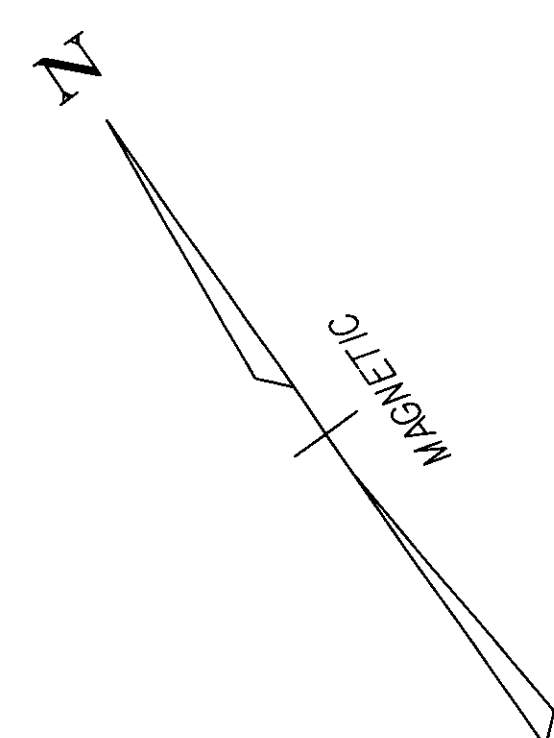
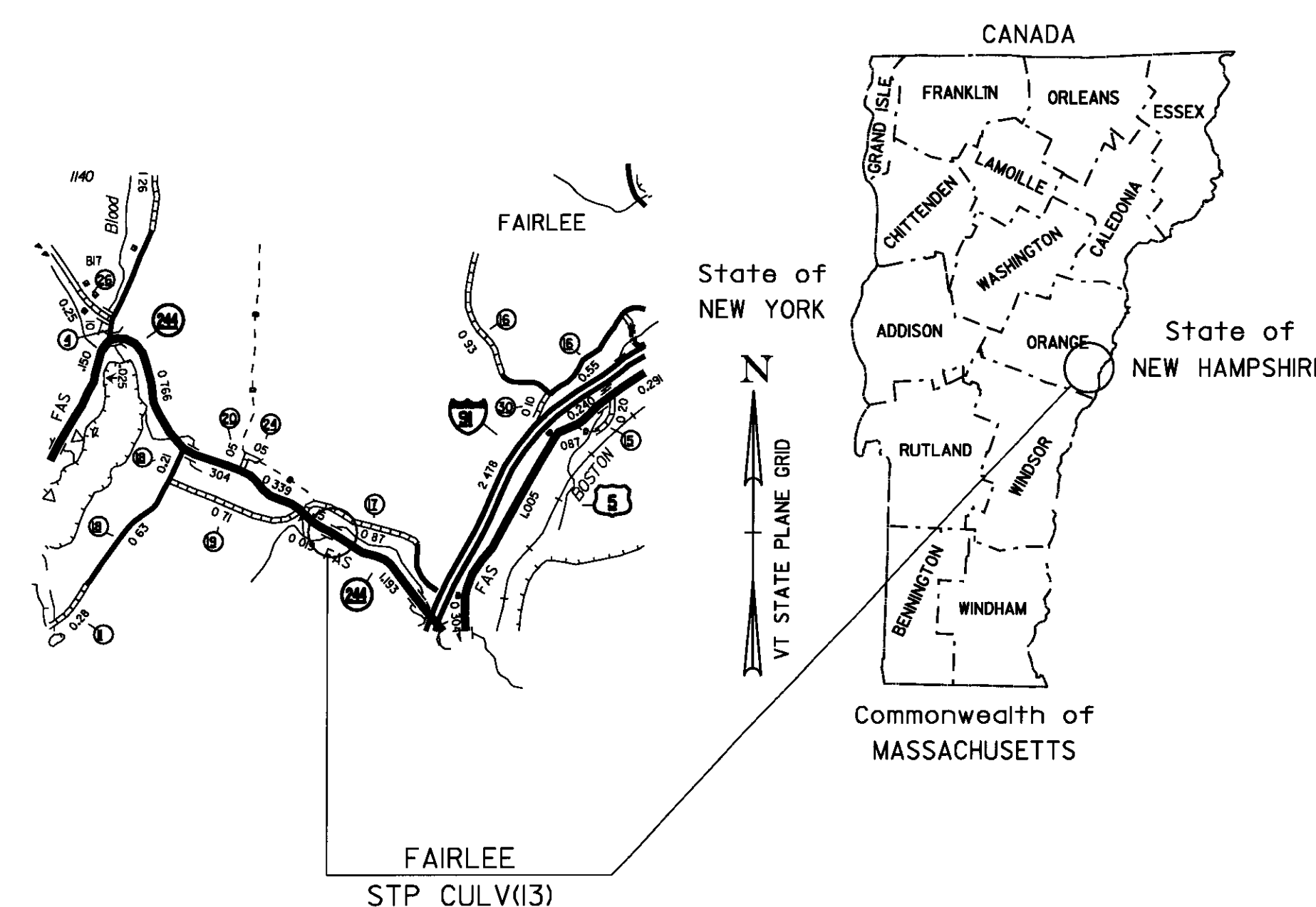


SEE SHEET 2 FOR INDEX OF SHEETS
AND LIST OF STANDARDS

STATE OF VERMONT AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT BRIDGE PROJECT TOWN OF FAIRLEE COUNTY OF ORANGE

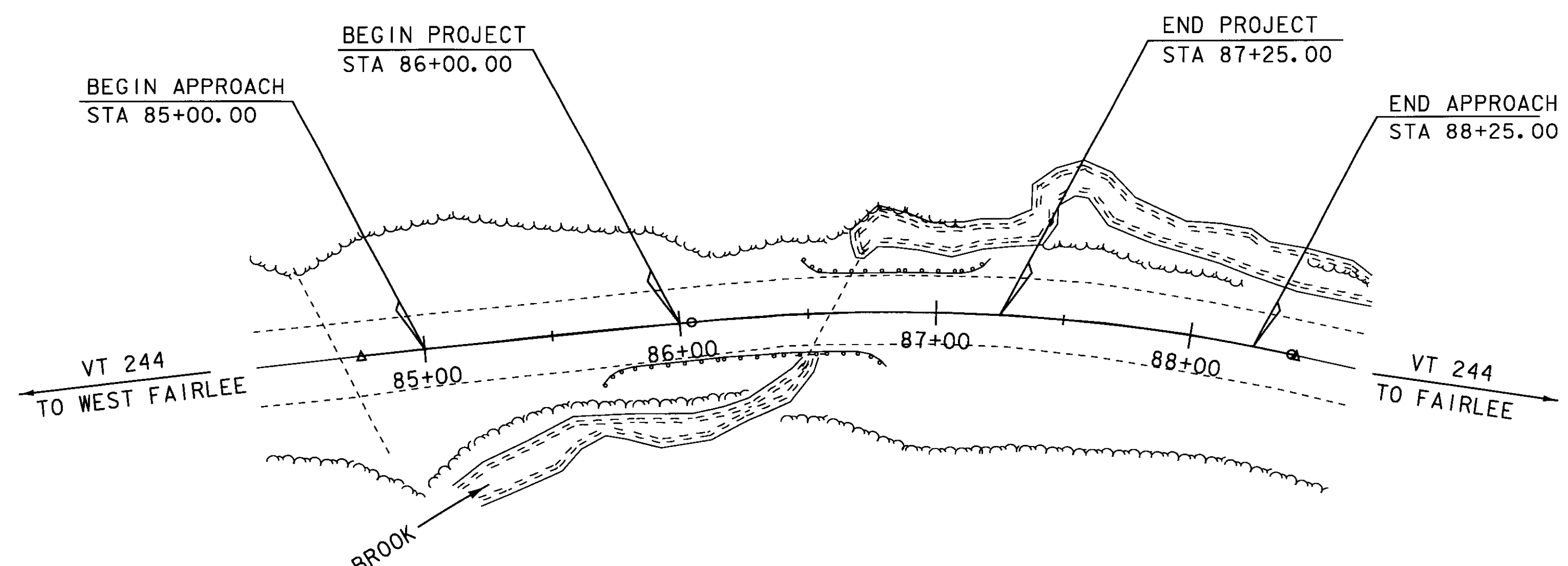


ROUTE NO : VT RT 244, RURAL MAJOR COLLECTOR BRIDGE NO : 9

PROJECT LOCATION: BEGINNING AT A POINT APPROXIMATELY 1.0 MI FROM THE JUNCTION OF VT 244 AND US 5 AND EXTENDING EASTERLY ALONG VT 244 FOR 125 FT.

PROJECT DESCRIPTION: REMOVAL OF EXISTING CULVERT AND REPLACEMENT WITH A NEW REINFORCED CONCRETE BOX CULVERT.

LENGTH OF STRUCTURE: N/A FEET
LENGTH OF ROADWAY: 125 FEET
LENGTH OF PROJECT: 125 FEET



RECORD PLANS	
CONTRACTOR	G.W. TATRO CONSTRUCTION, INC. - JEFFERSONVILLE, VT
RESIDENT ENGINEER	JIM FOREST
CONSTRUCTION BEGAN	AUGUST 3, 2009
CONSTRUCTION COMPLETE	OCTOBER 30, 2009
RECORD PLANS BY	JIM FOREST & NICK GARBACIK
I HEREBY CERTIFY THAT ALL THE CONSTRUCTION REQUIRED BY THIS SET OF DRAWINGS HAS BEEN ACCOMPLISHED AS INDICATED HEREIN	
BY	<i>James C. Forest</i> RESIDENT ENGINEER
DATE	11-15-10
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	
TOP OF CUT	
TOE OF SLOPE	

SURVEYED BY : R. GILMAN
SURVEYED DATE : 6/18/2008

DATUM
VERTICAL NAVD88
HORIZONTAL NAD83 (2007)

SCALE 1" = 40'-0"
40 0 40

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 2006, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JUNE 15, 2006 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

PLOTTED 11-MAR-2009

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED *John P. ...* DATE 3/12/09

PROJECT MANAGER : C.P. WILLIAMS

PROJECT NAME : FAIRLEE
PROJECT NUMBER : STP CULV (13)

SHEET 1 OF 26 SHEETS

PRELIMINARY INFORMATION SHEET

INDEX OF SHEETS

INDEX OF SHEETS

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4. QUANTITY SHEET #2
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7. ALIGNMENT & TRAVERSE TIE SHEET
8. LAYOUT
9. VT 244 PROFILE
10. PLAN AND ELEVATION
11. DETOUR MAP
12. TRAFFIC CONTROL
13. GENERAL NOTES
14. BOX CONSTRUCTION DETAILS
15. WINGWALL LAYOUT
16. ROCK WEIR DETAILS
17. NESTED HDSB GUARDRAIL DETAILS
18. EROSION CONTROL NARRATIVE
19. EPSC EXISTING CONDITIONS SITE PLAN
20. - 23. MAINLINE CROSS SECTIONS
24. - 26. CHANNEL CROSS SECTIONS

LIST OF STANDARDS

E-100	CONSTRUCTION APPROACH SIGNS	1/2/2004
E-102	CONSTRUCTION SIGN DETAILS	6/30/2003
E-102A	CONSTRUCTION SIGN DETAILS	5/1/2004
E-107	DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS	6/30/2003
E-107A	BREAKAWAY BARRICADE DETAILS	8/8/1995
E-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	8/8/1995
E-127	ROUTE MARKINGS AT RURAL INTERSECTIONS	8/8/1995
E-136A	U.S. ROUTE MARKER SIGN DETAILS	8/8/1995
E-136B	STATE ROUTE MARKER SIGN DETAILS	8/8/1995
G-1	STEEL BEAM GUARDRAIL (50MPH & OVER) HEAVY DUTY STEEL BEAM GUARDRAIL TWISTED END TERMINAL ANCHOR FOR STEEL BEAM RAIL	1/3/2000
G-1D	STEEL BEAM GUARDRAIL (40MPH & LESS) HEAVY DUTY STEEL BEAM GUARDRAIL STEEL BEAM MEDIAN BARRIER ANCHOR FOR STEEL BEAM RAIL	1/3/2000
G-19	GENERIC PLANS FOR GUARDRAIL END TERMINALS	11/15/2002

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: Jan. 27, 2009

DRAINAGE AREA: 0.41 sq. mi. (260 acres)
 CHARACTER OF TERRAIN: Hilly to mountainous, mostly forested with some open areas
 STREAM CHARACTERISTICS: Small, perennial, steep, sinuous stream.
 NATURE OF STREAMBED: Cobbles, gravel and sand

PEAK FLOW DATA

Q 2.33 =	35 cfs	Q 50 =	110 cfs
Q 10 =	70 cfs	Q 100 =	135 cfs
Q 25 =	90 cfs	Q 500 =	200 cfs

DATE OF FLOOD OF RECORD: unknown
 ESTIMATED DISCHARGE: unknown
 WATER SURFACE ELEV.: unknown
 NATURAL STREAM VELOCITY: @ Q50 = 7.3 fps
 ICE CONDITIONS: Low
 DEBRIS: Moderate
 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: 0.5% HEADWATERS: _____
 UNIFORM: X
 IMMEDIATELY ABOVE SITE: _____

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Corrugated metal pipe arch
 YEAR BUILT: 1948
 CLEAR SPAN(NORMAL TO STREAM): 71"
 VERTICAL CLEARANCE ABOVE STREAMBED: 47"
 WATERWAY OF FULL OPENING: 18 sq. ft.
 DISPOSITION OF STRUCTURE: Remove
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: unknown

WATER SURFACE ELEVATIONS AT:

Q2.33 =	719.9'	VELOCITY =	5.8 fps
Q10 =	721.0'	"	7.9 fps
Q25 =	721.5'	"	8.4 fps
Q50 =	721.9'	"	8.6 fps
Q100 =	722.2'	"	8.8 fps

LONG TERM STREAMBED CHANGES: Scour and channel erosion downstream.

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes
 FREQUENCY: Below Q25
 RELIEF ELEVATION: 721.3'
 DISCHARGE OVER ROAD @Q100: 24 cfs

UPSTREAM STRUCTURE

TOWN: None DISTANCE: _____
 HIGHWAY #: _____ STRUCTURE #: _____
 CLEAR SPAN: _____ CLEAR HEIGHT: _____
 YEAR BUILT: _____ FULL WATERWAY: _____
 STRUCTURE TYPE: _____

DOWNSTREAM STRUCTURE

TOWN: Fairlee DISTANCE: 4,000'
 HIGHWAY #: VT 244 STRUCTURE #: 11
 CLEAR SPAN: 5.0' CLEAR HEIGHT: 5.0'
 YEAR BUILT: Unknown FULL WATERWAY: 19.5 sq. ft.
 STRUCTURE TYPE: 5.0' R.C. Pipe

A LOAD RATING SHALL BE PROVIDED BY
THE PRECAST CONCRETE BOX FABRICATOR

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2010	1600	200	57	8.6	130
2030	2000	250	57	13.7	260

20 year ESAL for flexible pavement from 2010 to 2030 : 992,000
 40 year ESAL for flexible pavement from 2010 to 2050 : 2,618,000
 Design Speed : 50 mph

PROPOSED STRUCTURE

STRUCTURE TYPE: Precast concrete box
 CLEAR SPAN(NORMAL TO STREAM): 8.0'
 VERTICAL CLEARANCE ABOVE STREAMBED: 4.0'
 WATERWAY OF FULL OPENING: 32 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 =	719.0'	VELOCITY=	5.3 fps
Q10 =	719.7'	"	6.7 fps
Q25 =	720.1'	"	7.2 fps
Q50 =	720.5'	"	7.6 fps
Q100 =	720.9'	"	8.4 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: Q100
 RELIEF ELEVATION: 721.3'
 DISCHARGE OVER ROAD @Q100: 0 cfs

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 721.7' at inlet
 VERTICAL CLEARANCE: @ Q50 = 1.2'

SCOUR: Not applicable for a box structure.

REQUIRED CHANNEL PROTECTION: Stone Fill, Type III

PERMIT INFORMATION

AVERAGE DAILY FLOW: 1 cfs DEPTH OR ELEVATION: _____
 ORDINARY LOW WATER: 0.5 cfs 0.2'
 ORDINARY HIGH WATER: 15 cfs 1.0'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: None - Offsite detour
 CLEAR SPAN (NORMAL TO STREAM): _____
 VERTICAL CLEARANCE ABOVE STREAMBED: _____
 WATERWAY AREA OF FULL OPENING: _____

ADDITIONAL INFORMATION

DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTC: HL-93
2. DESIGN SPAN: _____
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL ON LEDGE: _____
4. ALLOWABLE LOAD FOR PILING: N/A
 PILE TYPE: _____
 ESTIMATED LENGTH: N/A
5. STRUCTURAL STEEL AASHTO M270MM270 GRADE: _____
6. REINFORCING STEEL GRADE: 60
7. CONCRETE, HIGH PERFORMANCE CLASS A fc: N/A
 CONCRETE, HIGH PERFORMANCE CLASS B fc: N/A
8. DESIGN SOIL UNIT WEIGHT: 140 pcf
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL: _____

TRAFFIC MAINTENANCE

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

PROJECT NAME: **FAIRLEE**
 PROJECT NUMBER: **STP CULV(13)**

FILE NAME: s08c060excel.dgn PLOT DATE: 3/4/2009
 PROJECT LEADER: C.P.WILLIAMS DRAWN BY: L.J.STONE
 DESIGNED BY: L.J.STONE CHECKED: E.L.RUSTAY
 PRELIMINARY INFORMATION SHEET SHEET 2 OF 26

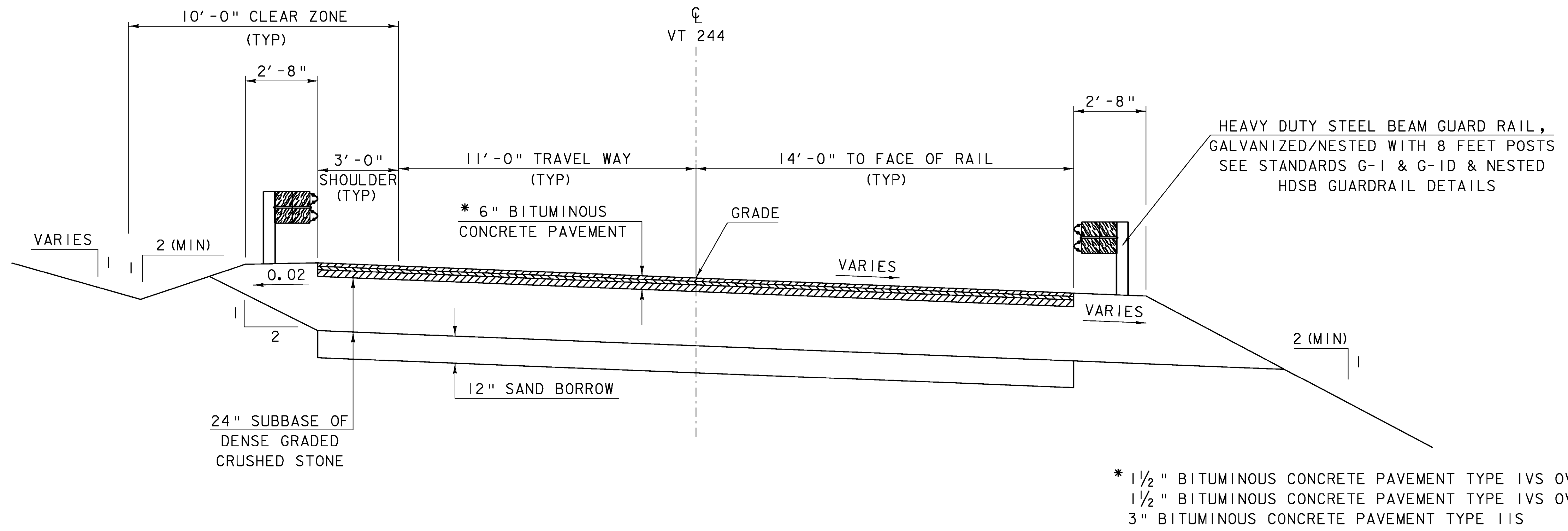
QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
						ROADWAY	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
						1				1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10				EARTHWORKS SUMMARY
						815				815		CY	COMMON EXCAVATION	203.15				FILL AVAILABLE
								135		135		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27				815 CY COMMON EXCAVATION: 815 x 1.0
						120				120		CY	SAND BORROW	203.31				40.5 CY UNCLASSIFIED CHANNEL EXCAVATION: 135 x 0.3
								270		270		CY	STRUCTURE EXCAVATION	204.25				81 CY STRUCTURE EXCAVATION: 270 x 0.3
								160		160		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30				936.5 CY TOTAL
						320				320		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10				FILL REQUIRED
						560				560		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35				138.6 CY PLANMETERED FILL: 138.6
						4				4		CWT	EMULSIFIED ASPHALT	404.65				159.39 CY FACTORED FILL: x 1.15
						1				1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50				0.61 CY ROUNDING
								3		3		GAL	WATER REPELLENT, SILANE	514.10				160 CY TOTAL
								35		35		SY	SHEET MEMBRANE WATERPROOFING, TORCH APPLIED	519.20				776.5 CY WASTE: 936.5-160
						1				1		EACH	REMOVAL OF STRUCTURE (8'-0" x 56'-0" CGMPA)	529.15				
								1		1		LS	PRECAST CONCRETE STRUCTURE (8'-0" x 4'-6" x 49'-6" BOX)	540.10				
							10			10		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25				
						1				1		TON	DUST AND ICE CONTROL WITH CALCIUM CHLORIDE	609.15				
								5		5		CY	STONE FILL, TYPE I	613.10				
								20		20		CY	STONE FILL, TYPE II	613.11				
								90		90		CY	STONE FILL, TYPE III	613.12				
								200		200		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED/NESTED W/8 FEET POSTS	621.217				
						2				2		EACH	MANUFACTURED TERMINAL SECTION, FLARED	621.50				
						2				2		EACH	MANUFACTURED TERMINAL SECTION, TANGENT	621.51				
						195				195		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
						40				40		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
						200				200		HR	FLAGGERS	630.15				
									1	1		LS	FIELD OFFICE, ENGINEERS	631.10				
									1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
									1	1		LU	FIELD OFFICE TELEPHONE (N.A.B.I.)	631.25				
						1				1		LS	MOBILIZATION/DEMobilIZATION	635.11				
						1				1		LS	TRAFFIC CONTROL	641.10				
						1				1		LS	PUBLIC RELATIONS OFFICER	641.12				
						73				73		DAY	PORTABLE CHANGEABLE MESSAGE SIGN RENTAL	641.17				
						650				650		LF	DURABLE 4 INCH WHITE LINE, THERMOPLASTIC	646.402				
						650				650		LF	DURABLE 4 INCH YELLOW LINE, THERMOPLASTIC	646.412				
								200		200		SY	GEOTEXTILE UNDER STONE FILL	649.31				
							10			10		LB	SEED	651.15				
							90			90		LB	FERTILIZER	651.18				
							1			1		TON	AGRICULTURAL LIMESTONE	651.20				
							1			1		TON	HAYMULCH	651.25				
							10			10		CY	TOPSOIL	651.35				

PROJECT NAME: **FAIRLEE**
 PROJECT NUMBER: **STP CULV(13)**
 FILE NAME: 08c060qty.xls PLOT DATE: 03/05/2009
 PROJECT LEADER: C.P.WILLIAMS DRAWN BY: L.J.STONE
 DESIGNED BY: L.J.STONE CHECKED BY: E.L.RUSTAY
 QUANTITY SHEET #1 SHEET 3 OF 26

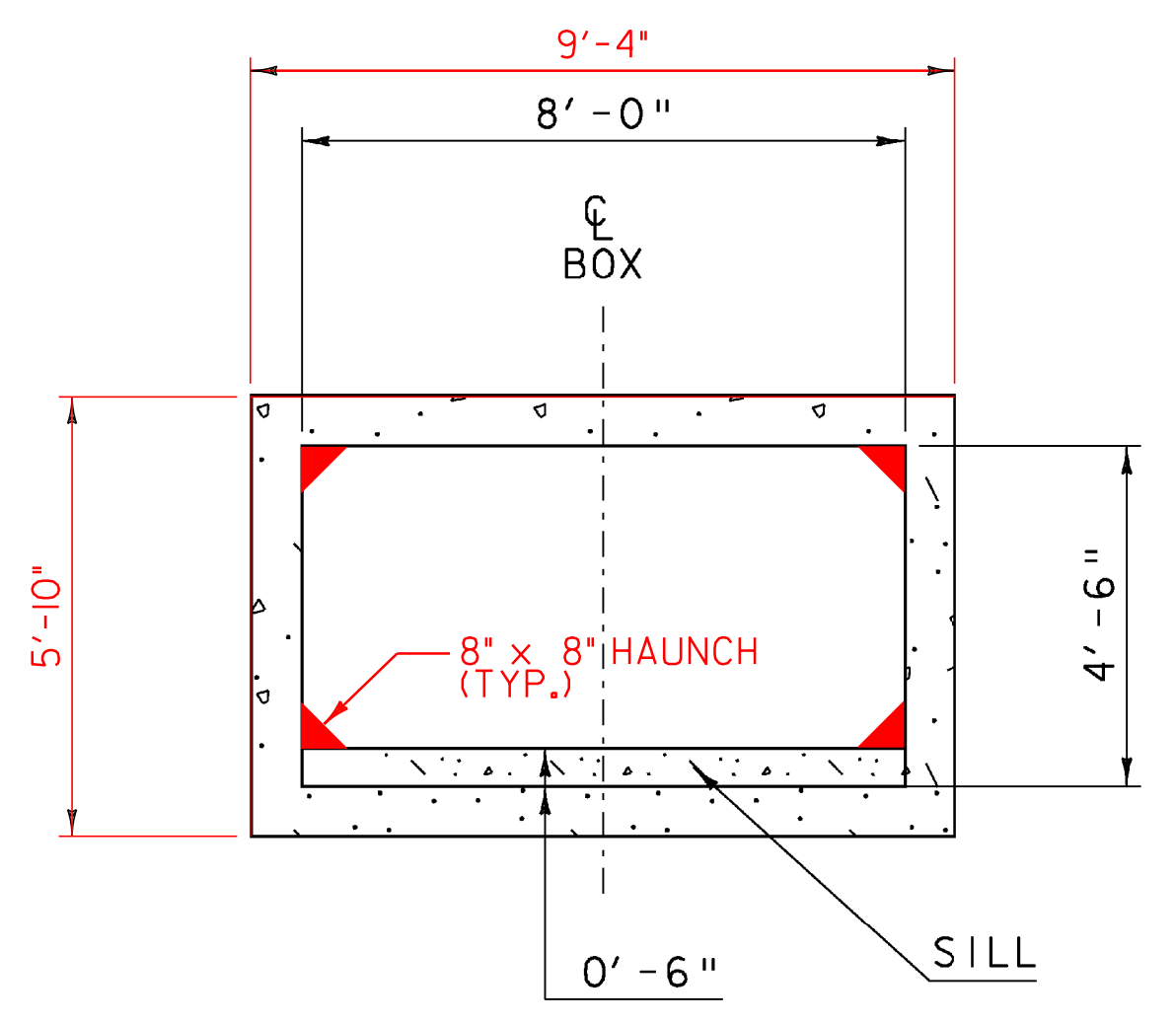
QUANTITY SHEET 2

SUMMARY OF ESTIMATED QUANTITIES										TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
						ROADWAY	EROSION CONTROL	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
							90			90		SY	GRUBBING MATERIAL	651.40				
							75			75		SY	TEMPORARY EROSION MATTING	653.20				
							1			1		EACH	SPECIAL PROVISION (ROCK WEIR)	900.620				
							60			60		HR	SPECIAL PROVISION (MONITORING EPSC PLAN)	900.630				
							1			1		LS	SPECIAL PROVISION (EPSC PLAN)	900.645				
								1		1		LS	SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)	900.645				
							1			1		LU	SPECIAL PROVISION (EROSION PREVENTION AND SEDIMENT CONTROL MEASURES) (N.A.B.I.)	900.650				
						1				1		LU	SPECIAL PROVISION (NCENTIVE/DISINCENTIVE) (N.A.B.I.)	900.650				
							1			1		LU	SPECIAL PROVISION (MAINTENANCE OF EPSC PLAN) (N.A.B.I.)	900.650				
						1				1		LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY) (N.A.B.I.)	900.650				
						1				1		LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT, SMALL QUANTITY) (N.A.B.I.)	900.650				
						273				273		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680				



MATERIAL ITEM	TOLERANCE
PAVEMENT	± 1/4 " TOTAL THICKNESS
AGGREGATE SURFACE COURSE	± 1/2 "
BASE COURSE	± 1/2 "
SUBBASE	± 1 "
SAND BORROW	± 1 "
GRANULAR BORROW	± 1 "

VT 244 TYPICAL SECTION
SCALE 3/8" = 1'-0"



PRECAST CONCRETE BOX CROSS SECTION
SCALE 3/8" = 1'-0"

**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 RYE GRASS	95	85
100.0	60.0			

SEEDING GENERAL NOTES

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

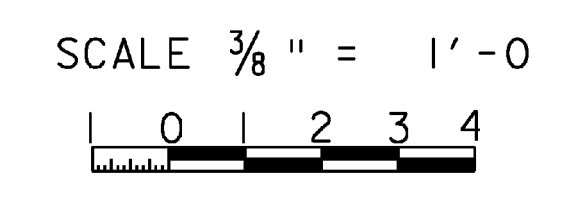
SEED: TO BE APPLIED PER SEEDING FORMULAS OR AS DIRECTED BY THE ENGINEER.

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).

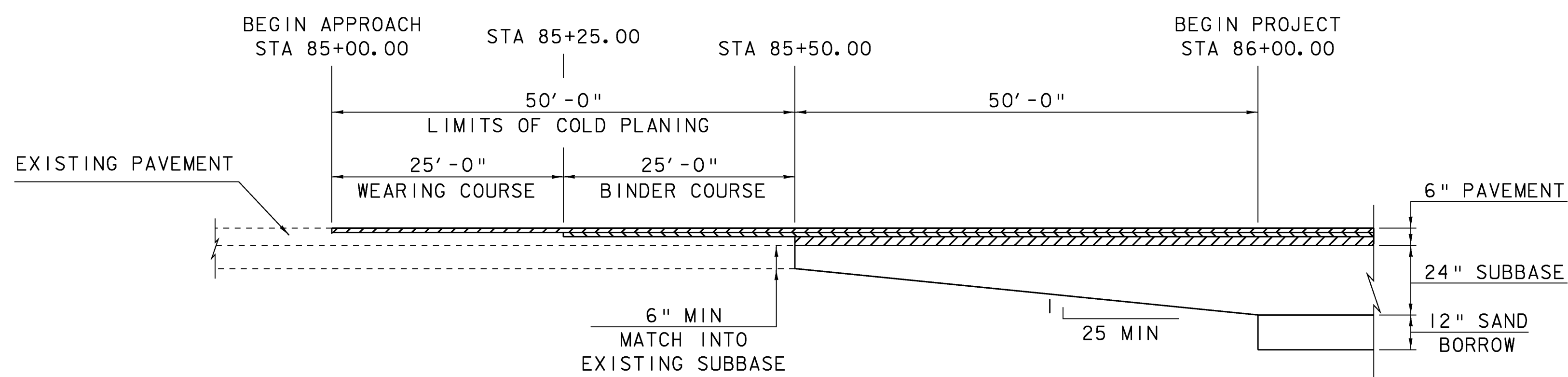
AGRICULTURAL LIMESTONE: TO BE APPLIED AT THE RATE OF 2 TONS/ACRE, OR AS DIRECTED BY THE ENGINEER.

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

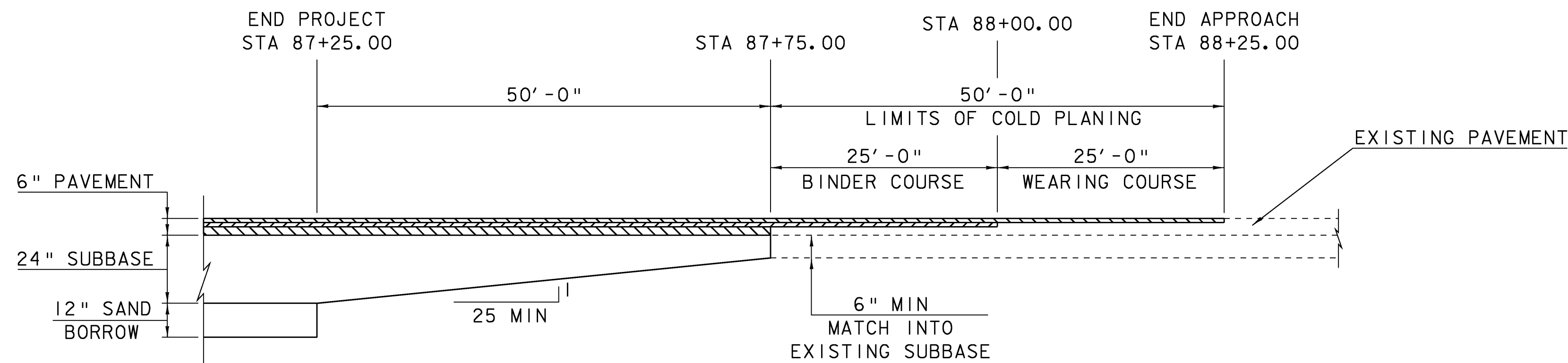
TOPSOIL: TO BE USED WITH SEED AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER.



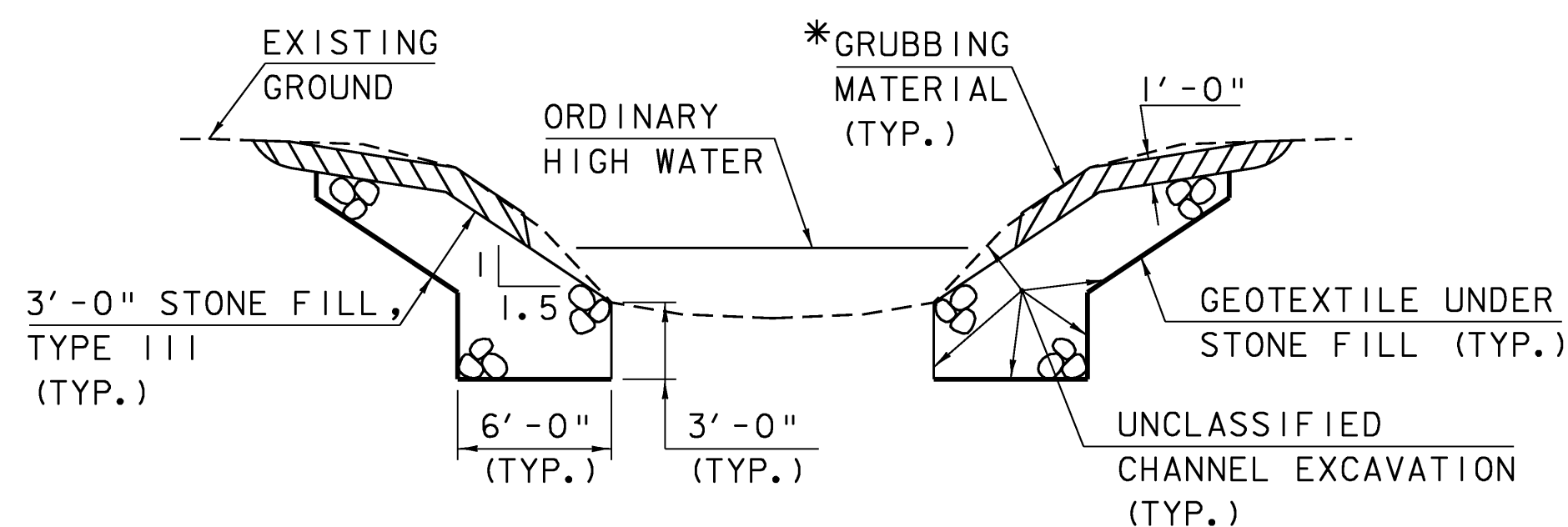
PROJECT NAME: FAIRLEE	PLOT DATE: 11-MAR-2009
PROJECT NUMBER: STP CULV (13)	DRAWN BY: L.J.STONE
FILE NAME: s08c060+yp.dgn	CHECKED BY: E.L.RUSTAY
PROJECT LEADER: C.P.WILLIAMS	SHEET 5 OF 26
DESIGNED BY: L.J.STONE	
TYPICAL SECTION	



BEGIN PROJECT MATERIAL TRANSITION
 HORIZONTAL SCALE: 1" = 10'-0"
 VERTICAL SCALE: NOT TO SCALE

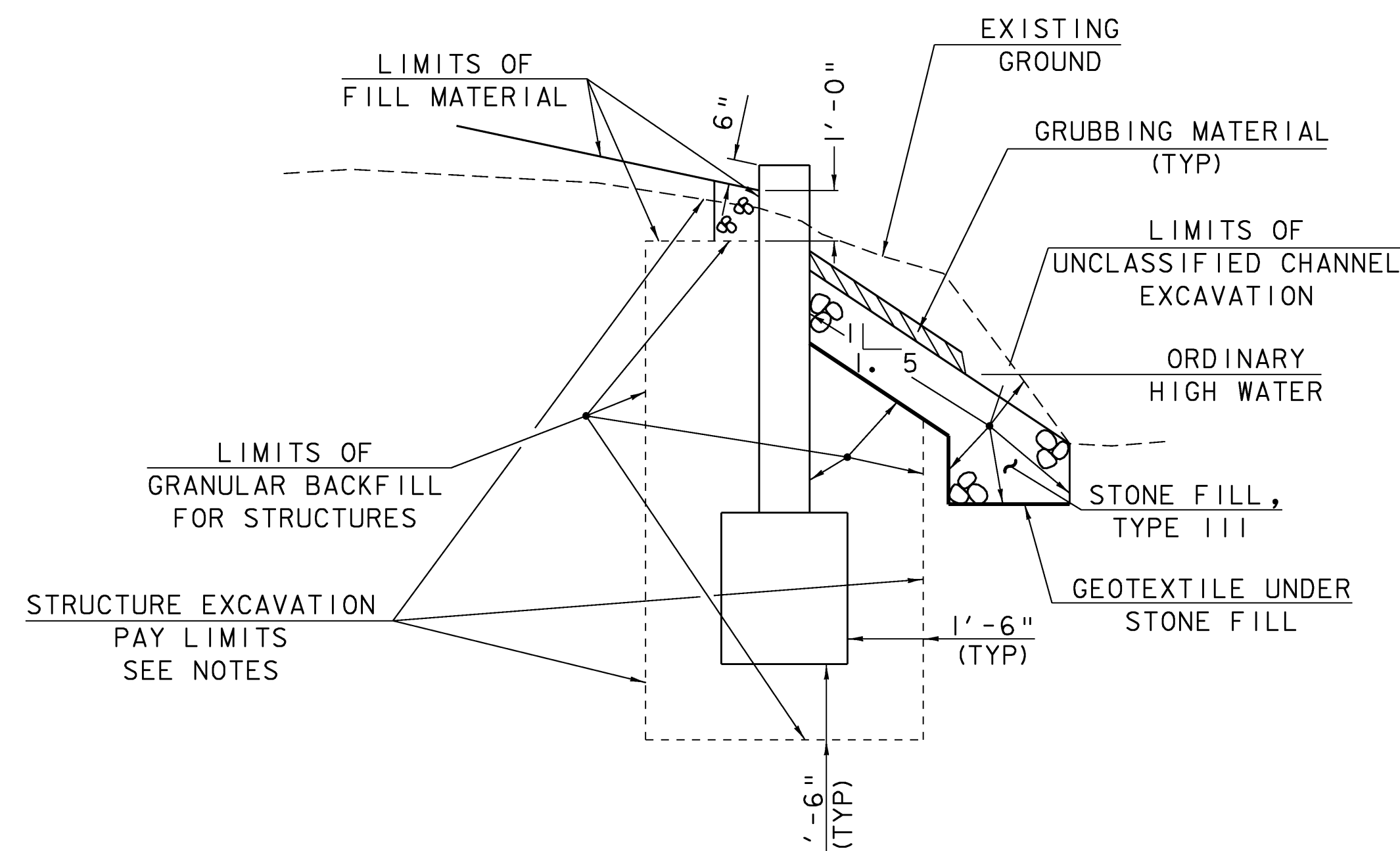


END PROJECT MATERIAL TRANSITION
 HORIZONTAL SCALE: 1" = 10'-0"
 VERTICAL SCALE: NOT TO SCALE



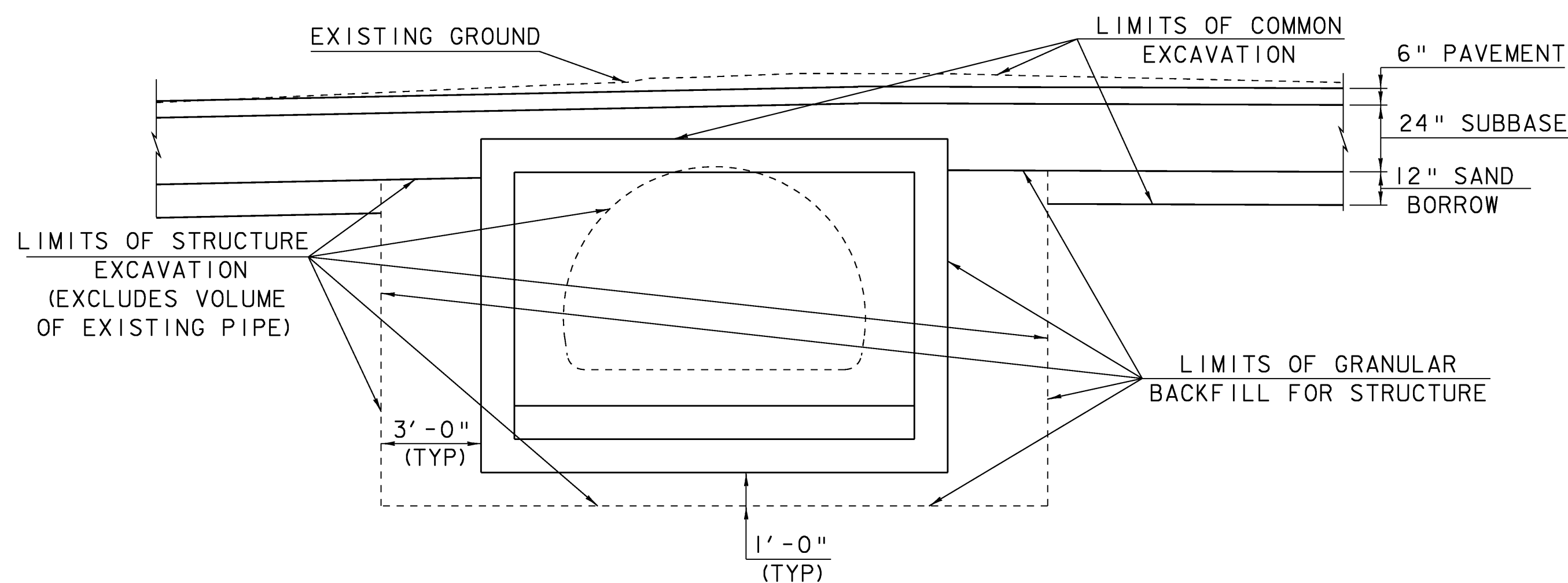
TYPICAL CHANNEL SECTION
 (NOT TO SCALE)

*WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF SUBBASE.



TYPICAL PRECAST WINGWALL SECTION
EXCAVATION AND FILL DETAIL
 (NOT TO SCALE)

- NOTE:
- 1) ACTUAL EXCAVATION SHALL BE DETERMINED BY THE CONTRACTOR. HOWEVER, ONLY THE EXCAVATION BETWEEN THE LIMITS SHOWN ABOVE WILL BE PAID FOR UNDER THE ITEM 204.25 "STRUCTURE EXCAVATION".
 - 2) ACTUAL FILL SHALL BE DETERMINED BY THE CONTRACTOR. HOWEVER, ONLY THE FILL BETWEEN THE LIMITS SHOWN ABOVE WILL BE PAID FOR UNDER THE ITEM 204.30 "GRANULAR BACKFILL FOR STRUCTURES".



TYPICAL CONCRETE BOX
EXCAVATION AND FILL DETAIL
 (NOT TO SCALE)

SCALE 1" = 10'-0"
 10 0 10

PROJECT NAME: FAIRLEE
 PROJECT NUMBER: STP CULV (13)

FILE NAME: s08c060+yp.dgn
 PROJECT LEADER: C.P.WILLIAMS
 DESIGNED BY: L.J.STONE
 EXCAVATION AND TRANSITION DETAILS

PLOT DATE: 11-MAR-2009
 DRAWN BY: L.J.STONE
 CHECKED BY: E.L.RUSTAY
 SHEET 6 OF 26

GPS CONTROL POINTS

HVCTRL #1
 HEBBARD AZ MK
 NORTH = 507225.134
 EAST = 1719892.381
 ELEV. = 767.524

GENERAL LOCATION, FAIRLEE, VT.

