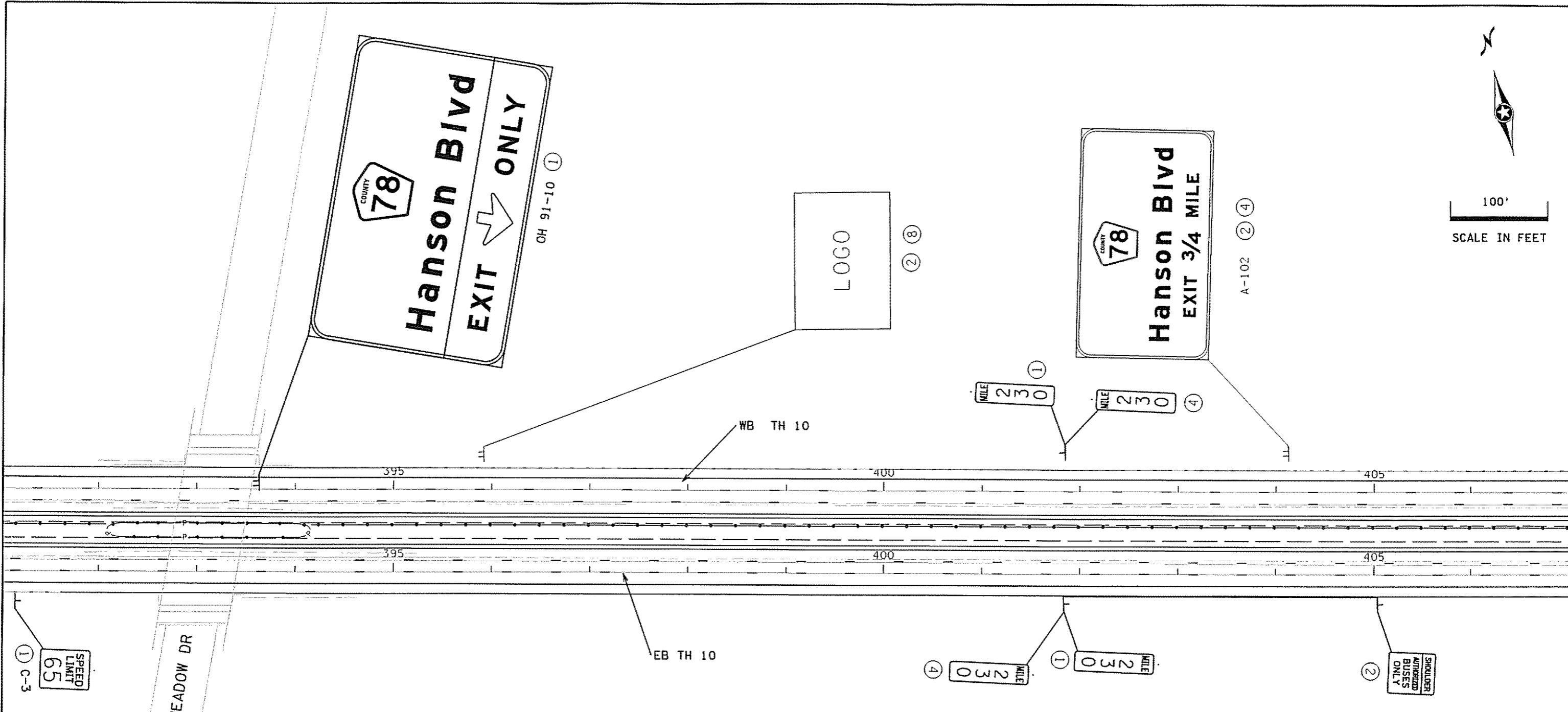
CERTIFIED BY *Shirley Hester* LIC. NO. 26804 DATE 2/6/2009

**SIGNING PLAN**

STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 182 OF 222 SHEETS

PLOTTED/REVISED: 2/6/2009

DISTRICT #: METRO  
I/PLOT NAME: 1021567\_P/S15H3  
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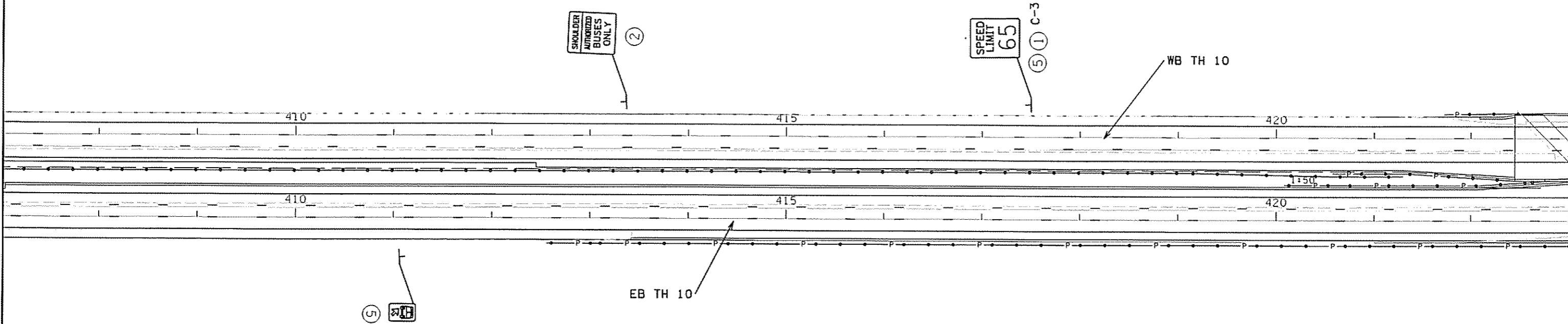
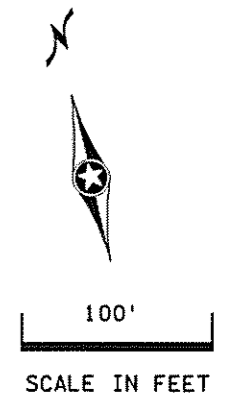


- NOTES:
- ① F. & I.
  - ② INPLACE
  - ④ REMOVE
  - ⑧ SALVAGE BY OTHERS SEE SPECIAL PROVISIONS



PLOTTED/REVISED: 2/6/2009

DISTRICT #: METRO  
I/PLOT NAME: 1021567\_P/S15H4  
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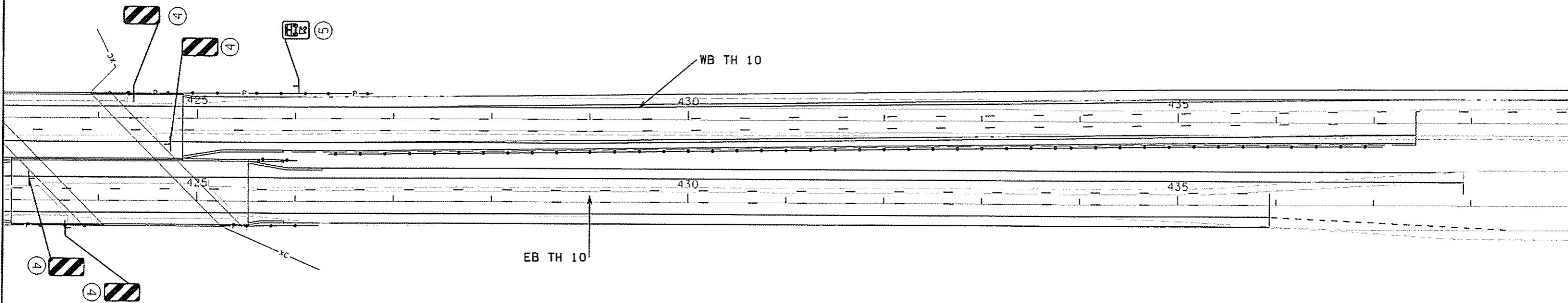
- NOTES:
- ① F. & I.
  - ② INPLACE
  - ⑤ REMOVE SIGN TYPE C

PLOTTED/REVISED: 2/6/2009



100'

SCALE IN FEET



NOTE:

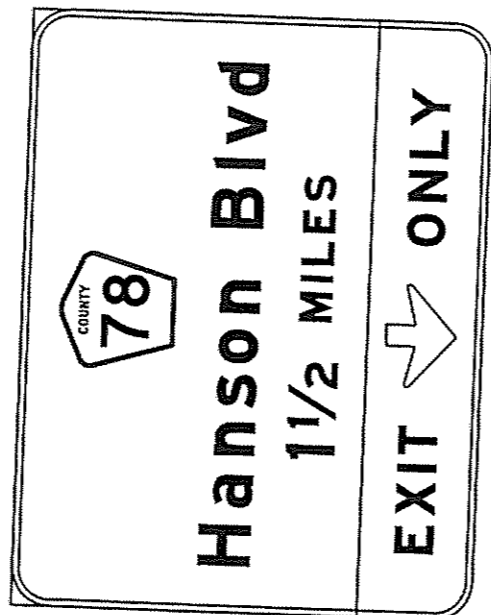
- ④ REMOVE
- ⑤ REMOVE SIGN TYPE C

DISTRICT #: METRO  
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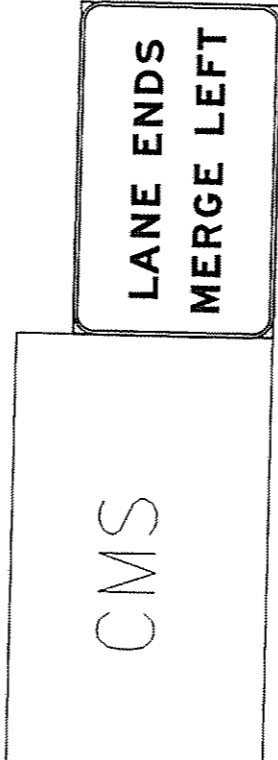
<b>DRAWN BY:</b> LPC	<b>CHECKED BY:</b>	<b>CERTIFIED BY:</b> <small>LICENSED PROFESSIONAL ENGINEER</small>	<b>LIC. NO.:</b> 26804	<b>DATE:</b> 2/6/2009	<b>SIGNING PLAN</b>
					<b>STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 185 OF 222 SHEETS</b>

PLOTTED/REVISED: 2/6/2009

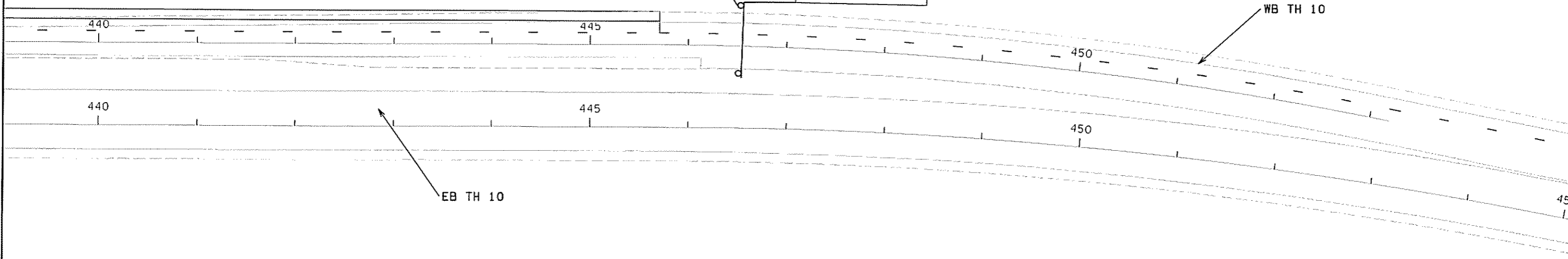
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I/PLOT NAME: 1021567\_PSISH6  
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OH 55-10 (6)



OH 55-10 (7)



NOTE:

- (6) F & I SIGN PANEL & PANEL MOUNTING POSTS
- (7) REMOVE SIGN PANEL & PANEL MOUNTING POSTS

SIGNING PLAN

DRAWN BY: LPC

CHECKED BY:

CERTIFIED BY

*Richard J. ...*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 2/6/2009

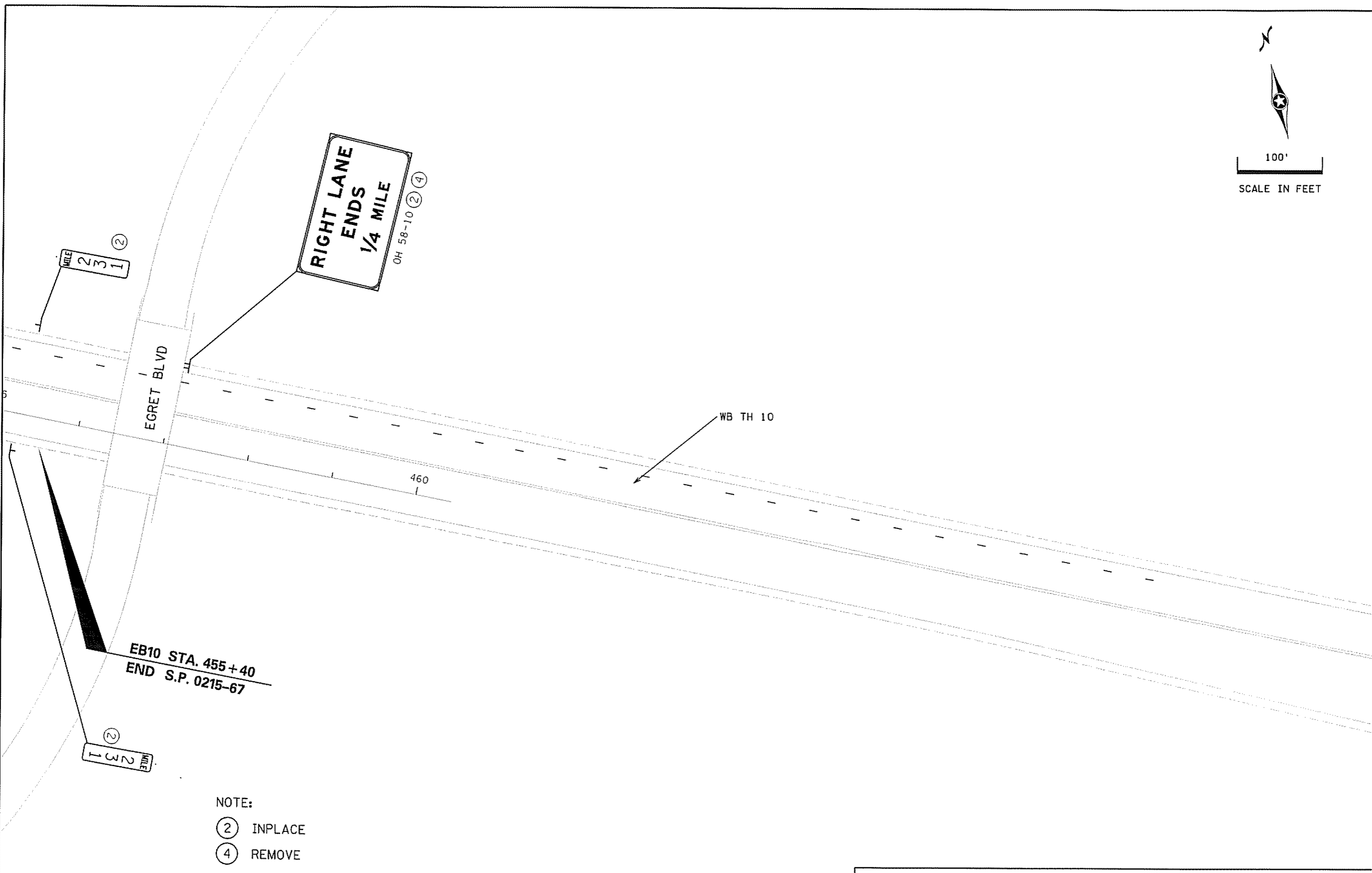
STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 186

OF 222 SHEETS

PLOTTED/REVISED: 2/6/2009

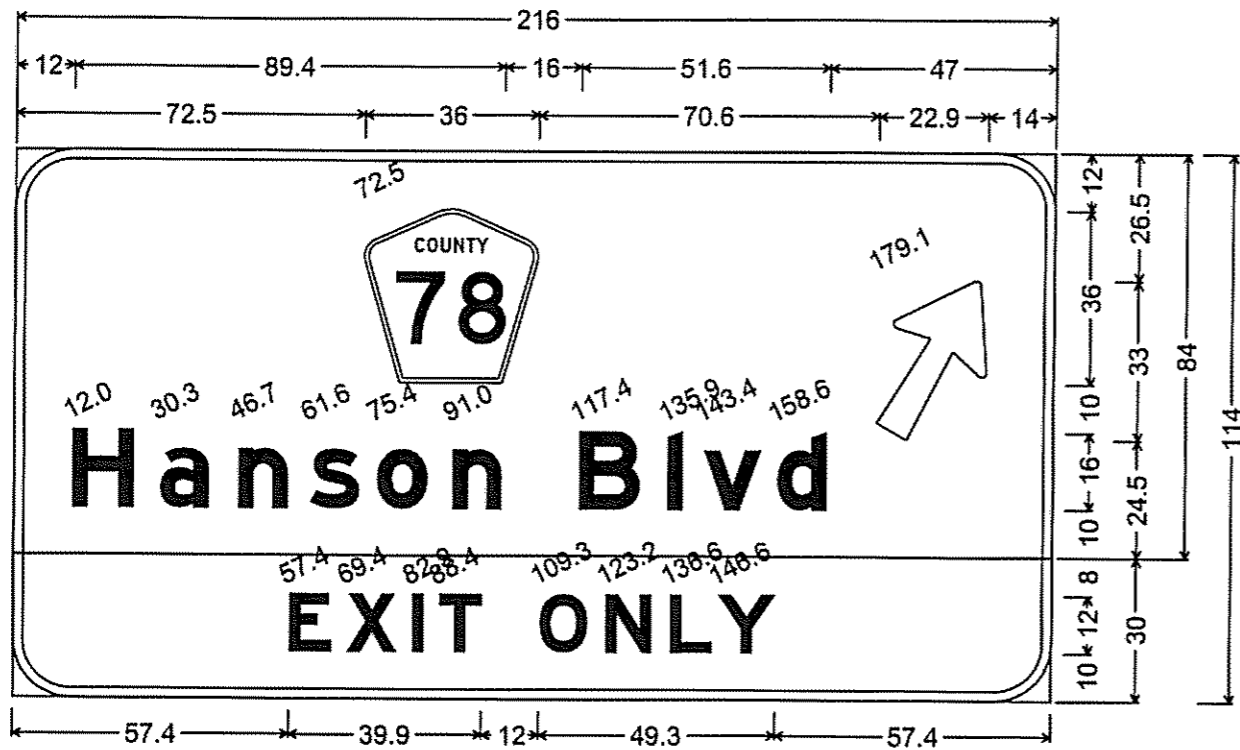
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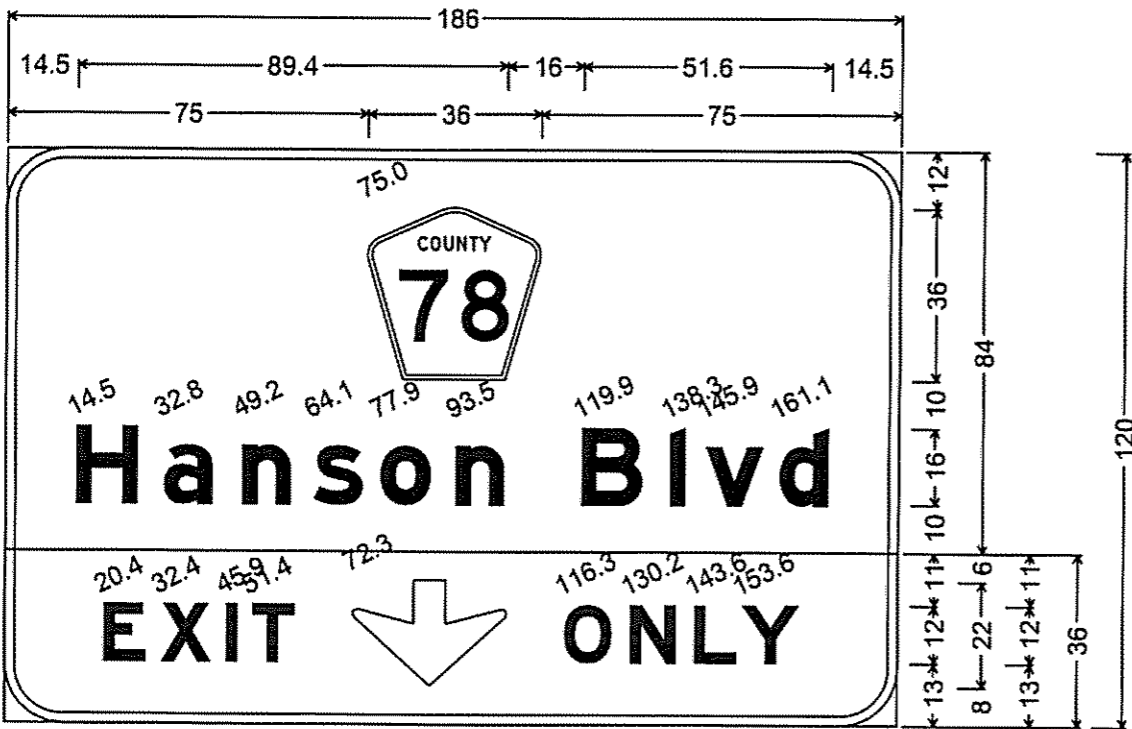
NOTE:  
② INPLACE  
④ REMOVE

PLOTTED/REVISED: 1/5/2009

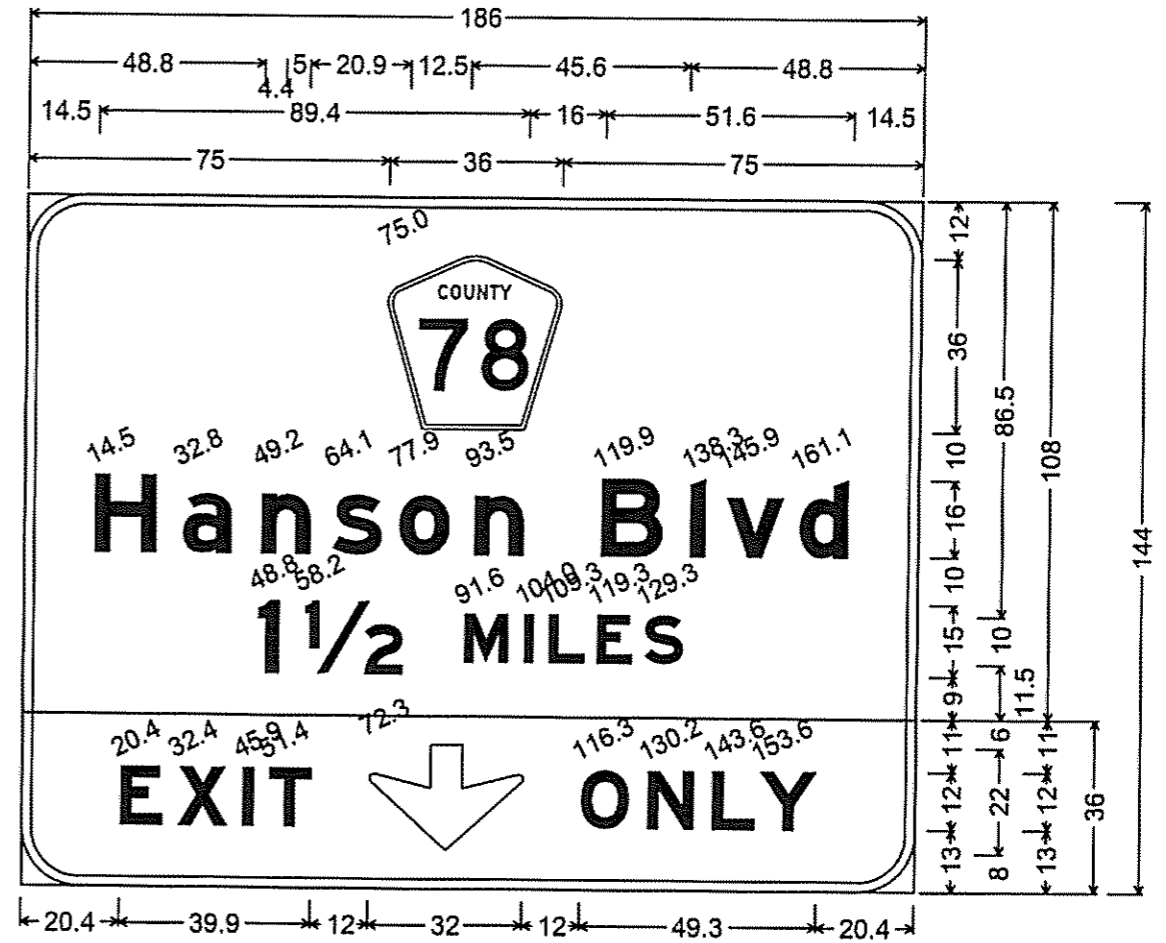
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PLOT NAME: 1021567\_jplcals-ps\_OHEchpanels  
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OH 90-10; 12.0" Radius, 2.0" Border, White on Green;  
 [Hanson Blvd] E Mod; Arrow 17 - 36.0" 60°;  
 12.0" Radius, 2.0" Border, White on Yellow;  
 [EXIT ONLY] Black E Mod;



OH 91-10; 12.0" Radius, 2.0" Border, White on Green;  
 [Hanson Blvd] E Mod;  
 12.0" Radius, 2.0" Border, White on Yellow;  
 [EXIT] Black E Mod; Down Arrow 22.0" 270° Black;  
 [ONLY] Black E Mod;



OH-55-10; 12.0" Radius, 2.0" Border, White on Green;  
 [Hanson Blvd] E Mod; [1 1/2 MILES] E Mod;  
 12.0" Radius, 2.0" Border, White on Yellow;  
 [EXIT] Black E Mod; Down Arrow 22.0" 270° Black;  
 [ONLY] Black E Mod;

NOTES:

1. CORNERS OF THE SIGN PANELS EXTENDING BEYOND THE BORDER SHALL NOT BE TRIMMED.
2. SEE STANDARD SIGNS MANUAL FOR ARROW, FRACTION AND OVERLAY DETAILS.

TYPE OH SIGN PANELS

SIGNING PLAN

DRAWN BY: LPC

CHECKED BY:

CERTIFIED BY

*Shirley A. Johnson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/5/2009

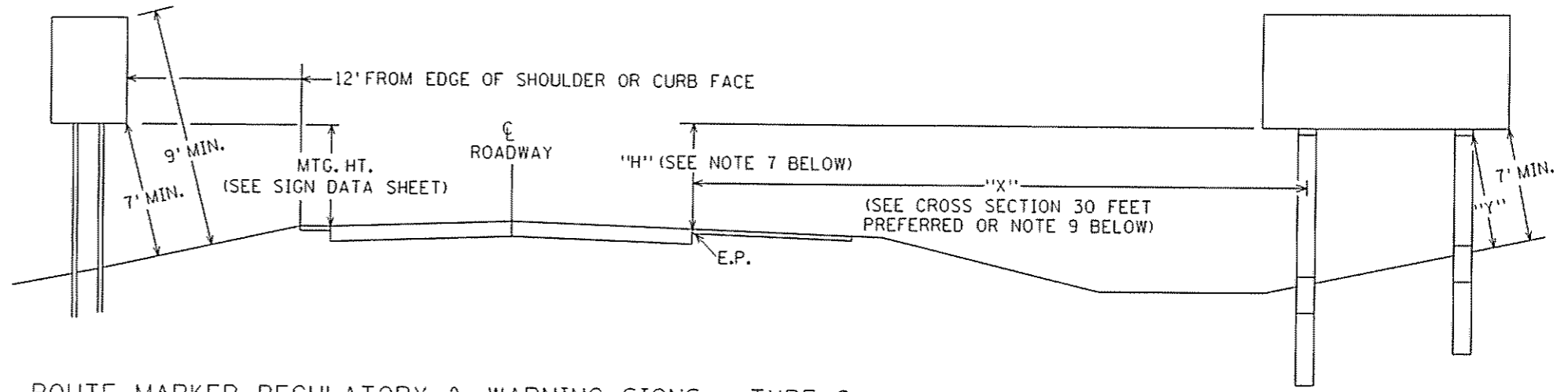
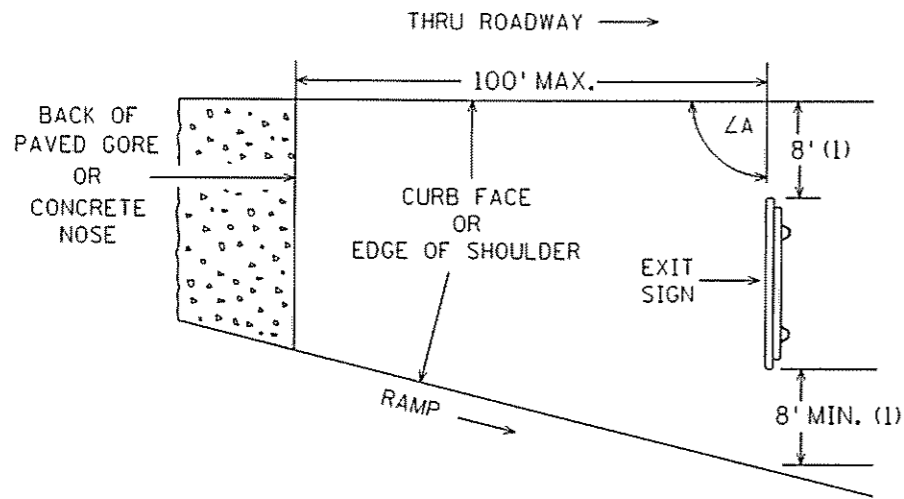
STATE PROJ. NO. 0215-67 (TH 10)

SHEET NO. 188

OF 222 SHEETS

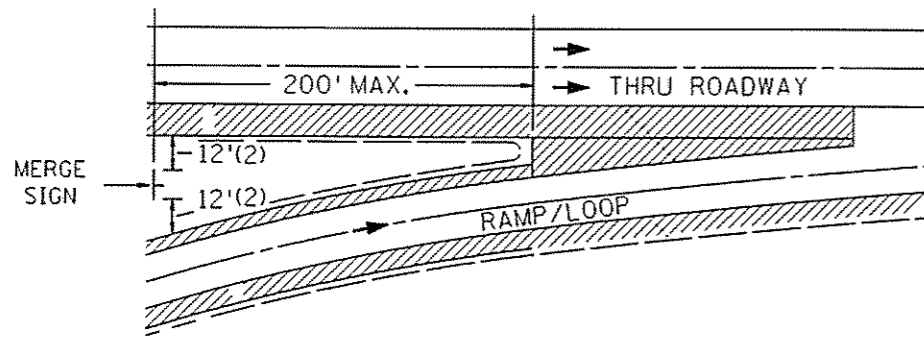
GORE PLACEMENT

ROADSIDE PLACEMENT



ROUTE MARKER, REGULATORY & WARNING SIGNS - TYPE C  
MINOR GUIDE SIGNS - TYPE D

MAJOR GUIDE SIGN - TYPE A



NOTES:

1. IF A SECONDARY SIGN IS MOUNTED BELOW A MAJOR SIGN, THE MAJOR SIGN SHALL BE AT LEAST 8' ABOVE THE PAVEMENT EDGE AND THE SECONDARY SIGN AT LEAST 5'.
2. ALL ROUTE MARKERS, WARNING AND REGULATORY SIGNS SHALL BE AT LEAST 7' ABOVE PAVEMENT EDGE.
3. SIGN FACES SHALL BE VERTICAL.
4. OVERHEAD SIGNS SHALL BE POSITIONED AT RIGHT ANGLES TO THE THRU ROADWAY UNLESS OTHERWISE NOTED.
5. TO AVOID SPECULAR GLARE,  $\Delta A$  SHALL BE APPROXIMATELY  $93^\circ$  FOR SIGNS LOCATED LESS THAN 30' FROM THE EDGE OF PAVEMENT AND APPROXIMATELY  $92^\circ$  FOR SIGNS LOCATED 30' OR MORE FROM EDGE OF PAVEMENT. THIS APPLIES TO SIGNS TYPE A, C, & D AND INCLUDES SIGNS IN THE GORE.
6. "Y" IS THE PERPENDICULAR DISTANCE FROM THE GROUND LINE TO THE FRICTION FUSE ON THE POST. THIS DISTANCE SHALL BE AT LEAST 7'.
7. WHERE "X" IS LESS THAN 30', "H" SHALL BE  $7' \pm 6"$ . WHERE "X" IS 30' OR GREATER, MINIMUM AND PREFERRED "H" IS 5'.
8. LATERAL CLEARANCES GIVEN APPLY TO RIGHT AND OR LEFT SIDE INSTALLATION.
9. WHEN A TYPE A SIGN IS INSTALLED DIRECTLY BEHIND TRAFFIC BARRIER, THE LEFT EDGE OF THE SIGN PANEL SHALL BE LOCATED A MINIMUM OF 4 FEET BEHIND THE FACE OF THE TRAFFIC BARRIER.

SPECIFIC NOTES:

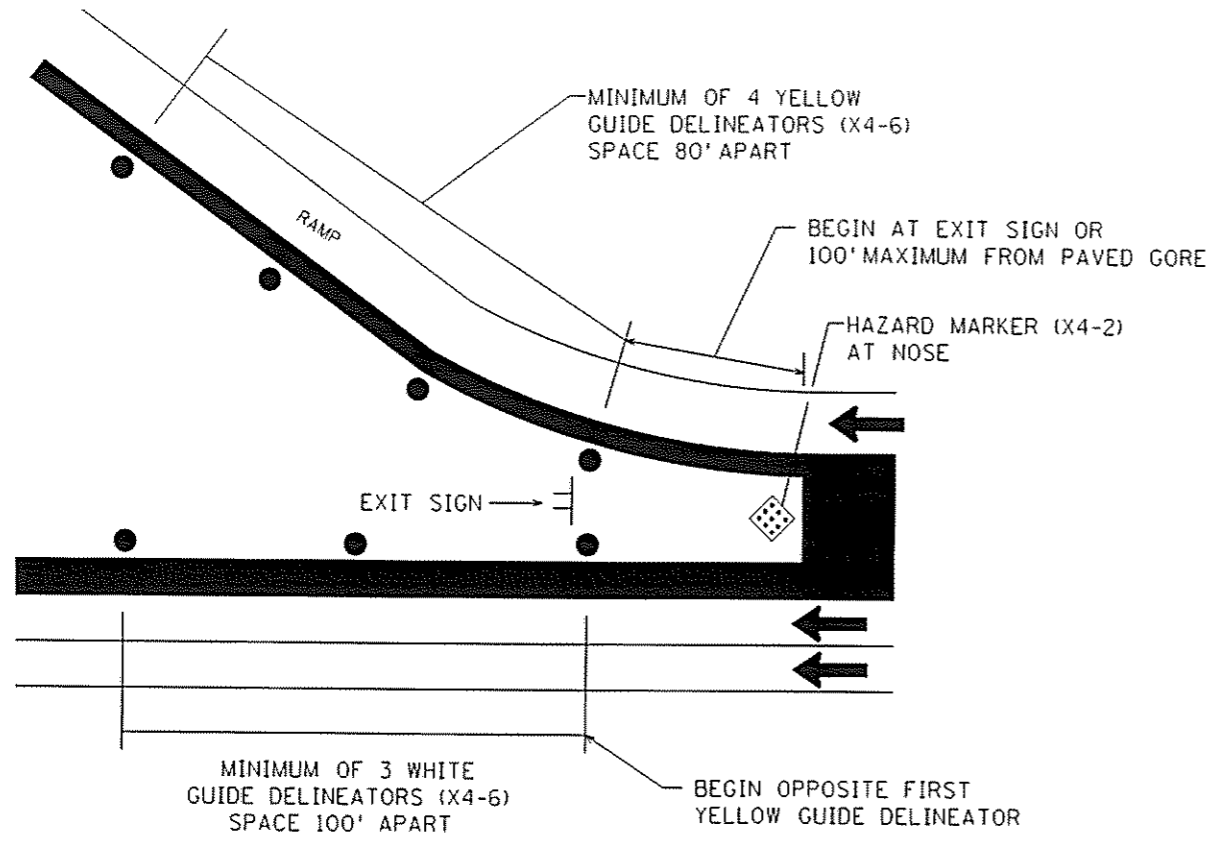
- (1) EXIT SIGNS  
IF THESE OFFSETS CANNOT BE ATTAINED WITHIN 100 FEET OF THE PAVED GORE, A 4 FOOT OFFSET IS ACCEPTABLE. IF THE 4 FOOT OFFSETS CANNOT BE ATTAINED WITHIN 100 FEET OF THE PAVED GORE, CONTACT THE PROJECT ENGINEER WHO WILL CONSULT WITH THE STATE SIGNING ENGINEER.
- (2) MERGE SIGNS  
IF THESE OFFSETS CANNOT BE ATTAINED WITHIN 200 FEET OF THE PAVED GORE, A 4 FOOT OFFSET IS ACCEPTABLE. IF THE 4 FOOT OFFSETS CANNOT BE ATTAINED WITHIN 200 FEET OF THE PAVED GORE, CONTACT THE PROJECT ENGINEER WHO WILL CONSULT WITH THE STATE SIGNING ENGINEER.

SIGN PLACEMENT

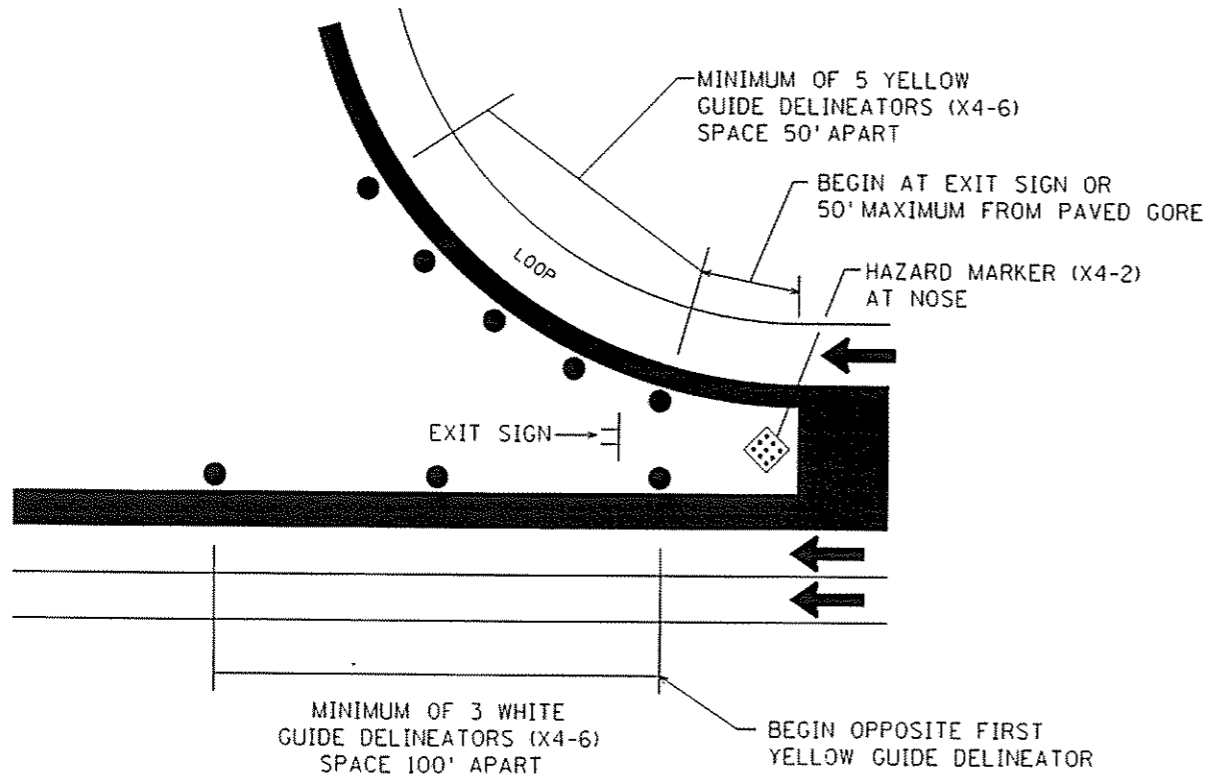
SIGNING PLAN

PLOTTED/REVISED: 1/5/2009

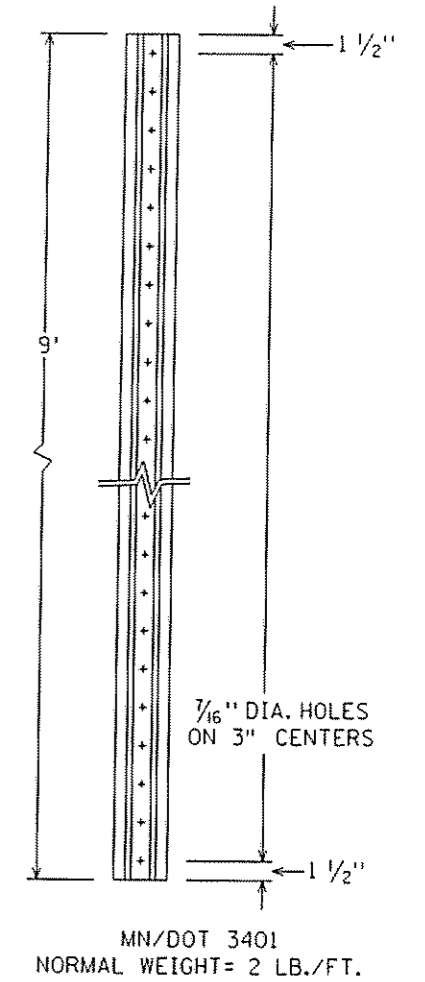
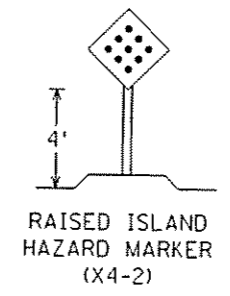
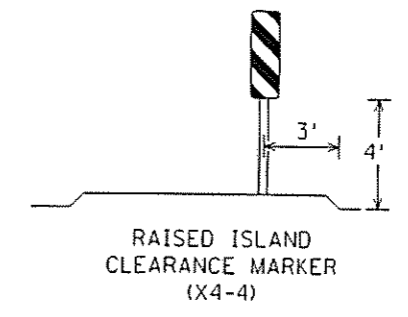
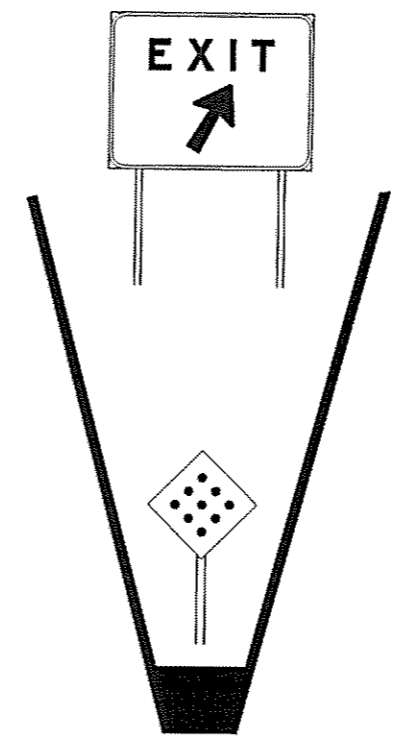
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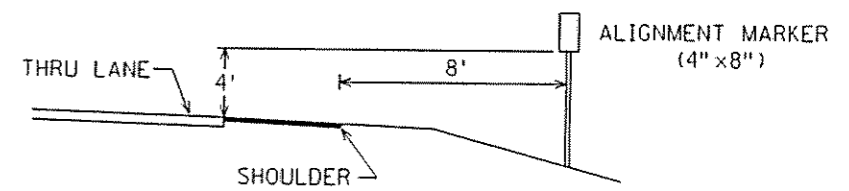
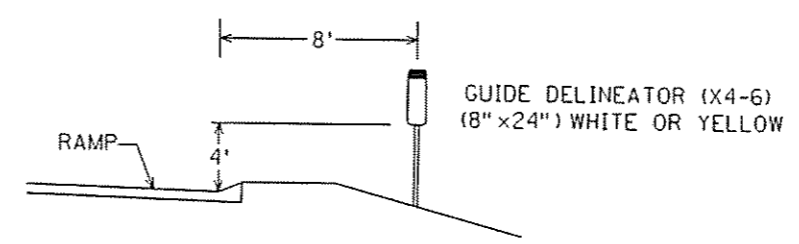
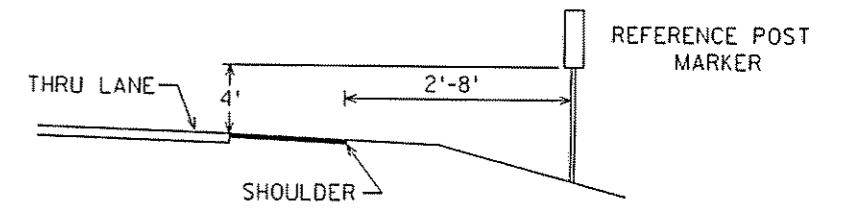
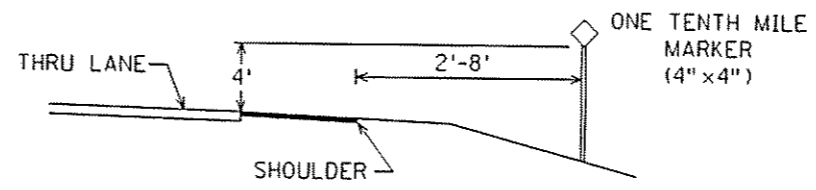
PLAN A  
RAMP DELINEATION



PLAN B  
LOOP DELINEATION



DELINEATOR POST



TYPICAL PLACEMENT

DELINEATORS AND MARKERS

SIGNING PLAN

REVISED: 8-5-08

CERTIFIED BY *Shirley A. Johnson*  
LICENSED PROFESSIONAL ENGINEER

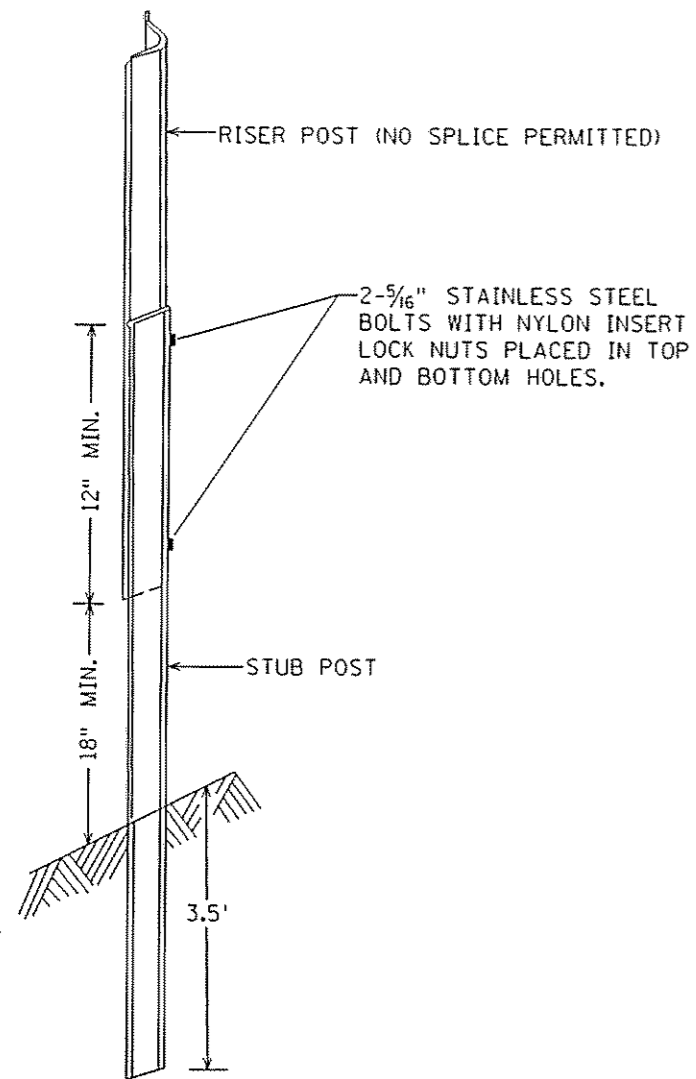
LIC. NO. 26804 DATE 1/5/2009

STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 190 OF 222 SHEETS

PLOTTED/REVISED: 1/5/2009

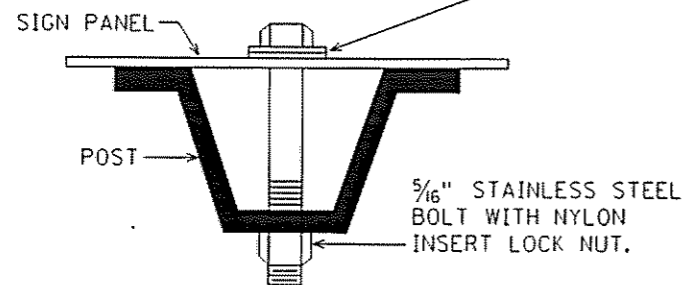
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### TYPE C & D POST

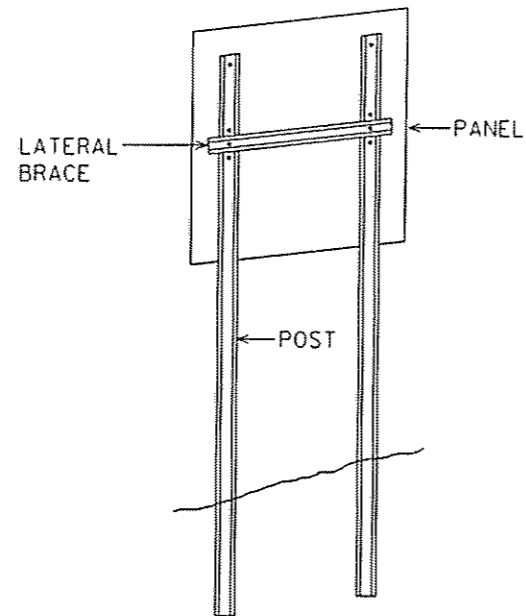


U POST SPLICE

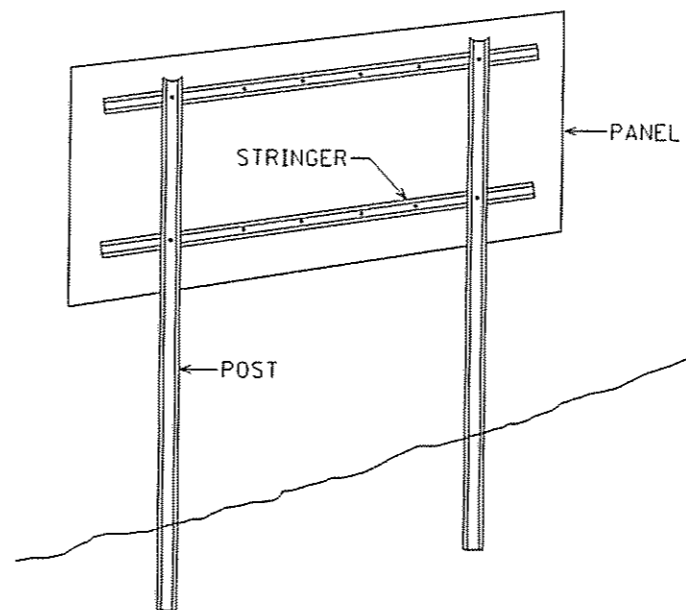
STAINLESS STEEL WASHER AND NYLON WASHER  
(T=1/32" MIN., I.D.=3/8" MAX., O.D.=3/8" MAX.)



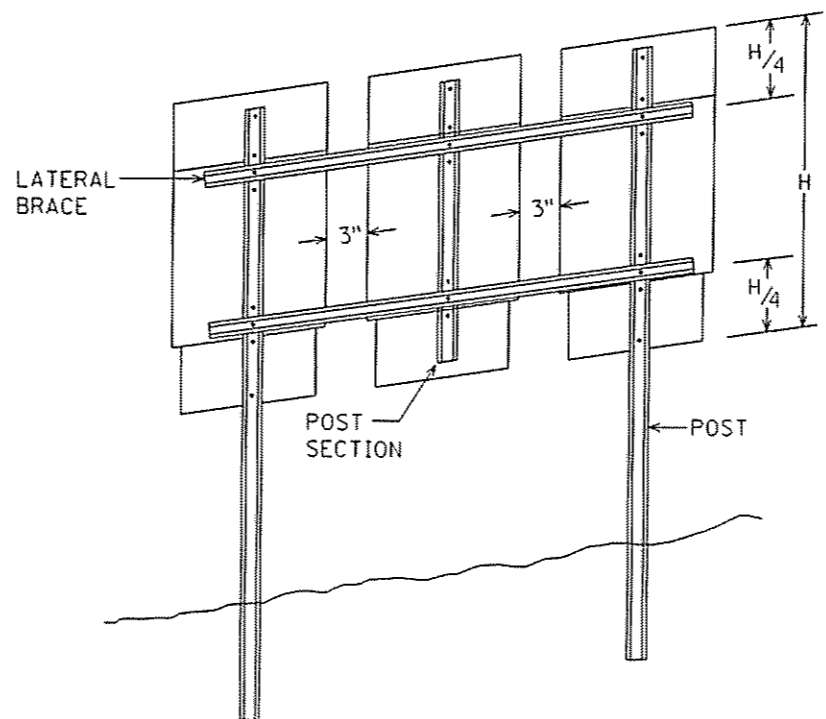
U POST MOUNTING  
TYPE C SIGNS



TYPICAL TYPE C INSTALLATION



TYPICAL TYPE D INSTALLATION



MODIFIED TYPE C INSTALLATION

### NOTES:

1. USE 3 LB/FT STUB POSTS, RISER POSTS, STRINGERS, KNEE BRACES, LATERAL BRACES AND KNEE BRACE STUB POSTS. ALL SHALL CONFORM TO MN/DOT 3401.
2. FOR TYPE D SIGN POSTS LENGTHS AND SPACINGS, SEE SIGN DATA SHEET.
3. TYPE D SIGN PANELS SHALL BE BOLTED TO STRINGERS AT 24" MAXIMUM INTERVALS IN ACCORDANCE WITH THE TYPE D STRINGER AND PANEL-JOINT DETAIL (SEE STANDARD SIGNS MANUAL).
4. MOUNTING (PUNCH CODE) FOR TYPE C SIGN PANELS SHALL BE AS INDICATED IN THE STANDARD SIGNS MANUAL UNLESS OTHERWISE SPECIFIED.
5. ALL RISER (VERTICAL) U POSTS SHALL BE SPLICED. DRIVEN STUB POSTS SHALL BE AT LEAST 7' LONG.
6. USE STAINLESS STEEL 5/16" BOLTS, WASHERS AND NYLON INSERT LOCK NUTS AS SHOWN FOR ALL GROUND MOUNTED AND OVERHEAD MOUNTED SIGNS.
7. STAINLESS STEEL WASHER WITH SAME DIMENSIONS SHALL BE PROVIDED BETWEEN ALL NYLON WASHERS AND BOLT HEADS.
8. BRACING STUBS SHALL BE NO MORE THAN 4" ABOVE GROUND AND EMBEDDED AT LEAST 3 1/2'.
9. A-FRAME BRACKET SHALL BE STEEL CONFORMING TO MN/DOT 3306 AND GALVANIZED IN ACCORDANCE WITH MN/DOT 3394.
10. COLLARS SHALL BE USED TO SHIM OVERLAYS AND DEMOUNTABLE LEGEND AWAY FROM PANEL WHERE INTERFERENCE WITH BOLT HEADS IS ENCOUNTERED. MN/DOT 3352.2A5.
11. 2 POST TYPE C SIGNS SHALL BE REINFORCED WITH AT LEAST ONE LATERAL BRACE. INSTALLATIONS WHERE THE TOTAL PANEL HEIGHT IS 60" OR MORE SHALL HAVE TWO LATERAL BRACES LOCATED APPROXIMATELY AT THE QUARTER POINTS.
12. WHERE 2 SINGLE POST TYPE C SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED Laterally BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND LOCATED APPROXIMATELY AT THE QUARTER POINTS.
13. WHERE 3 OR MORE TYPE C SIGNS ARE INSTALLED SIDE BY SIDE, THEY SHALL BE REINFORCED Laterally BY AT LEAST 2 BRACES, BOLTED AT EACH POST AND POST SECTION AND LOCATED APPROXIMATELY AT THE QUARTER POINTS AS SHOWN IN MODIFIED TYPE C INSTALLATION.

TYPE C & D SIGN  
STRUCTURAL DETAILS  
SHEET 1 OF 3

### SIGNING PLAN

REVISED: 8-5-08

CERTIFIED BY

*Shula H. Huson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

DATE 1/5/2009

STATE PROJ. NO. 0215-67 (TH 10)

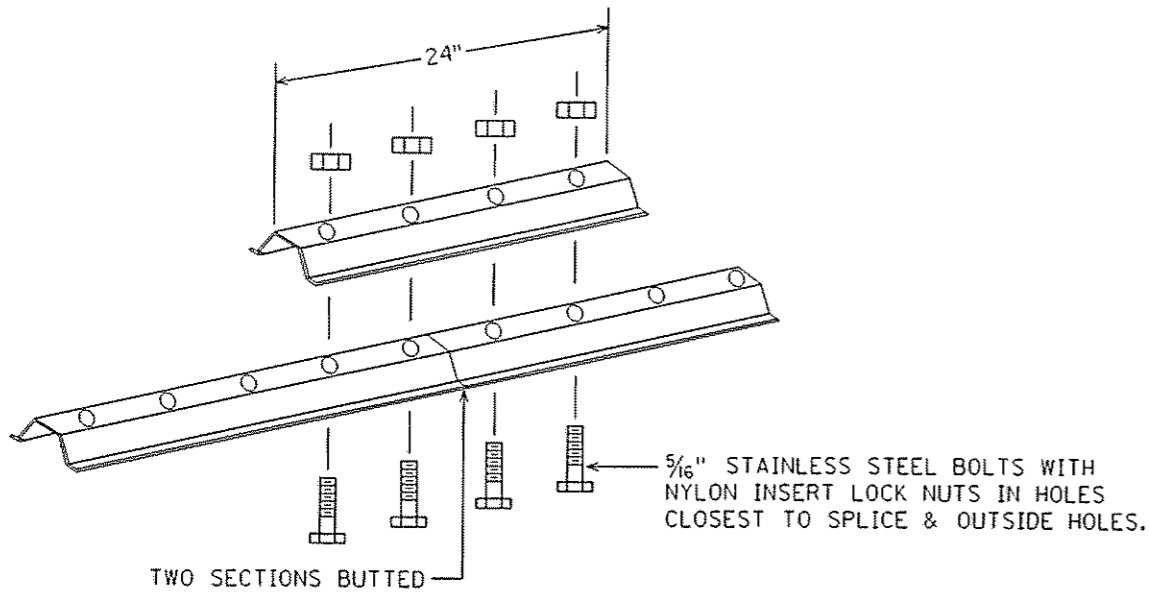
SHEET NO. 191

OF 222 SHEETS

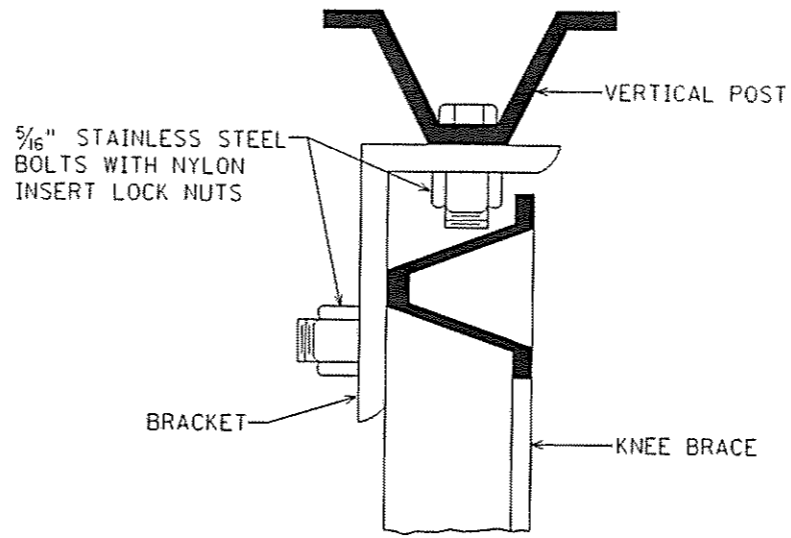


PLOTTED/REVISED: 1/5/2009

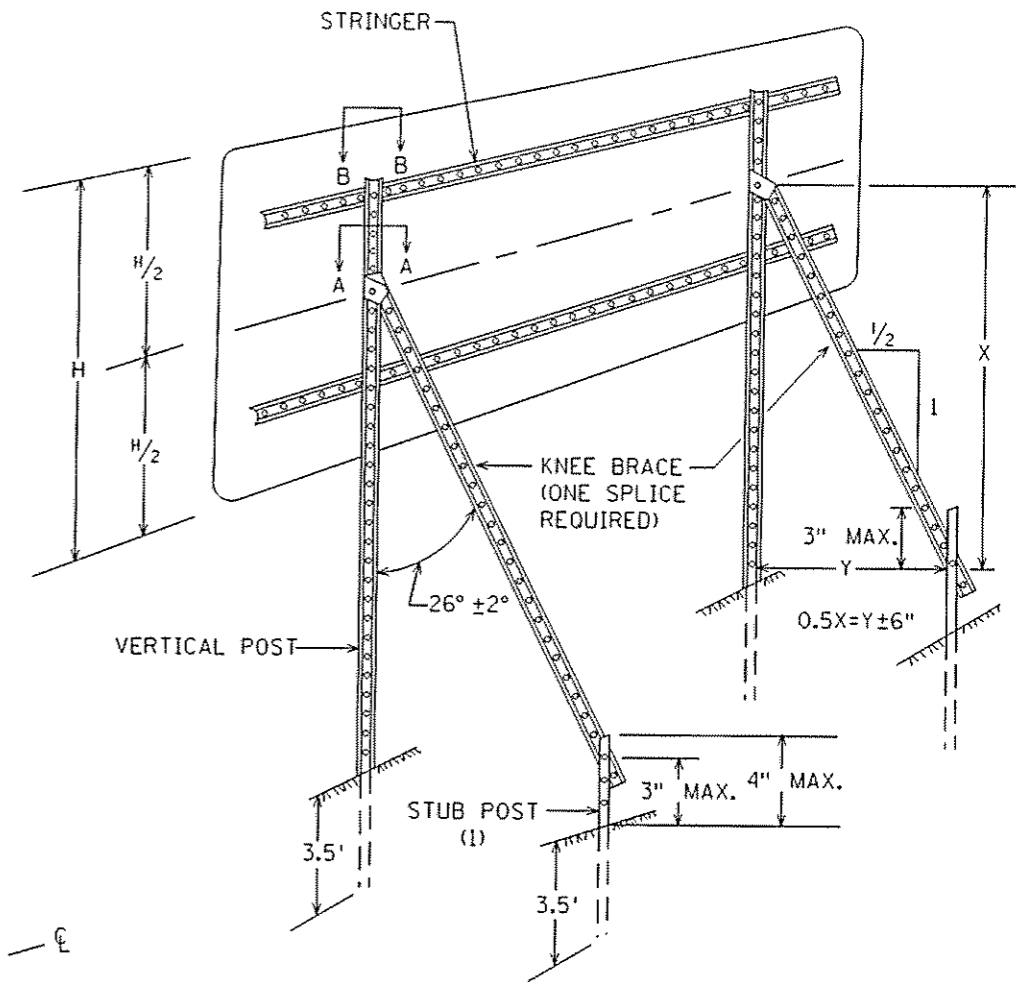
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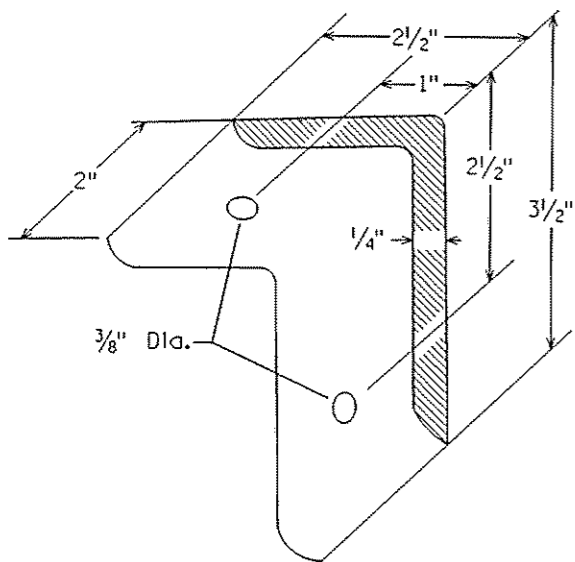
LATERAL BRACE OR STRINGER SPLICE DETAIL (EXPLODED VIEW)



SECTION A-A

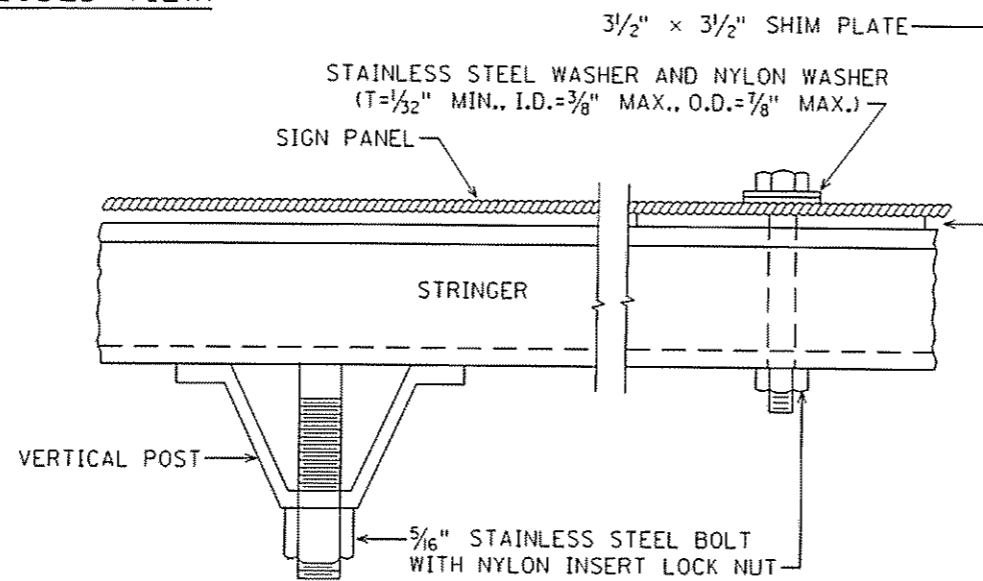


TYPICAL "A-FRAME" INSTALLATION TYPE "D" SIGNS

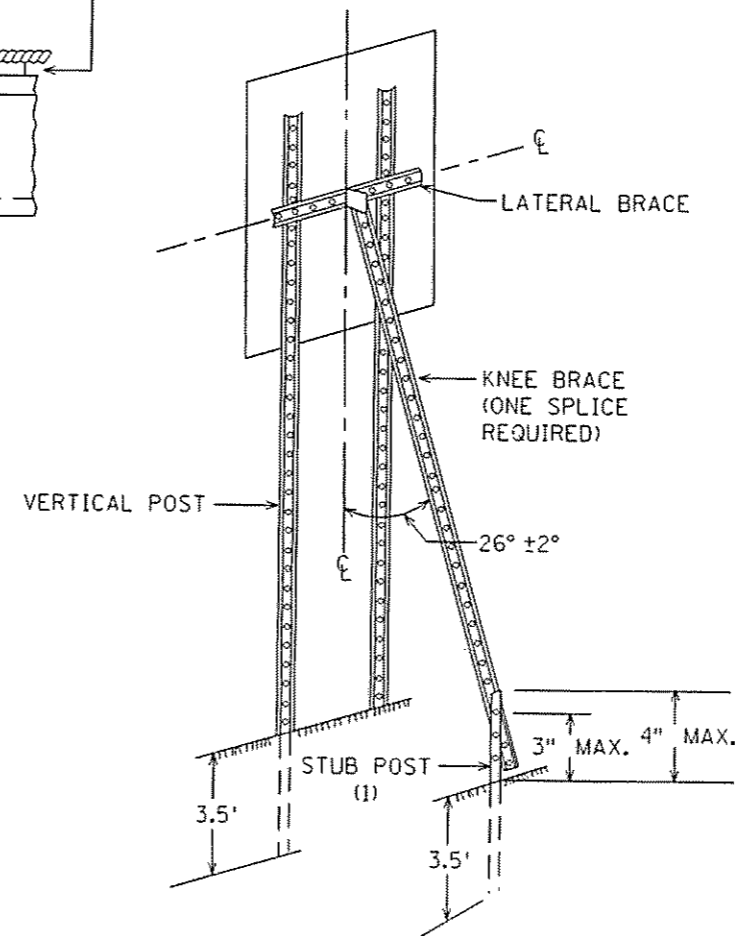


A-FRAME BRACKET

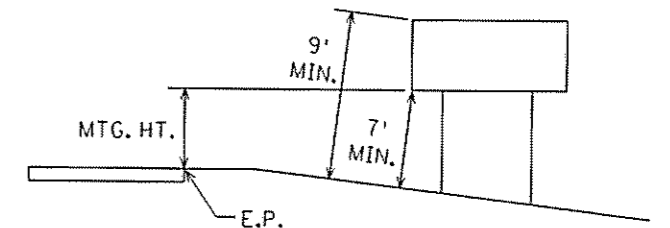
(STEEL MN/DOT 3306 GALVANIZED PER MN/DOT 3394)



SECTION B-B



TYPICAL "A-FRAME" INSTALLATION TYPE "C" SIGNS



TYPICAL MOUNTING

(1) OFFSET STUB POST 1' TOWARD ROADWAY RELATIVE TO VERTICAL POST. ATTACH STUB POST AND KNEE BRACE BACK TO BACK.

TYPE C & D SIGN STRUCTURAL DETAILS SHEET 2 OF 3

REVISED: 1-7-08

CERTIFIED BY

*Shirley A. Huson*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 26804

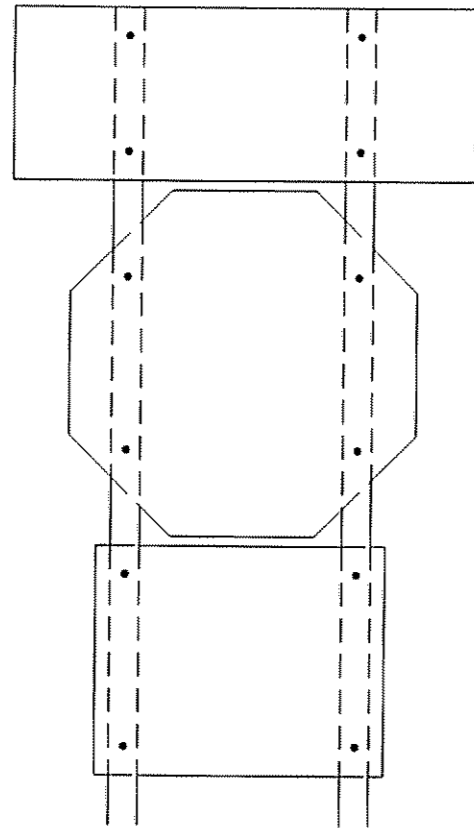
DATE 1/5/2009

STATE PROJ. NO. 0215-67 (TH 10)

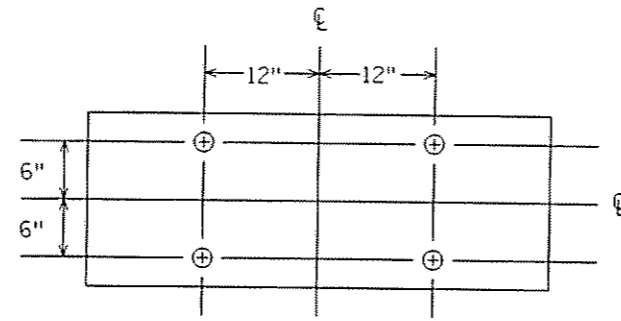
SHEET NO. 192

OF 222 SHEETS

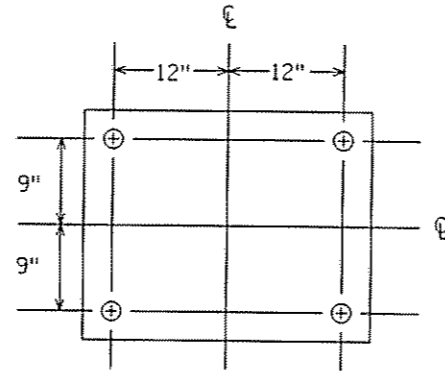
SIGNING PLAN



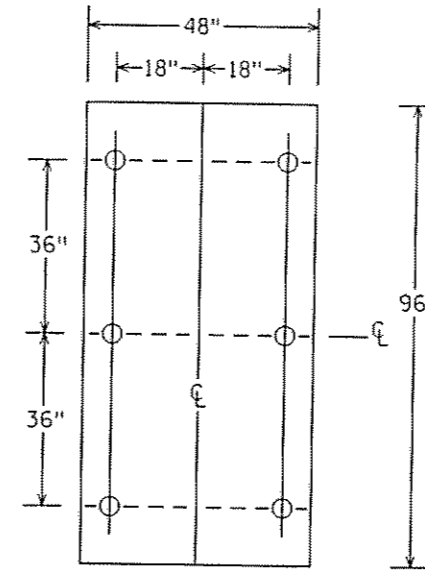
R6-1, R1-1 & (R6-3 OR R6-3a)  
MOUNTING



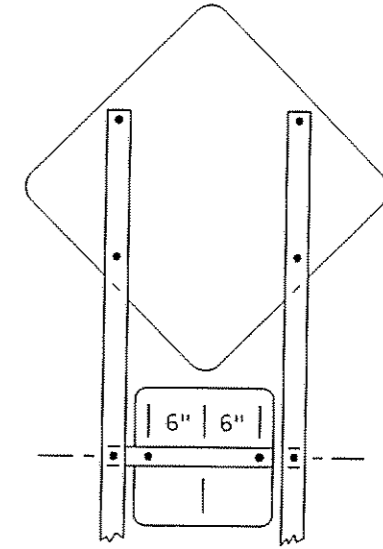
PUNCHING FOR R6-1(48" x 18")



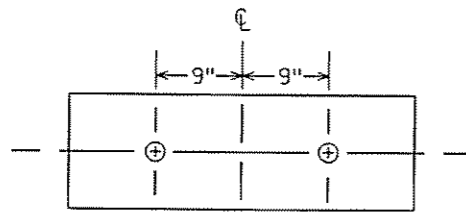
PUNCHING FOR R6-3 OR R6-3a(30" x 24")



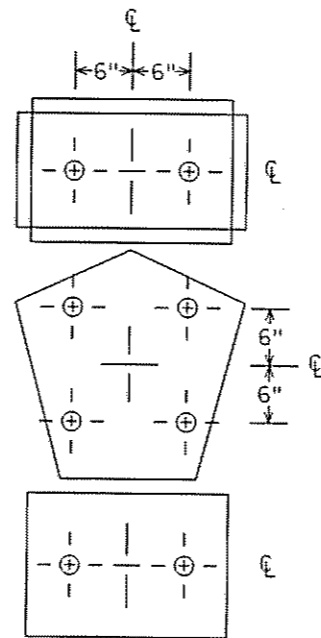
PUNCHING FOR R2-4b  
SPEED LIMIT



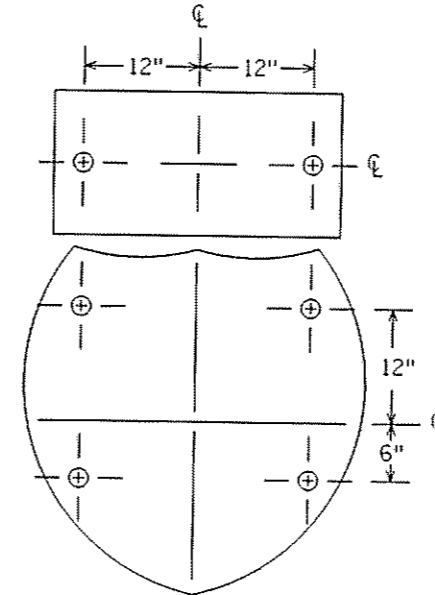
(W1-1, W1-2, W1-3, W1-4 OR W1-5) & W13-1  
MOUNTING



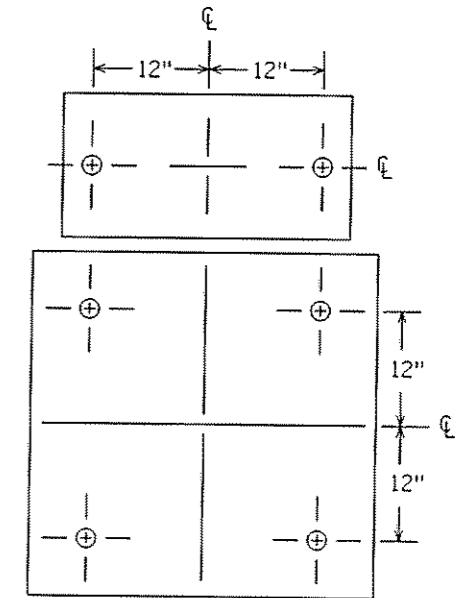
PUNCHING FOR R6-1(36" x 12")



M2-1A [21" x 15"] OR  
(M3-1A, M3-2A, M3-3A OR M3-4A) [24" x 12"] AND  
M1-6 [24" x 24"] AND  
(M5-1A, M5-2A, M6-1A, M6-2A, M6-3A M6-4A, M6-5A OR M6-6A) [21" x 15"]  
PUNCHING



(M3-1A, M3-2A, M3-3A OR M3-4A) [30" x 15"] AND  
M1-1 [45" x 36" OR 36" x 36"]  
PUNCHING

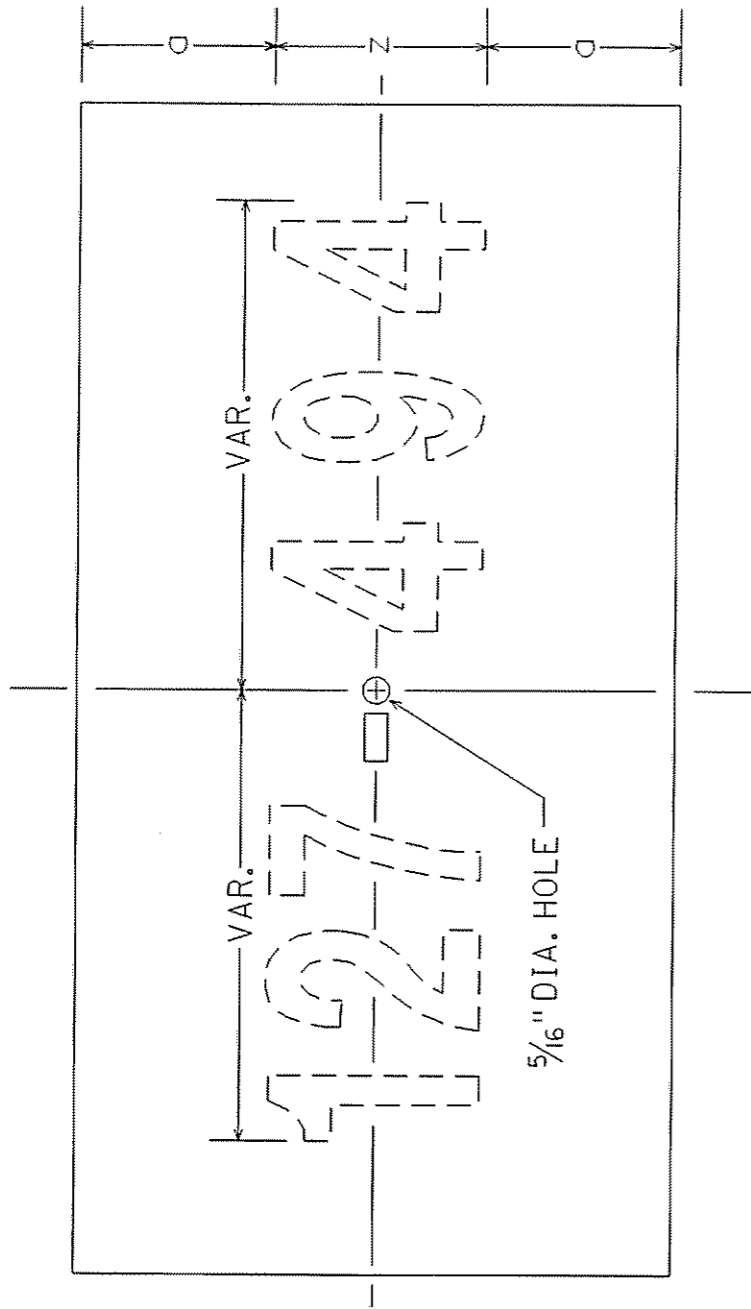


(M3-1, M3-1A, M3-2, M3-2A, M3-3, M3-3A M3-4 OR  
M3-4A) [30" x 15"] AND (M1-4 OR M1-5A) [36" x 36"]  
PUNCHING

TYPE C & D SIGN  
STRUCTURAL DETAILS  
SHEET 3 OF 3

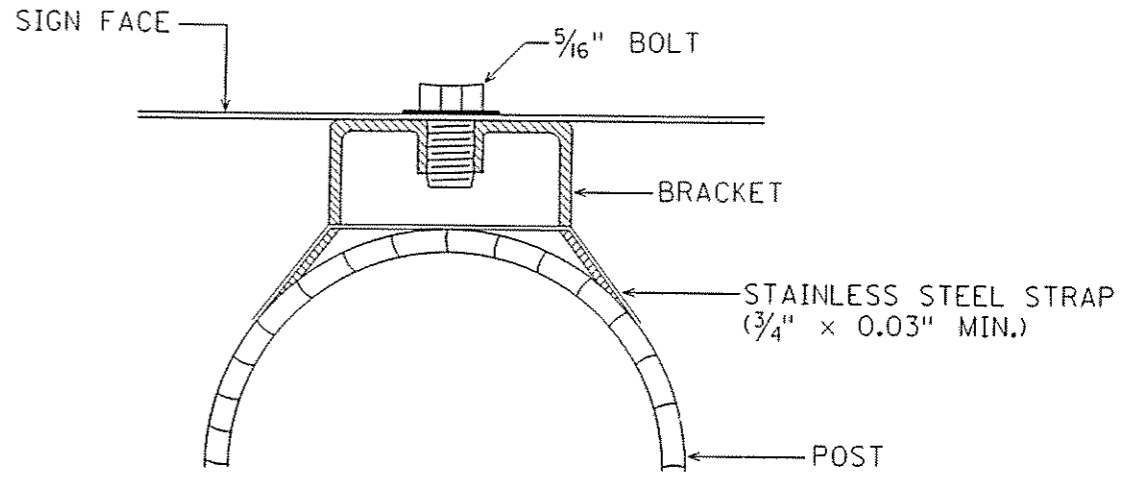
SIGNING PLAN

SIZE	12x6
RADIUS	
MARGIN	
BORDER	2
a	
b	
c	
d	
e	
f	
g	
h	
i	
j	
k	
l	
m	
n	
o	
p	
q	
r	
s	
t	
u	
v	
w	
x	
y	
z	
PUNCH CODE	2-C



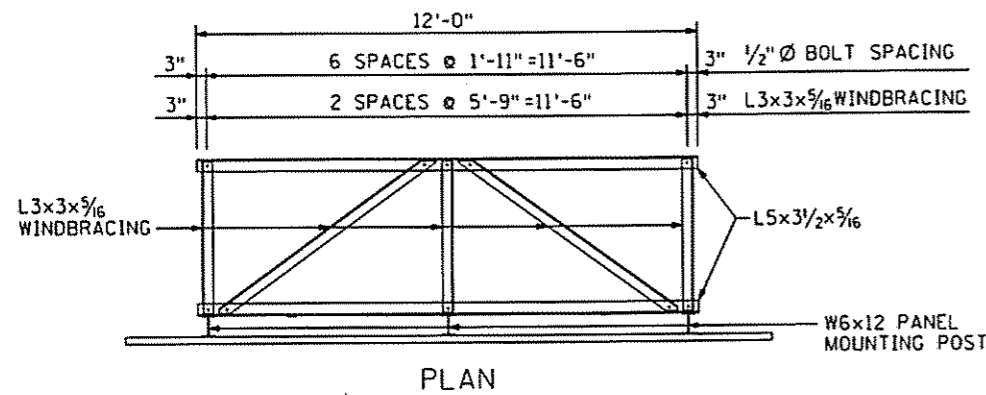
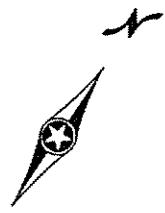
- NOTES: 1) ALL DIMENSIONS AND SIZES SHOWN ARE IN INCHES.  
 2) USE APPROPRIATE NUMERALS.  
 3) PLATE MATERIAL - (MN/DOT 3352.2A1b).  
 4) GREEN BACKGROUND - (MN/DOT 3352.2A2b).  
 5) WHITE NUMERALS OR LETTERS - (MN/DOT 3352.2A2b).

STATE OF MINNESOTA  
 DEPARTMENT OF TRANSPORTATION  
 STANDARD SIGN DRAWING  
 OH SIGN IDENTIFICATION  
 PLATE

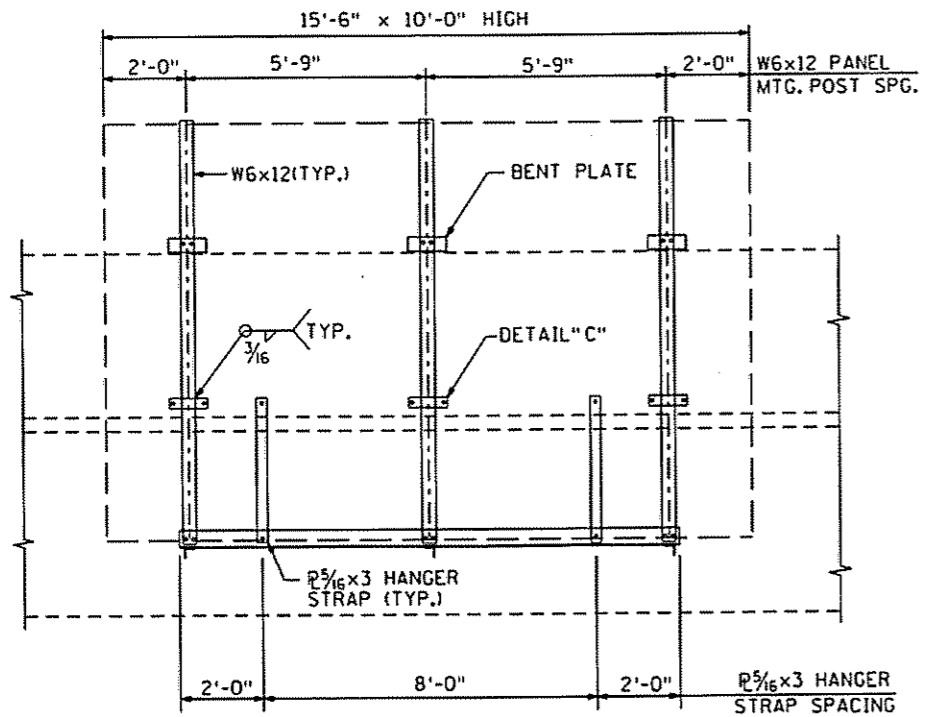


GALVANIZED OR STAINLESS  
 STEEL BRACKET, BOLT AND  
 WASHER.

STRAP MOUNTING DETAIL



PLAN



ELEVATION  
.51% SLOPE

**SIGN NOTES**

CONTRACTOR SHALL VERIFY DIMENSIONS BEFORE FABRICATION.

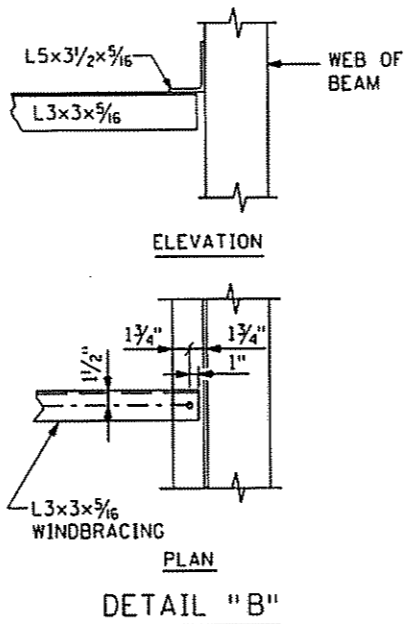
SIGN SUPPORTS TO BE VERTICAL.

SIGN TO BE PLACED PARALLEL TO BEAM FLANGE.

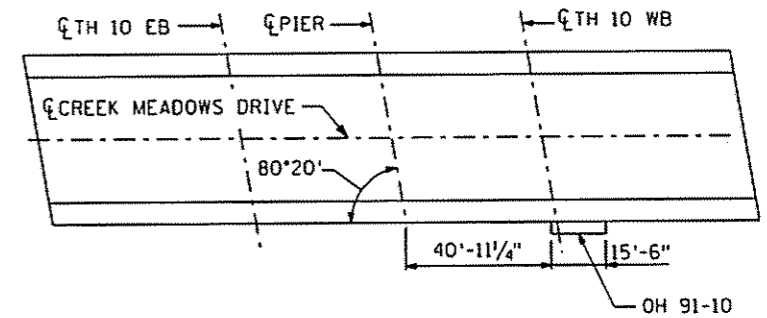
ALL CONNECTIONS TO BE 1/2" Ø BOLTS PER MN/DOT 3391 (A325), EXCEPT AS NOTED. HOLES TO BE 5/16" Ø

BOLT ANCHORAGES SHALL BE 1/2" Ø CHEMICAL ADHESIVE TYPE, APPROVED BY THE ENGINEER. HOLES TO BE 4 1/2" DEEP, MINIMUM, AND SHALL HAVE A MINIMUM ULTIMATE PULLOUT STRENGTH OF 8000#.

FOR GENERAL NOTES AND DETAILS NOT SHOWN SEE STANDARD SHEETS.

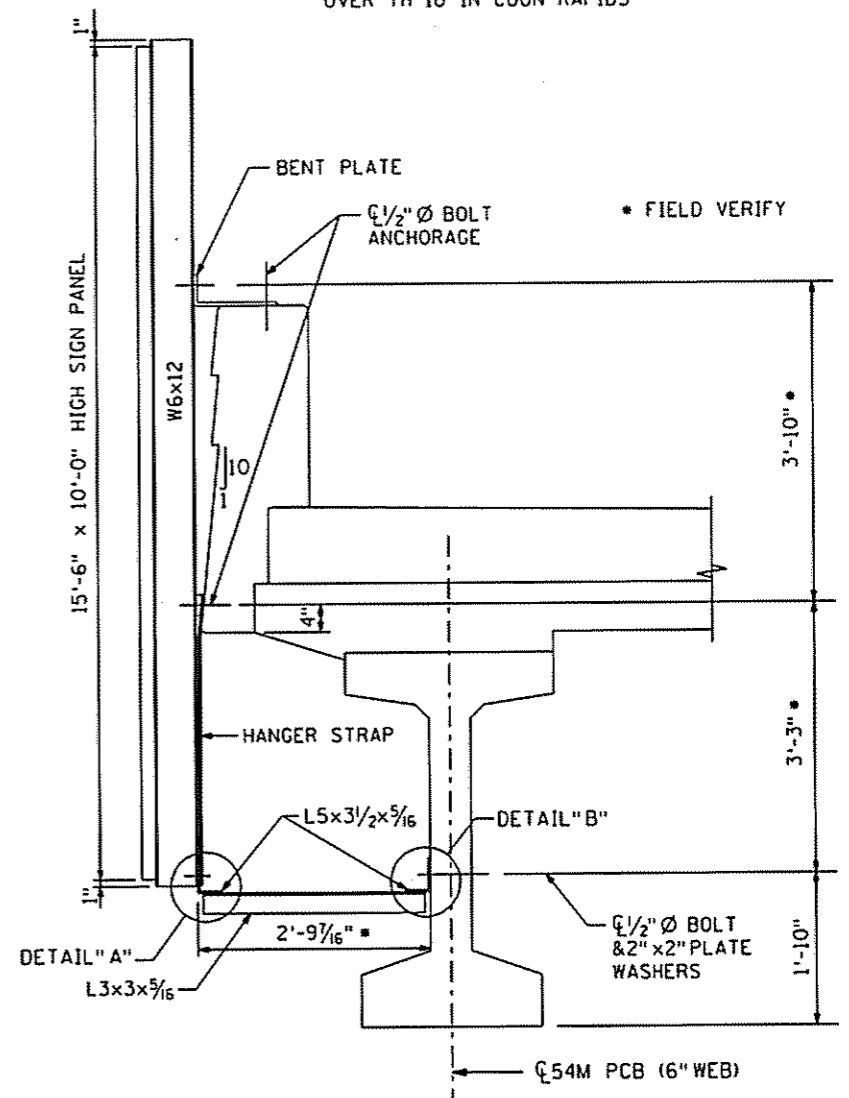


DETAIL "B"

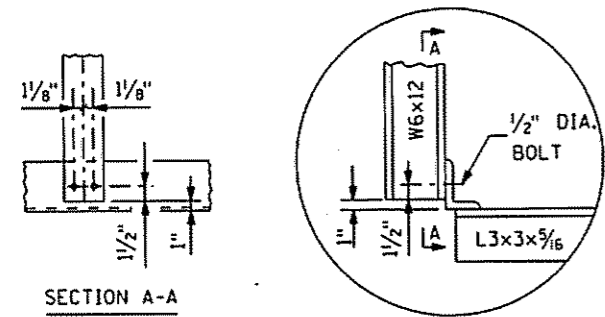


**SIGN LOCATION**

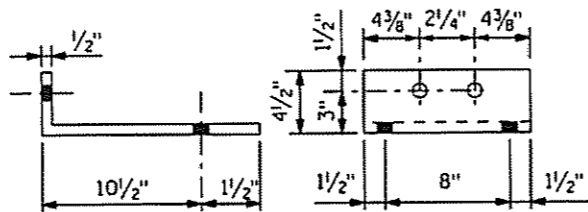
BR. 02562 - CREEK MEADOWS DRIVE  
OVER TH 10 IN COON RAPIDS



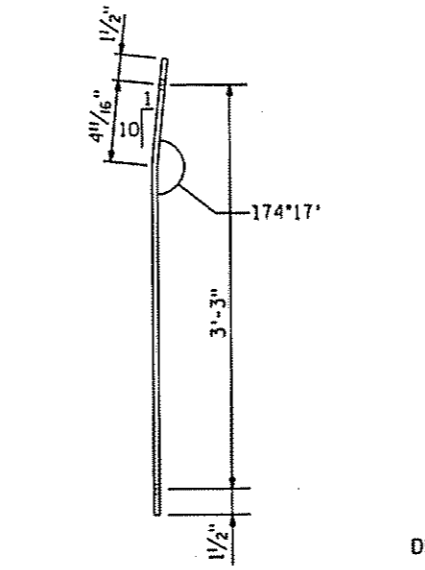
TYPICAL SECTION



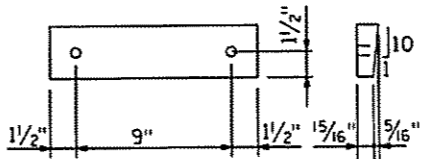
DETAIL "A"  
TYP. AT PANEL MOUNTING POST



BENT PLATE DETAIL  
TYP. AT PANEL MOUNTING POST



HANGER STRAP DETAIL  
R5/16x3



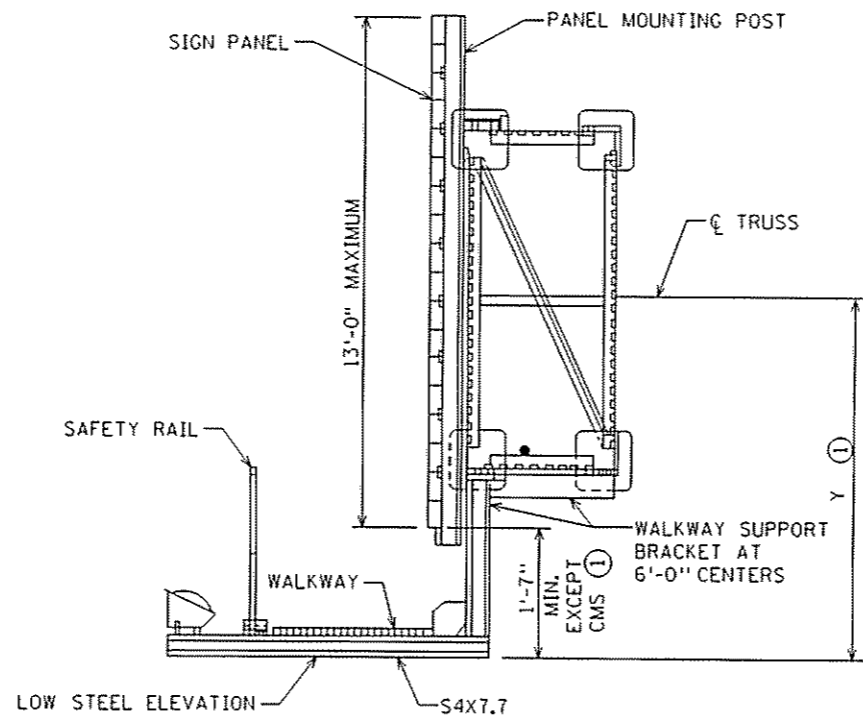
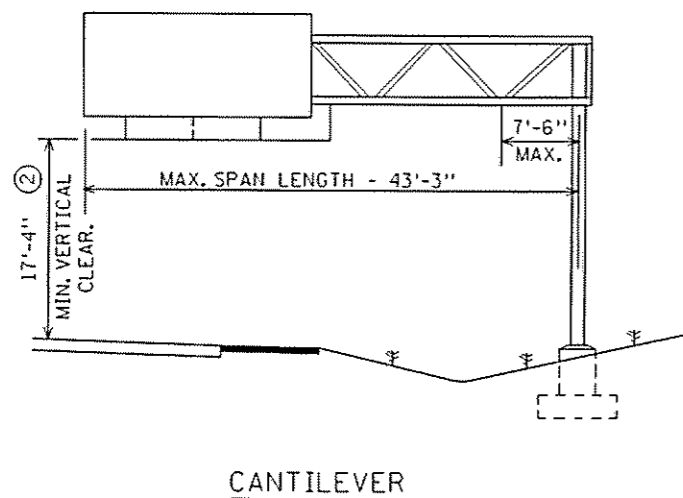
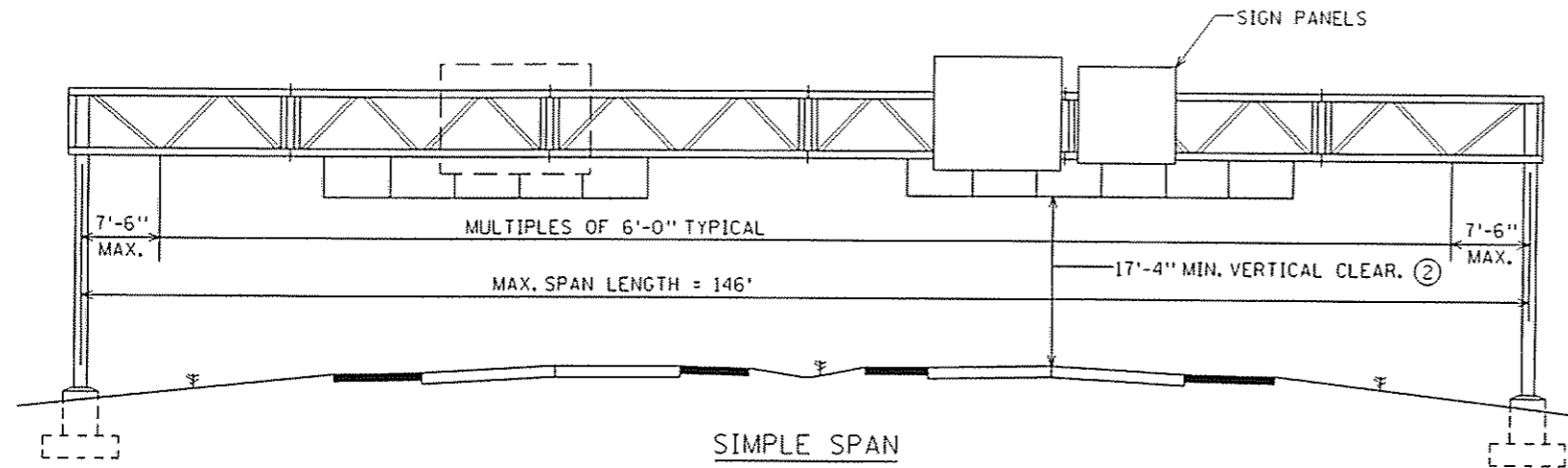
DETAIL "C"  
R1 1/4 x 3 x 1'-0"  
TAPERED

TRUSS QUANTITY	POUNDS	840
CERTIFIED BY <i>Thomas E. Merritt</i> THOMAS E. MERRITT, P.E.		
REG. NO. 18904	DATE	1/5/2009

STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION		
OVERHEAD SIGN DETAILS OH 91-10		
DES: T.E.M.	DR: D.K.L.	DATE DRAWN:
CHK: D.K.L.	CHK: T.E.M.	12/29/08

PLOTTED/REVISED: 1/5/2009

DISTRICT #: METRO  
 IPLOT NAME: T025670HST SHEETSST1  
 PATH & FILENAME: S:\TRAFFIC\TC\_Signing\0101021567\517\0215670HST SHEETS.dgn



**SPECIFIC NOTES:**

- ① DIMENSION Y IS CONSTANT AND BASED ON THE DEEPEST SIGN PANEL ABOVE THAT WALKWAY. WHEN STANDARD SIGN PANEL(S) AND CMS ARE MOUNTED ON THE SAME SPAN, DIMENSION Y SHALL BE GOVERNED BY THE CMS.
- ② MINIMUM CLEARANCE WILL BE MEASURED FROM THE HIGHEST ELEVATION OF PAVEMENT, SHOULDERS, AND MOUNTABLE CURBS, OR IF INSURMOUNTABLE CURBS ARE USED, THE HIGHEST ELEVATION BETWEEN CURB LINES.

**GENERAL NOTES:**

**DESIGN SPECIFICATIONS:**

TRUSS, POST, & HARDWARE:  
 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS DATED 1999.

**LOADING:**

WIND LOAD 90 M.P.H. NORMAL TO SIGN FACE IN COMBINATION WITH OTHER LOADS OUTLINED IN THE DESIGN SPECIFICATIONS.

**UNIT STRESSES:**

CONCRETE----- F<sub>c</sub> = 1,600 PSI  
 REINFORCEMENT STEEL----- F<sub>s</sub> = 24,000 PSI  
 FOOTING SOIL PRESSURE----- 1-1/4 TONS PER SQ. FT.

**MATERIALS:**

STRUCTURAL STEEL (EXCEPT POST, TUBES)- Mn/DOT 3306  
 POST STEEL----- VARIES  
 HIGH STRENGTH BOLTS----- Mn/DOT 3391.2B  
 ANCHOR RODS----- Mn/DOT 3385  
 CASTINGS----- Mn/DOT 3322  
 REINFORCEMENT  
 BARS----- Mn/DOT 3301  
 SPIRAL----- Mn/DOT 3305 NO SPLICES  
 WALKWAY GRATING----- FEDERAL SPECIFICATIONS RR-G-661b,  
 TYPE 1, STEEL  
 CONCRETE----- Mn/DOT 2461 (MIX 3Y43)

**FINISH:**

ALL COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION EXCEPT REINFORCEMENT BARS, LOWER PORTION OF ANCHOR RODS, ALUMINUM, AND OTHER NON FERROUS INCIDENTALS. GALVANIZING SHALL CONFORM TO Mn/DOT 3392 OR Mn/DOT 3394 AS APPLICABLE. BEARING SURFACES MUST BE SMOOTH.

**FABRICATION:**

FABRICATION OF STRUCTURAL METALS SHALL BE IN ACCORDANCE WITH Mn/DOT 2471, Mn/DOT 2564 AND THE APPLICABLE SPECIAL PROVISIONS. ALL WELDING TO BE CONTINUOUS. ALL CONTACT SURFACES MUST BE COMPLETELY SEALED.

**INSPECTION:**

INSPECTION BEFORE AND AFTER GALVANIZING PER Mn/DOT 1511 AND Mn/DOT 2471.

**INDEX OF STANDARD SIGN DRAWINGS**

DRAWING	TITLE
ST-1	GENERAL ELEVATION AND NOTES
ST-2	CAMBER, POST IDENTIFICATION AND ESTIMATED QUANTITIES
ST-3	FOUNDATIONS AND ANCHOR RODS
ST-4	TRUSS/POST CONNECTION & BASEPLATE
ST-5	SIGN TRUSS DETAILS - TYPE A
ST-6	SIGN TRUSS DETAILS - TYPE B
ST-7	SIGN TRUSS DETAILS - TYPE C
ST-8	WALKWAY DETAILS
ST-9	FOLDING HANDRAIL
ST-10	SIGN PANEL AND PANEL MOUNTING POST DETAILS
ST-11	ELECTRICAL DETAILS
ST-12	ELECTRICAL DETAILS
ST-13	ELECTRICAL DETAILS (CMS SIGNS)

**SECTION**

SIGN HEIGHT	Y ①	
6'-6"	4'-4"	CMS (NEW LED)
7'-0"	4'-7"	
7'-6"	4'-10"	
8'-0"	5'-1"	CMS (LED)
8'-6"	5'-4"	
9'-0"	5'-7"	CMS (DRUM)
9'-6"	5'-10"	
10'-0"	6'-1"	
10'-6"	6'-4"	
11'-0"	6'-7"	
11'-6"	6'-10"	
12'-0"	7'-1"	
12'-6"	7'-4"	
13'-0"	7'-7"	

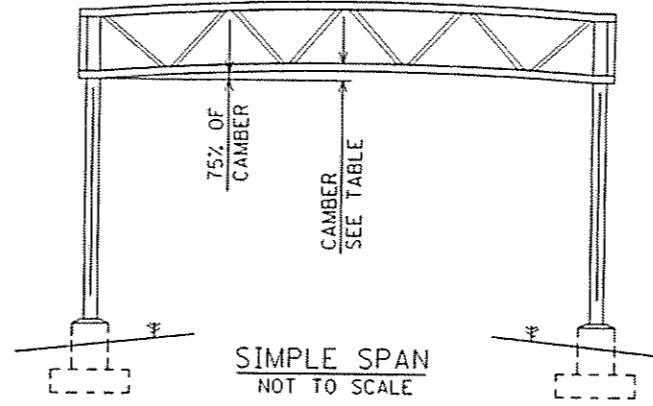
STANDARD OVERHEAD SIGN SUPPORTS INTERIM DESIGN B	
GENERAL ELEVATIONS AND NOTES	
DRAWING	ST-1

PLOTTED/REVISED: 1/5/2009

**SIMPLE SPAN**

SIMPLE SPAN TRUSS CAMBER												
SPAN	40	50	60	70	80	90	100	110	120	130	140	150
CAMBER	1/4	5/16	3/8	13/16	1 1/16	1 3/8	1 11/16	2	2 3/8	2 13/16	3 1/4	3 3/4
DL DEFLECTION	0	1/16	1/16	1/8	1/4	3/8	3/16	13/16	1 1/8	1 1/2	2 1/16	2 11/16
RESIDUAL CAMBER	1/4	3/8	5/16	11/16	1 1/16	1	1 1/8	1 3/16	1 1/4	1 5/16	1 3/8	1 1/16

NOTE:  
CAMBER AND DEFLECTIONS SHOWN ARE AT Q SPAN. THE DEFLECTIONS AND CAMBER AT THE QUARTER POINTS SHALL BE APPROXIMATELY 75% OF THESE VALUES.



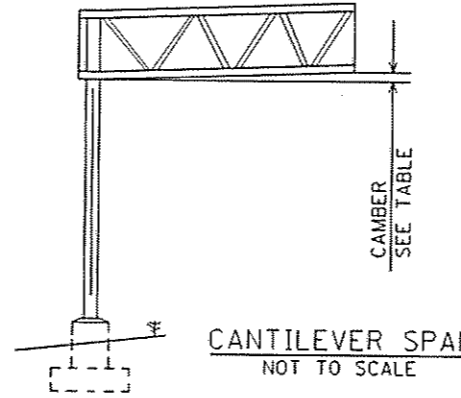
TRUSS QUANTITIES		
USE LENGTH FROM Q POST WHEN CALCULATING TOTAL WEIGHTS.		
TRUSS TYPE A	TRUSS TYPE B	TRUSS TYPE C
123 LBS./FT.	168 LBS./FT.	196 LBS./FT.

**CANTILEVER SPAN**

CANTILEVER SPAN TRUSS CAMBER					
SPAN	15'	20'	30'	40'	45'
CAMBER	1/8	1/4	3/8	1 1/16	1 1/4
DL DEFLECTION	0	0	1/16	3/16	1/4
RESIDUAL CAMBER	1/8	1/4	3/16	7/8	1

NOTE:  
CAMBER AND DEFLECTIONS SHOWN ARE SHOWN AT END OF CANTILEVER.

WHEN ERECTING CANTILEVER TRUSSES, THE POSTS SHALL BE SET 1/8" PER FOOT OUT OF PLUMB TO COMPENSATE FOR THE BENDING OF THE POSTS.



PANEL MOUNTING POST QUANTITIES INCLUDES MOUNTING ANGLES	
PANEL HEIGHT	WEIGHT/POST
6'-6"	70
7'-0"	74
7'-6"	78
8'-0"	82
8'-6"	86
9'-0"	90
9'-6"	93
10'-0"	97
10'-6"	101
11'-0"	105
11'-6"	160
12'-0"	166
12'-6"	172
13'-0"	178

**WALKWAY SUPPORT QUANTITIES**

USE MAXIMUM PANEL HEIGHT ON SPAN TO CALCULATE QUANTITIES. WHEN CONVENTIONAL SIGN PANEL(S) AND CMS ARE MOUNTED ON THE SAME SPAN, QUANTITIES SHALL BE GOVERNED BY THE CMS.

	PANEL HEIGHT	TRUSS TYPE (WEIGHT/SUPPORT)		
		A	B	C
CMS(NEW LED)	6'-6"	99	105	113
	7'-0"	101	107	115
	7'-6"	103	109	117
CMS(LED)	8'-0"	105	111	119
	8'-6"	107	113	121
CMS(DRUM)	9'-0"	109	115	123
	9'-6"	111	117	125
	10'-0"	113	119	127
	10'-6"	115	121	129
	11'-0"	135	142	151
	11'-6"	138	144	153
	12'-0"	141	147	156
12'-6"	143	150	159	
13'-0"	146	153	162	

FOR FOUNDATION QUANTITIES SEE DRAWING ST-3

**WALKWAY WEIGHTS:**

- USE 3'-4 3/4" WIDE GRATING @ 44 LBS/FT.
- WEIGHT INCLUDES HANDRAIL (12 LBS/FT.) AND FIXTURE MOUNTING CHANNELS (4 LBS/FT.).

POST IDENTIFICATION NUMBER	BASEPLATE DESIGN	PERMISSIBLE PIPE SECTIONS			
		MIN. YIELD=35 KSI		MIN. YIELD=42 KSI	
		OUTSIDE DIAMETER (INCH)	WALL THICKNESS (INCH)	OUTSIDE DIAMETER (INCH)	WALL THICKNESS (INCH)
1	A	N.A.	N.A.	18	0.250
2	A	18	0.375	18	0.312
3	A	18	0.500	18	0.375
4	A	18	0.562	18	0.500
5	B	18	0.938	18	0.750
6	B	20	0.594	20	0.500
7	B	N.A.	N.A.	20	0.812

WALL THICKNESS IS MINIMUM, THINNER WALLS WILL NOT BE APPROVED

**POST IDENTIFICATION NOTES:**

POST MATERIAL SHALL CONFORM TO ONE OF THE FOLLOWING SPECIFICATIONS:  
ASTM A709, GRADE 36  
ASTM A53, GRADE B  
API 5L, GRADES B, X42, X46, X52, X56, X60, X65

CONTRACTOR SHALL DEMONSTRATE THAT THE POST MATERIAL MEETS THE REQUIREMENTS OF ONE OF THE ABOVE CITED SPECIFICATIONS AND THE MINIMUM YIELD STRENGTH.

NO SPLICES OF ANY KIND WILL BE PERMITTED IN POSTS INTENDED FOR USE IN CANTILEVER TYPE STRUCTURES (BRIDGE TYPE BC).

ONE OF TWO POSTS FOR SIMPLE SPAN STRUCTURES (BRIDGE TYPE S) MAY INCORPORATE ONE WELDED CIRCUMFERENTIAL BUTT SPLICE CONFORMING TO AWS D1.1 DETAIL B-U2 IN THE UPPER 1/3 OF ITS LENGTH. BACK UP RINGS FOR THESE WELDED SPLICES SHALL BE COMMERCIAL PRODUCTS. BUTT WELDS REQUIRE RADIOGRAPHIC INSPECTION (Mn/DOT 2471.3).

ALL RADIOGRAPHIC INSPECTIONS AND MAGNETIC PARTICLE TESTING REPORTS AND RADIOGRAPHIC FILMS SHALL BECOME THE PROPERTY OF THE DEPARTMENT.

SEE DRAWING ST-4 FOR BASEPLATE DETAILS.

**POST QUANTITIES**

QUANTITIES INCLUDE ANCHORAGE ASSEMBLY AND TRUSS CONNECTION PLATES. PAY LENGTH OF POSTS IS FROM THE BOTTOM OF THE BASE PLATE (ELEV. A) TO THE TOP OF THE TRUSS. POST QUANTITIES ARE BASED ON GRADE 42 STEEL. NO ADJUSTMENTS WILL BE MADE IN THE QUANTITIES FOR THE USE OF GRADE 35 STEEL POSTS.

POST TYPE	CANTILEVER		SIMPLE SPAN		
	TRUSS TYPE A	TRUSS TYPE B	TRUSS TYPE A	TRUSS TYPE B	TRUSS TYPE C
1	1880+47 LBS/FT	2470+47 LBS/FT	1870+47 LBS/FT	1890+47 LBS/FT	1915+47 LBS/FT
2	1880+59 LBS/FT	2470+59 LBS/FT	1870+59 LBS/FT	1890+59 LBS/FT	1915+59 LBS/FT
3	1880+71 LBS/FT	2470+71 LBS/FT	1870+71 LBS/FT	1890+71 LBS/FT	1915+71 LBS/FT
4	1880+94 LBS/FT	2470+94 LBS/FT	1870+94 LBS/FT	1890+94 LBS/FT	1915+94 LBS/FT
5	1910+138 LBS/FT	2500+138 LBS/FT	2460+138 LBS/FT	2480+138 LBS/FT	2505+138 LBS/FT
6	N/A	2500+104 LBS/FT	N/A	2545+104 LBS/FT	2570+104 LBS/FT
7	N/A	2500+167 LBS/FT	N/A	2545+167 LBS/FT	2570+167 LBS/FT

STANDARD OVERHEAD SIGN SUPPORTS  
INTERIM DESIGN B

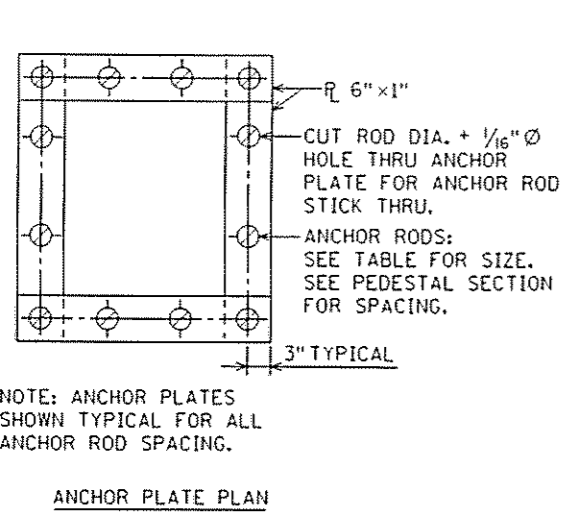
CAMBER, POST IDENTIFICATION  
AND ESTIMATED QUANTITIES

DRAWING ST-2

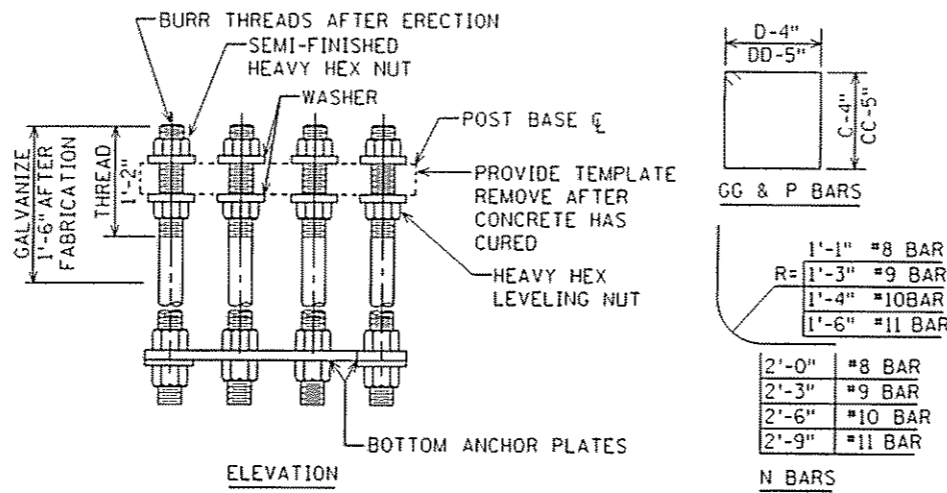
DISTRICT #: METRO  
PLOT NAME: T0215670HSTSHETSST  
PATH & FILENAME: S:\TRAFFIC\Signing\010\021567\PS\T0215670HST SHEETS.dgn

PLOTTED/REVISED: 1/5/2009

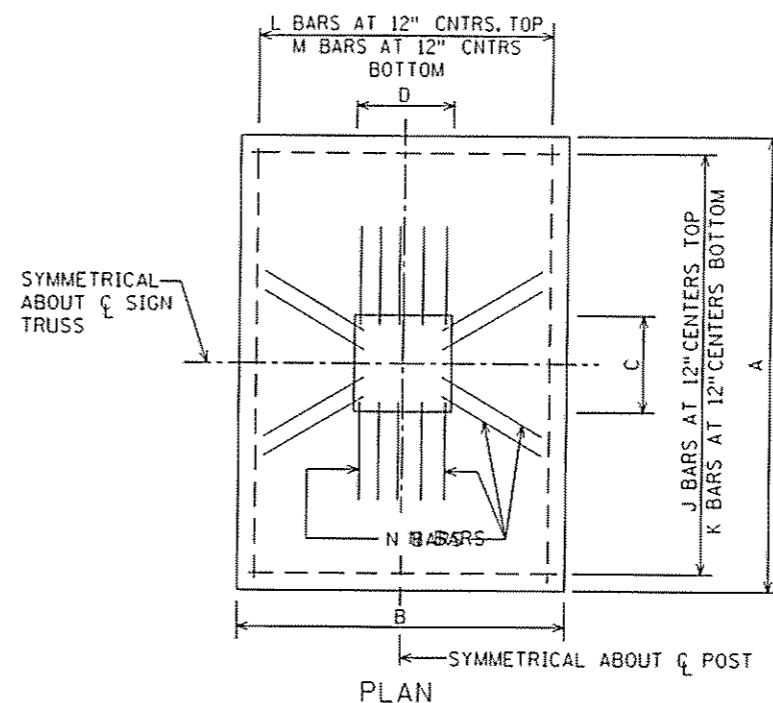
DISTRICT #: METRO  
 IPLOT NAME: T0215670HST SHEETS ST3  
 PATH & FILENAME: S:\TRAFFIC\TC Sign\021567\PS\T0215670HST SHEETS.dgn



NOTE: ANCHOR PLATES SHOWN TYPICAL FOR ALL ANCHOR ROD SPACING.



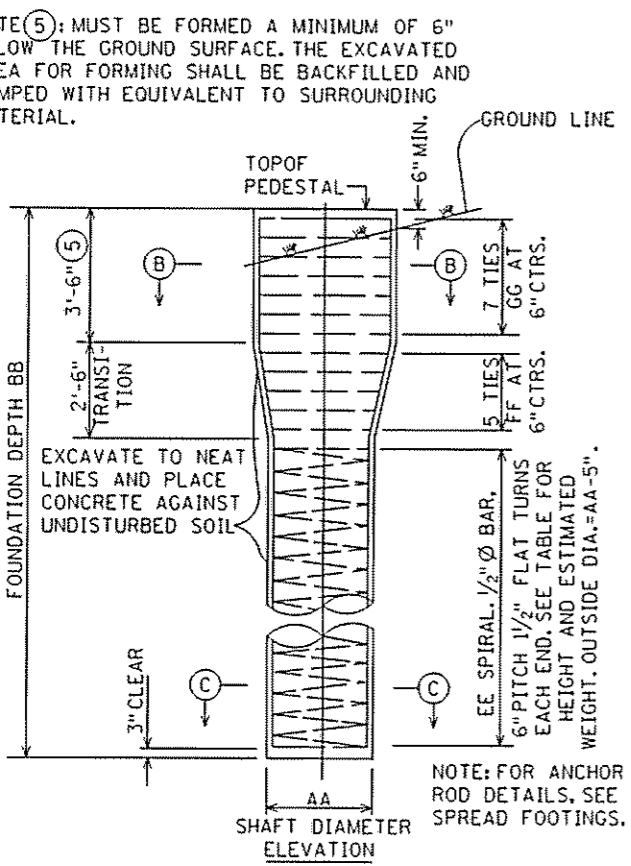
J, K, L, M, FF AND HH ARE STRAIGHT BARS  
 BAR BENDING DIAGRAMS



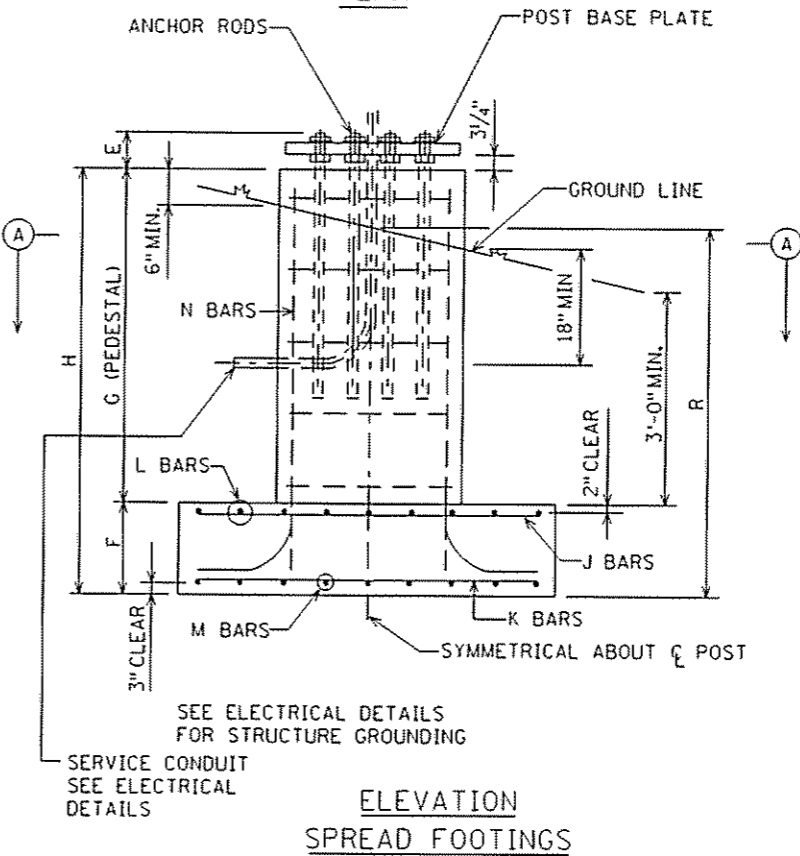
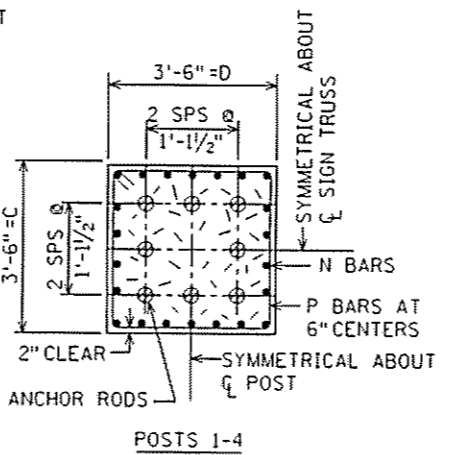
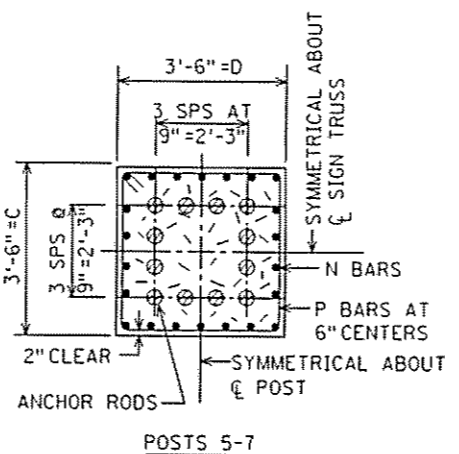
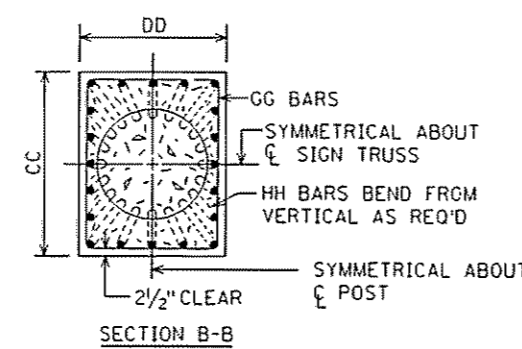
- SPECIFIC NOTES:**
- G IS IN FEET, ROUND UP TO WHOLE NUMBER. E.G. G=4.10/2G=8.2 NO. REQ'D=9.
  - G AND R ARE IN FEET.
  - BEND AS REQUIRED TO FORM A CLOSED LOOP.
  - FOR STRUCTURE STEEL SEE SPREAD FOOTING.
  - MUST BE FORMED A MIN. OF 6" BELOW THE GROUND SURFACE. THE SOIL EXCAVATED FOR FORMING SHALL BE BACKFILLED AND TAMPED TO EQUIVALENT COMPACTION AS SURROUNDING MATERIAL.
  - SPECIAL LARGE RADIUS BENDS ARE REQUIRED. SEE "BAR BENDING DIAGRAMS" FOR SIZES OF RADII.

- GENERAL NOTES:**
- SEE THE FORMAT SHEET FOR FOOTING LOCATIONS, POST DESIGNATIONS, TOP OF PEDESTAL ELEVATIONS AND BOTTOM OF FOOTING ELEVATIONS.
  - ALL CONCRETE SHALL CONFORM TO CONCRETE MIX 3Y43 (MN/DOT 2461).
  - ALL BAR DIMENSIONS ARE OUT TO OUT OF BARS.
  - ALL SPREAD FOOTINGS HAVE AN ALLOWABLE DESIGN BEARING PRESSURE OF 1 1/4 T PER SQUARE FOOT.
  - DRILLED SHAFTS SHALL BE USED ONLY WHEN SPECIFIED IN THE CONTRACT PLANS.
  - THE DRILLED SHAFTS HAVE AN ALLOWABLE DESIGN LATERAL BEARING PRESSURE OF 250 LBS. PER SQ. FT. PER FOOT OF DEPTH.
  - UNLESS OTHERWISE NOTED, ALL REINFORCEMENT BARS SHALL BE EPOXY COATED IN ACCORDANCE WITH MN/DOT 3301. SPIRAL BARS AND J, K, L & M BARS NEED NOT BE EPOXY COATED.
  - THE FOLLOWING TORQUE VALUES SHALL BE USED WHEN INSTALLING ALL ANCHOR NUTS FOR OVERHEAD SIGN STRUCTURES:  
 ANCHOR  

BOLT DIAMETER	TORQUE (FT./LBS.)
2/4"	375
2/2"	450



NOTE (5): MUST BE FORMED A MINIMUM OF 6" BELOW THE GROUND SURFACE. THE EXCAVATED AREA FOR FORMING SHALL BE BACKFILLED AND TAMPED WITH EQUIVALENT TO SURROUNDING MATERIAL.



POST NO.	DIMENSIONS				REINFORCING BARS				ESTIMATED QUANTITIES (4)						
	AA	BB	CC	DD	EE	FF (3)	GG	HH	CONCRETE CY	REIN	STEEL LBS.	CONCRETE CY (2)	REIN. STEEL LBS. (2)	ANCH. ASSM. LBS	ST. EXC. C.Y. (2)
1-4	3'-0"	23'-0"	3'-6"	3'-6"	16'-6" x 197 LBS.	5 #5 x 14'-11"	7 #5 x 14'-11"	20 #9 x 22'-7"	6.9		1910	9.3 + 0.46 G	945 + 98G	781	7.4 R
5-7	4'-0"	29'-0"	4'-0"	4'-0"	22'-6" x 362 LBS.	5 #5 x 16'-11"	7 #5 x 16'-11"	24 #10 x 28'-7"	14.1		3490	16.7 + 0.46 G	2333 + 133G	1320	12.1 R

POST NO.	SUMMARY OF ESTIMATED QUANTITIES																												
	ANCHOR RODS				J REIN. BARS				K REIN. BARS				L REIN. BARS				M REIN. BARS				(6) N REIN. BARS				P REIN. BARS (1)				
A	B	C	D	E	F	NO. REQ'D	DIA.	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH	NO. REQ'D	SIZE	LENGTH
1-4	14'-0"	9'-0"	3'-6"	3'-6"	8 1/2"	2'-0"	8	2 1/4"	3'-10 1/2"	14	#4	8'-6"	14	#6	8'-6"	10	#5	13'-6"	10	#7	13'-6"	20	#9	H + 2'-6"	26	#5	14'-3"		
5-7	18'-0"	12'-6"	3'-6"	3'-6"	9"	2'-0"	12	2 1/2"	4'-0"	19	#4	12'-0"	19	#6	12'-0"	13	#6	17'-6"	13	#10	17'-6"	24	#10	H + 2'-9"	26	#5	14'-3"		

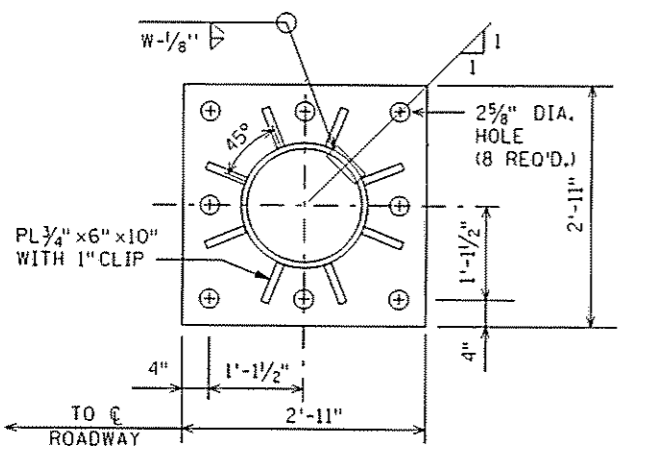
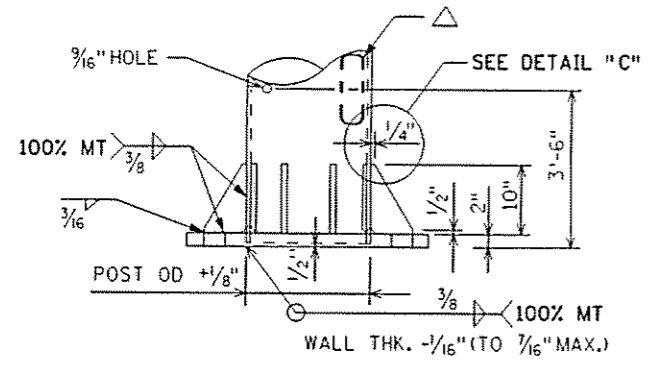
STANDARD OVERHEAD SIGN SUPPORTS  
 INTERIM DESIGN B

FOUNDATIONS AND  
 ANCHOR RODS

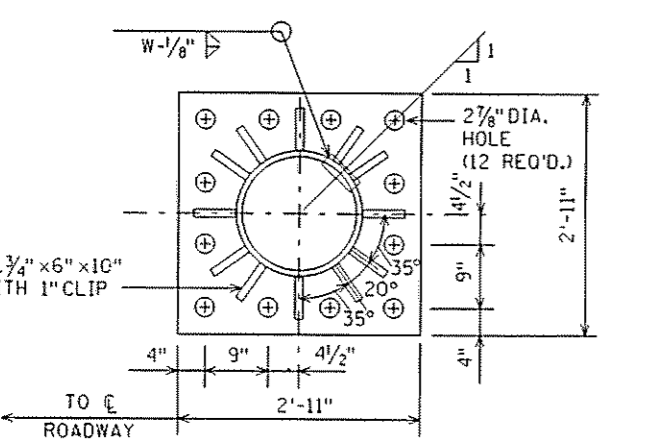
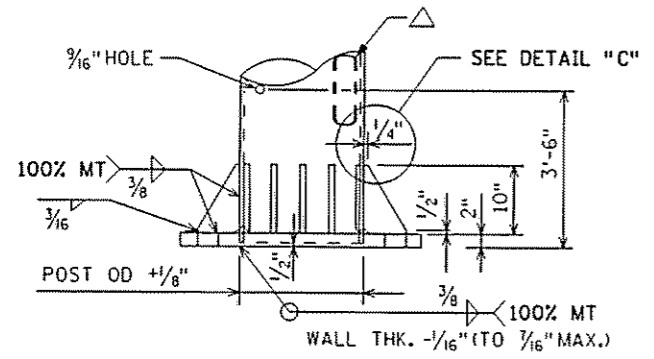
DRAWING ST-3

PLOTTED/REVISED: 1/5/2009

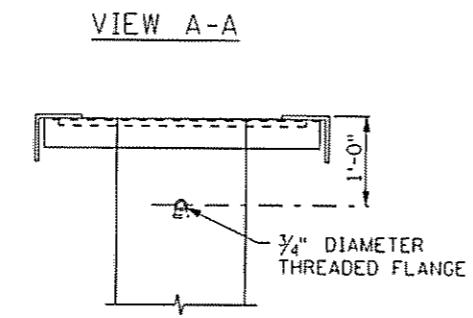
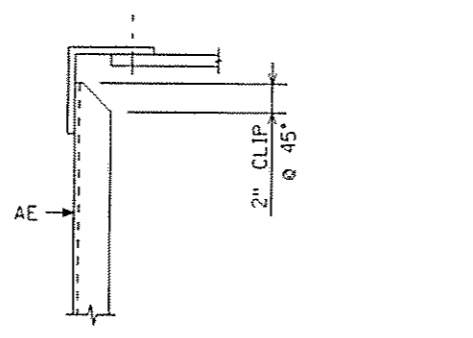
DISTRICT #: METRO  
PLOT NAME: T0215670HSTSHETSST4  
PATH & FILENAME: S:\TRAFFIC\TC Signling\010021567\T0215670HSTSHETS.dgn



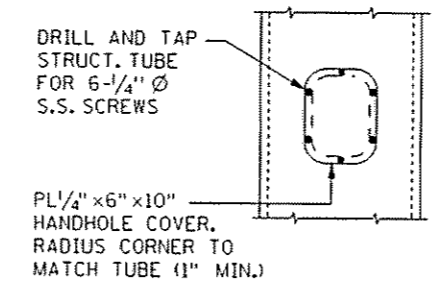
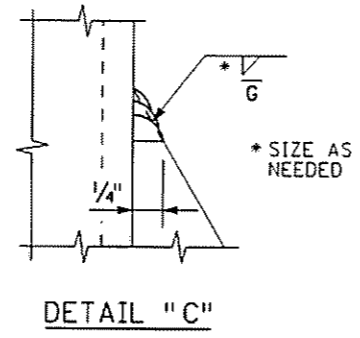
PLAN & ELEVATION - BASEPLATE TYPE A  
POST NO. 1 THRU 4



PLAN & ELEVATION - BASEPLATE TYPE B  
POST NO. 5 THRU 7

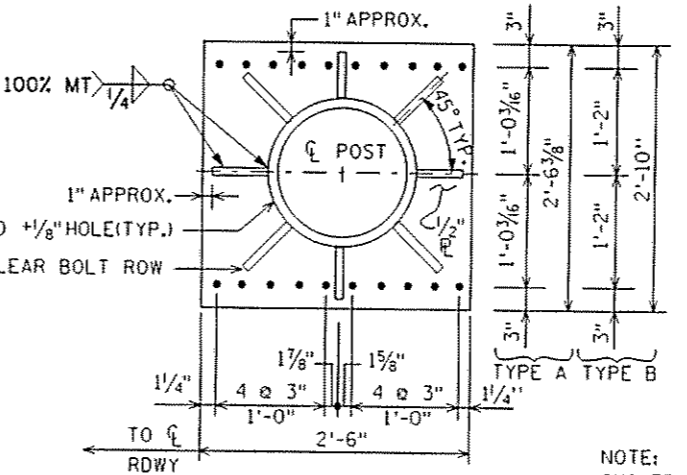
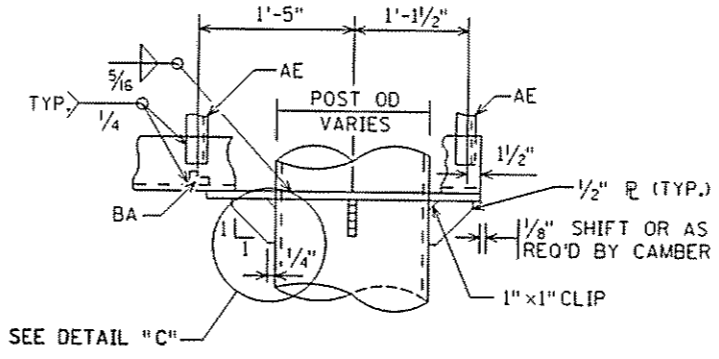
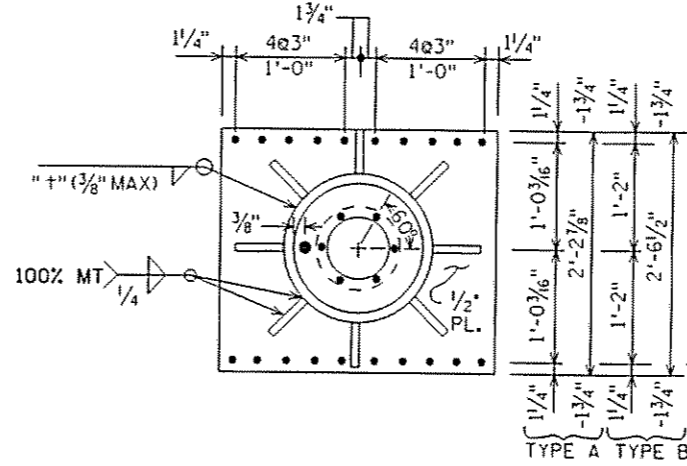
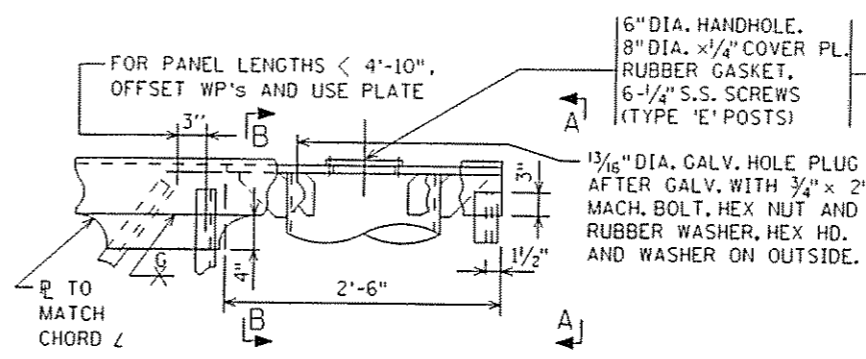


VIEW B-B  
(TYPE 'E' POSTS)



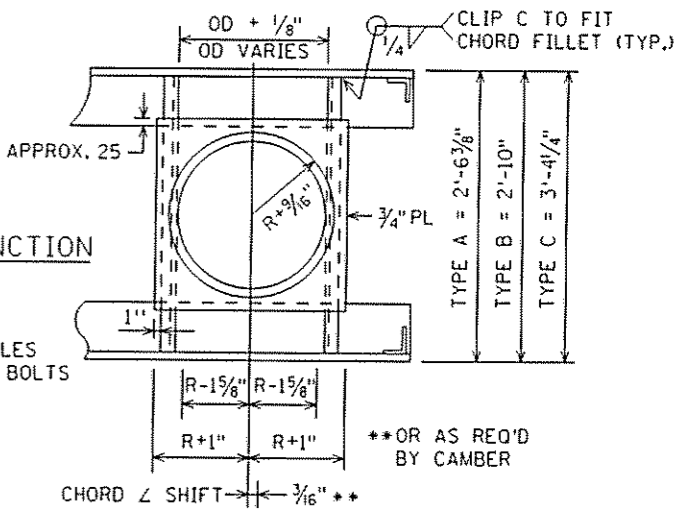
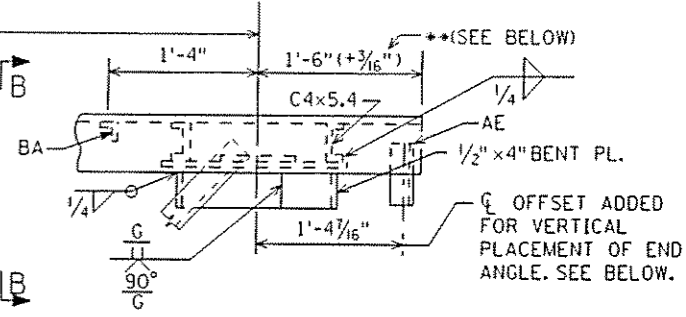
HANDHOLE & COVER PLATE DETAIL  
(TYPE 'E' POSTS)

△ = FOR TYPE 'E' POST ONLY; LOCATE 45° AWAY FROM TRAFFIC. 10" x 6" x 1/2" x 0'-2" STRUCTURAL TUBE OR EQUAL W/1/4" RUBBER GASKET.

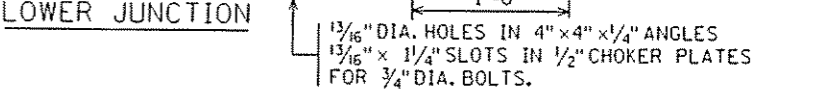
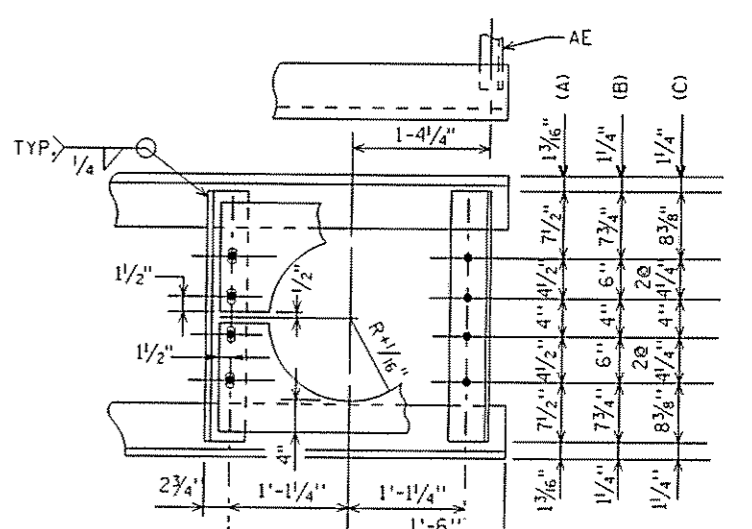


CANTILEVER TRUSS

NOTE: CHOKER PLATES AND HANDHOLE COVERS SHALL BE GALVANIZED SEPARATELY.



UPPER JUNCTION



LOWER JUNCTION

SIMPLE TRUSS

STANDARD OVERHEAD SIGN SUPPORTS INTERIM DESIGN B

TRUSS/POST CONNECTION & BASEPLATES

DRAWING ST-4



PLOTTED/REVISED: 1/5/2009

DISTRICT #: METRO  
 IPLOT NAME: T0215670HST SHEETS ST5  
 PATH & FILENAME: S:\TRAFFIC\TC\_Signing\010021567\ST5\T0215670HST SHEETS.dgn

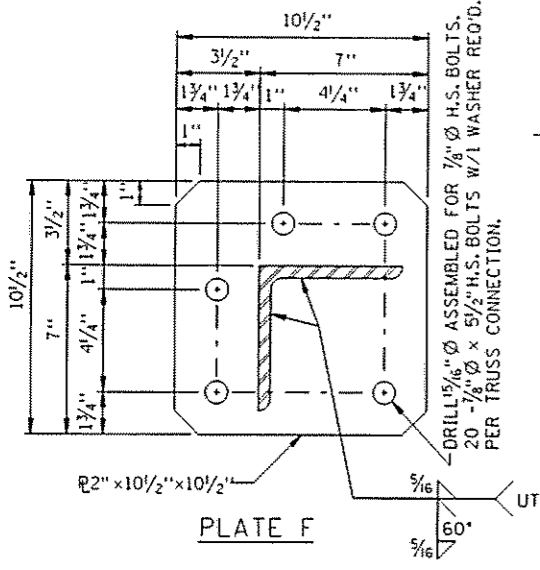
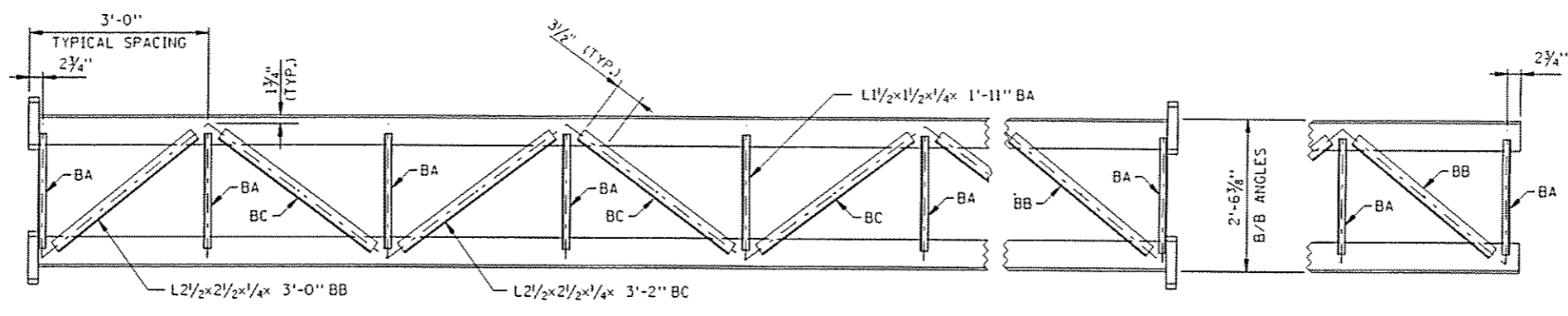


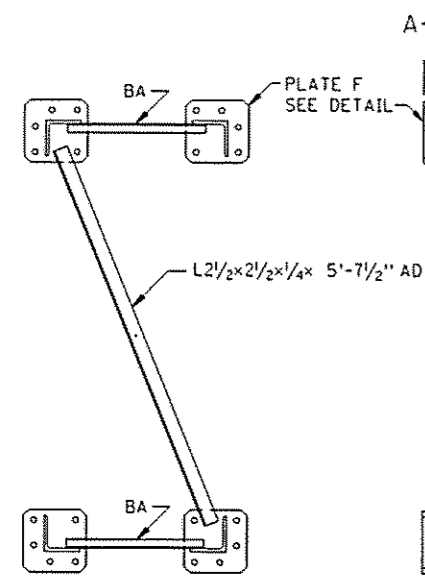
PLATE F



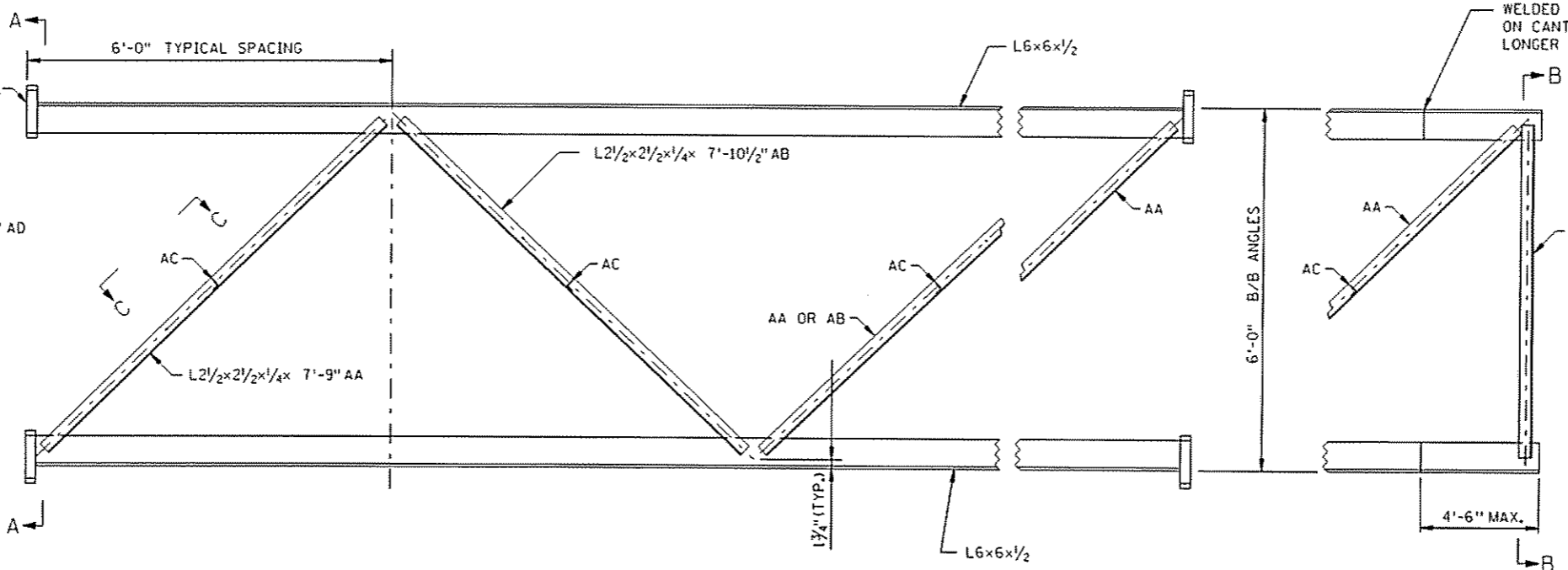
TOP VIEW

TOP VIEW

NOTES:  
 TRUSS SECTIONS SHALL BE MADE IN MULTIPLES OF 6'-0", EXCEPT THAT THE BRACING PANEL NEAREST EACH POST MAY VARY TO MAKE UP THE NEEDED SECTION LENGTH. WELDED CHORD SPLICES ARE NOT PERMITTED EXCEPT IN CANTILEVER TRUSSES AS NOTED BELOW.  
 CANTILEVER TRUSSES SHALL BE SUPPLIED AS A SINGLE UNIT WHENEVER POSSIBLE. WHEN CANTILEVER TRUSS LENGTH EXCEEDS 40'-0" CHORDS MAY BE SPLICED, AS SHOWN, IN THE END BRACING PANEL ONLY. CHORD SPLICE WELD SHALL BE COMPLETE PENETRATION, WITH 100% UT AND MT TESTING PER 2471.3M.  
 UNLESS OTHERWISE SHOWN, ALL WELDS SHALL BE 1/4" FILLET WELDS ALL AROUND.  
 BOLTED SPLICES SHALL NOT BE LOCATED BEHIND CMS SIGNS.  
 PROVIDE 2- 1/16" BRASS, STAINLESS STEEL OR GALVANIZED STEEL SHIMS AT EACH FLANGE TO BRING TRUSS INTO CORRECT CAMBER AND ALIGNMENT.  
 TRUSSES SHALL BE SHOP ASSEMBLED AND MATCH MARKED.  
 ALL VIEWS OF THE TRUSSES ARE DRAWN FROM THE INSIDE OF THE TRUSS LOOKING OUT.  
 SEE DRAWING ST-4 FOR POST CONNECTION DETAILS.

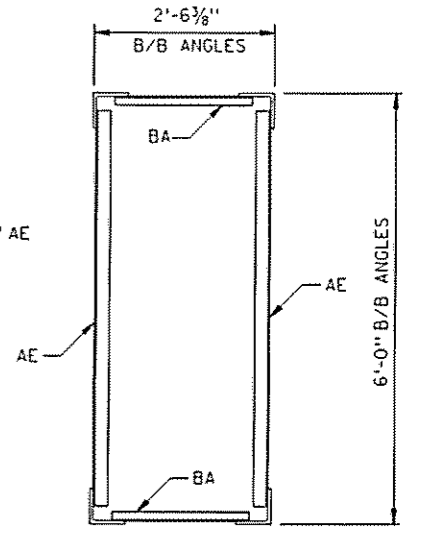


SECTION A-A

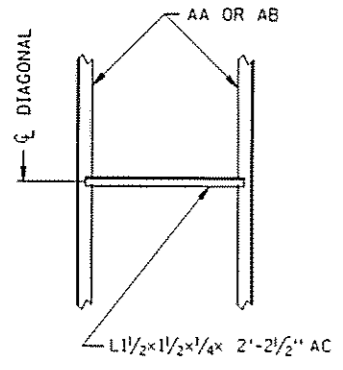


ELEVATION

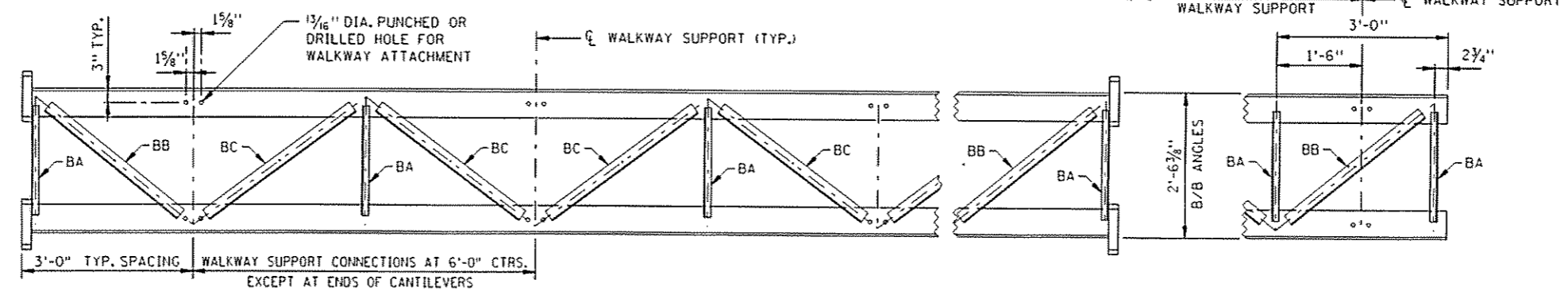
ELEVATION



SECTION B-B



SECTION C-C



BOTTOM VIEW  
 SIMPLE SPAN

BOTTOM VIEW  
 CANTILEVER END

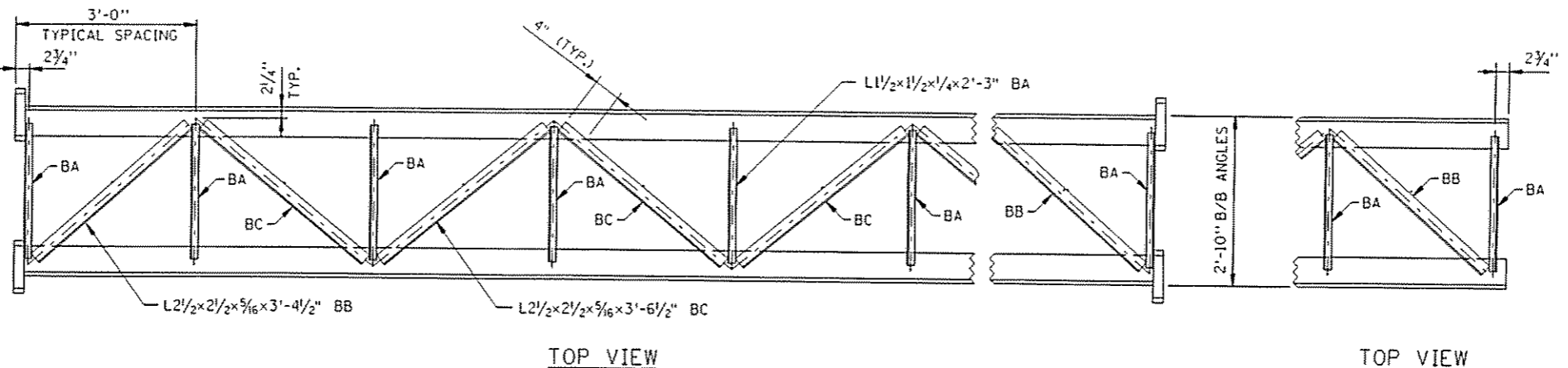
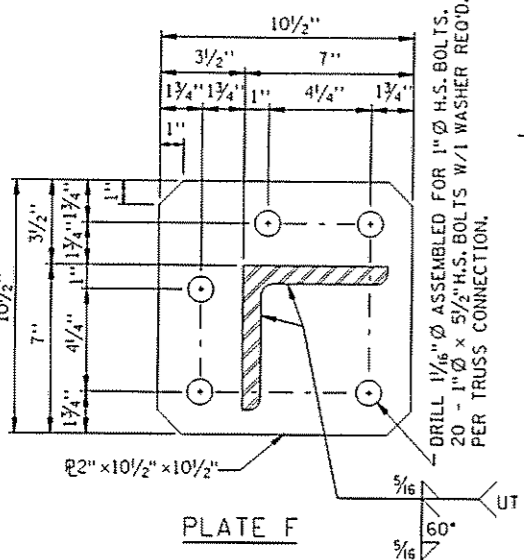
NOTE:  
 THE BOTTOM VIEW IS DETAILED TO PROVIDE FOR WALKWAY ATTACHMENT. WHERE THE WALKWAY IS OMITTED, PROVIDE STRUT BA AS INDICATED IN THE TOP VIEW.

DETAILS SHOWN ARE FOR THE FREE ENDS OF THE CANTILEVER SPANS. ALL OTHER DETAILS FOR CANTILEVER TRUSSES SHALL BE AS SHOWN FOR THE SIMPLE SPANS.

STANDARD OVERHEAD SIGN SUPPORTS INTERIM DESIGN B
SIGN TRUSS DETAILS TRUSS TYPE A
DRAWING ST-5

PLOTTED/REVISED: 1/5/2009

DISTRICT #: METRO  
I/PLOT NAME: T0215670HST SHEETS S16  
PATH & FILENAME: S:\TRAFFIC\TC\_Signing\01021567\PS10215670HST SHEETS S.dgn



**NOTES:**

TRUSS SECTIONS SHALL BE MADE IN MULTIPLES OF 6'-0", EXCEPT THAT THE BRACING PANEL NEAREST EACH POST MAY VARY TO MAKE UP THE NEEDED SECTION LENGTH. WELDED CHORD SPLICES ARE NOT PERMITTED EXCEPT IN CANTILEVER TRUSSES AS NOTED BELOW.

CANTILEVER TRUSSES SHALL BE SUPPLIED AS A SINGLE UNIT WHENEVER POSSIBLE. WHEN CANTILEVER TRUSS LENGTH EXCEEDS 40'-0" CHORDS MAY BE SPLICED, AS SHOWN, IN THE END BRACING PANEL ONLY. CHORD SPLICE WELD SHALL BE COMPLETE PENETRATION, WITH 100% UT AND MT TESTING PER 2471.3M.

UNLESS OTHERWISE SHOWN, ALL WELDS SHALL BE 1/4" FILLET WELDS ALL AROUND.

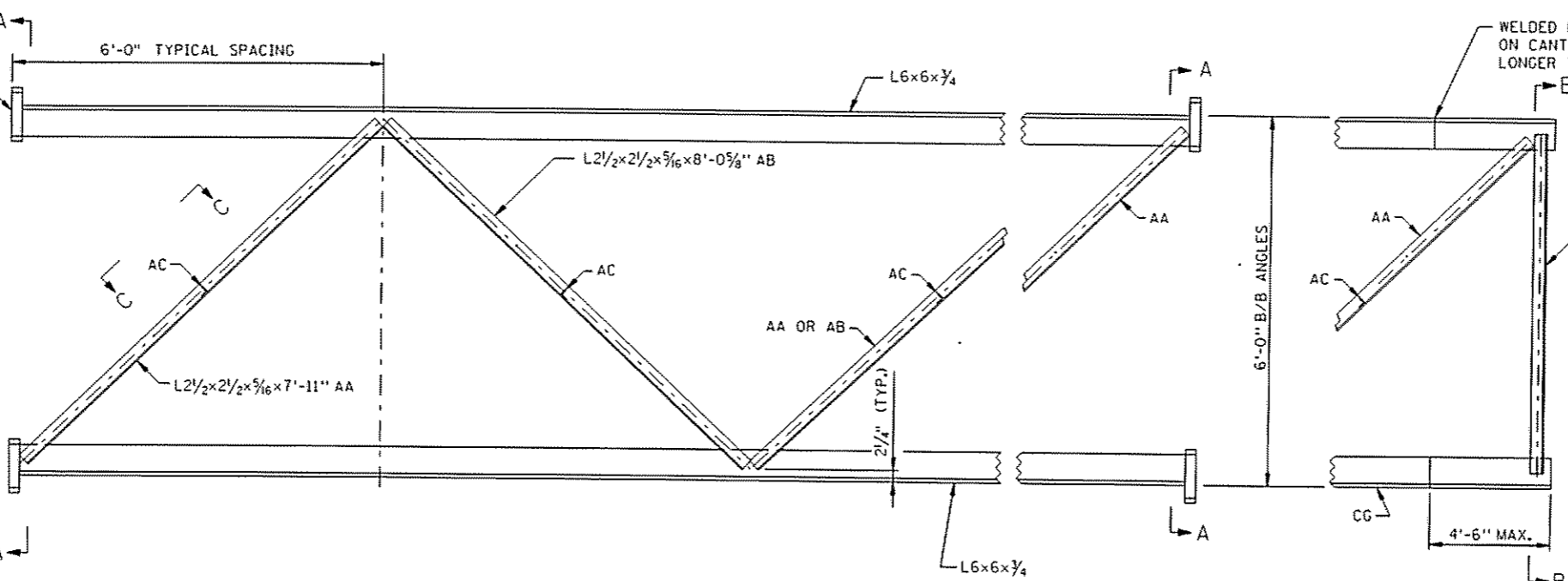
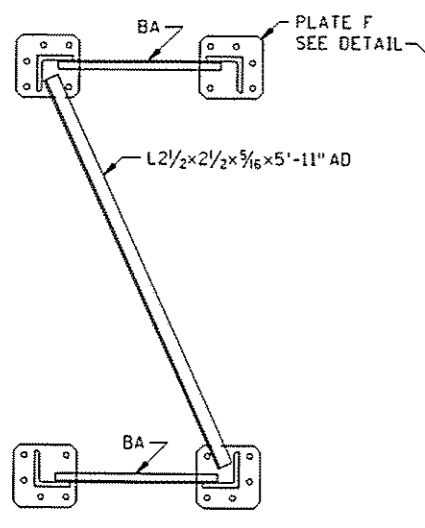
BOLTED SPLICES SHALL NOT BE LOCATED BEHIND CMS SIGNS.

PROVIDE 2- 1/16" BRASS, STAINLESS STEEL OR GALVANIZED STEEL SHIMS AT EACH FLANGE TO BRING TRUSS INTO CORRECT CAMBER AND ALIGNMENT.

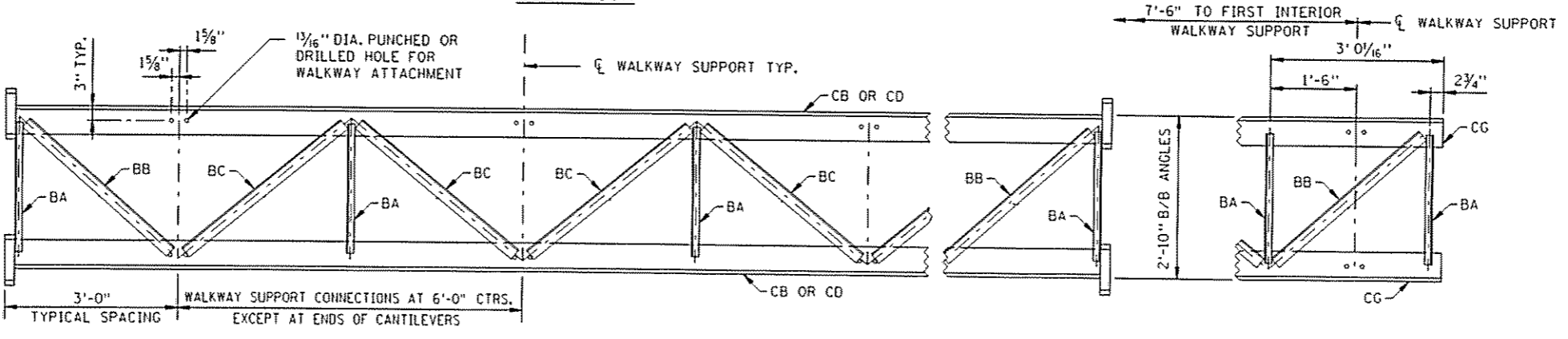
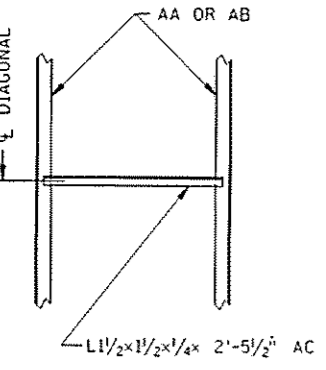
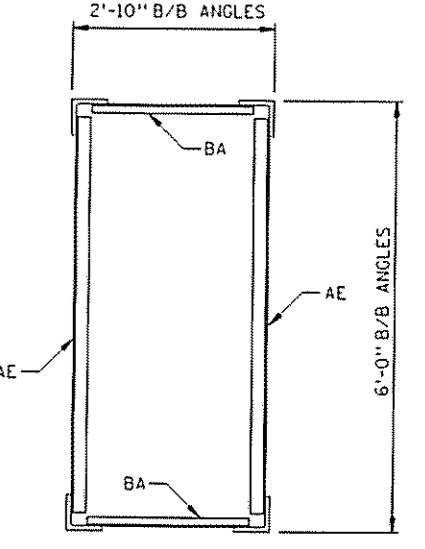
TRUSSES SHALL BE SHOP ASSEMBLED AND MATCH MARKED.

ALL VIEWS OF THE TRUSSES ARE DRAWN FROM THE INSIDE OF THE TRUSS LOOKING OUT.

SEE DRAWING ST-4 FOR POST CONNECTION DETAILS.



WELDED BUTT SPLICE PERMITTED ON CANTILEVER END OF CHORDS LONGER THAN 40'-0".



7'-6" TO FIRST INTERIOR WALKWAY SUPPORT

3' 0 1/16" WALKWAY SUPPORT

**NOTE:**  
THE BOTTOM VIEW IS DETAILED TO PROVIDE FOR WALKWAY ATTACHMENT. WHERE THE WALKWAY IS OMITTED, PROVIDE STRUT BA AS INDICATED IN THE TOP VIEW.

**BOTTOM VIEW**  
SIMPLE SPAN

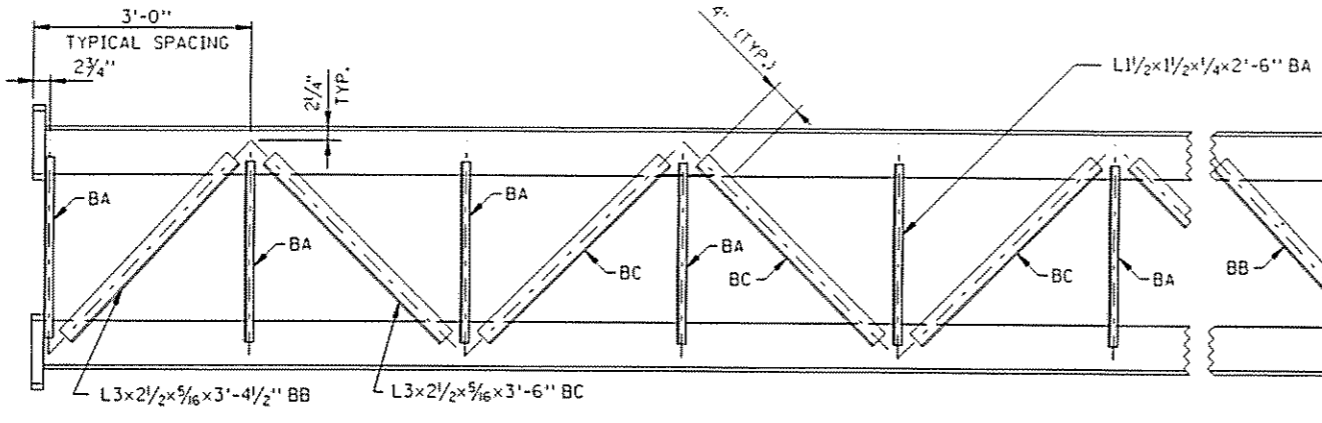
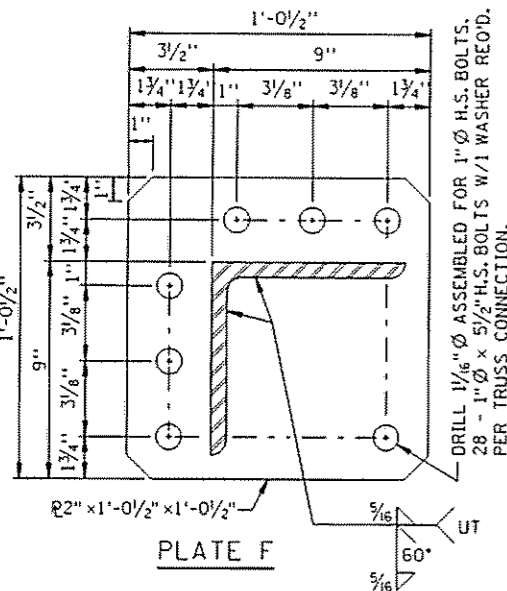
**BOTTOM VIEW**  
CANTILEVER END

DETAILS SHOWN ARE FOR THE FREE ENDS OF THE CANTILEVER SPANS. ALL OTHER DETAILS FOR CANTILEVER TRUSSES SHALL BE AS SHOWN FOR THE SIMPLE SPANS.

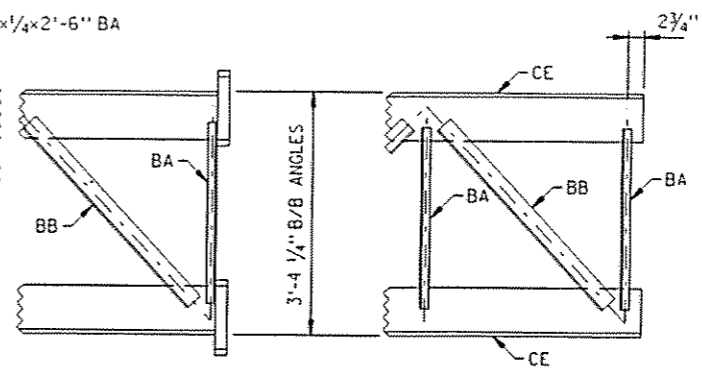
STANDARD OVERHEAD SIGN SUPPORTS INTERIM DESIGN B
SIGN TRUSS DETAILS TRUSS TYPE B
DRAWING ST-6

PLOTTED/REVISED: 1/5/2009

DISTRICT: METRO  
 I/PLOT NAME: T0215670HST SHEETS  
 PATH & FILENAME: S:\TRAFFIC\Signing\010021567\PS1\T0215670HST SHEETS.dgn

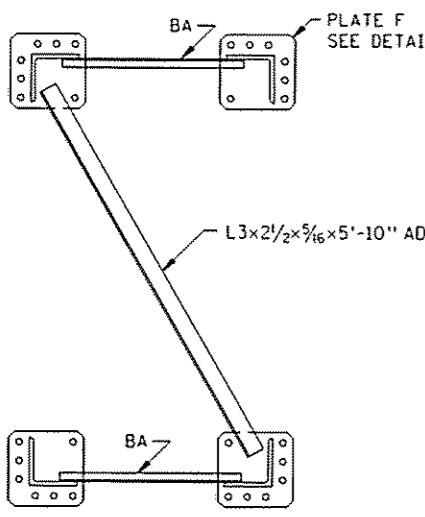


TOP VIEW

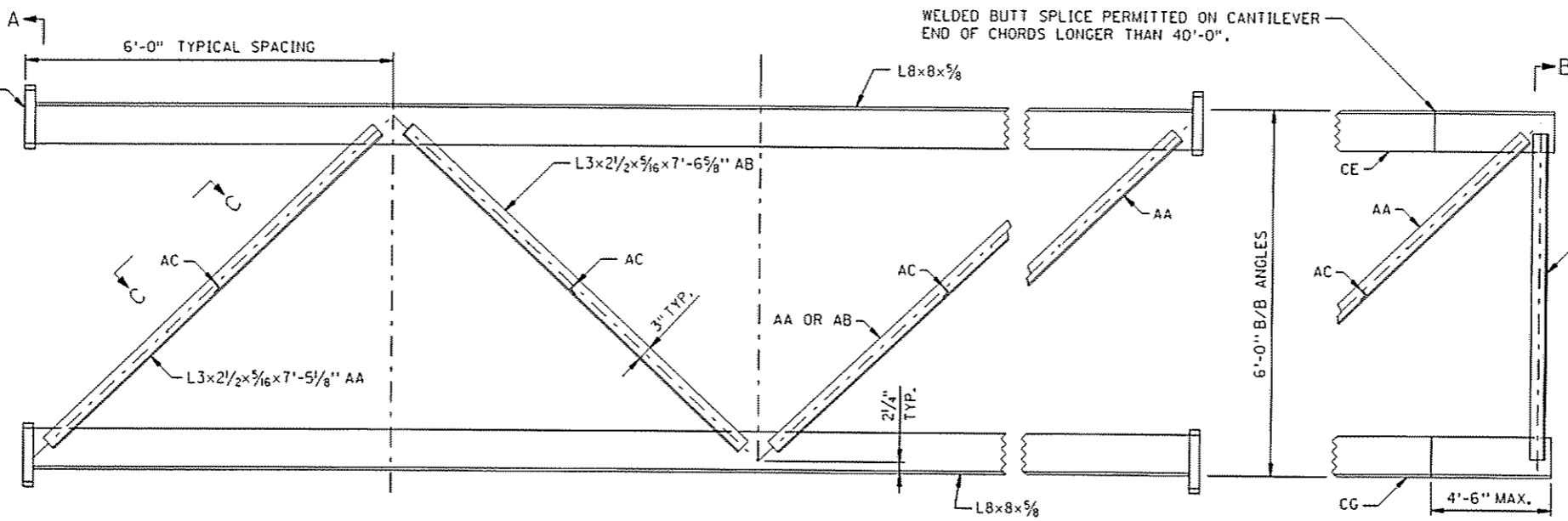


TOP VIEW

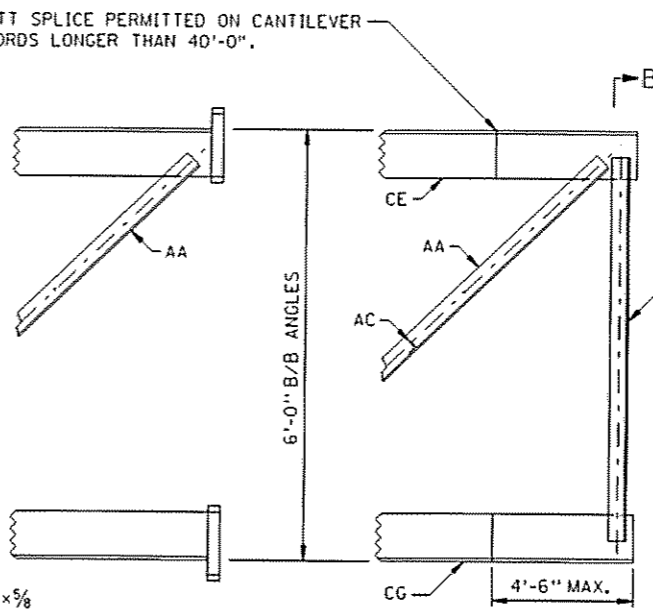
**NOTES:**  
 TRUSS SECTIONS SHALL BE MADE IN MULTIPLES OF 6'-0", EXCEPT THAT THE BRACING PANEL NEAREST EACH POST MAY VARY TO MAKE UP THE NEEDED SECTION LENGTH. WELDED CHORD SPLICES ARE NOT PERMITTED EXCEPT IN CANTILEVER TRUSSES AS NOTED BELOW.  
 CANTILEVER TRUSSES SHALL BE SUPPLIED AS A SINGLE UNIT WHENEVER POSSIBLE. WHEN CANTILEVER TRUSS LENGTH EXCEEDS 40'-0" CHORDS MAY BE SPLICED, AS SHOWN, IN THE END BRACING PANEL ONLY. CHORD SPLICE WELD SHALL BE COMPLETE PENETRATION, WITH 100% UT AND MT TESTING PER 247L3M.  
 UNLESS OTHERWISE SHOWN, ALL WELDS SHALL BE 1/4" FILLET WELDS ALL AROUND.  
 BOLTED SPLICES SHALL NOT BE LOCATED BEHIND CMS SIGNS.  
 PROVIDE 2- 1/16" BRASS, STAINLESS STEEL OR GALVANIZED STEEL SHIMS AT EACH FLANGE TO BRING TRUSS INTO CORRECT CAMBER AND ALIGNMENT.  
 TRUSSES SHALL BE SHOP ASSEMBLED AND MATCH MARKED.  
 ALL VIEWS OF THE TRUSSES ARE DRAWN FROM THE INSIDE OF THE TRUSS LOOKING OUT.  
 SEE DRAWING ST-4 FOR POST CONNECTION DETAILS.



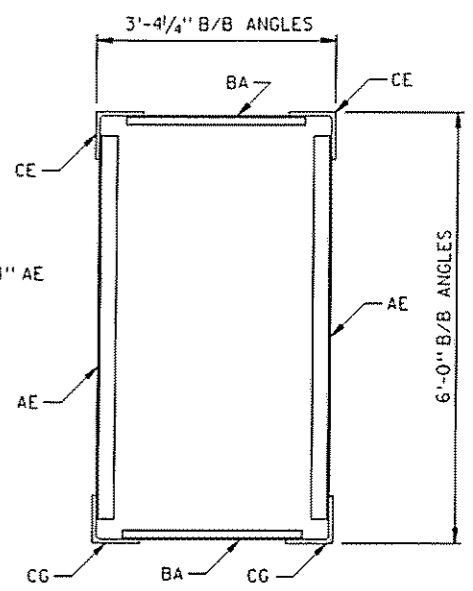
SECTION A-A



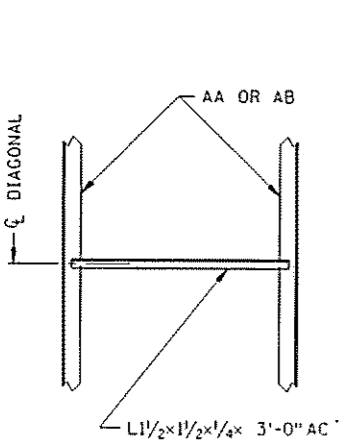
ELEVATION



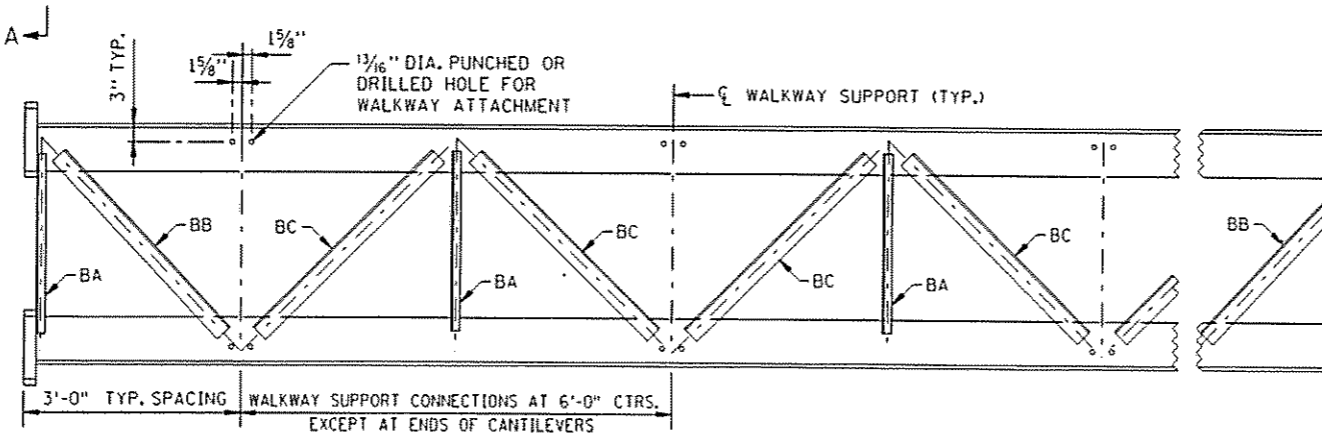
ELEVATION



SECTION B-B

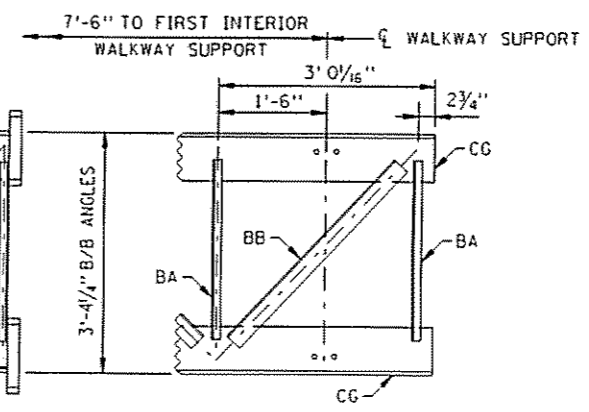


SECTION C-C



BOTTOM VIEW  
 SIMPLE SPAN

**NOTE:**  
 THE BOTTOM VIEW IS DETAILED TO PROVIDE FOR WALKWAY ATTACHMENT, WHERE THE WALKWAY IS OMITTED, PROVIDE STRUT BA AS INDICATED IN THE TOP VIEW.



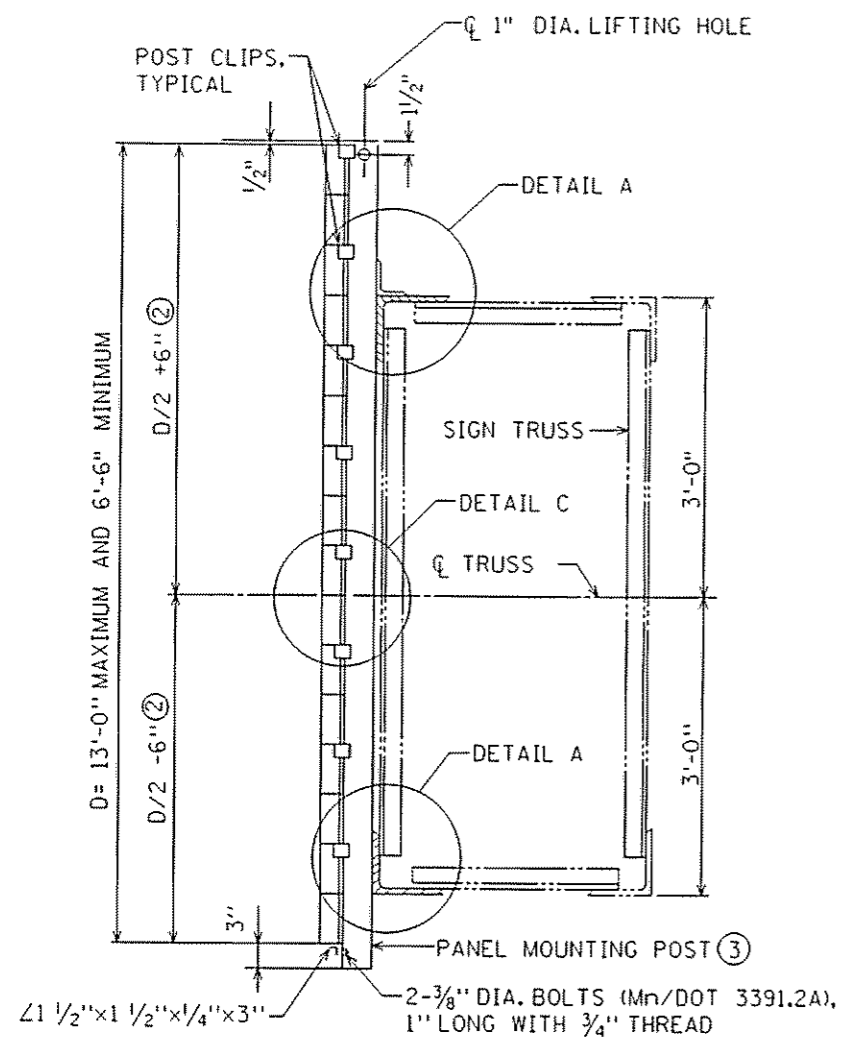
BOTTOM VIEW  
 CANTILEVER END

DETAILS SHOWN ARE FOR THE FREE ENDS OF THE CANTILEVER SPANS. ALL OTHER DETAILS FOR CANTILEVER TRUSSES SHALL BE AS SHOWN FOR THE SIMPLE SPANS.

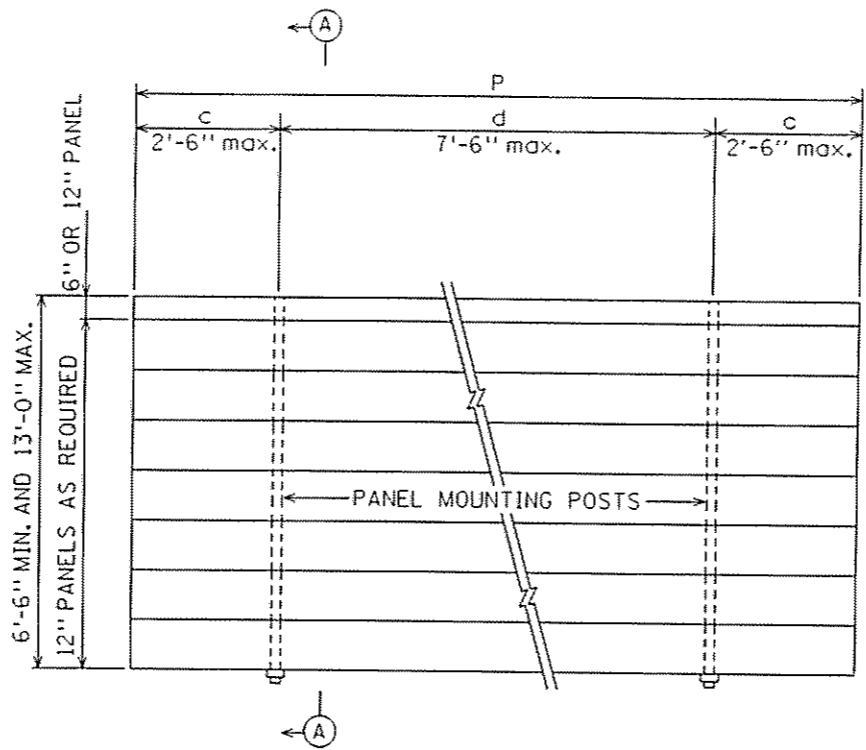
STANDARD OVERHEAD SIGN SUPPORTS INTERIM DESIGN B
SIGN TRUSS DETAILS TRUSS TYPE C
DRAWING ST-7

PLOTTED/REVISED: 1/5/2009

DISTRICT #: METRO  
 I/PLOT NAME: T0215670HST/SHEETS/ST10  
 PATH & FILENAME: S:\TRAFFIC\TC Signing\010021567\AP\ST0215670HST/SHEETS.dgn



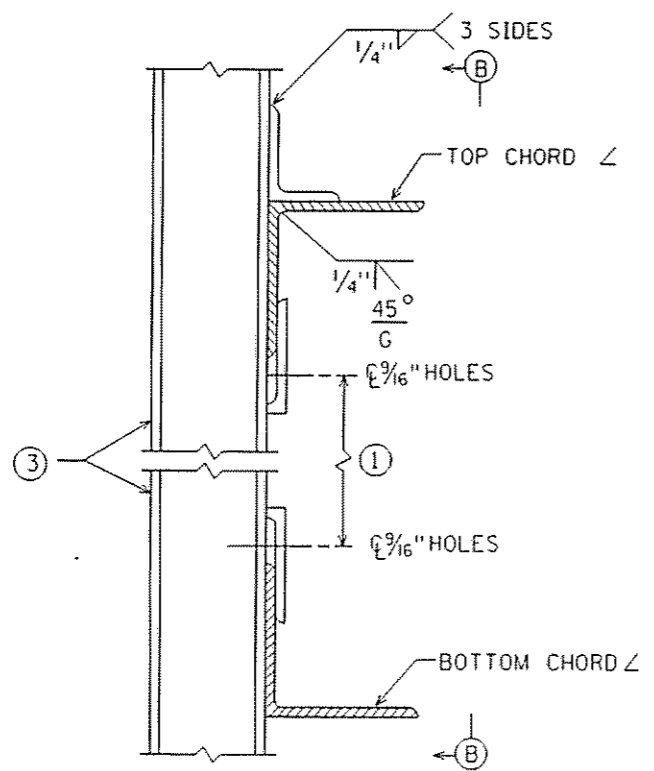
SECTION A-A



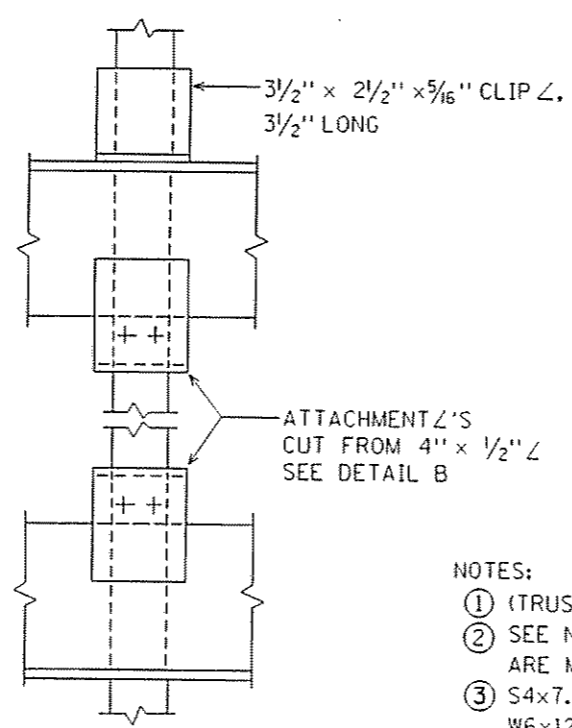
PANEL MOUNTING POST	
NO. OF POSTS	
2	P=144" OR LESS, c=.207P, d=.586P
3	P=150" THRU 204", c=.145P, d=.355P
4	P=210" THRU 276", c=.107P, d=.262P
5	P=282" THRU 348", c=.084P, d=.208P
6	P=354" THRU 420", c=.070P, d=.172P
7	P=426" THRU 492", c=.059P, d=.147P

POST SPACING MAY BE ADJUSTED AS REQUIRED IF CONFLICT WITH TRUSS DETAILS IS ENCOUNTERED.

SIGN PANEL ELEVATION

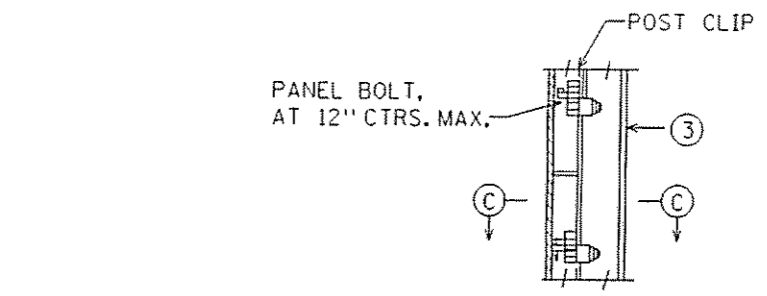


DETAIL A

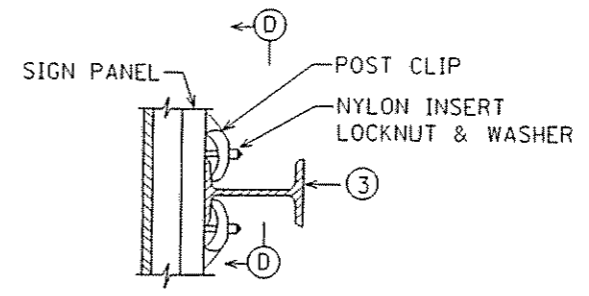


VIEW B-B

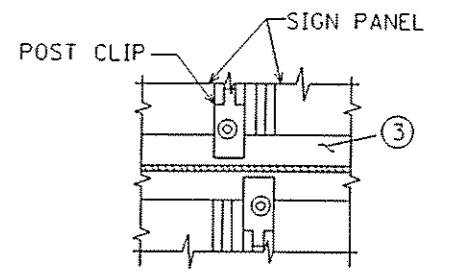
- NOTES:
- ① (TRUSS DEPTH)-(TOP & BOTTOM CHORD ∠ LEGS)-1/4"
  - ② SEE NOTE 1 ON ST-1 WHEN STANDARD PANELS AND CMS ARE MOUNTED ON THE SAME SPAN
  - ③ S4x7.7 FOR SIGN HEIGHTS ≤ 11'-0"  
 W6x12 FOR SIGN HEIGHTS OVER 11'-0"



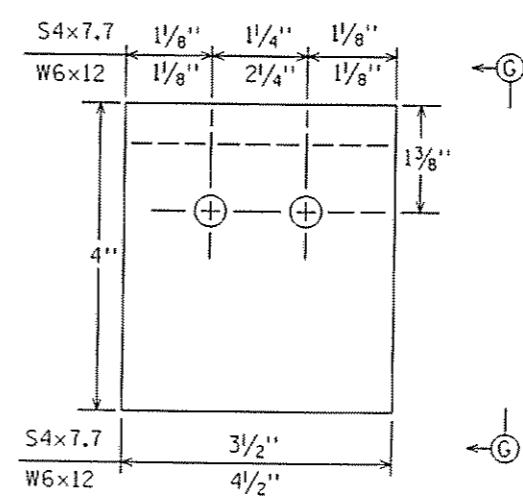
DETAIL C



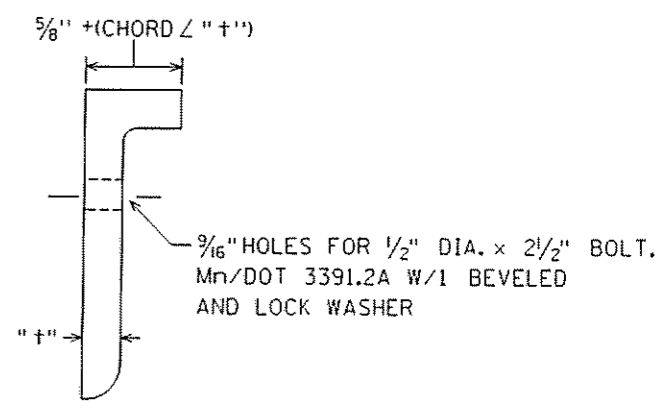
SECTION C



SECTION D-D



DETAIL B



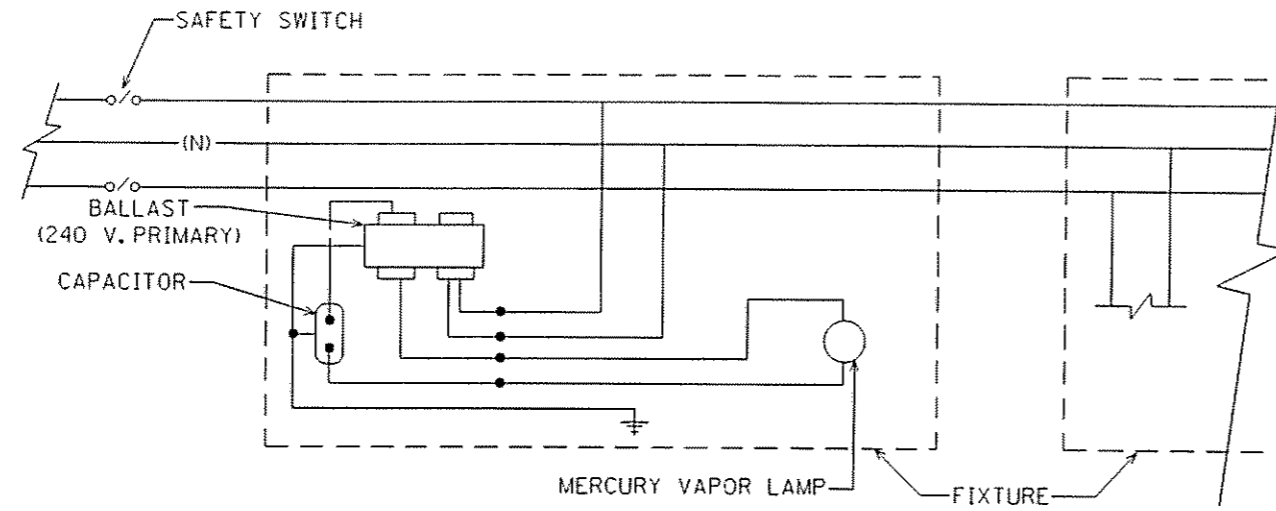
VIEW G-G

STANDARD OVERHEAD SIGN SUPPORTS  
 INTERIM DESIGN B

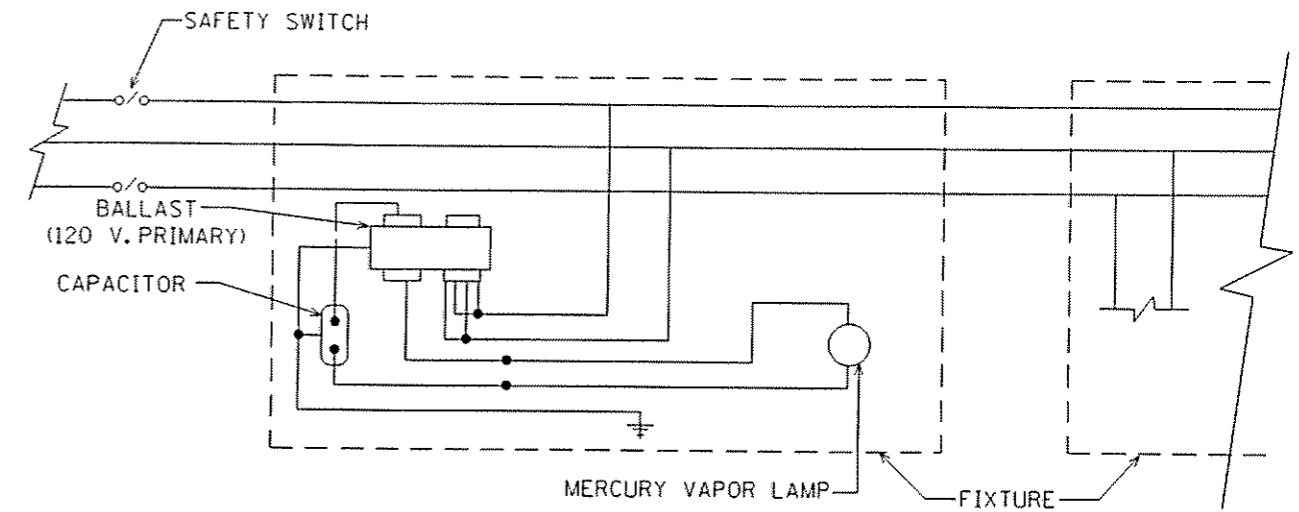
SIGN PANEL AND PANEL  
 MOUNTING POST DETAILS

DRAWING ST-10

PLOTTED/REVISED: 1/5/2009

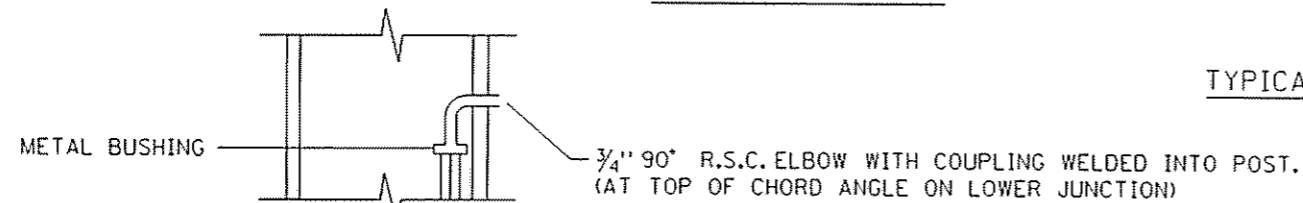


240/480 V. CIRCUIT



120/240 V. CIRCUIT

TYPICAL CIRCUIT DIAGRAMS



3 - 1/C NO. 12AWG. 600 VAC.. TYPE T.H.W. T.H.W.N. OR X.H.H.W. INSULATION. STRANDED COPPER CONDUCTORS TO SAFETY SWITCH.

SPLICE THE ARMORED CABLE CONDUCTORS TO THE CONDUCTORS FROM THE SAFETY SWITCH WITH SPLIT BOLT TYPE CONNECTORS AT THE LEVEL OF THE HANDHOLE. THE SPLICES SHALL BE INSULATED TO THE LEVEL OF INSULATION OF THE POWER CONDUCTORS AND SHALL BE WATERPROOFED. THE SPLICES SHALL BE DRESSED IN THE CENTER OF THE POST AND UP FROM THE BASE PLATE WITH SUFFICIENT EXCESS CONDUCTOR LENGTH PROVIDED TO PERMIT WITHDRAWAL OF THE SPLICES THROUGH THE HANDHOLE FOR MAINTENANCE PURPOSES.

GROUNDING BOLT, WASHER AND WING NUT

FASTEN THE ARMORED CABLE SHEATH TO THE GROUND CONNECTION

SIGN GROUNDING CABLE

3" 90° GALV. CONDUIT ELBOW (MUST EXTEND AT LEAST 6" ABOVE ELEV. A)

18" MIN.

5/8" DIA. X 15' COPPER CLAD STEEL GROUND ROD. ATTACH A BARE NO. 6 AWG GROUND CONDUCTOR TO THE GROUND ROD WITH A BRONZE GROUNDING CLAMP. WHERE ROCK IS ENCOUNTERED, SEE SECTION 250-83 NATIONAL ELECTRICAL CODE.

SIGN BASE DETAIL

ELECTRICAL NOTES:

1. WHEN SIGN LIGHTING SYSTEMS HAVE BEEN COMPLETED, THE CONTRACTOR SHALL, WITHOUT FURTHER COMPENSATION, CONDUCT BURNING AND RESISTANCE TESTS FOR FINAL ACCEPTANCE. THE RESISTANCE TO GROUND OF EACH UNGROUNDED CONDUCTOR SHALL BE NOT LESS THAN 8 MEGOHMS.
2. ALL FITTINGS, HUBS, UNIONS, BUSHINGS, ETC. SHALL BE SUPPLIED AS PART OF CONDUIT. CONDUIT ENTERING SIGN POSTS SHALL HAVE INSULATED GROUNDING BUSHINGS INSTALLED BEFORE PULLING WIRE.
3. CONDUIT ON STRUCTURE SHALL BE SURFACED MOUNTED, STRAPPED AT EVERY ANGLE BRACE WITH U-BOLT TYPE CLAMPS.
4. SUCCESSIVE LIGHTING FIXTURES SHALL BE CONNECTED ON ALTERNATE SIDES OF THE 3-WIRE CIRCUIT.
5. THE CABLE SHEATH SHALL EXTEND AT LEAST 4" ABOVE THE TOP OF THE CONDUIT END AND THE TAPE ARMOR OF ARMORED CABLE SHALL BE CONNECTED TO THE GROUNDING BOLT IN THE SIGN POSTS.
6. WIRING FROM THE SAFETY SWITCH TO LIGHTING FIXTURES SHALL BE 1/C NO. 12 AWG AND SHALL BE RUN IN 3/4" R.S.C. ALL SPLICING SHALL BE ACCOMPLISHED WITH A WIRE NUT AND WATERPROOF COATING. ALL CONDUIT CONNECTIONS SHALL BE RAIN TIGHT.

DISTRICT: METRO  
 I/PLOT NAME: T0215670HST SHEETS ST12  
 PATH & FILENAME: S:\TRAFFIC\TC Signlrg\010021567\T0215670HST SHEETS.dgn

STANDARD OVERHEAD SIGN SUPPORTS INTERIM DESIGN B	
ELECTRICAL DETAILS	
DRAWING	ST-12

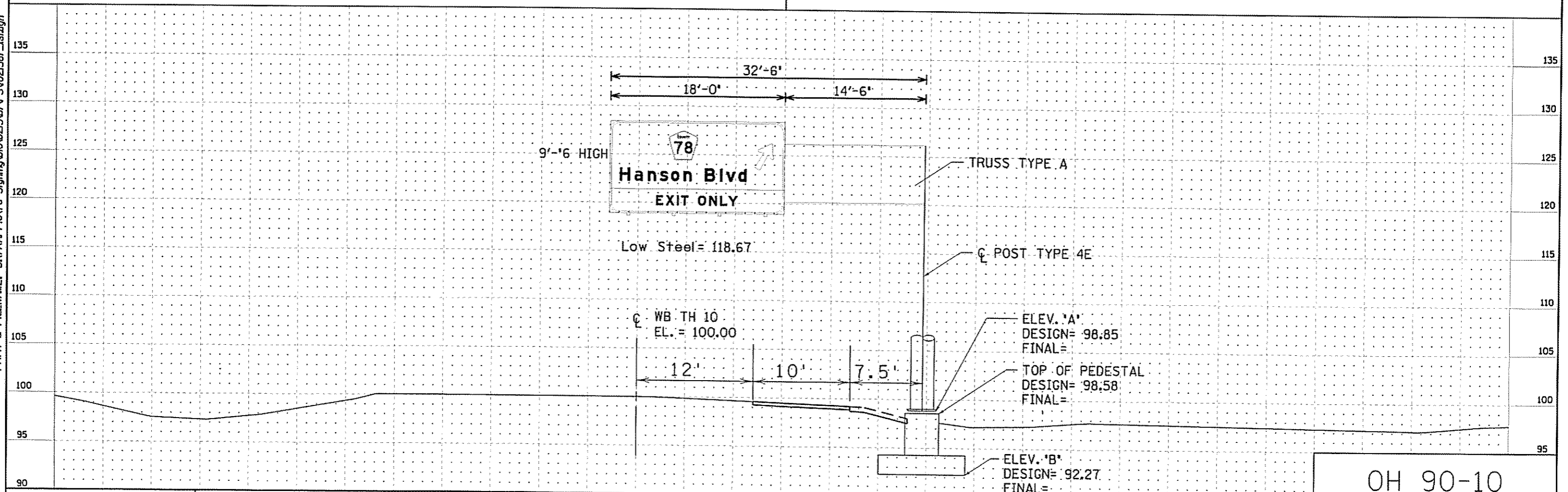
PLOTTED/REVISED: 1/5/2009

OH 90-10  
W.B. TH 10  
STA. 374+00  
QUANTITIES

	<u>DESIGN</u>	<u>FINAL</u>
POST STEEL	4448 LBS	_____
TRUSS STEEL	3998 LBS	_____
WALKWAY SUPPORT STEEL	LBS	_____
WALKWAY GRATING STEEL	LBS	_____
PANEL MOUNTING POST STEEL	372 LBS	_____
CONCRETE (SPREAD) FOOTINGS	11.3 CU YDS	_____

NOTES: 1. LOW STEEL IS BOTTOM OF POSTS ON TALLEST PANEL.  
2. STRUCTURE IS DESIGNED FOR FUTURE WALKWAY.

DISTRICT 4, METRO  
I/PLOT NAME: 1021567\_xsi019010  
PATH & FILENAME: S:\TRAFFIC\TC Sign\101021567\PSV021567\_xsi.dgn



OH 90-10

LEGEND OF SYMBOLS	
	CABLE TRAY
-----	CONDUIT - INPLACE
-----	CONDUIT - F&I
-----	CONDUIT FIBER ONLY - INPLACE
-----	CONDUIT FIBER ONLY - F&I
---	DIRECT BURIED COMMUNICATION CABLE - INPLACE
---	DIRECT BURIED COMMUNICATION CABLE - F&I
---	DIRECT BURIED POWER CABLE - INPLACE
---	DIRECT BURIED POWER CABLE - F&I
□	LOOP DETECTOR- DESIGN (SPECIFY)
⊞	FLASHER - INPLACE
⊞	FLASHER - F&I
↘	FLASHING BEACON - F&I
⌋	FOUNDATION INPLACE, GATE ARM - F&I
⌋	FOUNDATION F&I, GATE ARM - F&I
⌋	GATE ARM - INPLACE
⌋	GUARDRAIL END TREATMENT (SPECIFY)
•••••	GUARDRAIL (PLATE BEAM) - (SPECIFY)
⊙	HANDHOLE - INPLACE
⊙	HANDHOLE - F&I
⊞	JUNCTION BOX OR CONDULET - INPLACE
⊞	JUNCTION BOX OR CONDULET - F&I
↔	LANE ARROW
⌋	OVERHEAD SIGN - INPLACE
⌋	OVERHEAD SIGN - F&I
□	CABINET (SPECIFY) - INPLACE
■	CABINET (SPECIFY) - F&I
⊞	PEDESTAL - INPLACE
⊞	PEDESTAL - F&I

LEGEND OF SYMBOLS	
⊞	RAMP CONTROL SIGNAL (DESIGN ONE-WAY) - INPLACE
⊞	RAMP CONTROL SIGNAL (DESIGN ONE-WAY) - F&I
⊞	RAMP CONTROL SIGNAL (DESIGN TWO-WAY) - INPLACE
⊞	RAMP CONTROL SIGNAL (DESIGN TWO-WAY) - F&I
⊞	RAMP CONTROL SIGNAL (DESIGN ONE-WAY)(SCREW IN BASE) - INPLACE
⊞	RAMP CONTROL SIGNAL (DESIGN ONE-WAY)(SCREW IN BASE) - F&I
⊞	RAMP CONTROL SIGNAL (DESIGN TWO-WAY)(SCREW IN BASE) - INPLACE
⊞	RAMP CONTROL SIGNAL (DESIGN TWO-WAY)(SCREW IN BASE) - F&I
□	SHELTER (TMS) - INPLACE
■	SHELTER (TMS) - F&I
⌋	SIGN (TYPE A OR D) - (SPECIFY)
⌋	SIGN (TYPE C) - (SPECIFY)
⌋	SIGN (TYPE DMS) - (SPECIFY)
→	SIGNAL FACE - INPLACE
→	SIGNAL FACE - F&I
⊞	SPLICE CABINET - (SPECIFY)
⊞	SPLICE VAULT (FIBER OPTIC) - (SPECIFY)
⊞	TELEVISION CAMERA (CCTV) - (SPECIFY)
+	WOOD POLE - F&I
+	WOOD POLE - INPLACE
⊞	WOOD POLE F&I, SERVICE INSTALLATION - F&I
⊞	WOOD POLE INPLACE, SERVICE INSTALLATION - F&I
⊞	WOOD POLE INPLACE, SERVICE INSTALLATION - INPLACE
⊞	FIBER PATCHING SHELTER - F&I
▲	OUTDOOR FIBER SPLICE ENCLOSURE - F&I
⊞	PULL VAULT
⊞	ELECTRICAL SERVICE
⊞	TRANSFORMER

TABULATION OF TRAFFIC MANAGEMENT SYSTEM ESTIMATED QUANTITIES					
TAB	ITEM	NOTES	UNIT	TOTAL ESTIMATED QUANTITIES	SP 0215-67 ESTIMATED QUANTITY
	REMOVE WOOD POLE	2	EACH	1	1
	HANDHOLE TYPE-PVC METAL COVER		EACH	2	2
	BURIED CABLE SIGN		EACH	16	16
	2" NON-METALLIC CONDUIT		LN FT	170	170
	LEAD-IN CABLE 2 CONDUCTOR NO 14		LN FT	2350	2350
	LOOP DETECTOR DESIGN PREFORMED		EACH	7	7
	LOOP DETECTOR DESIGN SANCUT		EACH	17	17
	RELOCATE FIBER OPTIC CABLE	1	LN FT	100	100
	2" BORED CONDUIT		LN FT	150	150

NOTES:

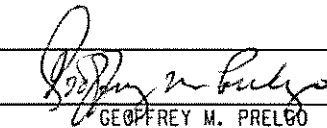
- AS NECESSARY AT NOISE WALL CROSSINGS
- INCLUDES WEATHERHEAD AND RISER

GENERAL NOTES:

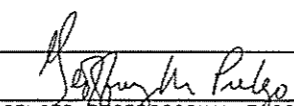
TURF ESTABLISHMENT SHALL BE CONSIDERED INCIDENTAL FOR RESTORATION WORK AT TRAFFIC MANAGEMENT SYSTEM INSTALLATION AREAS IN ACCORDANCE WITH MN/DOT 2575.1, 2575.2, 2575.3, AND THE FOLLOWING:

- SEED, MIXTURE 250 APPLIED AT A RATE OF 70 POUNDS/ACRE.
- EROSION CONTROL BLANKET
- COMMERCIAL FERTILIZER, TYPE 3 ANALYSIS 22-5-10 (NPK) APPLIED AT A RATE OF 350 POUNDS/ACRE.

