

SEE SHEET 2 FOR INDEX OF SHEETS
AND LIST OF STANDARDS.

STATE OF VERMONT
AGENCY OF TRANSPORTATION



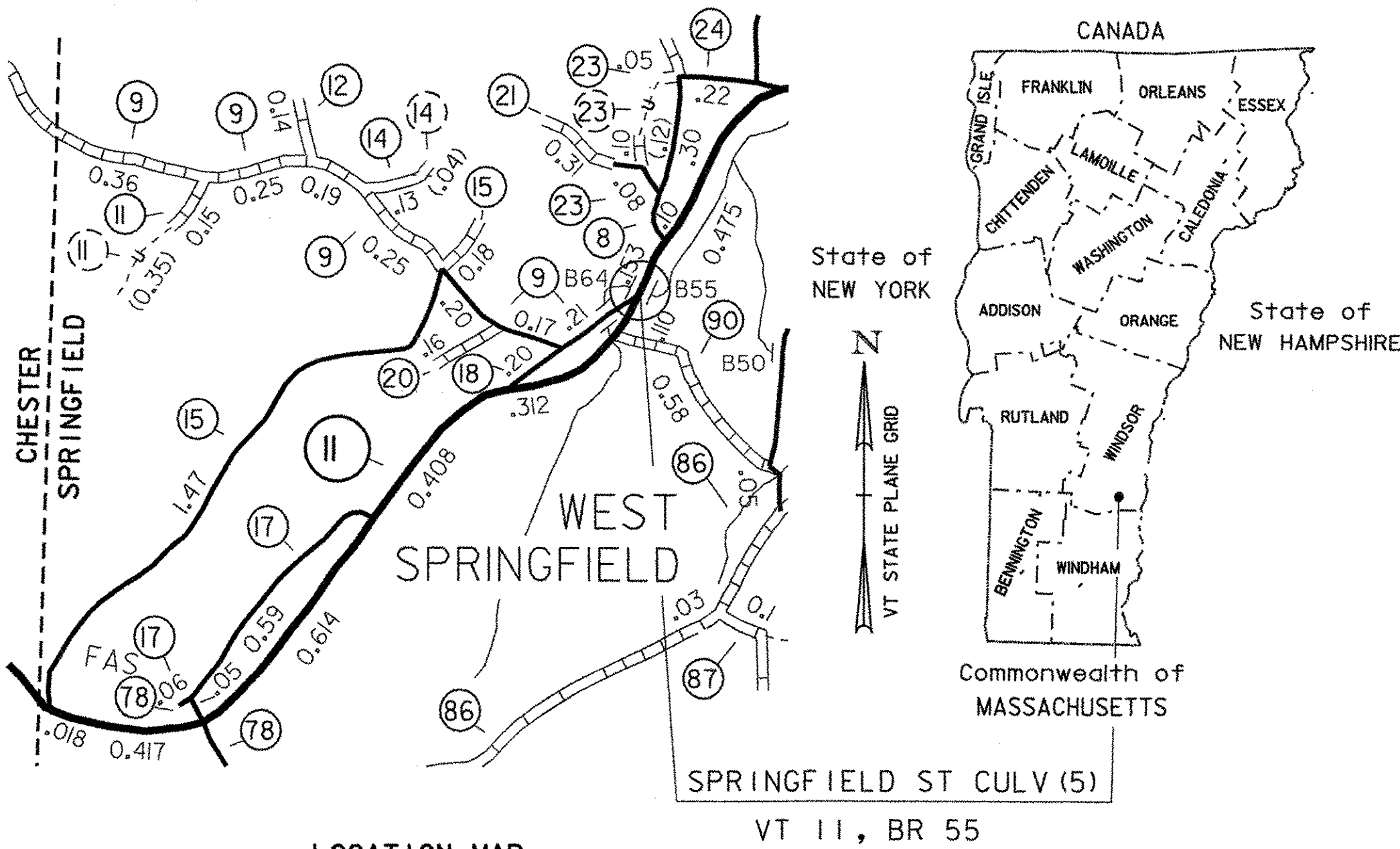
PROPOSED IMPROVEMENT
BRIDGE PROJECT
TOWN OF SPRINGFIELD
COUNTY OF WINDSOR

ROUTE NO: VT 11 MAJOR COLLECTOR BRIDGE NO: 55

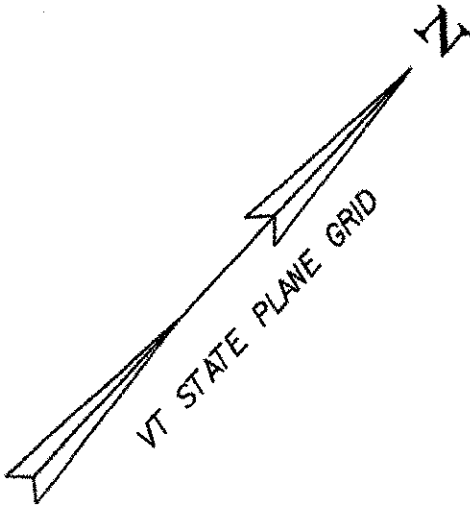
PROJECT LOCATION : BEGINNING AT A POINT IN THE TOWN OF SPRINGFIELD ALONG VT. RTE. 11
APPROXIMATELY 1.9 MILES EASTERLY FROM THE CHESTER-SPRINGFIELD
TOWN LINE.

PROJECT DESCRIPTION : REPLACEMENT OF EXISTING METAL CULVERT WITH A BURIED CONCRETE
STRUCTURE INCLUDING RELATED APPROACH ROADWAY AND CHANNEL WORK.

LENGTH OF STRUCTURE : 58.00 FEET
LENGTH OF ROADWAY : 142.00 FEET
LENGTH OF PROJECT : 200.00 FEET

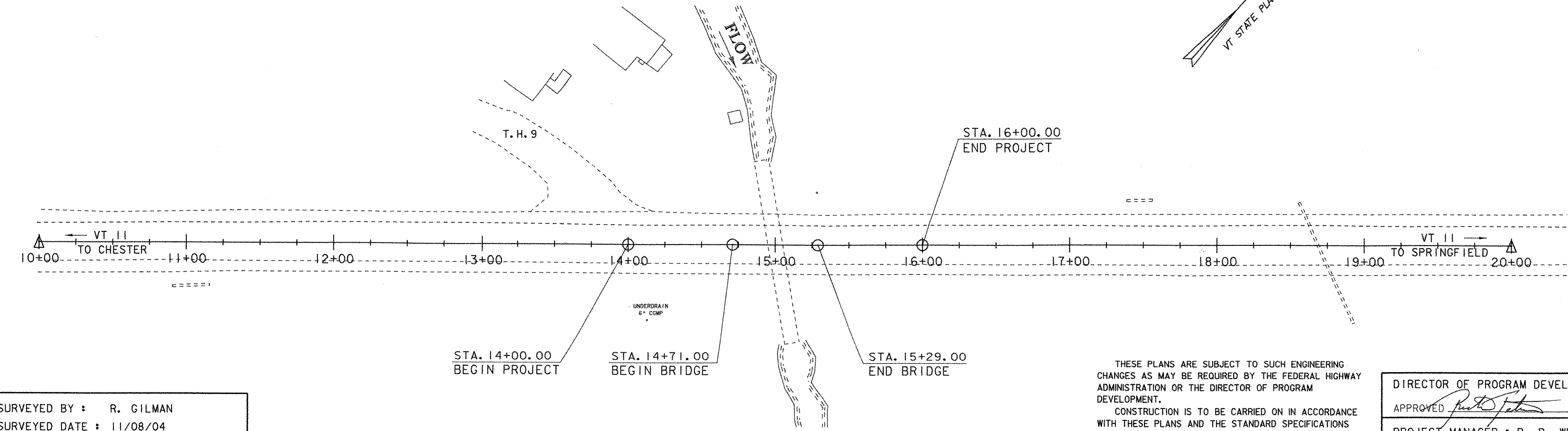


LOCATION MAP



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 : 11/08/04

DATUM
VERTICAL NAVD 88
HORIZONTAL NAD 83

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

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.

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED DATE 1-25-07
PROJECT MANAGER : R. R. WHITCOMB
PROJECT NAME : SPRINGFIELD
PROJECT NUMBER : ST CULV (5)
SHEET 1 OF 52 SHEETS

PRELIMINARY INFORMATION SHEET

FINAL HYDRAULIC REPORT

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- 7-8. LAYOUT SHEETS
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11. PHASE II TRAFFIC CONTROL
12. PHASE III TRAFFIC CONTROL
13. PERMANENT TRAFFIC SIGNS & PAVEMENT MARKINGS LAYOUT SHEET
14. TRAFFIC SIGN SUMMARY SHEET
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16. BORING LOGS
17. PLAN & ELEVATION SHEET
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- 23-24. EROSION PREVENTION & SEDIMENT CONTROL FINAL CONDITIONS
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39. MATERIALS TRANSITION DETAIL
- 40-46. MAINLINE SECTIONS
- 47-52. CHANNEL SECTIONS

E-5	SLOPE GRADING, EMBANKMENTS, MUCK	6/1/1994
E-100	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-121	STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD	8/8/1995
E-123	GUIDE SIGN PLACEMENT MISCELLANEOUS DETAILS	3/16/2004
E-141	REGULATORY SIGN DETAILS	9/20/1995
E-143	REGULATORY SIGN DETAILS	6/15/2004
E-160	FLANGED CHANNEL STEEL SIGN POST	5/20/1999
E-164	SQUARE STEEL SIGN POST	5/20/1999
E-191	PAVEMENT MARKING DETAILS	2/1/1999
E-193	PAVEMENT MARKING DETAILS	8/18/1995
G-1	STEEL BEAM GUARDRAIL WITH STEEL POSTS	1/3/2000
G-1D	STEEL BEAM GUARDRAIL WITH WOOD POSTS	1/3/2000
	STEEL BEAM GUARDRAIL APPROACH END TERMINAL	
	STEEL BEAM GUARDRAIL TRAILING END TERMINAL	
	ANCHOR FOR STEEL BEAM RAIL	
	STEEL BEAM MEDIAN BARRIER	
G-18	PRECAST CONCRETE TEMPORARY TRAFFIC BARRIER	6/1/1994
G-19	GENERIC GRADING PLANS FOR GUARDRAIL END TERMINALS	11/15/2002

Date: April 2007

Date: April 2007

DRAINAGE AREA : 2.82 sq. mi.
 CHARACTER OF TERRAIN : Hilly, mostly forested.
 STREAM CHARACTERISTICS : Sinuous, moderately steep.
 NATURE OF STREAMBED : Gravel and cobbles.

Q 2.33 =	<u>150 cfs</u>	Q 50 =	<u>540 cfs</u>
Q 10 =	<u>330 cfs</u>	Q 100 =	<u>630 cfs</u>
Q 25 =	<u>450 cfs</u>	Q 500 =	<u>880 cfs</u>

DATE OF FLOOD OF RECORD	Unknown
ESTIMATED DISCHARGE:	Unknown
WATER SURFACE ELEV.:	Unknown
NATURAL STREAM VELOCITY:	@ Q50 = 6.2 ft/s
ICE CONDITIONS :	Moderate
DEBRIS:	Heavy
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: _____

STRUCTURE TYPE:	Corrugated Metal Plate Pipe
YEAR BUILT:	1961
CLEAR SPAN(NORMAL TO STREAM):	Diameter = 114"
VERTICAL CLEARANCE ABOVE STREAMBED:	
WATERWAY OF FULL OPENING:	70.9 sq. ft.
DISPOSITION OF STRUCTURE:	Remove
TYPE OF MATERIAL UNDER SUBSTRUCTURE:	Unknown

Q2.33 =	736.9'	VELOCITY=	15.8 ft/s
Q10 =	739.5'	"	19.1 ft/s
Q25 =	741.0'	"	20.5 ft/s
Q50 =	742.1'	"	21.3 ft/s
Q100 =	743.1'	"	22.0 ft/s

IS THE ROADWAY OVERTOPPED BELOW Q100: No

FREQUENCY: Above Q100

RELIEF ELEVATION: 744.0'

DISCHARGE OVER ROAD @Q100: None

TOWN:	Springfield	DISTANCE:	700'
HIGHWAY #:	TH9	STRUCTURE #:	Br64
CLEAR SPAN:	14'	CLEAR HEIGHT:	6'
YEAR BUILT:	Unknown	FULL WATERWAY:	84 sq. ft.
STRUCTURE TYPE:	Bridge		

TOWN:	<u>Springfield</u>	DISTANCE:	<u>3,600'</u>
HIGHWAY #:	<u>VT11</u>	STRUCTURE #:	<u>B756</u>
CLEAR SPAN:	<u>12'-10"</u>	CLEAR HEIGHT:	<u>8'-4"</u>
YEAR BUILT:	<u>1961</u>	FULL WATERWAY:	<u>85 sq. ft.</u>
STRUCTURE TYPE:	<u>CMPPA</u>		

YEAR	ADT	DHV	% D	% T	ADTT
2006	6300	700	50	7	380
2026	8100	890	690	10	50

20 year ESAL for flexible pavement from	2006	to	2026	:	2,377,000
40 year ESAL for flexible pavement from	2006	to	2046	:	5,864,000
Design Speed :	50	mph			

WATER SURFACE ELEVATIONS AT:

Q25 =	736.0'	"	9.7 ft/s
Q50 =	736.3'	"	10.4 ft/s

Q100 = 736.6' " 11.1 ft/s

Q100 = 736.6' " 11.1 ft/s

IS THE ROADWAY OVERSTREET BELOW Q100: NO

FREQUENCY: Above Q100

IS THE ROADWAY OVERSTREET BELOW Q100: NO

FREQUENCY: Above Q100

RELIEF ELEVATION: 744.0'

DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 739.8'

VERTICAL CLEARANCE: @ Q50 = 3.5'

SCOUR: No scour with Stone Fill, Type III lining the channel

REQUIRED CHANNEL PROTECTION: Stone Fill Type III

AVERAGE DAILY FLOW:	6 cfs	DEPTH OR ELEVATION:
ORDINARY LOW WATER:	3 cfs	Depth>1.0'
ORDINARY HIGH WATER:	64 cfs	Depth=2.0'

STRUCTURE TYPE: No temporary bridge required. Water diversion may be required. ***
 CLEAR SPAN (NORMAL TO STREAM): _____
 VERTICAL CLEARANCE ABOVE STREAMBED: _____
 WATERWAY AREA OF FULL OPENING: _____

*** If traffic is maintained with phased construction, a temporary pipe maybe used to convey water through the construction area. A 60" pipe is the minimum size that should be used, based on passing a Q2.33 flood with 6.4' of headwater. The contractor may propose other options as long as a minimum water area of 19.6 sq. ft. is maintained.

1.	DESIGN LIVE LOAD AASHTO	HS-25-44
2.	DESIGN SPAN	56'
3.	ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL	4000 psf
4.	ON LEDGE N/A	
5.	ALLOWABLE LOAD FOR PILING	N/A
6.	TYPE N/A	
7.	ESTIMATED LENGTH	
8.	STRUCTURAL STEEL AASHTO M270/M270 GRADE	N/A
9.	REINFORCING STEEL GRADE	80
10.	CONCRETE, HIGH PERFORMANCE CLASS A	fc: N/A
11.	CONCRETE, HIGH PERFORMANCE CLASS B	fc: 3500 psi

8. DESIGN SOIL UNIT WEIGHT	140 pcf
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL	3000 psf

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

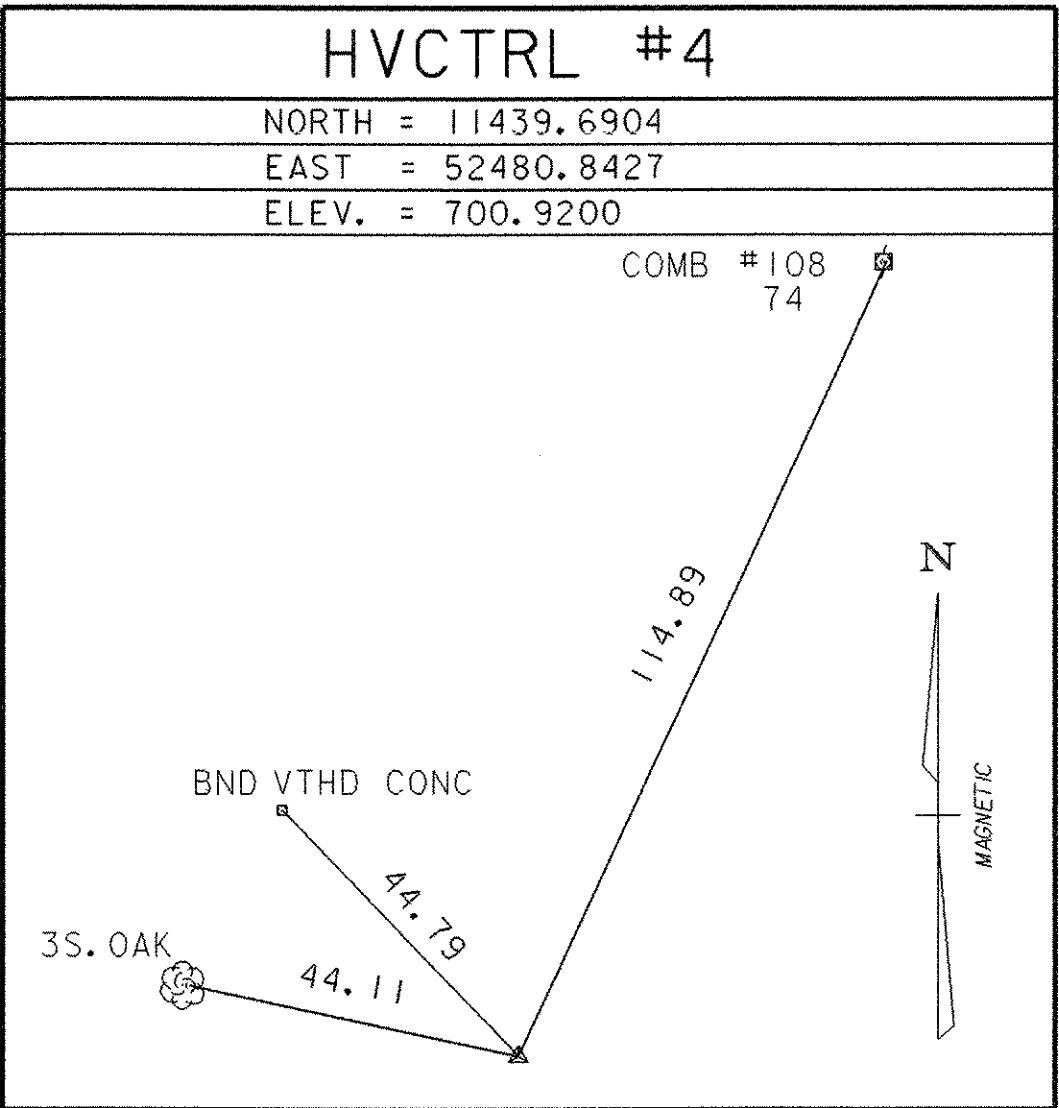
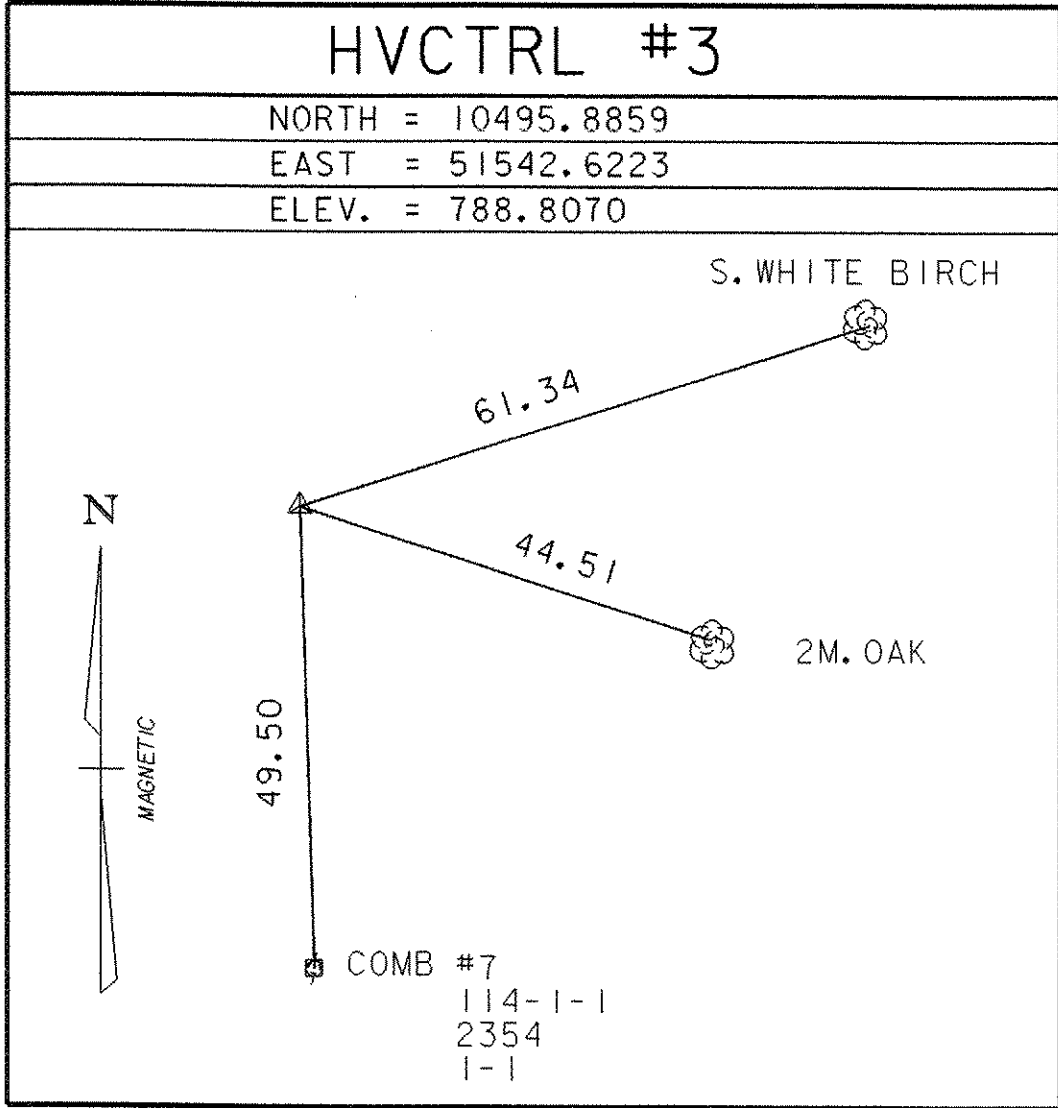
PROJECT NAME: **SPRINGFIELD**
PROJECT NUMBER: **ST CULV(5)**

FILE NAME: s04c178pi.xls	PLOT DATE: 4/24/2007
PROJECT MANAGER: R. Whitcomb	DRAWN BY: L. Bullock
DESIGNED BY: D. Bonneau	CHECKED BY: D. Peterson
PRELIMINARY INFORMATION SHEET	SHEET 2 OF 52

GPS CONTROL POINTS

TRAVERSE TIES

ALIGNMENT TIES



* MAIN TRAVERSE COMPLETED: NOV. 4, 2004 BY R.GILMAN PC & J.HULETT

VT 11 STA. 10+00.00

N = 10627.2487
E = 51640.3718

VT 11 STA. 20+00.00

N = 11306.5509
E = 52374.2304

CHANNEL LINE STA. 50+00.00

N = 10906.4248
E = 52086.9426

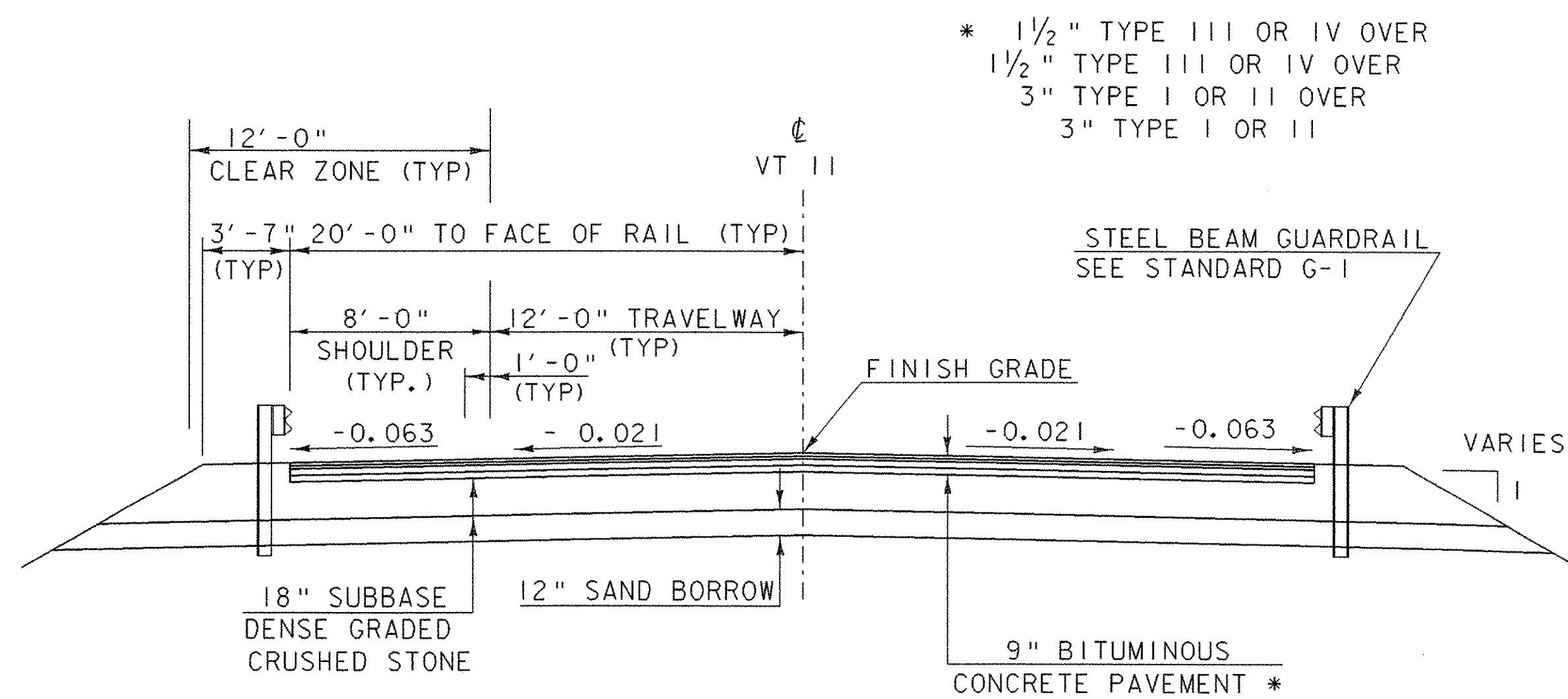
CHANNEL LINE STA. 52+00.00

N = 11027.3748
E = 51927.6596

TIE SHEET

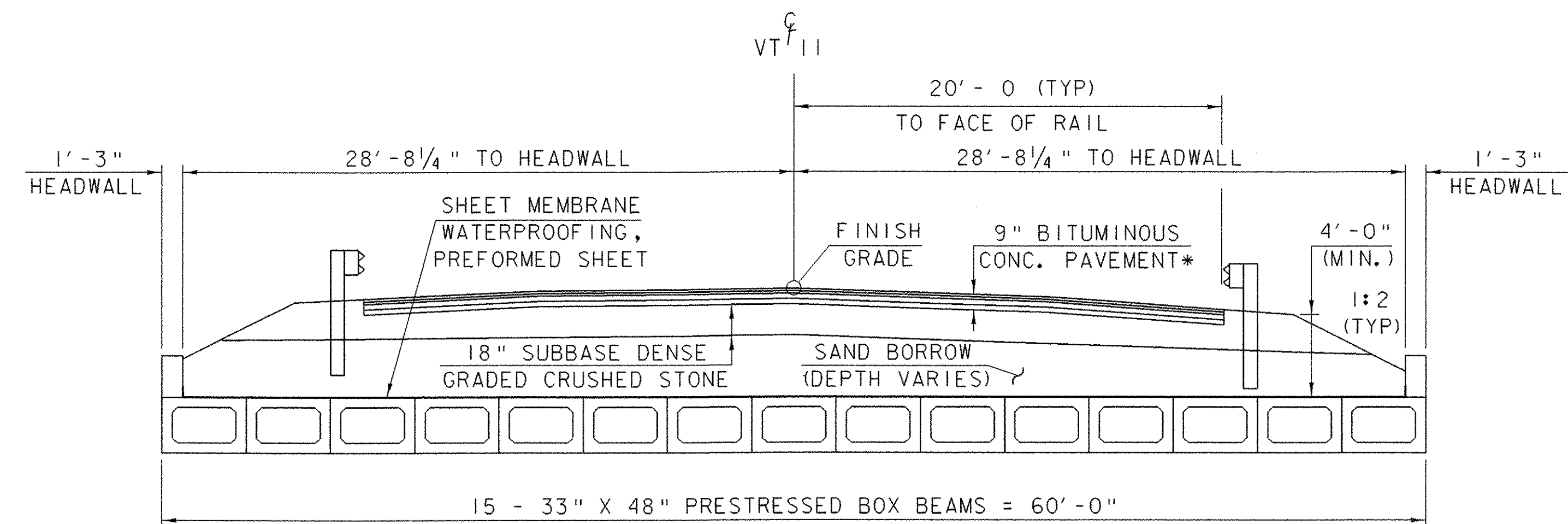
DATUM	
VERTICAL	NAVD88
HORIZONTAL	ASSUMED
ADJUSTMENT	N/A

PROJECT NAME: SPRINGFIELD	
PROJECT NUMBER: ST CULV(5)	
FILE NAME: x04cl78+1.dgn	PLOT DATE: 21-MAY-2007
PROJECT LEADER: R.R. WHITCOMB	DRAWN BY: J.HULETT
DESIGNED BY: J. PERRIGO	CHECKED BY: P.HODGE
SHEET 3 OF 52	



ROADWAY TYPICAL SECTION

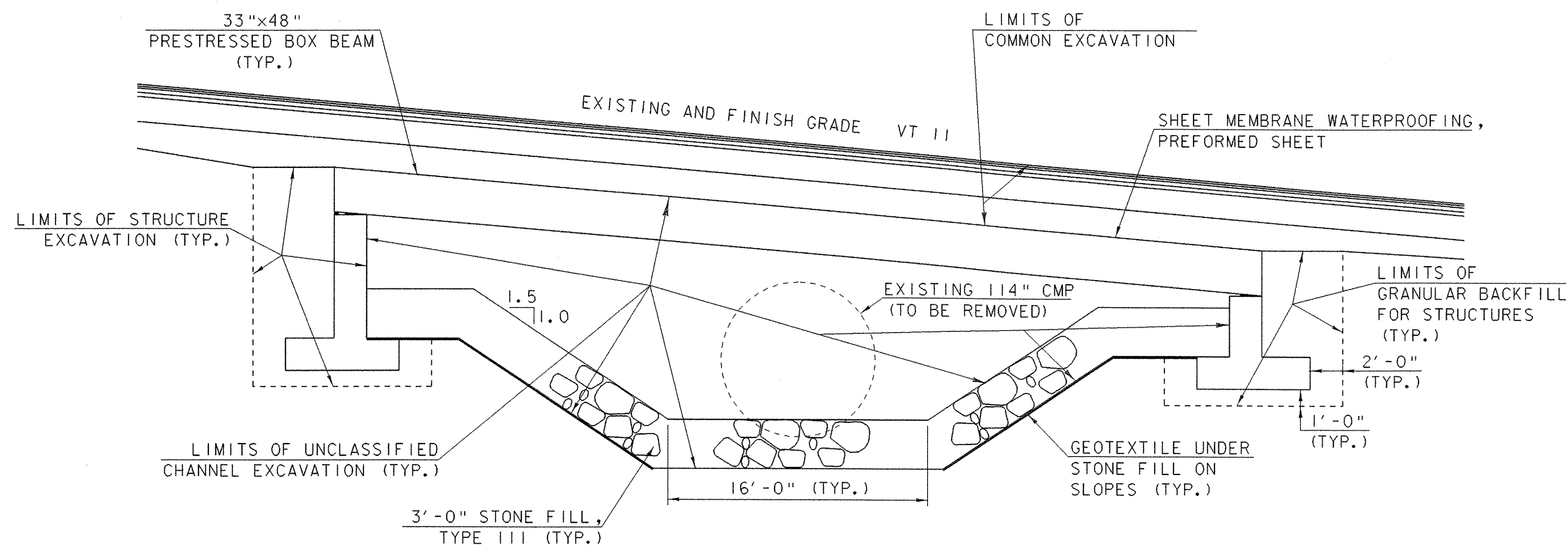
SCALE 1" = 5'-0"



NOTE: SEE ROADWAY TYPICAL SECTION FOR ADDITIONAL DETAILS

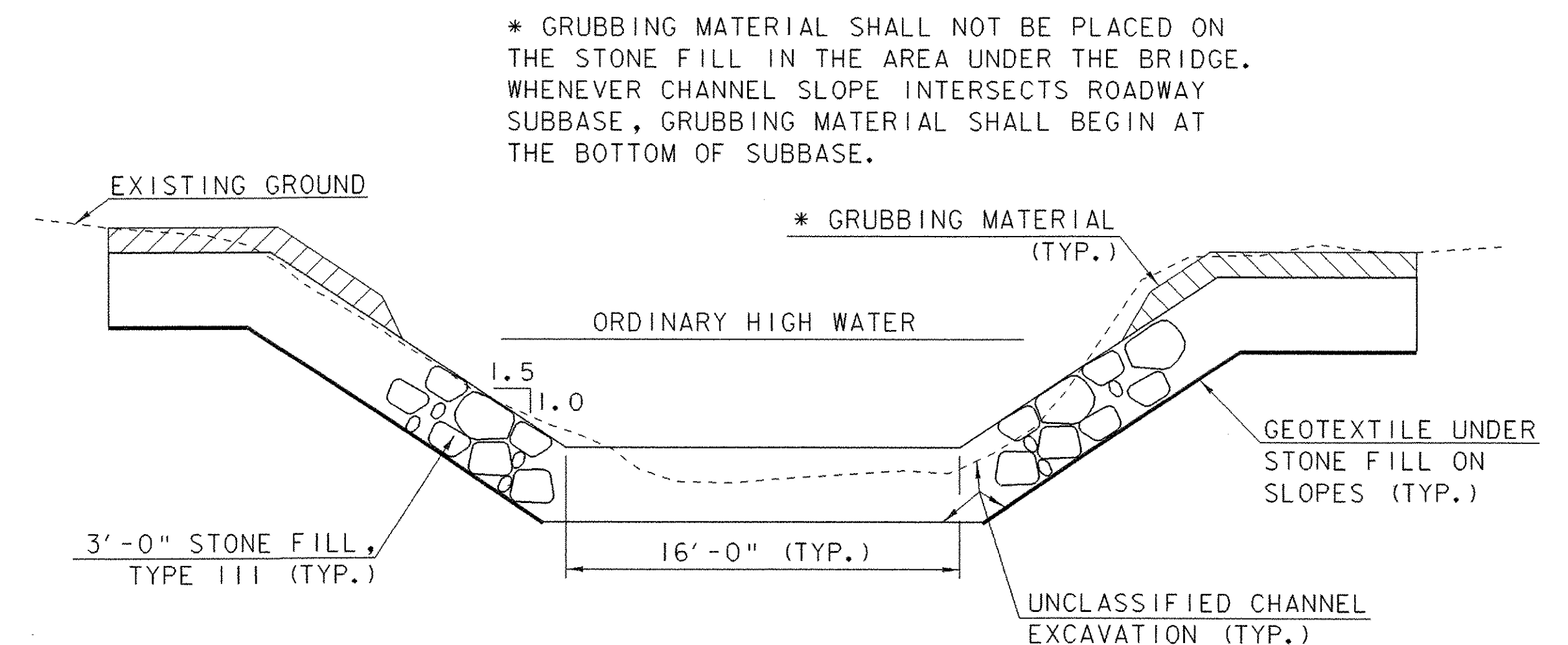
BRIDGE TYPICAL SECTION

SCALE 1" = 5'-0"



SUBSTRUCTURE TYPICAL SECTION

SCALE 1" = 5'-0"



CHANNEL TYPICAL SECTION

SCALE 1" = 5'-0"

MATERIAL TOLERANCES

PAVEMENT	+/- 1/4" (TOTAL THICKNESS)
BASE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"
GRANULAR BORROW	+/- 1"

TYPICAL SECTIONS SHEET

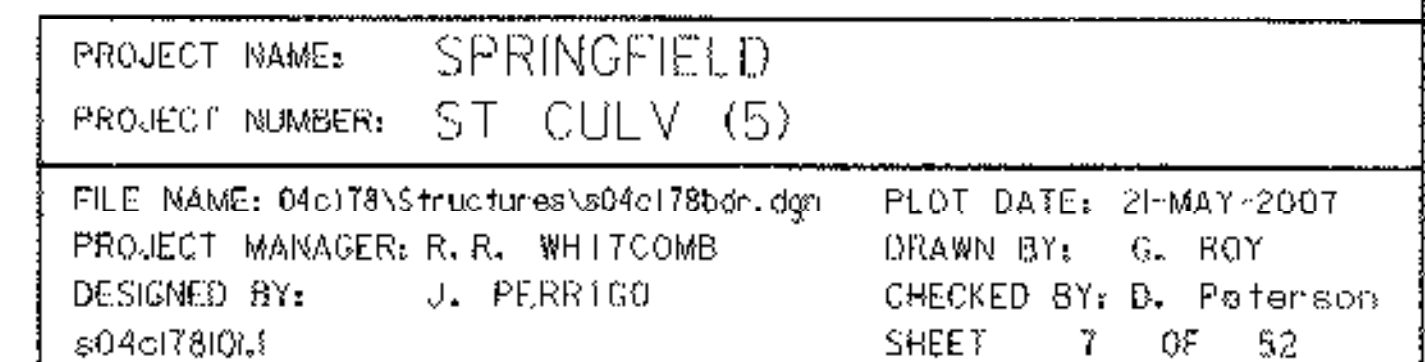
PROJECT NAME: SPRINGFIELD
PROJECT NUMBER: ST CULV(5)

FILE NAME: /04cl78/str/s04cl78typ.dgn
PROJECT LEADER: R. WHITCOMB
DESIGNED BY: J. PERRIGO
PLOT DATE: 21-MAY-2007
DRAWN BY: M. HALE
CHECKED BY: D. PETERSON
SHEET 4 OF 52

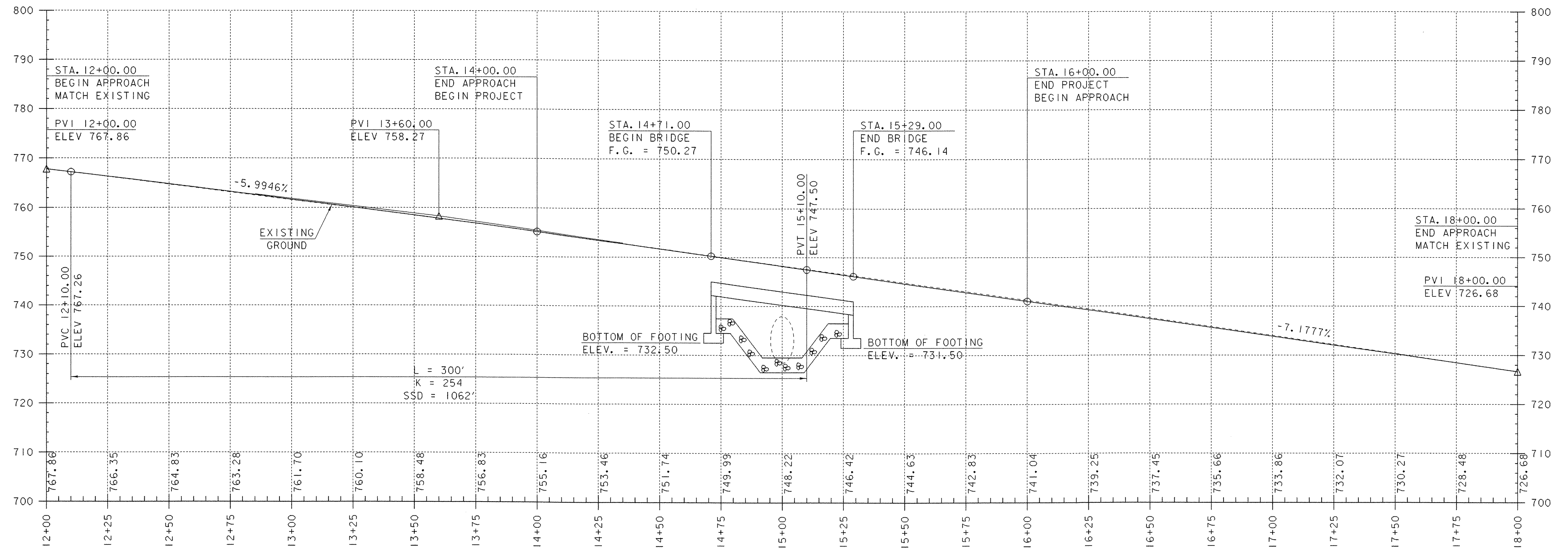
STATE OF VERMONT AGENCY OF TRANSPORTATION															QUANTITY SHEET									
SUMMARY OF ESTIMATED QUANTITIES															TOTALS			DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
	ROADWAY		CHANNEL		SUPER- STRUC- TURE		ABUT. #1		ABUT. #2		EROSION CONTROL		FULL CE ITEMS		BRIDGE QUANTITY	ROUND	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	QUANTITIES	UNIT	ITEMS
	1																1		LS	CLEARING AND GRUBBING, INCLUDING INDIVIDUAL TREES AND STUMPS	201.10			
	2810																2810		CY	COMMON EXCAVATION	203.15			
			2170													2170	2170		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27	10	CY	ITEM 204.20 TEMPORATY EROSION CONTROL
	850										10						850		CY	SAND BORROW	203.31	10	CY	ITEM 613.10 STONE FILL, TYPE I
																	10		CY	TRENCH EXCAVATION OF EARTH	204.20	110	SY	ITEM 649.51 GEOTEXTILE FOR SILT FENCE
							350		270								10		CY	STRUCTURE EXCAVATION	204.25	10	LB	ITEM 651.17 SEED-WINTER RYE
							250		190								440		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30	1	TON	ITEM 651.25 HAY MULCH
	450																450		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10	10	EA	ITEM 651.26 HAY BALES FOR EROSION CONTROL
	1980																1980		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35	30	SY	ITEM 653.20 TEMPORARY EROSION MATTING
	12																12		CWT	EMULSIFIED ASPHALT	404.65	20	CY	ITEM 653.25 TEMPORARY STONE CHECK DAM, TYPE I
	1220																1220		TON	BITUMINOUS CONCRETE PAVEMENT (PG 58-28)	408.25			
				11			119		90							220	220		CY	CONCRETE, HIGH PERFORMANCE CLASS B	501.34			
	2250																2250		SF	TEMPORARY STEEL SHEET PILING	505.36			
							10070		7840							17910	17910		LB	REINFORCNG STEEL	507.15			
				1050												1050	1050		LB	EPOXY COATED REINFORCING STEEL	507.17			
				870												870	870		LF	PRESTRESSED CONCRETE BOX BEAMS (33" X 48")	510.21			
				812												812	812		LF	GROUTING SHEAR KEYS	510.24			
				4			5		3							12	12		GAL	WATER REPELLENT , SILANE	514.10			
				377												377	377		SY	SHEET MEMBRANE WATERPROOFING, PREFORMED SHEET	519.21			
			1													1	1		EACH	REMOVAL OF STRUCTURE (9'-6" x 120'-0" CGMPP)	529.15			
				60												60	60		EACH	BEARING DEVICE ASSEMBLY, ELASTOMERIC PAD	531.11			
	20															20	20		LF	6" UNDERDRAIN	605.10			
	1										2					1	1		EACH	UNDERDRAIN FLUSHING BASIN	605.95			
																2	2		HR	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	608.25			
	80															80	80		MGAL	DUST CONTROL WITH WATER	609.10			
	3															3	3		TON	DUST AND ICE CONTROL WITH CALCIUM CHLORIDE	609.15			
	30										10					40	40		CY	STONE FILL, TYPE I	613.10			
			740													740	740		CY	STONE FILL, TYPE II	613.12			
	2															2	2		EA	MANUFACTURED TERMINAL SECTION, FLARED	621.50			
	5															5	5		EACH	ENERGY ABSORPTION ATTENUATOR	621.56			
	1															1	1		EACH	ANCHOR FOR STEEL BEAM RAIL	621.80			
	750															750	750		LF	REMOVE AND RESET GUARDRAIL	621.75			
	80															80	80		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80			
	1															1	1		EACH	REMOVAL AND DISPOSAL OF GUIDE POSTS	621.81			
	1110															1110	1110		LF	TEMPORARY TRAFFIC BARRIER	621.90			
	100															100	100		HR	UNIFORMED TRAFFIC OFFICERS	630.10			
	500															500	500		HR	FLAGGERS	630.15			
													1			1	1		LS	FIELD OFFICE, ENGINEERS	631.10			
													1			1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16			
													1			1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17			
																						PROJECT NAME: SPRINGFIELD		
																						PROJECT NUMBER: ST CULV (5)		
																						FILE NAME: \Structures\04c178qty.xls		
																						PLOT DATE: 5/23/2007		
																						PROJECT MANAGER: R. R. WHITCOMB		
																						DRAWN BY: D. PETERSON		
																						DESIGNED BY: D. PETERSON		
																						CHECKED BY: W. LAMMER		
																						QUANTITY SHEET #1		
																						SHEET 5 OF 52		

QUANTITY SHEET

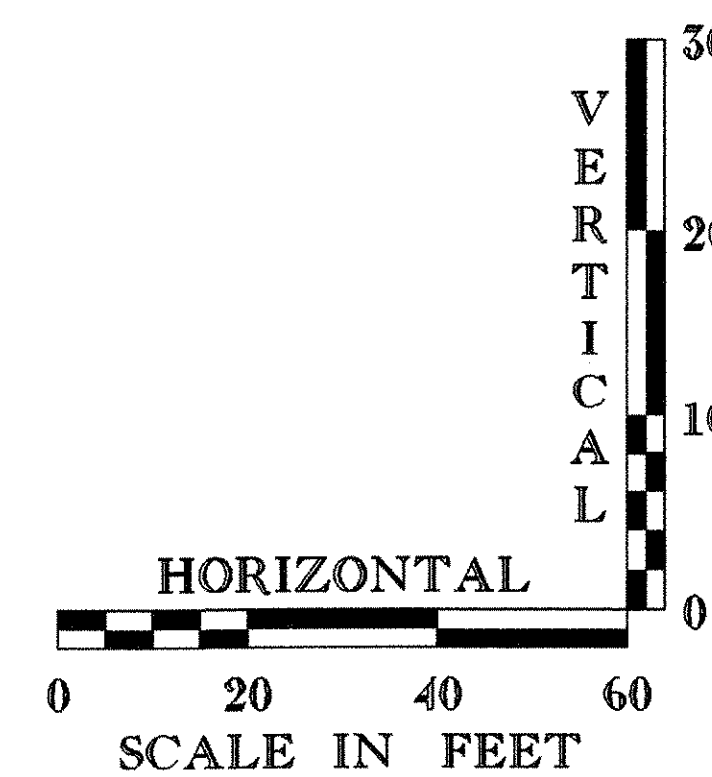
SUMMARY OF ESTIMATED QUANTITIES															TOTALS			DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
	ROADWAY		CHANNEL		SUPER- STRUC- TURE		ABUT. #1		ABUT. #2		EROSION CONTROL		FULL CE ITEMS		BRIDGE QUANTITY	ROUND	GRAND TOTAL	FINAL	UNIT	ITEMS		ITEM NUMBER	QUANTITIES	UNIT
	1																1		LS	MOBILIZATION/DEMOBILIZATION	635.11			
	1																1		LS	TRAFFIC CONTROL	641.10			
	1200																1200		LF	DURABLE 4 INCH WHITE LINE, THERMOPLASTIC	646.402			
	1100																1100		LF	DURABLE 4 INCH YELLOW LINE, THERMOPLASTIC	646.412			
	25																25		LF	DURABLE 24 INCH STOP BAR	646.480			
	4																4		EA	DURABLE LETTER OR SYMBOL	646.490			
	100																100		EACH	LINE STRIPING TARGETS	646.76			
			560												560		560		SY	GEOTEXTILE UNDER STONE FILL	649.31			
											110						110		SY	GEOTEXTILE FOR SILT FENCE	649.51			
											20						20		LB	SEED	651.15			
											10						10		LB	SEED, WINTER RYE	651.17			
											100						100		LB	FERTILIZER	651.18			
											1						1		T	AGRICULTURAL LIMESTONE	651.20			
											1						1		T	HAY MULCH	651.25			
											70						70		CY	TOPSOIL	651.35			
			210												210		210		SY	GRUBBING MATERIAL	651.40			
											1						1		LS	EPSC PLAN	652.10			
											50						50		HR	MONITORING EPSC PLAN	652.20			
											1						1		LU	MAINTENANCE OF EPSC PLAN (N.A.B.I.)	652.30			(N.A.B.I.)= NOT A BID ITEM
											10						10		EACH	HAYBALES	653.15			
											30						30		SY	TEMPORARY EROSION MATTING	653.20			
											960						960		SY	PERMANENT EROSION MATTING	653.21			
											20						20		CY	TEMPORARY STONE CHECK DAM, TYPE I	653.25			
											50						50		CY	VEHICLE TRACKING PAD	653.35			
											1060						1060		LF	PROJECT DEMARCATION FENCE	653.55			
	14																14		SF	TRAFFIC SIGNS, TYPE A	675.20			
	28																28		LF	BEGIN OPTIONS FLANGED CHANNEL SIGN POST	675.301			
	28																28		LF	SQUARE TUBE SIGN POST AND ANCHOR END OPTIONS	675.341			
	4																4		EA	REMOVING SIGNS	675.50			
	1																1		LS	SPECIAL PROVISION (TEMPORARY ROADWAY)(PHASE II)	900.645			
	1																1		LS	SPECIAL PROVISION (TEMPORARY ROADWAY)(PHASE III)	900.645			
	1																1		LU	SPECIAL PROVISION (EMISSION CONTROL DEVICE, BULLDOZER) (N.A.B.I.)	900.650			
	1																1		LU	SPECIAL PROVISION (EMISSION CONTROL DEVICE, DUMP TRUCK) (N.A.B.I.)	900.650			
	1																1		LU	SPECIAL PROVISION (EMISSION CONTROL DEVICE, EXCAVATOR) (N.A.B.I.)	900.650			



PROFILE ALONG PROPOSED CENTERLINE VT 11

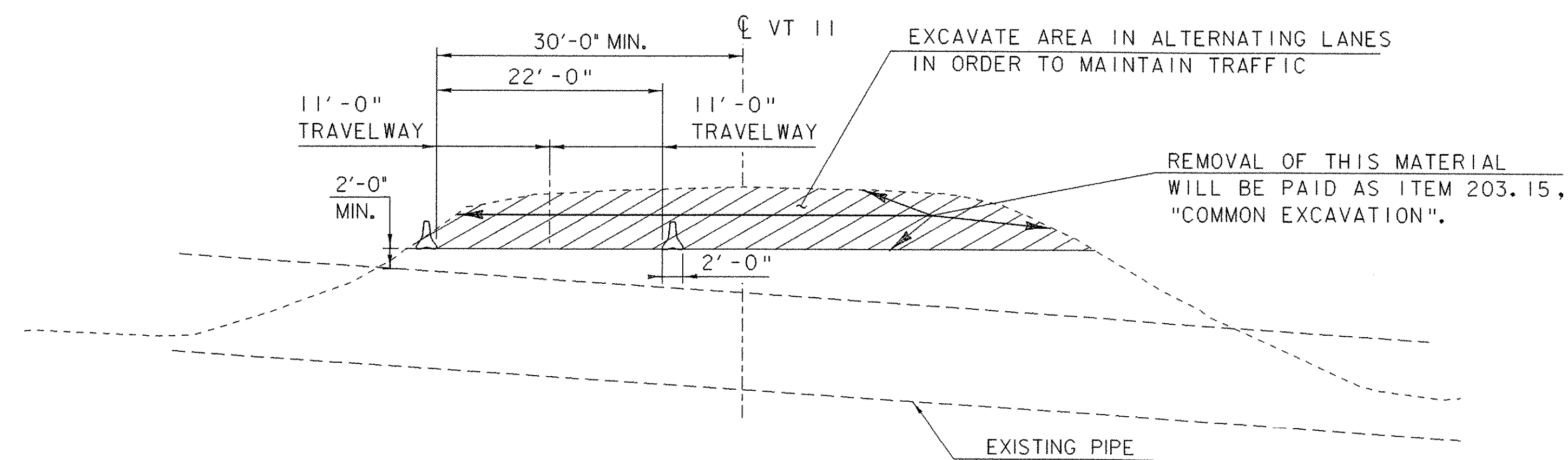


NOTE:
ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING
GROUND ALONG NEW CENTERLINE.
ELEVATIONS SHOWN TO THE NEAREST HUNDREDTH ARE
FINISH GRADES ALONG NEW CENTERLINE.

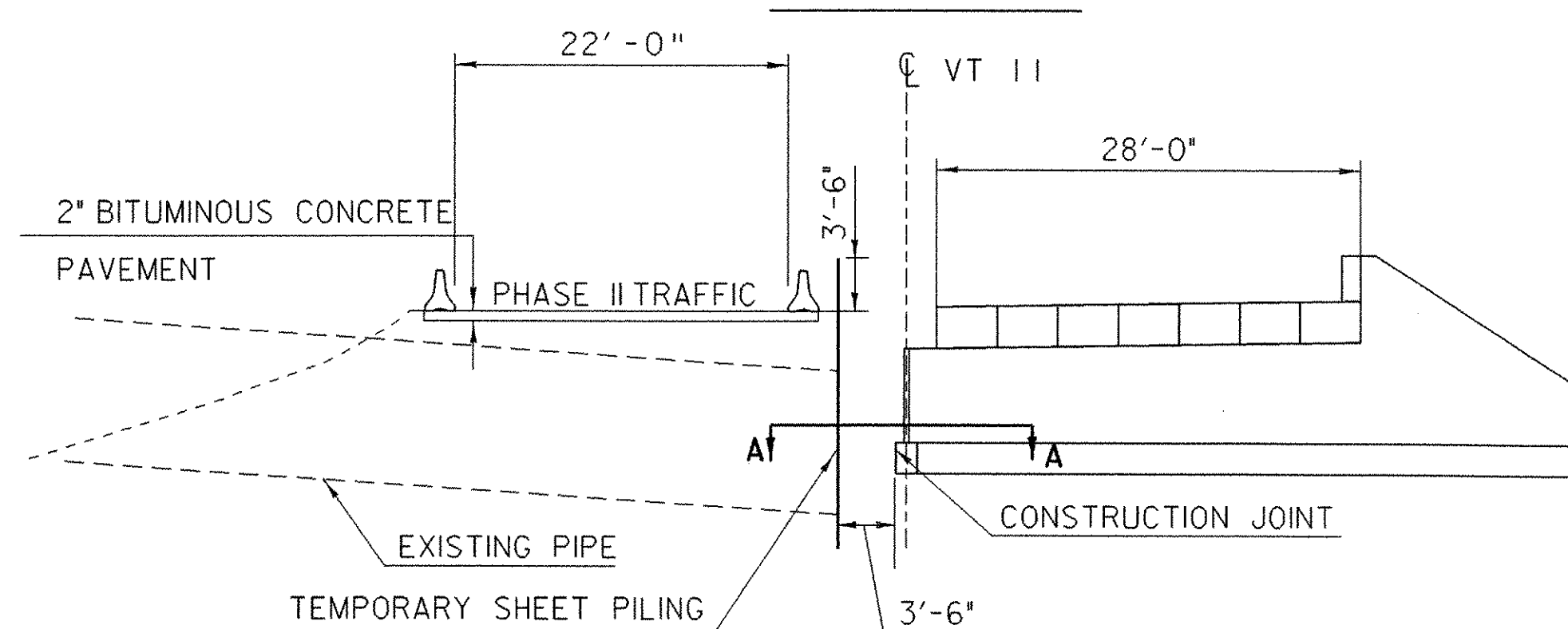


PROFILE SHEET

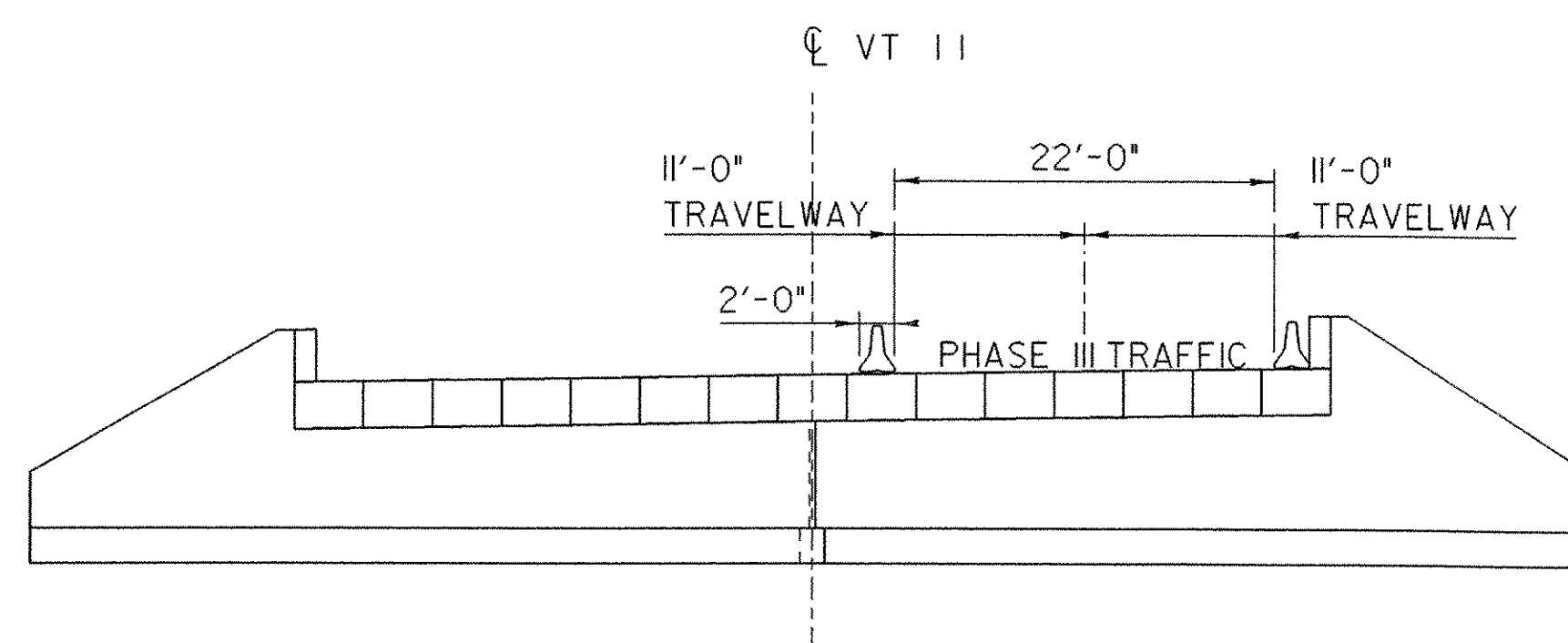
PROJECT NAME:	SPRINGFIELD	
PROJECT NUMBER:	ST CULV (5)	
FILE NAME:	04cl78\Structures\s04cl78xsl.dgn	PLOT DATE:
PROJECT MANAGER:	R.R. WHITCOMB	DRAWN BY:
DESIGNED BY:	J. PERRIGO	CHECKED BY:
s04cl78pfl.i		SHEET
		9 OF 52



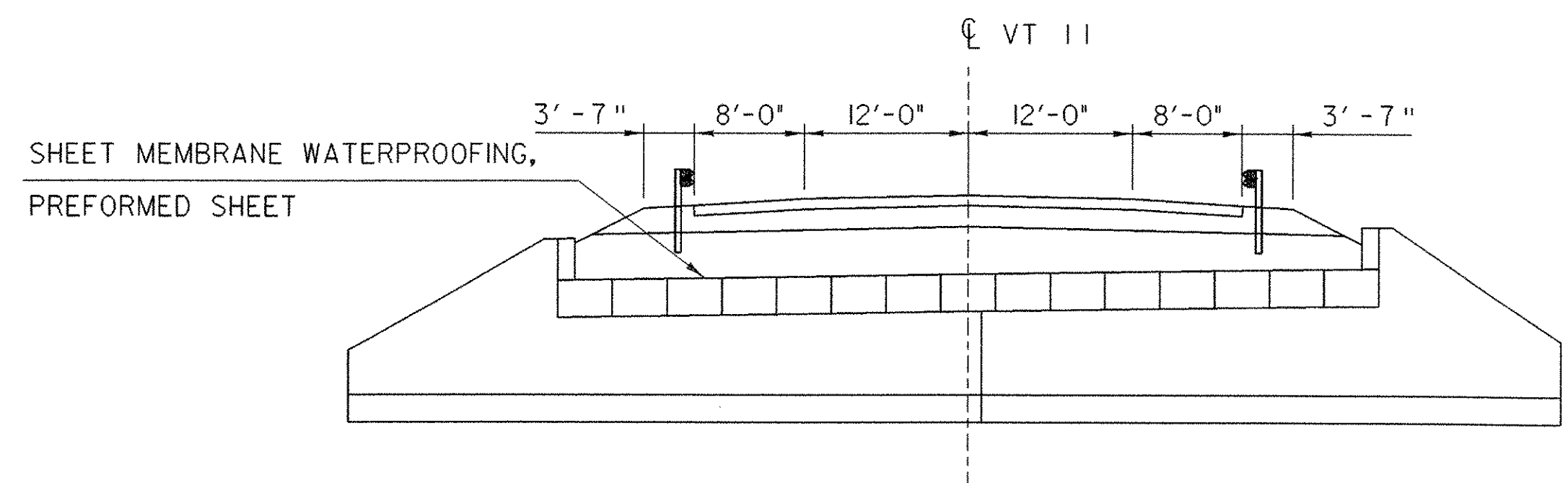
PHASE I



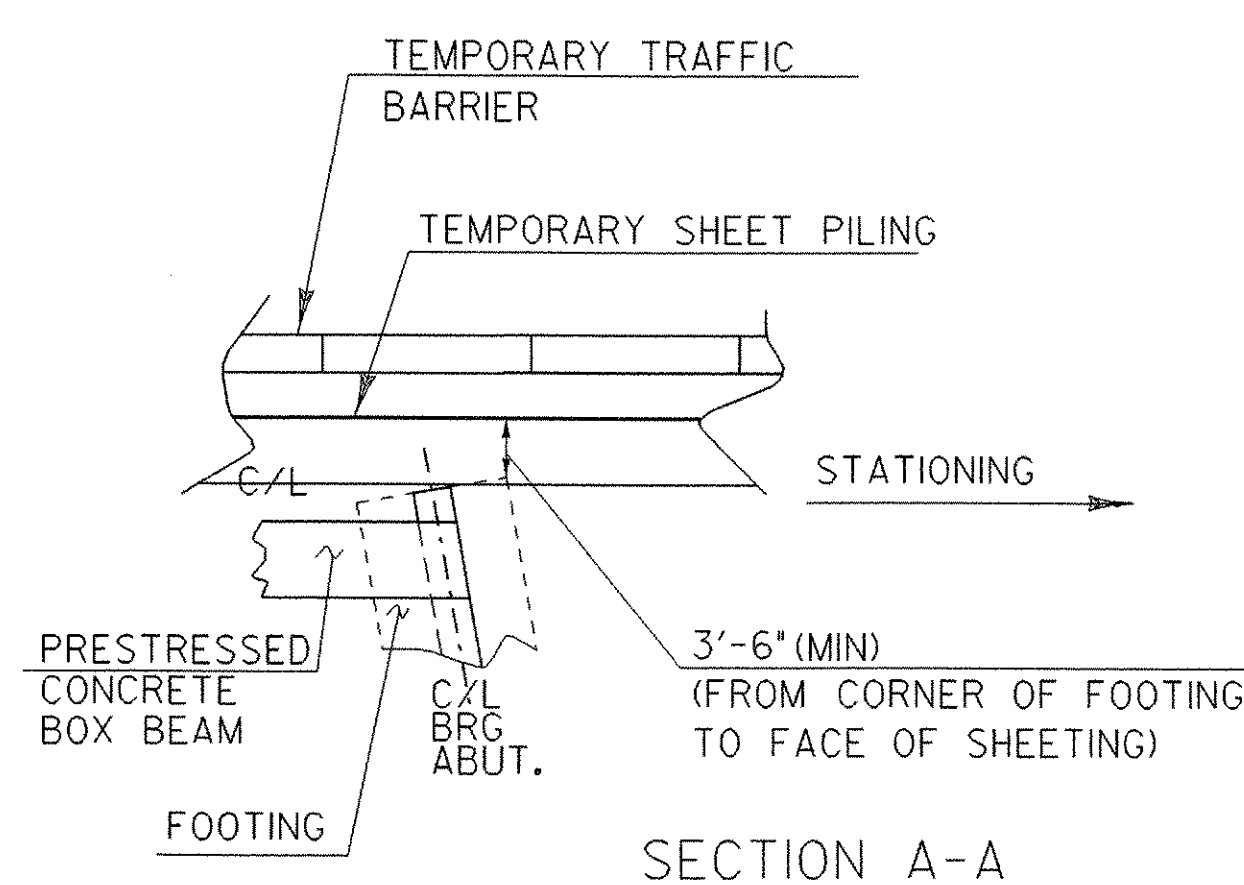
PHASE II



PHASE III



PHASE IV



SECTION A-A

PROPOSED TRAFFIC CONTROL PLAN

PHASE I: EXCAVATE EXISTING ROADWAY, ALTERNATING LANES IN ORDER TO MAINTAIN TRAFFIC UNTIL THE REQUIRED GRADE IS ACHIEVED. A MINIMUM COVER OF 2'-0" IS REQUIRED OVER THE EXISTING PIPE WHILE TRAFFIC IS ROUTED OVER THE PIPE.

THE FOLLOWING SIGNS WILL BE REQUIRED DURING THIS PHASE:
BUMP (W8-1) VAOT STANDARD E 101
PAVEMENT ENDS (W8-3) VAOT STANDARD E 101

PHASE II: PLACE TEMPORARY SHEET PILING AND BARRIER AT THE LOCATIONS SHOWN TO CREATE A TWO-WAY TEMPORARY ROADWAY. DIRECT ALL TRAFFIC ONTO THIS ROADWAY. SEE SPECIAL PROVISION 900.645 FOR DETAILS ON TEMPORARY ROADWAY PAY ITEM. WITH TRAFFIC MAINTAINED ON PHASE II TEMPORARY ROADWAY, CONSTRUCT SECTION OF NEW BRIDGE TO THE CONSTRUCTION JOINT AS SHOWN.

