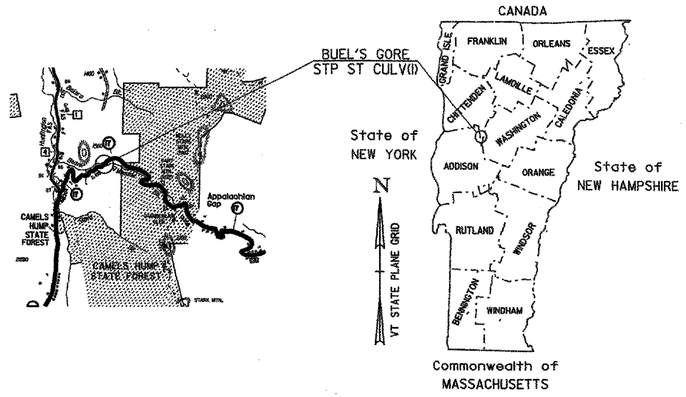
NOTE:
SEE PRELIMINARY SHEET FOR INDEX OF SHEETS
AND LIST OF STANDARDS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

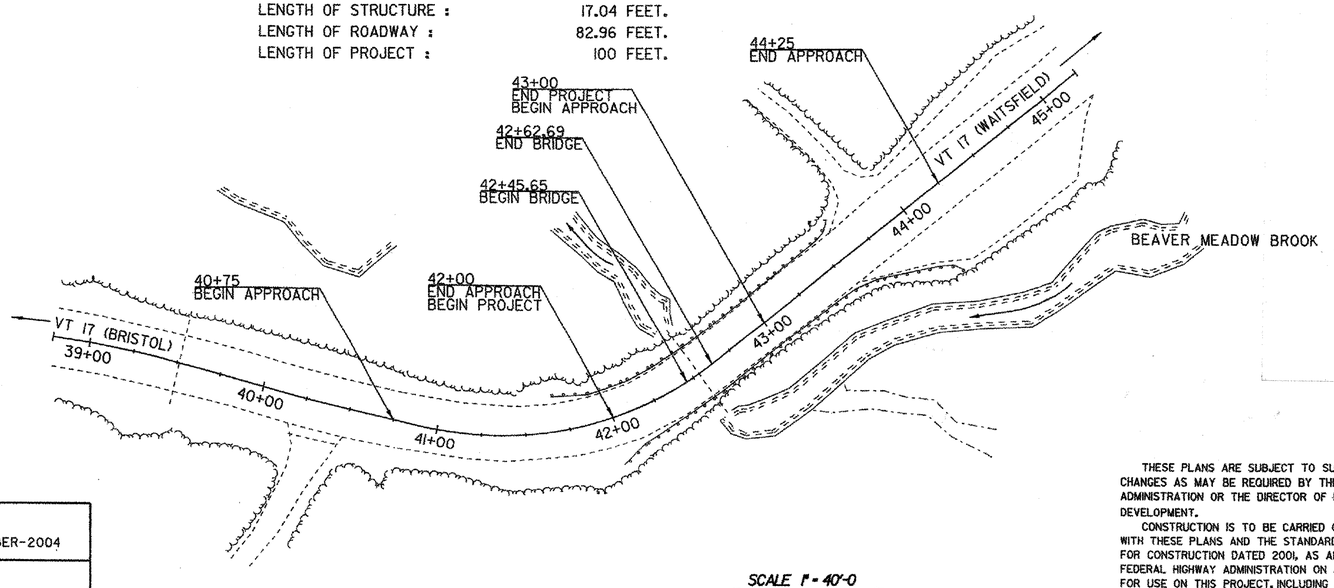


PROPOSED IMPROVEMENT
BRIDGE PROJECT
TOWN OF BUEL'S GORE
CHITTENDEN COUNTY
VT. ROUTE 17 - MAJOR COLLECTOR
BRIDGE NO. 27

PROJECT LOCATION : BEGINNING AT A POINT ON VT ROUTE 17 APPROXIMATELY 1 MILE EAST OF THE T.H.4/VT ROUTE 17 INTERSECTION

PROJECT DESCRIPTION : REMOVAL AND DISPOSAL OF EXISTING STRUCTURE AND PLACEMENT OF A ~~NEW BOX CULVERT~~ NEW PRECAST ARCH WITH CAST IN PLACE FOOTINGS FOR ARCH AND WINGWALLS, INCLUDING ASSOCIATED TEMPORARY CHANNEL AND TEMPORARY ROADWAY APPROACH WORK.

LENGTH OF STRUCTURE : 17.04 FEET.
LENGTH OF ROADWAY : 82.96 FEET.
LENGTH OF PROJECT : 100 FEET.



SCALE 1" = 40'-0
40 0 40

RECORD PLANS

CONTRACTOR: PIKE INDUSTRIES, INC. – BERLIN, VT
RESIDENT ENGINEER: IAN JENIKE
CONSTRUCTION BEGAN: 7/13/2006
CONSTRUCTION COMPLETE: 10/30/2006
RECORD PLANS BY: IAN JENIKE & N. GARBACIK

I HEREBY CERTIFY THAT ALL THE CONSTUCTION REQUIRED BY THIS SET OF DRAWINGS HAS BEEN ACCOMPLISHED AS INDICATED HEREIN.

BY _____ RESIDENT ENGINEER
DATE 5/2/07

NOTE: Any further information concerning final quantities, amounts or other details relative to this project may be found at Central Files in the electronic archives.

CONVENTIONAL SYMBOLS

COUNTY LINE
TOWN LINE
LIMITS OF ACCESS
POINT OF ACCESS
FENCE LINE
STONE WALL
TRAVELED WAY
GUARD RAIL
RAILROAD
SURVEY LINE
CULVERT
POWER POLE
TELEPHONE POLE
TREES
CONTROL OF ACCESS
PROPERTY LINE
R.O.W. TAKING LINE
SLOPE RIGHTS SR SR SR
TOP OF CUT
TOE OF SLOPE

SURVEYED BY : L ORVIS
SURVEYED DATE : 16-NOVEMBER-2004

DATUM
VERTICAL NAVD 27
HORIZONTAL ASSUMED

THESE PLANS ARE SUBJECT TO SUCH ENGINEERING CHANGES AS MAY BE REQUIRED BY THE FEDERAL HIGHWAY ADMINISTRATION OR THE DIRECTOR OF PROGRAM DEVELOPMENT.

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2001, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JANUARY 4, 2001 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED _____ DATE 3-28-06
PROJECT MANAGER : M. EVANS-MONGEON

PROJECT NAME : BUEL'S GORE
PROJECT NUMBER : STP ST CULV(1)
IPARM: S04C1381.1
SHEET 1 OF 30 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET

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2.	PRELIMINARY INFORMATION SHEET
3.	TYPICAL SECTIONS
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7.	TIE SHEET
8.	PLAN SHEET
9.	BLANK
10.	TRAFFFIC SIGN SUMMARY SHEET
11.	BANKING DIAGRAM AND PROFILE SHEET
12-17.	EROSION PREVENTION AND SEDIMENT CONTROL SHEETS
18-19.	TRAFFIC CONTROL SHEETS
20.	BLANK
21.	PLAN AND ELEVATION SHEET
22.	GENERAL NOTES
23.	BOX PROFILE AND DETAILS
24.	WING WALL AND HEADWALL DETAILS
25.	BLANK
26-28.	MAINLINE SECTIONS
29.	MATERIAL TRANSITION
30.	CHANNEL SECTIONS

STANDARDS

B-71	RESIDENTIAL AND COMMERCIAL DRIVES	7/8/2005
E-100	CONSTRUCTION APPROACH SIGNS	1/2/2004
E-100A	SIDE ROAD CONSTRUCTION - APPROACH SIGNS	1/2/2004
E-101	CONSTRUCTION SIGN DETAILS	5/30/2003
E-102	CONSTRUCTION SIGN DETAILS	6/30/2003
E-102A	CONSTRUCTION SIGN DETAILS	5/1/2004
E-106	TRAFFIC CONTROL - MISCELLANEOUS DETAILS	3/1/2004
E-107	DELINEATION, BARRICADES AND DETOURS FOR U-TURNS ON DIVIDED HIGHWAY	6/30/2003
E-107A	BREAKAWAY BARRICADE DETAILS	8/8/1995
E-108	CONSTRUCTION ZONE LONGITUDINAL DROP OFFS	8/18/1995
E-110	MAJOR MAINTENANCE OPERATION LANE CLOSURE	8/8/1995
E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	8/8/1995
E-134	BRIDGE NUMBER PLAQUE	8/8/1995
E-138	MILEMARKER DETAILS - STATE & TOWN HIGHWAYS	5/30/2003
E-140	REGULATORY SIGN DETAILS	8/30/1996
E-150	WARNING SIGN DETAILS	5/1/2004
E-152	WARNING SIGN DETAILS	5/1/2004
E-155	WARNING SIGN DETAILS	5/1/2004
E-160	FLANGED CHANNEL STEEL SIGN POST	5/20/1999
E-170	TRAFFIC CONTROL SIGNALS PEDESTAL POST MOUNTED	11/4/1999
E-171A	TRAFFIC CONTROL SIGNALS GENERAL NOTES & DETAILS	8/9/1995
E-171B	TRAFFIC CONTROL SIGNALS MISC. DETAILS	8/9/1995
E-171C	TRAFFIC CONTROL SIGNALS CANTILEVER MOUNTING DETAILS	8/9/1995
E-172	VEHICLE DETECTOR LOOP DETAILS	8/9/1995
E-173	PULL BOXES AND JUNCTION BOXES	8/9/1995
E-175	POWER DROP STANCHIONS	11/17/1993
E-193	PAVEMENT MARKING DETAILS	8/18/1995
E-197	DELINEATOR PLACEMENT TYPICAL	4/1/2005
E-198	DELINEATORS AND MILEPOSTS	4/1/2005
G-1	STEEL BEAM GUARDRAIL WITH STEEL POSTS STEEL BEAM GUARDRAIL WITH WOOD POSTS	1/3/2000
G-1D	STEEL BEAM GUARDRAIL APPROACH END TERMINAL STEEL BEAM GUARDRAIL TRAILING END TERMINAL ANCHOR FOR STEEL BEAM GUARDRAIL STEEL BEAM MEDIAN BARRIER	1/3/2000
G-18	PRECAST CONCRETE TEMPORARY TRAFFIC BARRIER	6/1/1994
G-19	GENERIC GRADING PLANS FOR GUARDRAIL END TERMINALS	11/15/2002

FINAL HYDRAULIC REPORT

TOWN: Buel's Gore
PROJECT #: STP ST CULV (1)
HIGHWAY #: VT 17
COUNTY: Chittenden
STREAM: Beaver Meadow
STRUCTURE #: 27

HYDROLOGIC DATA

DRAINAGE AREA : 0.93 sm
CHARACTER OF TERRAIN : Hilly to Mountainous
STREAM CHARACTERISTICS : Sinuous
NATURE OF STREAMBED : Gravel, Cobbles

PEAK FLOW DATA

Q 2.33 =	60 cfs	Q 50 =	250 cfs
Q 10 =	140 cfs	Q 100 =	325 cfs
Q 25 =	200 cfs	Q 500 =	460 cfs

DATE OF FLOOD OF RECORD: unknown
ESTIMATED DISCHARGE: unknown
WATER SURFACE ELEV.: unknown
NATURAL STREAM VELOCITY: @ Q50 = 8.0 f/s
ICE CONDITIONS : Moderate
DEBRIS: Modetate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Yes
IS ORDINARY RISE RAPID? Yes
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE:

WATERSHED STORAGE: 1%
HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: CGMPP
YEAR BUILT: 1954
CLEAR SPAN(NORMAL TO STREAM): 7.0 ft
VERTICAL CLEARANCE: 7.0 ft
WATERWAY OF FULL OPENING: 38.5 sf
DISPOSITION OF STRUCTURE: Removal of old structure
TYPE OF MATERIAL UNDER SUBSTRUCTURE: n/a

WATER SURFACE ELEVATIONS AT:

Q2.33 =	1449.9 ft	VELOCITY =	11.2 ft/s
Q10 =	1450.8 ft	"	13.8 ft/s
Q25 =	1451.9 ft	"	14.9 ft/s
Q50 =	1452.8 ft	"	15.7 ft/s
Q100 =	1454.0 ft	"	16.7 ft/s

LONG TERM STREAMBED CHANGES: Large stream wide scour hole at outlet.

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: 1456.0 ft at Sta. 42+00
DISCHARGE OVER ROAD @Q100: N/A

UPSTREAM STRUCTURE

TOWN: Buel's Gore
HIGHWAY #: V.T. 17
CLEAR SPAN: 6.0 ft
YEAR BUILT: 1957
STRUCTURE TYPE: CMP
DISTANCE: 3,800 ft
STRUCTURE #: 29
CLEAR HEIGHT: 6.0 ft
FULL WATERWAY: 28.3 sf

DOWNSTREAM STRUCTURE

TOWN: Starksboro
DISTANCE: 3,700 ft

LOAD FACTOR - LOAD RATING (TONS)

LOADING LEVELS	TRUCK						
	H	HS	3S2	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY	N/A	N/A					
POSTED	N/A	N/A	N/A		N/A	N/A	N/A
OPERATING		N/A	N/A	N/A	N/A	N/A	

COMMENTS: TO BE DETERMINED BY FABRICATOR

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2005	960	260	50	6	40
2025	1200	290	50	10	80

20 year ESAL for flexible pavement from 2005 to 2025 : 203,000
40 year ESAL for flexible pavement from 2005 to 2045 : 501,000
Design Speed : 40 mph

HIGHWAY #: T.H. 4
CLEAR SPAN: 15.0 ft
YEAR BUILT: unknown
STRUCTURE TYPE: Bridge
STRUCTURE #: 5
CLEAR HEIGHT: 8.0 ft
FULL WATERWAY: 120 sf

PROPOSED STRUCTURE

STRUCTURE TYPE: Concrete Box with 1' high bed retention sills & stone fill in bottom

CLEAR SPAN(NORMAL TO STREAM): 15.0 ft Stone lined
VERTICAL CLEARANCE ABOVE STREAMBED: 5.3 ft average
WATERWAY OF FULL OPENING: 97.5 sf

WATER SURFACE ELEVATIONS AT:

Q2.33 =	1449.9 ft	VELOCITY =	6.5 ft/s
Q10 =	1450.5 ft	"	9.0 ft/s
Q25 =	1450.8 ft	"	10.3 ft/s
Q50 =	1451.0 ft	"	11.1 ft/s
Q100 =	1451.3 ft	"	12.1 ft/s

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: N/A
RELIEF ELEVATION: 1456.0 ft at Sta. 42+00
DISCHARGE OVER ROAD @Q100: N/A

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 1452.6 ft
VERTICAL CLEARANCE: @ Q50 = 1.5 ft

SCOUR: N/A

REQUIRED CHANNEL PROTECTION: Type II Stone Fill

PERMIT INFORMATION

AVERAGE DAILY FLOW:	2 cfs	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	1 cfs	< 0.5 ft
ORDINARY HIGH WATER:	28 cfs	1.5 ft

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: 84" diameter pipe extension (see traffic control sheets)
CLEAR SPAN (NORMAL TO STREAM): n/a
VERTICAL CLEARANCE ABOVE STREAMBED: n/a
WATERWAY AREA OF FULL OPENING: 9.6 sq. ft.

ADDITIONAL INFORMATION

Stream diversion, min: 42" pipe, 9.6 sq. ft. waterway, (3.6 ft headwater at Q2.33)

DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTO HS-25-44
2. DESIGN SPAN 15FT
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL MAX 4KSF
   ON LEDGE N/A
4. ALLOWABLE LOAD FOR PILING N/A
   TYPE N/A
   ESTIMATED LENGTH N/A
5. STRUCTURAL STEEL AASHTO M270MM270 GRADE N/A
6. REINFORCING STEEL GRADE 60
7. CONCRETE, HIGH PERFORMANCE CLASS A f'c: 4000 psi
   CONCRETE, HIGH PERFORMANCE CLASS B f'c: 3500 psi
8. DESIGN SOIL UNIT WEIGHT 140 pcf
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL N/A

TRAFFIC MAINTENANCE

1. IS TRAFFIC TO BE MAINTAINED? YES
   IF YES, ON EXISTING STRUCTURE? PHASE I OF TRAFFIC PACKAGE
   OR ON TEMPORARY BRIDGE? PHASE II OF TRAFFIC PACKAGE
   ONE OR TWO-WAY TRAVEL? ONE
2. TRAFFIC CONTROL SIGNALS REQUIRED? YES
3. ARE SIDEWALKS REQUIRED? NO
   IF SO, ON WHAT SIDE?

NOTE
N/A = NOT APPLICABLE

PROJECT NAME: **BUELS GORE**
PROJECT NUMBER: **STP ST CULV(1)**

FILE NAME: **/04C138/str/s04c138pi.xls**
PROJECT MANAGER: **M. EVANS-MONGEON**
DESIGNED BY: **W. FARLEY**
PRELIMINARY INFORMATION SHEET
PLOT DATE: **05-APR-2006**
DRAWN BY: **T. HUSK**
CHECKED BY: **W. FARLEY**
SHEET **2** OF **30**

TYPICAL SECTIONS

MATERIAL TOLERANCE TABLE

MATERIAL ITEM	THICKNESS TOLERANCE
PAVEMENT (TOTAL DEPTH)	± 1/4"
BASE COURSE (TOTAL DEPTH)	± 1/2"
SUBBASE (TOTAL DEPTH)	± 1"

3" BITUMINOUS CONCRETE, TYPE III OR IV (TWO-1 1/2" LIFTS) (PG 58-34)
5" BITUMINOUS CONCRETE, TYPE I OR II (TWO-2 1/2" LIFTS) (PG 58-34)
36" SUBBASE OF DENSE GRADED CRUSHED STONE

SEEDING FORMULA RURAL AREAS

% WT.	LBS./A.	NAME	PUR %	GERM %
37.5	22.5	CREEPING RED FESCUE	98	85
37.5	22.5	TALL FESCUE	95	90
5.0	3.0	RED TOP	95	90
15.0	9.0	BIRDSFOOT TREFOIL	98	85
5.0	3.0	ANNUAL RYEGRASS	95	85
100.0	60.0			

GENERAL NOTES

SEED MIXTURE: SHALL NOT HAVE A WEED CONTENT EXCEEDING 0.40% BY WEIGHT AND SHALL BE FREE OF ALL NOXIOUS SEED.

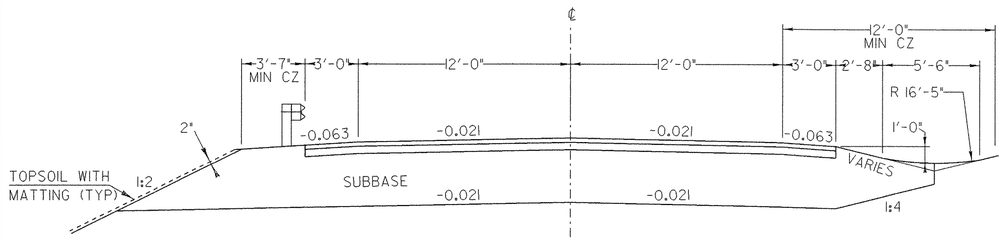
SEED: TO BE APPLIED PER SEEDING FORMULAS OR AS DIRECTED BY THE ENGINEER.

FERTILIZER: FORMULA 10-20-10, TO BE USED WITH SEED, APPLIED AT THE RATE OF 500 LBS./ACRE. (HYDRO SEEDERS MAY USE 19-19-19 FORMULA).

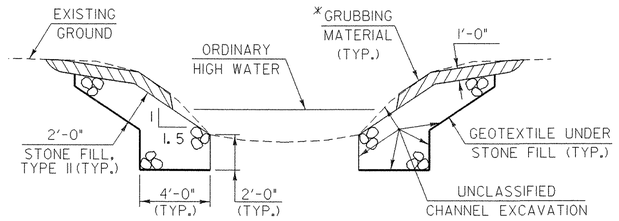
AGRICULTURAL LIMESTONE: TO BE APPLIED AT THE RATE OF 2 TONS/ACRE, OR AS DIRECTED BY THE ENGINEER.

HAY MULCH: TO BE PLACED ON EARTH SLOPES AT THE RATE OF 2 TONS/ACRE, OR AS DIRECTED BY THE ENGINEER.

TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.

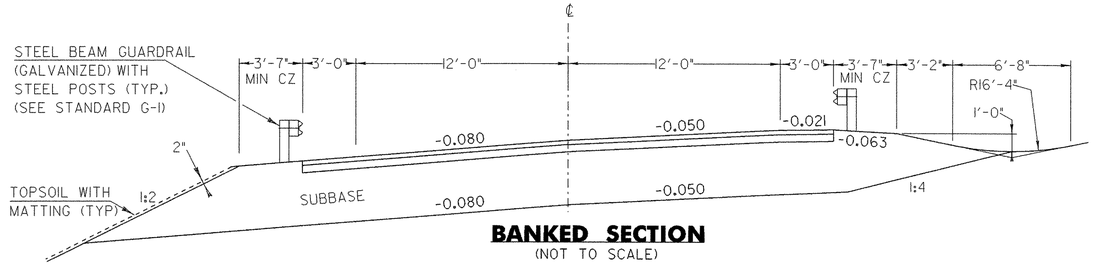


NORMAL SECTION
(NOT TO SCALE)

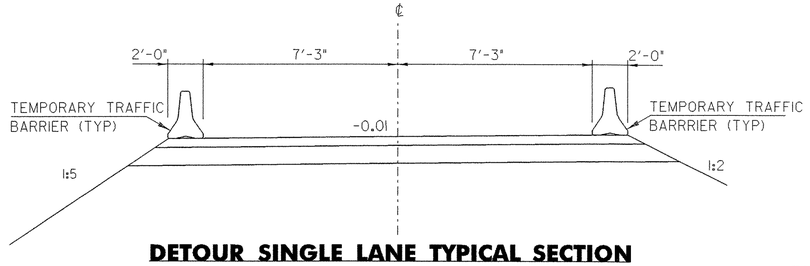


TYPICAL CHANNEL SECTION
(NOT TO SCALE)

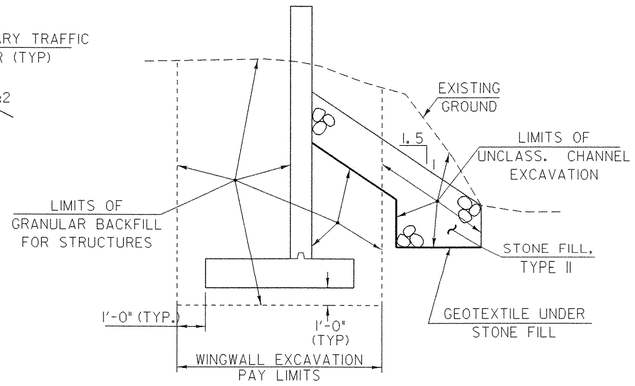
* GRUBBING MATERIAL SHALL NOT BE PLACED ON THE STONE FILL IN THE AREA UNDER THE BRIDGE. WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.



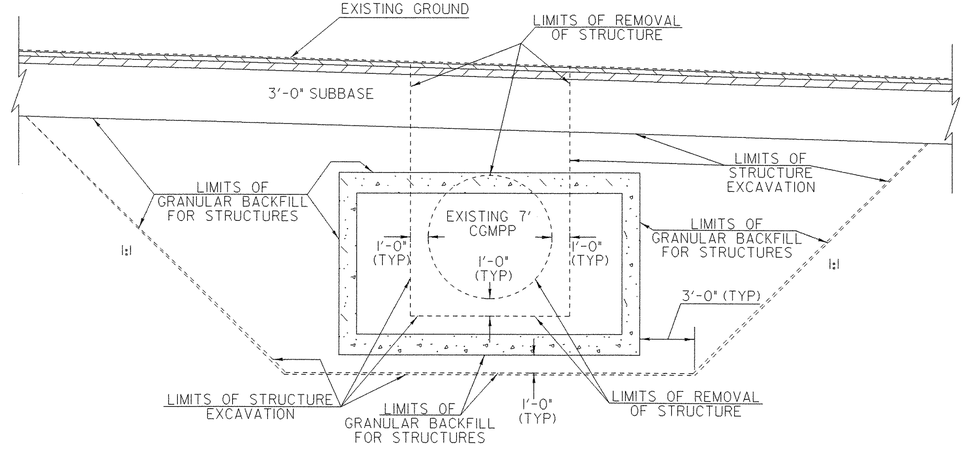
BANKED SECTION
(NOT TO SCALE)



DETOUR SINGLE LANE TYPICAL SECTION
6" AGGREGATE SURFACE COURSE
12" GRAVEL SUBBASE
(NOT TO SCALE)



TYPICAL WINGWALL SECTION
(NOT TO SCALE)



TYPICAL BOX SECTION EXCAVATION AND FILL LIMITS
(NOT TO SCALE)

LIMITS OF STRUCTURE EXCAVATION WILL BE THE DIFFERENCE BETWEEN THE LIMITS SHOWN FOR THE REMOVAL OF STRUCTURE AND THE LIMITS OF STRUCTURE EXCAVATION SHOWN FOR THE NEW PRECAST BOX CULVERT EXCAVATION.

TYPICAL SECTIONS

PROJECT NAME:	BUELS GORE
PROJECT NUMBER:	STP ST CULV(1)

FILE NAME: 04c138/structures/s04c138typ.dgn	PLOT DATE: 05-APR-2006
PROJECT LEADER: M. EVANS-MONGEON	DRAWN BY: W. FARLEY
DESIGNED BY: W. FARLEY	CHECKED BY: M EVANS-MONGEON
IPARM: s04c138typ.i	SHEET 3 OF 30

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET #1

SUMMARY OF ESTIMATED QUANTITIES

BRIDGE	EROSION CONTROL	ROADWAY	FULL C&E ITEMS	BRIDGE QUANTITY
		1		
		1013		
		32		
		1154		
		967		
		340		
		760		
		5		
		417		
1446				
4				
60				
		1		
1				
1				
		5		
		5		
		50		
		5		
		5		
		34		
		40		
107				
1				
	650			
		342		
		4		
		415		
		750		
		40		
		40		
			1	
			1	
			1	
		1		
		1		
		700		
		700		
		25		
		200		

TOTALS

ROUND	GRAND TOTAL	FINAL
	1	
7	1020	
8	40	
6	1160	
3	970	
	340	
	760	
	5	
8	425	
4	1450	
	4	
	60	
	1	
	1	
	1	
	5	
	5	
	50	
	5	
	5	
	34	
	40	
	107	
	1	
	650	
	342	
	4	
	415	
	750	
	40	
	40	
	1	
	1	
	1	
	1	
	1	
	700	
	700	
	25	
	200	

DESCRIPTIONS

UNIT	ITEMS	ITEM NUMBER
LS	CLEARING AND GRUBBING (INCL. INDV. TREES & STUMPS)	201.10
CY	COMMON EXCAVATION	203.15
CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27
CY	STRUCTURE EXCAVATION	204.25
CY	GRANULAR BACKFILL FOR STRUCTURES	204.30
SY	COLD PLANING-BIT.PAVEMENT	210.10
CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35
CWT	EMULSIFIED ASPHALT	404.65
TON	BITUMINOUS CONCRETE PAVEMENT (PG 58-34)	406.25
SF	TEMPORARY STEEL SHEET PILING	505.36
GAL	WATER REPELLENT (MOD. -SILANE)	514.10
SY	SHEET MEMBRANE WATERPROOFING (PREFORMED SHEET)	519.20
LS	ONE-WAY TEMPORARY BRIDGE (7' X 25' CGMP) (MOD)	528.10
EACH	REMOVAL OF STRUCTURE (7' X 56' CGMPP)	529.15
LS	PRECAST CONCRETE STRUCTURE (15' X 8' X 56' BOX)	540.10
HR	BULLDOZER RENTAL, TYPE I	608.10
HR	POWER GRADER RENTAL	608.15
HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25
HR	TRUCK RENTAL	608.37
HR	LOADER RENTAL, TYPE I	608.40
CY	STONE FILL, TYPE I	613.10
CY	STONE FILL, TYPE II	613.11
CY	STONE FILL, TYPE II (MOD)	613.11
LS	TEMPORARY RELOCATION OF STREAM	614.10
LF	SNOW FENCE (MOD.- PDF)	620.70
LF	STEEL BEAM GUARD RAIL (GALVANIZED)	621.20
EACH	MANUFACTURED TERMINAL SECTION (FLARED)	621.505
LF	REMOVL AND DISP OF GUARD RAIL	621.80
LF	TEMPORARY TRAFFIC BARRIER	621.90
HR	UNIFORMED TRAFFIC OFFICERS	630.10
HR	FLAGGERS	630.15
LS	FIELD OFFICE-ENGINEERS	631.10
LS	TESTING EQUIPMENT - BITUMINOUS	631.17
LU	FIELD OFFICE - TELEPHONE (N.A.B.I.)	631.25
LS	MOBILIZATION / DEMOBILIZATION	635.11
LS	TRAFFIC CONTROL	641.10
LF	4" WHITE LINE	646.20
LF	4" YELLOW LINE	646.21
EACH	LINE STRIPING TARGETS	646.76
SY	GEOTEXTILE UNDER STONE FILL	649.31

DETAILED SUMMARY OF QUANTITIES

QUANTITIES	UNIT	ITEMS

PROJECT NAME: **BUELS GORE**
PROJECT NUMBER: **STP ST CULV(1)**

FILE NAME: **04c138/str/s04c138qs.dgn**
PROJECT MANAGER: **M.EVANS-MONGEON**
DESIGNED BY: **W.FARLEY**
QUANTITY SHEET #1

PLOT DATE: **25-APR-2006**
DRAWN BY: **W.FARLEY**
CHECKED BY: **M EVANS-MONGEON**
SHEET **4** OF **30**

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET #2

SUMMARY OF ESTIMATED QUANTITIES																TOTALS			DESCRIPTIONS			DETAILED SUMMARY OF QUANTITIES		
												BRIDGE	EROSION CONTROL	ROADWAY	FULL C&E ITEMS	BRIDGE QUANTITY	ROUND	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	QUANTITIES	UNIT	ITEMS
													240					240		SY	GEOTEXTILE FOR SILT FENCE	649.51			
													50					50		LB	SEED	651.15			
													50					50		LB	SEED-WINTER RYE	651.17			
													100					100		LB	FERTILIZER	651.18			
													1					1		TON	AGRICULTURAL LIMESTONE	651.20			
													1					1		TON	HAYMULCH	651.25			
													50					50		EACH	HAY BALES FOR EROSION CONTROL	651.26			
													40					40		CY	TOPSOIL	651.35			
														50				50		SY	GRUBBING MATERIAL	651.40			
													1					1		LS	EROSION PREVENTION & SEDIMENT CONTROL PLAN	652.10			
													14					14		HR	MONITORING EROSION PREVENTION & SEDIMENT CONTROL PLAN	652.20			
													1					1		LU	MAINTENANCE OF EROSION PREVENTION & SEDIMENT CONTROL PLAN (N.A.B.I.)	652.30			
													1110					1110		SY	EROSION MATTING	654.10			
														2				2		SF	TRAFFIC SIGNS, TYPE A	675.20			
														16				16		LF	FLANGED CHANNEL SIGN POST	675.301			
														1				1		EACH	REMOVING SIGNS	675.50			
														1				1		EACH	TEMPORARY TRAFFIC SIGNAL SYSTEM	678.40			

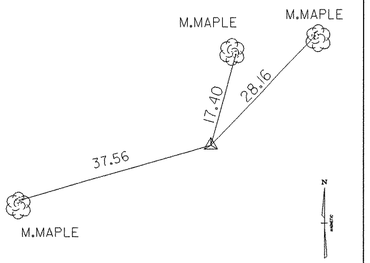
PROJECT NAME: **BUELS GORE**
PROJECT NUMBER: **STP ST CULV(1)**

FILE NAME: **04c138/str/s04c138qs.dgn**
PROJECT MANAGER: **M.EVANS-MONGEON**
DESIGNED BY: **W.FARLEY**
QUANTITY SHEET #2

PLOT DATE: **05-APR-2006**
DRAWN BY: **W.FARLEY**
CHECKED BY: **M EVANS-MONGEON**
SHEET **5** OF **30**

TRAVERSE TIES

HVCTRL #2
NORTH = 9919.54
EAST = 50172.55
ELEV. = 1450.05



HVCTRL #3
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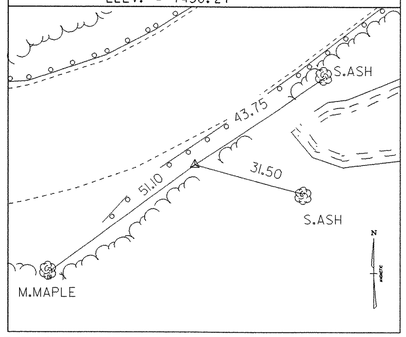
ELEV. = 1458.21



HVCTRL #4
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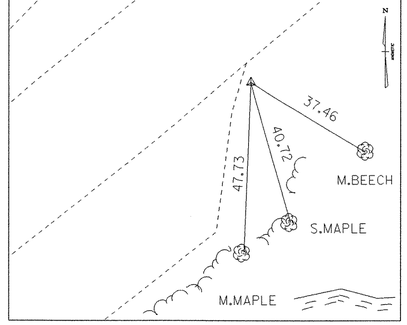
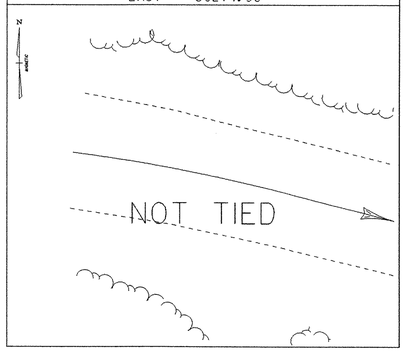


Traverse completed 10/18/2004 by L.Orvis P.C. & J.Hulett

ALIGNMENT TIES

POB 38+79.20
NORTH = 9907.23
EAST = 50274.98



ALIGNMENT TIES

PI 39+00.00
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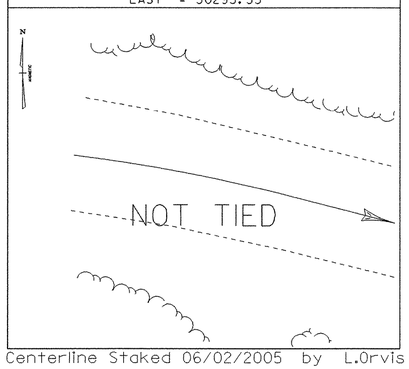

PC 39+23.45
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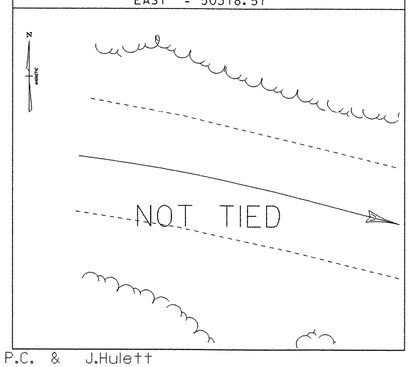

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NOT TIED

PT 39+35.56
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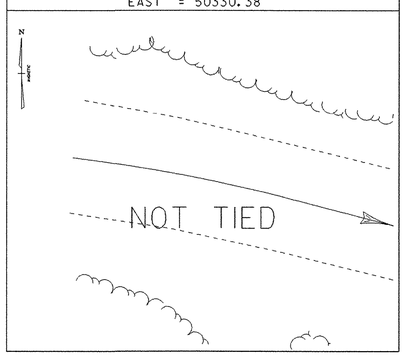

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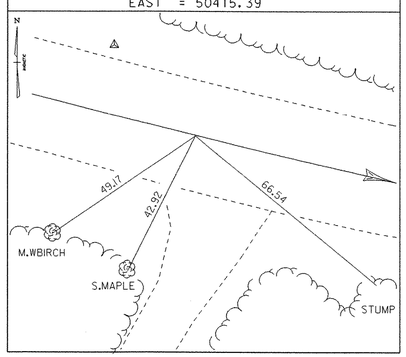

Centerline Staked 06/02/2005 by L.Orvis P.C. & J.Hulett

ALIGNMENT TIES

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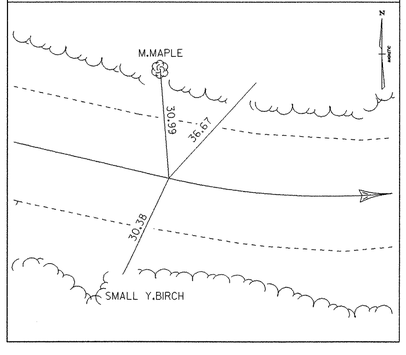

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NOT TIED

PT 42+70.50
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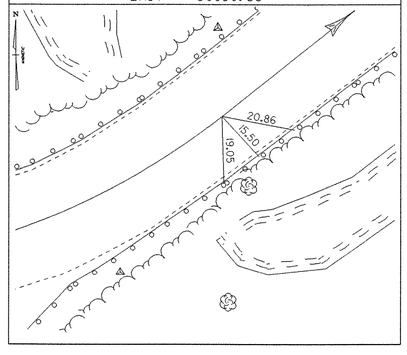

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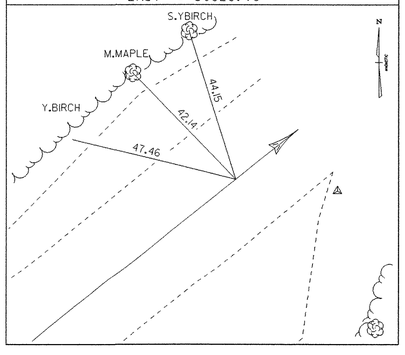

POE 45+23.32
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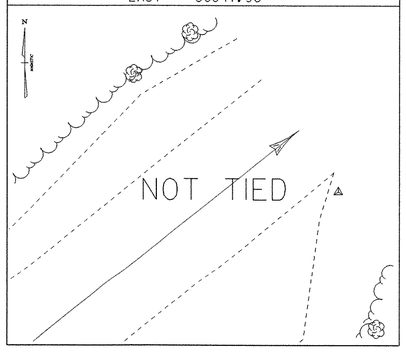


DATUM
VERTICAL NAVD 27
HORIZONTAL ASSUMED
ADJUSTMENT NONE

COORDINATES ASSUMED

TIE SHEET

PROJECT NAME: BUELS GORE
PROJECT NUMBER: STP ST CULV (1)

FILE NAME: 04cl38/survey/x04cl38ti.dgn
PROJECT LEADER: M.EVANS-MONGEON
DESIGNED BY: W.FARLEY
IPARM: s04cl38tie.i
PLOT DATE: 05-APR-2006
DRAWN BY: J. H & R. B
CHECKED BY: M.EVANS-MONGEON
SHEET 7 OF 30

STEEL BEAM GUARD RAIL (GALVANIZED)
STA 41+86.54LT - 43+48.97LT
STA 42+16.41RT - 43+96.01RT
NOTE: STA 43+49.80RT - 43+61.93RT WILL HAVE ONE PREFABRICATED 12'-6" SECTION OF RAIL WITH A 30' RADIUS

MANUFACTURED TERMINAL SECTION (FLARED)
STA 41+73.32LT - 41+86.54LT
STA 42+05.55RT - 42+16.41RT
STA 43+48.97LT - 43+60.83LT
STA 43+96.01RT - 44+04.86RT

REMOVAL AND DISPOSAL OF GUARD RAIL
STA 41+67.12LT - 43+62.89LT
STA 41+97.84RT - 44+06.11RT

CONSTRUCT DRIVE
STA 43+83.17LT (21' PAVED)

4" WHITE LINE
STA 40+75LT - 44+25LT (SOLID EDGE LINE)
STA 40+75RT - 44+25RT (SOLID EDGE LINE)

4" YELLOW LINE
STA 40+75℄ - 44+25℄ (SOLID DOUBLE LINE)