TO REACH FROM THE I-91 BRIDGES OVER VT ROUTE 244 GO NORTHWEST ALONG VT ROUTE 244 FOR 0.9 MI (1.4 KM) TO THE INTERSECTION OF HEBBARD ROAD LEFT AND BRAGG HILL ROAD RIGHT. CONTINUE STRAIGHT AHEAD AND GO NORTHWEST ALONG VT ROUTE 244 FOR 0.25 MI (0.4 KM) TO THE INTERSECTION OF A PAVED DRIVE LEFT LEADING TO HOUSE NO 1425. CONTINUE STRAIGHT AHEAD AND GO NORTHWEST ALONG VT ROUTE 244 FOR ABOUT 30 M (98.4 FT) TO THE SITE OF THE MARK ON THE LEFT.

THE MARK IS SET 7 CM (3 INCHES) BELOW GROUND SURFACE IN THE TOP OF A FENO STYLE MONUMENT.

IT IS 5.0 M (16.4 FT) WEST SOUTHWEST OF AND ABOUT 0.2 M (0.7 FT) LOWER THAN THE CENTERLINE OF VT ROUTE 244, 32.4 M (106.3 FT) NORTH NORTHWEST OF THE CENTERLINE OF THE PAVED DRIVE, 6.3 M (20.7 FT) SOUTHEAST OF POLE NO 6/37/3/24, 22.8 M (74.8 FT) NORTH OF THE NORTH CORNER OF HOUSE NO 1425, 11.4 M (37.4 FT) SOUTH SOUTHEAST OF THE CENTER OF THE WEST SOUTHWEST (INLET) END OF A 45 CM (18 INCHES) DIAMETER METAL CULVERT, AND 0.3 M (1.0 FT) EAST NORTHEAST OF A FIBERGLASS WITNESS POST.

HVCTRL #2
 HEBBARD

NORTH = 506482.208
 EAST = 1720913.094
 ELEV. = 765.666

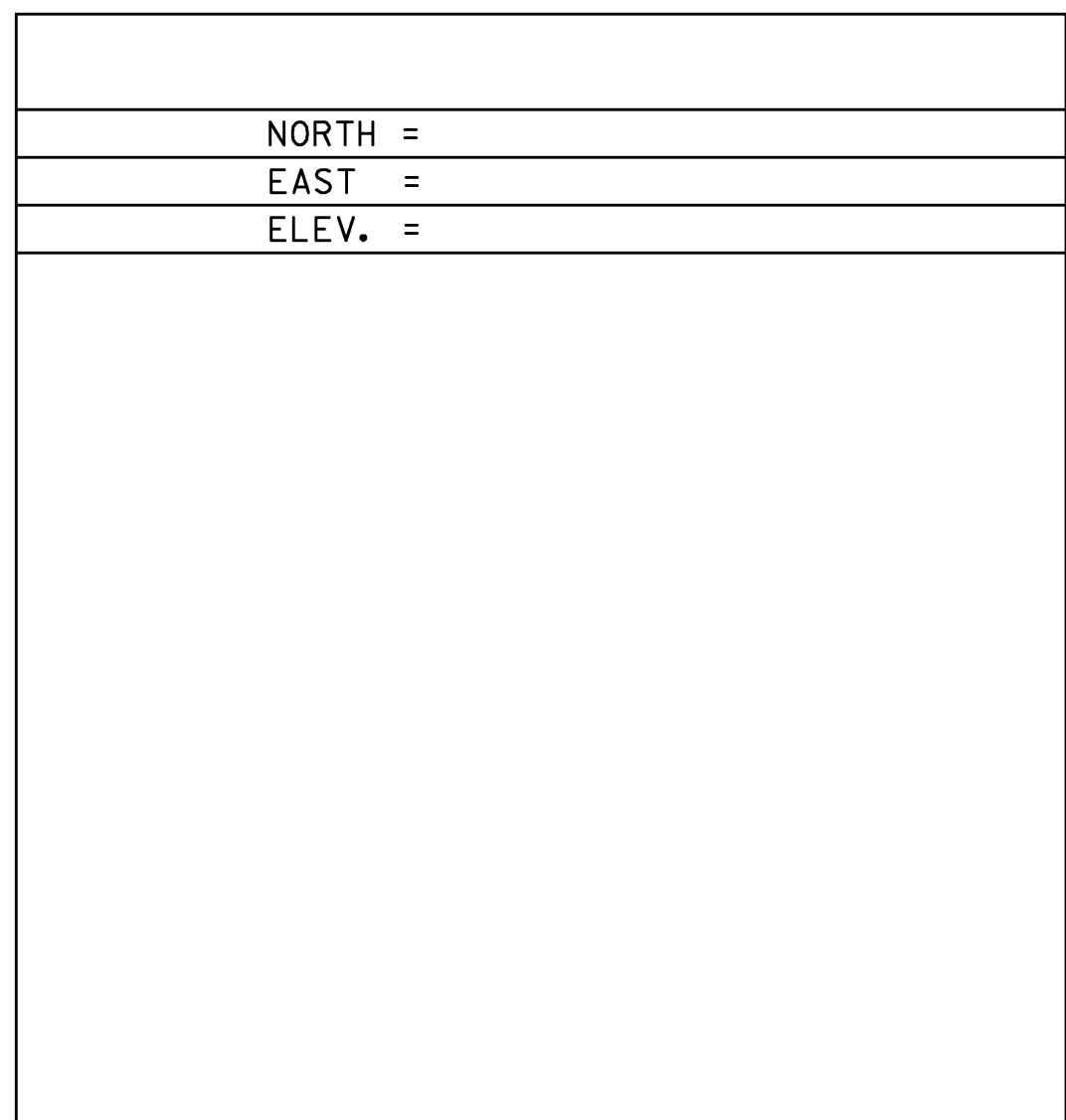
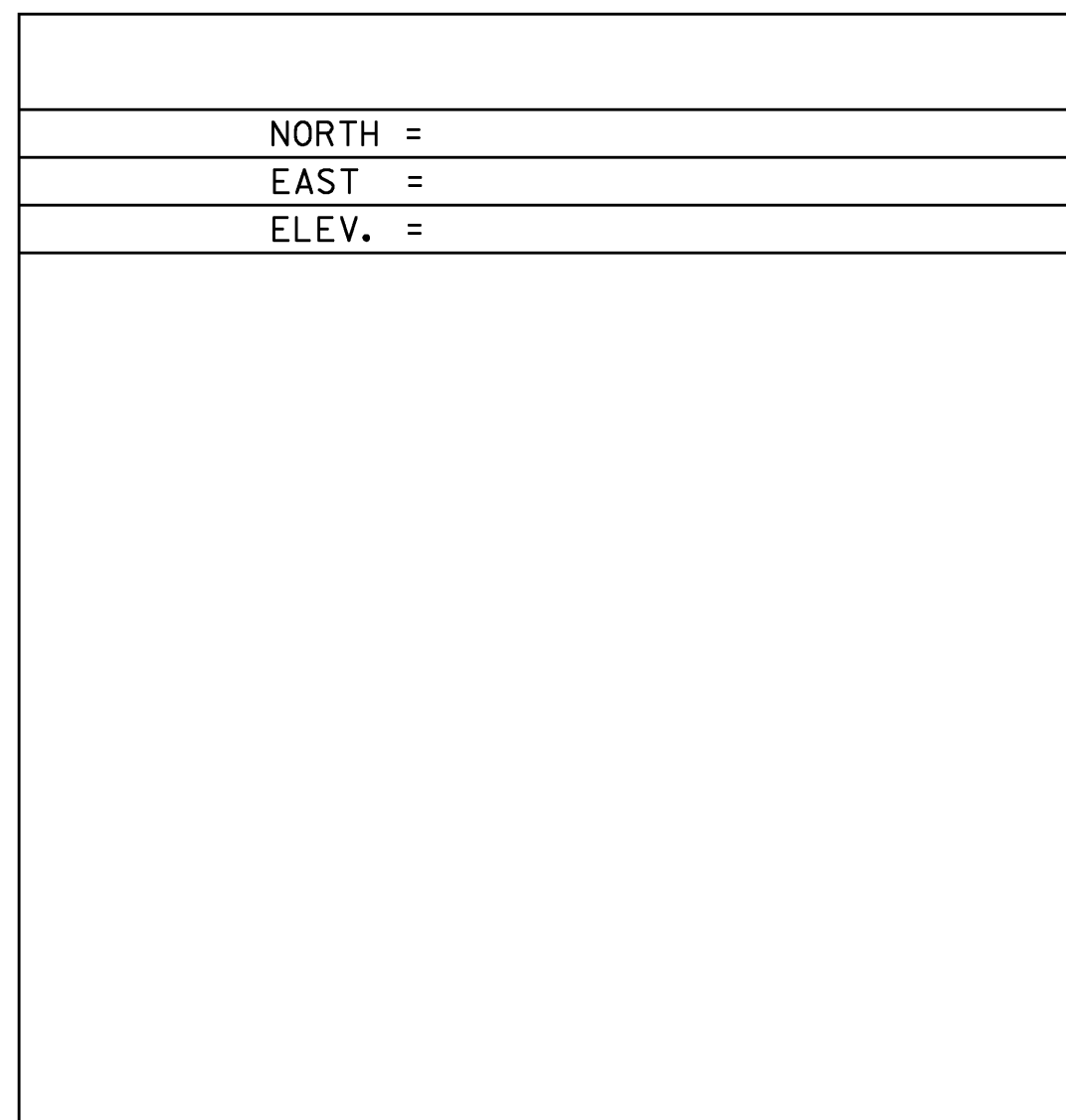
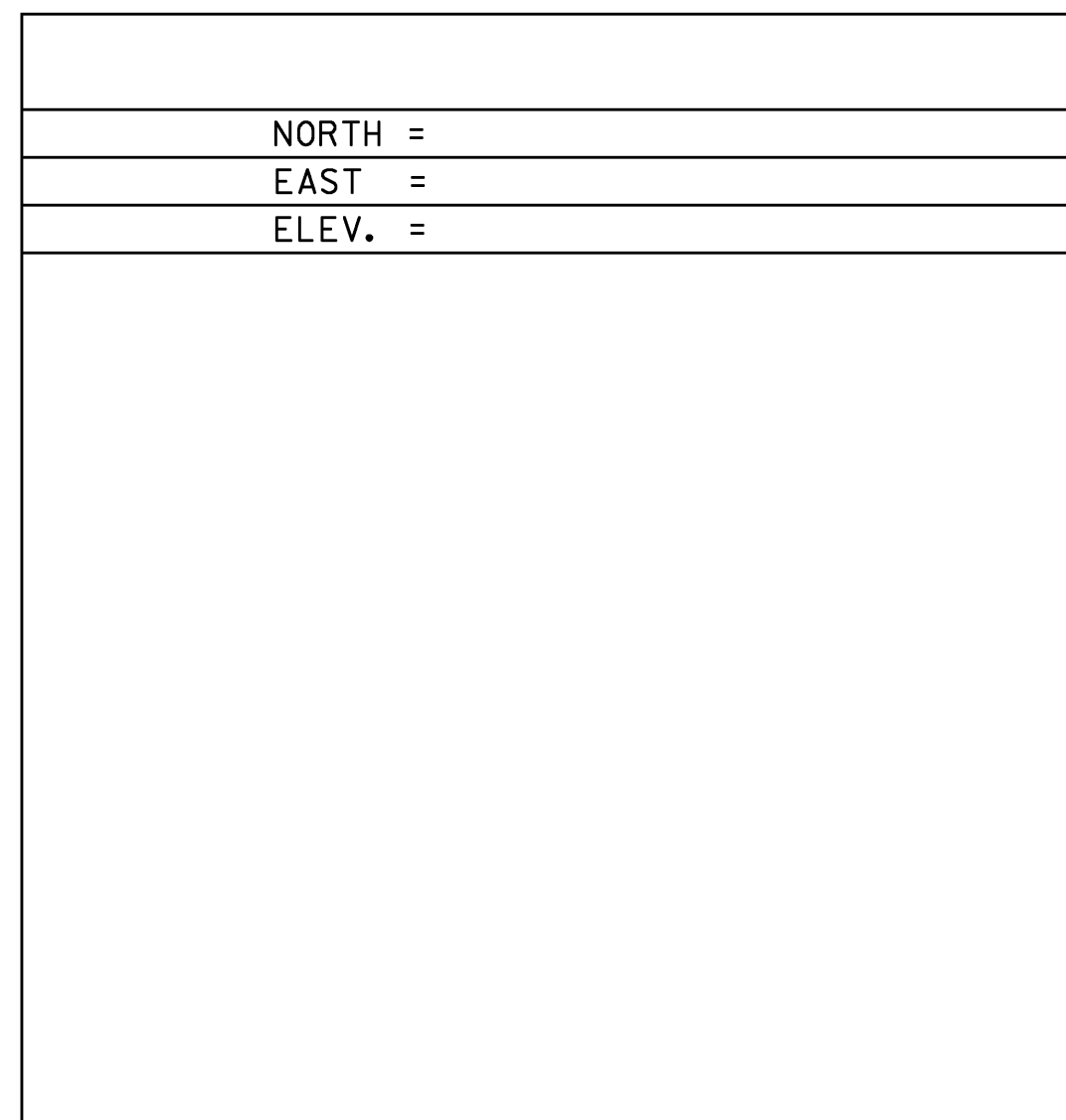
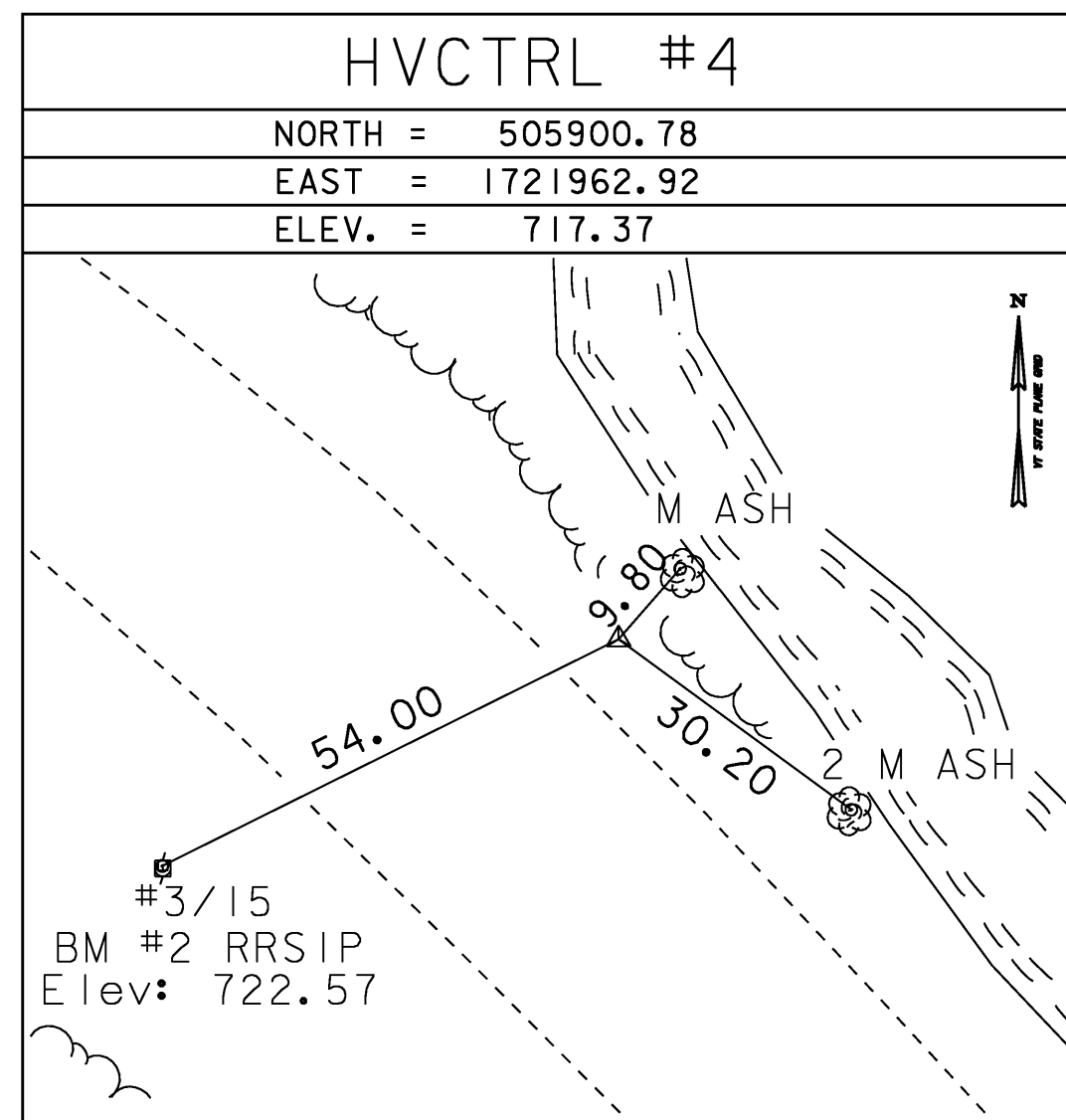
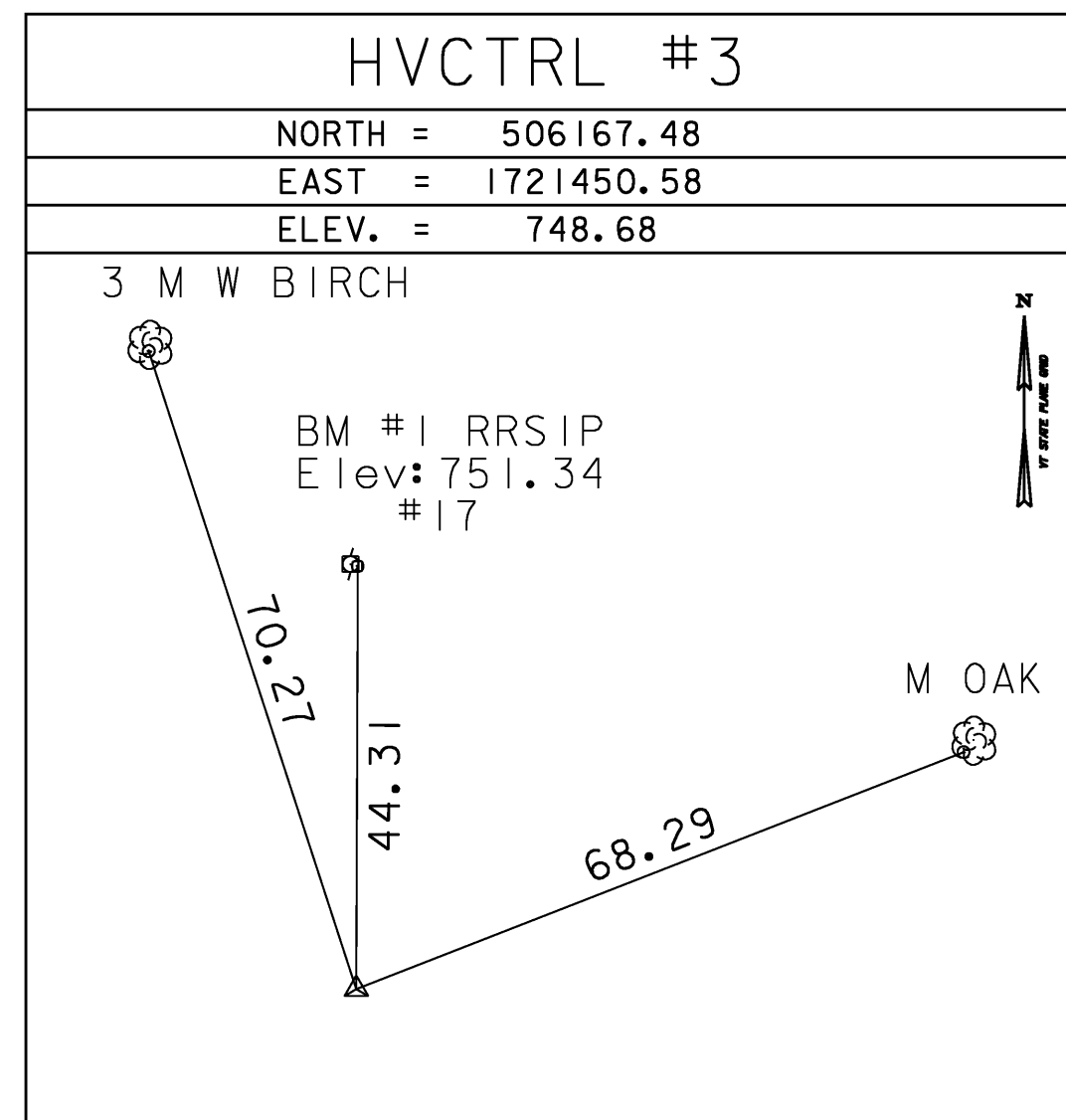
GENERAL LOCATION, FAIRLEE, VT.

TO REACH FROM THE I-91 BRIDGES OVER VT ROUTE 244 GO NORTHWEST ALONG VT ROUTE 244 FOR 0.9 MI (1.4 KM) TO THE INTERSECTION OF HEBBARD ROAD LEFT AND BRAGG HILL ROAD RIGHT AND THE SITE OF THE MARK ON THE LEFT IN THE WEST QUADRANT OF THE INTERSECTION.

THE MARK IS SET 7 CM (3 INCHES) BELOW GROUND SURFACE IN THE TOP OF A FENO STYLE MONUMENT.

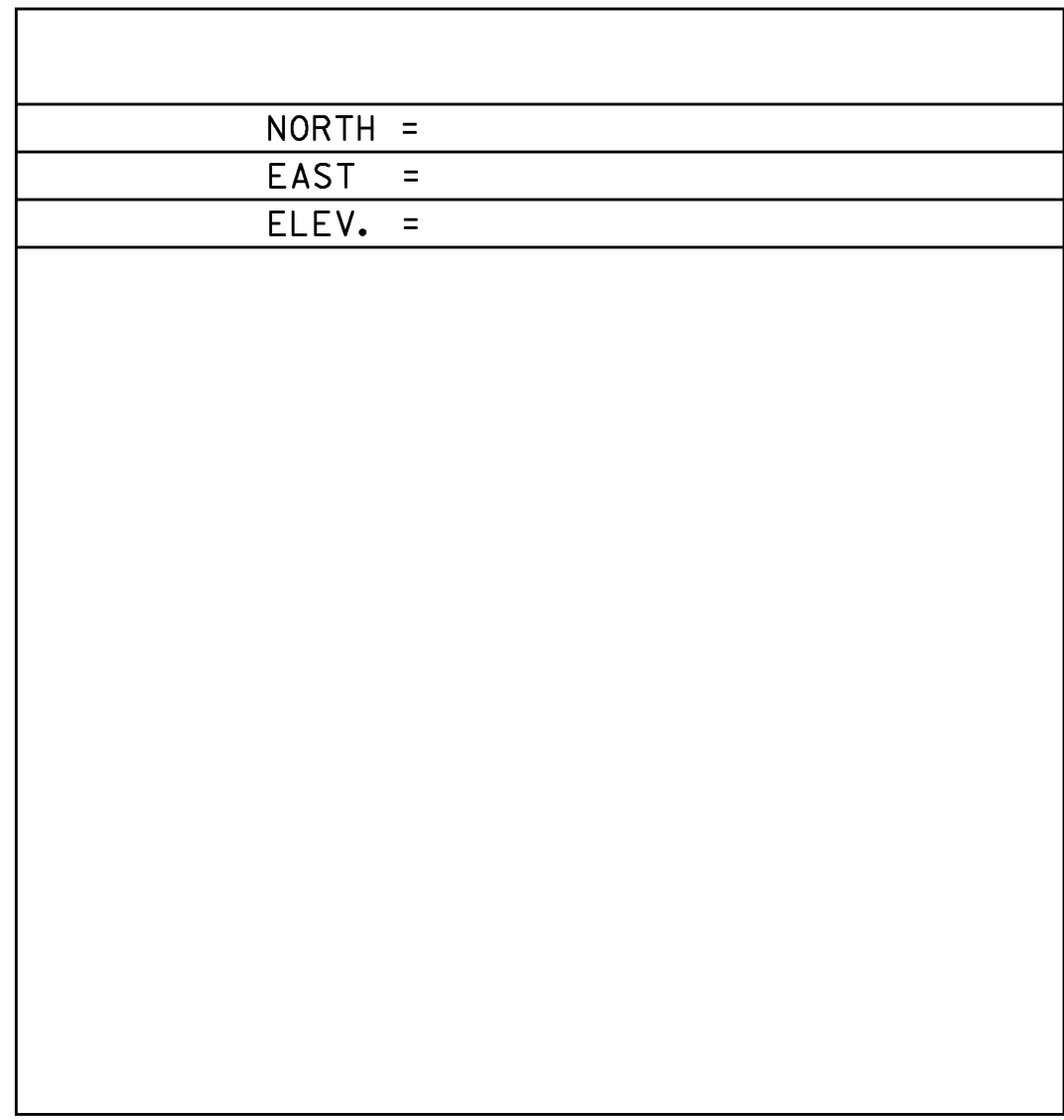
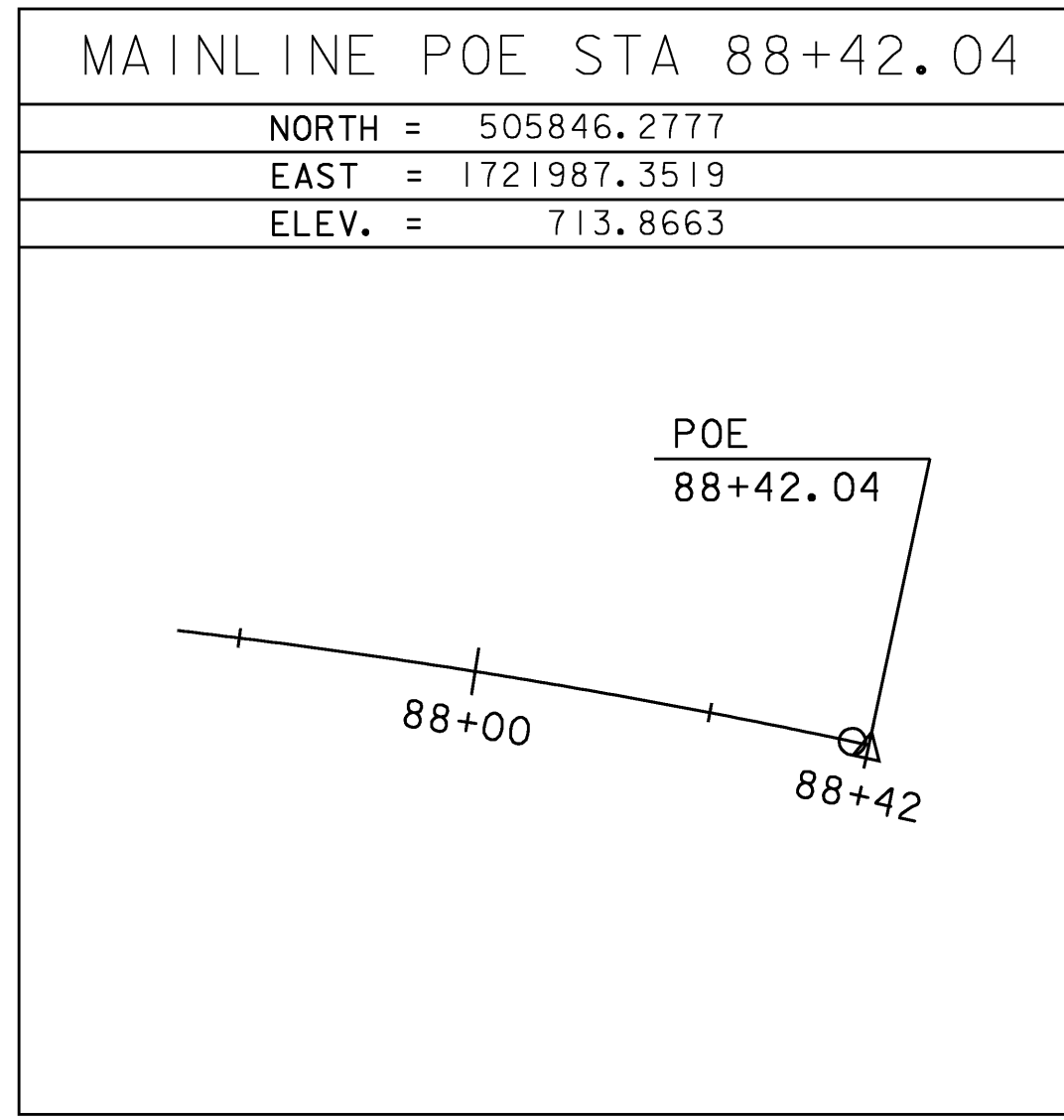
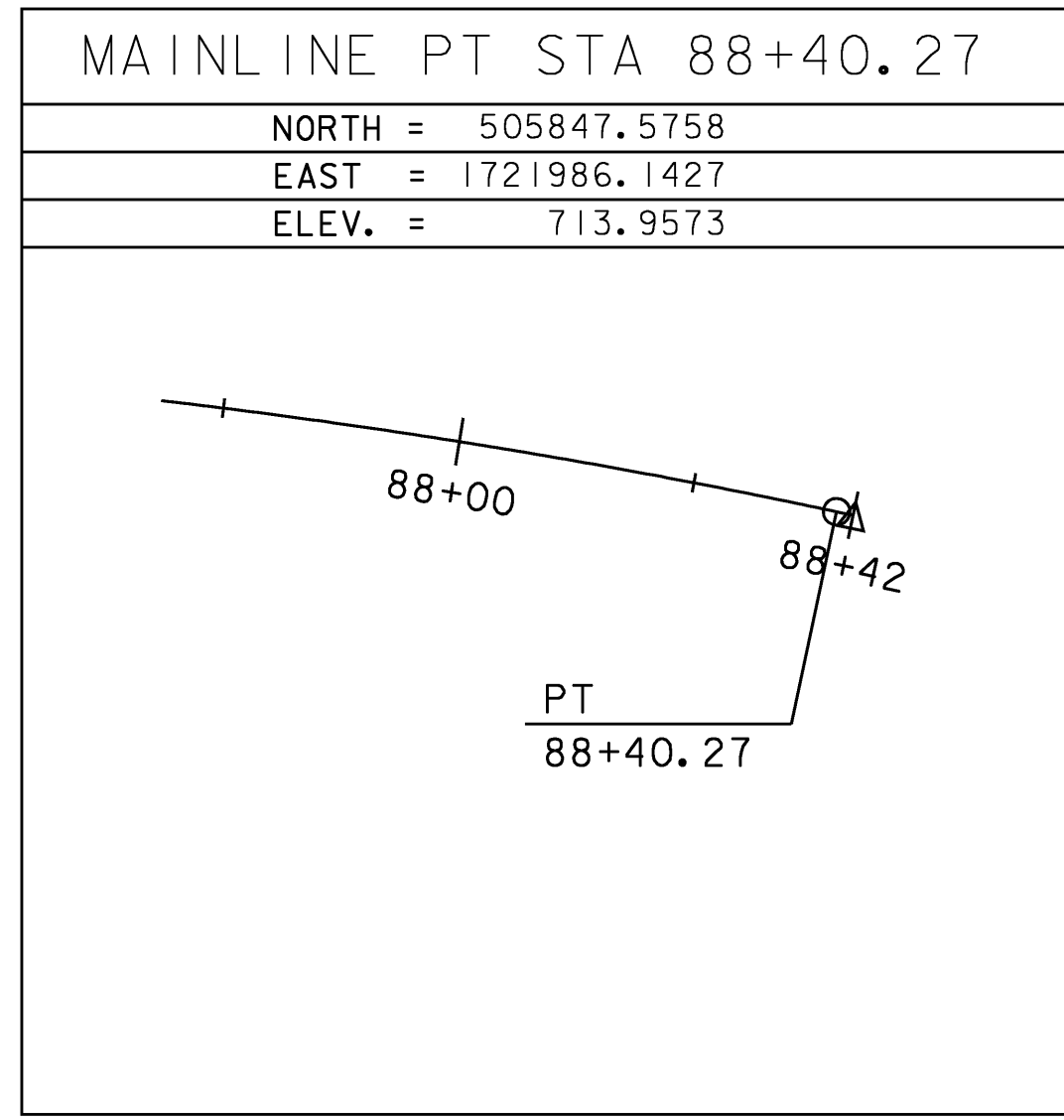
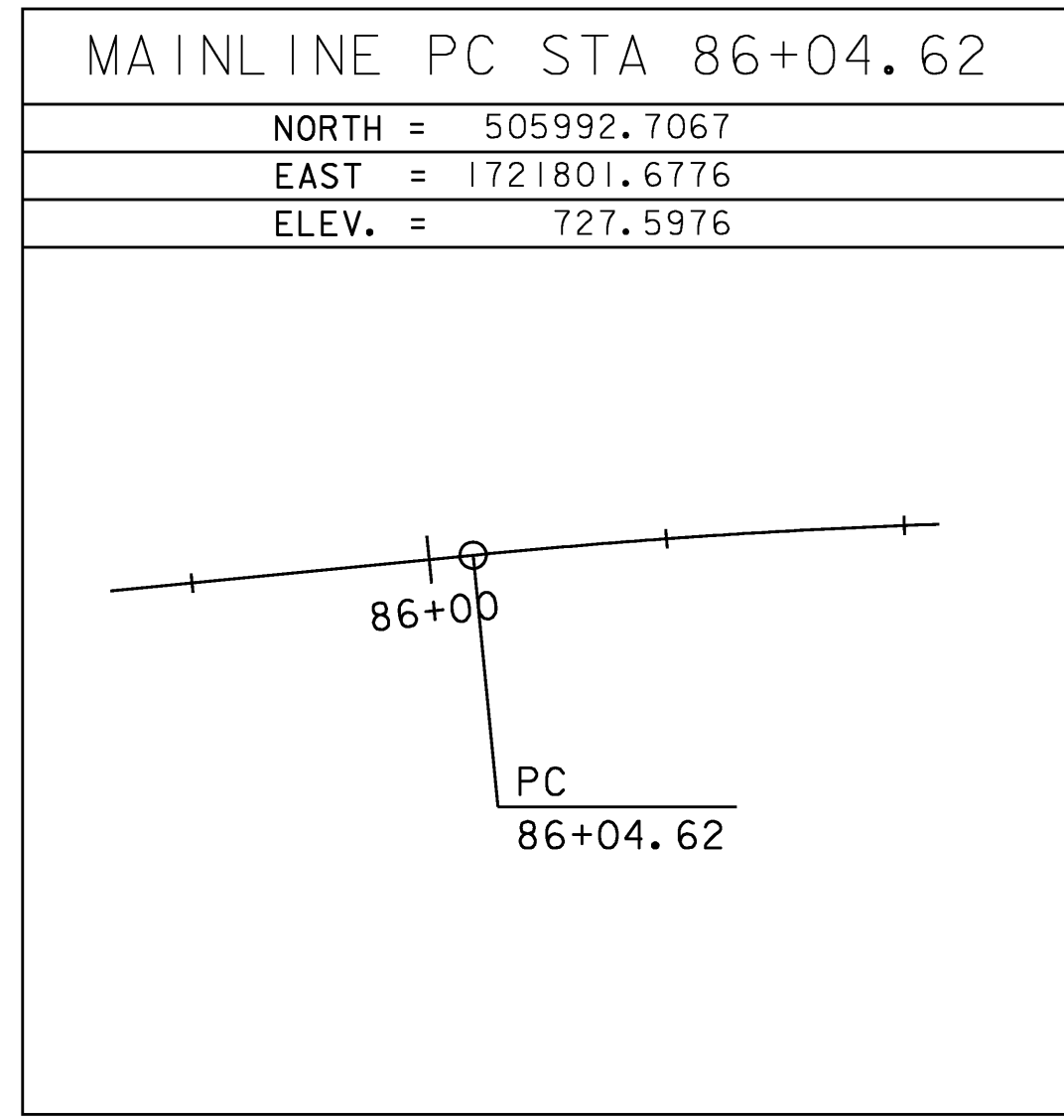
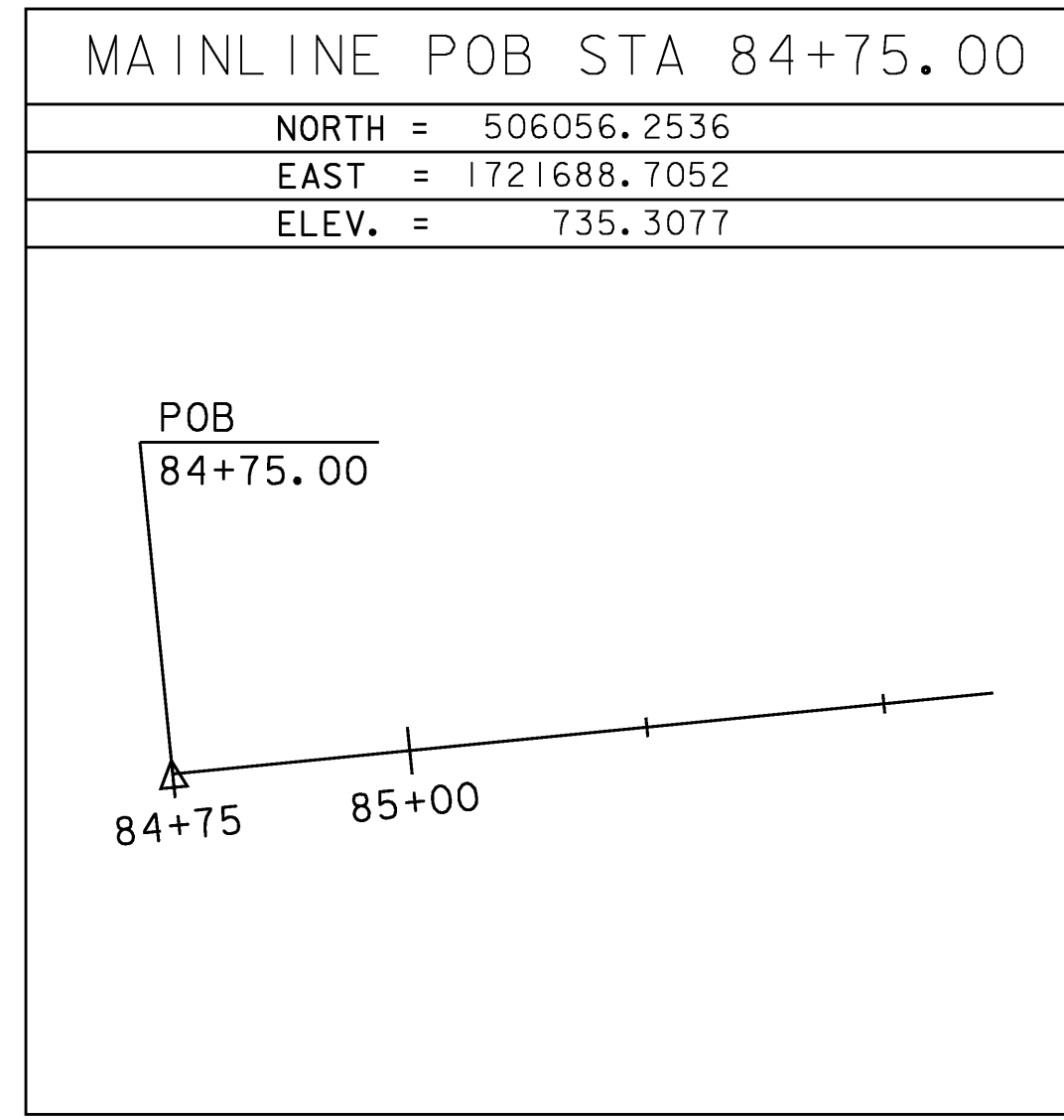
IT IS 7.6 M (24.9 FT) SOUTHWEST OF AND 0.1 M (0.3 FT) LOWER THAN THE CENTERLINE OF VT ROUTE 244, 14.9 M (48.9 FT) NORTH NORTHWEST OF THE CENTERLINE OF HEBBARD ROAD, 29.1 M (95.5 FT) SOUTH OF POLE NO 32/3/19, 25.6 M (84.0 FT) WEST OF POLE NO 31 1/2 /18X, AND 0.3 M (1.0 FT) NORTHEAST OF A FIBERGLASS WITNESS POST.

TRAVERSE TIES



* Main Traverse Completed 6/18/08 by R. Gilman P.C. & P. Winters

ALIGNMENT TIES



DATUM	
VERTICAL	NAVD 88
HORIZONTAL	NAD 83 (07)
ADJUSTMENT	COMPASS

PROJECT NAME:	Fairlee
PROJECT NUMBER:	STP CULV (I3)
FILE NAME:	08c060\survey\08c060t1.dg
PROJECT LEADER:	C. P. WILLIAMS
DESIGNED BY:	L. J. STONE
ALIGNMENT & TRAVERSE TIE SHEET	
PLOT DATE:	11-MAR-2009
DRAWN BY:	R. Bullock
CHECKED BY:	E. L. RUSTAY
SHEET 7	OF 26

REMOVAL AND DISPOSAL OF EXISTING GUARDRAIL
 STA 86+48.00 LT - 87+20.00 LT
 STA 85+68.00 RT - 86+80.00 RT

HEAVY DUTY STEEL BEAM GUARDRAIL,
 GALVANIZED/NESTED WITH 8 FEET POSTS
 STA 86+13.00 LT - 87+11.00 LT
 STA 86+05.00 RT - 87+07.00 RT

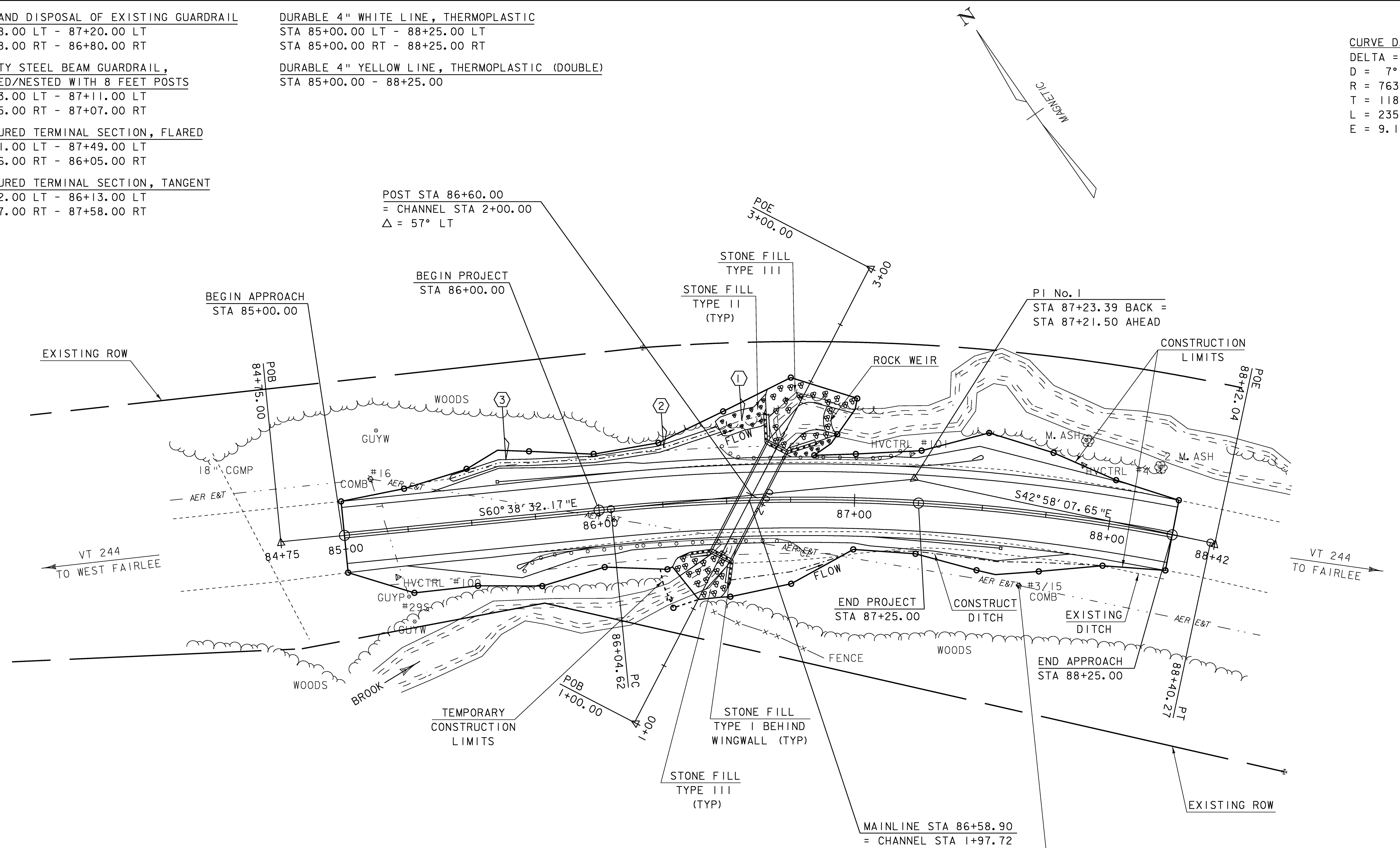
MANUFACTURED TERMINAL SECTION, FLARED
 STA 87+11.00 LT - 87+49.00 LT
 STA 85+66.00 RT - 86+05.00 RT

MANUFACTURED TERMINAL SECTION, TANGENT
 STA 85+62.00 LT - 86+13.00 LT
 STA 87+07.00 RT - 87+58.00 RT

DURABLE 4" WHITE LINE, THERMOPLASTIC
 STA 85+00.00 LT - 88+25.00 LT
 STA 85+00.00 RT - 88+25.00 RT

DURABLE 4" YELLOW LINE, THERMOPLASTIC (DOUBLE)
 STA 85+00.00 - 88+25.00

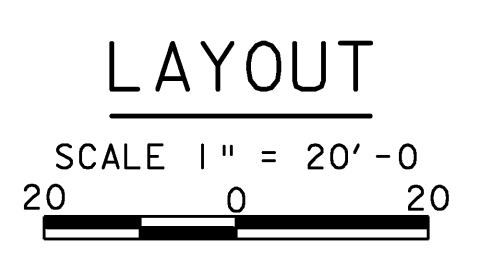
CURVE DATA VT 244
 DELTA = 17°40'25"
 D = 7°30'00"
 R = 763.94'
 T = 118.77'
 L = 235.65'
 E = 9.18'



NEW DRAINAGE DITCH
 ① STA 86+48.27 LT 28.20 - 86+66.23 LT 35.24

CONSTRUCT GRASS SWALE
 ② STA 85+43.22 LT 18.00 - 86+48.27 LT 28.20

TEMPORARY EROSION MATTING
 ③ STA 85+43.22 LT 18.00 - 86+48.27 LT 28.20



PROJECT NAME: FAIRLEE
 PROJECT NUMBER: STP CULV (13)

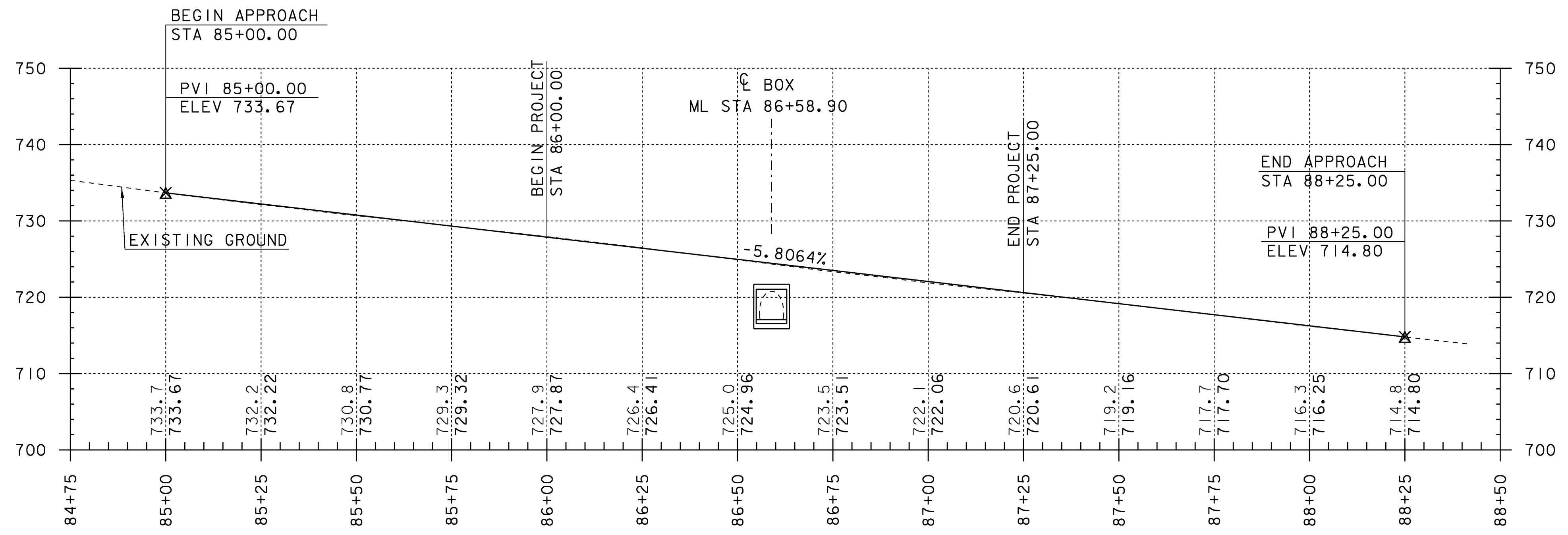
FILE NAME: s08c060bdr.dgn
 PROJECT LEADER: C.P.WILLIAMS
 DESIGNED BY: L.J.STONE
 LAYOUT

PLOT DATE: 11-MAR-2009
 DRAWN BY: L.J.STONE
 CHECKED BY: E.L.RUSTAY
 SHEET 8 OF 26

EXISTING BRIDGE DATA
 4H X 6W METAL PIPE
 CULVERT BUILT IN 1948
 CULVERT BARREL LENGTH = 56FT.
 WATERWAY AREA = 18SF.