PHASE III: CONSTRUCT PHASE III TEMPORARY ROADWAY. TEMPORARY ROADWAY (EXCLUDING BRIDGE DECK) SHALL BE PAVED WITH 2" BITUMINOUS CONCRETE PAVEMENT. TRAFFIC WILL BE ALLOWED DIRECTLY ON THE PRESTRESSED BOX UNITS AFTER ALL POST TENSIONING AND PATCHING IS COMPLETE. CONSTRUCT REMAINING PORTION OF NEW BRIDGE AND CHANNEL.

PHASE IV: PLACE SHEET MEMBRANE WATERPROOFING, PREFORMED FABRIC AND CONSTRUCT NEW ROAD IN ALTERNATING LANES IN ORDER TO MAINTAIN TWO-WAY TRAFFIC.

TRAFFIC CONTROL

PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV (5)	DRAWN BY:	J. PERRIGO
FILE NAME:	04c178\Structures\s04c178tpl.dgn	CHECKED BY:	C. CARLSON
PROJECT MANAGER:	R.R. WHITCOMB	SHEET	10 OF 52
DESIGNED BY:	J. PERRIGO		
s04c178m01.i			

ATTENUATOR NOTES

ENERGY ABSORPTION ATTENUATORS WILL BE PLACED AS SHOWN ON THE TRAFFIC CONTROL PLAN SHEETS TO ALLOW THE CONTRACTOR ACCESS TO THE WORK AREAS. THE ENERGY ABSORPTION ATTENUATORS FOR THIS PROJECT SHALL BE SUITABLE FOR A NARROW WIDTH APPLICATION AND SHALL BE INSTALLED AS SHOWN ON THE TRAFFIC CONTROL PLAN SHEETS. THESE ATTENUATORS WILL BE PAID FOR UNDER THE ITEM 621.57 "ENERGY ABSORPTION ATTENUATOR" (SAND FILLED PLASTIC BARRELS).

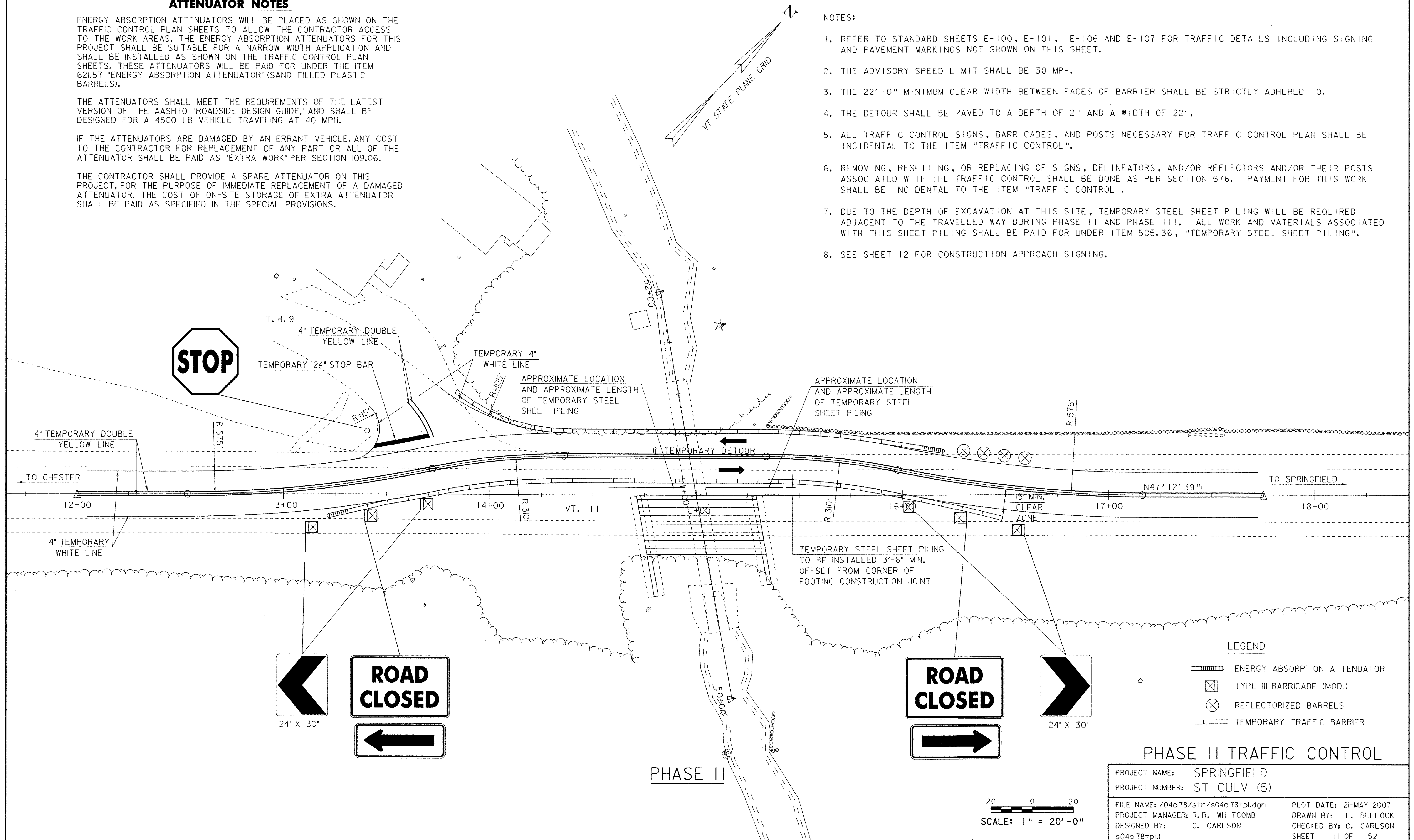
THE ATTENUATORS SHALL MEET THE REQUIREMENTS OF THE LATEST VERSION OF THE AASHTO "ROADSIDE DESIGN GUIDE," AND SHALL BE DESIGNED FOR A 4500 LB VEHICLE TRAVELING AT 40 MPH.

IF THE ATTENUATORS ARE DAMAGED BY AN ERRANT VEHICLE, ANY COST TO THE CONTRACTOR FOR REPLACEMENT OF ANY PART OR ALL OF THE ATTENUATOR SHALL BE PAID AS "EXTRA WORK" PER SECTION 109.06.

THE CONTRACTOR SHALL PROVIDE A SPARE ATTENUATOR ON THIS PROJECT, FOR THE PURPOSE OF IMMEDIATE REPLACEMENT OF A DAMAGED ATTENUATOR. THE COST OF ON-SITE STORAGE OF EXTRA ATTENUATOR SHALL BE PAID AS SPECIFIED IN THE SPECIAL PROVISIONS.

NOTES:

1. REFER TO STANDARD SHEETS E-100, E-101, E-106 AND E-107 FOR TRAFFIC DETAILS INCLUDING SIGNING AND PAVEMENT MARKINGS NOT SHOWN ON THIS SHEET.
2. THE ADVISORY SPEED LIMIT SHALL BE 30 MPH.
3. THE 22'-0" MINIMUM CLEAR WIDTH BETWEEN FACES OF BARRIER SHALL BE STRICTLY ADHERED TO.
4. THE DETOUR SHALL BE PAVED TO A DEPTH OF 2" AND A WIDTH OF 22'.
5. ALL TRAFFIC CONTROL SIGNS, BARRICADES, AND POSTS NECESSARY FOR TRAFFIC CONTROL PLAN SHALL BE INCIDENTAL TO THE ITEM "TRAFFIC CONTROL".
6. REMOVING, RESETTNG, OR REPLACING OF SIGNS, DELINEATORS, AND/OR REFLECTORS AND/OR THEIR POSTS ASSOCIATED WITH THE TRAFFIC CONTROL SHALL BE DONE AS PER SECTION 676. PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO THE ITEM "TRAFFIC CONTROL".
7. DUE TO THE DEPTH OF EXCAVATION AT THIS SITE, TEMPORARY STEEL SHEET PILING WILL BE REQUIRED ADJACENT TO THE TRAVELLED WAY DURING PHASE II AND PHASE III. ALL WORK AND MATERIALS ASSOCIATED WITH THIS SHEET PILING SHALL BE PAID FOR UNDER ITEM 505.36, "TEMPORARY STEEL SHEET PILING".
8. SEE SHEET 12 FOR CONSTRUCTION APPROACH SIGNING.



LEGEND

- ENERGY ABSORPTION ATTENUATOR
- TYPE III BARRICADE (MOD.)
- REFLECTORIZED BARRELS
- TEMPORARY TRAFFIC BARRIER

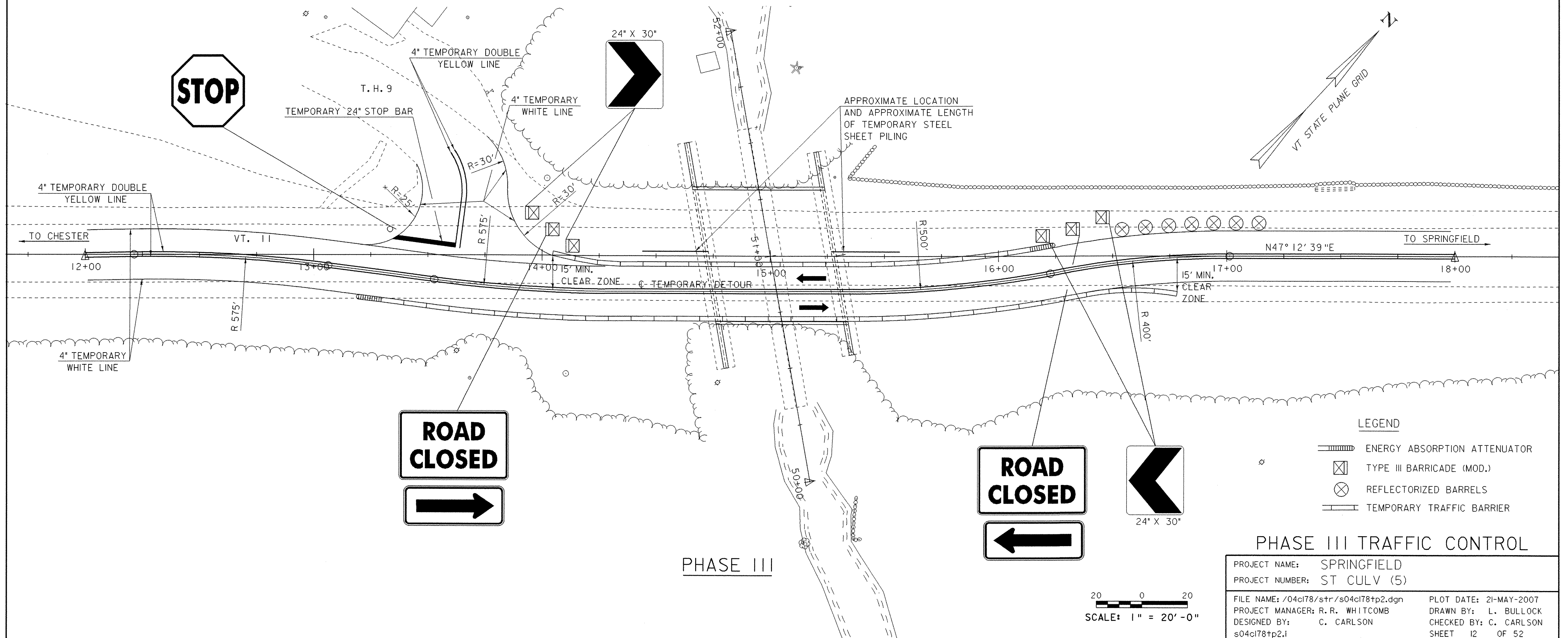
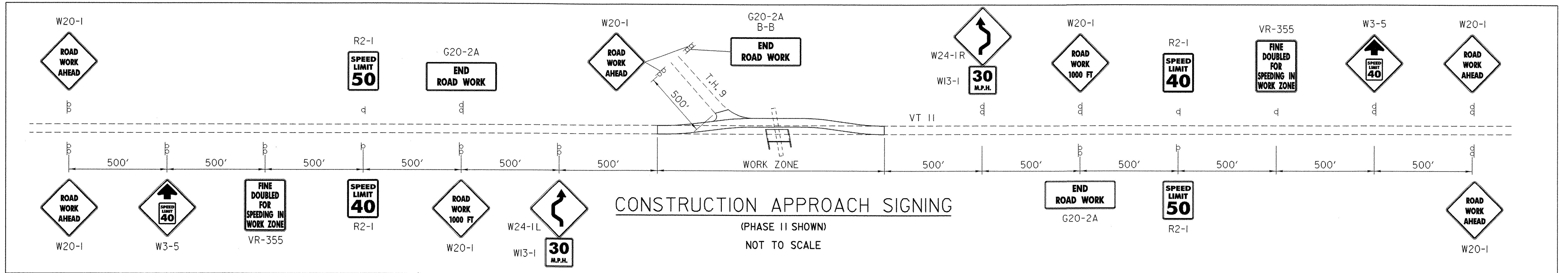
PHASE II TRAFFIC CONTROL

PROJECT NAME: SPRINGFIELD
PROJECT NUMBER: ST CULV (5)

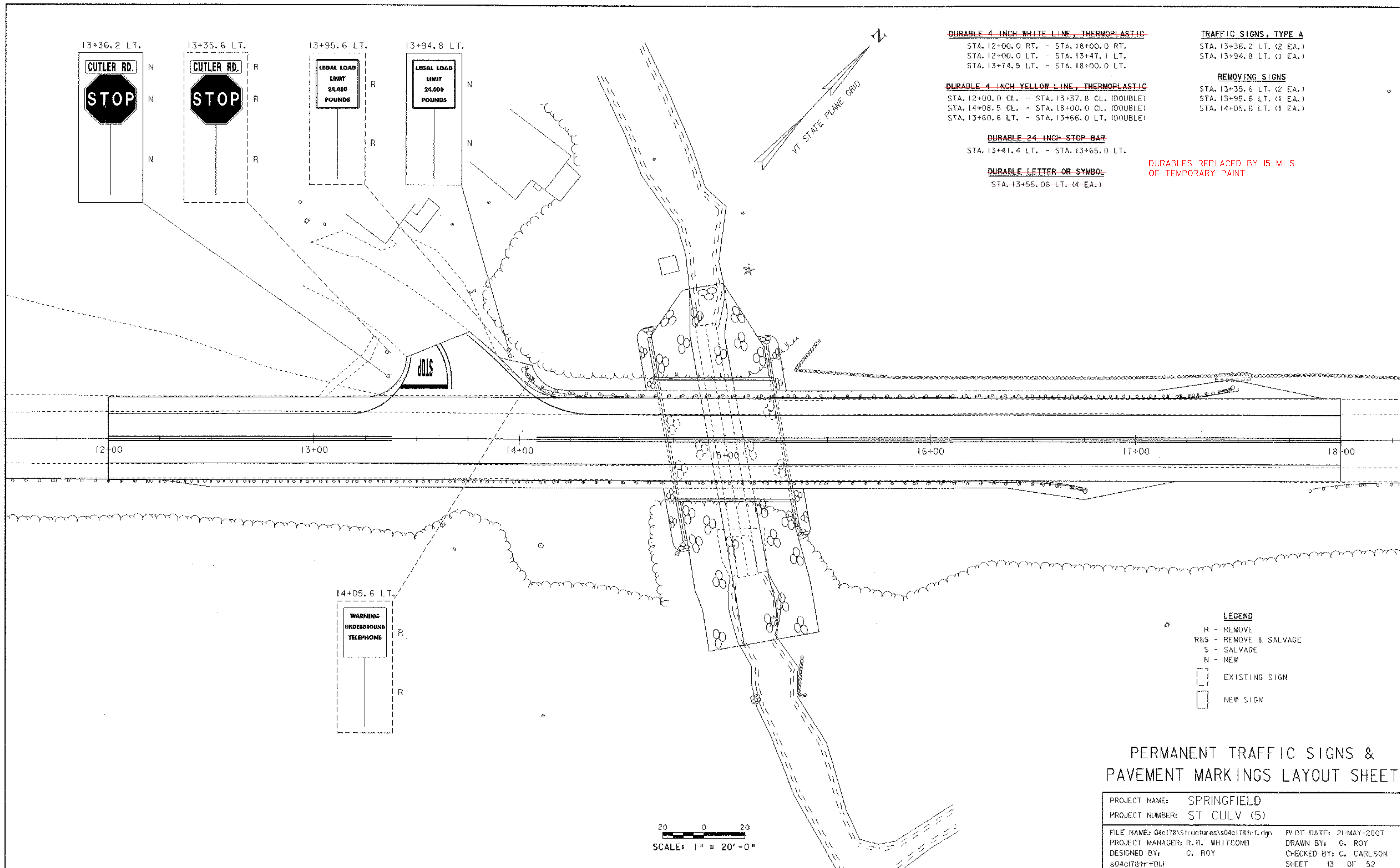
FILE NAME: /04cl78/str/s04cl78+pl.dgn
PROJECT MANAGER: R.R. WHITCOMB
DESIGNED BY: C. CARLSON
s04cl78+pl.i

PLOT DATE: 21-MAY-2007
DRAWN BY: L. BULLOCK
CHECKED BY: C. CARLSON
SHEET 11 OF 52

20 0 20
SCALE: 1" = 20'-0"



PHASE III TRAFFIC CONTROL			
PROJECT NAME:	SPRINGFIELD		
PROJECT NUMBER:	ST CULV (5)		
FILE NAME:	/04cl78/str/s04cl78tp2.dgn	PLOT DATE:	21-MAY-2007
PROJECT MANAGER:	R.R. WHITCOMB	DRAWN BY:	L. BULLOCK
DESIGNED BY:	C. CARLSON	CHECKED BY:	C. CARLSON
s04cl78tp2.i		SHEET	12 OF 52



DURABLE 4 INCH WHITE LINE, THERMOPLASTIC

STA. 12+00.0 RT. - STA. 18+00.0 RT.
STA. 12+00.0 LT. - STA. 13+47.1 LT.
STA. 13+74.5 LT. - STA. 18+00.0 LT.

DURABLE 4 INCH YELLOW LINE, THERMOPLASTIC

STA. 12+00.0 CL. - STA. 13+37.8 CL. (DOUBLE)
STA. 14+08.5 CL. - STA. 18+00.0 CL. (DOUBLE)
STA. 13+60.6 LT. - STA. 13+66.0 LT. (DOUBLE)

DURABLE 24 INCH STOP BAR

STA. 13+41.4 LT. - STA. 13+65.0 LT.

DURABLE LETTER OR SYMBOL

STA. 13+55.06 LT. (4 EA.)

TRAFFIC SIGNS, TYPE A

STA. 13+36.2 LT. (2 EA.)
STA. 13+94.8 LT. (1 EA.)

REMOVING SIGNS

STA. 13+35.6 LT. (2 EA.)
STA. 13+95.6 LT. (1 EA.)
STA. 14+05.6 LT. (1 EA.)

DURABLES REPLACED BY 15 MILS
OF TEMPORARY PAINT

LEGEND

R - REMOVE
R&S - REMOVE & SALVAGE
S - SALVAGE
N - NEW

EXISTING SIGN
NEW SIGN

PERMANENT TRAFFIC SIGNS &
PAVEMENT MARKINGS LAYOUT SHEET

PROJECT NAME: SPRINGFIELD
PROJECT NUMBER: ST CULV (5)

FILE NAME: 04c178\structures\04c178trf.dgn PLOT DATE: 21-MAY-2007
PROJECT MANAGER: R. R. WHITCOMB DRAWN BY: G. ROY
DESIGNED BY: G. ROY CHECKED BY: C. CARLSSON
04c178trf01j SHEET 13 OF 52

20 0 20
SCALE: 1" = 20'-0"

TRAFFIC SIGN SUMMARY SHEET

[illegible]

SOIL CLASSIFICATION

AASHTO	
A1	Gravel and Sand
A3	Fine Sand
A2	Silty or Clayey Gravel and Sand
A4	Silty Soil - Low Compressibility
A5	Silty Soil - Highly Compressible
A6	Clayey Soil - Low Compressibility
A7	Clayey Soil - Highly Compressible

ROCK QUALITY DESIGNATION

R.Q.D. (%)	ROCK DESCRIPTION
<25	Very Poor
25 to 50	Poor
51 to 75	Fair
76 to 90	Good
>90	Excellent

SHEAR STRENGTH

UNDRAINED SHEAR STRENGTH IN P.S.F.	CONSISTENCY
<250	Very Soft
250-500	Soft
500-1000	Med. Stiff
1000-2000	Stiff
2000-4000	Very Stiff
>4000	Hard

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

DENSITY (GRANULAR SOILS)		CONSISTENCY (COHESIVE SOILS)	
N	DESCRIPTIVE TERM	N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

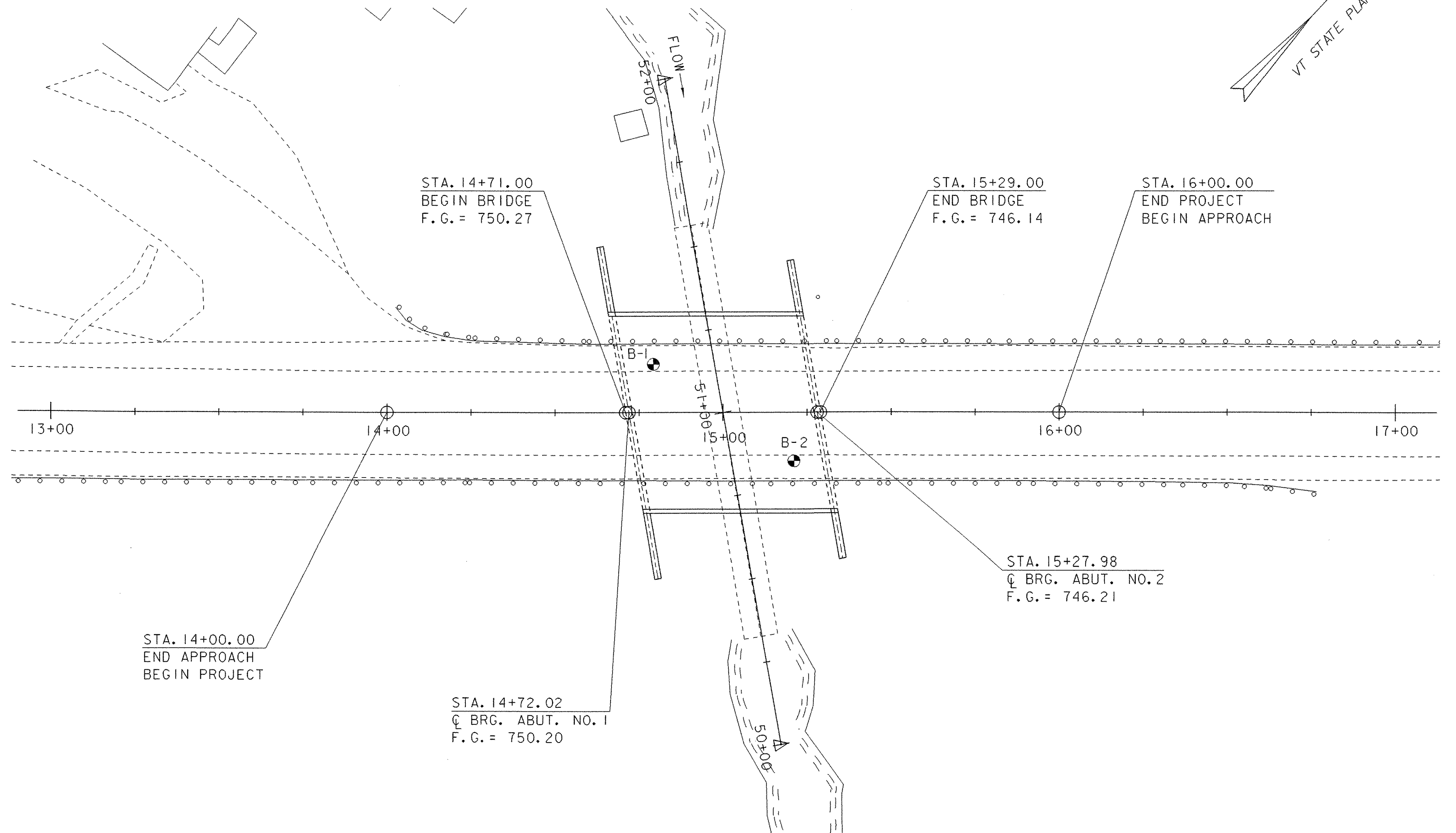
COMMONLY USED SYMBOLS

▼	Water Elevation
⊕	Standard Penetration Boring
⊗	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test
	Blow Count Per Foot For:
	2" O.D. Sampler
	1 3/8" I.D. Sampler
	Hammer Weight Of 140 Lbs.
	Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1 1/8"
BX	Core Size 1 5/8"
NX	Core Size 2 1/8"
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
SI	Silt
CI	Clay
HP	Hardpan
Le	Ledge
NLTD	No Ledge To Depth
CNPF	Can Not Penetrate Further
TLOB	To Ledge Or Boulder
NR	No Recovery
Rec.	Recovery
1/2 Rec.	Percent Recovery
RQD	Rock Quality Designation
CBR	California Bearing Ratio
<	Less Than
>	Greater Than
R	Refusal (N > 100)

COLOR			
blk	Black	pnk	Pink
bl	Blue	pu	Purple
brn	Brown	rd	Red
dk	Dark	tn	Tan
gry	Gray	wh	White
gn	Green	yel	Yellow
lt	Light	mltc	Multicolored
or	Orange		

BORING CHART - MAINLINE

HOLE NO.	STATION	OFFSET	GROUND ELEVATION	BEDROCK ELEVATION
B1	14+79.36	14.00' LT	749.29 FT	NONE
B2	15+21.13	14.00' RT	747.56 FT	NONE



BORING LAYOUT SHEET

20 0 20
SCALE: 1" = 20'-0"

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.	VARVED - Alternate layers of silt and clay.
BOULDER - A rock fragment with an average dimension > 12 inches.	HARDPAN - Extremely dense soil, cemented layer, not softened when wet.
COBBLE - Rock fragments with an average dimension between 3 and 12 inches.	MUCK - Soft organic soil (containing > 10% organic material).
GRAVEL - Rounded particles of rock < 3" and > 0.075" (#10 sieve).	MOISTURE CONTENT - Weight of water divided by dry weight of soil.
SAND - Particles of rock < 0.075" (#10 sieve) and > 0.0025" (#200 sieve).	FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.
SILT - Soil < 0.0025" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.	STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.
CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.	DIP - Inclination of bed with a horizontal plane.

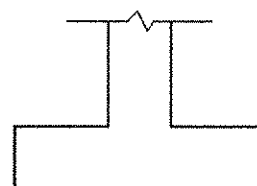
GENERAL NOTES

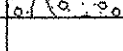
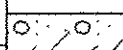
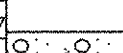
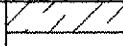
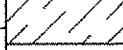
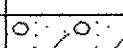
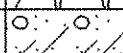
- The subsurface explorations shown herein were made between 03-02-06 and 03-21-06 by the Agency.
- Soil and rock classifications, properties and descriptions are based on engineering interpretation from available subsurface information by the Agency and may not necessarily reflect actual variations in subsurface conditions that may be encountered between individual boring or sample locations.
- Observed water levels and/or conditions indicated are as recorded at the time of exploration and may vary according to the prevailing rainfall, methods of exploration and other factors.
- Engineering judgement was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor access to the same data available to the Agency. The subsurface information is presented in good faith and is not intended as a substitute for personal investigation, independent interpretation, independent analysis or judgement by the Contractor.
- Pictorial structure details shown on the boring plan layout or soils profile are for illustrative purposes only and may not accurately portray final contract details.
- Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

BORING INFORMATION SHEET (1)

PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV(5)	DRAWN BY:	G. ROY
FILE NAME:	04c178\Str\s04c178bor.dgn .1	CHECKED BY:	C. CARLSON
PROJECT MANAGER:	R. R. WHITCOMB	SHEET	15 OF 52
DESIGNED BY:	C. CARLSON		

ABUTMENT NO. 1
BOT. FTG 732.50

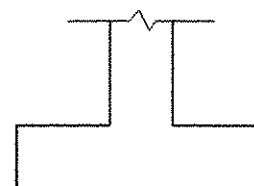


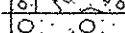
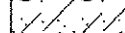
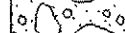
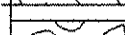
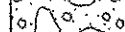
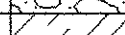
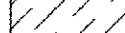
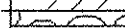
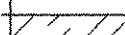
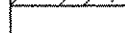
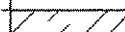
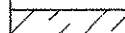
		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: B-1 SHEET 1 of 1 DATE STARTED: 10/05/05 DATE COMPLETED: 10/06/05			
PROJECT NAME: SPRINGFIELD SITE NAME: VT.11 STATION: 4+79.36 OFFSET: -14.00 VTSPG:		PROJECT NUMBER: ST CULV(5) SITE NUMBER: MULTI-PLATE GROUND ELEVATION: 749.29 ft GROUNDWATER DEPTH: 15.2 ft 10/06/05					
BORING CREW CREW CHIEF: GARROW DRILLER: GARROW LOGGER: RUSSELL		BORING RIG: LARGE SKID RIG w/AUTO HAMMER BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL CHECKED BY: DLG					
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
		Asphalt, 0.0 ft - 0.5 ft					
		A-1-B, GrSa, brn, Moist, Rec. = 1.1 ft	22	7.4	34.0	54.3	11.7
		A-2-4, GrSiSa, brn, Moist, Rec. = 0.5 ft	62	10.1	24.9	47.6	27.5
		Cored ahead, Cobbles, 6.5 ft - 8.5 ft					
10		No Recovery, 10.0 ft - 12.0 ft	13				
		Visual Class: A-2-4, Si Sa Gr, brn-gry, Moist, Rec. = 0.4 ft, 15.0 ft - 17.0 ft, Insufficient sample for testing.	40				
20		Boulders, 18.5 ft - 22.0 ft					
		A-4, SiSa HP, gry, Moist, Rec. = 0.9 ft	95/1.0'	9.8	11.2	48.2	40.6
		A-4, SiSa HP, gry, Moist, Rec. = 1.3 ft	103/1.0'	9.7	15.8	46.1	38.1
30		A-2-4, GrSiSa HP, gry, Moist, Rec. = 1.1 ft	R	9.2	24.0	43.7	32.3
		A-4, SiSa HP, gry, Moist, Rec. = 0.5 ft	62/0.5'	9.8	12.0	50.2	37.8
		Boulders & Cobbles, 36.0 ft - 40.0 ft					
40		A-2-4, SiSa, gry, Moist, Rec. = 1.1 ft	98	19.2	7.1	66.4	26.5
		A-4, GrSiSa, gry, Moist, Rec. = 1.8 ft	83	11.8	20.7	40.9	38.4
50		A-4, GrSiSa, gry, Moist, Rec. = 1.9 ft	79	10.7	21.5	40.5	38.0
		Hole stopped @ 52.0 ft					

LOG OF BORING: SPRINGFIELD STCULV(5).DPT, VT, MAT.DAT, 2/1/06

LOG OF BORING: SPRINGFIELD STCULV(5).DGP, VT, AUTODAT 2/1/06

ABUTMENT NO. 2
BOT. FTG 731.50



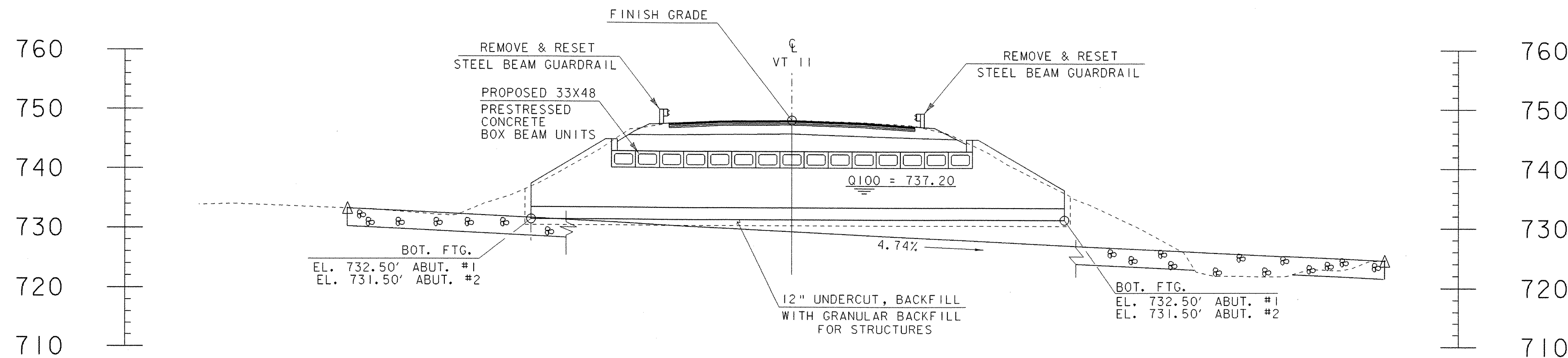
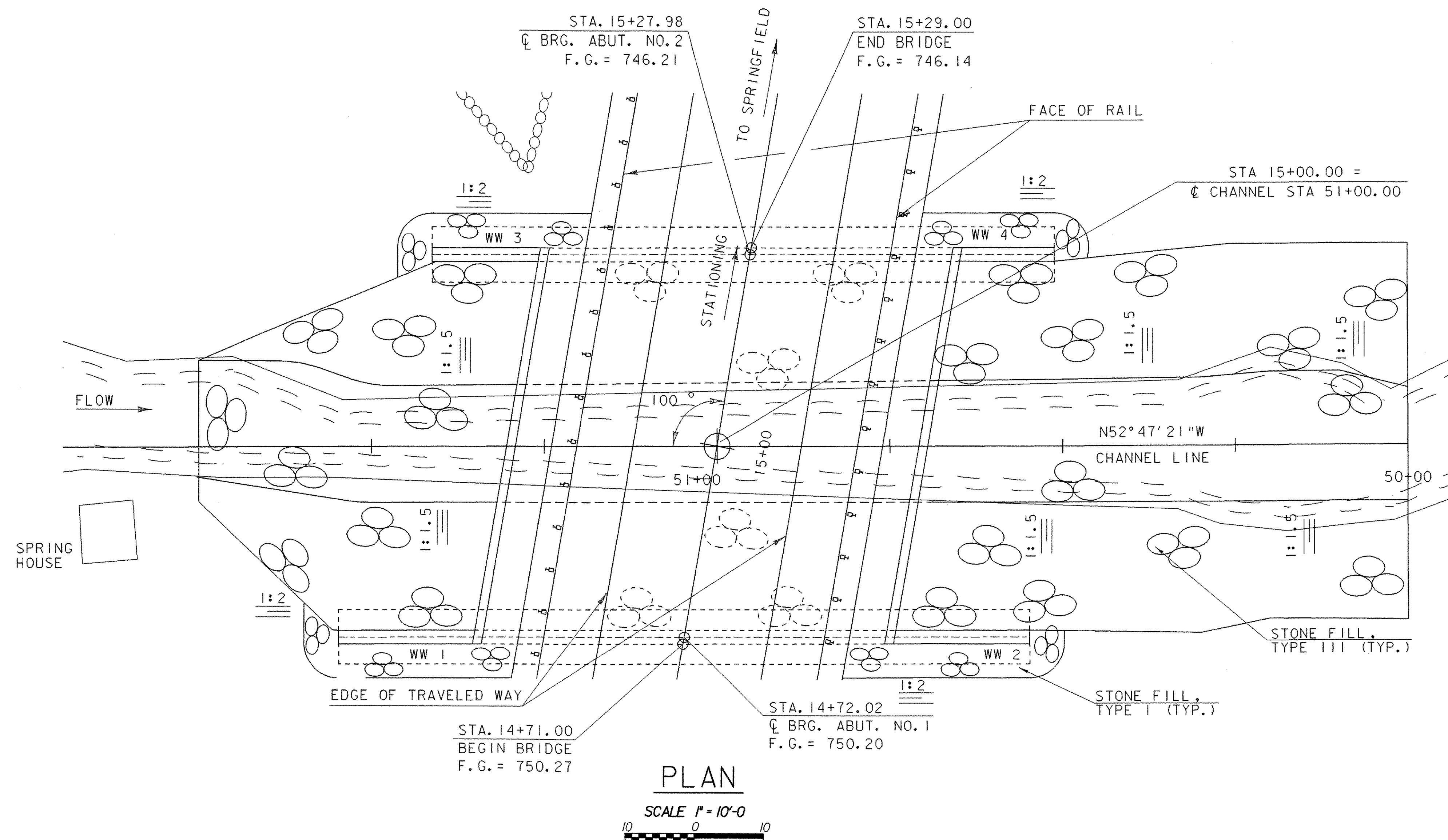
		STATE OF VERMONT AGENCY OF TRANSPORTATION MATERIALS & RESEARCH SECTION SUBSURFACE INFORMATION		BORING NUMBER: B-2 SHEET 1 of 1 DATE STARTED: 10/04/05 DATE COMPLETED: 10/05/05			
PROJECT NAME: SPRINGFIELD SITE NAME: VT.11 STATION: 5+21.13 OFFSET: 14.00 VTSPG:			PROJECT NUMBER: ST CULV(5) SITE NUMBER: MULTI-PLATE GROUND ELEVATION: 747.56 ft GROUNDWATER DEPTH: Caved in @ 16.3'				
BORING CREW CREW CHIEF: GARROW DRILLER: GARROW LOGGER: RUSSELL			BORING RIG: LARGE SKID RIG w/AUTO HAMMER BORING TYPE: WASH BORE SAMPLE TYPE: SPLIT BARREL CHECKED BY: DLG				
DEPTH (ft)	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER FOOT	M.C. (%)	GRAVEL (%)	SAND (%)	FINES (%)
		Asphalt, 0.0 ft - 0.4 ft	18	9.6	38.3	47.6	14.1
		A-1-b, GrSa, brn, Moist, Rec. = 1.0 ft	15	11.5	19.2	66.7	14.1
		A-2-4, Sa, brn, Moist, Rec. = 1.4 ft					
		A-1-b, SaGr, brn-gry, Moist, Rec. = 1.2 ft	30	9.4	44.8	40.1	15.1
		A-1-b, GrSa, gry, Moist, Rec. = 1.6 ft	47	8.6	39.4	45.0	15.6
		A-2-4, GrSa, gry, Moist, Rec. = 1.6 ft	37	9.9	32.8	48.9	18.3
10		A-1-b, GrSa, gry, Moist, Rec. = 1.3 ft	42	9.1	37.8	45.1	17.1
		A-1-b, SaGr, gry, Moist, Rec. = 1.5 ft	71	8.2	46.3	39.0	14.7
		Cobbles, 14.5 ft - 16.0 ft					
		Lost water, Possible void, No Recovery, 16.0 ft - 18.0 ft	29				
20		A-1-b, SaGr, brn-gry, MTW, Rec. = 0.7 ft	7	12.2	47.0	39.9	13.1
		A-4, GrSaSi, gry, MTW, Rec. = 1.5 ft	42	7.7	20.6	34.2	45.2
		Boulder & Hardpan, 22.0 ft - 22.5 ft	R				
							
		A-4, SiSa HP, gry, MTW, Rec. = 0.8 ft	59/0.3'	9.5	12.6	47.9	39.5
							
		A-4, SaSi HP, gry, MTW, Rec. = 1.4 ft	52/0.2'	12.6	11.5	42.6	45.9
		A-4, SiSa HP, gry, MTW, Rec. = 1.6 ft	R	10.5	8.1	47.1	44.8
30		A-2-4, SiSa HP, gry, MTW, Rec. = 1.7 ft	112/1.0'	10.4	18.4	49.3	32.3
		A-4, SiSa HP, gry, MTW, Rec. = 1.5 ft	89	11.0	15.3	43.3	41.4
40		A-2-4, SiSa HP, gry, MTW, Rec. = 0.4 ft	118/1.0'	9.0	14.9	49.8	35.3
		A-4, GrSiSa HP, gry, MTW, Rec. = 1.0 ft	R	9.7	24.6	39.4	36.0
50		A-4, SiSa HP, gry, MTW, Rec. = 2.0 ft	89	9.6	16.9	44.2	38.9
		Hole stopped @ 52.0 ft					

NO. OF BORING SPRINGFIELD STATION: 021 VT. 11/05/05 21/08

LOG OF BORING: SPRINGFIELD STCULV(5).DGP, VT, AUTODAT 2/1/06

BORING LOGS

PROJECT NAME: SPRINGFIELD	
PROJECT NUMBER: ST CULV(5)	
FILE NAME: /04ci78/str/s04ci78bor.dgn	PLOT DATE: 21-MAY-2007
PROJECT LEADER: R. WHITCOMB	DRAWN BY: str3
DESIGNED BY: C. CARLSON	CHECKED BY: C. CARLSON
s04ci78bor2.i	SHEET 16 OF 52



SECTION ALONG CHANNEL ϕ
(HEADWALLS & FOOTINGS SHOWN FOR CLARITY)

PROJECT NAME:	SPRINGFIELD	PLLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV(5)	DRAWN BY:	J. PERRIGO
FILE NAME:	/04cl78/str/s04cl78pe.dgn	CHECKED BY:	D. PETERSON
PROJECT LEADER:	R. WHITCOMB	SHEET	17 OF 52
DESIGNED BY:	D. BONNEAU		

PROJECT DESCRIPTION

This project involves the replacement of a culvert serving an un-named stream. The project is on VT 11, a paved state highway, in the Town of Springfield. The existing 114" corrugated metal culvert will be removed. A new 55' span buried prestressed box beam bridge with concrete stemwalls and footings will be constructed on the existing culvert alignment. Traffic will be maintained during construction via different traffic phases. Total roadway approach work including both approaches, is approximately 600 feet. The limits of construction do not approach any buildings or other structures. Natural resources within the project area have been clearly identified and shown in the existing conditions site plan.

This project will be completed in one construction season.

The project is located at: 43 17' 34" N 72 31' 13" W

Total disturbed area (excluding waste and borrow areas): 0.96 acres
Should conditions change and result in 1 or more acres of earth disturbance within the project limits, or should the project become part of a common plan of development, then the contractor will be responsible for additional permitting with the Agency of Natural Resources.

SITE INVENTORY & ANALYSIS

OFF SITE DRAINAGE CHARACTERISTICS:

The property surrounding the project site consists of mostly rolling wooded terrain. Both upstream and downstream slopes average roughly 6 percent grade with well defined drainage ways.

DRAINAGE, WATERWAYS, BODIES OF WATER:

The stream is described as a flashy and steep cold water stream. The stream bed is made up of cobbles and gravel with some boulders. The banks along both sides of the river both upstream and downstream are high and steep with mature vegetation consisting of a mix of softwoods with a few hardwood species. The contributing drainage area at the highway crossing is approximately 2.82 sq. mi.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:

The topography surrounding the site is mostly rolling hills. There is a residence upstream of the project and overhead utility lines following parallel to VT 11 on the downstream side of the road with relocation required. Buried utilities along VT 11 on the upstream side of the road will also require relocation or temporary support.

VEGETATION:

The vegetation along VT 11 is a mix of roadside grasses & small shrubs to the extent of the project limits. Construction activities should not have any effect on other vegetation.

Following construction, the roadside slopes will be stabilized with stone fill and/or grassy vegetation with standard seed and mulch practices.

SOILS:

The soils identified within the project area have been classified as Berkshire & Monadnock fine sandy loam, very stony, on 15 - 35 percent slopes. However, during the construction of VT 11, the grade was raised approximately 10' through this section of roadway and as such, the natural soils throughout the site have been disturbed and filled over. It is expected that coarse granular fill will be the primary soil type encountered during excavation of the existing roadway.

The soils shall be treated as highly erodible.

SENSITIVE RESOURCE AREAS:

No sensitive resource areas other than the stream and riparian area have been identified for this site. Protection of the stream from siltation and erosion will be accomplished to the extent practicable by providing temporary pipes or a lined channel while the footings and stem walls are placed.

There have been no Threatened and Endangered Species identified within the project limits.

PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES:

The disturbance of soils will be necessary to remove the existing culvert. A temporary means of conveying the stream through the site will be utilized while the new footings and stem walls are constructed. This will prevent the stream from mixing with disturbed soils until the new stream bed through the bridge has been finished.

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.

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. Slopes shall be stabilized within 48 hours of forecasted rain.

Seeding, mulching and biodegradable erosion control matting, or an equivalent, shall be used to stabilize all slopes greater than 1:3. These slopes shall be stabilized within 48 hours of reaching final grade or during intermittent phases of construction.

Silt fence will be installed a distance of 5'-10' from the toe of fill slopes to prevent sediment transport to down gradient areas. Each line of silt fence will be placed along the contour with the lower edge buried 6' to prevent underflow and ends turned slightly up grade 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 shall be 100'. Silt fence shall be installed prior to any upslope earthwork.

Measures such as temporary stone check dams and silt fence shall be regularly maintained and shall be checked for sediment build-up. Sediment build-up shall be removed when the level of sediment reaches one-half the height of the control measure. Sediment shall be disposed of at an approved site such that it will not be subject to erosion.

Stabilized construction entrances to the project site, staging areas, as well as to waste and borrow areas shall be established. The minimum size of a stabilized construction entrance is 12' x 50'. All surface water flowing to or diverted towards a construction entrance shall be piped under the stone. Pipes shall be appropriately sized for the contributing area, however, no pipes smaller than 6 inch diameter shall be used. See typical detail on sheet 24 for materials and construction method to be utilized when constructing a stabilized entrance.

PERMANENT EROSION CONTROL MEASURES

Several permanent erosion control measures will be utilized:

Stone lining of the stream banks with Stone Fill, Type III and around the wingwalls and on the disturbed roadway slopes with Stone Fill, Type I will be utilized. The stone lining will stabilize the slopes during storm events.

Stream bank vegetation will be introduced in the grubbing material that is to be placed over the stream bank rip rap.

GENERAL EROSION & SEDIMENT CONTROL GUIDELINES

The Erosion 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, storm water 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 and sediment control measures as shown in the Erosion Control Plan or as directed by the Engineer. Do not modify the type, size or location of any control or 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.

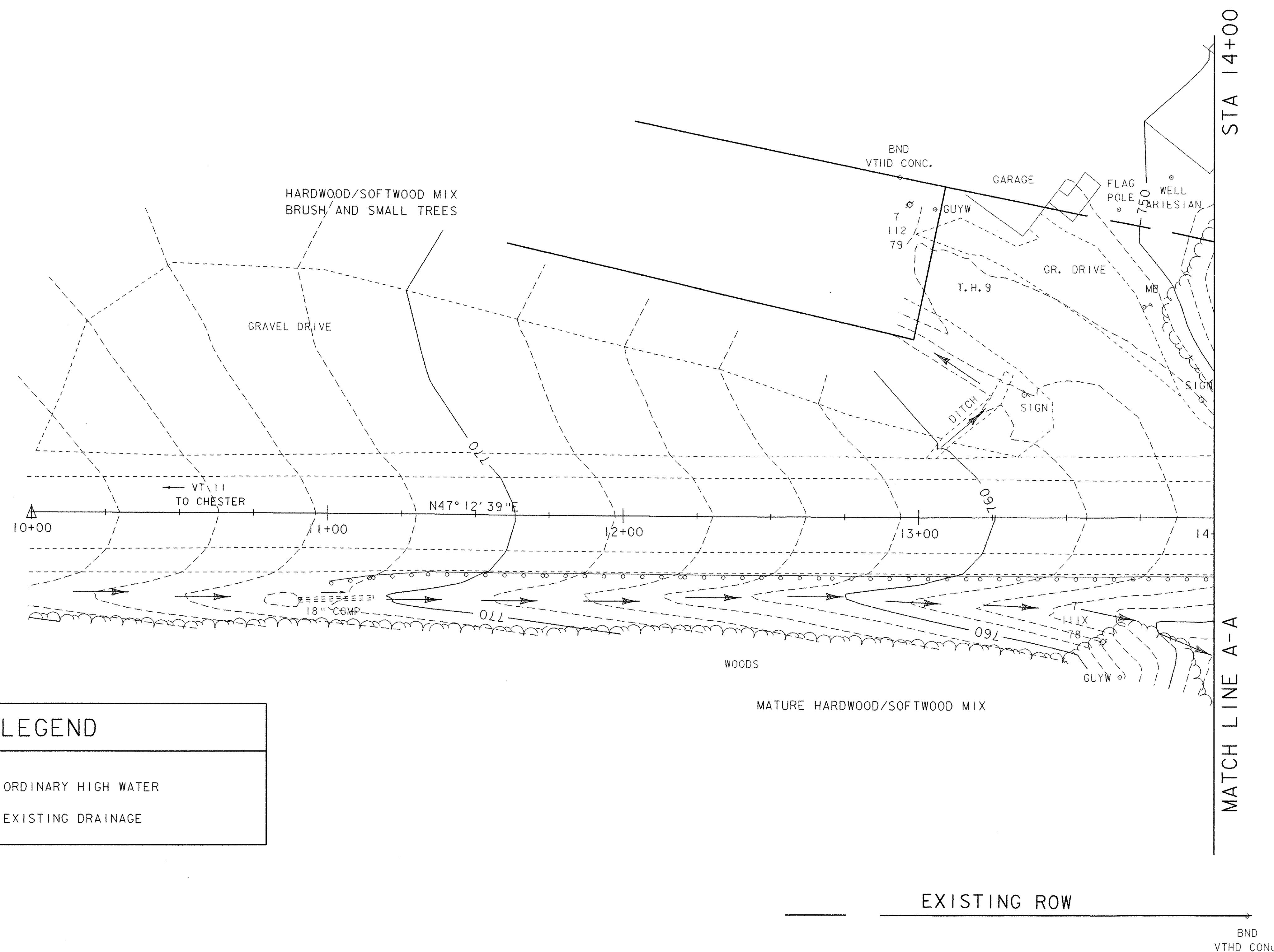
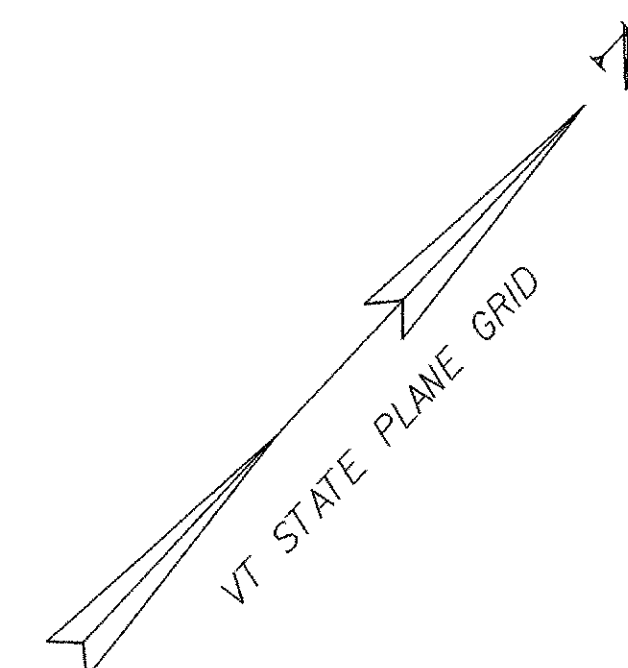
Maintaining vegetated buffers along the stream banks, wetlands or other sensitive areas is a crucial erosion and sediment control measure that should be established wherever possible.

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.

EROSION PREVENTION & SEDIMENT CONTROL NARRATIVE

PROJECT NAME: SPRINGFIELD	
PROJECT NUMBER: ST CULV(5)	
FILE NAME: /04CI78/str/s04ci78ecbdr.dgn	PLOT DATE: 22-MAY-2007
PROJECT LEADER: R. WHITCOMB	DRAWN BY: M. HALE
DESIGNED BY: D. BONNEAU	CHECKED BY: C. CARLSON
s04ci78ecn.i	SHEET 18 OF 52



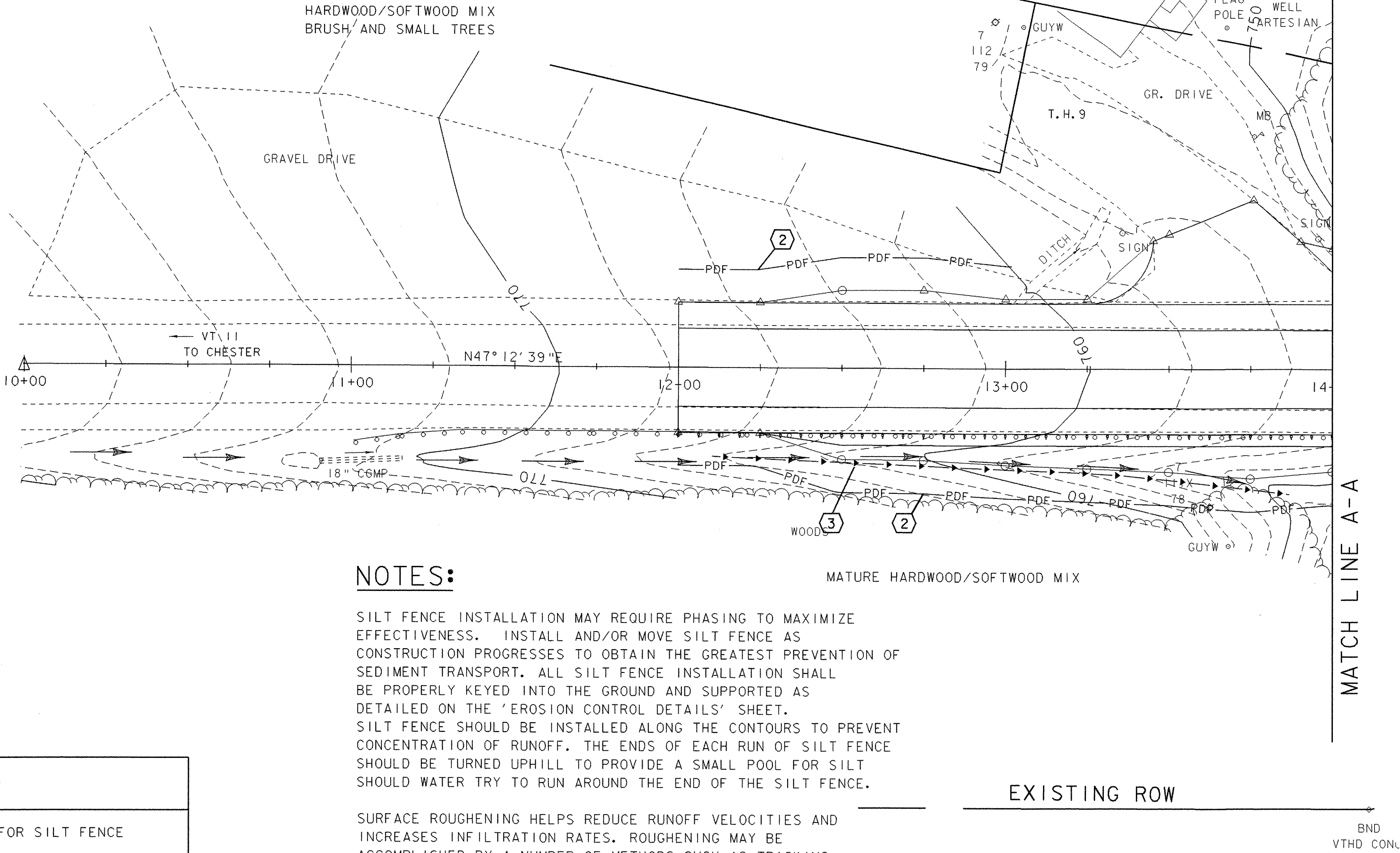
EROSION PREVENTION & SEDIMENT CONTROL EXISTING CONDITIONS

PROJECT NAME:	SPRINGFIELD
PROJECT NUMBER:	ST CULV(5)

FILE NAME: /04CI78/str/s04cl78ecbdr.dgn	PLOT DATE: 2I-MAY-2007
PROJECT LEADER: R. WHITCOMB	DRAWN BY: M. HALE
DESIGNED BY: D. BONNEAU	CHECKED BY:
s04cl78ec0l.i	SHEET 19 OF 52

EROSION AND SEDIMENT CONTROL INDEX	
NO.	DESCRIPTION
①	INSTALL SILT FENCE ALONG CONTOURS
②	PROJECT LIMITS DEMARCATION FENCE
③	INSTALL CHECK DAMS

NOTE: ALL DISTURBED AREAS WITH SLOPES STEEPER THAN 1:3 WILL REQUIRE TEMPORARY EROSION MATTING (SEE SHEET 25)



NOTES:

SILT FENCE INSTALLATION MAY REQUIRE PHASING TO MAXIMIZE EFFECTIVENESS. INSTALL AND/OR MOVE SILT FENCE AS CONSTRUCTION PROGRESSES TO OBTAIN THE GREATEST PREVENTION OF SEDIMENT TRANSPORT. ALL SILT FENCE INSTALLATION SHALL BE PROPERLY KEYED INTO THE GROUND AND SUPPORTED AS DETAILED ON THE 'EROSION CONTROL DETAILS' SHEET. SILT FENCE SHOULD BE INSTALLED ALONG THE CONTOURS TO PREVENT CONCENTRATION OF RUNOFF. THE ENDS OF EACH RUN OF SILT FENCE SHOULD BE TURNED UPHILL TO PROVIDE A SMALL POOL FOR SILT SHOULD WATER TRY TO RUN AROUND THE END OF THE SILT FENCE.

SURFACE ROUGHENING HELPS REDUCE RUNOFF VELOCITIES AND INCREASES INFILTRATION RATES. ROUGHENING MAY BE ACCOMPLISHED BY A NUMBER OF METHODS SUCH AS TRACKING UP AND DOWN THE SLOPE WITH A BULLDOZER, TRACKING ACROSS THE SLOPE WITH A WHEELED VEHICLE OR ANY METHOD OF SCARIFYING THE SLOPE SUCH THAT THE GROOVES CREATED RUN PERPENDICULAR TO THE DIRECTION OF WATER RUNOFF.

FOR CLARITY, AREAS TO BE SEEDED AND MULCHED HAVE NOT BEEN INDICATED, HOWEVER, ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED AS APPLICABLE.

LEGEND

- GEOTEXTILE FOR SILT FENCE
- STONE FILL, TYPE I
- STONE FILL, TYPE III
- PDF PROJECT DEMARCATION FENCE
- EXISTING DRAINAGE
- CHECK DAMS

EROSION PREVENTION & SEDIMENT CONTROL PLAN

PROJECT NAME:	SPRINGFIELD	PROJECT NUMBER:	ST CULV(5)
FILE NAME:	04CI78/str/s04ci78ecbdr.dgn	DESIGNED BY:	D. BONNEAU
PROJECT LEADER:	R. WHITCOMB	CHECKED BY:	C. CARLSON
PLOT DATE:	21-MAY-2007	DRAWN BY:	M. HALE
			SHEET 21 OF 52

NOTES:

SILT FENCE INSTALLATION MAY REQUIRE PHASING TO MAXIMIZE EFFECTIVENESS. INSTALL AND/OR MOVE SILT FENCE AS CONSTRUCTION PROGRESSES TO OBTAIN THE GREATEST PREVENTION OF SEDIMENT TRANSPORT. ALL SILT FENCE INSTALLATION SHALL BE PROPERLY KEYED INTO THE GROUND AND SUPPORTED AS DETAILED ON THE 'EROSION CONTROL DETAILS' SHEET. SILT FENCE SHOULD BE INSTALLED ALONG THE CONTOURS TO PREVENT CONCENTRATION OF RUNOFF. THE ENDS OF EACH RUN OF SILT FENCE SHOULD BE TURNED UPHILL TO PROVIDE A SMALL POOL FOR SILT SHOULD WATER TRY TO RUN AROUND THE END OF THE SILT FENCE.

SURFACE ROUGHENING HELPS REDUCE RUNOFF VELOCITIES AND INCREASES INFILTRATION RATES. ROUGHENING MAY BE ACCOMPLISHED BY A NUMBER OF METHODS SUCH AS TRACKING UP AND DOWN THE SLOPE WITH A BULLDOZER, TRACKING ACROSS THE SLOPE WITH A WHEELED VEHICLE OR ANY METHOD OF SCARIFYING THE SLOPE SUCH THAT THE GROOVES CREATED RUN PERPENDICULAR TO THE DIRECTION OF WATER RUNOFF.

FOR CLARITY, AREAS TO BE SEEDED AND MULCHED HAVE NOT BEEN INDICATED, HOWEVER, ALL DISTURBED AREAS SHALL BE SEEDED AND MULCHED AS APPLICABLE.

NOTE: ALL DISTURBED AREAS WITH SLOPES STEEPER THAN 1:3 WILL REQUIRE TEMPORARY EROSION MATTING (SEE SHEET 25)

EXISTING ROW

BND
VTHD CONC.

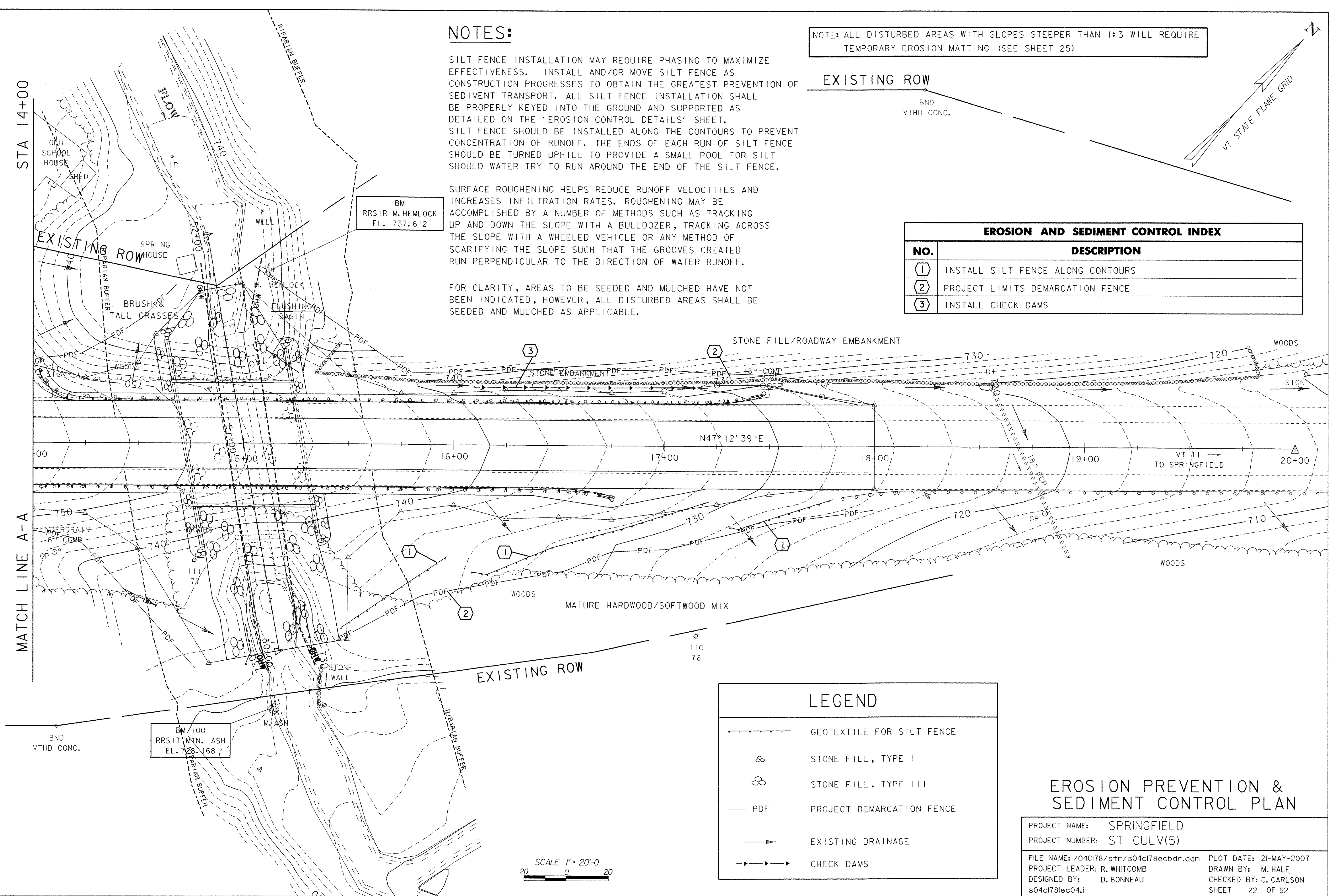
VT STATE PLANE GRID

EROSION AND SEDIMENT CONTROL INDEX

NO.	DESCRIPTION
①	INSTALL SILT FENCE ALONG CONTOURS
②	PROJECT LIMITS DEMARCATION FENCE
③	INSTALL CHECK DAMS

STA 14+00

MATCH LINE A-A

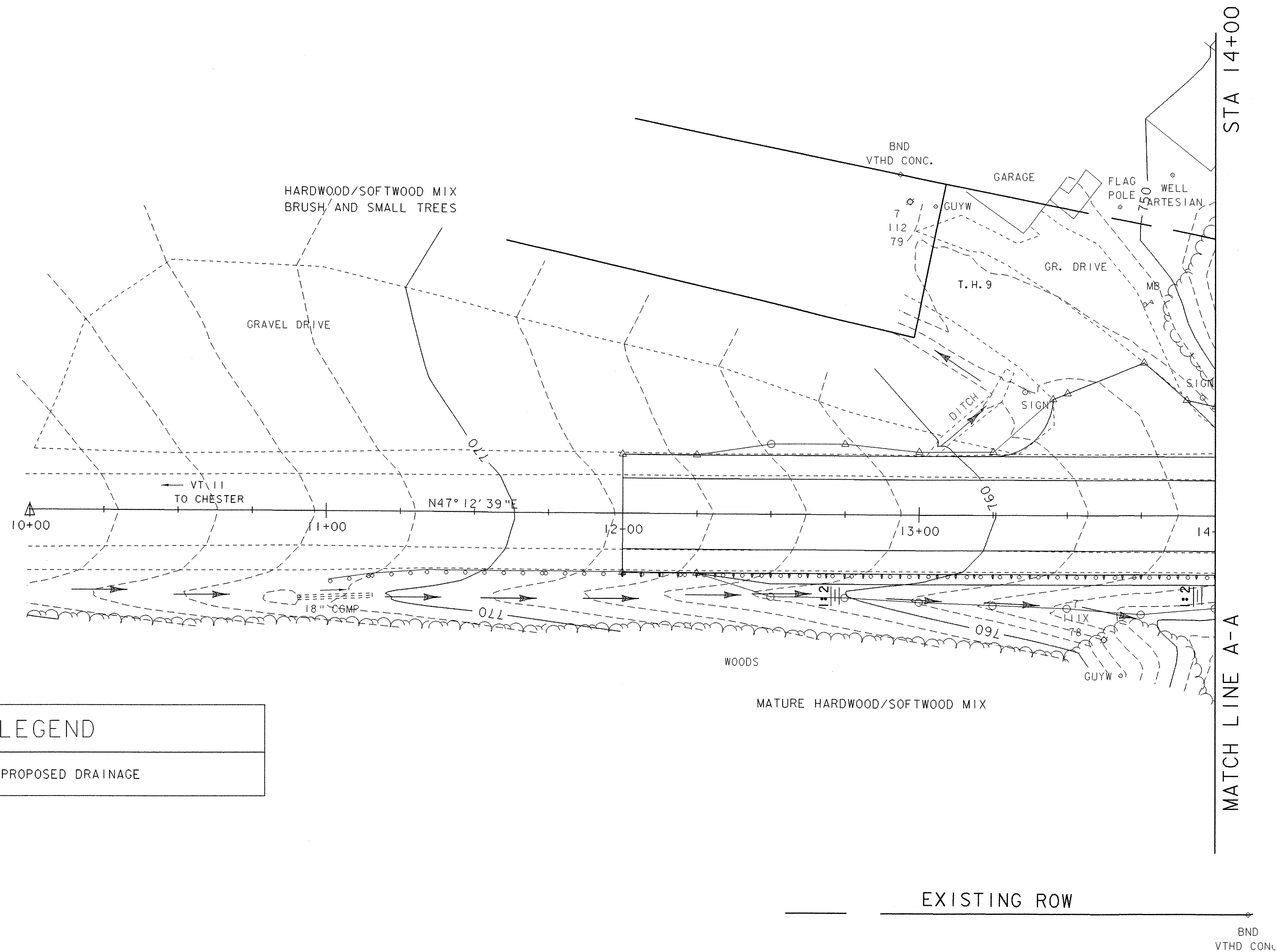


LEGEND

- GEOTEXTILE FOR SILT FENCE
- STONE FILL, TYPE I
- STONE FILL, TYPE III
- PDF PROJECT DEMARCATION FENCE
- EXISTING DRAINAGE
- CHECK DAMS

EROSION PREVENTION & SEDIMENT CONTROL PLAN

PROJECT NAME: SPRINGFIELD
PROJECT NUMBER: ST CULV(5)
FILE NAME: /04CI78/str/s04ci78ecbdr.dgn PLOT DATE: 21-MAY-2007
PROJECT LEADER: R. WHITCOMB DRAWN BY: M. HALE
DESIGNED BY: D. BONNEAU CHECKED BY: C. CARLSON
s04ci78lec04.i SHEET 22 OF 52



LEGEND	
	PROPOSED DRAINAGE

EXISTING ROW

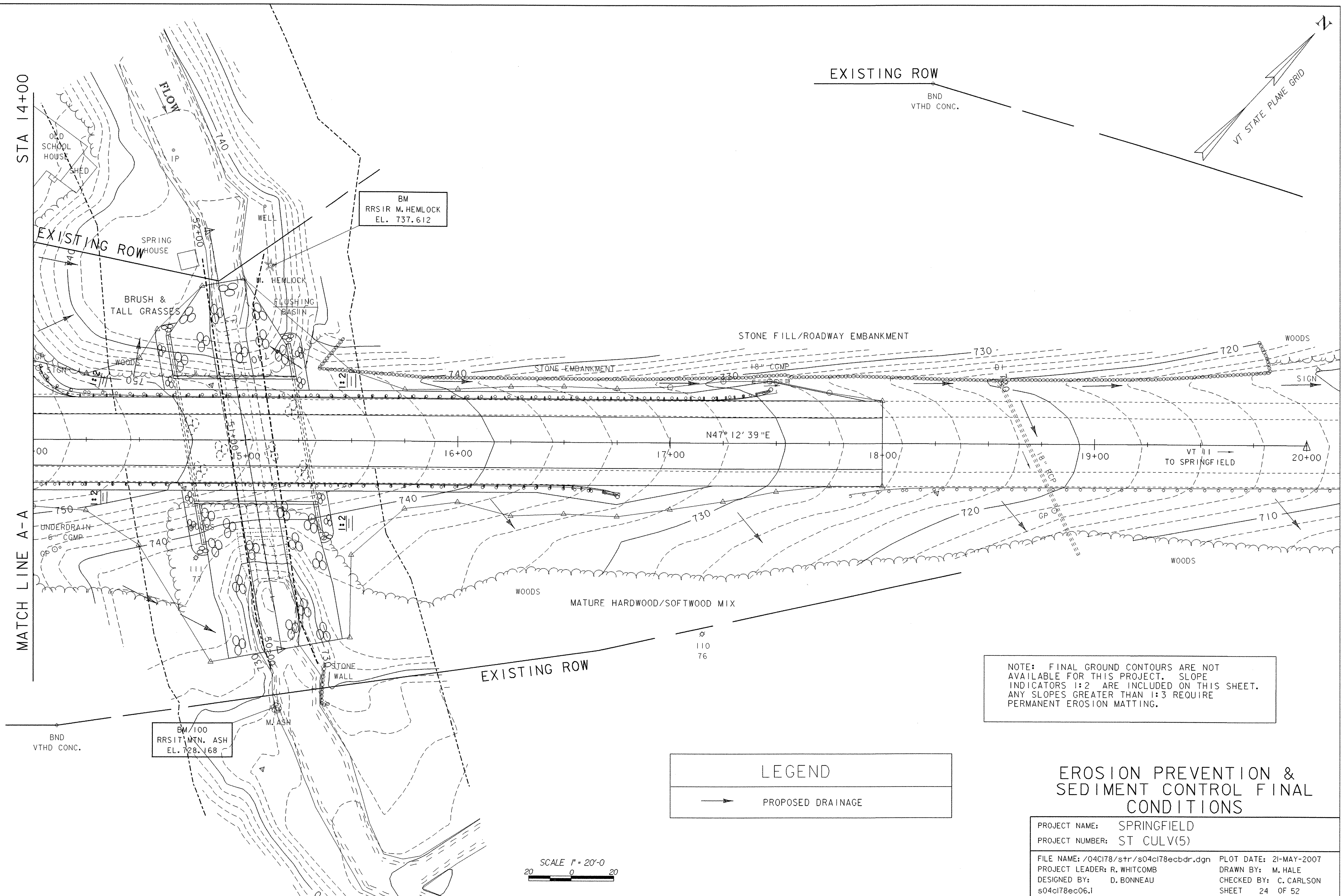
BND
VTHD CONC.