I HEREBY CERTIFY THAT SHEETS 206 THROUGH 216 OF THIS PLAN  
 WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND  
 THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER  
 THE LAWS OF THE STATE OF MINNESOTA.

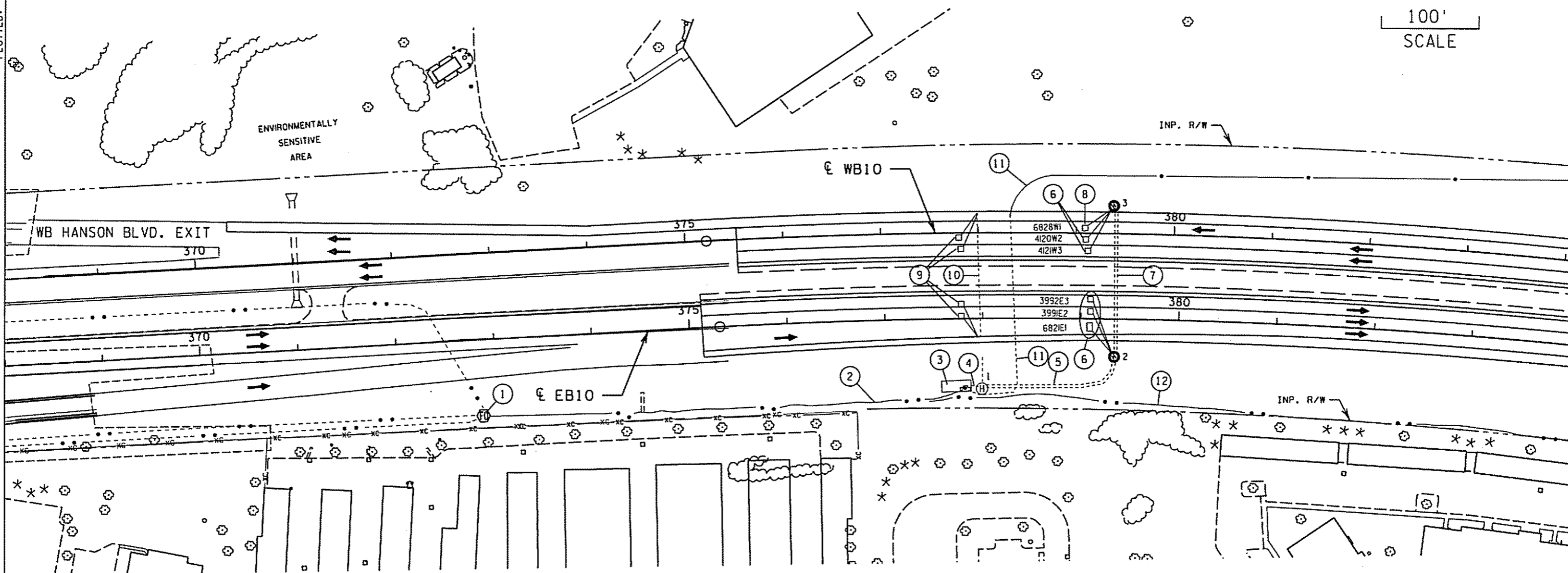
  
 \_\_\_\_\_  
 GEOFFREY M. PRELEO  
 DATE JAN. 15, 2009 LIC. NO. 26530  
 DESIGNER Scott Coozenoy

REV. NO.	DATE: / /
REV. NO.	DATE: / /

CERTIFIED BY  LIC. NO. 26530 JAN. 15 2009  
 LICENSED PROFESSIONAL ENGINEER

STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 206 OF 222 SHEETS

TMS COMPONENTS



- ① INPLACE FO SPLICE VAULT & OUTDOOR FIBER SPLICE ENCL.
- ② INPLACE FO CABLE (36SM) & 1-FO PIGTAIL (6SM)
- ③ INPLACE 334Z-99 CAB. (10-229.64)
- ④ INPLACE 2" NMC & 4-2/C NO.14  
F&I 6-2/C NO.14
- ⑤ F&I 2" NMC & 6-2/C NO.14
- ⑥ F&I LOOP DETECTOR DESIGN SAWCUT

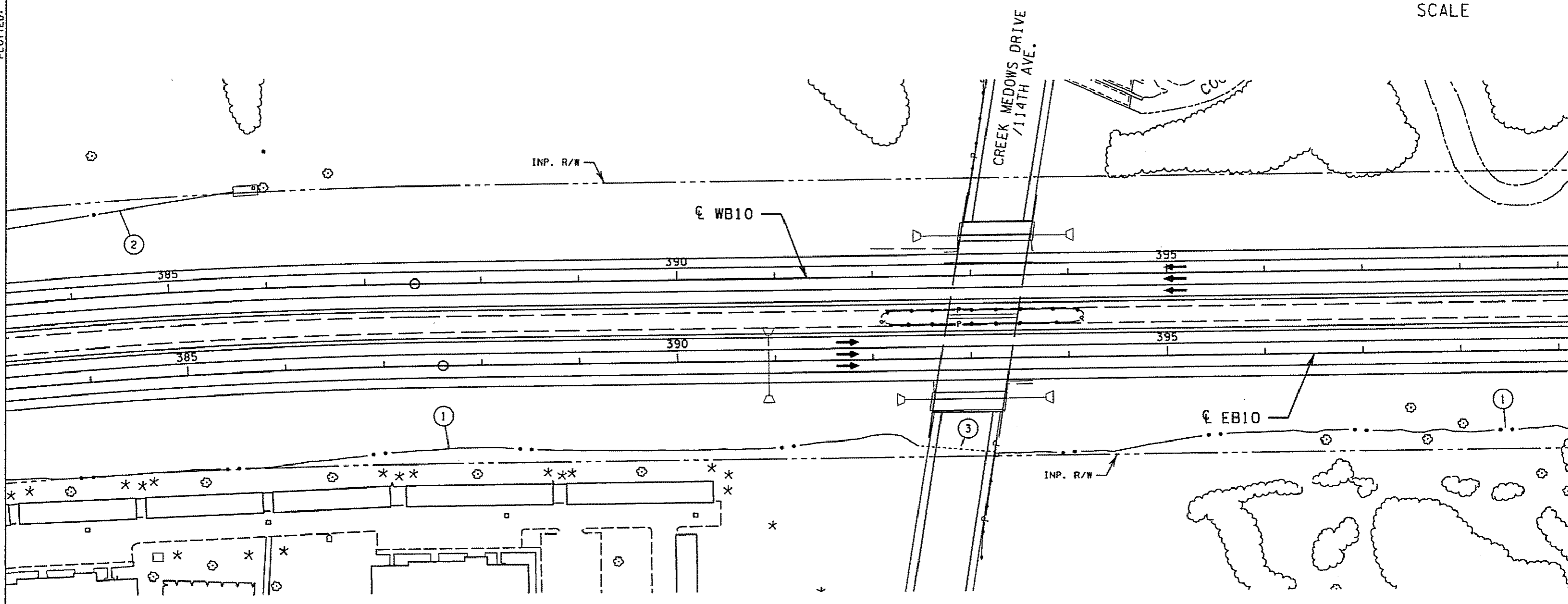
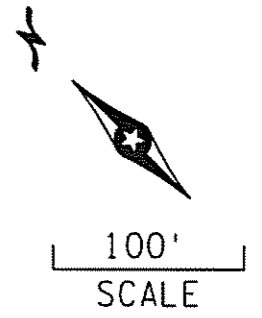
- ⑦ F&I 2" NMC BORE & 3-2/C NO.14
- ⑧ F&I LOOP DETECTOR DESIGN PREFORMED
- ⑨ ABANDON INPLACE LOOP DETECTORS
- ⑩ ABANDON INPLACE 2" NMC & 2-2/C NO.14
- ⑪ SOP FROM CONNEXUS ENERGY
- ⑫ INPLACE FO CABLE (36SM)

TRAFFIC MANAGEMENT SYSTEM  
 TH 10 EAST OF HANSON BLVD.

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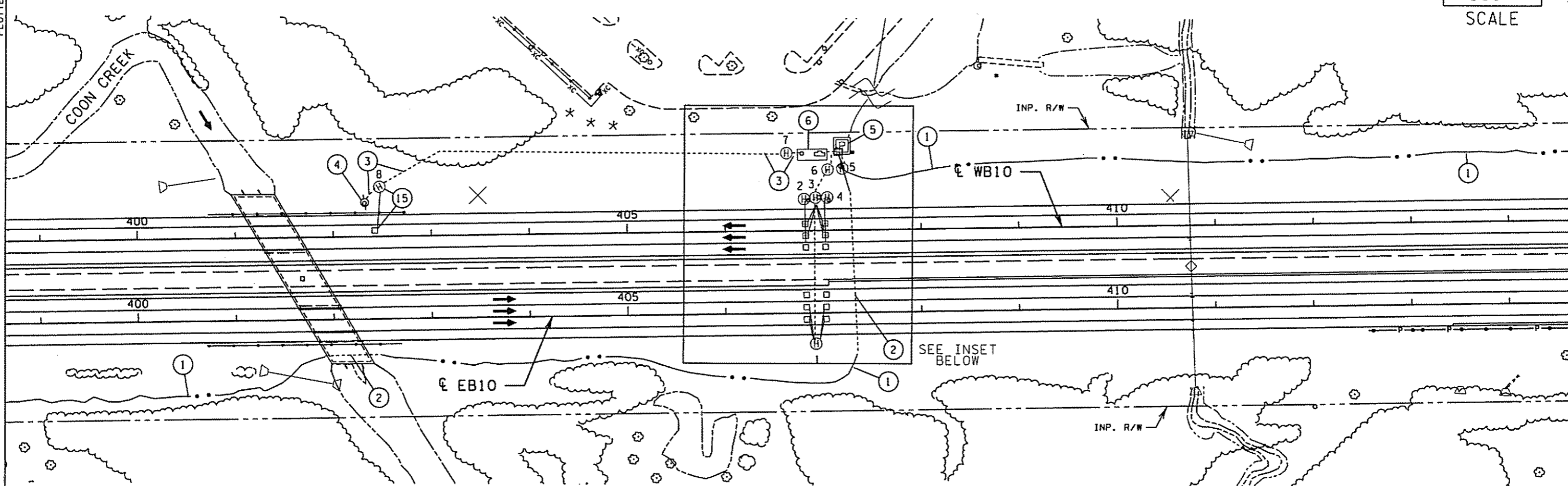
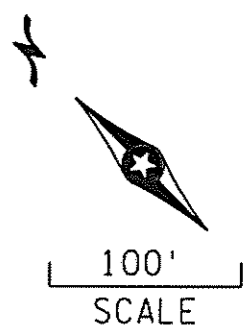
- ① INPLACE FO CABLE (36SM)
- ② INPLACE SOP FROM CONNEXUS ENERGY
- ③ INPLACE 2" NMC & 1-FO CABLE (36SM)

TRAFFIC MANAGEMENT SYSTEM  
 TH 10 AT 114TH AVE.

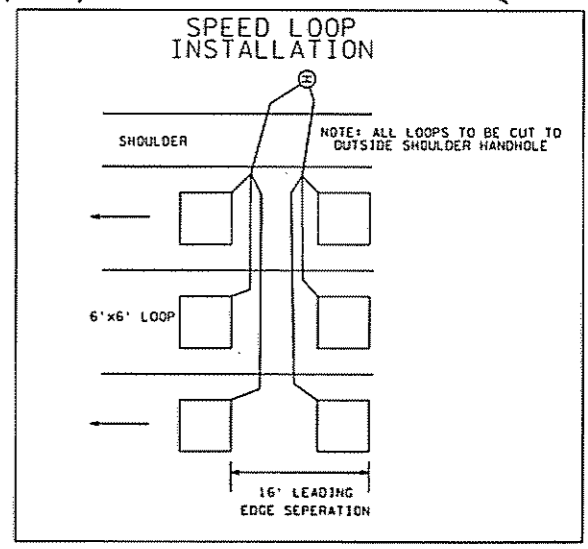
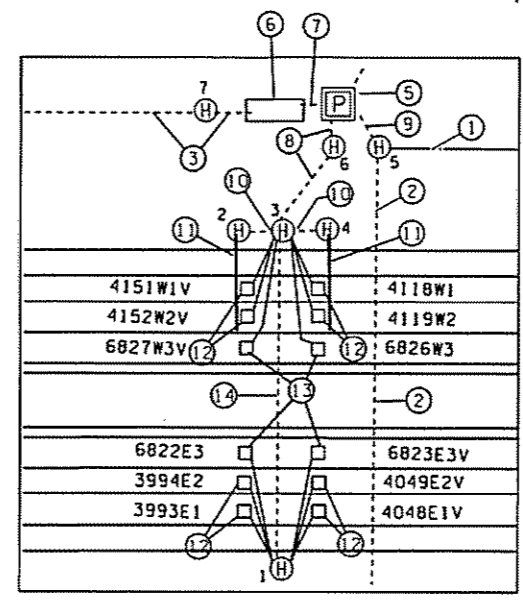
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- ① INPLACE FO CABLE (36SM)
- ② INPLACE 2" NMC & 1-FO CABLE (36SM)
- ③ INPLACE 3" NMC, 1-COAX, 1-2/C NO.14 & 1 12/PR.19
- ④ REMOVE INPLACE WOOD POLE WITH WEATHERHEAD & RISER
- ⑤ INPLACE PATCHING SHELTER (10-230.10)
- ⑥ INPLACE 334Z CABINET SHELL
- ⑦ INPLACE 3" NMN, 1-FO PIGTAIL (6SM) & 1-3/C NO.8  
INPLACE 3" NMC (EMPTY)
- ⑧ INPLACE 2" NMC & 4-2/C NO.14  
F&I 4-2/C NO.14  
INPLACE 2" NMC & 8-2/C NO.14
- ⑨ INPLACE 3" NMC & 2-FO CABLES (36SM)
- ⑩ INPLACE 2" NMC & 2-2/C NO.14
- ⑪ INPLACE 3" NMC FOR FUTURE NON-INTRUSIVE DETECTION SYSTEM  
APPROX. 20" BELOW TOP OF PAVEMENT
- ⑫ ABANDON INPLACE LOOP DETECTOR  
F&I LOOP DETECTOR DESIGN SAWCUT
- ⑬ F&I LOOP DETECTOR DESIGN SAWCUT
- ⑭ INPLACE 2" NMC & 4-2/C NO.14  
F&I 2-2/C NO.14
- ⑮ ABANDON INPLACE LOOP DETECTOR  
COIL 1-2/C NO.14, 1-12/PR19 & 1-COAX CABLE IN HH, ENCAPSULATE ENDS  
DISCONNECT CABLES AT PATCHING SHELTER END-INCIDENTAL

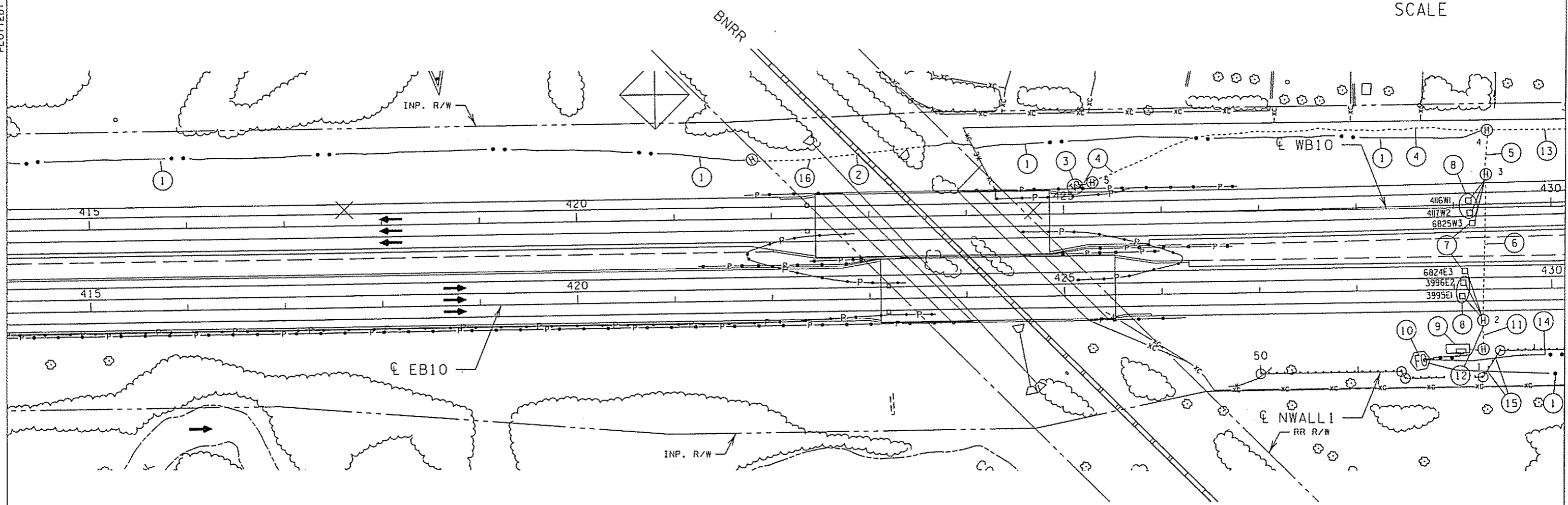
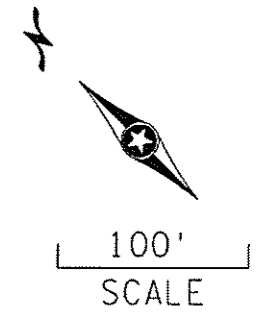


TRAFFIC MANAGEMENT SYSTEM  
 TH 10 AT COON CREEK

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NOTE: USE CAUTION DURING CONSTRUCTION OF NOISE WALL TO PROTECT NEARBY FIBER OPTIC CABLES

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>① INPLACE 1-FO CABLE (36SM)</li> <li>② INPLACE 3" RSC &amp; 1-FO CABLE (36SM)</li> <li>③ INPLACE CCTV HARDWARE &amp; FOUNDATION</li> <li>④ INPLACE 2" NMC, 1-3/C NO.8 &amp; 1-FO PIGTAIL (6SM)</li> <li>⑤ INPLACE 3" NMC, 3-1/C NO.6 &amp; 1-FO PIGTAIL (6SM)</li> <li>⑥ INPLACE 3" NMC, 3-1/C NO.6, 2-2/C NO.14 &amp; 1-FO PIGTAIL (6SM)<br/>F&amp;I 1-2/C NO.14</li> <li>⑦ F&amp;I LOOP DETECTOR DESIGN PREFORMED</li> <li>⑧ ABANDON INPLACE LOOP DETECTOR<br/>F&amp;I LOOP DETECTOR DESIGN SAWCUT</li> <li>⑨ INPLACE 334Z-99 CABINET (10-230.58)</li> </ul> | <ul style="list-style-type: none"> <li>⑩ INPLACE FO SPLICE VAULT</li> <li>⑪ INPLACE 3" NMC, 3-1/C NO.6, 4-2/C NO.14 &amp; 1-FO PIGTAIL (6SM)<br/>F&amp;I 2-2/C NO.14</li> <li>⑫ INPLACE FO PIGTAIL (6SM)</li> <li>⑬ INPLACE 2" NMC, 1-3/C NO.8 &amp; 3-1/C NO.6</li> <li>⑭ INPLACE 2-FO PIGTAILS (6SM)</li> <li>⑮ HAND DIG TO LOCATE FIBER CABLES PRIOR TO SETTING WALL POSTS<br/>EXPOSE FIBER AND RELOCATE AS NECESSARY FOR SETTING WALL POSTS<br/>PLACE BURIED CABLE SIGNS EACH SIDE OF WALL AT CABLE CROSSINGS</li> <li>⑯ HAND DIG TO EXPOSE INPLACE RSC &amp; 1-FO CABLE (36SM)<br/>SLEEVE CONDUIT THRU PROPOSED BRIDGE WING WALL-(SEE<br/>BRIDGE PLANS) VERIFY CONDUIT ELEVATION PRIOR TO CONSTRUCTION</li> </ul> |
|---|--|

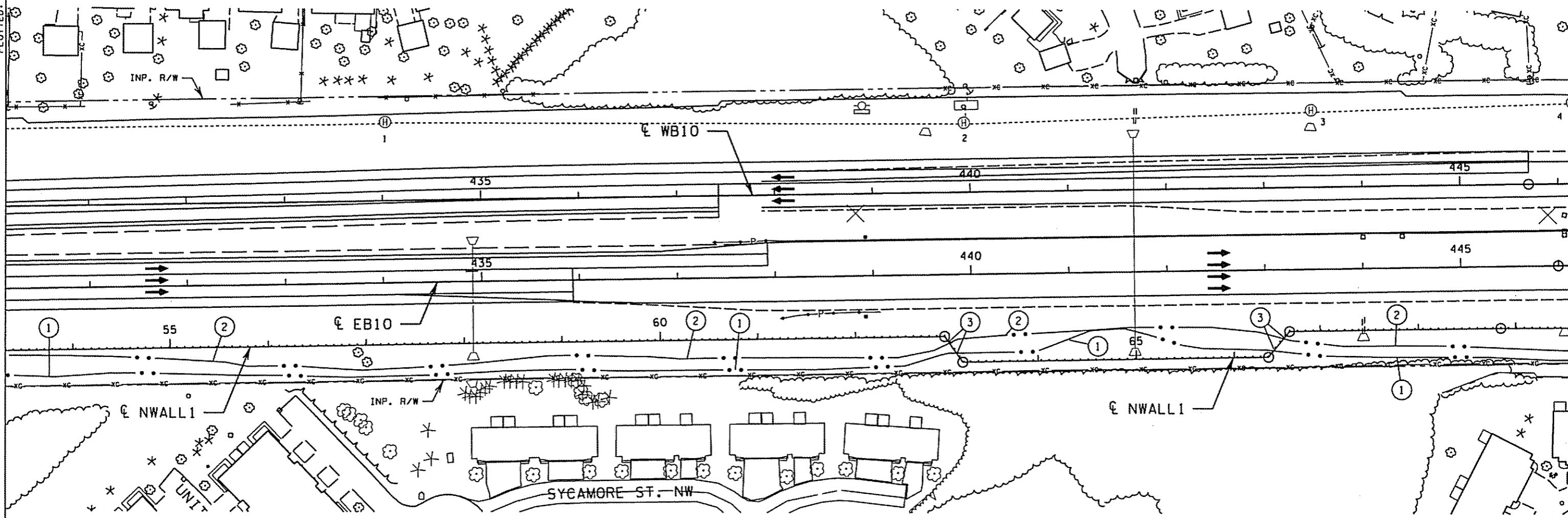
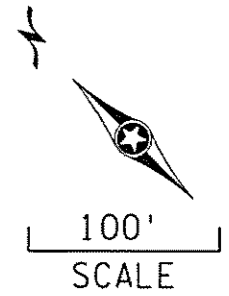
TRAFFIC MANAGEMENT SYSTEM  
 TH 10 AT BNRR

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REV. NO.	DATE: / /

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 LICENSED PROFESSIONAL ENGINEER

LIC.NO. 26530 JAN. 15 2009

STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 210 OF 222 SHEETS



NOTE: USE CAUTION DURING CONSTRUCTION OF NOISE WALL TO PROTECT NEARBY FIBER OPTIC CABLES

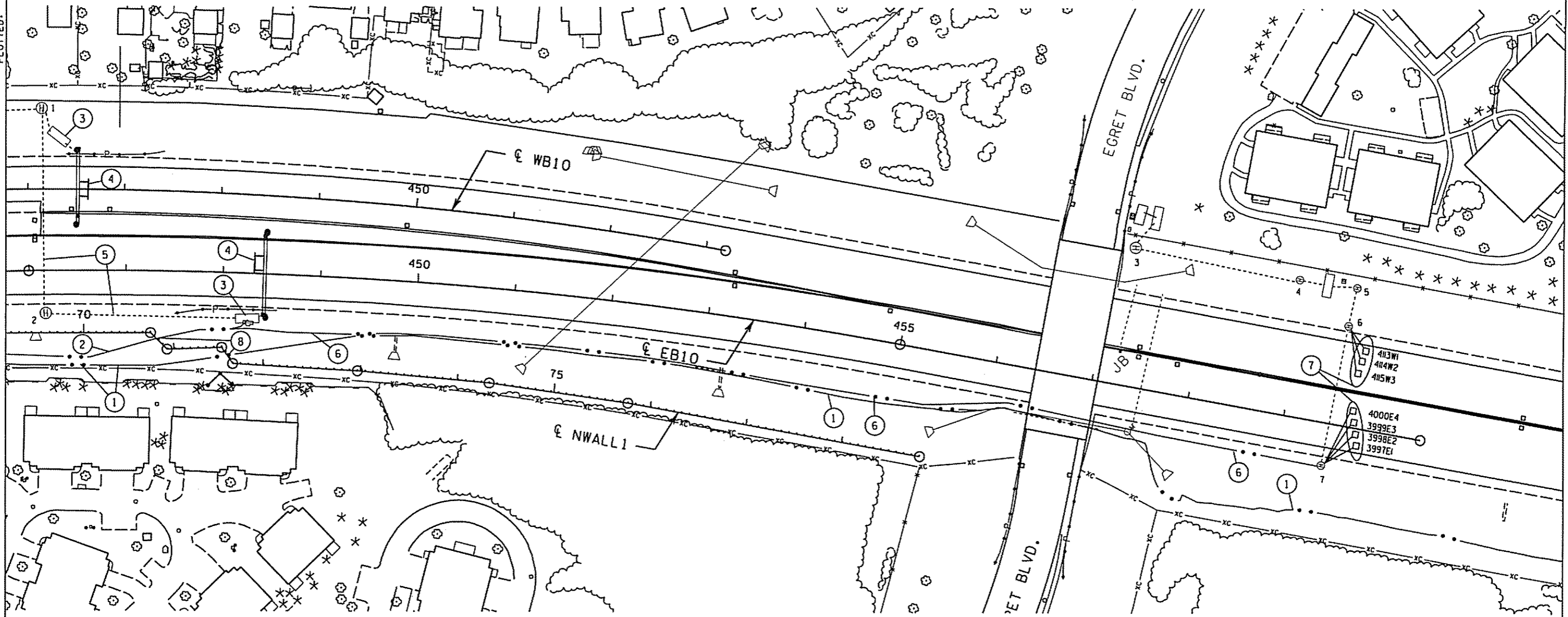
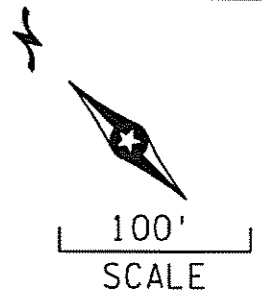
- ① INPLACE 1-FO CABLE (365M)
- ② INPLACE 2-FO PIGTAILS (65M)
- ③ HAND DIG TO LOCATE FIBER CABLES PRIOR TO SETTING WALL POSTS  
 EXPOSE FIBER AND RELOCATE AS NECESSARY FOR SETTING WALL POSTS  
 PLACE BURIED CABLE SIGNS EACH SIDE OF WALL AT CABLE CROSSINGS

TRAFFIC MANAGEMENT SYSTEM  
 TH 10 EAST OF BNRR

REV. NO.	DATE: / /
REV. NO.	DATE: / /

CERTIFIED BY *Stephen M. Phelps* LIC. NO. 26530 JAN. 15 2009  
 LICENSED PROFESSIONAL ENGINEER

STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 211 OF 222 SHEETS



NOTE: USE CAUTION DURING CONSTRUCTION OF NOISE WALL TO PROTECT NEARBY FIBER OPTIC CABLES

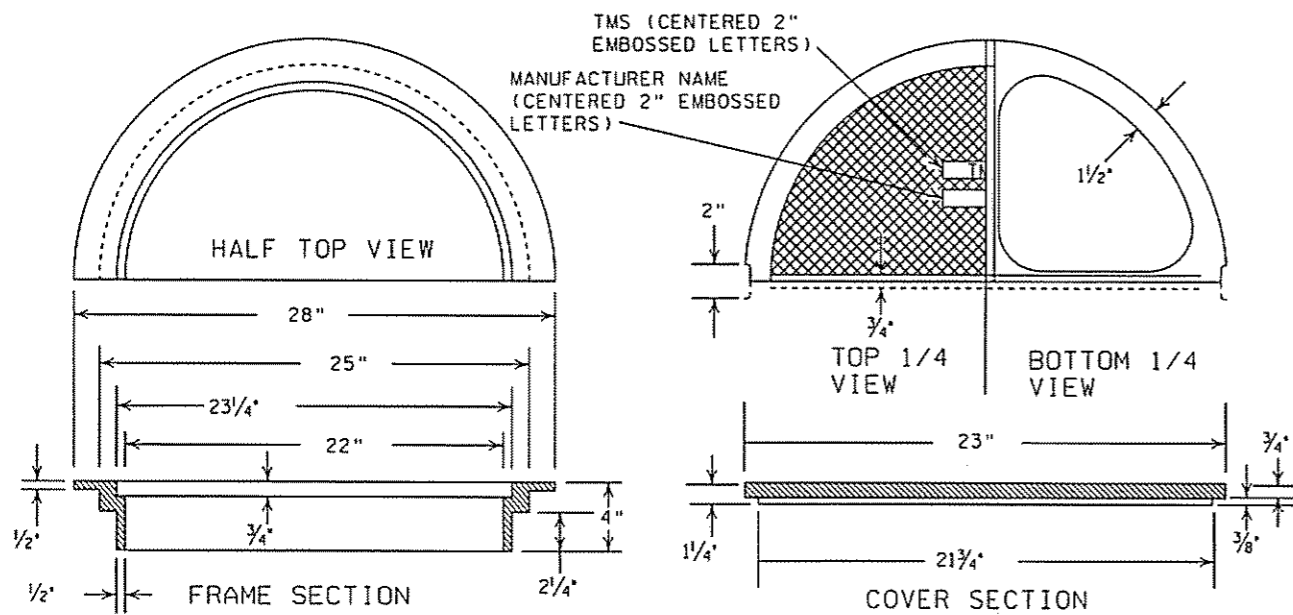
- ① INPLACE 1-FO CABLE (365M)
- ② INPLACE 2-FO PIGTAILS (65M)
- ③ INPLACE 334Z DMS CONTROL CABINET
- ④ INPLACE LED DMS
- ⑤ INPLACE 3" NMC, 3-1/2 NO.2 & 1-FO PIGTAIL (65M)

- ⑥ INPLACE 1-FO PIGTAIL (65M)
- ⑦ INPLACE LOOP DETECTOR
- ⑧ HAND DIG TO LOCATE FIBER CABLES PRIOR TO SETTING WALL POSTS  
 EXPOSE FIBER AND RELOCATE AS NECESSARY FOR SETTING WALL POSTS  
 PLACE BURIED CABLE SIGNS EACH SIDE OF WALL AT CABLE CROSSINGS

TRAFFIC MANAGEMENT SYSTEM  
 TH 10 AT EGRET BLVD.

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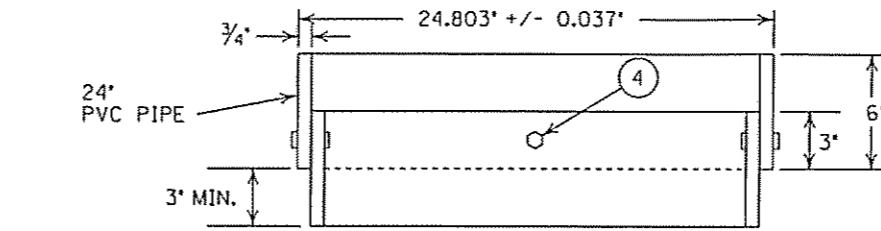
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FRAME AND COVER CASTING

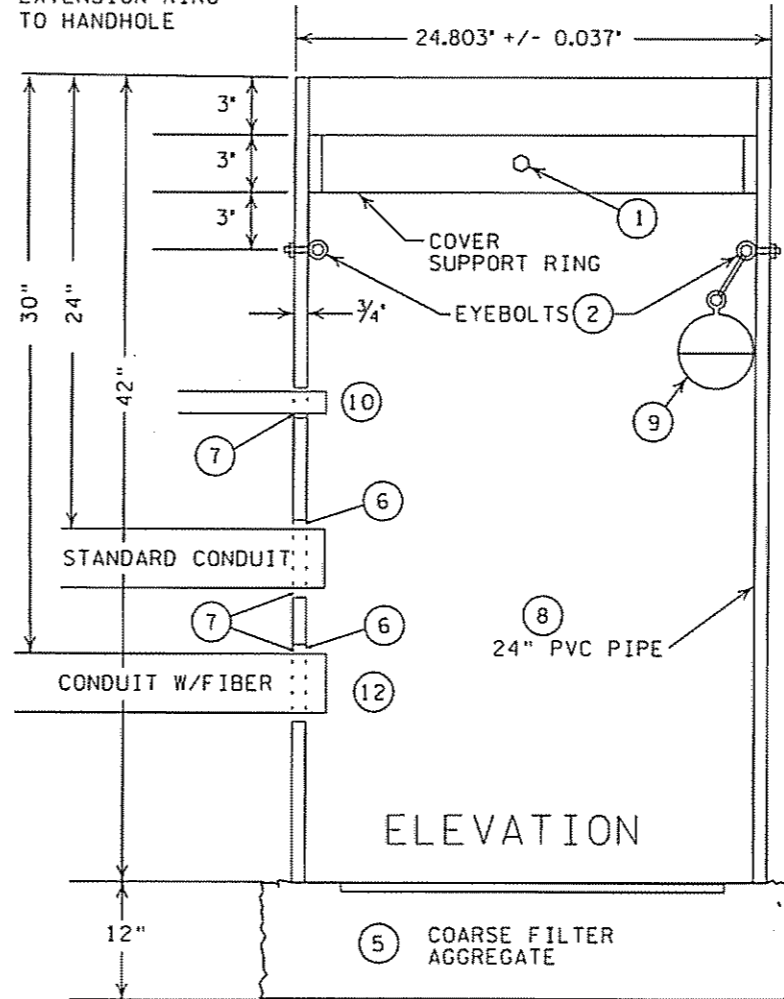
NOTE:  
 ALL CASTINGS ARE GRAY IRON PER  
 MN/DOT SPEC. 3321 CLASS 35B

LIGHT DUTY METAL COVER

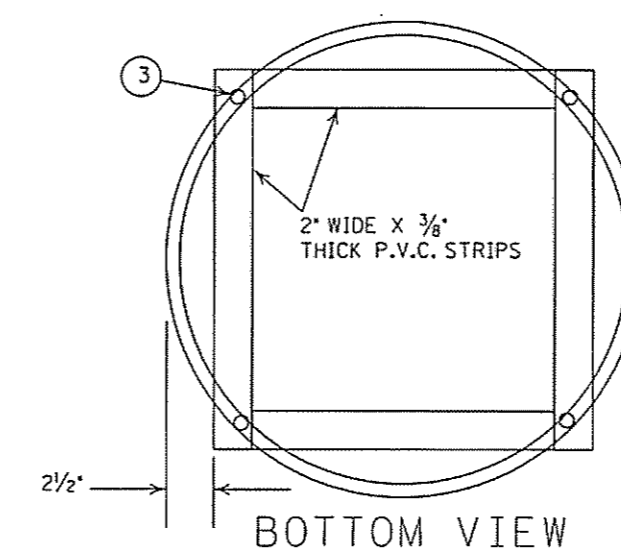


USE APPROVED P.V.C. CEMENT TO ATTACH EXTENSION RING TO HANDHOLE

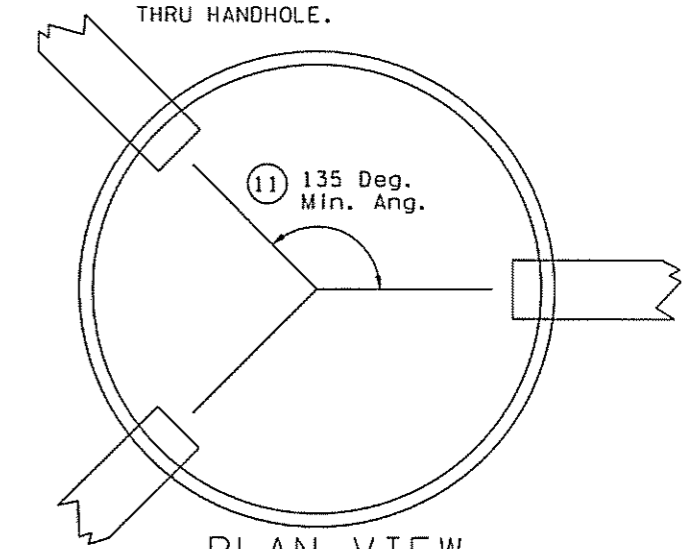
EXTENSION RING (AS REQUIRED)



ELEVATION



BOTTOM VIEW



PLAN VIEW

HANDHOLE DETAIL - (PVC HANDHOLE/METAL COVER)

NOTES:

- ① ATTACH SPLIT 24" DIA. P.V.C. COVER SUPPORT RING WITH FOUR 3/8 " DIA. X 2" LONG BOLTS AND NUTS AT 90° APART.
- ② TWO TYPE 2 SHOULDER EYEBOLTS, 3/8 " DIA. X 1 1/4 " SHANK LENGTH, WITH HEX. NUTS AT 180° APART (FOR LIFTING HANDHOLES AND SUPPORTING ELECTRICAL CABLES).
- ③ FOUR 1/4 " X 1 1/4 " LONG GALVANIZED LAG SCREWS.
- ④ ATTACH SPLIT 24" DIA. PVC EXTENSION RING WITH FOUR 3/8 " DIA. X 2" LONG BOLTS AT 90° APART. THE BOLTS & NUTS COMPLY WITH MN/DOT 3391.2E, THE OTHER HARDWARE WITH 3392.
- ⑤ COMPACT COARSE FILTER AGGREGATE COMPLYING WITH MN/DOT 3149.2H TO A 12" DEPTH.
- ⑥ CONDUIT ENTRANCES IN THE BARREL ARE SIZED 1.0" LARGER THAN THE CONDUIT USED.
- ⑦ PLUG HANDHOLE AT CONDUIT INSTALLATION, PROVIDING A WATER TIGHT SEAL.
- ⑧ THE PVC PIPE COMPLIES WITH ASTM F 9T-1.
- ⑨ INSTALL ORANGE LOCATER BALL WITH TIE WRAP TO EYE BOLT
- ⑩ MINIMUM CONDUIT DEPTH FOR LOOP WIRES SHALL BE 1.5'.
- ⑪ F&I CONDUITS NO SHARPER THAN 135 DEG. FOR INSTALLATIONS OF CONDUIT WHERE FIBER WILL PASS THRU.
- ⑫ F&I CONDUITS WITH FIBER PASSING THRU AT 30" DEPTH THRU HANDHOLES. TRANSITION TO/FROM STANDARD 36" FIBER DEPTH OR PUSH DEPTH OUTSIDE HANDHOLES. NOTE:PROVIDE 36" CONDUIT STUB OUT FOR DIRECT BURIED FIBER PASSING THRU HANDHOLE.

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CERTIFIED BY *Jeffrey M. Puleo* LIC. NO. 26530 JAN. 15 2009  
 LICENSED PROFESSIONAL ENGINEER

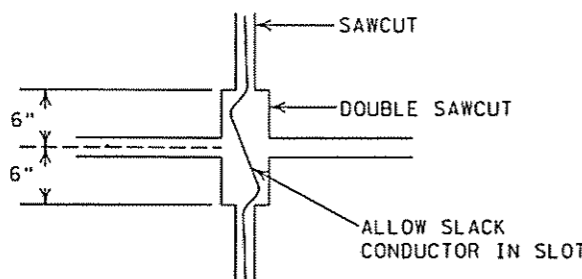
STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 213 OF 222 SHEETS

1. SAWCUT DETECTORS IN RAMPS & LOOPS ARE VARIABLE SIZED, AND INSTALLED IN THE CENTER OF THE LANE.
2. THE LOOP DETECTOR CONDUCTOR IS 1/C NO.14 COPPER, XLPE OR XHHW INSULATED WIRE. THE WIRE IS CONTAINED IN A FLEXIBLE POLYETHYLENE TUBING.
3. USE A SEALANT MADE SPECIFICALLY TO SEAL LOOP DETECTOR SAWCUTS IN CONCRETE ROADWAYS. USE AN APPROVED SEALANT IN BITUMINOUS ROADWAYS AND CONCRETE ROADWAYS THAT ARE TO BE OVERLAYED WITH BITUMINOUS.

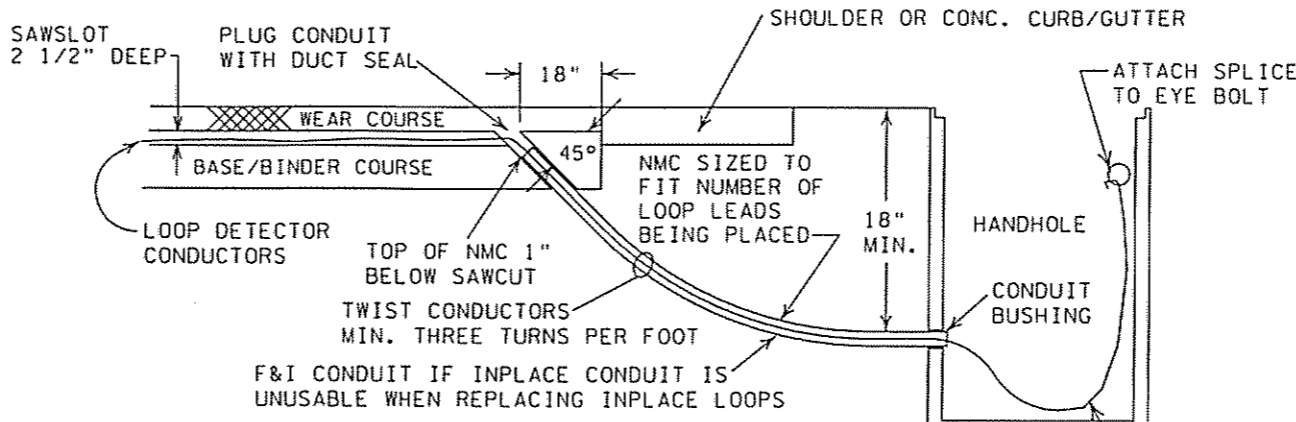
**METHOD**

4. CLEAN ALL DEBRIS FROM THE ENTIRE LOOP DETECTOR AREA.
5. MARK THE LOOP SAWCUTS ON THE ROADWAY.  
 NOTE: LOCATE LOOPS IN PAVEMENT TO MINIMIZE THE CROSSING OF JOINTS AND CRACKS WITHIN THE PAVEMENT.
6. SAW THE CUT TO 2 1/2" +/- 1/4" DEEP BY 1/8" WIDER THAN THE "OD" OF THE CONDUCTOR. SMOOTH THE BOTTOM AND ANGLES TO PREVENT DAMAGE TO INSULATION.
7. REAM THE CONDUIT ENDS. PLUG THE CONDUIT IN THE ROADWAY TO PREVENT THE LOOP SEALANT FROM ENTERING THE CONDUIT.
8. DRILL THE CORNERS 1/4" DEEPER THAN THE SAW SLOT AND SMOOTH THE HOLE CORNERS.
9. CLEAN AND DRY THE ENTIRE LOOP DETECTOR AREA.
10. F&I BEAD OF LOOP DETECTOR SEALANT TO WITHIN 6" OF LOOP CONDUCTORS CONDUIT. INSTALL CLEAN, DRY LOOP CONDUCTOR STAYING TO THE OUTSIDE OF THE CORNERS. DO NOT INSTALL THE CONDUCTOR TIGHT. PUSH THE CONDUCTORS TO THE BOTTOM OF THE SAWSLIT WITH A BLUNT TOOL.
11. INSTALL 3/4" DIAMETER BY 2" FOAM BACKER ROD AT 2.0' INTERVALS TO HOLD THE CONDUCTOR AT THE BOTTOM OF THE SAWCUT. INSTALL LOOP SEALANT.
12. F&I CONDUCTOR PER JOINT/CRACK DETAIL EACH TIME A JOINT OR PAVEMENT CRACK IS CROSSED.
13. TWIST THE CONDUCTORS 9 TURNS PER METER IN THE CONDUIT FROM THE ROADWAY TO THE SPLICE WITHIN THE HANDHOLE.
14. SOLDER THE LOOP CONDUCTOR TO LEAD-IN LEAVING THE JOINTS STAGGERED. PLACE IT INTO SPLICE ENCAPSULATOR WITH A PLASTIC TUBE AND END CAPS THAT FUNCTION AS SPOUTS. USE A TWO PART INSULATING RESIN, CONFINED IN A UNIPAK, THAT TURNS BLACK WHEN MIXED AND BECOMES HARD WHEN CURED. F&I BOTH LOOP CONDUCTORS AND LEAD-IN WIRE INTO THE SAME END OF THE TUBE AND ENCAPSULATE THE SPLICE.
15. SAWCUTS SHALL REMAIN 2.0' FROM OTHER SAWCUTS.
16. FILL SAW SLOT UNIFORMLY ACCORDING TO THE LOOP SEALANT MANUFACTURERS RECOMMENDED DEPTH. WIPE ALL EXCESS SEALANT MATERIAL FROM THE ROADWAY SURFACE.

NOTE: ALL SAWCUT LOOP DETECTORS SHALL HAVE 4 TURNS

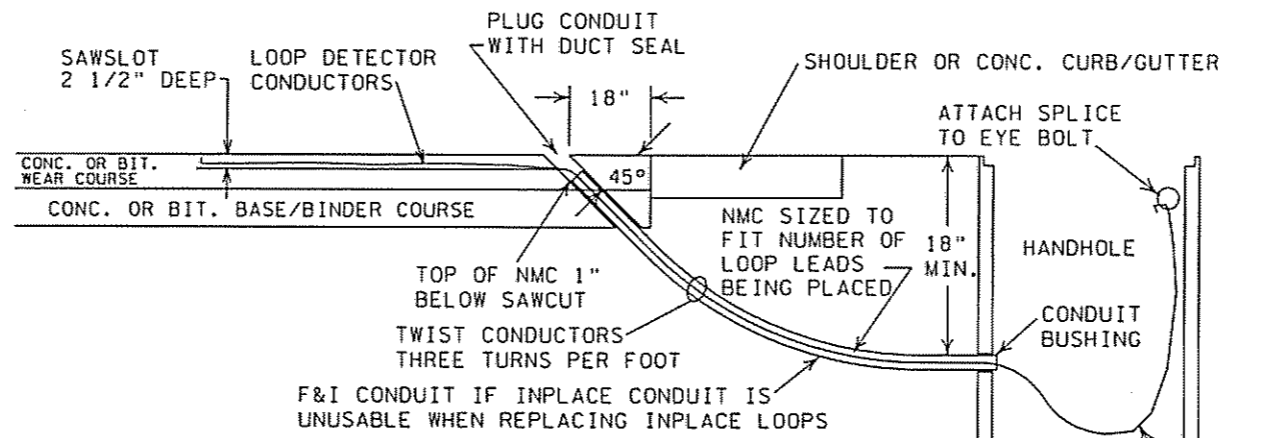


**JOINT/CRACK INSTALLATION**



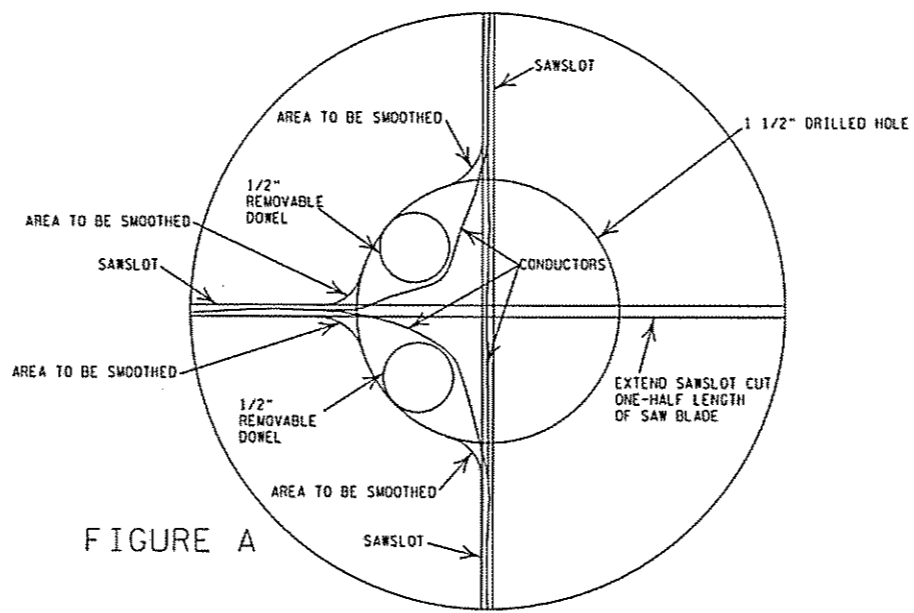
**LOOP/HANDHOLE INSTALLATION (MILL & OVERLAY CONSTRUCTION)**

\* NOTE: SAWCUT LOOP DETECTOR BETWEEN BINDER AND WEAR COURSES

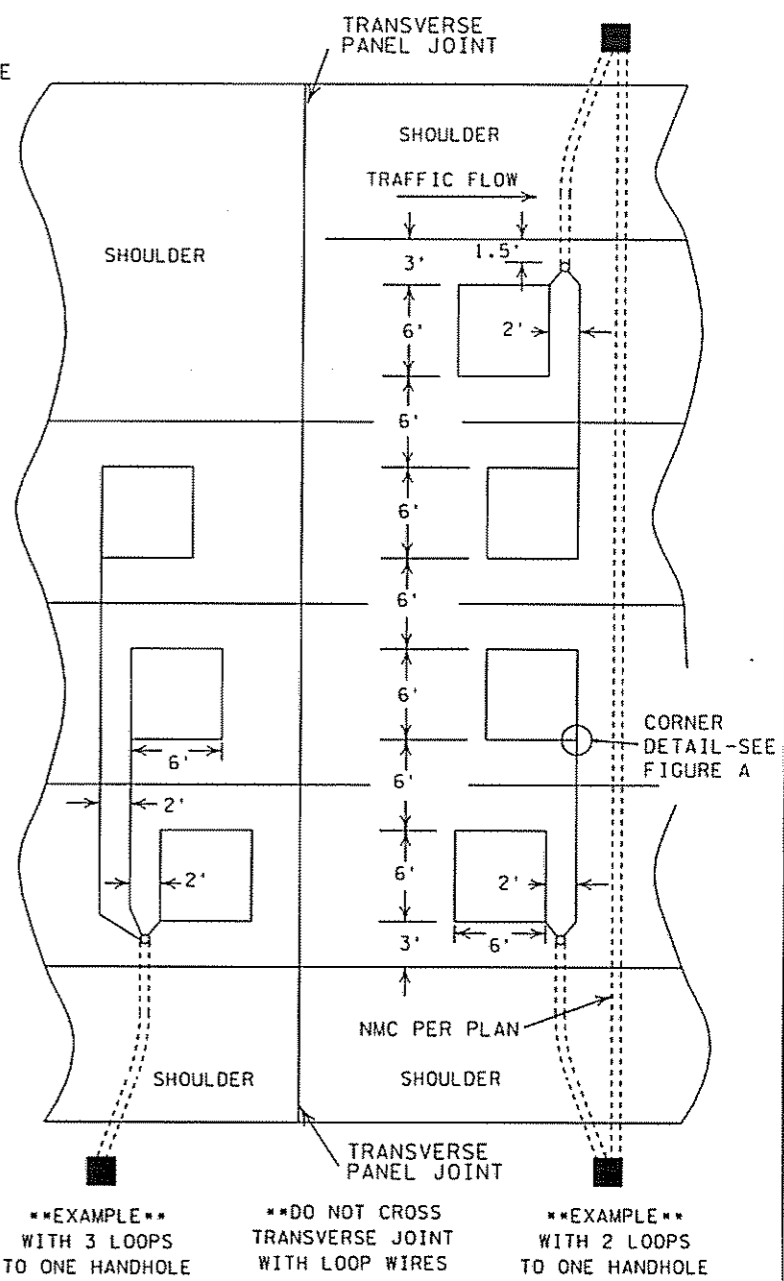


**LOOP/HANDHOLE INSTALLATION (INPLACE ROADWAYS)**

\* NOTE: SAWCUT LOOP DETECTOR INTO WEAR COURSE OR CONC. SURFACE

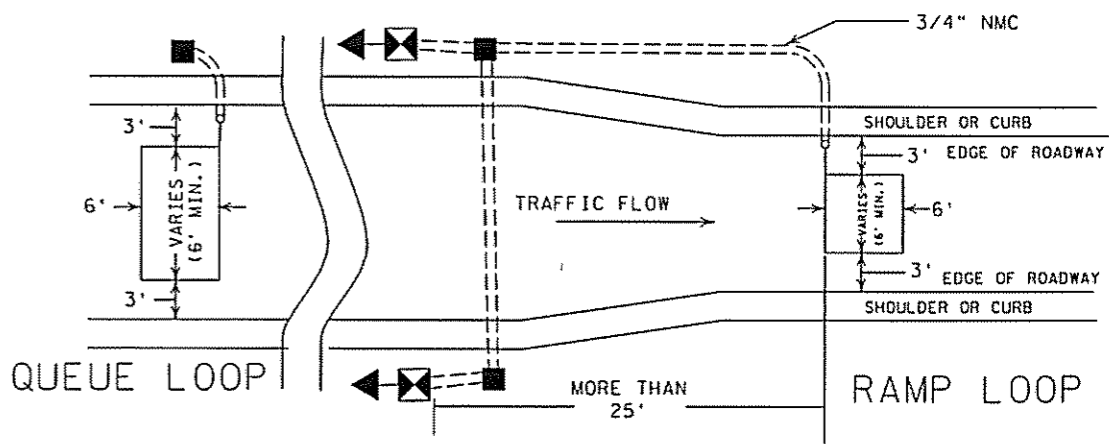


**DRILL SAWCUT CORNERS**



**MAINLINE DETECTORS**

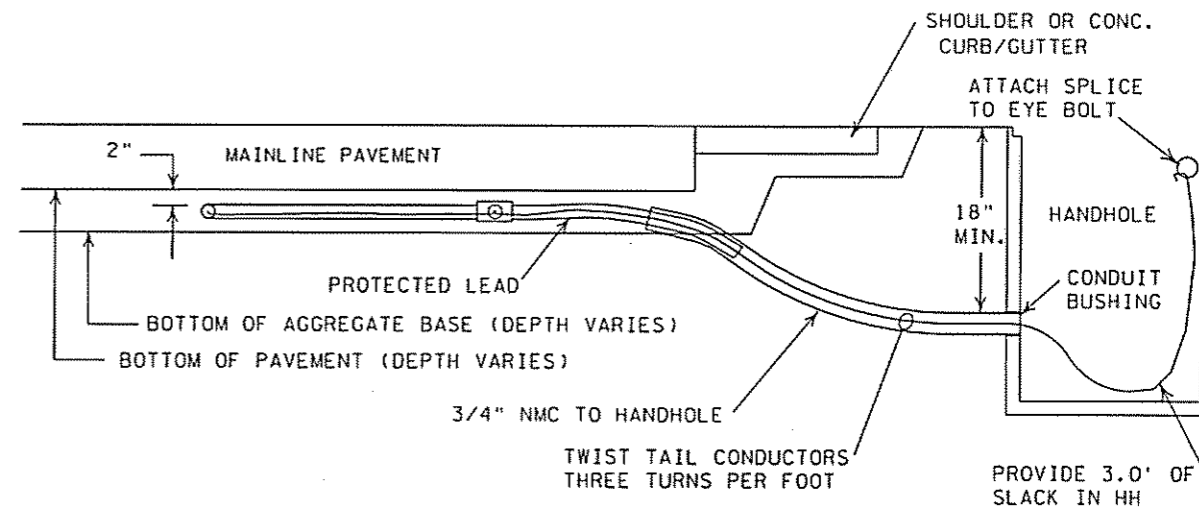
NOTE: LOOP LEADS SHALL NOT CROSS TRANSVERSE JOINTS IN CONCRETE PAVEMENT. MOVE A LOOP TO THE NEXT PANEL AND F&I A SEPARATE CONDUIT TO THE HH IF ALL LOOPS WILL NOT FIT ONE PANEL AND MAINTAIN SEPARATIONS SHOWN



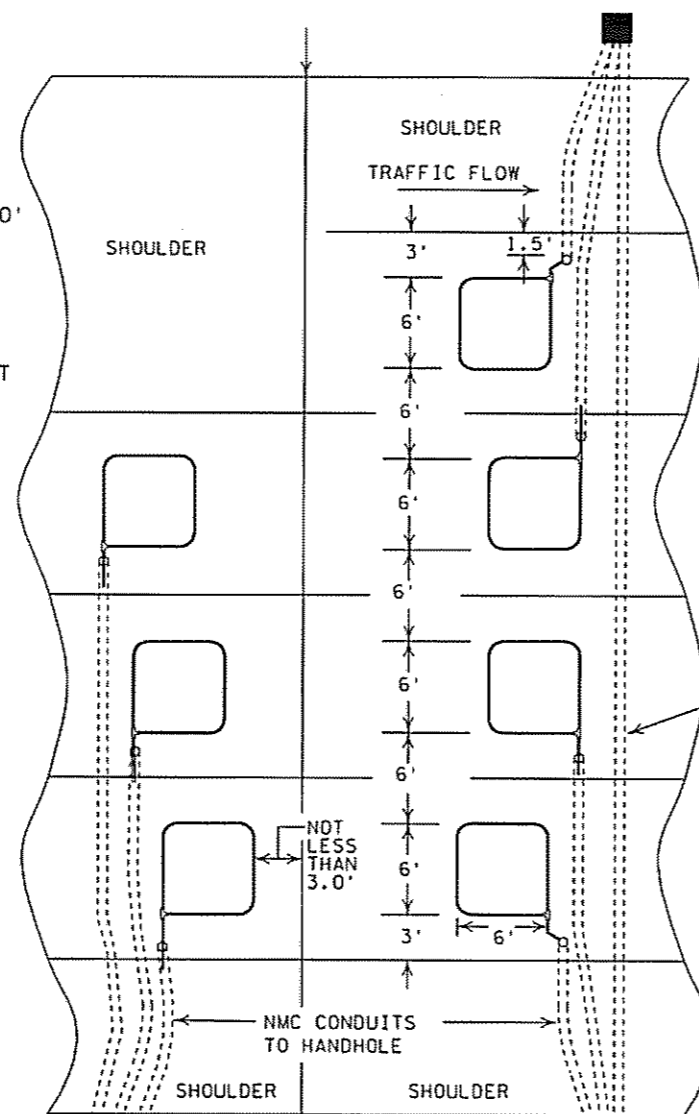
**TMS SAWCUT LOOP DETECTOR TYPICAL-PART ONE**

**GENERAL NOTES:**

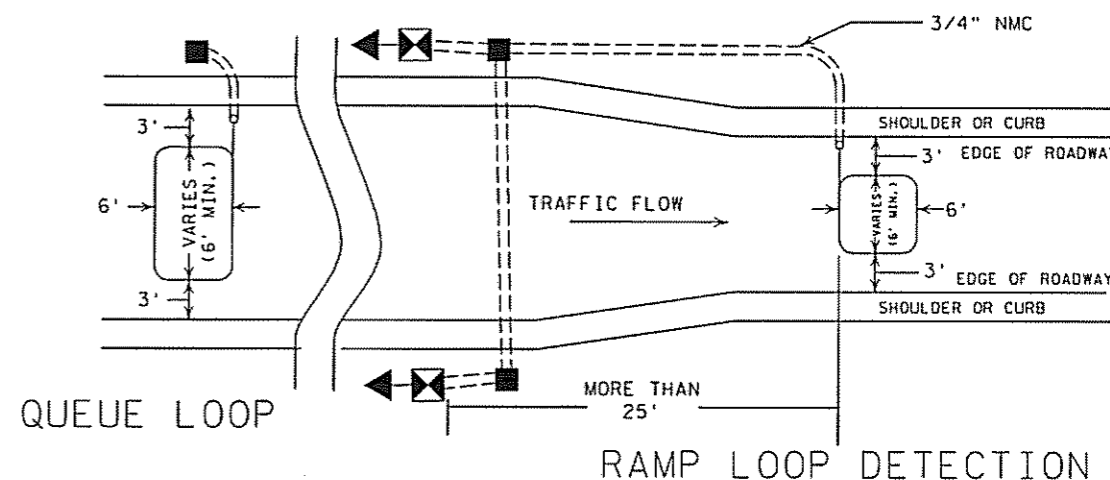
1. SEE SPECIAL PROVISIONS FOR REQUIRED LOOP DETECTOR CONDUCTOR SPLICE KIT.
2. THE LOOP DETECTOR HEAD SHALL BE 5/8" O.D. POLYPROPYLENE CONDUIT AND SHALL BE INJECTED WITH HOT RUBBERIZED ASPHALT AFTER CONDUCTOR PLACEMENT TO ENCAPSULATE THE WIRE AND PROVIDE A MOISTURE BARRIER
3. PREFORMED LOOP DETECTORS ARE VARIABLE SIZED DEPENDING ON ROADWAY LOCATION AND SHALL BE INSTALLED IN THE CENTER OF THE LANE. PAVEMENT JOINTS FOR CONCRETE PAVING SHALL BE ESTABLISHED BEFORE LOOP PLACEMENT TO MAINTAIN A MIN. OF 3.0' FROM DOWEL BASKET PLACEMENT
4. THE LOOP DETECTOR CONDUCTOR IS 1/C NO. 16 STRANDED COPPER WITH XHHW INSULATION.
5. THE PROTECTED LEAD PORTION OF LOOP SHALL EXTEND FROM THE TEE CONNECTOR, ENDING A MIN. OF 1.0' INSIDE THE NMC CONDUIT
6. THE LOOP DETECTOR CONDUCTORS SHALL BE TWISTED THREE TURNS PER FOOT FROM THE NMC TEE CONNECTOR TO THE HANDHOLE.
7. EACH LOOP DETECTOR CONDUIT TO THE HANDHOLE SHALL BE SLOPED TOWARDS THE HANDHOLE.
8. THE LOOP DETECTOR CONDUCTORS SHALL END IN THE HANDHOLE.
9. NO SPLICES ALLOWED IN LOOP CONDUCTOR EXCEPT AT HANDHOLE
10. SEE SPECIAL PROVISIONS FOR TESTING REQUIREMENTS OF LOOP DETECTORS
11. THE LOOP DETECTOR CONDUCTORS AND THE LOOP DETECTOR LEAD-IN CABLE CONDUCTORS SHALL BE PROPERLY PREPARED AND CLEANED BEFORE SPLICING. SOLDER THE LOOP CONDUCTOR TO LEAD-IN CONDUCTORS, THEN PLACE IT INTO THE SPLICE ENCAPSULATOR
12. INSTALL THE SPLICE IN A PLASTIC TUBE WITH END CAPS THAT FUNCTION AS SPOUTS. USE A TWO PART INSULATING RESIN, CONFINED IN A UNIPAK, THAT TURNS BLACK WHEN MIXED AND BECOMES HARD WHEN CURED. F&I BOTH LOOP CONDUCTORS AND LEAD-IN INTO THE SAME END OF THE TUBE AND ENCAPSULATE THE SPLICE.
13. THE LOOP INSULATION RESISTANCE READING MUST BE GREATER THAN 100 MEG OHM.
14. "NEVER FAIL LOOP SYSTEMS" DETECTOR-MODEL A WITH THE MNDOT PART NUMBER NOTED BELOW HAS MET THESE REQUIREMENTS



**CONDUIT/HANDHOLE INSTALLATION**



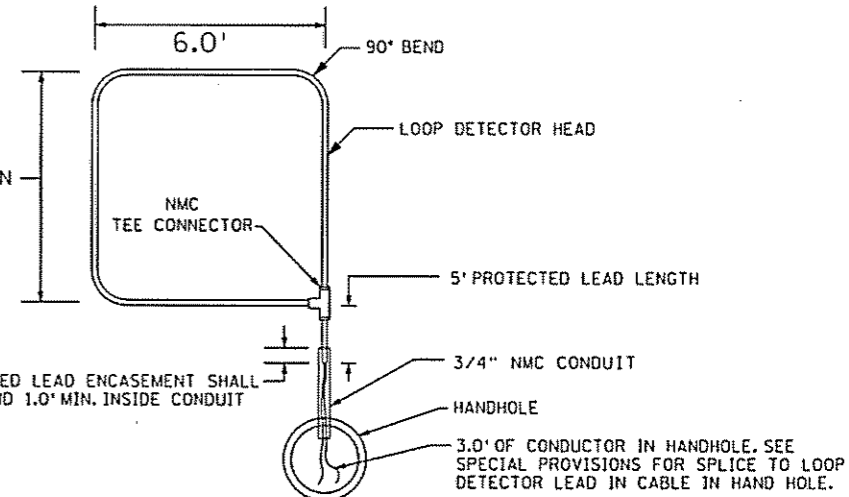
**MAINLINE DETECTORS**



**QUEUE LOOP**

**RAMP LOOP DETECTION**

THIS DIMENSION VARIES ACCORDING TO DETECTOR SIZE & IS DEPENDENT UPON THE DETECTORS LOCATION WITHIN THE ROADWAY, RAMP, OR LOOP



**TYPICAL PREFORMED LOOP DETECTOR DETAIL**

**MODEL A**

- 6' LENGTH
- XX=REQUIRED WIDTH
- 4 TURNS
- 5' PROTECTED LEAD

**A6XX4590-XHHW-MN**

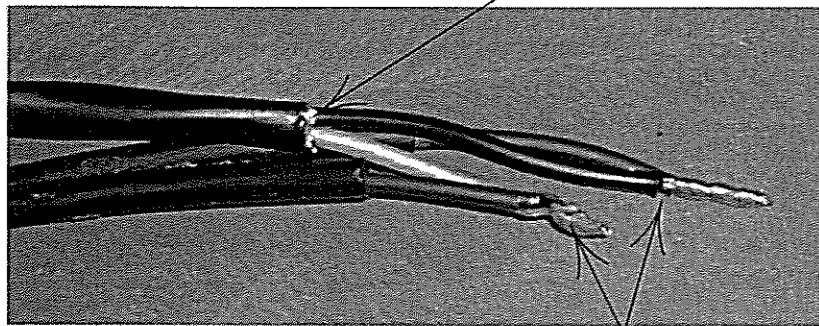
- MNDOT
- WIRE TYPE
- 90' UNPROTECTED LEAD

**PART NUMBER INFORMATION**

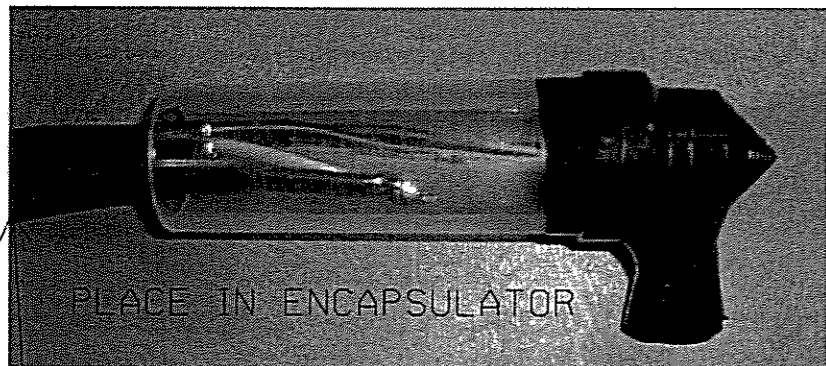
**TMS "PREFORMED" LOOP DETECTOR-PART ONE**



CUT & REMOVE DRAIN WIRE

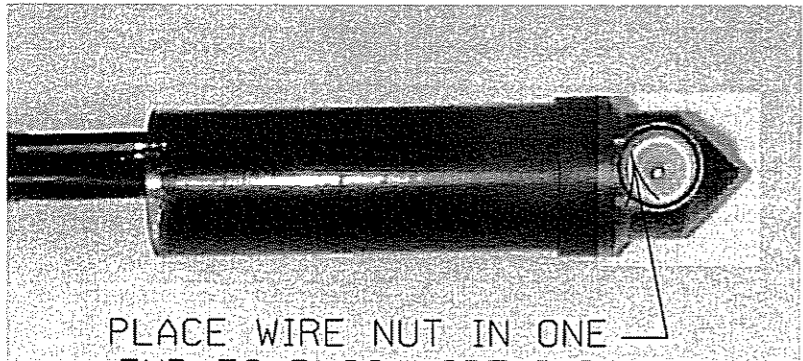


STAGGER SOLDERED BUTT SPLICE



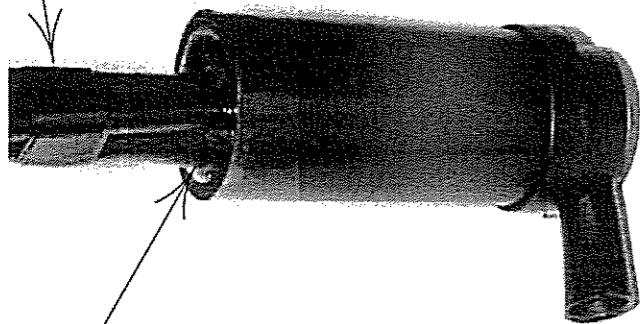
PLACE IN ENCAPSULATOR

TAPE WIRE TOGETHER BEFORE SPLICE



PLACE WIRE NUT IN ONE END TO BLOCK OPENING

TAPE



FILL ENCAPSULATOR COMPLETELY-ALLOW FINISHED SPLICE TO CURE SO EPOXY DOES NOT RUN OUT

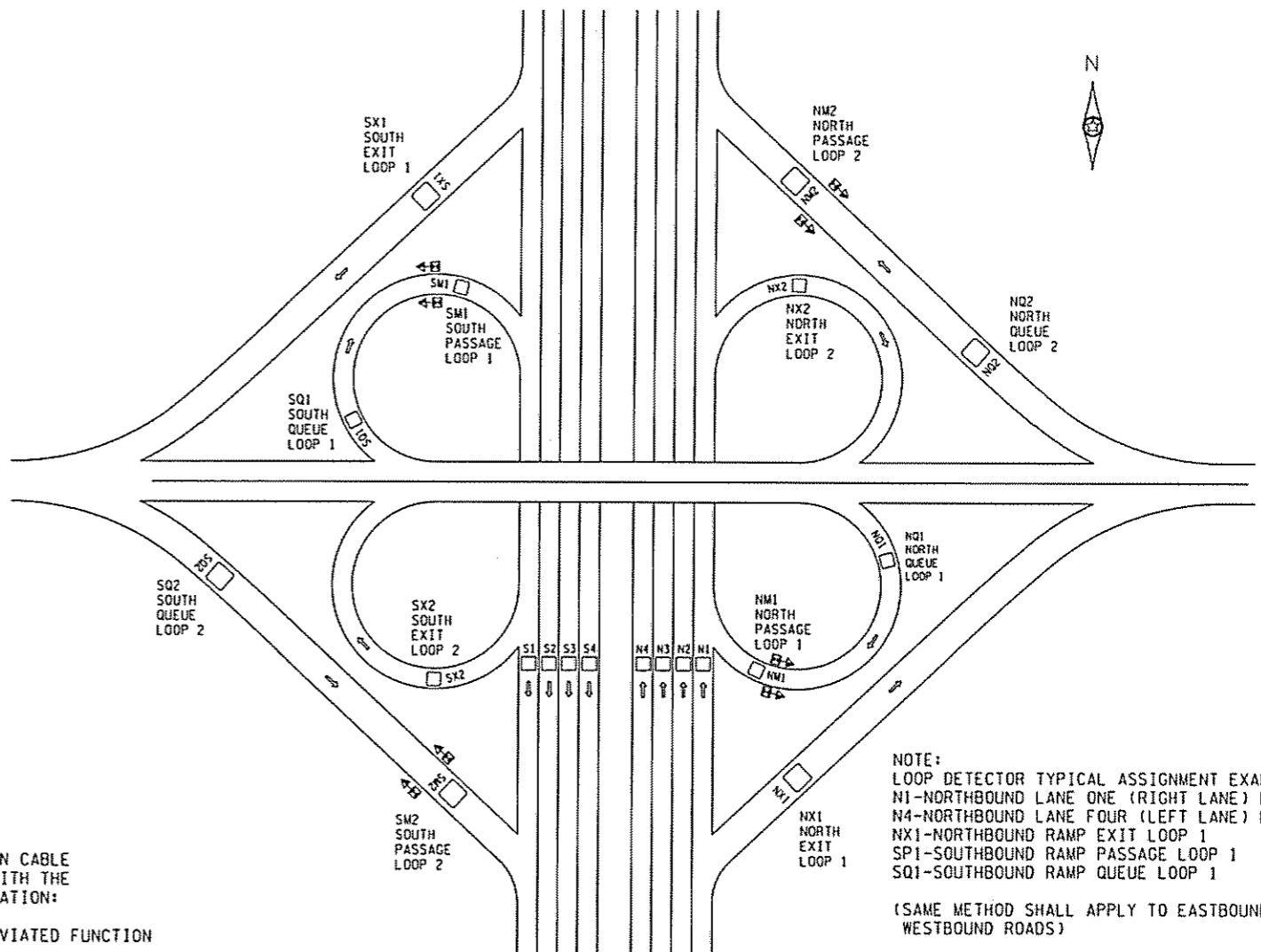
LOOP DETECTOR SPLICE FOR SAWCUT AND PREFORMED LOOPS

REV. NO.	DATE: / /
REV. NO.	DATE: / /

CERTIFIED BY *[Signature]*  
LICENSED PROFESSIONAL ENGINEER

LIC.NO. 26530 JAN. 15 2009

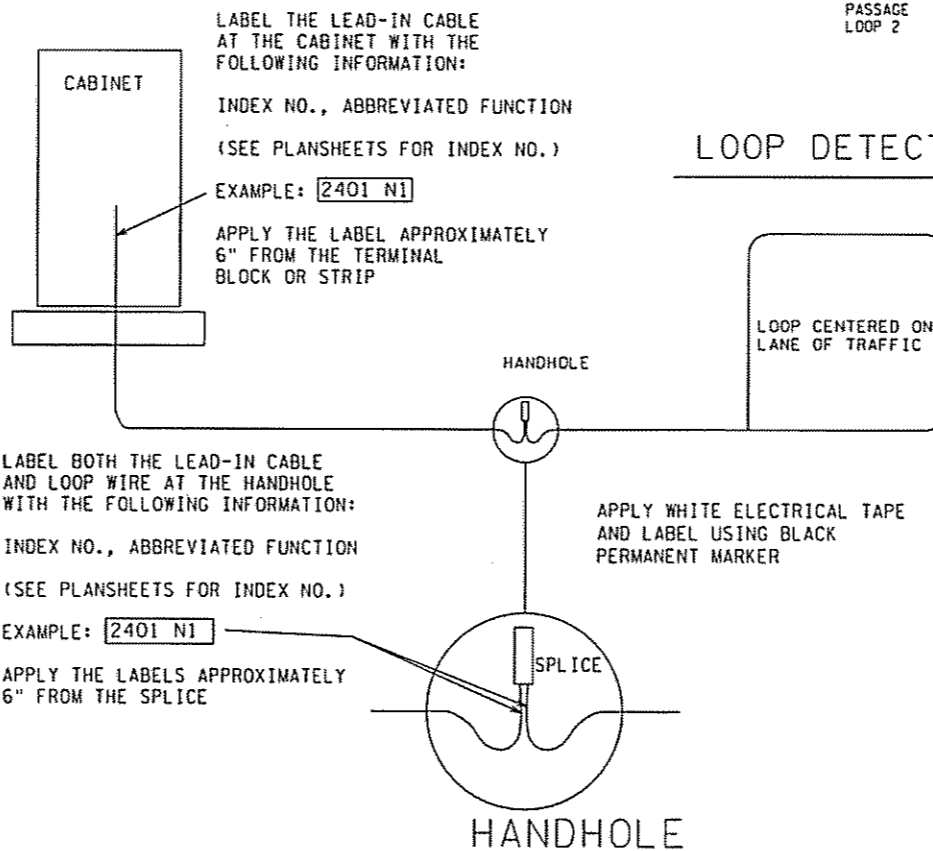
STATE PROJ. NO. 0215-67 (TH 10) SHEET NO. 216 OF 222 SHEETS



NOTE:  
 LOOP DETECTOR TYPICAL ASSIGNMENT EXAMPLES  
 N1-NORTHBOUND LANE ONE (RIGHT LANE) POSITION  
 N4-NORTHBOUND LANE FOUR (LEFT LANE) POSITION  
 NX1-NORTHBOUND RAMP EXIT LOOP 1  
 SP1-SOUTHBOUND RAMP PASSAGE LOOP 1  
 SQ1-SOUTHBOUND RAMP QUEUE LOOP 1

(SAME METHOD SHALL APPLY TO EASTBOUND & WESTBOUND ROADS)

LOOP DETECTOR FUNCTION DESIGNATIONS



LOOP DETECTOR CABLE LABELING

TMS LOOP DETECTOR TYPICAL-PART TWO

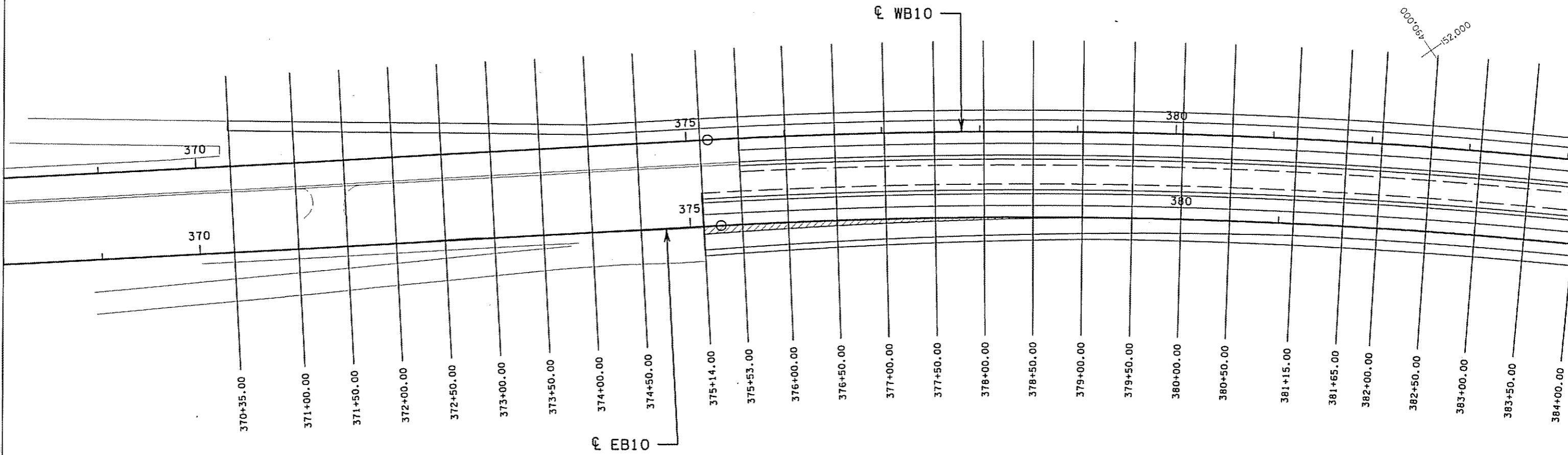
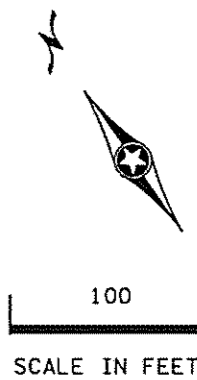
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000'00" -152.500

000'00" -152.000



EB10 STA. 367+99 TO 384+01

SHEET 1 OF 6

**CROSS SECTION LAYOUT**

DRAWN BY: HG

CHECKED BY: PAD

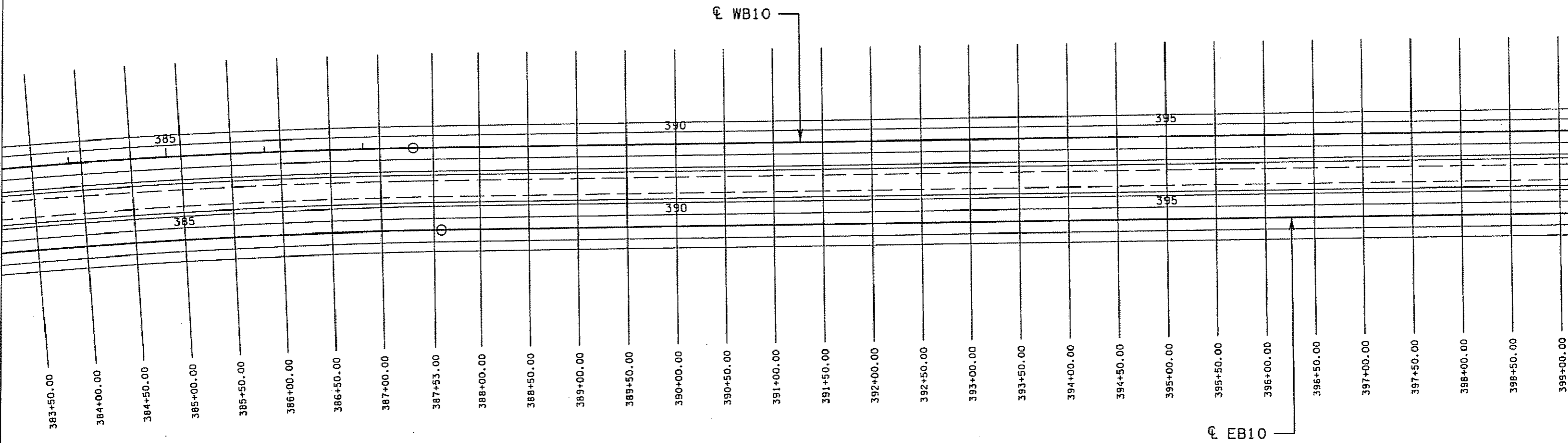
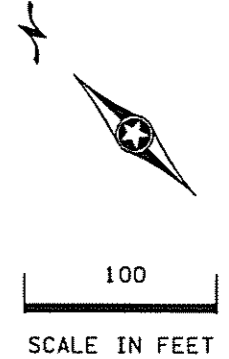
CERTIFIED BY

*Peter Danich*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 217 OF 222 SHEETS

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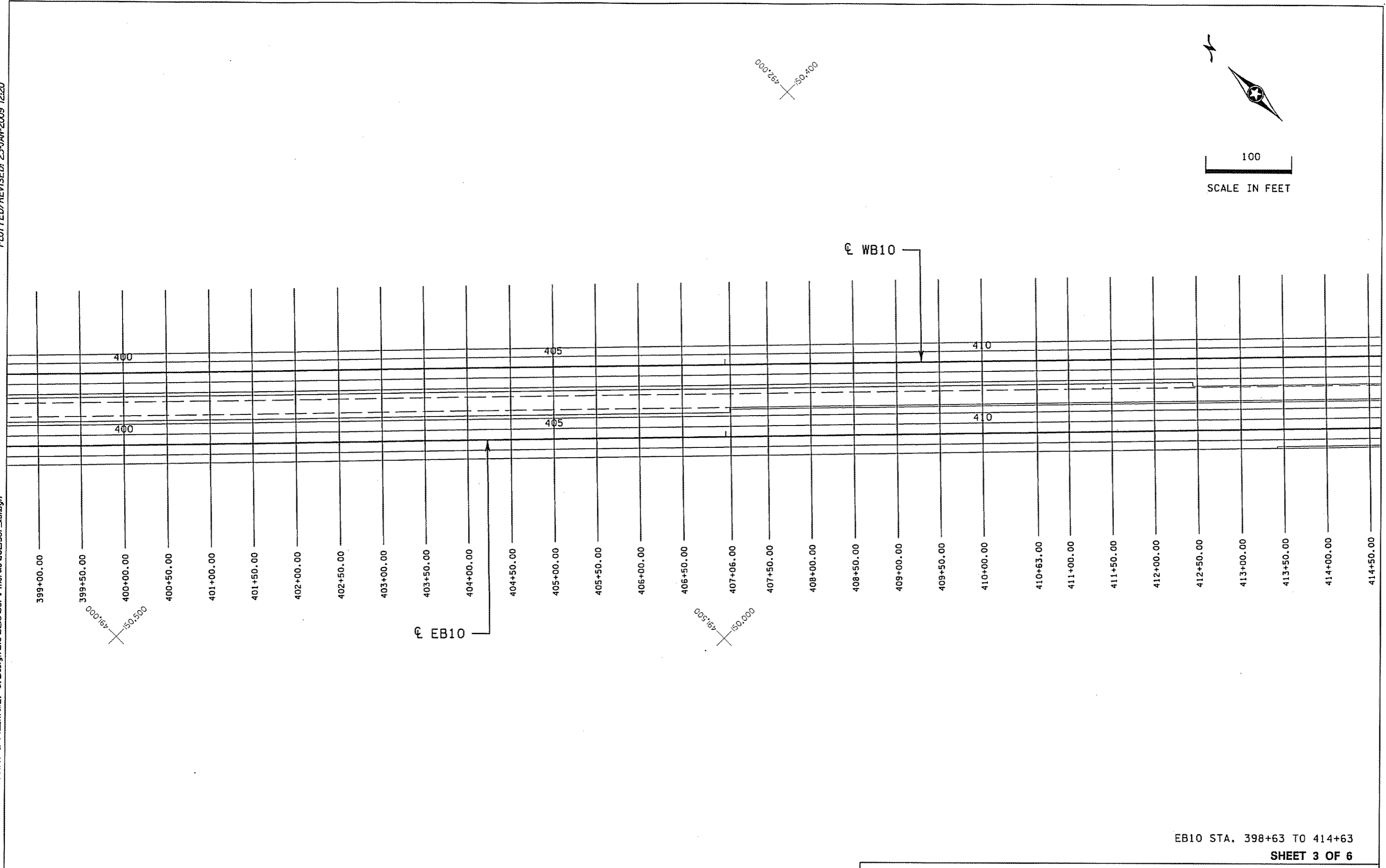
EB10 STA. 383+12 TO 399+13

SHEET 2 OF 6

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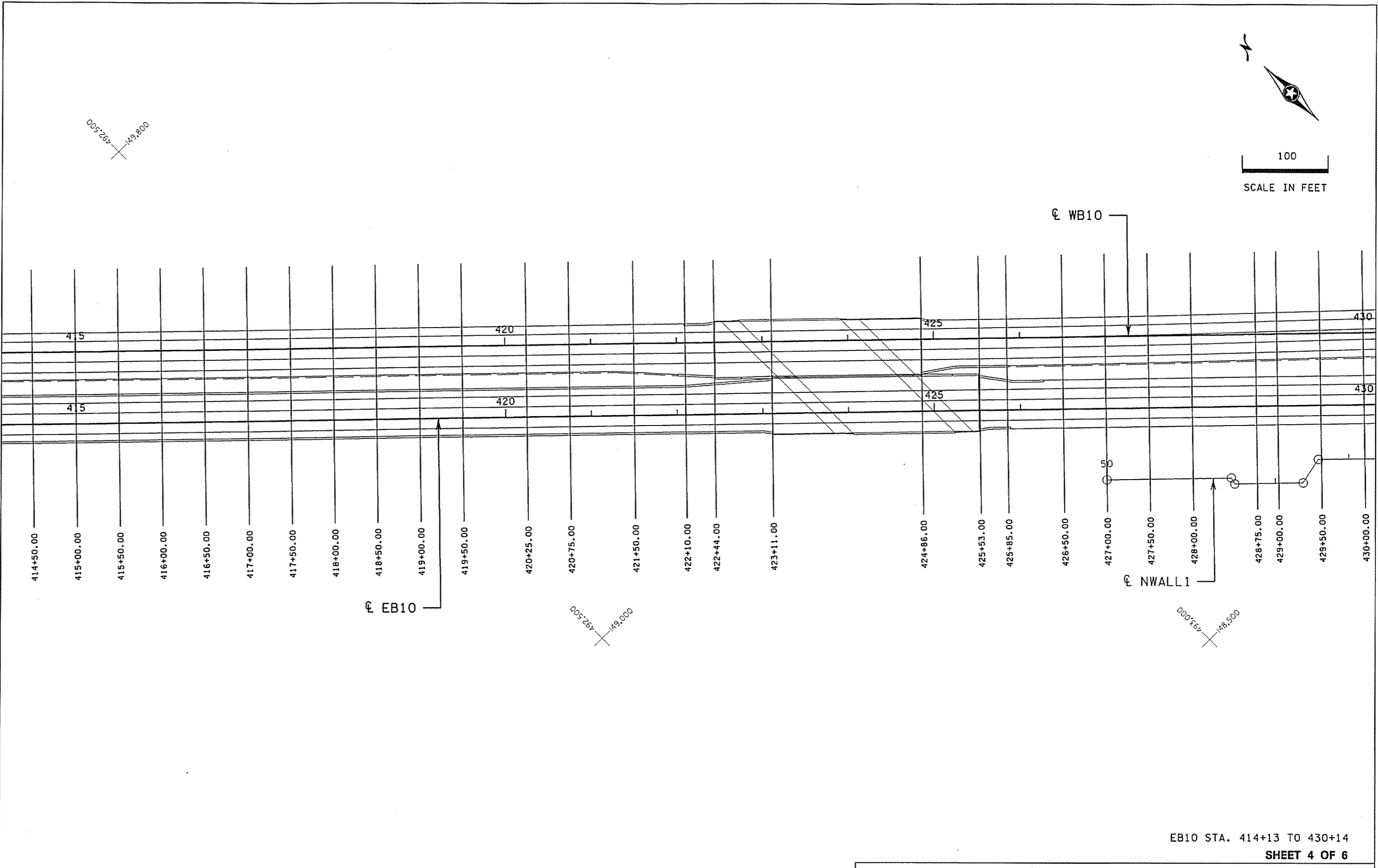
EB10 STA. 398+63 TO 414+63

SHEET 3 OF 6

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EB10 STA. 414+13 TO 430+14

SHEET 4 OF 6

CROSS SECTION LAYOUT

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CHECKED BY: PAD

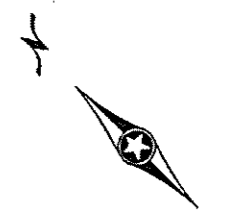
CERTIFIED BY Peter Daniel LIC. NO. 45053 DATE 1/22/09  
LICENSED PROFESSIONAL ENGINEER

STATE PROJ. NO. 0215-67 (T.H. 10) SHEET NO. 220 OF 222 SHEETS

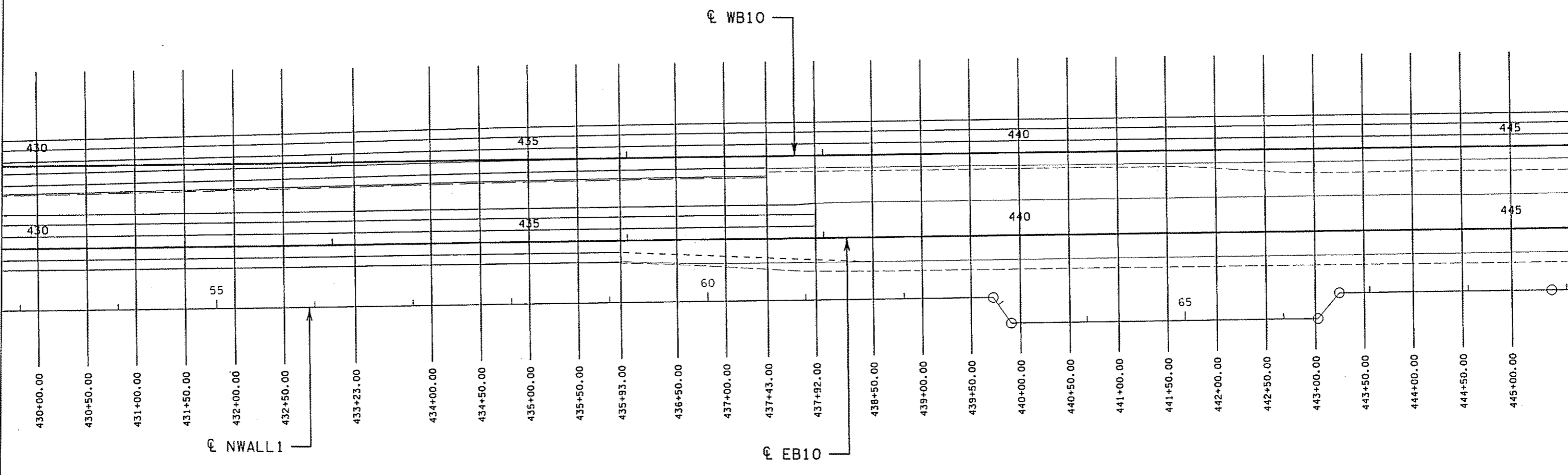
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494.000  
148.500



100  
SCALE IN FEET



493.500  
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EB10 STA. 429+64 TO 445+64

SHEET 5 OF 6

CROSS SECTION LAYOUT

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CHECKED BY: PAD

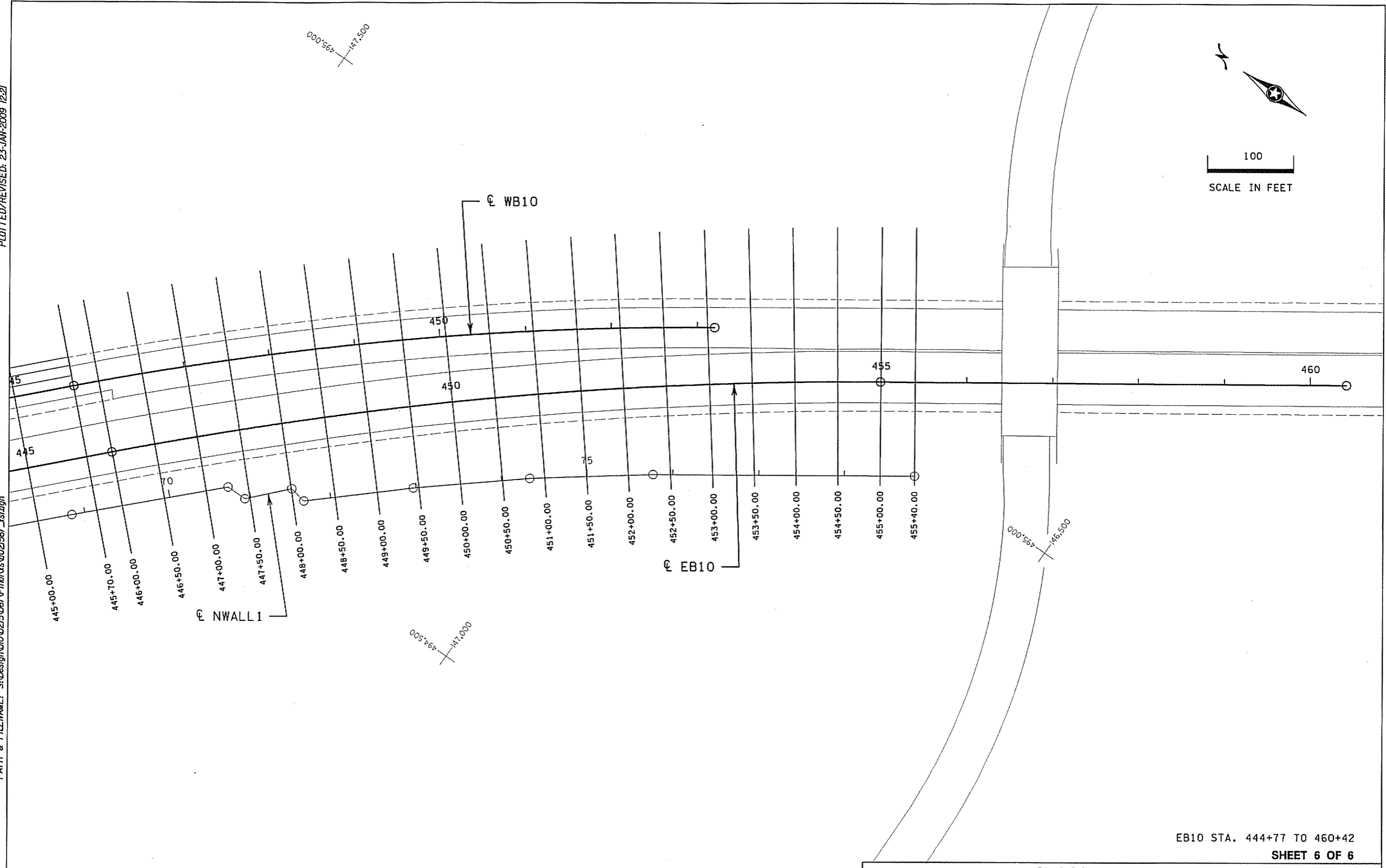
CERTIFIED BY Peter Danich  
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LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 221 OF 222 SHEETS

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EB10 STA. 444+77 TO 460+42

SHEET 6 OF 6

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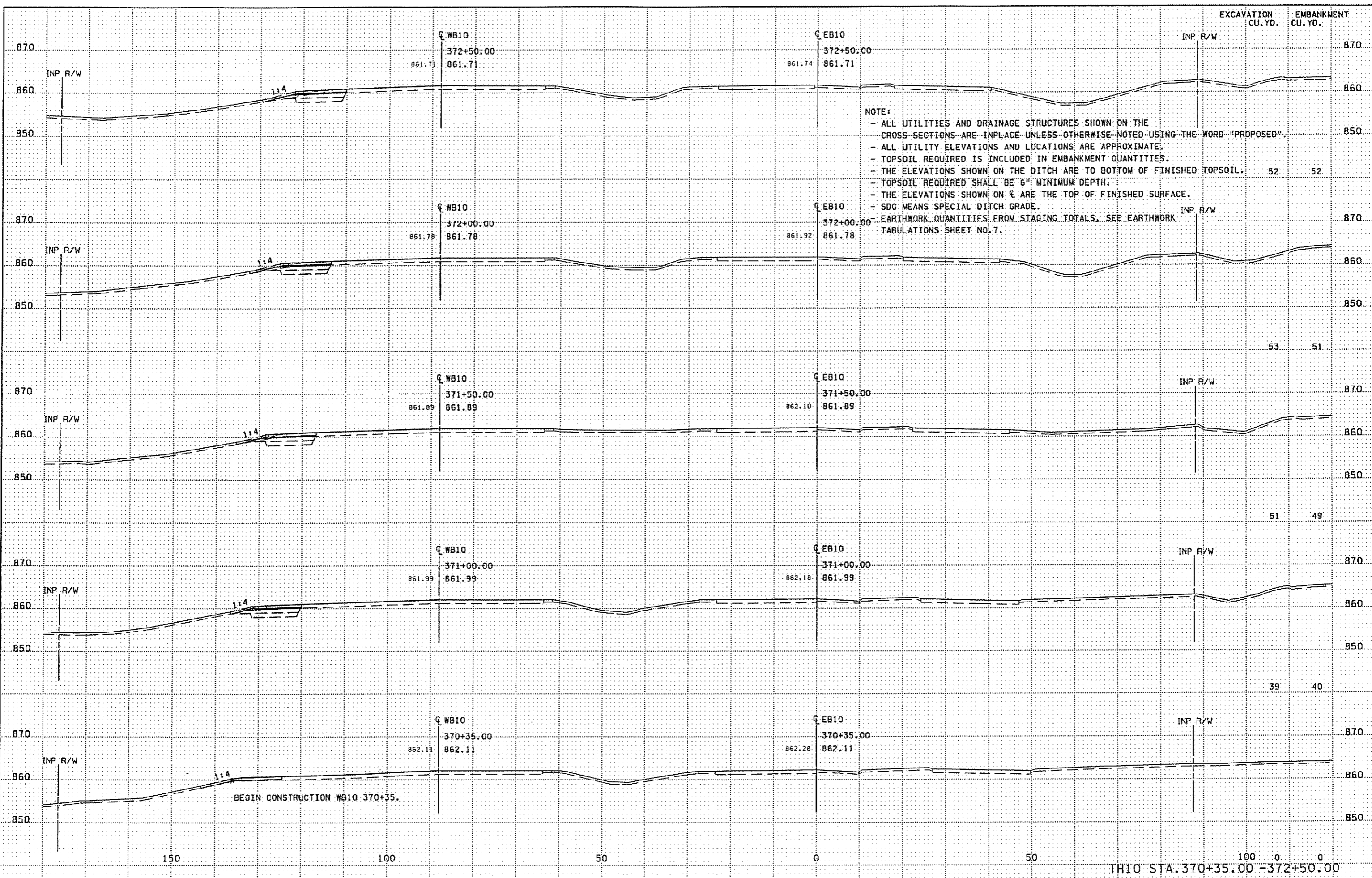
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LIC. NO. 45053 DATE 1/22/09

STATE PROJ. NO. 0215-67 (T.H. 10 ) SHEET NO. 222 OF 222 SHEETS

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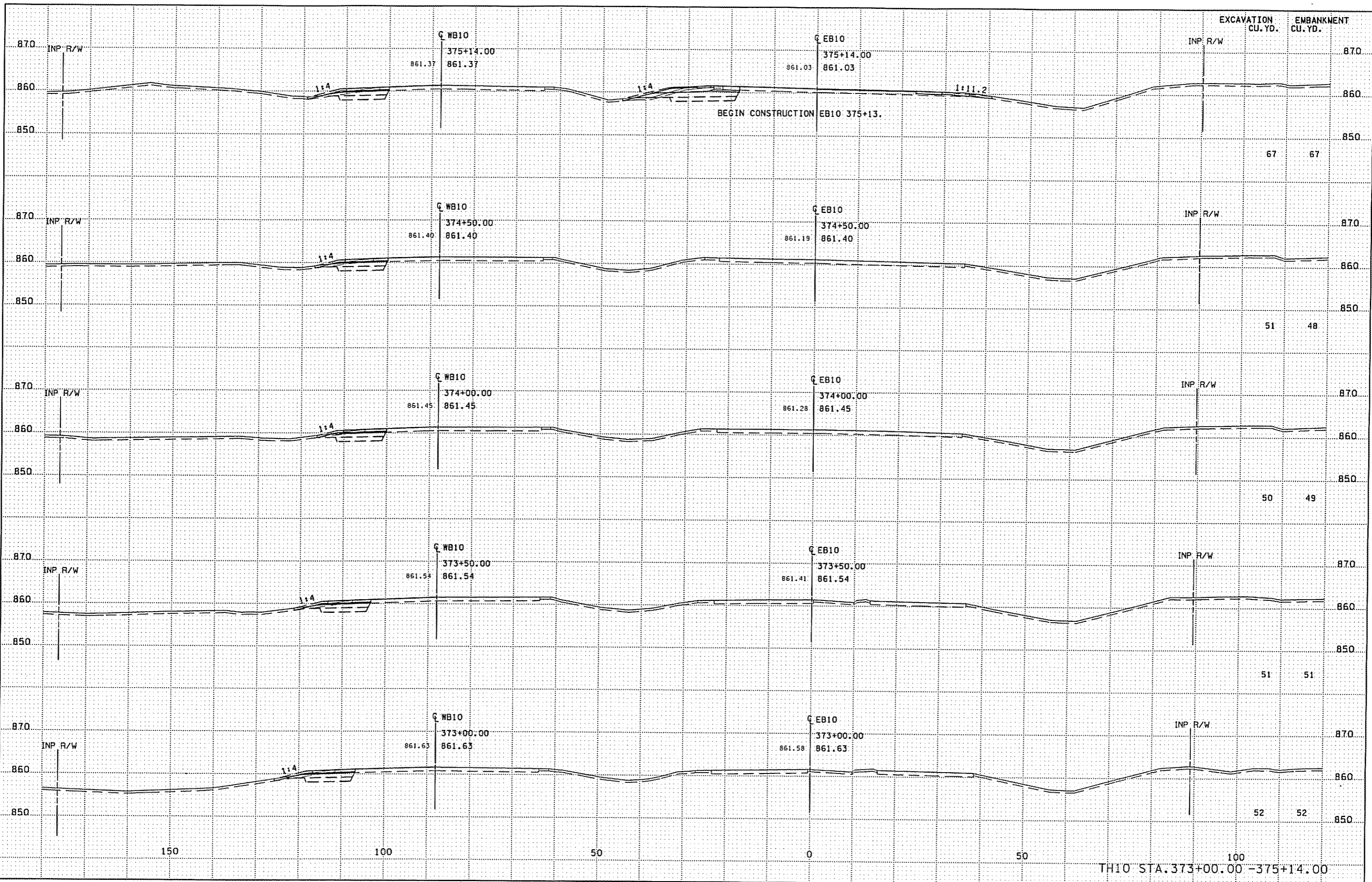


BEGIN CONSTRUCTION WB10 370+35.

TH10 STA. 370+35.00 - 372+50.00



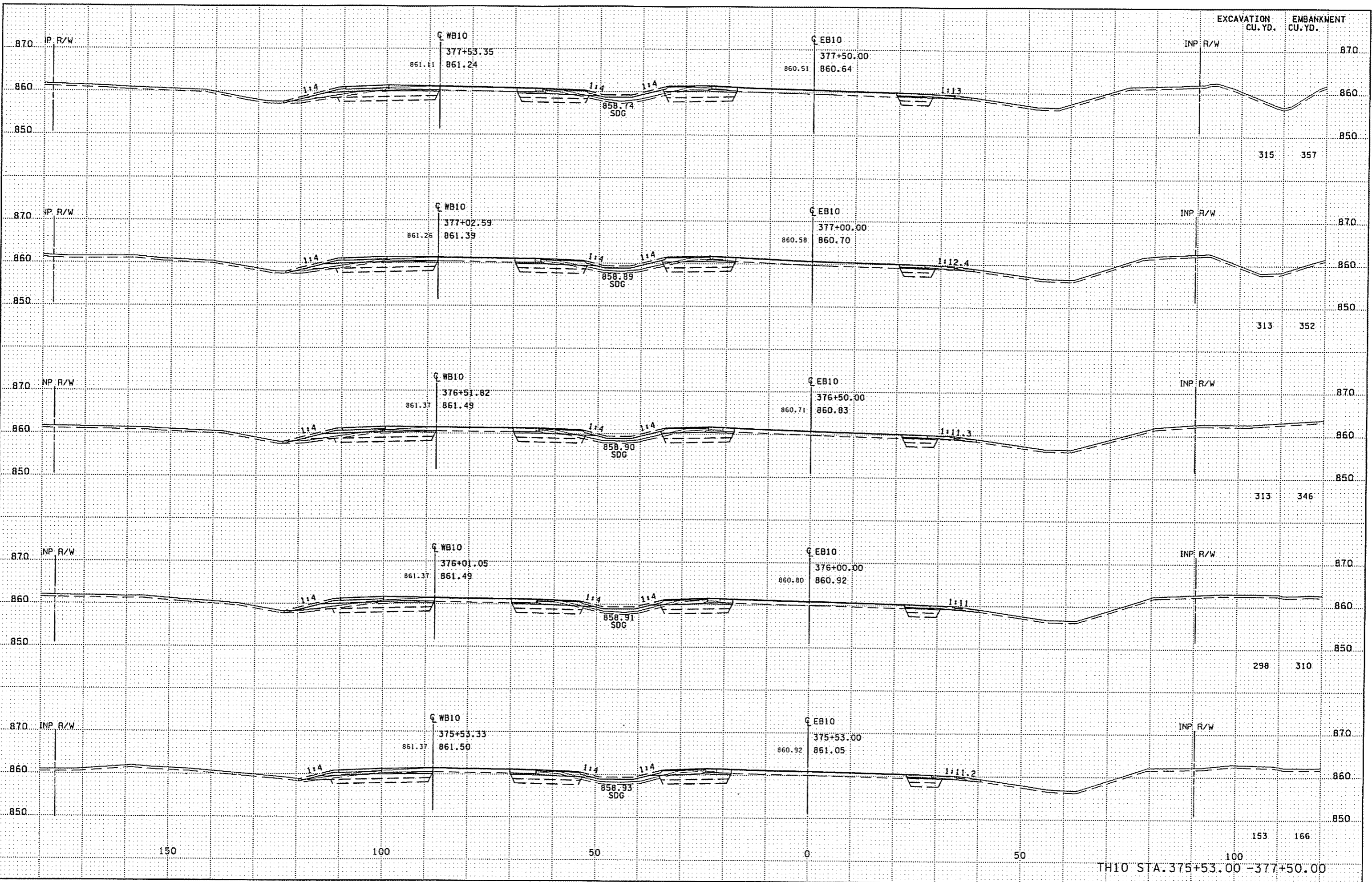
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TH10 STA. 373+00.00 - 375+14.00

PLOTTED/REVISED: 22-JAN-2009 13:29

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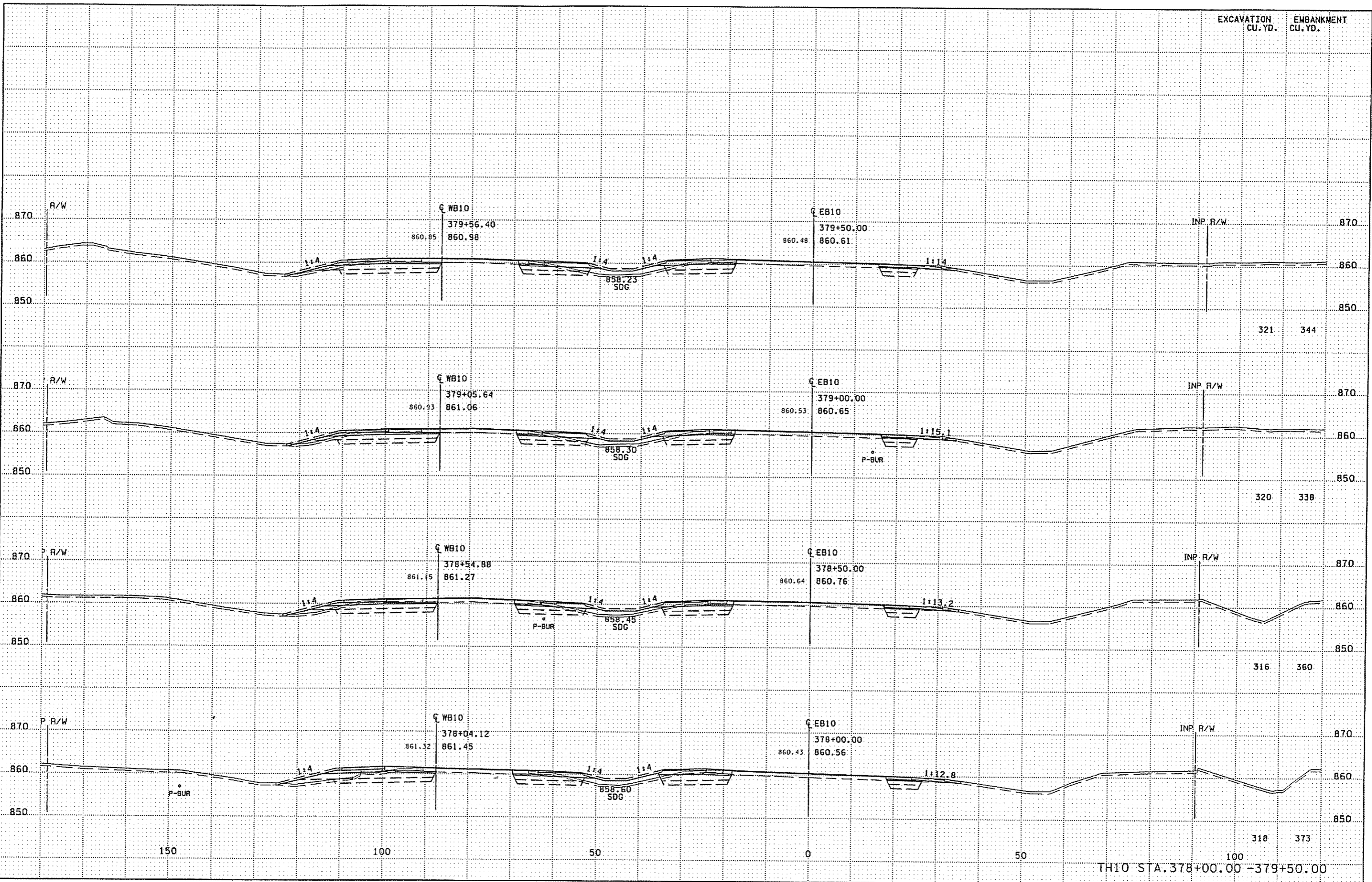
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EXCAVATION  
CU. YD.

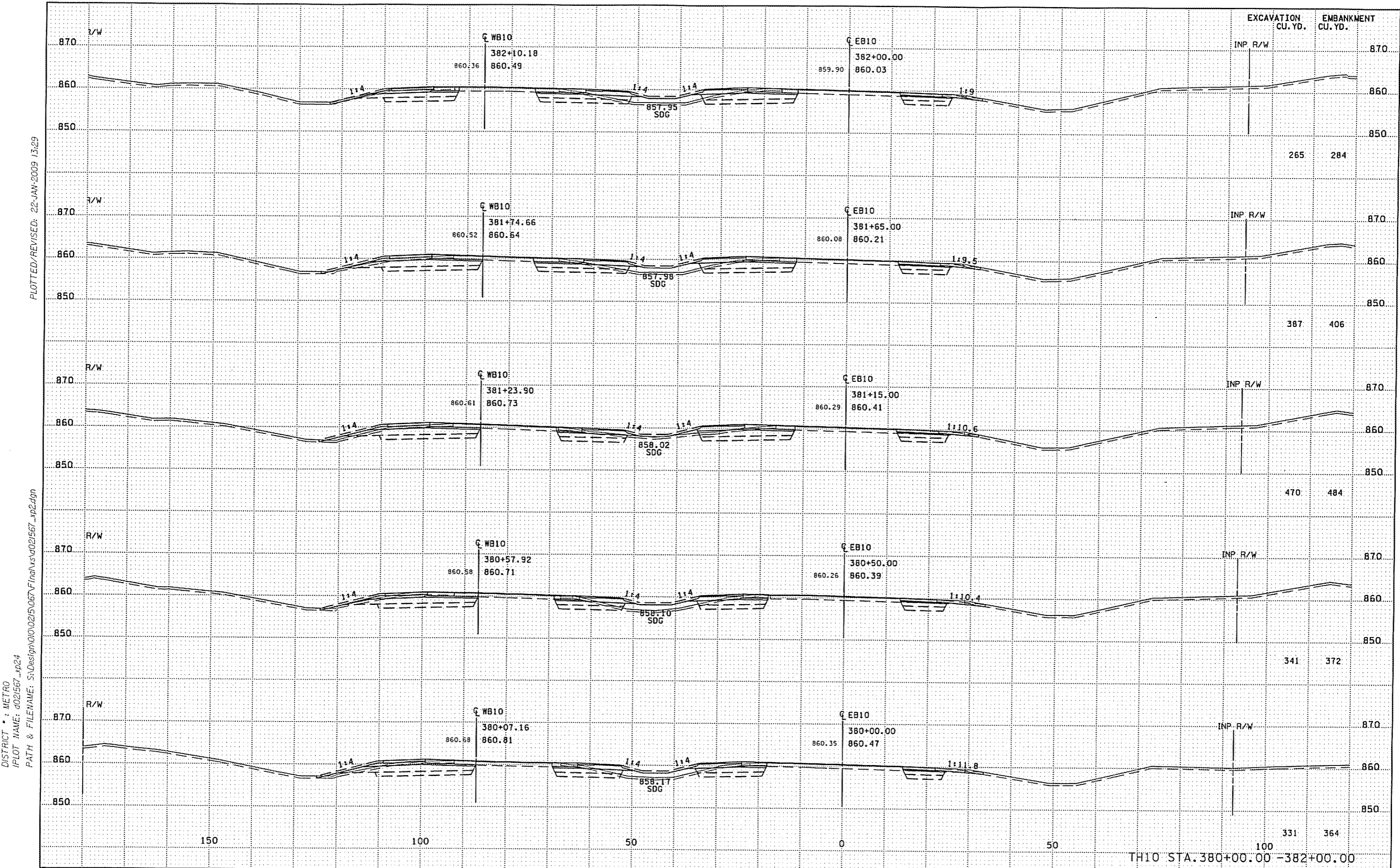
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TH10 STA. 378+00.00 - 379+50.00

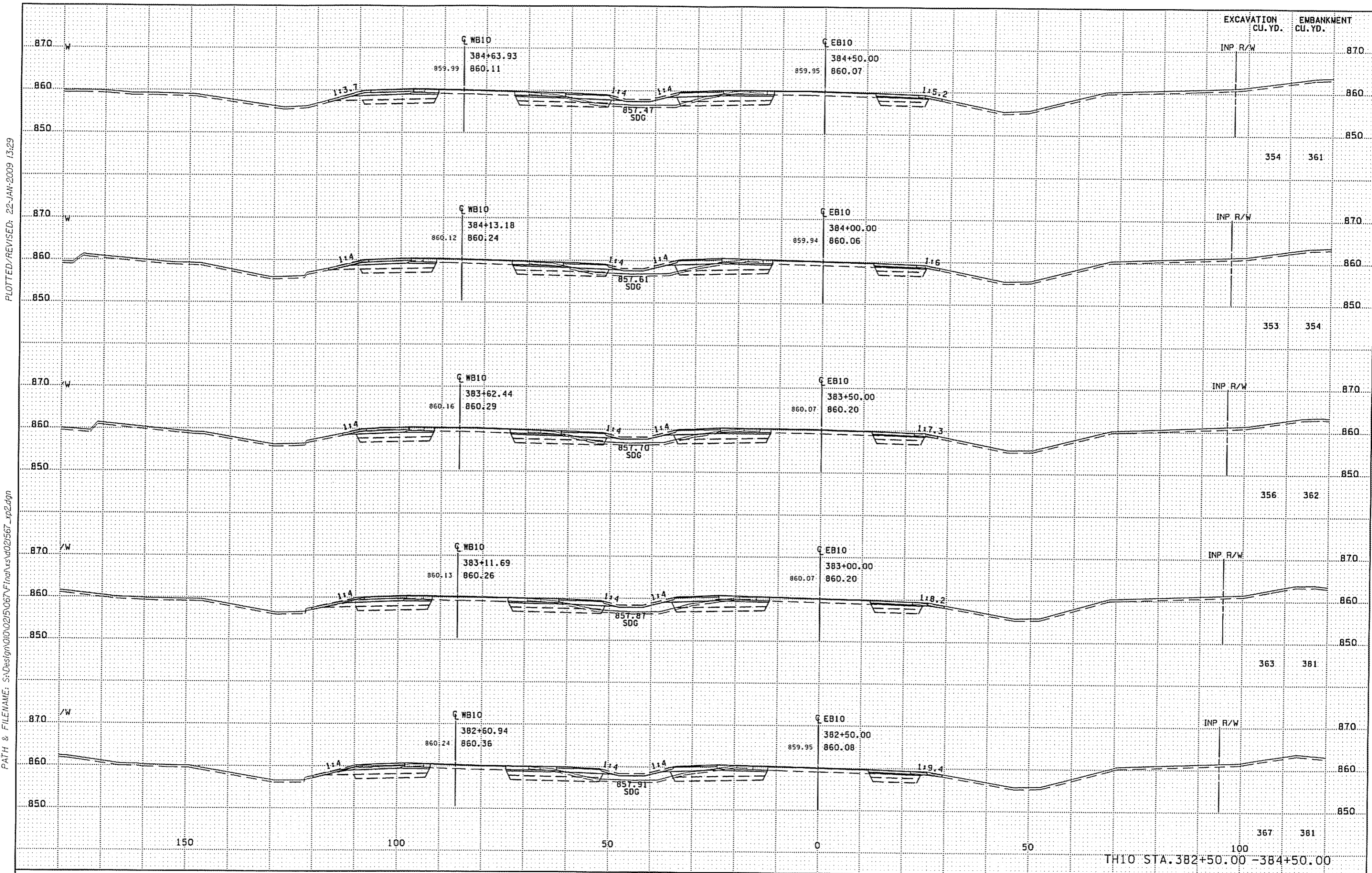


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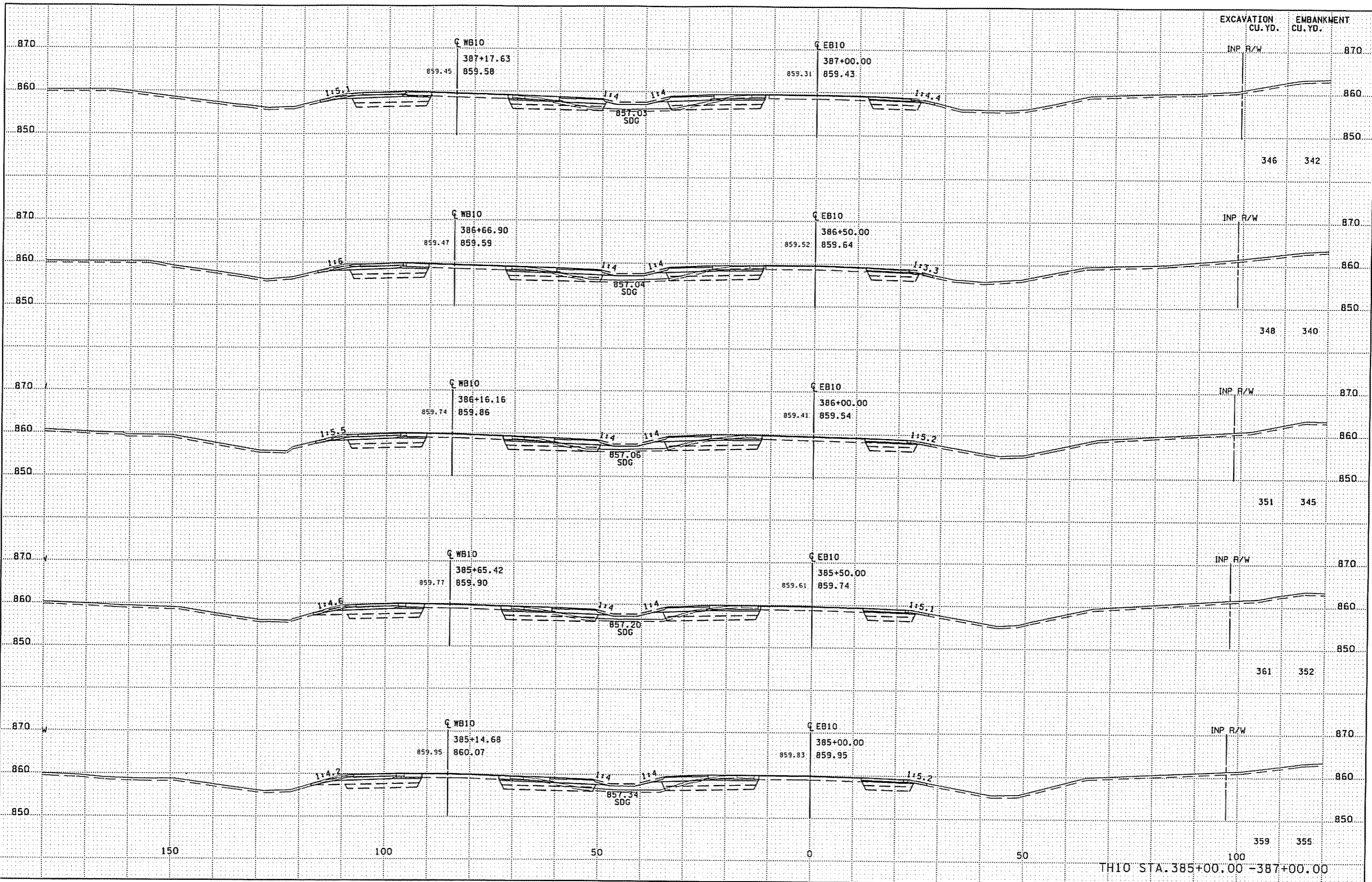
TH10 STA. 380+00.00 - 382+00.00

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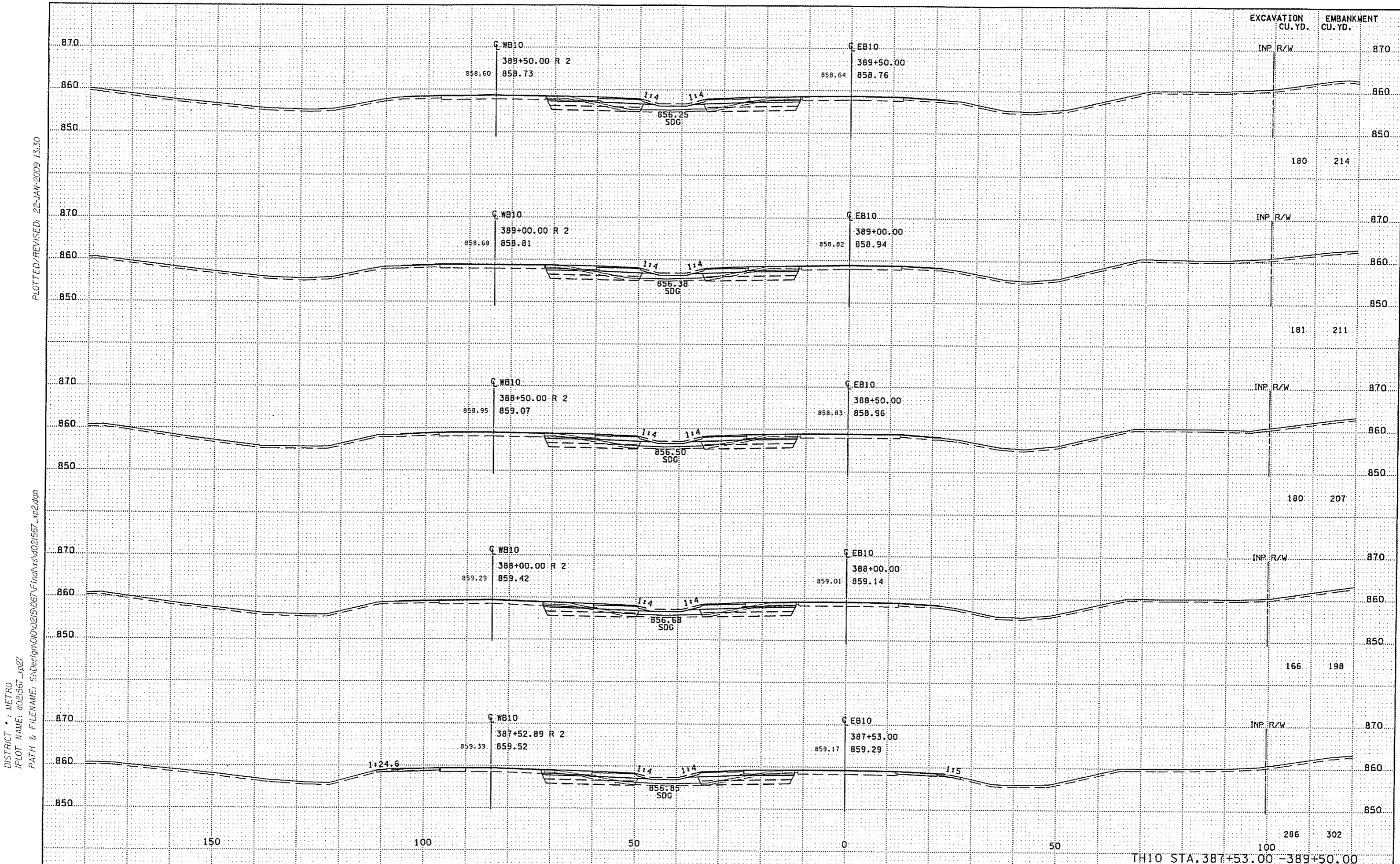


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TH10 STA. 385+00.00 - 387+00.00



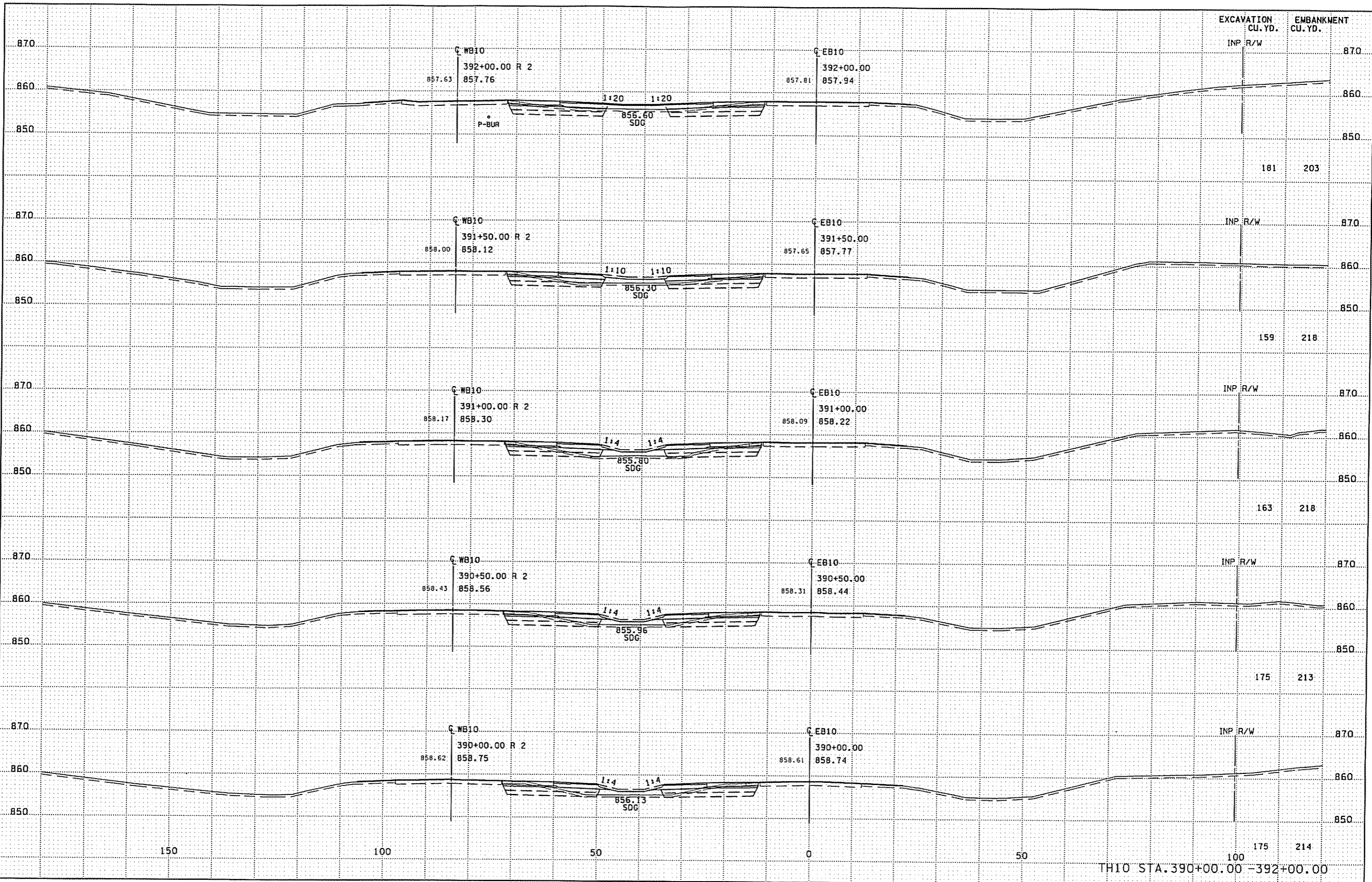
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TH10 STA. 387+53.00 - 389+50.00

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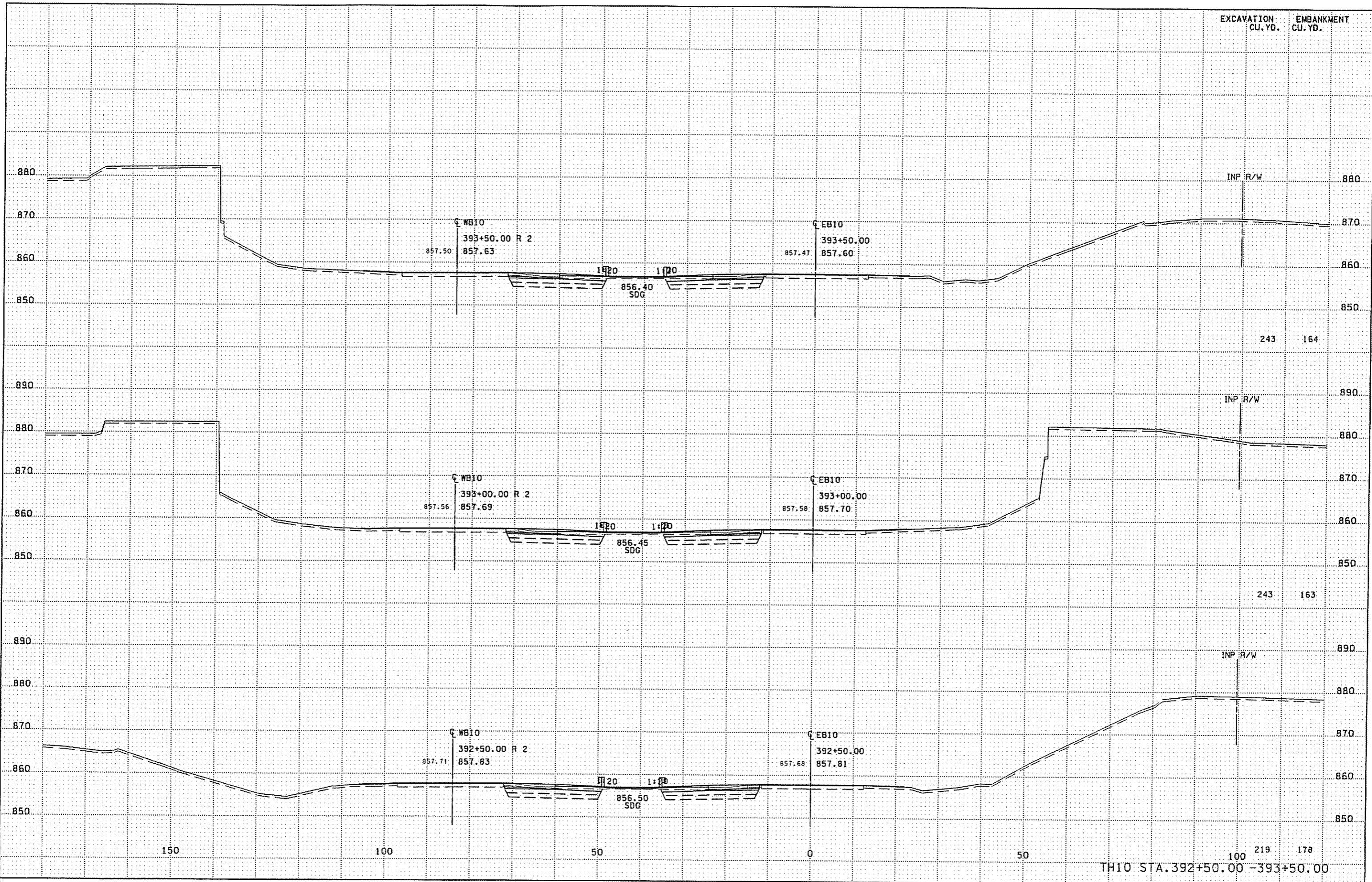


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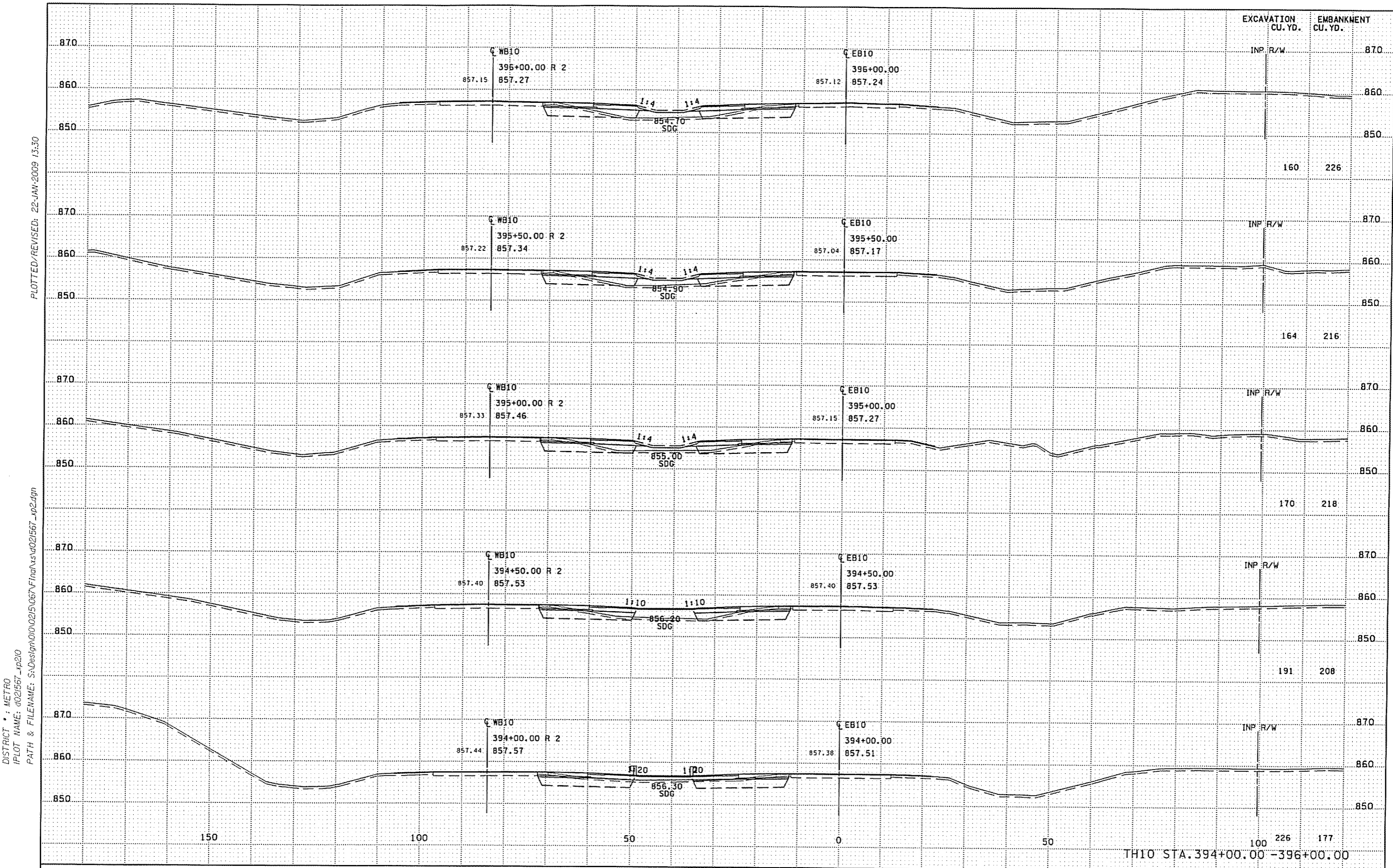
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 PATH & FILENAME: S:\Design\010\0215067\Final\vs\d021567\_xp2.dgn

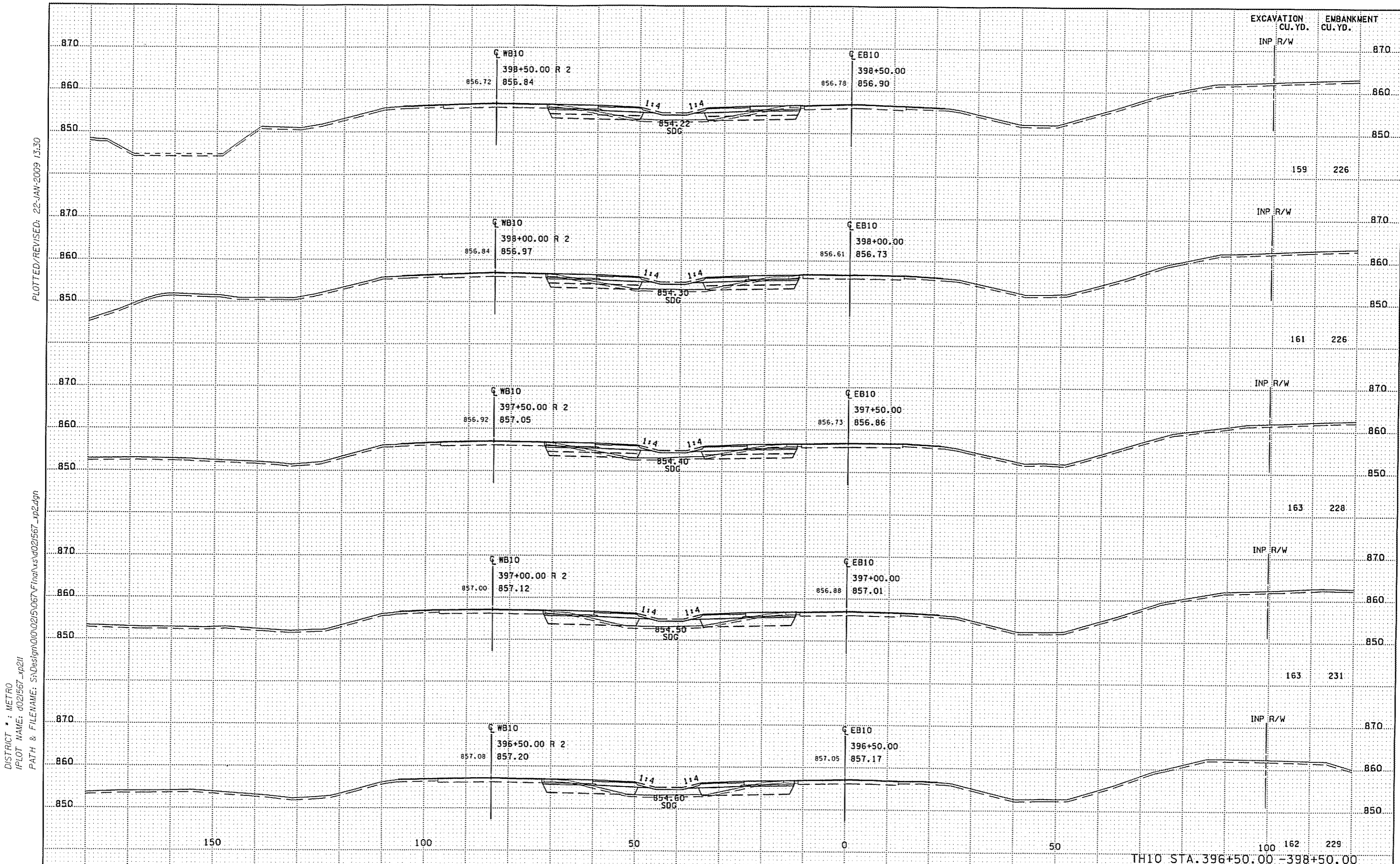


TH10 STA. 392+50.00 - 393+50.00



DISTRICT: METRO  
 PLOT NAME: 021567\_xp210  
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 PLOTTED/REVISED: 22-JAN-2009 13:30

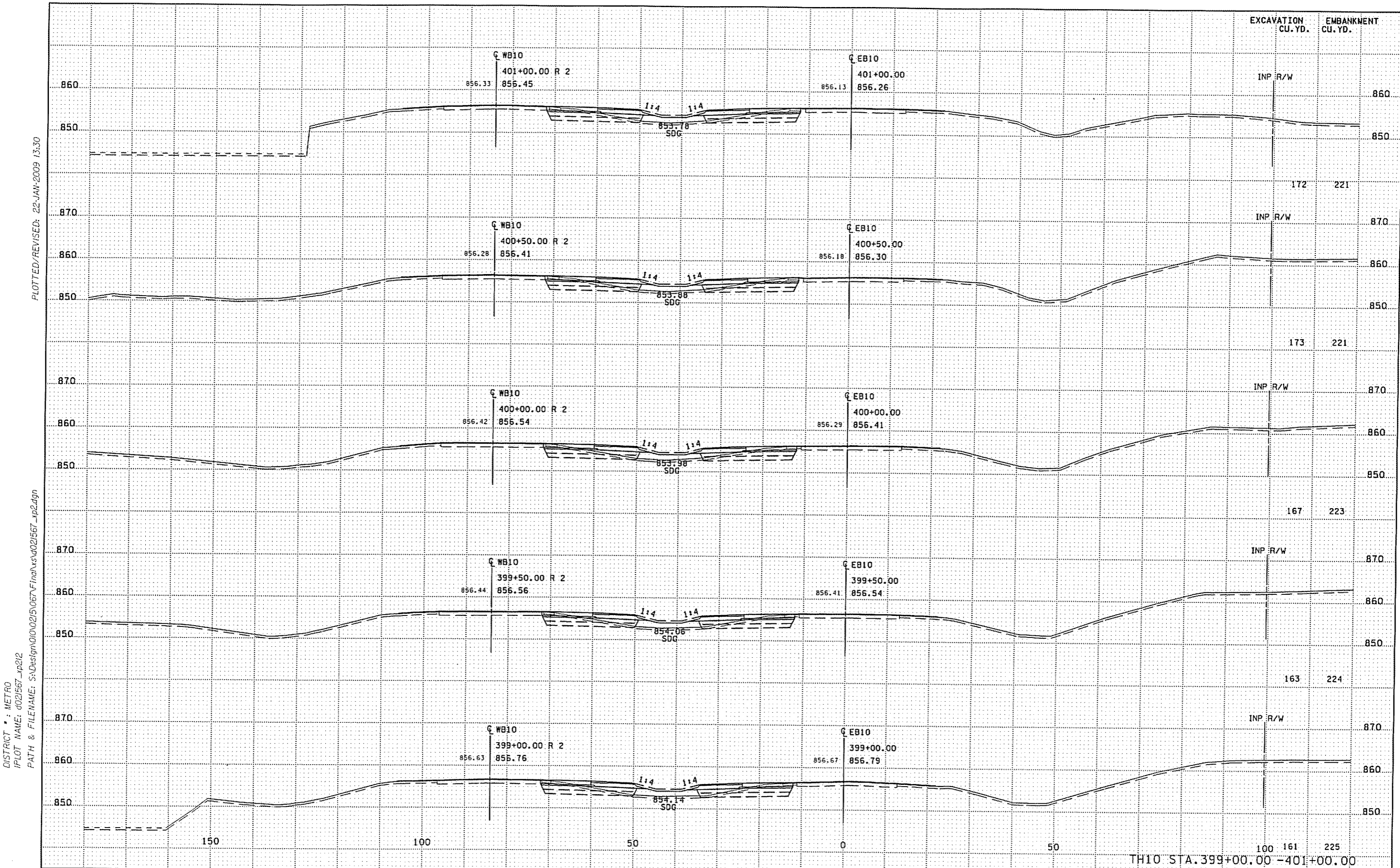
TH10 STA. 394+00.00 - 396+00.00



DISTRICT \* : METRO  
 PLOT NAME: 021567\_xp211  
 PATH & FILENAME: S:\Design\010\021567\Final\021567\_xp2.dgn

PLOTTED/REVISED: 22-JAN-2009 13:30

TH10 STA. 396+50.00 - 398+50.00

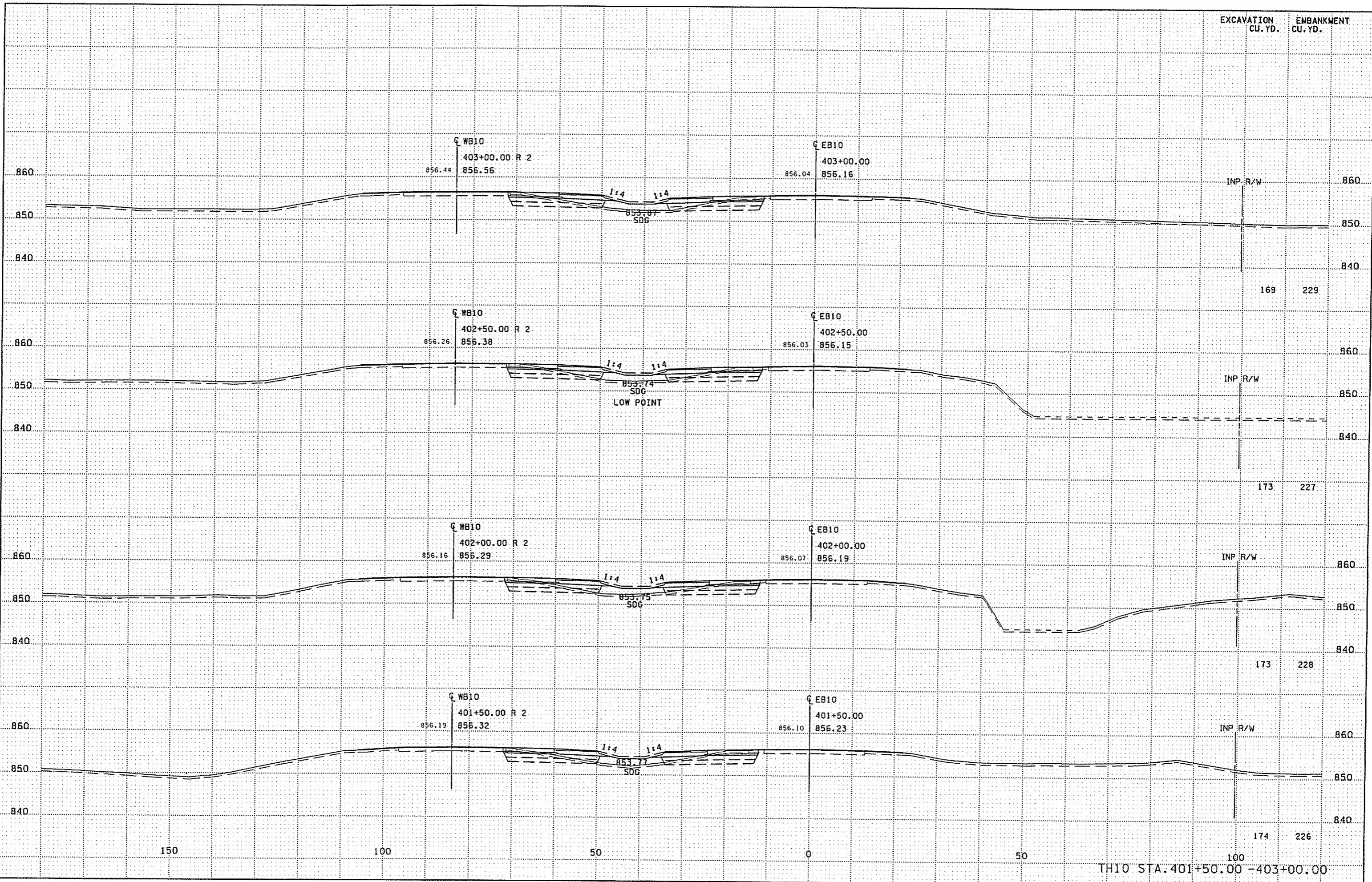


PLOTTED/REVISED: 22-JAN-2009 13:30

DISTRICT: METRO  
 PLOT NAME: 021567\_ap212  
 PATH & FILENAME: S:\Design\010\021567\Final\rs\021567\_ap2.dgn

TH10 STA. 399+00.00 - 401+00.00

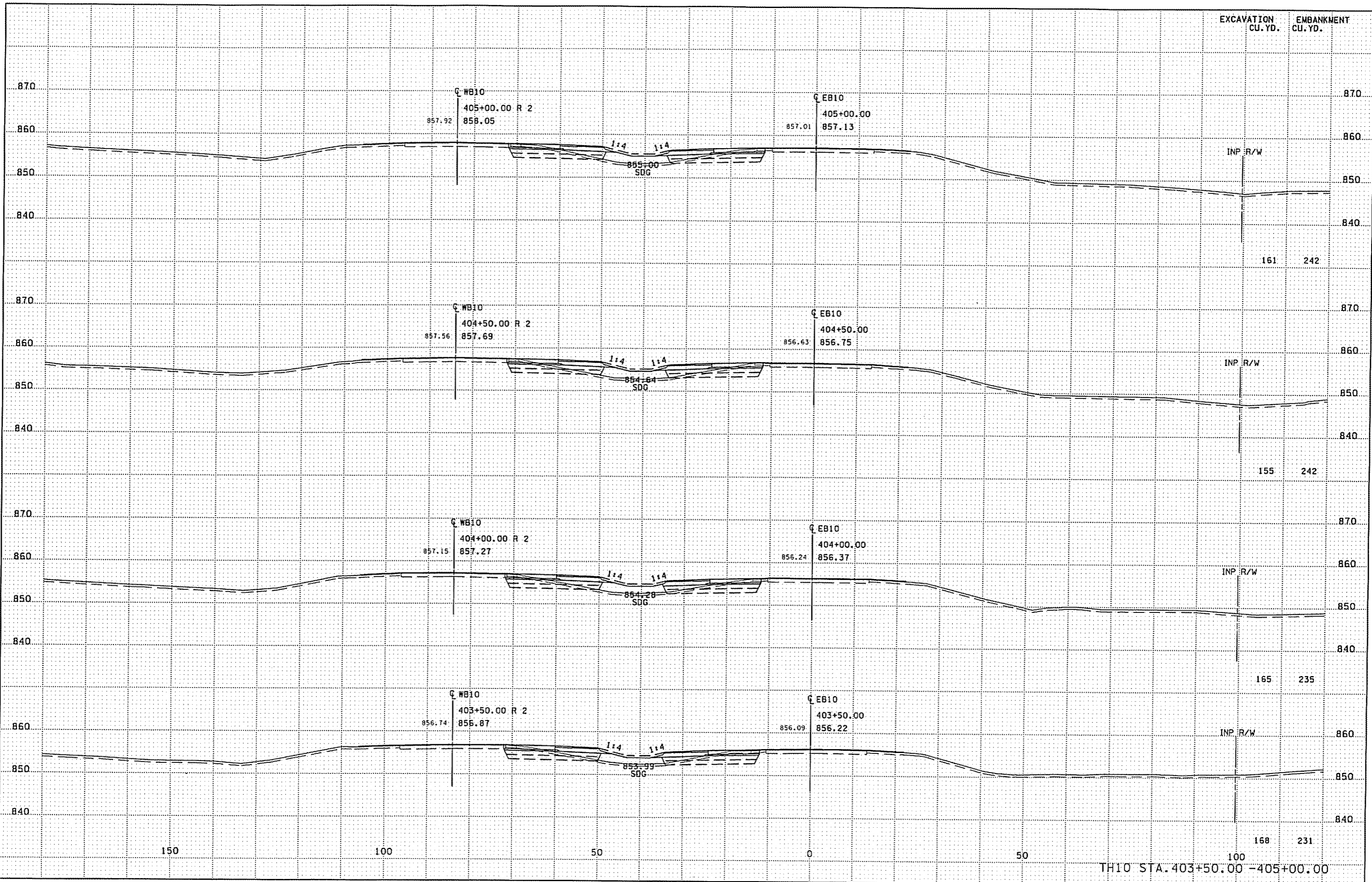
DISTRICT: METRO  
 PLOT NAME: 4021567\_xp213  
 PATH & FILENAME: S:\Design\0\0215067\Final\4021567\_xp2.dgn  
 PLOTTED/REVISED: 22-JAN-2009 13:30



TH10 STA. 401+50.00 - 403+00.00

DISTRICT : METRO  
 PLOT NAME: 021567\_xp214  
 PATH & FILENAME: S:\Design\0\0215067\Final\021567\_xp2.dgn

PLOTTED/REVISED: 22-JAN-2009 13:31



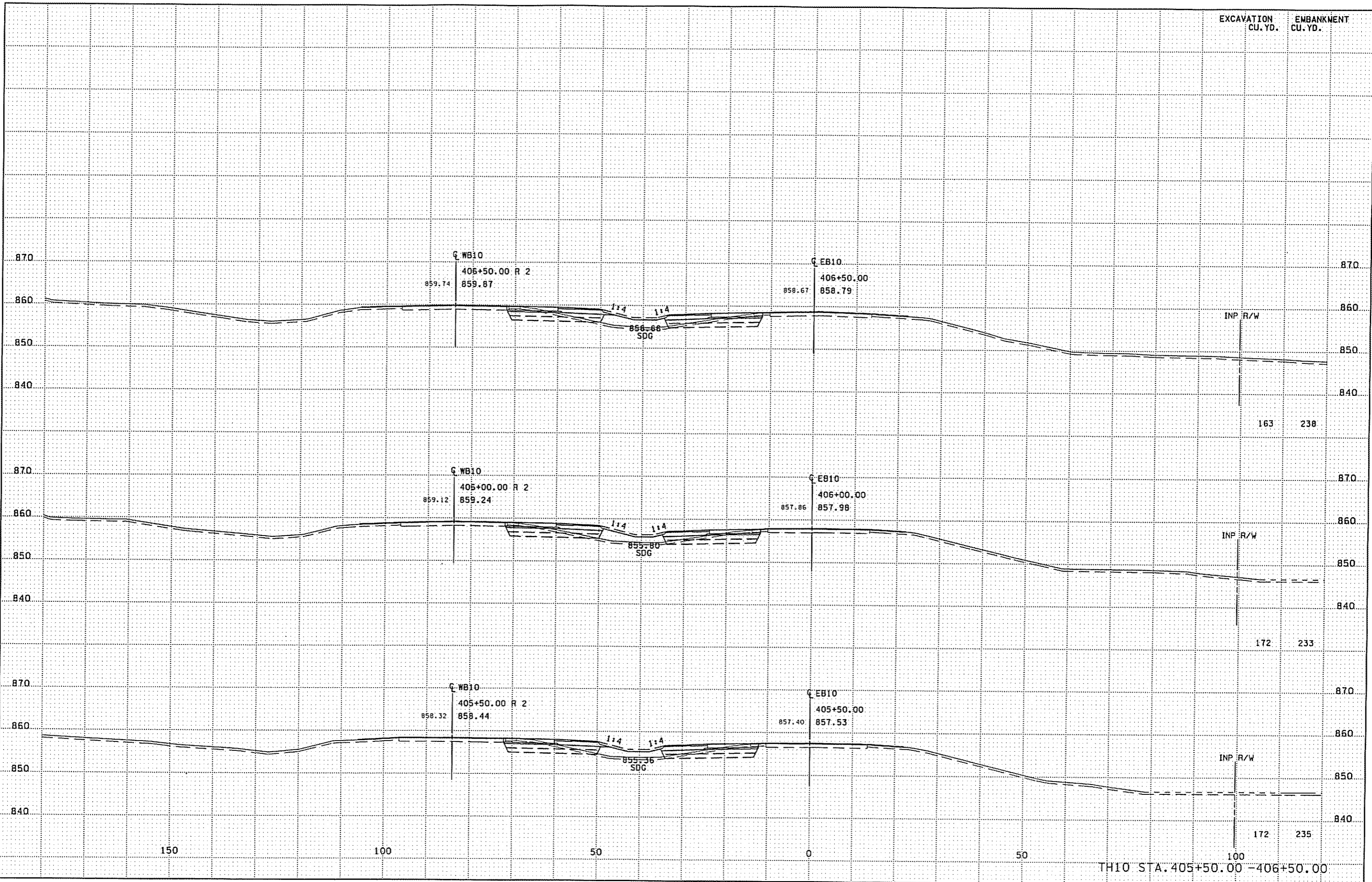
TH10 STA. 403+50.00 - 405+00.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:31

DISTRICT: METRO  
PLOT NAME: 021567\_ip215  
PATH & FILENAME: S:\Design\010\0215\067\Final\021567\_ip2.dgn



INP R/W

163 238

INP R/W

172 233

INP R/W

172 235

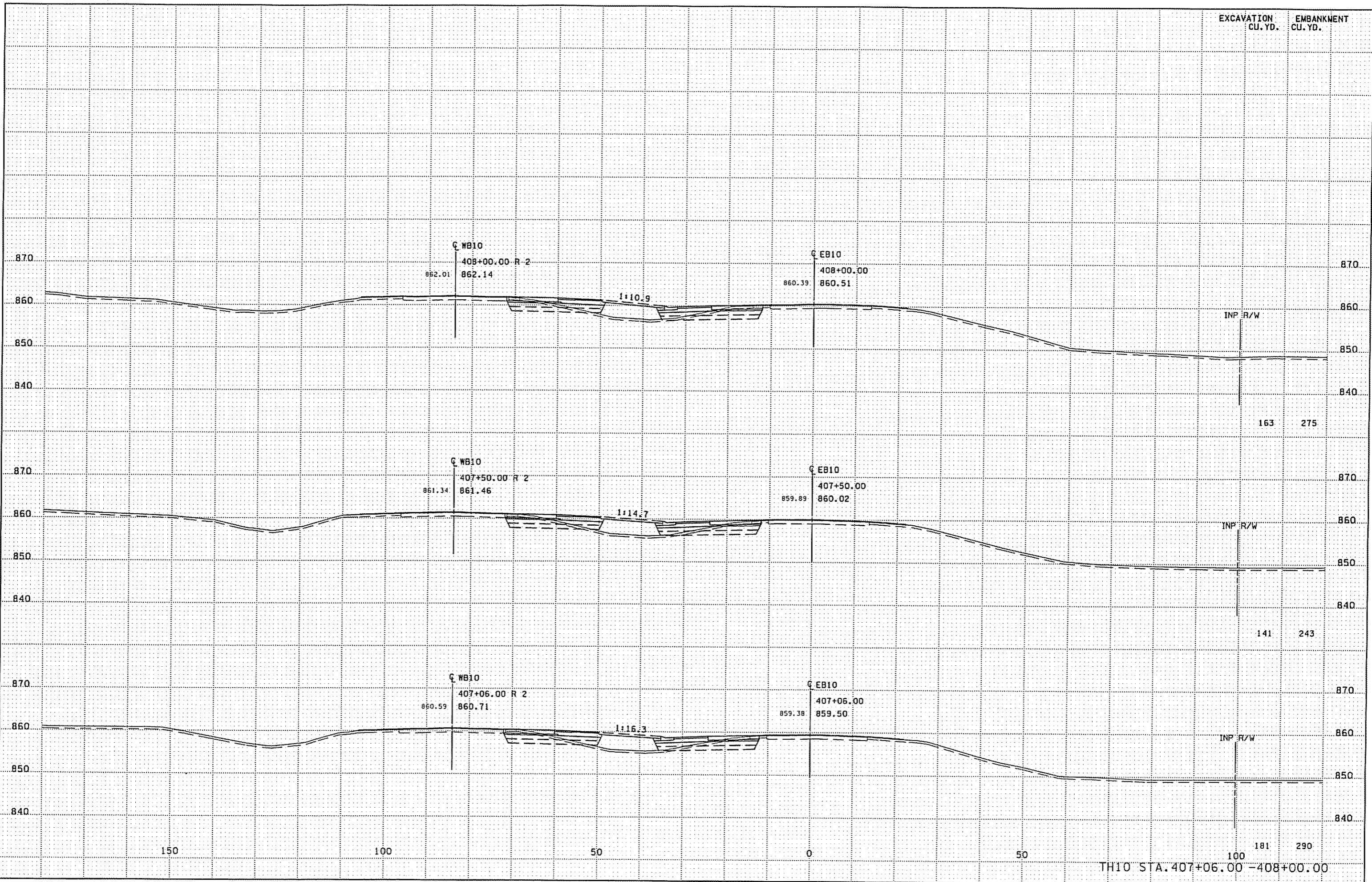
TH10 STA. 405+50.00 -406+50.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:31

DISTRICT : METRO  
 PLOT NAME: 021567\_xp216  
 PATH & FILENAME: S:\Design\0\0215067\Final\021567\_xp2.dgn



TH10 STA. 407+06.00 - 408+00.00

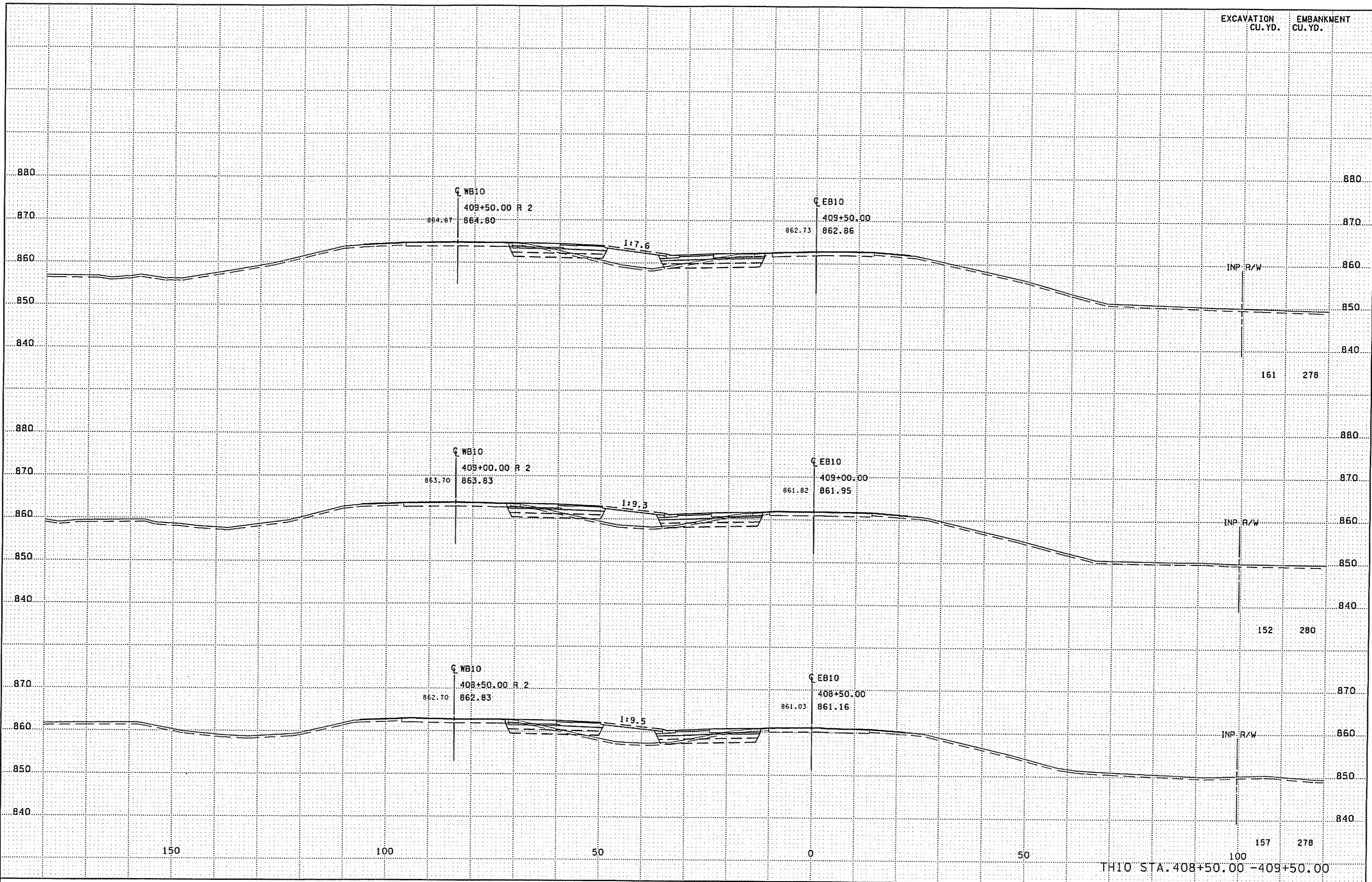


EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

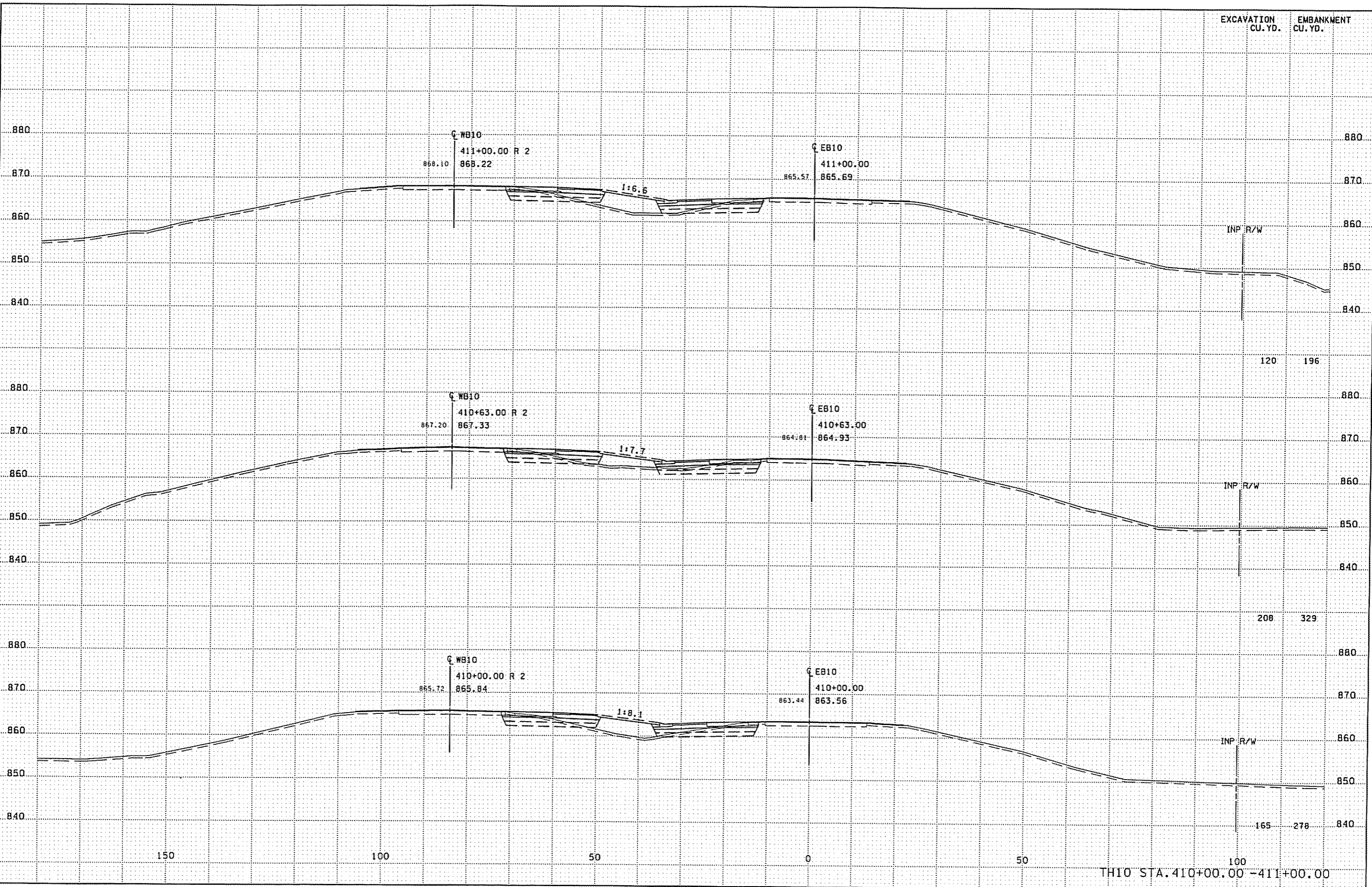
PLOTTED/REVISED: 22-JAN-2009 13:31

DISTRICT : METRO  
 PLOT NAME: 021567\_xp217  
 PATH & FILENAME: S:\Design\010\021567\Final\021567\_xp2.dgn



THIS STA. 408+50.00 - 409+50.00

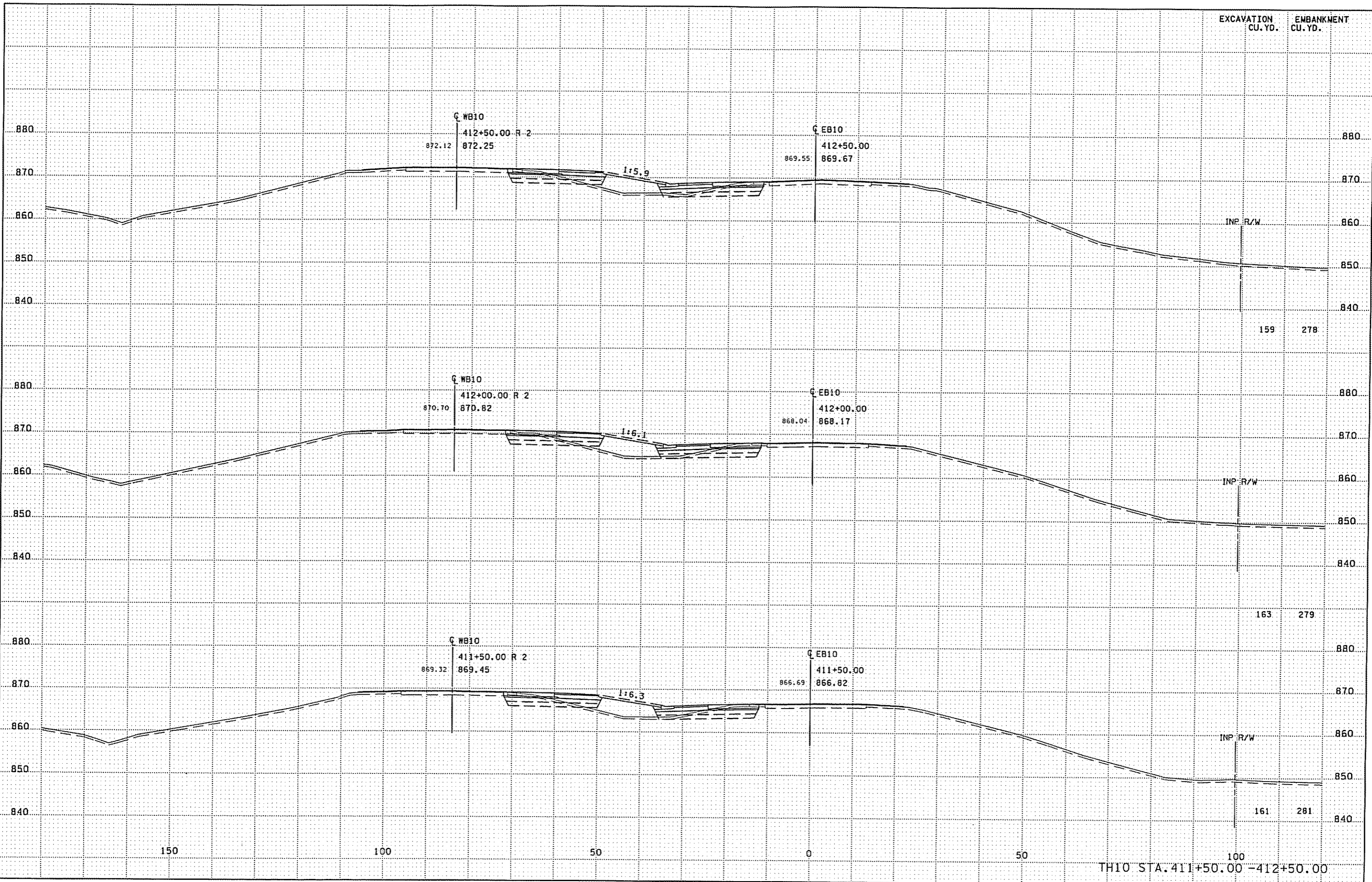
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 PLOTTED/REVISED: 22-JAN-2009 15:31



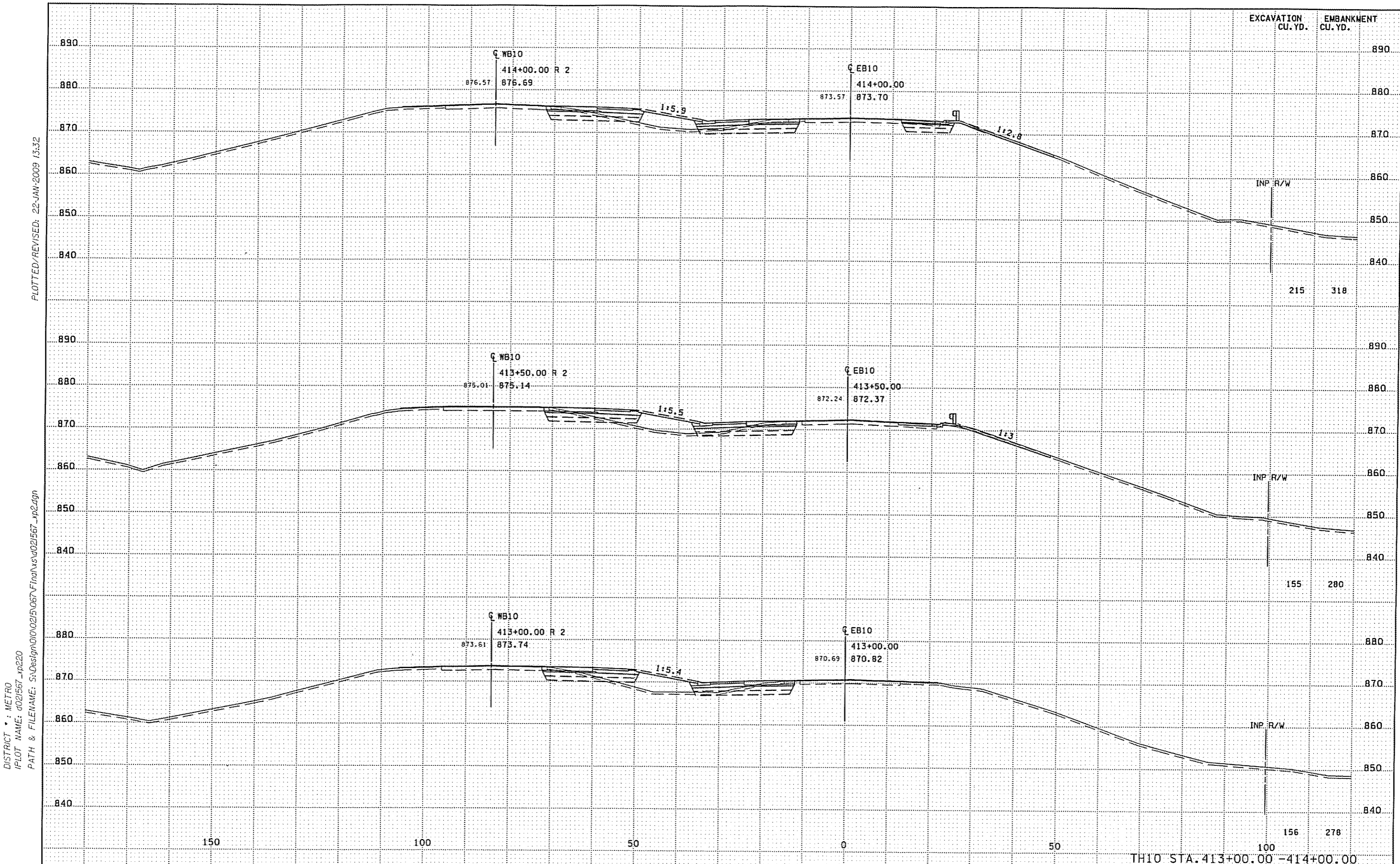
TH10 STA. 410+00.00 - 411+00.00

DISTRICT : METRO  
 PLOT NAME: 021567\_xp219  
 PATH & FILENAME: S:\Design\0\0215067\Final\021567\_xp2.dgn

PLOTTED/REVISED: 22-JAN-2009 13:31



TH10 STA. 411+50.00 - 412+50.00



PLOTTED/REVISED: 22-JAN-2009 13:32

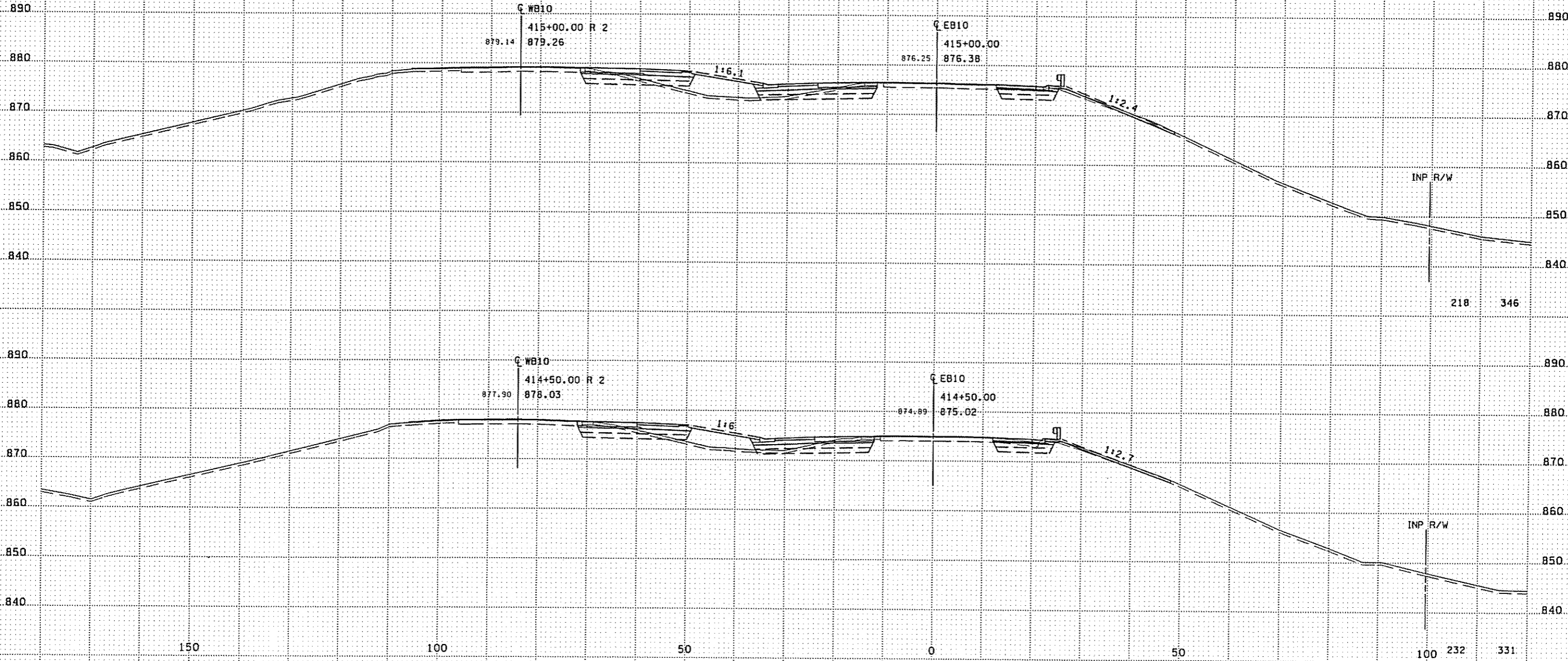
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TH10 STA. 413+00.00 - 414+00.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:32



DISTRICT : METRO  
PLOT NAME: 021567\_xp221  
PATH & FILENAME: S:\Design\01\0215067\Final\vs\021567\_xp2.dgn

150

100

50

0

50

100

232

331

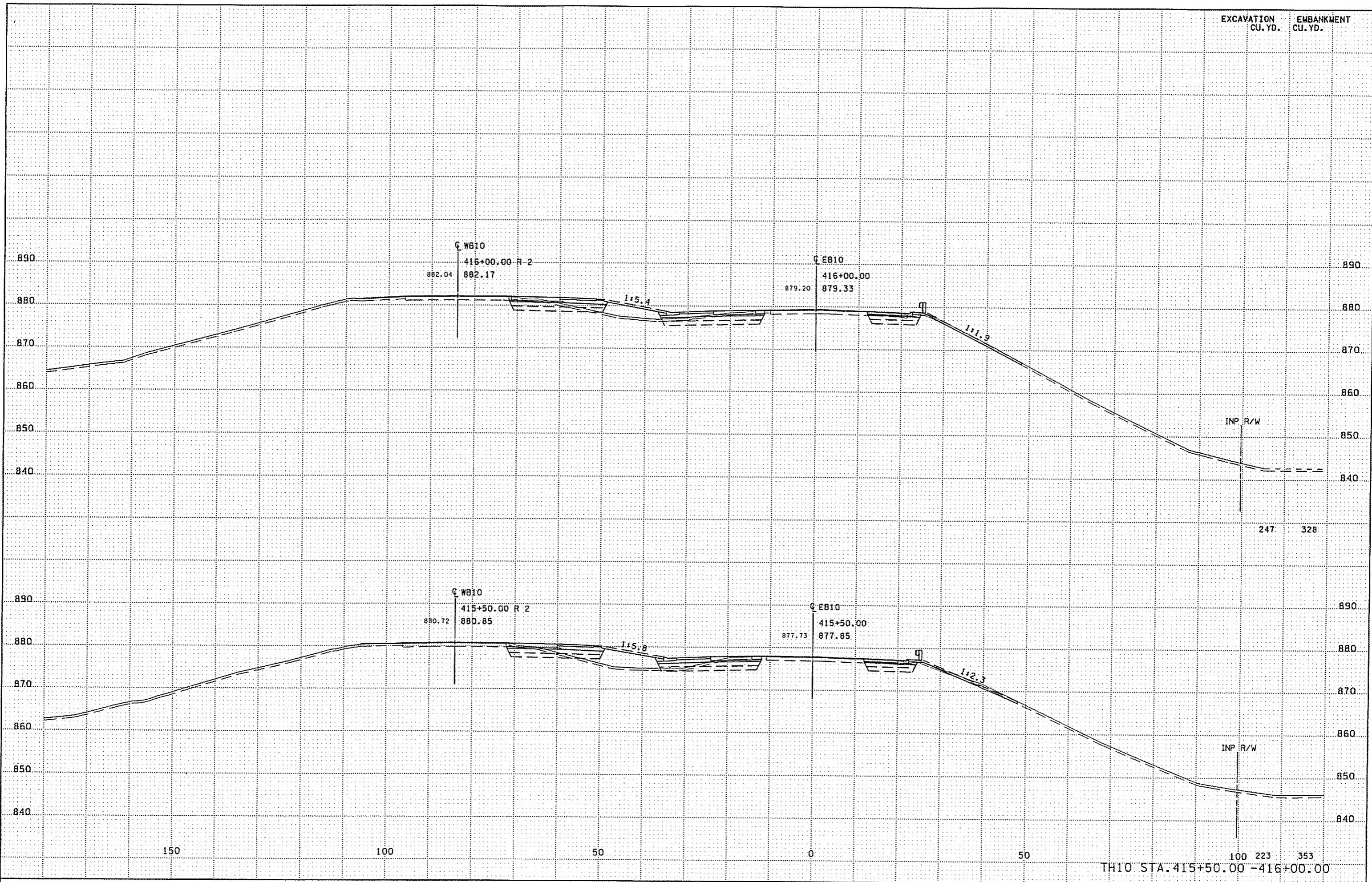
TH10 STA. 414+50.00 - 415+00.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:32

DISTRICT \* : METRO  
 PLOT NAME: 021567\_xp222  
 PATH & FILENAME: S:\Design\010\0215067\Final\021567\_xp2.dgn



INP R/W

247 328

INP R/W

100 223 353

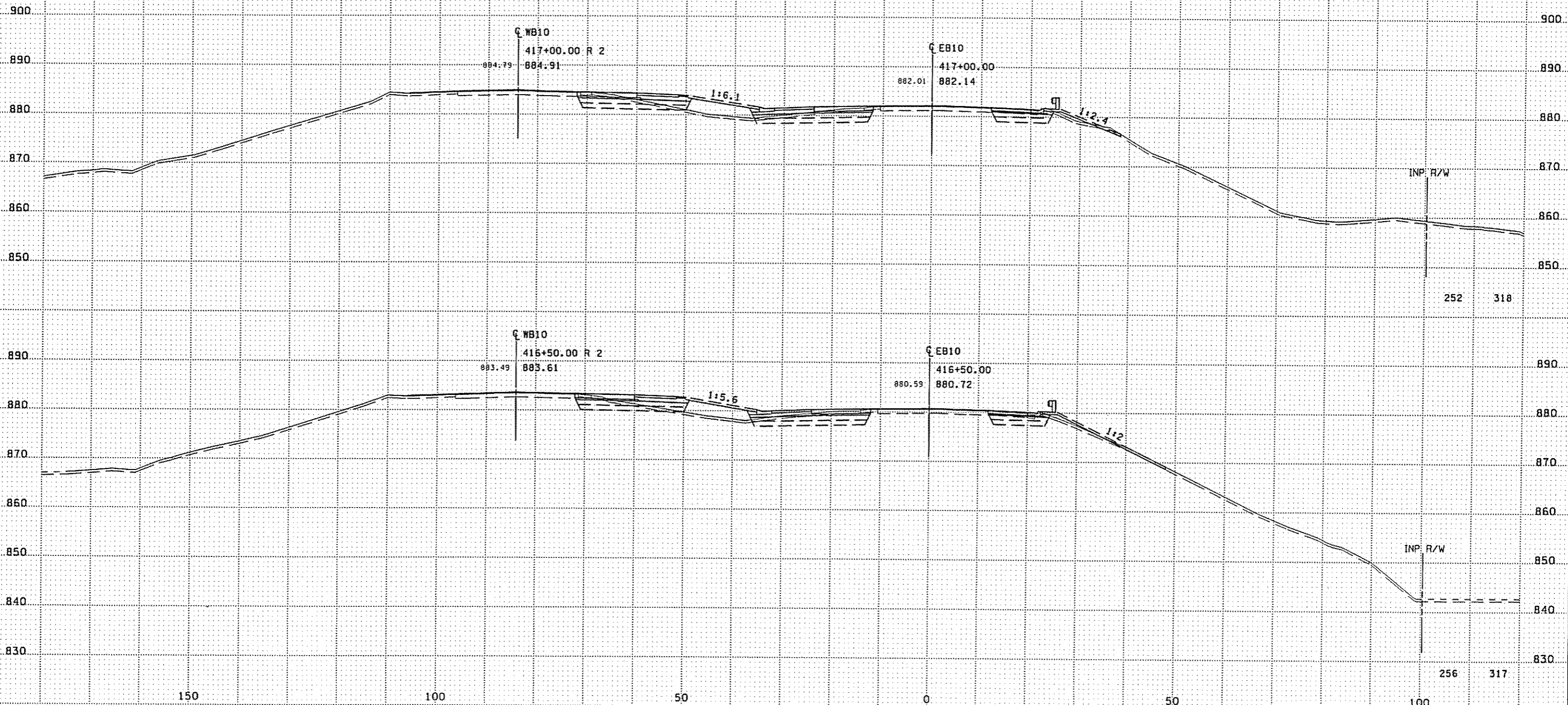
TH10 STA. 415+50.00 - 416+00.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:32

DISTRICT : METRO  
 PLOT NAME: 021567\_xp223  
 PATH & FILENAME: S:\Design\0\021567\Final\rs\021567\_xp2.dgn



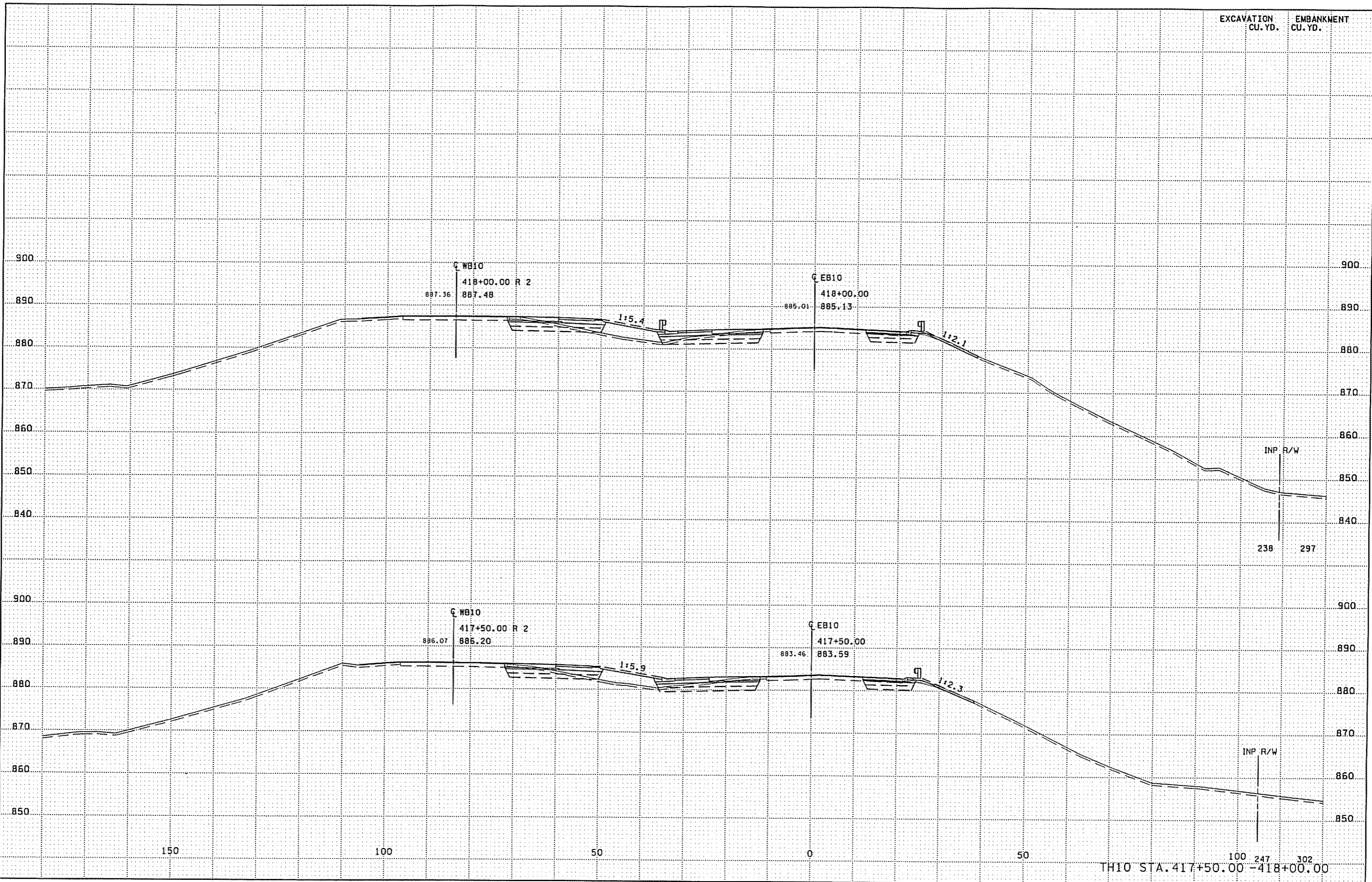
TH10 STA. 416+50.00 - 417+00.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:32

DISTRICT : METRO  
PLOT NAME: 021567\_xp224  
PATH & FILENAME: S:\Design\010\0215067\Final\021567\_xp2.dgn



150

100

50

0

50

100

247

302

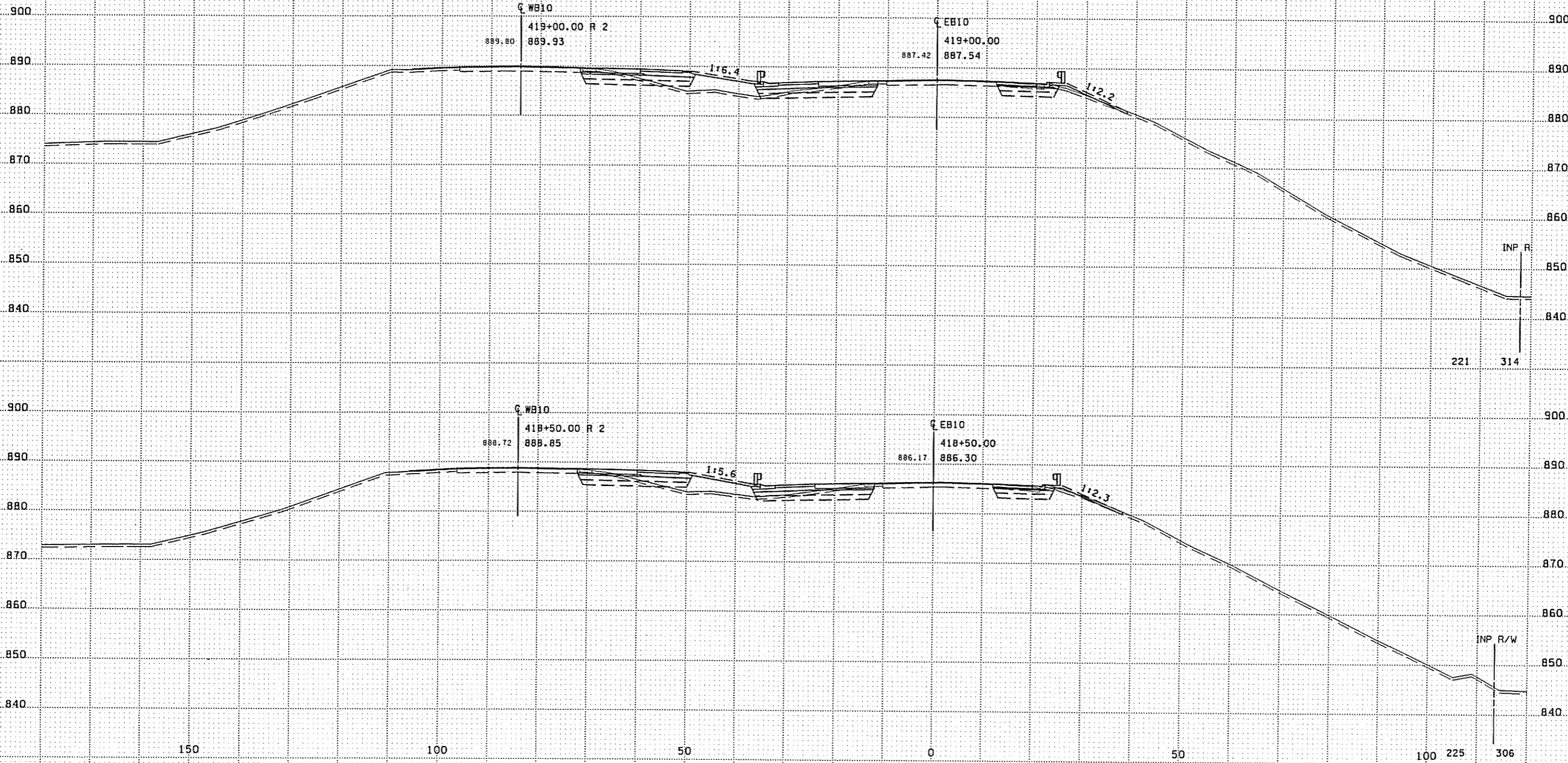
TH10 STA. 417+50.00 - 418+00.00



EXCAVATION  
CU. YD.      EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:32

DISTRICT : METRO  
PLOT NAME: 021567\_xp225  
PATH & FILENAME: S:\Design\01\0215\06\TH10\021567\_xp2.dgn



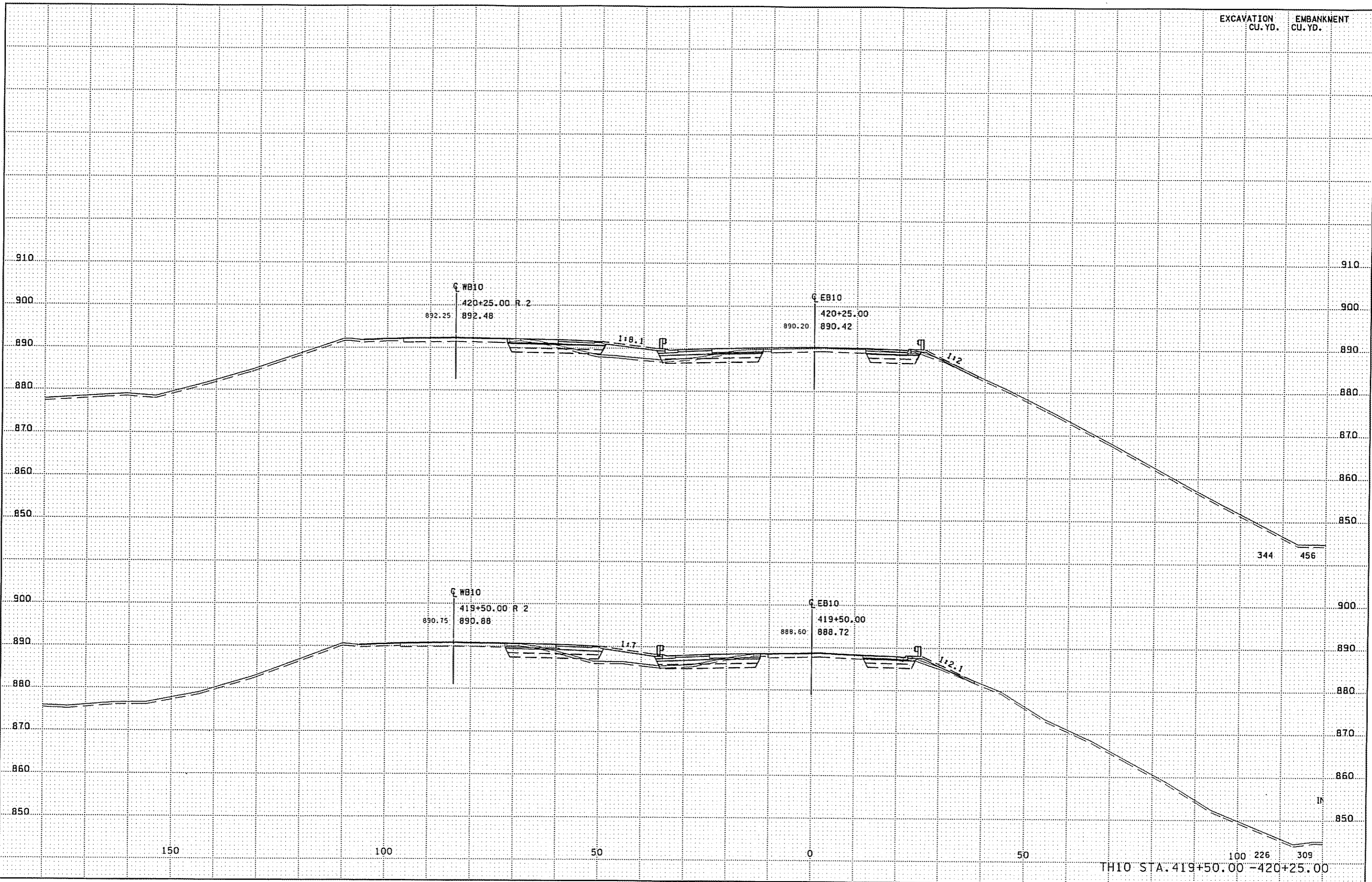
TH10 STA. 418+50.00 - 419+00.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:33

DISTRICT: METRO  
 PLOT NAME: 021567\_xp226  
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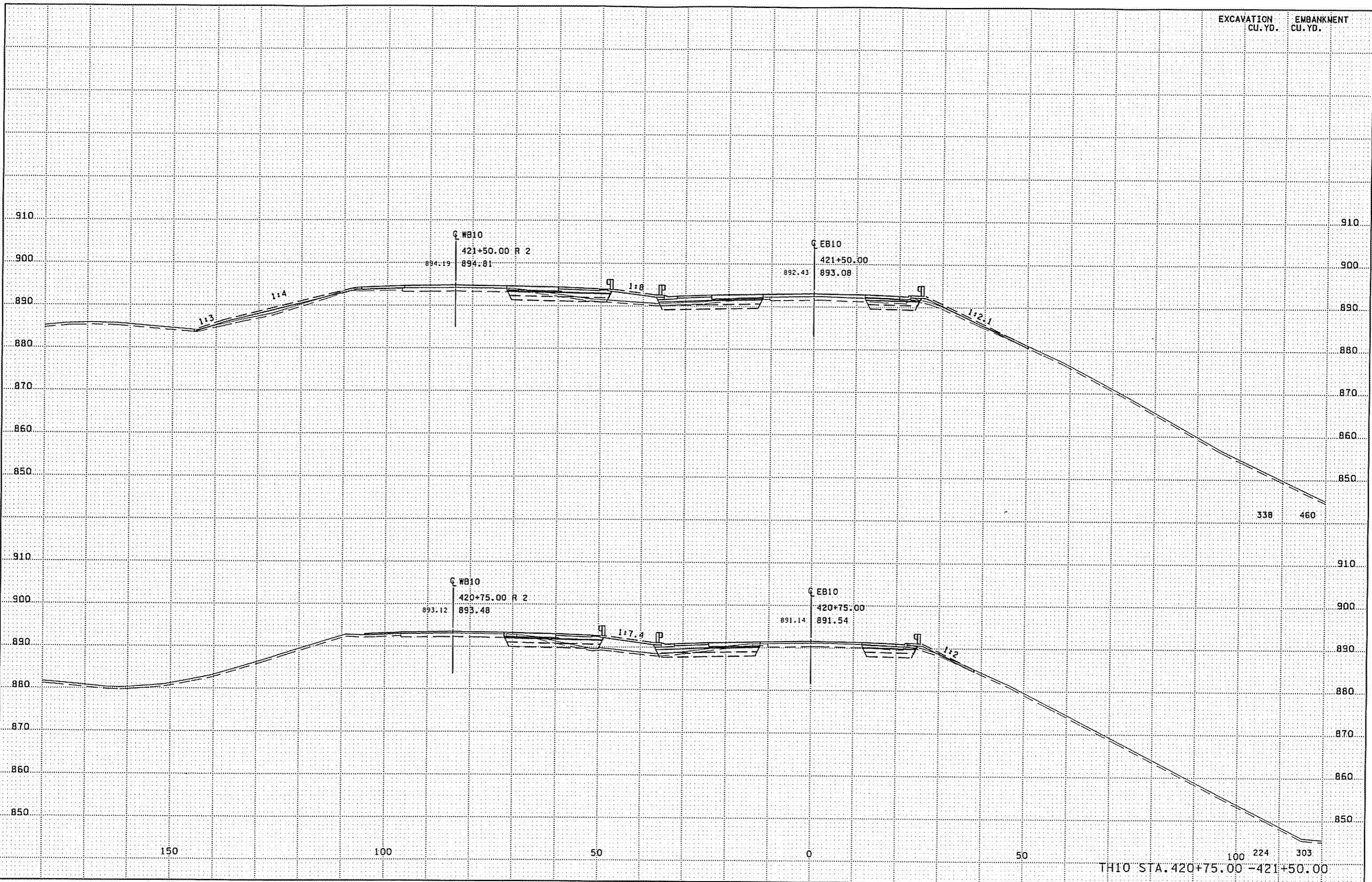


TH10 STA. 419+50.00 - 420+25.00

EXCAVATION  
CU. YD.      EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:33

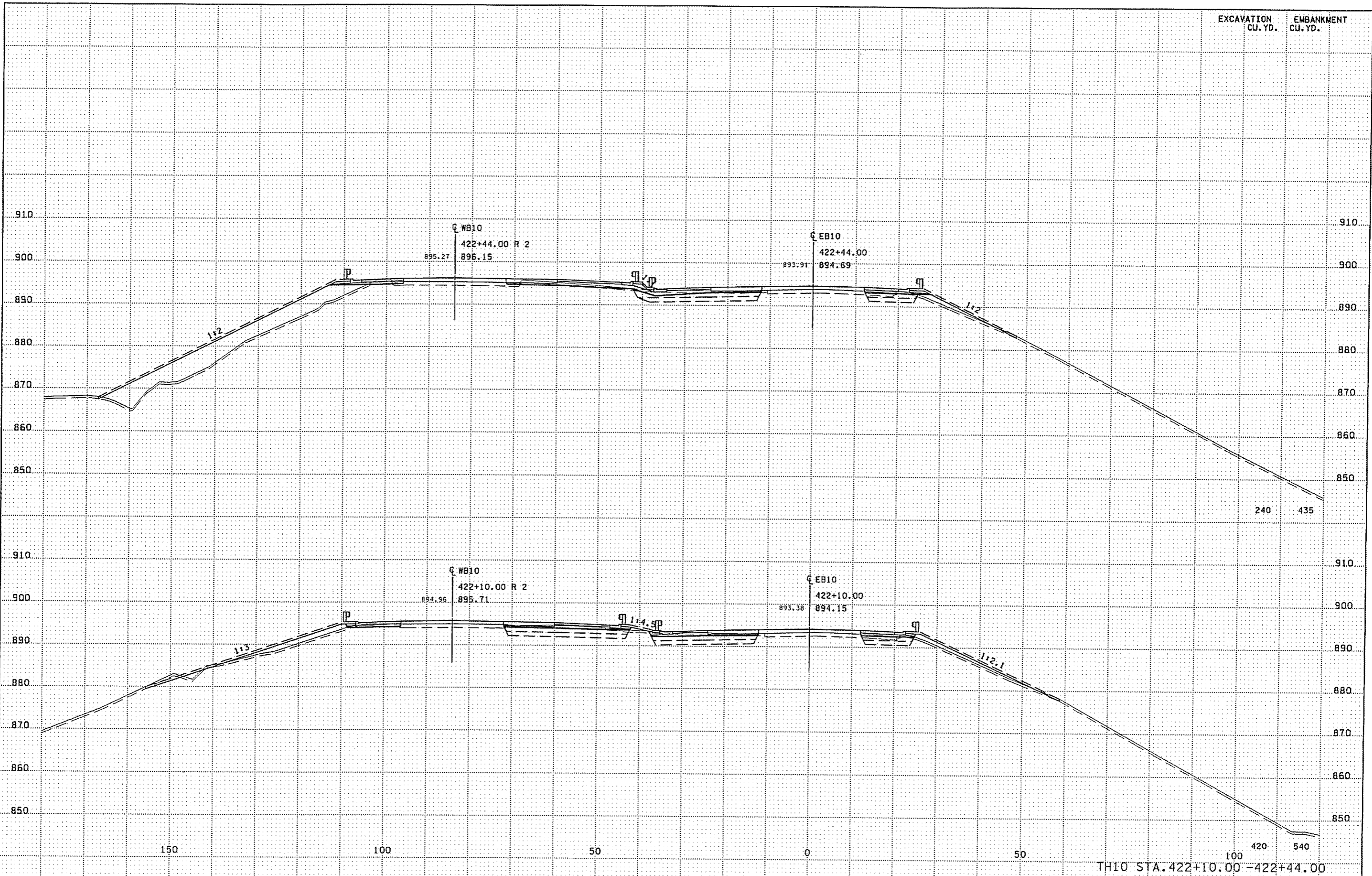
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PATH & FILENAME: S:\Design\01\0215\067\Final\4021567\_1p2.dgn



EXCAVATION  
CU. YD.      EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:33

DISTRICT : METRO  
PLOT NAME: 021567 \_rp228  
PATH & FILENAME: S:\Design\01021567\Final\021567 \_rp2.dgn