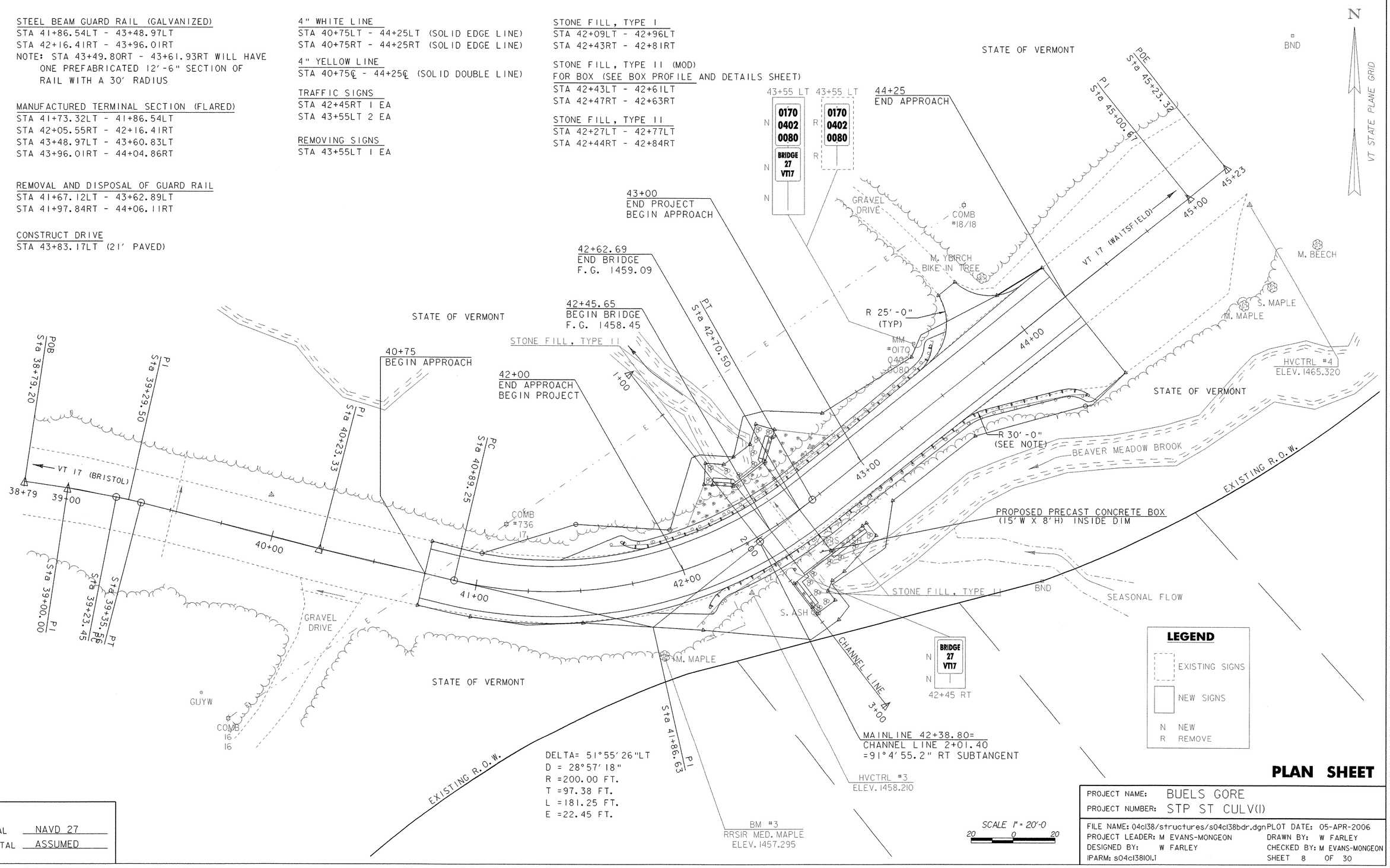
TRAFFIC SIGNS
STA 42+45RT 1 EA
STA 43+55LT 2 EA

REMOVING SIGNS
STA 43+55LT 1 EA

STONE FILL, TYPE I
STA 42+09LT - 42+96LT
STA 42+43RT - 42+81RT

STONE FILL, TYPE II (MOD)
FOR BOX (SEE BOX PROFILE AND DETAILS SHEET)
STA 42+43LT - 42+61LT
STA 42+47RT - 42+63RT

STONE FILL, TYPE II
STA 42+27LT - 42+77LT
STA 42+44RT - 42+84RT



LEGEND
- EXISTING SIGNS
- NEW SIGNS
- N NEW
- R REMOVE

PLAN SHEET

DATUM
VERTICAL NAVD 27
HORIZONTAL ASSUMED

PROJECT NAME: BUELS GORE
PROJECT NUMBER: STP ST CULV(1)

FILE NAME: 04c138/structures/s04c138bdr.dgn PLOT DATE: 05-APR-2006
PROJECT LEADER: M EVANS-MONGEON DRAWN BY: W FARLEY
DESIGNED BY: W FARLEY CHECKED BY: M EVANS-MONGEON
IPARM: s04c13801.i SHEET 8 OF 30

STATE OF VERMONT
AGENCY OF TRANSPORTATION

TRAFFIC SIGN SUMMARY SHEET

MILEMARKER, STATION, OR SIGN NUMBER	SIGN LEGEND	SIGN DIMENSIONS			NEW & SALVAGED SIGNS				EXIST POST		NEW SIGN POSTS																				SIGN DETAIL	
		EA	WIDTH (IN)	HEIGHT (IN)	"A" AREA (FT^2)	"B" AREA (FT^2)	SALV SIGN	SALV TIS	RETAIN	SALVAGE	NO. OF POSTS	FLANGED CHANNEL lb/ft			SQUARE STEEL (in) lb/ft			ANCHOR	SLEEVE	TUBULAR ALUMINUM Ø (in) lb/ft			FOUNDATION	TUBULAR STEEL Ø (in) lb/ft				W-SHAPE STEEL FTG. SIZE		WEIGHT	POST SIZE	SIGN REQUIRED	REMARKS	DETAIL ON SHEET NUMBER	STD. SHEET NUMBER
												1.12	2.0	3.0	1.75	2.0	2.5			3.0	4.0	4.0 MOD		3.0	3.5	4.0	5.0	24"	30"						
															1.88	2.16	3.35			1.3	1.7	1.7		7.6	9.0	10.8	14.6								
											OPTION ITEMS																									
42+45 RT	BRIDGE 27 VT17	1	6	8	0.333						1		X																				VD-701		E-134
43+55 LT	0170 0402 0080	1	6	10	0.417						1		X																				VD-700		E-138
	BRIDGE 27 VT17	1	6	8	0.333																												VD-701		E-134
TOTALS		SF 1.083	SF	EA.	SF						FT 16				FT				EA	LB			EA.	LB				EA.	EA.	LB					

FINAL POST LENGTHS ARE TO BE DETERMINED IN THE FIELD. POST SIZES ARE COMPUTED BASED ON INFORMATION FURNISHED ON THE STANDARD SHEETS AND THE TRAFFIC & SAFETY DIVISION'S "SIGN POST DESIGN GUIDELINE."

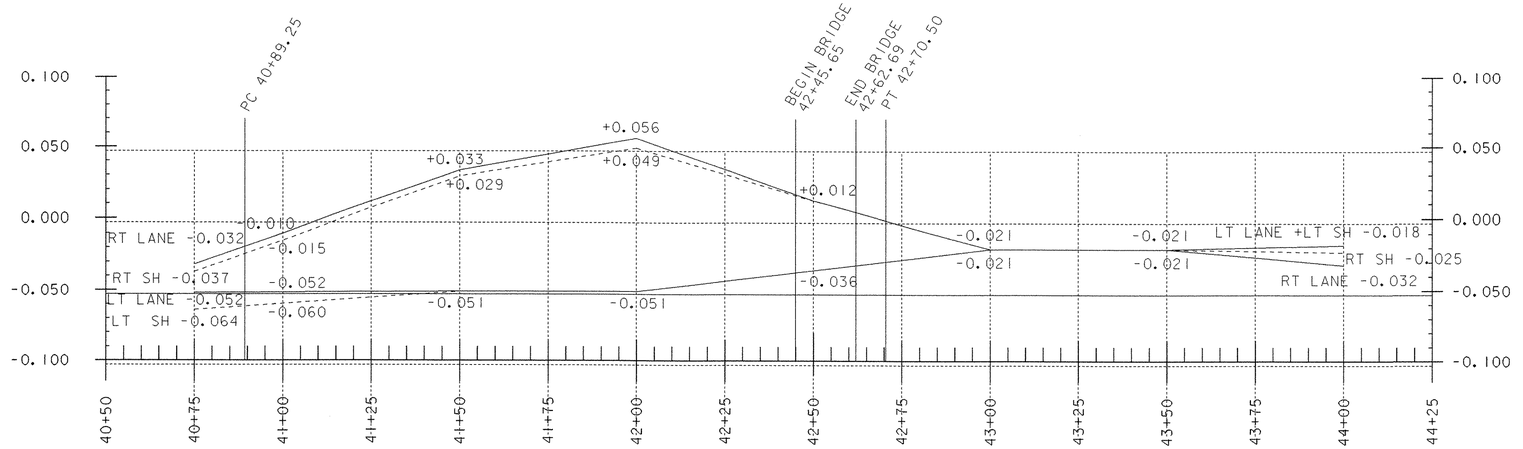
TRAFFIC SIGN SUMMARY SHEET

PROJECT NAME: BUELS GORE
PROJECT NUMBER: STP ST CULV(I)

FILE NAME: 04cl38/str/s04cl38tc.dgn
PROJECT LEADER: M. EVANS-MONGEON
DESIGNED BY: W. FARLEY
IPARM: s04cl38tss.i

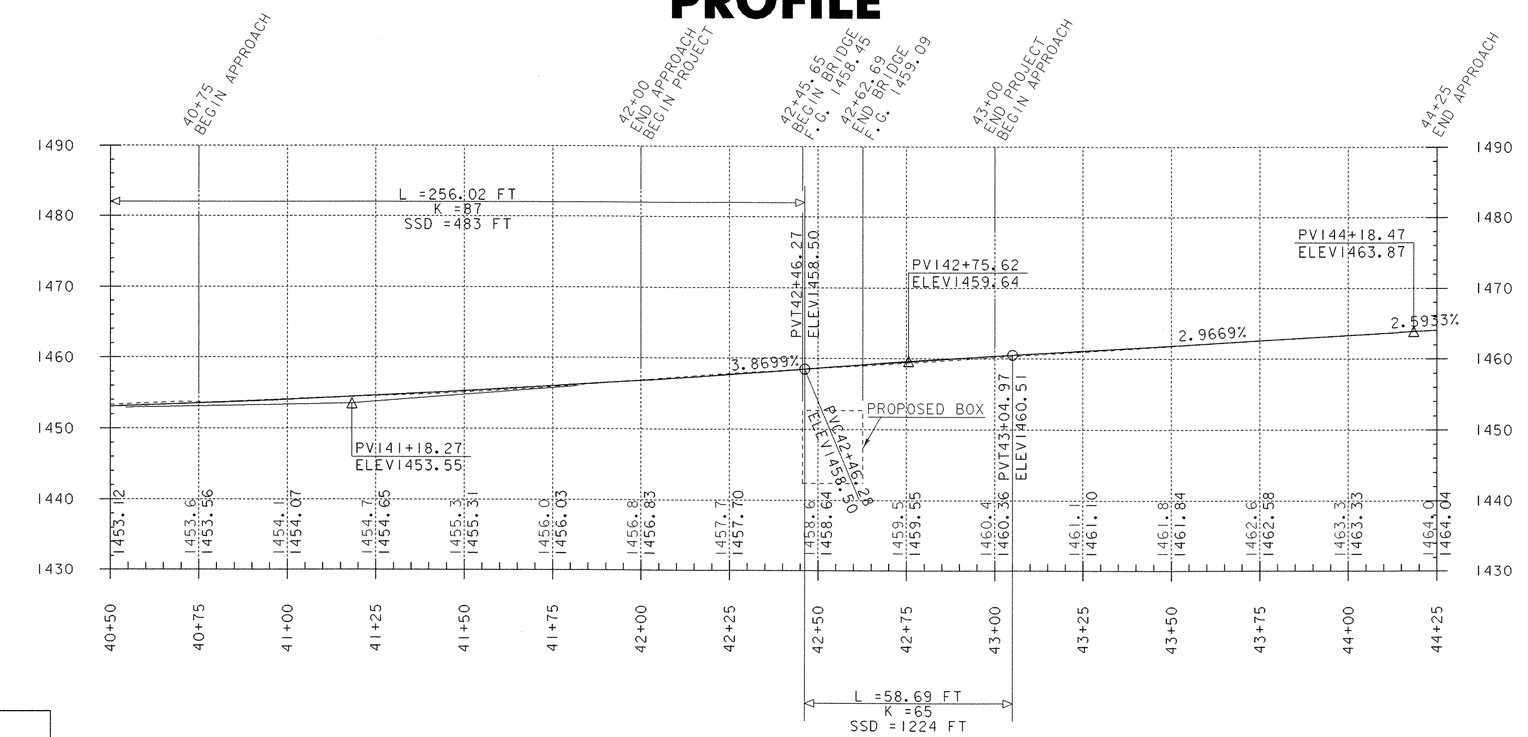
PLOT DATE: 05-APR-2006
DRAWN BY: W. FARLEY
CHECKED BY: M EVANS-MONGEON
SHEET 10 OF 30

BANKING DIAGRAM



SCALE 1" = 20'-0
20 0 20

PROFILE



SCALE 1" = 40'-0
10 0 10

SCALE 1" = 20'-0
20 0 20

DATUM
VERTICAL NAVD 27
HORIZONTAL ASSUMED

BANKING DIAGRAM AND PROFILE SHEET

PROJECT NAME: BUELS GORE
PROJECT NUMBER: STP ST CULV(1)

FILE NAME: 04c138/structures/s04c138xs.dgn
PROJECT LEADER: M EVANS-MONGEON
DESIGNED BY: W FARLEY
IPARM: s04c138profile.i
PLOT DATE: 05-APR-2006
DRAWN BY: W FARLEY
CHECKED BY: M EVANS-MONGEON
SHEET 11 OF 30

STATE OF VERMONT
AGENCY OF TRANSPORTATION

EROSION PREVENTION AND SEDIMENT CONTROL NARRATIVE

DESCRIPTION OF PROJECT

This project involves the reconstruction of a culvert over the Beaver Meadow Brook. The project is on VT Route 17, a paved, Major Collector state highway, in the unincoporated gore of Buel's Gore. The existing culvert will be replaced by a box culvert.

Total roadway work is approximately 100 feet. The limits of construction do not approach any buildings or other structures. No "Threatened & Endangered Species,' Wetlands, or Historic Resources have been identified in the project area.

It is anticipated that this project will last one construction season.

Total disturbed area (excluding waste, borrow and staging areas):
0.25 ha (0.62 ac.)

SITE INVENTORY & ANALYSIS

OFF SITE DRAINAGE CHARACTERISTICS:
The property surrounding the project site consists of well established vegetation, moderate to steeply sloping, mixed softwood and hardwood forest with well defined drainage ways. Due to the nature of the surrounding terrain, runoff water entering the project site will be primarily limited to that which is conveyed along roadway ditches, and that which follows VT Route 17 along the 14% grade at the end of the project limits. The current roadway ditches are not well defined and are not lined with stone.

DRAINAGE, WATERWAYS, BODIES OF WATER:
Beaver Meadow Brook is located in the project area. There are no other water bodies or wetlands within the project area. The Beaver Meadow Brook is classified as hilly to mountainous, sinuous and containing a streambed of mostly cobbles and gravel. The contributing drainage area at the bridge crossing is 0.93 sq. mi.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:
The topography of the project site is mountainous and wooded with VT Route 17 following parallel to Beaver Meadow Brook which is contained by steep river banks along each side. Development along VT Route 17 consists of a mix of permanent and seasonal residences, none of which exist near the project limits. Overhead utility service follows along VT Route 17.

VEGETATION:
A mix of hardwood and softwood trees of all sizes exist along VT Route 17. No fields or other agricultural crops exist near the project. Impacts to vegetation will be limited to that which are affected by the construction of the new culvert.

Following construction of the new culvert, the temporary culvert and roadway will be removed, vegetation reestablished with standard seed & mulch practices.

SOILS:
The Soil Conservation Service has mapped the soils throughout Chittenden County. The soil type identified for this project site is Peru extremely stony loam. This soil type is described as '...Slopes range from 100 to 1000 feet in length...The hazard of water erosion is slight where this soil is vegetated and very severe where it is not. Surface runoff is rapid. The soils have a layer of very fine sandy loam or silty loam or are gravelly or sandy loam.

The listed Soil Erodibility Coefficient (K-value) for this soil type is 0.20. Generally, K-values indicate the following: 0.0 - 0.23 = low erodibility; 0.24 - 0.36 = moderate erodibility; 0.37 and higher = higher erodibility.

SENSITIVE RESOURCE AREAS:
No 'Threatened & Endangered Species' have been identified within the project limits and there will be no adverse effect to Historic or Archaeological features. Beaver Meadow Brook is the only identified resource and being a steep, high gradient stream, there are no wetlands within the vicinity of the project.

PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES:
Disturbance of soils near natural or man-made waterways consists of that which is necessary to construct a new box culvert and subsequent headwalls as well as the removal of the existing crossing.

TEMPORARY EROSION PREVENTION & SEDIMENT CONTROL

TEMPORARY EROSION PREVENTION MEASURES TO BE UTILIZED INCLUDE:
"Project Demarcation Fencing," denoted -PDF- on the plans, to delineate the limits the contractor can access with construction equipment. This measure limits the area that can be disturbed and exposed to erosion.

Seed and mulch will be used on slopes flatter than or equal to 3:1. Seeding and biodegradable erosion control matting, or an equivalent product, will be utilized on all slopes steeper than 3:1 that are not lined with stone fill. Areas at stations 42+00 - 44+00 RT and 40+50 - 43+75 LT will require this technique. These slopes shall be stabilized within 48 hours of reaching final grade or during intermittent phases of construction activity.

Tracking of all exposed slopes, combined with temporary mulching, will also be utilized on a regular basis. Any slopes to be exposed for several days prior to final grading shall be tracked and mulched. The forecast of rainfall events shall also trigger protection of exposed slopes.

TEMPORARY MEASURES TO CONTROL SEDIMENT TRANSPORT INCLUDE:
Silt fence will be installed a distance of 5'-10' from the toe of slopes to prevent sediment transport to down gradient areas. Each line of silt fence will be placed along the contour with ends turned slightly uphill to create a ponding effect should water try to run along the fencing and around the ends. The maximum slope length between separate runs of silt fence is 100'. Silt fence shall be installed prior to any upslope earthwork.

All measures shall be checked regulary for accumulation of sediment. Sediment build-up shall be removed when the level of sediment reaches one-half the height of the control measure. Sediments shall be disposed of in an approved area such that they will not be subject to erosion.

Temporary sediment settling basins may or may not be utilized on this project. If a settling basin is to be used for dewatering a cofferdam, it should be sized based upon the pumping rate and target particle size to be settled out for the project site. The follow sizing criteria is based upon a target particle size of 0.01 mm and is provided as general guidance. (See Sediment Settling Basin Sizing Criteria.)

TEMPORARY STREAM RELOCATION
The temporary relocation of stream shall compy with the specification for item 614.10 Temporary Relocation of Stream.

PERMANENT EROSION CONTROL MEASURES

SEVERAL PERMANENT EROSION CONTROL MEASURES WILL BE UTILIZED:
Stone lining of the stream banks with Stone Fill, Type II as detailed in the plans. This stone will protect from stream bank erosion during design storm events.

Grass, or other suitable ground cover will be established outside of the roadway limits where stone lining has not been specified.

GENERAL EROSION PREVENTION & SEDIMENT CONTROL GUIDELINES

The Erosion Prevention and Sediment Control Plans are meant as a guideline for preventing erosion and controlling sediment transport. The work outlined in this narrative consists of applying measures throughout the life of the project to control erosion and minimize the sedimentation of receiving waters. The measures include stabilization and structural practices, stormwater controls and other pollution prevention controls.

Coordinate the installation, use, and removal of erosion and sediment control measures with construction activities to ensure economical, effective and continuous erosion and sediment control. Employ temporary stabilization practices in incremental stages as construction proceeds. The contractor will use additional erosion control measures as necessitated by the sequence of construction and as directed by the Engineer. See section 105.23 of the Vermont AOT Standard Specifications for Construction, dated 2001.

Install all erosion prevention and sediment control measures as shown in the Erosion Prevention and Sediment Control Plan or as directed by the Engineer. Do not modify the type, size or location of any prevention or control practice without approval of the Engineer. Any changes shall be noted on the plans, in the weekly inspection report and reported to the appropriate authority in a timely manner. Inspect all control measures weekly and after each rainfall event. Repair measures promptly once damage is discovered.

Preventing initial soil erosion is much more effective than treating eroded sediment. Therefore, stabilize all disturbed areas promptly after construction activity has temporarily or permanently ceased. Temporary vegetation shall be established if the area is to be without construction activity for a period of 14 days. Perimeter control measures shall be installed following clearing, but prior to the start of any grubbing or grading activity, install other temporary controls in incremental stages as construction proceeds.

Maintaining vegetated buffers along stream banks, wetlands or other sensitive areas is a crucial erosion and sediment control measure that should be established wherever possible.

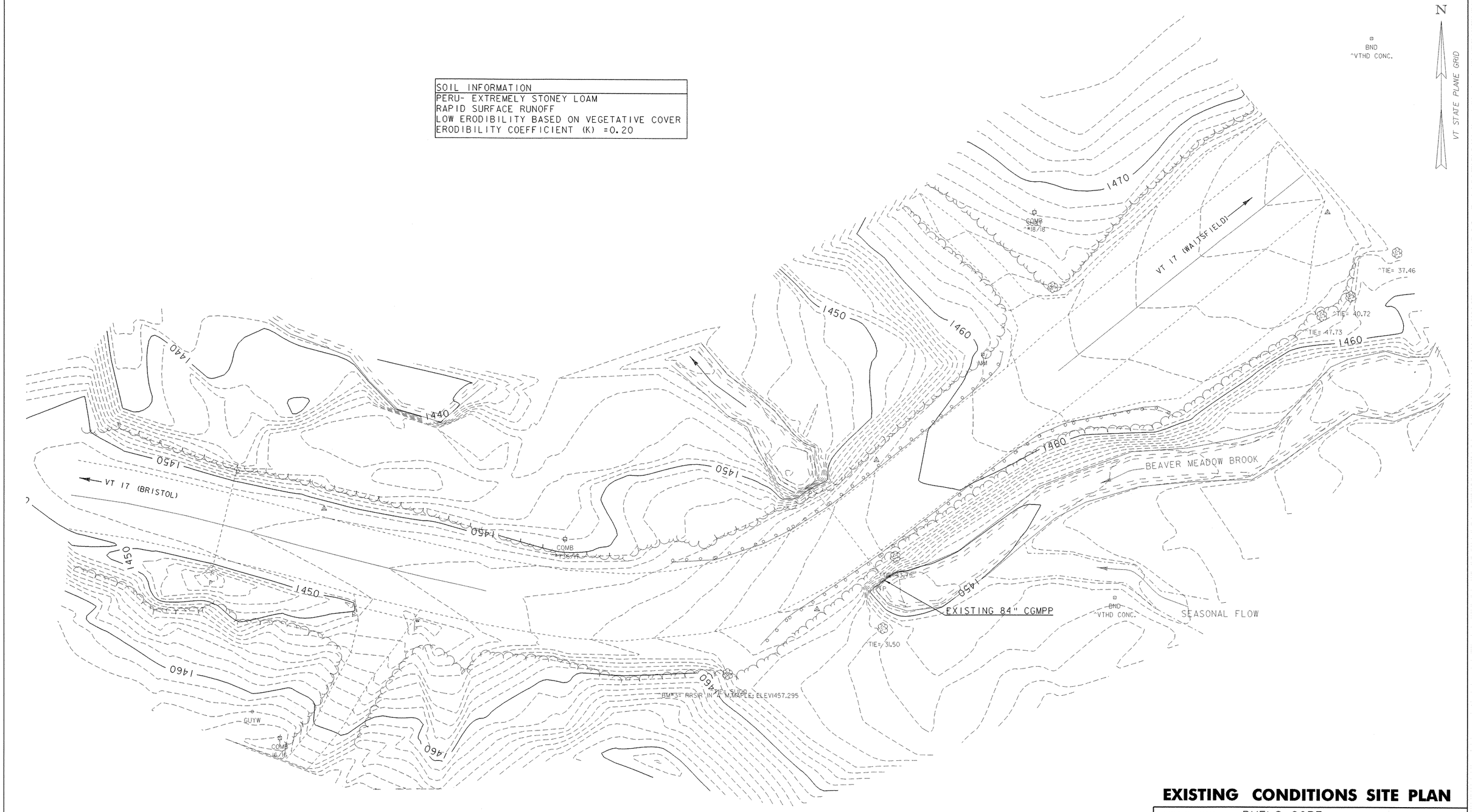
Control only sediment-laden runoff generated by the project site. Collect and route clean offsite runoff around or through the project site using diversion berms, diversion channels, culverts and/or temporary pipes.

Do not allow construction equipment to operate on the down slope side of perimeter control measures.

SEDIMENT SETTLING BASIN SIZING CRITERIA

PUMP FLOW RATE		REQUIRED SURFACE AREA		LENGTH / WIDTH = 2:1			
Q(gpm)	Q(m^3/s)	(ft^2)	(m^2)	L (ft)	W (ft)	L (m)	W (m)
50	0.0032	595	55	35.0	17.0	10.6	5.3
100	0.0063	1200	111	49.0	24.5	15.0	7.5
150	0.0095	1776	165	59.6	29.8	18.2	9.1
200	0.0126	2368	220	68.8	34.4	21.0	10.5
250	0.0158	2970	276	77.0	38.5	23.4	11.7
300	0.0189	3560	330	84.4	42.2	25.8	12.9
350	0.0221	4155	386	91.2	45.6	27.8	13.9

SOIL INFORMATION
PERU- EXTREMELY STONEY LOAM
RAPID SURFACE RUNOFF
LOW ERODIBILITY BASED ON VEGETATIVE COVER
ERODIBILITY COEFFICIENT (K) =0.20



DATUM

VERTICAL NAVD 27

HORIZONTAL ASSUMED

SCALE 1" = 20'-0

20 0 20

EXISTING CONDITIONS SITE PLAN

PROJECT NAME: BUELS GORE

PROJECT NUMBER: STP ST CULV(1)

FILE NAME: 04cl38/structures/s04cl38ec.dgn PLOT DATE: 05-APR-2006

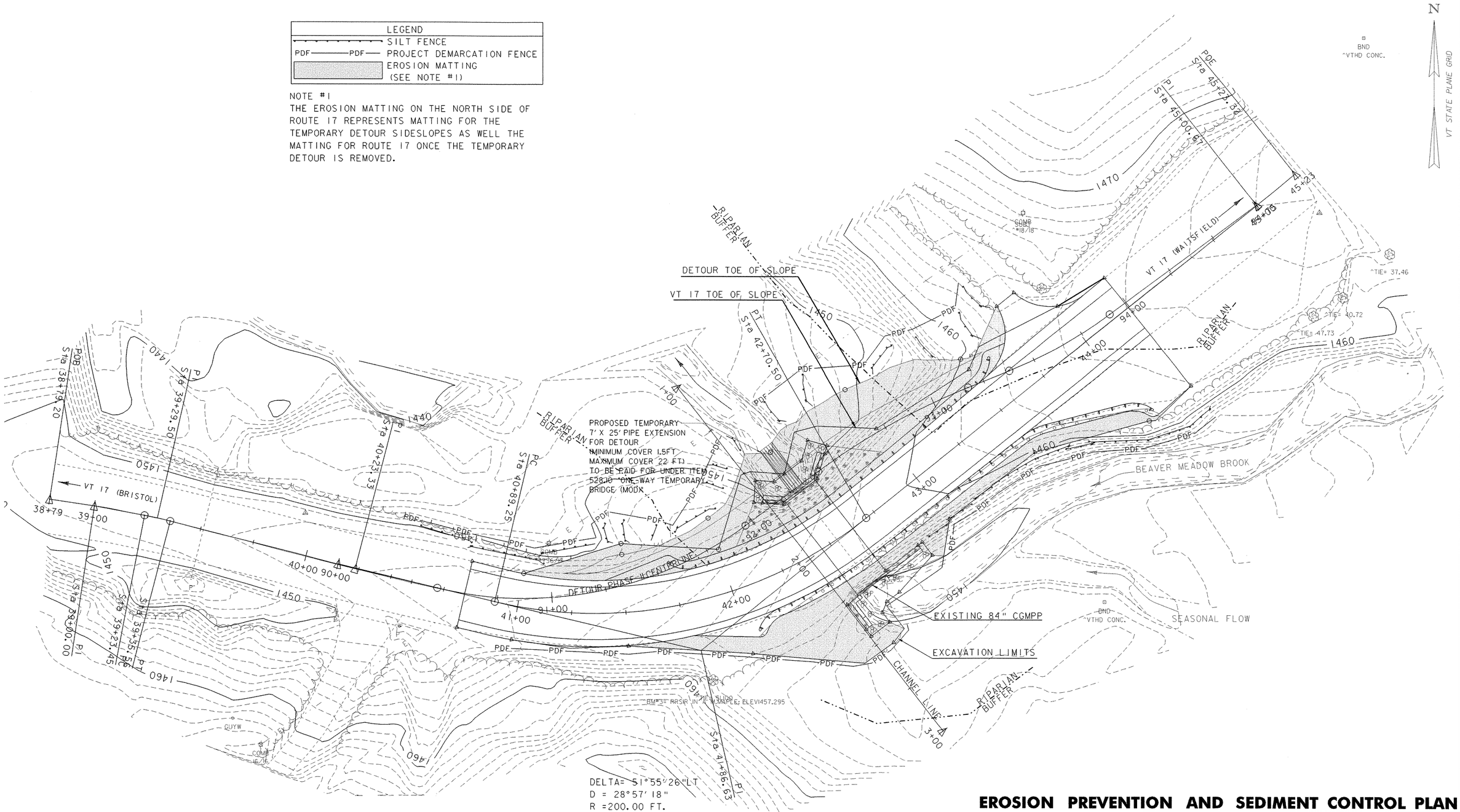
PROJECT LEADER: M EVANS-MONGEON DRAWN BY: W FARLEY

DESIGNED BY: W FARLEY CHECKED BY: M EVANS-MONGEON

IPARM: s04cl38ecl.1 SHEET 13 OF 30

LEGEND	
———	SILT FENCE
PDF———PDF—	PROJECT DEMARCATION FENCE
	EROSION MATTING (SEE NOTE #1)

NOTE #1
THE EROSION MATTING ON THE NORTH SIDE OF ROUTE 17 REPRESENTS MATTING FOR THE TEMPORARY DETOUR SIDESLOPES AS WELL THE MATTING FOR ROUTE 17 ONCE THE TEMPORARY DETOUR IS REMOVED.



DELTA= 51°55'26"LT
D = 28°57'18"
R =200.00 FT.
T =97.38 FT.
L =181.25 FT.
E =22.45 FT.

DATUM

VERTICAL	NAVD 27
HORIZONTAL	ASSUMED

EROSION PREVENTION AND SEDIMENT CONTROL PLAN

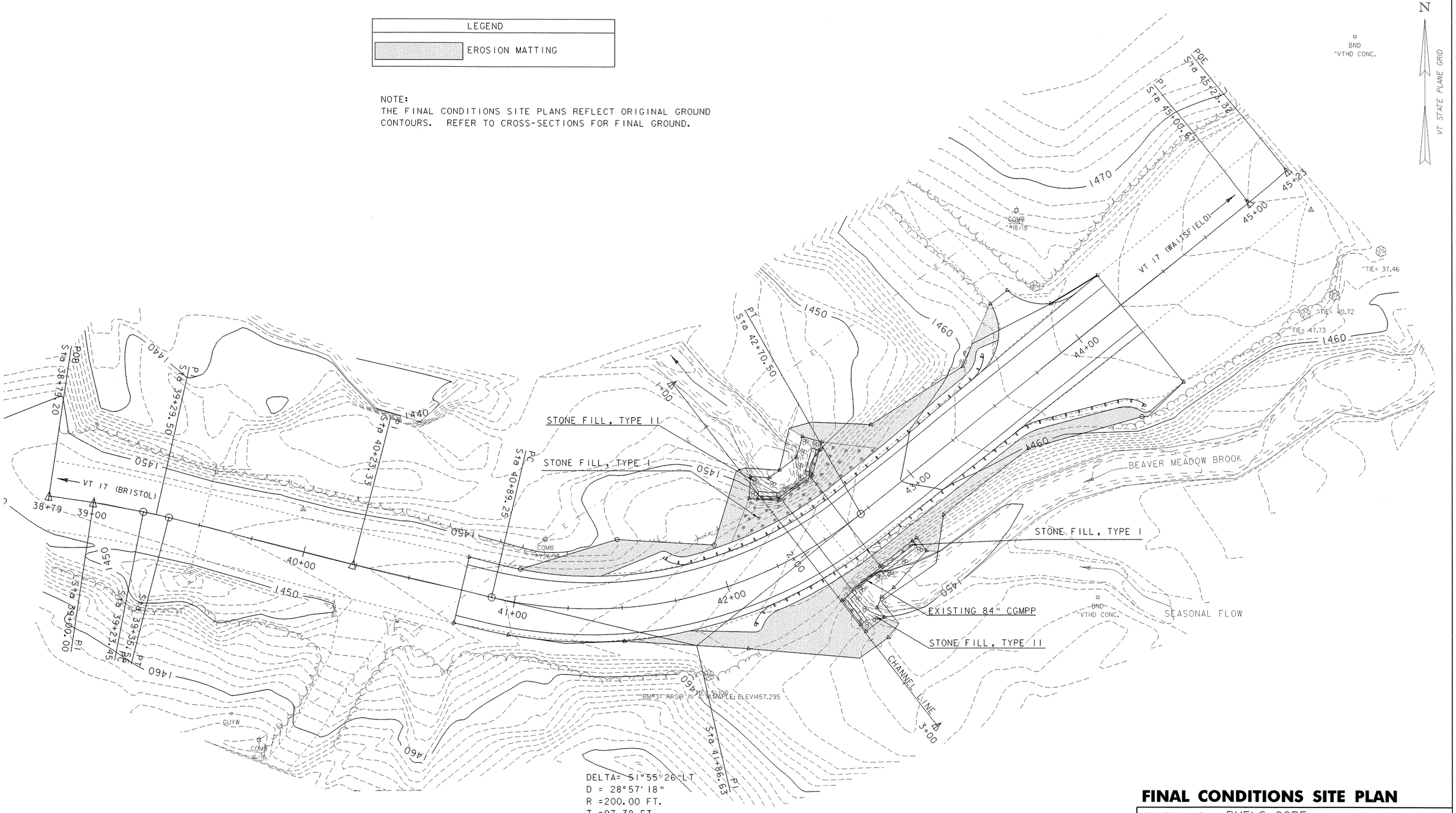
SCALE 1" = 20'-0
20 0 20

PROJECT NAME:	BUELS GORE
PROJECT NUMBER:	STP ST CULV(1)

FILE NAME: 04c138/structures/s04c138ec.dgn	PLOT DATE: 05-APR-2006
PROJECT LEADER: M EVANS-MONGEON	DRAWN BY: W FARLEY
DESIGNED BY: W FARLEY	CHECKED BY: M EVANS-MONGEON
IPARM: s04c138ec2.i	SHEET 14 OF 30

LEGEND	
	EROSION MATTING

NOTE:
THE FINAL CONDITIONS SITE PLANS REFLECT ORIGINAL GROUND CONTOURS. REFER TO CROSS-SECTIONS FOR FINAL GROUND.



DATUM

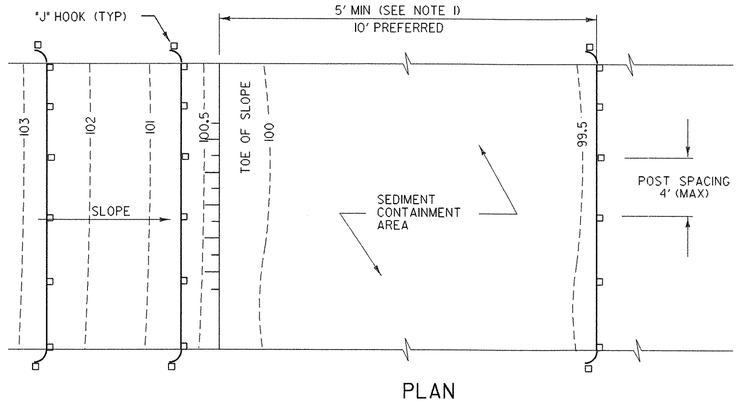
VERTICAL NAVD 27
HORIZONTAL ASSUMED

SCALE 1" = 20'-0
20 0 20

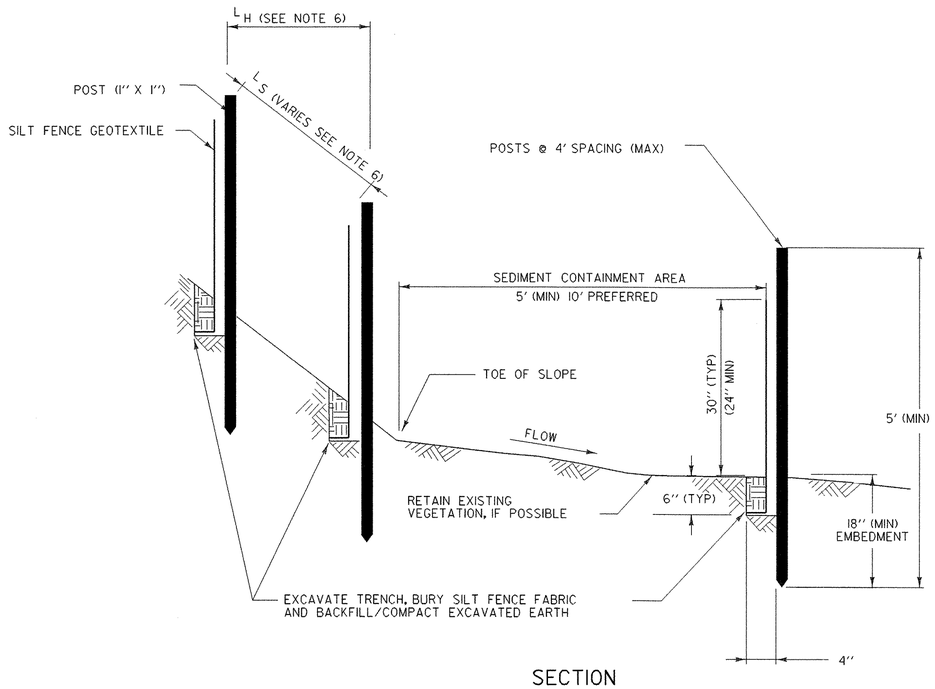
FINAL CONDITIONS SITE PLAN

PROJECT NAME: BUELS GORE
PROJECT NUMBER: STP ST CULV(1)

FILE NAME: 04cl38/structures/s04cl38ec.dgn
PROJECT LEADER: M EVANS-MONGEON
DESIGNED BY: W FARLEY
IPARM: s04cl38ec3.1
PLOT DATE: 05-APR-2006
DRAWN BY: W FARLEY
CHECKED BY: M EVANS-MONGEON
SHEET 15 OF 30



PLAN



SECTION

SILT FENCE - TEMPORARY

SILT FENCE

APPLICATION NOTES:

A. THE PRIMARY PURPOSE OF SILT FENCE IS TO REDUCE RUNOFF VELOCITY AND TRAP SEDIMENT. VELOCITY IS REDUCED, WATER IS IMPOUNDED BEHIND THE MEASURE, AND SEDIMENT FALLS OUT OF SUSPENSION.