BM#2
 RR SPIKE IN POLE
 ELEV: 722.57

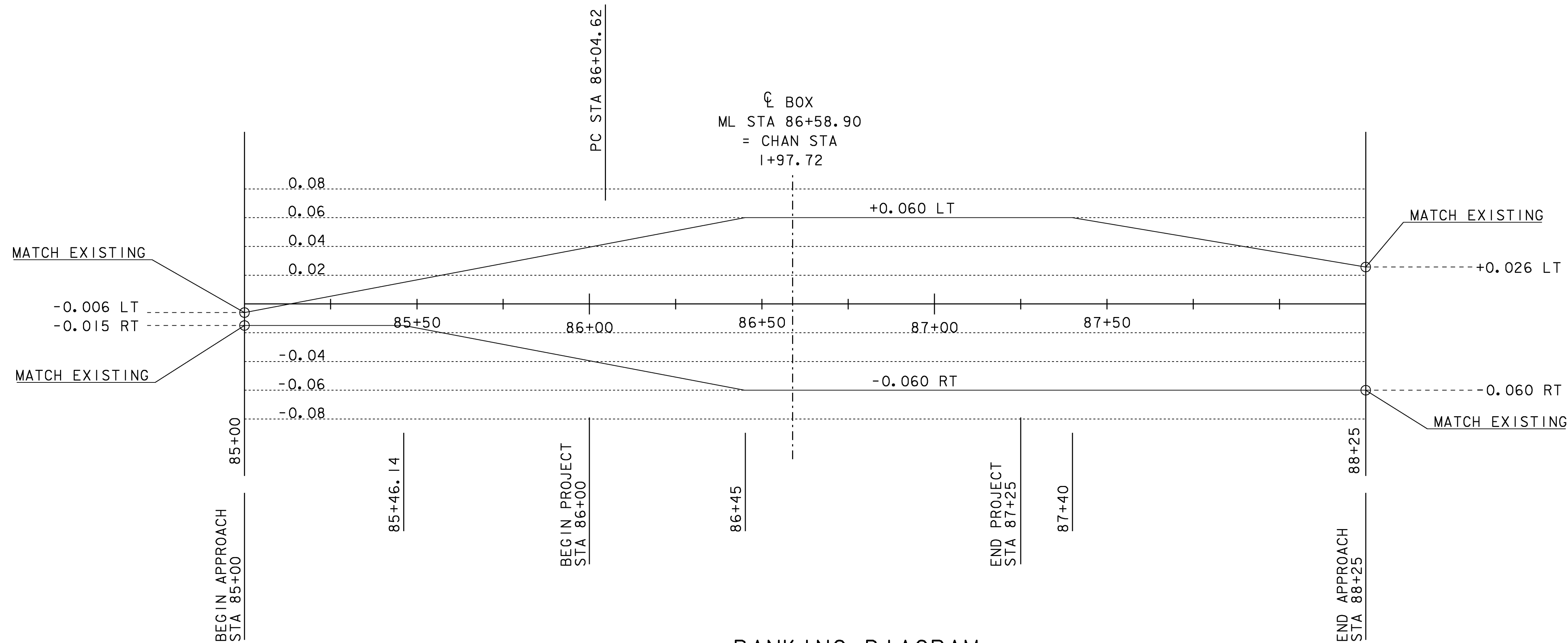
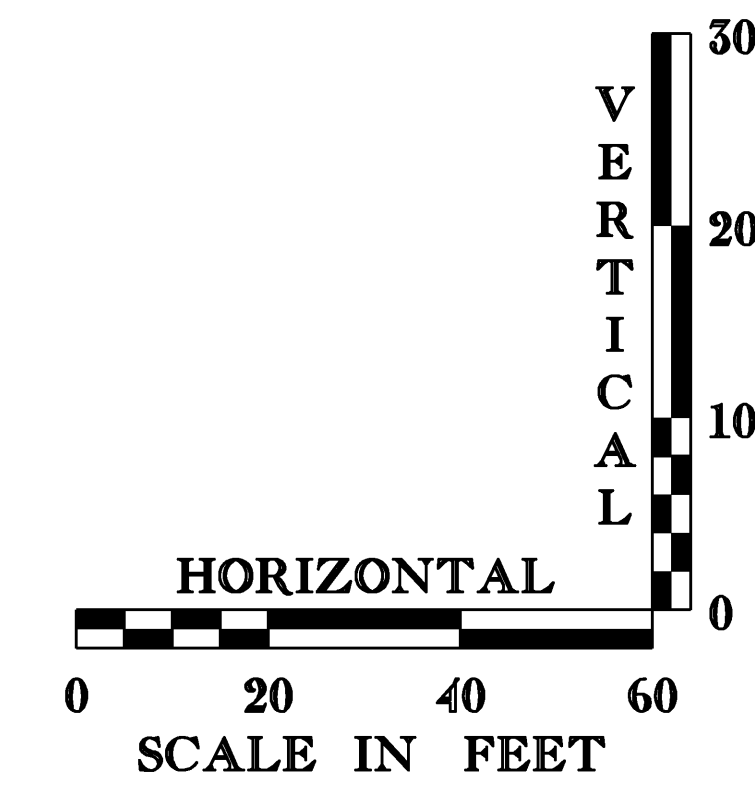
VT 244 MAINLINE PROFILE



NOTES:

GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG \bar{C} .

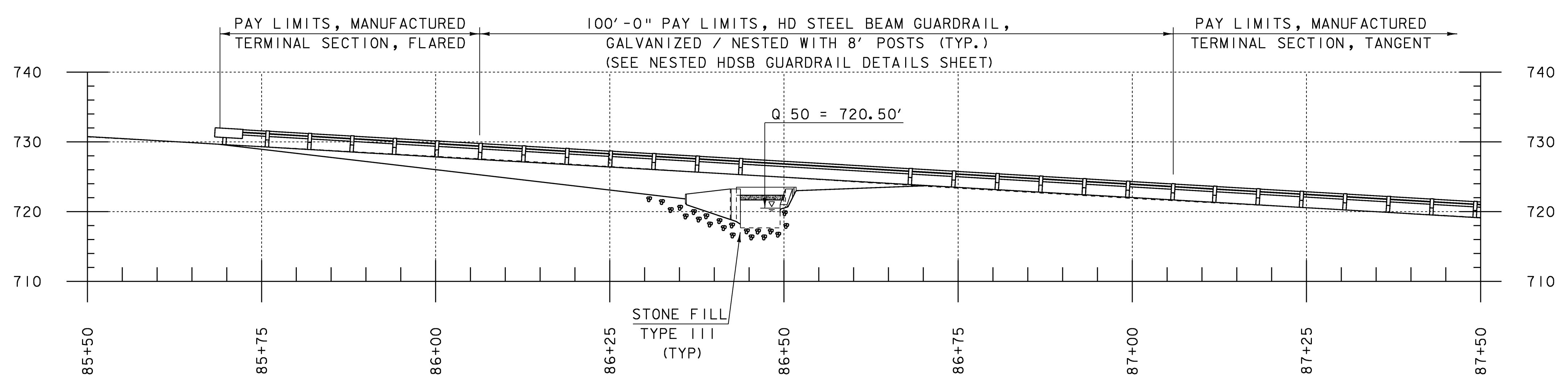
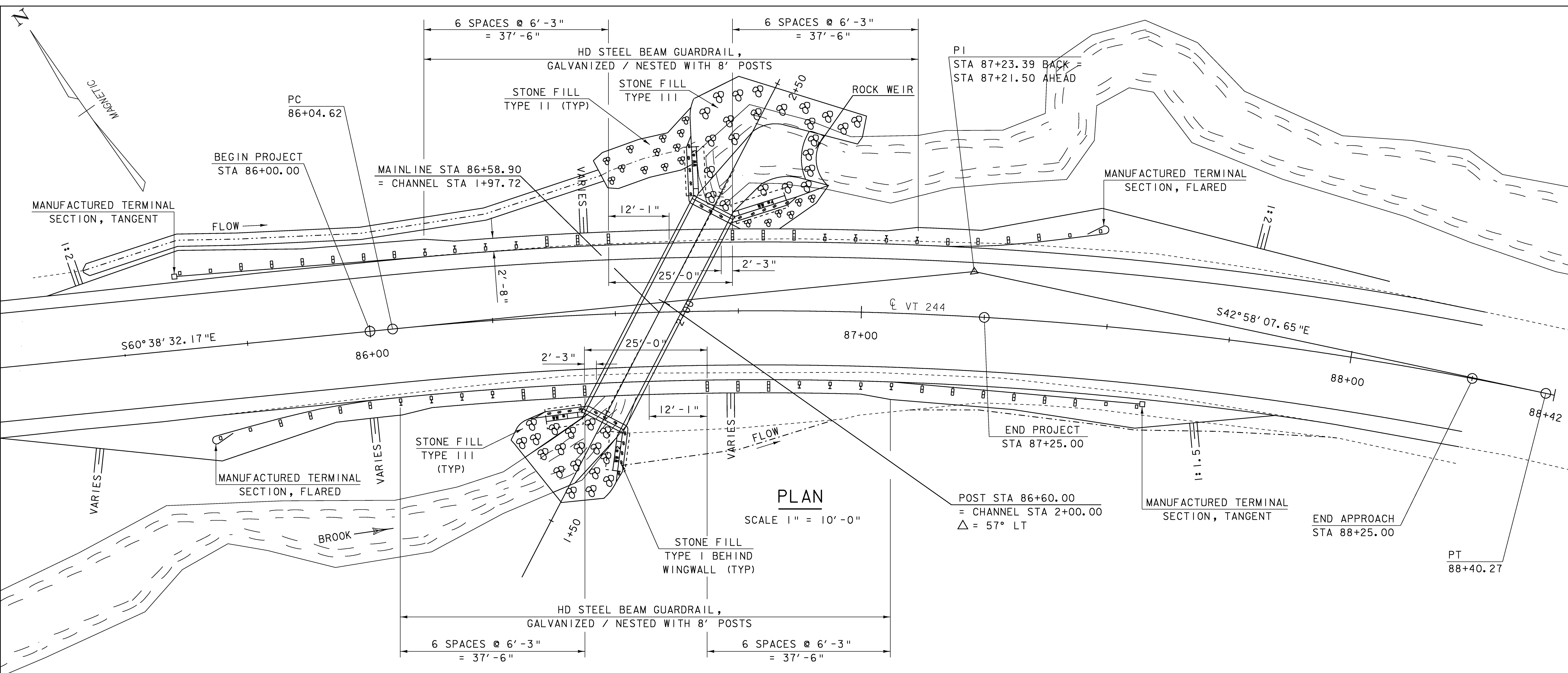
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE PROPOSED GROUND ALONG \bar{C} .



PROJECT NAME: FAIRLEE
PROJECT NUMBER: STP CULV (13)

FILE NAME: s08c060pro.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: L.J.STONE
VT 244 PROFILE

PLOT DATE: 11-MAR-2009
DRAWN BY: L.J.STONE
CHECKED BY: E.L.RUSTAY
SHEET 9 OF 26



ELEVATION @ UPSTREAM FASCIA VIEW
SCALE 1" = 10'-0"

PROJECT NAME: FAIRLEE	PLOT DATE: 11-MAR-2009
PROJECT NUMBER: STP CULV (13)	DRAWN BY: L.J.STONE
FILE NAME: s08c060pe.dgn	CHECKED BY: E.L.RUSTAY
PROJECT LEADER: C.P.WILLIAMS	SHEET 10 OF 26
DESIGNED BY: L.J.STONE	
PLAN AND ELEVATION	

TRAFFIC CONTROL NOTES:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DETOUR AND CONSTRUCTION SIGNING. THE EXACT LOCATION WILL BE COORDINATED BY THE RESIDENT ENGINEER AND THE CONTRACTOR AND SHALL BE IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES, DATED 2003, AND ITS LATEST REVISIONS AND THE LATEST EDITION OF THE STANDARD HIGHWAY SIGNS (SHS) BOOK.

TRAFFIC CONTROL WARNING SIGNS SHALL BE PROVIDED PER STANDARDS E-100, E-102 AND E-102A. ADDITIONAL PROJECT CONSTRUCTION SIGNS SHALL BE INSTALLED AS REQUIRED BY THE RESIDENT ENGINEER.

ALL ON AND OFF PROJECT SIGNS AND BARRICADES AS REQUIRED FOR THE DETOUR AND/OR ORDERED BY THE RESIDENT ENGINEER WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PAID FOR UNDER THE ITEM 641.10, "TRAFFIC CONTROL". ALL SIGNS AND BARRICADES SHALL BE INSPECTED DAILY AND REPAIRED AS NECESSARY. ALL SIGNS AND BARRICADES SHALL BE CLEARED OF DUST AND DEBRIS WEEKLY.

THE STATE ROUTE MARKERS USED FOR THE DETOUR AS SHOWN ON THE PLANS, SHALL FOLLOW STANDARDS E-127 AND E-136B. THESE SIGNS SHALL BE REMOVED AT THE END OF THE CONSTRUCTION PERIOD. THESE SIGNS AND THEIR REMOVAL SHALL BE PAID FOR UNDER ITEM 641.10 "TRAFFIC CONTROL"

PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE PLACED AT THE APPROXIMATE LOCATIONS SHOWN ON THE PLANS OR WHERE DESIGNATED BY THE RESIDENT ENGINEER. TWO SIGNS SHALL BE PLACED AT THE PROJECT LOCATION 14 DAYS PRIOR TO THE START OF CONSTRUCTION TO WARN OF THE IMPENDING DETOURS. THESE SHALL THEN BE REMOVED AND DEPLOYED TO THE LOCATIONS SHOWN ONCE CONSTRUCTION HAS BEGUN. PAYMENT FOR THESE SIGNS SHALL BE INCLUDED IN ITEM 641.17 "PORTABLE CHANGEABLE MESSAGE SIGN RENTAL".

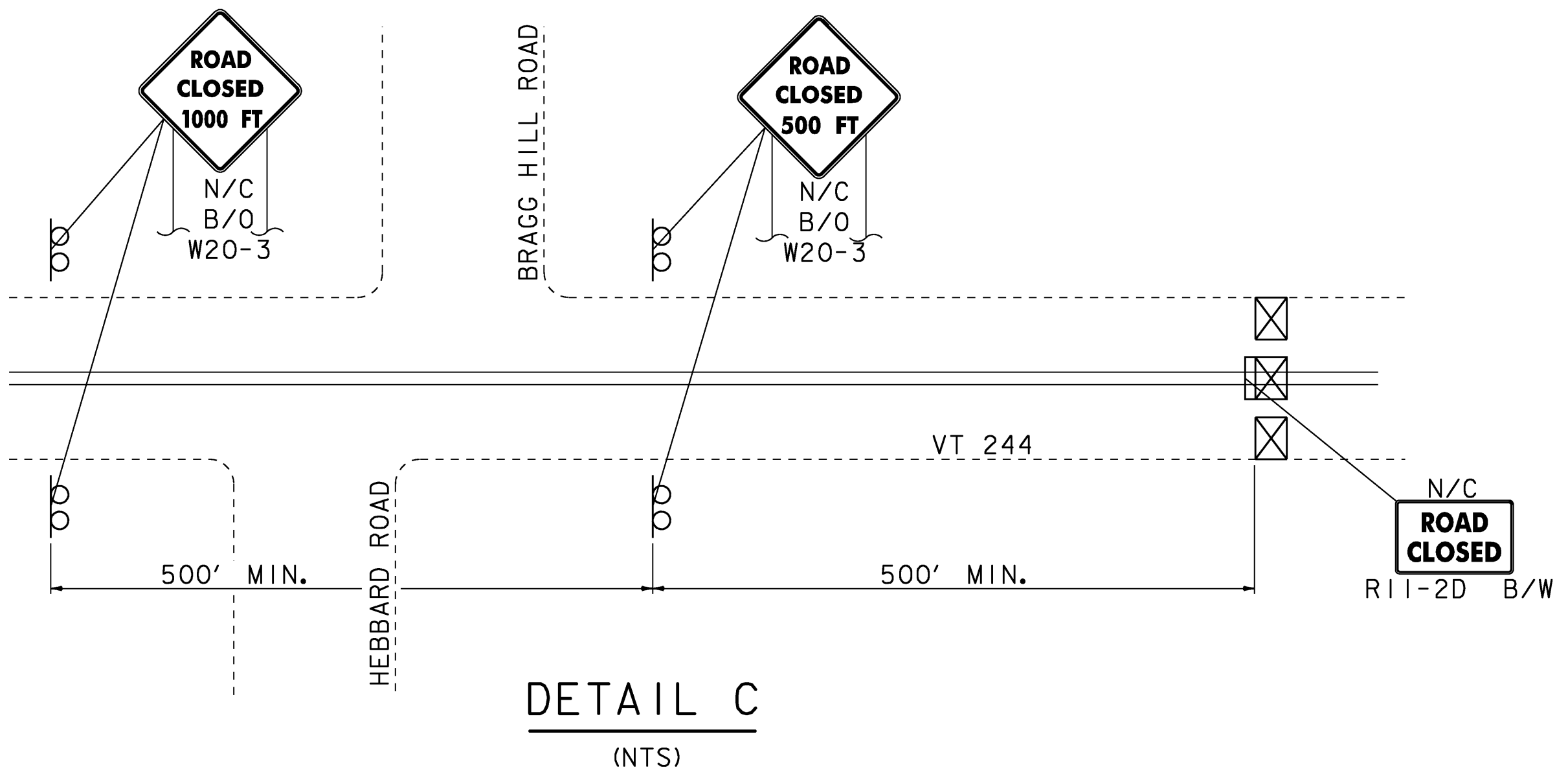
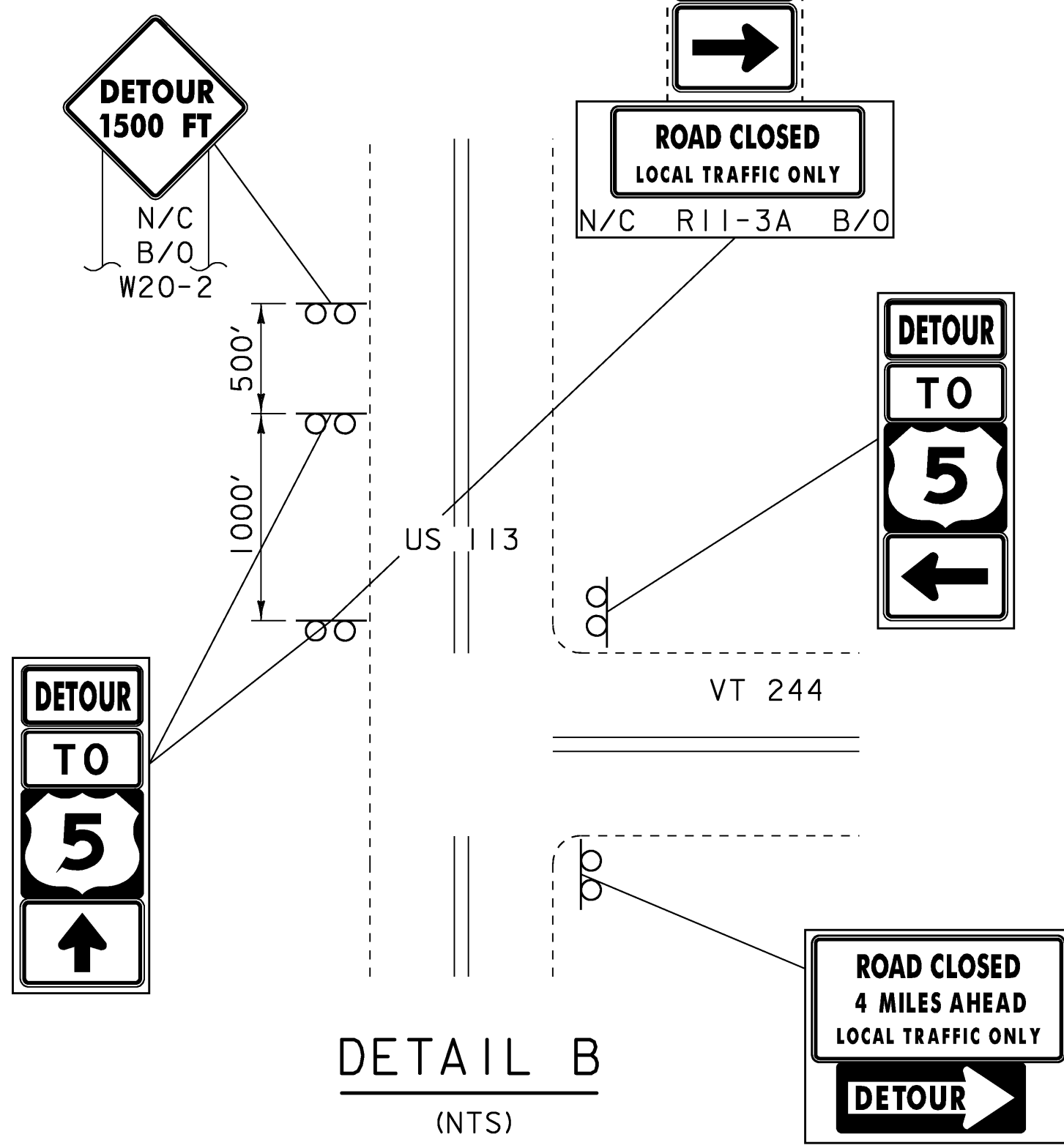
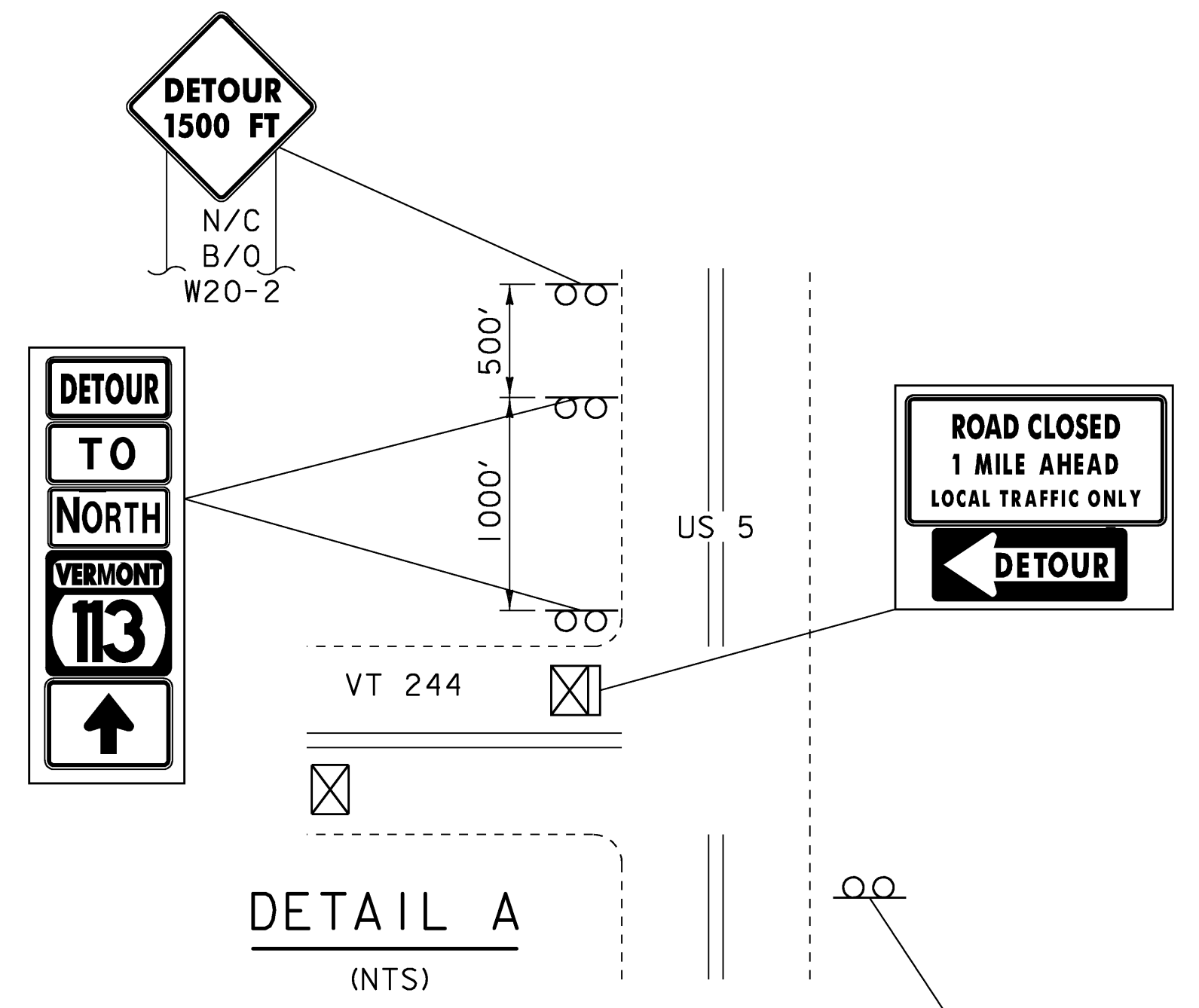
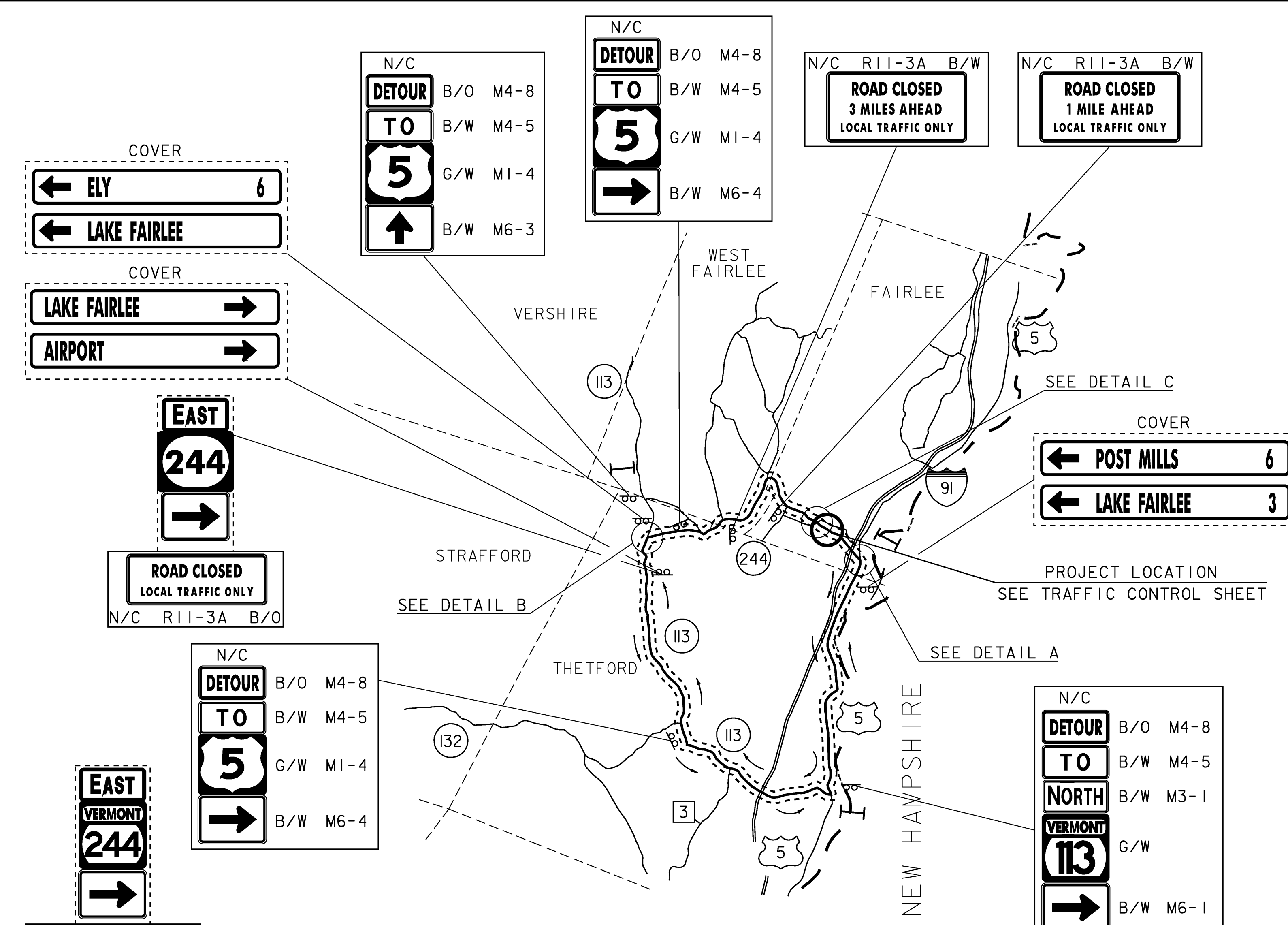
ITEM 641.12 "PUBLIC RELATIONS OFFICER" HAS BEEN INCLUDED FOR THE COORDINATION OF DETOUR INFORMATION AND TRAFFIC DELAYS FOR THE PUBLIC.

INSTALLATION OF DETOUR SIGNS SHALL NOT BLOCK ANY EXISTING TRAFFIC CONTROL SIGN ASSEMBLIES. CONTRACTOR SHALL TRY TO MAINTAIN AT LEAST 200 FEET BETWEEN SIGN ASSEMBLIES.

IT WILL BE THE RESPONSIBILITY OF THE RESIDENT ENGINEER TO MAKE ADJUSTMENTS AS NEEDED TO THE TRAFFIC CONTROL PLAN DUE TO CONFLICTS WITH EXISTING SIGNS AND DRIVEWAYS. ALL SIGNS REMOVED OR COVERED BY THE CONTRACTOR SHALL BE REPLACED OR UNCOVERED WHEN THE TRAFFIC CONTROL PLAN IS DISASSEMBLED.

FULL ACCESS TO ALL SIDE ROADS AND DRIVES WITHIN THE PROJECT LIMITS SHALL BE MAINTAINED AT ALL TIMES. THIS WORK SHALL BE CONSIDERED INCIDENTAL TO ITEM 641.10, "TRAFFIC CONTROL".

CONTACT DIG-SAFE AT 1-888-344-7233 PRIOR TO BREAKING GROUND TO INSTALL ANY SIGN POSTS.



LEGEND

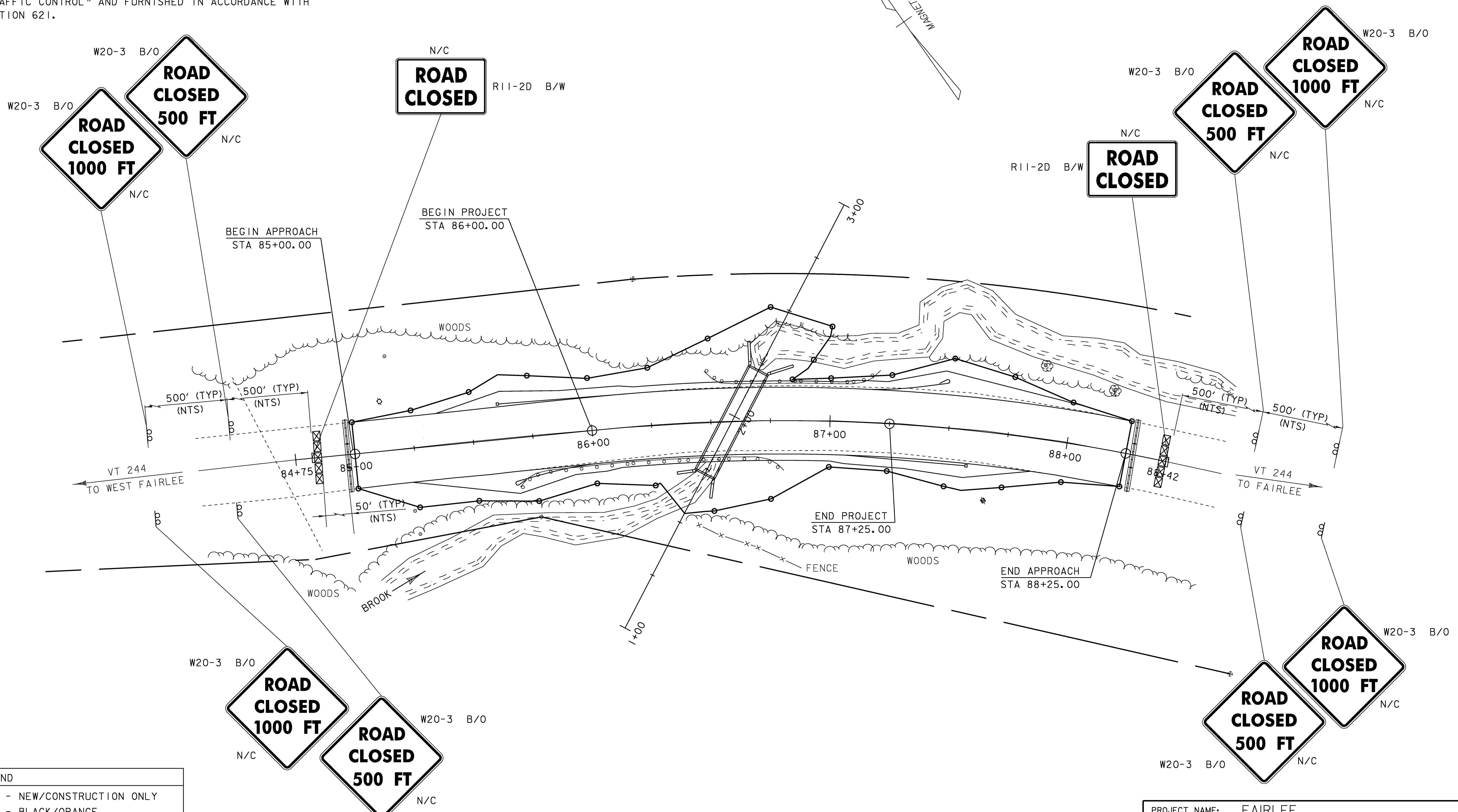
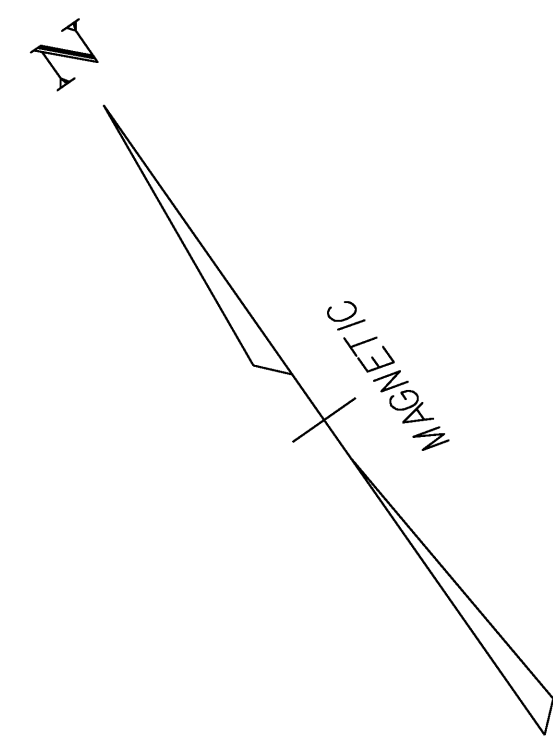
N/C	- NEW/CONSTRUCTION ONLY
B/O	- BLACK/ORANGE
G/W	- GREEN/WHITE
B/W	- BLACK/WHITE
⊠	- SIGN POST
⊠	- TYPE III BARRICADE
⊠	- TYPE III BARRICADE (MOD.)
I	- PORTABLE CHANGEABLE MESSAGE SIGN

DETOUR MAP
(NTS)

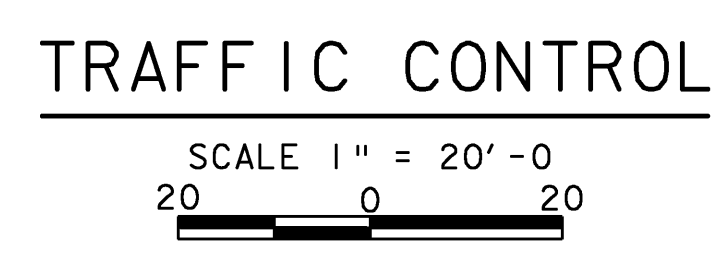
PROJECT NAME:	FAIRLEE
PROJECT NUMBER:	STP CULV (13)
FILE NAME:	s08c060detour.dgn
PROJECT LEADER:	C.P.WILLIAMS
DESIGNED BY:	L.J.STONE
DETOUR MAP	
PLOT DATE:	11-MAR-2009
DRAWN BY:	L.J.STONE
CHECKED BY:	E.L.RUSTAY
SHEET	11 OF 26

NOTE:
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR SIGNS AND BARRICADES SHOWN ON THIS SHEET. THEY SHALL BE PAID FOR UNDER ITEM 641.10 "TRAFFIC CONTROL".

TEMPORARY TRAFFIC BARRIER AT EACH END OF THE PROJECT SHALL BE CONSIDERED INCIDENTAL TO PAY ITEM 641.10, "TRAFFIC CONTROL" AND FURNISHED IN ACCORDANCE WITH SECTION 621.



LEGEND	
N/C	- NEW/CONSTRUCTION ONLY
B/O	- BLACK/ORANGE
B/W	- BLACK/WHITE
	- TYPE III BARRICADE
	- TYPE III BARRICADE (MOD.)
	- TEMPORARY TRAFFIC BARRIER



PROJECT NAME:	FAIRLEE	PLOT DATE:	11-MAR-2009
PROJECT NUMBER:	STP CULV (13)	DRAWN BY:	L.J.STONE
FILE NAME:	s08c060bdr.dgn	CHECKED BY:	E.L.RUSTAY
PROJECT LEADER:	C.P.WILLIAMS	TRAFFIC CONTROL	SHEET 12 OF 26
DESIGNED BY:	L.J.STONE		

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2006, AND ITS LATEST REVISIONS, AND THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, DATED 2007, AND ITS LATEST REVISIONS.
2. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68° FAHRENHEIT, UNLESS NOTED OTHERWISE.
3. A MINIMUM OF 1'-0" COVER OVER THE BOX MUST BE PROVIDED BEFORE ALLOWING ANY VEHICLE OVER THE NEW STRUCTURE.
4. ITEM 529.15, "REMOVAL OF STRUCTURE" SHALL BE USED FOR REMOVAL OF THE EXISTING PIPE ARCH AND ANY PORTIONS OF HEADWALLS NOT REMOVED UNDER THE ITEMS "STRUCTURE EXCAVATION" OR "UNCLASSIFIED CHANNEL EXCAVATION".
5. REINFORCING STEEL PLACEMENT TOLERANCES SHALL BE AS FOLLOWS:
SPACING +/- 1"
CLEARANCE +/- 1/4"
6. TACK COAT: EMULSIFIED ASPHALT IS TO BE APPLIED AT A RATE OF 0.025 GAL/SY BETWEEN SUCCESSIVE COURSES OF PAVEMENT OR AS DIRECTED BY THE ENGINEER.
7. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" X 1".
8. WATER REPELLENT, SILANE SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES OF THE BOX, WINGWALLS, AND HEADWALLS. WATER REPELLENT SHALL BE APPLIED TO THE EXPOSED INSIDE SURFACE OF THE BOX STARTING AT THE OPENING AT EACH END AND EXTENDING 3 FEET INTO THE BOX, INCLUDING THE BOTTOM SURFACE OF THE TOP SLAB AND THE TOP SURFACE OF THE BOTTOM SLAB. THIS SHALL BE PAID FOR UNDER ITEM 514.10, "WATER REPELLENT, SILANE".
9. THIS CULVERT SHALL BE BUILT USING ACCELERATED CONSTRUCTION TECHNIQUES. SEE SPECIAL PROVISIONS FOR DETAILS.
10. ALL ROADWORK AND BRIDGE WORK HAS BEEN DESIGNED TO BE CONSTRUCTED WITHIN THE EXISTING RIGHT OF WAY AS SHOWN ON THE PLANS.
11. FOR INFORMATION REGARDING UTILITIES, SEE THE SPECIAL PROVISIONS.
12. CARE SHALL BE TAKEN WHEN DRIVING GUARDRAIL POSTS OVER THE BOX AS TO NOT DAMAGE THE BOX WITH THE BREAKAWAY POST. THE PORTION OF RAIL ABOVE THE BOX SHALL BE A 25'-0" SECTION OF DOUBLE NESTED RAIL. THE PAYMENT FOR NESTED RAIL SECTIONS OVER THE BOX SHALL BE PAID FOR UNDER ITEM 621.217, "HD STEEL BEAM GUARDRAIL, GALVANIZED/NESTED W/8 FEET POSTS".
13. NO SUBSURFACE INVESTIGATION HAS BEEN CONDUCTED ON THIS PROJECT. LEDGE OR BOULDERS MAY OR MAY NOT BE ENCOUNTERED DURING THE CONSTRUCTION PROCESS. IF NECESSARY, THE ENGINEER WILL MAKE A DETERMINATION REGARDING SUBSURFACE CONDITIONS IN ACCORDANCE WITH SUBSECTION 104.08.

