MINNESOTA DEPARTMENT OF TRANSPORTATION

CONSTRUCTION PLAN FOR GRADING, BITUMINOUS SURFACING, DRAINAGE, BR. # 38015, BR. # 38X05, BR. # 38X06, & REPAIR BR. # 8285 & # 9405 & SPLIT ROCK RIVER WAYSIDE SAFETY IMPROVEMENTS

SP 3806-60 LOCATED ON T.H. 61 FROM 3,036' SOUTHWEST OF SPLIT ROCK RIVER TO 1,621' NORTHEAST OF SPLIT ROCK STATE PARK ENTRANCE

STATE PROJ. NO. S.P. 3806-60 (T.H. 61)

GROSS LENGTH	17,630	FEET	3.339	MILES
BRIDGES-LENGTH	123	FEET	0.023	MILES
EXCEPTIONS-LENGTH	0	FEET	0	MILES
NET LENGTH	17,630	FEET	3.339	MILES

REF. POINT 42+00.824 TO REF. POINT 46+00.163

PLOTTED/REVISED: 04-JAN-2010

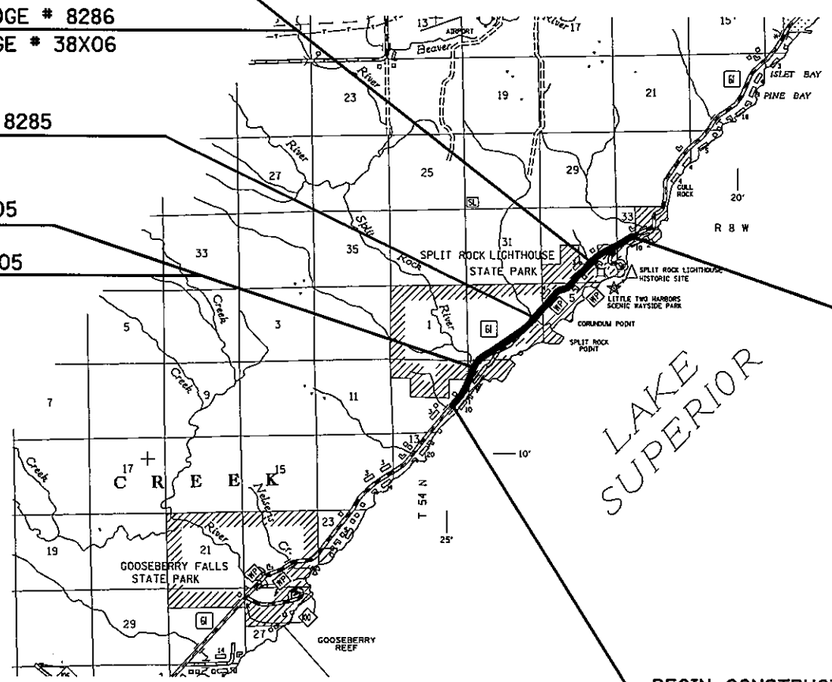
CONST. BRIDGE # 38015

REMOVE BRIDGE # 8286
CONST. BRIDGE # 38X06

REPAIR BRIDGE # 8285

REPAIR BRIDGE # 9405

CONST. BRIDGE # 38X05



END CONSTRUCTION
END S.P. 3806-60 (T.H. 61)
R.P. 46+00.163
T.H. 61 CONST. STA. 2439+69.81

BEGIN CONSTRUCTION
BEGIN S.P. 3806-60 (T.H. 61)
R.P. 42+00.824
T.H. 61 CONST. STA. 2258+98.48

HYDRAULICS INFORMATION	
STREAM NAME :	SPLIT ROCK RIVER
DRAINAGE AREA :	43.7 SQ. MI.
DESIGN FLOOD (50 YEAR FREQUENCY)	3960 cfs
HEADWATER ELEVATION :	612.4
GREATEST FLOOD (500 YEAR FREQUENCY)	8435 cfs
HEADWATER ELEVATION :	624.7
BASIC FLOOD (100 YEAR FREQUENCY)	4960 cfs
HEADWATER ELEVATION :	614.5

HYDRAULICS INFORMATION	
STREAM NAME :	UNNAMED STREAM (R.P. 44+00.403)
DRAINAGE AREA :	3.23 SQ. MI.
DESIGN FLOOD (50 YEAR FREQUENCY)	1030 cfs
HEADWATER ELEVATION :	719.2
GREATEST FLOOD (OVERTOPPING 1.22 X Q100)	1480 cfs
HEADWATER ELEVATION :	726.45
BASIC FLOOD (100 YEAR FREQUENCY)	1330 cfs
HEADWATER ELEVATION :	723.8

HYDRAULICS INFORMATION	
STREAM NAME :	STREAM (R.P. 45+00.485)
DRAINAGE AREA :	0.97 SQ. MI.
DESIGN FLOOD (50 YEAR FREQUENCY)	701.3 cfs
HEADWATER ELEVATION :	694.4
GREATEST FLOOD (500 YEAR FREQUENCY)	780 cfs
HEADWATER ELEVATION :	702.4
BASIC FLOOD (100 YEAR FREQUENCY)	440 cfs
HEADWATER ELEVATION :	701.6

FED. PROJ. NO. HPPH-NH-SB H136(002)

GOVERNING SPECIFICATIONS

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

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X1 - X147	CROSS SECTIONS

THIS PLAN CONTAINS 367 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: TOM VOSBURGH LICENSE # 16445

DATE: Jan 4, 2010 SIGNATURE: Tom Vosburgh

DESIGN SQUAD S. JOHNSON, J. SYRIA, S. SMITH, J. MADILL

RECOMMENDED FOR APPROVAL 1/4 2010
DISTRICT TRANSPORTATION ENGINEER

RECOMMENDED FOR APPROVAL 1/4 2010
DISTRICT MATERIALS ENGINEER

RECOMMENDED FOR APPROVAL 1/4 2010
DISTRICT WATER RESOURCES/HYDRAULICS ENGINEER

RECOMMENDED FOR APPROVAL 1/4 2010
DISTRICT TRAFFIC ENGINEER

RECOMMENDED FOR APPROVAL 1/7 2010
STATE PRE-LETTING ENGINEER

OFFICE OF LAND MANAGEMENT APPROVAL 1/11 2010
FOR DIRECTOR, LAND MANAGEMENT

APPROVED Jan 12 2010
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:

DESIGN DESIGNATION

INDEX MAP SCALE	5280'	Design ESALS FLEXIBLE	2030 = 1,535,000
PLAN	100'	ADT (Current Year)	2008 = 4000
PROFILE HORIZ.	100'	ADT (Future Year)	2030 = 5208
VERT.	10'	DHV (Design Hr. Vol.)	=
		D (Directional Distr.)	= %
		T (Heavy Commercial)	= 11 %

Design Speed 60 MPH
Based on STOPPING Sight Distance
Height of eye 3.5' Height of object 2.0'
Design Speed not achieved at:
STA. TO STA. MPH
STA. TO STA. MPH

PROJECT LOCATION
COUNTY : LAKE
DISTRICT : 1A

FOR PLANS AND UTILITIES SYMBOLS SEE TECHNICAL MANUAL

STATE PROJ. NO.	CHARGE IDENTIFIER
3806-60	

DISTRICT : DULUTH
IPLOT NAME: This sheet
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/D3806-60_TSH.dgn

STATE PROJ. NO. 3806-60 (T.H. 61 = 001) SHEET NO. 1 OF 200 SHEETS

BEGIN CONSTRUCTION
BEGIN S.P. 3806-60 (T.H. 61)
T.H. 61 CONST. STA. 2258+98.48
RP. 42+00.824

CONST. BRIDGE #38X05

CONST. SPLIT ROCK RIVER REST AREA

℄ T.H. 61 CONST.

CONST. 12' BYPASS LANE

CONST. 11' BYPASS LANE

CONST. 10' RT. TURN LANE

200
SCALE IN FEET

REPAIR BRIDGE #9405

CONST. 11' RT. TURN LANE

℄ T.H. 61 CONST.

200
SCALE IN FEET

DESIGNATED SENSITIVE AREA, DO NOT DISTURB.

CONST. BRIDGE #38X05

PLOTTED/REVISED: 09-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: glo-3
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/glo3.dgn

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

GENERAL LAYOUT

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 2 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009

D 1° 00' 01" (CHORD BEARING)
T 733.10
L 1,458.25
R 5,727.96

REPAIR BRIDGE #8225

℄ T.H. 61 CONST.

2325 2330 2335 2340 2345 2350

200
SCALE IN FEET

R 11,459.16

L 1,241.99

℄ T.H. 61 CONST.

200
SCALE IN FEET

2355 2360 2365 2370 2375 2380

BIKE TRAIL

CONST. 12' RT. TURN LANE

℄ SPLIT ROCK OVERLOOK

DISTRICT #: DULUTH
IPLOT NAME: glo-4
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/glo3.dgn

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

GENERAL LAYOUT

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 3 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010

CURVE C7

2008 CONST PI 2393+81.77
X 629,374.835
Y 250,978.844
Δ 6° 14' 12" (LT)
D 0° 30' 00"
T 624.29
L 1,247.34
R 11,459.16

CONST. DNR ACCESS RD. TO R/W LINE

BUILDING REMOVAL
T.H. 61 CONST. STA. 2409+00
RP. 45+00.612

CONST. BRIDGE #38015

℄ T.H. 61 CONST.

CONST. BYPASS LANE

℄ SPLIT ROCK OVERLOOK

CONST. BRIDGE #38X06

CONST. DNR ACCESS RD. TO R/W LINE

2008 INPL R/W POT 1786+74.80
R/W LT POT 1786+74.8=
R/W LT PT 1786+61.0=
2008 INPL R/W PT 1786+58.72 =
EQUATION=

CURVE 1784+

2008 INPL R/W PI 1784+39.39
X 630,497.843

2008 INPL R/W PC 1782+16.49
R/W LT 1782+18.9=
2008 INPL R/W POT 1782+16.49=

200

SCALE IN FEET

END CONSTRUCTION
END S.P. 3806-60 (T.H. 61)
T.H. 61 CONST. STA. 2439+69.81
RP. 46+00.163

℄ T.H. 61 CONST.

BUILDING REMOVAL A
T.H. 61 CONST. STA. 2436+75
RP. 46+00.145

CONST. 12' LT. TURN LANE

CONST. 12' RT. TURN LANE

2008 POT 1753+51.27
R/W L POT 1753+51.27=
A PT. 6' LT. 1983 PT 1749+10.05=

200

SCALE IN FEET

DISTRICT : DULUTH
IPLOT NAME: glo-5
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/glo3.dgn

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

GENERAL LAYOUT

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 4 OF 200 SHEETS

STATEMENT OF ESTIMATED QUANTITIES

TAB.	SHEET NO.	ITEM NO.	DESCRIPTION			UNITS	TOTAL ESTIMATED QUANTITIES
		2013.601	SURVEY EQUIPMENT			LUMP SUM	1
		2015.601	BLAST MONITOR/SURVEY			LUMP SUM	1
		2021.501	MOBILIZATION			LUMP SUM	1
		2021.602	WELL SURVEY			EACH	4
		2031.501	FIELD OFFICE TYPE D			EACH	1
		2031.503	FIELD LABORATORY TYPE D			EACH	1
		2041.610	TRAINEES			HOUR	3 000
		2051.501	MAINT & RESTORATION OF HAUL ROADS			LUMP SUM	1
A	10	2101.501	CLEARING	(P)		ACRE	26.7
A	10	2101.506	GRUBBING	(P)		ACRE	26.7
	143 - 144	2103.501	BUILDING REMOVAL			LUMP SUM	1
	145 - 146	2103.501	BUILDING REMOVAL A			LUMP SUM	1
M,N	14,15	2104.501	REMOVE PIPE CULVERTS	(P)		LIN FT	1 513
K	12	2104.501	REMOVE CONCRETE CURB			LIN FT	260
Q	18	2104.501	REMOVE CABLE GUARD RAIL	(P)		LIN FT	168
Q	18	2104.501	REMOVE GUARD RAIL-PLATE BEAM	(P)		LIN FT	1 103
M	14	2104.501	REMOVE CONCRETE BOX CULVERT	(P)		LIN FT	392
K	12	2104.503	REMOVE CONCRETE WALK	(P)		SQ FT	260
B	10	2104.505	REMOVE BITUMINOUS PAVEMENT	(P)		SQ YD	34 764
B	10	2104.505	REMOVE BITUMINOUS SHOULDER PAVEMENT	(P)		SQ YD	14 889
M,N	14,15	2104.509	REMOVE PIPE APRON			EACH	38
	143 - 146	2104.509	REMOVE SEPTIC TANK		(1)	EACH	2
Q	18	2104.509	REMOVE ANCHORAGE ASSEMBLY - CABLE			EACH	2
	156 - 168	2104.509	REMOVE DELINEATOR			EACH	16
	156 - 168	2104.509	REMOVE MARKER			EACH	4
	156 - 168	2104.509	REMOVE SIGN TYPE C			EACH	44
Y	154	2104.509	REMOVE SIGN TYPE D			EACH	1
Q	18	2104.509	REMOVE ENERGY ABSORBING TERMINAL	(P)	(2)	EACH	13
C	10	2104.513	SAWING BIT PAVEMENT (FULL DEPTH)			LIN FT	445
Q	18	2104.521	SALVAGE GUARD RAIL			LIN FT	5 027
Q	18	2104.523	SALVAGE ENERGY ABSORBING TERMINAL		(2)	EACH	6
Z	154	2104.523	SALVAGE SIGN TYPE C			EACH	2
BB	154	2104.523	SALVAGE SIGN TYPE D			EACH	4
	143 - 146	2104.525	ABANDON & SEAL WELL SHAFT		(3)	EACH	1
		2104.601	HAUL SALVAGED MATERIAL		(4)	LUMP SUM	1
D	11	2105.501	COMMON EXCAVATION	(P)		CU YD	174 775
D	11	2105.503	ROCK EXCAVATION	(P)		CU YD	196 923
D	11	2105.521	GRANULAR BORROW (CV)	(P)		CU YD	94 978
D	11	2105.522	SELECT GRANULAR BORROW (CV)	(P)		CU YD	92 081
D	11	2105.522	SELECT GRANULAR BORROW MOD 10% (CV)	(P)		CU YD	464
M	14	2105.604	GEOTEXTILE FABRIC TYPE V			SQ YD	5 903
E,F	11	2105.607	EXCAVATION SPECIAL			CU YD	20 020
L	13	2211.503	AGGREGATE BASE (CV) CLASS 5	(P)		CU YD	174
L	13	2211.503	AGGREGATE BASE (CV) CLASS 6	(P)		CU YD	14 809
L	13	2221.503	AGGREGATE SHOULDERING (CV) CLASS 5	(P)		CU YD	825
G	12	2232.501	MILL BITUMINOUS SURFACE (4.0")			SQ YD	3 400
G	12	2232.603	MILLED RUMBLE STRIPS-INTERMITTENT			LIN FT	22 734
H	12	2301.531	EXPANSION JOINTS DESIGN E8H			LIN FT	100
H	12	2301.553	BRIDGE APPROACH PANELS			SQ YD	230

(1) INCLUDES REMOVAL OF DRAIN FIELD. (INCIDENTAL)

(2) ET-2000.

(3) AFTER ABANDONMENT AND SEALING HAVE BEEN COMPLETED, THE WELL SHAFT SHALL BE REMOVED TO AN ELEVATION 3' BELOW THE EXISTING GROUND. (INCIDENTAL)

(4) 100 % STATE FUNDS.

PLOTTED/REVISED: 07-JAN-2010
DISTRICT: DULUTH
IPLOT NAME: EQ-I
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_EQ.dgn

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 07-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

ESTIMATED QUANTITIES

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 5 OF 200 SHEETS

STATEMENT OF ESTIMATED QUANTITIES

TAB.	SHEET NO.	ITEM NO.	DESCRIPTION	UNITS	TOTAL ESTIMATED QUANTITIES
L	13	2331.603	JOINT ADHESIVE	LIN FT	17 909
I	12	2331.604	BITUMINOUS PAVEMENT RECLAMATION (P)	SQ YD	22 938
L	13	2357.606	BITUMINOUS MATERIAL FOR SHOULDER TACK	GALLONS	3 341
L	13	2360.503	TYPE SP 12.5 WEAR CRS MIX(3,C)2" THICK	SQ YD	14 311
L	13	2360.503	TYPE SP 12.5 WEAR CRS MIX(3,C)3.0" THICK	SQ YD	35 686
L	13	2360.503	TYPE SP 12.5 WEAR CRS MIX(4,C)2.0" THICK	SQ YD	111 936
L	13	2360.503	TYPE SP 12.5 NON WR CRS MIX(3,B)2" THICK	SQ YD	59 070
	45,B1,B7	2402.585	PIPE RAILING	LIN FT	180
	B15 - B18	2411.501	STRUCTURAL CONCRETE (3Y43)	CU YD	5
P	17,46	2411.507	CONCRETE SURGE BASIN	EACH	3
	44	2411.507	CONCRETE STAIRWAY	EACH	1
	B15 - B18	2411.541	REINFORCEMENT BARS	POUND	460
	B15 - B18	2411.618	RECONSTRUCT CULVERT FLOOR	SQ FT	6 250
	B8 - B14	2412.511	12X7 PRECAST CONCRETE BOX CULVERT	LIN FT	180
	B1 - B7	2412.511	12X10 PRECAST CONCRETE BOX CULVERT	LIN FT	60
	B8 - B14	2412.512	12X7 PRECAST CONCRETE BOX CULV END SECT	EACH	2
	B1 - B7	2412.512	12X10 PRECAST CONCRETE BOX CULV END SECT	EACH	2
	B15 -B18	2433.516	ANCHORAGES TYPE REINF BARS	EACH	56
	B15 -B18	2433.618	CONCRETE SURFACE REPAIR	SQ FT	30
M,P	14,17	2451.509	AGGREGATE BEDDING (CV)	CU YD	1 724
D	11	2451.607	ROCK EXCAVATION IN TRENCH (P)	CU YD	326
	B15 - B18	2452.618	STEEL SHEET PILING (PERMANENT)	SQ FT	3 150
N	15	2501.511	12" CP PIPE CULVERT (SMOOTH)	LIN FT	26
N	15	2501.511	18" CP PIPE CULVERT	LIN FT	230
N	15	2501.511	18" CP PIPE CULVERT (SMOOTH)	LIN FT	394
M,N	14,15	2501.511	24" CP PIPE CULVERT (SMOOTH)	LIN FT	346
N	15	2501.515	15" CAS PIPE APRON	EACH	2
N	15	2501.515	24" CAS PIPE APRON	EACH	16
M,N	14,15	2501.515	30" CAS PIPE APRON	EACH	8
M	14	2501.515	24" RC PIPE APRON	EACH	4
M	14	2501.515	30" RC PIPE APRON	EACH	5
M	14	2501.515	36" RC PIPE APRON	EACH	4
M	14	2501.515	42" RC PIPE APRON	EACH	9
M	14	2501.515	48" RC PIPE APRON	EACH	2
M	14	2501.515	60" RC PIPE APRON	EACH	2
	54	2501.515	84" RC PIPE APRON	EACH	1
	54	2501.515	90" RC PIPE APRON	EACH	1
M	14	2501.517	A-S DIAPHRAGM FOR 24" CONCRETE PIPE	EACH	3
M	14	2501.517	A-S DIAPHRAGM FOR 30" CONCRETE PIPE	EACH	1
N	15	2501.517	A-S DIAPHRAGM FOR 18" CP PIPE	EACH	2
M,N	14,15	2501.517	A-S DIAPHRAGM FOR 24" CP PIPE	EACH	8
M	14	2501.561	24" RC PIPE CULVERT DES 3006	LIN FT	214
M	14	2501.561	30" RC PIPE CULVERT DES 3006	LIN FT	106
M	14	2501.561	30" RC PIPE CULVERT DES 3006 CL IV	LIN FT	108
M	14	2501.561	30" RC PIPE CULVERT DES 3006 CL V	LIN FT	162
M	14	2501.561	36" RC PIPE CULVERT DES 3006	LIN FT	100
M	14	2501.561	36" RC PIPE CULVERT DES 3006 CL V	LIN FT	334
M	14	2501.561	42" RC PIPE CULVERT DES 3006	LIN FT	166

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

ESTIMATED QUANTITIES

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 6 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010
DISTRICT #: DULUTH
IPLOT NAME: EQ-2
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_EQ.dgn

STATEMENT OF ESTIMATED QUANTITIES

TAB.	SHEET NO.	ITEM NO.	DESCRIPTION	UNITS	TOTAL ESTIMATED QUANTITIES
M	14	2501.561	42" RC PIPE CULVERT DES 3006 CL III	LIN FT	34
M	14	2501.561	42" RC PIPE CULVERT DES 3006 CL IV	LIN FT	160
M	14	2501.561	48" RC PIPE CULVERT DES 3006 CL III	LIN FT	34
M	14	2501.561	48" RC PIPE CULVERT DES 3006 CL IV	LIN FT	44
M	14	2501.561	60" RC PIPE CULVERT DES 3006 CL. II	LIN FT	64
N	15	2501.569	18" CAS SAFETY APRON	EACH	12
M	14	2501.575	30" RC DISSIPATOR RING	EACH	10
M	14	2501.575	36" RC DISSIPATOR RING	EACH	5
M	14	2501.575	42" RC DISSIPATOR RING	EACH	30
M	14	2501.575	48" RC DISSIPATOR RING	EACH	10
M	14,58A	2501.602	SAFETY GRATE FOR 30" GS APRON	EACH	6
M	14,58	2501.602	SAFETY GRATE FOR 24" RC APRON	EACH	4
M	14,58	2501.602	SAFETY GRATE FOR 30" RC APRON	EACH	5
M	14,58	2501.602	SAFETY GRATE FOR 36" RC APRON	EACH	3
M	14,58	2501.602	SAFETY GRATE FOR 42" RC APRON	EACH	5
M	14,58	2501.602	SAFETY GRATE FOR 60" RC APRON	EACH	2
	54	2501.603	LINING CULVERT PIPE (84")	LIN FT	136
O	16	2502.501	4" PRECAST CONCRETE HEADWALL	EACH	57
O	16	2502.521	4" TP PIPE DRAIN	LIN FT	939
O	16	2502.541	4" PERF TP PIPE DRAIN	LIN FT	18 780
P	17	2503.511	12" CP PIPE SEWER	LIN FT	231
P	17	2503.541	12" RC PIPE SEWER DES 3006	LIN FT	46
P	17	2506.501	CONST DRAINAGE STRUCTURE DESIGN G OR H	LIN FT	15.8
P	17	2506.501	CONST DRAINAGE STRUCTURE DESIGN I	LIN FT	4.8
P	17	2506.516	CASTING ASSEMBLY	EACH	5
J,M	12,14	2511.501	RANDOM RIPRAP CLASS II	CU YD	131
J,M,N,P	12,14,15,17,B8	2511.501	RANDOM RIPRAP CLASS III	CU YD	499
J,M	12,14	2511.515	GEOTEXTILE FILTER TYPE III	SQ YD	465
J,M,N,P	12,14,15,17	2511.515	GEOTEXTILE FILTER TYPE IV	SQ YD	834
J	12	2511.607	RANDOM RIPRAP SPECIAL	CU YD	70
	54	2519.607	CLSM LOW DENSITY	CU YD	47
K	12	2521.501	4" CONCRETE WALK	SQ FT	9 365
	190 - 193	2521.618	4" CONCRETE WALK SPECIAL	SQ FT	720
K	12	2531.501	CONCRETE CURB & GUTTER DESIGN B424	LIN FT	50
K	12	2531.501	CONCRETE CURB & GUTTER DESIGN B624	LIN FT	302
K	12	2531.501	CONCRETE CURB & GUTTER DESIGN D424	LIN FT	2 568
	38	2533.507	PORTABLE PREC CONC BAR DES 8337-PINNED	LIN FT	5 600
	189 - 193	2540.602	KIOSK	EACH	1
W	20	2540.602	MAIL BOX SUPPORT	EACH	5
	189 - 193	2540.602	STONE MONUMENT	EACH	1
Q	18	2554.501	TRAFFIC BARRIER DESIGN SPECIAL	LIN FT	100
Q	18	2554.501	TRAFFIC BARRIER DESIGN B8338	LIN FT	6 375
Q	18	2554.523	END TREATMENT-TANGENT TERMINAL (1)	EACH	14
Q	18	2554.602	GUARDRAIL POST SEAT	EACH	4
M	14,60	2554.602	GUIDE POST TYPE SPECIAL	EACH	32
Q	18	2554.602	INSTALL ENERGY ABSORBING TERMINAL (2)	EACH	6
	38	2554.615	IMPACT ATTENUATOR (3)	ASSEMBLY	16

(1) SHALL CONSIST OF ET-2000 OR SKT-350.
(2) ET-2000.
(3) FOR CONSTRUCTION ONLY.

PLOTTED/REVISED: 08-JAN-2010
IPLOT NAME: EQ-3
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_EQ.dgn

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 08-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

ESTIMATED QUANTITIES

STATEMENT OF ESTIMATED QUANTITIES

TAB.	SHEET NO.	ITEM NO.	DESCRIPTION	UNITS	TOTAL ESTIMATED QUANTITIES
R	18,47	2557.501	WIRE FENCE DESIGN SPECIAL	LIN FT	472
		2563.601	TRAFFIC CONTROL	LUMP SUM	1
CC	155	2564.531	SIGN PANELS TYPE C	SQ FT	242
AA	154,155	2564.531	SIGN PANELS TYPE D	SQ FT	69
FF	155	2564.537	INSTALL SIGN TYPE C	EACH	2
BB	154	2564.537	INSTALL SIGN TYPE D	EACH	4
DD	155	2564.550	DELINEATOR TYPE X4-13	EACH	4
EE	155	2564.551	REFERENCE POST MARKER	EACH	4
DD	155	2564.552	HAZARD MARKER X4-2	EACH	2
T	19	2573.502	SILT FENCE, TYPE HEAVY DUTY	LIN FT	8 725
T	19	2573.502	SILT FENCE, TYPE MACHINE SLICED	LIN FT	18 377
S	19	2573.512	TEMPORARY DITCH CHECK TYPE 1	LIN FT	1 185
S	19	2573.512	TEMPORARY DITCH CHECK TYPE 2	LIN FT	330
S	19	2573.513	TEMPORARY DITCH CHECK TYPE 7 (1)	CU YD	141
P	17	2573.530	STORM DRAIN INLET PROTECTION	EACH	4
U	20	2575.501	SEEDING (P)	ACRE	24.9
U	20	2575.502	SEED MIXTURE 250	POUND	1 741
	61	2575.505	SODDING TYPE EROSION	SQ YD	54
U	20	2575.511	MULCH MATERIAL TYPE 1	TON	37
U	20	2575.519	DISK ANCHORING	ACRE	18.3
V	20	2575.525	EROSION STABILIZATION MAT CLASS 1	SQ YD	697
U	20	2575.532	FERTILIZER TYPE 1	POUND	8 705
U	20	2575.560	HYDRAULIC SOIL STABILIZER TYPE 8	POUND	23 074
		2575.603	MULCH TYPE SPECIAL	LIN FT	2 000
	61	2575.604	EROSION STABILIZATION MAT	SQ YD	54
X	150	2580.603	INTERIM PAVEMENT MARKING	LIN FT	33 825
X	150	2582.501	PAVT MSSG (HANDICAPPED SYMBOL) POLY PREF	EACH	1
X	150	2582.502	24" SOLID LINE YELLOW-POLY PREF (GR IN)	LIN FT	249
X	150	2582.502	4" SOLID LINE WHITE-EPOXY (GROUND IN)	LIN FT	37 143
X	150	2582.502	8" DOTTED LINE WHITE-EPOXY (GROUND IN)	LIN FT	90
X	150	2582.502	4" SOLID LINE YELLOW-EPOXY (GROUND IN)	LIN FT	8 750
X	150	2582.502	4" BROKEN LINE YELLOW-EPOXY (GROUND IN)	LIN FT	3 050

(1) PERMANENT.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 07-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

ESTIMATED QUANTITIES

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 8 OF 200 SHEETS

PLOTTED/REVISED: 07-JAN-2010
DISTRICT : DULUTH
IPLOT NAME: EQ-4
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_EQ.dgn

SOILS AND CONSTRUCTION NOTES

ALL EXCAVATION IS CONSIDERED - COMMON EXCAVATION, WITH THE EXCEPTION OF ROCK EXCAVATION AND EXCAVATION SPECIAL.

ANY REFERENCE TO "TOPSOIL" IN THE PLAN OR SPECIAL PROVISIONS WILL PERTAIN TO THE UPPER 4" OF NATURAL (IN-PLACE) SOIL AS NOTED IN THE SOILS AND CONSTRUCTION NOTES IN THIS PLAN. TOPSOIL BORROW (SPEC. - 3877) IS NOT REQUIRED ON THIS CONTRACT.
THE UPPER 4" (AVERAGE) OF NATURAL SOILS IS CONSIDERED USABLE FOR TOPSOIL. SALVAGE THE EXISTING TOPSOIL FROM ALL AREAS DISTURBED BY CONSTRUCTION, FOR PLACEMENT ON CONSTRUCTION SLOPES. CONSTRUCTION SLOPES SHALL BE COVERED WITH 4" OF SALVAGED TOPSOIL. IF THERE IS INSUFFICIENT AMOUNT OF TOPSOIL AVAILABLE, "A" HORIZON SOILS ARE ACCEPTABLE FOR USE AS TOPSOIL.

FOR INFORMATION ONLY - NOT A PAY ITEM: THE TOTAL ESTIMATED TOPSOIL REQUIRED IS 16,765 CU YD AND IS INCLUDED IN THE COMMON EXCAVATION QUANTITIES.

THE MN/DOT SURVEY SECTION WILL PROVIDE SUFFICIENT HORIZONTAL AND VERTICAL CONTROL PRIOR TO THE BEGINNING OF ANY CONSTRUCTION STAKING REQUIRED FOR THE PROJECT.

TEMPORARY AND INTERMEDIATE EXCAVATION LIMITS AND SLOPES ARE TO BE DETERMINED BY THE CONTRACTOR DURING CONSTRUCTION. DEPENDING ON SOIL PROPERTIES AND SAFETY FACTORS, ADDITIONAL EXCAVATION AND BACKFILL BEYOND THE LIMITS SHOWN IN THE PLAN SHALL BE CONSIDERED THE CONTRACTORS RESPONSIBILITY WITH NO DIRECT PAYMENT.

THE CONTRATOR SHALL NOT STORE ANY ROCK OR TOPSOIL OUTSIDE THE PLANNED CONSTRUCTION LIMITS UNLESS APPROVED BY THE ENGINEER. ALL AREAS DISTURBED BY THE CONTRACTOR'S EQUIPMENT WHICH WERE OUTSIDE THE INPLACE R/W (SHOWN IN PLAN VIEW), SHALL BE RESTORED, AS APPROVED BY THE ENGINEER, AT THE CONTRACTORS EXPENSE. (2105)

BITUMINOUS SURFACING, CONCRETE ITEMS, ABANDONED UTILITY ITEMS OR ANY OTHER MATERIAL WHICH MAY BE ENCOUNTERED DURING CONSTRUCTION THAT ARE NOT SUITABLE FOR SALVAGE OR FOR ROADWAY CONSTRUCTION, SHALL BE DISPOSED OF BY THE CONTRACTOR OFF THE RIGHT-OF-WAY AT AN APPROVED DISPOSAL SITE.

TEMPORARY EROSION CONTROL :
EARTHWORK FINISHING AND TOPSOIL COVERING OPERATIONS SHALL BE CONDUCTED CONCURRENTLY WITH GRADING OPERATIONS SO FAR AS TO PERMIT COMPLETION OF THE EROSION CONTROL ITEMS AT THE EARLIEST PRACTICAL TIME. TOPSOIL COVERING SHALL BE COMPLETED AS SOON AS POSSIBLE AFTER THE GRADING SOILS HAVE BEEN FINISHED TO GRADE IN ANY SIGNIFICANT AREA.

GRADING GRADE IS DEFINED AS THE BOTTOM OF THE PROPOSED CLASS 6 AGGREGATE BASE.

SUBCUT DEPTHS ARE MEASURED FROM THE PROPOSED GRADING GRADE UNLESS OTHERWISE NOTED.

SELECT GRADING SOILS ARE DEFINED AS ANY SOILS WITH THE EXCEPTION OF TOPSOIL, PEAT, SILT LOAM, WOOD OR ANY OTHER ORGANIC SOILS.

NORMAL DITCH DEPTHS AND SPECIAL DITCH GRADES ARE COMPUTED TO THE BOTTOM OF THE TOPSOIL.

BLASTED ROCK SURFACES UNDER THE ROADWAY WITHIN SHOULDER P.I.'S SHALL NOT TRAP WATER AND SHOULD NOT HAVE A SLOPE STEEPER THAN 1:10 TRANSVERSE AND 1:20 PARALLEL TO ℄.

SEE SPECIAL PROVISIONS FOR REQUIREMENTS PERTAINING TO USING PROCESSED SHOT ROCK IN LIEU OF SELECT GRANULAR BORROW.

SHOT ROCK MAY BE USED AS EMBANKMENT MATERIAL IN AREAS SELECTED BY THE CONTRACTOR AND APPROVED BY THE ENGINEER, NOT DESIGNATED TO RECEIVE SELECT GRANULAR BORROW OR SELECT GRAN MOD. THE UPPER 1 FT OF ALL SHOT ROCK EMBANKMENTS SHALL BE CONSTRUCTED OF ROCK SPALLS OF SUFFICIENT SIZE AND CHARACTER TO FILL SURFACE VOIDS IN A MATRIX SUCH THAT IT PREVENTS THE MIGRATION OF BASE MATERIAL INTO UNDERLYING VOIDS IN THE ROCK FILL TO THE SATISFACTION OF THE ENGINEER.

UNDER THE TOPSOIL, SHOT ROCK SHALL BE COVERED WITH 1 FT OF ROCK SPALLS AND 1 FT OF SELECT GRADING SOILS AS DIRECTED BY THE ENGINEER. THE SELECT GRADING SOIL QUANTITY IS INCLUDED IN EMBANKMENT. NO ADDITIONAL PAYMENT FOR THIS WORK WILL BE MADE.

ANY EXTRA WORK ASSOCIATED WITH ENCOUNTERING ISOLATED LOCATIONS OF BITUMINOUS THAT IS THICKER THAN OR EQUAL TO THE DEPTH OF RECLAIMING IS CONSIDERED INCIDENTAL. HOWEVER, IF SUBSTANTIAL AMOUNTS OF THICK BITUMINOUS ARE ENCOUNTERED THAT SIGNIFICANTLY AFFECTS RECLAIMING AND COMPACTION ACTIVITIES, THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY TO DETERMINE IF ANY PAYMENT FOR EXTRA WORK IS MERITED.

TURF ESTABLISHMENT :
SEED ALL AREAS DISTURBED BY CONSTRUCTION WITH SEED MIXTURE 250 (GENERAL ROADSIDE) AT A RATE OF 70 LBS/ACRE.

FERTILIZE ALL SEEDED AREAS WITH FERTILIZER TYPE 1 (ANALYSIS 10-10-10 NPK) SPE. 2575 APPLIED AT A RATE OF 300 LBS/ACRE. FERTILIZER SHALL NOT BE USED WITHIN 150 FT. OF WETLANDS, STREAMS, OR LAKES.

AREAS WITH 1:3 SLOPES AND FLATTER APPLY TYPE 1 MULCH AT A RATE OF 2 TONS/ACRE AND DISC ANCHOR.

AREAS WITH SLOPES STEEPER THAN 1:3 (EXCEPT THOSE THAT ARE ON TOP OF VERTICAL ROCK CUTS) APPLY HYDRAULIC SOIL STABILIZER TYPE 8 AT A RATE OF 3500 LBS/ACRE.

1:2 SLOPES ABOVE VERTICAL ROCK CUTS APPLY ROCK RUBBLE SLOPE DRESSING, NO MORE THAN 20' IN WIDTH AND WITH A MAX. PARTICLE SIZE OF 12.0". (INCIDENTAL)

PLACE BITUMINOUS MATERIAL FOR SHOULDER TACK ON ALL EXPOSED CLASS 5 AGGREGATE SHOULDERING AT A RATE OF 0.18 gal/sq. yd. (COMPUTED 3.0' BEYOND SHLD P.I.). MULCH DISTRIBUTION EQUIPMENT WILL NOT BE ALLOWED ON THE SLOPE AGGREGATE FACE OR INSLOPE DURING THE APPLICATION PROCESS.

COMPACTION OF SELECT GRADING SOILS, SELECT GRANULAR BORROW, SELECT GRANULAR BORROW MOD., AGGREGATE BASE AND AGGREGATE BEDDING SHALL BE OBTAINED BY THE "LIGHT WEIGHT DEFLECTOMETER (LWD) METHOD OF COMPACTION". COMPACTION OF AGGREGATE SHOULDERING WILL BE BY QUALITY COMPACTION.

THE CONTRACTORS ACTIVITIES SHALL NOT EXCEED CONSTRUCTION LIMITS IN THE WETLANDS AREAS. THIS INCLUDES EQUIPMENT, WORKING, PLACING OR STOCKPILING MATERIAL, OR IMPACTING THE WETLANDS IN ANY OTHER WAY.

THE RIGHT-OF-WAY SHOWN IN THIS PLAN GIVES A GRAPHICAL LOCATION WITH RESPECT TO THE GEOMETRIC LOCATION. FOR EXACT RIGHT-OF-WAY LIMITS, SEE RIGHT-OF-WAY MAP FILED WITH MN/DOT RIGHT-OF-WAY OFFICE, 1123 MESABA AVE. DULUTH, MN 55811.

T.H. 61 CONST. ALIGNMENT AS SHOWN IN THIS PLAN IS THE DESIGNATED CONSTRUCTION ALIGNMENT FOR THIS PLAN.

DESIGN SPEED FOR THIS PROJECT IS 60 MPH. CLEAR ZONE FOR THIS PROJECT IS 36' FROM EDGE OF TRAVELED LANE, BASED ON A 55 MPH DESIGN SPEED.

IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO UTILIZE THE "ONE CALL EXCAVATION NOTICE SYSTEM" REQUIRED BY MINNESOTA STATUTE 216D.

FOR PIT INFORMATION, CONTACT THE DISTRICT 1 DULUTH PAVEMENT MANAGEMENT SPECIALIST.

ALL CONCRETE TRUCKS SHALL WASH OUT WITHIN THE PROJECT LIMITS AWAY FROM ANY WATERS OF THE STATE (INCLUDING HIGHWAY DITCHES), AT A LOCATION SPECIFIED BY THE ENGINEER. HARDENED CONCRETE WASTE MUST BE REMOVED FROM THE PROJECT LIMITS AND PROPERLY DISPOSED OF OFF MN/DOT R/W. (INCIDENTAL)

BUILDING DEMOLITION:
MULCH ALL AREAS DISTURBED BY CONTRACTORS WITH MULCH MATERIAL TYPE 1 APPLIED AT A RATE OF 2 TONS/ACRE, MULCH SHALL BE PLACED AS DIRECTED BY THE ENGINEER.

THE UPPER 3 INCHES OF FILL SHALL BE OF A QUALITY SUFFICIENT TO ESTABLISH HERBACEOUS GROWTH.

LIST OF PUBLIC WATERS:
LAKE SUPERIOR
SPLIT ROCK RIVER
(2) UNNAMED STREAMS

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

SOILS AND CONSTRUCTION NOTES

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 9 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010
DISTRICT #: DULUTH
IPLOT NAME: tbl-A
PATH & FILENAME: Projects/D1_DUL/061/3806/060/Design/d3806-60_TBl.dgn

STANDARD PLATES

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

PLATE NO.	DESCRIPTION
3001B	REINFORCED CONCRETE REDUCER PIPE
3002B	REINFORCED CONCRETE INCREASER PIPE
3006G	GASKET JOINT FOR R.C. PIPE (2 SHEETS)
3040F	CORRUGATED METAL PIPE CULVERT
3100G	CONCRETE APRON FOR REINFORCED CONCRETE PIPE
3124B	METAL APRON CONNECTION
3128H	METAL SAFETY APRON & GRATE (2 SHEETS)
3129A	METAL APRON FOR CORRUGATED POLYETHYLENE PIPE
3131C	PRECAST CONCRETE HEADWALL FOR SUBSURFACE DRAINS
3133C	RIPRAP AT RCP OUTLETS
3134C	RIPRAP AT CMP OUTLETS
3145F	CONCRETE PIPE TIES
3221C	CORRUGATED STEEL PIPE COUPLING BAND (3 SHEETS)
4006L	MANHOLE OR CATCH BASIN PRECAST - DESIGNS G AND H
4008E	CATCH BASIN (SECTIONAL CONCRETE PIPE) - DESIGN I
4011E	PRECAST CONCRETE BASE
4026A	CONCRETE ENCASED CONCRETE ADJUSTING RINGS
4101D	RING CASTING FOR MANHOLE OR CATCH BASIN
4108F	ADJUSTING RINGS FOR CATCH BASINS AND MANHOLES
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
5010A	REINFORCED CONCRETE PIPE ENERGY DISSIPATORS
7102I	CONCRETE CURB & GUTTER (DESIGN BR,D,S,B4,B5,& D3) (2 SHEETS)
7109C	MEDIAN NOSE & ISLAND (UNDIVIDED TO DIVIDED ROADWAY)
7113A	CONCRETE APPROACH NOSE DETAIL
8000I	STANDARD BARRICADES
8316C	POST SEAT FOR ANCHORAGE ON FOOTING OR BOX CULVERTS
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 (INSTALLATION WITH STEEL POSTS) (4 SHEETS)
9101B	SHAPING AND SODDING OF SLOPES AT BOX CULVERT ENDS
9102D	TURF ESTABLISHMENT AREAS (AT PIPE CULVERT ENDS)
9350A	MAILBOX SUPPORT

SPECIAL DITCH GRADES

STATION TO STATION	LOCATION	BEG. ELEV.	END ELEV.	% GRADE
S.P. 3806-60 (T.H. 61)				
2264+30.04 - 2265+00.00	LT	650.860	650.210	-0.929
2276+66.65 - 2278+00.00	LT	642.510	641.950	-0.420
2282+50.00 - 2284+00.00	LT	638.820	637.810	-0.673
2297+50.00 - 2299+50.00	LT	645.470	647.020	0.775
2344+00.00 - 2345+00.00	LT	719.020	716.890	-2.130
2348+50.00 - 2349+50.00	LT	726.690	728.270	1.580
2349+50.00 - 2351+00.00	LT	728.270	729.360	0.727
2354+85.25 - 2355+50.00	LT	733.350	734.000	1.004
2355+50.00 - 2356+50.00	LT	734.000	734.170	0.170
2362+00.00 - 2363+00.00	LT	733.730	732.070	-1.660
2364+50.00 - 2364+83.83	LT	724.360	723.930	-1.271
2364+83.83 - 2365+00.00	LT	723.930	725.060	6.988
2367+00.00 - 2368+00.00	LT	719.310	716.000	-3.310
2368+00.00 - 2368+25.00	LT	716.000	715.000	-4.000
2368+25.00 - 2368+50.00	LT	715.000	716.000	4.000
2368+50.00 - 2369+00.00	LT	716.000	716.270	0.540
2369+00.00 - 2370+00.00	LT	716.270	720.170	3.900
2371+65.57 - 2371+85.00	LT	720.090	718.000	-10.757
2371+85.00 - 2372+00.00	LT	718.000	721.100	20.667
2386+50.00 - 2387+00.00	LT	753.580	753.070	-1.020
2394+50.00 - 2395+00.00	LT	739.580	733.600	-11.960
2395+00.00 - 2395+50.00	LT	733.600	728.200	-10.800
2395+50.00 - 2396+00.00	LT	728.200	727.030	-2.340
2396+00.00 - 2396+36.01	LT	727.030	725.000	-5.637
2396+36.01 - 2396+50.00	LT	725.000	727.830	20.229
2396+50.00 - 2397+00.00	LT	727.830	728.230	0.800
2401+50.00 - 2402+44.53	LT	724.420	721.570	-3.015
2433+00.00 - 2439+69.00	LT	671.480	669.440	-0.305
2411+50.00 - 2413+00.00	LT	733.620	732.670	-0.633
2325+00.00 - 2326+50.00	RT	683.860	690.100	4.160
2360+44.48 - 2360+50.00	RT	734.890	733.770	-20.290
2360+50.00 - 2364+83.83	RT	733.770	718.780	-3.455
2372+50.00 - 2373+07.00	RT	718.000	717.000	-1.750
2386+50.00 - 2387+00.00	RT	753.580	753.070	-1.020
2411+50.00 - 2414+00.00	RT	731.870	730.340	-0.612
SPLIT ROCK OVERLOOK CONN.				
2+50 - 3+30	LT	748.400	748.200	-0.25

A CLEARING & GRUBBING①

STATION TO STATION	LOC.	SPEC. 2101 CLEARING ACRE	SPEC. 2101 GRUBBING ACRE
S.P. 3806-60 (T.H. 61)			
2258+98.48 - 2282+50	LT & RT	1.15	1.15
2282+50 - 2305+50	LT & RT	1.24	1.24
2305+50 - 2328+50	LT & RT	1.55	1.55
2328+50 - 2345+00	LT & RT	0.64	0.64
2345+00 - 2373+00	LT & RT	4.71	4.71
2373+00 - 2395+00	LT & RT	7.43	7.43
2395+00 - 2417+00	LT & RT	5.51	5.51
2417+00 - 23439+69.81	LT & RT	4.45	4.45
PROJECT TOTALS:		26.7	26.7

① THE OUTER LIMITS OF THE CLEARING AND GRUBBING WERE COMPUTED AS FOLLOWS: A MAXIMUM DISTANCE OF 10' WAS ADDED OUTSIDE OF ALL THE CONSTRUCTION LIMITS UNLESS THE DISTANCE FROM THE CONSTRUCTION LIMITS TO EITHER THE R/W OR T.E. LINE IS LESS THAN 10', IF THERE IS LESS THAN 10' THEN OUTER LIMITS OF THE CLEAR AND GRUB AREA IS TO THE R/W OR T.E. LINE.

② AVERAGE BITUMINOUS DEPTH IS APPROXIMATELY 8.5".

③ INCLUDES REMOVALS OF PORTIONS OF THE INPLACE BIKE TRAIL, SEE ALIGNMENT, TOPOGRAPHY, R/W, & REMOVALS SHEETS FOR LOCATIONS.

④ SAWCUTS LOCATED ON INPLACE BIKE TRAIL.

B REMOVE BITUMINOUS PAVEMENT

STATION	LOCATION	SPEC. 2104 REMOVE BITUMINOUS PAVEMENT ② SQ FT	SPEC. 2104 REMOVE BITUMINOUS SHOULDER PAVEMENT SQ FT
S.P. 3806-60 (T.H. 61)			
2258+98.48 - 2282+50	LT & RT	56 ③	3 779
2282+50 - 2305+50	LT & RT		4 088
2305+50 - 2328+50	LT & RT		4 088
2328+50 - 2345+00	LT & RT		2 934
2345+00 - 2373+00	LT & RT	9 091 ③	
2373+00 - 2395+00	LT & RT	4 406 ③	
2395+00 - 2417+00	LT & RT	8 125	
2417+00 - 2439+69+81	LT & RT	10 777	
SPLIT ROCK RIVER REST AREA			
2287+05 - 2289+18	LT	1 186	
SPLIT ROCK OVERLOOK			
7+82 - 10+15	RT	653	
ENTRANCES	LT & RT	470	
PROJECT TOTALS:		34 764	14 889

C SAWING PAVEMENT - SPEC. 2104

STATION	LOCATION	SAWING BITUMINOUS PAVEMENT (FULL DEPTH) LIN FT
S.P. 3806-60 (T.H. 61)		
2258+98.48	℄	28
2262+93	RT	21
2264+30	RT	33
2268+34 ④	RT	10
2268+84 ④	RT	10
2368+80 ④	RT	10
2372+01 ④	RT	10
2379+42 ④	RT	10
2379+62 ④	RT	10
2383+42 ④	RT	10
2383+64 ④	RT	10
2422+04	RT	27
2439+69.81	℄	46
SPLIT ROCK OVERLOOK		
3+61	℄	37
8+35 - 9+67	RT	145
12+53	℄	28
PROJECT TOTALS:		445

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

STANDARD PLATES, DITCH GRADES & CONSTRUCTION CHARTS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 10 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010
DISTRICT #: DULUTH
IPLOT NAME: tbl-C
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_TBl.dgn

D EARTHWORK TABULATION

STATION	EXCAVATION ②				EMBANKMENT		BORROW		
	COMMON EXC. REGULAR ①	COMMON EXC. TOPSOIL ①	ROCK	ROCK EXC. IN TRENCH	TOPSOIL	COMMON (CV)	GRAN. BORROW (CV)	SEL. GRAN. BORROW (CV)	SEL. GRAN. MOD 10% (CV) ⑦
	CU YD	CU YD	CU YD	CU YD	CU YD	CU YD	CU YD	CU YD	CU YD
S.P. 3806-60 (T.H. 61)									
2258+98 - 2282+50	4 547	1 295	3 461		1 295	806		699	
2282+50 - 2305+50	1 076	999	24		999	1 022		792	
2305+50 - 2328+50	1 229	1 166	1 600		1 166	1 445			
2328+50 - 2345+00	1 673	953	1 053		953	1 269		197	
2345+00 - 2373+00	12 681 ③	3 290	130		3 290	19 170	53 649	21 833	
2373+00 - 2395+00	15 656	3 085	142 584		2 410 ④	7 605	12 758	12 186	
2395+00 - 2417+00	62 847	2 766	9 148		2 766	9 034	28 571	14 706	464 ⑤
2417+00 - 2439+70	36 315	2 788	29 730		2 788	458		25 415	
ENTRANCES	2 146			19 ⑧		1 431		482	
DNR ACCESS ROAD									
55+07 - 58+00	4 387	141			141	2 192		1 773	
OVERLOOK CONNECTION									
0+50 - 3+00	176	107	5 816		107	41		650	
PIPE CULVERTS ⑥	14 052			307				12 617	
BIKE TRAIL RE-ALIGNMENT									
2368+80 - 2372+00	60	25			25	326			
SPLIT ROCK RIVER REST AREA									
2286+21 - 2289+37		1 315	3 377		825	1 707		731	
BUILDING REMOVAL									
2409+00						203			
BUILDING REMOVAL A									
2436+75						276			
PROJECT TOTALS:	156 845	17 930	196 923	326	16 765	46 985	94 978	92 081	464

① COMMON EXC. & COMMON EXC. TOPSOIL HAVE BEEN INCLUDED AS A SINGLE PAY ITEM "COMMON EXCAVATION - SPEC. 2105."

② THIS MATERIAL IF NOT USED IN CONSTRUCTION SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND BE DISPOSED OF OUTSIDE THE R/W IN ACCORDANCE WITH SPEC. - 2105.

③ INCLUDES (578 CU YD) FOR INPLACE T.H. 61 ROAD OBLITERATION FROM STA. 2371+50 -2373+00 RT.

④ INCLUDES (518 CU YD) FOR INPLACE T.H. 61 ROAD OBLITERATION STA. 2373+00 - 2379+00 AND OVERLOOK CONNECTION STA. 0+99 - 3+61.

⑤ INCLUDES (232 CU YD) FOR THE SOUTHWEST BRIDGE ABUTMENT AND (232 CU YD) FOR THE NORTHEAST BRIDGE ABUTMENT.

⑥ INCLUDES BOX CULVERTS AT STA. 2289+34 & 2403+58.

⑦ SELECT GRANULAR MATERIAL MODIFIED 10% SHALL COMPLY WITH SPEC. 3149.282, MODIFIED TO 10% OR LESS PASSING THE NUMBER 200 SIEVE.

⑧ SEE ENTRANCE - CULVERTS CHART FOR LOCATIONS.

NOTE: 1.2 SHRINKAGE FACTOR FOR COMMON EMBANKMENT.

DITCH BLOCKS

STATION	LOCATION	ELEVATION
S.P. 3806-60 (T.H. 61)		
2324+50	LT	688.60
2332+14	LT	703.00
2340+63	LT	717.60
2354+69	LT	735.40
2420+42	LT	713.00

E EXCAVATION SPECIAL - TACONITE TAILINGS ⑨

STATION TO STATION	LOC.	SPEC. 2105 EXCAVATION SPECIAL ⑩
		CU YDS
S.P. 3806-60 (T.H. 61)		
2289+34 (TRAIL UNDERPASS)	LT & RT	489
2324+68 (C/L CULVERT)	LT & RT	1 108
2332+56 (C/L CULVERT)	LT & RT	1 039
2340+89 (C/L CULVERT)	LT & RT	825
2345+00 - 2349+00	LT & RT	1 037
2417+00 - 2419+00	LT & RT	2 148
2419+00 - 2423+00	LT & RT	2 578
2423+00 - 2424+00	LT & RT	752
2424+00 - 2425+00	LT & RT	644
2425+00 - 2428+00	LT & RT	2 356
2428+00 - 2430+00	LT & RT	981
2430+00 - 2433+00	LT & RT	589
TOTALS:		14 546

F EXC. SPECIAL - BIT. TREATED BASE ⑨

STATION TO STATION	LOC.	SPEC. 2105 EXCAVATION SPECIAL ⑩
		CU YDS
S.P. 3806-60 (T.H. 61)		
2352+00 - 2353+00	LT & RT	338
2353+00 - 2354+00	LT & RT	231
2354+00 - 2355+00	LT & RT	118
2355+00 - 2356+00	LT & RT	119
2356+00 - 2357+00	LT & RT	119
2357+00 - 2358+00	LT & RT	124
2358+00 - 2359+00	LT & RT	99
2359+00 - 2360+00	LT & RT	47
2360+00 - 2361+00	LT & RT	36
2361+00 - 2362+00	LT & RT	41
2362+00 - 2363+00	LT & RT	73
2415+00 - 2416+00	LT & RT	361
2416+00 - 2419+00	LT & RT	1 983
2419+00 - 2420+00	LT & RT	785
2420+00 - 2421+00	LT & RT	578
2421+00 - 2422+00	LT & RT	422
TOTALS:		5 474

⑨ FOR FINAL DISPOSITION OF TACONITE TAILINGS AND BITUMINOUS TREATED BASE SEE (2105) CONTAMINATED SOIL AND REGULATED MATERIAL IN THE SPECIAL PROVISIONS.