B. SILT FENCE SHALL BE INSTALLED ON A LINE OF EQUAL ELEVATION (CONTOUR). IT MAY BE INSTALLED AT INTERMEDIATE POINTS UP SLOPES AS WELL AS AT THE BOTTOM, AS SHOWN IN THE DETAIL.

C. SILT FENCE SHALL NOT BE USED ACROSS CONCENTRATED FLOW.

GENERAL NOTES:

1. SILT FENCE SHALL GENERALLY BE PLACED A MINIMUM OF 5 FEET BEYOND TOE OF SLOPE. 10 FEET PREFERRED, TO PROVIDE ADEQUATE AREA FOR SEDIMENT STORAGE AND FACILITATE MAINTENANCE OF SEDIMENT CONTAINMENT AREA.

2. ALL ENDS SHALL BE "J" HOOKED TO TRAP SEDIMENT.

3. IN AREAS WITH TWO SLOPES, SILT FENCE SHALL BE USED TO ERECT A DAM AND TRAP SEDIMENT AT THE BASE OF THE STEEPER SLOPE.

4. THE BOTTOM EDGE OF SILT FENCE SHALL BE BURIED A MINIMUM OF 6 INCHES BELOW GROUND, AND KEYED IN 4 INCHES. THE FENCE SHALL BE INSTALLED WITH THE POSTS ON THE DOWNSTREAM SIDE OF THE FABRIC.

5. MAXIMUM DRAINAGE AREA TRIBUTARY TO 100 FEET OF SILT FENCE SHALL BE 0.25 ACRES.

6. THE FOLLOWING ARE MAXIMUM SLOPE LENGTHS FOR THESE MEASURES:

CONSTRUCTED SLOPE	SLOPE LENGTH (LS) FT	HORIZONTAL LENGTH (LH) FT
3 : 1	80	75
4 : 1	130	125
5 : 1	200	200
> 5 : 1	250	250

7. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.

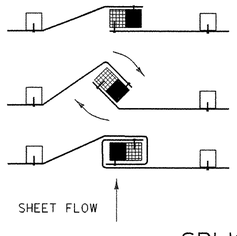
8. MEASURES SHALL BE CLEANED AND REPAIRED AS NEEDED. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.

9. SILT FENCE SHALL BE REMOVED WHEN THE AREA HAS BEEN STABILIZED. AT TIME OF REMOVAL OF THE SILT FENCE, THE DISTURBED AREA SHALL BE REPAIRED AND STABILIZED.

10. PAYMENT FOR INSTALLATION AND REMOVAL OF SILT FENCE SHALL BE MADE UNDER THE GEOTEXTILE FOR SILT FENCE ITEM.

11. PAYMENT FOR MONITORING SILT FENCE SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.

12. PAYMENT FOR MAINTAINING SILT FENCE SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.



1. PLACE THE END POST OF ONE FENCE INSIDE THE END POST OF THE OTHER FENCE.
2. ROTATE BOTH POSTS AT LEAST 180 DEGREES IN A CLOCKWISE DIRECTION TO CREATE A TIGHT SEAL WITH THE FABRIC MATERIAL
3. DRIVE BOTH POSTS 18 INCHES INTO THE GROUND AND BURY THE FLAP IN THE TRENCH.

SPLICING DETAIL

REVISIONS AND CORRECTIONS

MAY 18, 2004 N. GARBACIK

DETAIL

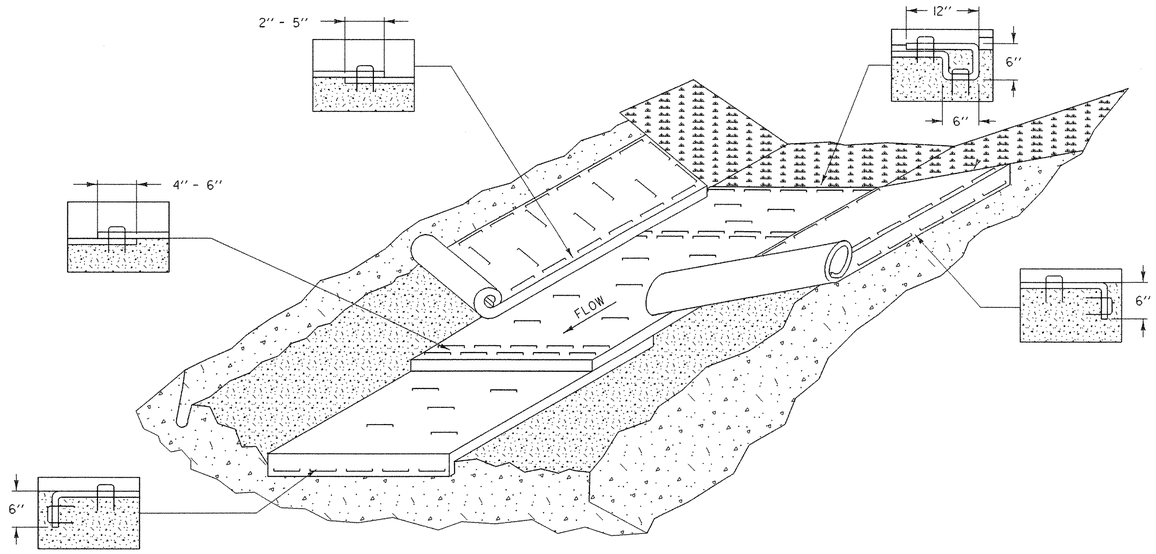
EPSC-1

EROSION PREVENTION & SEDIMENT CONTROL DETAILS SILT FENCE

EPSC SILT FENCE

PROJECT NAME: BUELS GORE
PROJECT NUMBER: STP ST CULV (1)

FILE NAME: 04cl38/structures/s04cl38ecbdr.dgn PLOT DATE: 05-APR-2006
PROJECT LEADER: M EVANS-MONGEON DRAWN BY: EPSC
DESIGNED BY: EPSC CHECKED BY: EPSC
IPARM: epscl.i SHEET 16 OF 30



EROSION PROTECTION FOR DITCHES

APPLICATION NOTES:

A. THE PURPOSE OF LINING THE DITCH WITH EROSION MATTING IS TO REDUCE EROSION AND AID THE ESTABLISHMENT OF VEGETATION AT LOW VELOCITIES.

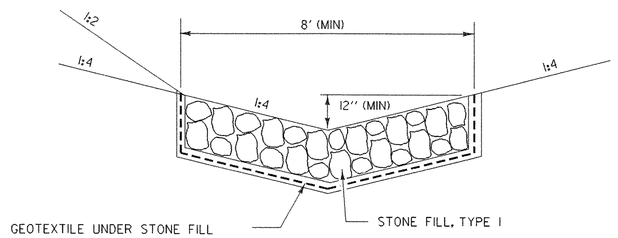
B. THE FOLLOWING CHARTS SHALL BE USED TO DETERMINE THE APPROPRIATE EROSION CONTROL MEASURE:

DITCH AND CHANNEL PROTECTION	
SLOPE	LINING
< 1%	GRASS
1% TO 4 %	EROSION MATTING
4 % TO 10 %	STONE FILL, TYPE I
> 10 %	STONE FILL, TYPE II

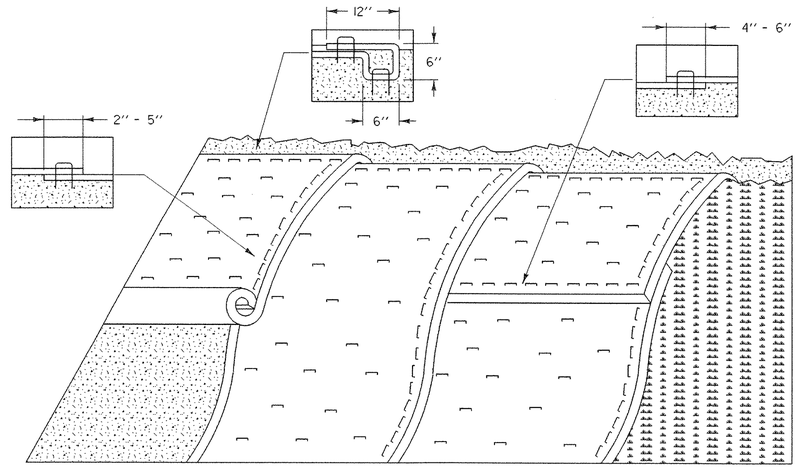
STONE FILL THICKNESS	
STONE FILL TYPE	THICKNESS
TYPE I	1 FT
TYPE II	2 FT

GENERAL NOTES:

1. WATER MAY NEED TO BE DIVERTED TO ALLOW PROPER MATTING INSTALLATION.
2. GRADE AND SMOOTH CHANNEL TO PROVIDE GOOD MATTING TO SOIL SURFACE CONTACT.
3. APPLY FERTILIZER, LIME, AND SEED PRIOR TO PLACING MATTING.
4. INSTALL MATTING IN THE CENTER OF THE CHANNEL, IN THE DIRECTION OF THE WATER FLOW.
5. INSTALL MATTING ON THE SIDE SLOPES OF THE CHANNEL, OVERLAPPING THE CENTER MAT.
6. ANCHOR MATTING AS SHOWN, UTILIZING ANCHOR STAPLES. STAPLE PLACEMENT SHALL BE DETERMINED BY THE MANUFACTURER'S INTALLATION INSTRUCTIONS.
7. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
8. MEASURES SHALL BE REPAIRED AND RESTAPLED AS NECESSARY TO ENSURE PROPER FUNCTION.
9. PAYMENT FOR INSTALLATION OF MATTING SHALL BE MADE UNDER THE EROSION CONTROL WITH MATTING ITEM.
10. PAYMENT FOR MONITORING EROSION CONTROL MATTING SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
11. PAYMENT FOR MAINTAINING DITCH PROTECTION SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.



TEMPORARY
STONE LINED
DITCH



EROSION PREVENTION FOR SIDE SLOPES

APPLICATION NOTES:

A. THE PURPOSE OF MATTING ON SIDE SLOPES IS TO REDUCE EROSION AND AID THE STABLISHMENT OF VEGETATION

B. EROSION CONTROL MATTING SHALL BE USED FOR THE FOLLOWING REASONS:

- SIDE SLOPES > 3:1 (H:V)
- AREAS WHERE SEED AND MULCH WILL NOT STAY IN PLACE ALONE
- WHERE SEEDING IS OUTSIDE THE GROWING SEASON.

GENERAL NOTES:

1. GRADE AND SMOOTH THE SLOPE TO PROVIDE GOOD MATTING TO SOIL SURFACE CONTACT.
2. APPLY FERTILIZER, LIME, AND SEED PRIOR TO PLACING MATTING.
3. ANCHOR MATTING AS SHOWN, UTILIZING ANCHOR STAPLES. STAPLE PLACEMENT SHALL BE DETERMINED BY THE MANUFACTURER'S INTALLATION INSTRUCTIONS.
4. UNROLL MATTING VERTICALLY DOWN SLOPE IN THE DIRECTION OF WATER FLOW.
5. OVERLAP UPPER MATTING OVER LOWER MATTING AS SHOWN.
6. OVERLAP ADJACENT MATTING AS SHOWN.
7. CUT EXCESS MATTING AT END OF SLOPE AND ANCHOR THE END.
8. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
9. MATTING SHALL BE REPAIRED AND RESTAPLED AS NECESSARY TO ENSURE PROPER FUNCTION.
10. PAYMENT FOR INSTALLATION OF MATTING SHALL BE MADE UNDER THE EROSION CONTROL WITH MATTING ITEM.
11. PAYMENT FOR MONITORING EROSION CONTROL MATTING SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
12. PAYMENT FOR MAINTAINING SLOPE PROTECTION SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.

REVISIONS AND CORRECTIONS

MAY 18, 2004 N. GARBACIK

DETAIL

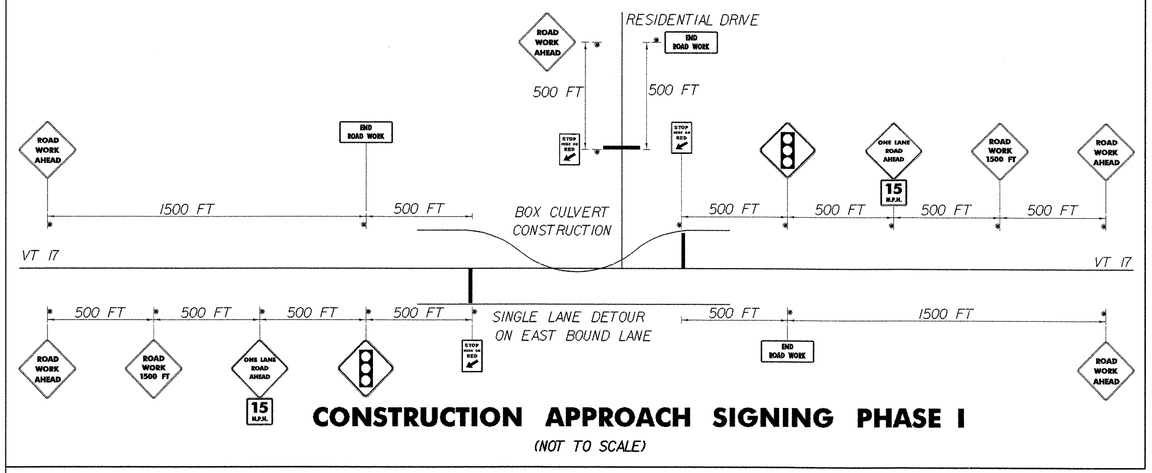
EPSC-5

EROSION PREVENTION & SEDIMENT CONTROL DETAILS DITCH & SLOPE PROTECTION

EPSC DITCH & SLOPE PROTECTION

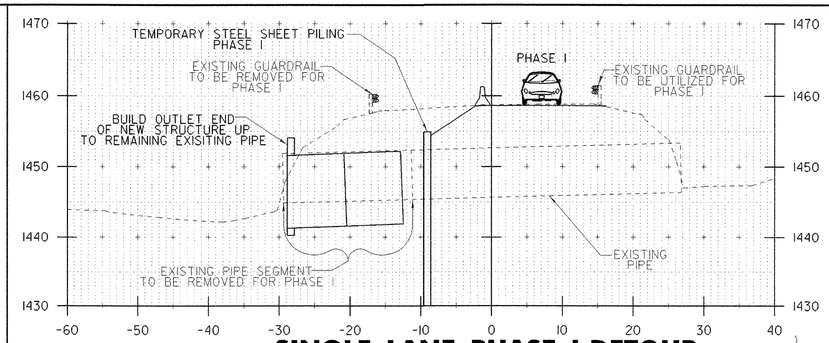
PROJECT NAME: BUELS GORE
PROJECT NUMBER: STP ST CULV (I)

FILE NAME: 04cl38/structures/s04cl38ecbdr.dgn PLOT DATE: 05-APR-2006
PROJECT LEADER: M EVANS-MONGEON DRAWN BY: EPSC
DESIGNED BY: EPSC CHECKED BY: EPSC
IPARM: epsc5.i SHEET 17 OF 30



CONSTRUCTION APPROACH SIGNING PHASE I

(NOT TO SCALE)



SINGLE LANE PHASE I DETOUR

MAINLINE STA 42+54 SKEWED ALONG BOX LINE

SCALE 1" = 40'-0

40 0 40

BND

PHASING DIAGRAM

(ALL TIMING IN SECONDS)

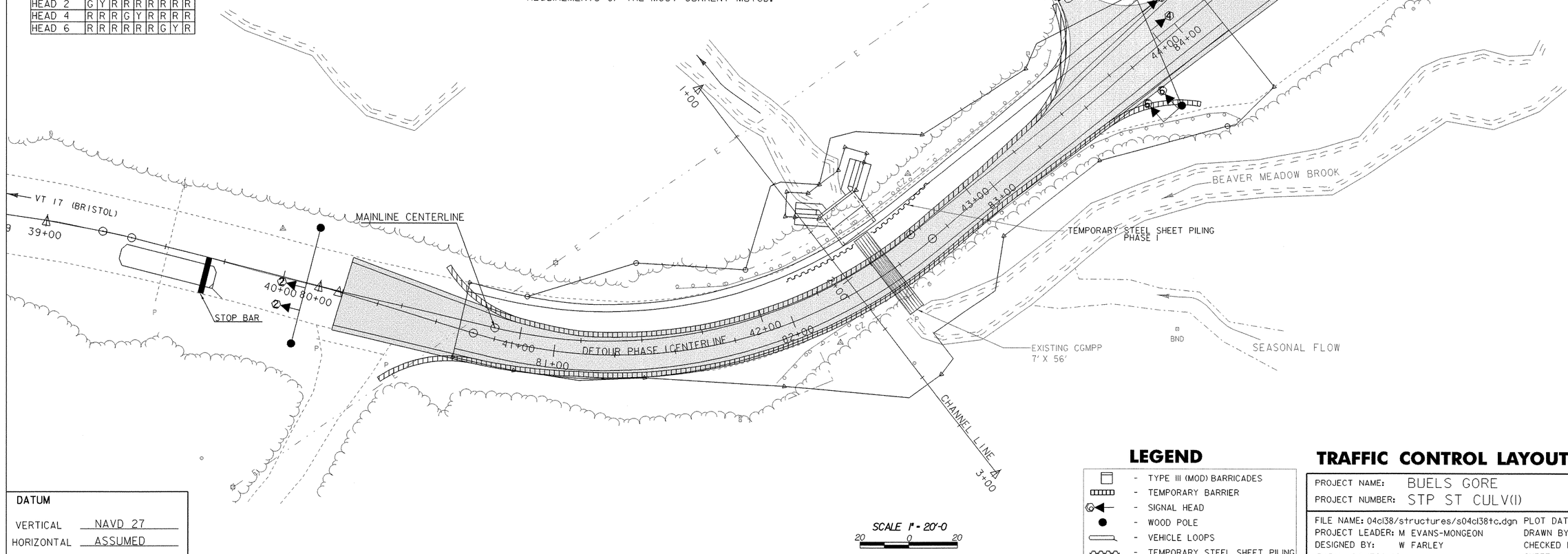
PHASE	Ø2			Ø4			Ø6		
MINIMUM	6			6			3		
EXTENSION	2			2			0		
MAXIMUM	16	4	19	16	4	19	10	4	16
HEAD 2	G	Y	R	R	R	R	R	R	R
HEAD 4	R	R	R	G	Y	R	R	R	R
HEAD 6	R	R	R	R	R	R	G	Y	R

SPECIAL REQUIREMENTS

APPROACH	TEMPORARY VEHICLE DETECTOR
2	X
4	X
6	X

NOTES:

1. SIGNAL TIMING SHALL BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.
2. ANY MODIFICATIONS TO THE TEMPORARY TRAFFIC SIGNAL SYSTEM WILL BE APPROVED BY THE ENGINEER PRIOR TO ANY CHANGES BEING MADE.
3. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE REQUIREMENTS OF THE MOST CURRENT MUTCD.



SCALE 1" = 20'-0

20 0 20

LEGEND

- TYPE III (MOD) BARRICADES
- TEMPORARY BARRIER
- SIGNAL HEAD
- WOOD POLE
- VEHICLE LOOPS
- TEMPORARY STEEL SHEET PILING

TRAFFIC CONTROL LAYOUT PHASE I

DATUM

VERTICAL NAVD 27

HORIZONTAL ASSUMED

PROJECT NAME: BUELS GORE

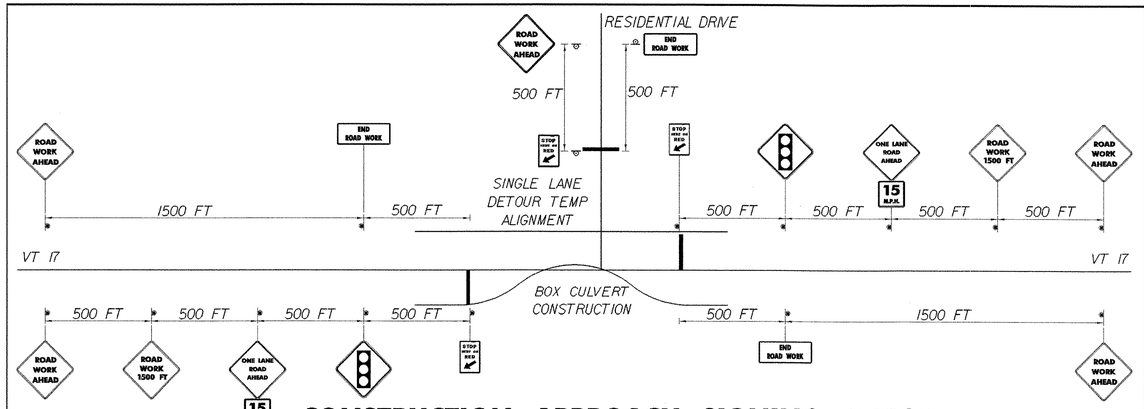
PROJECT NUMBER: STP ST CULV(I)

FILE NAME: 04cl38/structures/s04cl38tc.dgn PLOT DATE: 05-APR-2006

PROJECT LEADER: M EVANS-MONGEON DRAWN BY: W FARLEY

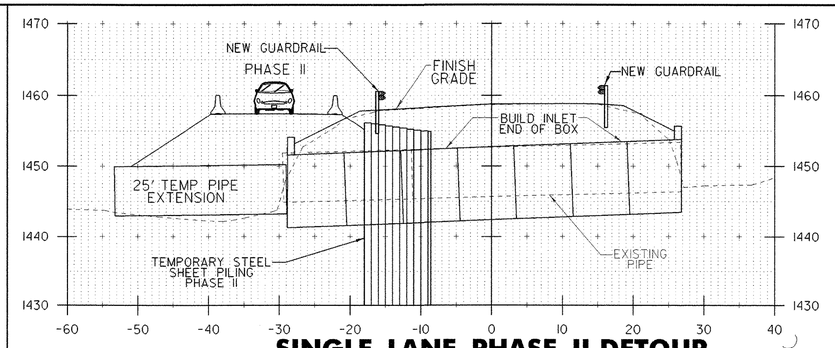
DESIGNED BY: W FARLEY CHECKED BY: M EVANS-MONGEON

IPARM: s04cl38tcl.I SHEET 18 OF 30



CONSTRUCTION APPROACH SIGNING PHASE II

(NOT TO SCALE)

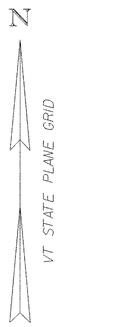


SINGLE LANE PHASE II DETOUR

MAINLINE STA 42+54 SKEWED ALONG BOX LINE

SCALE 1" = 40'-0

40 0 40



PHASING DIAGRAM

(ALL TIMING IN SECONDS)

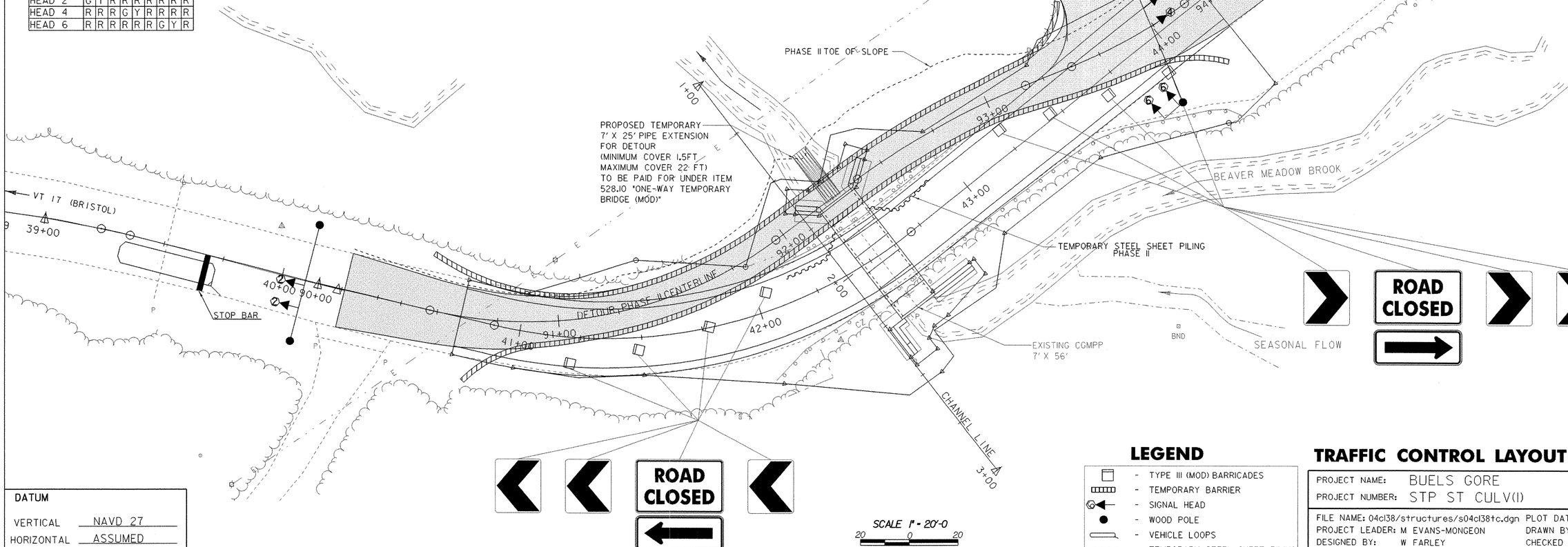
PHASE	Ø2			Ø4			Ø6		
MINIMUM	6			6			3		
EXTENSION	2			2			0		
MAXIMUM	16	4	19	16	4	19	10	4	16
HEAD 2	G	Y	R	R	R	R	R	R	R
HEAD 4	R	R	R	G	Y	R	R	R	R
HEAD 6	R	R	R	R	R	R	G	Y	R

SPECIAL REQUIREMENTS

APPROACH	TEMPORARY VEHICLE DETECTOR
2	X
4	X
6	X

NOTES:

1. SIGNAL TIMING SHALL BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS.
2. ANY MODIFICATIONS TO THE TEMPORARY TRAFFIC SIGNAL SYSTEM WILL BE APPROVED BY THE ENGINEER PRIOR TO ANY CHANGES BEING MADE.
3. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE REQUIREMENTS OF THE MOST CURRENT MUTCD.



SCALE 1" = 20'-0

20 0 20

LEGEND

- TYPE III (MOD) BARRICADES
- TEMPORARY BARRIER
- SIGNAL HEAD
- WOOD POLE
- VEHICLE LOOPS
- TEMPORARY STEEL SHEET PILING

TRAFFIC CONTROL LAYOUT PHASE II

DATUM

VERTICAL NAVD 27

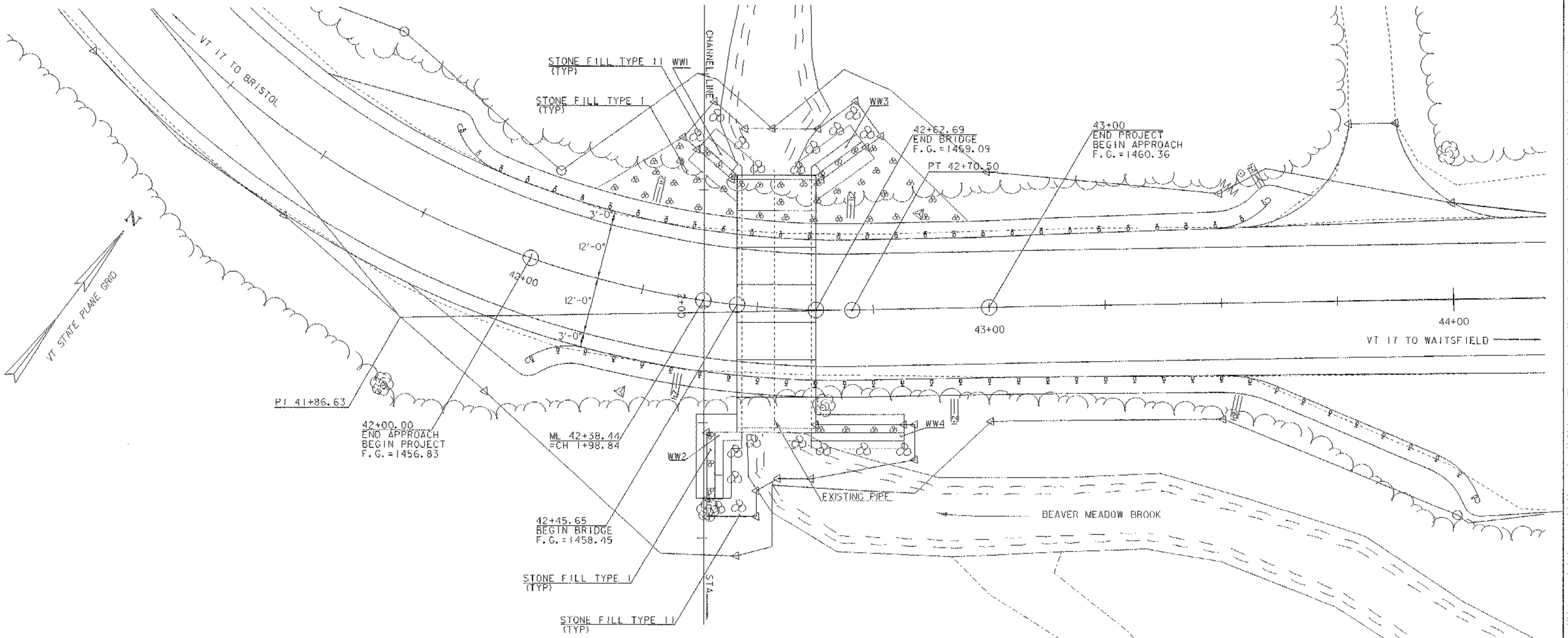
HORIZONTAL ASSUMED

PROJECT NAME: BUELS GORE

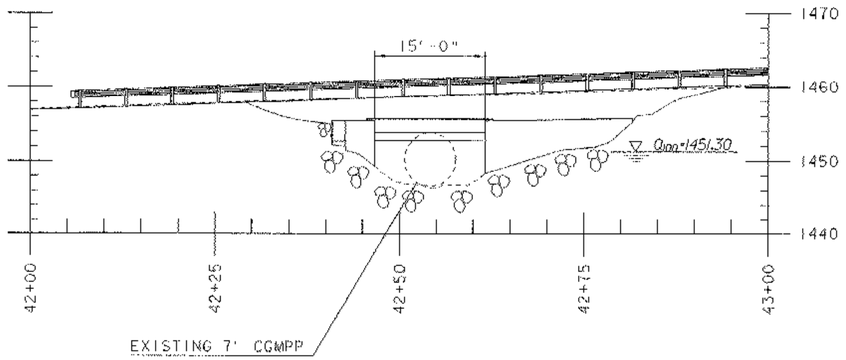
PROJECT NUMBER: STP ST CULV(1)

FILE NAME: 04c138/structures/s04c138tc.dgn
PROJECT LEADER: M EVANS-MONGEON
DESIGNED BY: W FARLEY
IPARM: s04c138tc2.i

PLOT DATE: 05-APR-2006
DRAWN BY: W FARLEY
CHECKED BY: M EVANS-MONGEON



PRECAST BOX CULVERT CHANGED TO PRECAST ARCH WITH CAST IN PLACE FOOTINGS FOR ARCH AND WINGWALLS.



SCALE 1" = 10'-0

10 0 10

DATUM

VERTICAL NAVD 27

HORIZONTAL ASSUMED

PLAN AND ELEVATION SHEET

PROJECT NAME: BUELS GORE

PROJECT NUMBER: STP ST CULV(1)

FILE NAME: /04c138/structures/s04c138pe.dgn
PROJECT LEADER: M. EVANS-MONGEON
DESIGNED BY: W. FARLEY
JPARM: s04c138pe.1

PLOT DATE: 05-APR-2006
DRAWN BY: W. FARLEY
CHECKED BY: M EVANS-MONGEON

STATE OF VERMONT
AGENCY OF TRANSPORTATION

GENERAL NOTES

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE AGENCY OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR CONSTRUCTION, DATED 2001, AND ITS LATEST REVISIONS, AND THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SEVENTEENTH (17th) EDITION, AND ITS LATEST REVISIONS.

2. IN-STREAM CONSTRUCTION SHALL BE RESTRICTED TO JUNE 1 TO OCTOBER 1, UNLESS THE CONTRACTOR OBTAINS WRITTEN PERMISSION FROM THE AGENCY OF NATURAL RESOURCES TO DO WORK OUTSIDE OF THAT TIME FRAME.

3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT SILTATION OR POLLUTION, ESPECIALLY THE DISCHARGE OF RAW CONCRETE, INTO ANY BROOK, STREAM OR RIVER.

4. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68 DEGREES F UNLESS OTHERWISE NOTED.

5. ACCESS TO ALL DRIVES WILL BE MAINTAINED AT ALL TIMES, DURING THE CONSTRUCTION OF THIS PROJECT.

6. ITEM 529.15 "REMOVAL OF STRUCTURE" SHALL BE USED FOR REMOVAL OF THE PIPE AND ANY PORTIONS OF HEADWALLS AND WINGWALLS NOT REMOVED UNDER ITEM 204.25 "STRUCTURE EXCAVATION" OR ITEM 203.27 "UNCLASSIFIED CHANNEL EXCAVATION".

7. ITEM 404.65 "EMULSIFIED ASPHALT" IS TO BE APPLIED AT A RATE OF 0.015 GAL/SY BETWEEN SUCCESSIVE COURSES OF PAVEMENT OR AS DIRECTED BY THE ENGINEER.

8. ITEM 621.20 "STEEL BEAM GUARD RAIL (GALVANIZED) SHALL USE 6 FOOT LONG POSTS IN ACCORDANCE WITH STANDARD G-1. CARE SHALL BE TAKEN NOT TO DRIVE THE POSTS TOO DEEP IN THE VICINITY OF THE PRECAST BOX IN ORDER TO AVOID IMPACT WITH THE TOP OF THE BOX.

EARTHWORK AND RELATED ITEMS

9. TEMPORARY CONSTRUCTION FILLS WITHIN THE WATERCOURSE FOR ANY PURPOSE SHALL CONSIST OF CLEAN STONE FILL ONLY. NO OTHER FILLING IN THE STREAM SHALL OCCUR WITHOUT THE APPROVAL OF THE STREAM ALTERATION ENGINEER.

10. ITEM 613.10 "STONE FILL, TYPE I" SHALL BE USED AS SHOWN IN THE PLANS AND AT THE DISCRETION OF THE RESIDENT ENGINEER TO PREVENT EROSION BEHIND THE WINGWALLS AND HEADWALLS. PAYMENT SHALL BE MADE UNDER ITEM 613.10, "STONE FILL, TYPE I".

TEMPORARY DETOUR/TEMPORARY BRIDGE

11. TRAFFIC SHALL BE MAINTAINED WITH A MULTI-PHASE SINGLE LANE DETOUR CONTROLLED WITH TRAFFIC SIGNALS.

12. PHASE I OF THE DETOUR WILL UTILIZE THE EAST BOUND LANE WHILE THE OUTLET END OF THE NEW PRECAST BOX IS INSTALLED ALONG WITH WINGWALL 1, 3 AND HEADWALL 1.

13. PHASE II OF THE DETOUR WILL REQUIRE GOING OFF ALIGNMENT TO THE NORTH OR DOWNSTREAM. A TEMPORARY PIPE WILL NEED TO BE PLACED AT THE OUTLET OF THE NEW PRECAST BOX ALREADY INSTALLED. PAYMENT WILL BE MADE UNDER ITEM 528.10 "ONE-WAY TEMPORARY BRIDGE (MOD).

LEDGE

14. NO BORINGS WERE TAKEN ON THIS PROJECT, SUBSURFACE CONDITIONS MAY VARY FROM THE CONDITIONS ASSUMED FOR DESIGN. IF ANY LEDGE IS ENCOUNTERED, THE PROJECT MANAGER SHALL BE NOTIFIED IMMEDIATELY.

PRECAST CONCRETE BOX, PRECAST WINGWALLS AND PRECAST HEADWALLS

15. DESIGN CRITERIA:
A. SOIL UNIT WEIGHT = 125 PCF
B. DESIGN LIVE LOAD = AASHTO HS-25
C. WINGWALL FOOTING PRESSURE = MAXIMUM 3 KSF
D. F.S. OVERTURNING >= 2.0
E. SLIDING >= 1.5

16. ALL CONCRETE ITEMS SHALL BE PRECAST CONCRETE INCLUDING ALL BOX SEGMENTS, HEADWALLS, CUTOFF WALLS, BED RETENTION SILLS AND WINGWALLS. ALL CONNECTIONS SHALL BE DESIGNED BY THE FABRICATOR AND PAYMENT SHALL BE INCIDENTAL TO THE ITEM 540.10 "PRECAST CONCRETE STRUCTURE". ALL PRECAST COMPONENT AND CONNECTION DETAILS SHALL BE SUBMITTED TO THE PROJECT ENGINEER FOR APPROVAL.

17. THE PRECAST BOX SECTIONS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND SHAPE WILL BE DEPENDENT ON THE FABRICATOR. THE MINIMUM REQUIREMENTS FOR THE PRECAST BOX ARE TO INCLUDE INSIDE DIMENSIONS TO MEET AN 8'-0" HIGH BY 15'-0" WIDE OPENING. THE INLET AND OUTLET SEGMENTS SHALL HAVE VERTICAL FACES AS SHOWN IN THE PLANS.

18. THE EXTERIOR (TOP AND SIDES) OF ALL CONCRETE BOX SEGMENT JOINTS ALONG WITH ALL LIFTING HOLES SHALL BE FILLED WITH MORTAR TYPE IV AFTER BEING SET IN THEIR FINAL POSITION. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 540.10 "PRECAST CONCRETE STRUCTURE".

19. A TWO (2) FOOT WIDE STRIP OF MEMBRANE WATEPROOFING SHALL BE APPLIED AT EACH BOX JOINT (TOP AND SIDES.) MEMBRANE SHALL BE CENTERED ON THE JOINT AND COVER THE FULL WIDTH OF THE TOP AND FULL HEIGHT OF THE SIDES. THE SIDES SHALL BE COVERED FIRST AND THE ROOF WILL FOLLOW. ANY OVERLAPPING OF MEMBRANE SHALL BE DONE IN A SHINGLE TYPE STYLE TO SHED WATER AND SHALL OVERLAP A MINIMUM OF ONE(1) FOOT. PAYMENT FOR MEMBRANE SHALL BE UNDER ITEM 519.20 "SHEET MEMBRANE WATERPROOFING (PREFORMED SHEET)".

20. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" BY 1".