EARTHWORK AND RELATED ITEMS

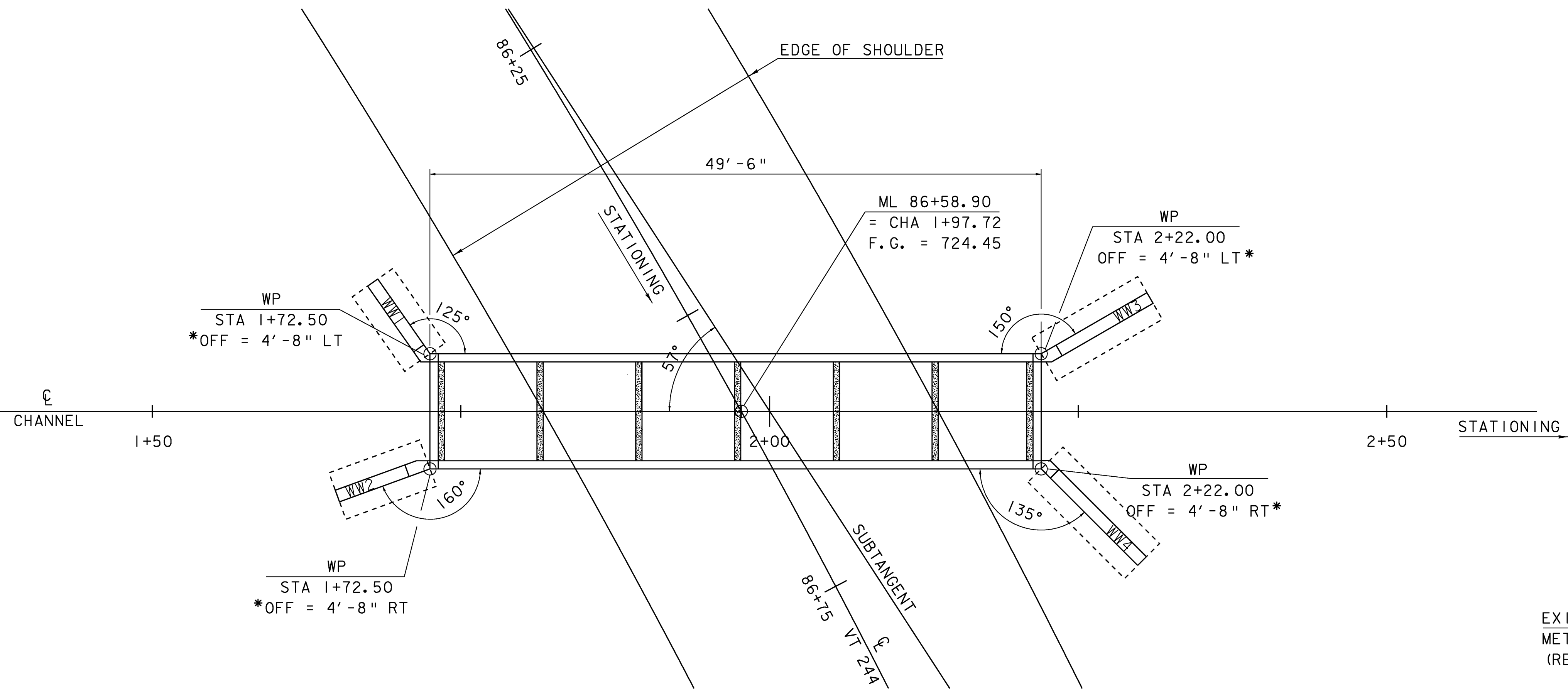
14. TEMPORARY CONSTRUCTION FILLS WITHIN THE WATERCOURSE FOR ANY PURPOSE SHALL CONSIST OF CLEAN STONE FILL ONLY. NO OTHER FILLING IN THE STREAM SHALL OCCUR WITHOUT THE APPROVAL OF THE STREAM ALTERATION ENGINEER.
15. "STONE FILL, TYPE I" SHALL BE USED AT THE DISCRETION OF THE RESIDENT ENGINEER TO PREVENT EROSION BEHIND THE WINGWALLS AND AS DIRECTED ON THE PLANS. PAYMENT FOR MATERIAL AND PLACEMENT SHALL BE MADE UNDER ITEM 613.10, "STONE FILL, TYPE I".

PRECAST CONCRETE BOX

16. DESIGN CRITERIA:
 - A. DESIGN SHALL BE IN ACCORDANCE WITH 2007 AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.
 - B. SOIL UNIT WEIGHT OF RETAINED SOIL = 140 PCF
 - C. DESIGN LIVE LOAD = AASHTO HL-93
 - D. NOMINAL (UNFACTORED) BEARING RESISTANCE <= 6.7 KSF
 - E. USE K_o FOR THE DESIGN OF THE CONCRETE BOX AND K_a FOR THE DESIGN OF THE WINGWALLS.
 - F. CONCRETE COMPRESSIVE STRENGTH - SEE SUBSECTION 540.05(e)
 - G. ALL REINFORCING STEEL SHALL BE GRADE 60 BLACK REBAR.
 - H. THE WINGWALLS MUST BE AN EARTH RETAINING WALL SYSTEM WHICH HAS BEEN REVIEWED AND APPROVED BY THE STATE OF VERMONT AGENCY OF TRANSPORTATION.
17. THE LUMP SUM COST FOR ITEM 540.10, "PRECAST CONCRETE STRUCTURE" SHALL INCLUDE PRECAST HEADWALLS, PRECAST WINGWALLS, PRECAST CUTOFF WALLS, ANY JOINT SEALER REQUIRED, AND ANY OTHER LABOR AND MATERIALS NECESSARY TO INSTALL THE BOX.
18. A LOAD RATING SHALL BE PROVIDED BY THE PRECAST CONCRETE BOX FABRICATOR. THIS SHALL BE PAID FOR UNDER ITEM 540.10, "PRECAST CONCRETE STRUCTURE".
19. THE PRECAST SECTIONS ARE SHOWN FOR REFERENCE ONLY. THE ACTUAL DIMENSIONS AND CONFIGURATION WILL BE DEPENDENT ON THE FABRICATOR. THE MINIMUM INSIDE CLEAR DIMENSION SHALL BE 8'-0" AND THE RISE SHALL BE 4'-6". THE ENDS OF THE FIRST AND LAST UNITS SHALL BE VERTICAL.
20. HEADWALLS, CUTOFF WALLS, AND WINGWALLS #1, #2, #3, & #4 SHALL BE PRECAST. ALL CONNECTIONS SHALL BE DESIGNED AND SUBMITTED TO THE STRUCTURES ENGINEER FOR APPROVAL.
21. BACKFILLING BEHIND THE BOX AND USE OF EQUIPMENT ON OR ADJACENT TO THE BOX SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
22. THE SILLS WILL BE 1'-0" FRONT TO BACK AND 8'-0" LONG AS SHOWN IN PLANS. THEY WILL BE PRECAST CONCRETE PLACED AT THE FACTORY AS SHOWN ON THE PLANS AT ROUGHLY 8'-0" ON CENTER AND AT BOTH THE INLET AND THE OUTLET.
23. THE STRUCTURE WILL BE AT A 2.50% GRADE SIMULATING THAT OF THE STREAM.
24. THE EXTERIOR (TOP AND SIDES) OF ALL CONCRETE BOX 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".
25. A TWO (2) FOOT WIDE STRIP OF MEMBRANE WATERPROOFING SHALL BE INSTALLED (IN ACCORDANCE WITH SECTION 519) AT EACH BOX JOINT (TOP AND SIDES). THE MEMBRANE SHALL BE CENTERED ON THE JOINT AND COVER THE FULL HEIGHT OF THE SIDE JOINTS. THE TOP OF THE JOINTS SHALL THEN BE COVERED WITH THE TWO (2) FOOT STRIP OF MEMBRANE. THE SHEETS SHALL OVERLAP THE EDGES BY ONE (1) FOOT ON EACH SIDE. THE PAYMENT FOR MEMBRANE SHALL BE UNDER THE ITEM 519.20, "SHEET MEMBRANE WATERPROOFING, TORCH APPLIED".
26. THE FABRICATOR SHALL PROVIDE FABRICATION DRAWINGS, CONFORMING TO VAOT STANDARD SPECIFICATION SUBSECTION 105.03 AND THE APPLICABLE PROVISIONS OF SUBSECTION 540.10 AND DESIGN CALCULATIONS TO THE STRUCTURES ENGINEER FOR WRITTEN APPROVAL PRIOR TO CONSTRUCTION.
27. NO HOLES SHALL BE DRILLED IN THE BOX WITHOUT THE APPROVAL OF THE FABRICATOR AND THE STATE OF VERMONT AGENCY OF TRANSPORTATION.
28. NEW PRECAST CONCRETE BOX AND WINGWALLS SHALL BE INSTALLED IN THE DRY. CONTROL OF WATER SHALL BE PAID FOR UNDER PAY ITEM 900.645, "SPECIAL PROVISION (TEMPORARY RELOCATION OF STREAM)".

PROJECT NAME: FAIRLEE
PROJECT NUMBER: STP CULV (13)

FILE NAME: s08c060notes.dgn	PLOT DATE: 11-MAR-2009
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: E.L.RUSTAY
GENERAL NOTES	SHEET 13 OF 26

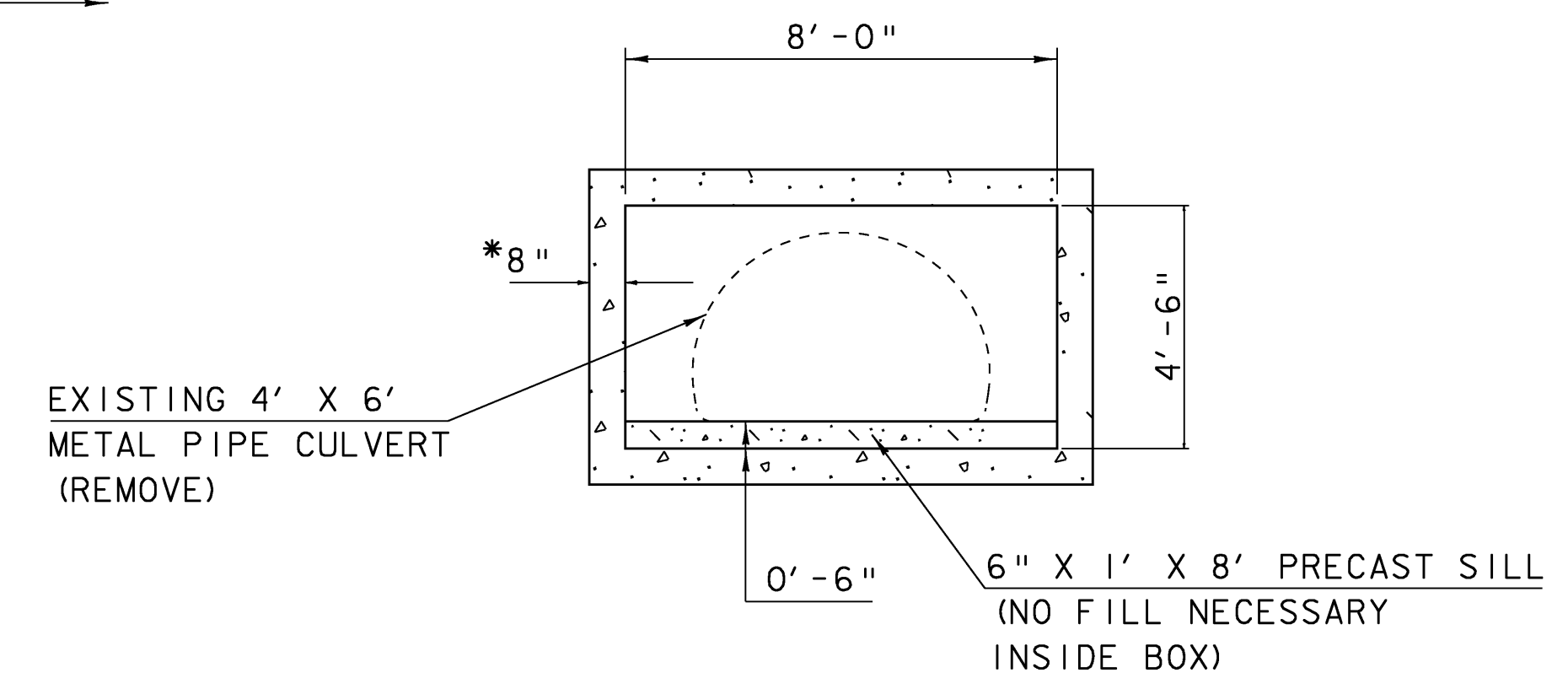


PRECAST CONCRETE BOX LAYOUT

SCALE 1" = 6'-0"
 6 3 0 6

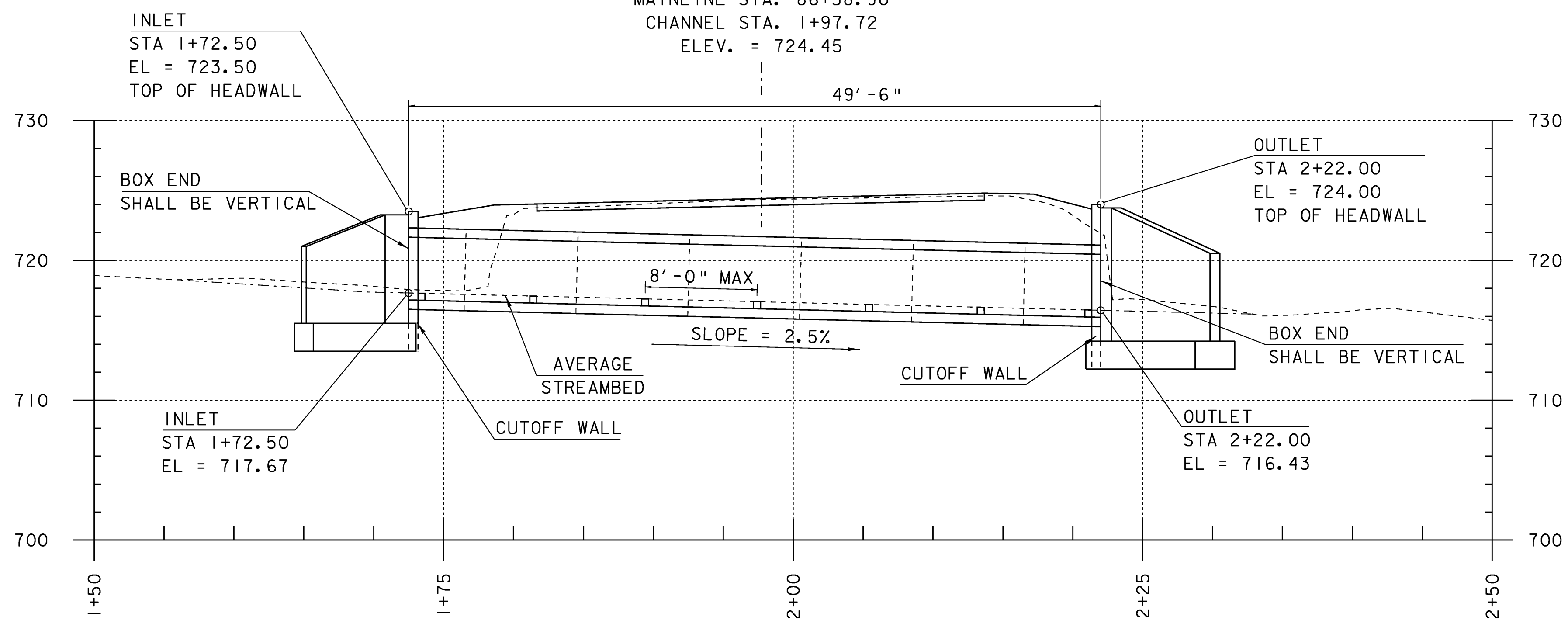
VT 244
 MAINLINE STA. 86+58.90
 CHANNEL STA. 1+97.72
 ELEV. = 724.45

***NOTE:**
 DIMENSIONS SHOWN ARE MEASURED
 BASED ON AN ASSUMED BOX WALL
 THICKNESS OF 0'-8".



PRECAST CONCRETE BOX CROSS SECTION

SCALE 1" = 3'-0"
 3 0 3

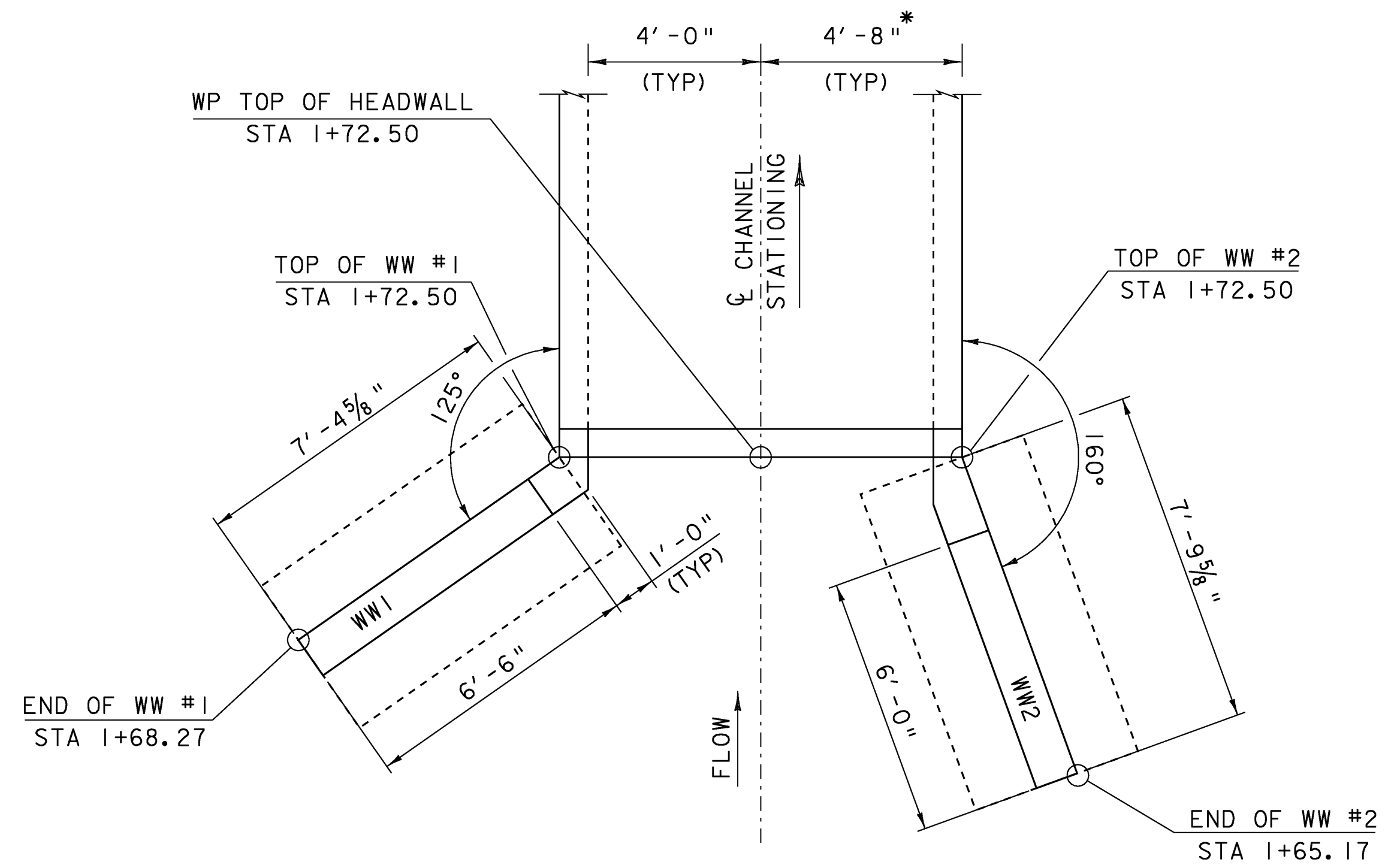


PRECAST CONCRETE BOX ELEVATION VIEW

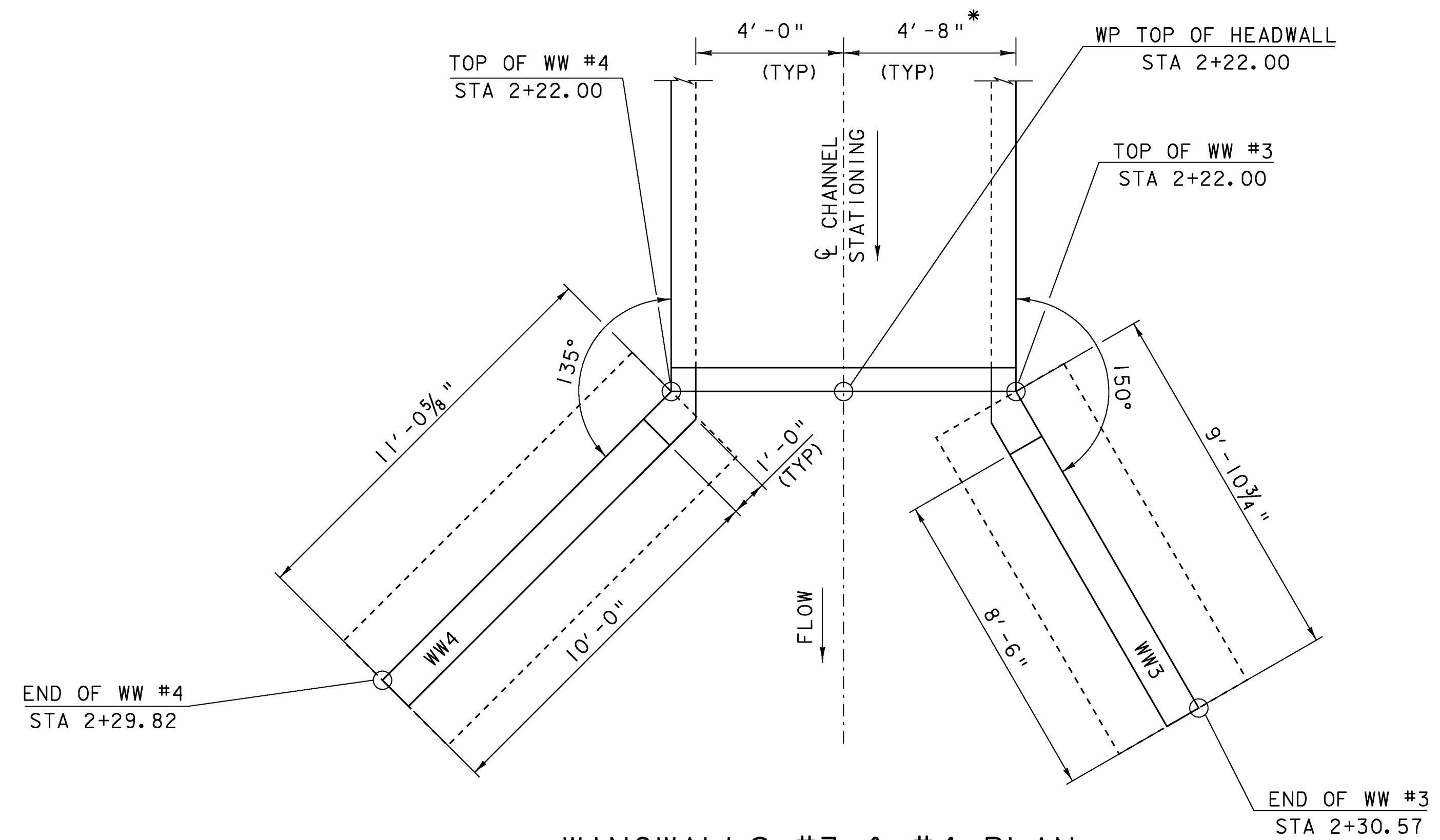
(PROFILE ALONG CL OF CHANNEL)

SCALE 1" = 6'-0"
 6 3 0 6

PROJECT NAME: FAIRLEE	PLOT DATE: 11-MAR-2009
PROJECT NUMBER: STP CULV (13)	DRAWN BY: L.J.STONE
FILE NAME: s08c060pipepro.dgn	CHECKED BY: E.L.RUSTAY
PROJECT LEADER: C.P.WILLIAMS	SHEET 14 OF 26
DESIGNED BY: L.J.STONE	
BOX CONSTRUCTION DETAILS	

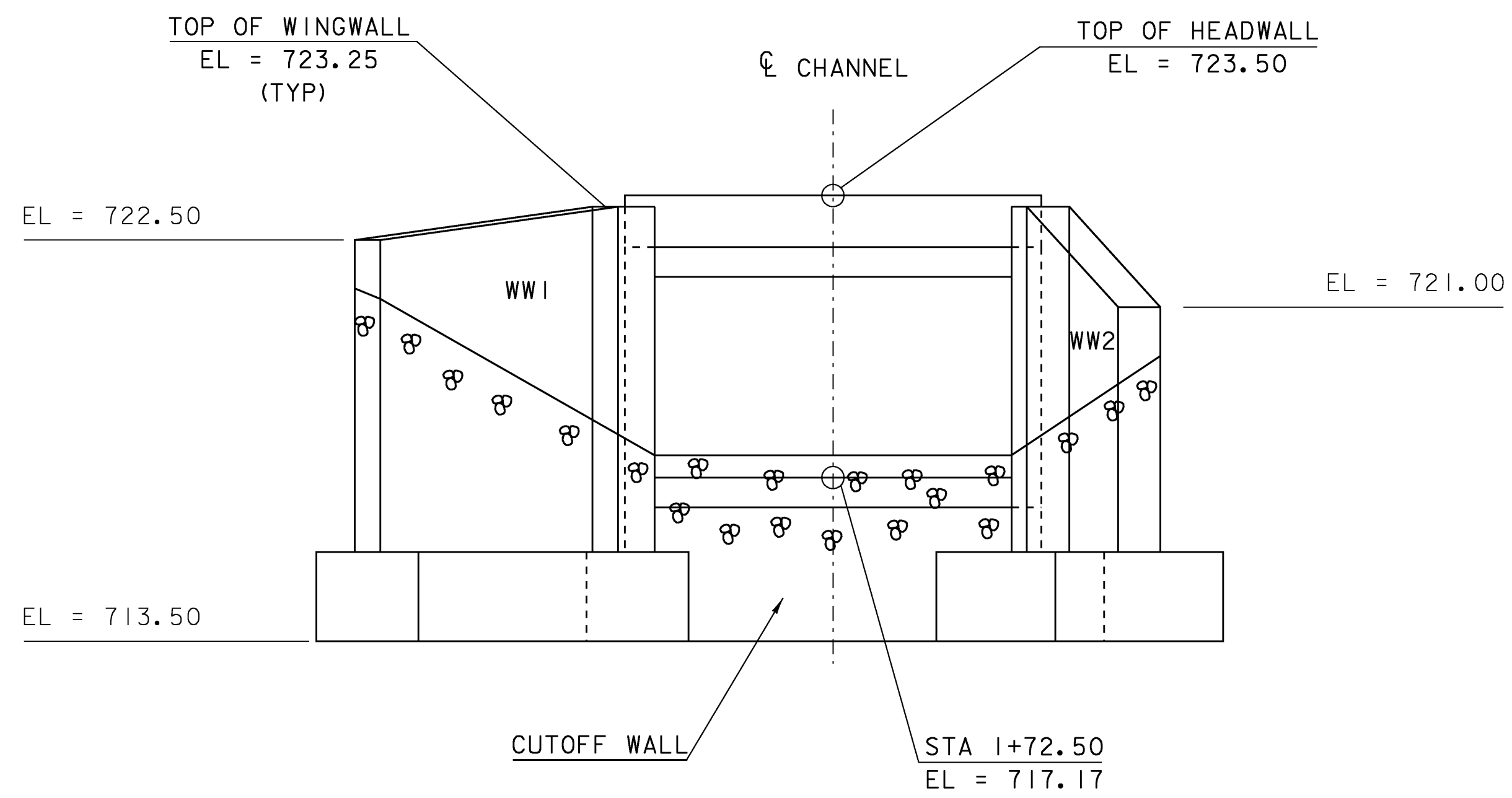


WINGWALLS #1 & #2 PLAN
SCALE 3/8" = 1'-0"

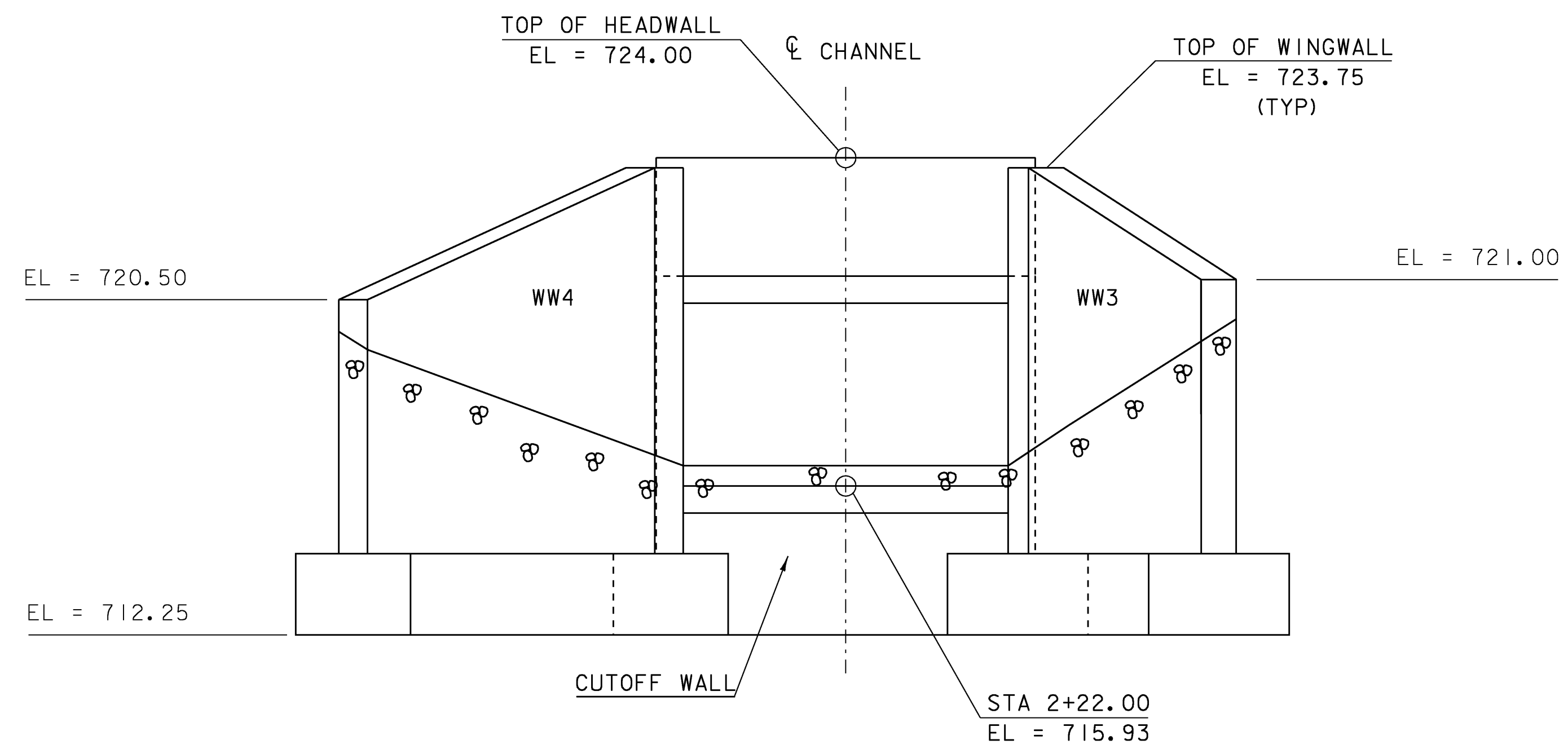


WINGWALLS #3 & #4 PLAN
SCALE 3/8" = 1'-0"

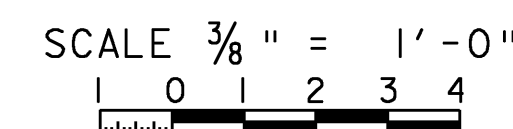
*NOTE:
DIMENSIONS SHOWN ARE MEASURED
BASED ON AN ASSUMED BOX WALL
THICKNESS OF 0'-8".



WINGWALLS #1 & #2 ELEVATION
SCALE 3/8" = 1'-0"
(AT INLET)



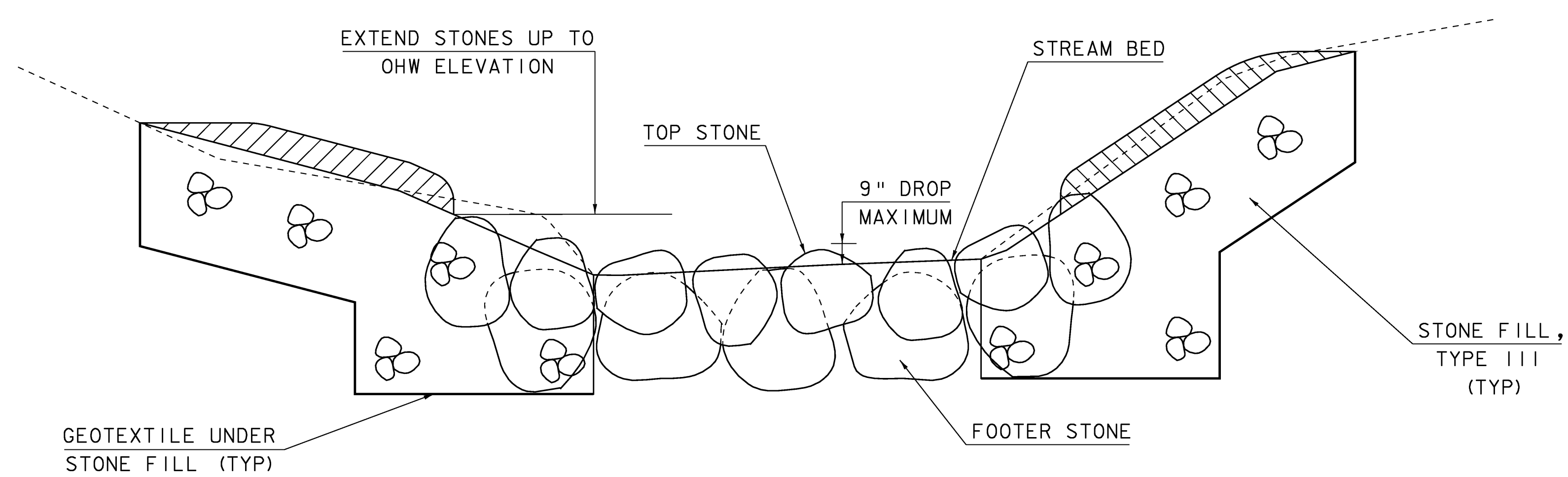
WINGWALLS #3 & #4 ELEVATION
SCALE 3/8" = 1'-0"
(AT OUTLET)



PROJECT NAME: FAIRLEE
PROJECT NUMBER: STP CULV (13)

FILE NAME: s08c060p1pepro.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: L.J.STONE
WINGWALL LAYOUT

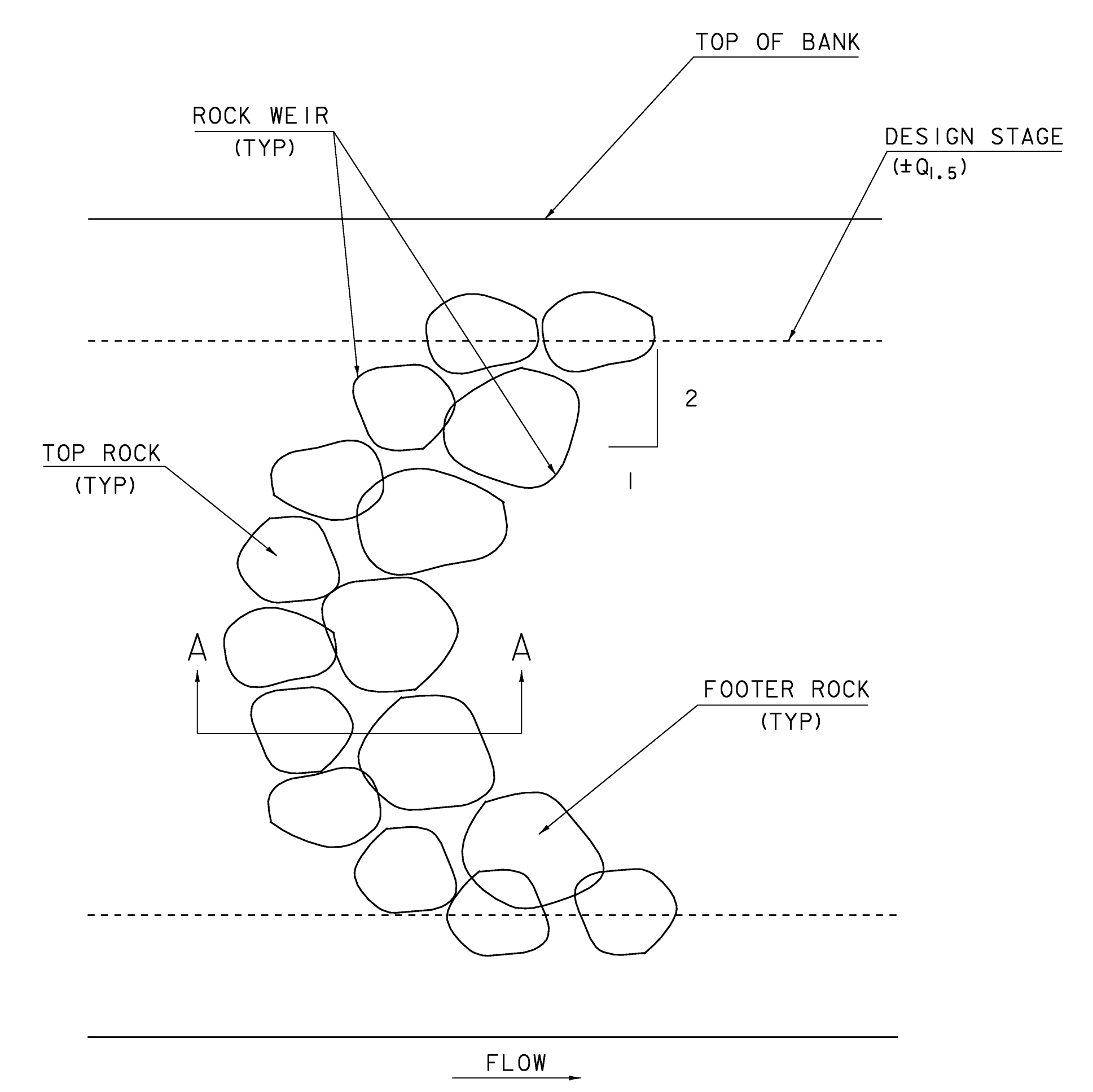
PLOT DATE: 11-MAR-2009
DRAWN BY: L.J.STONE
CHECKED BY: E.L.RUSTAY
SHEET 15 OF 26



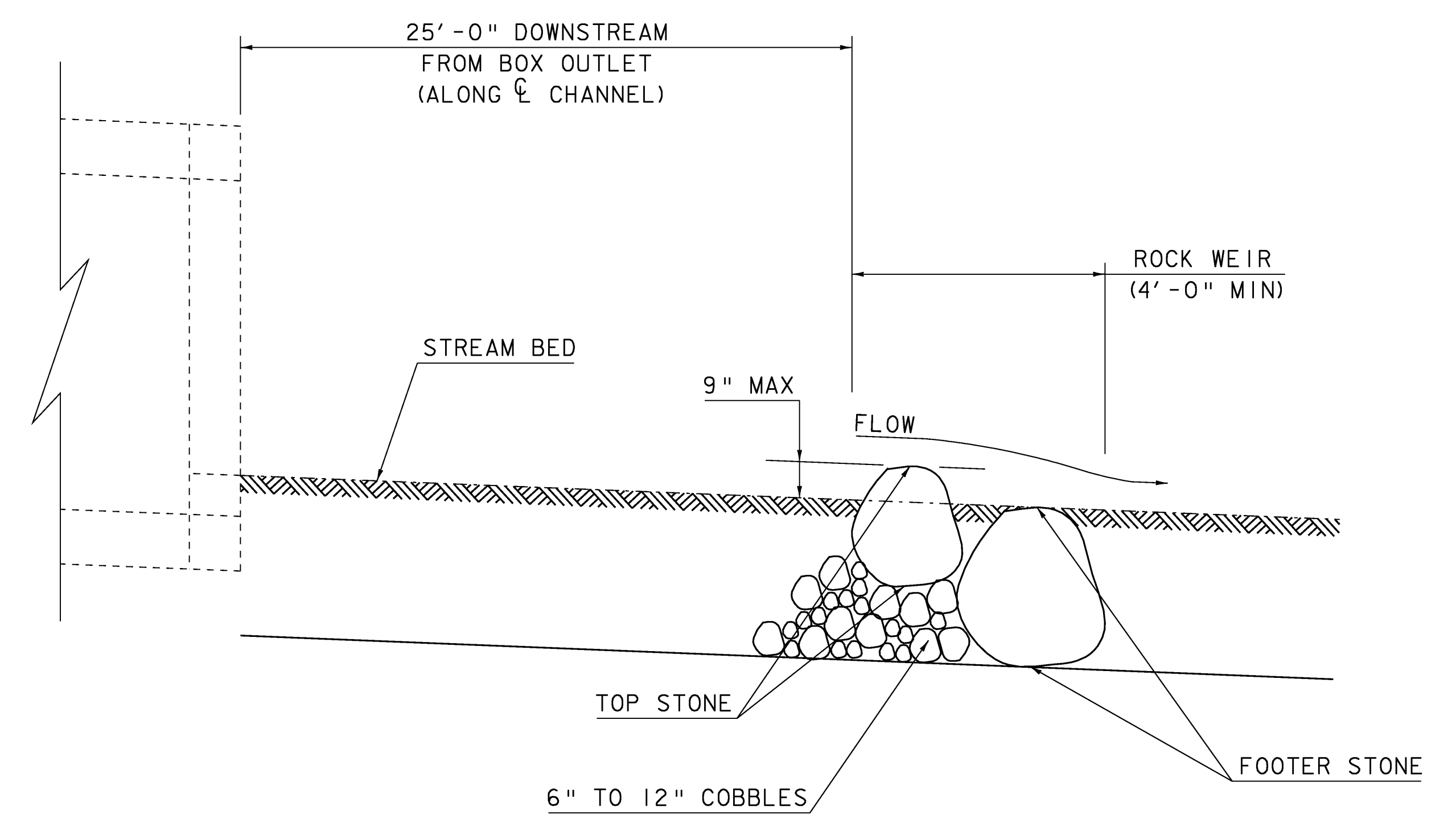
SECTION AT ROCK WEIR IN CHANNEL
(NTS)

ROCK WEIR NOTES:

1. THE ROCK WEIR SHALL BE USED FOR OUTLET SCOUR CONTROL.
2. THE STONES FOR THE ROCK WEIR, ANY ASSOCIATED WORK, AND MATERIALS NEEDED TO CONSTRUCT THE ROCK WEIR SHALL BE PAID FOR UNDER ITEM 900.620 "SPECIAL PROVISION (ROCK WEIR)".
3. ASSURE COMPATIBILITY OF STRUCTURE WITH PLAN FORM LOCATION, ASSOCIATED BED FEATURES, AND CHANNEL LONGITUDINAL SLOPE.
4. THERE SHALL BE ONE ROCK WEIR LOCATED 25'-0" DOWNSTREAM ALONG \bar{C} , FROM THE OUTLET OF THE BOX CULVERT.