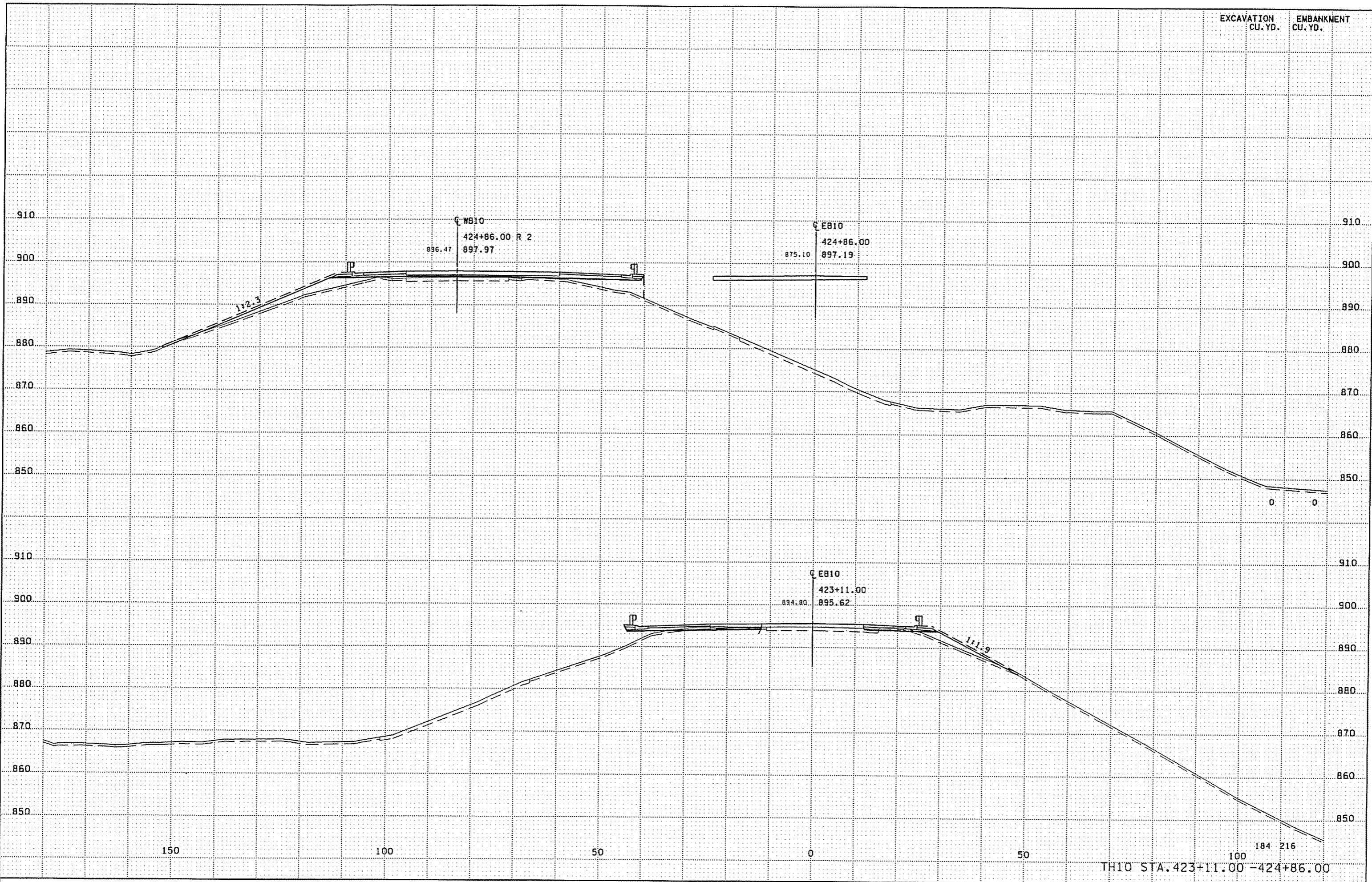
TH10 STA. 422+10.00 - 422+44.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

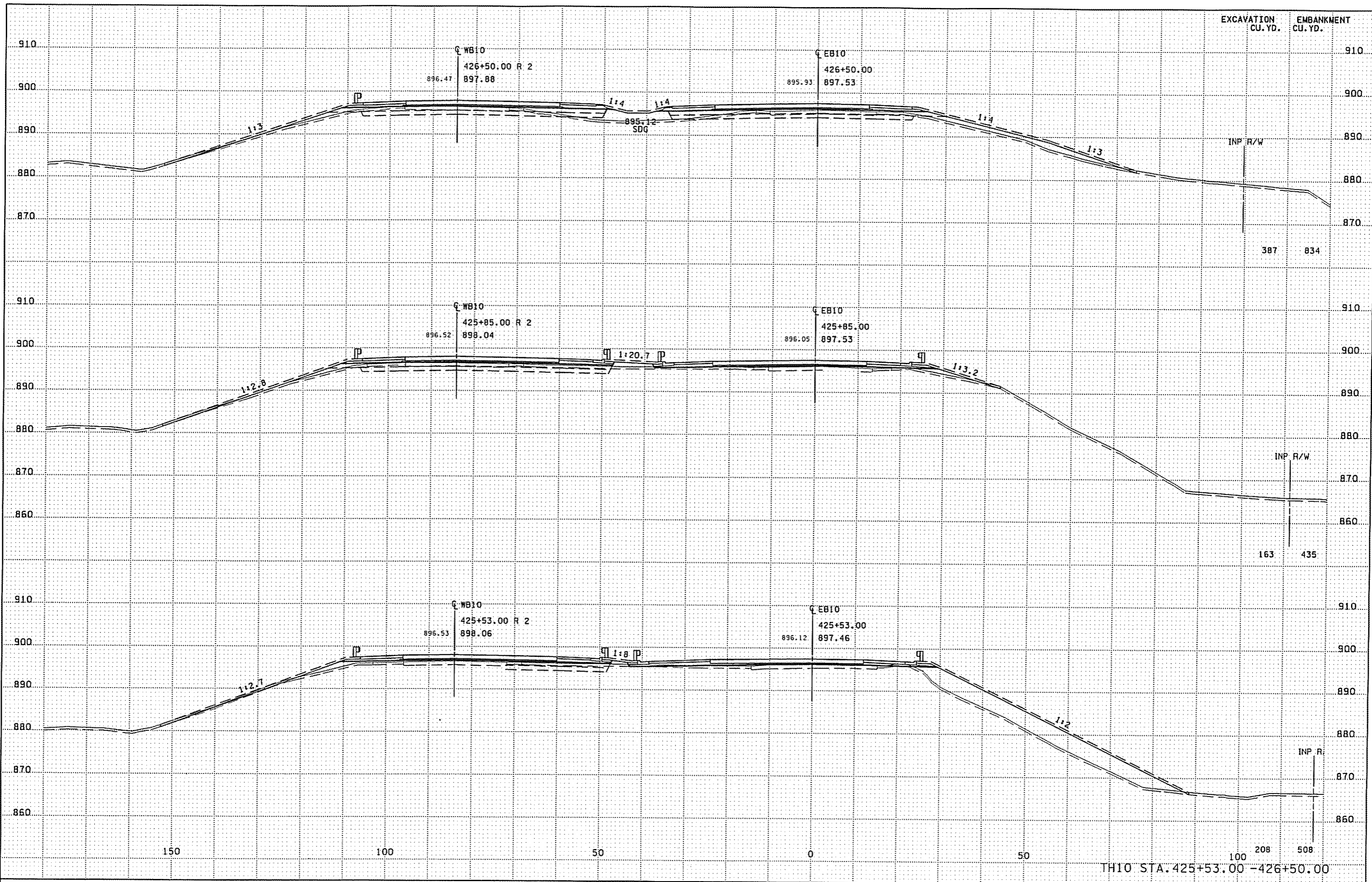
PLOTTED/REVISED: 22-JAN-2009 13:33

DISTRICT : METRO  
PLOT NAME: 4021567\_xp229  
PATH & FILENAME: S:\Design\010\0215\067\Final\4021567\_xp2.dgn



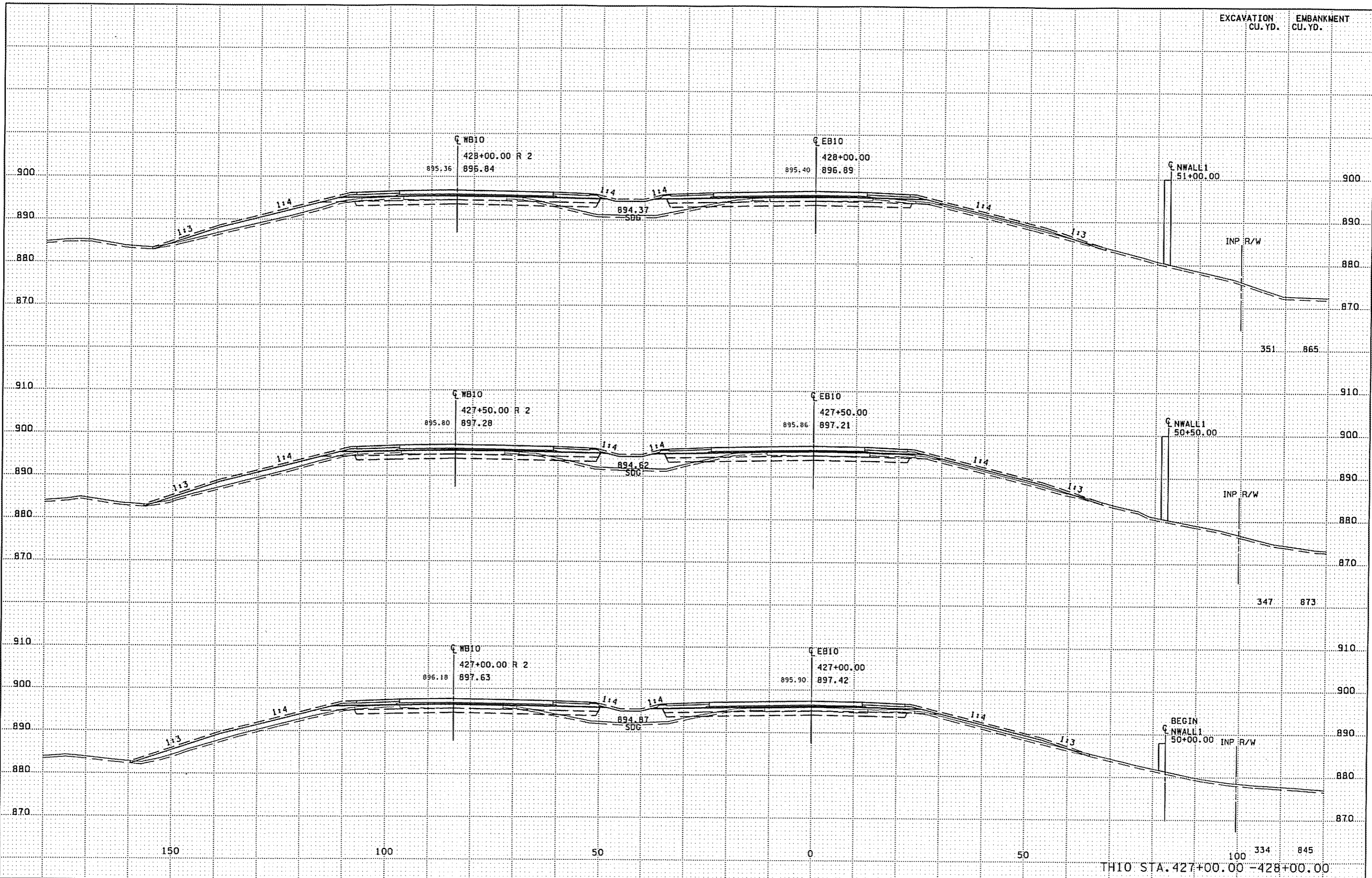
TH10 STA. 423+11.00 - 424+86.00

DISTRICT : METRO  
 PLOT NAME: 021567\_xp230  
 PATH & FILENAME: S:\Design\01\0215\06\TH10\vs\021567\_xp2.dgn



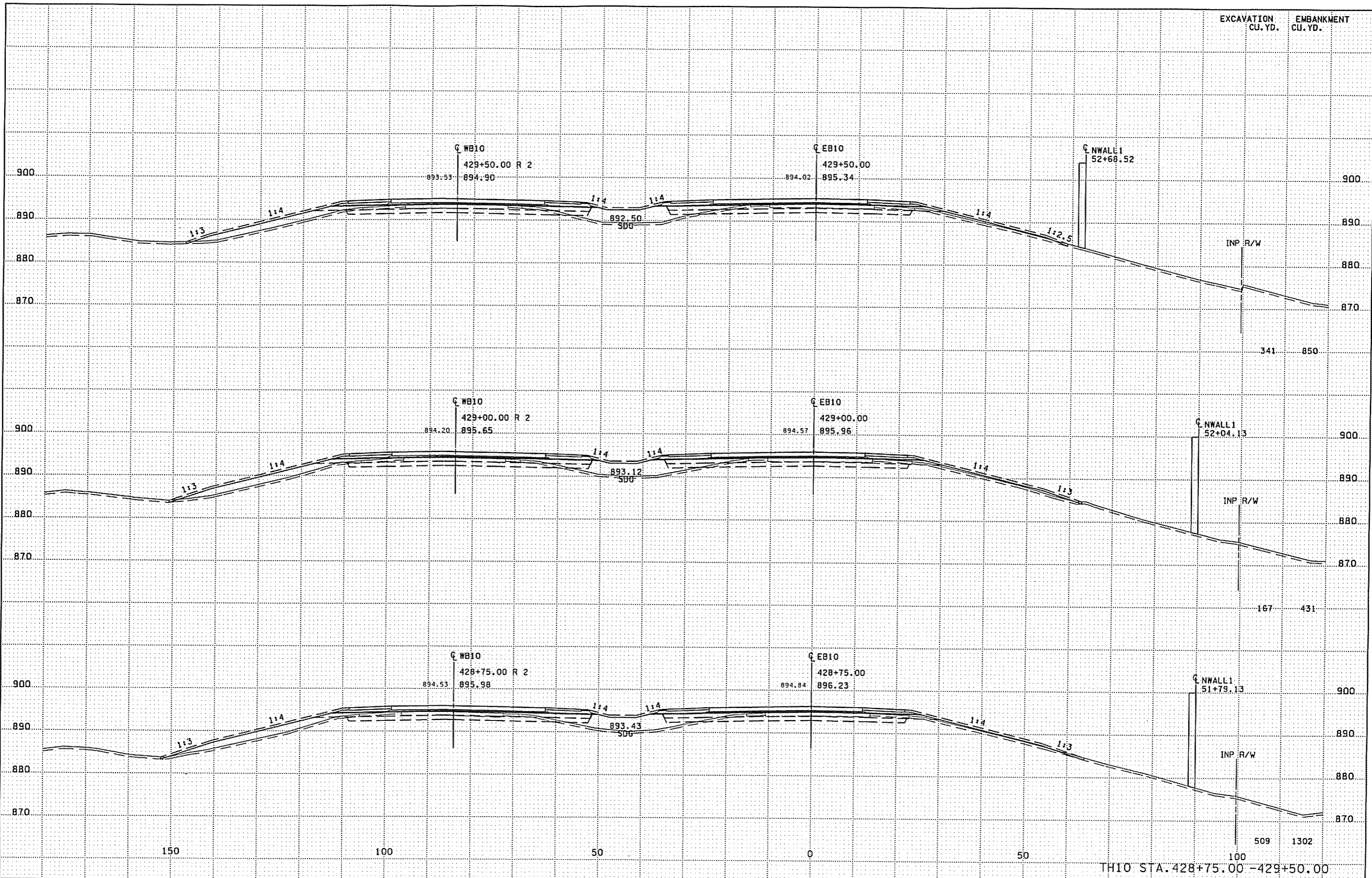
TH10 STA. 425+53.00 - 426+50.00

DISTRICT : METRO  
 PLOT NAME: d021567\_xp231  
 PATH & FILENAME: S:\Design\010\0215\067\Final\Asvd021567\_xp2.dgn  
 PLOTTED/REVISED: 22-JAN-2009 13:34



DISTRICT : METRO  
 PLOT NAME: 021567\_xp232  
 PATH & FILENAME: S:\Design\010\021567\Final\021567\_xp2.dgn

PLOTTED/REVISED: 22-JAN-2009 13:34



TH10 STA. 428+75.00 - 429+50.00

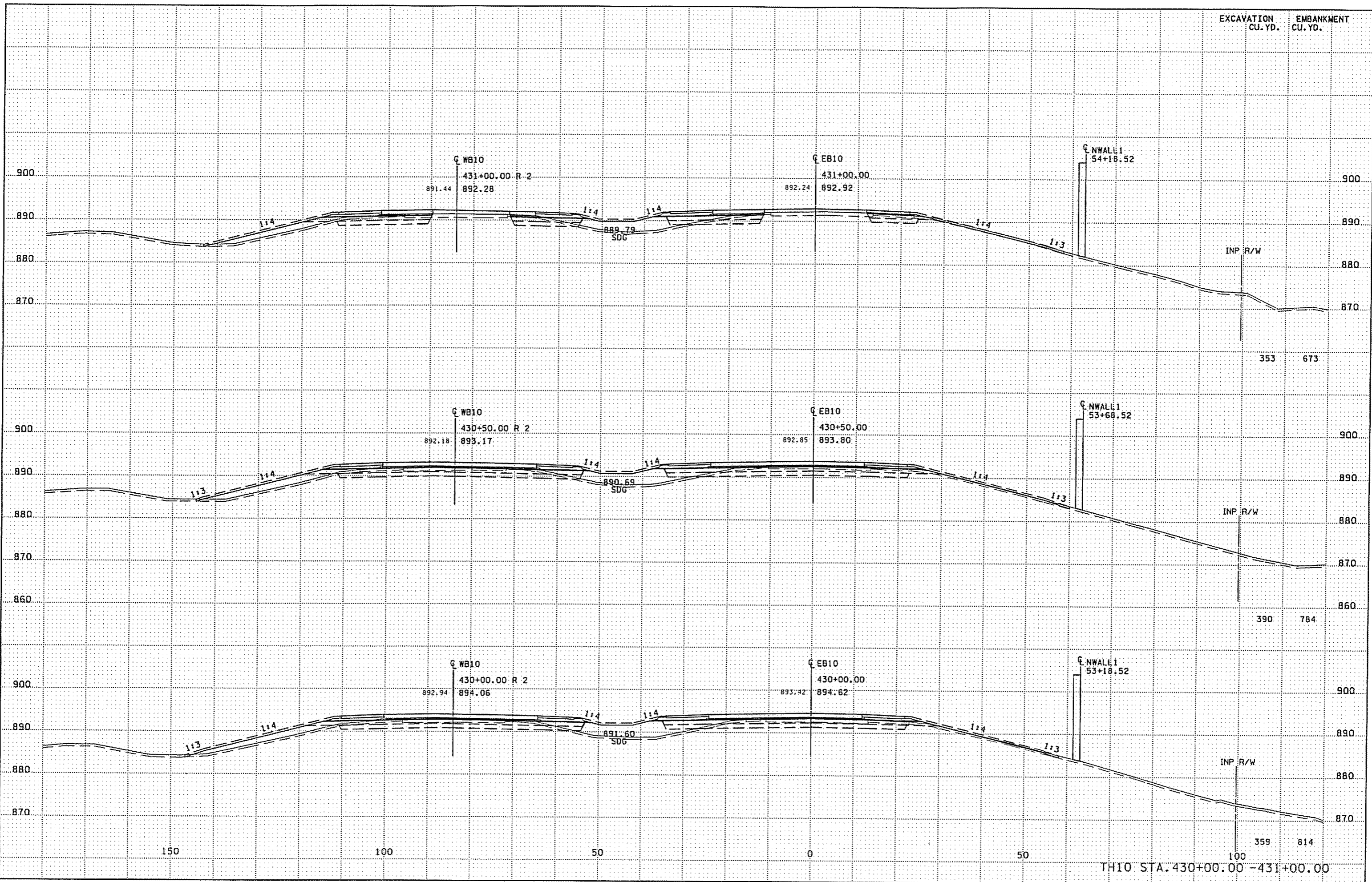


EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

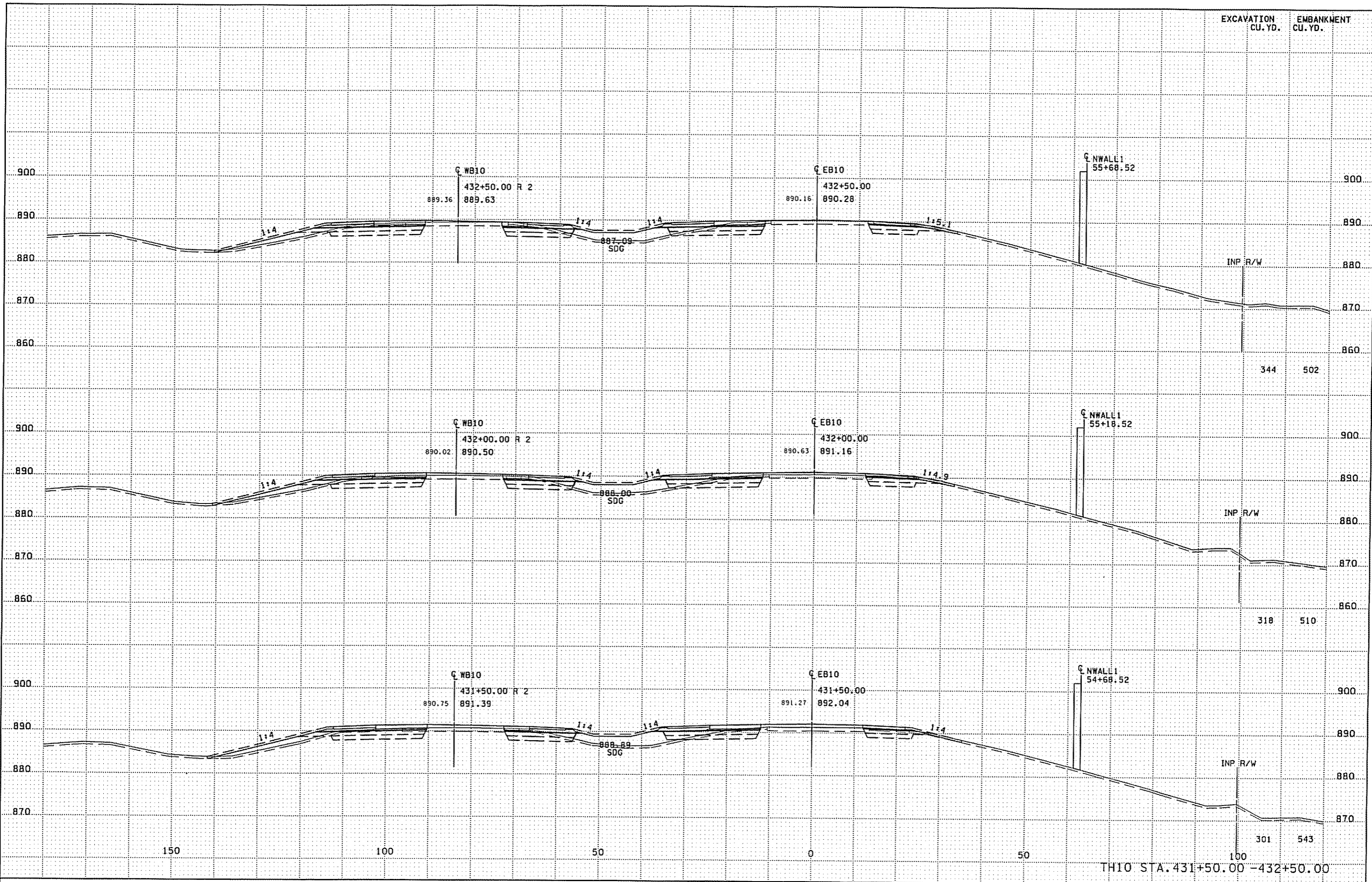
PLOTTED/REVISED: 22-JAN-2009 13:34

DISTRICT : METRO  
 PLOT NAME: 021567\_xp233  
 PATH & FILENAME: S:\Design\01\0215067\Final\021567\_xp2.dgn



TH10 STA. 430+00.00 - 431+00.00

DISTRICT : METRO  
 PLOT NAME: 021567\_xp234  
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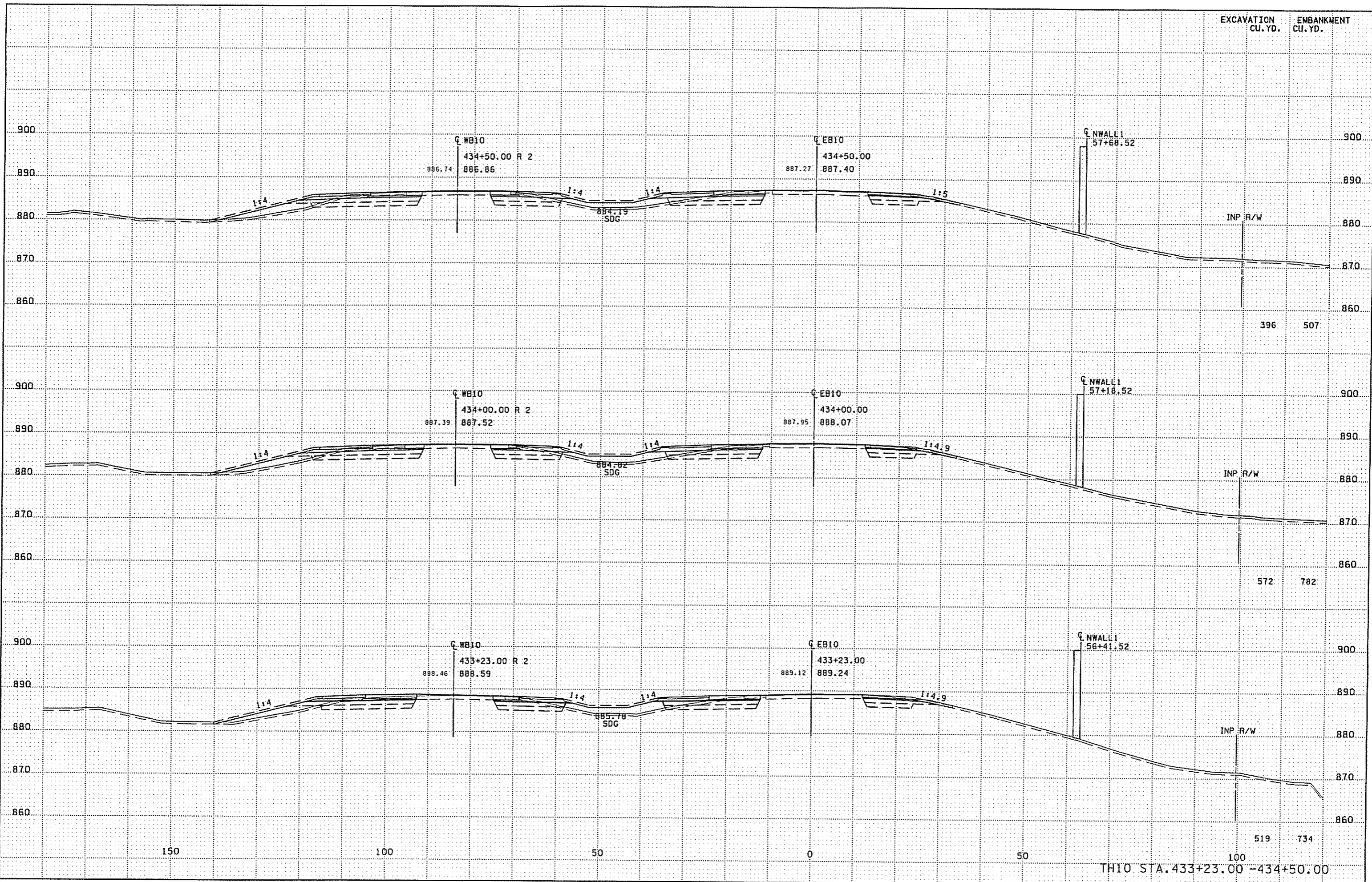


TH10 STA. 431+50.00 - 432+50.00

PLOTTED/REVISED: 22-JAN-2009 13:35

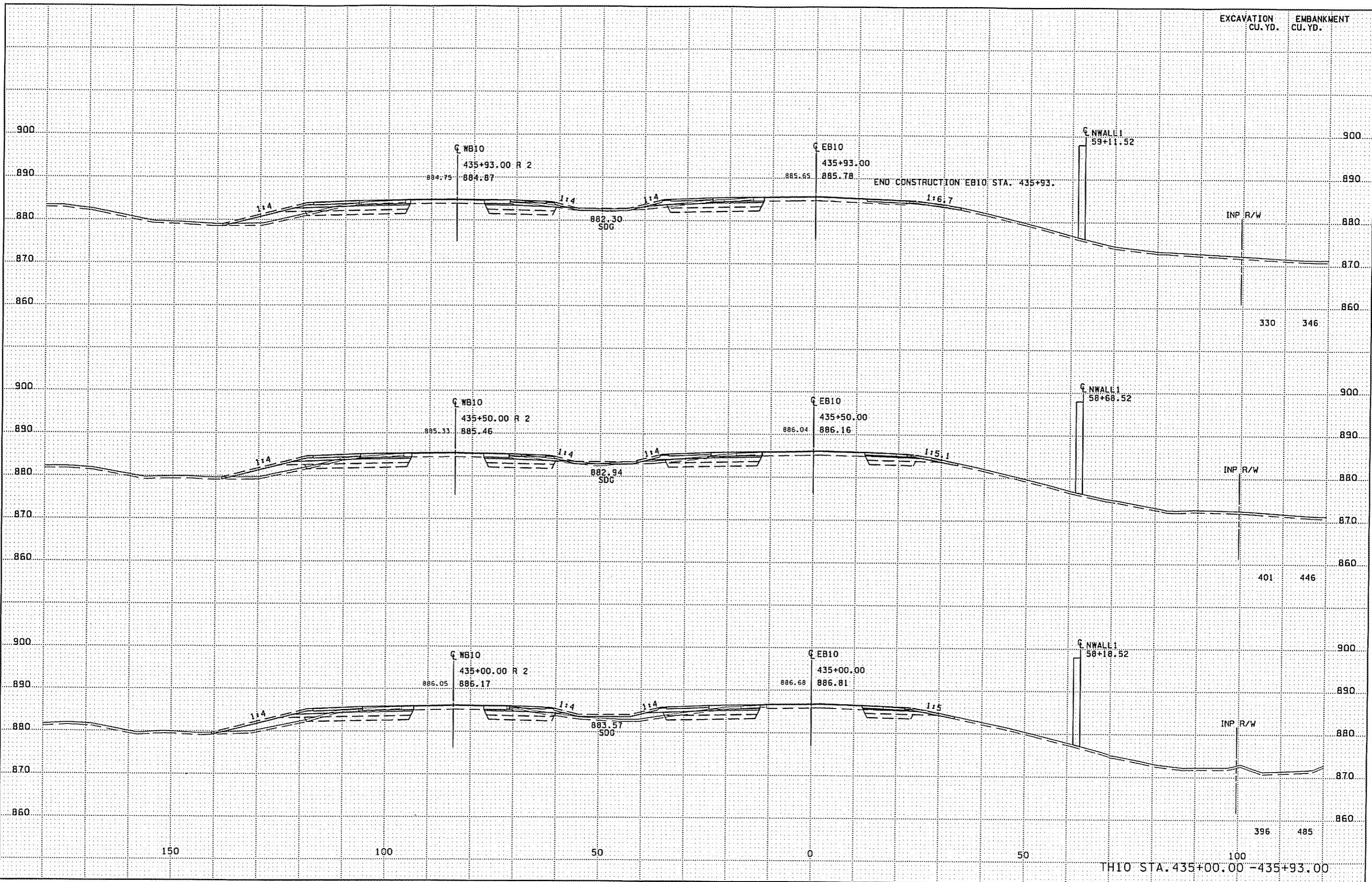
DISTRICT : METRO  
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 PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_xp2.dgn

PLOTTED/REVISED: 22-JAN-2009 13:35



DISTRICT : METRO  
 PLOT NAME: 021567\_xp236  
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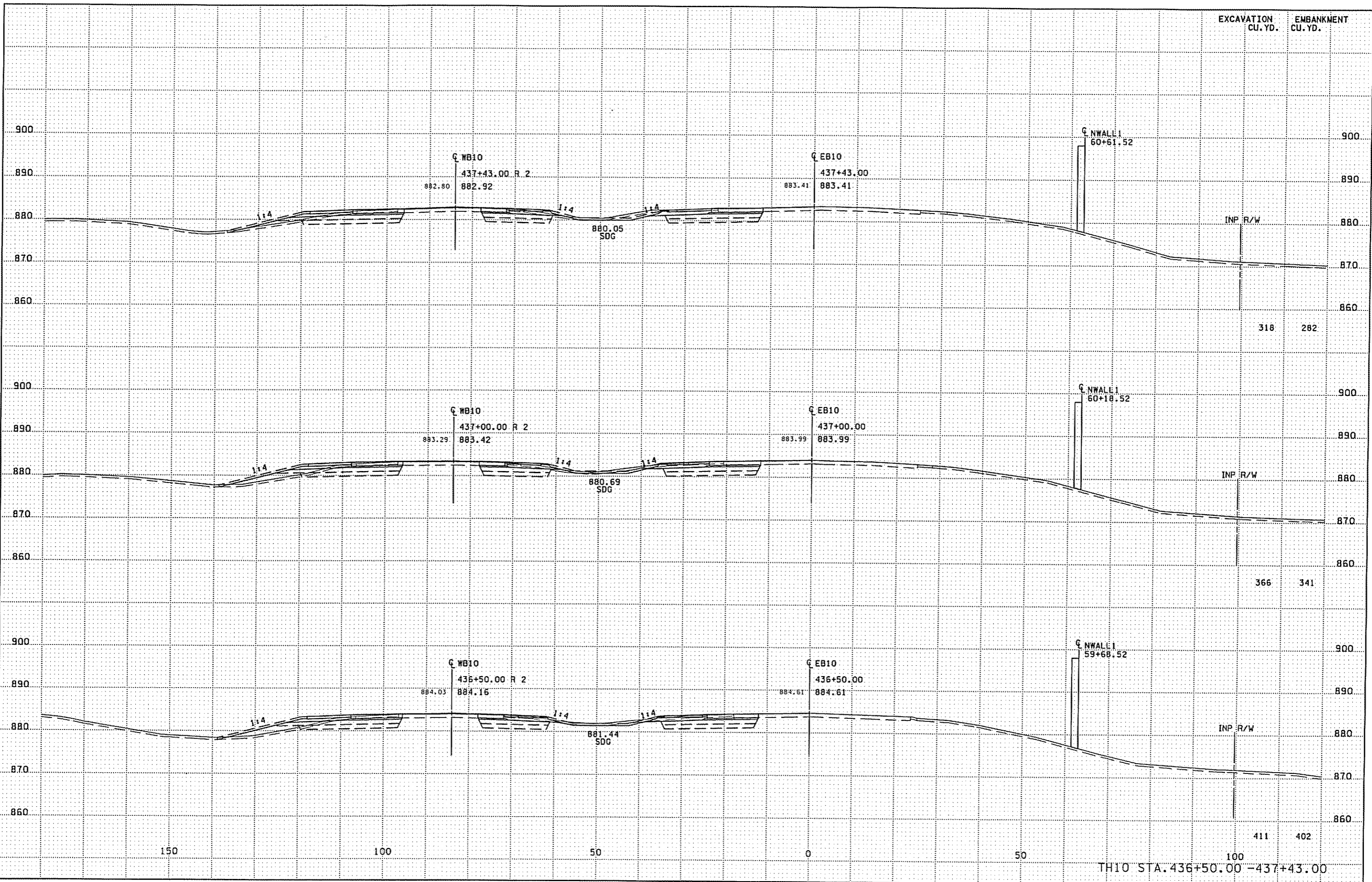
PLOTTED/REVISED: 22-JAN-2009 13:35



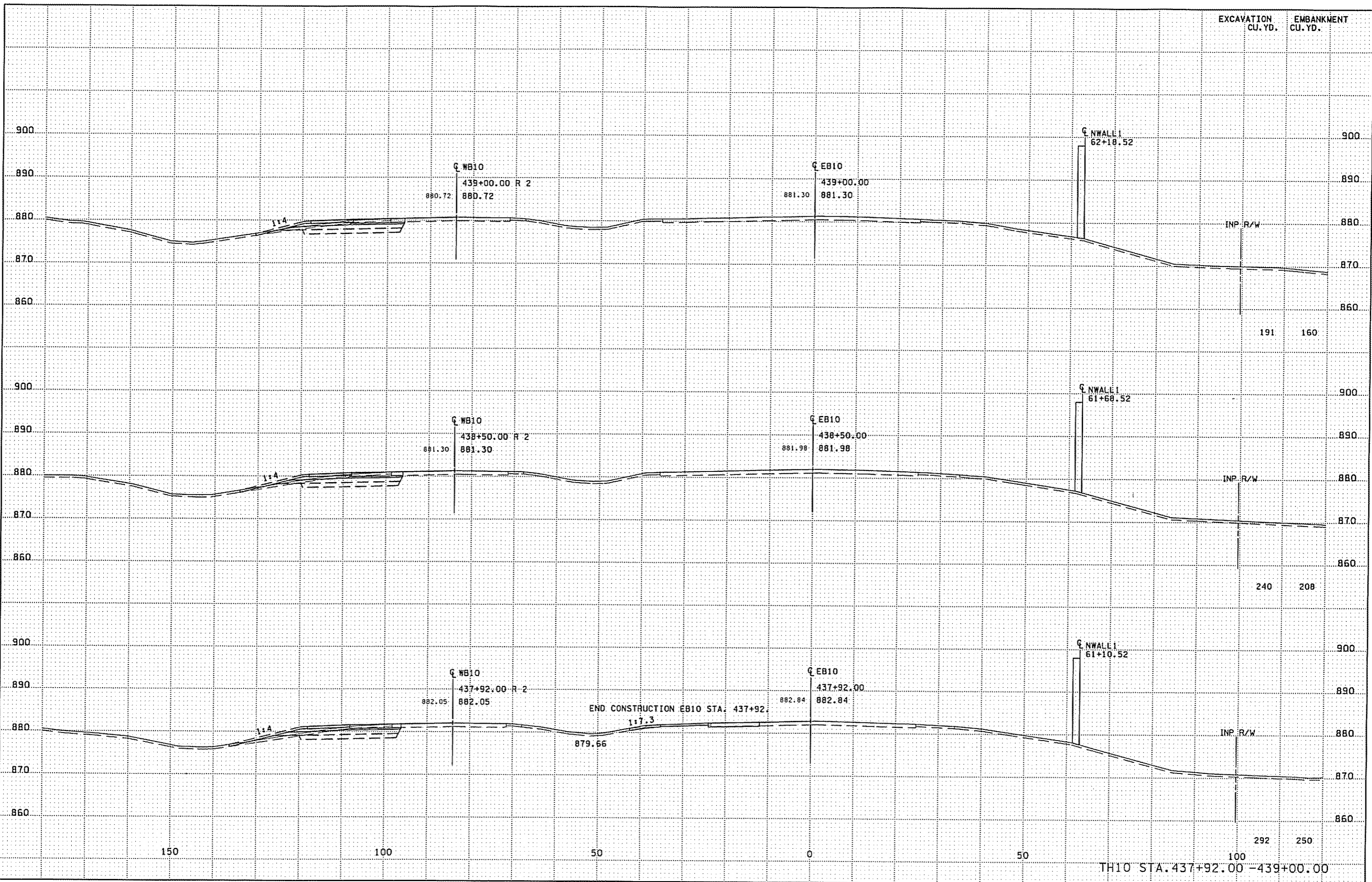
TH10 STA. 435+00.00 -435+93.00

DISTRICT \* : METRO  
 PLOT NAME: 021567\_vp237  
 PATH & FILENAME: S:\Design\01\0215\067\Final\va\021567\_vp2.dgn

PLOTTED/REVISED: 22-JAN-2009 13:35



DISTRICT : METRO  
 PLOT NAME: 021567\_vp238  
 PATH & FILENAME: S:\Design\01\0215\06\Final\vs\021567\_vp2.dgn  
 PLOTTED/REVISED: 22-JAN-2009 13:36



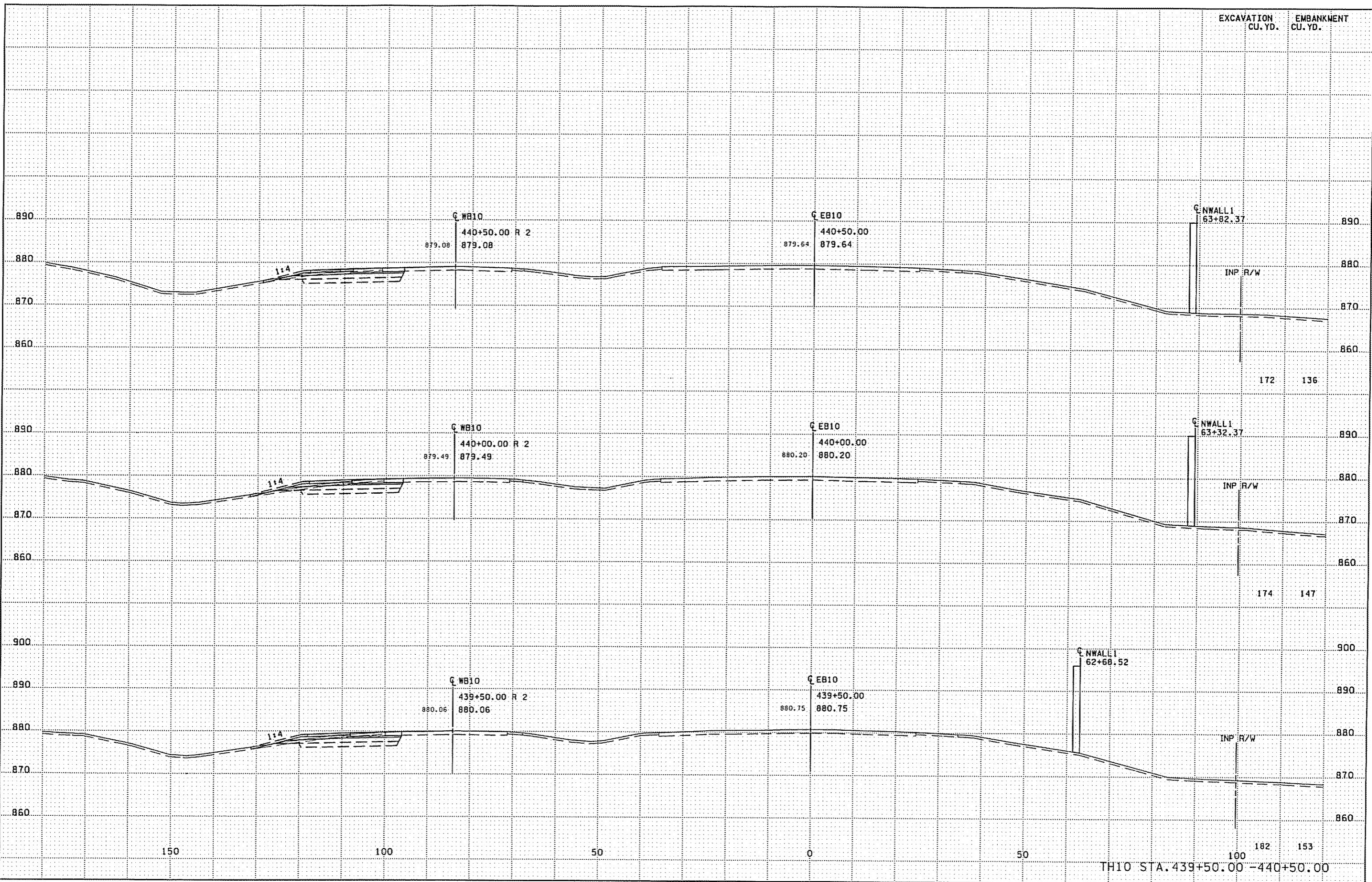
TH10 STA. 437+92.00 - 439+00.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

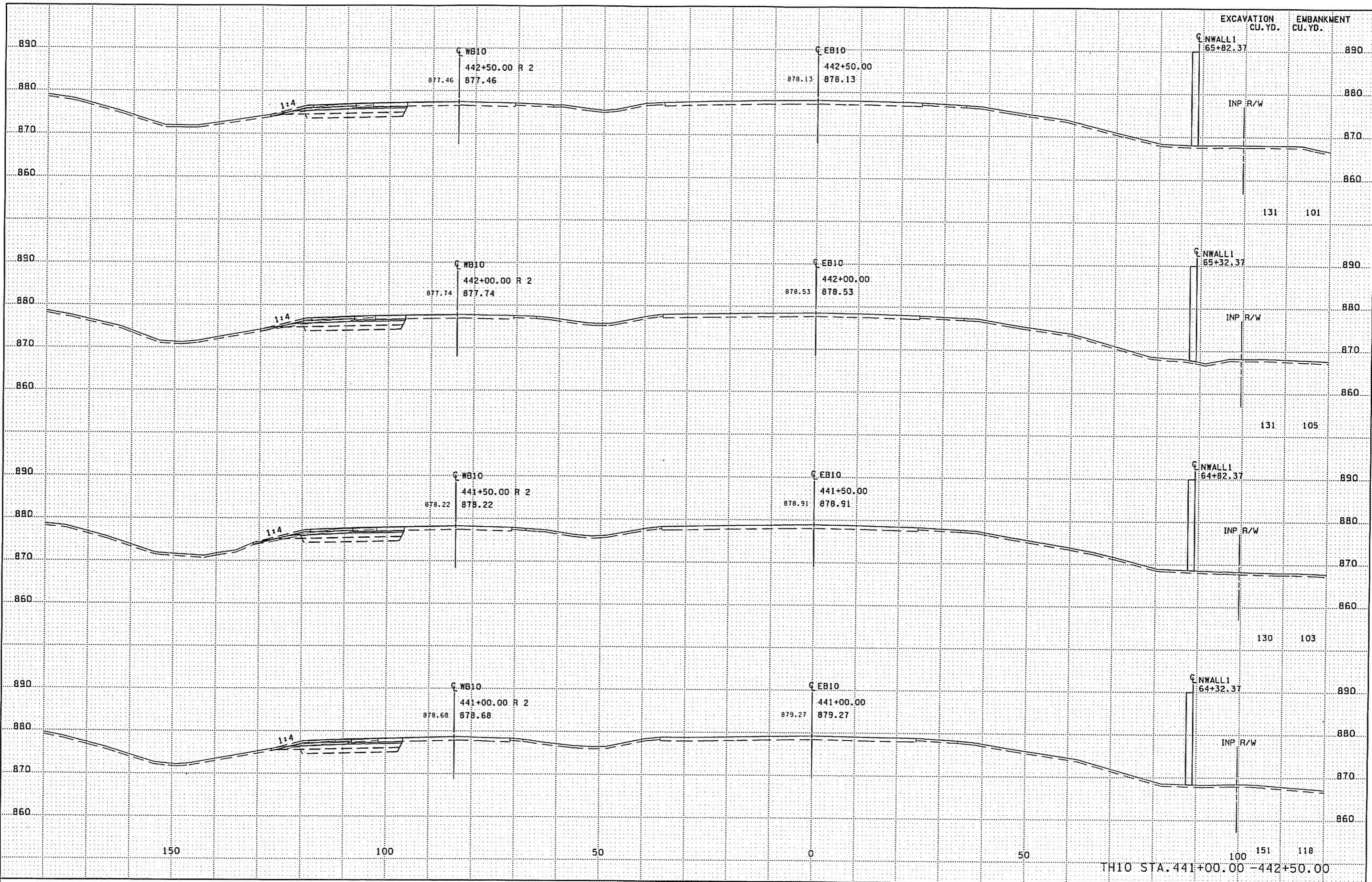
PLOTTED/REVISED: 22-JAN-2009 13:36

DISTRICT : METRO  
 PLOT NAME: 021567\_xp239  
 PATH & FILENAME: S:\Design\01\0215\06\T\In\As\021567\_xp2.dgn



DISTRICT : METRO  
 PLOT NAME: 021567\_xp240  
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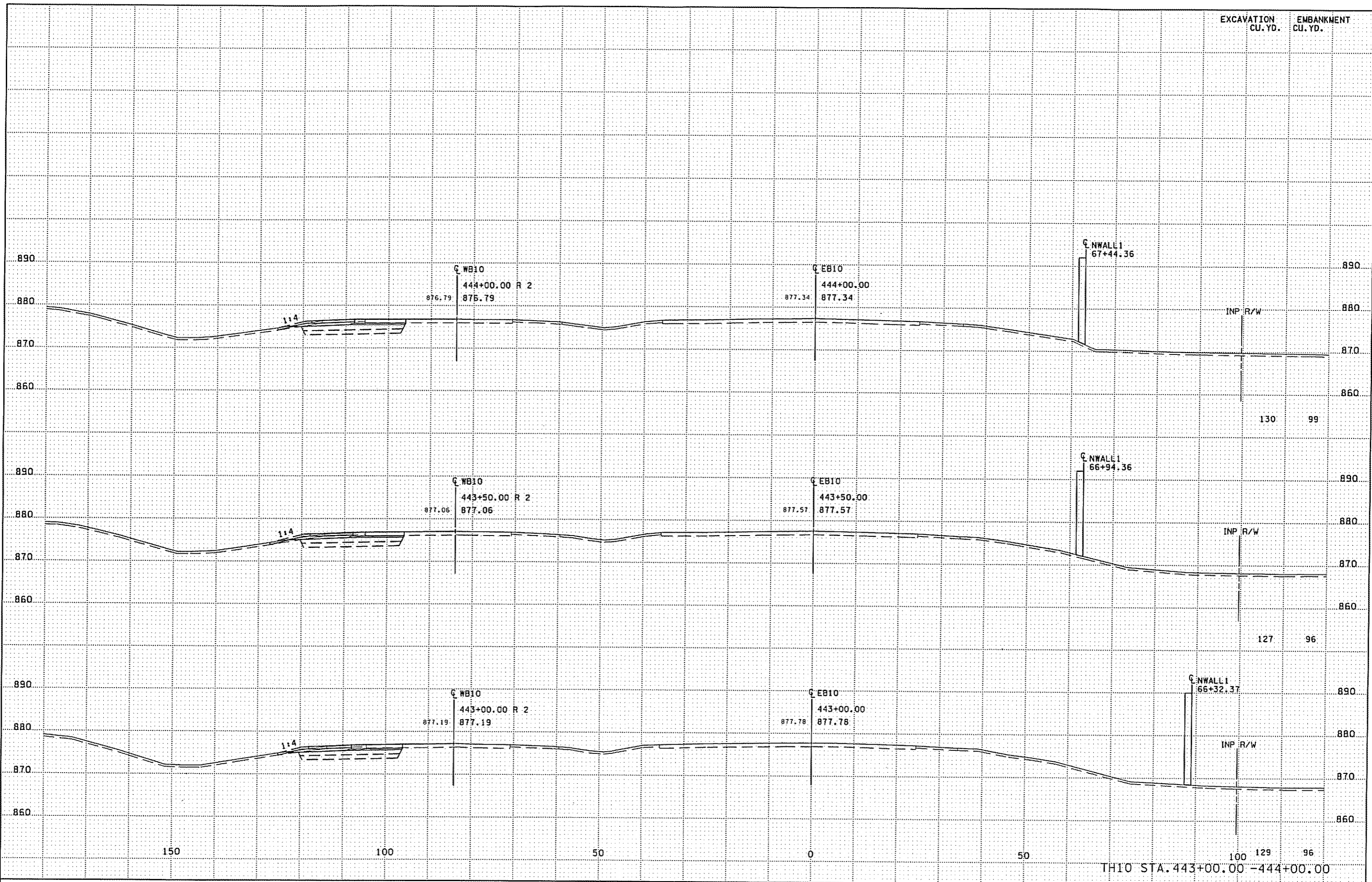
PLOTTED/REVISED: 22-JAN-2009 13:36





DISTRICT : METRO  
 PLOT NAME: 021567\_xp241  
 PATH & FILENAME: S:\Design\010\021567\Final\021567\_xp2.dgn

PLOTTED/REVISED: 22-JAN-2009 13:36

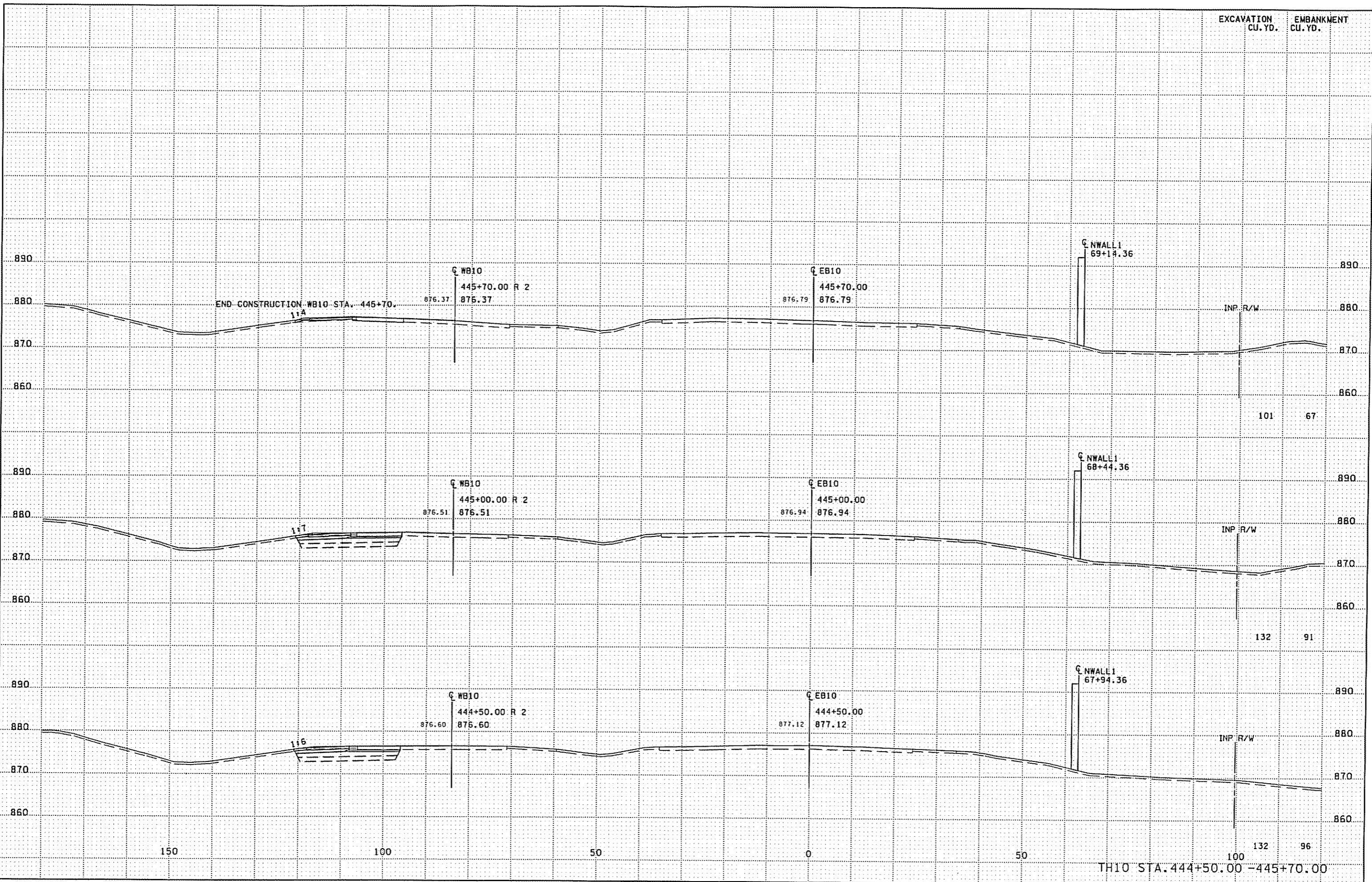


TH10 STA. 443+00.00 - 444+00.00

EXCAVATION  
CU. YD.    EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:36

DISTRICT : METRO  
PLOT NAME: 021567\_xp2.dgn  
PATH & FILENAME: S:\Design\0\021567\Final\021567\_xp2.dgn



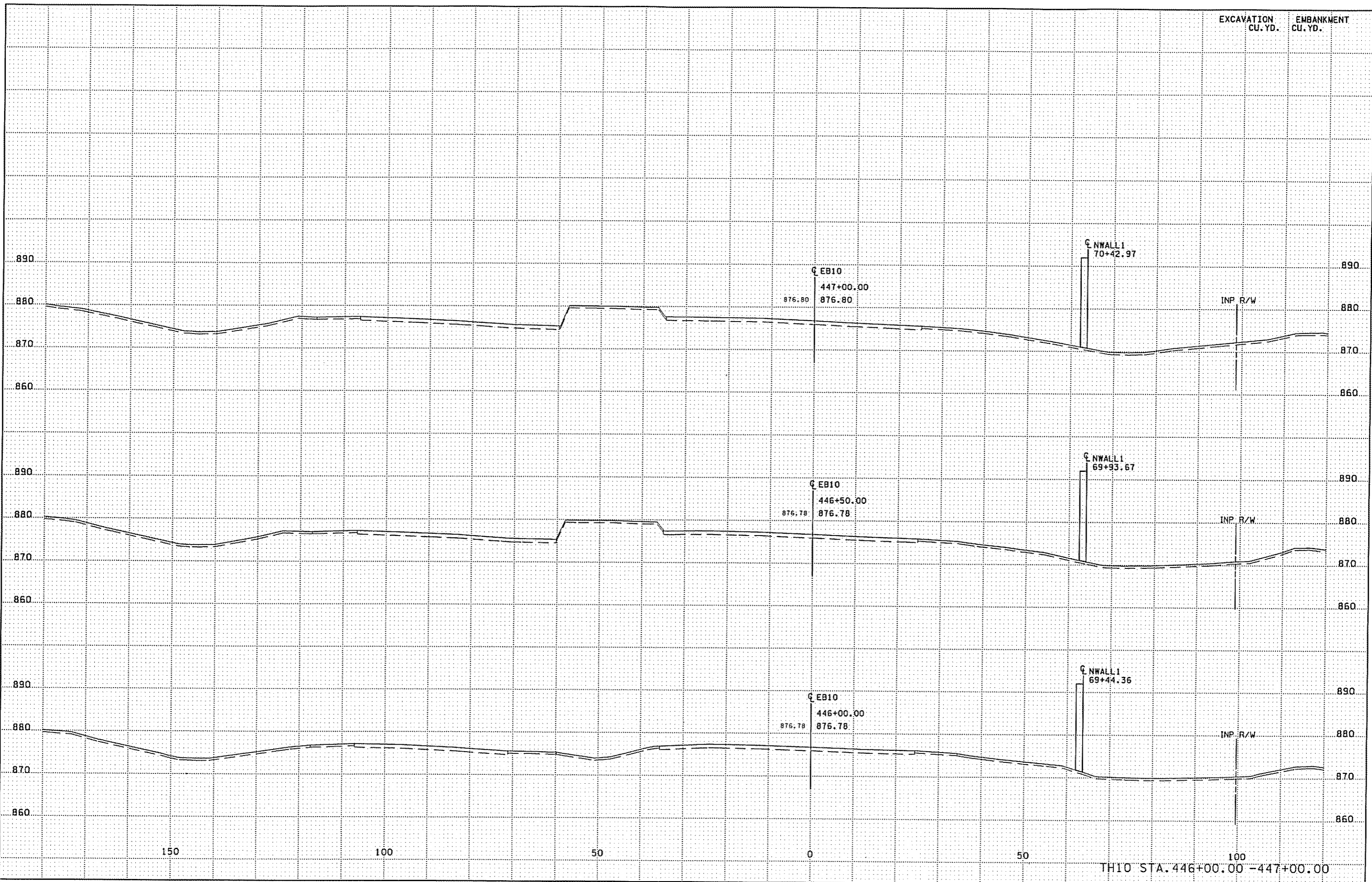
TH10 STA. 444+50.00 - 445+70.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:37

DISTRICT : METRO  
PLOT NAME: 021567\_xp243  
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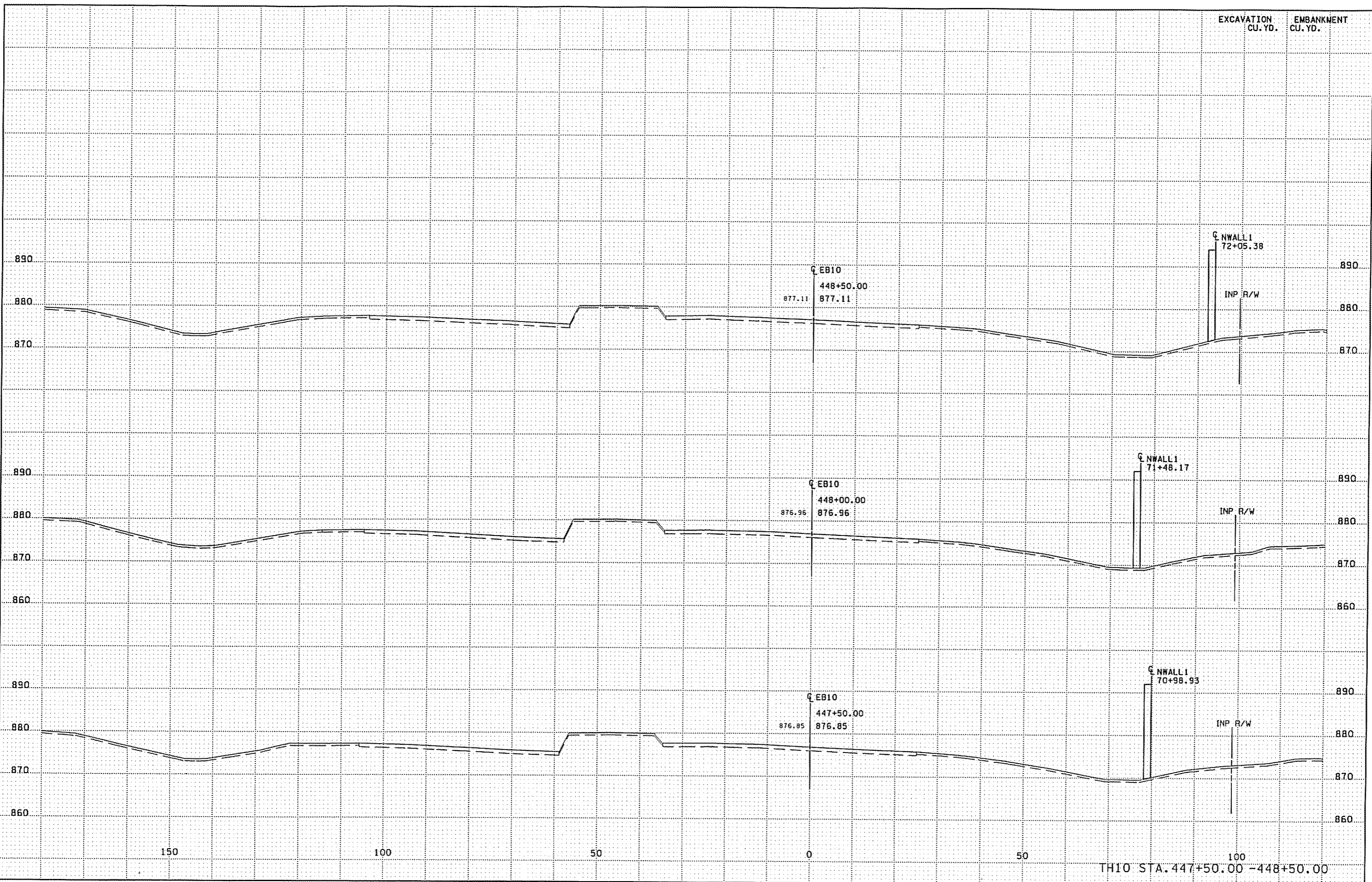
TH10 STA. 446+00.00 - 447+00.00

EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:37

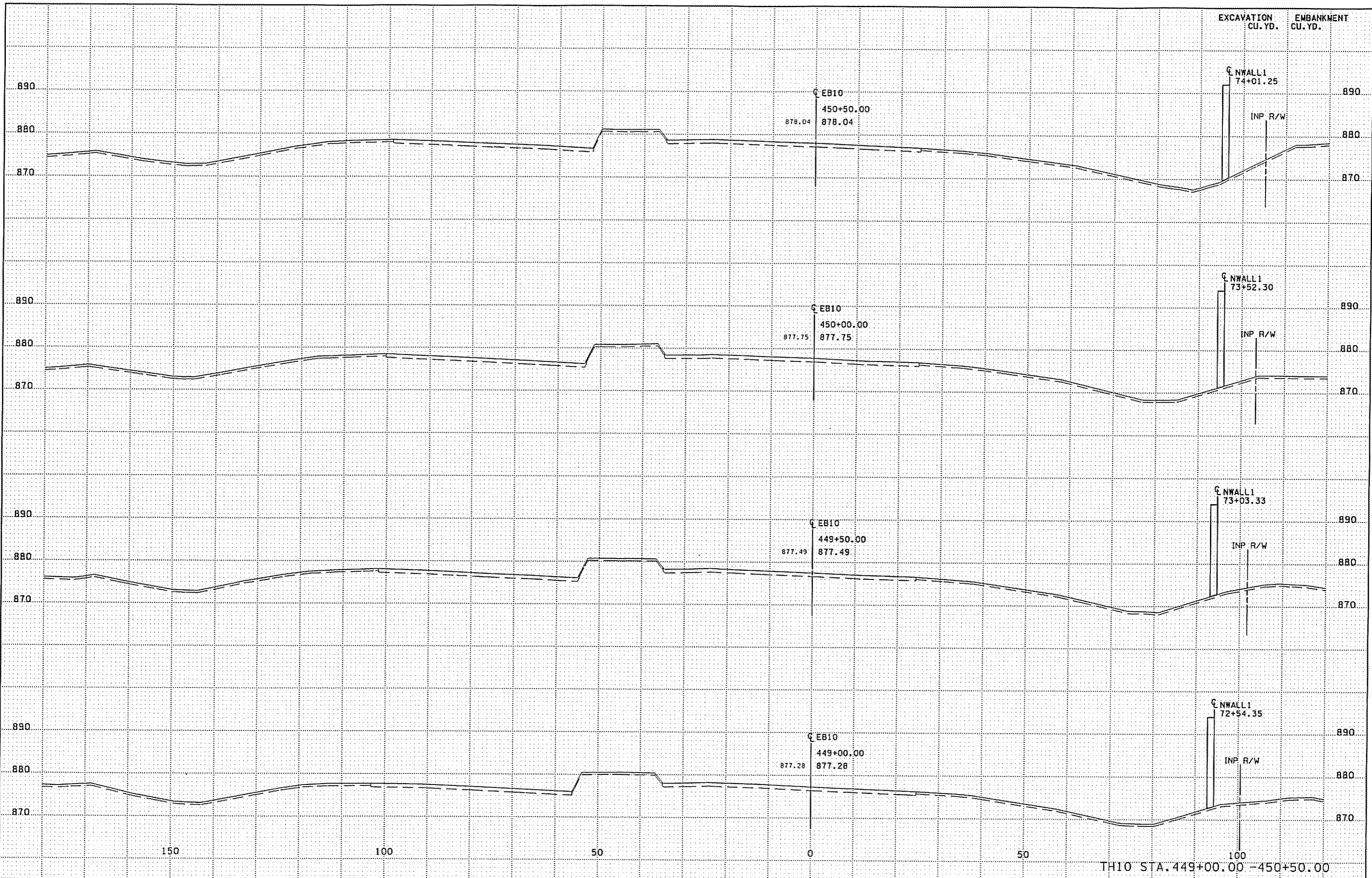
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PLOT NAME: 021567\_xp244  
PATH & FILENAME: S:\Design\01\0215\06\T\Final\021567\_xp2.dgn



TH10 STA. 447+50.00 - 448+50.00

PLOTTED/REVISED: 22-JAN-2009 13:37

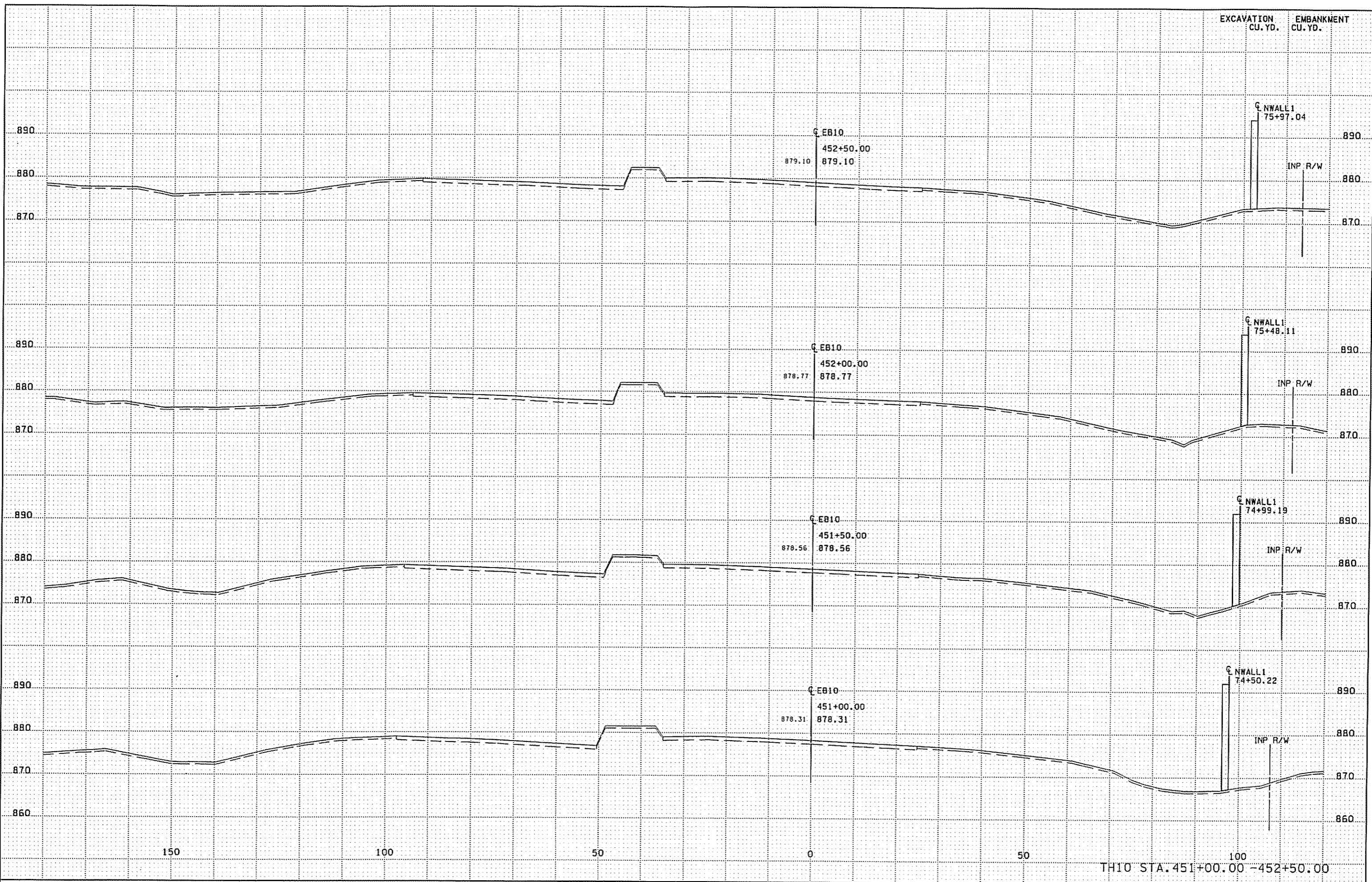
DISTRICT : METRO  
PLOT NAME: 021567\_xp245  
PATH & FILENAME: S:\Design\01\0215\067\Final\021567\_xp2.dgn



TH10 STA. 449+00.00 - 450+50.00

DISTRICT : METRO  
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PATH & FILENAME: S:\Design\010\0215\06\Final\021567\_xp2.dgn

PLOTTED/REVISED: 22-JAN-2009 13:37



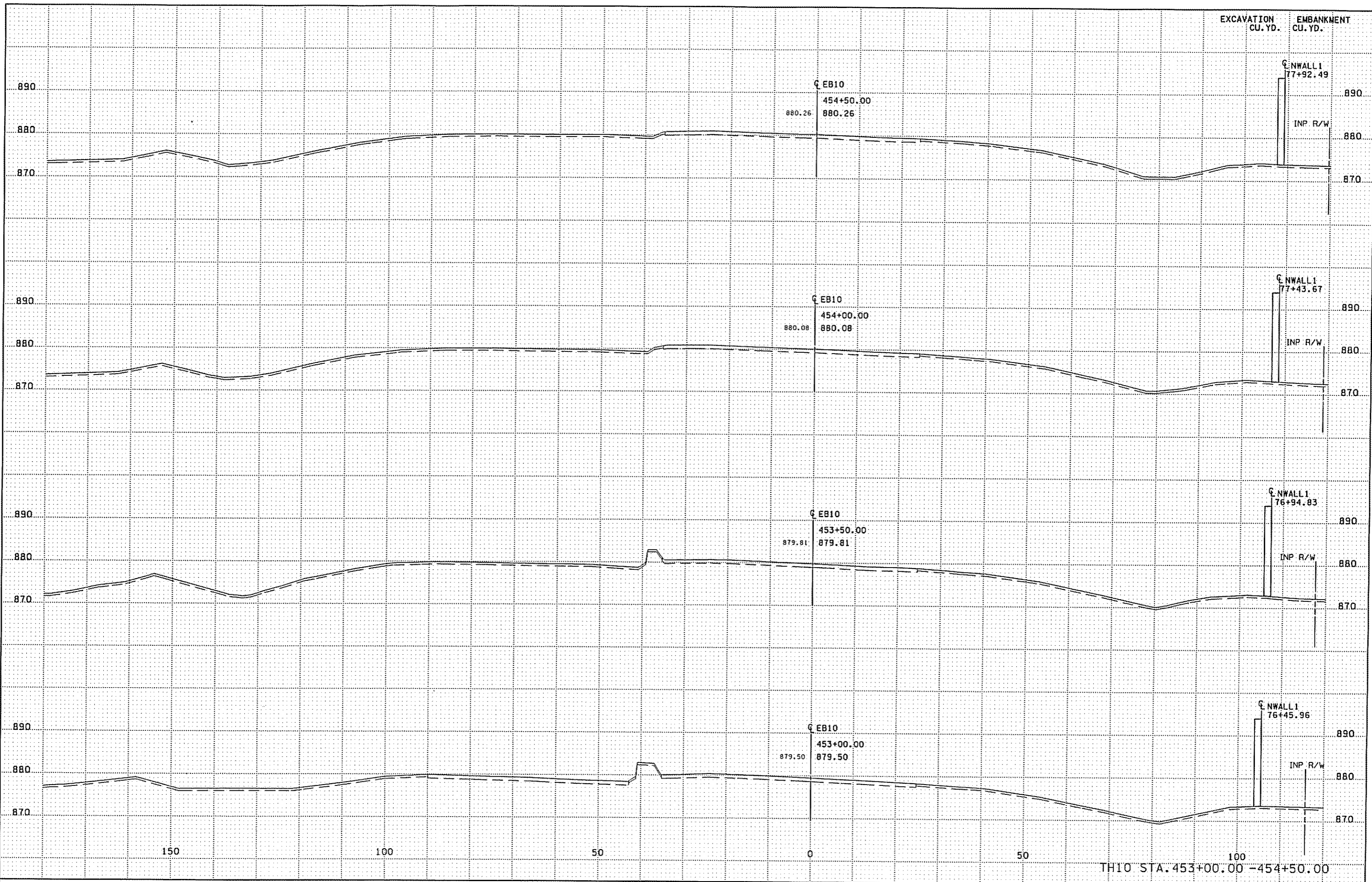
EXCAVATION  
CU. YD.

EMBANKMENT  
CU. YD.

TH10 STA. 451+00.00 - 452+50.00

DISTRICT : METRO  
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PLOTTED/REVISED: 22-JAN-2009 13:37

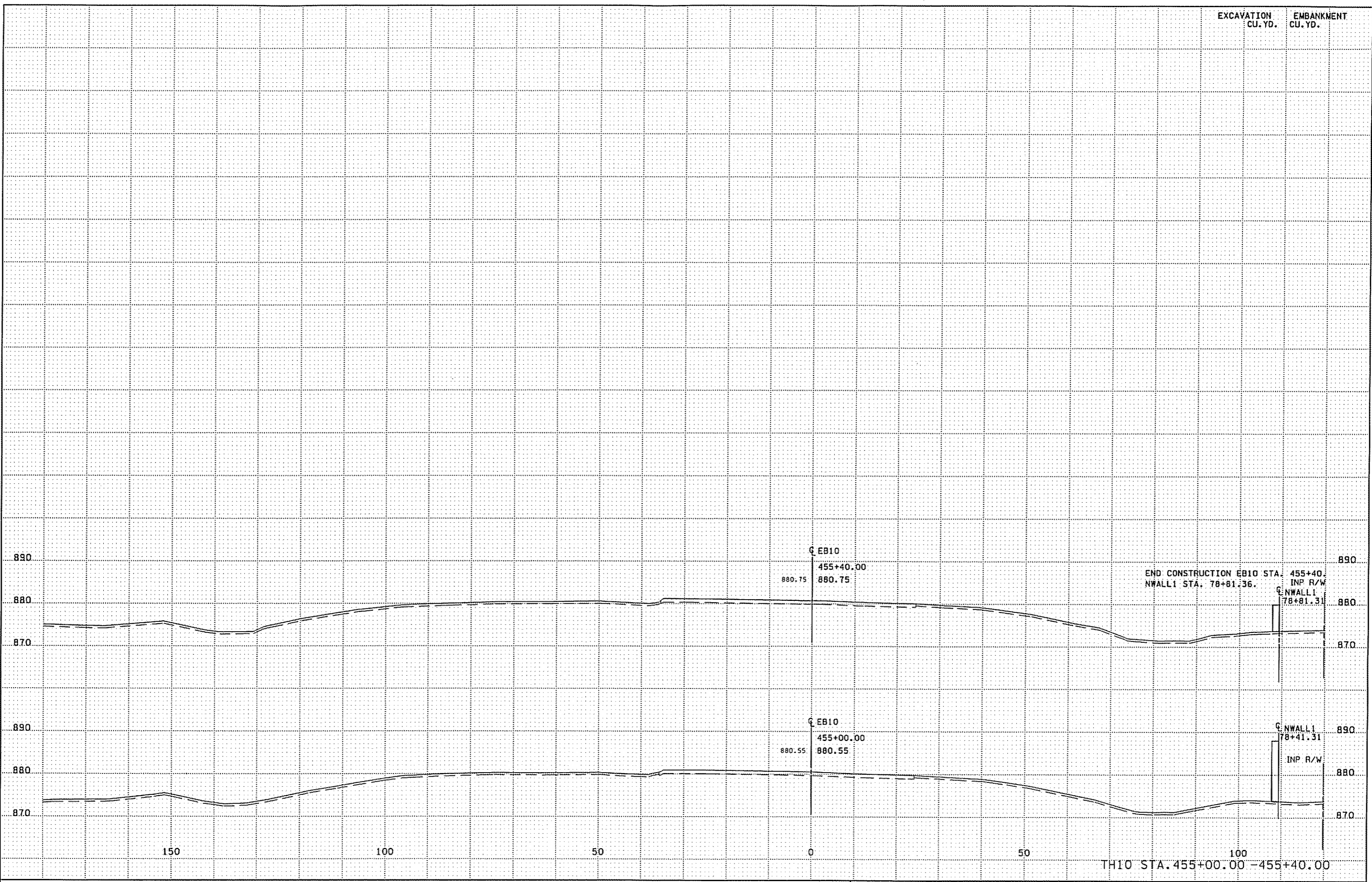


TH10 STA. 453+00.00 - 454+50.00

EXCAVATION  
CU. YD.      EMBANKMENT  
CU. YD.

PLOTTED/REVISED: 22-JAN-2009 13:38

DISTRICT : METRO  
PLOT NAME: 021567\_xp248  
PATH & FILENAME: S:\Design\01010215\067\Final\021567\_xp2.dgn





# MINNESOTA DEPARTMENT OF TRANSPORTATION

## CONSTRUCTION PLAN FOR CURB AND GUTTER

LOCATED ON T.H. 10 EB EXIT RAMP FROM 350' EAST OF RAMP NOSE TO HANSON AVE IN COON RAPIDS

FED. PROJ. NO. \_\_\_\_\_ STATE FUNDS \_\_\_\_\_

### GOVERNING SPECIFICATIONS

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION SHALL GOVERN.

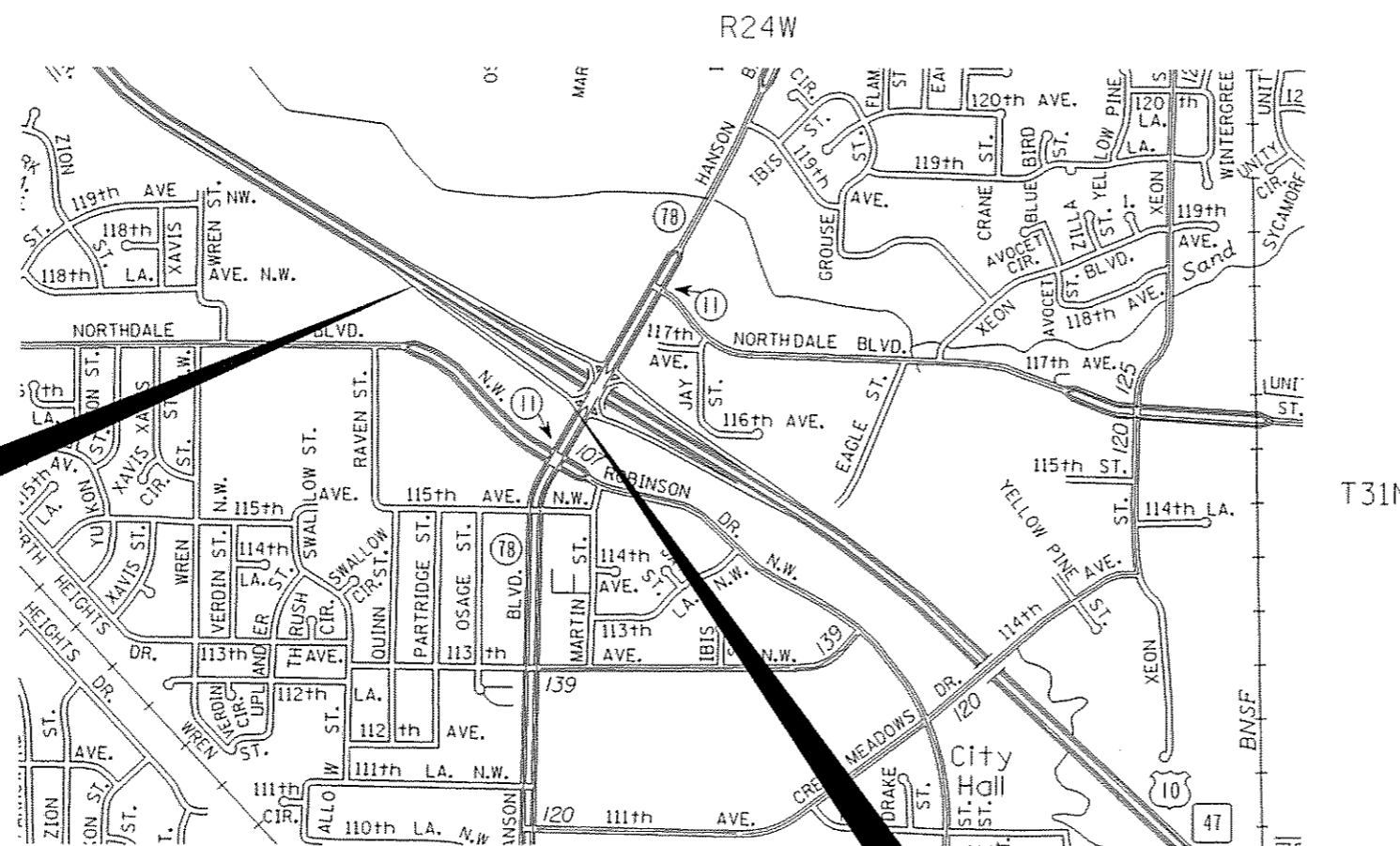
### INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	ESTIMATED QUANTITIES, TAB. INDEX AND STANDARD PLATES
3	EARTHWORK TABULATION AND SUMMARY
4	SOILS AND CONSTRUCTION NOTES
5-6	TABLATIONS
7	INPLACE UTILITIES PLAN
8	INPLACE UTILITY TABULATION
9	TYPICAL SECTIONS
10-18	STANDARD PLAN SHEETS AND MISC. DETAILS
19	ALIGNMENT TABULATION
20	CONSTRUCTION PLAN
21	DRAINAGE PLAN
22	DRAINAGE PROFILES AND TABULATION
23	TURF ESTABLISHMENT EROSION AND REMOVALS

STATE PROJ. NO. **0215-72 (TH 10)**  
 GROSS LENGTH .983 FEET 0.186 MILES  
 BRIDGES-LENGTH 0 FEET \_\_\_\_\_ MILES  
 EXCEPTIONS-LENGTH 0 FEET \_\_\_\_\_ MILES  
 NET LENGTH .983 FEET 0.186 MILES  
 REF. POINT. 228+00.755 TO REF. POINT. 229+00.042...

**EQUATIONS**  
 HNBR1 PI 450+52.40 =  
 A PT 12' RT OF RAMP1 STA. 850+52.40 HNBR1

NOTE: LENGTH AND DESCRIPTION BASED ON RAMP1 ALIGNMENT (HNBR1)



BEGIN S.P. 0215-72

HNBR1 STA. 442+16 (RAMP C1)

END S.P. 0215-72

HNBR1 STA. 851+99 (CONNECTION C)

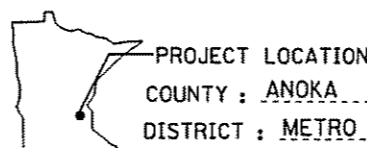
PLAN 100'  
 INDEX MAP 750'

### DESIGN DESIGNATION

Design ESALS \_\_\_\_\_  
 ADT (Current Year) \_\_\_\_\_  
 ADT (2027) \_\_\_\_\_  
 DHV (Design Hr. Vol.) \_\_\_\_\_  
 D (Directional Distr.) \_\_\_\_\_ %  
 T (Heavy Commercial) \_\_\_\_\_ %

Design Speed **70 MPH (T.H.10)**  
 Based on **STOPPING** Sight Distance  
 Height of eye **3.5'** Height of object **0.5'**

PLAN REVISIONS		
DATE	SHEET NO.	APPROVED BY



FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL

STATE PROJ. NO. **0215-72** CHARGE IDENTIFIER \_\_\_\_\_

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: **PETER DAVICH** LICENSE # **45053**

DATE: **2/13/09** SIGNATURE: *Peter Davich*

DESIGN SQUAD **KHA VUE AND ROGER OPPEGARD**

RECOMMENDED FOR APPROVAL *Glen C. Ellis* 2/13 20 09  
 DISTRICT TRANSPORTATION ENGINEER

RECOMMENDED FOR APPROVAL *Benjamin J. Sina* 2/12 20 09  
 DISTRICT MATERIALS ENGINEER

RECOMMENDED FOR APPROVAL *Beth Hummel* 2-13 20 09  
 DISTRICT WATER RESOURCES/HYDRAULICS ENGINEER

RECOMMENDED FOR APPROVAL *Michael P. Kelly* 2-13 20 09  
 DISTRICT TRAFFIC ENGINEER

RECOMMENDED FOR APPROVAL *Valerika Anderson* 2-19 20 09  
 STATE PRE-LETTING ENGINEER

OFFICE OF LAND MANAGEMENT APPROVAL *Robert W. White* 2/23 20 09  
 DIRECTOR, LAND MANAGEMENT

APPROVED **2/23 20 09** *Robert W. White*  
 STATE DESIGN ENGINEER

I HEREBY CERTIFY THAT THE FINAL FIELD REVISIONS, IF ANY, WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

PRINT NAME: \_\_\_\_\_ LICENSE # \_\_\_\_\_

DATE: \_\_\_\_\_ SIGNATURE: \_\_\_\_\_

PLOTTED/REVISED: 12-FEB-2009 09:00

DISTRICT #: METRO  
 PLOT NAME: 021572\_jsh\_sfh\_01  
 PATH & FILENAME: S:\Design\010\0215\072\FINAL\0215072\_jsh.dgn

30-42-2 DR

PLOTTED/REVISED: 17-FEB-2009 16:17

STATEMENT OF ESTIMATED QUANTITIES					
TAB	SHEET NO.	ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES
		2021.501	MOBILIZATION	LUMP SUM	
		2031.501	FIELD OFFICE TYPE D	EACH	
		2031.503	FIELD LABORATORY TYPE DX	EACH	
		2051.501	MAINT AND RESTORATION OF HAUL ROADS	LUMP SUM	
C	5	2104.513	SAWING BITUMINOUS PAVEMENT (FULL DEPTH)	LIN FT	1025
A,B	3	2105.501	COMMON EXCAVATION	CU YD	479
A,B	3	2105.525	TOPSOIL BORROW (CV)	CU YD	69
H	6	2105.550	SUBSOILING	ACRE	0.8
A,B	3	2211.503	AGGREGATE BASE (CV) CLASS 5	CU YD	232
A,B	3	2360.501	TYPE SP 12.5 WEARING COURSE MIXTURE (4,B)	TON	38
G	22	2501.515	12" RC PIPE APRON	EACH	3
G	22	2503.541	12" RC PIPE SEWER DESIGN 3006	LIN FT	127
G	22	2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN C OR G	LIN FT	5.5
G	22	2506.501	CONSTRUCT DRAINAGE STRUCTURE DESIGN C G OR H	LIN FT	12.1
E	5	2506.516	CASTING ASSEMBLY	EACH	4
G	22	2511.501	RANDOM RIPRAP CLASS 2	CU YD	9
G	22	2511.515	GEOTEXTILE FILTER TYPE 3	SQ YD	26
D	5	2531.501	CONCRETE CURB & GUTTER DESIGN D424	LIN FT	983
G	22	2554.509	GUIDE POST TYPE B	EACH	3
K	28	2563.601	TRAFFIC CONTROL	LUMP SUM	
H	6	2573.502	SILT FENCE, TYPE MACHINE SLICED	LIN FT	983
H	6	2573.530	STROM DRAIN INLET PROTECTION	EACH	4
H	6	2573.540	FILTER LOG TYPE STRAW BIOROLL	LIN FT	16
H	6	2575.501	SEEDING	ACRE	0.8
H	6	2575.502	SEED MIXTURE 250	POUND	60
H	6	2575.523	EROSION CONTROL BLANKETS CATEGORY 1	SQ YD	3220
H	6	2575.532	FERTILIZER TYPE 3	POUND	297

TABULATION INDEX		
TAB	SHEET NO.	DESCRIPTION
A	3	EARTHWORK QUANTITIES //AGG BITUMINOUS
B	3	EARTHWORK SUMMARY
C	5	SAWCUTS
D	5	CURB & GUTTER
E	5	CASTING ASSEMBLIES SUMMARY
F	8	INPLACE UTILITIES
G	22	PERMANENT DRAINAGE TABULATION
H	6	PERMANENT TURF ESTABLISHMENT

THE FOLLOWING STANDARD PLATES, APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION, SHALL APPLY ON THIS PROJECT.	
STANDARD PLATES	
PLATE NO.	DESCRIPTION
3000L	REINFORCED CONCRETE PIPE (5 SHEETS)
3100G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
4002F	MANHOLE OR CATCH BASIN (MASONRY, FIELD CONSTRUCTION) - DESIGN C)
4006L	MANHOLE OR CATCH BASIN PRECAST - DESIGNS G AND H
4010H	CONCRETE SHORT CONE & ADJUSTING RING (SECTIONAL CONCRETE)
4011E	PRECAST CONCRETE BASE
4132F	CATCH BASIN FRAME CASTING (FOR SQUARE GRATE) - CASTING NO. 805
4154B	CATCH BASIN GRATE CASTING - CASTING NO. 816
4180J	MANHOLE OR CATCH BASIN STEP
7102I	CONCRETE CURB AND GUTTER (DESIGN BR, D, S, B4, B5 AND D3 (2 SHEETS)
7111J	INSTALLATION OF CATCH BASIN CASTINGS (CONCRETE CURB AND GUTTER)
8000I	STANDARD BARRICADES
8150C	INSTALLATION OF CULVERT MARKERS
9102D	TURF ESTABLISHMENT AREAS (AT PIPE CULVERT ENDS)

DISTRICT #: METRO  
 PLOT NAME: 021572.tbl\_est\_qty\_SHT\_02  
 PATH & FILENAME: S:\Design\021572\FINAL\021572.tbl.dgn

DRAWN BY: RKO

CHECKED BY: PD

CERTIFIED BY

*Peter Daniel*  
 LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 02/03/09

**ESTIMATED QUANTITIES TAB INDEX AND STD. PLATE**

STATE PROJ. NO. 0215-72 (T.H. 10) SHEET NO. 2 OF 23 SHEETS

PLOTTED/REVISED: 17-FEB-2009 14:54

DISTRICT #: METRO  
 IPLOT NAME: 0021572\_fb\_a\_b\_SHT\_03  
 PATH & FILENAME: S:\Design\010\021507\FINAL\0021572\_TBldgr

BITUMINOUS AND AGGREGATE & EARTHWORK <span style="float: right;">A</span>											
STATION TO STATION	LOCATION (FT)	COMMON EXCAVATION (EV)					EMBANKMENT (CV)		BIT SPEC. 2360 TYPE SP 12.5 WEARING (SPNEB440B) ① TONS		
		AGGREGATE BASE SPEC. 2211 CLASS 5 CU. YD.	AGGREGATE SHOULDERING SPEC. 2221 CLASS 2 CU. YD.	RUBBLE CU. YD.	INPLACE TOPSOIL EXC CU. YD.	SUITABLE GRADING CU. YD.	TOPSOIL CU. YD.	AGGREGATE BASE SPEC. 2211 CLASS 5 CU. YD.			
<b>RAMP C1</b>											
ALIGNMENT											
HNBRC1											
442+16	TO	450+52	11 RT TO 22 RT	16							
442+16	TO	450+52	14 RT TO 24 RT		24						
442+16	TO	450+52	8 RT TO 24 RT			47					
442+16	TO	450+52	24.5 RT TO 36.4 RT								
442+16	TO	450+52	24.5 RT TO 36.4 RT				190	186	213		
442+16	TO	450+52	8 RT TO 21 RT						32		
442+30	TO	442+49	13 RT TO 19 RT						22		
442+26	TO	442+34	15 RT TO 43 RT						35		
443+96	TO	444+04	23 RT TO 60 RT						46		
446+46	TO	446+54	23 RT TO 83 RT						48		
								63			
<b>RAMP C1</b>											
NHBC1											
850+52	TO	851+99	6 RT TO 12 RT	3							
850+52	TO	851+99			5						
850+52	TO	851+99				9					
850+52	TO	851+99	14 RT TO 24 RT				34				
850+52	TO	851+99	14 RT TO 24 RT					33	38		
850+52	TO	851+99	21 RT TO 22 RT						6		
			TOTALS:	19	29	56	224	151	293	251	38

EARTHWORK SUMMARY <span style="float: right;">B</span>		
	CU. YDS.	SHRINKAGE 1.20%
<b>EXCAVATION (EV)</b>		
COMMON EXCAVATION	479	
- TOPSOIL EXCAVATION	224	187
- RUBBLE	56	
TOTAL SUIT GRADING EXC.	199	166
<b>EMBANKMENT (CV)</b>		
AGG. 2211 CLASS 5	232	
TOPSOIL REQUIRED	293	
- TOPSOIL AVAILABLE	224	
TOPSOIL BORROW	69	

NOTE:  
 ① TACK TO BE USED ON THE VERTICAL FACES OF THE PATCH.  
 COST FOR THIS ITEM IS INCIDENTAL.

# SOILS AND CONSTRUCTION NOTES

1. TOP OF GRADING GRADE IS DEFINED AS THE BOTTOM OF THE CLASS 5. AGGREGATE BASE.
2. SUITABLE GRADING MATERIAL ON THIS PROJECT SHALL CONSIST OF ALL SOILS ENCOUNTERED EXCEPT TOPSOIL, DEBRIS, ORGANIC MATERIAL, AND OTHER UNSTABLE MATERIAL.
3. COARSE FILTER AGGREGATE SHALL BE A FREE-DRAINING MINERAL PRODUCT EXCLUDING CRUSHED CARBONATE QUARRY-ROCK, CRUSHED CONCRETE OR SALVAGED BITUMINOUS MIXTURE. IT MUST MEET THE GRADATION REQUIREMENT IN 3149.2H.
4. IN AREAS TO BE DISTURBED, THE TOPSOIL SHALL BE REMOVED AND STOCKPILED FOR REUSE AS SLOPE DRESSING. IN AREAS WHERE TURF ESTABLISHMENT SOILS WERE ENCOUNTERED, APPROXIMATE DEPTHS RANGED FROM A MINIMUM OF 4 INCHES TO A MAXIMUM OF 6 INCHES.
5. A SHRINKAGE FACTOR OF 120% WAS USED FOR NORMAL GRADING AND TOPSOIL, (EXCAVATED VOLUME TO COMPACTED VOLUME).
6. AS A PRECAUTIONARY MEASURE FROM A SOILS STANDPOINT, TRAFFIC LANES TO BE USED DURING CONSTRUCTION MUST BE DELINEATED TO KEEP VEHICLES A SAFE DISTANCE AWAY FROM THE ADJACENT EXCAVATION. THE DELINEATION SHOULD COINCIDE WITH POINTS ESTABLISHED BY PROJECTING A 2(H):1(V) OR FLATTER SLOPE BETWEEN THE EDGE OF THE TRAFFIC SURFACE AND THE BOTTOM OF THE EXCAVATION. IN AREAS OF MUCK EXCAVATION, USE 3(H):1(V) OR FLATTER.
7. ALL TRASH AND DEBRIS ENCOUNTERED WITHIN THE PROJECT LIMITS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE RECYCLED OR DISPOSED OUTSIDE THE RIGHT OF WAY IN ACCORDANCE WITH SPEC. 2104.3C. THIS WORK SHALL BE INCIDENTAL UNLESS OTHERWISE IDENTIFIED AS BID ITEM WORK.
8. OBTAIN COMPACTION ON THE AGGREGATE BASE PORTIONS OF THE PERMANENT AND TEMPORARY CONSTRUCTION IN ACCORDANCE WITH THE "PENETRATION INDEX METHOD" REQUIREMENTS. THE TEST SHALL BE PERFORMED IN ACCORDANCE WITH MN/DOT SPEC. 2211.3C3. THIS INCLUDES ANY AREAS WHERE CRUSHED CONCRETE OR SALVAGED ASPHALT CONCRETE IS USED FOR AGGREGATE BASE.
9. BITUMINOUS AND CONCRETE ITEMS DISTURBED BY CONSTRUCTION SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE RECYCLED TO THE EXTENT ALLOWED IN BASE AND SURFACING ITEMS OR DISPOSED OF OUTSIDE THE RIGHT OF WAY IN ACCORDANCE WITH MN/DOT SPEC. 2104.3C.
10. WHEN REMOVING BITUMINOUS, FULL-DEPTH SAWCUTS SHOULD BE MADE PERPENDICULAR TO THE ROADWAY CENTERLINE.
11. SLOPE DRESSING IS DEFINED AS THE TOPSOIL OR OTHER SOIL PLACED DURING PRIOR CONSTRUCTION TO PROVIDE A MEDIUM FOR ESTABLISHING TURF.
12. BITUMINOUS MATERIAL FOR TACK COAT SHALL BE APPLIED AT THE RATE OF 0.05 GAL/SQ.YD. AND SHALL BE CONSIDERED INCIDENTAL.
13. EXCAVATION QUANTITIES AT THE 4 DRAINAGE STRUCTURES ARE BASED ON 4' WIDTH AND 1:1 SIDE SLOPES.

PLOTTED/REVISED: 02-FEB-2009 15:30

DISTRICT #: METRO  
 PLOT NAME: 0215072\_scd\_sht\_04  
 PATH & FILENAME: S:\Design\0215072\FINAL\0215072\_scd.dgn

DRAWN BY: KV	CHECKED BY: RKO	CERTIFIED BY <u><i>Peter Daniel</i></u> <small>LICENSED PROFESSIONAL ENGINEER</small>	LIC. NO. 45053 DATE 02/03/09	<b>SOILS AND CONSTRUCTION NOTES</b> STATE PROJ. NO. 0215-72 (T.H. 10) SHEET NO. 4 OF 23 SHEETS
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PLOTTED/REVISED: 02-FEB-2009 15:30

CURB AND GUTTER <span style="float: right;">D</span>				
STATION TO STATION		LOCATION (FT)		CONCRETE CURB & GUTTER DESIGN 0424
				LIN FT
RAMP C1				
ALIGNMENT				
HNBRC1				
442+16	TO	450+52	14 RT TO 24 RT	836
RAMP C1				
ALIGNMENT				
HNBCC				
850+52	TO	851+99	24 RT	147
TOTALS:				983

CASTING ASSEMBLY <span style="float: right;">E</span>			
ASSEMBLY	ASSEMBLIES REQUIRED	CASTING NO.	STANDARD PLATE NO.
D-4	4	FRAME CASTING NO. 805 GRATE CASTING NO. 816	4132 4154

SAWCUTS <span style="float: right;">C</span>				
STATION TO STATION		LOCATION (FT)		SAWING BITUMINOUS PAVEMENT (FULL DEPTH)
				LIN FT
RAMP C1				
ALIGNMENT				
HNBRC1				
442+16			10 RT TO 16 RT	6
442+16	TO	442+60	10 RT	44
442+60			10 RT TO 16 RT	6
442+60	TO	443+88	14 RT TO 20 RT	128
443+88			18 RT TO 24 RT	6
443+88	TO	444+12	18 RT	24
444+12			18 RT TO 24 RT	6
444+12	TO	446+36	21 RT	224
446+36			18 RT TO 24 RT	6
446+36	TO	446+60	18 RT	24
446+60			18 RT TO 24 RT	6
446+60	TO	450+52	21 RT	392
RAMP C1				
ALIGNMENT				
HNBCC				
850+52	TO	851+99	9 RT	147
851+99			6 RT TO 12 RT	6
TOTALS:				1025

CURB AND GUTTER, SAWCUTS, AND CASTING ASSEMBLIES

**TABULATIONS**

DRAWN BY: RKO

CHECKED BY: RKO

CERTIFIED BY

*Peter Douriel*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 02/03/09

STATE PROJ. NO. 0215-72 (T.H. 10) SHEET NO. 5 OF 23 SHEETS

DISTRICT #: METRO  
 IPLOT NAME: 0021572\_ib.c.d.p\_sht\_05  
 PATH & FILENAME: S:\Design\0215\0215\02\FINAL\0021572\_IB.dgn

PERMANENT TURF ESTABLISHMENT AND EROSION CONTROL

H

STATION TO STATION		LOCATION (FT)	SEEDING	SUBSOILING	SEED MIXTURE 250	FERTILIZER TYPE 3	EROSION CONTROL BLANKETS CATEGORY 1	SILT FENCE, TYPE MACHINE SLICED	FILTER LOG TYPE STRAW BIOROLL	STORM DRAIN INLET PROTECTION	
			ACRE	ACRE	POUND	POUND	SQ YD	LIN FT	LIN FT	EACH	
RAMP C1											
ALIGNMENT											
HNBRC1											
442+16	TO	450+52	24 RT TO VAR RT	0.78	0.78	55	273	2908	798		
442+30			14.8 RT						8	1	
442+50			16.2 RT						8	1	
444+00			23 RT							1	
446+50			23 RT							1	
RAMP C1											
ALIGNMENT											
HNBCC											
850+52	TO	851+99	12 RT TO 32 RT	0.07	0.07	5	24	312	185		
			<b>TOTALS:</b>	0.8	0.8	60	297	3220	983	16	4

NOTE:

① ANALYSIS 22-5-10. FERTILIZE WITH TYPE 3 FERTILIZER AT THE RATE OF 350 LBS/ACRE.

TURF ESTABLISHMENT

TABULATIONS

DRAWN BY: RKO

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*Peter Danial*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 02/03/09

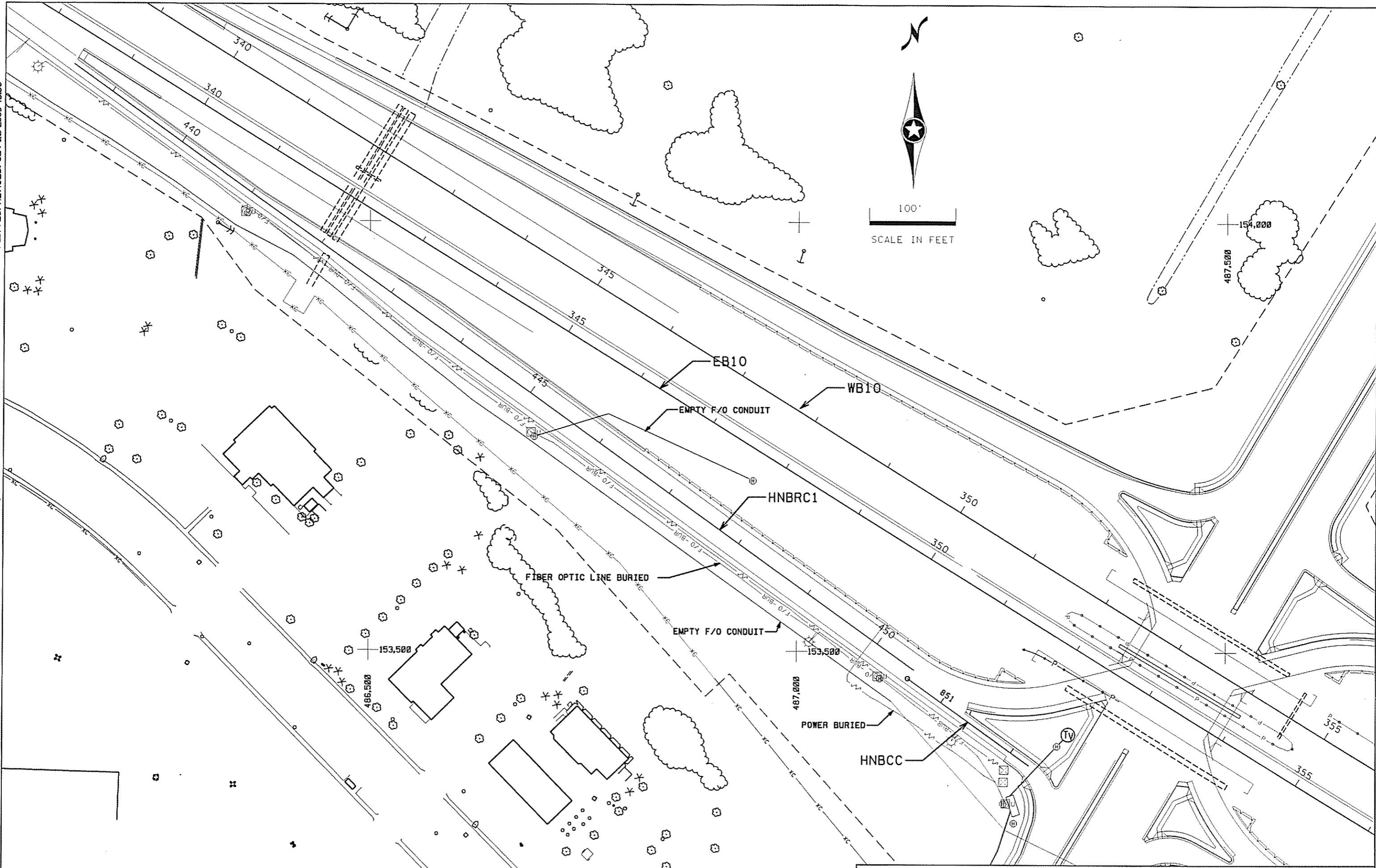
STATE PROJ. NO. 0215-72 (T.H. 10) SHEET NO. 6 OF 23 SHEETS

PLOTTED/REVISED: 17-FEB-2009 13:51

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PLOTTED/REVISED: 02-FEB-2009 15:30

DISTRICT #: METRO  
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PATH & FILENAME: S:\Design\010\0215072\FINAL\00215072\_UTIL.dgn



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CERTIFIED BY *Peter Danisch*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 02/03/09

STATE PROJ. NO. 0215-72 (T.H. 10) SHEET NO. 7 OF 23 SHEETS

PLOTTED/REVISED: 17-FEB-2009 13:51

DISTRICT #: METRO  
 PLOT NAME: 0021572.tb.f\_SHT\_08  
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UTILITIES AND ELECTRICAL AND COMMUNICATIONS							F
STATION	ROADWAY NAME	OFFSET (FT)	ITEM INPLACE	REMARKS			OWNERSHIP
				LEAVE AS IS	ADJUST	RELOCATE	
<b>INPLACE T.H. 10 EB (EB10)</b>							
337+71 R 9 - 337+87 R 9	EB10	43R - 94R	F/O BUR	X			MN/DOT
338+13 R 9	EB10	66R	L POLE	X			MN/DOT
338+13 R 9 - 352+02 R 9	EB10	56R - 167R	USL	X			MN/DOT
338+47 R 9 - 352+24 R 9	EB10	92R - 219R	F/O COND		X		MN/DOT (1) (2)
341+07 R 9	EB10	80R	COM HH	X			MN/DOT
341+07 R 9 - 352+24 R 9	EB10	75R - 196R	F/O BUR		X		MN/DOT (1) (2)
345+25 R 9	EB10	122R	COM HH	X			MN/DOT
345+33 R 9 - 347+70 R 9	EB10	33R - 122R	F/O COND	X			MN/DOT
347+75 R	EB10	33R	HH	X			MN/DOT
349+30 R 9	EB10	158R	L POLE	X			MN/DOT
349+89 R 9 - 352+09 R 9	EB10	92R - 182R	P-BUR	X			CONEX
350+19 R 9	EB10	149R	COM HH	X			MN/DOT
351+32 R 9	EB10	167R	L POLE	X			MN/DOT
352+24 R 9	EB10	196R	COM HH	X			MN/DOT

UTILITY LEGEND	
COM HH	= COMMUNICATION HANDHOLE
F/O-COND	= EMPTY FIBER CONDUIT
F/O-BUR	= FIBER OPTIC LINE BURIED
HH	= HANDHOLE
L POLE	= LIGHT POLE
P-BUR	= POWER BURIED
USL	= UNDERGROUND STREET LIGHT LINE

UTILITY OWNERSHIP	
MN/DOT	= MINNESOTA DEPT. OF TRANSPORTATION
CONEX	= CONNEXUS ENERGY

NOTES:

- ALL UTILITY WORK SHOWN ON THESE SHEETS SHALL BE DONE BY OTHERS UNLESS NOTED.
- ALL RELOCATES AND ADJUSTMENTS ARE SUBJECT TO MN/DOT RIGHT OF WAY.
- PRIOR TO ANY EXCAVATION WORK, THE CONTRACTOR IS HEREBY REMINDED OF HIS RESPONSIBILITY UNDER MINNESOTA STATUTES 2160 AND RULES CHAPTER 7560 TO CONTACT GOPHER STATE ONE- CALL FOR THE LOCATION OF UNDERGROUND UTILITIES (FACILITIES).
- THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

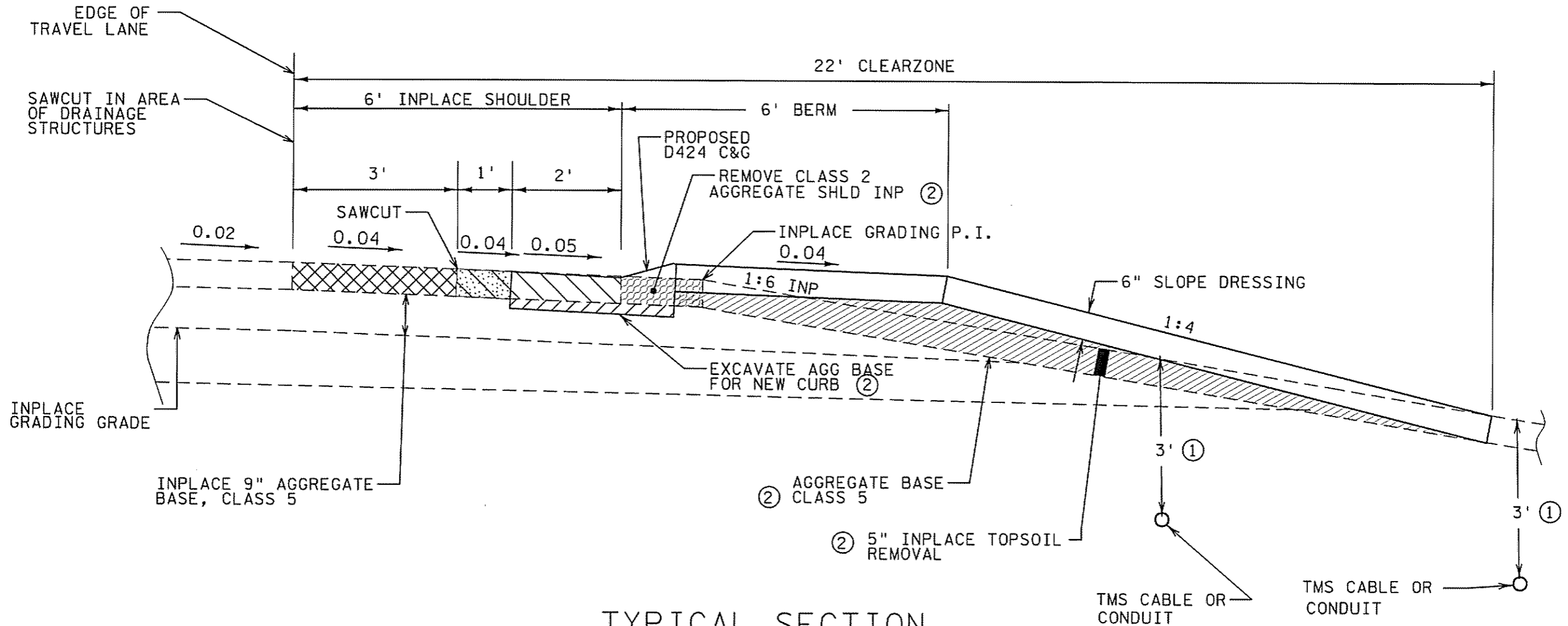
- ① LOCATE THE TWO TMS CONDUITS IN THE VICINITY OF THE TRENCH AND EXPOSE THEM USING A VACUUM EXCAVATOR OR HAND DIGGING. USE A RIGID STRUCTURE TO SUPPORT THE CONDUITS ACROSS THE EXCAVATION. INSERT THE 12" RC PIPE BENEATH THE UTILITIES.
- ② WORK TO BE DONE BY CONTRACTOR.

UTILITIES /ELECTRICAL AND COMMUNICATIONS  
**TABULATIONS**


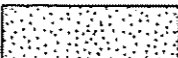



PLOTTED/REVISED: 17-FEB-2009 14:07

DISTRICT #: METRO  
PLOT NAME: 0215072.tbl\_SHT\_09  
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**TYPICAL SECTION**  
 HNBRC1 STA. 442+16 TO HNBCC STA. 851+99

-  6" BIT. REMOVAL ②
-  6" BITUMINOUS
-  INPLACE 6" BIT SHLD.

- NOTES:
- ALL SLOPES ARE SHOWN IN FT/FT UNLESS NOTED.
  - ① APPROXIMATE DEPTH SEE UTILITY PLAN FOR MORE DETAILS AND INSTRUCTIONS FOR EXCAVATION AROUND NEW DRAINAGE PIPES, SEE SHEET 8
  - ② PAID FOR AS COMMON EXCAVATION.

**TYPICAL SECTIONS**

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CHECKED BY: RKO

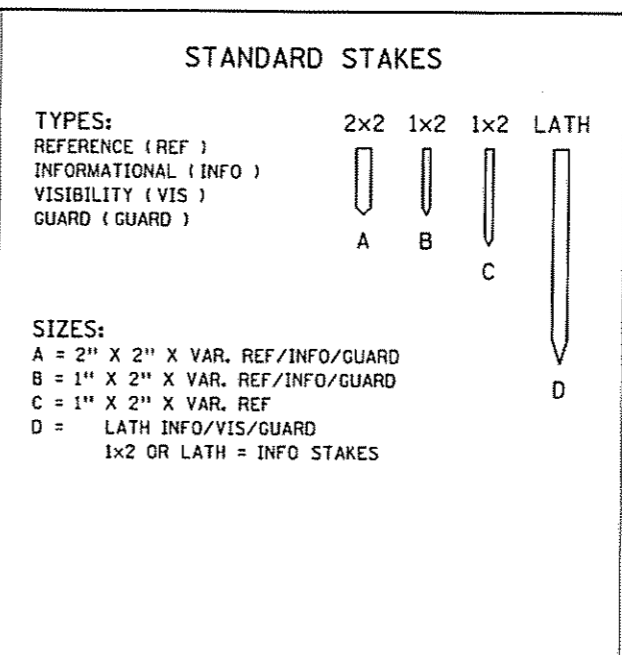
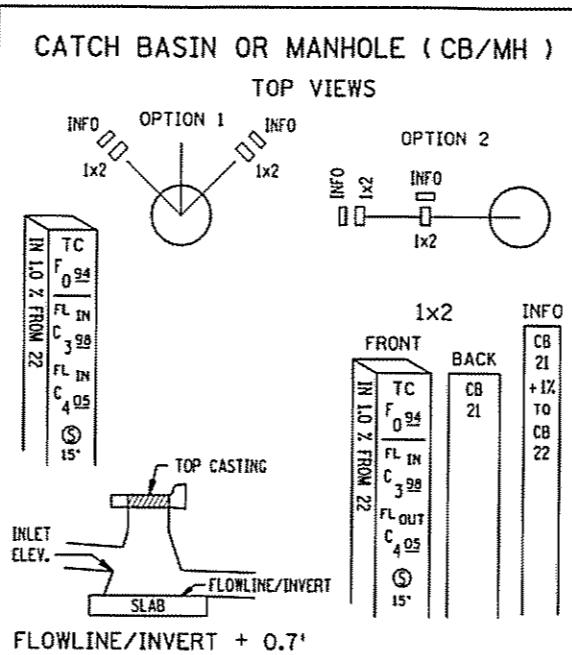
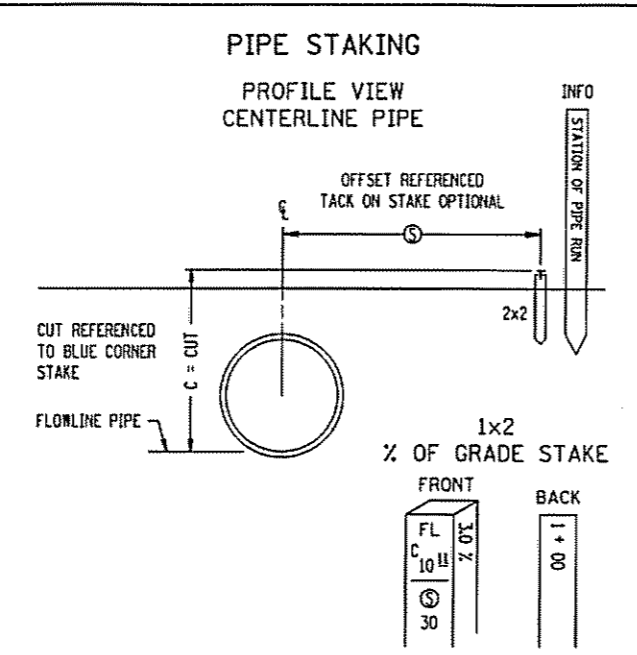
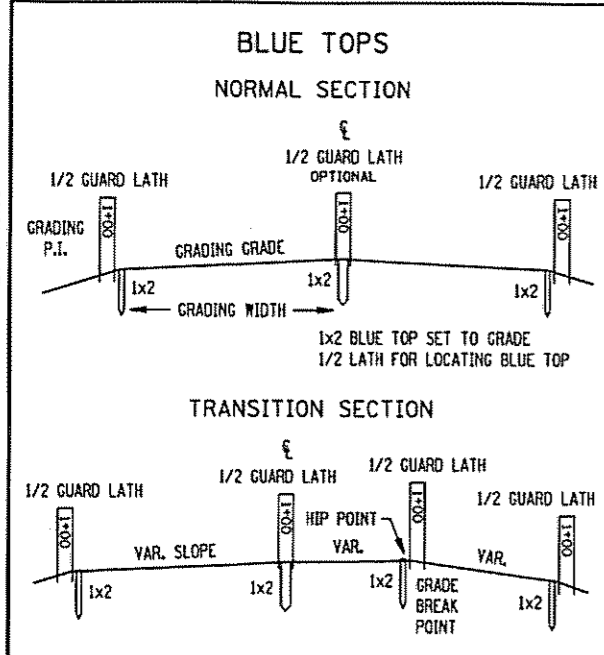
CERTIFIED BY

*Peter Danisch*  
 LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 02/03/09

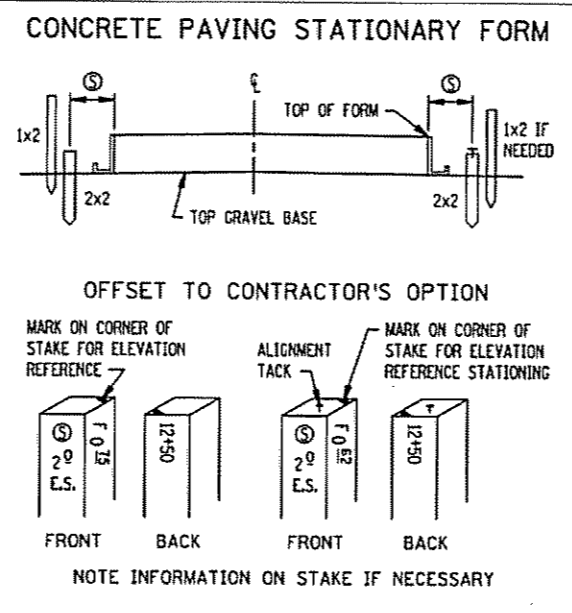
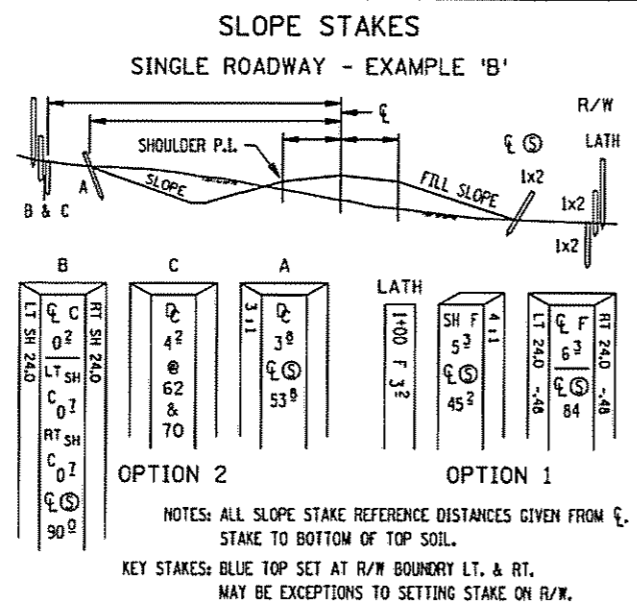
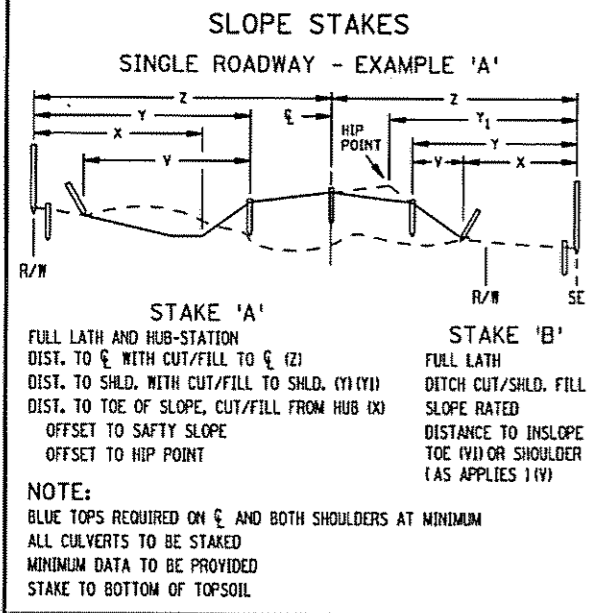
STATE PROJ. NO. 0215-72 (T.H. 10) SHEET NO. 9 OF 23 SHEETS

DISTRICT #: METRO  
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 PLOTTED/REVISED: 22-JAN-2009 10:09



### ABBREVIATIONS

BBL = BARREL (PIPE)	HH = HANDHOLE
B.C. = BACK CURB	HP = HIP POINT
C & G = CURB & GUTTER	LT = LEFT
C = CUT	MH = MANHOLE
CAP = CORR. ALUM. PIPE	NB = NORTHBOUND
CB = CATCH BASIN	⊙ = OFFSET
CL = CENTERLINE	PAR = PARCEL
CL & GR = CLEAR & GRUB	% = PERCENT GRADE
CMP = CORR. METAL PIPE	P.E. = PERM. EASEMENT
COR = CORNER	RAD = RADIUS POINT
CR = CROWN	RCP = REINF. CONC. PIPE
CSP = CORR. STEEL PIPE	RP = REFERENCE POINT
DC = DITCH CUT	RSC = REINF. SECT. CONC.
D.E. = DRAINAGE EASEMENT	RT = RIGHT
DI = DROP INLET	R/W = RIGHT OF WAY
EB = EASTBOUND	SB = SOUTHBOUND
E.M. = EDGE BITUMINOUS MAT	SCP = SECT. CONC. PIPE
E.S. = EDGE CONCRETE SLAB	SH = SHOULDER
F = FILL	TC = TOP CASTING OR TOP CURB
FF = FRONT FACE	T.E. = TEMP. EASEMENT
FL = FLOW LINE	3 : 1 = SLOPE (EXAMPLE)
FL IN = FLOWLINE INLET	WB = WESTBOUND
FL OUT = FLOWLINE OUTLET	WP = WORKING POINTS
GR = GRADE	
GW = GRADING WIDTH	



### RECOMMENDED STAKING INTERVALS

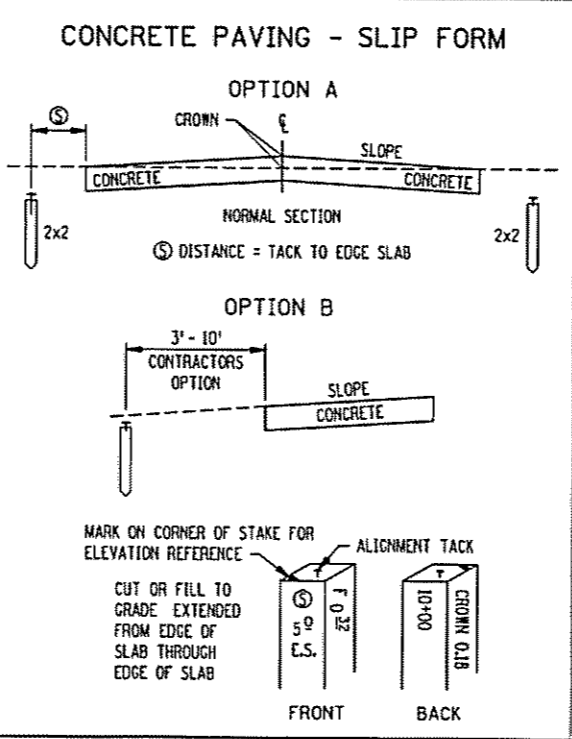
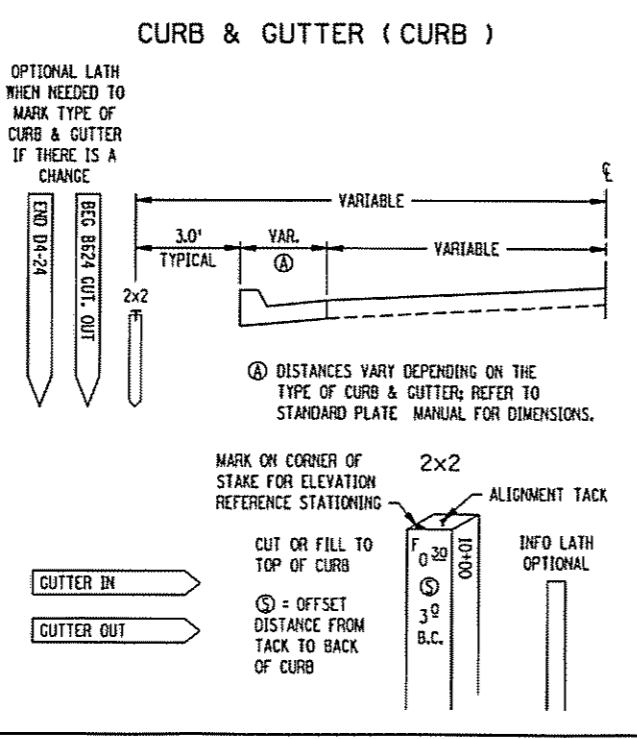
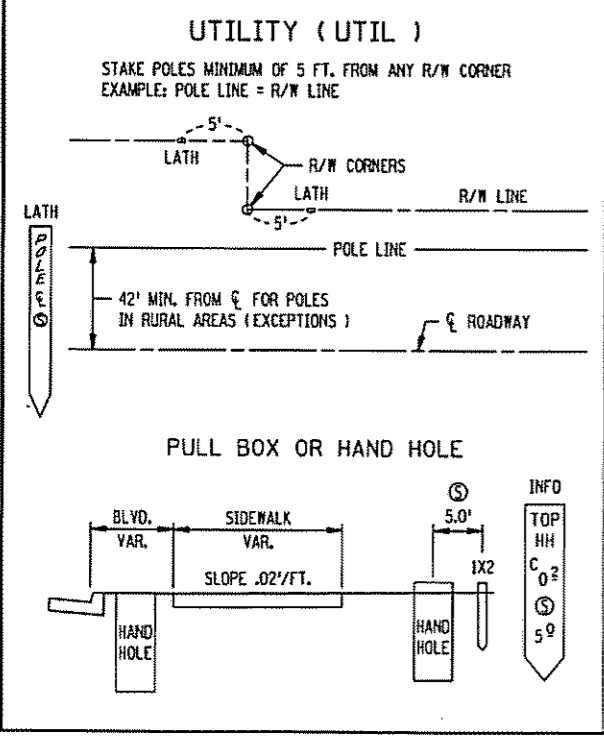
FIGURE A

	SLOPE STAKES	SUB GRADE B.T.	CLASS MATERIAL B.T.	CONC PAVT	C & G	CL & GR LIMITS	MUCK EXC.	R/W	TEMP. EASE.
TANGENT	100	100	100	50	50	ALL CORNERS	100	ALL CORNERS	ALL CORNERS
HORIZ. CURVE									
0 - 3'	100	100	100	50	50	ALL CORNERS	100	ALL CORNERS	ALL CORNERS
OVER 3'	100	50	50	25	25	ALL CORNERS	100	ALL CORNERS	ALL CORNERS
VERT. CURVE									
M' 100' CHORD	100	100	100	50	50				
0 - .25									
M' OVER .25	100	50	50	25	25				
TRAN.	50	50							

### STAKING TOLERANCES ( FEET )

	HORIZONTAL	VERTICAL
CONSTRUCTION LIMITS	± 1.5	
CLEARING & GRUBBING	2.0	
SLOPES STAKES	2.0	± 0.2
KEY STAKES	0.2	0.03
DRAINAGE STAKES	0.05	0.05
CURB & GUTTER	0.07	0.03
PAVING	0.05	0.03
ALIGNMENT	0.07	
UTILITY	0.10	0.05
STRUCTURAL	0.02	0.02
GUARD RAIL	0.5	
BUILDINGS	0.04	
O.H. SIGNS	0.05	0.05
MUCK EXCAVATION LIMITS	2.0	
R/W B-POINTS	0.10	
NOISE WALLS	1.0	0.5

THE TOLERANCES ARE RELATIVE TO PROJECT DATUM

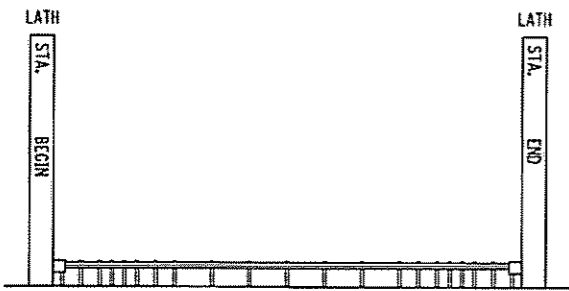


### DISCLAIMER

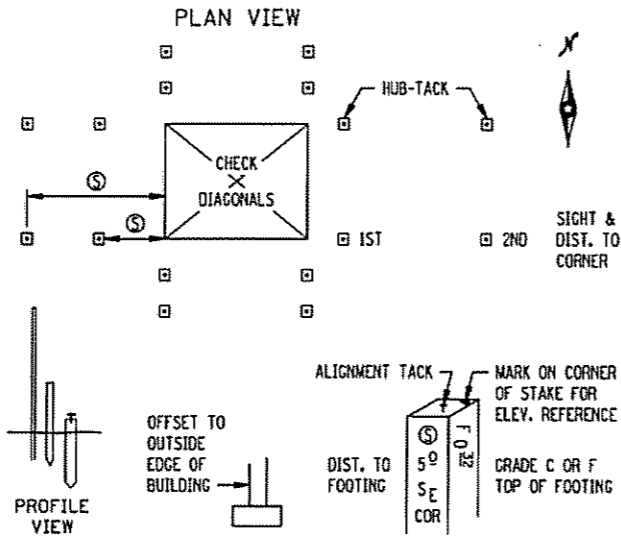
THESE STAKING INFORMATION SHEETS ARE FOR INFORMATION PURPOSES ONLY. STAKING PROCEDURES VARY AND MAY BE SUBJECT TO CHANGE DURING CONSTRUCTION BY CIRCUMSTANCES AND/OR AGREEMENTS BETWEEN SURVEY CREW AND CONTRACTOR.

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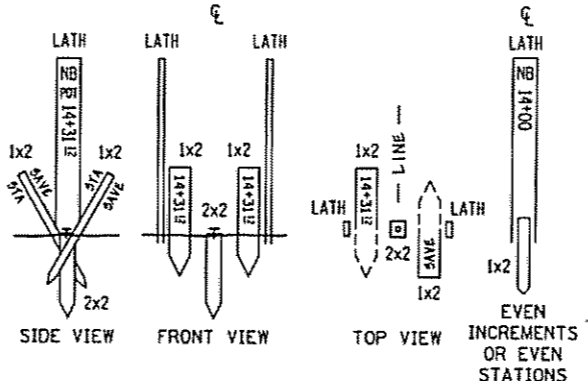
### GUARDRAIL (GUARD)



### BUILDING (BUILD) FOUNDATION / FOOTING

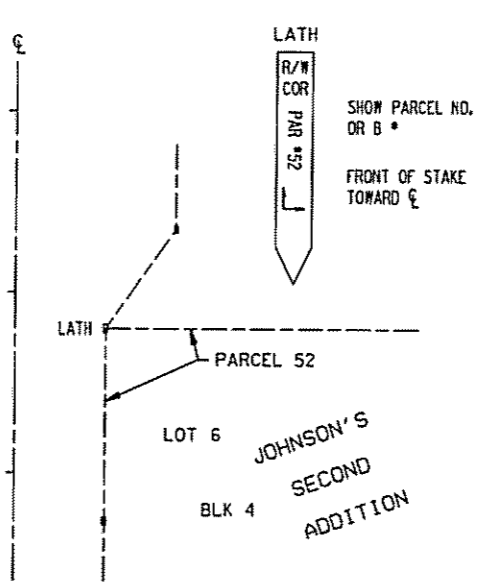


### ALIGNMENT POINTS (ALIGN)

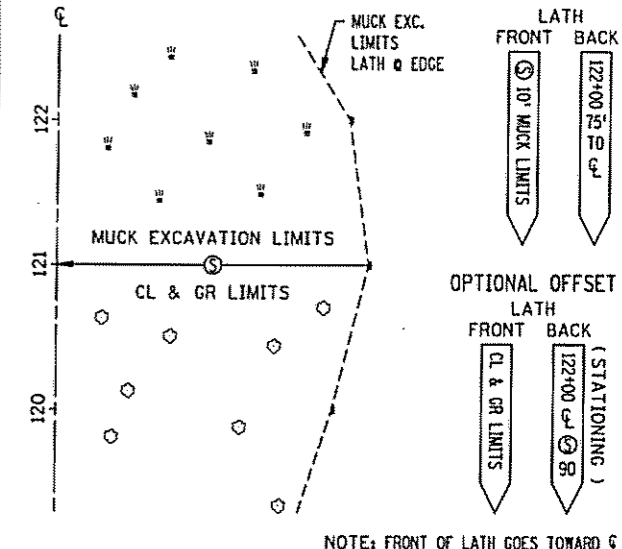


STAKE C = 2" X 2" HUB (LENGTH MAY VARY) SET AS TEMPORARY STAKE. MAY BE REPLACED BY MDOT MARKER AFTER CONSTRUCTION IS COMPLETED.  
SET AT GROUND LEVEL (TEMPORARY CONSTRUCTION STAKE).  
TACK SET AT ALIGNMENT POINTS.  
STAKE A = GUARD STAKES SET AT ANGLE IN GROUND 6" EACH SIDE OF STAKE D, WITH STATIONING READ WHEN LOOKING UP STATION.

### R/W & TEMP. EASEMENT (R/W)

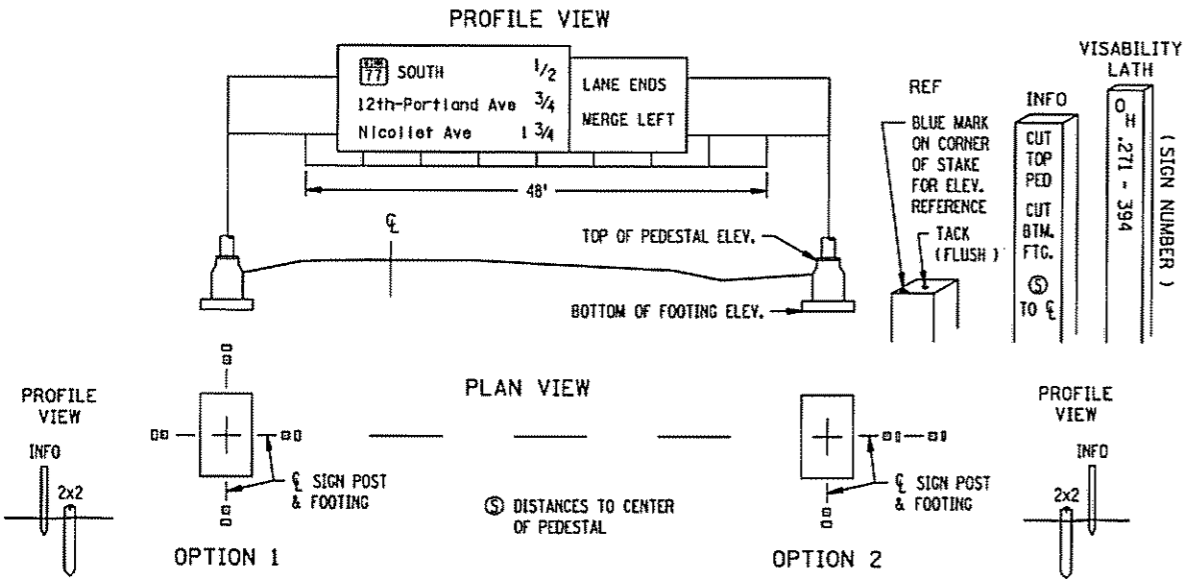


### CLEAR & GRUBBING LIMITS (CLEAR) OR MUCK EXCAVATION LIMITS (MUCK)

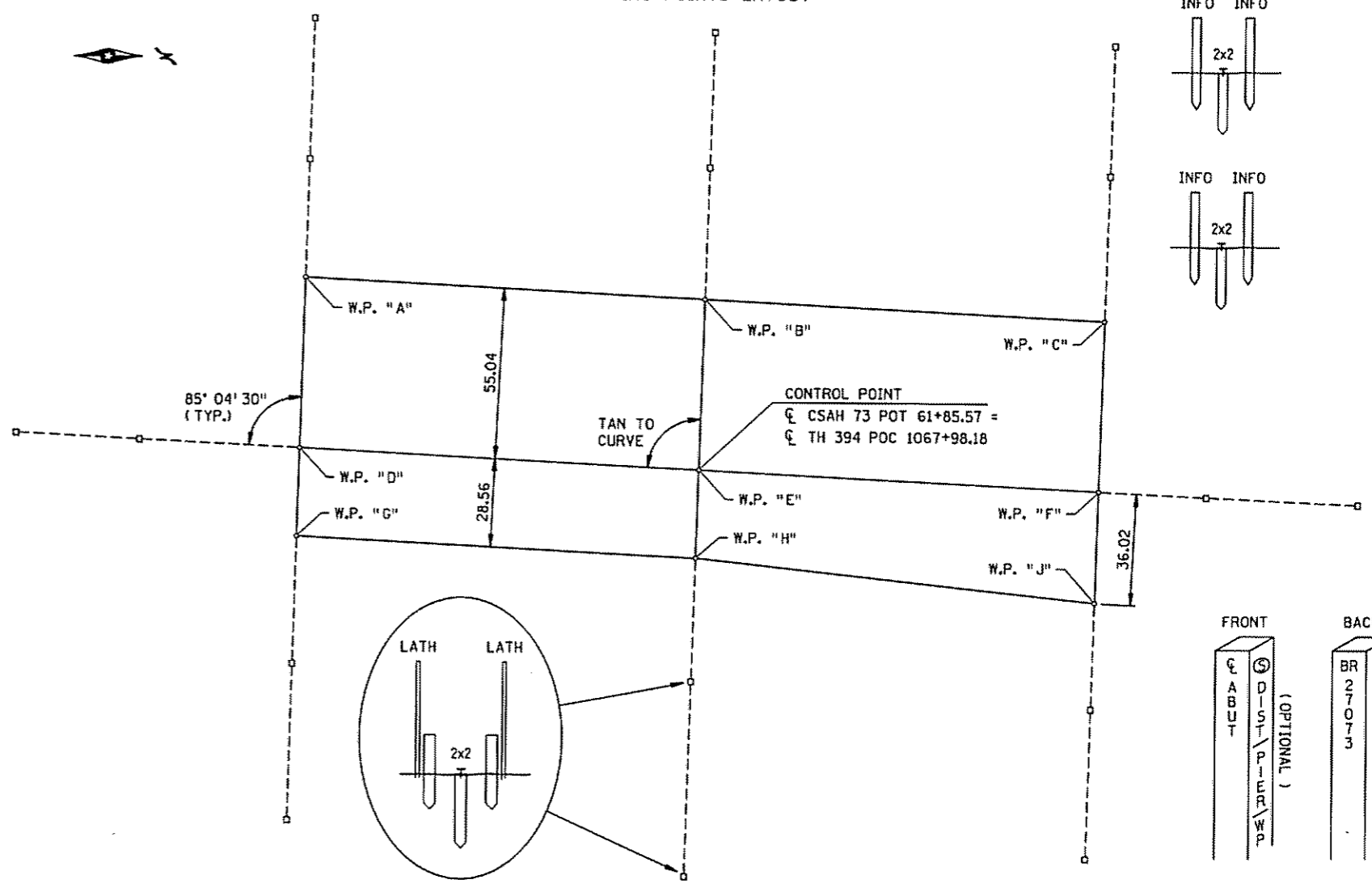


NOTE: FRONT OF LATH GOES TOWARD

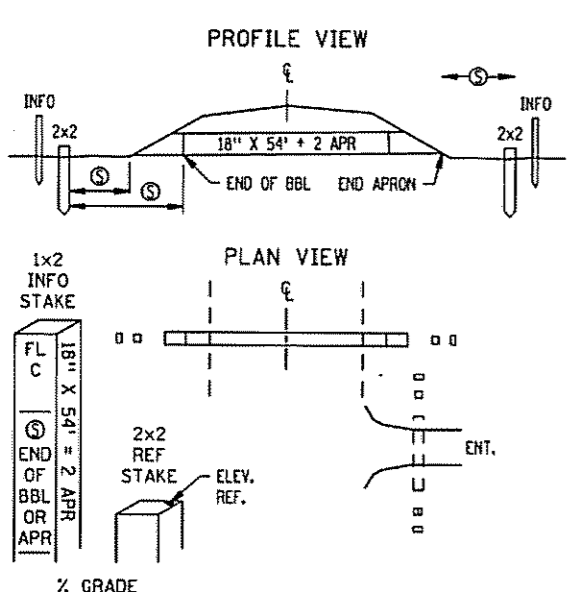
### OVERHEAD SIGNS (SIGN)



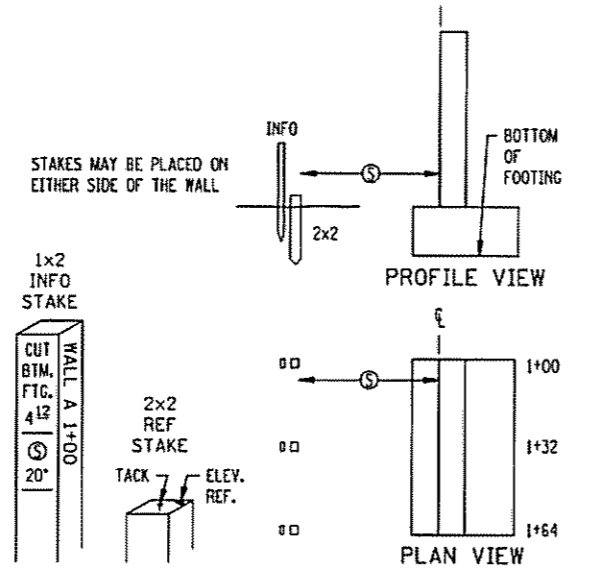
### BRIDGESTAKING (BRIDGE) WORKING POINTS LAYOUT



### CULVERT



### WALL



STANDARD SHEET NO. 5-297.115 (2 OF 2)  
STANDARD APPROVED: DECEMBER 21, 1994

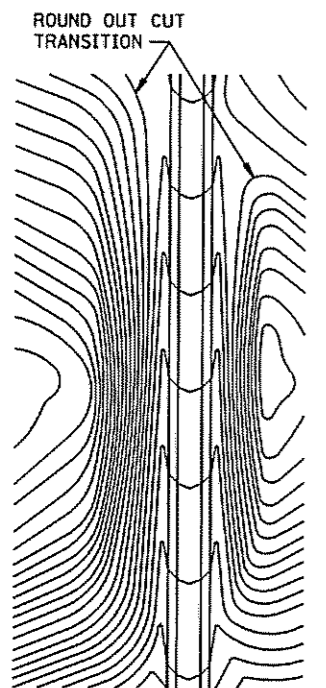
### STAKING INFORMATION SHEET

STATE PROJ. NO. 0215-72 (TH 10) SHEET NO. 11 OF 23 SHEETS

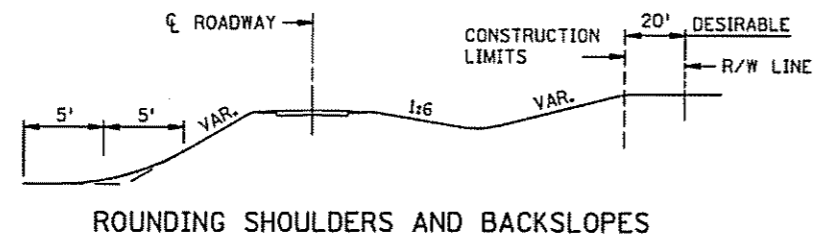
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PLOTTED/REVISED: 22-JAN-2009 10:09

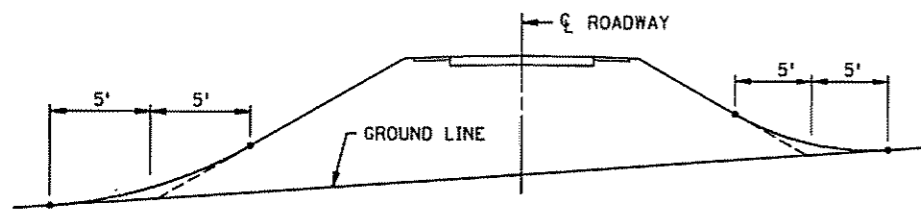
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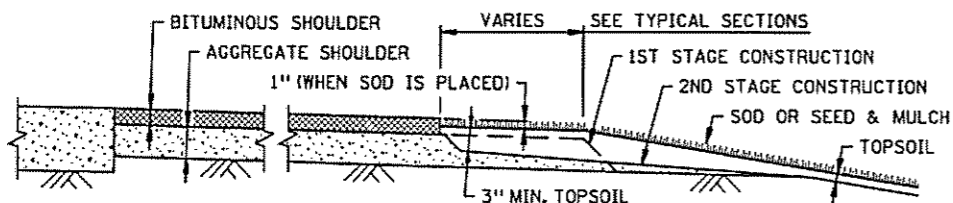
CONTOURING ROAD CUTS



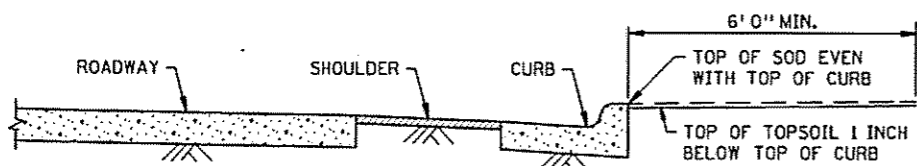
ROUNDING SHOULDERS AND BACKSLOPES



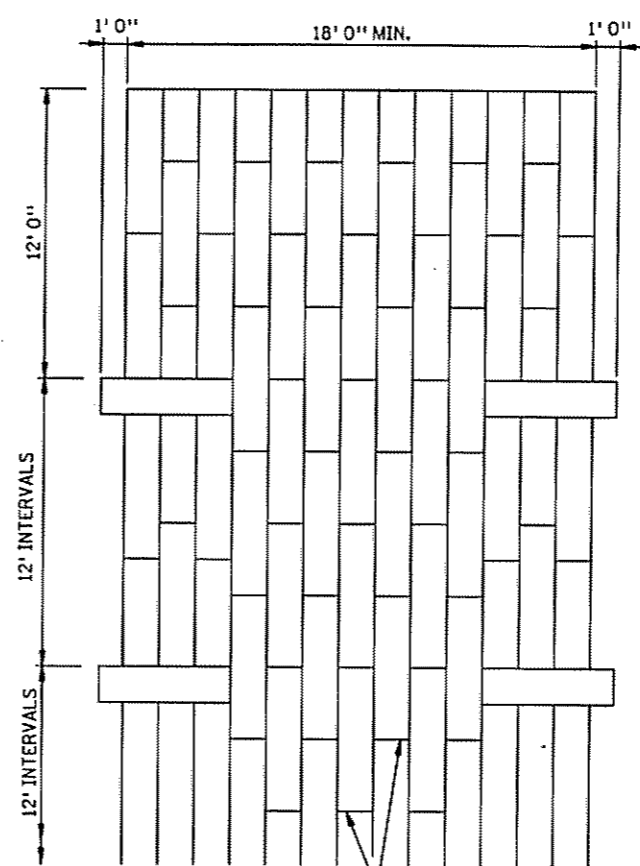
SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES



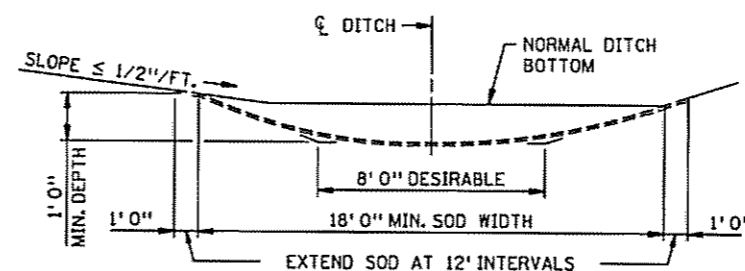
SHAPING AND TOPSOILING INSLOPES



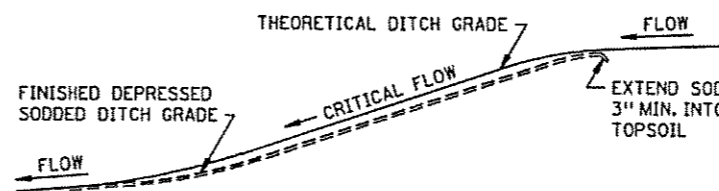
SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED



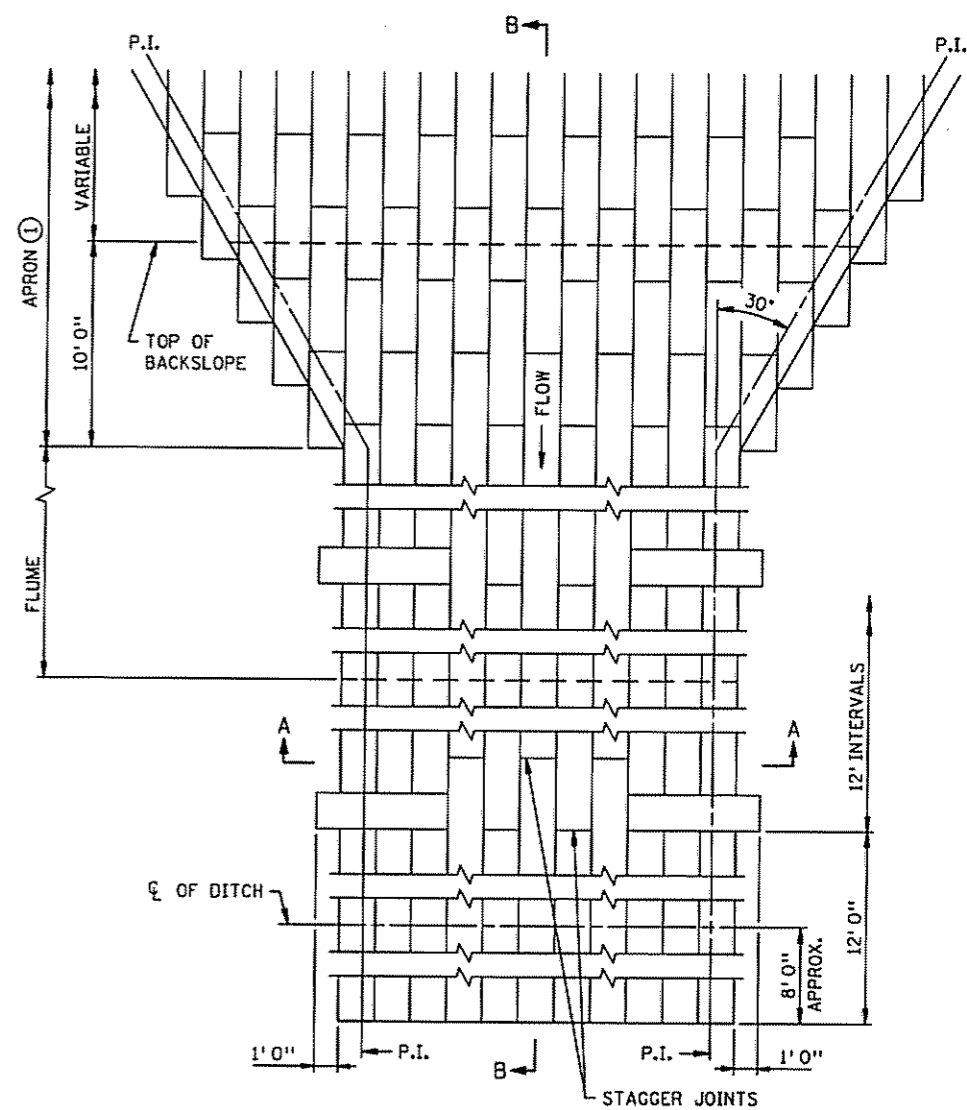
PLAN VIEW



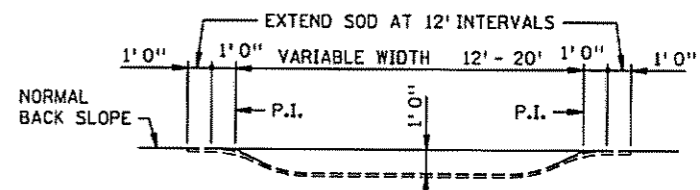
SODDED DITCH CROSS SECTION  
WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.),  
FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.



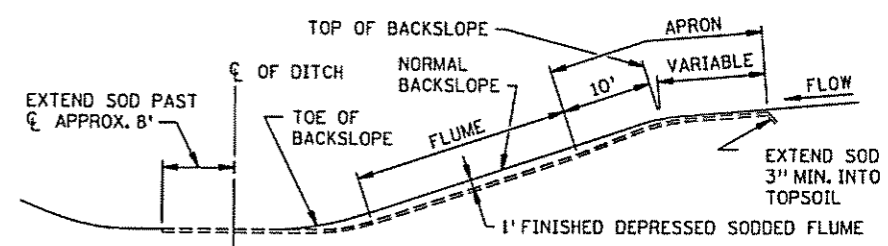
DITCH PROFILE  
SODDED DITCH DETAILS



PLAN VIEW



SECTION A-A



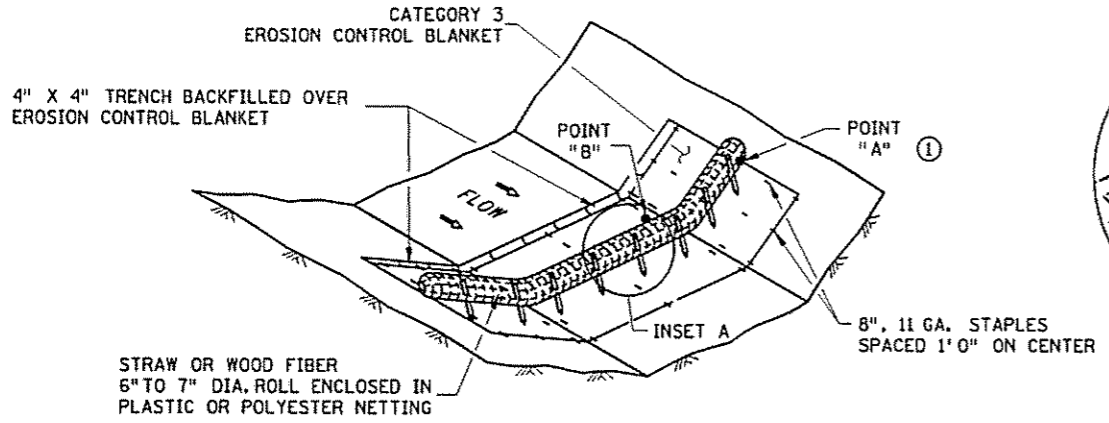
SECTION B-B  
SODDED FLUME DETAILS

NOTES:  
SEE SPEC. 2575.3 FOR ADDITIONAL INFORMATION.  
① CONSTRUCT TAPER AS DIRECTED BY THE ENGINEER.

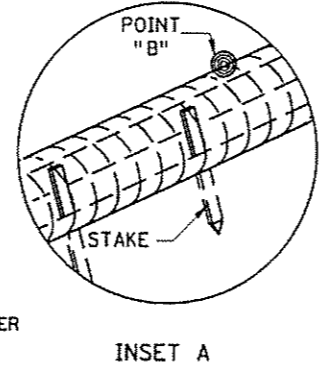
STANDARD SHEET NO. 5-297.404	TITLE: PERMANENT EROSION CONTROL ALONG ROADWAYS, DITCHES AND FLUMES
STANDARD APPROVED: NOVEMBER 20, 2002	
STATE PROJ. NO. 0215-72 (TH 10 ) SHEET NO. 12 OF 23 SHEETS	

PLOTTED/REVISED: 22-JAN-2009 10:09

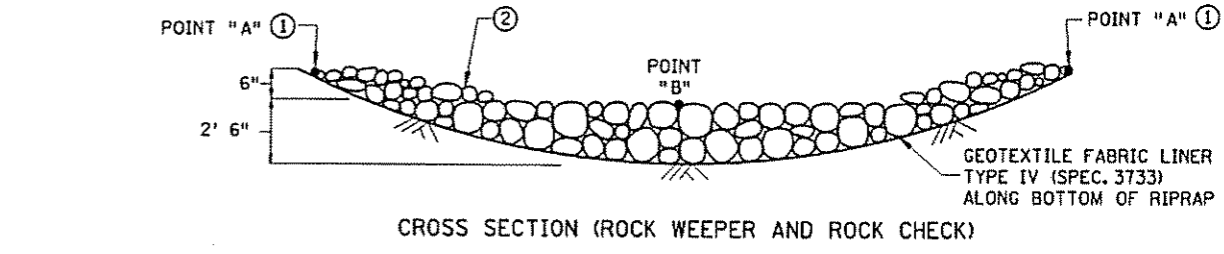
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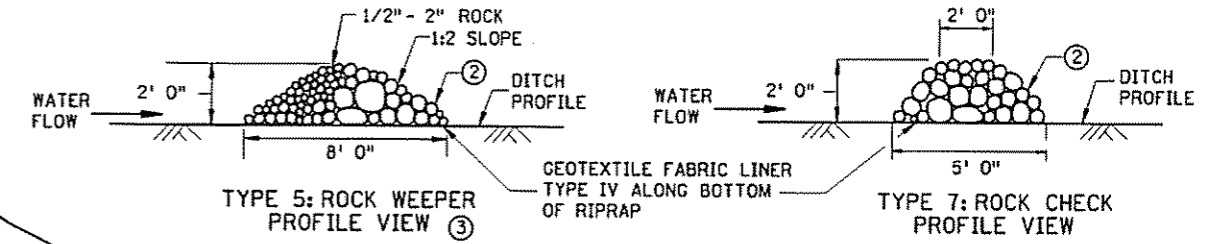
**TYPE 3: BIOROLL BLANKET SYSTEM DITCH CHECK**



**INSET A**



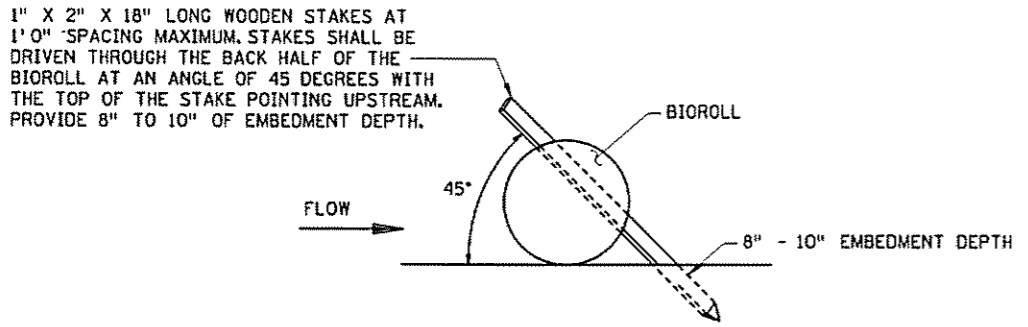
**CROSS SECTION (ROCK WEEPER AND ROCK CHECK)**



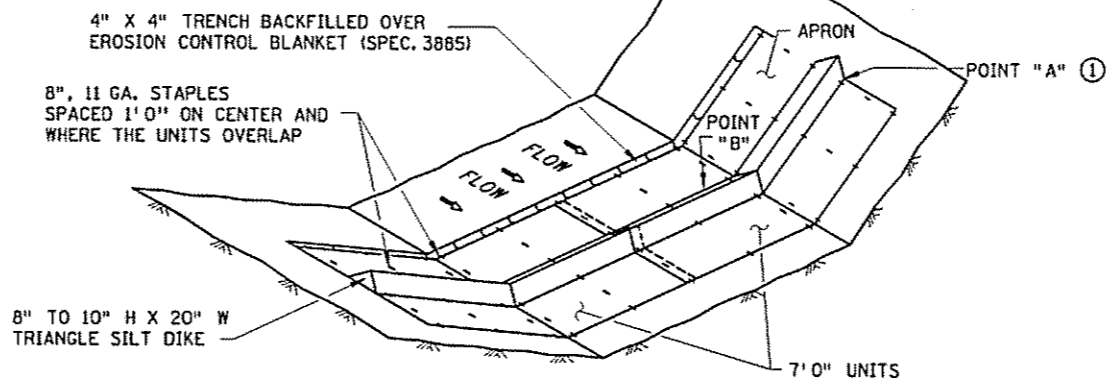
**TYPE 5: ROCK WEEPER PROFILE VIEW ③**

**TYPE 7: ROCK CHECK PROFILE VIEW**

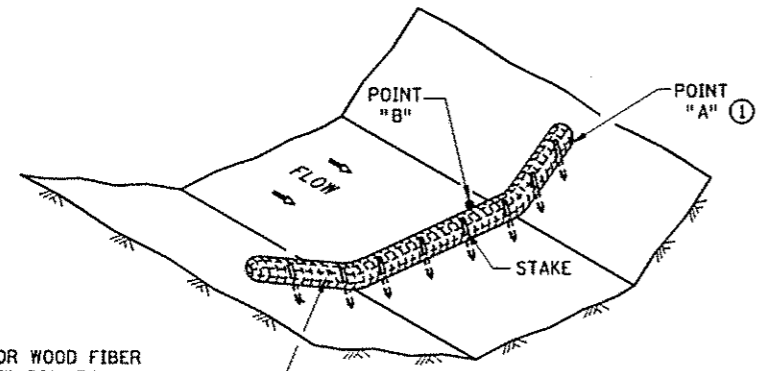
**TYPE 5: ROCK WEEPER AND TYPE 7: ROCK CHECK DITCH CHECKS ④**  
 USE ON ROUGH GRADED AREAS



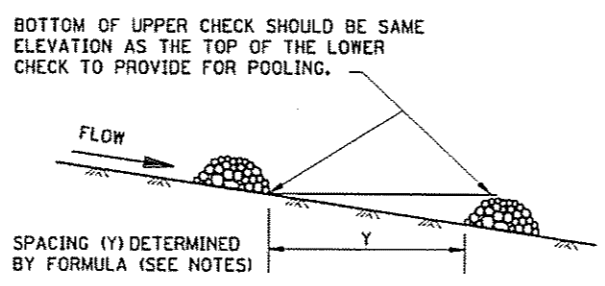
**BIOROLL STAKING DETAIL**



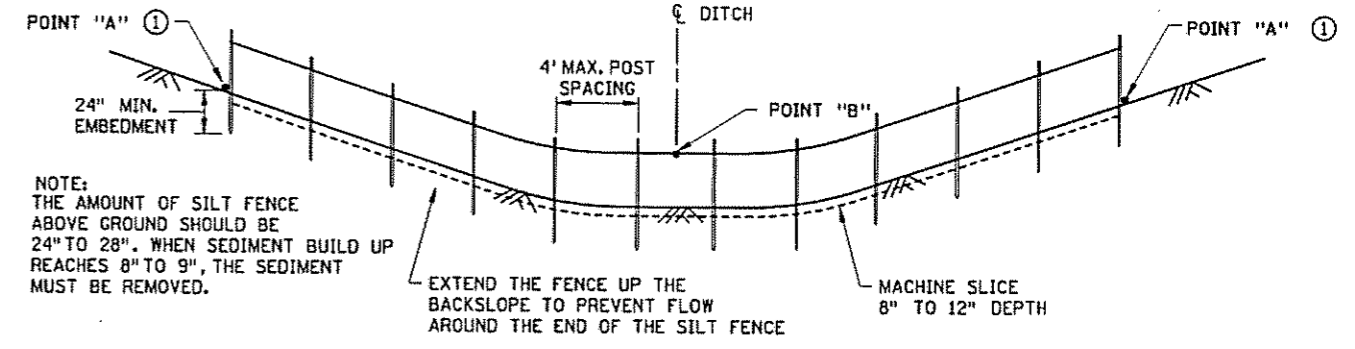
**TYPE 6: GEOTEXTILE TRIANGULAR DIKE DITCH CHECK**



**TYPE 2: BIOROLL DITCH CHECK**  
 USE ON ROUGH GRADED AREAS



**DITCH CHECK SPACING ④**



**TYPE 1: SLICED IN SILT FENCE DITCH CHECK**

**NOTES:**

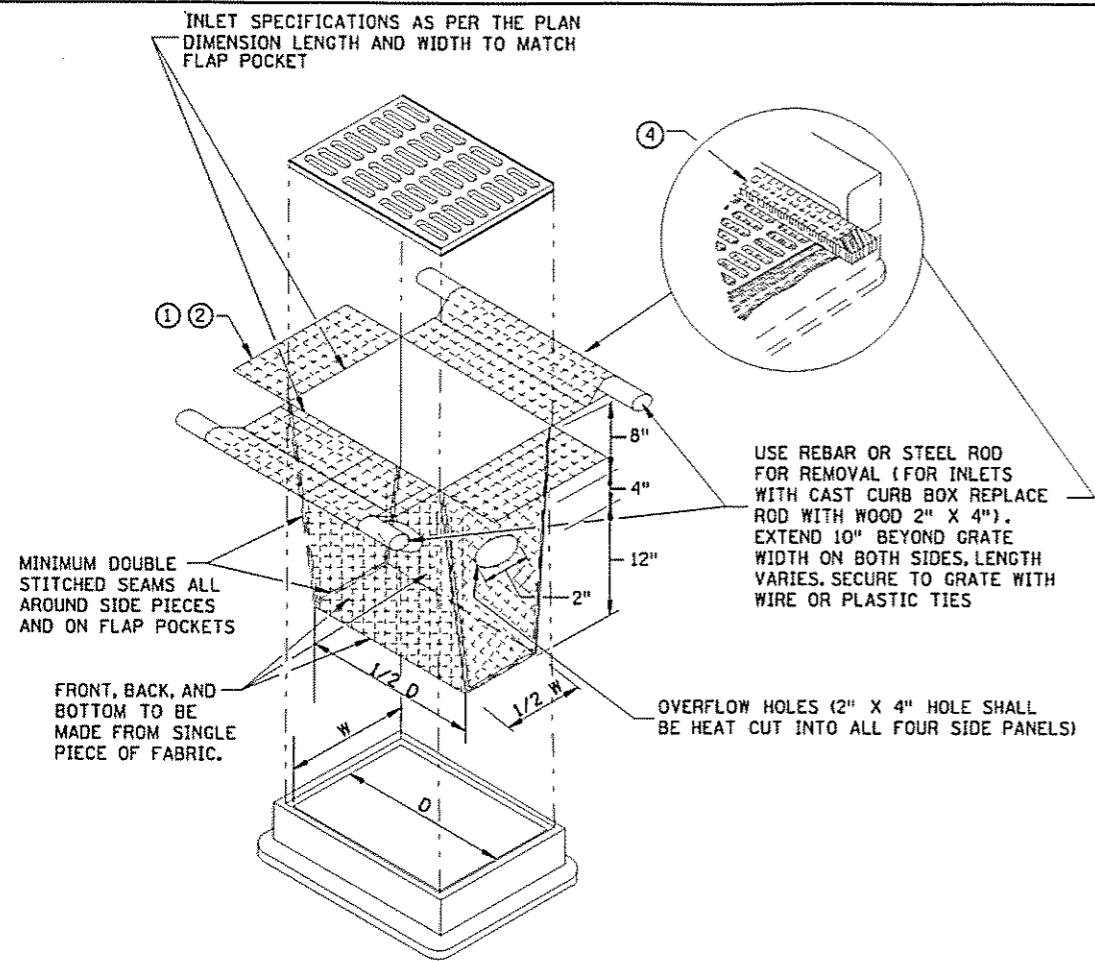
- SEE SPECS. 2573, 3601, 3733, 3885, 3886 & 3889.
- APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:  
 APPROXIMATE SPACING OF DITCH CHECKS (FT.) =  $Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\% \text{ CHANNEL SLOPE}} \times 100$
- ① POINT "A" MUST BE A MINIMUM OF 6 INCHES HIGHER THAN POINT "B" TO ENSURE THAT WATER FLOWS OVER THE DIKE AND NOT AROUND THE ENDS.
- ② CLASS I - IV RIPRAP (SPEC. 3601) WITH GEOTEXTILE FABRIC LINER, TYPE IV (SPEC. 3733).
- ③ THE ROCK WEEPER FILTERS SEDIMENT OUT OF THE WATER BETTER THAN THE OTHER DITCH CHECKS. THE ROCK WEEPER COULD BE USED AS A PERMANENT WATER FILTERING FEATURE.
- ④ PERMANENT ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE WILL NEED TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

GENERAL DESIGN GUIDELINES						
DITCH CHECK TYPE	SILT FENCE	BIOROLL	BIOROLL BLANKET	TRIANGULAR DIKE	ROCK WEEPER	ROCK CHECK
STORM FREQUENCY:	2 YR. - 24 HR.	2 YR. - 24 HR.	2 YR. - 24 HR.	2 YR. - 24 HR.	5 YR. - 24 HR.	5 YR. - 24 HR.
MAX. FLOW VELOCITY:	< 1 FT./SECOND	1.5 FT./SECOND	4.5 FT./SECOND	1.5 FT./SECOND	12 FT./SECOND	12 FT./SECOND
MAX. DITCH GRADE:	0% - 0.5%	1.5% - 3%	1.5% - 3%	1.5% - 2.0%	3% - 5%	3% - 5%
MAX. DRAINAGE AREA:	1 ACRE	2 ACRE	2 ACRE	4 ACRE	4+ ACRE	4+ ACRE

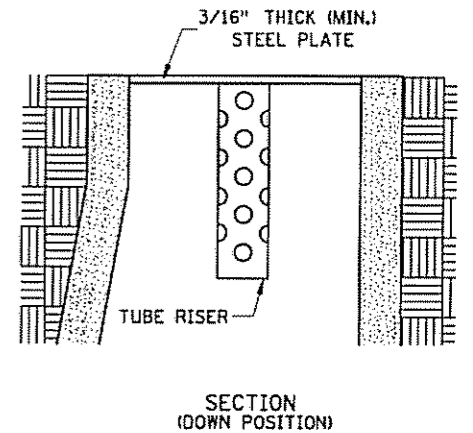
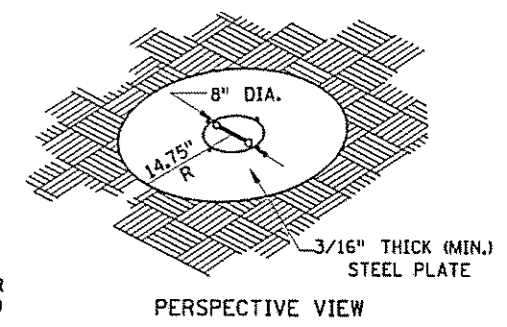
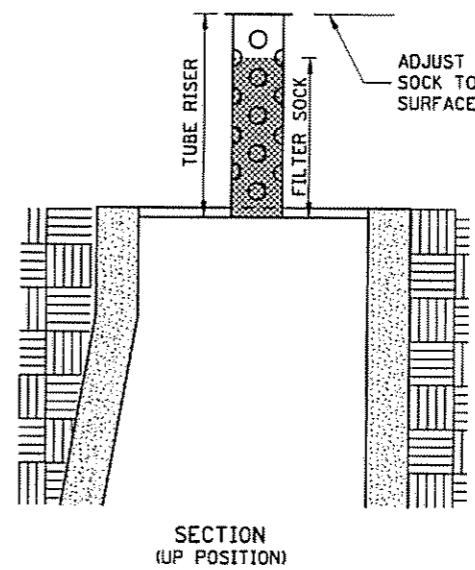
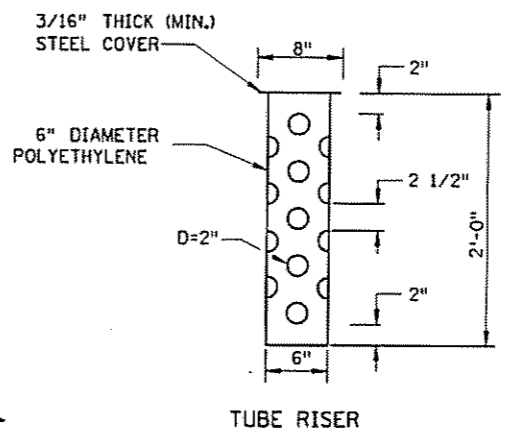
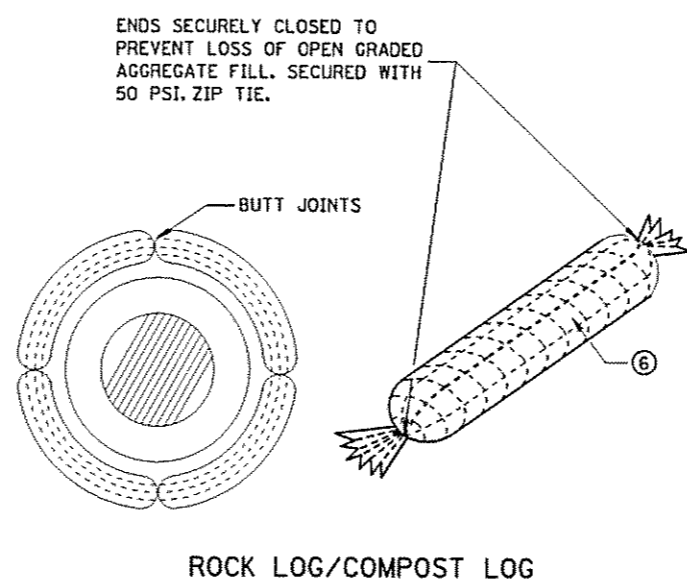
STANDARD SHEET NO. 5-297.405 ( 3 OF 4 )	<b>TEMPORARY SEDIMENT CONTROL DITCH CHECK/BARRIER</b>
STANDARD APPROVED: SEPTEMBER 27, 2006	
STATE PROJ. NO. 0215-72 ( TH 10 ) SHEET NO. 15 OF 23 SHEETS	

PLOTTED/REVISED: 22-JAN-2009 10:09

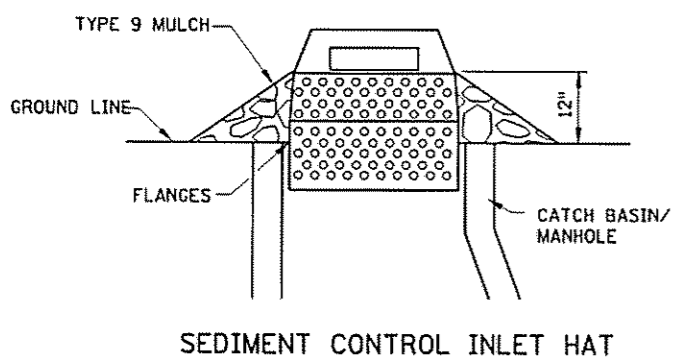
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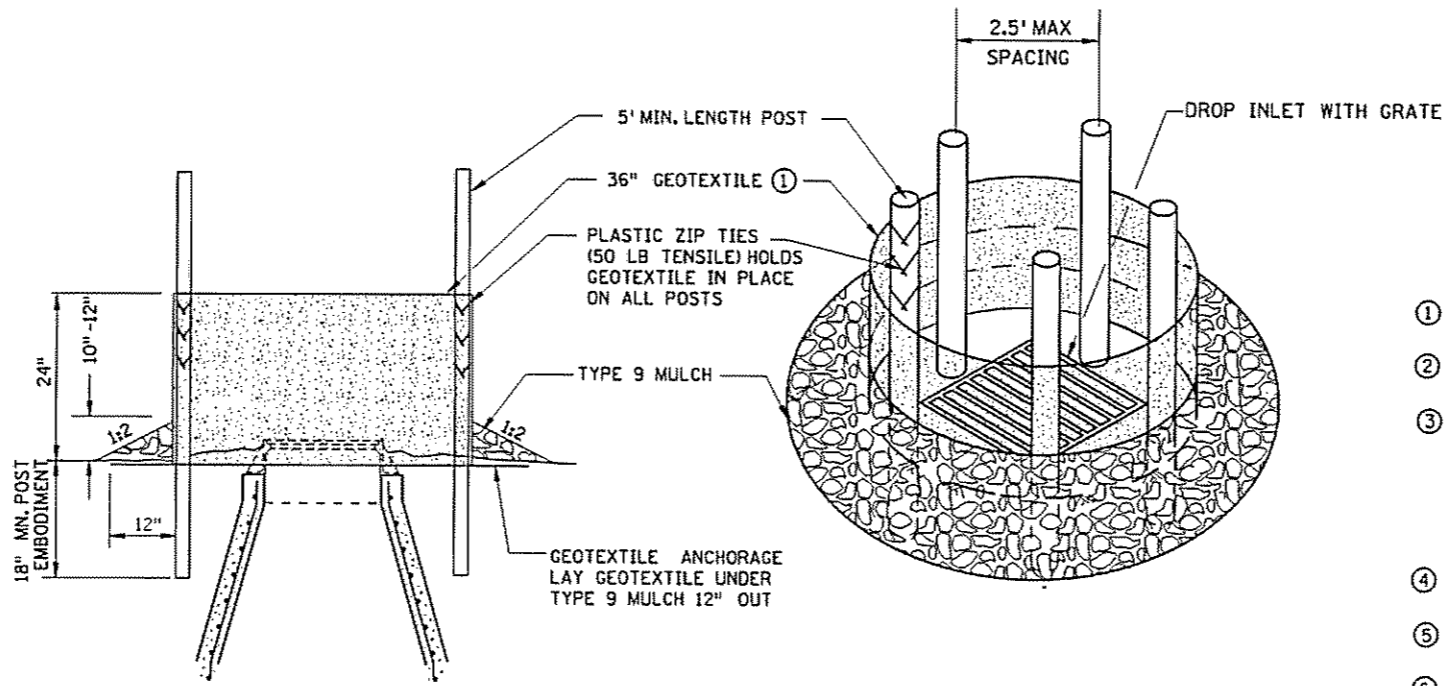
**FILTER BAG INSERT ③**  
 (CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX)



**POP-UP HEAD**



NOTE:  
 THE SEDIMENT CONTROL BARRIER SHALL BE A METAL OR PLASTIC/POLYETHYLENE RISER SIZED TO FIT INSIDE THE CATCH BASIN/MANHOLE; HAVE PERFORATIONS TO ALLOW FOR WATER INFILTRATION; HAVE AN OVERFLOW OPENING, FLANGES AND A LID/COVER.



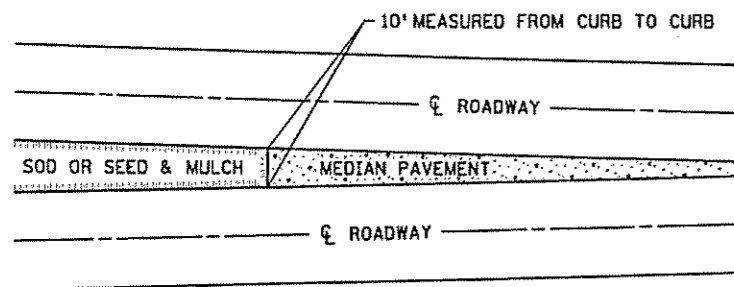
**SILTS FENCE RING AND ROCK FILTER BERM**  
 USE WHERE INLET DRAINS IN AN AREA WITH SLOPES AT 1:3 OR LESS

- NOTES:**  
 SEE SPECS. 2573, 3137, 3886 & 3891.  
 MANUFACTURED ALTERNATIVES LISTED ON Mn/DOT'S APPROVED PRODUCTS LIST MAY BE SUBSTITUTED.
- ① ALL GEOTEXTILE USED FOR INLET PROTECTION SHALL BE MONOFILAMENT IN BOTH DIRECTIONS, MEETING SPEC. 3806.
  - ② FINISHED SIZE, INCLUDING POCKETS WHERE REQUIRED SHALL EXTEND A MINIMUM OF 10 INCHES AROUND THE PERIMETER TO FACILITATE MAINTENANCE OR REMOVAL.
  - ③ INSTALLATION NOTES:  
 DO NOT INSTALL FILTER BAG INSERT IN INLETS SHALLOWER THAN 30 INCHES, MEASURED FROM THE BOTTOM OF THE INLET TO THE TOP OF THE GRATE. THE INSTALLED BAG SHALL HAVE A MINIMUM SIDE CLEARANCE OF 3 INCHES BETWEEN THE INLET WALLS AND THE BAG, MEASURED AT THE BOTTOM OF THE OVERFLOW HOLES. WHERE NECESSARY THE CONTRACTOR SHALL CLINCH THE BAG, USING PLASTIC ZIP TIES, TO ACHIEVE THE 3 INCH SIDE CLEARANCE.
  - ④ FLAP POCKETS SHALL BE LARGE ENOUGH TO ACCEPT WOOD 2 INCH X 4 INCH OR USE A ROCK SOCK OR SAND BAGS IN PLACE OF THE FLAP POCKETS.
  - ⑤ SOCK HEIGHT MUST NOT BE SO HIGH AS TO SLOW DOWN WATER FILTRATION TO CAUSE FLOODING OF THE ROADWAY.
  - ⑥ GEOTEXTILE SOCK BETWEEN 4-10 FEET LONG AND 4-6 INCH DIAMETER. SEAM TO BE JOINED BY TWO ROWS OF STITCHING WITH A PLASTIC MESH BACKING OR PROVIDE A HEAT BONDED SEAM (OR APPROVED EQUIVALENT). FILL ROCK LOG WITH OPEN GRADED AGGREGATE CONSISTING OF SOUND DURABLE PARTICLES OF COARSE AGGREGATE CONFORMING TO SPEC. 3137 TABLE 3137-1; CA-3 GRADATION.

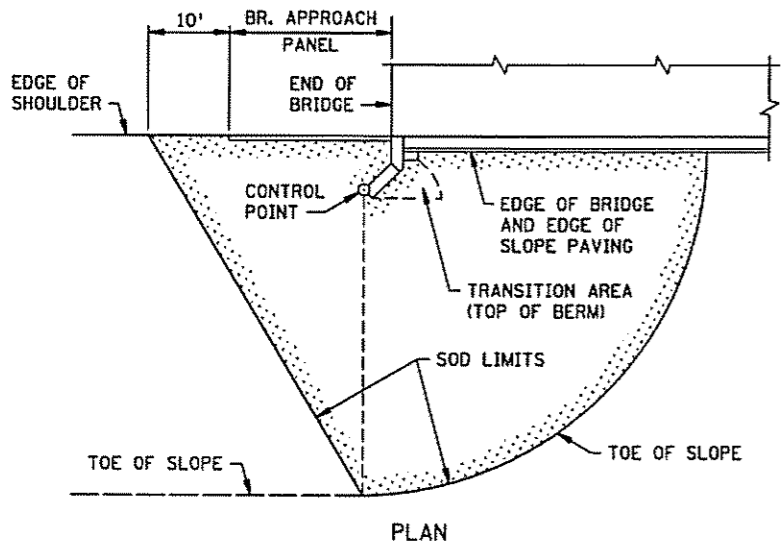
STANDARD SHEET NO. 297.405 (4 OF 4)	TITLE: TEMPORARY SEDIMENT CONTROL STORM DRAIN INLET PROTECTION
STANDARD APPROVED: SEPTEMBER 27, 2006	
STATE PROJ. NO. 0215-72 (TH 10 ) SHEET NO. 16 OF 23 SHEETS	

PLOTTED/REVISED: 22-JAN-2009 10:10

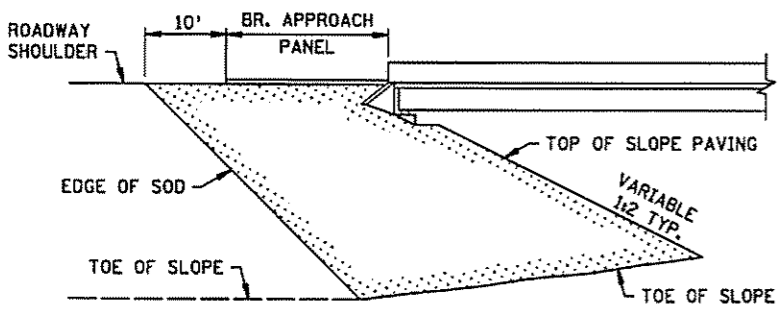
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SODDING LIMITS AT GORE AREA

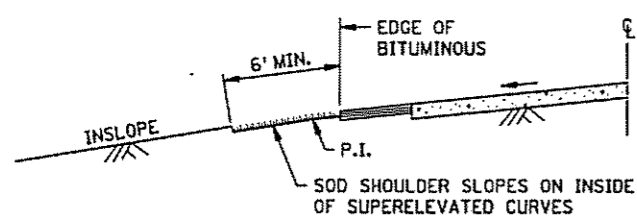


PLAN

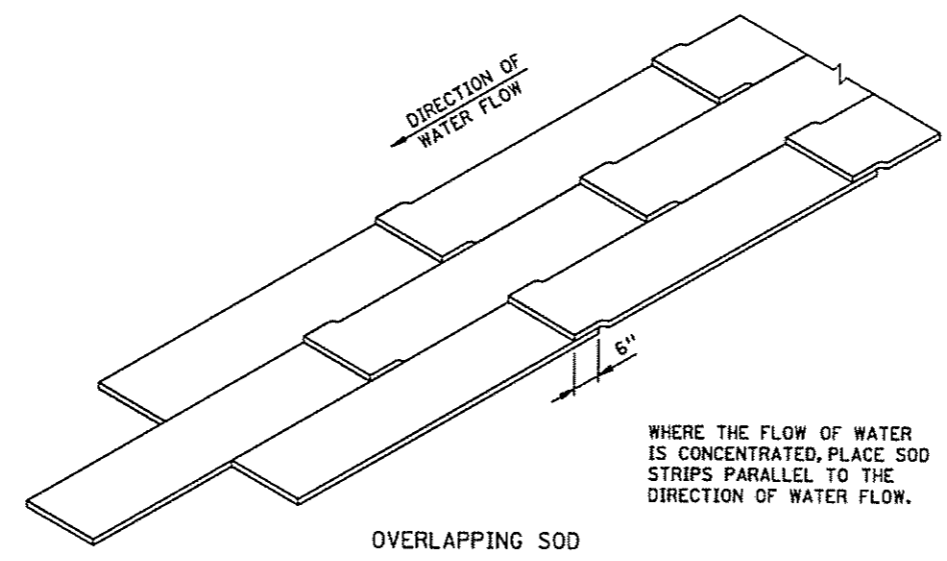


ELEVATION

SODDING LIMITS AT BRIDGE APPROACH FILLS

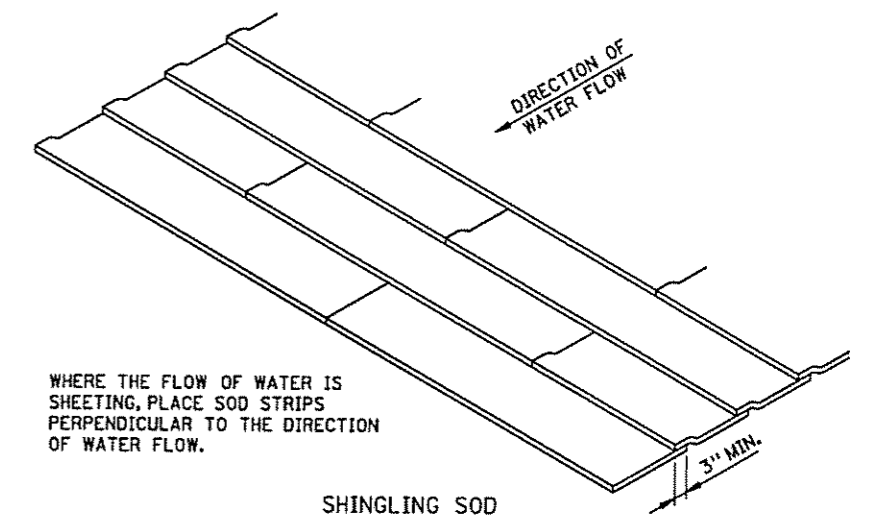


SODDING INSLOPES OF SUPERELEVATED CURVES



OVERLAPPING SOD

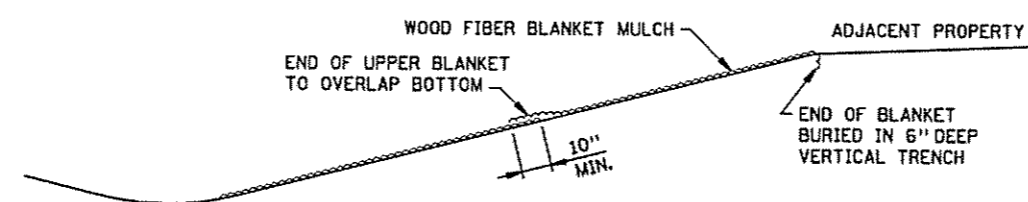
WHERE THE FLOW OF WATER IS CONCENTRATED, PLACE SOD STRIPS PARALLEL TO THE DIRECTION OF WATER FLOW.



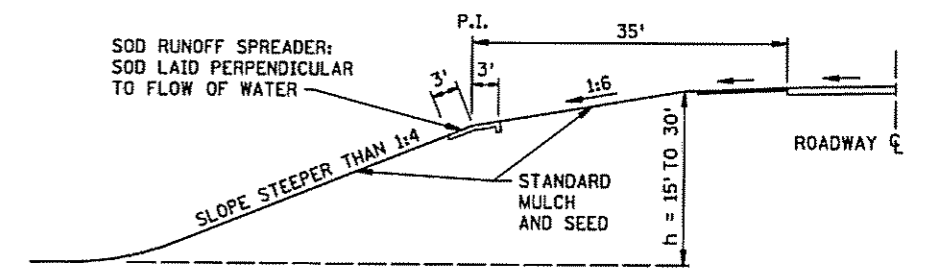
SHINGLING SOD

WHERE THE FLOW OF WATER IS SHEETING, PLACE SOD STRIPS PERPENDICULAR TO THE DIRECTION OF WATER FLOW.

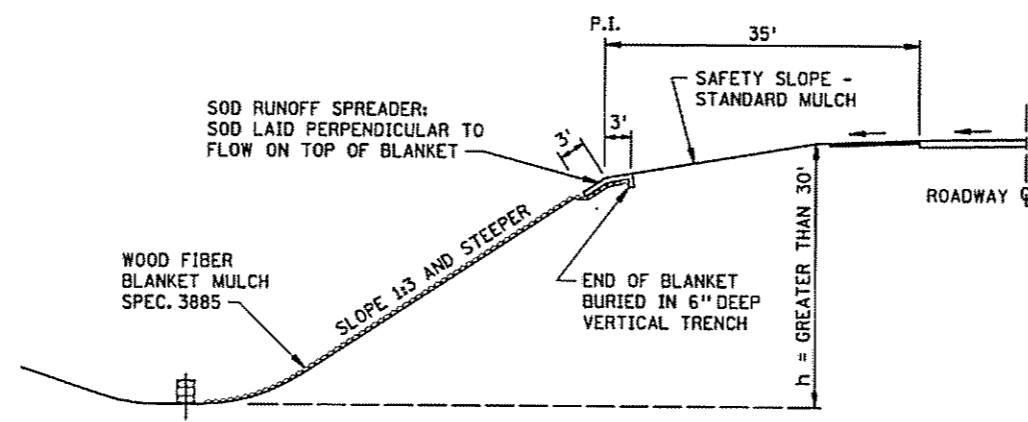
SPECIAL SOD PLACEMENT TECHNIQUES



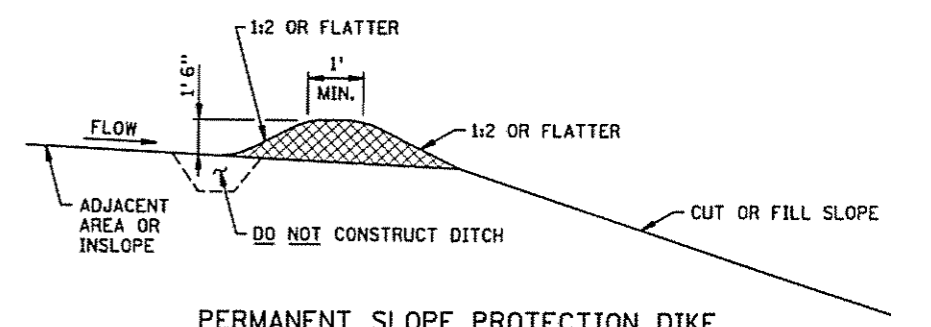
WOOD FIBER BLANKET INSTALLATION ON A CUT SLOPE



BROKEN-BACK SAFETY FILL SLOPE



WOOD FIBER BLANKET INSTALLATION ON AN INSLOPE (WHEN REQUIRED)



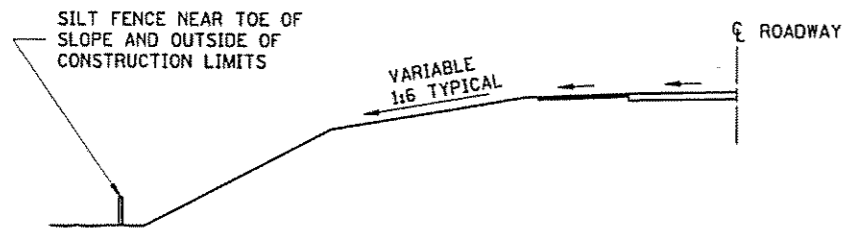
PERMANENT SLOPE PROTECTION DIKE

STANDARD SHEET NO. 5-297.406	TITLE: PERMANENT EROSION CONTROL ALONG ROADWAYS AND AT GORE AREAS & BRIDGE APPROACH FILLS
STANDARD APPROVED: JANUARY 31, 1985	
STATE PROJ. NO. 0215-72 (TH 10 ) SHEET NO.17 OF 23 SHEETS	

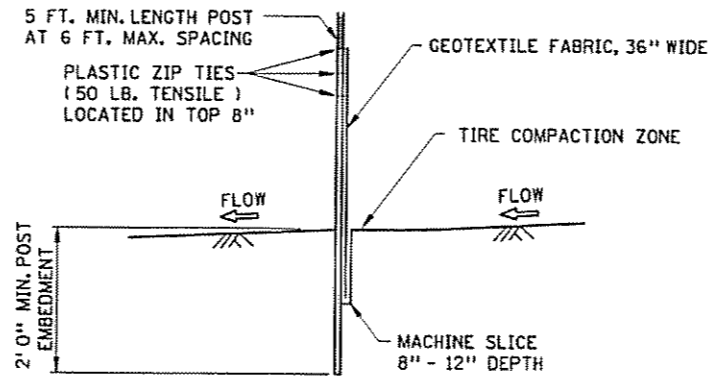
REVISION DATE  
10-26-2000

PLOTTED/REVISED: 22-JAN-2009 10:10

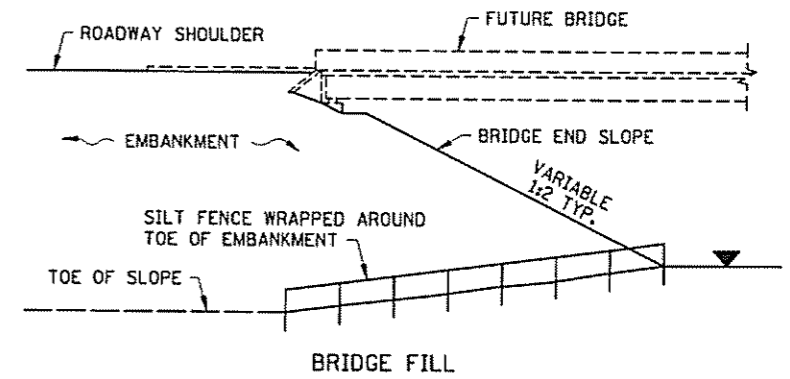
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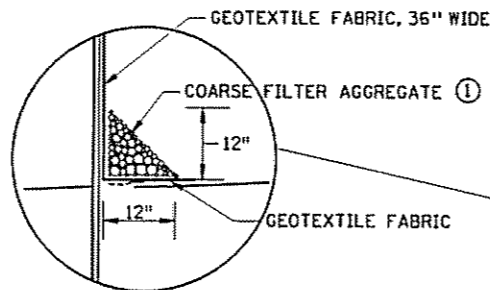
LOCATION OF SILT FENCE AT TOE OF ROADWAY EMBANKMENT



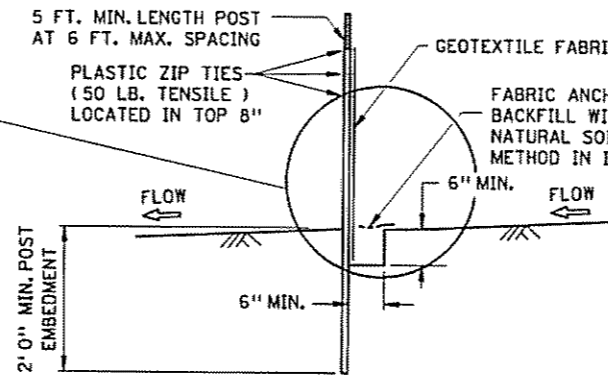
SILT FENCE, MACHINE SLICED  
 DESIGN GUIDELINES:  
 TO PROTECT AREAS FROM SHEET FLOW.  
 MAXIMUM CONTRIBUTING AREA: 1 ACRE.



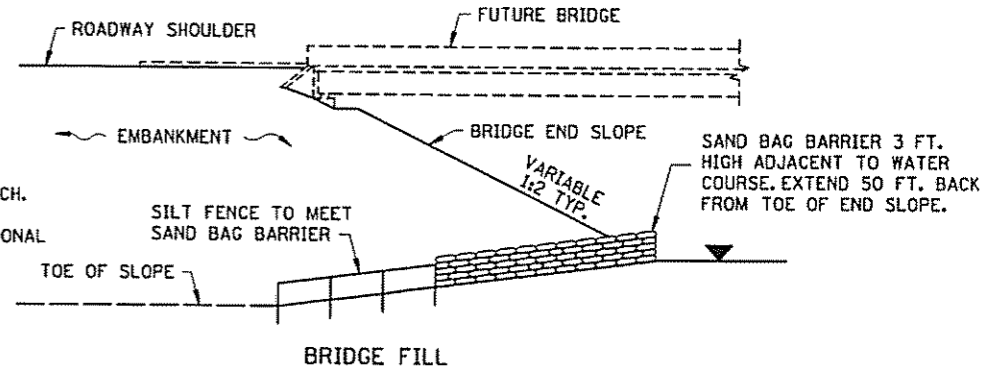
BRIDGE FILL  
 DESIGN GUIDELINES:  
 WATER COURSE FLOW VELOCITY: STAGNANT  
 CONTRIBUTING SLOPE AREA: 1/2 ACRE



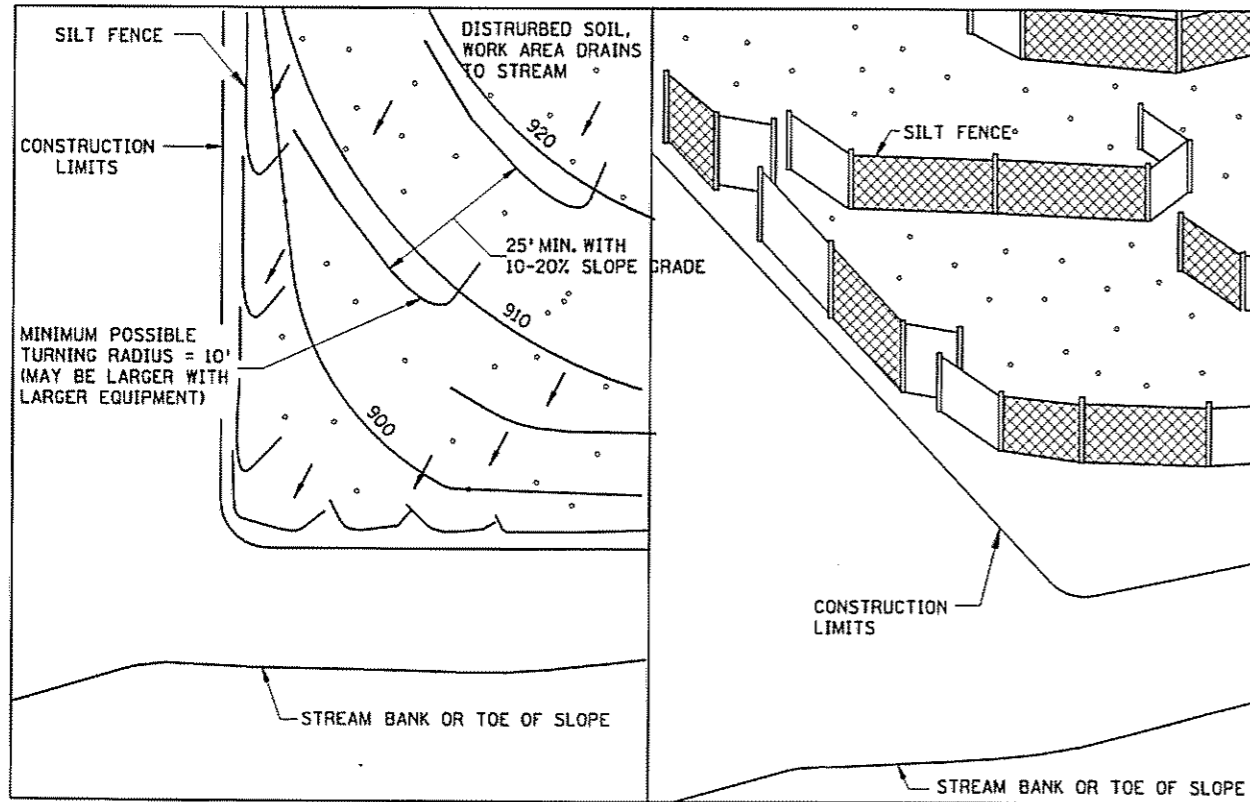
OPTIONAL METHOD FOR SILT FENCE, HEAVY DUTY



SILT FENCE, HEAVY DUTY (HAND INSTALLED)  
 DESIGN GUIDELINES:  
 TO PROTECT AREAS FROM SHEET FLOW.  
 MAXIMUM CONTRIBUTING AREA: 1 ACRE.



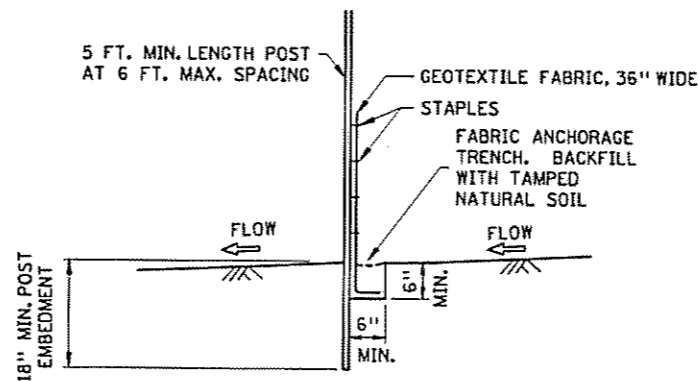
BRIDGE FILL  
 DESIGN GUIDELINES:  
 WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC.  
 CONTRIBUTING SLOPE AREA: 1 ACRE



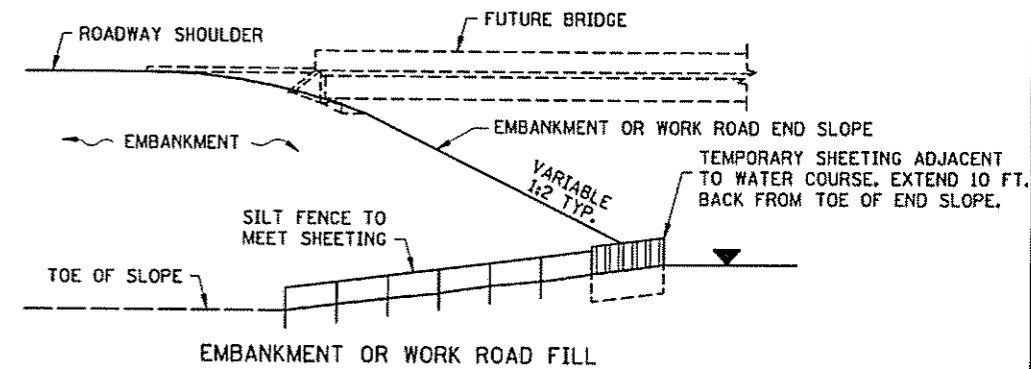
PLAN VIEW

SIDE VIEW

SILT FENCE, J-HOOK INSTALLATION



SILT FENCE, PREASSEMBLED  
 DESIGN GUIDELINES:  
 TO PROTECT AREAS FROM SHEET FLOW.  
 MAXIMUM CONTRIBUTING AREA: 1 ACRE.



EMBANKMENT OR WORK ROAD FILL  
 DESIGN GUIDELINES:  
 WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC.  
 CONTRIBUTING SLOPE AREA: 3 ACRES  
 SILT FENCE AT BRIDGE EMBANKMENT ADJACENT TO WATER

NOTES:

- SEE SPECS. 2573, 3149 & 3886.
- ① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.

STANDARD SHEET NO. 5-297.408 (1 OF 2)	TITLE: TEMPORARY SEDIMENT CONTROL SILT FENCE
STANDARD APPROVED: SEPTEMBER 27, 2006	
STATE PROJ. NO. 0215-72 (TH 10 ) SHEET NO. 18 OF 23 SHEETS	



PLOTTED/REVISED: 02-FEB-2009 15:30

HNBRC1 (RAMP C1)				ALIGNMENT DATA								
CURVE NUMBER	POINT NUMBER	POINT TYPE	STATION	NOTES	CURVE DATA					COORDINATES		AZIMUTH
					DELTA	DEGREE (FT.)	RADIUS (FT.)	TANGENT (FT.)	LENGTH (FT.)	Y	X	
	1151	POT	438+45.47	= A PT. 41' RT. EB TH10/47 STA. 338+44.10						154,180.566	486,155.176	129° 33' 53"
	1152	PI	450+52.40	= A PT. 6' RT RAMP C2 STA. 450+52.40						153,478.591	487,136.966	PI
HNBCC (CONNECTION C)				ALIGNMENT DATA								
CURVE NUMBER	POINT NUMBER	POINT TYPE	STATION	NOTES	CURVE DATA					COORDINATES		AZIMUTH
					DELTA	DEGREE (FT.)	RADIUS (FT.)	TANGENT (FT.)	LENGTH (FT.)	Y	X	
	1190	PI	850+52.40	= A PT. 12' RT. OF RAMP C1 STA. 450+52.40						153,468.830	487,129.986	129° 33' 53"
	1191	PI	852+80.12							153,336.382	487,315.228	PI
(HNBCC-1)	1192	PC	852+30.60		89° 03' 00" RT	106° 06' 12"	54.000	49.525	80.158	153,365.188	487,274.940	210° 36' 52"
	1193	RP								153,321.260	487,243.533	
	1194	PT	853+10.75							153,293.760	487,290.006	
	1195	PI	853+10.75	= A PT. 18' LT. OF SB HANSON STA. 12+08.16						153,293.760	487,290.006	PI

DISTRICT #: METRO  
 IPLOT NAME: 00215072\_dil\_sht\_19  
 PATH & FILENAME: S:\Design\010\0215072\FINAL\00215072\_A11.dgn

**ALIGNMENT TABULATION**

DRAWN BY: KV

CHECKED BY: RKO

CERTIFIED BY

*Peter Daniels*  
LICENSED PROFESSIONAL ENGINEER

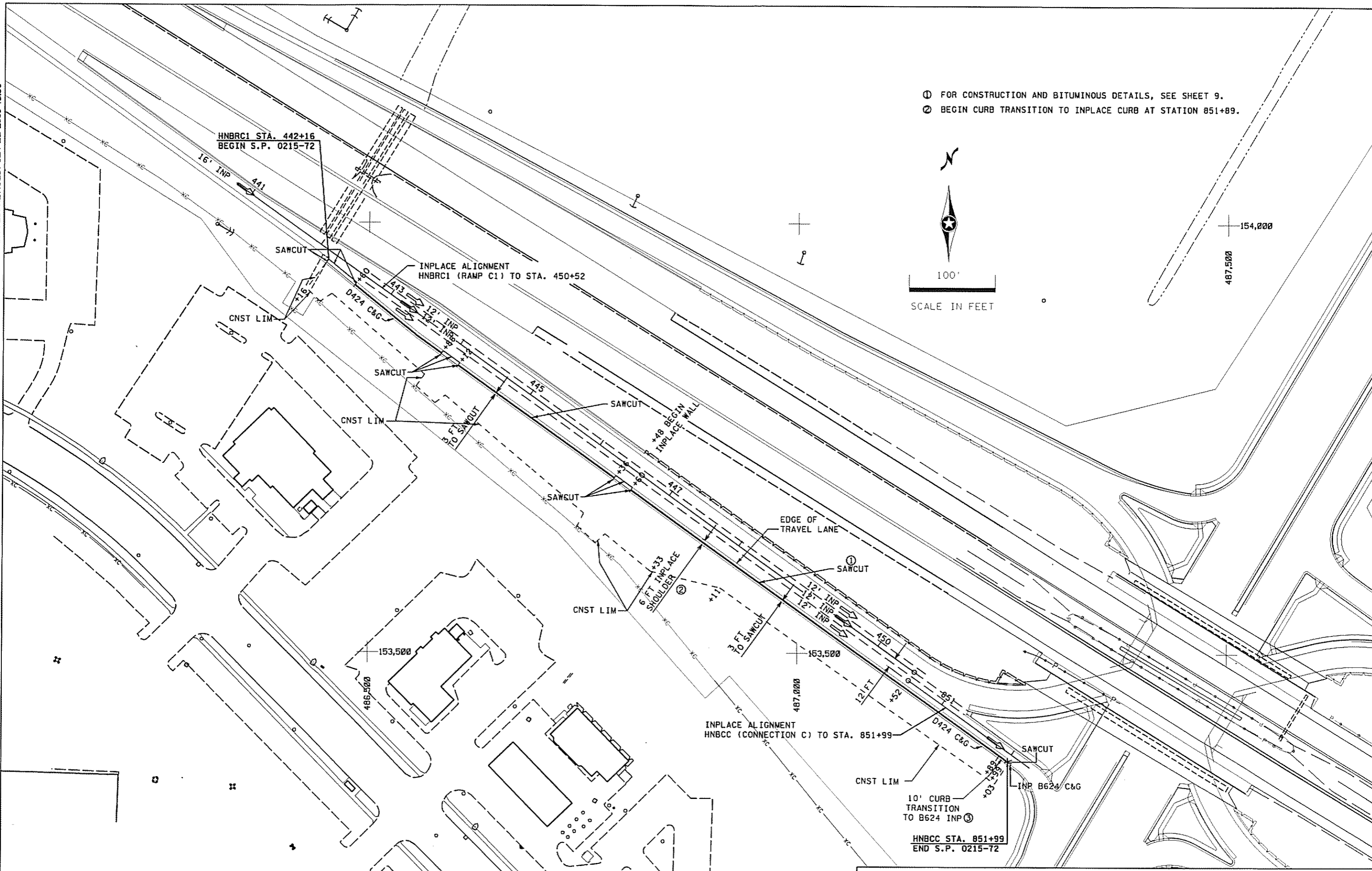
LIC. NO. 45053 DATE 02/03/09

STATE PROJ. NO. 0215-72 (T.H. 10) SHEET NO. 19 OF 23 SHEETS

PLOTTED/REVISED: 02-FEB-2009 15:30

DISTRICT #: METRO  
 I/PLOT NAME: 0215072\_cpl\_sht\_20  
 PATH & FILENAME: S:\Design\010215072\FINAL\0215072\_CPL.dgn

- ① FOR CONSTRUCTION AND BITUMINOUS DETAILS, SEE SHEET 9.
- ② BEGIN CURB TRANSITION TO INPLACE CURB AT STATION 851+89.