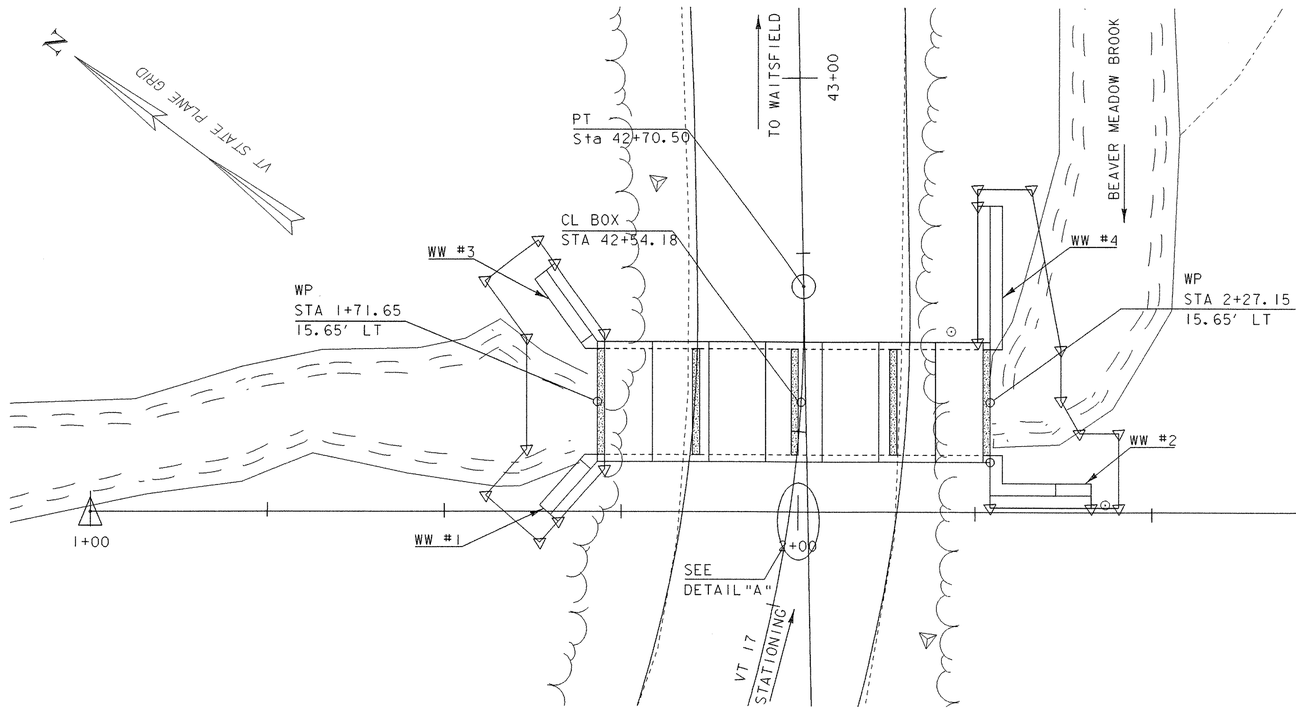
21. ITEM 514.10 "WATER REPELLENT (MOD.-SILANE") SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES EXCEPT THE INSIDE OF THE BOX MEASURED 3 FEET FROM THE OPENING OF EACH END INWARD.

22. IT WILL BE REQUIRED TO DIVERT THE STREAM IN SOME CAPACITY DURING CONSTRUCITON. REFER TO SPECIAL PROVISION 614.10 (TEMPORARY RELOCATION OF STREAM) FOR DETAILS.

GENERAL NOTES

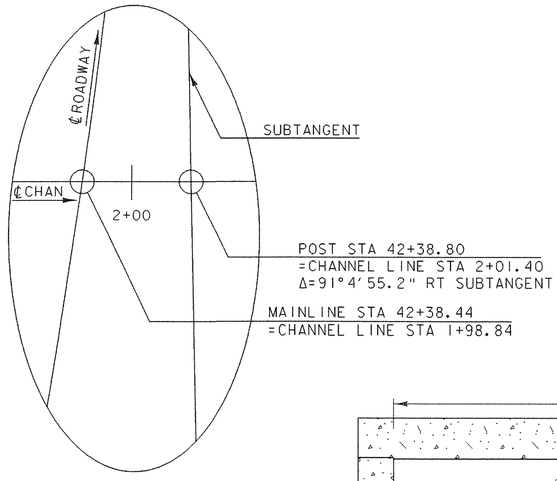
PROJECT NAME:	BUELS GORE
PROJECT NUMBER:	STP ST CULV(1)

FILE NAME: 04c138/str/s04c138gen.xls	PLOT DATE: 05-APR-2006
PROJECT LEADER: M. EVANS-MONGEON	DRAWN BY: W. FARLEY
DESIGNED BY: W. FARLEY	CHECKED BY: M. EVANS-MONG
IPARM: s04c138gen.i	SHEET 22 OF 30



PRECAST CONCRETE BOX - LAYOUT

SCALE 1" = 10'-0

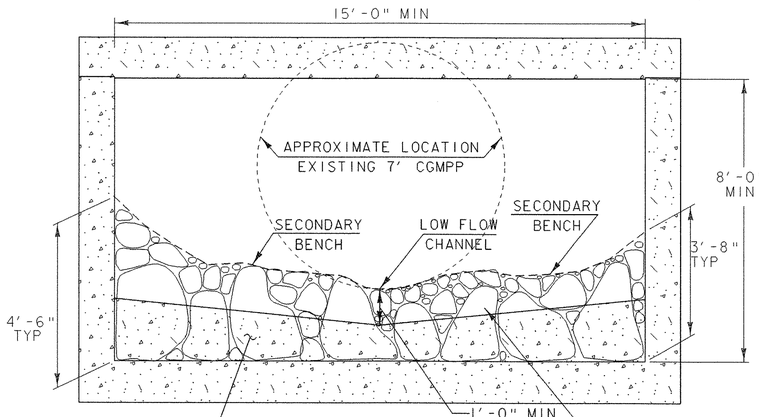


DETAIL "A"

NTS

NOTES

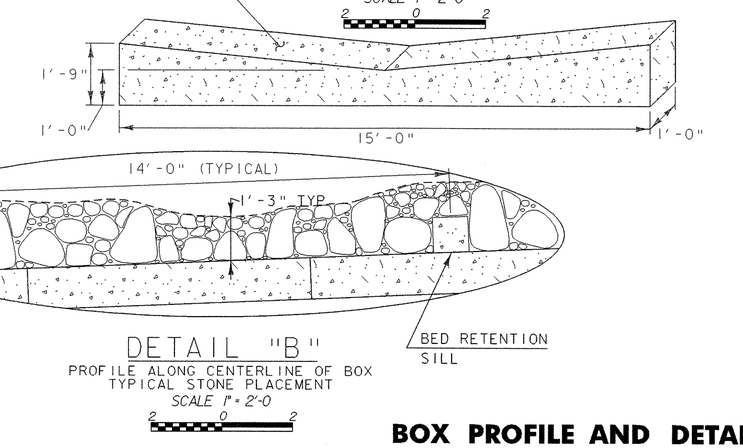
1. SECTION A-A ILLUSTRATES STONE FILL, TYPE II (MOD) PLACEMENT AT THE BED RETENTION SILLS.
2. CONTINUE THE STONE PLACEMENT PATTERN WITHIN THE BOX TO A POINT 10 FEET BEYOND THE INLET AND OUTLET OR TO THE LIMITS SHOWN ON THE PLANS IN ORDER TO BLEND INTO THE EXISTING STREAM BOTTOM.
3. WINGWALL THICKNESS IS SHOWN ONLY FOR ILLUSTRATION. THE FABRICATOR WILL DETERMINE THE APPROPRIATE THICKNESS.



SECTION A-A

PRECAST CONCRETE BOX TYPICAL SECTION AND STONE PLACEMENT

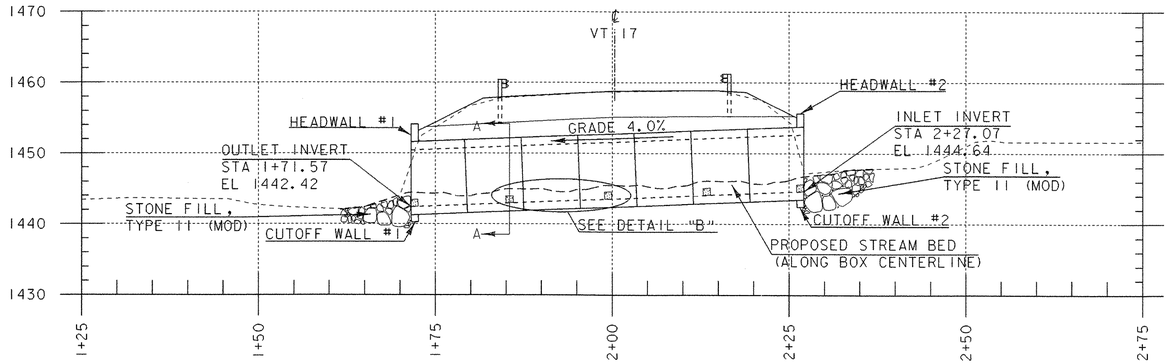
SCALE 1" = 2'-0



DETAIL "B"

PROFILE ALONG CENTERLINE OF BOX
TYPICAL STONE PLACEMENT

SCALE 1" = 2'-0



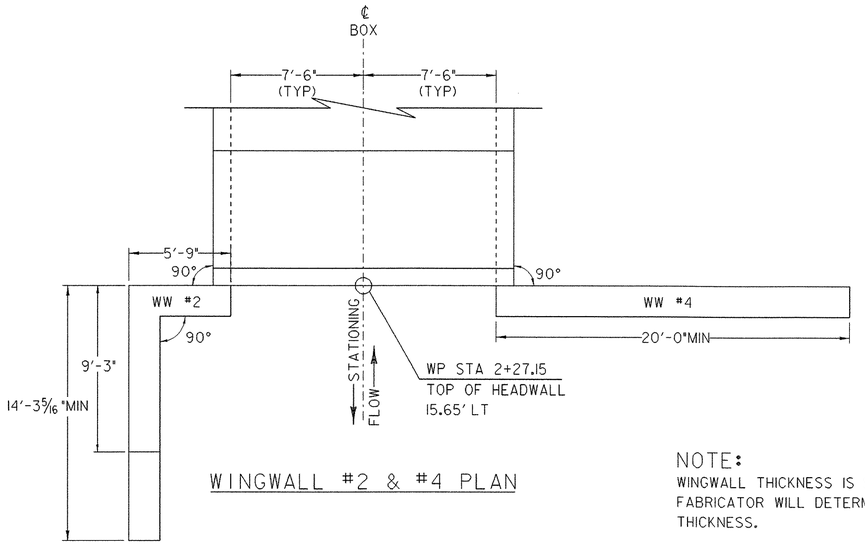
PRECAST CONCRETE BOX - PROFILE

SCALE 1" = 10'-0

BOX PROFILE AND DETAILS

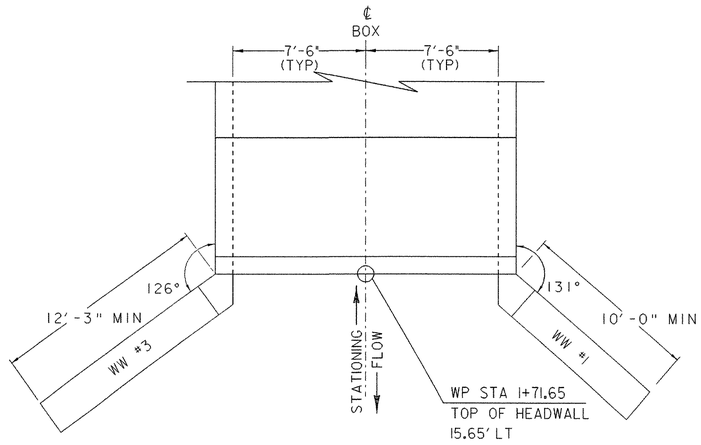
PROJECT NAME:	BUELS GORE
PROJECT NUMBER:	STP ST CULV(1)

FILE NAME: 04c138/str/s04c138chanpro.dgn	PLOT DATE: 05-APR-2006
PROJECT LEADER: M. EVANS-MONGEON	DRAWN BY: W. FARLEY
DESIGNED BY: W. FARLEY	CHECKED BY: M EVANS-MONGEON
IPARM: 04c138chanpro.i	SHEET 23 OF 30

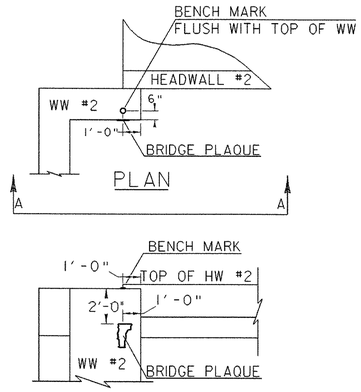


WINGWALL #2 & #4 PLAN

NOTE:
WINGWALL THICKNESS IS SHOWN FOR ILLUSTRATION. THE FABRICATOR WILL DETERMINE THE APPROPRIATE THICKNESS.

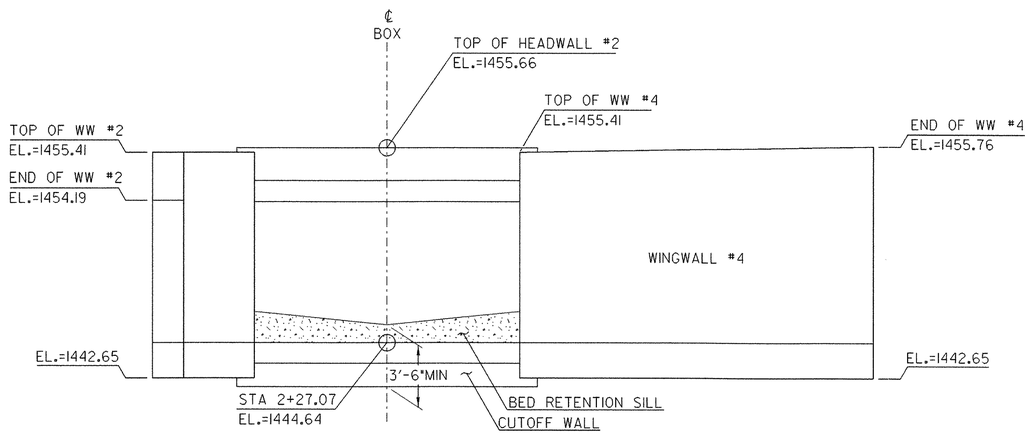


WINGWALL #1 & #3 PLAN

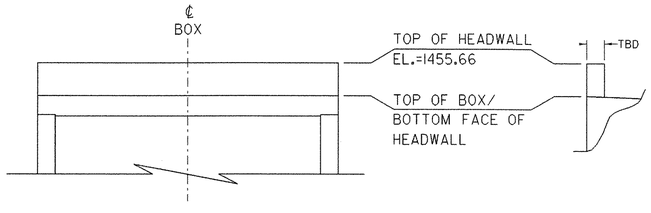


VIEW A-A
BENCH MARK AND BRIDGE PLAQUE LOCATION

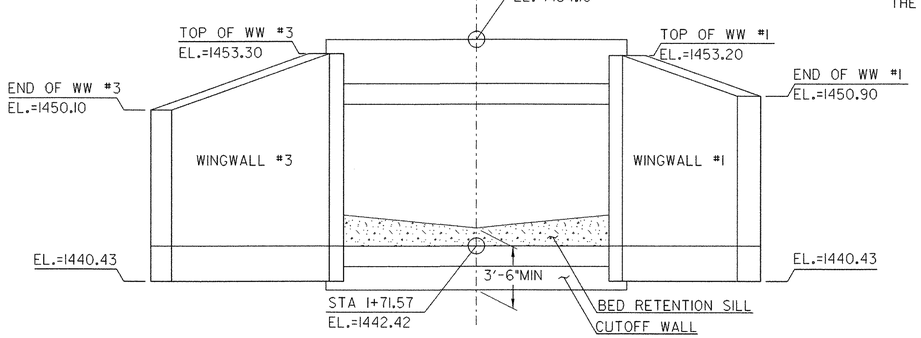
THE BENCH MARK AND BRIDGE PLAQUE WILL BE SUPPLIED BY THE AGENCY OF TRANSPORTATION AND SHALL BE INSTALLED BY THE CONTRACTOR ON WINGWALL #2 AS SHOWN OR AS DIRECTED BY THE RESIDENT ENGINEER.



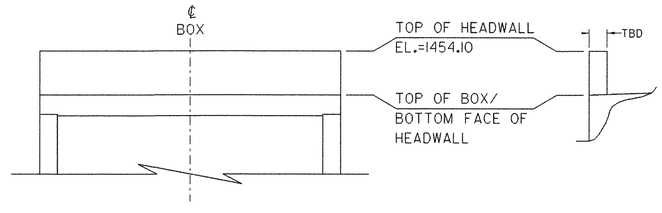
WINGWALL #2 & #4 ELEVATION



HEADWALL #2 ELEVATION



WINGWALL #1 & #3 PLAN



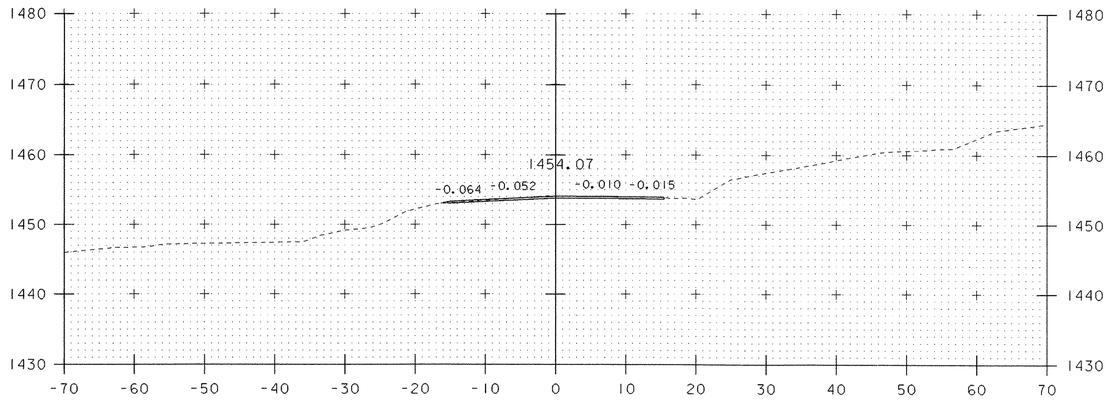
HEADWALL #1 ELEVATION

WINGWALL & HEADWALL DETAILS

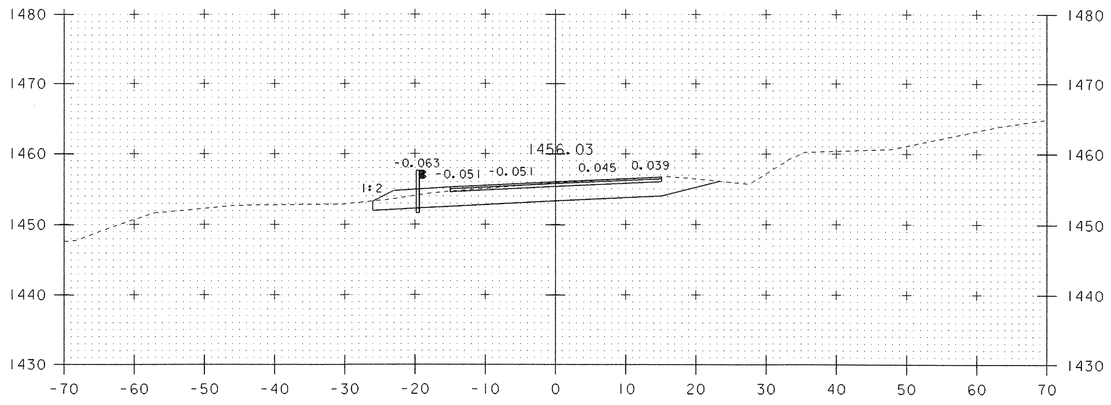
PROJECT NAME:	BUELS GORE
PROJECT NUMBER:	STP ST CULV(1)

FILE NAME: 04c138/structures/s04c138ww.dgn	PLOT DATE: 05-APR-2006
PROJECT LEADER: M. EVANS-MONGEON	DRAWN BY: W. FARLEY
DESIGNED BY: W. FARLEY	CHECKED BY: M EVANS-MONGEON
IPARM: s04c138ww.i	SHEET 24 OF 30

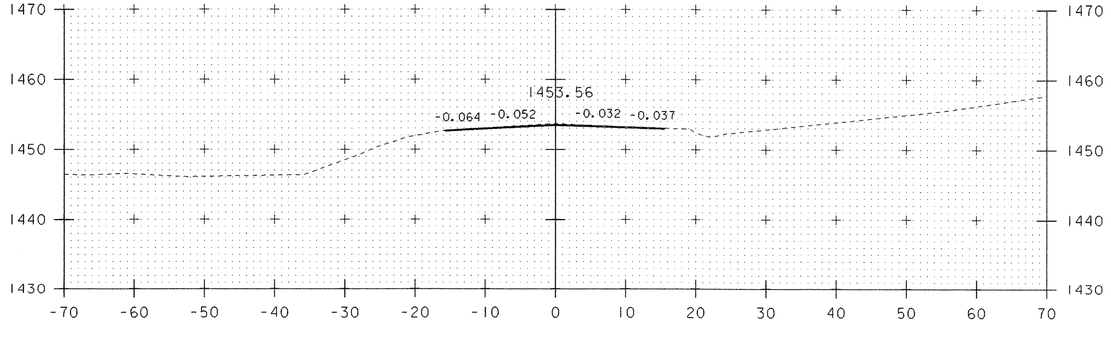
SCALE 1" = 4'-0
4 0 4



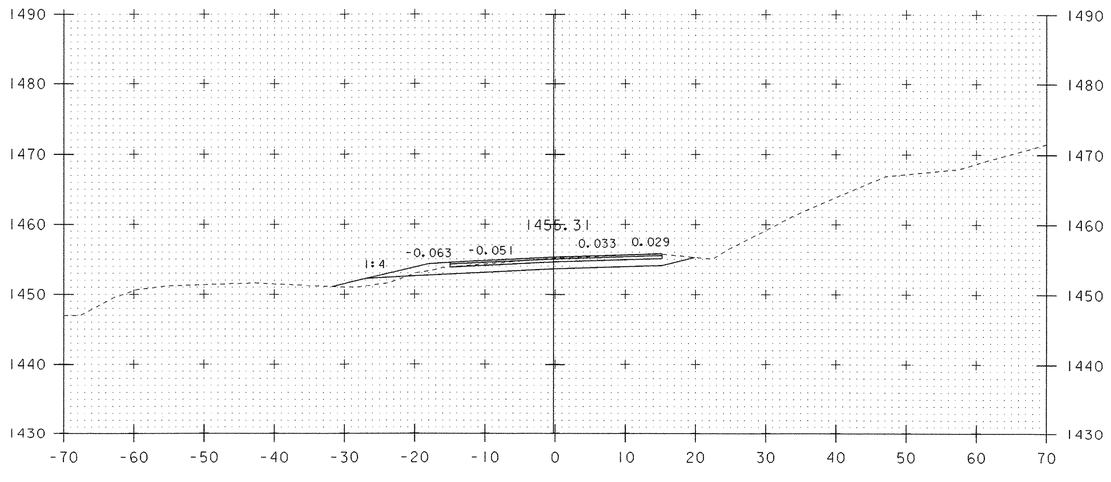
41+00



41+75



40+75
BEGIN APPROACH



41+50

DATUM
VERTICAL NAVD 27
HORIZONTAL ASSUMED

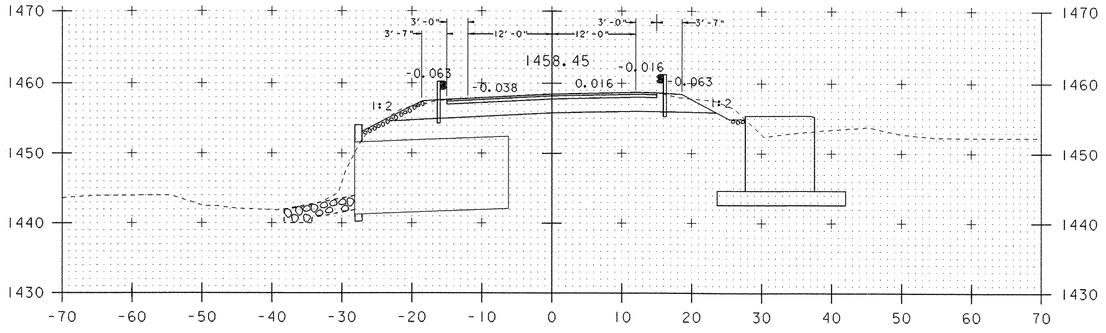
SCALE 1" = 10'-0
10 0 10

MAINLINE SECTIONS 40+75 – 41+75

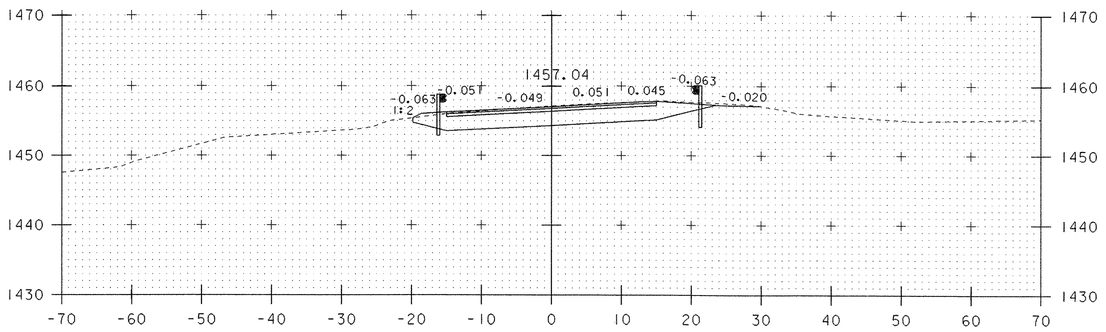
PROJECT NAME: BUEL'S GORE
PROJECT NUMBER: STP ST CULV(1)

FILE NAME: /structures/s04c138xs.dgn
PROJECT LEADER: M. EVANS-MONGEON
DESIGNED BY: W. FARLEY
s04C138xsl.i

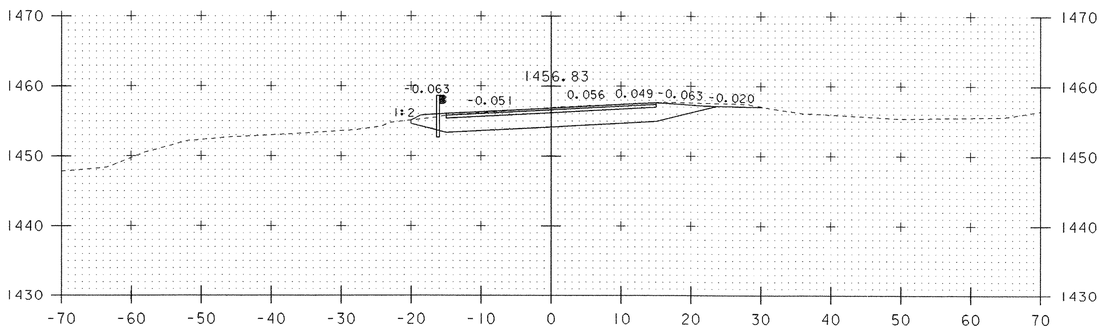
PLOT DATE: 05-APR-2006
DRAWN BY: W. FARLEY
CHECKED BY: M EVANS-MONGEON
SHEET 26 OF 30



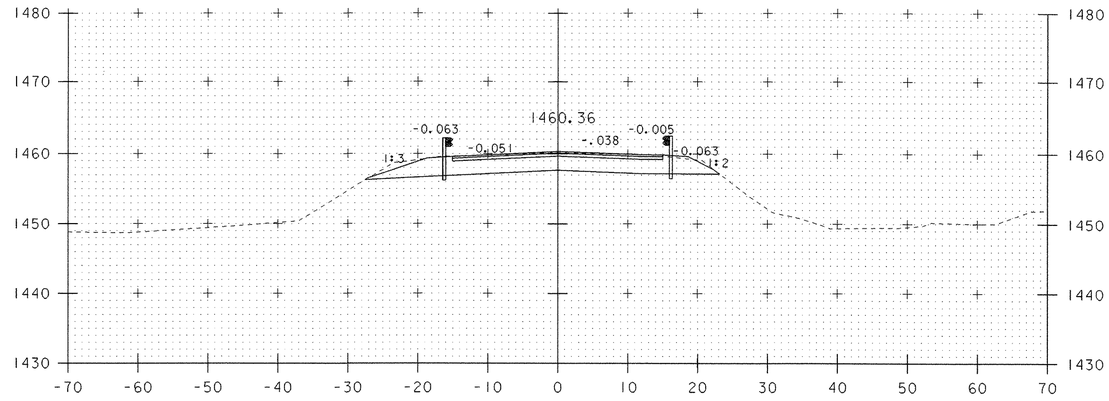
42+45.65
BEGIN BRIDGE



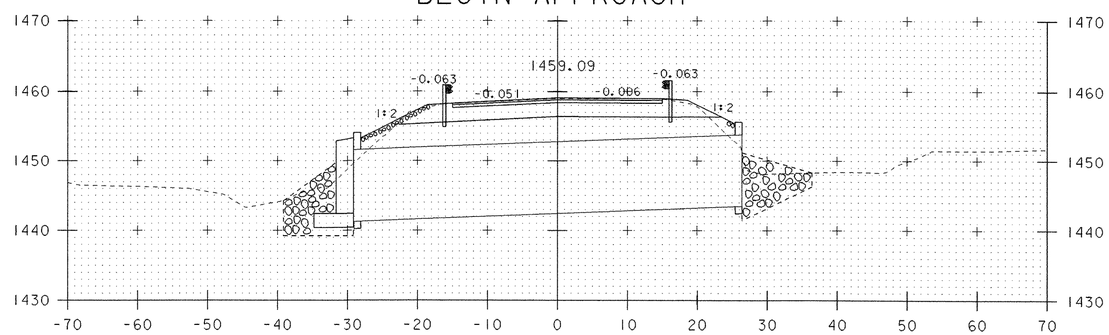
42+06



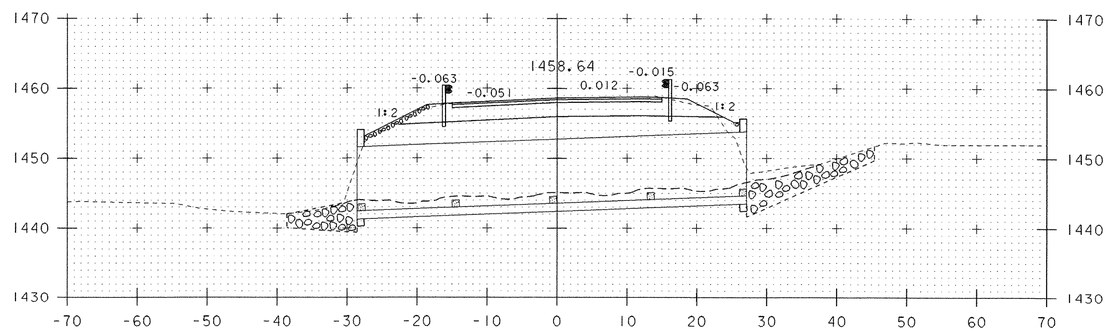
42+00
END APPROACH
BEGIN PROJECT



43+00
END PROJECT
BEGIN APPROACH



42+62.69
END BRIDGE



42+50

DATUM
VERTICAL NAVD 27
HORIZONTAL ASSUMED

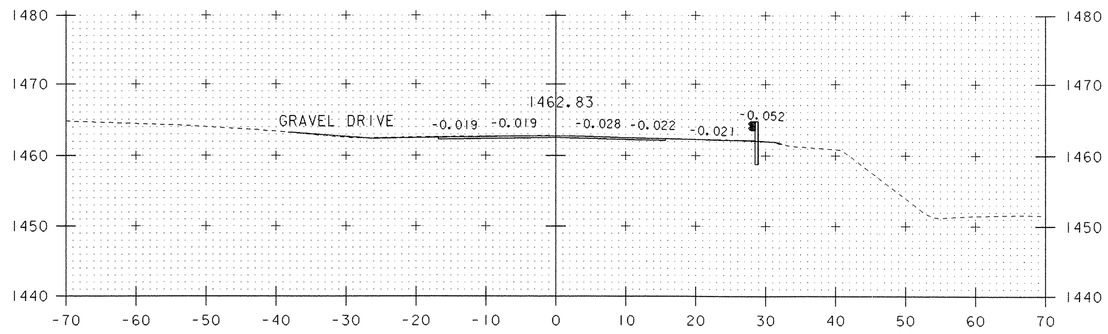
SCALE 1" = 10'-0
10 0 10

MAINLINE SECTIONS 42+00 - 43+00

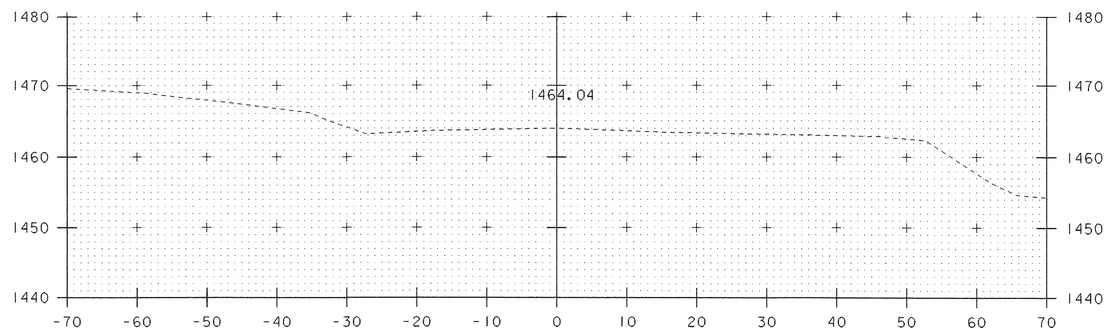
PROJECT NAME: BUEL'S GORE
PROJECT NUMBER: STP ST CULV(1)

FILE NAME: /structures/s04cl38xs.dgn
PROJECT LEADER: M. EVANS-MONGEON
DESIGNED BY: W. FARLEY
s04cl38xs2.i

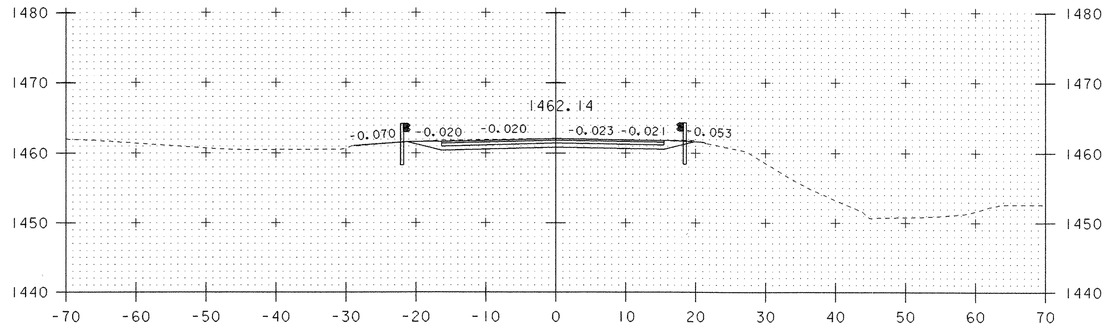
PLOT DATE: 05-APR-2006
DRAWN BY: W. FARLEY
CHECKED BY: M EVANS-MONGEON
SHEET 27 OF 30



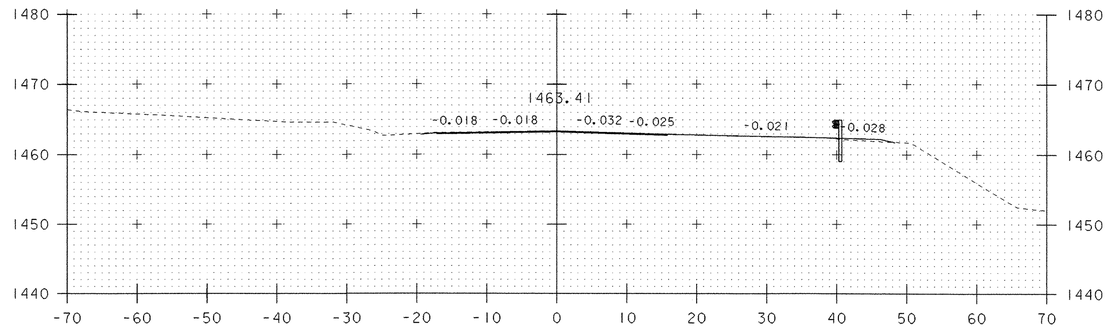
43+83



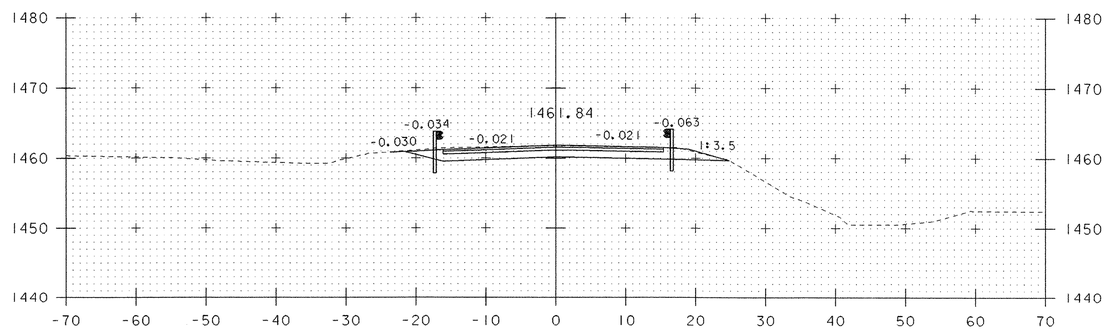
44+25
END APPROACH



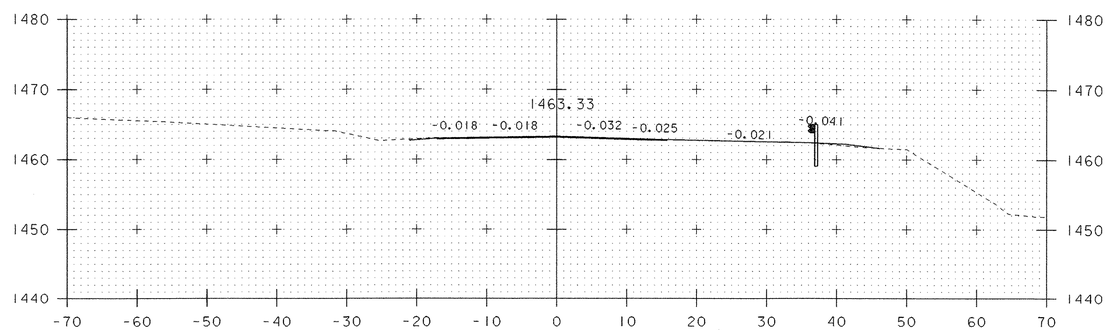
43+60



44+03



43+50



44+00

DATUM

VERTICAL NAVD 27

HORIZONTAL ASSUMED

SCALE 1" = 10'-0

10 0 10

MAINLINE SECTIONS 43+50 – 44+25

PROJECT NAME: BUEL'S GORE

PROJECT NUMBER: STP ST CULV(1)

FILE NAME: /structures/s04cl38xs.dgn

PROJECT LEADER: M. EVANS-MONGEON

DESIGNED BY: W. FARLEY

s04cl38xs3.1

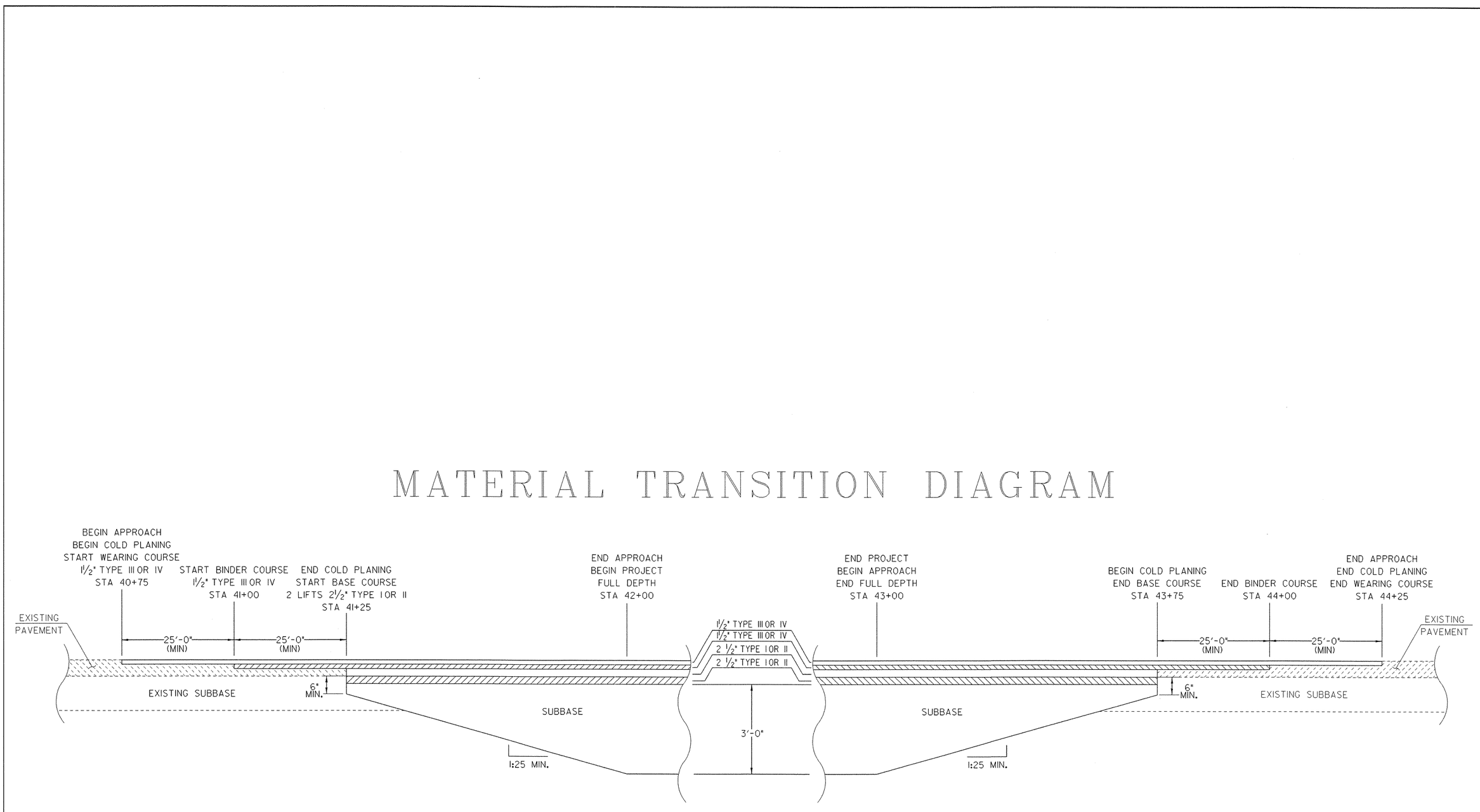
PLOT DATE: 05-APR-2006

DRAWN BY: W. FARLEY

CHECKED BY: M EVANS-MONGEON

SHEET 28 OF 30

MATERIAL TRANSITION DIAGRAM

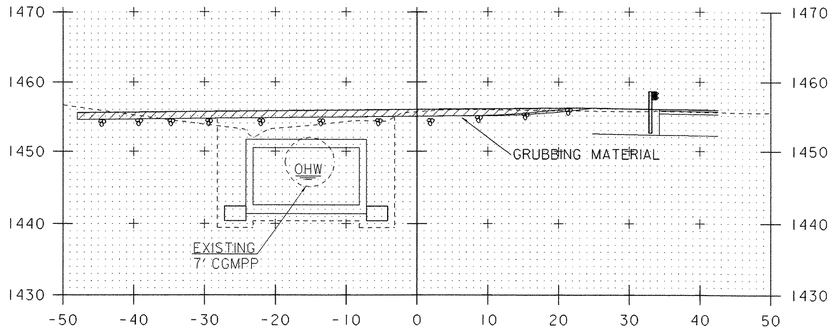


MATERIAL TRANSITION

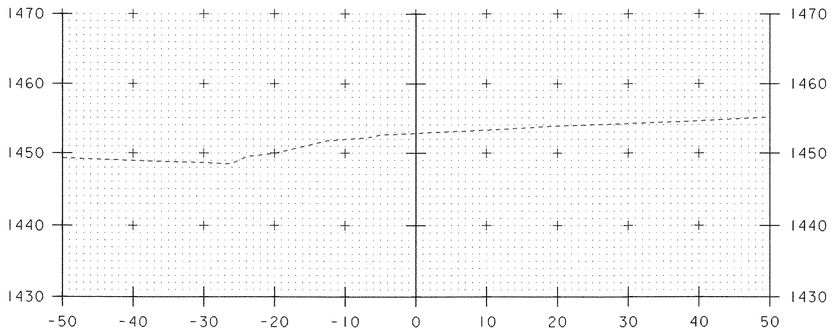
N.T.S.