ROCK WEIR PLAN VIEW
(NTS)

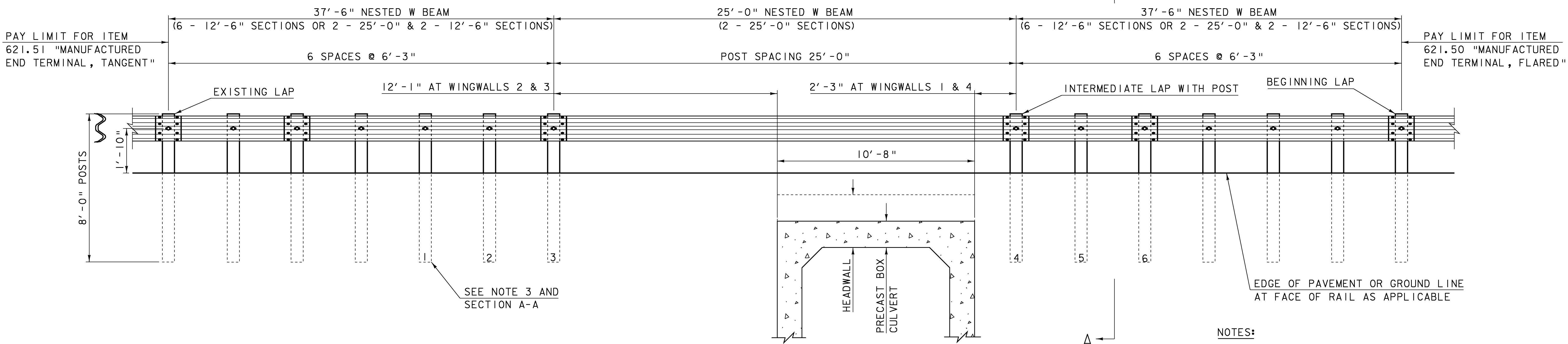


SECTION A-A
(NTS)

PROJECT NAME: FAIRLEE	PLOT DATE: 11-MAR-2009
PROJECT NUMBER: STP CULV (13)	DRAWN BY: L.J.STONE
FILE NAME: s08c060p1pepro.dgn	CHECKED BY: E.L.RUSTAY
PROJECT LEADER: C.P.WILLIAMS	SHEET 16 OF 26
DESIGNED BY: L.J.STONE	
ROCK WEIR DETAILS	



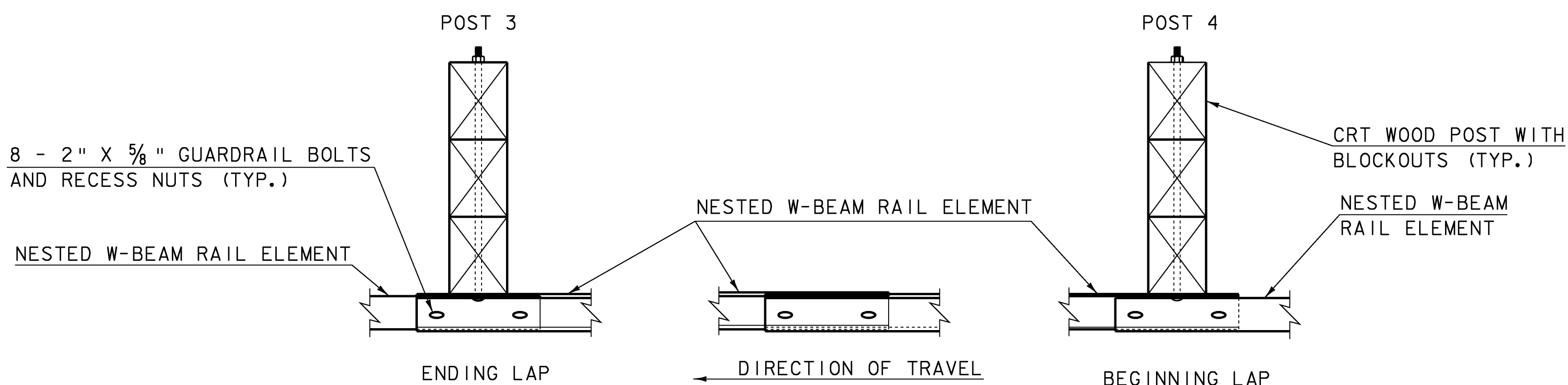
NESTED RAILING PLAN VIEW
(NTS)



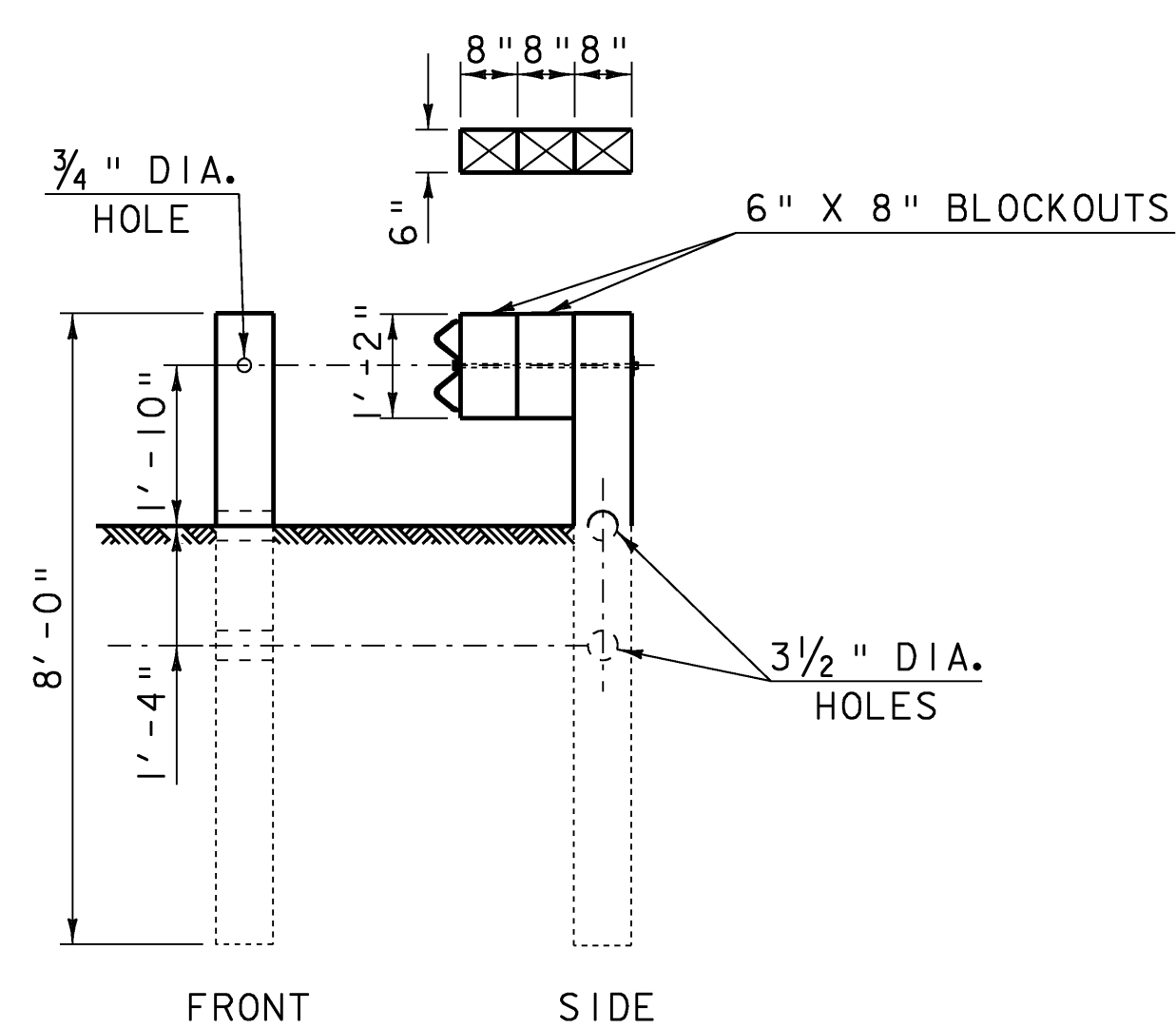
NESTED RAILING ELEVATION VIEW
(NTS)

NOTES:

1. RAIL MEETS TEST LEVEL 3 REQUIREMENTS OF NCHRP REPORT 350.
2. 25'-0" RAIL LENGTH WILL BE USED TO ELIMINATE THE INTERMEDIATE LAP WITHOUT A POST.
3. POSTS 1 THRU 6 ARE BREAKAWAY CONTROLLED RELEASING TERMINAL (CRT) POSTS, SEE SECTION A-A FOR DETAILS.
4. POSTS 1 THRU 6 HAVE TWO, 6" X 8" BLOCKOUTS. SEE SECTION A-A FOR DETAILS.
5. ON POSTS 1 THRU 6, GUARDRAIL BOLT "D", AS SHOWN ON STD G1, SHALL BE 26" LONG.
6. ON ALL POSTS WHERE THE RAIL IS DOUBLE-NESTED GUARDRAIL BOLT "A", AS SHOWN ON STD G1, SHALL BE 2" LONG.
7. ALL POSTS WHERE THE RAIL IS DOUBLE-NESTED SHALL BE 8 FEET LONG TO PROVIDE FOR A 2'-8" SLOPE BREAKLINE.
8. SEE STD G1 FOR ADDITIONAL GUARDRAIL DETAILS.



INTERMEDIATE LAP WITHOUT POST
(NTS)



SECTION A-A
(POSTS 1 THRU 6)
(SEE NOTES 3 & 4)

PROJECT NAME: FAIRLEE
PROJECT NUMBER: STP CULV (13)

FILE NAME: s08c060r-all.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: L.J.STONE
NESTED HDSB GUARDRAIL DETAILS

PLOT DATE: 11-MAR-2009
DRAWN BY: L.J.STONE
CHECKED BY: E.L.RUSTAY
SHEET 17 OF 26

EROSION CONTROL NARRATIVE

1.1 PROJECT DESCRIPTION

THIS PROJECT INVOLVES THE REPLACEMENT OF THE EXISTING CORRUGATED GALVANIZED METAL PIPE ARCH CULVERT (CGMPAC) WITH A PRE-CAST CONCRETE BOX CULVERT, ALONG WITH MINIMAL APPROACH AND CHANNEL WORK. BRIDGE #9 IS LOCATED IN THE TOWN OF FAIRLEE ON VT RT 244, APPROXIMATELY 1.0 MILES WEST OF ITS INTERSECTION WITH US RT 5. THE NEW CULVERT WILL BE A CONCRETE BOX APPROXIMATELY 50' LONG, 4' TALL AND 8' WIDE. THE NEW CULVERT WILL BE ON THE SAME ALIGNMENT, AT A 57° SKEW FROM THE CENTERLINE TANGENT. ALL SLOPES AND ALL VEGETATION WILL BE RETURNED TO THEIR ORIGINAL CONDITION THROUGH STANDARD SEED AND MULCH PRACTICES. STONE FILL TYPE III WILL BE USED TO STABILIZE THE RIVER BANKS. EXISTING STONE FILL WILL BE STABILIZED, WITHIN THE STONE FILL LIMITS, WHERE DEEMED NECESSARY BY THE RESIDENT ENGINEER.

NOTE: AREA OF DISTURBANCE SHALL INCLUDE LIMITS OF EARTH DISTURBANCE WITHIN THE PROJECT AREA, INCLUDING ANY WASTE, STAGING AND BORROW AREAS WITHIN OR DIRECTLY ADJACENT TO THE PROJECT LIMITS.

TOTAL AREA OF DISTURBANCE IS APPROXIMATELY 0.36 ACRES.

IT IS ANTICIPATED THAT THIS PROJECT WILL LAST ONE CONSTRUCTION SEASON.

1.2 SITE INVENTORY

1.2.1 OFF SITE DRAINAGE CHARACTERISTICS (UP AND DOWN-GRADIENT)

THE PROPERTY SURROUNDING THE PROJECT SITE CONSISTS OF WELL ESTABLISHED VEGETATION WITH MODERATE TO STEEP SLOPES, AND A HILLY TO MOUNTAINOUS DRAINAGE BASIN. THE WATER RUNOFF SHOULD BE MINIMAL AND BE LIMITED TO THE PROJECT AREA DUE TO THE NATURE OF THE SURROUNDING TERRAIN.

1.2.2 DRAINAGE, WATERWAYS, BODIES OF WATER, AND PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES

THERE ARE NO OTHER WATER BODIES OR WETLANDS WITHIN THE PROJECT AREA. THERE ARE NO STRUCTURES UPSTREAM FROM BRIDGE 9. A REINFORCED CONCRETE PIPE WITH A WATERWAY OPENING OF 19.5 SQUARE FEET IS LOCATED 4,000 FEET DOWNSTREAM FROM BRIDGE 9.

1.2.3 TOPOGRAPHY, EXISTING ROADS, BUILDINGS

THE TOPOGRAPHY OF THE PROJECT SITE IS HILLY, MOSTLY FORESTED WITH SOME OPEN AREAS. THE LAND AT THE PROJECT SITE HAS MODERATE SLOPES WITH STEEP RIVER BANKS. THERE ARE NO RESIDENTIAL IMPACTS IN THE IMMEDIATE AREA.

1.2.4 VEGETATION

THE VEGETATION IN THE PROJECT AREA IS MADE UP OF FORESTED AREAS WITH SOME CLEARINGS NEAR THE SITE. THE IMPACT TO VEGETATION WILL BE LIMITED TO THAT WHICH IS AFFECTED BY REPLACEMENT OF THE EXISTING CULVERT.

AFTER THE PROJECT IS FINISHED THE SLOPES WILL BE STABILIZED WITH STONE FILL AND VEGETATION WILL BE REESTABLISHED WITH STANDARD SEED AND MULCH PRACTICES.

1.2.5 SOILS

ALL SOIL DATA CAME FROM THE U.S. DEPARTMENT OF AGRICULTURE SOIL CONSERVATION SERVICE FOR THE COUNTY OF ORANGE, VERMONT. THE PROJECT AREA IS UNDERLAIN BY THE CABOT SOIL SERIES WHICH IS CHARACTERIZED AS A VERY STONY SILT LOAM, SLOPES = 3% TO 15%, THE SOIL HAS A "K FACTOR" = 0.32. THE SOIL IS CONSIDERED MODERATELY ERODABLE.

NOTE: K-VALUES GENERALLY INDICATE THE FOLLOWING: 0.0-0.23 = LOW EROSION POTENTIAL; 0.24-0.36 = MODERATE EROSION POTENTIAL; 0.37 AND HIGHER = HIGH EROSION POTENTIAL.

1.2.6 SENSITIVE RESOURCE AREAS

CRITICAL HABITATS: NO
HISTORICAL OR ARCHEOLOGICAL AREAS: NO
PRIME AGRICULTURAL LAND: NO
THREATENED AND ENDANGERED SPECIES: NO
WATER RESOURCE: NO
WETLANDS: NO

1.3 RISK EVALUATION

THIS PROJECT DOES NOT FALL UNDER THE JURISDICTION OF CONSTRUCTION GENERAL PERMIT 3-9020 BASED ON THE PROJECT IMPACT AREA. SHOULD CHANGES PRIOR TO OR DURING CONSTRUCTION RESULT IN ONE OR MORE ACRES OF EARTH DISTURBANCE OR SHOULD THE PROJECT BECOME PART OF A LARGER PLAN OF DEVELOPMENT, THEN THE SELECTED CONTRACTOR WILL BE RESPONSIBLE FOR ADDITIONAL PERMITTING WITH VANR VIA FILING OF THE APPROPRIATE NOTICE OF INTENT UNDER THE CONSTRUCTION GENERAL PERMIT PROCESS.

1.4 EROSION PREVENTION AND SEDIMENT CONTROL

THE CONTRACTOR SHALL REFER TO THE VTRANS EROSION PREVENTION AND SEDIMENT CONTROL PLAN CHECKLIST TO DEVELOP THE EPSC PLAN. THIS CHECKLIST SHALL BE OBTAINED FROM THE ENGINEER.

THE EROSION CONTROL PLANS ARE MEANT AS A GUIDELINE FOR PREVENTING EROSION AND CONTROLLING SEDIMENT TRANSPORT.

1.4.1 MARK SITE BOUNDARIES

PROJECT DEMARCATION FENCING (PDF) SHALL BE USED TO DELINEATE THE LIMITS THE CONTRACTOR CAN ACCESS WITH CONSTRUCTION EQUIPMENT. THIS MEASURE LIMITS THE AREA THAT CAN BE DISTURBED AND EXPOSED TO EROSION.

1.4.2 LIMIT DISTURBANCE AREA

THE CONTRACTOR SHALL ESTABLISH THE LIMITS OF CONSTRUCTION ACCORDING TO THE CONTRACT. ALL EFFORTS SHALL BE MADE TO MINIMIZE EARTH DISTURBANCE.

1.4.3 STABILIZE CONSTRUCTION EXIT

STABILIZED CONSTRUCTION ENTRANCES SHALL BE UTILIZED AS ACCEPTED IN THE EPSC PLAN.

1.4.4 INSTALL SILT FENCE

SILT FENCE SHALL BE INSTALLED ACCORDING TO THE ACCEPTED EPSC PLAN OR AS NECESSARY. IT SHALL BE NOTED THAT SILT FENCE SHALL BE INSTALLED PRIOR TO ANY UP SLOPE WORK.

1.4.5 DIVERT UPLAND RUNOFF

UPLAND RUNOFF SHALL BE DIVERTED AROUND THE PROJECT AS APPROPRIATE.

1.4.6 SLOW DOWN CHANNELIZED RUNOFF

CHANNELIZED RUNOFF SHALL BE TREATED AS NECESSARY.

1.4.7 CONSTRUCT PERMANENT CONTROLS

STONE FILL TYPE III SHALL BE USED TO STABILIZE PROPOSED SLOPES.

STREAM BANK VEGETATION WILL BE INTRODUCED IN THE GRUBBING MATERIAL THAT IS TO BE PLACED OVER THE STREAM BANK STONE FILL.

TEMPORARY EROSION CONTROL MATTING SHALL BE APPLIED TO THE LENGTH OF THE GRASS SWALE IN ORDER TO ESTABLISH GRASS. THIS IS A FINAL CONDITION TO BE APPLIED AFTER SEED, FERTILIZER, MULCH, AND TOPSOIL.

1.4.8 STABILIZE EXPOSED SOILS

UTILIZE STABILIZATION METHODS SUCH AS SEED AND MULCH OR METHODS AS ACCEPTED BY THE ENGINEER. STABILIZATION METHODS SHALL BE APPLIED TO EXPOSED EARTH WITHIN 48 HOURS OF EARTH DISTURBANCE. PAYMENT FOR TEMPORARY SOIL STABILIZATION WILL BE MADE UNDER ITEM 900.650, "SPECIAL PROVISION (EROSION PREVENTION AND SEDIMENT CONTROL MEASURES)(N.A.B.I.)".

1.4.9 WINTER STABILIZATION

WINTER WORK IS NOT ANTICIPATED.

1.4.10 STABILIZE SOIL AT FINAL GRADE

ALL DISTURBED AREAS SHALL RECEIVE TOPSOIL, SEED AND MULCH TO ESTABLISH VEGETATION. SEEDING SHALL BE APPLIED IN ACCORDANCE WITH THE PLANS. PAYMENT FOR TURF ESTABLISHMENT WILL BE MADE UNDER SECTION 651 OF THE SPECIFICATIONS.

1.4.11 DE-WATERING ACTIVITIES

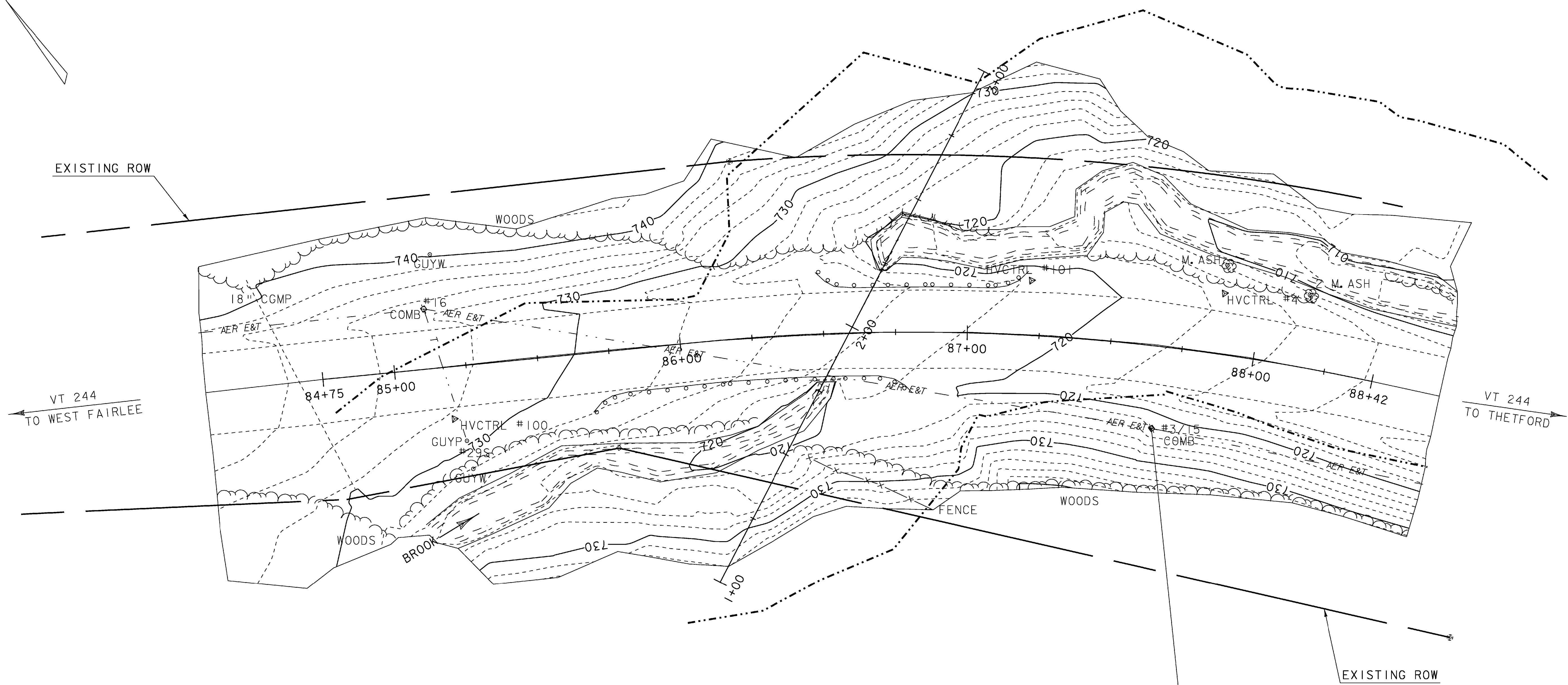
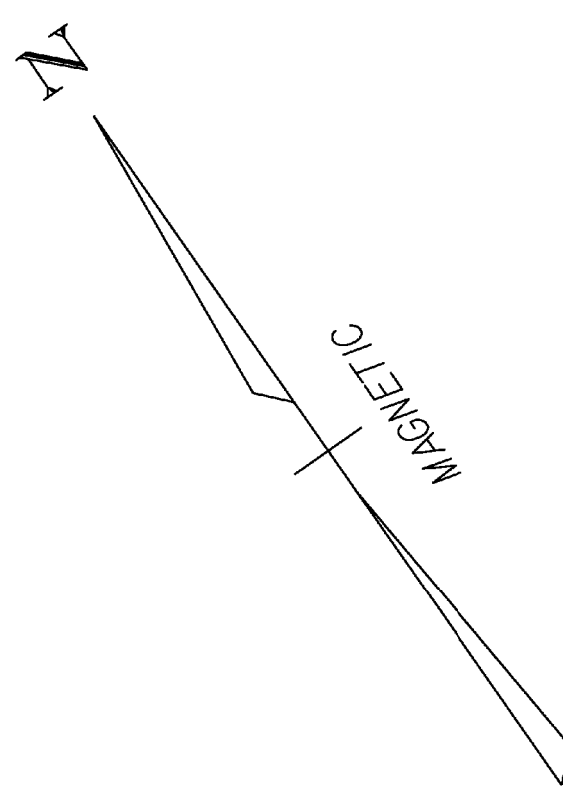
ANY NECESSARY DEWATERING SHALL BE PERFORMED AS INDICATED IN THE ACCEPTED EPSC PLAN.

1.4.12 INSPECT YOUR SITE

INSPECT SITE BASED ON PERMIT AUTHORIZATION OR SPECIAL PROVISION REQUIREMENTS.

PROJECT NAME: FAIRLEE
PROJECT NUMBER: STP CULV (13)

FILE NAME: s08c060ecnotes.dgn PLOT DATE: 11-MAR-2009
PROJECT LEADER: C.P.WILLIAMS DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE CHECKED BY: E.L.RUSTAY
EROSION CONTROL NARRATIVE SHEET 18 OF 26



BM#2
RR SPIKE IN POLE
ELEV: ~~722.57~~
723.07

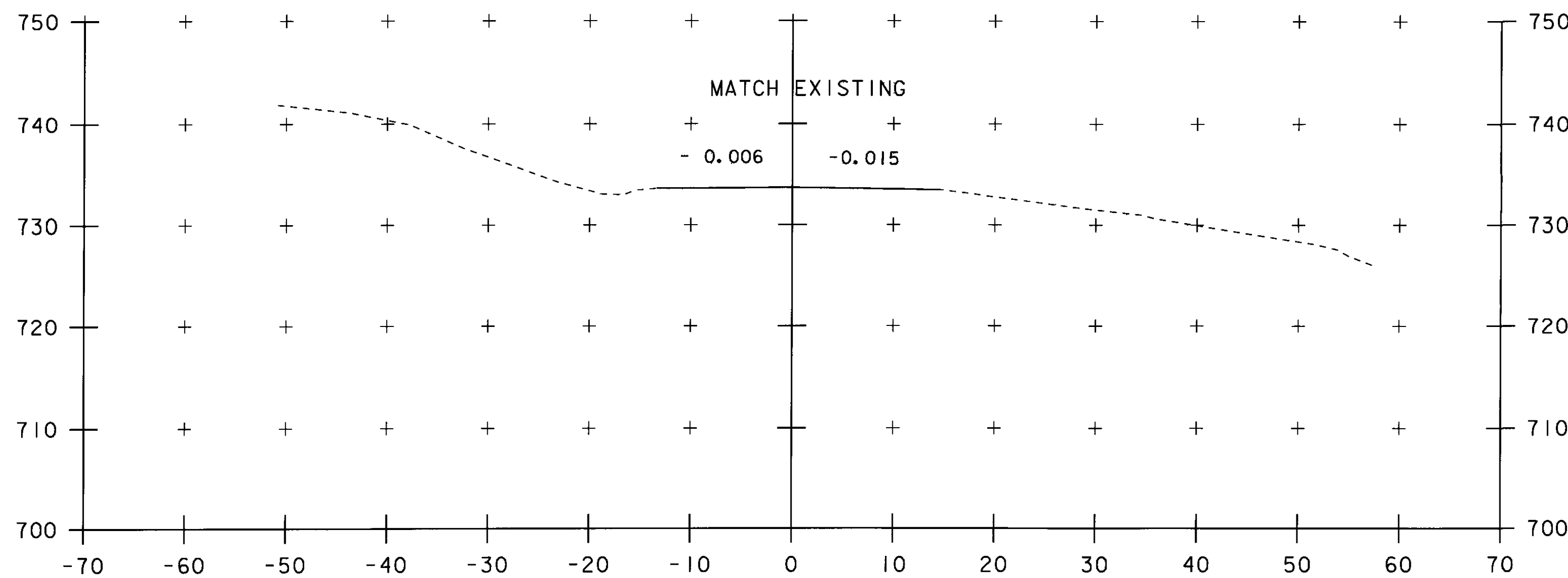
EPSC EXISTING CONDITIONS SITE PLAN

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83 (2007)

LEGEND
— AER E&T — AERIAL ELECTRIC & TELEPHONE
- - - - - RIPARIAN BUFFER ZONE

SCALE 1" = 20' - 0
20 0 20

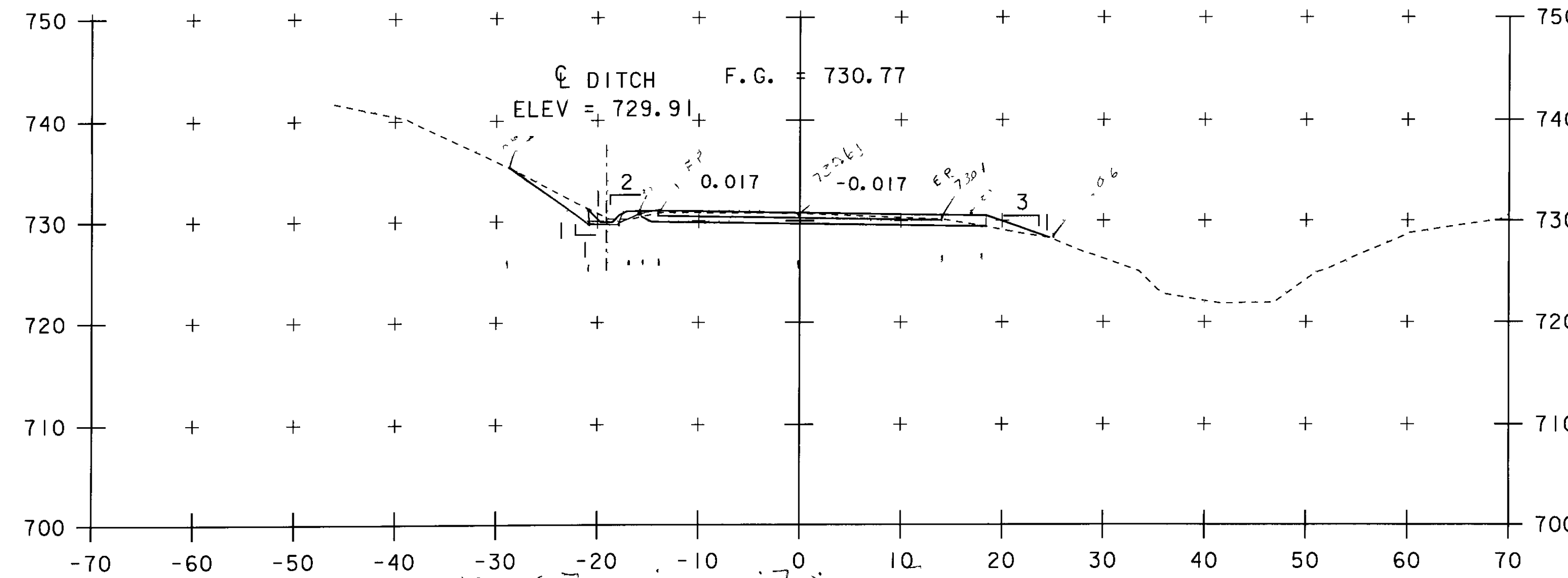
PROJECT NAME: FAIRLEE	PLOT DATE: 11-MAR-2009
PROJECT NUMBER: STP CULV (13)	DRAWN BY: L.J.STONE
FILE NAME: s08c060bdr_ero.dgn	CHECKED BY: E.L.RUSTAY
PROJECT LEADER: C.P.WILLIAMS	SHEET 19 OF 26
DESIGNED BY: L.J.STONE	
EPSC EXISTING CONDITIONS SITE PLAN	



203.15 (containing Ex)
A = 0.54

85+00

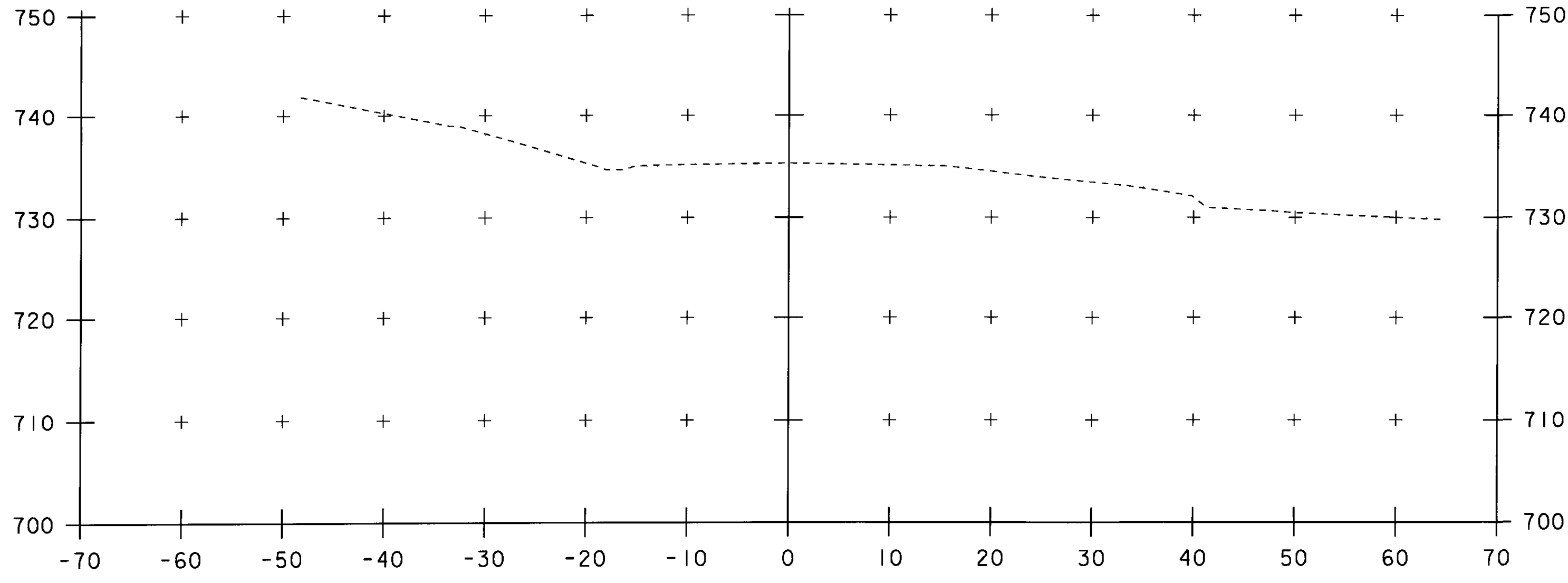
BEGIN APPROACH
STA 85+00.00



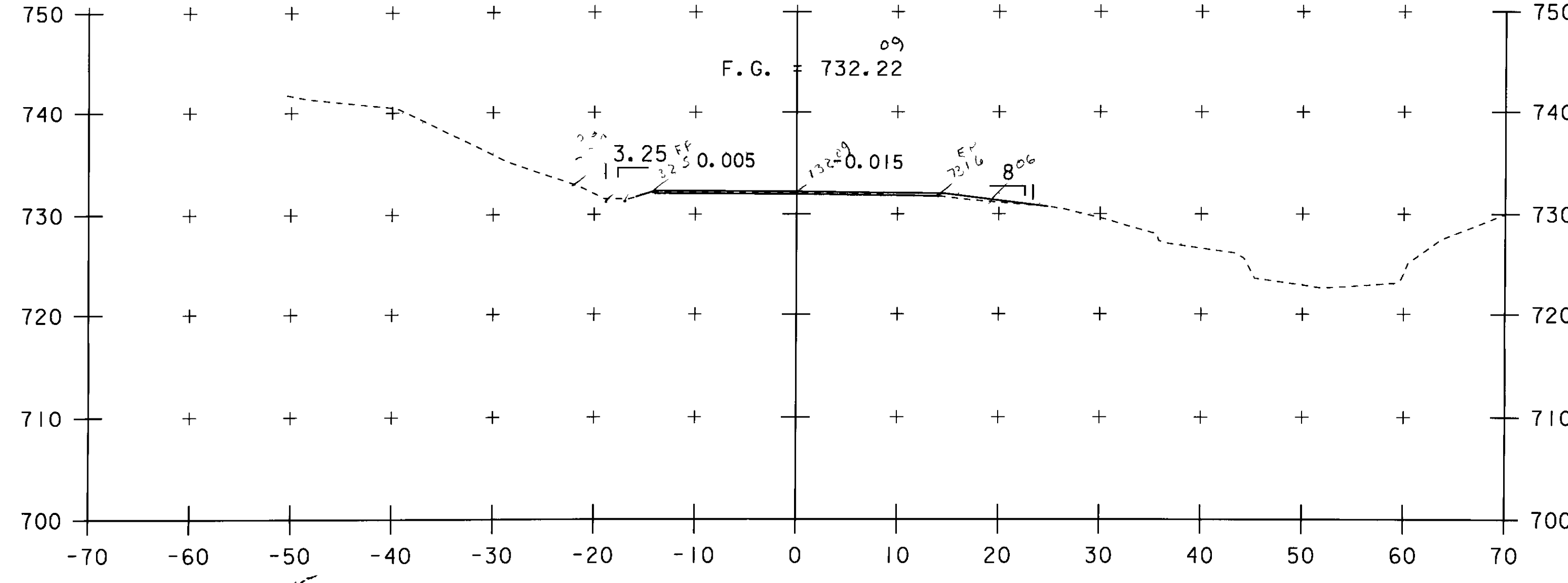
203.15
 $A = \left[\frac{(6+1.5) \cdot 80}{2} - \frac{15 \cdot 0.01}{2} \right] + \left[\frac{(6+1.5) \cdot (14) \cdot 1.01}{2} + \frac{1+0.5}{2} \cdot (14) - 0.5 \cdot 14 \right]$
 $A = 1.5(80) - 0.75(0.01) + 14(1.01) + (25)(14) - 7(14)$
 $A = 6 + 3 + 175 + 14 = 196$
 $A = 15.25 \text{ SF} = 9 \text{ SF}$
 $A = 3.92 \text{ SF}$

85+50

A = 2.11 SF



84+75



203.15
A = 0.54

85+25

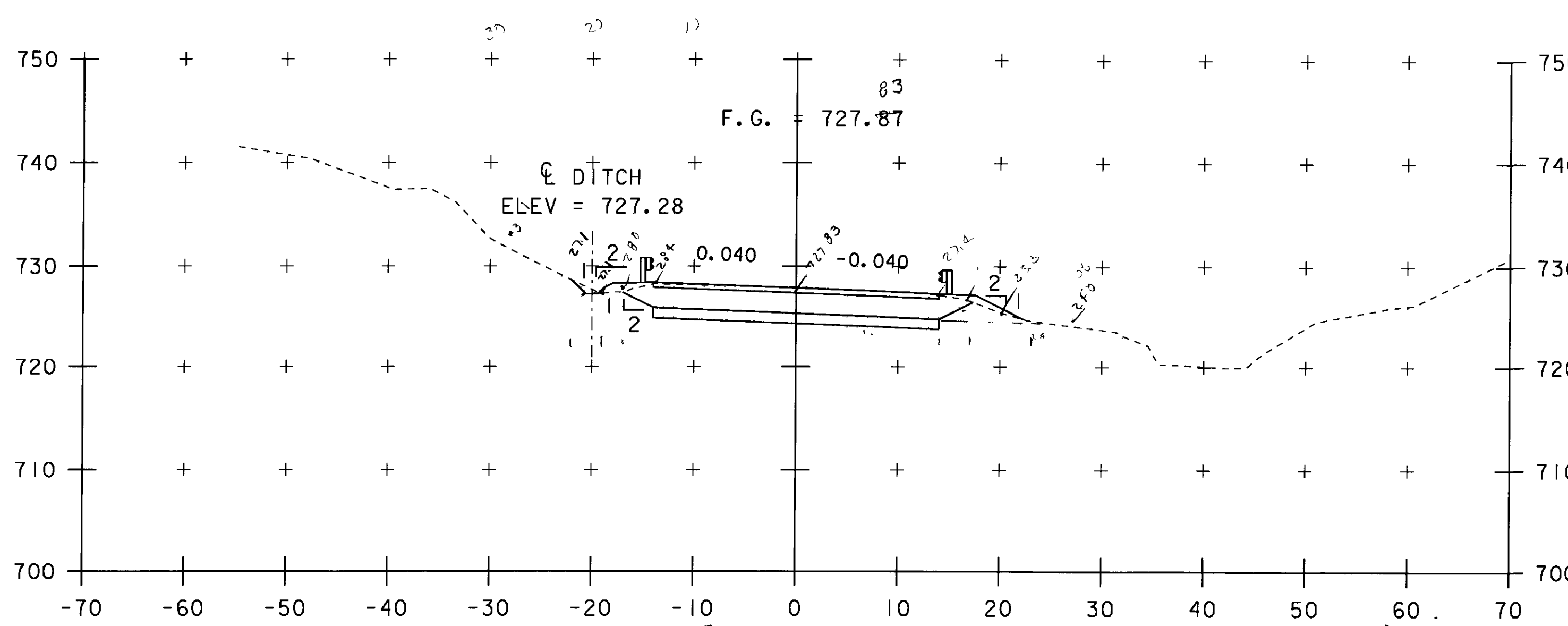
A = 0.54

SCALE 1" = 10'-0"
10 0 10

STA. 84+75 TO STA. 85+50

✓ 202-3-10

PROJECT NAME: FAIRLEE	
PROJECT NUMBER: STP CULV (13)	
FILE NAME: s08c060xsl.dgn	PLOT DATE: 11-MAR-2009
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: E.L.RUSTAY
MAINLINE CROSS SECTIONS (1)	SHEET 20 OF 26



#203.5

$$A = \left[\frac{(15+0)}{2} \right] 3.0 + \left[\frac{(0+2.5)}{2} \right] 3.0 + (2.5 \times 3.5) + \left[\frac{(2.5+1.5)}{2} \right] 3.0 + \left[\frac{(1.5+0)}{2} \right] 6.0$$

$$A = 1.57 \times 3.0 + (1.25 \times 3.0) + (2.5 \times 3.5) + (2.0 \times 3.0) + 0.001 \times 6.0$$

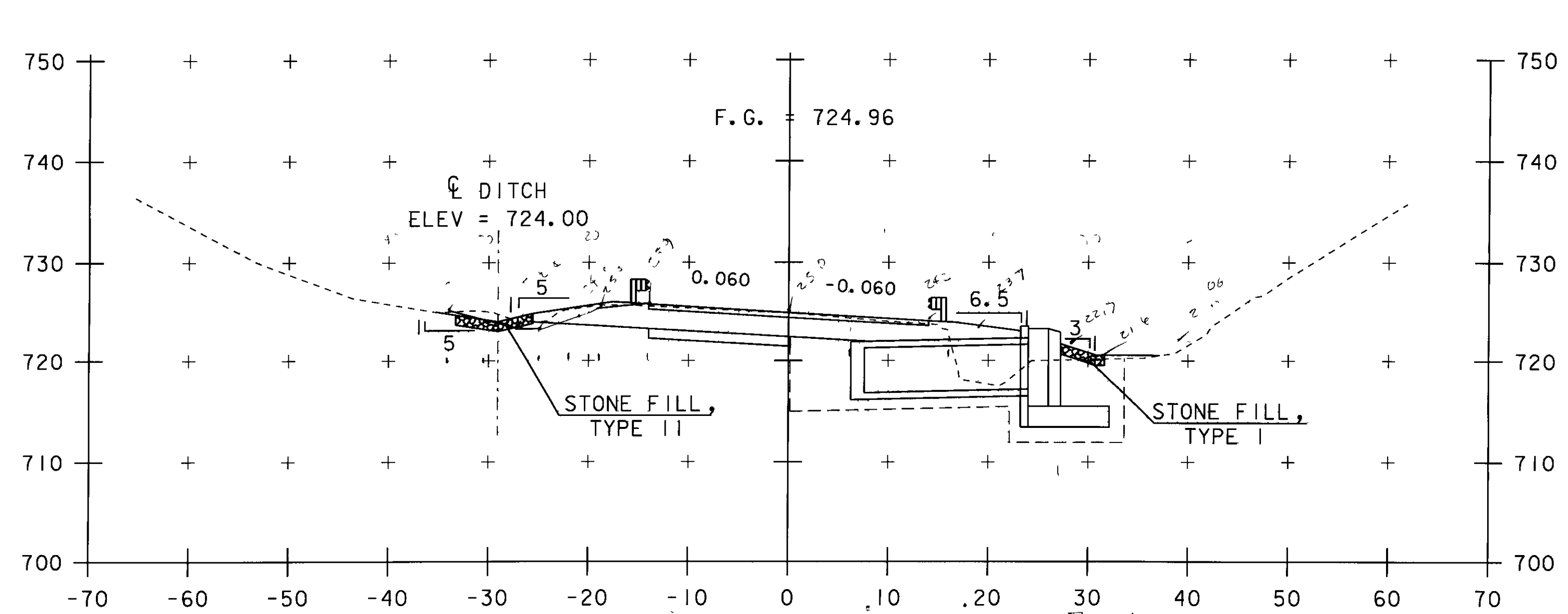
$$A = 2.25 + 3.75 + 9.8 + 6.6 + 5.7$$

$$A = 116.3^2 = 9.55$$

$$A = 12.9254$$

86+00
BEGIN PROJECT
STA 86+00.00

A 8.71



#203.15

$$A = \left[\frac{(6+2.5)}{2} \right] 3.5 + \left[\frac{(2.5+1)}{2} \right] 5.5 + \left[\frac{(1+1.5)}{2} \right] 2.5 + (2.5 \times 5) + (1.5 \times 5) + (2.5 \times 5) + (1.5 \times 5) + (2.5 \times 2) + (10.0)$$