⑩ TACONITE TAILINGS AND BITUMINOUS TREATED BASE QUANTITIES ARE APPROXIMATE.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

CONSTRUCTION CHARTS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 11 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010
DISTRICT #: DULUTH
IPLOT NAME: tbl-B
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_TBl.dgn

M — MAINLINE DRAINAGE – CULVERTS

STATION	LOC.	INPLACE	REMARKS	SPEC. 2104 REMOVE: PIPE CULVERTS (LIN FT)	SPEC. 2104 REMOVE: CONCRETE BOX CULVERT (LIN FT)	SPEC. 2104 REMOVE: PIPE APRON (EACH)	SPEC. 2105: COMMON EXC. (16) (CU YD)	SPEC. 2105: SEL. GRAN. BORROW (CV) (16) (CU YD)	SPEC. 2105: GEO-TEXTILE FABRIC TYPE V (SQ YD)	SPEC. 2451: ROCK EXC. IN TRENCH (16) (CU YD)	SPEC. 2451: AGG. BED. (CV) (14) (CU YD)	DIA. OR SPAN (INCH)	CLASS	SPEC. 2501: RC PIPE CULVERT DESIGN 3006 (15) (LIN FT)	SPEC. 2501: RC PIPE APRON (15) (EACH)	SPEC. 2501: ANTI SEEPAGE DIAPHRAGMS (17) "A" (EACH)	SPEC. 2501: ANTI SEEPAGE DIAPHRAGMS (17) "B" (EACH)	SPEC. 2501: SAFETY GRATE (EACH)	SPEC. 2501: DISSI-PATOR RINGS (EACH)	SPEC. 2501: CP PIPE CULVERT (SMOOTH) (LIN FT)	SPEC. 2501: CAS PIPE APRON (EACH)	SPEC. 2511: RANDOM RIPRAP CL. II (CUYD)	SPEC. 2511: RANDOM RIPRAP CL. III (CU YD)	SPEC. 2511: GEOTEXTILE FILTER TYPE III (SQ YD)	SPEC. 2511: GEOTEXTILE FILTER TYPE IV (SQ YD)	SPEC. 2554: GUIDE POST TYPE SPECIAL (EACH)
S.P. 3806-60 (T.H. 61)																										
2268+83	C/L	42" X 141' CMP (INCL. APRONS)	REMOVE	141		2	2 214	1 806	224		158	42	IV	76	1											1
									152			48	IV	44 (1)	1				5 (2)				19.4		43.5	1
2289+34	C/L		BR# 38X05				1 321	744	667		130															
2311+24	C/L	30" X 200' CMP (INCL. APRONS)	REMOVE	200		2	4 322	3 627	395		197	36	V	140	1											1
									125			42	III	34 (3)	1				5 (4)				16.3		36.5	1
2324+68	C/L	30" X 102' RCP (INCL. APRONS)	REMOVE	102		2	1 010	819	133		104	36		42	1			1								1
									125			42		34 (3)	1				5 (4)				16.3		36.5	1
2332+56	C/L	30" X 98' RCP (INCL. APRONS)	REMOVE	98		2	1 228	959	171		97	30		58	1			1								1
									99			36		24 (5)	1			1	5 (6)				13.8		30.9	1
2340+89	C/L	30" X 77' RCP (INCL. APRONS)	REMOVE	77		2	868	720	112		90	36		34	1			1								1
									125			42		34 (3)	1			1	5 (4)				16.3		36.5	1
2346+50	C/L						300	137	224		133	60	II	64	2			2								2
2354+85	C/L	24" X 24" X 33' CONC. BOX	REMOVE		33		95	52	144		53	24		48	1			1								1
		24" X 10' CMP EXT. RT. (+ APRON)		10		1			93			30		24 (7)	1			1	5 (6)			7.3		24.5		1
		24" X 19' CMP EXT. LT. (+ APRON)		19		1																				
2364+84	C/L	24" X 24" X 37' CONC. BOX	REMOVE		37		192	267	245		73	42	IV	84	1											1
		24" X 12' CMP EXT. RT. (+ APRON)		12		1			125			48	III	34 (1)	1				5 (4)				16.3		36.5	1
		24" X 12' CMP EXT. LT. (+ APRON)		12		1																				
2369+09	C/L	36" X 36" X 52' CONC. BOX	REMOVE		52		523	912	517		158	36	V	194 (8)												
		36" X 14' CMP EXT. RT. (+ APRON)		14		1			152			42		36 (11)	2			2	5 (12)				16.3		36.5	2
		36" X 58' CMP EXT. LT. (+ APRON)		58		1																				
2371+65	C/L	36" X 36" X 48' CONC. BOX	REMOVE		48		444	805	448		128	30	V	162	1			1								1
		36" X 10' CMP EXT. RT. (+ APRON)		10		1			125			42		34 (9)	1			1	5 (10)			10.9		36.6		1
		36" X 44' CMP EXT. LT. (+ APRON)		44		1																				
2396+36	C/L	24" X 24" X 38' CONC. BOX	REMOVE		38		301	407	304		95	30	IV	108	1			1								1
		24" X 10' CMP EXT. RT. (+ APRON)		10		1			109			42		28 (9)	1			1	5 (10)			10.9		36.6		1
2403+36	C/L	W1010 X 78' CONC. BOX	REMOVE																							
		LINED WITH 108"X104' CMP + APRONS																								
2403+58	C/L		BR# 38X06				1 234	1 229	1 089		192															
2420+27	C/L	24" X 24" X 35' CONC. BOX	REMOVE		35			57		70	44	24		100	2	1	1	2					8.2		18.4	2
		24" X 21' CMP EXT. RT. (NO APRON)		21																						
		24" X 26' CMP EXT. LT. (NO APRON)		26																						
2430+31	C/L	24" X 24" X 39' CONC. BOX	REMOVE		39			76		108	28	24		66	1	1		1								1
		24" X 8' CMP EXT. RT. (NO APRON)		8							14	30		24 (7)	1		1	1	5 (6)			7.3		24.5		1
		24" X 16' CMP EXT. LT. (NO APRON)		16																						
SPLIT ROCK OVERLOOK																										
3+31	C/L	24" X 24" X 34' CONC. BOX	REMOVE		34					18	(13)	24				1	1			80		6.5		21.9		
		24" X 12' CMP EXT. RT. (+ APRON)		12		1						30						2			2					2
		24" X 35' CMP EXT. LT. (+ APRON)		35		1																				
7+32	C/L	24" X 24" X 42' CONC. BOX	REMOVE		42					68	(13)	24				1	1			94			9.8		22	
		24" X 16' CMP EXT. RT. (+ APRON)		16		1						30						2			2					2
		24" X 25' CMP EXT. LT. (+ APRON)		25		1																				
12+53	C/L	24" X 24" X 34' CONC. BOX	REMOVE		34					43	(13)	24				1	1			66			9.8		22	
		24" X 10' CMP EXT. RT. (+ APRON)		10		1						30						2			2					2
		24" X 19' CMP EXT. LT. (+ APRON)		19		1																				
TOTALS:				995	392	25	14 052	12 617	5 903	307	1 694											43	143	144	319	32

(1) LENGTH INCLUDES 1-42" TO 48" INCREASER.
(2) TYPE 1 DISSIPATOR RINGS SPACED AT 9 FT CENTER TO CENTER FROM OUTLET APRON.
(3) LENGTH INCLUDES 1-36" TO 42" INCREASER.
(4) TYPE 1 DISSIPATOR RINGS SPACED AT 7 FT CENTER TO CENTER FROM OUTLET APRON.
(5) LENGTH INCLUDES 1-30" TO 36" INCREASER.
(6) TYPE 1 DISSIPATOR RINGS SPACED AT 5 FT CENTER TO CENTER FROM OUTLET APRON.
(7) LENGTH INCLUDES 1-24" TO 30" INCREASER.
(8) LENGTH INCLUDES 1-7.5 DEGREE BEND SECTION.
(9) LENGTH INCLUDES 1-30" TO 36" INCREASER AND 1-36" TO 42" INCREASER.
(10) TYPE 2 DISSIPATOR RINGS SPACED AT 5 FT CENTER TO CENTER FROM OUTLET APRON.
(11) LENGTH INCLUDES 1-36" TO 42" DECREASER AND 1-36" TO 42" INCRASER.
(12) 4 - TYPE 1 AND 1 - TYPE 2 DISSIPATOR RINGS SPACED AT 5 FT CENTER TO CENTER FROM OUTLET APRON. TYPE 2 DISSIPATOR RING TO BE PLACED THE FURTHEST FROM THE OUTLET APRON.
(13) AGGREGATE BEDDING SHALL BE INCIDENTAL ON CP PIPE CULVERTS.
(14) FOR CULVERT TREATMENT AND BEDDING INFORMATION SEE CONSTRUCTION DETAIL SHEETS.
(15) TIE ALL JOINTS ON CONCRETE PIPE CULVERTS AND CONCRETE APRONS. (INCIDENTAL)
(16) QUANTITIES BROKEN DOWN FOR INDIVIDUAL PIPES, FOR INFORMATION ONLY. SEE THE EATHWORK CHART FOR PROJECT TOTALS.
(17) SEE CONSTRUCTION DETAILS FOR ADDITIONAL INFORMATION.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 08-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

CONSTRUCTION CHARTS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 14 OF 200 SHEETS

PLOTTED/REVISED: 08-JAN-2010
PLOT NAME: tbl-j
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_TBl.dgn

S DITCH CHECKS – SPEC. 2573

STATION - STATION	LOC.	PERMANENT TYPE 7 ROCK CHECK ①②③ CU YD	TEMPORARY TYPE 1 SLICED IN SILT FENCE LIN FT	TEMPORARY TYPE 2 BIOROLL LIN FT
S.P. 3806-60 (T.H. 61)				
2260+00	LT		15	
2261+50	LT		15	
2264+00	LT		15	
2267+00	LT		15	
2268+00	LT	3		
2268+50	LT	3		
2269+10	LT	3		
2269+60	LT	3		
2274+50	LT & RT	6		
2276+00	RT		15	
2278+00	RT		15	
2280+00	RT		15	
2282+50	RT		15	
2283+50	RT		15	
2284+00	RT	3		
2295+50	RT	3		
2296+50	LT	3		
2296+50	RT		15	
2297+00	LT		15	
2297+50	RT		15	
2298+00	LT & RT	6		
2299+00	LT & RT		30	
2301+00	LT & RT		30	
2303+00	LT & RT		30	
2305+00	LT		15	
2309+00	LT		15	
2311+00	LT		15	
2311+50	LT		15	
2312+50	LT		15	
2313+50	LT		15	
2314+50	LT			15
2315+50	LT		15	
2316+50	LT			15
2317+50	LT & RT		30	
2318+50	RT			15
2320+00	RT		15	
2321+00	RT			15
2325+00	LT & RT		30	
2325+50	RT			15
2326+00	LT & RT			30
2327+00	LT & RT		30	
2328+50	LT & RT		30	
2330+00	RT		15	
2331+50	RT		15	
2333+00	LT			15
2333+50	LT & RT		30	
2334+50	LT		15	
2335+50	RT		15	
2336+00	LT		15	
2337+00	LT & RT		30	
2338+50	LT & RT			30
2341+50	LT		15	
2344+50	LT			15
2345+00	LT		15	
2345+50	LT	3		
2347+50	LT	3		
2348+00	LT			15
2348+50	LT		15	
2349+50	LT & RT		30	
2351+50	LT & RT		30	

STATION - STATION	LOC.	PERMANENT TYPE 7 ROCK CHECK ①②③ CU YD	TEMPORARY TYPE 1 SLICED IN SILT FENCE LIN FT	TEMPORARY TYPE 2 BIOROLL LIN FT
S.P. 3806-60 (T.H. 61)				
2353+00	LT		15	
2355+00	LT & RT		30	
2356+50	LT			15
2357+50	LT & RT		30	
2361+75	RT		15	
2362+50	LT & RT		30	
2363+25	RT		15	
2364+00	LT & RT	6		
2364+50	LT & RT		30	
2367+00	LT & RT		30	
2367+50	LT & RT			30
2368+00	LT & RT	6		
2368+50	LT & RT	6		
2369+00	LT			15
2369+50	LT		15	
2370+00	LT		15	
2370+50	LT		15	
2372+00	LT	3		
2372+50	LT			15
2373+00	LT		15	
2373+00	RT	3		
2373+50	LT & RT	6		
2374+00	LT			15
2374+50	LT		15	
2375+50	LT & RT	6		
2378+00	LT	3		
2379+00	RT	3		
2381+00	LT & RT	6		
2387+50	LT & RT	6		
2390+50	LT	3		
2393+50	LT	3		
2395+00	LT	3		
2395+50	LT	3		
2396+00	LT	3		
2396+50	LT	3		
2397+00	LT		15	
2397+50	LT			15
2400+00	LT		15	
2402+00	LT		15	
2402+35	LT		15	
2402+50	LT			15
2403+00	LT	3		
2405+50	RT		15	
2411+50	LT & RT		30	
2414+50	LT & RT	6		
2417+00	LT & RT	6		
2418+00	RT		15	
2419+00	RT			15
2420+00	LT	3		
2422+50	LT	3		
2425+00	LT	3		
2428+00	LT	3		
2434+00	LT	3		
2435+50	LT		15	
2438+00	LT		15	
2439+00	LT			15
2439+50	LT		15	
PROJECT TOTAL:		141	1 185	330

① WHEN ROCK DITCH CHECK IS PLACED IN AN AREA OF A ROCK CUT THE GEOTEXTILE FABRIC MAY BE ELIMINATED.

② GEOTEXTILE FABRIC IS INCIDENTAL.

③ FOR ADDITIONAL INFORMATION SEE TEMPORARY SEDIMENT CONTROL SHEET (3 OF 4) IN THE STANDARD PLAN SHEETS.

T TEMP. EROSION CONTROL – SPEC. 2573

STATION	LOC.	SILT FENCE TYPE HEAVY DUTY LIN FT	SILT FENCE TYPE MACHINE SLICED LIN FT	REMARKS
S.P. 3806-60 (T.H. 61)				
2258+98.48 - 2325+00	RT		6 602	AT CONST. LIMITS
2262+00 - 2272+00	LT		1 000	AT CONST. LIMITS
2273+00 - 2274+50	LT		150	AT ELEVATION 646.0
2274+40 - 2275+50	LT		110	AT ELEVATION 645.0
2284+50 - 2286+50	LT		200	AT CONST. LIMITS
2288+00 - 2297+50	LT	950		AT CONST. LIMITS
2300+00 - 2317+00	LT		1 700	AT CONST. LIMITS
2324+50 - 2328+00	LT		350	AT CONST. LIMITS
2327+00 - 2356+50	RT		2 950	AT CONST. LIMITS
2332+56	LT	50		AROUND PIPE APRON
2338+50 - 2348+50	LT		1 000	AT CONST. LIMITS
2345+75 - 2346+40	LT	100		AT ELEVATION 714.0
2345+75 - 2346+75	RT	100		AT ELEVATION 714.0
2354+85	LT	50		AROUND PIPE APRON
2360+50 - 2375+00	RT	1 450		AT CONST. LIMITS
2363+50 - 2367+00	LT	350		AT CONST. LIMITS
2363+75 - 2364+79	RT	104		AT ELEVATION 730.0
2364+50 - 2364+79	LT	29		AT ELEVATION 730.0
2364+89 - 2367+00	RT	211		AT ELEVATION 729.0
2364+89 - 2368+20	LT	331		AT ELEVATION 729.0
2366+90 - 2369+04	RT	204		AT ELEVATION 724.0
2368+30 - 2369+50	LT	120		AT ELEVATION 729.0
2369+14 - 2370+50	RT	136		AT ELEVATION 727.0
2369+40 - 2371+61	LT	221		AT ELEVATION 731.0
2370+40 - 2371+61	RT	121		AT ELEVATION 729.0
2370+50 - 2375+50	LT	500		AT CONST. LIMITS
2371+71 - 2373+00	LT	129		AT ELEVATION 734.0
2371+71 - 2374+00	RT	229		AT ELEVATION 730.0
2372+90 - 2373+50	LT	60		AT ELEVATION 735.0
2389+00 - 2405+50	RT		1 650	AT CONST. LIMITS
2392+67 - 2393+50	RT	83		AT ELEVATION 738.0
2392+90 - 2394+50	RT	160		AT ELEVATION 736.0
2394+40 - 2395+50	RT	110		AT ELEVATION 734.0
2395+40 - 2396+31	RT	91		AT ELEVATION 732.0
2396+36	LT	50		AROUND PIPE APRON
2396+41 - 2398+00	RT	159		AT ELEVATION 730.0
2397+50 - 2405+50	LT	800		AT CONST. LIMITS
2397+90 - 2399+50	RT	160		AT ELEVATION 728.0
2399+40 - 2402+80	RT	340		AT ELEVATION 727.0
2402+50 - 2402+80	LT	30		AT ELEVATION 727.0
2403+83 - 2404+50	LT	67		AT ELEVATION 716.0
2404+40 - 2405+00	LT	60		AT ELEVATION 727.0
2408+25 - 2408+85	LT		60	AT ELEVATION 738.0
2408+25 - 2410+10	LT	200		BUILDING REMOVAL SITE
2409+10 - 2410+50	LT		140	AT ELEVATION 738.0
2410+00 - 2410+50	RT		50	AT ELEVATION 735.0
2410+40 - 2411+75	LT		135	AT ELEVATION 736.0
2411+50 - 2412+50	RT		100	AT ELEVATION 735.0
2415+50 - 2416+00	RT		50	AT ELEVATION 728.0
2415+90 - 2416+50	RT		60	AT ELEVATION 726.0
2417+25 - 2417+75	RT		50	AT ELEVATION 721.0
2419+50 - 2439+69.81	RT		2 020	AT CONST. LIMITS
2420+27	LT	50		AROUND PIPE APRON
2430+31	LT	50		AROUND PIPE APRON
2435+25 - 2435+75	LT	50		AT ELEVATION 676.0
2436+20 - 2437+70	LT	170		BUILDING REMOVAL SITE
2437+75 - 2438+25	RT	50		AT ELEVATION 669.0
SPLIT ROCK OVERLOOK				
3+31	LT	50		AROUND PIPE APRON
3+31	RT	150		AROUND PIPE APRON
7+32	LT	50		AROUND PIPE APRON
7+32	RT	150		AROUND PIPE APRON
12+53	LT	50		AROUND PIPE APRON
12+53	RT	150		AROUND PIPE APRON
PROJECT TOTALS:		8 725	18 377	

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

CONSTRUCTION CHARTS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 19 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010

DISTRICT : DULUTH
IPLOT NAME: tbl-H
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_TBl.dgn

U TURF ESTABLISHMENT - SPEC. 2575

STATION	LOC.	SEEDING	SEED MIXTURE 250	MULCH MATERIAL TYPE 1	DISK ANCHORING	FERTILIZER TYPE 1	HYDRUALIC SOIL STABILIZER TYPE 8
		ACRE	POUND	TON	ACRE	POUND	POUND
S.P. 3806-60 (T.H. 61)							
2258+98.48 - 2282+50	LT & RT	1.56	109	2.3	1.1	547	1 502
2282+50 - 2305+50	LT & RT	1.81	127	2.0	1.0	635	2 817
2305+50 - 2328+50	LT & RT	1.40	98	2.3	1.2	492	864
2328+50 - 2345+00	LT & RT	1.14	80	1.8	0.9	399	788
2345+00 - 2373+00	LT & RT	5.33	373	5.8	2.9	1864	8 428
2373+00 - 2395+00	LT & RT	4.88	342	9.1	4.6	1 708	1 091
2395+00 - 2417+00	LT & RT	4.91	344	6.1	3.1	1 720	6 509
2417+00 - 2439+69.81	LT & RT	3.83	268	7.0	3.5	1 340	1 075
BUILDING REMOVAL							
2409+00				0.3			
BUILDING REMOVAL A							
2436+75				0.2			
PROJECT TOTALS:		24.9	1 741	37	18.3	8 705	23 074

V MISC. EROSION CONTROL

STATION - STATION	LOCATION	SPEC. 2575 EROSION STABILIZATION MAT CLASS 1
		SQ YD
S.P. 3806-60 (T.H. 61)		
2364+00 - 2365+00	LT DITCH	89
2368+00 - 2368+50	LT DITCH	44
2371+61 - 2375+00	TOE OF SLOPE LT	301
2374+50 - 2375+50	CUT RUN-OUT RT	89
2396+31 - 2397+00	LT DITCH	62
2405+50 - 2406+00	RT DITCH	82
2405+50 - 2405+85	LT DITCH	30
PROJECT TOTALS:		697

W MAIL BOX SUPPORT

STATION	LOC.	SPEC. 2540 MAIL BOX SUPPORT
		EACH
S.P. 3806-60 (T.H. 61)		
2263+08	RT	1
2264+44	RT	1
2273+47	RT	1
2421+15	RT	2
PROJECT TOTALS:		5

ENTRANCE & ROAD CONNECTIONS

STATION	LOC.	TYPE	SURFACE	SECTION	WIDTH	REMARKS
S.P. 3806-60 (T.H. 61)						
2260+68	RT	FIELD	GRAVEL	I	16	
2262+91	RT	RES.	BIT.	II	16	
2264+29	RT	RES.	BIT.	II	16	
2264+53	LT	FIELD	GRAVEL	I	16	
2272+95	RT	COMM.	GRAVEL	III	32	
2282+16	RT	COMM.	GRAVEL	III	30	
2305+93	RT	COMM.	GRAVEL	III	30	
2345+03	RT	FIELD	GRAVEL		16	ELIMINATE
2348+88	RT	FIELD	GRAVEL	I	10	
2348+96	LT	FIELD	GRAVEL	I	10	
2358+29	LT	RES.	GRAVEL	II	16	
2370+60	RT	FIELD	GRAVEL		12	ELIMINATE
2378+00	RT	RD. CONN.	BIT.	IV	32	
2389+00	RT	RD. CONN.	BIT.	IV	32	
2398+30	RT	FIELD	GRAVEL		18	ELIMINATE
2399+77	RT	FIELD	GRAVEL		18	ELIMINATE
2402+16	LT	FIELD	GRAVEL		10	ELIMINATE
2405+05	RT	FIELD	GRAVEL		12	ELIMINATE
2406+00	LT	RES.	GRAVEL	II	16	
2422+04	RT	RD. CONN.	BIT.	IV	32	
2426+18	LT	RES.	GRAVEL	II	16	
2433+79	RT	FIELD	GRAVEL		14	ELIMINATE
2436+27	LT	RES.	GRAVEL		10	ELIMINATE
2436+76	LT	RES.	GRAVEL		12	ELIMINATE
2437+12	RT	FIELD	GRAVEL		10	ELIMINATE
2437+41	LT	RES.	GRAVEL		17	ELIMINATE

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

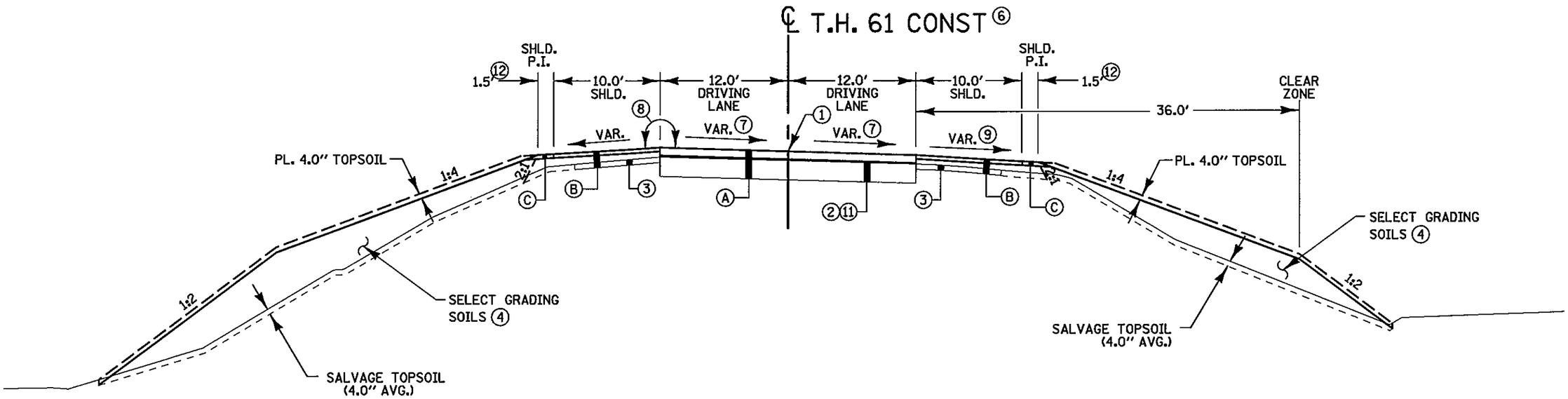
CONSTRUCTION CHARTS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 20 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010
DISTRICT #: DULUTH
IPLOT NAME: tbl-1
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_TBl.dgn

TYPICAL SECTION - MAINLINE SUPERELEVATION RECLAMATION ⑤

APPLIES : T.H. 61 CONST. STA. 2265+99 - 2279+19
2286+24 - 2304+45
2326+71 - 2344+95



① PROFILE GRADE TOP OF FINISHED BITUMINOUS SURFACE.

② RECLAIM BITUMINOUS PAVEMENT & AGGREGATE BASE (14.0") - SPEC. 2331.

③ REMOVE INPLACE BITUMINOUS SHOULDER, PAID FOR AS REMOVE BITUMINOUS SHOULDER PAVEMENT - SPEC. 2104.

④ ANY SOILS (INCLUDING TACONITE TAILINGS) WITH THE EXCEPTION OF TOPSOIL, PEAT, SILT LOAM, WOOD OR OTHER ORGANIC MATERIALS.

⑤ IF IN ROCK SEE RECLAMATION IN ROCK TYPICAL SECTION.

⑥ FOR ALIGNMENT DATA, SEE ALIGNMENT TABULATION CHARTS.

⑦ FOR CROSS SLOPES SEE SUPER ELEVATION SHEETS.

⑧ 0.07'/FT. MAXIMUM ROLLOVER.

⑨ CONSTRUCT -0.04'/FT. CROSS SLOPE EXCEPT WHERE CROSS SLOPE OF ADJACENT LANE EXCEEDS -0.04'/FT., THEN SLOPE SHALL MATCH ADJACENT LANE.

⑩ IN ORDER TO ESTABLISH THE PROPOSED PROFILE ELEV. IN AREAS, ADDITIONAL VAR. DEPTH AGGREGATE BASE WILL NEED TO BE BLENDED IN WITH THE RECLAIMED MATERIAL IN ORDER TO ACHIEVE PROPER ELEV. BEFORE BITUMINOUS IS PLACED. AS DIRECTED BY THE ENGINEER.

⑪ RECLAIM BITUMINOUS PAVEMENT & AGGREGATE BASE (16.0") FROM STA. 2274+34 - 2279+19 - SPEC. 2331. SEE CONSTRUCTION CHART FOR ADDITIONAL (16.0") RECLAIM LOCATIONS.

⑫ IN GUARDRAIL AREAS CONSTRUCT 3.0' AGGREGATE SHOULDER. SEE CONST. CHART & PLANNED CONST. SHEETS FOR LOCATIONS.

Ⓐ
- 2.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440C)
- 2.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440C)
- 2.0" TYPE SP 12.5 NON WEARING COURSE MIXTURE (SPNWB330B)
- PLACE TACK COAT BETWEEN BIT. COURSES - SPEC. 2357 - INCIDENTAL
- 1.0' RECLAIMED MATERIAL - SPEC. 2331
- VAR. DEPTH AGGREGATE BASE (CV) CL. 6 - SPEC. 2211 ⑩

Ⓑ
- 3.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB330C)
- VAR. DEPTH AGGREGATE BASE (CV) CL. 6 - SPEC. 2211

Ⓒ
- 3.0" AGGREGATE SHOULDERING (CV) CL. 5 - SPEC. 2221

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

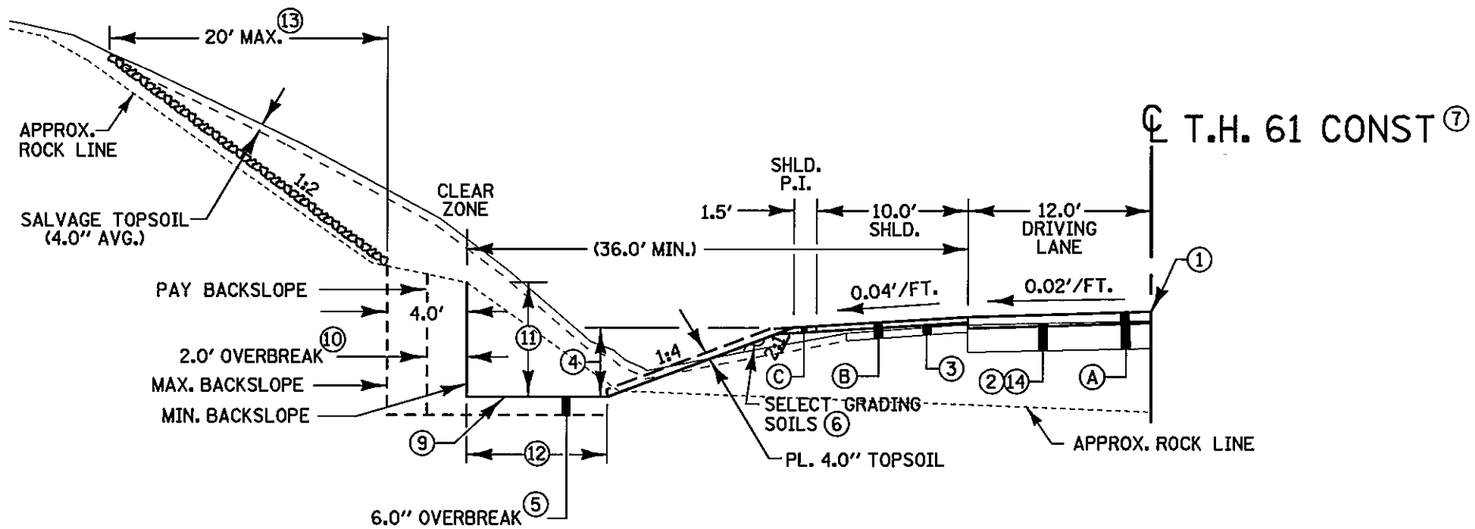
TYPICAL SECTION

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 26 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT : DULUTH
IPLOT NAME: TSI-C
PATH & FILENAME: Projects/D1_DUL/061/3806/060/Design/D3806060_TSI.DGN

TYPICAL SECTION - MAINLINE IN ROCK RECLAMATION

APPLIES : T.H. 61 CONST. STA. 2276+00 - 2282+50 LT.
2318+00 - 2323+50 LT.
2329+00 - 2332+50 LT.



1. PROFILE GRADE TOP OF FINISHED BITUMINOUS SURFACE.
2. RECLAIM BITUMINOUS PAVEMENT & AGGREGATE BASE (14.0") - SPEC. 2331.
3. REMOVE INPLACE BITUMINOUS SHOULDER, PAID FOR AS REMOVE BITUMINOUS SHOULDER PAVEMENT - SPEC. 2104.
4. 3.0' DITCH DEPTH. FOR SPECIAL DITCH GRADES SEE SPECIAL DITCH GRADE CHART.
5. 6.0" OVERBREAK. ROCK EXCAVATION COMPUTED TO BOTTOM OF 6.0" OVERBREAK.
6. ANY SOILS (INCLUDING TACONITE TAILINGS) WITH THE EXCEPTION OF TOPSOIL, PEAT, SILT LOAM, WOOD OR OTHER ORGANIC MATERIALS.
7. FOR ALIGNMENT DATA, SEE ALIGNMENT TABULATION CHARTS.
8. IN ORDER TO ESTABLISH THE PROPOSED PROFILE ELEV. IN AREAS, ADDITIONAL VAR. DEPTH AGGREGATE BASE WILL NEED TO BE BLENDED IN WITH THE RECLAIMED MATERIAL IN ORDER TO ACHIEVE PROPER ELEV. BEFORE BITUMINOUS IS PLACED. AS DIRECTED BY THE ENGINEER.
9. NO TOPSOIL IN ROCK DITCH BOTTOMS. FILL DITCH WITH ROCK SPALLS TO GAIN PROPER DITCH GRADE. (INCIDENTAL)
10. NO HORIZONTAL OVERBREAK ALLOWED FOR ROCK CUTS GREATER THAN 15'.
11. IF ROCK CUT IS LESS THAN 15' USE "RUSTIC FACE BLASTING METHOD" (2' HORIZONTAL OVERBREAK). IF ROCK CUT GREATER THAN 15' USE "SMOOTH FACE BLASTING METHOD" (NO HORIZONTAL OVERBREAK).
12. VAR. WIDTH DITCH (9.0' MIN.) TO MAINTAIN PROPER CLEAR ZONE WIDTH.
13. PL. ROCK RUBBLE SLOPE DRESSING ON 1:2 SLOPES ON TOP OF VERTICAL ROCK CUTS, NO MORE THAN 20' IN WIDTH AND WITH A MAX. PARTICLE SIZE OF 12.0". (INCIDENTAL)
14. RECLAIM BITUMINOUS PAVEMENT & AGGREGATE BASE (16.0") FROM STA. 2276+00 - 2281+44 - SPEC. 2331. SEE CONSTRUCTION CHART FOR ADDITIONAL (16.0") RECLAIM LOCATIONS.

A
- 2.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440C)
- 2.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440C)
- 2.0" TYPE SP 12.5 NON WEARING COURSE MIXTURE (SPNWB330B)
- PLACE TACK COAT BETWEEN BIT. COURSES - SPEC. 2357 - INCIDENTAL
- 1.0' RECLAIMED MATERIAL - SPEC. 2331
- VAR. DEPTH AGGREGATE BASE (CV) CL. 6 - SPEC. 2211 8

B
- 3.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB330C)
- VAR. DEPTH AGGREGATE BASE (CV) CL. 6 - SPEC. 2211

C
- 3.0" AGGREGATE SHOULDERING (CV) CL. 5 - SPEC. 2221

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

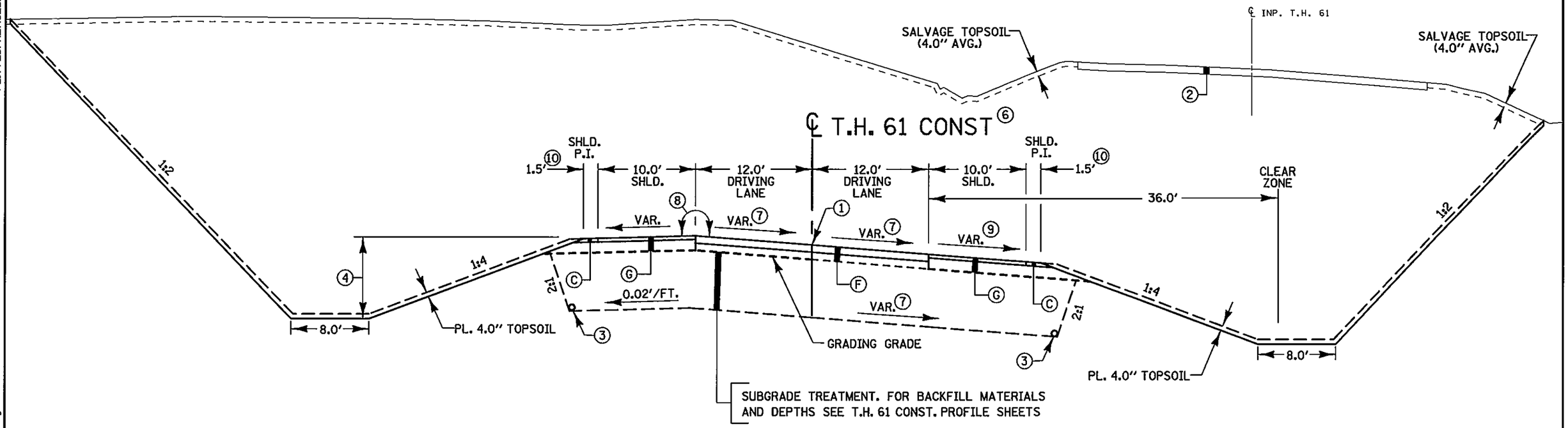
TYPICAL SECTION

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 27 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT : DULUTH
IPLOT NAME: TSI-D
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/D380660_TSI.DGN

TYPICAL SECTION - MAINLINE SUPERELEVATION (5)

APPLIES : T.H. 61 CONST. STA. 2363+32 - 2379+38 (11)
2404+35 - 2414+68
2434+56 - 2439+69.81



1. PROFILE GRADE TOP OF FINISHED BITUMINOUS SURFACE.
2. REMOVE BITUMINOUS PAVEMENT (FULL WIDTH OF INPLACE PAVEMENT) - SPEC. 2104.
3. FOR SUBSURFACE DRAIN CONSTRUCTION DETAILS, SEE CONST. DETAILS & CROSS SECTIONS.
4. 5.5' DITCH DEPTH ON LEFT & RIGHT. FOR SPECIAL DITCH GRADES SEE SPECIAL DITCH GRADE CHART.
5. IF IN ROCK, SEE SUBCUT IN ROCK TYPICAL SECTION.
6. FOR ALIGNMENT DATA, SEE ALIGNMENT TABULATION CHARTS.
7. FOR CROSS SLOPES SEE SUPER ELEVATION SHEETS.
8. 0.07'/FT. MAXIMUM ROLLOVER.
9. CONSTRUCT -0.04'/FT. CROSS SLOPE EXCEPT WHERE CROSS SLOPE OF ADJACENT LANE EXCEEDS -0.04'/FT., THEN SLOPE SHALL MATCH ADJACENT LANE.
10. IN GUARDRAIL AREAS CONSTRUCT 3.0' AGGREGATE SHOULDER. SEE CONST. CHART & PLANNED CONST. SHEETS FOR LOCATIONS.
11. RT. TURNLANE FROM STA. 2373+07 - 2379+01 RT. SEE TURNLANE/BYPASS TYPICAL SECTION FOR DETAILS.

(C) 3.0" AGGREGATE SHOULDERING (CV) CL. 5 - SPEC. 2221

(F)
2.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440C)
2.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440C)
2.0" TYPE SP 12.5 NON WEARING COURSE MIXTURE (SPNWB330B)
PLACE TACK COAT BETWEEN BIT. COURSES - SPEC. 2357 - INCIDENTAL
6.0" AGGREGATE BASE (CV) CL. 6 - SPEC. 2211

(G)
3.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB330C)
VAR. DEPTH (9.0" MAX.) AGGREGATE BASE (CV) CL. 6 - SPEC. 2211

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 10-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

TYPICAL SECTION

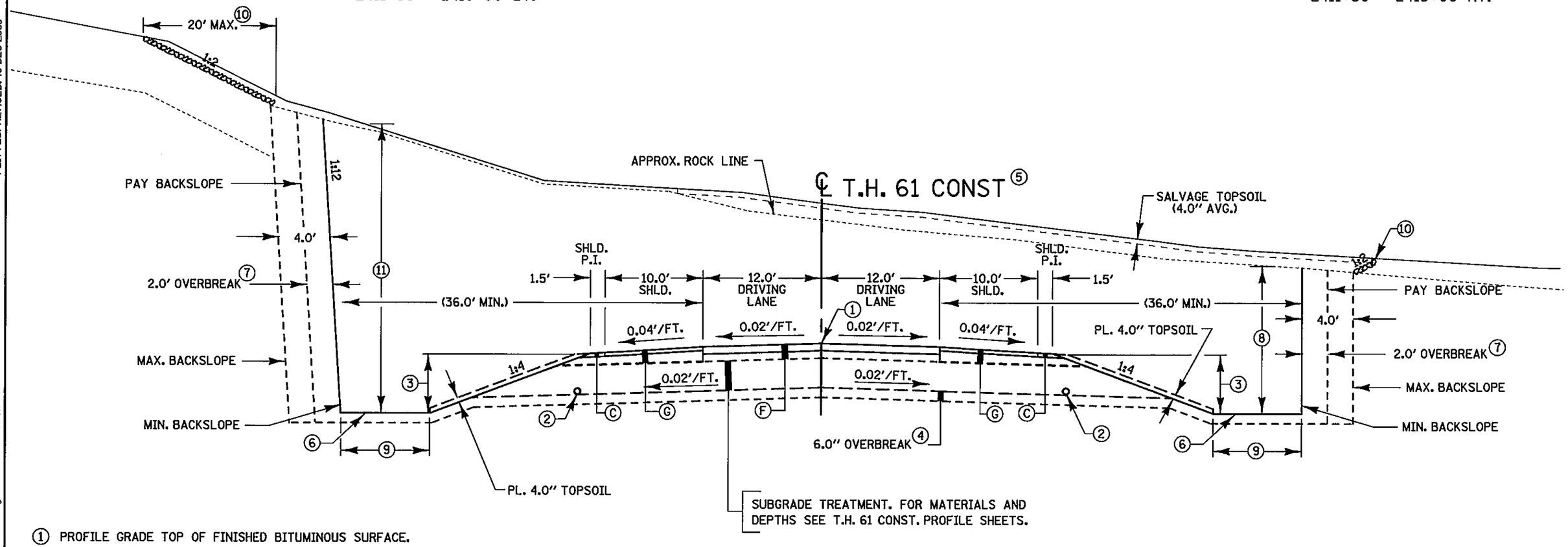
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 31 OF 200 SHEETS

PLOTTED/REVISED: 10-DEC-2009
DISTRICT *: DULUTH
IPLOT NAME: TSH
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/D380660_TSI.DGN

TYPICAL SECTION - MAINLINE SUBCUT IN ROCK

APPLIES : T.H. 61 CONST. STA. 2375+00 - 2394+00 LT.⑬
2411+50 - 2413+00 LT.

APPLIES : T.H. 61 CONST. STA. 2375+00 - 2394+00 RT.⑫
2411+50 - 2413+00 RT.



SUBGRADE TREATMENT. FOR MATERIALS AND DEPTHS SEE T.H. 61 CONST. PROFILE SHEETS.

① PROFILE GRADE TOP OF FINISHED BITUMINOUS SURFACE.

② FOR SUBSURFACE DRAIN CONSTRUCTION DETAILS, SEE CONST. DETAILS & CROSS SECTIONS.

③ 3.5' DITCH DEPTH ON LEFT & RIGHT. FOR SPECIAL DITCH GRADES SEE SPECIAL DITCH GRADE CHART.

④ 6.0" OVERBREAK. ROCK EXCAVATION COMPUTED TO BOTTOM OF 6.0" OVERBREAK.

⑤ FOR ALIGNMENT DATA, SEE ALIGNMENT TABULATION CHARTS.

⑥ NO TOPSOIL IN ROCK DITCH BOTTOMS. FILL DITCH WITH ROCK SPALLS TO GAIN PROPER DITCH GRADE. (INCIDENTAL)

⑦ NO HORIZONTAL OVERBREAK ALLOWED FOR ROCK CUTS GREATER THAN 15'.

⑧ IF ROCK CUT IS LESS THAN 15' USE "RUSTIC FACE BLASTING METHOD" (2' HORIZONTAL OVERBREAK).
IF ROCK CUT GREATER THAN 15' USE "SMOOTH FACE BLASTING METHOD" (NO HORIZONTAL OVERBREAK).

⑨ VAR. WIDTH DITCH (9.0' MIN.) TO MAINTAIN PROPER CLEAR ZONE WIDTH.

⑩ PL. ROCK RUBBLE SLOPE DRESSING ON 1:2 SLOPES ON TOP OF VERTICAL ROCK CUTS, NO MORE THAN 20' IN WIDTH AND WITH A MAX. PARTICLE SIZE OF 12.0". (INCIDENTAL)

⑪ IF ROCK CUT IS GREATER THAN 30.0' USE A 12:1 BATTER ON THE ROCK FACE.

⑫ RT. TURNLANE FROM STA. 2375+00 - 2379+01 RT. SEE TURNLANE/BYPASS TYPICAL SECTION FOR DETAILS.

⑬ BYPASS LANE FROM STA. 2386+57 - 2392+67 LT. SEE TURNLANE/BYPASS TYPICAL SECTION FOR DETAILS.

Ⓒ 3.0" AGGREGATE SHOULDERING (CV) CL. 5 - SPEC. 2221

Ⓕ
2.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440C)
2.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB440C)
2.0" TYPE SP 12.5 NON WEARING COURSE MIXTURE (SPNWB330B)
PLACE TACK COAT BETWEEN BIT. COURSES - SPEC. 2357 - INCIDENTAL
6.0" AGGREGATE BASE (CV) CL. 6 - SPEC. 2211

Ⓖ
3.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB330C)
VAR. DEPTH (9.0" MAX.) AGGREGATE BASE (CV) CL. 6 - SPEC. 2211

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 10-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

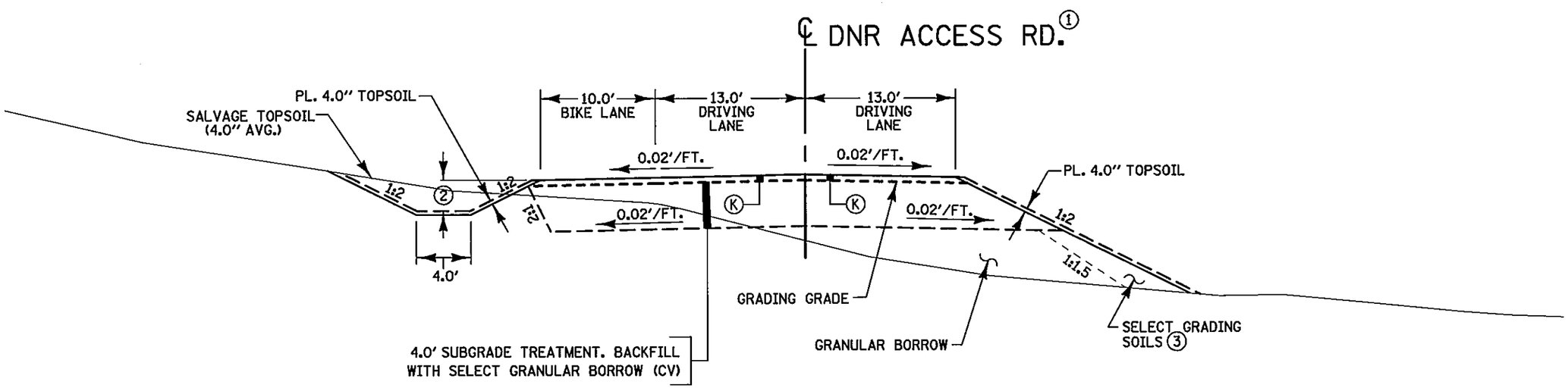
TYPICAL SECTION

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 32 OF 200 SHEETS

PLOTTED/REVISED: 10-DEC-2009
DISTRICT *: DULUTH
IPLOT NAME: TSH
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/D380660_TSLDGN

TYPICAL SECTION - DNR ACCESS RD.

APPLIES : DNR ACCESS RD. STA. 55+07 - 57+80



Ⓚ 6.0" AGGREGATE BASE (CV) CL. 5 - SPEC. 2211

① FOR ALIGNMENT DATA, SEE ALIGNMENT TABULATION CHARTS.
② 3.0' DITCH DEPTH.
③ ANY SOILS (INCLUDING TACONITE TAILINGS) WITH THE EXCEPTION OF TOPSOIL, PEAT, SILT LOAM, WOOD OR OTHER ORGANIC MATERIALS.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

TYPICAL SECTIONS

STATE PROJ. NO. 3806-60 (T.H. 61) SHEET NO. 35 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT #: DULUTH
IPLOT NAME: TSI-N
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/D380660_TSI.DGN

SPLIT ROCK RIVER REST AREA

CURVE SPLTRK-1
PI 102+04.31
X 621,322.055
Y 244,354.759
Δ 105° 43' 47.69" (RT)
D 114° 35' 29.61"
T 66.03'
L 92.27'
R 50.00'
PC 101+38.28
PT 102+30.54

2288+35.83 (168.56' LT)
X 621265.81
Y 244267.74
OUTL. EL. 615.23

PL. 101' x 12" CP PIPE CULVERT
+CONC. SURGE BASIN ②

2289+96.40 (113.44' LT)
X 621388.22
Y 244395.25
OUTL. EL. 603.84

PL. 102' x 12" CP PIPE CULVERT
+1-12" X 22.5° CP PIPE ELBOW
+CONC. SURGE BASIN ②

2286+56.34 (86.34' LT)
X 621267.88
Y 244068.79
EL. 637.96 (GUTTER)

2286+56.34 (60.00' LT)
X 621292.00
Y 244058.21
EL. 638.51 (GUTTER)

2286+21.34 (60 LT)
X 621277.95
Y 244026.16
35' RAD. (TO GUTTER)

2286+21.33 (25' LT)
X 621310.00
Y 244012.09
EL. 646.40 (GUTTER)

2287+05.36 (35.00' LT)
X 621334.58
Y 244093.07
EL. 638.79 (GUTTER)

2287+05.36 (30.00' LT)
X 621339.16
Y 244091.06
5' RAD. (TO GUTTER)

2287+05.36 (25.00' LT)
X 621343.74
Y 244089.05
EL. 639.00 (GUTTER)

2287+75.68 (85.38' LT)
X 621316.80
Y 244177.88
T.C. 637.02 (C.B. 1)

2289+00.93 (87.03' LT)
X 621367.98
Y 244294.60
T.C. 636.62 (C.B. 2)

2289+02.69 (58.80' LT)
X 621394.27
Y 244284.16
EL. 637.63 (GUTTER)

2288+54.82 (34.90' LT)
X 621395.53
Y 244230.12
EL. 638.14 (GUTTER)

2288+54.91 (29.91' LT)
X 621400.10
Y 244228.13
5' RAD. (TO GUTTER)

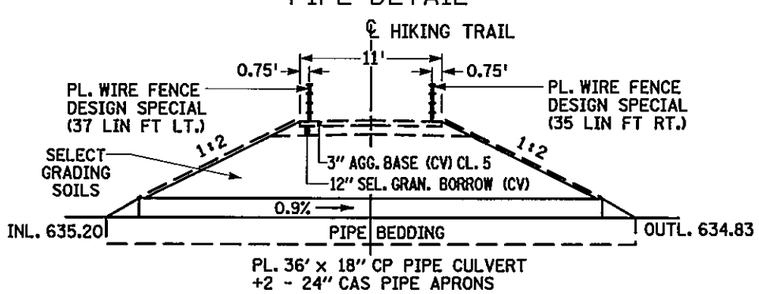
2288+55.00 (25' LT)
X 621404.67
Y 244226.14
EL. 638.35 (GUTTER)

2289+36.96 (60 LT)
X 621408.29
Y 244316.23
35' RAD. (TO GUTTER)

2289+36.69 (25' LT)
X 621439.64
Y 244300.66
EL. 638.88 (GUTTER)

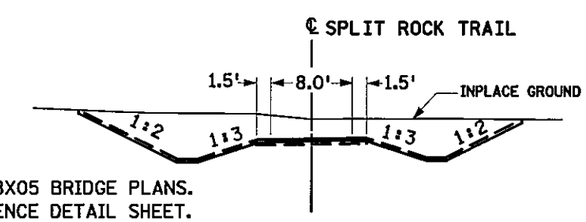
4-P
HIKING TRAIL
BEG. SPLIT ROCK TRAIL STA. 100+00.00 EL. 638.21
20' R
10'
SDG -15.9%
PL. CL. 3 RIPRAP IN DITCH BOTTOM
EL. 626.15
SPLIT ROCK TRAIL STA.100+35 (4.7' RT.) BEG. WIRE FENCE DESIGN SPECIAL
20' R
EL. 634.60
PC. 101+38.28
SDG -0.9%
5' SIDEWALK
EL. 637.13
PT. 102+30.54
SPLIT ROCK TRAIL STA. 102+55 (4.7' RT.) END WIRE FENCE DESIGN SPECIAL
T-BUR
-0.7% SLOPE
B624 C&G
END D424 C&G
END D424 C&G
SDG -0.9%
EL. 618.25
EL. 623.41
-2.0%
SDG 0.5%
EL. 619.66
2' DITCH BOT.
CONST. PEDESTRIAN UNDERPASS BR. 38X05
12' x 150' TRUCK & TRAILER STOPPING LANE
D424 C&G
BEG. D424 C&G
4" CONC. WALK
℄ T.H. 61 CONST.
2286+00
2288+00
PI
2290+00
BEG. D424 C&G
SDG 3.7%

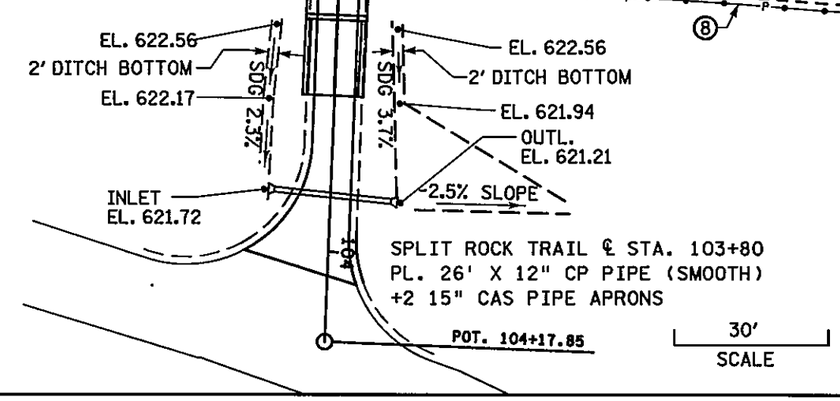
PIPE DETAIL



DITCH DETAIL

SPLIT ROCK TRAIL STA. 103+53 to 104+04.77





① CONNECT SUBSURFACE DRAINS TO BOTH CATCH BASINS (INCIDENTAL).
② SEE CONCRETE SURGE BASIN DETAIL.
③ SEE STAIR DETAIL SHEETS.
④ SEE KIOSK AND ROCK CAIRN DETAIL.
⑤ SEE 38X05 BRIDGE PLANS.
⑥ SEE FENCE DETAIL SHEET.
⑦ SEE PIPE DETAIL THIS SHEET.
⑧ TRAFFIC BARRIER DESIGN B8338, SEE TRAFFIC BARRIER CHART FOR LOCATIONS AND LENGTHS.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

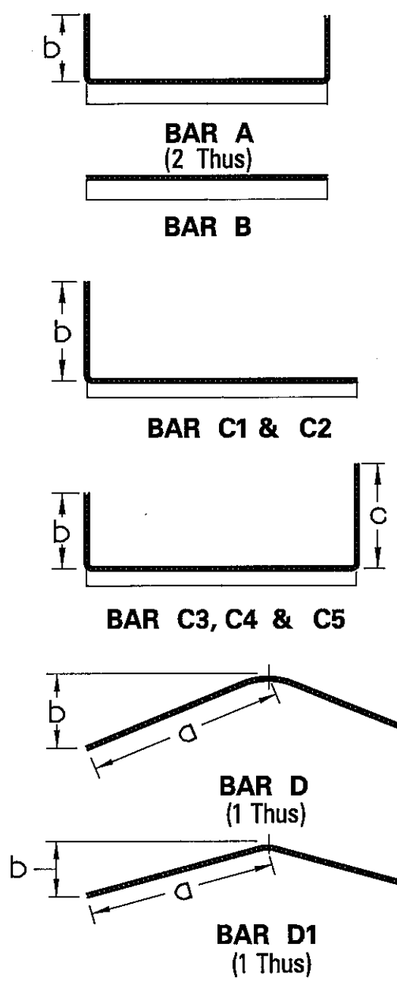
DATE 10-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

CONSTRUCTION DETAIL - SPLIT ROCK RIVER REST AREA

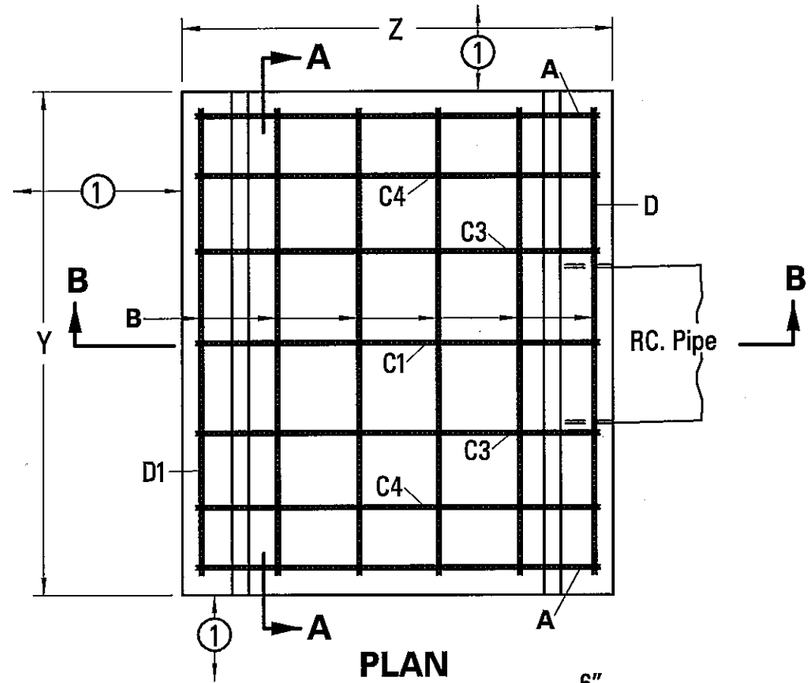
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 41 OF 200 SHEETS

DISTRICT : DULUTH
PLOT NAME: REST AREA DETAIL
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/plan sheets/Split Rock Rest Area (PLAN SHEETS)/SplitRock_cp0.dgnPLOTTED/REVISED: 10-DEC-2009

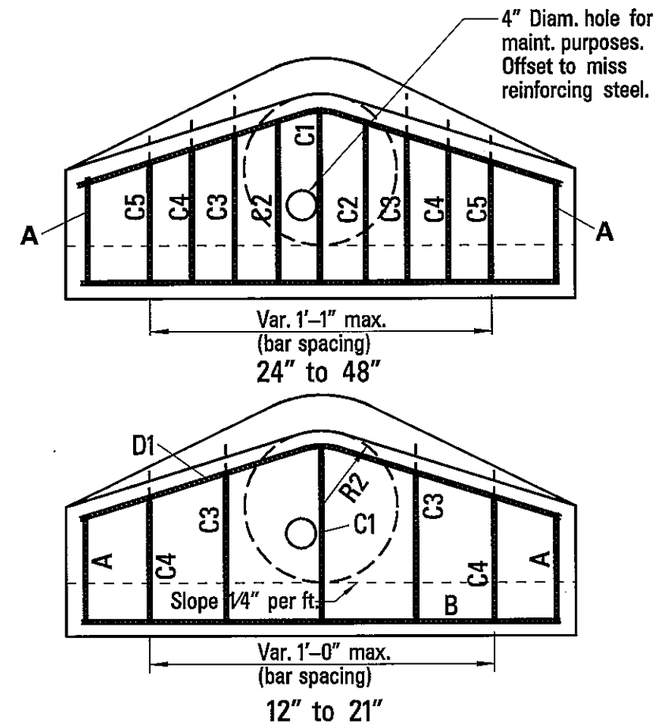
CONCRETE SURGE BASIN ②



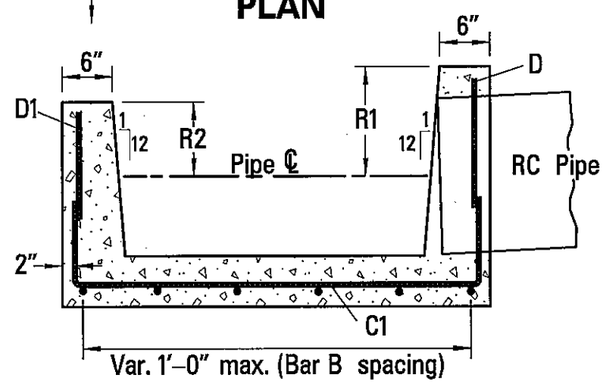
REINFORCING BAR DETAILS
All reinforcing bars are No. 13 bars.



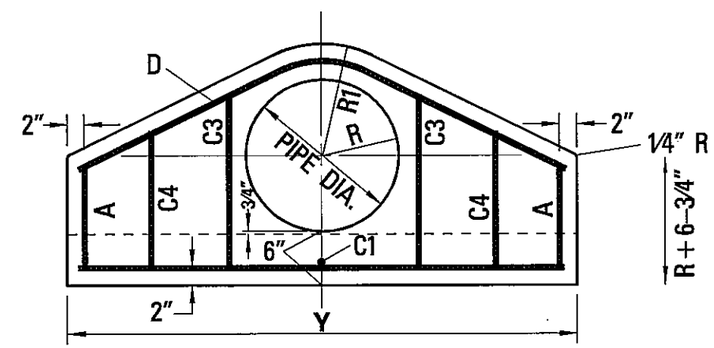
PLAN



END VIEW



SECTION B–B



SECTION A–A

PIPE DIA.	R	R1	R2	Y	Z	REINFORCING BAR DIMENSIONS																												CONCRETE	STEEL
						A		B		C1			C2			C3				C4				C5				D		D1			
						a	b	No. Req.	a	a	b	No. Req.	a	b	No. Req.	a	b	c	No. Req.	a	b	c	No. Req.	a	b	c	No. Req.	a	b	a	b	CU. YDS.	LBS.
12"	6"	0'-10"	6"	4'-0"	3'-0"	2'-8"	0'-10"	4	3'-8"	2'-8"	1'-3"	1	-	-	-	2'-8"	1'-2"	1'-5"	2	2'-8"	1'-0"	1'-2"	2	-	-	-	-	2'-0"	0'-10"	1'-11"	0'-5 1/2"	0.36	38
15"	7 1/2"	0'-11 3/4"	7 1/2"	4'-4"	3'-6"	3'-2"	0'-11 1/2"	6	4'-0"	3'-2"	1'-6"	1	-	-	-	3'-2"	1'-4"	1'-8"	2	3'-2"	1'-2"	1'-4"	2	-	-	-	-	2'-3"	0'-11 1/2"	2'-1 1/2"	0'-7"	0.46	48
18"	9"	1'-1 3/8"	9"	5'-0"	4'-3"	3'-11"	1'-1"	6	4'-8"	3'-11"	1'-9"	1	-	-	-	3'-11"	1'-7"	1'-10"	2	3'-11"	1'-4"	1'-6"	2	-	-	-	-	2'-7 1/2"	1'-1"	2'-6"	0'-8"	0.66	57
21"	10 1/2"	1'-3 1/8"	10 1/2"	5'-7 1/2"	4'-8"	4'-4"	1'-2 1/2"	6	5'-4"	4'-4"	2'-0"	1	-	-	-	4'-4"	1'-9"	2'-1"	2	4'-4"	1'-5"	1'-7"	2	-	-	-	-	2'-11 1/2"	1'-3"	2'-9 1/2"	0'-10"	0.83	64
24"	12"	1"-4 7/8"	12"	6'-3"	5'-0"	4'-8"	1'-4"	6	5'-11"	-	-	-	4'-8"	2'-3"	2	4'-8"	1'-11"	2'-3"	2	4'-8"	1'-7"	1'-9"	2	-	-	-	-	3'-4"	1'-4 1/2"	3'-3"	1'-0"	1.02	88
30"	15"	1'-8 3/8"	15"	7'-7"	6'-0"	5'-8"	1'-7"	8	7'-3"	5'-8"	2'-9"	1	5'-8"	2'-7"	2	5'-8"	2'-4 1/2"	2'-8 1/2"	2	5'-8"	2'-1"	2'-4"	2	5'-8"	1'-11"	2'-0"	2	4'-0"	1'-7 1/2"	3'-10"	1'-2 1/2"	1.50	119
33"	16 1/2"	1'-10 1/8"	16 1/2"	8'-2 1/2"	6'-6"	6'-2"	1'-8 1/2"	8	7'-10"	6'-2"	3'-0"	1	6'-2"	2'-10"	2	6'-2"	2'-7"	2'-11"	2	6'-2"	2'-4"	2'-7"	2	6'-2"	2'-0 1/2"	2'-2 1/2"	2	4'-3 1/2"	1'-10"	4'-2"	1'-4"	1.80	129
36"	18"	1'-11 3/4"	18"	8"-10 1/2"	7'-0"	6'-8"	1'-10"	8	8'-6"	6'-8"	3'-3"	1	6'-8"	3'-1"	2	6'-8"	2'-9 1/2"	3'-2 1/2"	2	6'-8"	2'-6"	2'-9"	2	6'-8"	2'-2"	2'-4"	2	4'-8 1/2"	1'-11 1/2"	4'-6 1/2"	1'-5 1/2"	2.09	139
42"	21"	2'-3 1/4"	21"	10'-2"	8'-0"	7'-8"	2'-1"	10	9'-10"	7'-8"	3'-9"	1	7'-8"	3'-7"	2	7'-8"	3'-2"	3'-7"	2	7'-8"	2'-10"	3'-1"	2	7'-8"	2'-5"	2'-7"	2	5'-5"	2'-3"	5'-3"	1'-8 1/2"	2.85	168
48"	24"	2"-6 3/4"	24"	11'-6"	9'-0"	8'-8"	2'-4"	10	11'-2"	8'-8"	4'-3"	1	8'-8"	4'-1"	2	8'-8"	3'-8"	4'-1"	2	8'-8"	3'-3"	3'-7"	2	8'-8"	2'-10"	3'-0"	2	6'-3"	2'-6 1/2"	6'-0"	1'-11 1/2	3.71	201

① 18" Class III Rip-rap on Type IV Geotextile filter.
Placed 10' outside of basin on all sides except on culvert side.