PROJECT NAME:	BUELS GORE
PROJECT NUMBER:	STP ST CULV(I)

FILE NAME: 04cl38/structures/s04cl38typ.dgn	PLOT DATE: 05-APR-2006
PROJECT LEADER: M. EVANS-MONGEON	DRAWN BY: W. FARLEY
DESIGNED BY: W. FARLEY	CHECKED BY: M. EVANS-MONGEON
IPARM: s04cl38mattrans.i	SHEET 29 OF 30

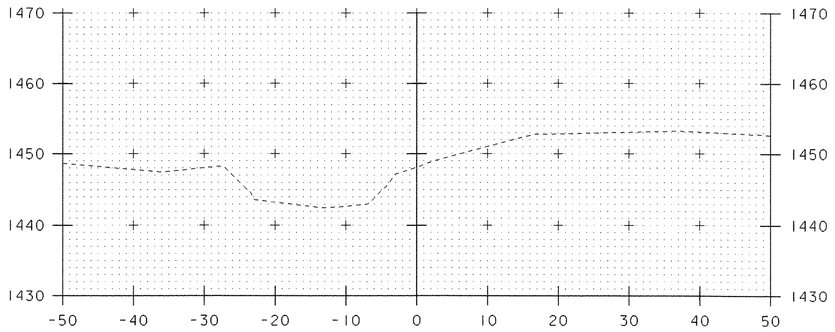


1+75



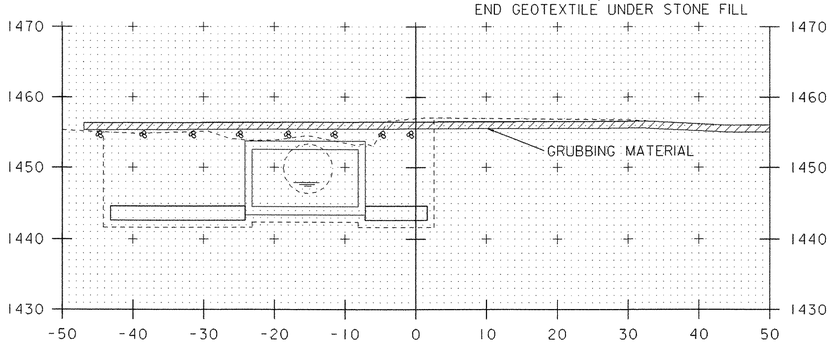
2+50

STA 2+54
END UNCLASSIFIED CHANNEL EXCAVATION
END GRANULAR BACKFILL FOR STRUCTURES
END GRUBBING MATERIAL
END STONE FILL, TYPE II
END GEOTEXTILE UNDER STONE FILL

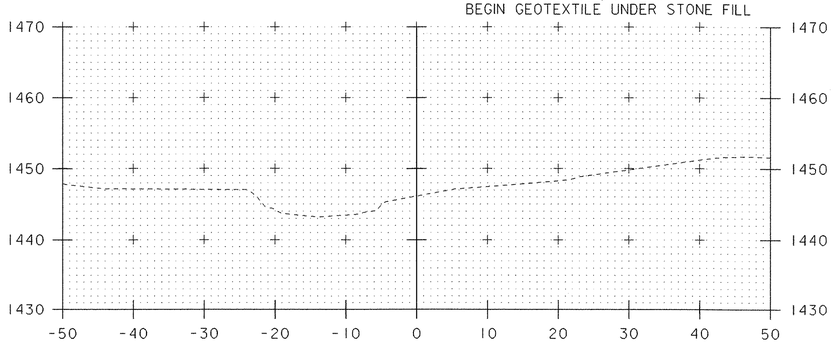


1+50

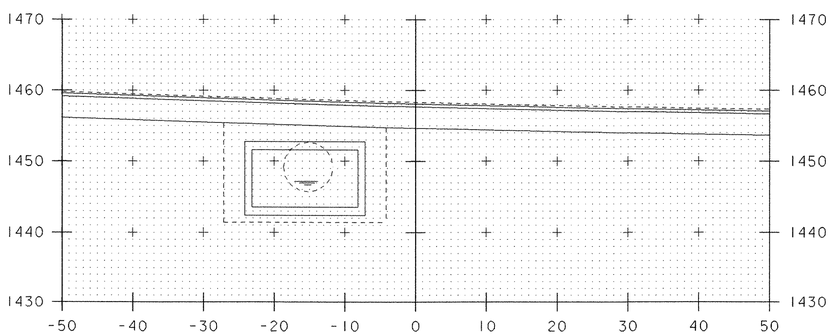
STA 1+51
BEGIN UNCLASSIFIED CHANNEL EXCAVATION
BEGIN GRANULAR BACKFILL FOR STRUCTURES
BEGIN GRUBBING MATERIAL
BEGIN STONE FILL, TYPE II
BEGIN GEOTEXTILE UNDER STONE FILL



2+25



1+25



2+00

DATUM

VERTICAL NAVD 27

HORIZONTAL ASSUMED

SCALE 1" = 10'-0

10 0 10

CHANNEL SECTIONS 1+25 - 2+50

PROJECT NAME: BUEL'S GORE

PROJECT NUMBER: STP ST CULV(I)

FILE NAME: /structures/s04cl38xs.dgn
PROJECT LEADER: M. EVANS-MONGEON
DESIGNED BY: W. FARLEY
s04cl38cxl.i

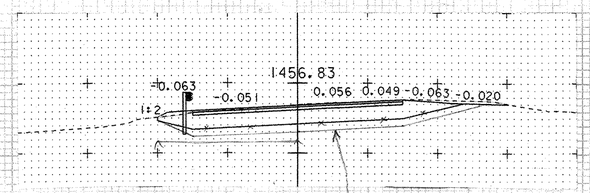
PLOT DATE: 05-APR-2006
DRAWN BY: W. FARLEY
CHECKED BY: M EVANS-MONGEON
SHEET 30 OF 30

1460

1450

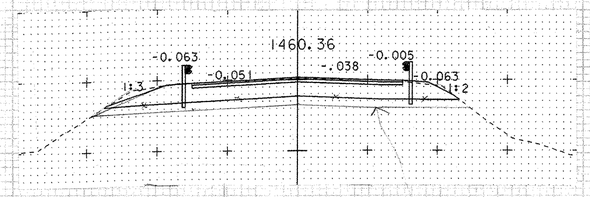
1440

A = 0.51 X 100 = 51 #.
41+25
FOR SUB. OF C.G. = 51 - 8/12 X 30 = 51 #. JNC 1-22-07



This is correct

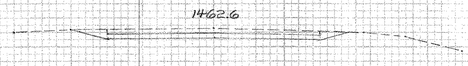
A = 1.34 X 100 = 134 #
42+00
* FOR SUBBASE OF CRUSHED GRAVEL = 134 - 5X.6X5'-1X.6X15' - 8/12X30 = 108.75 # JNC 1-22-07
X SEE FINALS BOOK, P. 26



A = 1.71 X 100 = 171 #.
43+00
FOR SUB. OF C.G. = 171 - 1.5 X 12 X 11 - 8/12 X 30 = ~~144.10~~ # OK
~~11/30/06~~ 144.40 JNC 1-22-07

1470

1460



1450

A = 0.45 X 100 = 45 #.
43+75
FOR SUB. OF C.G. = 45 - 8/12 X 30 = 25 # JNC 1-22-07

STA.	AREA (SF)	AVG. AREA	DISTANCE	VOL. (CF)
41+25	51			
		92.5	75	6937.5
42+00	134			
		152.5	100	15,250
43+00	171			
		108	75	8100
43+75	45			

TOTAL = 30,287.5/27 = 1121.76 CY

CHECKED 8/22/06 BY DMF

BUELS GORE
STP ST CULV (1)

ITEM 203.15
COMMON EXCAVATION

IJ 8/22/06

031

LEGEND

- STRUCTURE EXCAVATION
- WINGWALL EXCAVATION
- COMMON EXCAVATION
- REMOVAL OF STRUCTURE
- UNCLASSIFIED CHANNEL EXCAVATION

OVER EXCAVATION (EXTRA STRUCTURE EXCAVATION)

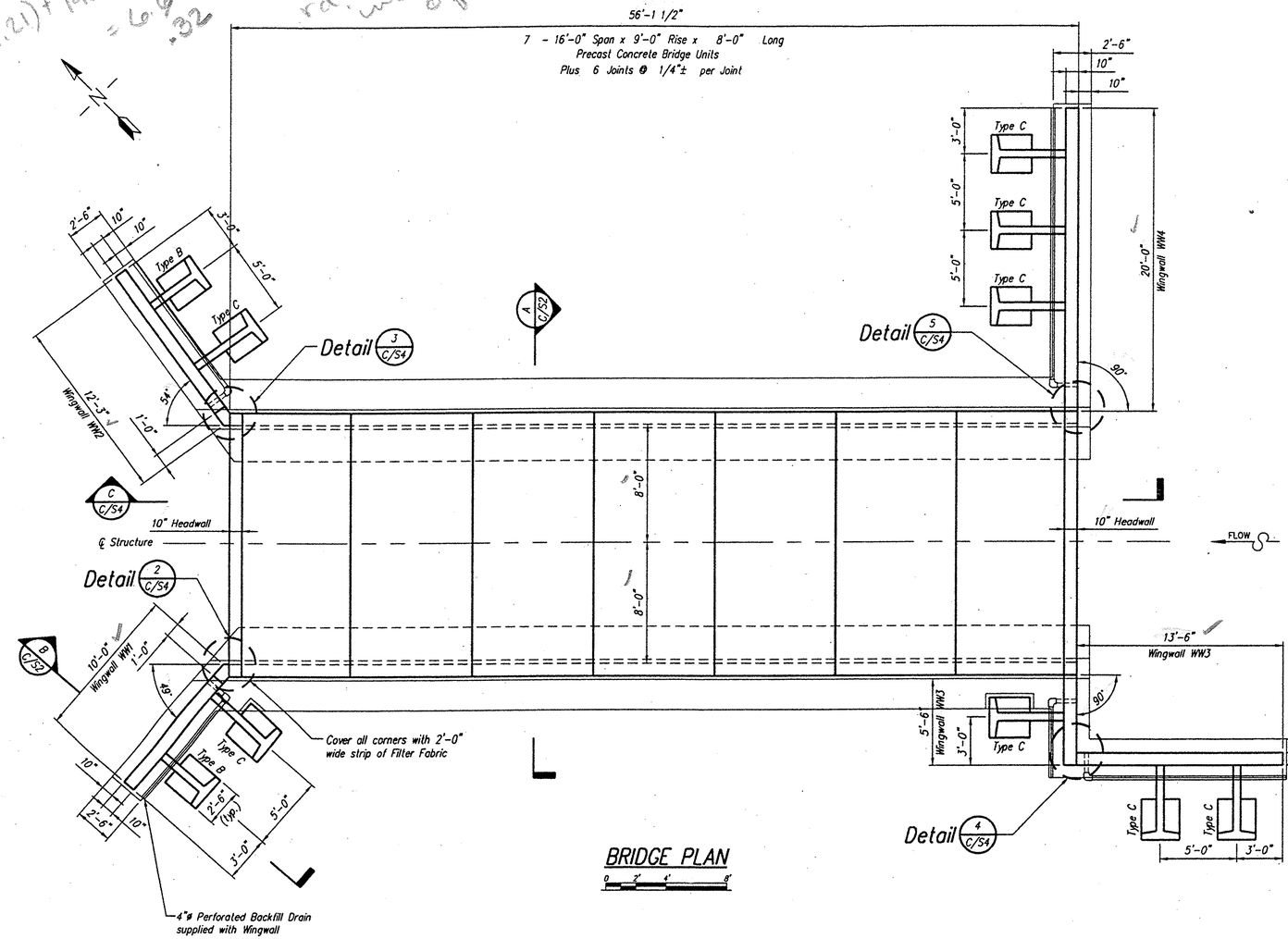
STA	AREA	AVE AREA	LENGTH	VOLUME
1+85	0			
		132.3 SF	8'	105.8 CF
1+93	264.5 SF			
		36.8 SF	23'	846.4 CF
2+16	47.1 SF			
		42.1 SF	11'	463.9 CF
2+27	37.2 SF			
		18.6 SF	4'	74.4 CF
2+31	0			

TOTAL = 1490.5 CF = 55.2 CY

→ EXTRA SUBBASE OF DENSE GRADED CRUSHED STONE = 55.2 CY

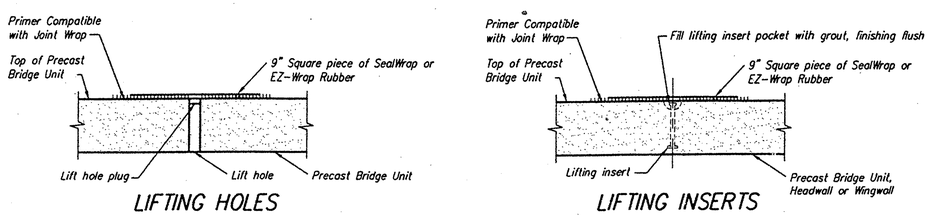
FINAL SURVEY
SURVEYED
PLOTTED
CHECKED
DATE
BY
KENSHAW SURVEY
ENGINEERING
LAND SURVEYING
CONSULTANTS

HIGHWAY PROJECT NO. 0372
PLATE 3-FULL CROSS SECTION-FULL LINE
PHOTOSTAT REPRODUCIBLE
NOTE IN M.E.S.



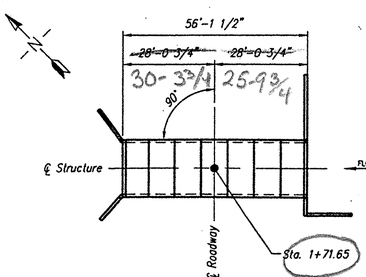
BRIDGE PLAN

0 2' 4' 8'



TYPICAL LIFT POINT SEALING DETAIL

not to scale



LOCATION PLAN

0 20' 40'

NOTES

GENERAL NOTES:

1. This bridge has been designed for general site conditions. The project engineer shall be responsible for the structure's suitability to the existing site conditions and for the hydraulic evaluation -- including scour and confirmation of soil conditions.
2. Prior to construction, contractor must verify all elevations shown through the engineer.
3. Only Concrete Systems, Inc. the CON/SPAN® approved precaster in New England may provide the structure designed in accordance with these plans.
4. The use of another precast structure with the design assumptions used for the CON/SPAN® structure may lead to serious design errors. Use of any other precast structure with this design and drawings voids any certification of this design and warranty. CONTECH Bridge Solutions Inc. assumes no liability for design of any alternate or similar type structures.
5. Alternate structures may be considered, provided that signed and sealed design drawings (and calculations) are submitted to the engineer 2 weeks prior to the bid date for review and approval.
6. Proposed alternates to a CON/SPAN® Bridge System must submit at least two (2) independently verified full scale load tests that confirm the proposed design methodology of the three sided/arch structure(s). The proposed alternate, upon satisfactory confirmation of design methodology, may be considered an acceptable alternate.

DESIGN DATA

Design Loading:
Bridge Units: HS25-44
Headwalls: Earth Pressure Only
Wingwalls: Earth Pressure Only
Design Fill Height: 2'-0" min. to 6'-0" max. from top of crown to top of pavement.
Design Method: Load factor per AASHTO Specification
Assumed net allowable soil bearing pressure: 2500 PSF *
Assumed gross allowable soil bearing pressure: 3000 PSF *

*At the time of design, a geotechnical report for the project site was not available. It is the project engineer's, owner's and/or the contractor's responsibility to verify that the actual site conditions at the time of construction are consistent with the assumed allowable soil bearing pressure with a geotechnical investigation from a qualified geotechnical engineer.

MATERIALS

Precast units shall be constructed and installed in accordance with CON/SPAN® Specifications. Concrete for Footings shall have a minimum compressive strength of 4000 psi. Reinforcing steel for footings shall conform to ASTM A615 or A996-Grade 60.

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BY _____ DATE 6/1/06

STATE OF VERMONT
WILLIAM D. LOCKWOOD
No. 6739
PROFESSIONAL ENGINEER
6-22-06

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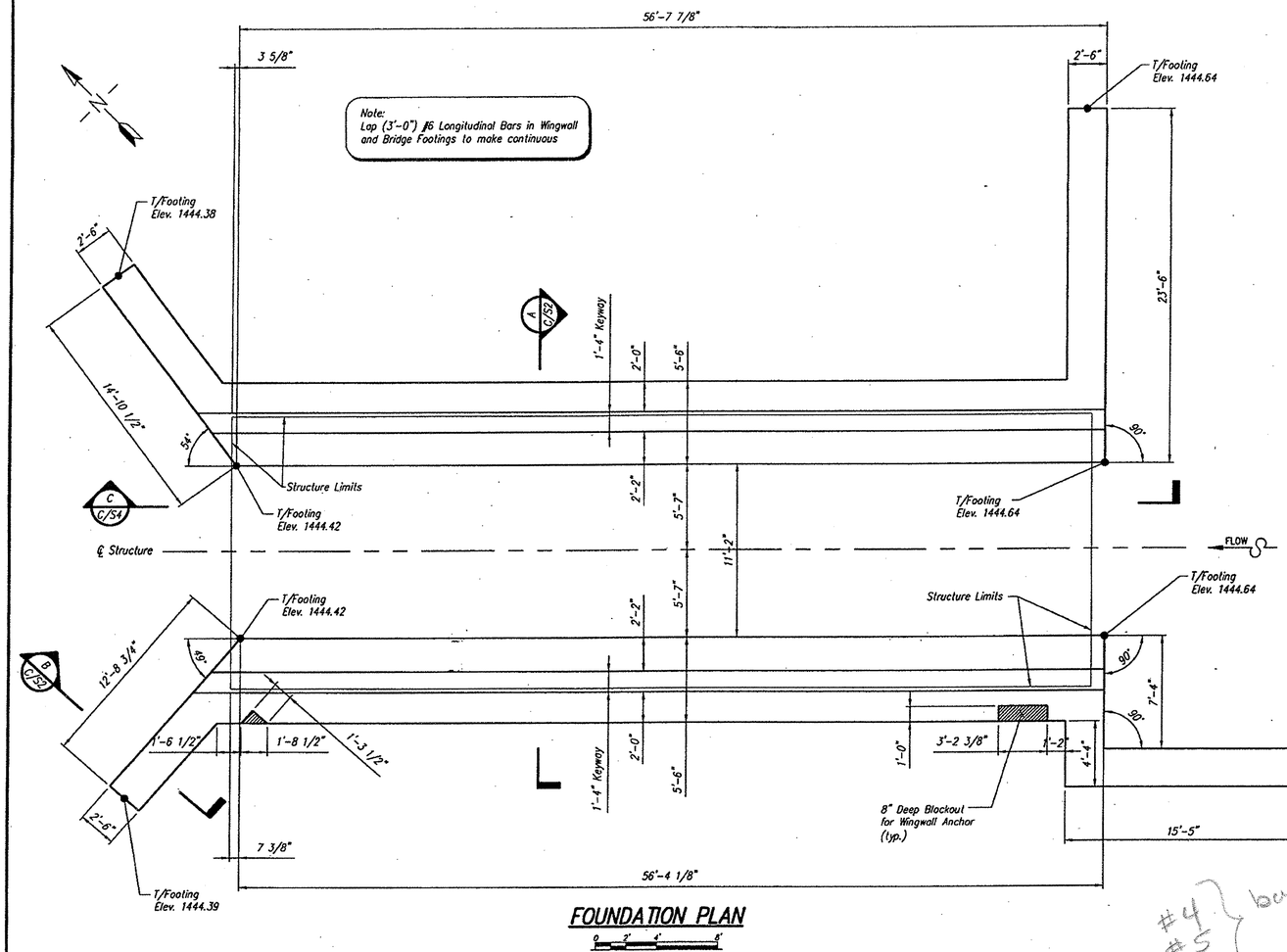
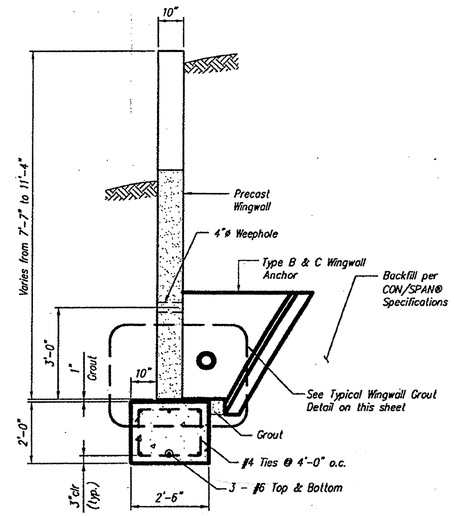
033

Designed KJG	CS Project No. 14688
Drawn WLC	
Checked MRW	Sheet No. C/S1
Date 6/22/06	



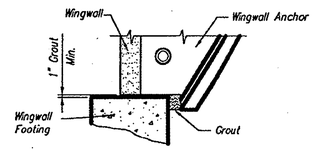
FOUNDATION PLAN

0 2' 4' 8'



SECTION B C/S1

0 1' 2' 4'

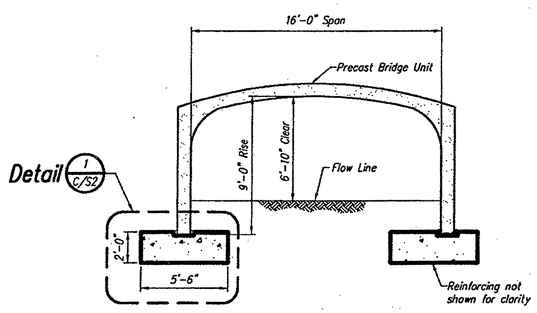


Notes:
- Minimum 1" Grout under wingwall leg & anchor stem.
- Area between wingwall footing and wingwall anchor shall be grouted solid before backfill.

TYPICAL WINGWALL GROUT DETAIL

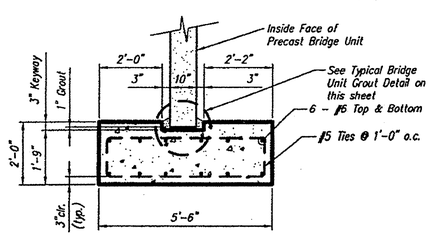
not to scale

#4 }
#5 } bars
#6 }



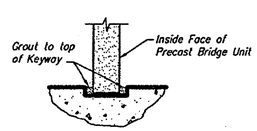
SECTION A C/S1

0 2' 4' 8'



DETAIL 1 C/S2

0 1' 2' 4'



Note:
Fill entire keyway including nominal 1" void between bottom of keyway and bottom of precast bridge unit leg with grout.

TYPICAL BRIDGE UNIT GROUT DETAIL

not to scale

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William D Fahrwood

7-17-06

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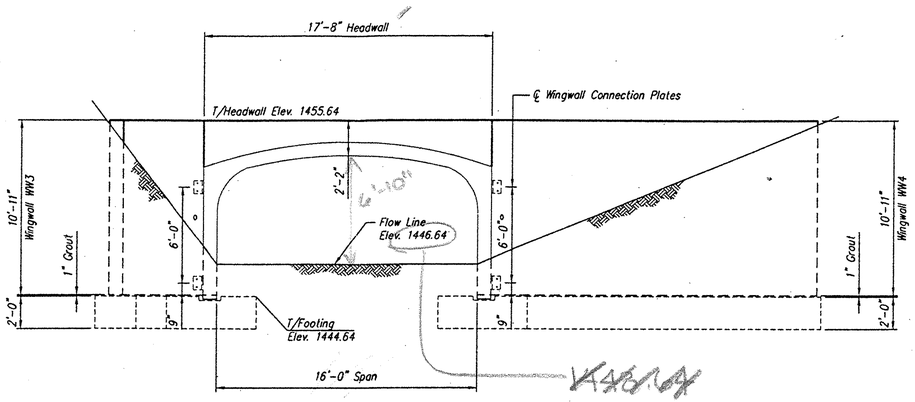
034

Designed	KJG	C/S Project No. 14688
Drawn	WLC	
Checked	MRW	Sheet No. C/S2
Date	6/22/06	



UPSTREAM END ELEVATION

0 2' 4' 8'

need top inside to be at Least
1448.64 + 6' 6'9"
1455.64

1455.64
- 1448.64
2
3

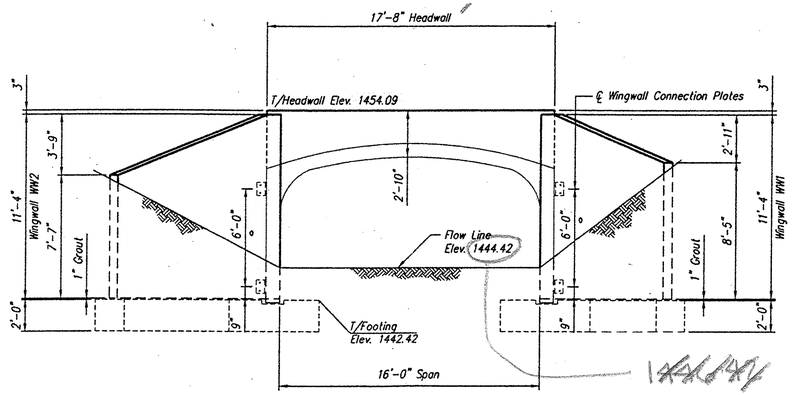
1444.64 + 10'-11"
- 2'-2" = 1453.39
- 1448.64
4.79

Bill's design
flow line to top of headwall
= 1455.64 - (1444.64+2')
= ~~8.77~~ 9.02'

℄ inlet = 1454.10 - (1442.42+2)
℄ outlet = 9.68

on this plan
1455.64 - 1446.64 = 9

ftg to inside top of arch = ~~1442.64~~



DOWNSTREAM END ELEVATION

0 2' 4' 8'

1451.26
1453.47

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STATE OF VERMONT
WILLIAM D. LOCKWOOD
No. 6739
REGISTERED PROFESSIONAL ENGINEER
6-22-06

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Designed	KJG	C/S Project No. 14688
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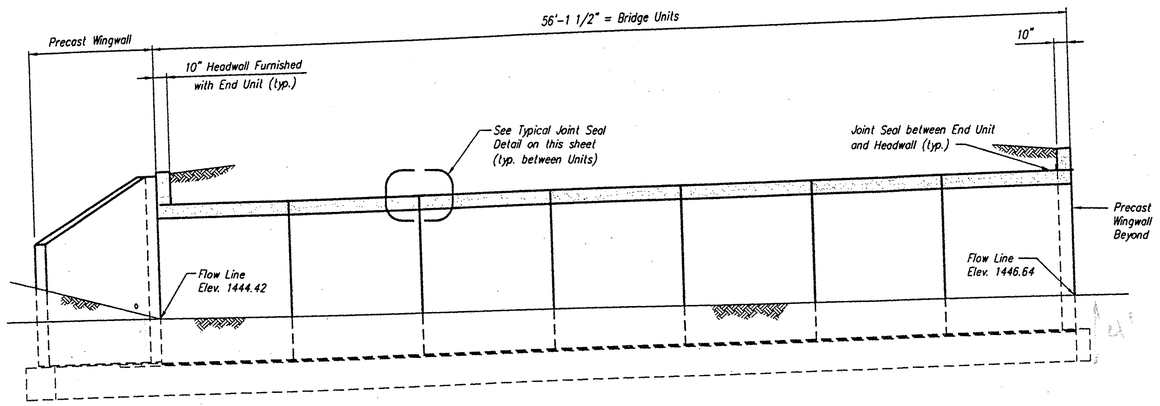
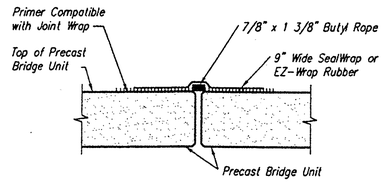
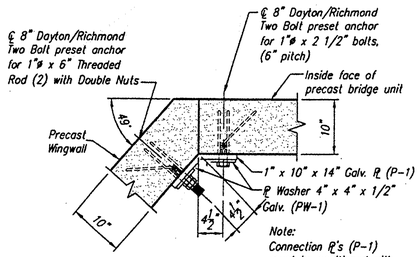
Checked	MRW	Sheet No. C/S3
Date	6/22/06	



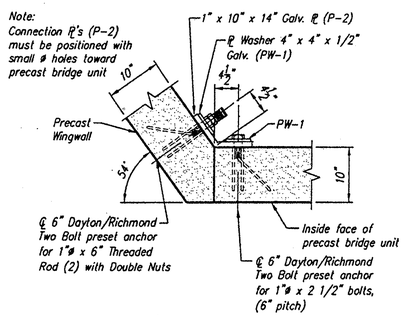
SECTION C
C/S1 — 0, 2', 4', 8'



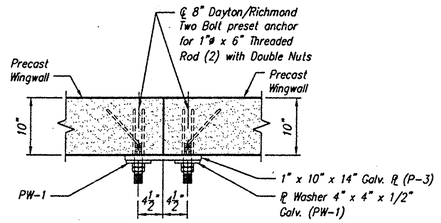
TYPICAL JOINT SEAL DETAIL
not to scale



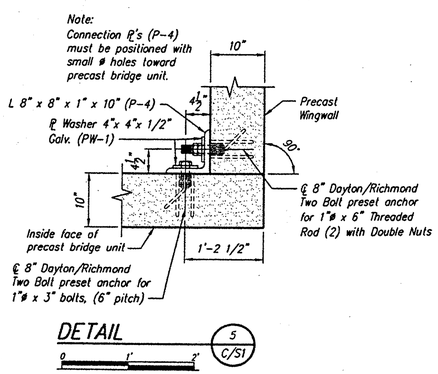
DETAIL 2
C/S1 — 0, 1', 2'



DETAIL 3
C/S1 — 0, 1', 2'



DETAIL 4
C/S1 — 0, 1', 2'



DETAIL 5
C/S1 — 0, 1', 2'

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WILLIAM D. LOCKWOOD
No. 6739
PROFESSIONAL ENGINEER
6-22-06

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Designed	KJG
Drawn	WLC
Checked	MRW
Date	6/22/06
C/S Project No.	14688
Sheet No.	C/S4

036

SPECIFICATIONS FOR MANUFACTURE AND INSTALLATION OF CON/SPAN® BRIDGE SYSTEMS

1. DESCRIPTION

This work shall consist of constructing a CON/SPAN ® bridge in accordance with these specifications and in reasonably close conformity with the lines, grades, design and dimensions shown on the plans or as established by the Engineer. In situations where two or more specifications apply to this work, the most stringent requirements shall govern.

2. TYPES

Precast reinforced concrete CON/SPAN® bridge units manufactured in accordance with this specification shall be designated by span and rise. Precast reinforced concrete CON/SPAN® wingwalls and headwalls manufactured in accordance with this specification shall be designated by length, height, and deflection angle.

3. MATERIALS - CONCRETE

The concrete for the culverts shall be air-entrained when installed in areas subject to freeze-thaw conditions, composed of portland cement, fine and coarse aggregates, admixtures and water. Air-entrained concrete shall contain 6 ± 2 percent air. The air entraining admixture shall conform to AASHTO M154.

3.1 Portland Cement - Shall conform to the requirements of ASTM Specifications C150-Type I, Type II, or Type III cement.

3.2 Coarse Aggregate - Shall consist of stone having a maximum size of 1 inch. Aggregate shall meet requirements for ASTM C33.

3.3 Water Reducing Admixture - The manufacturer may submit for approval by the Engineer, a water-reducing admixture for the purpose of increasing workability and reducing the water requirement for the concrete.

3.4 Calcium Chloride - The addition to the mix of calcium chloride or admixtures containing calcium chloride will not be permitted.

4. MATERIALS - STEEL REINFORCEMENT AND HARDWARE

All reinforcing steel for the culverts shall be fabricated and placed in accordance with the detailed shop drawings submitted by the manufacturer.

4.1 Steel Reinforcement - Reinforcement shall consist of welded wire fabric conforming to ASTM Specification A 185 or A 497, or deformed billet steel bars conforming to ASTM Specification A 615, Grade 60. Longitudinal distribution reinforcement may consists of welded wire fabric or deformed billet-steel bars.

4.2 Hardware:
Bolts and threaded rods for wingwall connections shall conform to ASTM A 307. Nuts shall conform to AASHTO M 292 (ASTM A 194) Grade 2H. All bolts, threaded rods and nuts used in wingwall connections shall be mechanically zinc coated in accordance with ASTM B 695 Class 50.

Structural Steel for wingwall connection plates and plate washers shall conform to AASHTO M 270 (ASTM A 709) Grade 36 and shall be hot dip galvanized as per AASHTO M 111 (ASTM A 123).

Inserts for wingwalls shall be 1" diameter Two-Bolt Preset Wingwall Anchors as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700.

Ferrule Loop Inserts shall be F-64 Ferrule Loop Inserts as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700.

Hook Bolts used in attached headwall connections shall be ASTM A 307.

Inserts for detached headwall connections shall be AISI Type 304 stainless steel, F-58 Expanded Coil Inserts as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700. Coil rods and nuts used in headwall connections shall be AISI Type 304 stainless steel. Washers used in headwall connections shall be either AISI Type 304 stainless steel plate washers or AASHTO M 270 (ASTM A 709) Grade 36 plate washers hot dip galvanized as per AASHTO M 111 (ASTM A 153).

Reinforcing bar splices shall be made using the Dowel Bar Splicer System as manufactured by Dayton/Richmond Concrete Accessories, Miamisburg, Ohio, (800) 745-3700, and shall consist of the Dowel Bar Splicer (DB-SAE) and Dowel-In (DI).

5. MANUFACTURE

5.1 Mixture - The aggregates, cement and water shall be proportioned and mixed in a batch mixer to produce a homogeneous concrete meeting the strength requirements of this specification. The proportion of portland cement in the mixture shall not be less than 564 pounds (6 sacks) per cubic yard of concrete.

5.2 Curing - The precast concrete culvert units shall be cured for a sufficient length of time so that the concrete will develop the specified compressive strength in 28 days or less. Any one of the following methods of curing or combinations thereof shall be used:

5.2.1 Steam Curing - The culverts may be low pressure, steam cured by a system that will maintain a moist atmosphere.

5.2.2 Water Curing - The culverts may be water cured by any method that will keep the sections moist.

5.2.3 Membrane Curing - A sealing membrane conforming to the requirements of ASTM Specification C 309 may be applied and shall be left intact until the required concrete compressive strength is attained. The concrete temperature at the time of application shall be within ± 10 degrees F of the atmospheric temperature. All surfaces shall be kept moist prior to the application of the compounds and shall be damp when the compound is applied.

5.3 Forms - the forms used in manufacture shall be sufficiently rigid and accurate to maintain the culvert dimensions within the permissible variations given in Section 7 of these specifications. All casting surfaces shall be of a smooth material.

5.4 Handling - Handling devices or holes shall be permitted in each culvert for the purpose of handling and setting.

5.5 Storage - The precast elements shall be stored in such a manner to prevent cracking or damage. The units shall not be moved until the concrete compressive strength has reached a minimum of 2500 psi, and they shall not be stored in an upright position until the concrete compressive strength is a minimum of 4,000 psi.

6. DESIGN

6.1 The precast element dimension and reinforcement details shall be as prescribed in the plan and the shop drawings provided by the manufacturer, subject to the provisions of Section 7, below. The minimum concrete compressive strength shall be as shown on the shop drawings. The minimum steel yield strength shall be 60,000 psi, unless otherwise noted on the shop drawings.

6.2 The precast elements are designed in accordance with the "Standard Specifications for Highway Bridges" 17th Edition, adopted by the American Association of State Highway and Transportation Officials, 2002. A minimum of one foot of cover above the crown of the bridge units is required in the installed condition. (Unless noted otherwise on the shop drawings and designed accordingly.)