**CONSTRUCTION PLAN**

DRAWN BY: RKO

CHECKED BY: PD

CERTIFIED BY

*Peter Daniel*  
 LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 02/03/09

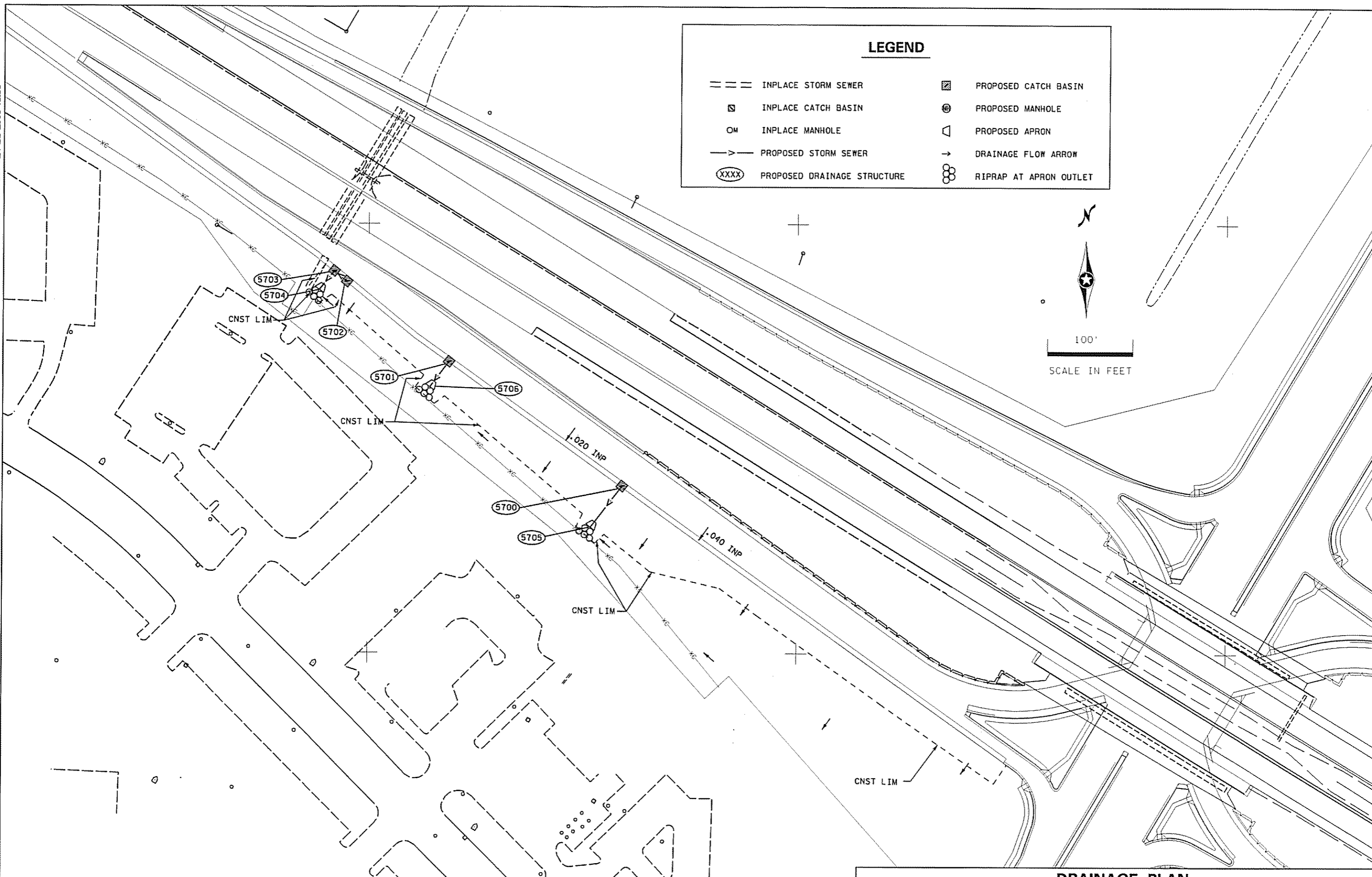
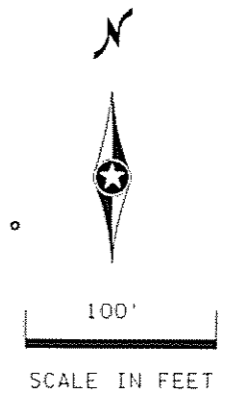
STATE PROJ. NO. 0215-72 (T.H. 10) SHEET NO. 20 OF 23 SHEETS

PLOTTED/REVISED: 02-FEB-2009 15:30

DISTRICT #: METRO  
PLOT NAME: 00215072\_dr1\_SHT\_21  
PATH & FILENAME: S:\Design\010215072\FINAL\DRAINAGE\00215072\_DR1.dgn

**LEGEND**

==	INPLACE STORM SEWER	▣	PROPOSED CATCH BASIN
▣	INPLACE CATCH BASIN	⊕	PROPOSED MANHOLE
OM	INPLACE MANHOLE	▽	PROPOSED APRON
—>	PROPOSED STORM SEWER	→	DRAINAGE FLOW ARROW
⊕	PROPOSED DRAINAGE STRUCTURE	⊕	RIPRAP AT APRON OUTLET



**DRAINAGE PLAN**

DRAWN BY: RKO

CHECKED BY: PD

CERTIFIED BY *Peter Davis*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE 02/03/09

STATE PROJ. NO. 0215-72 (T.H. 10) SHEET NO. 21 OF 23 SHEETS

PLOTTED/REVISED: 12-FEB-2009 08:58

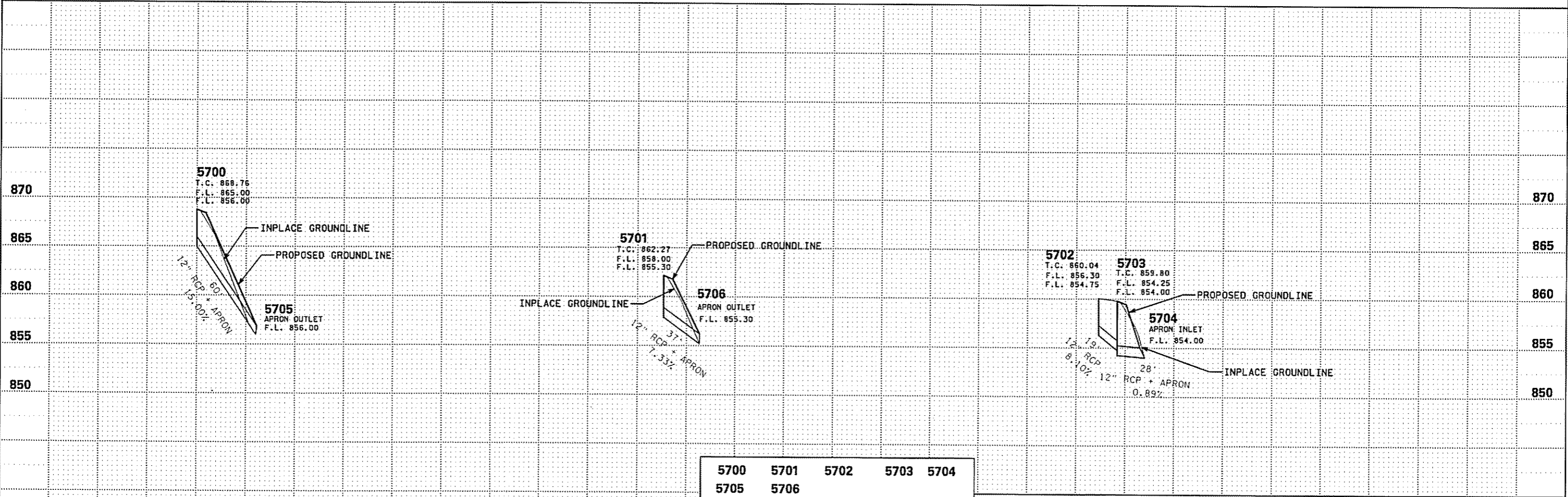
## DRAINAGE TABULATION

G

STRUCTURE NO.		STRUCTURE LOCATION			DRAINAGE STRUCTURES						TOP OF CASTING ELEV.	OUTLET ELEV.	INLET ELEV. ②	12" RCP PIPE SEWER DESIGN 3006 LIN FT	APRON EACH	APRON TYPE	GUIDE POSTS TYPE B EACH	RIPRAP CLASS II CU YD	GEOTEXTILE FILTER TYPE III SQ YD	
					DESIGN PAY HEIGHT		CASTING ASSEMBLY TYPE ①	STEPS REQ'D.	TYPE	C OR H										C OR G
					LIN FT	LIN FT														
5700	5705	HNBR1	446+50	23.0'	RT	CB	4.0		D-4		868.76	865.00	856.00	55	1	RC APRON	1	2.8	8.4	
5701	5706	HNBR1	444+00	23.0'	RT	CB	4.3		D-4		862.27	858.00	855.30	31	1	RC APRON	1	2.8	8.4	
5702	5703	HNBR1	442+50	16.2'	RT	CB	3.8		D-4		860.04	856.30	854.75	19						
5703	5704	HNBR1	442+30	14.8'	RT	CB		5.5	D-4	YES	859.80	854.25	854.00	22	1	RC APRON	1	2.8	8.4	
<b>TOTALS:</b>								<b>12.1</b>	<b>5.5</b>					<b>127</b>	<b>3</b>		<b>3</b>	<b>9</b>	<b>26</b>	

- NOTES: - STATION AND OFFSET ARE AT CENTER OF STRUCTURE UNLESS OTHERWISE NOTED.  
 - FLOWLINE (F.L.) ELEVATIONS ARE AT CENTER OF STRUCTURE OR END OF APRON.  
 - ALL CONCRETE PIPE SEWER IS DESIGN 3006 GASKET JOINT PIPE. TIE ALL JOINTS (INCIDENTAL).  
 - MANHOLE AND CATCH BASINS REQUIRE NO SUMP.
- ① FOR CASTING ASSEMBLY KEY AND SUMMARY, SEE SHEET NO. 5.  
 ② INLET ELEVATION AT DOWNSTREAM STRUCTURE.

DISTRICT #: METRO  
 IPLOT NAME: 0215072\_prj\_tabs\_SHT\_22  
 PATH & FILENAME: S:\Design\0215072\FINAL\DRAINAGE\0215072\_PROI.dgn



5700	5701	5702	5703	5704
5705	5706			

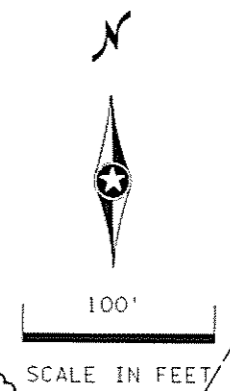
### DRAINAGE TABULATION AND PROFILES

PLOTTED/REVISED: 17-FEB-2009 13:51

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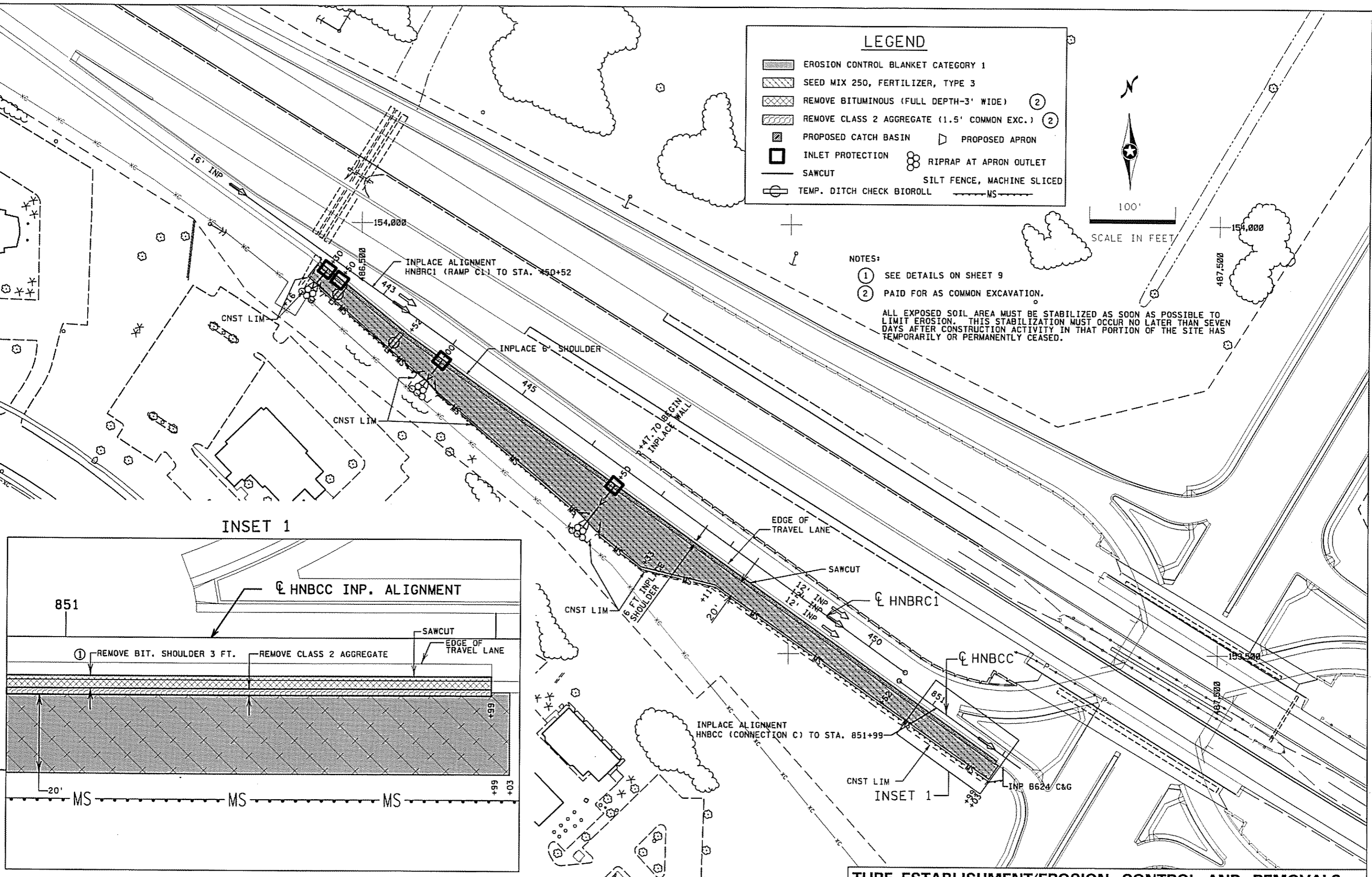
### LEGEND

	EROSION CONTROL BLANKET CATEGORY 1		PROPOSED APRON
	SEED MIX 250, FERTILIZER, TYPE 3		RIPRAP AT APRON OUTLET
	REMOVE BITUMINOUS (FULL DEPTH-3' WIDE)		SILT FENCE, MACHINE SLICED
	REMOVE CLASS 2 AGGREGATE (1.5' COMMON EXC.)		TEMP. DITCH CHECK BIOROLL
	PROPOSED CATCH BASIN		
	INLET PROTECTION		
	SAWCUT		

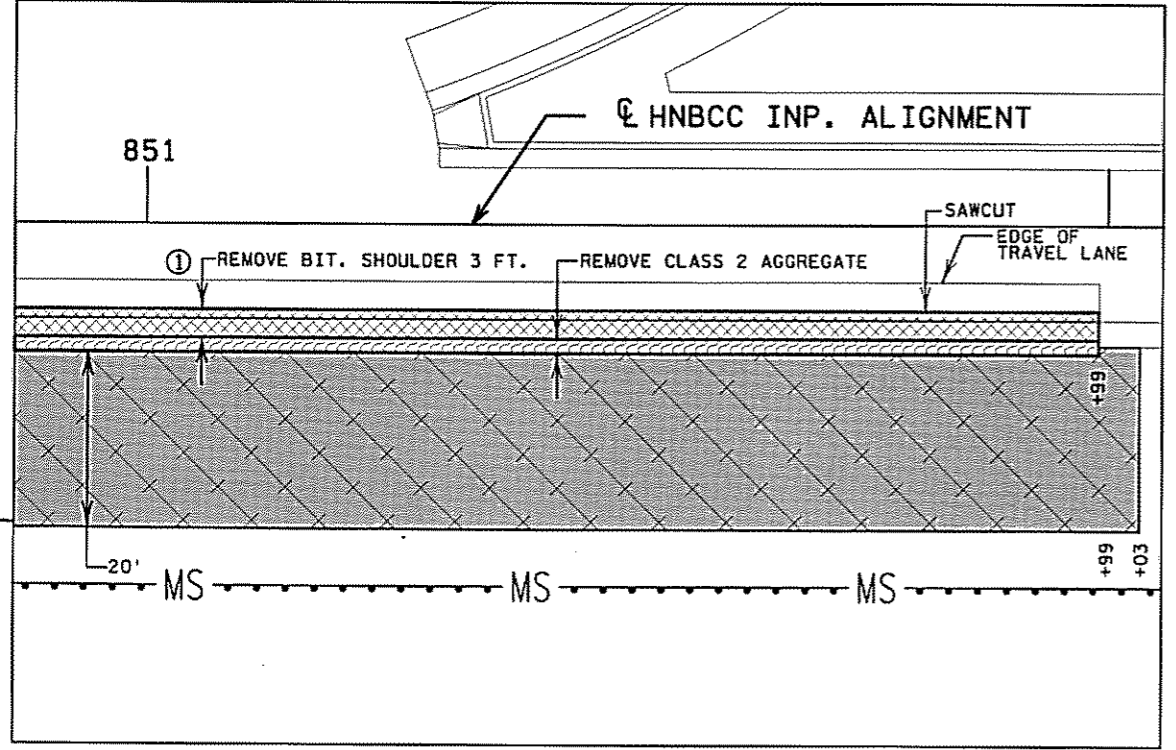


- NOTES:
- ① SEE DETAILS ON SHEET 9
  - ② PAID FOR AS COMMON EXCAVATION.

ALL EXPOSED SOIL AREA MUST BE STABILIZED AS SOON AS POSSIBLE TO LIMIT EROSION. THIS STABILIZATION MUST OCCUR NO LATER THAN SEVEN DAYS AFTER CONSTRUCTION ACTIVITY IN THAT PORTION OF THE SITE HAS TEMPORARILY OR PERMANENTLY CEASED.



INSET 1



### TURF ESTABLISHMENT/EROSION CONTROL AND REMOVALS

DRAWN BY: KV

CHECKED BY: RKO

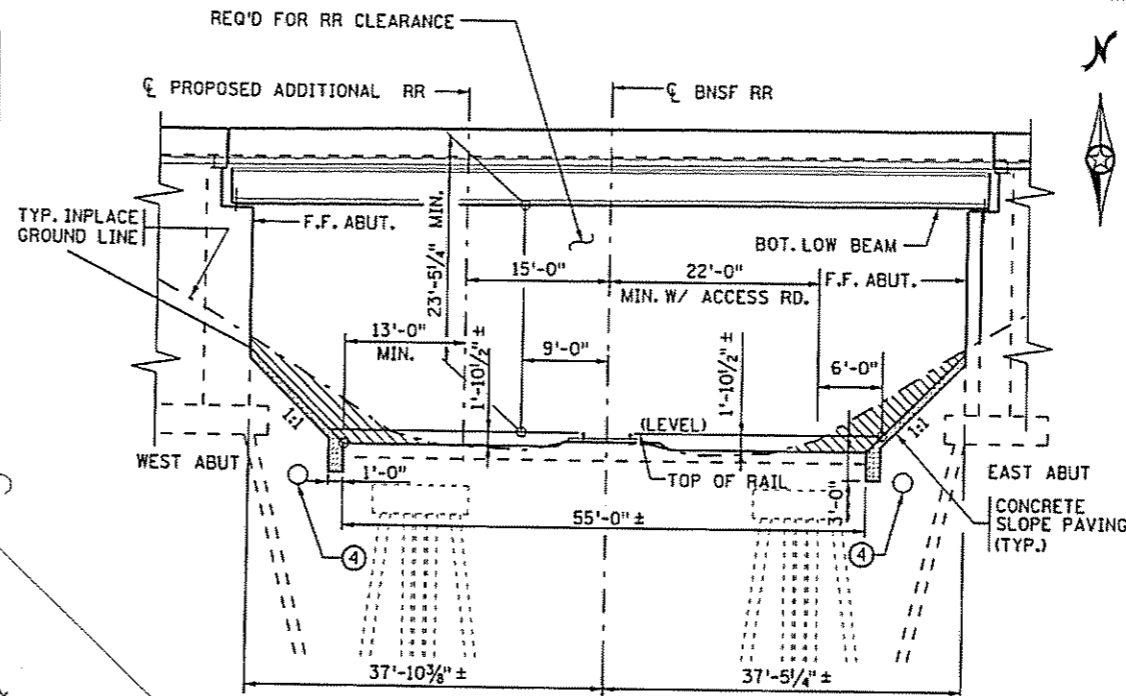
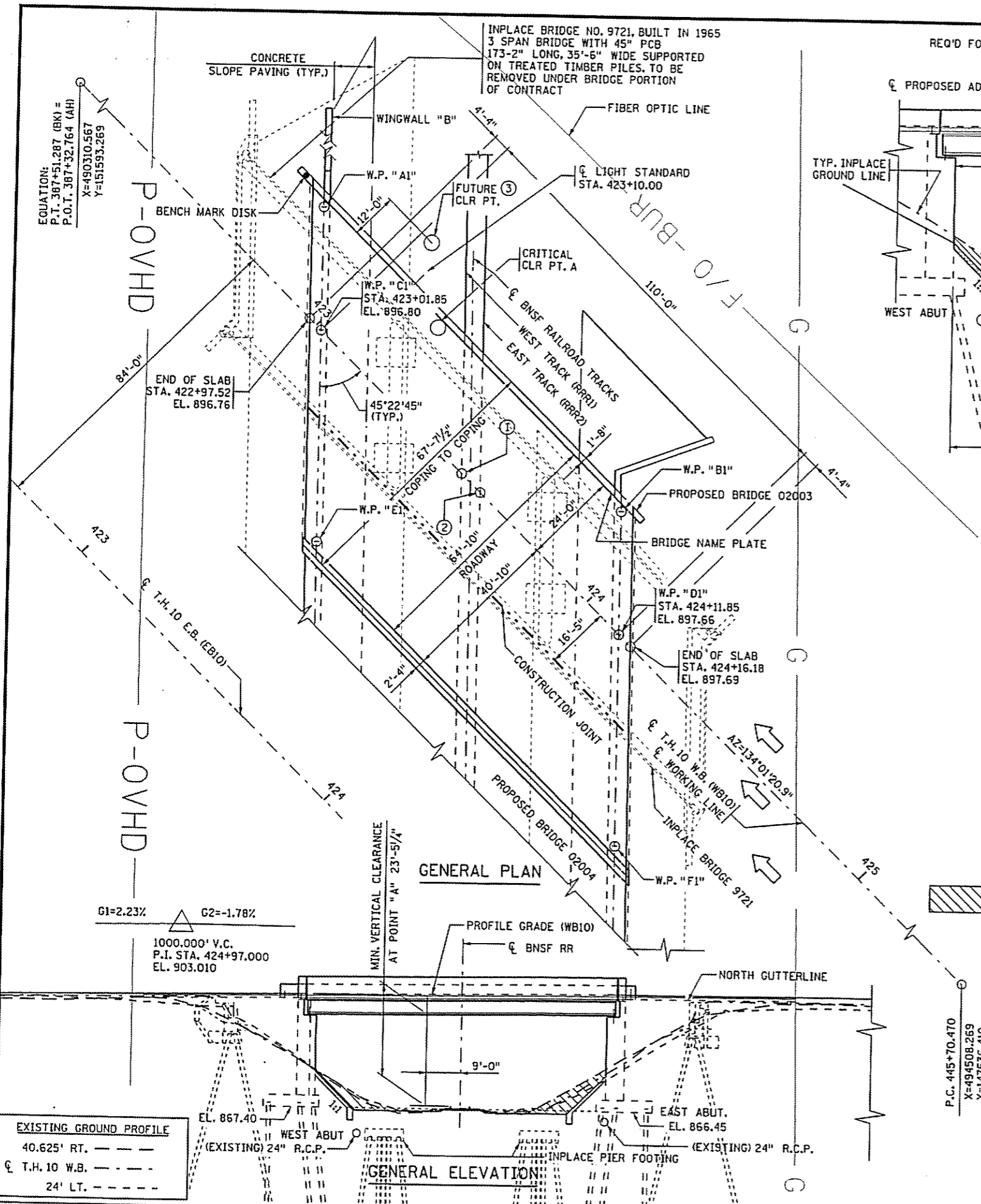
CERTIFIED BY

*Peter Danial*  
LICENSED PROFESSIONAL ENGINEER

LIC. NO. 45053 DATE

STATE PROJ. NO. 0215-72 (T.H. 10)

SHEET NO. 23 OF 23 SHEETS



RAILROAD SECTION UNDER BRIDGE

NOTES:

- ① T.H. 10 W.B. (WB10) 423+53.701 = WEST TRACK OF B.N.S.F. R.R. (RRR1) 6+79.622 X=492914.264 Y=149076.933  $\Delta=45^{\circ}17'20.6''$
- ② T.H. 10 W.B. (WB10) 423+60.601 = EAST TRACK OF B.N.S.F. R.R. (RRR2) 5+57.649 X=492919.225 Y=149072.138  $\Delta=45^{\circ}10'05.9''$
- ③ VERTICAL CLEARANCE TO ACCOMMODATE 12'-0" FUTURE WIDENING TO OUTSIDE SHOULDER.
- ④ NEW 24" R.C.P. APPROX. INVERT EL. 863.0 (INCLUDED IN GRADING PLAN).

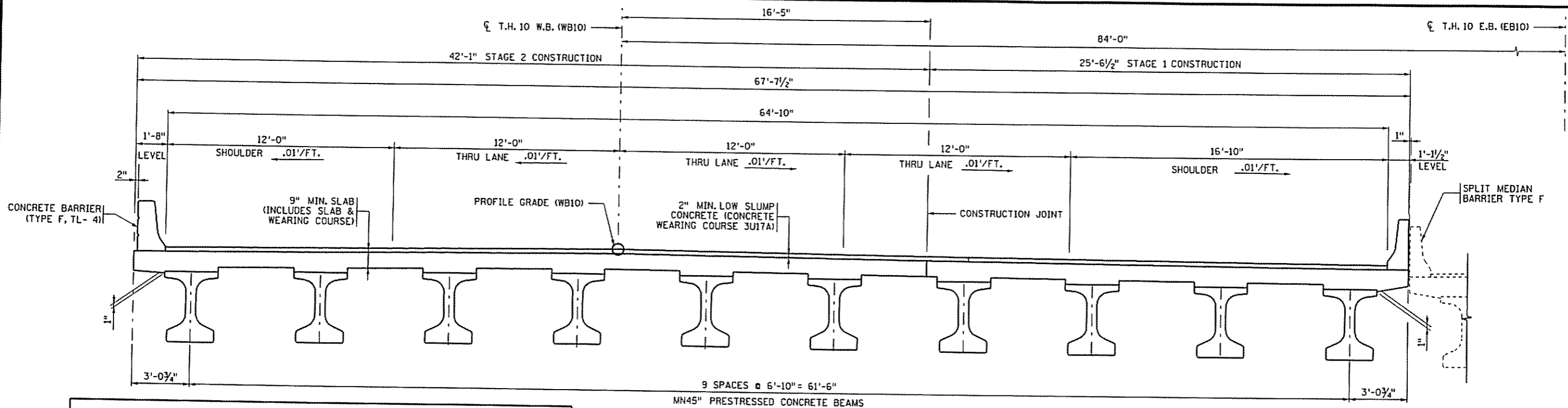
CONSTRUCTION WILL BE STAGED SEE SHEETS 4-9.  
 ABUTMENTS SET PARALLEL AT  $AZ=179^{\circ}24'5.9''$   
 SEE SHEET NO. 58 & 59 WINGWALL, SLOPE PROTECTION AND DITCH DETAILS.  
 0.01% LANE CROSS SLOPES WERE ESTABLISHED FOR MINIMAL GRADE RAISE REQUIREMENTS AND CHECKED AGAINST DRAINAGE REQUIREMENTS.  
 APPROXIMATELY 11.7' DRAINAGE SPREAD ON WIDENED CONFIGURATION (INSIDE SHOULDERS)  
 SEE BORING SHEET FOR IN PLACE UTILITIES.  
 $\phi$  BNSF IS ASSUMED ALIGNMENT BETWEEN TRACKS.  
 HATCHED AREA TO BE REMOVED UNDER THE GRADING PORTION OF THE CONTRACT.

STATE FUNDS	
DESIGN DATA	
2007 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS	
LOAD AND RESISTANCE FACTOR DESIGN METHOD	
HL 93 LIVE LOAD	
DEAD LOAD INCLUDES 20 p.s.f. ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS	
MATERIAL DESIGN PROPERTIES:	
REINFORCED CONCRETE:	
$f'_c = 4$ ksi	$n = 8$
$F_y = 60$ ksi	FOR REINFORCEMENT
PRESTRESSED CONCRETE:	
$f'_c = 7.5$ ksi	$n=1$
$f_{pu} = 270$ ksi	FOR 0.6" DIAMETER LOW RELAXATION STRANDS
DECK AREA = 8025 SQ. FT.	
52000 PROJECTED A.D.T. FOR YEAR 2028	
2200 PROJECTED A.D.T.T. FOR YEAR 2028	
DESIGN SPEED = 70 MILES PER HOUR	
BRIDGE OPERATING RATING HS 56	

LIST OF SHEETS	
NO.	DESCRIPTION
1	GENERAL PLAN AND ELEVATION
2	SCHEDULE OF QUANTITIES
3	BRIDGE LAYOUT
4-9	STAGING
10-16	WEST ABUTMENT GEOMETRICS
17-24	WEST ABUTMENT REINFORCEMENT
25-26	WINGWALL B GEOMETRICS
27-28	WINGWALL B REINFORCEMENT
29-36	EAST ABUTMENT GEOMETRICS
37-45	EAST ABUTMENT REINFORCEMENT
46	FRAMING PLAN
47	MN 45" PRESTRESSED CONCRETE BEAM
48-54	SUPERSTRUCTURE DETAILS & REINFORCEMENT
55	CONCRETE BARRIER (TYPE F, TL-4)
56	SPLIT MEDIAN BARRIER
57	WIRE FENCE (DESIGN W-1)
58-59	CONCRETE SLOP PAVING UNDER BRIDGES
60	CONDUIT SYSTEMS
61-62	WATERPROOF EXPANSION DEVICE
63-69	DETAILS
70	AS-BUILT BRIDGE DATA
71	BRIDGE SURVEY
72	BORING LOCATION

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.  
 SIGNED: *Moises C. Dimaclangan* DATE: 2/23/09  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACLANGAN LIC. NO. 46209

TRUNK HIGHWAY NO. 10  
 MINNESOTA  
 DEPARTMENT OF TRANSPORTATION  
**BRIDGE NO. 02003**  
 T.H. 10 W.B. OVER  
 BNSF RAILROAD MILEPOINT 135.37  
 3.0 MILES S.E. OF JUNCTION OF T.H. 242  
 IN COON RAPIDS  
 IDENTIFICATION NO. 501  
**GENERAL PLAN AND ELEVATION**  
 SEC. 14 T 31 N R 24 W  
 CITY COON RAPIDS ANOKA COUNTY  
 APPROVED: *Kevin Weston* STATE BRIDGE ENGINEER  
 DATE: 2/23/09 FOR  
 DES. P.J.K. DR. N.A. 02003  
 CHK. M.C.D. CHK. J.A.J.



9 SPACES @ 6'-10" = 61'-6"  
MN45" PRESTRESSED CONCRETE BEAMS

**TRANSVERSE SECTION THRU DECK**

**SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE**

ITEM NO.	ITEM	UNIT	QUANTITY
2104.601	REMOVE REGULATED WASTE MATERIAL (BRIDGE)	LUMP SUM	1
2401.501	STRUCTURAL CONCRETE (1A43)	CU.YD.	557 (P)
2401.501	STRUCTURAL CONCRETE (3Y43)	CU.YD.	1004 (P)
2401.512	BRIDGE SLAB CONCRETE (3Y36)	SQ.FT.	8025 (P)
2401.513	TYPE F (TL-4) RAILING CONCRETE (3Y46)	LIN. FT.	124 (P)
2401.514	SPLIT MEDIAN BARRIER CONCRETE (3Y46)	LIN. FT.	115 (P)
2401.541	REINFORCEMENT BARS	POUND	52300 (P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	122870 (P)
2401.601	STRUCTURE EXCAVATION	LUMP SUM	1
2401.618	BRIDGE DECK PLANING	SQ.FT.	7298 (P)
2402.591	EXPANSION JOINT DEVICES TYPE 5	LIN. FT.	187 (P)
2402.595	BEARING ASSEMBLY	EACH	20 (P)
① 2404.501	CONCRETE WEARING COURSE (3U17A)	SQ.FT.	15578 (P)
2405.502	PRESTRESSED CONCRETE BEAMS MN45	LIN. FT.	1113 (P)
2405.511	DIAPHRAGMS FOR TYPE MN45 PREST BEAMS	LIN. FT.	123 (P)
② 2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1
2452.507	C-I-P CONCRETE PILING DELIVERED 12"	LIN. FT.	6900
2452.508	C-I-P CONCRETE PILING DRIVEN 12"	LIN. FT.	6900
2452.519	C-I-P CONCRETE TEST PILE 60 FT. LONG 12"	EACH	4
2452.527	PILE REDRIVING	EACH	4
2452.601	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	1
2452.602	PILE ANALYSIS	EACH	2
2452.603	PREBORING (EARTH)	LIN. FT.	35
2472.525	COUPLERS (REINFORCEMENT BARS) T-22	EACH	92 (P)
2472.525	COUPLERS (REINFORCEMENT BARS) T-19	EACH	60 (P)
2472.525	COUPLERS (REINFORCEMENT BARS) T-16	EACH	20 (P)
2502.502	DRAINAGE SYSTEM TYPE (8910)	LUMP SUM	1
2514.501	CONCRETE SLOPE PAVING	SQ. YD.	600 (P)
2545.509	CONDUIT SYSTEM (LIGHTING)	LUMP SUM	1
2557.501	WIRE FENCE DESIGN SPECIAL	LIN. FT.	106 (P)

**CONSTRUCTION NOTES**

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS. THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR NUMBER WHICH APPROXIMATES THE NOMINAL DIAMETER OF THE BAR IN MILLIMETERS (mm).

BAR MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE WERE COMPUTED USING LRFD METHODOLOGY. ULTIMATE PILE CAPACITY DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

SEE SHEET 72 FOR INPLACE UTILITIES.

① ITEM INCLUDES 7884 SQ. F.T. FOR BRIDGE APPROACH PANELS.

② REMOVE EXISTING BRIDGE NO. 9721.

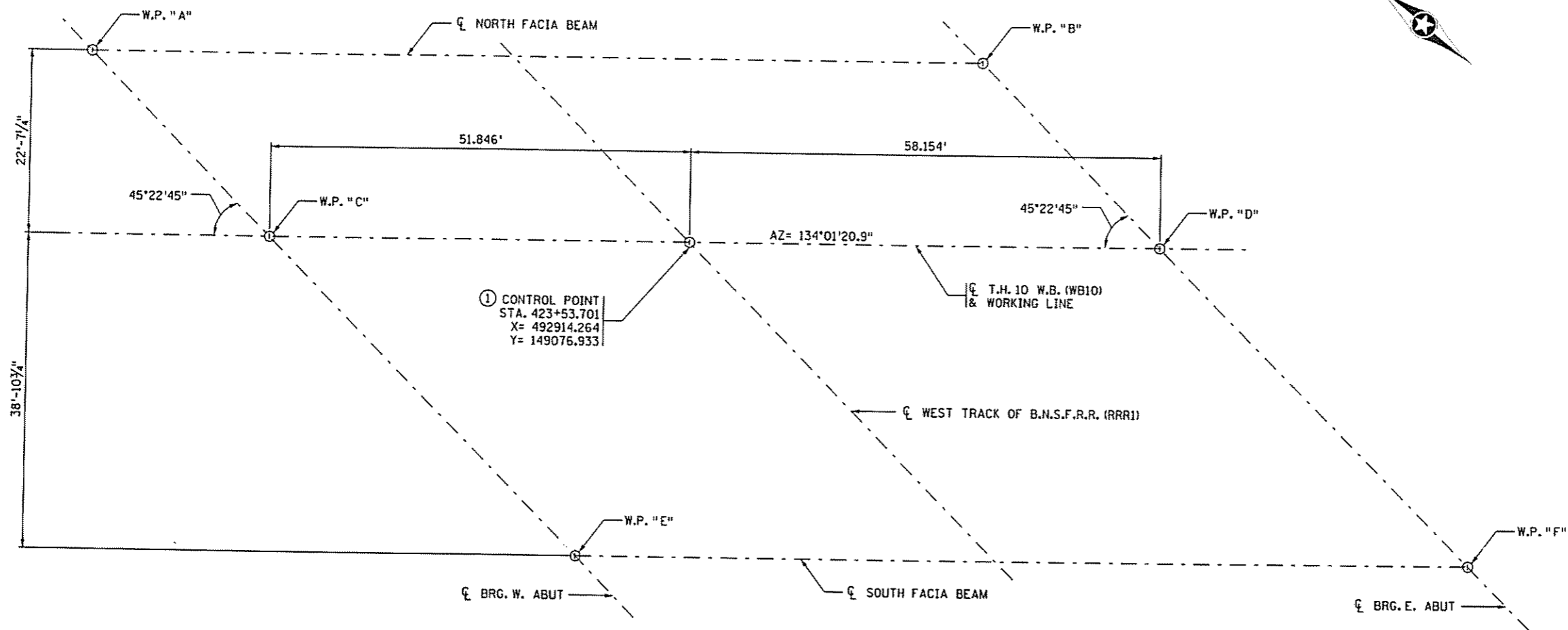
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: SCHEDULE OF QUANTITIES

DES: P.J.K. DR: N.A. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.

BRIDGE NO. 02003

SHEET NO. 2 OF 72 SHEETS



WORKING POINT LAYOUT

NOTES:

① T.H. 10 W.B. (WB10) 423+53.701 = WEST TRACK OF B.N.S.F. R.R. (RRR1)  
6+79.622 X=492914.264 Y=149076.933  $\angle$ =45°17'20.6"

POINT	STATION	X-COORDIN.	Y-COORDIN.	DIMENSIONS BETWEEN WORKING POINTS						ELEVATIONS			POINT
				A	B	C	D	E	F	TOP OF RDWY.	TOP OF RDWY. TO BR. SEAT	BRIDGE SEAT	
A	422+79.55	492876.651	149144.719		110.00	31.76	134.22		181.43	896.34	5.01	891.33	A
B	423+89.55	492955.748	149068.276			90.56	31.76	78.83		897.30	5.18	892.12	B
C	423+01.85	492876.982	149112.963				110.00	54.65	153.40				C
D	424+11.85	492956.080	149036.520					54.65					D
E	423+40.24	492877.553	149058.320					110.00		896.77	5.01	891.76	E
F	424+50.24	492956.651	148981.876							897.46	5.18	892.28	F

TOP OF ROADWAY TO BRIDGE SEAT		
	WEST ABUTMENT	EAST ABUTMENT
OVERLAY THICKNESS	2"	2"
STRUCTURAL SLAB THICKNESS	7"	7"
STOOL HEIGHT	2 7/8"	2 7/8"
BEAM HEIGHT	45"	45"
BEARING HEIGHT	3 1/4"	5 1/4"
TOTAL (IN.)	60 1/8"	62 1/8"
TOTAL (FT.)	5.01'	5.18'

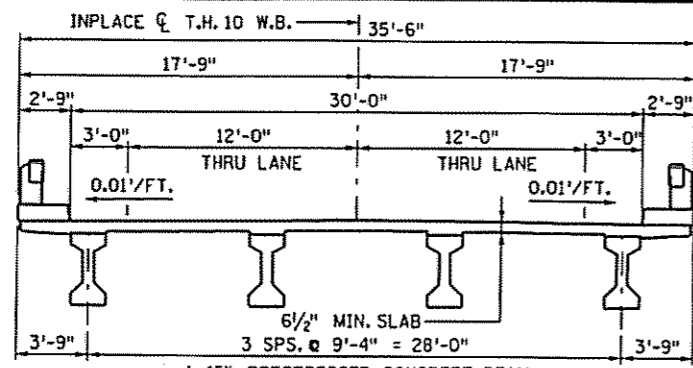
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

BRIDGE LAYOUT

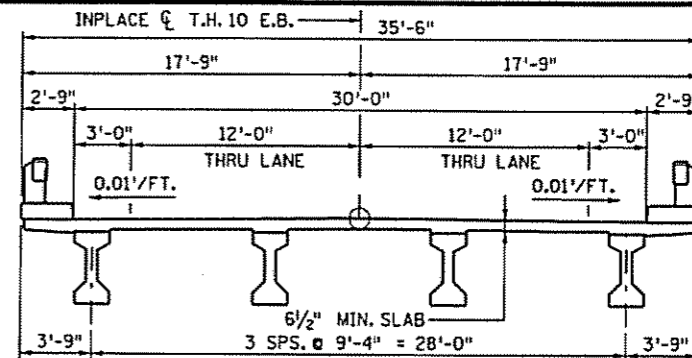
DES: P.J.K. DR: N.A. APPROVED: 2/23/09  
 CHK: M.C.D. CHK: J.A.J.  
 SHEET NO. 3 OF 72 SHEETS

BRIDGE NO. 02003

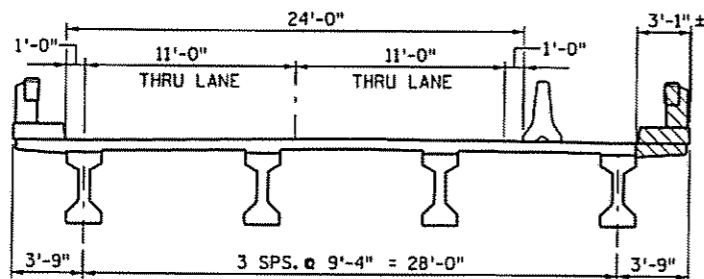




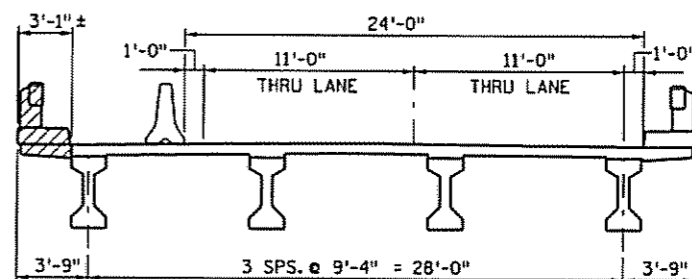
INPLACE BRIDGE 9721



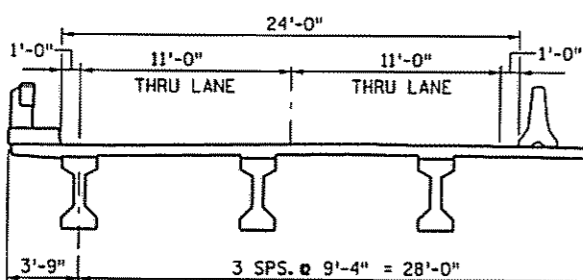
INPLACE BRIDGE 9722



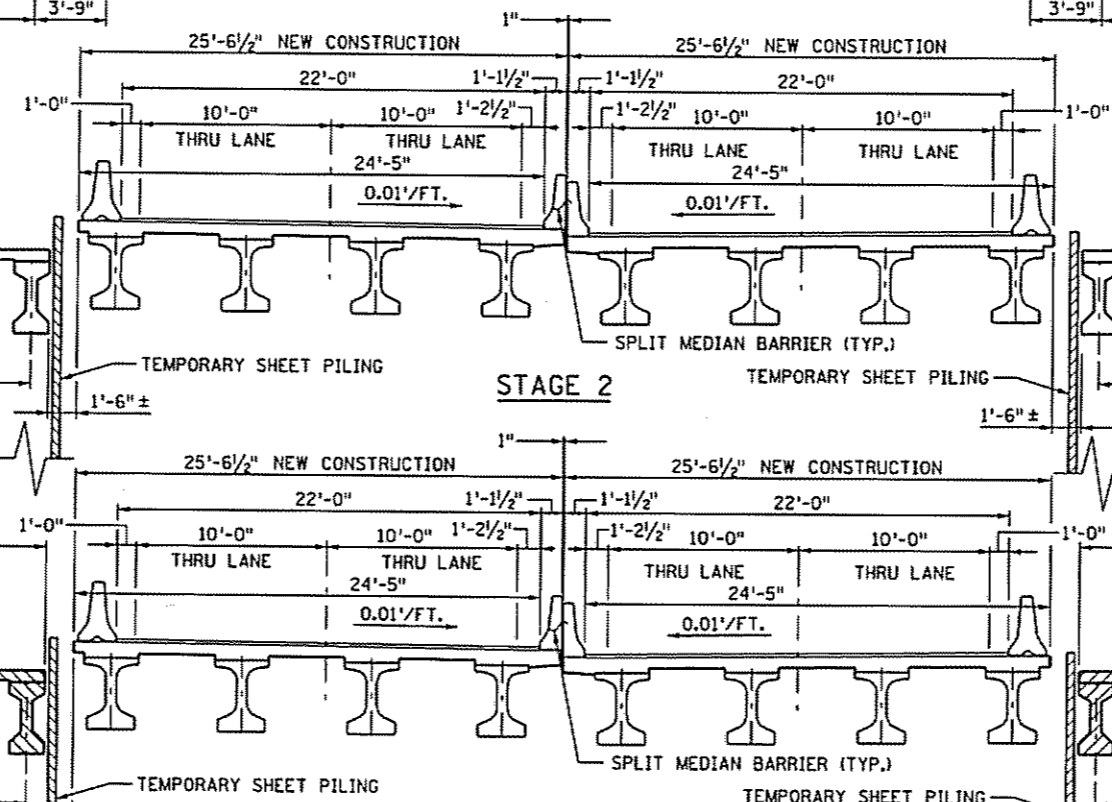
INPLACE BRIDGE 9721



INPLACE BRIDGE 9722



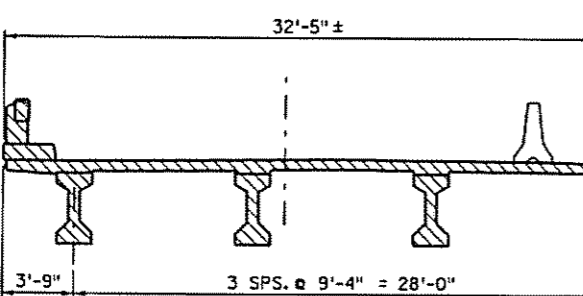
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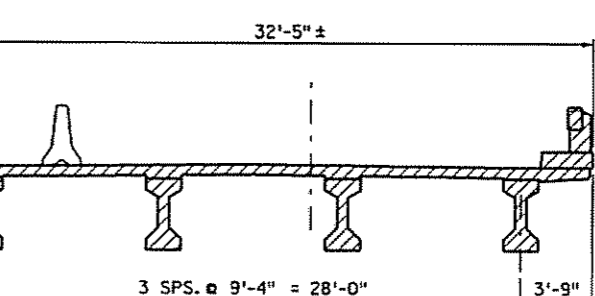
STAGE 1

STAGE 2

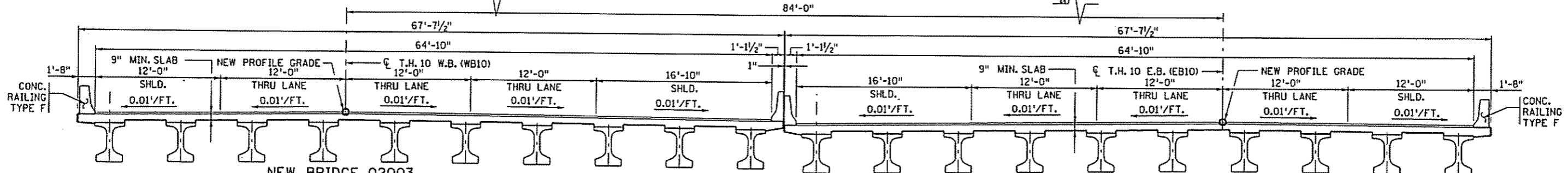
STAGE 3



REMOVE INPLACE BRIDGE 9721



REMOVE INPLACE BRIDGE 9722



NEW BRIDGE 02003

NEW BRIDGE 02004

FINAL BRIDGES

STAGING

DR: D.K.S.

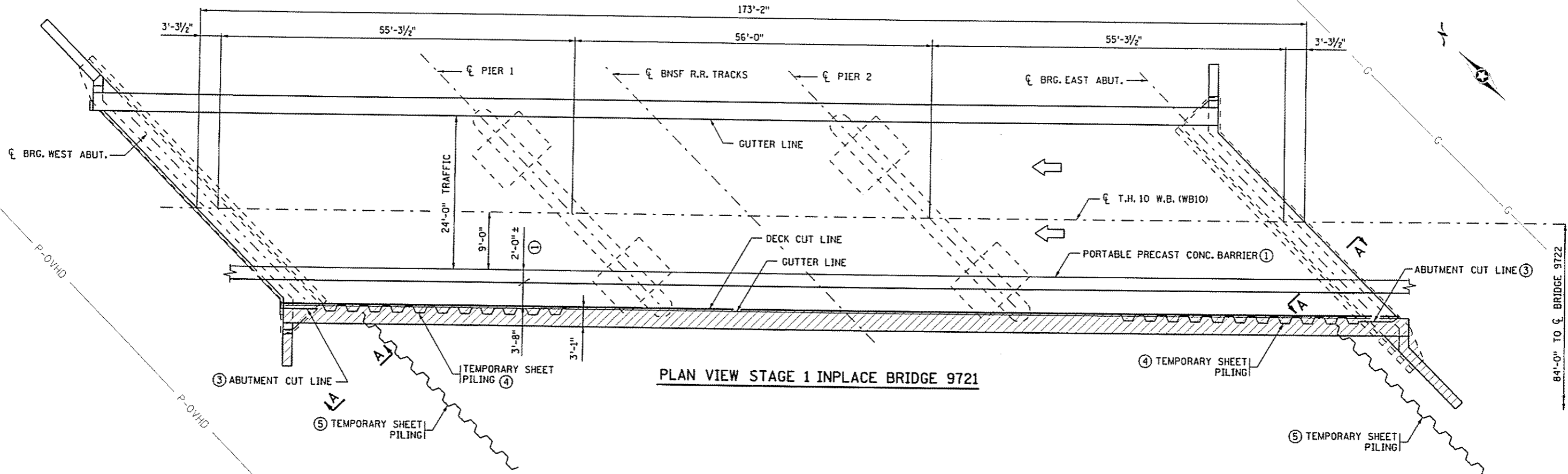
CHK: D.T.P.

BRIDGE NO.

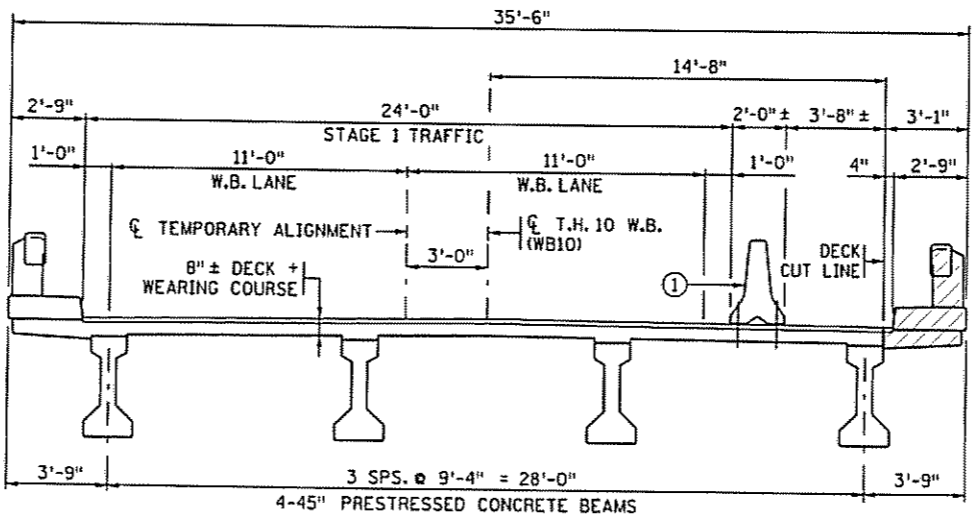
STATE PROJECT NO. 0215-02003 & 0215-02004

SHEET NO. 4 OF 72 SHEETS

02003 & 02004



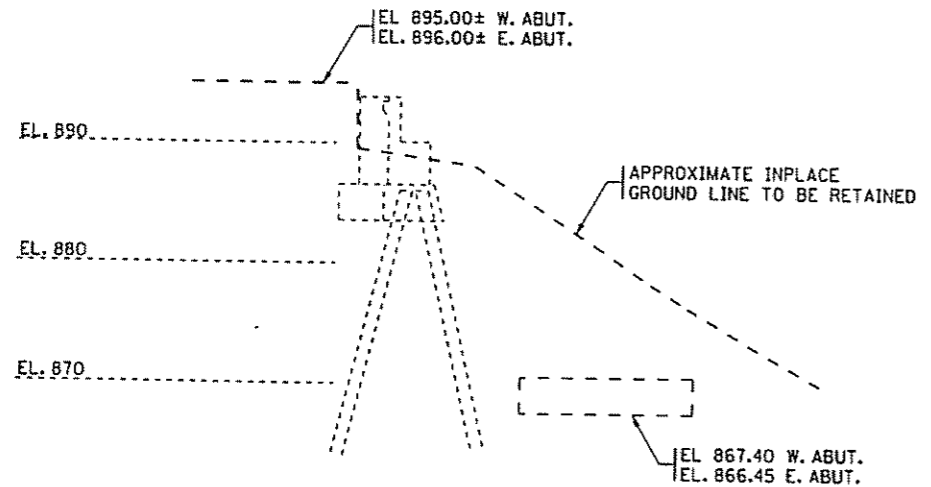
PLAN VIEW STAGE 1 INPLACE BRIDGE 9721



TRANSVERSE SECTION

**STAGE 1 NOTES:**

- HATCHED AREAS DENOTE REMOVAL.
- DIMENSIONS AND ELEVATIONS SHOWN ARE FROM THE ORIGINAL PLAN DATED 3-8-65.
- ① INSTALL PORTABLE PRECAST CONCRETE BARRIER AND ANCHOR TO DECK. SEE DETAIL B920. BARRIER TO BE INCLUDED IN GRADING PORTION OF PLAN.
- ② REMOVE SOUTH PORTION OF DECK AND RAILING TO EDGE OF FASCIA BEAM.
- ③ REMOVE WINGWALLS AND ABUTMENT CORNERS AS SHOWN ON SHEET NO. 6. THE EXACT REMOVAL LIMITS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD. BEARINGS SHALL REMAIN INTACT.
- ④ TEMPORARY SHEET PILING FOR RETAINING SLOPES IN FRONT OF THE INPLACE ABUTMENTS WHILE EXCAVATING FOR NEW FOOTINGS MAY REMAIN THROUGH STAGE 2. SHEET PILING SHALL BE DESIGNED BY THE CONTRACTOR. SEE THE SPECIAL PROVISIONS.
- ⑤ TEMPORARY SHEET PILING FOR CRANE PAD (IF NEEDED) TO MAINTAIN CLEARANCE FROM OVERHEAD POWER LINE AND GAS LINE. SHEET PILING SHALL BE DESIGNED BY THE CONTRACTOR. SEE THE SPECIAL PROVISIONS.



VIEW A-A  
(FOR SHEET PILE DESIGN)

CERTIFIED BY *Mel Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

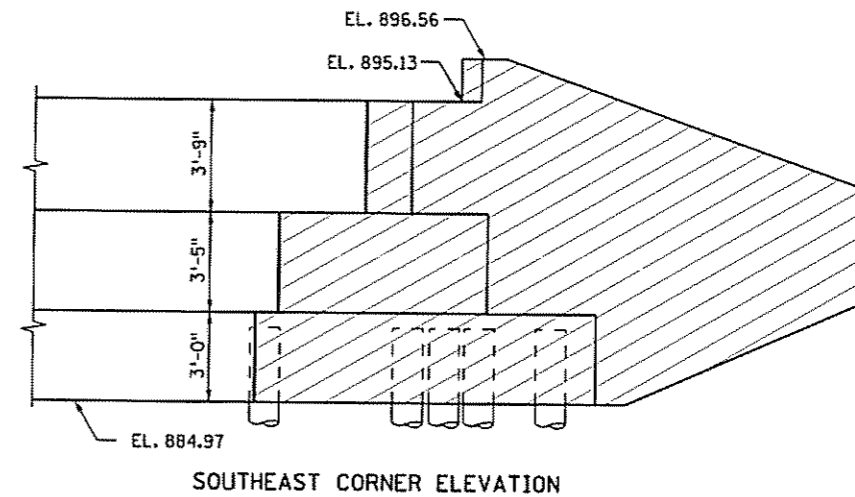
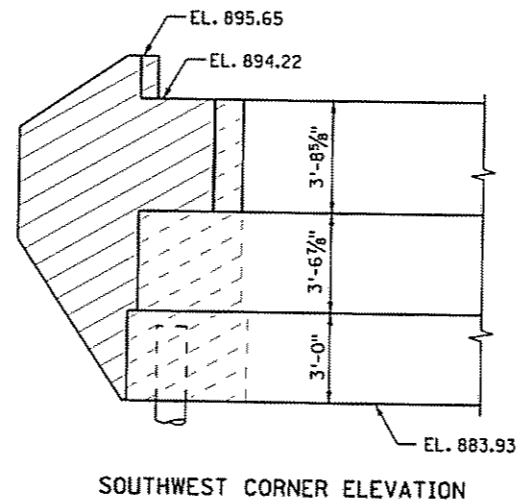
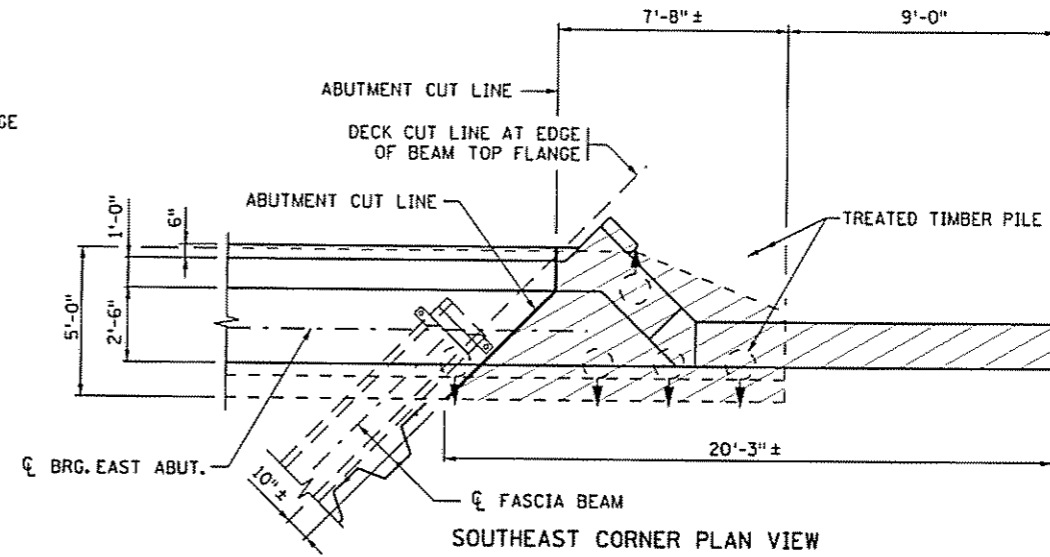
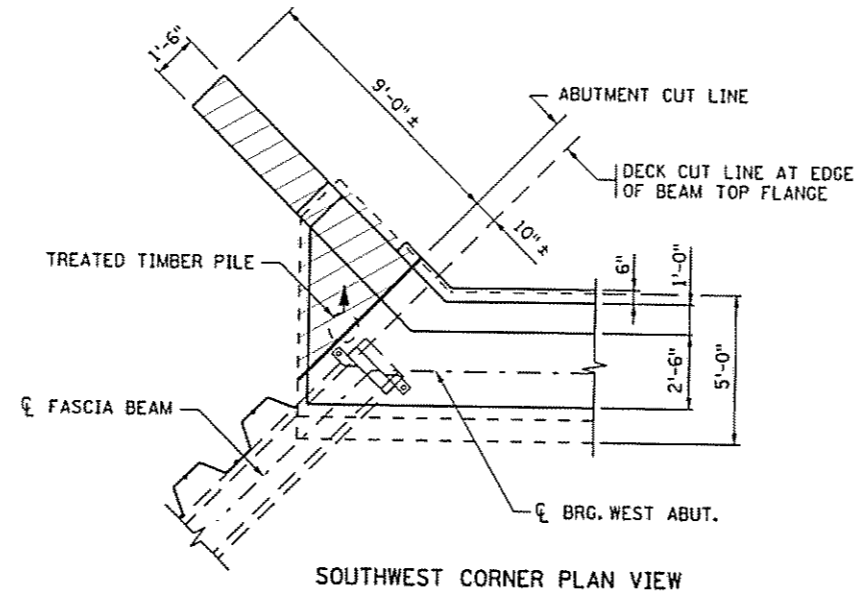
TITLE: STAGING DETAILS  
(STAGE 1)

DES: PJK	DR: NKL	APPROVED: 2/23/09
CHK: MCD	CHK: JAJ	

SHEET NO. 5 OF 72 SHEETS

BRIDGE NO. 02003

2/23/2009 SrDesign\10\2003\10-02003.dwg



ABUTMENT REMOVAL DETAILS

STAGE 1 NOTES:

HATCHED AREAS DENOTE REMOVAL.

DIMENSIONS AND ELEVATIONS SHOWN ARE FROM THE ORIGINAL PLAN DATED 3-8-65.

REMOVE WINGWALLS AND ABUTMENT CORNERS AS SHOWN. THE EXACT REMOVAL LIMITS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD. BEARINGS SHALL REMAIN INTACT.

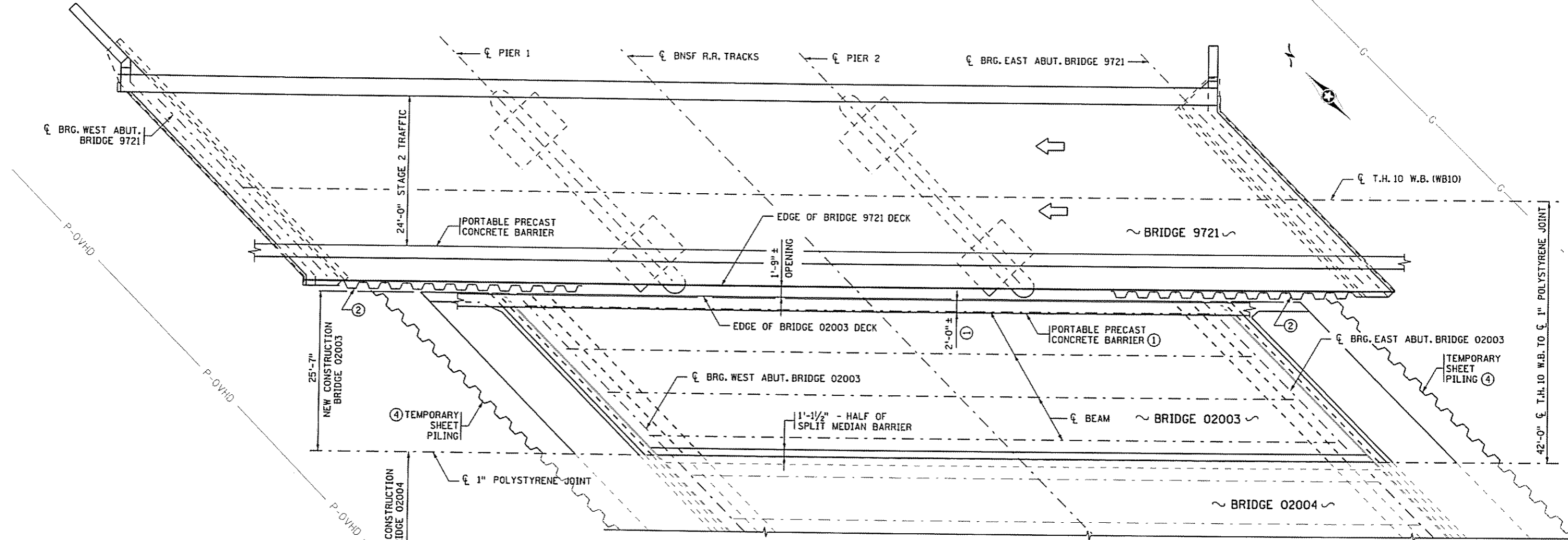
2/23/2009 S:\Design\182003\182003-1\182003-1.dgn

CERTIFIED BY MCDimaculangan 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

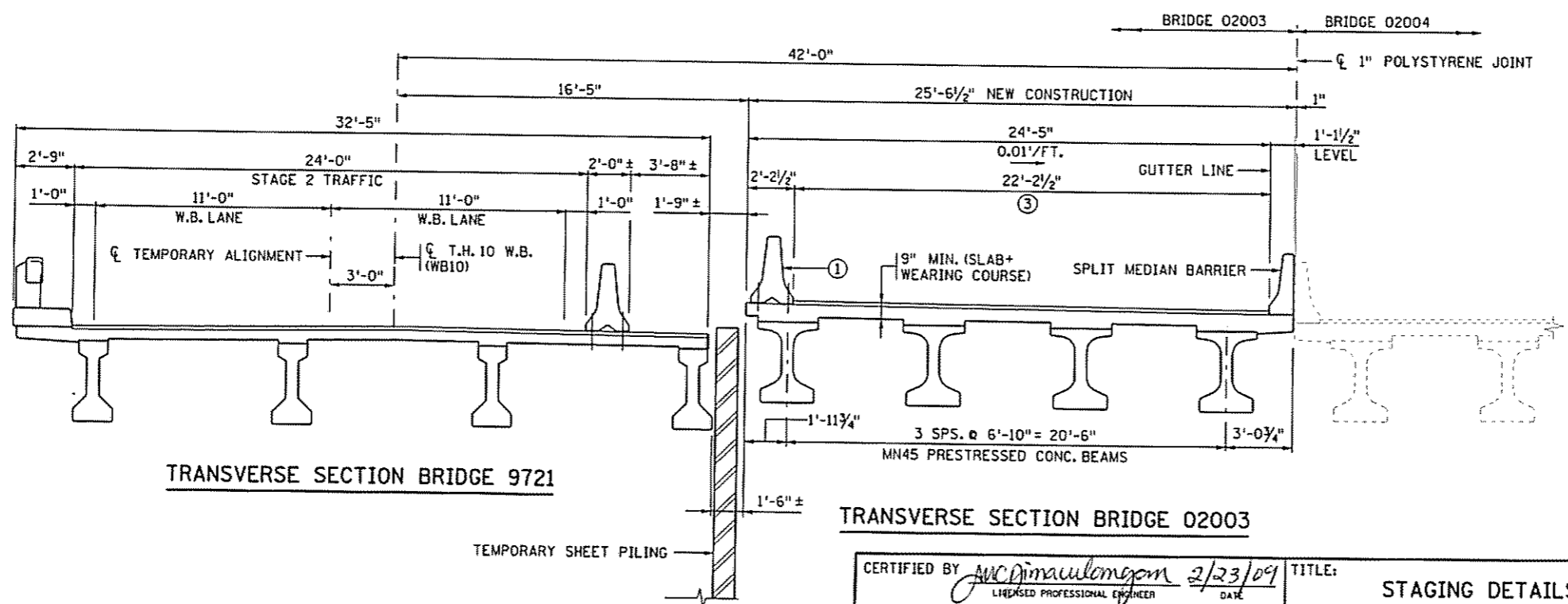
STAGING DETAILS  
 (STAGE 1)

DES: PJK	DR: NKL	APPROVED: 2/23/09
CHK: MCD	CHK: JAJ	
SHEET NO. 6 OF 72 SHEETS		

BRIDGE NO.  
02003



PLAN VIEW STAGE 2 BRIDGE 9721 & BRIDGE 02003



TRANSVERSE SECTION BRIDGE 9721

TRANSVERSE SECTION BRIDGE 02003

- STAGE 2 NOTES:**
- CONSTRUCT PORTION OF ABUTMENTS AND SUPERSTRUCTURE FOR BRIDGE 02003.
  - ① INSTALL PORTABLE PRECAST CONCRETE BARRIER AND ANCHOR TO NEW DECK. SEE DETAIL B920. BARRIER TO BE INCLUDED IN GRADING PORTION OF PLAN.
  - ② SEE THE SPECIAL PROVISIONS FOR TEMPORARY SHEET PILING.
  - ③ LIMITS OF CONCRETE WEARING COURSE (3U17A).
  - ④ TEMPORARY SHEET PILING FOR CRANE PAD (IF NEEDED) TO MAINTAIN CLEARANCE FROM OVERHEAD POWER LINE AND GAS LINE. SHEETING SHALL BE DESIGNED BY THE CONTRACTOR. SEE THE SPECIAL PROVISIONS.

CERTIFIED BY *MCDimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

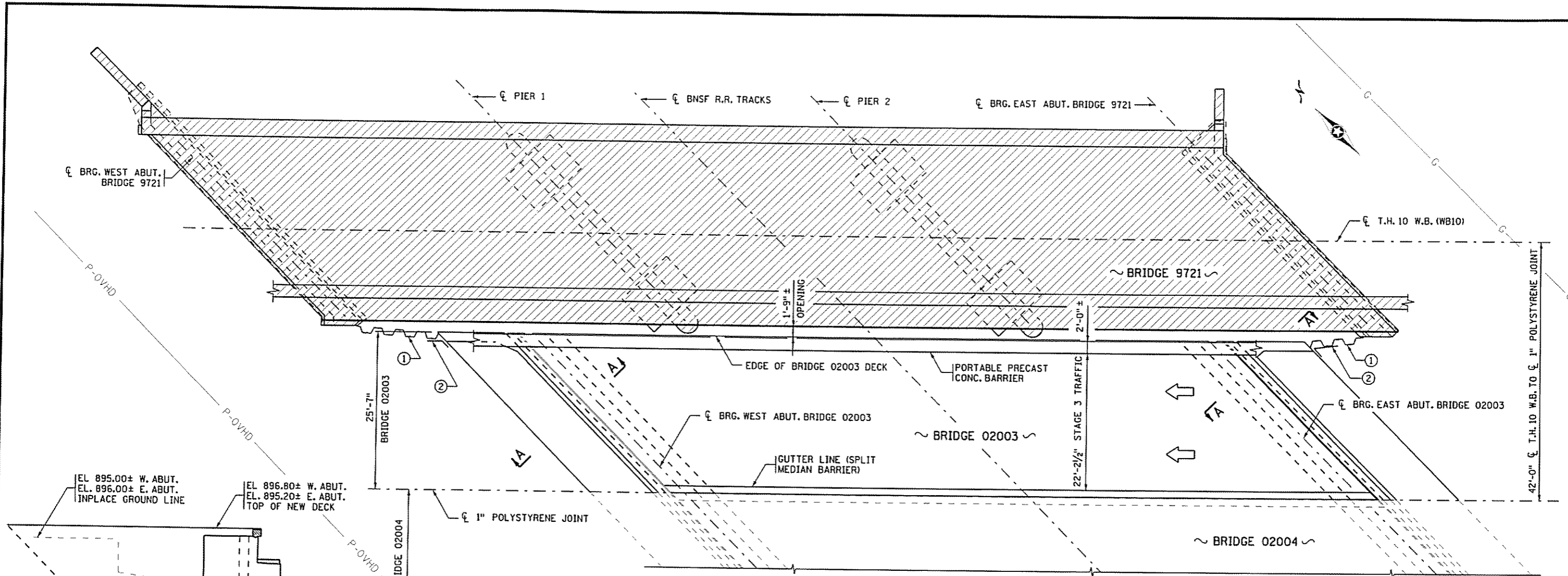
TITLE: STAGING DETAILS (STAGE 2)

DES: PJK	DR: NKL	APPROVED: 2/23/09
CHK: MCD	CHK: JAJ	

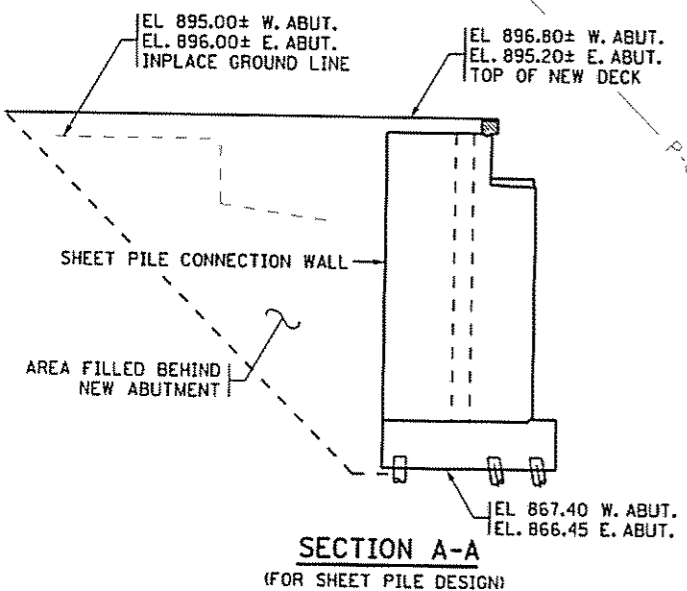
SHEET NO. 7 OF 72 SHEETS

BRIDGE NO. 02003

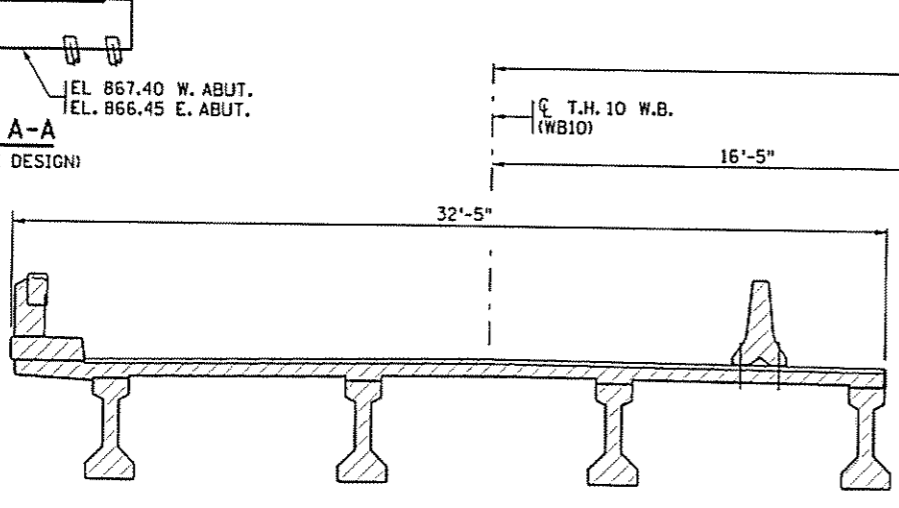
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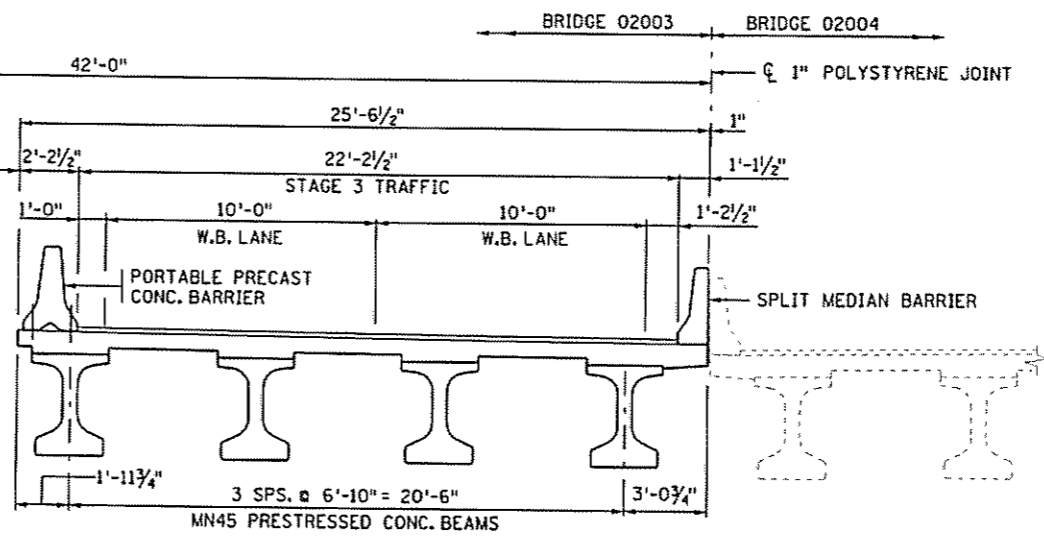
PLAN VIEW STAGE 3 BRIDGE 9721 & BRIDGE 02003



SECTION A-A  
(FOR SHEET PILE DESIGN)



TRANSVERSE SECTION BRIDGE 9721



TRANSVERSE SECTION BRIDGE 02003

STAGE 3 NOTES:

- HATCHED AREAS DENOTE REMOVAL.
- MOVE TRAFFIC TO NEW PORTION OF BRIDGE 02003.
- REMOVE REMAINING PORTION OF BRIDGE 9721.
- ① RELOCATE TEMPORARY SHEET PILING FROM THE FRONT OF THE INPLACE ABUTMENT AS NEEDED TO PERMIT CONSTRUCTION OF THE REMAINDER OF THE NEW FOOTING AND TO RETAIN THE APPROACHES FOR THE NEW BRIDGE.
- ② GEOTEXTILE FABRIC OR TIMBER LAGGING AS NEEDED. INCIDENTAL TO "STEEL SHEET PILING (TEMPORARY)".

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

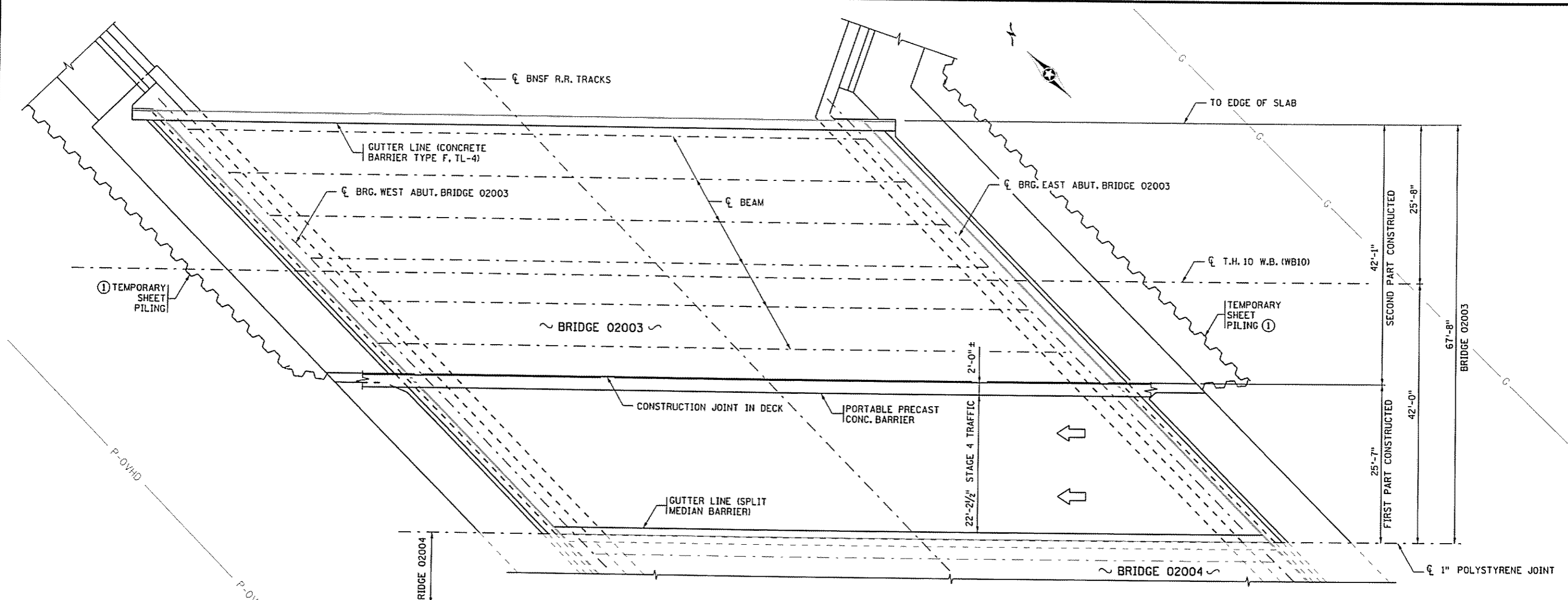
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DES: PJK	DR: NKL	APPROVED: 2/23/09
CHK: MCD	CHK: JAJ	

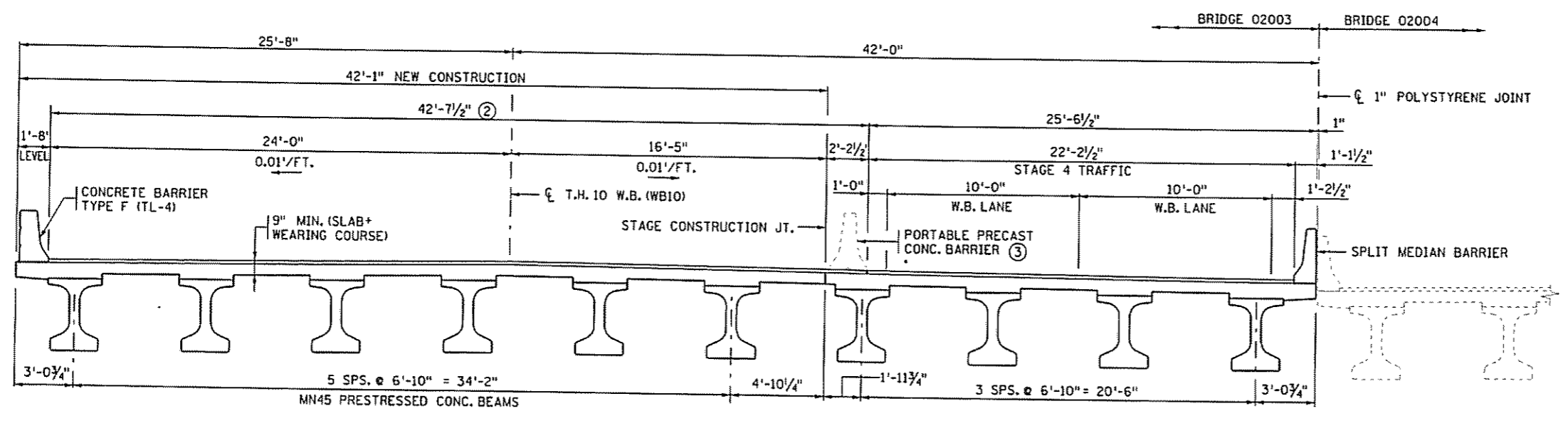
SHEET NO. 8 OF 72 SHEETS

BRIDGE NO. 02003

2/23/2009 5:\Design\BNSF\02003\03-02003.dwg



PLAN VIEW STAGE 4 BRIDGE 02003



TRANSVERSE SECTION BRIDGE 02003

STAGE 4 NOTES:

- CONSTRUCT REMAINING PORTION OF ABUTMENTS AND SUPERSTRUCTURE FOR BRIDGE 02003.
- FOR FINAL TRANSVERSE SECTION SEE SHEET NO. 2.
- ① TEMPORARY SHEET PILING FOR CRANE PAD (IF NEEDED) TO MAINTAIN CLEARANCE FROM OVERHEAD POWER LINE AND GAS LINE. SHEET PILING SHALL BE DESIGNED BY THE CONTRACTOR. SEE THE SPECIAL PROVISIONS.
- ② LIMITS OF CONCRETE WEARING COURSE (3U17A).
- ③ REMOVE PORTABLE PRECAST CONCRETE BARRIER PRIOR TO PLACEMENT OF WEARING COURSE.

2/23/2009 S:\Design\02003\02003\_1.dgn

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: STAGING DETAILS (STAGE 4)

DES: PJK	DR: NKL	APPROVED: 2/23/09
CHK: MCD	CHK: JAJ	

SHEET NO. 9 OF 72 SHEETS

BRIDGE NO. 02003



WEST ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	95.6
FACTORED LIVE LOAD	3.3
*FACTORED DESIGN LOAD	98.9

\*BASED ON STRENGTH I LOAD COMBINATION

WEST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE $R_n$ - TONS/PILE		
FIELD CONTROL METHOD	$\phi_{dyn}$	* $R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	247.2
PDA	0.65	152.1

\*  $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{dyn}$

### PILE NOTES

- 2 CAST-IN-PLACE CONC. TEST PILES 60 FT. LONG
- 54 CAST-IN-PLACE CONC. PILES EST. LENGTH 50 FT.
- 56 CAST-IN-PLACE CONC. PILES REQ'D FOR WEST ABUTMENT

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\odot$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

PILES TO HAVE A NOMINAL DIAMETER OF 12".

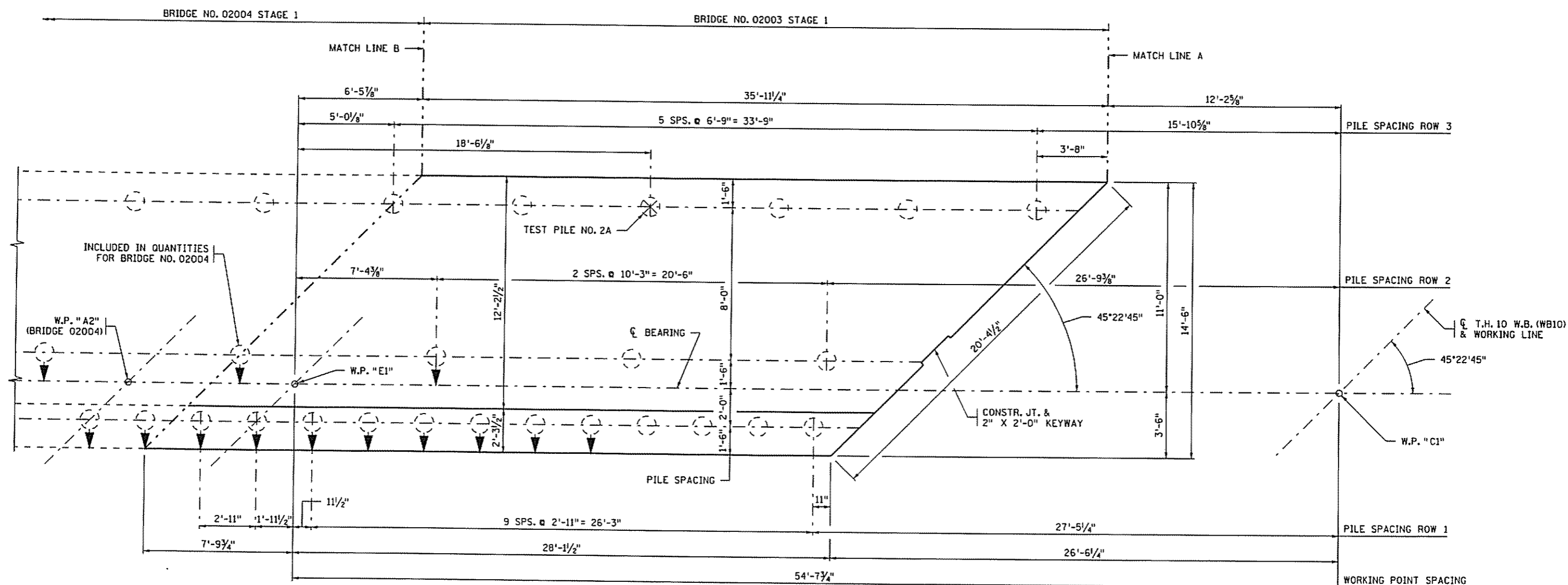
FOR PILE SPLICE DETAILS SEE DETAIL B201.

PILE DIRECTION SHOWN MAY BE ADJUSTED BY THE FIELD ENGINEER FOR INTERFERENCE PROBLEMS.

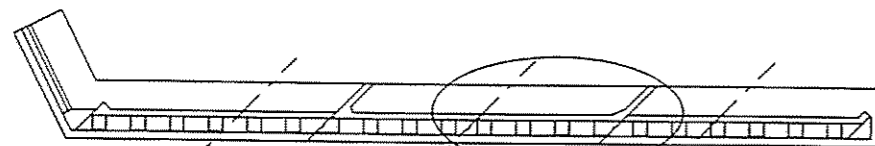
### SUMMARY OF QUANTITIES FOR WEST ABUTMENT

	STAGE 1	STAGE 2	TOTAL
STRUCTURAL CONCRETE (1A43)	78	135	213 CU. YD.
STRUCTURAL CONCRETE (3Y43)	163	262	425 CU. YD.
REINFORCEMENT BARS	8070	12700	20770 POUND
REINFORCEMENT BARS (EPOXY COATED)	12930	17640	30570 POUND
C-I-P CONCRETE PILING DELIVERED 12"	1000	1700	2700 LIN. FT.
C-I-P CONCRETE PILING DRIVEN 12"	1000	1700	2700 LIN. FT.
C-I-P CONCRETE TEST PILE 60 FT. LONG 12"	1	1	2 EACH
MEMBRANE WATERPROOFING	55	90	145 LIN. FT.
COUPLERS (REINFORCEMENT BARS) T-16	10	—	10 EACH
COUPLERS (REINFORCEMENT BARS) T-19	30	—	30 EACH
COUPLERS (REINFORCEMENT BARS) T-22	44	—	44 EACH
PILE REDRIVING	1	1	2 EACH
PILE ANALYSIS	1	—	1 EACH

- ① DOES NOT INCLUDE TEST PILES.
- ② PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).



FOOTING PLAN WEST ABUTMENT



BRIDGE NO. 02004

BRIDGE NO. 02003

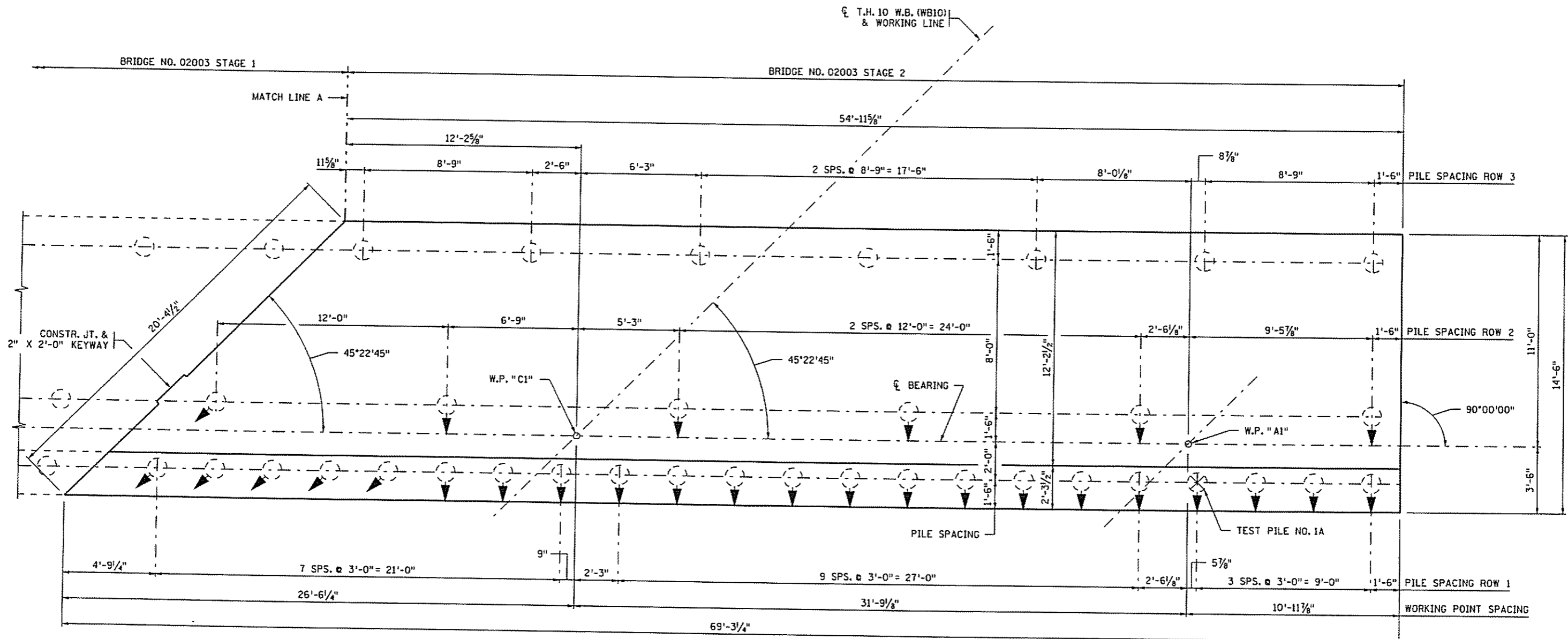
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
 WEST ABUTMENT GEOMETRICS

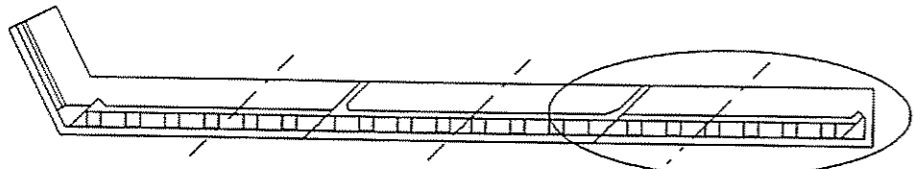
DES: M.C.D. DR: K.G.S. APPROVED: 2/23/09  
 CHK: P.J.K. CHK: J.A.J.

BRIDGE NO.  
 02003

SHEET NO. 10 OF 72 SHEETS



FOOTING PLAN WEST ABUTMENT



BRIDGE NO. 02004

BRIDGE NO. 02003

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
 WEST ABUTMENT GEOMETRICS

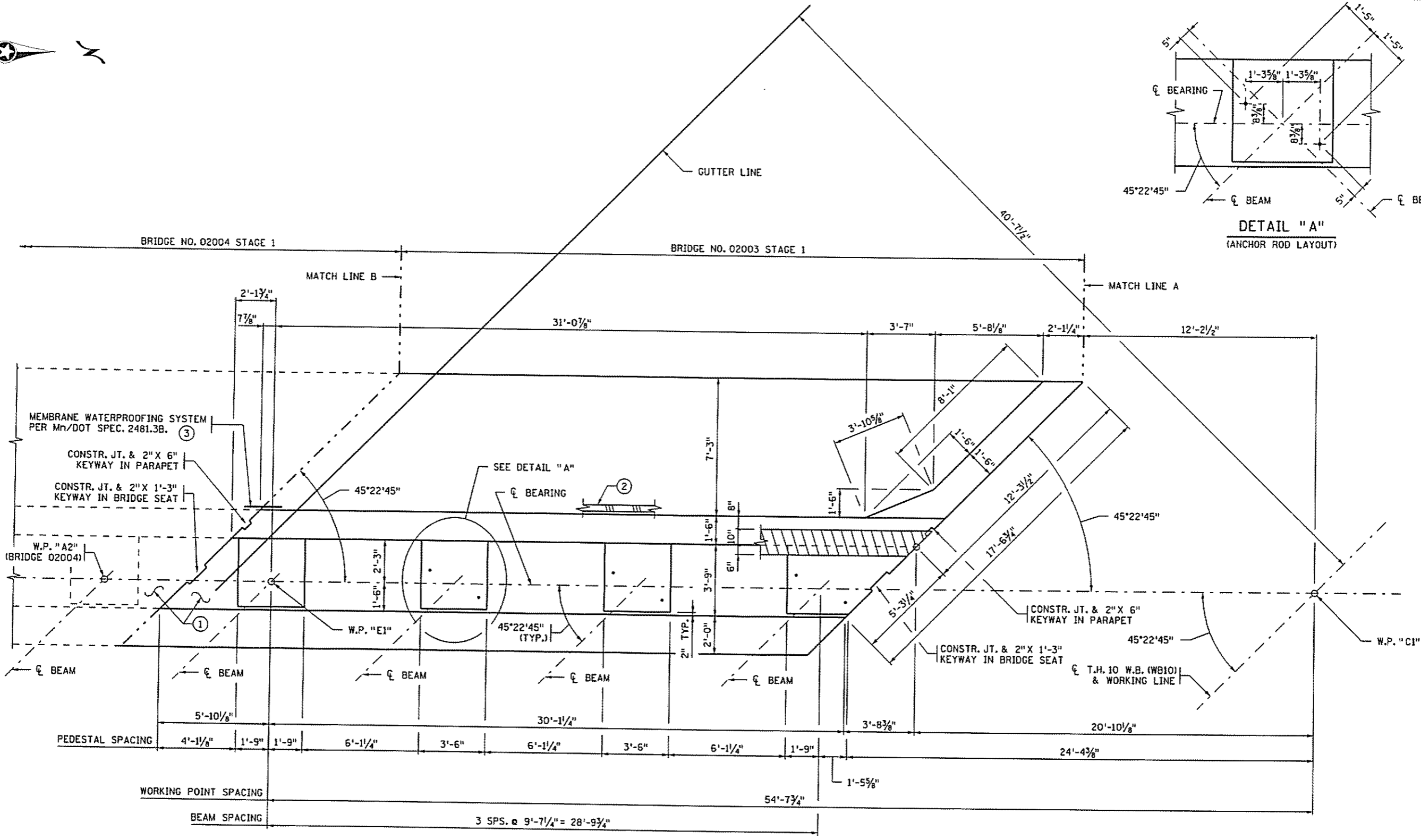
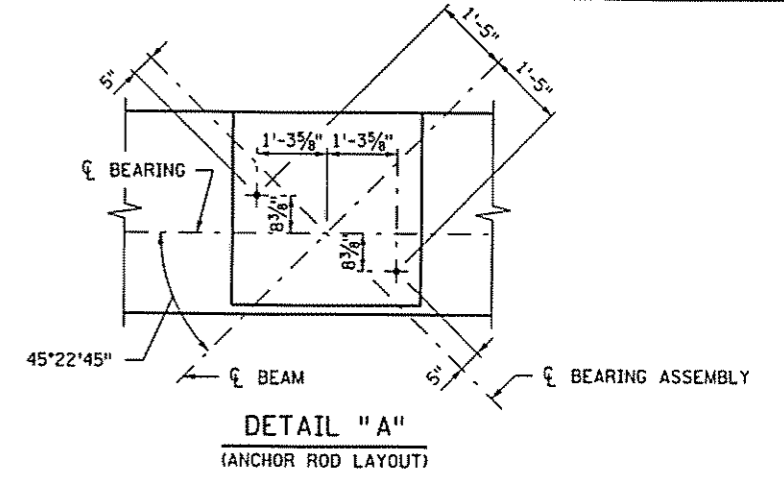
DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 11 OF 72 SHEETS

BRIDGE NO. 02003

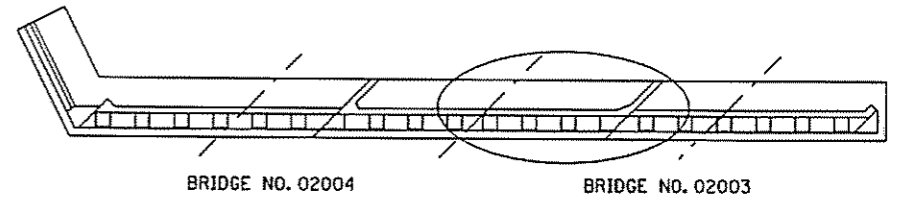
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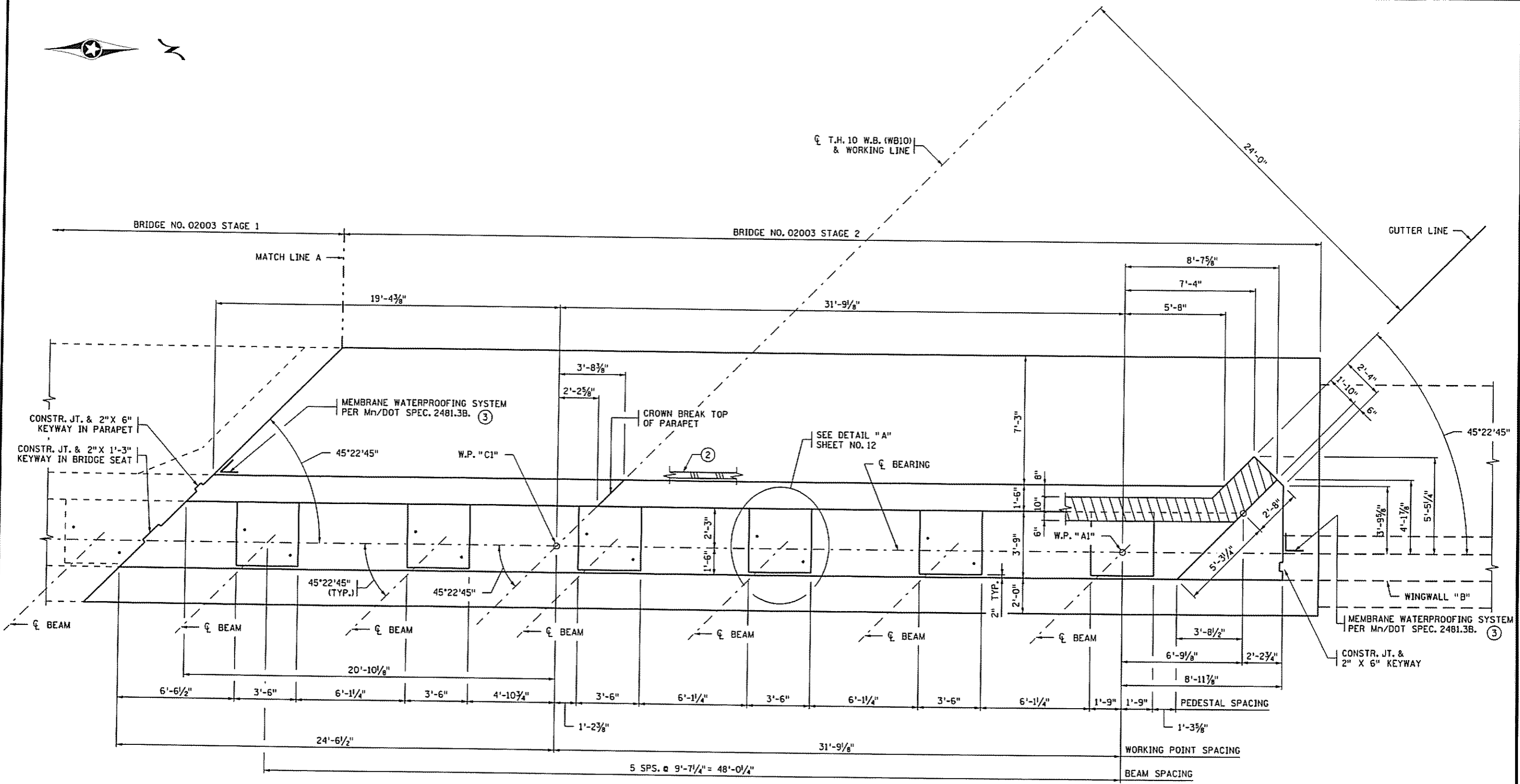
PLAN VIEW WEST ABUTMENT

- NOTES:**
- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
  - ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).



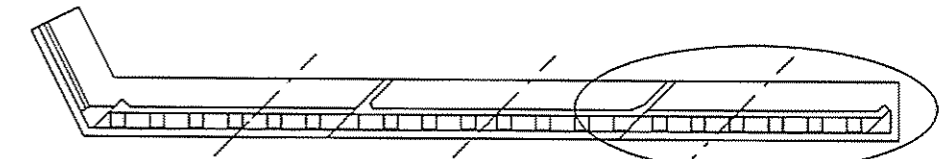
CERTIFIED BY: <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE NAME: MOISES C. DIMACULANGAN LIC. NO. 46209		TITLE: <b>WEST ABUTMENT GEOMETRICS</b>	DES: M.C.D. DR: K.G.S. APPROVED: CHK: P.J.K. CHK: J.A.J. 2/23/09	BRIDGE NO. 02003 SHEET NO. 12 OF 72 SHEETS
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PLAN VIEW WEST ABUTMENT

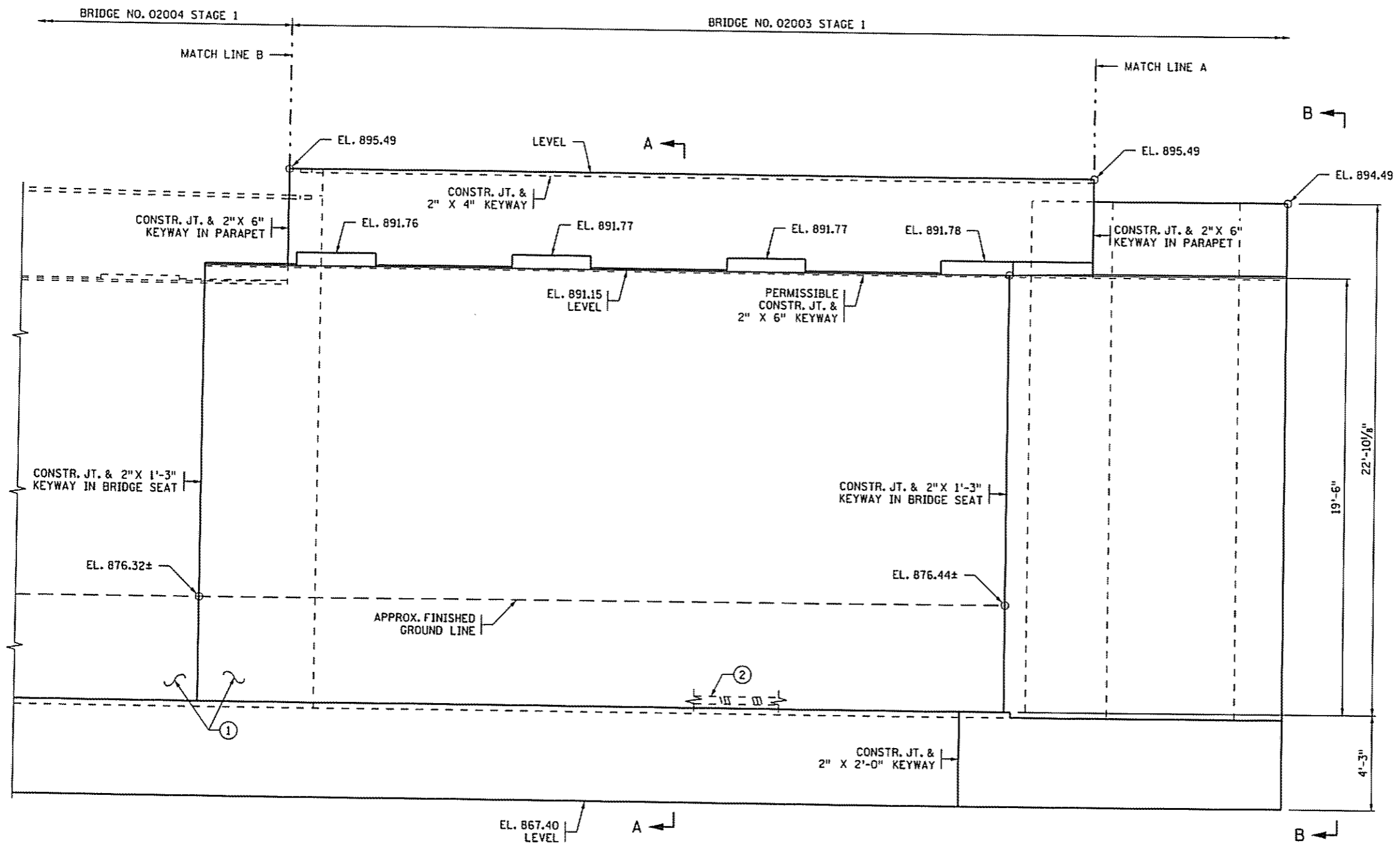
- NOTES:**
- ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
  - ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).



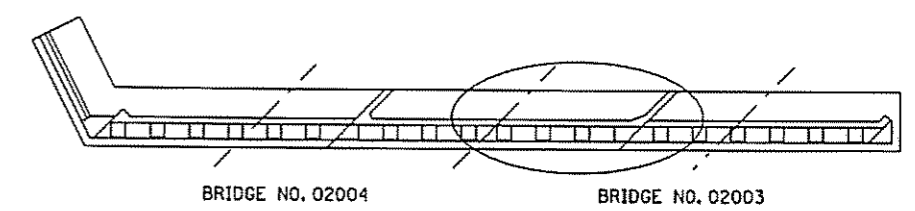
BRIDGE NO. 02004 BRIDGE NO. 02003

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CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 DATE LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209		TITLE: <b>WEST ABUTMENT GEOMETRICS</b>		DES: M.C.D. DR: K.G.S. APPROVED: <i>2/23/09</i> CHK: P.J.K. CHK: J.A.J.		BRIDGE NO. 02003 SHEET NO. 13 OF 72 SHEETS	
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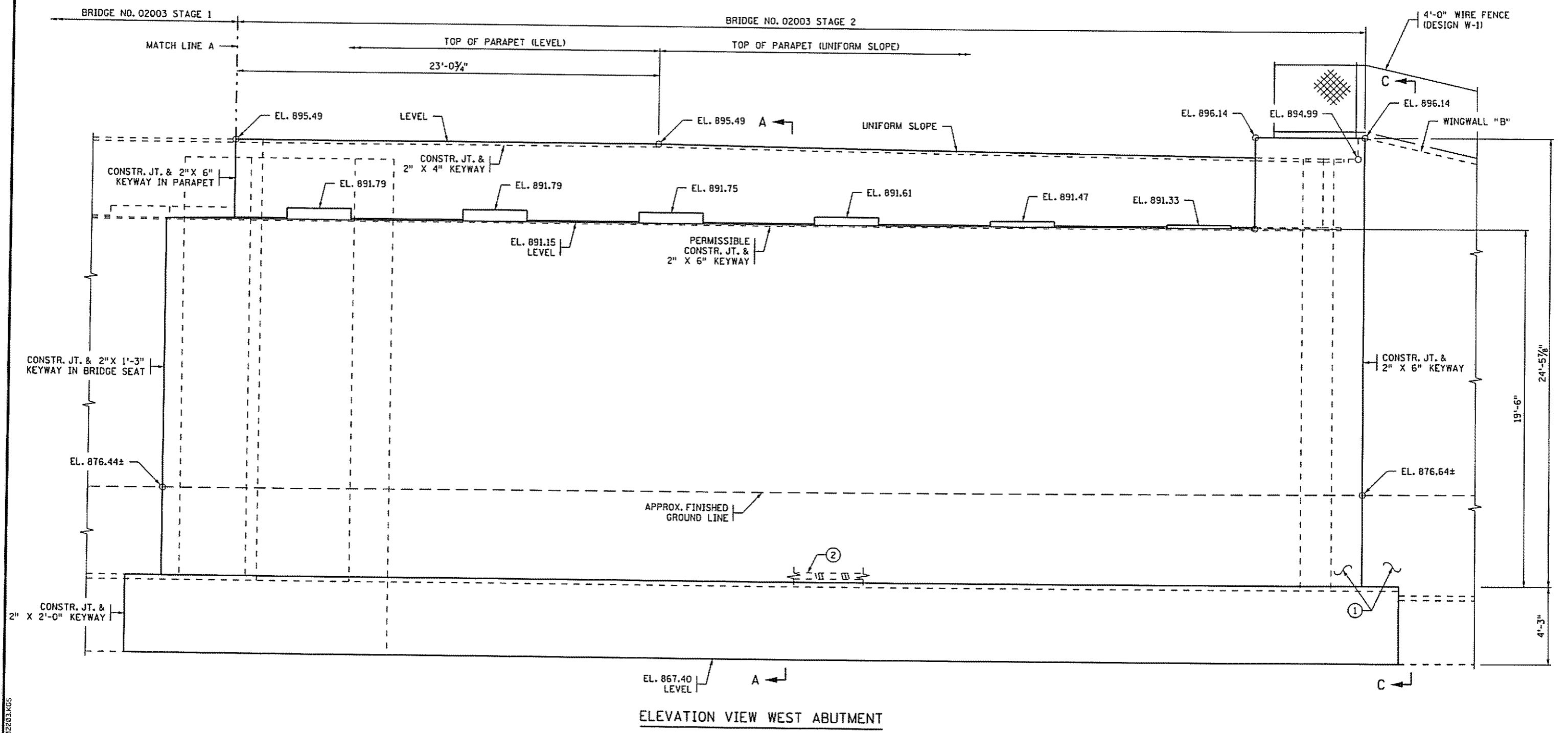
ELEVATION VIEW WEST ABUTMENT



- NOTES:**
- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- FOR SECTION A-A & B-B SEE SHEET NO. 16.

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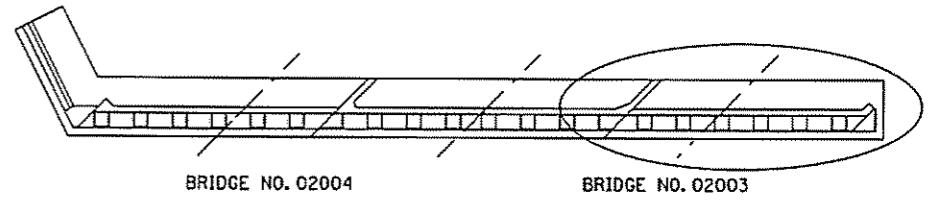
CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 <small>LICENSED PROFESSIONAL ENGINEER DATE</small>		TITLE: WEST ABUTMENT GEOMETRICS		DES: M.C.D. CHK: P.J.K.	DR: K.G.S. CHK: J.A.J.	APPROVED: 2/23/09	BRIDGE NO. 02003 SHEET NO. 14 OF 72 SHEETS
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209							



ELEVATION VIEW WEST ABUTMENT

NOTES:

- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- FOR SECTION A-A & C-C SEE SHEET NO. 16.

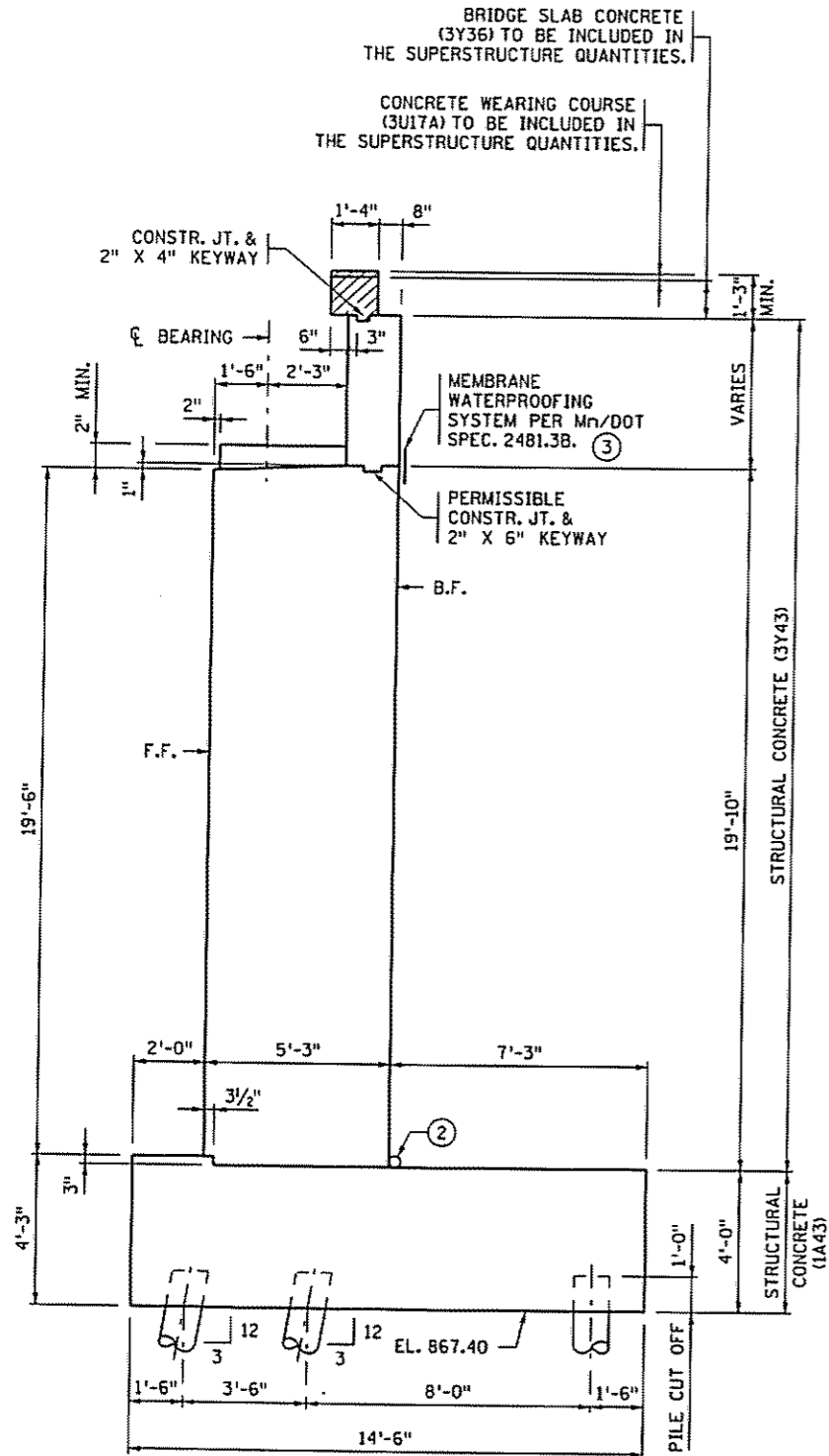


CERTIFIED BY: <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE NAME: MOISES C. DIMACULANGAN LIC. NO. 46209		TITLE: WEST ABUTMENT GEOMETRICS		DES: M.C.D. CHK: P.J.K.	DR: K.G.S. CHK: J.A.J.	APPROVED: 2/23/09	BRIDGE NO. 02003 SHEET NO. 15 OF 72 SHEETS
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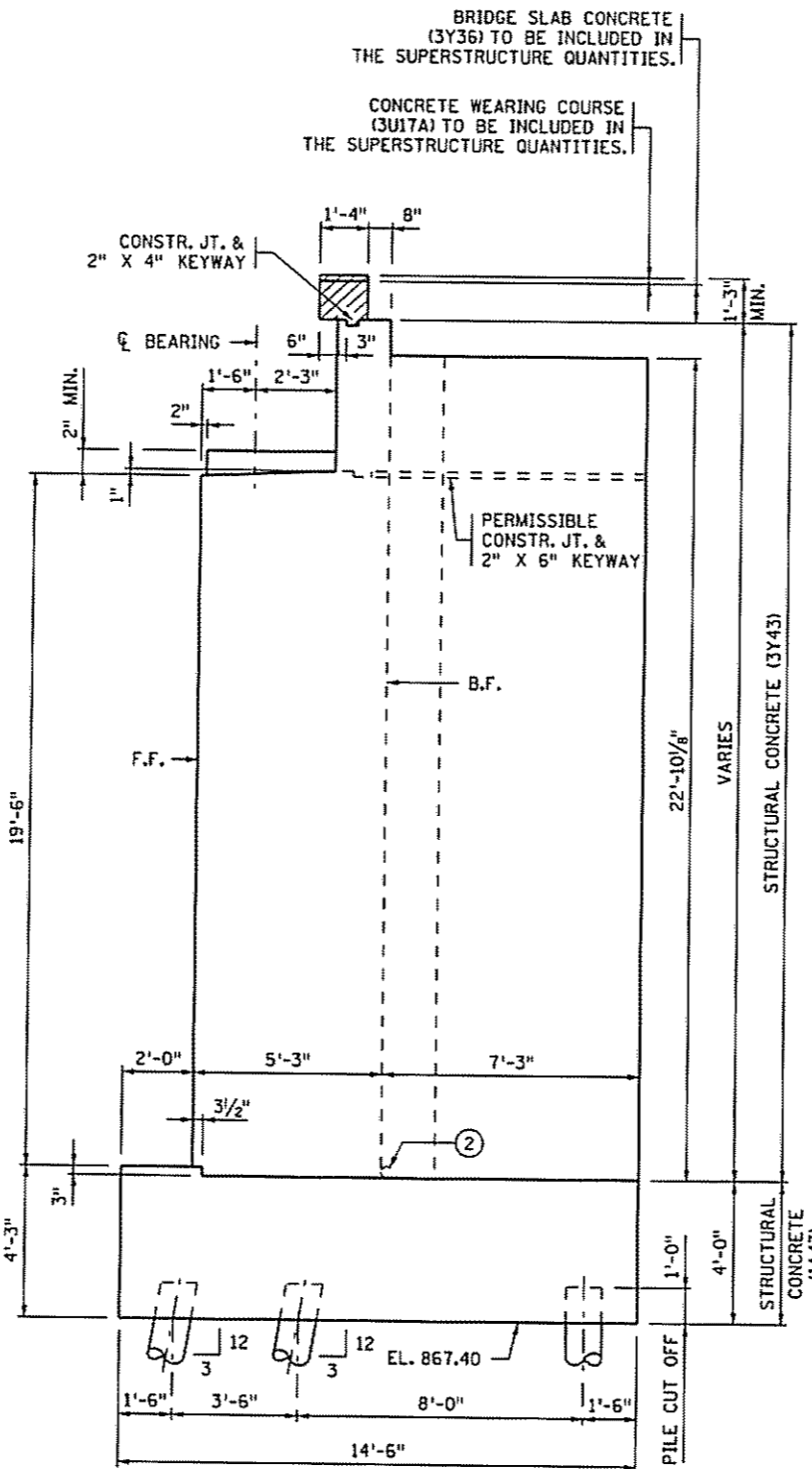
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**NOTES:**

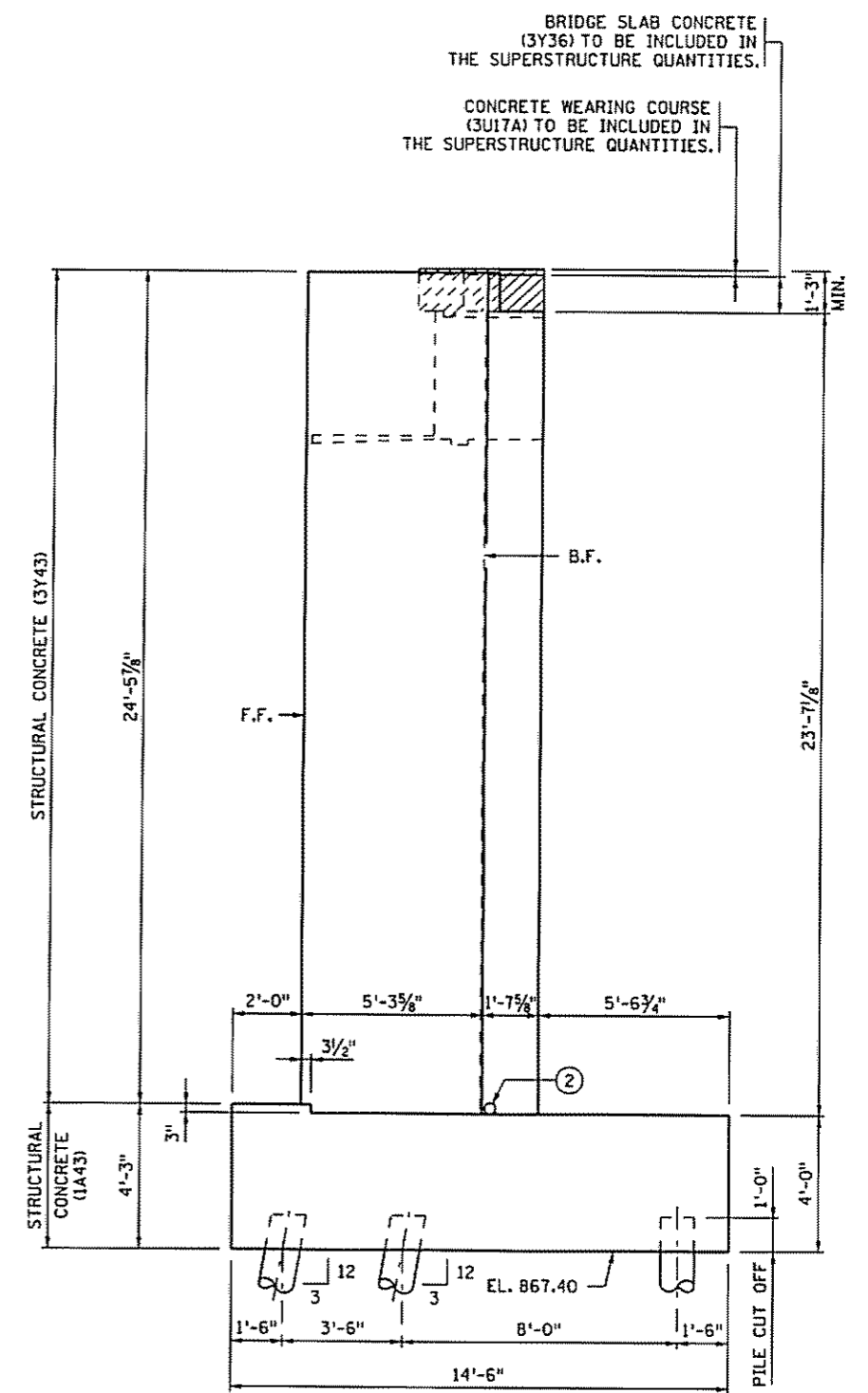
- ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
  - ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).
- F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.



**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

2/12/2009 S:\Design\B\B2003\MG3\02003.MG3

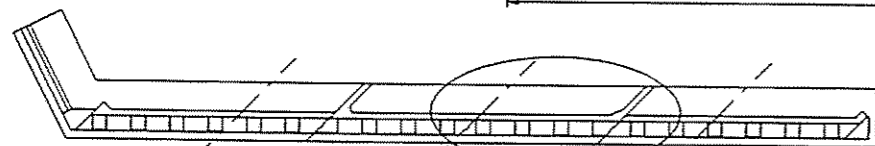
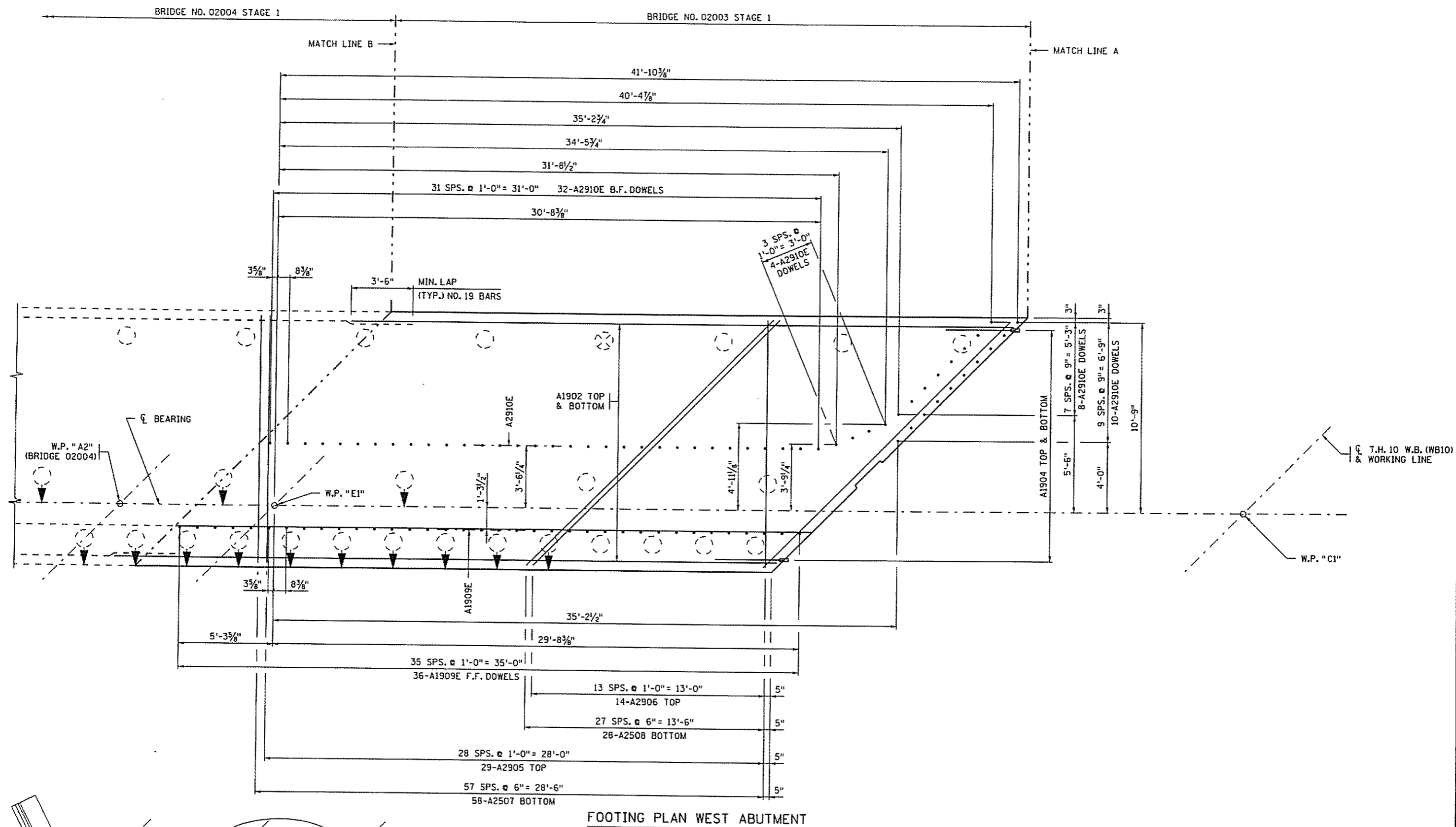
CERTIFIED BY: <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE		TITLE: WEST ABUTMENT GEOMETRICS	
DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09	BRIDGE NO. 02003
CHK: P.J.K.	CHK: J.A.J.	SHEET NO. 16 OF 72 SHEETS	



**NOTES:**

F.F. DENOTES FRONT FACE.

B.F. DENOTES BACK FACE.



BRIDGE NO. 02004

BRIDGE NO. 02003

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: WEST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

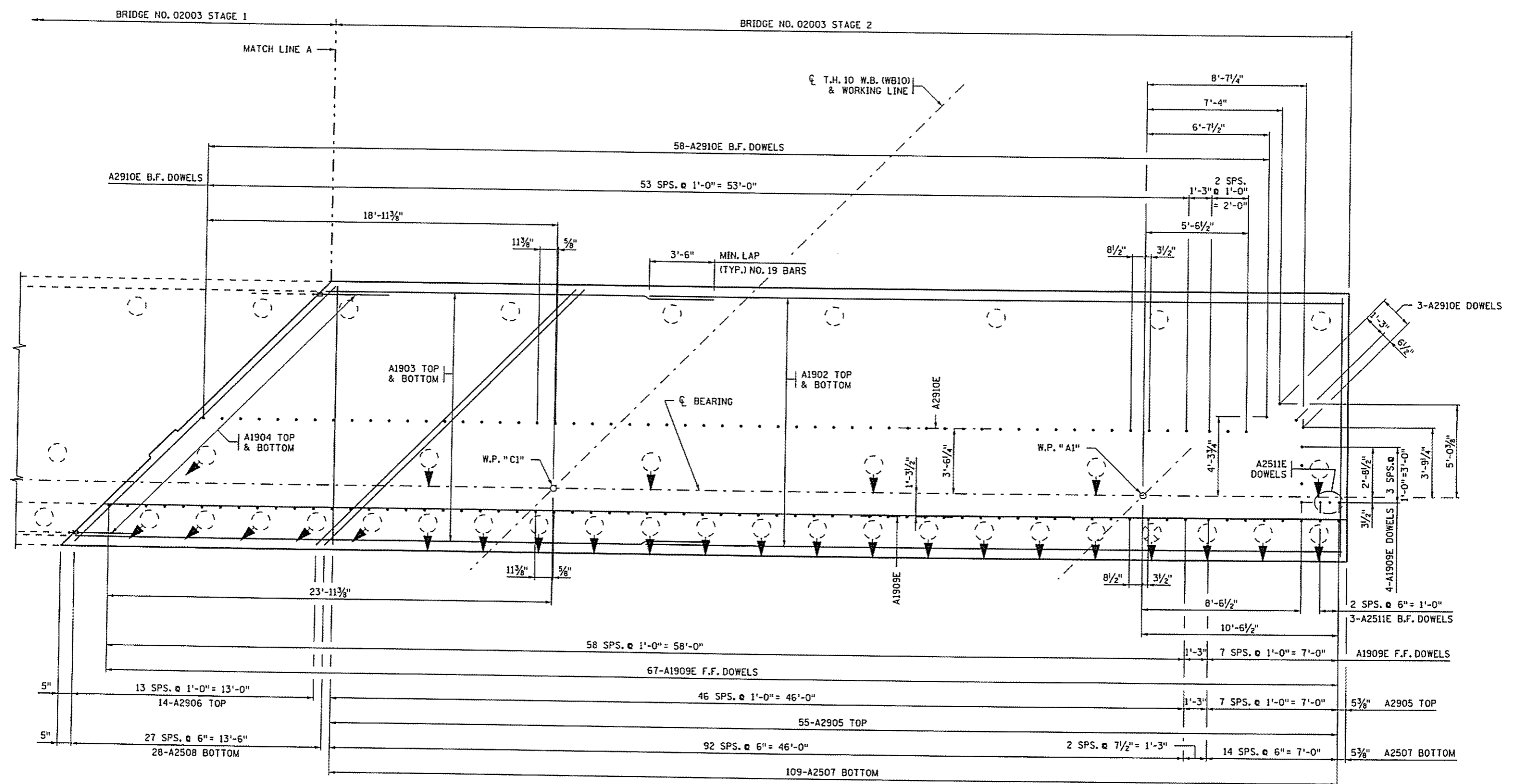
SHEET NO. 17 OF 72 SHEETS

BRIDGE NO. 02003

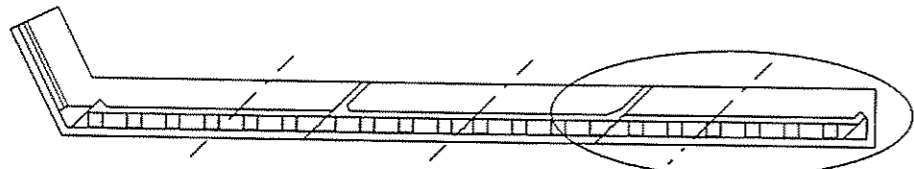
2/26/2009 S:\Design\02003\KGS\02003.KGS



**NOTES:**  
 F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.



**FOOTING PLAN WEST ABUTMENT**



BRIDGE NO. 02004

BRIDGE NO. 02003

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

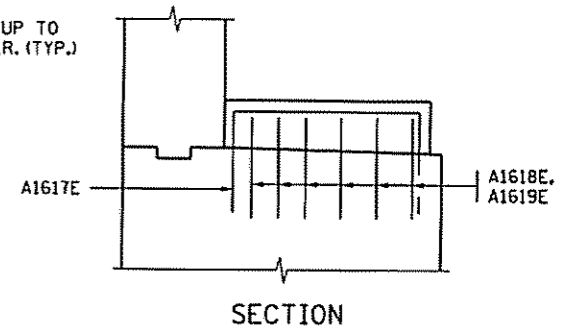
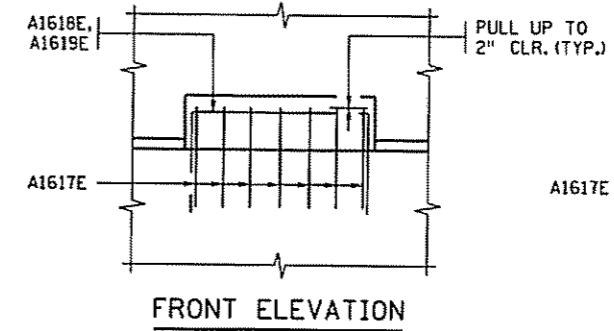
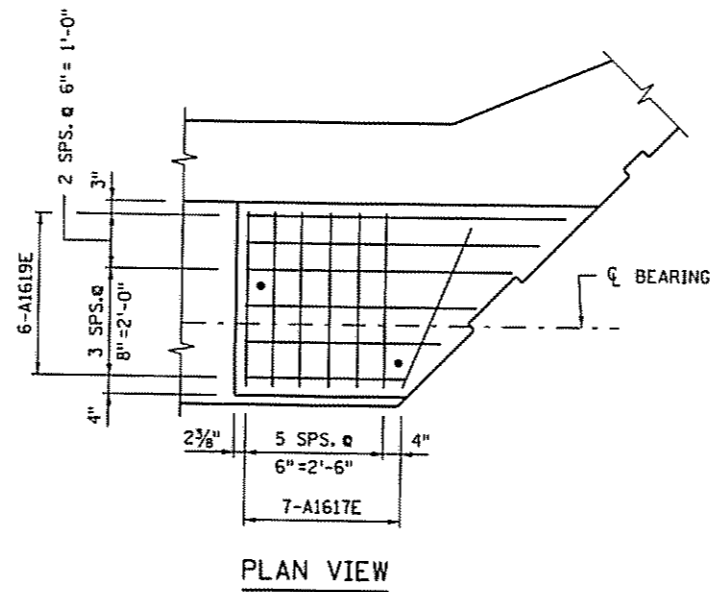
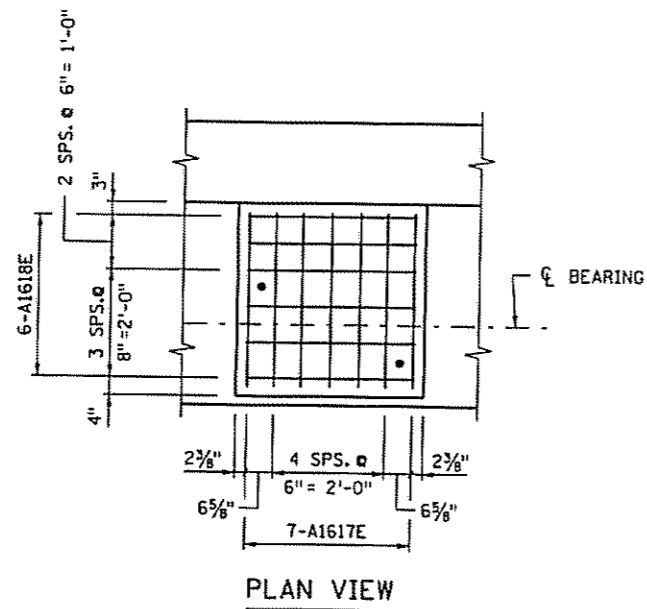
TITLE: WEST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

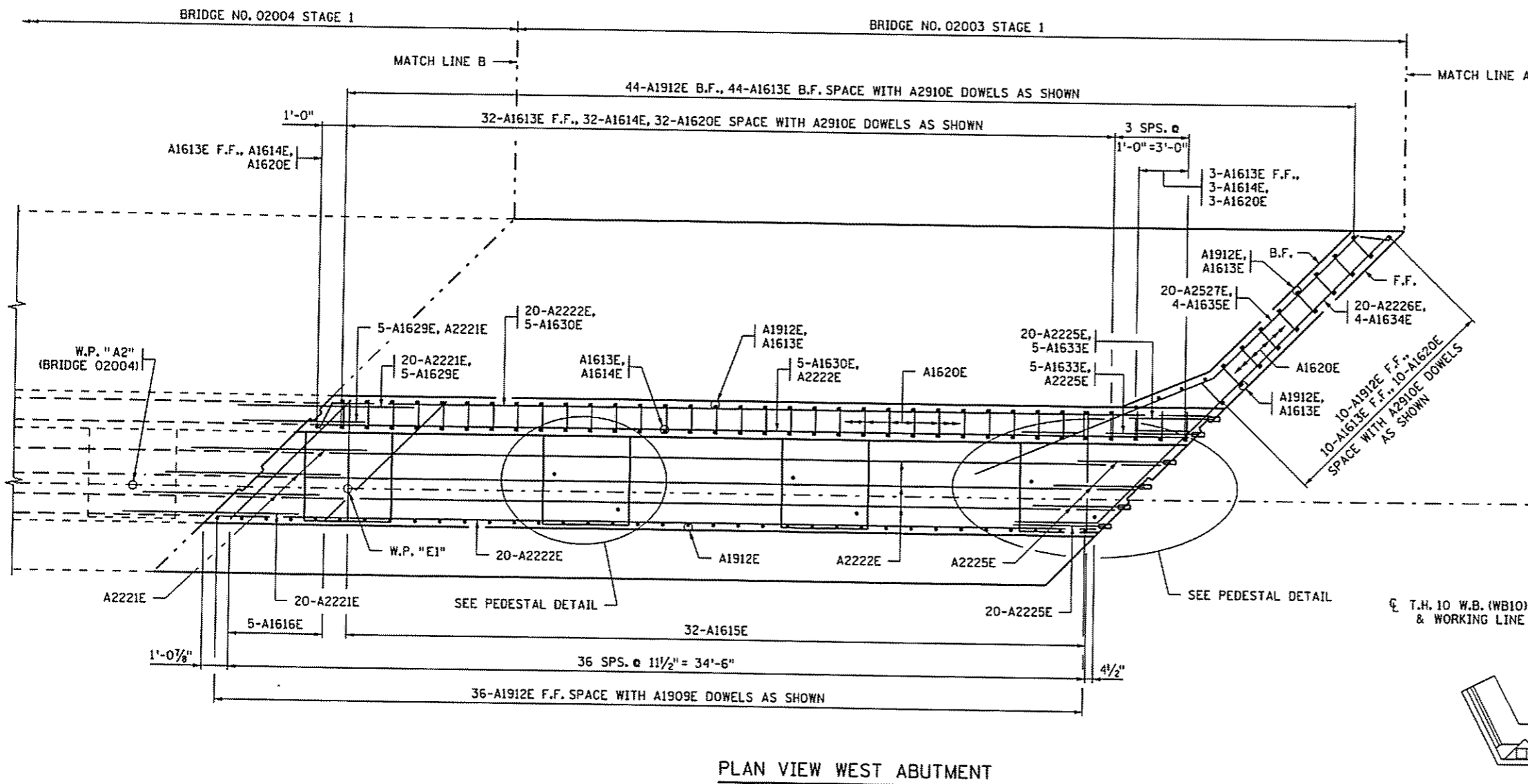
SHEET NO. 18 OF 72 SHEETS

BRIDGE NO. 02003

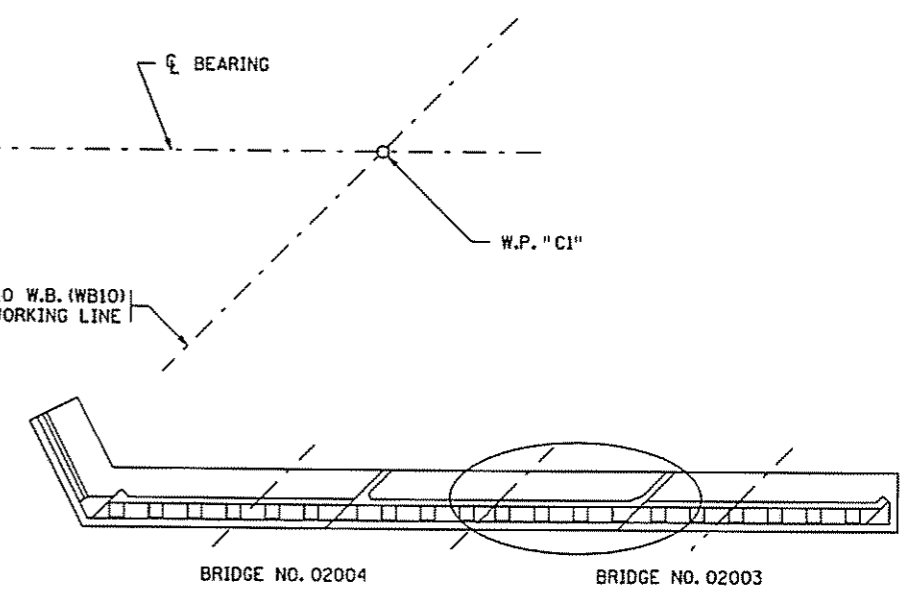
S:\Design\02003\KGS\02003.KGS 2/16/2009



PEDESTAL DETAIL



- NOTES:**  
 F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.



S:\Design\18\02003\KGS\02003.KGS

CERTIFIED BY Moises C. Dimaculangan 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**WEST ABUTMENT REINFORCEMENT**

DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 19 OF 72 SHEETS

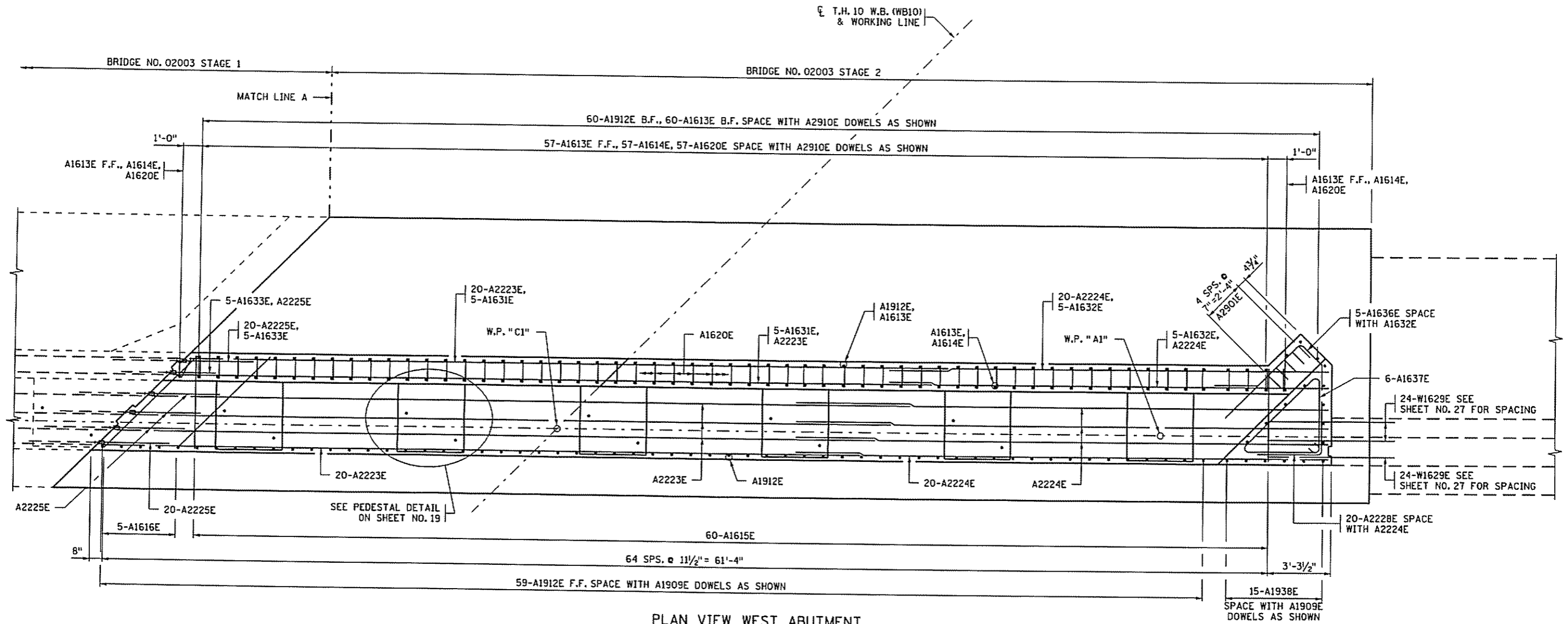
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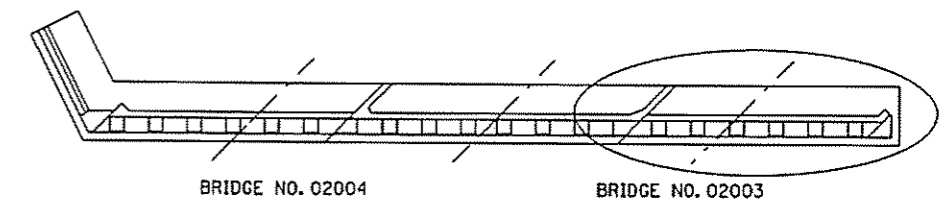


**NOTES:**

F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.



**PLAN VIEW WEST ABUTMENT**



S:\Design\02003\KGS\02003.KGS

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**WEST ABUTMENT REINFORCEMENT**

DES: M.C.D. DR: K.G.S. APPROVED: 2/23/09  
 CHK: P.J.K. CHK: J.A.J.  
 SHEET NO. 20 OF 72 SHEETS

BRIDGE NO. 02003

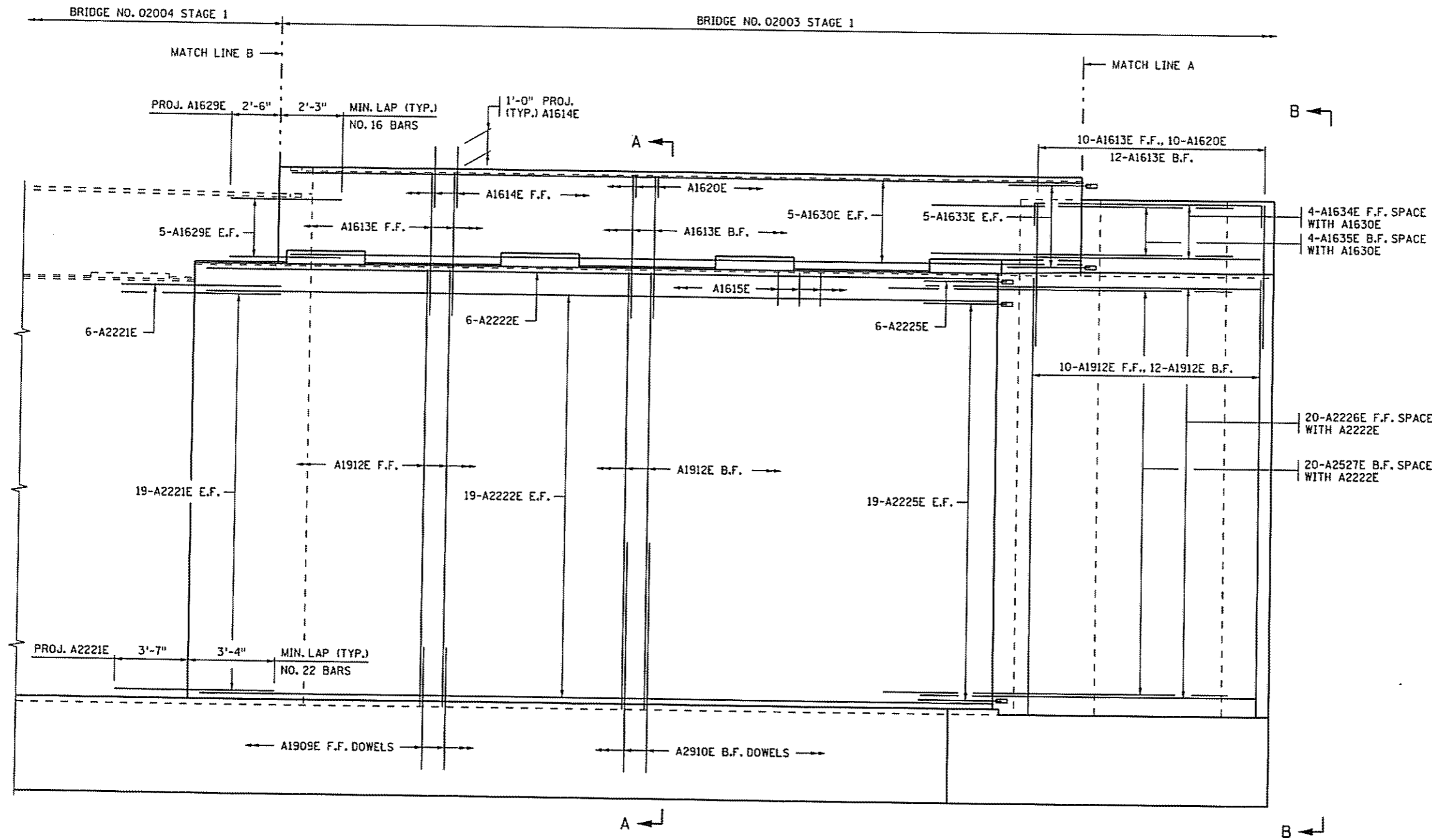
**NOTES:**

F.F. DENOTES FRONT FACE.

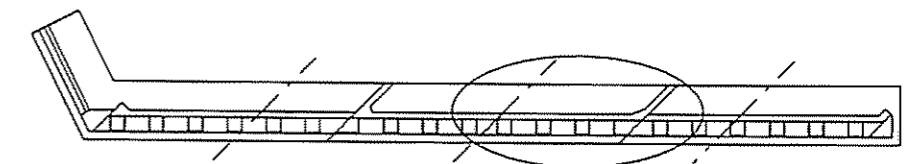
B.F. DENOTES BACK FACE.

E.F. DENOTES EACH FACE.

SEE SHEET NO. 23 FOR SECTION A-A & B-B.



**ELEVATION VIEW WEST ABUTMENT**



BRIDGE NO. 02004

BRIDGE NO. 02003

2/12/2009 5:\Design\020003\KGS\02003.KGS

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

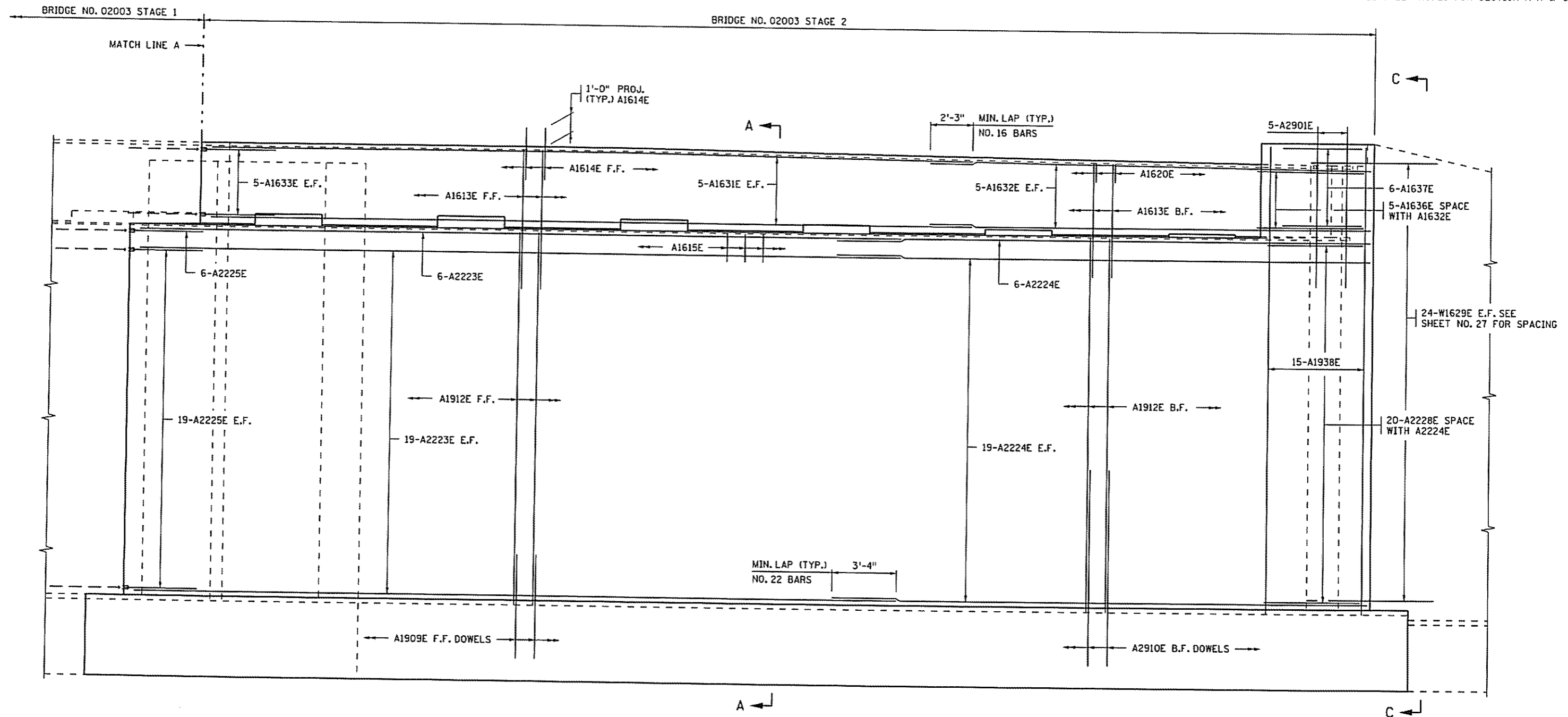
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**WEST ABUTMENT REINFORCEMENT**

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CHK: P.J.K.	CHK: J.A.J.	

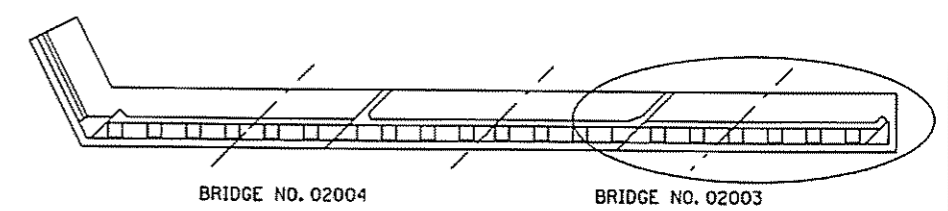
SHEET NO. 21 OF 72 SHEETS

BRIDGE NO. 02003

**NOTES:**  
 F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.  
 E.F. DENOTES EACH FACE.  
 SEE SHEET NO. 23 FOR SECTION A-A & C-C.



ELEVATION VIEW WEST ABUTMENT



2/12/2009 S:\Design\01\02003\KGS\02003.KGS

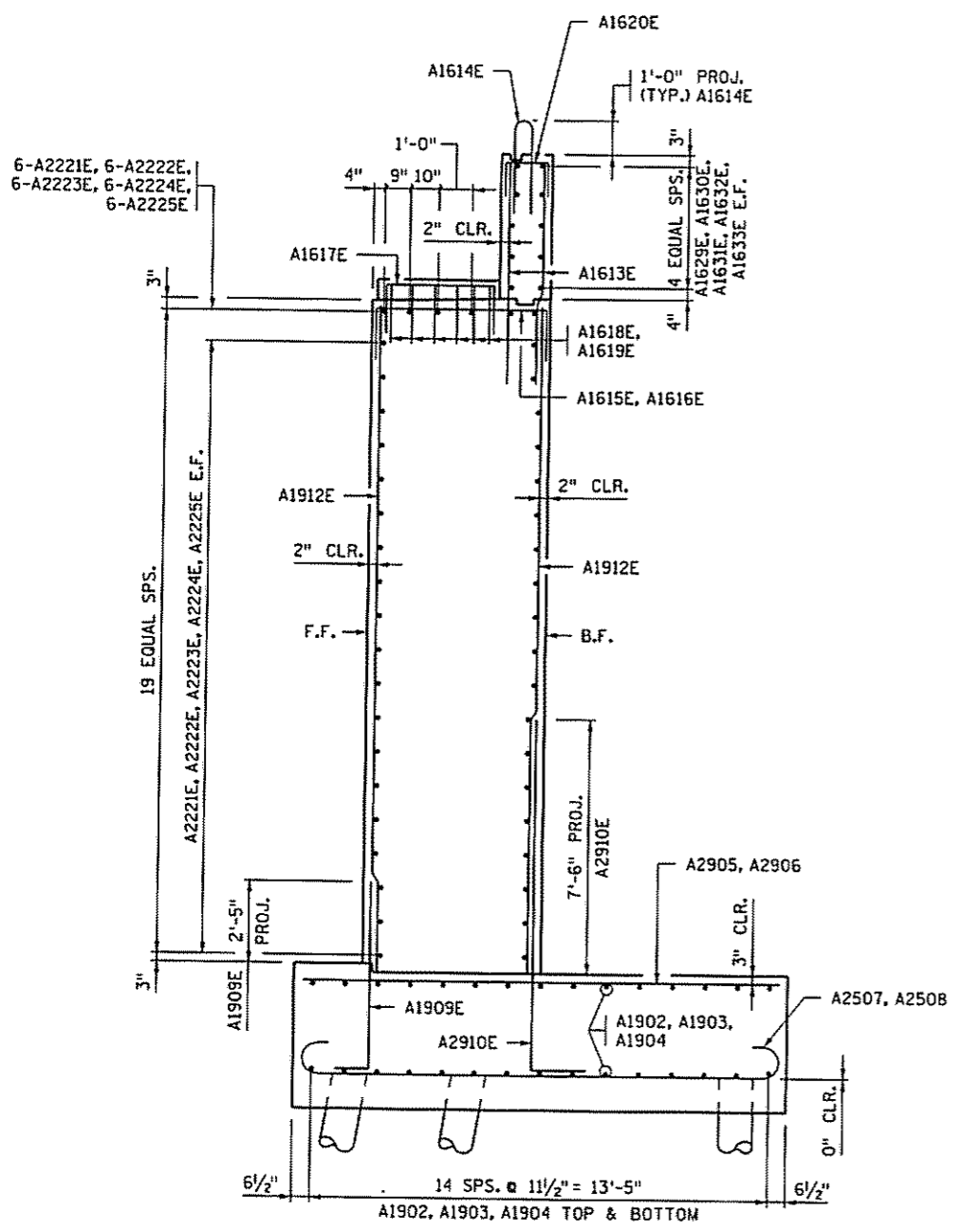
CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: <b>WEST ABUTMENT REINFORCEMENT</b>	DES: M.C.D.	DR: K.G.S.	APPROVED:	BRIDGE NO. <b>02003</b>
		CHK: P.J.K.	CHK: J.A.J.	2/23/09	
SHEET NO. 22 OF 72 SHEETS					

**NOTES:**

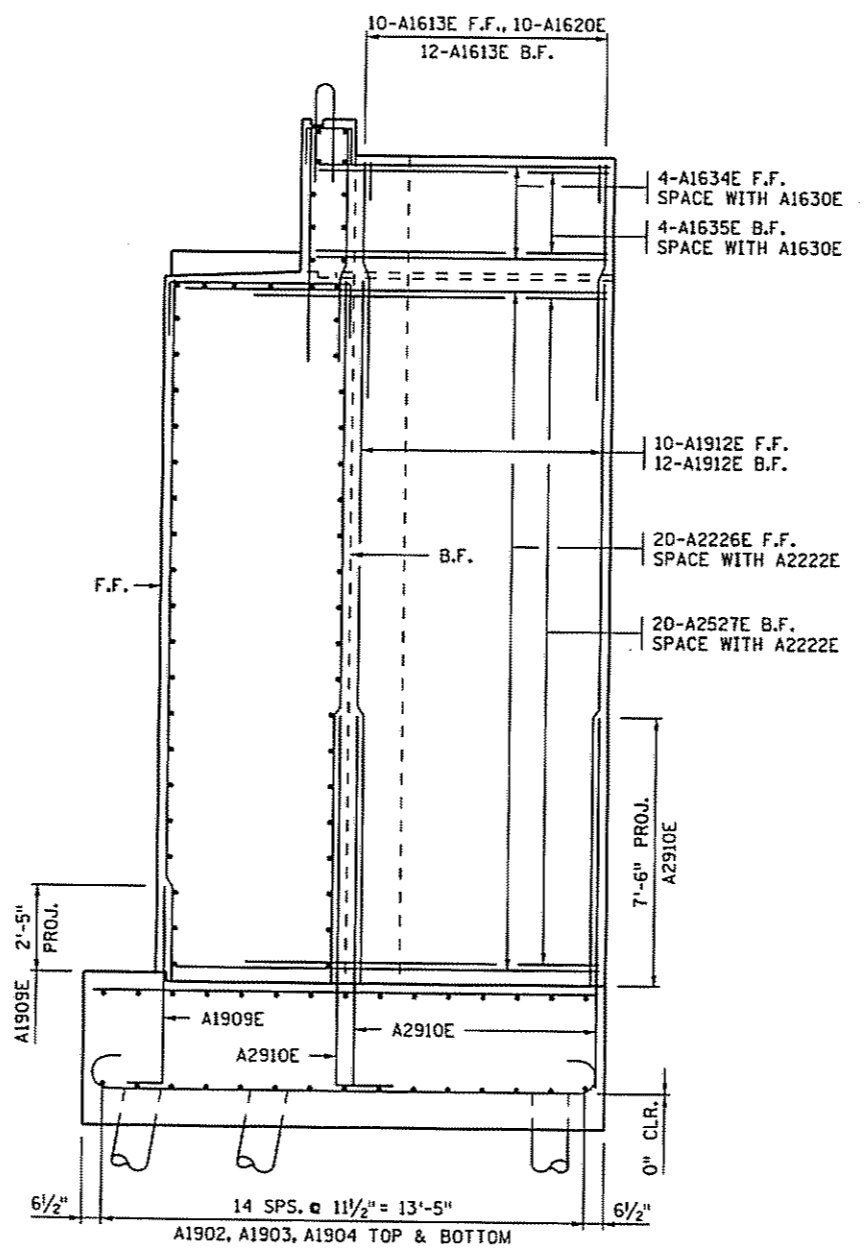
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B.F. DENOTES BACK FACE.

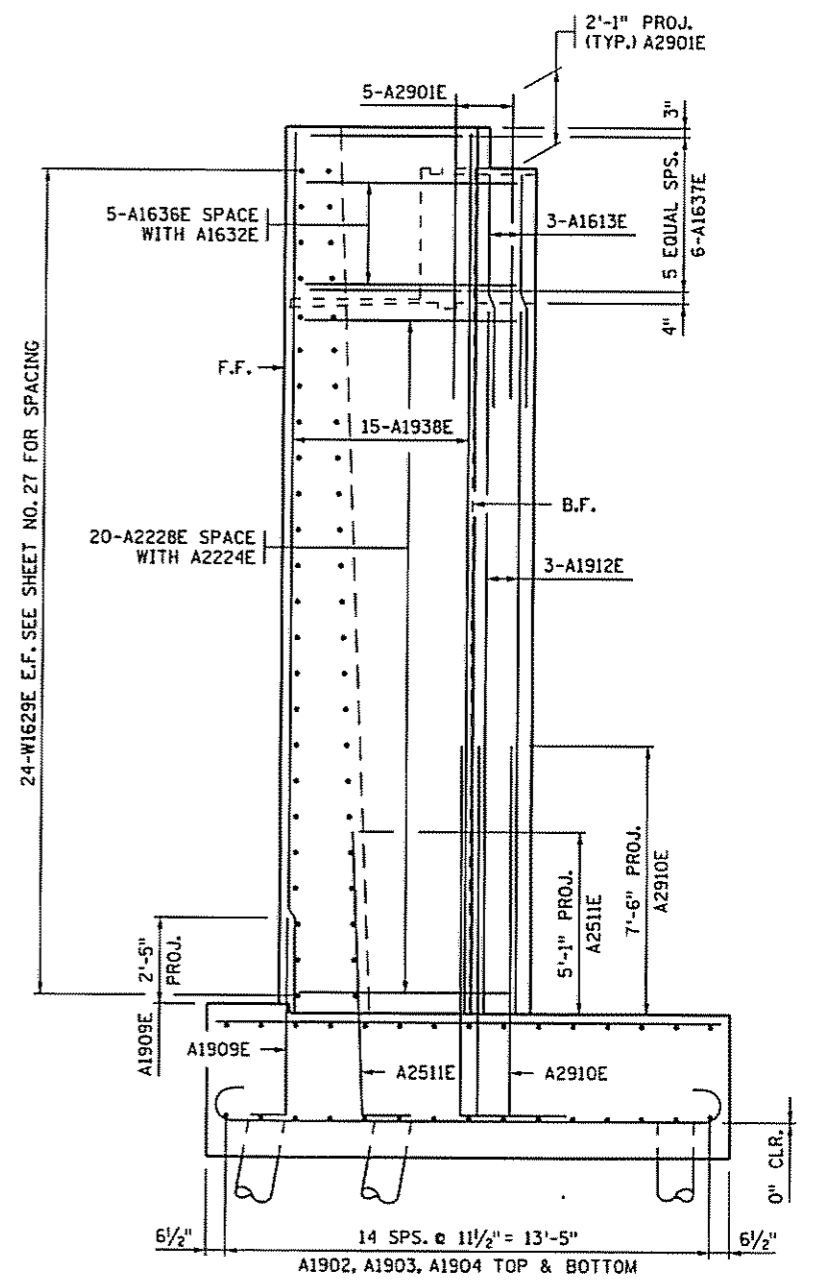
E.F. DENOTES EACH FACE.



**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

2/17/2009 5:15 Design/AN/02003/KGS/02003.KGS

CERTIFIED BY Moises C. Dimaculangan 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: **WEST ABUTMENT REINFORCEMENT**

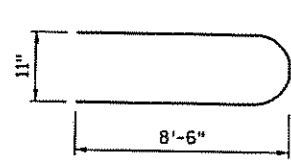
DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 23 OF 72 SHEETS

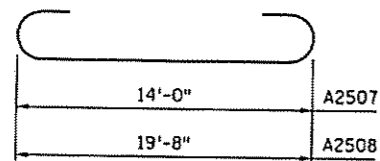
BRIDGE NO. 02003

BILL OF REINFORCEMENT FOR WEST ABUTMENT

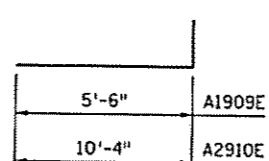
BAR	NO. STAGE 1	NO. STAGE 2	TOTAL NO.	LENGTH	SHAPE	LOCATION
A2901E	—	5	5	17'-7"		RAILING TIE
A1902	30	30	60	37'-6"		FOOTING LONGIT., TOP & BOTTOM
A1903	—	2 SERIES OF 15	2 SERIES OF 15	21'-0"		FOOTING LONGIT., TOP & BOTTOM
A1904	(1)	(1)	30	(1)		FOOTING COUPLERS
A2905	29	55	84	14'-0"		FOOTING TRANSVERSE TOP
A2906	14	14	28	19'-8"		FOOTING TRANSVERSE TOP
A2507	58	109	167	15'-10"		FOOTING TRANSVERSE BOTTOM
A2508	28	28	56	21'-6"		FOOTING TRANSVERSE BOTTOM
A1909E	36	71	107	6'-6"		FOOTING DOWEL
A2910E	54	61	115	11'-11"		FOOTING DOWEL
A2511E	—	3	3	9'-4"		FOOTING DOWEL
A1912E	90	119	209	19'-4"		BRIDGE SEAT VERTICAL EACH FACE
A1613E	90	119	209	6'-5"		PARAPET VERTICAL EACH FACE
A1614E	36	59	95	6'-10"		PARAPET VERTICAL FRONT FACE
A1615E	32	60	92	7'-11"		BRIDGE SEAT TIE
A1616E	5	5	10	8'-5"		BRIDGE SEAT TIE
A1617E	28	42	70	6'-3"		BRIDGE SEAT TIE
A1618E	18	36	54	6'-2"		BRIDGE SEAT TIE
A1619E	1 SERIES OF 6	—	1 SERIES OF 6	6'-0" TO 9'-0"		BRIDGE SEAT TIE
A1620E	46	59	105	4'-2"		PARAPET TIE
A2221E	44	—	44	7'-2"		BRIDGE SEAT HORIZONTAL
A2222E	44	—	44	35'-6"		BRIDGE SEAT HORIZONTAL
A2223E	—	44	44	40'-0"		BRIDGE SEAT HORIZONTAL
A2224E	—	44	44	28'-0"		BRIDGE SEAT HORIZONTAL
A2225E	(2)	(2)	44	(2)		BRIDGE SEAT COUPLERS
A2226E	20	—	20	20'-3"		BRIDGE SEAT HORIZONTAL
A2527E	20	—	20	16'-0"		BRIDGE SEAT HORIZONTAL
A2228E	—	20	20	15'-6"		BRIDGE SEAT HORIZONTAL
A1629E	10	—	10	5'-0"		PARAPET HORIZONTAL
A1630E	10	—	10	35'-6"		PARAPET HORIZONTAL
A1631E	—	10	10	40'-0"		PARAPET HORIZONTAL
A1632E	—	10	10	23'-3"		PARAPET HORIZONTAL
A1633E	(3)	(3)	10	(3)		PARAPET COUPLERS
A1634E	4	—	4	13'-10"		PARAPET HORIZONTAL
A1635E	4	—	4	16'-9"		PARAPET HORIZONTAL
A1636E	—	5	5	12'-3"		PARAPET HORIZONTAL
A1637E	—	6	6	16'-9"		PARAPET HORIZONTAL
A1938E	—	15	15	24'-4"		N.W. CORNER VERTICAL



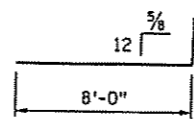
A2901E



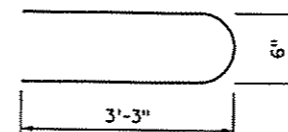
A2507, A2508



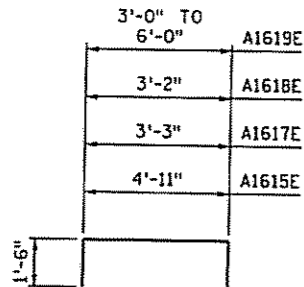
A1909E, A2910E



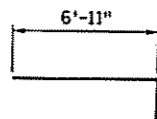
A2511E



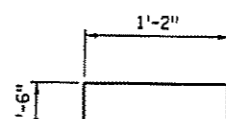
A1614E



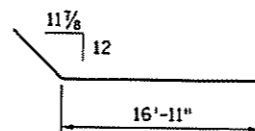
A1615E, A1617E, A1618E, A1619E



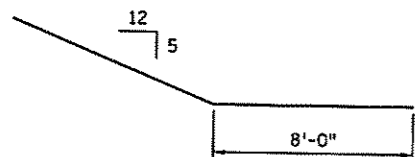
A1616E



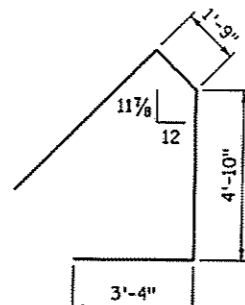
A1620E



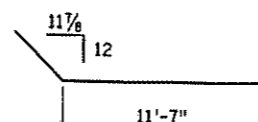
A2226E



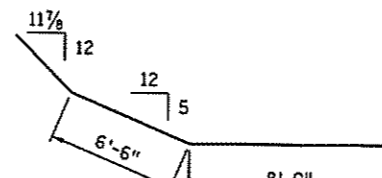
A2527E



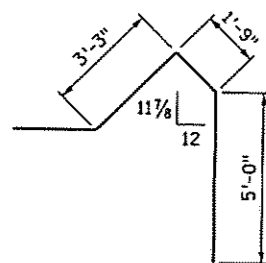
A2228E



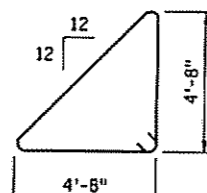
A1634E



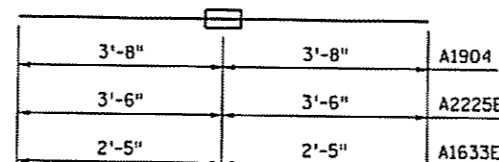
A1635E



A1636E



A1637E



A1904, A2225E, A1633E

NOTES:

- (1) A1904 NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-19". 3'-6" MINIMUM LAP EACH SIDE OF COUPLER.
- (2) A2225E NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS (EPOXY COATED)". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-22". 3'-4" MINIMUM LAP EACH SIDE OF COUPLER.
- (3) A1633E NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS (EPOXY COATED)". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-16". 2'-3" MINIMUM LAP EACH SIDE OF COUPLER.

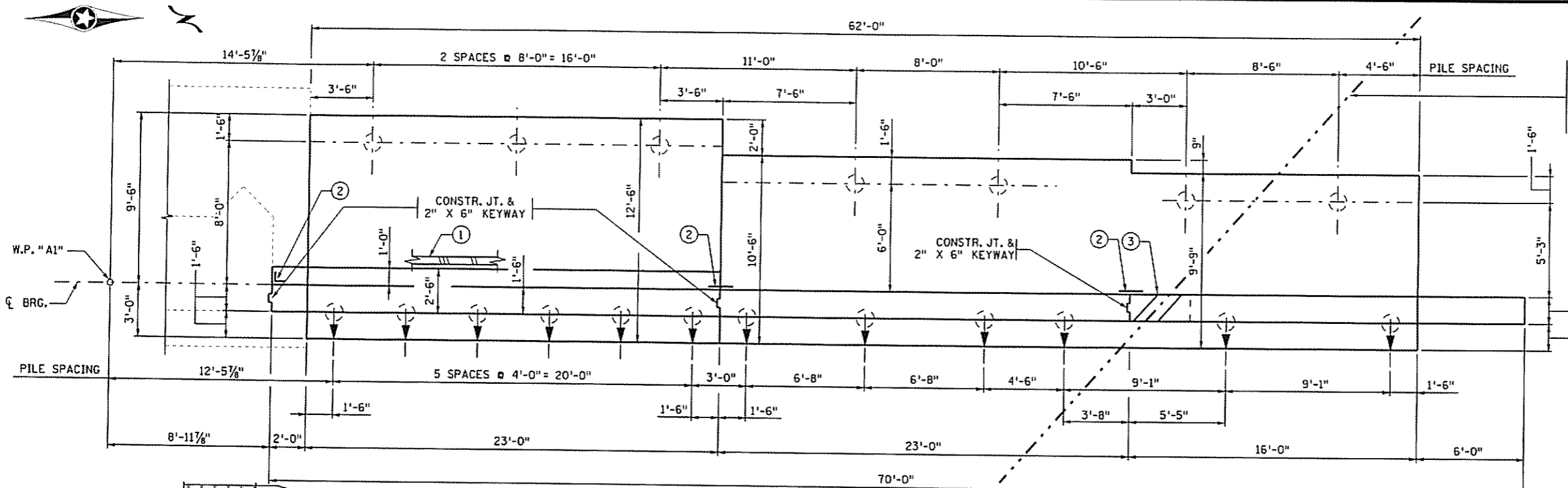
S:\Design\0102003\KGS\020033.KGS 2/12/2009

CERTIFIED BY *M.C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

WEST ABUTMENT REINFORCEMENT

DES: M.C.D. DR: K.G.S. APPROVED: 2/23/09  
 CHK: P.J.K. CHK: J.A.J.  
 SHEET NO. 24 OF 72 SHEETS

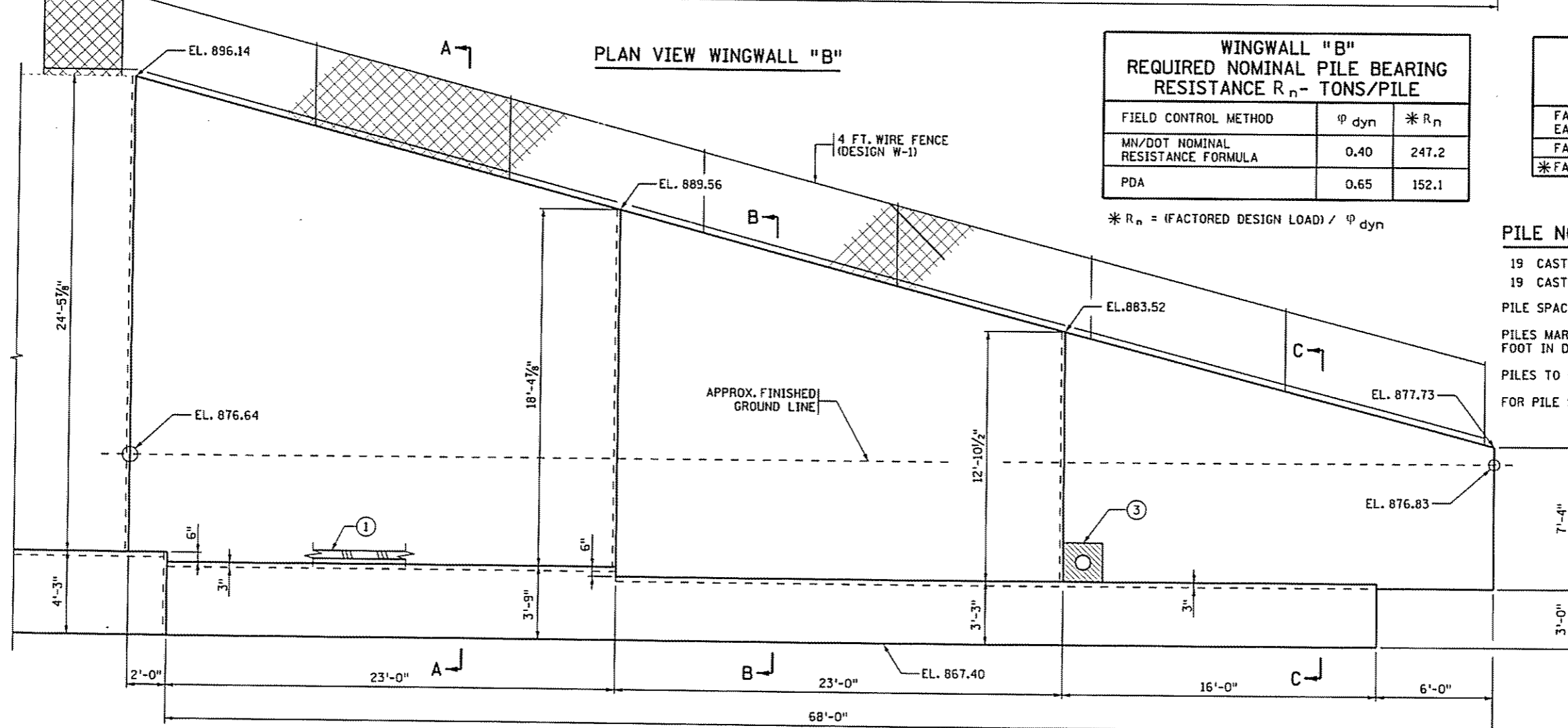
BRIDGE NO. 02003



FIBER OPTIC LINE.  
THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING THE FIBER OPTIC LINE. ANY DAMAGE TO THE FIBER OPTIC LINE IS THE CONTRACTORS RESPONSIBILITY. CONTACT BRIDGE OFFICE IF NEEDED FOR REVISED PILE LAYOUT.

③ EXACT ELEVATION OF FIBER OPTIC LINE IS NOT KNOWN. BLOCK OUT WALL FORMS AND INSTALL SPLIT CONDUIT SLEEVE.

PAYMENT FOR LOCATING, PROTECTING, AND PROVIDING SPLIT CONDUIT SLEEVE SHALL BE CONSIDERED AN INCIDENTAL EXPENSE FOR WHICH NO DIRECT PAYMENT WILL BE MADE.



WINGWALL "B" REQUIRED NOMINAL PILE BEARING RESISTANCE $R_n$ - TONS/PILE		
FIELD CONTROL METHOD	$\phi_{dyn}$	* $R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	247.2
PDA	0.65	152.1

\*  $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{dyn}$

WINGWALL "B" COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	95.6
FACTORED LIVE LOAD	3.3
* FACTORED DESIGN LOAD	98.9

\* BASED ON STRENGTH I LOAD COMBINATION

**PILE NOTES**

- 19 CAST-IN-PLACE CONC. PILES EST. LENGTH 50 FT.
- 19 CAST-IN-PLACE CONC. PILES REQ'D FOR WINGWALL "B"
- PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.
- PILES MARKED THUS  $\odot$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.
- PILES TO HAVE A NOMINAL DIAMETER OF 12".
- FOR PILE SPLICE DETAILS SEE DETAIL B201.

**NOTES:**

- ① PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- ② MEMBRANE WATERPROOFING SYSTEM PER MN/DOT SPEC. 2481.3B. PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).

**ELEVATION WINGWALL "B"**  
(PILES NOT SHOWN)

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**WINGWALL "B" GEOMETRICS**

DES: P.J.K. DR: N.A. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.  
SHEET NO. 25 OF 72 SHEETS

BRIDGE NO. 02003

**SUMMARY OF QUANTITIES  
FOR WINGWALL "B"**

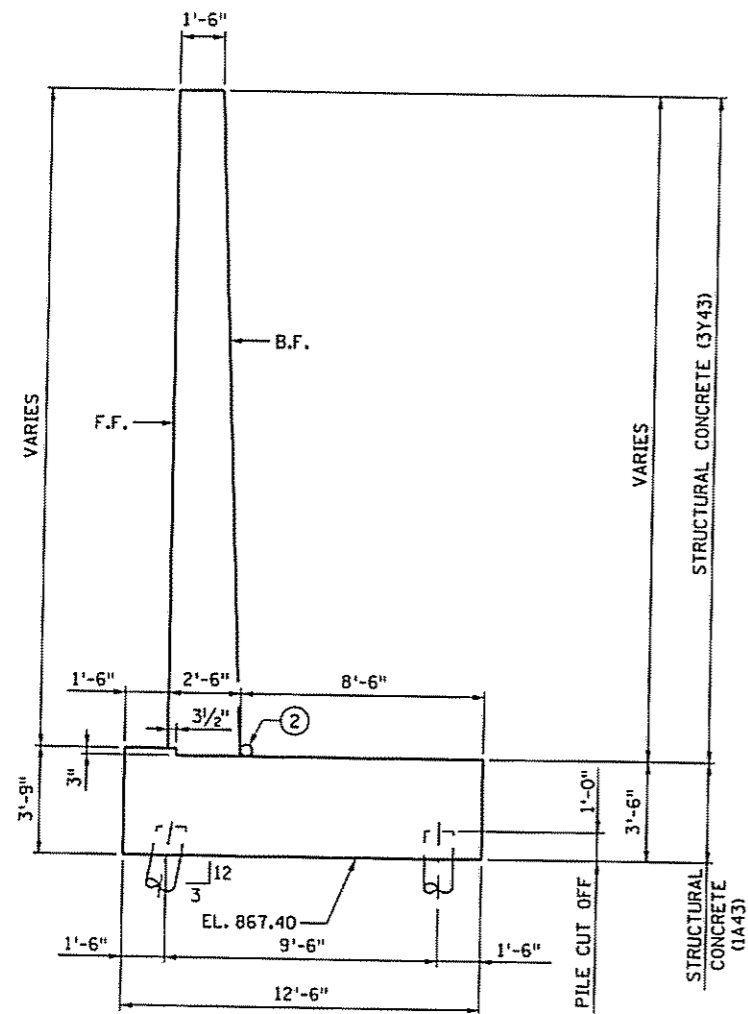
STRUCTURAL CONCRETE (1A43)	82 CU. YD.
STRUCTURAL CONCRETE (3Y43)	73 CU. YD.
REINFORCEMENT BARS	6590 POUND
REINFORCEMENT BARS (EPOXY COATED)	10440 POUND
C-I-P CONCRETE PILING DELIVERED 12"	950 LIN. FT.
C-I-P CONCRETE PILING DRIVEN 12"	950 LIN. FT.
① MEMBRANE WATERPROOFING	57 LIN. FT.

① PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).

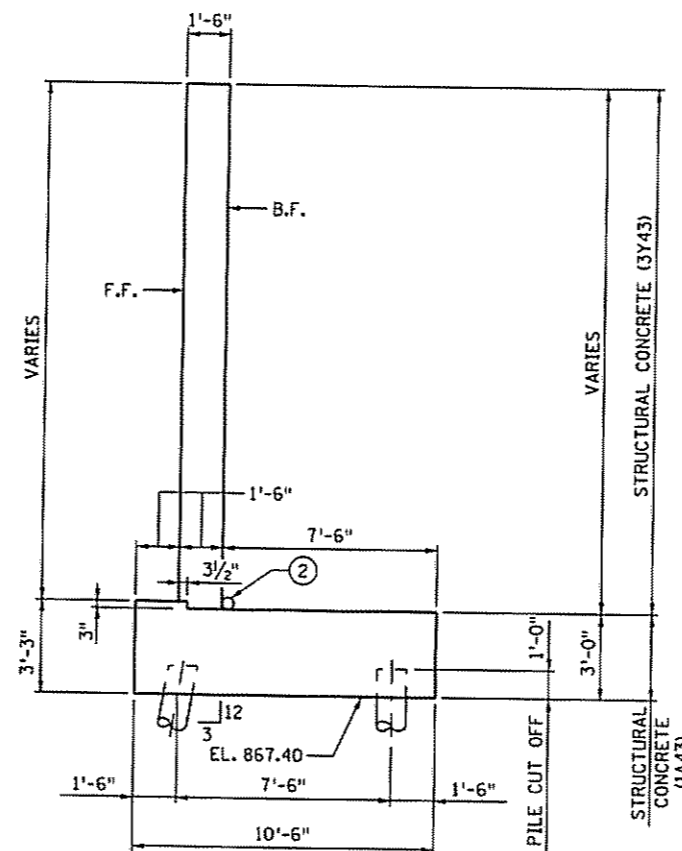
② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.

F.F. DENOTES FRONT FACE.

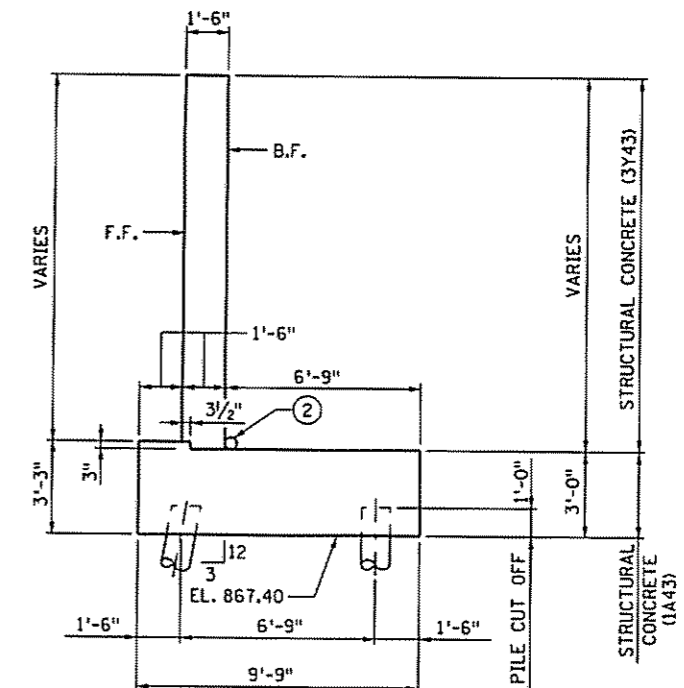
B.F. DENOTES BACK FACE.



**SECTION A-A**



**SECTION B-B**



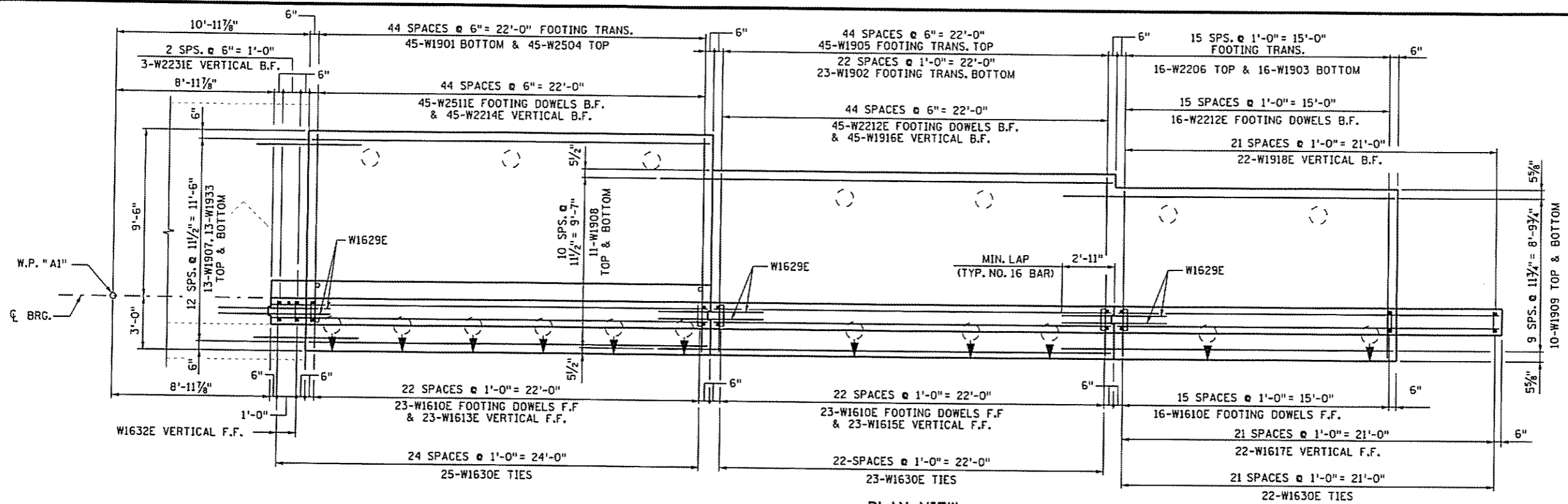
**SECTION C-C**

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

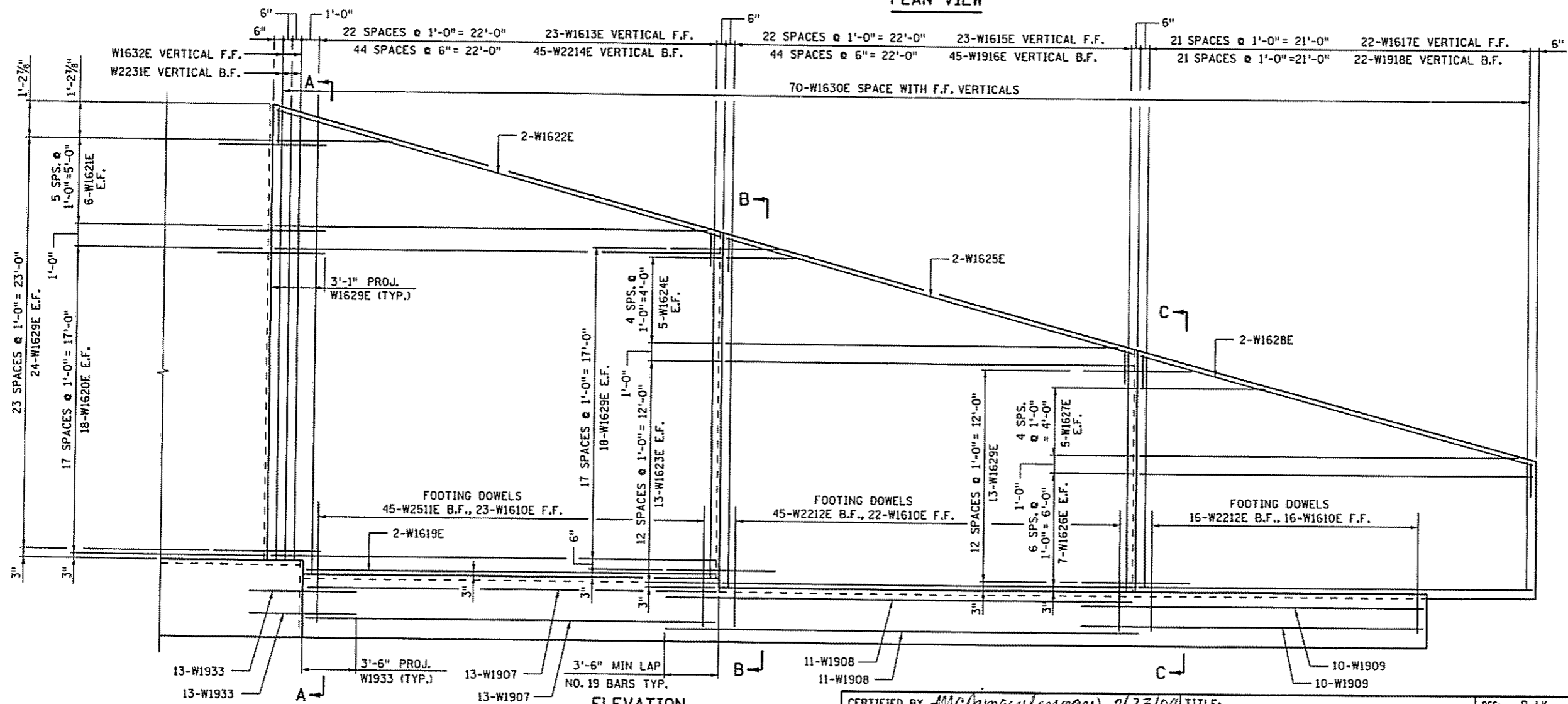
TITLE:  
**WINGWALL "B" GEOMETRICS**

DES: P.J.K. DR: N.A. APPROVED: 2/23/09  
 CHK: M.C.D. CHK: J.A.J.  
 SHEET NO. 26 OF 72 SHEETS

BRIDGE NO.  
 02003



PLAN VIEW

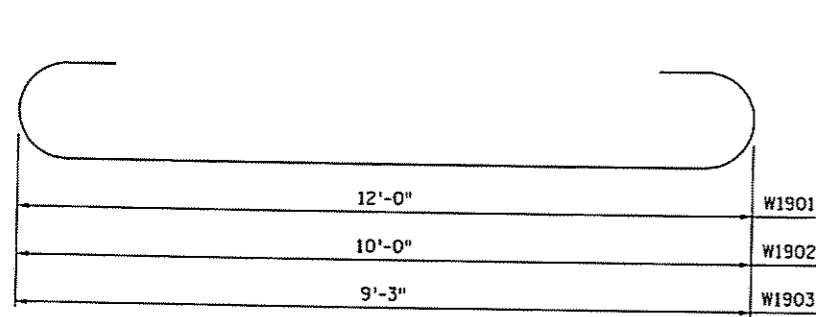


ELEVATION  
(PILES NOT SHOWN)

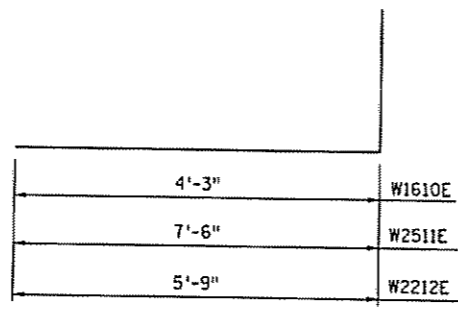
NOTES:  
 F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.  
 E.F. DENOTES EACH FACE.

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE NAME: MOISES C. DIMACULANGAN LIC. NO. 46209		TITLE: <b>WINGWALL "B" REINFORCEMENT</b>		DES: P.J.K. CHK: M.C.D.	DR: N.A. CHK: J.A.J.	APPROVED: <i>2/23/09</i>	BRIDGE NO. 02003
SHEET NO. 27 OF 72 SHEETS							

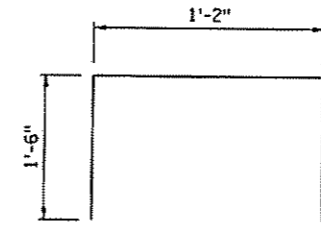




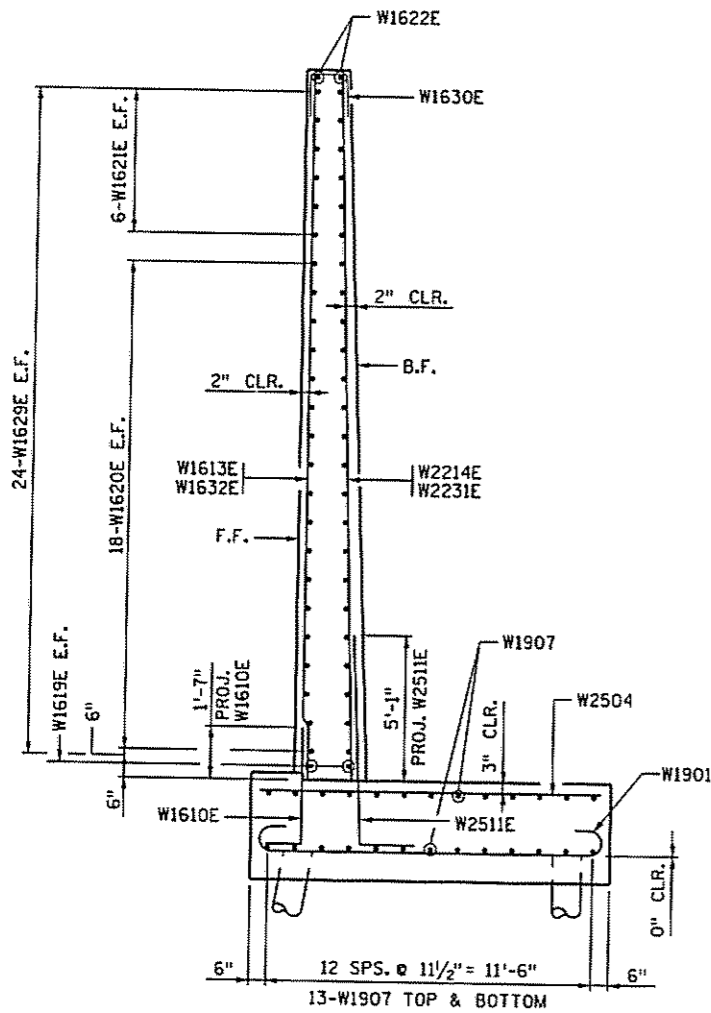
W1901, W1902 & W1903



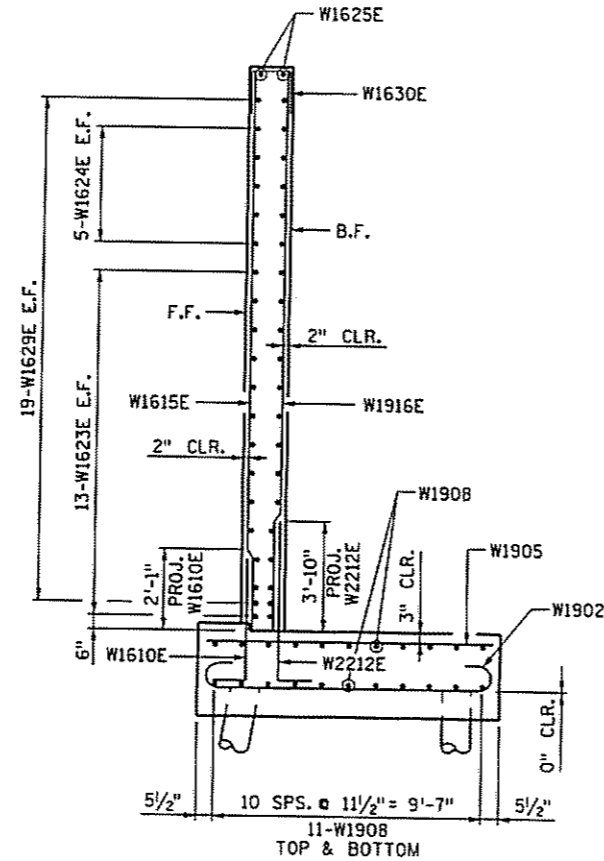
W1610E, W2511E & W2212E



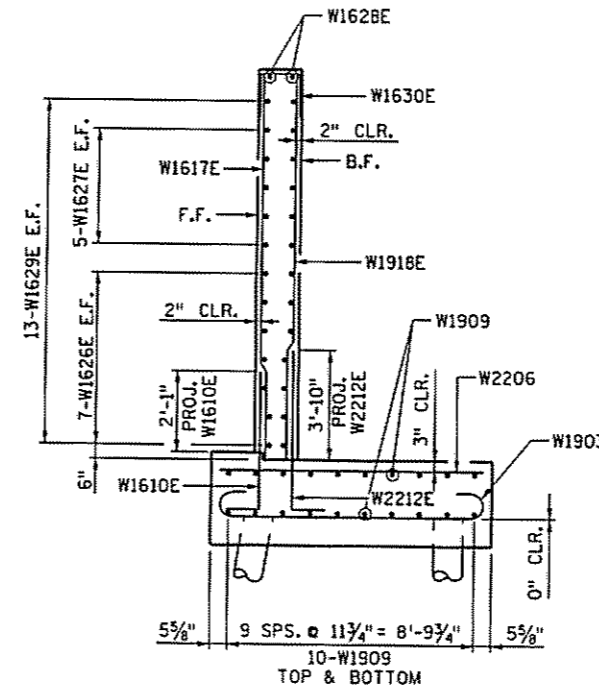
W1630E



SECTION A-A



SECTION B-B



SECTION C-C

NOTES:

- F.F. DENOTES FRONT FACE.
- B.F. DENOTES BACK FACE.
- E.F. DENOTES EACH FACE.

BILL OF REINFORCEMENT FOR WINGWALL "B"

BAR	NO.	LENGTH	SHAPE	LOCATION
W1901	45	13'-4"	U	FOOTING TRANSVERSE BOTTOM
W1902	23	11'-4"	U	FOOTING TRANSVERSE BOTTOM
W1903	16	10'-7"	U	FOOTING TRANSVERSE BOTTOM
W2504	45	12'-0"	U	FOOTING TRANSVERSE TOP
W1905	45	10'-0"	U	FOOTING TRANSVERSE TOP
W2206	16	9'-3"	U	FOOTING TRANSVERSE TOP
W1907	26	22'-8"	U	FOOTING LONGITUDINAL TOP & BOTTOM
W1908	22	26'-6"	U	FOOTING LONGITUDINAL TOP & BOTTOM
W1909	20	19'-6"	U	FOOTING LONGITUDINAL TOP & BOTTOM
W1610E	62	5'-1"	J	FOOTING DOWEL F.F.
W2511E	45	8'-10"	J	FOOTING DOWEL B.F.
W2212E	61	6'-11"	J	FOOTING DOWEL B.F.
W1613E	1 SERIES OF 23	24'-2" TO 18'-4"	—	WINGWALL VERTICAL F.F.
W2214E	1 SERIES OF 45	24'-5" TO 18'-7"	—	WINGWALL VERTICAL B.F.
W1615E	1 SERIES OF 23	18'-7" TO 12'-10"	—	WINGWALL VERTICAL F.F.
W1916E	1 SERIES OF 45	18'-10" TO 13'-1"	—	WINGWALL VERTICAL B.F.
W1617E	1 SERIES OF 22	12'-6" TO 7'-0"	—	WINGWALL VERTICAL F.F.
W1918E	1 SERIES OF 22	12'-7" TO 7'-1"	—	WINGWALL VERTICAL B.F.
W1619E	2	22'-8"	—	WINGWALL HORIZONTAL
W1620E	36	24'-8"	—	WINGWALL HORIZONTAL
W1621E	2 SERIES OF 6	22'-10" TO 3'-10"	—	WINGWALL HORIZONTAL
W1622E	2	25'-5"	—	WINGWALL HORIZONTAL
W1623E	26	22'-8"	—	WINGWALL HORIZONTAL
W1624E	2 SERIES OF 5	20'-8" TO 5'-6"	—	WINGWALL HORIZONTAL
W1625E	2	23'-5"	—	WINGWALL HORIZONTAL
W1626E	14	21'-8"	—	WINGWALL HORIZONTAL
W1627E	2 SERIES OF 5	20'-6" TO 5'-3"	—	WINGWALL HORIZONTAL
W1628E	2	22'-5"	—	WINGWALL HORIZONTAL
W1629E	112	6'-2"	—	WINGWALL HORIZONTAL
W1630E	70	4'-2"	U	WINGWALL TIE
W2231E	3	24'-2"	—	WINGWALL VERTICAL B.F.
W1632E	2	23'-11"	—	WINGWALL VERTICAL F.F.
W1933	26	7'-0"	—	FOOTING LONGITUDINAL TOP & BOTTOM

CERTIFIED BY *M.C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

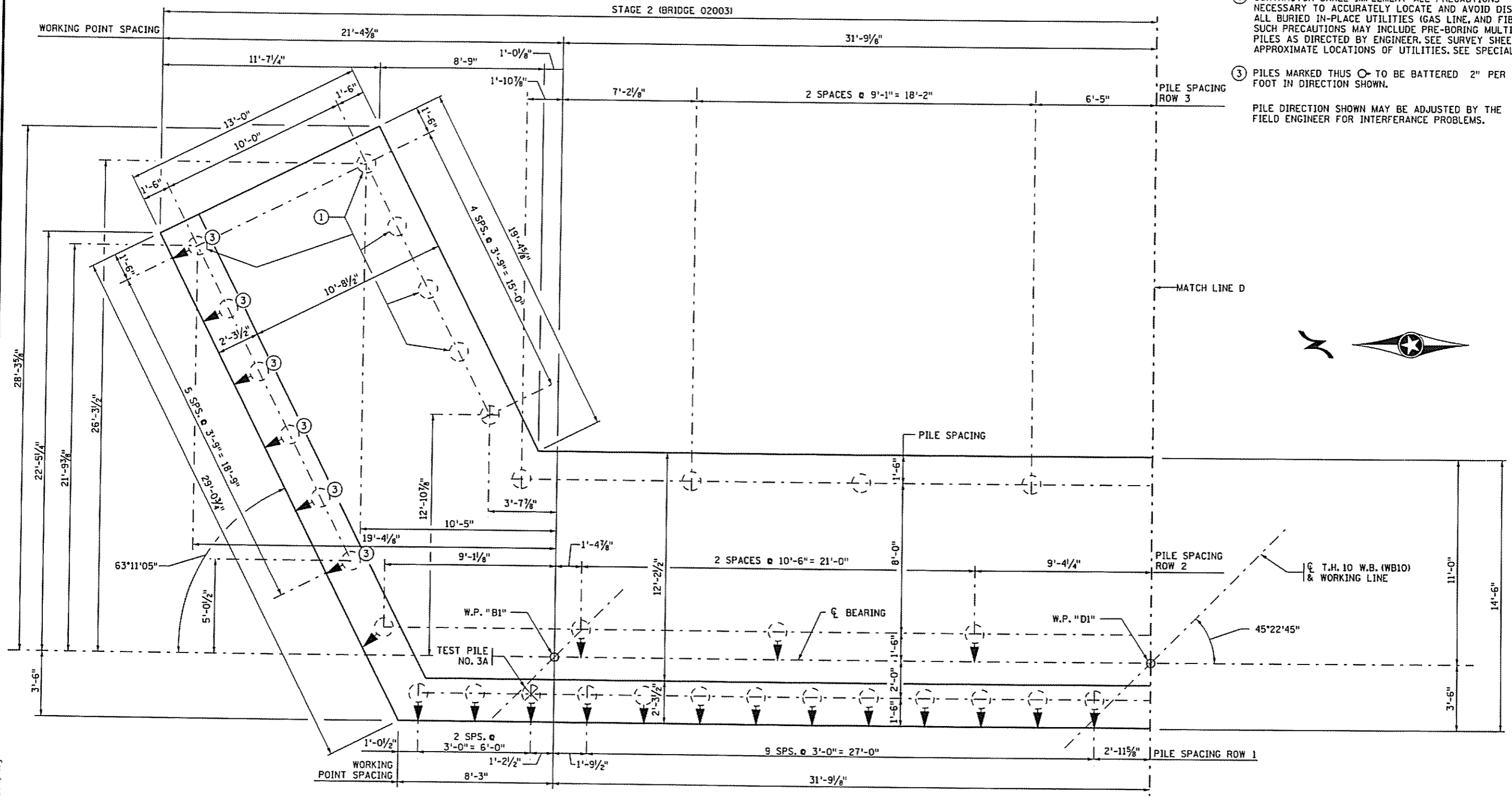
TITLE:  
 WINGWALL "B" REINFORCEMENT

DES: P.J.K. DR: N.A. APPROVED: 2/23/09  
 CHK: M.C.D. CHK: J.A.J.  
 SHEET NO. 28 OF 72 SHEETS

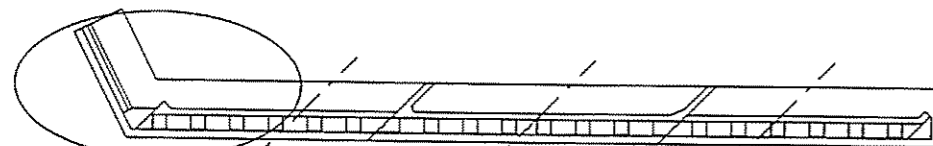
BRIDGE NO. 02003

**NOTE:**

- ① CONTRACTOR SHALL IMPLEMENT ALL PRECAUTIONS NECESSARY TO ACCURATELY LOCATE AND AVOID DISTURBING ALL BURIED IN-PLACE UTILITIES (GAS LINE, AND FIBER OPTIC LINE). SUCH PRECAUTIONS MAY INCLUDE PRE-BORING MULTIPLE PILES AS DIRECTED BY ENGINEER. SEE SURVEY SHEETS FOR APPROXIMATE LOCATIONS OF UTILITIES. SEE SPECIAL PROVISIONS.
  - ③ PILES MARKED THUS  $\odot$  TO BE BATTERED 2" PER FOOT IN DIRECTION SHOWN.
- PILE DIRECTION SHOWN MAY BE ADJUSTED BY THE FIELD ENGINEER FOR INTERFERENCE PROBLEMS.