② Surge basin is available as a precast unit.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

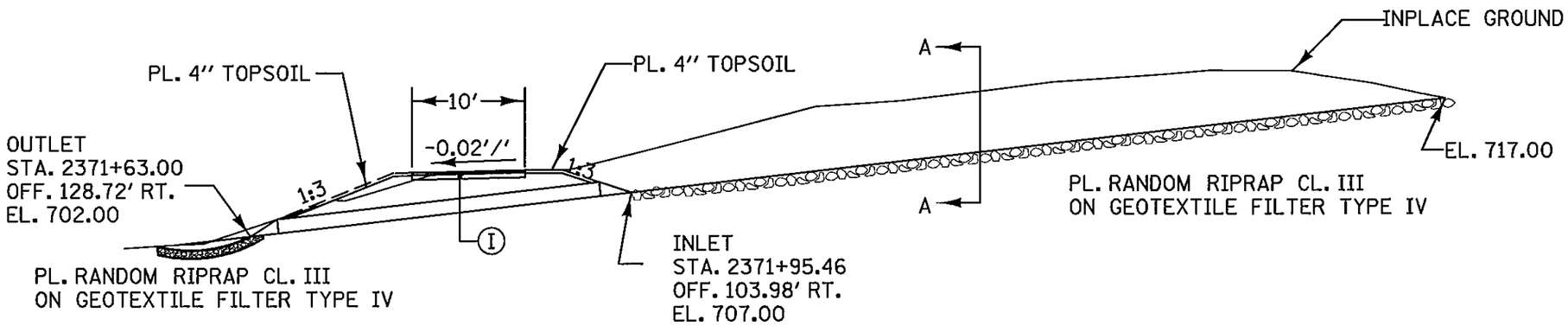
CONSTRUCTION DETAILS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 46 OF 200 SHEETS

DISTRICT : DULUTH
IPLOT NAME: Conc Surge Basin
PATH & FILENAME: Projects/DI_DUL/06i/3806/060/Design/plan sheets/Split Rock Rest Area (PLAN SHEETS)/Conc Surge Basin.dgn
PLOTTED/REVISED: 04-JAN-2010

BIKE TRAIL DRAINAGE DETAIL

APPLIES: T.H. 61 CONST. STA. 2371+57 - 2372+64 RT.



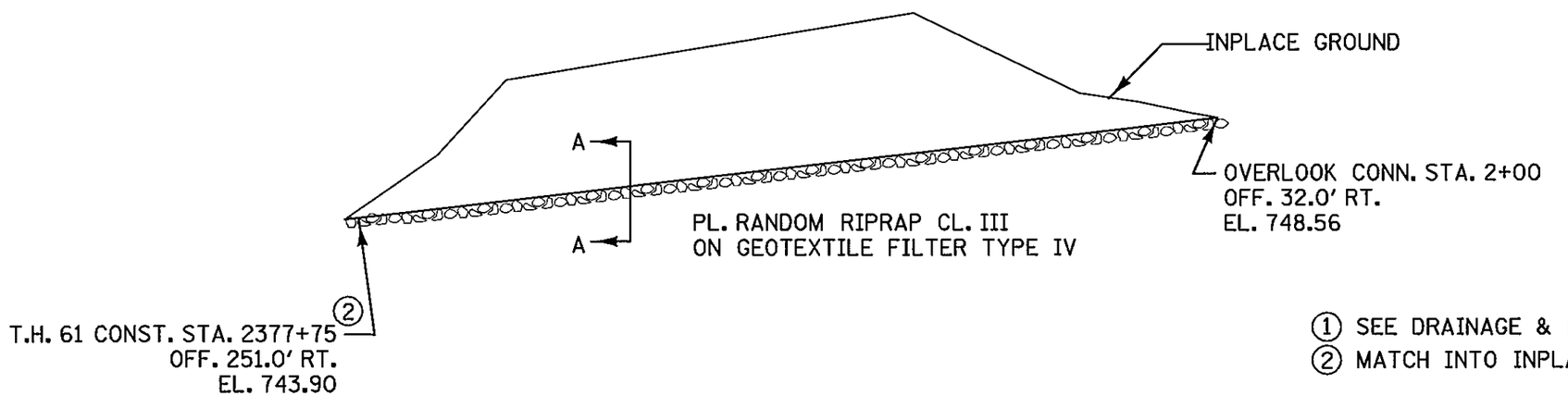
PL. 18" X 40' CP PIPE CULVERT + 2 - 24" CAS APRONS.

SECTION A-A

(I) 3.0" TYPE SP 12.5 WEARING COURSE MIXTURE (SPWEB330C)
4.0" AGGREGATE BASE (CV) CL. 6 - SPEC. 2211

OVERLOOK CONNECTION DRAINAGE DETAIL

APPLIES: OVERLOOK CONN. STA. 2+00 RT. - T.H. 61 CONST. STA. 2377+75 RT.(1)



SECTION A-A

(1) SEE DRAINAGE & EROSION CONTROL SHEETS FOR PLAN VIEW.
(2) MATCH INTO INPLACE DITCH, AS DIRECTED BY THE ENGINEER..

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

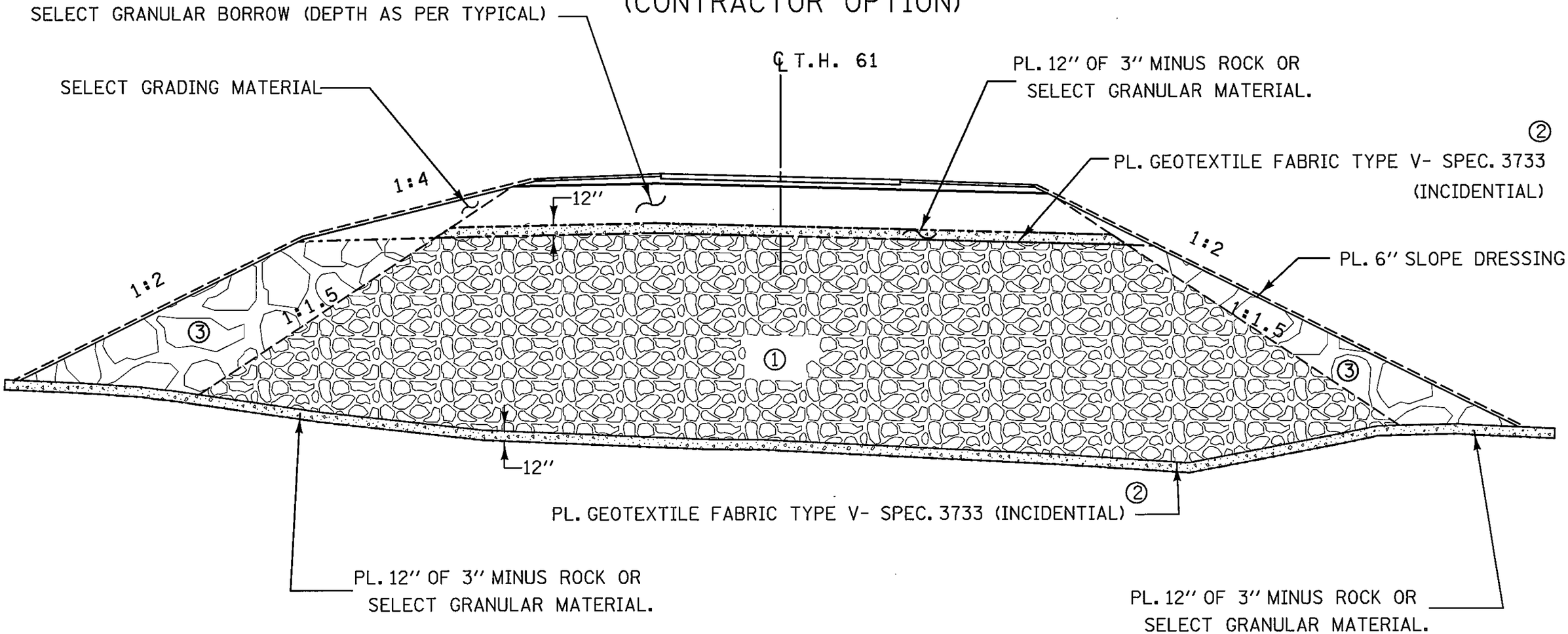
DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

CONSTRUCTION DETAIL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 48 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT #: DULUTH
IPLOT NAME: biketrail culvert DETAIL
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/biketrail culvert.dgn

ROCK FILL AREAS
(CONTRACTOR OPTION)



① 2' MAXIMUM ROCK SIZE PLACED IN 2' MAXIMUM LIFTS AS DIRECTED BY THE ENGINNER.
NO ROCK EXCEEDING 24" IN GREATEST DIMENSION. PAID FOR AS GRANULAR BORROW SPEC. 2105

② GEOTEXTILE FABRIC NEEDS TO CONFORM TO THE VOIDS IN THE ROCKS AS DIRECTED BY THE ENGINEER.

③ WELL CONSOLIDATED ROCK FILL OF ANY SIZE ROCK EXCAVATION MATERIAL.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

CONSTRUCTION DETAIL

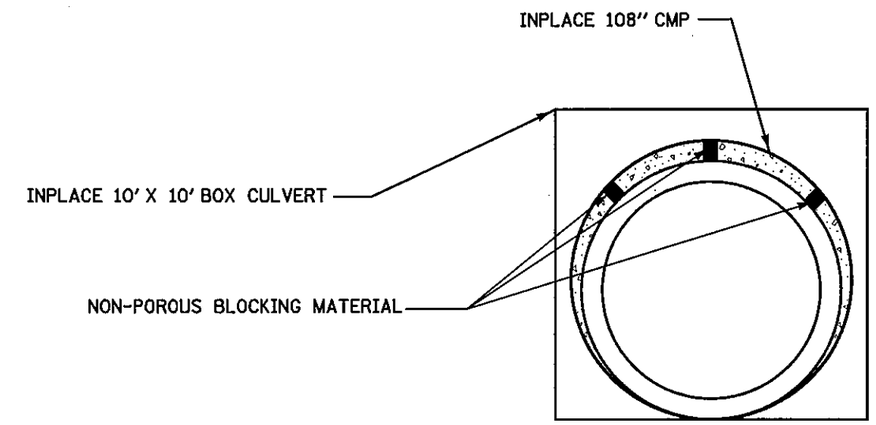
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 49 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT : DULUTH
IPLOT NAME: rockfill_detail
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/rockfill_detail.dgn

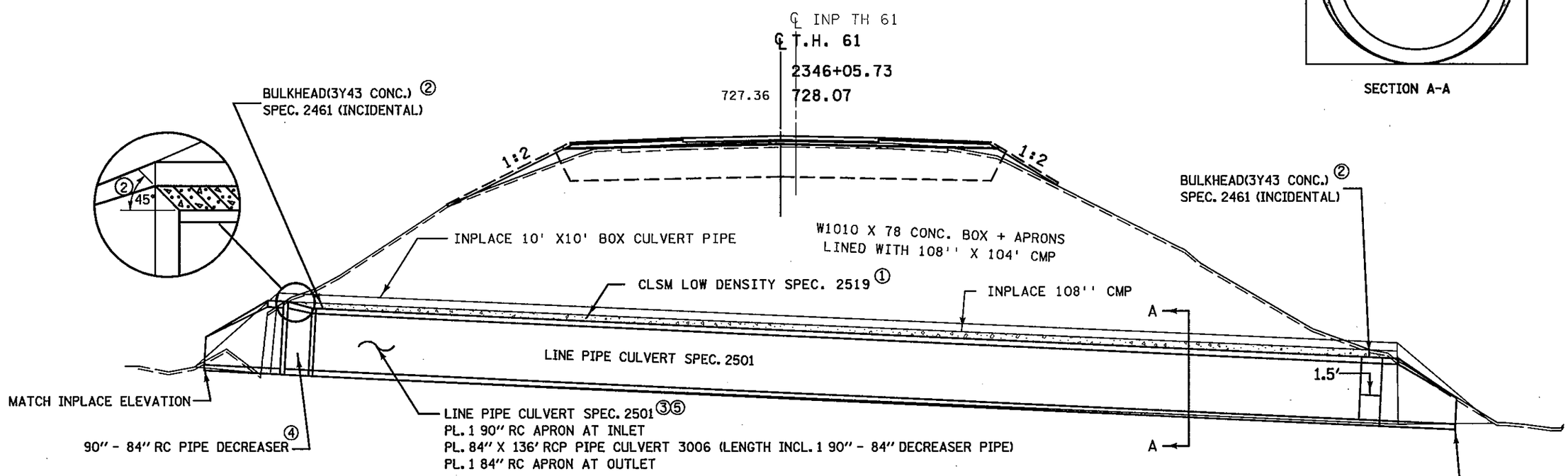
LINING CULVERT PIPE - SPEC. 2501

TYPE R.C.

APPLIES : T.H. 61 STA. 2346+05.73



SECTION A-A



① CLSM LOW DENSITY GROUT FOR THIS INSTALLATION IS ESTIMATED AT APPROXIMATELY 47 CU. YDS.

② THE INLET SHALL BE BEVELED 45° AS SHOWN AND THE OUTLET SHALL BE CONSTRUCTED FLUSH.

③ PIPE LINERS SHALL BE SECURED TO THE INVERT OF THE EXISTING CULVERT BY MEANS AS APPROVED BY THE ENGINEER TO PREVENT THE LINER FROM FLOATING DURING THE GROUTING OPERATIONS.

④ SEE CONCRETE REDUCER/INCREASER SHEET FOR DETAILS.

⑤ TIE ALL PIPE JOINTS INSIDE PIPE CULVERT (INCIDENTAL).

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

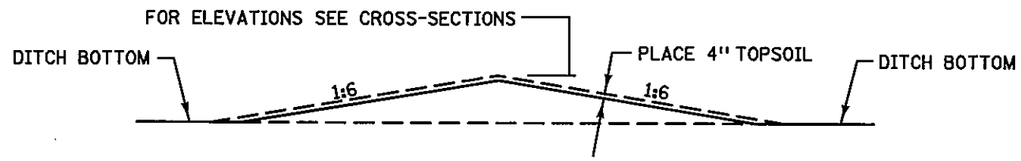
DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

CONSTRUCTION DETAILS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 54 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010
DISTRICT #: DULUTH
USER NAME: $$@USER$NAME@$$
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_DDI.dgn
FILE NAME: @FILENAME@

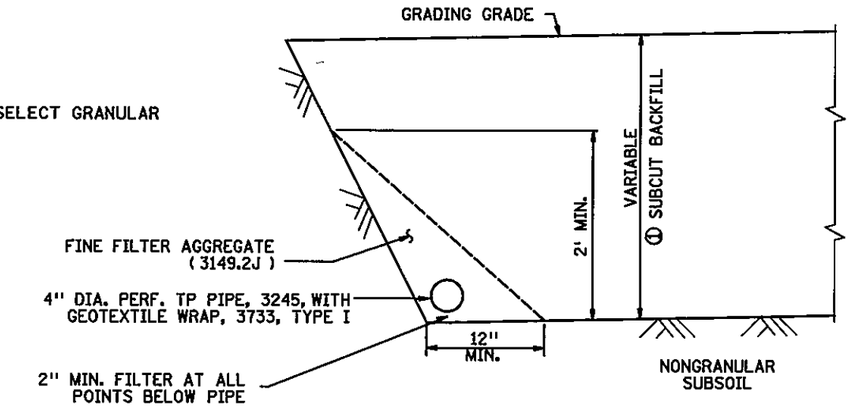
DITCH BLOCK DETAIL ①



① FOR DITCH BLOCK LOCATIONS SEE CONSTRUCTION CHART.

PERFORATED PIPE DETAIL

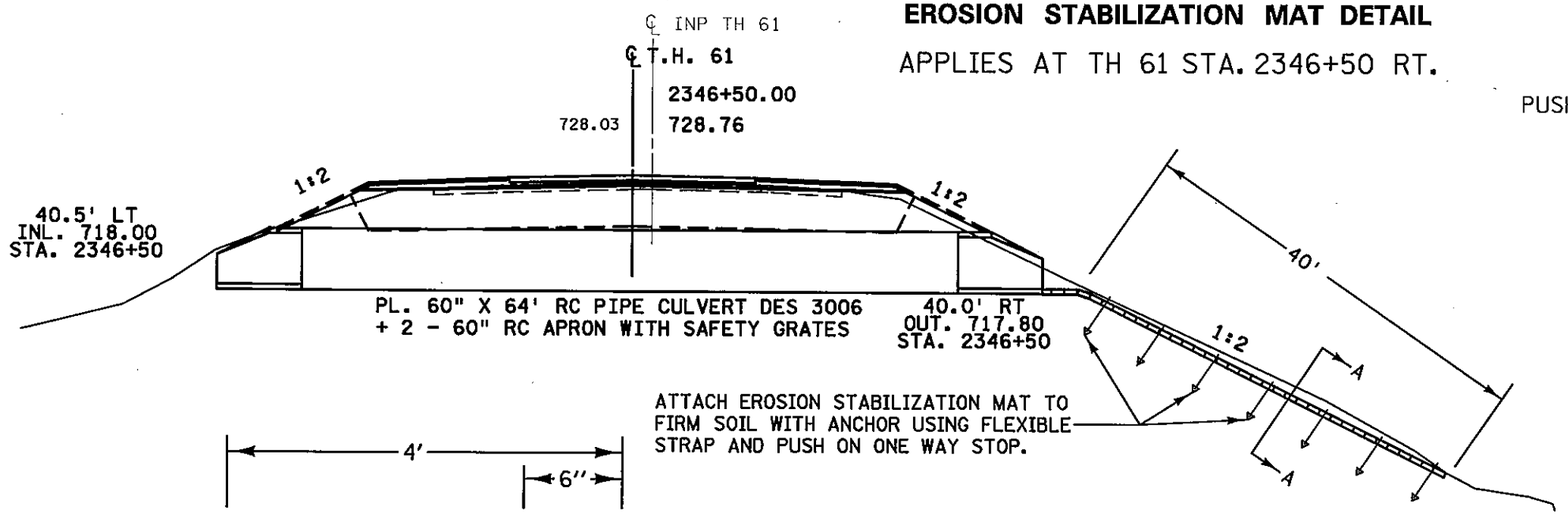
① GRANULAR, SELECT GRANULAR OR SELECT GRANULAR MODIFIED.

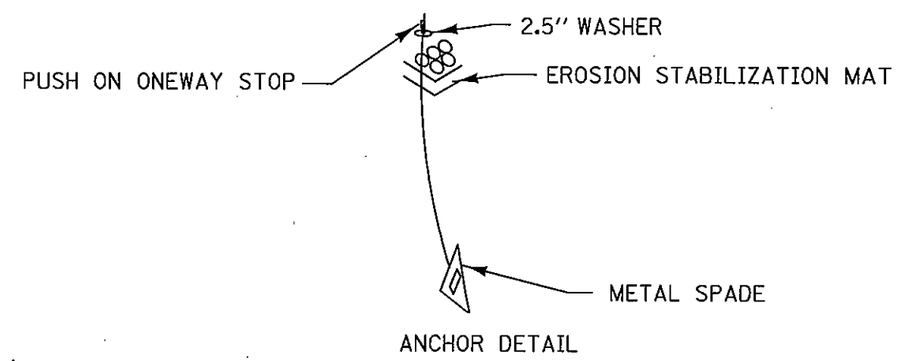


TYPICAL SECTION

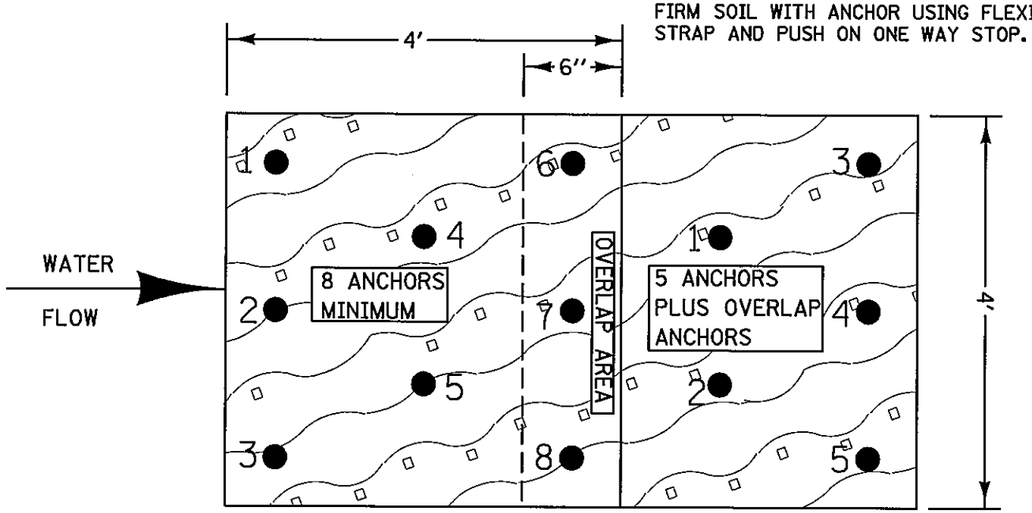
EROSION STABILIZATION MAT DETAIL

APPLIES AT TH 61 STA. 2346+50 RT.



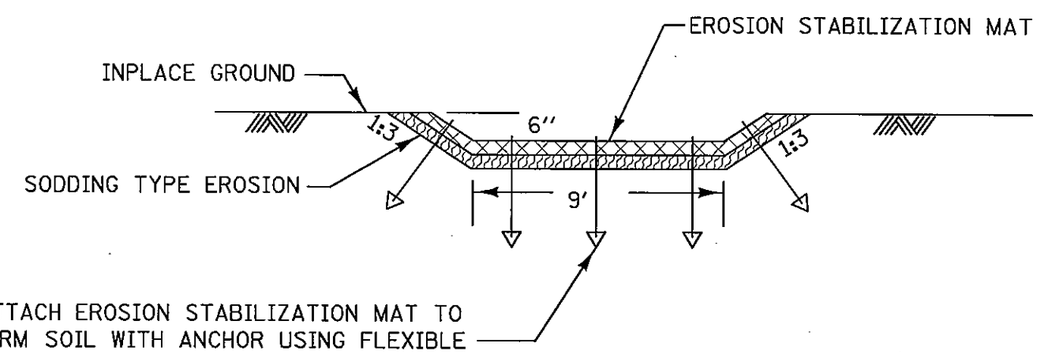


ANCHOR DETAIL



ANCHOR DETAIL FOR EROSION STABILIZATION MAT AND SOD

SECTION A-A



ADD EXTRA ANCHORS IF NECESSARY TO ENSURE CONSISTENT CONTACT WITH SOIL, OR IMPROVE SOIL SURFACE SMOOTHNESS.

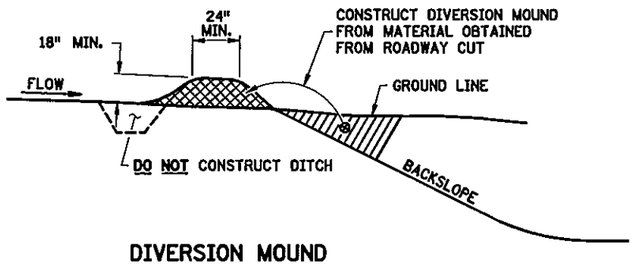
I HEREBY CERTIFY THAT THIS PLAN SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

CONSTRUCTION DETAILS

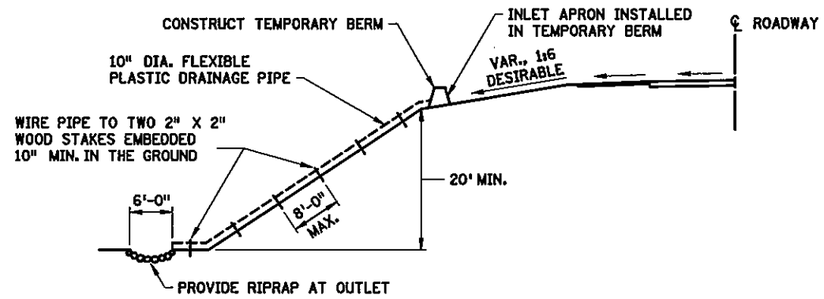
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 61 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010
DISTRICT *: DULUTH
IPLOT NAME: ditch-block_PERFPIPE
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d3806-60_DD2.dgn



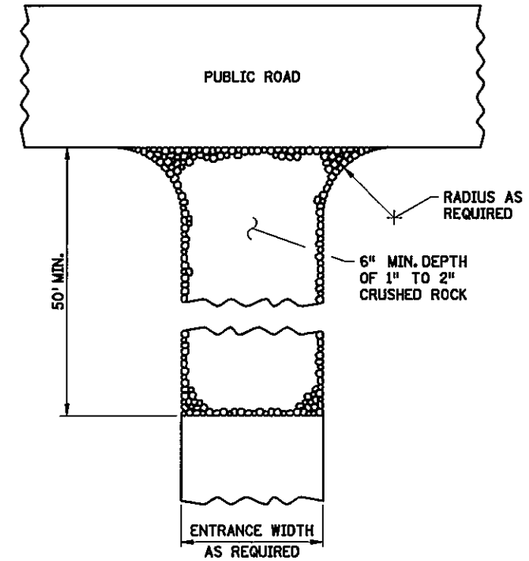
DIVERSION MOUND

DESIGN GUIDELINES:
STORM FREQUENCY: 10 YEAR - 24 HOUR
MAXIMUM DRAINAGE AREA: 5 ACRES
MAXIMUM DIVERSION: GRADE 5%

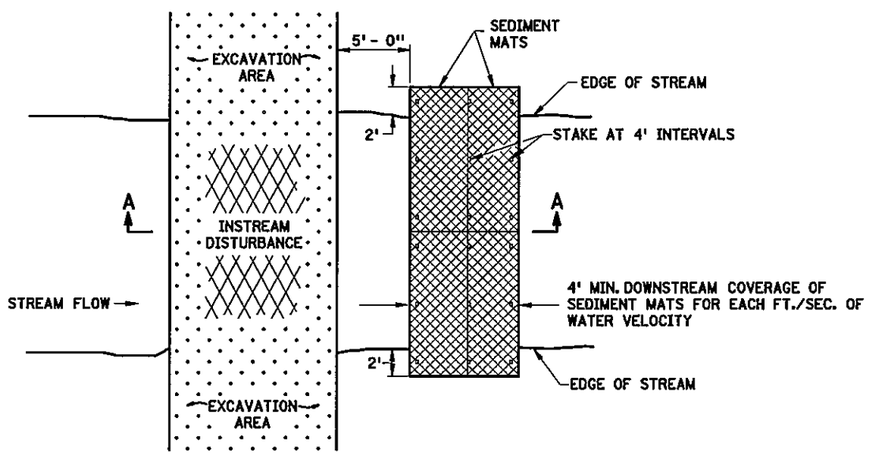


TEMPORARY DOWN DRAIN ON FILL SLOPE

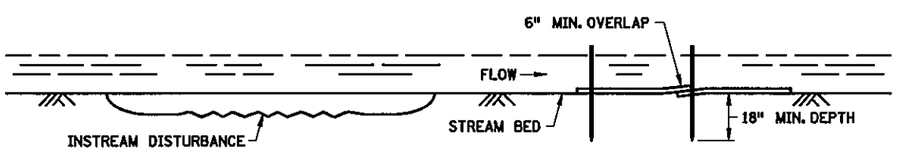
DESIGN GUIDELINES:
STORM FREQUENCY: 2 YEAR - 24 HOUR
MAXIMUM DRAINAGE AREA: 3 ACRES



ROCK CONSTRUCTION ENTRANCE ①



PLAN VIEW

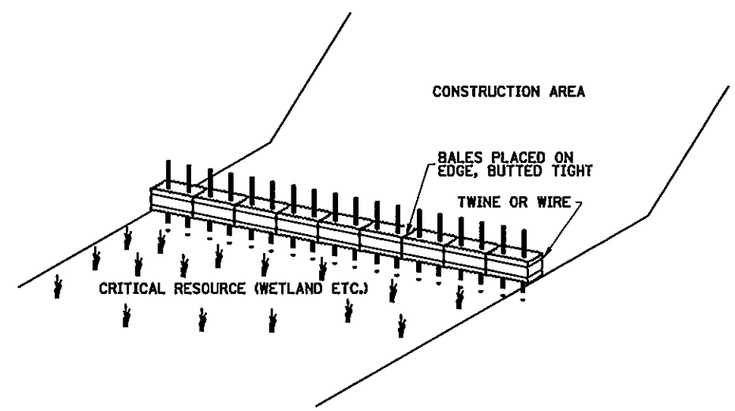


SECTION A-A

SEDIMENT MAT ⑥

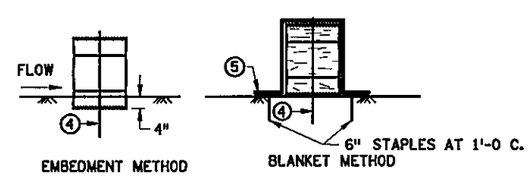
TYPICAL STREAM BED INSTALLATION

DESIGN GUIDELINES:
MAXIMUM FLOW VELOCITY: 5 FT./SEC.
MAXIMUM FLOW DEPTH: 2 FT.



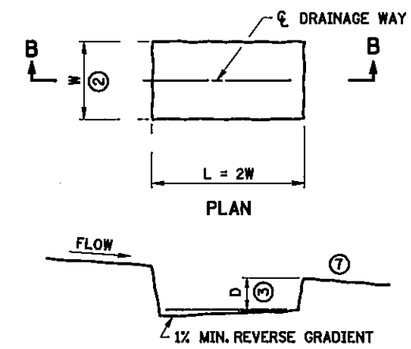
BALE BARRIERS

TO BE USED FOR CRITICAL PERIMETER CONTROL AREAS



BALE BARRIER DETAIL

APPROX. BALE SIZE: 14" X 18" X 36" LONG



SECTION B-B

SEDIMENT TRAP DETAIL

NOTES:
SEE SPECS. 2573, 3892, & 3894.

① ROCKS AT ENTRANCE CLEAN WORKSITE MUD OFF OF TRUCK TIRES BEFORE TRUCKS ENTER MAIN ROAD. KEEPING MUD OFF THE ROAD WILL PREVENT AUTO DAMAGE AND KEEP CONSTRUCTION SEDIMENT OUT OF DRAINAGE SYSTEMS AND WETLANDS. GEOTEXTILE MAY BE PLACED UNDER THE ROCK TO KEEP ROCKS SEPARATE FROM SOIL.

② W = 10 FT. MIN., 20 FT. MAX.

③ D = 2 FT.

④ TWO 2 IN. X 2 IN. WOOD STAKES OR REINFORCING BARS IN EACH BALE EMBEDDED 10 INCHES MINIMUM IN THE GROUND.

⑤ PLACE A CATEGORY 3 EROSION CONTROL BLANKET, 6 FT. WIDE MINIMUM, OVER THE BALE INSTEAD OF TRENCHING.

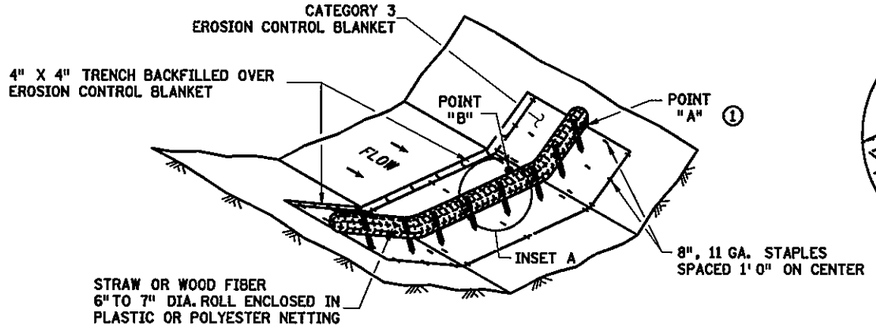
⑥ THIS DETAIL MAY NOT BE ACCEPTABLE FOR WORK ON PUBLIC WATERS, SEE GENERAL PUBLIC WATERS PERMIT (GP) 2004-0001.

⑦ LOCATION OF DOWNSTREAM TEMPORARY SEDIMENT CONTROL DEVICE.

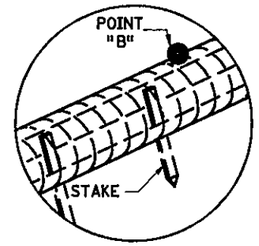
STANDARD SHEET NO.	TITLE:
5-297.405 (2 of 4)	TEMPORARY SEDIMENT CONTROL
STANDARD APPROVED: SEPTEMBER 27, 2006	MISCELLANEOUS DETAILS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 80 OF 200 SHEETS

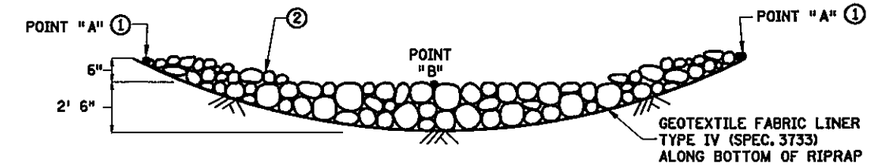
PLOTTED/REVISED: 09-DEC-2009
DISTRICT #: DULUTH
USER NAME: $$@USER$NAME@$$
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/plan sheets/Standard plan sheets/s405_2_spn.dgn
FILE NAME: @FILENAME@



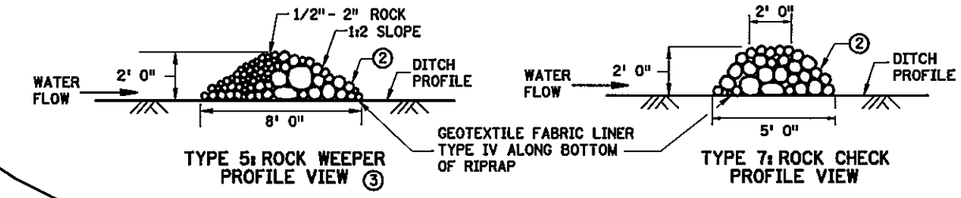
TYPE 3: BIOROLL BLANKET SYSTEM DITCH CHECK



INSET A



CROSS SECTION (ROCK WEEPER AND ROCK CHECK)

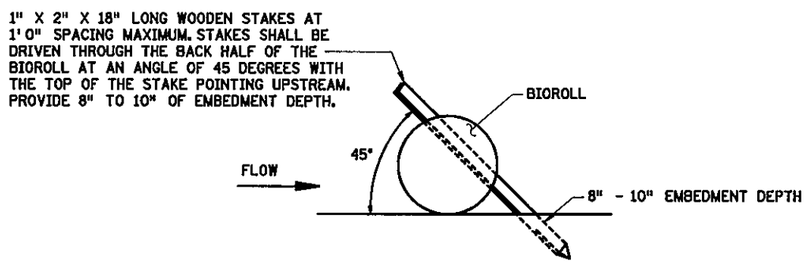


TYPE 5: ROCK WEEPER
PROFILE VIEW ③

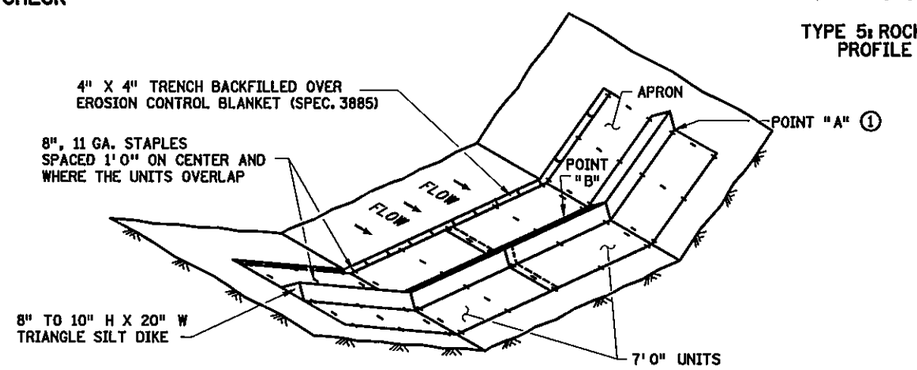
TYPE 7: ROCK CHECK
PROFILE VIEW

TYPE 5: ROCK WEEPER AND
TYPE 7: ROCK CHECK DITCH CHECKS ④

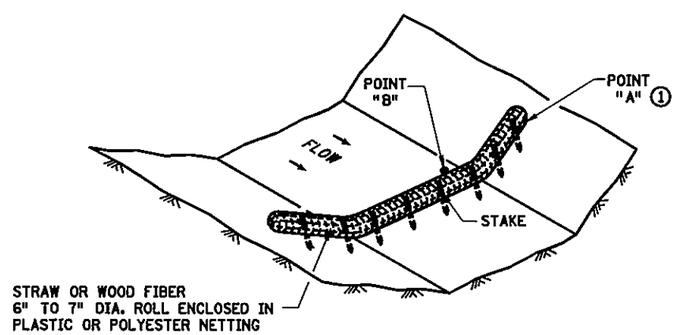
USE ON ROUGH GRADED AREAS



BIOROLL STAKING DETAIL

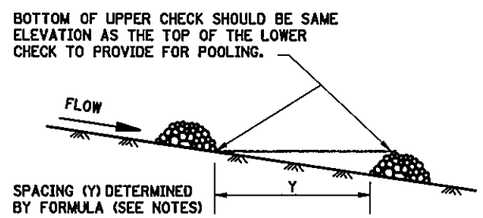


TYPE 6: GEOTEXTILE TRIANGULAR DIKE DITCH CHECK

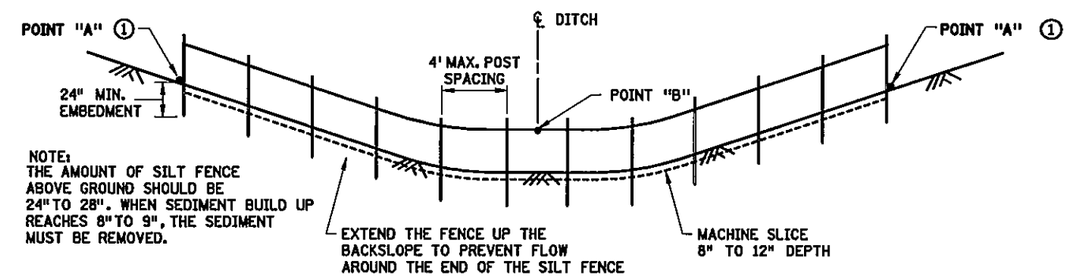


TYPE 2: BIOROLL DITCH CHECK

USE ON ROUGH GRADED AREAS



DITCH CHECK SPACING ④



TYPE 1: SLICED IN SILT FENCE DITCH CHECK

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

NOTES:

SEE SPECS. 2573, 3601, 3733, 3885, 3886 & 3889.

APPROXIMATE SPACING BETWEEN EACH DITCH CHECK SHOULD BE DETERMINED FROM THE FOLLOWING SPACING FORMULA:

$$\text{APPROXIMATE SPACING OF DITCH CHECKS (FT.)} = Y = \frac{\text{DITCH CHECK HEIGHT (FT)}}{\text{\% CHANNEL SLOPE}} \times 100$$

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.

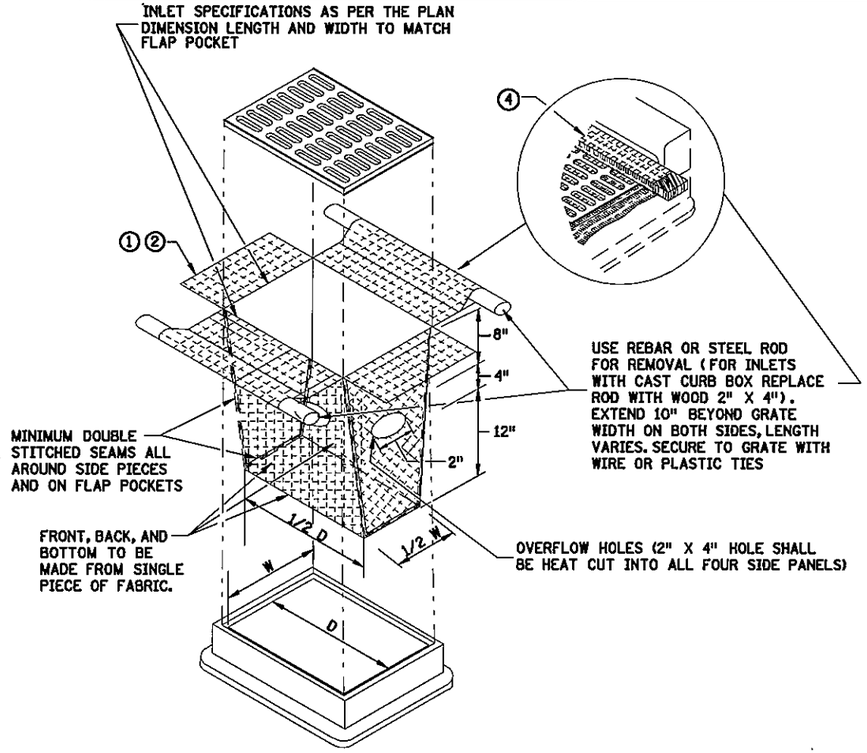
④ PERMANENT ROCK DITCH CHECKS PLACED WITHIN THE CLEAR ZONE WILL NEED TO BE 18" OR LESS IN HEIGHT. A 1:6 APPROACH AND DEPARTURE SLOPE SHALL BE PROVIDED.

STANDARD SHEET NO.
5-297.405 (3 OF 4)
STANDARD APPROVED:
SEPTEMBER 27, 2006

TEMPORARY SEDIMENT CONTROL
DITCH CHECK/BARRIER

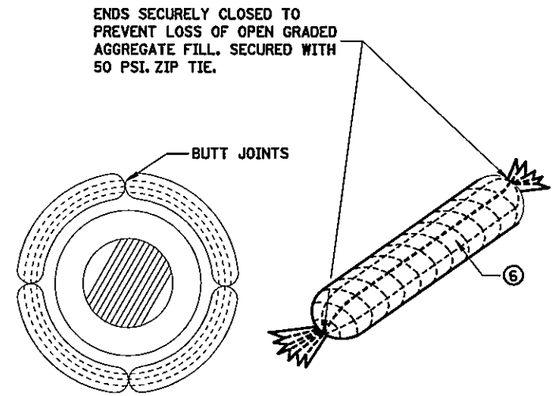
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 81 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT #: DULUTH
USER NAME: $$@USER$NAME@$$
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/plan sheets/Standard plan sheets/s405_3_spn.dgn
FILE NAME: @FILENAME@

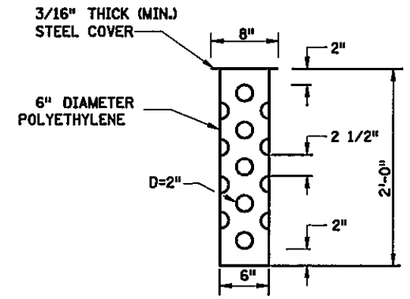


FILTER BAG INSERT ③

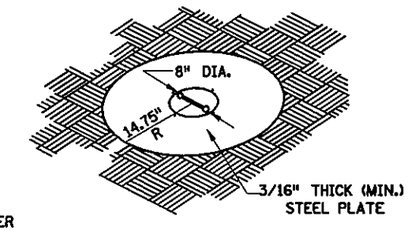
(CAN BE INSTALLED IN ANY INLET TYPE WITH OR WITHOUT A CURB BOX)



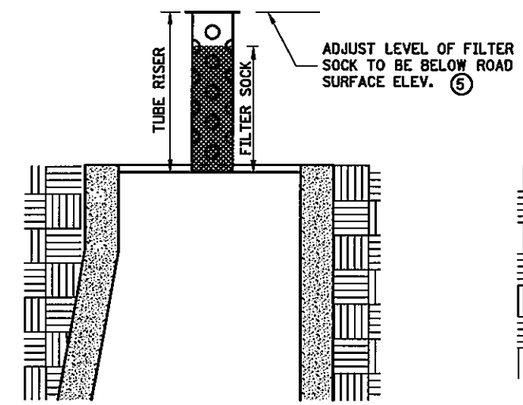
ROCK LOG/COMPOST LOG



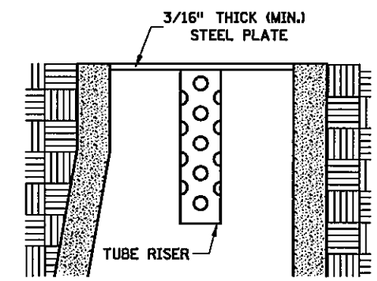
TUBE RISER



PERSPECTIVE VIEW

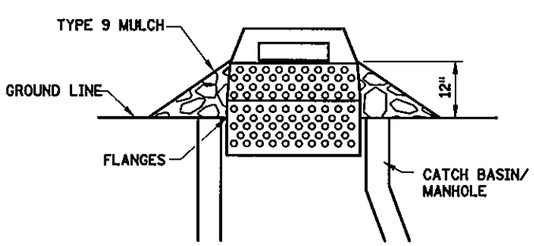


SECTION
(UP POSITION)



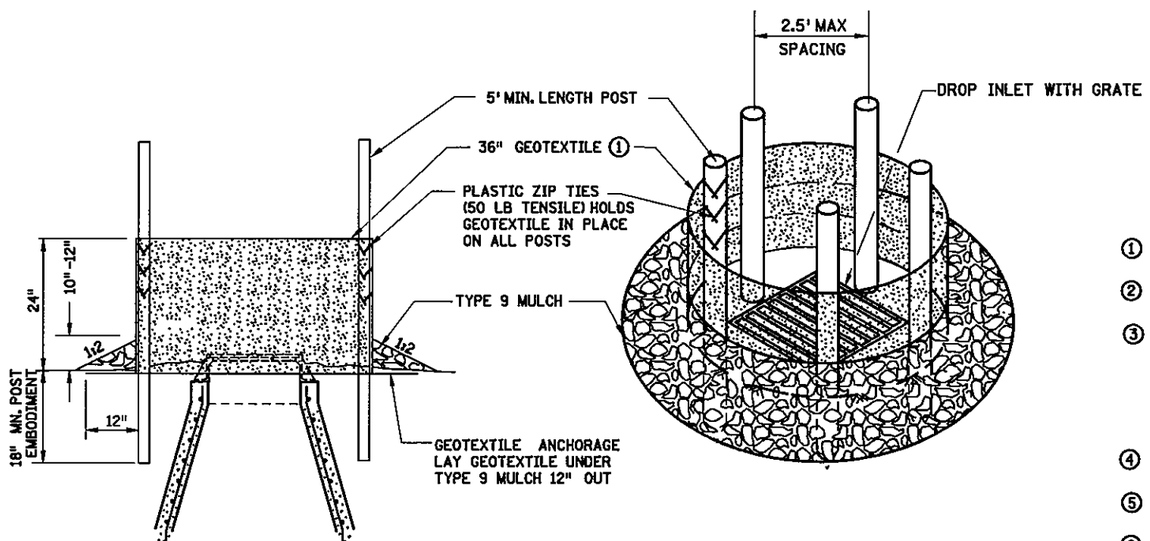
SECTION
(DOWN POSITION)

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.

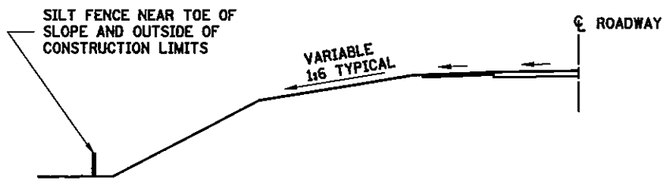
⑤ SOCK HEIGHT MUST NOT BE SO HIGH AS TO SLOW DOWN WATER FILTRATION TO CAUSE FLOODING OF THE ROADWAY.

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.

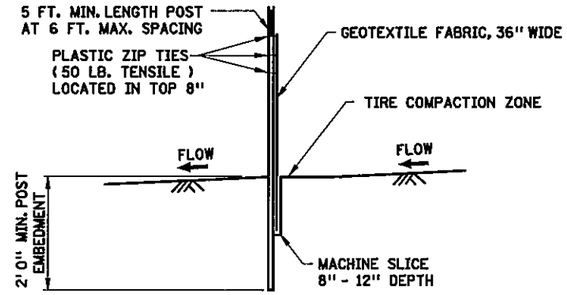
STANDARD SHEET NO. 297.405 (4 OF 4)	TITLE: TEMPORARY SEDIMENT CONTROL STORM DRAIN INLET PROTECTION
STANDARD APPROVED: SEPTEMBER 27, 2006	

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 82 OF 200 SHEETS

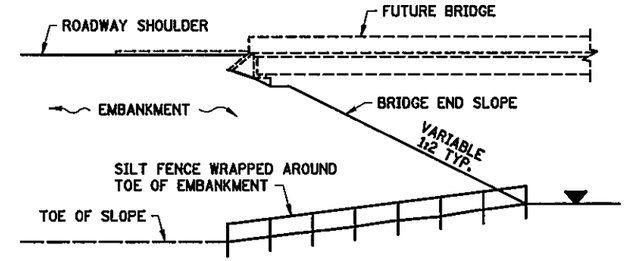
PLOTTED/REVISED: 09-DEC-2009
DISTRICT #: DULUTH
USER NAME: $$USER$NAME$$$
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/plan sheets/Standard plan sheets/s405_4_spn.dgn
FILE NAME: @FILENAME@



LOCATION OF SILT FENCE
AT TOE OF ROADWAY EMBANKMENT

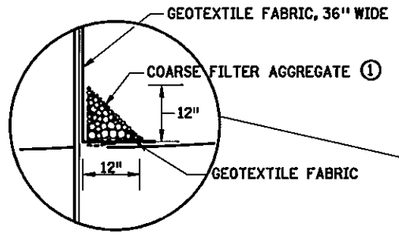


SILT FENCE, MACHINE SLICED
DESIGN GUIDELINES:
TO PROTECT AREAS FROM SHEET FLOW.
MAXIMUM CONTRIBUTING AREA: 1 ACRE.

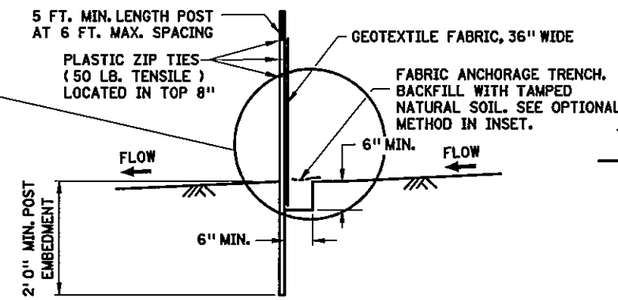


BRIDGE FILL

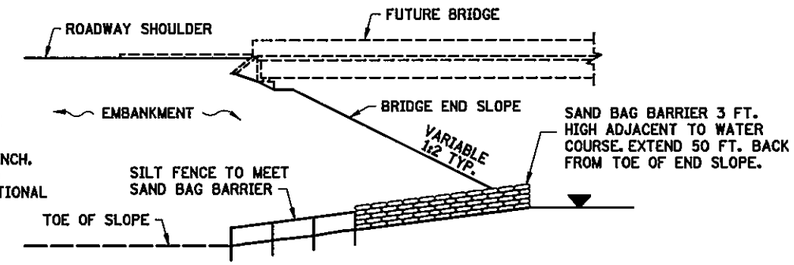
DESIGN GUIDELINES:
WATER COURSE FLOW VELOCITY: STAGNANT
CONTRIBUTING SLOPE AREA: 1/2 ACRE



OPTIONAL METHOD
FOR SILT FENCE, HEAVY DUTY

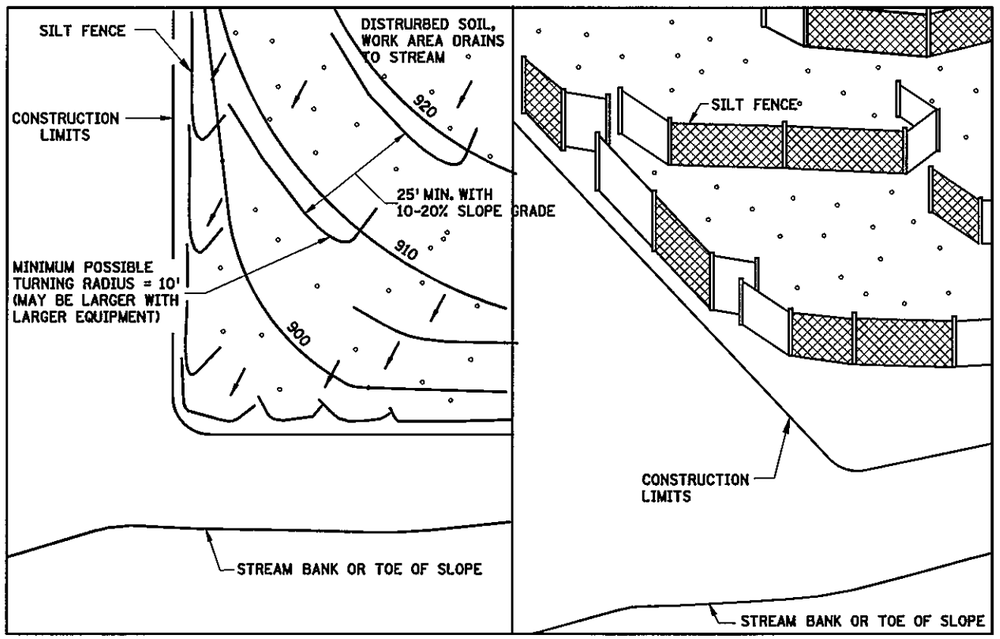


SILT FENCE, HEAVY DUTY
(HAND INSTALLED)
DESIGN GUIDELINES:
TO PROTECT AREAS FROM SHEET FLOW.
MAXIMUM CONTRIBUTING AREA: 1 ACRE.



BRIDGE FILL

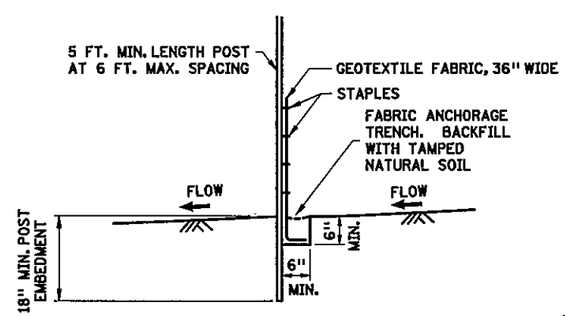
DESIGN GUIDELINES:
WATER COURSE FLOW VELOCITY: 1 TO 7 FT./SEC.
CONTRIBUTING SLOPE AREA: 1 ACRE



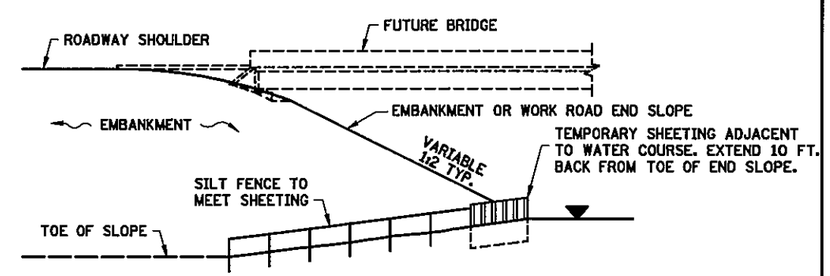
PLAN VIEW

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

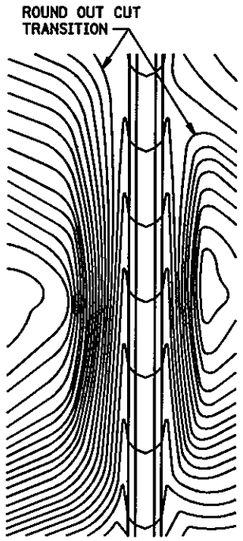
DESIGN GUIDELINES:
WATER COURSE FLOW VELOCITY: 8 TO 15 FT./SEC.
CONTRIBUTING SLOPE AREA: 3 ACRES

SILT FENCE AT BRIDGE EMBANKMENT ADJACENT TO WATER

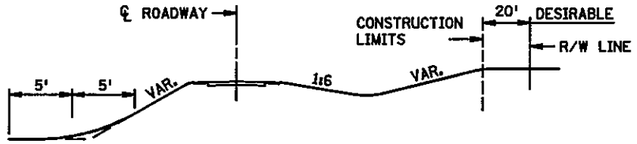
NOTES:
SEE SPECS. 2573, 3149 & 3886.
① COARSE FILTER AGGREGATE (SPEC. 3149) SHALL BE INCIDENTAL.