6.3 Placement of Reinforcement in Precast Bridge Units - The cover of concrete over the outside circumferential reinforcement shall be 2 inches minimum. The cover of concrete over the inside circumferential reinforcement shall be 1 1/2 inches minimum, unless otherwise noted on the shop drawings. The clear distance of the end circumferential wires shall not be less than one inch nor more than two inches from the ends of each section. Reinforcement shall be assembled utilizing single or multiple layers of welded wire fabric (not to exceed 3 layers), supplemented with a single layer of deformed billet-steel bars, when necessary. Welded wire fabric shall be composed of circumferential and longitudinal wires meeting the spacing requirements of 6.6, below, and shall contain sufficient longitudinal wires extending through the bridge unit to maintain the shape and position of the reinforcement. Longitudinal distribution reinforcement may be welded wire fabric or deformed billet-steel bars and shall meet the spacing requirements of 6.6, below. The ends of the longitudinal distribution reinforcement shall be not more than 3 inches and not less than 1 1/2 inches from the ends of the bridge unit. .

6.4 Placement of Reinforcement for Precast Wingwalls and Headwalls - The cover of concrete over the longitudinal and transverse reinforcement shall be 2 inches minimum. The clear distance from the end of each precast element to the end transverse reinforcing steel shall not be less than one inch nor more than two inches. Reinforcement shall be assembled utilizing a single layer of welded wire fabric, or a single layer of deformed billet-steel bars. Welded wire fabric shall be composed of transverse and longitudinal wires meeting the spacing requirements of 6.7, below, and shall contain sufficient longitudinal wires extending through the element to maintain the shape and position of the reinforcement. Longitudinal reinforcement may be welded wire fabric or deformed billet-steel bars and shall meet the spacing requirements of 6.7, below. The ends of the longitudinal reinforcement shall be not more than 3 inches and not less than 1 1/2 inches from the ends of the walls.

6.5 Bending of Reinforcement for Precast Bridge Units - The outside and inside circumferential reinforcing steel for the corners of the bridge shall be bent to such an angle that is approximately equal to the configuration of the bridge's outside corner.

6.6 Laps, Welds, and Spacing for Precast Bridge Units - Tension splices in the circumferential reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.2 and 8.32.6. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.1 and 8.32.5. The overlap of welded wire fabric shall be measured between the outer most longitudinal wires of each fabric sheet. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 8.25. For splices other than tension splices, the overlap shall be a minimum of 12" for welded wire fabric or deformed billet-steel bars. The spacing center to center of the circumferential wires in a wire fabric sheet shall be not less than 2 inches nor more than 4 inches. The spacing center to center of the longitudinal wires shall not be more than 8 inches. The spacing center to center of the longitudinal distribution steel for either line of reinforcing in the top slab shall be not more than 16 inches.

6.7 Laps, Welds, and Spacing for Precast Wingwalls and Headwalls - Splices in the reinforcement shall be made by lapping. Laps may be tack welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.2 and 8.32.6. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.1 and 8.32.5. For deformed billet-steel bars, the overlap shall meet the requirements of AASHTO 8.25. The spacing center-to-center of the wires in a wire fabric sheet shall be not less than 2 inches nor more than 8 inches.

7. PERMISSIBLE VARIATIONS

7.1 Bridge Units

7.1.1 Internal Dimensions - The internal dimension shall vary not more than 1% from the design dimensions nor more than 1-1/2 inches whichever is less. The haunch dimensions shall vary not more than 3/4 inch from the design dimension.

7.1.2 Slab and Wall Thickness - The slab and wall thickness shall not be less than that shown in the design by more than 1/4 inch. A thickness more than that required in the design shall not be cause for rejection.

7.1.3 Length of Opposite Surfaces - Variations in laying lengths of two opposite surfaces of the bridge unit shall not be more than 1/2 inch in any section, except where beveled ends for laying of curves are specified by the purchaser.

7.1.4 Length of Section - The underrun in length of a section shall not be more than 1/2 inch in any bridge unit.

7.1.5 Position of Reinforcement - The maximum variation in position of the reinforcement shall be ± 1/2 inch. In no case shall the cover over the reinforcement be less than 1 1/2 inches for the outside circumferential steel or be less than 1 inch for the inside circumferential steel as measured to the external or internal surface of the bridge. These tolerances or cover requirements do not apply to mating surfaces of the joints.

7.1.6 Area of Reinforcement - The areas of steel reinforcement shall be the design steel areas as shown in the manufacturer's shop drawings. Steel areas greater than those required shall not be cause for rejection. The permissible variation in diameter of any reinforcement shall conform to the tolerances prescribed in the ASTM Specification for that type of reinforcement.

7.2 Wingwalls and Headwalls

7.2.1 Wall Thickness - The wall thickness shall not vary from that shown in the design by more than 1/2 inch.

7.2.2 Length/ Height of Wall sections - The length and height of the wall shall not vary from that shown in the design by more than 1/2 inch.

7.2.3 Position of Reinforcement - The maximum variation in the position of the reinforcement shall be ± 1/2 inch. In no case shall the cover over the reinforcement be less than 1 1/2 inches.

7.2.4 Size of Reinforcement - The permissible variation in diameter of any reinforcing shall conform to the tolerances prescribed in the ASTM Specification for that type of reinforcing. Steel area greater than that required shall not be cause for rejection.

8. TESTING AND INSPECTION

8.1 Type of Test Specimen - Concrete compressive strength shall be determined from compression tests made on cylinders or cores. For cylinder testing, a minimum of 4 cylinders shall be taken during each production run. For core testing, one core shall be cut from each of 3 precast elements selected at random from each production group. A production group shall be defined as 15 or fewer bridge units (of a particular size), wingwalls or headwalls in a continuous production run. For each continuous production run, each production group or fraction thereof shall be considered separately for the purpose of testing and acceptance. A production run shall be considered continuous if not interrupted for more than 3 consecutive days.

8.2 Compression Testing - Cylinders shall be made and tested as prescribed by the ASTM C 39 Specification. Cores shall be obtained and tested for compressive strength in accordance with the provisions of the ASTM C497 Specification.

8.3 Acceptability of Cylinder Tests - When the average compressive strength of all cylinders tested is equal to or greater than the design compressive strength, and not more than 10% of the cylinders tested have a compressive strength less than the design concrete strength, and no cylinder tested has a compressive strength less than 80% of the design compressive strength, then the lot shall be accepted. When the compressive strength of the cylinders tested does not conform to this acceptance criteria, the acceptability of the lot may be determined as described in section 8.4, below.

8.4 Acceptability of Core Tests - The compressive strength of the concrete in each production group as defined in 8.1 is acceptable when the average core test strength is equal to or greater than the design concrete strength. When the compressive strength of the core tested is less than the design concrete strength, the precast element from which that core was taken may be re-cored. When the compressive strength of the re-core is equal to or greater than the design concrete strength, the compressive strength of the concrete in that production group is acceptable.

8.4.1 When the compressive strength of any recore is less than the design concrete strength, the precast element from which that core was taken shall be rejected. Two precast elements from the remainder of the group shall be selected at random and one core shall be taken from each. If the compressive strength of both cores is equal to or greater than the design concrete strength, the compressive strength of the remainder of that group is acceptable. If no compressive strength of either of the two cores tested is less than the design concrete strength, the remainder of the group shall be rejected or, at the option of the manufacturer, each precast element of the remainder of the group shall be cored and accepted individually; and any of these elements that have cores with less than the design concrete strength shall be rejected.

8.4.2 Plugging Core Holes - The core holes shall be plugged and sealed by the manufacturer in a manner such that the elements will meet all of the test requirements of this specification. Precast elements so sealed shall be considered satisfactory for use.

8.4.3 Test Equipment - Every manufacturer furnishing culverts under this specification shall furnish all facilities and personnel necessary to carryout the test required.

9. JOINTS

The bridge units shall be produced with flat butt ends. The ends of the bridge units shall be such that when the sections are laid together they will make a continuous line of with a smooth interior free of appreciable irregularities, all compatible with the permissible variations in Section 7, above. The joint width shall not exceed 3/4 inches.

10. WORKMANSHIP AND FINISH

The bridge units, wingwalls, and headwalls shall be substantially free of fractures. The ends of the bridge units shall be normal to the walls and centerline of the bridge section, within the limits of the variations given in section 7, above, except where beveled ends are specified. The faces of the wingwalls and headwalls shall be parallel to each other, within the limits of variations given in section 7, above. The surface of the precast elements shall be a smooth steel form or troweled surface. Trapped air pockets causing surface defects shall be considered as part of a smooth, steel form finish.

11. REPAIRS

Precast elements may be repaired, if necessary, because of imperfections in manufacture or handling damage and will be acceptable if, in the opinion of the purchaser, the repairs are sound, properly finished and cured, and the repaired section conforms to the requirements of this specification.

12. INSPECTION

The quality of materials, the process of manufacture, and the finished culverts shall be subject to inspection by the purchaser.

13. REJECTION

The precast elements shall be subject to rejection on account of any of the specification requirements. Individual precast elements may be rejected because of any of the following:

13.1 Fractures or cracks passing through the wall, except for a single end crack that does not exceed one half the thickness of the wall.

13.2 Defects that indicate proportioning, mixing, and molding not in compliance with Section 5 of these specifications.

13.3 Honeycombed or open texture.

13.4 Damaged ends, where such damage would prevent making a satisfactory joint.

14. MARKING

Each bridge unit shall be clearly marked by waterproof paint. The following shall be shown on the inside of the vertical leg of the bridge section:
Bridge Span X Bridge Rise
Date of Manufacture
Name or trademark of the manufacturer

15. CONSTRUCTION REQUIREMENTS

15.1 Footings - The bridge units and wingwalls shall be installed on either precast or cast-in-place concrete footings. The design size and elevation of the footings shall be as determined by the Engineer. A three inch deep keyway shall be formed in the top surface of the bridge footing three inches clear of the inside and outside faces of the bridge units, unless specified otherwise on the plans. No keyway is required in the wingwall footings, unless otherwise specified on the plans. The footings shall be given a smooth float finish and shall reach a compressive strength of 2,000 psi before placement of the bridge and wingwall elements. The completed footing surface shall be constructed in accordance with grades shown on the plans. When tested with a 10 foot straight edge, the surface shall not vary more than 1/4 inch in 10 feet. If a precast concrete footing is used, the contractor shall prepare a 4 inch thick base layer of compacted granular material the full width of the footing prior to placing the precast footing.

15.2 Placement of the Bridge Units, Wingwalls and Headwalls - The bridge units, wingwalls and headwalls shall be placed as shown on the Engineer's plan drawings. Special care shall be taken in setting the elements to the true line and grade. The bridge units and wingwalls shall be set on 6" x 6" masonite or steel shims. A minimum gap of 1/2 inch shall be provided between the footing and the bottom of the bridge's vertical legs or the wingwall. The gap shall be filled with cement grout (Portland cement and water or cement mortar composed of Portland cement, sand and water) with a minimum 28-day compressive strength of 3000 psi. If units have been set with temporary ties (cables, bars, etc.) grout must attain a minimum compressive strength of 1500 psi before ties may be removed.

15.3 External Protection of Joints - The butt joint made by two adjoining bridge units shall be covered with a 7/8" x 1 3/8" preformed bituminous joint sealant and a minimum of a 9 inch wide joint wrap. The surface shall be free of dirt before applying the joint material. A primer compatible with the joint wrap to be used shall be applied for a minimum width of nine inches on each side of the joint. The external wrap shall be either EZ-WRAP RUBBER by PRESS-SEAL GASKET CORPORATION, SEAL WRAP by MAR MAC MANUFACTURING CO. INC. or approved equal. The joint shall be covered continuously from the bottom of one bridge section leg, across the top of the arch and to the opposite bridge section leg. Any laps that result in the joint wrap shall be a minimum of six inches long with the overlap running downhill.

In addition to the joints between bridge units, the joint between the end bridge unit and the headwall shall also be sealed as described above. If precast wingwalls are used, the joint between the end bridge unit and the wingwall shall be sealed with a 2'-0" strip of filter fabric. Also, if lift holes are formed in the arch units, they shall be primed and covered with a 9" x 9" square of joint wrap.

During the backfilling operation, care shall be taken to keep the joint wrap in its proper location over the joint.

15.4 Backfill - Backfill shall be considered as all replaced excavation and new embankment adjacent to the CON/SPAN® bridge units, wingwalls, and headwalls. The project construction and material specifications which include the specifications for excavation for structures and roadway excavation and embankment construction, shall apply except as modified in this section.

No backfill shall be placed against any structural elements until they have been approved by the Engineer.

Backfill against a waterproofed surface shall be placed carefully to avoid damage to the waterproofing material.

Mechanical tampers or approved compacting equipment shall be used to compact all backfill and embankment immediately adjacent to each side and over the top of each bridge unit until it is covered to a minimum depth of one foot, unless the design fill height is less than 1'-0". The backfill within the Critical Backfill Zone (shown in the diagrams below) shall be placed in lifts of eight inches or less (loose depth). Heavy compaction equipment shall not be operated in this area or over the bridge until it is covered to a depth of one foot, unless the design fill height is less than 1'-0".

Lightweight dozers and graders may be operated over bridge units having one foot of compacted cover, but heavy earth moving equipment (larger than a D-4 Dozer weighing in excess of 12 tons and having track pressures of eight psi or greater) shall require two feet of cover unless the design cover is less than two feet. In no case shall equipment operating in excess of the design load (HS20 or HS25) be permitted over the bridge units unless approved by CON/SPAN®.

Any additional fill and subsequent excavation required to provide this minimum cover shall be made at no additional cost to the project.

As a precaution against introducing unbalanced stresses in the bridge, when placing backfill at no time shall the difference between the heights of fill on opposite sides of the bridge exceed 24".

Backfill in front of wingwalls shall be carried to ground lines shown in the plans.

For fill heights over 12 feet, no backfilling may begin until a backfill compaction testing plan has been coordinated with and approved by CON/SPAN® Bridge Systems. Cost of the backfill compaction testing shall be included in the cost of the precast units. This included cost applies only to projects with fill heights over 12 feet (as measured from top crown of arch to finished grade).

16. QUALITY ASSURANCE

The Precaster shall demonstrate adherence to the standards set forth in the NPCA Quality Control Manual. The Precaster shall meet either Section 16.1 or 16.2.

16.1 Certification: The Precaster shall be certified by the Precast/Prestressed Concrete Institute Plant Certification Program or the National Precast Concrete Association's Plant Certification Program prior to and during production of the products covered by this specification.

16.2 Qualifications, Testing and Inspection

16.2.1 The Precaster shall have been in the business of producing precast concrete products similar to those specified for a minimum of three years. He shall maintain a permanent quality control department or retain an independent testing agency on a continuing basis. The agency shall issue a report, certified by a licensed engineer, detailing the ability of the Precaster to produce quality products consistent with industry standards.

16.2.2 The Precaster shall show that the following tests are performed in accordance with the ASTM standards indicated. Tests shall be performed for each 150 cubic yards of concrete placed, but not less frequently than once per production run, as defined in §8 of these specifications.

16.2.2.1 Air Content: C231 or C173

16.2.2.2 Compressive Strength: C39, C497

16.2.3 The Precaster shall provide documentation demonstrating compliance with this section to CON/SPAN® Bridge Systems at regular intervals or upon request.

16.2.4 The Owner may place an inspector in the plant when the products covered by this specification are being manufactured.

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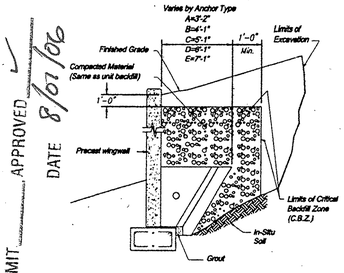
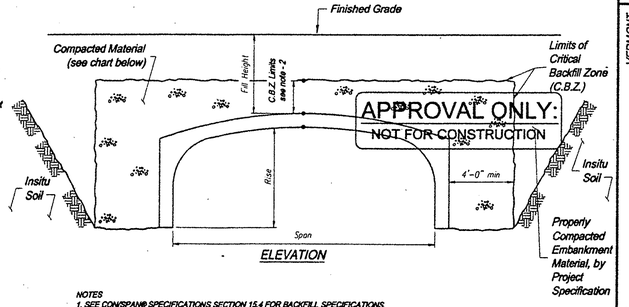


WINGWALL BACKFILL REQUIREMENTS

BACKFILL DESCRIPTION (AASHTO M 145-91)								
Group Classification	A-1		A-3	A-2				A-4
	A-1-a	A-1-b		A-2-4	A-2-5	A-2-6	A-2-7	
Sieve Analysis, Percent Passing (100% Passing 3" Sieve)								
No. 10	50 max.							
No. 40	30 max.	50 max.	51 min.					
No. 200	15 max.	25 max.	10 max.	35 max.	35 max.	35 max.	35 max.	36 min.
Characteristics of Fraction Passing No. 40								
Liquid Limit				40 max.	41 min.	40 max.	41 min.	40 max.
Plasticity Index	6 max.		N.P.	10 max.	10 max.	11 min.	11 min.	10 max.
Usual Types of Significant Constituent Materials	Stone Fragments, Gravel & Sand		Fine Sand	Silty or Clayey Gravel and Sand				Silty Soils
General Rating as Subgrade	Excellent to Good							Fair to Poor



ELEVATION

NOTES
1. SEE CON/SPAN® SPECIFICATIONS SECTION 15.4 FOR BACKFILL SPECIFICATIONS.
2. FOR FILL HEIGHTS GREATER THAN 2'-0", C.B.Z. LIMIT SHALL BE 2'-0" ABOVE ARCH CROWN. FOR FILL HEIGHTS LESS THAN 2'-0", THE FINISHED GRADE SHALL BE THE BOUNDARY LINE FOR THE C.B.Z.
3. BACKFILLING OPERATIONS WITHIN THE C.B.Z. SHALL BE PERFORMED IN LIFTS OF 8" OR LESS (LOOSE DEPTH).
4. MAXIMUM DRY DENSITY SHALL BE DETERMINED BY AASHTO T-99 OR OTHER APPROVED METHODS.
5. BACKFILL SHALL BE COMPACTED IN LAYERS UNTIL THE DENSITY IS NOT LESS THAN 85% OF THE MAXIMUM DRY DENSITY.

SPAN	FILL HEIGHT	ACCEPTABLE MATERIAL INSIDE C.B.Z.	ACCEPTABLE MATERIAL OUTSIDE C.B.Z.
≤ 24'-0"	≥ 12'-0"	A1, A3	**
≤ 24'-0"	< 12'-0"	A1, A2, A3, A4	**
> 24'-0"	ALL	A1, A3	**

** EMBANKMENT MATERIAL PER PROJECT SPECIFICATIONS

BACKFILL REQUIREMENTS

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VERMONT
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BUELS GORE
037

Designed	KJG
Drawn	WLC
Checked	MRW
Date	6/22/06
CS Project No.	14688
Sheet No.	C/S5

REVISED 1/13/93 SPEC/LINE
REVISED 1/15/98 SPEC/LINE
REVISED 6/12/98 SPEC/LINE
REVISED 1/29/98 SPEC/LINE
REVISED 1/11/99 SPEC/LINE
REVISED 1/4/99 SPEC/LINE
REVISED 3/5/99 SPEC/LINE
REVISED 11/14/99 SPEC/LINE
REVISED 1/10/00 SPEC/LINE
REVISED 3/20/01 SPEC/LINE

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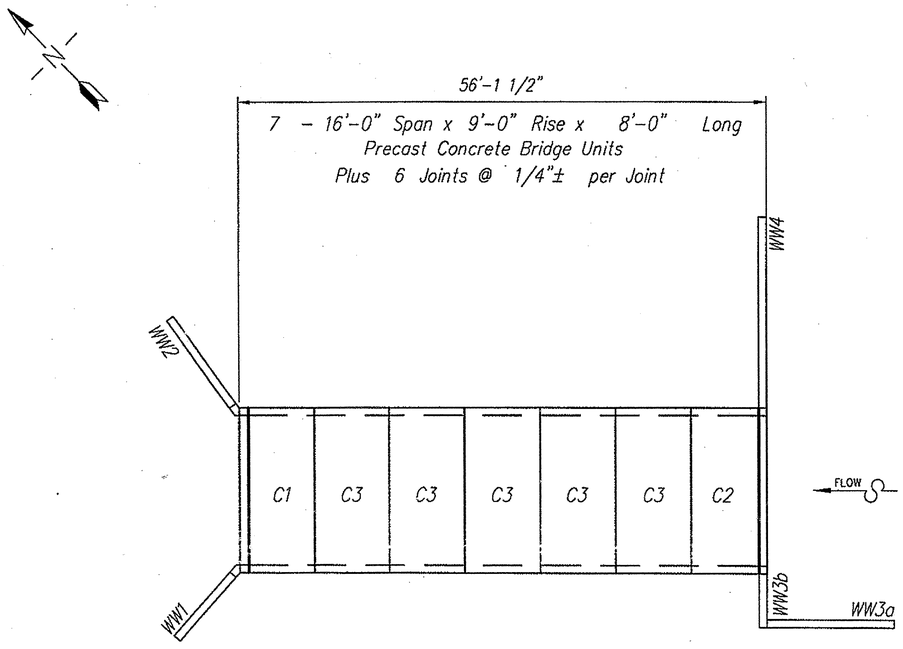
Notes:
- All edges of Precast to have a 3/4" chamfer



KEY PLAN

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Sheet Title: KEY PLAN SHOP DRAWING

VERMONT
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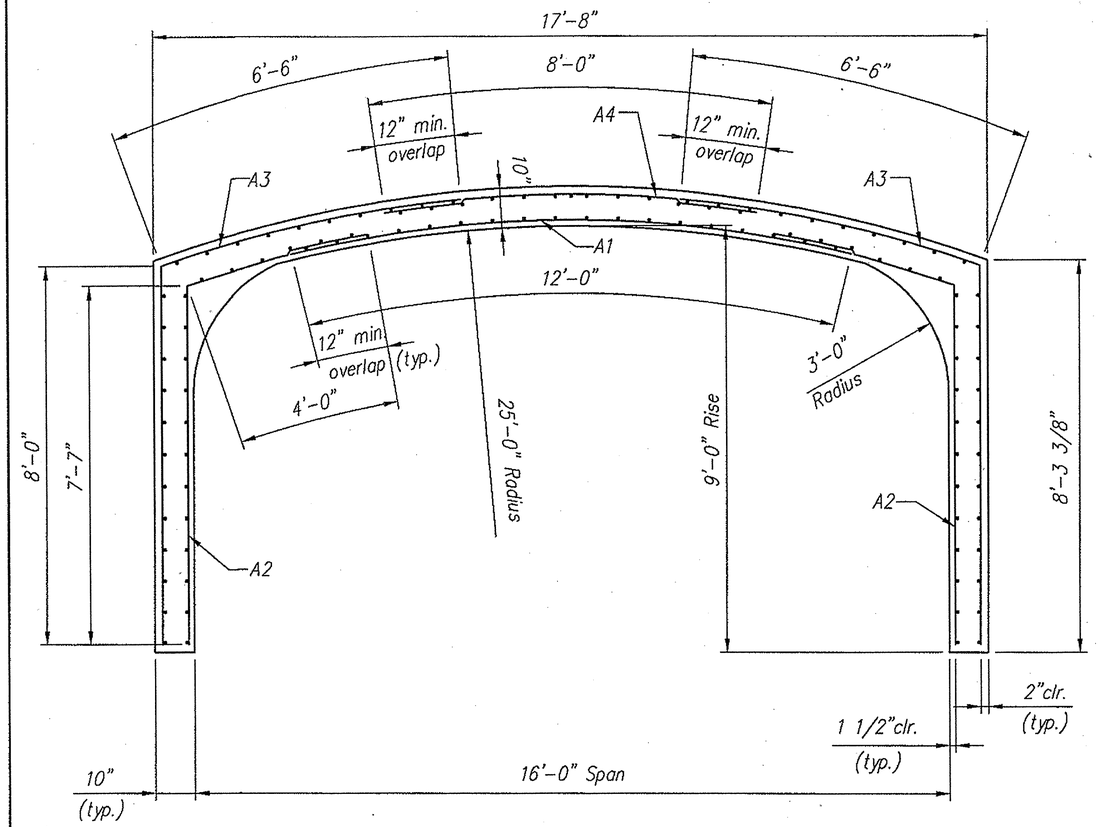
Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S1
Chk'd By: MRW	
Date: 8/25/06	038



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NOTES:
1. Minimum 28-Day Concrete Compressive Strength shall be 4000 psi.
2. Overlap Length shall be measured from last crosswire.
3. Dimensions shown are for form system "A".
4. Minimum yield strength for welded wire fabric shall be 65,000 psi.
5. Reinforcing shall be limited to a maximum of three layers of reinforcing (WWF or bars) per area (A1, A2, A3 or A4).
6. All edges of Precast to have a 3/4" chamfer.
7. Spacing of longitudinal reinforcement must be a maximum of 8" o.c. For multiple layers of mesh, only the outer most layer (A1a or A3a) must be a maximum of 8" o.c.

Weight of Required Reinforcement = 112 lbs/ft

Sheet no.	Circumferential Area Req'd (in^2/ft)	Longitudinal Area Req'd (in^2/ft)	Mesh Size	Length (ft)	Circumferential Area Supl'd (in^2/ft)	Longitudinal Area Supl'd (in^2/ft)
1	A1 = 0.54	0.13	2x6 W10xW6.5	12'-0"	0.60	0.13
2	A2 = 0.24	0.13	4x6 W8xW6.5	11'-7"	0.24	0.13
3	A3 = 0.42	0.13	4x6 W8xW6.5 +#4 @ 12" circ.	14'-6"	0.44	0.13
4	A4 = 0.24	0.13	4x6 W8xW6.5	8'-0"	0.24	0.13
5						
6						
7						

Design Loading: HS25-44

Cover = 2'-0" min. \ 6'-0" max.

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Sheet Title: PRECAST UNIT REINFORCEMENT SHOP DRAWING

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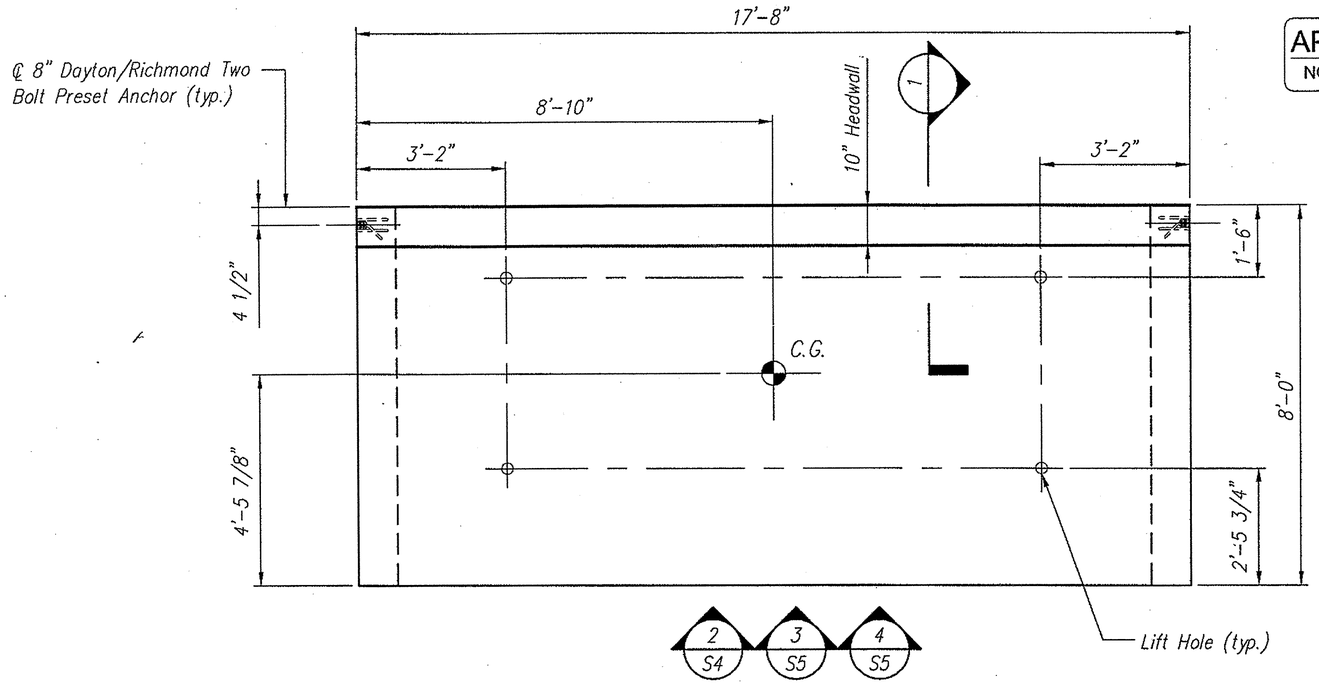
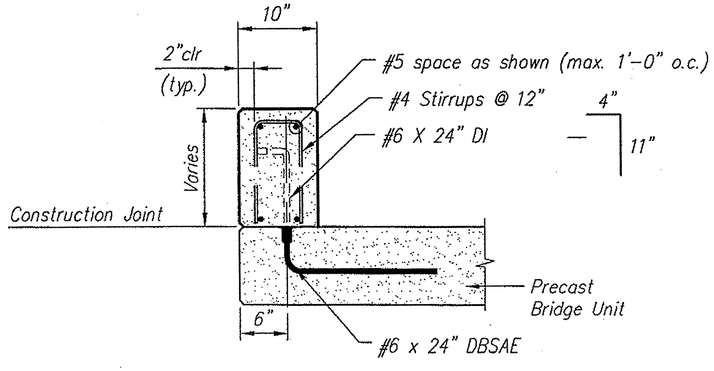
Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S2
Chk'd By: MRW	
Date: 8/25/06	039



PLAN



SECTION 1 S3,S6

Notes:
- All edges of Precast to have a 3/4" chamfer
- Bridge Unit will not hang level. Adjust cable lengths as required

Unit Weight = 17.6 Tons
Headwall Weight = 2.8 Tons
Total Weight = 20.4 Tons

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Sheet Title: HEADWALL END UNIT - C1
SHOP DRAWING

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Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S3
Chk'd By: MRW	
Date: 8/25/06	040

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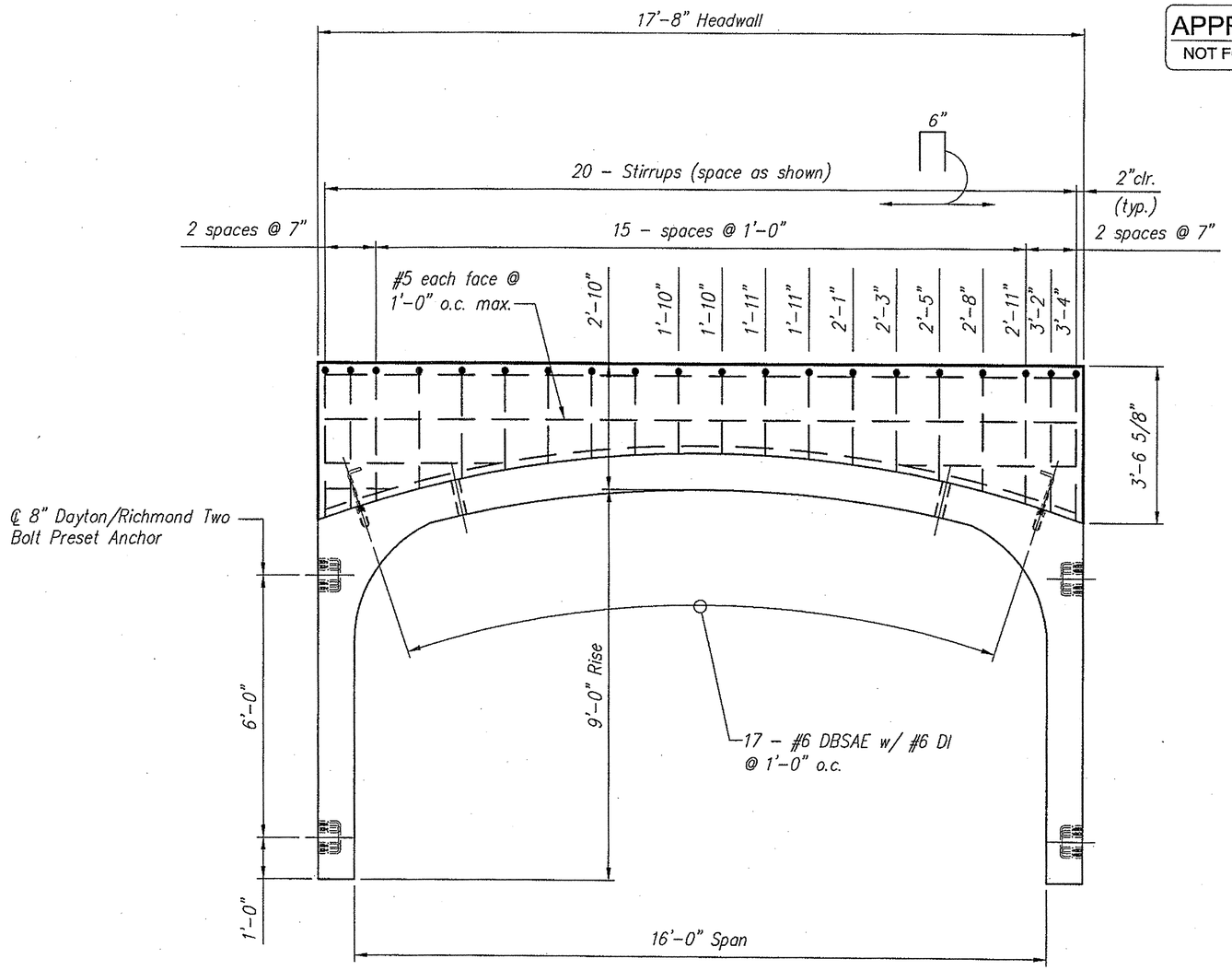

ELEVATION 2 / S3

Headwall		Arch Unit		
Concrete	Reinf. Steel	Concrete	Reinf. Steel	WWF
28-day: 4000 psi	60,000 psi uncoated	28-day: 4000 psi	60,000 psi uncoated	65,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

Notes:
- All edges of Precast to have a 3/4" chamfer
- Elevation is looking at back face of Headwall
- See Sheet S5 for C.G. & Edge Lift Points
- See Sheet S2 for Bridge Unit Dimensions

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Sheet Title: HEADWALL REINFORCING - C1
SHOP DRAWING

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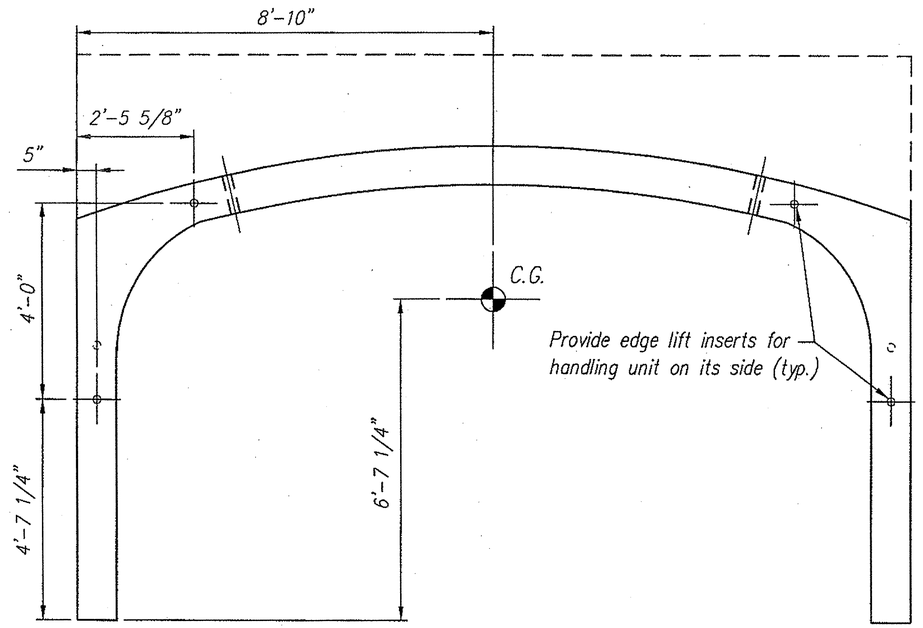
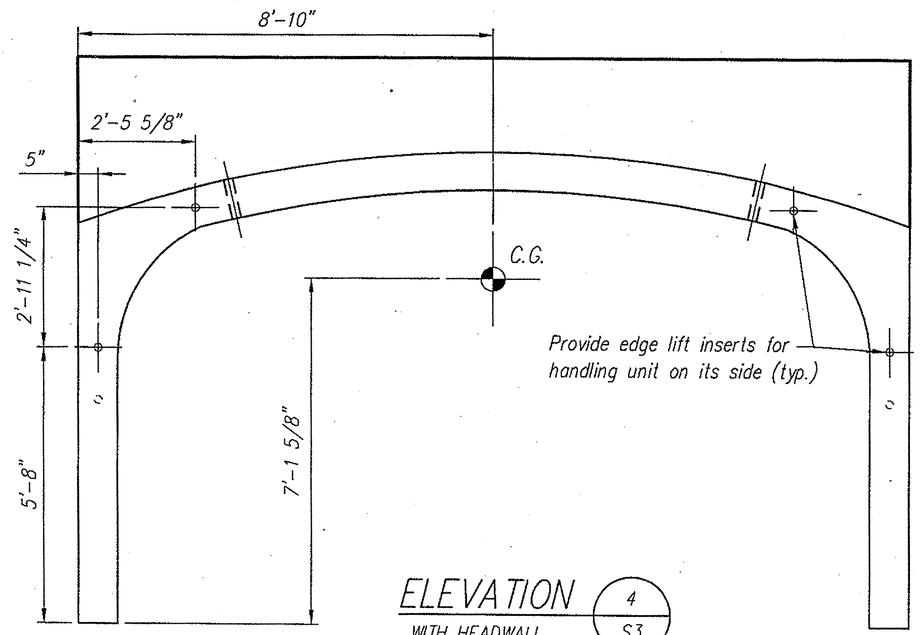
Drawn By: WLC	Sheet No. S4
Chk'd By: MRW	
Date: 8/25/06	0411



ELEVATION WITHOUT HEADWALL (3 / S3)



ELEVATION WITH HEADWALL (4 / S3)

Notes:
- All edges of Precast to have a 3/4" chamfer
- Elevation is looking at back face of Headwall
- Bridge Unit will not hang level. Adjust cable lengths as required

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Sheet Title: C.G. & EDGE LIFT POINTS - C1
SHOP DRAWING

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Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S5
Chk'd By: MRW	
Date: 8/25/06	042