**PLAN VIEW EAST ABUTMENT**



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**EAST ABUTMENT GEOMETRICS**

DES: M.C.D. DR: P.F. APPROVED: *2/23/09*  
 CHK: P.J.K. CHK: J.A.J.  
 SHEET NO. 29 OF 72 SHEETS

BRIDGE NO.  
**02003**

EAST ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	95.6
FACTORED LIVE LOAD	3.3
* FACTORED DESIGN LOAD	98.9

\* BASED ON STRENGTH I LOAD COMBINATION

EAST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE $R_n$ - TONS/PILE		
FIELD CONTROL METHOD	$\phi_{dyn}$	* $R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	247.2
PDA	0.65	152.1

\*  $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{dyn}$

### PILE NOTES

- 2 CAST-IN-PLACE CONC. TEST PILES 60 FT. LONG
- 65 CAST-IN-PLACE CONC. PILES EST. LENGTH 50 FT.
- 67 CAST-IN-PLACE CONC. PILES REQ'D FOR EAST ABUTMENT

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\odot$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN EXCEPT AS NOTED.

PILES TO HAVE A NOMINAL DIAMETER OF 12".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

- ③ PILES MARKED THUS  $\odot$  TO BE BATTERED 2" PER FOOT IN DIRECTION SHOWN.

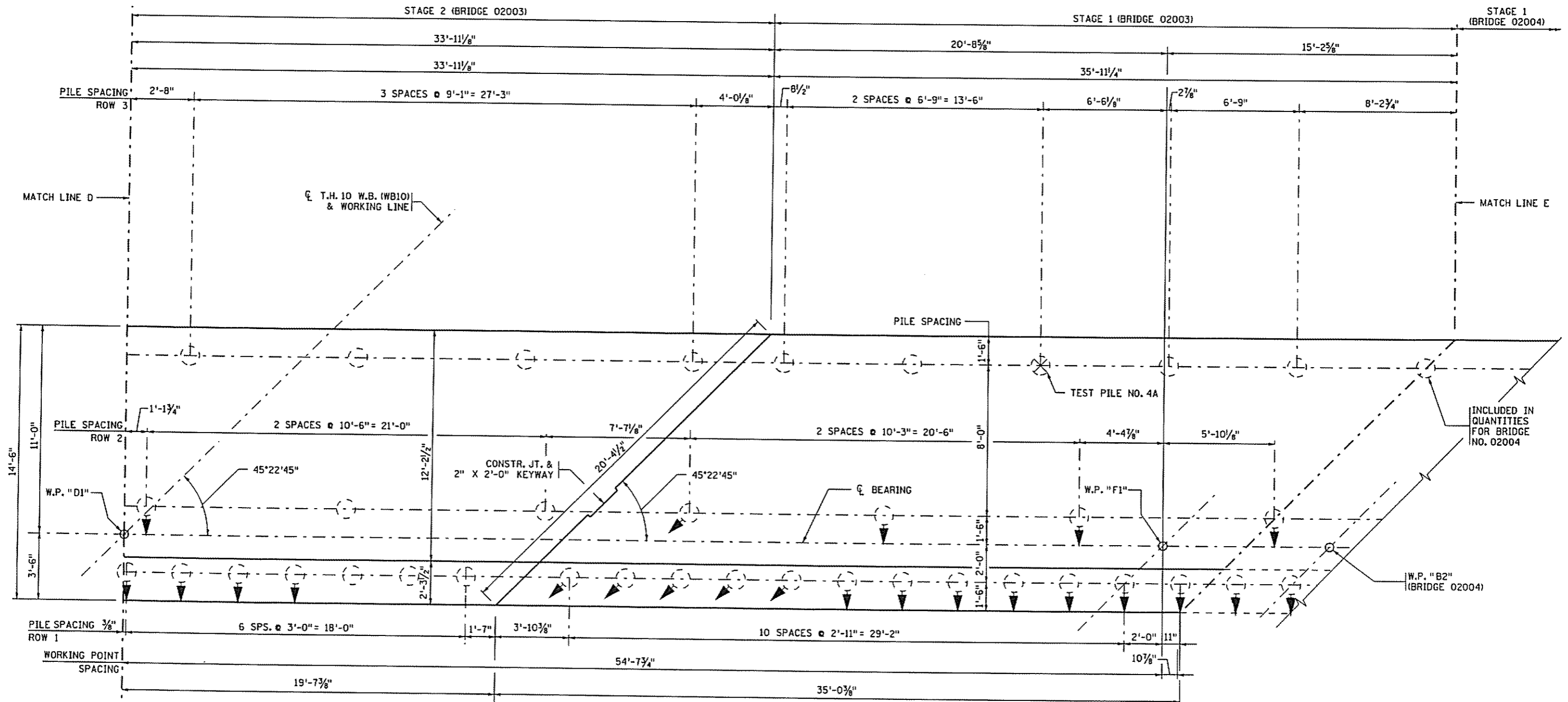
PILE DIRECTION SHOWN MAY BE ADJUSTED BY THE FIELD ENGINEER FOR INTERFERENCE PROBLEMS.

### SUMMARY OF QUANTITIES FOR EAST ABUTMENT

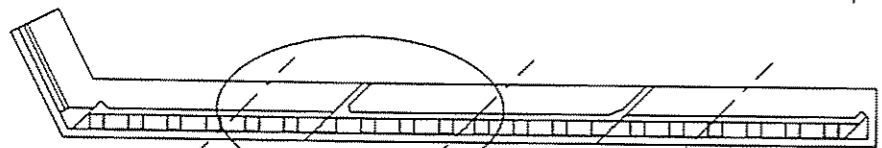
	STAGE 1	STAGE 2	TOTAL
STRUCTURAL CONCRETE (1A43)	78	184	262 CU. YD.
STRUCTURAL CONCRETE (3Y43)	176	330	506 CU. YD.
REINFORCEMENT BARS	8020	16920	24940 POUND
REINFORCEMENT BARS (EPOXY COATED)	13310	25060	38370 POUND
① C-I-P CONCRETE PILING DELIVERED 12"	1000	2250	3250 LIN. FT.
① C-I-P CONCRETE PILING DRIVEN 12"	1000	2250	3250 LIN. FT.
② C-I-P CONCRETE TEST PILE 60 FT. LONG 12"	1	1	2 EACH
MEMBRANE WATERPROOFING	58	120	178 LIN. FT.
COUPLERS (REINFORCEMENT BARS) T-16	10	—	10 EACH
COUPLERS (REINFORCEMENT BARS) T-19	30	—	30 EACH
COUPLERS (REINFORCEMENT BARS) T-22	48	—	48 EACH
PILE REDRIVING	1	1	2 EACH
PILE ANALYSIS	1	—	1 EACH

- ① DOES NOT INCLUDE TEST PILES.

- ② PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).



PLAN VIEW EAST ABUTMENT



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

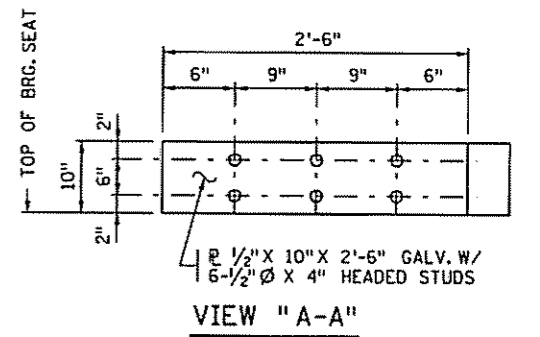
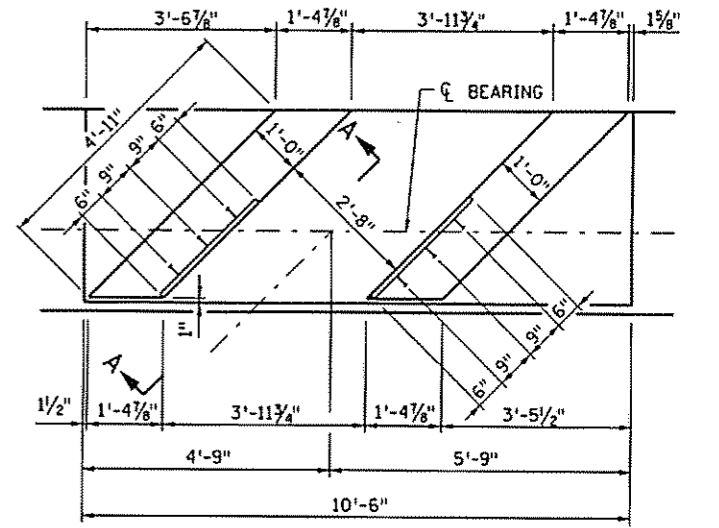
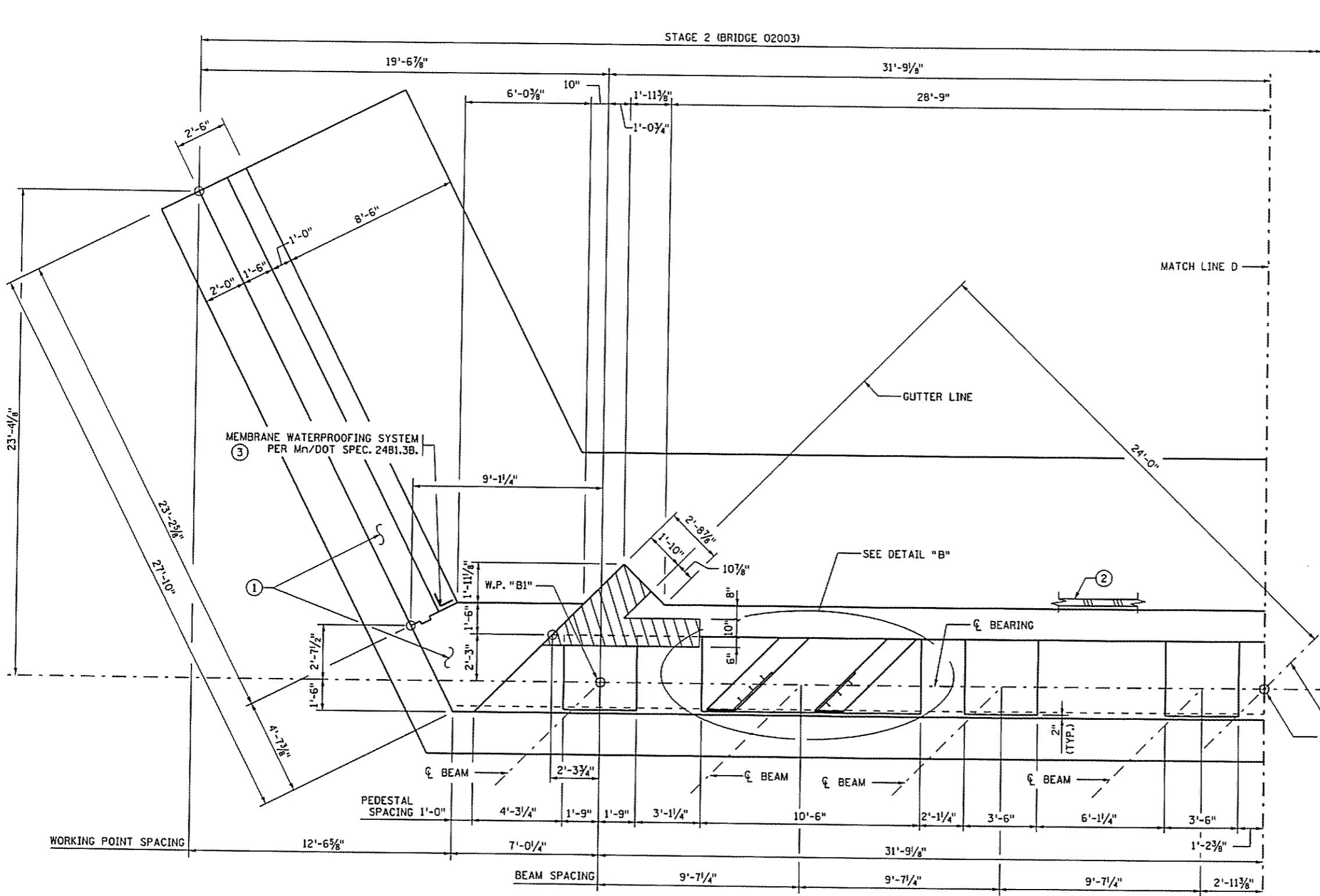
TITLE:  
 EAST ABUTMENT GEOMETRICS

DES: M.C.D. DR: P.F. APPROVED: 2/23/09  
 CHK: P.J.K. CHK: J.A.J.

BRIDGE NO.  
 02003

SHEET NO. 30 OF 72 SHEETS

STAGE 2 (BRIDGE 02003)

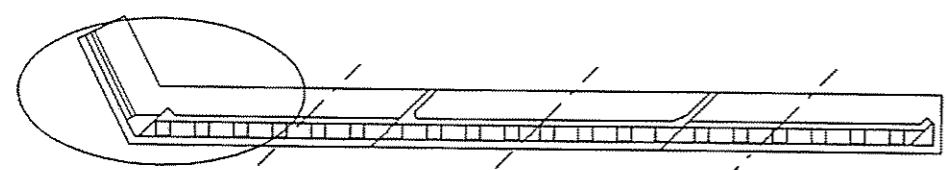


GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394. PLATES TO BE STRUCTURAL STEEL, Mn/DOT SPEC. 3306. PLATES TO BE INCLUDED IN PRICE BID FOR OTHER ITEMS. ESTIMATED WEIGHT = 42 LB. EACH, 2 REQUIRED FOR EAST ABUTMENT.

PLAN VIEW EAST ABUTMENT

NOTES:

- 1 THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
- 2 PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- 3 PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43). FOR WINGWALL DETAILS SEE SHEET NO. 35.



BRIDGE NO. 02003

BRIDGE NO. 02004

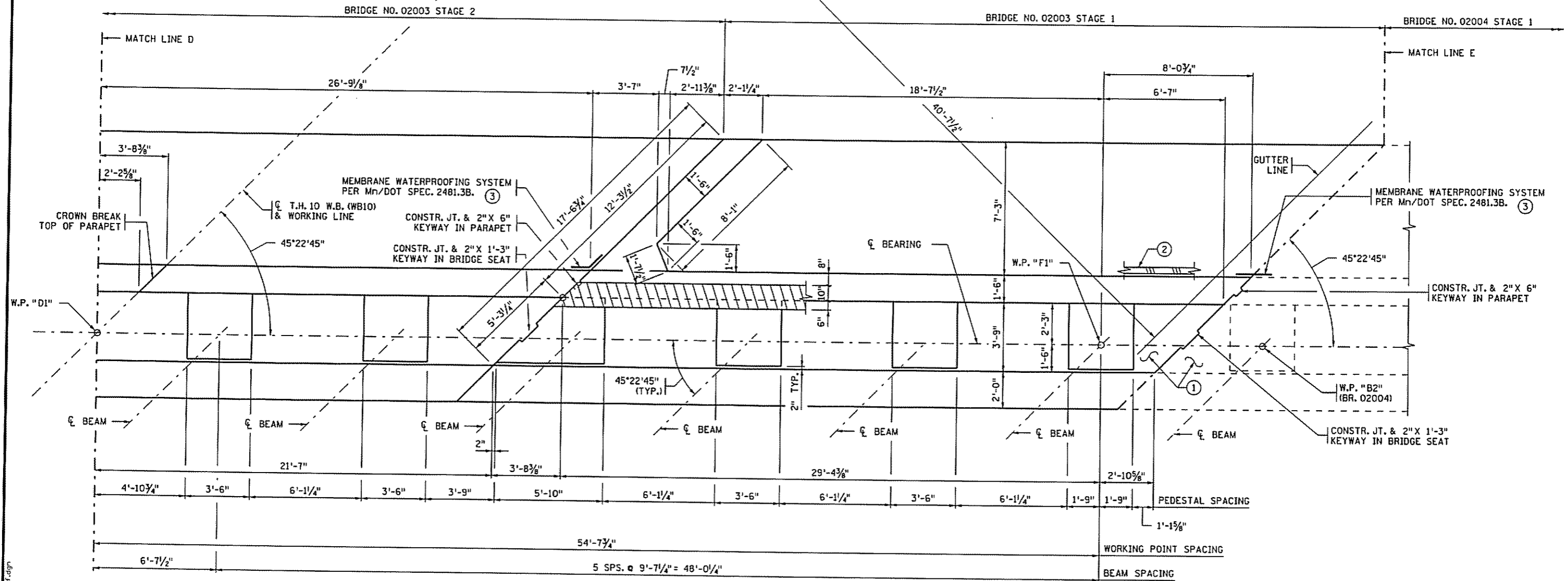
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: EAST ABUTMENT GEOMETRICS

DES: M.C.D. DR: P.F. APPROVED: 2/23/09  
 CHK: P.J.K. CHK: J.A.J.

BRIDGE NO. 02003  
 SHEET NO. 31 OF 72 SHEETS

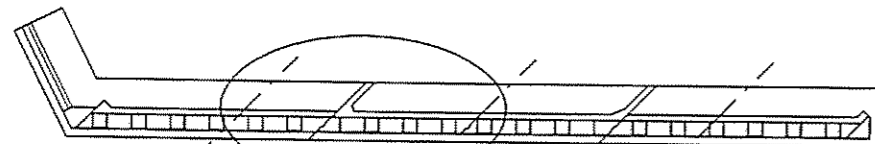
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PLAN VIEW EAST ABUTMENT

NOTES:

- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
- ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).



BRIDGE NO. 02003

BRIDGE NO. 02004

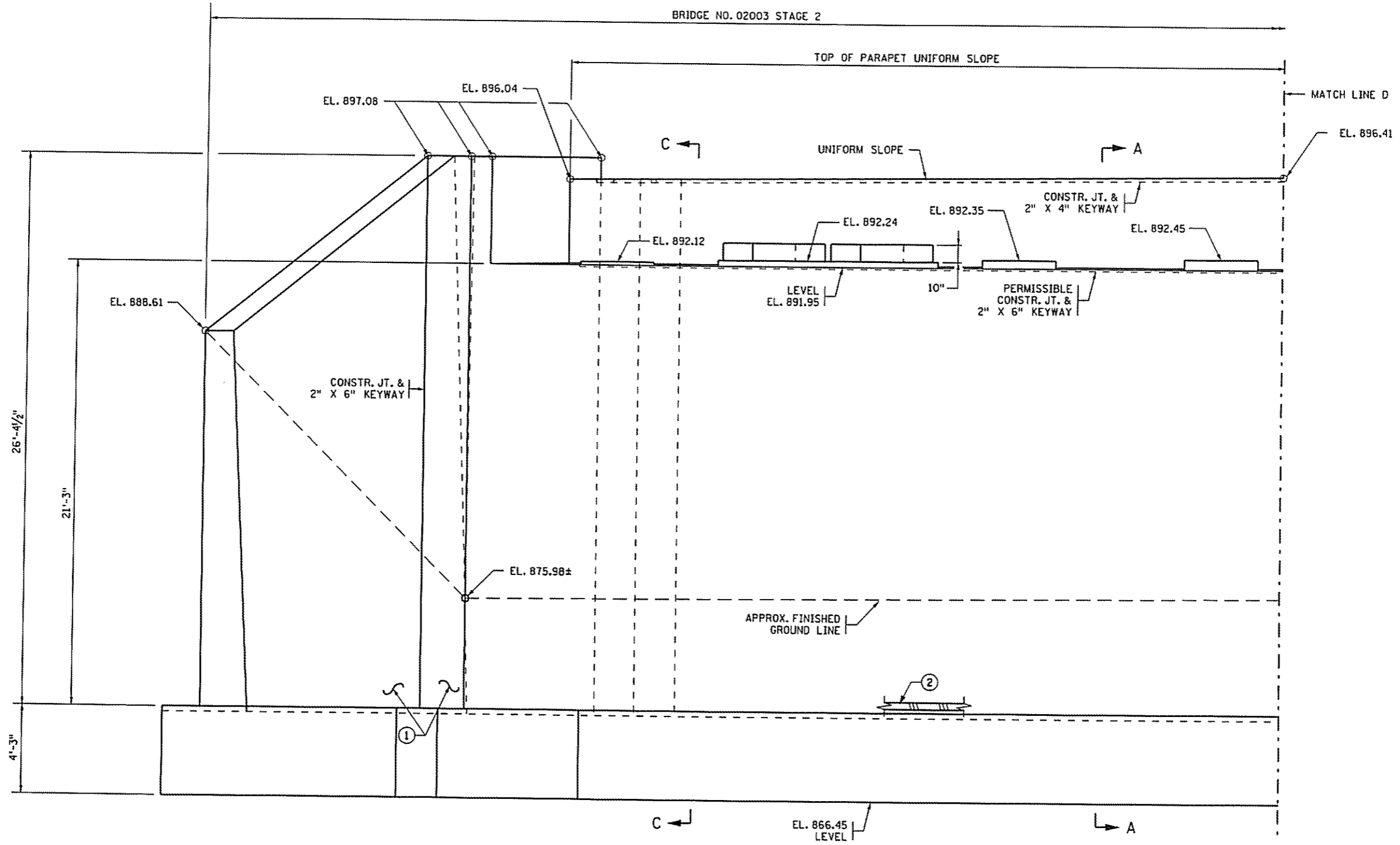
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: EAST ABUTMENT GEOMETRICS

DES: M.C.D.	DR: P.F.	APPROVED: <i>2/23/09</i>
CHK: P.J.K.	CHK: J.A.J.	

BRIDGE NO. 02003

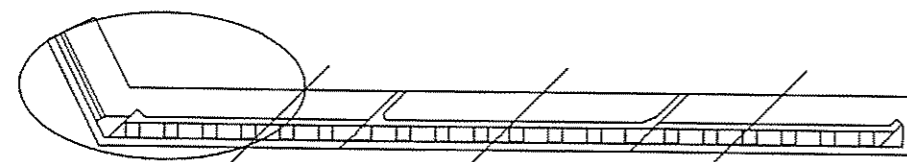
SHEET NO. 32 OF 72 SHEETS



ELEVATION VIEW EAST ABUTMENT

NOTES:

- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- FOR SECTION A-A & C-C SEE SHEET NO. 36.  
FOR WINGWALL DETAILS SEE SHEET NO. 35.



BRIDGE NO. 02003

BRIDGE NO. 02004

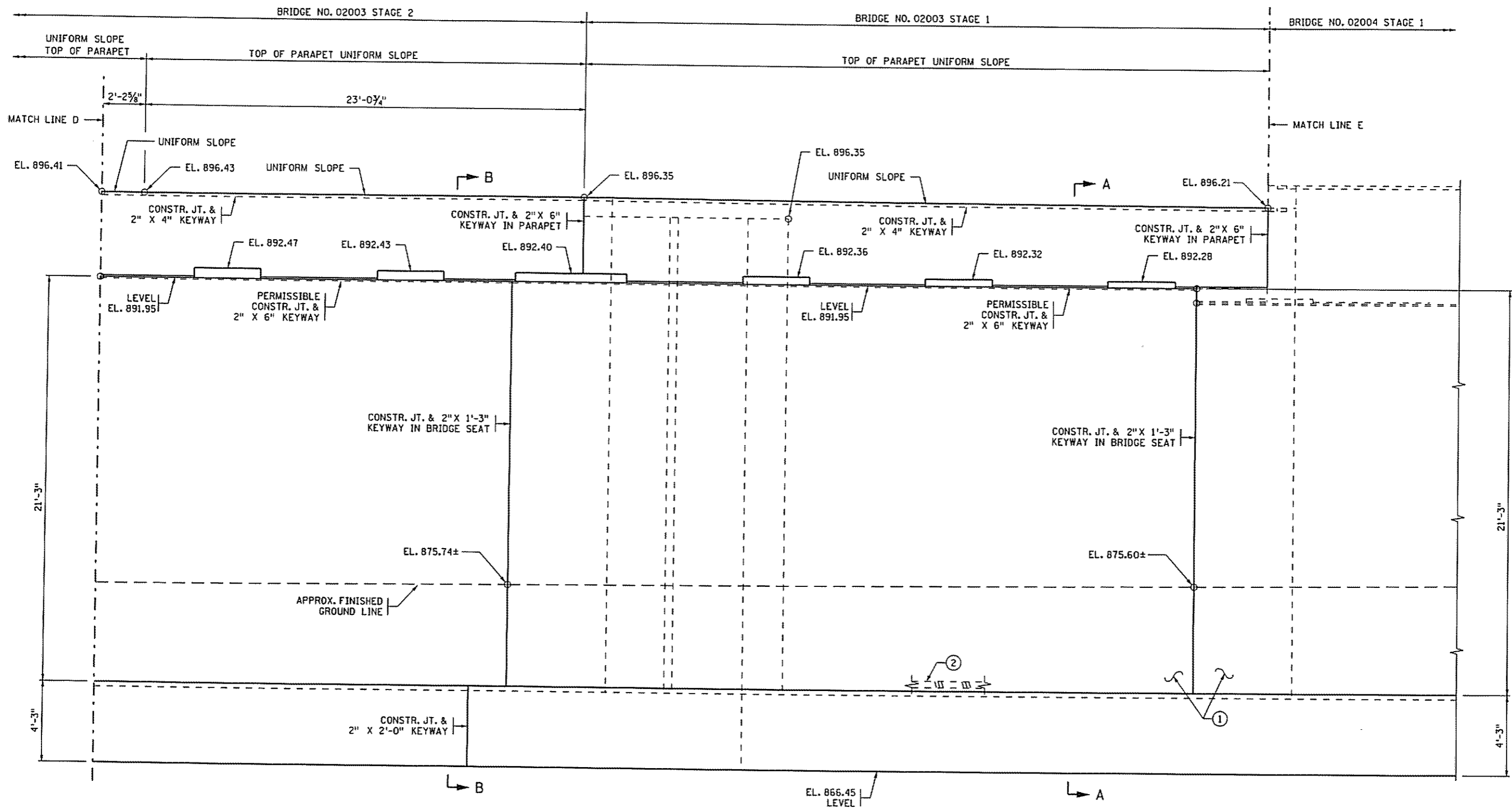
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
 EAST ABUTMENT GEOMETRICS

DES: M.C.D	DR: P.F.	APPROVED: <i>2/23/09</i>
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 33 OF 72 SHEETS

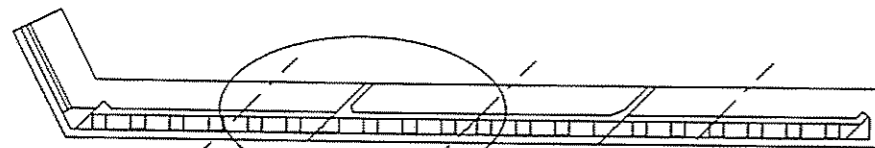
BRIDGE NO.  
 02003



ELEVATION VIEW EAST ABUTMENT

NOTES:

- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- FOR SECTION A-A & B-B SEE SHEET NO. 36.



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *M.C. Dimaculangan* 2/23/09 / DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

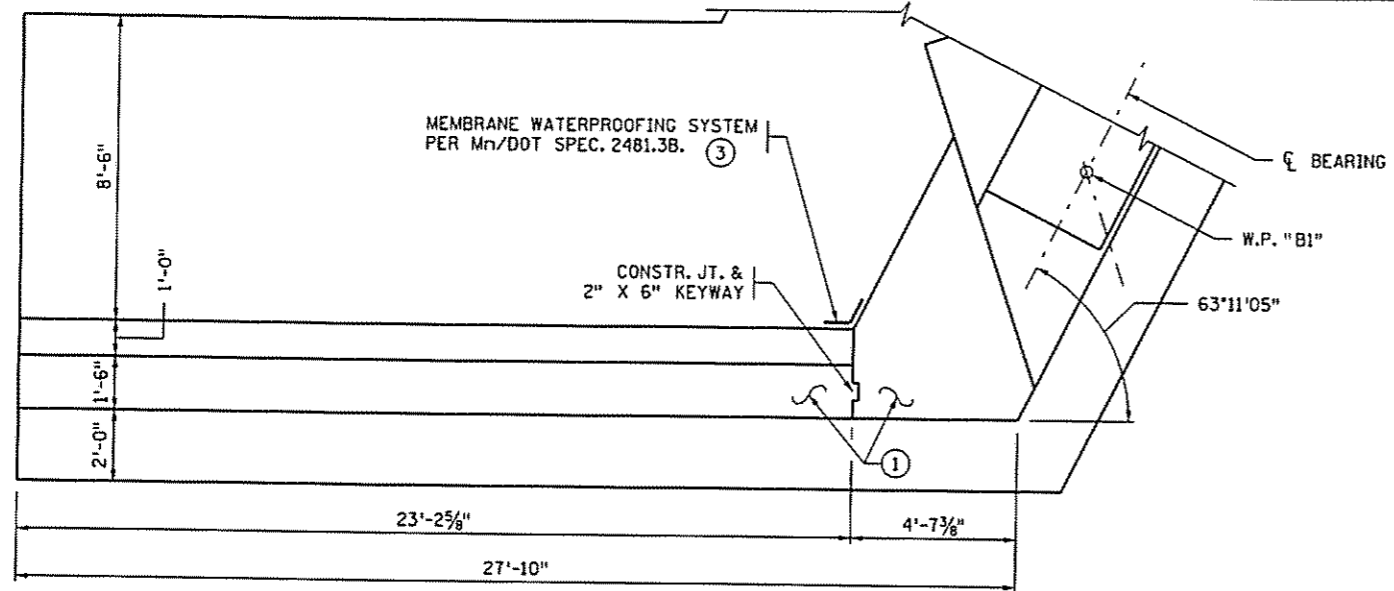
TITLE: EAST ABUTMENT GEOMETRICS

DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

BRIDGE NO. 02003

SHEET NO. 34 OF 72 SHEETS

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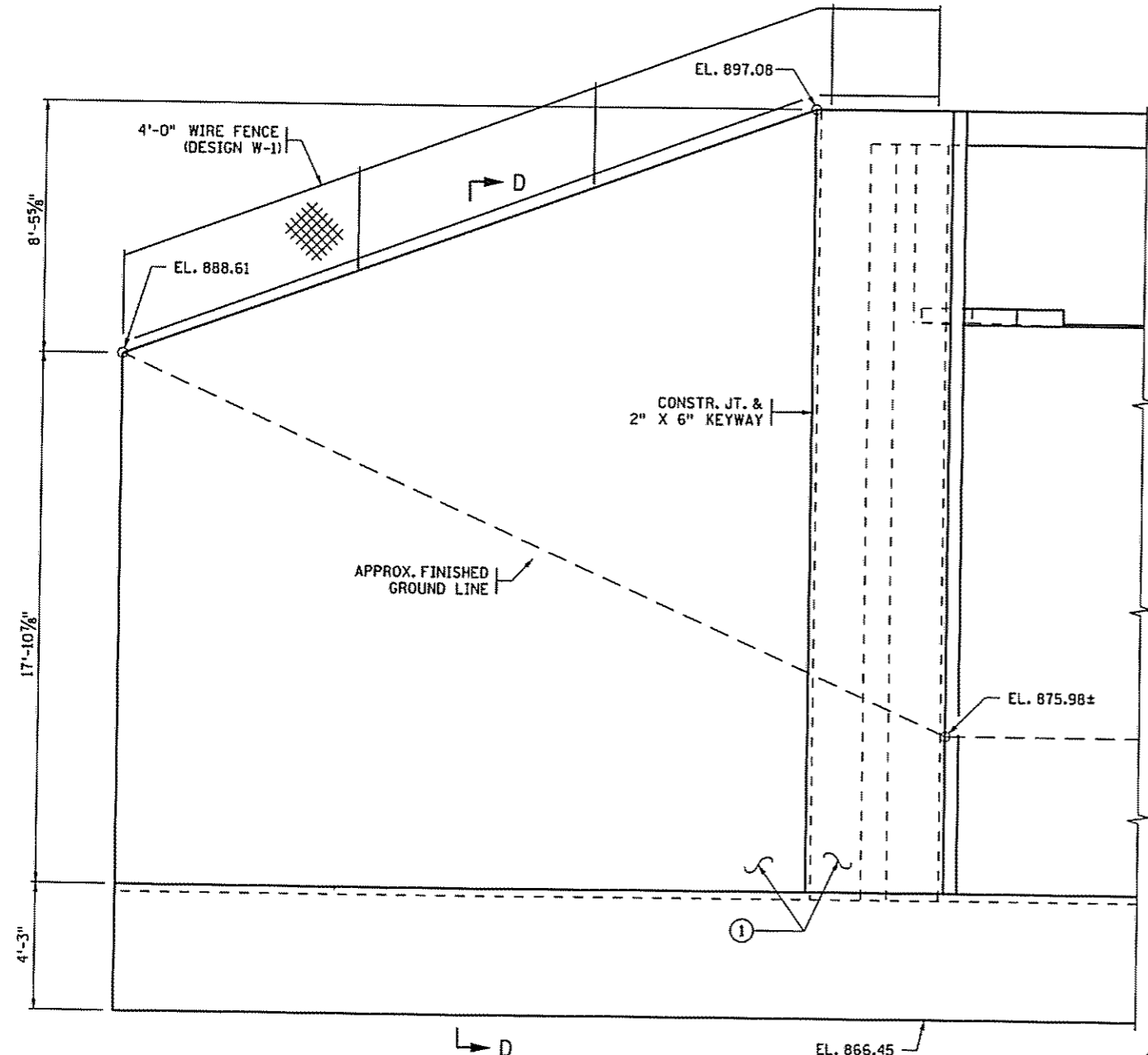
NORTH EAST WINGWALL PLAN



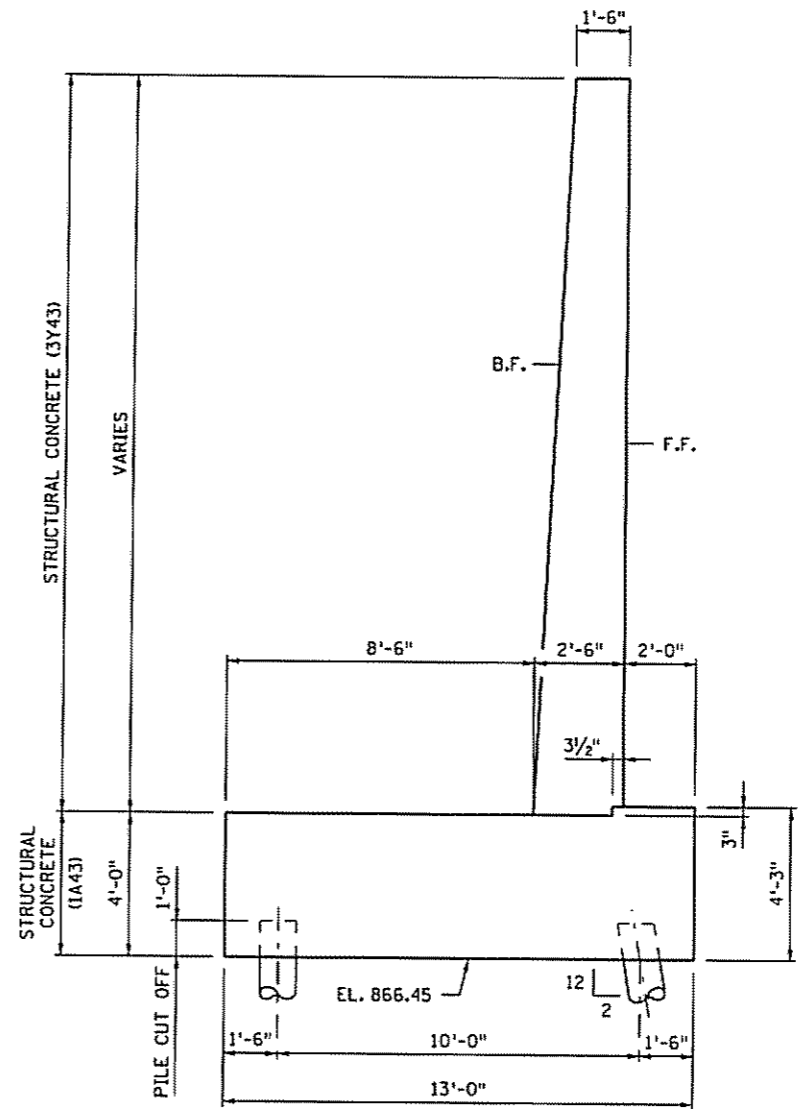
NOTES:

- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
- ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).

F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.



NORTH EAST WINGWALL ELEVATION



SECTION D-D

2/19/2009 5:\Design\N2003\N2003\LEASTABUT.dgn

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE		TITLE: <b>EAST ABUTMENT GEOMETRICS</b>		DES: M.C.D. CHK: P.J.K.	DR: P.F. CHK: J.A.J.	APPROVED: <i>2/23/09</i>	BRIDGE NO. <b>02003</b>
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209				SHEET NO. 35 OF 72 SHEETS			

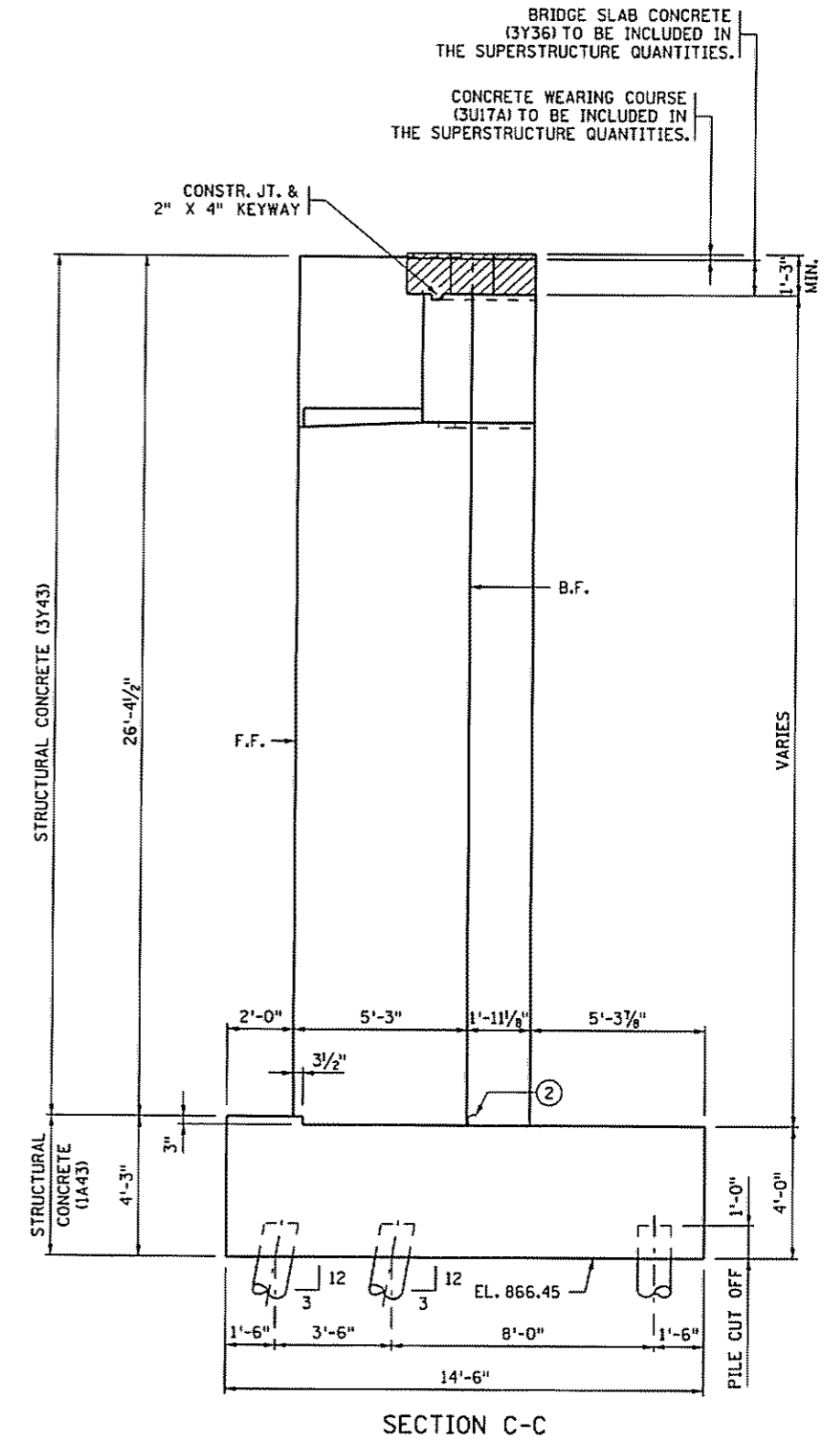
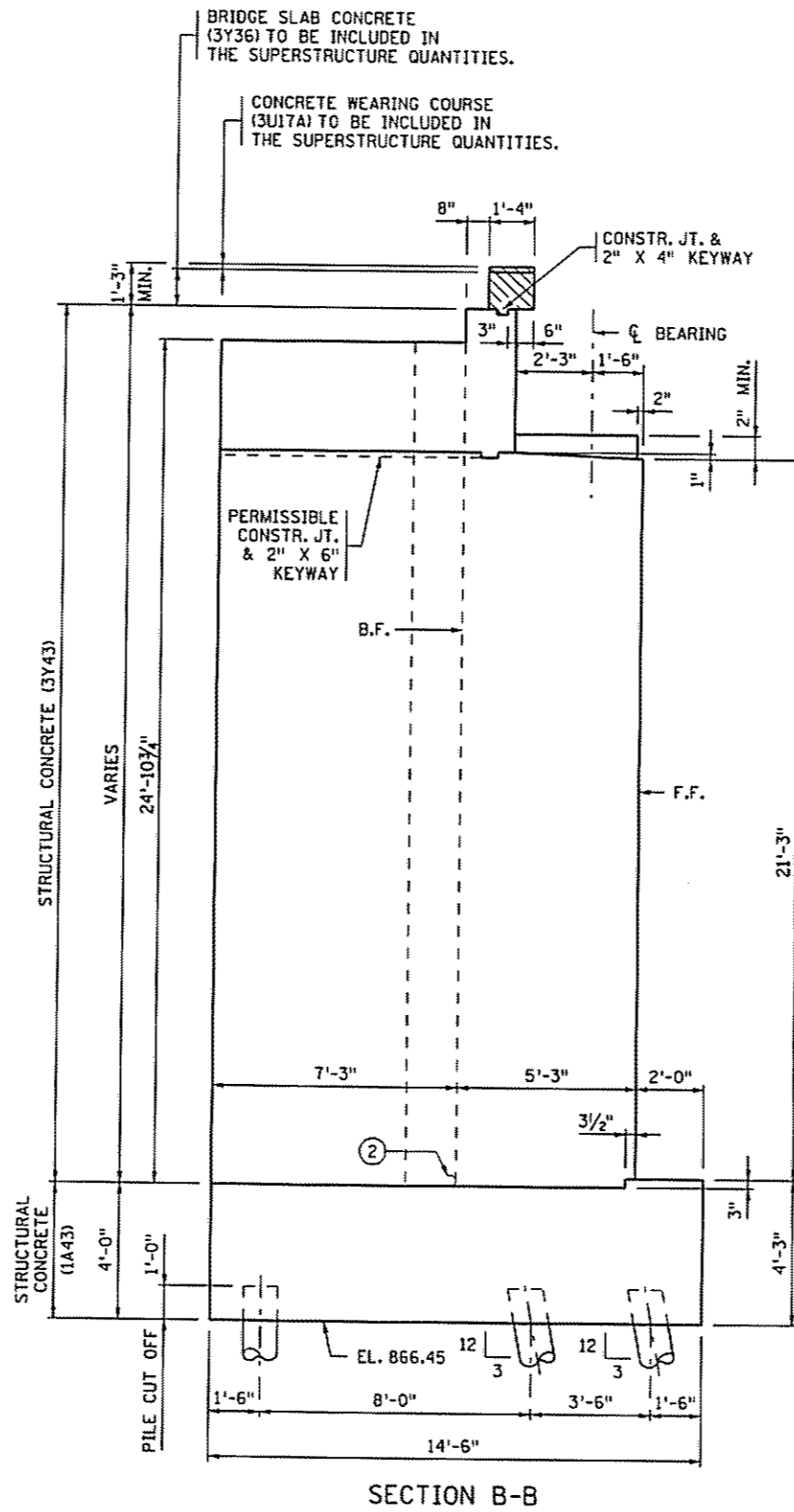
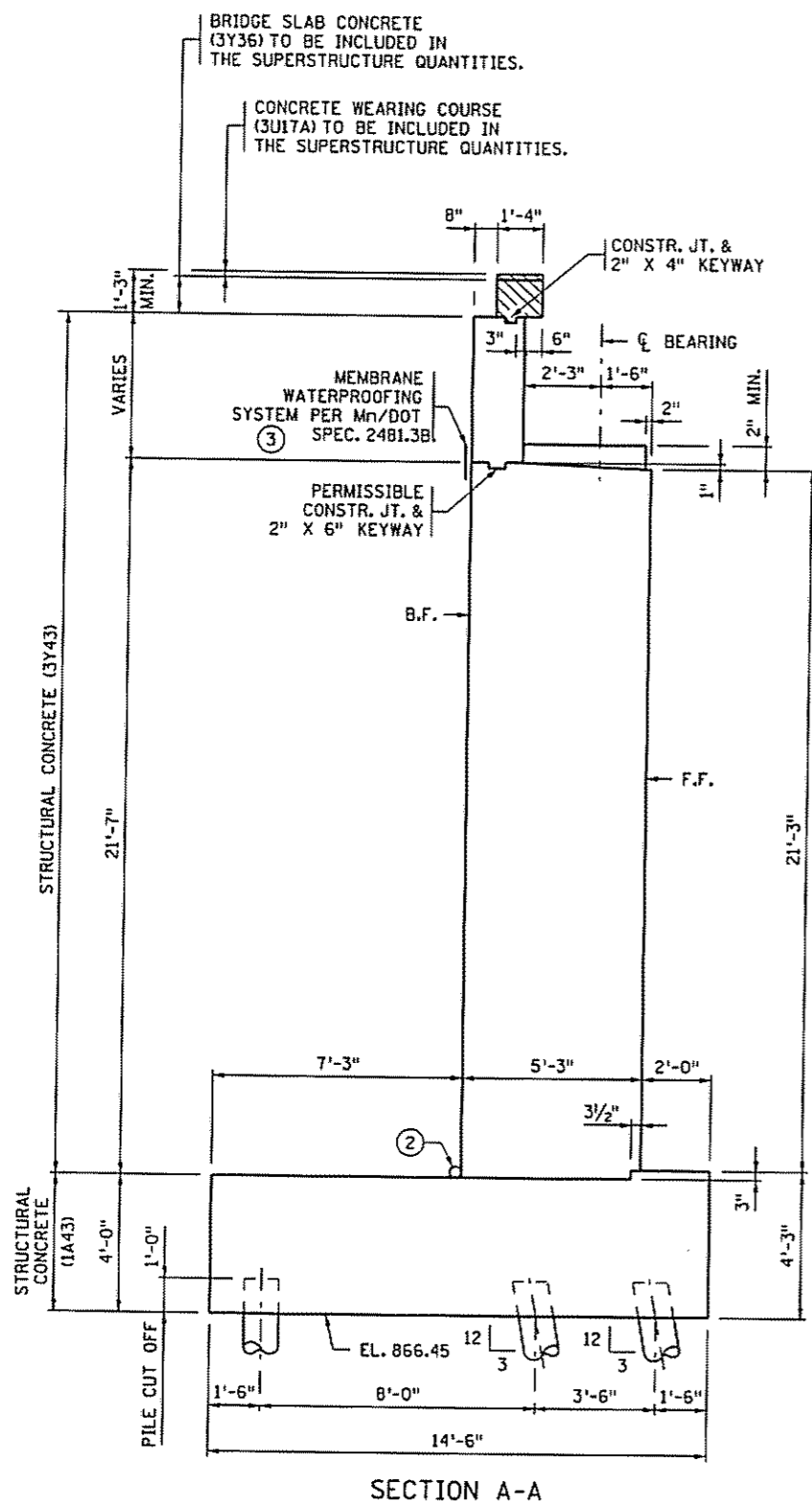


**NOTES:**

- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
- ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).

F.F. DENOTES FRONT FACE.

B.F. DENOTES BACK FACE.



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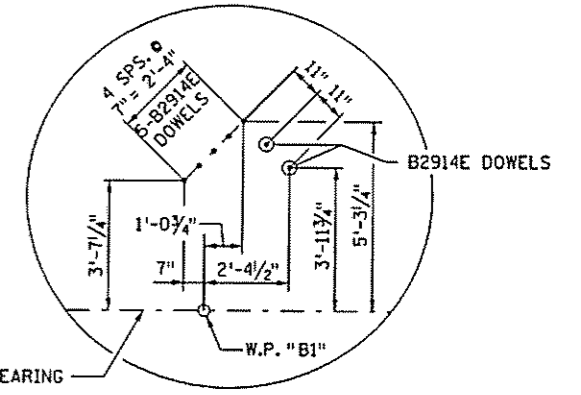
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
 EAST ABUTMENT GEOMETRICS

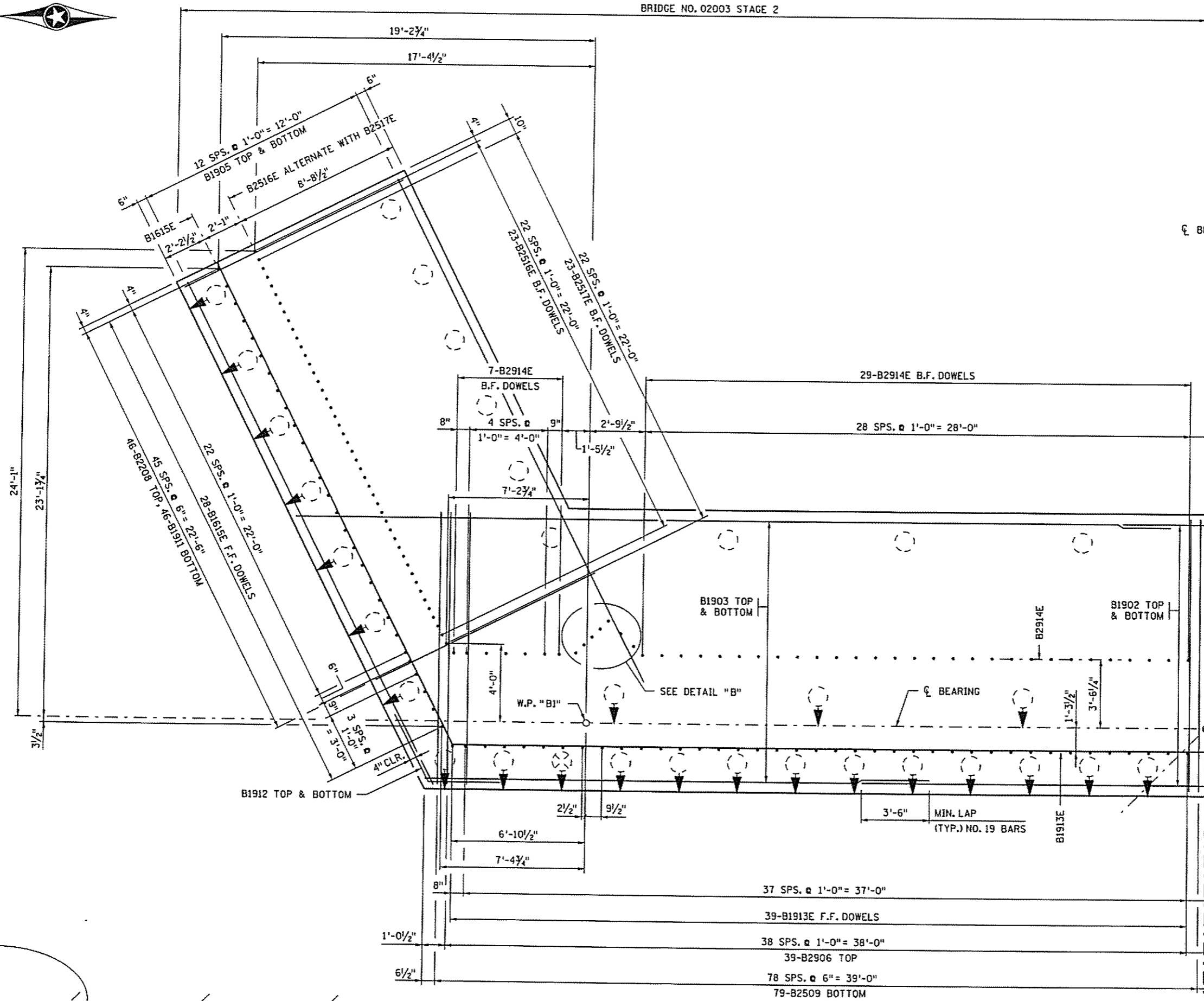
DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 36 OF 72 SHEETS

BRIDGE NO. 02003



DETAIL "B"  
(DOWEL BAR LOCATION DETAIL)



MATCH LINE D

11 5/8" B2914E B.F. DOWELS

45°22'45"

W.P. "D1"

11 5/8" B1913E F.F. DOWELS

11 5/8"

5 5/8"

FOOTING PLAN EAST ABUTMENT

CERTIFIED BY *M.C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

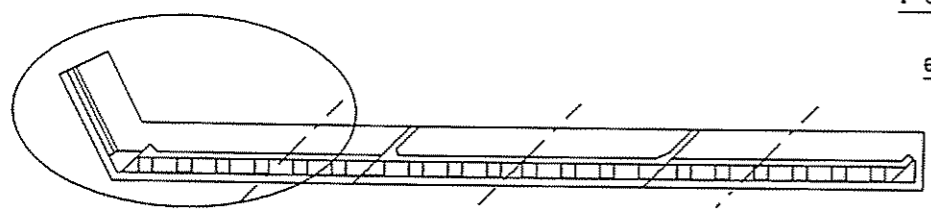
TITLE:  
 EAST ABUTMENT  
 REINFORCEMENT

DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

BRIDGE NO.  
 02003

SHEET NO. 37 OF 72 SHEETS

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BRIDGE NO. 02003

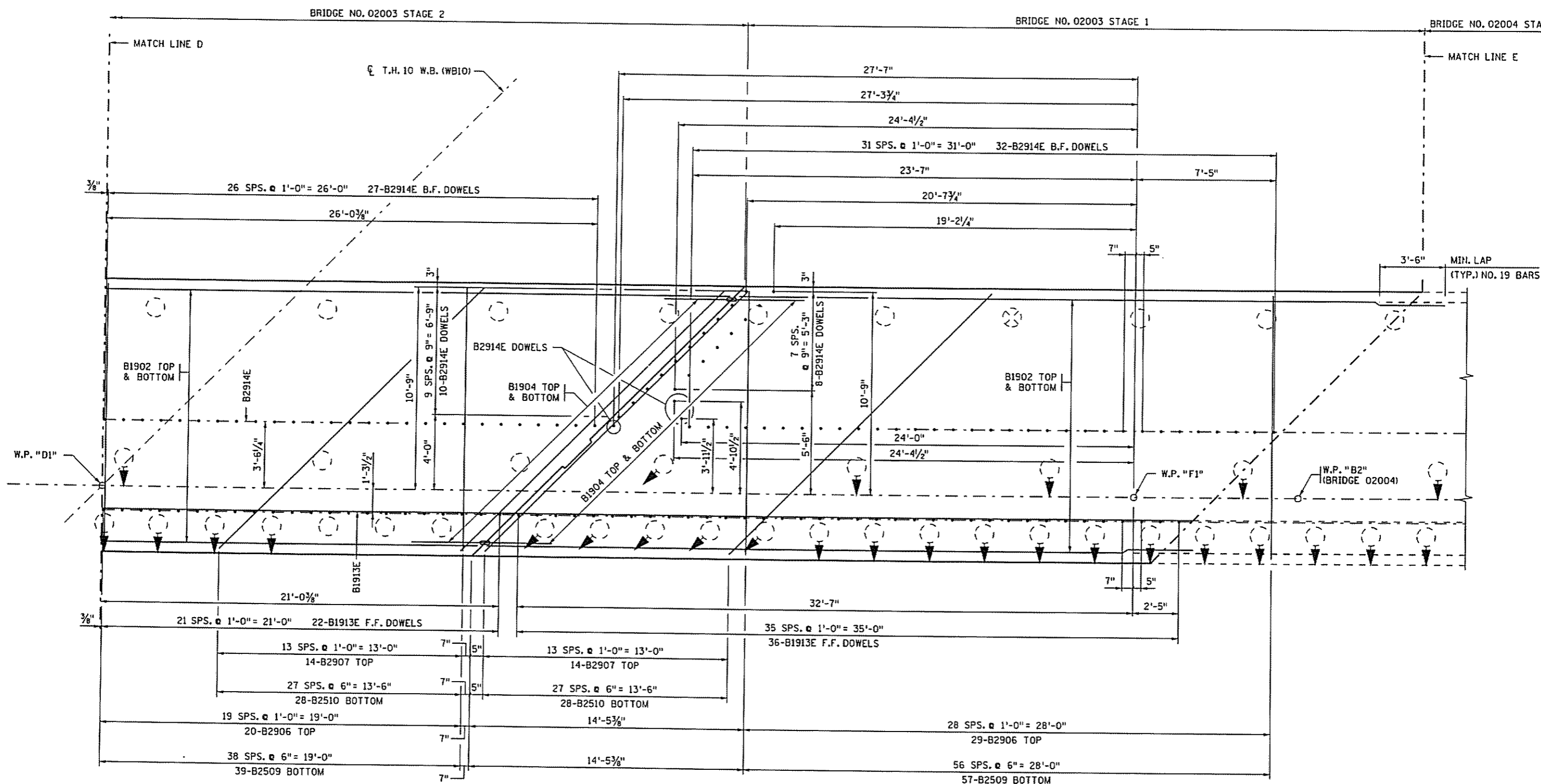
BRIDGE NO. 02004



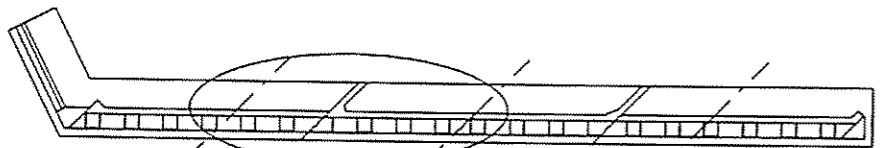
**NOTES:**

F.F. DENOTES FRONT FACE.

B.F. DENOTES BACK FACE.



**FOOTING PLAN EAST ABUTMENT**



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *M.C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**EAST ABUTMENT REINFORCEMENT**

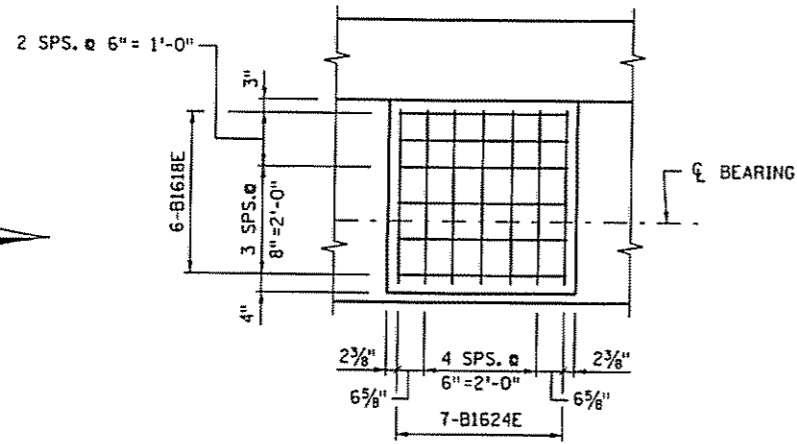
DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 38 OF 72 SHEETS

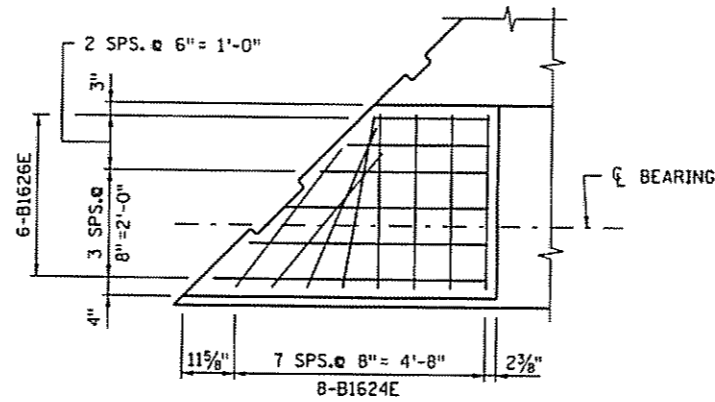
BRIDGE NO.  
**02003**

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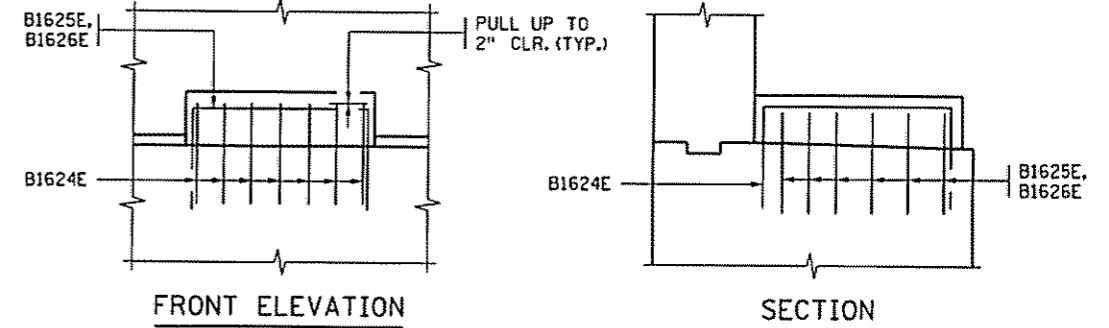




PLAN VIEW



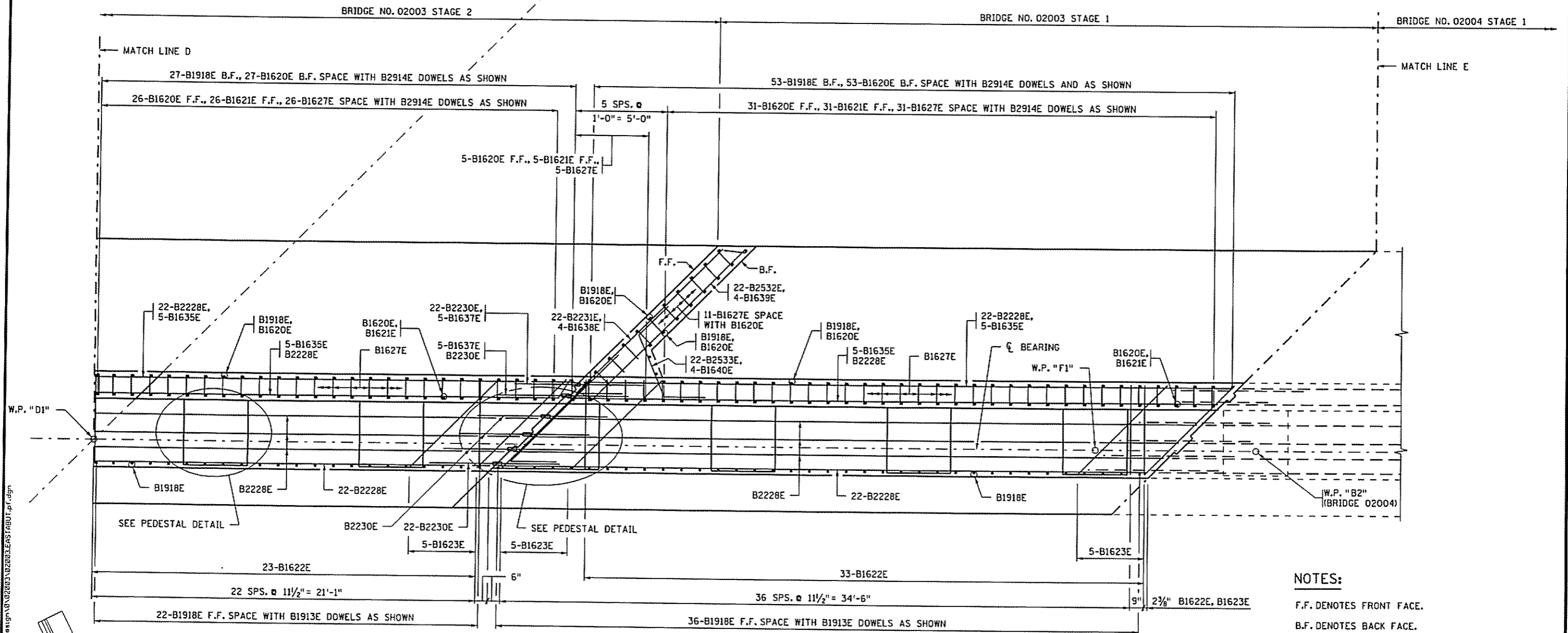
PLAN VIEW



FRONT ELEVATION

SECTION

PEDESTAL DETAIL



PLAN VIEW EAST ABUTMENT

NOTES:

- F.F. DENOTES FRONT FACE.
- B.F. DENOTES BACK FACE.

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BRIDGE NO. 02003

BRIDGE NO. 02004

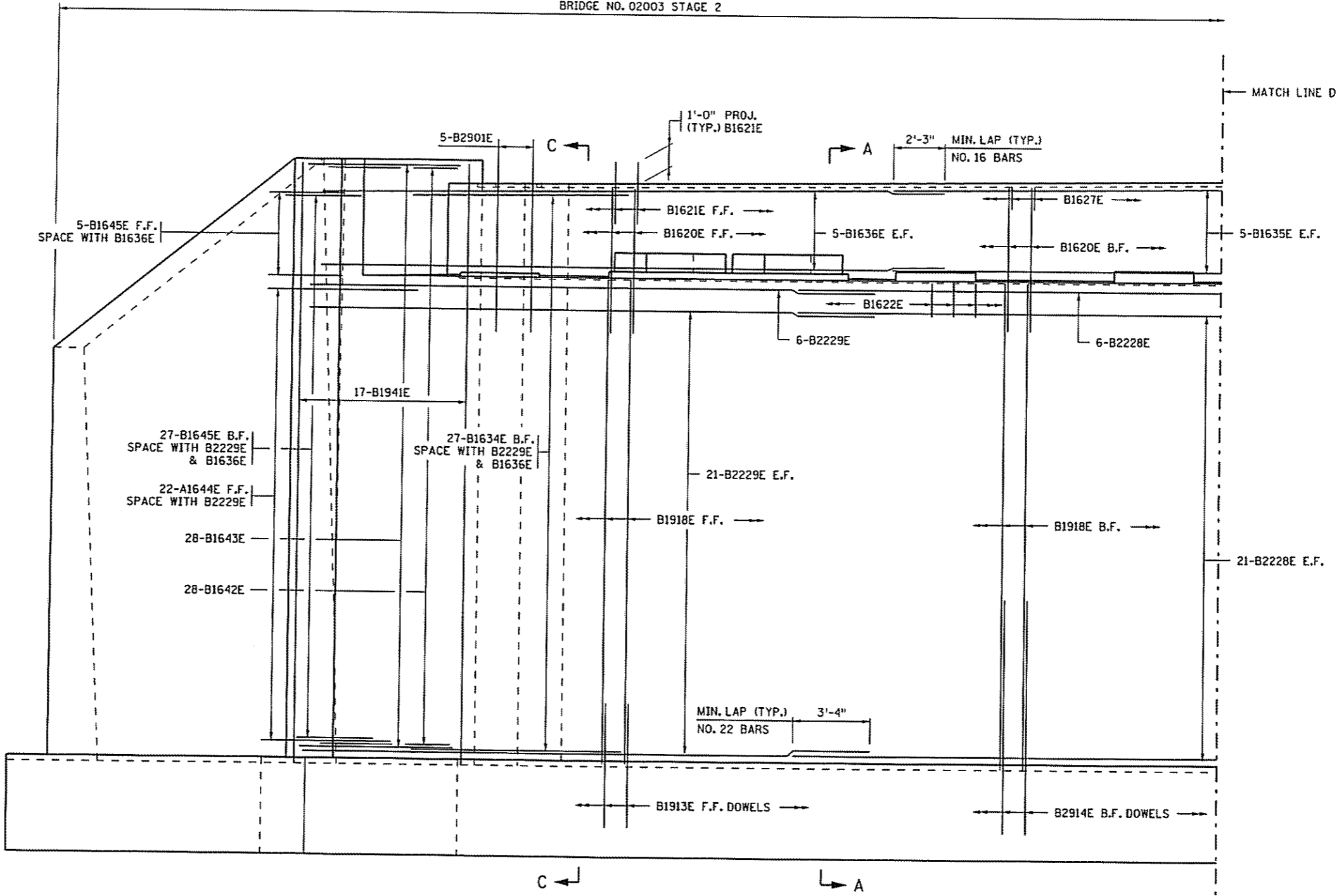
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: EAST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	
SHEET NO. 40 OF 72 SHEETS		

BRIDGE NO. 02003

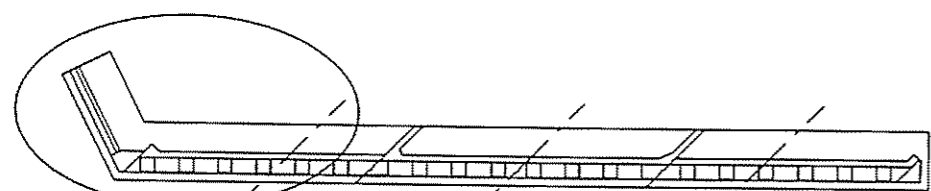
BRIDGE NO. 02003 STAGE 2



ELEVATION VIEW EAST ABUTMENT

NOTES:

- F.F. DENOTES FRONT FACE.
- B.F. DENOTES BACK FACE.
- E.F. DENOTES EACH FACE.
- SEE SHEET NO. 44 FOR SECTION A-A & C-C.
- FOR WINGWALL REINFORCEMENT SEE SHEET NO. 43.



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

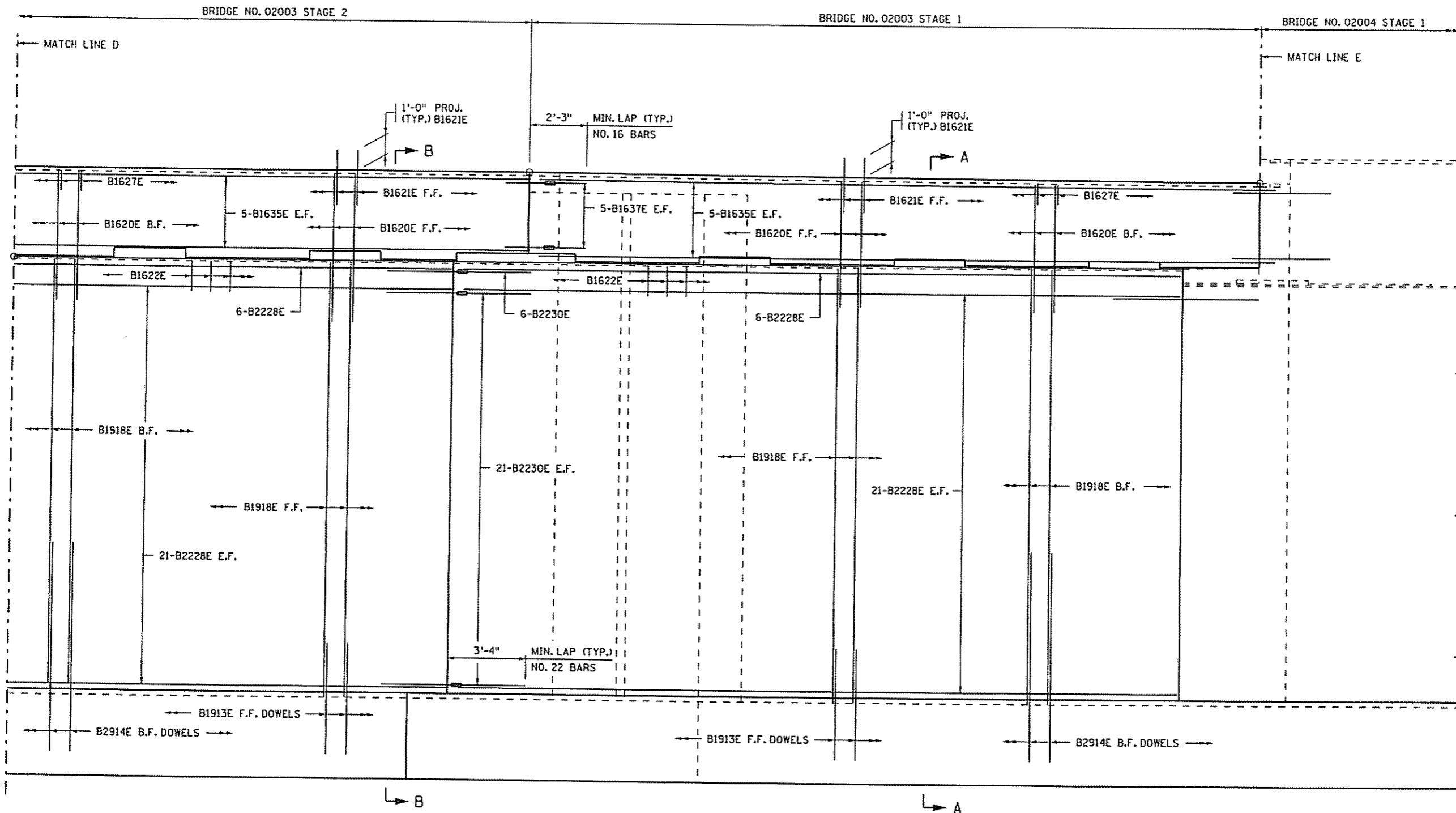
TITLE: EAST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: P.F.	APPROVED: <i>2/23/09</i>
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 41 OF 72 SHEETS

BRIDGE NO. 02003

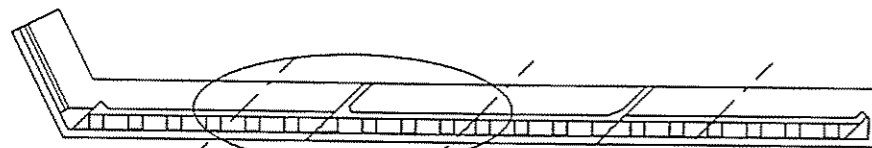
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ELEVATION VIEW EAST ABUTMENT

NOTES:

- F.F. DENOTES FRONT FACE.
- B.F. DENOTES BACK FACE.
- E.F. DENOTES EACH FACE.
- SEE SHEET NO. 44 FOR SECTION A-A & B-B.



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: EAST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: P.F.	APPROVED: <i>2/23/09</i>
CHK: P.J.K.	CHK: J.A.J.	

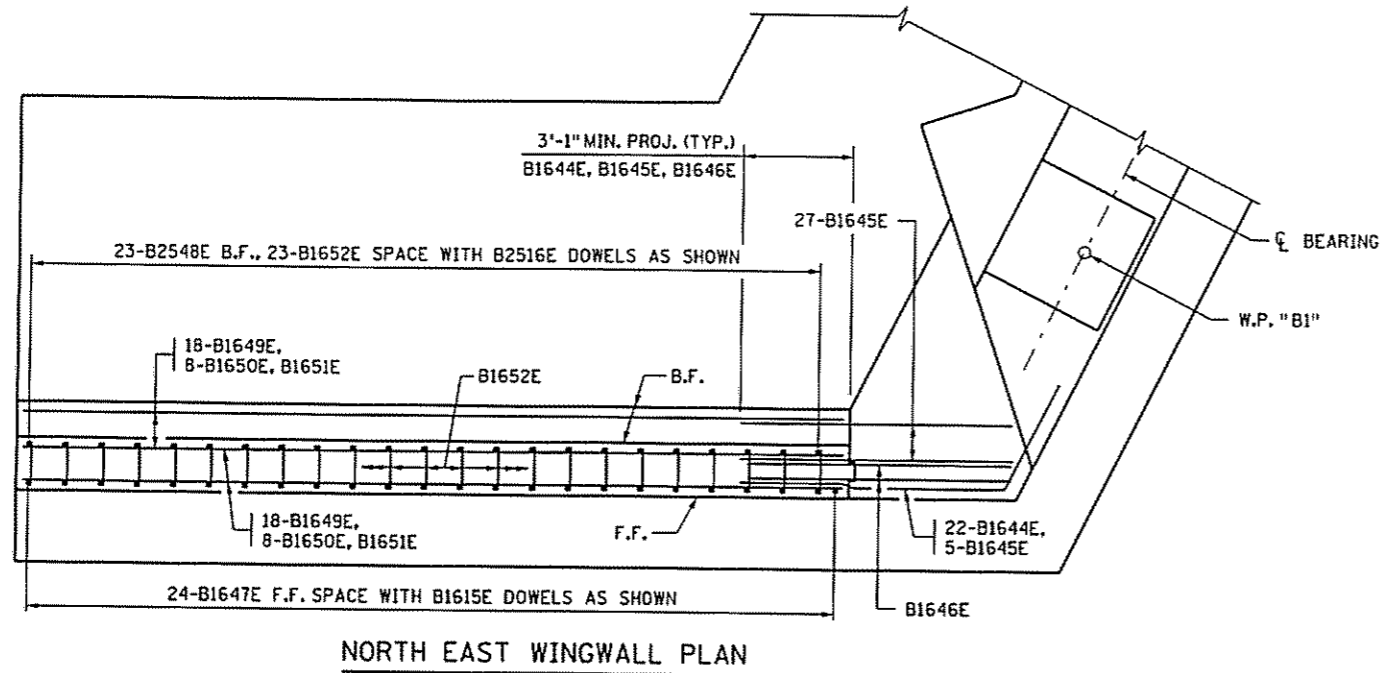
BRIDGE NO. 02003

SHEET NO. 42 OF 72 SHEETS

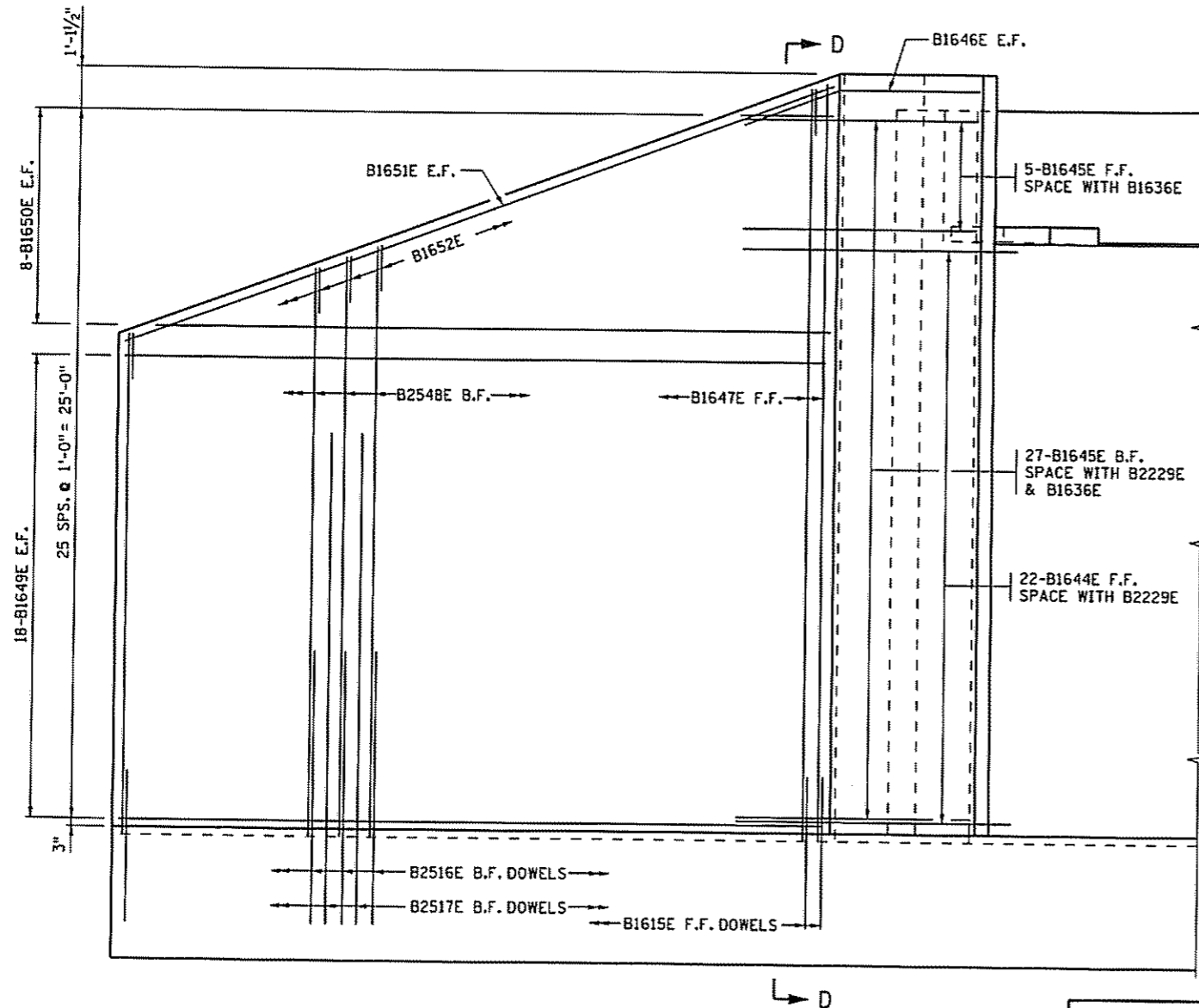
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**NOTES:**

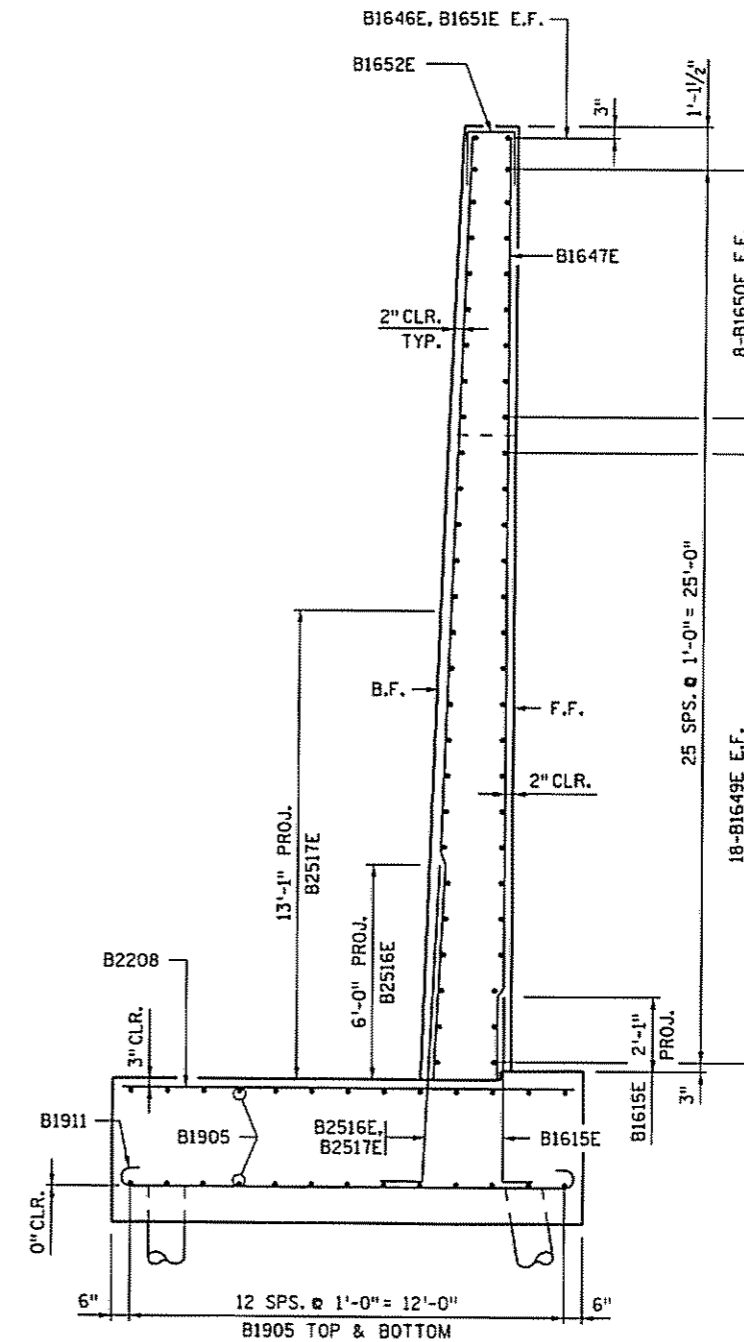
F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.  
 E.F. DENOTES EACH FACE.



**NORTH EAST WINGWALL PLAN**



**NORTH EAST WINGWALL ELEVATION**



**SECTION D-D**

2/21/2009 S:\Design\A\2003\2003.EAST ABUT REINFORCEMENT.dgn

CERTIFIED BY Moises C. Dimaculangan 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: **EAST ABUTMENT REINFORCEMENT**

DES: M.C.D	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

BRIDGE NO. 02003

SHEET NO. 43 OF 72 SHEETS

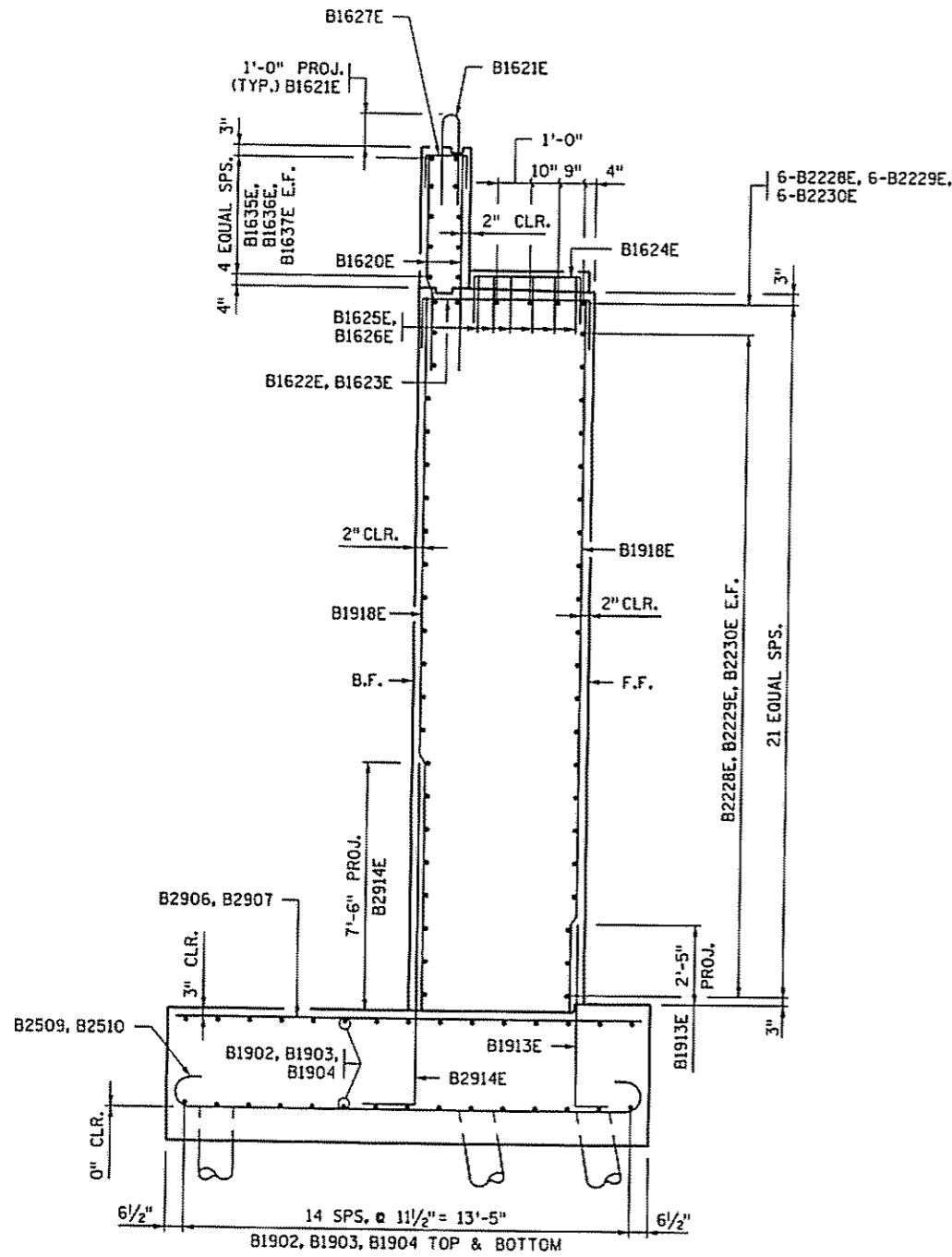


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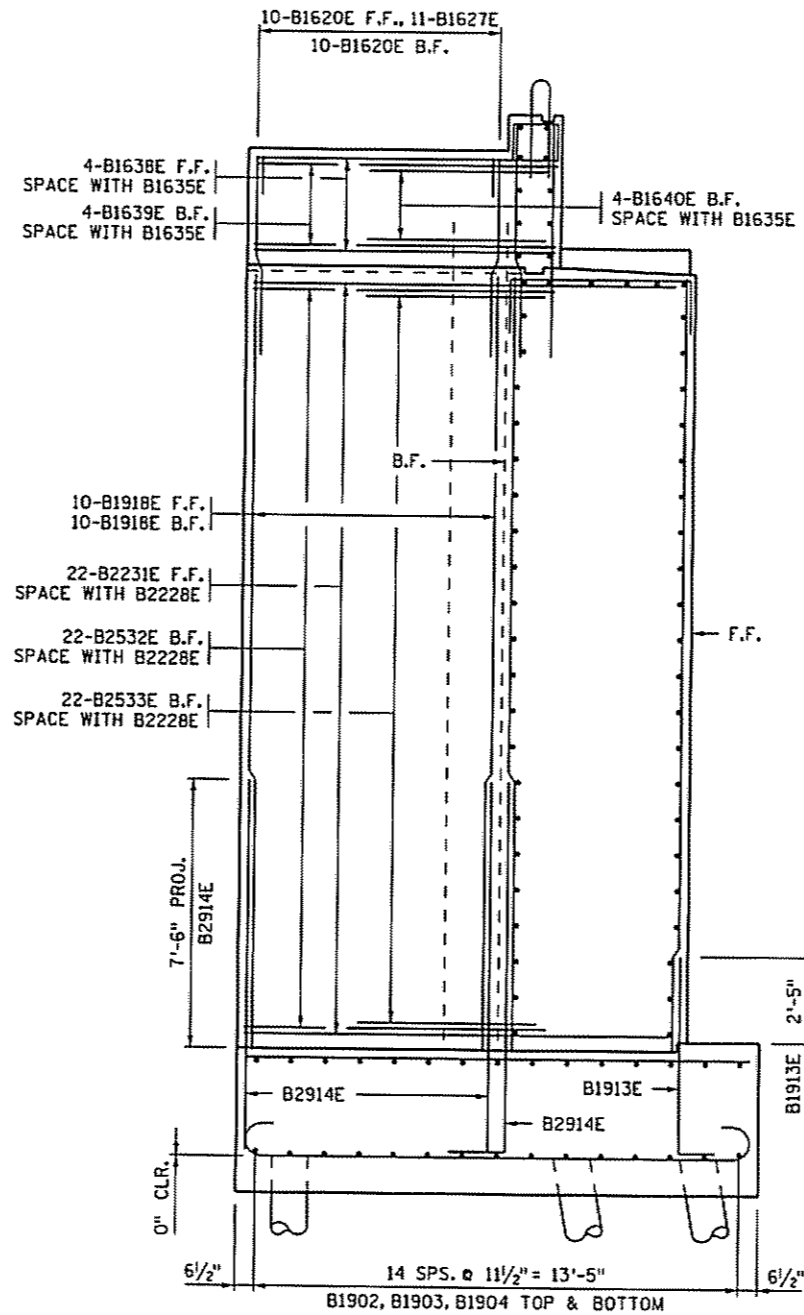
F.F. DENOTES FRONT FACE.

B.F. DENOTES BACK FACE.

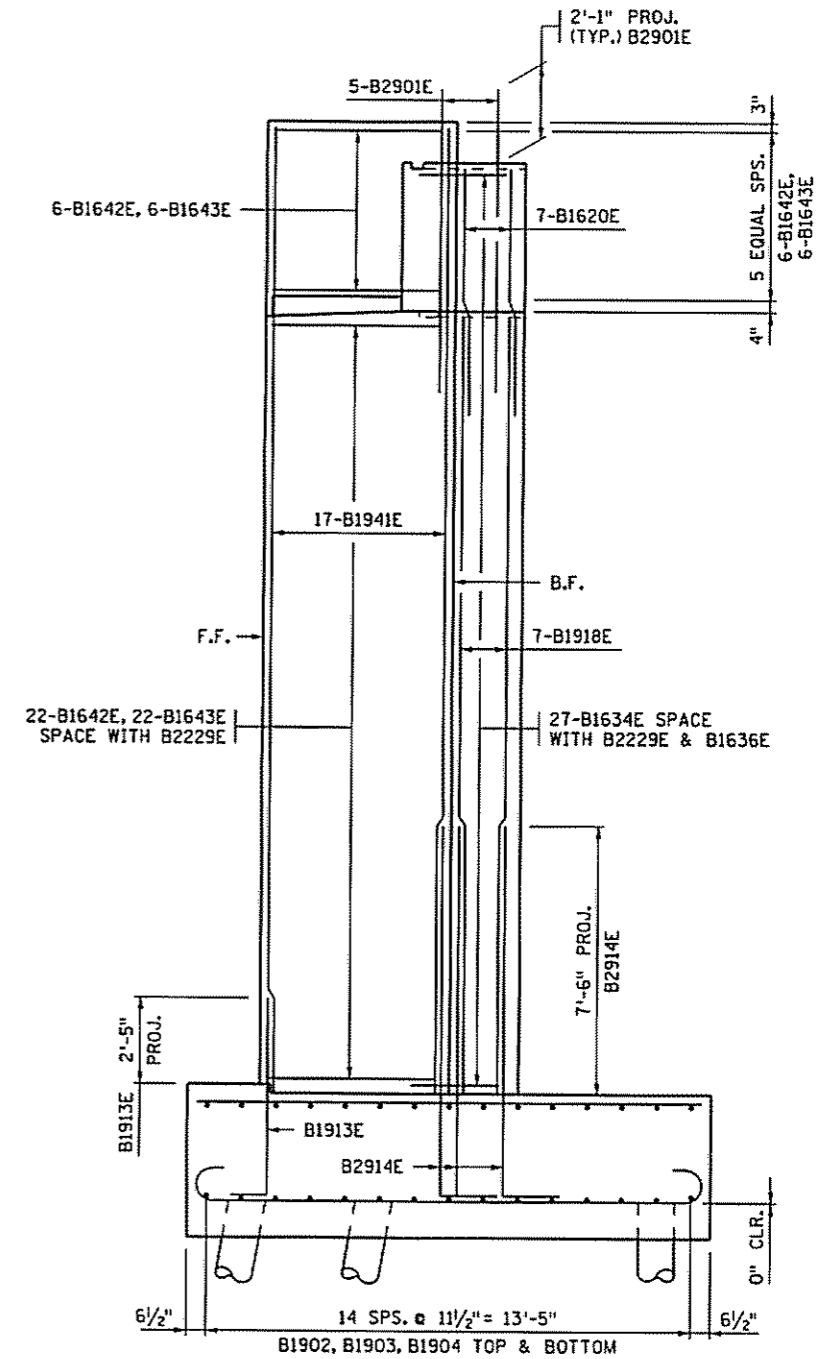
E.F. DENOTES EACH FACE.



SECTION A-A



SECTION B-B



SECTION C-C

2/19/2009 S:\Users\grm\Drawings\2009\2003\2003\2003\ABUT.dwg

CERTIFIED BY *M.C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: EAST ABUTMENT REINFORCEMENT

DES: M.C.D. DR: P.F. APPROVED: 2/23/09  
CHK: P.J.K. CHK: J.A.J.  
SHEET NO. 44 OF 72 SHEETS

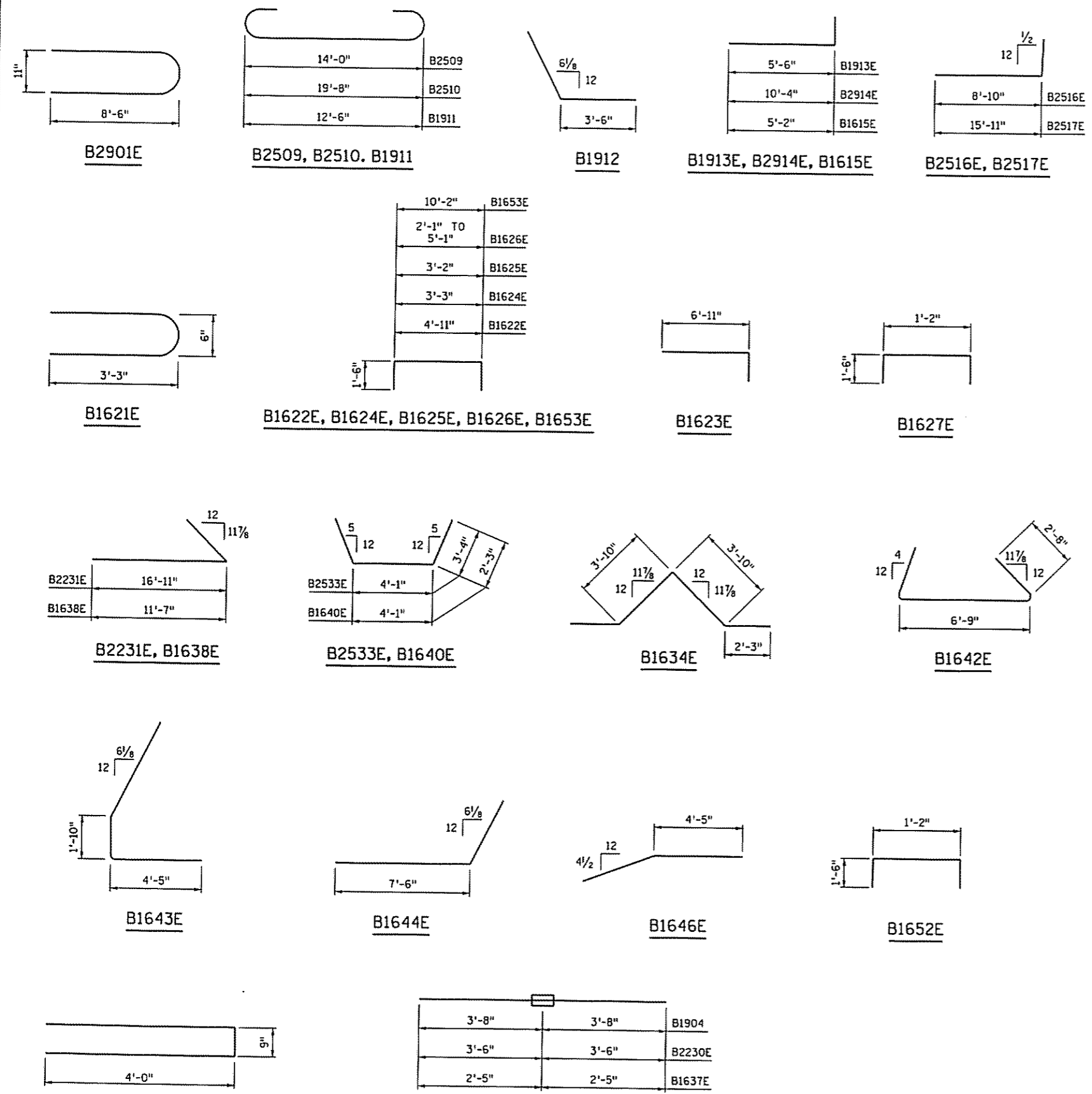
BRIDGE NO. 02003

BILL OF REINFORCEMENT FOR EAST ABUTMENT

BAR	NO. STAGE 1	NO. STAGE 2	TOTAL NO.	LENGTH	SHAPE	LOCATION
B2901E	—	5	5	17'-7"		RAILING TIE
B1902	30	30	60	37'-6"		FOOTING LONGIT., TOP & BOTTOM
B1903	—	2 SERIES OF 15	2 SERIES OF 15	25'-11"		FOOTING LONGIT., TOP & BOTTOM
B1904	(1)	(1)	30	(1)		FOOTING COUPLERS
B1905	—	26	26	28'-9"		FOOTING LONGIT., TOP & BOTTOM
B2906	29	59	88	14'-0"		FOOTING TRANSVERSE TOP
B2907	14	14	28	19'-8"		FOOTING TRANSVERSE TOP
B2208	—	46	46	12'-6"		FOOTING TRANSVERSE TOP
B2509	57	118	175	15'-10"		FOOTING TRANSVERSE BOTTOM
B2510	28	28	56	21'-6"		FOOTING TRANSVERSE BOTTOM
B1911	—	46	46	13'-10"		FOOTING TRANSVERSE BOTTOM
B1912	—	2	2	7'-0"		FOOTING HORIZONTAL
B1913E	36	61	97	6'-6"		FOOTING DOWEL
B2914E	53	70	123	11'-11"		FOOTING DOWEL
B1615E	—	28	28	6'-0"		FOOTING DOWEL
B2516E	—	23	23	10'-2"		FOOTING DOWEL
B2517E	—	23	23	17'-3"		FOOTING DOWEL
B1918E	89	122	211	21'-1"		BRIDGE SEAT VERTICAL EACH FACE
B1619E	—	8	8	4'-7"		SHEAR BLOCK HORIZONTAL
B1620E	89	122	211	6'-5"		PARAPET VERTICAL EACH FACE
B1621E	36	59	95	6'-10"		PARAPET VERTICAL FRONT FACE
B1622E	33	61	94	7'-11"		BRIDGE SEAT TIE
B1623E	10	5	15	8'-5"		BRIDGE SEAT TIE
B1624E	29	56	85	6'-3"		BRIDGE SEAT TIE
B1625E	18	30	48	6'-2"		BRIDGE SEAT TIE
B1626E	1 SERIES OF 6	—	1 SERIES OF 6	5'-1"		BRIDGE SEAT TIE
B1627E	47	59	106	4'-2"		PARAPET TIE
B2228E	48	48	96	35'-6"		BRIDGE SEAT HORIZONTAL
B2229E	—	48	48	33'-9"		BRIDGE SEAT HORIZONTAL
B2230E	(2)	(2)	48	(2)		BRIDGE SEAT COUPLERS
B2231E	22	—	22	20'-3"		BRIDGE SEAT HORIZONTAL
B2532E	22	—	22	11'-10"		BRIDGE SEAT HORIZONTAL
B2533E	22	—	22	10'-9"		BRIDGE SEAT HORIZONTAL
B1634E	—	27	27	12'-2"		BRIDGE SEAT & PARAPET HORIZONTAL
B1635E	10	10	20	35'-6"		PARAPET HORIZONTAL
B1636E	—	10	10	32'-8"		PARAPET HORIZONTAL
B1637E	(3)	(3)	10	(3)		PARAPET COUPLERS
B1638E	4	—	4	13'-10"		PARAPET HORIZONTAL
B1639E	4	—	4	11'-10"		PARAPET HORIZONTAL
B1640E	4	—	4	8'-7"		PARAPET HORIZONTAL
B1941E	—	17	17	26'-2"		N.E. CORNER VERTICAL
B1642E	—	28	28	12'-1"		N.E. CORNER HORIZONTAL
B1643E	—	28	28	11'-7"		N.E. CORNER HORIZONTAL
B1644E	—	22	22	9'-9"		N.E. CORNER HORIZONTAL
B1645E	—	32	32	7'-6"		N.E. CORNER HORIZONTAL
B1646E	—	2	2	7'-4"		N.E. CORNER HORIZONTAL
B1647E	—	1 SERIES OF 24	1 SERIES OF 24	17'-10"		TO 26'-0"
B2548E	—	1 SERIES OF 23	1 SERIES OF 23	18'-1"		TO 26'-1"
B1649E	—	36	36	22'-10"		WINGWALL HORIZONTAL EACH FACE
B1650E	—	2 SERIES OF 8	2 SERIES OF 8	2'-5"		TO 21'-7"
B1651E	—	2	2	24'-4"		WINGWALL HORIZONTAL EACH FACE
B1652E	—	23	23	4'-2"		WINGWALL TIE
B1653E	—	7	7	13'-2"		BRIDGE SEAT TIE
B1654E	—	18	18	8'-9"		SHEAR BLOCK VERTICAL

NOTES:

- B1904 NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-19". 3'-6" MINIMUM LAP EACH SIDE OF COUPLER.
- B2230E NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS (EPOXY COATED)". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-22". 3'-4" MINIMUM LAP EACH SIDE OF COUPLER.
- B1637E NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS (EPOXY COATED)". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-16". 2'-3" MINIMUM LAP EACH SIDE OF COUPLER.



3'-8"	3'-8"	B1904
3'-6"	3'-6"	B2230E
2'-5"	2'-5"	B1637E

B1904, B2230E, B1637E

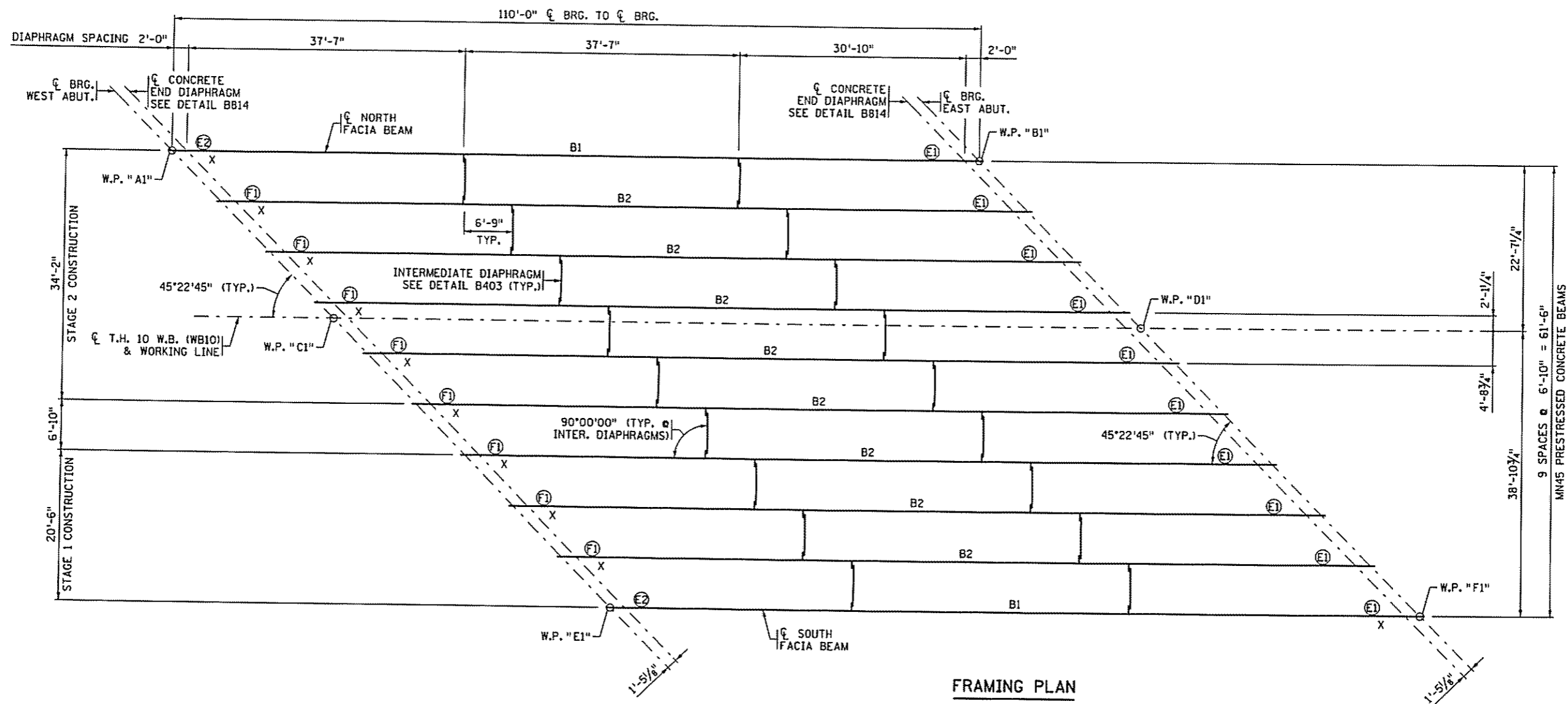
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: EAST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09	BRIDGE NO. 02003
CHK: P.J.K.	CHK: J.A.J.		

SHEET NO. 45 OF 72 SHEETS

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**FRAMING PLAN**

**NOTES:**

- X DENOTES X END OF BEAM.
- (E1) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE E1. SEE DETAIL B311.
- (E2) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE E2. SEE DETAIL B311.
- (F1) DENOTES FIXED CURVED PLATE BEARING ASSEMBLY, TYPE F1. SEE DETAIL B310.

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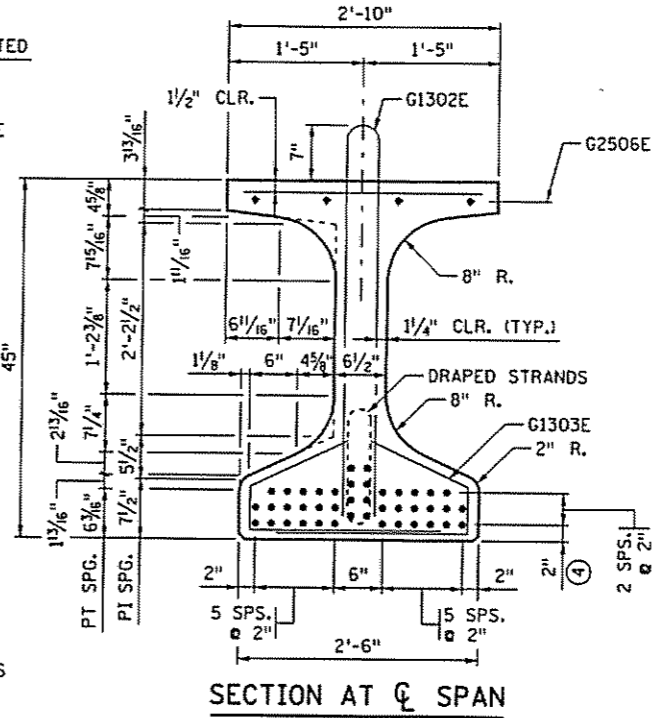
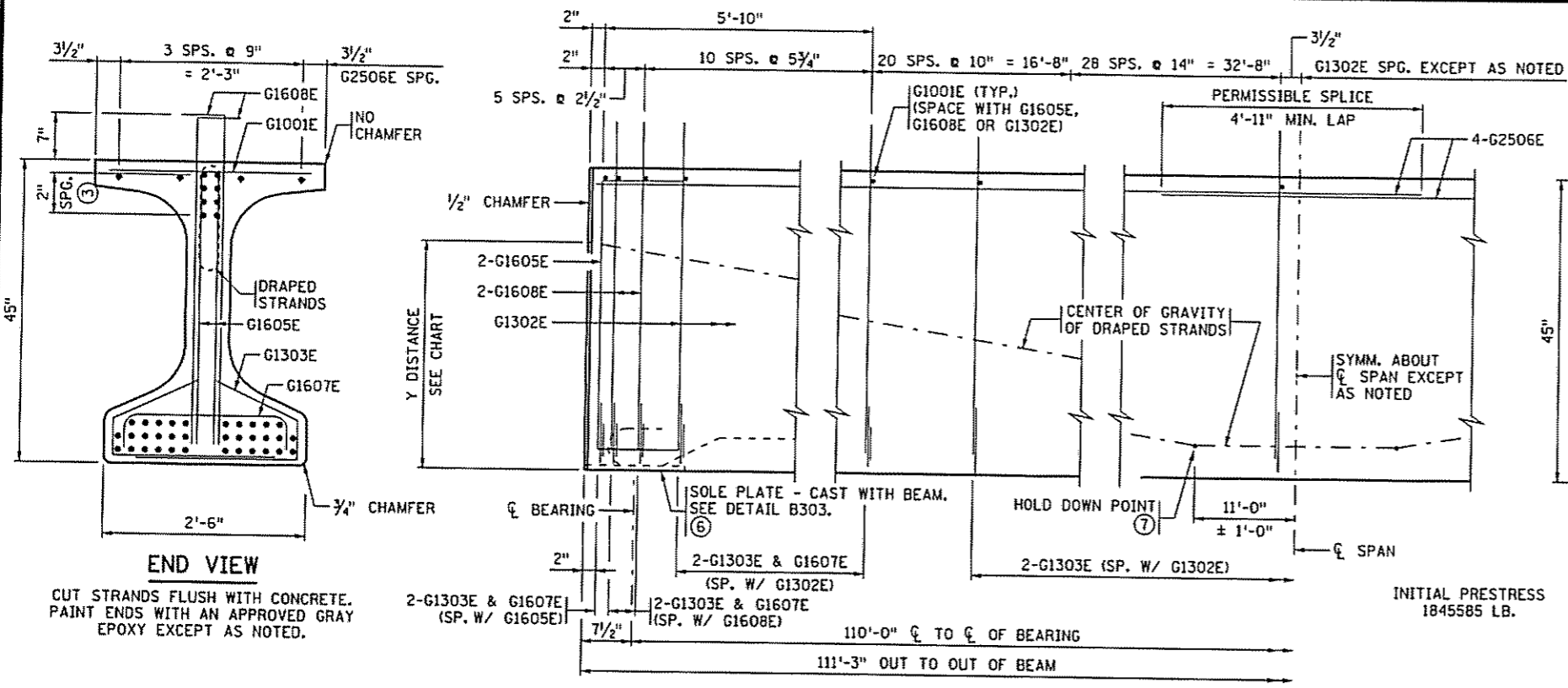
CERTIFIED BY *M. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

FRAMING PLAN

DES: P.J.K.	DR: J.H.B.	APPROVED: 2/23/09
CHK: M.C.D.	CHK: J.A.J.	

SHEET NO. 46 OF 72 SHEETS

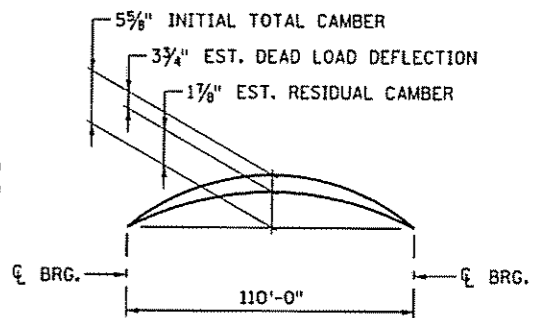
BRIDGE NO. 02003



Y DISTANCES (IN INCHES)			
	NO.	CL SPAN	END
STRAIGHT STRANDS	34	3.88	
DRAPED STRANDS	8	6	39
TOTAL STRANDS	42	4.29	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



INITIAL CAMBER IS GIVEN AFTER DIAPHRAGMS ARE IN PLACE.

DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, RAILING, SIDEWALK AND MEDIAN WHERE APPLICABLE.

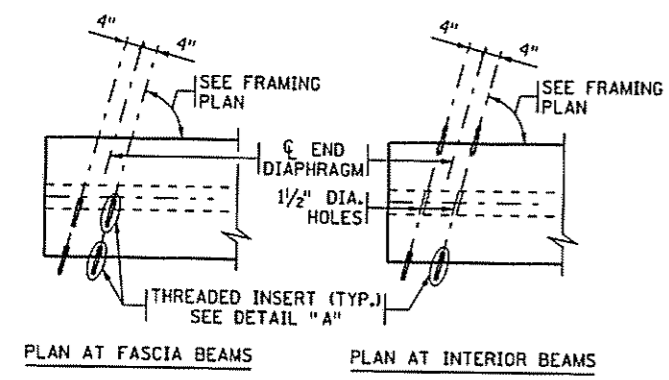
ENGINEER WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE CONTRACTOR TO BUILD FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS.

**END VIEW**  
CUT STRANDS FLUSH WITH CONCRETE. PAINT ENDS WITH AN APPROVED GRAY EPOXY EXCEPT AS NOTED.

**BEAM ELEVATION**

**SECTION AT CL SPAN**

**CAMBER DIAGRAM**

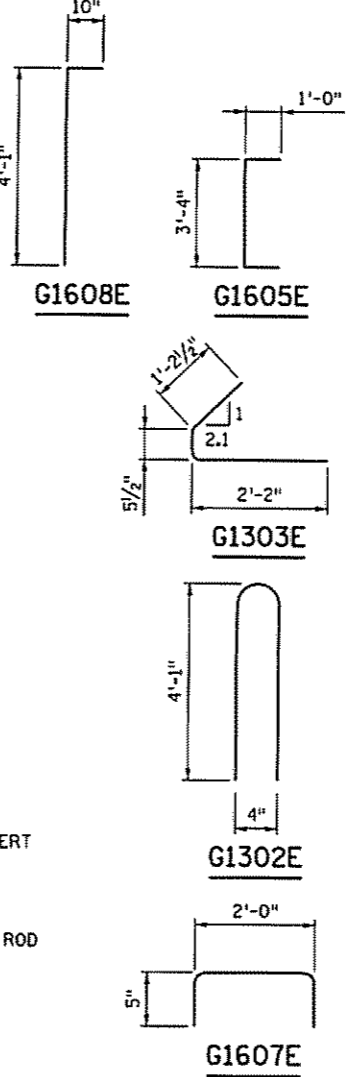


**PLAN AT FASCIA BEAMS**      **PLAN AT INTERIOR BEAMS**

CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	23.25 ksi
LONG TERM LOSSES	25.89 ksi

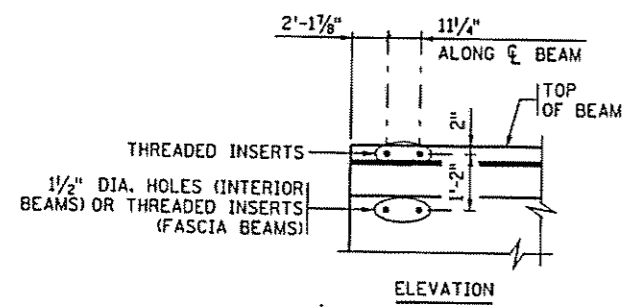
MINIMUM CONCRETE STRENGTH - P.S.I.	
① f'cl	② f'c
7000	7500

PRESTRESSING STRAND DIAMETER	
⑤ 1/2" □	
⑥ 0.60" ☒	

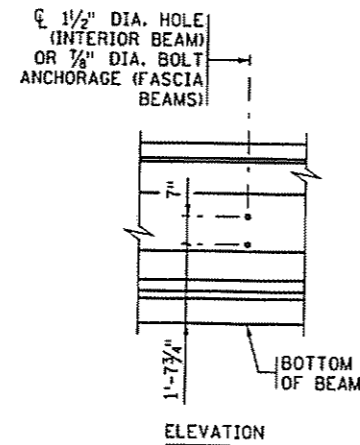


**GENERAL NOTES**

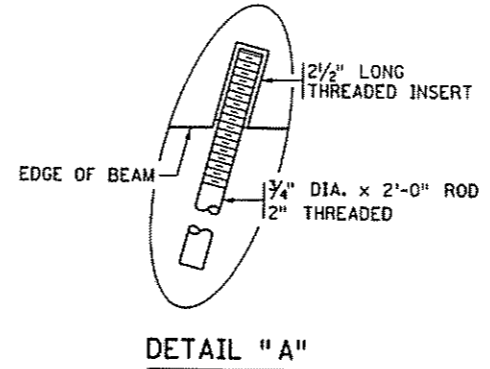
- TOPS OF BEAMS SHALL BE ROUGH FLOATED AND BROOMED TRANSVERSELY FOR BOND.
- PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.
- EACH BEAM SHALL BE MARKED, SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS. MARKINGS SHALL BE MADE ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. FASCIA BEAMS SHALL BE MARKED ON THE INSIDE FACE. ALL MARKINGS SHALL BE STENCILED AND BE CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.
- ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET SHALL BE INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE Mn/DOT SPEC. 2405.
- SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.
- APPROXIMATE WEIGHT OF BEAM IS 41.3 TONS.
- AS AN ALTERNATE TO THE DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.
- ① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.
- ② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.
- ③ DRAPED STRANDS.
- ④ STRAIGHT STRANDS.
- ⑤ PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION STRAND, CONFORMING TO ASTM A416, GRADE 270.
- ⑥ FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE.
- ⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.



**CONCRETE END DIAPHRAGM**  
PARAPET ABUTMENT  
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



**STEEL INTERMEDIATE DIAPHRAGM**  
(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)



**DETAIL "A"**

REVISED:  
APPROVED: OCTOBER 26, 2005  
*David C. Morrison*  
STATE BRIDGE ENGINEER

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

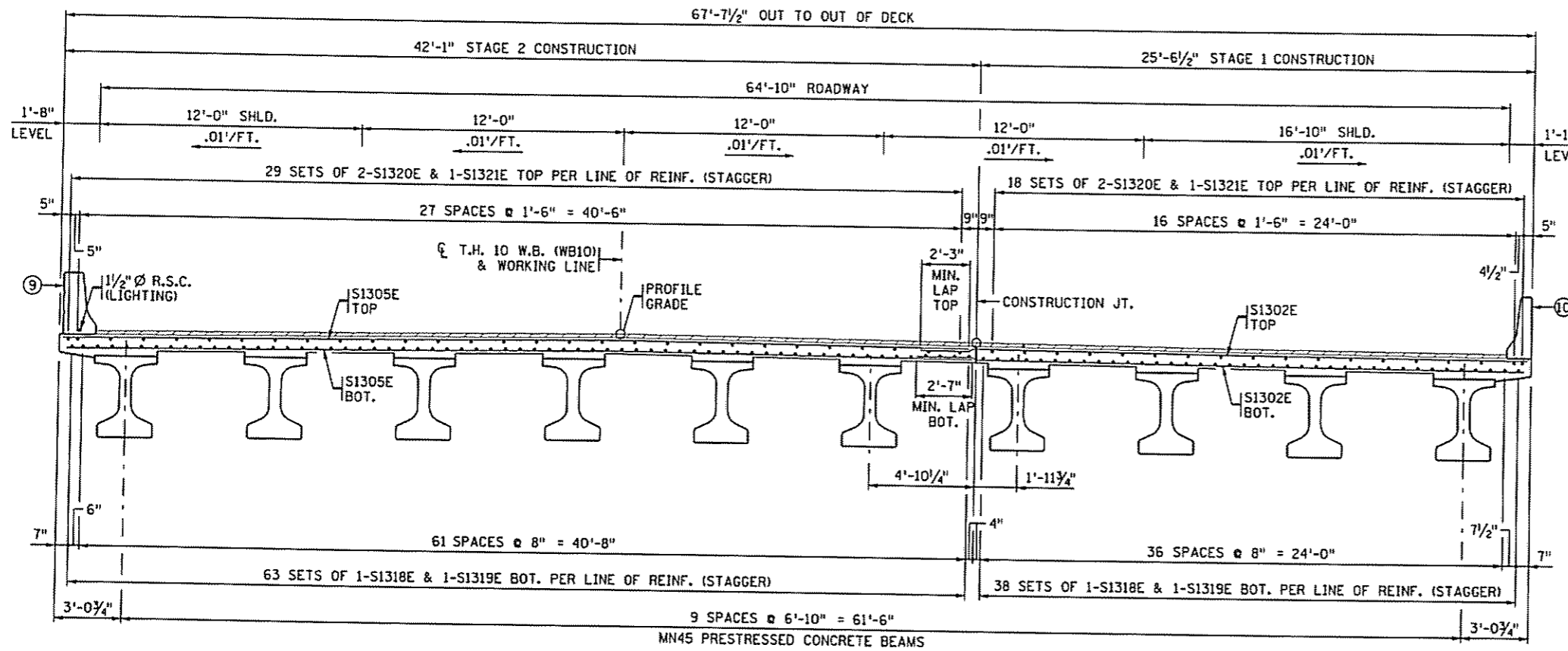
TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-112

BEAMS B1-B2		FIG. 5-397.507	
DES: P.J.K.	DR: J.H.B.	APPROVED: 2/23/09	BRIDGE NO. 02003
CHK: M.C.D.	CHK: J.A.J.	SHEET NO. 47 OF 72 SHEETS	

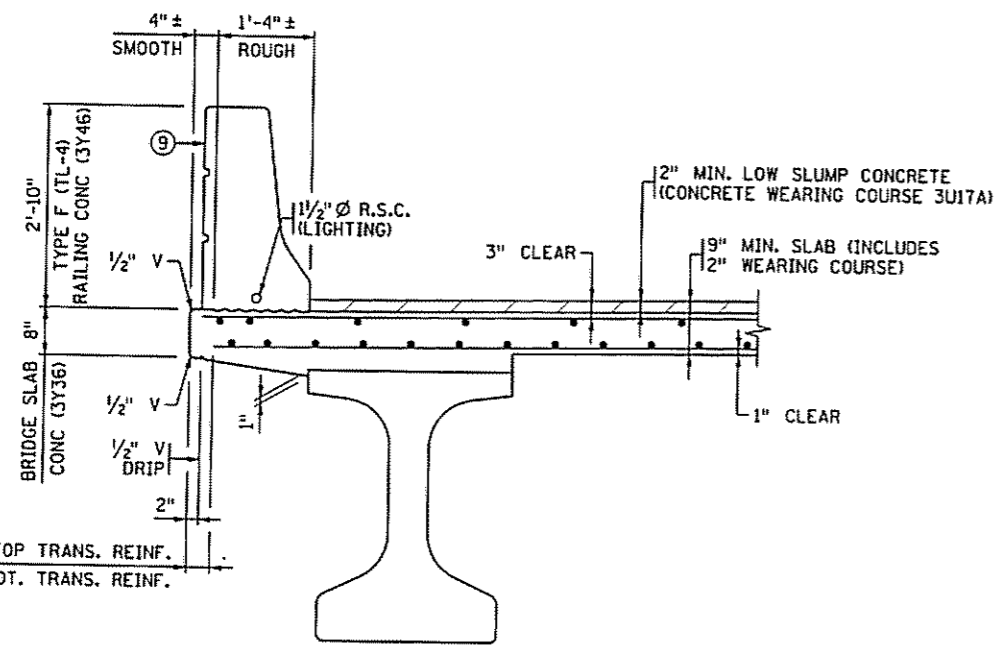
SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE

ITEM	STAGE 1 NO.	STAGE 2 NO.	TOTAL
① BRIDGE SLAB CONCRETE (3Y36)	3031	4994	8025 SQ. FT.
② CONCRETE WEARING COURSE (3U17A)			15578 SQ. FT.
③ TYPE F (TL-4) RAILING CONCRETE (3Y46)		124	124 LIN. FT.
④ REINFORCEMENT BARS (EPOXY COATED)	17960	25530	43490 POUND
⑤ EXP. CURVED PLATE BEARING ASSEMBLY TYPE E1	4	6	10 EACH
⑤ EXP. CURVED PLATE BEARING ASSEMBLY TYPE E2	1	1	2 EACH
⑤ FIXED CURVED PLATE BEARING ASSEMBLY TYPE F1	3	5	8 EACH
⑤ EXPANSION JOINT DEVICES TYPE 5	71	116	187 LIN. FT.
⑤ DIAPHRAGMS FOR TYPE MN45 PREST. BEAMS	41	82	123 LIN. FT.
⑤ PRESTRESSED CONCRETE BEAMS MN45	445	668	1113 LIN. FT.
⑥ BENCH MARK DISK		1	1 EACH
⑦ 1" THICK CORK	7	10	17 SQ. FT.
⑦ BRIDGE NAME PLATE		1	1 EACH
⑧ SPLIT MEDIAN BARRIER CONC (3Y46)	115		115 LIN. FT.
⑦ 1" POLYSTYRENE TYPE B	390		390 SQ. FT.

- ① STAGE 1 CONSTRUCTION:  
"BRIDGE SLAB CONCRETE (3Y36)" VOLUME WAS COMPUTED USING AN AVERAGE STOOD HEIGHT OF 2 1/4 INCHES. ITEM INCLUDES APPROXIMATELY 75 CU. YDS. FOR SLAB AND END BLOCKS, AND APPROXIMATELY 10 CU. YDS. FOR END DIAPHRAGMS.
- STAGE 2 CONSTRUCTION:  
"BRIDGE SLAB CONCRETE (3Y36)" VOLUME WAS COMPUTED USING AN AVERAGE STOOD HEIGHT OF 2 1/4 INCHES. ITEM INCLUDES APPROXIMATELY 123 CU. YDS. FOR SLAB AND END BLOCKS, AND APPROXIMATELY 20 CU. YDS. FOR END DIAPHRAGMS.
- ② "CONCRETE WEARING COURSE (3U17A)" VOLUME IS APPROXIMATELY 96 CU. YDS. ITEM INCLUDES 7884 SQ. FT. FOR BRIDGE APPROACH PANELS.
- ③ "TYPE F (TL-4) RAILING CONCRETE (3Y46)" VOLUME IS APPROXIMATELY 15 CU. YDS.
- ④ INCLUDES SLAB, END DIAPHRAGM, MEDIAN BARRIER AND CONCRETE BARRIER TYPE F (TL-4) REINFORCEMENT.
- ⑤ PAYMENT FOR BEARINGS INCLUDED IN ITEM "BEARING ASSEMBLY" PER EACH.
- ⑥ STATE WILL FURNISH DISK. BEND PRONGS OUTWARD TO ANCHOR DISK IN CONCRETE. BOTTOM OF DISK TOP TO BE PLACED FLUSH WITH CONCRETE. PAYMENT FOR PLACING SHALL BE CONSIDERED INCIDENTAL TO ITEM "TYPE F (TL-4) RAILING CONCRETE (3Y46)".
- ⑦ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO CONCRETE PAY ITEMS.
- ⑧ "SPLIT MEDIAN BARRIER CONCRETE (3Y46)" VOLUME IS APPROXIMATELY 9 CU. YDS.
- ⑨ CONCRETE BARRIER TYPE F (TL-4).
- ⑩ SPLIT MEDIAN BARRIER TYPE F.



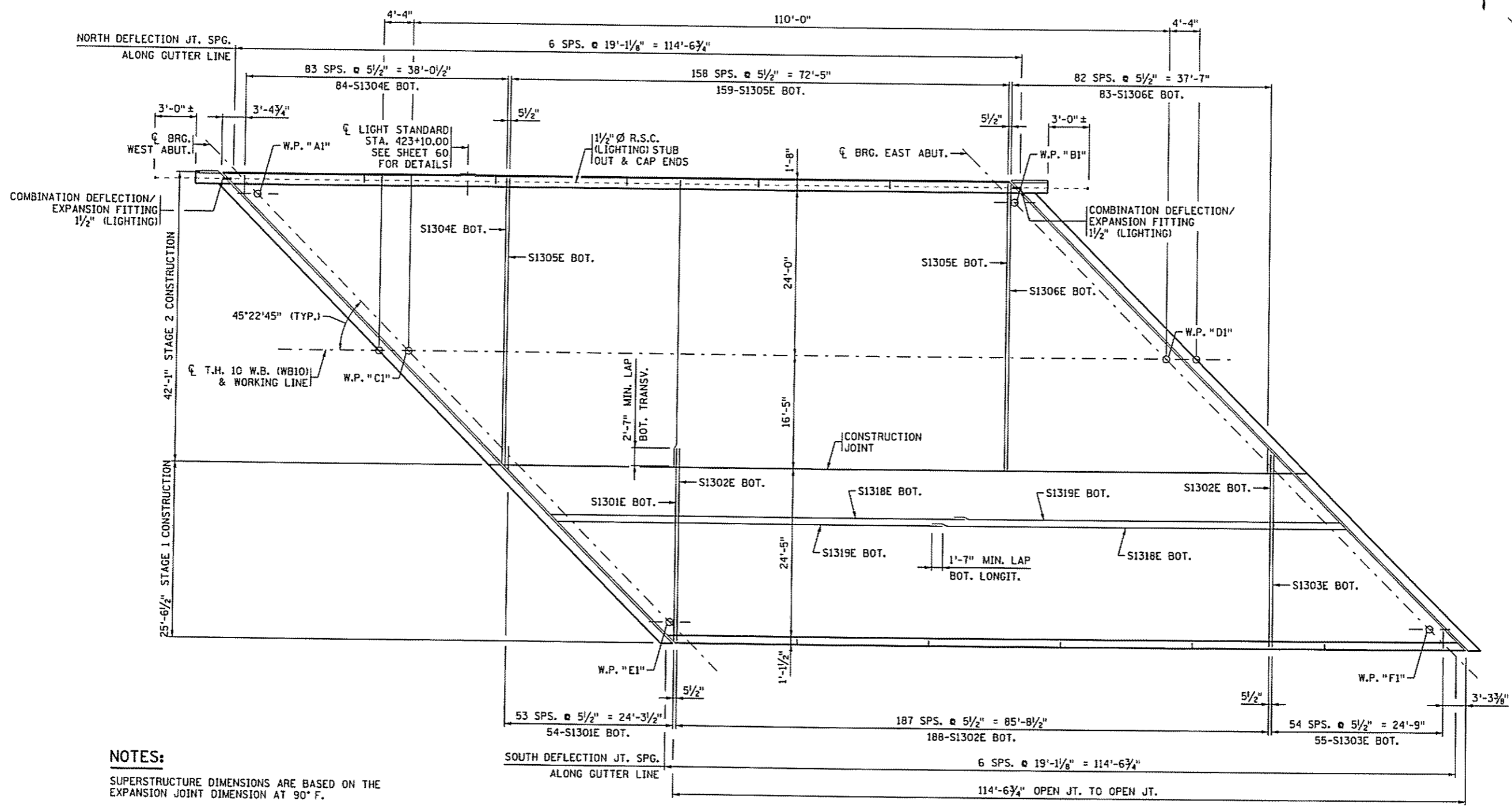
TRANSVERSE SECTION



PART TRANSVERSE SECTION THRU DECK

2/17/2009 S:\Design\022003\JHB\Ab-02003.swp.dgn

CERTIFIED BY <i>M.C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: SUPERSTRUCTURE DETAILS AND REINFORCEMENT	DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09 CHK: M.C.D. CHK: J.A.J.	BRIDGE NO. 02003 SHEET NO. 48 OF 72 SHEETS
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**NOTES:**

SUPERSTRUCTURE DIMENSIONS ARE BASED ON THE EXPANSION JOINT DIMENSION AT 90° F.

SEE CORNER REINFORCEMENT DETAILS, SHEET 51 FOR DIMENSIONS AT EXPANSION JOINT OPENINGS.

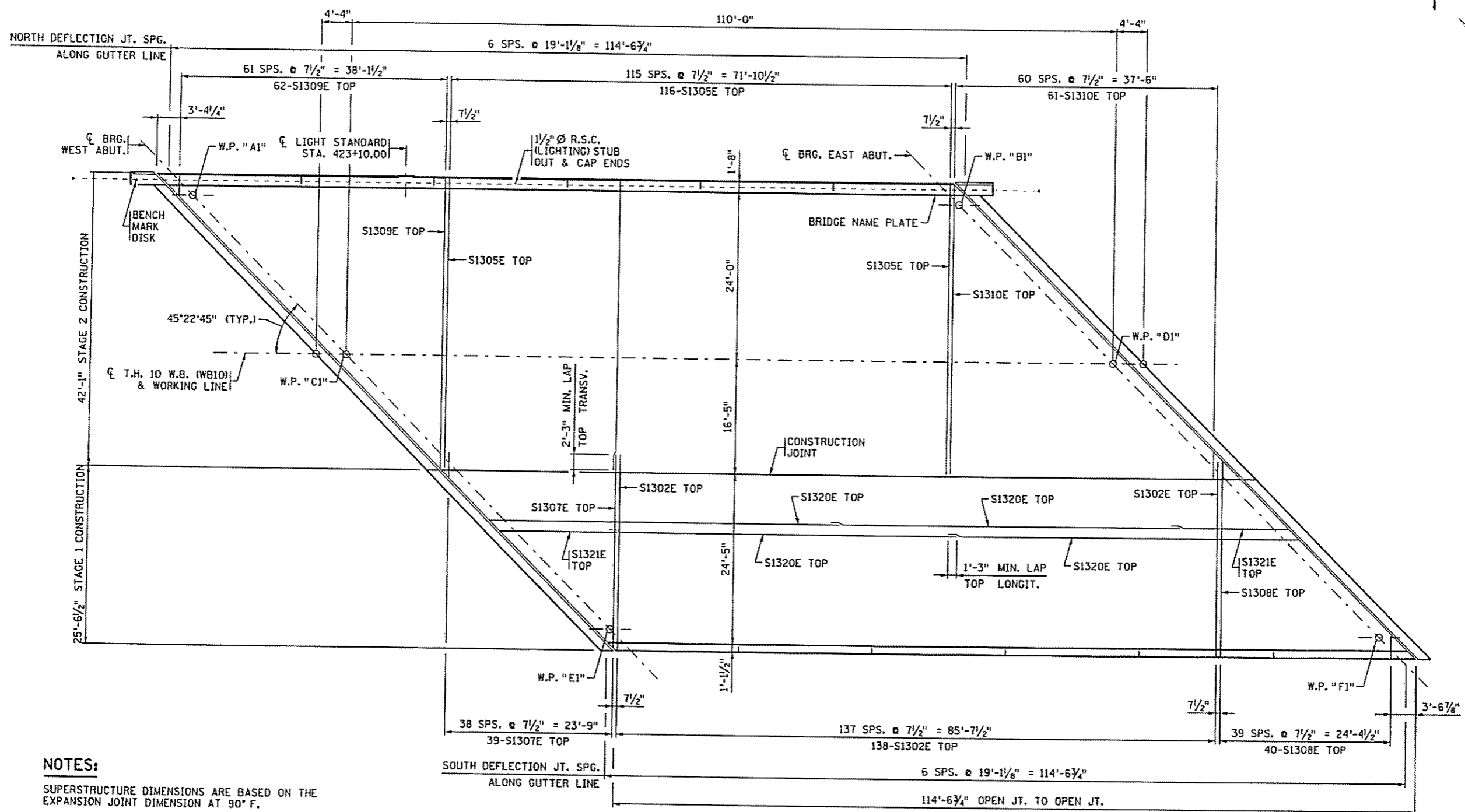
FOR ADDITIONAL REINFORCEMENT DETAILS AT END BLOCK AND N.W. AND S.E. CORNERS, SEE PART LONGITUDINAL SECTION SHEET 52 AND CORNER DETAILS SHEET 51.

SEE SHEET 60 FOR ADDITIONAL "CONDUIT SYSTEM (LIGHTING DETAILS)".

**DECK PLAN**  
BOTTOM REINFORCEMENT ONLY SHOWN.  
FINISHED DECK SHOWN.

2/17/2009 5:\Design\02003\JHB\02003.swp.dgn

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: SUPERSTRUCTURE DETAILS AND REINFORCEMENT	DES: P.J.K.	DR: J.H.B.	APPROVED: 2/23/09	BRIDGE NO. 02003
		CHK: M.C.D.	CHK: J.A.J.	SHEET NO. 49 OF 72 SHEETS	

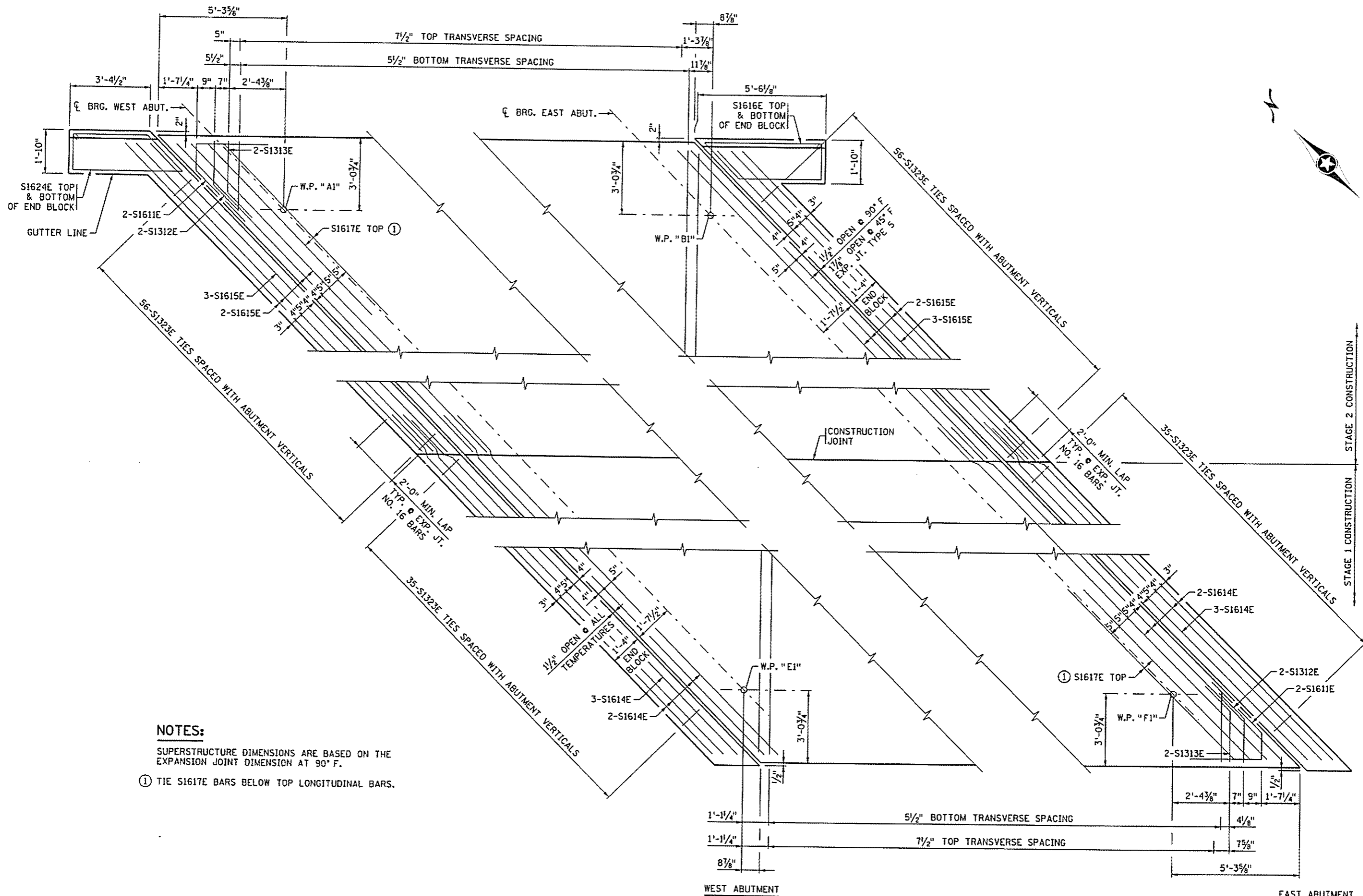


**NOTES:**  
 SUPERSTRUCTURE DIMENSIONS ARE BASED ON THE EXPANSION JOINT DIMENSION AT 90° F.  
 SEE CORNER REINFORCEMENT DETAILS, SHEET 51 FOR DIMENSIONS AT EXPANSION JOINT OPENINGS.  
 FOR ADDITIONAL REINFORCEMENT DETAILS AT END BLOCK AND N.W. AND S.E. CORNERS, SEE PART LONGITUDINAL SECTION SHEET 52 AND CORNER DETAILS SHEET 51.

**DECK PLAN**  
 TOP REINFORCEMENT ONLY SHOWN.  
 FINISHED DECK SHOWN.

2/17/2009 S:\Design\102003\JHB\022003.swp.dgn

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: SUPERSTRUCTURE DETAILS AND REINFORCEMENT	DES: P.J.K.	DR: J.H.B.	APPROVED:	BRIDGE NO. 02003
		CHK: M.C.D.	CHK: J.A.J.	2/23/09	



**NOTES:**

SUPERSTRUCTURE DIMENSIONS ARE BASED ON THE EXPANSION JOINT DIMENSION AT 90° F.

- ① TIE S1617E BARS BELOW TOP LONGITUDINAL BARS.

**CORNER REINFORCEMENT DETAILS**

BARRIERS NOT SHOWN

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: SUPERSTRUCTURE  
 DETAILS AND REINFORCEMENT

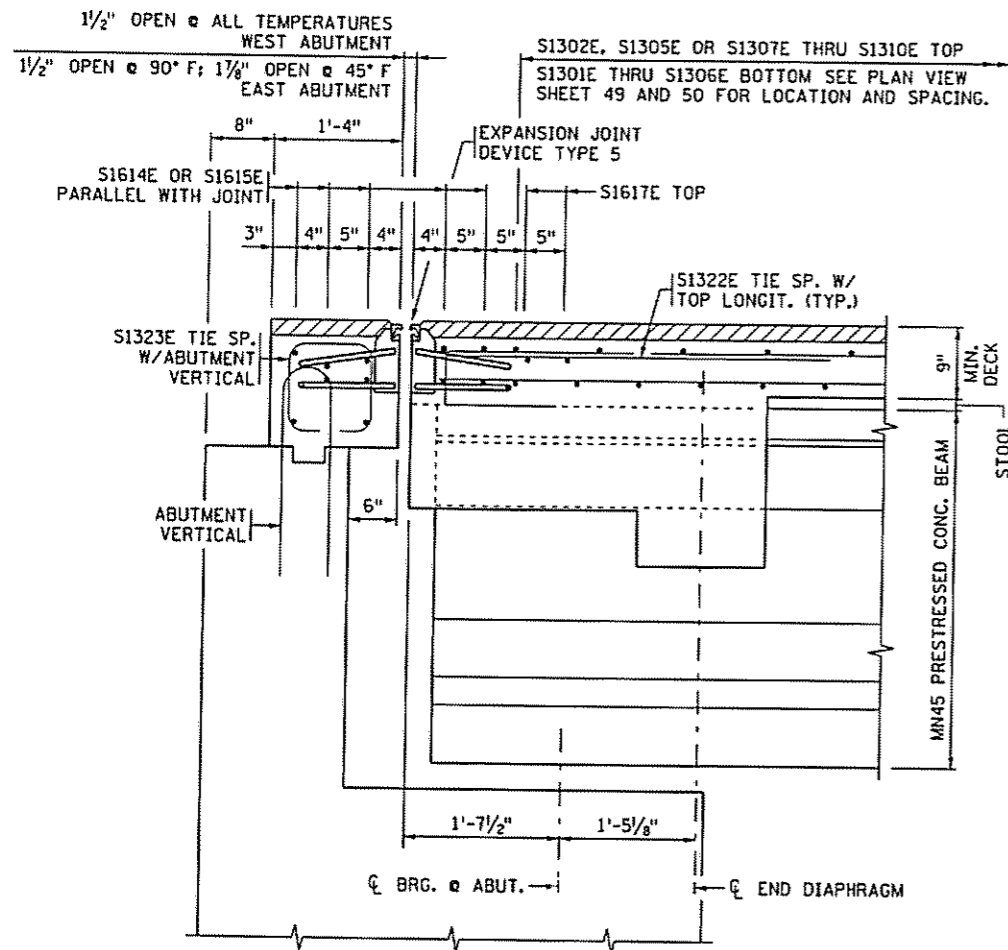
DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
 CHK: M.C.D. CHK: J.A.J.

BRIDGE NO. 02003

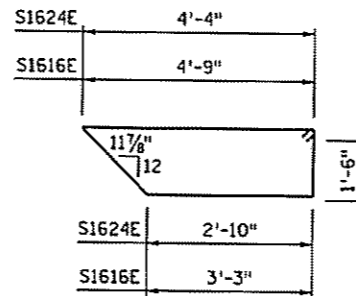
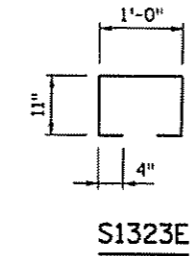
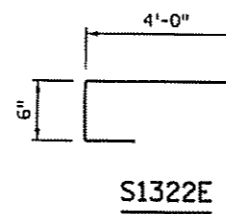
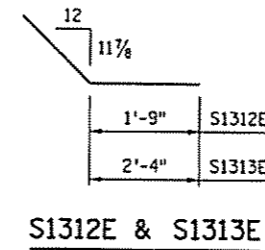
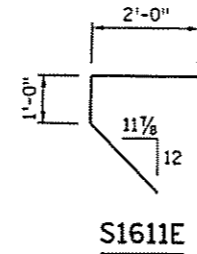
SHEET NO. 51 OF 72 SHEETS

S:\Design\0102003\JHB\02003.ssp.dgn 2/17/2009





PART LONGITUDINAL SECTION  
(DIMENSIONS NORMAL TO JOINT)



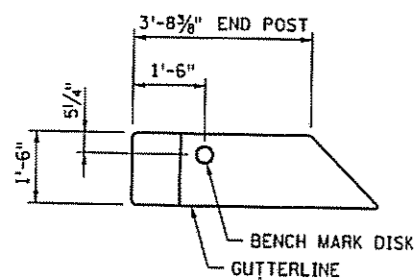
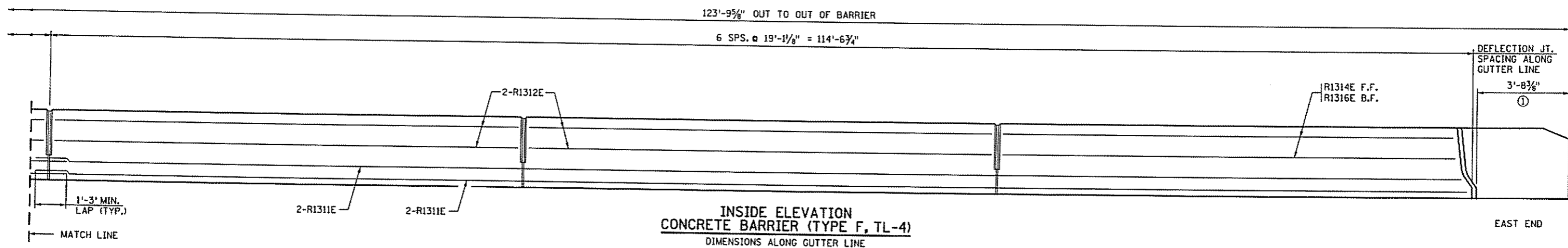
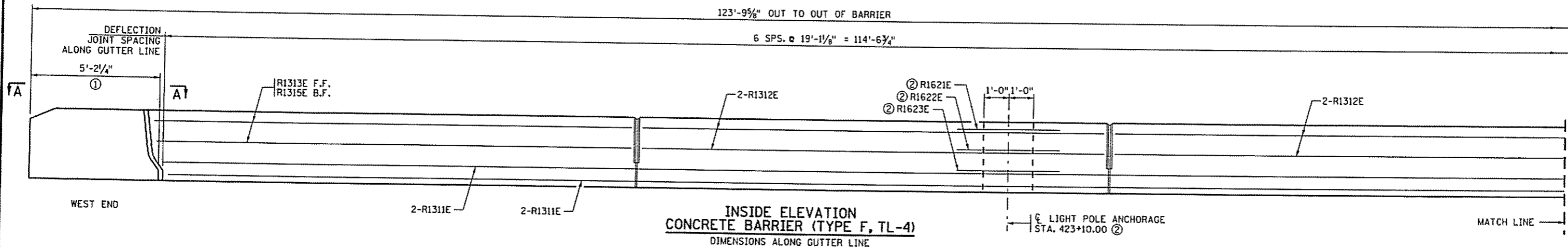
S1616E & S1624E

BILL OF REINFORCEMENT FOR SUPERSTRUCTURE

BAR	STAGE 1 NO.	STAGE 2 NO.	LENGTH	SHAPE	LOCATION
S1301E	1 SER. OF 54	—	VAR. 3'-4" TO 27'-11"	—	DECK TRANSVERSE BOTTOM
S1302E	326	—	28'-0"	—	DECK TRANS. BOT. & TOP
S1303E	1 SER. OF 55	—	VAR. 2'-9" TO 27'-10"	—	DECK TRANSVERSE BOTTOM
S1304E	—	1 SER. OF 84	VAR. 2'-10" TO 41'-4"	—	DECK TRANSVERSE BOTTOM
S1305E	—	275	41'-7"	—	DECK TRANS. BOT. & TOP
S1306E	—	1 SER. OF 83	VAR. 3'-4" TO 41'-5"	—	DECK TRANSVERSE BOTTOM
S1307E	1 SER. OF 39	—	VAR. 3'-7" TO 27'-9"	—	DECK TRANSVERSE TOP
S1308E	1 SER. OF 40	—	VAR. 3'-2" TO 27'-10"	—	DECK TRANSVERSE TOP
S1309E	—	1 SER. OF 62	VAR. 3'-0" TO 41'-7"	—	DECK TRANSVERSE TOP
S1310E	—	1 SER. OF 61	VAR. 3'-7" TO 41'-7"	—	DECK TRANSVERSE TOP
S1611E	2	2	6'-0"	—	CORNER TIE TOP & BOT.
S1312E	2	2	3'-9"	—	DECK CORNER TOP & BOT.
S1313E	2	2	4'-4"	—	DECK CORNER TOP & BOT.
S1614E	22	—	38'-2"	—	TRANS. TOP & BOT. @ JT.
S1615E	—	22	58'-8"	—	TRANS. TOP & BOT. @ JT.
S1616E	—	2	12'-7"	—	END BLOCK @ CORNER
S1617E	2	2	10'-0"	—	DECK TRANS. TOP @ CORNER
S1318E	38	63	60'-0"	—	DECK LONGITUDINAL BOT.
S1319E	38	63	55'-10"	—	DECK LONGITUDINAL BOT.
S1320E	36	58	50'-0"	—	DECK LONGITUDINAL TOP
S1321E	18	29	16'-9"	—	DECK LONGITUDINAL TOP
S1322E	36	58	6'-1"	—	LONGITUDINAL END OF DECK
S1323E	70	112	3'-6"	—	END BLOCK TIE
S1624E	—	2	11'-9"	—	END BLOCK @ CORNER

2/17/2009 S:\Design\1022003\JHB\br-022003.swp.dgn

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: SUPERSTRUCTURE DETAILS AND REINFORCEMENT	DES: P.J.K.	DR: J.H.B.	APPROVED:	BRIDGE NO. 02003
		CHK: M.C.D.	CHK: J.A.J.	2/23/09	
SHEET NO. 52 OF 72 SHEETS					



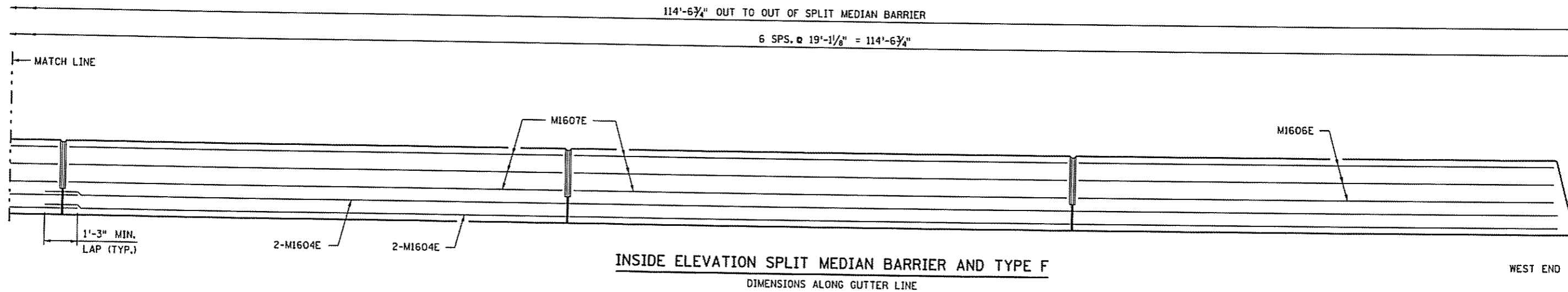
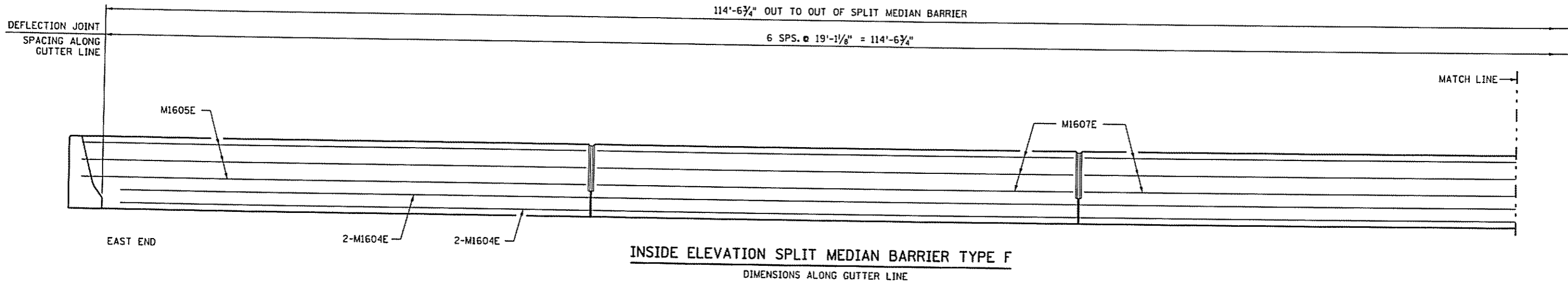
VIEW A-A  
NORTHWEST CORNER ONLY

**NOTES:**

- F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.  
SUPERSTRUCTURE DIMENSIONS ARE BASED ON THE EXPANSION JOINT DIMENSION AT 90° F.
- ① FOR END POST DETAILS AND REINFORCEMENT SEE SHEET NO. 55.
  - ② FOR DETAILS AND ADDITIONAL REINFORCEMENT AT LIGHT POLE ANCHORAGE SEE SHEET NO. 60.

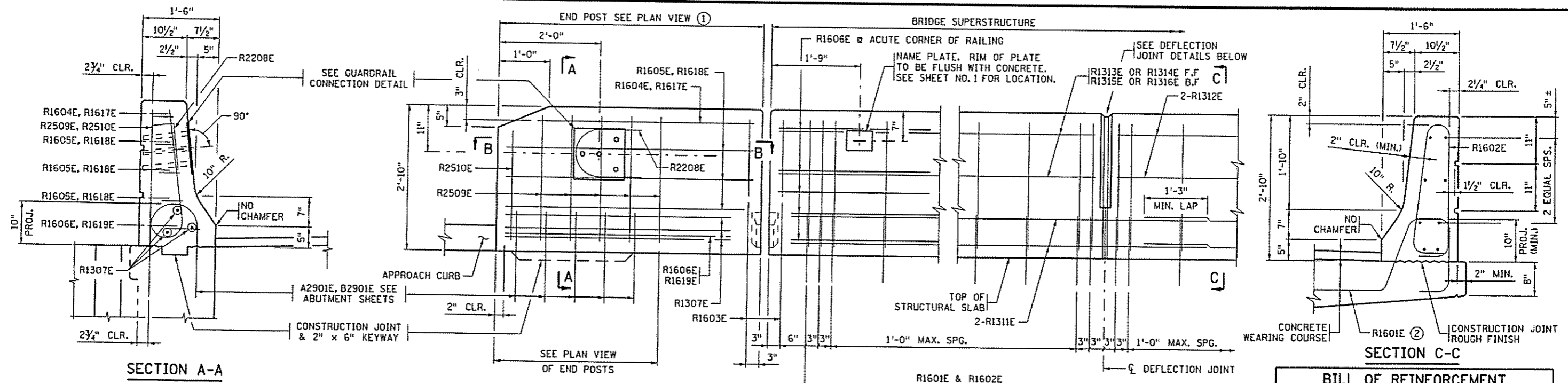
2/16/2009 S:\Design\042003\KCS\02003.BRL

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: SUPERSTRUCTURE DETAILS AND REINFORCEMENT		DES: PJK CHK: MCD	DR: LKL CHK: JAJ	APPROVED: 2/23/09	BRIDGE NO. 02003 SHEET NO. 53 OF 72 SHEETS



2/16/2009 S:\Design\022003\K05\B2003.RAL

CERTIFIED BY <i>MCDimaculangan</i> 2/23/09 <small>LICENSED PROFESSIONAL ENGINEER</small> NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: <b>SUPERSTRUCTURE DETAILS AND REINFORCEMENT</b>	DES: PKJ	DR: LKL	APPROVED: <i>2/23/09</i>	BRIDGE NO. 02003
		CHK: MCD	CHK: JAJ		



**NOTES:**  
 F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.

**EXPANSION JOINT**  
 (EXPANSION DEVICE NOT SHOWN)

**DEFLECTION JOINT**

**INSIDE ELEVATION OF BARRIER**  
 (CONCRETE WEARING COURSE NOT SHOWN)

**BARRIER MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350**

**GENERAL NOTES**

LENGTH OF "TYPE F (TL-4) RAILING CONCRETE (3Y46) FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE BARRIER.

CONCRETE BARRIER = 477 LBS./FT. (0.117 CU. YDS./FT.)

FINISH ALL EDGES OF BARRIER AND END POST WITH 1/2" VEE, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONCRETE DEFLECTION JOINTS SHALL BE 20 FT.

SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

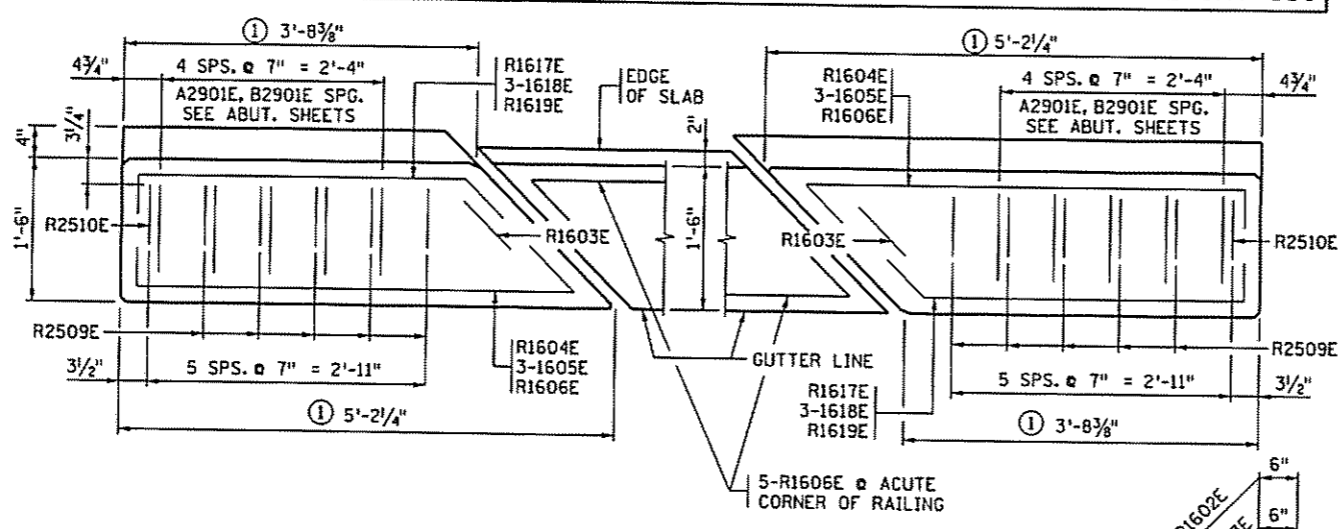
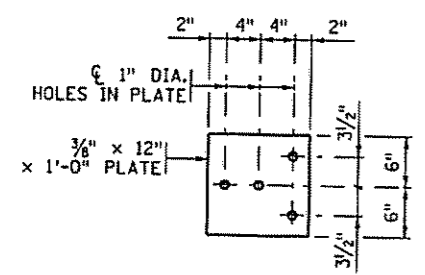
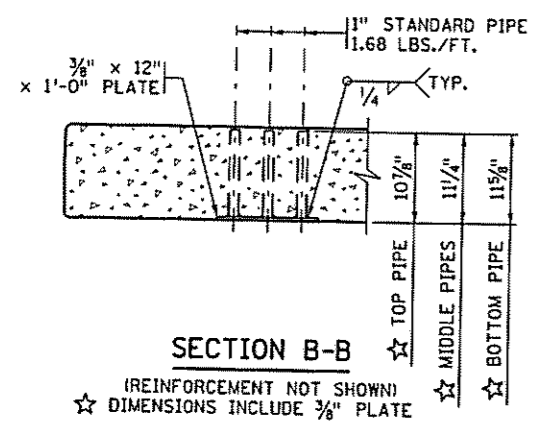
GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, Mn/DOT SPEC. 3306.

GUARDRAIL CONNECTION, CORK, AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO CONCRETE PAY ITEMS.

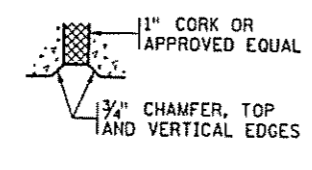
BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

- ① END POST DIMENSIONS ARE ALONG GUTTER LINE OR OUTSIDE FACE OF END POST.
- ② PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT.

BILL OF REINFORCEMENT FOR BARRIER				
BAR	NO.	LENGTH	SHAPE	LOCATION
R1601E	135	5'-5"		BARRIER DOWEL
R1602E	135	6'-7"		BARRIER VERTICAL
R1603E	4	4'-7"		BARRIER VERTICAL
R1604E	2	4'-11"		END POST
R1605E	6	5'-7"		END POST
R1606E	12	5'-7"		END POST
R1307E	6	2'-11"		END POST
R2208E	2	4'-1"		END POST
R2509E	10	5'-4"		END POST
R2510E	2	4'-9"		END POST
R1311E	8	57'-2"		BARRIER LONGIT.
R1312E	16	18'-8"		BARRIER LONGIT.
R1313E	2	19'-0"		BARRIER LONGIT.
R1314E	2	17'-6"		BARRIER LONGIT.
R1315E	2	19'-11"		BARRIER LONGIT.
R1316E	2	17'-5"		BARRIER LONGIT.
R1617E	2	3'-8"		END POST
R1618E	6	4'-4"		END POST
R1619E	2	4'-5"		END POST

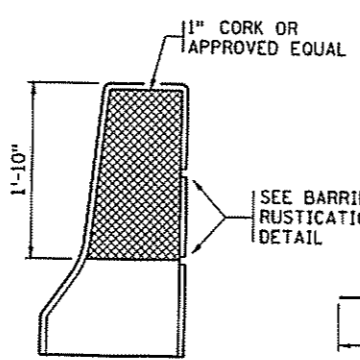


**GUARDRAIL CONNECTION DETAIL**  
 GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394 ESTIMATED WEIGHT = 22 LBS

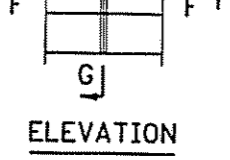
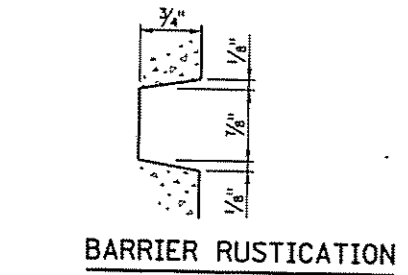


SECTION E-E

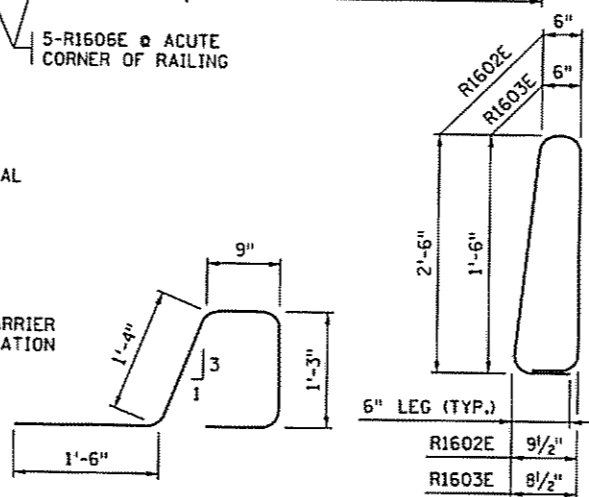
SECTION F-F



SECTION G-G



DEFLECTION JOINT DETAILS



R1601E

R1602E & R1603E

R1604E, R1605E & R1606E

R2509E & R2510E

R1617E, R1618E & R1619E

REVISED: 05-26-2006  
 APPROVED: DECEMBER 18, 2003  
 STATE BRIDGE ENGINEER

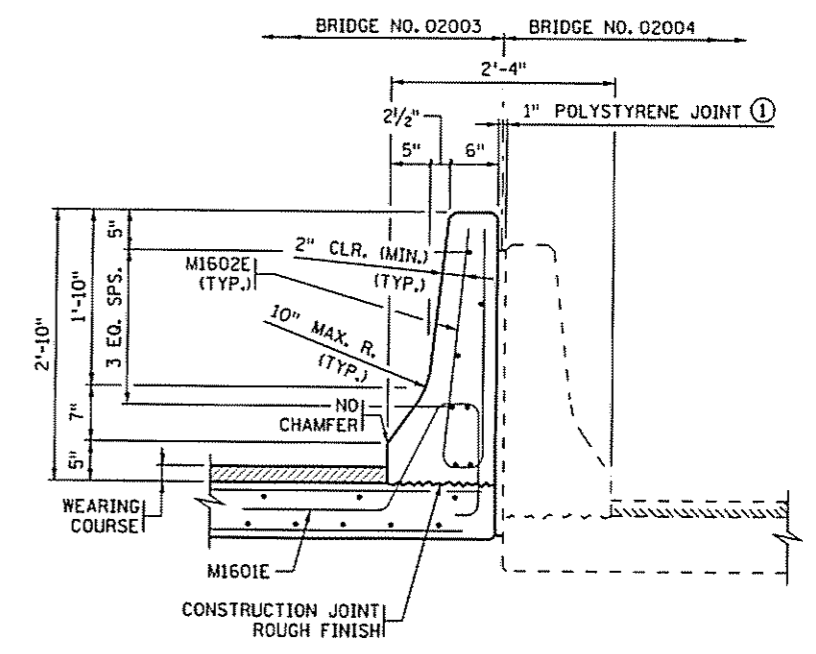
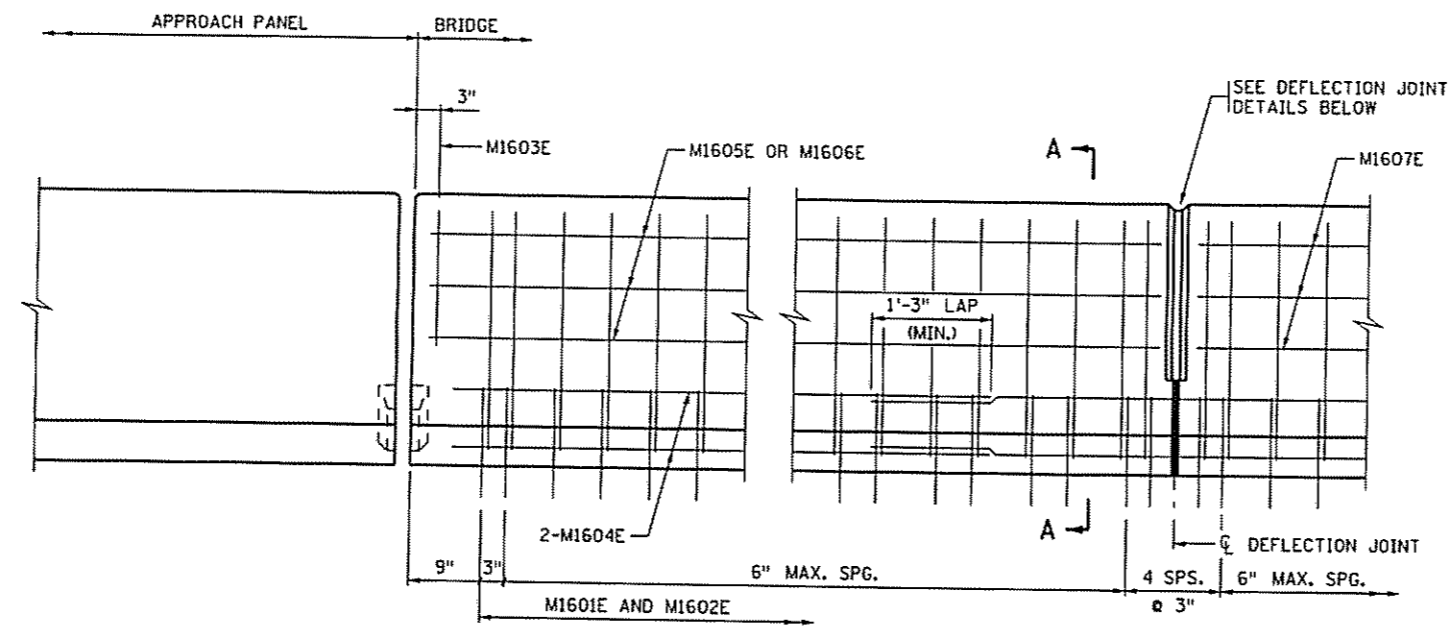
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

CONCRETE BARRIER (TYPE F, TL-4)  
 WITH SEPARATE END POST  
 (WITH CONCRETE WEARING COURSE)

DES: PJK DR: LKL  
 CHK: MCD CHK: JAJ  
 APPROVED: 2/23/09  
 SHEET NO. 55 OF 72 SHEETS

BRIDGE NO. 02003

MODIFIED FIG. 5-397.116



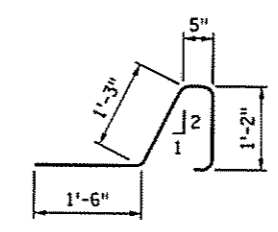
EXPANSION JOINT  
EXPANSION DEVICE NOT SHOWN

INSIDE ELEVATION OF BARRIER  
WEARING COURSE NOT SHOWN

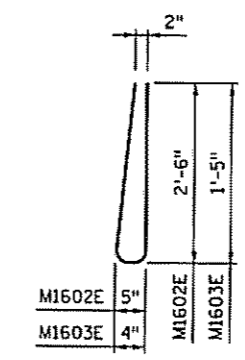
DEFLECTION JOINT

SECTION A-A

RAIL MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350.



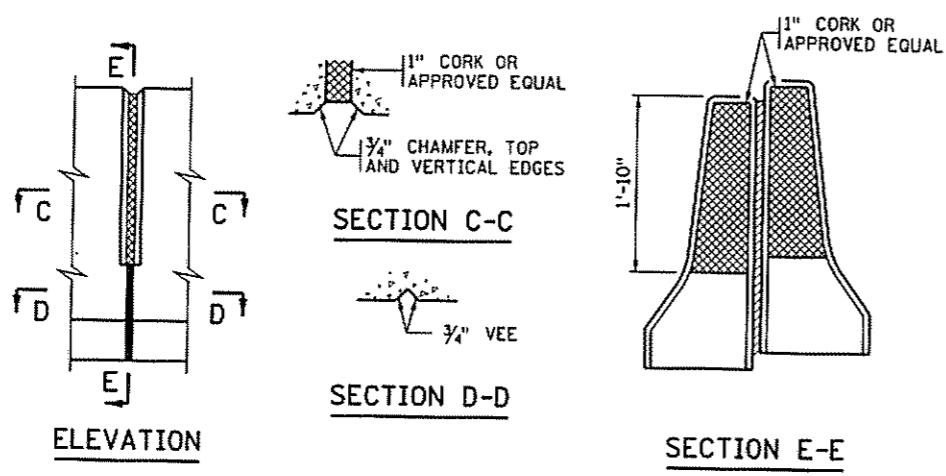
M1601E



M1602E & M1603E

GENERAL NOTES

- CONCRETE BARRIER SHALL BE CONC. MIX 3Y46. CONCRETE BARRIER = 634 LBS./FT. (0.157 CU. YDS/FT.)
- FINISH ALL EDGES OF BARRIER WITH 1/2" VEE EXCEPT WHERE OTHERWISE NOTED.
- MAXIMUM SPACING OF CONCRETE DEFLECTION JOINTS SHALL BE 20 FT.
- SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.
- BARRIER QUANTITIES ARE INCLUDED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.
- ① POLYSTYRENE TYPE B. SEE SPECIAL PROVISIONS.



DEFLECTION JOINT DETAILS

BILL OF REINFORCEMENT FOR BARRIER				
BAR	NO.	LENGTH	SHAPE	LOCATION
M1601E	238	4'-7"		BARRIER DOWEL
M1602E	238	5'-5"		BARRIER VERTICAL
M1603E	2	3'-2"		BARRIER VERTICAL
M1604E	8	57'-9"		BARRIER LONGITUDINAL
M1605E	3	19'-4"		BARRIER LONGITUDINAL
M1606E	3	17'-10"		BARRIER LONGITUDINAL
M1607E	12	18'-8"		BARRIER LONGITUDINAL

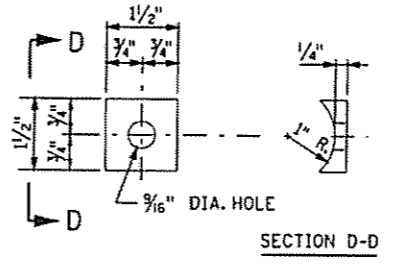
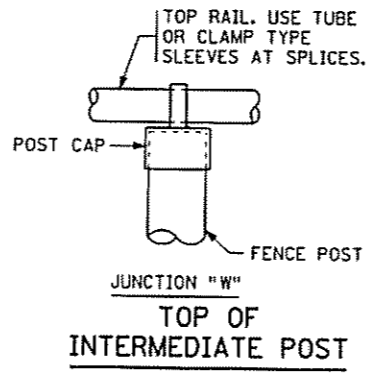
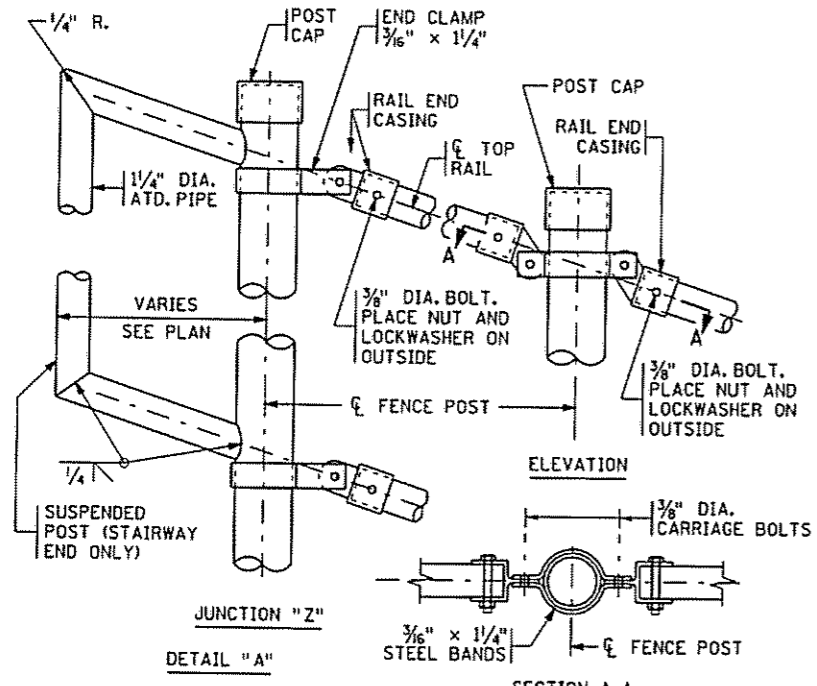
REVISED:  
APPROVED: OCTOBER 29, 2004  
*David A. Johnson*  
STATE BRIDGE ENGINEER

CERTIFIED BY *Moises C. Dimaculangan* 2/23/04  
LICENSED PROFESSIONAL ENGINEER DATE  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

SPLIT MEDIAN BARRIER  
TYPE F  
(WITH WEARING COURSE)

DES: P.J.K. DR: K.G.S. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J. BRIDGE NO. 02003  
SHEET NO. 56 OF 72 SHEETS

FIG. 5-397.131



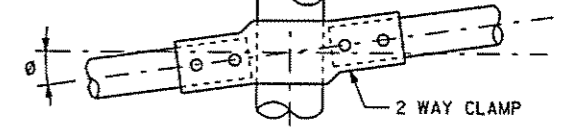
**GROOVED WASHER**  
AN APPROVED ALTERNATE WILL BE CONSIDERED

**2 WAY CLAMP BENDING TABLE**

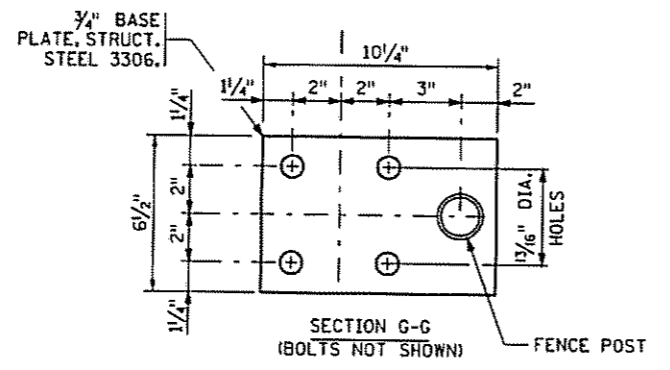
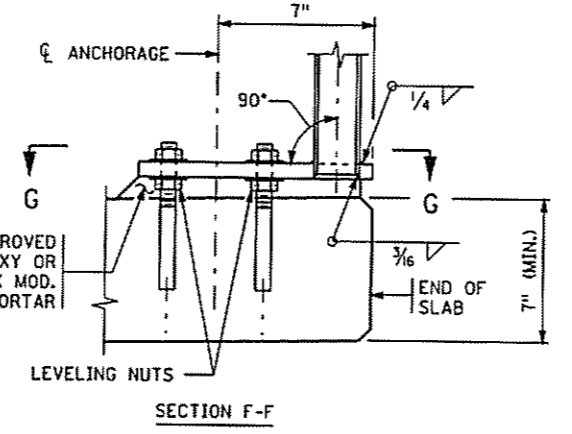
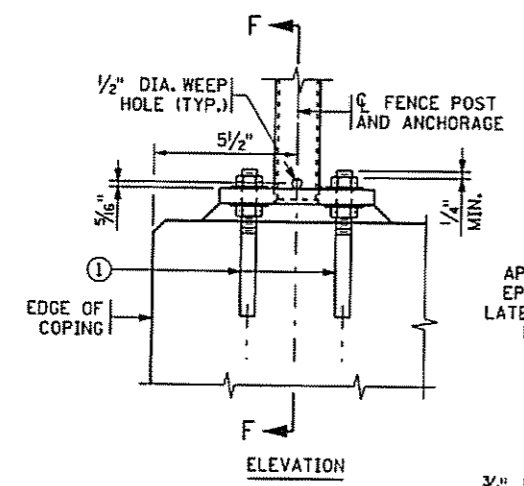
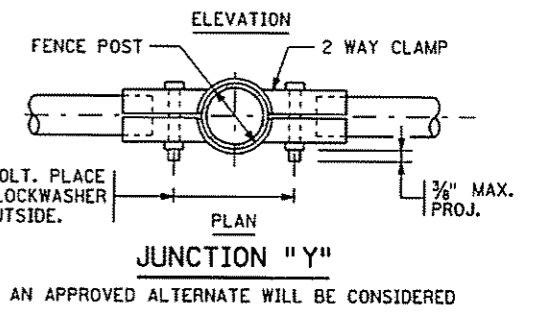
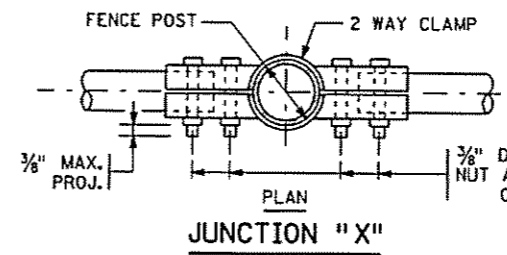
GRADE OF FENCE	Ø
0° TO 2°	0"
2° TO 6°	4"
6° TO 10°	8"

**GENERAL NOTES**  
LENGTH OF "WIRE FENCE, DESIGN W-1" FOR PAYMENT SHALL BE MEASURED BETWEEN THE CENTERS OF THE END RAILPOSTS.  
MAXIMUM SPACING FOR 2 1/2" STANDARD PIPE POSTS IS 8 FT.  
ALL PIPE DIAMETERS ARE NOMINAL.  
FENCE POSTS AND ANCHORAGES SHALL BE SET VERTICAL UNLESS OTHERWISE NOTED. AT BOLT TYPE ANCHORAGES, PACK SPACE BETWEEN BASE PLATE AND CONCRETE WITH APPROVED MORTAR AFTER NUTS HAVE BEEN ADJUSTED AND TIGHTENED.  
FOR ALTERNATE TO TYPE 1 ANCHORAGES SEE DETAIL B905 "FENCE POST ANCHORAGE" TYPE A END POSTS.  
CONTRACTOR WILL SELECT APPROPRIATE DETAILS TO CONSTRUCT FENCE.

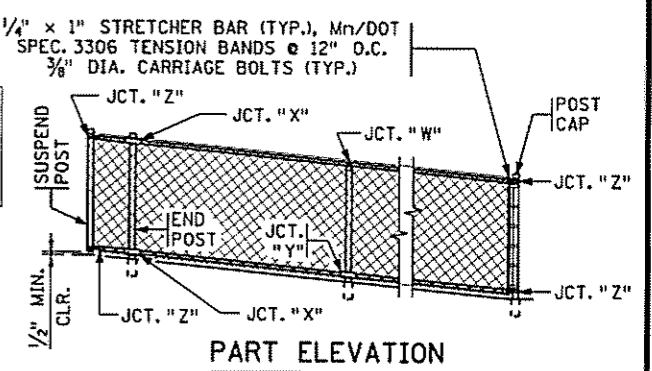
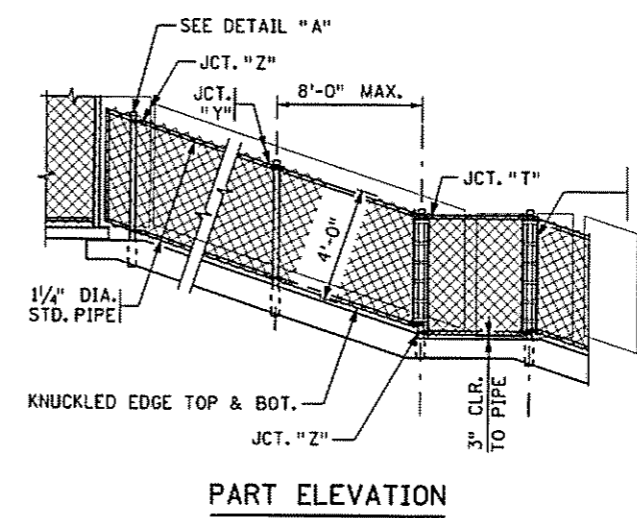
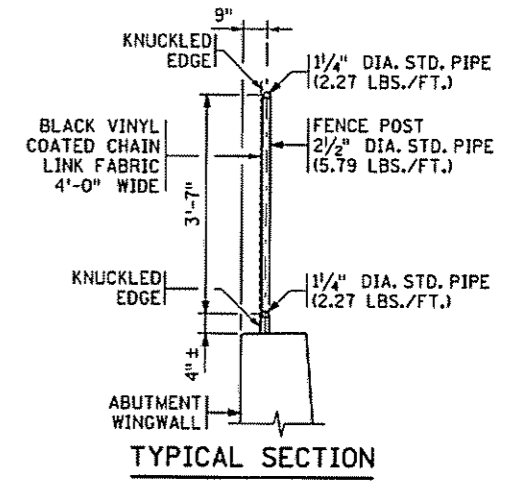
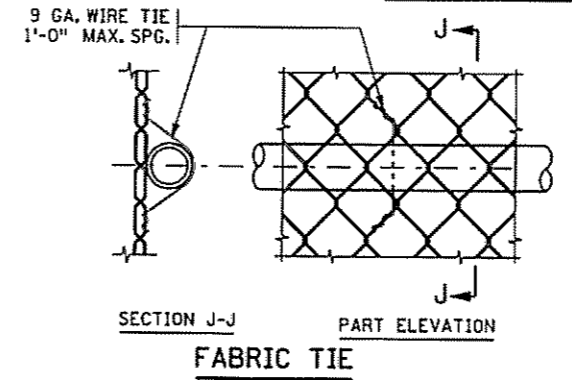
① 3/8" DIA. CHEMICAL ANCHOR RODS, Mn/DOT SPEC. 3385, TYPE A, WITH 3" THREADS, 2 NUTS AND 2 CUT WASHERS PER ROD. MINIMUM ULTIMATE BOND STRENGTH SHALL BE 20,000 POUNDS, WITH A MINIMUM 5" EMBEDMENT LENGTH. SEE SPECIAL PROVISIONS.



JUNCTION "T"  
AN APPROVED ALTERNATE WILL BE CONSIDERED  
**POST CONNECTIONS**



**BOLT ANCHORAGE FOR FENCE POSTS-TYPE 2**  
FOR SLAB THICKNESS OF 7" (MIN.)



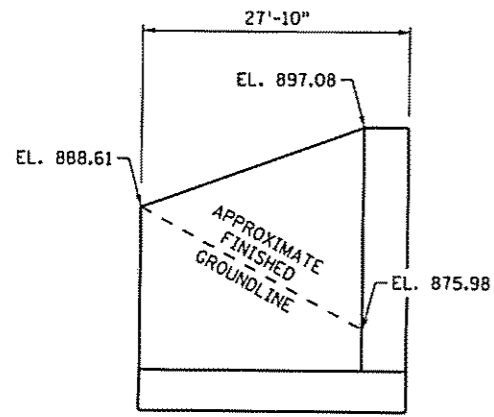
2/17/2009 SA:\04\19\18\2003\118\02003.dwg L.dgn

REVISION: 04-23-2003  
APPROVED: NOVEMBER 26, 1985  
*Donald J. Manning*  
STATE BRIDGE ENGINEER

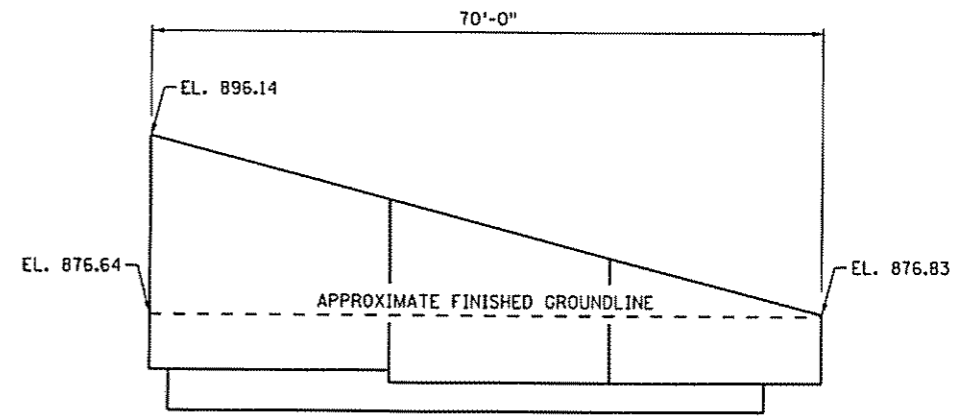
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

4 FT. WIRE FENCE (DESIGN W-1)

MODIFIED FIG. 5-397.202  
DES: P.J.K. DR: J.H.B. APPROVED: *Moises C. Dimaculangan*  
CHK: M.C.D. CHK: J.A.J.  
SHEET NO. 57 OF 72 SHEETS  
BRIDGE NO. 02003



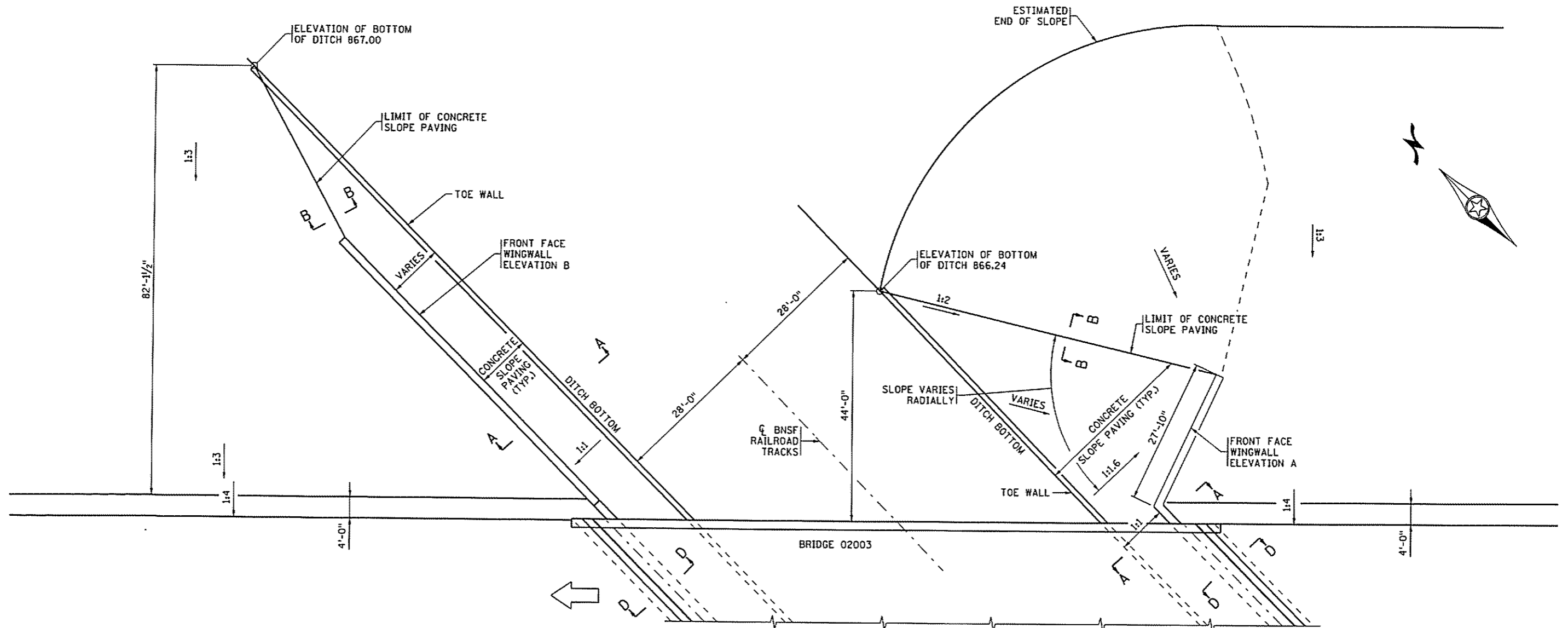
**WINGWALL ELEVATION A**  
FRONT FACE SHOWN



**WINGWALL ELEVATION B**  
FRONT FACE SHOWN

**NOTES:**

- SEE SHEET 1 RAILROAD SECTION UNDER BRIDGE (FOR RAILROAD DITCH DETAILS).
- SEE SHEET 59 FOR SECTION A-A, B-B AND D-D.
- THE SLOPE ARROWS ARE POINTING UPHILL.



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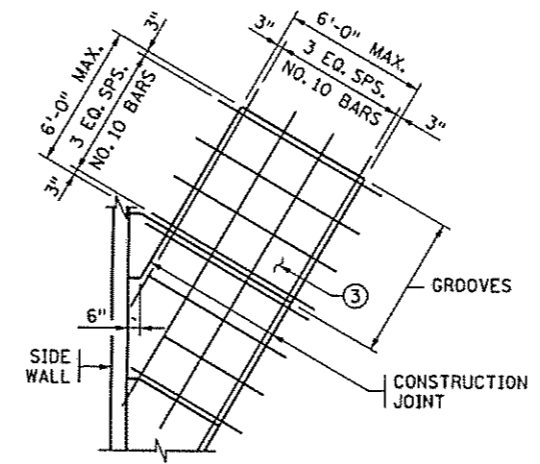
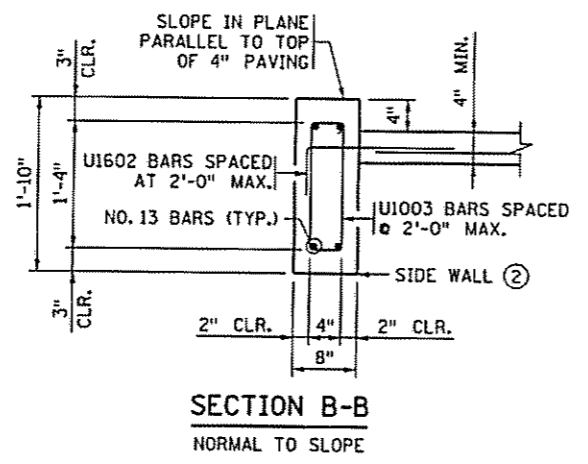
CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: <b>CONCRETE SLOPE PAVING UNDER BRIDGES</b>			DES: P.J.K. DR: J.H.B. APPROVED: <i>2/23/09</i> CHK: M.C.D. CHK: J.A.J.	BRIDGE NO. 02003 SHEET NO. 58 OF 72 SHEETS
	DATE: 2/23/09				

**CONCRETE & REINFORCEMENT  
UNIT QUANTITIES**

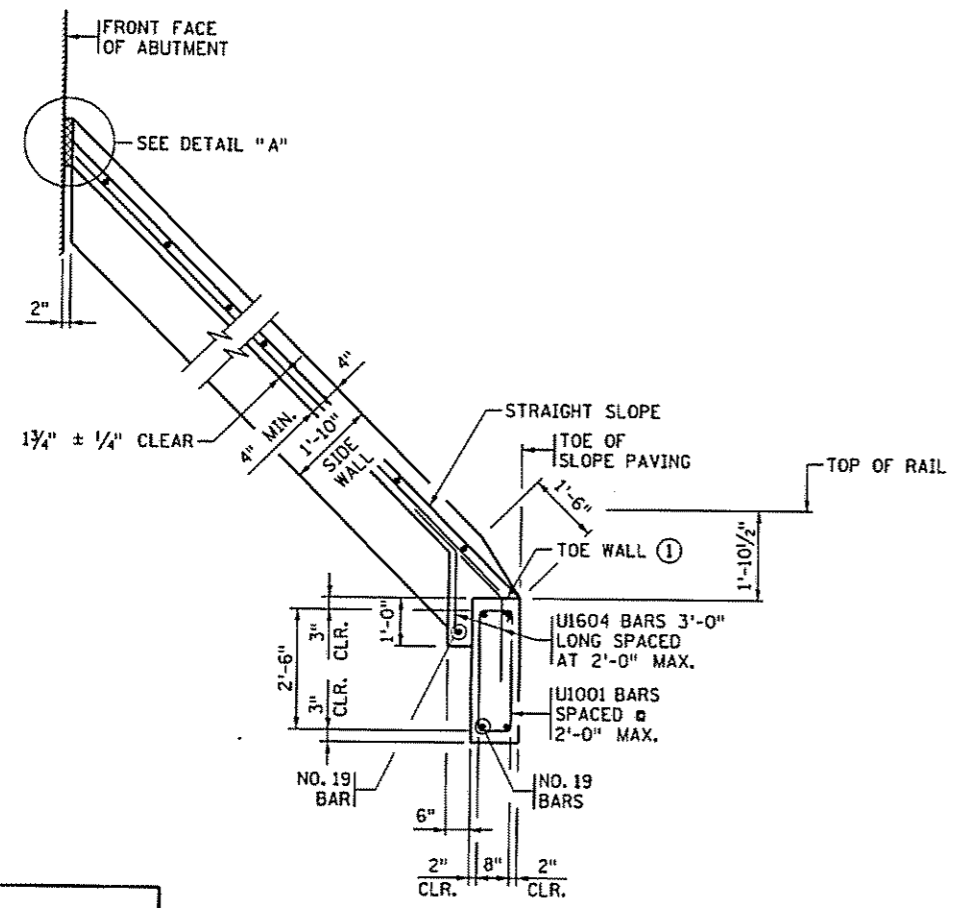
- ① 0.111 CU. YD. OF CONCRETE/LIN. FT.  
8.37 LBS. OF REINFORCEMENT/LIN. FT.
- ② 0.046 CU. YD. OF CONCRETE/LIN. FT.  
4.46 LBS. OF REINFORCEMENT/LIN. FT.
- ③ 0.111 CU. YD. OF CONCRETE/SQ. YD.  
4.50 LBS. OF REINFORCEMENT/SQ. YD.

**GENERAL NOTE**

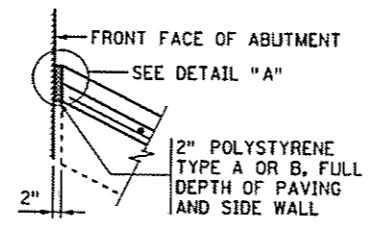
SLOPES ARE EXPRESSED AS A RATIO OF  
VERTICAL DISTANCE; HORIZONTAL DISTANCE.



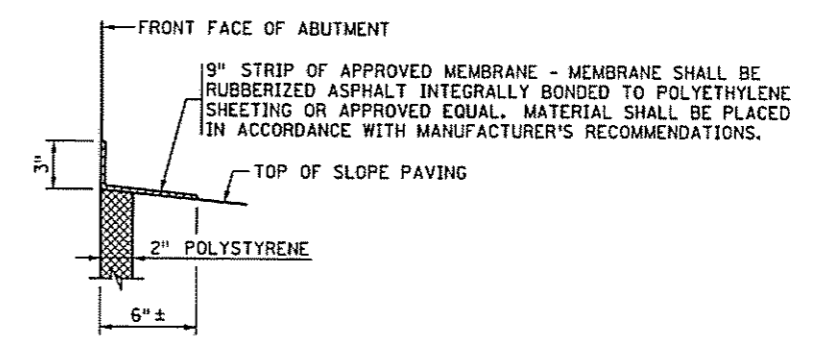
**PAVING DETAIL**



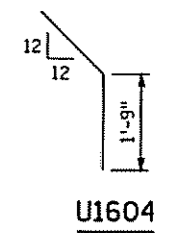
**SECTION A-A**  
1:1 SLOPE SHOWN



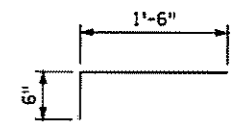
**SECTION D-D**  
HIGH ABUTMENTS WITHOUT RUSTICATION



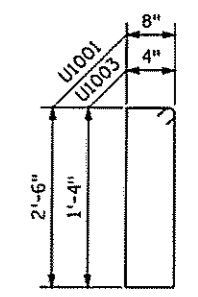
**DETAIL "A"**  
SLOPE PAVING AS PER Mn/DOT SPEC. 2514.



**U1604**



**U1602**



**U1001 & U1003**

2/17/2009 S:\Design\02003\JHB\02003.dwg

REVISION:  
APPROVED: SEPTEMBER 26, 2003  
*Samuel A. Johnson*  
STATE BRIDGE ENGINEER

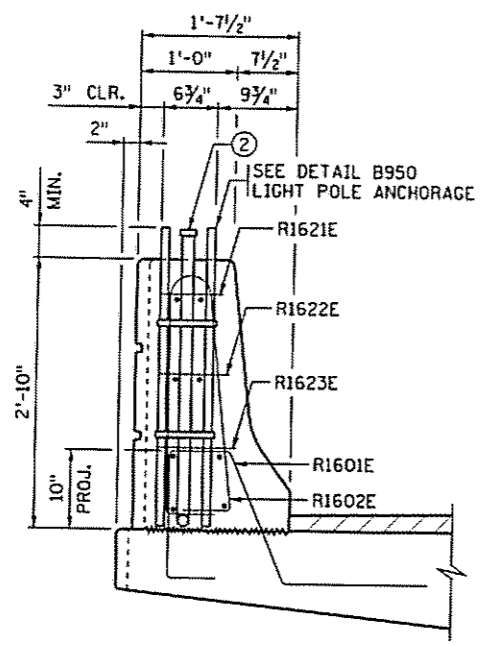
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

**CONCRETE SLOPE PAVING  
UNDER BRIDGES**

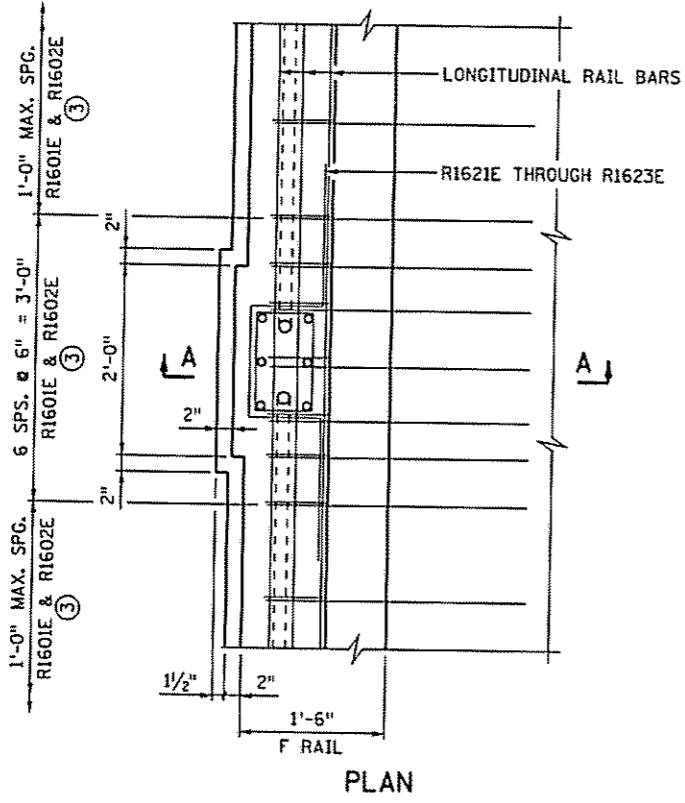
DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.