STANDARD SHEET NO. 5-297.408 (1 OF 2)	TITLE: TEMPORARY SEDIMENT CONTROL SILT FENCE
STANDARD APPROVED: SEPTEMBER 27, 2006	
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 83 OF 200 SHEETS	

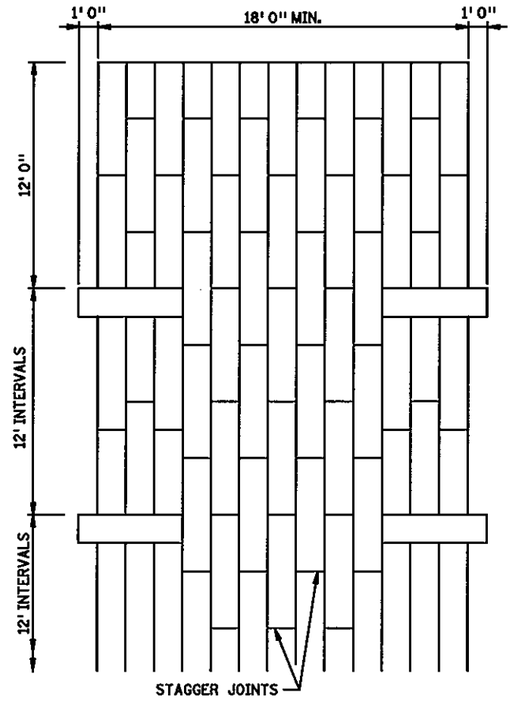
PLOTTED/REVISED: 09-DEC-2009
DISTRICT *: DULUTH
USER NAME: $$@USER$NAME@$$
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/plan sheets/Standard plan sheets/s408_1_spn.dgn
FILE NAME: @FILENAME@



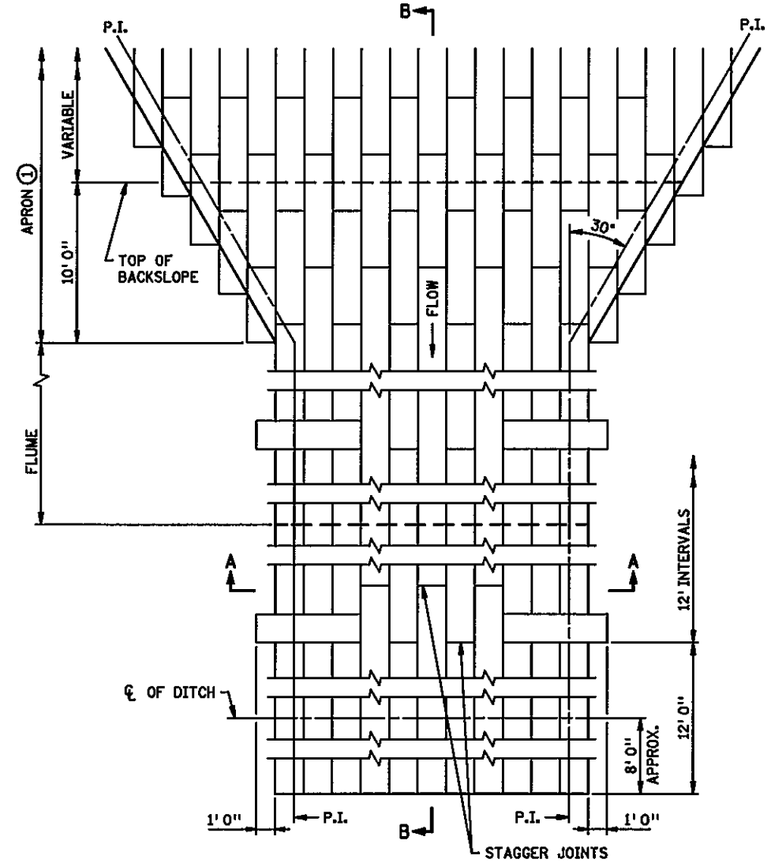
CONTOURING ROAD CUTS



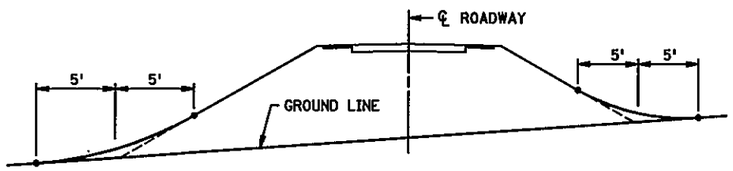
ROUNDING SHOULDERS AND BACKSLOPES



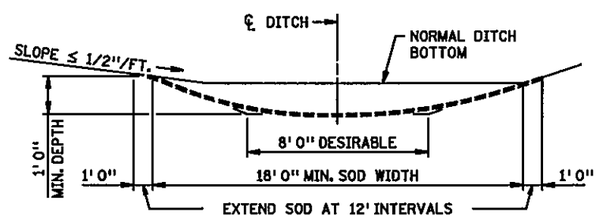
PLAN VIEW



PLAN VIEW

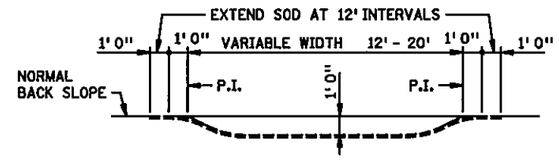


SHAPING FOR DRAINAGE ALONG THE TOE OF FILL SLOPES

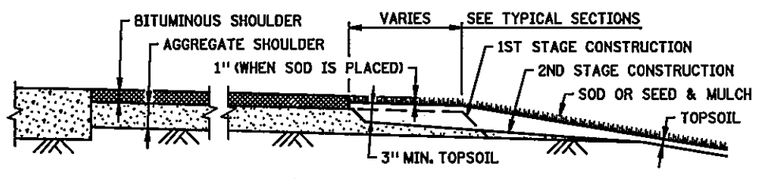


SODDED DITCH CROSS SECTION

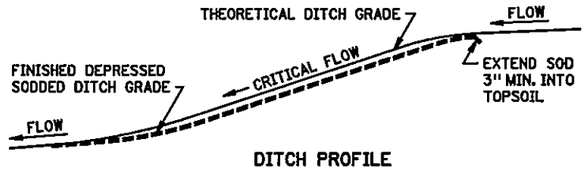
WHERE FRONT OR BACK SLOPE IS FLAT (LESS THAN 1/2"/FT.), FIRST NOTCH DITCH AND THEN PROVIDE ROUNDING.



SECTION A-A

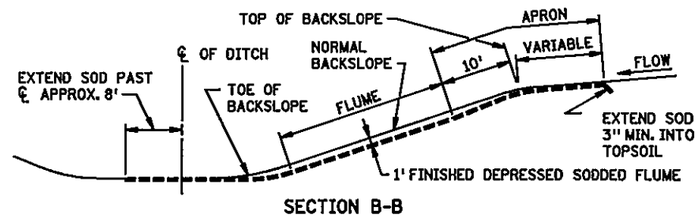


SHAPING AND TOPSOILING INSLOPES



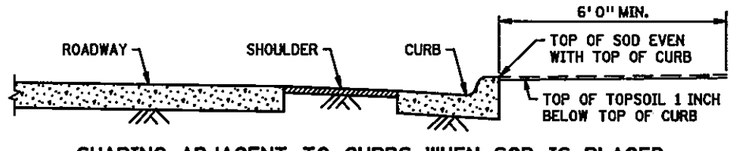
DITCH PROFILE

SODDED DITCH DETAILS



SECTION B-B

SODDED FLUME DETAILS



SHAPING ADJACENT TO CURBS WHEN SOD IS PLACED

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. 3806-60 (TH 61) SHEET NO. 84 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT #: DULUTH
USER NAME: $$$USER$NAME$$$
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/plan sheets/Standard plan sheets/s404_1_spn.dgn
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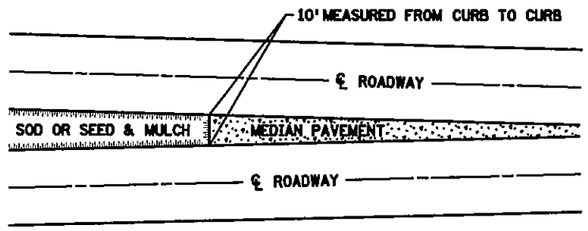
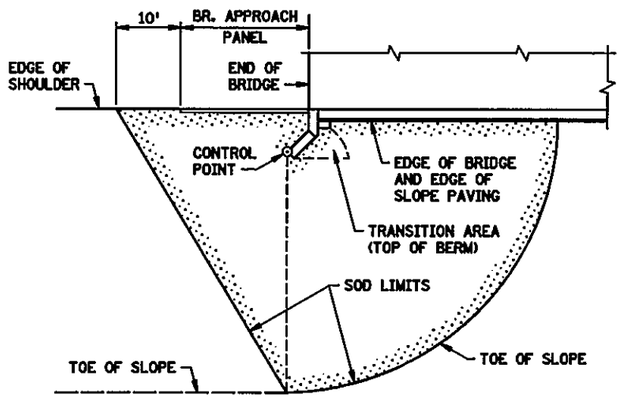
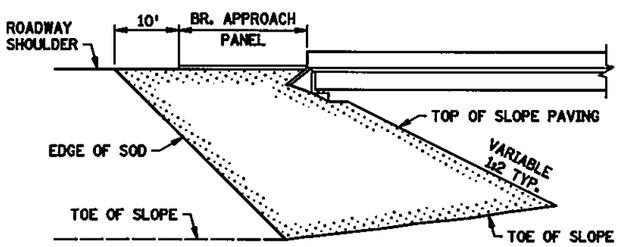


SODDING LIMITS AT GORE AREA

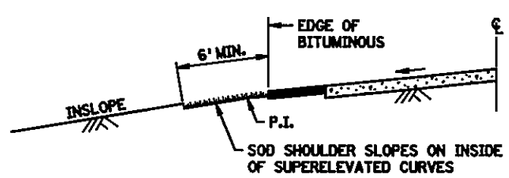


PLAN

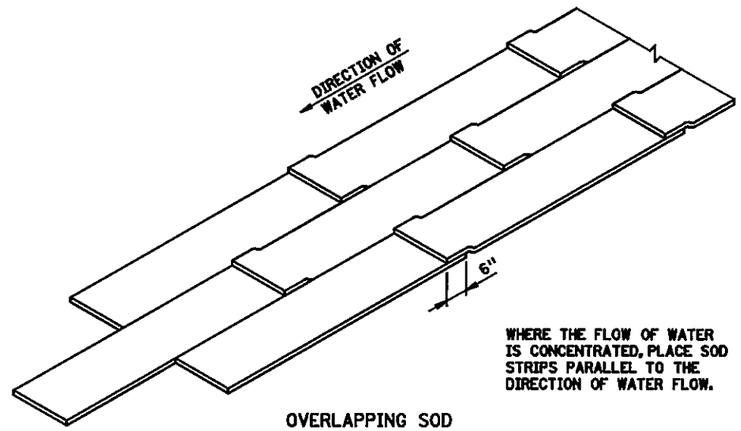


ELEVATION

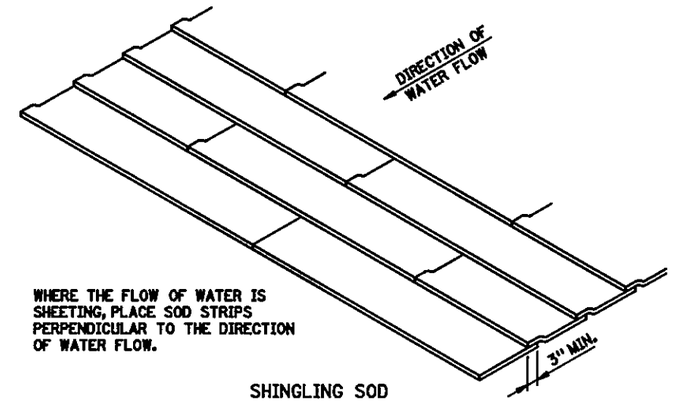
SODDING LIMITS AT BRIDGE APPROACH FILLS



SODDING INSLOPES OF SUPERELEVATED CURVES

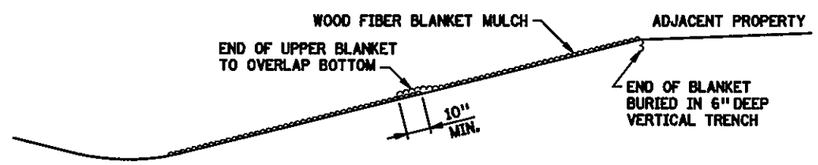


OVERLAPPING SOD

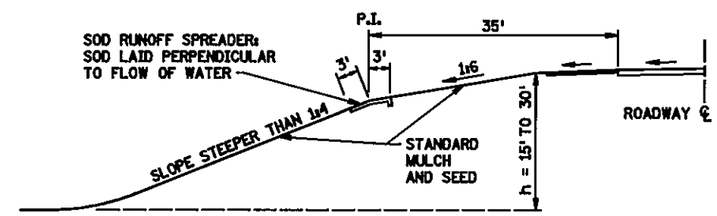


SHINGLING SOD

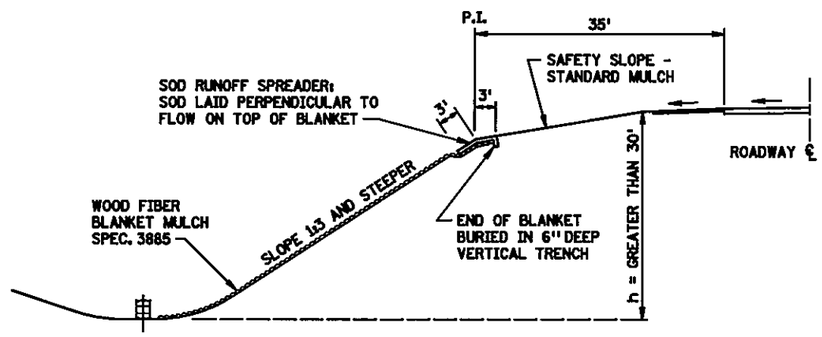
SPECIAL SOD PLACEMENT TECHNIQUES



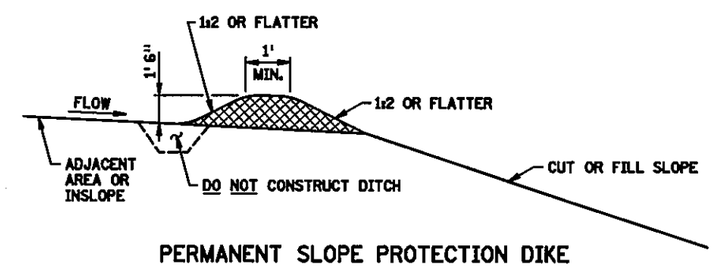
WOOD FIBER BLANKET INSTALLATION ON A CUT SLOPE



BROKEN-BACK SAFETY FILL SLOPE



WOOD FIBER BLANKET INSTALLATION ON AN INSLOPE
(WHEN REQUIRED)



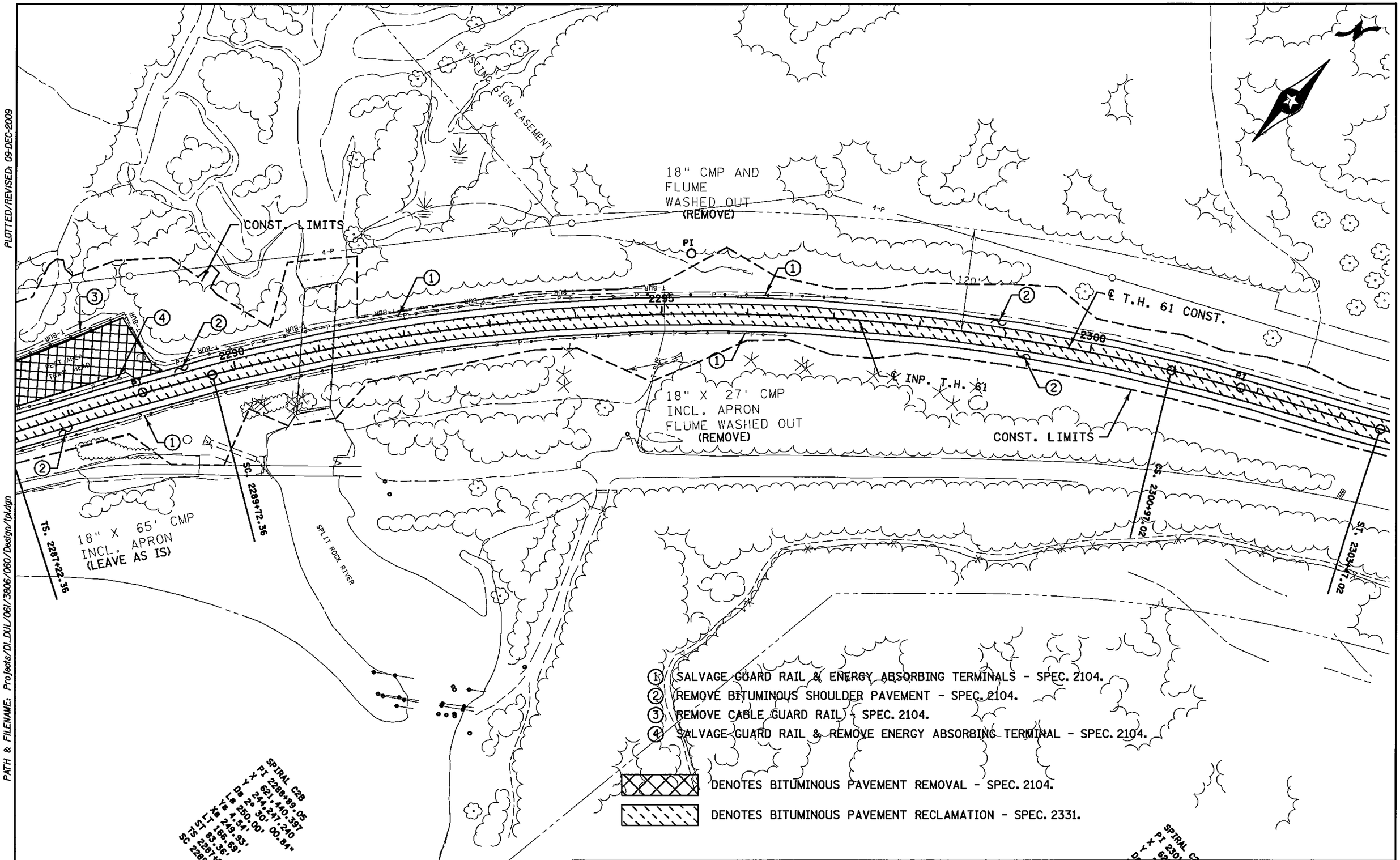
PERMANENT SLOPE PROTECTION DIKE

STANDARD SHEET NO. 5-297.406	TITLE: PERMANENT EROSION CONTROL ALONG ROADWAYS AND AT GORE AREAS & BRIDGE APPROACH FILLS
STANDARD APPROVED: JANUARY 31, 1985	
REVISION DATE 10-26-2000	STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 85 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT #: DULUTH
USER NAME: $$@USER$NAME@$$
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/plan sheets/Standard plan sheets/s406_1_spn.dgn
FILE NAME: @FILENAME@

PLOTTED/REVISED: 09-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: tp3
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/tpl.dgn



I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

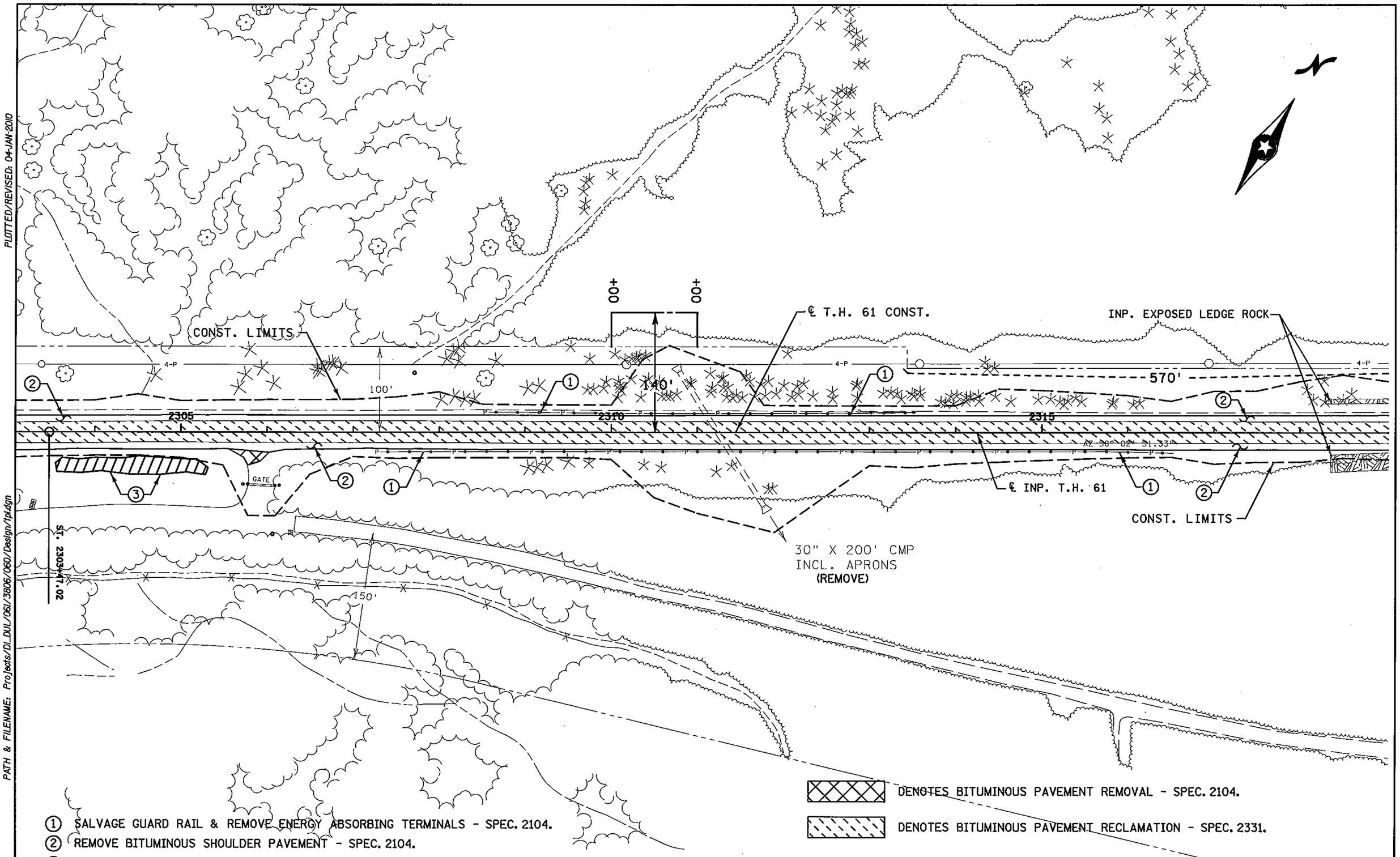
DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

ALIGNMENT, TOPOGRAPHY, R/W & REMOVALS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 95 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010

DISTRICT #: DULUTH
IPLOT NAME: tp4
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/tpl.dgn



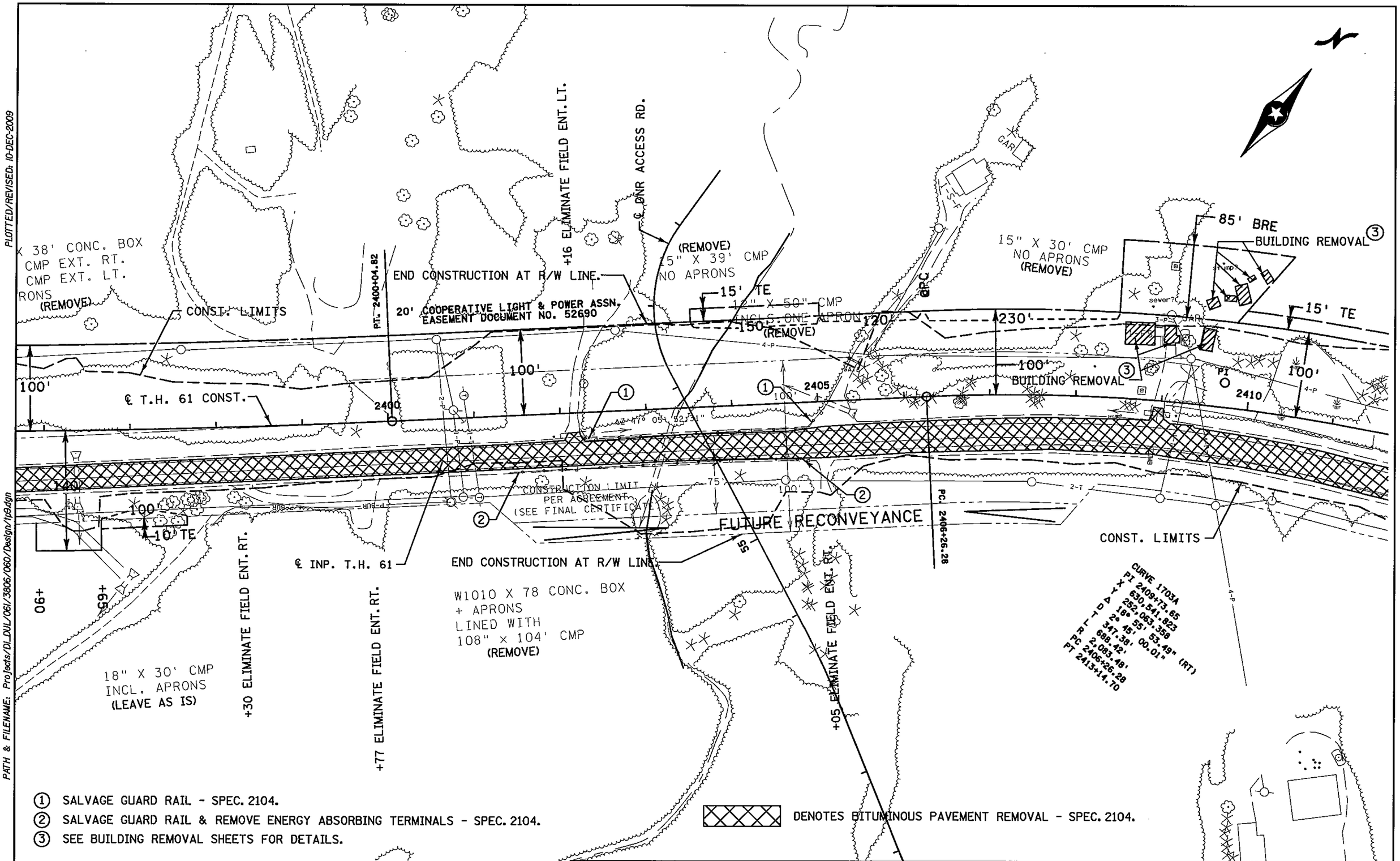
1. SALVAGE GUARD RAIL & REMOVE ENERGY ABSORBING TERMINALS - SPEC. 2104.
2. REMOVE BITUMINOUS SHOULDER PAVEMENT - SPEC. 2104.
3. DESIGNATED SENSITIVE AREA, DO NOT DISTURB.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

ALIGNMENT, TOPOGRAPHY, R/W & REMOVALS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 96 OF 200 SHEETS



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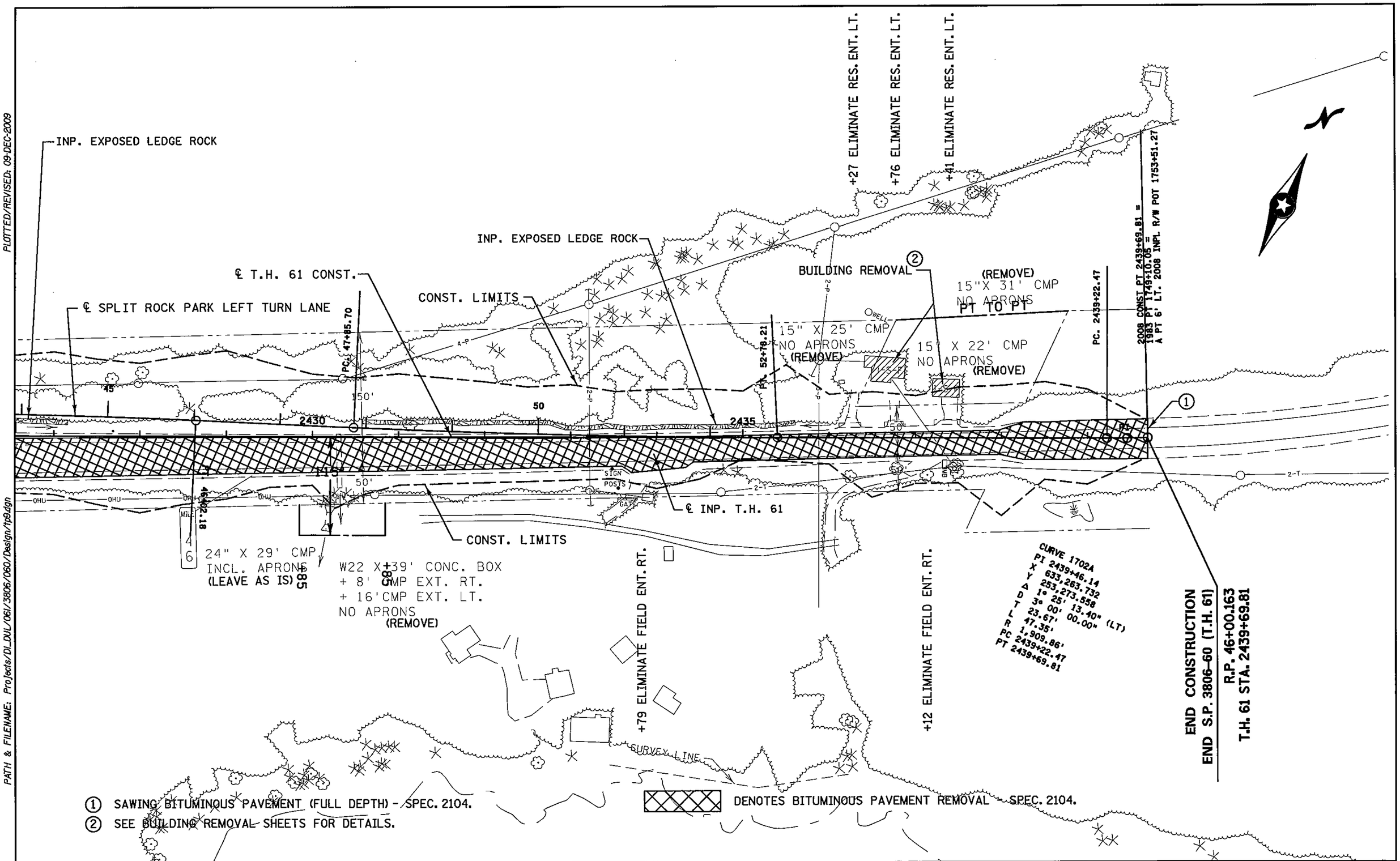
DATE 10-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

ALIGNMENT, TOPOGRAPHY, R/W & REMOVALS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 102 OF 200 SHEETS



① SAWING BITUMINOUS PAVEMENT (FULL DEPTH) - SPEC. 2104.

② SEE BUILDING REMOVAL SHEETS FOR DETAILS.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

ALIGNMENT, TOPOGRAPHY, R/W & REMOVALS

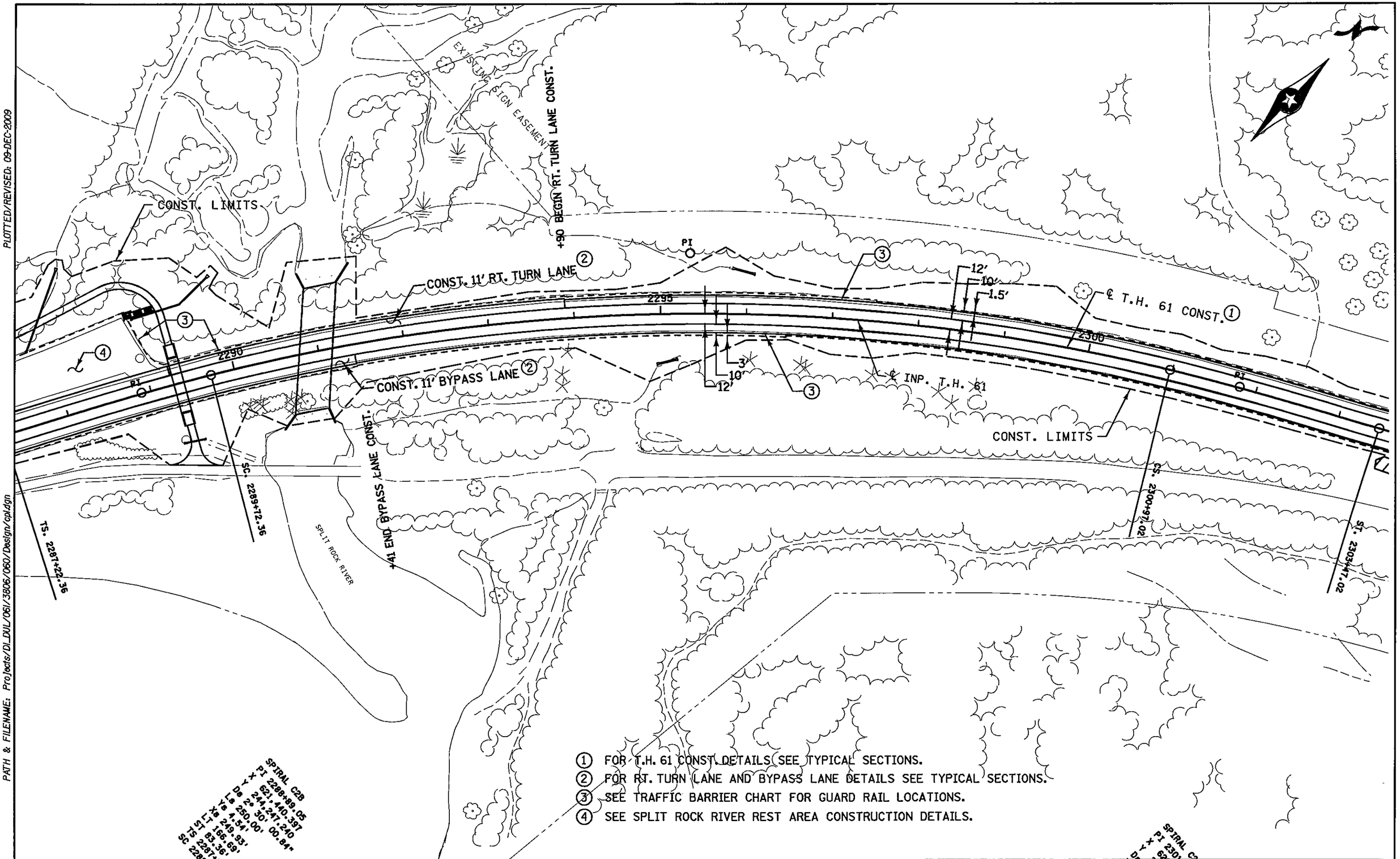
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 104 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009

DISTRICT : DULUTH
IPLOT NAME: tpl2
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/tp9.dgn

PLOTTED/REVISED: 09-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: cp-3
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/cpl.dgn

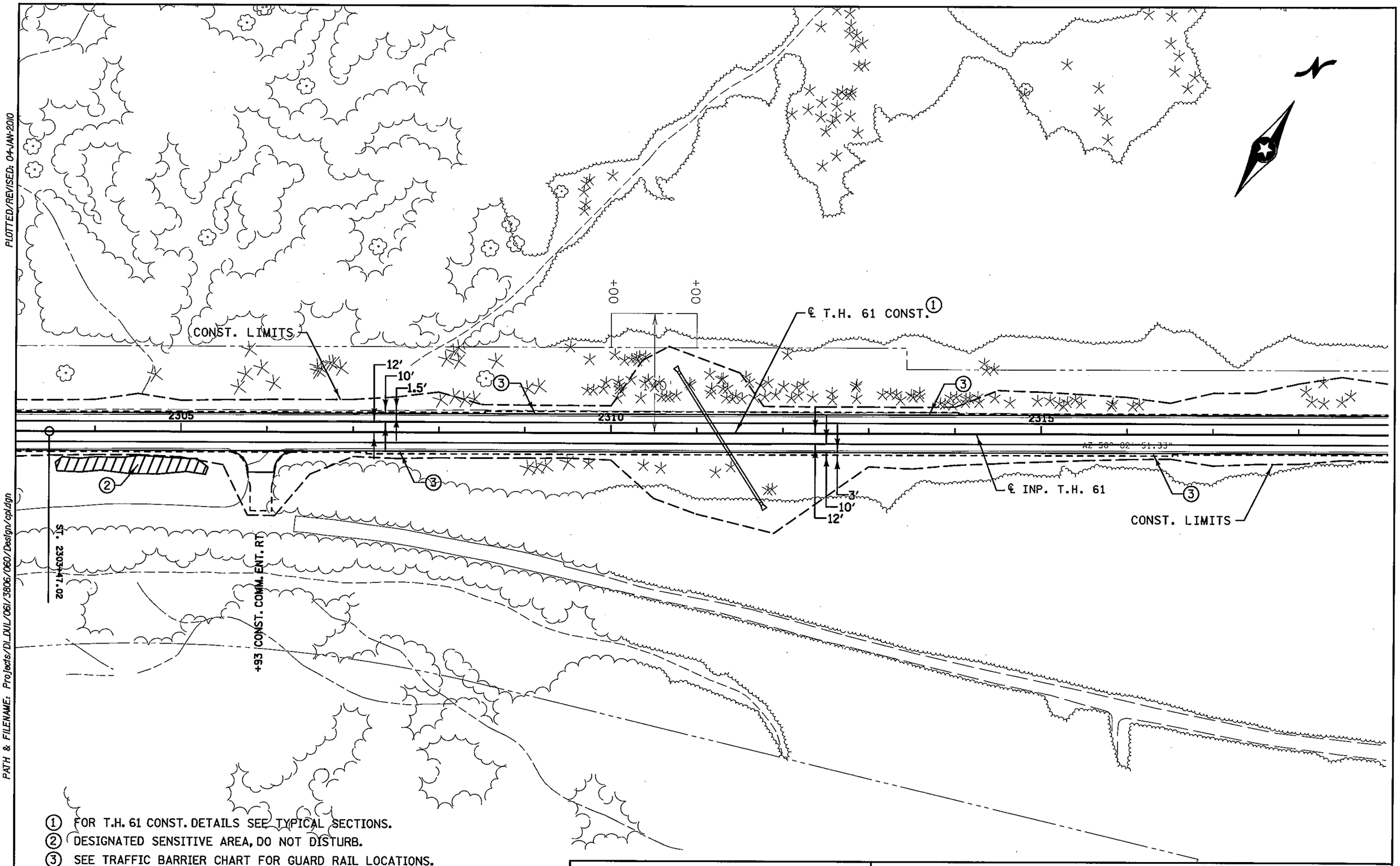


I HEREBY CERTIFY THAT THIS PLAN SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

PLANNED CONSTRUCTION

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 107 OF 200 SHEETS



① FOR T.H. 61 CONST. DETAILS SEE TYPICAL SECTIONS.
② DESIGNATED SENSITIVE AREA, DO NOT DISTURB.
③ SEE TRAFFIC BARRIER CHART FOR GUARD RAIL LOCATIONS.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Voshburgh
TOM VOSHBURGH

PLANNED CONSTRUCTION

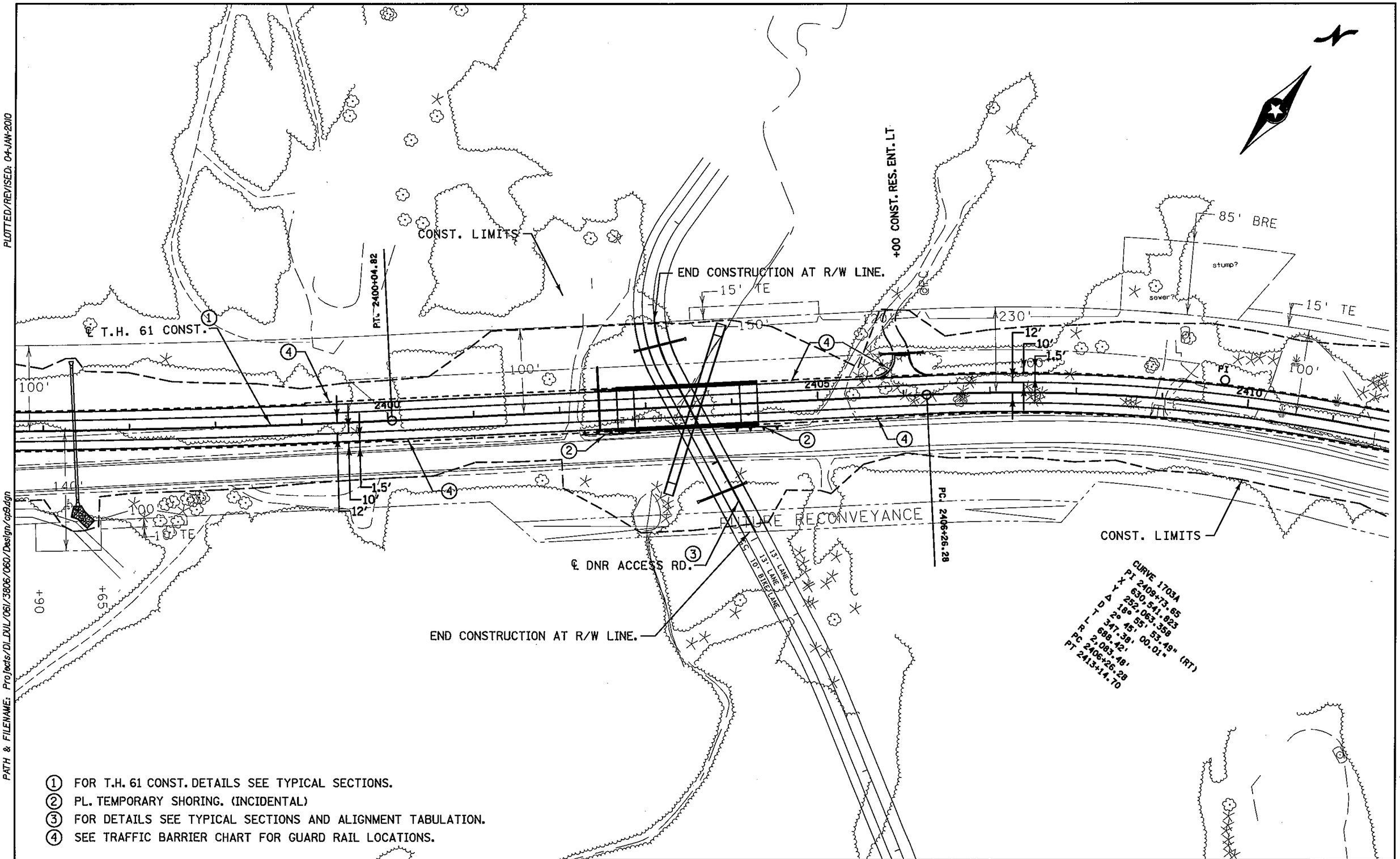
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 108 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010

DISTRICT #: DULUTH
IPLOT NAME: cp-4
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/cpl.dgn

PLOTTED/REVISED: 04-JAN-2010

DISTRICT #: DULUTH
IPLOT NAME: cpl0
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/cp9.dgn



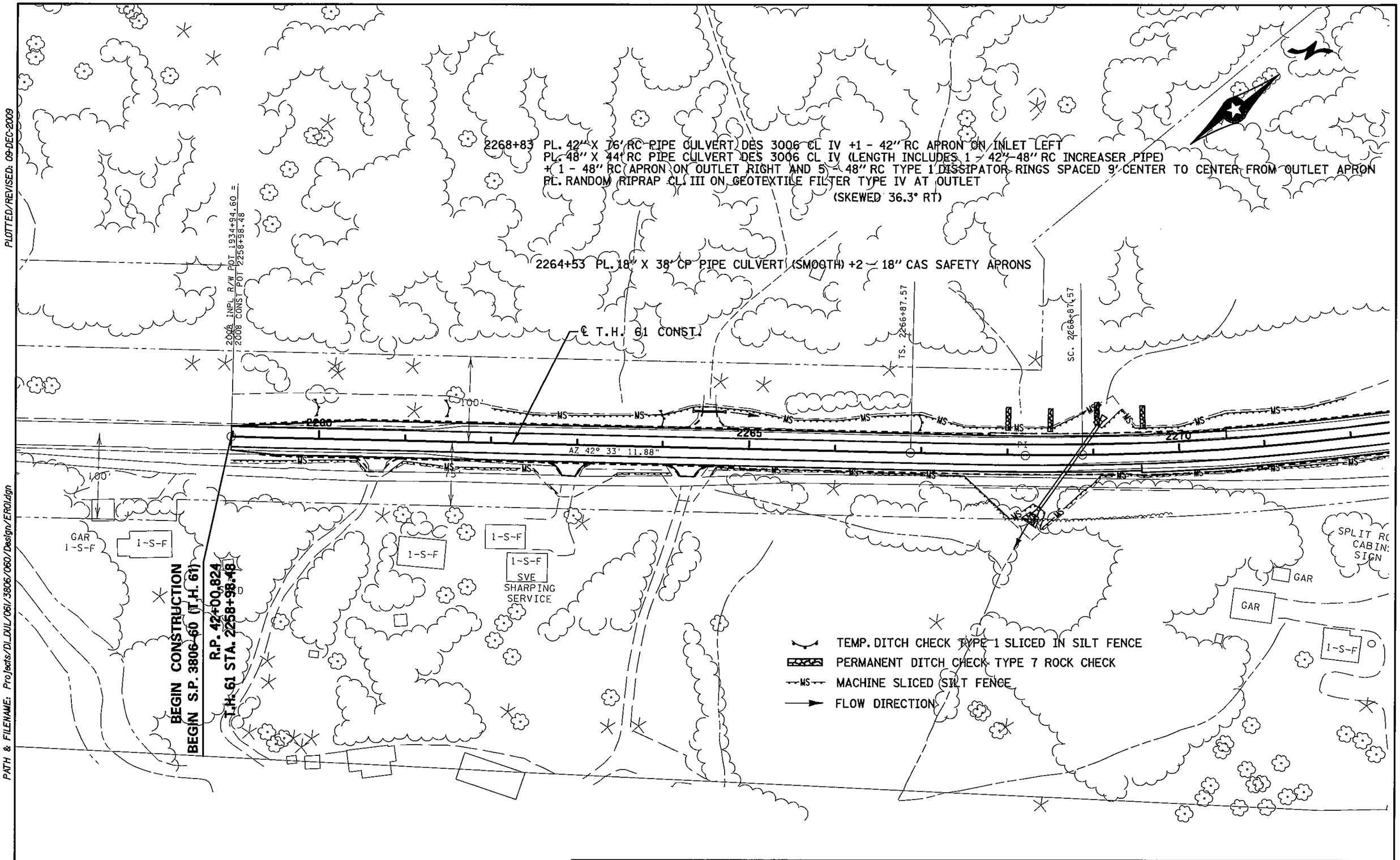
1. FOR T.H. 61 CONST. DETAILS SEE TYPICAL SECTIONS.
2. PL. TEMPORARY SHORING. (INCIDENTAL)
3. FOR DETAILS SEE TYPICAL SECTIONS AND ALIGNMENT TABULATION.
4. SEE TRAFFIC BARRIER CHART FOR GUARD RAIL LOCATIONS.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

PLANNED CONSTRUCTION

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 114 OF 200 SHEETS



DISTRICT #: DULUTH
IPLOT NAME: ERO-1
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ERO1.dgn

PLOTTED/REVISED: 09-DEC-2009

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DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

DRAINAGE & EROSION CONTROL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 117 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: ERO-2
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ERO1.dgn

2272+95 RT PL. 18" X 56' CP PIPE CULVERT (SMOOTH) +2 - 18" CAS SAFETY APRONS

2282+16 RT PL. 18" X 42' CP PIPE CULVERT (SMOOTH) +2 - 18" CAS SAFETY APRONS

100+00 ② PL. 18" X 26' CP PIPE CULVERT +2 - 24" CAS PIPE APRONS
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET

CS. 2276+29.93

ST. 2278+29.93

℄ T.H. 61 CONST.

2275

2280

2285

AZ 23° 40' 32.18"

APPROXIMATE BIT BIKE TRAIL

ROCK INS

1-S-F

TS. 2287+22.36

① FOR STORM SEWER AND STRUCTURE INFORMATION, SEE CONSTRUCTION DETAILS AND STORM SEWER CHART.

② PIPE LOCATED ON SPLIT ROCK RIVER REST AREA TRAIL, SEE ENTRANCE - CULVERTS CHART AND CONSTRUCTION DETAILS FOR ADDITIONAL INFORMATION.

TEMP. DITCH CHECK TYPE 1 SLICED IN SILT FENCE

PERMANENT DITCH CHECK TYPE 7 ROCK CHECK

MS MACHINE SLICED SILT FENCE

FLOW DIRECTION

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

DRAINAGE & EROSION CONTROL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 118 OF 200 SHEETS

2289+34 PL. 12' X 10' X 60' BOX CULVERT + 2 END SECTIONS (BRIDGE #38X05)

2290+98 REPAIR BRIDGE #9405

EXISTING SIGN EASEMENT

2295+96 LT PL. 18" X 26' CP PIPE CULVERT +2 - 24" CAS PIPE APRONS
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET

℄ T.H. 61 CONST.

120'

2295

2290

2300

REST AREA TRAIL HEAD

2295+07 RT PL. 18" X 24' CP PIPE CULVERT +2 - 24" CAS PIPE APRONS
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET

SC. 2289+72.36

TS. 2287+22.36

TS. 2300+16.02

ST. 2303+47.02

103+80 ④ PL. 12" X 26' CP PIPE CULVERT (SMOOTH) +2 - 15" CAS SAFETY APRONS

TEMP. DITCH CHECK TYPE 1 SLICED IN SILT FENCE

PERMANENT DITCH CHECK TYPE 7 ROCK CHECK

HD HEAVY DUTY SILT FENCE

MS MACHINE SLICED SILT FENCE

FLOW DIRECTION

SPIRAL C2B
PI 2288+89.05
Y X 621,440.397
244,247.240
Ds 30' 00.84"
Ls 250.00'
Xs 4.54'
Ys 249.93'
LT 166.69'
ST 83.36'
TS 2287+
SC 228

SPIRAL C
PI 230
Y X 62
D

① PL. RANDOM RIPRAP CL. II ON GEOTEXTILE FILTER TYPE III IN GULLEY AREA, AS DIRECTED BY THE ENGINEER.
② DESIGNATED SENSITIVE AREA DO NOT DISTURB.
③ FOR STORM SEWER AND STRUCTURE INFORMATION, SEE CONSTRUCTION DETAILS AND STORM SEWER CHART.
④ PIPE LOCATED ON SPLIT ROCK RIVER REST AREA TRAIL, SEE ENTRANCE - CULVERTS CHART AND CONSTRUCTION DETAILS FOR ADDITIONAL INFORMATION.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

DRAINAGE & EROSION CONTROL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 119 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: ERO-3
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ERO1.dgn

PLOTTED/REVISED: 04-JAN-2010

DISTRICT #: DULUTH
IPLOT NAME: ERO-4
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ERO1.dgn

2311+24 PL. 36" X 140' RC PIPE CULVERT DES 3006 CL V + 1 - 36" RC APRON ON INLET LEFT
PL. 42" X 34' RC PIPE CULVERT DES 3006 CL III (LENGTH INCLUDES 1 - 36"-42" RC INCREASER PIPE) +
1 - 42" RC APRON ON OUTLET RIGHT AND 5 - 42" RC TYPE 1 DISSIPATOR RINGS SPACED 7' CENTER TO CENTER FROM OUTLET APRON
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET
(SKEWED 32.0° LT)

℄ T.H. 61 CONST.

100'

100'

2305

2310

2315

AZ 58° 02' 51.33"

EXISTING SIGN EASEMENT

ST. 2303+47.02

150'

100'

EXISTING SIGN EASEMENT

① PL. RANDOM RIPRAP CL. II ON GEOTEXTILE FILTER TYPE III IN GULLEY AREA, AS DIRECTED BY THE ENGINEER.
② DESIGNATED SENSITIVE AREA DO NOT DISTURB.

TEMP. DITCH CHECK TYPE 1 SLICED IN SILT FENCE
TEMP. DITCH CHECK TYPE 2 BIOROLL
MS MACHINE SLICED SILT FENCE
FLOW DIRECTION

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

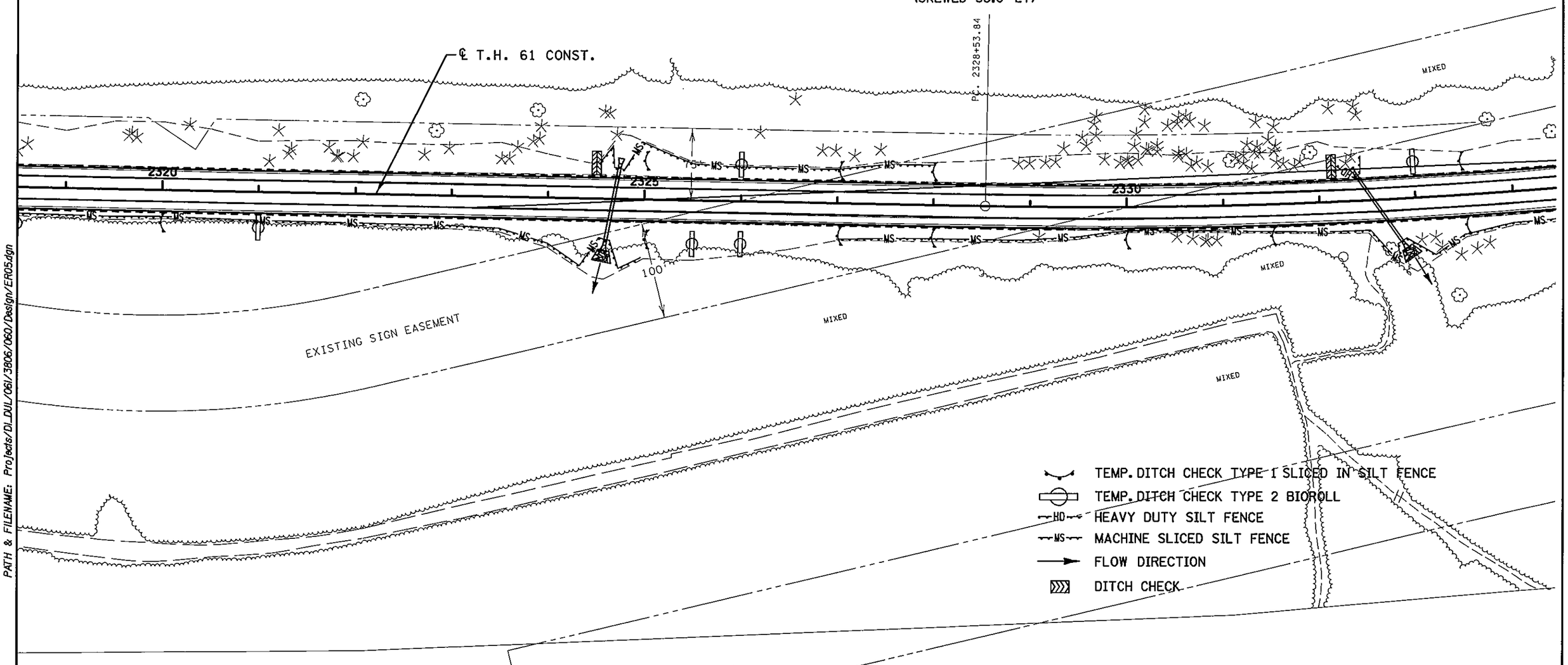
DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

DRAINAGE & EROSION CONTROL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 120 OF 200 SHEETS

2324+68 PL. 36" X 42' RC PIPE CULVERT DES 3006 + 1 - 36" RC APRON WITH SAFETY GRATE ON INLET APRON LEFT
PL. 42" X 34' RC PIPE CULVERT DES 3006 (LENGTH INCLUDES 1 - 36"-42" RC INCREASER PIPE) +1 - 42"
RC APRON ON OUTLET RIGHT AND 5 - 42" RC TYPE 1 DISSIPATOR RINGS SPACED 7' CENTER TO CENTER FROM OUTLET APRON
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET
(SKEWED 10.2° RT)

2332+56 PL. 30" X 58' RC PIPE CULVERT DES 3006 + 1 - 30" RC APRON WITH SAFETY GRATE ON INLET APRON LEFT
PL. 36" X 24' RC PIPE CULVERT DES 3006 (LENGTH INCLUDES 1 - 30"-36" RC INCREASER PIPE)
+ 1 - 36" RC APRON WITH SAFETY GRATE ON OUTLET APRON RIGHT AND 5 - 36" RC TYPE 1 DISSIPATOR
RINGS SPACED 5' CENTER TO CENTER FROM OUTLET APRON
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET
(SKEWED 33.0° LT)



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DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

DRAINAGE & EROSION CONTROL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 121 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: ERO-5
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ER05.dgn

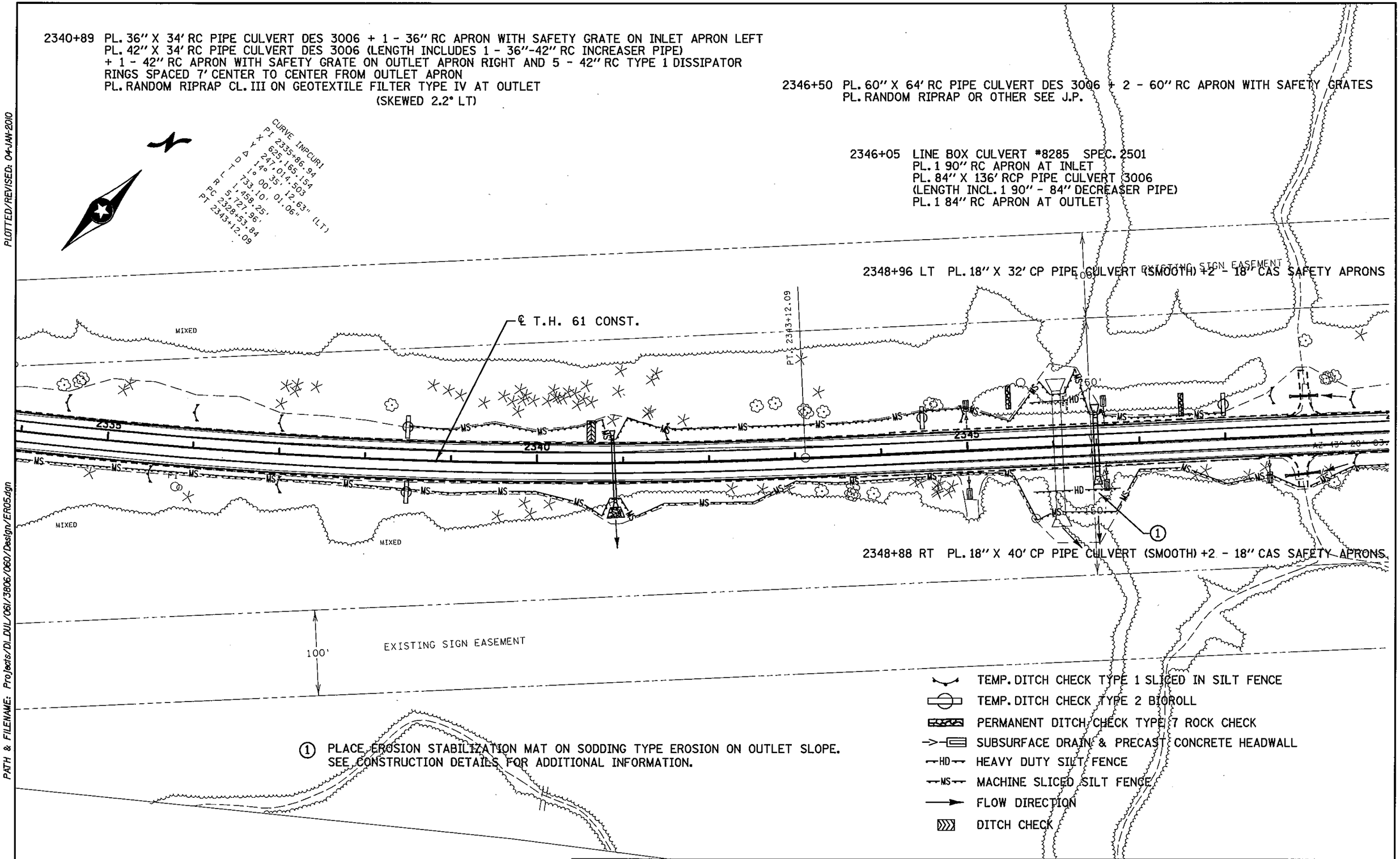
2340+89 PL. 36" X 34' RC PIPE CULVERT DES 3006 + 1 - 36" RC APRON WITH SAFETY GRATE ON INLET APRON LEFT
PL. 42" X 34' RC PIPE CULVERT DES 3006 (LENGTH INCLUDES 1 - 36"-42" RC INCREASER PIPE)
+ 1 - 42" RC APRON WITH SAFETY GRATE ON OUTLET APRON RIGHT AND 5 - 42" RC TYPE 1 DISSIPATOR
RINGS SPACED 7' CENTER TO CENTER FROM OUTLET APRON
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET
(SKEWED 2.2° LT)

2346+50 PL. 60" X 64' RC PIPE CULVERT DES 3006 + 2 - 60" RC APRON WITH SAFETY GRATES
PL. RANDOM RIPRAP OR OTHER SEE J.P.