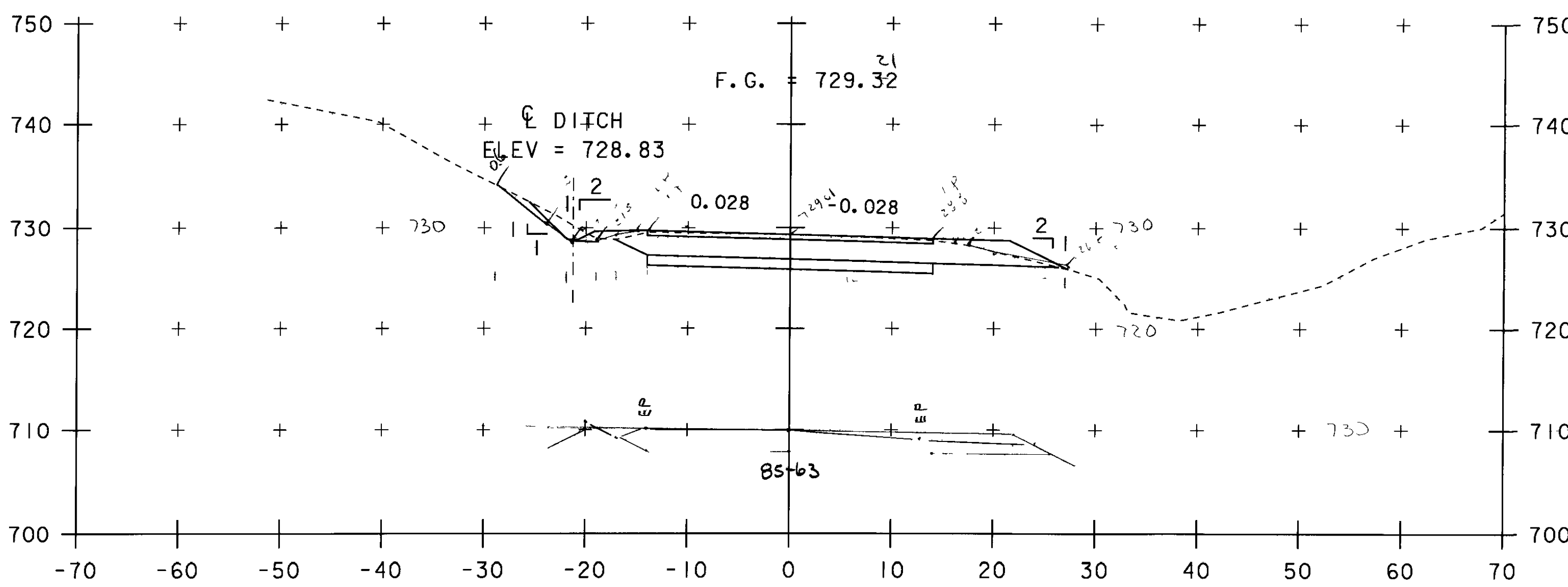
$$A = 125.3^2 - (1.75 \times 5.5) + (1.25 \times 5) + (2) \times 2.5 + 1.5 \times 5 + (2.5 \times 5) + (1.5 \times 5) + (2.5 \times 5) + (1.5 \times 5) + (2.5 \times 2) + (10.0)$$

$$A = 122.75^2 = 9.55$$

$$A = 13.64$$

86+50

A = 9.94



#203.15 Common Ex

$$A = \left[\frac{(15+0)}{2} \right] 3.0 + \left[\frac{(0+2.5)}{2} \right] 3.0 + (2.5 \times 3.5) + \left[\frac{(2.5+1)}{2} \right] 3.0$$

$$A = (1.75 \times 3.0) - (1.75 \times 3.0) + (1.25 \times 3.0) + (2.5 \times 3.5) + (2.0 \times 3.0) + (1.25 \times 3.0)$$

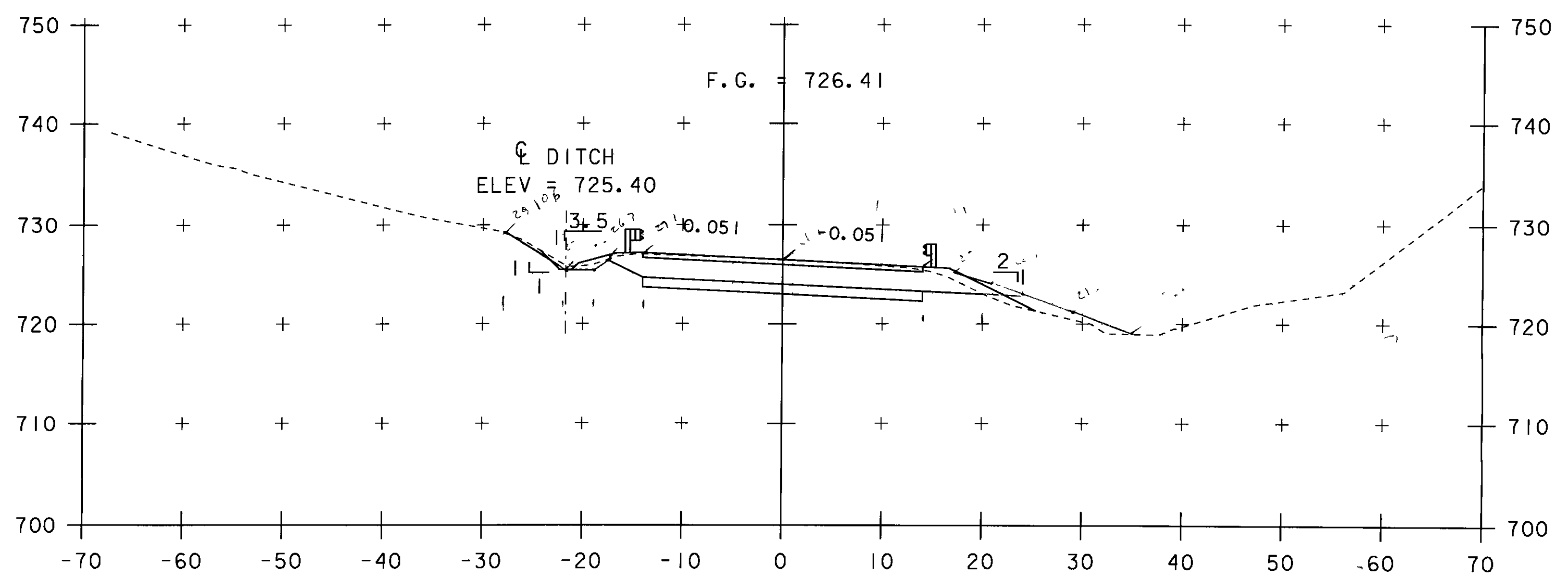
$$A = 6.75 + 2.25 + 3.75 + 9.8 + 11.25$$

$$A = 127.5^2 = 9$$

$$A = 14.1154$$

85+75

A 8.53



#203.15

$$A = \left[\frac{(0+5.5)}{2} \right] 1.5 + \left[\frac{(5.5+3)}{2} \right] 2.5 + (3 \times 3) + \left[\frac{(3+2)}{2} \right] 2.5 + (2 \times 2) + (2.5 \times 2) + (1.5 \times 2)$$

$$A = (0.25 \times 1.5) + (0.5 \times 2.5) + (1.25 \times 3) + (2.5 \times 2.5) + (2 \times 2) + (2.5 \times 2) + (1.5 \times 2)$$

$$A = 1.5 + 1.5 + 3.75 + 9.8 + 7.5$$

$$A = 112.5^2 = 9$$

$$A = 12.54$$

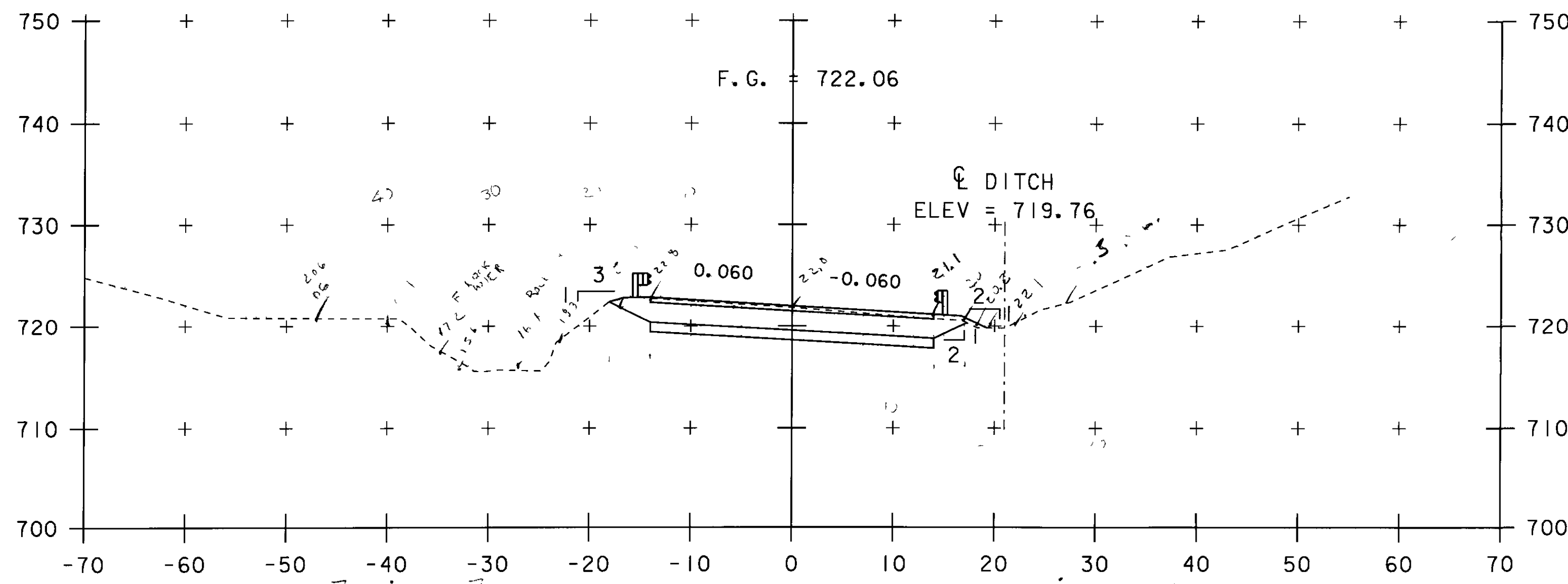
86+25

A = 12.54

SCALE 1" = 10'-0"

STA. 85+75 TO STA. 86+50

PROJECT NAME: FAIRLEE	DATE: 2-8-10
PROJECT NUMBER: STP CULV (13)	
FILE NAME: s08c060xsl.dgn	PLOT DATE: 11-MAR-2009
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: E.L.RUSTAY
MAINLINE CROSS SECTIONS (2)	SHEET 21 OF 26



$$A = \left[\frac{(0+2.5)}{2} \right] (4.0) + \left[\frac{(3.5+3.0)}{2} \right] (3.0) + \left[\frac{(4.0+0)}{2} \right] (3.0)$$

$$A = 12.5 + 4.5 + 6.0 = 23.0$$

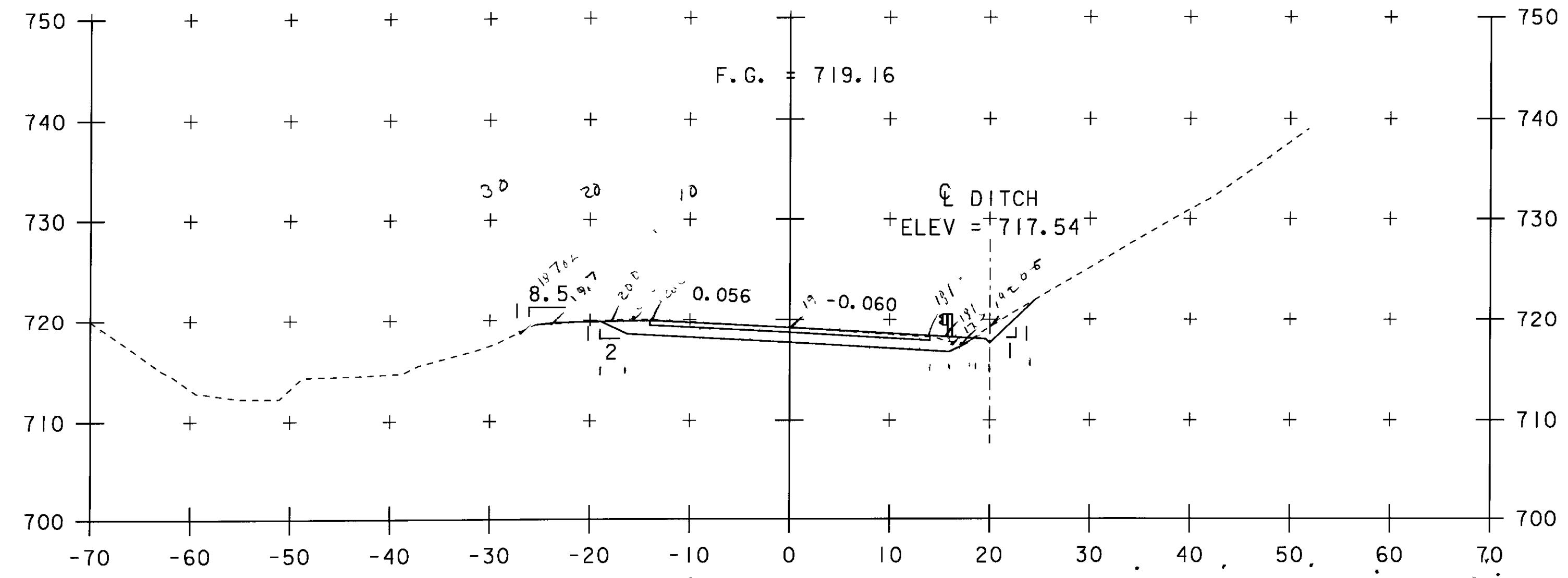
$$A = 5' + 9' + 3' = 17'$$

$$A = 99.5 = 99.5$$

$$A = 11.00 \text{ SY}$$

87+00

728



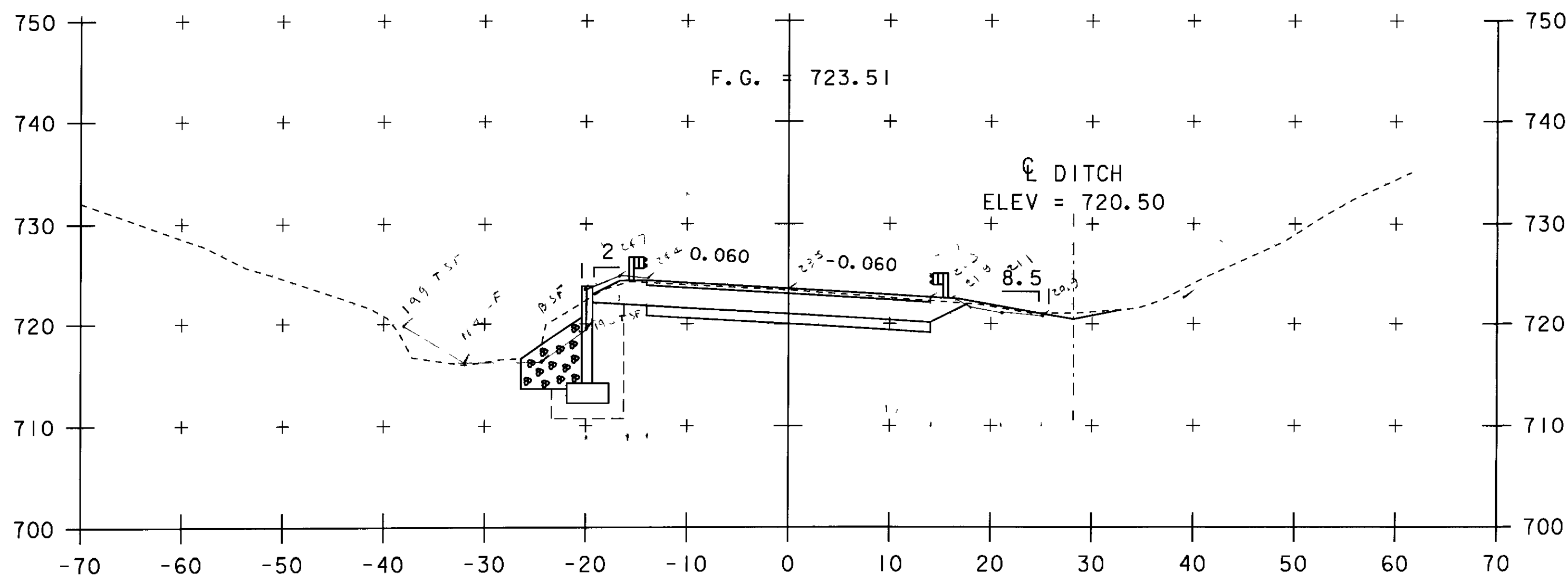
$$A = \left[\frac{(0+1.75)}{2} \right] (2.5) + (30.5) (1.75) + \left[\frac{(1.75+1)}{2} \right] (2.0) + \left[\frac{(0+2)}{2} \right] (1.5) + \left[\frac{(2-1)}{2} \right] (1.5)$$

$$A = 2.1875 + 53.125 + 2.75 + 1.5 + 0.75 = 64.3125$$

$$A = 64.3125 \text{ SY}$$

87+50

4.28 SY



$$A = \left[\frac{(2+)}{2} \right] (2.5) + (30.5) (2.5) + \left[\frac{(3.5+1.0)}{2} \right] (3.5) + \left[\frac{(0.5-0)}{2} \right] (4.0)$$

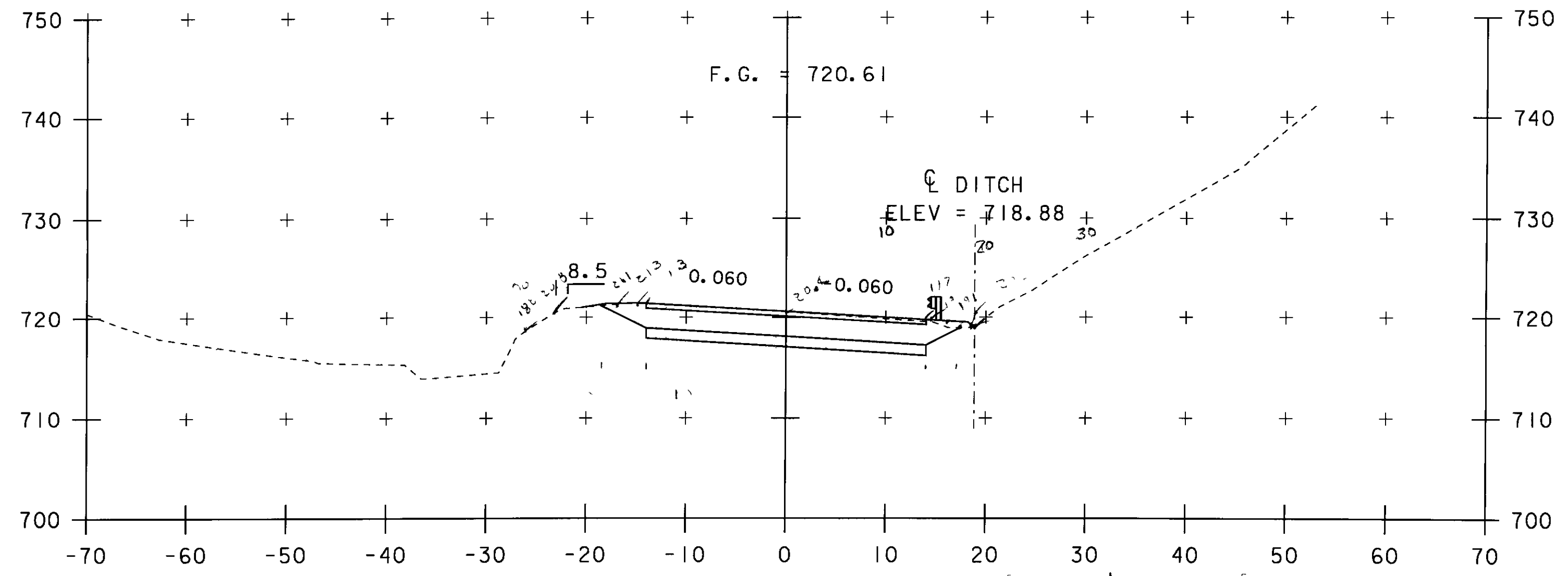
$$A = 2.5 + 76.375 + 2.25 + 2.0 = 83.125$$

$$A = 7' + 5' + 1' + 1' = 14'$$

$$A = 11.00 \text{ SY}$$

86+75

A. 8.10



$$A = \left[\frac{(2+)}{2} \right] (2.5) + (30.5) (2.5) + \left[\frac{(3.5+1.0)}{2} \right] (3.5) + \left[\frac{(0.5-0)}{2} \right] (4.0)$$

$$A = 2.5 + 76.375 + 2.25 + 2.0 = 83.125$$

$$A = 5' + 6.25' + 96' + 3.75' = 107.375'$$

$$A = 106.375 + 9.75 = 116.125$$

$$A = 11.93$$

$$A = 11.93 \text{ SY}$$

87+25

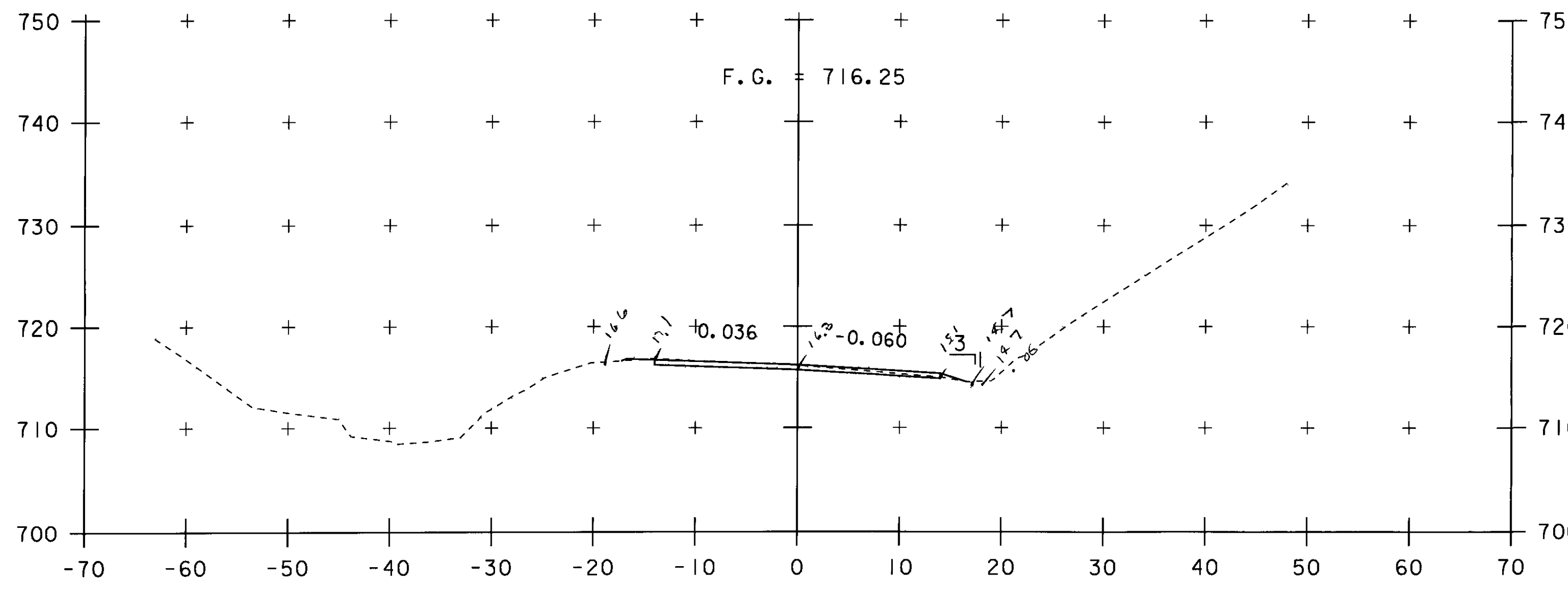
END PROJECT
STA 87+25.00

A. 7.34 SY

SCALE 1" = 10'-0"

STA. 86+75 TO STA. 87+50

PROJECT NAME:	FAIRLEE	PLOT DATE:	11-MAR-2009
PROJECT NUMBER:	STP CULV (13)	DRAWN BY:	L.J.STONE
FILE NAME:	s08c060xsl.dgn	CHECKED BY:	E.L.RUSTAY
PROJECT LEADER:	C.P.WILLIAMS	SHEET	22 OF 26
DESIGNED BY:	L.J.STONE		
MAINLINE CROSS SECTIONS (3)			

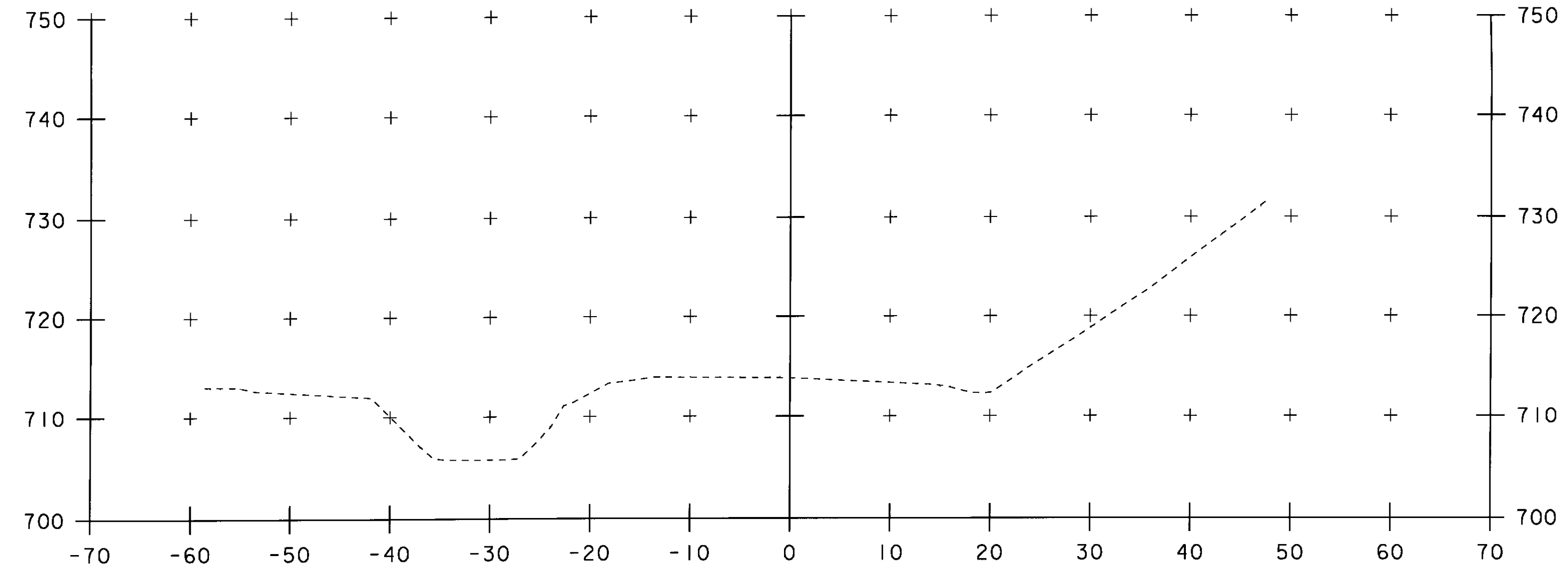


$$A = (0.5)(14) + \left[\frac{0.5+6}{2}\right](14)$$

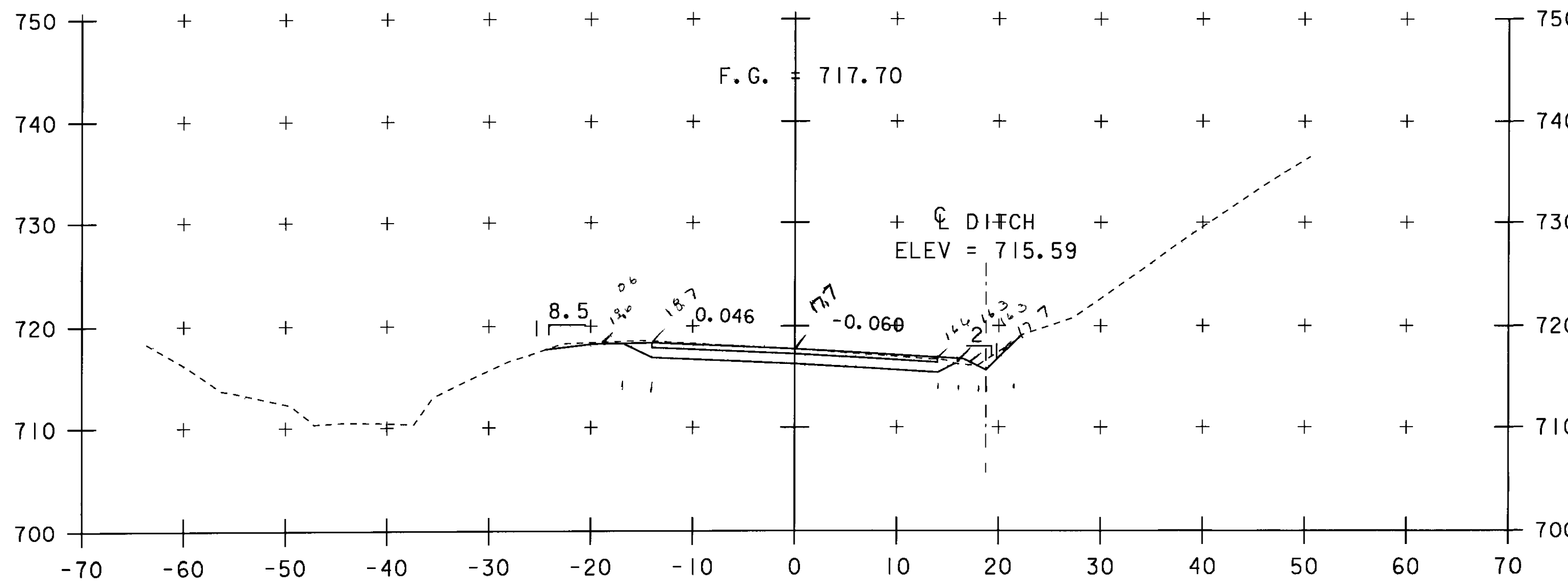
$$A = 7' + 3.5'$$

$$A = 10.5 \text{ sf} = 1.17 \text{ sy}$$

88+00



88+42



$$A = \frac{0.5(17.5)}{2} [36' + (26)(1.5)] + \left[\frac{1.5(70)}{2}\right] 2.0 + \left[\frac{6+11}{2}\right] (0) + \left[\frac{1+0}{2}\right] 3.5$$

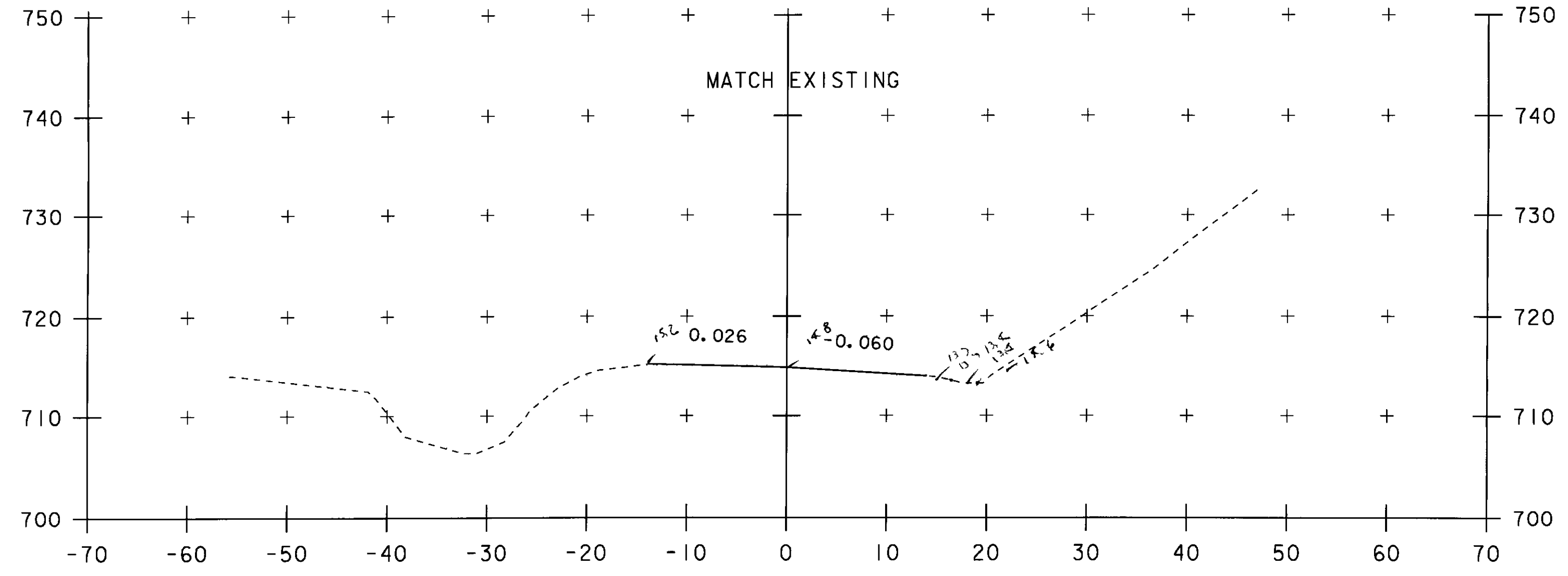
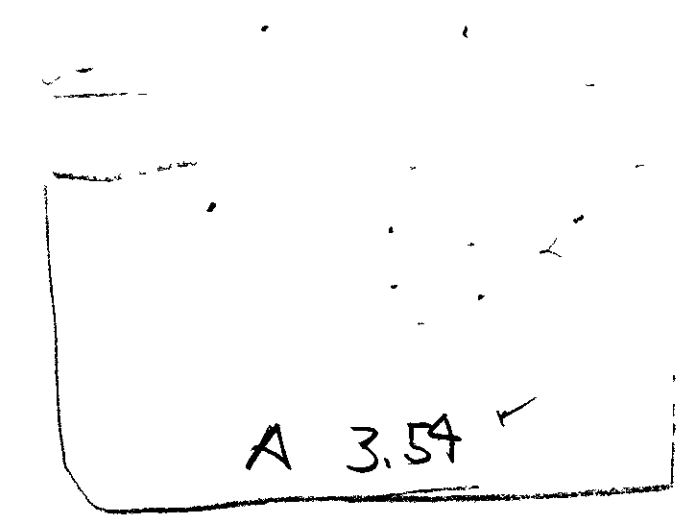
$$= (0.5)(17.5)(30) + (26)(1.5) + (1.5)(70)(2) + (6)(11) + (1)(0) + (1)(3.5)$$

$$= 62.5' + 42' + 15' + 0.5' + 1.75'$$

$$A = 48.375' = 9.675 \text{ sy}$$

$$A = 5.38 \text{ sy}$$

87+75



88+25

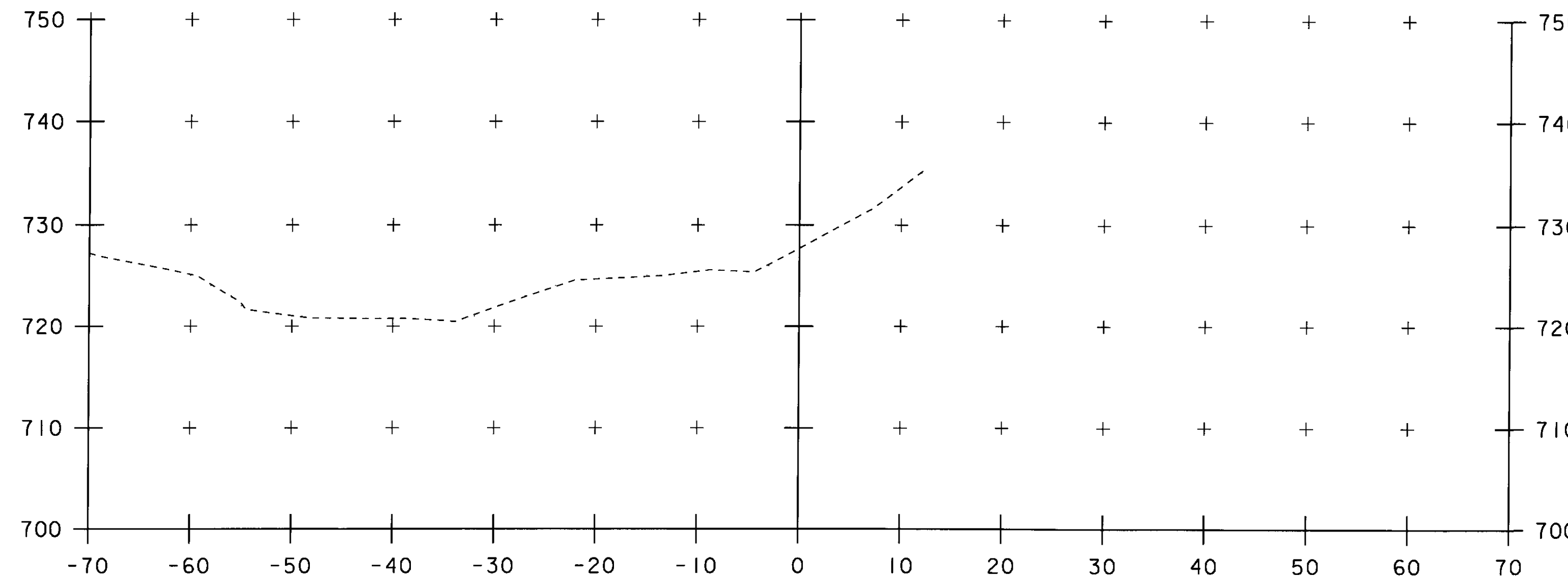
END APPROACH
STA 88+25.00

✓ *fa* 2-8-10

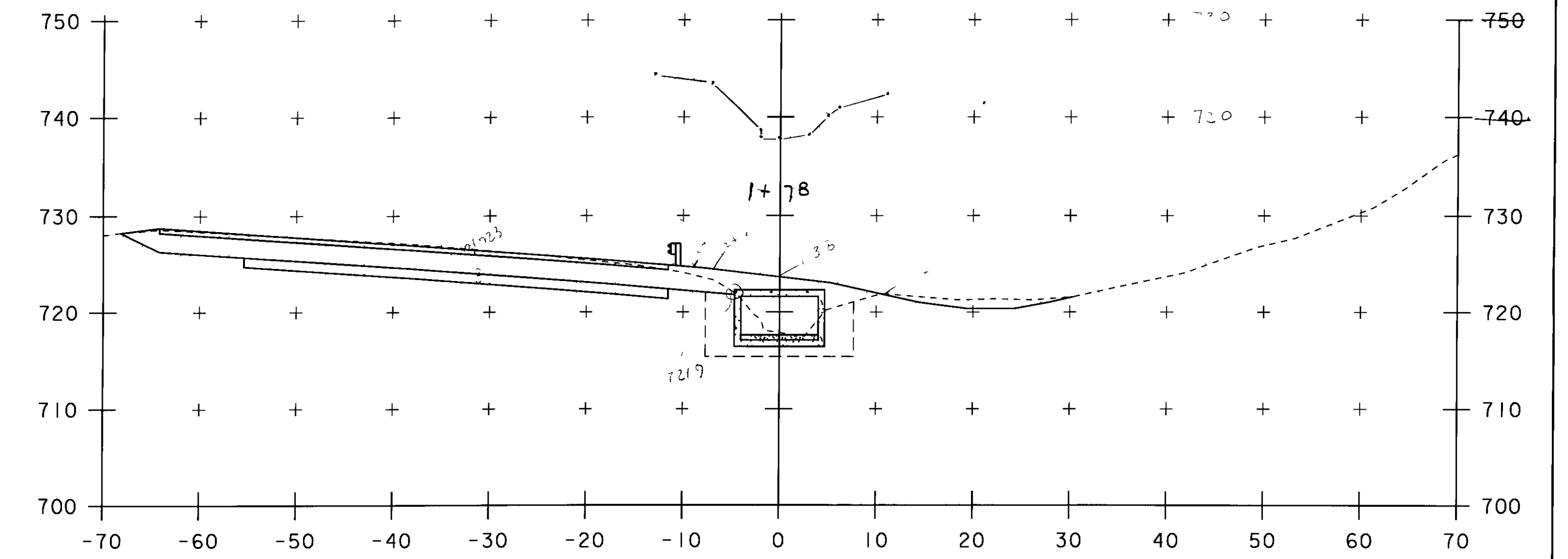
SCALE 1" = 10'-0"

STA. 87+75 TO STA. 88+42

PROJECT NAME: FAIRLEE	
PROJECT NUMBER: STP CULV (13)	
FILE NAME: s08c060xsl.dgn	PLOT DATE: 11-MAR-2009
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: E.L.RUSTAY
MAINLINE CROSS SECTIONS (4)	SHEET 23 OF 26

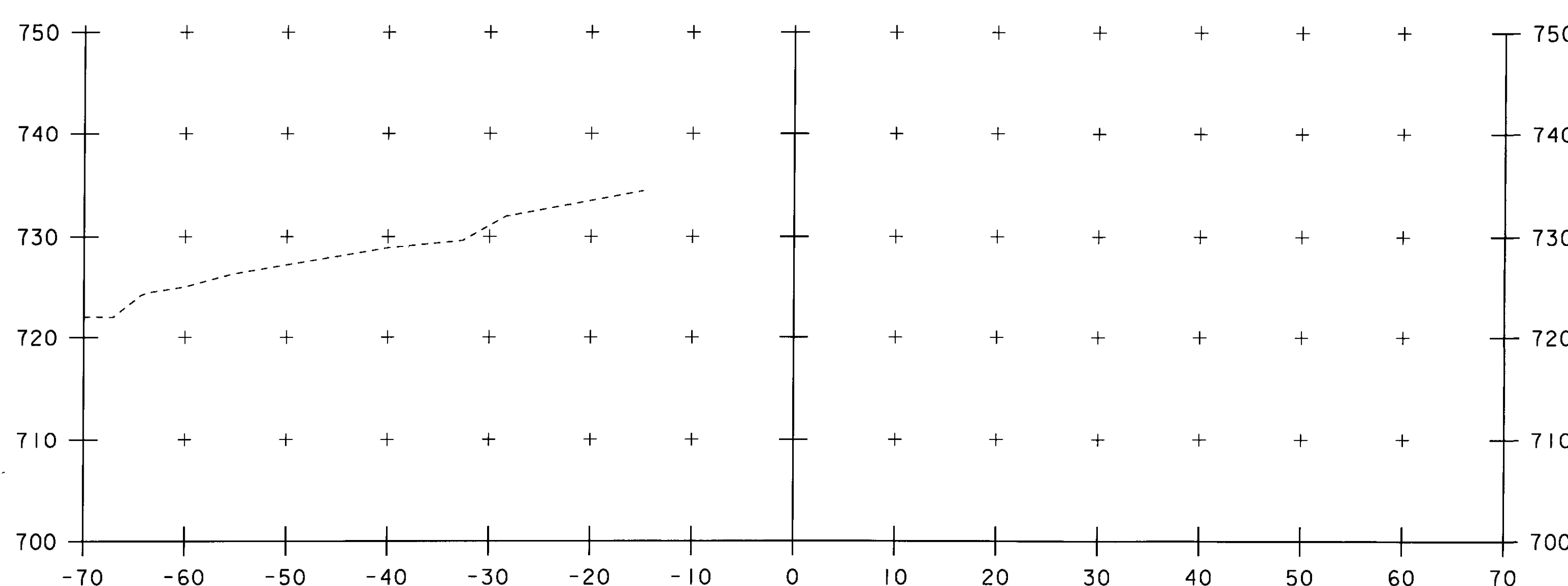


I+25

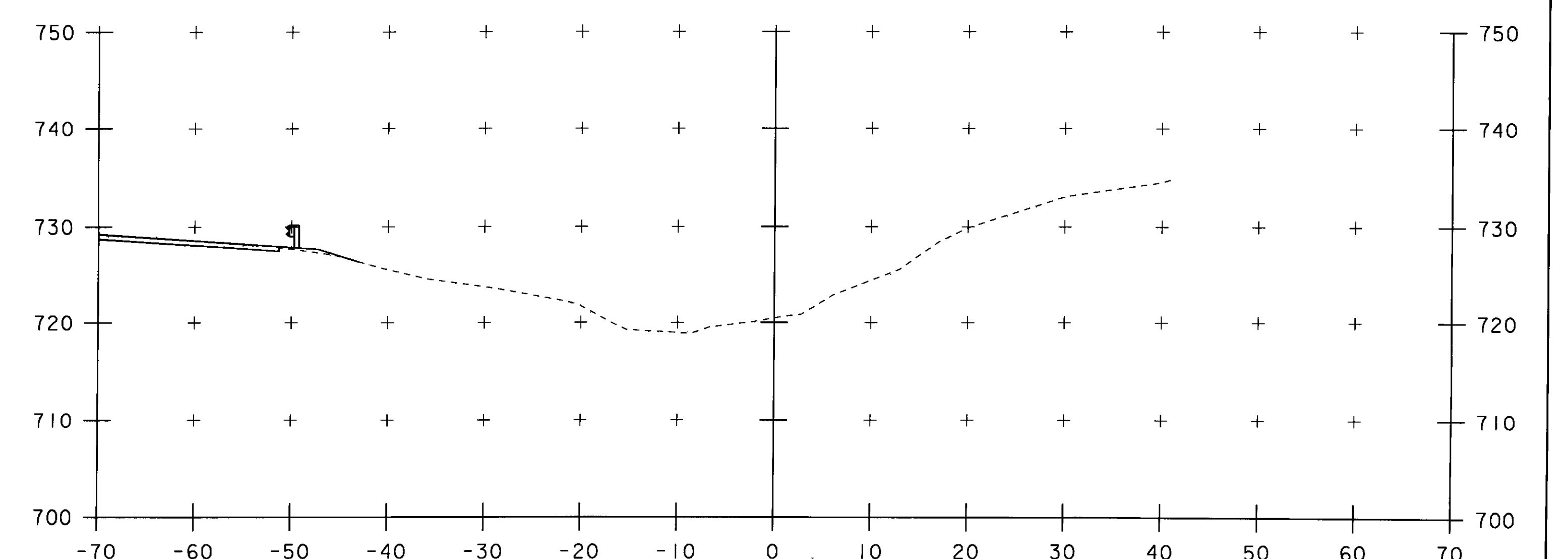


STA I+75.00 LT & RT
 END UNCLASSIFIED CHANNEL EXCAVATION
 END GEOTEXTILE UNDER STONE FILL
 END STONE FILL TYPE III
 END GRUBBING MATERIAL