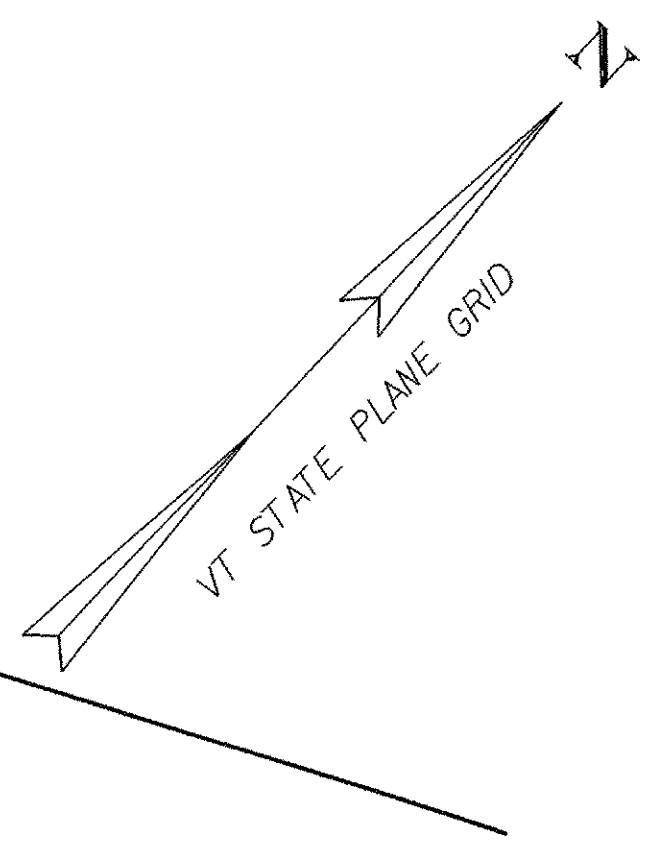
EROSION PREVENTION & SEDIMENT CONTROL FINAL CONDITIONS

PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV(5)	DRAWN BY:	M. HALE
FILE NAME:	/04C178/str/s04cl78ecbdr.dgn	CHECKED BY:	C. CARLSON
PROJECT LEADER:	R. WHITCOMB	SHEET	23 OF 52
DESIGNED BY:	D. BONNEAU		
s04cl78ec05.1			

STA 14+00
MATCH LINE A-A



EXISTING ROW
BND
VTHD CONC.



STONE FILL/ROADWAY EMBANKMENT

STONE EMBANKMENT

N47° 12' 39" E

TO SPRINGFIELD

MATURE HARDWOOD/SOFTWOOD MIX

EXISTING ROW

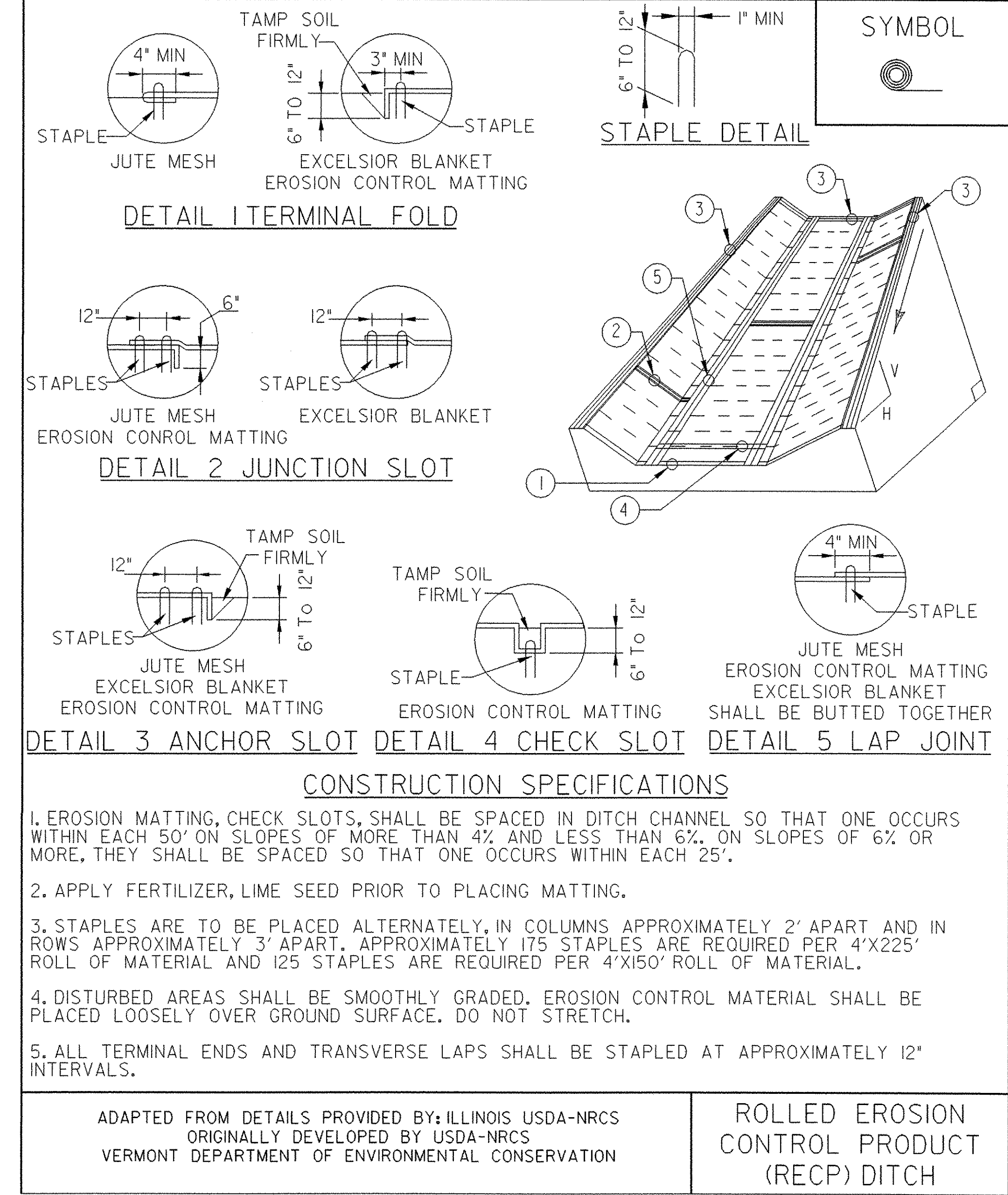
NOTE: FINAL GROUND CONTOURS ARE NOT AVAILABLE FOR THIS PROJECT. SLOPE INDICATORS 1:2 ARE INCLUDED ON THIS SHEET. ANY SLOPES GREATER THAN 1:3 REQUIRE PERMANENT EROSION MATTING.

LEGEND	
	PROPOSED DRAINAGE

SCALE 1" = 20'-0"
20 0 20

EROSION PREVENTION & SEDIMENT CONTROL FINAL CONDITIONS

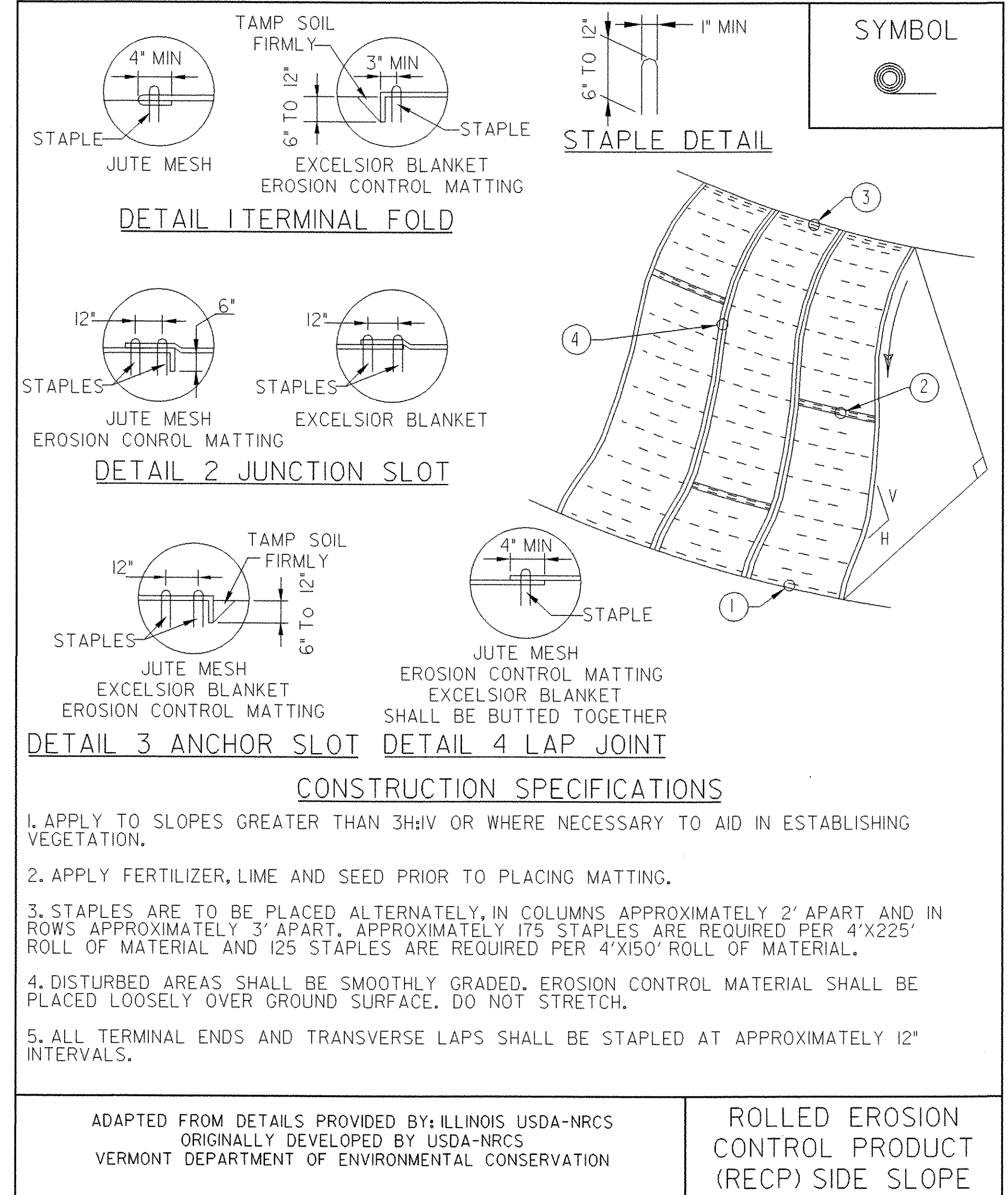
PROJECT NAME: SPRINGFIELD	
PROJECT NUMBER: ST CULV(5)	
FILE NAME: /04ci78/str/s04ci78ecbdr.dgn	PLOT DATE: 21-MAY-2007
PROJECT LEADER: R. WHITCOMB	DRAWN BY: M. HALE
DESIGNED BY: D. BONNEAU	CHECKED BY: C. CARLSON
s04ci78ec06.i	SHEET 24 OF 52



NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS ITEM SHALL BE PAID FOR UNDER ITEM
653.20 TEMPORARY EROSION MATTING OR
653.21 PERMANENT EROSION MATTING

REVISIONS		
MARCH 8, 2007	JMF	
APRIL 16, 2007	WHF	



NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006- "FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS ITEM SHALL BE PAID FOR UNDER ITEM
653.20 TEMPORARY EROSION MATTING OR
653.21 PERMANENT EROSION MATTING

REVISIONS		
NEW		
APRIL 16, 2007	WHF	

**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).

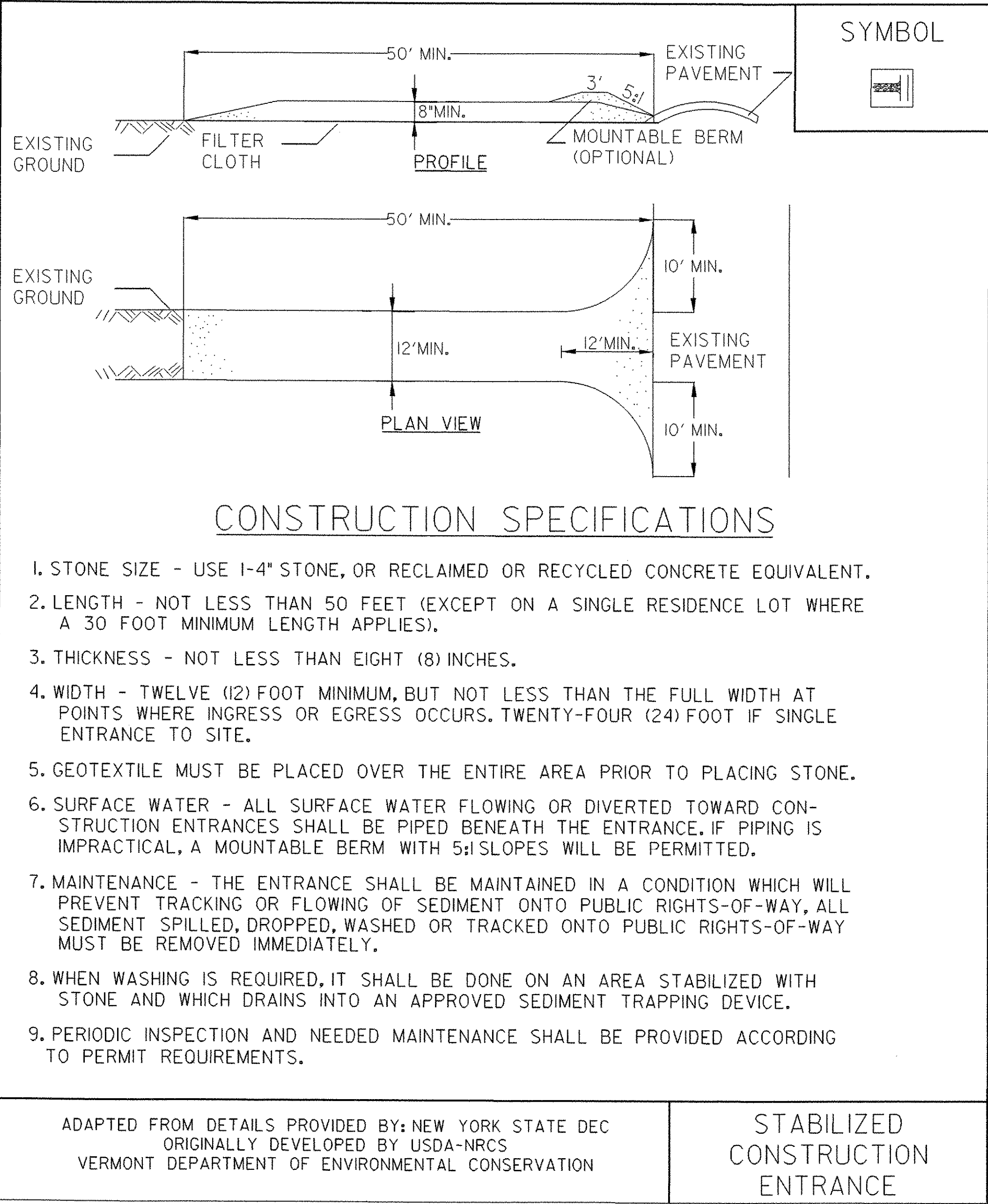
AGRICULTURAL LIMESTONE: TO BE APPLIED AT THE RATE OF 2 TONS/ACRE, OR AS DIRECTED BY THE ENGINEER.

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.

**EROSION PREVENTION &
SEDIMENT CONTROL DETAILS**

PROJECT NAME:	SPRINGFIELD
PROJECT NUMBER:	ST CULV(5)
FILE NAME: /04CI78/str/s04ci78ecbdr.dgn	PLOT DATE: 21-MAY-2007
PROJECT LEADER: R. WHITCOMB	DRAWN BY: M. HALE
DESIGNED BY: D. BONNEAU	CHECKED BY: C. CARLSON
s04ci78ec07.1	SHEET 25 OF 52



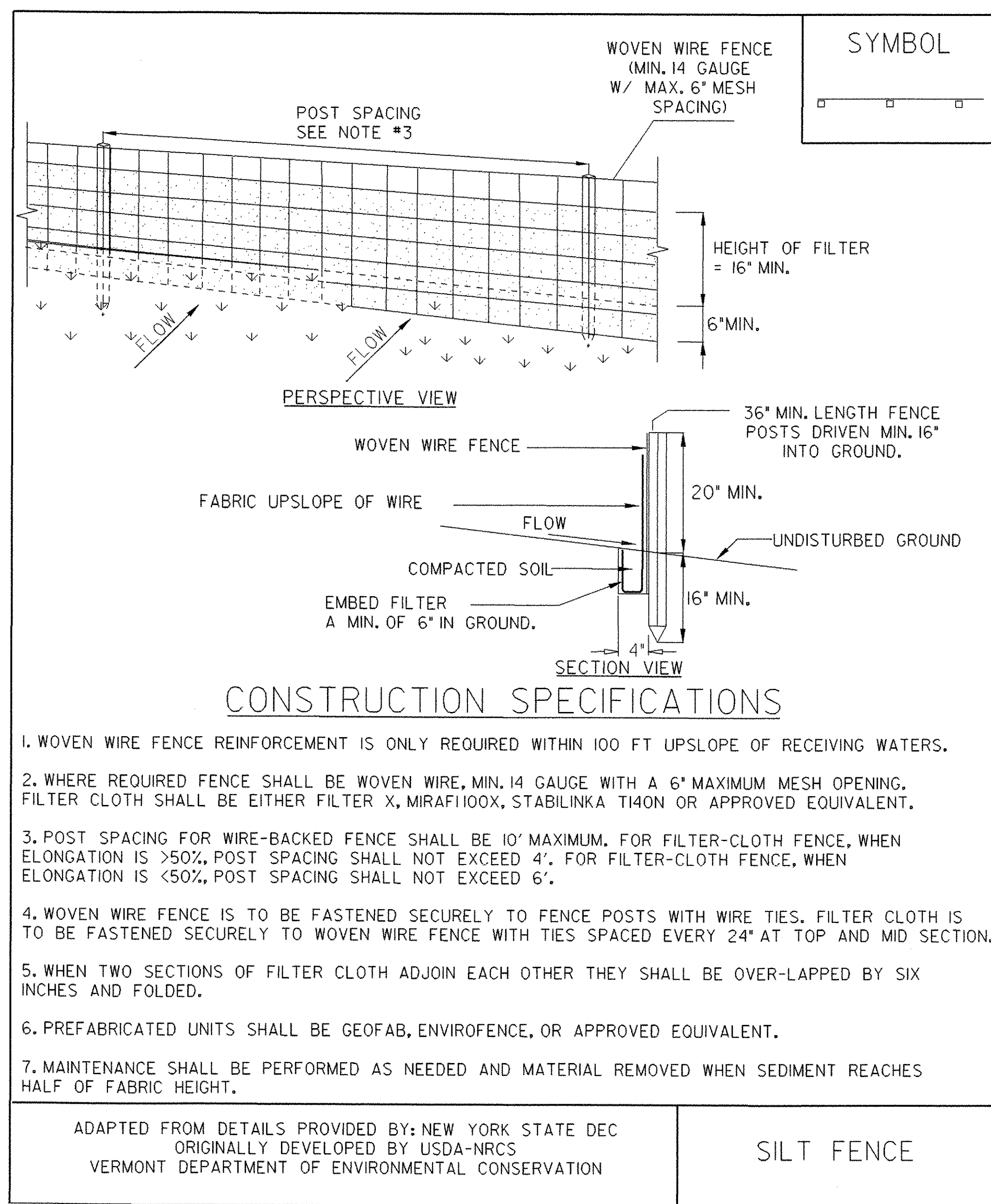
NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS ITEM SHALL BE PAID FOR UNDER ITEM
653.35 VEHICLE TRACKING PAD

REVISIONS	
FEBRUARY 9, 2007	WHF
MARCH 8, 2007	JMF

EROSION PREVENTION & SEDIMENT CONTROL DETAILS

PROJECT NAME: SPRINGFIELD	
PROJECT NUMBER: ST CULV(5)	
FILE NAME: /04C178/str/s04c178ecbdr.dgn	PLOT DATE: 21-MAY-2007
PROJECT LEADER: R. WHITCOMB	DRAWN BY: M. HALE
DESIGNED BY: D. BONNEAU	CHECKED BY: C. CARLSON
s04c178ec08.i	SHEET 26 OF 52



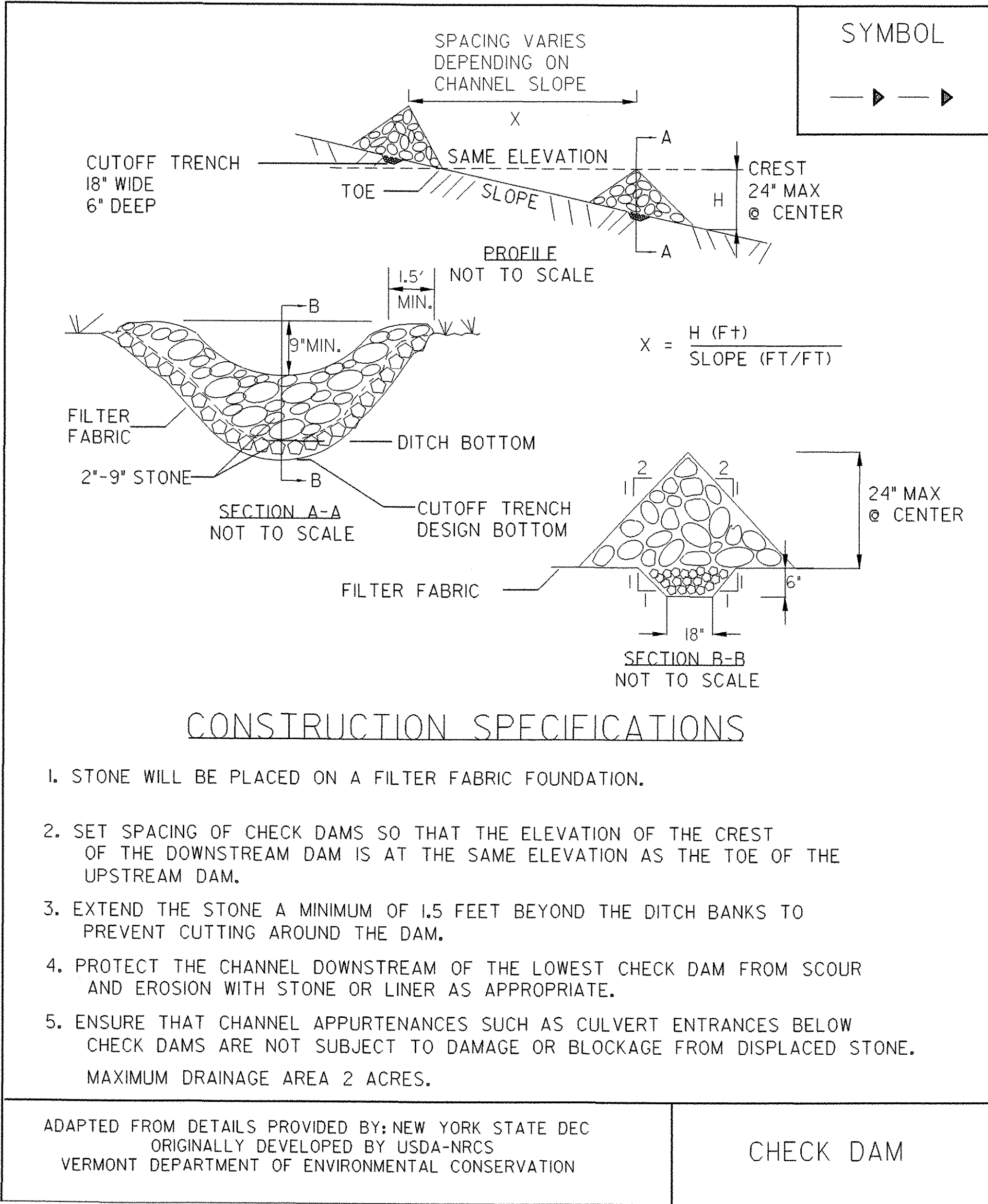
NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION PREVENTION & SEDIMENT CONTROL -2006-" FROM THE VT AGENCY OF NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS ITEM SHALL BE PAID FOR UNDER ITEM
649.51 GEOTEXTILE FOR SILT FENCE (FILTER FABRIC ONLY FENCE)
900 SERIES SPECIAL PROVISION (WOVEN WIRE REINFORCED FENCE)

EROSION PREVENTION & SEDIMENT CONTROL DETAILS

PROJECT NAME: SPRINGFIELD
PROJECT NUMBER: ST CULV(5)

FILE NAME: /04CI78/str/s04cl78ecbdr.dgn PLOT DATE: 21-MAY-2007
PROJECT LEADER: R. WHITCOMB DRAWN BY: M. HALE
DESIGNED BY: D. BONNEAU CHECKED BY: C. CARLSON
s04cl78ec09.i SHEET 27 OF 52



NOTES:
REFER TO "THE VERMONT STANDARDS & SPECIFICATIONS FOR EROSION
PREVENTION & SEDIMENT CONTROL ~2006~" FROM THE VT AGENCY OF
NATURAL RESOURCES FOR ADDITIONAL GUIDANCE.

THIS ITEM SHALL BE PAID FOR UNDER ITEM
653.25 TEMPORARY STONE CHECK DAM, TYPE I

REVISIONS	
MARCH 8, 2007	JMF

EROSION PREVENTION &
SEDIMENT CONTROL DETAILS

PROJECT NAME: SPRINGFIELD	
PROJECT NUMBER: ST CULV(5)	
FILE NAME: /04C178/str/s04cl78ecbdr.dgn	PLOT DATE: 21-MAY-2007
PROJECT LEADER: R. WHITCOMB	DRAWN BY: M. HALE
DESIGNED BY: D. BONNEAU	CHECKED BY: C. CARLSON
s04cl78ec10.i	SHEET 28 OF 52

GENERAL NOTES:

- ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION 2006 STANDARD SPECIFICATIONS FOR CONSTRUCTION, THE 2002 AASHTO BRIDGE DESIGN SPECIFICATIONS AND THEIR LATEST REVISIONS.
- DIMENSIONS ARE HORIZONTAL OR VERTICAL IN FEET & INCHES AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.
- THE BRIDGE IS DESIGNED FOR HS 25-44 LIVE LOAD WITH NO ALLOWANCE FOR FUTURE LOADS.
- WATER QUALITY. PREVENT POLLUTION, AND DISCHARGE OF SILT OR RAW CONCRETE INTO THE WATERWAY AS DIRECTED BY THE RESIDENT ENGINEER.
- IN-STREAM CONSTRUCTION. PERMITS DESIGNATE AND LIMIT THE PERIOD FOR IN-STREAM CONSTRUCTION FROM JUNE 1 TO OCTOBER 1. THE AGENCY OF NATURAL RESOURCES MUST APPROVE ANY DEVIATION FROM THIS PERIOD IN WRITING.

TRAFFIC CONTROL

- TRAFFIC SHALL BE MAINTAINED DURING THE CONSTRUCTION OF THE NEW BRIDGE BY PHASED CONSTRUCTION. SEE SHEETS 10-12 AND SPECIAL PROVISION 900.645 FOR MORE INFORMATION.

EARTH & CHANNEL WORK

- THE EXISTING CULVERT, HEADWALLS AND ANY APPURTENANCES WILL BE REMOVED UNDER PAY ITEM, 529.15, REMOVAL OF STRUCTURE.
- PLACE STONE FILL UNDER THE BRIDGE BEFORE PLACING THE PRESTRESS UNITS.
- THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING METHODS OF CONSTRUCTION TO MAINTAIN STREAM FLOW DURING THE CONSTRUCTION OF THIS PROJECT. METHODS MUST COMPLY WITH SOUND ENVIRONMENTAL PRACTICES AND BE APPROVED BY THE ENGINEER PRIOR TO IMPLEMENTATION. IF A TEMPORARY PIPE IS USED, IT MUST BE A MINIMUM OF 60" DIAMETER. ALL COSTS ASSOCIATED WITH THIS WORK WILL BE CONSIDERED INCIDENTAL TO ALL OTHER CONTRACT ITEMS.
- TEMPORARY SHEET PILING IS INCLUDED TO SEPARATE PHASE II AND III CONSTRUCTION. THE TOP LIMIT FOR MEASUREMENT WILL BE A MAXIMUM OF 3.5 FEET ABOVE THE ADJACENT ROADWAY SURFACE AND THE BOTTOM LIMIT WILL BE AS SHOWN IN THE SUBMITTED DESIGN UNLESS DRIVING CONDITIONS PROHIBIT DRIVING TO THE DESIGN DEPTH, IN WHICH CASE, THE BOTTOM LIMIT WILL BE THE ACTUAL DEPTH REACHED.
- THE UNDERDRAIN FLUSHING BASIN LOCATED AT STATION 15+25 LT SHALL BE REMOVED AND REPLACED IN A NEW LOCATION TO BE DETERMINED BY THE RESIDENT ENGINEER. TWENTY FEET OF 6" UNDERDRAIN IS INCLUDED IN THE QUANTITIES TO BE USED TO CONNECT THE NEW UNDERDRAIN FLUSHING BASIN WITH THE EXISITING UNDERDRAIN.

STRUCTURAL CONCRETE

- ITEM 501.34 "CONCRETE, HIGH PERFORMANCE CLASS B" WILL BE USED FOR ALL NON-PRESTRESSED CONCRETE. THE COST OF INSTALLING THE AGENCY PROVIDED BRIDGE PLAQUE WILL BE CONSIDERED INCIDENTAL TO THIS ITEM.
- EPOXY COATED REINFORCING STEEL SHALL BE USED IN THE HEADWALLS.
- UNCOATED REINFORCEMENT SHALL BE USED FOR ALL OTHER NON-PRESTRESSED CONCRETE.
- THE TOLERANCE FOR PLACEMENT OF REINFORCEMENT WILL BE WITHIN 1 INCH OF THE SPACING AND 1/4 INCH OF THE CONCRETE COVER SHOWN IN THE PLANS.
- THE MINIMUM CONCRETE COVER FOR REINFORCING STEEL IS 2 INCHES ON THE FACES OF WALLS AGAINST EARTH AND 3 INCHES ELSEWHERE UNLESS OTHERWISE NOTED.
- CONSTRUCT CONCRETE JOINTS AS INDICATED ON THE PLANS OR DIRECTED BY THE RESIDENT ENGINEER. CONSTRUCT SHEAR KEYS MONOLITHICALLY AND CONTINUOUSLY UNLESS OTHERWISE INDICATED. TERMINATE SHEAR KEYS 6 INCHES FROM ENDS OF JOINTS. PLACE SHEAR KEYS UPWARD IN HORIZONTAL JOINTS.
- UNLESS OTHERWISE NOTED, ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1 INCH BY 1 INCH.
- CONSTRUCT SCORE MARKS AS INDICATED ON THE PLANS OR AS DIRECTED BY THE RESIDENT ENGINEER.

- APPLY WATER REPELLENT, SILANE TO ALL EXPOSED SURFACES OF WINGWALLS AND HEADWALLS. ALSO APPLY TO EXPOSED SURFACES OF PRESTRESSED FASCIA UNITS INCLUDING THE BOTTOM SURFACE AND THE ABUTMENT BETWEEN THE FASCIA AND A VERTICAL LINE DEFINED BY THE JOINT BETWEEN THE PRESTRESSED FASCIA UNITS AND THE FIRST INTERIOR UNIT.

PRESTRESSED CONCRETE

- ITEM 510.21 "PRESTRESSED CONCRETE BOX BEAMS". PRESTRESSED PRECAST MEMBERS SHALL:
 - CONFORM TO SECTION 510 "PRESTRESSED CONCRETE".
 - BE 33" X 48" BOX BEAMS.
 - USE CONCRETE WITH F'C = 6,000 PSI AND FC = 4,000 PSI.
 - BE DESIGNED FOR COMBINATIONS OF AASHTO HS 25-44 LIVE LOAD AND DEAD LOADS INCLUDING VARYING DEPTHS OF ROADWAY FILL MATERIAL UP TO AND INCLUDING FINISH GRADE.
 - CONTAIN CONTINUOUS VOIDS EXCEPT AS SHOWN IN THE PLAN DETAIL.
 - HAVE VOID DRAINS AT THE ENDS OF EACH VOID. THE VOID DRAINS SHALL BE 3/4 INCH DIAMETER, NON-FERROUS, AND CLEANED AFTER ERECTION.
 - CONTAIN PRESTRESSING STRANDS WHICH ARE 0.6 INCH DIAMETER, 270 KSI, LOW RELAXATION STRANDS PULLED TO 75% OF THEIR YIELD.
 - HAVE THE ENDS OF THE STRANDS RECESSED AND GROUTED ACCORDING TO STANDARD PRACTICE.
- THE FABRICATOR MAY, WITH THE APPROVAL OF THE STRUCTURES ENGINEER, ALTER THE DESIGN TO MEET THE PLANT'S PRESTRESSING OPERATION AND MATERIAL REQUIREMENTS. AN ALTERNATE STRAND CONFIGURATION MAY BE SUBMITTED FOR APPROVAL PROVIDED THAT THE DESIGN IS STAMPED AND SIGNED BY A PROFESSIONAL ENGINEER LICENSED IN THE STATE OF VERMONT AND THAT THE DESIGN MEETS ALL OF THE APPLICABLE DESIGN CRITERIA, LOADINGS AND CODES.
- THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL CONCRETE ENGINEER AT THE VAOT MATERIALS AND RESEARCH SECTION TWO WEEKS PRIOR TO THE PRESTRESS FABRICATOR CONSTRUCTING THE UNITS.
- TRANSVERSE TIES.
 - THE 1/2 INCH DIAMETER TRANSVERSE STRANDS SHALL BE POLYSTRAND OR EQUIVALENT.
 - THE STRANDS SHALL BE COVERED WITH A SEAMLESS POLYPROPYLENE SHEATH WITH CORROSION INHIBITOR GREASE BETWEEN SHEATH AND STRAND.
 - THE 3/4 INCH TIE PLATES SHALL CONFORM TO AASHTO M270/M270M GR 50.
 - THE PLATES AND CHUCKS SHALL BE GALVANIZED AFTER FABRICATION ACCORDING TO AASHTOM232/M232M.
 - INSTALL TRANSVERSE STRANDS BEFORE PLACING MORTAR.
- FILL THE JOINTS BETWEEN THE BOX BEAMS WITH MORTAR, TYPE IV, AS DESCRIBED IN SECTION 510.13. THE CONTRACTOR SHALL SUPPLY ENOUGH GROUT CUBE MOLDS TO MAKE 3 SETS OF 3 DAY CUBES, 3 SETS OF 28 DAY CUBES AND A MINIMUM OF 3 MORE CUBES TO TEST FOR THE 1500 PSI MINIMUM COMPRESSIVE STRENGTH REQUIRED FOR POST TENSIONING. PAYMENT SHALL BE BY ITEM 510.24, "GROUTING SHEAR KEYS".

PROPOSED CONSTRUCTION SEQUENCE FOR BOX BEAMS (PHASE II)

PHASE II

- LAYOUT WORKING LINES.
 - LAY OUT WORKING LINES FOR THE ENTIRE BRIDGE WIDTH ON THE BEAM SEAT.
 - MEASURE ALL WORKING LINES FROM A COMMON WORKING POINT.
 - BASE THE WORKING LINES ON THE NOMNAL BEAM WIDTHS.
- VERIFY BEAM SEAT ELEVATIONS
 - MEASURE ELEVATIONS AT BEAM SEATS.
 - IF SEATS ARE HIGH, GRIND TO CORRECT ELEVATIONS.
 - IF SEATS ARE LOW, SHIM TO CORRECT ELEVATIONS. INSTALL BEARINGS.
- ERECT BEAMS
 - PLACE BEAMS TO FIT WITHIN THE WORKING LINES.
 - AS WORK PROGRESSES, INSTALL HARDWOOD WEDGES BETWEEN ADJACENT BEAMS TO MAINTAIN PROPER JOINT OPENING (A MINIMUM OF ONE WEDGE AT EACH LATERAL TIE).
 - DRILL ANCHOR BOLT HOLES.
 - PLACE ANCHOR BOLTS.
 - GROUT ANCHOR BOLTS IN ABUTMENT.
- INSTALL BACKER ROD
 - PLACE FILLER BELOW THE KEYS BOTTOM AS SHOWN ON THE PLANS.

- INSTALL PHASE II TRANSVERSE TIES
 - FEED TIES THROUGH DUCTS.
 - VERIFY THAT HARDWOOD WEDGES ARE IN PLACE AS REQUIRED TO PREVENT SLIPPAGE OF BEAMS.
 - POST-TENSION TIES USING A CALIBRATED JACK TO APPROXIMATELY 5,000 LBS TO REMOVE SAG IN THE TIE AND TO SEAT THE CHUCK.
- GROUT SHEAR KEYS
 - CLEAN JOINTS WITH AN OIL FREE AIR-BLAST IMMEDIATELY BEFORE
 - GROUT PLACEMENT. VERIFY THAT THE BACKER ROD IS STILL IN PLACE.
 - FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR ADDITIONAL JOINT PREPARATION AND GROUT PLACEMENT.
 - CAREFULLY ROD JOINTS TO ELIMINATE ANY POSSIBILITY OF VOIDS.
- POST-TENSION TRANSVERSE TIES
 - GROUT SHALL ATTAIN A MINIMUM COMPRESSIVE STRENGTH OF 1,500 PSI, BASED ON THE MANUFACTURER'S RECOMMENDATIONS, PRIOR TO STRESSING.
 - POST- TENSION TIES TO 30 KIP USING A CALIBRATED JACK OPERATED BY QUALIFIED PERSONNEL.
- END DETAILS
 - GROUT ANCHOR BOLT ENDS IN BOX BEAMS TO BRIDGE SEATS.
 - BEFORE GROUT CURES, PLACE WASHER PLATE AND INSTALL HOLD DOWN NUTS.
 - TIGHTEN NUT AND GROUT OVER NUT AND BOLT

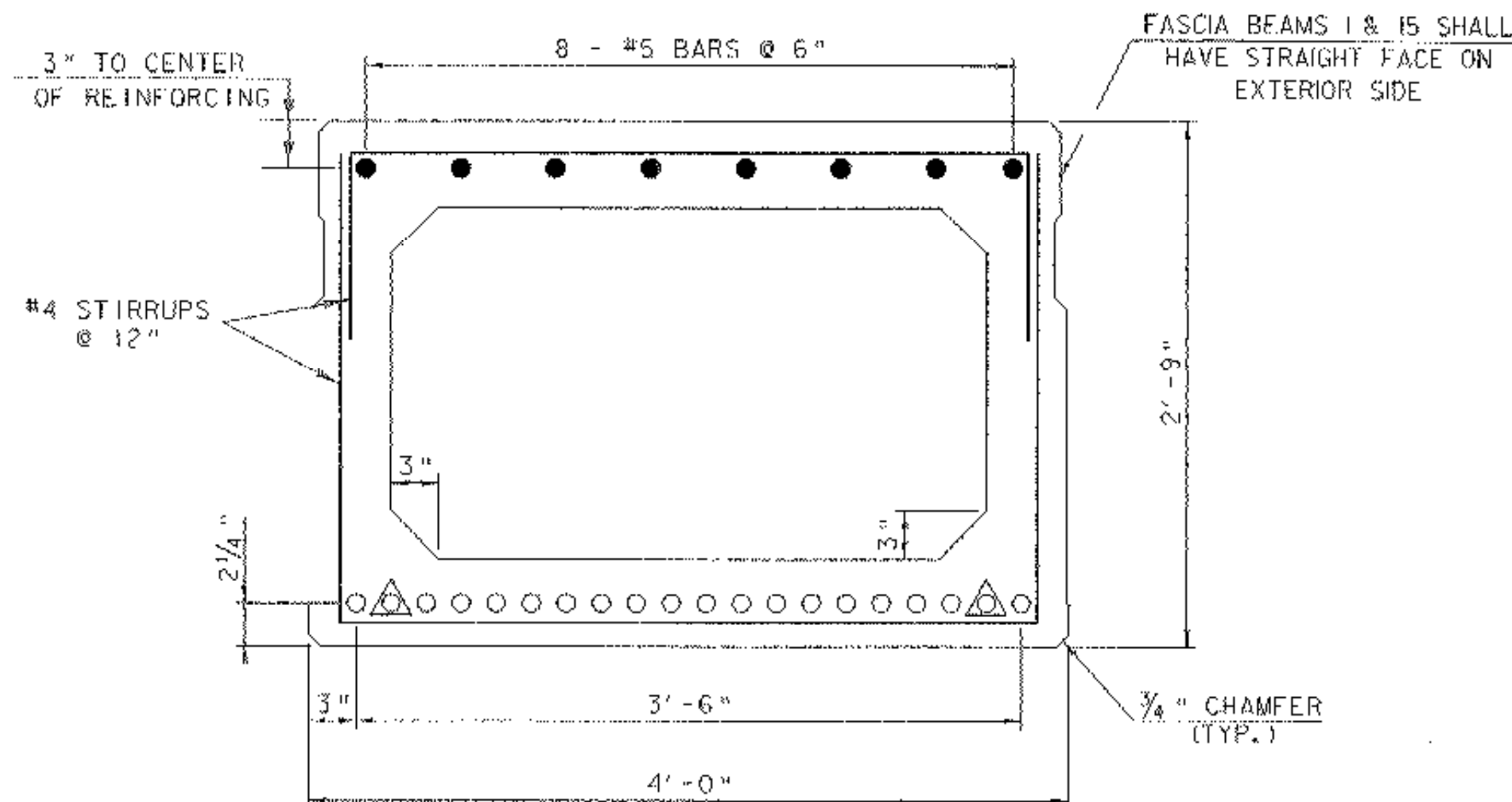
- FINISH WORK
 - REMOVE WEDGES AND PATCH DECK.

PROPOSED CONSTRUCTION SEQUENCE FOR BOX BEAMS (PHASE III)

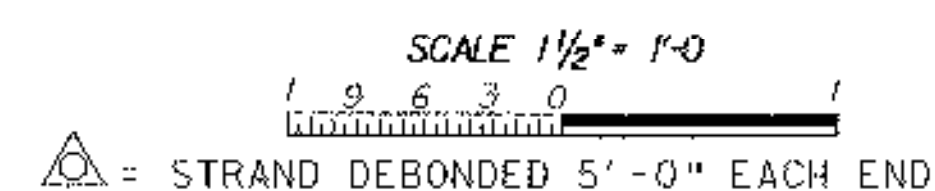
- REPEAT STEPS 1-4 FROM PHASE II CONSTRUCTION SEQUENCE.
- INSTALL PHASE III TRANSVERSE TIES:
 - FEED TIES THROUGH DUCTS FROM DOWNSTREAM FASCIA (PHASE II CONSTRUCTION) THROUGH TO UPSTREAM FASCIA (PHASE III).
 - VERIFY THAT HARDWOOD WEDGES ARE IN PLACE AS REQUIRED PREVENTING SLIPPAGE OF BEAMS.
 - POST-TENSION TIES USING A CALIBRATED JACK TO APPROXIMATELY 5,000 LBS TO REMOVE SAG IN THE TIE AND TO SEAT THE CHUCK.
- REPEAT STEPS 6-9 FROM PHASE II CONSTRUCTION SEQUENCE.
- FINISH WORK:
 - REMOVE WEDGES, PATCH DECK AND FASCIA BEAMS AT TRANSVERSE TIES (BOTH UPSTREAM AND DOWNSTREAM FASCIAS).

PROJECT NOTES

PROJECT NAME:	SPRINGFIELD		
PROJECT NUMBER:	ST CULV(5)		
FILE NAME: /04cl78/str/s04cl78pn.dgn	PLOT DATE: 23-MAY-2007		
PROJECT LEADER: R. WHITCOMB	DRAWN BY: G. ROY		
DESIGNED BY: C. CARLSON	CHECKED BY: C. CARLSON		
s04cl78pn.i	SHEET 29 OF 52		



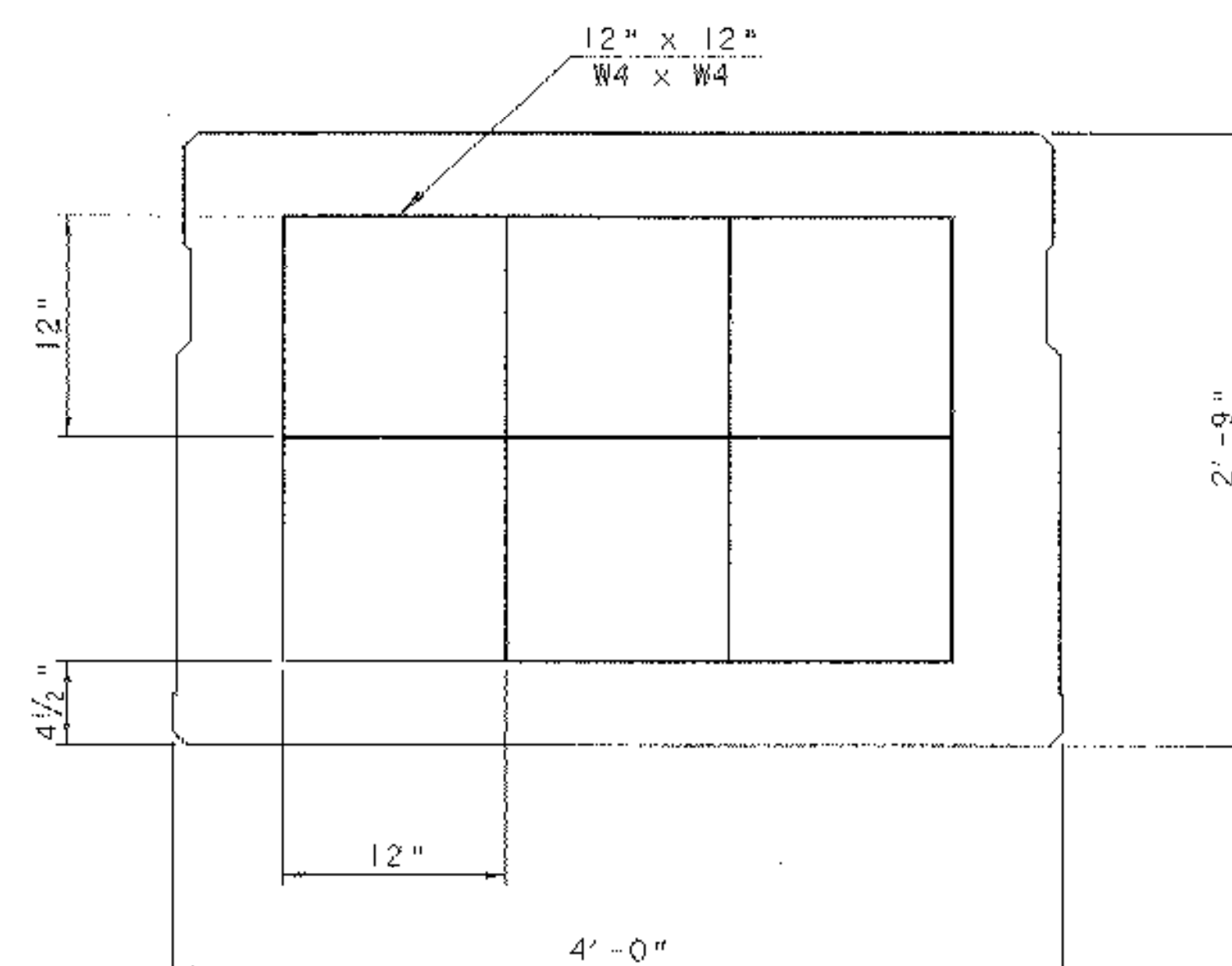
33" X 48" BOX BEAM



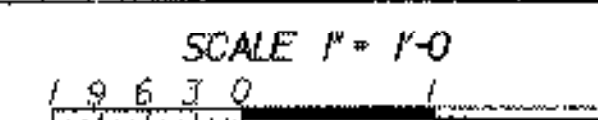
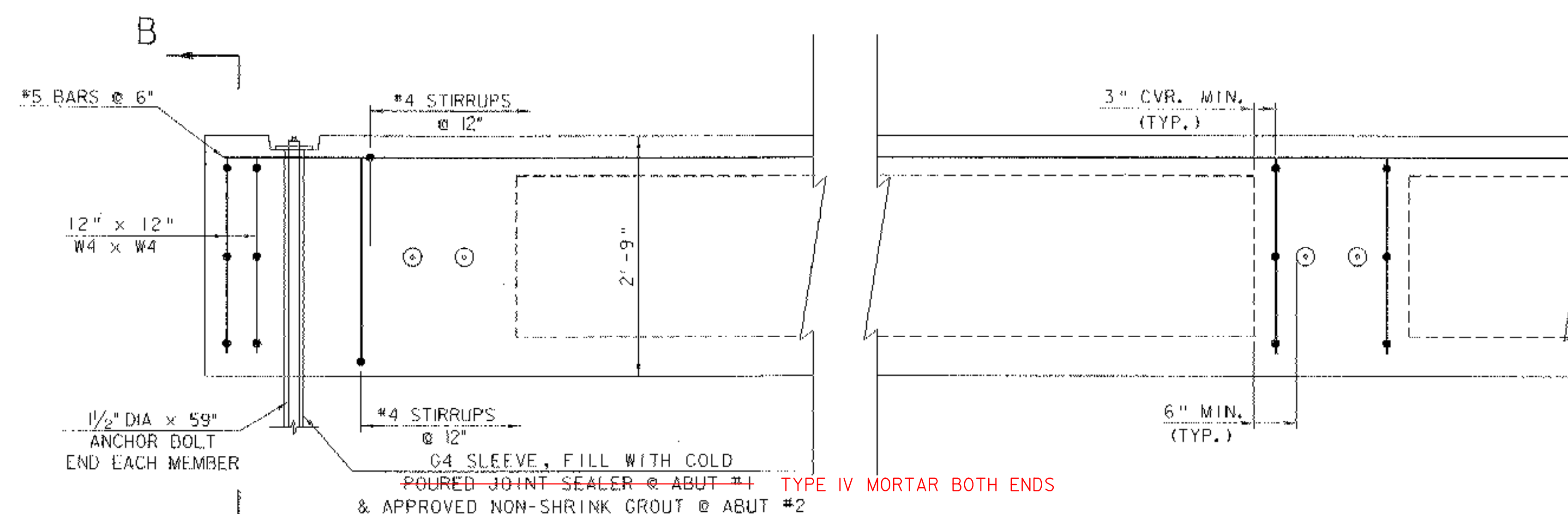
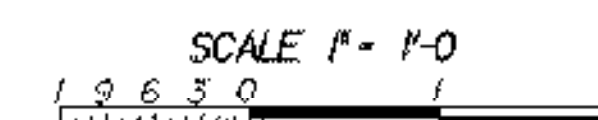
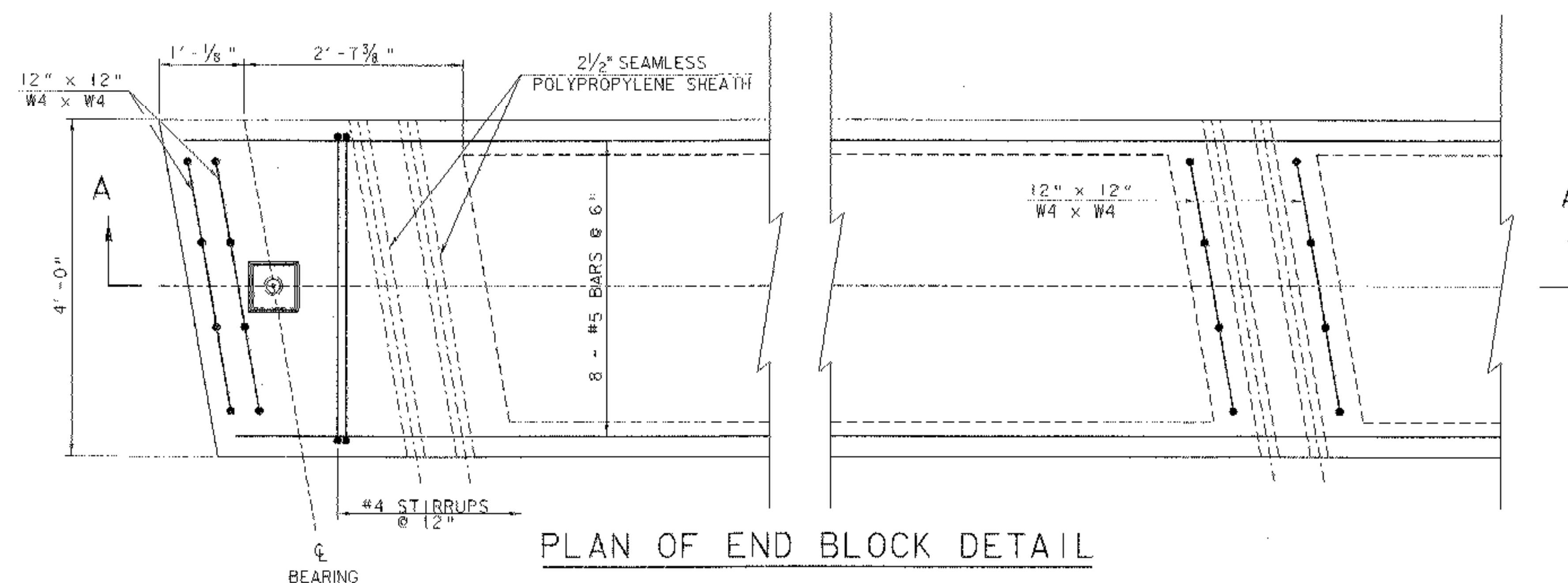
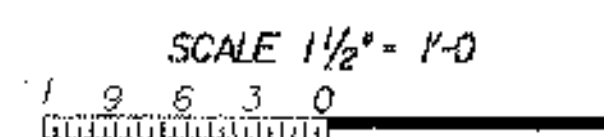
MAX NUMBER OF STRANDS FOR 33" X 48" BEAM

ROW*	NO. OF STRANDS
1 @ 2 1/4"	20 STRANDS

* ROWS ARE ALWAYS AT SPECIFIED DISTANCES FROM BOTTOM OF UNIT



SECTION B-B



SERVICE LOADS - FINAL CONDITION

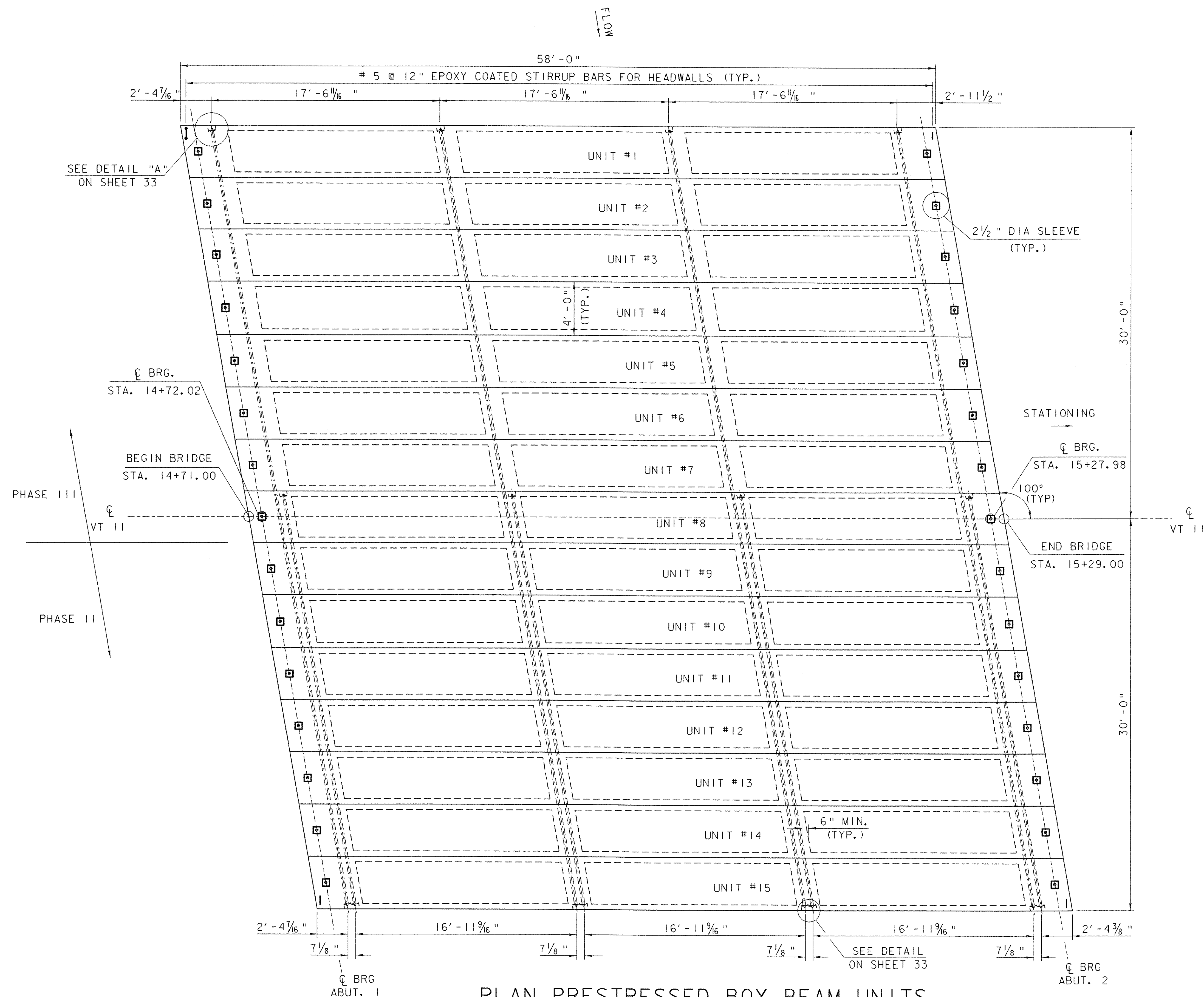
PRESTRESSED CONCRETE BOX BEAM	33" X 48"
MEMBER MOMENT	307 FT KIP
DEAD LOAD MOMENT (W/OUT MEMBER MOMENT)	1098 FT KIP
LIVE LOAD MOMENT	235 FT KIP
DEAD LOAD REACTION	101 KIP
LIVE LOAD REACTION	17 KIP
CAMBER UNDER DEAD LOADS AT ERECTION	0.51 IN
CAMBER UNDER DEAD LOADS AT LONG TERM	-1.7 IN

NOTE:
SEE SHEET 31 FOR FASCIA BEAM DETAILS.

SUPERSTRUCTURE DETAILS

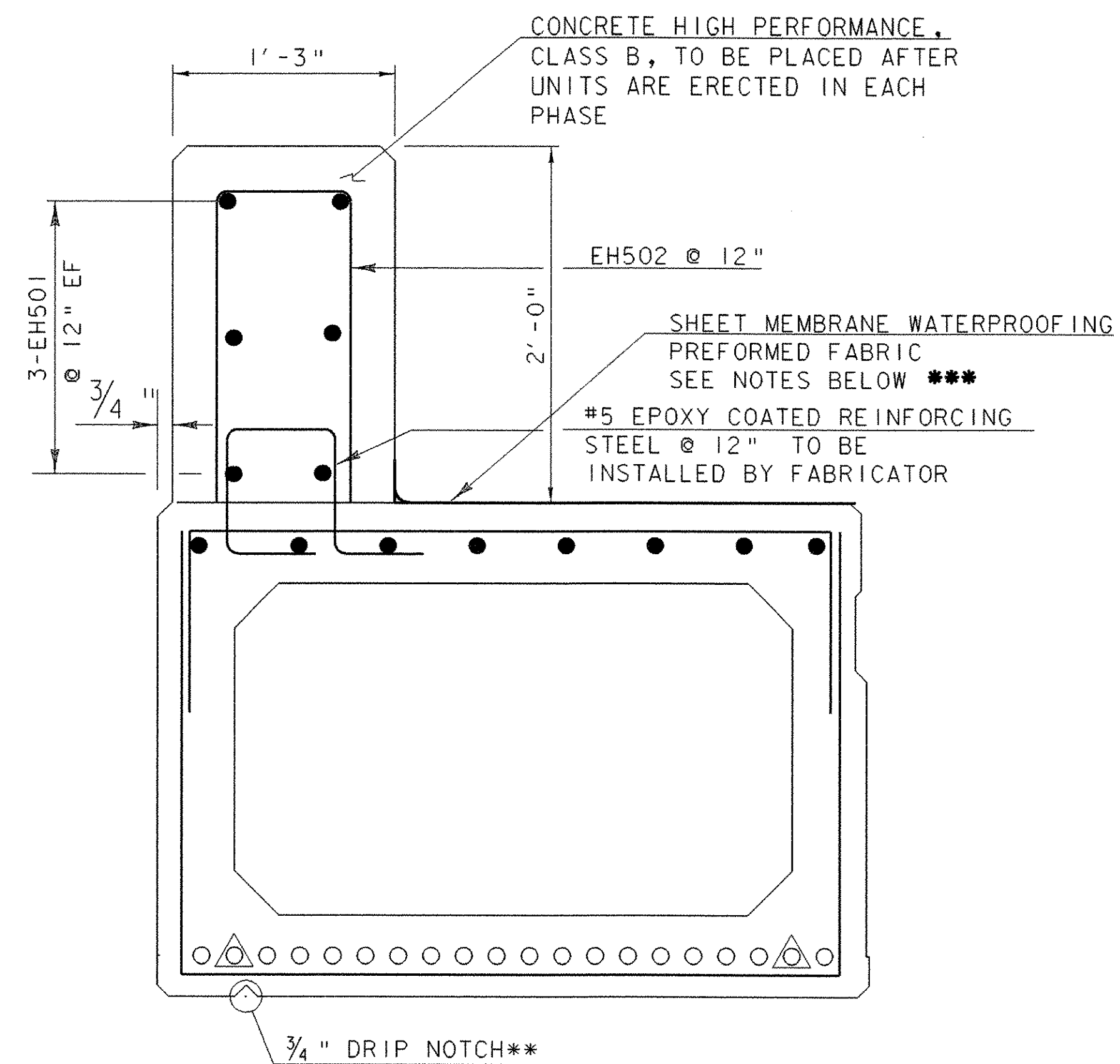
33" x 48" BOX BEAM

PROJECT NAME:	SPRINGFIELD	FILE NAME:	/04cl78/str/s04cl78fp.dgn	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV(5)	PROJECT LEADER:	R. WHITCOMB	DRAWN BY:	D. PETERSON
		DESIGNED BY:	D. PETERSON	CHECKED BY:	W. LAMMER
					SHEET 30 OF 52



PLAN PRESTRESSED BOX BEAM UNITS

SCALE 1/4" = 1'-0"



LEFT FASCIA BEAM AND HEADWALL DETAIL (UNIT 1)

(RIGHT FASCIA UNIT 15 IS MIRROR IMAGE OF UNIT 1.)