FIG. 5-397.301  
BRIDGE NO. 02003  
SHEET NO. 59 OF 72 SHEETS

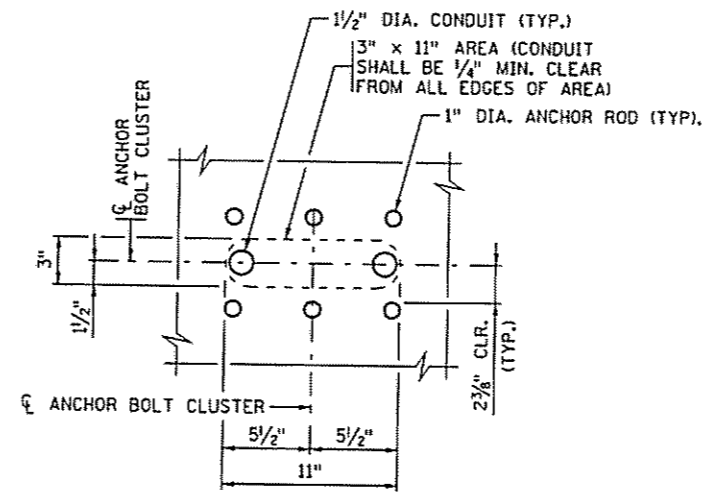




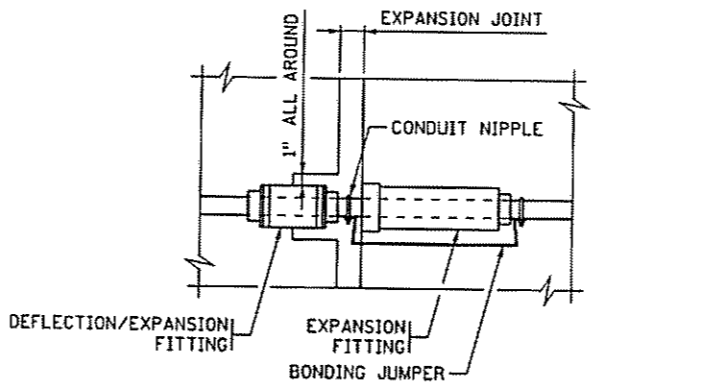
SECTION A-A ③



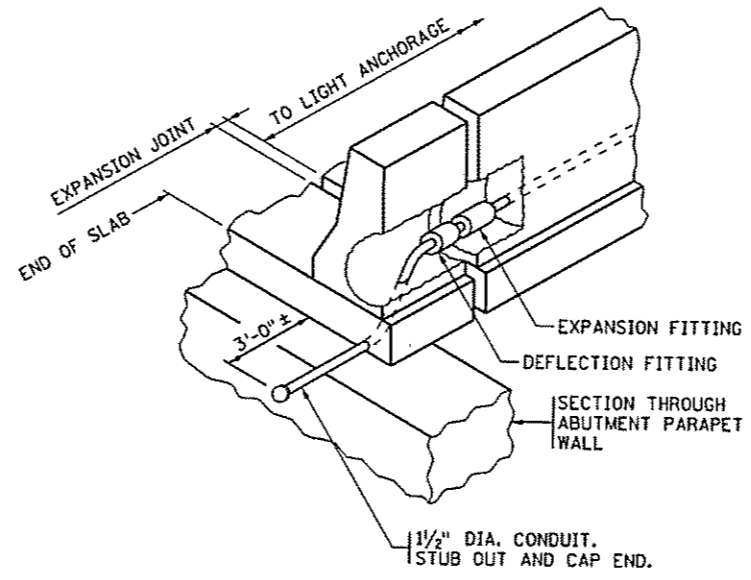
PLAN  
LIGHT POLE ANCHORAGE  
ON TYPE F, TL-4 BARRIER ③



CONDUIT PLACEMENT DETAIL



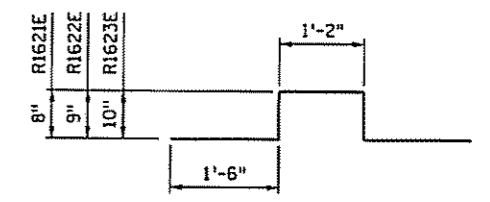
COMBINATION DEFLECTION/EXPANSION FITTING



VIEW AT END OF BRIDGE  
APPROACH SLAB NOT SHOWN

SUMMARY OF QUANTITIES FOR CONDUIT SYSTEM (LIGHTING)	
LIGHT POLE ANCHORAGE	1 EACH
① 1/2" DIA. R.S.C.	136 LIN. FT.
1/2" DIA. END CAPS	4 EACH
COMBINATION DEFLECTION/EXPANSION FITTING	1 EACH
REINFORCEMENT BARS (EPOXY COATED)	20 POUND

① SYSTEM TO BE GROUNDED.  
ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR "CONDUIT SYSTEM (LIGHTING)"



R1621E, R1622E & R1623E

BILL OF REINFORCEMENT FOR RAILING AT LIGHT POLE				
BAR	NO.	LENGTH	SHAPE	LOCATION
R1621E	1	5'-6"		LONGITUDINAL TIE
R1622E	1	5'-8"		LONGITUDINAL TIE
R1623E	1	5'-10"		LONGITUDINAL TIE

GENERAL NOTES  
② THE 1/2" DIA. CONDUIT SHALL EXTEND 3" ABOVE THE RAILING AND BE CAPPED.  
③ SEE STANDARD RAILING SHEETS FOR ADDITIONAL REINFORCEMENT PLACEMENT AND DETAIL DIMENSIONS.

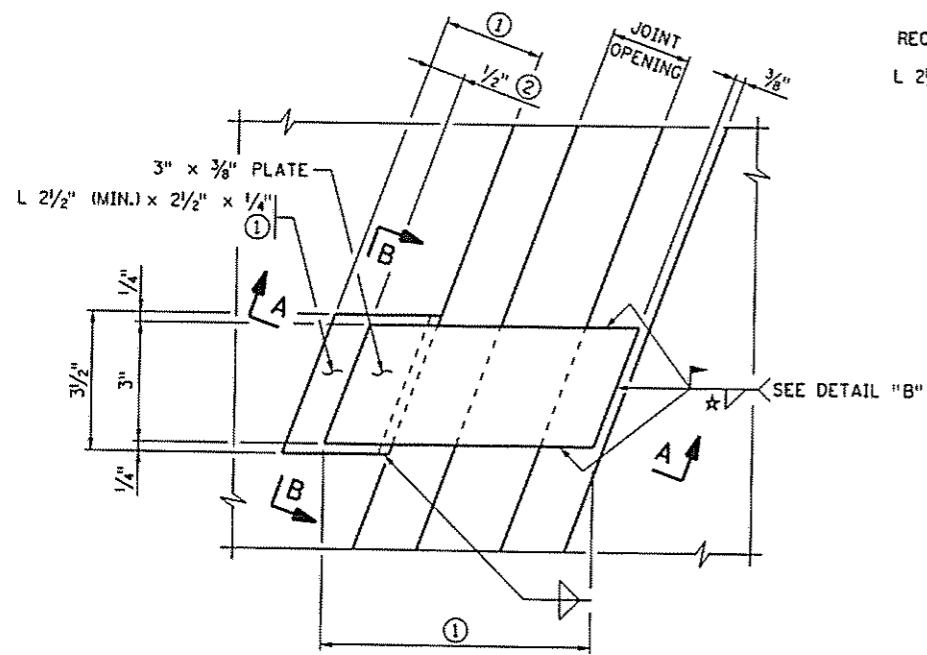
REVISION:  
APPROVED: SEPTEMBER 26, 2003  
*Samuel A. Blaylock*  
STATE BRIDGE ENGINEER

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

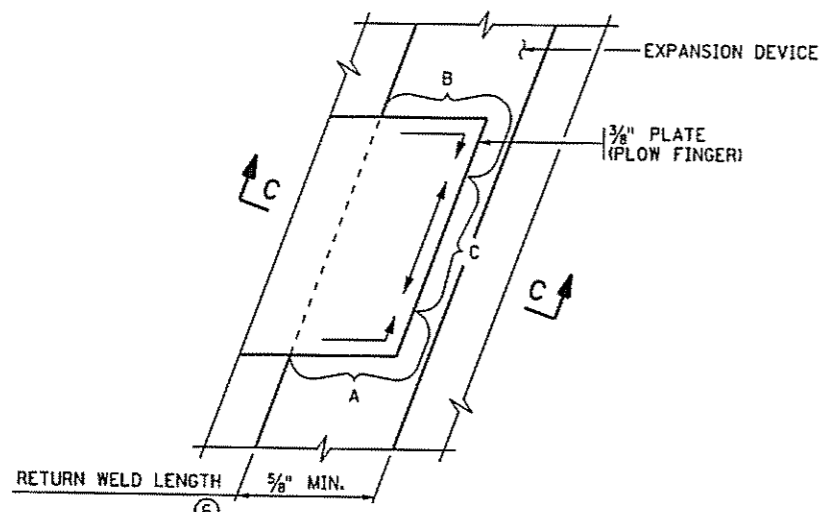
CONDUIT SYSTEM (LIGHTING)  
CONCRETE BARRIER (TYPE F, TL-4)

DES: PJK DR: LKL  
CHK: MCD CHK: JAJ  
APPROVED: 2/23/09  
SHEET NO. 60 OF 72 SHEETS

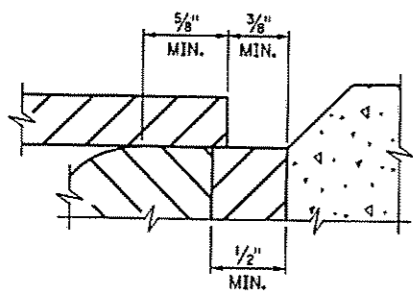
FIG. 5-397.403  
BRIDGE NO. 02003



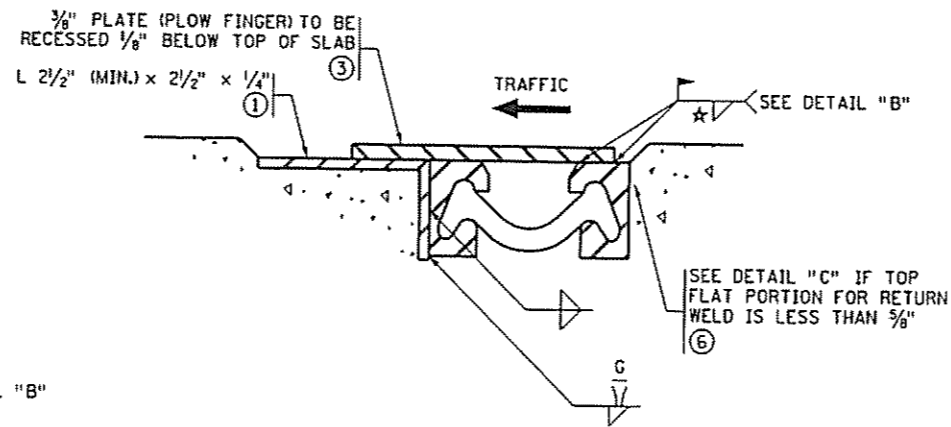
DETAIL "A"



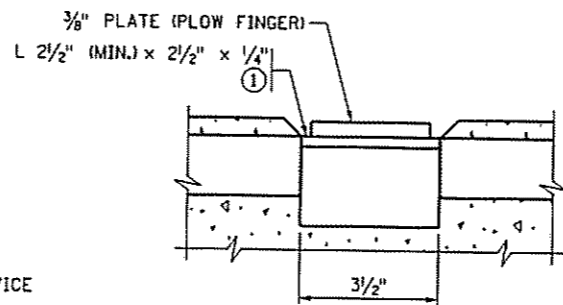
DETAIL "B"



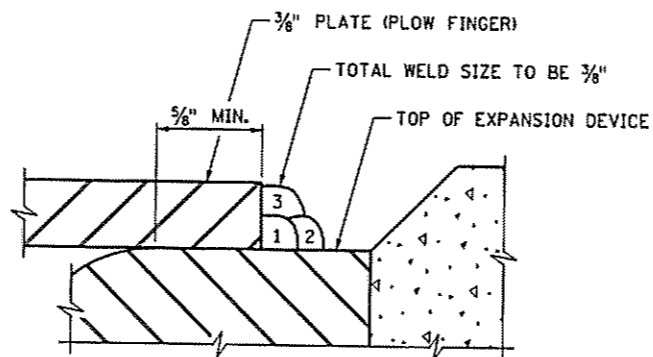
DETAIL "C"



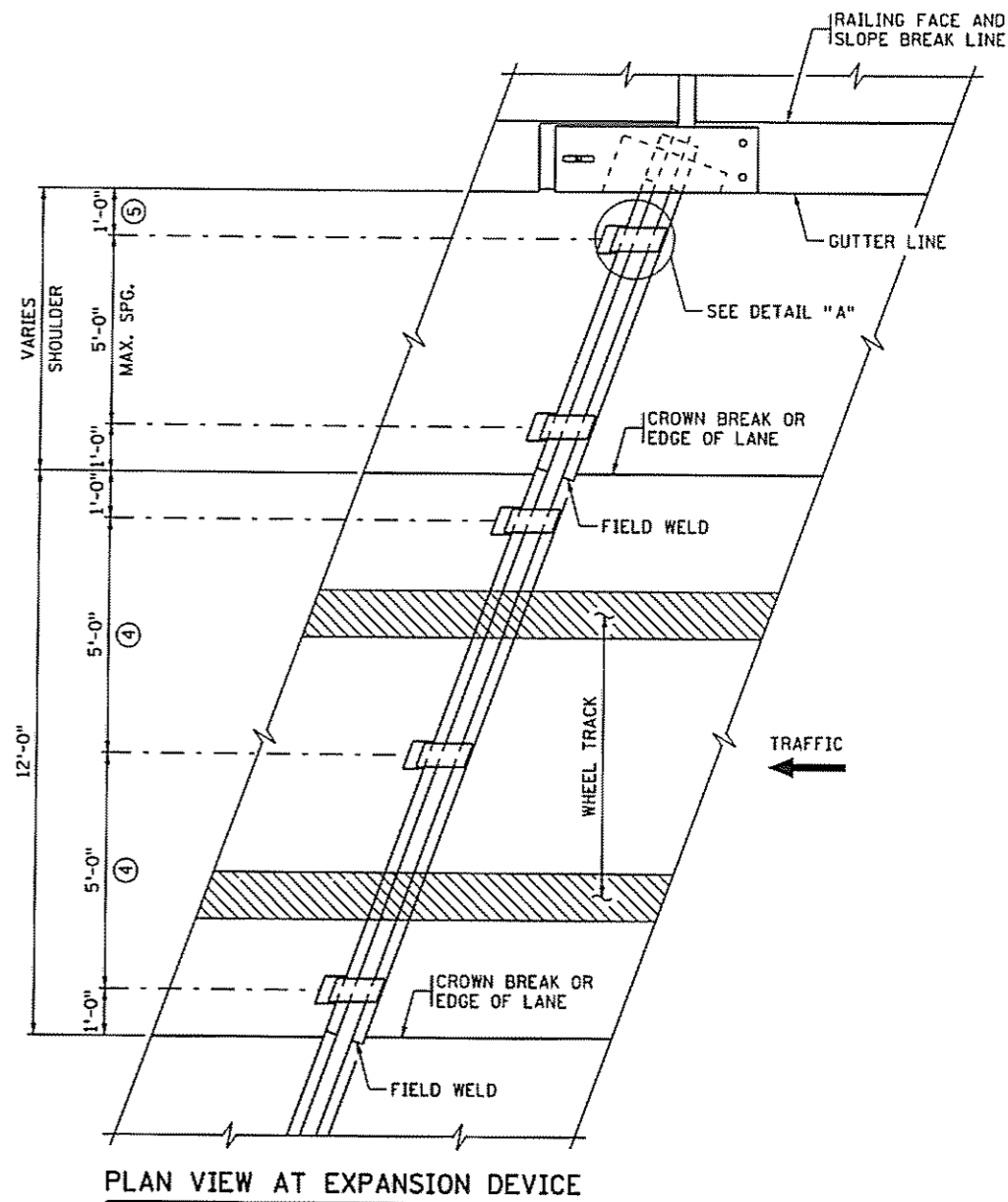
SECTION A-A



SECTION B-B



SECTION C-C



PLAN VIEW AT EXPANSION DEVICE

★ WELDING PROCEDURE FOR PLOW FINGERS

- ALL WELDING SHALL BE DONE WITH 1/8" AWS Mn/DOT SPEC. 5.1 TYPE E7016 OR E7018 ELECTRODE.
- WELD PASS 1 IN AREAS A AND B FIRST, THEN AREA C, FOLLOW WITH PASSES 2 AND 3 IN SAME ORDER AS SHOWN IN DETAIL "B".
- REMOVE ALL WELD SLAG AND OTHER RESIDUE BETWEEN PASSES.
- ALLOW AT LEAST 5 MINUTES COOLING TIME BETWEEN EACH OF NINE WELD PASSES.
- REPAIR ALL GALVANIZING DAMAGED BY REMOVAL AND WELDING, IN ACCORDANCE WITH Mn/DOT SPEC. 2471.3L

GENERAL NOTES

- DO NOT GALVANIZE PLOW FINGERS.
- VARIABLES WITH SKEW AND EXPANSION OPENING.
  - MINIMUM IN CLOSED POSITION.
  - EVERY SNOW PLOW FINGER SHALL HAVE FULL AND DIRECT BEARING ON THE PLATE THAT IS LOCATED UNDER THE MOVEMENT SIDE OF THE FINGER. NO CLICKING NOISE WILL BE ALLOWED.
  - MODIFY IF LANE WIDTH DIFFERS FROM 12 FT.
  - OMIT LAST PLOW FINGER ON DEVICE WITH CURVED END.
  - ADD BACKING BAR AS REQUIRED: 1/2" MIN. THICKNESS, 1/2" DEEP.

S:\Design\082003\1148\1148-02003.L.dwg 2/17/2003

REVISION:  
 APPROVED: SEPTEMBER 26, 2003  
*Daniel J. Meyer*  
 STATE BRIDGE ENGINEER

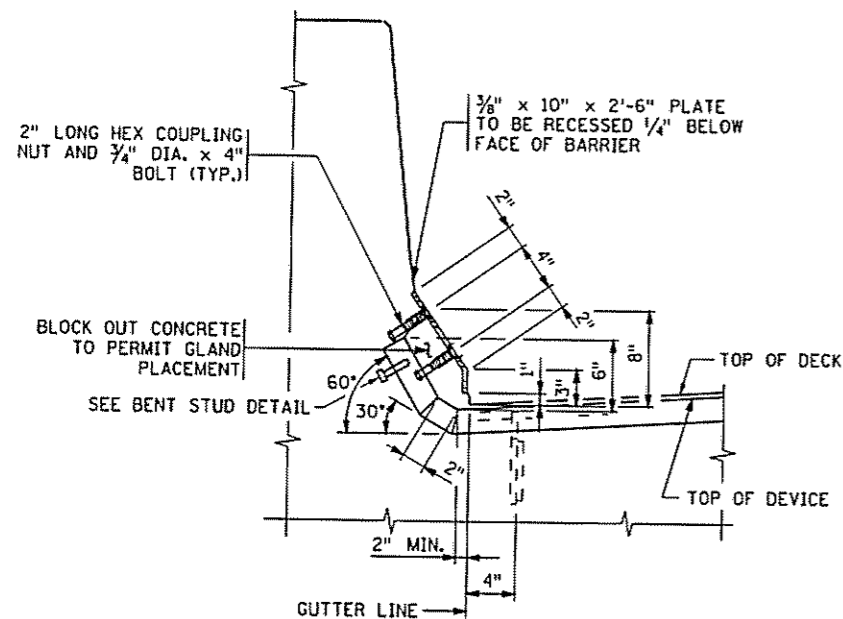
CERTIFIED BY *Moises C. Dimaculangan* 2/23/04  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

WATERPROOF EXPANSION DEVICE  
 SNOW PLOW PROTECTION  
 (USE ON SKEWS OVER 15' AND LESS THAN 50')

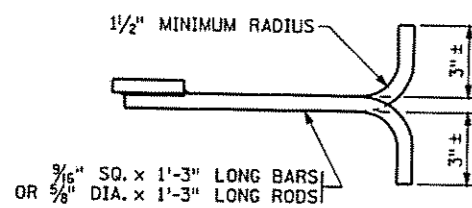
DES: P.J.K.	DR: J.H.B.	APPROVED: 2/23/04	BRIDGE NO. 02003
CHK: M.C.D.	CHK: J.A.J.		

FIG. 5-397.628

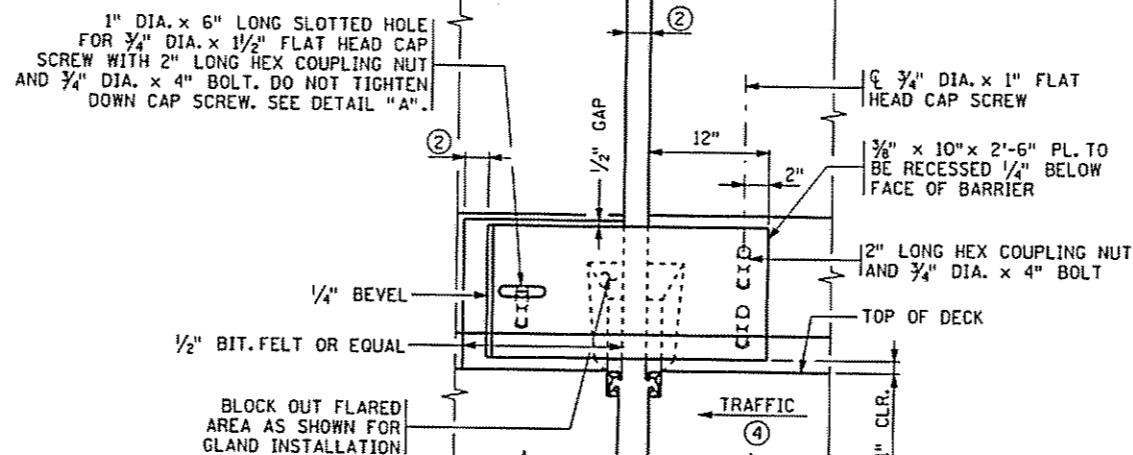
SHEET NO. 61 OF 72 SHEETS



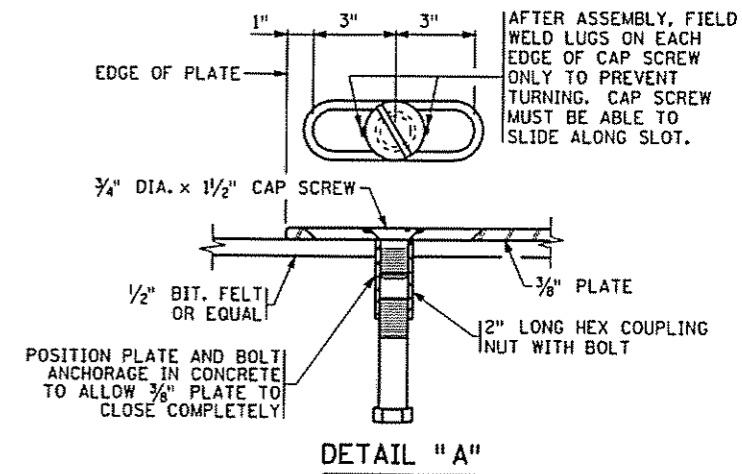
SECTION THROUGH BARRIER  
TYPE F BARRIER



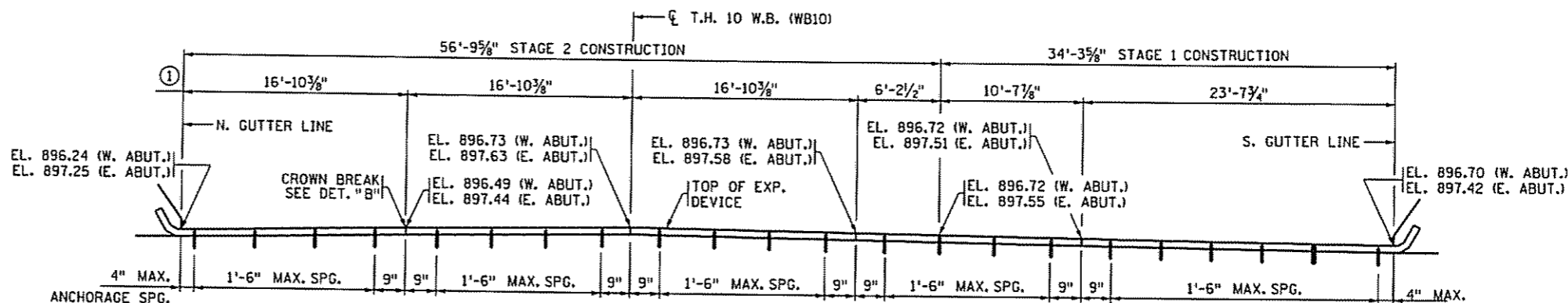
BAR-ROD DETAIL



BARRIER ELEVATION

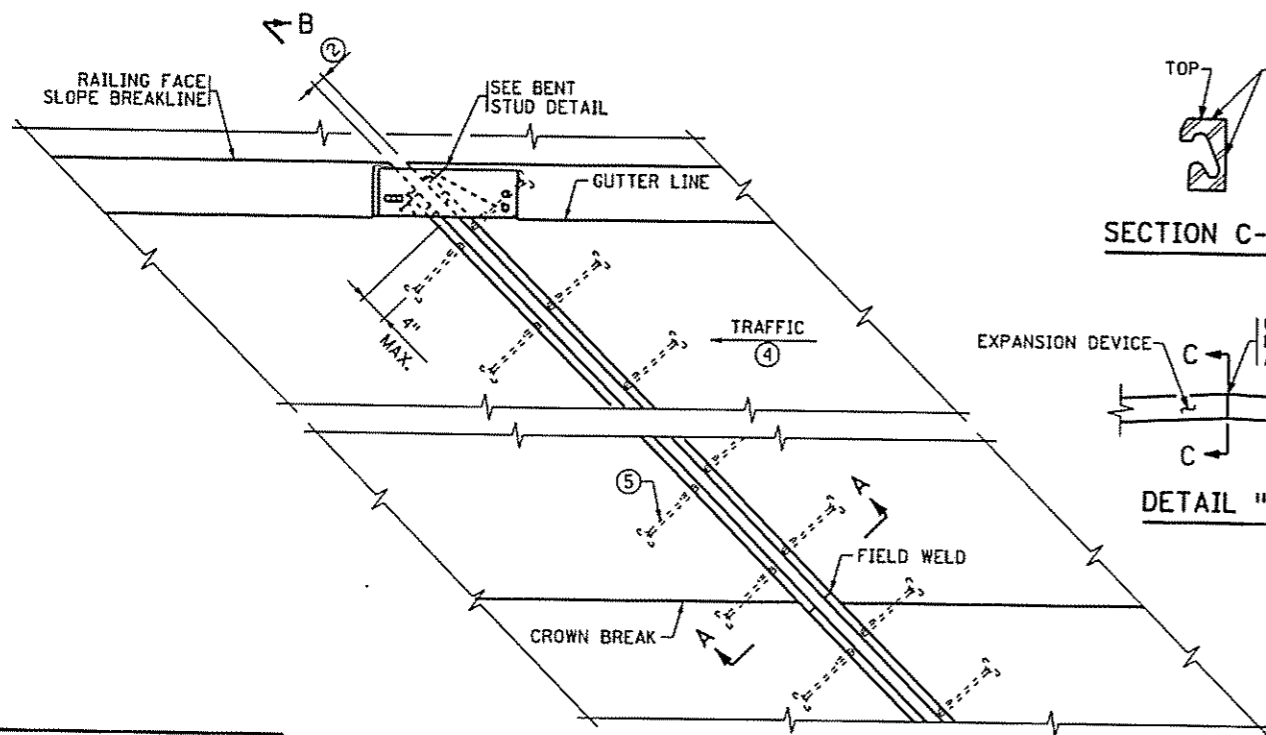


DETAIL "A"

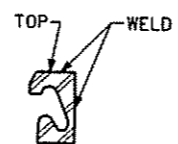


SECTION B-B ~ ALONG CL JOINT

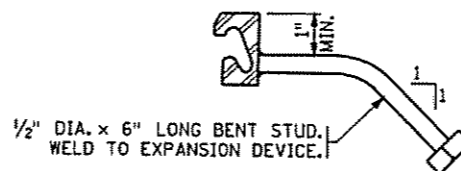
ELEVATIONS SHOWN ARE 1/2" BELOW TOP OF SLAB @ CL JOINT



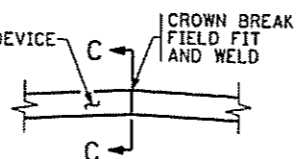
PLAN VIEW @ EXPANSION DEVICE  
WITH STRAIGHT DEVICE



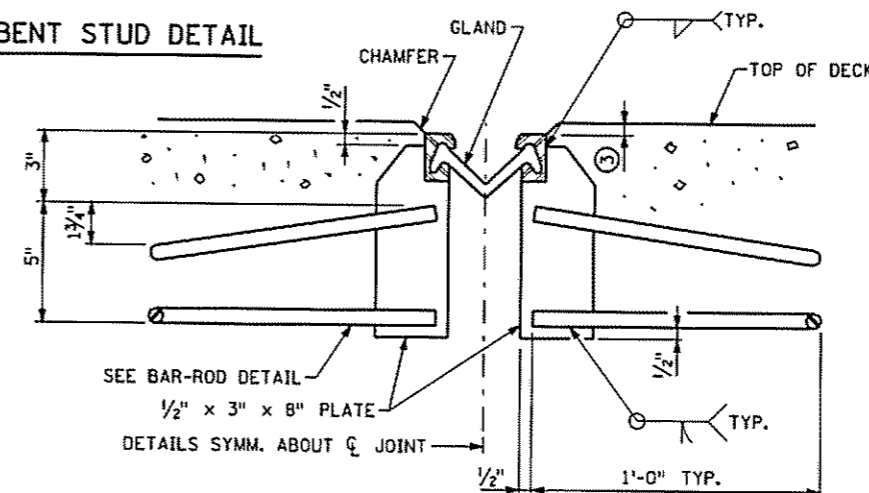
SECTION C-C



BENT STUD DETAIL



DETAIL "B"



SECTION A-A

GENERAL NOTES

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER Mn/DOT SPEC. 3394. GALVANIZE FASTENERS AS PER Mn/DOT SPEC. 3392.

JOINTS IN EXTRUSION SHALL BE LOCATED AT BREAKS IN TRANSVERSE PROFILE AND AS OTHERWISE REQUIRED. JOINTS SHALL BE CLOSE FIT AND WELDED. REPAIR AFTER WELDING AS PER Mn/DOT SPEC. 2471.3L.

STRUCTURAL STEEL SHALL COMPLY WITH Mn/DOT SPEC. 3306 OR Mn/DOT SPEC. 3309.

EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF 1/8" IN 10 FT.

CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE.

LENGTH OF PAYMENT FOR DEVICE IS FROM OUT TO OUT OF EXTRUSION ALONG CENTERLINE OF JOINT.

- ① DIMENSIONS ARE ALONG CENTERLINE OF JOINT.
- ② 1/2" @ ALL TEMPERATURES WEST ABUTMENT. 1/2" AT 90°F; 1/8" AT 45°F EAST ABUTMENT
- ③ 1/2" (WITH 5/8" MAX.) WHEN SNOWPLOW FINGERS ARE USED.
- ④ SEE SHEET NO. 1 FOR DIRECTION OF TRAFFIC.
- ⑤ PLACE BAR-ROD NORMAL TO JOINT ON NEW BRIDGES.

2/17/2009 S:\Design\BAR\2003\118\118\02003.dwg

REVISION:  
APPROVED: SEPTEMBER 26, 2003  
*David A. Peterson*  
STATE BRIDGE ENGINEER

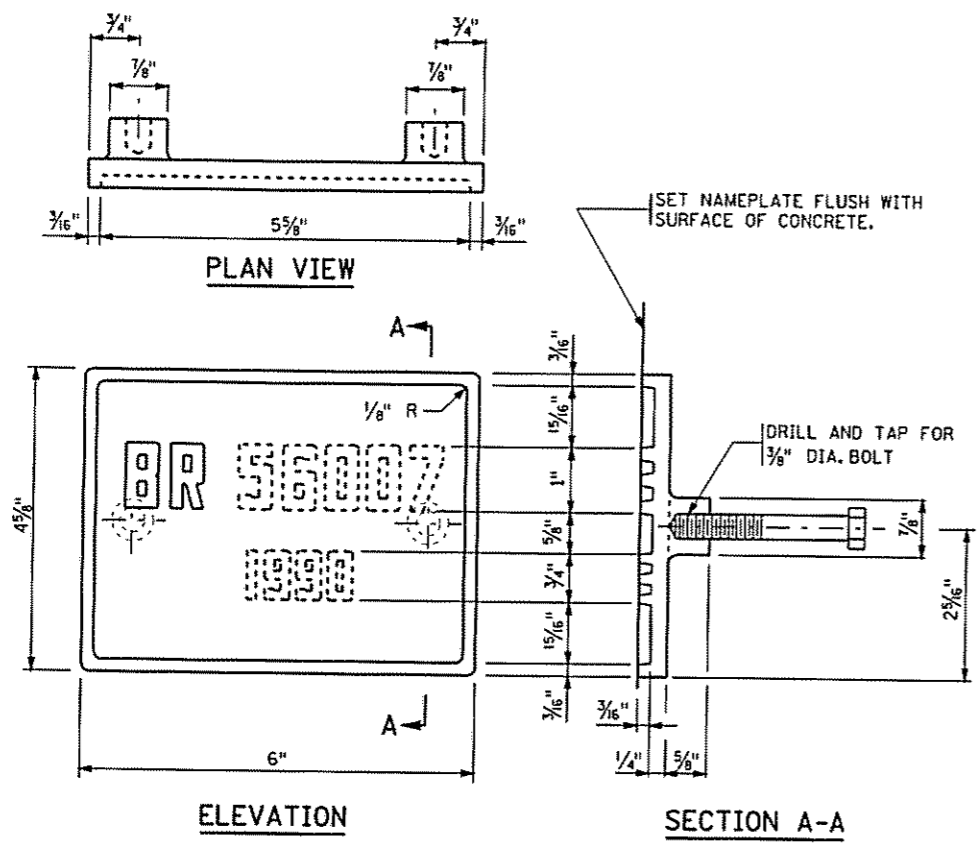
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

WATERPROOF  
EXPANSION DEVICE  
(WITH TYPE F BARRIER)

DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.  
SHEET NO. 62 OF 72 SHEETS

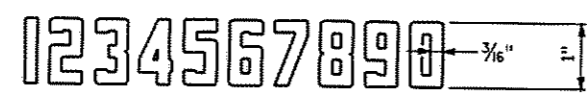
FIG. 5-397.627 MODIFIED

BRIDGE NO.  
02003

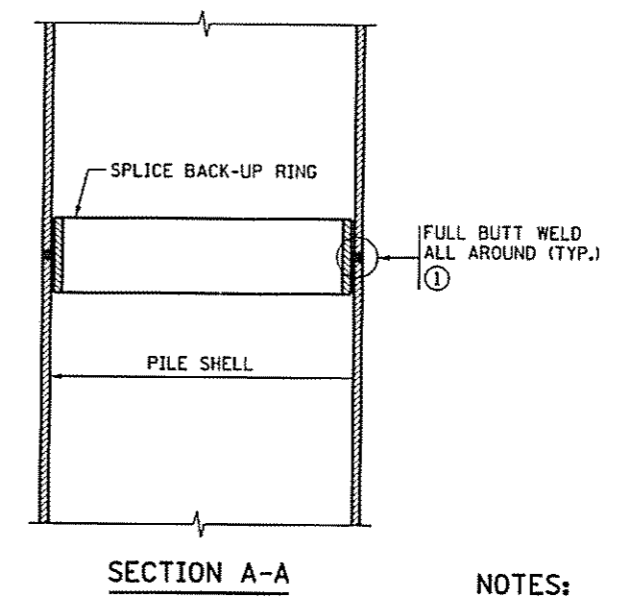
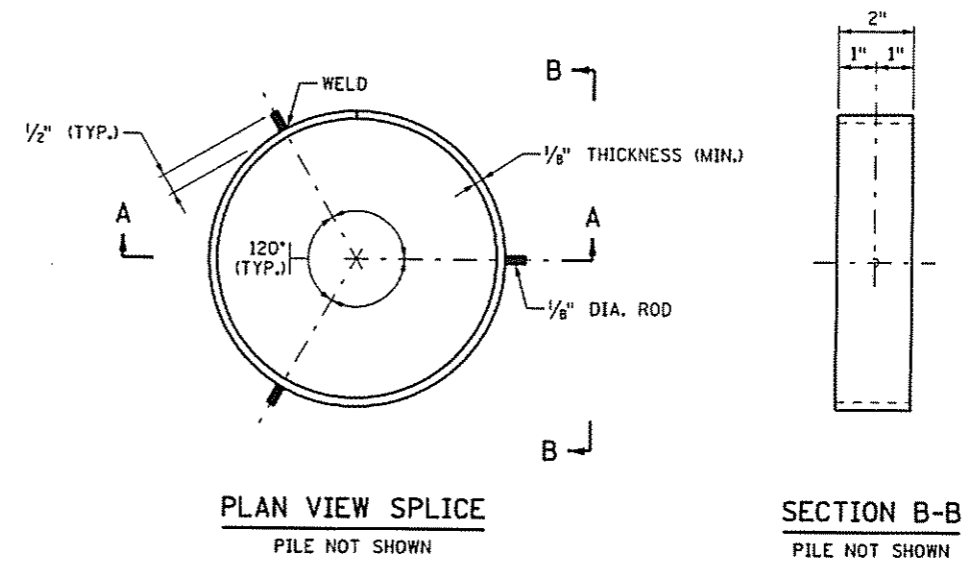


THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

BRIDGE 02003  
YEAR 2009



**NOTES:**  
 NO SHOP DRAWING REQUIRED.  
 MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3327.  
 LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.  
 DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".  
 HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.  
 TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.  
 FURNISH 2 STEEL BOLTS 3/8" DIA. x 3" LONG WITH EACH PLATE.  
 ALL DIMENSIONS FOR 3/4" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.

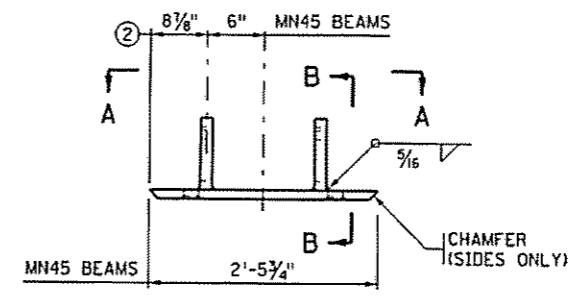


**NOTES:**  
 APPROVED COMMERCIAL PILE SPLICE BACK-UP RING MAY BE USED IN LIEU OF THE TYPE DETAILED. BACK-UP RING SHALL HAVE A TIGHT FIT.  
 WELDING ELECTRODES SHALL BE CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011.  
 ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.  
 WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN 0° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.  
 ① FOR PILE SHELL THICKNESSES GREATER THAN 1/2", USE A B-U4a WELD CONFIGURATION.

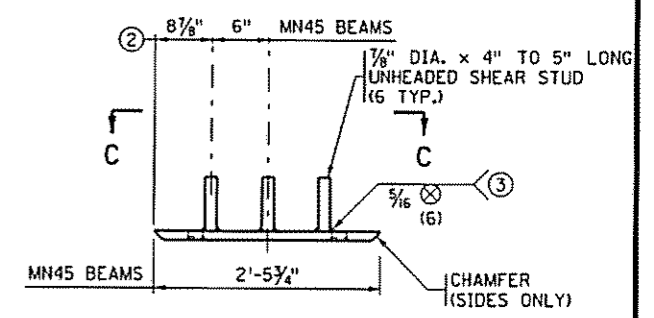
APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	BRIDGE NAMEPLATE (FOR NEW BRIDGES)		B101

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	PILE SPLICE (CAST-IN-PLACE CONCRETE PILES)		B201

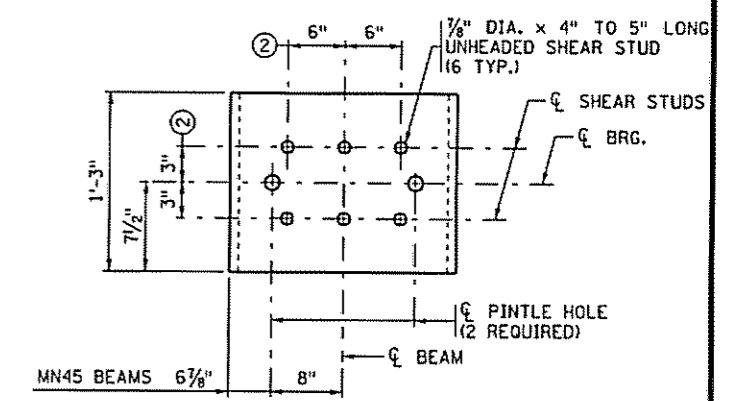
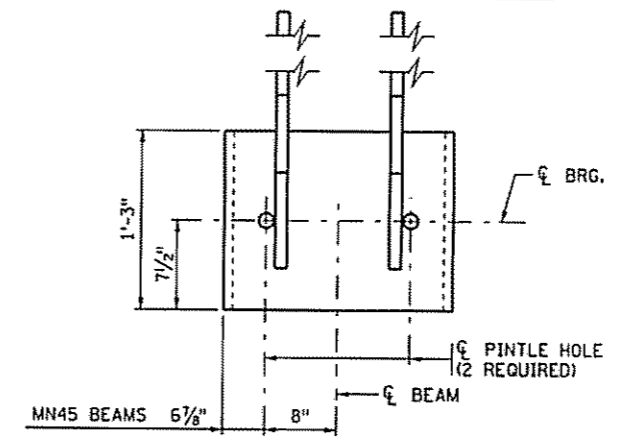
CERTIFIED BY <i>M. C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE	TITLE: DETAILS	DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09	BRIDGE NO. 02003
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209		CHK: M.C.D. CHK: J.A.J.	SHEET NO. 63 OF 72 SHEETS



FRONT ELEVATION - OPTION 1

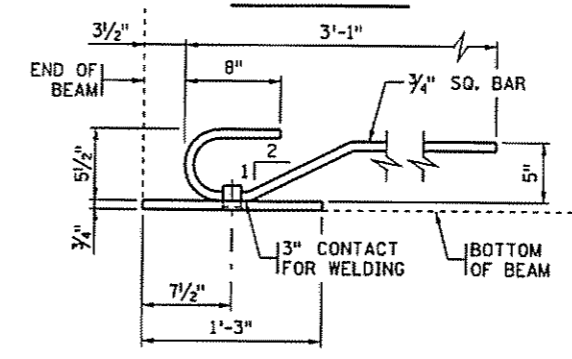


FRONT ELEVATION - OPTION 2

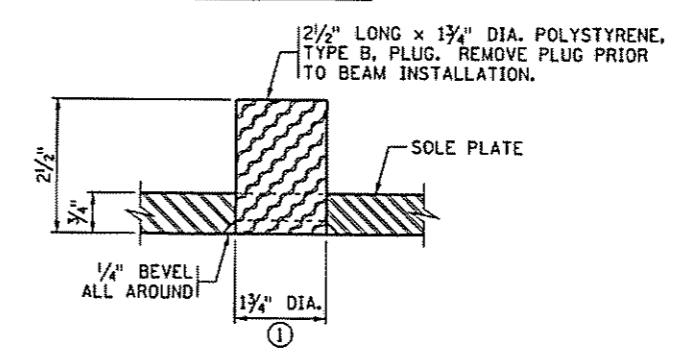


SECTION A-A

SECTION C-C



SECTION B-B



PINTLE HOLE DETAIL

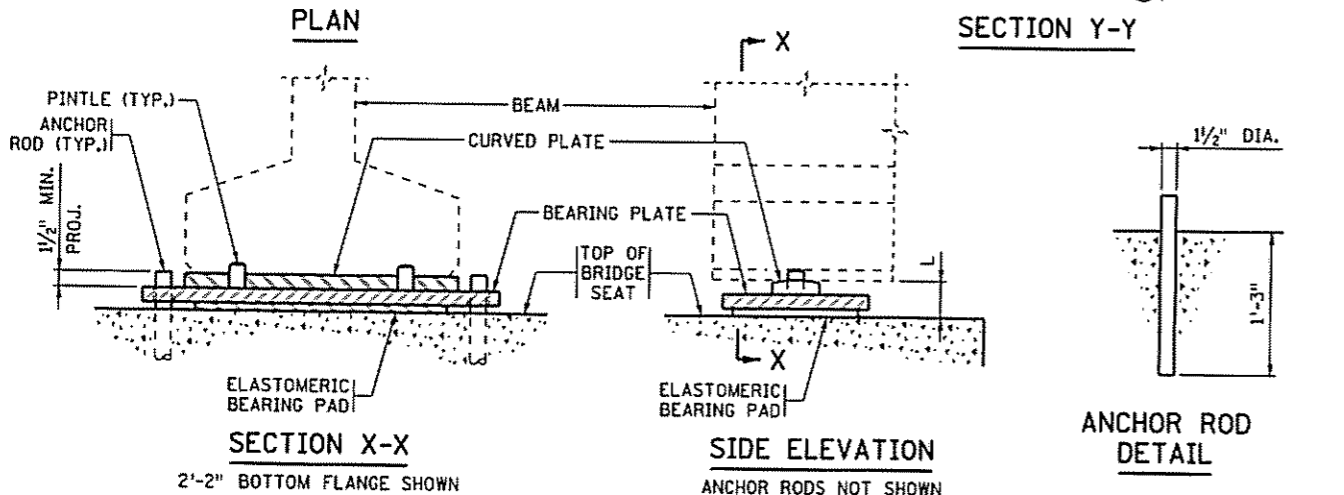
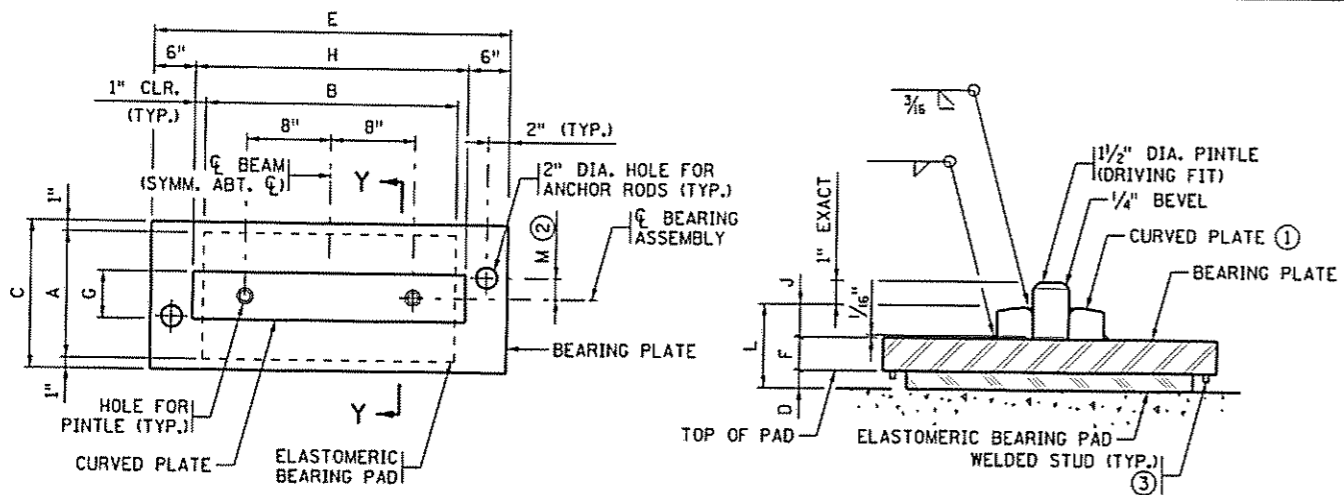
**NOTES:**

- MATERIAL TO BE STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.
- WELDED STUDS TO BE WELDABLE CARBON STEEL PER Mn/DOT SPEC. 3391.2D.
- SOLE PLATE FOR BEARING ASSEMBLY TO BE GALVANIZED PER Mn/DOT SPEC. 3394 AFTER FABRICATION.
- PINTLE HOLES SHALL BE FREE OF ZINC BUILD UP FROM GALVANIZING.
- SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.
- ① FOR 1 1/2" DIA. PINTLES.
- ② THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS. HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.
- ③ THE REQUIREMENTS FOR WELDING STUDS SHALL COMPLY WITH AASHTO/AWS D1.5.

APPROVED: OCTOBER 26, 2005	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 06-14-2006 10-28-2008	DETAIL NO.
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	SOLE PLATE (PRESTRESSED CONCRETE BEAMS) (FOR BEARINGS WITH PINTLES)		B303

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE	TITLE: DETAILS	DES: P.J.K. OR: J.H.B. CHK: M.C.D. CHK: J.A.J.	APPROVED: 2/23/09	BRIDGE NO. 02003
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209		SHEET NO. 64 OF 72 SHEETS		

S:\Design\10\2003\JHB\02003.dwt.dgn 2/17/2009



ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ANCHOR ROD OFFSET		ASSY. HEIGHT	CURVED PLATE
			A	B	D		C	E	F	G	H	J	+/- (2)	M		
F1	W. ABUT.	MN45	12"	24"	1/2"	8.0	14"	38"	1 1/2"	4 1/2"	26"	1 1/4"	+	5"	3 1/4"	16"

**NOTES:**

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH Mn/DOT SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH Mn/DOT SPEC. 3306.

ANCHOR RODS SHALL COMPLY WITH Mn/DOT SPEC. 3306. GALVANIZE PER Mn/DOT SPEC. 3394.

PINTLES SHALL COMPLY WITH Mn/DOT SPEC. 3309.

GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER Mn/DOT SPEC. 3394, EXCEPT AS NOTED.

PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.

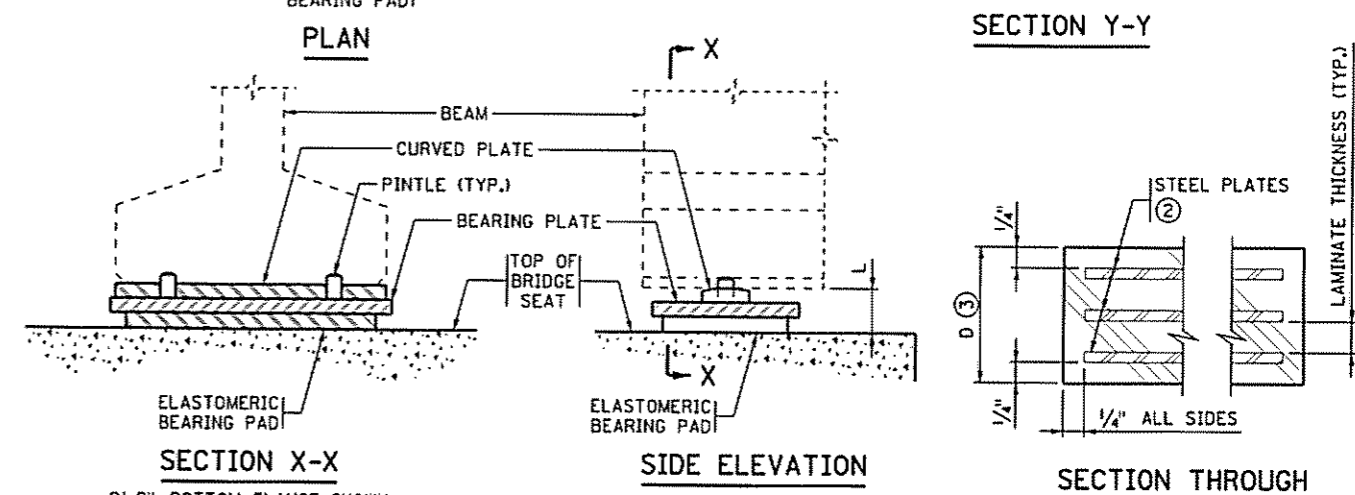
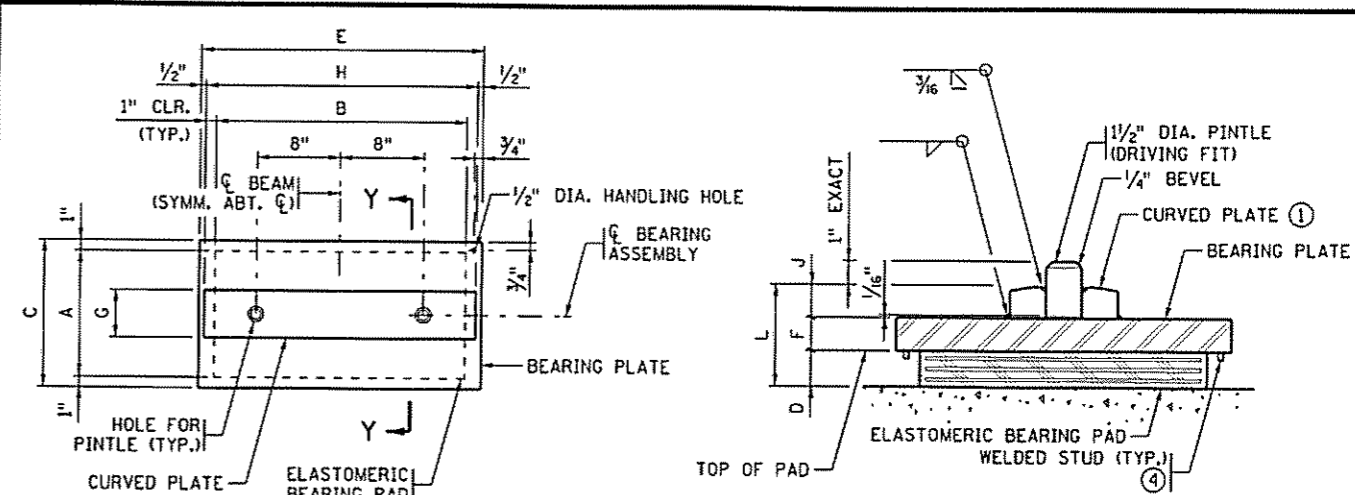
(1) THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.

(2) "+-" DENOTES OFFSET AS SHOWN. "--" DENOTES OFFSET OPPOSITE OF SHOWN.

(3) 5/16" DIA. x 3/8" KNOCK-OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = 1/2". MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

**DESIGN DATA:**  
 MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1/2" PINTLES.

APPROVED: OCTOBER 26, 2005	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 08-10-2006 10-28-2008	DETAIL NO. <b>B310</b>
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	<b>CURVED PLATE BEARING ASSEMBLY</b> (PRESTRESSED CONCRETE BEAMS) (FIXED)		



ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			STEEL PLATES		LAMINATES	SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ASSY. HEIGHT	CURVED PLATE	
			A	B	D	NO.	THICK.			C	E	F	G	H	J			L
E1	E. ABUT.	MN45	12"	24"	2 1/2"	4	1/8"	3	1/2"	8	14"	27"	1 1/2"	4 1/2"	26"	1 1/4"	5 1/4"	16"
E2	W. ABUT.	MN45	12"	24"	1/2"	-	-	1	1/2"	8	14"	27"	1 1/2"	4 1/2"	26"	1 1/4"	3 1/4"	16"

**NOTES:**

ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH Mn/DOT SPEC. 3741.

ALL STEEL PLATES SHALL COMPLY WITH Mn/DOT SPEC. 3306.

PINTLES SHALL COMPLY WITH Mn/DOT SPEC. 3309.

GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER Mn/DOT SPEC. 3394, EXCEPT AS NOTED.

PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.

(1) THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.

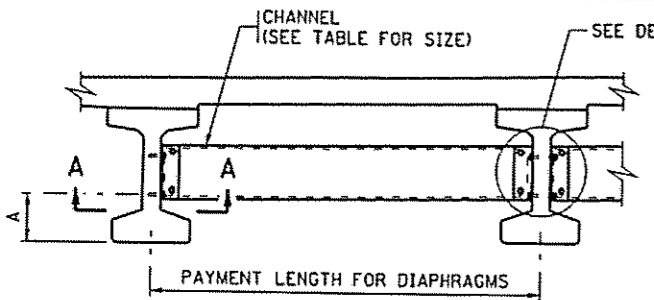
(2) DO NOT GALVANIZE THESE PLATES.

(3) THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.

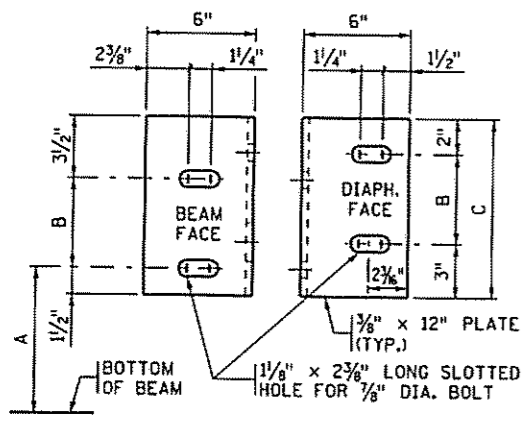
(4) 5/16" DIA. x 3/8" KNOCK-OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = 1/2". MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

**DESIGN DATA:**  
 MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1/2" PINTLES.

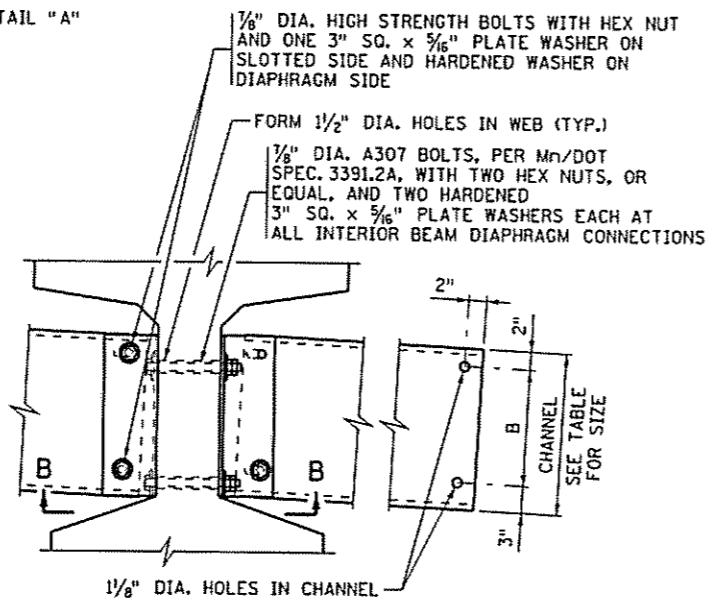
APPROVED: OCTOBER 26, 2005	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISED 08-10-2006 10-28-2008	DETAIL NO. <b>B311</b>
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	<b>CURVED PLATE BEARING ASSEMBLY</b> (PRESTRESSED CONCRETE BEAMS) (EXPANSION)		



PART TRANSVERSE SECTION AT DIAPHRAGM

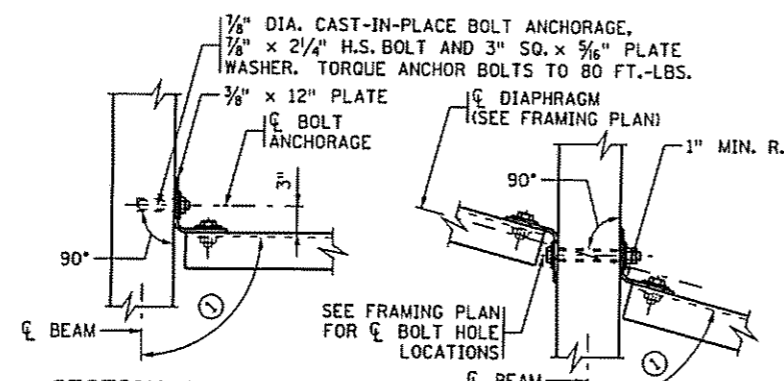


DIAPHRAGM CONNECTION FOR MN45 BEAMS



DETAIL "A"

INTERIOR BEAM WITH CONTINUOUS LINE OF DIAPHRAGMS



SECTION A-A

TYPICAL SECTION AT ALL FASCIA BEAMS

SECTION B-B

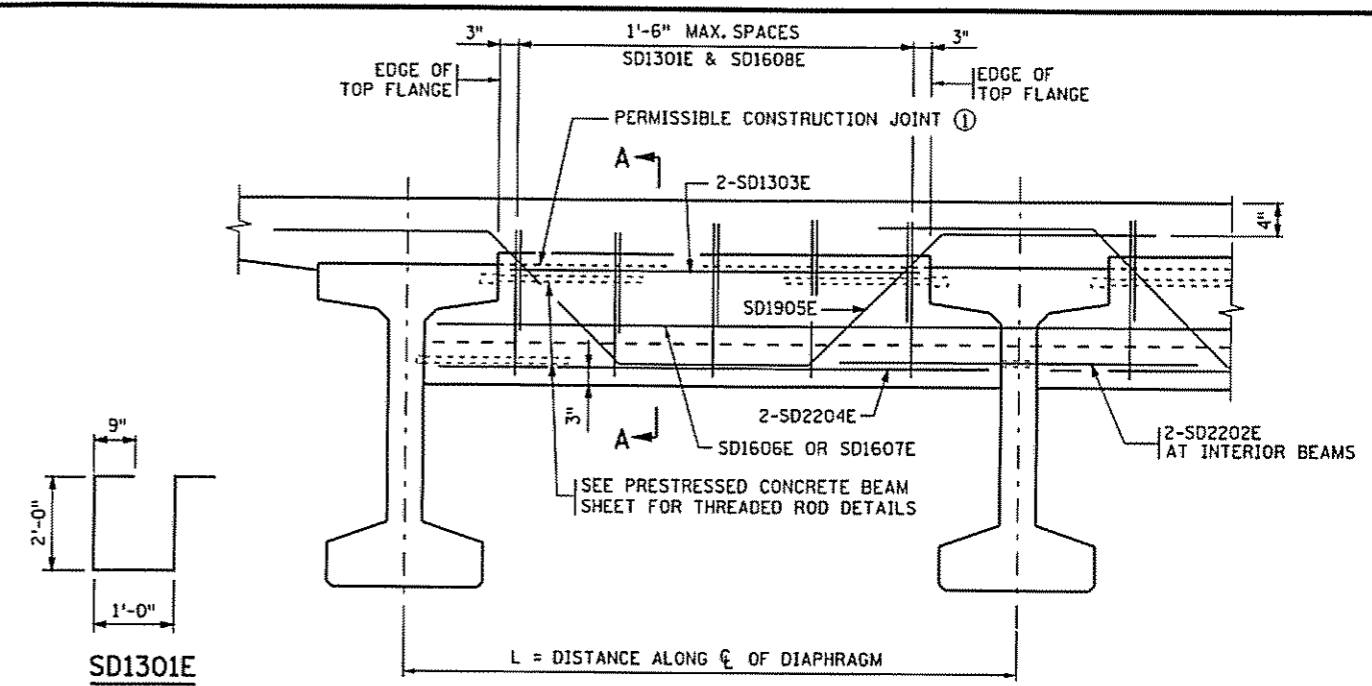
TYPICAL SECTION AT INTERIOR BEAM WITH CONTINUOUS OR STAGGERED INTERMEDIATE DIAPHRAGMS

NOTES:

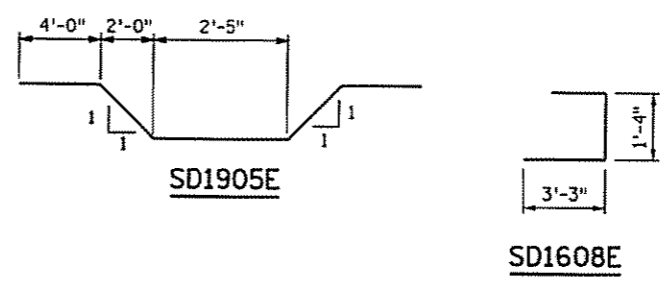
- ALL STEEL SHALL CONFORM TO Mn/DOT SPEC. 3306.
- INSTALLATION SHALL CONFORM TO Mn/DOT SPEC. 2405.3M.
- THE LEG OF THE 12" PLATE SHALL BE SHOP BENT TO CONFORM TO THE DIAPHRAGM. A 3/8" x 6" x 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.
- ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, SHALL BE INCLUDED IN UNIT PRICE BID FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.
- BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE 5/16" IN THICKNESS, AND HAVE LEGS 5" LONG.

① FOR SKEW ANGLES OVER 20°, USE 90°.

BEAM HEIGHT	DISTANCE			CHANNEL SIZE
	A	B	C	
MN45	1'-7 3/4"	7"	1'-0"	C12x20.7



PART TRANSVERSE SECTION

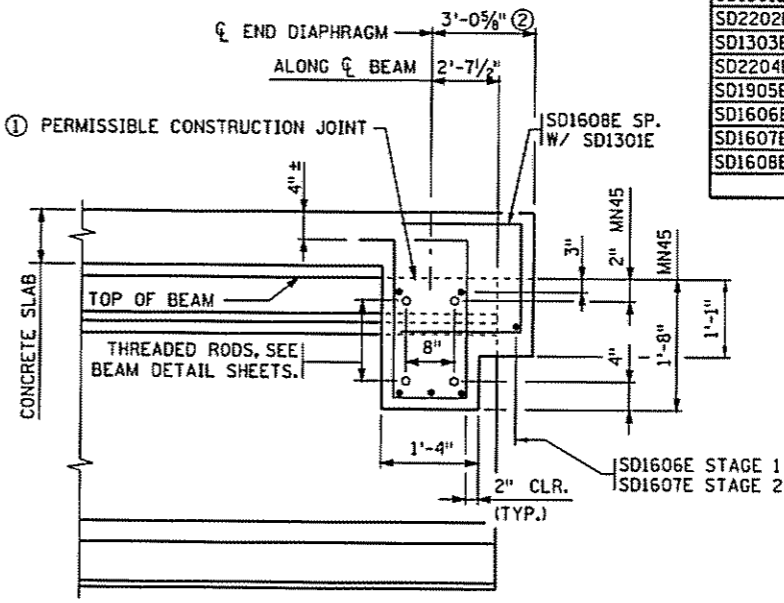


DISTANCE "L" ALONG C OF DIAPHRAGM	BARS REQUIRED			
	STRAIGHT		BENT	
	NO.	SIZE	NO.	SIZE
OVER 8' TO 11'	2	22E	1	19E

BILL OF REINFORCEMENT FOR END DIAPHRAGM					
BAR	STAGE 1 NO.	STAGE 2 NO.	LENGTH	SHAPE	LOCATION
SD1301E	30	60	6'-10"	□	VERTICAL TIE
SD2202E	12	20	5'-0"	—	LONG. THRU BEAM
SD1303E	12	24	5'-3"	—	LONG. TOP
SD2204E	12	24	8'-4"	—	LONG. BOTTOM
SD1905E	8	10	16'-1"	—	LONGITUDINAL
SD1606E	2	—	38'-0"	—	LONGITUDINAL
SD1607E	—	2	54'-6"	—	LONGITUDINAL
SD1608E	30	60	7'-10"	□	VERTICAL TIE

NOTES:

- END DIAPHRAGM SHALL BE CONC. MIX NO. 3Y36.
- QUANTITIES FOR END DIAPHRAGM CONCRETE AND REINFORCEMENT SHOWN ON THIS DETAIL SHALL BE LISTED IN SUPERSTRUCTURE QUANTITIES.
- THREADED RODS ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.
- ① USE OF CONSTRUCTION JOINT REQUIRES CLEARANCE FOR EXPANSION DEVICE. WHEN CONSTRUCTION JOINT IS USED AT THIS LOCATION, DIAPHRAGM FALSEWORK SHALL REMAIN IN PLACE UNTIL COMPLETION OF SLAB CURING PERIOD.
- ② PERPENDICULAR TO CENTERLINE OF DIAPHRAGM.



SECTION A-A

APPROVED: OCTOBER 26, 2005

STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION

REVISOR: 06-14-2006

DETAIL NO. B403

STEEL INTERMEDIATE DIAPHRAGM (FOR MN45 PRESTRESSED CONCRETE BEAMS)

APPROVED: OCTOBER 26, 2005

STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION

REVISOR: 06-14-2006

DETAIL NO. B814 MODIFIED

CONCRETE END DIAPHRAGM (MN45 PRESTRESSED CONCRETE BEAMS) (PARAPET ABUTMENT)

CERTIFIED BY: *Moises C. Dimaculangan* 2/23/09 DATE: 2/23/09

NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

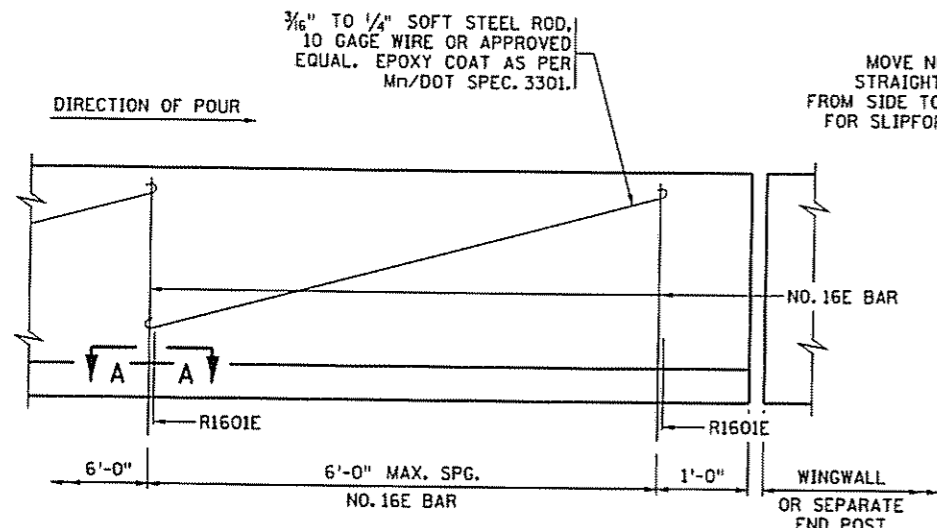
TITLE: DETAILS

DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09

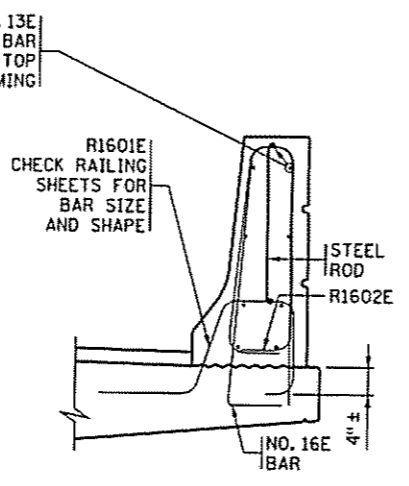
CHK: M.C.D. CHK: J.A.J.

SHEET NO. 66 OF 72 SHEETS

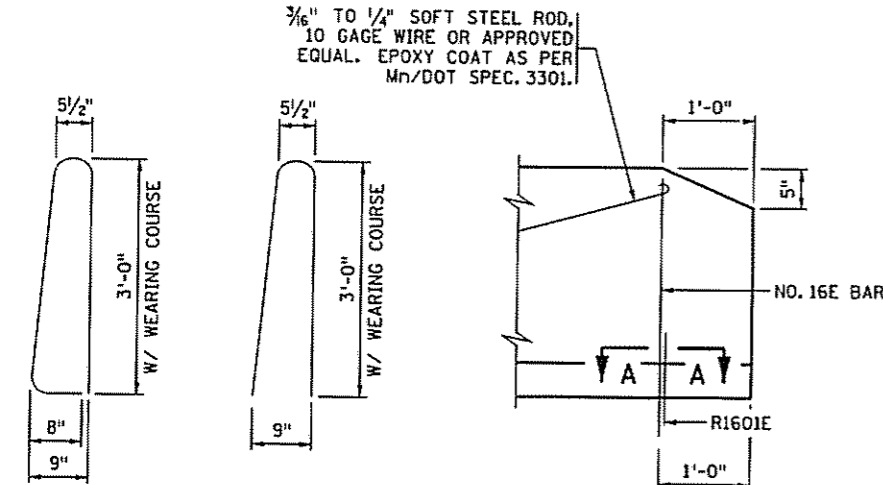
BRIDGE NO. 02003



**INSIDE ELEVATION OF RAILING**

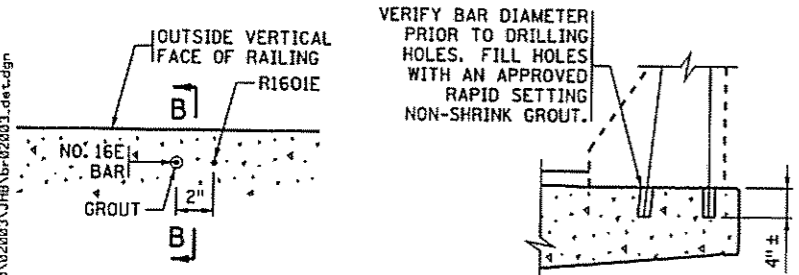


**RAILING SECTION**



**INSIDE ELEVATION OF RAILING**

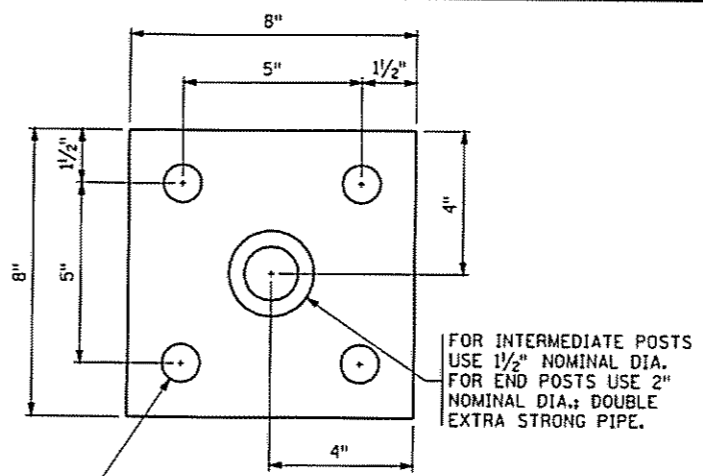
**NO. 16E BAR** DRILLED IN ALTERNATE **NO. 16E BAR** AT END OF WINGWALL



**SECTION A-A** **SECTION B-B**

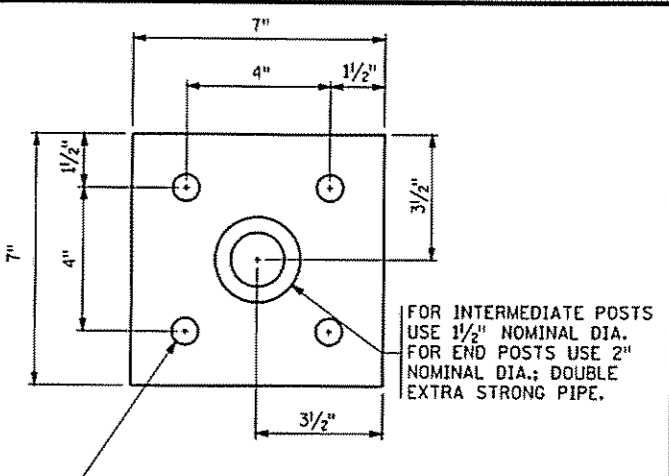
**INSTALLATION DETAILS FOR NO. 16E (DRILLED IN ALTERNATE)**

**NOTES:**  
 CONTRACTOR WILL TOOL V-GROOVE AT DEFLECTION JOINTS AT TIME RAIL IS CAST AND SHALL EXTEND V-GROOVE AROUND ENTIRE PERIMETER OF RAIL.  
 FOR ADDITIONAL DIMENSIONS, DETAILS, REINFORCEMENT AND NOTES SEE RAILING SHEET.  
 FORM RAIL FOR A MINIMUM OF 2' ON EACH SIDE OF EXPANSION DEVICES, LIGHT STANDARDS AND DECK DRAIN BOX OUTS.  
 PAY QUANTITIES WILL NOT BE ADJUSTED AS A RESULT OF SELECTING THIS ALTERNATE.  
 USE A SIMILAR METHOD FOR TALLER RAILINGS OR MODIFIED VERSIONS OF THIS RAILING.



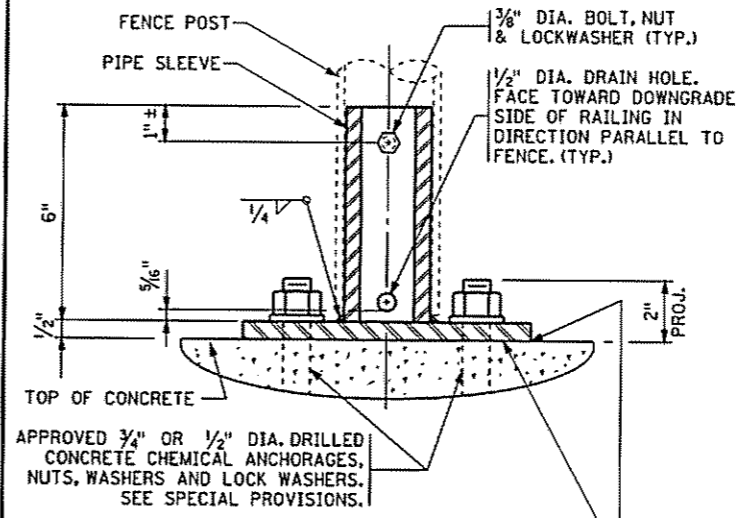
**PLAN VIEW - TYPE A**

ESTIMATED WEIGHT = 12 OR 14 LBS.



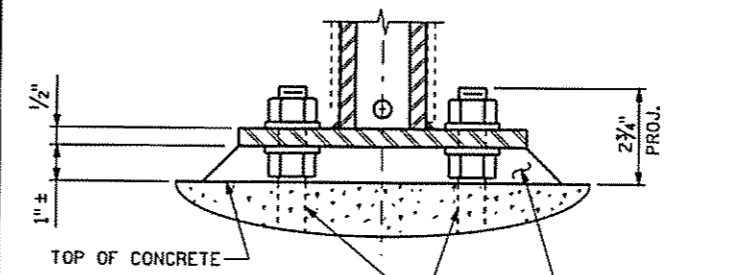
**PLAN VIEW - TYPE B**

ESTIMATED WEIGHT = 10 OR 12 LBS.



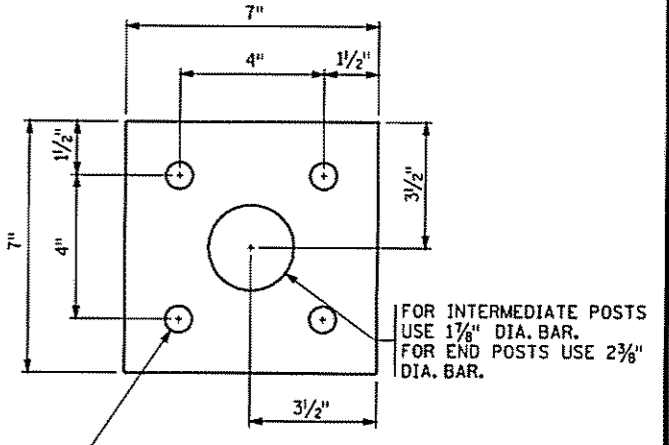
**TYPICAL SECTION**

APPROVED 3/4\"/>



**GROUT ALTERNATE**

DOUBLE NUT OPTION SHOWN. USE ONLY WHEN MAXIMUM SHIM DIMENSION IS GREATER THAN 1/4\"/>



**PLAN VIEW - TYPE C**

ESTIMATED WEIGHT = 12 OR 15 LBS.

**NOTES:**  
 STRUCTURAL STEEL PER Mn/DOT SPEC. 3306  
 STRUCTURAL PIPE PER Mn/DOT SPEC. 3362  
 GALVANIZE THE FENCE POST ANCHORAGE AFTER FABRICATION PER Mn/DOT SPEC. 3394. GALVANIZE THE FASTENERS PER Mn/DOT SPEC. 3392.  
 DOUBLE EXTRA STRONG PIPE WEIGHTS:  
 1 1/2\"/>

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	<b>CONCRETE RAILING (TYPE F)</b> (SLIPFORM ALTERNATE)		<b>B830</b>

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	<b>FENCE POST ANCHORAGE</b>		<b>B905</b>



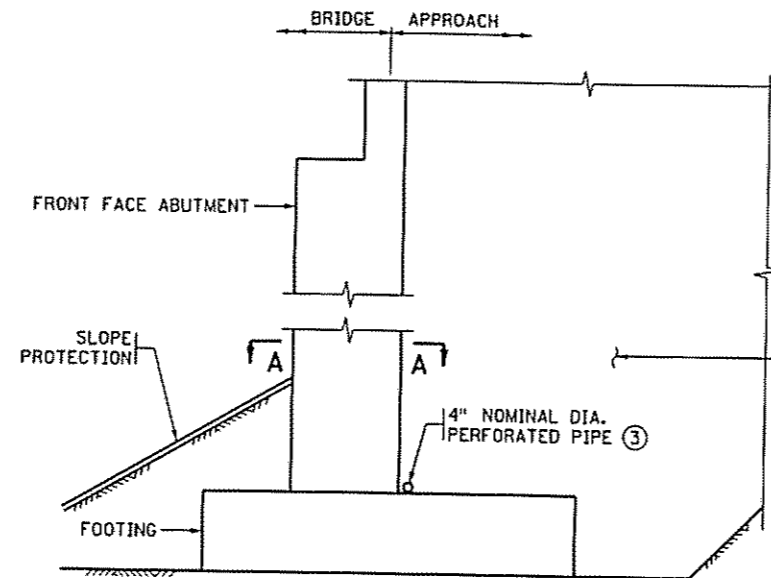
**SUMMARY OF QUANTITIES FOR DRAINAGE SYSTEM**

4" DIA. PERFORATED PIPE	270 LIN. FT.
4" DIA. END CAP	2 EACH
PIPE SLEEVE	2 EACH

THE SUMMARY OF QUANTITIES FOR DRAINAGE SYSTEM IS AS SHOWN ABOVE. ANY ADDITIONAL MINOR ITEMS OR SLIGHT CHANGES OF QUANTITIES REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

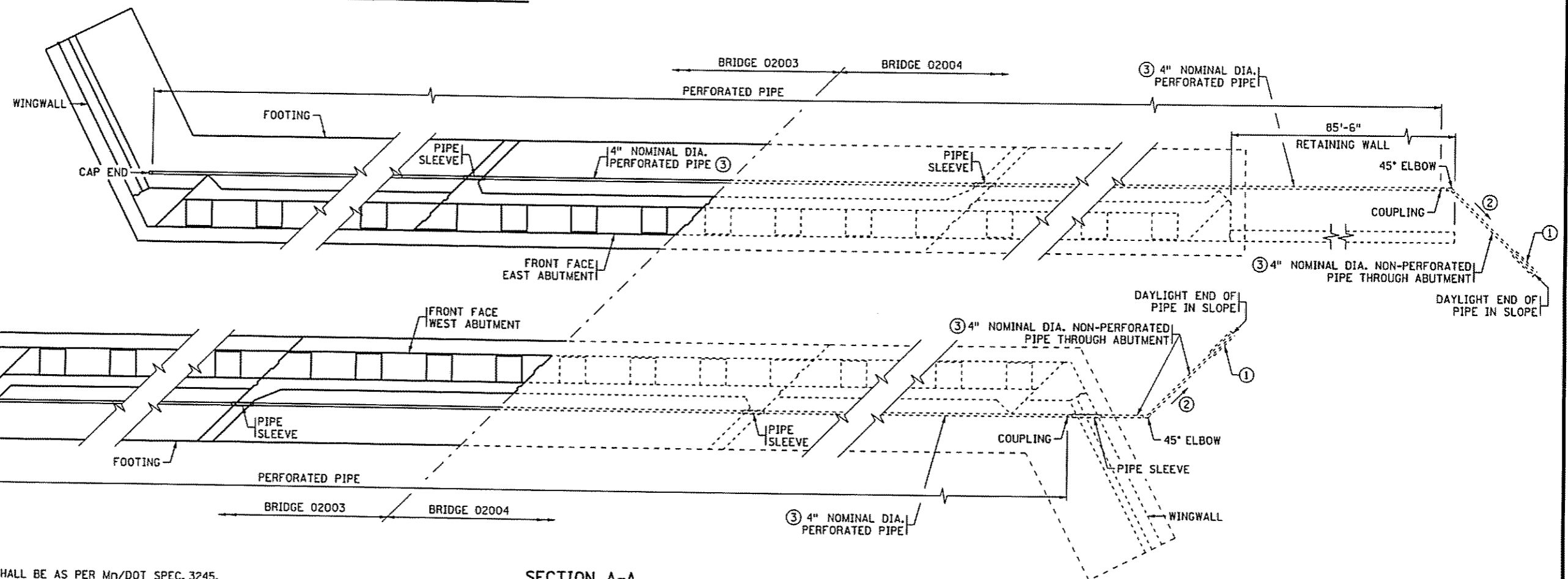
PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR ITEM 2502.502 "DRAINAGE SYSTEM TYPE (B910)".

QUANTITIES ARE FOR BOTH ENDS OF BRIDGE.



MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3149.2B  
SELECT GRANULAR BORROW, MODIFIED SO THAT NO MORE THAN 10% PASSES A NO. 200 SIEVE.  
(UNDER GRADING PORTION OF CONTRACT)

**SECTION THROUGH ABUTMENT**



**SECTION A-A**

**NOTES:**

ALL PIPE SHALL BE AS PER Mn/DOT SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER Mn/DOT SPEC. 3733, TYPE I. ATTACH TO PIPE AS PER Mn/DOT SPEC. 2502.

- ① PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.
- ② 1/8" PER FT. MINIMUM SLOPE.
- ③ TO BE PLACED AS DIRECTED BY ENGINEER IN FIELD.

APPROVED: NOVEMBER 22, 2002

*Daniel J. Johnson*  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION

**DRAINAGE SYSTEM**  
(FOR HIGH ABUTMENTS)

REVISED  
04-20-2004  
08-25-2006

DETAIL NO.

**B910  
MODIFIED**

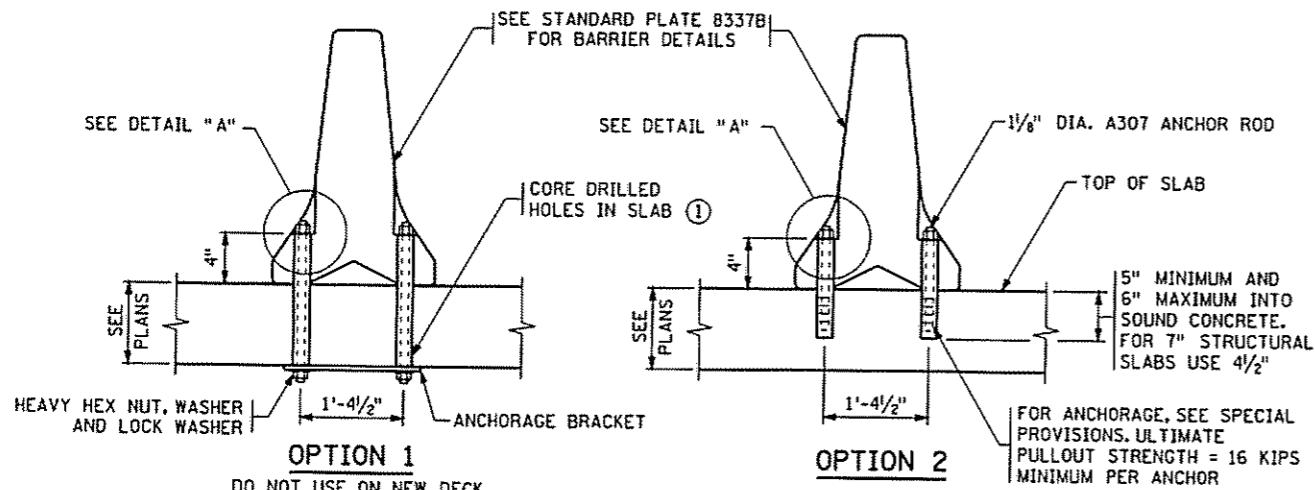
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

DETAILS

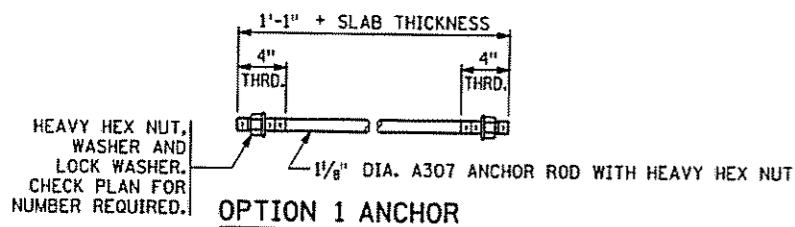
DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.  
SHEET NO. 68 OF 72 SHEETS

BRIDGE NO.  
**02003**

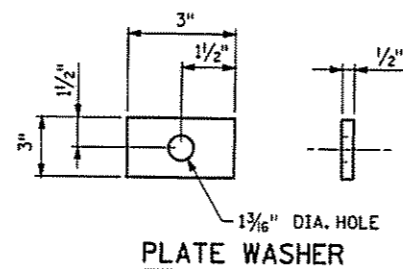
2/17/2009 S:\Design\0202003\JHB\02003.dwg



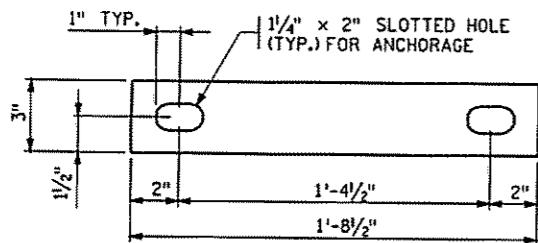
**ANCHORAGE DETAILS**  
REINFORCEMENT NOT SHOWN



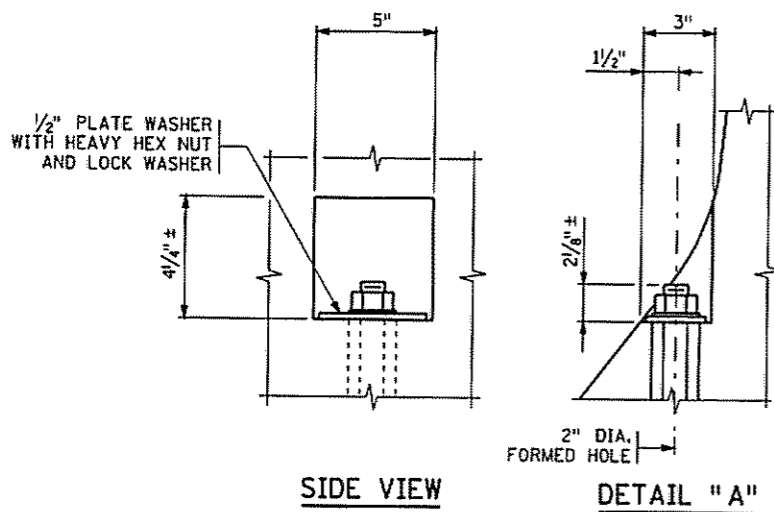
**OPTION 1 ANCHOR**



**PLATE WASHER**



**ANCHORAGE BRACKET FOR OPTION 1**

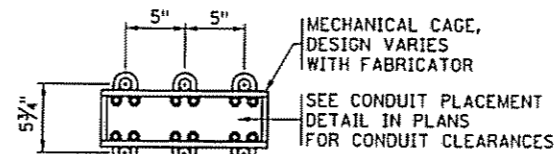


**SIDE VIEW**

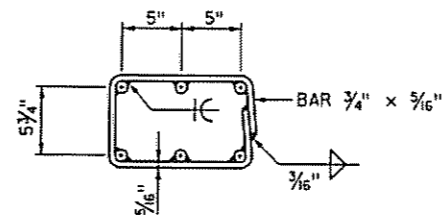
**DETAIL "A"**

**NOTES:**

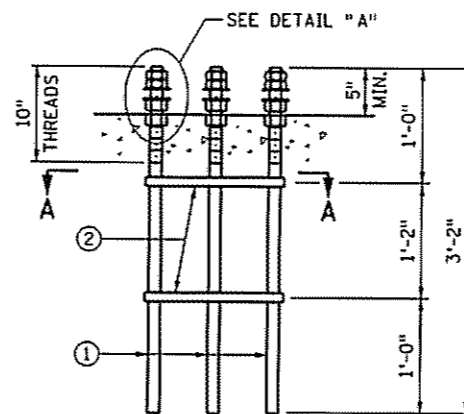
- ALL EXPOSED HARDWARE IS TO BE GALVANIZED AS PER Mn/DOT SPEC. 3392.
- ALL STRUCTURAL STEEL IS TO BE Mn/DOT SPEC. 3306 UNLESS OTHERWISE NOTED.
- COST OF ANCHORAGES IS INCIDENTAL TO THE COST OF PLACING THE PORTABLE PRECAST BARRIER.
- FILL ANCHORAGE HOLES WITH AN APPROVED EPOXY GROUT AFTER THE PORTABLE BARRIERS ARE REMOVED.
- ① PERCUSSION DRILLING OF THESE HOLES IS NOT PERMITTED.



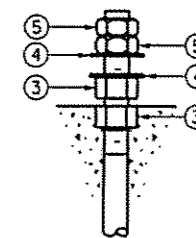
**SECTION A-A**  
ALTERNATE MECHANICAL CAGE



**SECTION A-A**  
ALTERNATE WELDED CAGE



**ELEVATION**



**DETAIL "A"**

**NOTES:**

- ALL RODS ARE TO BE 1" NOMINAL DIA. WITH 1 - 8UNC - 2A THREADS. HEAVY HEX NUTS, JAM NUTS, AND FLAT WASHERS PER Mn/DOT SPEC. 3391.2A FOR 1" DIA. THREADED RODS. NUTS TO BE TAPPED 1/64" OVERSIZED PRIOR TO GALVANIZING, AND RETAPPED TO STANDARD SIZE AFTER GALVANIZING.
- GALVANIZE THREADED RODS, CAGES, AND NUTS AFTER FABRICATION AS PER Mn/DOT SPEC. 3392.
- TOP OF THE LOWER NUTS SHALL BE FLUSH WITH TOP OF CONCRETE RAILING.
- SUBSTITUTE MATERIALS PER Mn/DOT SPEC. 1605.
- ① THREADED RODS, STEEL AS PER Mn/DOT SPEC. 3309, 3310, OR 3385 TYPE B (6 REQUIRED).
- ② PROVIDE A MECHANICAL OR WELDED CAGE FOR ROD ALIGNMENT. STEEL AS PER Mn/DOT SPEC. 3306 (2 REQUIRED).
- ③ HEAVY HEX NUTS FOR 1" DIA. RODS (12 REQUIRED).
- ④ FLAT WASHERS FOR 1" DIA. RODS (12 REQUIRED).
- ⑤ JAM NUTS FOR 1" DIA. RODS (12 REQUIRED).

APPROVED: NOVEMBER 22, 2002

*Daniel J. Morgan*  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**PORTABLE PRECAST BARRIER ANCHORAGE**  
(TEMPORARY USAGE IN LIMITED BARRIER DISPLACEMENT AREAS)

REVISED  
07-29-2003

DETAIL NO.  
MODIFIED

B920

APPROVED: NOVEMBER 22, 2002

*Daniel J. Morgan*  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**ANCHOR BOLT CLUSTER FOR LIGHT POLES**

REVISED  
10-26-2004  
03-02-2005

DETAIL NO.

B950

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

DETAILS

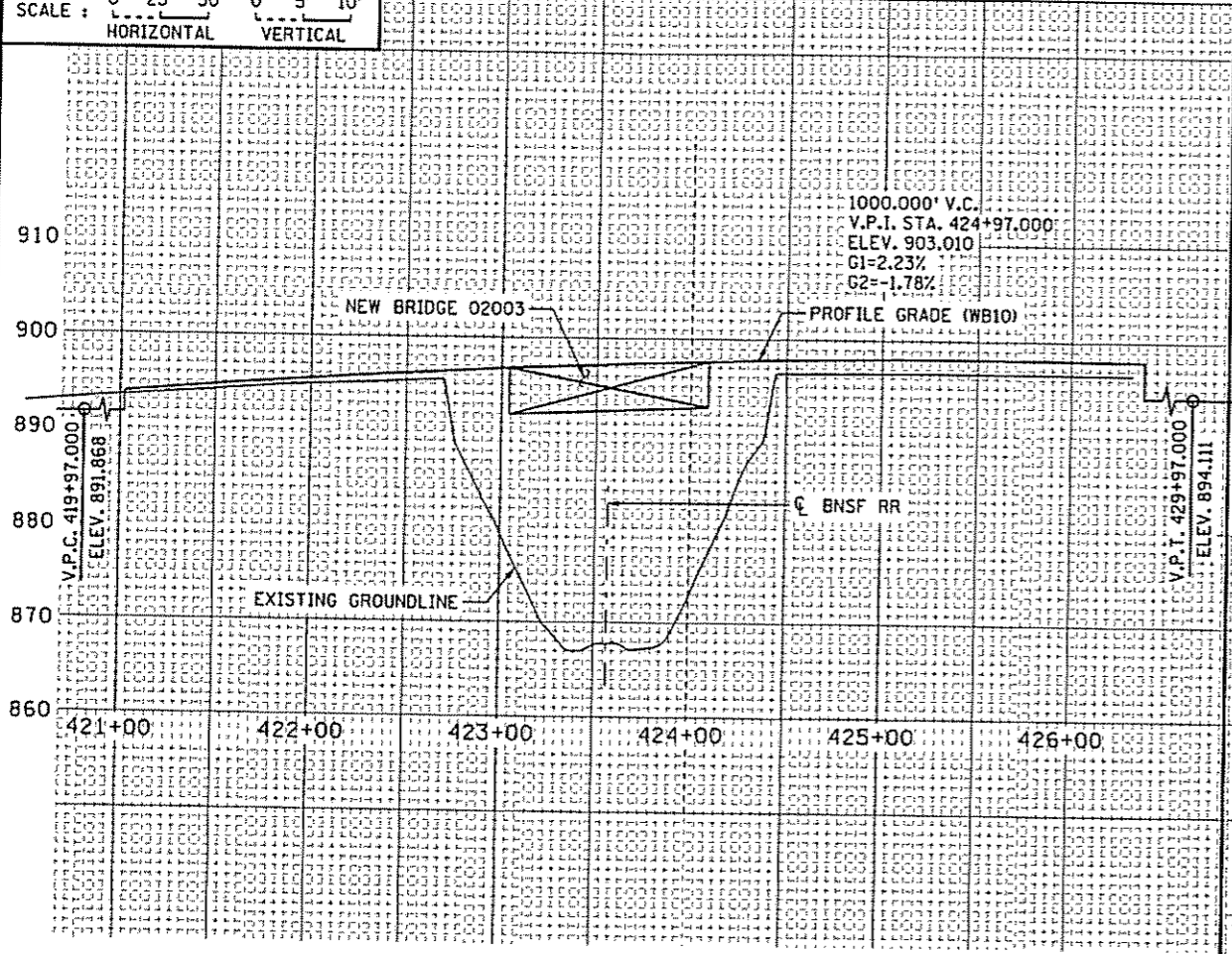
DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.  
SHEET NO. 69 OF 72 SHEETS

BRIDGE NO.  
02003

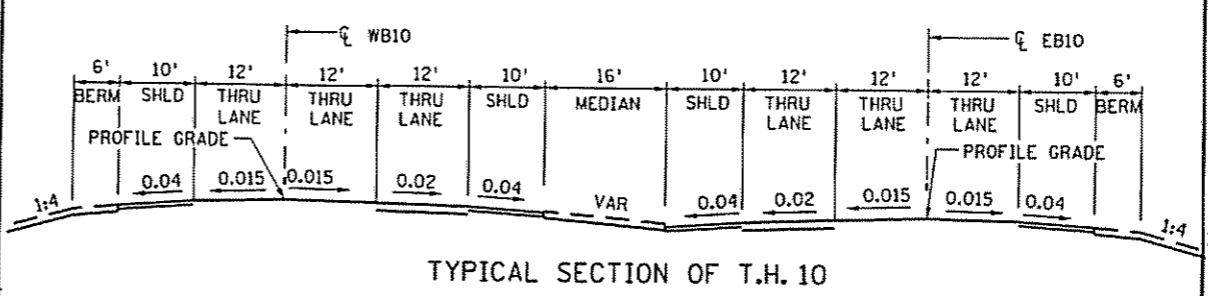


**CONTRACTED PROFILE**  
SCALE: 0 25' 50' 0 5' 10'  
HORIZONTAL VERTICAL

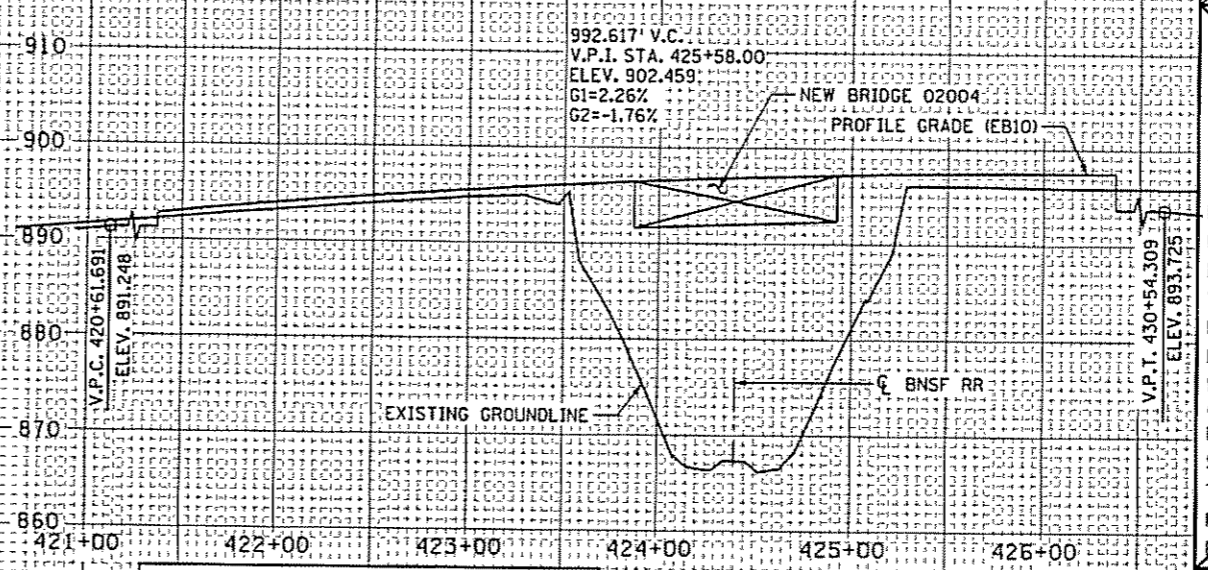
**TH 10 W.B. PROFILE**



**TYPICAL SECTIONS & PERTINENT DATA**  
SCALES AS SHOWN



**TH 10 E.B. PROFILE**



**LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE**

- SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS, SLIDING BANKS, RECREATIONAL BOATING.
- OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARLY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY); GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS-SECTIONAL AREA ETC.
- APPARENT HIGH WATER ELEVATION OBTAINED FROM:
- OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

**HYDRAULIC ENGINEERS RECOMMENDATION**

DATE \_\_\_\_\_

STREAM OR DITCH DESIGNATION \_\_\_\_\_

DRAINAGE AREA \_\_\_\_\_

MAX. FLOOD ON RECORD \_\_\_\_\_

MAXIMUM OBSERVED HIGH WATER ELEVATION \_\_\_\_\_

DESIGN FLOOD ( YR. FREQ. ) C.F.S. \_\_\_\_\_

DESIGN STAGE ELEVATION \_\_\_\_\_

DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S. \_\_\_\_\_

TOTAL STAGE INCREASE FT. \_\_\_\_\_

LOW MEMBER AT OR ABOVE ELEVATION \_\_\_\_\_

FLOWLINE ELEVATION \_\_\_\_\_ SKEW ANGLE \_\_\_\_\_

WATERWAY AREA REQUIRED BELOW ELEVATION = SQ.FT. \_\_\_\_\_

AT RIGHT ANGLES TO CHANNEL \_\_\_\_\_

BASIC FLOOD (100 YR. FREQ.) C.F.S. \_\_\_\_\_

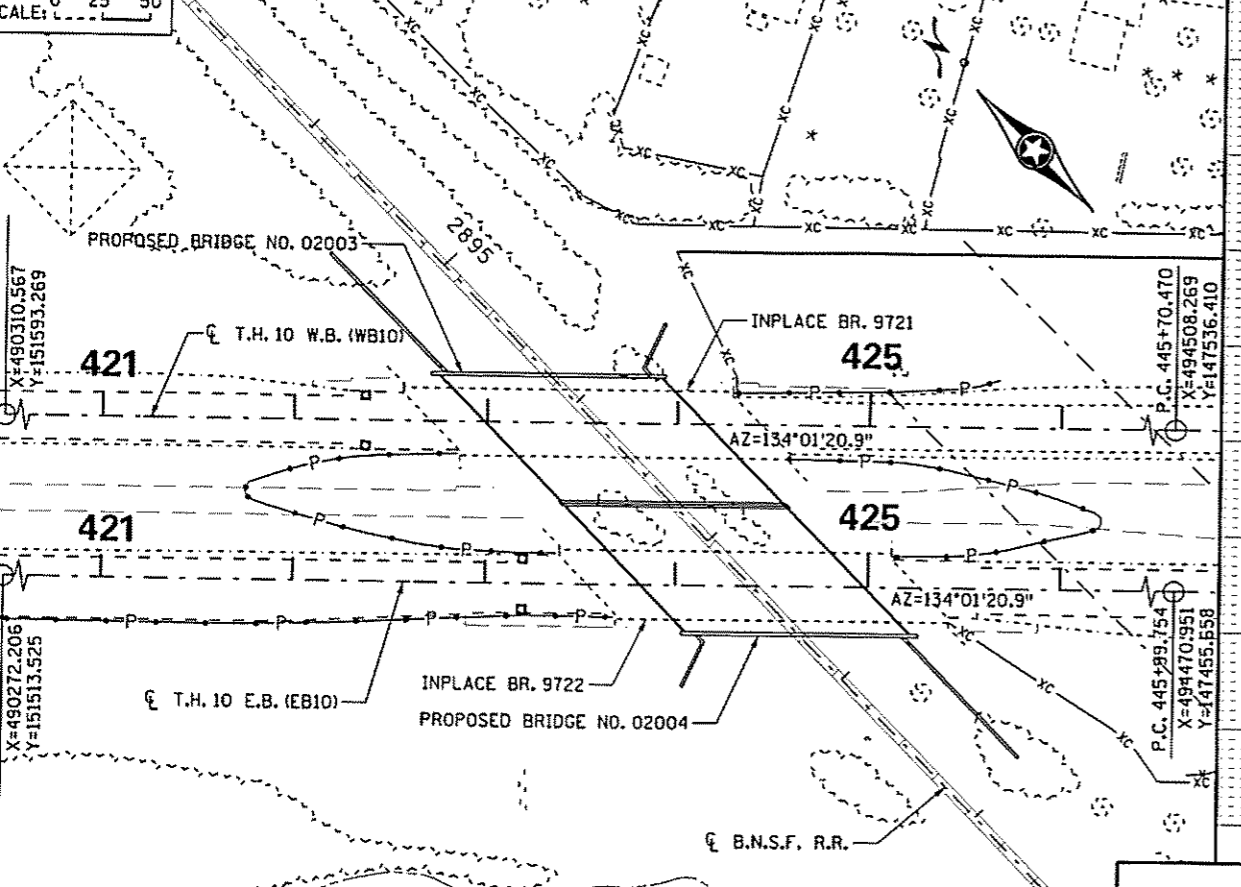
STAGE ELEVATION FT. \_\_\_\_\_

TOTAL STAGE INCREASE FT. \_\_\_\_\_

MEAN VELOCITY THROUGH STRUCTURE F.P.S. \_\_\_\_\_

ESTIMATED DEPTH OF PIER SCOUR = FT. \_\_\_\_\_

**PLAT**  
SCALE: 0 25' 50'

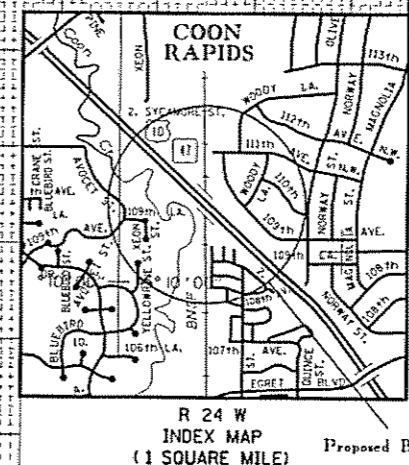


**TOP OF WEST RAIL (RRR1)**

POINT	X	Y	ELEVATION
DH8060	492,916.431	148,873.634	867.649
DH8061	492,916.149	148,897.876	867.760
DH8062	492,915.893	148,921.026	867.838
DH8063	492,915.694	148,943.957	867.974
DH8064	492,915.435	148,967.031	868.071
DH8065	492,915.142	148,990.134	868.119
DH8066	492,914.923	149,014.472	868.186
DH8067	492,914.665	149,036.141	868.256
DH8068	492,914.464	149,060.283	868.376
DH8069	492,914.185	149,083.501	868.460
DH8070	492,913.971	149,107.113	868.505
DH8071	492,913.688	149,130.560	868.581
DH8072	492,913.476	149,151.821	868.646

**TOP OF EAST RAIL (RRR2)**

POINT	X	Y	ELEVATION
DH8095	492,918.437	149,152.200	868.588
DH8096	492,918.660	149,127.546	868.544
DH8097	492,918.860	149,103.346	868.472
DH8098	492,919.108	149,080.423	868.435
DH8099	492,919.453	149,055.997	868.380
DH8100	492,919.653	149,031.618	868.234
DH8101	492,919.958	149,009.059	868.159
DH8102	492,920.273	148,984.626	868.132
DH8103	492,920.383	148,961.906	868.058
DH8104	492,920.567	148,938.933	867.937
DH8105	492,920.864	148,914.620	867.801
DH8106	492,921.255	148,890.293	867.700
DH8107	492,921.379	148,865.915	867.601



BRIDGE SURVEY SHEETS MADE FROM : PHOTO TIN pa0215.tin

BENCH MARK NAME 0215 0  
BENCH MARK ELEVATION 895.923 (N.A.V.D. 1988)

DESCRIPTION (2007) STAMPING: UNSTAMPED  
AT COON RAPIDS, 1.55 MILES NORTHWEST OF JUNCTION OF TRUNK HIGHWAY 10 AND FOLEY BOULEVARD, 20 FEET WEST OF WESTBOUND TRUNK HIGHWAY 10, IN SOUTHWEST ABUTMENT OF WESTBOUND TRUNK HIGHWAY 10 BRIDGE 9721 OVER RAILROAD, AT TRUNK HIGHWAY 10 MILEPOINT 230.35, 0.7 FOOT SOUTHWEST OF SOUTHWEST GUARDRAIL FOUNDATION

2nd BENCH MARK NAME 0215 P  
2nd BENCH MARK ELEVATION 896.488 (N.A.V.D. 1988)

DESCRIPTION (2007) STAMPING: 0215 P 1970  
IN COON RAPIDS, IN SOUTHEAST CORNER OF TRUNK HIGHWAY 10 BRIDGE 9722 OVER RAILROAD (SOUTH BRIDGE), TO TRUNK HIGHWAY 10 MILEPOINT 230.35, 0.8 FEET SOUTHWEST OF GUARDRAIL, 11 FEET NORTH OF WITNESS POST

MINNESOTA  
DEPARTMENT OF TRANSPORTATION

**BRIDGE SURVEY**

RR MILE POST 135.37  
PROPOSED BRIDGE LOCATED 3.0 MILES S.E. OF JUNCTION OF T.H. 242  
SEC 14 TWP 31 N R 24 W  
CITY OF COON RAPIDS COUNTY ANOKA  
BRIDGE NO. **02003**

EXISTING 24" R.C.P. TO BE REMOVED

NOTE:  
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF C/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

INPLACE BRIDGE NO. 9721, BUILT IN 1965  
3 SPAN BRIDGE WITH 45" PCB  
173'-2" LONG, 35'-6" WIDE SUPPORTED  
ON TREATED TIMBER PILES. TO BE  
REMOVED UNDER BRIDGE PORTION  
OF CONTRACT

INPLACE BRIDGE NO. 9722, BUILT IN 1965  
3 SPAN BRIDGE WITH 45" PCB  
173'-2" LONG, 35'-6" WIDE SUPPORTED  
ON TREATED TIMBER PILES. TO BE  
REMOVED UNDER BRIDGE PORTION  
OF CONTRACT

CONE PENETROMETER TEST (CPT) SOUNDING LOCATIONS ARE NOTED IN THE PLAN VIEW. CPT SOUNDING INFORMATION IS NOT SHOWN IN THE BRIDGE PROFILE DUE TO THE AMOUNT OF DATA ASSOCIATED WITH THIS INVESTIGATION TECHNIQUE. THE COMPLETE SOUNDING LOGS MAY BE FOUND ON THE Mn/DOT WEBSITE AT:  
<http://www.mrr.dot.state.mn.us/geotechnical/foundations/borings/borings.asp>  
OR ARE AVAILABLE IN PRINT ON REQUEST. THESE LOGS ARE CONSIDERED A PORTION OF THE PROJECT DOCUMENTS.

EL. 900	422	423	424	425	426	427	EL. 900
EL. 880							EL. 880
EL. 860							EL. 860
EL. 840							EL. 840
EL. 820							EL. 820
EL. 800							EL. 800
EL. 780							EL. 780
EL. 760							EL. 760
							EL. 740

T1  
ELEVATION - 894.8

28  
45  
36  
38  
20  
10  
23  
11  
11  
3  
910  
18  
1520  
24  
1780  
31  
1900  
64  
72  
60  
42  
88  
36

LOAMY FINE SAND, BROWN, DAMP TO MOIST

SAND, LIGHT GRAY-BROWN, MOIST TO WET

PLASTIC SILT LOAM TO SILTY CLAY LOAM WITH A SAND LAYER @ 39.0'; SILT TRACES, A FEW THIN SEAMS OF PLATE BLOCKY CLAY; GRAY WITH LIGHT GRAYS AND DARK GRAYS; MOIST

LOAMY SAND TO SAND, LIGHT GRAY AND WET

SLIGHTLY PLASTIC SANDY LOAM WITH A FEW PEBBLES, GRAY AND VERY MOIST

SANDY CLAY LOAM WITH SOME PEBBLES, GRAY AND VERY MOIST

CLAY LOAM, BROWN AND MOIST

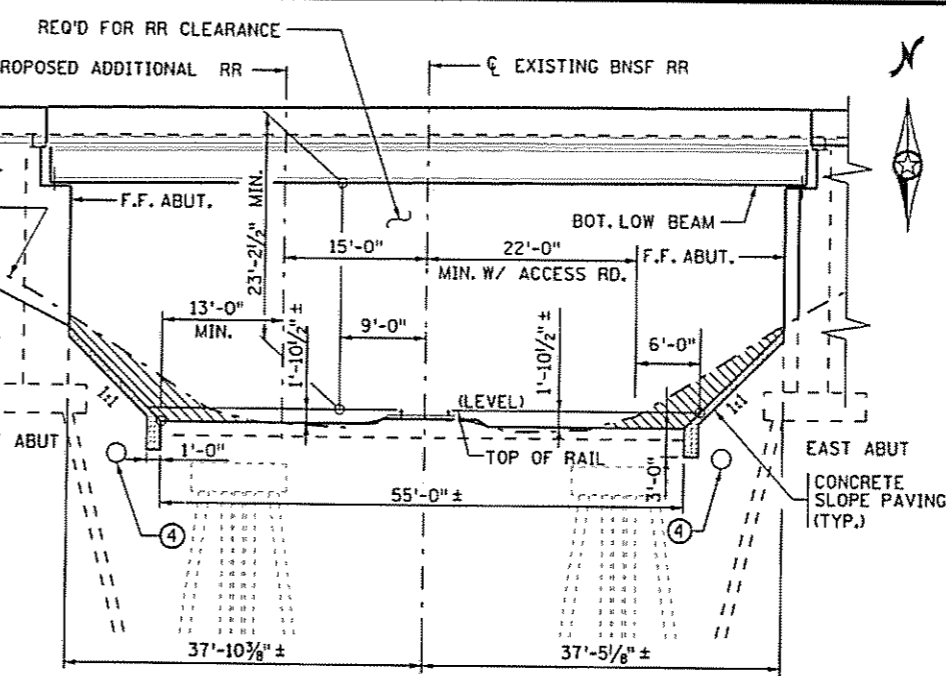
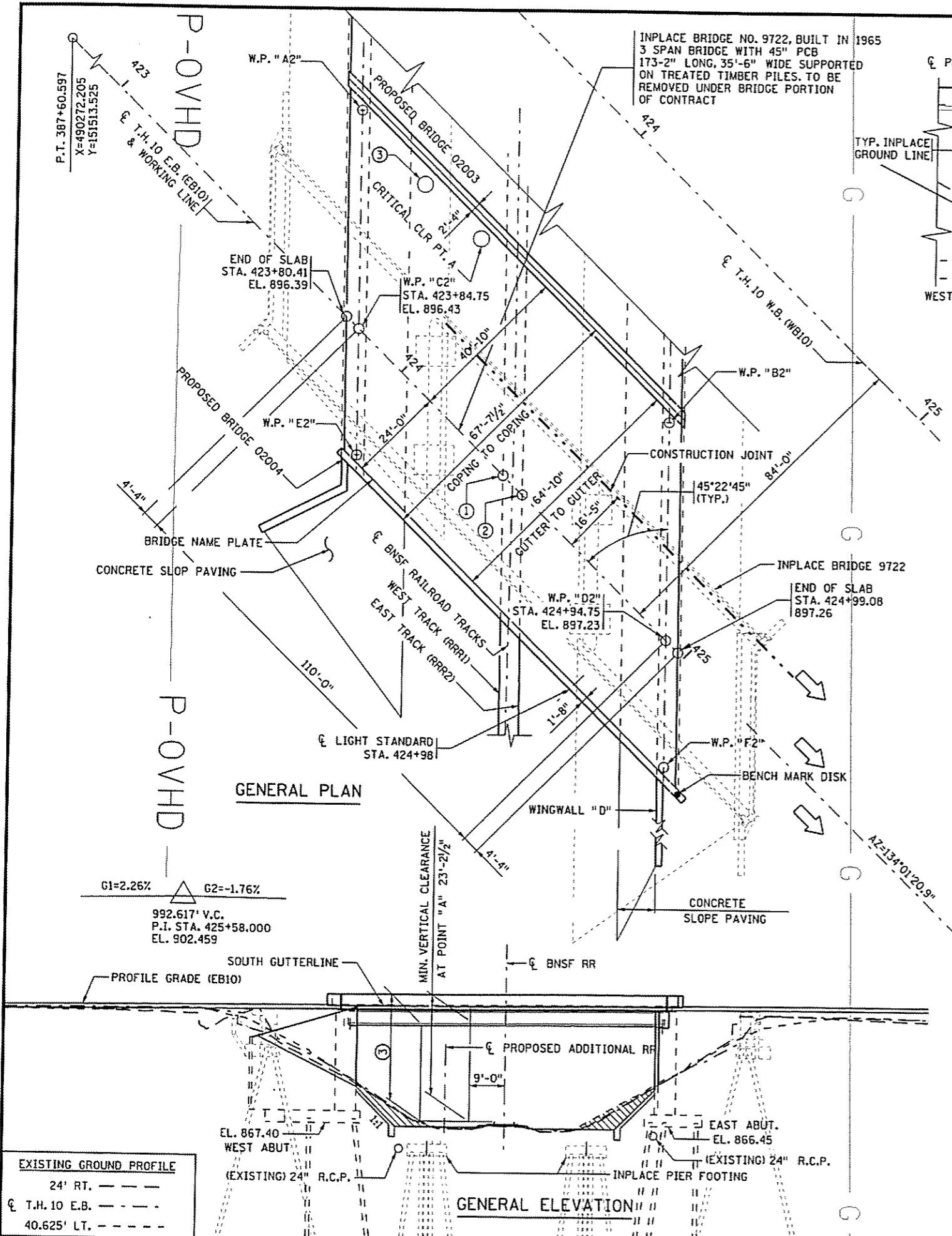
PLASTIC TO SLIGHTLY PLASTIC SILT LOAM WITH A FEW PEBBLES AND SILT TRACES, BROWN AND MOIST

SILT WITH A FEW PEBBLES, TRACES OF BLOCKY CLAY 79.0'-80.0'; BROWN AND VERY MOIST

SILTY CLAY LOAM, BROWN AND WET

BOTTOM OF HOLE - 95.5'

EXISTING GROUND PROFILE FROM T.H. 10 E.B.  
24' RT. ---  
T.H. 10 E.B. ---  
108' LT. ---



RAILROAD SECTION UNDER BRIDGE

NOTES:

- ① T.H. 10 E.B. (EB10) 424+36.639 = WEST TRACK OF B.N.S.F. R.R. (RRR1) 5+61.577 X=492915.526 Y=148958.895  $\Delta$ =45°20'03.9"
- ② T.H. 10 E.B. (EB10) 424+43.479 = EAST TRACK OF B.N.S.F. R.R. (RRR2) 6+75.653 X=492920.445 Y=148954.141  $\Delta$ =45°31'07.0"
- ③ T.H. 10 E.B. (EB10) 423+67.956 OFF 38.8958= WEST TRACK OF B.N.S.F. R.R. (RRR1) 6+37.538 OFF 21.52 X=492893.169 Y=149034.594  $\Delta$ =45°17'43.30" VERTICAL CLEARANCE= 22'-11 1/2"
- ④ NEW 24" R.C.P. APROX. INVERT EL. 863.0 (INCLUDED IN GRADING PLAN).

CONSTRUCTION WILL BE STAGED SEE SHEETS 4-9.  
 ABUTMENTS SET PARALLEL AT AZ=179°24'5.9"  
 SEE SHEET NO. 58 & 59 WINGWALL, SLOPE PROTECTION AND DITCH DETAILS.  
 0.01'/' LANE CROSS SLOPES WERE ESTABLISHED FOR MINIMAL GRADE RAISE REQUIREMENTS AND CHECKED AGAINST DRAINAGE REQUIREMENTS.  
 APPROXIMATELY 11.4' DRAINAGE SPREAD ON WIDENED CONFIGURATION (OUTSIDE SHOULDERS)  
 SEE BORING SHEET FOR INPLACE UTILITIES.  
 $\phi$  BNSF IS ASSUMED ALIGNMENT BETWEEN TRACKS.

HATCHED AREA TO BE REMOVED UNDER THE GRADING PORTION OF THE CONTRACT.

**STATE FUNDS**

**DESIGN DATA**

2007 AND CURRENT INTERIM AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS  
 LOAD AND RESISTANCE FACTOR DESIGN METHOD  
 HL 93 LIVE LOAD  
 DEAD LOAD INCLUDES 20 p.s.f. ALLOWANCE FOR FUTURE WEARING COURSE MODIFICATIONS

**MATERIAL DESIGN PROPERTIES:**  
 REINFORCED CONCRETE:  
 $f'_c = 4$  ksi  $n = 8$   
 $F_y = 60$  ksi FOR REINFORCEMENT  
 PRESTRESSED CONCRETE:  
 $f'_c = 7.5$  ksi  $n=1$   
 $f_{pu} = 270$  ksi FOR 0.6" DIAMETER LOW RELAXATION STRANDS

DECK AREA = 8025 SQ. FT.  
 50000 PROJECTED A.D.T. FOR YEAR 2028  
 2100 PROJECTED A.D.T. FOR YEAR 2028  
 DESIGN SPEED = 70 MILES PER HOUR  
 BRIDGE OPERATING RATING HS 56

**LIST OF SHEETS**

NO.	DESCRIPTION
1	GENERAL PLAN AND ELEVATION
2	SCHEDULE OF QUANTITIES
3	BRIDGE LAYOUT
4-9	STAGING
10-17	WEST ABUTMENT GEOMETRICS
18-26	WEST ABUTMENT REINFORCEMENT
27-33	EAST ABUTMENT GEOMETRICS
34-41	EAST ABUTMENT REINFORCEMENT
42-43	WINGWALL D GEOMETRICS
44-45	WINGWALL D REINFORCEMENT
46	FRAMING PLAN
47	MN 45" PRESTRESSED CONCRETE BEAM
48-54	SUPERSTRUCTURE DETAILS & REINFORCEMENT
55	CONCRETE BARRIER (TYPE F, TL-4)
56	SPLIT MEDIAN BARRIER
57	WIRE FENCE (DESIGN W-1)
58-59	CONCRETE SLOP PAVING UNDER BRIDGES
60	CONDUIT SYSTEMS
61-62	WATERPROOF EXPANSION DEVICE
63-69	DETAILS
70	AS-BUILT BRIDGE DATA
71	BRIDGE SURVEY
72	BORING LOCATION

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

SIGNED: *Moises C. Dimaculangan* DATE: 2/23/09  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC NO. 46209

TRUNK HIGHWAY NO. 10  
 MINNESOTA  
 DEPARTMENT OF TRANSPORTATION

**BRIDGE NO. 02004**

T.H. 10 E.B. OVER  
 BNSF RAILROAD MILEPOINT 135.37  
 3.0 MILES S.E. OF JUNCTION OF T.H. 242  
 IN COON RAPIDS  
 IDENTIFICATION NO. 501

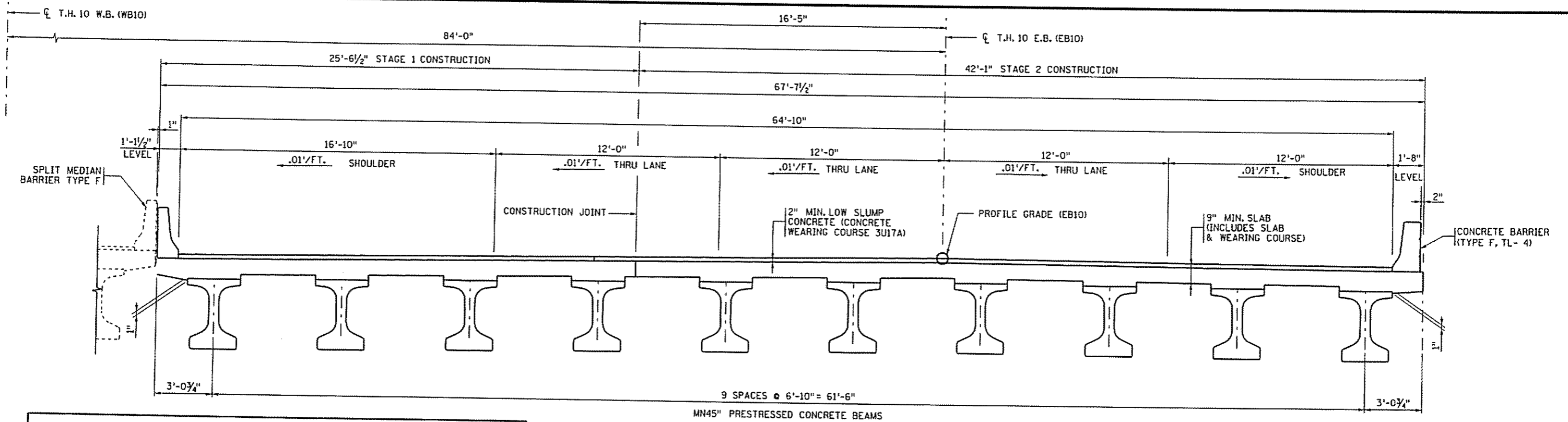
**GENERAL PLAN AND ELEVATION**

SEC. 14 T 31 N R 24 W  
 CITY COON RAPIDS MNOKA COUNTY

APPROVED: *Kevin Weston* STATE BRIDGE ENGINEER  
 DATE: 2/23/09 FOR

DES. P.J.K.	DR. N.A.	02004
CHK. M.C.D.	CHK. J.A.J.	

DR 2-25-09



9 SPACES @ 6'-10" = 61'-6"  
MN45" PRESTRESSED CONCRETE BEAMS

SCHEDULE OF QUANTITIES FOR ENTIRE BRIDGE

ITEM NO.	ITEM	UNIT	QUANTITY
2104.601	REMOVE REGULATED WASTE MATERIAL (BRIDGE)	LUMP SUM	1
2401.501	STRUCTURAL CONCRETE (1A43)	CU.YD.	585
2401.501	STRUCTURAL CONCRETE (3Y43)	CU.YD.	1002 (P)
2401.512	BRIDGE SLAB CONCRETE (3Y36)	SQ.FT.	8025 (P)
2401.513	TYPE F (TL-4) RAILING CONCRETE (3Y46)	LIN. FT.	124 (P)
2401.514	SPLIT MEDIAN BARRIER CONCRETE (3Y46)	LIN. FT.	115 (P)
2401.541	REINFORCEMENT BARS	POUND	54240 (P)
2401.541	REINFORCEMENT BARS (EPOXY COATED)	POUND	123730 (P)
2401.601	STRUCTURE EXCAVATION	LUMP SUM	1
2401.618	BRIDGE DECK PLANING	SQ.FT.	7298 (P)
2402.591	EXPANSION JOINT DEVICES TYPE 5	LIN. FT.	187 (P)
2402.595	BEARING ASSEMBLY	EACH	20 (P)
① 2404.501	CONCRETE WEARING COURSE (3U17A)	SQ.FT.	15578 (P)
2405.502	PRESTRESSED CONCRETE BEAMS MN45	LIN. FT.	1113 (P)
2405.511	DIAPHRAGMS FOR TYPE MN45 PREST BEAMS	LIN. FT.	123 (P)
② 2442.501	REMOVE EXISTING BRIDGE	LUMP SUM	1
2452.507	C-I-P CONCRETE PILING DELIVERED 12"	LIN. FT.	7350
2452.508	C-I-P CONCRETE PILING DRIVEN 12"	LIN. FT.	7350
2452.519	C-I-P CONCRETE TEST PILE 60 FT. LONG 12"	EACH	4
2452.527	PILE REDRIVING	EACH	4
2452.601	STEEL SHEET PILING (TEMPORARY)	LUMP SUM	1
2452.602	PILE ANALYSIS	EACH	2
2472.525	COUPLERS (REINFORCEMENT BARS) T-22	EACH	92 (P)
2472.525	COUPLERS (REINFORCEMENT BARS) T-19	EACH	60 (P)
2472.525	COUPLERS (REINFORCEMENT BARS) T-16	EACH	20 (P)
2502.502	DRAINAGE SYSTEM TYPE (8910)	LUMP SUM	1
2514.501	CONCRETE SLOPE PAVING	SQ. YD.	621 (P)
2545.509	CONDUIT SYSTEM (LIGHTING)	LUMP SUM	1
2557.501	WIRE FENCE DESIGN SPECIAL	LIN. FT.	122 (P)

TRANSVERSE SECTION THRU DECK

CONSTRUCTION NOTES

THE 2005 EDITION OF THE MINNESOTA DEPARTMENT OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION" SHALL GOVERN.

BRIDGE SEAT REINFORCEMENT SHALL BE CAREFULLY PLACED TO AVOID INTERFERENCE WITH DRILLING HOLES FOR ANCHOR RODS. THE BEAMS SHALL BE ERECTED IN FINAL POSITION PRIOR TO DRILLING HOLES FOR AND PLACING ANCHOR RODS.

THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR NUMBER WHICH APPROXIMATES THE NOMINAL DIAMETER OF THE BAR IN MILLIMETERS (mm).

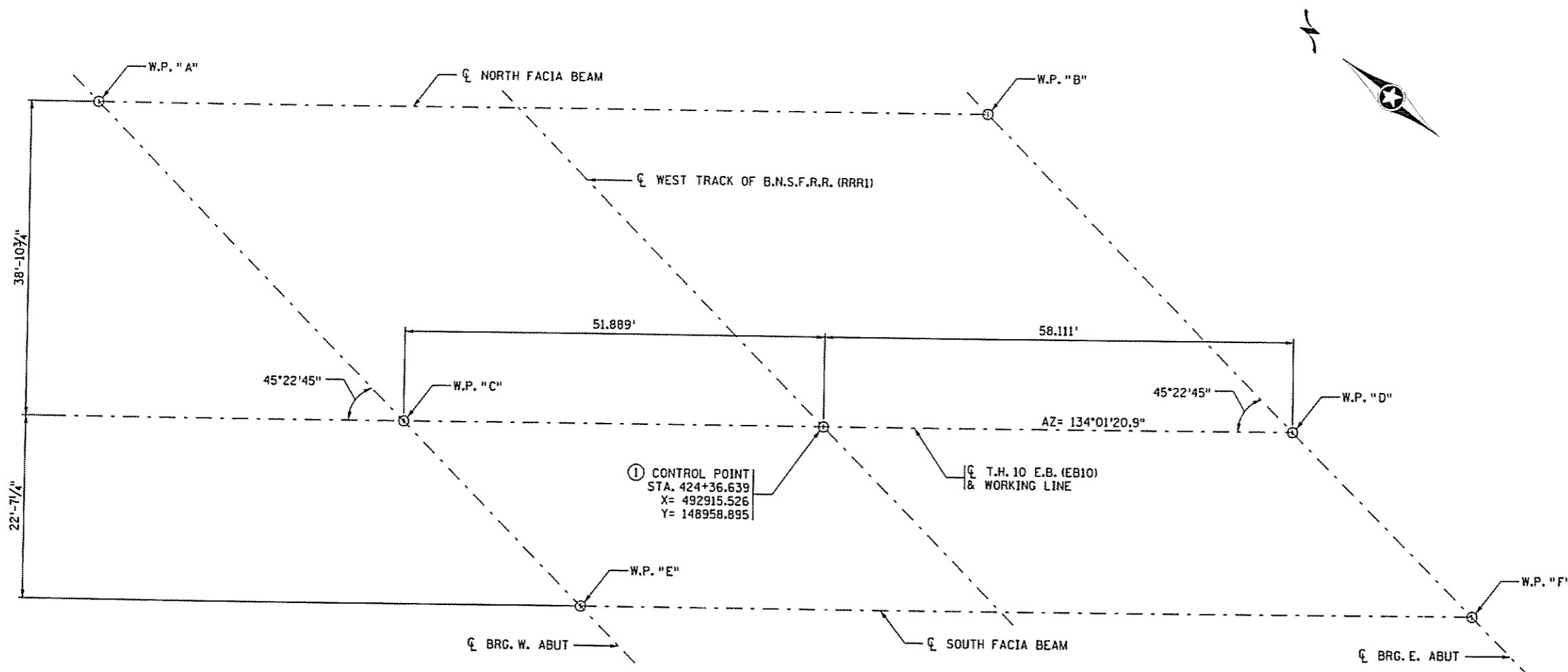
BAR MARKED WITH THE SUFFIX "E" SHALL BE EPOXY COATED IN ACCORDANCE WITH SPEC. 3301.

THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA".

THE PILE LOADS SHOWN IN THE PLANS AND THE CORRESPONDING NOMINAL PILE BEARING RESISTANCE WERE COMPUTED USING LRFD METHODOLOGY. ULTIMATE PILE CAPACITY DETERMINED IN THE FIELD SHALL INCORPORATE THE METHODS AND/OR FORMULAS DESCRIBED IN THE SPECIAL PROVISIONS.

- SEE SHEET 72 FOR INPLACE UTILITIES.
- ① ITEM INCLUDES 7884 SQ. F.T. FOR BRIDGE APPROACH PANELS.
  - ② REMOVE EXISTING BRIDGE NO. 9722.

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE		TITLE: SCHEDULE OF QUANTITIES		DES: P.J.K.	DR: N.A.	APPROVED:	BRIDGE NO. 02004
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209				CHK: M.C.D.	CHK: J.A.J.	2/23/09	
				SHEET NO. 2 OF 72 SHEETS			



**WORKING POINT LAYOUT**

**NOTES:**

- ① T.H. 10 E.B. (EB10) 424+36.64 = WEST TRACK OF B.N.S.F. R.R. (RRR1) 5+61.58 X=492915.526 Y=148958.895  $\angle=45^{\circ}20'03.9''$

POINT	STATION	X-COORDIN.	Y-COORDIN.	DIMENSIONS BETWEEN WORKING POINTS						ELEVATIONS			POINT
				A	B	C	D	E	F	TOP OF ROWY.	TOP OF ROWY. TO BR. SEAT	BRIDGE SEAT	
A	423+46.37	492877.644	149049.598		110.00	54.65	153.40		181.43	895.65	4.88 *	890.77	A
B	424+56.37	492956.742	148973.154			81.50	54.65	78.83		896.62	5.04 *	891.58	B
C	423+84.75	492878.215	148994.954				110.00	31.76	134.22				C
D	424+94.75	492957.312	148918.511					31.76					D
E	424+07.06	492878.547	148963.198					110.00		896.41	5.01	891.40	E
F	425+17.06	492957.644	148886.755							897.11	5.18	891.93	F

TOP OF ROADWAY TO BRIDGE SEAT				
	WEST ABUTMENT EXCEPT NORTH FACIA BEAM	WEST ABUTMENT NORTH FACIA BEAM	EAST ABUTMENT EXCEPT NORTH FACIA BEAM	EAST ABUTMENT NORTH FACIA BEAM
OVERLAY THICKNESS	2"	2"	2"	2"
STRUCTURAL SLAB THICKNESS	7"	7"	7"	7"
STOOL HEIGHT	2 7/8"	1 1/4"	2 7/8"	1 1/4"
BEAM HEIGHT	45"	45"	45"	45"
BEARING HEIGHT	3 1/4"	3 1/4"	5 1/4"	5 1/4"
TOTAL (IN.)	60 7/8"	58 1/2"	62 1/8"	60 1/2"
TOTAL (FT.)	5.01'	4.88'	5.18'	5.04'

\* AT NORTH FACIA BEAM STOOL HEIGHT IS 1/4" AT ENDS OF BEAM AND 0" AT MIDSPAN FOR RR CLEARANCE AT FUTURE TRACK.

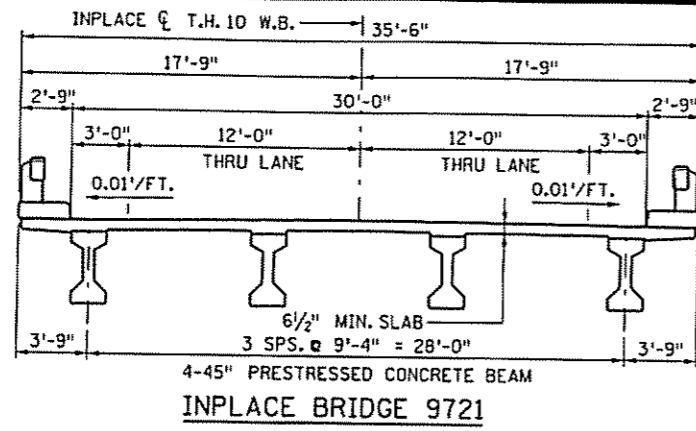
CERTIFIED BY M.C. Dimaculangan 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

BRIDGE LAYOUT

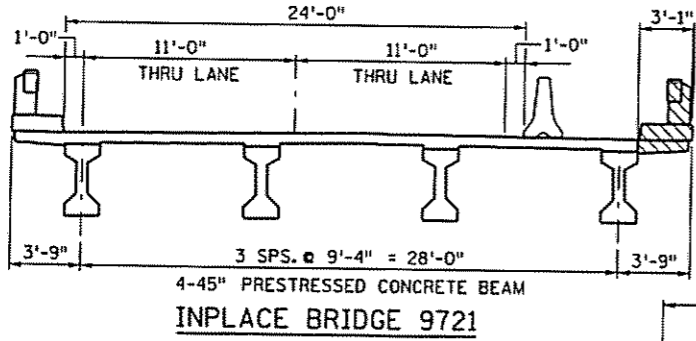
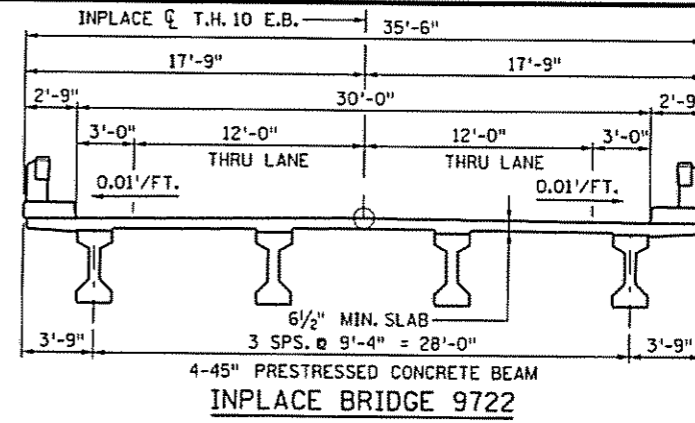
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 CHK: M.C.D. CHK: J.A.J.  
 SHEET NO. 3 OF 72 SHEETS

BRIDGE NO. 02004

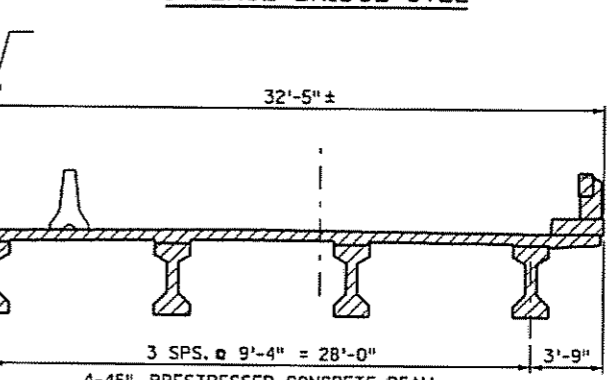
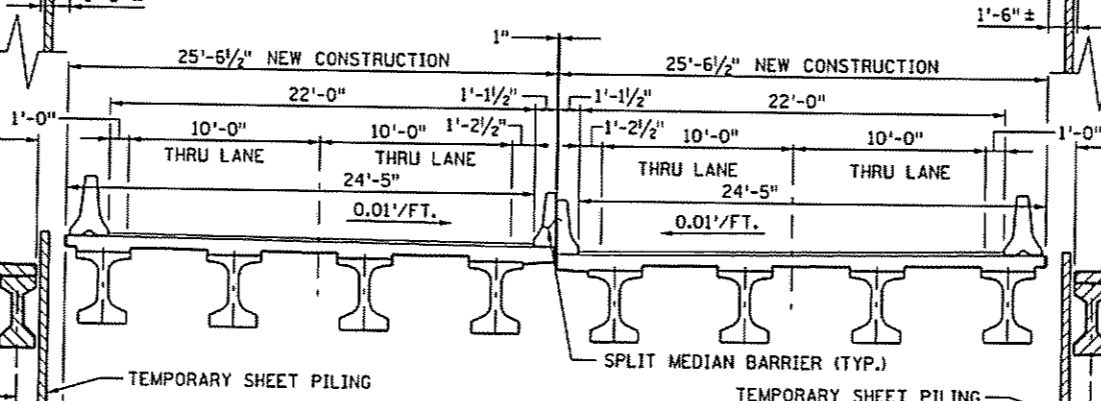
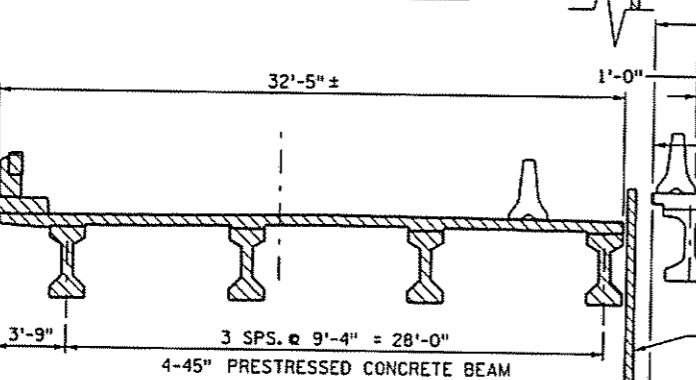
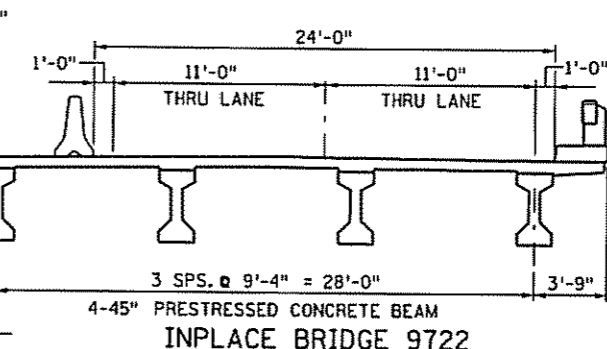
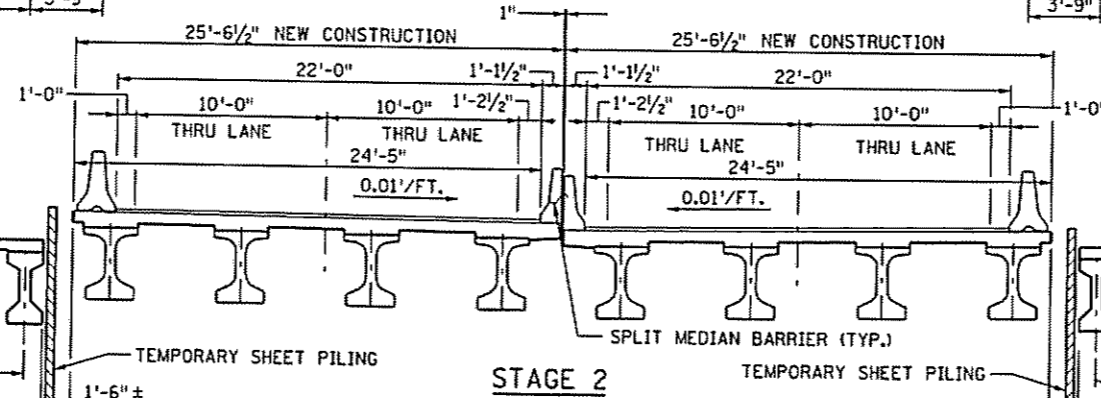
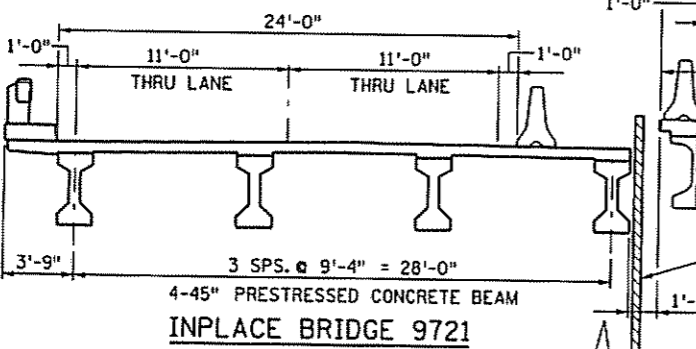
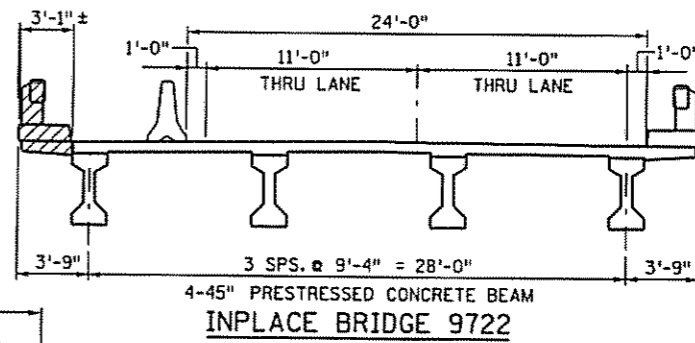




INPLACE BRIDGES

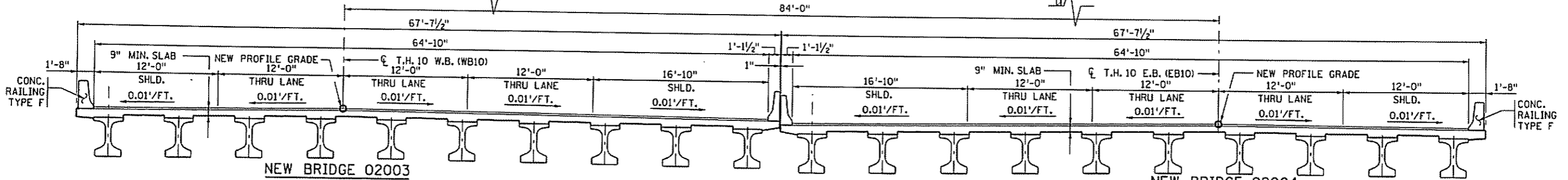


STAGE 1



REMOVE INPLACE BRIDGE 9721

REMOVE INPLACE BRIDGE 9722



FINAL BRIDGES

STAGING

DR: D.K.S.

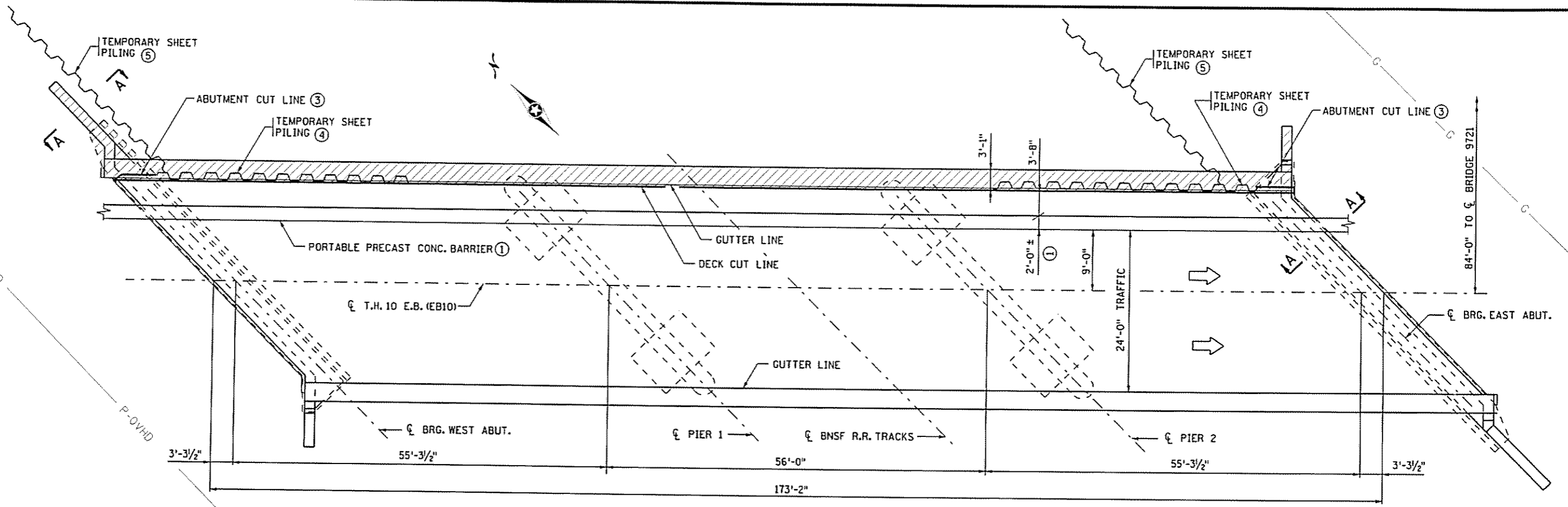
CHK: D.T.P.

BRIDGE NO.

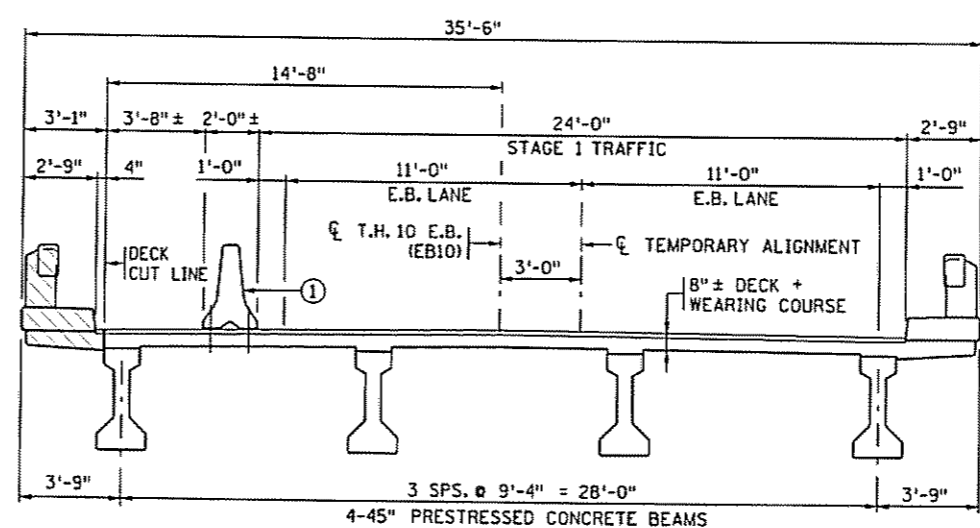
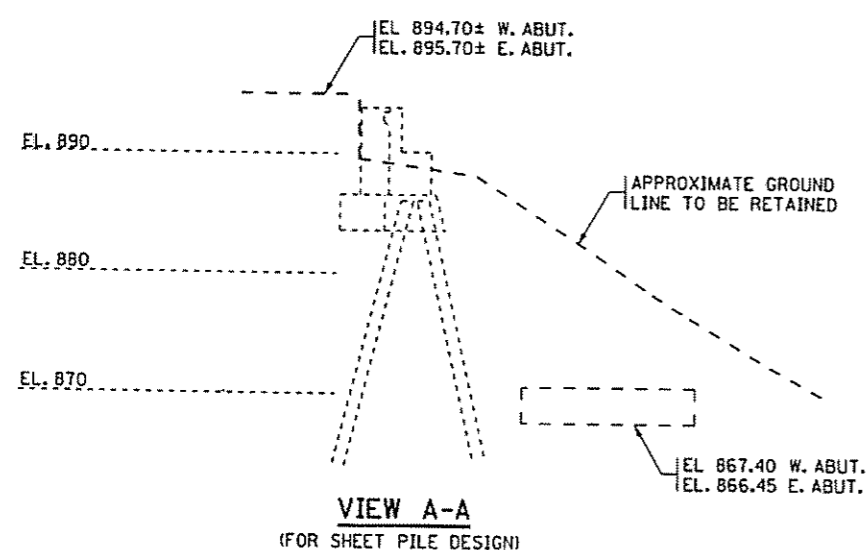
STATE PROJECT NO. 0215-02003 & 0215-02004

SHEET NO. 4 OF 72 SHEETS

02003 & 02004



PLAN VIEW STAGE 1 INPLACE BRIDGE 9722



STAGE 1 NOTES:

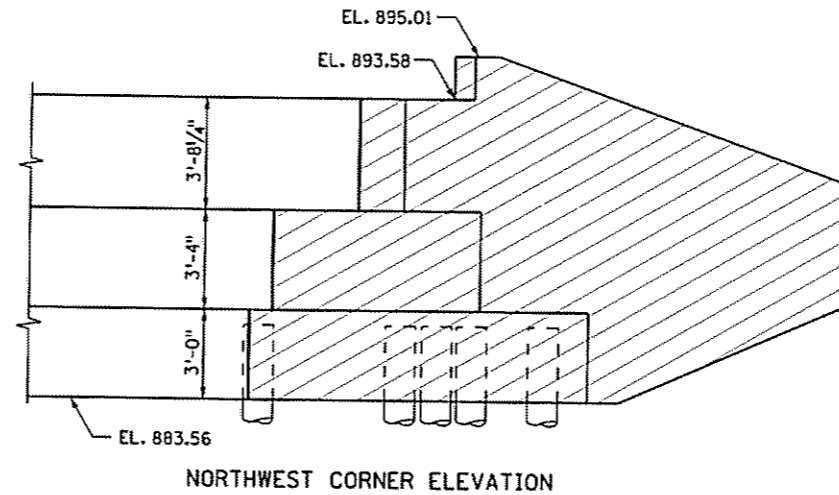
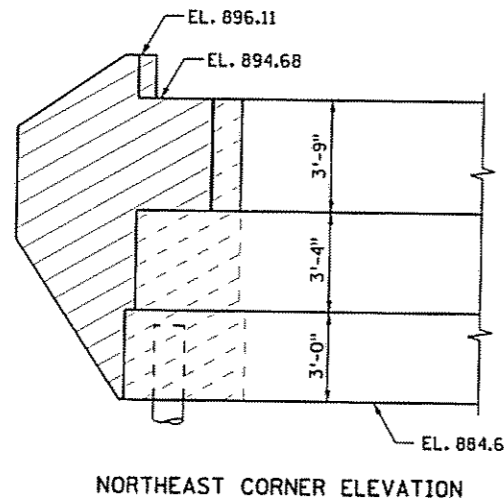
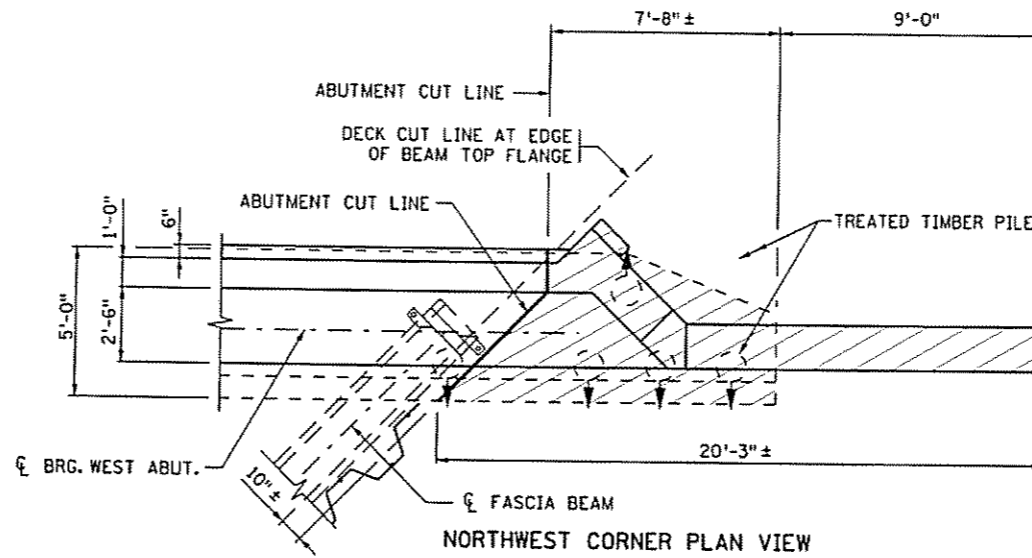
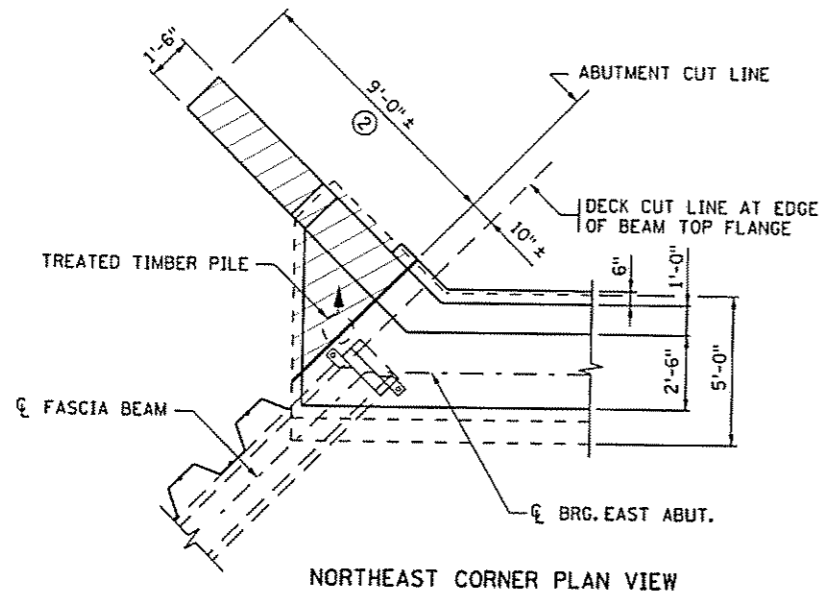
- ① INSTALL PORTABLE PRECAST CONCRETE BARRIER AND ANCHOR TO DECK. SEE DETAIL B920. BARRIER TO BE INCLUDED IN GRADING PORTION OF PLAN.
- ② REMOVE NORTH PORTION OF DECK AND RAILING TO EDGE OF FASCIA BEAM.
- ③ REMOVE WINGWALLS AND ABUTMENT CORNERS AS SHOWN ON SHEET NO. 6. THE EXACT REMOVAL LIMITS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD. BEARINGS SHALL REMAIN INTACT.
- ④ TEMPORARY SHEET PILING FOR RETAINING SLOPES IN FRONT OF THE INPLACE ABUTMENTS WHILE EXCAVATING FOR NEW FOOTINGS MAY REMAIN THROUGH STAGE 2. SHEET PILING SHALL BE DESIGNED BY THE CONTRACTOR. SEE THE SPECIAL PROVISIONS.
- ⑤ TEMPORARY SHEET PILING FOR CRANE PAD (IF NEEDED) TO MAINTAIN CLEARANCE FROM OVERHEAD POWER LINE AND GAS LINE. SHEET PILING SHALL BE DESIGNED BY THE CONTRACTOR. SEE THE SPECIAL PROVISIONS.

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

STAGING DETAILS  
(STAGE 1)

DES: PJK	DR: NKL	APPROVED: 2/23/09	BRIDGE NO. 02004
CHK: MCD	CHK: JAJ		
SHEET NO. 5 OF 72 SHEETS			

2/23/2009 S:\Design\BRIDGE\BRIDGE 9721\br 02004.dwg



ABUTMENT REMOVAL DETAILS

STAGE 1 NOTES:

HATCHED AREAS DENOTE REMOVAL.

DIMENSIONS AND ELEVATIONS SHOWN ARE FROM THE ORIGINAL PLAN DATED 3-8-65.

REMOVE WINGWALLS AND ABUTMENT CORNERS AS SHOWN. THE EXACT REMOVAL LIMITS WILL BE DETERMINED BY THE ENGINEER IN THE FIELD. BEARINGS SHALL REMAIN INTACT.

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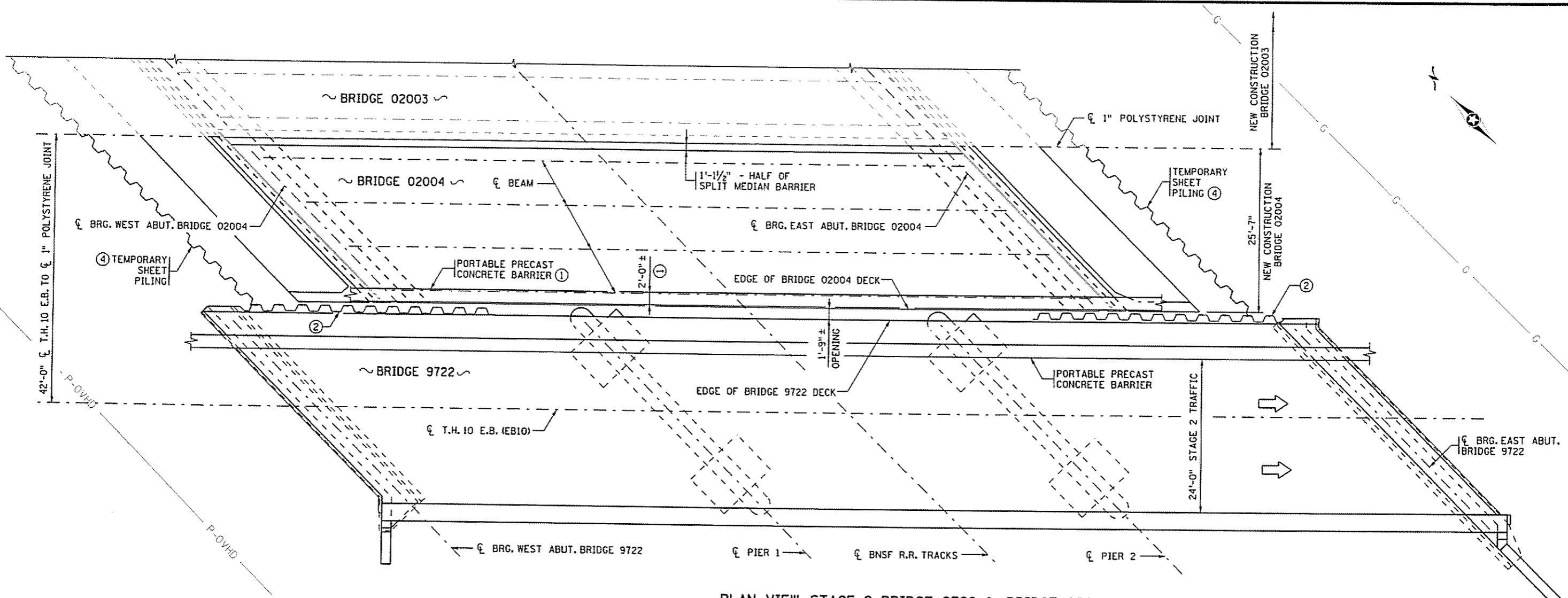
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: STAGING DETAILS (STAGE 1)

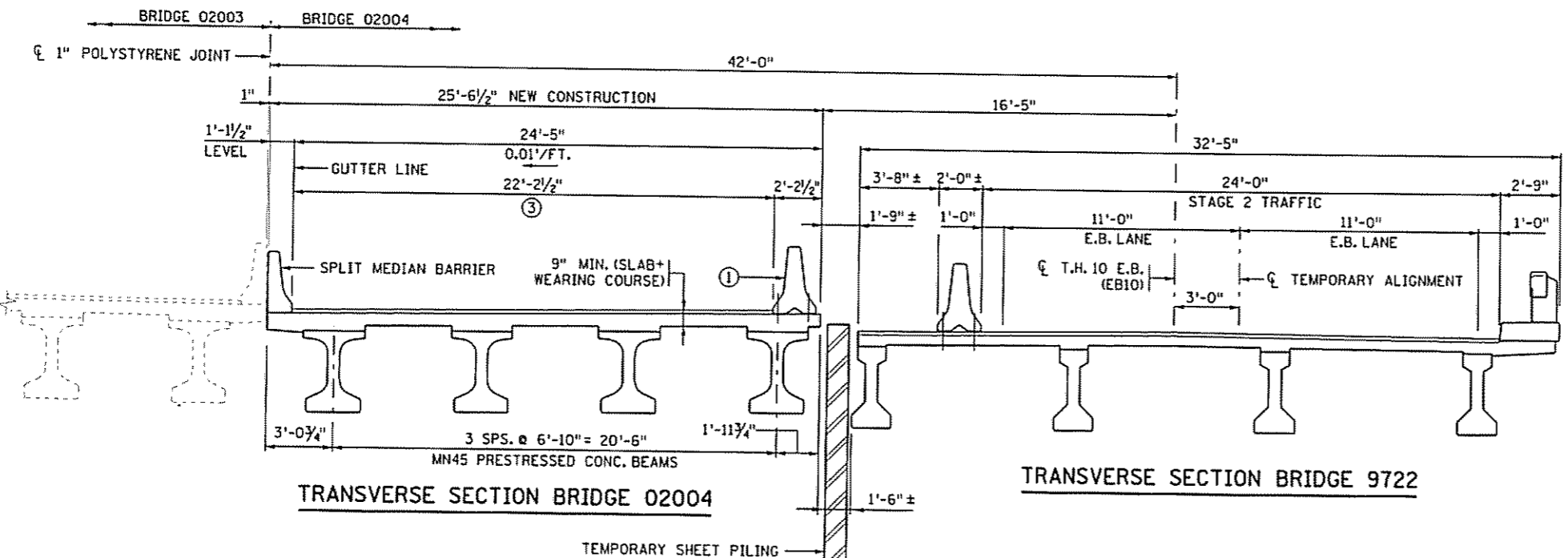
DES: PJK	DR: NKL	APPROVED: <i>2/23/09</i>
CHK: MCD	CHK: JAJ	

SHEET NO. 6 OF 72 SHEETS

BRIDGE NO. 02004



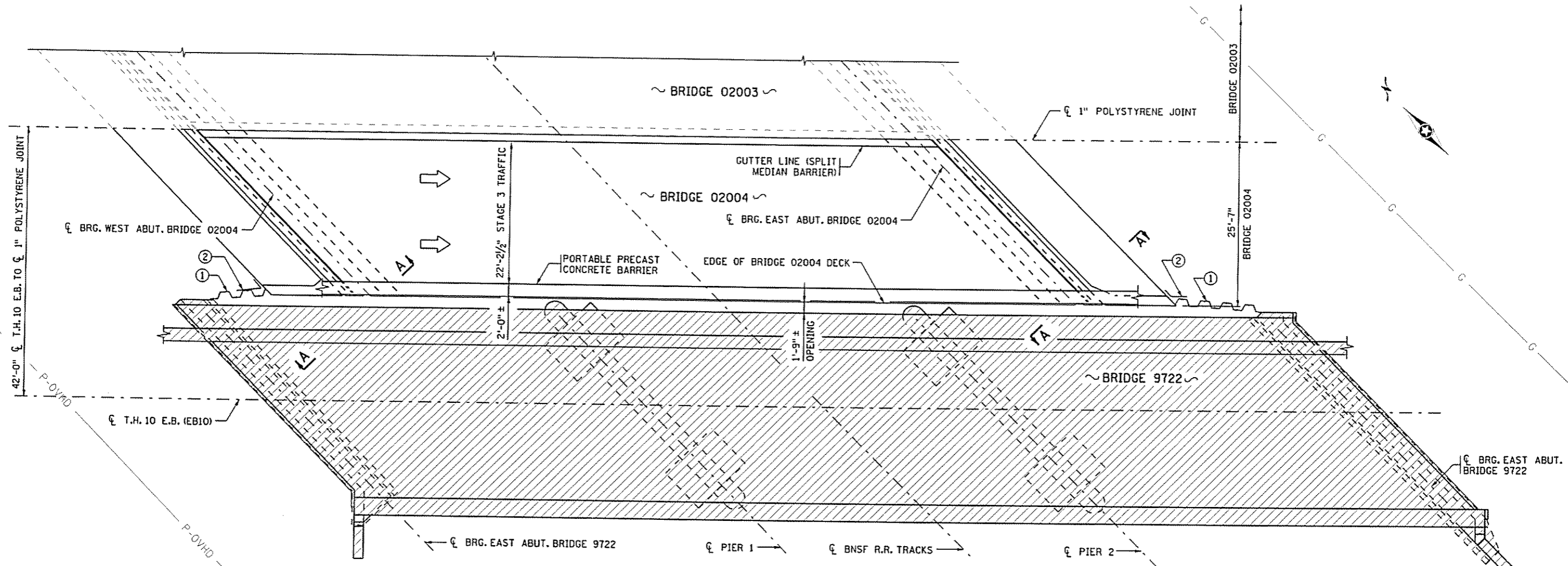
PLAN VIEW STAGE 2 BRIDGE 9722 & BRIDGE 02004



- STAGE 2 NOTES:**
- CONSTRUCT PORTION OF ABUTMENTS AND SUPERSTRUCTURE FOR BRIDGE 02004.
  - ① INSTALL PORTABLE PRECAST CONCRETE BARRIER AND ANCHOR TO NEW DECK. SEE DETAIL B920. BARRIER TO BE INCLUDED IN GRADING PORTION OF PLAN.
  - ② SEE THE SPECIAL PROVISIONS FOR TEMPORARY SHEET PILING.
  - ③ LIMITS OF CONCRETE WEARING COURSE (3U17A).
  - ④ TEMPORARY SHEET PILING FOR CRANE PAD (IF NEEDED) TO MAINTAIN CLEARANCE FROM OVERHEAD POWER LINE AND GAS LINE. SHEETING SHALL BE DESIGNED BY THE CONTRACTOR. SEE THE SPECIAL PROVISIONS.

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 <small>REGISTERED PROFESSIONAL ENGINEER</small> NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: STAGING DETAILS (STAGE 2)	DES: PJK CHK: MCD	DR: NKL CHK: JAJ	APPROVED: 2/23/09 SHEET NO. 7 OF 72 SHEETS	BRIDGE NO. 02004
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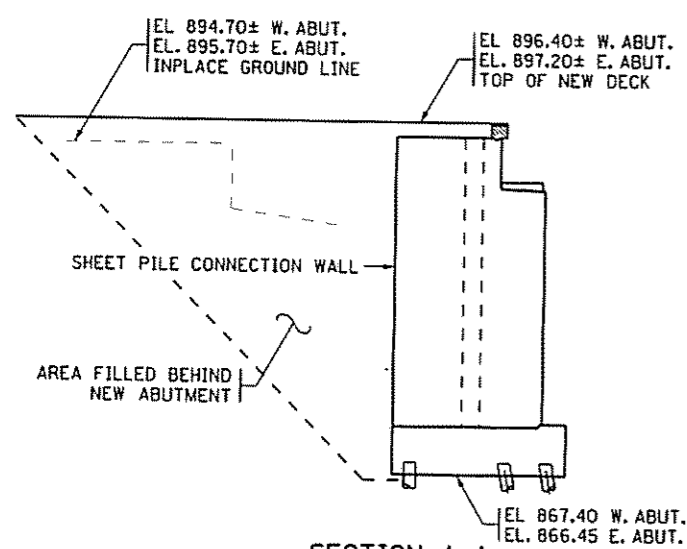
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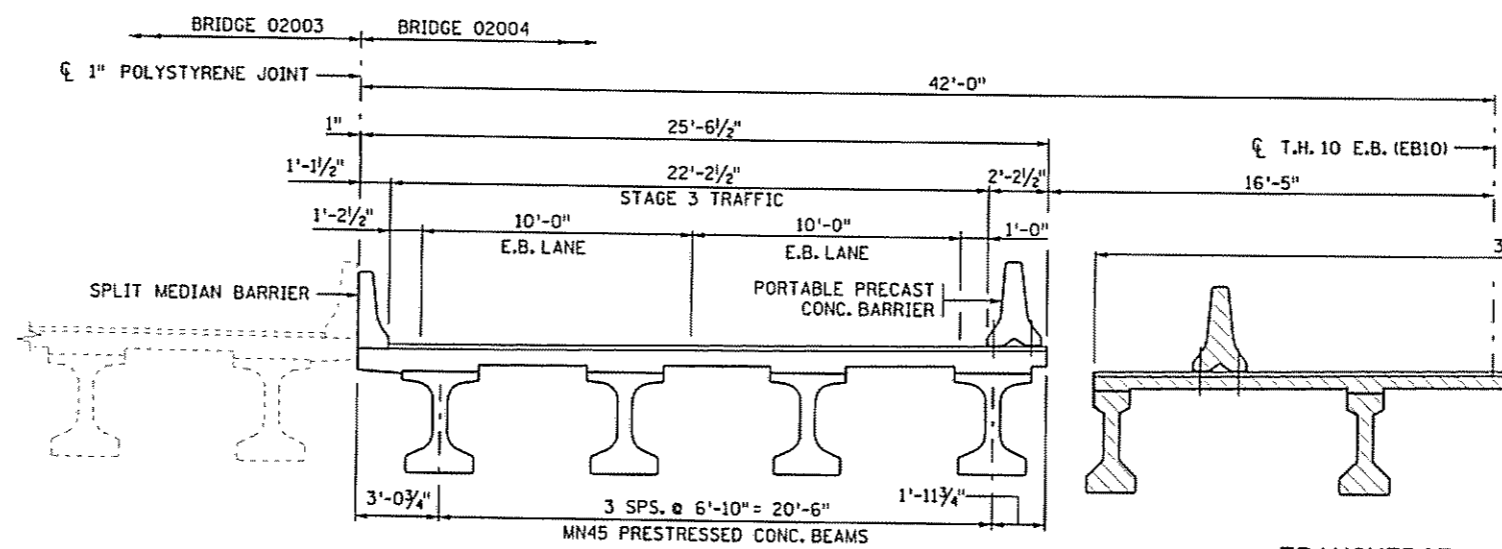
PLAN VIEW STAGE 3 BRIDGE 9722 & BRIDGE 02004

STAGE 3 NOTES:

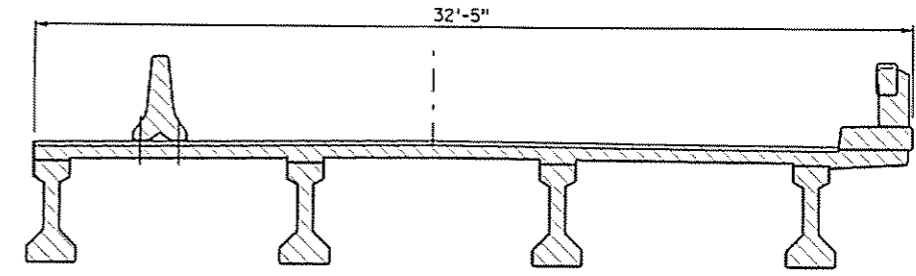
- HATCHED AREAS DENOTE REMOVAL.
- MOVE TRAFFIC TO NEW PORTION OF BRIDGE 02004.
- REMOVE REMAINING PORTION OF BRIDGE 9722.
- ① RELOCATE TEMPORARY SHEET PILING FROM THE FRONT OF THE INPLACE ABUTMENT AS NEEDED TO PERMIT CONSTRUCTION OF THE REMAINDER OF THE NEW FOOTING AND TO RETAIN THE APPROACHES FOR THE NEW BRIDGE.
- ② GEOTEXTILE FABRIC OR TIMBER LAGGING AS NEEDED, INCIDENTAL TO "STEEL SHEET PILING (TEMPORARY)".



SECTION A-A  
(FOR SHEET PILE DESIGN)



TRANSVERSE SECTION BRIDGE 02004



TRANSVERSE SECTION BRIDGE 9722

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

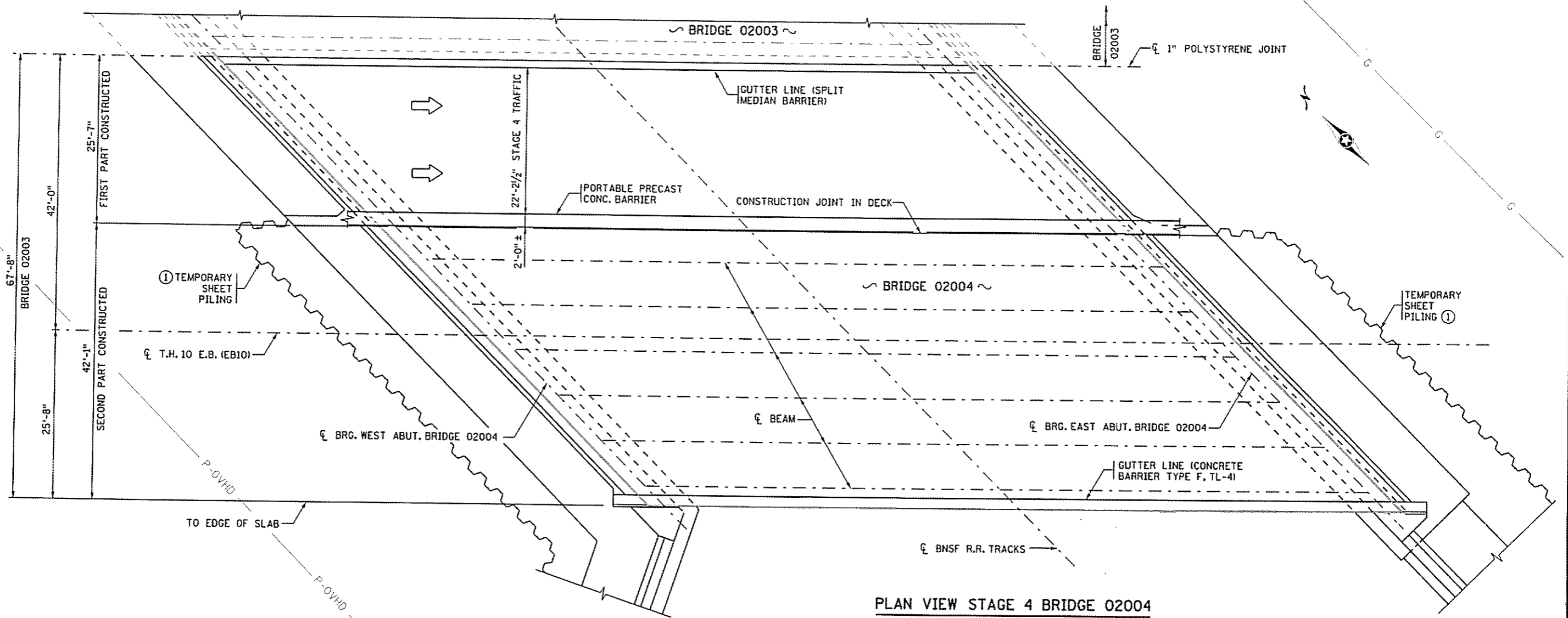
TITLE: STAGING DETAILS  
(STAGE 3)

DES: PJK	DR: NKL	APPROVED: 2/23/09
CHK: MCD	CHK: JAJ	

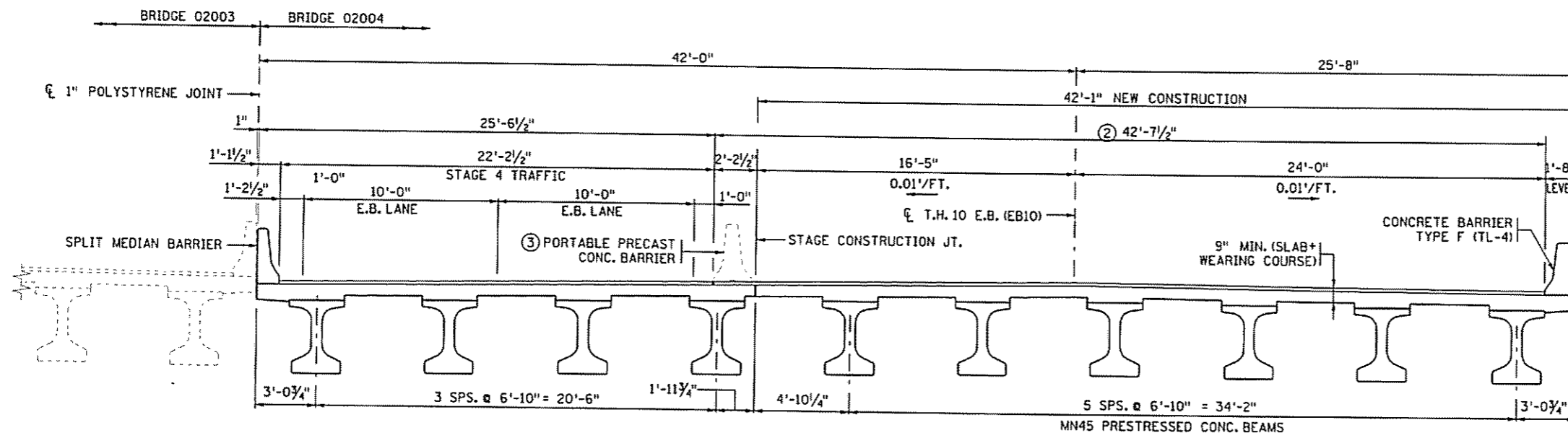
SHEET NO. 8 OF 72 SHEETS

BRIDGE NO. 02004

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PLAN VIEW STAGE 4 BRIDGE 02004



TRANSVERSE SECTION BRIDGE 02004

**STAGE 4 NOTES:**

- CONSTRUCT REMAINING PORTION OF ABUTMENTS AND SUPERSTRUCTURE FOR BRIDGE 02004.
- FOR FINAL TRANSVERSE SECTION SEE SHEET NO. 2.
- ① TEMPORARY SHEET PILING FOR CRANE PAD (IF NEEDED) TO MAINTAIN CLEARANCE FROM OVERHEAD POWER LINE AND GAS LINE. SHEET PILING SHALL BE DESIGNED BY THE CONTRACTOR. SEE THE SPECIAL PROVISIONS.
- ② LIMITS OF CONCRETE WEARING COURSE (3U17A).
- ③ REMOVE PORTABLE PRECAST CONCRETE BARRIER PRIOR TO PLACEMENT OF WEARING COURSE.

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CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

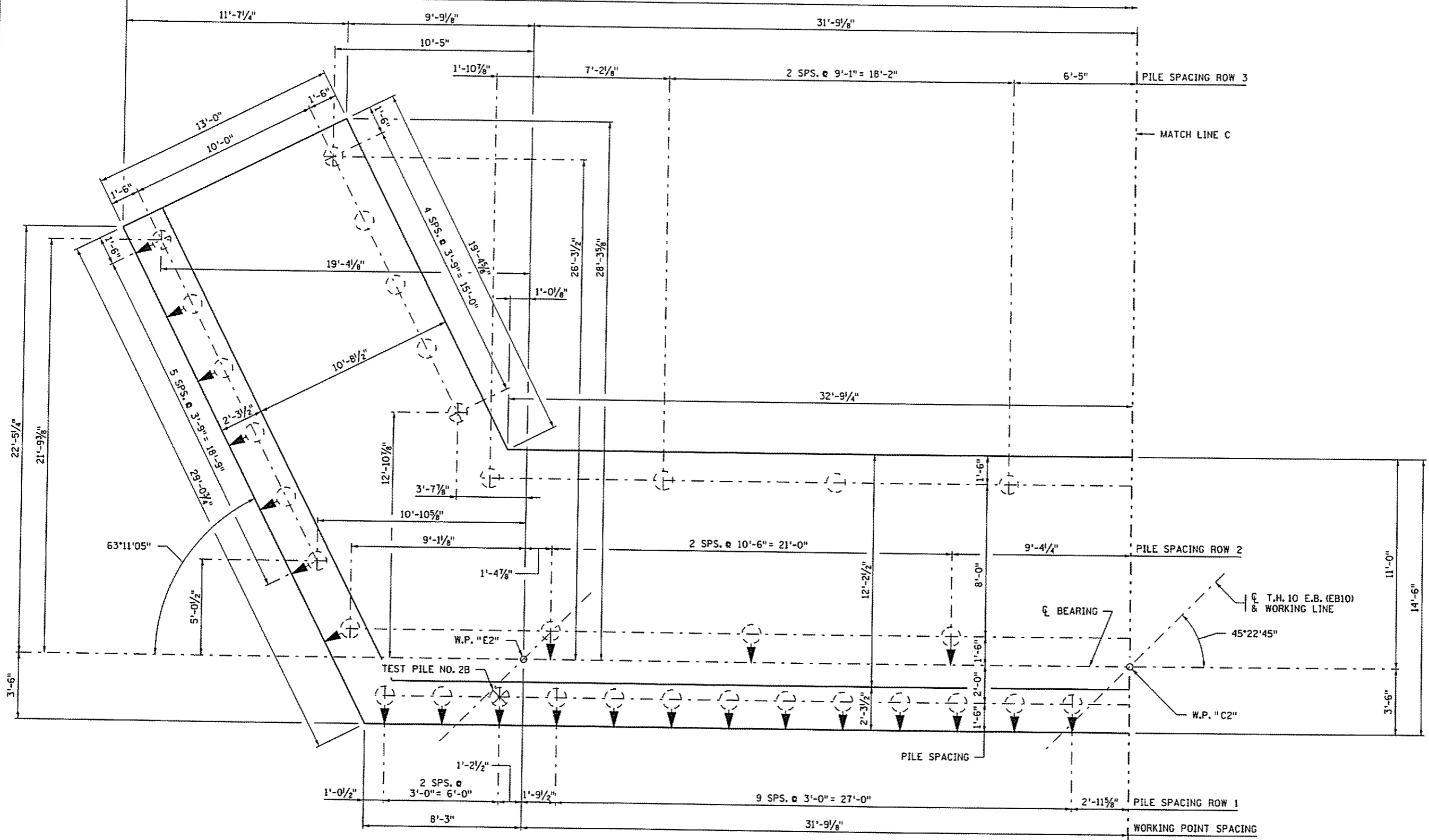
TITLE: STAGING DETAILS (STAGE 4)

DES: PJK DR: NKL APPROVED: 2/23/09  
 CHK: MCD CHK: JAJ  
 SHEET NO. 9 OF 72 SHEETS

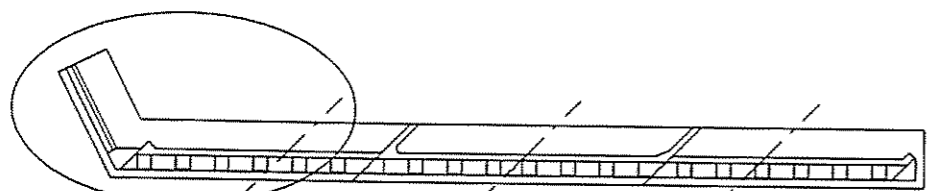
BRIDGE NO. 02004



BRIDGE NO. 02004 STAGE 2



FOOTING PLAN WEST ABUTMENT



BRIDGE NO. 02004

BRIDGE NO. 02003

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: WEST ABUTMENT GEOMETRICS

DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 10 OF 72 SHEETS

BRIDGE NO. 02004

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WEST ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	95.6
FACTORED LIVE LOAD	3.3
*FACTORED DESIGN LOAD	98.9

\*BASED ON STRENGTH I LOAD COMBINATION

WEST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE $R_n$ - TONS/PILE		
FIELD CONTROL METHOD	$\phi_{dyn}$	* $R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	247.2
PDA	0.65	152.1

\*  $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{dyn}$

### PILE NOTES

- 2 CAST-IN-PLACE CONC. TEST PILES 60 FT. LONG
- 65 CAST-IN-PLACE CONC. PILES EST. LENGTH 50 FT.
- 67 CAST-IN-PLACE CONC. PILES REQ'D FOR WEST ABUTMENT

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\odot$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

PILES TO HAVE A NOMINAL DIAMETER OF 12".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

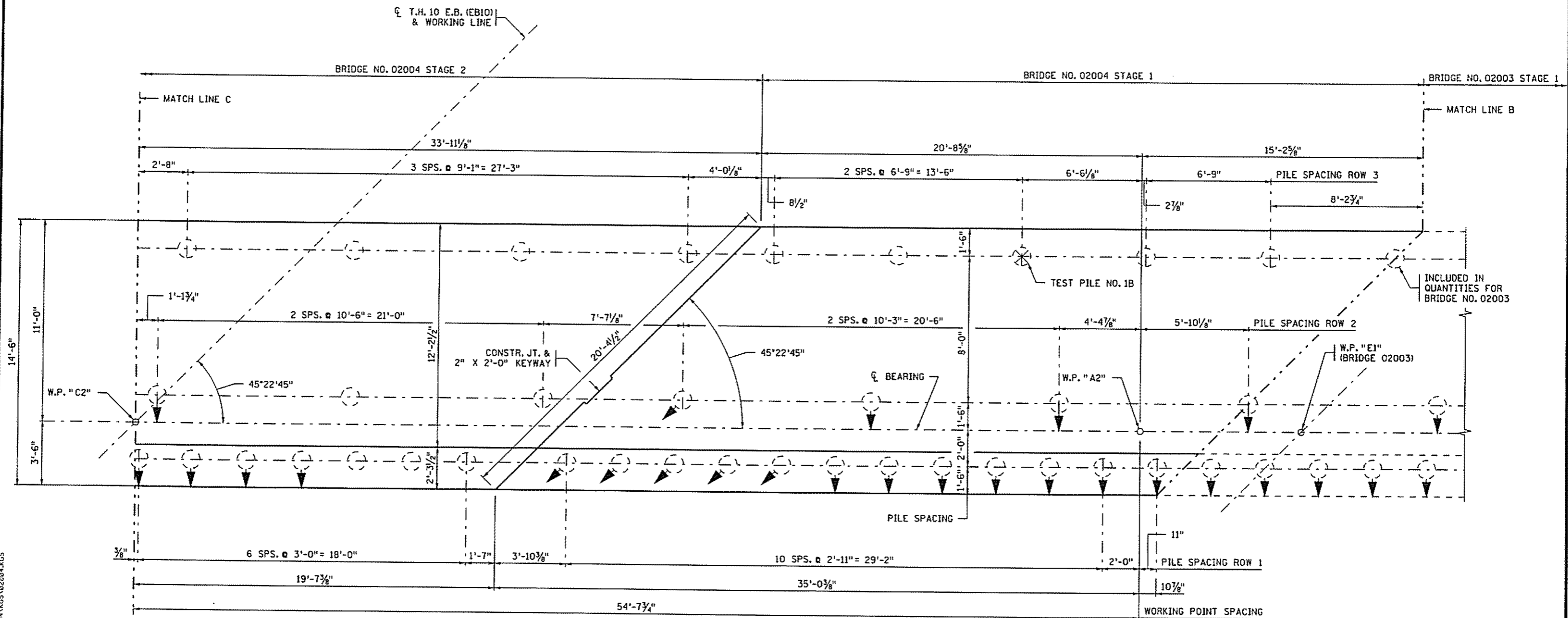
PILE DIRECTION SHOWN MAY BE ADJUSTED BY THE FIELD ENGINEER FOR INTERFERENCE PROBLEMS.

### SUMMARY OF QUANTITIES FOR WEST ABUTMENT

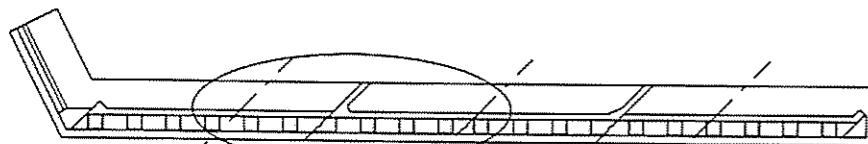
	STAGE 1	STAGE 2	TOTAL
STRUCTURAL CONCRETE (1A43)	78	184	262 CU. YD.
STRUCTURAL CONCRETE (3Y43)	157	300	457 CU. YD.
REINFORCEMENT BARS	8020	16920	24940 POUND
REINFORCEMENT BARS (EPOXY COATED)	12490	23460	35950 POUND
C-I-P CONCRETE PILING DELIVERED 12"	1000	2250	3250 LIN. FT.
C-I-P CONCRETE PILING DRIVEN 12"	1000	2250	3250 LIN. FT.
C-I-P CONCRETE TEST PILE 60 FT. LONG 12"	1	1	2 EACH
MEMBRANE WATERPROOFING	77	114	191 LIN. FT.
COUPLERS (REINFORCEMENT BARS) T-16	10	—	10 EACH
COUPLERS (REINFORCEMENT BARS) T-19	30	—	30 EACH
COUPLERS (REINFORCEMENT BARS) T-22	44	—	44 EACH
PILE REDRIVING	1	1	2 EACH
PILE ANALYSIS	1	—	1 EACH

① DOES NOT INCLUDE TEST PILES.

② PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).



FOOTING PLAN WEST ABUTMENT



BRIDGE NO. 02004

BRIDGE NO. 02003

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

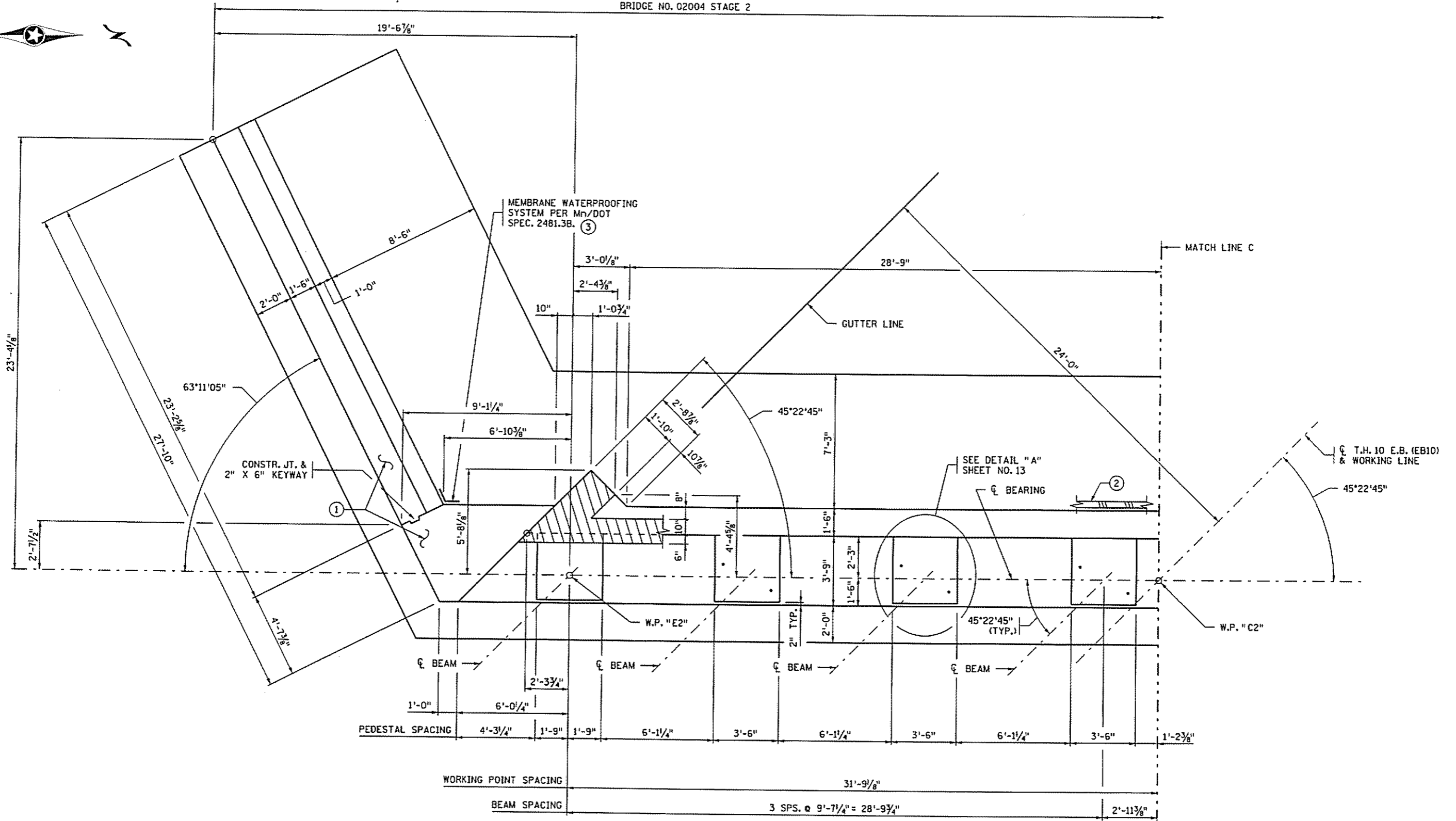
TITLE:  
 WEST ABUTMENT GEOMETRICS

DES: M.C.D. DR: K.G.S. APPROVED: 2/23/09  
 CHK: P.J.K. CHK: J.A.J.

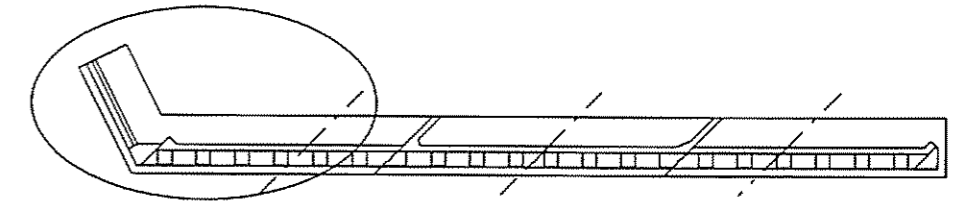
BRIDGE NO.  
 02004

SHEET NO. 11 OF 72 SHEETS





PLAN VIEW WEST ABUTMENT



NOTES:

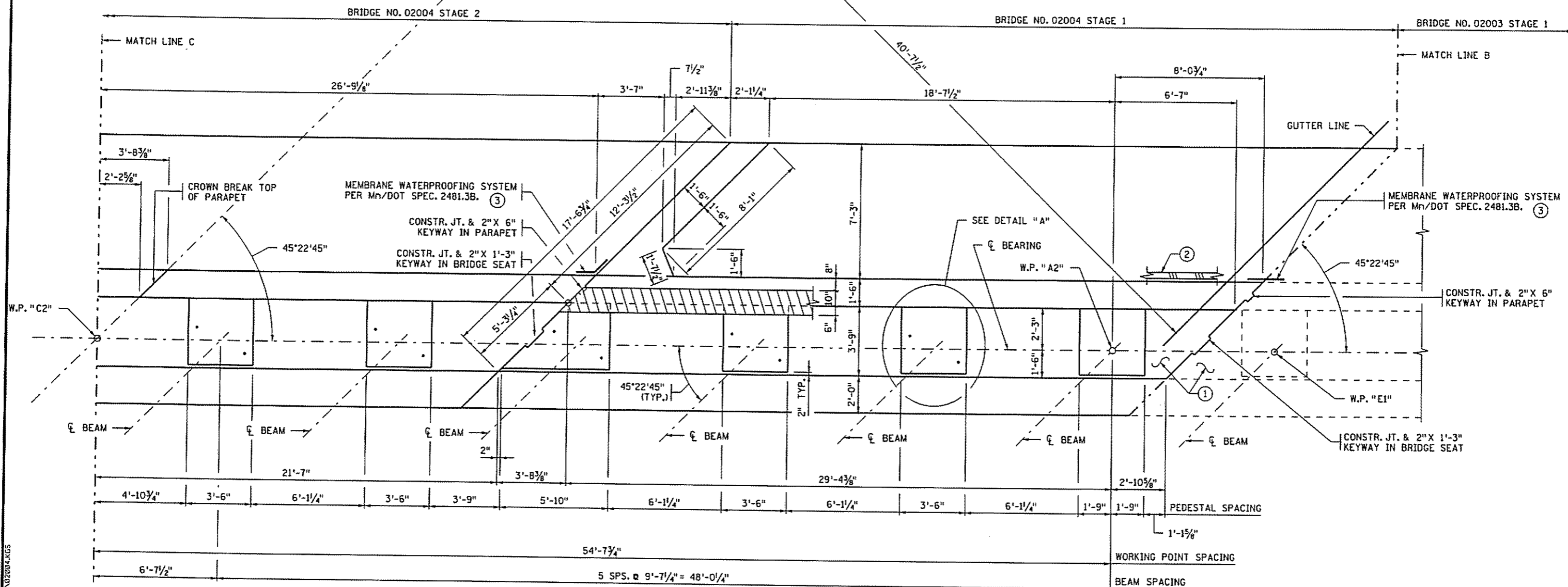
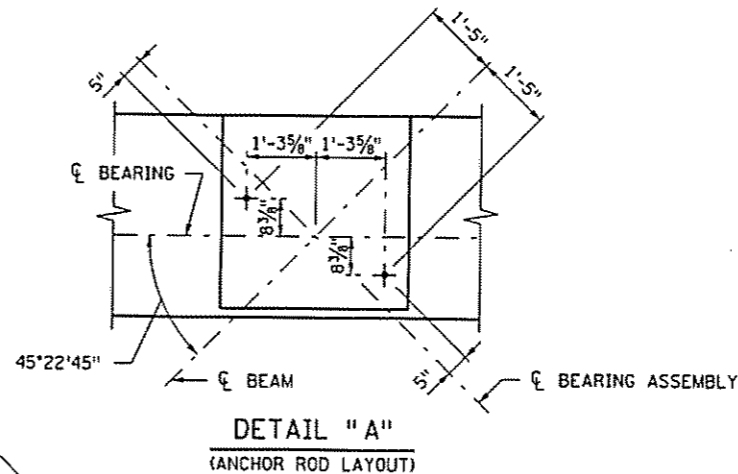
- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
- ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43). FOR WINGWALL DETAILS SEE SHEET NO. 16.

BRIDGE NO. 02004 BRIDGE NO. 02003

CERTIFIED BY: <i>M.C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE		TITLE: WEST ABUTMENT GEOMETRICS	
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	DES: M.C.D. CHK: P.J.K.	DR: K.G.S. CHK: J.A.J.	APPROVED: 2/23/09 SHEET NO. 12 OF 72 SHEETS

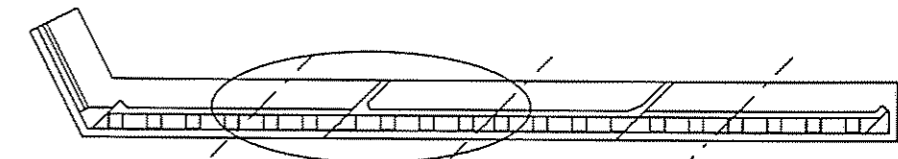
BRIDGE NO. 02004

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- NOTES:**
- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
  - ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).

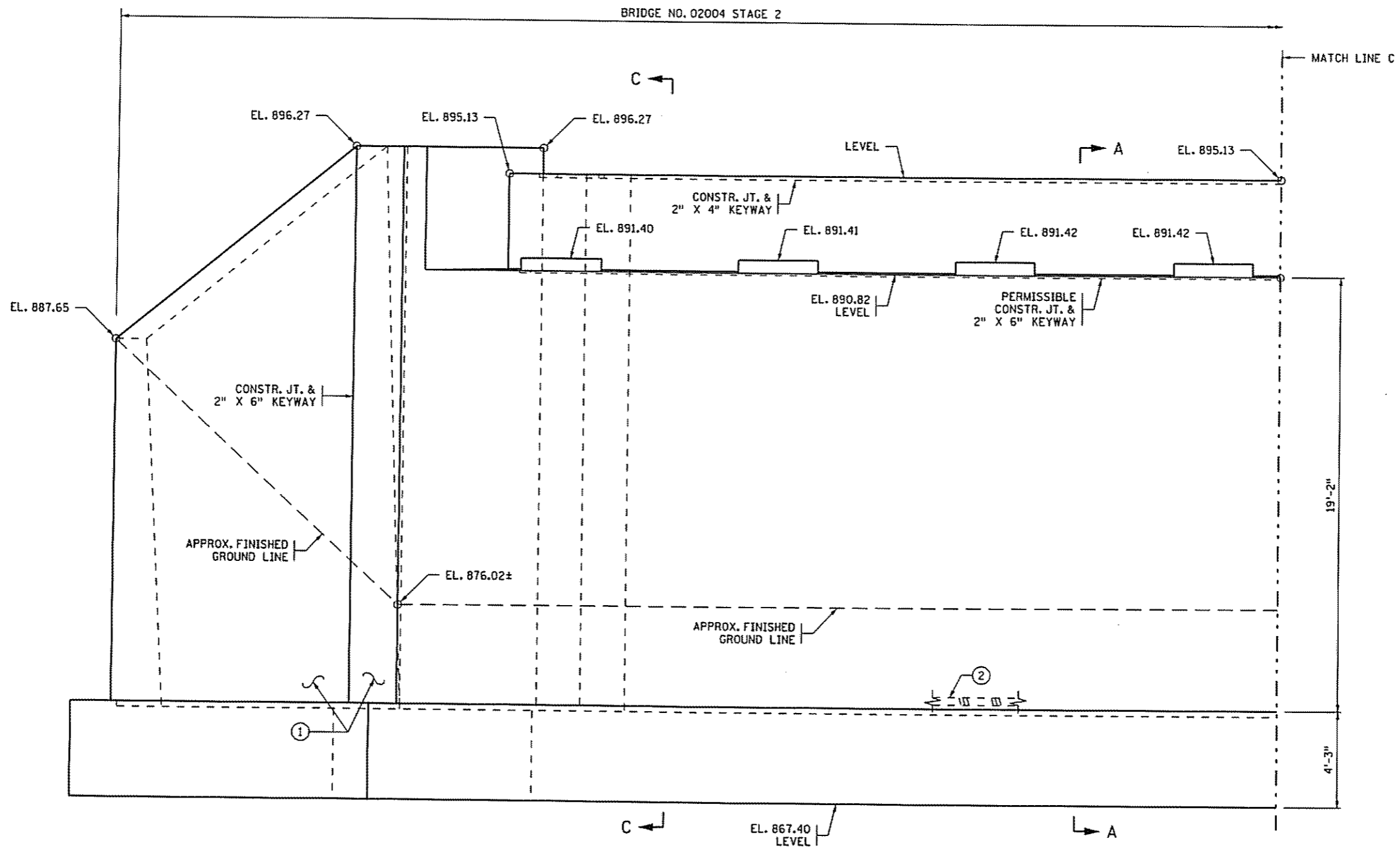
**PLAN VIEW WEST ABUTMENT**



BRIDGE NO. 02004 BRIDGE NO. 02003

CERTIFIED BY <i>McMaullangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE NAME: MOISES C. DIMACULANGAN LIC. NO. 46209		TITLE: <b>WEST ABUTMENT GEOMETRICS</b>		DES: M.C.D. CHK: P.J.K.	DR: K.G.S. CHK: J.A.J.	APPROVED: 2/23/09	BRIDGE NO. <b>02004</b>
SHEET NO. 13 OF 72 SHEETS							

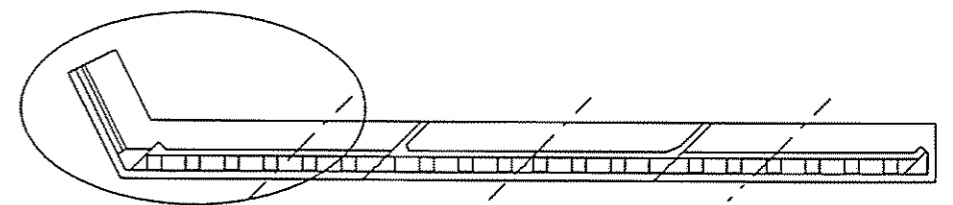
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ELEVATION VIEW WEST ABUTMENT

NOTES:

- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- FOR SECTION A-A & C-C SEE SHEET NO. 17.  
FOR WINGWALL DETAILS SEE SHEET NO. 16.



CERTIFIED BY Moises C. Dimaculangan 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

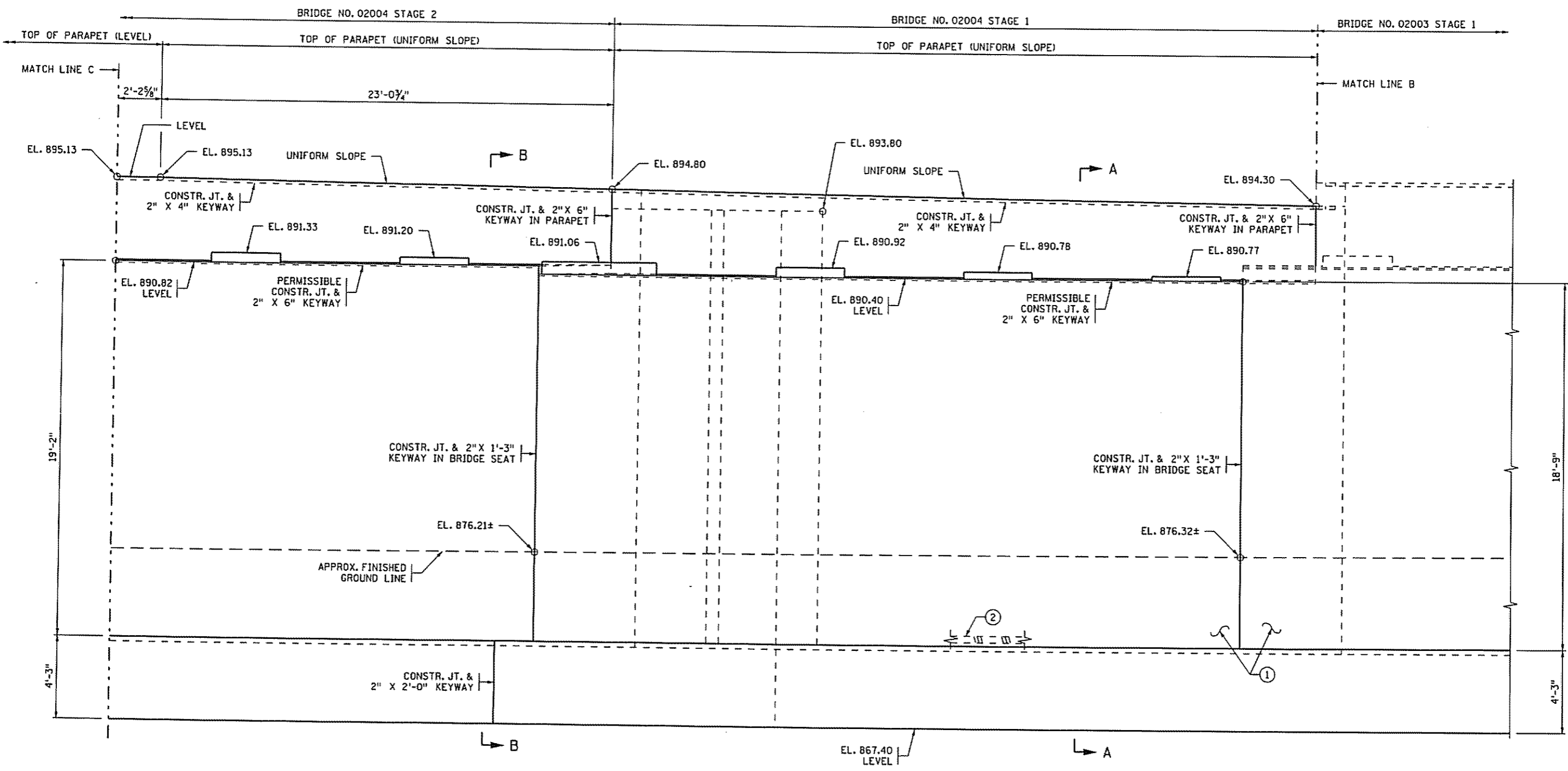
TITLE: WEST ABUTMENT GEOMETRICS

DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 14 OF 72 SHEETS

BRIDGE NO. 02004

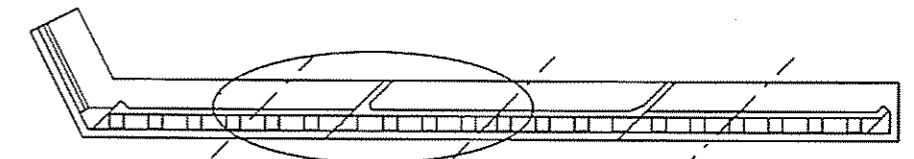
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ELEVATION VIEW WEST ABUTMENT

NOTES:

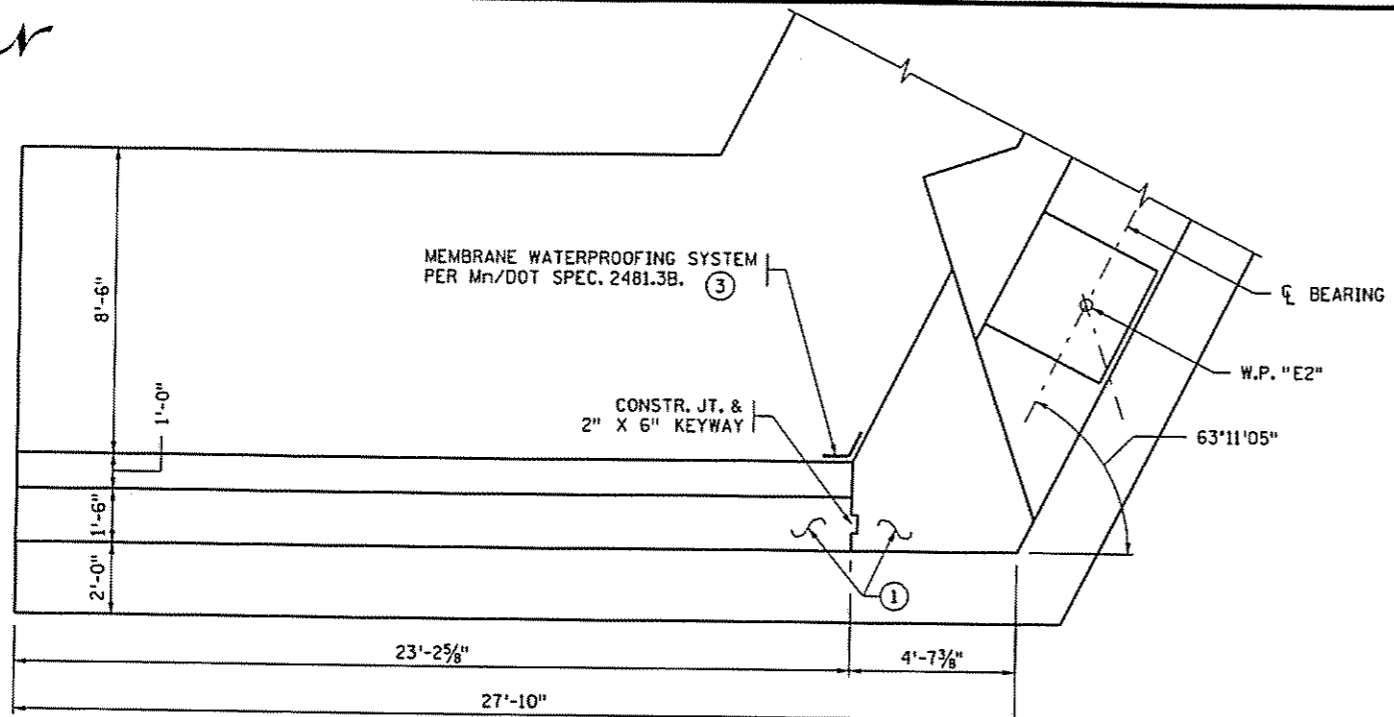
- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- FOR SECTION A-A & B-B SEE SHEET NO. 17.