I+75



I+00



STA I+55.00 RT
 BEGIN UNCLASSIFIED CHANNEL EXCAVATION
 BEGIN GEOTEXTILE UNDER STONE FILL
 BEGIN STONE FILL TYPE III
 BEGIN GRUBBING MATERIAL

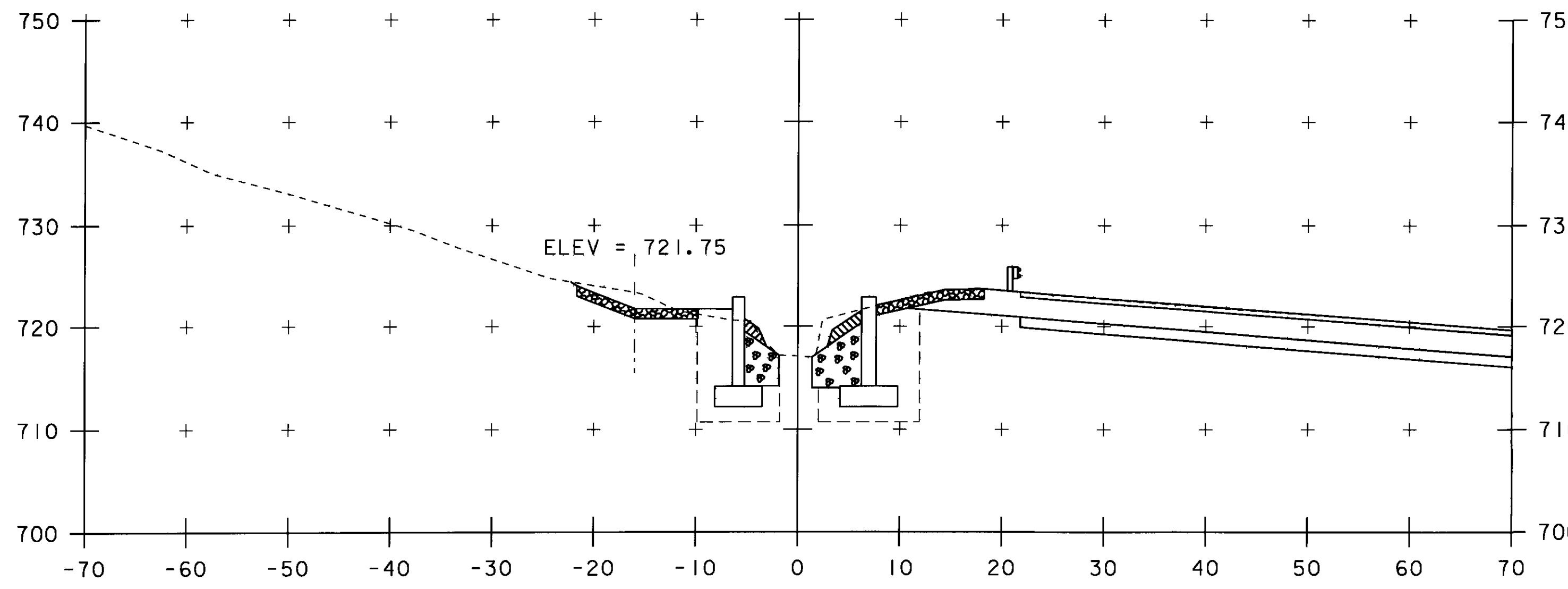
I+50

STA I+60.00 LT
 BEGIN UNCLASSIFIED CHANNEL EXCAVATION
 BEGIN GEOTEXTILE UNDER STONE FILL
 BEGIN STONE FILL TYPE III
 BEGIN GRUBBING MATERIAL

SCALE 1" = 10'-0"
 10 0 10

STA. I+00 TO STA. I+75

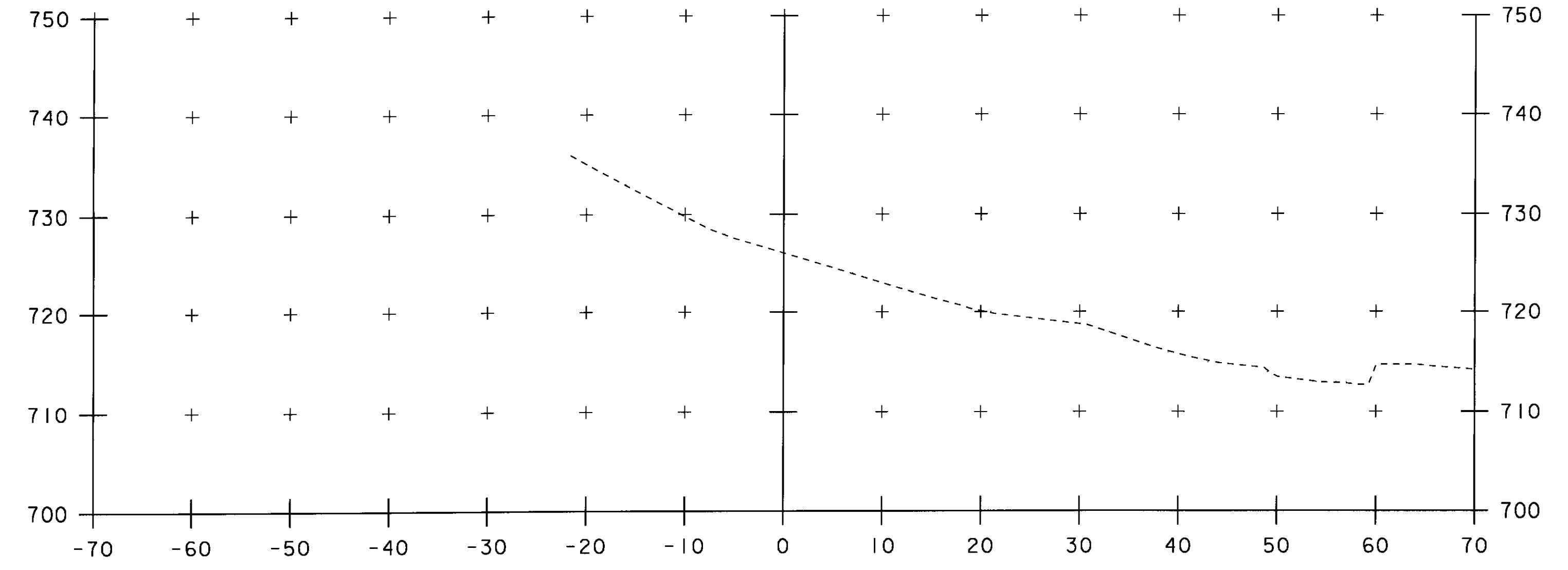
PROJECT NAME: FAIRLEE	
PROJECT NUMBER: STP CULV (13)	
FILE NAME: s08c060xsl.dgn	PLOT DATE: 11-MAR-2009
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: E.L.RUSTAY
CROSS SECTIONS (1)	
SHEET 24 OF 26	



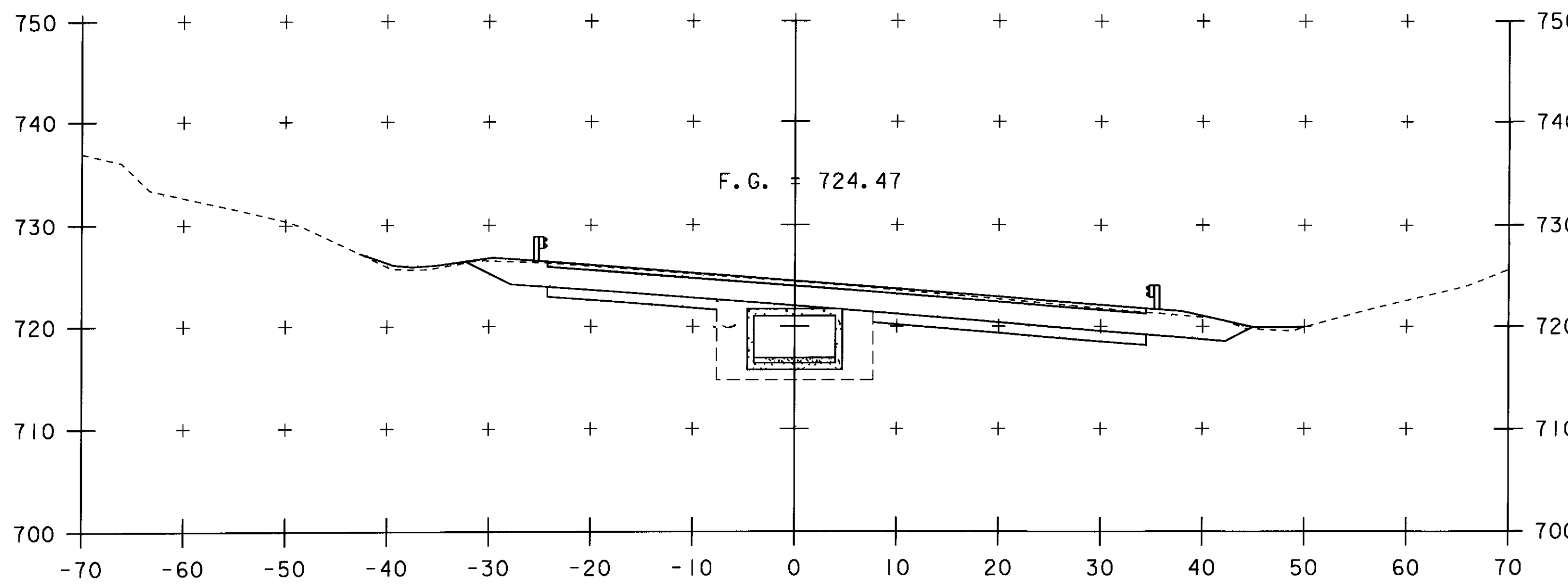
STA 2+55.00 LT
 END UNCLASSIFIED CHANNEL EXCAVATION
 END GEOTEXTILE UNDER STONE FILL
 END STONE FILL TYPE III
 END GRUBBING MATERIAL

2+25

STA 2+35.00 RT
 END UNCLASSIFIED CHANNEL EXCAVATION
 END GEOTEXTILE UNDER STONE FILL
 END STONE FILL TYPE III
 END GRUBBING MATERIAL

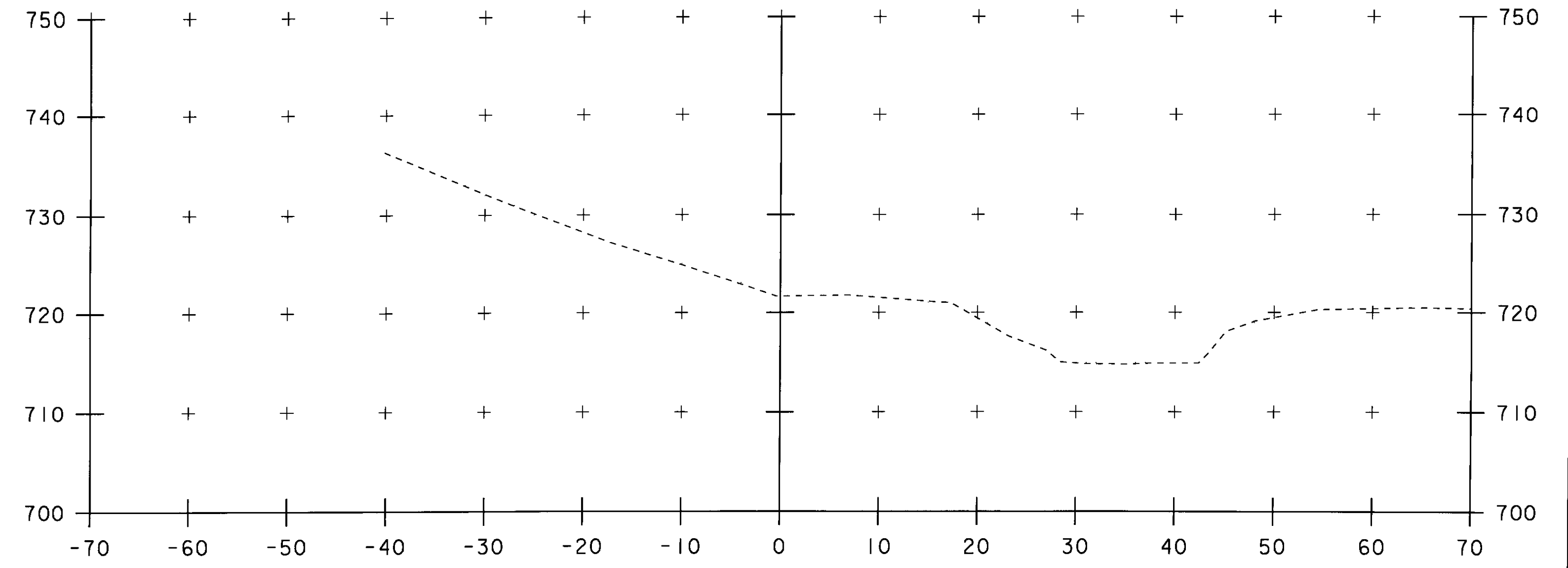


2+75



STA 2+20.00 LT & RT
 BEGIN UNCLASSIFIED CHANNEL EXCAVATION
 BEGIN GEOTEXTILE UNDER STONE FILL
 BEGIN STONE FILL TYPE III
 BEGIN GRUBBING MATERIAL

2+00

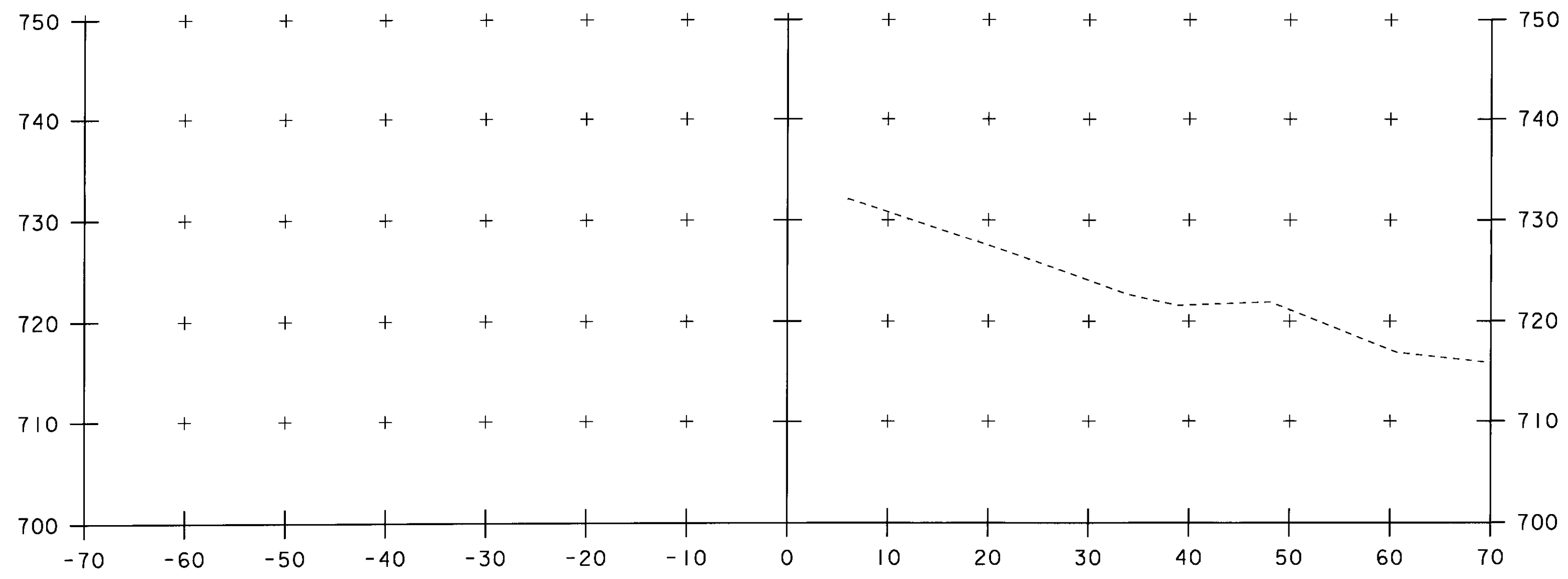


2+50

SCALE 1" = 10'-0"
 10 0 10

STA. 2+00 TO STA. 2+75

PROJECT NAME: FAIRLEE	PLOT DATE: 11-MAR-2009
PROJECT NUMBER: STP CULV (13)	DRAWN BY: L.J.STONE
FILE NAME: s08c060xsl.dgn	CHECKED BY: E.L.RUSTAY
PROJECT LEADER: C.P.WILLIAMS	SHEET 25 OF 26
DESIGNED BY: L.J.STONE	CROSS SECTIONS (2)

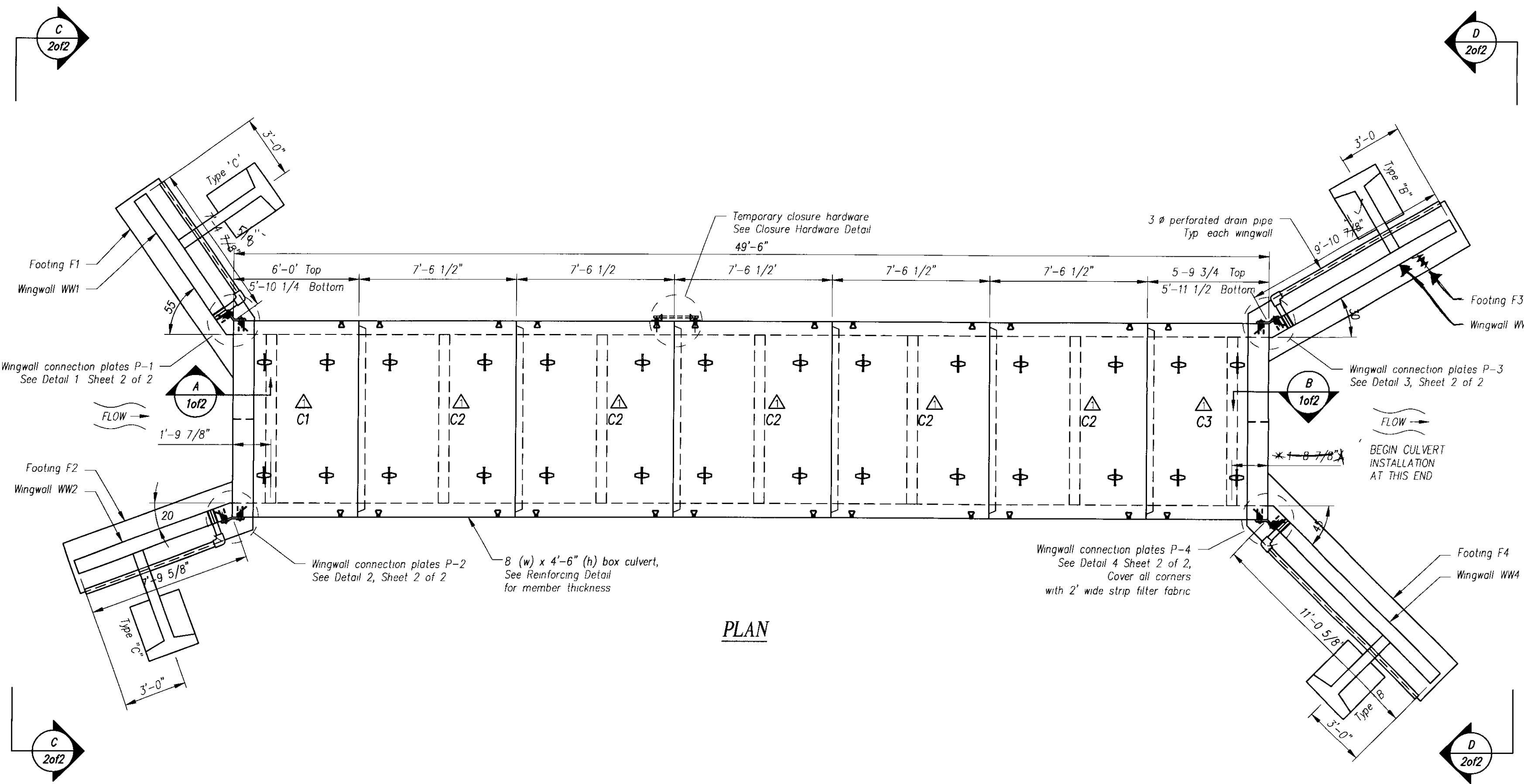


3+00

SCALE 1" = 10'-0"
 10 0 10

STA. 3+00 TO STA. 3+00

PROJECT NAME: FAIRLEE	
PROJECT NUMBER: STP CULV (13)	
FILE NAME: s08c060xsl.dgn	PLOT DATE: 11-MAR-2009
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: L.J.STONE
DESIGNED BY: L.J.STONE	CHECKED BY: E.L.RUSTAY
CROSS SECTIONS (3)	SHEET 26 OF 26



PLAN

- GENERAL NOTES**
- Reference Standards
AASHTO "Standard Specifications for Highway Bridges" LRFD
ASTM C1433
 - Design Parameters
Live load AASHTO HL-93
Earth Cover 15' to 35'
Concrete Design strength $f'_c = 5000$ psi
Unit weight = 150 pcf
Reinforcing ASTM A615 (rebar), grade 60
ASTM A185 (WVF) $f_y = 60$ ksi
Soil Unit weight = 140 pcf
Minimum lateral pressure coefficient 25
Maximum lateral pressure coefficient 50
Cover to reinforcing 1 1/2" u n o
 - Dimensions include a joint gap Actual culvert piece length is 1/2" shorter (i.e. C2 = 7'-6")
 - No dampproofing supplied by CSI
 - DBS are Dowel Bar Splicers and DI are Dowel Ins
 - Water Repellent Silane shall be applied to all exposed surfaces of the Box, Wingwalls, and Headwalls also exposed inside surface of the Box starting at the opening at each end and extending 3 feet into the Box, including bottom surface of the Top Slab and top surface of the Bottom Slab
 - Headwalls not designed for impact
 - Two foot wide strip of membrane waterproofing shall be installed at each box joint (Top and Sides)
 - ALL EXPOSED EDGES SHALL HAVE A 3/4" HAMMER

BOX CULVERT PIECE SCHEDULE (MX-FA5000SC)

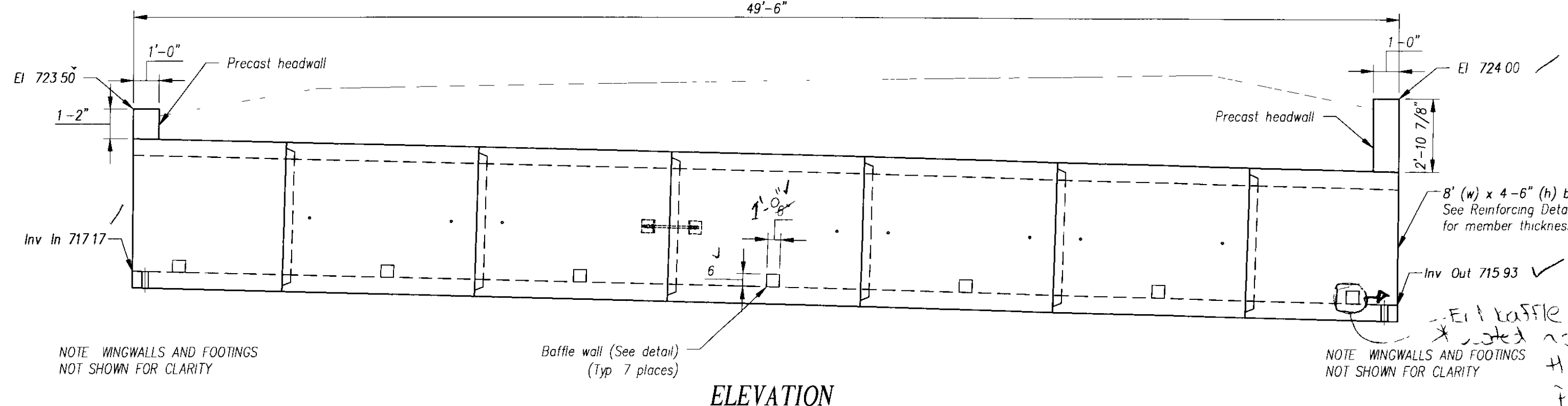
MARK	QTY	LENGTH	YDS	WEIGHT
C1	1	5.89'	4.80	9.72 TONS
C2	5	7.50'	5.44	11.01 TONS
C3	1	5.89'	5.17	10.48 TONS

WINGWALL PIECE SCHEDULE (MX-FA4000SC)

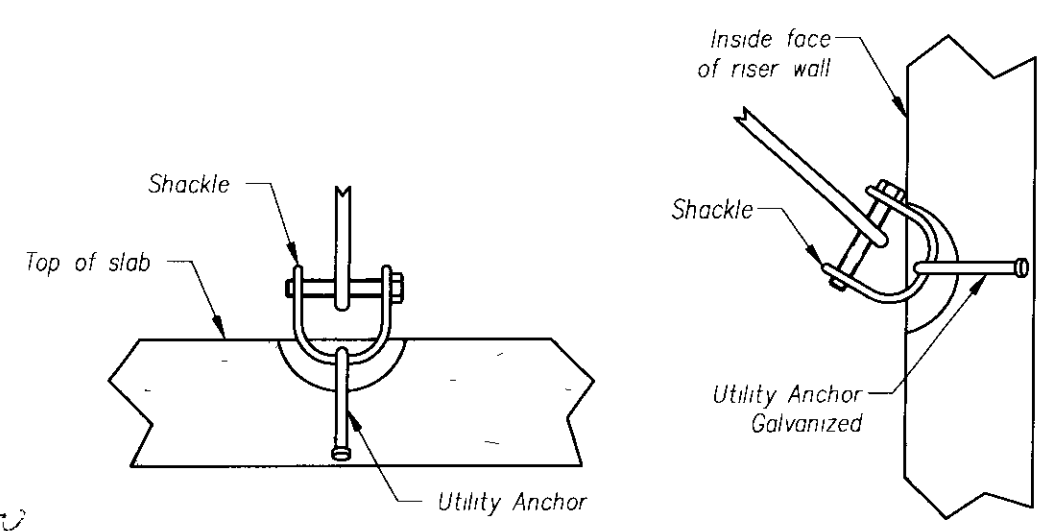
MARK	QTY	LENGTH	YDS	WEIGHT
WW1	1	7.75'	1.12	3.17 TONS
WW2	1	7.92'	1.02	2.97 TONS
WW3	1	10.08'	1.66	4.26 TONS
WW4	1	11.33'	1.80	4.55 TONS
F1	1	12.38'	2.88	5.83 TONS
F2	1	12.83'	2.88	5.83 TONS
F3	1	14.92'	3.48	7.05 TONS
F4	1	16.04'	3.84	7.78 TONS

ALL WORK AND MATERIALS, DELIVERY AND GRouting SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PAID FOR UNLESS NOTED

RECEIVED
 JUN 25 2009
 BY *CPW* DATE 7/2/09

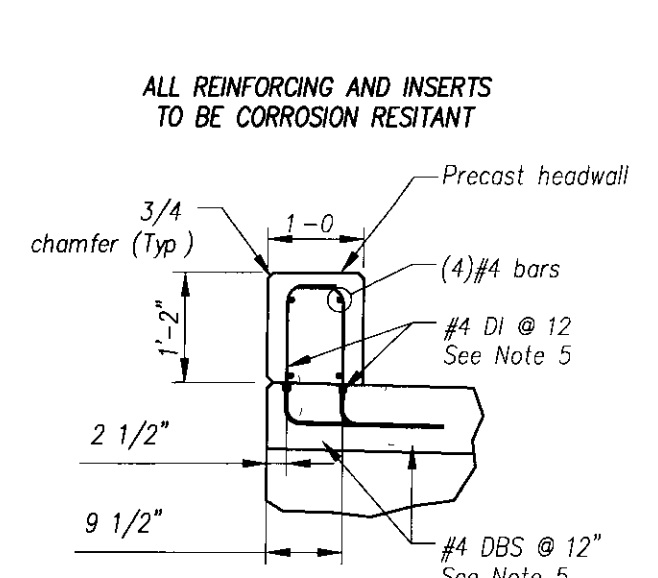


ELEVATION

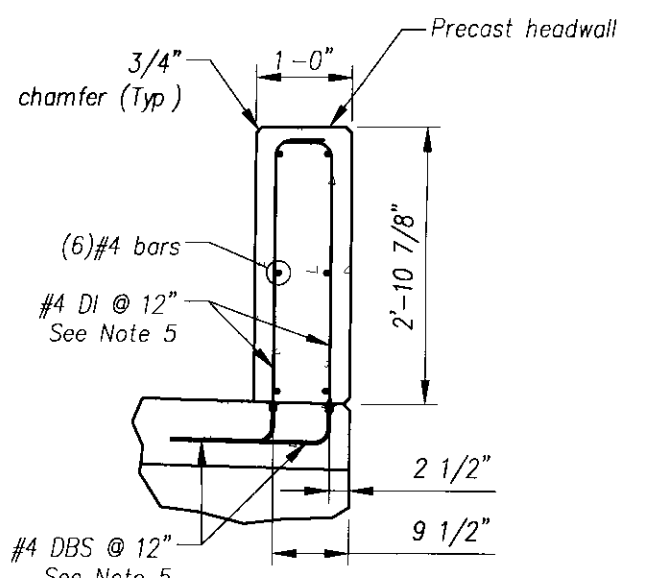


CULVERT LIFTING DETAIL

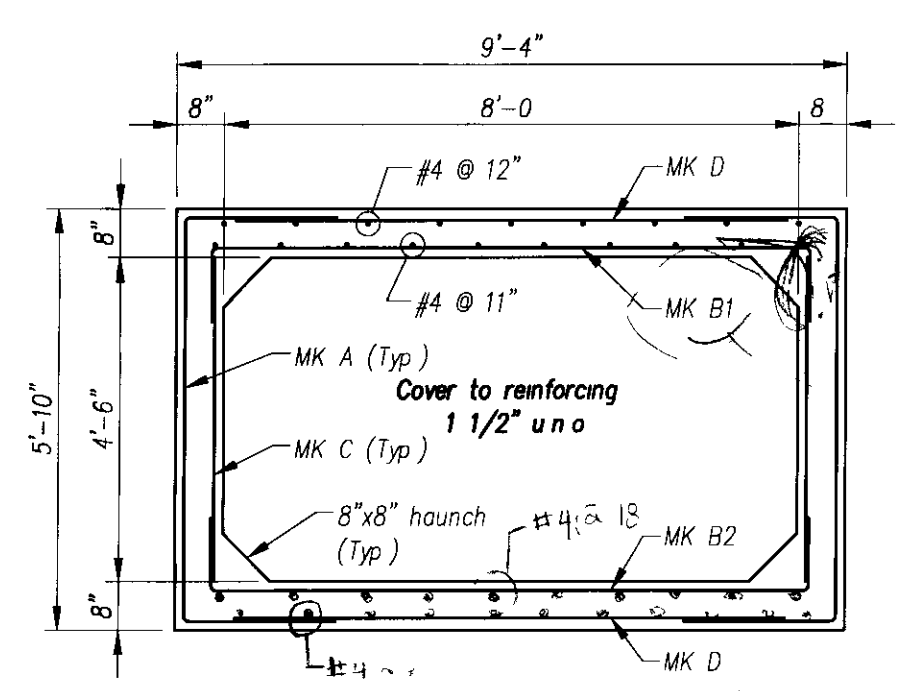
WINGWALL LIFTING DETAIL



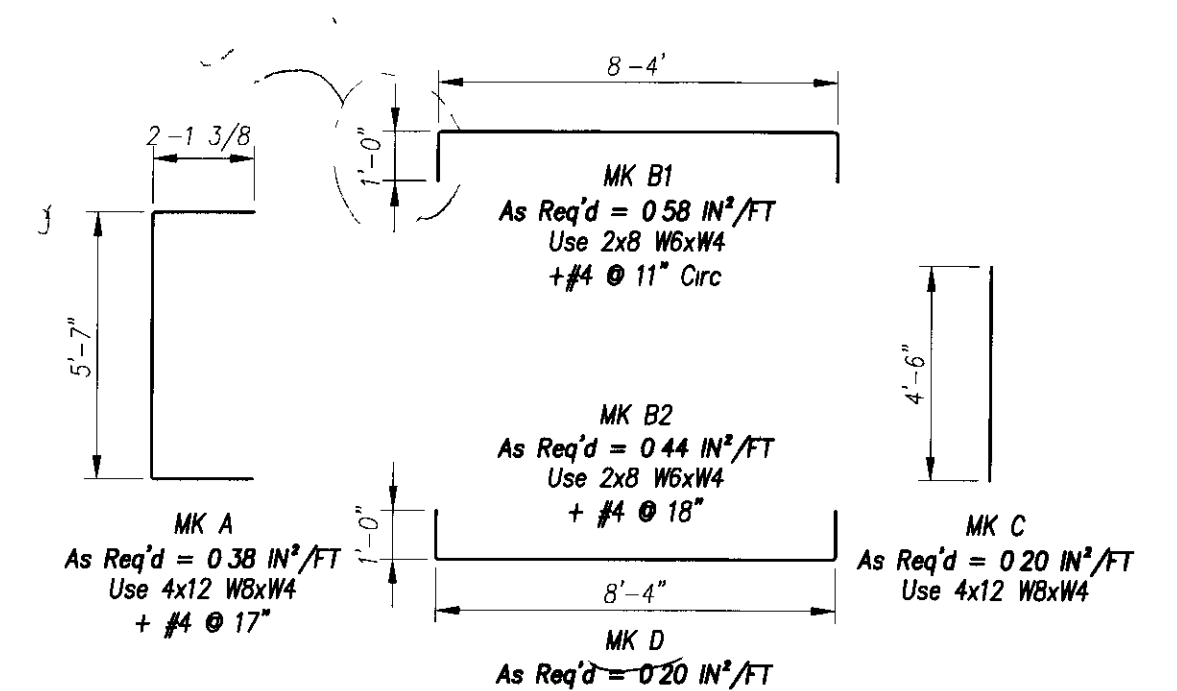
SECTION A
1 of 2



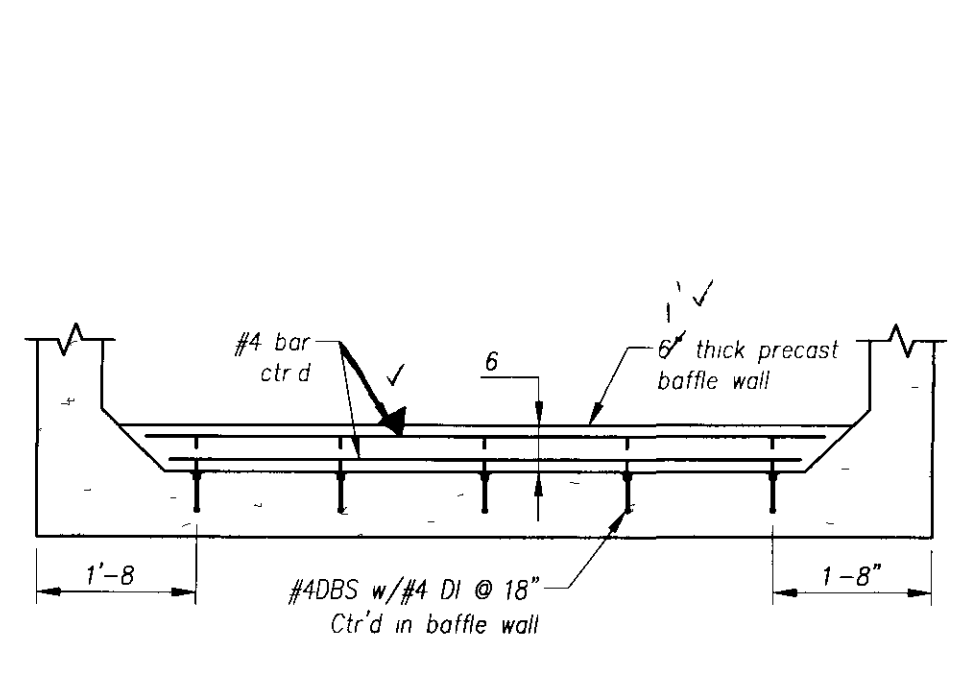
SECTION B
1 of 2



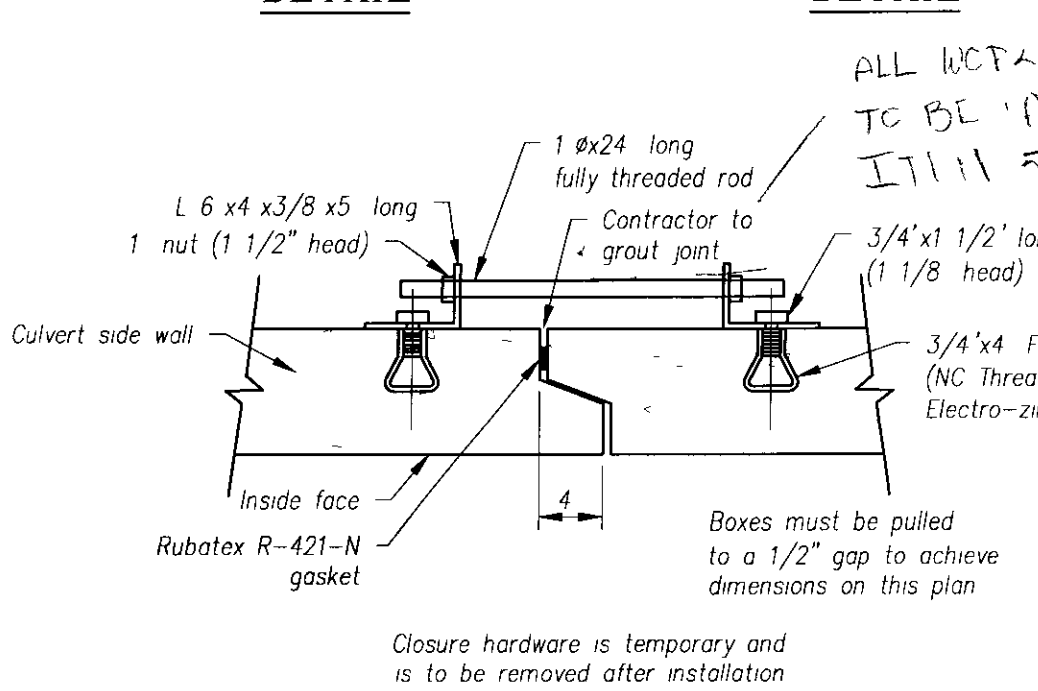
REINFORCING DETAIL



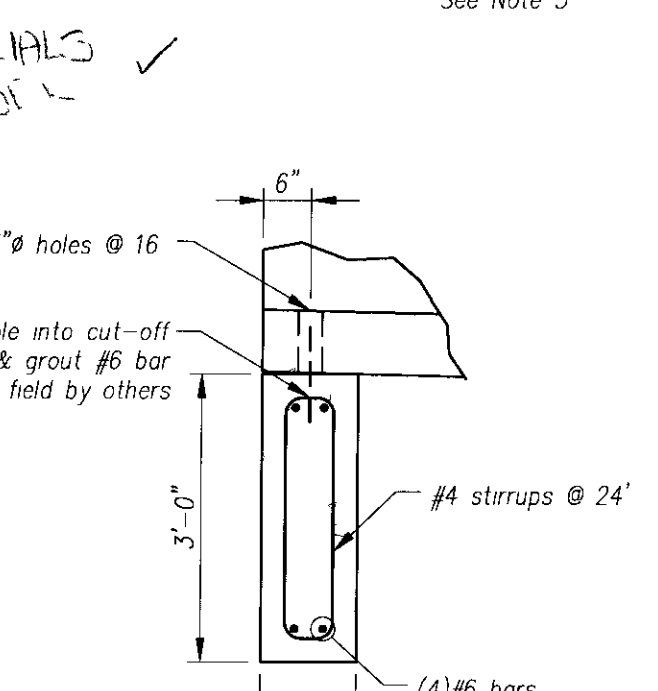
BENDING SCHEDULE



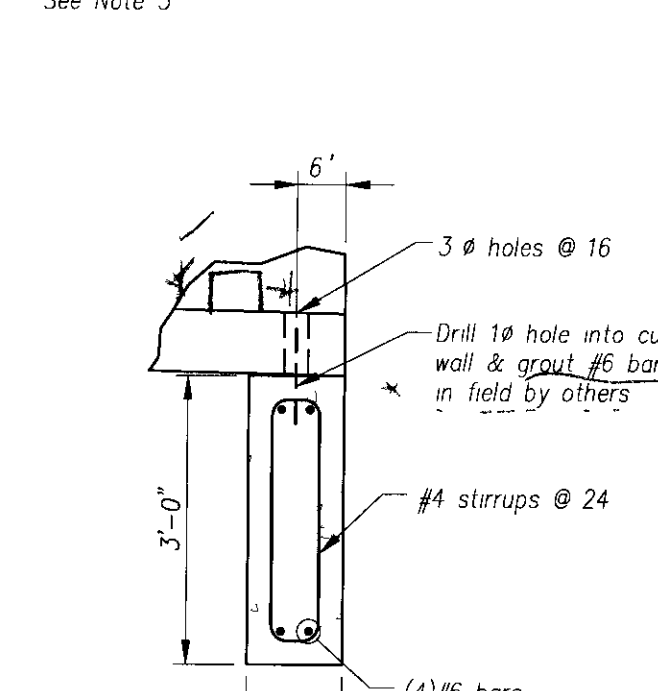
BAFFLE WALL DETAIL



CLOSURE HARDWARE DETAIL



SECTION A
1 of 2



SECTION B
1 of 2

Contractor to verify that all information shown on drawings has been thoroughly checked, complies with the contract documents and is adequate to meet the field conditions. Some dimensions and details may differ slightly from contract drawings to accommodate the manufacturing or design process. Approval of this drawing indicates that any deviation from the contract documents has been reviewed and found to be acceptable. Production will not commence until receipt of signed, approved shop drawings.

This drawing contains information proprietary to CONCRETE SYSTEMS, INC. The drawing is disclosed with the understanding that it will be retained in confidence and its use limited solely to the purpose for which it is disclosed. It is understood that no reproduction of this drawing is authorized without permission from CONCRETE SYSTEMS, INC. and that it will be returned to CONCRETE SYSTEMS, INC. upon request.