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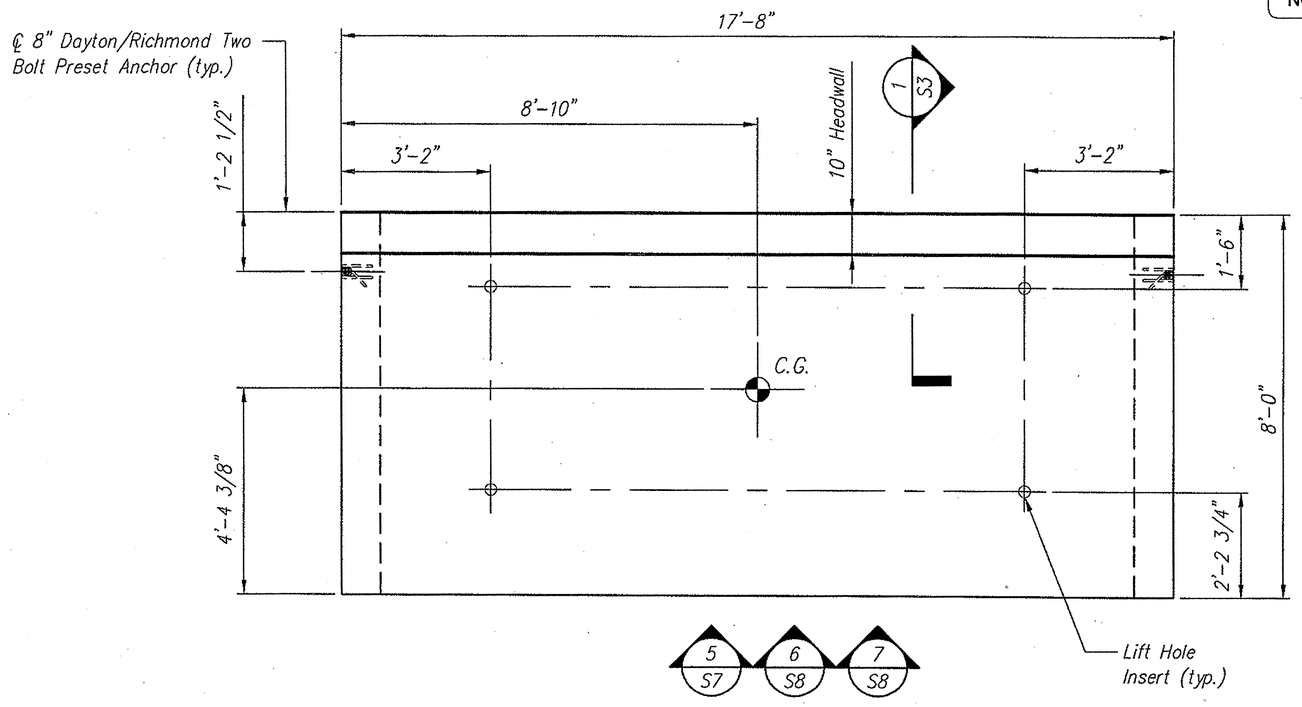

PLAN

Notes:
- All edges of Precast to have a 3/4" chamfer
- Bridge Unit will not hang level. Adjust cable lengths as required

Unit Weight = 17.6 Tons
Headwall Weight = 2.0 Tons
Total Weight = 19.7 Tons

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Sheet Title: HEADWALL END UNIT - C2
SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S6
Chk'd By: MRW	
Date: 8/25/06	043

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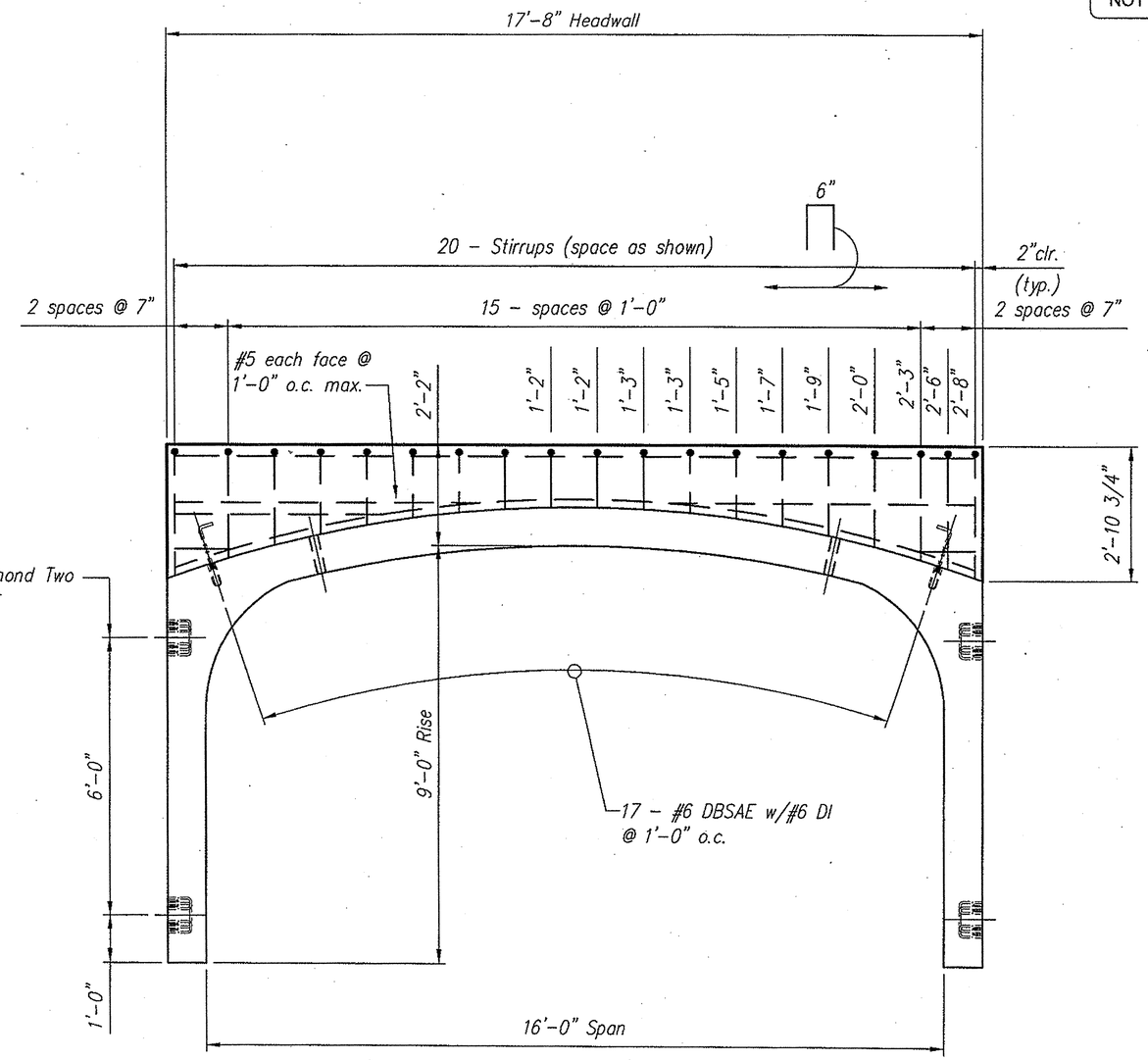

ELEVATION 5/S6

Headwall		Arch Unit		
Concrete	Reinf. Steel	Concrete	Reinf. Steel	WWF
28-day. 4000 psi	60,000 psi uncoated	28-day. 4000 psi	60,000 psi uncoated	65,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

Notes:
- All edges of Precast to have a 3/4" chamfer
- Elevation is looking at back face of Headwall
- See Sheet S8 for C.G. & Edge Lift Points
- See Sheet S2 for Bridge Unit Dimensions

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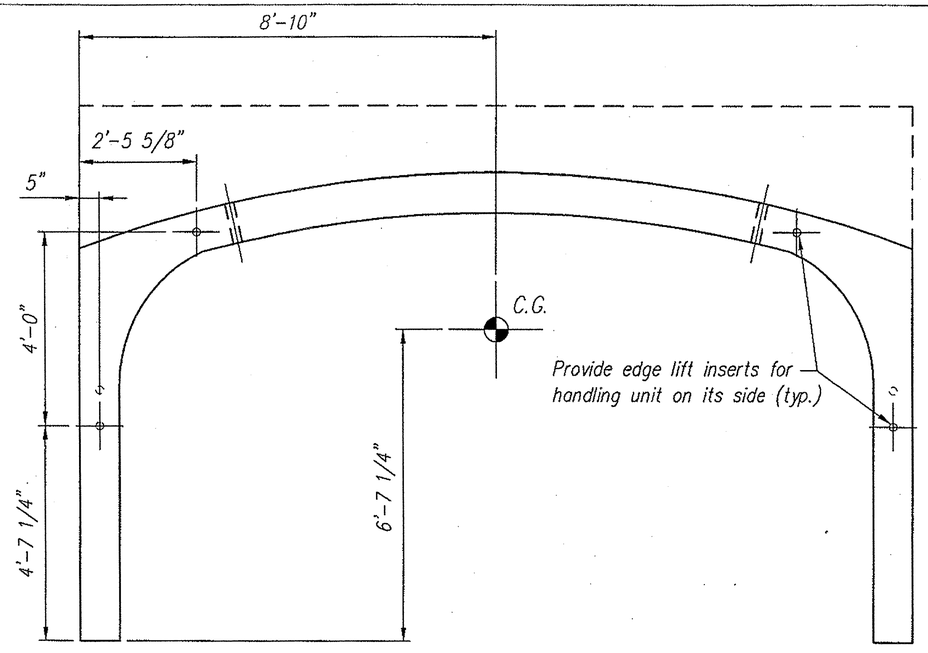
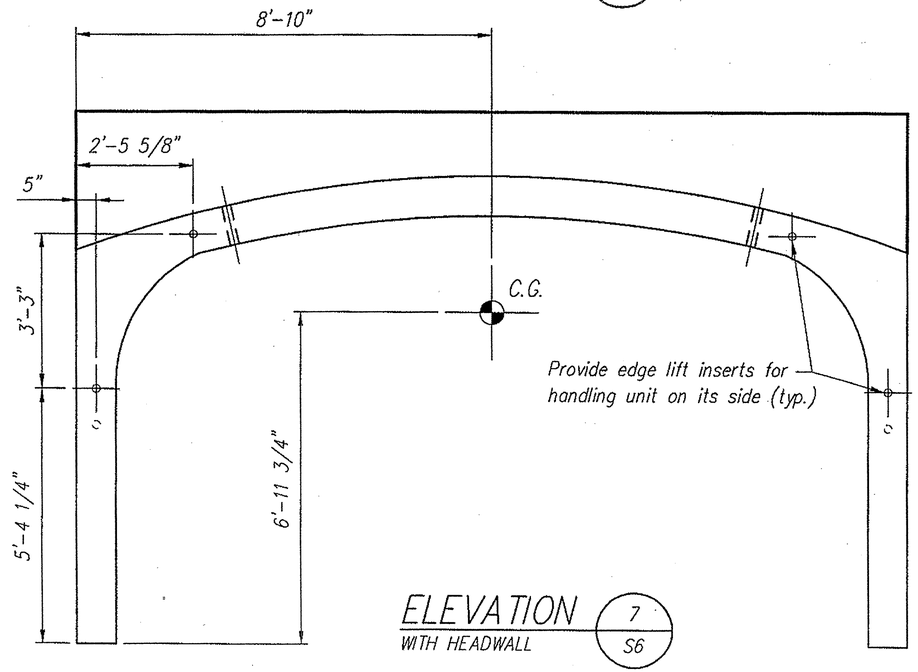
Sheet Title: HEADWALL REINFORCING - C2
SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S7
Chk'd By: MRW	
Date: 8/25/06	044



ELEVATION 6 / S6
WITHOUT HEADWALL



ELEVATION 7 / S6
WITH HEADWALL

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Notes:
- All edges of Precast to have a 3/4" chamfer
- Elevation is looking at back face of Headwall
- Bridge Unit will not hang level. Adjust cable lengths as required

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Sheet Title: C.G. & EDGE LIFT POINTS - SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S8
Chk'd By: MRW	
Date: 8/25/06	045

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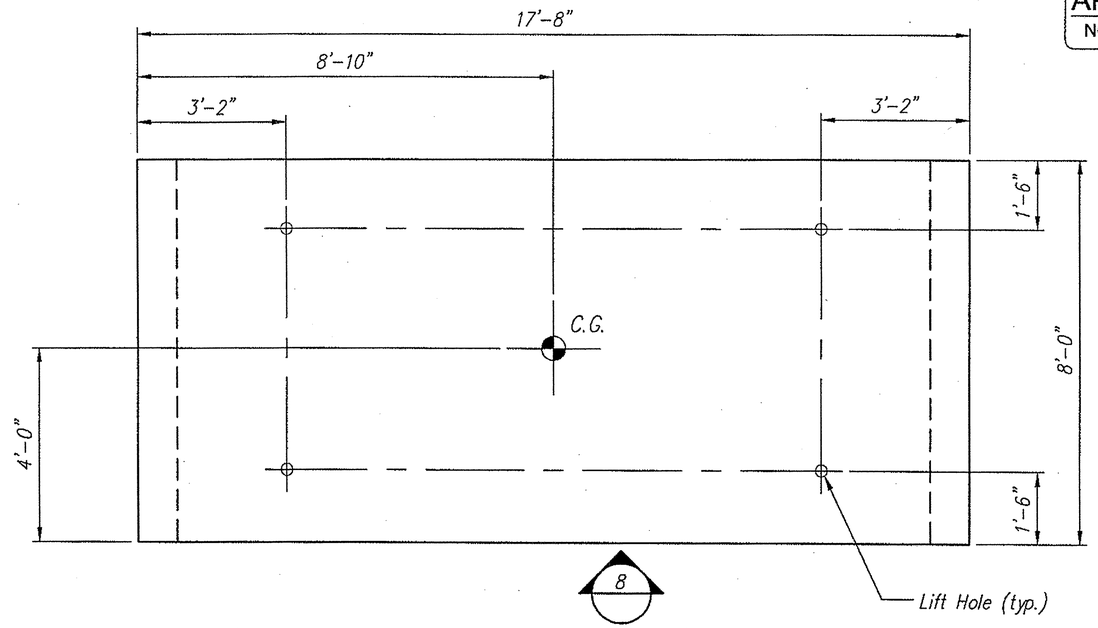
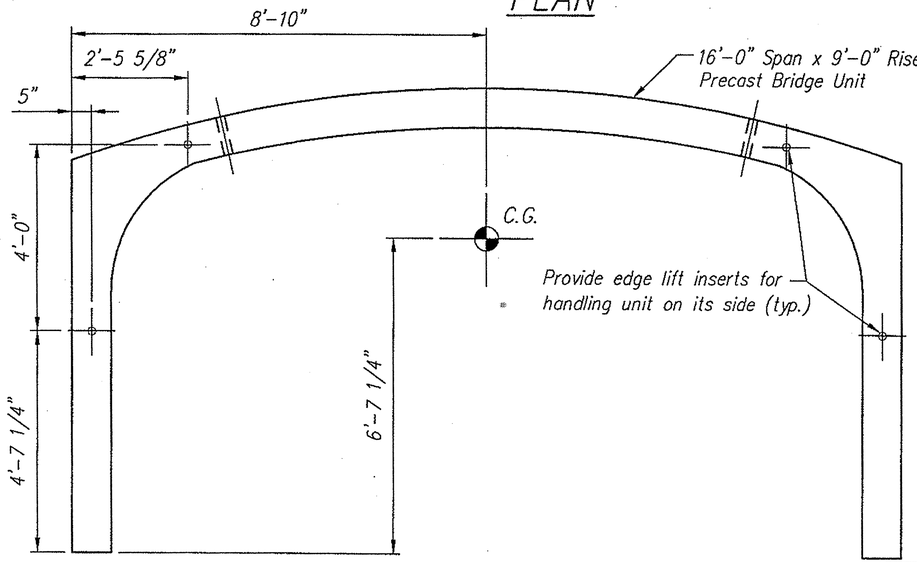


8
PLAN



ELEVATION 8

Arch Unit		
Concrete	Reinf. Steel	WWF
28-day 4000 psi	60,000 psi uncoated	65,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

Notes:
- All edges of Precast to have a 3/4" chamfer
- See Sheet S2 for Bridge Unit Dimensions

Total Weight = 17.6 Tons

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Sheet Title: INTERIOR UNIT - C3 SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S9
Chk'd By: MRW	
Date: 8/25/06	046

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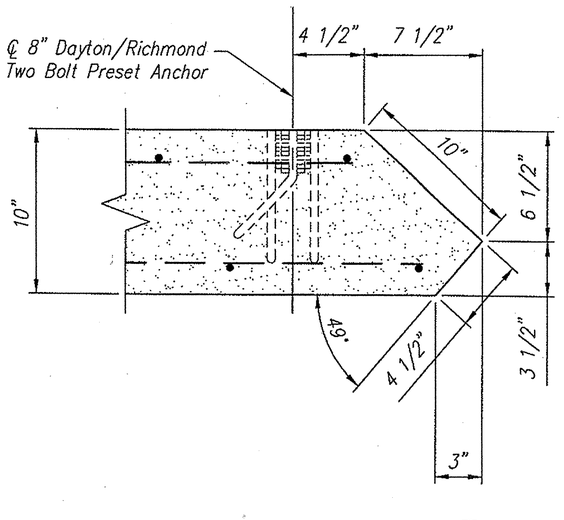
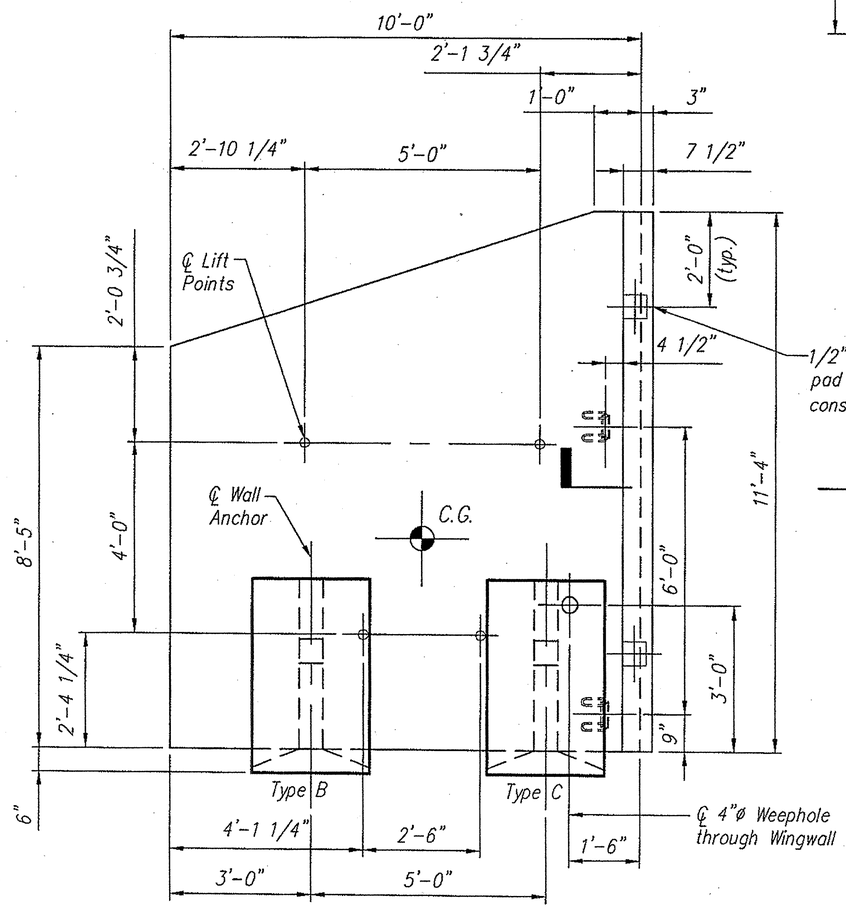
FOR LIFTING USE 8UA671
UTILITY ANCHORS



SECTION 9



ELEVATION

Notes:
- All edges of Precast to have a 3/4" chamfer
- See Sheet S11 for Reinforcing Detail
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall
- Wingwall will not hang level. Adjust cable lengths as required

Total Weight = 7.9 Tons

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Sheet Title: WINGWALL WW1 SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S10
Chk'd By: MRW	
Date: 8/25/06	047

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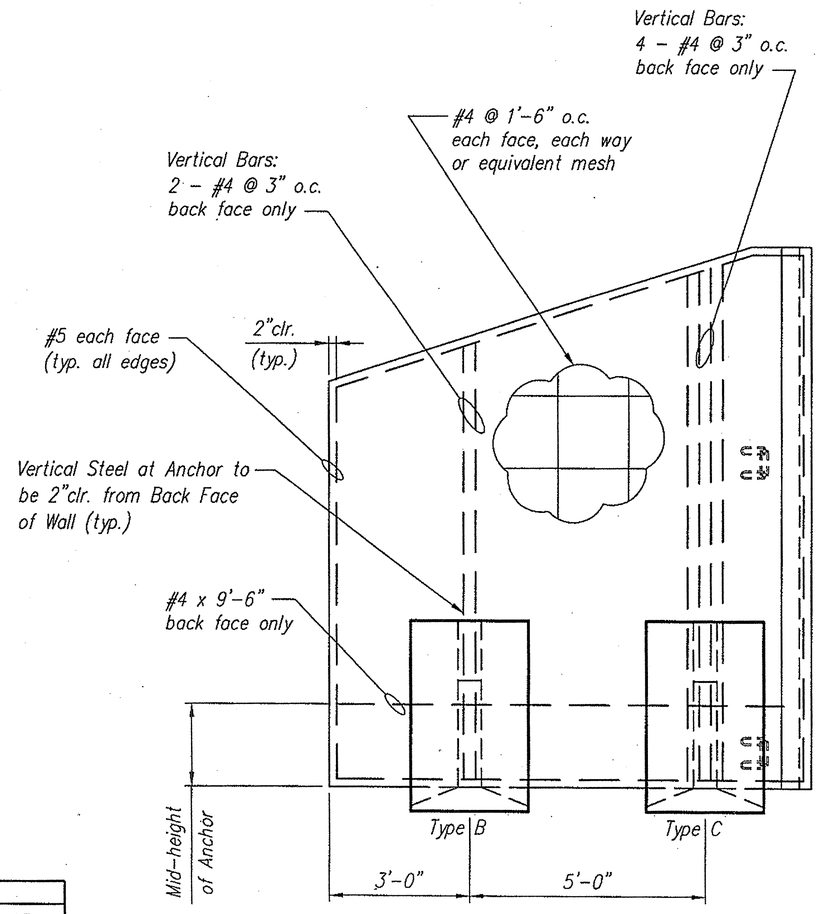

REINFORCING DETAIL

(For Anchor Reinforcing See Sheet S20 & S21)

Wingwall		
Concrete	Reinf. Steel	WWF
28–day: 4000 psi	60,000 psi uncoated	65,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross–sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

Notes:
- All edges of Precast to have a 3/4" chamfer
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall

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Sheet Title: WINGWALL REINFORCING - WW1
SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S11
Chk'd By: MRW	
Date: 8/25/06	048

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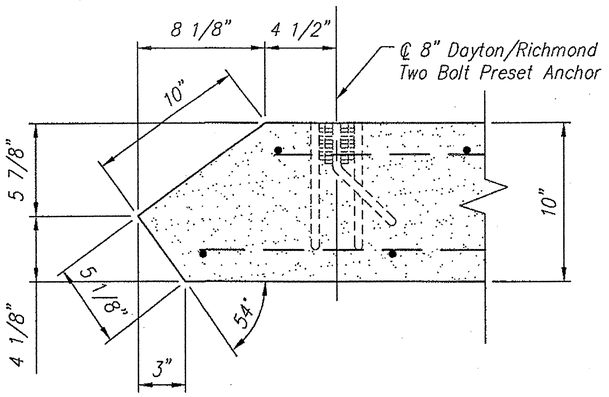
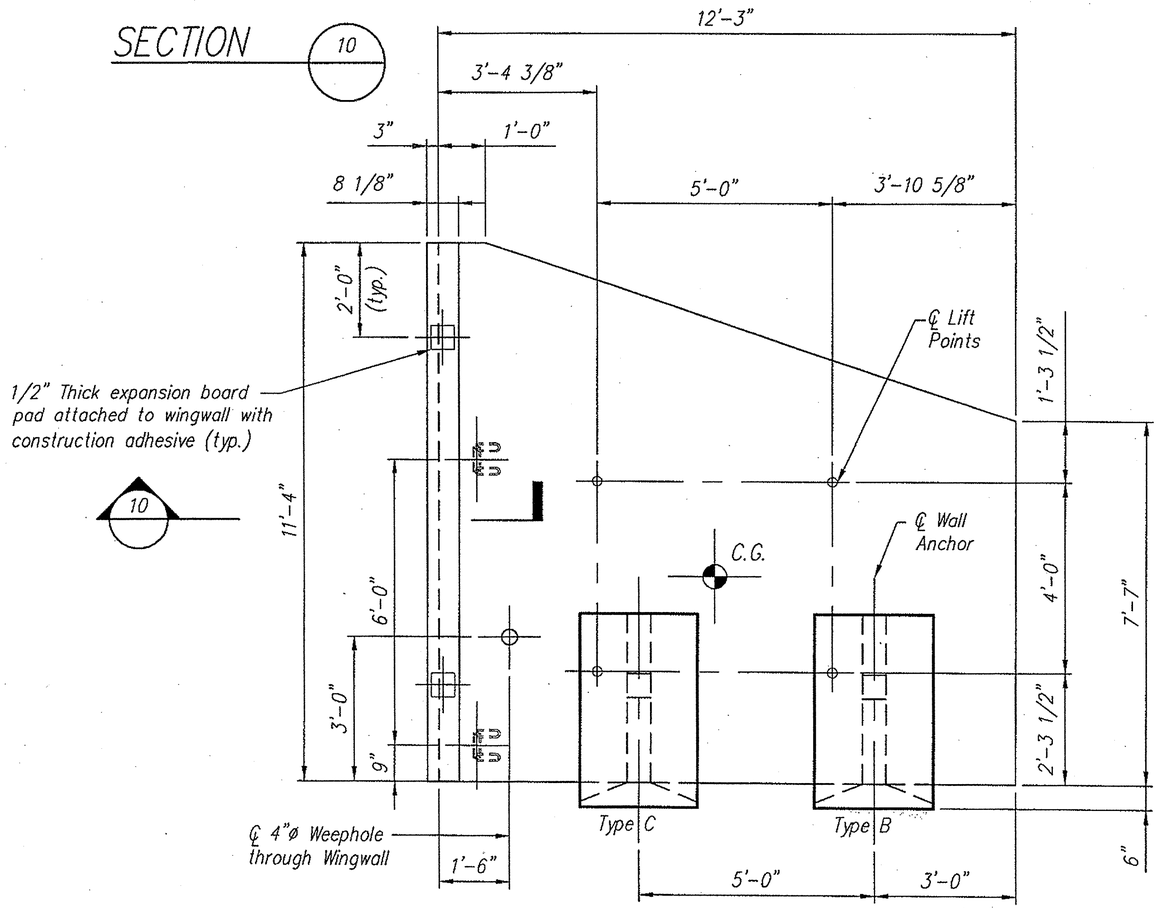


SECTION 10

FOR LIFTING USE 8UA671
UTILITY ANCHORS



ELEVATION

Notes:
- All edges of Precast to have a 3/4" chamfer
- See Sheet S13 for Reinforcing Detail
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall

Total Weight = 9.0 Tons

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Sheet Title: WINGWALL WW2 SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S12
Chk'd By: MRW	
Date: 8/25/06	049

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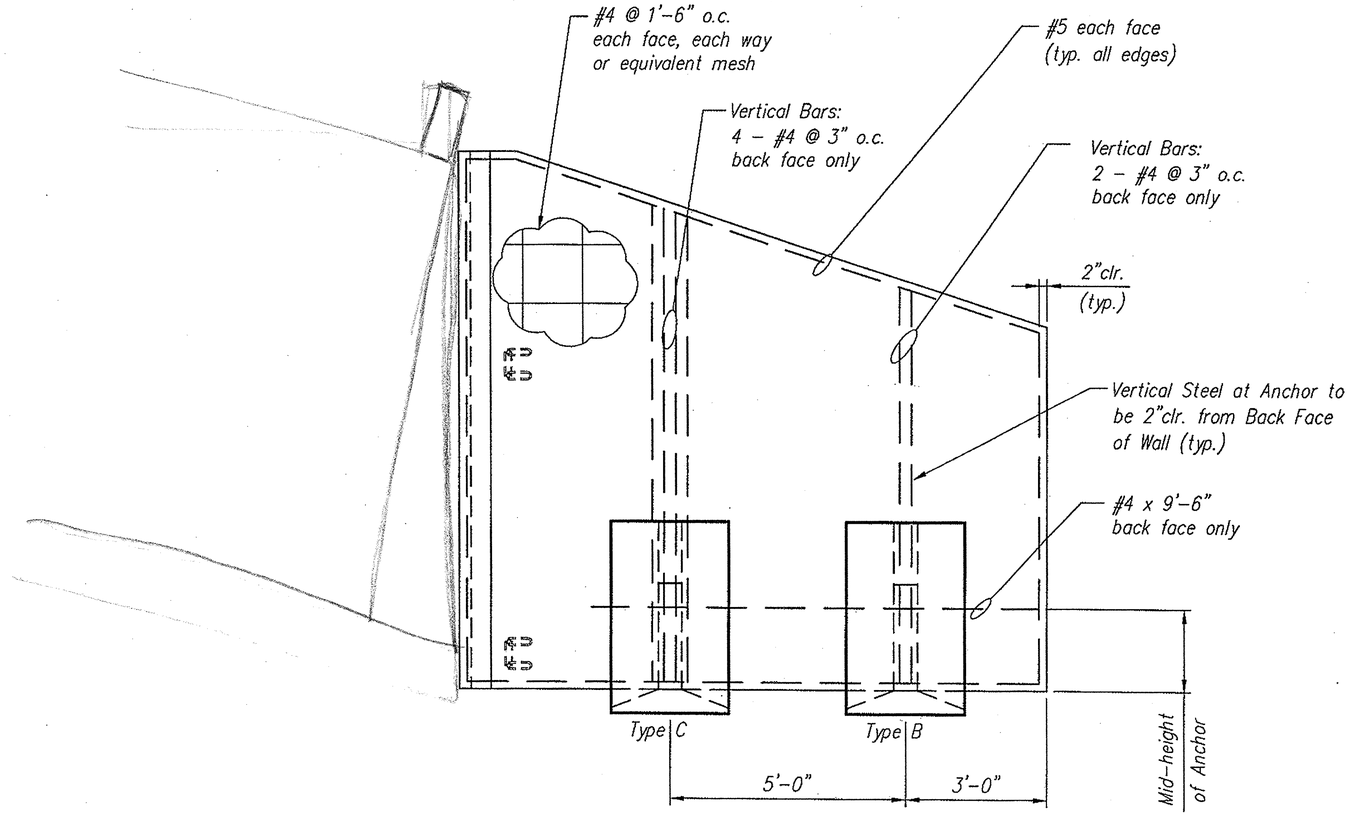

Wingwall		
Concrete	Reinf. Steel	WWF
28-day: 4000 psi	60,000 psi uncoated	65,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

REINFORCING DETAIL

(For Anchor Reinforcing See Sheet S20 & S21)

Notes:
- All edges of Precast to have a 3/4" chamfer
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall

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Sheet Title: WINGWALL REINFORCING - WW2
SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S13
Chk'd By: MRW	
Date: 8/25/06	050

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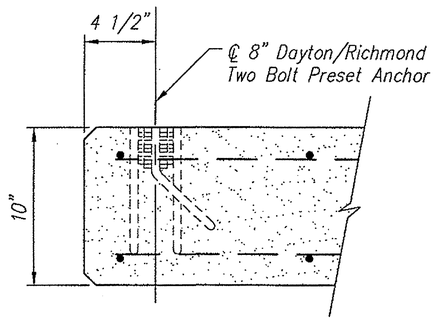
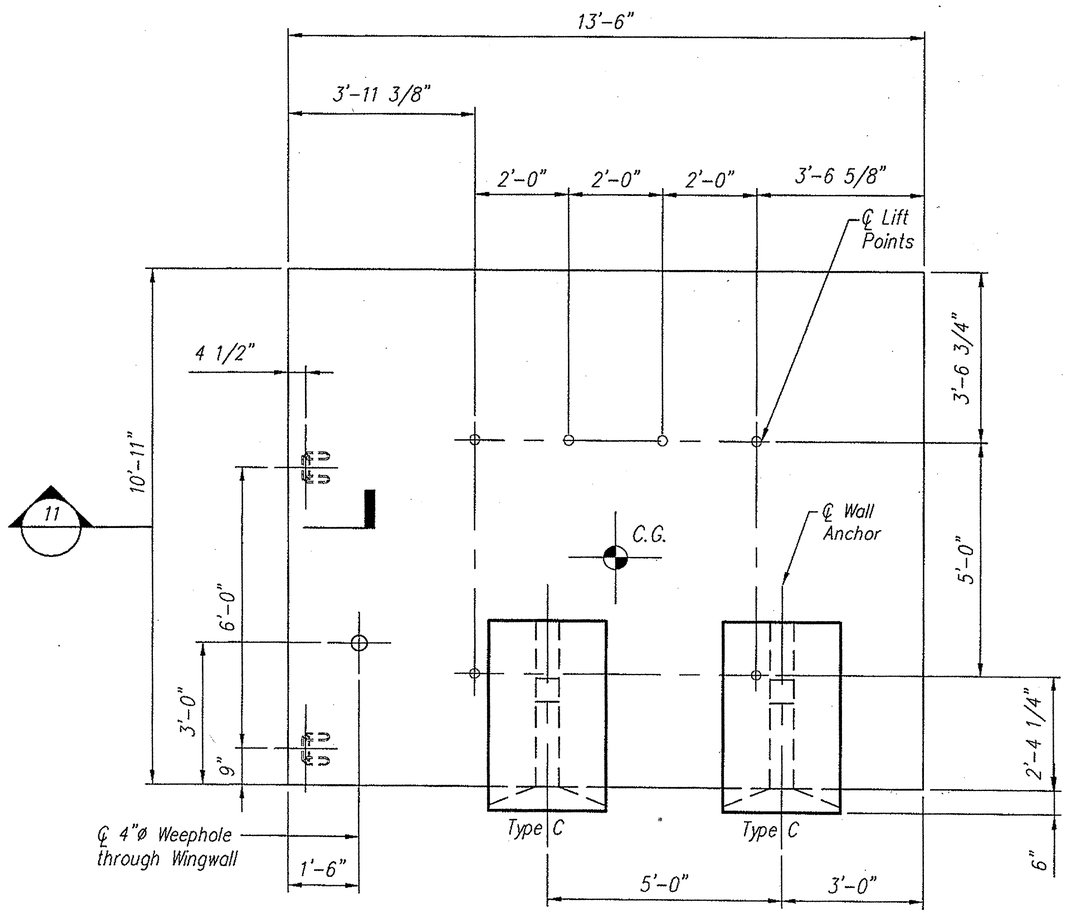


SECTION 11

FOR LIFTING USE 8UA671
UTILITY ANCHORS



ELEVATION

Notes:
- All edges of Precast to have a 3/4" chamfer
- See Sheet S15 for Reinforcing Detail
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall

Total Weight = 11.0 Tons

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Sheet Title: WINGWALL WW3a SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S14
Chk'd By: MRW	
Date: 8/25/06	051

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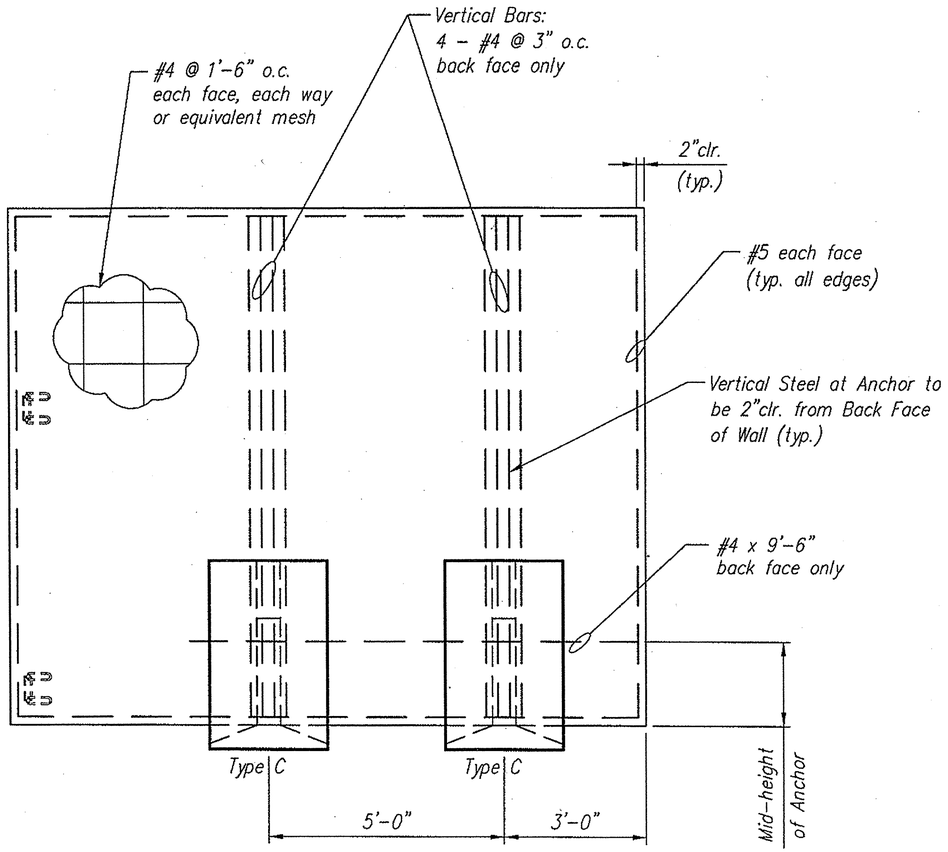

REINFORCING DETAIL

(For Anchor Reinforcing See Sheet S21)

Wingwall		
Concrete	Reinf. Steel	WWF
28-day. 4000 psi	60,000 psi uncoated	65,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

Notes:
- All edges of Precast to have a 3/4" chamfer
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall

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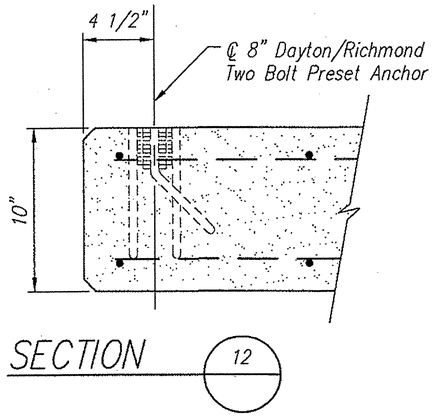
Sheet Title: WINGWALL REINFORCING - WW3a
SHOP DRAWING

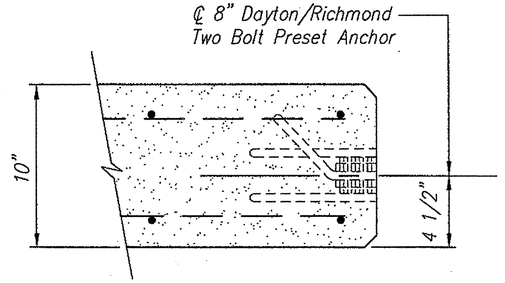
VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S15
Chk'd By: MRW	
Date: 8/25/06	052



SECTION 12

FOR LIFTING USE 8UA671
UTILITY ANCHORS



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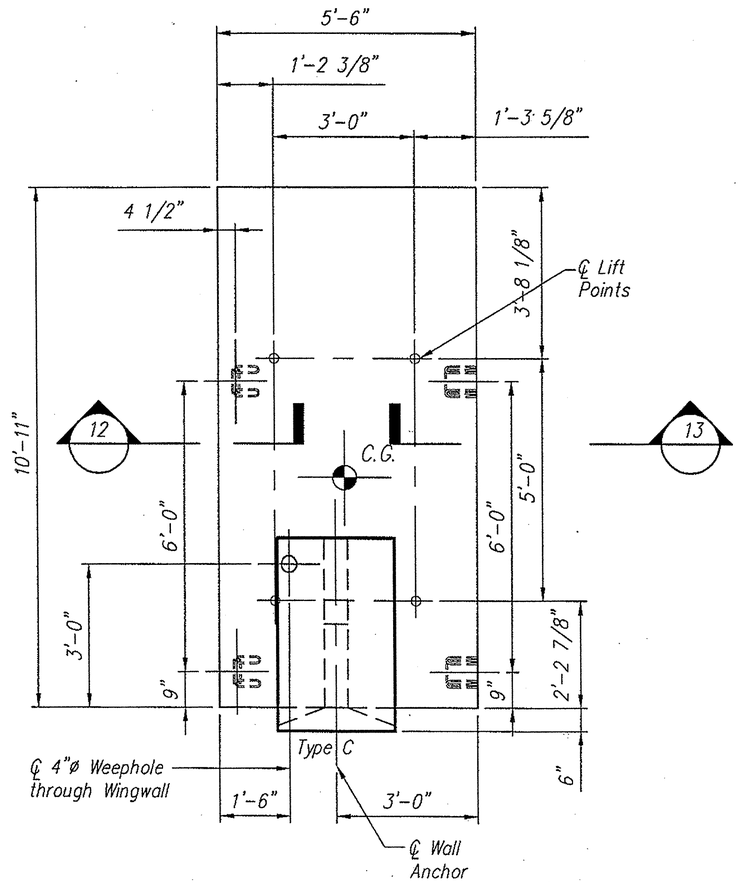