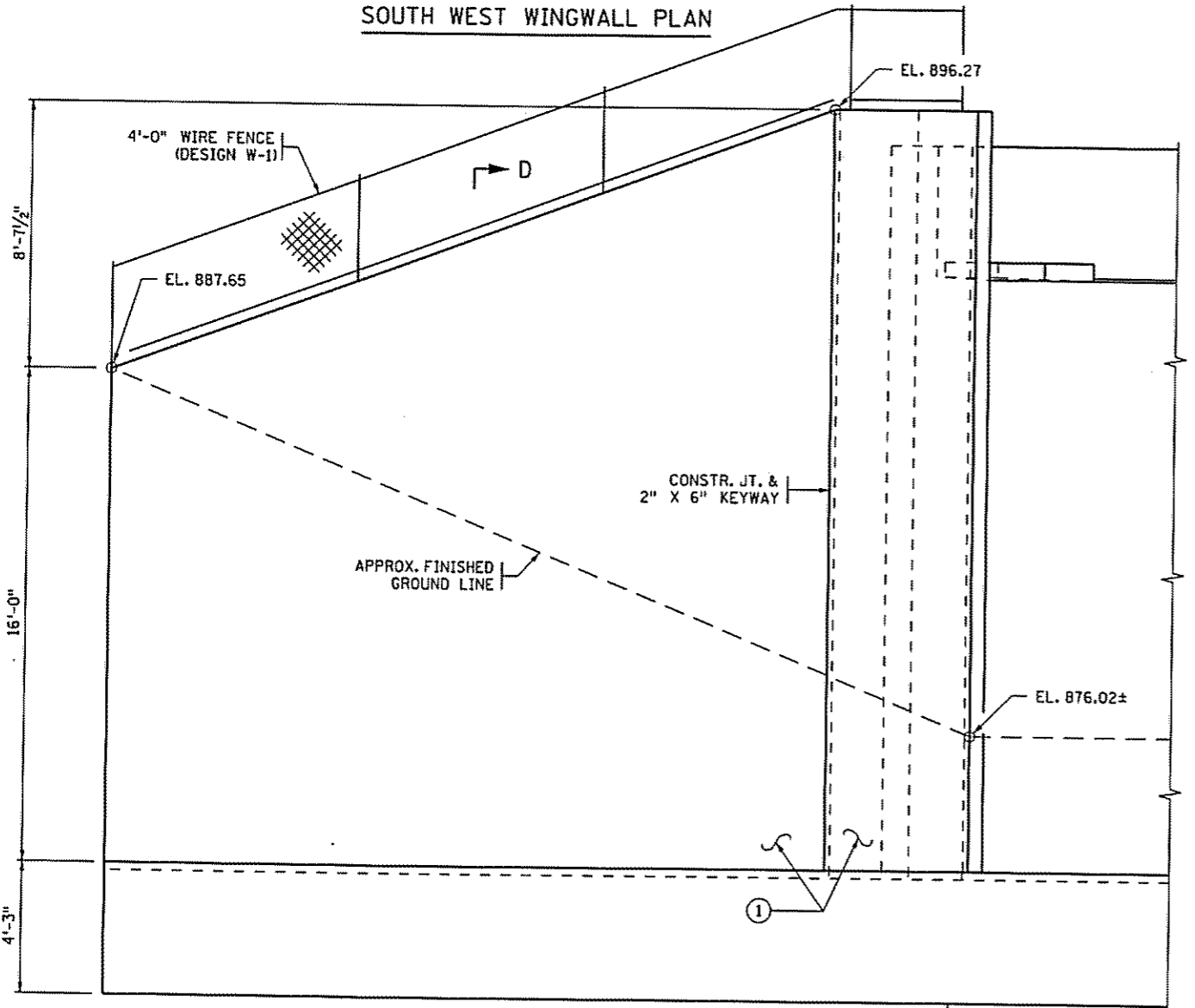
BRIDGE NO. 02004 BRIDGE NO. 02003

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 <small>LICENSED PROFESSIONAL ENGINEER</small>		DATE 2/23/09	TITLE: WEST ABUTMENT GEOMETRICS	DES: M.C.D. DR: K.G.S.	APPROVED: 2/23/09	BRIDGE NO. 02004
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209				CHK: P.J.K. CHK: J.A.J.	SHEET NO. 15 OF 72 SHEETS	

2/12/2009 S:\Design\B2004\KGS\02004.KGS

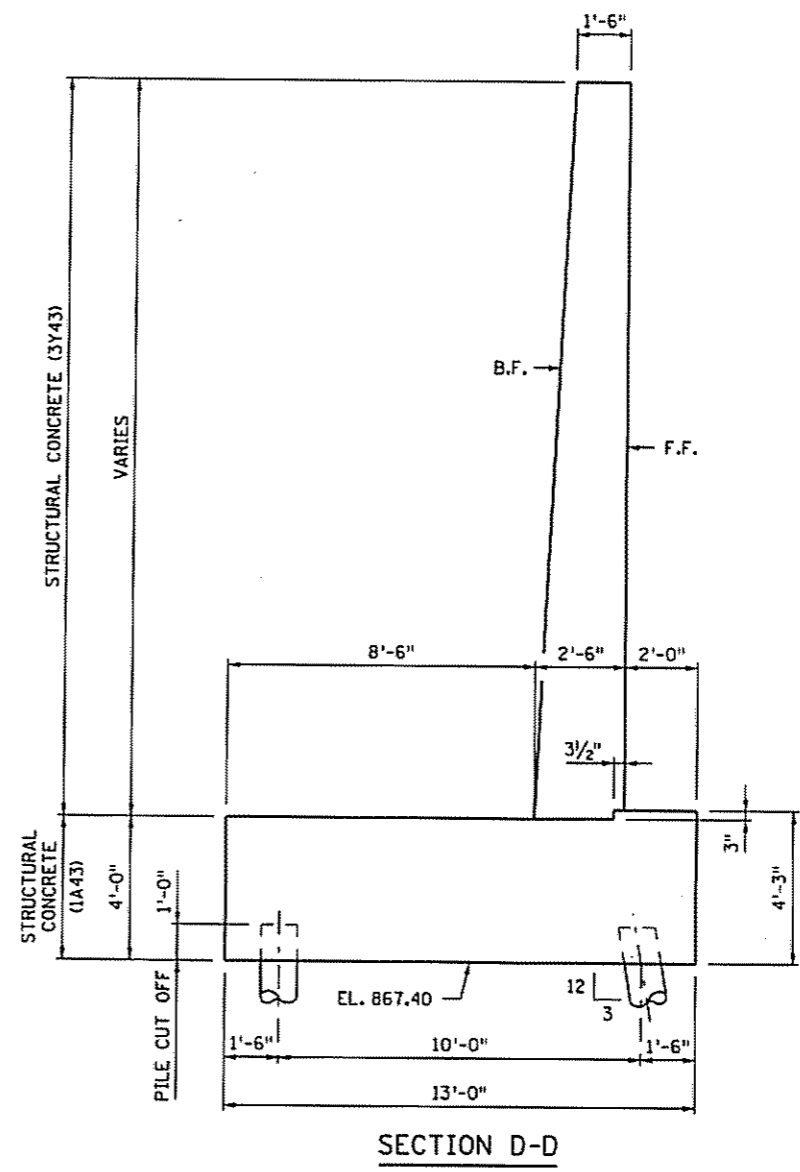


SOUTH WEST WINGWALL PLAN



SOUTH WEST WINGWALL ELEVATION

- NOTES:**
- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).
- F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.



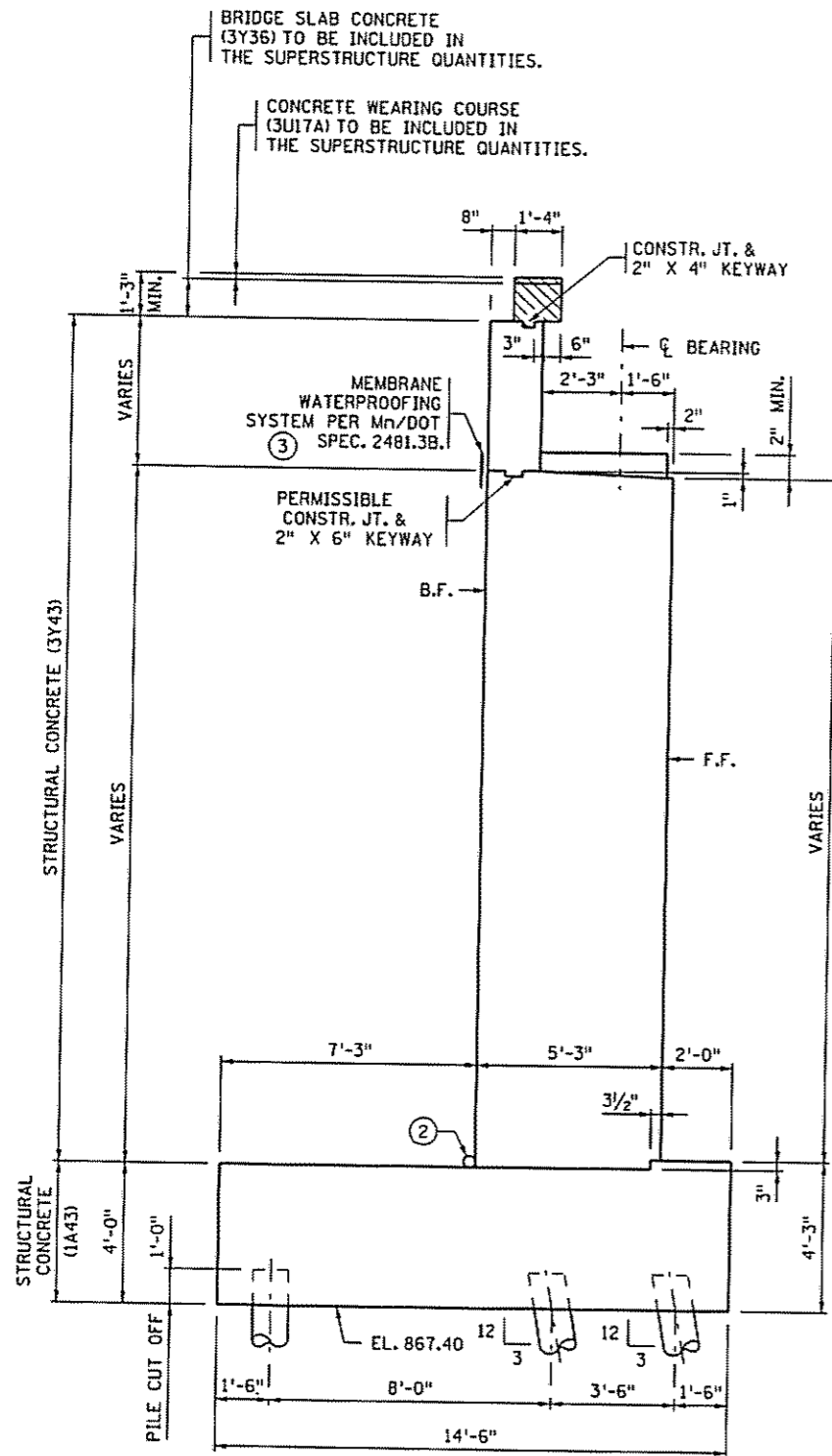
SECTION D-D

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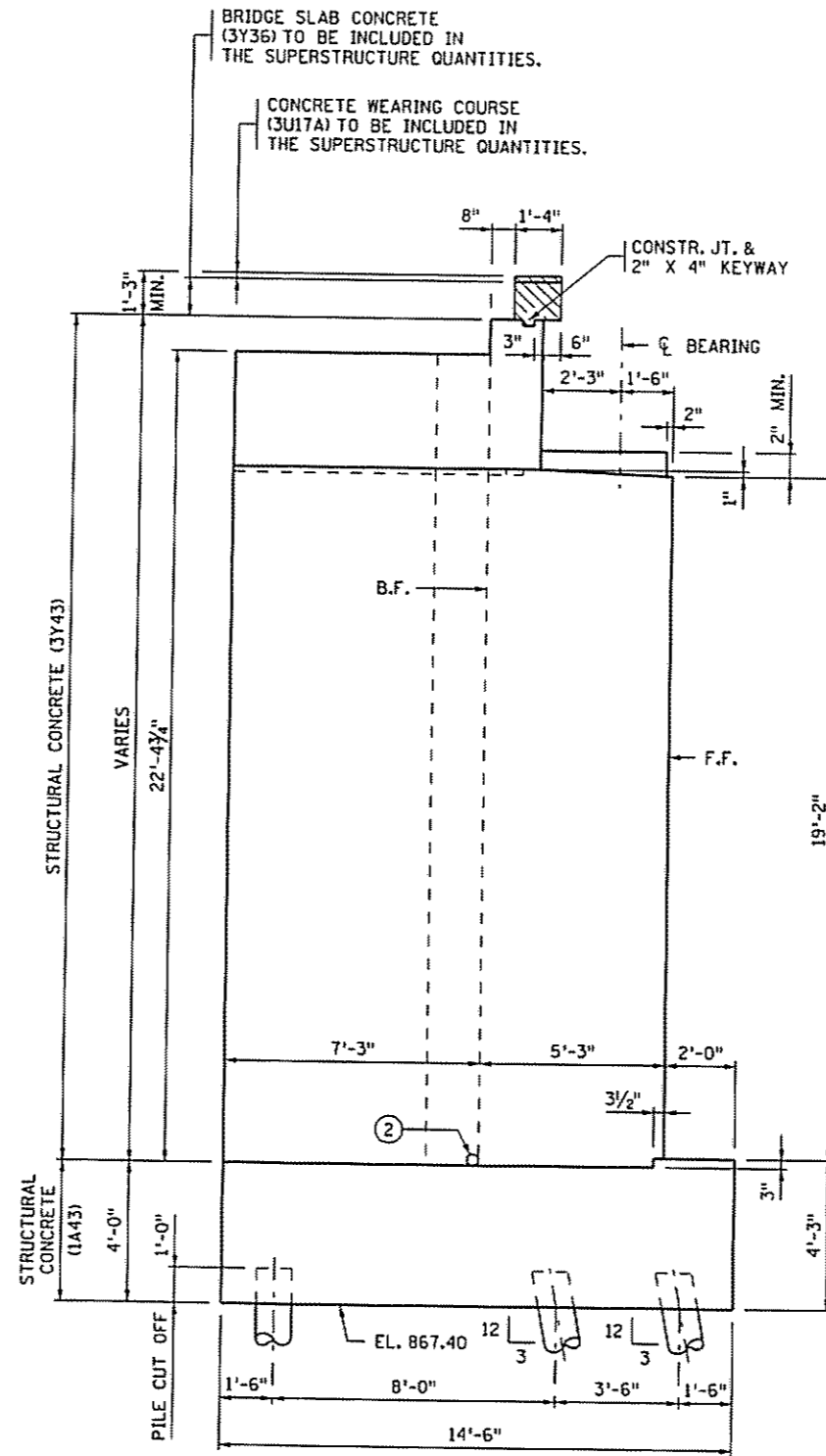
CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 <small>LICENSED PROFESSIONAL ENGINEER</small>		TITLE: WEST ABUTMENT GEOMETRICS		DES: M.C.D. CHK: P.J.K.	DR: K.G.S. CHK: J.A.J.	APPROVED: 2/23/09	BRIDGE NO. 02004
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209				SHEET NO. 16 OF 72 SHEETS			

**NOTES:**

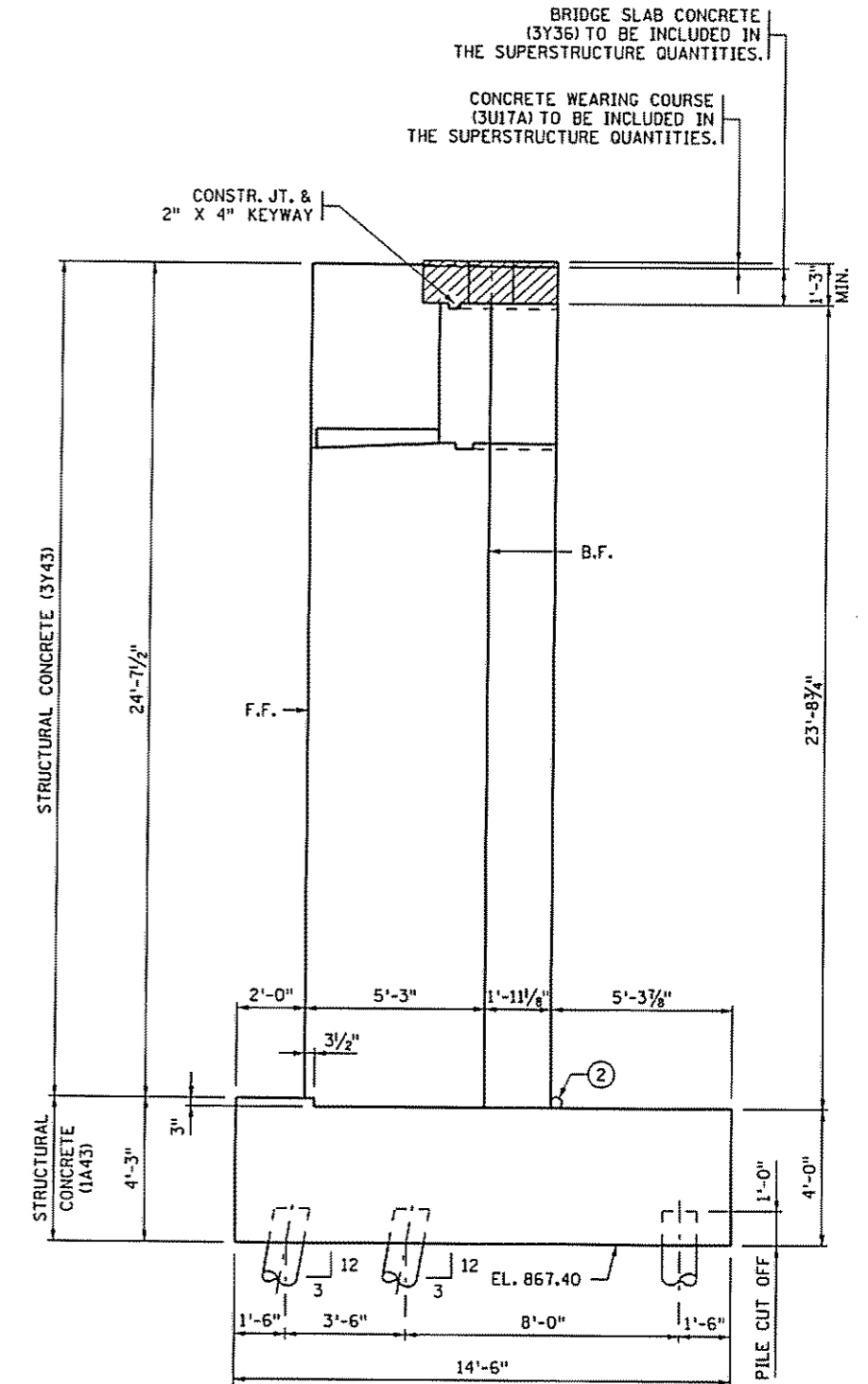
- ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
  - ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).
- F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.



**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

2/16/2009 S:\Design\02004\KGS\02004.KGS

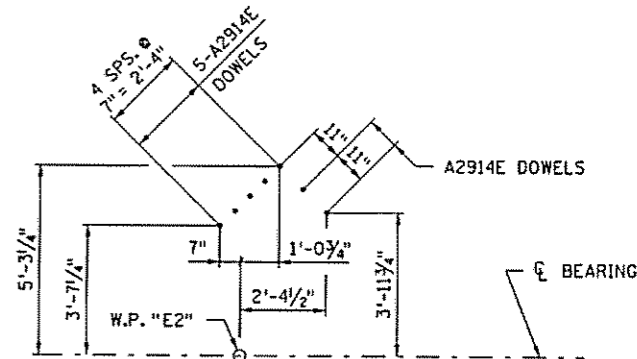
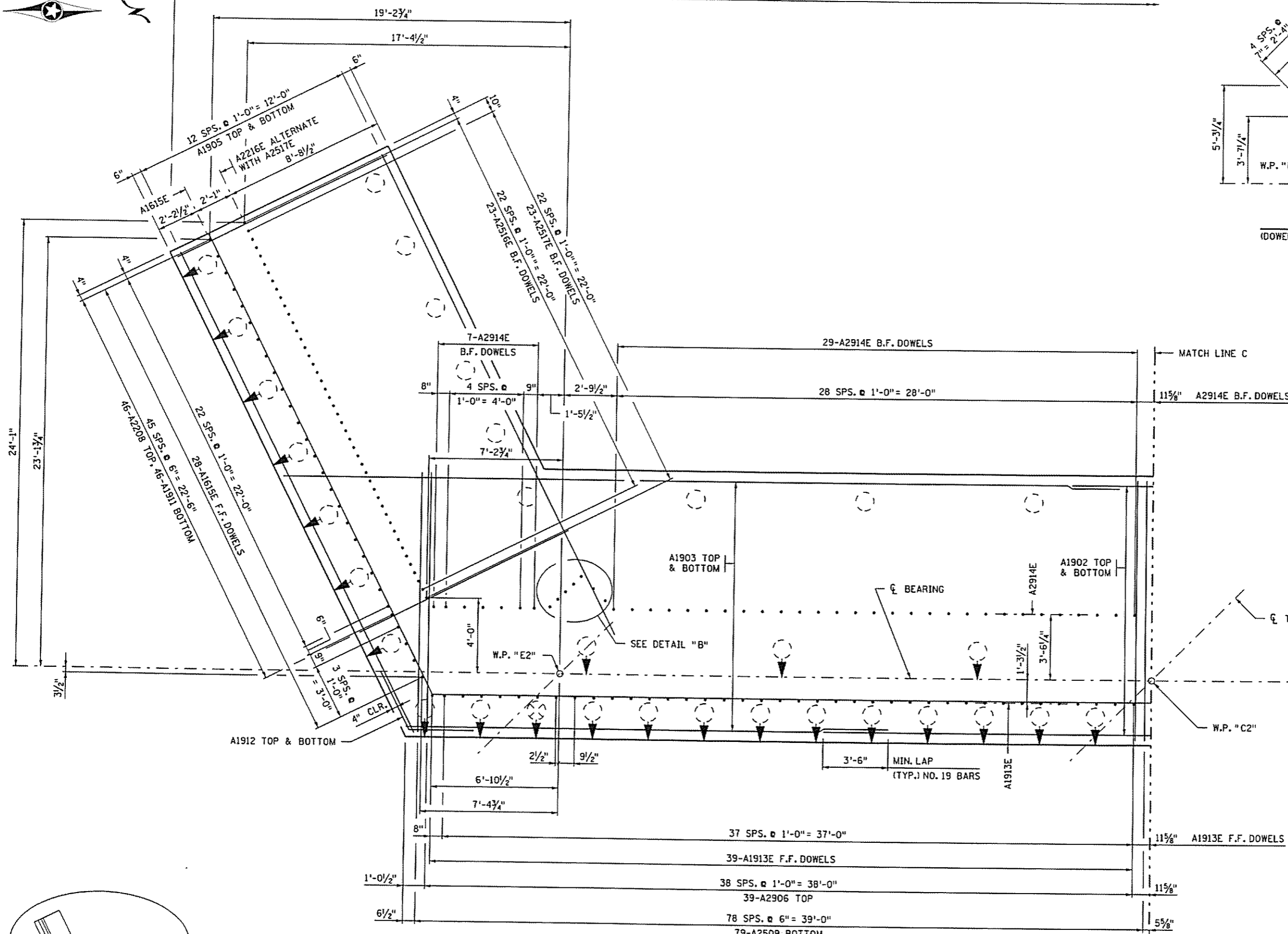
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**WEST ABUTMENT GEOMETRICS**

DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 17 OF 72 SHEETS

BRIDGE NO.  
 02004



DETAIL "B"  
(DOWEL BAR LOCATION DETAIL)

NOTES:  
F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.

FOOTING PLAN WEST ABUTMENT

CERTIFIED BY *McArmaulungan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
WEST ABUTMENT  
REINFORCEMENT

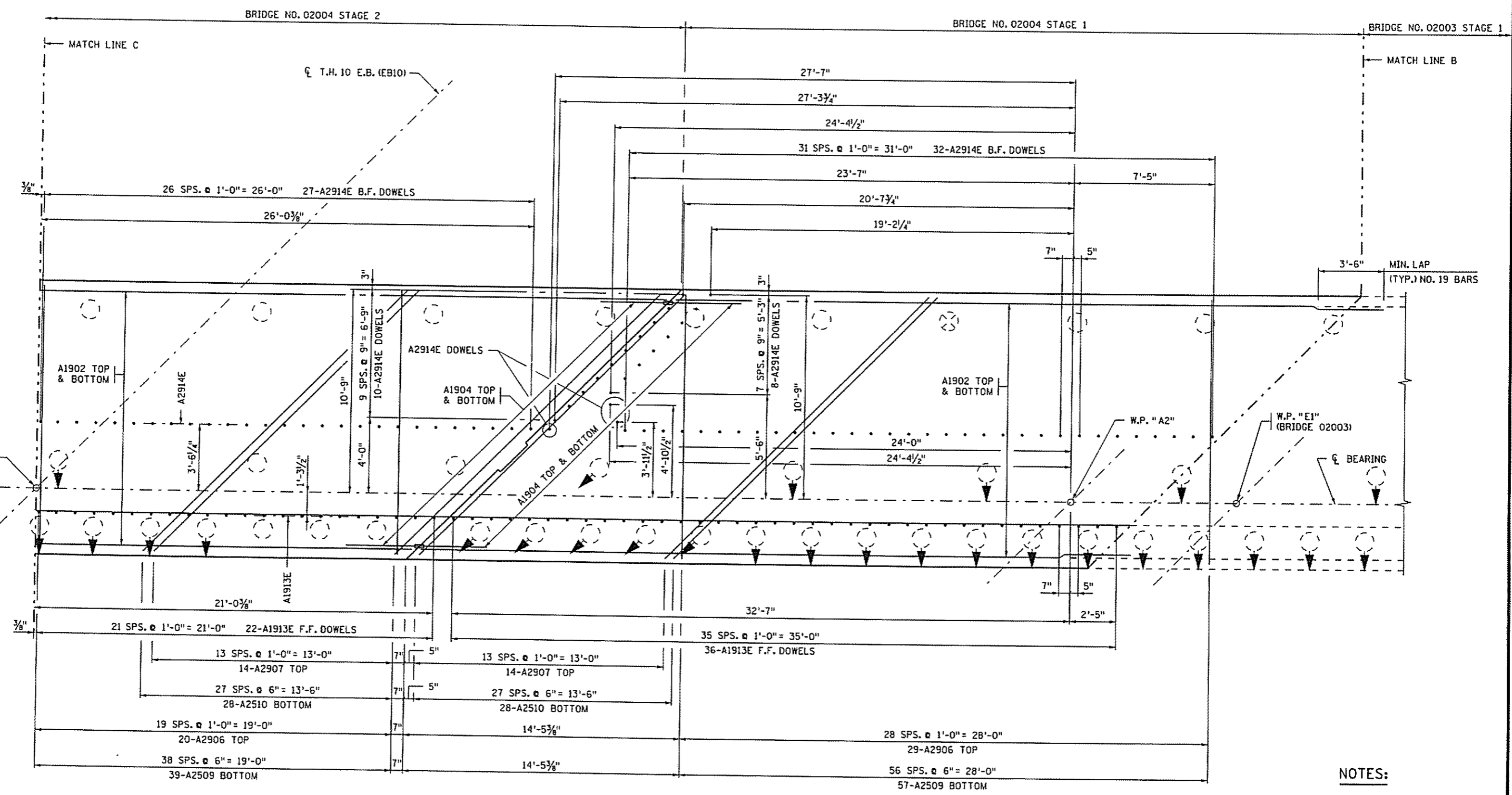
DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

BRIDGE NO. 02004  
SHEET NO. 18 OF 72 SHEETS

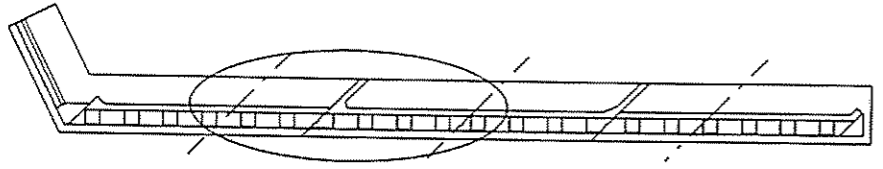
S:\Design\102004\KGS\02004.KGS 2/16/2009

BRIDGE NO. 02004

BRIDGE NO. 02003



NOTES:  
 F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.



BRIDGE NO. 02004      BRIDGE NO. 02003

CERTIFIED BY *Mohamadzhan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
 WEST ABUTMENT  
 REINFORCEMENT

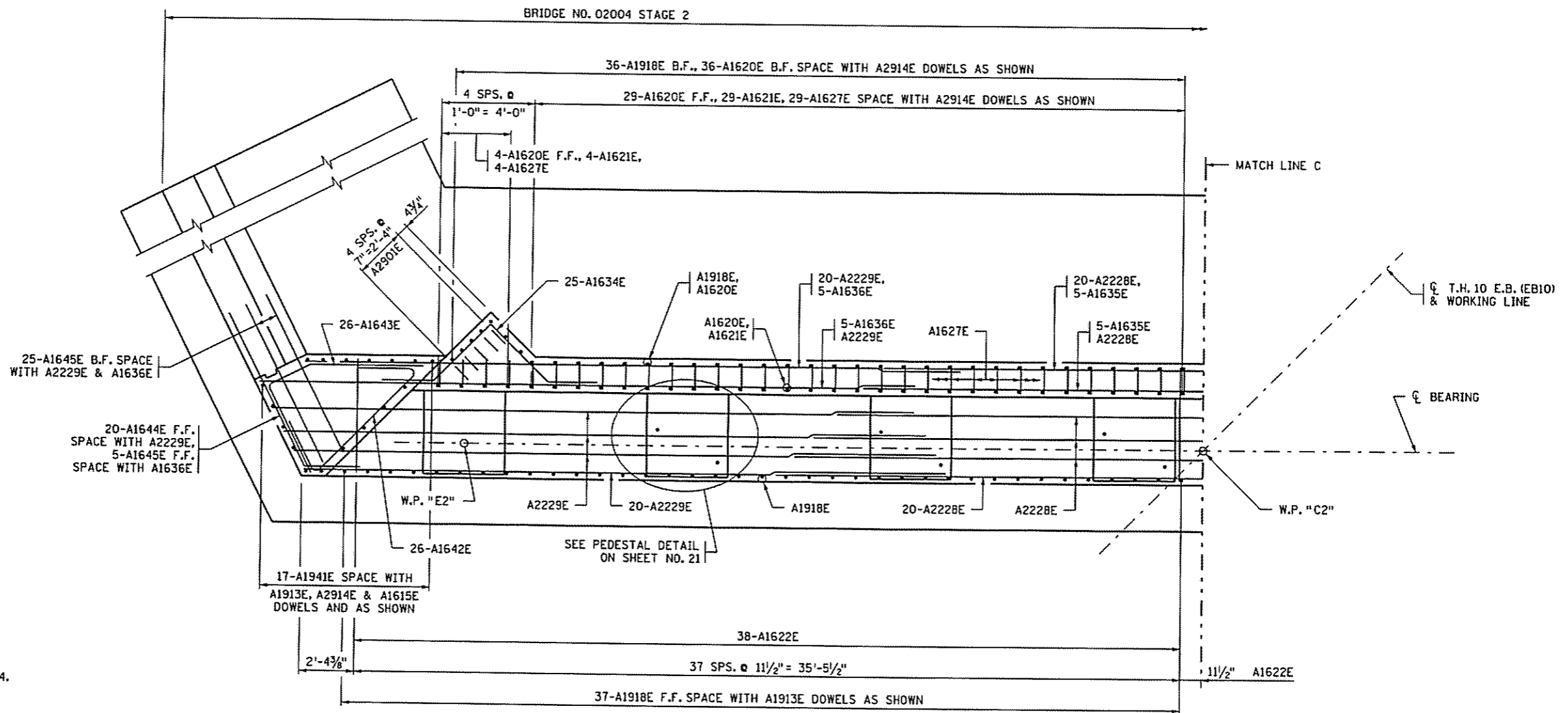
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CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 19 OF 72 SHEETS

BRIDGE NO.  
 02004

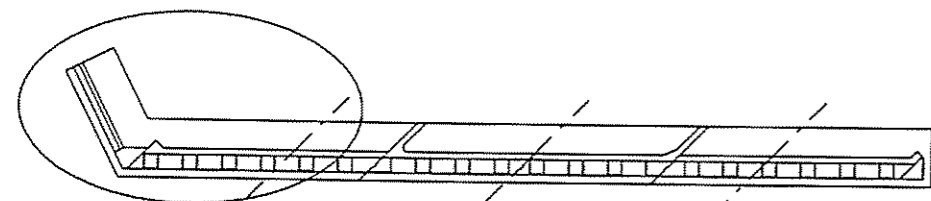
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**NOTES:**

- F.F. DENOTES FRONT FACE.
- B.F. DENOTES BACK FACE.
- FOR WINGWALL REINFORCEMENT SEE SHEET NO. 24.



BRIDGE NO. 02004

BRIDGE NO. 02003

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**WEST ABUTMENT  
 REINFORCEMENT**

DES: M.C.D.	DR: K.G.S.	APPROVED:
CHK: P.J.K.	CHK: J.A.J.	2/23/09
SHEET NO. 20 OF 72 SHEETS		

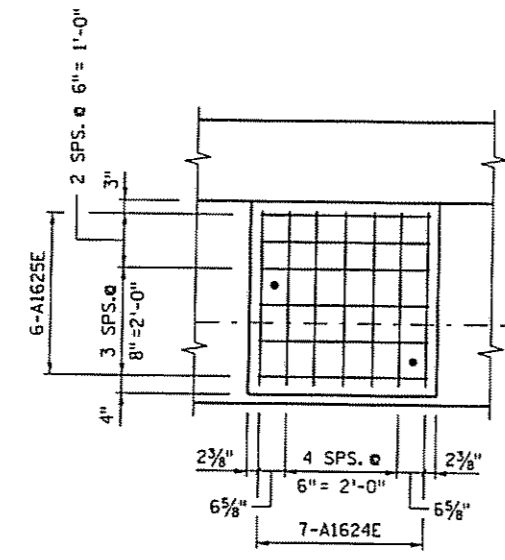
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 02004

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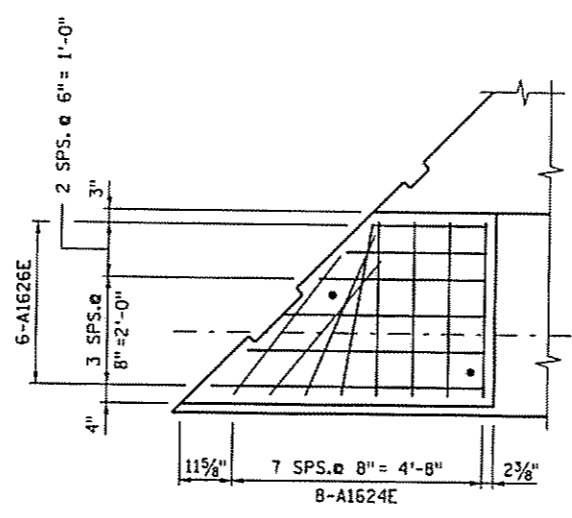


**NOTES:**

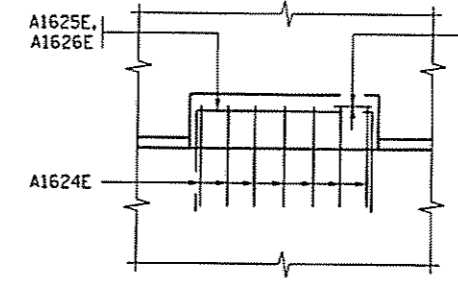
F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.



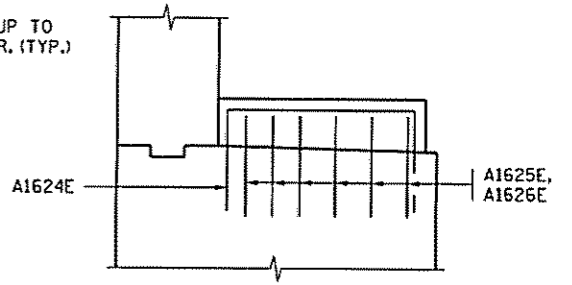
PLAN VIEW



PLAN VIEW



FRONT ELEVATION



SECTION

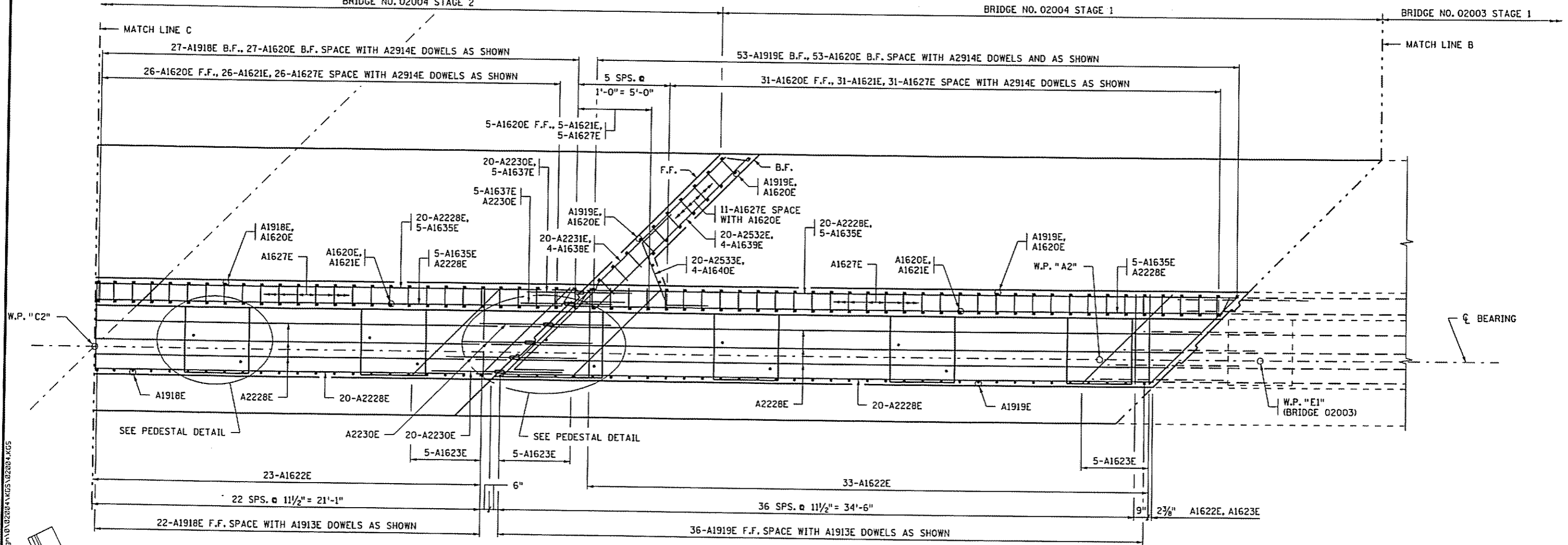
PEDESTAL DETAIL

CL T.H. 10 E.B. (EB10) & WORKING LINE

BRIDGE NO. 02004 STAGE 2

BRIDGE NO. 02004 STAGE 1

BRIDGE NO. 02003 STAGE 1



PLAN VIEW WEST ABUTMENT

2/16/2009 Sr:\Design\02004\KCS\02004.KCS

BRIDGE NO. 02004

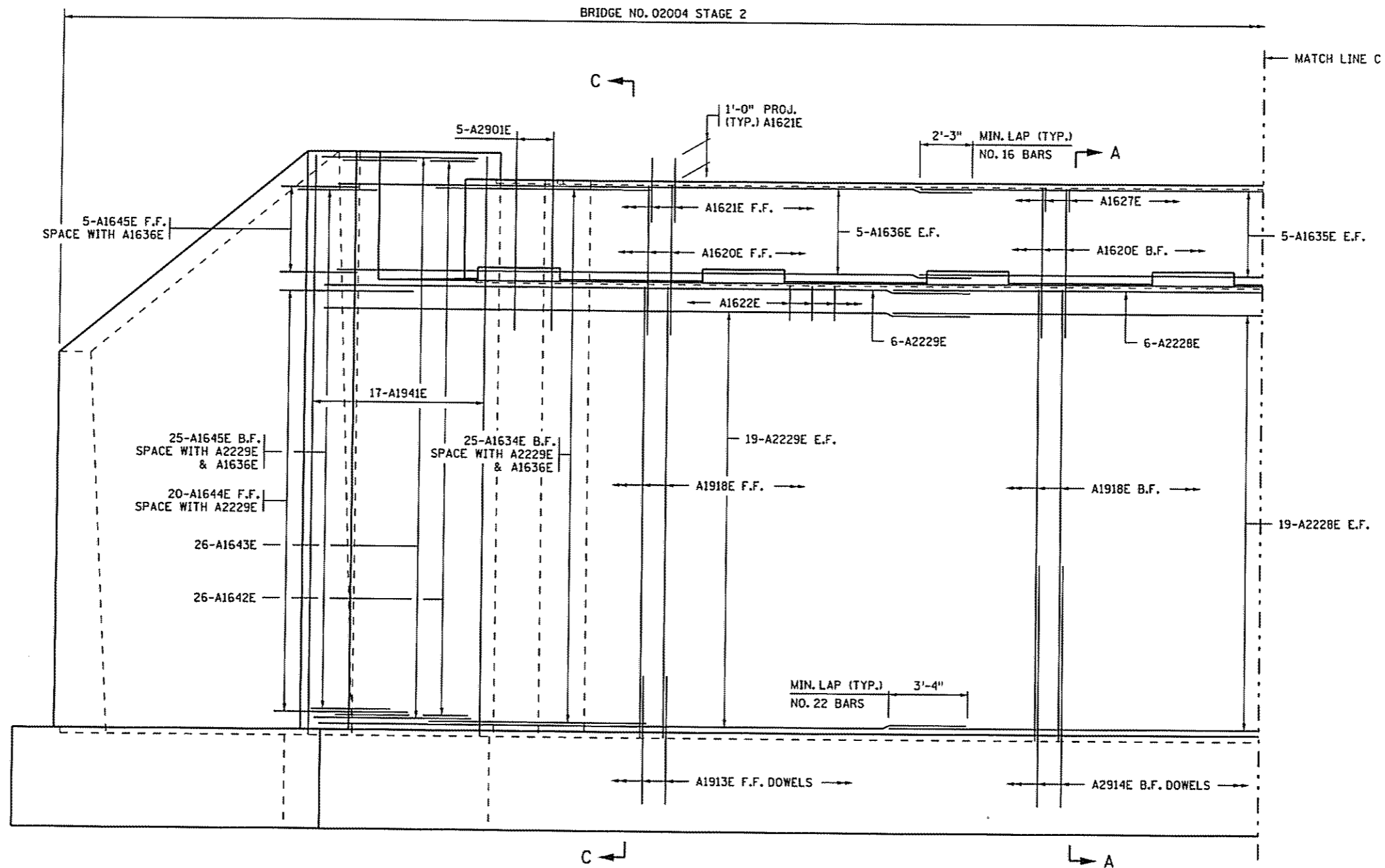
BRIDGE NO. 02003

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: WEST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

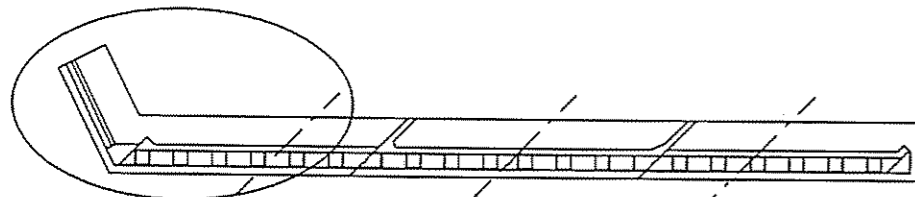
BRIDGE NO. 02004  
SHEET NO. 21 OF 72 SHEETS



ELEVATION VIEW WEST ABUTMENT

NOTES:

- F.F. DENOTES FRONT FACE.
- B.F. DENOTES BACK FACE.
- E.F. DENOTES EACH FACE.
- SEE SHEET NO. 25 FOR SECTION A-A & C-C.
- FOR WINGWALL REINFORCEMENT SEE SHEET NO. 24.



BRIDGE NO. 02004

BRIDGE NO. 02003

CERTIFIED BY *M.C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

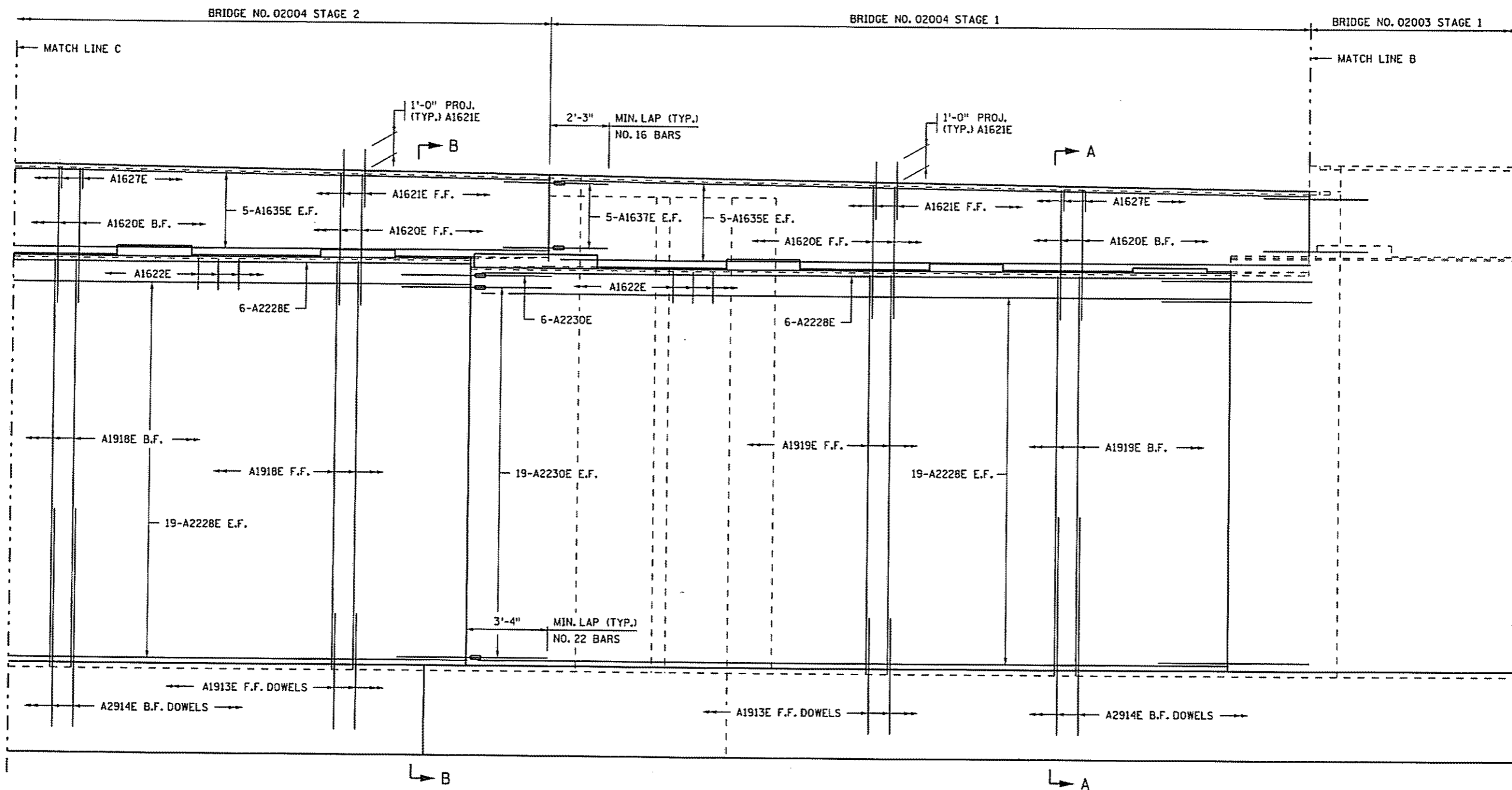
TITLE: WEST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 22 OF 72 SHEETS

BRIDGE NO. 02004

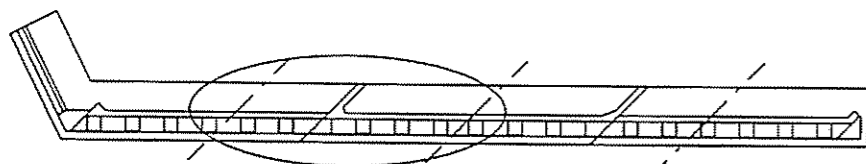
2/12/2009 S:\Design\B2004\KGS\02004.KGS



ELEVATION VIEW WEST ABUTMENT

NOTES:

- F.F. DENOTES FRONT FACE.
- B.F. DENOTES BACK FACE.
- E.F. DENOTES EACH FACE.
- SEE SHEET NO. 25 FOR SECTION A-A & B-B.



BRIDGE NO. 02004

BRIDGE NO. 02003

CERTIFIED BY *M.C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**WEST ABUTMENT REINFORCEMENT**

DES: M.C.D.	DR: K.G.S.	APPROVED:
CHK: P.J.K.	CHK: J.A.J.	2/23/09

SHEET NO. 23 OF 72 SHEETS

BRIDGE NO.  
 02004

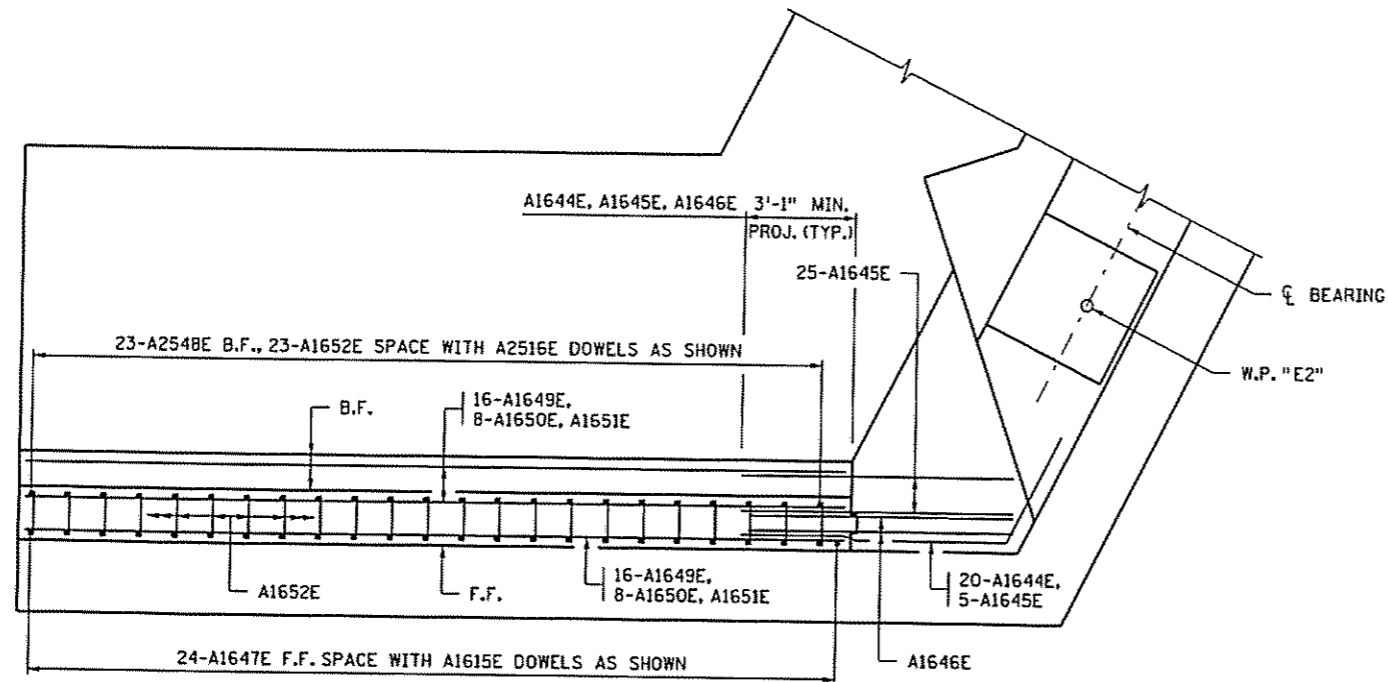
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**NOTES:**

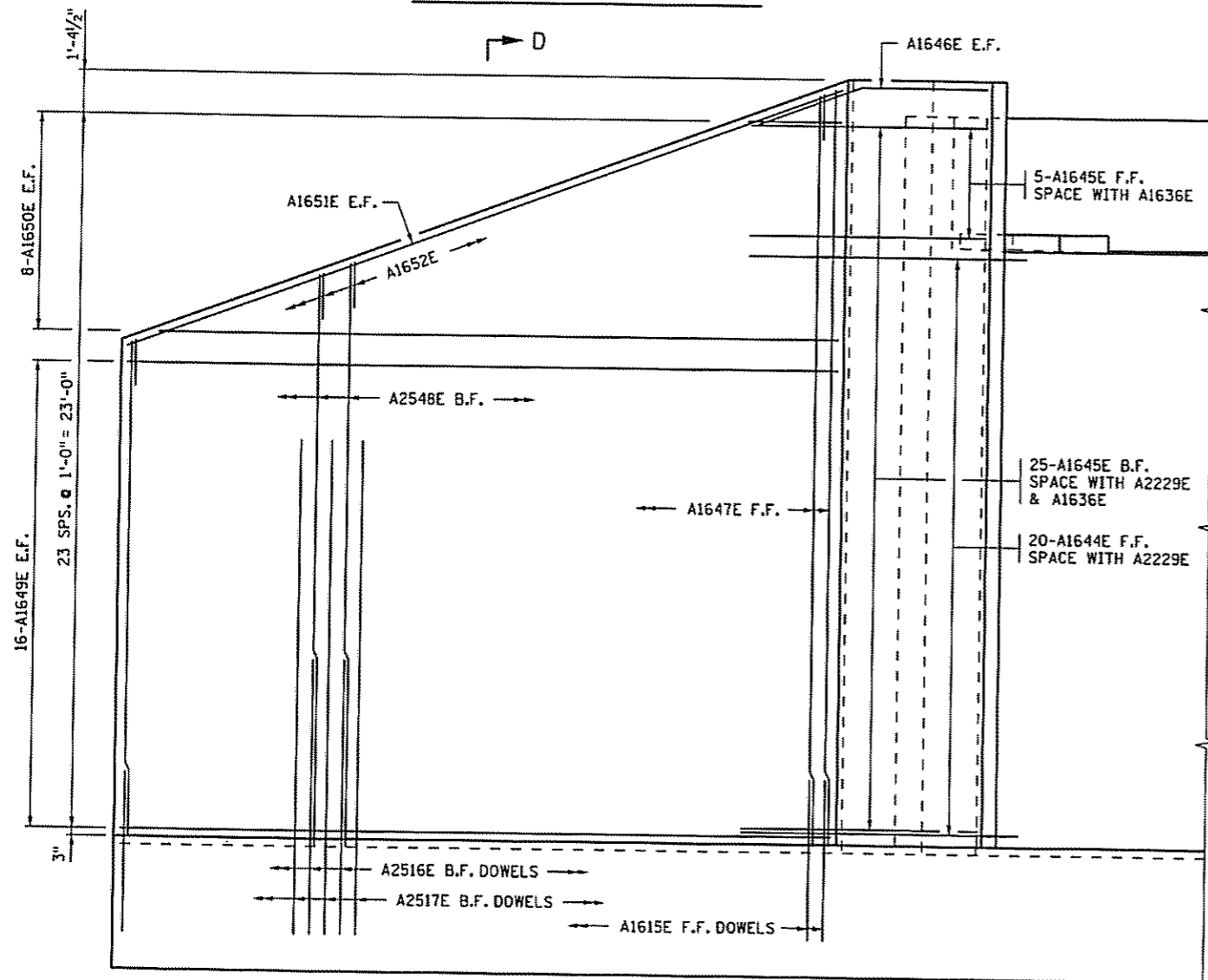
F.F. DENOTES FRONT FACE.

B.F. DENOTES BACK FACE.

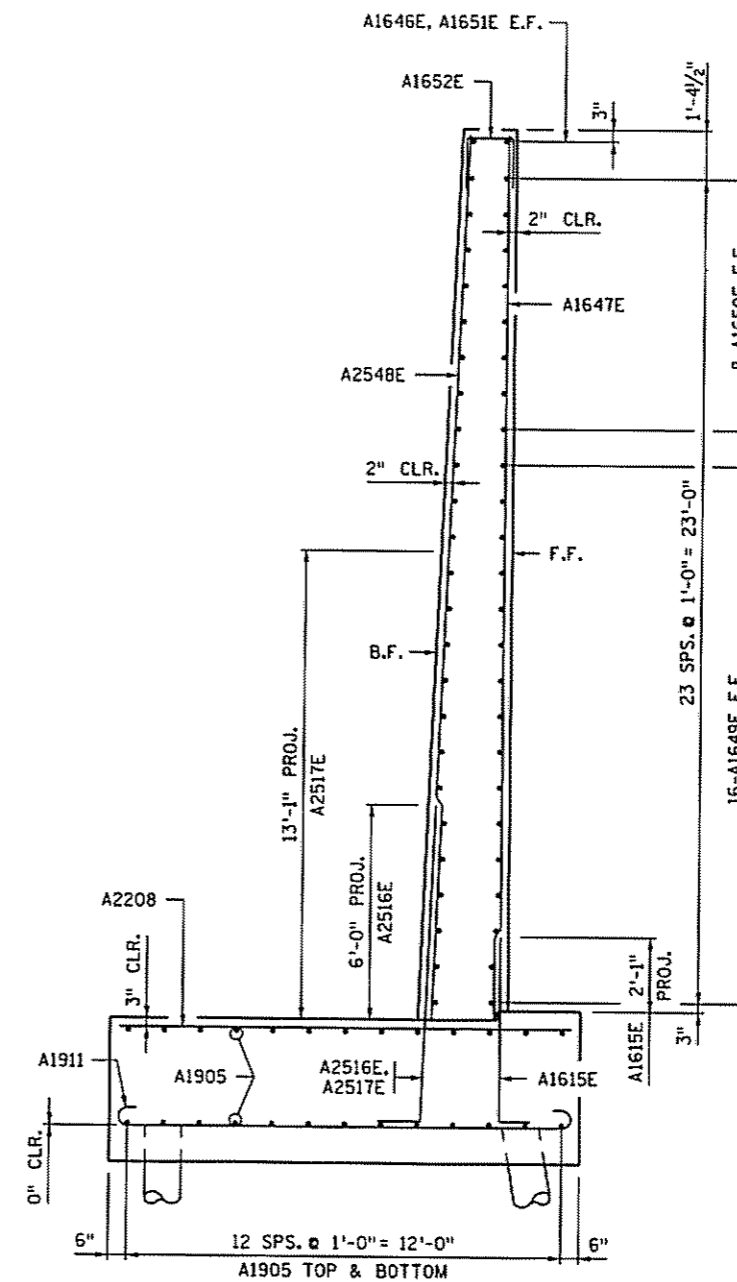
E.F. DENOTES EACH FACE.



**SOUTH WEST WINGWALL PLAN**



**SOUTH WEST WINGWALL ELEVATION**



**SECTION D-D**

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CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**WEST ABUTMENT REINFORCEMENT**

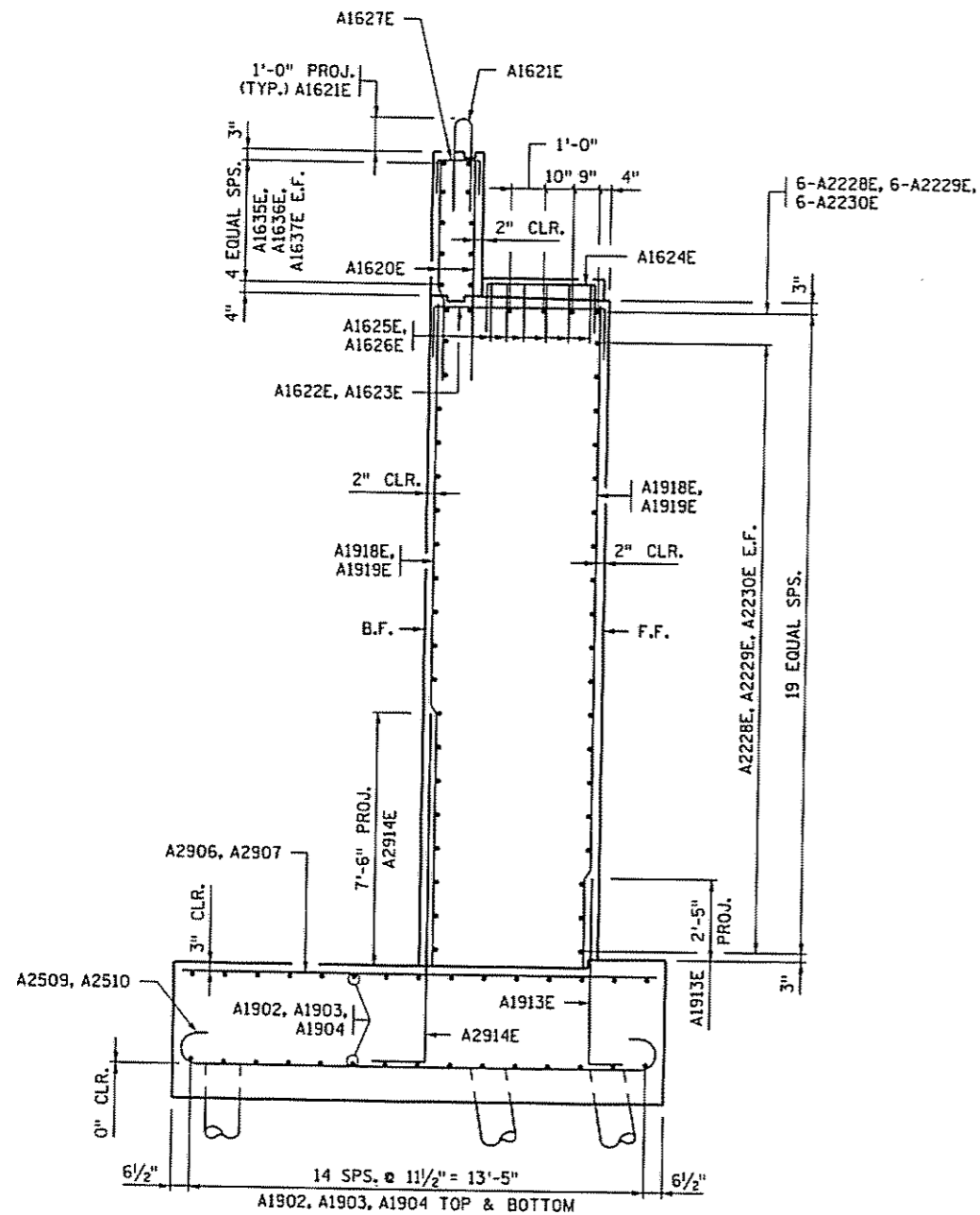
DES: M.C.D.	DR: K.G.S.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 24 OF 72 SHEETS

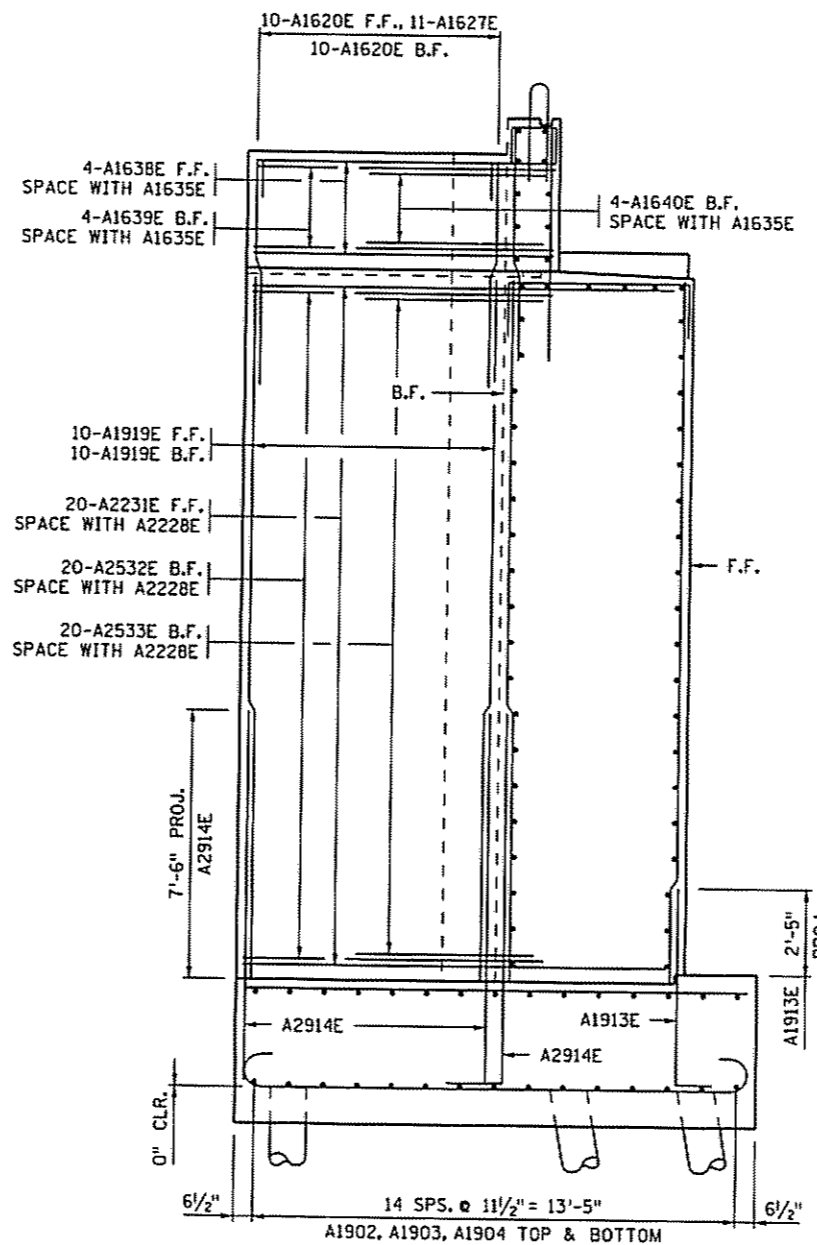
BRIDGE NO.  
 02004

**NOTES:**

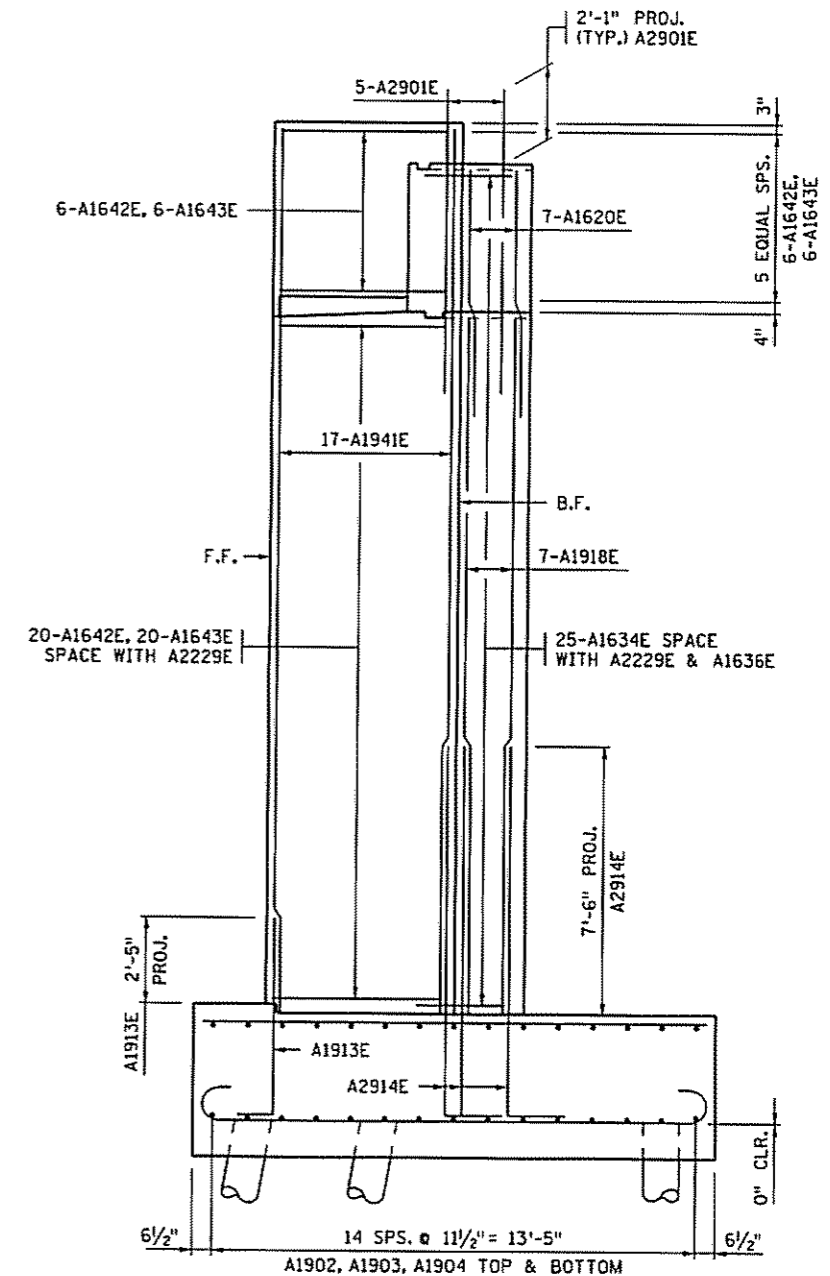
F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.  
 E.F. DENOTES EACH FACE.



**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

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CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

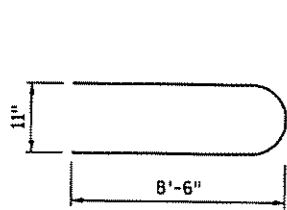
TITLE:  
**WEST ABUTMENT  
 REINFORCEMENT**

DES: M.C.D.	DR: K.G.S.	APPROVED:
CHK: P.J.K.	CHK: J.A.J.	2/23/09
SHEET NO. 25 OF 72 SHEETS		

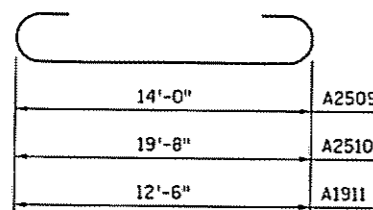
BRIDGE NO.  
 02004

BILL OF REINFORCEMENT FOR WEST ABUTMENT

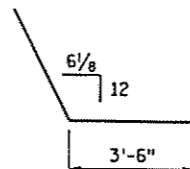
BAR	NO. STAGE 1	NO. STAGE 2	TOTAL NO.	LENGTH	SHAPE	LOCATION
A2901E	—	5	5	17'-7"	—	RAILING TIE
A1902	30	30	60	37'-6"	—	FOOTING LONGIT., TOP & BOTTOM
A1903	—	2 SERIES OF 15	2 SERIES OF 15	25'-11"	—	FOOTING LONGIT., TOP & BOTTOM
A1904	(1)	(1)	30	(1)	—	FOOTING COUPLERS
A1905	—	26	26	28'-9"	—	FOOTING LONGIT., TOP & BOTTOM
A2906	29	59	88	14'-0"	—	FOOTING TRANSVERSE TOP
A2907	14	14	28	19'-8"	—	FOOTING TRANSVERSE TOP
A2208	—	46	46	12'-6"	—	FOOTING TRANSVERSE TOP
A2509	57	118	175	15'-10"	—	FOOTING TRANSVERSE BOTTOM
A2510	28	28	56	21'-6"	—	FOOTING TRANSVERSE BOTTOM
A1911	—	46	46	13'-10"	—	FOOTING TRANSVERSE BOTTOM
A1912	—	2	2	7'-0"	—	FOOTING HORIZONTAL
A1913E	36	61	97	6'-6"	—	FOOTING DOWEL
A2914E	53	70	123	11'-11"	—	FOOTING DOWEL
A1615E	—	28	28	6'-0"	—	FOOTING DOWEL
A2516E	—	23	23	10'-2"	—	FOOTING DOWEL
A2517E	—	23	23	17'-3"	—	FOOTING DOWEL
A1918E	—	122	122	19'-0"	—	BRIDGE SEAT VERTICAL EACH FACE
A1919E	89	—	89	18'-7"	—	BRIDGE SEAT VERTICAL EACH FACE
A1620E	89	122	211	6'-5"	—	PARAPET VERTICAL EACH FACE
A1621E	36	59	95	6'-10"	—	PARAPET VERTICAL FRONT FACE
A1622E	33	61	94	7'-11"	—	BRIDGE SEAT TIE
A1623E	10	5	15	8'-5"	—	BRIDGE SEAT TIE
A1624E	29	42	71	6'-3"	—	BRIDGE SEAT TIE
A1625E	18	36	54	6'-2"	—	BRIDGE SEAT TIE
A1626E	1 SERIES OF 6	—	1 SERIES OF 6	5'-1" TO 8'-1"	—	BRIDGE SEAT TIE
A1627E	47	59	106	4'-2"	—	PARAPET TIE
A2228E	44	44	88	35'-6"	—	BRIDGE SEAT HORIZONTAL
A2229E	—	44	44	33'-9"	—	BRIDGE SEAT HORIZONTAL
A2230E	(2)	(2)	44	(2)	—	BRIDGE SEAT COUPLERS
A2231E	20	—	20	20'-3"	—	BRIDGE SEAT HORIZONTAL
A2532E	20	—	20	11'-10"	—	BRIDGE SEAT HORIZONTAL
A2533E	20	—	20	10'-9"	—	BRIDGE SEAT HORIZONTAL
A1634E	—	25	25	12'-2"	—	BRIDGE SEAT & PARAPET HORIZONTAL
A1635E	10	10	20	35'-6"	—	PARAPET HORIZONTAL
A1636E	—	10	10	32'-8"	—	PARAPET HORIZONTAL
A1637E	(3)	(3)	10	(3)	—	PARAPET COUPLERS
A1638E	4	—	4	13'-10"	—	PARAPET HORIZONTAL
A1639E	4	—	4	11'-10"	—	PARAPET HORIZONTAL
A1640E	4	—	4	8'-7"	—	PARAPET HORIZONTAL
A1941E	—	17	17	24'-5"	—	S.W. CORNER VERTICAL
A1642E	—	26	26	12'-1"	—	S.W. CORNER HORIZONTAL
A1643E	—	26	26	11'-7"	—	S.W. CORNER HORIZONTAL
A1644E	—	20	20	9'-9"	—	S.W. CORNER HORIZONTAL
A1645E	—	30	30	7'-6"	—	S.W. CORNER HORIZONTAL
A1646E	—	2	2	7'-4"	—	S.W. CORNER HORIZONTAL
A1647E	—	1 SERIES OF 24	1 SERIES OF 24	15'-11" TO 24'-3"	—	WINGWALL VERTICAL FRONT FACE
A2548E	—	1 SERIES OF 23	1 SERIES OF 23	16'-2" TO 24'-4"	—	WINGWALL VERTICAL BACK FACE
A1649E	—	32	32	22'-10"	—	WINGWALL HORIZONTAL EACH FACE
A1650E	—	2 SERIES OF 8	2 SERIES OF 8	3'-0" TO 21'-10"	—	WINGWALL HORIZONTAL EACH FACE
A1651E	—	2	2	24'-5"	—	WINGWALL HORIZONTAL EACH FACE
A1652E	—	23	23	4'-2"	—	WINGWALL TIE



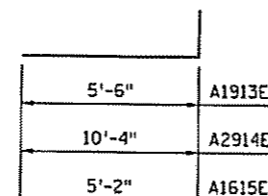
A2901E



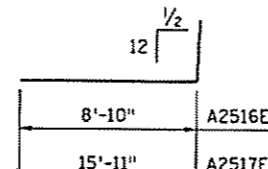
A2509, A2510, A1911



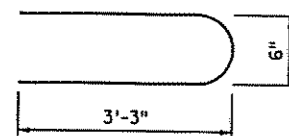
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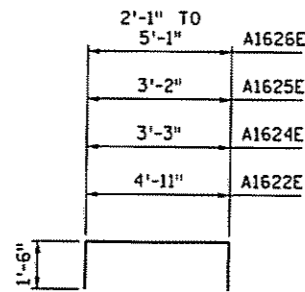
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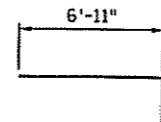
A2516E, A2517E



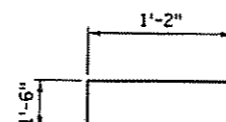
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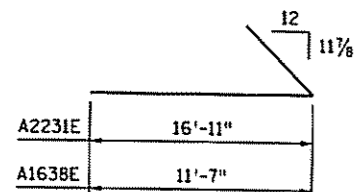
A1622E, A1624E, A1625E, A1626E



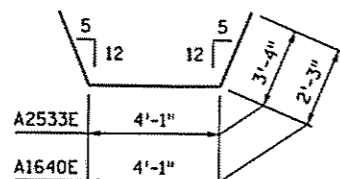
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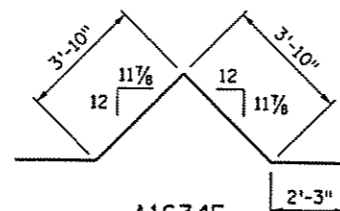
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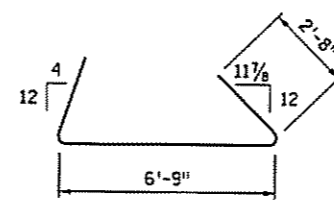
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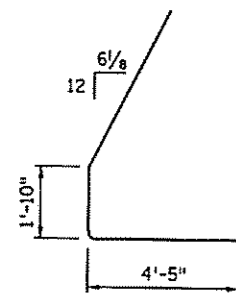
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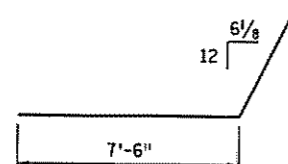
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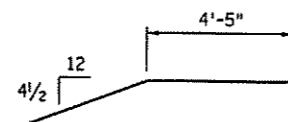
A1642E



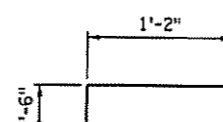
A1643E



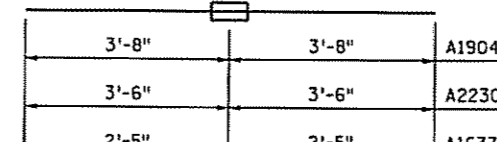
A1644E



A1646E



A1652E



A1904, A2230E, A1637E

NOTES:

- A1904 NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-19". 3'-6" MINIMUM LAP EACH SIDE OF COUPLER.
- A2230E NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS (EPOXY COATED)". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-22". 3'-4" MINIMUM LAP EACH SIDE OF COUPLER.
- A1637E NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS (EPOXY COATED)". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-16". 2'-3" MINIMUM LAP EACH SIDE OF COUPLER.

2/12/2009 S:\Design\B\B2208\KGS\02004.KGS

CERTIFIED BY Moises C. Dimaculangan 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: WEST ABUTMENT REINFORCEMENT

DES: M.C.D. DR: K.G.S. APPROVED: 2/23/09  
 CHK: P.J.K. CHK: J.A.J.

SHEET NO. 26 OF 72 SHEETS

BRIDGE NO. 02004

EAST ABUTMENT COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	95.6
FACTORED LIVE LOAD	3.3
*FACTORED DESIGN LOAD	98.9

\*BASED ON STRENGTH I LOAD COMBINATION

EAST ABUTMENT REQUIRED NOMINAL PILE BEARING RESISTANCE $R_n$ - TONS/PILE		
FIELD CONTROL METHOD	$\phi_{dyn}$	* $R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	247.2
PDA	0.65	152.1

\*  $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{dyn}$

### PILE NOTES

- 2 CAST-IN-PLACE CONC. TEST PILES 60 FT. LONG
- 54 CAST-IN-PLACE CONC. PILES EST. LENGTH 50 FT.
- 56 CAST-IN-PLACE CONC. PILES REQ'D FOR EAST ABUTMENT

PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.

PILES MARKED THUS  $\odot$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.

PILES TO HAVE A NOMINAL DIAMETER OF 12".

FOR PILE SPLICE DETAILS SEE DETAIL B201.

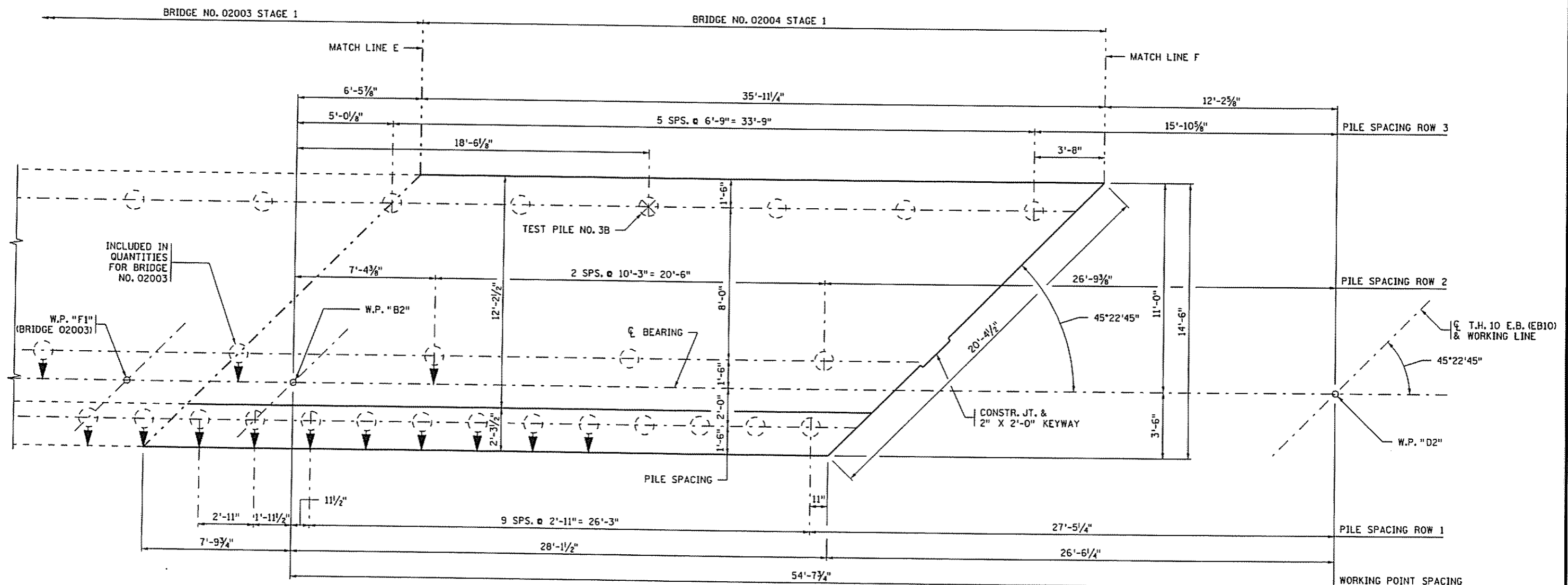
PILE DIRECTION SHOWN MAY BE ADJUSTED BY THE FIELD ENGINEER FOR INTERFERENCE PROBLEMS.

### SUMMARY OF QUANTITIES FOR EAST ABUTMENT

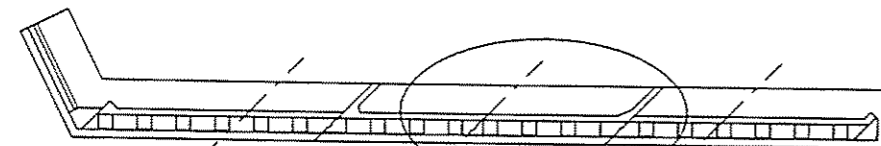
	STAGE 1	STAGE 2	TOTAL
STRUCTURAL CONCRETE (1A43)	78	135	213 CU. YD.
STRUCTURAL CONCRETE (3Y43)	171	281	452 CU. YD.
REINFORCEMENT BARS	8070	12700	20770 POUND
REINFORCEMENT BARS (EPOXY COATED)	13640	18900	32540 POUND
① C-I-P CONCRETE PILING DELIVERED 12"	1000	1700	2700 LIN. FT.
① C-I-P CONCRETE PILING DRIVEN 12"	1000	1700	2700 LIN. FT.
C-I-P CONCRETE TEST PILE 60 FT. LONG 12"	1	1	2 EACH
② MEMBRANE WATERPROOFING	81	117	198 LIN. FT.
COUPLERS (REINFORCEMENT BARS) T-16	10	—	10 EACH
COUPLERS (REINFORCEMENT BARS) T-19	30	—	30 EACH
COUPLERS (REINFORCEMENT BARS) T-22	48	—	48 EACH
PILE REDRIVING	1	1	2 EACH
PILE ANALYSIS	1	—	1 EACH

① DOES NOT INCLUDE TEST PILES.

② PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).



FOOTING PLAN EAST ABUTMENT



BRIDGE NO. 02003

BRIDGE NO. 02004

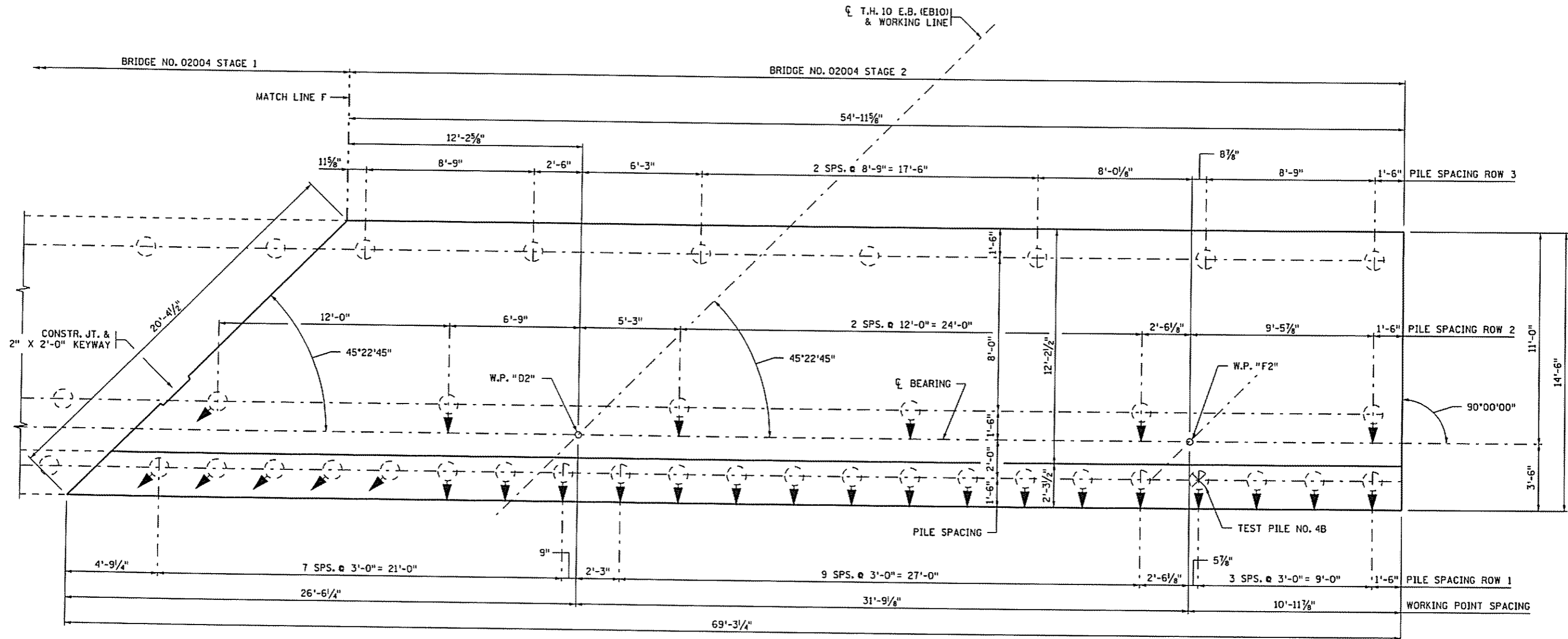
CERTIFIED BY *M.C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
 EAST ABUTMENT GEOMETRICS

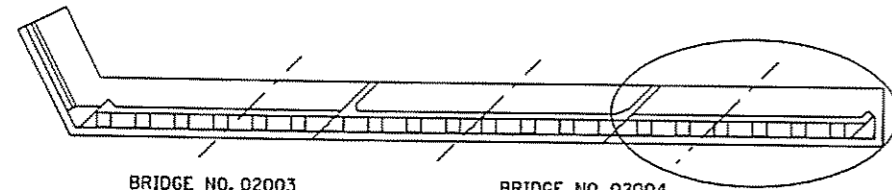
DES: M.C.D. DR: P.F. APPROVED: 2/23/09  
 CHK: P.J.K. CHK: J.A.J.  
 SHEET NO. 27 OF 72 SHEETS

BRIDGE NO.  
 02004





FOOTING PLAN EAST ABUTMENT



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

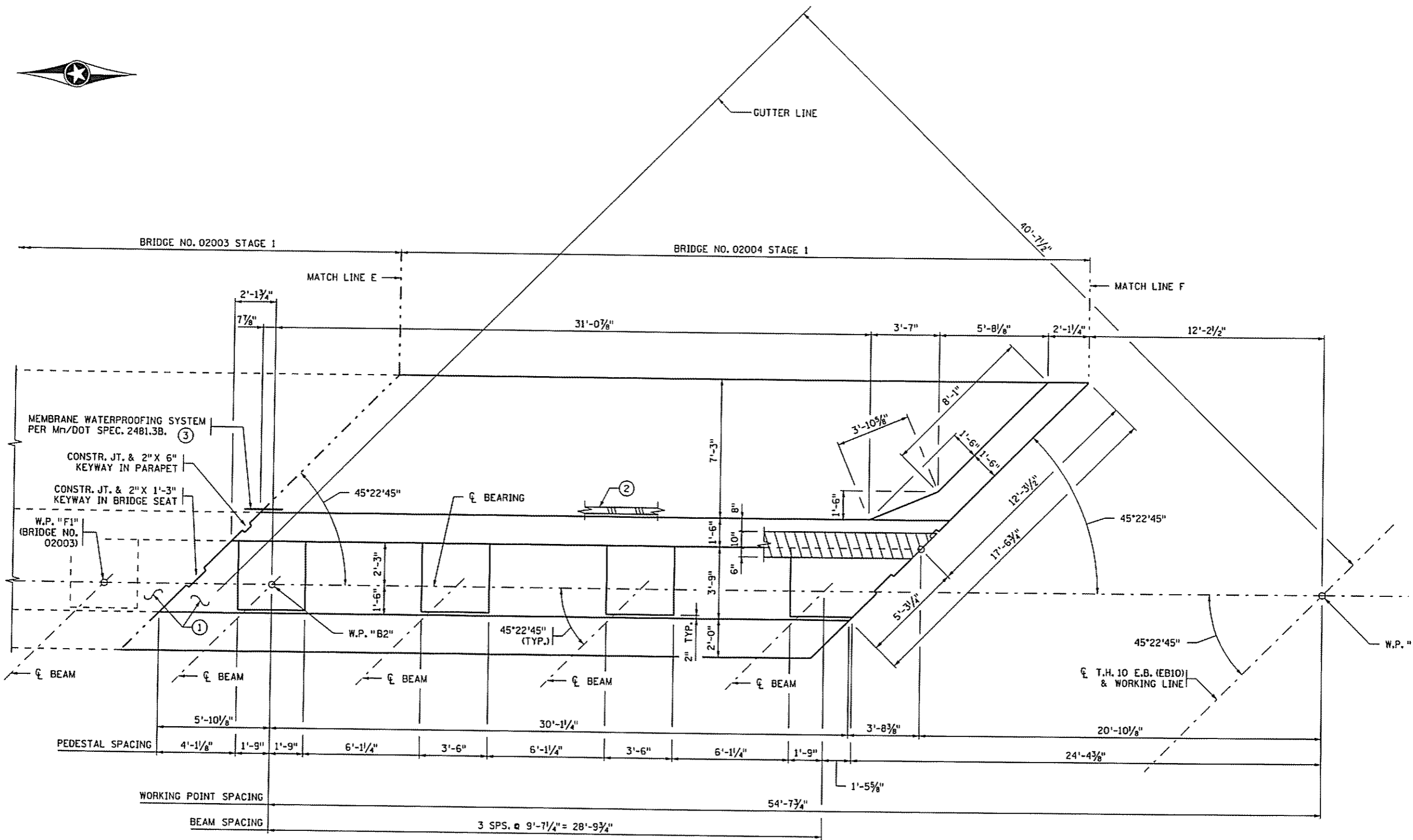
TITLE:  
 EAST ABUTMENT GEOMETRICS

DES: M.C.D.	DR: P.F.	APPROVED: <i>2/23/09</i>
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 28 OF 72 SHEETS

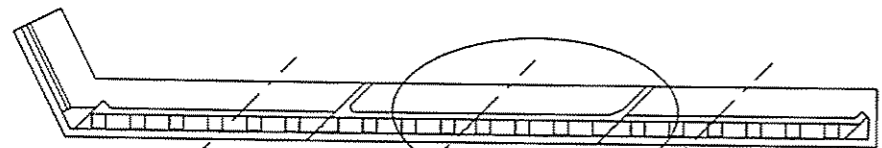
BRIDGE NO.  
 02004

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PLAN VIEW EAST ABUTMENT

- NOTES:**
- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
  - ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).



BRIDGE NO. 02003      BRIDGE NO. 02004

CERTIFIED BY *M. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER      DATE  
 NAME: MOISES C. DIMACULANGAN      LIC. NO. 46209

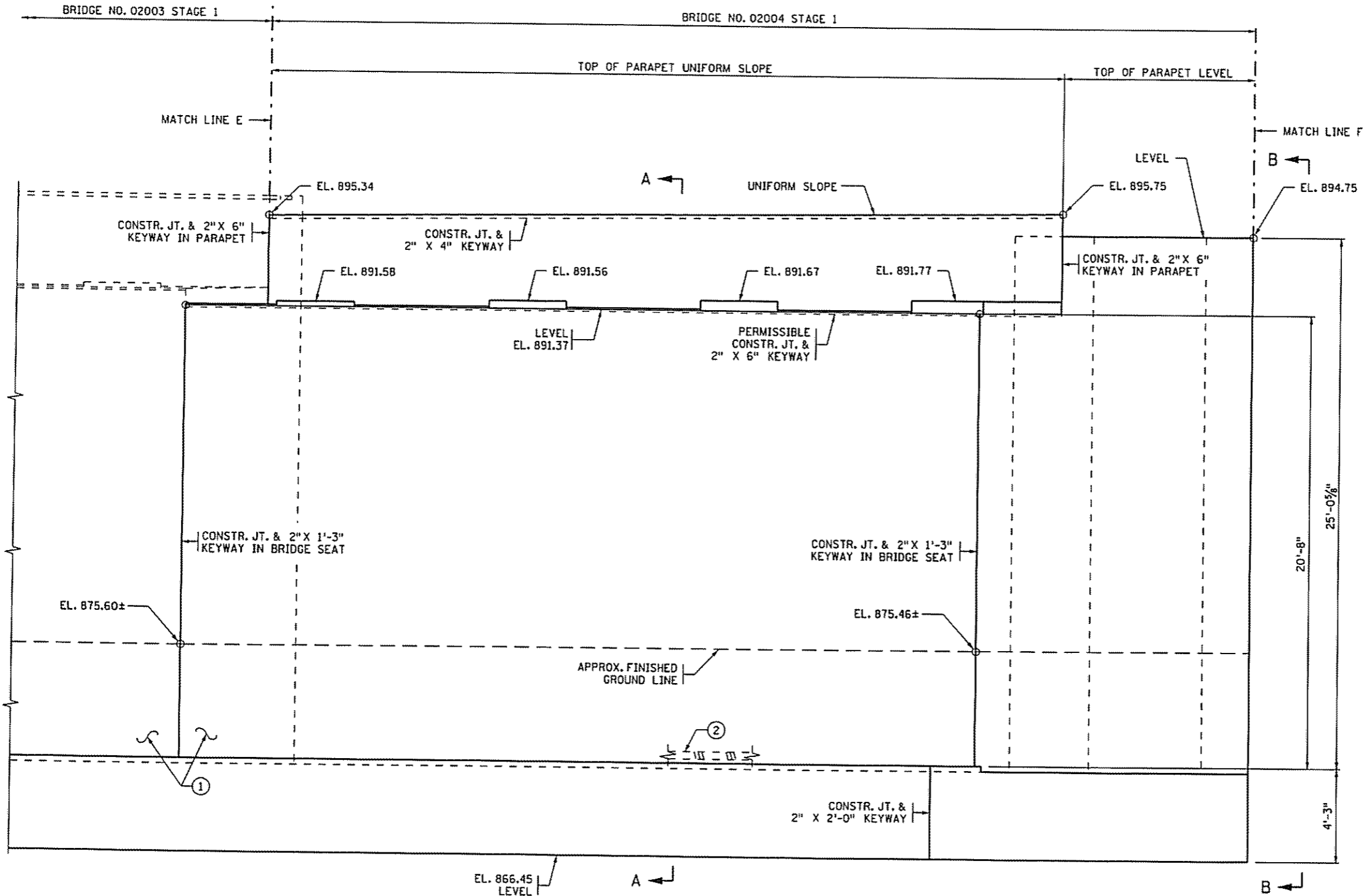
TITLE:  
 EAST ABUTMENT GEOMETRICS

DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

BRIDGE NO. 02004  
 SHEET NO. 29 OF 72 SHEETS

2/18/2009 5:\Design\02003\02004\02004.EAST ABUTMENT.dgn

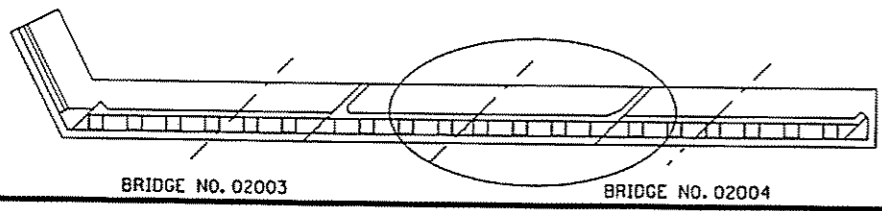




ELEVATION VIEW EAST ABUTMENT

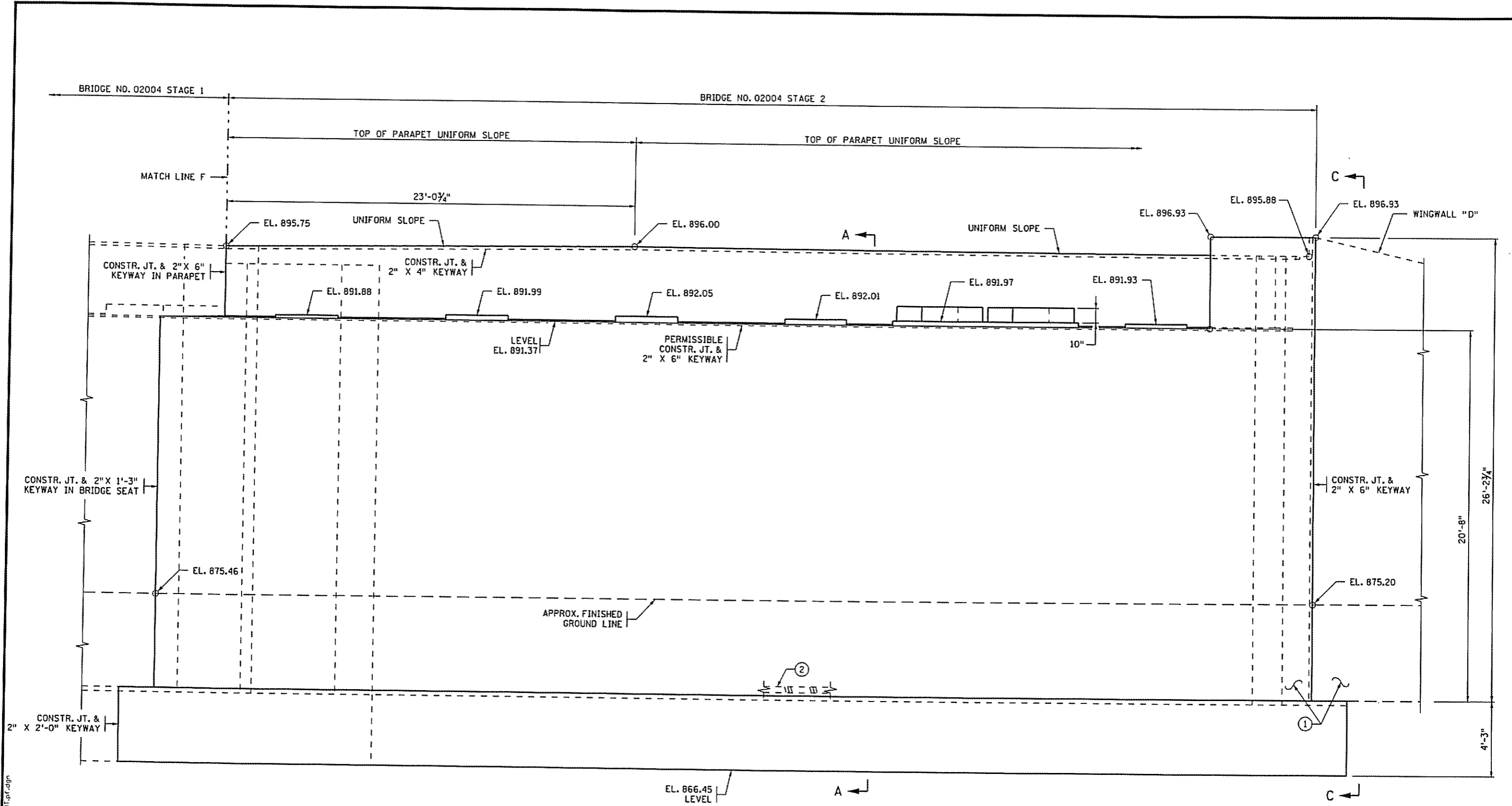
NOTES:

- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- FOR SECTION A-A & B-B SEE SHEET NO. 33.



CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 <small>LICENSED PROFESSIONAL ENGINEER DATE</small>		TITLE: EAST ABUTMENT GEOMETRICS	
NAME: MOISES C. DIMACULANGAN <small>LIC. NO. 46209</small>	DES: M.C.D. CHK: P.J.K.	DR: P.F. CHK: J.A.J.	APPROVED: 2/23/09 BRIDGE NO. 02004 SHEET NO. 31 OF 72 SHEETS

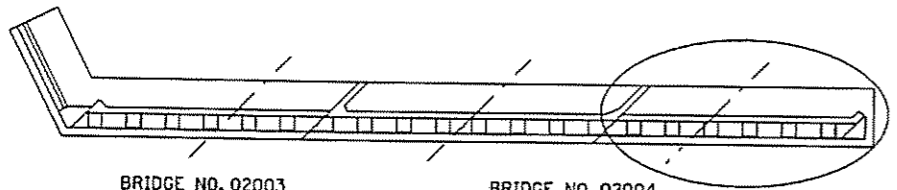
2/18/2009 S:\Design\B\02004\02004.EASTABUT.plt.dgn



ELEVATION VIEW EAST ABUTMENT

NOTES:

- ① THERE SHALL BE A 72 HOUR MINIMUM TIME DELAY BETWEEN CONCRETE POURS OF ADJACENT ABUTMENT SECTIONS THAT HAVE VERTICAL CONSTRUCTION JOINTS.
  - ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- FOR SECTION A-A & C-C SEE SHEET NO. 33.



BRIDGE NO. 02003      BRIDGE NO. 02004

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER      DATE  
 NAME: MOISES C. DIMACULANGAN      LIC. NO. 46209

TITLE: EAST ABUTMENT GEOMETRICS

DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 32 OF 72 SHEETS

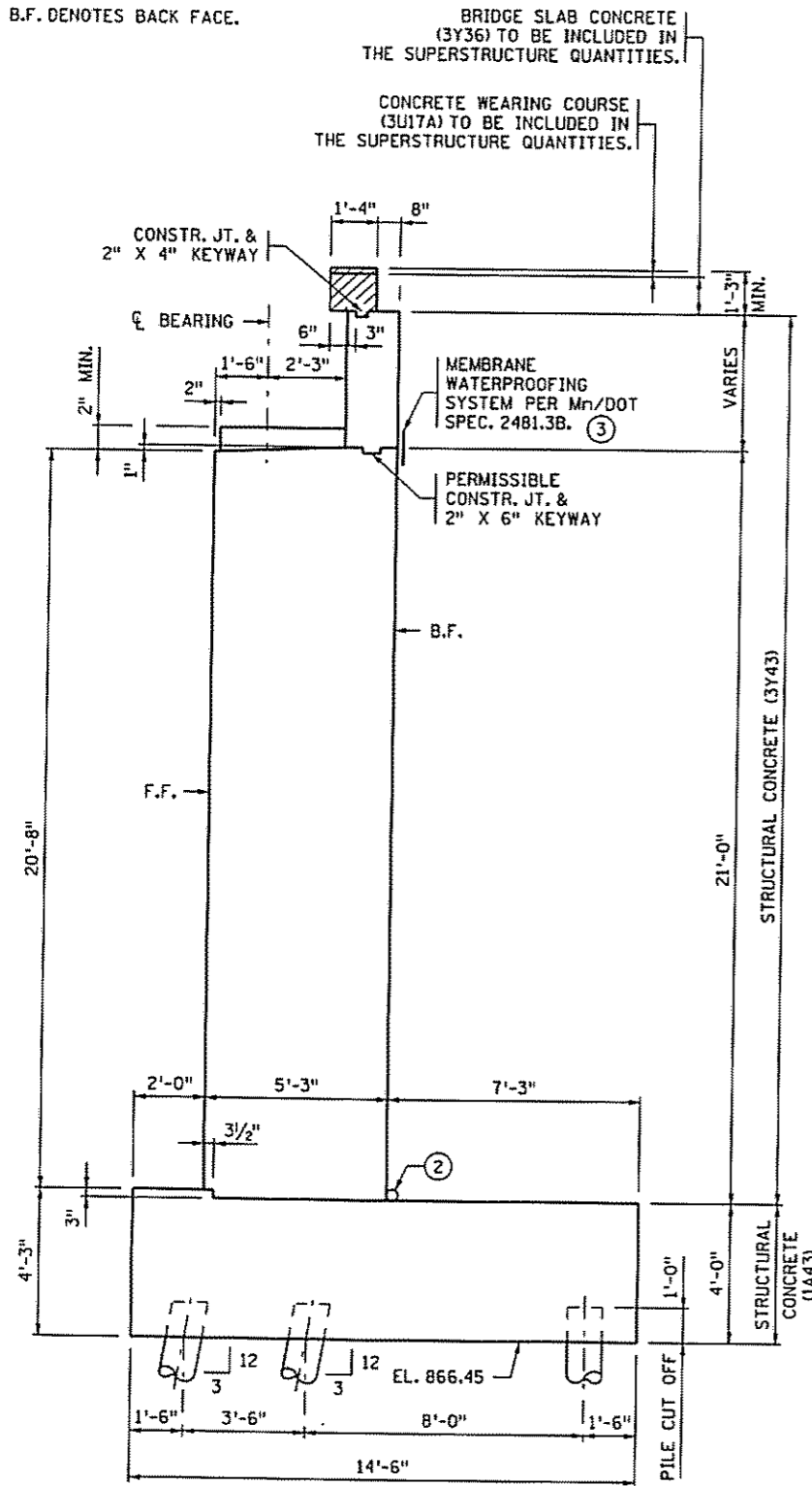
BRIDGE NO. 02004

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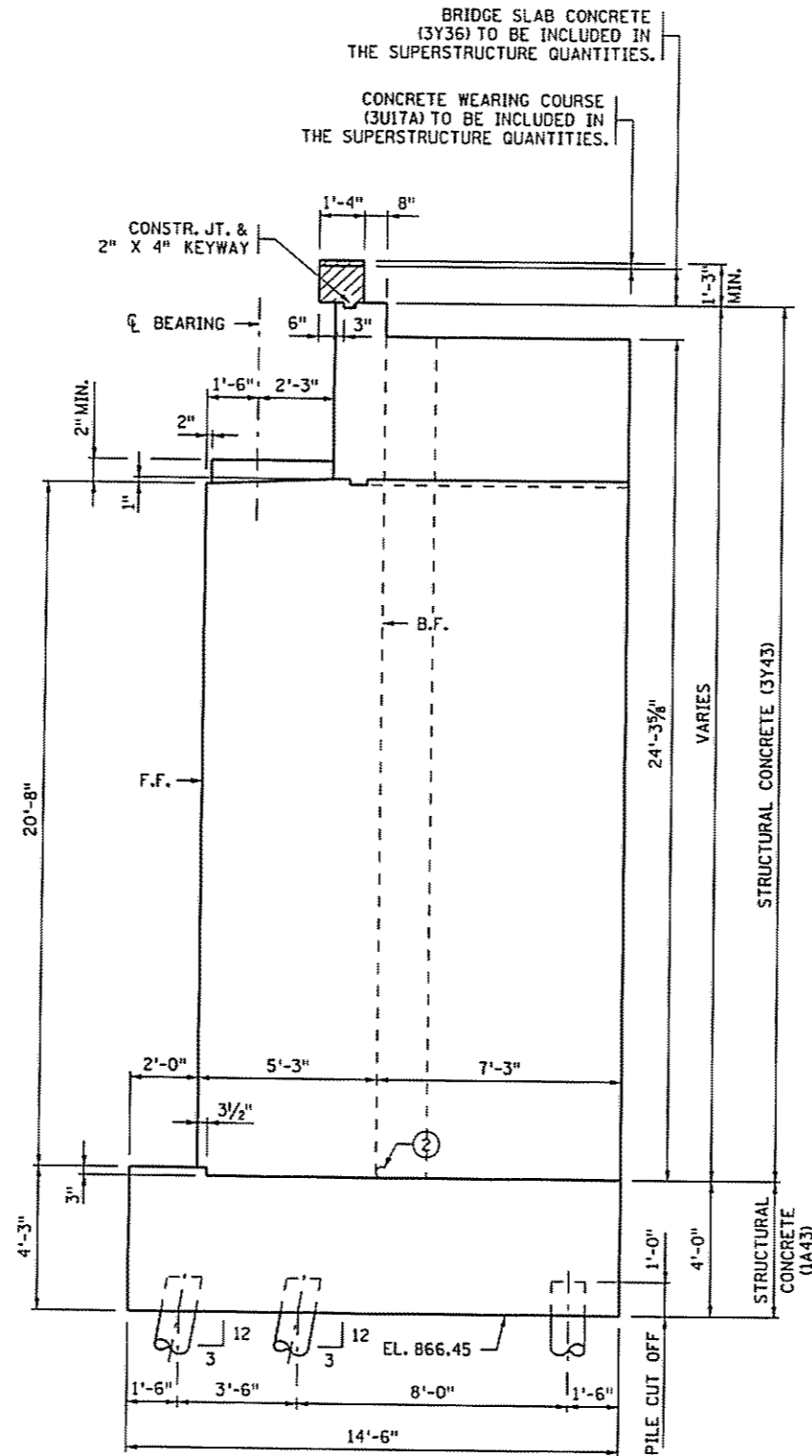
**NOTES:**

- ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- ③ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).

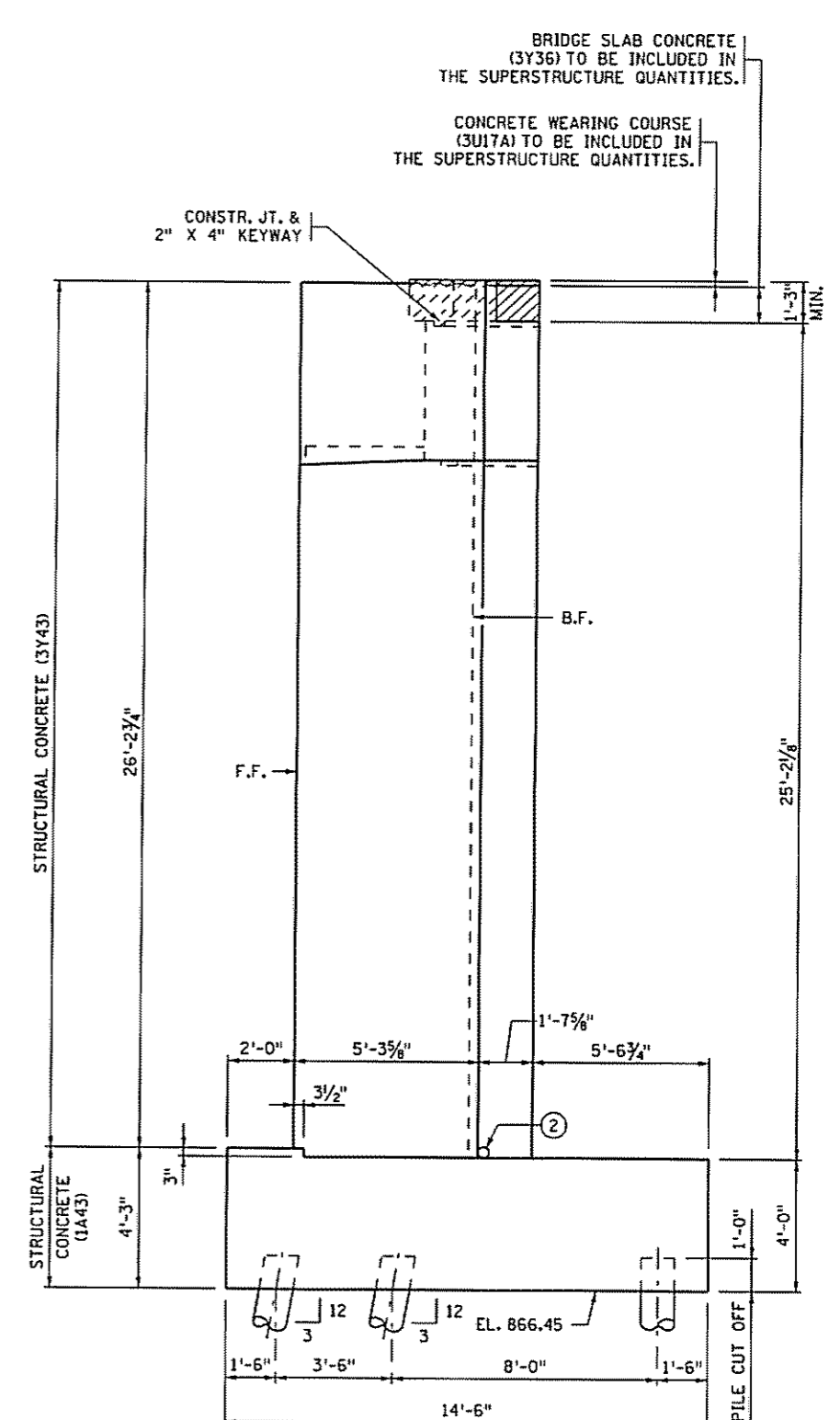
F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.



**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

2/18/2009 S:\Design\2009\02004\02004.EAST ABUT.dgn

CERTIFIED BY Moises C. Dimaculangan 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: **EAST ABUTMENT GEOMETRICS**

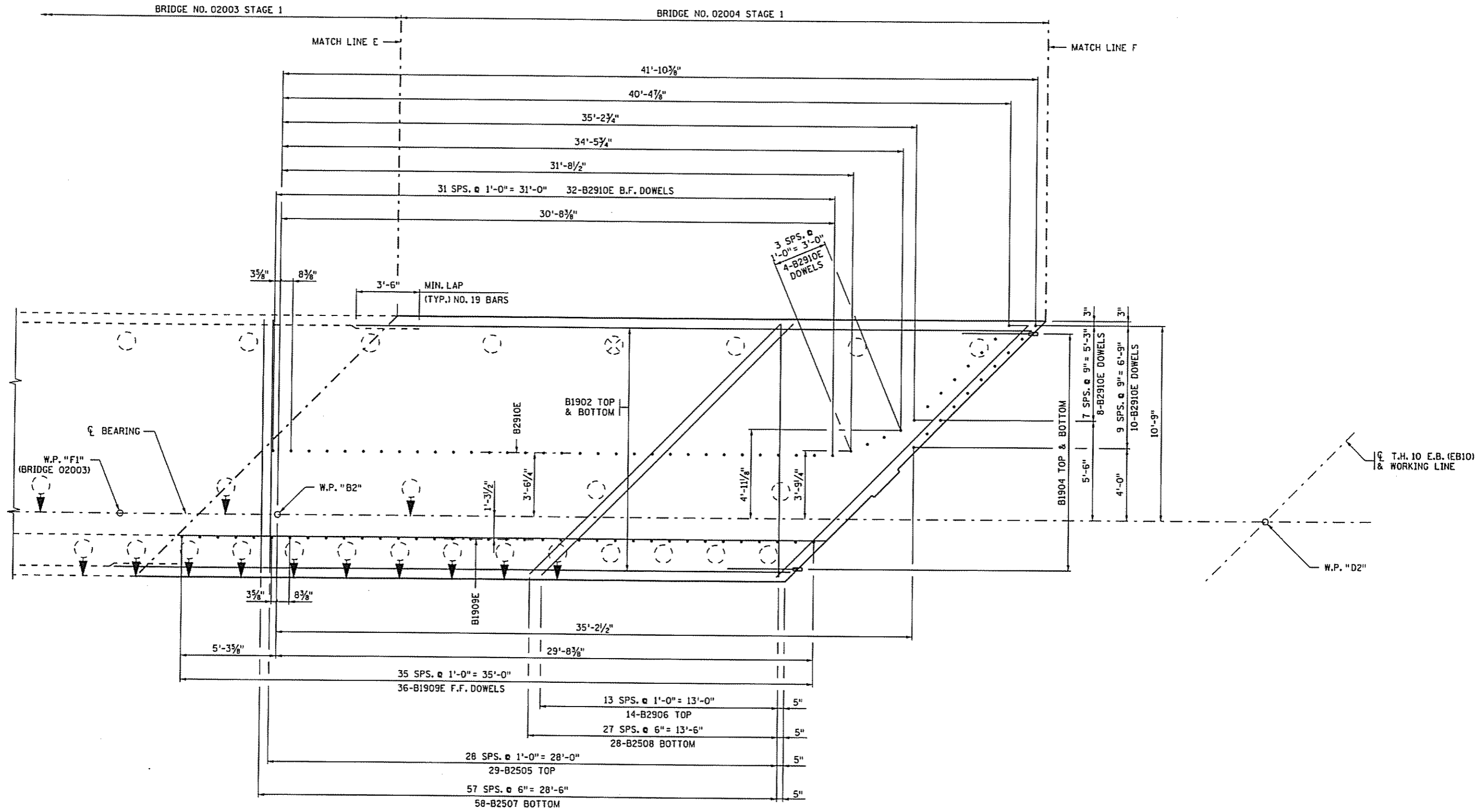
DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

BRIDGE NO. 02004

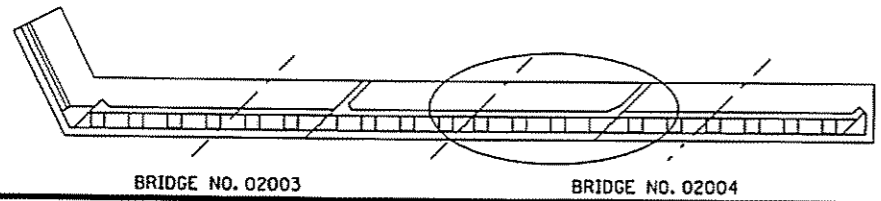
SHEET NO. 33 OF 72 SHEETS



**NOTES:**  
 F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.



FOOTING PLAN EAST ABUTMENT

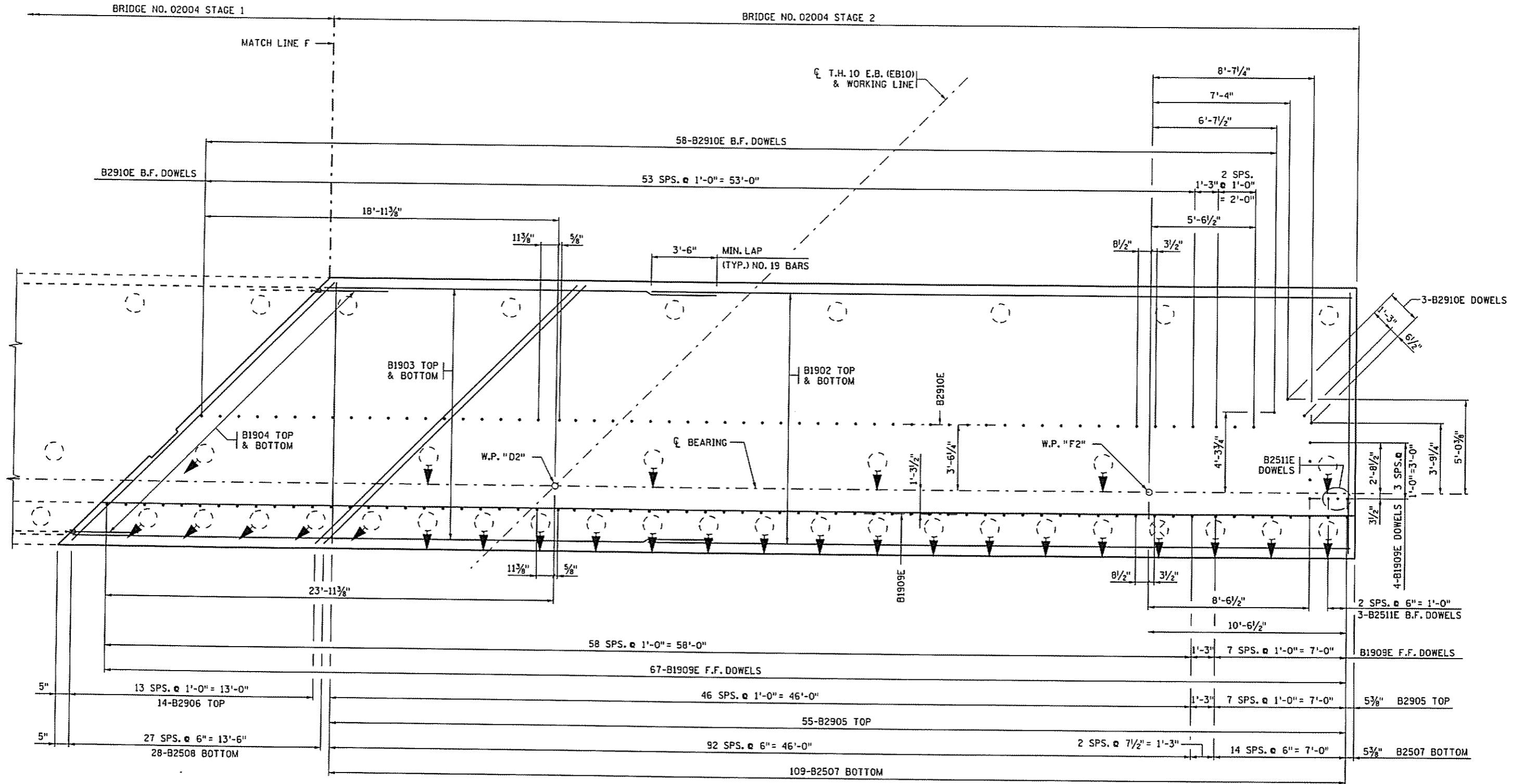


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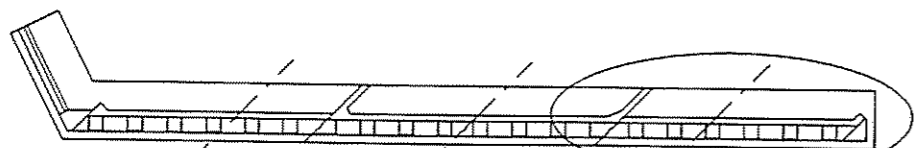
CERTIFIED BY <i>M. C. Dimaculangan</i> LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	DATE 2/23/09	TITLE: <b>EAST ABUTMENT REINFORCEMENT</b>	DES: M.C.D.	DR: P.F.	APPROVED:	BRIDGE NO. <b>02004</b>
			CHK: P.J.K.	CHK: J.A.J.	2/23/09	

**NOTES:**

F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.



**FOOTING PLAN EAST ABUTMENT**



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *MCDimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: **EAST ABUTMENT REINFORCEMENT**

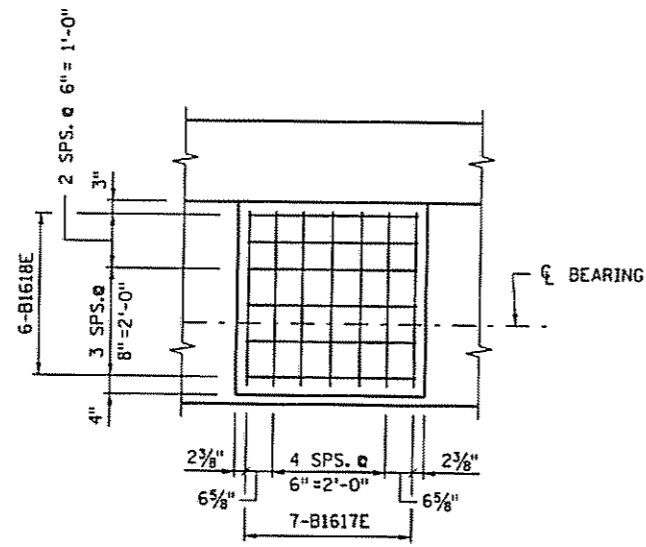
DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 35 OF 72 SHEETS

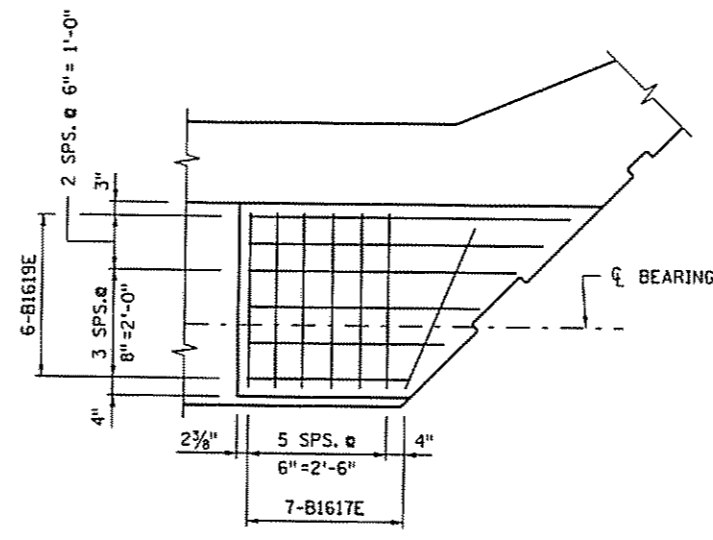
BRIDGE NO. 02004

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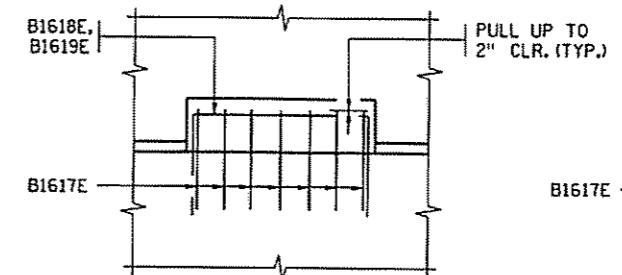




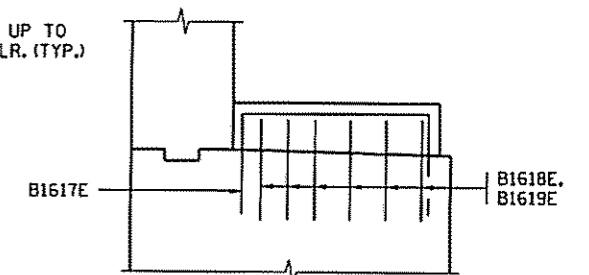
PLAN VIEW



PLAN VIEW

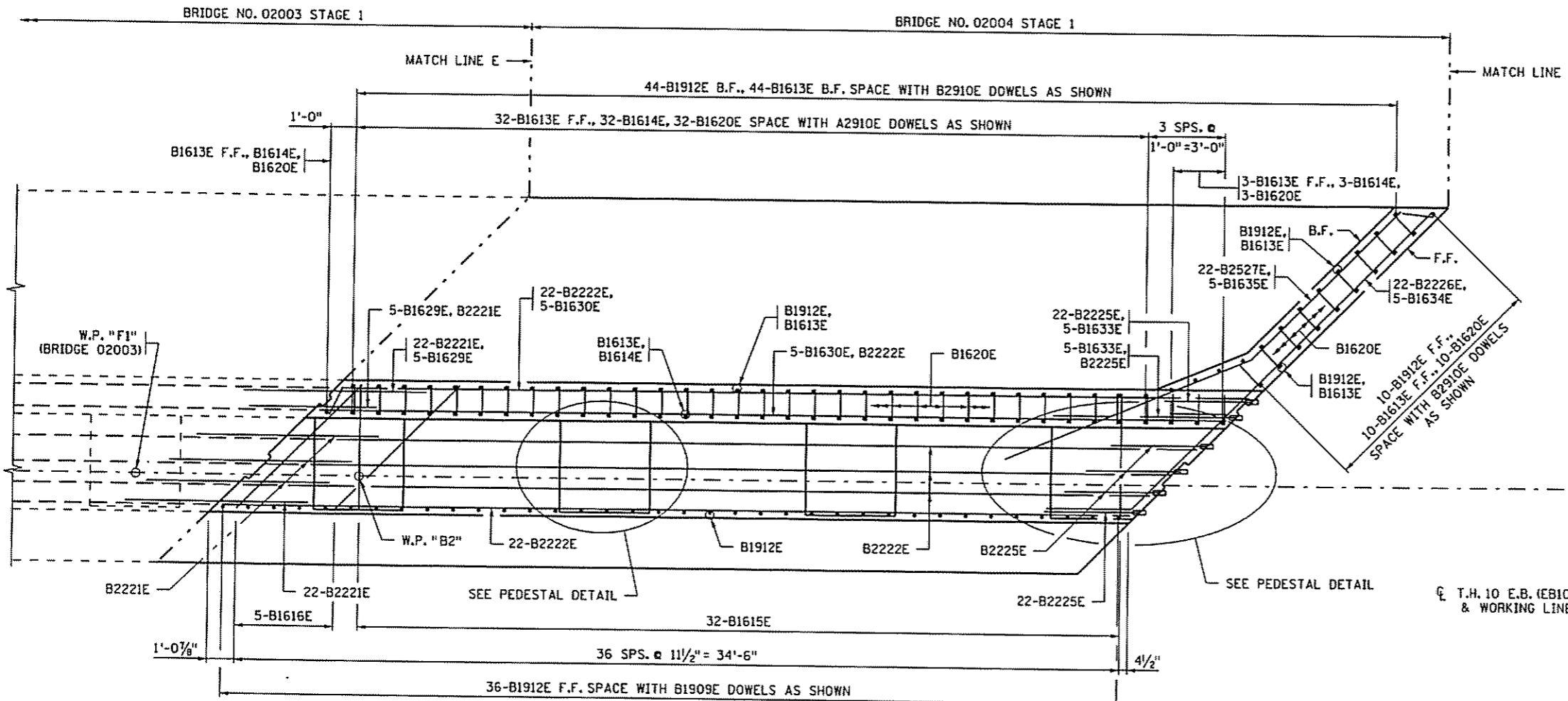


FRONT ELEVATION



SECTION

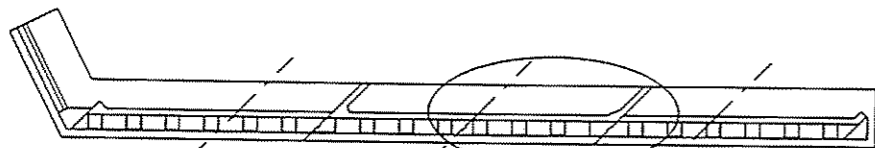
PEDESTAL DETAIL



PLAN VIEW EAST ABUTMENT

NOTES:

- F.F. DENOTES FRONT FACE.
- B.F. DENOTES BACK FACE.



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: EAST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

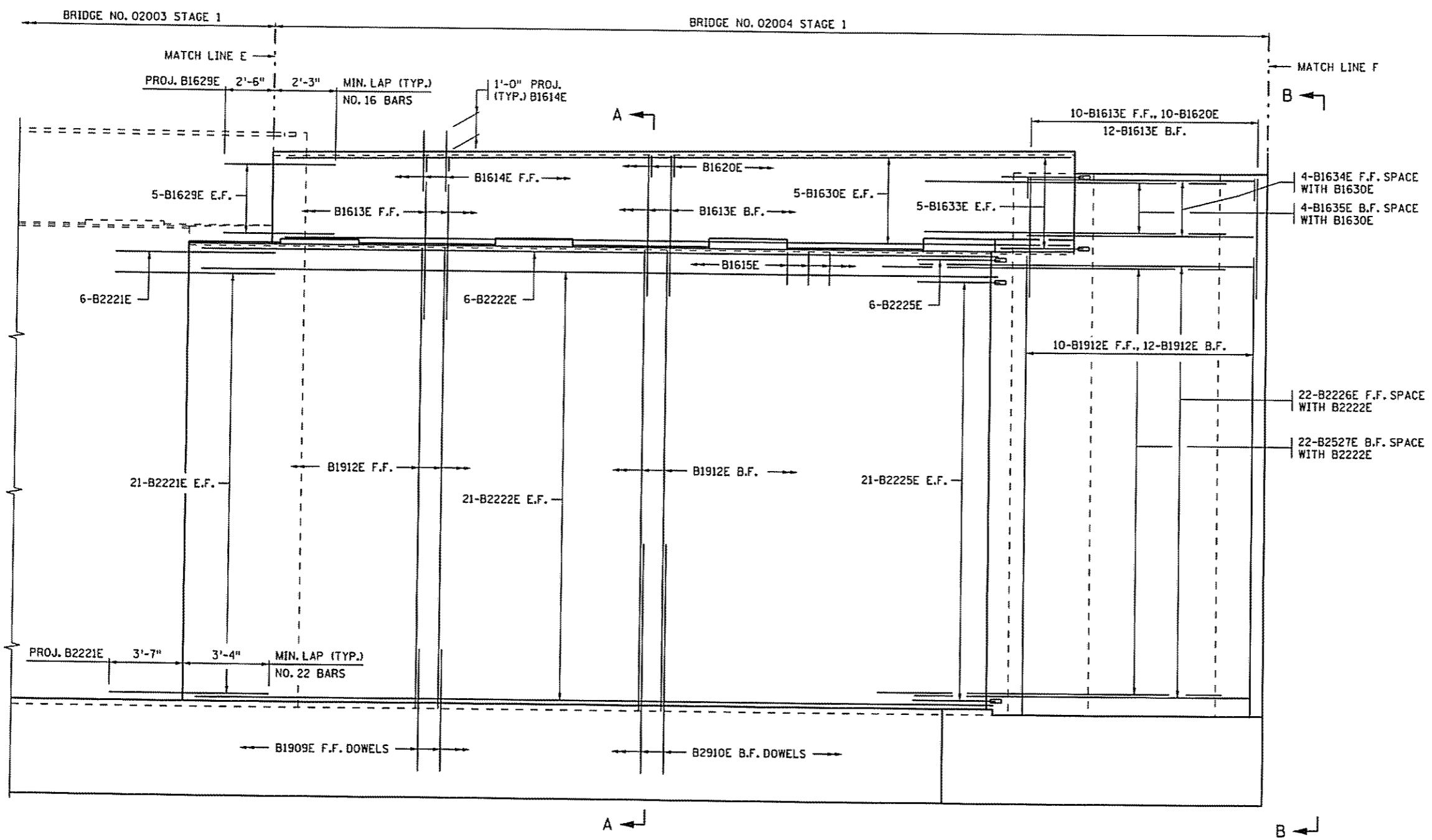
SHEET NO. 36 OF 72 SHEETS

BRIDGE NO. 02004

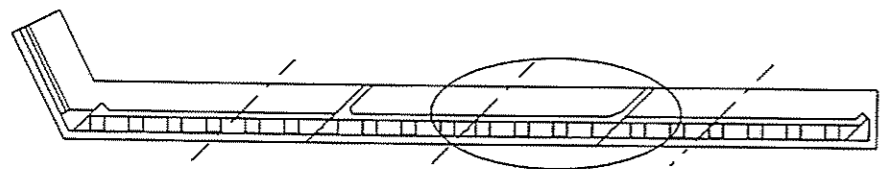


**NOTES:**

F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.  
 E.F. DENOTES EACH FACE.  
 SEE SHEET NO. 40 FOR SECTION A-A AND B-B.



ELEVATION VIEW EAST ABUTMENT



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *M.C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: EAST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

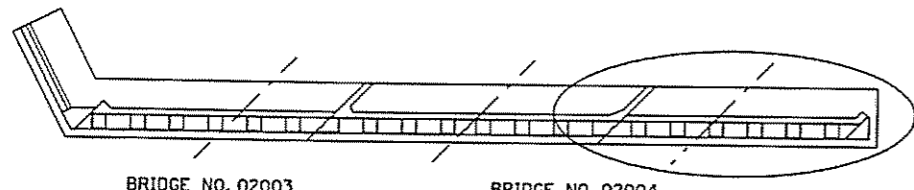
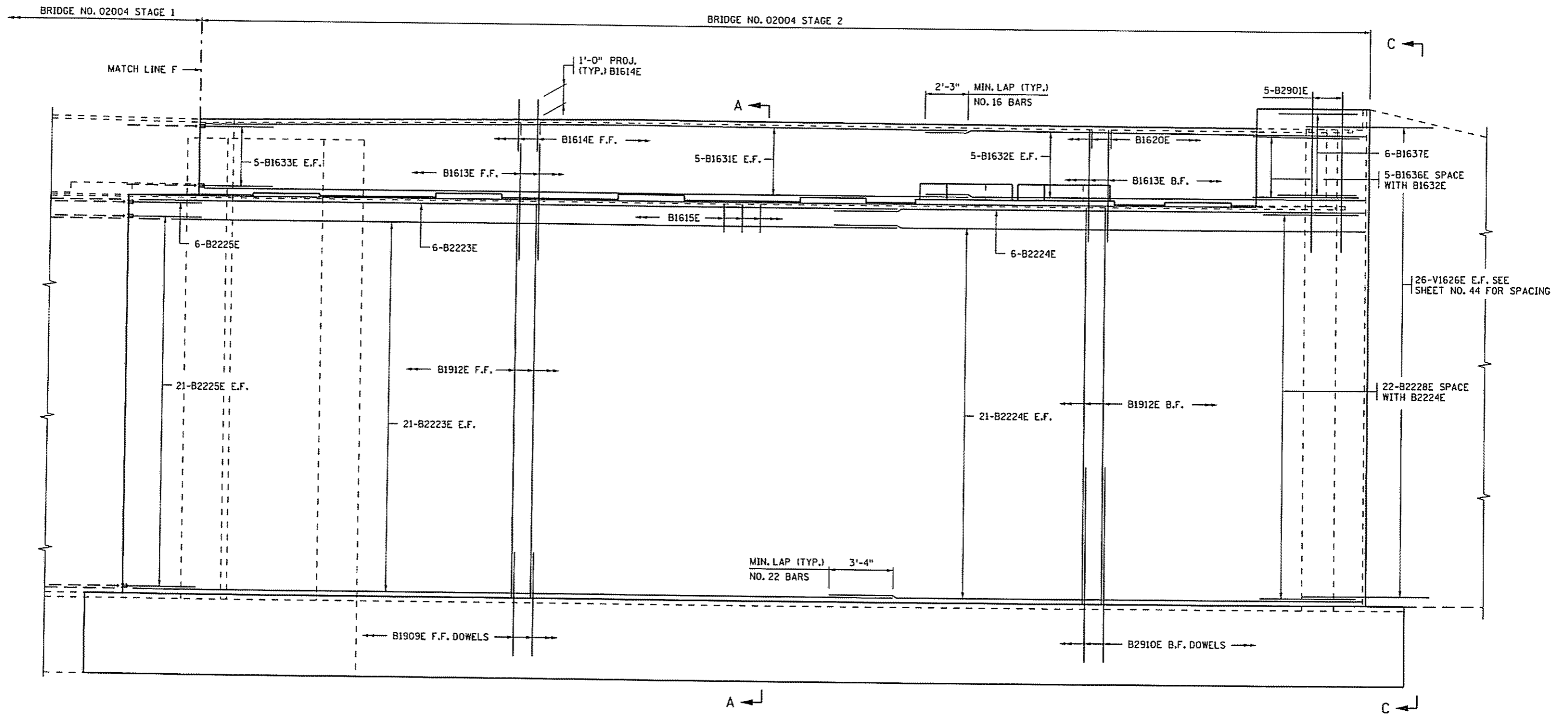
SHEET NO. 38 OF 72 SHEETS

BRIDGE NO. 02004

2/18/2009 S:\Design\BNG2004\02004.EASTABUT.apr.dgn

**NOTES:**

F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.  
 E.F. DENOTES EACH FACE.  
 SEE SHEET NO. 40 FOR SECTION A-A AND C-C.



BRIDGE NO. 02003

BRIDGE NO. 02004

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
**EAST ABUTMENT  
 REINFORCEMENT**

DES: M.C.D.	DR: P.F.	APPROVED: <i>2/23/09</i>
CHK: P.J.K	CHK: J.A.J.	

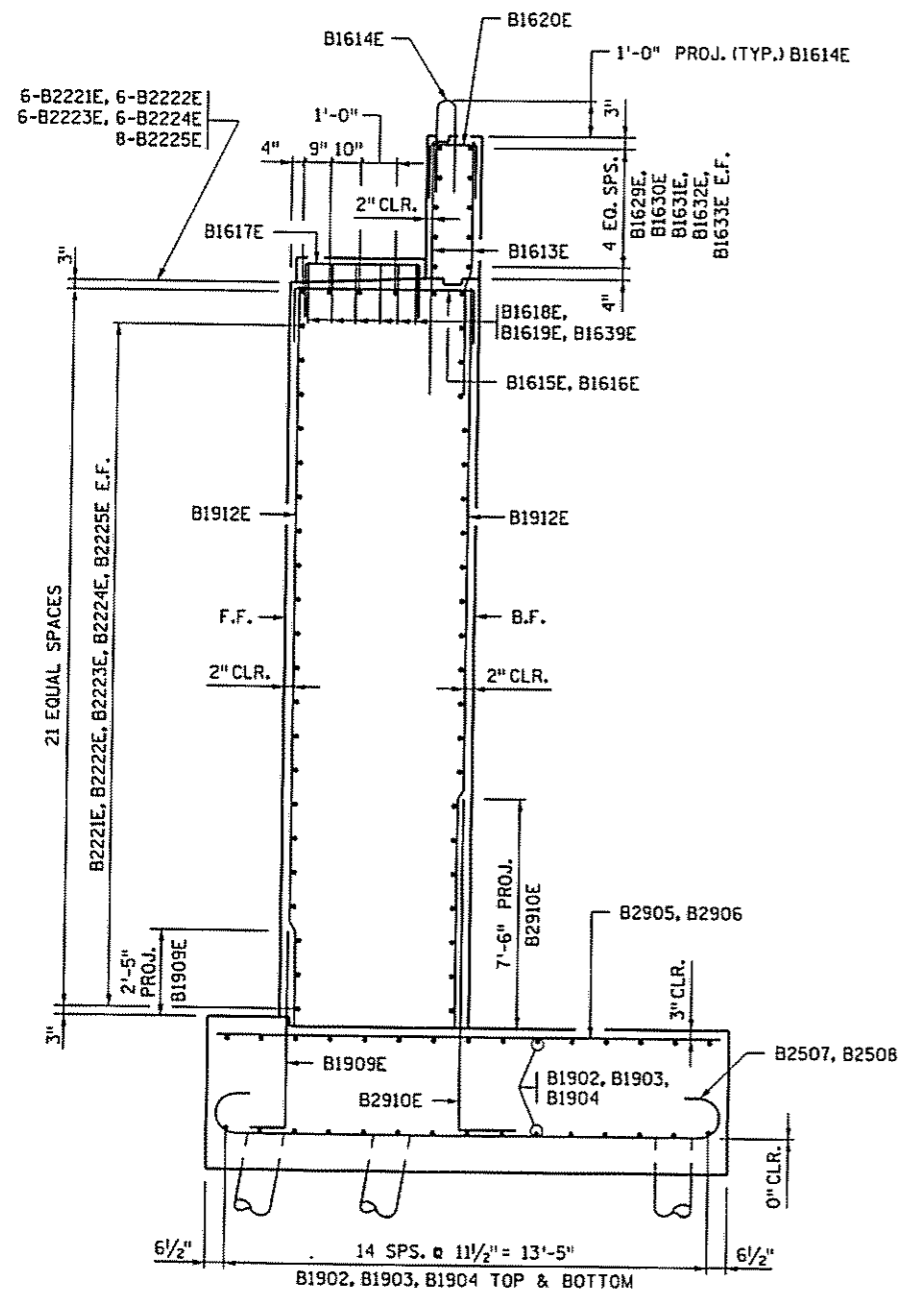
SHEET NO. 39 OF 72 SHEETS

BRIDGE NO.  
 02004

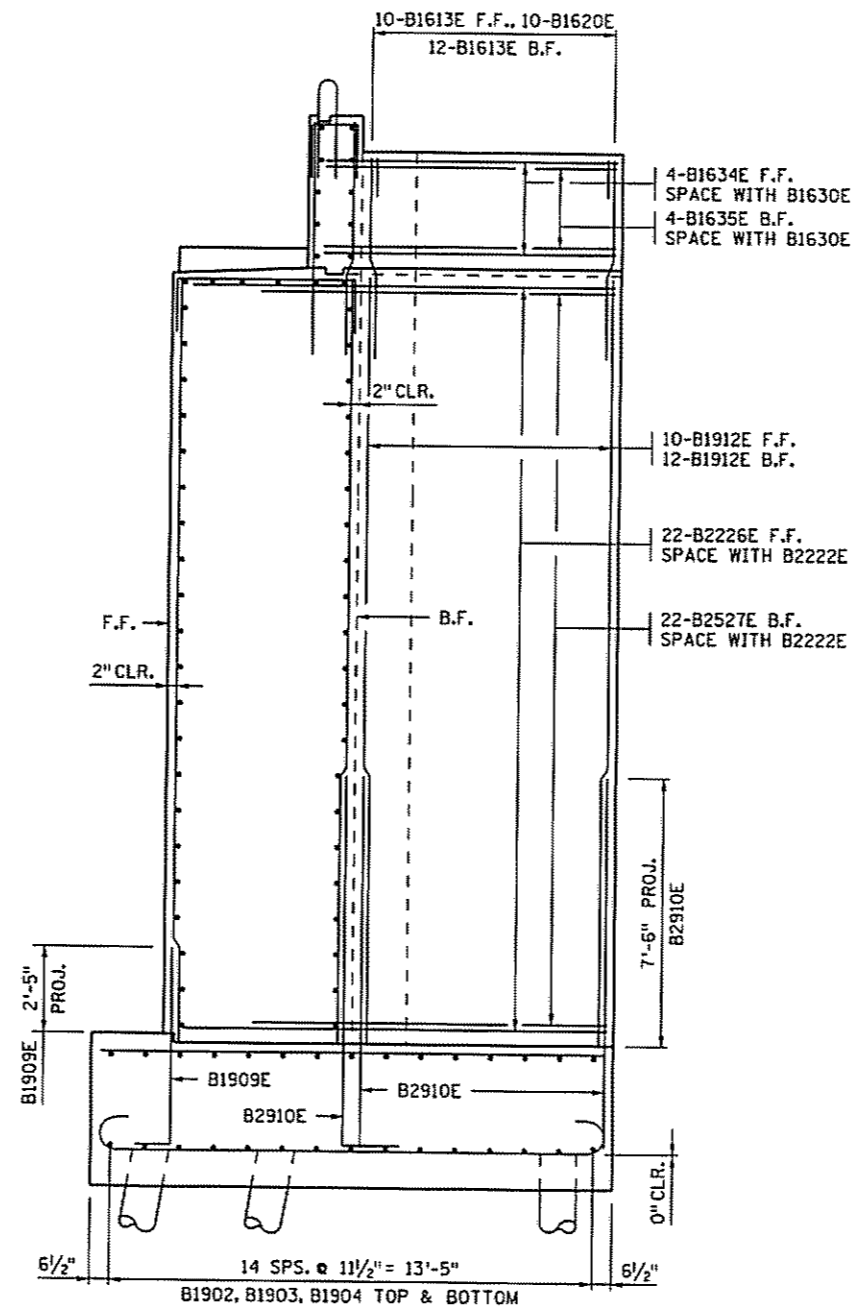
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**NOTES:**

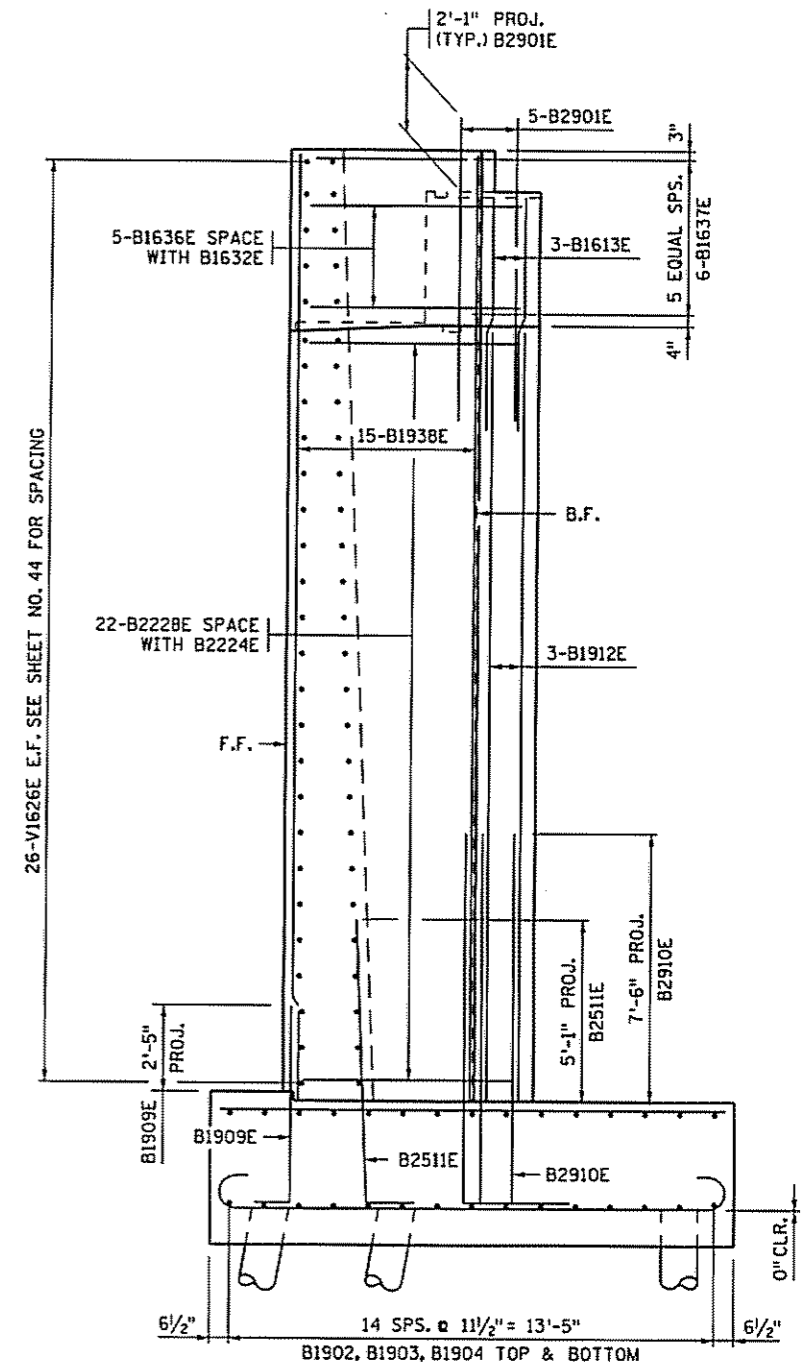
F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.  
 E.F. DENOTES EACH FACE.



**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

2/18/2009 5:\Design\B2004\02004.EASTABUT.rvt.dgn

CERTIFIED BY *moises dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

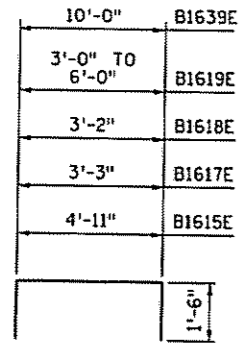
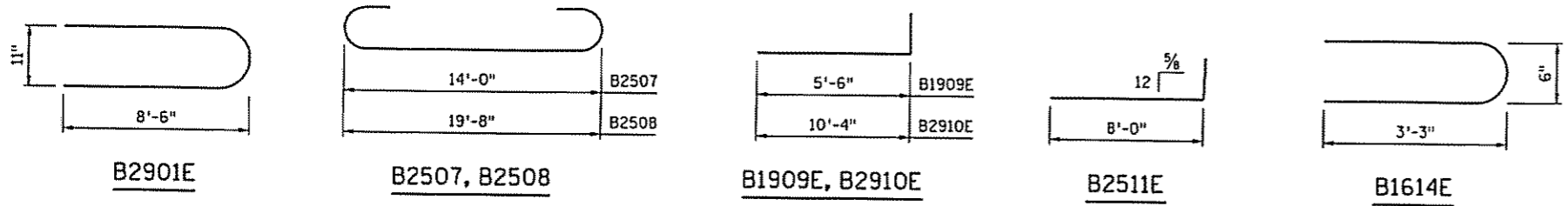
TITLE: EAST ABUTMENT REINFORCEMENT

DES: M.C.D. DR: P.F. APPROVED: 2/23/09  
 CHK: P.J.K. CHK: J.A.J.  
 SHEET NO. 40 OF 72 SHEETS

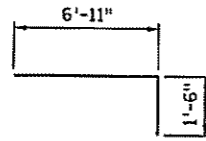
BRIDGE NO. 02004

BILL OF REINFORCEMENT FOR EAST ABUTMENT

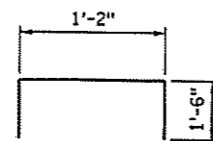
BAR	NO. STAGE 1	NO. STAGE 2	TOTAL NO.	LENGTH	SHAPE	LOCATION
B2901E	—	5	5	17'-7"		RAILING TIE
B1902	30	30	60	37'-6"		FOOTING LONGIT., TOP & BOTTOM
B1903	—	2 SERIES OF 15	2 SERIES OF 15	21'-0" TO 34'-3"		FOOTING LONGIT., TOP & BOTTOM
B1904	(1)	(1)	30	(1)		FOOTING COUPLERS
B2905	29	55	84	14'-0"		FOOTING TRANSVERSE TOP
B2906	14	14	28	19'-8"		FOOTING TRANSVERSE TOP
B2507	58	109	167	15'-10"		FOOTING TRANSVERSE BOTTOM
B2508	28	28	56	21'-6"		FOOTING TRANSVERSE BOTTOM
B1909E	36	71	107	6'-6"		FOOTING DOWEL
B2910E	54	61	115	11'-11"		FOOTING DOWEL
B2511E	—	3	3	9'-4"		FOOTING DOWEL
B1912E	90	119	209	20'-6"		BRIDGE SEAT VERTICAL EACH FACE
B1613E	90	119	209	6'-9"		PARAPET VERTICAL EACH FACE
B1614E	36	59	95	6'-10"		PARAPET VERTICAL FRONT FACE
B1615E	32	60	92	7'-11"		BRIDGE SEAT TIE
B1616E	5	5	10	8'-5"		BRIDGE SEAT TIE
B1617E	28	56	84	6'-3"		BRIDGE SEAT TIE
B1618E	18	30	48	6'-2"		BRIDGE SEAT TIE
B1619E	1 SERIES OF 6	—	6	6'-0" TO 9'-0"		BRIDGE SEAT TIE
B1620E	46	59	105	4'-2"		PARAPET TIE
B2221E	48	—	48	7'-2"		BRIDGE SEAT HORIZONTAL
B2222E	48	—	48	35'-6"		BRIDGE SEAT HORIZONTAL
B2223E	—	48	48	40'-0"		BRIDGE SEAT HORIZONTAL
B2224E	—	48	48	28'-0"		BRIDGE SEAT HORIZONTAL
B2225E	(2)	(2)	48	(2)		BRIDGE SEAT COUPLERS
B2226E	22	—	22	20'-3"		BRIDGE SEAT HORIZONTAL
B2527E	22	—	22	16'-0"		BRIDGE SEAT HORIZONTAL
B2228E	—	22	22	15'-6"		BRIDGE SEAT HORIZONTAL
B1629E	10	—	10	5'-0"		PARAPET HORIZONTAL
B1630E	10	—	10	35'-6"		PARAPET HORIZONTAL
B1631E	—	10	10	40'-0"		PARAPET HORIZONTAL
B1632E	—	10	10	23'-3"		PARAPET HORIZONTAL
B1633E	(3)	(3)	10	(3)		PARAPET COUPLERS
B1634E	4	—	4	13'-10"		PARAPET HORIZONTAL
B1635E	4	—	4	16'-9"		PARAPET HORIZONTAL
B1636E	—	5	5	12'-3"		PARAPET HORIZONTAL
B1637E	—	6	6	16'-9"		PARAPET HORIZONTAL
B1938E	—	15	15	26'-0"		S.E. CORNER VERTICAL
B1639E	—	7	7	13'-0"		BRIDGE SEAT TIE
B1640E	—	18	18	8'-9"		SHEAR BLOCK VERTICAL
B1641E	—	8	8	4'-7"		SHEAR BLOCK HORIZONTAL



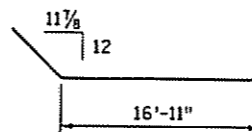
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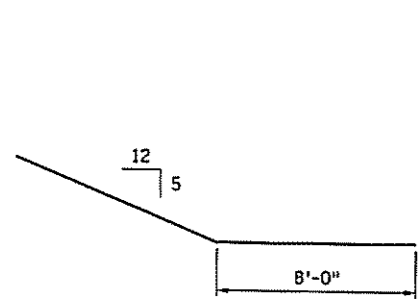
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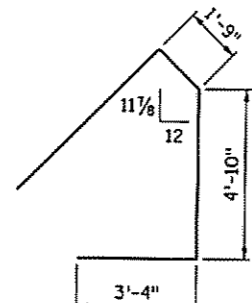
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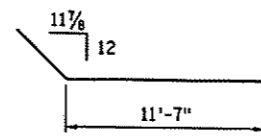
B2226E



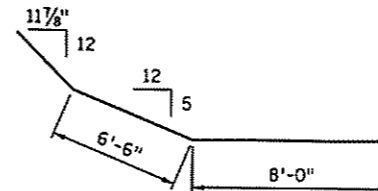
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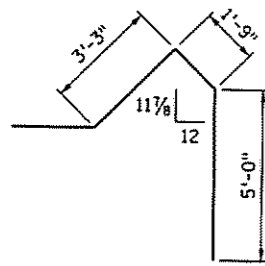
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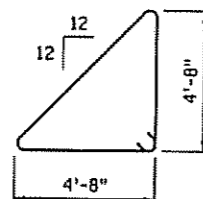
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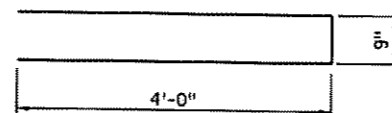
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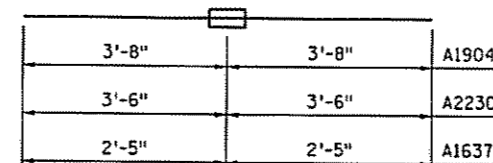
B1636E



B1637E



B1640E



B1904, B2230E, B1637E

NOTES:

- B1904 NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-19". 3'-6" MINIMUM LAP EACH SIDE OF COUPLER.
- B2225E NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS (EPOXY COATED)". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-22". 3'-4" MINIMUM LAP EACH SIDE OF COUPLER.
- B1633E NOT INCLUDED IN WEIGHT OF "REINFORCEMENT BARS (EPOXY COATED)". TO BE INCLUDED IN ITEM "COUPLERS (REINFORCEMENT BARS) T-16". 2'-3" MINIMUM LAP EACH SIDE OF COUPLER.

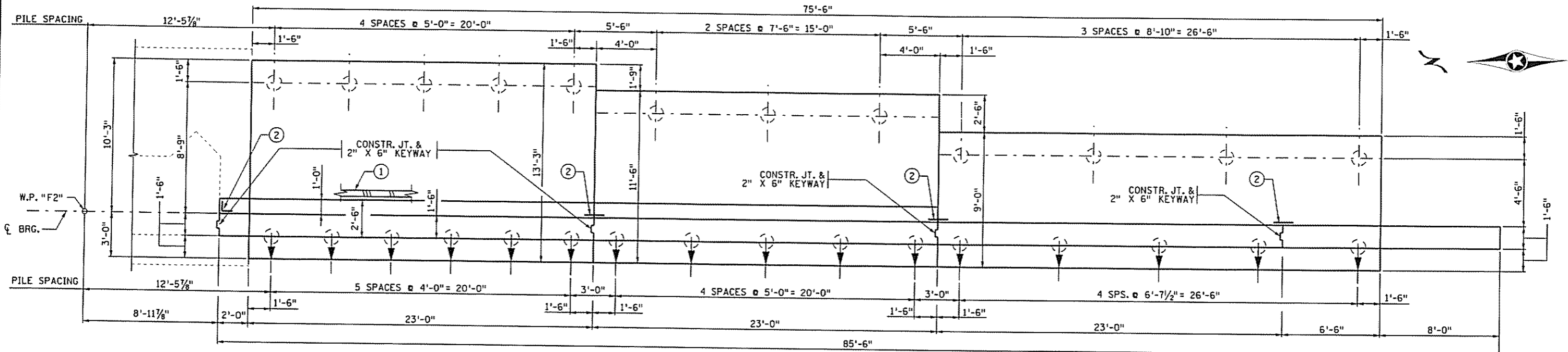
2/19/2009 5:\Design\B2228\412228\412228.dwg

CERTIFIED BY Moises C. Dimaculangan 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

EAST ABUTMENT REINFORCEMENT

DES: M.C.D.	DR: P.F.	APPROVED: 2/23/09	BRIDGE NO. 02004
CHK: P.J.K.	CHK: J.A.J.		

SHEET NO. 41 OF 72 SHEETS



PLAN VIEW WINGWALL "D"

WINGWALL "D" REQUIRED NOMINAL PILE BEARING RESISTANCE $R_n$ - TONS/PILE		
FIELD CONTROL METHOD	$\phi_{dyn}$	* $R_n$
MN/DOT NOMINAL RESISTANCE FORMULA	0.40	247.2
PDA	0.65	152.1

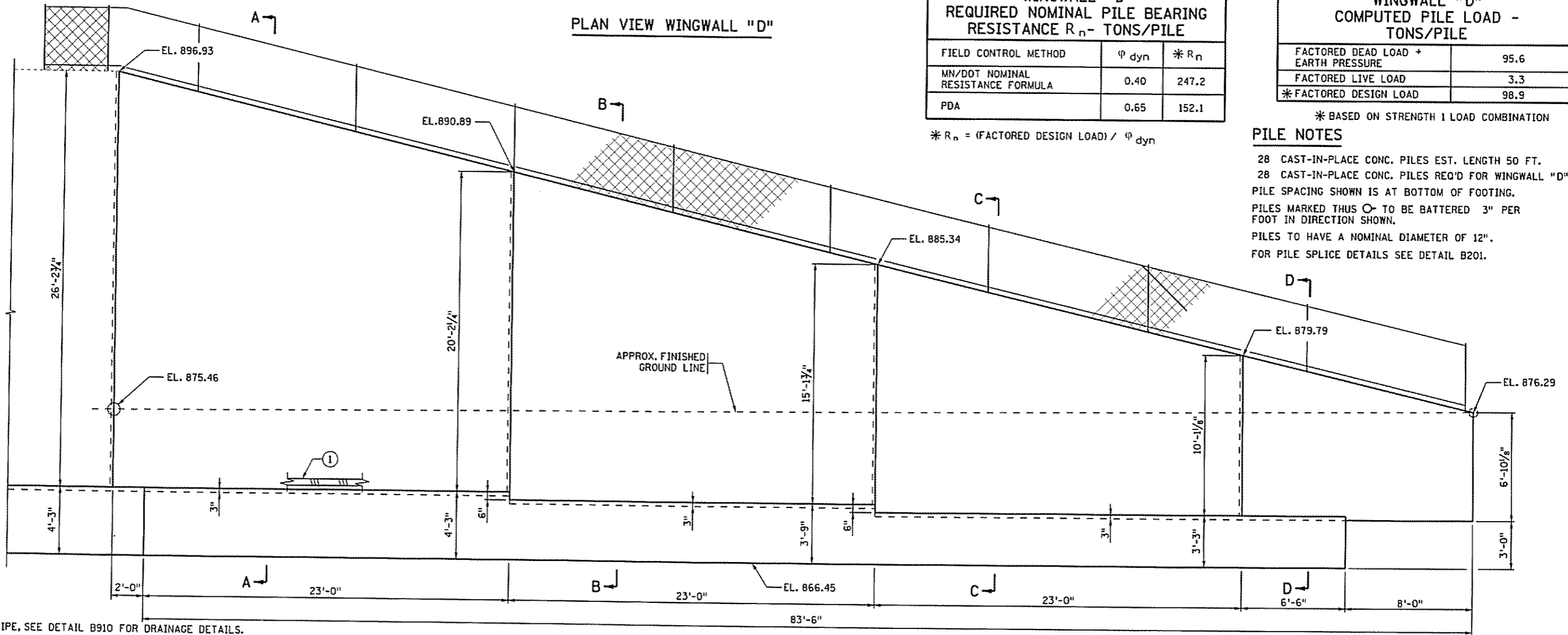
\*  $R_n = (\text{FACTORED DESIGN LOAD}) / \phi_{dyn}$

WINGWALL "D" COMPUTED PILE LOAD - TONS/PILE	
FACTORED DEAD LOAD + EARTH PRESSURE	95.6
FACTORED LIVE LOAD	3.3
* FACTORED DESIGN LOAD	98.9

\* BASED ON STRENGTH I LOAD COMBINATION

PILE NOTES

28 CAST-IN-PLACE CONC. PILES EST. LENGTH 50 FT.  
 28 CAST-IN-PLACE CONC. PILES REQ'D FOR WINGWALL "D"  
 PILE SPACING SHOWN IS AT BOTTOM OF FOOTING.  
 PILES MARKED THUS  $\odot$  TO BE BATTERED 3" PER FOOT IN DIRECTION SHOWN.  
 PILES TO HAVE A NOMINAL DIAMETER OF 12".  
 FOR PILE SPLICE DETAILS SEE DETAIL B201.



ELEVATION WINGWALL "D"  
(PILES NOT SHOWN)

NOTES:

- ① PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.
- ② MEMBRANE WATERPROOFING SYSTEM PER Mn/DOT SPEC. 2481.3B. PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43). SEE SHEET NO. 43 FOR SECTIONS A-A, B-B, C-C AND D-D.

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE:  
 WINGWALL "D" GEOMETRICS

DES: M.C.D. DR: N.A. APPROVED: *2/23/09*  
 CHK: P.J.K. CHK: J.A.J.

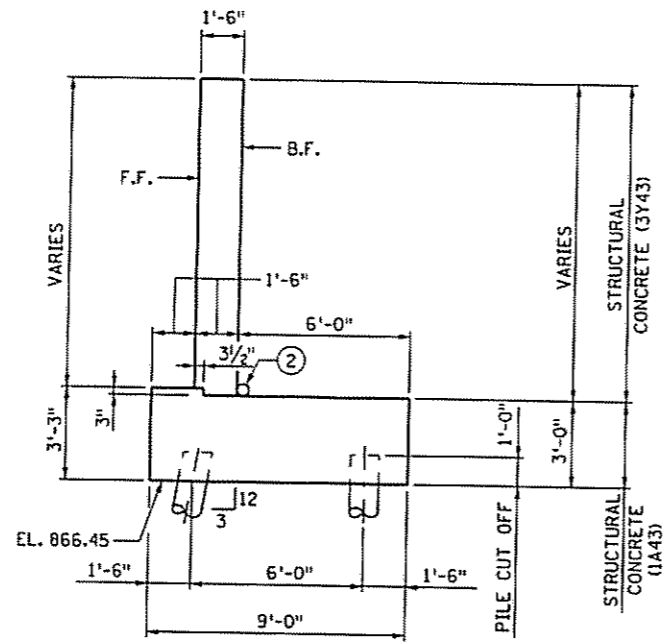
BRIDGE NO. 02004  
 SHEET NO. 42 OF 72 SHEETS

**SUMMARY OF QUANTITIES  
FOR WINGWALL "D"**

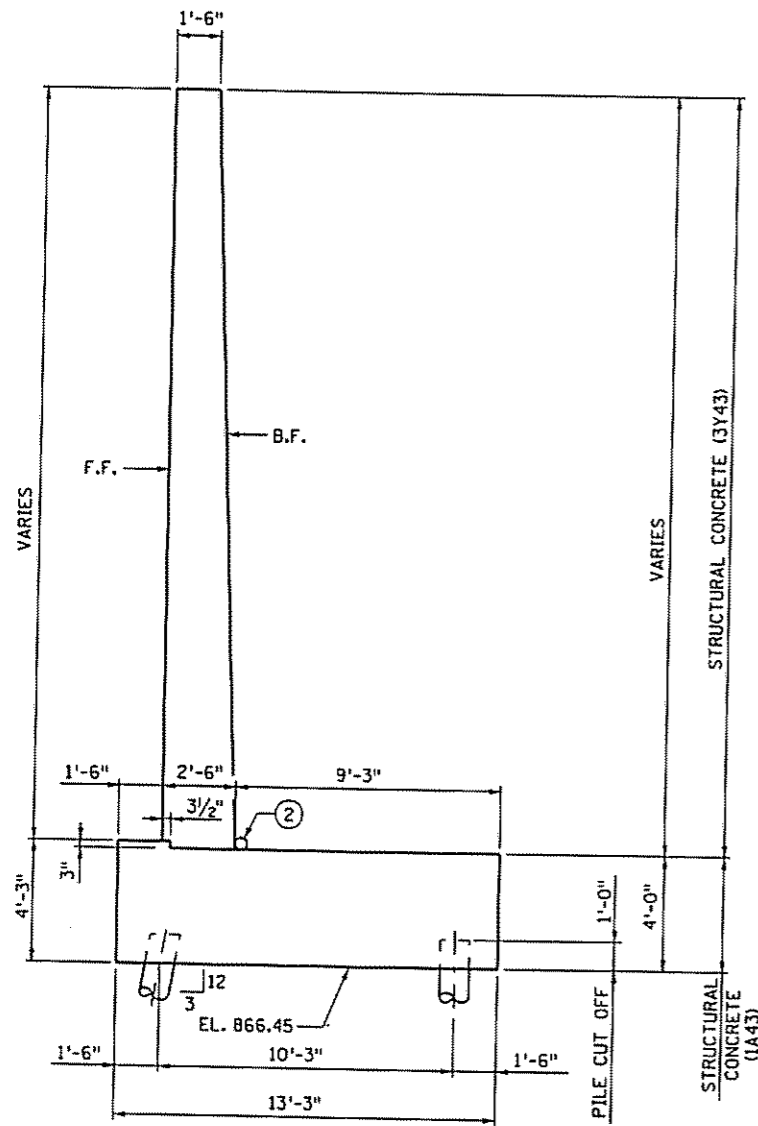
STRUCTURAL CONCRETE (1A43)	110 CU. YD.
STRUCTURAL CONCRETE (3Y43)	93 CU. YD.
REINFORCEMENT BARS	8530 POUND
REINFORCEMENT BARS (EPOXY COATED)	11750 POUND
C-I-P CONCRETE PILING DELIVERED 12"	1400 LIN. FT.
C-I-P CONCRETE PILING DRIVEN 12"	1400 LIN. FT.
MEMBRANE WATERPROOFING	73 LIN. FT.

- ① PAYMENT SHALL BE CONSIDERED INCIDENTAL TO STRUCTURAL CONCRETE (3Y43).
- ② PERFORATED PIPE, SEE DETAIL B910 FOR DRAINAGE DETAILS.

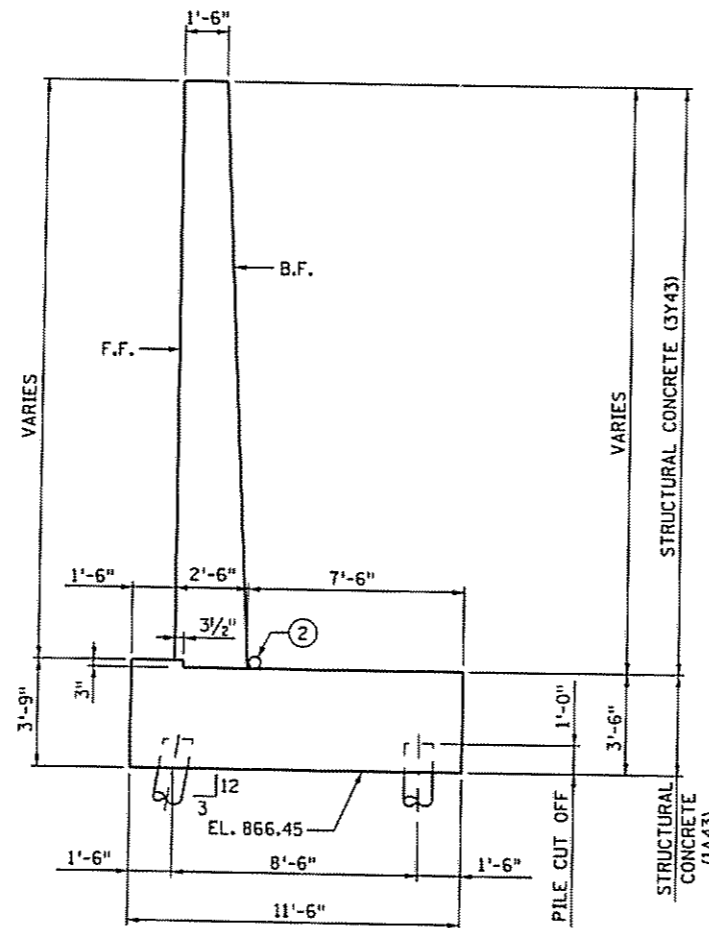
F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.



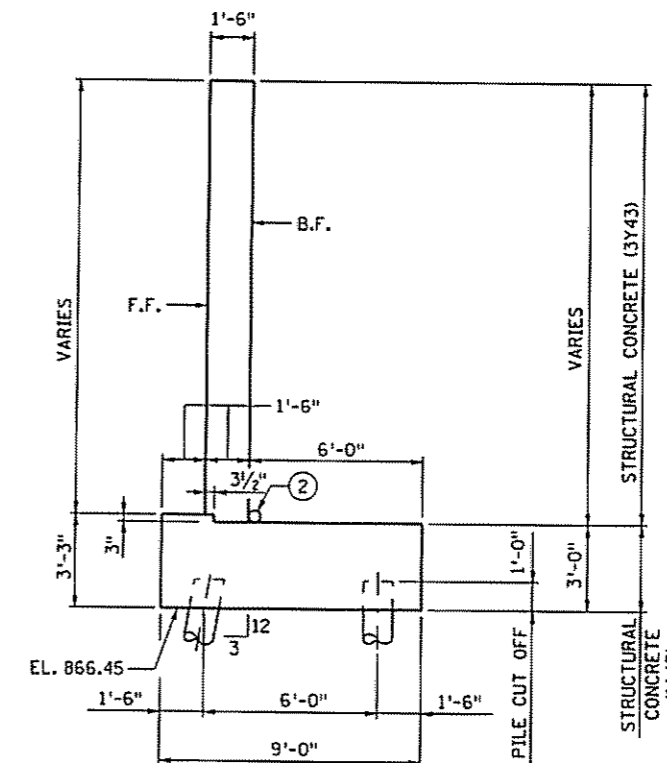
**SECTION D-D**



**SECTION A-A**



**SECTION B-B**



**SECTION C-C**

CERTIFIED BY *M.C. Dimaculangan* 2/23/09  
DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

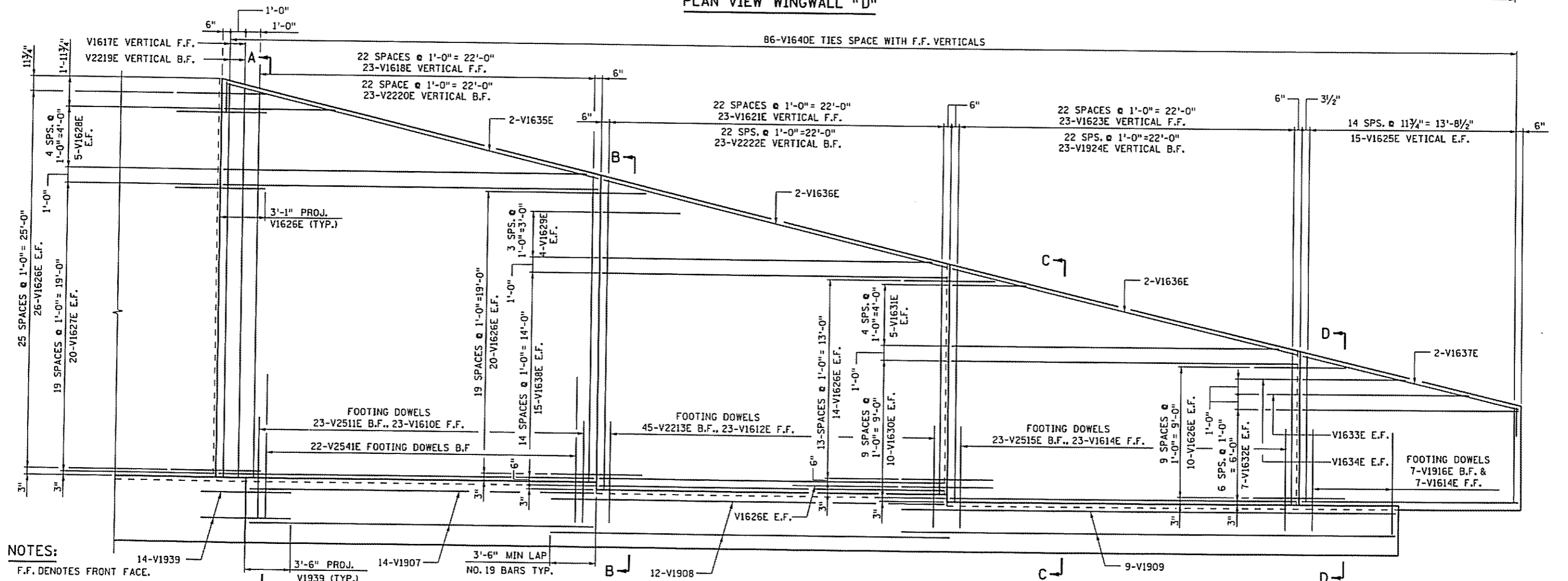
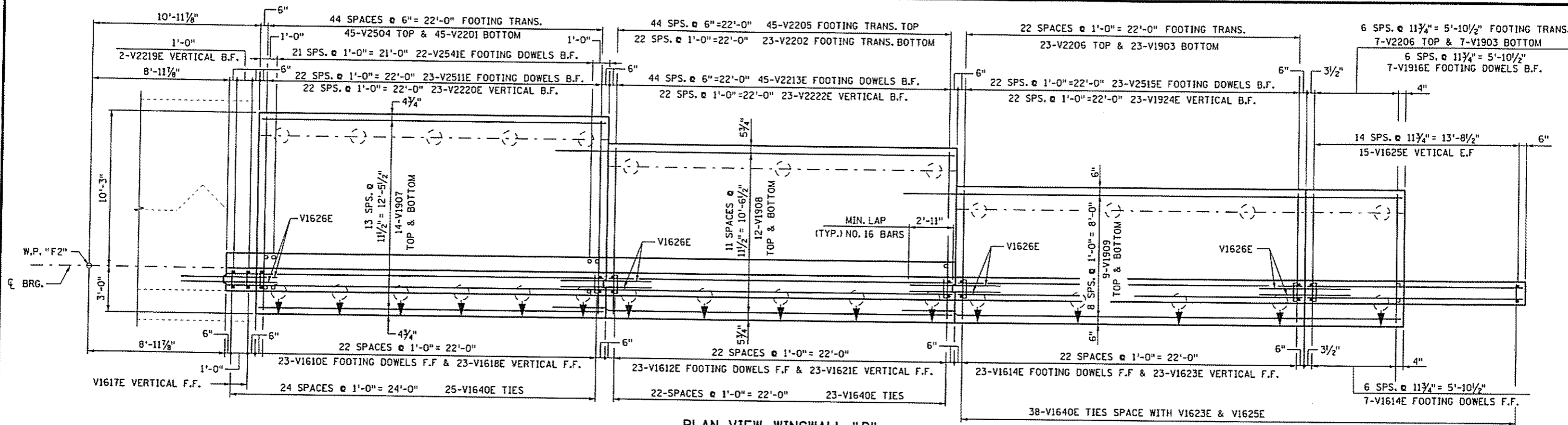
TITLE:  
**WINGWALL "D" GEOMETRICS**

DES: M.C.D.	DR: N.A.	APPROVED: <i>2/23/09</i>
CHK: P.J.K.	CHK: J.A.J.	

SHEET NO. 43 OF 72 SHEETS

BRIDGE NO.  
 02004





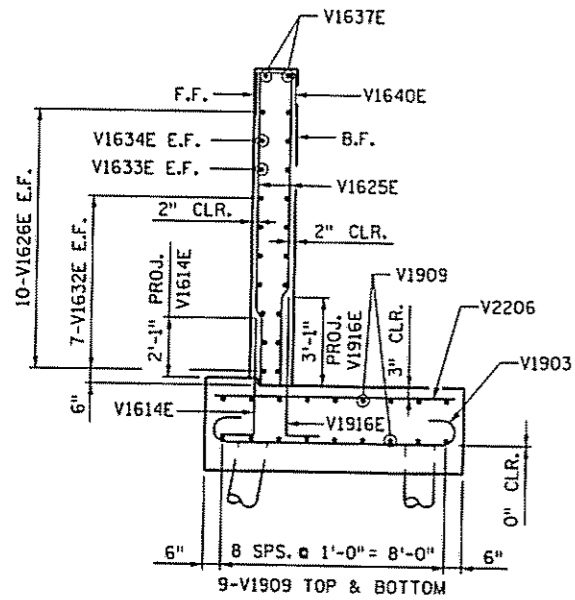
**NOTES:**  
 F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.  
 E.F. DENOTES EACH FACE.  
 SEE SHEET NO. 45 FOR SECTIONS A-A, B-B, C-C AND D-D.

CERTIFIED BY *M.C. Dimaculangan* 2/23/09 DATE  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: WINGWALL "D" REINFORCEMENT

DES: M.C.D.	DR: N.A.	APPROVED: 2/23/09
CHK: P.J.K.	CHK: J.A.J.	

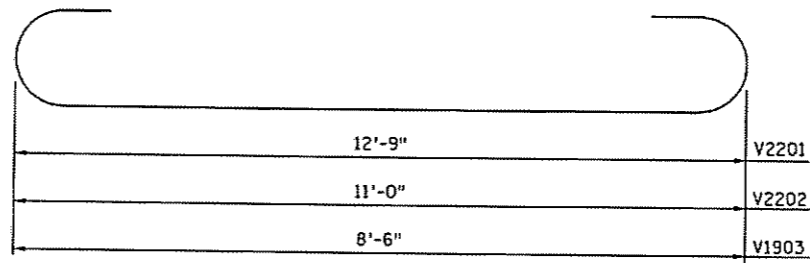
SHEET NO. 44 OF 72 SHEETS BRIDGE NO. 02004



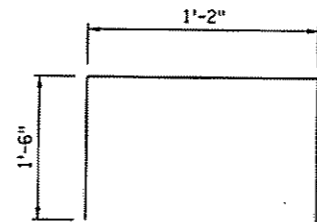
SECTION D-D

5'-3"	V1610E
8'-0"	V2511E
4'-9"	V1612E
8'-5"	V2213E
4'-3"	V1614E
7'-0"	V2515E
5'-0"	V1916E
12'-11"	V2541E

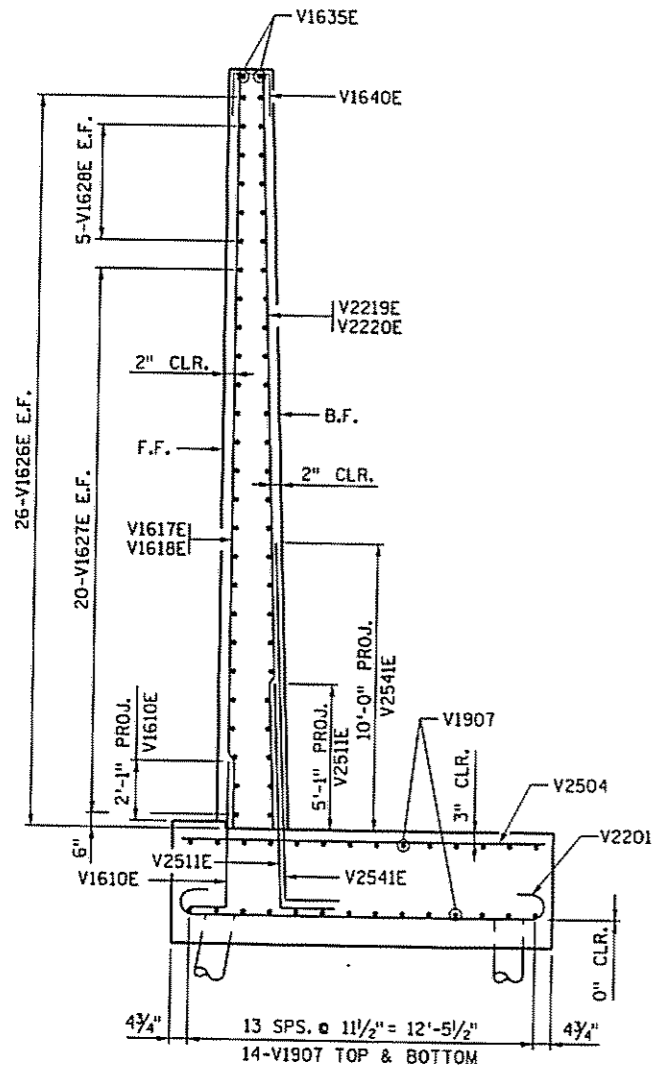
V1610E, V2511E, V1612E, V2213E, V1614E, V2515E, V1916E & V2541E



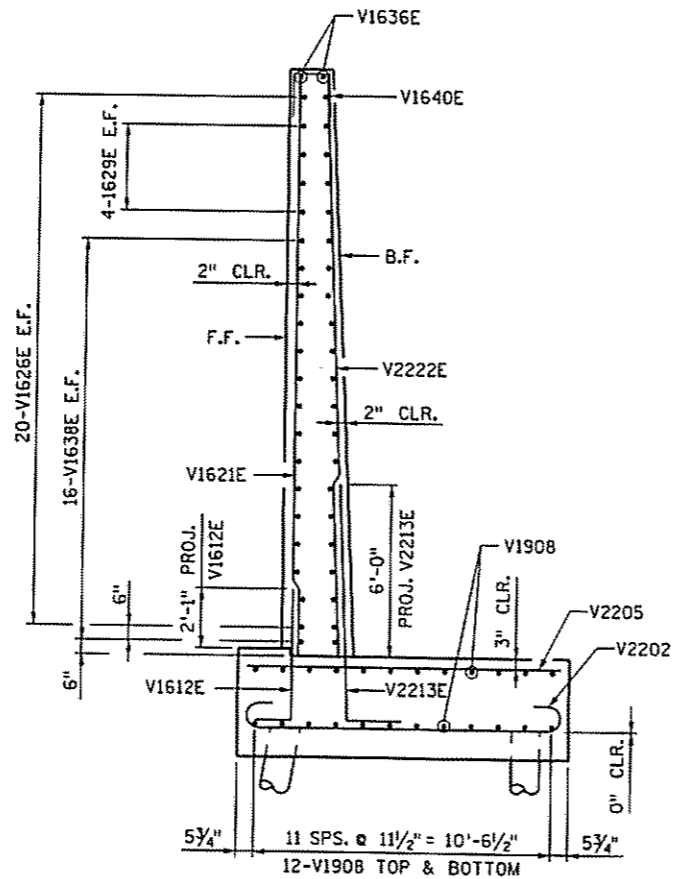
V2201, V2202 & V1903



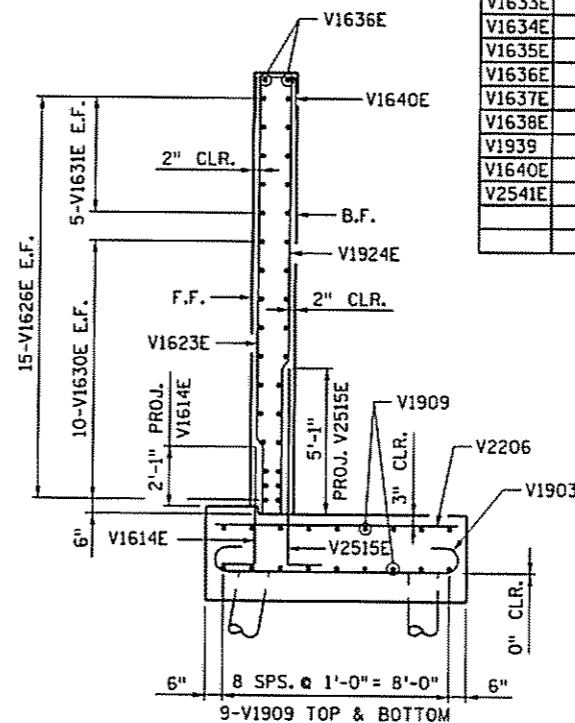
V1640E



SECTION A-A



SECTION B-B



SECTION C-C

BILL OF REINFORCEMENT FOR WINGWALL "D"

BAR	NO.	LENGTH	SHAPE	LOCATION
V2201	45	14'-5"	U	FOOTING TRANSVERSE BOTTOM
V2202	23	12'-8"	U	FOOTING TRANSVERSE BOTTOM
V1903	30	9'-10"	U	FOOTING TRANSVERSE BOTTOM
V2504	45	12'-9"	U	FOOTING TRANSVERSE TOP
V2205	45	11'-0"	U	FOOTING TRANSVERSE TOP
V2206	30	8'-6"	U	FOOTING TRANSVERSE TOP
V1907	28	22'-8"	U	FOOTING LONGITUDINAL TOP & BOTTOM
V1908	24	26'-6"	U	FOOTING LONGITUDINAL TOP & BOTTOM
V1909	18	33'-0"	U	FOOTING LONGITUDINAL TOP & BOTTOM
V1610E	23	6'-1"	U	FOOTING DOWEL F.F.
V2511E	23	9'-4"	U	FOOTING DOWEL B.F.
V1612E	23	5'-7"	U	FOOTING DOWEL F.F.
V2213E	45	9'-7"	U	FOOTING DOWEL B.F.
V1614E	30	5'-1"	U	FOOTING DOWEL F.F.
V2515E	23	8'-4"	U	FOOTING DOWEL B.F.
V1916E	7	6'-0"	U	FOOTING DOWEL B.F.
V1617E	2	25'-8"	U	WINGWALL VERTICAL F.F.
V1618E	1 SERIES OF 23	25'-4" TO 20'-1"	U	WINGWALL VERTICAL F.F.
V2219E	2	25'-11"	U	WINGWALL VERTICAL B.F.
V2220E	1 SERIES OF 23	25'-7" TO 20'-4"	U	WINGWALL VERTICAL B.F.
V1621E	1 SERIES OF 23	20'-5" TO 15'-1"	U	WINGWALL VERTICAL F.F.
V2222E	1 SERIES OF 23	20'-8" TO 15'-4"	U	WINGWALL VERTICAL B.F.
V1623E	1 SERIES OF 23	15'-4" TO 10'-0"	U	WINGWALL VERTICAL F.F.
V1924E	1 SERIES OF 23	15'-7" TO 10'-3"	U	WINGWALL VERTICAL B.F.
V1625E	2 SERIES OF 15	9'-10" TO 6'-6"	U	WINGWALL VERTICAL E.F.
V1626E	142	6'-2"	U	WINGWALL HORIZONTAL
V1627E	40	24'-8"	U	WINGWALL HORIZONTAL
V1628E	2 SERIES OF 5	23'-11" TO 7'-4"	U	WINGWALL HORIZONTAL
V1629E	2 SERIES OF 4	19'-7" TO 7'-2"	U	WINGWALL HORIZONTAL
V1630E	20	22'-8"	U	WINGWALL HORIZONTAL
V1631E	2 SERIES OF 5	21'-5" TO 4'-10"	U	WINGWALL HORIZONTAL
V1632E	14	14'-2"	U	WINGWALL HORIZONTAL
V1633E	2	10'-11"	U	WINGWALL HORIZONTAL
V1634E	2	6'-9"	U	WINGWALL HORIZONTAL
V1635E	2	25'-4"	U	WINGWALL HORIZONTAL
V1636E	4	23'-3"	U	WINGWALL HORIZONTAL
V1637E	2	14'-6"	U	WINGWALL HORIZONTAL
V1638E	32	22'-8"	U	WINGWALL HORIZONTAL
V1939	28	7'-0"	U	FOOTING LONGITUDINAL TOP & BOTTOM
V1640E	86	4'-2"	U	WINGWALL TIE
V2541E	22	14'-3"	U	FOOTING DOWEL B.F.

NOTES:

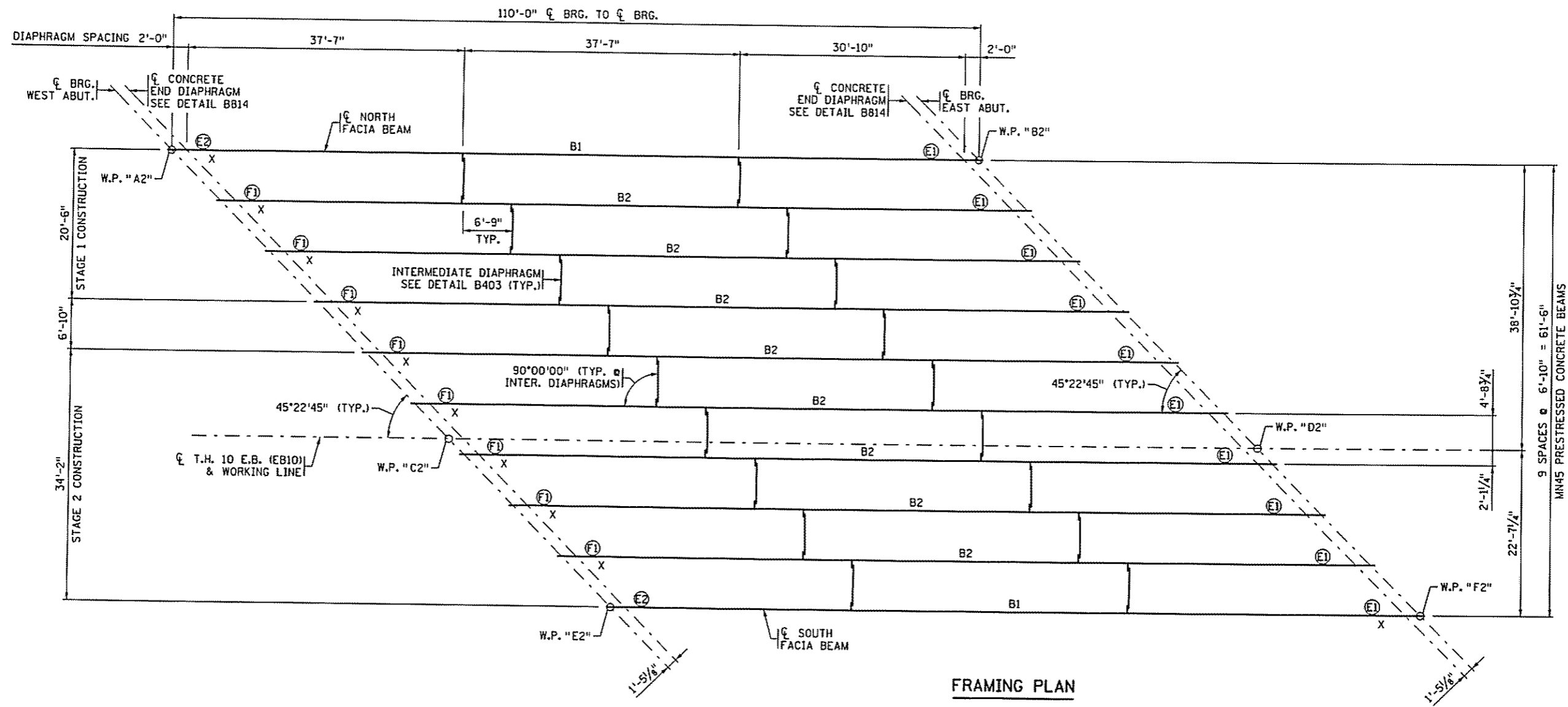
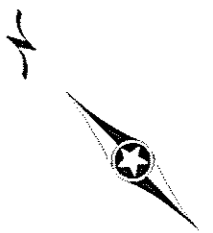
F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.  
E.F. DENOTES EACH FACE.

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: WINGWALL "D" REINFORCEMENT

DES: M.C.D. DR: N.A. APPROVED: 2/23/09  
CHK: P.J.K. CHK: J.A.J.  
SHEET NO. 45 OF 72 SHEETS

BRIDGE NO. 02004



**FRAMING PLAN**

**NOTES:**

- X DENOTES X END OF BEAM.
- (E1) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE E1. SEE DETAIL B311.
- (E2) DENOTES EXPANSION CURVED PLATE BEARING ASSEMBLY, TYPE E2. SEE DETAIL B311.
- (F1) DENOTES FIXED CURVED PLATE BEARING ASSEMBLY, TYPE F1. SEE DETAIL B310.

2/17/2009 5:\Design\022004\JHB\022004.swp.dgn

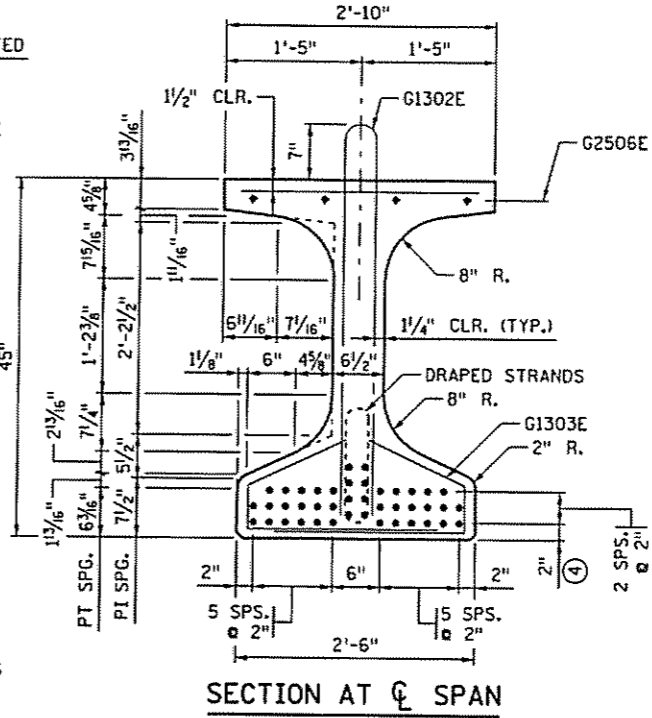
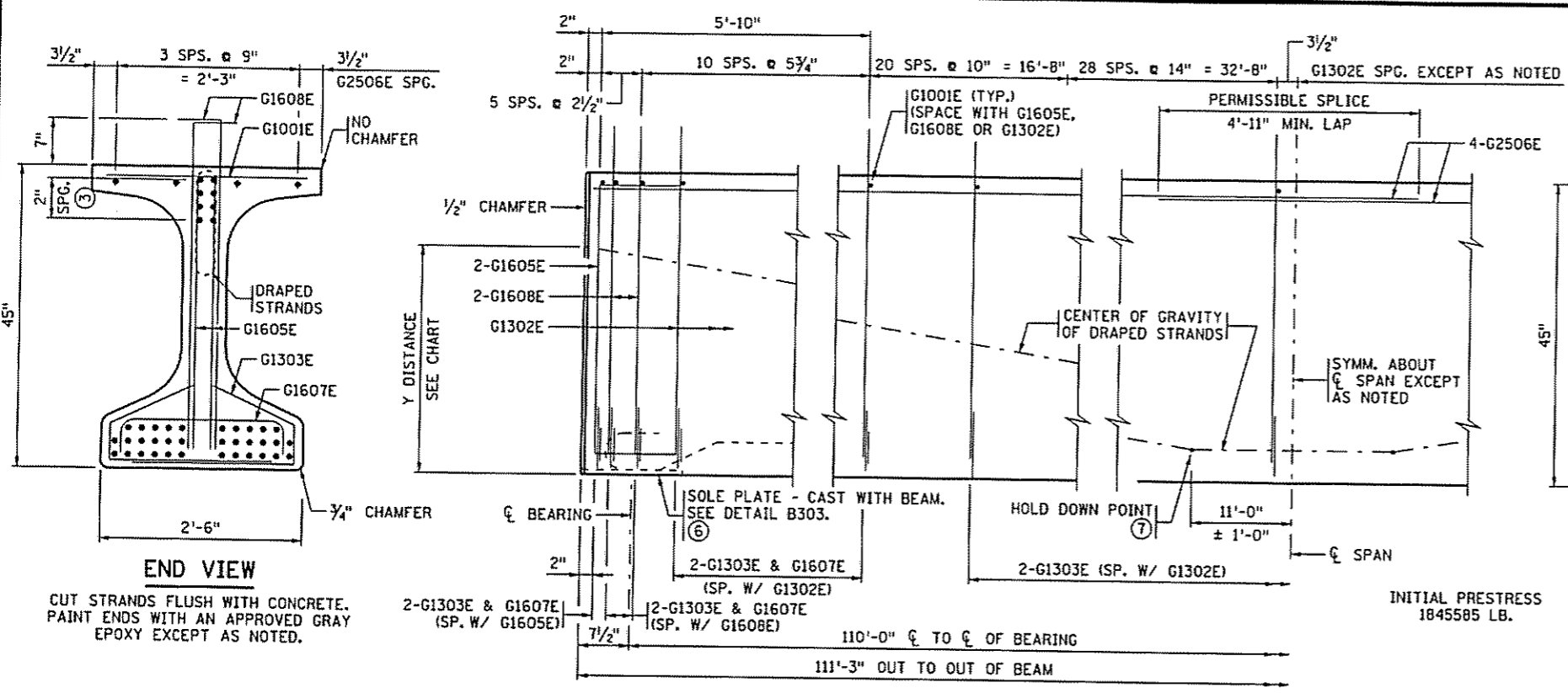
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: **FRAMING PLAN**

DES: P.J.K.	DR: J.H.B.	APPROVED: <i>2/23/09</i>
CHK: M.C.D.	CHK: J.A.J.	

SHEET NO. 46 OF 72 SHEETS

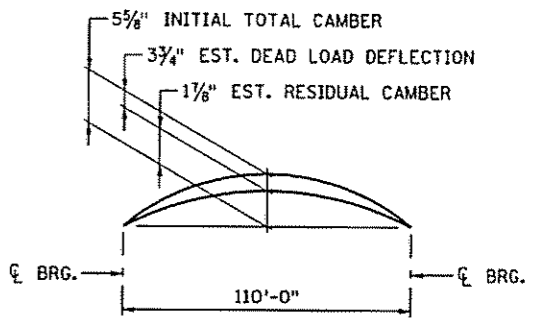
BRIDGE NO. 02004



Y DISTANCES (IN INCHES)			
	NO.	CL SPAN	END
STRAIGHT STRANDS	34	3.88	
DRAPED STRANDS	8	6	39
TOTAL STRANDS	42	4.29	

Y = DISTANCE TO CENTER OF GRAVITY OF STRANDS FROM BOTTOM OF BEAM. ALL STRANDS SPACED 2" CENTER TO CENTER, HORIZONTALLY AND VERTICALLY, EXCEPT AS NOTED.

□ A TOLERANCE OF ± 1" WILL BE PERMITTED IN THIS DIMENSION.



INITIAL CAMBER IS GIVEN AFTER DIAPHRAGMS ARE IN PLACE.

DEAD LOAD DEFLECTION SHOWN IS FOR WEIGHT OF SLAB, WEARING COURSE, RAILING, SIDEWALK AND MEDIAN WHERE APPLICABLE.

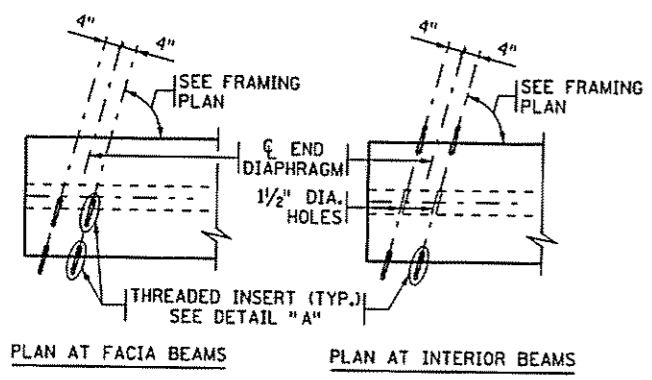
ENGINEER WILL TAKE ELEVATIONS AT TOP OF BEAMS AFTER ERECTION AND WILL ALLOW FOR DEFLECTION SHOWN TO ENABLE CONTRACTOR TO BUILD FORMS TO CORRECT GRADE AND SPECIFIED SLAB THICKNESS.