CURVE INFCUR1
PI 2335+86.94
X 625,165.154
Y 247,014.503
Δ 14° 35' 12.63" (LT)
D 1° 00' 01.06"
T 733.10'
L 1,458.25'
R 5,727.96'
PC 2328+53.84
PT 2343+12.09

2346+05 LINE BOX CULVERT #8285 SPEC. 2501
PL. 1 90" RC APRON AT INLET
PL. 84" X 136' RCP PIPE CULVERT 3006
(LENGTH INCL. 1 90" - 84" DECREASER PIPE)
PL. 1 84" RC APRON AT OUTLET

2348+96 LT PL. 18" X 32' CP PIPE CULVERT (SMOOTH) +2 - 18" CAS SAFETY APRONS



① PLACE EROSION STABILIZATION MAT ON SODDING TYPE EROSION ON OUTLET SLOPE.
SEE CONSTRUCTION DETAILS FOR ADDITIONAL INFORMATION.

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DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

DRAINAGE & EROSION CONTROL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 122 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010

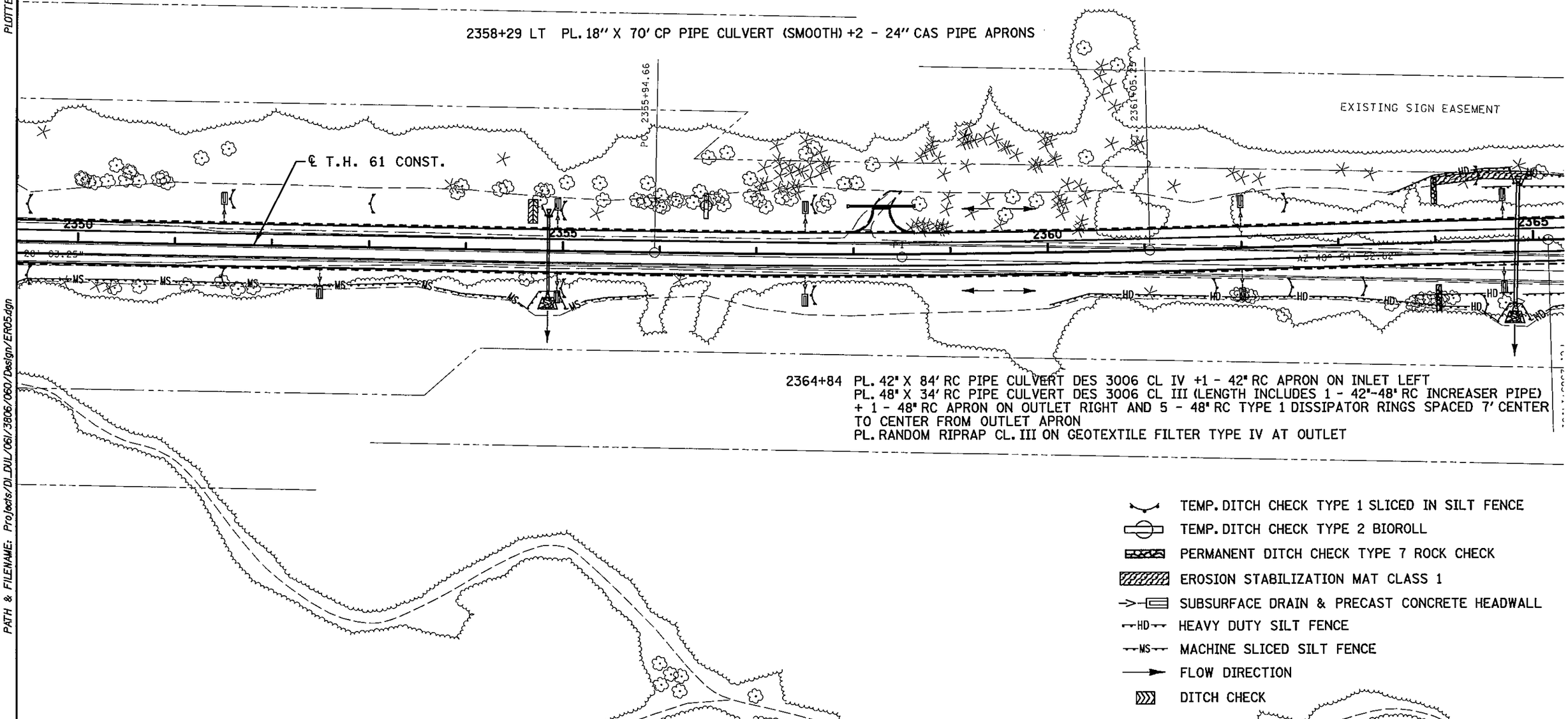
DISTRICT #: DULUTH
IPLOT NAME: ER0-6
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ER05.dgn

T 255.34
L 510.59
R 11,459.16

2354+85 PL. 24" X 48' RC PIPE CULVERT DES 3006 + 1 - 24" RC APRON WITH SAFETY GRATE ON INLET APRON LEFT
PL. 30" X 24' RC PIPE CULVERT DES 3006 (LENGTH INCLUDES 1 - 24"-30" RC INCREASER PIPE) + 1 - 30" RC APRON WITH SAFETY GRATE ON OUTLET APRON RIGHT AND 5 - 30" RC TYPE 1 DISSIPATOR RINGS SPACED 5' CENTER TO CENTER FROM OUTLET APRON
PL. RANDOM RIPRAP CL. II ON GEOTEXTILE FILTER TYPE III AT OUTLET

CURVE C9
PI 2358+50.00
Y 626,727.419
X 248,662.781
Δ 2° 33' 10.63" (LT)
D 0° 30' 00.00"
T 255.34'
L 510.59'
R 11,459.16'
PC 2355+94.66
PT 2361+05.25

2358+29 LT PL. 18" X 70' CP PIPE CULVERT (SMOOTH) +2 - 24" CAS PIPE APRONS



2364+84 PL. 42" X 84' RC PIPE CULVERT DES 3006 CL IV +1 - 42" RC APRON ON INLET LEFT
PL. 48" X 34' RC PIPE CULVERT DES 3006 CL III (LENGTH INCLUDES 1 - 42"-48" RC INCREASER PIPE) + 1 - 48" RC APRON ON OUTLET RIGHT AND 5 - 48" RC TYPE 1 DISSIPATOR RINGS SPACED 7' CENTER TO CENTER FROM OUTLET APRON
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET

TEMP. DITCH CHECK TYPE 1 SLICED IN SILT FENCE
TEMP. DITCH CHECK TYPE 2 BIOROLL
PERMANENT DITCH CHECK TYPE 7 ROCK CHECK
EROSION STABILIZATION MAT CLASS 1
SUBSURFACE DRAIN & PRECAST CONCRETE HEADWALL
HD HEAVY DUTY SILT FENCE
MS MACHINE SLICED SILT FENCE
FLOW DIRECTION
DITCH CHECK

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 10-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

DRAINAGE & EROSION CONTROL

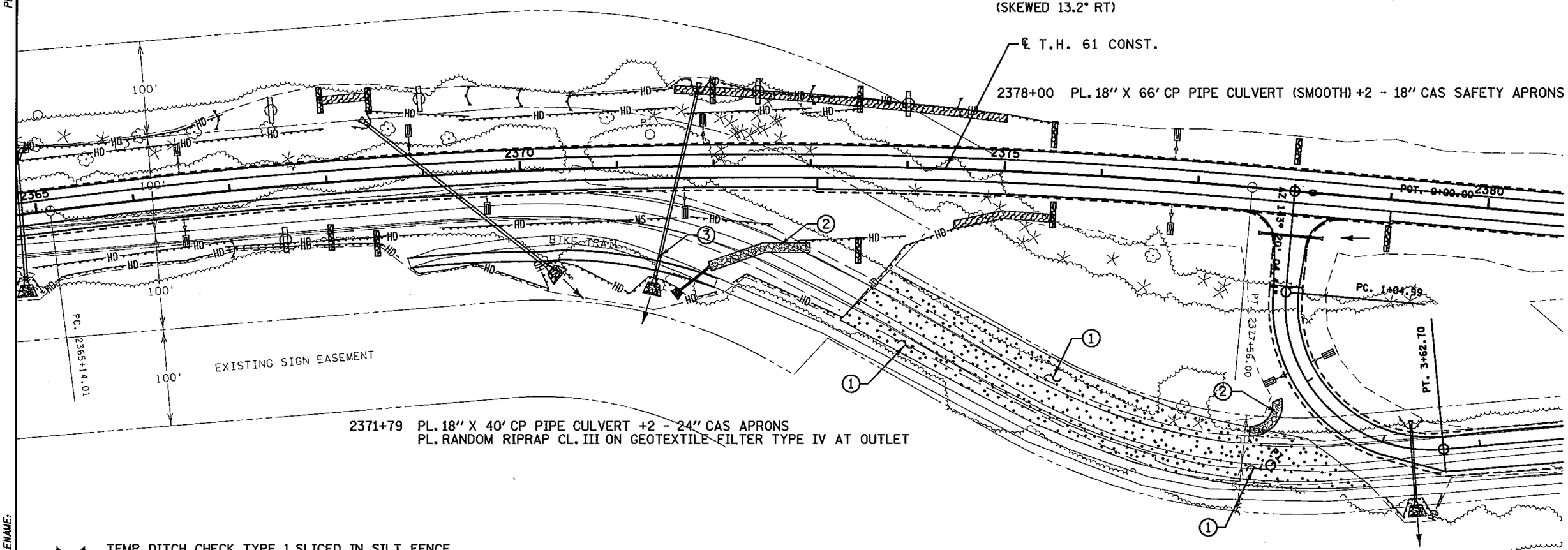
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 123 OF 200 SHEETS

PLOTTED/REVISED: 10-DEC-2009
DISTRICT #: DULUTH
IPLOT NAME: ER0-7
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ER05.dgn

Δ 12° 25' 12" (RT)
D 1° 00' 00"
T 623.44
L 1,241.99
R 5,729.58

2369+09 PL. 36" X 194' RC PIPE CULVERT DES 3006 CL V (LENGTH INCLUDES 1 - 36" RC 7.5 DEGREE BEND)
PL. 42" X 36' RC PIPE CULVERT DES 3006 (LENGTH INCLUDES 1 - 42"-36" RC DECREASER PIPE AND 1 - 36"-42" RC INCREASER PIPE) + 2 - 42" RC APRONS WITH SAFETY GRATES AND 4 - 42" RC TYPE 1 DISSIPATOR RINGS SPACED 5' CENTER TO CENTER FROM OUTLET APRON AND 1 - 42" RC TYPE 2 DISSIPATOR RING SPACED 4' FROM 36" - 42" RC INCREASER
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET
(SKEWED 48.1° LT)

2371+65 PL. 30" X 162' RC PIPE CULVERT DES 3006 CL V + 1 - 30" RC APRON INLET LEFT ③
PL. 42" X 34' RC PIPE CULVERT DES 3006 (LENGTH INCLUDES 1 - 30"-36" RC INCREASE PIPE AND 1 - 36"-42" RC INCREASER PIPE) +1 - 42" RC APRON ON OUTLET RIGHT AND 5 - 42" RC TYPE 2 DISSIPATOR RINGS SPACED 5' CENTER TO CENTER FROM OUTLET APRON
PL. RANDOM RIPRAP CL. II ON GEOTEXTILE FILTER TYPE III AT OUTLET
(SKEWED 13.2° RT)



3+31 PL. 24" X 80' CP PIPE CULVERT (SMOOTH) + 2 - 30" CAS PIPE APRONS WITH SAFETY GRATES
PL. RANDOM RIPRAP CL. II ON GEOTEXTILE FILTER TYPE III AT OUTLET

TEMP. DITCH CHECK TYPE 1 SLICED IN SILT FENCE
TEMP. DITCH CHECK TYPE 2 BIOROLL
PERMANENT DITCH CHECK TYPE 7 ROCK CHECK
EROSION STABILIZATION MAT CLASS 1
SUBSURFACE DRAIN & PRECAST CONCRETE HEADWALL
HD HEAVY DUTY SILT FENCE
FLOW DIRECTION

CURVE C10
PI 2371+37.45
X 627,57[illegible]
Y 249,[illegible]
D 12°25'11.82"
Δ 12°25'00.00"
R 5,729.58
PC 2365+[illegible]
PT 237[illegible]

① PL. 4.0" TOPSOIL AFTER BITUMINOUS PAVEMENT HAS BEEN REMOVED. SHAPE TO DRAIN AS DIRECTED BY THE ENGINEER. (INCIDENTAL)

② PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV IN DITCH BOTTOM, AS DIRECTED BY THE ENGINEER. SEE CONSTRUCTION CHARTS AND DETAILS.

③ FOR STORM SEWER AND STRUCTURE INFORMATION, SEE CONSTRUCTION DETAILS AND STORM SEWER CHART.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

DRAINAGE & EROSION CONTROL

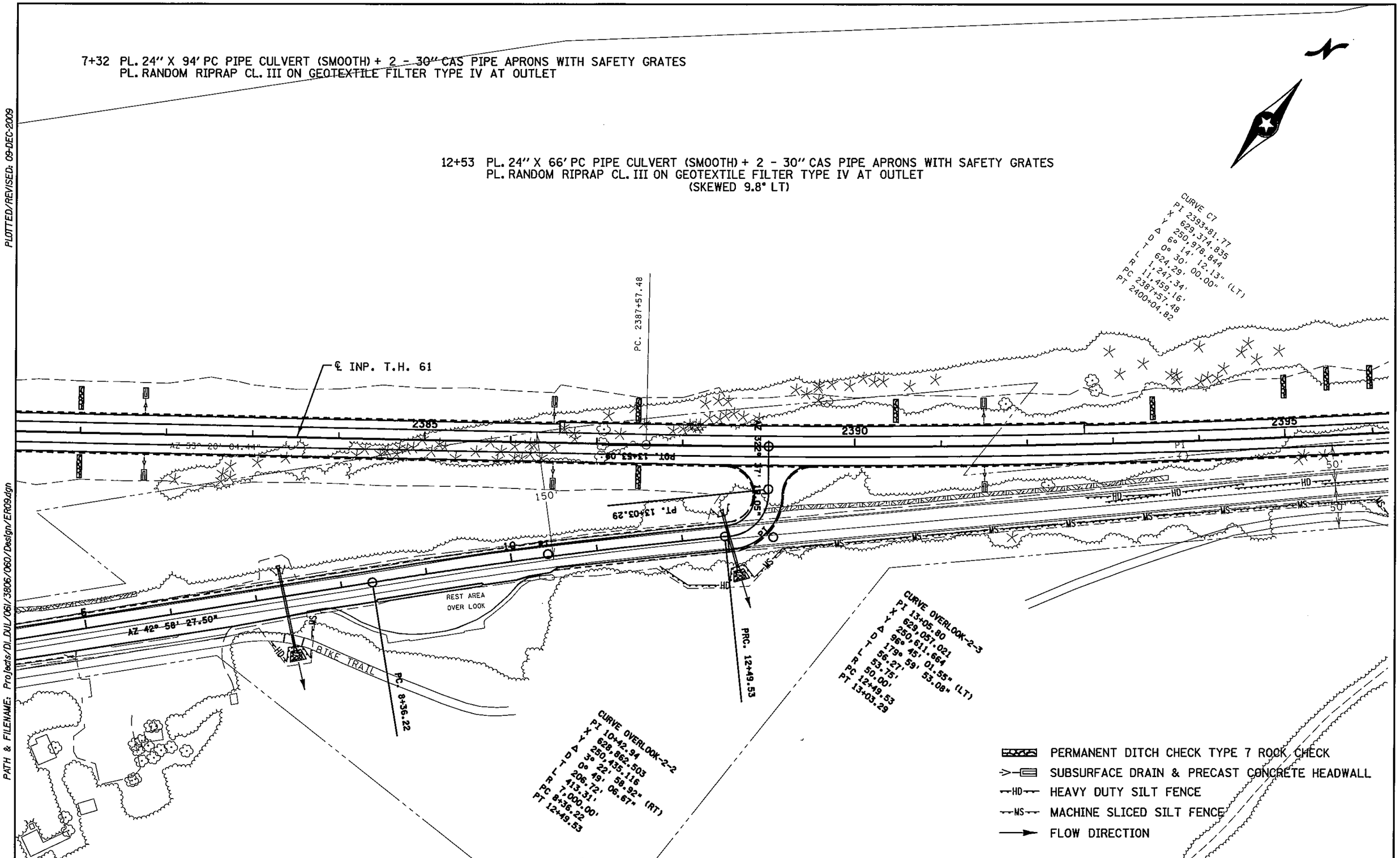
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 124 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010

DISTRICT #:
IPLOT NAME: ERO-8
PATH & FILENAME:

7+32 PL. 24" X 94' PC PIPE CULVERT (SMOOTH) + 2 - 30" CAS PIPE APRONS WITH SAFETY GRATES
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET

12+53 PL. 24" X 66' PC PIPE CULVERT (SMOOTH) + 2 - 30" CAS PIPE APRONS WITH SAFETY GRATES
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET
(SKEWED 9.8° LT)



I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

DRAINAGE & EROSION CONTROL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 125 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: ERO-9
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ERO9.dgn

2396+36 PL. 30" X 108' RC PIPE CULVERT DES 3006 CL IV + 1 - 30" RC APRON INLET LEFT
PL. 42" X 28' RC PIPE CULVERT DES 3006 (LENGTH INCLUDES 1 - 30"-36" RC INCREASE PIPE AND 1 - 36"-42" RC INCREASER PIPE) +1 - 42" RC APRON ON OUTLET RIGHT AND 5 - 42" RC TYPE 2 DISSIPATOR RINGS SPACED 5' CENTER TO CENTER FROM OUTLET APRON
PL. RANDOM RIPRAP CL. II ON GEOTEXTILE FILTER TYPE III AT OUTLET
(SKEWED 2.0° LT)

2402+87 - 2403+10 PL. BRIDGE #38015 ①

2403+59 PL. 12' X 7' X 180' BOX CULVERT + 2 END SECTIONS (BRIDGE #38X06) ②

57+50 ④ PL. 18" X 60' PC PIPE CULVERT + 2 - 24" CAS PIPE APRONS
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET

2406+00 LT PL. 18" X 50' CP PIPE CULVERT (SMOOTH) +2 - 24" CAS PIPE APRONS

END CONSTRUCTION AT R/W LINE.

PT. 2400+04.82

2400 2405 2410

55+64 ④ PL. 18" X 44' PC PIPE CULVERT + 2 - 24" CAS PIPE APRONS
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT INLET AND OUTLET

PC 2406+26.28

℄ INP. T.H. 61

END CONSTRUCTION AT R/W LINE.

CG 10' BIKE LANE 13' LANE 13' LANE

CURVE 1703A
PI 2409+73.65
X 630,541.823
Y 252,063.358
Δ 18° 55' 53.49" (RT)
D 2° 45' 00.01"
T 347.38'
L 688.42'
R 2,083.48'
PC 2406+26.28
PT 2413+14.70

TEMP. DITCH CHECK TYPE 1 SLICED IN SILT FENCE
TEMP. DITCH CHECK TYPE 2 BIOROLL
PERMANENT DITCH CHECK TYPE 7 ROCK CHECK
EROSION STABILIZATION MAT CLASS 1
SUBSURFACE DRAIN & PRECAST CONCRETE HEADWALL
HD HEAVY DUTY SILT FENCE
MS MACHINE SLICED SILT FENCE
FLOW DIRECTION

① SEE BRIDGE PLAN SHEETS FOR DETAILS.
② SEE BOX CULVERT PLAN SHEETS FOR DETAILS.
③ FOR STORM SEWER AND STRUCTURE INFORMATION, SEE CONSTRUCTION DETAILS AND STORM SEWER CHART.
④ PIPE LOCATED ON DNR ACCESS ROAD, SEE ENTRANCE - CULVERTS CHART AND CONSTRUCTION DETAILS FOR ADDITIONAL INFORMATION.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 31-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosbugh TOM VOSBUGH

DRAINAGE & EROSION CONTROL

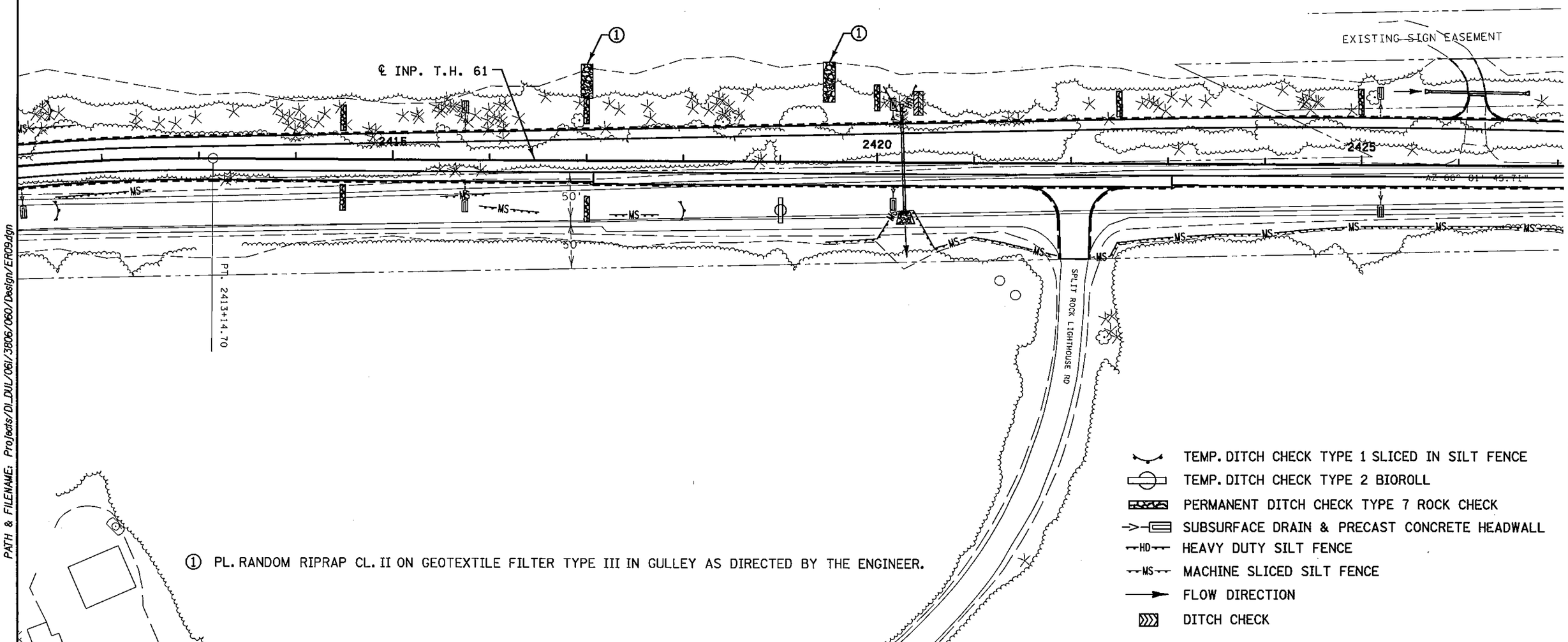
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 126 OF 200 SHEETS

PLOTTED/REVISED: 31-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: ER0-10
PATH & FILENAME: Projects/DL DUL/061/3806/060/Design/ER09.dgn

2420+27 PL. 24" X 100' RC PIPE CULVERT + 2 - 24" RC APRON WITH SAFETY GRATES
PL. RANDOM RIPRAP CL. III ON GEOTEXTILE FILTER TYPE IV AT OUTLET

2426+18 LT PL. 24" X 106' CP PIPE CULVERT (SMOOTH) +2 - 30" CAS PIPE APRONS



① PL. RANDOM RIPRAP CL. II ON GEOTEXTILE FILTER TYPE III IN GULLEY AS DIRECTED BY THE ENGINEER.

TEMP. DITCH CHECK TYPE 1 SLICED IN SILT FENCE
TEMP. DITCH CHECK TYPE 2 BIOROLL
PERMANENT DITCH CHECK TYPE 7 ROCK CHECK
SUBSURFACE DRAIN & PRECAST CONCRETE HEADWALL
HD HEAVY DUTY SILT FENCE
MS MACHINE SLICED SILT FENCE
FLOW DIRECTION
DITCH CHECK

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

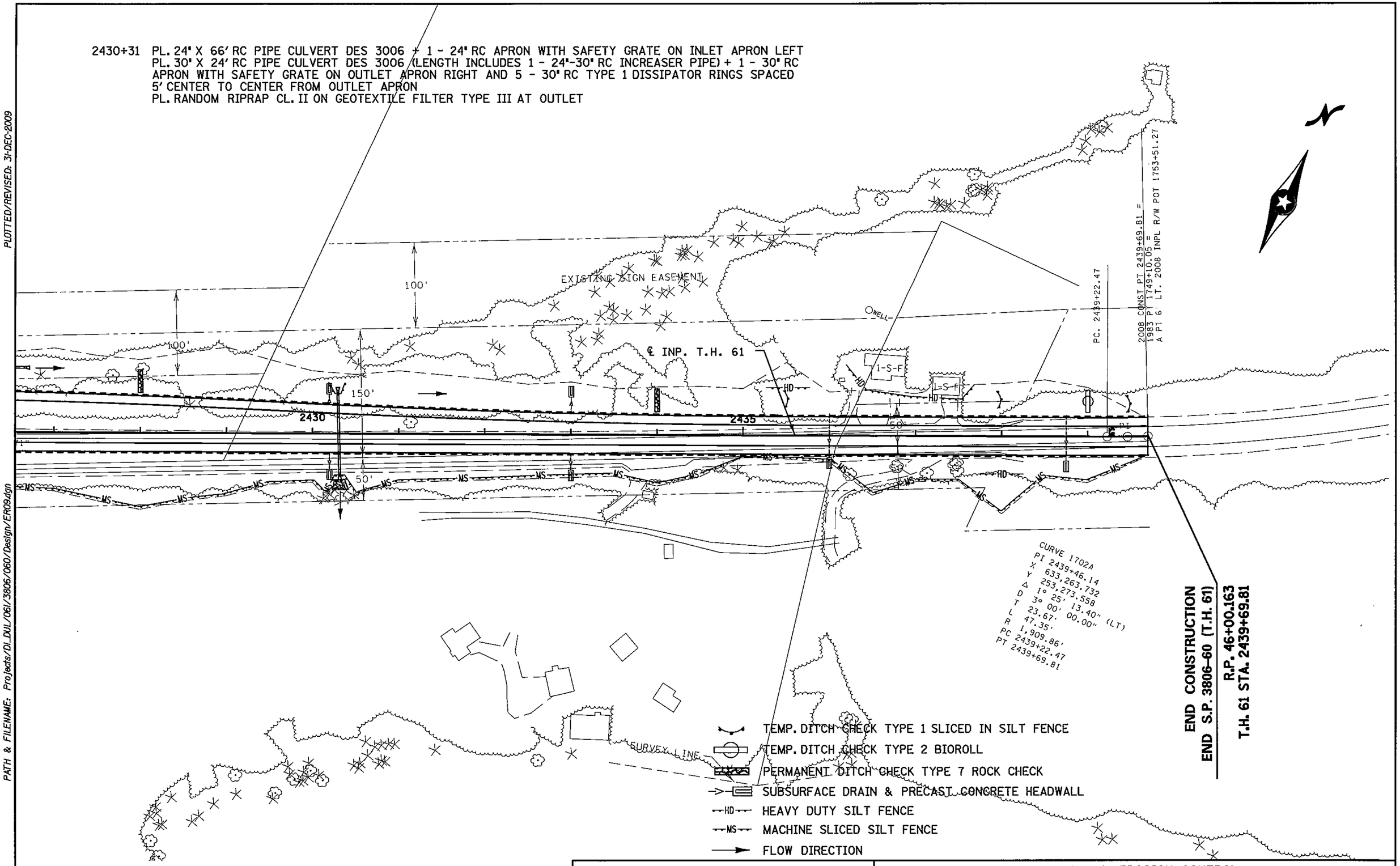
DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

DRAINAGE & EROSION CONTROL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 127 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010
DISTRICT #: DULUTH
IPLOT NAME: ERO-II
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ER09.dgn

2430+31 PL. 24" X 66' RC PIPE CULVERT DES 3006 + 1 - 24" RC APRON WITH SAFETY GRATE ON INLET APRON LEFT
PL. 30" X 24' RC PIPE CULVERT DES 3006 (LENGTH INCLUDES 1 - 24"-30" RC INCREASER PIPE) + 1 - 30" RC APRON WITH SAFETY GRATE ON OUTLET APRON RIGHT AND 5 - 30" RC TYPE 1 DISSIPATOR RINGS SPACED 5' CENTER TO CENTER FROM OUTLET APRON
PL. RANDOM RIPRAP CL. II ON GEOTEXTILE FILTER TYPE III AT OUTLET



I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

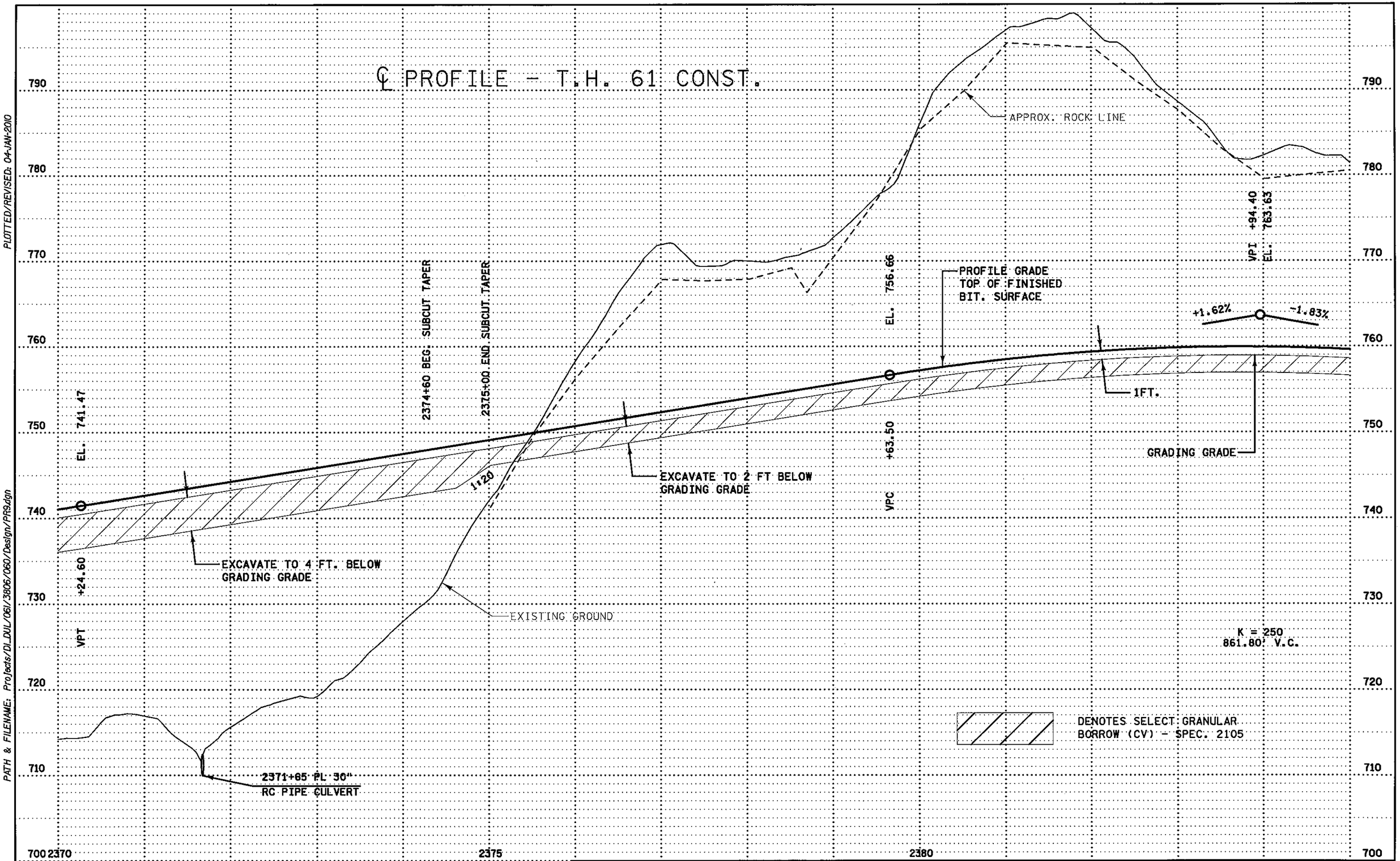
DATE 31-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

DRAINAGE & EROSION CONTROL

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 128 OF 200 SHEETS

PLOTTED/REVISED: 31-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: ERO-12
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/ER09.dgn



I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

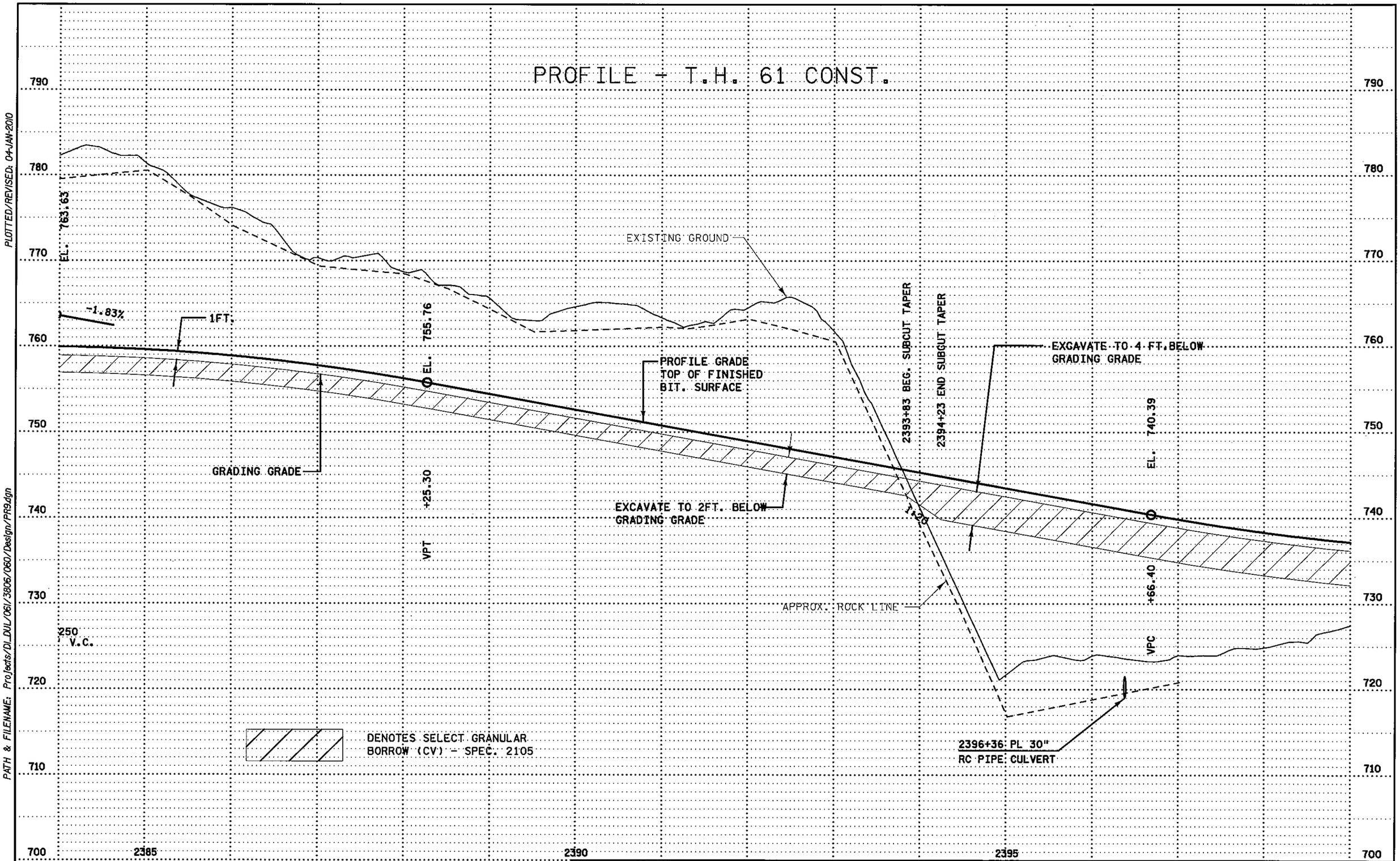
PROFILE

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 138 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010

DISTRICT #: DULUTH
IPLOT NAME: PR9
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/PR9.dgn

PROFILE - T.H. 61 CONST.



PLOTTED/REVISED: 04-JAN-2010

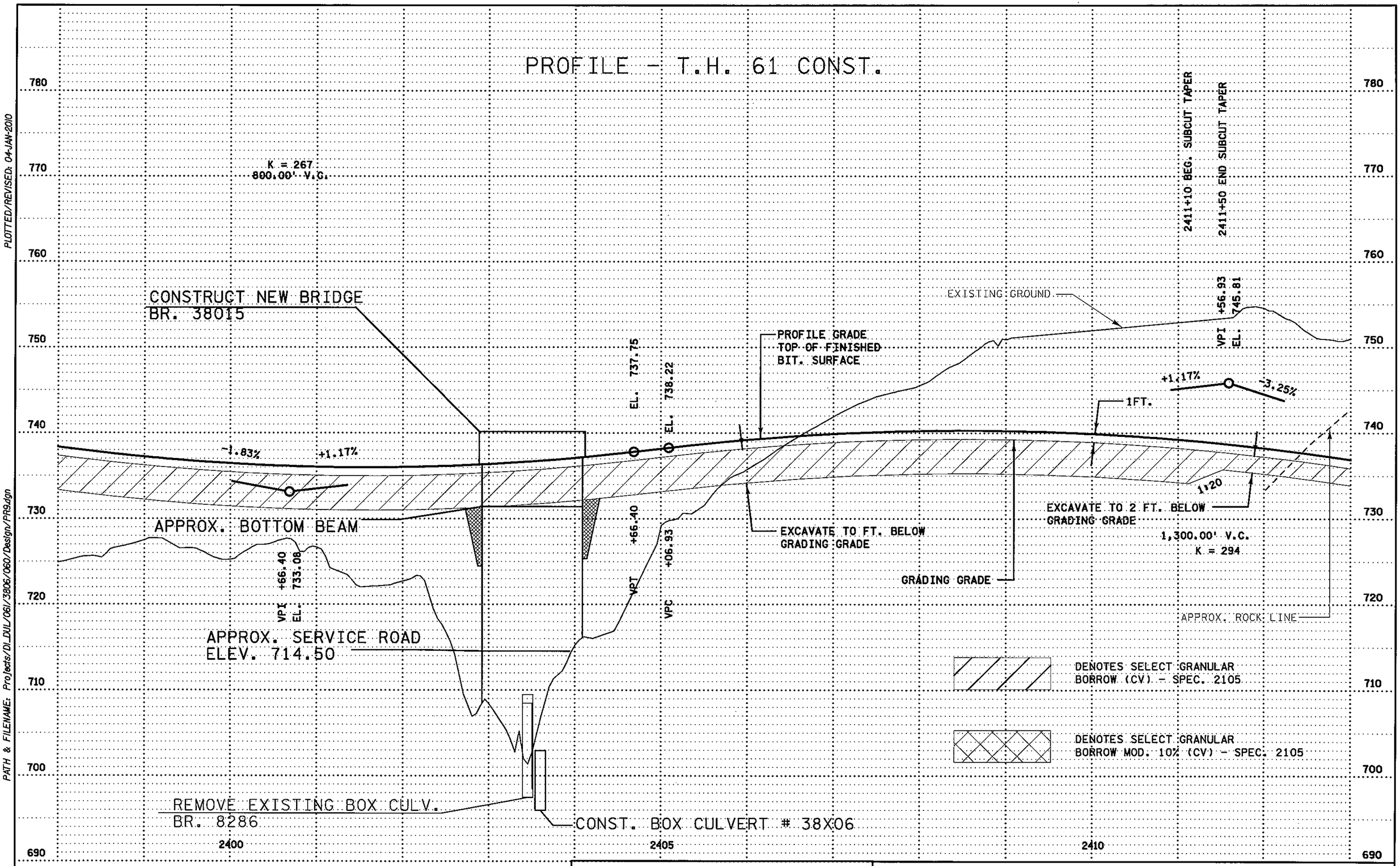
DISTRICT #: DULUTH
IPLOT NAME: pr10
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/PR9.dgn

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

PROFILE

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 139 OF 200 SHEETS



PLOTTED/REVISED: 04-JAN-2010

DISTRICT #: DULUTH
IPLOT NAME: prll
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/PR9.dgn

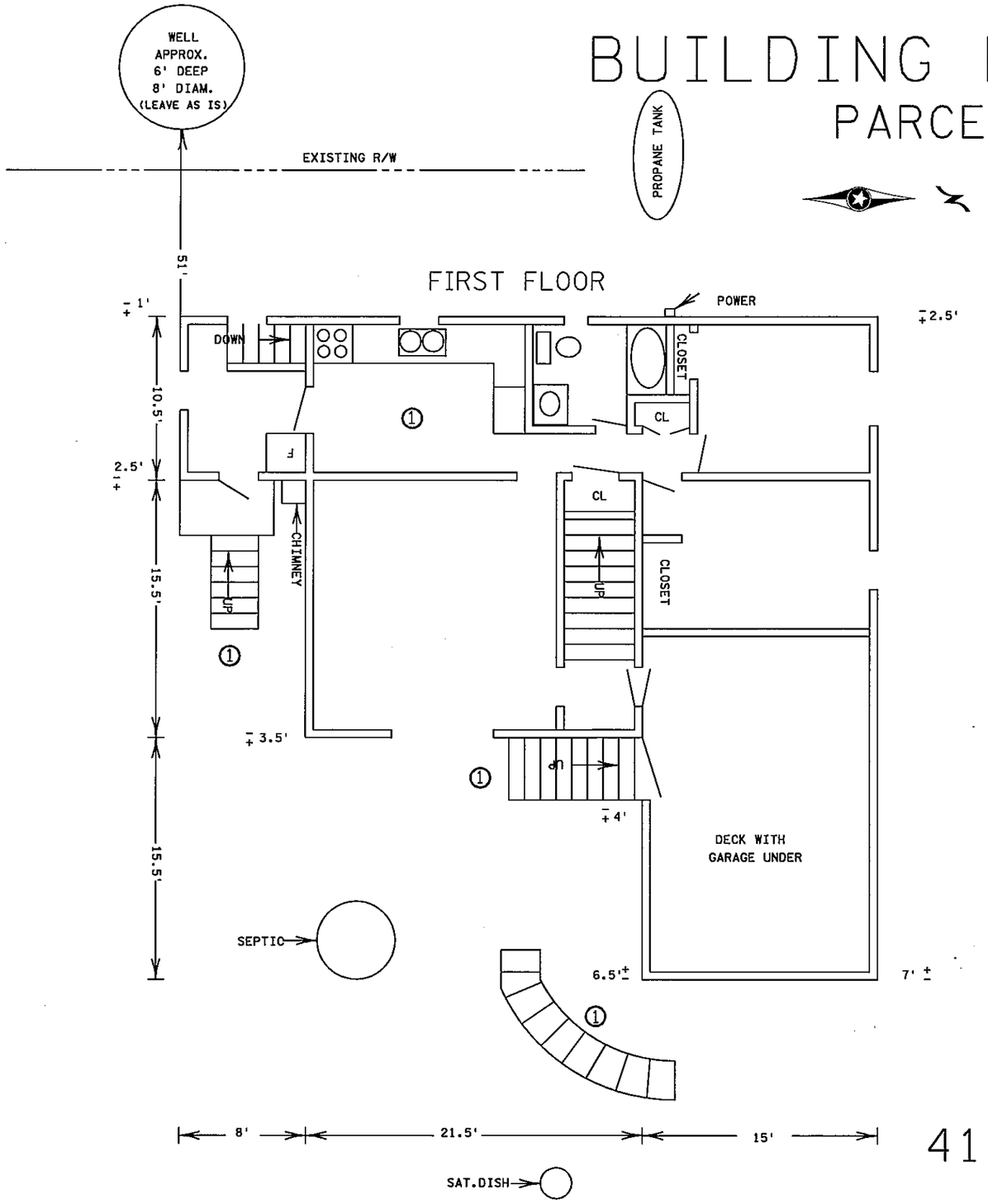
I HEREBY CERTIFY THAT THIS PLAN SHEET WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

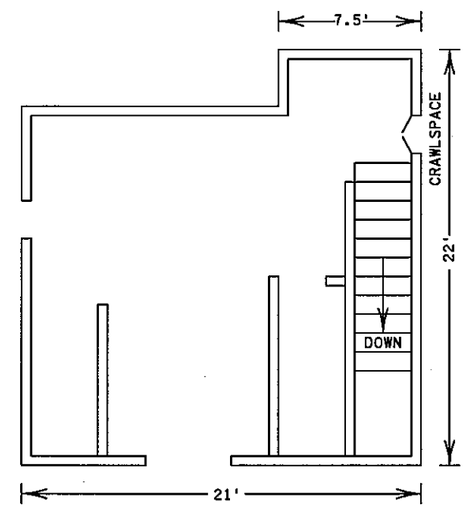
DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

PROFILE

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 140 OF 200 SHEETS

BUILDING REMOVAL A
PARCEL 75





SECOND FLOOR

4133 HWY 61

NO SCALE

① REMOVE CONCRETE WALK, STEPS AND PATIO (INCIDENTAL)

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.

DATE 04-JAN-2010 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

BUILDING REMOVAL - PARCEL75

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 145 OF 200 SHEETS

PLOTTED/REVISED: 04-JAN-2010

DISTRICT #: DULUTH
IPLOT NAME: Bldgrem_75_I
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/plan sheets/Building Removal/d3806-60_Bldgrem.dgn

NOTES & GUIDELINES

GENERAL INFORMATION

1. THE CONTRACTOR SHALL FURNISH, INSTALL AND MAINTAIN THE DEVICES IN THIS TRAFFIC CONTROL PLAN UNLESS OTHERWISE NOTED. IN PLACE SIGNING MUST ALSO BE MAINTAINED OR TEMPORARILY RELOCATED FOR CONSTRUCTION ACTIVITIES.

2. FIELD CONDITIONS MAY REQUIRE MODIFICATIONS OF THIS LAYOUT AS DEEMED NECESSARY BY THE ENGINEER.

3. ALL DISTANCES ARE APPROXIMATE. PLANS ARE NOT DRAWN TO SCALE.

4. THE CONTRACTOR IS RESPONSIBLE FOR PROTECTING ANY WORK AREAS NEAR TRAFFIC IN ACCORDANCE WITH THE MNMUTCD.

5. SIGN INSTALLATIONS SHALL NOT OBSTRUCT EXISTING SIGNS.

6. THE ITEM "TRAFFIC CONTROL" COVERS ALL DEVICES SHOWN ON THE PLAN SHEETS AND OTHER SETUPS REQUIRED BY THE CONTRACTOR'S OPERATIONS.

SIGNING

1. ALL TRAFFIC CONTROL DEVICES, INCLUDING OVERHEAD SIGNS ON ROADS OPEN TO TRAFFIC THAT ARE NOT CONSISTENT 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 ATTACHED TYPICAL SIGN FRAMING AND INSTALLATION DETAILS. 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 WITHIN 2 WEEKS (5-18.4(B)).

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 TEMPORARY RIGID ORANGE WARNING AND RIGID ORANGE GUIDE SIGNS SHALL BE FABRICATED WITH TYPE HP FLO (HIGH PERFORMANCE FLUORESCENT SIGN SHEETING FOR RIGID TEMPORARY OR PERMANENT SIGNS). ALL RIGID SIGNS INSTALLED, OTHER THAN THOSE WITH ORANGE BACKGROUNDS, ON A TEMPORARY BASIS SHALL BE FABRICATED WITH TYPE HP (HIGH PERFORMANCE SHEETING FOR RIGID PERMANENT SIGNS). INPLACE SIGNS THAT STILL APPLY DURING TEMPORARY OPERATIONS MAY REMAIN IN PLACE WITH NO CHANGE IN SIGN SHEETING REQUIRED.

   BARRICADES FABRICATED WITH EITHER ASTM TYPE VII, SIGN SHEETING FOR RIGID TEMPORARY SIGNS OR TYPE HP (HIGH PERFORMANCE SHEETING FOR RIGID PERMANENT SIGNS) MAY BE INTERMIXED AND USED ON ANY PROJECT UNTIL THE JANUARY 1, 2010 IMPLEMENTATION DATE.

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 PLACEMENT OF THE FINAL SIGNS TO ASSURE THAT THE FINAL SIGNS ARE PLACED AS NEEDED, OR PROVIDE TEMPORARY SIGNING AT THEIR EXPENSE UNTIL THE FINAL SIGNING IS PLACED.

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 THE 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. BARRIER DELINEATION SHALL BE INCLUDED IN THE LUMP SUM TRAFFIC CONTROL ITEM.

I HEREBY CERTIFY THAT THIS PLAN SHEET 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.
DATE 31-DEC-2009 LIC. NO. 26405 ENGINEER James A. Miles
JAMES A. MILES

PLOTTED/REVISED: 31-DEC-2009
DISTRICT : DULUTH
IPLOT NAME: t380660_tcl
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Traffic/Striping/t380660_pml.dgn

MATERIALS TABULATION

NOTES	DESCRIPTION	UNITS	KIOSK (1)	STONE MONUMENT (1)
	SIGN BASE			
	COMMON EXCAVATION	CU YD	3	3
	CLASS 5	CU YD	2	2
	FOOTINGS			
	18" X 48" CONCRETE CYLINDER	EACH		5
	24" X 48" CONCRETE CYLINDER	EACH	5	
	GRANULAR MATERIAL	CU YD	1	1
	1/2" STEEL NON-CORROSIVE "H" BRACKETS	EACH	4	
	EPOXY COATED REINFORCEMENT BAR - NO. 10	POUND	68	80
	STRUCTURE			
	48" X 48" X 32" BOULDER	EACH		1
	36" X 30" X 30" BOULDER	EACH		1
	30" X 24" X 24" BOULDER	EACH		1
	24" X 18" X 18" BOULDER	EACH		1
	18" X 18" X 18" BOULDER	EACH		1
	2" X 4" X 8' CEDAR POSTS	EACH	12	
	2" X8" X 5' ROUGH SAWN CEDAR	EACH	8	
	2" X8" X 4' ROUGH SAWN CEDAR	EACH	2	
	DOWEL BAR ANCHORS - 20"x1.5" GAL. BAR	EACH	1	
	DOWEL BAR ANCHORS - 16"x1.5" GAL. BAR	EACH	4	
	HARDWARE			
	5/8" X 10" GALV MACHINE BOLT ASSEMBLY	EACH	72	
	SPECIAL SURFACE TREATMENT	SQ. FT.	4	
	ALUMINUM INTERPRETIVE PANELS	EACH	4	

(1) PAID FOR AS EACH

DATE 12-07-2009 LIC. NO. 26551

SIGNATURE TODD A. CARROLL, LLA

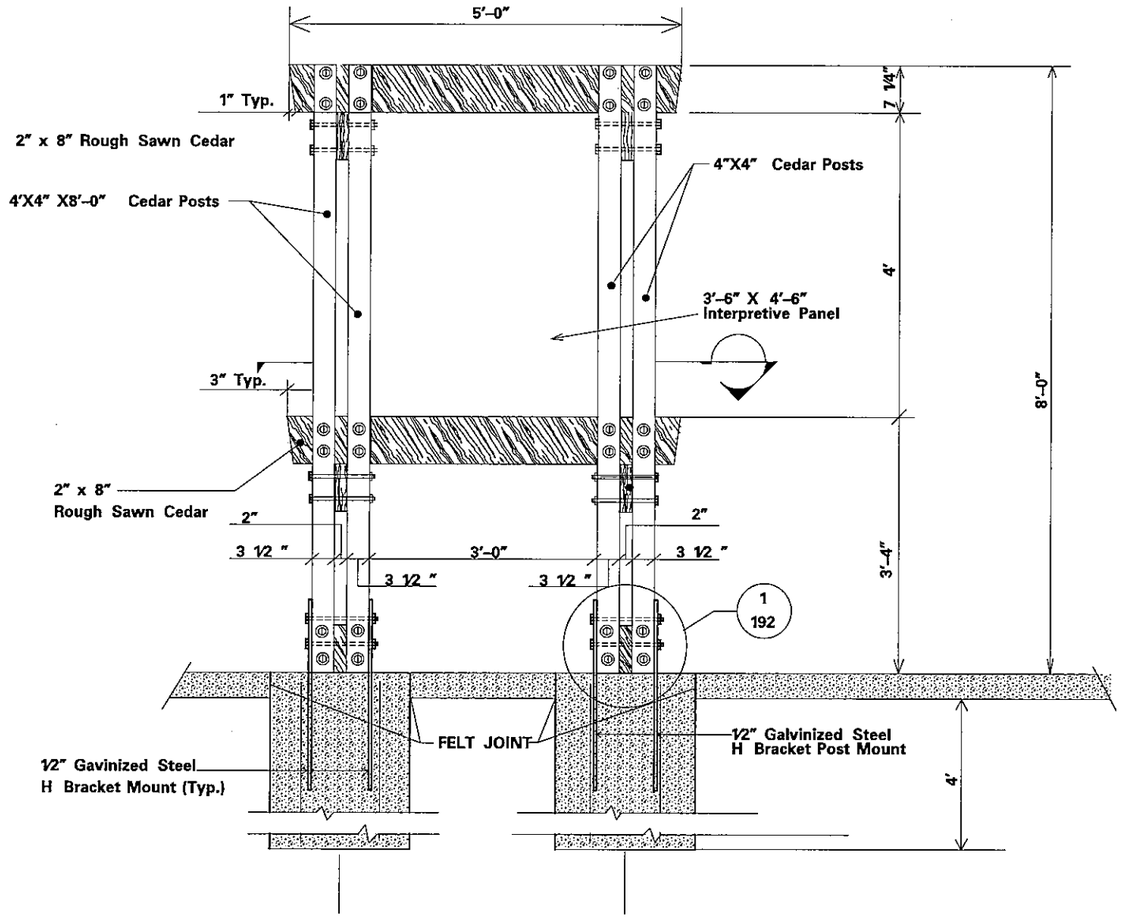
I HEREBY CERTIFY THAT THIS PLAN SHEET(S) 189-193 WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.