**STOP DRIP NOTCH 5' -0" FROM ENDS OF UNIT AND OUTLET AT 45° TO FASCIA. DRIP NOTCH ONLY ON FASCIA BEAMS.

*** SHEET MEMBRANE WATERPROOFING NOTES

1. POLYURETHANE MEMBRANE AND BLAST CLEANING SHALL BE INCLUDED IN THE UNIT PRICE BID FOR SHEET MEMBRANE WATERPROOFING.
2. SHEET MEMBRANE WATERPROOFING SHALL EXTEND TO FACE OF HEADWALL.
3. BLAST CLEAN 3 FEET FROM FACE OF HEADWALL AND 3 INCHES UP HEADWALL FACE PRIOR TO PLACING MEMBRANE.
4. TWO COATS OF POLYURETHANE MEMBRANE SHALL BE PLACED 3 INCHES UP THE FACE OF THE HEADWALL AND 4 INCHES ALONG PRESTRESS UNIT.
5. SEE NEXT SHEET FOR ADDITIONAL DETAILS.

DECK DETAILS

PROJECT NAME:	SPRINGFIELD	FILE NAME:	/04cl78/str/s04cl78fp.dgn	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV(5)	PROJECT LEADER:	R. WHITCOMB	DRAWN BY:	D. PETERSON
		DESIGNED BY:	D. PETERSON	CHECKED BY:	W. LAMMER
				SHEET	31 OF 52

NTS

ABUTMENT NO. 1

NTS

NOTE:
SEE VAOT SPECIFICATION 714.08
FOR ANCHOR BOLTS & NUTS

* 1/2" x 5" x 5" WASHER
WITH 1 1/2" DIA.
HOLE (GALVANIZED)

ABUTMENT NO. 2

SCALE $\frac{3}{4}" = 1'-0"$

SCALE 1" = 1'-0"

ELASTOMERIC BEARING DETAIL

* 4 - $\frac{3}{8}$ " LAYERS OF ELASTOMERIC BETWEEN
5 LAYERS OF 14 GAGE STEEL REINFORCING PLATES

SCALE 3" = 1'-0"

BRIDGE END DETAILS

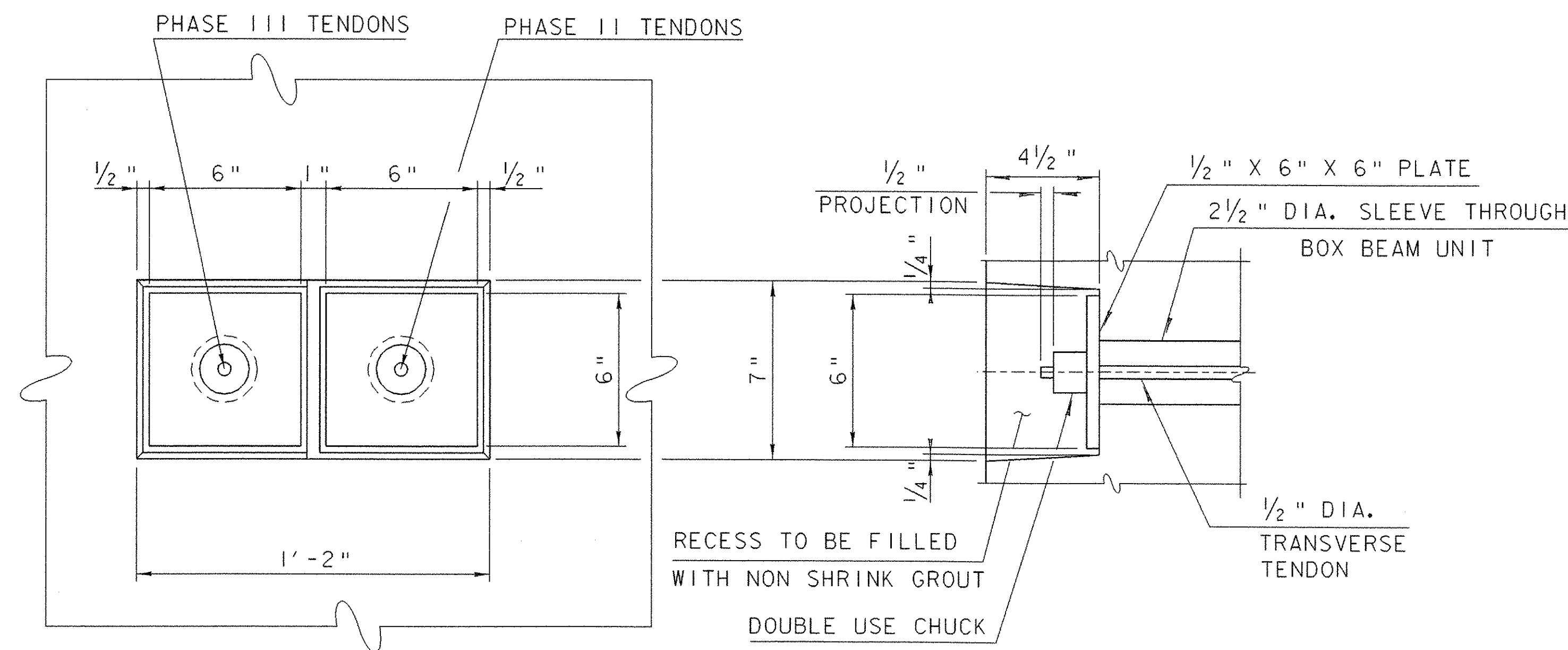
PROJECT NAME:	SPRINGFIELD
PROJECT NUMBER:	ST CULV(5)

FILE NAME: /04cl78/str/s04cl78fp.dgn
PROJECT LEADER: R. WHITCOMB
DESIGNED BY: D. PETERSON

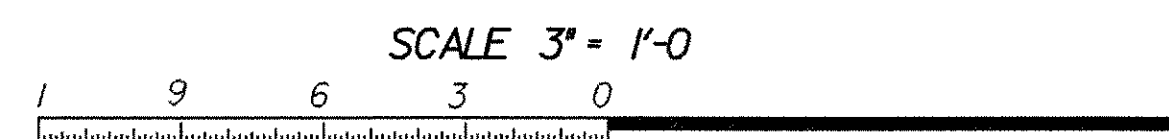
PLOT DATE: 11-JUN-2007
DRAWN BY: D. PETERSON
CHECKED BY: W. LAMMER
SHEET 32 OF 52

1. BEARINGS SHALL BE PAID FOR UNDER ITEM 531.11, "BEARING DEVICE ASSEMBLY, ELASTOMERIC PAD"
2. ALTERNATE CONFIGURATIONS FOR ELASTOMERIC BEARINGS MAY BE SUBMITTED FOR APPROVAL.
ANY ALTERNATE BEARING SUBMITTED SHALL BE DESIGNED AND CERTIFIED TO MEET THE LOADS AND CRITERIA SHOWN ON THIS SHEET AND MAINTAIN THE ANCHORAGE SYSTEM SHOWN. THE BEARINGS SHALL BE DESIGNED ACCORDING TO AASHTO "STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES" 2002 EDITION AND ITS LATEST REVISIONS.
3. THE BEARING SHAPE FACTOR SHALL BE BETWEEN 5.0 AND 12.0.
4. ALL REINFORCEMENT BETWEEN LAYERS OF ELASTOMERIC SHALL BE STEEL GRADE 50. NO FABRIC REINFORCEMENT WILL BE PERMITTED.
5. ELASTOMERIC BEARINGS REINFORCED WITH STEEL SHALL HAVE A 1/8" EDGE SEAL OF ELASTOMERIC INTEGRAL WITH THE BEARING OVER ALL PLATES.
6. ALL MATERIALS AND FABRICATION SHALL BE PER AASHTO DIVISION II SECTION 18.2 AND AASHTO MATERIAL SPECIFICATION M251.
7. DESIGN CRITERIA:
 - A. TEMPERATURE RANGE: 80 F
 - B. 60 DUROMETER ELASTOMERIC
 - C. MAXIMUM BEARING STRESS: 1000 psi
 - D. DESIGN ROTATION: 0.015 rad
 - E. REACTION/BEARING:
RDL: 101 kips
RLL: 17 kips
8. COMPRESSIBLE SEALER. THE FABRICATOR SHALL SUPPLY A SELF ADHESIVE COMPRESSIBLE SEALER BETWEEN THE BOTTOM OF THE UNITS AND THE BRIDGE SEAT. THIS COMPRESSIBLE SEALER SHALL SURROUND THE 2 1/2" DIA SLEEVE IN THE UNIT. THE PURPOSE OF THE SEALER IS TO FACILITATE PLACEMENT OF THE "MORTAR, TYPE IV" AROUND THE ANCHOR BOLTS.
9. PAYMENT FOR PROVIDING AND INSTALLING PVC WATERSTOP SHALL BE INCIDENTAL TO ITEM 501.34, "CONCRETE HIGH PERFORMANCE, CLASS B".

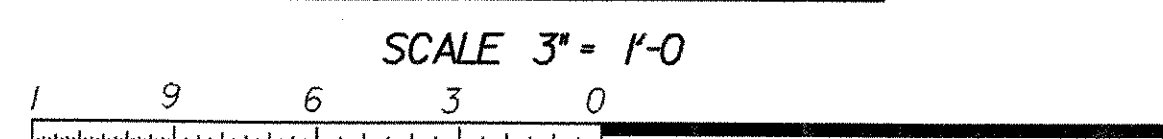
KEY	DATE	BY	REVISION
⚠	06/11/2007	VAOT	ADDENDUM NO. I



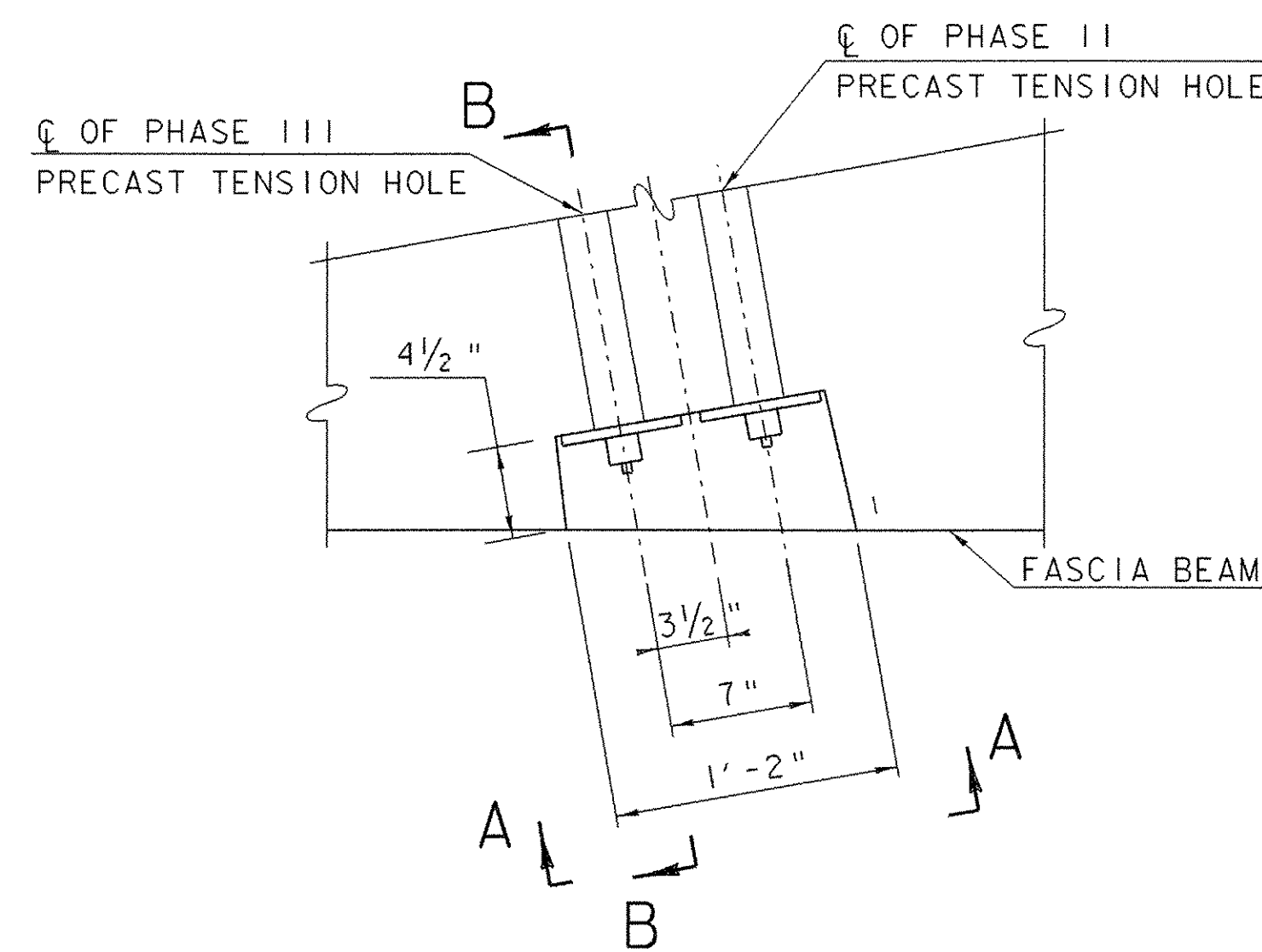
SECTION A-A



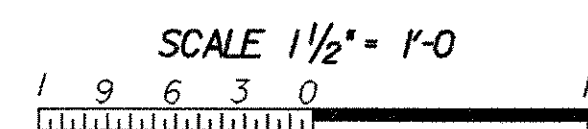
SECTION B-B



NOTES:
1/2" x 6" x 6" PLATES SHALL BE PERPENDICULAR TO THE LONGITUDINAL AXIS OF THE TENDON IN ALL PLANES.

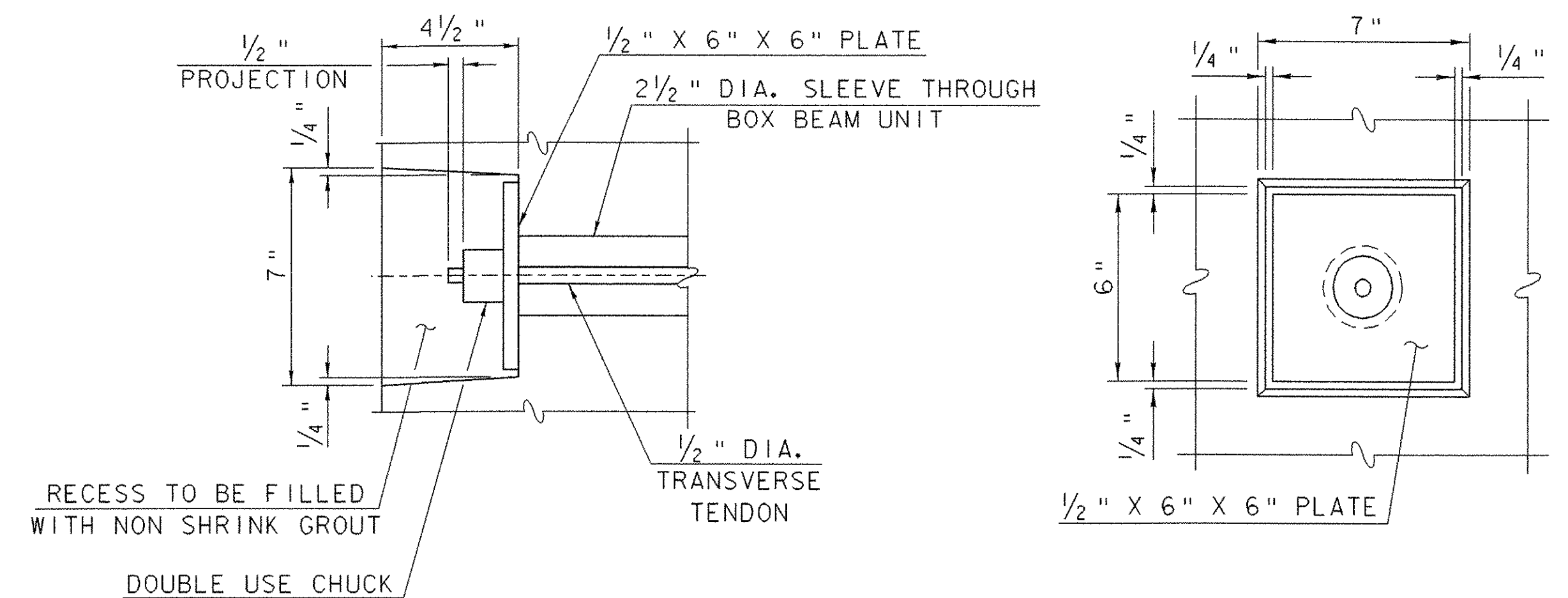


PHASE CONSTRUCTION TRANSVERSE TENDON RECESS

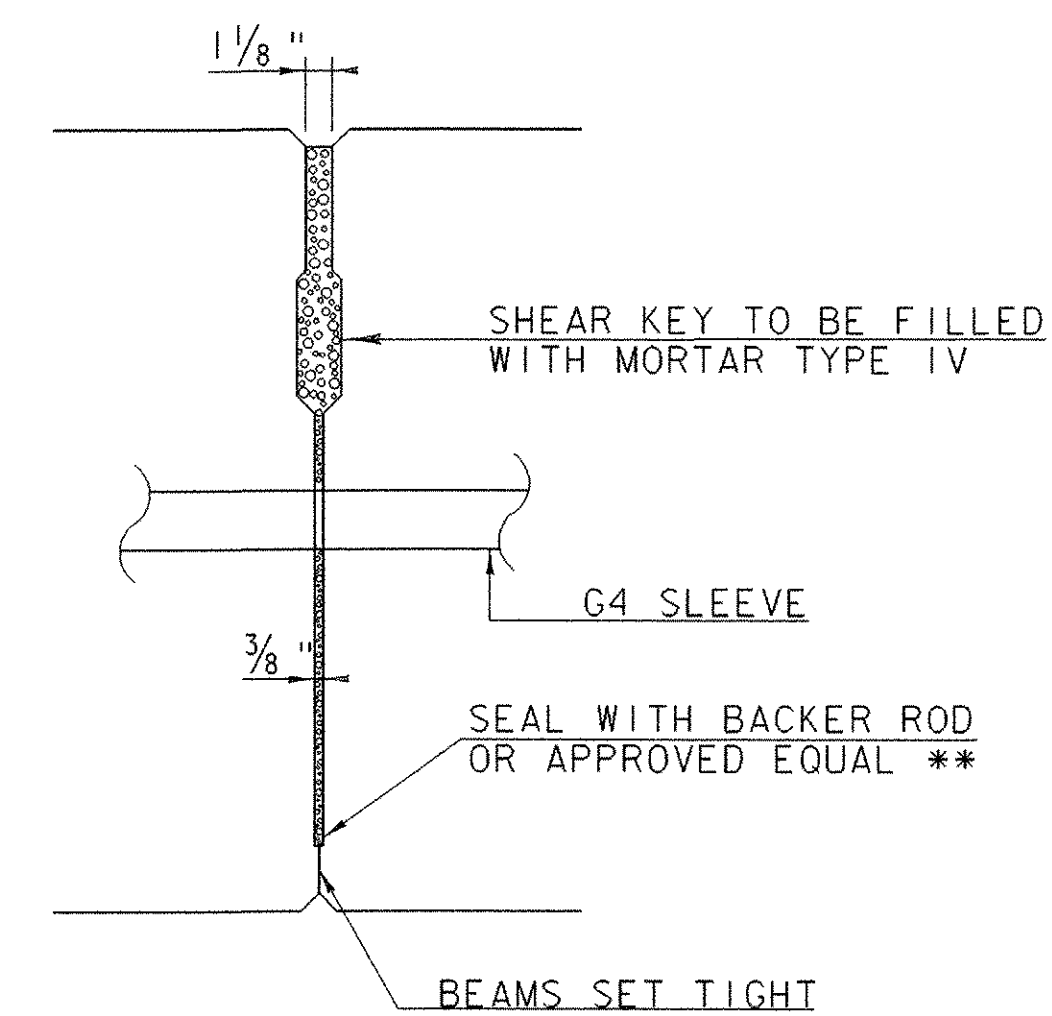
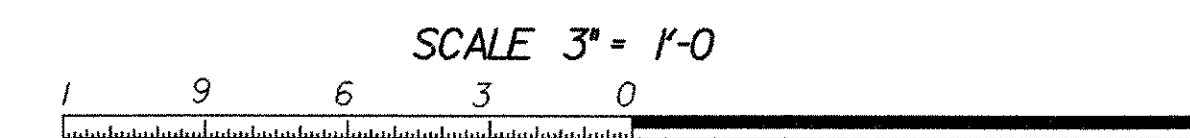


NOTES

1. TRANSVERSE TIES SHALL BE COVERED BY SEAMLESS POLYPROPYLENE SHEATH (WITH CORROSION INHIBITOR GREASE BETWEEN SHEATH AND STRAND) FOR THE LENGTH OF STRAND, EXCEPT AT ANCHORAGE LOCATIONS. TIES SHALL BE TENSIONED TO 30000#.
2. THE 1/2" PLATE SHALL CONFORM TO AASHTO M270 GRADE 50. THE PLATE AND CHUCK SHALL BE GALVANIZED ACCORDING TO AASHTO M111.

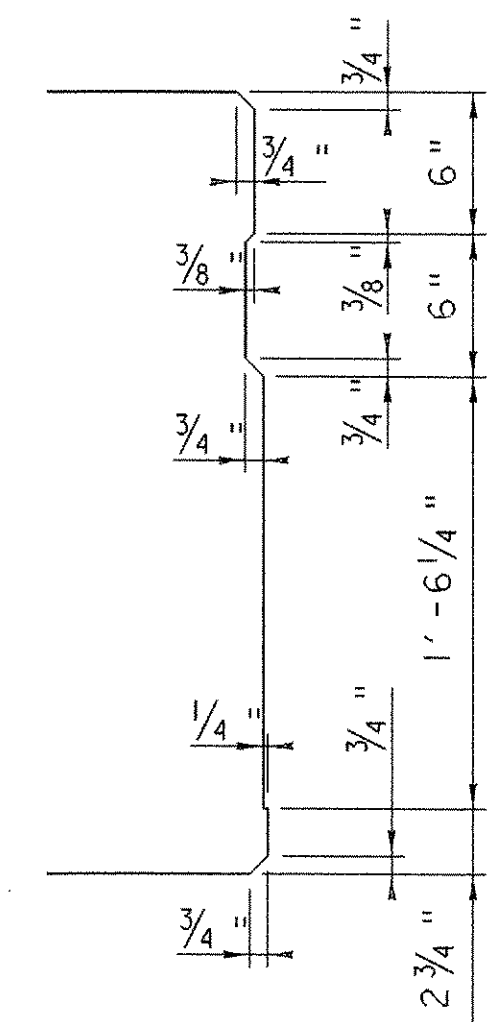
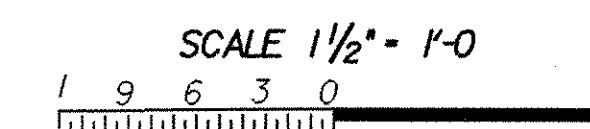


DETAIL "A"

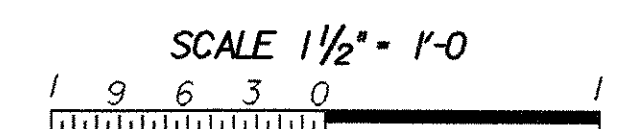


SHEAR KEY SECTION FOR BOX BEAMS

**NOTE: INSTALL AFTER UNITS HAVE BEEN PLACED

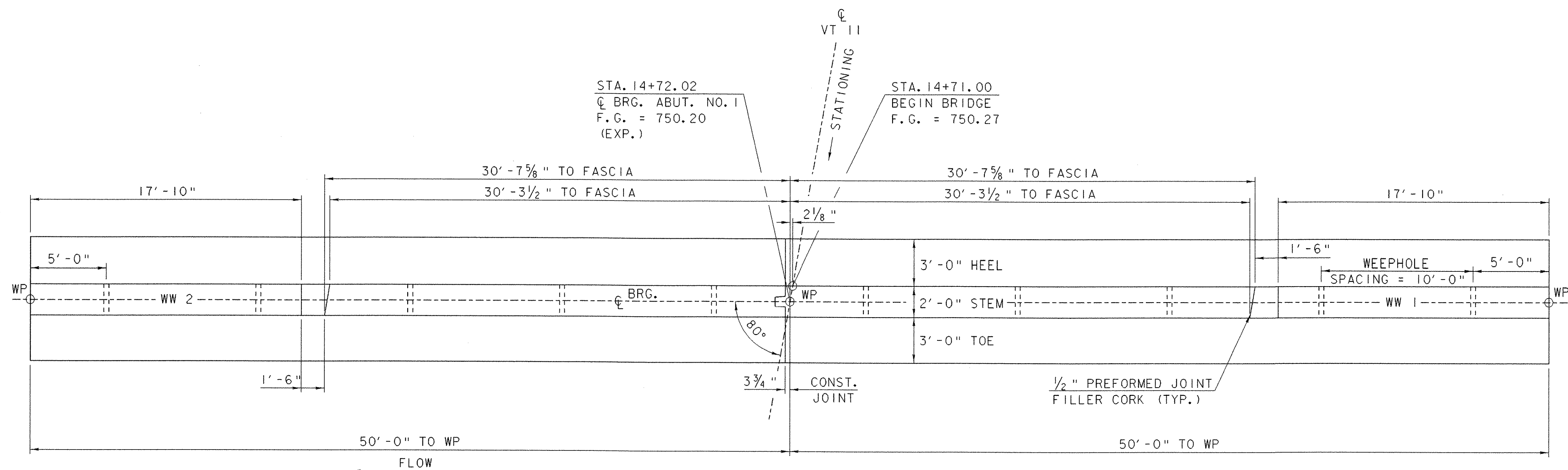


SHEAR KEY DETAIL FOR BOX BEAMS



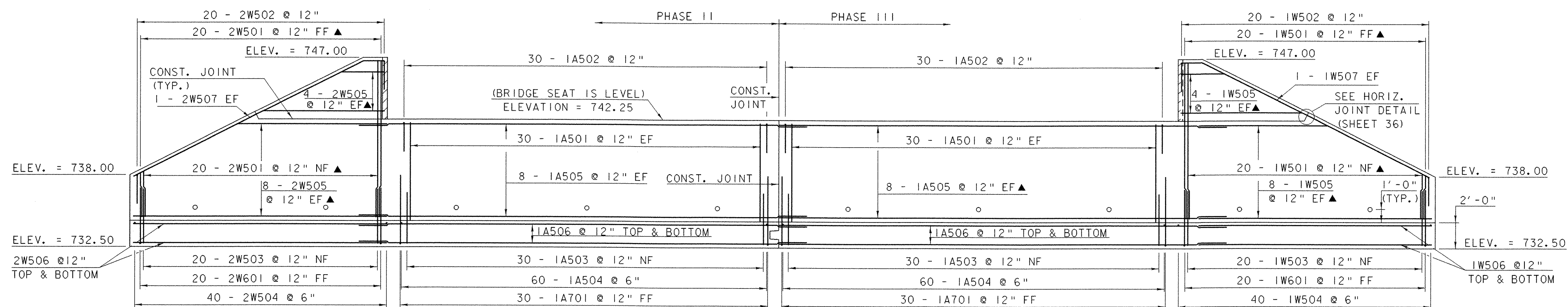
TRANSVERSE TENDON AND SHEAR KEY DETAILS

PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV(5)	DRAWN BY:	D. PETERSON
FILE NAME:	/04cl78/str/s04cl78fp.dgn	CHECKED BY:	W. LAMMER
DESIGNED BY:	D. PETERSON	SHEET	33 OF 52



ABUTMENT NO. 1 PLAN

SCALE: 1/4" = 1'-0"



ABUTMENT NO. 1 ELEVATION

SCALE: 1/4" = 1'-0"

NOTES:

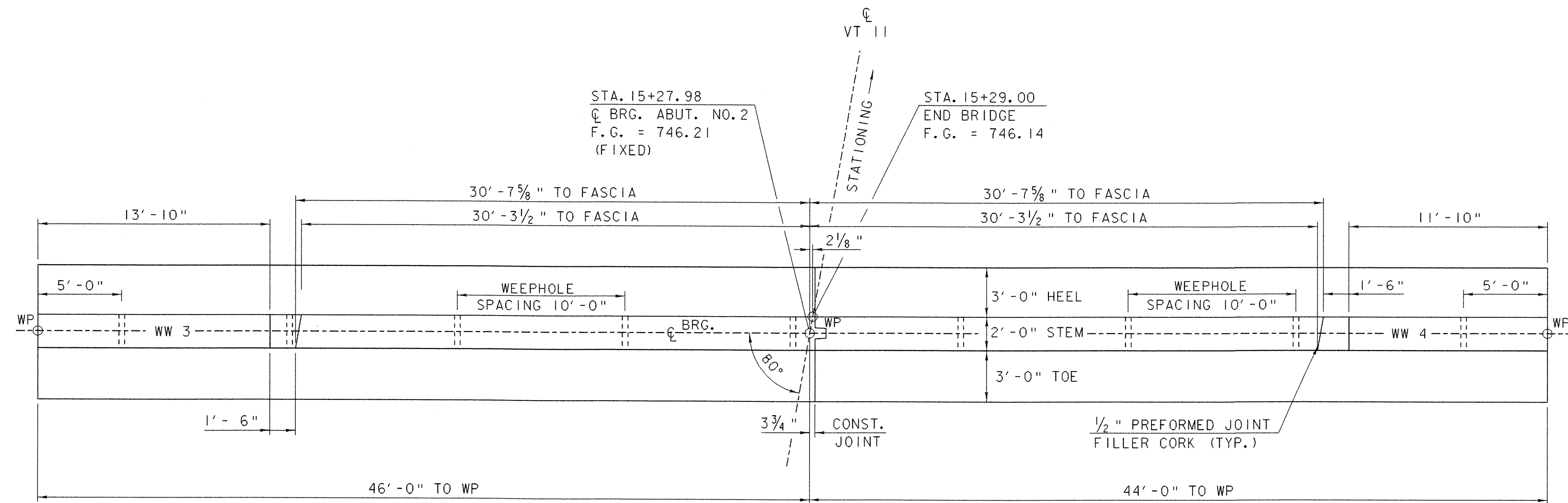
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR UNLESS OTHERWISE SPECIFIED
2'-2" MIN. LAP UNLESS OTHERWISE SPECIFIED

ABUTMENT NO. 1 DETAILS

PROJECT NAME: SPRINGFIELD
PROJECT NUMBER: ST CULV (5)

FILE NAME: /04cl78/str/s04cl78ab.dgn
PROJECT MANAGER: R.R. WHITCOMB
DESIGNED BY: D. PETERSON

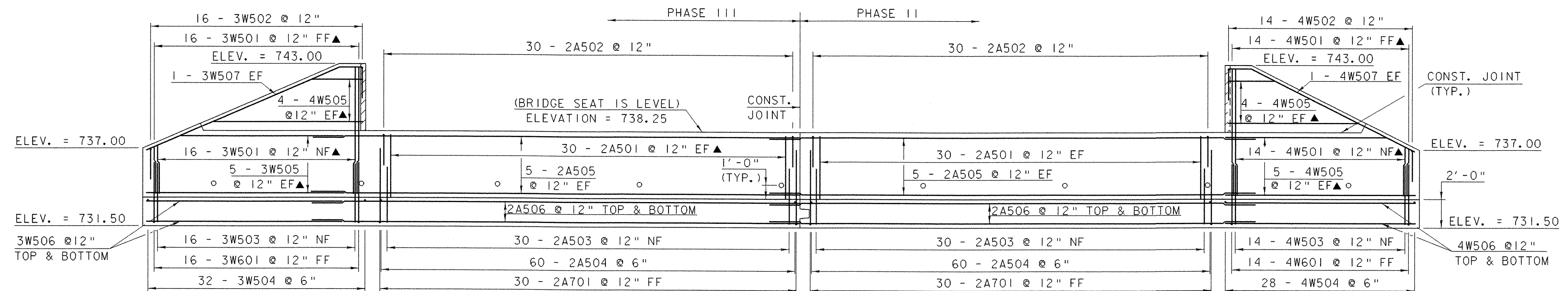
PLOT DATE: 21-MAY-2007
DRAWN BY: D. PETERSON
CHECKED BY: W. LAMMER
SHEET 34 OF 52



ABUTMENT NO. 2 PLAN

SCALE: 1/4" = 1'-0"

FLOW →



ABUTMENT NO. 2 ELEVATION

SCALE: 1/4" = 1'-0"

NOTES:

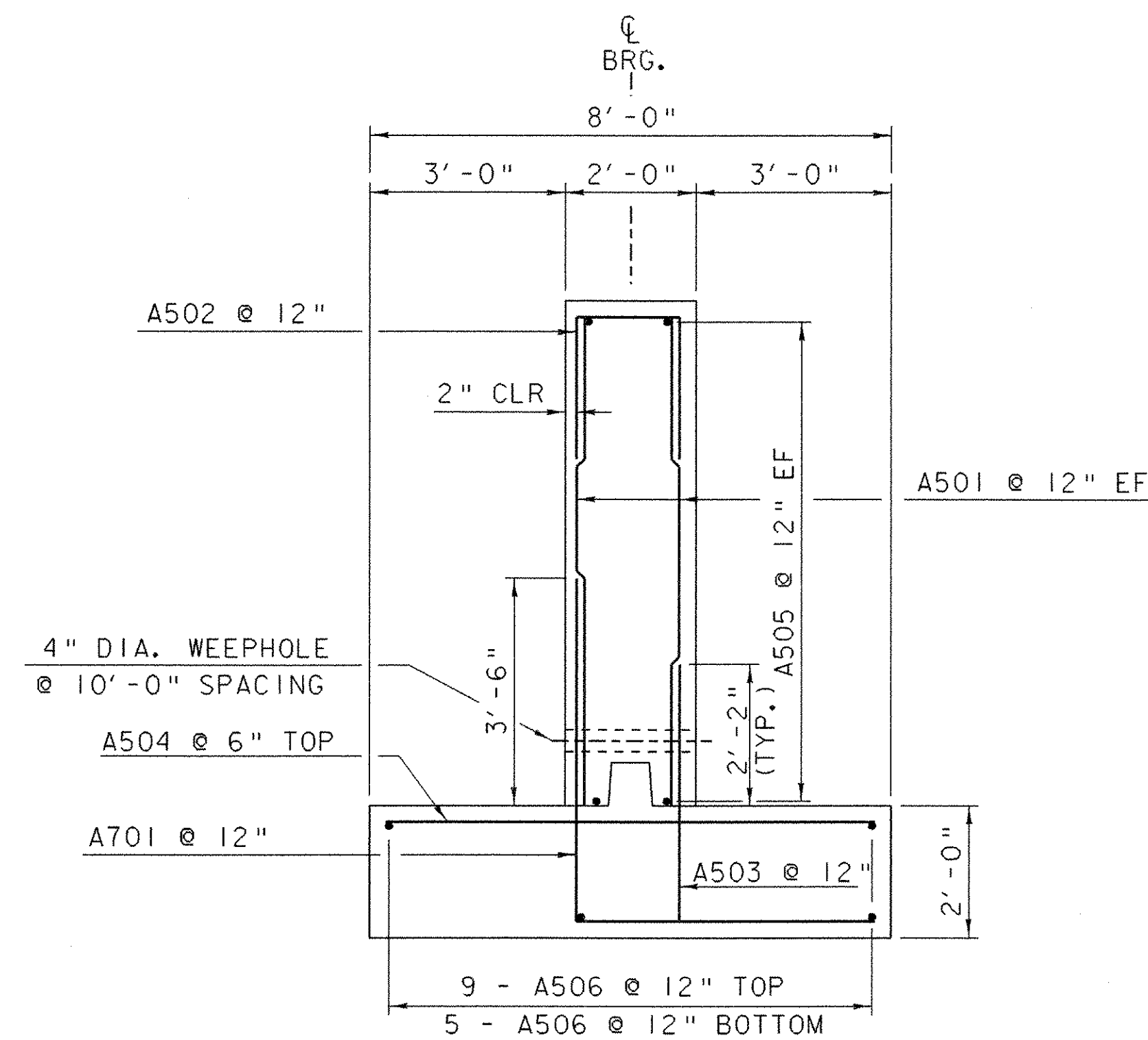
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR UNLESS OTHERWISE SPECIFIED
2'-2" MIN. LAP UNLESS OTHERWISE SPECIFIED

ABUTMENT NO. 2 DETAILS

PROJECT NAME: SPRINGFIELD
PROJECT NUMBER: ST CULV (5)

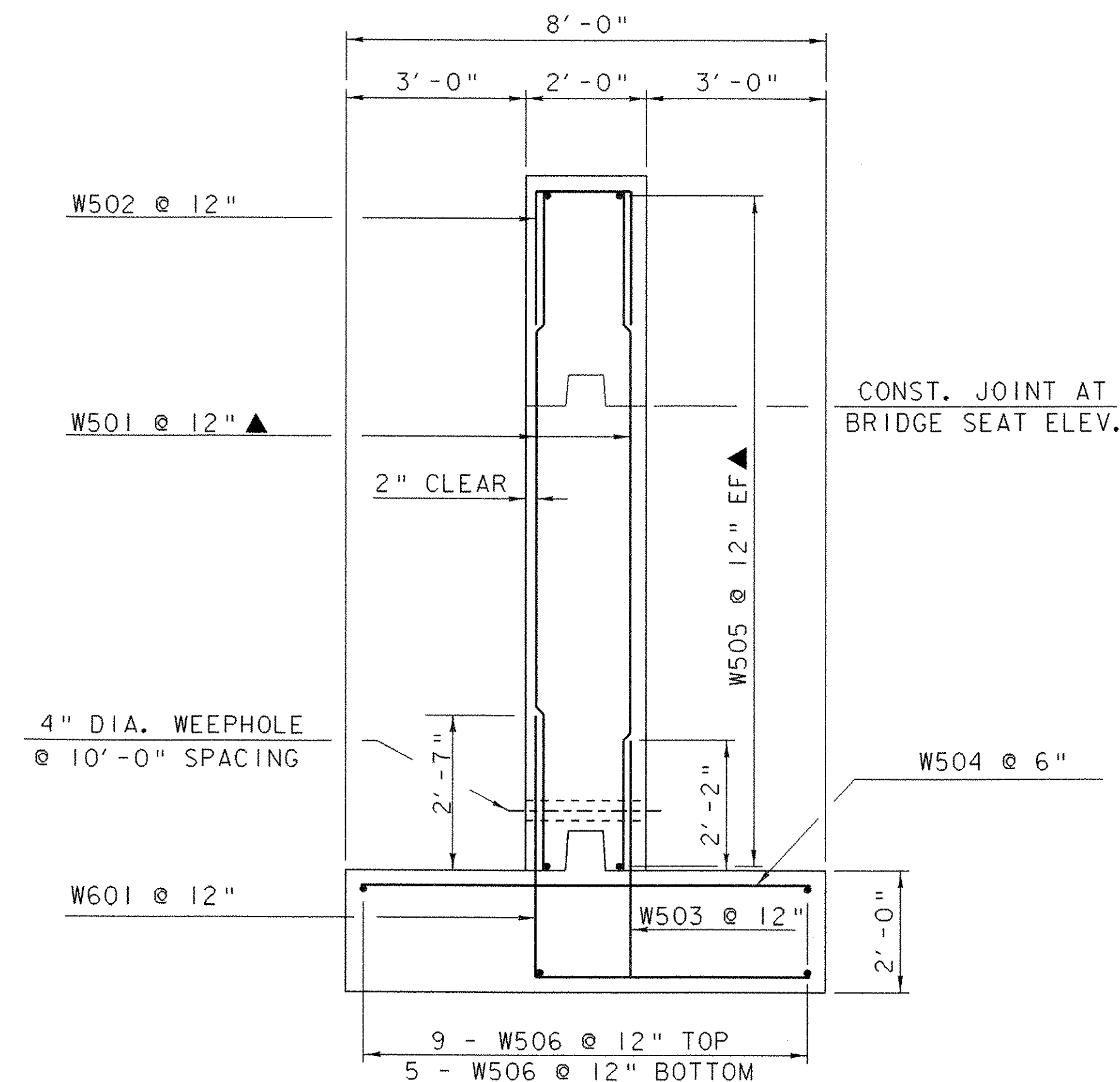
FILE NAME: /04cl78/str/s04cl78ab.dgn
PROJECT MANAGER: R.R. WHITCOMB
DESIGNED BY: D. PETERSON

PLOT DATE: 21-MAY-2007
DRAWN BY: D. PETERSON
CHECKED BY: W. LAMMER
SHEET 35 OF 52



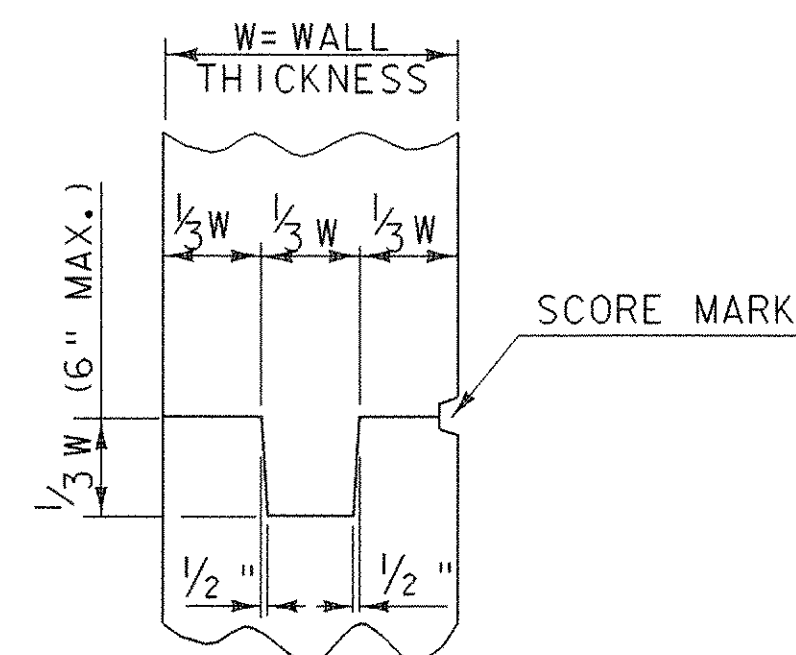
ABUTMENT TYPICAL

SCALE: 1/2" = 1'-0"

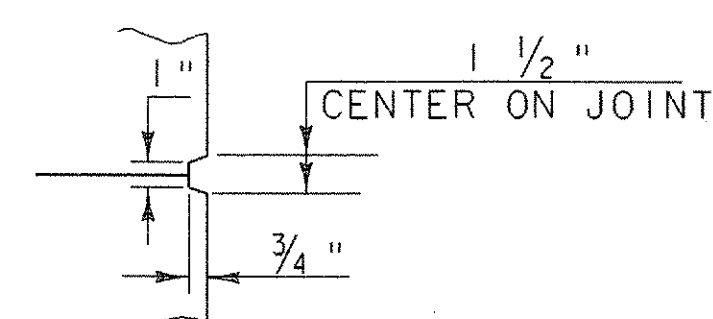


WINGWALL TYPICAL

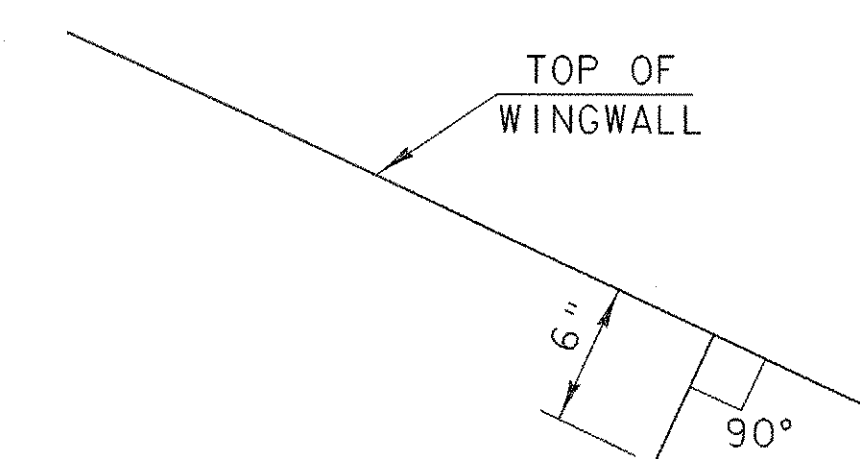
SCALE: 1/2" = 1'-0"



TYPICAL CONCRETE CONSTRUCTION JOINT



SCORE MARK DETAIL



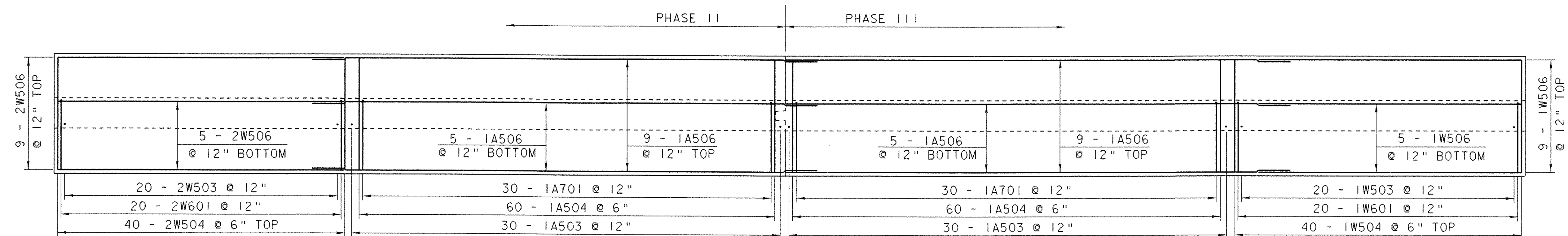
HORIZONTAL CONSTRUCTION JOINT DETAIL

NOTES:

- NF = NEAR FACE
- FF = FAR FACE
- EF = EACH FACE
- ▲ = CUT TO FIT IN FIELD
- 3" CLEAR UNLESS OTHERWISE SPECIFIED
- 2'-2" MIN. LAP UNLESS OTHERWISE SPECIFIED

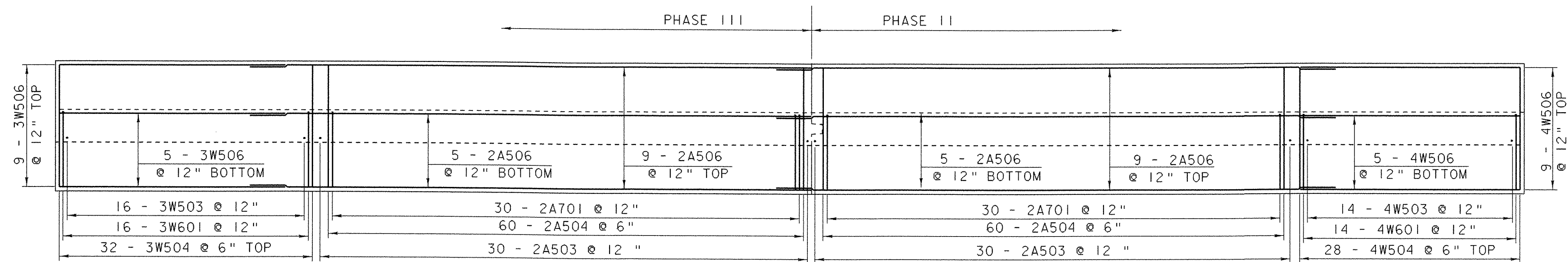
ABUTMENT AND WINGWALL TYPICAL SECTIONS

PROJECT NAME: SPRINGFIELD	FILE NAME: /04cl78/str/s04cl78ab.dgn	PLOT DATE: 21-MAY-2007
PROJECT NUMBER: ST CULV (5)	PROJECT MANAGER: R. R. WHITCOMB	DRAWN BY: D. PETERSON
	DESIGNED BY: D. PETERSON	CHECKED BY: W. LAMMER
		SHEET 36 OF 52



ABUTMENT NO. 1 FOOTING REINFORCING PLAN

SCALE: $\frac{1}{4}" = 1'-0"$



ABUTMENT NO. 2 FOOTING REINFORCING PLAN

SCALE: $\frac{1}{4}" = 1'-0"$

NOTES:

NF = NEAR FACE
 FF = FAR FACE
 EF = EACH FACE
 ▲ = CUT TO FIT IN FIELD
 3" CLEAR UNLESS OTHERWISE SPECIFIED
 2'-2" MIN. LAP UNLESS OTHERWISE SPECIFIED

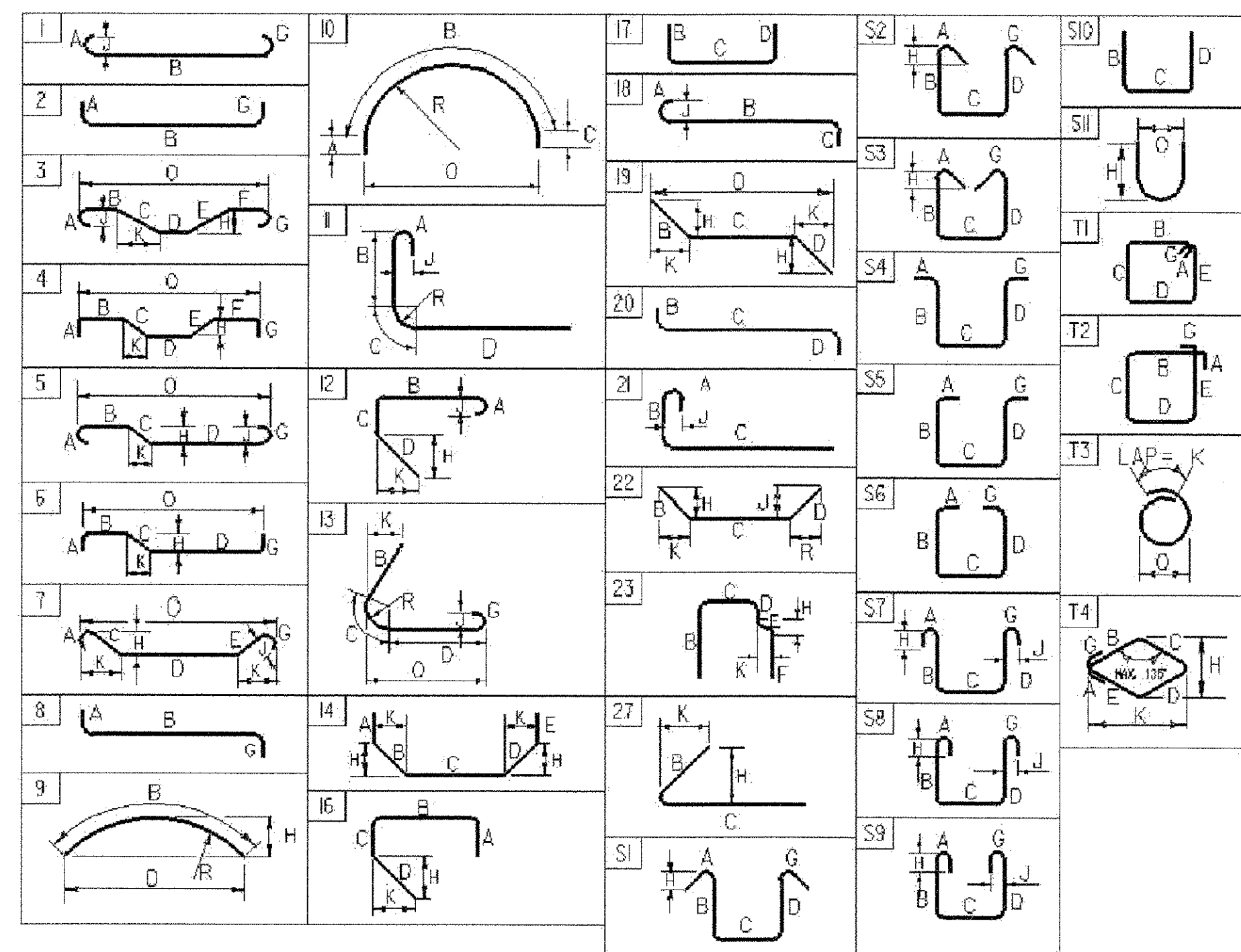
FOOTING REINFORCING PLAN

PROJECT NAME: SPRINGFIELD	PLOT DATE: 21-MAY-2007
PROJECT NUMBER: ST CULV (5)	DRAWN BY: D. PETERSON
FILE NAME: /04cl78/str/s04cl78ab.dgn	CHECKED BY: W. LAMMER
DESIGNED BY: D. PETERSON	SHEET 37 OF 52

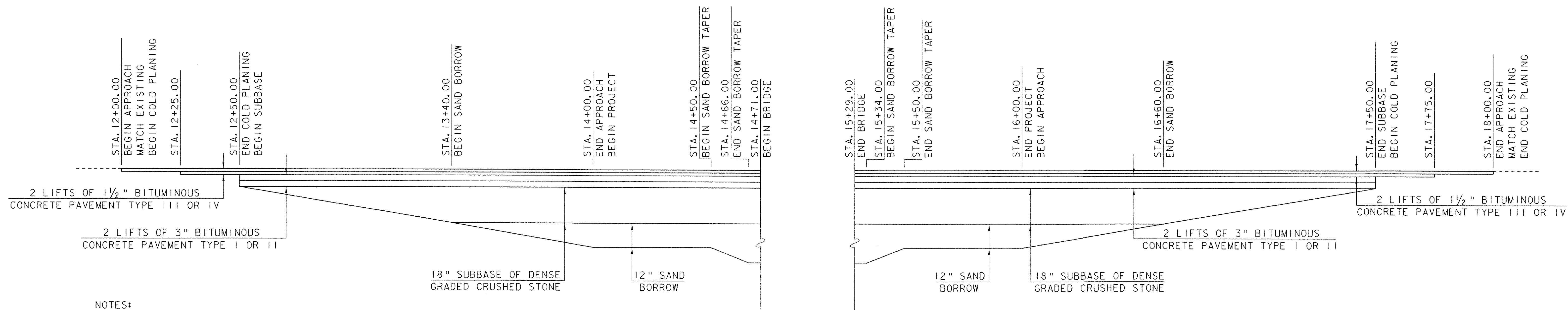
REINFORCING STEEL SCHEDULE

~ NOTES ~

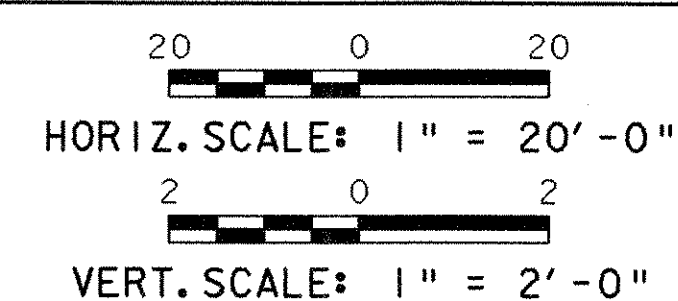
1. UNLESS OTHERWISE DESIGNATED, ALL BAR REINFORCEMENT FOR CONCRETE IN SIZES UP TO AND INCLUDING NO. 18 SHALL CONFORM TO THE REQUIREMENTS OF THE "SPECIFICATIONS FOR DEFORMED BILLET-STEEL BARS FOR CONCRETE REINFORCEMENT", AASHTO M 31 (ASTM A 615-S1). ALL BARS SHALL BE GRADE 60, UNLESS OTHERWISE DESIGNATED.
2. FOR TYPICAL BENDING DETAILS, RECOMMENDED PIN DIAMETER "D" OF BENDS AND HOOKS, AND OTHER STANDARD PRACTICE, SEE CURRENT CONCRETE REINFORCING STEEL INSTITUTE "MANUAL OF STANDARD PRACTICE".
3. BARS WHICH REQUIRE MORE ACCURATE BENDING THAN STANDARD PRACTICES SHOULD HAVE LIMITS INDICATED.
4. ALL DIMENSIONS ARE OUT TO OUT OF BAR EXCEPT "A" AND "G" ON STANDARD 180 DEGREE AND 135 DEGREE HOOKS.
5. "J" DIMENSION ON 180 DEGREE HOOKS TO BE SHOWN ONLY WHERE NECESSARY TO RESTRICT HOOK SIZE. OTHERWISE, STANDARD HOOKS ARE TO BE USED.
6. "H" DIMENSION ON STIRRUPS TO BE SHOWN ONLY WHEN NECESSARY TO MAINTAIN CLEARANCES.
7. WHERE SLOPE DIFFERS FROM 45 DEGREES, DIMENSIONS "H" AND "K" MUST BE SHOWN.
8. ▲ DENOTES BARS TO BE CUT IN FIELD.
9. * DENOTES ONE EXTRA BAR ADDED FOR TESTING PURPOSES.
10. △ DENOTES TWO EXTRA BARS ADDED FOR TESTING PURPOSES.
11. E IN BAR MARK PREFIX DENOTES EPOXY COATED REINFORCING STEEL.