**END VIEW**  
CUT STRANDS FLUSH WITH CONCRETE. PAINT ENDS WITH AN APPROVED GRAY EPOXY EXCEPT AS NOTED.

**BEAM ELEVATION**

**SECTION AT CL SPAN**

**CAMBER DIAGRAM**

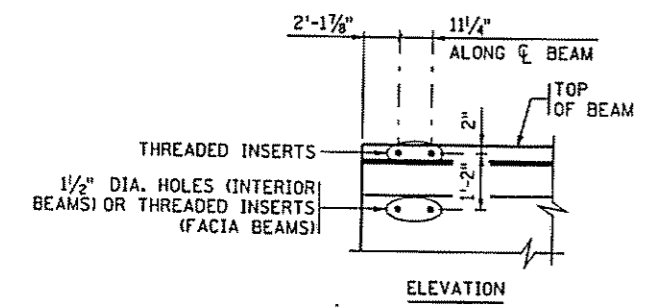


**PLAN AT FACIA BEAMS**      **PLAN AT INTERIOR BEAMS**

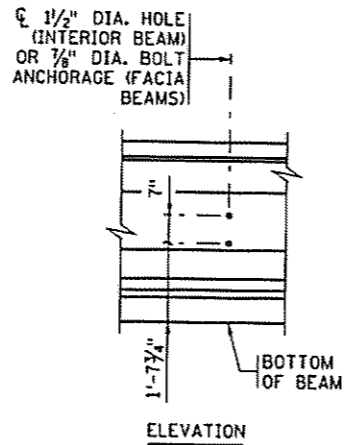
CALCULATED PRESTRESS LOSSES	
ELASTIC SHORTENING LOSS	23.25 ksi
LONG TERM LOSSES	25.89 ksi

MINIMUM CONCRETE STRENGTH - P.S.I.	
① f'cl	② f'c
7000	7500

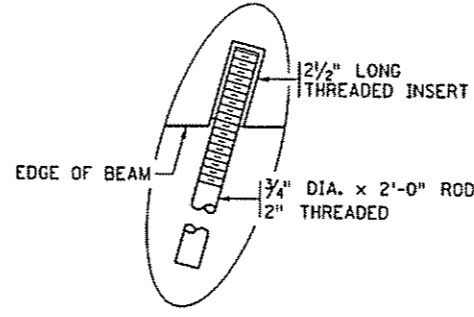
PRESTRESSING STRAND DIAMETER	
⑤ 1/2" □	
⑥ 0.60" ☒	



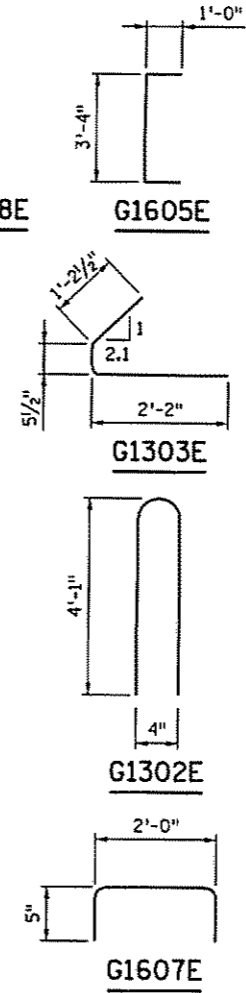
**CONCRETE END DIAPHRAGM**  
PARAPET ABUTMENT  
(SEE DETAIL B814 FOR DIAPHRAGM DETAILS)



**STEEL INTERMEDIATE DIAPHRAGM**  
(SEE DETAIL B403 FOR DIAPHRAGM DETAILS)



**DETAIL "A"**



**GENERAL NOTES**

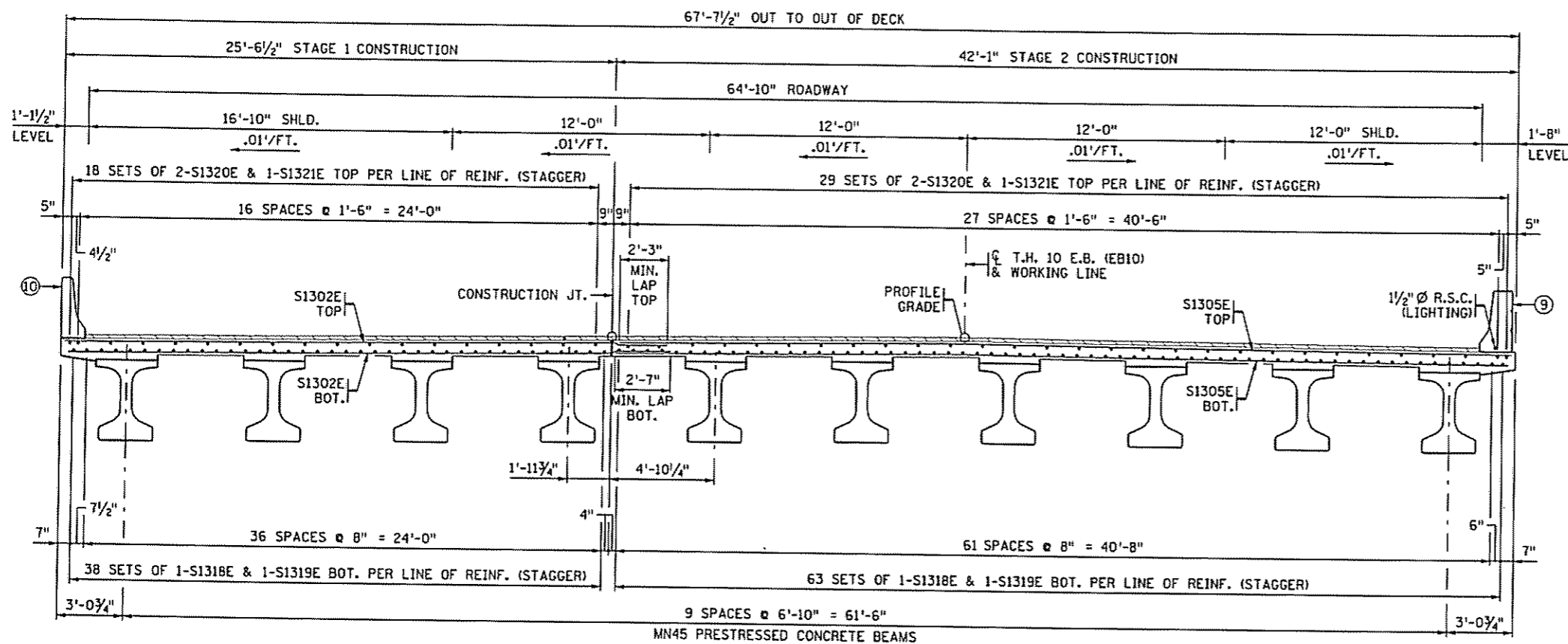
- TOPS OF BEAMS SHALL BE ROUGH FLOATED AND BROOMED TRANSVERSELY FOR BOND.
- PROVIDE HANDLING HOOKS OR DEVICES AS REQUIRED BY CONTRACTOR.
- EACH BEAM SHALL BE MARKED, SHOWING BRIDGE NUMBER, CASTING DATE, AND INDIVIDUAL IDENTIFICATION LETTERS AND NUMBERS. MARKINGS SHALL BE MADE ON THE FACE OF THE BEAM, NEAR THE END, SO LOCATED THAT THEY WILL BE EXPOSED AFTER THE END DIAPHRAGMS HAVE BEEN CAST. FACIA BEAMS SHALL BE MARKED ON THE INSIDE FACE. ALL MARKINGS SHALL BE STENCILED AND BE CLEARLY LEGIBLE. FOR LOCATION OF BEAMS, SEE FRAMING PLAN.
- ALL MATERIAL AND WORK SHOWN OR NOTED ON THIS SHEET SHALL BE INCLUDED IN UNIT PRICE BID FOR PRESTRESSED CONCRETE BEAMS. SEE Mn/DOT SPEC. 2405.
- SEE FRAMING PLAN FOR BEAM END MARKED "X" AND DIAPHRAGM SPACING.
- APPROXIMATE WEIGHT OF BEAM IS 41.3 TONS.
- AS AN ALTERNATE TO THE DIAPHRAGM ANCHORAGES SHOWN, THE CONTRACTOR MAY SUBMIT DETAILS OF A CAST-IN-PLACE ANCHORAGE TO THE ENGINEER FOR APPROVAL. ANCHORAGE MUST PROVIDE AN ULTIMATE PULL OUT STRENGTH OF 15 KIPS PER ANCHORAGE.
- ① MINIMUM CONCRETE STRENGTH AT TIME OF PRESTRESS TRANSFER.
- ② MINIMUM CONCRETE STRENGTH WHEN BEAM CAN BE TRANSPORTED AND INSTALLED.
- ③ DRAPED STRANDS.
- ④ STRAIGHT STRANDS.
- ⑤ PRESTRESSING STRANDS SHALL BE 7-WIRE LOW RELAXATION STRAND, CONFORMING TO ASTM A416, GRADE 270.
- ⑥ FOR INTEGRAL ABUTMENT, SOLE PLATE CAN BE ELIMINATED OR REPLACED WITH AN APPROVED PROTECTION PLATE.
- ⑦ CENTER OF GRAVITY OF HOLD DOWNS WHEN MULTIPLE HOLD DOWNS ARE USED.

REVISED:  
APPROVED: OCTOBER 26, 2005  
*David J. Anderson*  
STATE BRIDGE ENGINEER

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: MN45" PRESTRESSED CONCRETE BEAM (PRETENSIONED) MN45-112

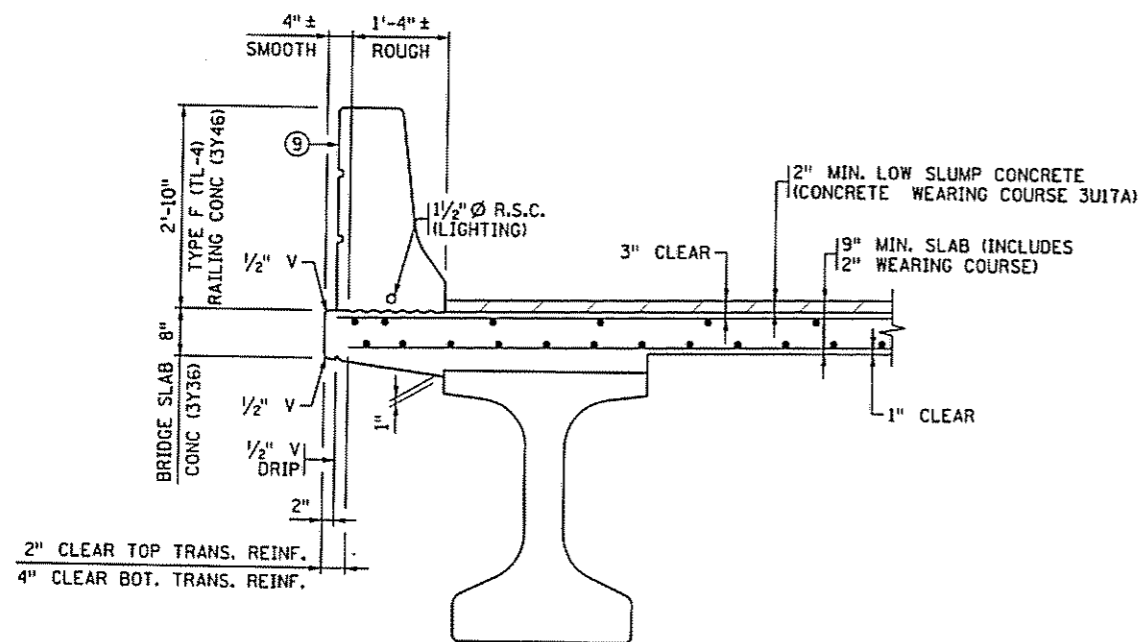
BEAMS B1-B2      FIG. 5-397.507  
DES: P.J.K.    DR: J.H.B.    APPROVED: 2/23/09  
CHK: M.C.D.    CHK: J.A.J.  
SHEET NO. 47 OF 72 SHEETS      BRIDGE NO. 02004



NORTH SIDE

TRANSVERSE SECTION

SOUTH SIDE



PART TRANSVERSE SECTION THRU DECK

SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE

ITEM	STAGE 1 NO.	STAGE 2 NO.	TOTAL
① BRIDGE SLAB CONCRETE (3Y36)	3031	4994	8025 SQ. FT.
② CONCRETE WEARING COURSE (3U17A)			15578 SQ. FT.
③ TYPE F (TL-4) RAILING CONCRETE (3Y46)		124	124 LIN. FT.
④ REINFORCEMENT BARS (EPOXY COATED)	17960	25530	43490 POUND
⑤ EXP. CURVED PLATE BEARING ASSEMBLY TYPE E1	4	6	10 EACH
⑤ EXP. CURVED PLATE BEARING ASSEMBLY TYPE E2	1	1	2 EACH
⑤ FIXED CURVED PLATE BEARING ASSEMBLY TYPE F1	3	5	8 EACH
⑤ EXPANSION JOINT DEVICES TYPE 5	71	116	187 LIN. FT.
⑤ DIAPHRAGMS FOR TYPE MN45 PREST. BEAMS	41	82	123 LIN. FT.
⑤ PRESTRESSED CONCRETE BEAMS MN45	445	668	1113 LIN. FT.
⑥ BENCH MARK DISK		1	1 EACH
⑦ 1" THICK CORK	7	10	17 SQ. FT.
⑦ BRIDGE NAME PLATE		1	1 EACH
⑧ SPLIT MEDIAN BARRIER CONC (3Y46)	115		115 LIN. FT.

- ① STAGE 1 CONSTRUCTION:  
"BRIDGE SLAB CONCRETE (3Y36)" VOLUME WAS COMPUTED USING AN AVERAGE STOOL HEIGHT OF 2 1/4 INCHES. ITEM INCLUDES APPROXIMATELY 75 CU. YDS. FOR SLAB AND END BLOCKS, AND APPROXIMATELY 10 CU. YDS. FOR END DIAPHRAGMS.  
STAGE 2 CONSTRUCTION:  
"BRIDGE SLAB CONCRETE (3Y36)" VOLUME WAS COMPUTED USING AN AVERAGE STOOL HEIGHT OF 2 1/4 INCHES. ITEM INCLUDES APPROXIMATELY 123 CU. YDS. FOR SLAB AND END BLOCKS, AND APPROXIMATELY 20 CU. YDS. FOR END DIAPHRAGMS.
- ② "CONCRETE WEARING COURSE (3U17A)" VOLUME IS APPROXIMATELY 96 CU. YDS. ITEM INCLUDES 7884 SQ. FT. FOR BRIDGE APPROACH PANELS.
- ③ "TYPE F (TL-4) RAILING CONCRETE (3Y46)" VOLUME IS APPROXIMATELY 15 CU. YDS.
- ④ INCLUDES SLAB, END DIAPHRAGM, MEDIAN BARRIER AND CONCRETE BARRIER TYPE F (TL-4) REINFORCEMENT.
- ⑤ PAYMENT FOR BEARINGS INCLUDED IN ITEM "BEARING ASSEMBLY" PER EACH.
- ⑥ STATE WILL FURNISH DISK. BEND PRONGS OUTWARD TO ANCHOR DISK IN CONCRETE. BOTTOM OF DISK TOP TO BE PLACED FLUSH WITH CONCRETE. PAYMENT FOR PLACING SHALL BE CONSIDERED INCIDENTAL TO ITEM "TYPE F (TL-4) RAILING CONCRETE (3Y46)".
- ⑦ PAYMENT SHALL BE CONSIDERED INCIDENTAL TO CONCRETE PAY ITEMS.
- ⑧ "SPLIT MEDIAN BARRIER CONCRETE (3Y46)" VOLUME IS APPROXIMATELY 9 CU. YDS.
- ⑨ CONCRETE BARRIER TYPE F (TL-4).
- ⑩ SPLIT MEDIAN BARRIER TYPE F.

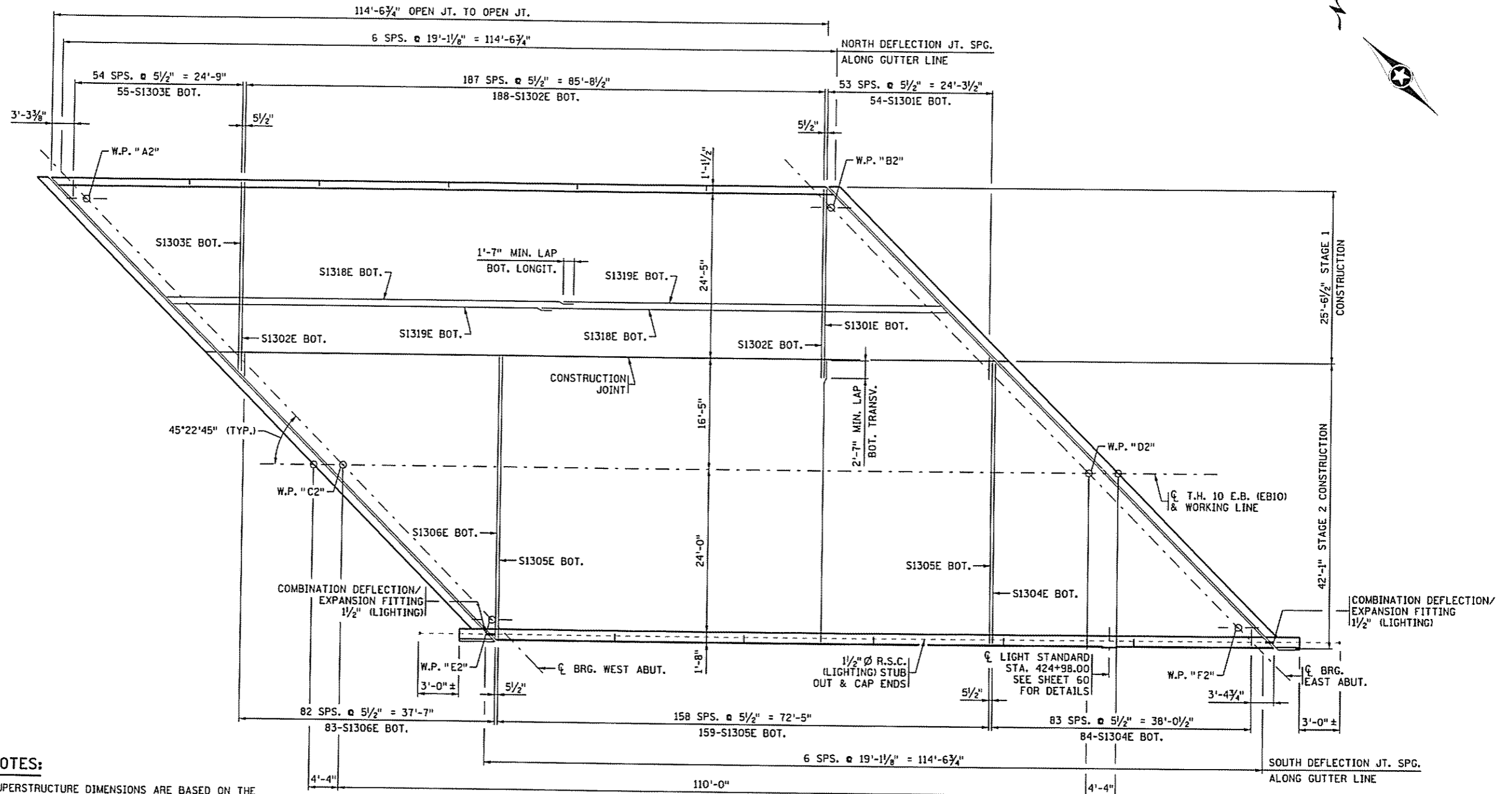
2/17/2009 S:\Design\BR2004\JHB\br2004.ssp.dgn

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: SUPERSTRUCTURE  
 DETAILS AND REINFORCEMENT

DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
 CHK: M.C.D. CHK: J.A.J.

BRIDGE NO. 02004  
 SHEET NO. 48 OF 72 SHEETS



**NOTES:**

SUPERSTRUCTURE DIMENSIONS ARE BASED ON THE EXPANSION JOINT DIMENSION AT 90° F.

SEE CORNER REINFORCEMENT DETAILS, SHEET 51 FOR DIMENSIONS AT EXPANSION JOINT OPENINGS.

FOR ADDITIONAL REINFORCEMENT DETAILS AT END BLOCK AND N.W. AND S.E. CORNERS, SEE PART LONGITUDINAL SECTION SHEET 52 AND CORNER DETAILS SHEET 51.

SEE SHEET XX FOR ADDITIONAL "CONDUIT SYSTEM (LIGHTING DETAILS)".

**DECK PLAN**

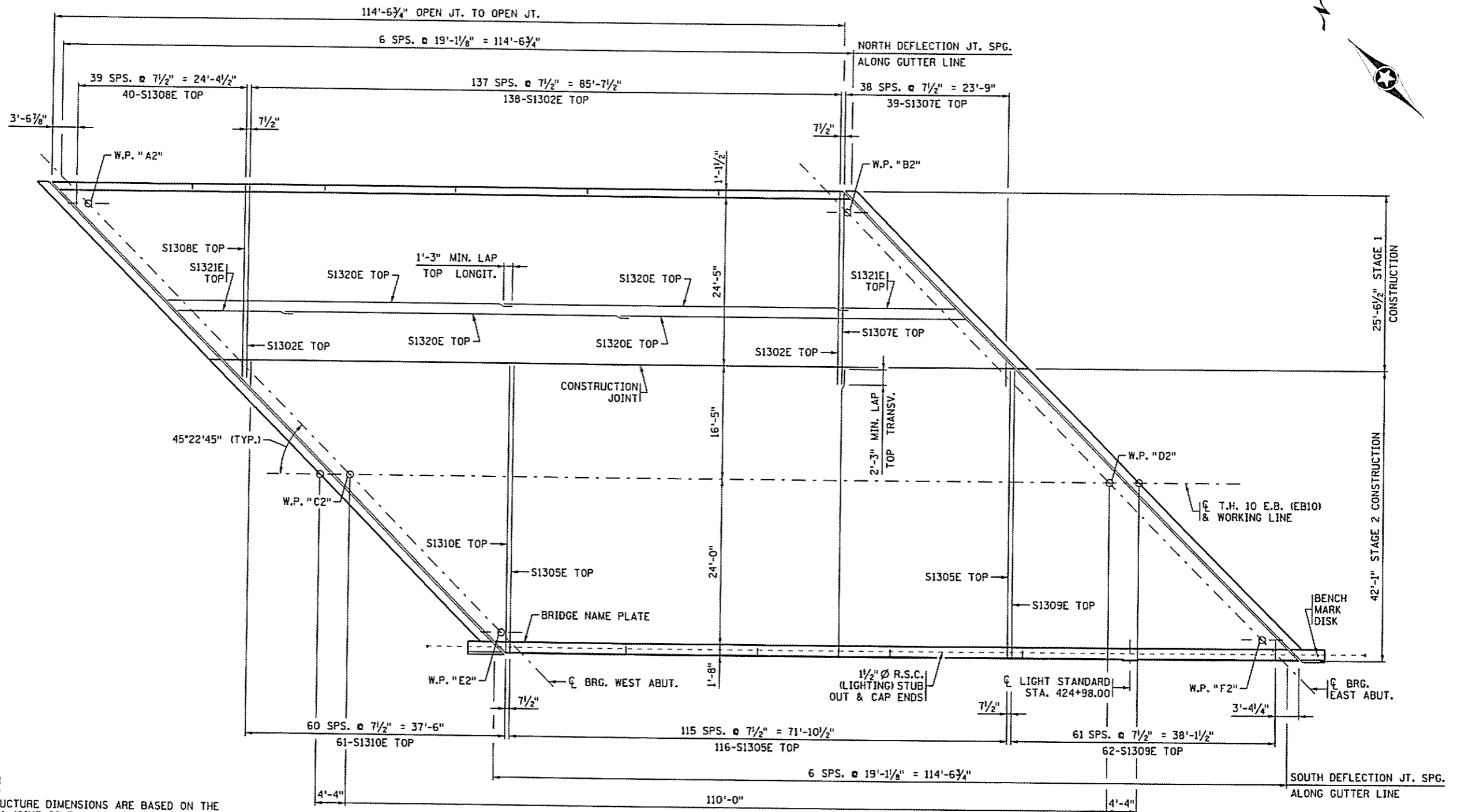
BOTTOM REINFORCEMENT ONLY SHOWN.  
FINISHED DECK SHOWN.

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

TITLE: SUPERSTRUCTURE  
DETAILS AND REINFORCEMENT

DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.  
SHEET NO. 49 OF 72 SHEETS

BRIDGE NO.  
02004



**NOTES:**

SUPERSTRUCTURE DIMENSIONS ARE BASED ON THE EXPANSION JOINT DIMENSION AT 90° F.

SEE CORNER REINFORCEMENT DETAILS, SHEET 51 FOR DIMENSIONS AT EXPANSION JOINT OPENINGS.

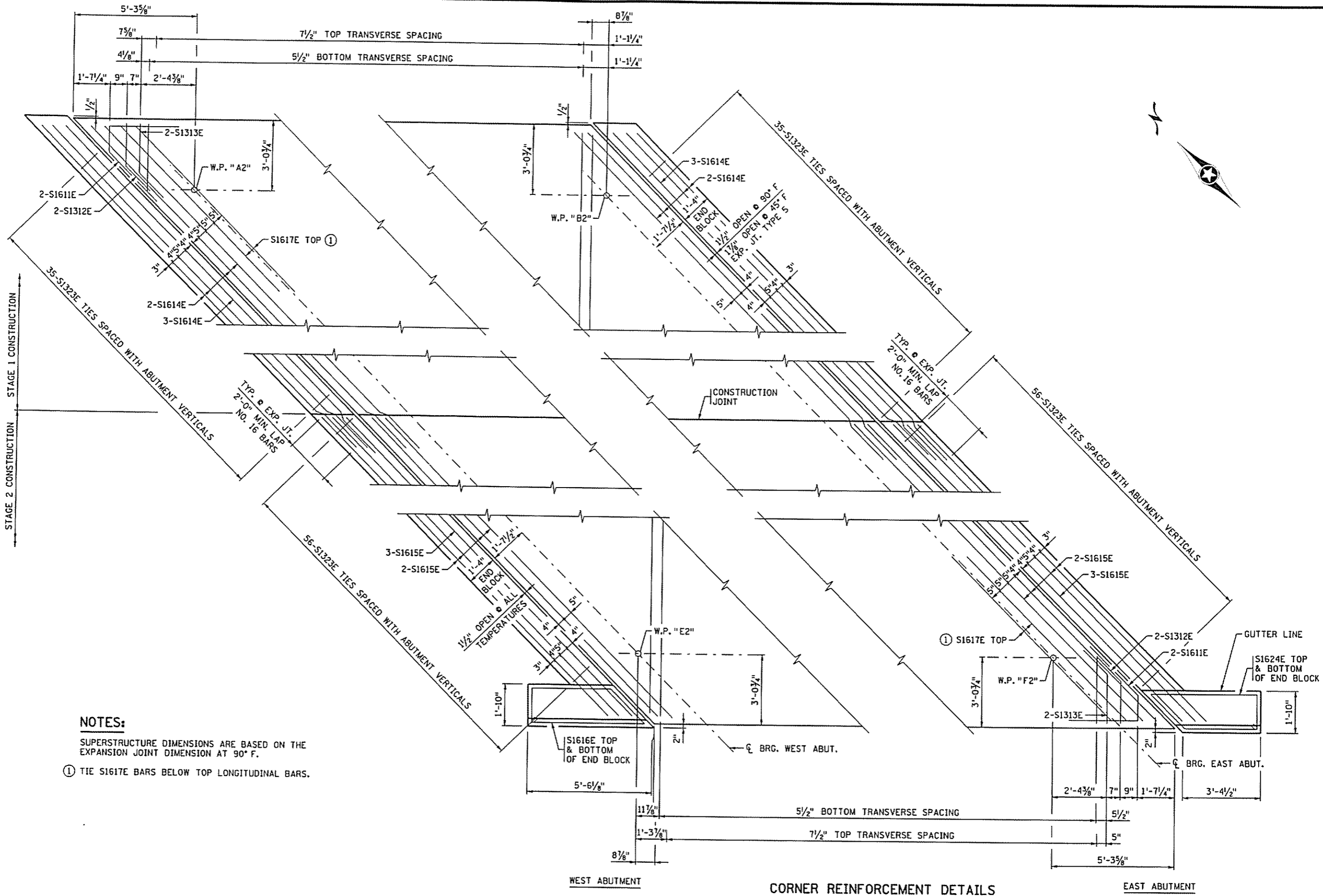
FOR ADDITIONAL REINFORCEMENT DETAILS AT END BLOCK AND N.W. AND S.E. CORNERS, SEE PART LONGITUDINAL SECTION SHEET 52 AND CORNER DETAILS SHEET 51.

**DECK PLAN**

TOP REINFORCEMENT ONLY SHOWN,  
FINISHED DECK SHOWN.

2/17/2009 5:10 Design\1802004\JHE\1802004.dwg

CERTIFIED BY <i>Moises C. Dimaculangan</i> LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	DATE 2/23/09	TITLE: SUPERSTRUCTURE DETAILS AND REINFORCEMENT	DES: P.J.K.	DR: J.H.B.	APPROVED: 2/23/09	BRIDGE NO. 02004
			CHK: M.C.D.	CHK: J.A.J.		



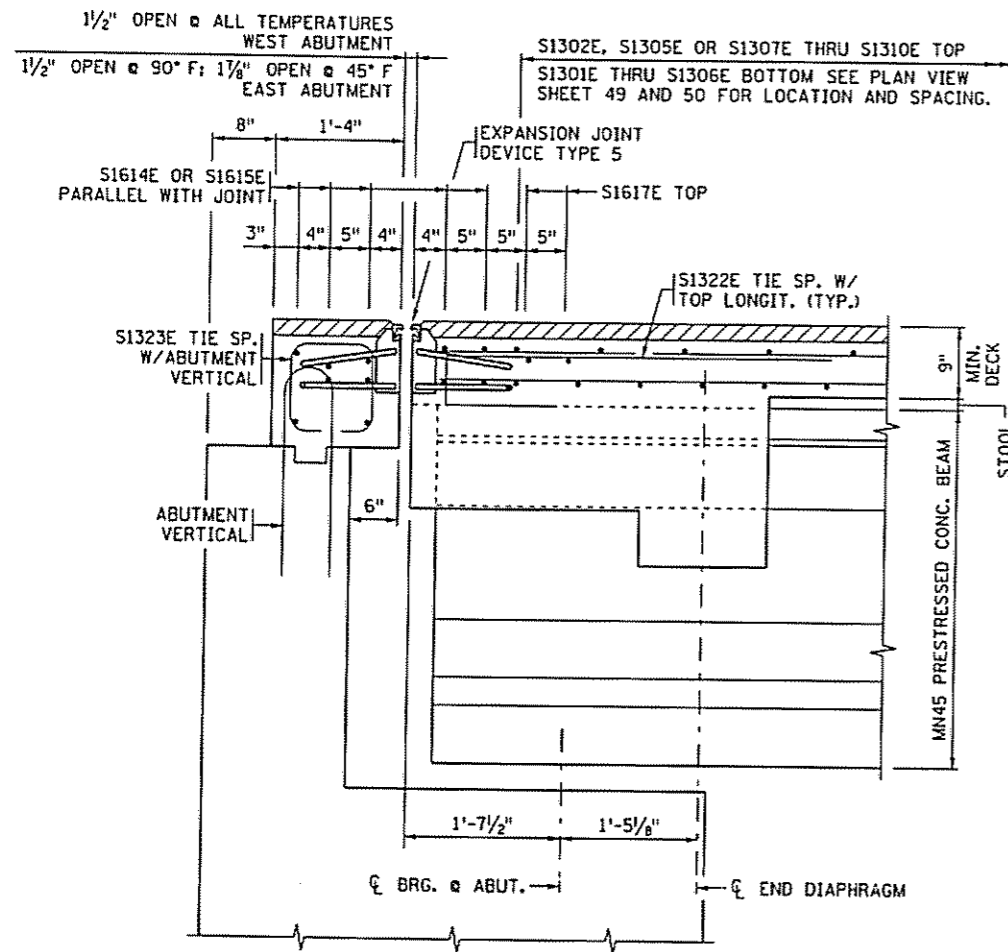
**NOTES:**  
 SUPERSTRUCTURE DIMENSIONS ARE BASED ON THE EXPANSION JOINT DIMENSION AT 90° F.  
 ① TIE S1617E BARS BELOW TOP LONGITUDINAL BARS.

WEST ABUTMENT      CORNER REINFORCEMENT DETAILS      EAST ABUTMENT  
 BARRIERS NOT SHOWN

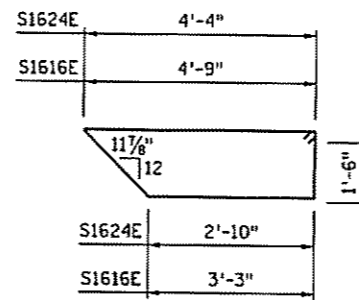
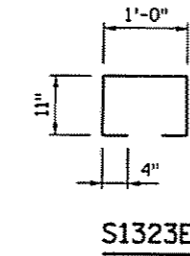
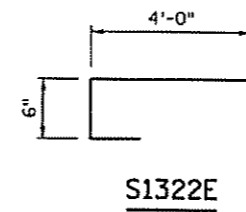
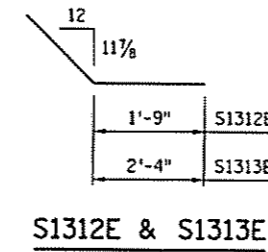
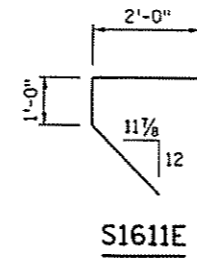
CERTIFIED BY <i>Moises C. Dimaculangan</i> LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN      LIC. NO. 46209	DATE 2/23/09	TITLE: SUPERSTRUCTURE DETAILS AND REINFORCEMENT	DES: P.J.K.	DR: J.H.B.	APPROVED:	BRIDGE NO. 02004
			CHK: M.C.D.	CHK: J.A.J.	2/23/09	

2/17/2009 5:\Design\020204\JHB\02004.dwg





**PART LONGITUDINAL SECTION**  
(DIMENSIONS NORMAL TO JOINT)



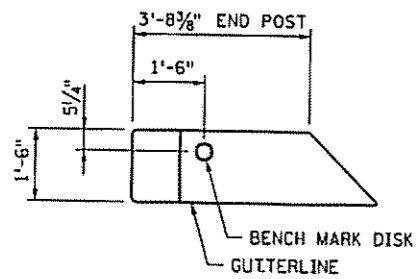
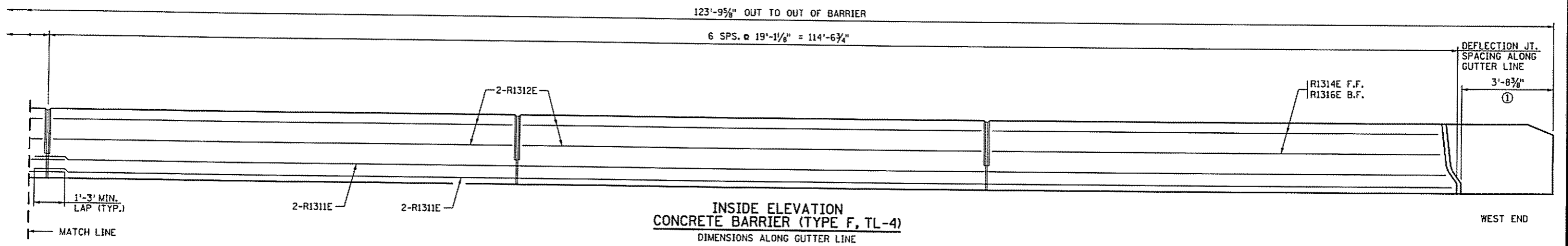
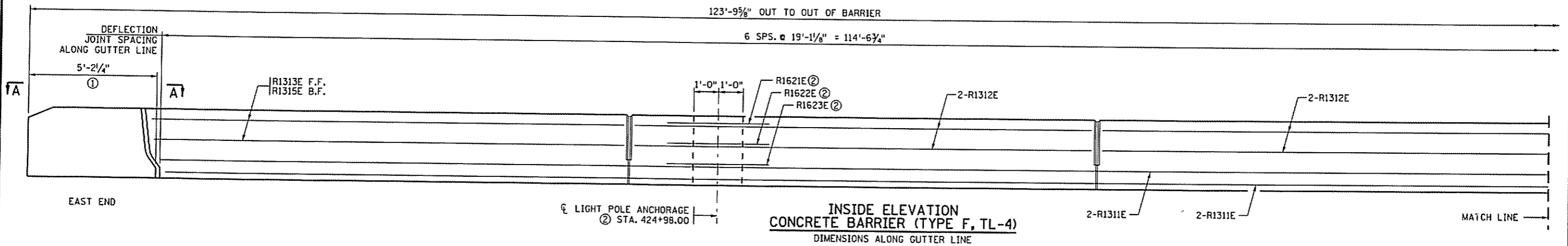
**S1616E & S1624E**

**BILL OF REINFORCEMENT FOR SUPERSTRUCTURE**

BAR	STAGE 1 NO.	STAGE 2 NO.	LENGTH	SHAPE	LOCATION
S1301E	1 SER. OF 54	—	VAR. 3'-4" TO 27'-11"	—	DECK TRANSVERSE BOTTOM
S1302E	326	—	28'-0"	—	DECK TRANS. BOT. & TOP
S1303E	1 SER. OF 55	—	VAR. 2'-9" TO 27'-10"	—	DECK TRANSVERSE BOTTOM
S1304E	—	1 SER. OF 84	VAR. 2'-10" TO 41'-4"	—	DECK TRANSVERSE BOTTOM
S1305E	—	275	41'-7"	—	DECK TRANS. BOT. & TOP
S1306E	—	1 SER. OF 83	VAR. 3'-4" TO 41'-5"	—	DECK TRANSVERSE BOTTOM
S1307E	1 SER. OF 39	—	VAR. 3'-7" TO 27'-9"	—	DECK TRANSVERSE TOP
S1308E	1 SER. OF 40	—	VAR. 3'-2" TO 27'-10"	—	DECK TRANSVERSE TOP
S1309E	—	1 SER. OF 62	VAR. 3'-0" TO 41'-7"	—	DECK TRANSVERSE TOP
S1310E	—	1 SER. OF 61	VAR. 3'-7" TO 41'-7"	—	DECK TRANSVERSE TOP
S1611E	2	2	6'-0"	—	CORNER TIE TOP & BOT.
S1312E	2	2	3'-9"	—	DECK CORNER TOP & BOT.
S1313E	2	2	4'-4"	—	DECK CORNER TOP & BOT.
S1614E	22	—	38'-2"	—	TRANS. TOP & BOT. @ JT.
S1615E	—	22	58'-8"	—	TRANS. TOP & BOT. @ JT.
S1616E	—	2	12'-7"	—	END BLOCK @ CORNER
S1617E	2	2	10'-0"	—	DECK TRANS. TOP @ CORNER
S1318E	38	63	60'-0"	—	DECK LONGITUDINAL BOT.
S1319E	38	63	55'-10"	—	DECK LONGITUDINAL BOT.
S1320E	36	58	50'-0"	—	DECK LONGITUDINAL TOP
S1321E	18	29	16'-9"	—	DECK LONGITUDINAL TOP
S1322E	36	58	6'-1"	—	LONGITUDINAL END OF DECK
S1323E	70	112	3'-6"	—	END BLOCK TIE
S1624E	—	2	11'-9"	—	END BLOCK @ CORNER

5:\Design\022004\JIB\022004.dwg 2/17/2009

CERTIFIED BY <i>MCDimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: SUPERSTRUCTURE DETAILS AND REINFORCEMENT	DES: P.J.K.	DR: J.H.B.	APPROVED: 2/23/09	BRIDGE NO. 02004
		CHK: M.C.D.	CHK: J.A.J.	SHEET NO. 52 OF 72 SHEETS	



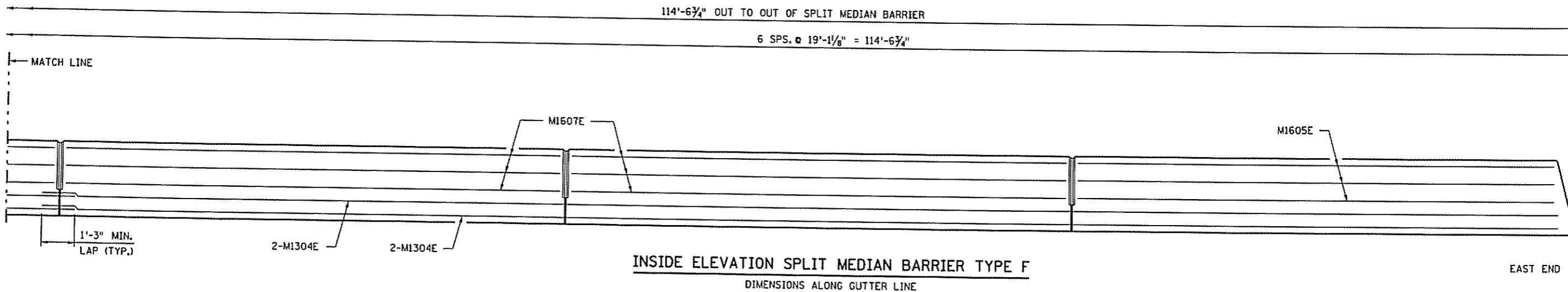
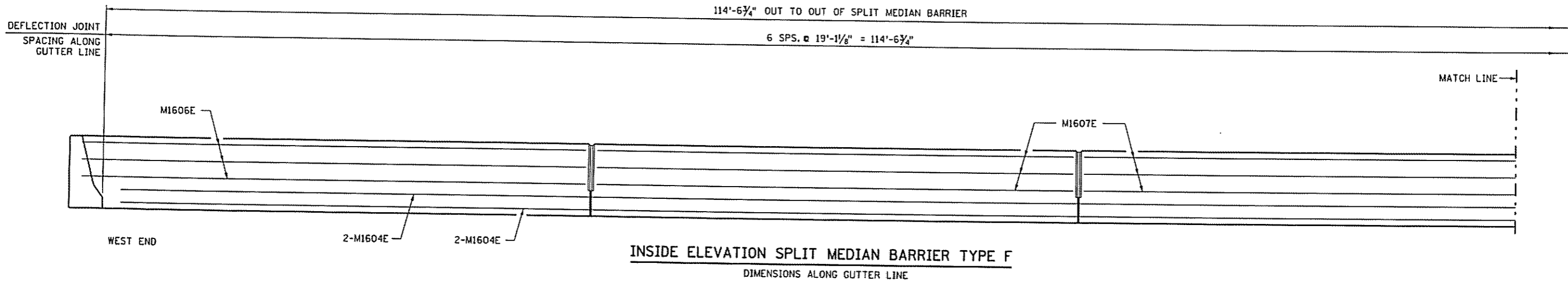
VIEW A-A  
(SOUTHEAST CORNER ONLY)

**NOTES:**

- F.F. DENOTES FRONT FACE.  
B.F. DENOTES BACK FACE.  
SUPERSTRUCTURE DIMENSIONS ARE BASED ON THE EXPANSION JOINT DIMENSION AT 90° F.
- ① FOR END POST DETAILS AND REINFORCEMENT SEE SHEET NO. 55.  
② FOR DETAILS AND ADDITIONAL REINFORCEMENT AT LIGHT POLE ANCHORAGE SEE SHEET NO. 60.

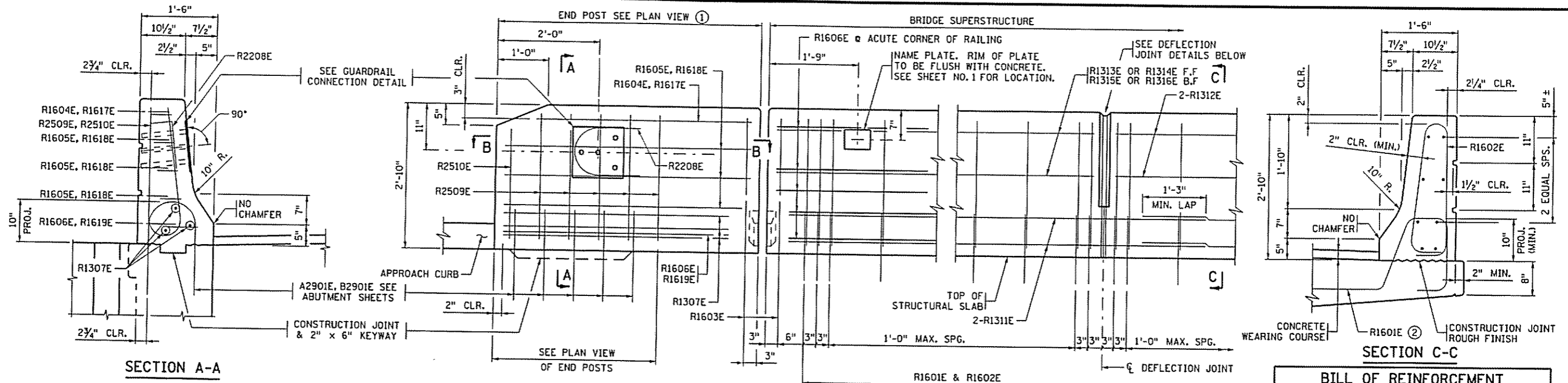
2/16/2009 5:\Design\A\02004\VC05\02004.dwg

CERTIFIED BY <i>Moises C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: <b>SUPERSTRUCTURE DETAILS AND REINFORCEMENT</b>	DES: PJK	DR: LKL	APPROVED:	BRIDGE NO. 02004
		CHK: MCD	CHK: JAJ	2/23/09	



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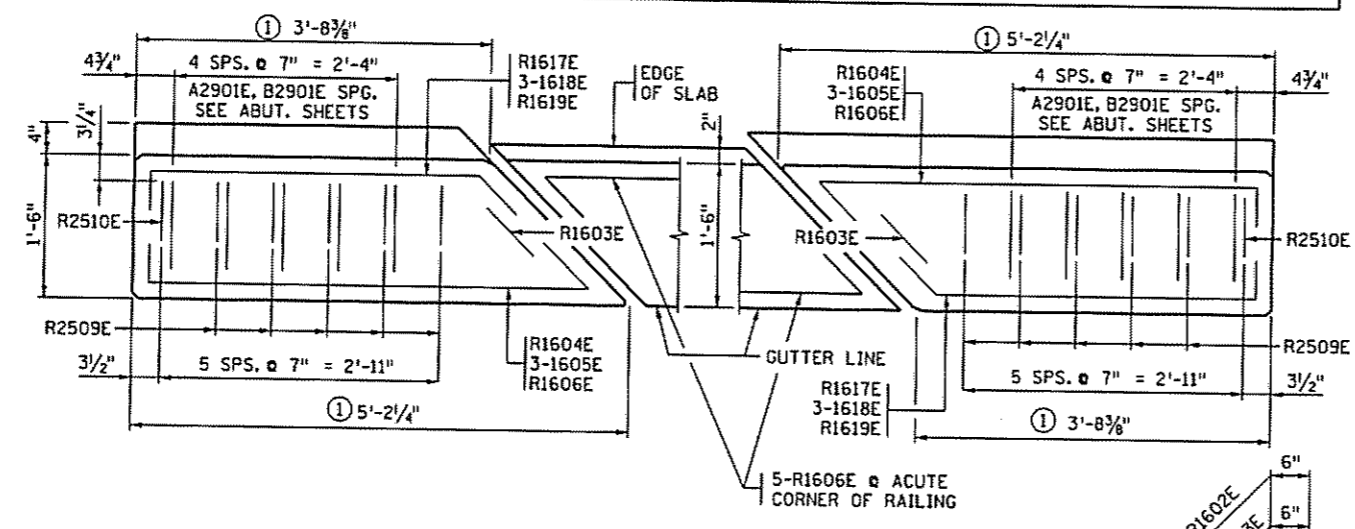
CERTIFIED BY <i>Moises C. Dimaculangan</i> <b>2/23/09</b> <small>LICENSED PROFESSIONAL ENGINEER</small> NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: <b>SUPERSTRUCTURE DETAILS AND REINFORCEMENT</b>	DES: PJK	DR: LKL	APPROVED: <i>2/23/09</i>	BRIDGE NO. 02004
		CHK: MCD	CHK: JAJ		



**NOTES:**  
 F.F. DENOTES FRONT FACE.  
 B.F. DENOTES BACK FACE.

**EXPANSION JOINT**  
 (EXPANSION DEVICE NOT SHOWN)  
**INSIDE ELEVATION OF BARRIER**  
 (CONCRETE WEARING COURSE NOT SHOWN)

**BARRIER MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350**



**DEFLECTION JOINT**

**GENERAL NOTES**

LENGTH OF "TYPE F (TL-4) RAILING CONCRETE (3Y46) FOR PAYMENT SHALL BE MEASURED BETWEEN THE OUTSIDE FACES OF THE CONCRETE BARRIER.

CONCRETE BARRIER = 477 LBS./FT. (0.117 CU. YDS./FT.)

FINISH ALL EDGES OF BARRIER AND END POST WITH 1/2" VEE, EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONCRETE DEFLECTION JOINTS SHALL BE 20 FT.

SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

GUARDRAIL CONNECTION TO BE STRUCTURAL STEEL, Mn/DOT SPEC. 3306.

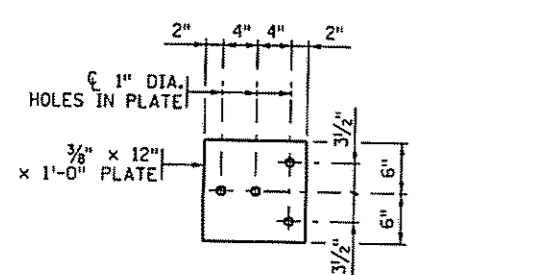
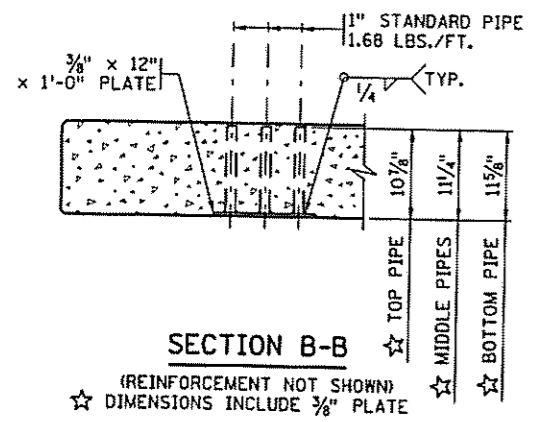
GUARDRAIL CONNECTION, CORK, AND NAME PLATE TO BE CONSIDERED INCIDENTAL TO CONCRETE PAY ITEMS.

BARRIER QUANTITIES ARE LISTED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

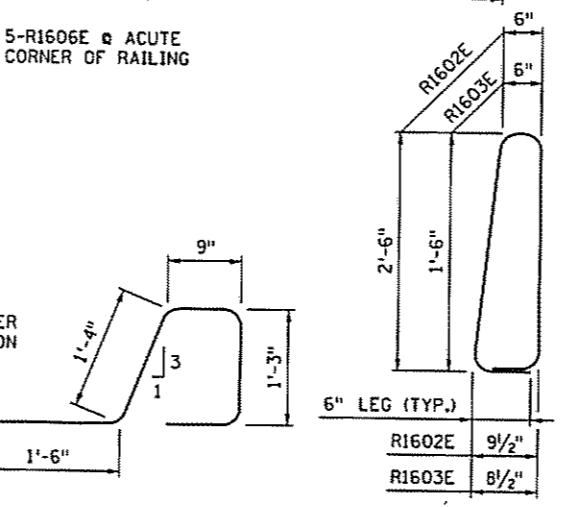
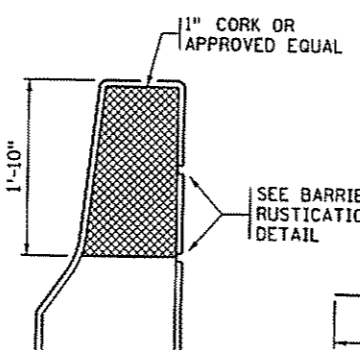
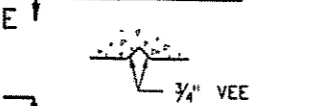
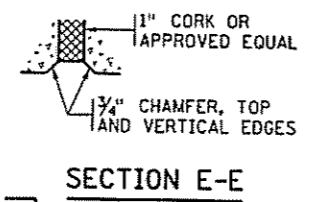
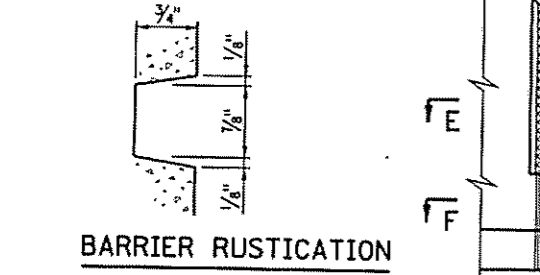
① END POST DIMENSIONS ARE ALONG GUTTER LINE OR OUTSIDE FACE OF END POST.

② PLACE BAR ON TOP OF BOTTOM REINFORCEMENT MAT.

BILL OF REINFORCEMENT FOR BARRIER				
BAR	NO.	LENGTH	SHAPE	LOCATION
R1601E	135	5'-5"		BARRIER DOWEL
R1602E	135	6'-7"		BARRIER VERTICAL
R1603E	4	4'-7"		BARRIER VERTICAL
R1604E	2	4'-11"		END POST
R1605E	6	5'-7"		END POST
R1606E	12	5'-7"		END POST
R1307E	6	2'-11"		END POST
R2208E	2	4'-1"		END POST
R2509E	10	5'-4"		END POST
R2510E	2	4'-9"		END POST
R1311E	8	57'-2"		BARRIER LONGIT.
R1312E	16	18'-8"		BARRIER LONGIT.
R1313E	2	19'-0"		BARRIER LONGIT.
R1314E	2	17'-6"		BARRIER LONGIT.
R1315E	2	19'-11"		BARRIER LONGIT.
R1316E	2	17'-5"		BARRIER LONGIT.
R1617E	2	3'-8"		END POST
R1618E	6	4'-4"		END POST
R1619E	2	4'-5"		END POST



**GUARDRAIL CONNECTION DETAIL**  
 GALVANIZE AFTER FABRICATION PER Mn/DOT SPEC. 3394 ESTIMATED WEIGHT = 22 LBS



REVISED: 05-26-2006  
 APPROVED: DECEMBER 18, 2003  
 STATE BRIDGE ENGINEER

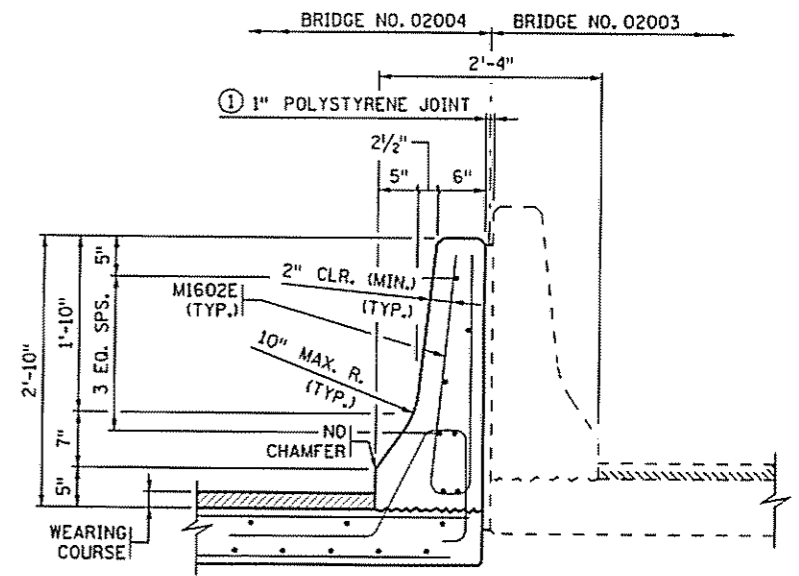
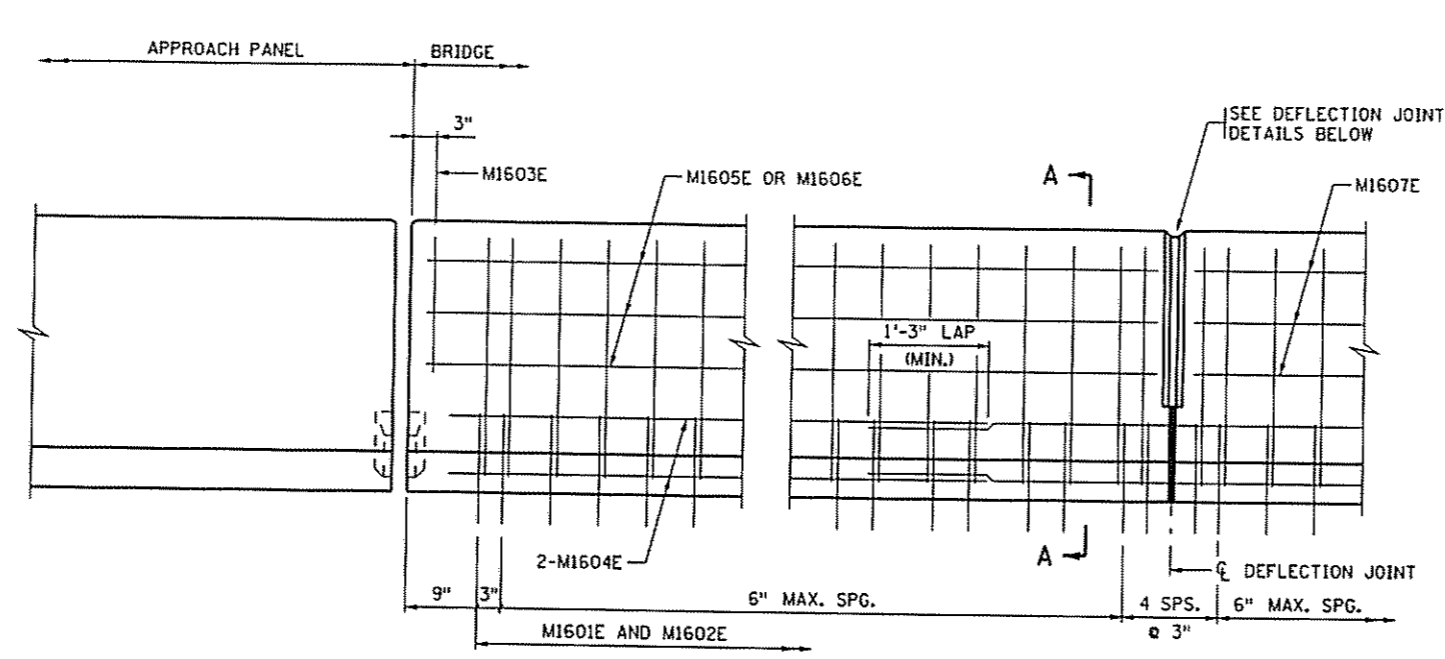
**ELEVATION**  
**DEFLECTION JOINT DETAILS**

CERTIFIED BY *M. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

CONCRETE BARRIER (TYPE F, TL-4)  
 WITH SEPARATE END POST  
 (WITH CONCRETE WEARING COURSE)

DES: PJK DR: LKL APPROVED: 2/23/09  
 CHK: MCD CHK: JAJ  
 SHEET NO. 55 OF 72 SHEETS

MODIFIED FIG. 5-397.116  
 BRIDGE NO. 02004

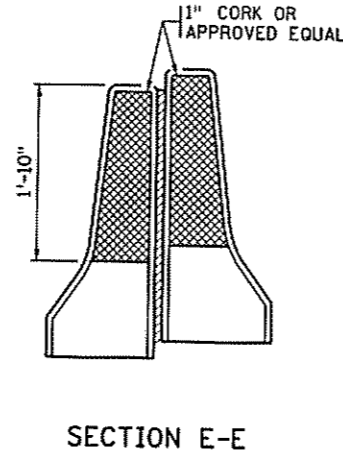
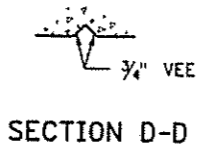
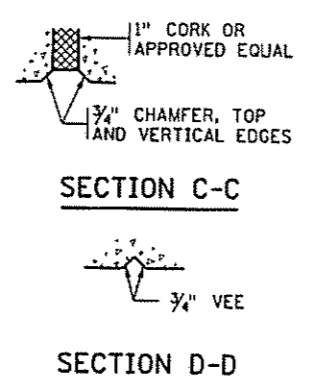
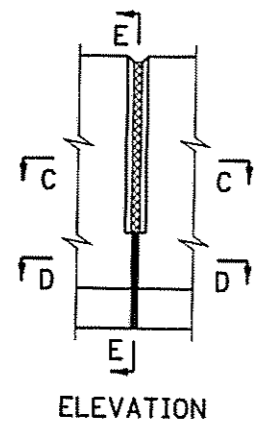


EXPANSION JOINT  
EXPANSION DEVICE NOT SHOWN

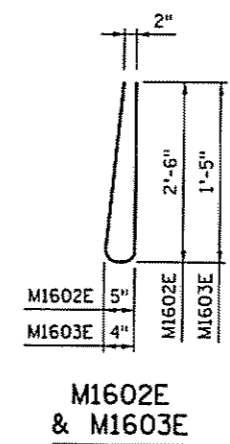
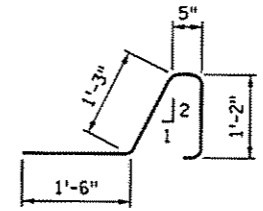
INSIDE ELEVATION OF BARRIER  
WEARING COURSE NOT SHOWN

DEFLECTION JOINT

RAIL MEETS TEST LEVEL 4 REQUIREMENTS OF NCHRP REPORT 350.



BILL OF REINFORCEMENT FOR BARRIER				
BAR	NO.	LENGTH	SHAPE	LOCATION
M1601E	238	4'-7"		BARRIER DOWEL
M1602E	238	5'-5"		BARRIER VERTICAL
M1603E	2	3'-2"		BARRIER VERTICAL
M1604E	8	57'-9"		BARRIER LONGITUDINAL
M1605E	3	19'-4"		BARRIER LONGITUDINAL
M1606E	3	17'-10"		BARRIER LONGITUDINAL
M1607E	12	18'-8"		BARRIER LONGITUDINAL



**GENERAL NOTES**

CONCRETE BARRIER SHALL BE CONC. MIX 3Y46.  
CONCRETE BARRIER = 634 LBS./FT. (0.157 CU. YDS/FT.)

FINISH ALL EDGES OF BARRIER WITH 1/2" VEE EXCEPT WHERE OTHERWISE NOTED.

MAXIMUM SPACING OF CONCRETE DEFLECTION JOINTS SHALL BE 20 FT.

SEE SUPERSTRUCTURE SHEET FOR JOINT SPACING.

BARRIER QUANTITIES ARE INCLUDED IN SUMMARY OF QUANTITIES FOR SUPERSTRUCTURE.

① POLYSTYRENE TYPE B. SEE SPECIAL PROVISIONS.

REVISED:

APPROVED: OCTOBER 29, 2004

*David C. Hanson*  
STATE BRIDGE ENGINEER

DEFLECTION JOINT DETAILS

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

SPLIT MEDIAN BARRIER  
TYPE F  
(WITH WEARING COURSE)

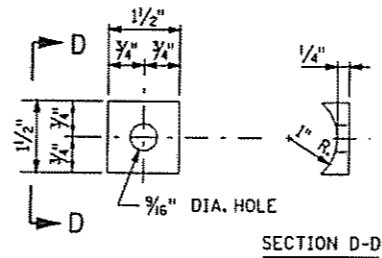
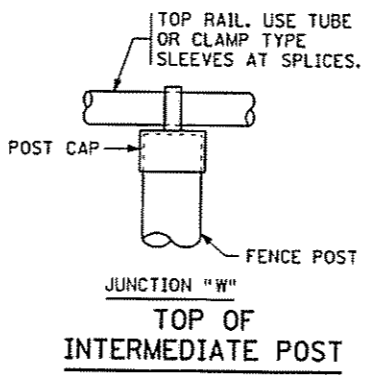
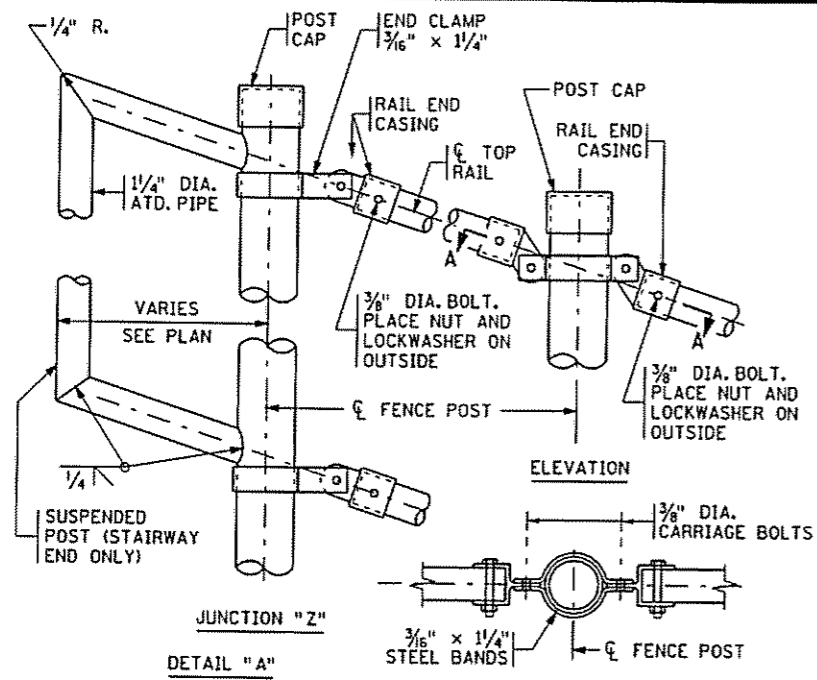
DES: P.J.K. DR: K.G.S.  
CHK: M.C.D. CHK: J.A.J.

APPROVED: 2/23/09

SHEET NO. 56 OF 72 SHEETS

FIG. 5-397.131

BRIDGE NO. 02004

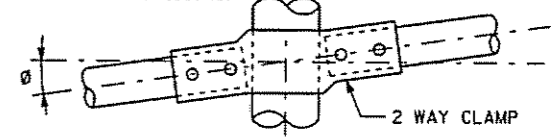


**GROOVED WASHER**  
AN APPROVED ALTERNATE WILL BE CONSIDERED

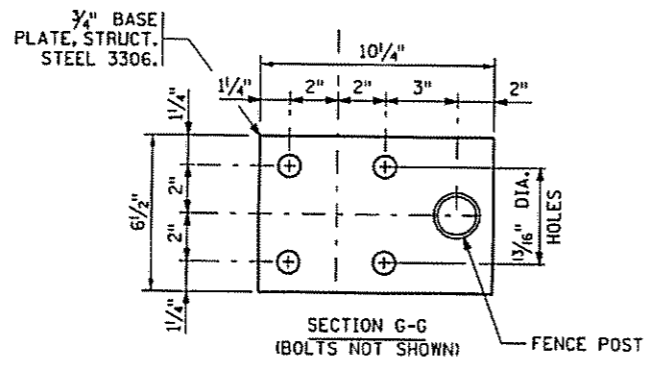
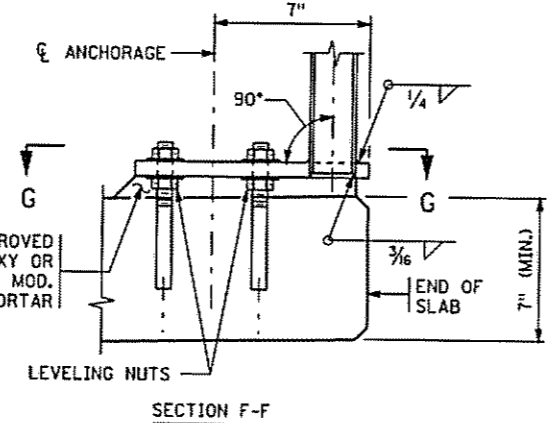
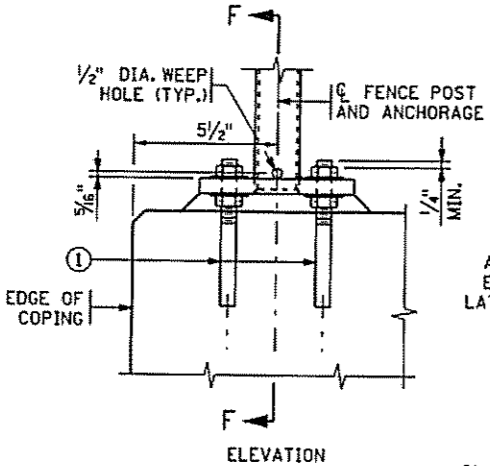
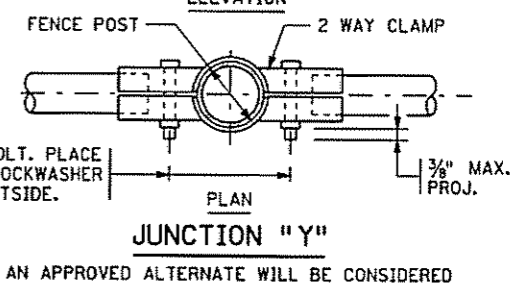
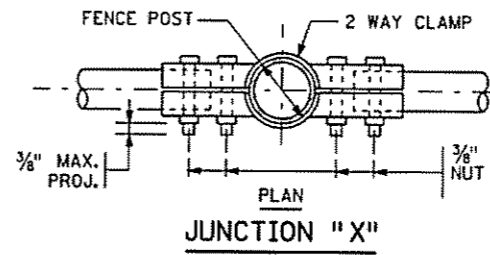
**GENERAL NOTES**  
LENGTH OF "WIRE FENCE, DESIGN W-1" FOR PAYMENT SHALL BE MEASURED BETWEEN THE CENTERS OF THE END RAILPOSTS.  
MAXIMUM SPACING FOR 2 1/2" STANDARD PIPE POSTS IS 8 FT.  
ALL PIPE DIAMETERS ARE NOMINAL.  
FENCE POSTS AND ANCHORAGES SHALL BE SET VERTICAL UNLESS OTHERWISE NOTED. AT BOLT TYPE ANCHORAGES, PACK SPACE BETWEEN BASE PLATE AND CONCRETE WITH APPROVED MORTAR AFTER NUTS HAVE BEEN ADJUSTED AND TIGHTENED.  
FOR ALTERNATE TO TYPE 1 ANCHORAGES SEE DETAIL B905 "FENCE POST ANCHORAGE" TYPE A END POSTS.  
CONTRACTOR WILL SELECT APPROPRIATE DETAILS TO CONSTRUCT FENCE.

① 5/8" DIA. CHEMICAL ANCHOR RODS, Mn/DOT SPEC. 3385, TYPE A, WITH 3" THREADS, 2 NUTS AND 2 CUT WASHERS PER ROD. MINIMUM ULTIMATE BOND STRENGTH SHALL BE 20,000 POUNDS, WITH A MINIMUM 5" EMBEDMENT LENGTH. SEE SPECIAL PROVISIONS.

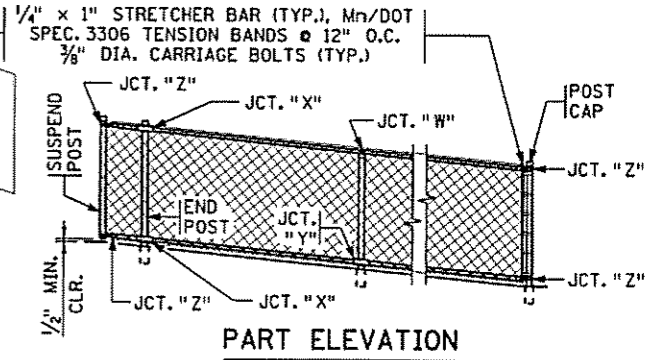
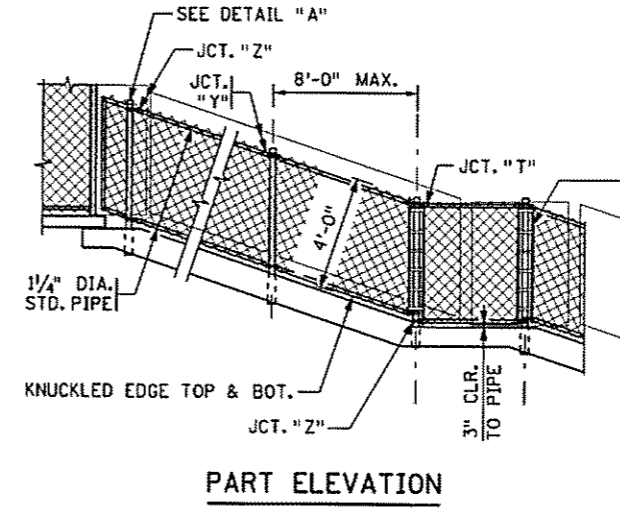
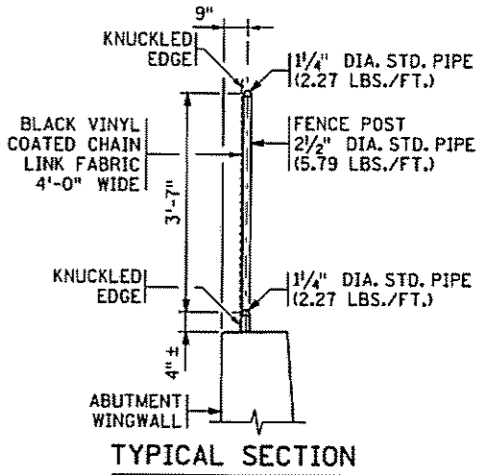
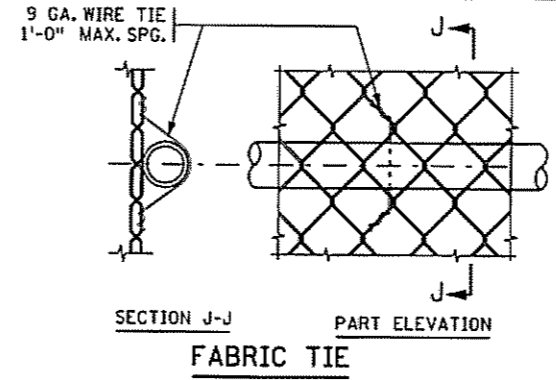
2 WAY CLAMP BENDING TABLE	
GRADE OF FENCE	Ø
0° TO 2°	0"
2° TO 6°	4"
6° TO 10°	8"



SECTION A-A  
JUNCTION "T"  
AN APPROVED ALTERNATE WILL BE CONSIDERED  
**POST CONNECTIONS**



**BOLT ANCHORAGE FOR FENCE POSTS-TYPE 2**  
FOR SLAB THICKNESS OF 7" (MIN.)



2/17/2005 SA Design 04-02004-118-NB-02004.dwg

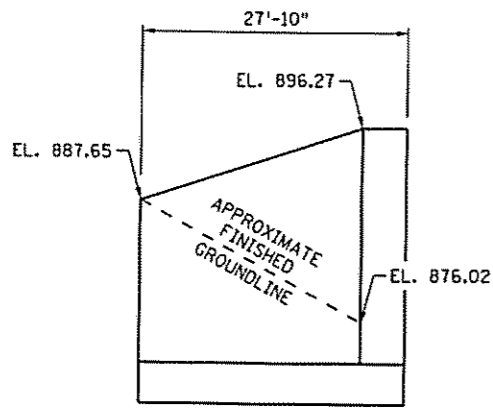
REVISION: 04-23-2003  
APPROVED: NOVEMBER 26, 1985  
*Donald H. Manning*  
STATE BRIDGE ENGINEER

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

4 FT. WIRE FENCE (DESIGN W-1)  
SHEET NO. 57 OF 72 SHEETS

DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.  
BRIDGE NO. 02004

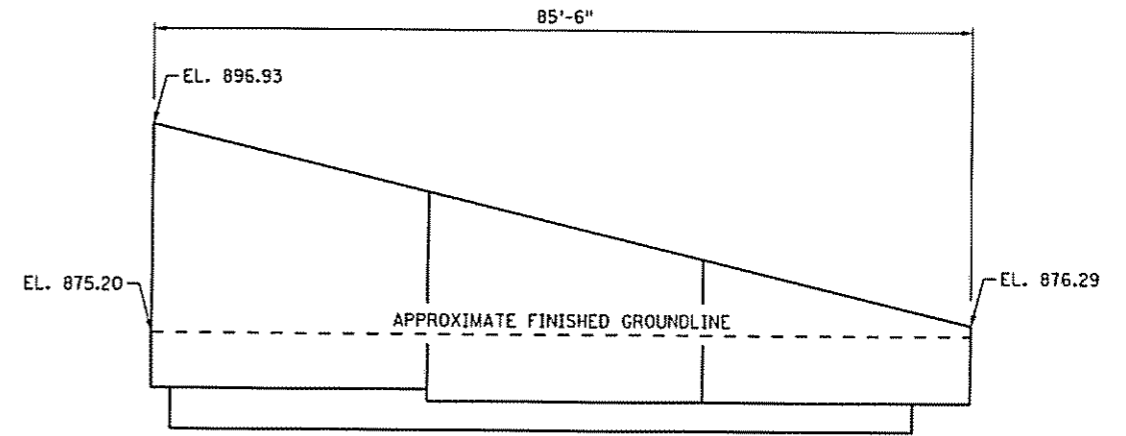
MODIFIED FIG. 5-397.202



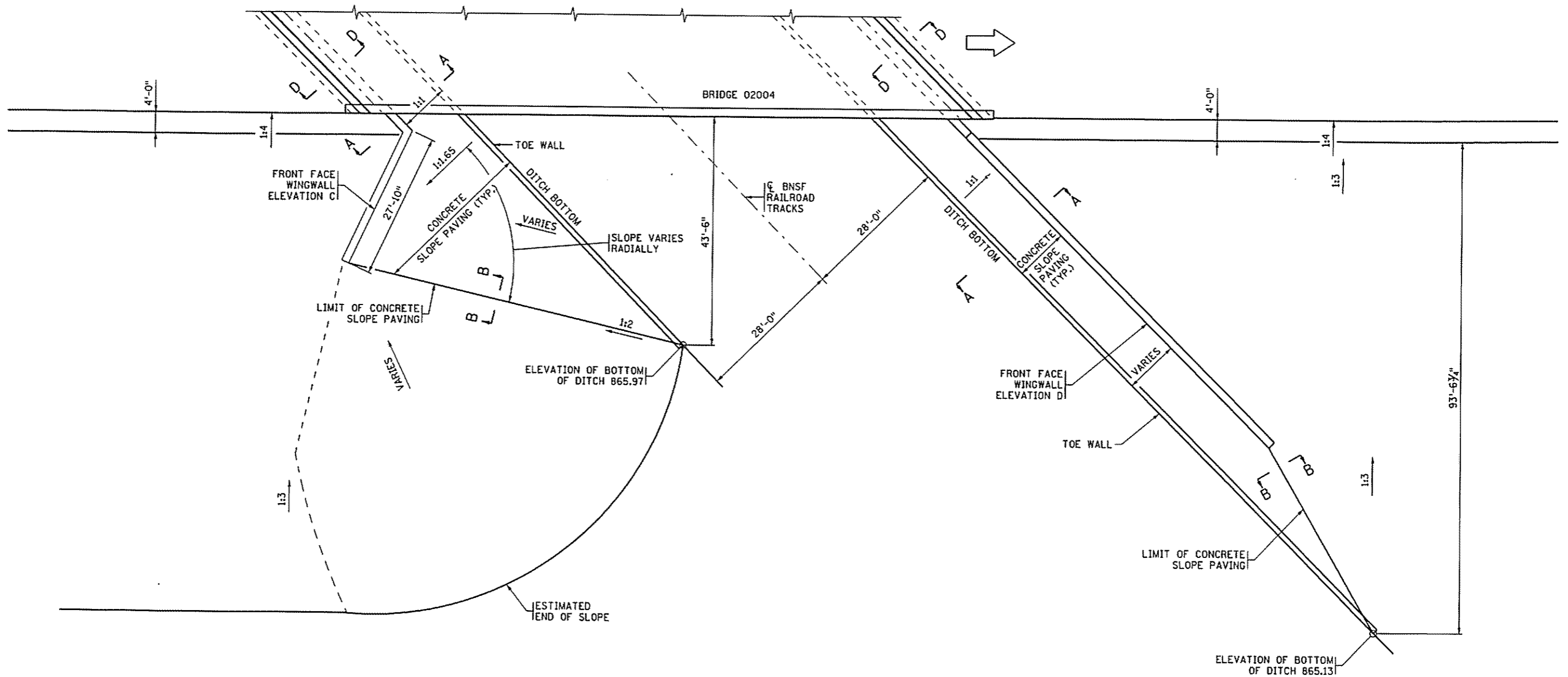
**WINGWALL ELEVATION C**  
FRONT FACE SHOWN

**NOTES:**

SEE SHEET 1 RAILROAD SECTION UNDER BRIDGE  
(FOR RAILROAD DITCH DETAILS).  
SEE SHEET 59 FOR SECTION A-A, B-B AND D-D.  
THE SLOPE ARROWS ARE POINTING UPHILL.



**WINGWALL ELEVATION D**  
FRONT FACE SHOWN



2/17/2009 S:\Drawings\02004\02004-1\02004-1.dwg

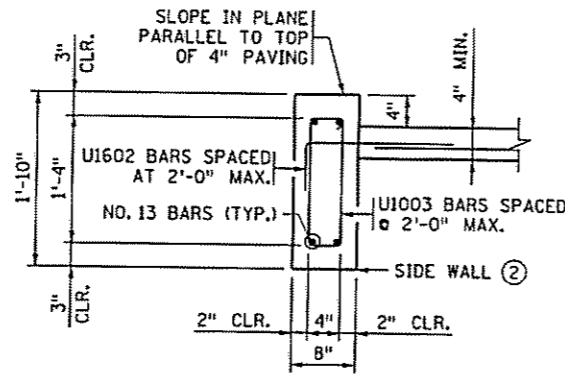
CERTIFIED BY <i>M.C. Dimaculangan</i> 2/23/09 LICENSED PROFESSIONAL ENGINEER DATE NAME: NOISES C. DIMACULANGAN LIC. NO. 46209	TITLE: <b>CONCRETE SLOPE PAVING UNDER BRIDGES</b>			DES: P.J.K. DR: J.H.B. APPROVED:	BRIDGE NO. 02004
	CHK: M.C.D. CHK: J.A.J. 2/23/09			SHEET NO. 58 OF 72 SHEETS	

**CONCRETE & REINFORCEMENT  
UNIT QUANTITIES**

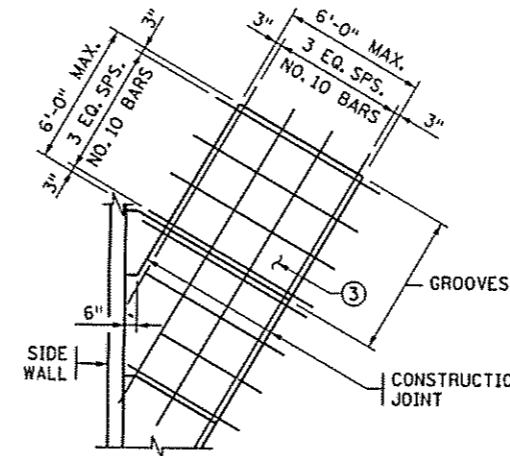
- ① 0.111 CU. YD. OF CONCRETE/LIN. FT.  
8.37 LBS. OF REINFORCEMENT/LIN. FT.
- ② 0.046 CU. YD. OF CONCRETE/LIN. FT.  
4.46 LBS. OF REINFORCEMENT/LIN. FT.
- ③ 0.111 CU. YD. OF CONCRETE/SQ. YD.  
4.50 LBS. OF REINFORCEMENT/SQ. YD.

**GENERAL NOTE**

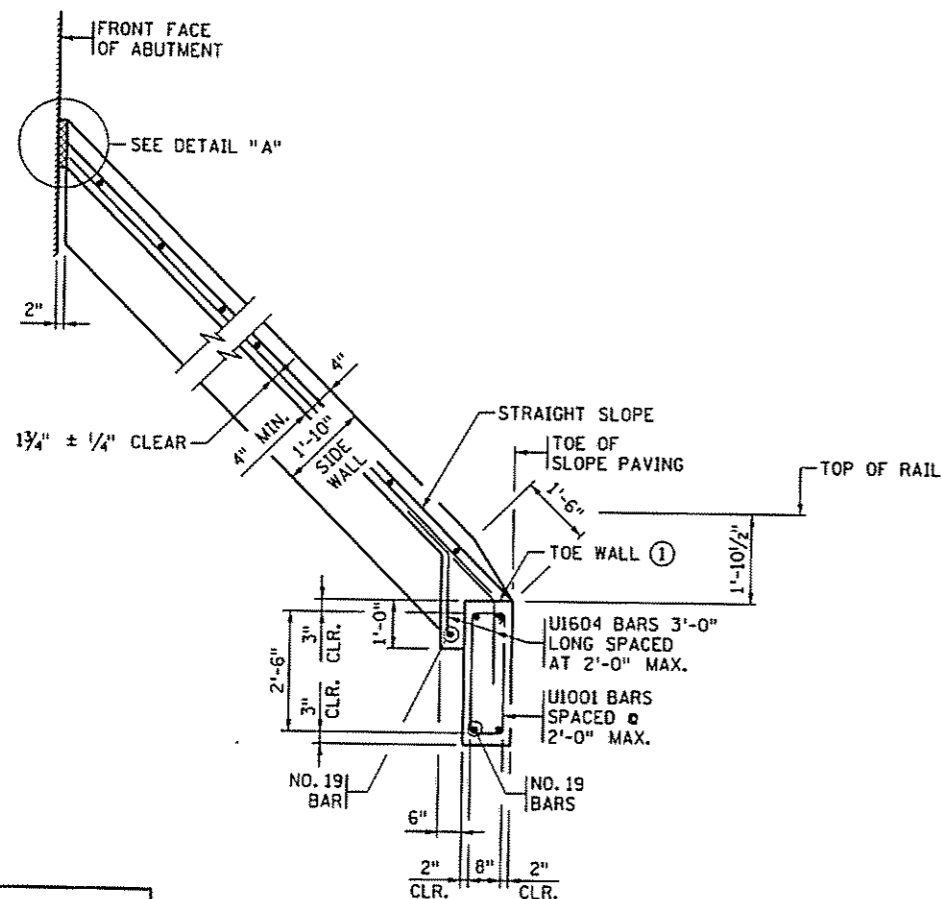
SLOPES ARE EXPRESSED AS A RATIO OF  
VERTICAL DISTANCE: HORIZONTAL DISTANCE.



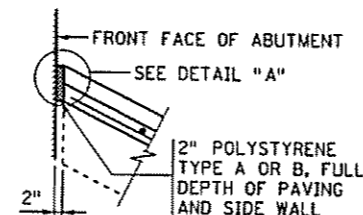
**SECTION B-B**  
NORMAL TO SLOPE



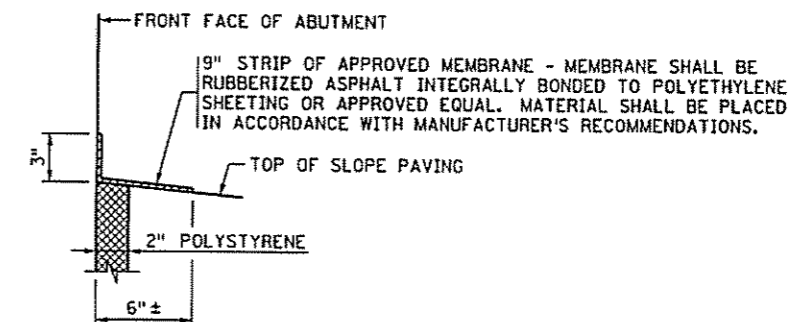
**PAVING DETAIL**



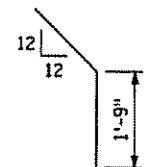
**SECTION A-A**  
1:1 SLOPE SHOWN



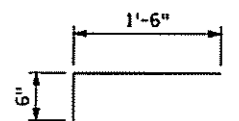
**SECTION D-D**  
HIGH ABUTMENTS WITHOUT RUSTICATION



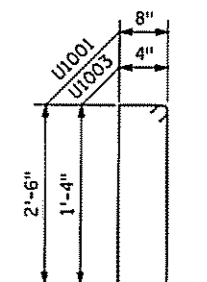
**DETAIL "A"**  
SLOPE PAVING AS PER Mn/DOT SPEC. 2514.



**U1604**



**U1602**



**U1001 & U1003**

S:\Design\BAND2804\JHB\br-02004.dwg

REVISION:  
APPROVED: SEPTEMBER 26, 2003  
*Samuel A. Anderson*  
STATE BRIDGE ENGINEER

CERTIFIED BY *M. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

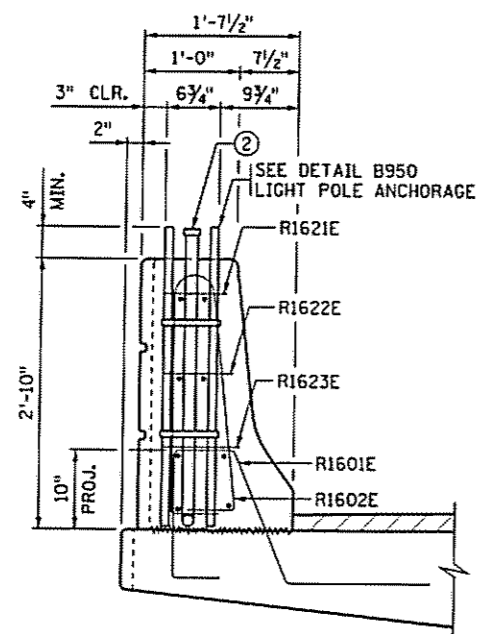
**CONCRETE SLOPE PAVING  
UNDER BRIDGES**

DES: P.J.K. DR: J.H.B.  
CHK: M.C.D. CHK: J.A.J.  
APPROVED: 2/23/09  
SHEET NO. 59 OF 72 SHEETS

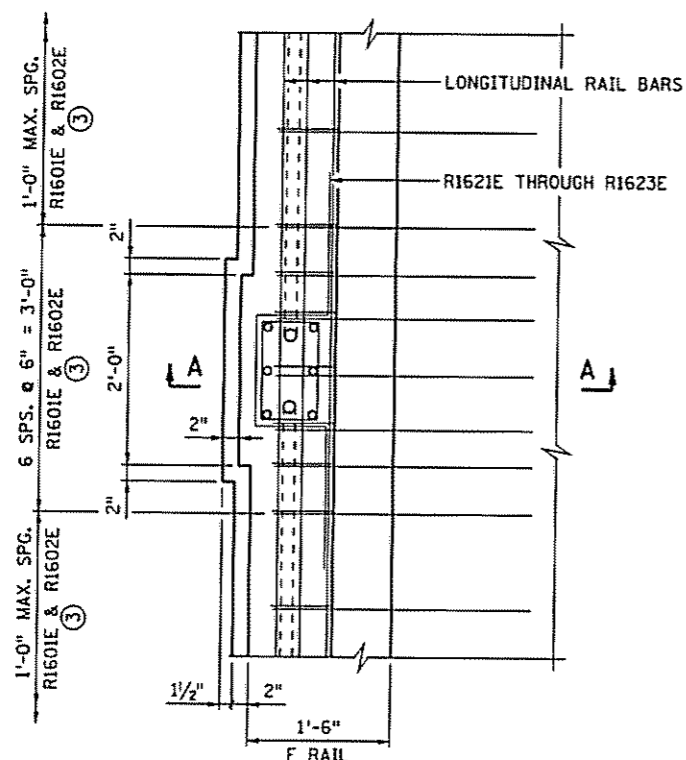
FIG. 5-397.301

BRIDGE NO.  
02004

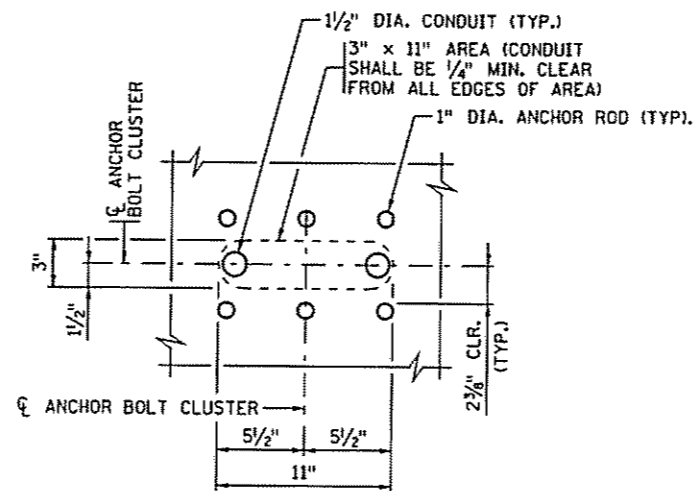




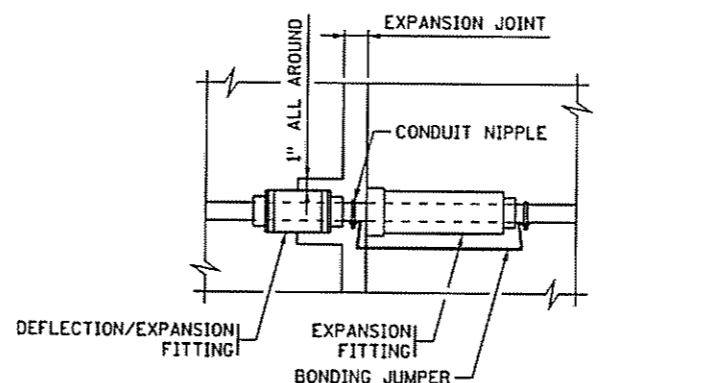
SECTION A-A ③



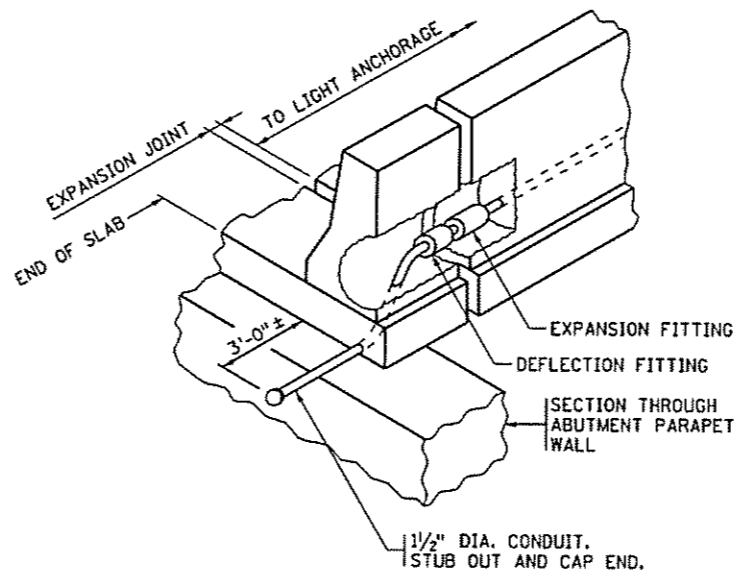
PLAN  
LIGHT POLE ANCHORAGE  
ON TYPE F, TL-4 BARRIER ③



CONDUIT PLACEMENT DETAIL



COMBINATION DEFLECTION/EXPANSION FITTING



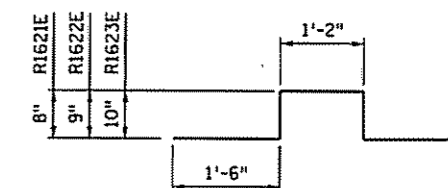
VIEW AT END OF BRIDGE  
APPROACH SLAB NOT SHOWN

SUMMARY OF QUANTITIES FOR  
CONDUIT SYSTEM (LIGHTING)

LIGHT POLE ANCHORAGE	1 EACH
① 1/2" DIA. R.S.C.	136 LIN. FT.
1/2" DIA. END CAPS	4 EACH
COMBINATION DEFLECTION/EXPANSION FITTING	1 EACH
REINFORCEMENT BARS (EPOXY COATED)	20 POUND

① SYSTEM TO BE GROUNDED.

ALL MATERIAL LISTED ABOVE IS INCLUDED IN PRICE BID FOR  
"CONDUIT SYSTEM (LIGHTING)"



R1621E, R1622E & R1623E

BILL OF REINFORCEMENT  
FOR RAILING AT LIGHT POLE

BAR	NO.	LENGTH	SHAPE	LOCATION
R1621E	1	5'-6"		LONGITUDINAL TIE
R1622E	1	5'-8"		LONGITUDINAL TIE
R1623E	1	5'-10"		LONGITUDINAL TIE

GENERAL NOTES

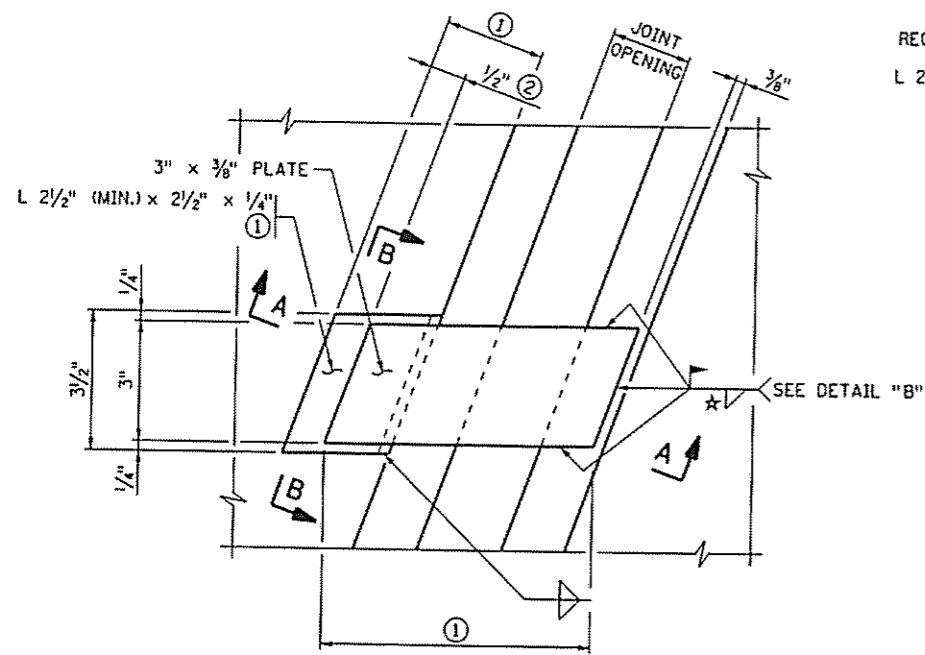
- ② THE 1/2" DIA. CONDUIT SHALL EXTEND 3" ABOVE THE RAILING AND BE CAPPED.
- ③ SEE STANDARD RAILING SHEETS FOR ADDITIONAL REINFORCEMENT PLACEMENT AND DETAIL DIMENSIONS.

REVISION:  
APPROVED: SEPTEMBER 26, 2003  
*David S. Hanson*  
STATE BRIDGE ENGINEER

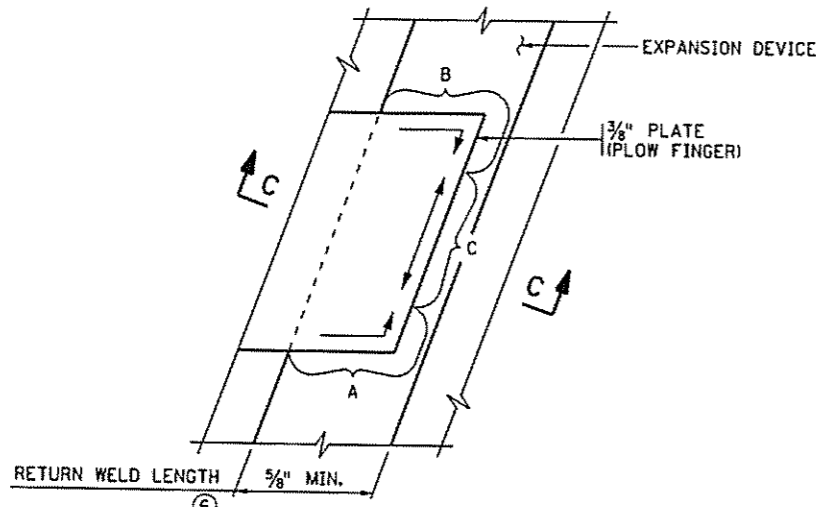
CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

CONDUIT SYSTEM (LIGHTING)  
CONCRETE BARRIER (TYPE F, TL-4)

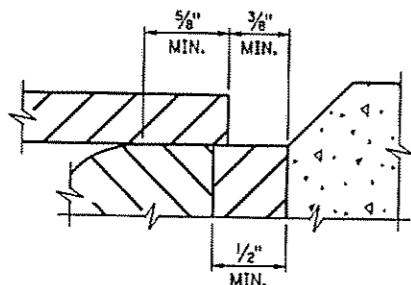
DES: PJK DR: LKL APPROVED: 2/23/09  
CHK: MCD CHK: JAJ  
FIG. 5-397.403  
BRIDGE NO. 02004  
SHEET NO. 60 OF 72 SHEETS



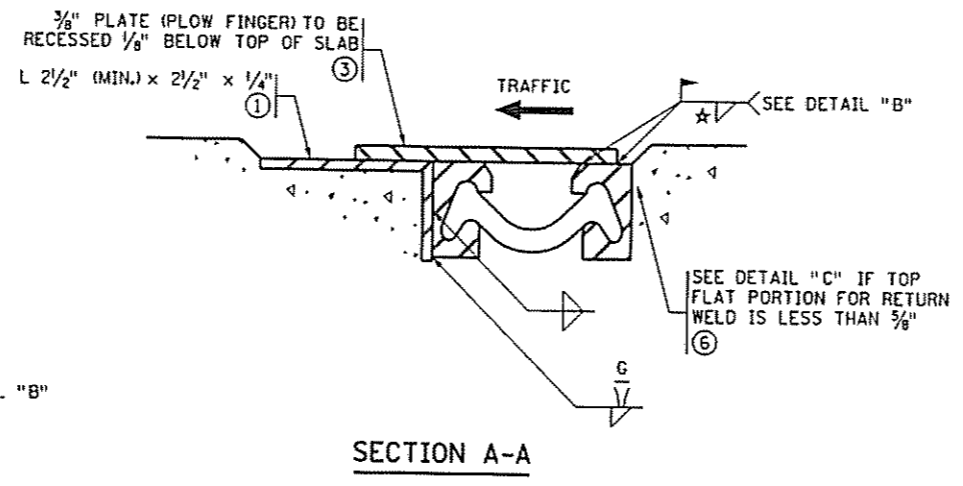
DETAIL "A"



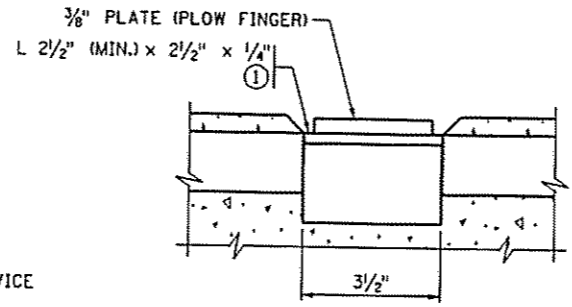
DETAIL "B"



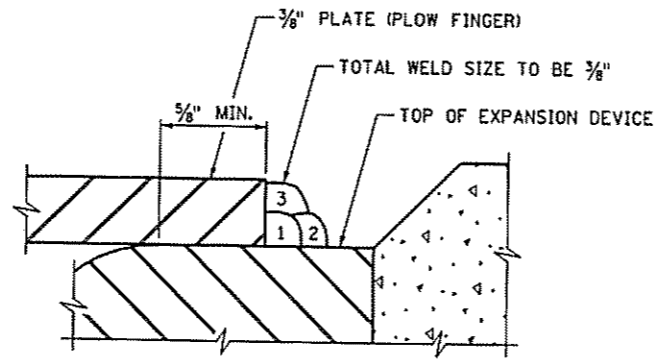
DETAIL "C"



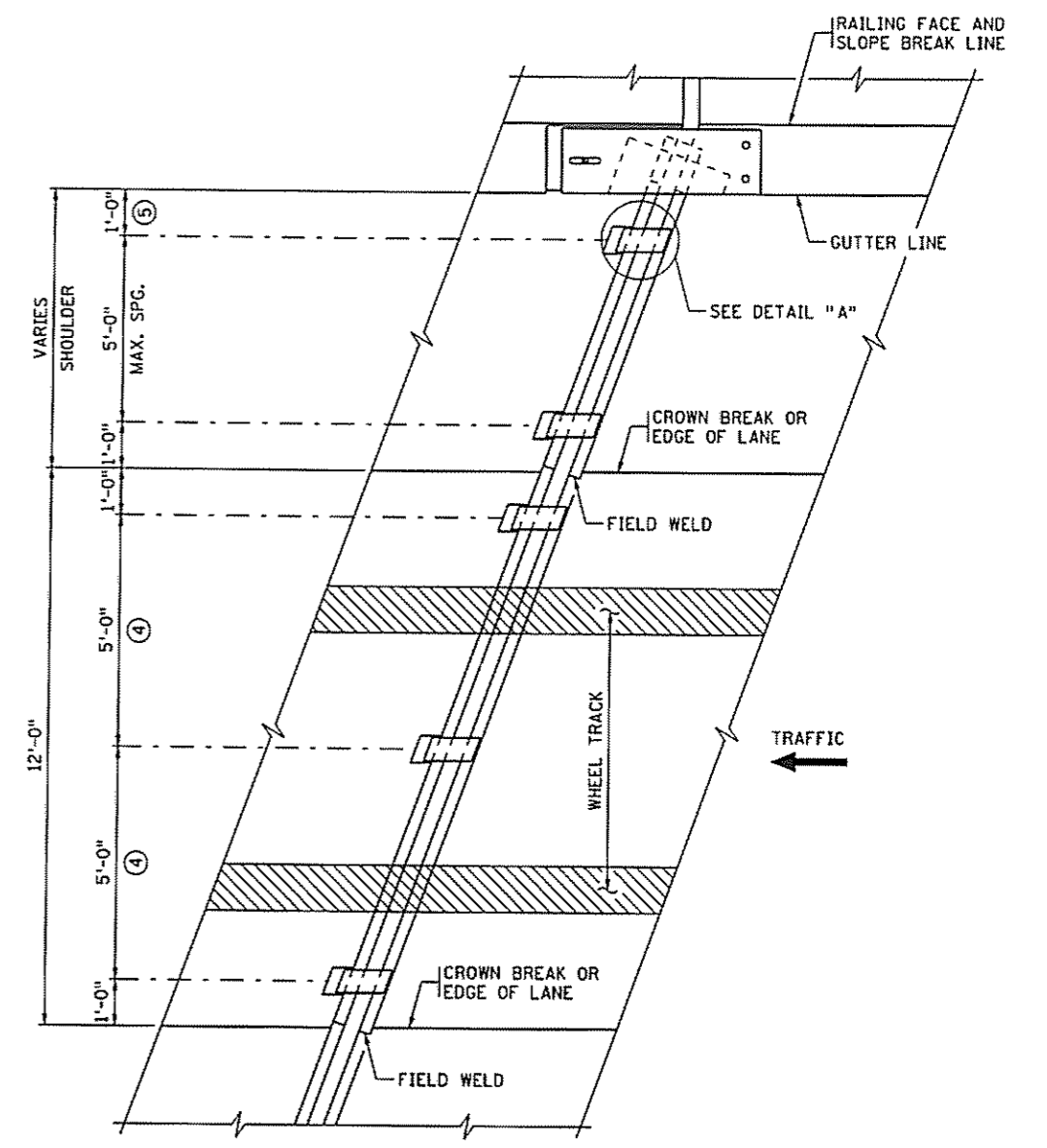
SECTION A-A



SECTION B-B



SECTION C-C



PLAN VIEW AT EXPANSION DEVICE

★ WELDING PROCEDURE FOR PLOW FINGERS

- A. ALL WELDING SHALL BE DONE WITH 1/8" AWS Mn/DOT SPEC. 5.1 TYPE E7016 OR E7018 ELECTRODE.
- B. WELD PASS 1 IN AREAS A AND B FIRST, THEN AREA C. FOLLOW WITH PASSES 2 AND 3 IN SAME ORDER AS SHOWN IN DETAIL "B".
- C. REMOVE ALL WELD SLAG AND OTHER RESIDUE BETWEEN PASSES.
- D. ALLOW AT LEAST 5 MINUTES COOLING TIME BETWEEN EACH OF NINE WELD PASSES.
- E. REPAIR ALL GALVANIZING DAMAGED BY REMOVAL AND WELDING, IN ACCORDANCE WITH Mn/DOT SPEC. 2471.3L

GENERAL NOTES

- DO NOT GALVANIZE PLOW FINGERS.
- ① VARIES WITH SKEW AND EXPANSION OPENING.
- ② MINIMUM IN CLOSED POSITION.
- ③ EVERY SNOW PLOW FINGER SHALL HAVE FULL AND DIRECT BEARING ON THE PLATE THAT IS LOCATED UNDER THE MOVEMENT SIDE OF THE FINGER. NO CLICKING NOISE WILL BE ALLOWED.
- ④ MODIFY IF LANE WIDTH DIFFERS FROM 12 FT.
- ⑤ OMIT LAST PLOW FINGER ON DEVICE WITH CURVED END.
- ⑥ ADD BACKING BAR AS REQUIRED: 1/2" MIN. THICKNESS, 1 1/2" DEEP.

2/17/2009 5:\Design\B\2004\JHB\B2004.dwg

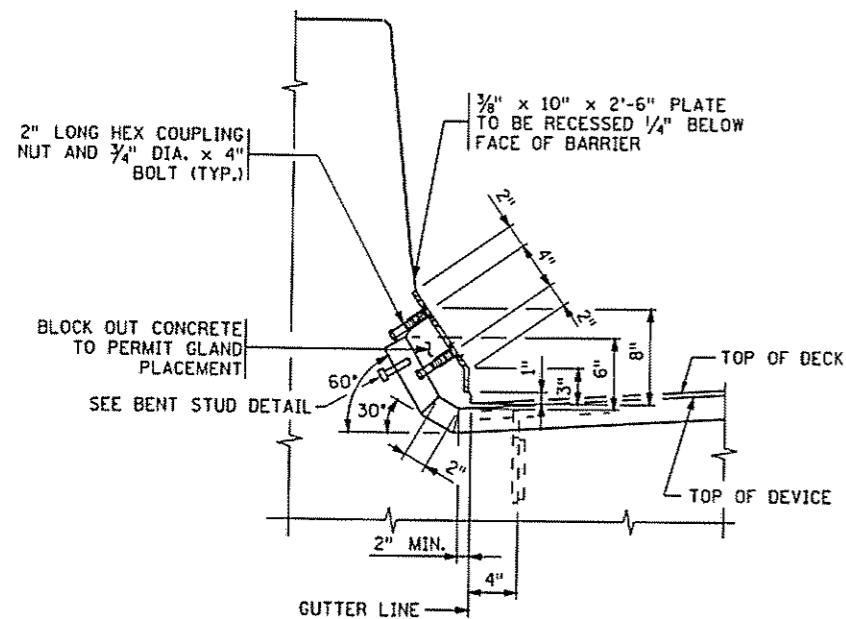
REVISION:  
 APPROVED: SEPTEMBER 26, 2003  
 State Bridge Engineer

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
 LICENSED PROFESSIONAL ENGINEER DATE  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

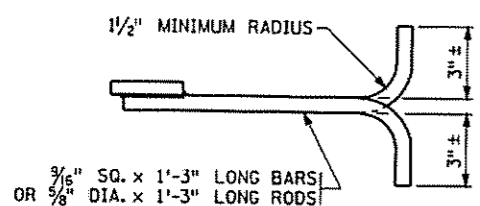
TITLE: WATERPROOF EXPANSION DEVICE  
 SNOW PLOW PROTECTION  
 (USE ON SKEWS OVER 15° AND LESS THAN 50°)

DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
 CHK: M.C.D. CHK: J.A.J.

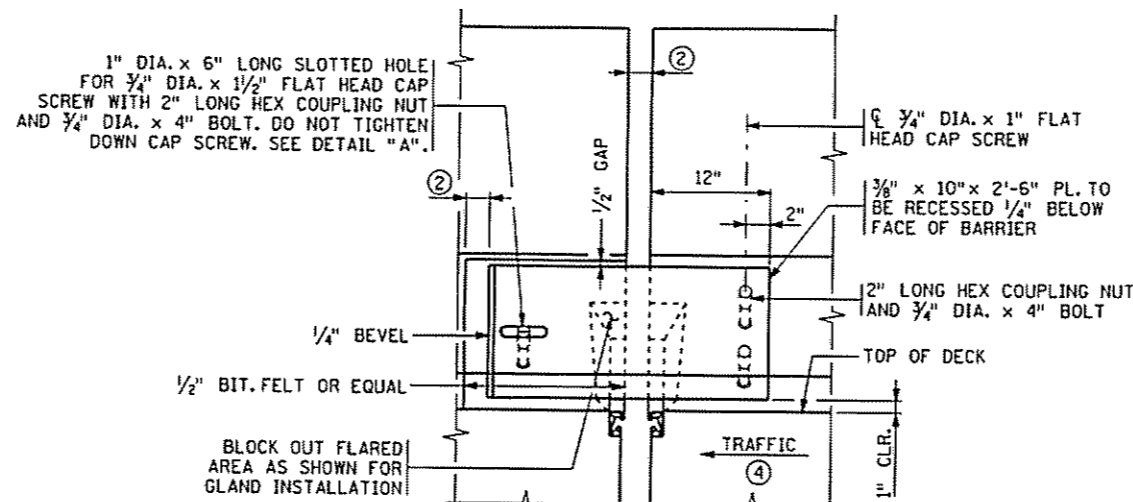
FIG. 5-397.628  
 BRIDGE NO. 02004  
 SHEET NO. 61 OF 72 SHEETS



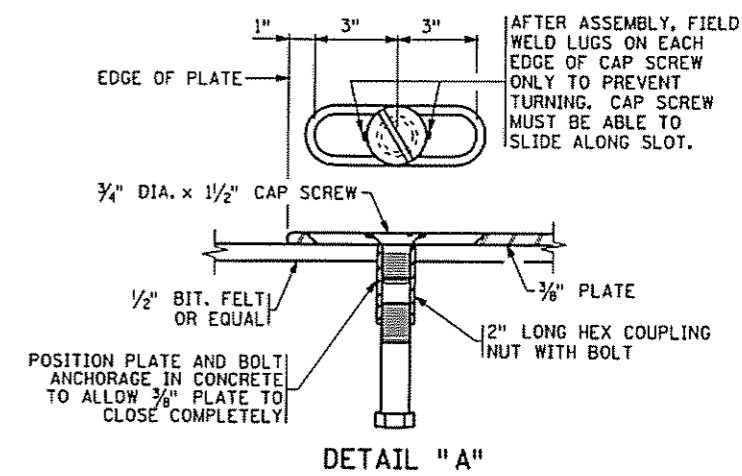
SECTION THROUGH BARRIER  
TYPE F BARRIER



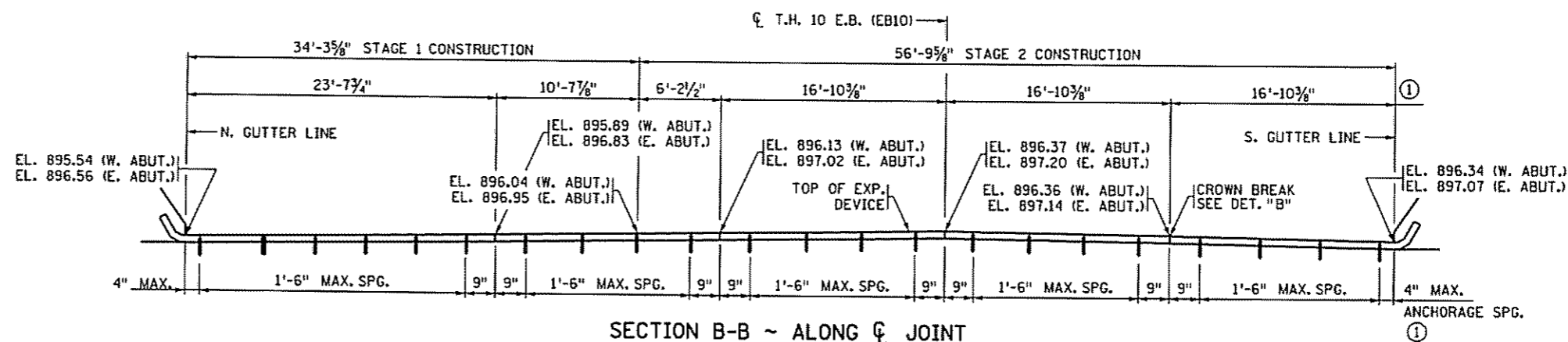
BAR-ROD DETAIL



BARRIER ELEVATION

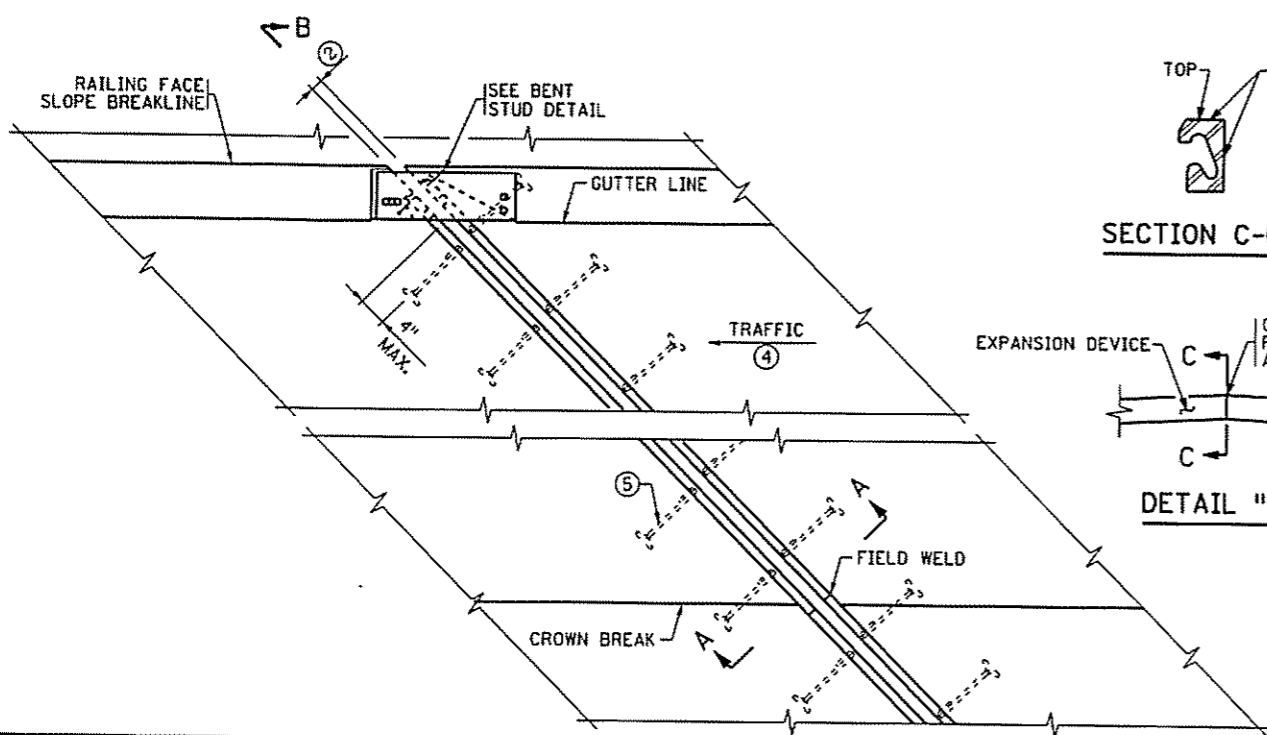


DETAIL "A"

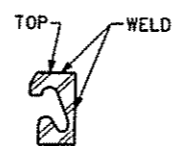


SECTION B-B ~ ALONG Q JOINT

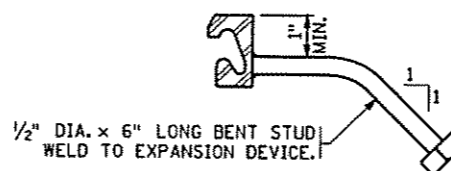
ELEVATIONS SHOWN ARE 1/2" BELOW TOP OF SLAB @ Q JOINT



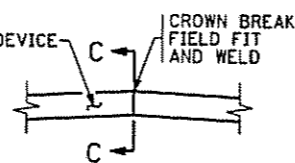
PLAN VIEW @ EXPANSION DEVICE  
WITH STRAIGHT DEVICE



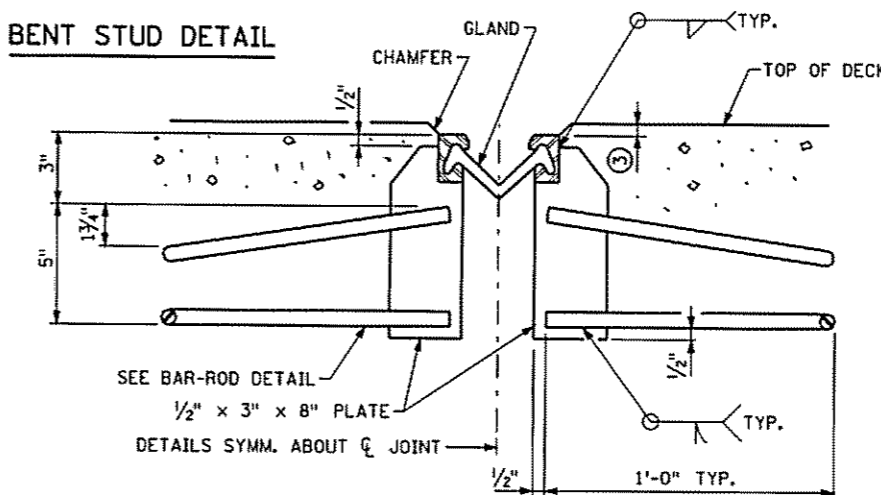
SECTION C-C



BENT STUD DETAIL



DETAIL "B"



SECTION A-A

GENERAL NOTES

GALVANIZE STRUCTURAL STEEL AFTER FABRICATION AS PER Mn/DOT SPEC. 3394. GALVANIZE FASTENERS AS PER Mn/DOT SPEC. 3392.

JOINTS IN EXTRUSION SHALL BE LOCATED AT BREAKS IN TRANSVERSE PROFILE AND AS OTHERWISE REQUIRED. JOINTS SHALL BE CLOSE FIT AND WELDED. REPAIR AFTER WELDING AS PER Mn/DOT SPEC. 2471.3L.

STRUCTURAL STEEL SHALL COMPLY WITH Mn/DOT SPEC. 3306 OR Mn/DOT SPEC. 3309.

EXPANSION DEVICE SHALL BE STRAIGHTENED TO A TOLERANCE OF 1/8" IN 10 FT.

CAP SCREWS SHALL BE COUNTERSUNK 1/16" BELOW TOP OF PLATE.

LENGTH OF PAYMENT FOR DEVICE IS FROM OUT TO OUT OF EXTRUSION ALONG CENTERLINE OF JOINT.

- ① DIMENSIONS ARE ALONG CENTERLINE OF JOINT.
- ② 1/2" @ ALL TEMPERATURES WEST ABUTMENT, 1/2" AT 90°F; 1 3/8" AT 45°F EAST ABUTMENT
- ③ 1/2" (WITH 5/8" MAX.) WHEN SNOWPLOW FINGERS ARE USED.
- ④ SEE SHEET NO. 1 FOR DIRECTION OF TRAFFIC.
- ⑤ PLACE BAR-ROD NORMAL TO JOINT ON NEW BRIDGES.

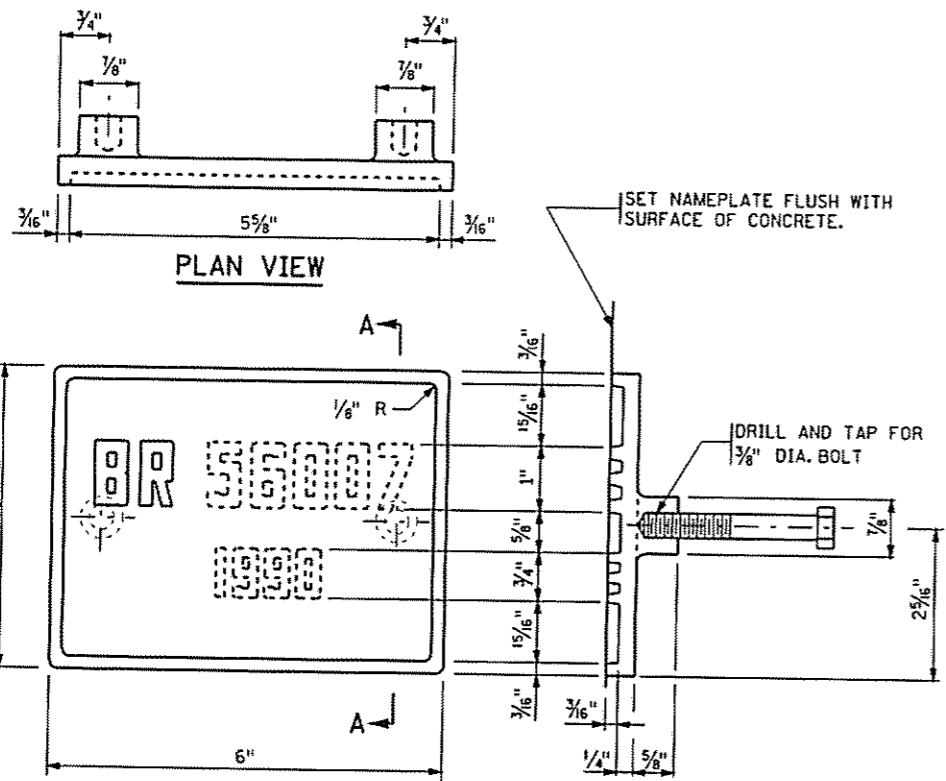
REVISION:
APPROVED: SEPTEMBER 26, 2003
<i>Moises C. Dimaculangan</i> STATE BRIDGE ENGINEER

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

WATERPROOF  
EXPANSION DEVICE  
(WITH TYPE F BARRIER)

DES: P.J.K.	DR: J.H.B.	APPROVED: 2/23/09	BRIDGE NO. 02004
CHK: M.C.D.	CHK: J.A.J.		
SHEET NO. 62 OF 72 SHEETS			

FIG. 5-397.627 MODIFIED

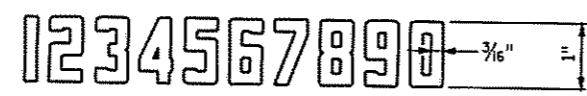


SET NAMEPLATE FLUSH WITH SURFACE OF CONCRETE.

DRILL AND TAP FOR 3/8" DIA. BOLT

THE DASHED NUMBERS SHOWN ABOVE ARE FOR ILLUSTRATION. DATA TO BE SHOWN ON NAMEPLATE IS AS FOLLOWS:

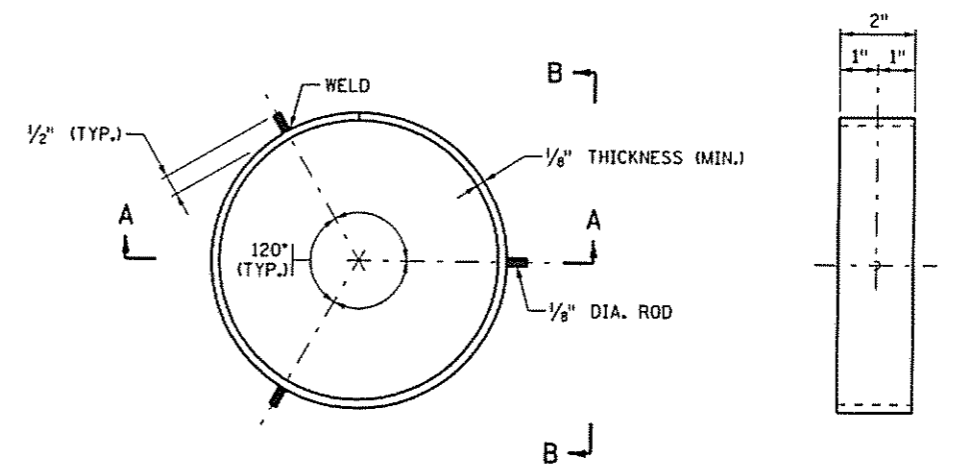
BRIDGE 02004  
YEAR 2009



NUMBERS FOR NAMEPLATE

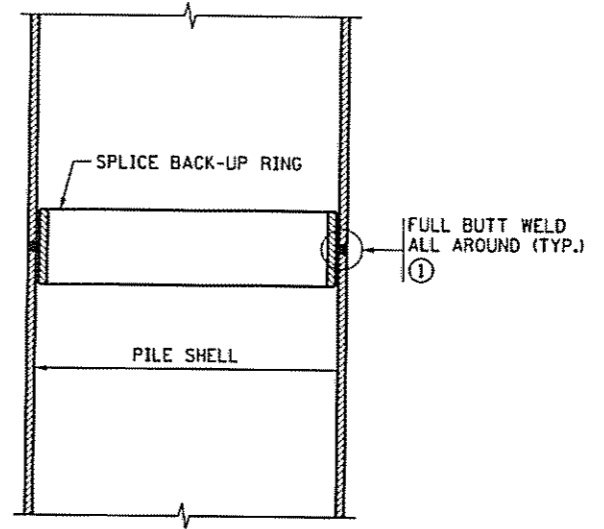
**NOTES:**

- NO SHOP DRAWING REQUIRED.
- MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3327.
- LETTERS AND NUMBERS SHALL CONFORM TO THOSE SHOWN.
- DRAFT ON LETTERS AND NUMBERS SHALL NOT BE MORE THAN 3" IN 12".
- HORIZONTAL SPACING OF LETTERS AND NUMBERS SHALL PRODUCE A BALANCED LAYOUT IN PROPORTION TO SPACING SHOWN.
- TOP SURFACE OF LETTERS, NUMBERS AND FRAMES SHALL BE BURNISHED.
- FURNISH 2 STEEL BOLTS 3/8" DIA. x 3" LONG WITH EACH PLATE.
- ALL DIMENSIONS FOR 3/4" HIGH LETTERS AND NUMBERS SHALL BE IN DIRECT PROPORTION TO THOSE SHOWN FOR THE 1" HIGH LETTERS AND NUMBERS.



PLAN VIEW SPLICE  
PILE NOT SHOWN

SECTION B-B  
PILE NOT SHOWN



SECTION A-A

**NOTES:**

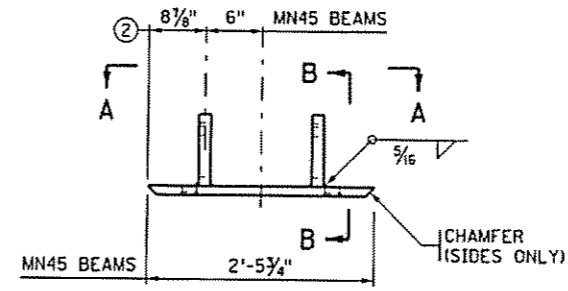
- APPROVED COMMERCIAL PILE SPLICE BACK-UP RING MAY BE USED IN LIEU OF THE TYPE DETAILED. BACK-UP RING SHALL HAVE A TIGHT FIT.
- WELDING ELECTRODES SHALL BE CELLULOSIC TYPE ELECTRODES E-6010 OR E-6011.
- ELECTRODES WHICH HAVE BECOME WET, SOILED OR DAMAGED SHALL NOT BE USED.
- WELDING SHALL NOT BE DONE WHEN THE AMBIENT TEMPERATURE IS LOWER THAN 0° F. OR WHEN THE PILE IS WET OR EXPOSED TO FALLING RAIN OR SNOW. WHEN THE PILE METAL TEMPERATURE IS BELOW 32° F., THE PILE METAL IN THE AREA OF THE WELD SHALL BE HEATED TO A MINIMUM TEMPERATURE OF 70° F. AND MAINTAINED AT THIS TEMPERATURE DURING WELDING.
- ① FOR PILE SHELL THICKNESSES GREATER THAN 1/2", USE A B-U4g WELD CONFIGURATION.

2/17/2009 5:50 Design\0102004\JH8\br-02004.dwg

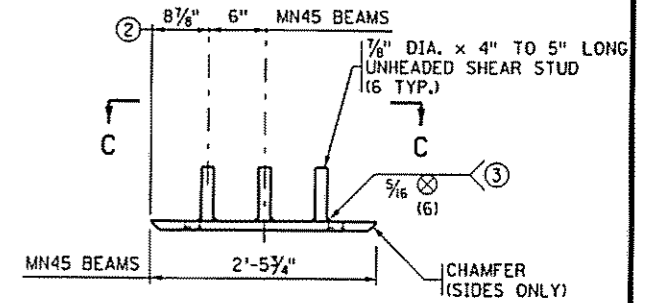
APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	BRIDGE NAMEPLATE (FOR NEW BRIDGES)		B101

APPROVED: NOVEMBER 22, 2002	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION	REVISION	DETAIL NO.
<i>Daniel J. Morgan</i> STATE BRIDGE ENGINEER	PILE SPLICE (CAST-IN-PLACE CONCRETE PILES)		B201

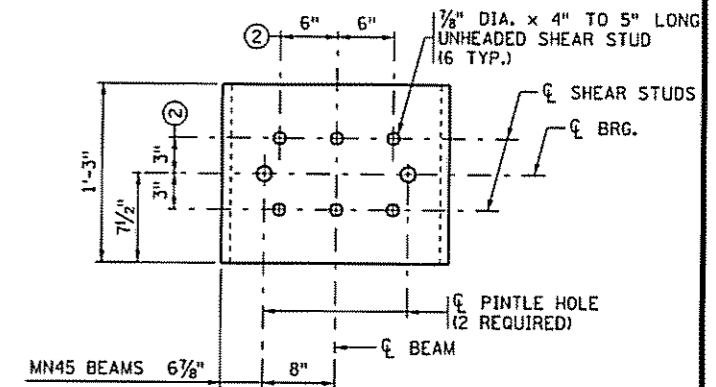
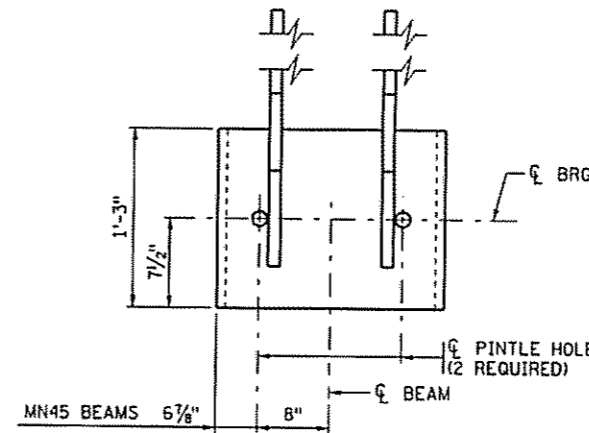
CERTIFIED BY <i>M.C. Dimaculangan</i> LICENSED PROFESSIONAL ENGINEER NAME: MOISES C. DIMACULANGAN LIC. NO. 46209	DATE 2/23/09	TITLE: DETAILS	DES: P.J.K. CHK: M.C.D.	DR: J.H.B. CHK: J.A.J.	APPROVED: 2/23/09	BRIDGE NO. 02004
SHEET NO. 63 OF 72 SHEETS						



FRONT ELEVATION - OPTION 1

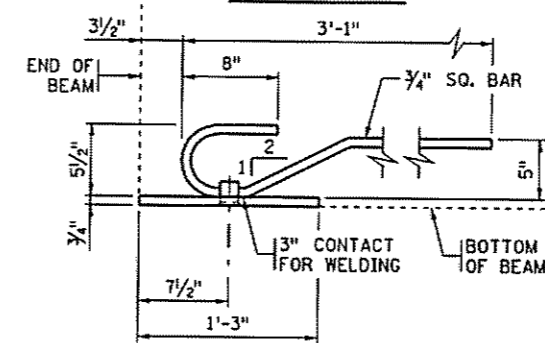


FRONT ELEVATION - OPTION 2

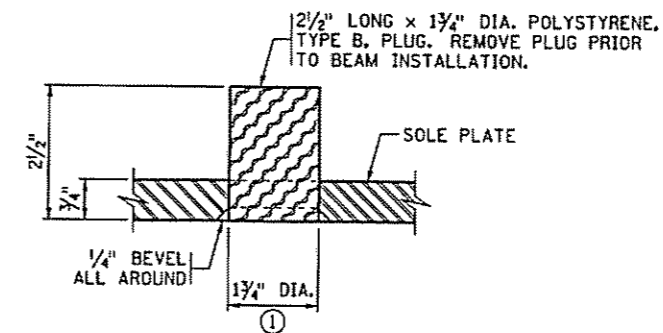


SECTION A-A

SECTION C-C



SECTION B-B



PINTLE HOLE DETAIL

**NOTES:**

MATERIAL TO BE STRUCTURAL STEEL PER Mn/DOT SPEC. 3306.

WELDED STUDS TO BE WELDABLE CARBON STEEL PER Mn/DOT SPEC. 3391.2D.

SOLE PLATE FOR BEARING ASSEMBLY TO BE GALVANIZED PER Mn/DOT SPEC. 3394 AFTER FABRICATION.

PINTLE HOLES SHALL BE FREE OF ZINC BUILD UP FROM GALVANIZING.

SOLE PLATES ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.

① FOR 1/2" DIA. PINTLES.

② THESE DIMENSIONS MAY BE MODIFIED TO CLEAR PRESTRESSED STRANDS. HOWEVER, CHANGES MUST BE APPROVED BY THE ENGINEER.

③ THE REQUIREMENTS FOR WELDING STUDS SHALL COMPLY WITH AASHTO/AWS D1.5.

APPROVED: OCTOBER 26, 2005

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION

REVISED  
06-14-2006  
10-28-2008

DETAIL NO.

*Samuel J. Morgan*  
STATE BRIDGE ENGINEER

SOLE PLATE  
(PRESTRESSED CONCRETE BEAMS)  
(FOR BEARINGS WITH PINTLES)

B303

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LIC. NO. 46209

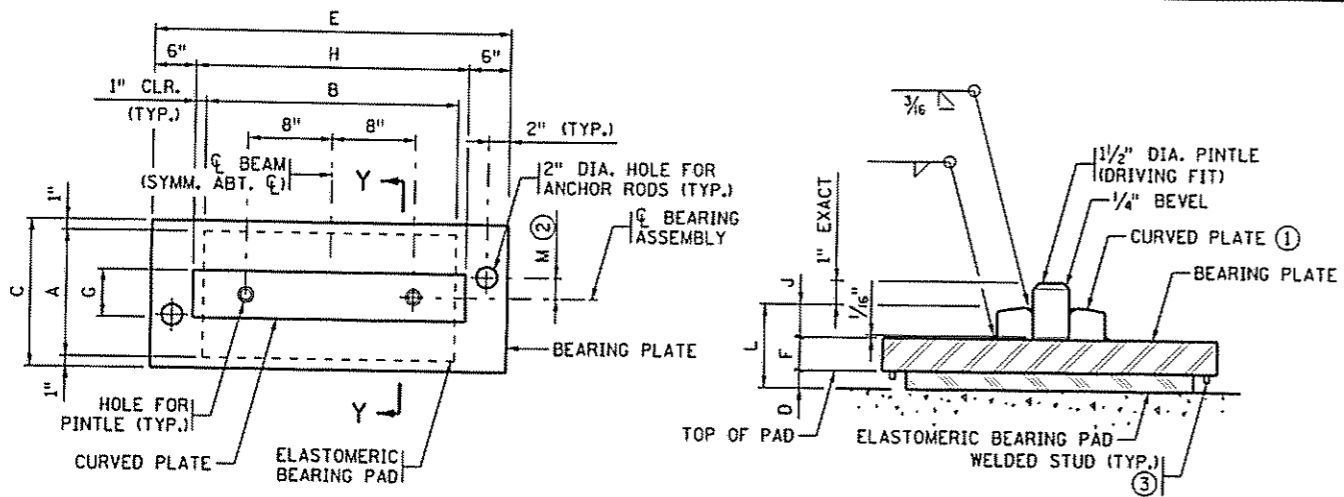
TITLE:

DETAILS

DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.

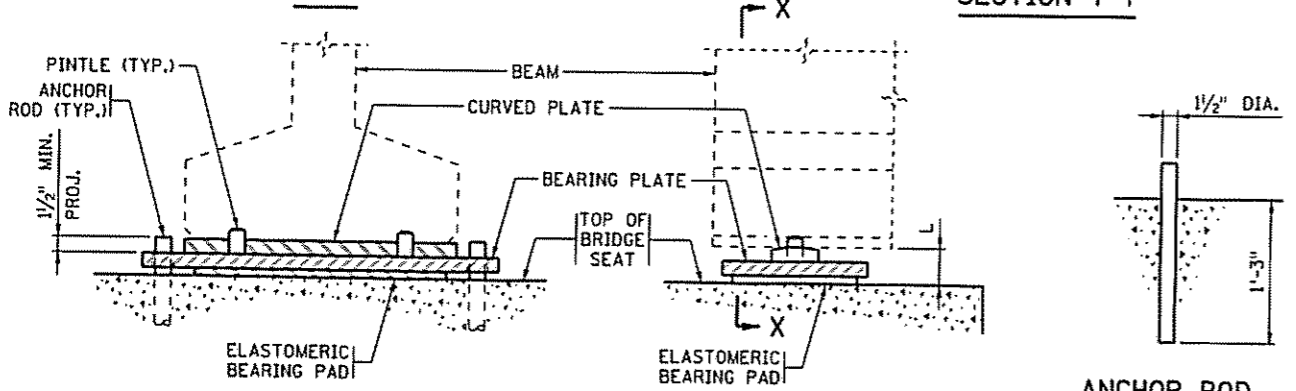
BRIDGE NO.  
02004

SHEET NO. 64 OF 72 SHEETS



PLAN

SECTION Y-Y



SECTION X-X

SIDE ELEVATION

ANCHOR ROD DETAIL

2'-2" BOTTOM FLANGE SHOWN

ANCHOR RODS NOT SHOWN

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ANCHOR ROD OFFSET	ASSY. HEIGHT	CURVED PLATE	
			A	B	D		C	E	F	G	H	J				M
F1	W. ABUT.	MN45	12"	24"	1/2"	8.0	14"	38"	1 1/2"	4 1/2"	26"	1 1/4"	+	5"	3 1/4"	16"

- NOTES:**
- ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH Mn/DOT SPEC. 3741.
  - ALL STEEL PLATES SHALL COMPLY WITH Mn/DOT SPEC. 3306.
  - ANCHOR RODS SHALL COMPLY WITH Mn/DOT SPEC. 3306. GALVANIZE PER Mn/DOT SPEC. 3394.
  - PINTLES SHALL COMPLY WITH Mn/DOT SPEC. 3309.
  - GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER Mn/DOT SPEC. 3394, EXCEPT AS NOTED.
  - PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.
- THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.
  - "+" DENOTES OFFSET AS SHOWN. "-" DENOTES OFFSET OPPOSITE OF SHOWN.
  - 5/16" DIA. x 3/8" KNOCK-OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = 1/2". MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

**DESIGN DATA:**  
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1/2" PINTLES.

APPROVED: OCTOBER 26, 2005

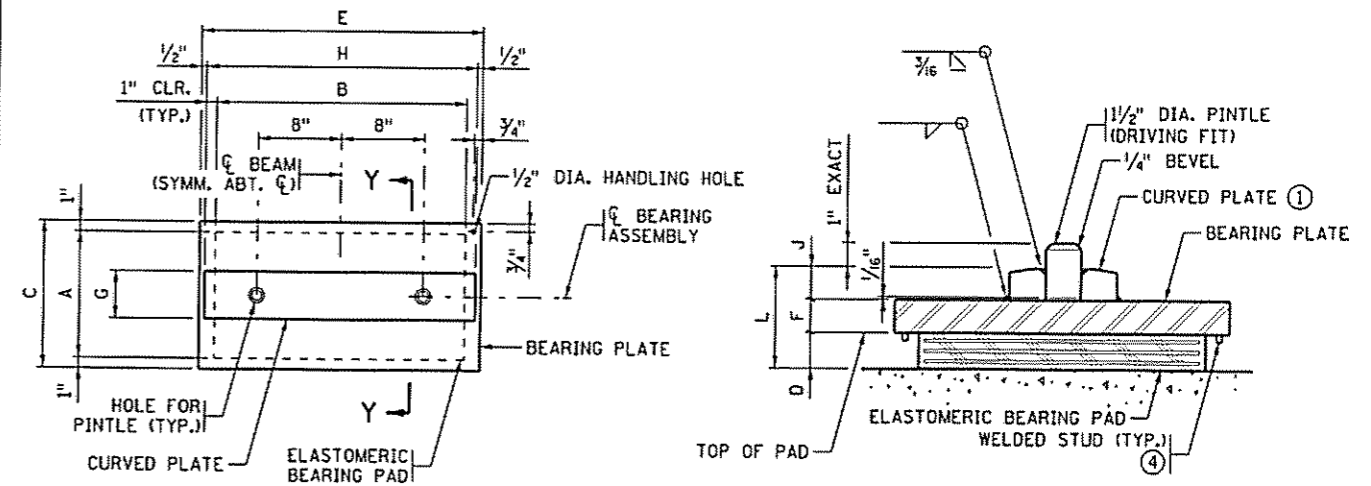
STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION

REVISOR: 08-10-2006, 10-28-2008

DETAIL NO. B310

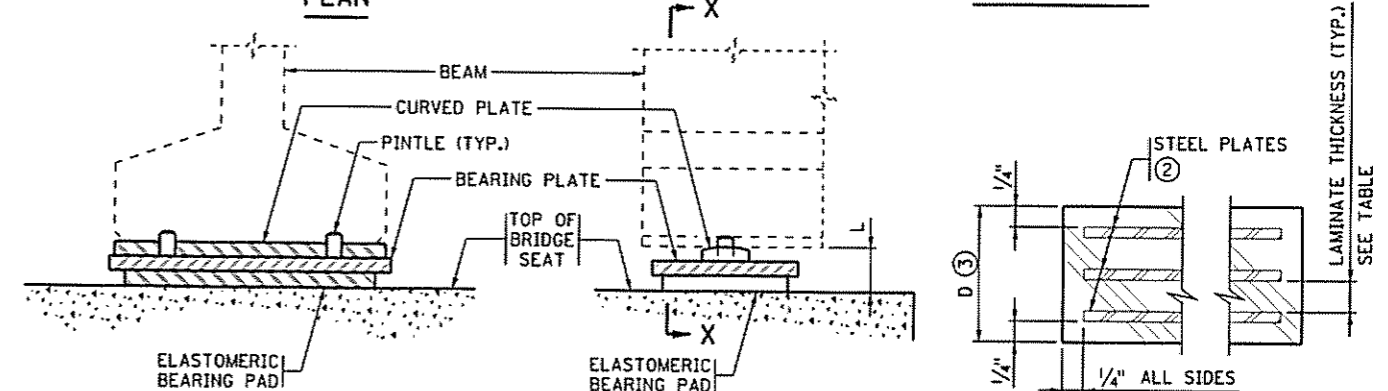
*Daniel J. Morgan*  
STATE BRIDGE ENGINEER

**CURVED PLATE BEARING ASSEMBLY**  
(PRESTRESSED CONCRETE BEAMS)  
(FIXED)



PLAN

SECTION Y-Y



SECTION X-X

SIDE ELEVATION

SECTION THROUGH ELASTOMERIC BEARING PAD

2'-2" BOTTOM FLANGE SHOWN

ASSEMBLY TYPE	LOCATION	BEAM SIZE	BEARING PAD SIZE			STEEL PLATES	LAMINATES	SHAPE FACTOR	BEARING PLATE SIZE			CURVED PLATE SIZE			ASSY. HEIGHT	CURVED PLATE		
			A	B	D				NO.	THICK.	NO.	THICK.	C	E			F	G
E1	E. ABUT.	MN45	12"	24"	2 1/2"	4	1/8"	3	1/2"	8	14"	27"	1 1/2"	4 1/2"	26"	1 1/4"	5 1/4"	16"
E2	W. ABUT.	MN45	12"	24"	1/2"	—	—	1	1/2"	8	14"	27"	1 1/2"	4 1/2"	26"	1 1/4"	3 1/4"	16"

- NOTES:**
- ELASTOMERIC MATERIALS AND PAD CONSTRUCTION SHALL COMPLY WITH Mn/DOT SPEC. 3741.
  - ALL STEEL PLATES SHALL COMPLY WITH Mn/DOT SPEC. 3306.
  - PINTLES SHALL COMPLY WITH Mn/DOT SPEC. 3309.
  - GALVANIZE STRUCTURAL STEEL BEARING ASSEMBLY AFTER FABRICATION PER Mn/DOT SPEC. 3394, EXCEPT AS NOTED.
  - PAYMENT FOR BEARING ASSEMBLY SHALL INCLUDE ALL MATERIAL ON THIS DETAIL.
- THE MIN. RADIUS SHALL BE 16" UNLESS OTHERWISE SPECIFIED IN THE TABLE. THE MAX. RADIUS SHALL BE 24". FINISH TO 250 MICRO. THE FINISHED THICKNESS OF THE PLATE MAY BE 1/16" LESS THAN SHOWN.
  - DO NOT GALVANIZE THESE PLATES.
  - THE TOTAL THICKNESS SHOWN INCLUDES THE STEEL PLATES.
  - 5/16" DIA. x 3/8" KNOCK-OFF WELD STUDS INSTALLED ON BEARING PLATE AROUND PERIMETER OF BEARING PAD. CENTERLINE STUD TO EDGE OF PAD DIMENSION = 1/2". MAX. STUD SPACING = 4", AND MAX. SPACING TO PAD CORNER = 2".

**DESIGN DATA:**  
MAXIMUM HORIZONTAL LOAD IS 70 KIPS FOR 1/2" PINTLES.

APPROVED: OCTOBER 26, 2005

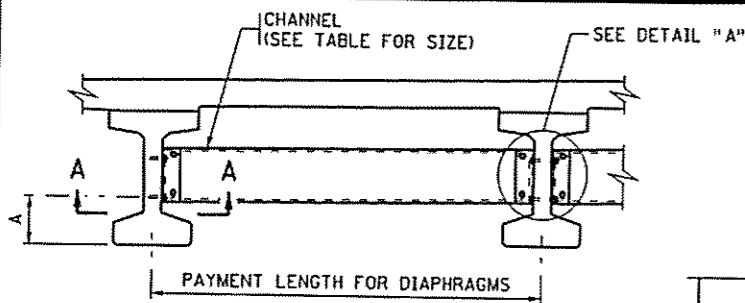
STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION

REVISOR: 08-10-2006, 10-28-2008

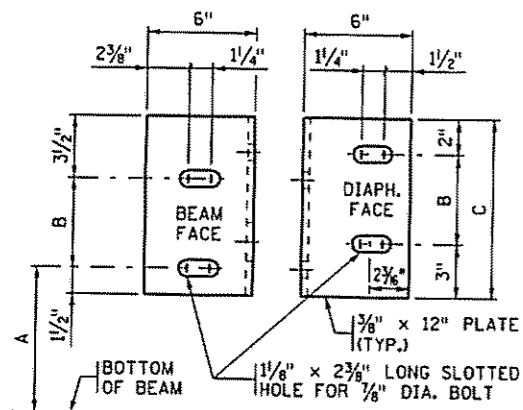
DETAIL NO. B311

*Daniel J. Morgan*  
STATE BRIDGE ENGINEER

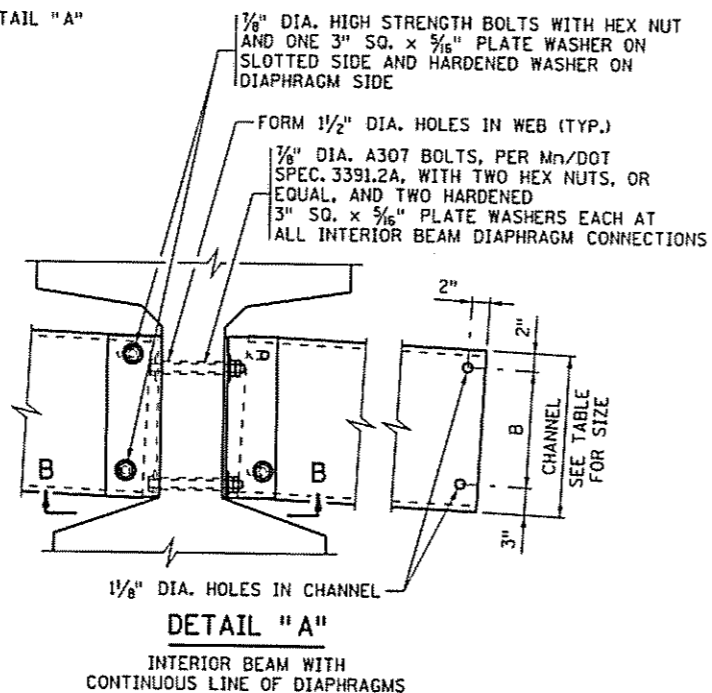
**CURVED PLATE BEARING ASSEMBLY**  
(PRESTRESSED CONCRETE BEAMS)  
(EXPANSION)



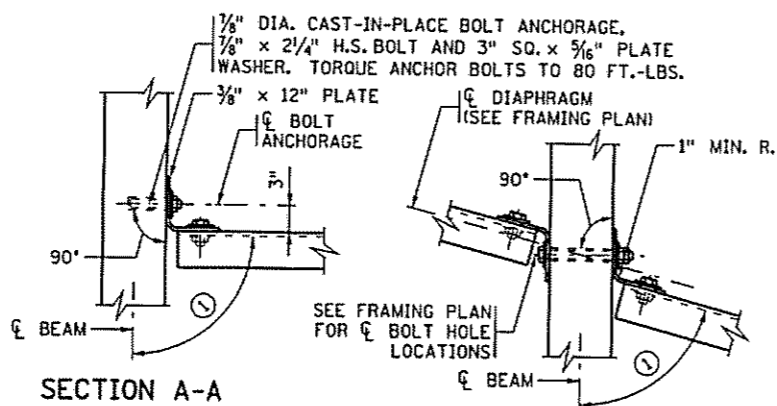
PART TRANSVERSE SECTION AT DIAPHRAGM



DIAPHRAGM CONNECTION FOR MN45 BEAMS



DETAIL "A" INTERIOR BEAM WITH CONTINUOUS LINE OF DIAPHRAGMS



SECTION A-A TYPICAL SECTION AT ALL FASCIA BEAMS

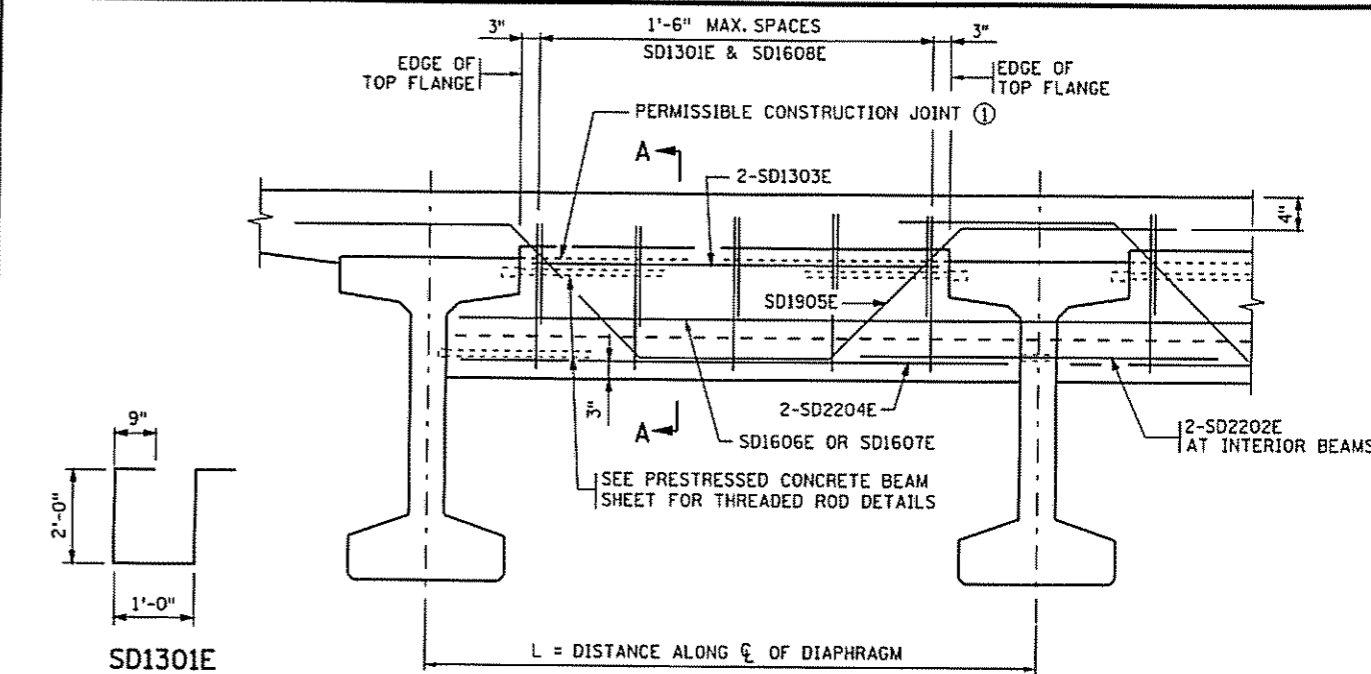
SECTION B-B TYPICAL SECTION AT INTERIOR BEAM WITH CONTINUOUS OR STAGGERED INTERMEDIATE DIAPHRAGMS

NOTES:

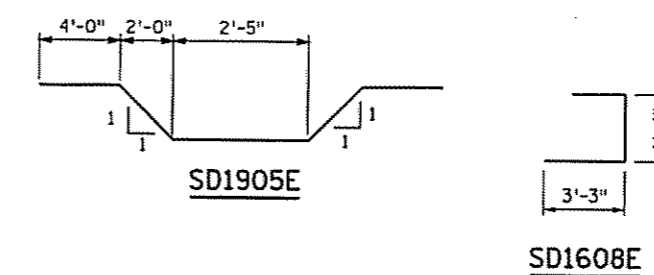
- ALL STEEL SHALL CONFORM TO Mn/DOT SPEC. 3306.
- INSTALLATION SHALL CONFORM TO Mn/DOT SPEC. 2405.3M.
- THE LEG OF THE 12" PLATE SHALL BE SHOP BENT TO CONFORM TO THE DIAPHRAGM. A 3/8" x 6" x 6" ANGLE MAY BE USED FOR DIAPHRAGMS PERPENDICULAR TO BEAMS.
- ALL STRUCTURAL STEEL SHOWN ON THIS DETAIL, INCLUDING BOLTS AND WASHERS, SHALL BE INCLUDED IN UNIT PRICE BID FOR DIAPHRAGMS FOR PRESTRESSED BEAMS.
- BENT PLATES MAY BE USED IN PLACE OF CHANNELS. THE BENT PLATES MUST BE THE SAME HEIGHT AS THE CHANNELS THEY REPLACE, BE 5/16" IN THICKNESS, AND HAVE LEGS 5" LONG.

① FOR SKEW ANGLES OVER 20°, USE 90°.

BEAM HEIGHT	DISTANCE			CHANNEL SIZE
	A	B	C	
MN45	1'-7 3/4"	7"	1'-0"	C12x20.7



PART TRANSVERSE SECTION

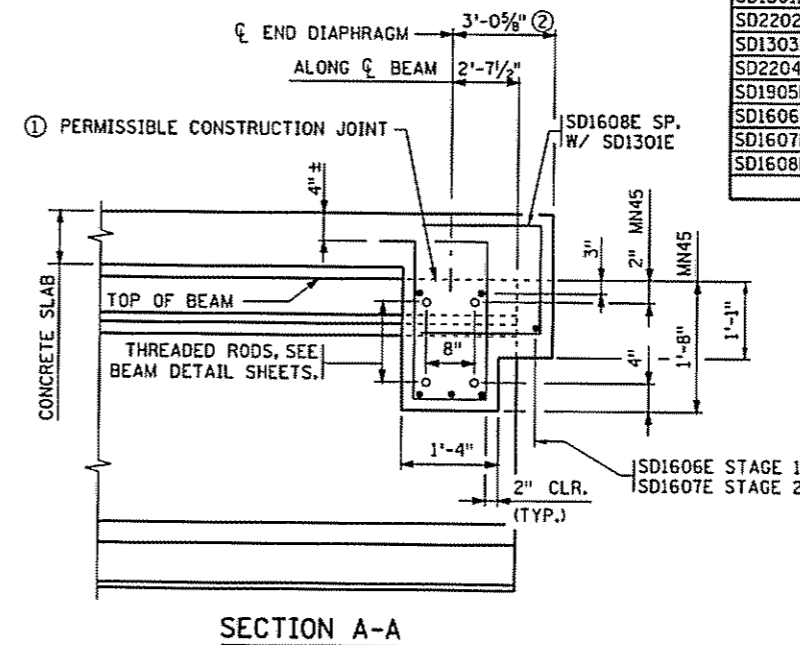


LONGITUDINAL REINFORCEMENT IN BOTTOM OF DIAPHRAGM				
DISTANCE "L" ALONG CL OF DIAPHRAGM	BARS REQUIRED			
	STRAIGHT		BENT	
	NO.	SIZE	NO.	SIZE
OVER 8' TO 11'	2	22E	1	19E

BILL OF REINFORCEMENT FOR END DIAPHRAGM					
BAR	STAGE 1 NO.	STAGE 2 NO.	LENGTH	SHAPE	LOCATION
SD1301E	30	60	6'-10"	U	VERTICAL TIE
SD2202E	12	20	5'-0"	—	LONG. THRU BEAM
SD1303E	12	24	5'-3"	—	LONG. TOP
SD2204E	12	24	8'-4"	—	LONG. BOTTOM
SD1905E	8	10	16'-1"	—	LONGITUDINAL
SD1606E	2	—	38'-0"	—	LONGITUDINAL
SD1607E	—	2	54'-5"	—	LONGITUDINAL
SD1608E	30	60	7'-10"	U	VERTICAL TIE

NOTES:

- END DIAPHRAGM SHALL BE CONC. MIX NO. 3Y36.
- QUANTITIES FOR END DIAPHRAGM CONCRETE AND REINFORCEMENT SHOWN ON THIS DETAIL SHALL BE LISTED IN SUPERSTRUCTURE QUANTITIES.
- THREADED RODS ARE INCIDENTAL TO PRESTRESSED CONCRETE BEAMS.
- ① USE OF CONSTRUCTION JOINT REQUIRES CLEARANCE FOR EXPANSION DEVICE. WHEN CONSTRUCTION JOINT IS USED AT THIS LOCATION, DIAPHRAGM FALSEWORK SHALL REMAIN IN PLACE UNTIL COMPLETION OF SLAB CURING PERIOD.
- ② PERPENDICULAR TO CENTERLINE OF DIAPHRAGM.

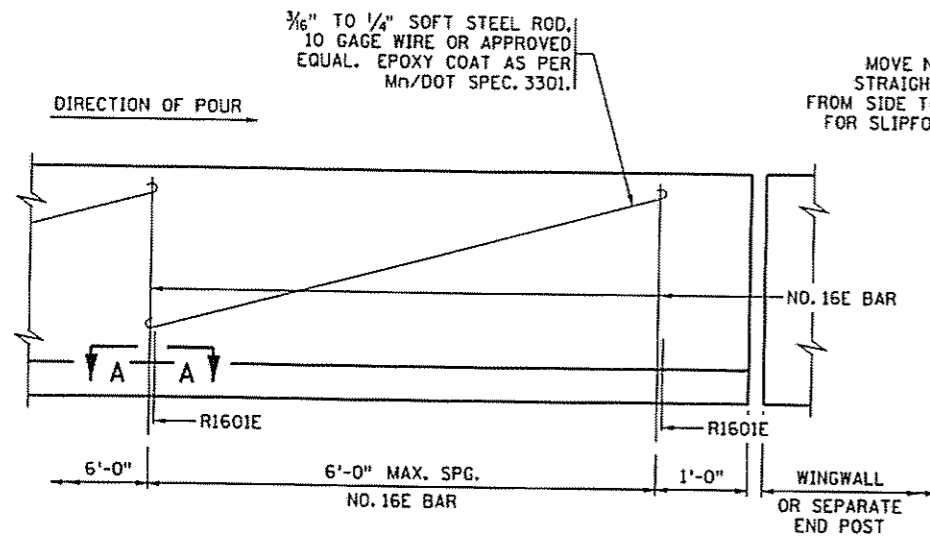


SECTION A-A

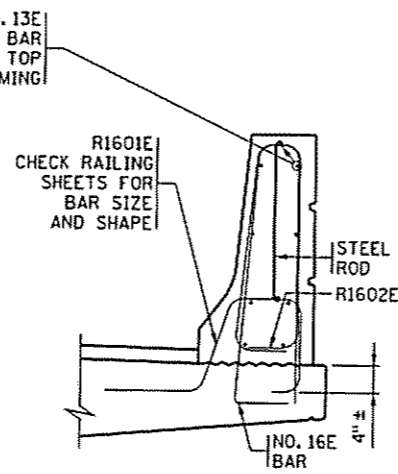
APPROVED: OCTOBER 26, 2005  
 STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION  
 STEEL INTERMEDIATE DIAPHRAGM (FOR MN45 PRESTRESSED CONCRETE BEAMS)  
 REVISED 06-14-2006  
 DETAIL NO. B403

APPROVED: OCTOBER 26, 2005  
 STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION  
 CONCRETE END DIAPHRAGM (MN45 PRESTRESSED CONCRETE BEAMS) (PARAPET ABUTMENT)  
 REVISED 06-14-2006  
 DETAIL NO. B814 MODIFIED

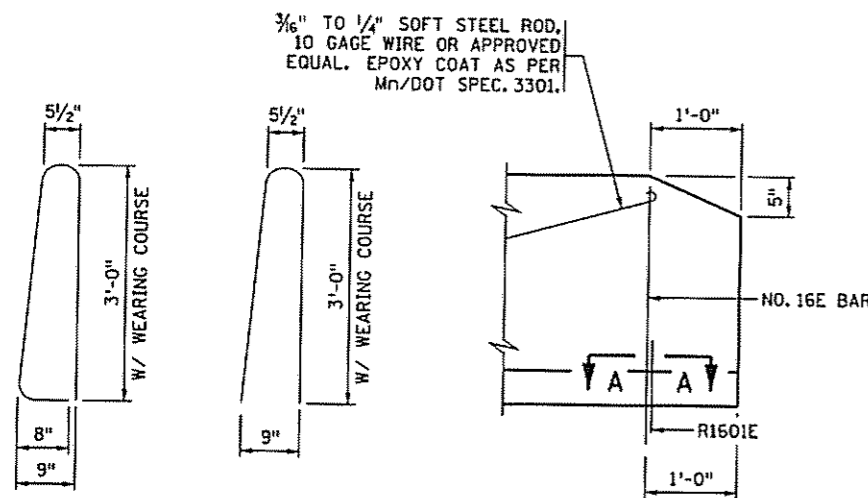
CERTIFIED BY: *Moises C. Dimaculangan* 2/23/09 DATE: 2/23/09  
 NAME: MOISES C. DIMACULANGAN LIC. NO. 46209  
 TITLE: DETAILS  
 DES: P.J.K. DR: J.H.B. APPROVED: 2/23/09  
 CHK: M.C.D. CHK: J.A.J.  
 SHEET NO. 66 OF 72 SHEETS  
 BRIDGE NO. 02004



**INSIDE ELEVATION OF RAILING**



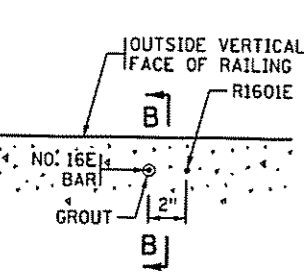
**RAILING SECTION**



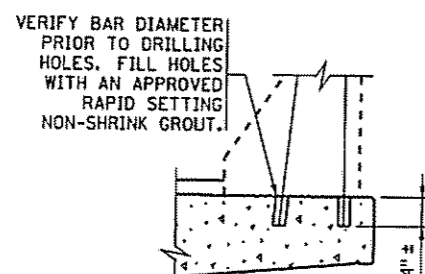
**INSIDE ELEVATION OF RAILING**

**NO. 16E BAR**  
DRILLED IN ALTERNATE

**NO. 16E BAR**  
AT END OF WINGWALL



**SECTION A-A**

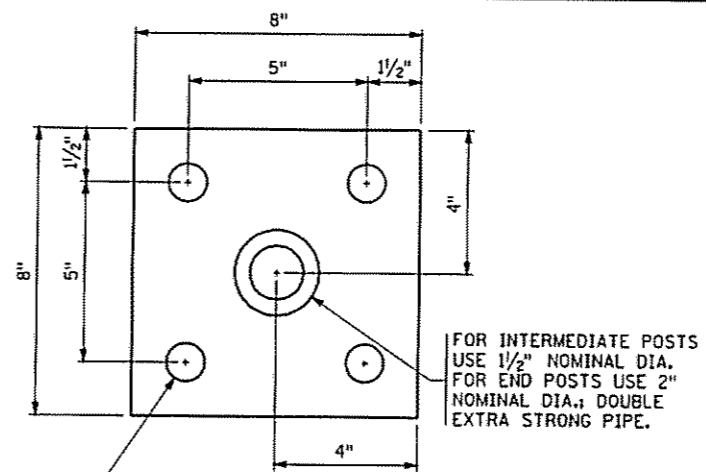


**SECTION B-B**

**INSTALLATION DETAILS FOR NO. 16E (DRILLED IN ALTERNATE)**

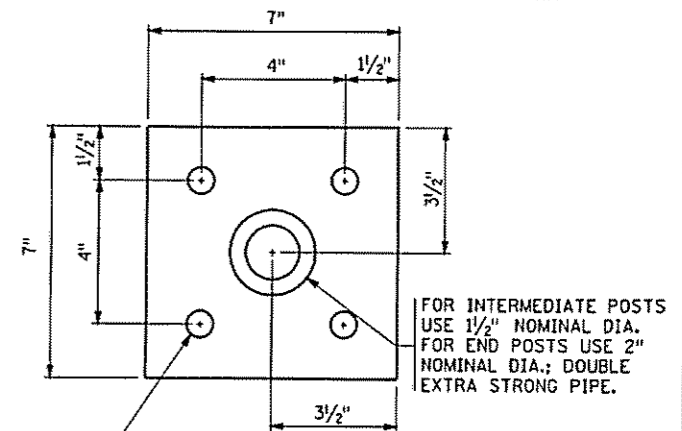
**NOTES:**

- CONTRACTOR WILL TOOL V-GROOVE AT DEFLECTION JOINTS AT TIME RAIL IS CAST AND SHALL EXTEND V-GROOVE AROUND ENTIRE PERIMETER OF RAIL.
- FOR ADDITIONAL DIMENSIONS, DETAILS, REINFORCEMENT AND NOTES SEE RAILING SHEET.
- FORM RAIL FOR A MINIMUM OF 2' ON EACH SIDE OF EXPANSION DEVICES, LIGHT STANDARDS AND DECK DRAIN BOX OUTS.
- PAY QUANTITIES WILL NOT BE ADJUSTED AS A RESULT OF SELECTING THIS ALTERNATE.
- USE A SIMILAR METHOD FOR TALLER RAILINGS OR MODIFIED VERSIONS OF THIS RAILING.



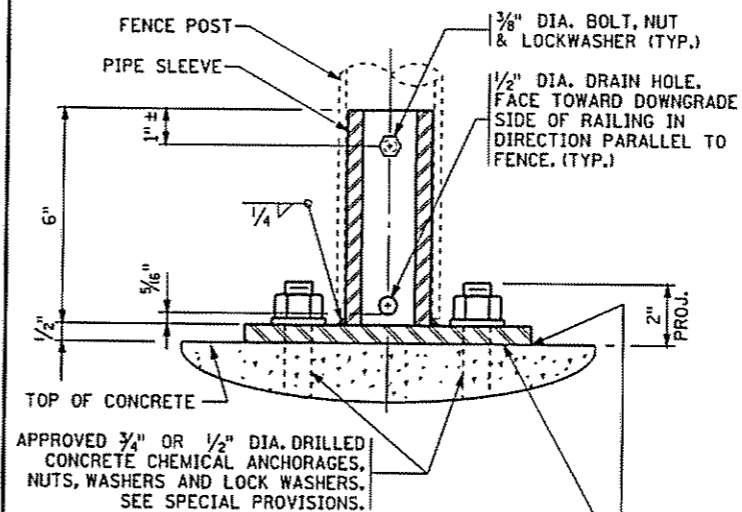
**PLAN VIEW - TYPE A**

ESTIMATED WEIGHT = 12 OR 14 LBS.



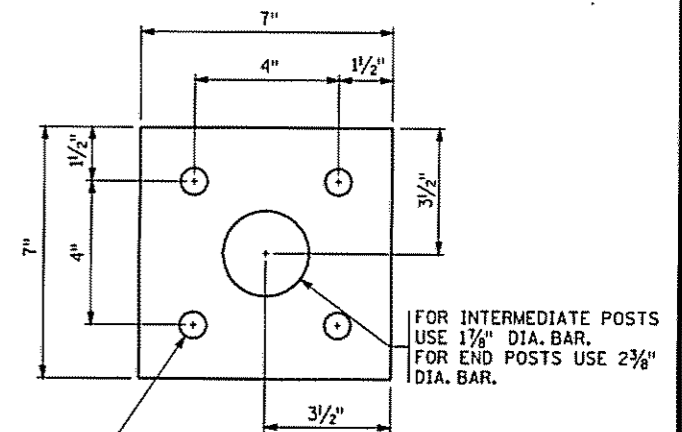
**PLAN VIEW - TYPE B**

ESTIMATED WEIGHT = 10 OR 12 LBS.



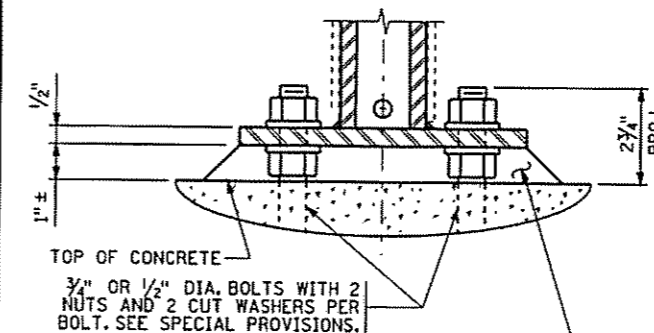
**TYPICAL SECTION**

CAULK FULL BOTTOM SURFACE AND EDGES OF BASE PLATE. SHIM AS REQUIRED TO LEVEL BASE PLATE, MAXIMUM 1/4".



**PLAN VIEW - TYPE C**

ESTIMATED WEIGHT = 12 OR 15 LBS.



**GROUT ALTERNATE**

DOUBLE NUT OPTION SHOWN. USE ONLY WHEN MAXIMUM SHIM DIMENSION IS GREATER THAN 1/4" OR AS NOTED IN THE SPECIAL PROVISIONS. USE APPROVED EPOXY OR LATEX MODIFIED MORTAR.

**NOTES:**

- STRUCTURAL STEEL PER Mn/DOT SPEC. 3306
- STRUCTURAL PIPE PER Mn/DOT SPEC. 3362
- GALVANIZE THE FENCE POST ANCHORAGE AFTER FABRICATION PER Mn/DOT SPEC. 3394. GALVANIZE THE FASTENERS PER Mn/DOT SPEC. 3392.
- DOUBLE EXTRA STRONG PIPE WEIGHTS:  
1/2" NOMINAL DIA. = 6.41 LBS./FT.  
2" NOMINAL DIA. = 9.03 LBS./FT.

APPROVED: NOVEMBER 22, 2002

*Daniel J. Morgan*  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**CONCRETE RAILING (TYPE F)**  
(SLIPFORM ALTERNATE)

REVISION  
DETAIL NO.  
**B830**

APPROVED: NOVEMBER 22, 2002

*Daniel J. Morgan*  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**FENCE POST ANCHORAGE**

REVISION  
DETAIL NO.  
**B905**

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

DETAILS

DES: P.J.K. OR: J.H.B. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.  
SHEET NO. 67 OF 72 SHEETS

BRIDGE NO. 02004



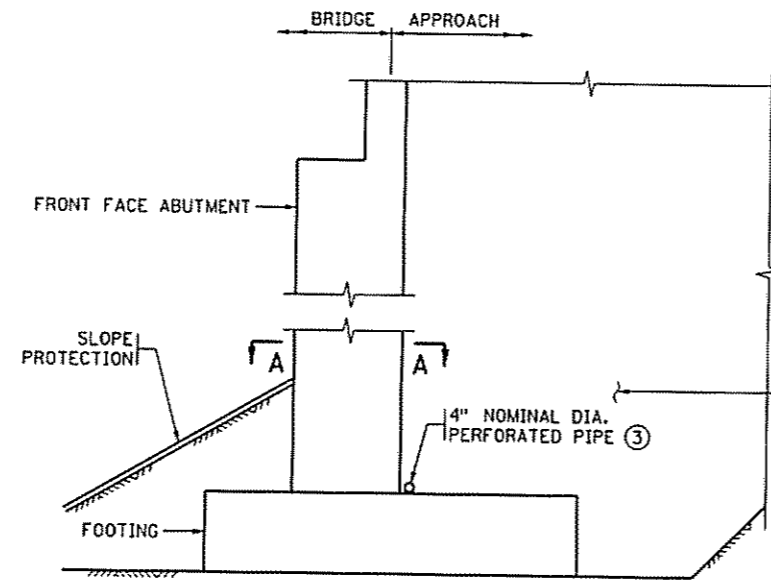
**SUMMARY OF QUANTITIES FOR DRAINAGE SYSTEM**

4" DIA. PERFORATED PIPE	290 LIN. FT.
4" DIA. NON-PERFORATED PIPE	60 LIN. FT.
45° ELBOW	2 EACH
4" DIA. COUPLING	2 EACH
PIPE SLEEVE	3 EACH
① PRECAST CONCRETE HEADWALL	2 EACH

THE SUMMARY OF QUANTITIES FOR DRAINAGE SYSTEM IS AS SHOWN ABOVE. ANY ADDITIONAL MINOR ITEMS OR SLIGHT CHANGES OF QUANTITIES REQUIRED SHALL BE FURNISHED BY THE CONTRACTOR WITH NO ADDITIONAL COMPENSATION.

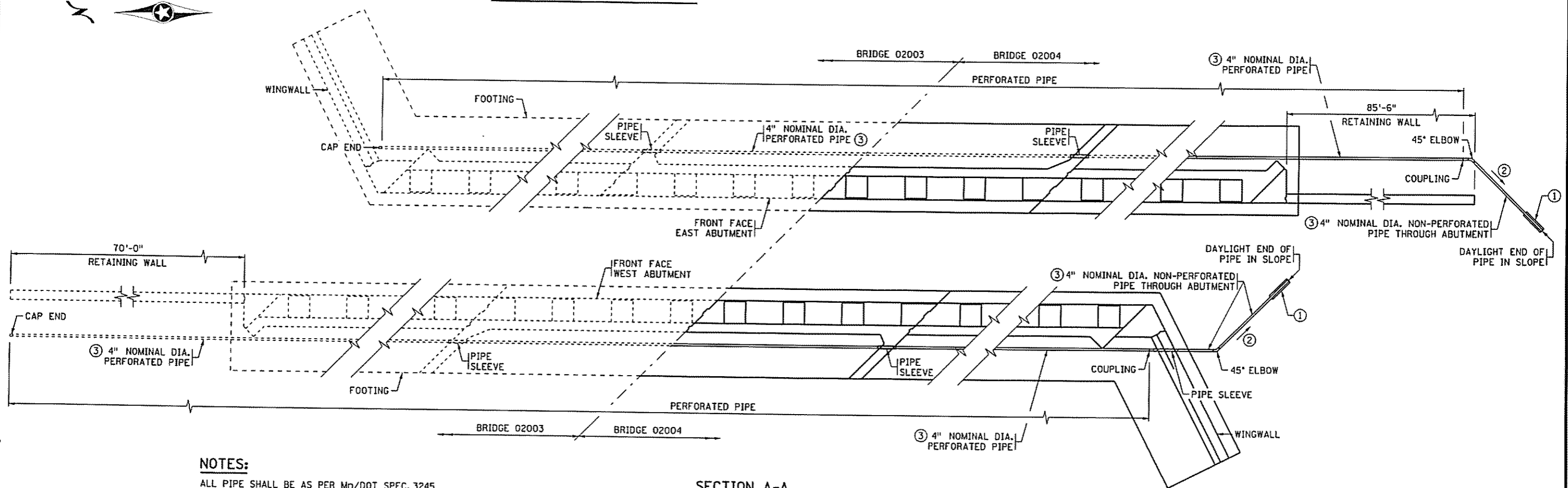
PAYMENT WILL BE INCLUDED IN THE SINGLE LUMP SUM PRICE FOR ITEM 2502.502 "DRAINAGE SYSTEM TYPE (B910)".

QUANTITIES ARE FOR BOTH ENDS OF BRIDGE.



MATERIAL SHALL COMPLY WITH Mn/DOT SPEC. 3149.2B  
SELECT GRANULAR BORROW, MODIFIED SO THAT NO MORE THAN 10% PASSES A NO. 200 SIEVE.  
(UNDER GRADING PORTION OF CONTRACT)

**SECTION THROUGH ABUTMENT**



**SECTION A-A**

**NOTES:**

ALL PIPE SHALL BE AS PER Mn/DOT SPEC. 3245.

WRAP PERFORATED PIPE WITH GEOTEXTILE AS PER Mn/DOT SPEC. 3733, TYPE I. ATTACH TO PIPE AS PER Mn/DOT SPEC. 2502.

- ① PRECAST CONCRETE HEADWALL WITH RODENT SCREEN. SEE STANDARD PLATE 3131 FOR DETAILS.
- ② 1/8" PER FT. MINIMUM SLOPE.
- ③ TO BE PLACED AS DIRECTED BY ENGINEER IN FIELD.

APPROVED: NOVEMBER 22, 2002

*Daniel J. Wagon*  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION

**DRAINAGE SYSTEM**  
(FOR HIGH ABUTMENTS)

REVISED  
04-20-2004  
08-25-2006

DETAIL NO.

**B910  
MODIFIED**

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09  
LICENSED PROFESSIONAL ENGINEER DATE  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

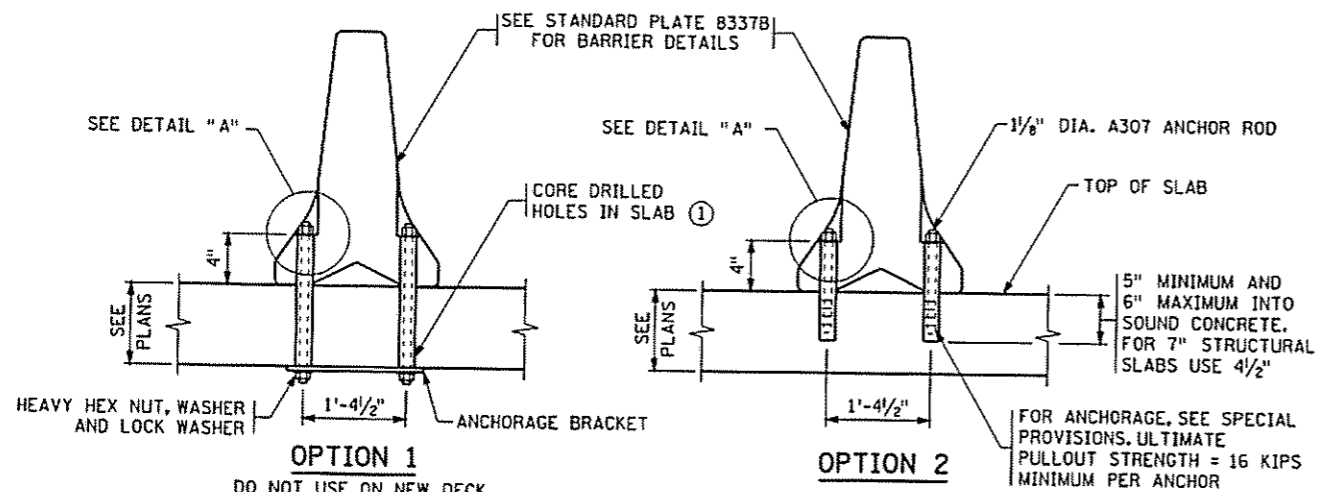
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**DETAILS**

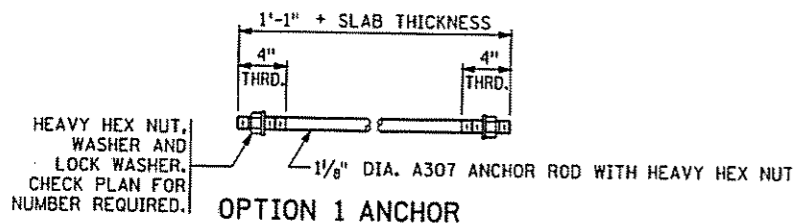
DES: P.J.K. DR: J.H.B.  
CHK: M.C.D. CHK: J.A.J. APPROVED: 2/23/09

SHEET NO. 68 OF 72 SHEETS

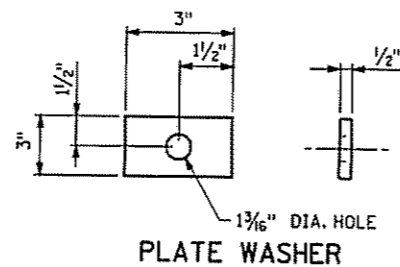
BRIDGE NO.  
**02004**



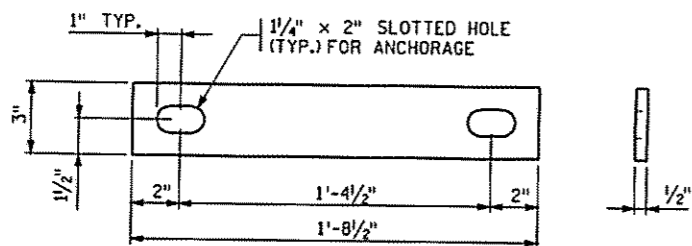
**ANCHORAGE DETAILS**  
REINFORCEMENT NOT SHOWN



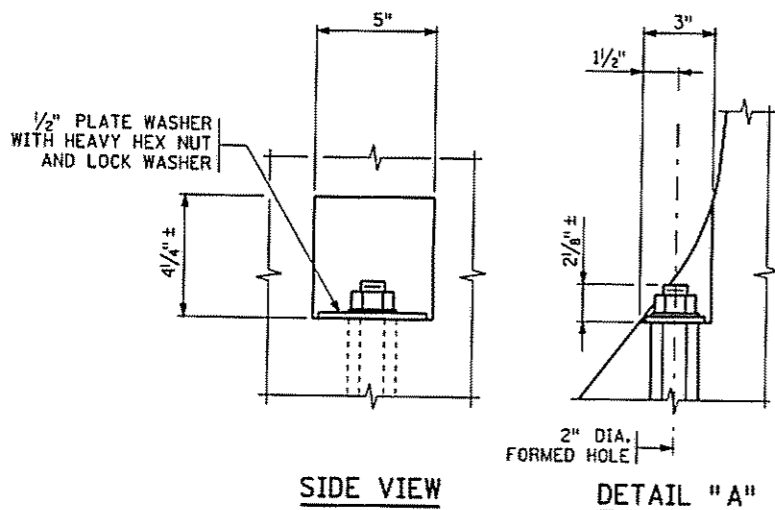
**OPTION 1 ANCHOR**



**PLATE WASHER**



**ANCHORAGE BRACKET FOR OPTION 1**

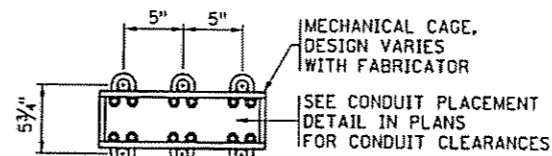


**SIDE VIEW**

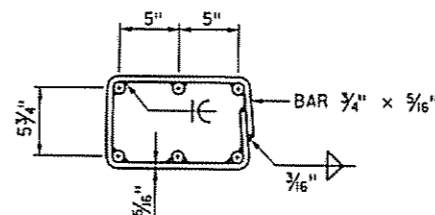
**DETAIL "A"**

**NOTES:**

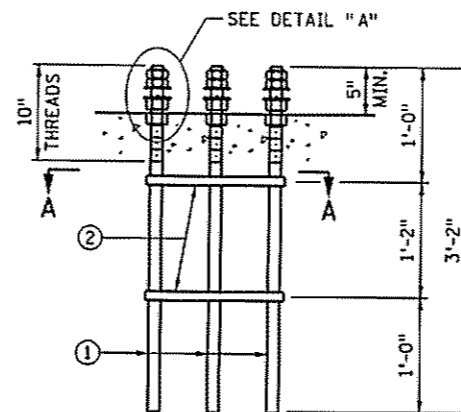
- ALL EXPOSED HARDWARE IS TO BE GALVANIZED AS PER Mn/DOT SPEC. 3392.
- ALL STRUCTURAL STEEL IS TO BE Mn/DOT SPEC. 3306 UNLESS OTHERWISE NOTED.
- COST OF ANCHORAGES IS INCIDENTAL TO THE COST OF PLACING THE PORTABLE PRECAST BARRIER.
- FILL ANCHORAGE HOLES WITH AN APPROVED EPOXY GROUT AFTER THE PORTABLE BARRIERS ARE REMOVED.
- ① PERCUSSION DRILLING OF THESE HOLES IS NOT PERMITTED.



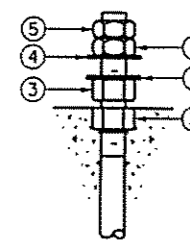
**SECTION A-A**  
ALTERNATE MECHANICAL CAGE



**SECTION A-A**  
ALTERNATE WELDED CAGE



**ELEVATION**



**DETAIL "A"**

**NOTES:**

- ALL RODS ARE TO BE 1" NOMINAL DIA. WITH 1 - BUNC - 2A THREADS. HEAVY HEX NUTS, JAM NUTS, AND FLAT WASHERS PER Mn/DOT SPEC. 3391.2A FOR 1" DIA. THREADED RODS. NUTS TO BE TAPPED 1/64" OVERSIZED PRIOR TO GALVANIZING, AND RETAPPED TO STANDARD SIZE AFTER GALVANIZING.
- GALVANIZE THREADED RODS, CAGES, AND NUTS AFTER FABRICATION AS PER Mn/DOT SPEC. 3392.
- TOP OF THE LOWER NUTS SHALL BE FLUSH WITH TOP OF CONCRETE RAILING.
- SUBSTITUTE MATERIALS PER Mn/DOT SPEC. 1605.
- ① THREADED RODS, STEEL AS PER Mn/DOT SPEC. 3309, 3310, OR 3385 TYPE B (6 REQUIRED).
- ② PROVIDE A MECHANICAL OR WELDED CAGE FOR ROD ALIGNMENT. STEEL AS PER Mn/DOT SPEC. 3306 (2 REQUIRED).
- ③ HEAVY HEX NUTS FOR 1" DIA. RODS (12 REQUIRED).
- ④ FLAT WASHERS FOR 1" DIA. RODS (12 REQUIRED).
- ⑤ JAM NUTS FOR 1" DIA. RODS (12 REQUIRED).

APPROVED: NOVEMBER 22, 2002

*Daniel J. Morgan*  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**PORTABLE PRECAST BARRIER ANCHORAGE**  
(TEMPORARY USAGE IN LIMITED BARRIER DISPLACEMENT AREAS)

REVISED  
07-29-2003

DETAIL NO.  
MODIFIED

B920

APPROVED: NOVEMBER 22, 2002

*Daniel J. Morgan*  
STATE BRIDGE ENGINEER

STATE OF MINNESOTA  
DEPARTMENT OF TRANSPORTATION  
**ANCHOR BOLT CLUSTER FOR LIGHT POLES**

REVISED  
10-26-2004  
03-02-2005

DETAIL NO.

B950

CERTIFIED BY *Moises C. Dimaculangan* 2/23/09 DATE  
LICENSED PROFESSIONAL ENGINEER  
NAME: MOISES C. DIMACULANGAN LIC. NO. 46209

DETAILS

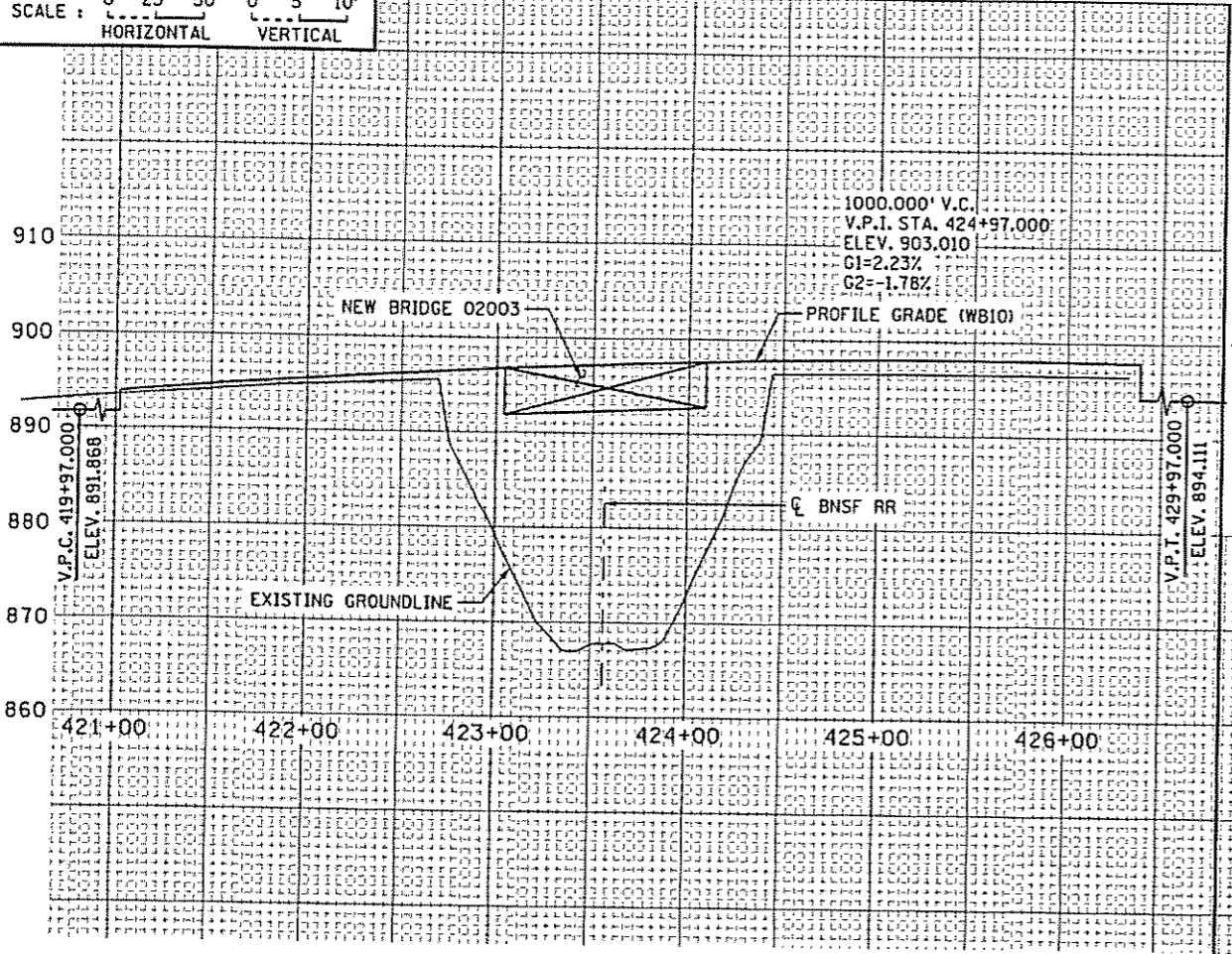
DES: P.J.K. GR: J.H.B. APPROVED: 2/23/09  
CHK: M.C.D. CHK: J.A.J.  
SHEET NO. 69 OF 72 SHEETS

BRIDGE NO.  
02004

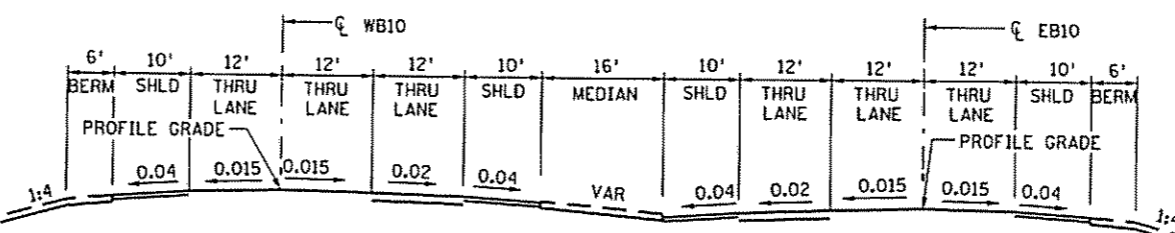


**CONTRACTED PROFILE**  
 SCALE: 0 25' 50' 0 5' 10'  
 HORIZONTAL VERTICAL

**TH 10 W.B. PROFILE**



**TYPICAL SECTIONS & PERTINENT DATA**  
 SCALES AS SHOWN

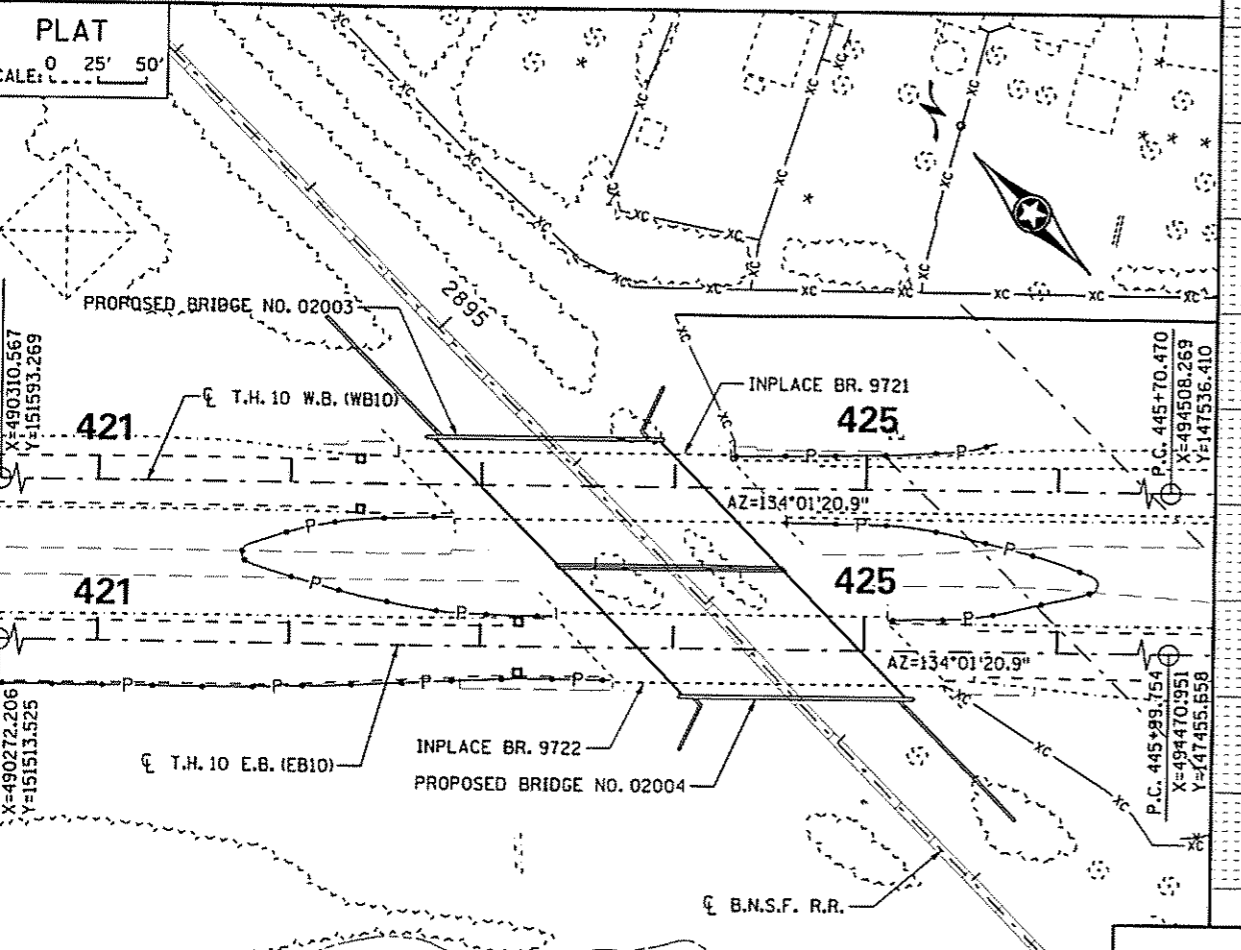
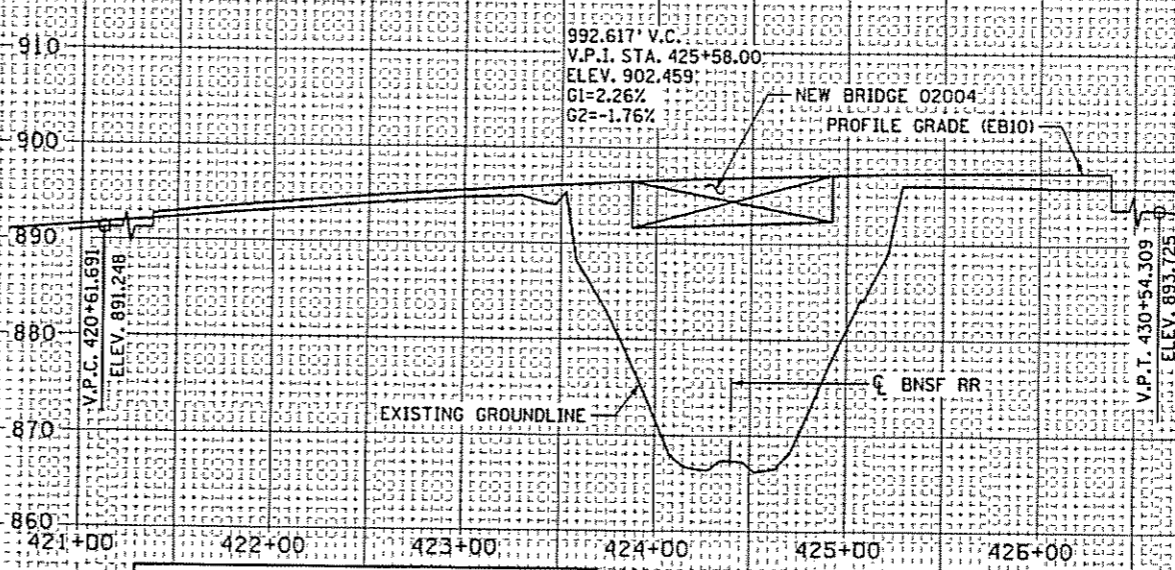


TYPICAL SECTION OF T.H. 10

**LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE**

- SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS, SLIDING BANKS, RECREATIONAL BOATING.
- OTHER BRIDGES OR CULVERTS OVER THE SAME STREAM (PARTICULARLY STRUCTURES WHICH CARRY HIGH WATER WITHOUT OVERFLOW OF ROADWAY): GIVEN LOCATION, TYPE, LENGTH, HEIGHT ABOVE HIGH WATER, CROSS-SECTIONAL AREA ETC.
- APPARENT HIGH WATER ELEVATION OBTAINED FROM:
- OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

**TH 10 E.B. PROFILE**

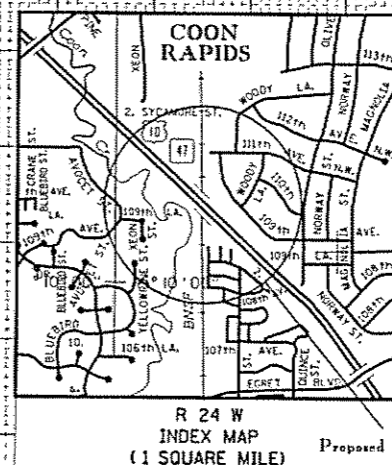


**TOP OF WEST RAIL (RRR1)**

POINT	X	Y	ELEVATION
DH8060	492,916.431	148,873.634	867.649
DH8061	492,916.149	148,897.876	867.760
DH8062	492,915.893	148,921.026	867.838
DH8063	492,915.694	148,943.957	867.974
DH8064	492,915.435	148,967.031	868.071
DH8065	492,915.142	148,990.134	868.119
DH8066	492,914.923	149,014.472	868.186
DH8067	492,914.665	149,036.141	868.256
DH8068	492,914.464	149,060.283	868.376
DH8069	492,914.185	149,083.501	868.460
DH8070	492,913.971	149,107.113	868.505
DH8071	492,913.688	149,130.560	868.581
DH8072	492,913.476	149,151.821	868.646

**TOP OF EAST RAIL (RRR2)**

POINT	X	Y	ELEVATION
DH8095	492,918.437	149,152.200	868.588
DH8096	492,918.660	149,127.546	868.544
DH8097	492,918.860	149,103.346	868.472
DH8098	492,919.108	149,080.423	868.435
DH8099	492,919.453	149,055.997	868.380
DH8100	492,919.653	149,031.618	868.234
DH8101	492,919.958	149,009.059	868.159
DH8102	492,920.273	148,984.626	868.132
DH8103	492,920.383	148,961.906	868.058
DH8104	492,920.567	148,938.933	867.937
DH8105	492,920.864	148,914.620	867.801
DH8106	492,921.255	148,890.293	867.700
DH8107	492,921.379	148,865.915	867.601



**HYDRAULIC ENGINEERS RECOMMENDATION**

DATE \_\_\_\_\_

STREAM OR DITCH DESIGNATION \_\_\_\_\_

DRAINAGE AREA \_\_\_\_\_

MAX. FLOOD ON RECORD \_\_\_\_\_

MAXIMUM OBSERVED HIGH WATER ELEVATION \_\_\_\_\_

DESIGN FLOOD ( YR. FREQ. ) C.F.S. \_\_\_\_\_

DESIGN STAGE ELEVATION \_\_\_\_\_

DESIGN MEAN VELOCITY THROUGH STRUCTURE F.P.S. \_\_\_\_\_

TOTAL STAGE INCREASE FT. \_\_\_\_\_

LOW MEMBER AT OR ABOVE ELEVATION \_\_\_\_\_

FLOWLINE ELEVATION \_\_\_\_\_ SKEW ANGLE \_\_\_\_\_

WATERWAY AREA REQUIRED BELOW ELEVATION = SQ.FT. \_\_\_\_\_

AT RIGHT ANGLES TO CHANNEL \_\_\_\_\_

BASIC FLOOD (100 YR. FREQ.) C.F.S. \_\_\_\_\_

STAGE ELEVATION FT. \_\_\_\_\_

TOTAL STAGE INCREASE FT. \_\_\_\_\_

MEAN VELOCITY THROUGH STRUCTURE F.P.S. \_\_\_\_\_

ESTIMATED DEPTH OF PIER SCOUR = FT. \_\_\_\_\_

BRIDGE SURVEY SHEETS MADE FROM : PHOTO TIN pa0215.tin

BENCH MARK NAME 0215 O

BENCH MARK ELEVATION 895.923 (N.A.V.D. 1988)

DESCRIPTION (2007) STAMPING: UNSTAMPED

AT COON RAPIDS, 1.55 MILES NORTHWEST OF JUNCTION OF TRUNK HIGHWAY 10 AND FOLEY BOULEVARD, 20 FEET SOUTHWEST OF WESTBOUND TRUNK HIGHWAY 10, IN SOUTHWEST ABUTMENT OF WESTBOUND TRUNK HIGHWAY 10 BRIDGE 9721 OVER RAILROAD, AT TRUNK HIGHWAY 10 MILEPOINT 230.35, 0.7 FOOT SOUTHWEST OF SOUTHWEST GUARDRAIL FOUNDATION

2nd BENCH MARK NAME 0215 P

2nd BENCH MARK ELEVATION 896.488 (N.A.V.D. 1988)

DESCRIPTION (2007) STAMPING: 0215 P 1970

IN COON RAPIDS, IN SOUTHWEST CORNER OF TRUNK HIGHWAY 10 BRIDGE 9722 OVER RAILROAD (SOUTH BRIDGE), TO TRUNK HIGHWAY 10 MILEPOINT 230.35, 0.8 FEET SOUTHWEST OF GUARDRAIL, 11 FEET NORTH OF WITNESS POST

MINNESOTA DEPARTMENT OF TRANSPORTATION

**BRIDGE SURVEY**

RR MILE POST 135.37

PROPOSED BRIDGE LOCATED 3.0 MILES S.E. OF JUNCTION OF T.H. 242

SEC 14 TWP 31 N R 24 W

CITY OF COON RAPIDS COUNTY ANOKA

BRIDGE NO. **02004**

EXISTING 24" R.C.P. TO BE REMOVED

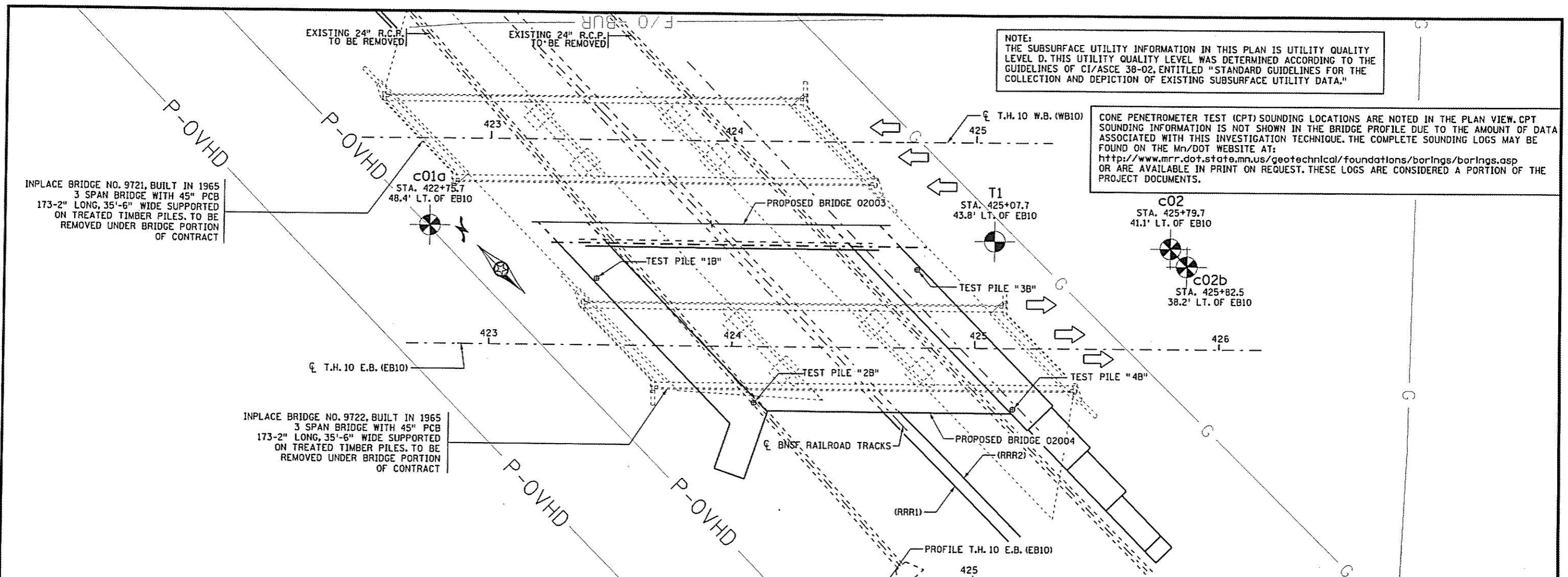
EXISTING 24" R.C.P. TO BE REMOVED

NOTE:  
THE SUBSURFACE UTILITY INFORMATION IN THIS PLAN IS UTILITY QUALITY LEVEL D. THIS UTILITY QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA."

CONE PENETROMETER TEST (CPT) SOUNDING LOCATIONS ARE NOTED IN THE PLAN VIEW. CPT SOUNDING INFORMATION IS NOT SHOWN IN THE BRIDGE PROFILE DUE TO THE AMOUNT OF DATA ASSOCIATED WITH THIS INVESTIGATION TECHNIQUE. THE COMPLETE SOUNDING LOGS MAY BE FOUND ON THE Mn/DOT WEBSITE AT:  
<http://www.mrr.dot.state.mn.us/geotechnical/foundations/borings/borings.asp>  
OR ARE AVAILABLE IN PRINT ON REQUEST. THESE LOGS ARE CONSIDERED A PORTION OF THE PROJECT DOCUMENTS.

INPLACE BRIDGE NO. 9721, BUILT IN 1965  
3 SPAN BRIDGE WITH 45" PCB  
173'-2" LONG, 35'-6" WIDE SUPPORTED  
ON TREATED TIMBER PILES. TO BE  
REMOVED UNDER BRIDGE PORTION  
OF CONTRACT

INPLACE BRIDGE NO. 9722, BUILT IN 1965  
3 SPAN BRIDGE WITH 45" PCB  
173'-2" LONG, 35'-6" WIDE SUPPORTED  
ON TREATED TIMBER PILES. TO BE  
REMOVED UNDER BRIDGE PORTION  
OF CONTRACT



EL. 900	422	423	424	425	426	427	EL. 900
EL. 880							EL. 880
EL. 860							EL. 860
EL. 840							EL. 840
EL. 820							EL. 820
EL. 800							EL. 800
EL. 780							EL. 780
EL. 760							EL. 760
EL. 740							EL. 740

TEST PILE NO. "18"

TEST PILE NO. "28"

TEST PILE NO. "38"

TEST PILE NO. "48"

TI  
STA. 425+07.7  
43.8' LT. OF EB10

c01a  
STA. 422+75.7  
48.4' LT. OF EB10

c02  
STA. 425+79.7  
41.1' LT. OF EB10

c02b  
STA. 425+82.5  
38.2' LT. OF EB10

COH SPT  
(psi) H60

ELEVATION - 894.8

28  
45  
36  
38  
20  
10  
23  
11  
11  
3  
910  
18  
1520  
24  
1780  
31  
1900  
64  
12  
142  
188  
36

LOAMY FINE SAND, BROWN, DAMP TO MOIST

SAND, LIGHT GRAY-BROWNS, MOIST TO WET

PLASTIC SILT LOAM TO SILTY CLAY LOAM WITH A SAND LAYER @ 39.0', SILT TRACES, A FEW THIN SEAMS OF PLATE BLOCKY CLAY; GRAY WITH LIGHT GRAYS AND DARK GRAYS; MOIST

LOAMY SAND TO SAND, LIGHT GRAY AND WET SLIGHTLY PLASTIC SANDY LOAM WITH A FEW PEBBLES, GRAY AND VERY MOIST

SANDY CLAY LOAM WITH SOME PEBBLES, GRAY AND VERY MOIST CLAY LOAM, BROWN AND MOIST

PLASTIC TO SLIGHTLY PLASTIC SILT LOAM WITH A FEW PEBBLES AND SILT TRACES, BROWN AND MOIST

SILT WITH A FEW PEBBLES, TRACES OF BLOCKY CLAY 79.0'-80.0'; BROWN AND VERY MOIST

SILTY CLAY LOAM, BROWN AND WET

BOTTOM OF HOLE - 95.5'

EXISTING GROUND PROFILE FROM T.H. 10 E.B.  
24' RT. ---  
T.H. 10 E.B. ---  
108' LT. ---