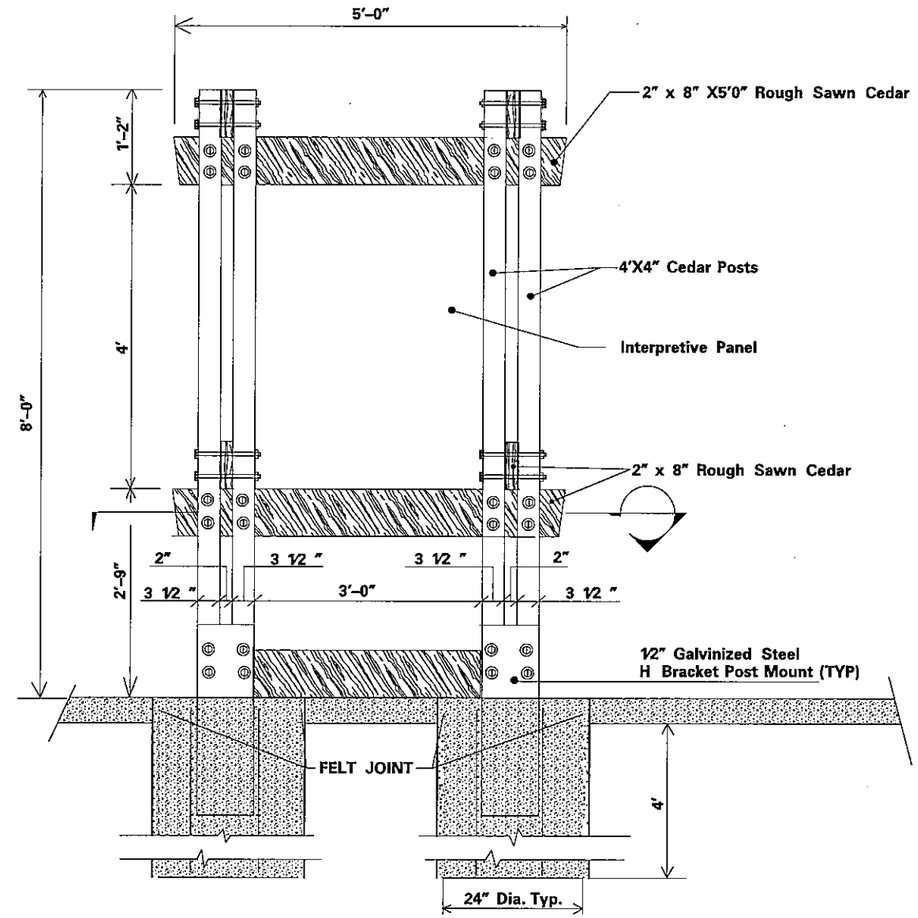
DATE MODIFIED:	TIME MODIFIED:	PROJECT MANAGER	DRAWN BY
1/6/2010	4:00:27 PM	SCOTT JOHNSON	SCOTT ROBINSON
			CHECKED BY TODD CARROLL

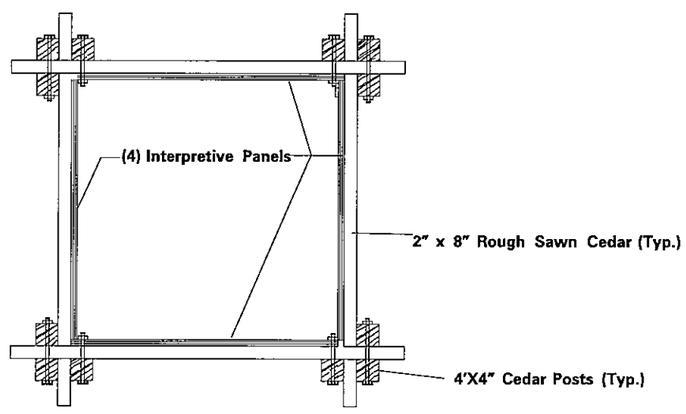
STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION
OFFICE OF TECHNICAL SUPPORT
LANDSCAPE ARCHITECTURE UNIT
TRANSPORTATION BUILDING
ST. PAUL, MINNESOTA 55155-1899

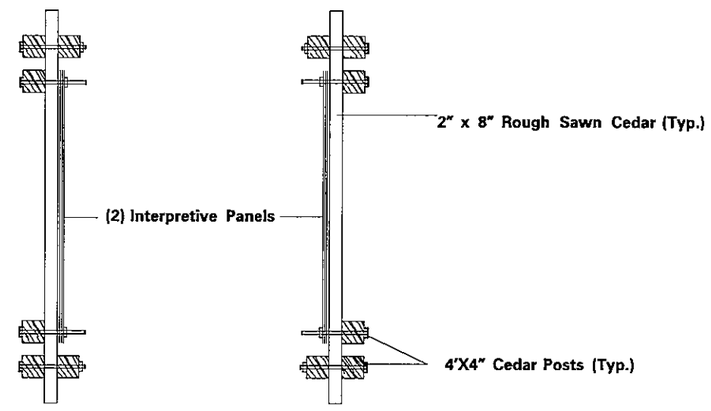
KISOK /STONE MONUMENT TABULATION

STATE PROJECT 3806-60 (T.H.61)





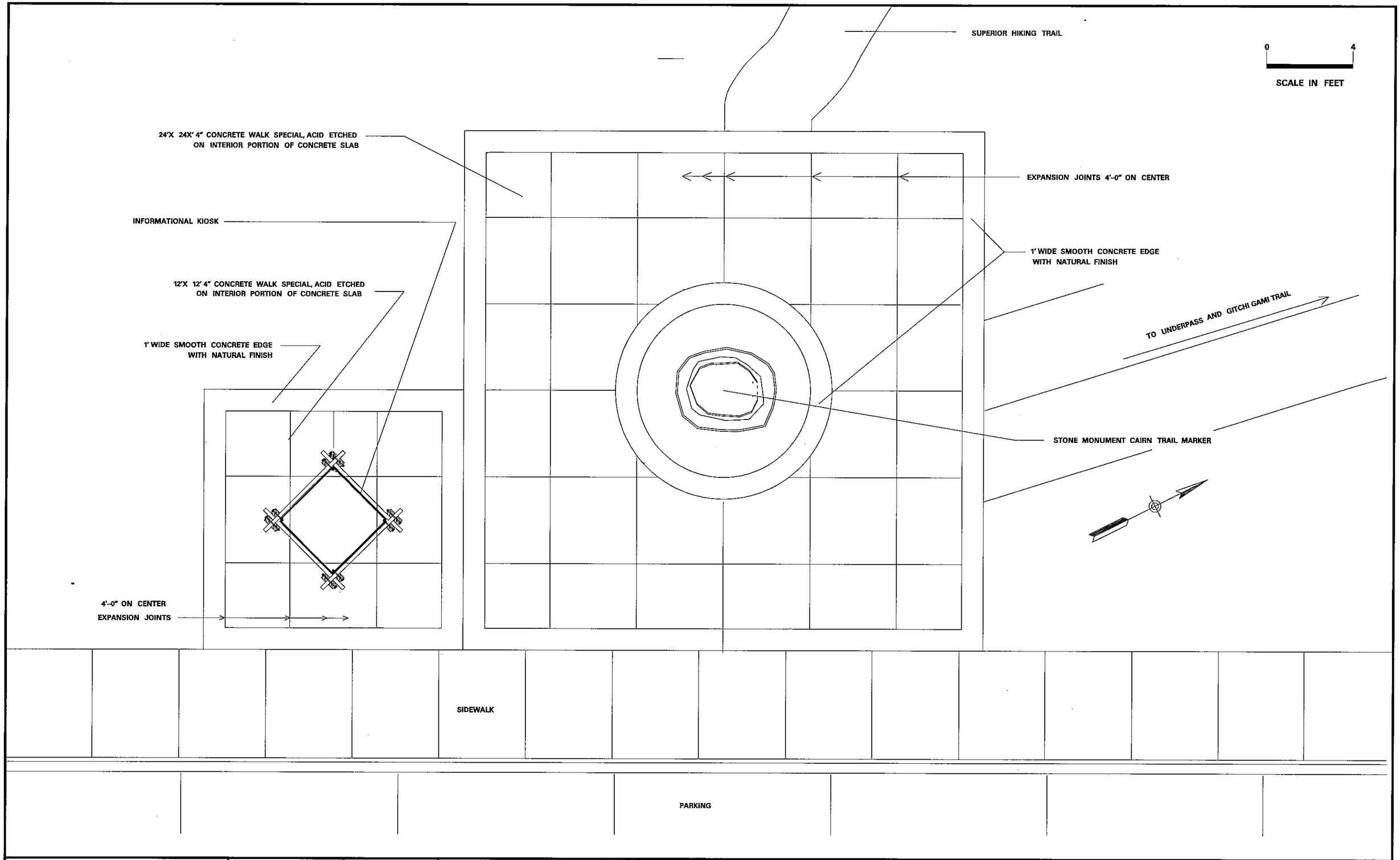




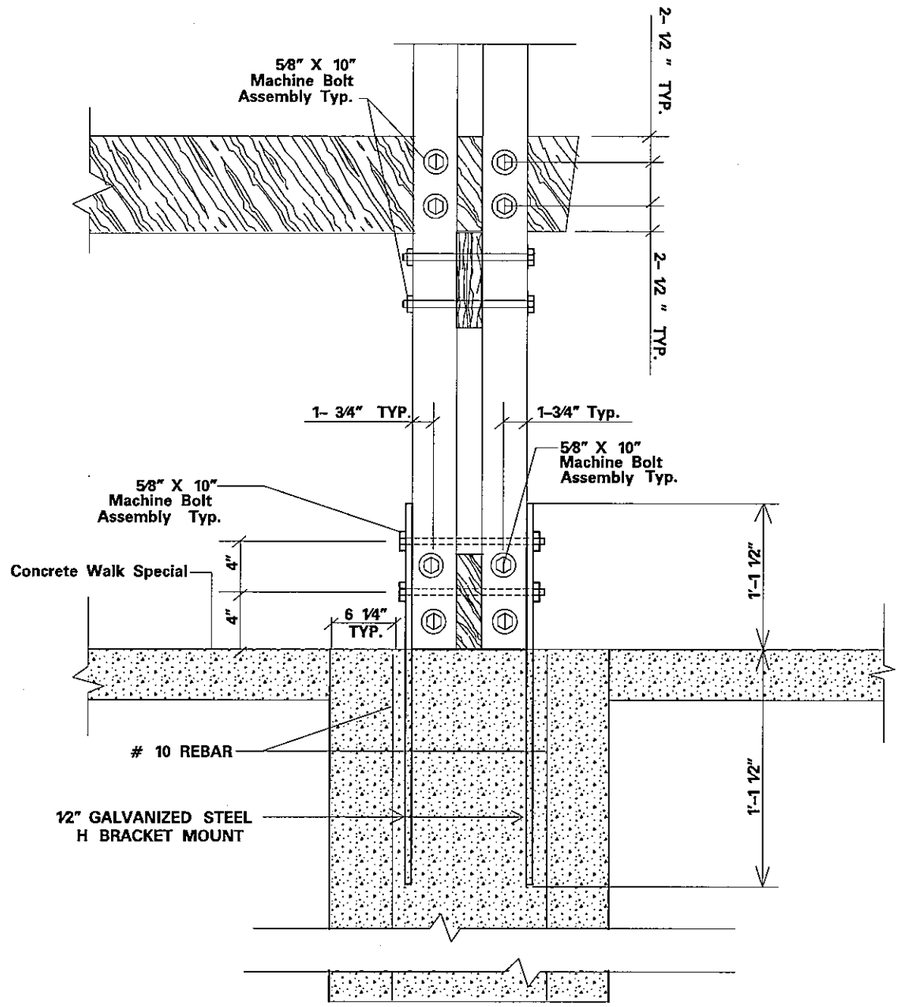
0 2

SCALE IN FEET

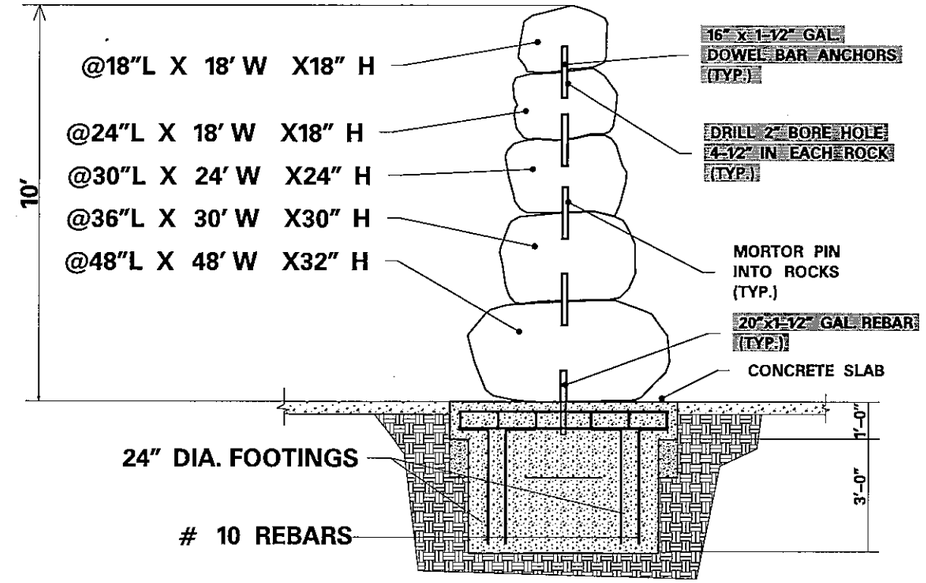
DATE MODIFIED: 1/5/2010	TIME MODIFIED: 2:34:21 PM	PROJECT MANAGER SCOTT JOHNSON	DRAWN BY SCOTT ROBINSON	DATE 9/23/2009 LIC. NO. 26552 SIGNATURE	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION OFFICE OF TECHNICAL SUPPORT LANDSCAPE ARCHITECTURE UNIT TRANSPORTATION BUILDING ST. PAUL, MINNESOTA 55155-1899	KIOSK DETAILS
			CHECKED BY TODD CARROLL	I HEREBY CERTIFY THAT THIS PLAN, SPECS WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.		STATE PROJECT 3806-60 (T.H.61) SHEET NO. 190 OF 200 SHEETS



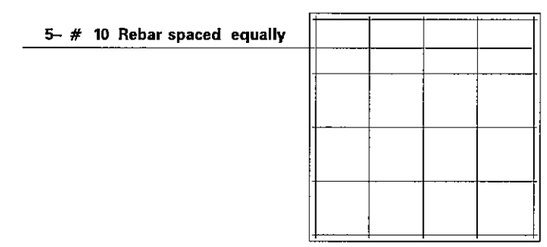
DATE MODIFIED:	TIME MODIFIED:	PROJECT MANAGER	DRAWN BY		STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION OFFICE OF TECHNICAL SUPPORT LANDSCAPE ARCHITECTURE UNIT TRANSPORTATION BUILDING ST. PAUL, MINNESOTA 55155-1899	KIOSK PLAN	
1/5/2010	2:34:22 PM	SCOTT JOHNSON	SCOTT ROBINSON	DATE 9/23/2009 LIC. NO. 18551 SIGNATURE I HEREBY CERTIFY THAT THIS PLAN, SPEC WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.		STATE PROJECT 3806-60 (T.H.61)	SHEET NO. 191 OF 200 SHEETS
			CHECKED BY TODD CARROLL				



1
190



STONE MONUMENT

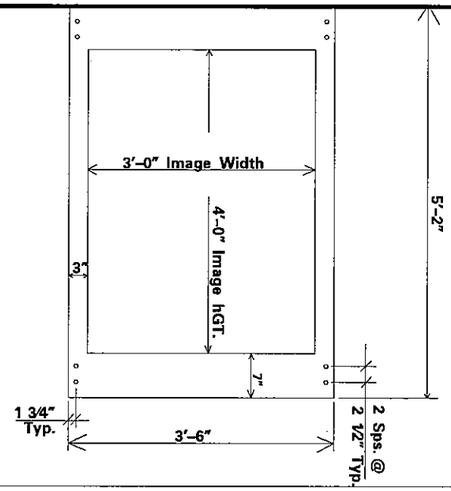


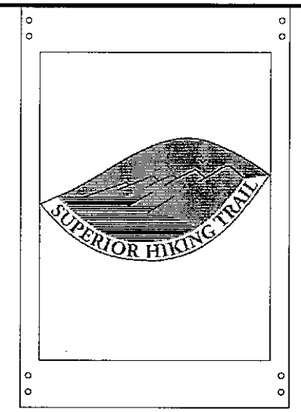
STONE MONUMENT FOOTING

0 4
SCALE IN FEET

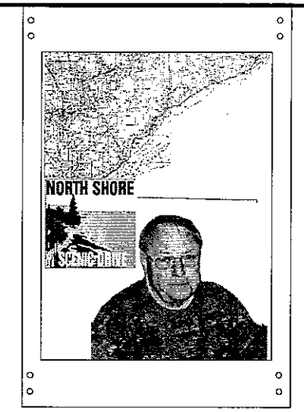
DATE MODIFIED:	TIME MODIFIED:	PROJECT MANAGER	DRAWN BY		STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION OFFICE OF TECHNICAL SUPPORT LANDSCAPE ARCHITECTURE UNIT TRANSPORTATION BUILDING ST. PAUL, MINNESOTA 55155-1899	KIOSK/STONE MONUMENT DETAILS	
1/5/2010	2:34:24 PM	SCOTT JOHNSON	SCOTT ROBINSON	DATE 9/23/2009 LIC. NO. 28551 SIGNATURE I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.		STATE PROJECT 3806-60 (T.H.61)	SHEET NO. 192 OF 200 SHEETS
			CHECKED BY TODD CARROLL				

Interpretive Signs Typical Dimesions

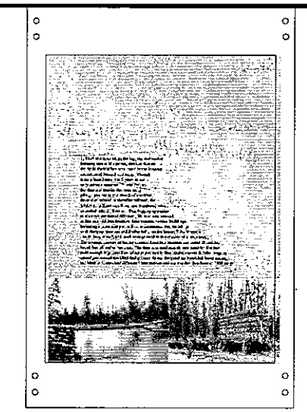




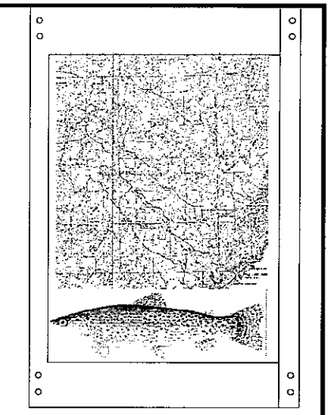
Panel # 4
Superior Hiking Trail



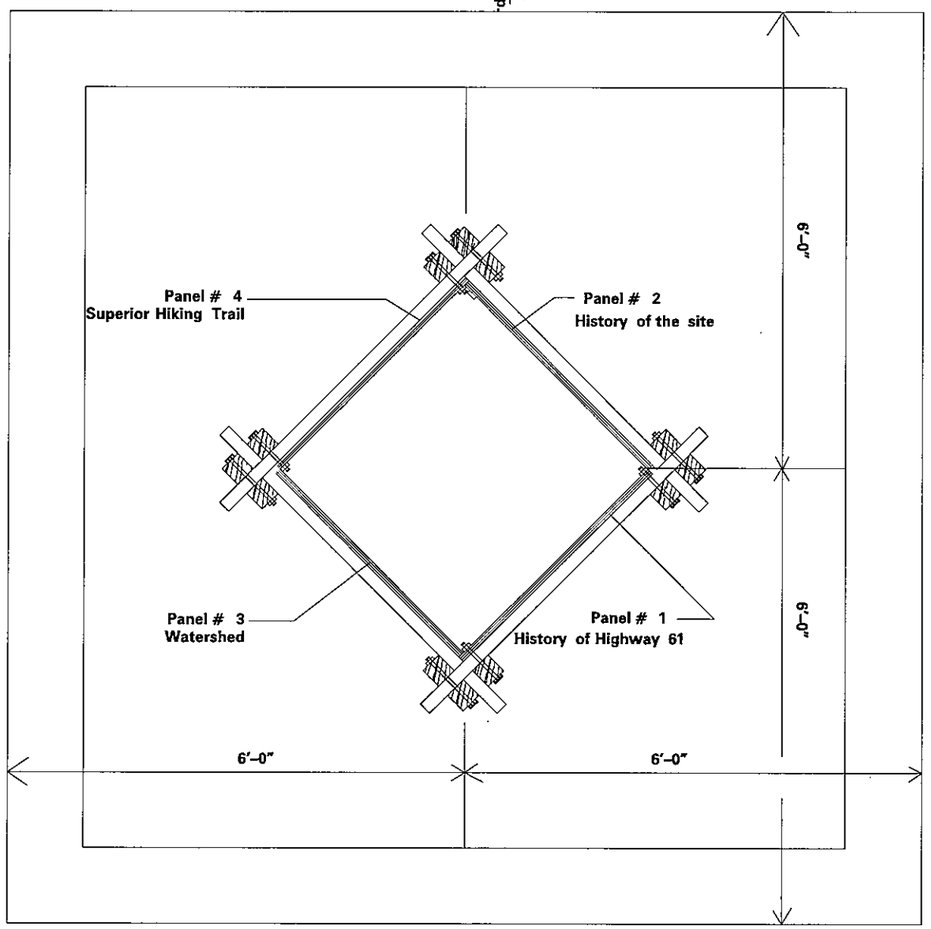
Panel # 1
History of Highway 61



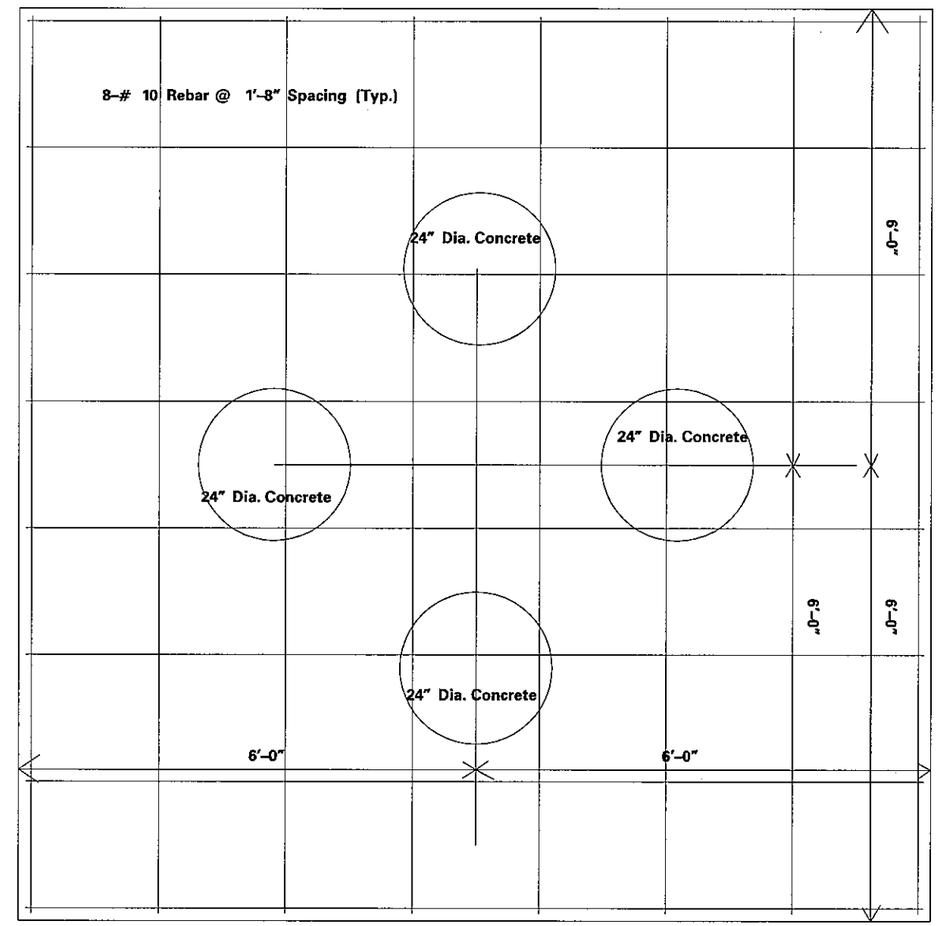
Panel # 2
History of the site



Panel # 3
Watershed



Sidewalk and parking Lot



Sidewalk and parking Lot

0 2
SCALE IN FEET

DATE MODIFIED: 1/5/2010	TIME MODIFIED: 4:00:34 PM	PROJECT MANAGER SCOTT JOHNSON	DRAWN BY SCOTT ROBINSON	DATE 9/23/2009 LIC. NO. 26551 SIGNATURE	STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION OFFICE OF TECHNICAL SUPPORT LANDSCAPE ARCHITECTURE UNIT TRANSPORTATION BUILDING ST. PAUL, MINNESOTA 55155-1899	KIOSK SIGN DETAIL	
			CHECKED BY TODD CARROLL	I HEREBY CERTIFY THAT THIS PLAN, SPECIFICATION, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL LANDSCAPE ARCHITECT UNDER THE LAWS OF THE STATE OF MINNESOTA.		STATE PROJECT 3806-60 (T.H.61)	SHEET NO. 193 OF 200 SHEETS

U.S. DEPARTMENT OF THE INTERIOR

FISH AND WILDLIFE SERVICE

Prepared by National Wetlands Inventory

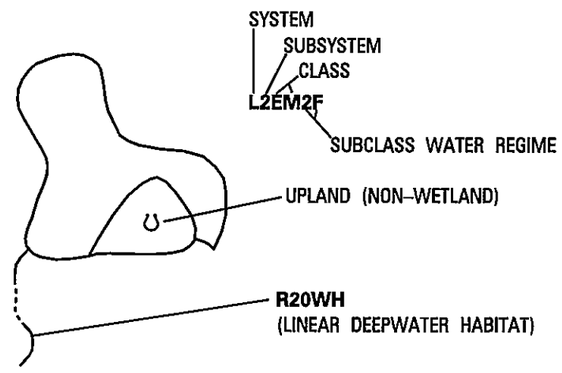
1992

SPECIAL NOTE

This document was prepared primarily by stereoscopic analysis of high altitude aerial photographs. Wetlands were identified on the photographs based on vegetation, visible hydrology, and geography in accordance with **Classification of Wetlands and Deepwater Habitats of the United States** (FWS/OBS – 79/31 December 1979). The aerial photographs typically reflect conditions during the specific year and season when they were taken. In addition, there is a margin of error inherent in the use of the aerial photographs. Thus, a detailed on the ground and historical analysis of a single site may result in a revision of the wetland boundries established through photographic interpretation. In addition, some small wetlands and those obscured by dense forest cover may not be included on this document.

Federal, State and local regulatory agencies with jurisdiction over wetlands may define and describe wetlands in a different manner than that used in this inventory. There is no attempt, in either the design or products of this inventory, to define the limits of proprietary jurisdiction of any Federal, State or local government or to establish the geographical scope of the regulatory programs of government agencies. **Persons Intending to engage in activities involving modification within or adjacent to wetland areas should seek the advice of appropriate Federal, State or local agencies concerning specified agency regulatory programs and proprietary jurisdiction that may affect such activities.**

SYMBOLOGY EXAMPLE



NOTES TO THE USER

- Wetlands which have been field examined are indicated on the map by an asterisk (*).
- Additions or corrections to the wetlands information displayed on this map are solicited. Please forward such information to the address indicated.
- Subsystems, Classes, Subclasses, and Water Regimes in *italics* were developed specifically for NATIONAL WETLANDS INVENTORY mapping.
- Some Areas designated as R4SB, R4SBW, OR R4SBJ (INTERMITTENT STREAMS) may not meet the definition of wetland.
- This map uses the class Unconsolidated Shore (US). On earlier NWI maps that class was designated Beach/Bar (BB), or Flat (FL). Subclasses remain the same in both versions.

Ʊ — Primarily represents **upland** areas, but may include unclassified wetlands such as man–modified areas, non photo–identifiable areas and/or unintentional omissions.

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DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

WETLANDS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 194 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT #:
IPLOT NAME: wetl
PATH & FILENAME:

PLOTTED/REVISED: 09-DEC-2009

SYSTEM — **M – MARINE**

SUBSYSTEM — **1 – SUBTIDAL**

CLASS	RB – ROCK BOTTOM	UB – UNCONSOLIDATED BOTTOM	AB – AQUATIC BED	RF – REEF	OW – OPEN WATER/ *Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic	1 Algal 3 Rotted Vascular 5 Unknown Submergent	1 Coral 3 Worm	

SUBSYSTEM — **2 – INTERTIDAL**

CLASS	AB – AQUATIC BED	RF – REEF	RS – ROCKY SHORE	US – UNCONSOLIDATED SHORE
Subclass	1 Algal 3 Rotted Vascular 5 Unknown Submergent	1 Coral 3 Worm	1 Bedrock 2 Rubble	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic

SYSTEM — **R – RIVERINE**

SUBSYSTEM — **1 – TIDAL**

CLASS	RB – ROCK	UB – UNCONSOLIDATED BOTTOM
Subclass	1 Bedrock 2 Rubble	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic

SUBSYSTEM — **2 – LOWER PERENNIAL**

CLASS	*SB – Streambed	AB – Aquatic Bed	RS – ROCKY SHORE	US – UNCONSOLIDATED SHORE	**EM – EMERGENT	OW – OPEN WATER/ *Unknown Bottom*
Subclass	1 Bedrock 2 Rubble 3 Cobble–Gravel 4 Sand 5 Mud 6 Organic 7 Vegetated	1 Algel 2 Aquatic Moss 3 Rotted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Bedrock 2 Rubble	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	2 Nonpersistent	

SUBSYSTEM — **3 – UPPER PERENNIAL**

SUBSYSTEM — **4 – INTERMITTENT**

SUBSYSTEM — **5 – UNKNOWN PERENNIAL**

*STREAMBED is limited to TIDAL and INTERMITTENT SUBSYSTEMS and comprises the only CLASS in the INTERMITTENT SUBSYSTEM

**EMERGENT is limited to TIDAL and LOWER PERENNIAL SUBSYSTEMS – The remaining CLASSES are found in all SUBSYSTEMS

SYSTEM — **P – PALUSTRINE**

CLASS	RB – ROCK BOTTOM	UB – UNCONSOLIDATED BOTTOM	AB – AQUATIC BED	US – UNCONSOLIDATED SHORE	ML – MOSS–LICHEN	EM – EMERGENT	SS – SCRUB–SHRUB	FO – FORESTED	OW – OPEN WATER/ *Unknown Bottom*
Subclass	1 Bedrock 2 Rubble	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic	1 Algel 2 Aquatic Moss 3 Rotted Vascular 4 Floating Vascular 5 Unknown Submergent 6 Unknown Surface	1 Cobble–Gravel 2 Sand 3 Mud 4 Organic 5 Vegetated	1 Moss 2 Lichen	1 Persistent 2 Nonpersistent	1 Broad–Leaved Deciduous 2 Needle–Leaved Deciduous 3 Broad–Leaved Evergreen 4 Needle–Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	1 Broad–Leaved Deciduous 2 Needle–Leaved Deciduous 3 Broad–Leaved Evergreen 4 Needle–Leaved Evergreen 5 Dead 6 Deciduous 7 Evergreen	

DISTRICT #:
IPLOT NAME: WET2
PATH & FILENAME:

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DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosbergh
TOM VOSBERGH

WETLANDS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 195 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009

E – ESTUARINE (SYSTEM)

1 – SUBTIDAL (SUBSYSTEM)

- **RB – ROCK BOTTOM**
  - 1 Bedrock
  - 2 Rubble
- **UB – UNCONSOLIDATED BOTTOM**
  - 1 Cobble–Gravel
  - 2 Sand
  - 3 Mud
  - 4 Organic
- **AB – AQUATIC BED**
  - 1 Algal
  - 3 Rotted Vascular
  - 4 Floating Vascular
  - 5 *Unknown Submergent*
  - 6 *Unknown Surface*
- **RF – REEF**
  - 2 Mollusc
  - 3 Worm
- **OW – OPEN WATER/** *Unknown Bottom*

2 – INTERTIDAL (SUBSYSTEM)

- **AB – AQUATIC BED**
  - 1 Algal
  - 3 Rotted Vascular
  - 4 Floating Vascular
  - 5 *Unknown Submergent*
  - 6 *Unknown Surface*
- **RF – REEF**
  - 2 Mollusc
  - 3 Worm
- **SB – STREAMBED**
  - 1 Cobble–Gravel
  - 2 Sand
  - 3 Mud
  - 4 Organic
- **RS – ROCKY SHORE**
  - 1 Bedrock
  - 2 Rubble
- **US – UNCONSOLIDATED SHORE**
  - 1 Cobble–Gravel
  - 2 Sand
  - 3 Mud
  - 4 Organic
- **EM – EMERGENT**
  - 1 Persistent
  - 2 Nonpersistent
- **SS – SCRUB–SHRUB**
  - 1 Broad–Leaved Deciduous
  - 2 Needle–Leaved Deciduous
  - 3 Broad–Leaved Evergreen
  - 4 Needle–Leaved Evergreen
  - 5 Dead
  - 6 Deciduous
  - 7 Evergreen
- **FO – FORESTED**
  - 1 Broad–Leaved Deciduous
  - 2 Needle–Leaved Deciduous
  - 3 Broad–Leaved Evergreen
  - 4 Needle–Leaved Evergreen
  - 5 Dead
  - 6 Deciduous
  - 7 Evergreen

(CLASS — Subclass)

L – LACUSTRINE (SYSTEM)

1 – LIMNETIC (SUBSYSTEM)

- **RB – ROCK BOTTOM**
  - 1 Bedrock
  - 2 Rubble
- **UB – UNCONSOLIDATED BOTTOM**
  - 1 Cobble–Gravel
  - 2 Sand
  - 3 Mud
  - 4 Organic
- **AB – AQUATIC BED**
  - 1 Algal
  - 2 Aquatic Moss
  - 3 Rotted Vascular
  - 4 Floating Vascular
  - 5 *Unknown Submergent*
  - 6 *Unknown Surface*
- **OW – OPEN WATER/** *Unknown Bottom*

2 – LITTORAL (SUBSYSTEM)

- **RB – ROCK BOTTOM**
  - 1 Bedrock
  - 2 Rubble
- **UB – UNCONSOLIDATED BOTTOM**
  - 1 Cobble–Gravel
  - 2 Sand
  - 3 Mud
  - 4 Organic
- **AB – AQUATIC BED**
  - 1 Algal
  - 2 Aquatic Moss
  - 3 Rotted Vascular
  - 4 Floating Vascular
  - 5 *Unknown Submergent*
  - 6 *Unknown Surface*
- **RS – ROCKY SHORE**
  - 1 Bedrock
  - 2 Rubble
- **US – UNCONSOLIDATED SHORE**
  - 1 Cobble–Gravel
  - 2 Sand
  - 3 Mud
  - 4 Organic
  - 5 Vegetated
- **EM – EMERGENT**
  - 2 Nonpersistent
- **OW – OPEN WATER/** *Unknown Bottom*

(CLASS — Subclass)

MODIFIERS

In order to more adequately describe wetland and deepwater habitats one or more of the water regime, water chemistry, soil, or special modifiers may be applied at the class or lower level in the hierarchy. The farmed modifier may also be applied to the ecological system.

WATER REGIME

Non–Tidal

- A Temporarily Flooded
- B Saturated
- C Seasonally Flooded
- D *Seasonally Flooded/ Well Drained*
- E *Seasonally Flooded/ Saturated*
- F Semipermanently Flooded
- G Intermittently Exposed
- H Permanently Flooded
- J Intermittently Flooded
- K Artificially Flooded
- W Intermittently Flooded/Temporary
- Y Saturated/Semipermanent/ Seasonal
- Z Intermittently Exposed/Permanent
- U *Unknown*

Tidal

- K *Artificially Flooded*
- L Subtidal
- M Irregularly Exposed
- N Regularly Flooded
- P Irregularly Flooded
- * S Temporary–Tidal
- * R Seasonal–Tidal
- * T Semipermanent–Tidal
- * V Permanent–Tidal
- U *Unknown*

* These water regimes are only used in tidally influenced, freshwater systems.

WATER CHEMISTRY

Coastal Halinity

- 1 Hyperhaline
- 2 Euhaline
- 3 Mixohaline *(Brackish)*
- 4 Polyhaline
- 5 Mesohaline
- 6 Oligohaline
- 0 Fresh

Inland Salinity

- 7 Hypersaline
- 8 Eusaline
- 9 Mixosaline
- 0 Fresh

pH Modifiers for all Fresh Water

- a Acid
- t Circumneutral
- l Alkaline

SOIL

- g Organic
- n Mineral

SPECIAL MODIFIERS

- b Beaver
- d *Partially Drained/Ditched*
- f Farmed
- h *Diked/Impounded*
- r Artificial Substrate
- s *Spoil*
- x Excavated

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DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

WETLANDS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 196 OF 200 SHEETS

DISTRICT #:
IPLOT NAME: wet3
PATH & FILENAME:

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Project Description
SP 3806-60 (T.H.61) consists of drainage, grading, bituminous paving, bridge construction over unnamed stream, rest area construction
Construction activities include excavation and grading for subcut treatments & culvert installation.
Net length of project S.P. 3806-60 is 3.30 miles

LIST OF MPCA, DNR special waters on this project.
SPLIT ROCK RIVER
LAKE SUPERIOR
(2) UNNAMED STREAMS

List of MPCA, DNR Impaired Lakes & Rivers
LAKE SUPERIOR

Project Engineer
The Project Engineer and the Contractor are responsible for implementation of the SWPPP and the installation, inspection, and maintenance of the erosion prevention and sediment control BMPs before and during construction. MN/DOT District 1 staff and members of MN/DOT's Office of Environmental Service are also available for assistance. MN/DOT District 1 Maintenance is responsible for long term operation and maintenance of the permanent storm water management system.

MN/DOT District 1
Duluth Headquarters
1123 Mesaba Avenue
Duluth, MN 55811
(218) 725-2800

Timing of BMP Installation
The erosion prevention and sediment control BMP's shall be installed as necessary to minimize erosion from disturbed surfaces and capture sediment on site, and shall meet the NPDES Permit Part IV Construction Activity Requirements

S.P. 3806-60
Area of Disturbance 47.01 acres
Existing Area of Impervious Surface = 15.81 acres
Post Construction Impervious Surface = 20.02 acres
New Impervious Area 4.21 acres = 183,364 sq. ft.

Construction Notes
Construction shall be governed by MN/DOT Spec Book and the special provisions. The Contractor shall keep the inspection and maintenance log.

TMDL Implementation Plans Containing Storm Water Requirements
No TMDL Implementation Plans currently exist for the receiving waters on this project.

Location of SWPPP Requirements In Project Plan

DESCRIPTION	TITLE	LOCATION
Summary of Impervious Area	SWPPP	197
Direction of Flow	TURF. ESTAB. & EROSION CONTROL	117 - 128
Receiving Surface Waters	SWPPP	197
Final stabilization	TURF. ESTAB. & EROSION CONTROL	117 - 128
Drainage Structures	Tab	17
Drainage Tabulation	Tab	17
Erosion Control Tabulation	Tab	19 - 20
Erosion Control Sheets	TURF. ESTAB. & EROSION CONTROL	117 - 128
Erosion Control Details	Standard Plan Sheets	80 - 85
Soil types	BORINGS	NA
Topographic features	ALIGN, TOPOG, R/W, REMOVALS	93 - 104
Construction limits	PLAN CONSTRUCTION	105 - 116
Locations not to disturb	NA	96
Pre Construction Grades	PROFILES	129 - 142
Final Grades	PROFILES	129 - 142

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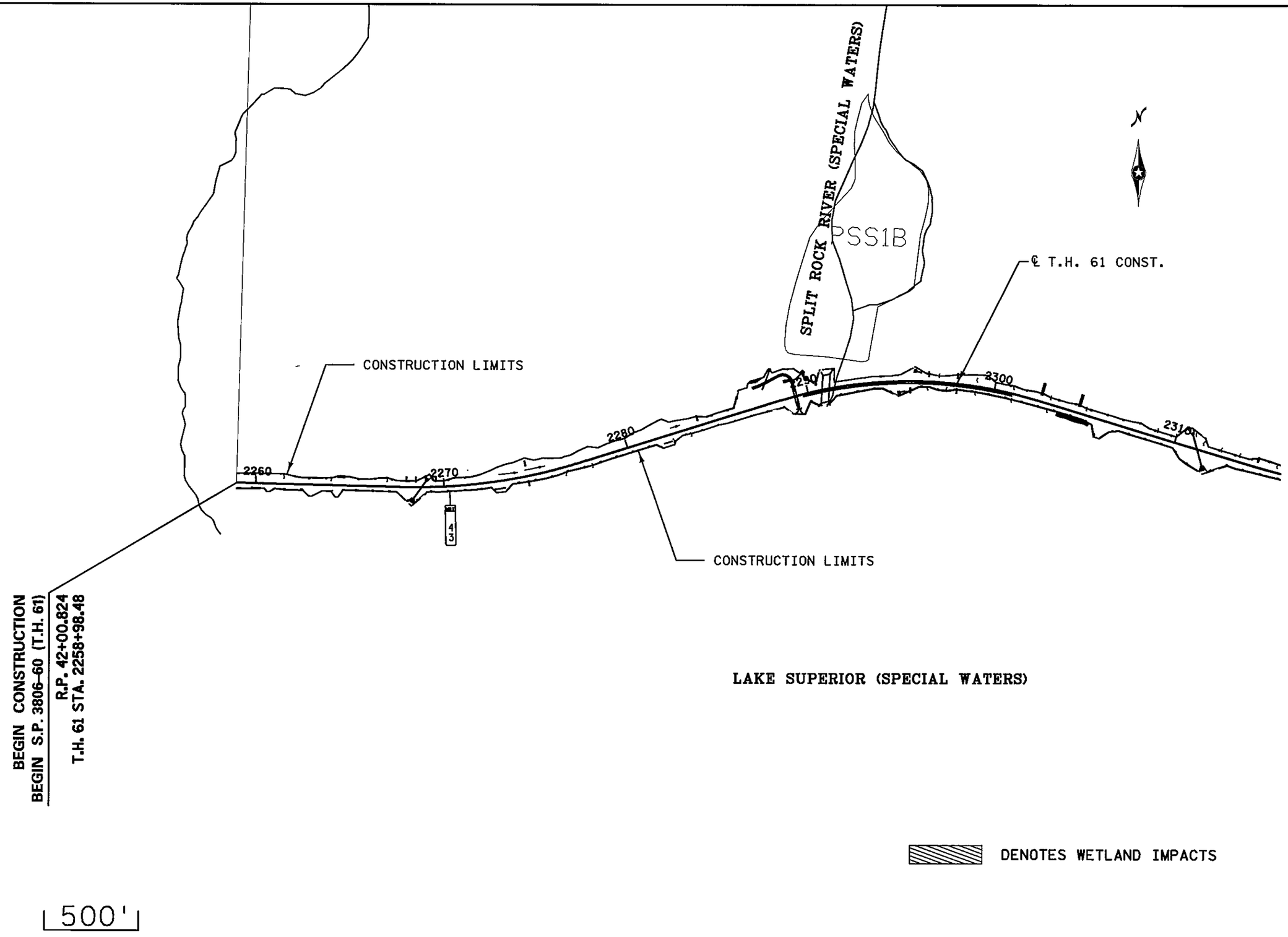
DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

SWPPP
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 197 OF 200 SHEETS

PLOTTED/REVISED: 09-DEC-2009
DISTRICT #: DULUTH
IPLOT NAME: wet4
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/WET.dgn

PLOTTED/REVISED: 09-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: wet5
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/WET1.dgn



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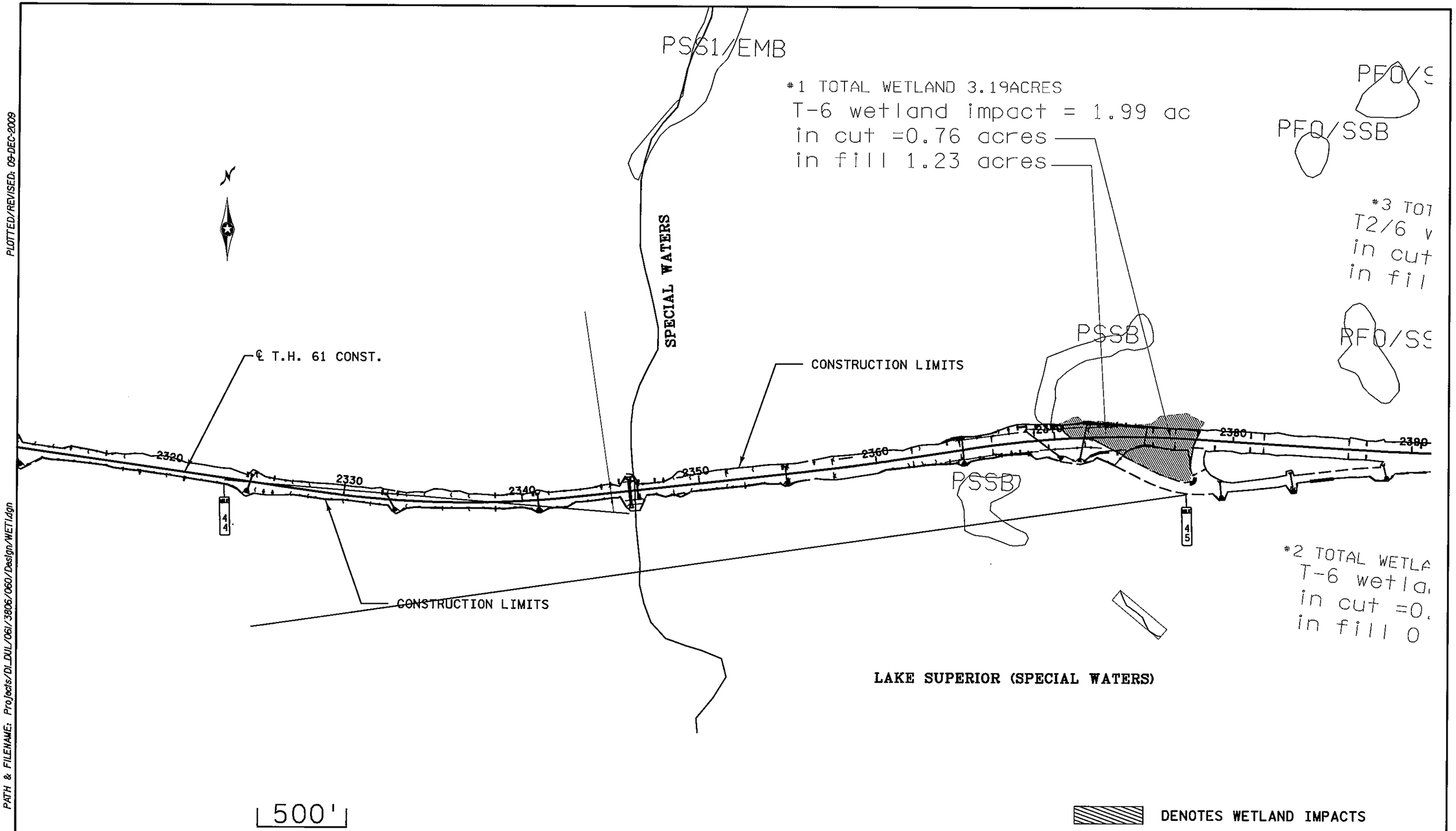
DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh
TOM VOSBURGH

WETLANDS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 198 OF 200 SHEETS



DISTRICT #: DULUTH
IPLOT NAME: wet6
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/WET1.dgn
PLOTTED/REVISED: 09-DEC-2009

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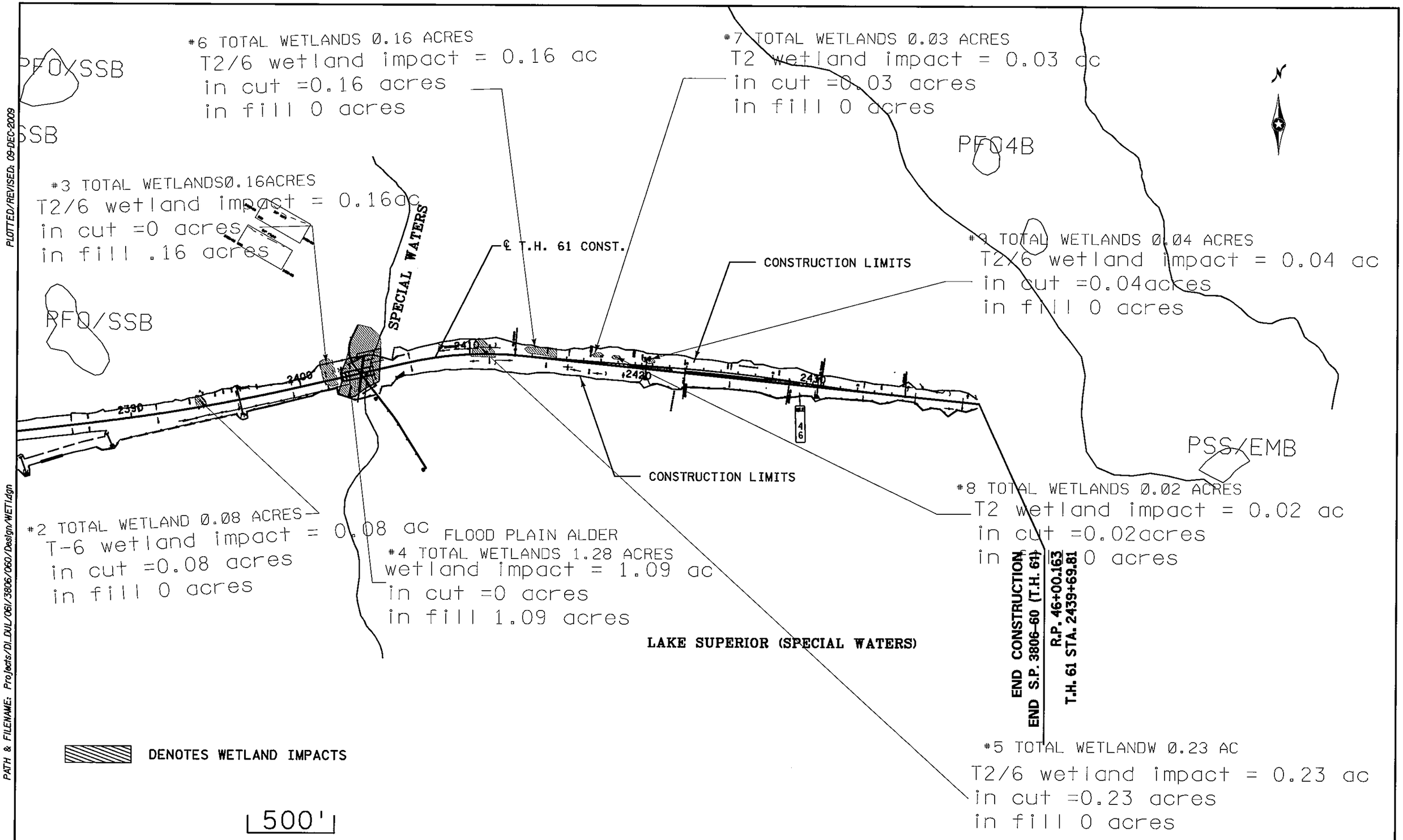
DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

WETLANDS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 199 OF 200 SHEETS



PLOTTED/REVISED: 09-DEC-2009

DISTRICT #: DULUTH
IPLOT NAME: w6l7
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/WETL.dgn

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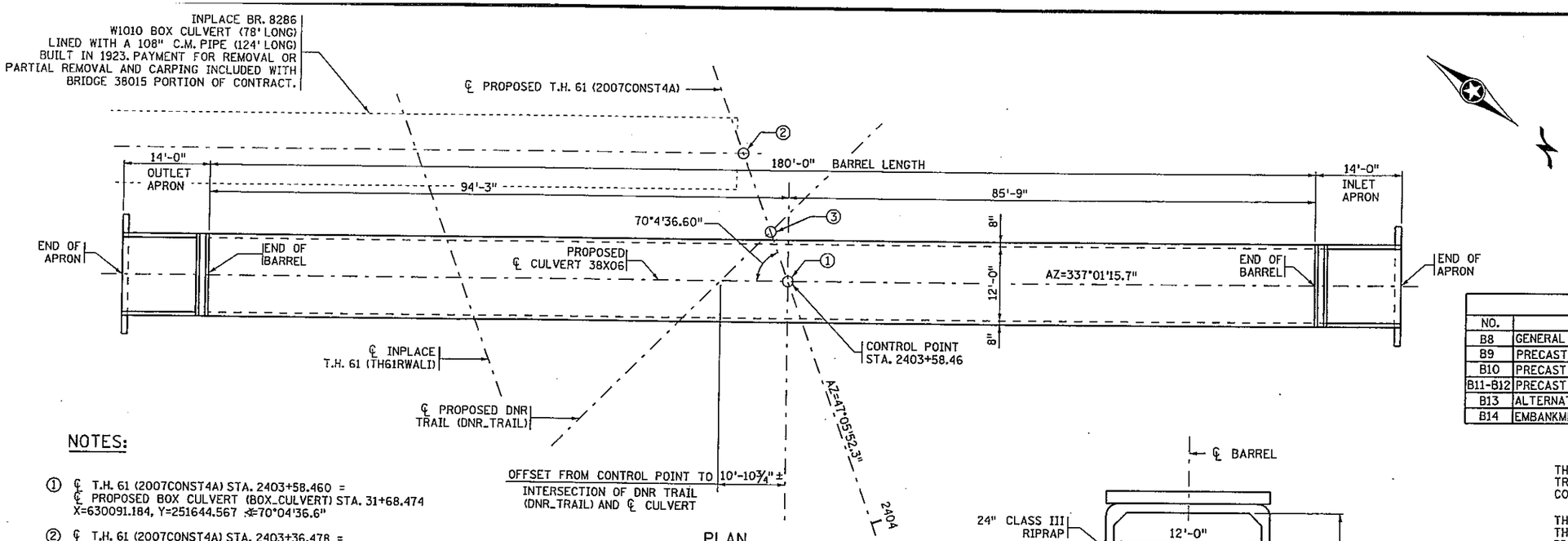
DATE 09-DEC-2009 LIC. NO. 16445 ENGINEER Tom Vosburgh TOM VOSBURGH

WETLANDS

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. 200 OF 200 SHEETS



PLAN

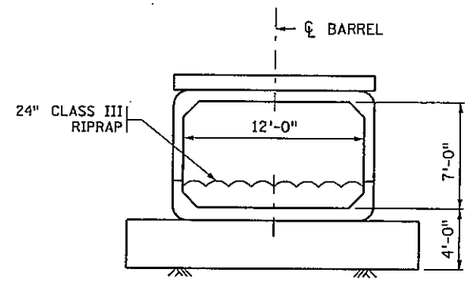
(TYPE 1 END SECTION SHOWN)

NOTES:

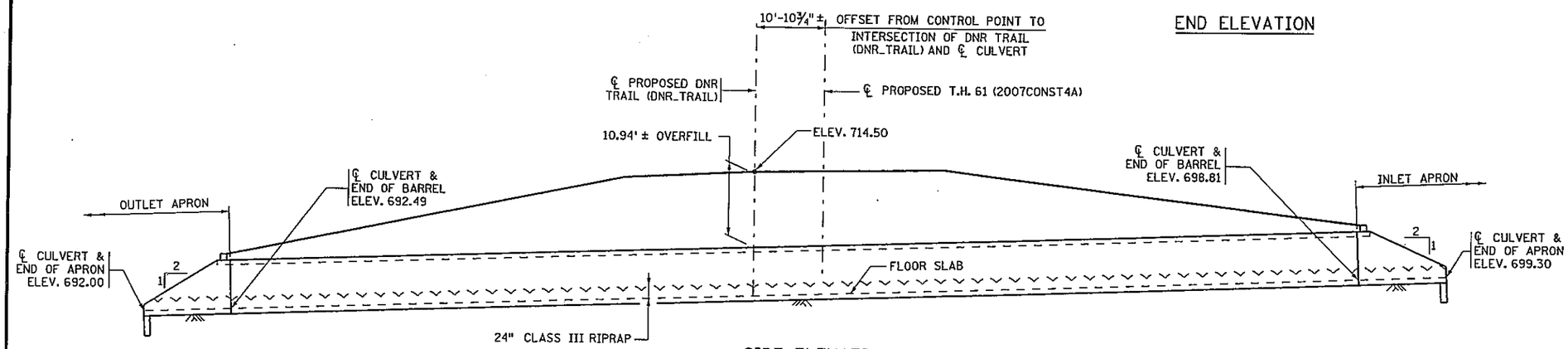
① ℄ T.H. 61 (2007CONST4A) STA. 2403+58.460 =
℄ PROPOSED BOX CULVERT (BOX_CULVERT) STA. 31+68.474
X=630091.184, Y=251644.567 ∡=70°04'36.6"

② ℄ T.H. 61 (2007CONST4A) STA. 2403+36.478 =
℄ STREAM (BRDG8286STRM)
STA. 12+43.298 X=630075.081, Y=251629.602 ∡=109°55'23.4"

③ ℄ T.H. 61 (2007CONST4A) STA. 2403+49.970 =
℄ PROPOSED DNR TRAIL (DNR TRAIL)
STA. 56+72.694 X=630084.964, Y=251638.787 ∡=65°00'00.0"



END ELEVATION



SIDE ELEVATION

SECTION IS ALONG ℄ CULVERT
(TYPE 1 END SECTION SHOWN)

SCHEDULE OF QUANTITIES FOR ENTIRE CULVERT

	ITEM NO.	ITEM	UNIT	QUANTITY
①	2412	12' X 7' PREC. CONC. BOX CULV.	LIN. FT.	180
	2412	12' X 7' PREC. CONC. BOX CULV., END SECTION	EACH	2
②	2511	RANDOM RIPRAP CLASS III	CU. YD.	185

① DESIGN FILL DEPTH 15'-0" MAX. 8'-0" MIN.

② INCLUDES RIPRAP INSIDE CULVERT AND APRON ONLY.

FED. PROJ. NO. NPPH H136 (002)

DESIGN DATA

2002 AND CURRENT INTERIM A.A.S.H.T.O.
DESIGN SPECIFICATIONS. LOADING: HS25
LOAD FACTOR DESIGN METHOD:

INSIDE HEIGHT =	7'-0"
INSIDE WIDTH =	12'-0"
HEIGHT OF WINGWALL AT END =	1'-9"
DEPTH OF DROPWALL =	3'-2"
SKEW ANGLE =	19°55'23.4"
MINIMUM DESIGN FILL DEPTH =	8'-0"
MAXIMUM DESIGN FILL DEPTH =	15'-0"
UNIT WEIGHT FILL =	130.0 LBS./CU.FT.
ANGLE INTERNAL FRICTION =	30.00 DEG.

fy = 60000 P.S.I. REINFORCEMENT BARS
fy = 65000 P.S.I. STEEL FABRIC
f'c = 5000 P.S.I. CONCRETE

LIST OF SHEETS

NO.	DESCRIPTION
B8	GENERAL PLAN AND ELEVATION
B9	PRECAST BARREL DETAILS
B10	PRECAST CONCRETE END SECTION TYPE I-SINGLE OR DOUBLE BARREL
B11-B12	PRECAST CONCRETE END SECTION TYPE III-SINGLE OR DOUBLE BARREL
B13	ALTERNATE DROPWALLS FOR BOX CULVERTS
B14	EMBANKMENT PROTECTION FOR BOX CULVERTS

CONSTRUCTION NOTES

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

THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR NUMBER WHICH APPROXIMATES THE NOMINAL DIAMETER OF THE BAR IN MILLIMETERS.

CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED UNLESS OTHERWISE NOTED.

ALL EXPOSED CONCRETE EDGES SHALL BE FORMED WITH A ½" OR ¾" CHAMFER UNLESS OTHERWISE NOTED.

CONSTRUCTION TO BE IN ACCORDANCE WITH SPEC. 2412, EXCEPT AS NOTED.

FOR STRUCTURE EXCAVATION AND BACKFILL SEE SPEC. 2451.

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."

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 Keith P. Molnau LICENSED PROFESSIONAL ENGINEER DATE 1-4-09

NAME: KEITH P. MOLNAU LIC NO. 22467

TRUNK HIGHWAY NO. 61
MINNESOTA
DEPARTMENT OF TRANSPORTATION

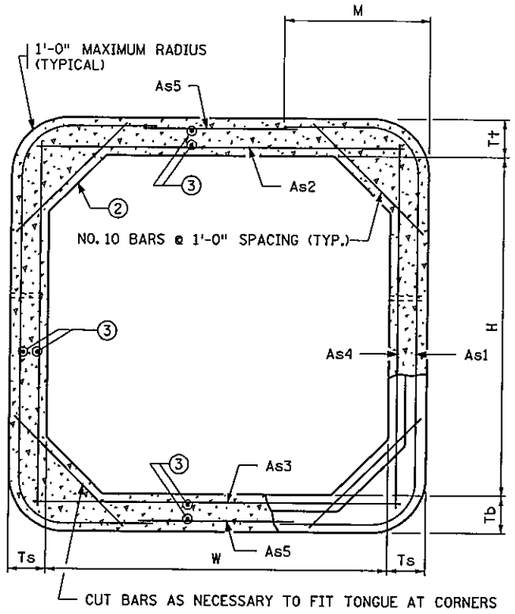
BRIDGE NO. 38X06
12' X 7' BOX CULVERT
T.H. 61 (OVER UNNAMED STREAM)
0.35 MILES SW OF THE ENTRANCE
TO THE SPLIT ROCK LIGHTHOUSE
STATION 2403+58.46
R.P. 45+00.506
CONCRETE BOX CULVERT
IDENTIFICATION NO. 113

GENERAL PLAN AND ELEVATION

SEC. 32 T. 56 N R. 8 W
BEAVER BAY TOWNSHIP LAKE COUNTY

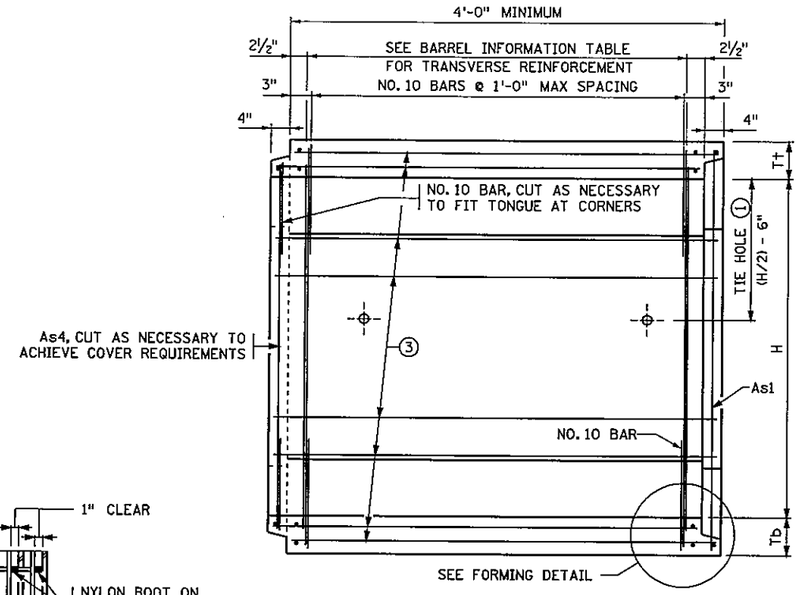
APPROVED Kevin Western STATE BRIDGE ENGINEER FOR
DATE 1/4/10

DES: J.A.J.	DR: N.A.	38X06
CHK: K.P.M.	CHK: J.A.J.	