PROJECT NAME: SPRINGFIELD	
PROJECT NUMBER: ST CULV (5)	
FILE NAME: I04c178\Structures\I04c178rss.xls	PLOT DATE: 4/23/2007
PROJECT MANAGER: R. R. Whitcomb	DRAWN BY: D. Peterson
DESIGNED BY: D. Peterson	CHECKED BY: W. Lammer
REINFORCING STEEL SCHEDULE SHEET #1	SHEET 38 OF 52

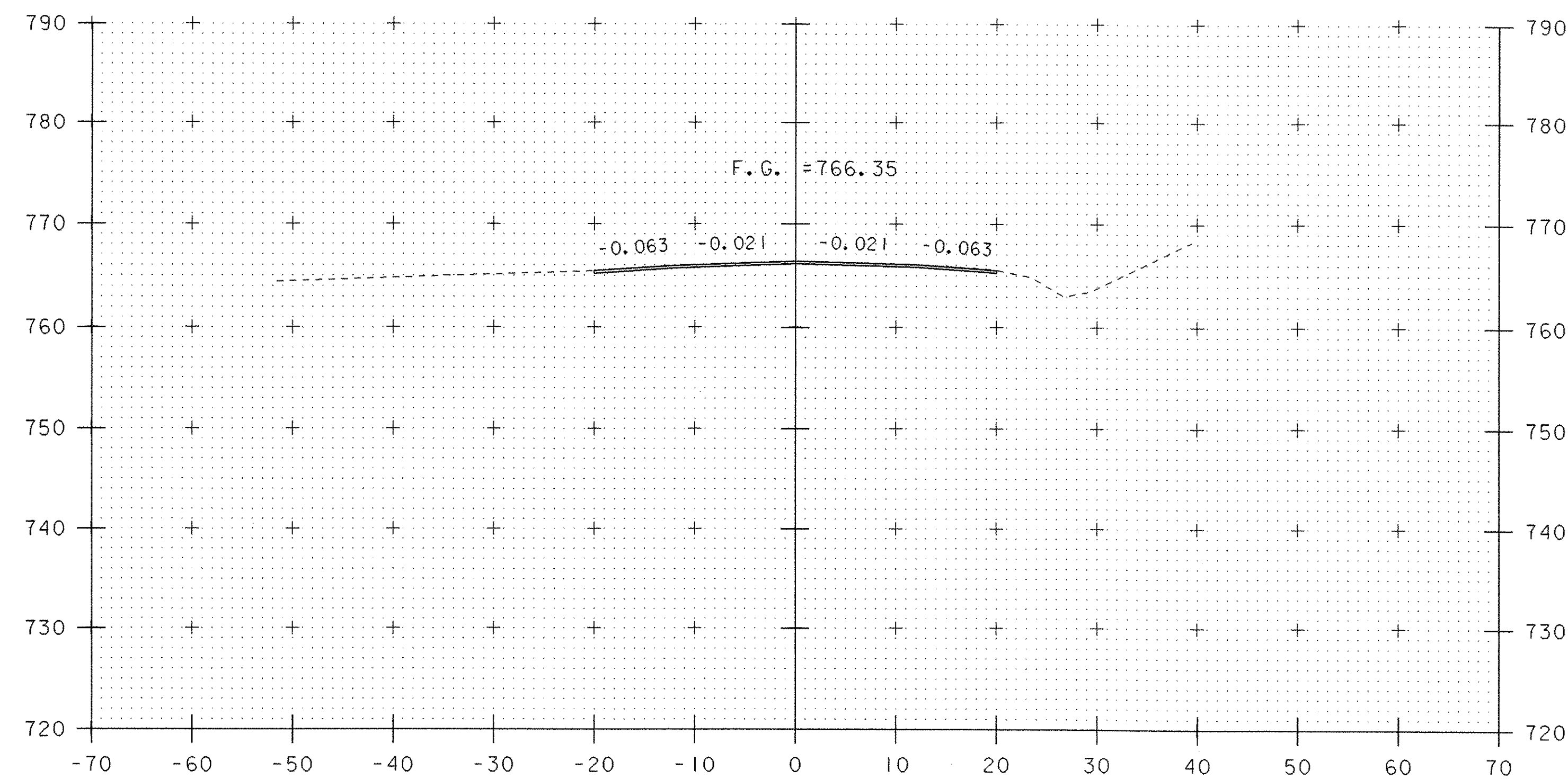


MATERIAL TRANSITION DETAIL

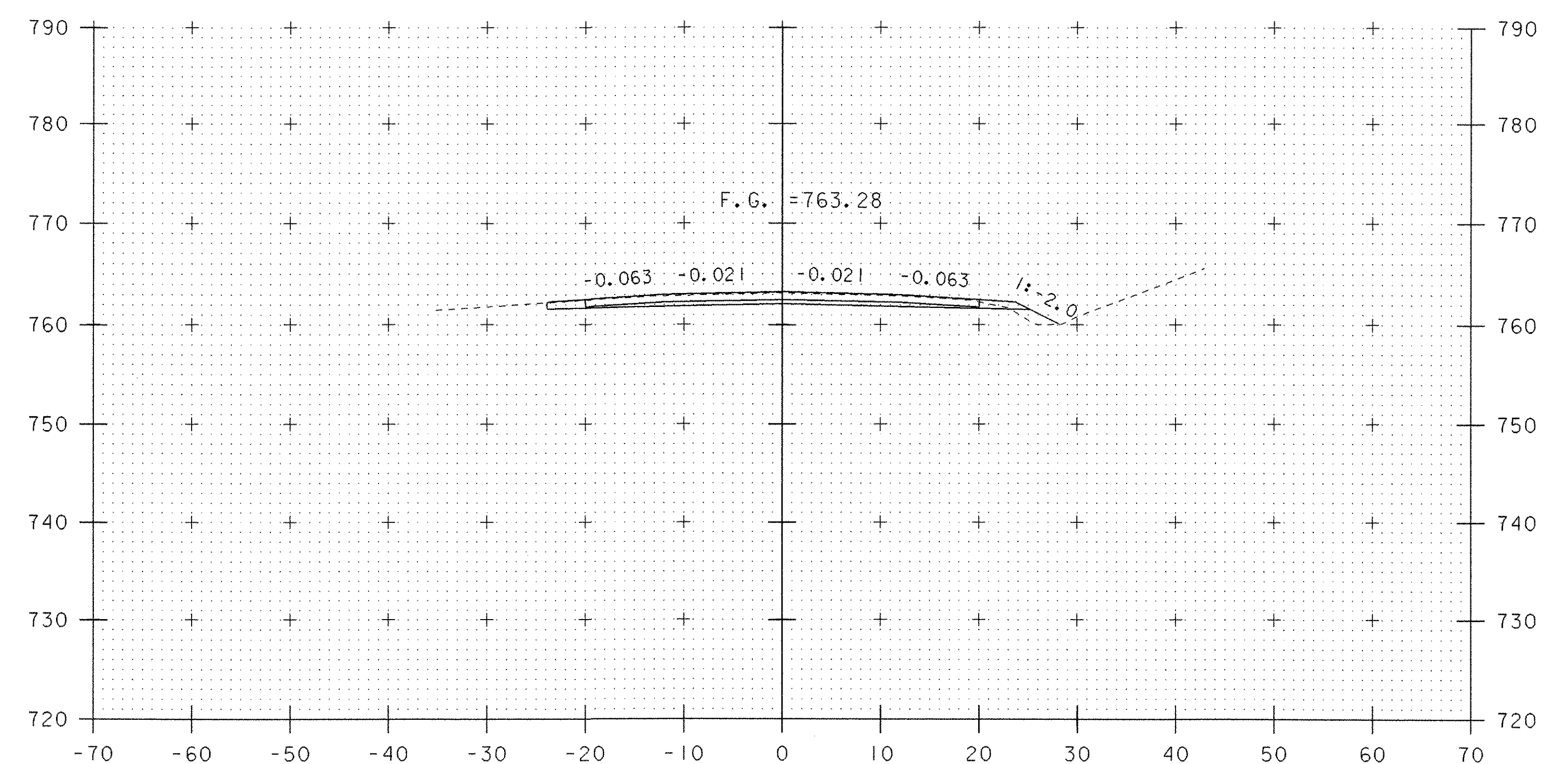


MATERIAL TRANSITION DETAIL

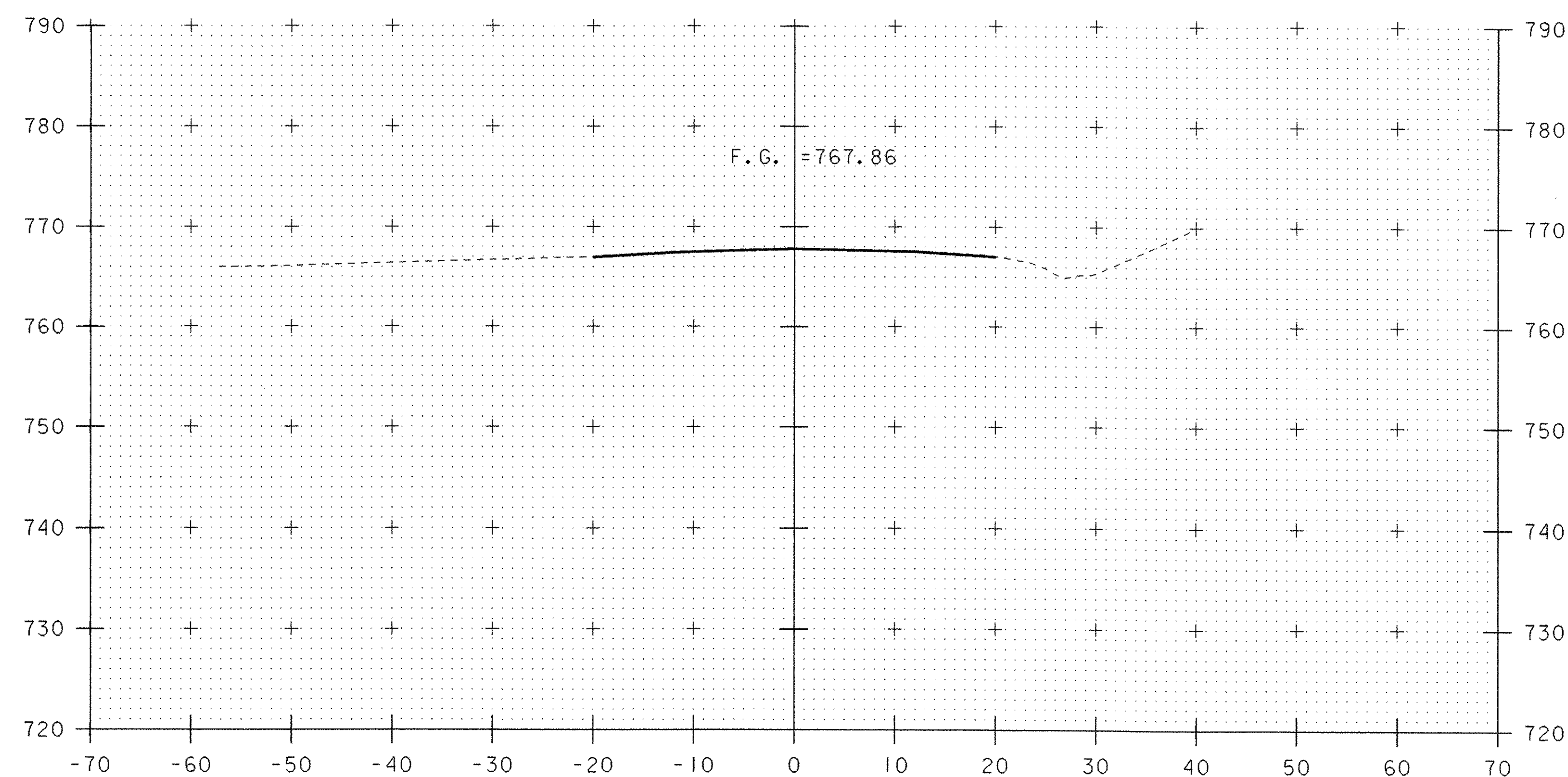
PROJECT NAME:	SPRINGFIELD
PROJECT NUMBER:	ST CULV (5)
FILE NAME: 04cl78\Structures\s04cl78xsl.dgn	PLOT DATE: 21-MAY-2007
PROJECT MANAGER: R.R. WHITCOMB	DRAWN BY: G. ROY
DESIGNED BY: J. PERRIGO	CHECKED BY: D. PETERSON
s04cl78mtd.1	SHEET 39 OF 52



12+25

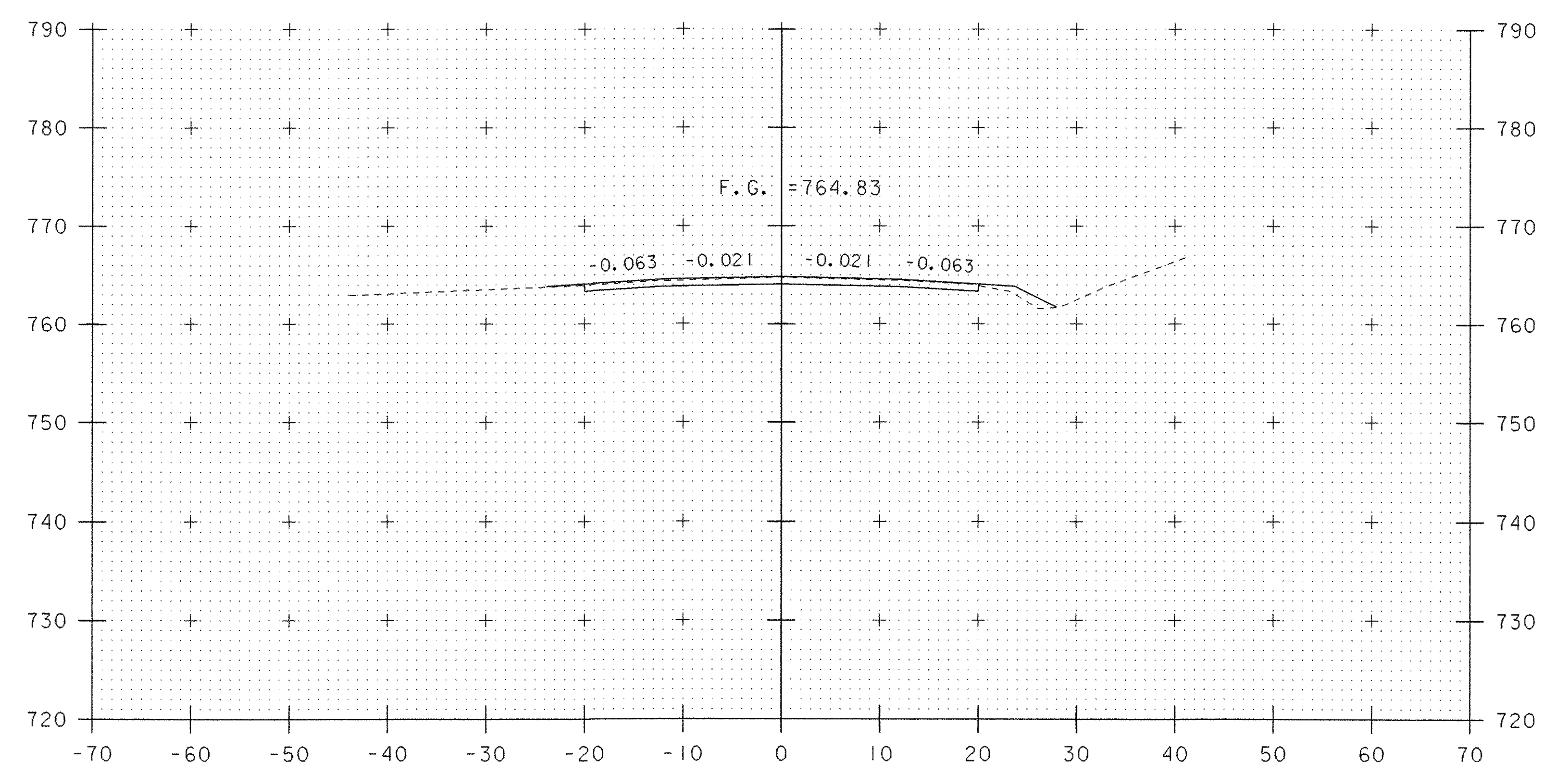


12+75



12+00

STA. 12+00.00
BEGIN APPROACH
MATCH EXISTING

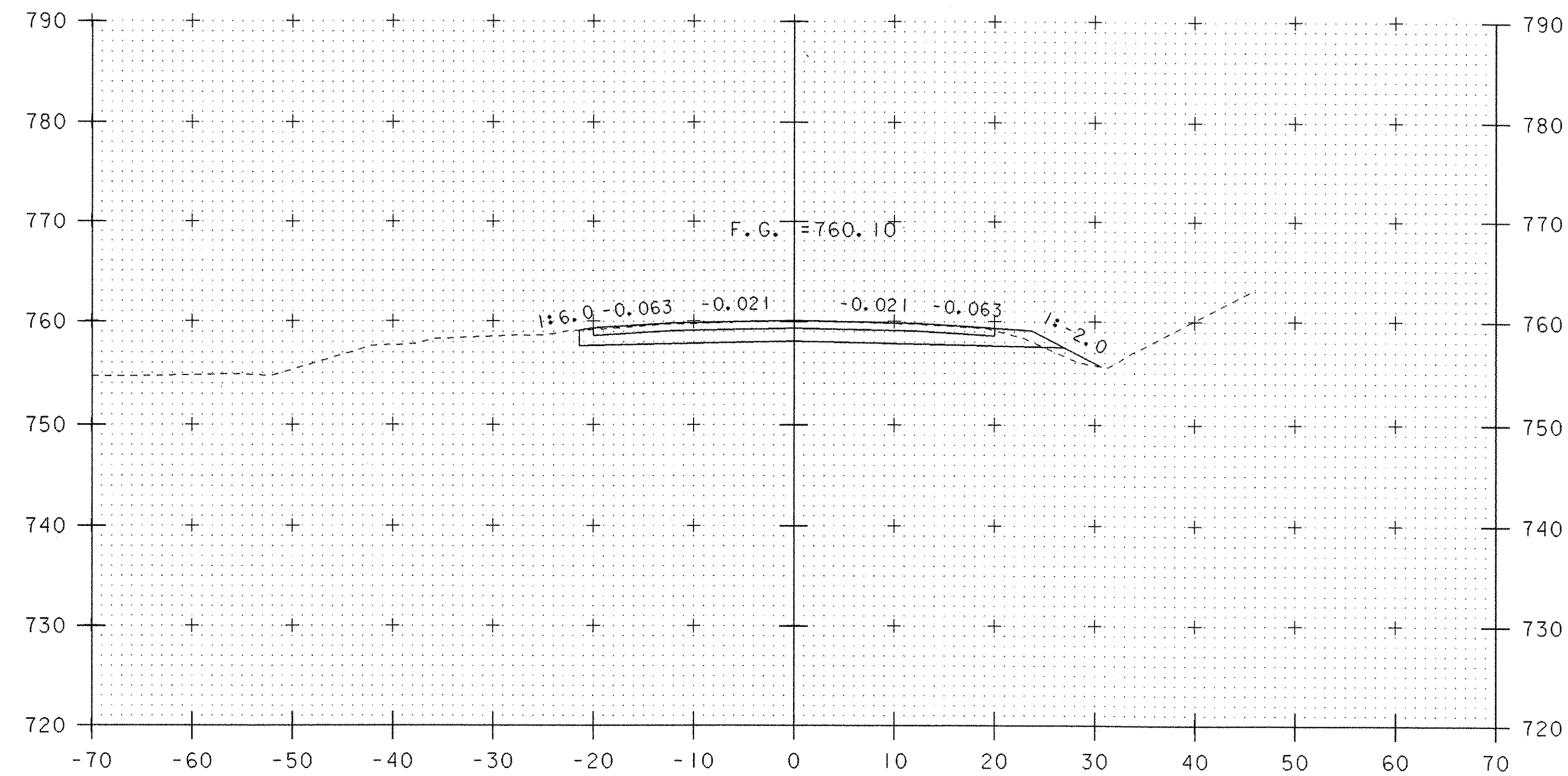


12+50

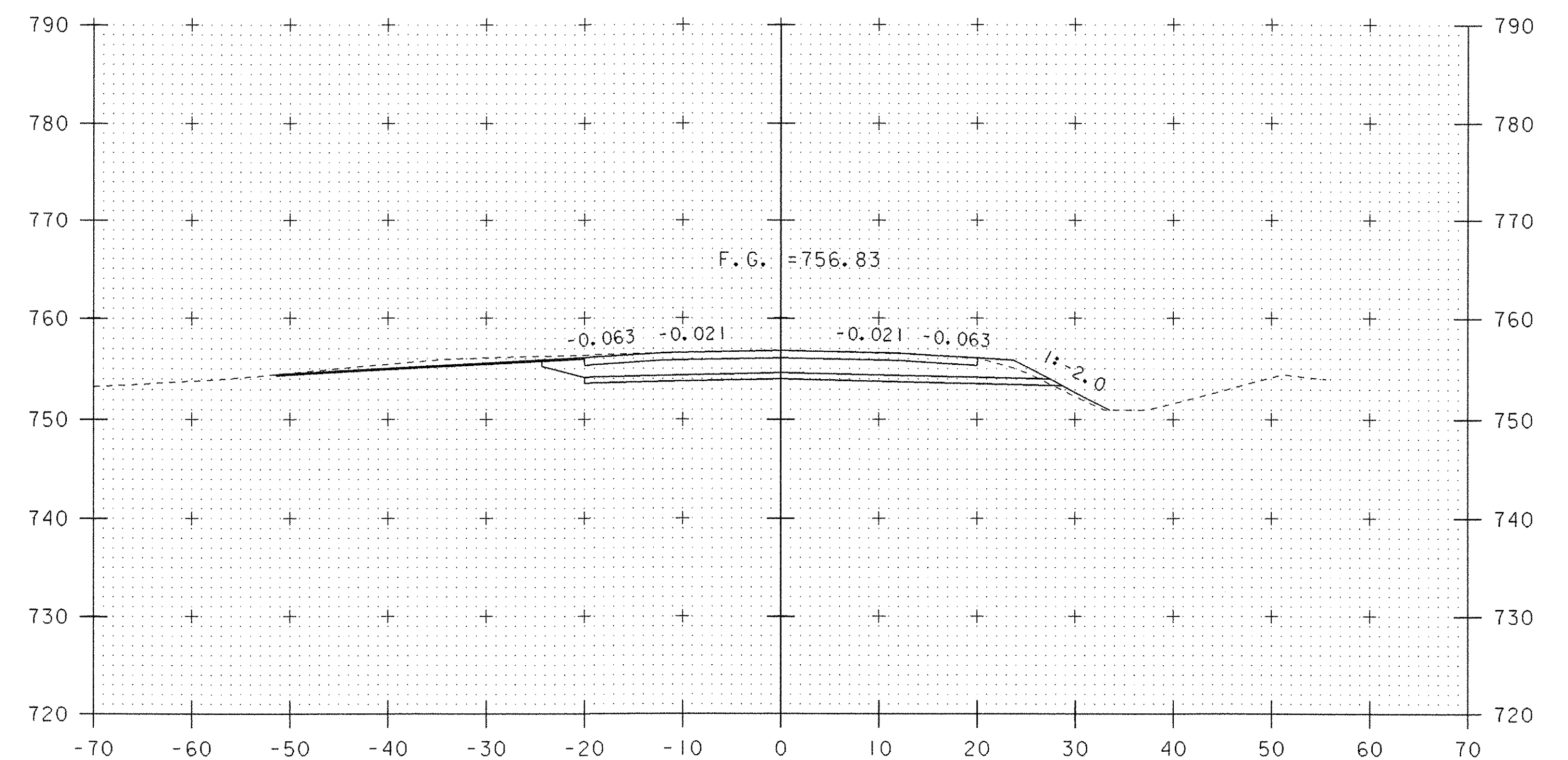
MAINLINE CROSS SECTIONS (1)

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

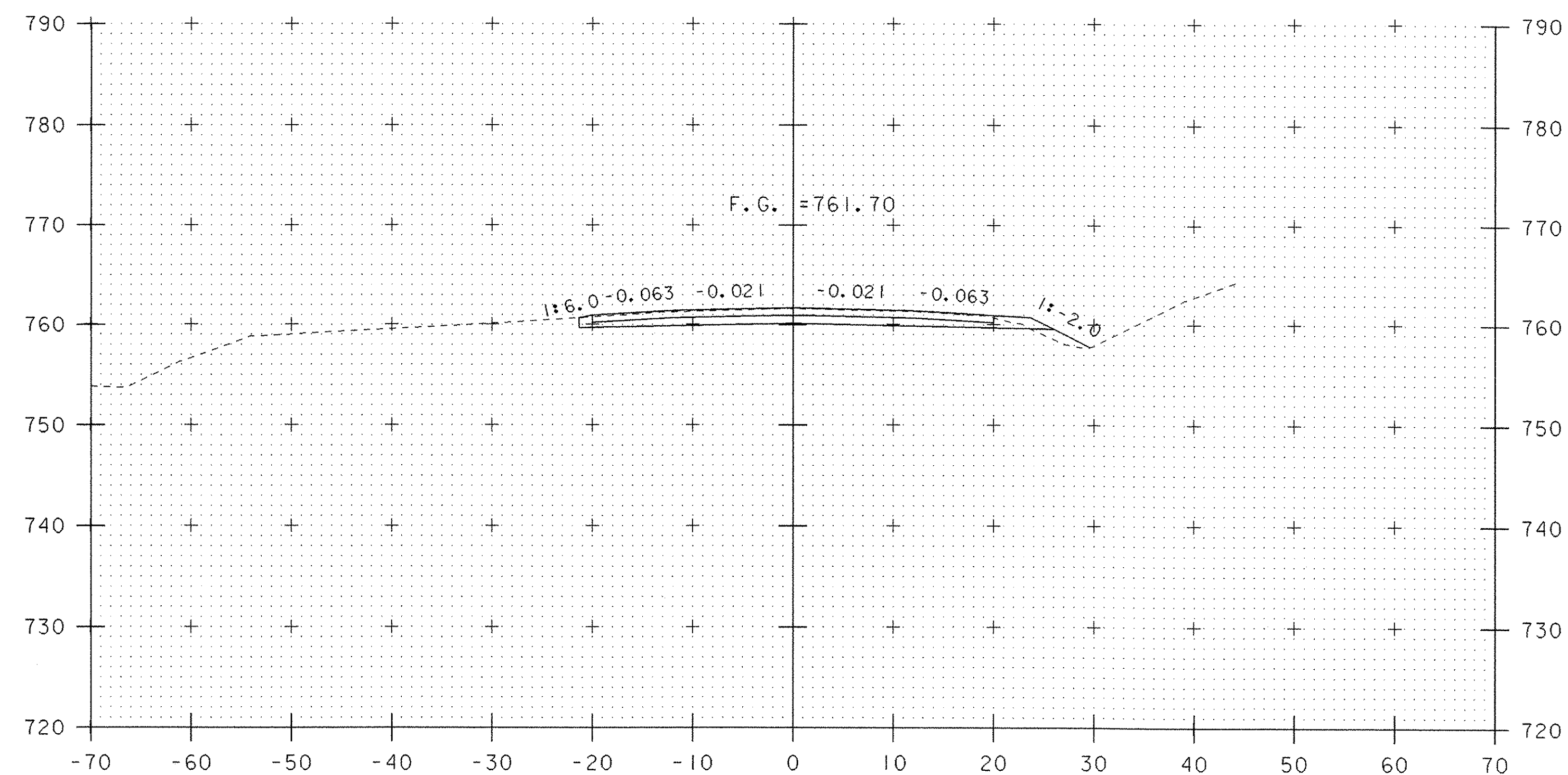
PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV (5)	DRAWN BY:	M. HALE
FILE NAME:	04c178\Structures\s04c178xs1.dgn	CHECKED BY:	D. PETERSON
PROJECT MANAGER:	R.R. WHITCOMB	SHEET	40 OF 52
DESIGNED BY:	J. PERRIGO		
s04c178m01.i			



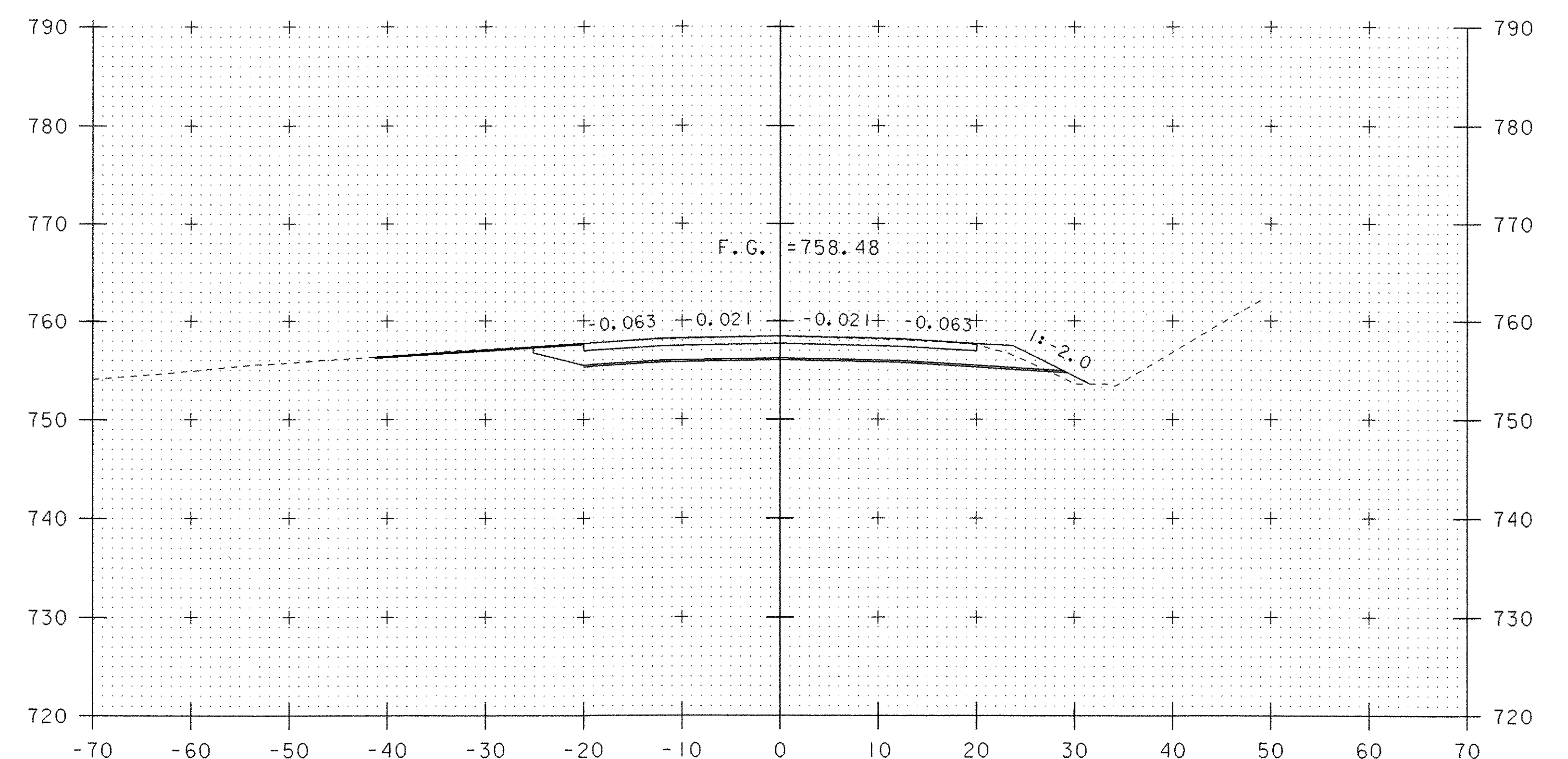
13+25



13+75



13+00

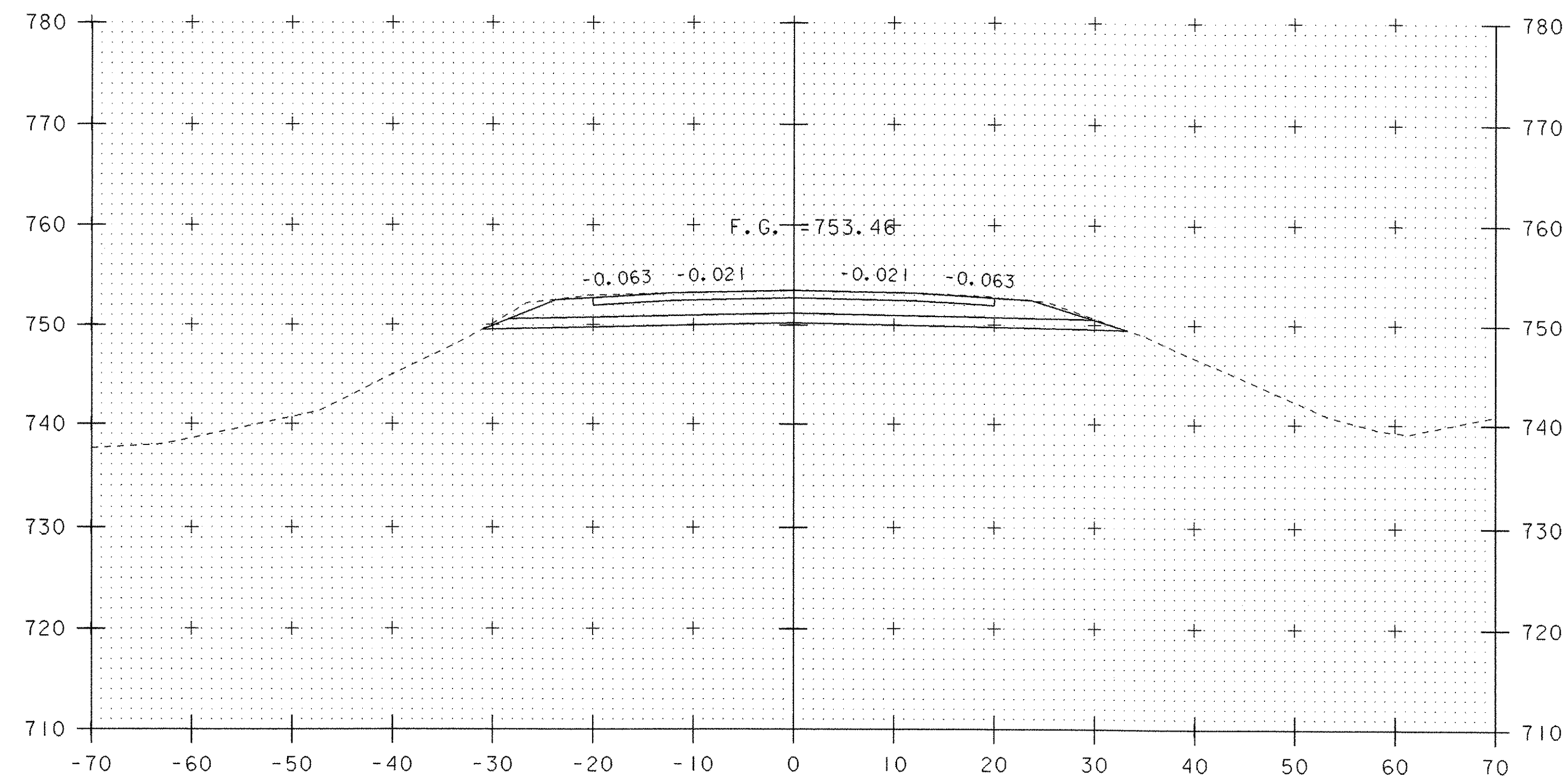


13+50

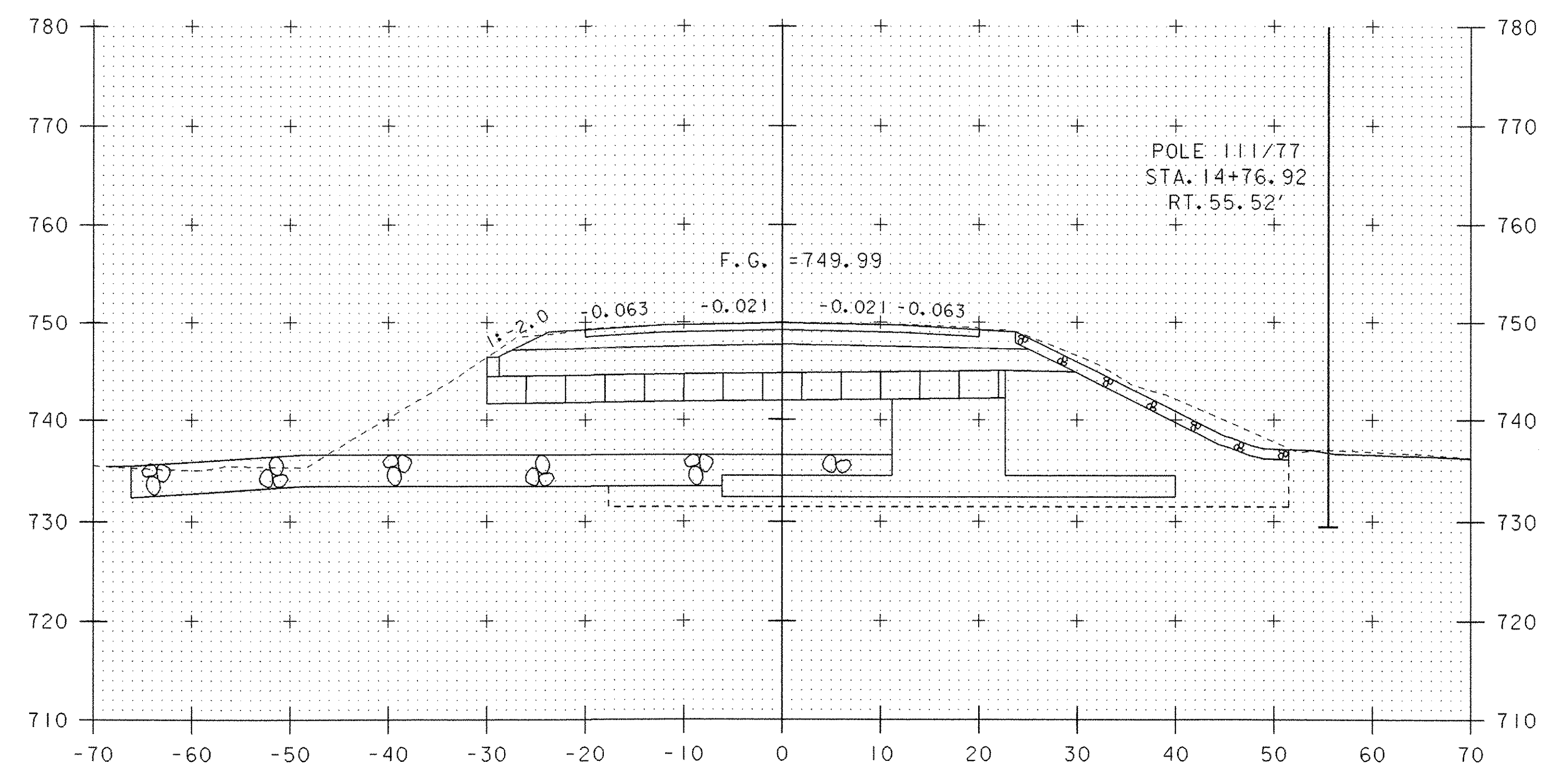
10 0 10
SCALE: 1" = 10'-0"

MAINLINE CROSS SECTIONS (2)

PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV (5)	DRAWN BY:	M. HALE
FILE NAME:	04c178\Structures\s04c178xs1.dgn	CHECKED BY:	D. PETERSON
PROJECT MANAGER:	R.R. WHITCOMB	SHEET	41 OF 52
DESIGNED BY:	J. PERRIGO		
s04c178m02.i			

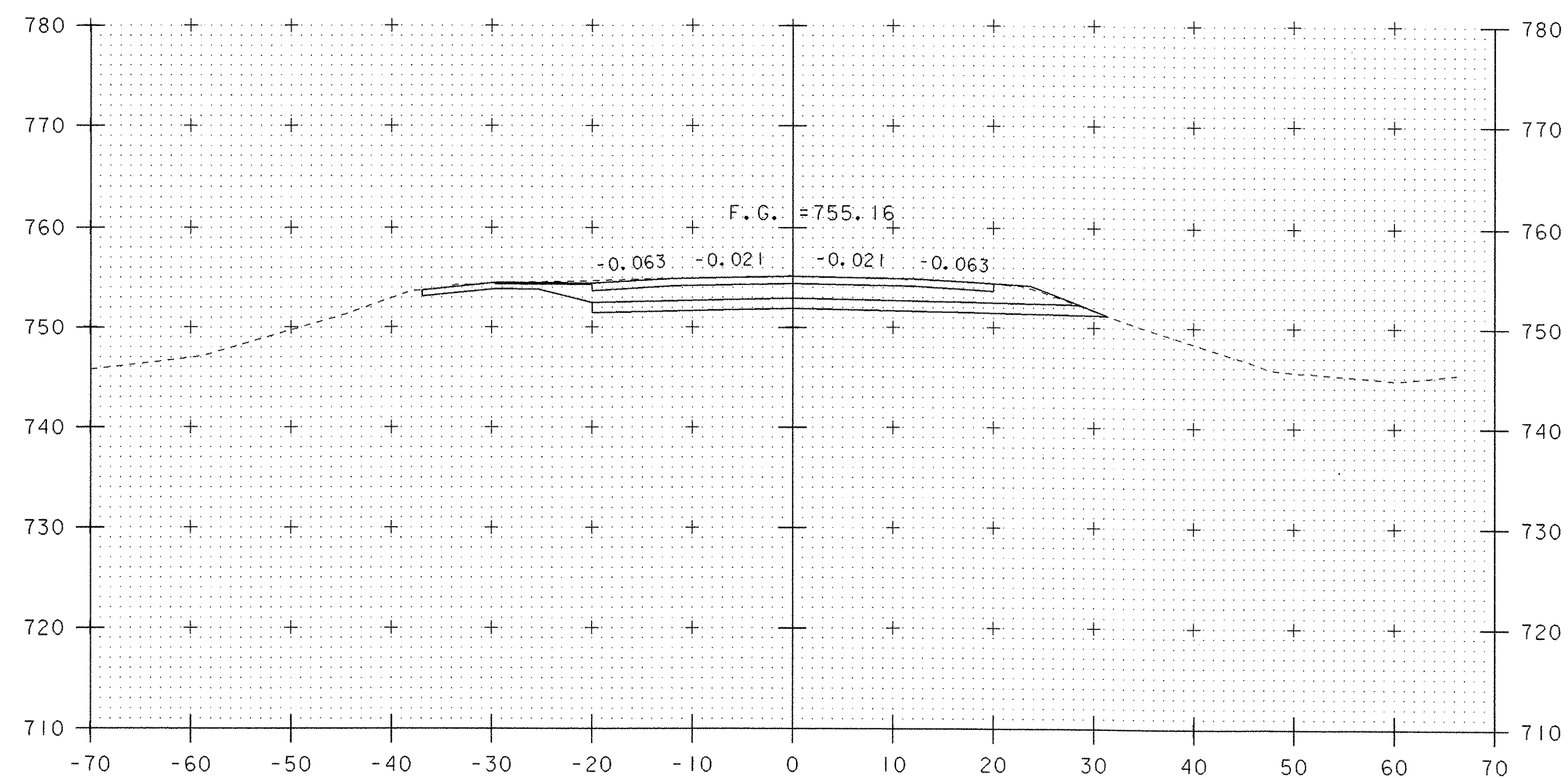


14+25



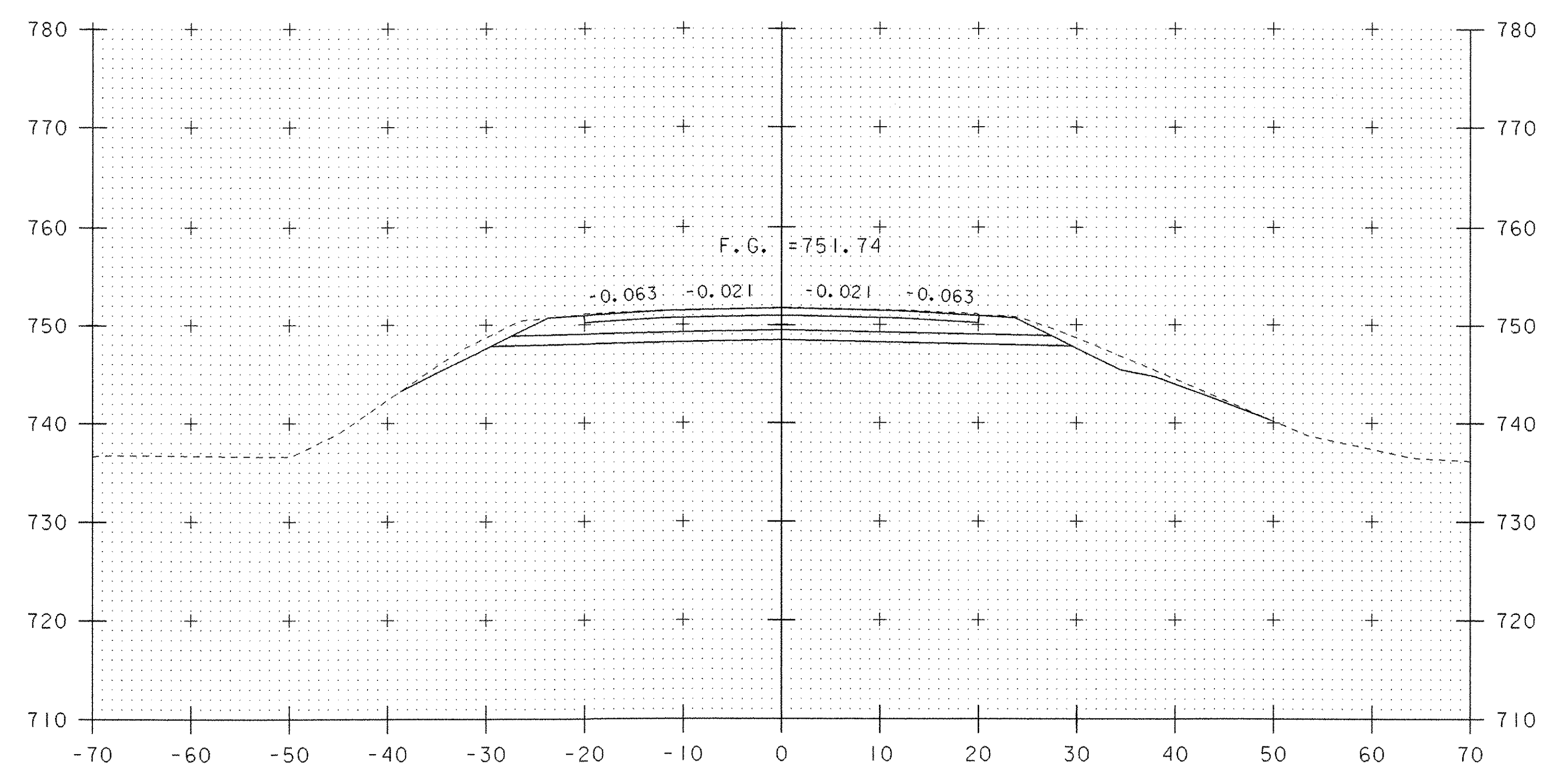
14+75

STA. 14+71.00
BEGIN BRIDGE



14+00

STA. 14+00.00
END APPROACH
BEGIN PROJECT

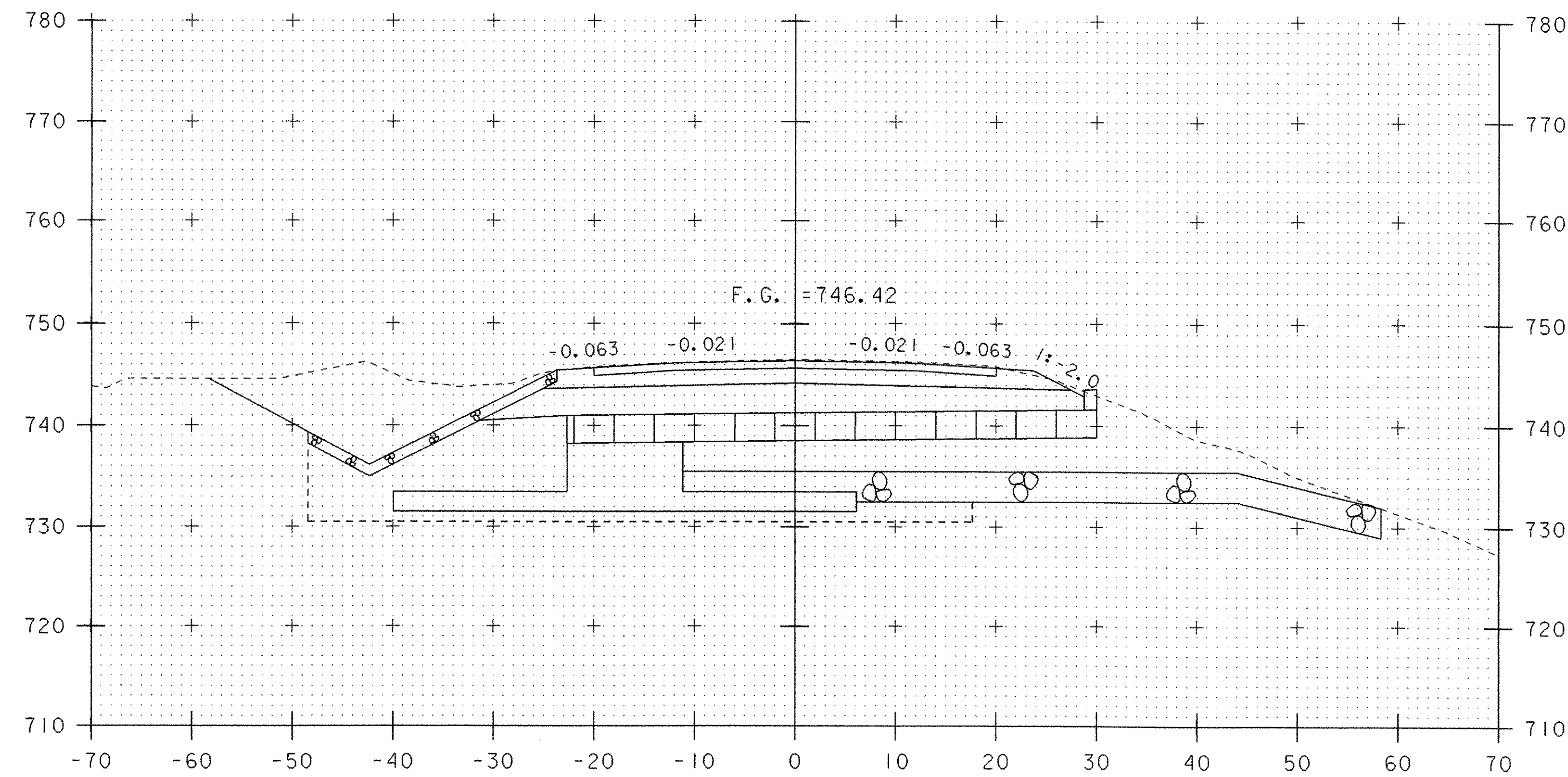


14+50

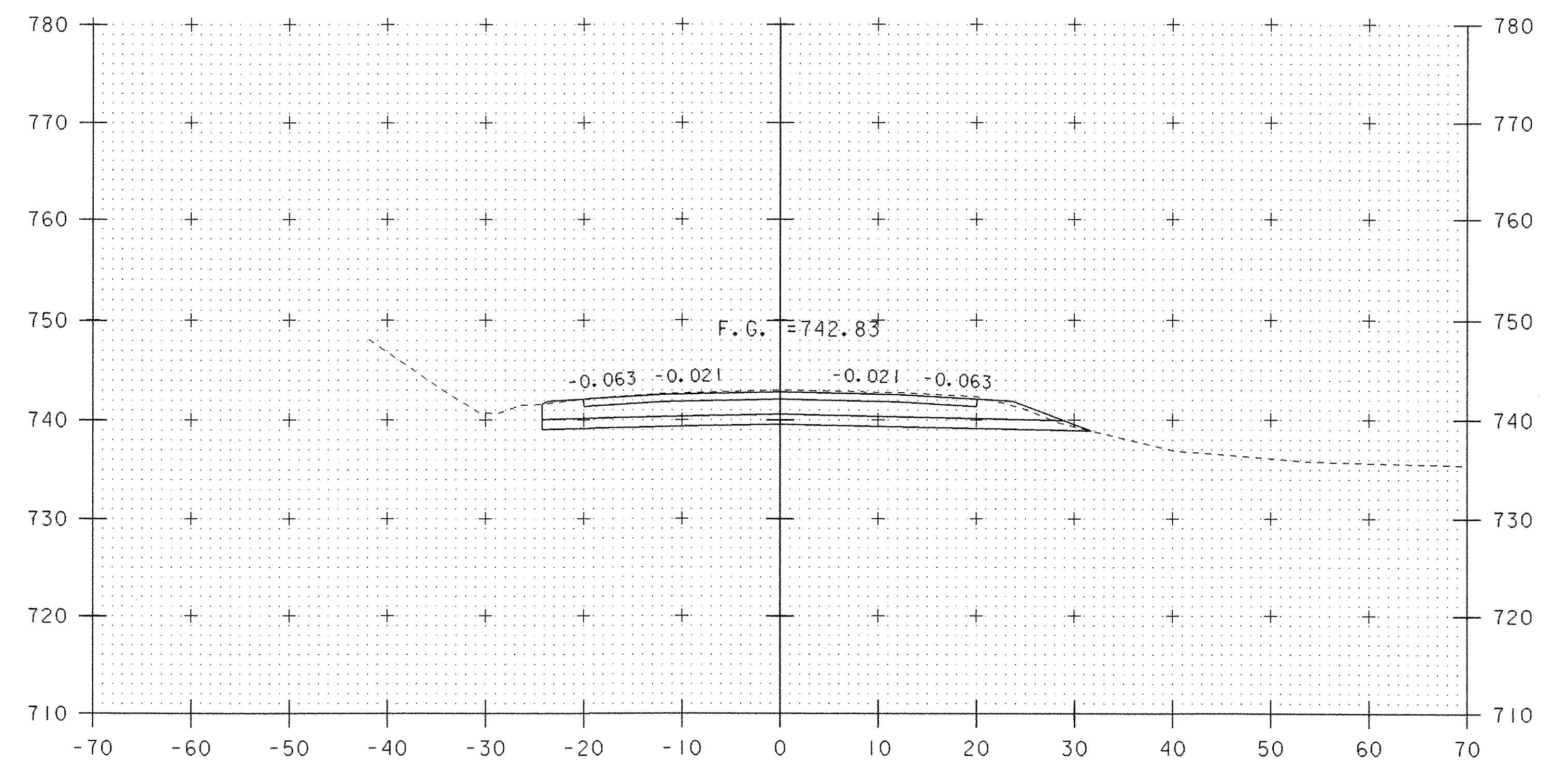
MAINLINE CROSS SECTIONS (3)

PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV (5)	DRAWN BY:	M. HALE
FILE NAME:	04c178\Structures\s04c178xsl.dgn	CHECKED BY:	D. PETERSON
PROJECT MANAGER:	R. R. WHITCOMB	SHEET	42 OF 52
DESIGNED BY:	J. PERRIGO		
s04c178m03.i			

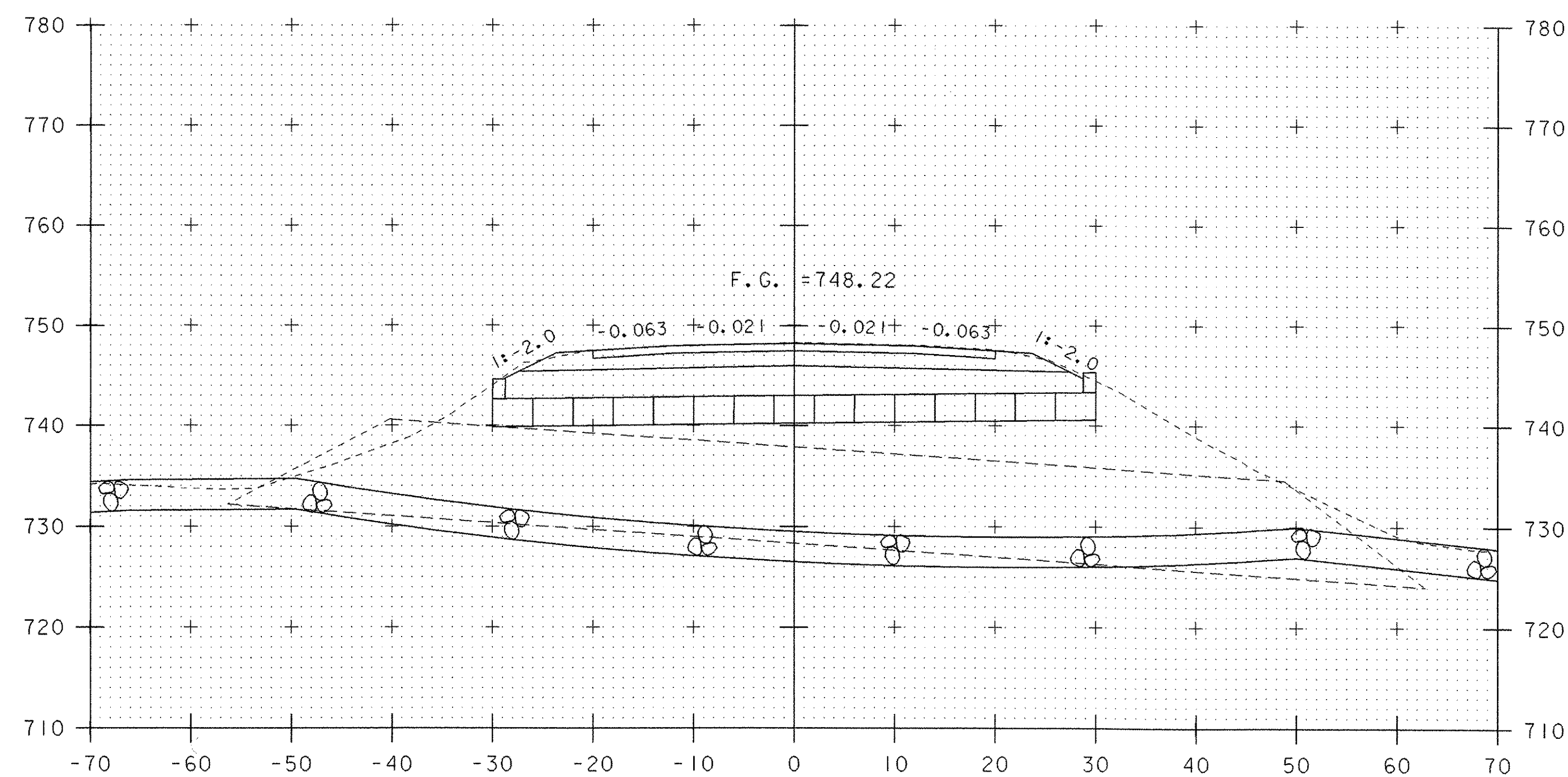
10 0 10
SCALE: 1" = 10'-0"



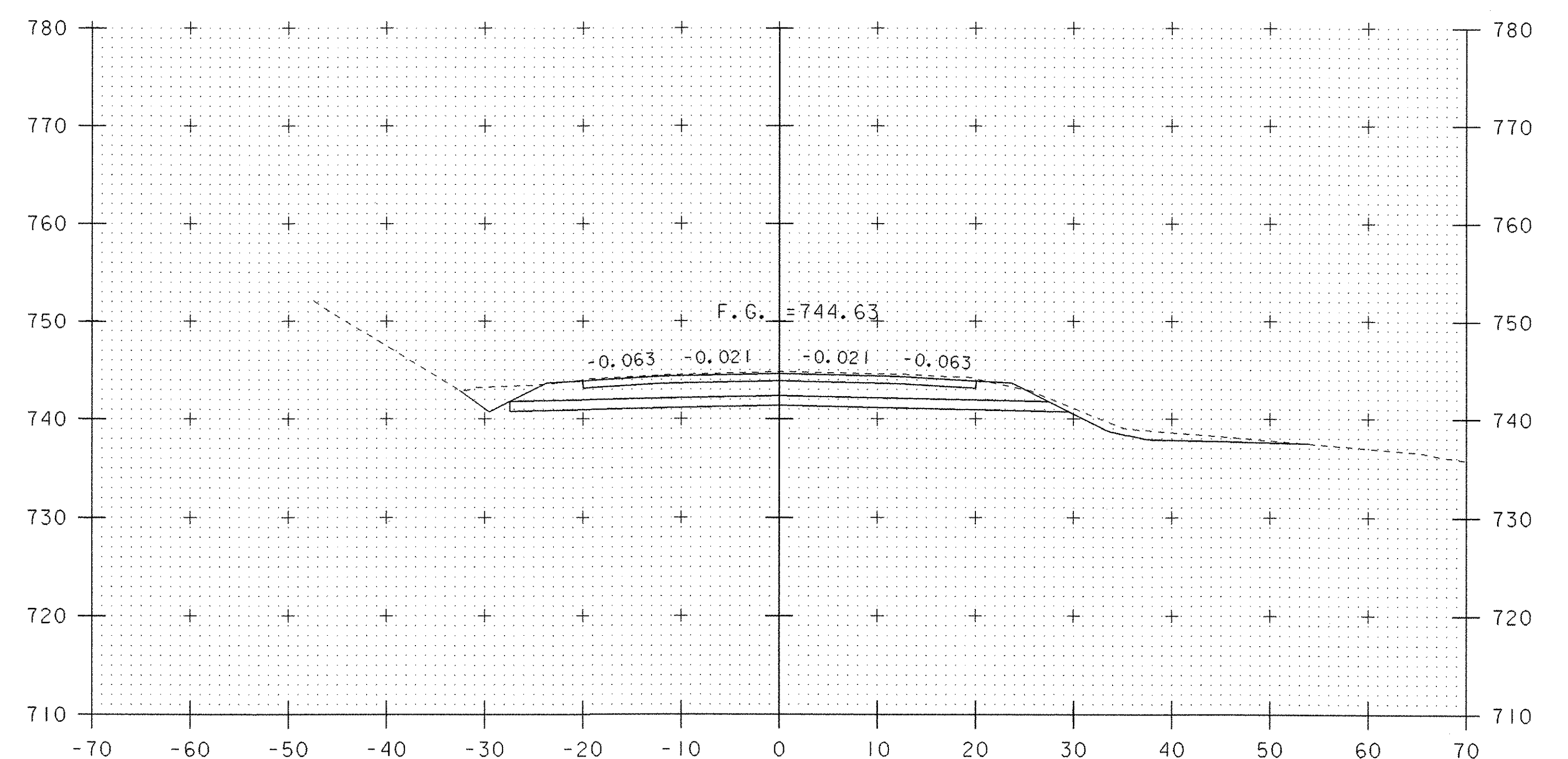
15+25



15+75



15+00



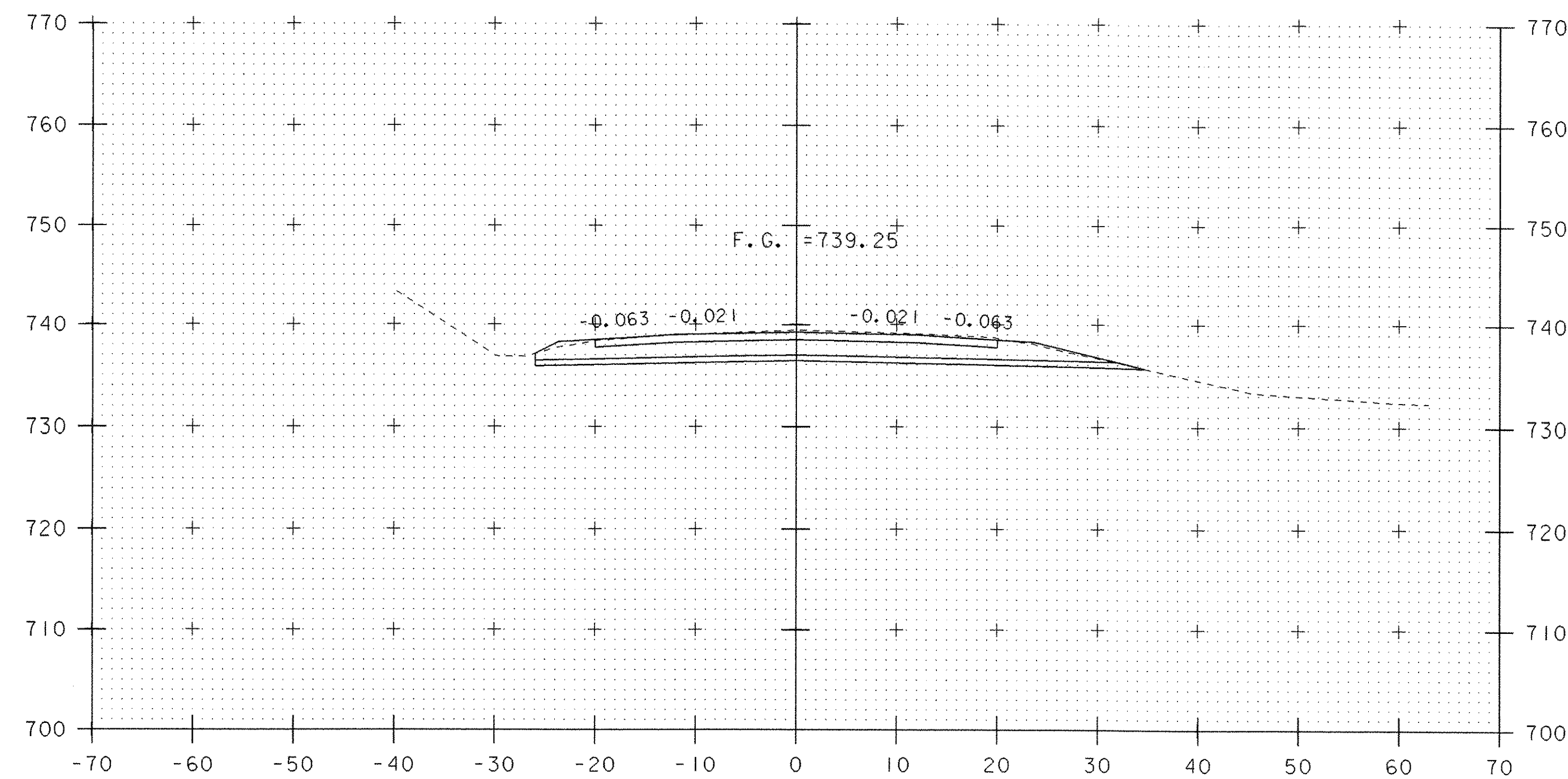
STA. 15+29.00
END BRIDGE

15+50

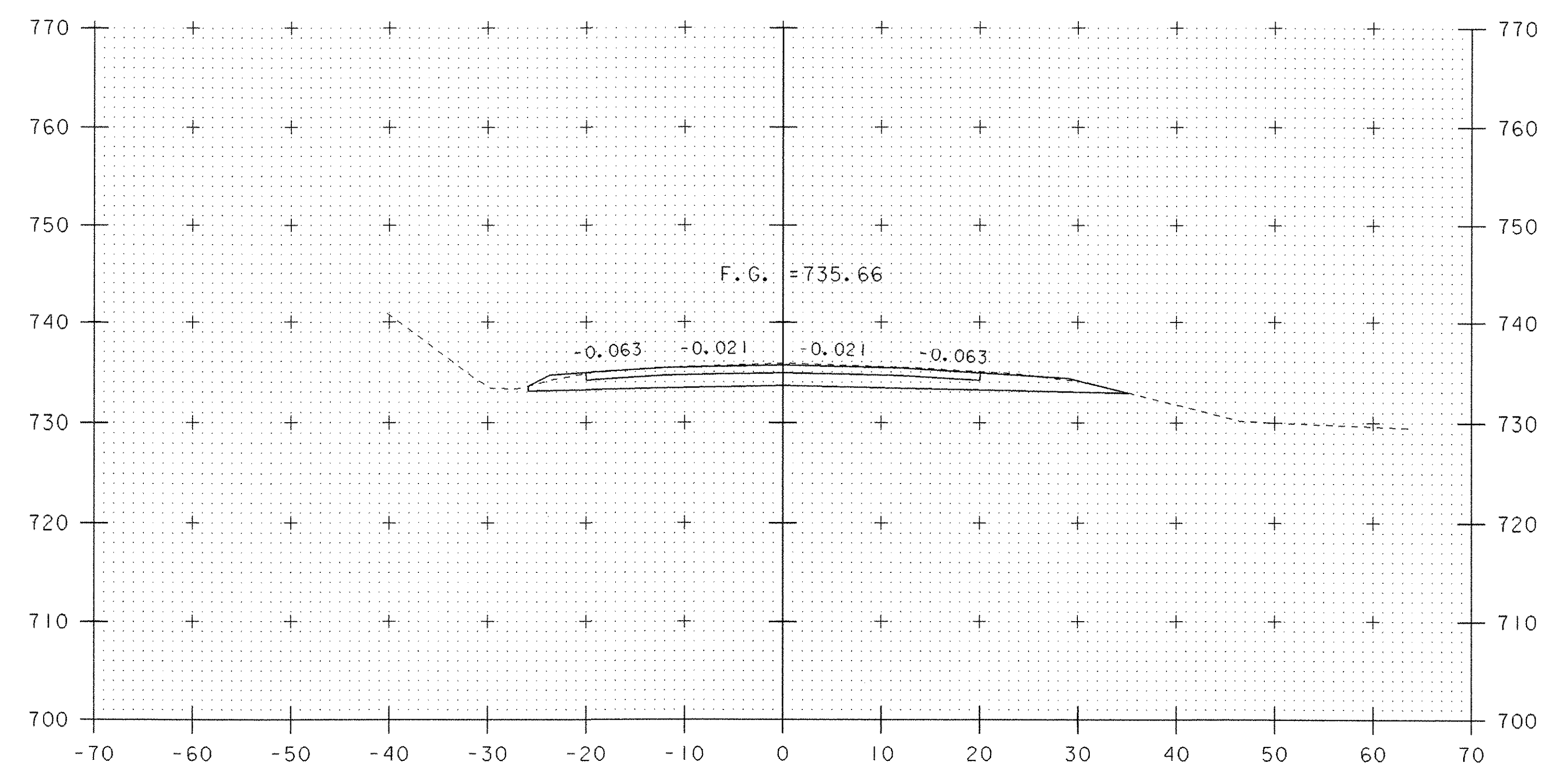
MAINLINE CROSS SECTIONS (4)

PROJECT NAME:	SPRINGFIELD	FILE NAME:	04cl78\Structures\s04cl78xsl.dgn	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV (5)	PROJECT MANAGER:	R.R. WHITCOMB	DRAWN BY:	M. HALE
		DESIGNED BY:	J. PERRIGO	CHECKED BY:	D. PETERSON
			s04cl78m04.l		SHEET 43 OF 52

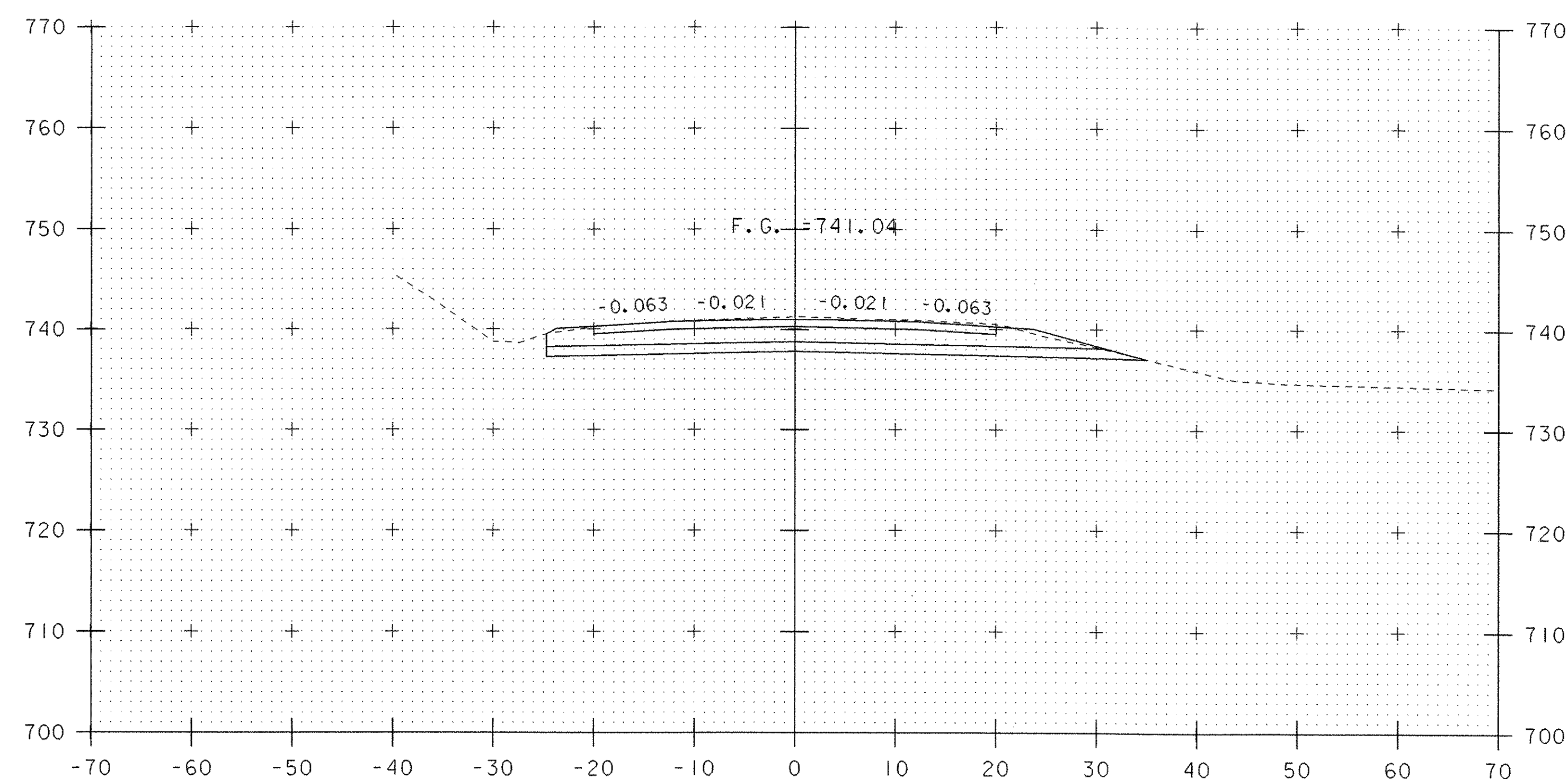
10 0 10
SCALE: 1" = 10'-0"