10			
9			
8			
7			
6			
5			
4			
3			
2			
1	06/23/09	Revised piece designations in plan view	MS
Rev	Date	DESCRIPTION	By
		REVISIONS	

This drawing is based upon information provided from the following documents and/or sources

Engineer
 Project No
 Drawings
 Specifications
 Other Sources

CSI
 Concrete Systems Inc
 9 Commercial St. Hudson, NH 03051
 Phone 603-889-4163
 Fax 603-888-2417

STATE AGENCY

Drawn By: F. LOPEZ
 Checked By: B. KOLAWOLE
 Approved By:

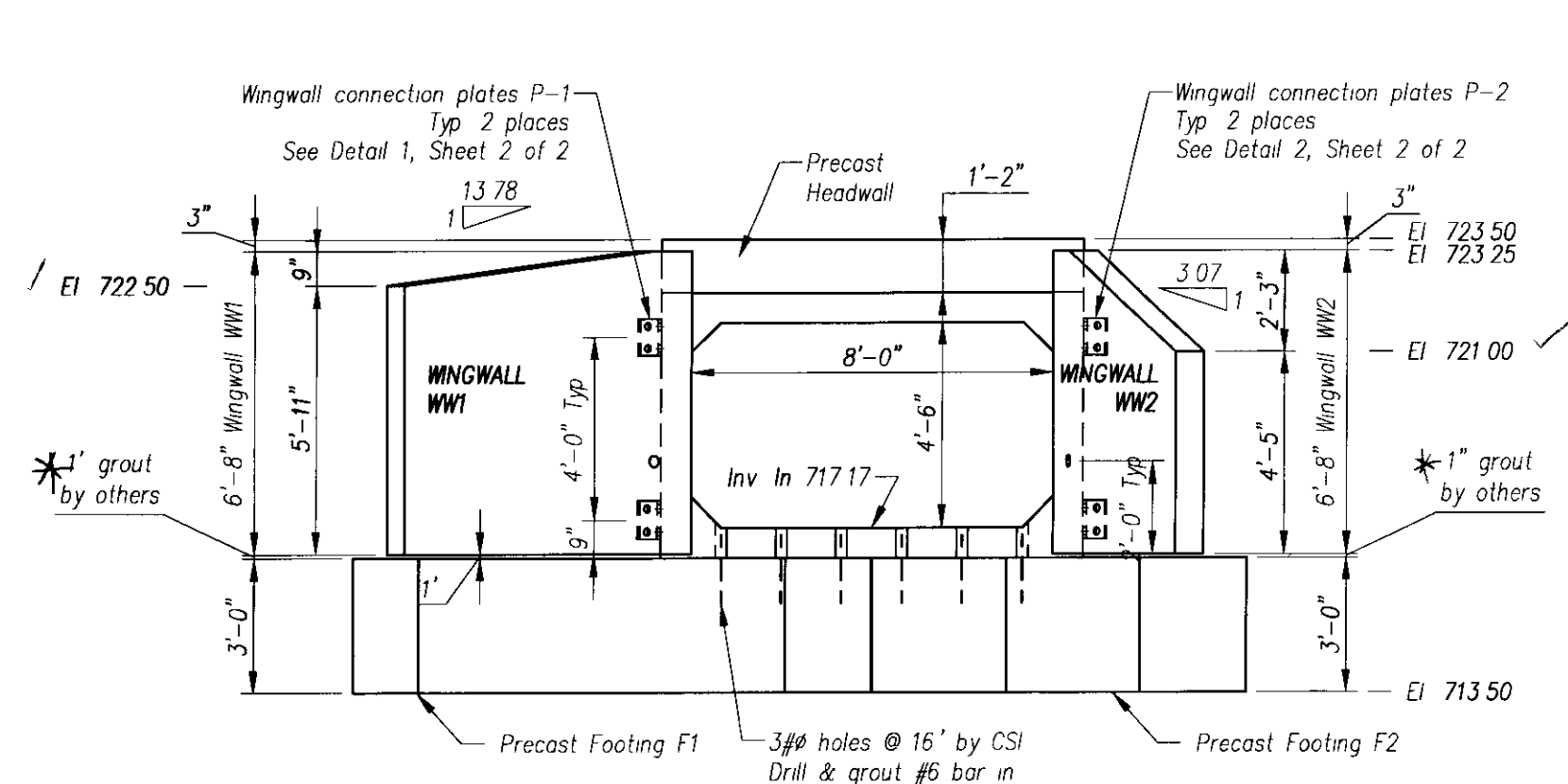
Date: 05/01/2009
 Date: 05/01/2009
 Date:

GW TATRO CONSTRUCTION
 VT/DOIR CULVERT
 FAIRLEE, VT

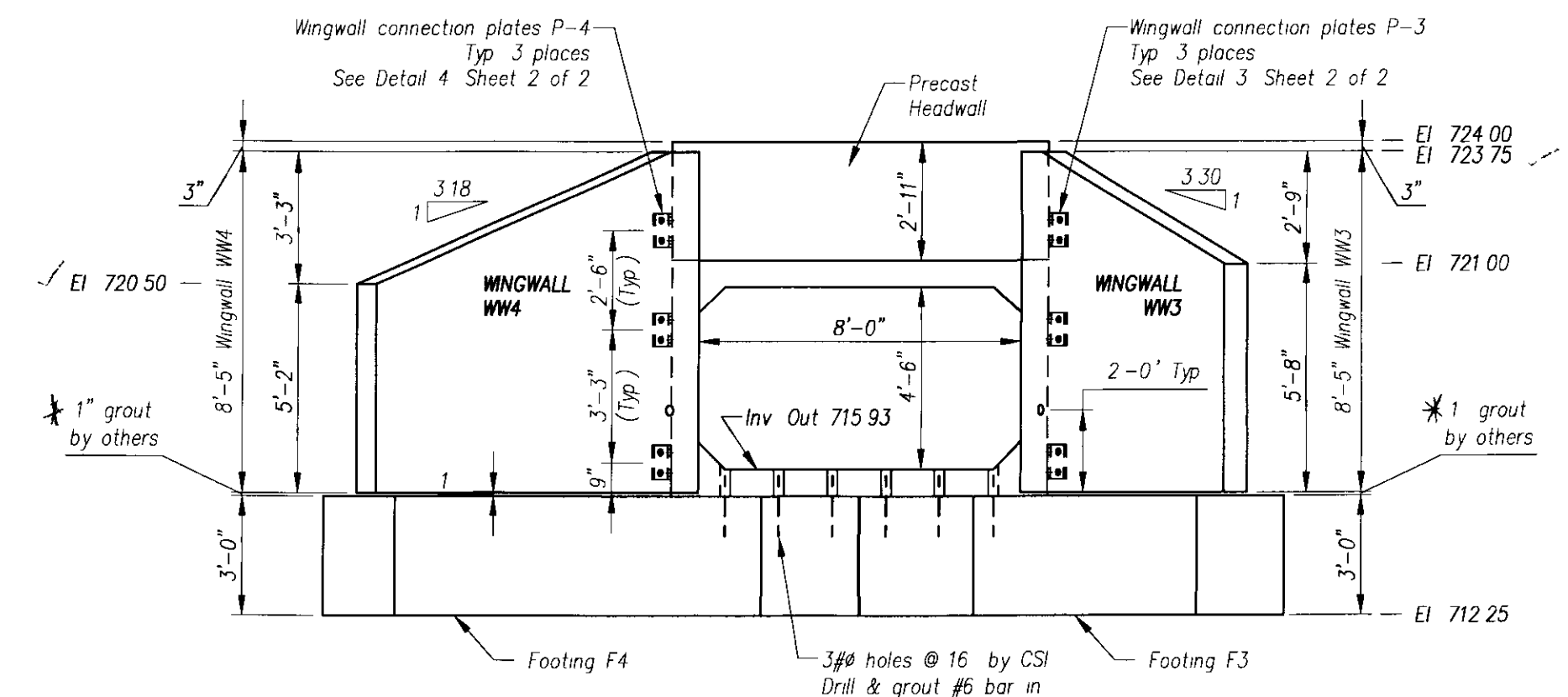
BOX CULVERT LAYOUT & DETAILS
 C19768-LO1-A

REV 1

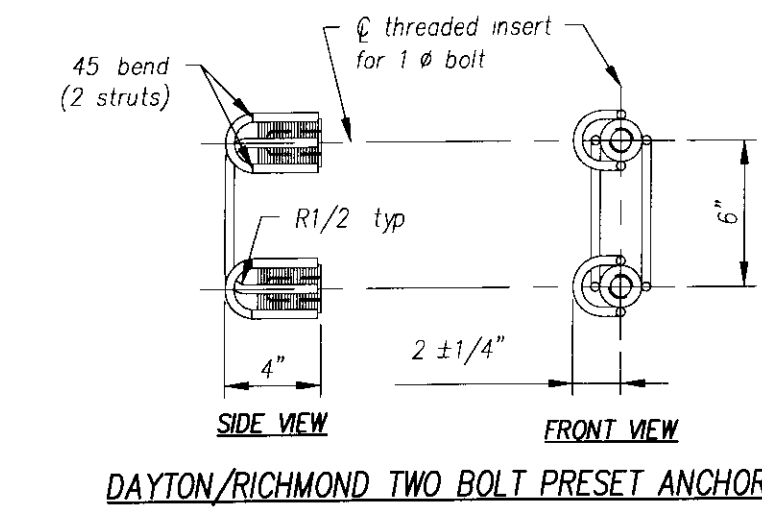
Quantity: Project No: STPCULV13 SHEET 1 OF 2



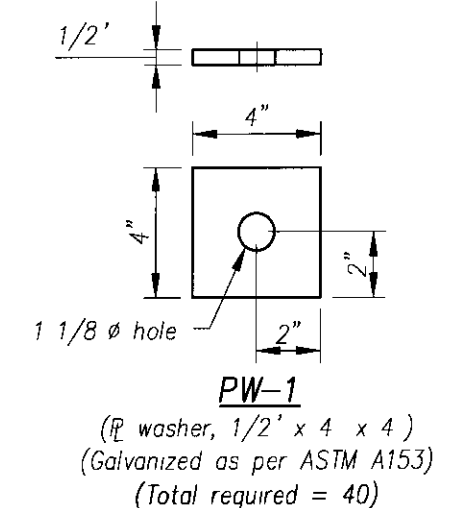
ELEVATION C
1 of 2



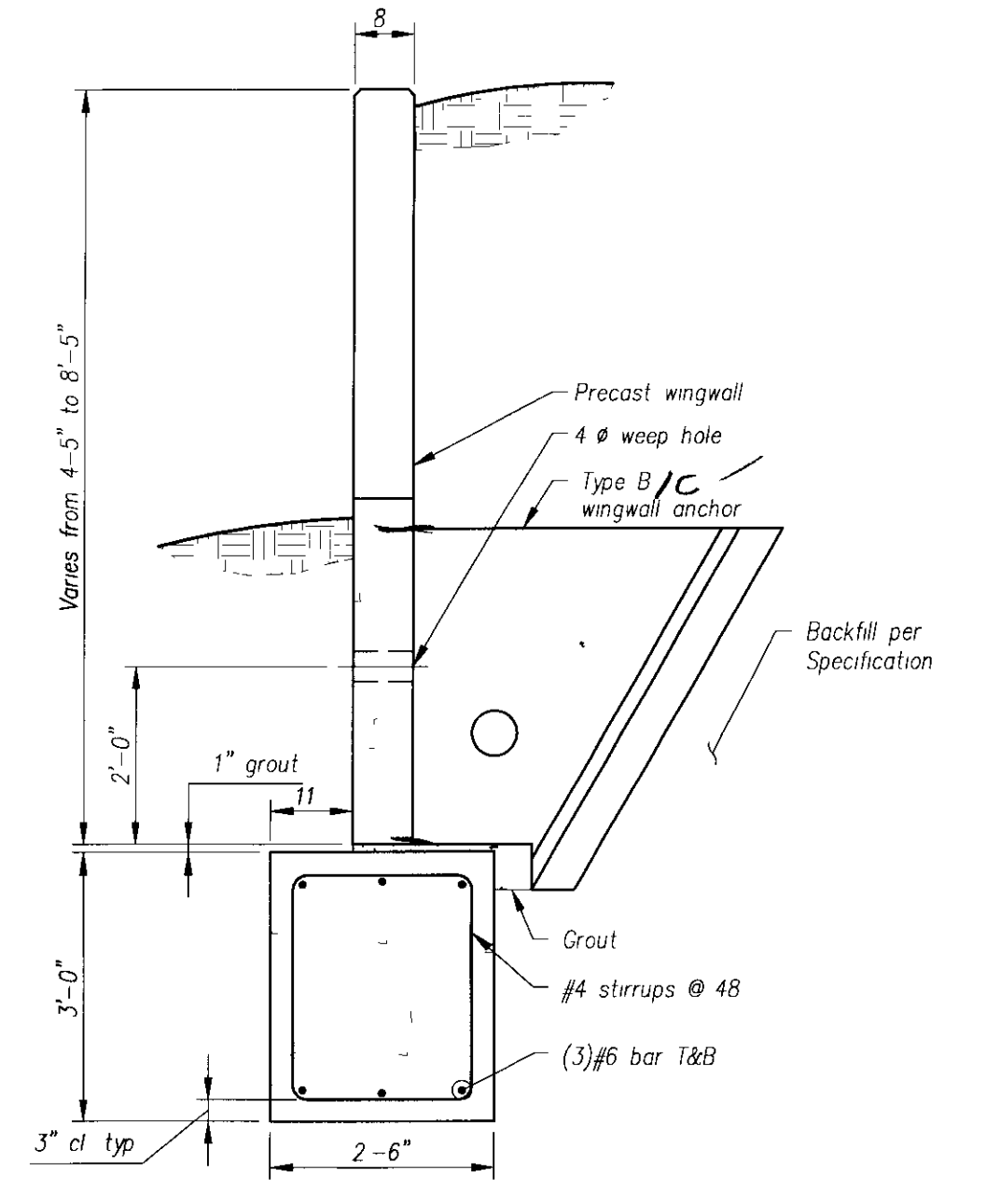
ELEVATION D
1 of 2



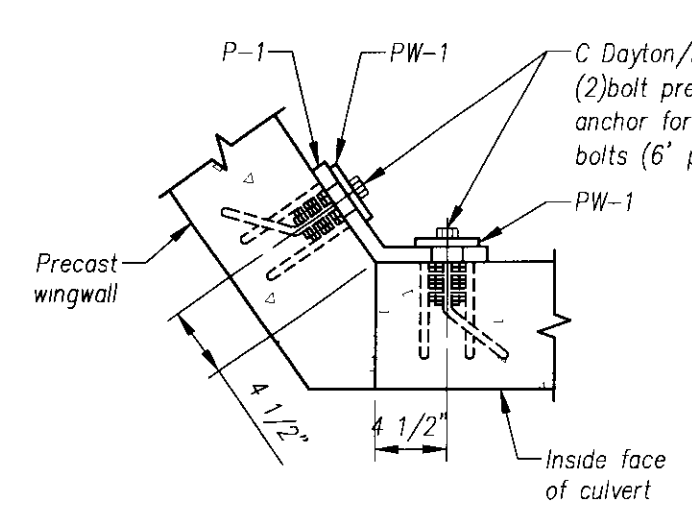
DAYTON/RICHMOND TWO BOLT PRESET ANCHOR



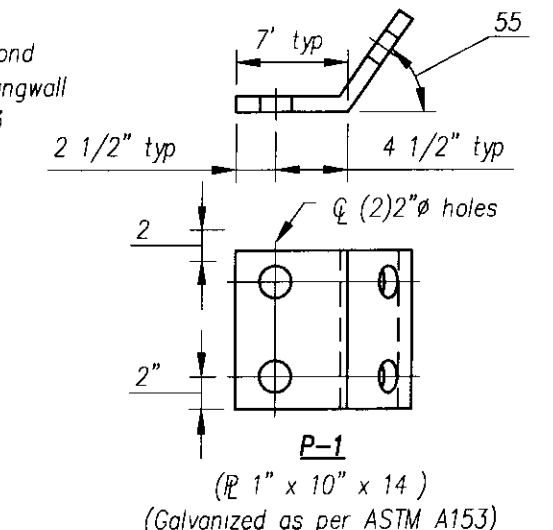
PW-1
(P washer, 1/2" x 4 x 4)
(Galvanized as per ASTM A153)
(Total required = 40)



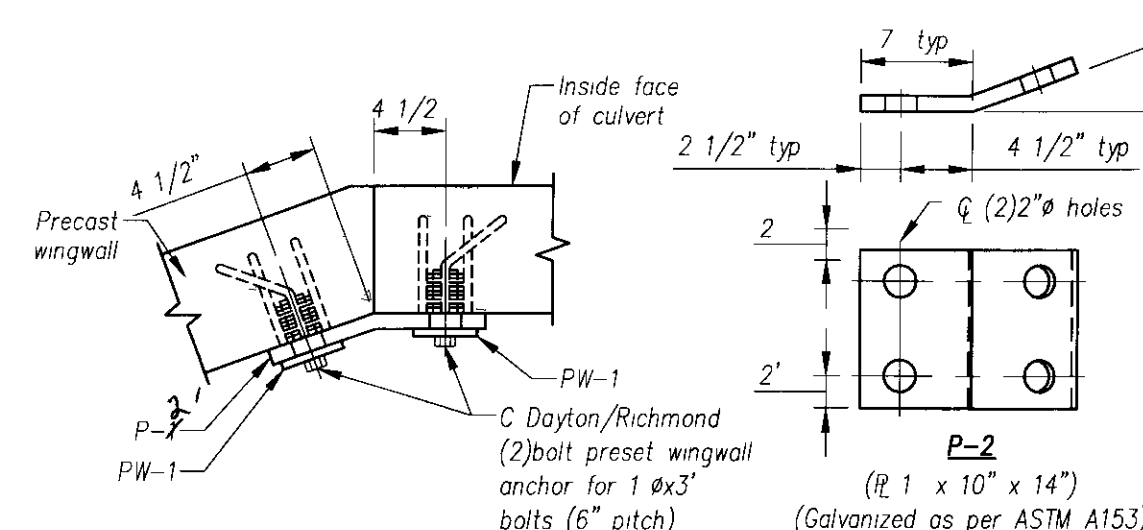
TYPICAL WINGWALL SECTION



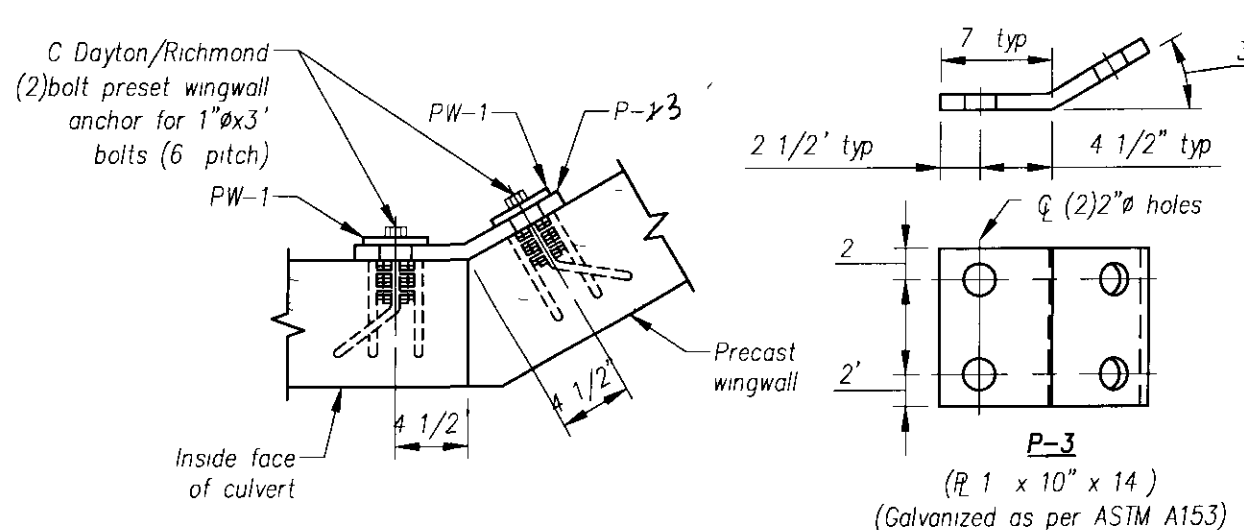
DETAIL 1
1,2 of 2



DETAIL 2
1,2 of 2

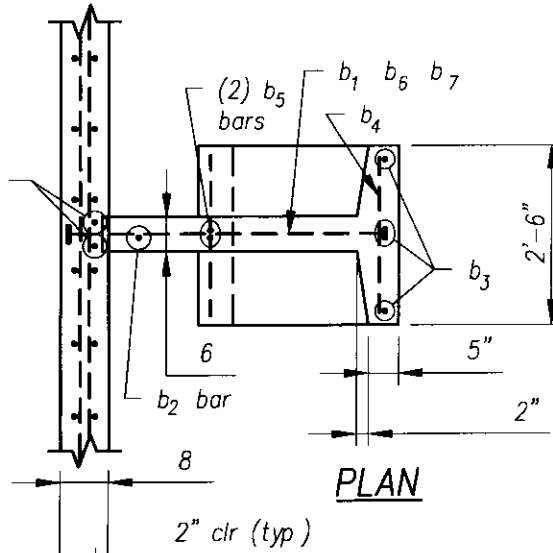


DETAIL 3
1,2 of 2

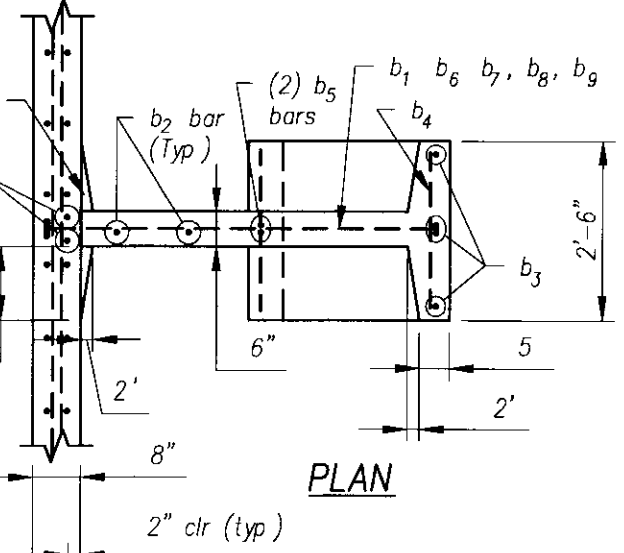
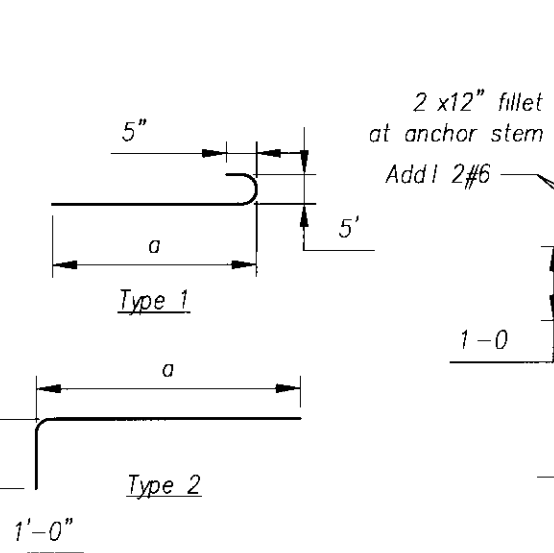


DETAIL 4
1,2 of 2

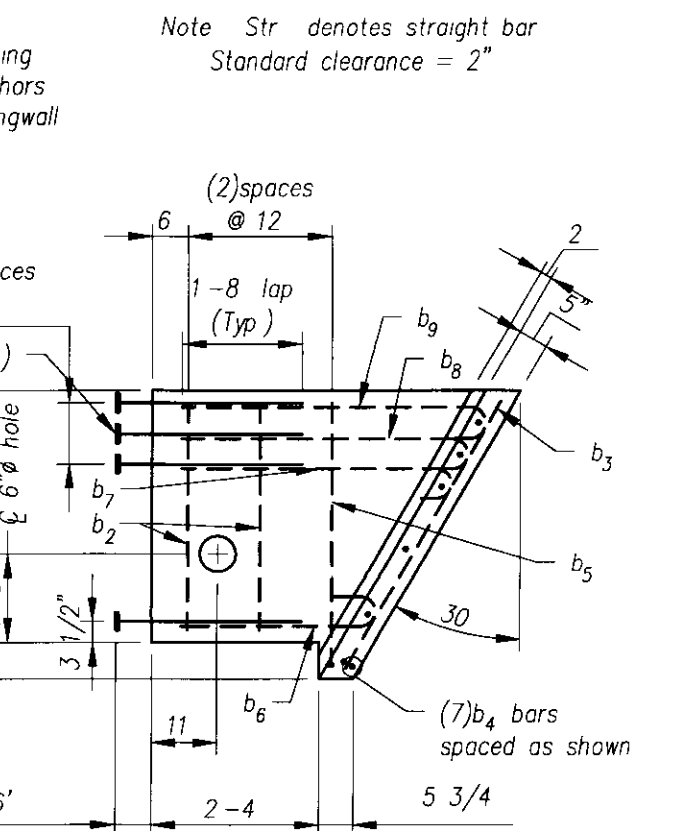
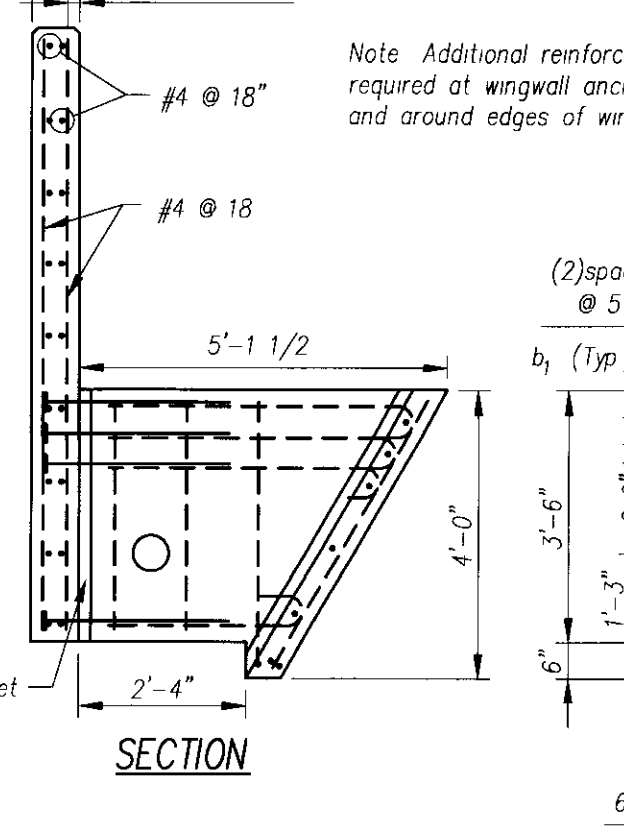
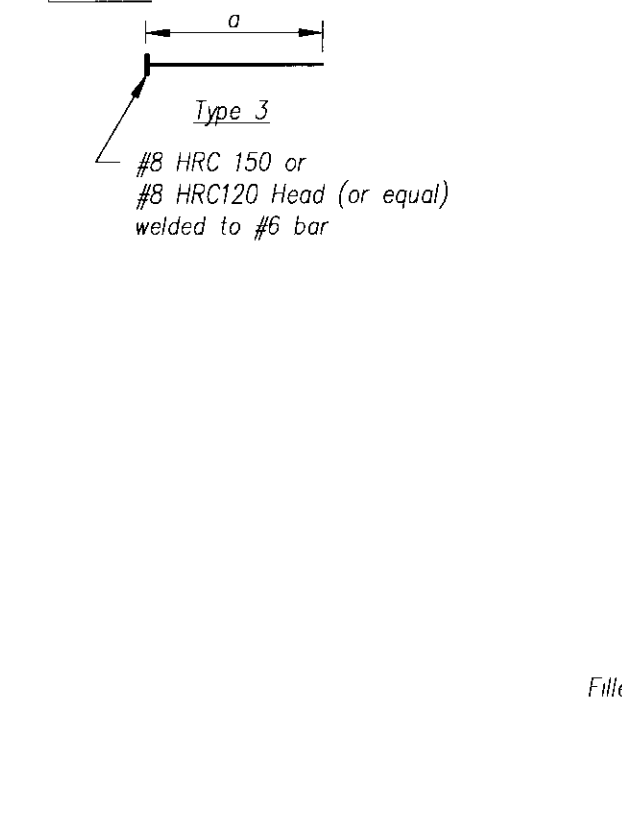
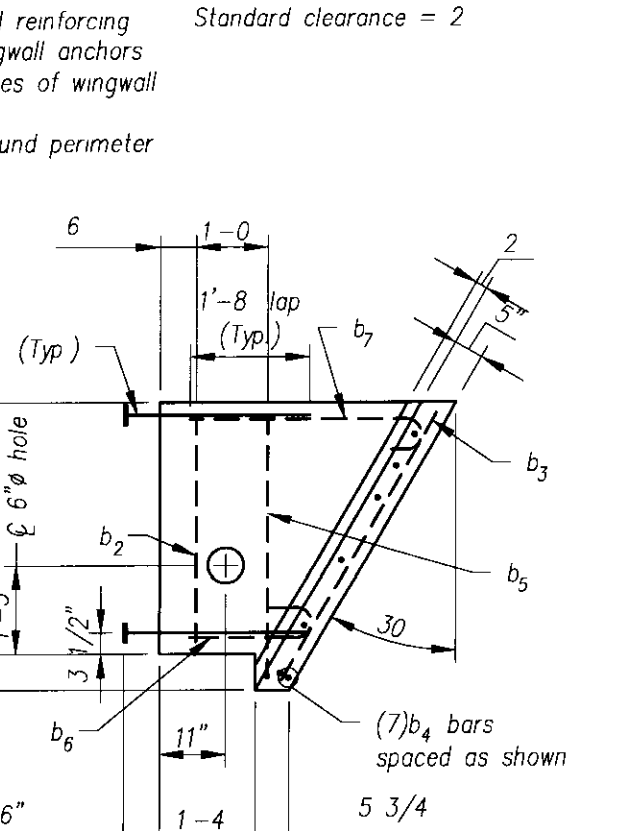
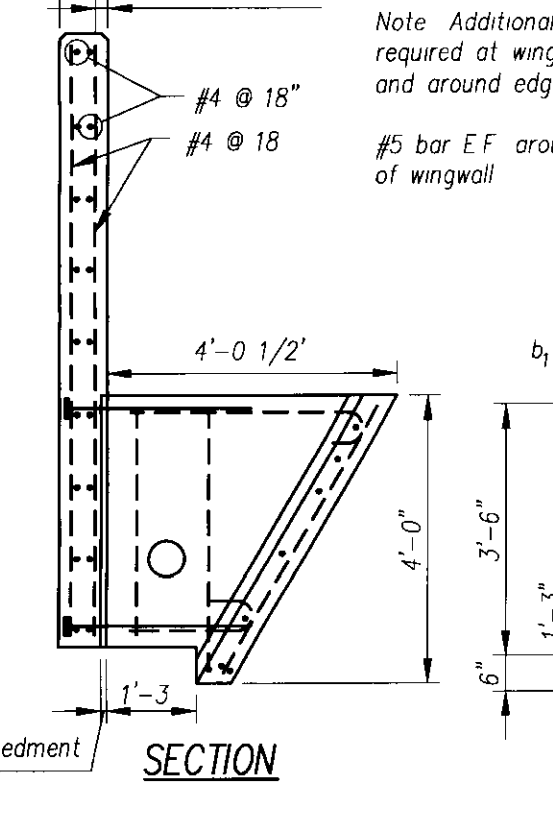
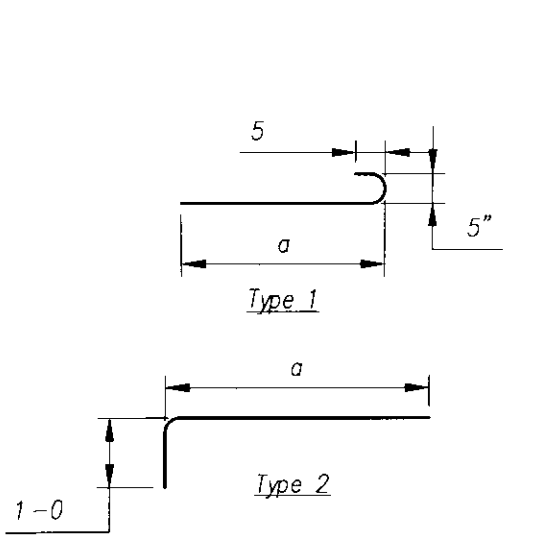
*ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITIONS OF THE SPECIFICATIONS



MARK	QTY	SIZE	a	TYPE	LENGTH
b ₁	2	#6	2-7	Str	3
b ₂	1	#5		Str	3-2
b ₃	4	#5		Str	4-3
b ₄	7	#5		Str	2-2
b ₅	2	#5	3-8		2
b ₆	1	#5	1'-9"		1
b ₇	1	#5	3'-2"		1



MARK	QTY	SIZE	a	TYPE	LENGTH
b ₁	4	#6	2-7	Str	3
b ₂	2	#5		Str	3-2
b ₃	4	#5		Str	4-2
b ₄	7	#5		Str	2-2
b ₅	2	#5	3-8		2
b ₆	1	#5	2'-9"		1
b ₇	1	#5	3-9		1
b ₈	1	#5	4-0		1
b ₉	1	#5	4-3		1



SECTION
1 embedment

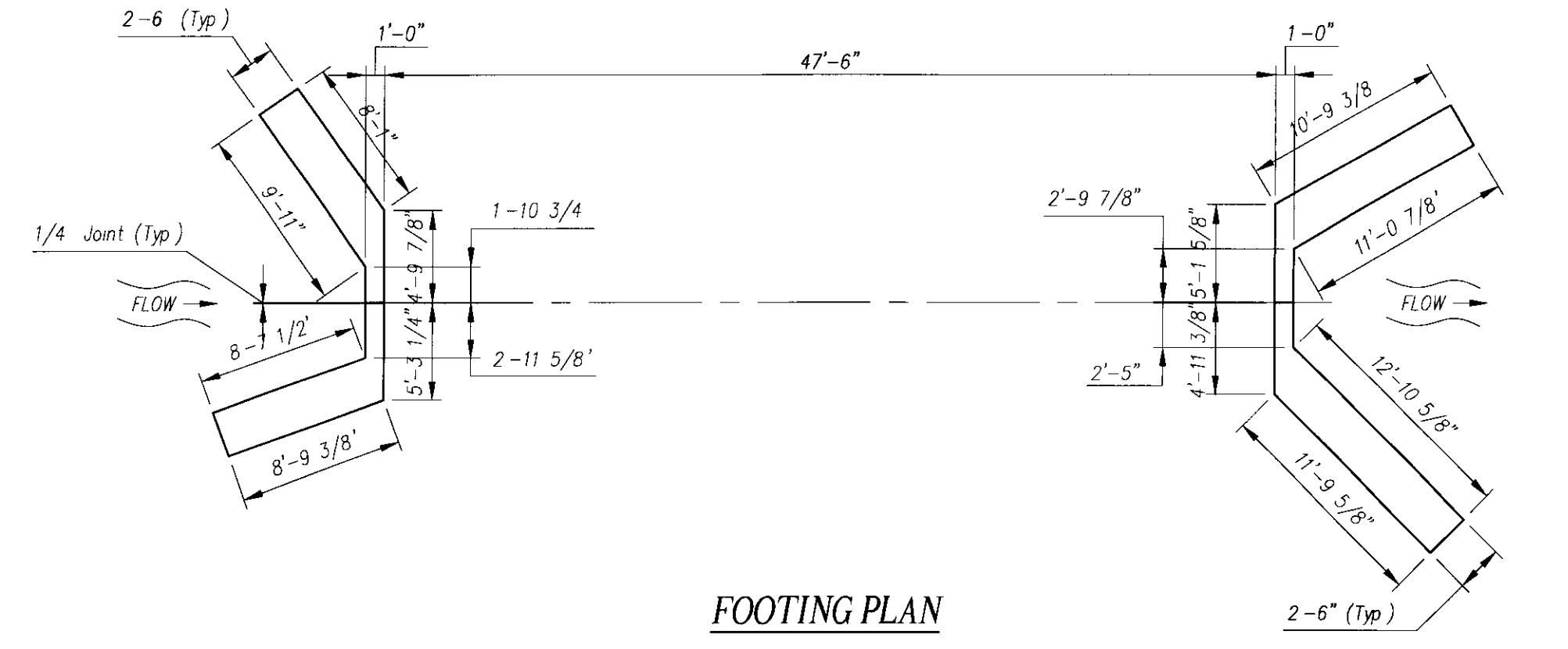
PRECAST ANCHOR TYPE B

PRECAST ANCHOR TYPE C

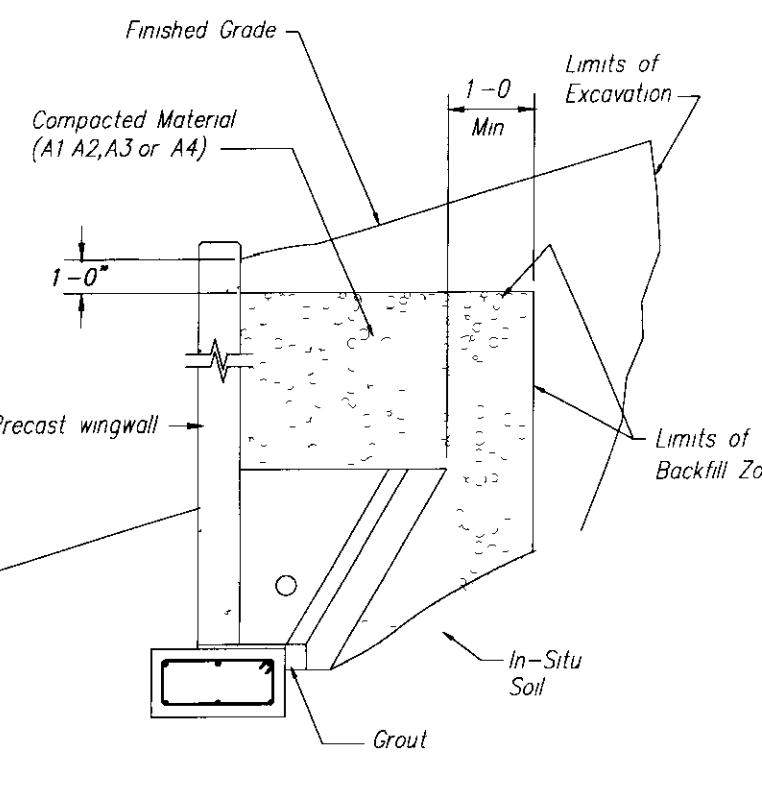
PRECAST ANCHOR TYPE C

PRECAST ANCHOR TYPE C

NOTES
GENERAL NOTES:
 1. The wingwalls have 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.
DESIGN DATA
 Design Method: Load factor per AASHTO Specification
 Wingwalls designed for Earth Pressure + Live Load Surcharge
 Assumed Allowable Soil Bearing: 4,000 PSF
MATERIALS
 - Precast units shall be constructed and installed in accordance with CON/SPAN Specifications
 - Concrete for Wingwalls and Footings shall have a minimum compressive strength of 4,000 psi
 - Reinforcing steel for Wingwalls and Footings shall conform to ASTM A615, A616 or A617-Grade 60



FOOTING PLAN



WINGWALL BACKFILL REQUIREMENTS

Group Classification	BACKFILL DESCRIPTION							
	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								
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				10 max	10 max	11 min	11 min	10 max
Usual Types of Significant Constituent Materials	6 max	NP		Fine Stone Fragments, Gravel & Sand	Silty Clayey Gravel and Sand	Sand	Silty Soils	Fair to Poor
General Rating as Subgrade				Excellent to Good				

NOTES
 1. BACKFILLING OPERATIONS WITHIN THE CBZ SHALL BE PERFORMED IN LIFTS OF 8" OR LESS (LOOSE DEPTH)
 2. MAXIMUM DRY DENSITY SHALL BE DETERMINED BY AASHTO T-99 OR OTHER APPROVED METHODS
 3. BACKFILL SHALL BE COMPACTED IN LAYERS UNTIL THE DENSITY IS NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY

RECEIVED
 JUN 25 2009
 RESUBMIT APPROVED AS NOTED
 BY CPW DATE 7/2/09

Contractor is to verify that all information shown on drawings has been thoroughly checked, complies with the contract documents and is adequate to meet the field conditions. Some dimensions and details may differ slightly from contract drawings to accommodate the manufacturing or design process. Approval of this drawing indicates that any deviation from the contract documents has been reviewed and found to be acceptable. Production will not commence until receipt of signed, approved shop drawings.

Rev	Date	DESCRIPTION	By
10			
9			
8			
7			
6			
5			
4			
3			
2			
1	06/23/09	Revised piece designations in plan view on sheet 1 of 2	MS

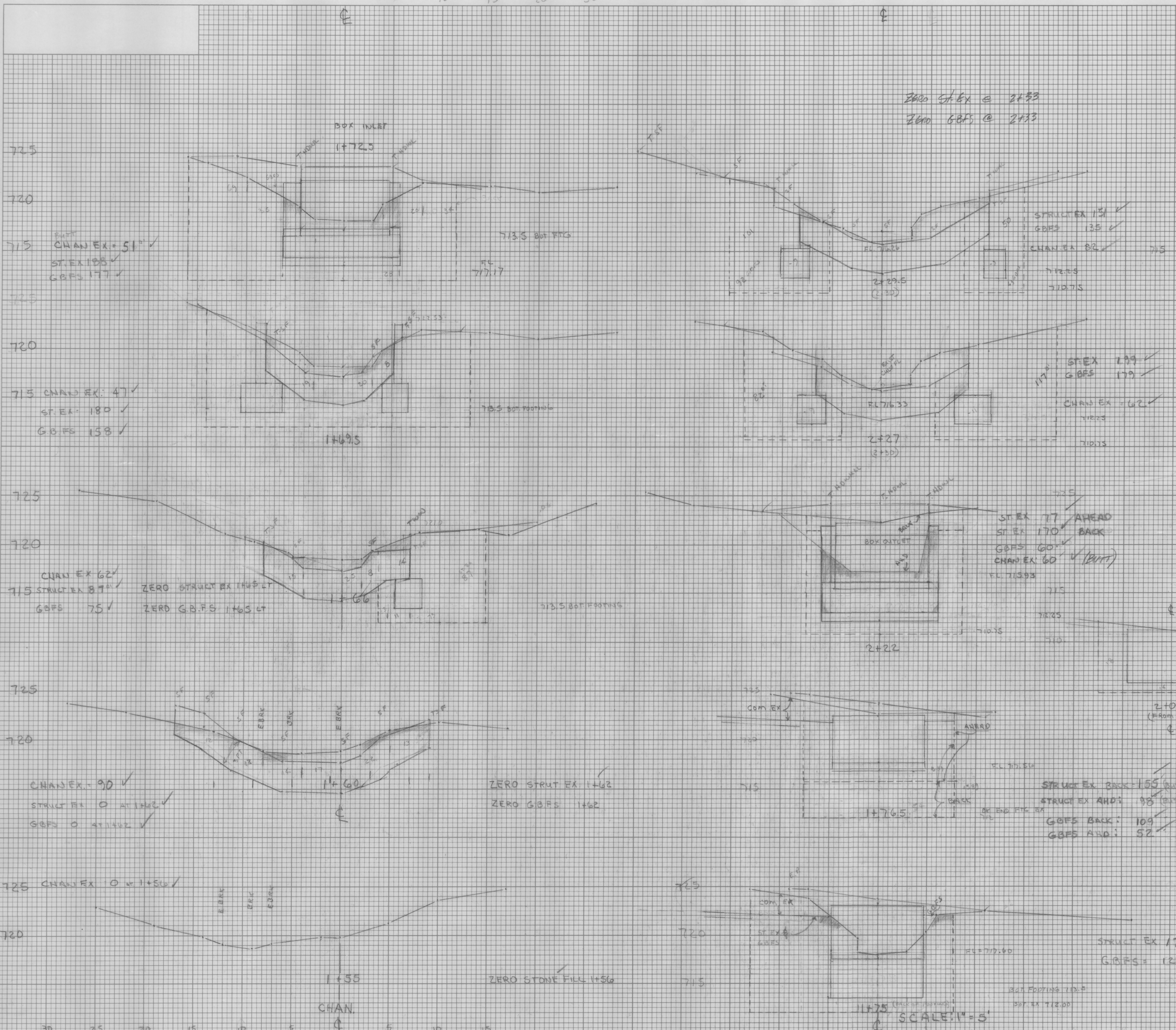
This drawing is based upon information provided from the following documents and/or sources
 Engineer
 Project No
 Drawings
 Specifications
 Other Sources

Concrete Systems Inc
 9 Commercial St Hudson NH 03051
 Phone 603-889-4163
 Fax 603-889-2417

STATE AGENCY
 Drawn By: F. LOPEZ
 Date: 05/01/2009
 Checked By: B. KOLAWOLE
 Date: 05/01/2009
 Approved By:

GW TATRO CONSTRUCTION
 VT/DOT: CULVERT
 FAIRLEE, VT
 BOX CULVERT LAYOUT & DETAILS
 C19768-L01-B
 SHEET 2 OF 2

5 10 15 20 30



ZERO STRUT EX @ 2+27
 ZERO GBFS @ 2+27

CHAN EX = 51 ✓
 STRUT EX 188 ✓
 GBFS 177 ✓

CHAN EX = 47 ✓
 STRUT EX 180 ✓
 GBFS 158 ✓

CHAN EX 62 ✓
 STRUT EX 87 ✓
 GBFS 75 ✓

CHAN EX = 90 ✓
 STRUT EX 0 AT 1+56 ✓
 GBFS 0 AT 1+56 ✓

CHAN EX 0 AT 1+56 ✓

713.5 BOT FPG
 FC 717.17

713.5 BOT FOOTING

713.5 BOT FOOTING

ZERO STRUT EX 1+63
 ZERO GBFS 1+62

ZERO STONE FILL 1+56

STRUCT EX 119 ✓
 GBFS 135 ✓
 CHAN EX 82 ✓
 712.75

STRUT EX 179 ✓
 GBFS 179 ✓
 CHAN EX = 62 ✓
 710.75

STRUT EX 177 AHEAD
 STRUT EX 170 BACK
 GBFS 60 ✓
 CHAN EX 60 ✓ (BUILT)
 FC 715.33

STRUCT EX BACK = 155 (BUILT)
 STRUCT EX AHD = 98 (BUILT)
 GBFS BACK = 109
 GBFS AHD = 52

STRUCT EX 17
 GBFS = 126

BOX FOOTING 713.0
 STRUT EX 712.00

SCALE: 1" = 5'

✓ 2/10/10 D58