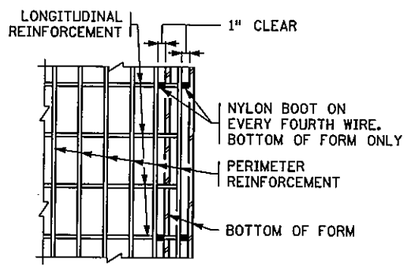
TRANSVERSE BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

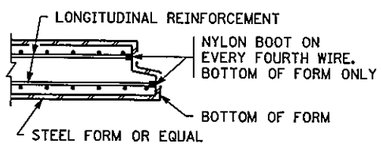


LONGITUDINAL BARREL SECTION

BAR REINFORCEMENT OPTION SHOWN

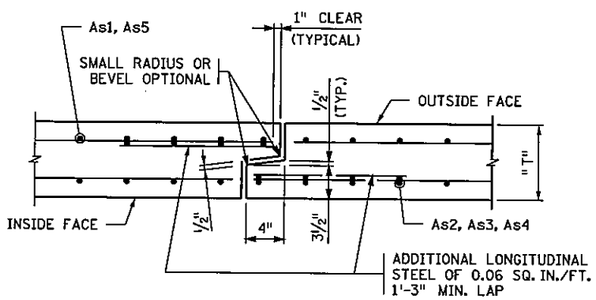


PLAN

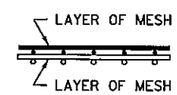


SECTION

FORMING DETAIL



TONGUE AND GROOVE JOINT DETAIL



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF STEEL FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE STEEL FABRIC SHALL BE PLACED AS SHOWN

CONSTRUCTION NOTES

CULVERTS TO BE CONSTRUCTED AS PER Mn/DOT SPEC. 2412 EXCEPT AS NOTED.

FILL HEIGHTS OF LESS THAN 2'-0" REQUIRE A DISTRIBUTION SLAB. SEE FIG. 5-395.100(A) AND FIG. 5-395.100(B) FOR ADDITIONAL INFORMATION.

IF THE DISTANCE BETWEEN DOUBLE BARRELS IS LESS THAN 2'-0" USE EITHER PEA ROCK OR LEAN MIX BACKFILL(Mn/DOT SPEC. 2520) BETWEEN THE CULVERTS AS APPROVED BY THE ENGINEER. (ALSO, PROVIDE APPROVED GROUT SEEPAGE CORE, MINIMUM 12" THICK, BETWEEN THE CULVERT'S TWO ENDS.) MINIMUM DISTANCE REQUIRED IS 6".

THE STEEL FABRIC, SHEAR REINFORCEMENT AND REINFORCEMENT BARS SHALL CONFORM TO APPLICABLE REQUIREMENTS OF AASHTO M259.

1½" MIN. AND 2" MAX. CONCRETE COVER ON ALL REINFORCEMENT, INCLUDING SHEAR REINFORCEMENT, EXCEPT FOR TONGUE AND GROOVE DETAIL.

ANY OF THE FOLLOWING COMBINATIONS OF STEEL REINFORCEMENT MAY BE USED:
(a) 1 OR 2 LAYERS OF MESH OR
(b) 1 LAYER OF MESH AND 1 LAYER OF REINFORCEMENT BARS OR
(c) 1 LAYER OF REINFORCEMENT BARS.
THE REINFORCEMENT SHALL BE DEVELOPED IN ACCORDANCE WITH AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES". IF BAR REINFORCEMENT IS SUBSTITUTED FOR WIRE MESH, THE AREAS OF REINFORCEMENT SHALL BE INCREASED BY 8%.

THE MAXIMUM SIZE OF REINFORCEMENT BARS SHALL BE NO. 19. THE MAXIMUM MESH SIZE SHALL BE ½" DIA. PER LAYER (MAXIMUM OF 2 LAYERS).

THE SPACING CENTER TO CENTER OF THE TRANSVERSE WIRES SHALL NOT BE LESS THAN 2" NOR MORE THAN 4". THE SPACING CENTER TO CENTER OF THE LONGITUDINAL WIRES SHALL NOT BE MORE THAN 8".

WELDING WILL NOT BE ALLOWED ON REINFORCEMENT BARS OR STEEL FABRIC, EXCEPT THAT THE ORIGINAL WELDING REQUIRED TO MANUFACTURE WIRE FABRIC IS ACCEPTABLE.

WHEN REINFORCEMENT IS CUT, ADDITIONAL REINFORCEMENT SHALL BE ADDED ON BOTH SIDES OF THE CUT MEMBER TO REPLACE OR EXCEED THE CUT STEEL.

CONCRETE SHALL BE MIX NO. 3W36 WITH NO CALCIUM CHLORIDE ALLOWED.

SHOP DRAWING APPROVAL PER Mn/DOT SPEC. 3238.2A IS NOT REQUIRED UNLESS OPENINGS OR ATTACHMENTS ARE PLACED ON A BARREL SEGMENT.

1 CULVERT TIES ARE TO BE 1" DIAMETER RODS. SEE STANDARD PLATE NO. 3145 FOR CONNECTION DETAILS.

2 HAUNCH SIZE AS FOLLOWS:
6'-0" AND 8'-0" WIDTHS - 6" TO 12"
10'-0" WIDTH - 10" TO 12"
12'-0" AND 14'-0" WIDTHS - 12"

3 MINIMUM LONGITUDINAL STEEL SHALL BE 0.06 SQ. IN. /FT.

BARREL INFORMATION

LOCATION	SIZE	CLASS	f'c (P.S.I.)	FILL HEIGHT RANGE (FT.)	DIMENSIONS W (FT.)	H (FT.)	Tt (IN.)	Tb (IN.)	Ts (IN.)	WEIGHT (LBS./FT.)	STEEL FABRIC REINFORCEMENT As1 AREA (IN.²/FT.)	As1 LENGTH (FT.)	As1 M (FT.)	As2 AREA (IN.²/FT.)	As2 LENGTH (FT.)	As3 AREA (IN.²/FT.)	As3 LENGTH (FT.)	As4 AREA (IN.²/FT.)	As4 LENGTH (FT.)	As5 AREA (IN.²/FT.)	As5 LENGTH (FT.)
	12' X 7'	3	5000	8'-15'	12	7	9	10	8	4785	1.17	14'-7"	3'-8"	1.60	12'-6"	1.60	12'-6"	0.20	7'-6"	0.06	8'-0"

REVISION:

APPROVED: DECEMBER 11, 2000

STATE BRIDGE ENGINEER

STATE PROJ. NO 3806-60 (T.H. 61) STA. 2403+58.46 R.P. 45+00.506

FIG. 5-395.101(A)

CERTIFIED BY Keith P. Molnau 12-7-09
LICENSED PROFESSIONAL ENGINEER DATE

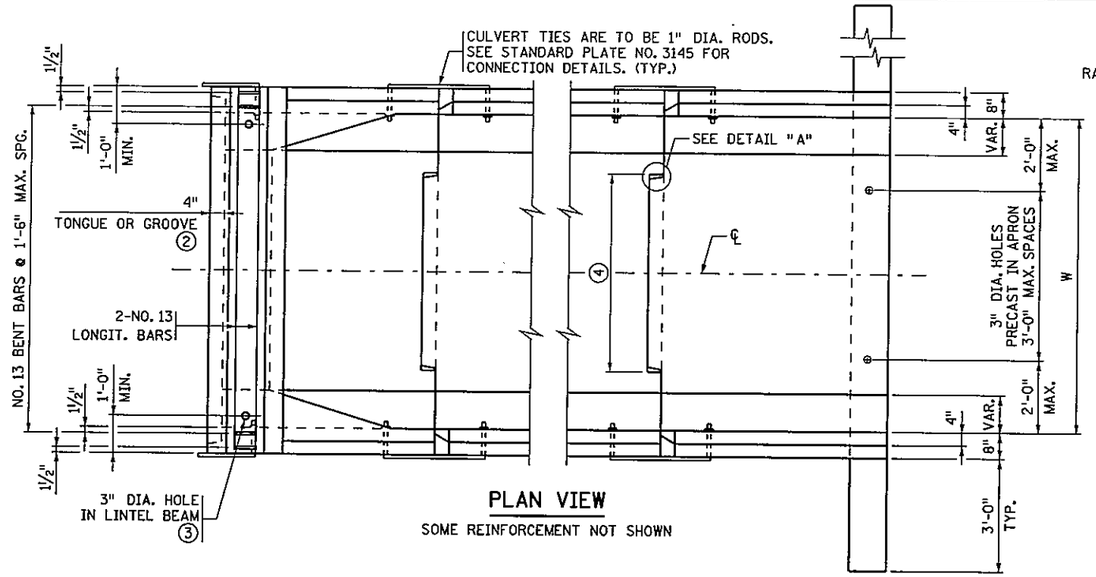
NAME: KEITH P. MOLNAU LIC. NO. 22467

TITLE: PRECAST BARREL DETAILS

DES: J.A.J. CHK: K.P.M. DR: N.A. CHK: J.A.J. APPROVED: 12/7/09

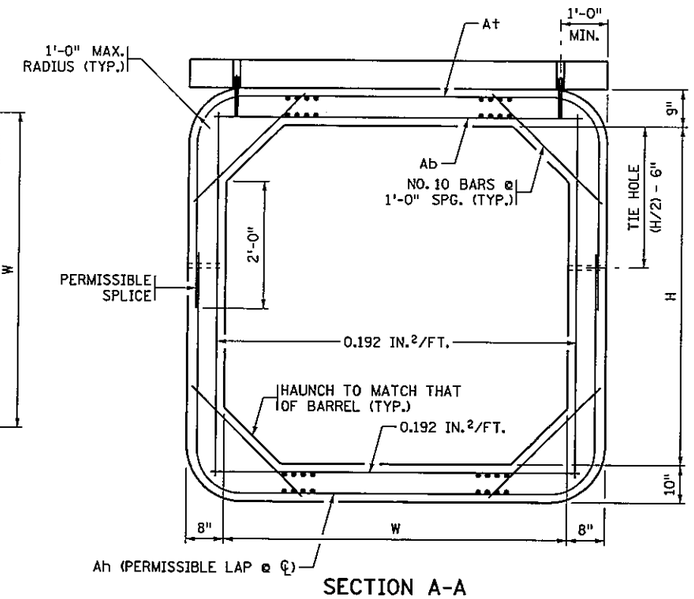
SHEET NO. B9 OF B18 SHEETS

BRIDGE NO. 38X06



PLAN VIEW

SOME REINFORCEMENT NOT SHOWN



SECTION A-A

CONSTRUCTION NOTES

SEE FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.

ALL END SECTIONS REQUIRE CURB ON LINTEL BEAM.

ON ALL END SECTIONS FOR WATERWAYS, USE DROPWALLS ON INLET AND OUTLET ENDS.

LONGITUDINAL REINFORCEMENT PARALLEL TO THE AXIS OF THE CULVERT SHALL HAVE A MINIMUM OF 0.06 SQUARE INCHES PER PERIPHERAL FOOT ON ALL FACES OF THE BARREL, EXCEPT IN THE TONGUE AND GROOVE AREA.

SEE FIG. 5-395.115 FOR EMBANKMENT PROTECTION.

FINISH ALL EXPOSED EDGES OF CONCRETE WITH ½" OR ¾" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.

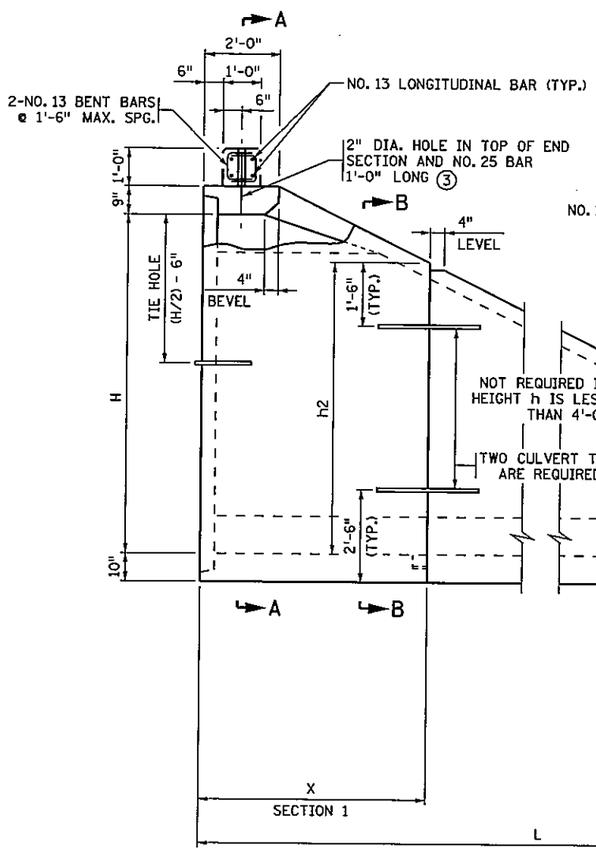
① WITH DOUBLE BOXES LOCATE DROPWALL JOINTS BETWEEN END SECTIONS. SEE FIG. 5-395.111 FOR ALTERNATE DROPWALLS. LIMITS OF EXCAVATION FOR DROPWALL TO BE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. DROPWALL TO BE CONCRETE MIX NO. 1A43 OR MIX NO. 3Y43. FURNISHING AND INSTALLATION OF DROPWALL TO BE INCLUDED IN PRICE BID FOR END SECTIONS. DROPWALL NOT REQUIRED FOR NON-WATERWAY USE.

② CHECK LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED.

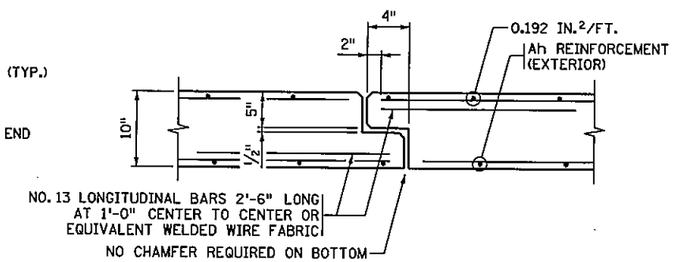
③ FILL HOLE WITH GROUT. GROUT SHALL CONSIST OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX SHALL HAVE A MAXIMUM SLUMP OF 4".

④ 3'-6" TONGUE AND 3'-7" GROOVE FOR 6'-0" WIDE CULVERTS. 5'-0" TONGUE AND 5'-1" GROOVE FOR CULVERTS OVER 6'-0" WIDE. CENTER TONGUE AND GROOVE ON ℄ OF EACH APRON JOINT.

⑤ AS AN ALTERNATE TO THE ONE LAYER MESH, PROVIDE TWO LAYERS OF REBAR OR WIRE MESH WITH THE STEEL AREA EQUAL TO HALF OF THE TEMPERATURE STEEL PER CODE REQUIREMENTS IN EACH FACE OF THE DROPWALL.

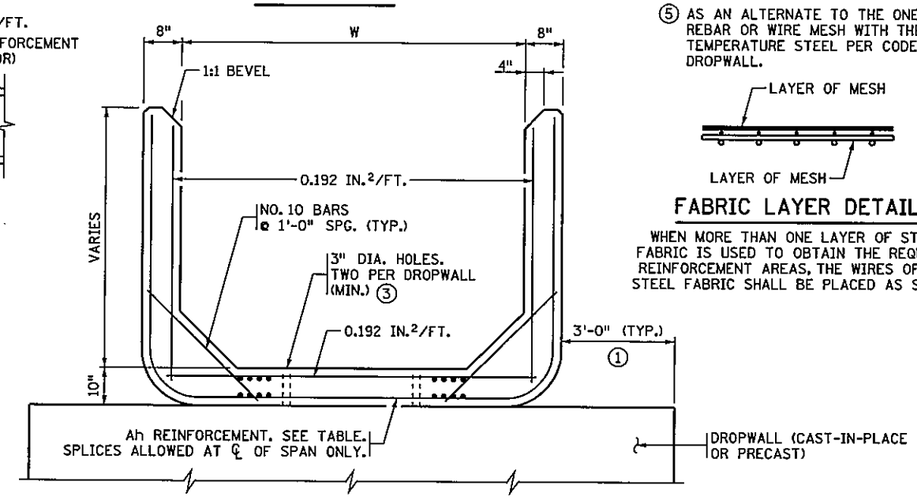


SIDE ELEVATION



TONGUE AND GROOVE JOINT DETAIL

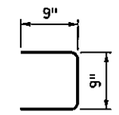
BETWEEN END SECTIONS



SECTION B-B

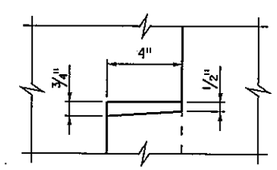
FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF STEEL FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE STEEL FABRIC SHALL BE PLACED AS SHOWN.



NO. 13 BENT BAR

At, Ab REINFORCEMENT		
WIDTH (FT.)	At (IN²/FT.)	Ab (IN²/FT.)
6	.27	.44
8	.47	.60
10	.62	.74
12	.88	1.06
14	1.20	1.58



DETAIL "A"

APRON DIMENSIONS & Ah REINFORCEMENT

H	L	SECTION 1		h2	SECTION 2		h3	SECTION 3		h4	SECTION 4		h5	SECTION 5		h6
FT.	FT.	X	Ah		Y	Ah		Z	Ah		ZZ	Ah		ZZZ	Ah	
4	8	8'	0.192	1'-9"												
5	10	6'	0.192	3'-9"	4'	0.192	1'-9"									
6	12	6'	0.192	4'-9"	6'	0.192	1'-9"									
7	14	6'	0.192	5'-9"	8'	0.192	1'-9"									
8	16	6'	0.20	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"						
9	18	6'	0.29	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"						
10	20	6'	0.42	8'-9"	6'	0.29	5'-9"	8'	0.192	1'-9"						
11	22	6'	0.60	9'-9"	6'	0.42	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"			
12	24	6'	0.78	10'-9"	6'	0.60	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"			
13	26	6'	1.03	11'-9"	6'	0.78	8'-9"	6'	0.28	5'-9"	8'	0.192	1'-9"			
14	28	6'	1.38	12'-9"	6'	1.03	9'-9"	6'	0.40	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"

NOTE: Ah IS AREA OF REINFORCEMENT PER FOOT OF LENGTH (IN²/FT.)

REVISION: 06-30-2003

APPROVED: DECEMBER 11, 2000

STATE BRIDGE ENGINEER

STATE PROJ. NO 3806-60 (T.H. 61) STA. 2403+58.46 R.P. 45+00.506

FIG. 5-395.102

CERTIFIED BY Kurt P. Molnau 12-7-09
LICENSED PROFESSIONAL ENGINEER DATE

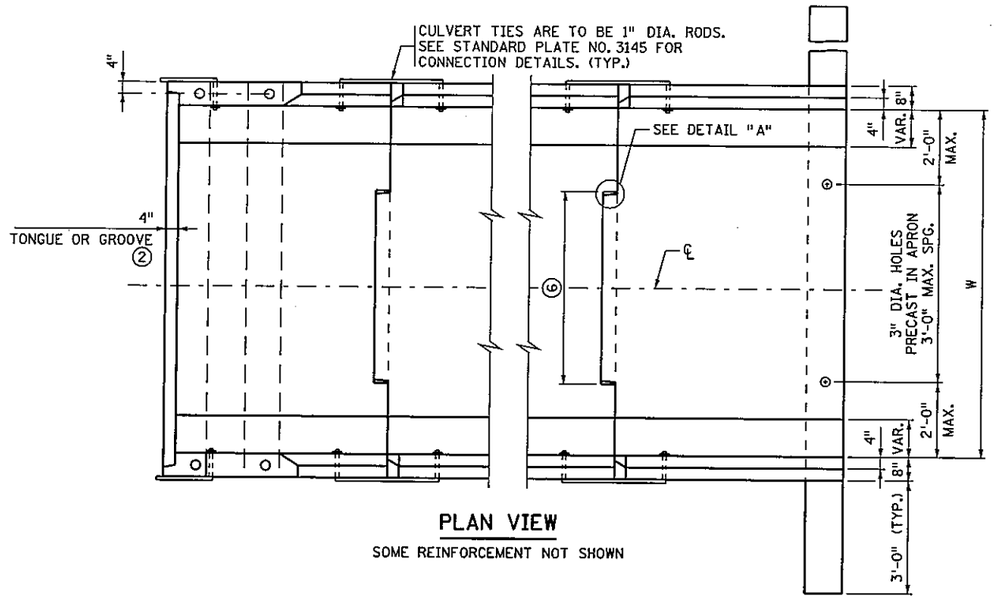
NAME: KEITH P. MOLNAU LIC. NO. 22467

TITLE: PRECAST CONCRETE END SECTION TYPE I - SINGLE OR DOUBLE BARREL FOR SKEWS UP TO 7½°

DES: J.A.J. DR: N.A. APPROVED: 12/7/09
CHK: K.P.M. CHK: J.A.J.

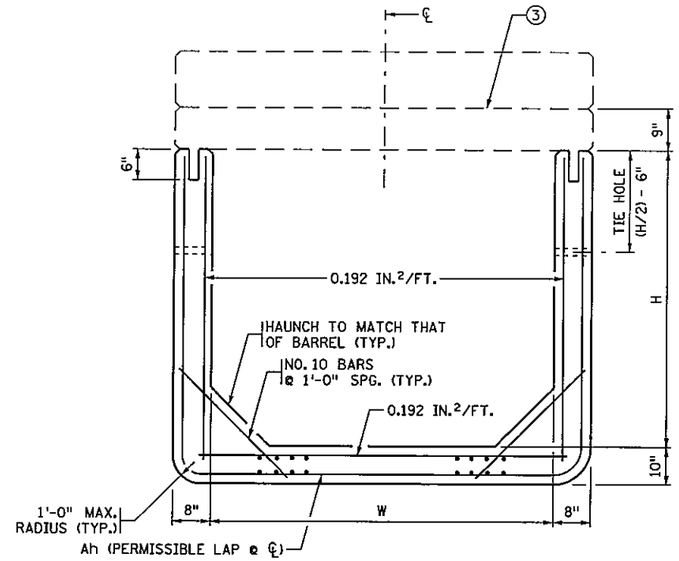
SHEET NO. B10 OF B18 SHEETS

BRIDGE NO. 38X06



PLAN VIEW

SOME REINFORCEMENT NOT SHOWN



SECTION A-A

CONSTRUCTION NOTES

SEE FIG. 5-395.101(A) AND FIG. 5-395.101(B) FOR ADDITIONAL DIMENSIONS AND CONSTRUCTION NOTES.

ON ALL END SECTIONS FOR WATERWAYS, USE DROPWALLS ON INLET AND OUTLET ENDS.

LONGITUDINAL REINFORCEMENT PARALLEL TO THE AXIS OF THE CULVERT SHALL HAVE A MINIMUM OF 0.06 SQUARE INCHES PER PERIPHERAL FOOT ON ALL FACES OF THE BARREL, EXCEPT IN THE TONGUE AND GROOVE AREA.

SEE FIG. 5-395.115 FOR EMBANKMENT PROTECTION.

FINISH ALL EXPOSED EDGES OF CONCRETE WITH 1/2" OR 3/4" CHAMFER OR RADIUS UNLESS OTHERWISE NOTED.

① WITH DOUBLE BOXES LOCATE DROPWALL JOINTS BETWEEN END SECTIONS. SEE FIG. 5-395.111 FOR ALTERNATE DROPWALLS. LIMITS OF EXCAVATION FOR DROPWALL TO BE APPROXIMATELY THE SAME AS DROPWALL DIMENSIONS. DROPWALL TO BE CONCRETE MIX NO. 1A43 OR 3Y43. FURNISHING AND INSTALLATION OF DROPWALL TO BE INCLUDED IN PRICE BID FOR END SECTIONS. DROPWALL NOT REQUIRED FOR NON-WATERWAY USE.

② CHECK LOCATION TO DETERMINE WHETHER A TONGUE OR A GROOVE IS USED.

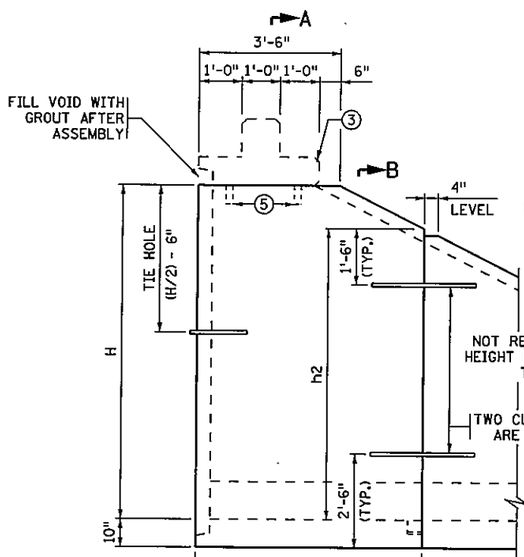
③ SEE FIG. 5-395.104(B) FOR LINTEL BEAM DETAILS.

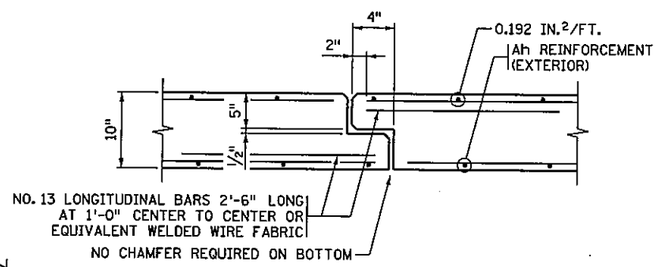
④ FILL HOLE WITH GROUT. GROUT SHALL CONSIST OF 1 PART CEMENT AND 2 PARTS SAND. USE TYPE 1A AIR ENTRAINED PORTLAND CEMENT. GROUT MIX SHALL HAVE A MAXIMUM SLUMP OF 4".

⑤ 2" DIAMETER HOLE, 6" DEEP IN TOP OF THE SECTION WALL.

⑥ 3'-6" TONGUE AND 3'-7" GROOVE FOR 6'-0" WIDE CULVERTS. 5'-0" TONGUE AND 5'-1" GROOVE FOR CULVERTS OVER 6'-0" WIDE. CENTER TONGUE AND GROOVE ON ℄ OF EACH APRON JOINT.

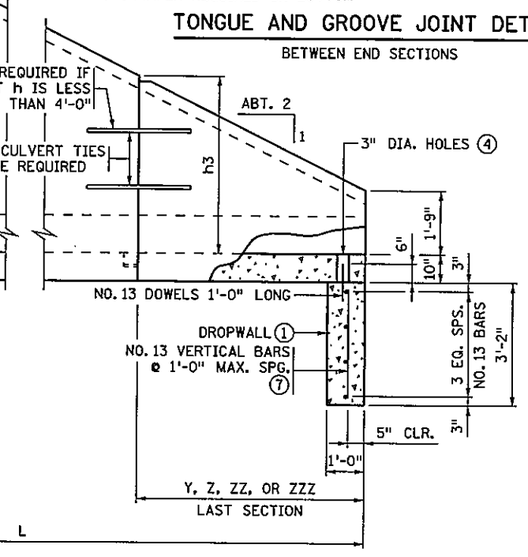
⑦ AS AN ALTERNATE TO THE ONE LAYER MESH, PROVIDE TWO LAYERS OF REBAR OR WIRE MESH WITH THE STEEL AREA EQUAL TO HALF OF THE TEMPERATURE STEEL PER CODE REQUIREMENTS IN EACH FACE OF THE DROPWALL.



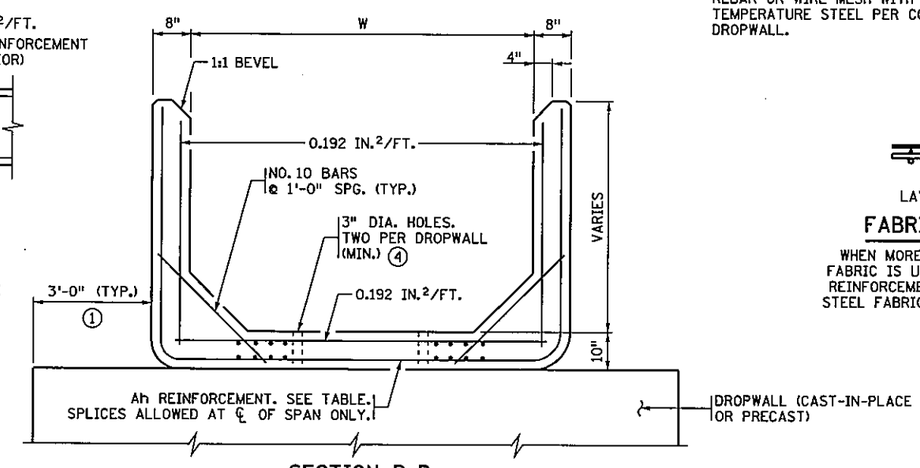


TONGUE AND GROOVE JOINT DETAIL

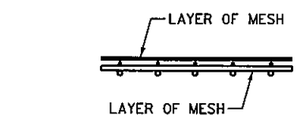
BETWEEN END SECTIONS



SIDE ELEVATION

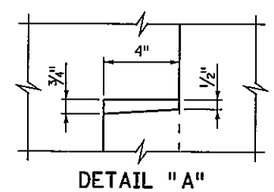


SECTION B-B



FABRIC LAYER DETAIL

WHEN MORE THAN ONE LAYER OF STEEL FABRIC IS USED TO OBTAIN THE REQUIRED REINFORCEMENT AREAS, THE WIRES OF THE STEEL FABRIC SHALL BE PLACED AS SHOWN.



DETAIL "A"

APRON DIMENSIONS & Ah REINFORCEMENT

H	L	SECTION 1		h2	SECTION 2		h3	SECTION 3		h4	SECTION 4		h5	SECTION 5		h6
FT.	FT.	X	Ah		Y	Ah		Z	Ah		ZZ	Ah		ZZZ	Ah	
4	8	8'	0.192	1'-9"												
5	10	6'	0.192	3'-9"	4'	0.192	1'-9"									
6	12	6'	0.192	4'-9"	6'	0.192	1'-9"									
7	14	6'	0.192	5'-9"	8'	0.192	1'-9"									
8	16	6'	0.20	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"						
9	18	6'	0.29	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"						
10	20	6'	0.42	8'-9"	6'	0.29	5'-9"	8'	0.192	1'-9"						
11	22	6'	0.60	9'-9"	6'	0.42	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"			
12	24	6'	0.78	10'-9"	6'	0.60	7'-9"	6'	0.20	4'-9"	6'	0.192	1'-9"			
13	26	6'	1.03	11'-9"	6'	0.78	8'-9"	6'	0.28	5'-9"	8'	0.192	1'-9"			
14	28	6'	1.38	12'-9"	6'	1.03	9'-9"	6'	0.40	6'-9"	6'	0.192	3'-9"	4'	0.192	1'-9"

NOTE: Ah IS AREA OF REINFORCEMENT PER FOOT OF LENGTH (IN²/FT.)

REVISION: 06-30-2003

APPROVED: DECEMBER 11, 2000

STATE BRIDGE ENGINEER

STATE PROJ. NO 3806-60 (T.H. 61) STA. 2403+58.46 R.P. 45+00.506

FIG. 5-395.104(A)

CERTIFIED BY Keith P. Molnau 12-7-09
LICENSED PROFESSIONAL ENGINEER DATE

NAME: KEITH P. MOLNAU LIC. NO. 22467

TITLE: PRECAST CONCRETE END SECTION TYPE III - SINGLE OR DOUBLE BARREL FOR SKEWS UP TO 7½°

DES: J.A.J. DR: N.A. APPROVED: 12/7/09
CHK: K.P.M. CHK: J.A.J.

SHEET NO. B11 OF B18 SHEETS

BRIDGE NO. 38X06

SCHEDULE OF QUANTITIES FOR ENTIRE CULVERT

	ITEM NO.	ITEM	UNIT	QUANTITY
①	2411.501	STRUCTURAL CONC. (3Y43)	CU.YD.	5
	2411.541	REINFORCEMENT BARS	POUND	460
②	2411.618	RECONSTRUCT CULVERT FLOOR	SQ.FT.	6250
	2433.516	ANCHORAGES TYPE REINF BARS	EACH	56
	2433.618	CONCRETE SURFACE REPAIR	SQ.FT.	30
	2452.618	STEEL SHEET PILING (PERMANENT)	SQ.FT.	3150

① INCLUDES HEADWALL EXTENSION.

② INCLUDES SCARIFYING FLOOR AND 4" CONCRETE OVERLAY.

DEWATERING (INCIDENTAL TO CULVERT)

RIPRAP (INCLUDED IN GRADING PLANS)

LIST OF SHEETS

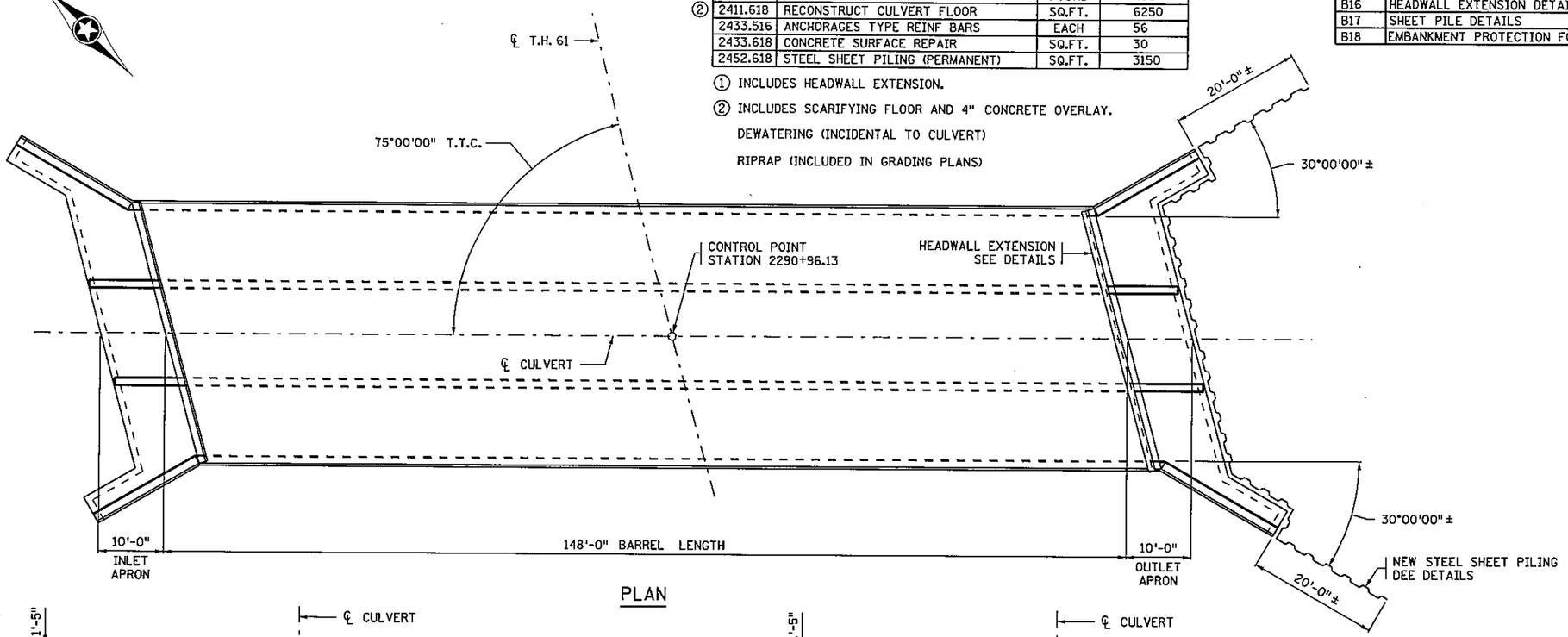
NO.	DESCRIPTION
B15	GENERAL PLAN AND ELEVATION
B16	HEADWALL EXTENSION DETAILS
B17	SHEET PILE DETAILS
B18	EMBANKMENT PROTECTION FOR BOX CULVERT

FED. PROJ. NO.NPPH H136 (002)

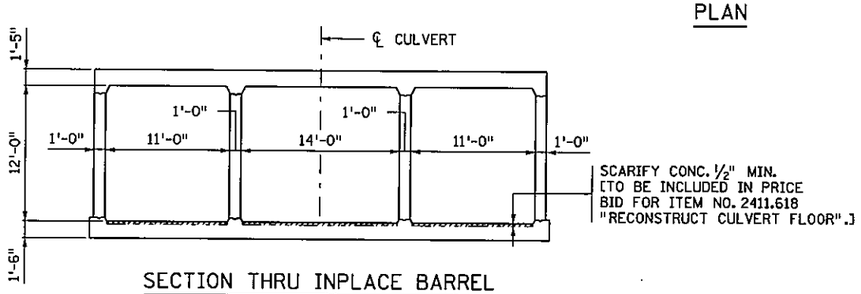
DESIGN DATA

2002 AND CURRENT INTERIM A.A.S.H.T.O.
DESIGN SPECIFICATIONS. LOADING: HS25
LOAD FACTOR DESIGN METHOD:

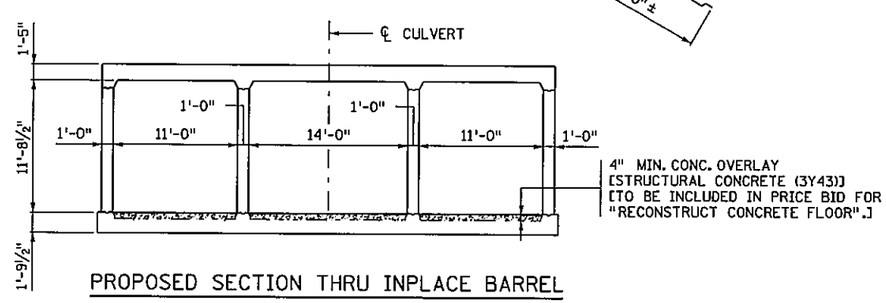
INSIDE HEIGHT = 12'-0"
INSIDE WIDTH = 11'-0", 14'-0", 11'-0"
SKEW ANGLE = 15°00'00"
fy = 60000 P.S.I. REINFORCEMENT BARS
f'c = 4000 P.S.I. CONCRETE



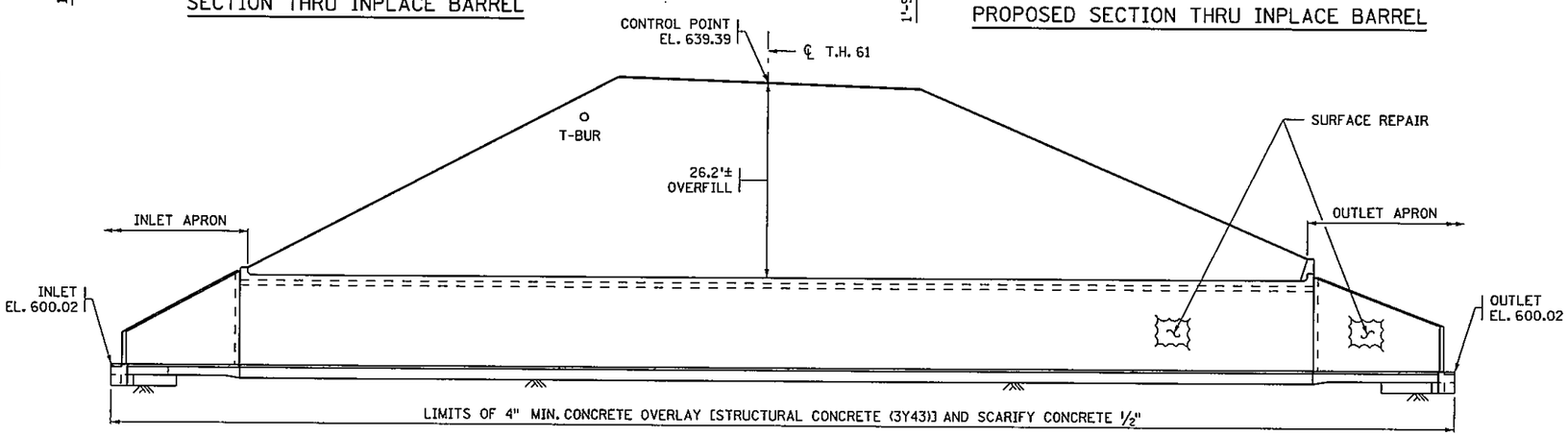
PLAN



SECTION THRU INPLACE BARREL



PROPOSED SECTION THRU INPLACE BARREL



SIDE ELEVATION

CONSTRUCTION NOTES

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

THE FIRST TWO DIGITS OF EACH BAR MARK INDICATE THE BAR NUMBER WHICH APPROXIMATES THE NOMINAL DIAMETER OF THE BAR IN MILLIMETERS.

ALL EXPOSED CONCRETE EDGES SHALL BE FORMED WITH A ½" OR ¾" CHAMFER UNLESS OTHERWISE NOTED.

FOR STRUCTURE EXCAVATION AND BACKFILL SEE SPEC. 2451.

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."

SHOP DRAWING FOR SHEET PILING AND CAP PLATE APPROVAL PER Mn/DOT SPEC. 2471.3B IS REQUIRED.

PRIOR TO DRIVING SHEET PILING, THE ENGINEER SHALL INSPECT THE OUTLET APRON FOR UNDERMINING BY PROBING OR OTHER SUITABLE MEANS. IF THE OUTLET APRON IS UNDERMINED, REPAIR SHALL BE MADE BY PARTIALLY FILLING WITH RIPRAP PRIOR TO DRIVING SHEET PILING. ADDITIONAL REPAIRS MAY BE REQUIRED BY DRILLING THRU APRON AND FILLING VOID WITH GROUT AS DETERMINED BY THE ENGINEER. ALL WORK TO REPAIR ANY UNDERMINING OF THE APRON SHALL BE PAID FOR PER MnDOT 1403 EXTRA WORK.

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 Keith P. Molnau DATE 12-7-09
LICENSED PROFESSIONAL ENGINEER
NAME: KEITH P. MOLNAU LIC NO. 22467

TRUNK HIGHWAY NO. 61
MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 9405
11', 14', 11' X 12' TRIPLE BOX CULVERT REPAIR
T.H. 61 OVER SPLIT ROCK RIVER
4.5 MILES N.E. OF JCT. C.S.A.H. 1
STATION 2290+96.13
RP 43+00.423

CONCRETE BOX CULVERT
IDENTIFICATION NO. 113

GENERAL PLAN AND ELEVATION

SEC. 7 T. 54 N R. 8 W

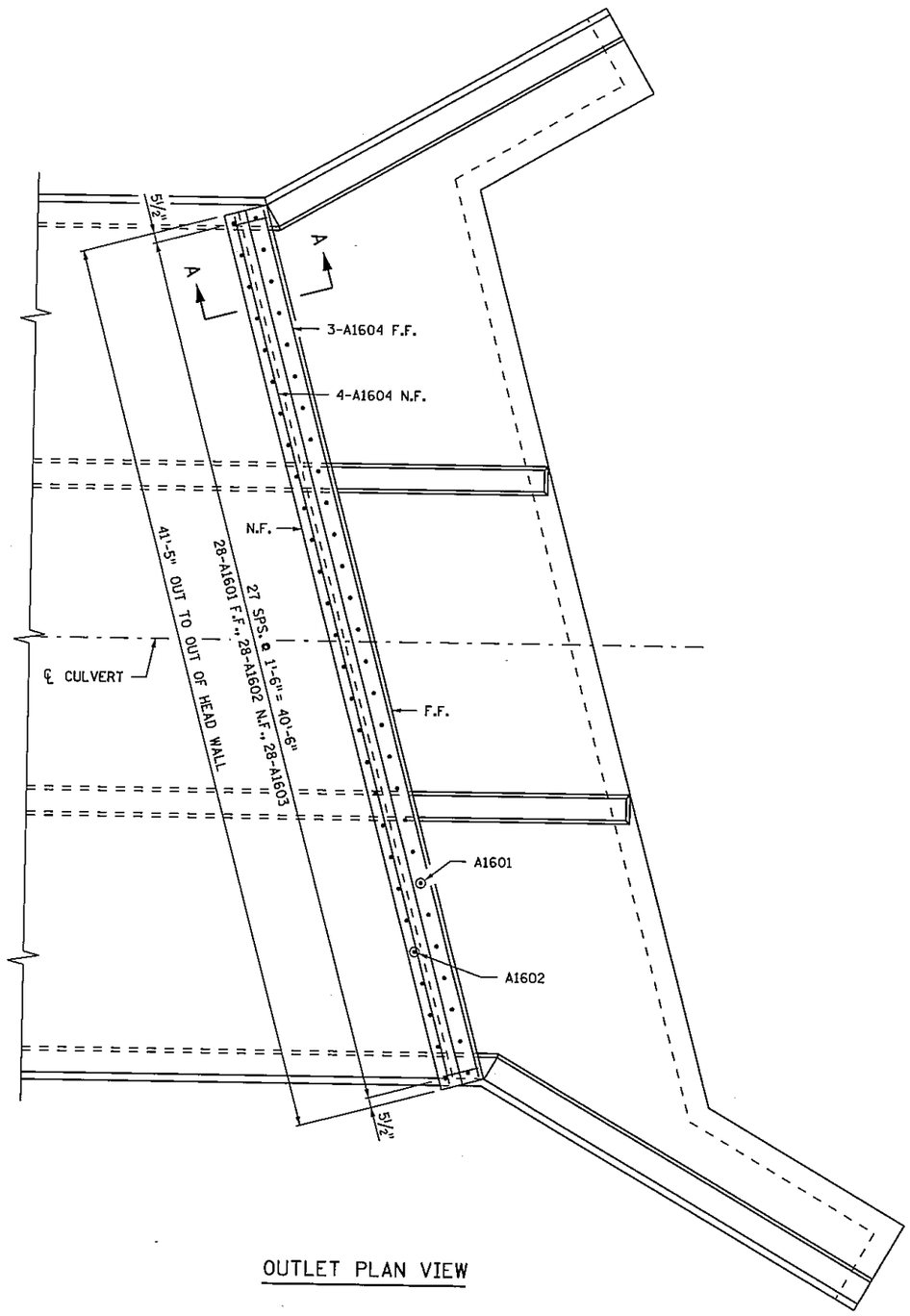
BEAVER BAY TOWNSHIP LAKE COUNTY

APPROVED Nancy Daubenberger for STATE BRIDGE ENGINEER

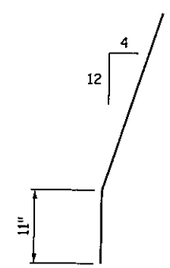
DATE 12/7/09

DES: K.P.M.	DR: K.G.S.	9405
CHK: J.A.J.	CHK: J.A.J.	

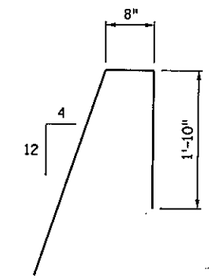
JOB NUMBER T14474 DESIGN UNIT: KEITH P. MOLNAU STATE PROJ. NO. 3806-60 (T.H. 61) STA. 2290+96.13 RP 43+00.423 SHEET NO. B15 OF B18 SHEETS



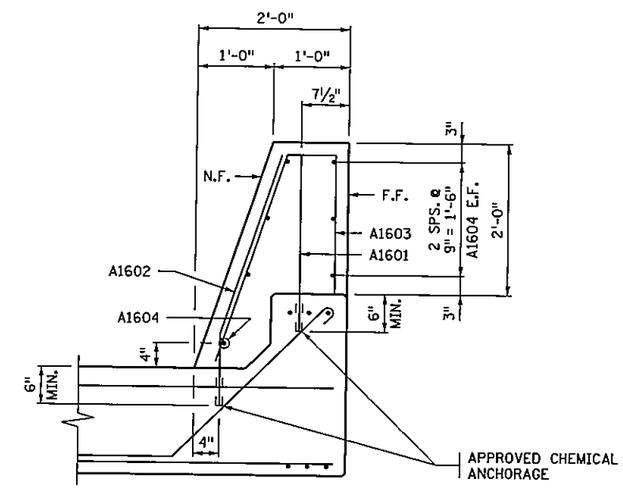
OUTLET PLAN VIEW



A1602



A1603



SECTION A-A

BILL OF REINFORCEMENT FOR HEADWALL EXTENSION OUTLET APRON

	BAR	NO.	LENGTH	SHAPE	LOCATION
②	A1601	28	2'-4"	STR.	HEADWALL DOWEL
②	A1602	28	3'-5"	BENT	HEADWALL DOWEL
	A1603	28	5'-4"	BENT	HEADWALL TIE
	A1604	7	41'-1"	STR.	HEADWALL HORIZONTAL

SUMMARY OF QUANTITIES FOR HEADWALL EXTENSION OUTLET APRON

	STRUCTURAL CONC. (3Y43)	5 CU. YD.
③	REINFORCEMENT BARS	460 POUND
	ANCHORAGES TYPE REINF. BARS	56 EACH

NOTES:

F.F. DENOTES FAR FACE

N.F. DENOTES NEAR FACE

E.F. DENOTES EACH FACE

2" CLEAR COVER ON REINFORCEMENT, UNLESS OTHERWISE NOTED.

① APPLY AN APPROVED EPOXY BONDING AGENT TO ALL SURFACES IN CONTACT WITH NEW CONCRETE.

② NOT INCLUDED IN WEIGHT OF REINFORCEMENT BARS. INCLUDED IN ITEM "ANCHORAGES TYPE REINFORCEMENT BARS."

③ DOES NOT INCLUDE ANCHORAGES TYPE REINF BARS.

STATE PROJ. NO 3806-60 (T.H. 61) STA. 2290+96.13 RP 43+00.423

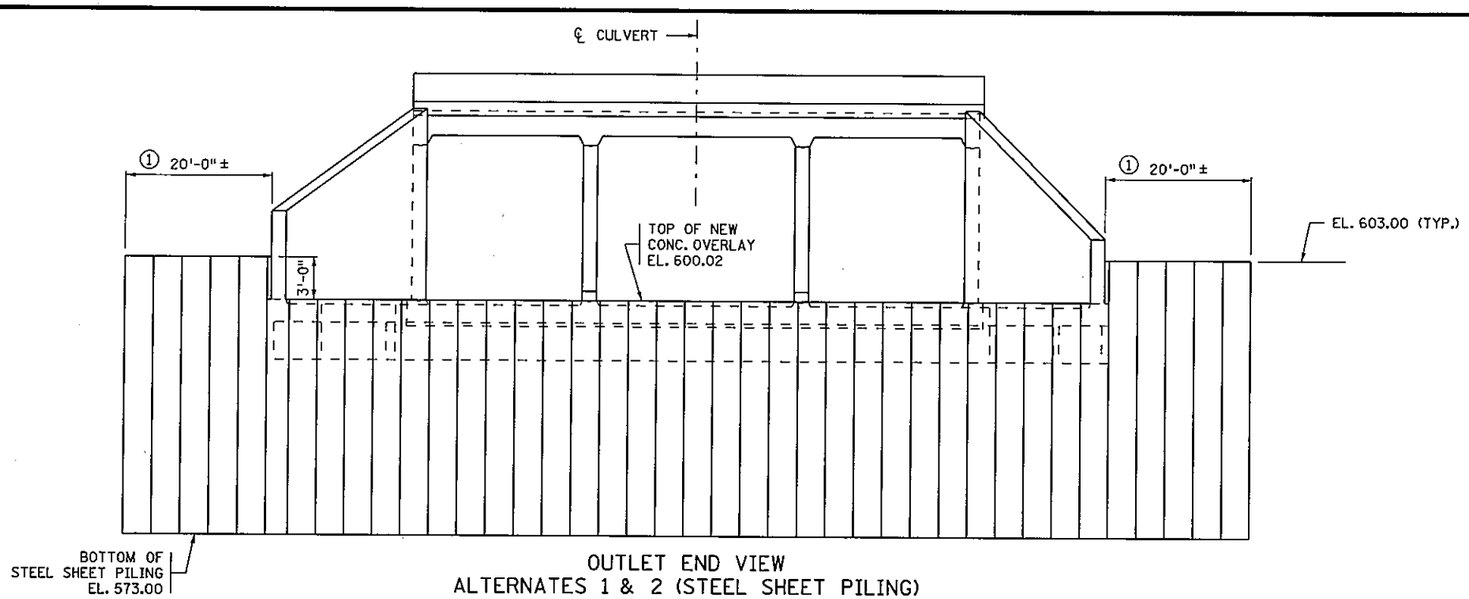
CERTIFIED BY Keith P. Molnau 12-7-09
LICENSED PROFESSIONAL ENGINEER DATE
NAME: KEITH P. MOLNAU LIC. NO. 22467

TITLE: HEADWALL EXTENSION DETAILS

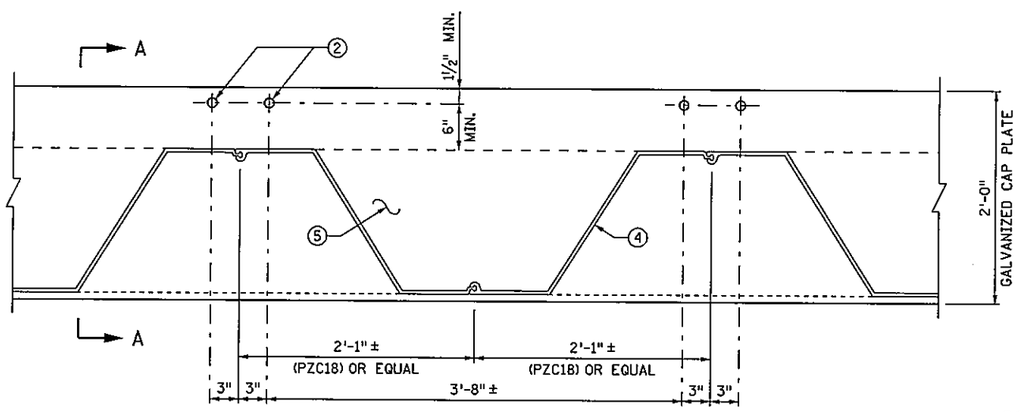
DES: K.P.M.	DR: K.G.S.	APPROVED: 12/7/09	BRIDGE NO. 9405
CHK: J.A.J.	CHK: J.A.J.		

SHEET NO. B16 OF B18 SHEETS

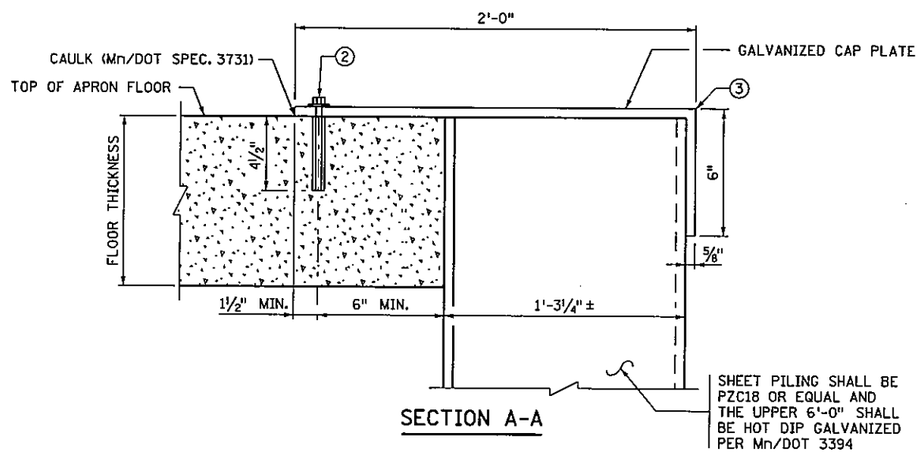
12/7/2009 9405CULV.REP



OUTLET END VIEW
ALTERNATES 1 & 2 (STEEL SHEET PILING)



PLAN VIEW ANCHOR SPACING DETAIL



SECTION A-A

CONSTRUCTION NOTES

GALVANIZE ALL FASTENERS AS PER Mn/DOT SPEC. 3392.

SHOP DRAWINGS FOR SHEET PILING AND CAP PLATE ARE REQUIRED PER Mn/DOT SPEC. 2471.3B.

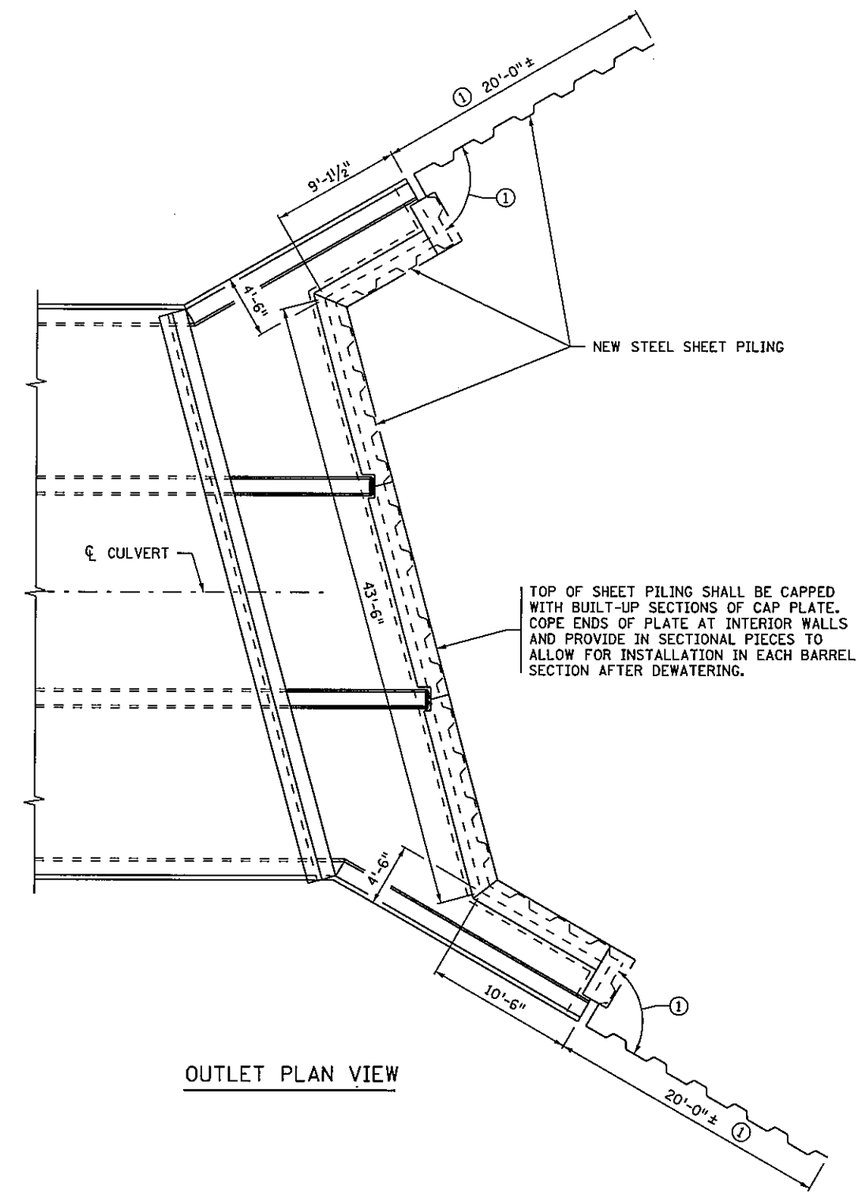
① PLACE SHEET PILING AS DIRECTED BY THE ENGINEER.

② FASTEN THE GALVANIZED CAP SHAPE WITH ½" DIAMETER APPROVED CHEMICAL ANCHORAGES WITH WASHER (4½" MIN. EMBEDMENT. (SEE ANCHOR SPACING DETAIL)

③ ⅝" THICK BUILT-UP CAP PLATE SHALL BE FABRICATED FOR PROPER FIT-UP. PLATES SHALL BE PER Mn/DOT SPEC. 3306 AND HOT DIP GALVANIZED PER Mn/DOT 3394.

④ STEEL SHEET PILING, SECTION PZC18 (ASTM A572 GR50) OR EQUAL (S=33.5 in^3/FT.)

⑤ FILL THE VOIDS AS SHOWN, WITH CONCRETE OR CONCRETE GROUT, AS APPROVED BY THE ENGINEER.