16+25

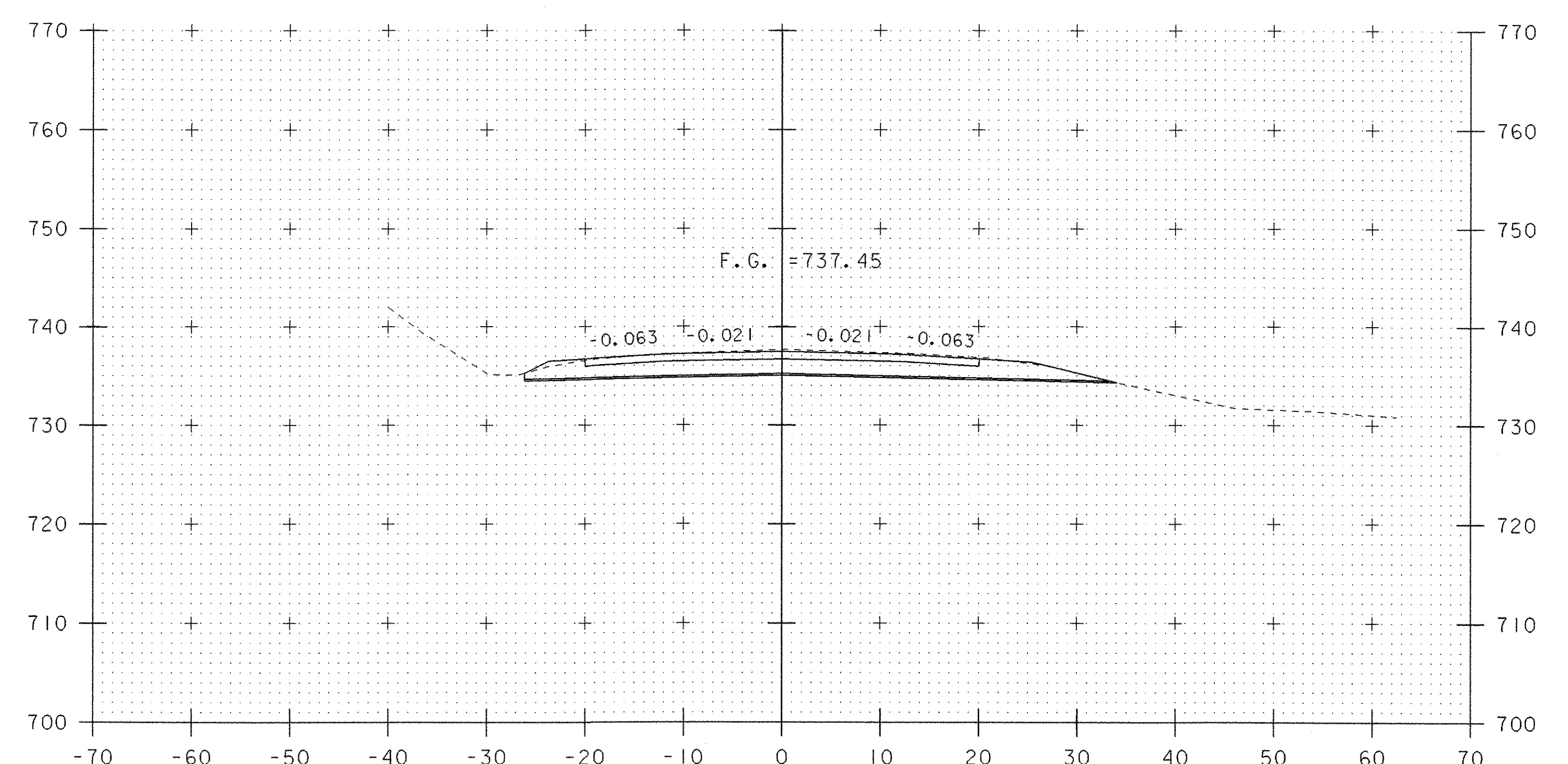


16+75



16+00

STA. 16+00.00
END PROJECT
BEGIN APPROACH

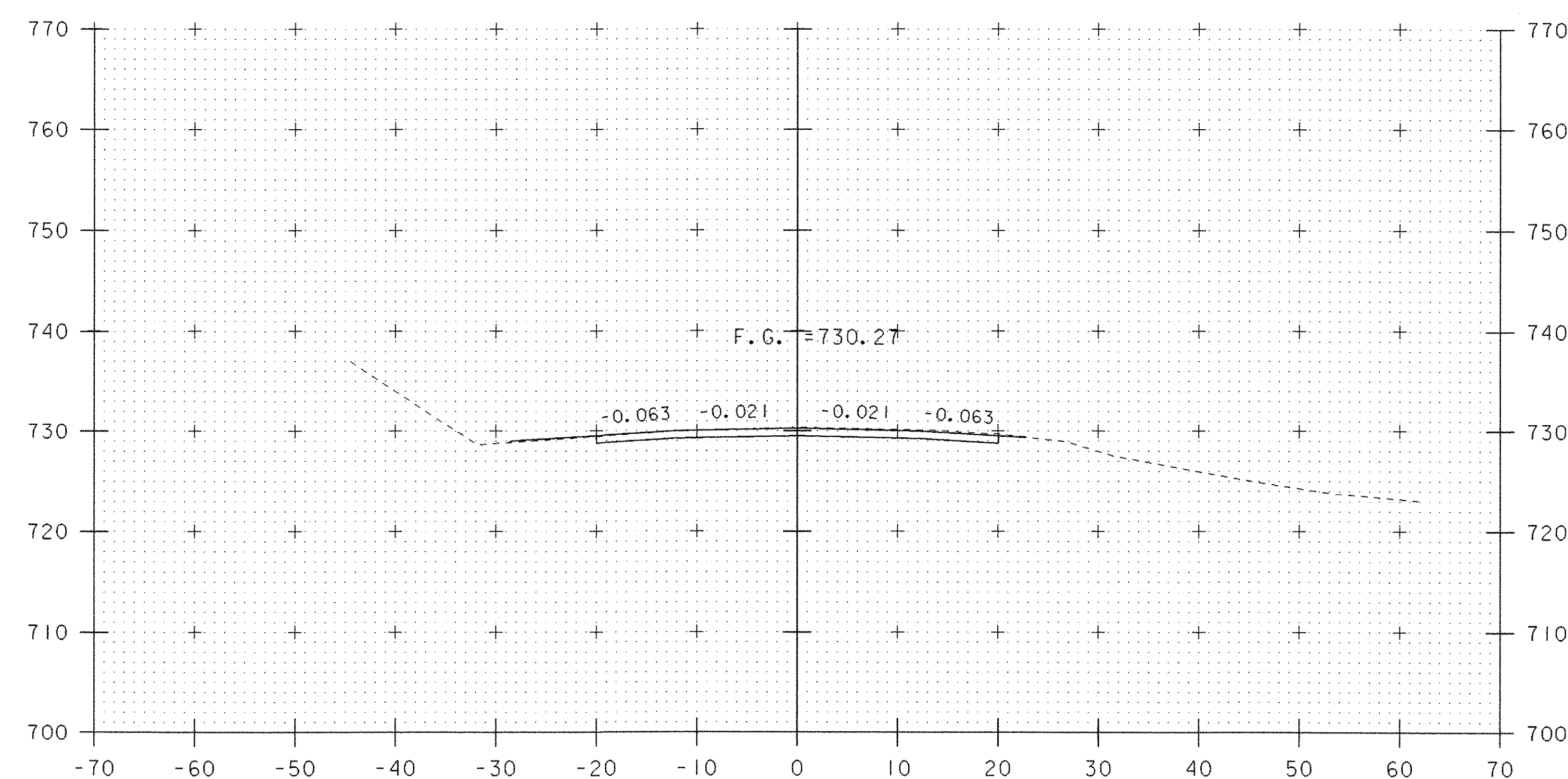
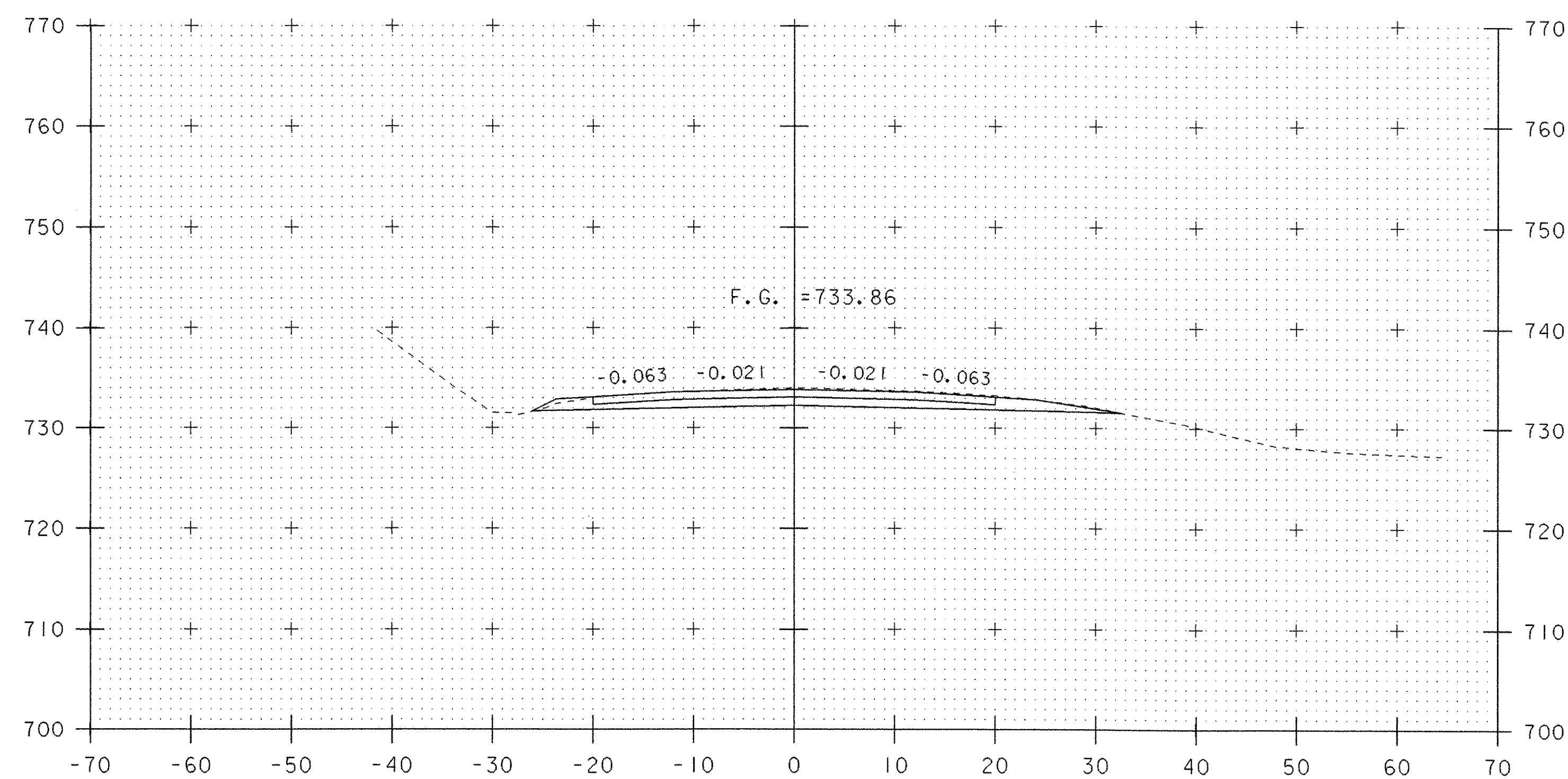
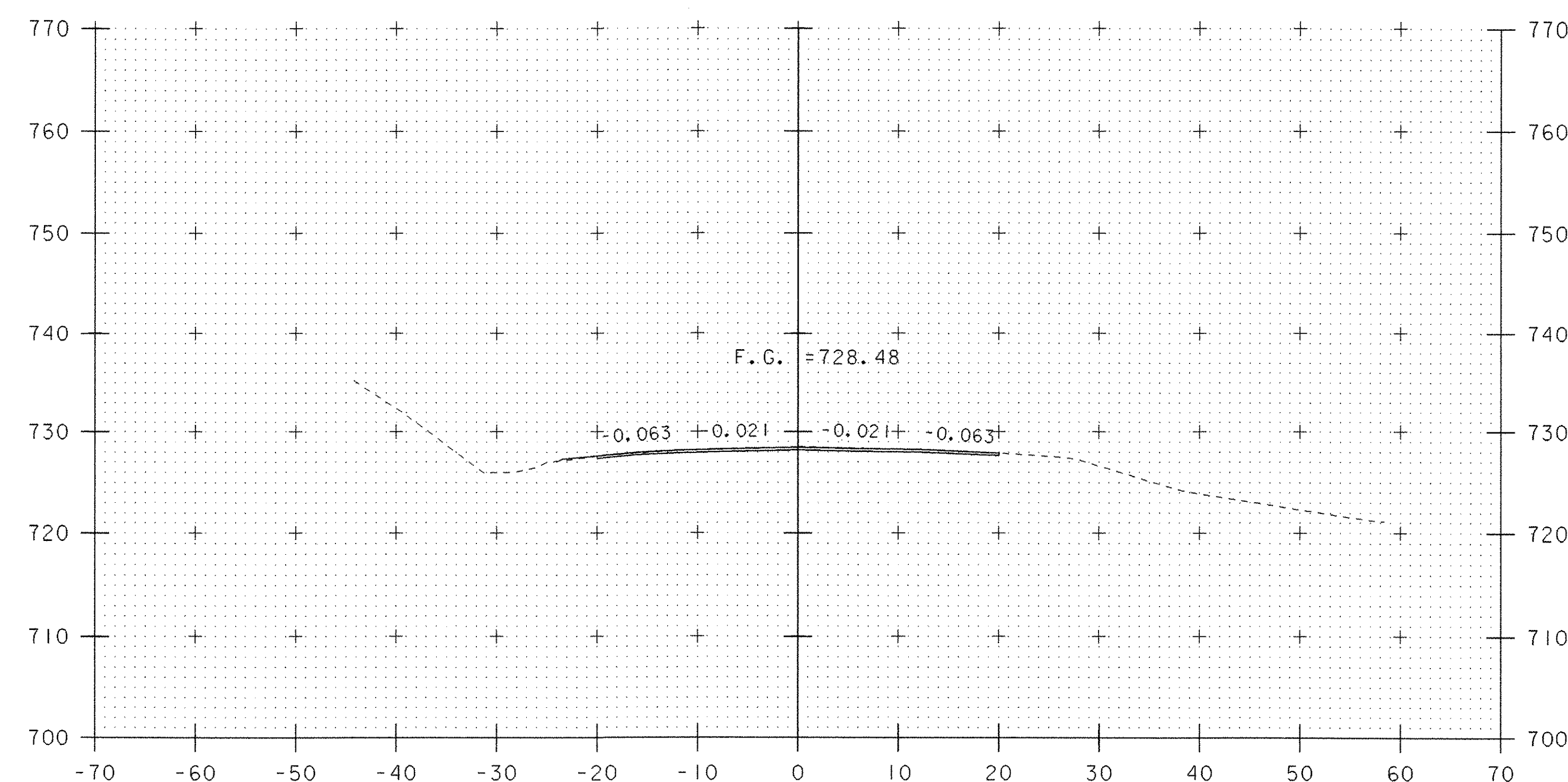
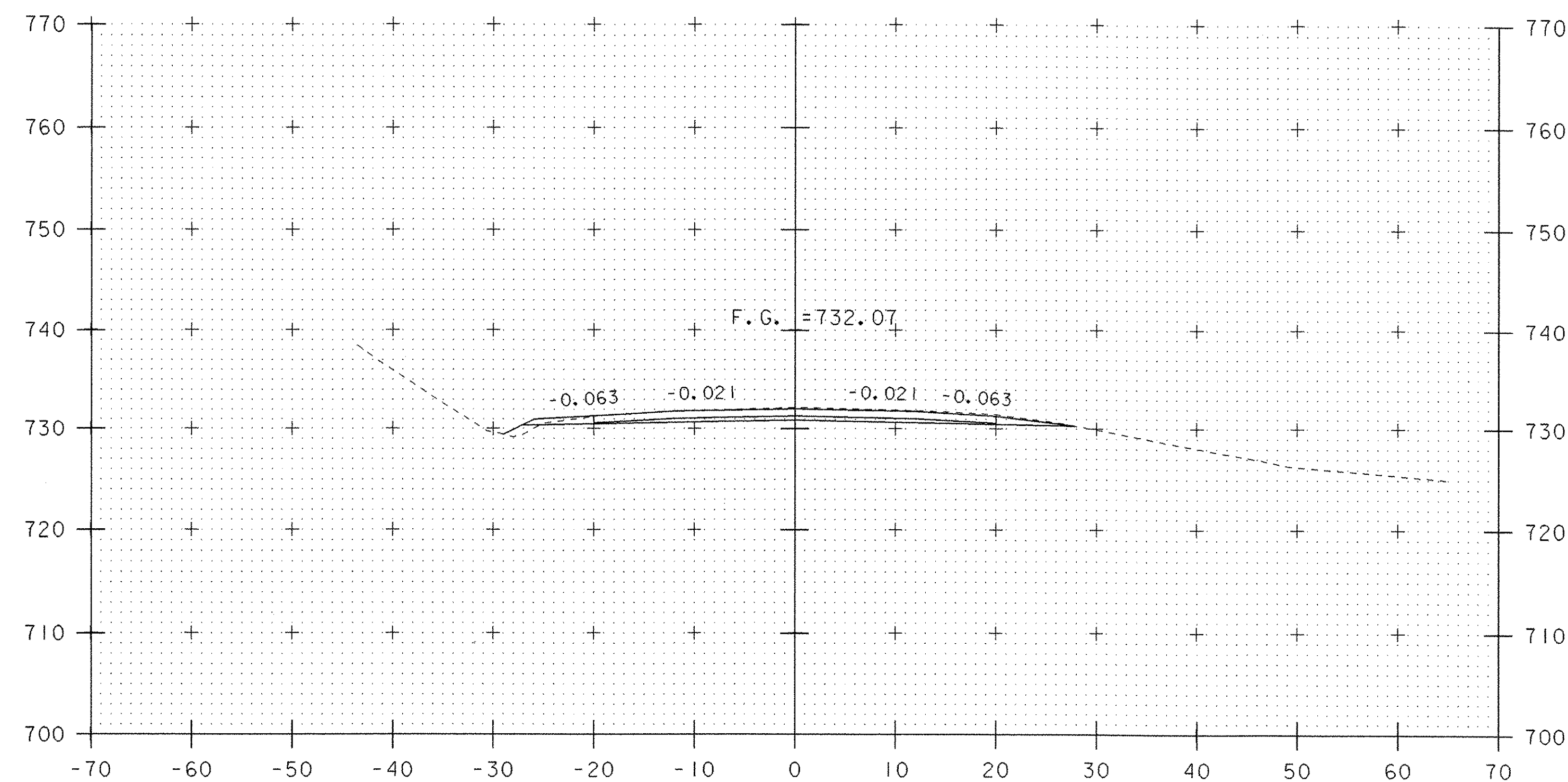


16+50

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

MAINLINE CROSS SECTIONS (5)

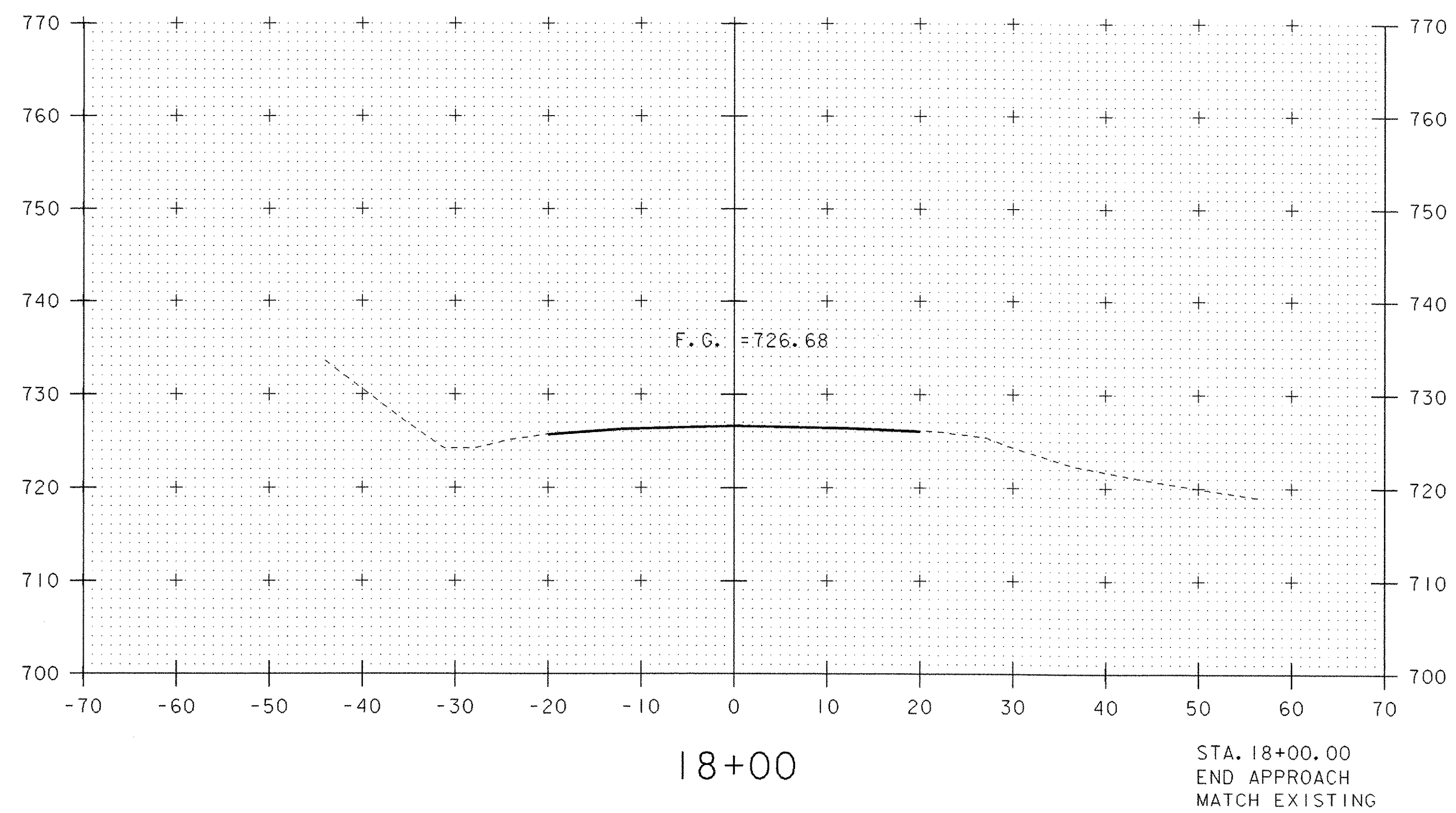
PROJECT NAME: SPRINGFIELD	PLOT DATE: 21-MAY-2007
PROJECT NUMBER: ST CULV (5)	DRAWN BY: M. HALE
FILE NAME: 04c178\Structures\s04c178xs1.dgn	CHECKED BY: D. PETERSON
PROJECT MANAGER: R.R. WHITCOMB	SHEET 44 OF 52
DESIGNED BY: J. PERRIGO	
s04c178m05.1	



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

MAINLINE CROSS SECTIONS (6)

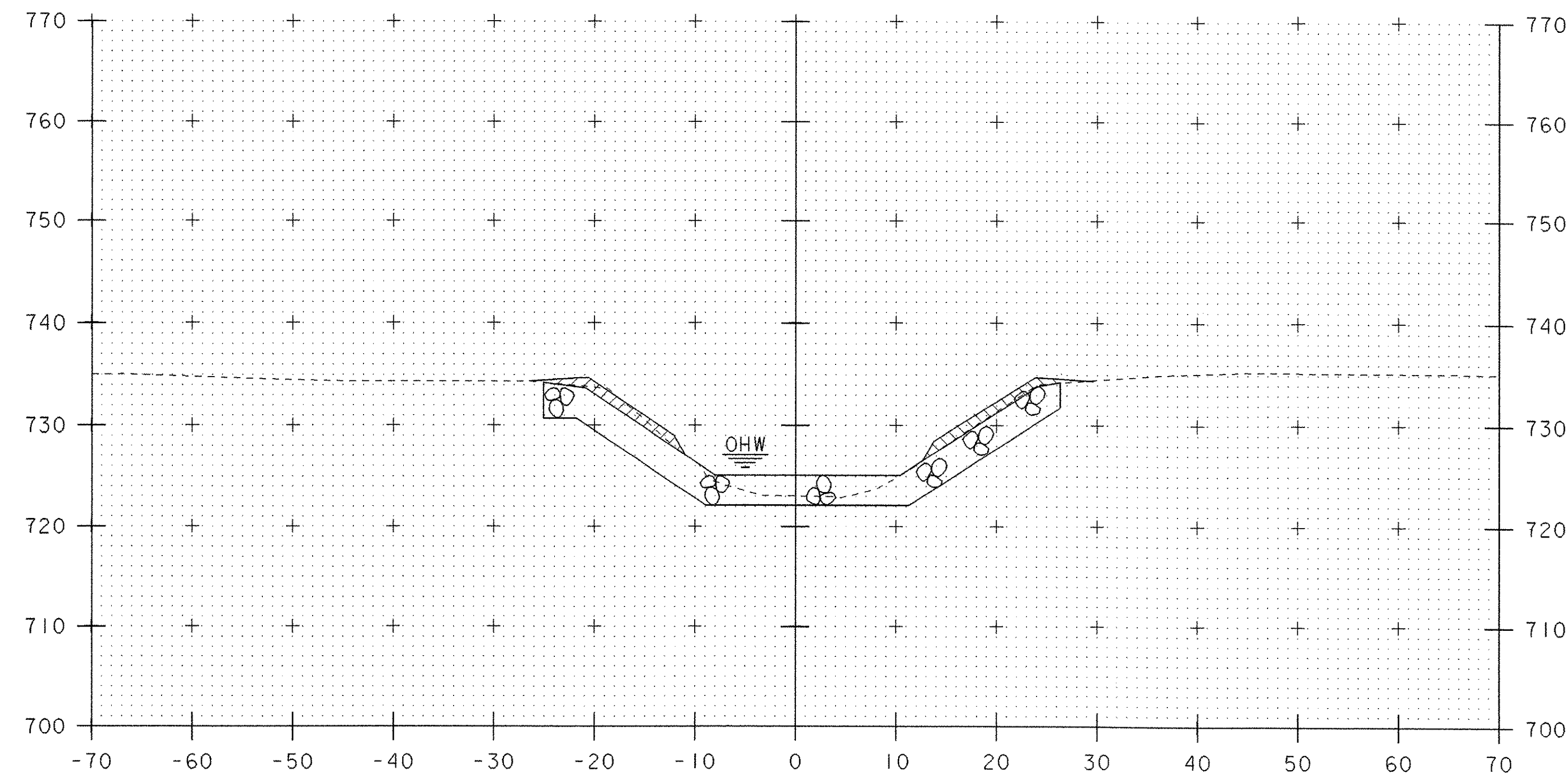
PROJECT NAME:	SPRINGFIELD	
PROJECT NUMBER:	ST CULV (5)	
FILE NAME:	04c178\Structures\s04c178xs1.dgn	PLOT DATE:
PROJECT MANAGER:	R. R. WHITCOMB	DRAWN BY:
DESIGNED BY:	J. PERRIGO	CHECKED BY:
s04c178m06.i		SHEET
		45 OF 52



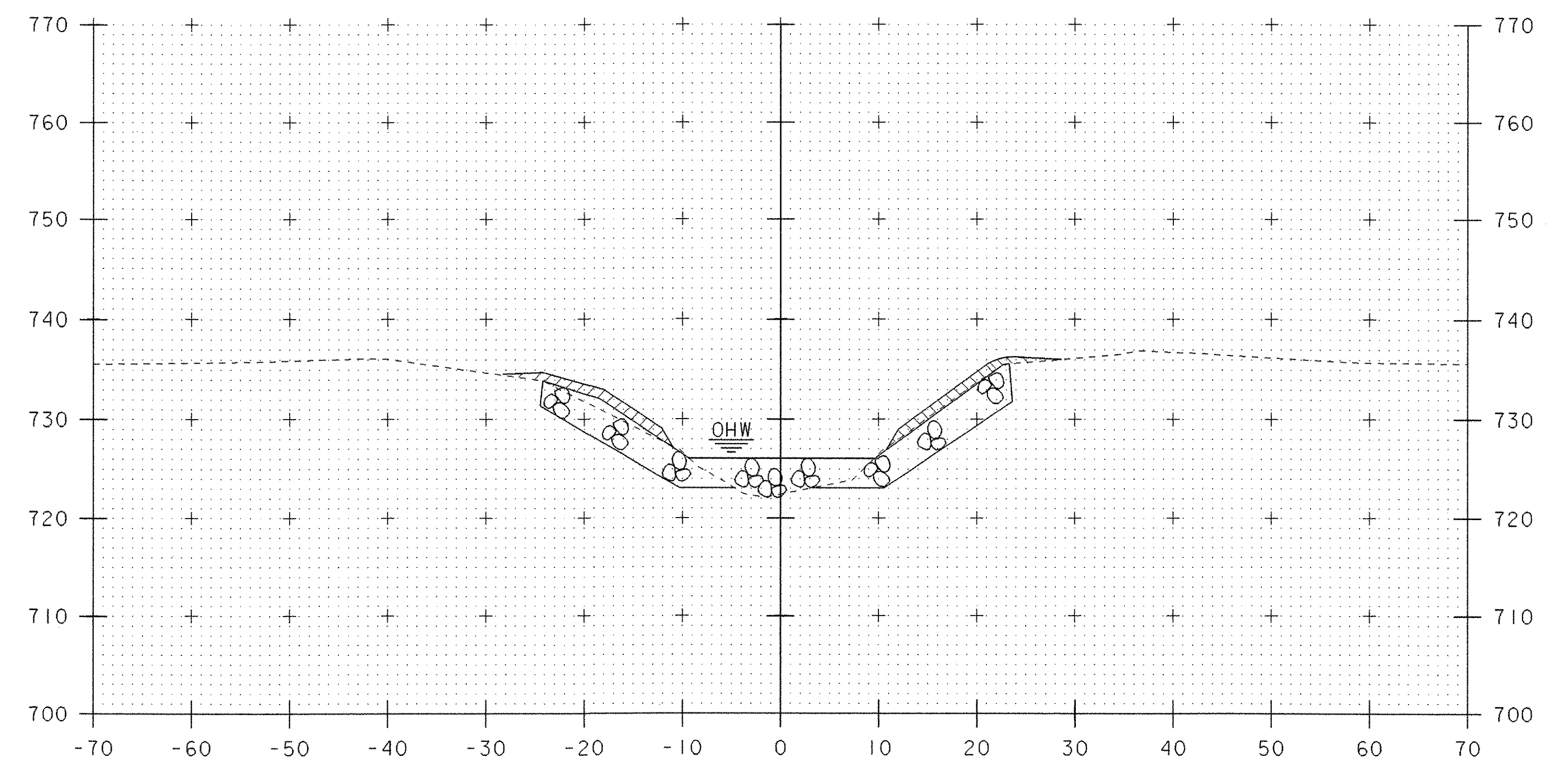
10 0 10
SCALE: 1" = 10'-0"

MAINLINE CROSS SECTIONS (7)

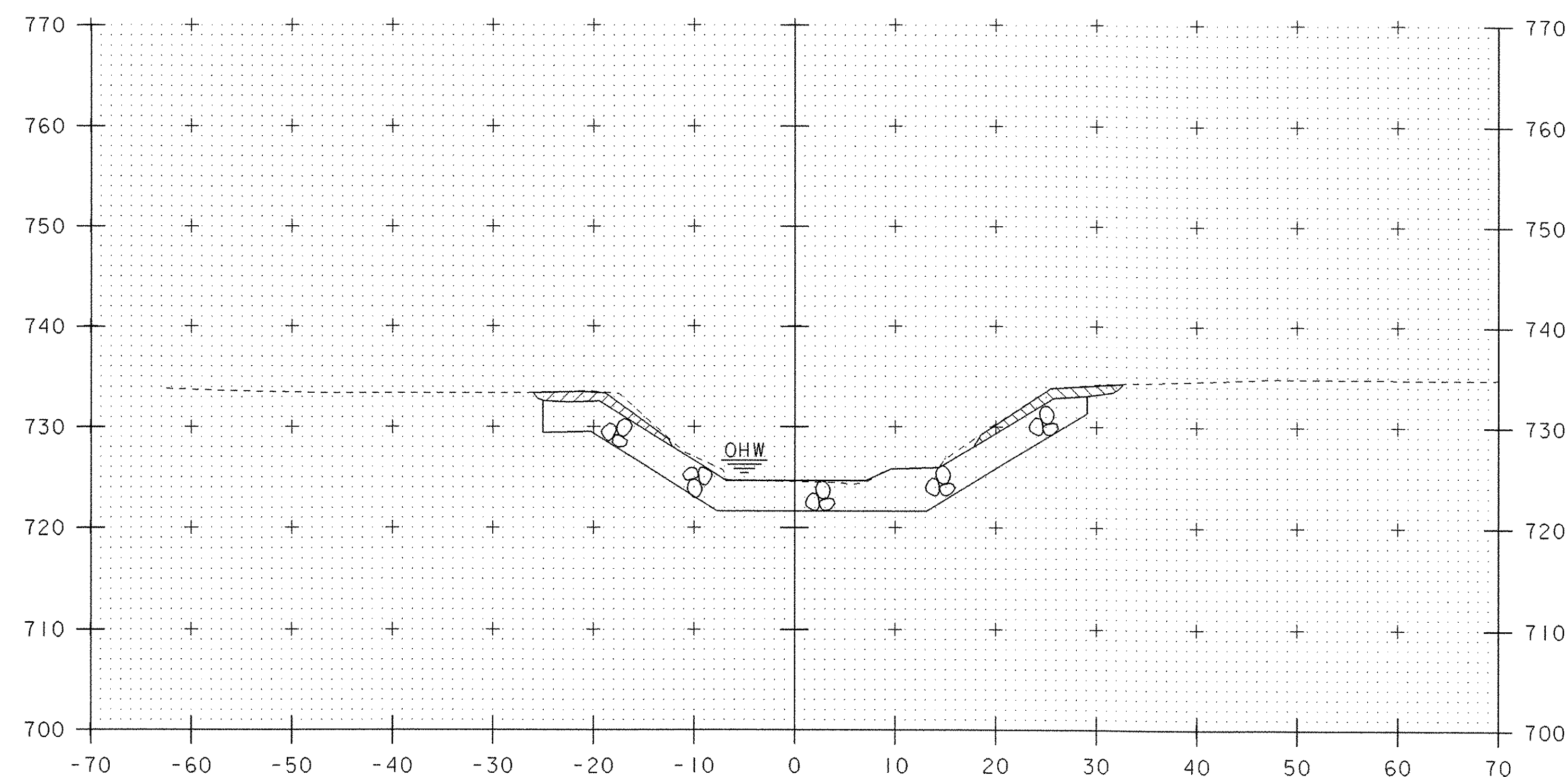
PROJECT NAME: SPRINGFIELD	PLOT DATE: 21-MAY-2007
PROJECT NUMBER: ST CULV (5)	DRAWN BY: M. HALE
FILE NAME: 04cl78\Structures\s04cl78xsl.dgn	CHECKED BY: D. PETERSON
PROJECT MANAGER: R. R. WHITCOMB	SHEET 46 OF 52
DESIGNED BY: J. PERRIGO	
s04cl78m07.i	



50+10

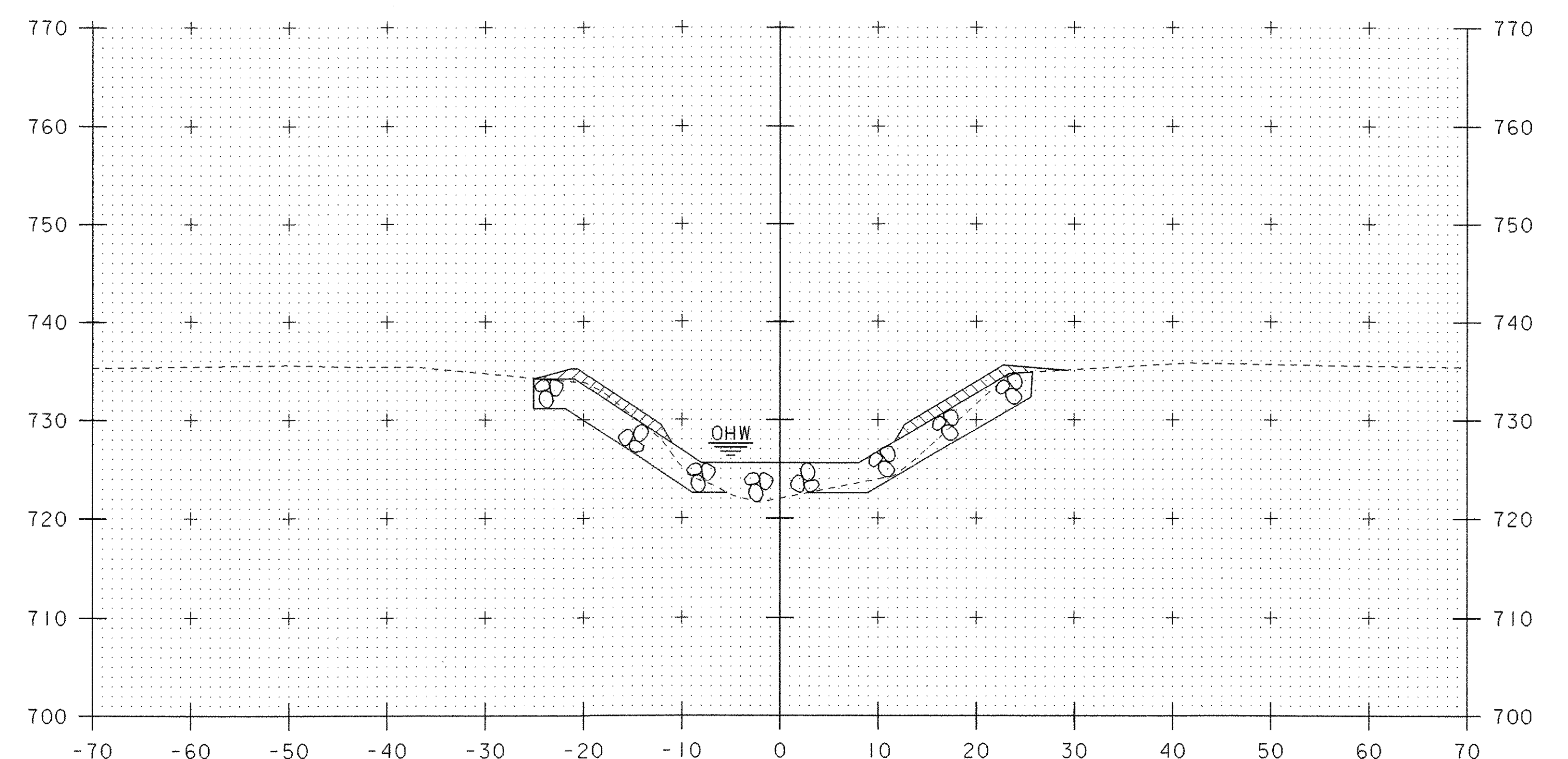


50+30



50+00

STA. 50+00.00
BEGIN UNCL. CHAN. EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

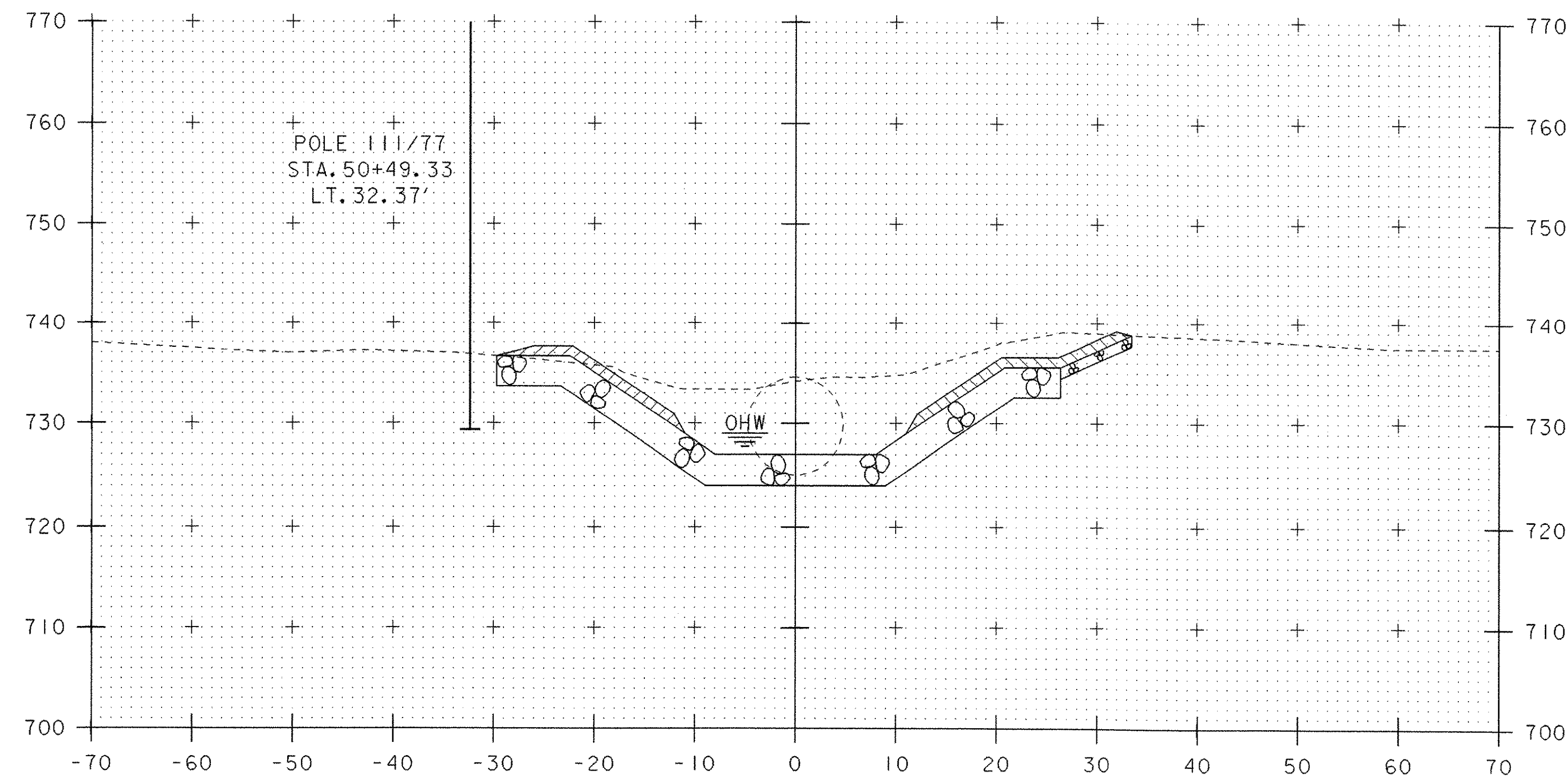


50+20

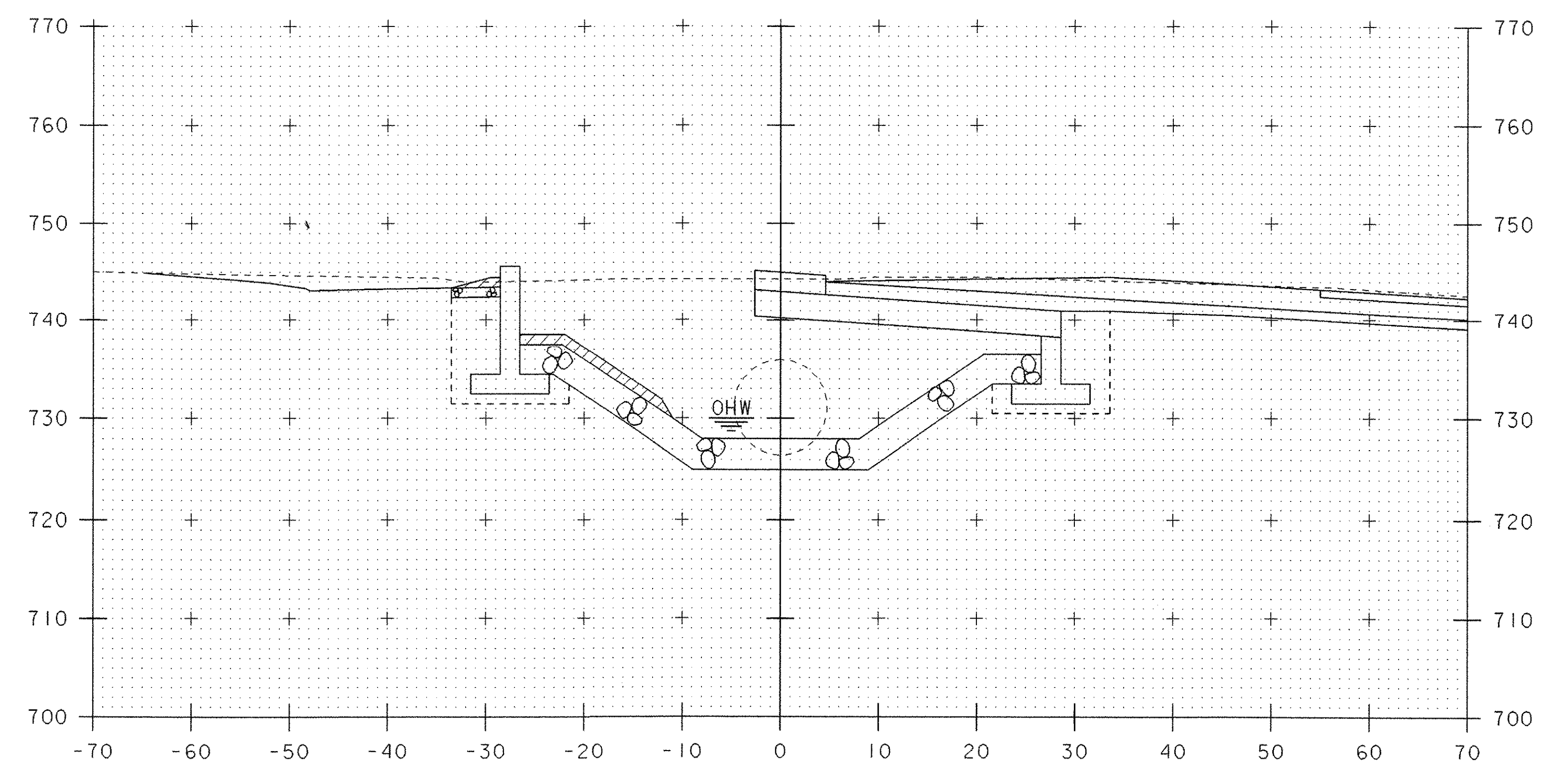
CHANNEL CROSS SECTIONS (1)

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

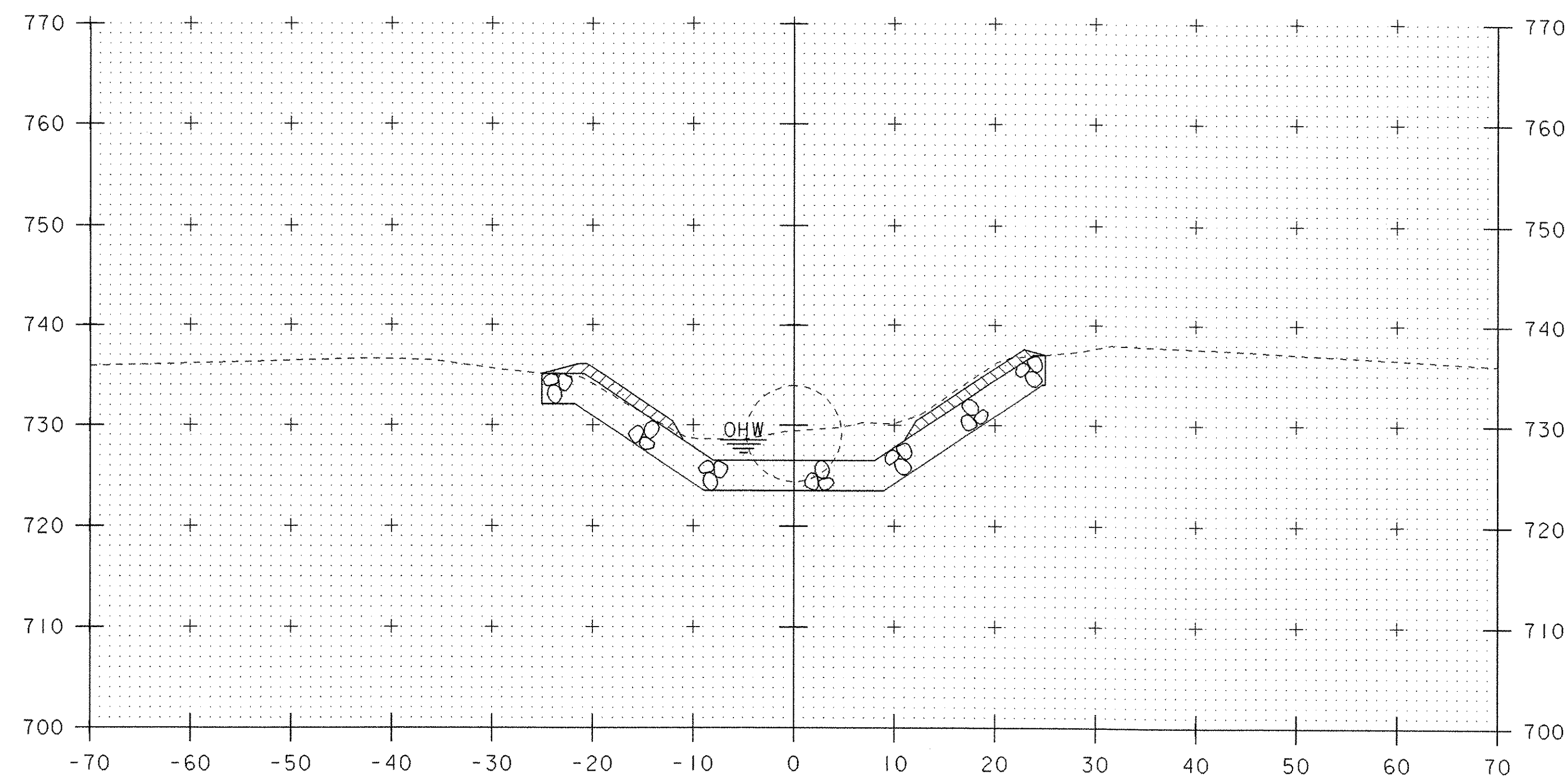
PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV (5)	DRAWN BY:	M. HALE
FILE NAME:	04c178\Structures\s04c178xs1.dgn	CHECKED BY:	D. PETERSON
PROJECT MANAGER:	R.R. WHITCOMB	SHEET	47 OF 52
DESIGNED BY:	J. PERRIGO		
s04c178c01.i			



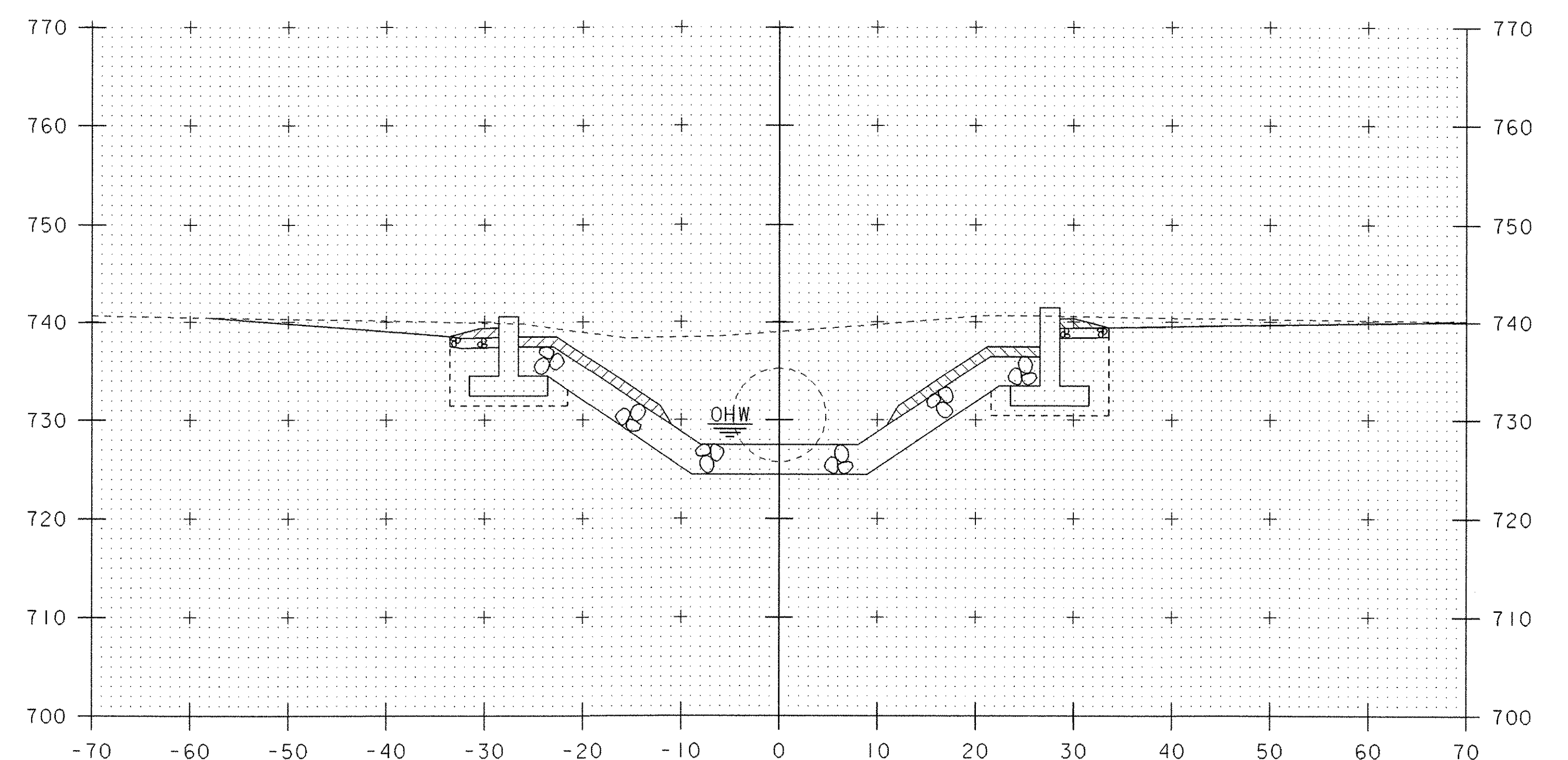
50+50



50+70



50+40



50+60

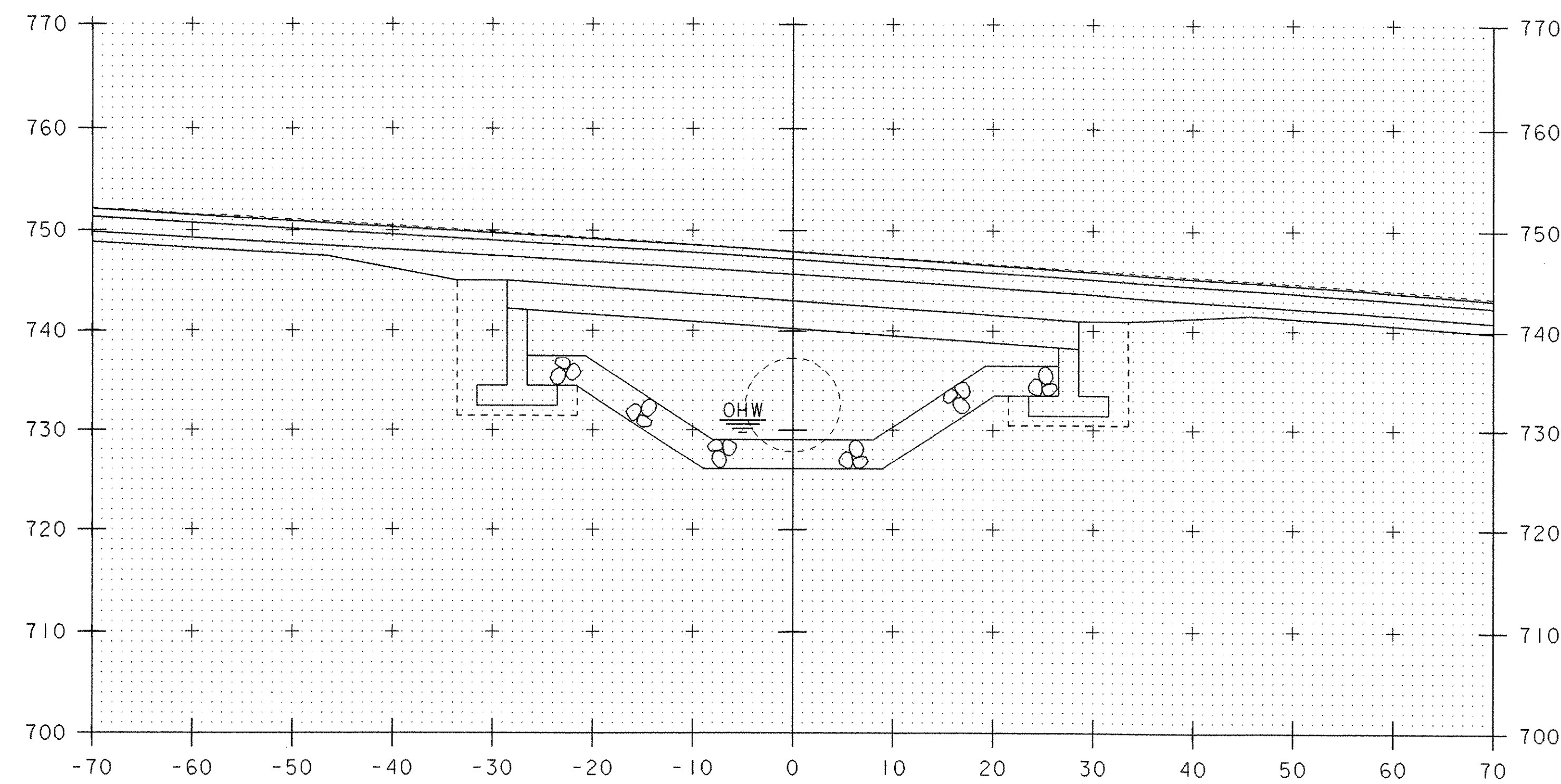
STA. 50+49.14 RT.
BEGIN STRUCTURE EXCAVATION
GRANULAR BACKFILL FOR STRUCTURES

STA. 50+52.8 LT.
BEGIN STRUCTURE EXCAVATION
GRANULAR BACKFILL FOR STRUCTURES

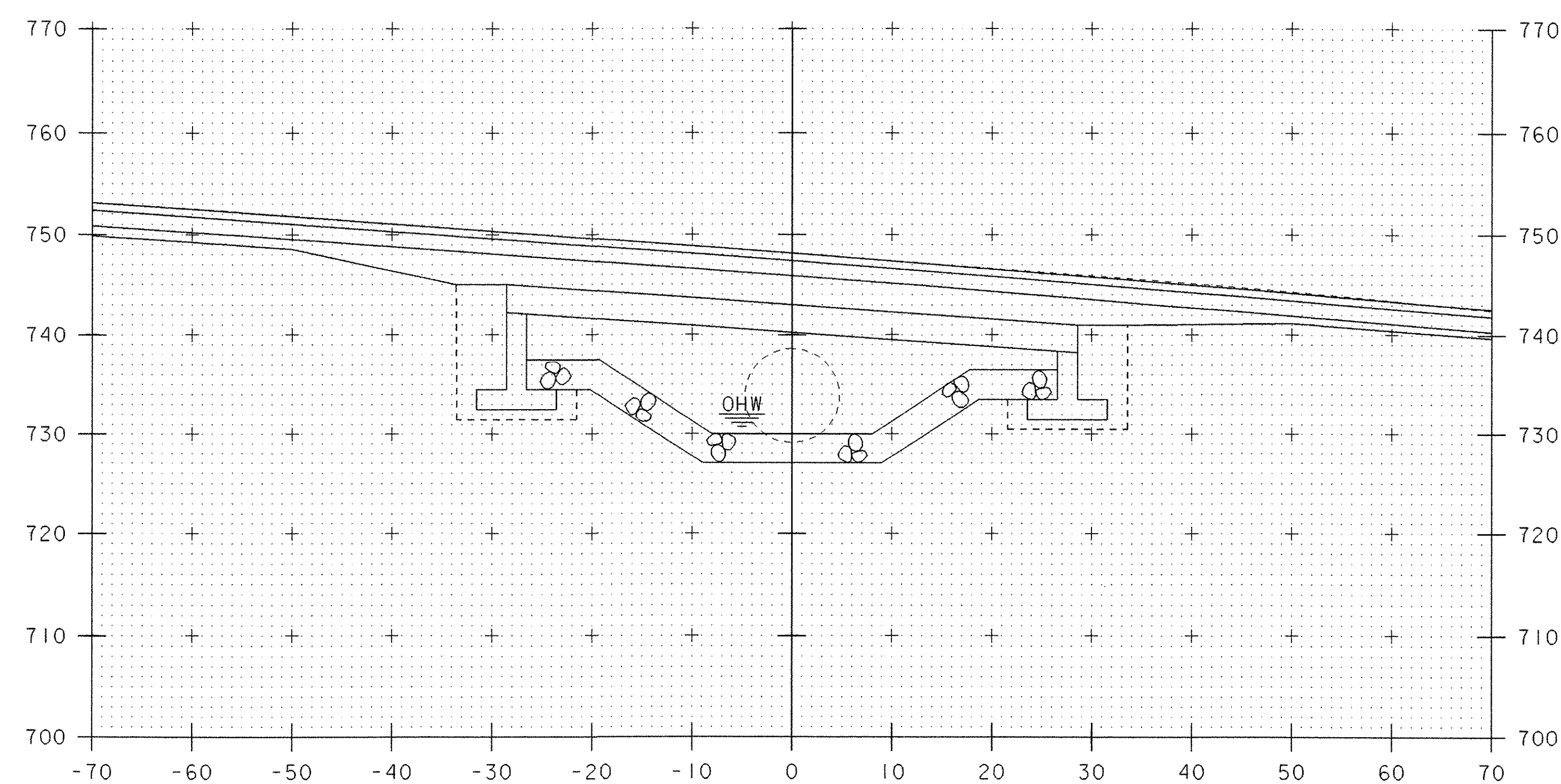
10 0 10
SCALE: 1" = 10'-0"

CHANNEL CROSS SECTIONS (2)

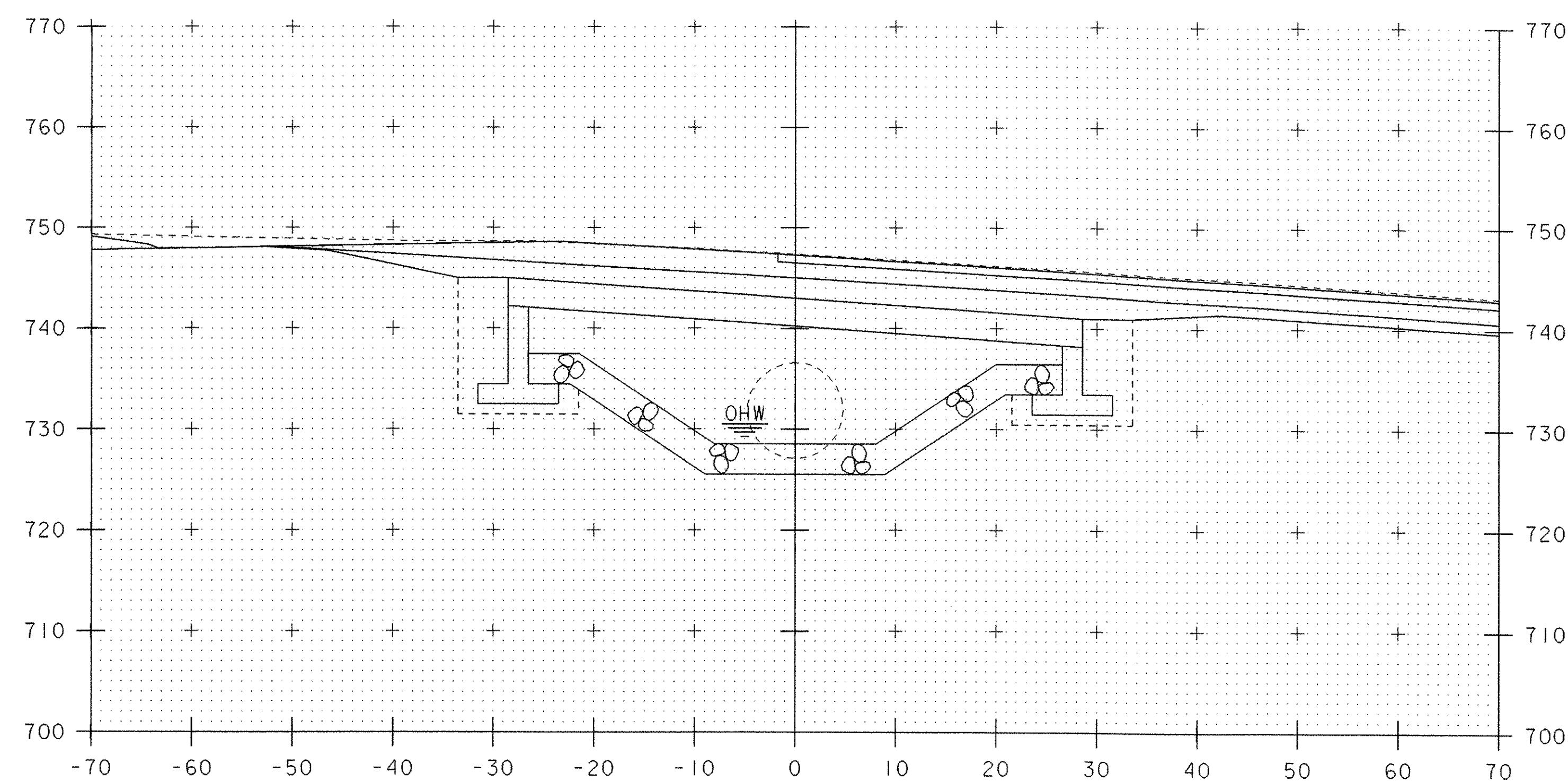
PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV (5)	DRAWN BY:	M. HALE
FILE NAME:	04c178\Structures\s04c178xsl.dgn	CHECKED BY:	D. PETERSON
PROJECT MANAGER:	R.R. WHITCOMB	SHEET	48 OF 52
DESIGNED BY:	J. PERRIGO		
s04c178c02.1			