ELEVATION

Notes:
- All edges of Precast to have a 3/4" chamfer
- See Sheet S17 for Reinforcing Detail
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall

Total Weight = 4.7 Tons

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Sheet Title: WINGWALL WW3b SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S16
Chk'd By: MRW	
Date: 8/25/06	053

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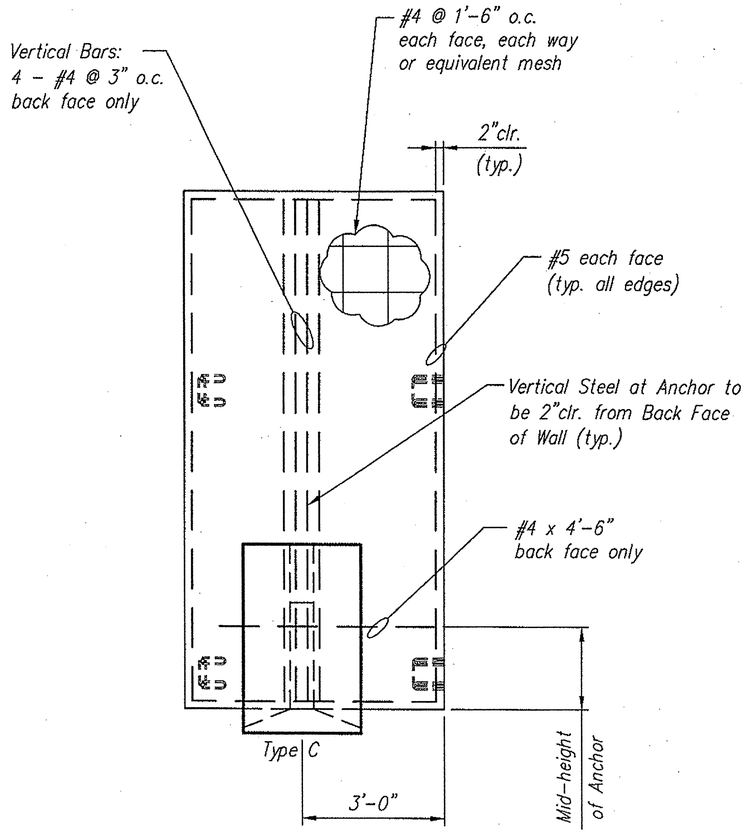

REINFORCING DETAIL

(For Anchor Reinforcing See Sheet S21)

Wingwall		
Concrete	Reinf. Steel	WWF
28-day 4000 psi	60,000 psi uncoated	65,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

Notes:
- All edges of Precast to have a 3/4" chamfer
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall

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Sheet Title: WINGWALL REINFORCING - WW3b SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S17
Chk'd By: MRW	
Date: 8/25/06	054

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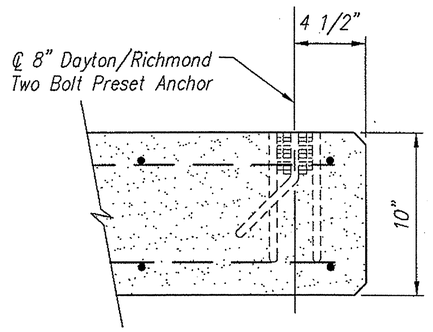
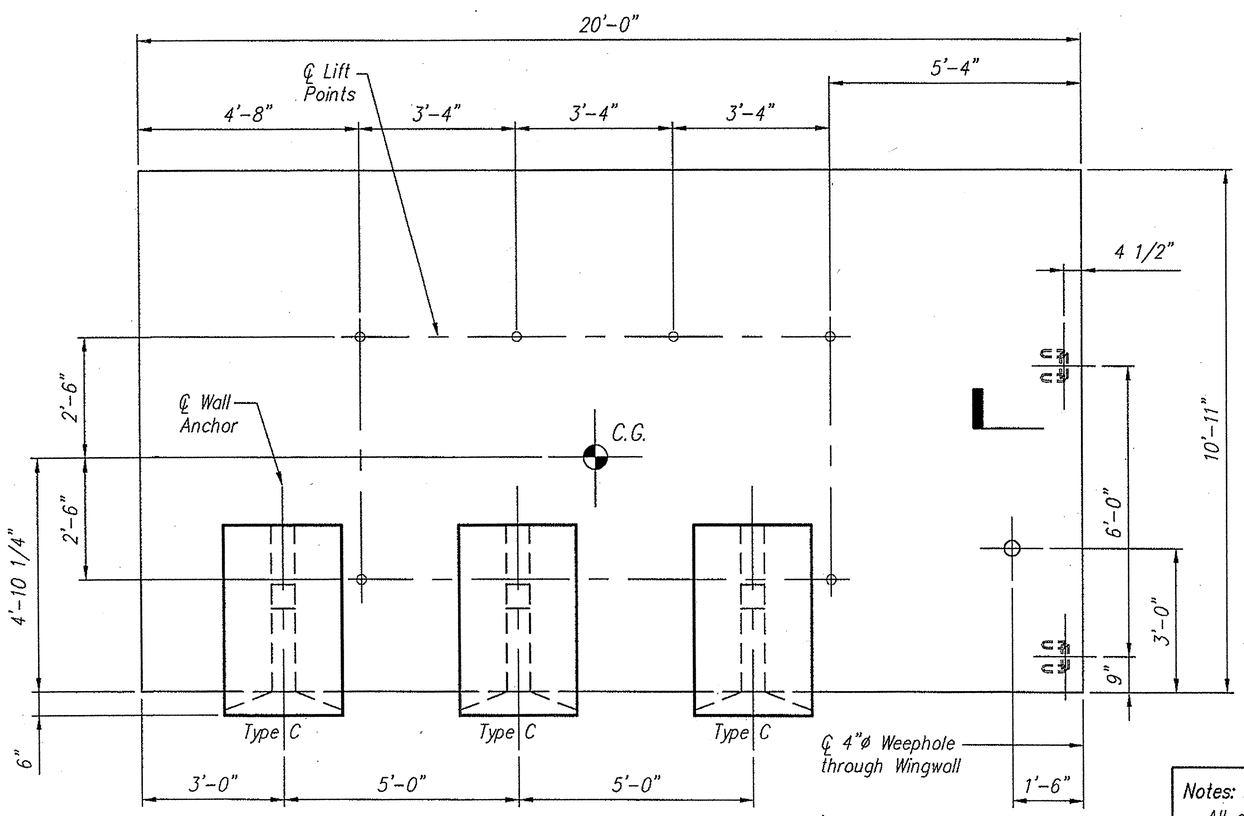
FOR LIFTING USE 8UA671
UTILITY ANCHORS

SHEAVES ARE REQUIRED!!!!!



SECTION 14



14

ELEVATION

Notes:
- All edges of Precast to have a 3/4" chamfer
- See Sheet S19 for Reinforcing Detail
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall

Total Weight = 16.3 Tons

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Sheet Title: WINGWALL WW4 SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S18
Chk'd By: MRW	
Date: 8/25/06	055

APPROVAL ONLY:
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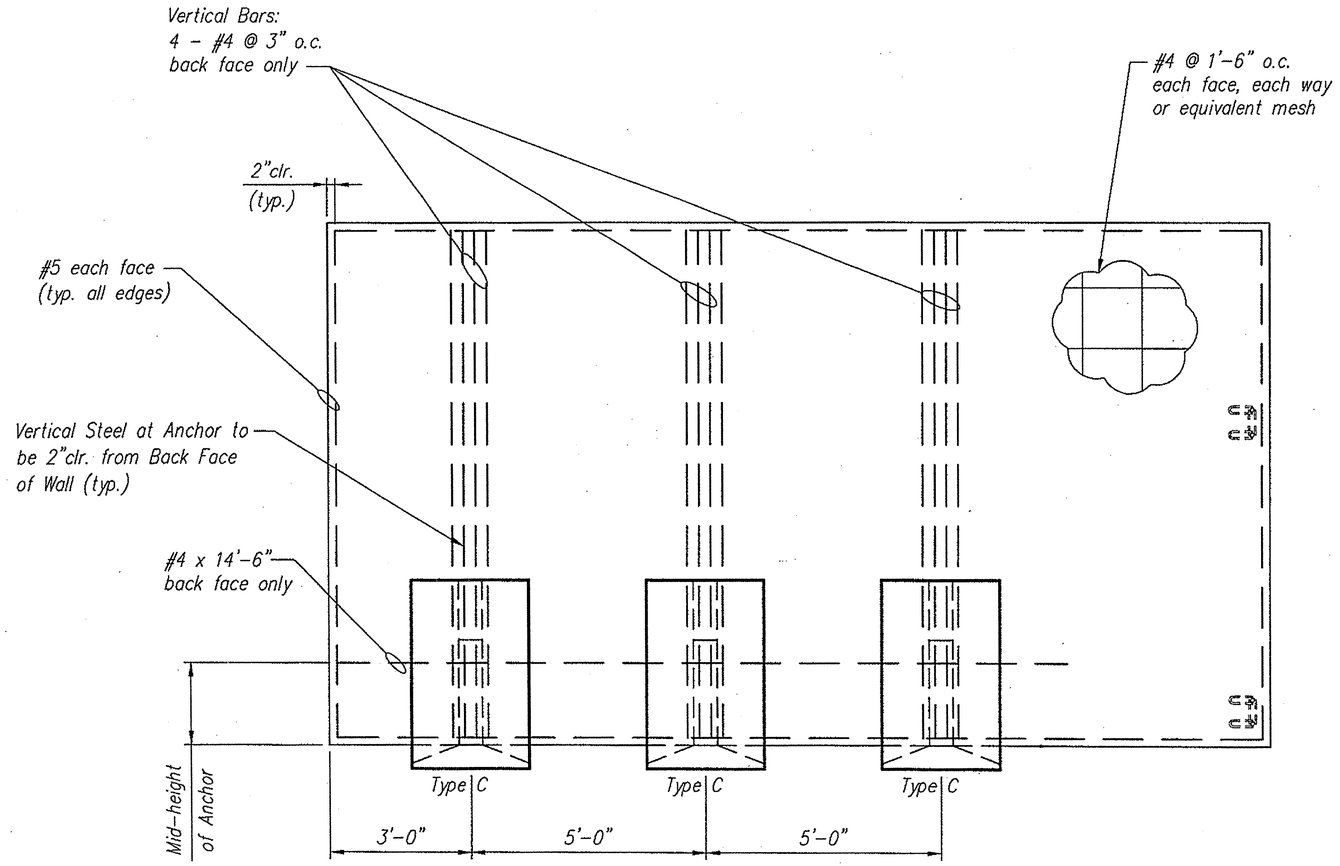

Wingwall		
Concrete	Reinf. Steel	WWF
28-day: 4000 psi	60,000 psi uncoated	65,000 psi uncoated

Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on either side of the cut.

REINFORCING DETAIL

(For Anchor Reinforcing See Sheet S21)

Notes:
- All edges of Precast to have a 3/4" chamfer
- Elevation is looking at back face of Wingwall
- Back face denotes anchor side of Wingwall

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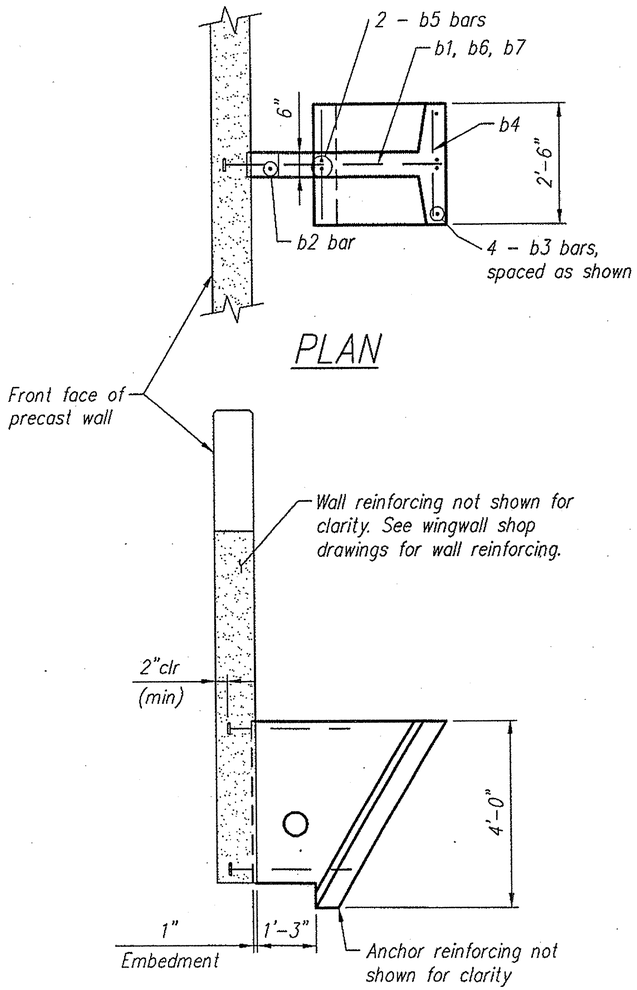
Sheet Title: WINGWALL REINFORCING - WW4
SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S19
Chk'd By: MRW	
Date: 8/25/06	056

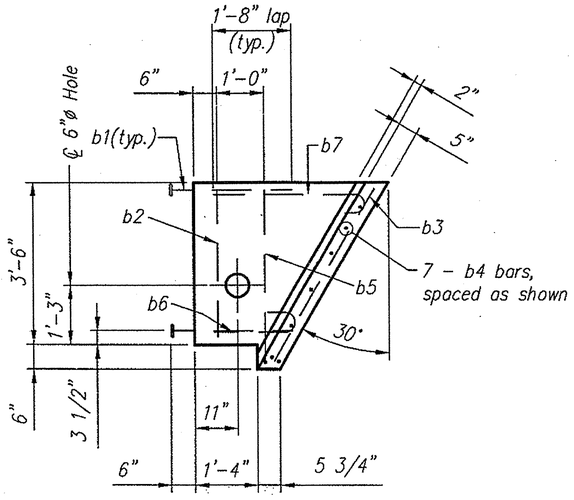


PLAN

SECTION

BAR LIST						
MARK	QTY.	SIZE	a	TYPE	LENGTH	FINISH
b1	2	#6	2'–7"	3	——	Epoxy*
b2	1	#5	——	Str.	3'–2"	Black
b3	4	#5	——	Str.	4'–3"	Black
b4	7	#5	——	Str.	2'–2"	Black
b5	2	#5	3'–8"	2	——	Black
b6	1	#5	1'–9"	1	——	Black
b7	1	#5	3'–2"	1	——	Black

Note: "Str." denotes straight bar.
Standard Clearance = 2"



PRECAST ANCHOR
TYPE B

APPROVAL ONLY:
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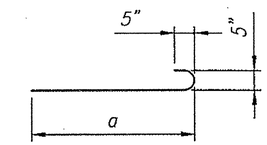
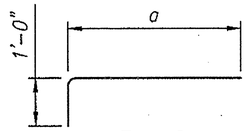
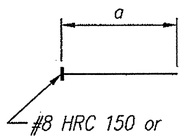


Type 1



Type 2



Type 3
(Epoxy Coated*)

*Note: Epoxy coating is not required on headed ends of Type 3 bars, but will not be detrimental if provided.

*Note: HRC heads provided by Headed Reinforcement Corp.

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1	
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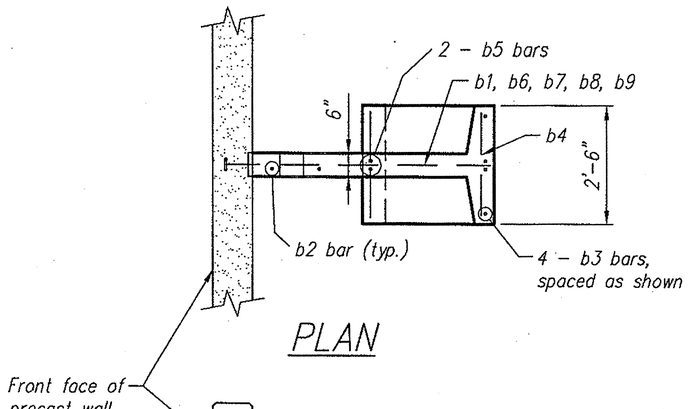
Sheet Title: WINGWALL ANCHOR B SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S20
Chk'd By: MRW	
Date: 8/25/06	057



PLAN

BAR LIST						
MARK	QTY.	SIZE	a	TYPE	LENGTH	FINISH
b1	4	#6	2'–7"	3	——	Epoxy*
b2	2	#5	——	Str.	3'–2"	Black
b3	4	#5	——	Str.	4'–3"	Black
b4	7	#5	——	Str.	2'–2"	Black
b5	2	#5	3'–8"	2	——	Black
b6	1	#5	2'–9"	1	——	Black
b7	1	#5	3'–9"	1	——	Black
b8	1	#5	4'–0"	1	——	Black
b9	1	#5	4'–3"	1	——	Black

Note: "Str." denotes straight bar.
Standard Clearance = 2"

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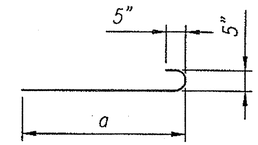

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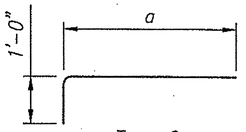
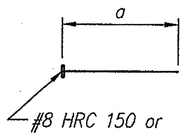


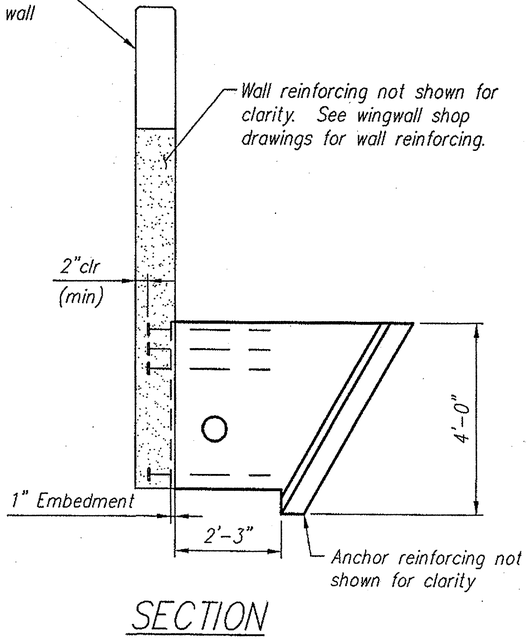
Type 2



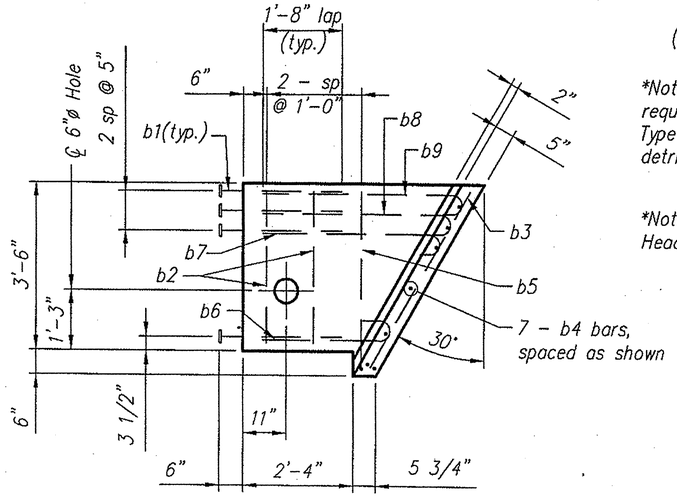
Type 3
(Epoxy Coated*)

*Note: Epoxy coating is not required on headed ends of Type 3 bars, but will not be detrimental if provided.

*Note: HRC heads provided by Headed Reinforcement Corp.



SECTION



PRECAST ANCHOR
TYPE C

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Sheet Title: WINGWALL ANCHOR C SHOP DRAWING

VERMONT
BUELS GORE
MONTPELIER

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S21
Chk'd By: MRW	
Date: 8/25/06	058

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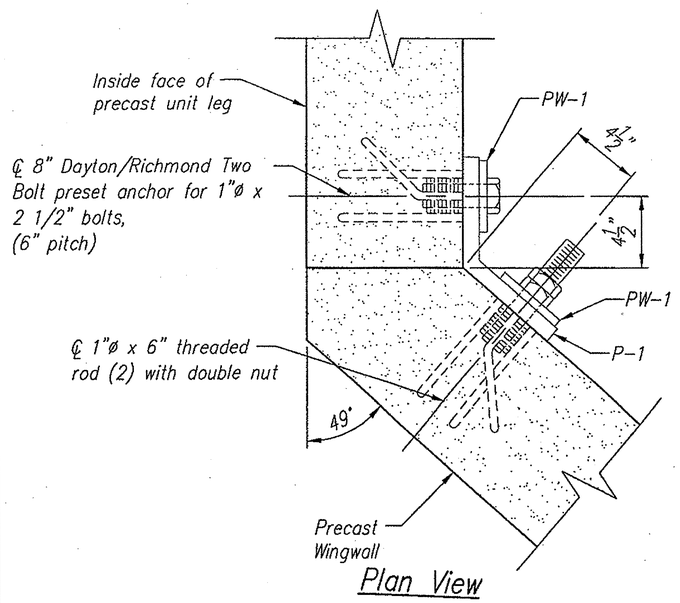
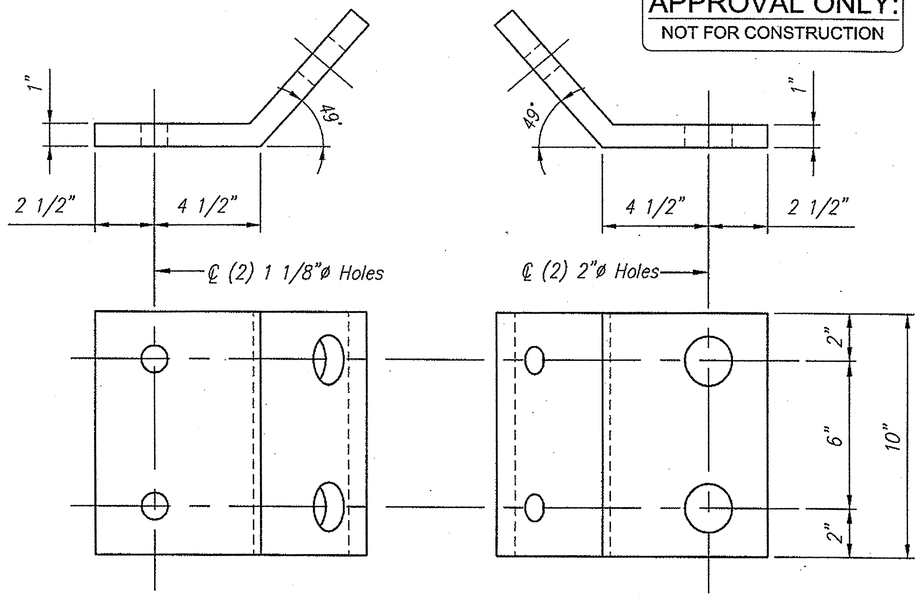


Plan View

Typical Connection Detail

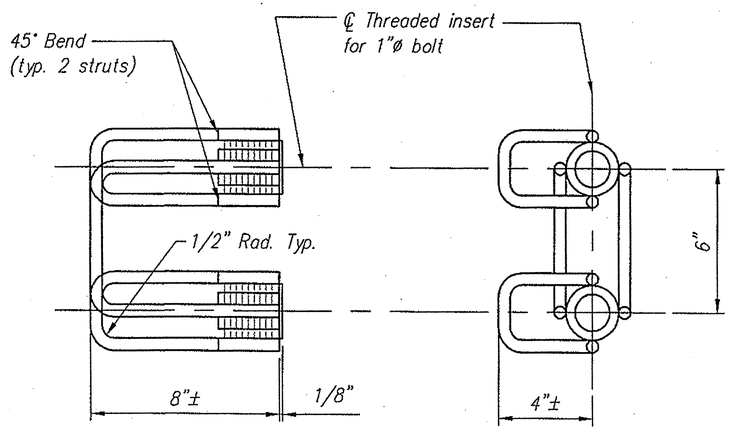


Unit Leg

Wingwall Leg

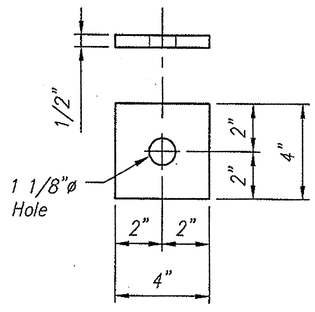
P-1

(PL 1" x 10" x 14")
(Galvanized as per ASTM A153)



Side View

Front View



PW-1

(PL washer, 1/2" x 4" x 4")
(Galvanized as per ASTM A153)

Dayton/Richmond Two Bolt Preset Anchor

PLATE P-1

Total Required = 2
(4) PW-1 Req'd. per Plate

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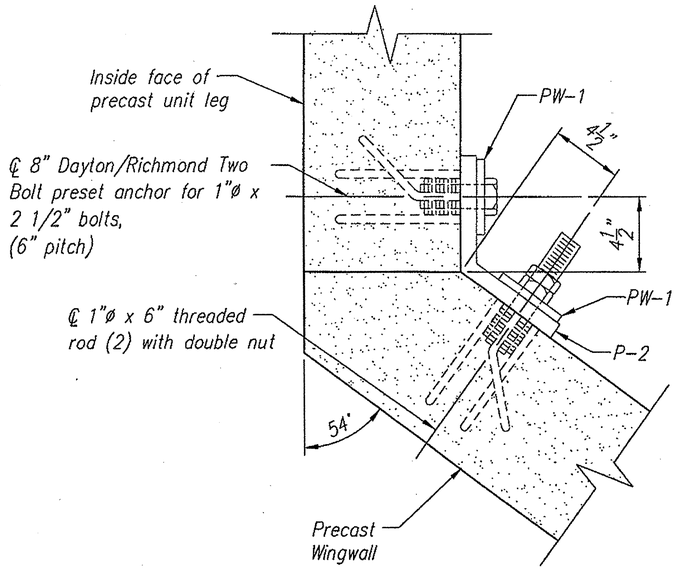
Sheet Title: WINGWALL CONNECTION PLATE SHOP DRAWING

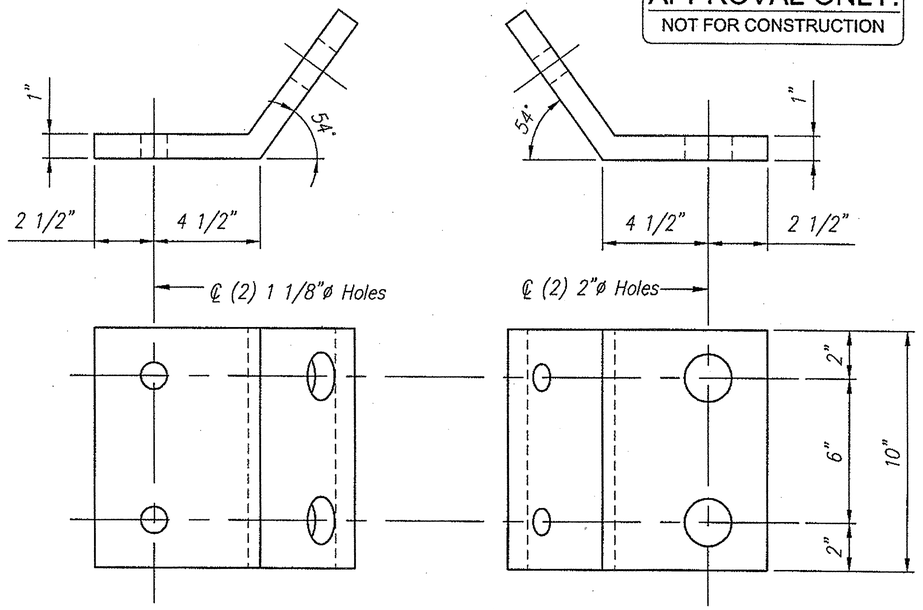
VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S22
Chk'd By: MRW	
Date: 8/25/06	059



Plan View

Typical Connection Detail

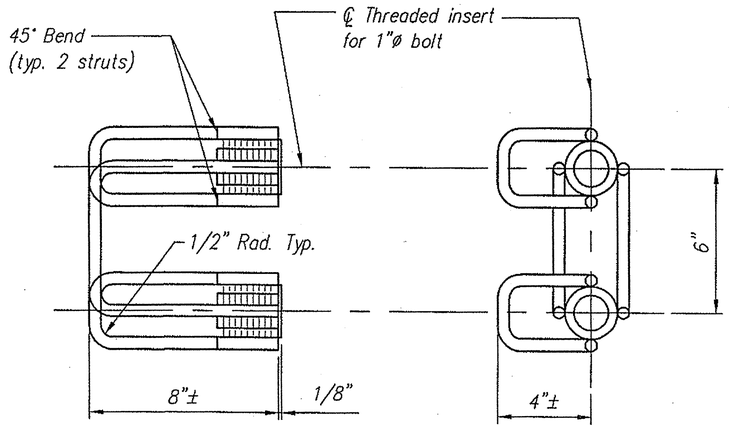


Unit Leg

Wingwall Leg

P-2

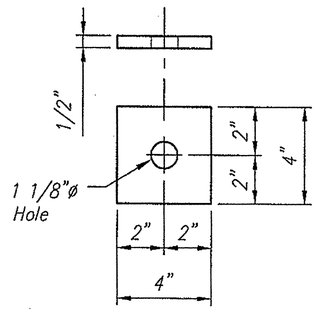
(PL 1" x 10" x 14")
(Galvanized as per ASTM A153)



Side View

Front View

Dayton/Richmond Two Bolt Preset Anchor



PW-1

(PL washer, 1/2" x 4" x 4")
(Galvanized as per ASTM A153)

PLATE P-2

Total Required = 2
(4) PW-1 Req'd. per Plate

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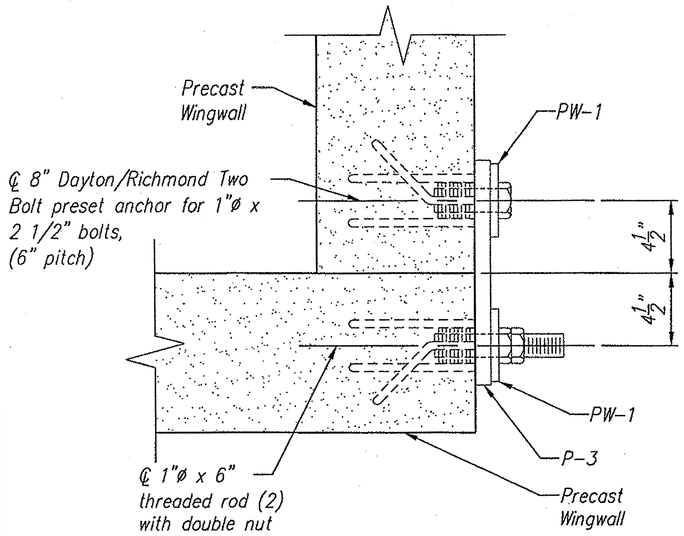
Sheet Title: WINGWALL CONNECTION PLATE SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S23
Chk'd By: MRW	
Date: 8/25/06	060



Plan View

Typical Connection Detail

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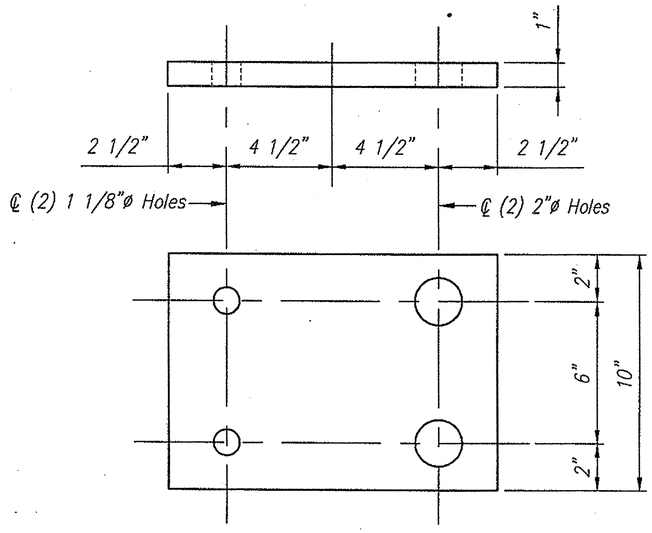
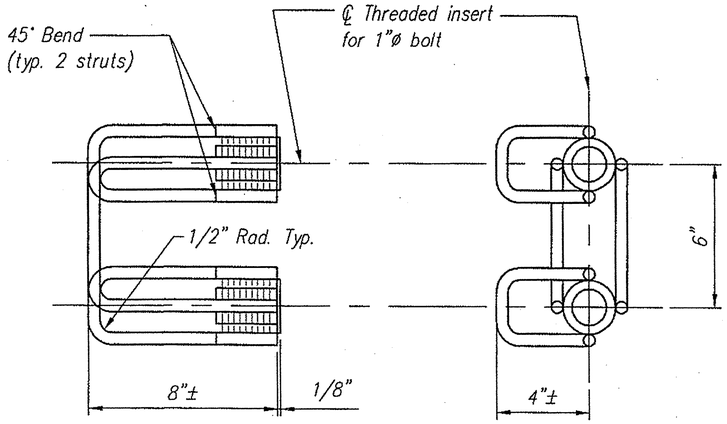
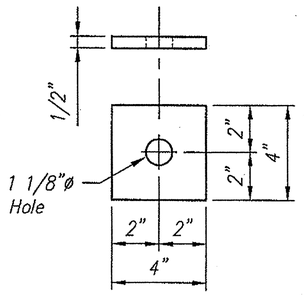


P-3

(ℙ, 1" x 10" x 14")
(Galvanized as per ASTM A153)



Side View Front View



PW-1

(ℙ washer, 1/2" x 4" x 4")
(Galvanized as per ASTM A153)

Dayton/Richmond Two Bolt Preset Anchor

PLATE P-3
Total Required = 2
(4) PW-1 Req'd. per Plate

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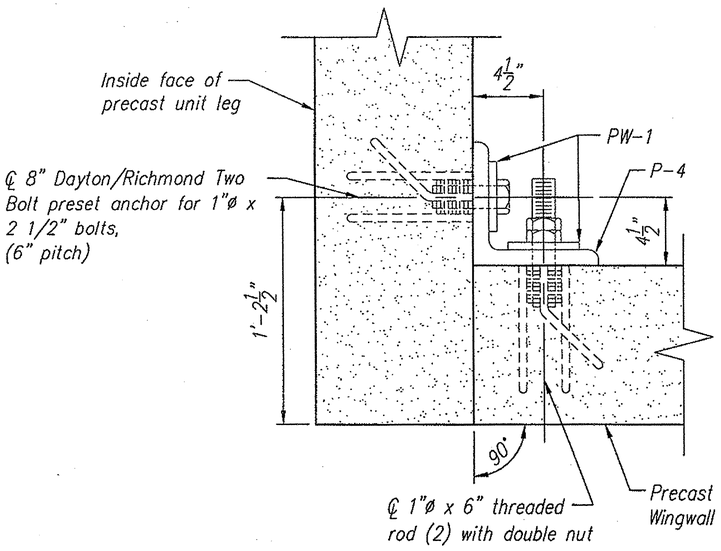
Sheet Title: WINGWALL CONNECTION PLATE SHOP DRAWING

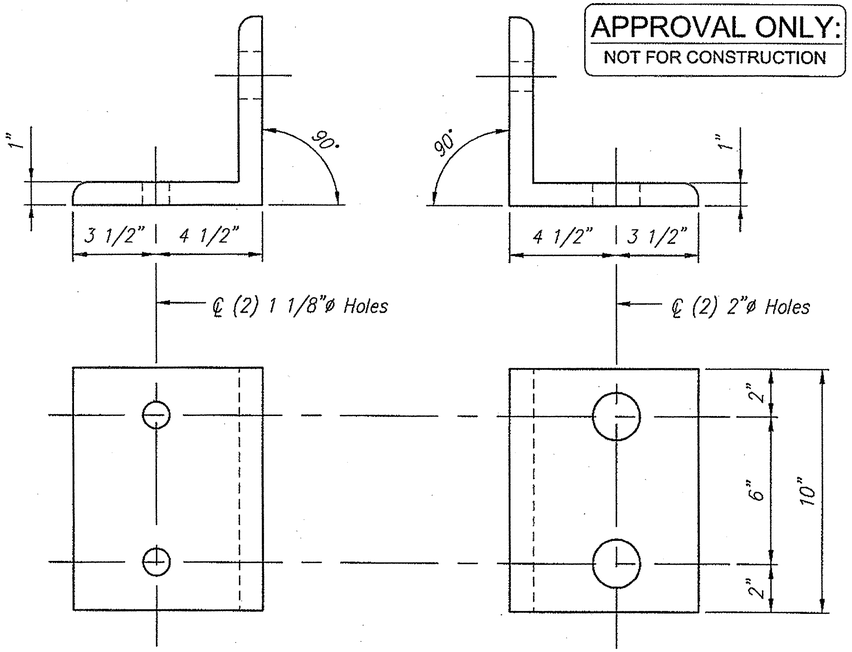
VERMONT
MONTPELIER
BUELS GORE

Des. By: KJG	Job No. 14688
Drawn By: WLC	Sheet No. S24
Chk'd By: MRW	
Date: 8/25/06	061



Plan View

Typical Connection Detail

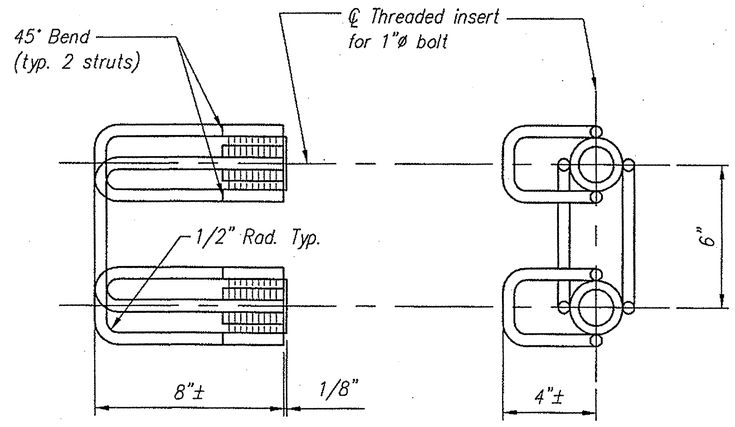


Unit Leg

Wingwall Leg

P–4

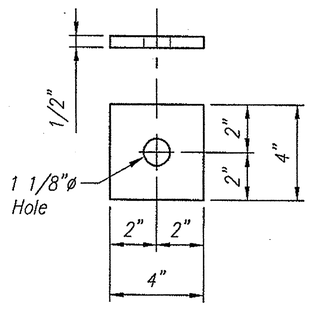
(∠ 8" x 8" x 1" x 10")
(Galvanized as per ASTM A153)



Side View

Front View

Dayton/Richmond Two Bolt Preset Anchor



PW–1

(℄ washer, 1/2" x 4" x 4")
(Galvanized as per ASTM A153)

PLATE P–2

Total Required = 4
(4) PW–1 Req'd. per Plate

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Sheet Title: WINGWALL CONNECTION PLATE SHOP DRAWING

VERMONT
MONTPELIER
BUELS GORE

Des. By:	Job No.
KJG	14688
Drawn By: WLC	Sheet No. S25
Chk'd By: MRW	
Date: 8/25/06	067