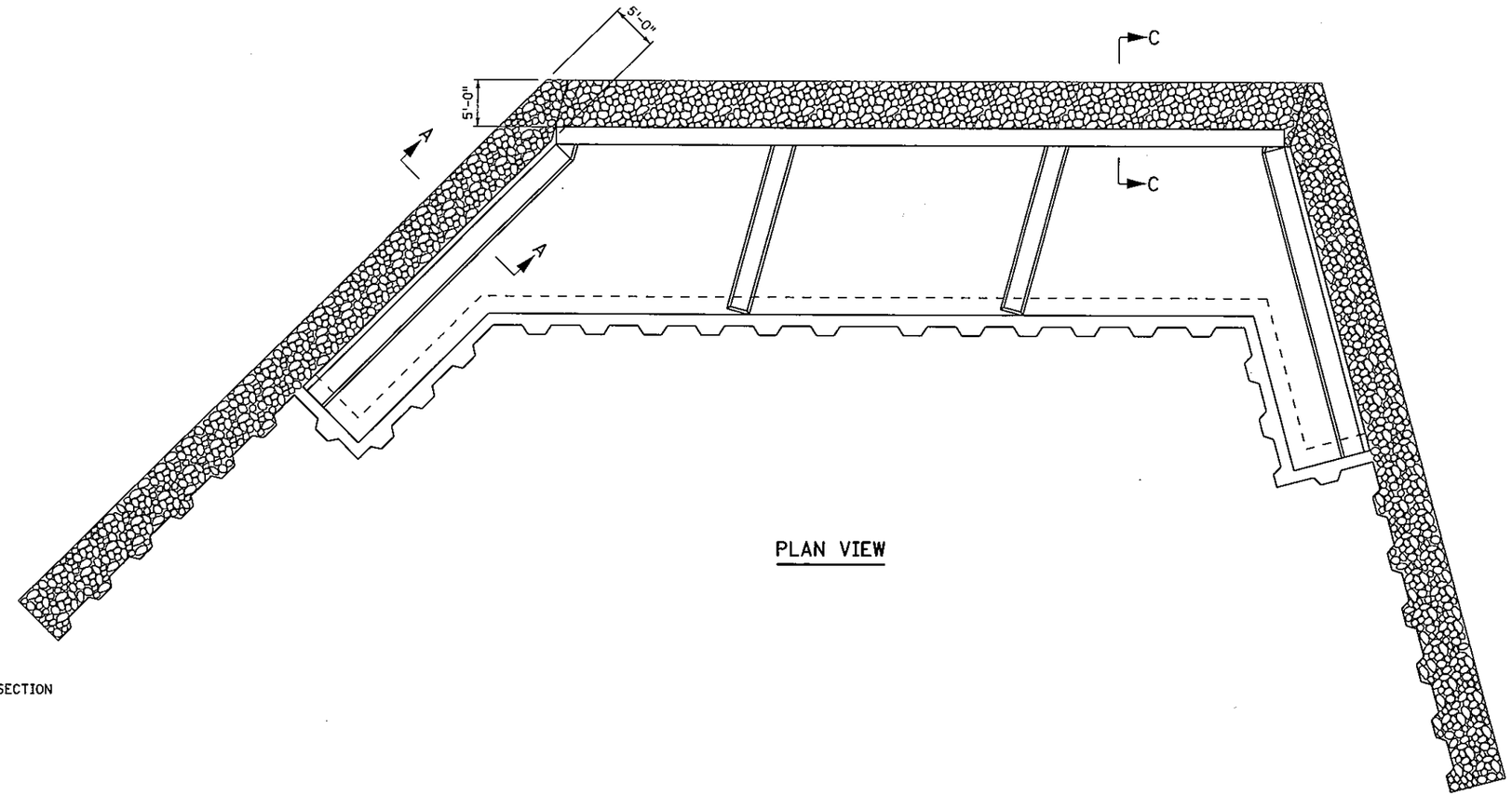


OUTLET PLAN VIEW

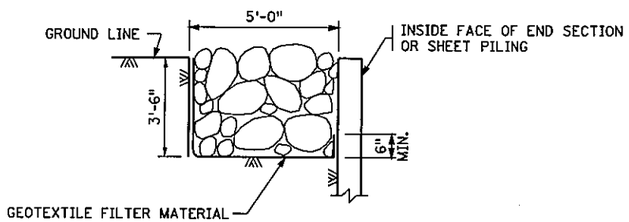
12/7/2009 9405CULV.REP

STATE PROJ. NO 3806-60 (T.H. 61) STA. 2290+96.13 RP 43+00.423

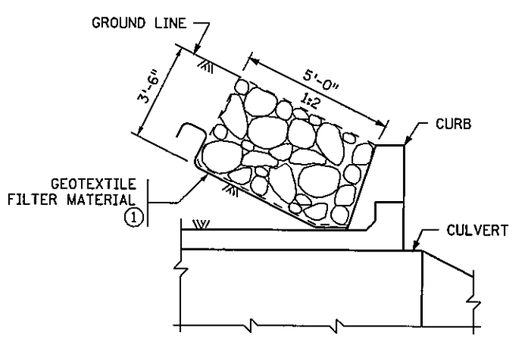
CERTIFIED BY Keith P. Molnau 12-7-09 (LICENSED PROFESSIONAL ENGINEER / DATE) NAME: KEITH P. MOLNAU LIC. NO. 22467	TITLE: SHEET PILING DETAILS	DES: K.P.M. CHK: J.R.C.	DR: K.G.S. CHK: J.A.J.	APPROVED: 12/7/09	BRIDGE NO. 9405
		SHEET NO. B17 OF B18 SHEETS			



PLAN VIEW



SECTION A-A



SECTION C-C

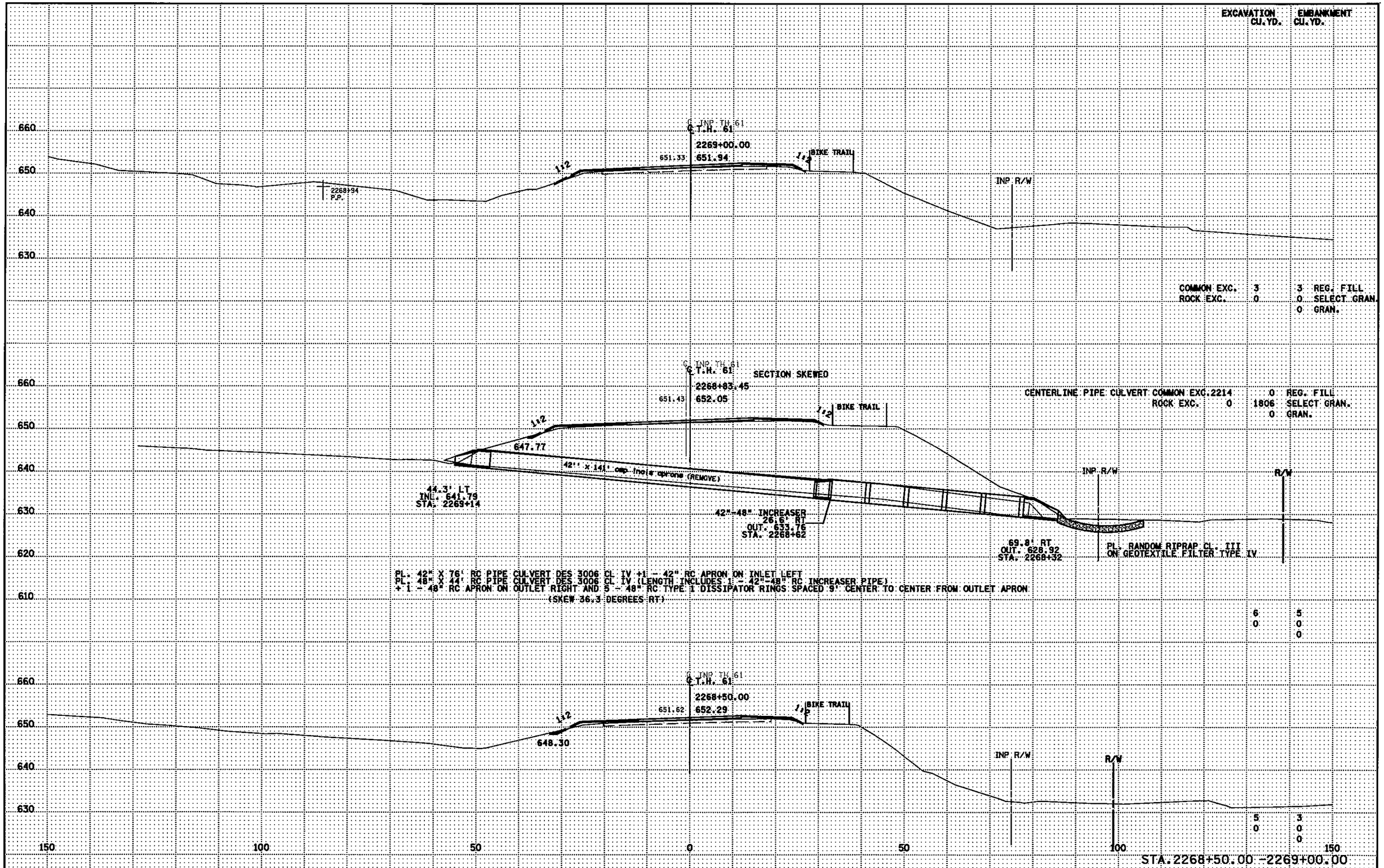
CONSTRUCTION NOTES

RIPRAP SHALL COMPLY WITH Mn/DOT SPECIAL PROVISIONS 2511, Mn/DOT SPECS 2511 AND 3601.

1. FOR TYPE OF GEOTEXTILE FILTER MATERIAL REQUIRED, SEE Mn/DOT SPEC. 3733. GEOTEXTILE STRIPS SHOULD BE CONTINUOUS WITHOUT OVERLAPS, EXCEPT FOR THE TOP STRIP, WHICH SHOULD SHINGLE VERTICAL STRIPS. THE TOP EDGE SHOULD BE BURIED TO PREVENT UNDERMINING (Mn/DOT SPEC. 2511.3B).
2. SLOPES 1:2 TO 1:3 MUST BE STEPPED TO MINIMIZE SLIDING POTENTIAL.
3. IF SLOPES ARE NOT STEPPED, GRANULAR FILTER SHOULD BE USED.

REVISION:
APPROVED: DECEMBER 11, 2000 — STATE BRIDGE ENGINEER

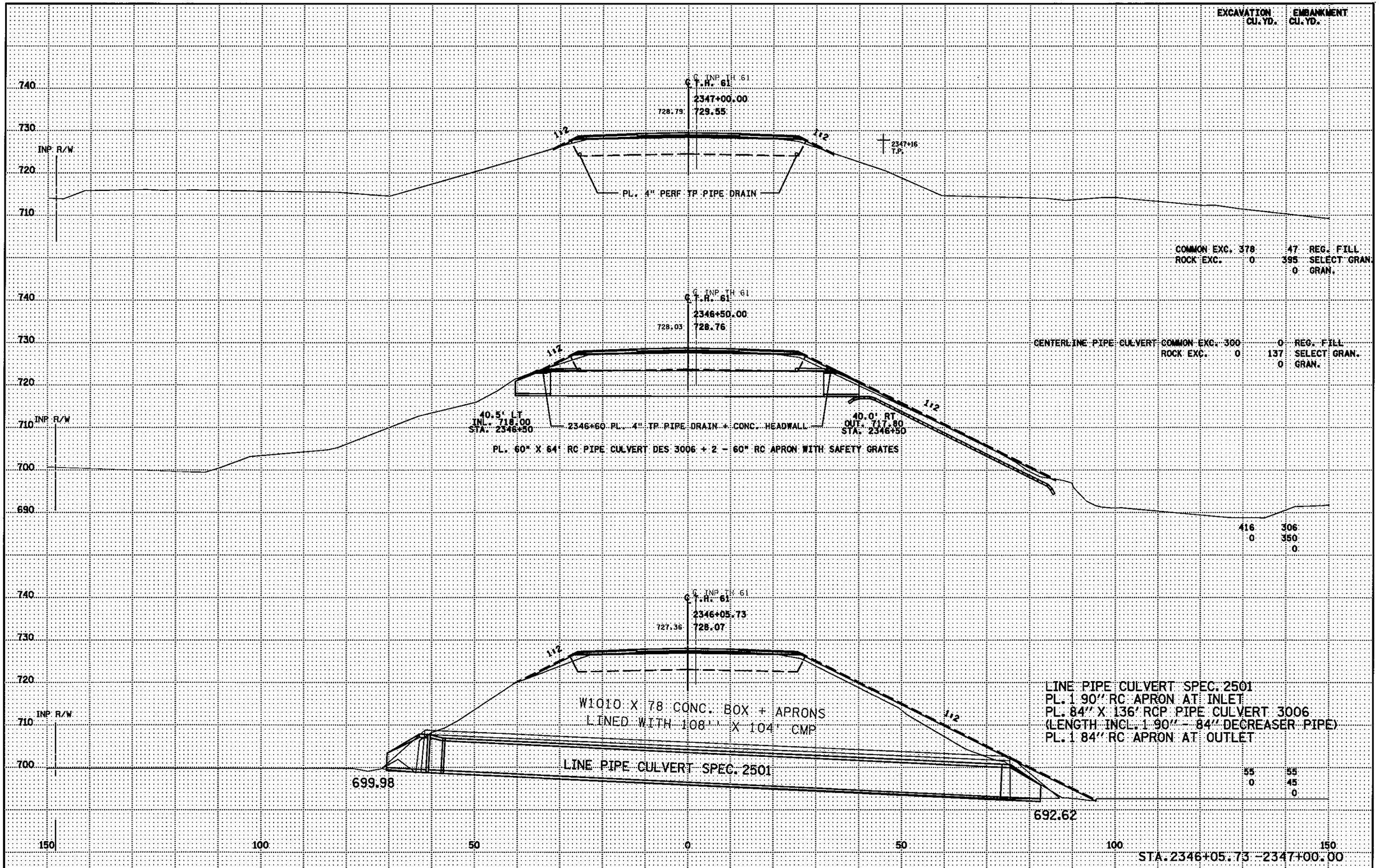
STATE PROJ. NO 3806-60 (T.H. 61) STA. 2290+96.13 RP 43+00.423				FIG. 5-395.115 (MODIFIED)
CERTIFIED BY Keith P. Molnau 12-7-09 (LICENSED PROFESSIONAL ENGINEER, DATE) NAME: KEITH P. MOLNAU LIC. NO. 22467	TITLE: EMBANKMENT PROTECTION FOR BOX CULVERTS	DES: K.P.M. CHK: J.A.J.	DR: K.G.S. CHK: J.A.J.	APPROVED: 12/7/09
		SHEET NO. B18 OF B18 SHEETS		BRIDGE NO. 9405



STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. X8 OF X147 SHEETS

PLOTTED/REVISED: 04-DEC-2009

DISTRICT *: DULUTH
IPLOT NAME: d380660_lr-5-09_xpl7
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d380660_lr-5-09_xpl.dgn



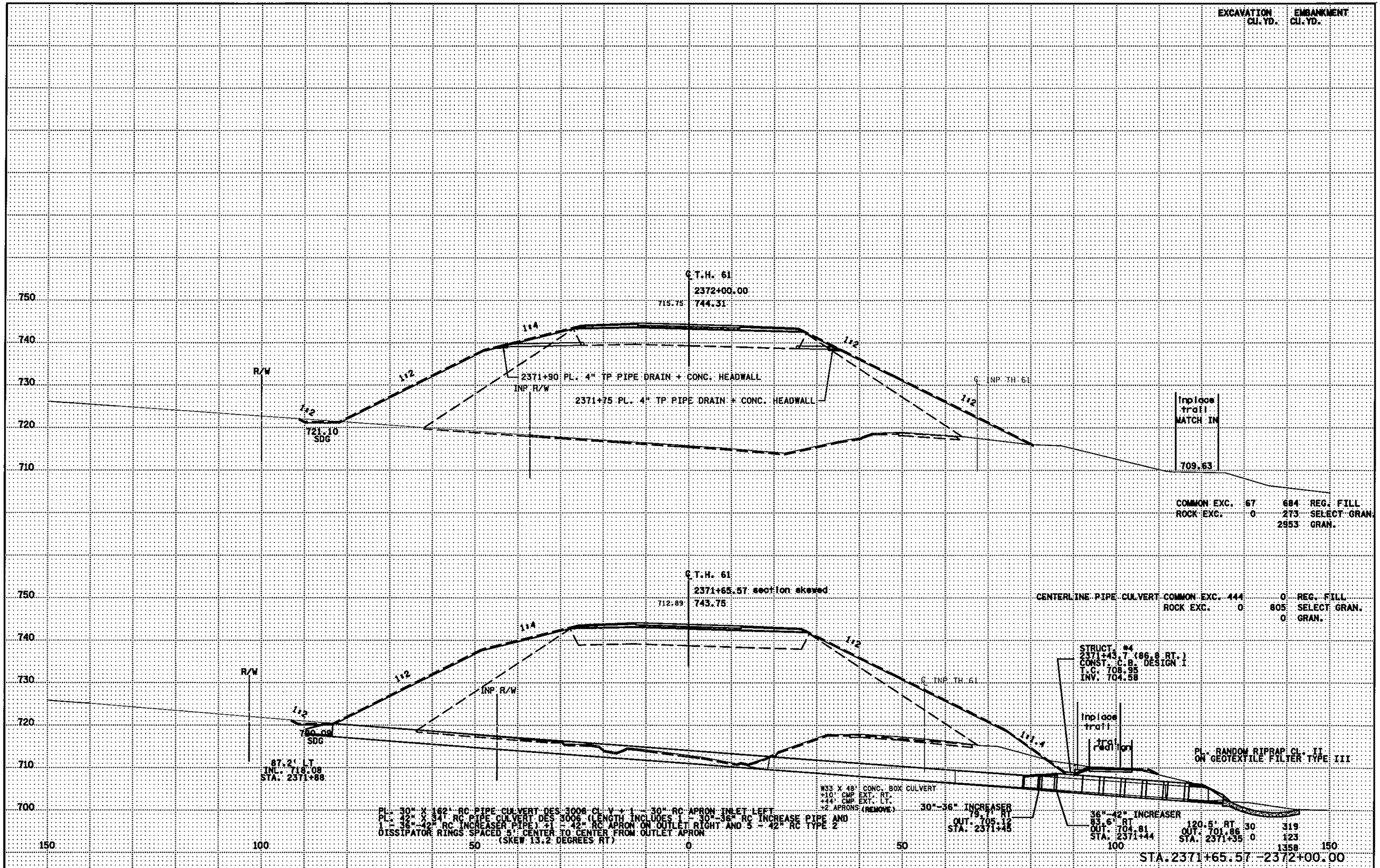
STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. X65 OF X147 SHEETS

PLOTTED/REVISED: 04-DEC-2009

DISTRICT # : DULUTH
IPLOT NAME: d380660_JI-5-09_xpl64
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d380660_JI-5-09_xpl.dgn

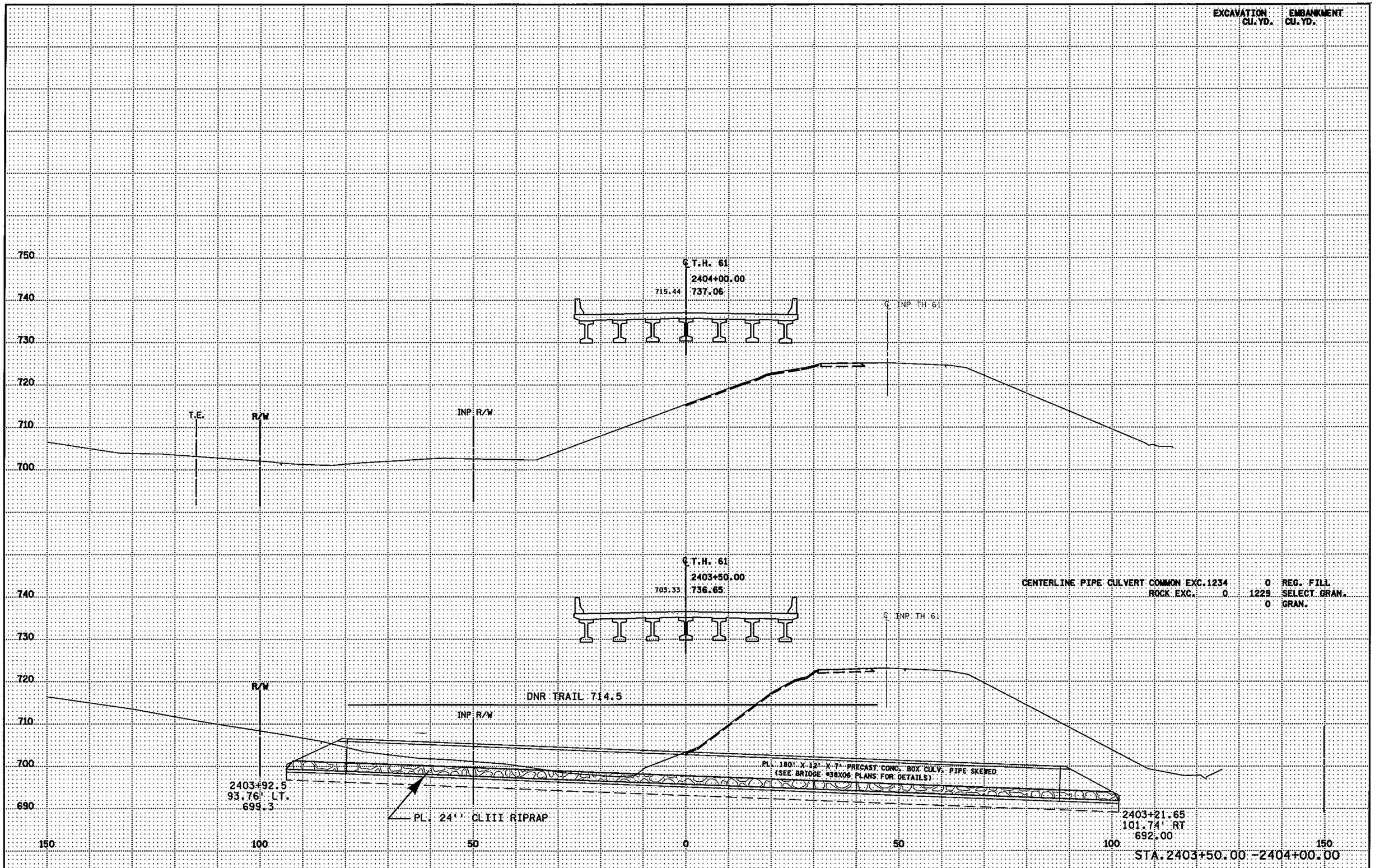
PLOTTED/REVISED: 04-DEC-2009
DISTRICT *: DULUTH
IPLOT NAME: d380660_JI-5-09_xpl81
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d380660_JI-5-09_xpl.dgn

	EXCAVATION CU.YD.	EMBANKMENT CU.YD.
COMMON EXC.	67	684 REG. FILL
ROCK EXC.	0	273 SELECT GRAN.
		2953 GRAN.



STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. X82 OF X147 SHEETS

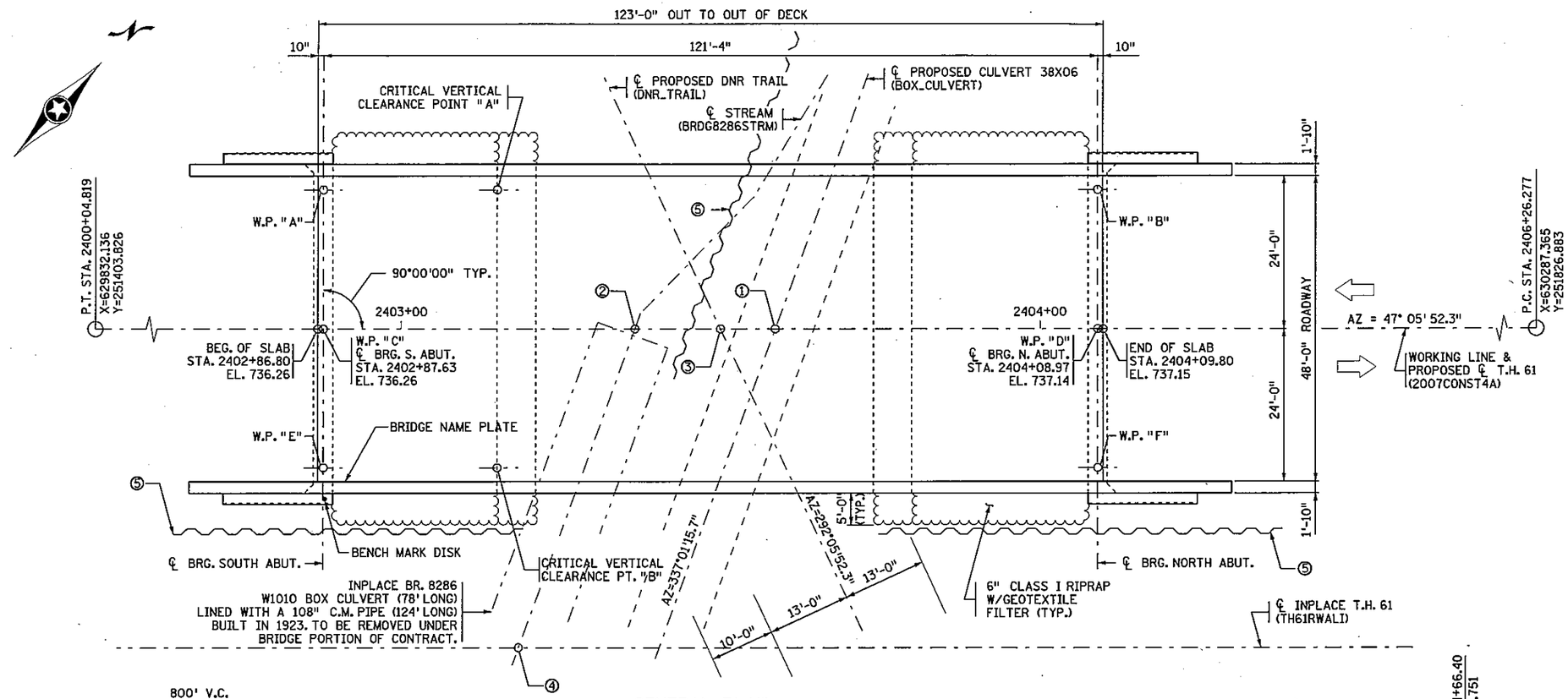
EXCAVATION CU.YD.	EMBANKMENT CU.YD.



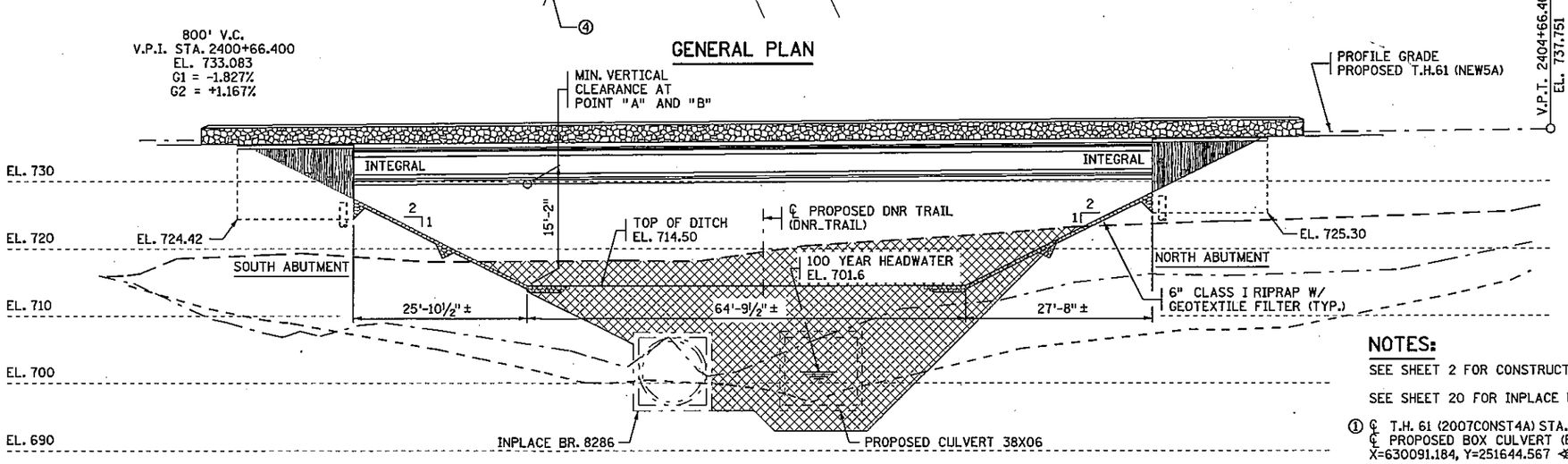
CENTERLINE PIPE CULVERT COMMON EXC.1234		0	REG. FILL
ROCK EXC.	0	1229	SELECT GRAN.
		0	GRAN.

STATE PROJ. NO. 3806-60 (TH 61) SHEET NO. X117 OF X147 SHEETS

PLOTTED/REVISED: 04-DEC-2009
DISTRICT *: DULUTH
IPLOT NAME: d380660_ll-5-09_xplll6
PATH & FILENAME: Projects/DI_DUL/061/3806/060/Design/d380660_ll-5-09_xpl.dgn



GENERAL PLAN



GENERAL ELEVATION

EXISTING GROUND PROFILE
24' RT.
℄ PROPOSED T.H. 61
24' LT.

NOTES:

SEE SHEET 2 FOR CONSTRUCTION NOTES.

SEE SHEET 20 FOR INPLACE UTILITIES.

① ℄ T.H. 61 (2007CONST4A) STA. 2403+58.460 =
℄ PROPOSED BOX CULVERT (BOX_CULVERT) STA. 31+68.474
X=630091.184, Y=251644.567 ∢=70°04'36.6"

② ℄ T.H. 61 (2007CONST4A) STA. 2403+36.478 =
℄ STREAM (BRDG8286STRM)
STA. 12+43.298 X=630075.081, Y=251629.602 ∢=109°55'23.4"

③ ℄ T.H. 61 (2007CONST4A) STA. 2403+49.970 =
℄ PROPOSED DNR TRAIL (DNR TRAIL)
STA. 56+72.694 X=630084.964, Y=251638.787 ∢=65°00'00.0"

④ ℄ INPLACE T.H. 61 (TH61RWALI) STA. 1790+00.646
℄ STREAM (BRDG8286STRM) STA. 12+96.562
X=630095.875, Y=251580.564

⑤ SHEET PILING INCLUDED IN BRIDGE PORTION OF CONTRACT.

FED. PROJ. NO. HPPH H136(002)

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
fy = 60 ksi FOR REINFORCEMENT
PRESTRESSED CONCRETE:
f'c = 7.6 ksi n = 1
fpu = 270 ksi FOR 0.6" DIAMETER LOW RELAXATION STRANDS

DECK AREA = 6355 SQ. FT.
5166 PROJECTED ADT FOR YEAR 2029
404 PROJECTED ADTT FOR YEAR 2029
DESIGN SPEED OVER = 55 MILES PER HOUR
OPERATING RATING HS 53.9

LIST OF SHEETS

NO.	DESCRIPTION
1	GENERAL PLAN AND ELEVATION
2	SCHEDULE OF QUANTITIES & TRANSVERSE SECTION
3	BRIDGE LAYOUT
4-8	ABUTMENT DETAILS
9	FRAMING PLAN
10	MN63" PRESTRESSED CONCRETE BEAM
11-13	SUPERSTRUCTURE DETAILS
14	CONCRETE BARRIER TYPE MOD. P-4, (TL-4)
15-17	DETAILS
18	RIPRAP SLOPE WITH GEOTEXTILE FILTER
19	AS-BUILT BRIDGE DATA
20	BRIDGE SURVEY
21	BRIDGE SURVEY PLAN AND PROFILE

NOTE:

AT LEAST 30 DAYS PRIOR TO CONSTRUCTION OF BRIDGE 38015, THE CONTRACTOR SHALL SUBMIT A BRIDGE REMOVAL AND CONSTRUCTION STAGING PLAN TO SHOW ALL STAGES OF THE CONTRACTOR'S PROPOSED OPERATIONS. SEE SPECIAL PROVISIONS.

PAYMENT FOR REMOVAL OF CROSS HATCHED AREA INCLUDED IN GRADING PORTION OF CONTRACT.

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 Keith P. Molnau DATE 11-19-09
LICENSED PROFESSIONAL ENGINEER
NAME: KEITH MOLNAU LIC NO. 22467

TRUNK HIGHWAY NO. 61
MINNESOTA
DEPARTMENT OF TRANSPORTATION

BRIDGE NO. 38015

T.H. 61 OVER STREAM
6.4 MILES NORTHEAST OF
JCT. OF C.S.A.H. 1 & T.H. 61

IDENTIFICATION NO. 501

GENERAL PLAN AND ELEVATION

SEC. 32 T 55 N R 8 W
BEAVER BAY TWP. LAKE COUNTY

APPROVED Donald W. Lagerquist
STATE BRIDGE ENGINEER
DATE 11/19/09

DES: M.C.D.	DR: D.C.H.	38015
CHK: K.P.M.	CHK: J.A.J.	

38015.1119.dgn
11/19/2009

Mol 1-14-10

GENERAL NOTES

SEE SPECIAL PROVISIONS FOR MATERIALS, PREPARATION AND PLACEMENT.

GEOTEXTILE FILTER MATERIAL AS PER Mn/DOT SPECIAL PROVISION 2511.

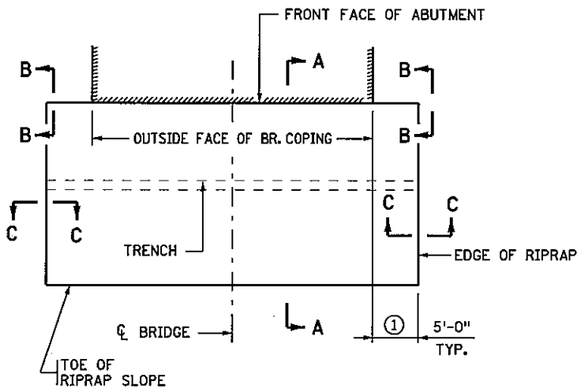
PAYMENT WILL BE MADE UNDER ITEM 2511.515 GEOTEXTILE FILTER TYPE IV (MODIFIED) BY THE SQ. YD.

PAYMENT WILL BE MADE UNDER ITEM 2511.501 RANDOM RIPRAP CLASS I BY THE CU. YD.

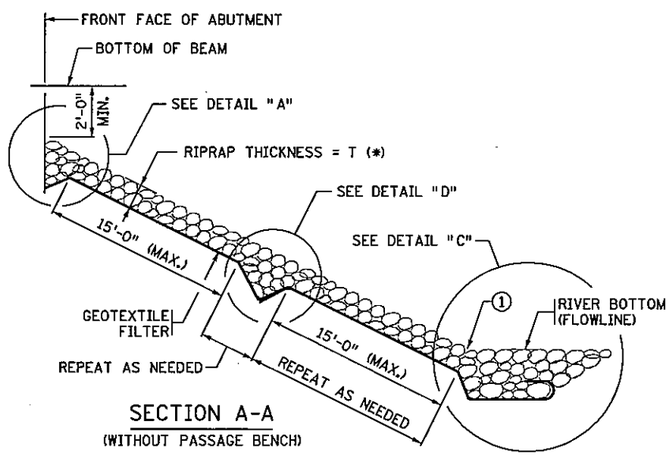
SLOPES ARE EXPRESSED AS A RATIO OF VERTICAL DISTANCE : HORIZONTAL DISTANCE.

SLOPE BOTTOM OF TRENCHES 1:20 PARALLEL TO ABUTMENT FACE TO PROVIDE POSITIVE DRAINAGE.

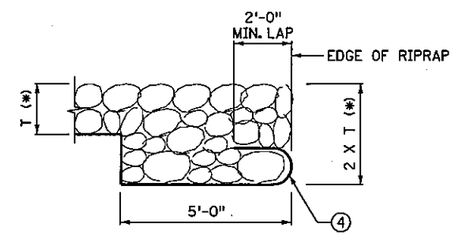
1. SEE PLAN SHEET NO. I FOR DIMENSIONS, AND FOR ELEVATIONS OF RIPRAP TOE.
2. PLACE RIPRAP IN TRENCH TO HOLD THE GEOTEXTILE FABRIC IN PLACE BEFORE PLACING THE REST OF THE RIPRAP (FROM THE BOTTOM OF THE SLOPE).
3. OVERLAP GEOTEXTILE FILTER 1'-6" MINIMUM.
4. WRAP GEOTEXTILE FILTER AROUND TOE, OVERHANG BETWEEN 1ST AND 2ND LAYER OF RIPRAP.
5. BURY EDGES OF GEOTEXTILE FILTER SUFFICIENTLY TO DIRECT WATER FLOW OVER THE FABRIC WITHOUT UNDERMINING.



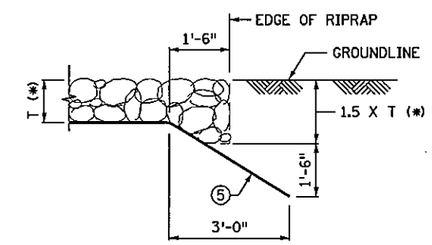
LAYOUT



SECTION A-A
(WITHOUT PASSAGE BENCH)

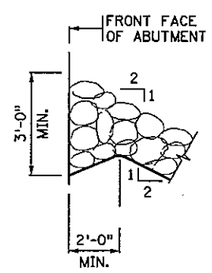


SECTION C-C

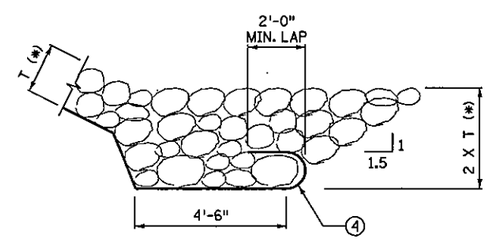


SECTION B-B

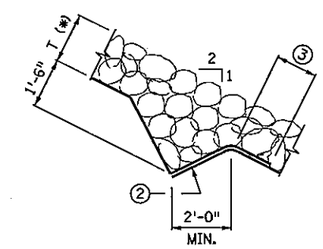
*	DIMENSION T
	CLASS I = 6"
	CLASS III = 1'-6"
	CLASS IV = 2'-0"



DETAIL "A"



DETAIL "C"



DETAIL "D"

CERTIFIED BY Keith P. Molnau LICENSED PROFESSIONAL ENGINEER 11-19-09 DATE NAME: KEITH P. MOLNAU LIC. NO. 22467	TITLE: RIPRAP SLOPE WITH GEOTEXTILE FILTER (SLOPES 1:2 AND FLATTER)	DES: M.C.D. CHK: K.P.M.	DR: D.C.H. CHK: J.A.J.	APPROVED: 11/19/09
		SHEET NO. 18 OF 21 SHEETS		BRIDGE NO. 38015

CONCRETE WEARING COURSE

☐ LOW SLUMP

☐ OTHER _____
TYPE OR MANUFACTURER

EXPANSION JOINTS

JOINT MANUFACTURER

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR JOINT USED

GLAND MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SIZE OF GLAND _____

MANUFACTURER'S IDENTIFICATION _____
MFR'S No. AND/OR LETTER DESIGNATION FOR GLAND USED

ELASTOMERIC BEARING PADS

PAD MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

SPECIAL SURFACE FINISH

SYSTEM: _____ COLOR: _____

FINISHING ROADWAY FACES OF BARRIER RAILING

TYPE: _____ COLOR: _____

ANTI-GRAFFITI COATING

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRODUCT NAME: _____ LOCATION: _____

PAINT SYSTEM

Mn/DOT SPECIFICATION NUMBER _____
2478 OR 2479 OR OTHER

MANUFACTURER _____
NAME AND ADDRESS (CITY, STATE)

PRIME COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

INTERMEDIATE COAT _____
Mn/DOT MATERIAL SPECIFICATION NUMBER

FINISH COAT _____ _____
Mn/DOT MATERIAL SPECIFICATION NUMBER COLOR

PLAN QUALITY

RATE 1 (AGREE), 2 (NEUTRAL), OR 3 (DISAGREE, PLEASE COMMENT BELOW)

DIMENSIONING AND DETAILING ADEQUATELY DESCRIBED REQUIRED CONSTRUCTION. _____

BAR LISTS AND QUANTITIES WERE TYPICALLY COMPLETE AND FREE OF ERRORS. _____

SCALE OF DRAWINGS AND OVERALL LEGIBILITY OF LINES AND TEXT WAS GOOD. _____

(SB) SPECIAL PROVISIONS ADEQUATELY DESCRIBED SPECIAL WORK AND PAYMENT. _____

COMMENTS: _____

NUMBER OF BRIDGE SUPPLEMENTAL AGREEMENTS: _____ COST: $ _____

LIST SIGNIFICANT ERRORS OR OMISSIONS IN PLAN DETAILS OR PAY QUANTITIES IN THE SPACE PROVIDED AT RIGHT.

BRIDGE REMOVAL / BRIDGE OPENING

NUMBER OF AND DATE OLD BRIDGE WAS REMOVED (IF APPLICABLE):

BRIDGE NUMBER _____ DATE REMOVED _____

DATE NEW BRIDGE WAS OPENED TO TRAFFIC _____

NOTIFY THE BRIDGE OFFICE BRIDGE MANAGEMENT UNIT WITH THIS INFORMATION AS SOON AS POSSIBLE. (651) 366-4557

OTHER ITEMS ①

① UTILITIES ADDED DURING CONSTRUCTION AND SPECIALTY ITEMS.

FINAL QUANTITIES ENTERED ON SCHEDULE OF QUANTITIES: YES ☐ NO ☐

SUMMARY OF SIGNIFICANT AS-BUILT CHANGES

THE AS-BUILT INFORMATION WAS ADDED TO THE PLAN BY:

_____ _____
INSPECTOR(S) SIGNATURE DATE

CHECKED BY: _____ _____
PROJECT ENGINEER/SUPERVISOR SIGNATURE DATE

AT THE TIME OF THE FINAL, THIS COMPLETED AS-BUILT BRIDGE DATA SHEET MUST BE SUBMITTED TO THE BRIDGE OFFICE - ATTN: REGIONAL CONSTRUCTION ENGINEER (MS610).

REVISION: 10-28-2008

APPROVED: SEPTEMBER 26, 2003
Daniel L. Dorgan
STATE BRIDGE ENGINEER

AS-BUILT DETAILS
(AS NEEDED)

FIG. 5-397.900

TITLE: AS-BUILT BRIDGE DATA

DES: DR: CHK: CHK:

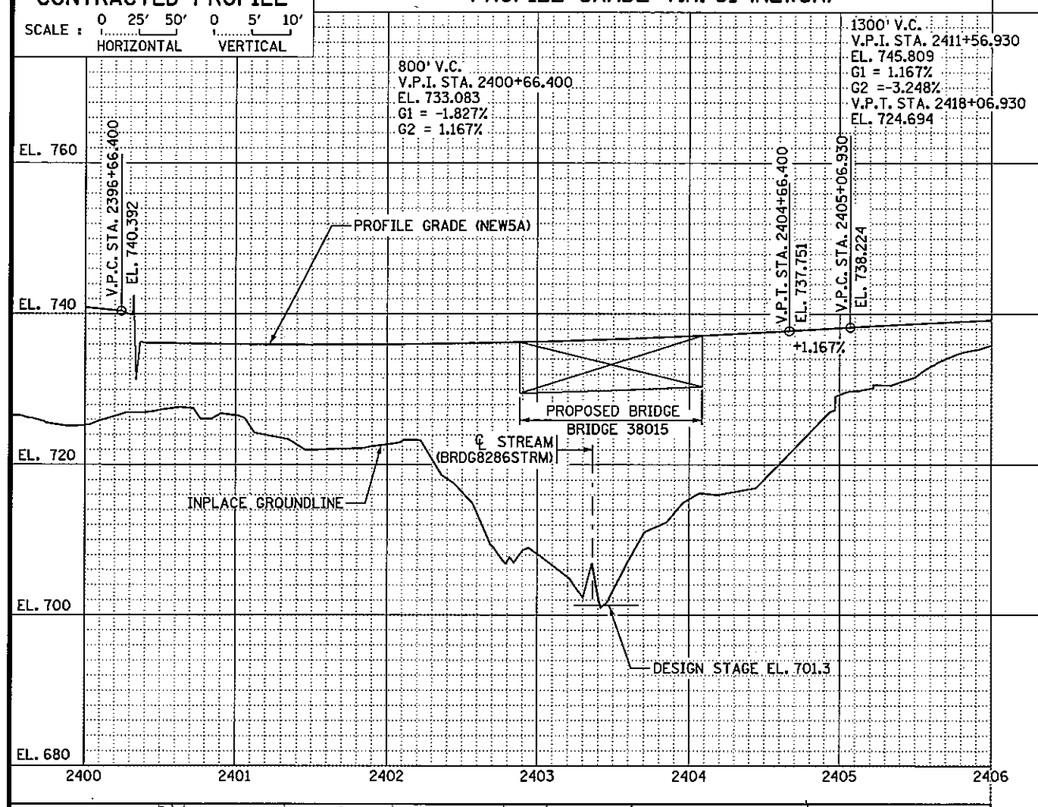
APPROVED: 11/19/09

SHEET NO. 19 OF 21 SHEETS

BRIDGE NO. 38015

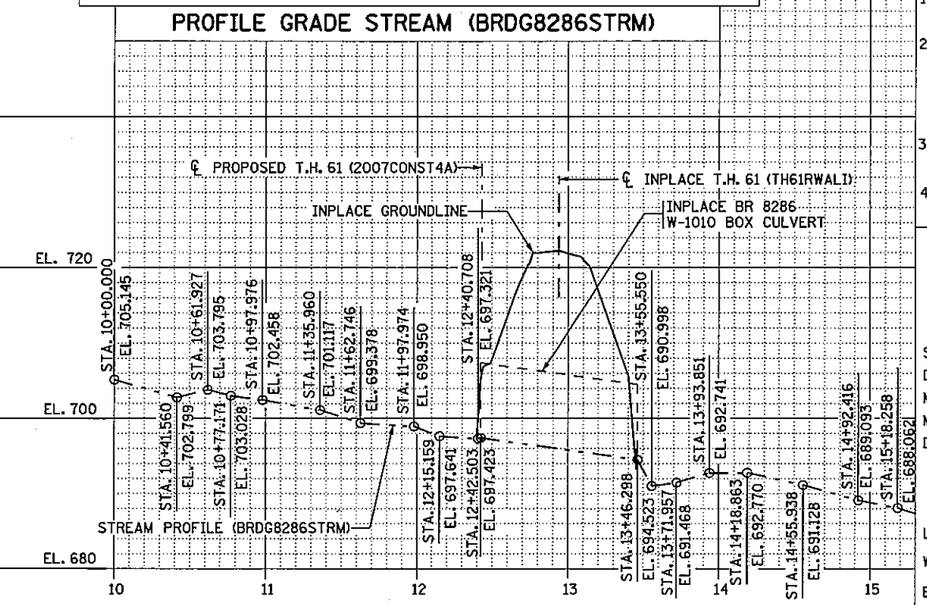
CONTRACTED PROFILE

SCALE : 0 25' 50' HORIZONTAL 0 5' 10' VERTICAL



TYPICAL SECTIONS & PERTINENT DATA

SCALES AS SHOWN



LOCATION ENGINEER'S OBSERVATIONS AT BRIDGE SITE

1. SPECIAL FEATURES: WATERFALLS, DAMS, FLOODS, ICE, DEBRIS, SLIDING BANKS, RECREATIONAL BOATING.
2. 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.
3. APPARENT HIGHWATER ELEVATION OBTAINED FROM:
4. OTHER DATA: APPROX. VELOCITY OF WATER AT TIME OF SURVEY.

HYDRAULIC ENGINEERS RECOMMENDATION

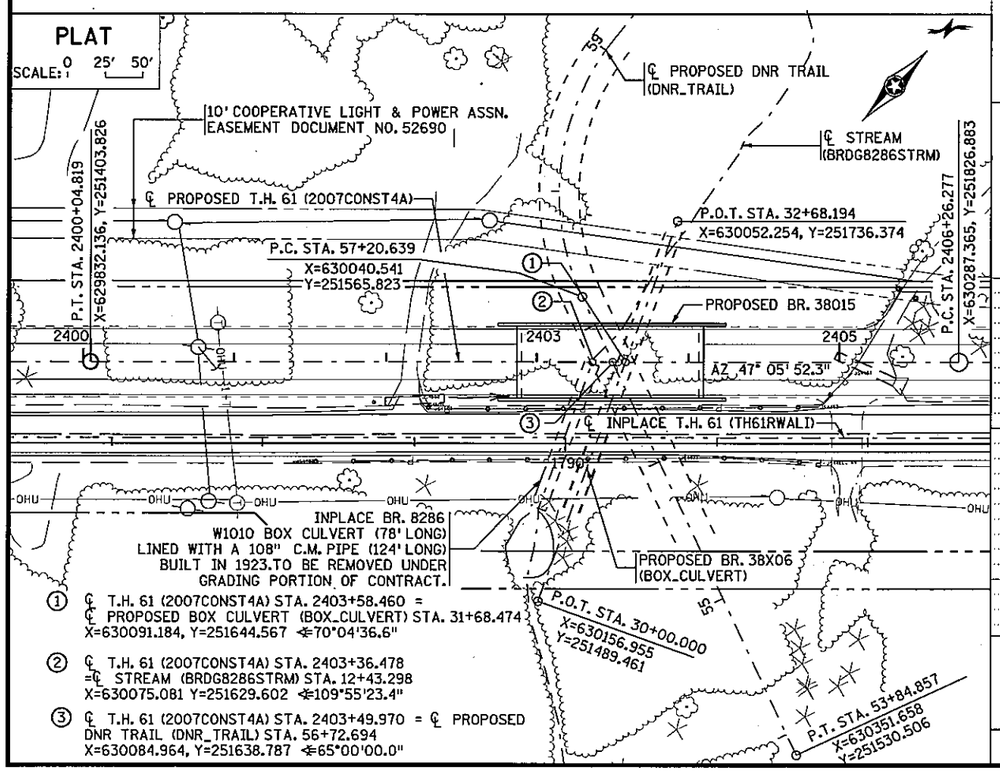
DATE: 07-28-09

*** RECOMMENDATION FOR CULVERT 38X06 ***

STREAM OR DITCH DESIGNATION: STREAM
DRAINAGE AREA: 0.97 SQ. MI.
MAX. FLOOD ON RECORD: NA C.F.S.
MAXIMUM OBSERVED HIGHWATER ELEVATION: N.A. FT.
DESIGN FLOOD (50 YR. FREQ.): 335 C.F.S.
DESIGN STAGE ELEVATION: 703.5 FT.
DESIGN MEAN VELOCITY THROUGH STRUCTURE: 11.3 F.P.S.
TOTAL STAGE INCREASE: 2.7 FT.
LOW MEMBER ELEVATION: N.A.
WATERWAY AREA REQUIRED: N.A.
BASIC FLOOD (100 YR. FREQ.): 440 C.F.S.
STAGE ELEVATION: 703.7 FT.
TOTAL STAGE INCREASE: 3.4 FT.
MEAN VELOCITY THROUGH STRUCTURE: 10.6 F.P.S.
GREATEST FLOOD (500 YR. FREQ.): N.A.
STAGE ELEVATION: N.A.
TOTAL STAGE INCREASE: N.A.
MEAN VELOCITY THROUGH STRUCTURE: N.A.
APPROXIMATE FLOWLINE ELEVATION: 701.3 FT. SKEW ANGLE: NA°
ESTIMATED DEPTH OF PIER SCOUR: N.A.

PLAT

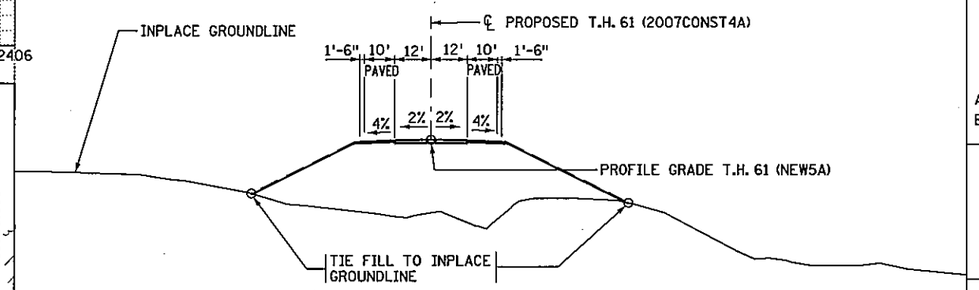
SCALE: 0 25' 50'



① ℄ T.H. 61 (2007CONST4A) STA. 2403+58.460 = ℄ PROPOSED BOX CULVERT (BOX_CULVERT) STA. 31+68.474
X=630091.184, Y=251644.567 ∢=70°04'36.6"

② ℄ T.H. 61 (2007CONST4A) STA. 2403+36.478 =℄ STREAM (BRDG8286STRM) STA. 12+43.298
X=630075.081 Y=251629.602 ∢=109°55'23.4"

③ ℄ T.H. 61 (2007CONST4A) STA. 2403+49.970 = ℄ PROPOSED DNR TRAIL (DNR_TRAIL) STA. 56+72.694
X=630084.964, Y=251638.787 ∢=65°00'00.0"



TYPICAL ROADWAY APPROACH

SCOUR CONFIRMATION RECOMMENDATION

DATE: 07-28-09

*** RECOMMENDATION FOR BRIDGE 38015 ***

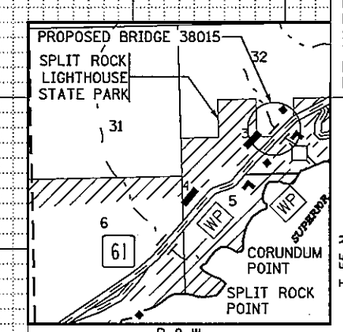
ESTIMATED TOTAL SCOUR AT PIER EL. NA (500 OR QT YR. FREQ.) SCOUR CODE=H FOUNDATION ABOVE WATER

BRIDGE SURVEY SHEETS MADE FROM :

BENCH MARK ELEVATION 713.37 (N.A.V.D. 88 ADJ.)
DESCRIPTION (1978) GEODETIC DATABASE STATION #16707 Q341

LOCATION 5.2 MILES SOUTHWEST ON T.H 61 FROM T.H. 61 BRIDGE OVER BEAVER RIVER IN BEAVER BAY, 0.15 MILES SOUTHWEST OF T.H. 61 MILEPOINT 45.85, 48 FT. NORTHWEST OF T.H. 61 OPPOSITE SPLIT ROCK LIGHTHOUSE STATE PARK ENTRANCE, IN NORTHWEST END OF LARGE BOULDER, 2.3 FT. NORTHWEST OF WITNESS POST.

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."



INDEX MAP (FOUR SECTIONS)

Date:
Initials:

MINNESOTA DEPARTMENT OF TRANSPORTATION

BRIDGE SURVEY

T.H. 61 OVER STREAM
PROPOSED BRIDGE LOCATED 6.4 MILES NORTHEAST OF JUNCTION OF C.S.A.H. 1

SEC 32 T 55 N R 8 W

COUNTY: LAKE

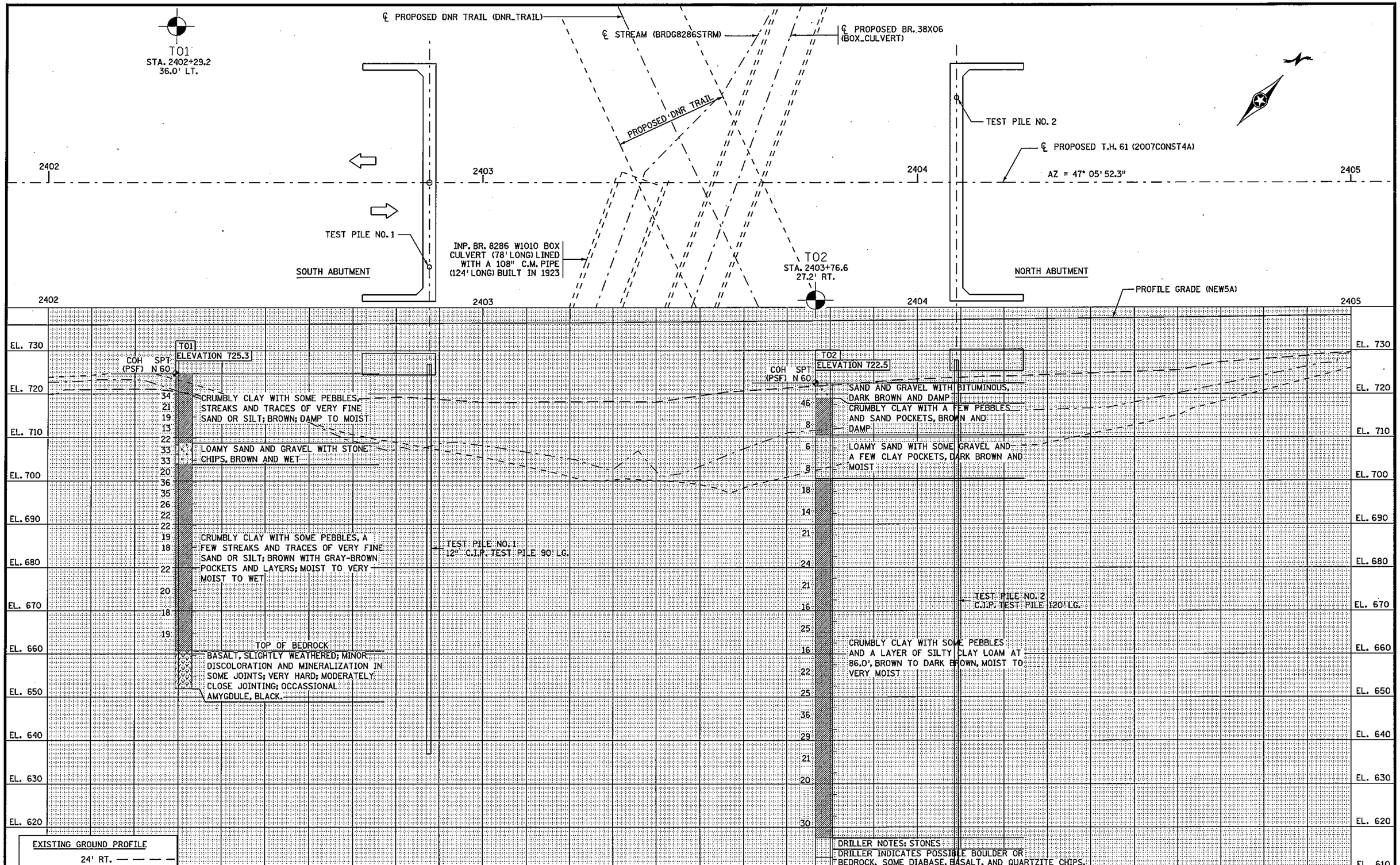
TOWNSHIP: BEAVER BAY

BRIDGE NO. **38015**

STATE PROJECT NO. 3806-38015

11/19/09

SHEET NO. 20 OF 21 SHEETS



BORINGS	DR: D.K.S.	CHK: L.G.A.	BRIDGE NO. 38015
STATE PROJECT NO. 3806-38015 11/19/09	SHEET NO. 21 OF 21 SHEETS		