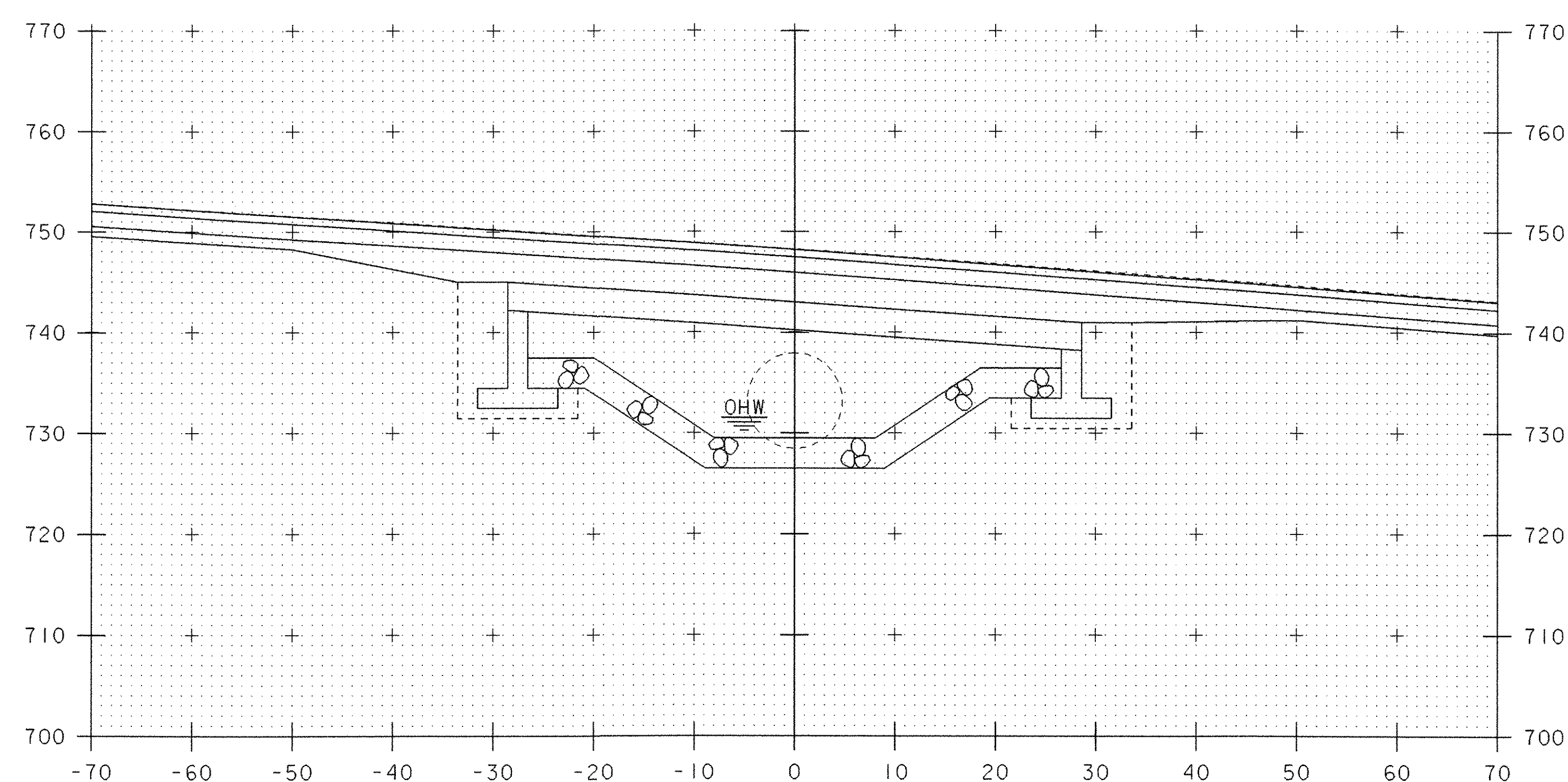
50+90



51+10



50+80

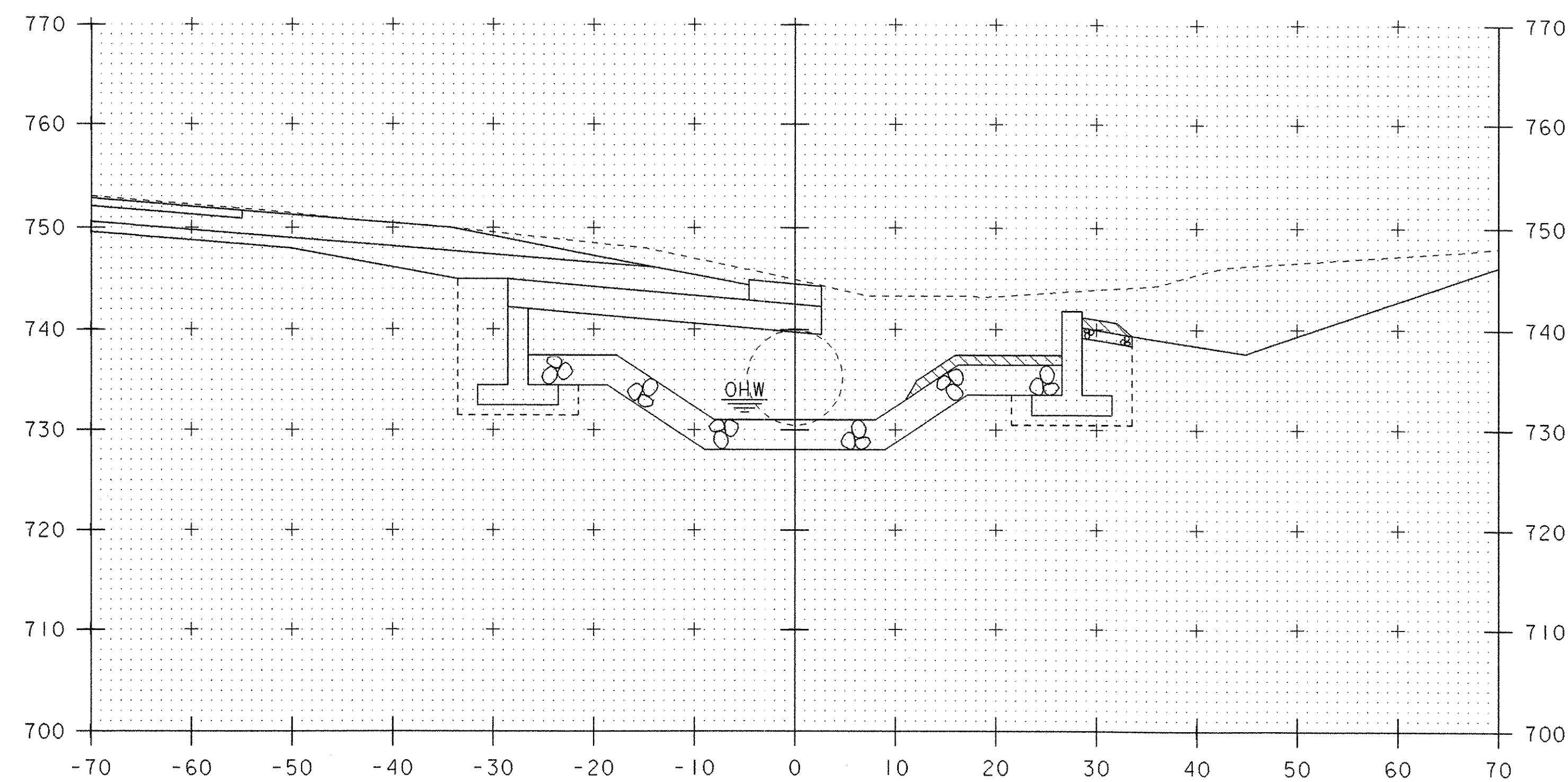


51+00

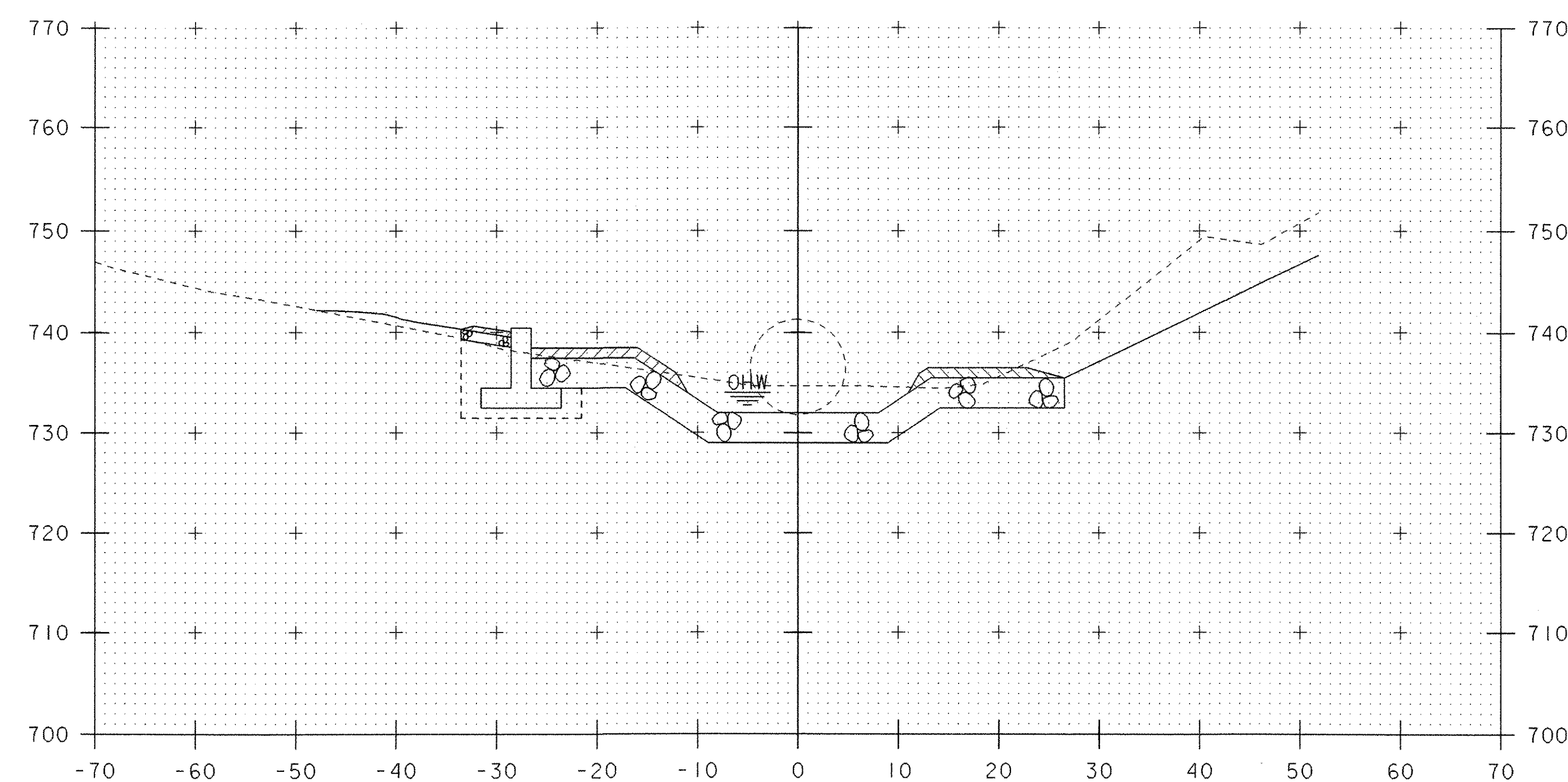
CHANNEL CROSS SECTIONS (3)

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

PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV (5)	DRAWN BY:	M. HALE
FILE NAME:	04c178\Structures\s04c178xsl.dgn	CHECKED BY:	D. PETERSON
PROJECT MANAGER:	R. R. WHITCOMB	SHEET	49 OF 52
DESIGNED BY:	J. PERRIGO		
s04c178c03.l			

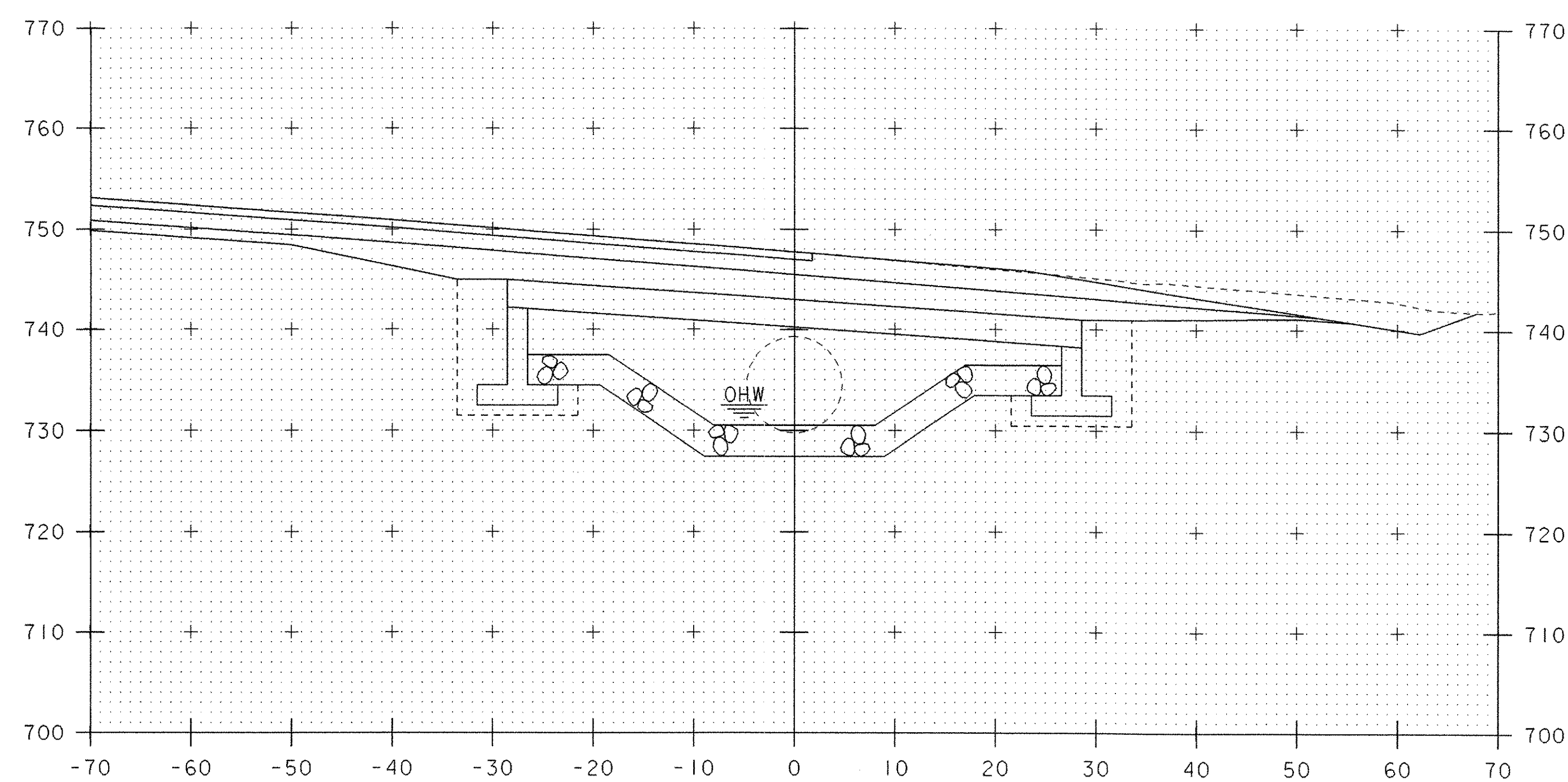


51+30

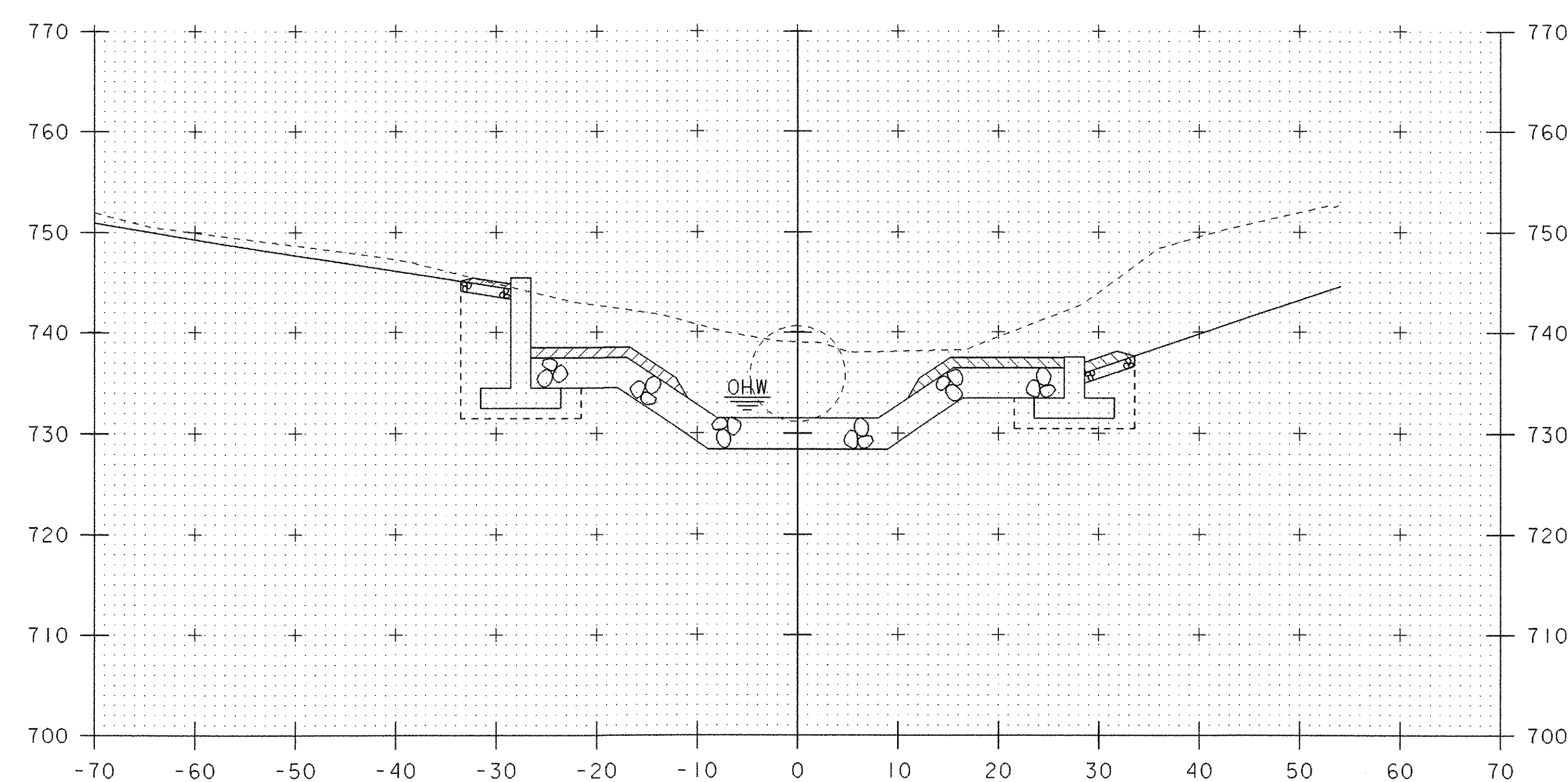


51+50

STA. 51+43.1 RT.
END STRUCTURE EXCAVATION
GRANULAR BACKFILL FOR STRUCTURES



51+20

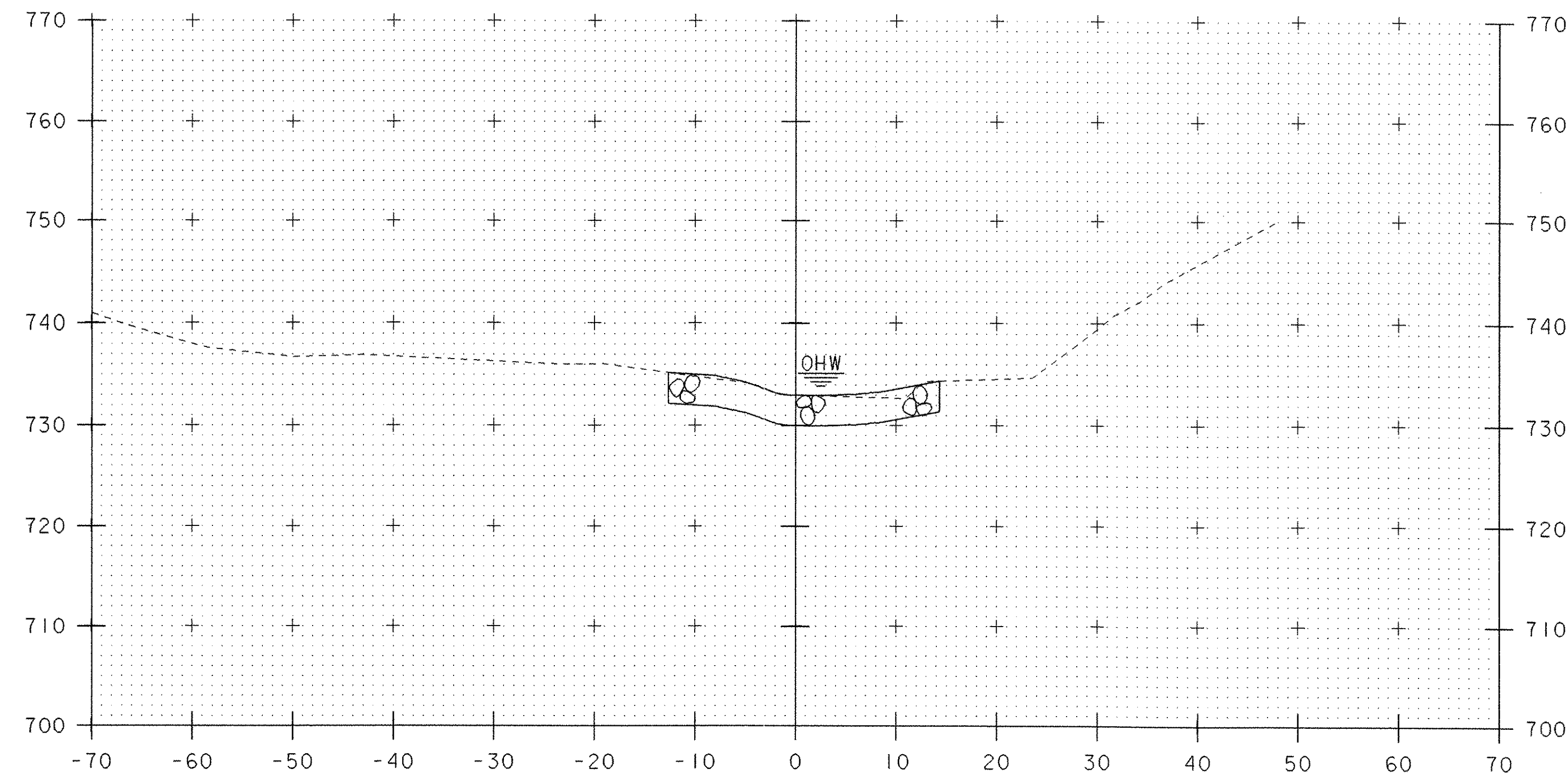


51+40

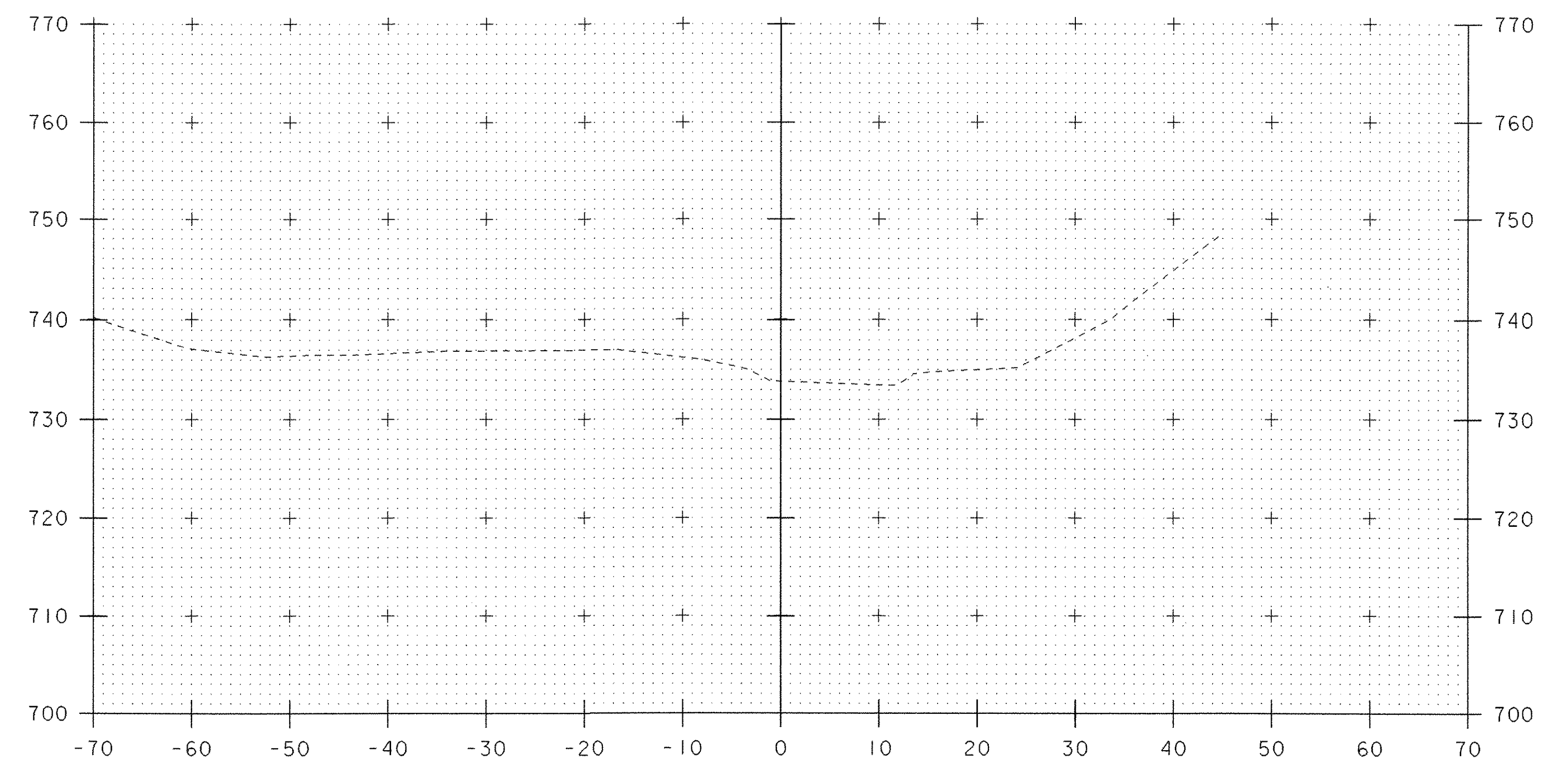
CHANNEL CROSS SECTIONS (4)

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

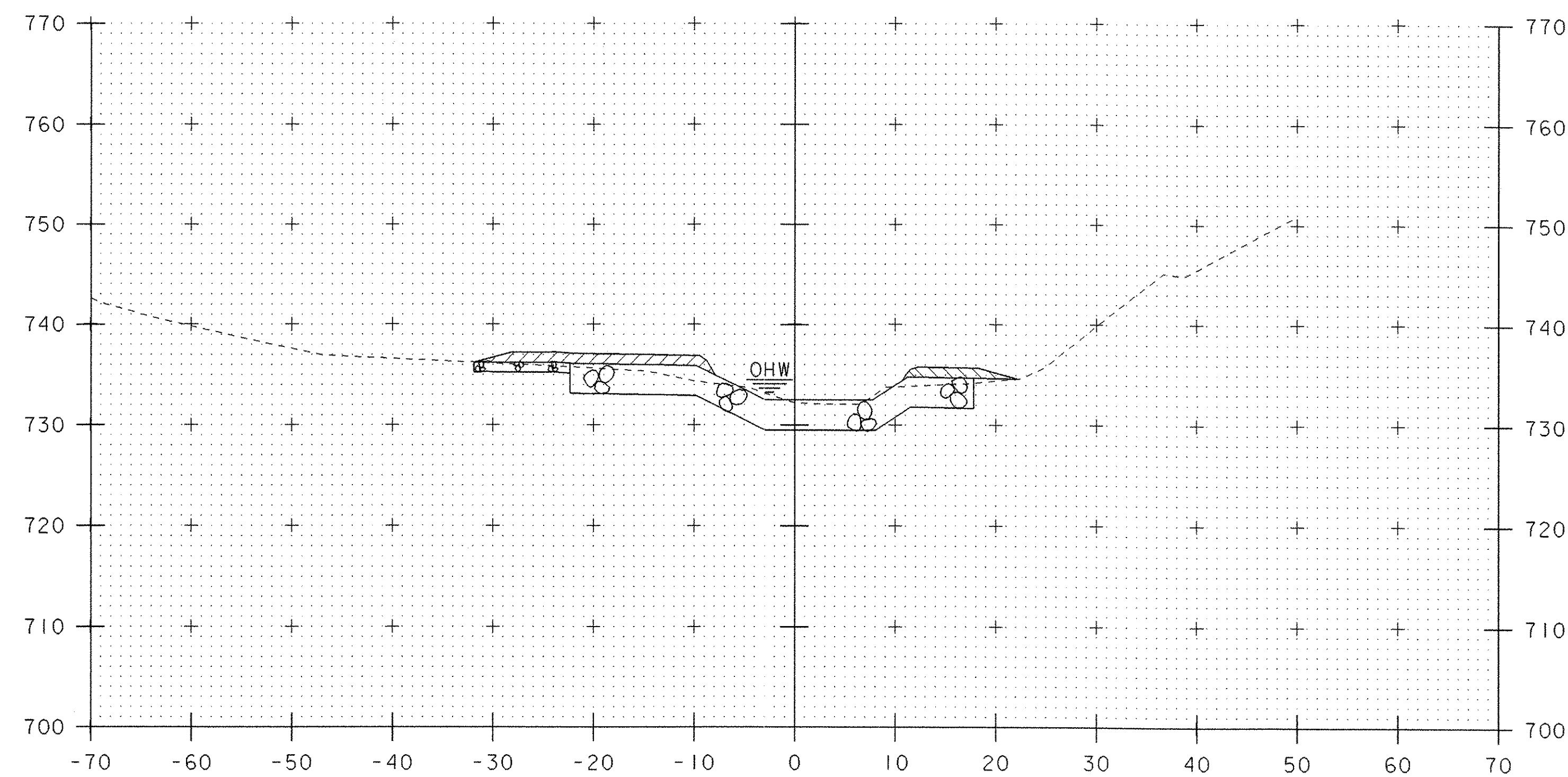
PROJECT NAME:	SPRINGFIELD	PLOT DATE:	21-MAY-2007
PROJECT NUMBER:	ST CULV (5)	DRAWN BY:	M. HALE
FILE NAME:	04c178\Structures\s04c178xsl.dgn	CHECKED BY:	D. PETERSON
PROJECT MANAGER:	R. R. WHITCOMB	SHEET	50 OF 52
DESIGNED BY:	J. PERRIGO		
s04c178c04.1			



51+70

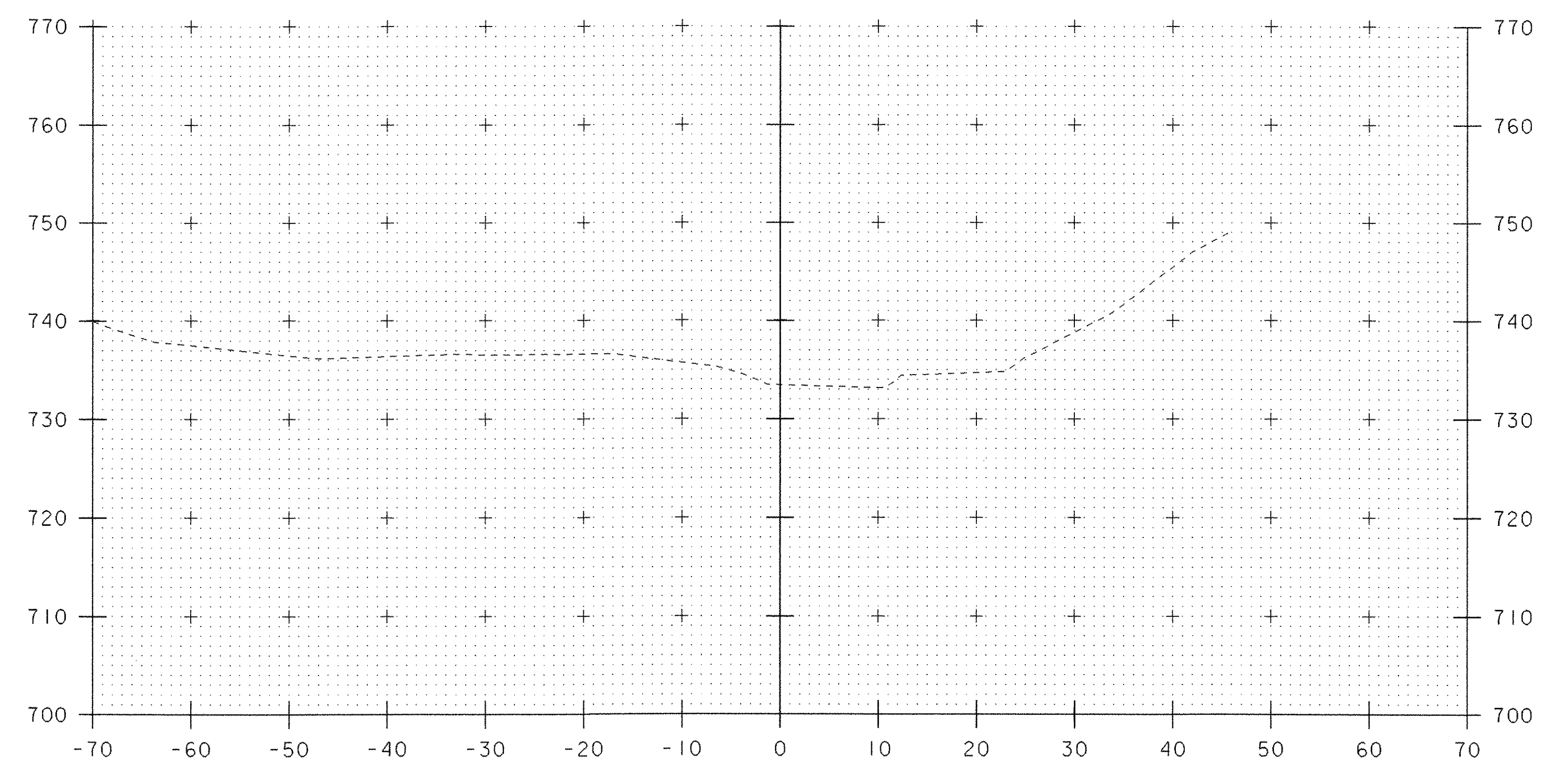


51+90



51+60

STA. 51+54.9 LT.
END STRUCTURE EXCAVATION
GRANULAR BACKFILL FOR STRUCTURES



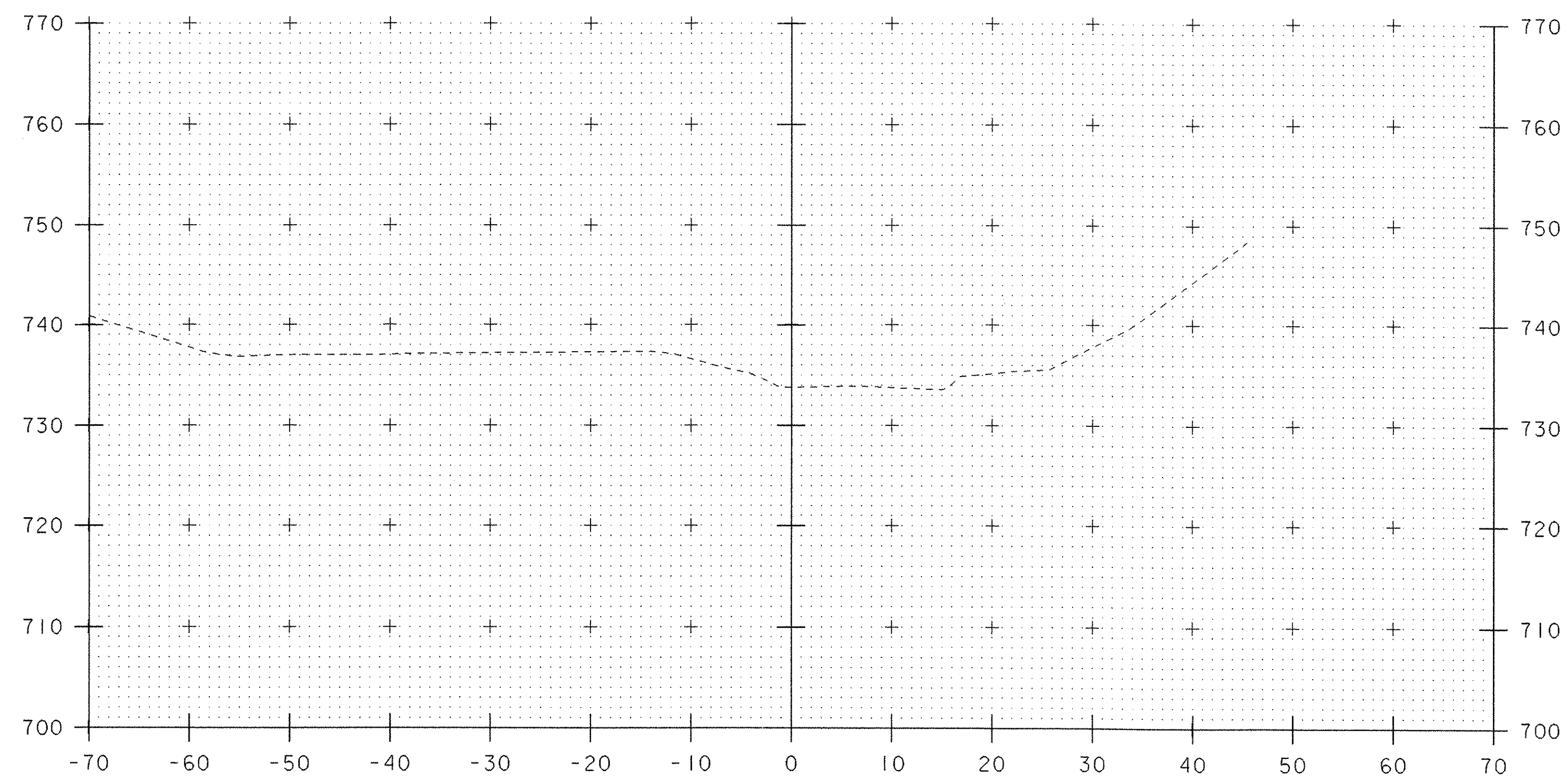
51+80

STA. 51+75.00
END UNCL. CHAN. EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE III
GRUBBING MATERIAL

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

CHANNEL CROSS SECTIONS (5)

PROJECT NAME:	SPRINGFIELD
PROJECT NUMBER:	ST CULV (5)
FILE NAME:	04c178\Structures\s04c178xs1.dgn
PROJECT MANAGER:	R. R. WHITCOMB
DESIGNED BY:	J. PERRIGO
s04c178c05.1	
PLOT DATE:	21-MAY-2007
DRAWN BY:	M. HALE
CHECKED BY:	D. PETERSON
SHEET	51 OF 52



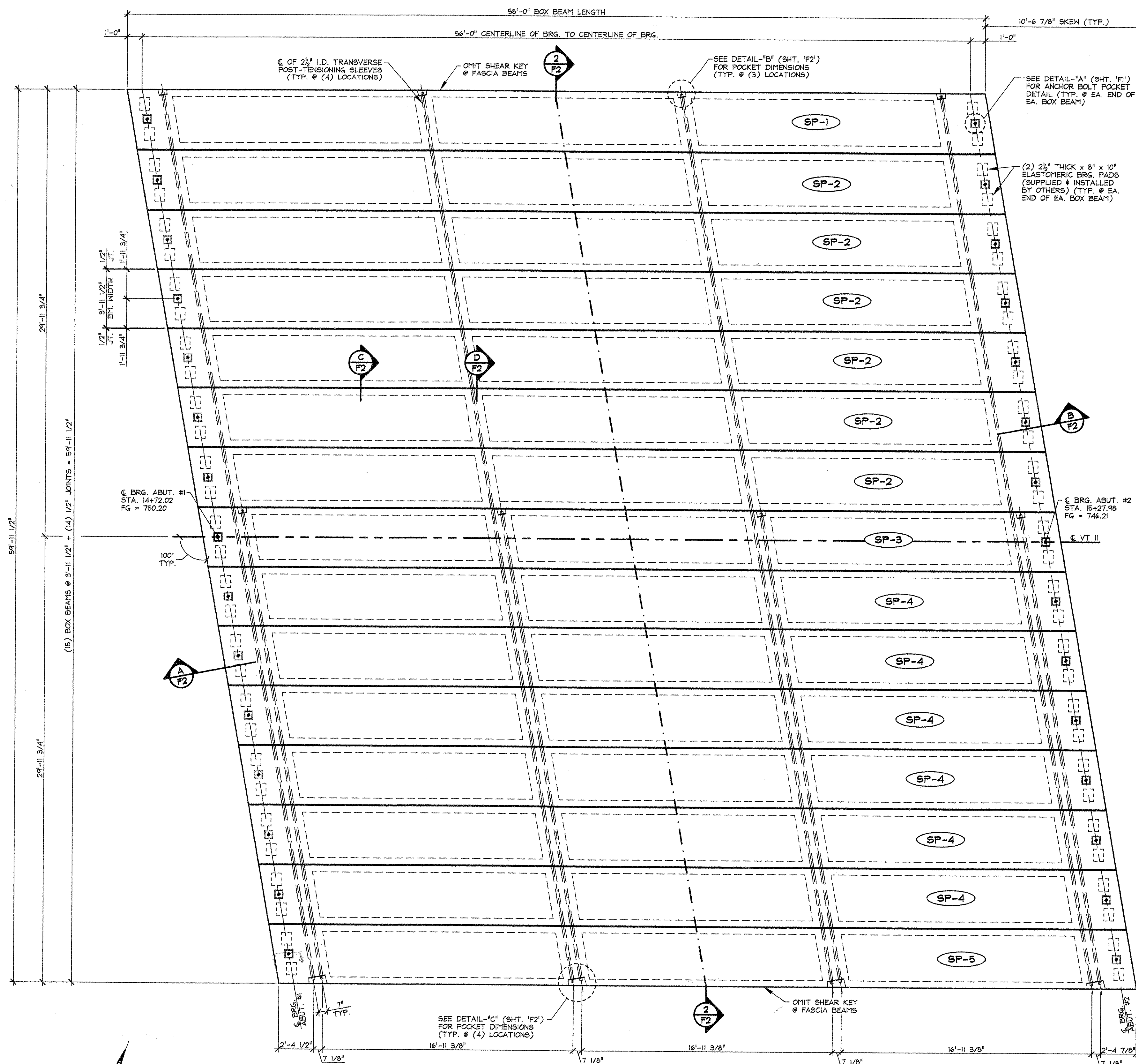
52+00

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

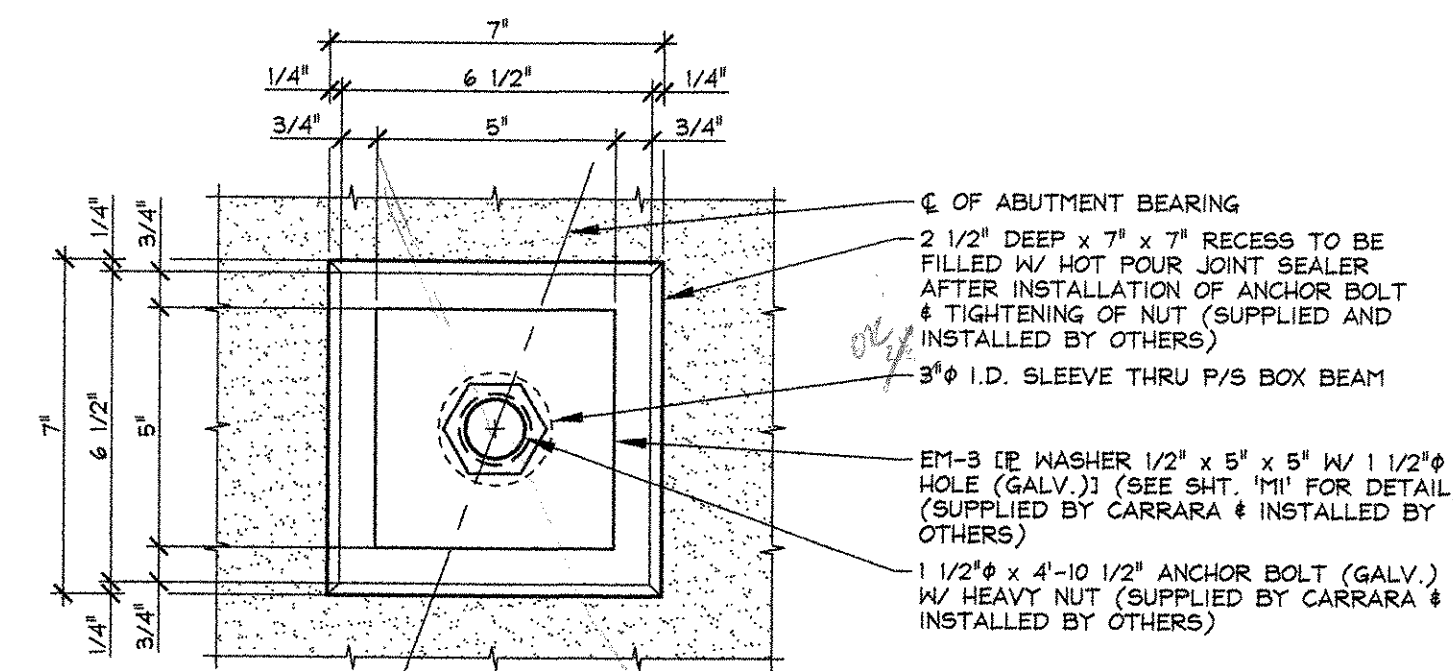
STA. 52+00 TO STA. 52+00

CHANNEL CROSS SECTIONS (6)

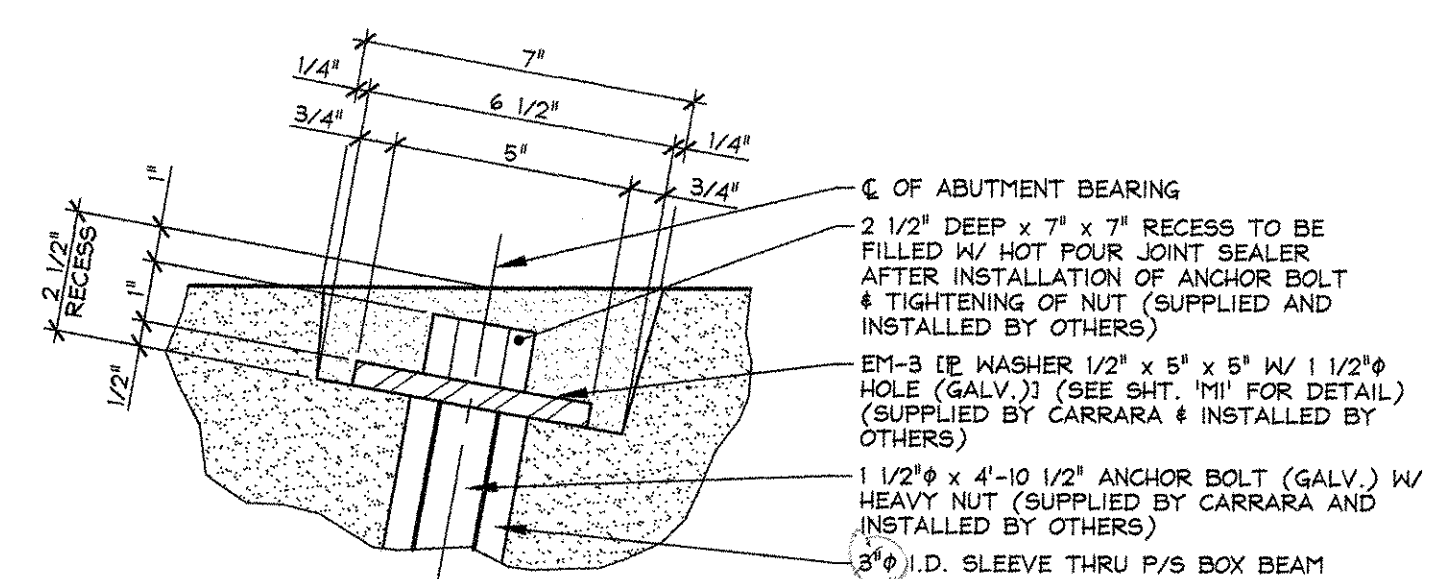
PROJECT NAME:	SPRINGFIELD	
PROJECT NUMBER:	ST CULV (5)	
FILE NAME:	04c178\Structures\s04c178xs1.dgn	PLOT DATE: 21-MAY-2007
PROJECT MANAGER:	R. R. WHITCOMB	DRAWN BY: M. HALE
DESIGNED BY:	J. PERRIGO	CHECKED BY: D. PETERSON
s04c178c06.i		SHEET 52 OF 52



PRESTRESSED BOX BEAM LAYOUT
1/4" = 1'-0"



PLAN @ BOX BEAM C



SECTION @ BOX BEAM C

DETAIL - \"A\"
3" = 1'-0"

GENERAL NOTES

- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 6,000 PSI.
- MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 4,000 PSI.
- REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31) AND SHALL BE EPOXY COATED.
- PRESTRESSING STRANDS SHALL CONFORM TO ASTM A-416 (AASHTO M228) AND SHALL CONSIST OF 0.60" x 270 KSI 7-WIRE LOW RELAXATION STRANDS.
- PRESTRESSING STRANDS SHALL EACH BE PULLED TO HAVE A NET TENSION OF 44.0 K AFTER ACCOUNTING FOR CHUCK SLIPPAGE. TENSION SHALL BE VERIFIED BY MEASURING STRAND ELONGATION. (SEE EXAMPLE ELONGATION CALCULATION AND TENSIONING PROCEDURE, THIS SHEET.)
- ENDS OF PRESTRESSING STRANDS SHALL BE CUT, RECESSED & GROUDED FLUSH WITH END OF BOX BEAMS.
- ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
- THE TOP OF BEAMS SHALL RECEIVE A FLOAT FINISH.
- SHEAR KEY SURFACES SHALL BE BLASTED CLEAN.
- BEAMS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. BEAMS SHALL BE STORED AND TRANSPORTED WITH TIMBER SUPPORTS WITHIN 2'-0" OF THE BEAM ENDS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
- MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. PS10.02 AND PS10.05 RESPECTIVELY. DESIGN MIX: J.P.C. BRIDGE MIX 430
- QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
- THE VOIDS MUST BE VENTED DURING CURING PERIOD.
- CURING METHOD: AS SOON AS THE TOP OF BEAM IS FINISHED, A COVER OF POLY AND A LAYER OF MOISTURE (OR BLUE BOARD) WILL BE PLACED OVER THE BEAM. THE DESIRED CURING TEMPERATURE RANGE SHALL NOT DROP BELOW 70°F. THE TEMPERATURE SHALL BE RECORDED BY AUTOMATIC SENSOR INSTRUMENTS ON GRAPH CHARTS, SPACED NOT MORE THAN 100' APART AND WILL CONTINUE UNTIL RELEASE STRENGTH IS ACHIEVED, (NATURAL CURE WITH NO EXTERNAL HEAT APPLIED). EACH CHART SHALL BE MARKED.
- TRANSVERSE POST-TENSIONING SEQUENCE:
 - ONCE VOIDED SLABS ARE ERECTED, POST-TENSION TENDONS TO APPROXIMATELY 5,000 LBS.
 - GROUT SHEAR KEYS.
 - ONCE SHEAR KEY GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI, POST TENSION TENDONS TO 30,000 LBS.

EXAMPLE PRESTRESSING STRAND ELONGATION CALC. AND TENSIONING
(NOT TO BE USED FOR CONSTRUCTION)

SIZE & GRADE: 0.60" x 270 KSI
AREA: 0.217 IN²
TENSION: 44,000 LB. EACH STRANDS
GRIP-TO-GRIP: 192'-4 3/4" = 192.81'
Es = 28,600,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)
EXAMPLE:
$$\Delta = \frac{PL}{AE} = \frac{(44,000 - 3,000) \times 192.81 \times 12}{0.217 \times 28,600,000} = 15.24"$$

THEREFORE: (TOLERANCES ± 5%)
 Δ UPPER LIMIT = 1.05 x 15.24" = 16.05" = 16 1/16"
 Δ LOWER LIMIT = 0.95 x 15.24" = 14.53" = 14 1/2"
EXTRA FORCE REQUIRED TO COMPENSATE FOR 1/2" CHUCK SLIPPAGE:
$$\Delta P = \frac{0.5 \times 44,000}{15.24} = 1,341 \text{ LBS.}$$

TOTAL TENSIONING FORCE = 44,000 + 1,341 = 45,341 LBS.

STRAND TENSIONING PROCEDURE:

- PULL EACH STRAND INITIALLY TO 3,000* LBS. AND MARK STRAND.
 - THEN PULL EACH STRAND TO A TOTAL TENSION OF 45,341* LBS. AND MEASURE ELONGATION AFTER SEATING. IT MUST BE BETWEEN 14 1/2" & 16 1/16".
- * NOTE: FORCES READ ON STRESSING JACK GAUGES MUST BE MADE TO CORRESPOND TO ABOVE VALUES BASED ON CALIBRATION DATA FOR SPECIFIC JACK USED.

APPROVAL STAMP:

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
2464 ONE STAR, MIDDLEBURY, VERMONT 05753 Phone: (802) 388-6361 Fax: (802) 388-9010

J.A. McDONALD, INC.
CONTRACTOR
LYNDON, VERMONT

STATE OF VERMONT A.O.T.
COUNTY OF WINDSOR

DATE: JUNE 20, 2007

TOWN OF SPRINGFIELD
VERMONT ROUTE 11

SCALE: NOTED

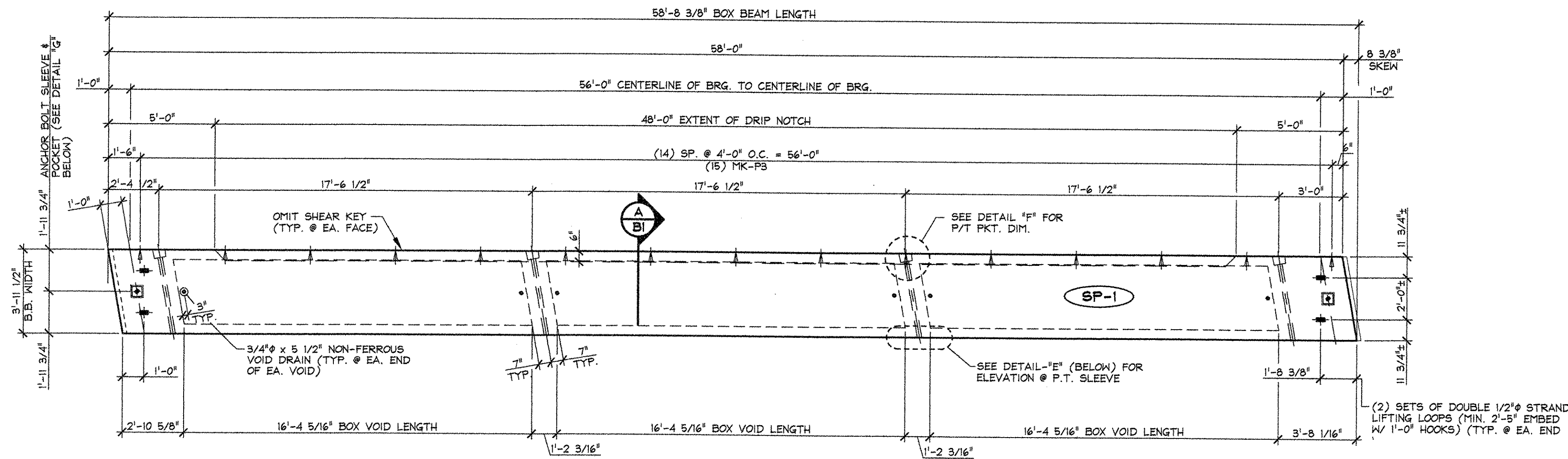
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CHKD: D.F. DFTM: T.J.D.

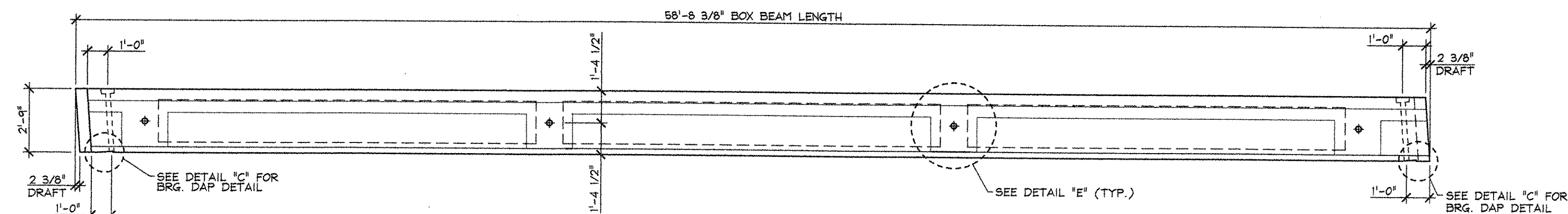
SUPERSTRUCTURE PLAN & DETAILS

JOB NO: 23258-007

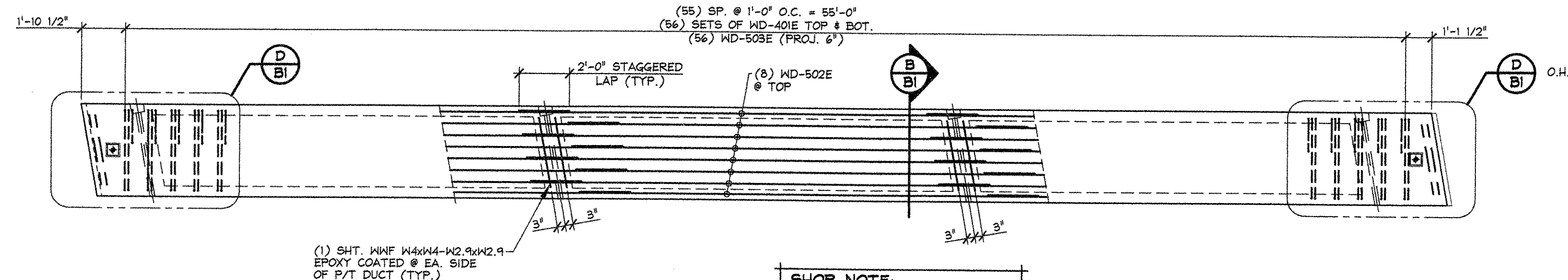
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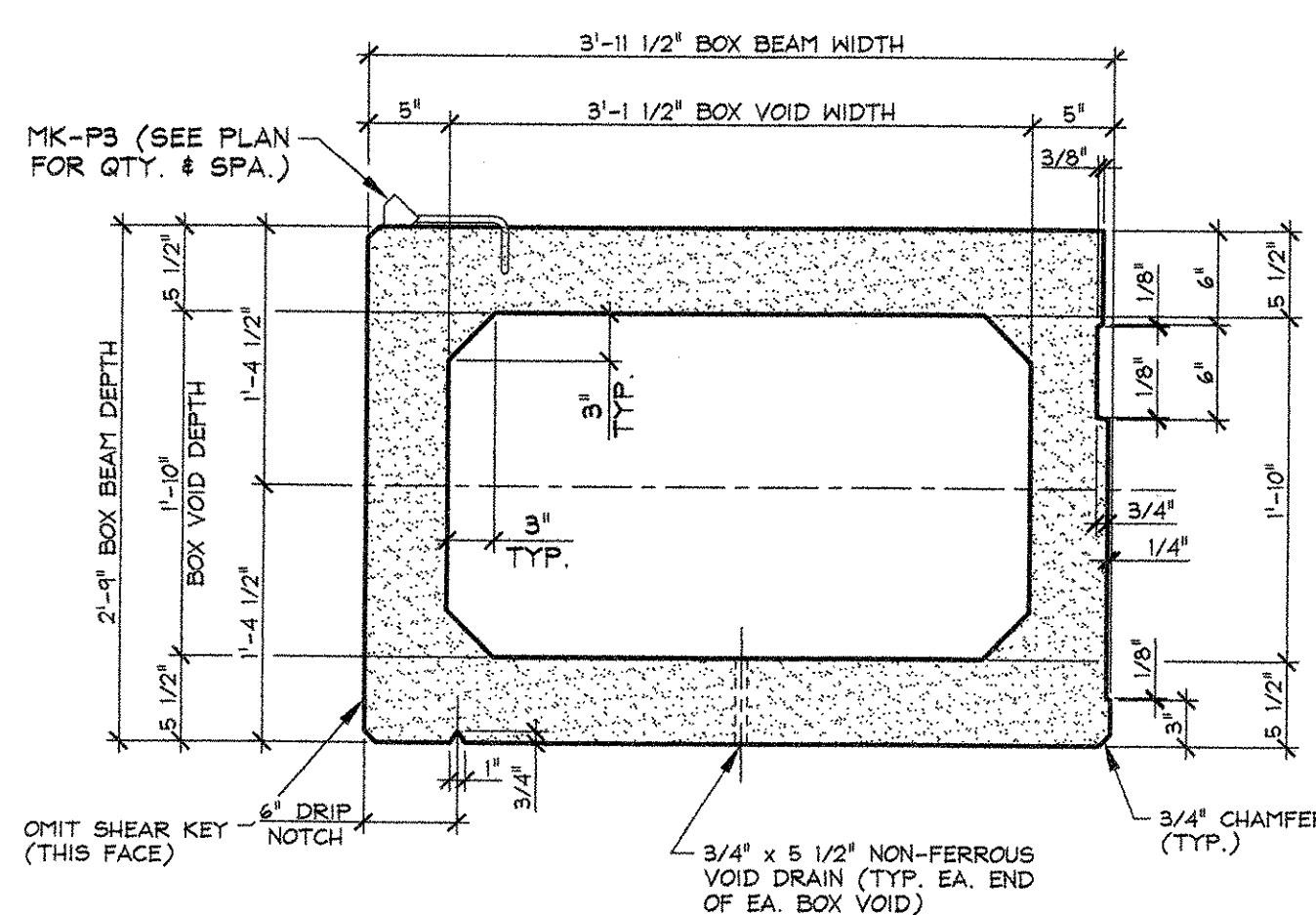
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1/4" = 1'-0"



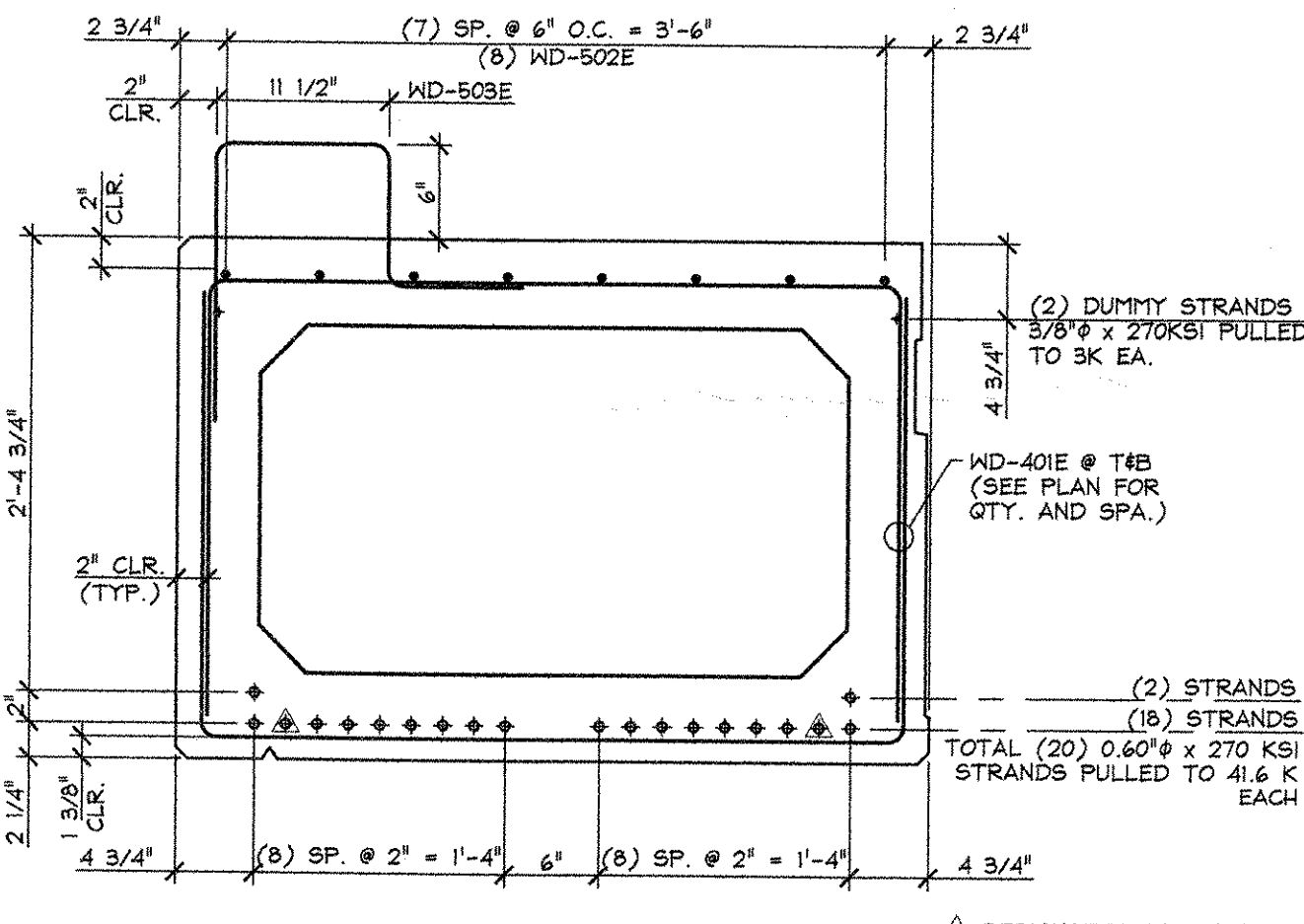
2 ELEVATION VIEW IN FORM
1/4" = 1'-0"



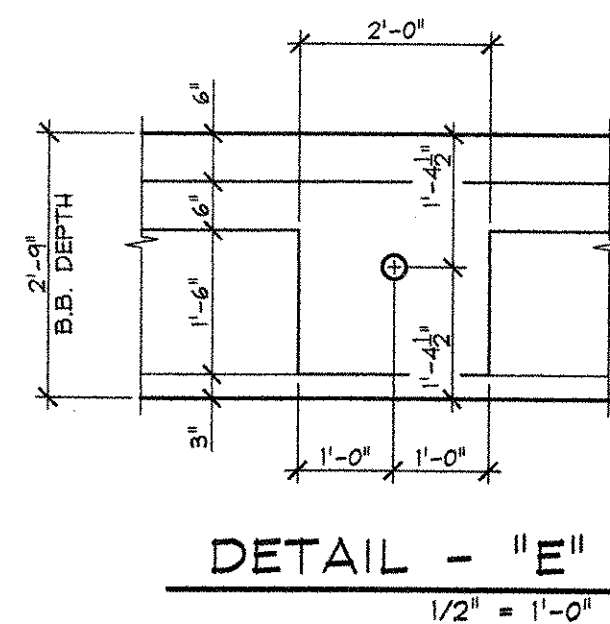
3 REINFORCING PLAN VIEW IN FORM
1/4" = 1'-0"



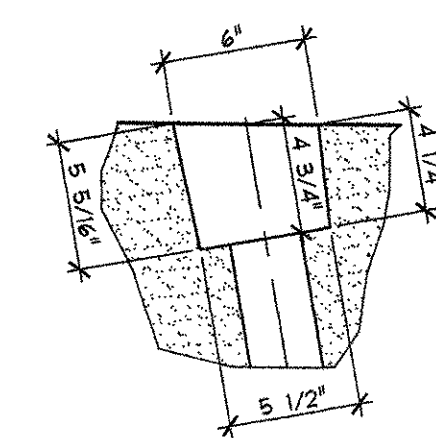
A DIMENSIONAL SECTION
1" = 1'-0"



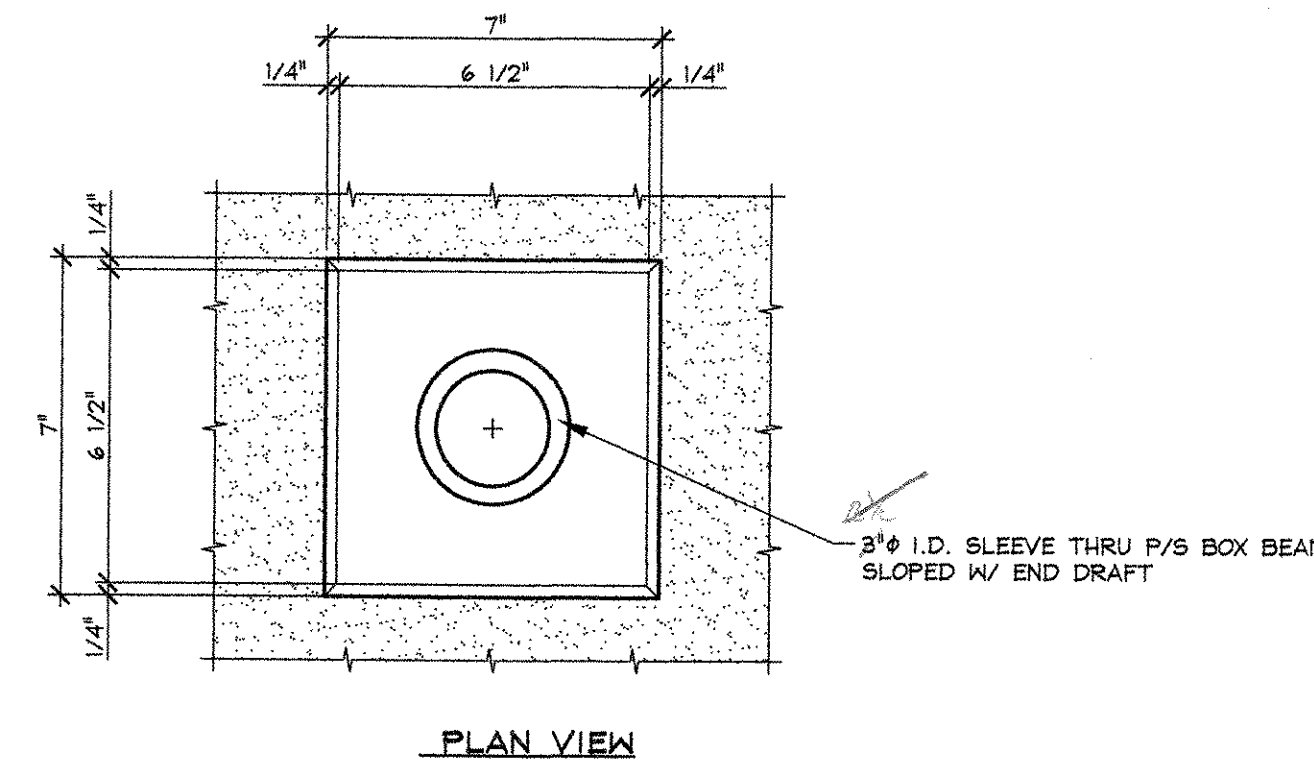
B REINFORCING SECTION
1" = 1'-0"



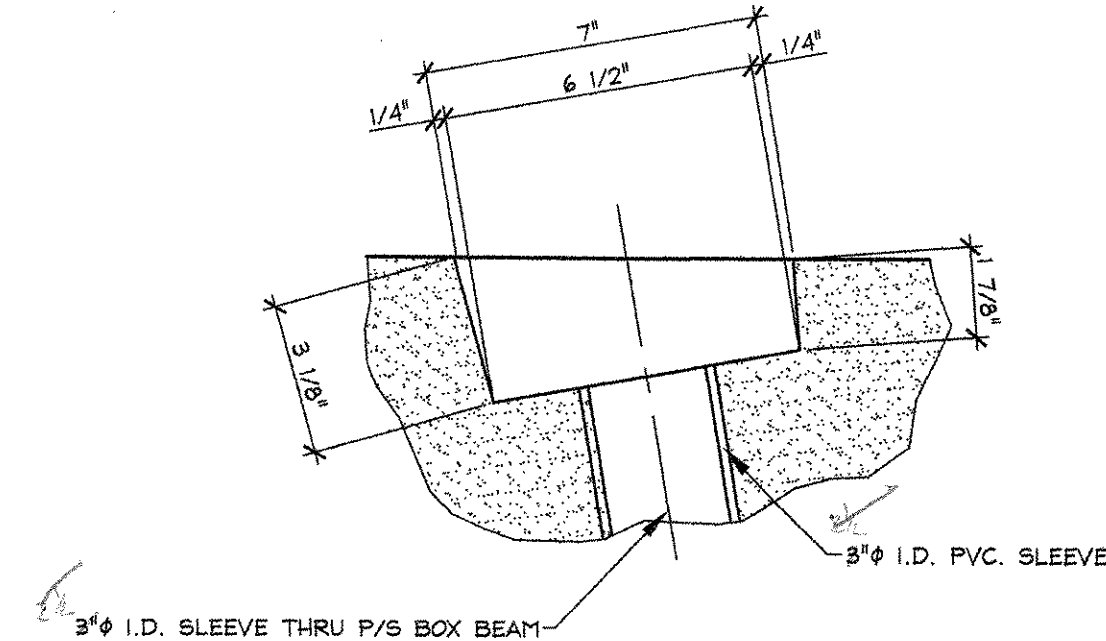
DETAIL - "E"
1/2" = 1'-0"



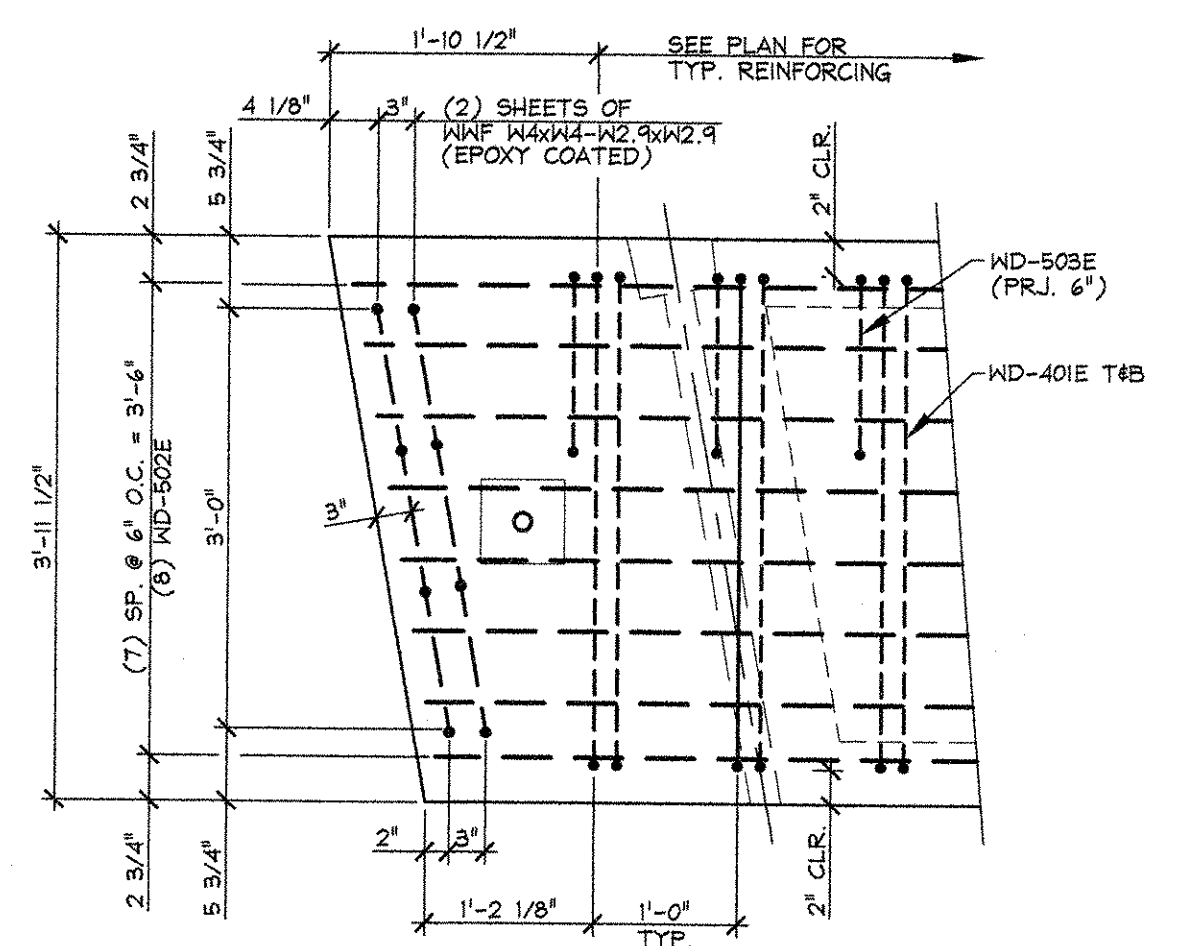
DETAIL - "F"
1 1/2" = 1'-0"



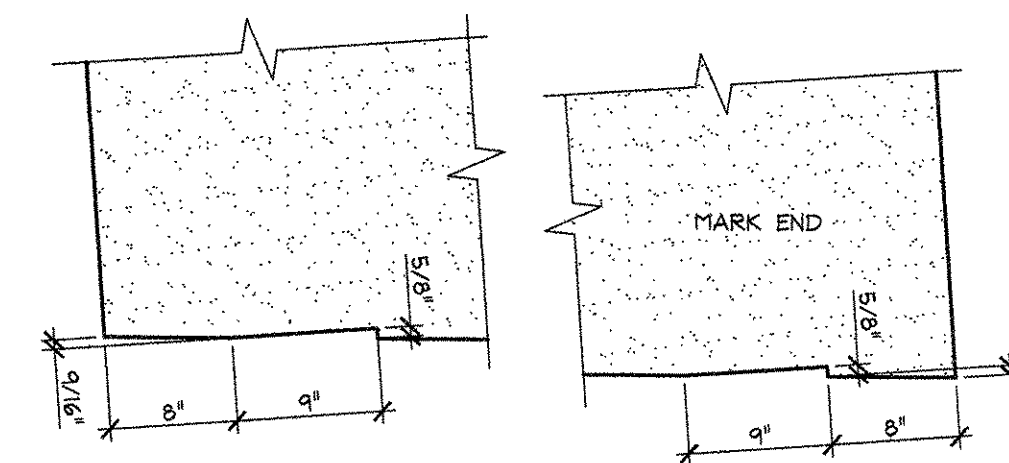
PLAN VIEW



DETAIL - "G"
3" = 1'-0"



D END BLOCK REINFORCING DETAIL
1" = 1'-0"



C BRG. BLOCKOUT DETAILS
1" = 1'-0"

MARK:	SP-1	QTY.:	1	WT.:	26.85 T	VOL.:	13.26 cy
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MATERIAL LIST / VOIDED BOX BEAM			
ITEM	MARK	DESCRIPTION	QTY
1	401	#4 BENT BAR (EPOXY COATED)	11
2	502	#5 x 57'-8" (W/ (3) 2'-0" STAGGERED LAPS)	8
3	503	#5 BENT BAR	5
4			
5			
6			
7			
8			
9			
10			
11			
12			
13		WWF W4xW4-W2.9xW2.9 [2'-0" x 3'-0"] (EPOXY COATED)	8
14	MK-P3	DAYTON C-24 TYPE 4-APR PRESS-STEEL PRECAST HALF HANGER (GALV.)	15
15		3'-1 1/2" x 1'-10" x 16'-4 5/16" BOX VOID	3
16		3/4"φ x 5 1/2" NON-FERROUS VOID DRAINS	6
17		DOUBLE 1/2"φ STRANDS LIFTING LOOPS	4
18			

APPROVAL STAMP:

RECEIVED
OK'D BY: *DRG* OK'D BY: *CLC*
JUL 10 2007
RESUBMIT: *✓* APPROVED: *✓*
BY: *RLW* DATE: *7/10/07*

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
2464 ONE ST., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010

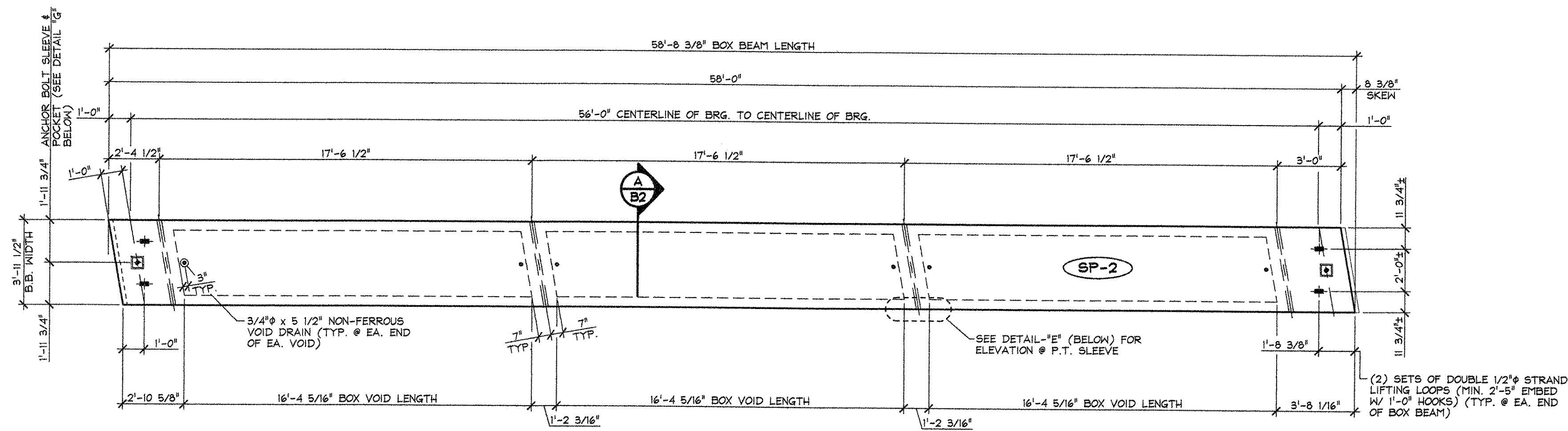
J.A. McDONALD, INC.
CONTRACTOR
LYNDON, VERMONT

STATE OF VERMONT A.O.T.
COUNTY OF WINDSOR

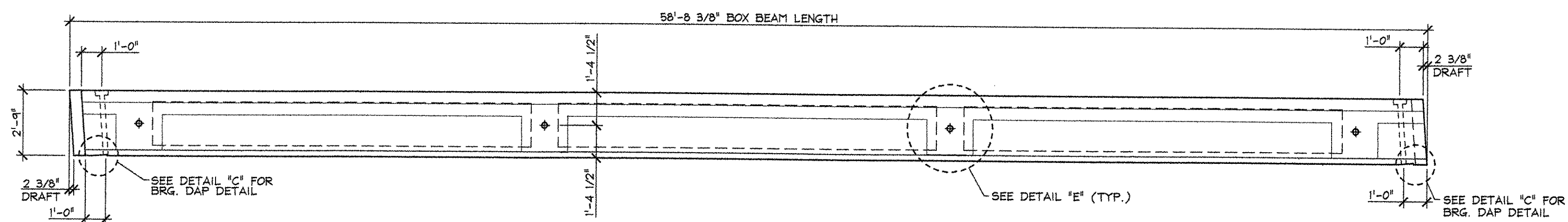
TOWN OF SPRINGFIELD
VERMONT ROUTE 11
BRIDGE NO.: 55 PROJECT NO.: ST CULV(5)

BOX BEAM SECTIONS & DETAILS

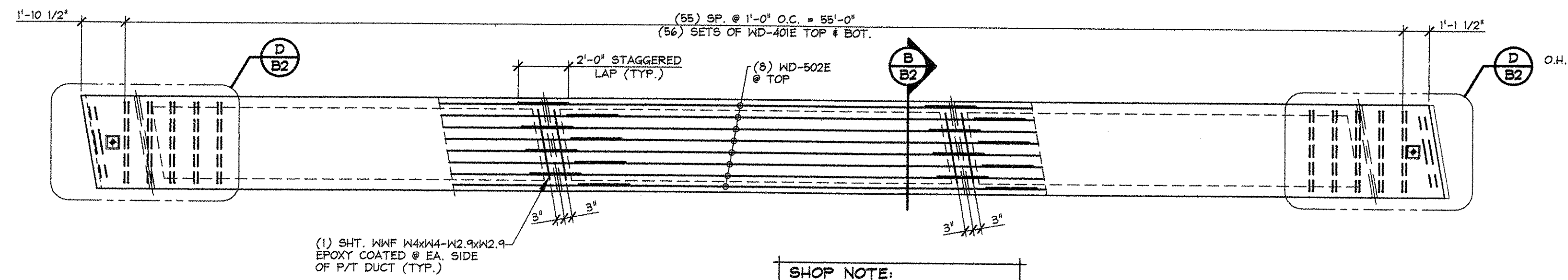
DATE: JUNE 20, 2007
SCALE: NOTED
CHKD: D.F. DFTM: T.J.D.
JOB NO: 23258-007
DWG. NO: B1



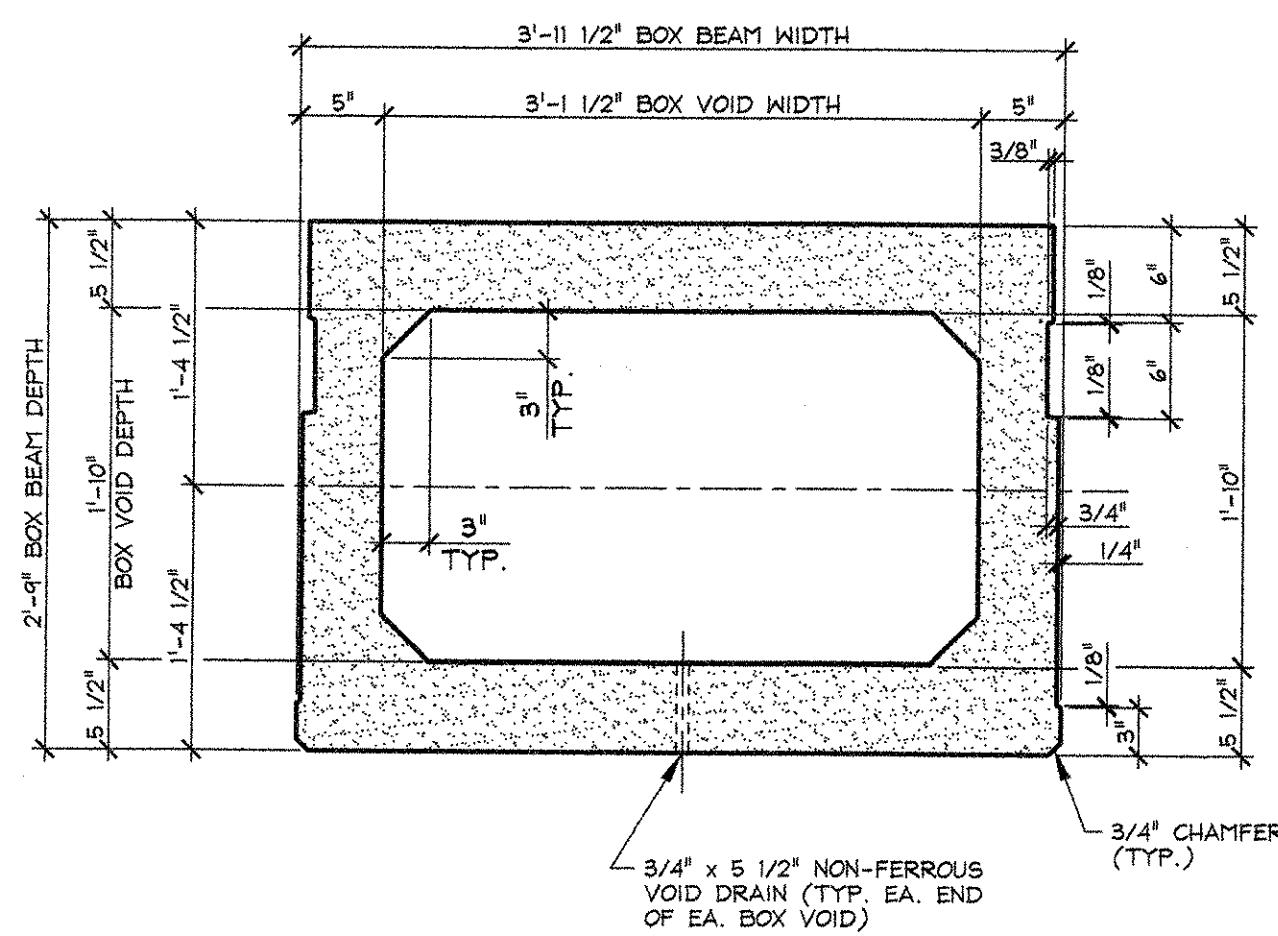
1 DIMENSIONAL PLAN VIEW IN FORM
B2
1/4" = 1'-0"



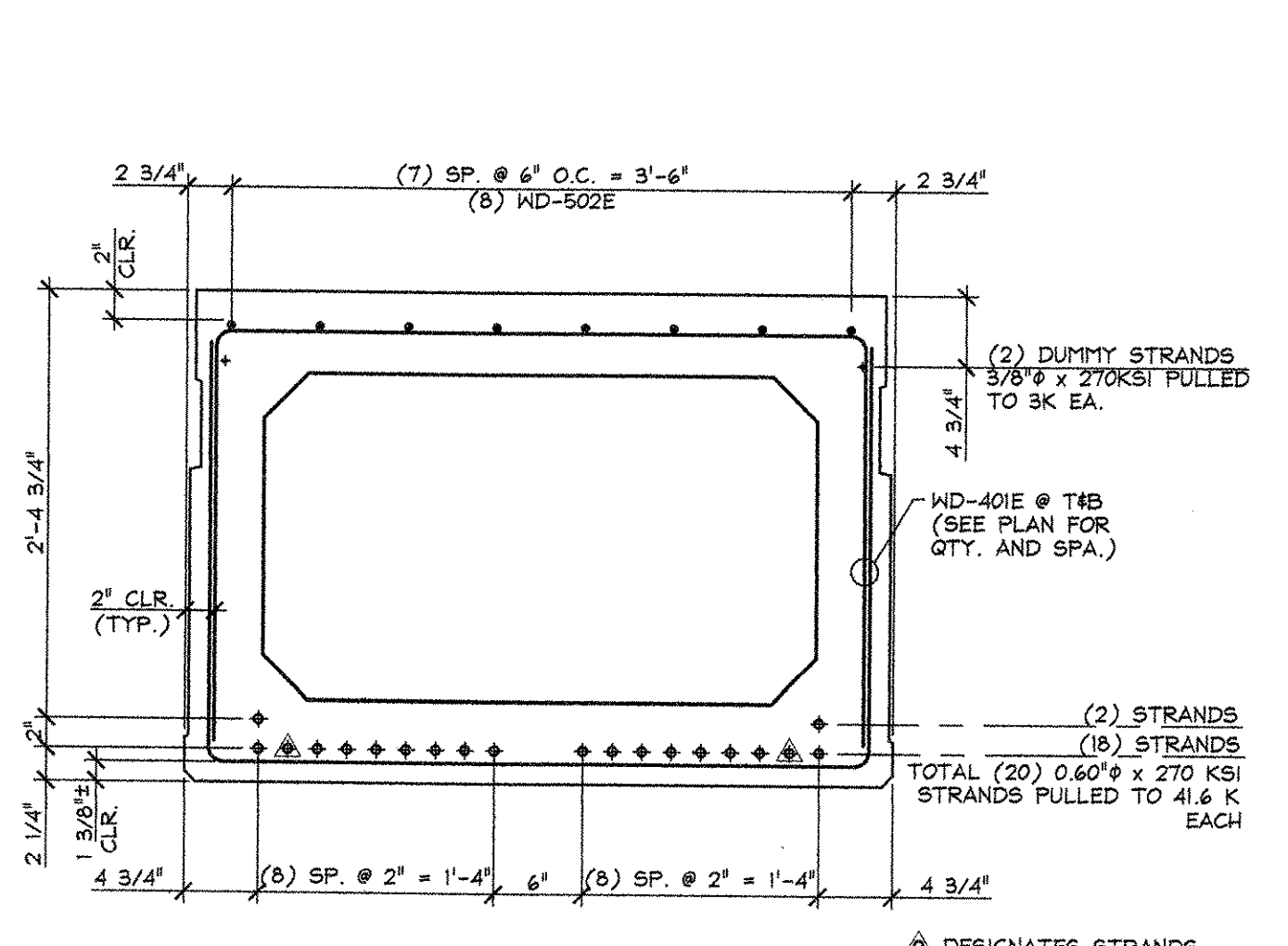
2 ELEVATION VIEW IN FORM
B2
1/4" = 1'-0"



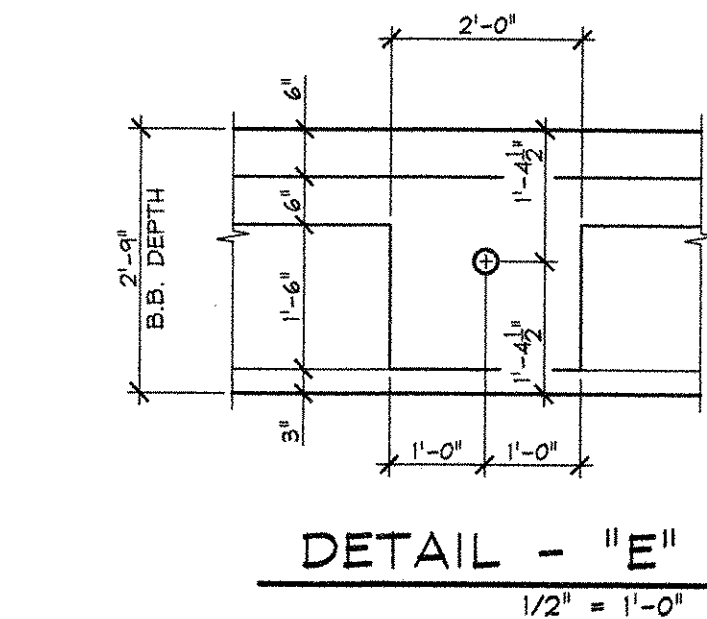
3 REINFORCING PLAN VIEW IN FORM
B2
1/4" = 1'-0"



A DIMENSIONAL SECTION
B2
1" = 1'-0"

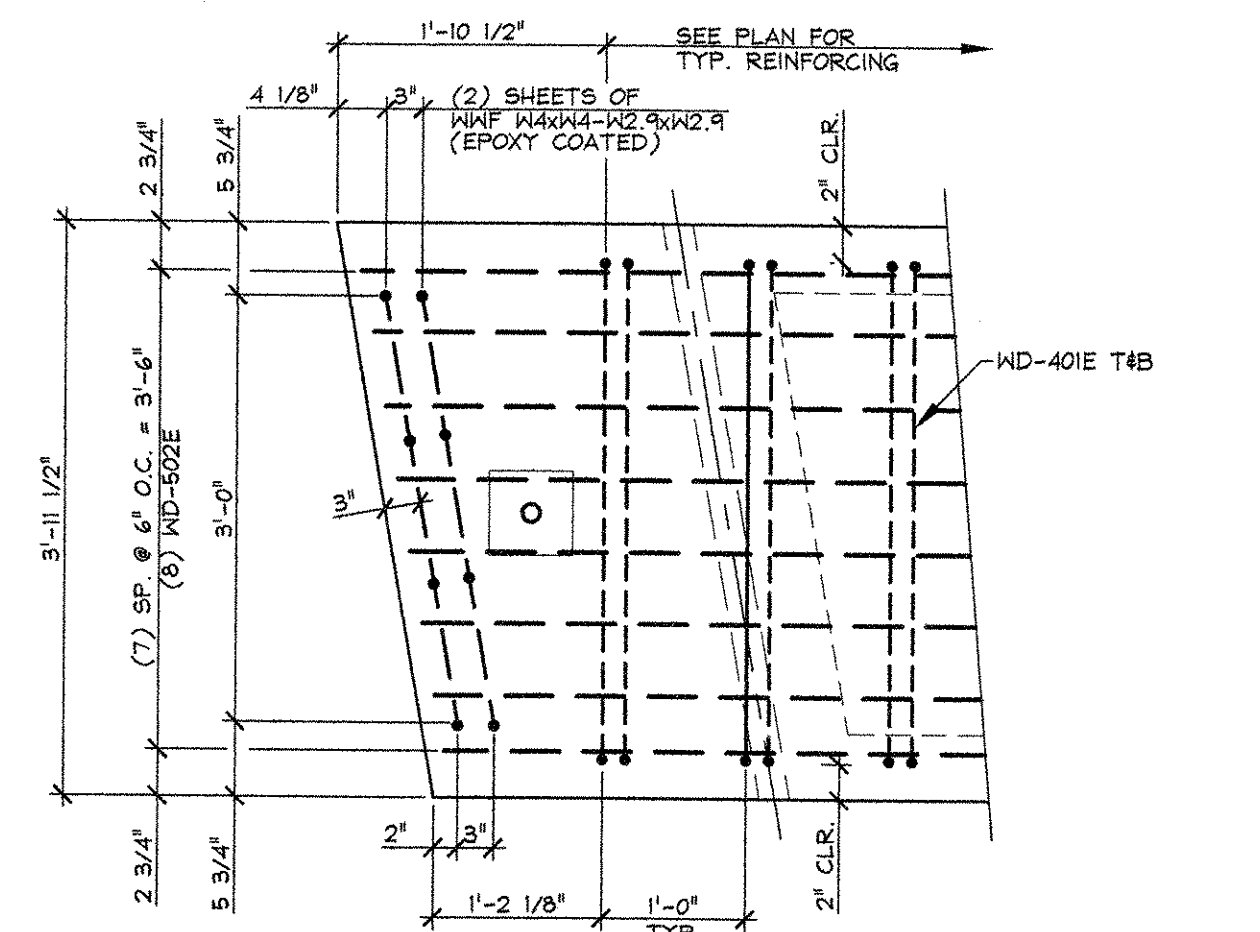
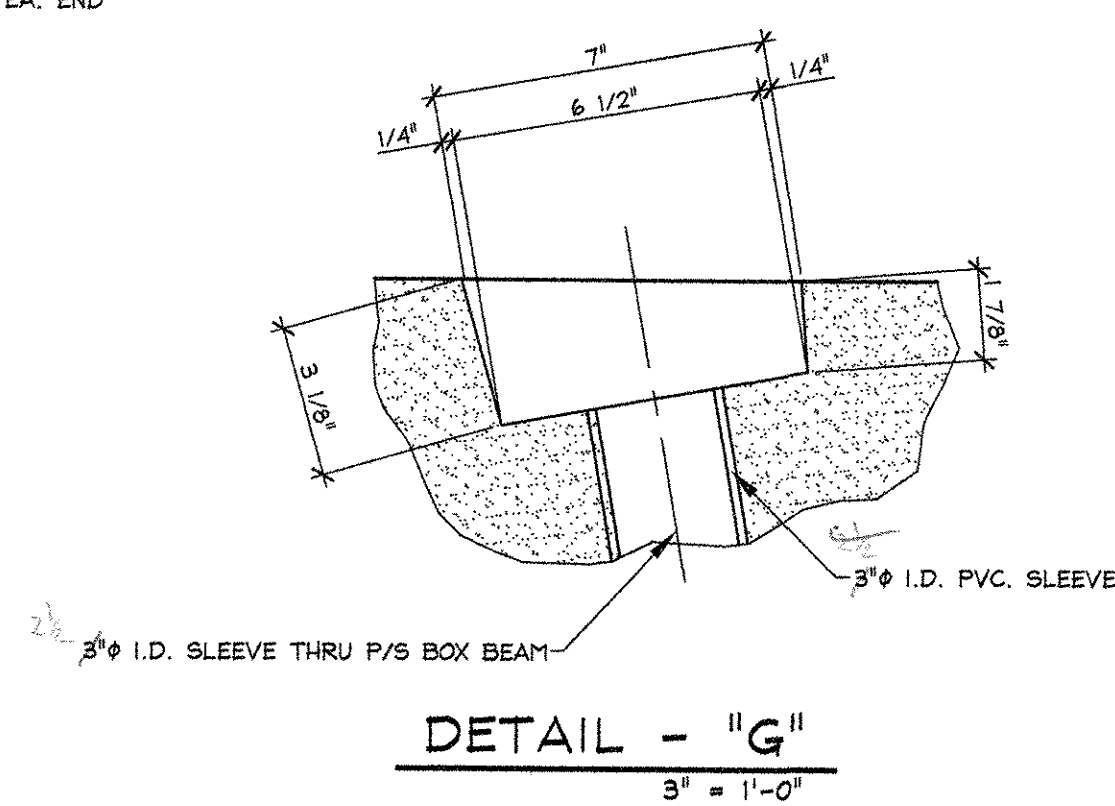
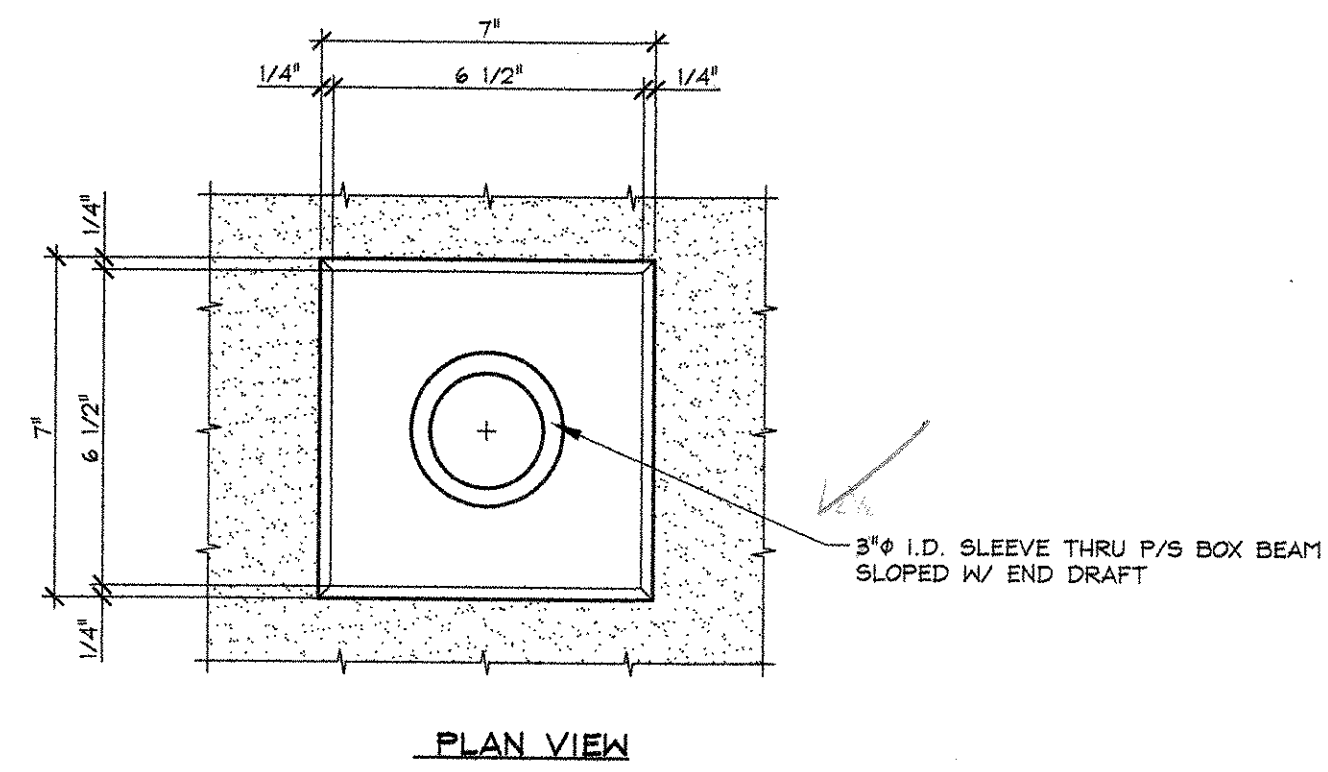


B REINFORCING SECTION
B2
1" = 1'-0"

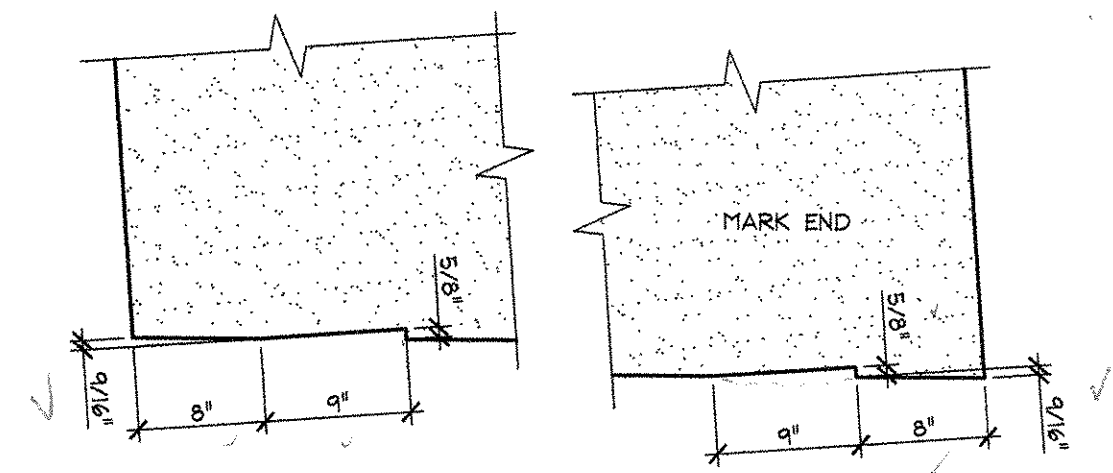


DETENSIONING SCHEDULE
N.T.S.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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D END BLOCK REINFORCING DETAIL
B2
1" = 1'-0"



C BRG. BLOCKOUT DETAILS
B2
1" = 1'-0"

MARK: SP-2	QTY.: 6	WT.: 26.85 T	VOL.: 13.26 cy
MATERIAL LIST / VOIDED BOX BEAM			
ITEM	MARK	DESCRIPTION	QTY.
1	401	#4 BENT BAR (EPOXY COATED)	112
2	502	#5 x 57'-8" (W/ (3) 2'-0" STAGGERED LAPS)	8
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15		W4F W4XW4-W2.9XW2.9 [2'-0" x 3'-0"] (EPOXY COATED)	8
17		3'-1 1/2" x 1'-10" x 16'-4 5/16" BOX VOID	3
18		3/4"φ x 5 1/2" NON-FERROUS VOID DRAINS	6
19		DOUBLE 1/2"φ STRANDS LIFTING LOOPS	4
20			

APPROVAL STAMP:

RECEIVED
OK'D BY: *DRP* OK'D BY: *CWC*
JUL 10 2007
RESUBMIT: *NEW* APPROVED: *NEW*
BY: *NEW* DATE: *7/10/07*

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
2444 CASE ST., MIDDLEBURY, VERMONT 05753 Phone: (802) 388-6361 Fax: (802) 388-9010

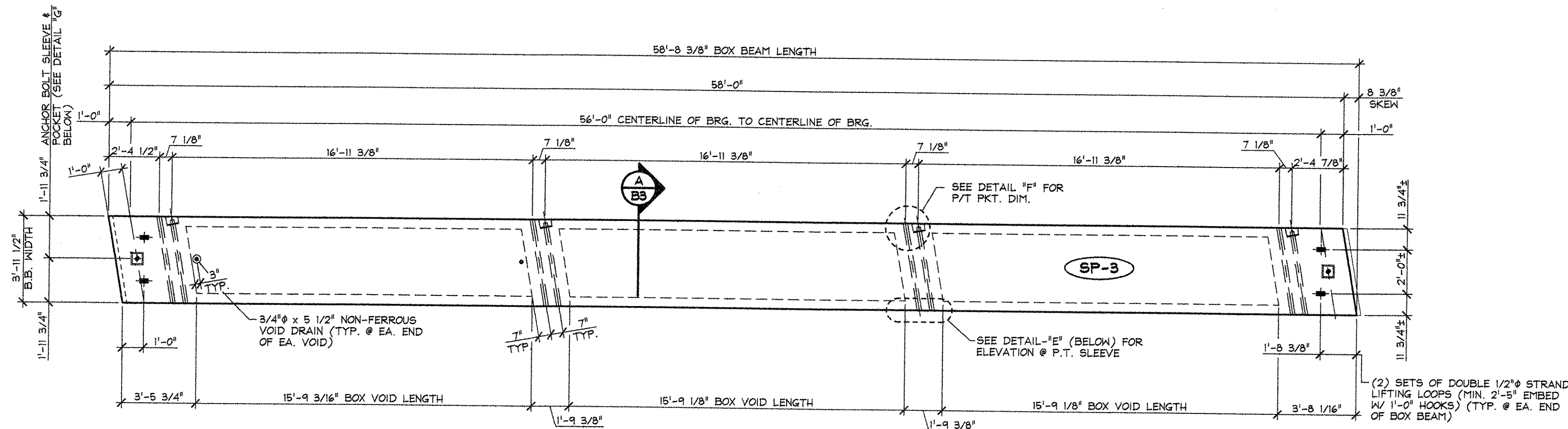
J.A. McDONALD, INC.
CONTRACTOR
LYNDON, VERMONT

STATE OF VERMONT A.O.T.
COUNTY OF WINDSOR

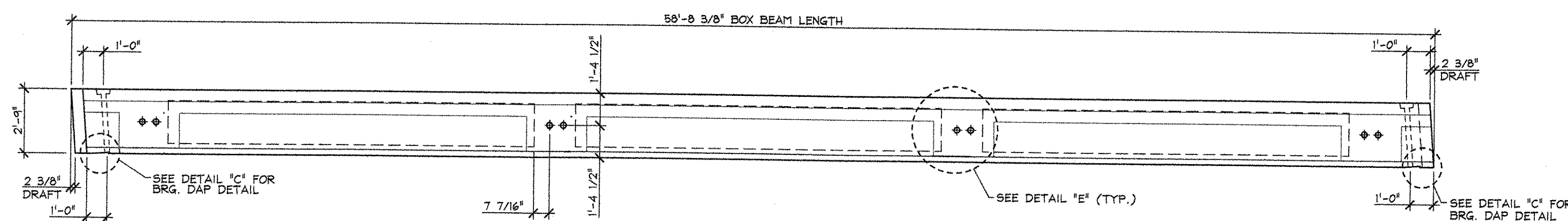
TOWN OF SPRINGFIELD
VERMONT ROUTE 11
BRIDGE NO.: 55 PROJECT NO.: ST CULV(5)

BOX BEAM SECTIONS & DETAILS

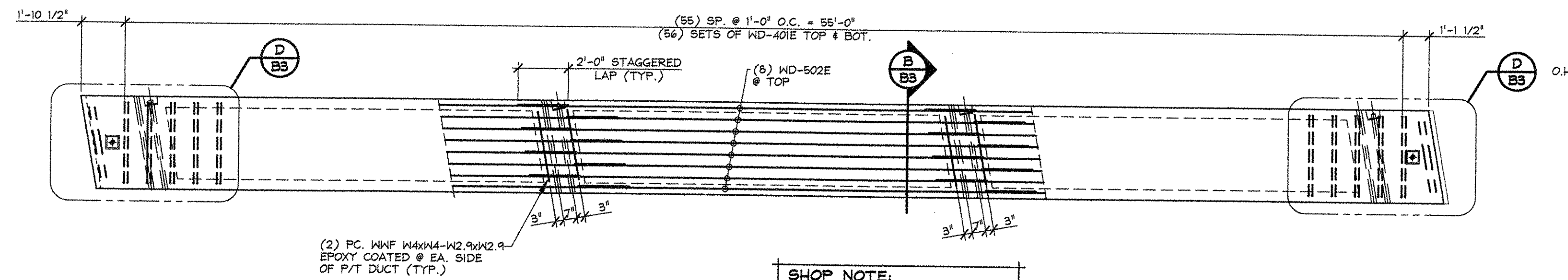
DATE: JUNE 20, 2007
SCALE: NOTED
CHKD: D.F. DFTM: T.J.D.
JOB NO: 23258-007
DWG. NO: B2



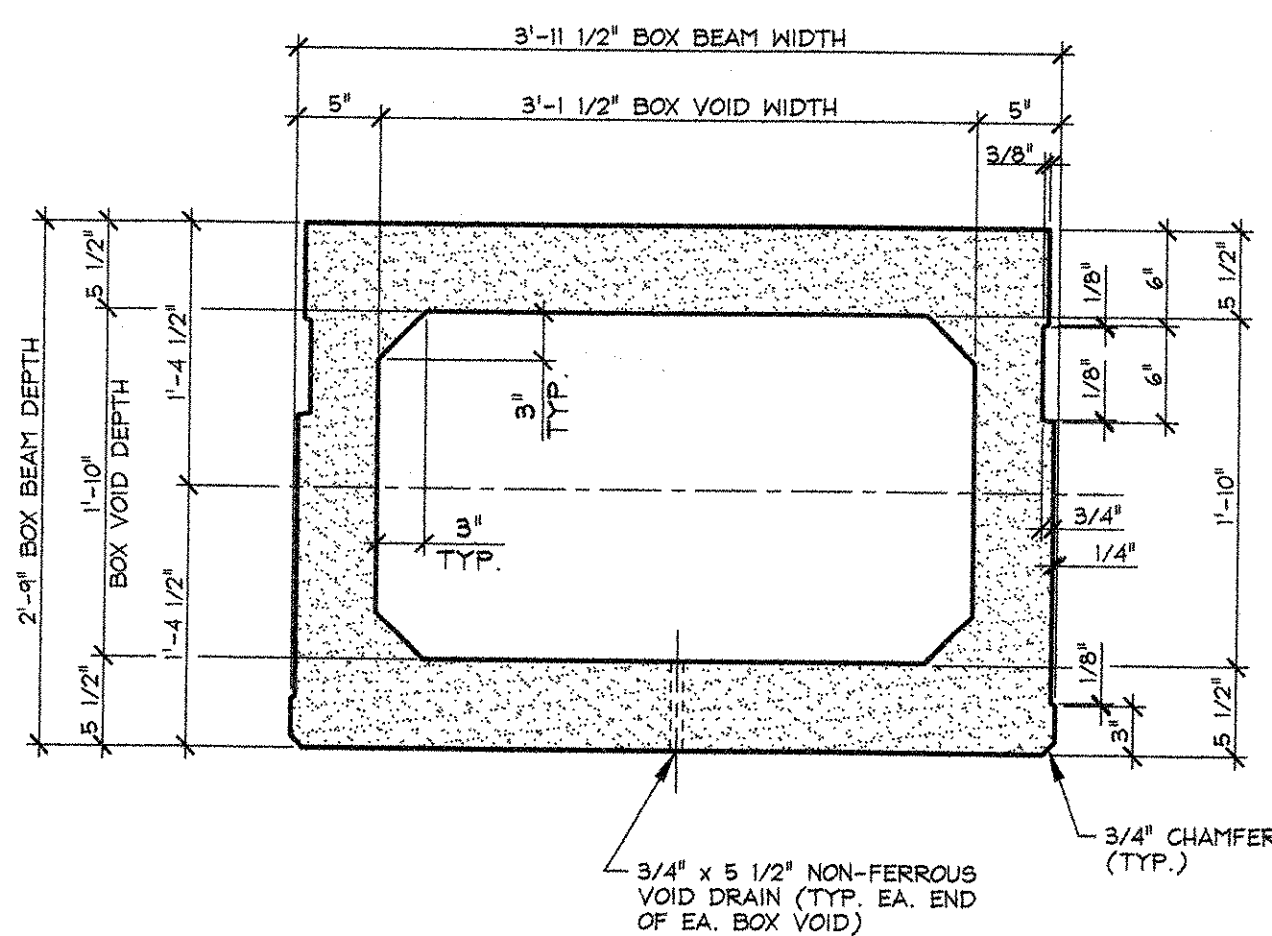
1 DIMENSIONAL PLAN VIEW IN FORM
B3
1/4" = 1'-0"



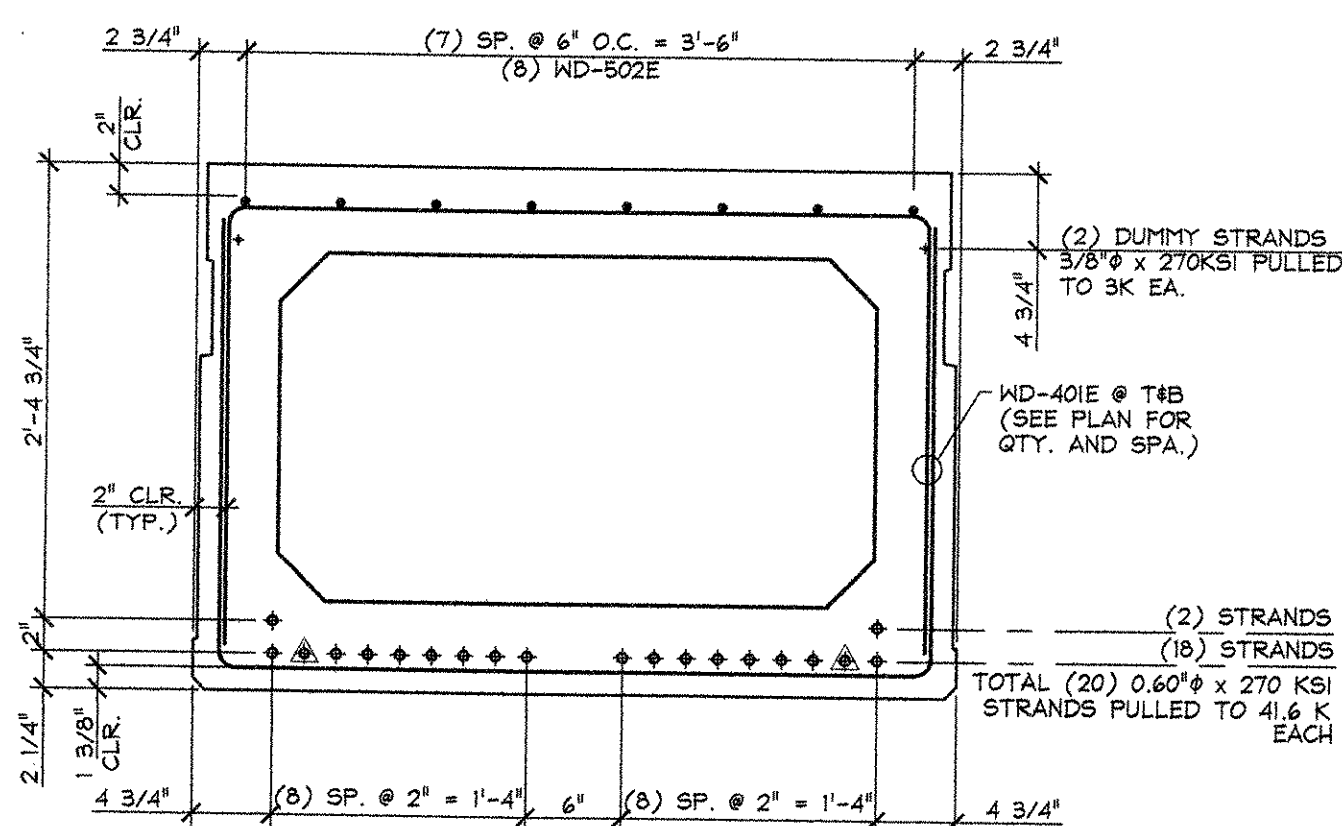
2 ELEVATION VIEW IN FORM
B3
1/4" = 1'-0"



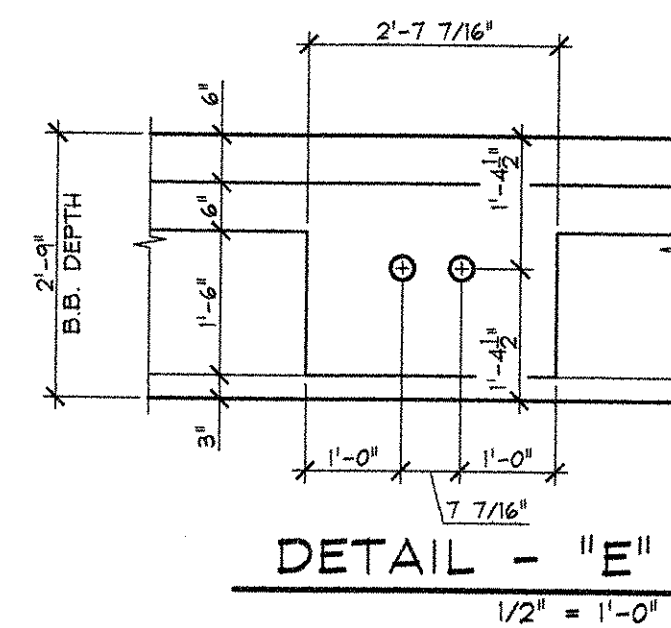
3 REINFORCING PLAN VIEW IN FORM
B3
1/4" = 1'-0"



A DIMENSIONAL SECTION
B3
1" = 1'-0"

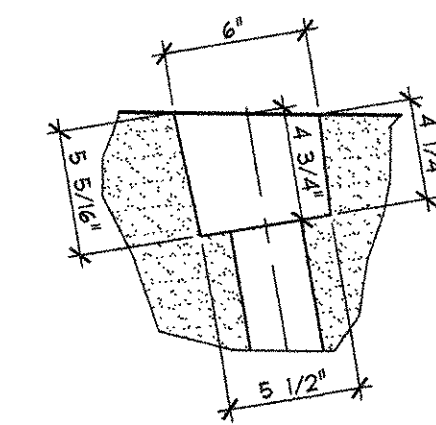


B REINFORCING SECTION
B3
1" = 1'-0"

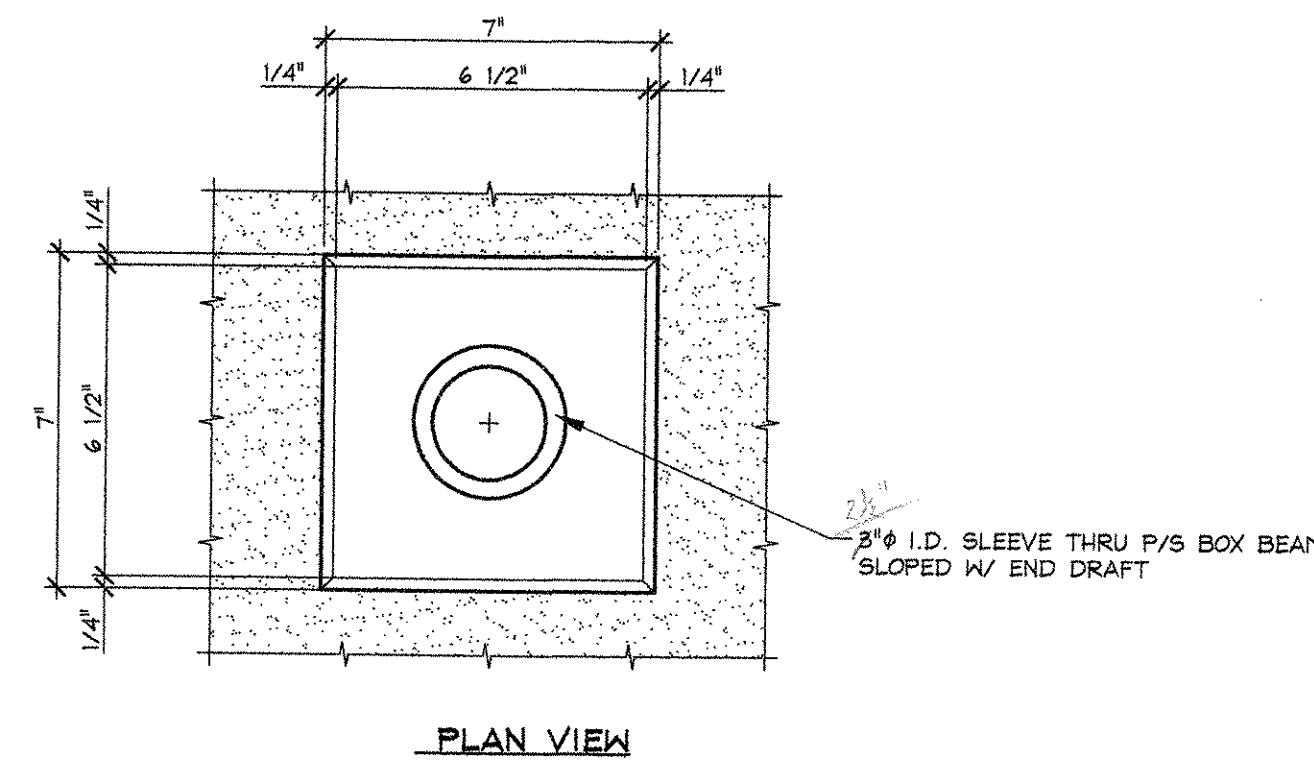


DETENSIONING SCHEDULE
N.T.S.

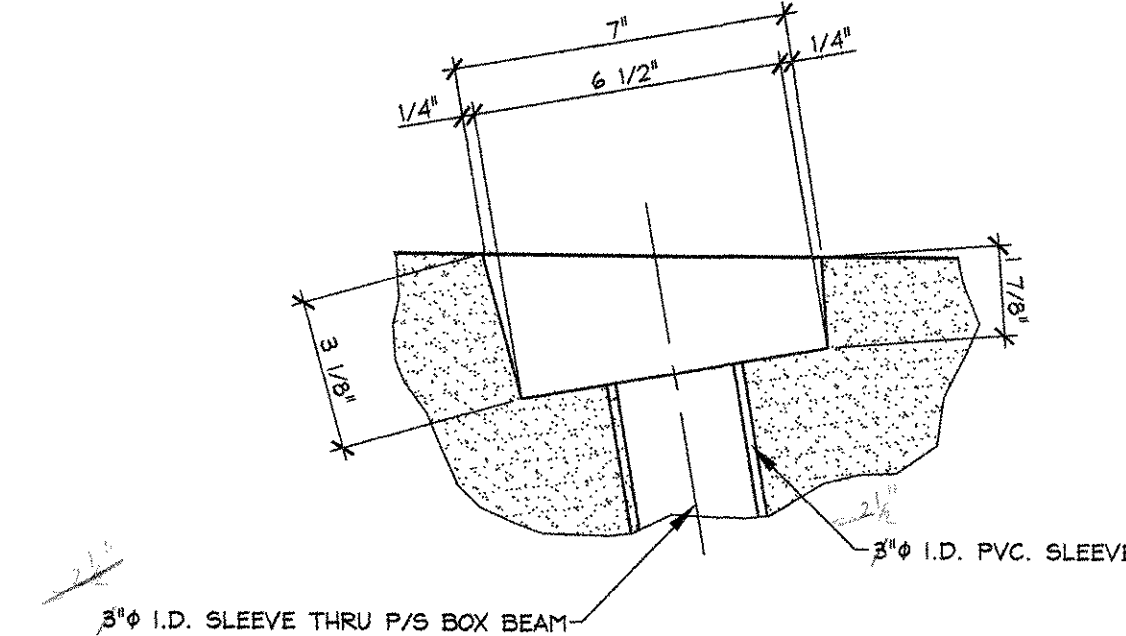
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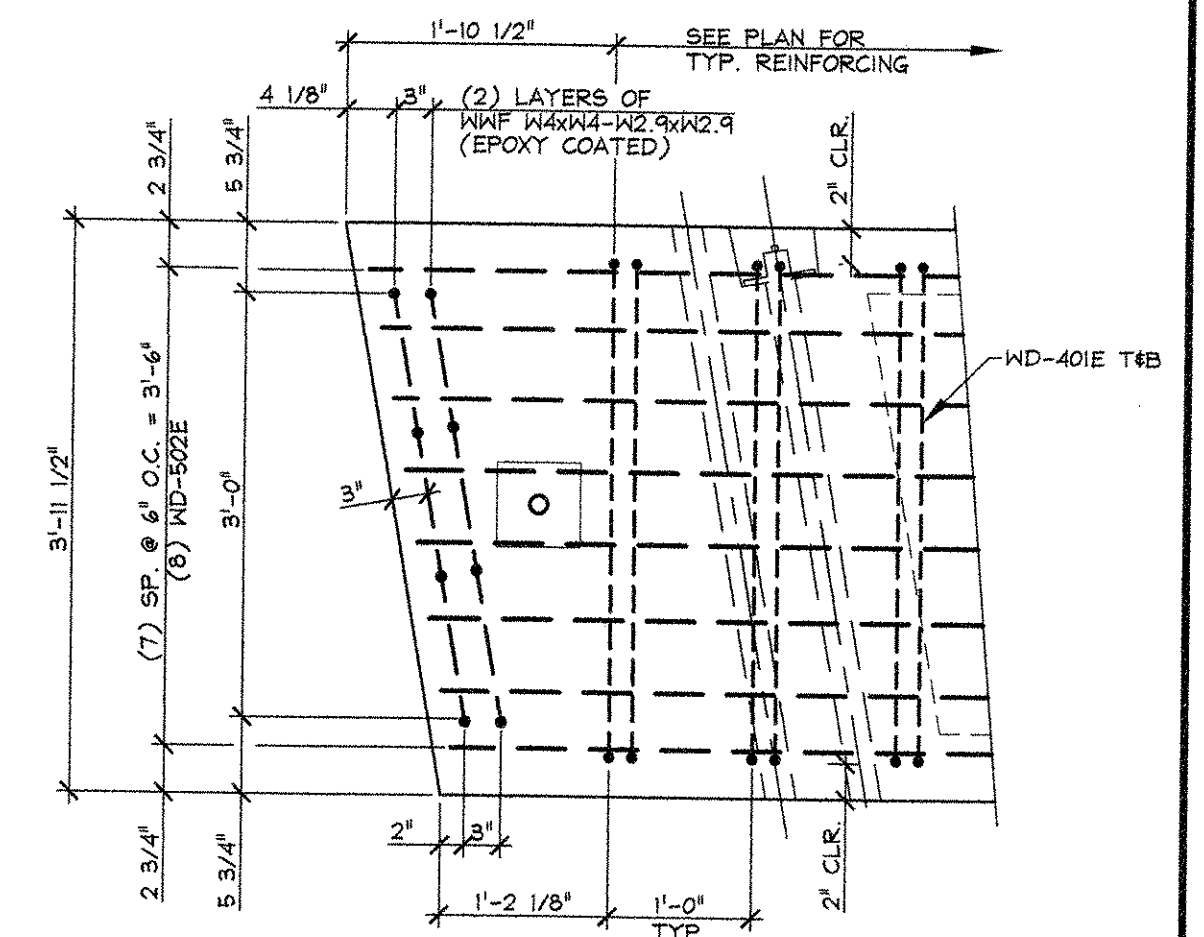
DETAIL - "F"
1 1/2" = 1'-0"



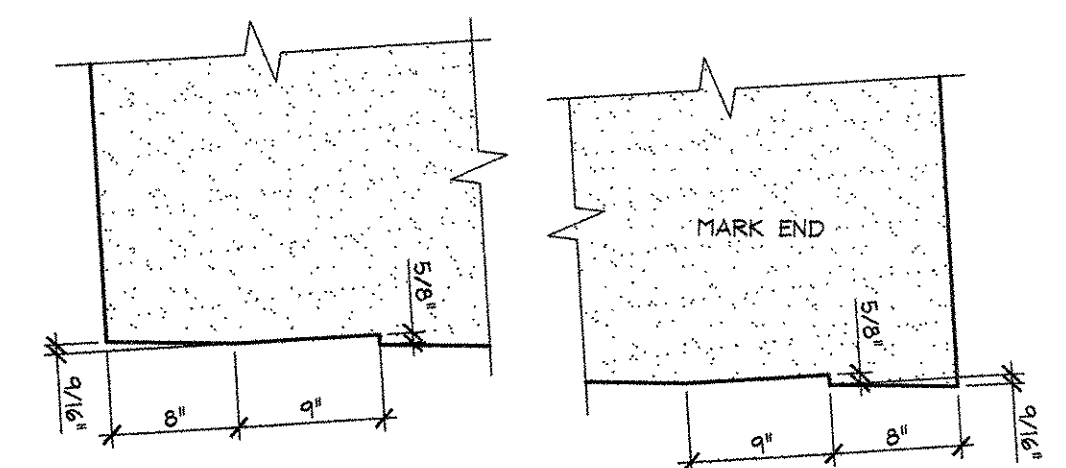
PLAN VIEW



DETAIL - "G"
3" = 1'-0"



D END BLOCK REINFORCING DETAIL
B3
1" = 1'-0"



C BRG. BLOCKOUT DETAILS
B3
1" = 1'-0"

MARK: SP-3		QTY.: 1	WT.: 27.58 T	VOL.: 13.62 cy
MATERIAL LIST / VOIDED BOX BEAM				
ITEM	MARK	DESCRIPTION		QTY.
1	401	#4 BENT BAR (EPOXY COATED)		112
2	502	#5 x 57'-8" (W/ (3) 2'-0" STAGGERED LAPS)		8
3				
4				
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15		W4xW4-W2.9xW2.9 (2'-0" x 3'-0") (EPOXY COATED)		8
16		3'-1 1/2" x 1'-10" x 15'-9 3/16" BOX VOID		3
17		3/4" x 5 1/2" NON-FERROUS VOID DRAINS		6
18		DOUBLE 1/2" STRANDS LIFTING LOOPS		4
19				

APPROVAL STAMP:

RECEIVED
CK'D BY: *[Signature]*
JUL 10 2007
RESUBMIT: *[Signature]* APPROVED: *[Signature]*
BY: *[Signature]* DATE: 7/10/07

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
2464 CASE ST., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010

J.A. McDONALD, INC.
CONTRACTOR
LYNDON, VERMONT

STATE OF VERMONT A.O.T.
COUNTY OF WINDSOR

DATE: JUNE 20, 2007

SCALE: NOTED

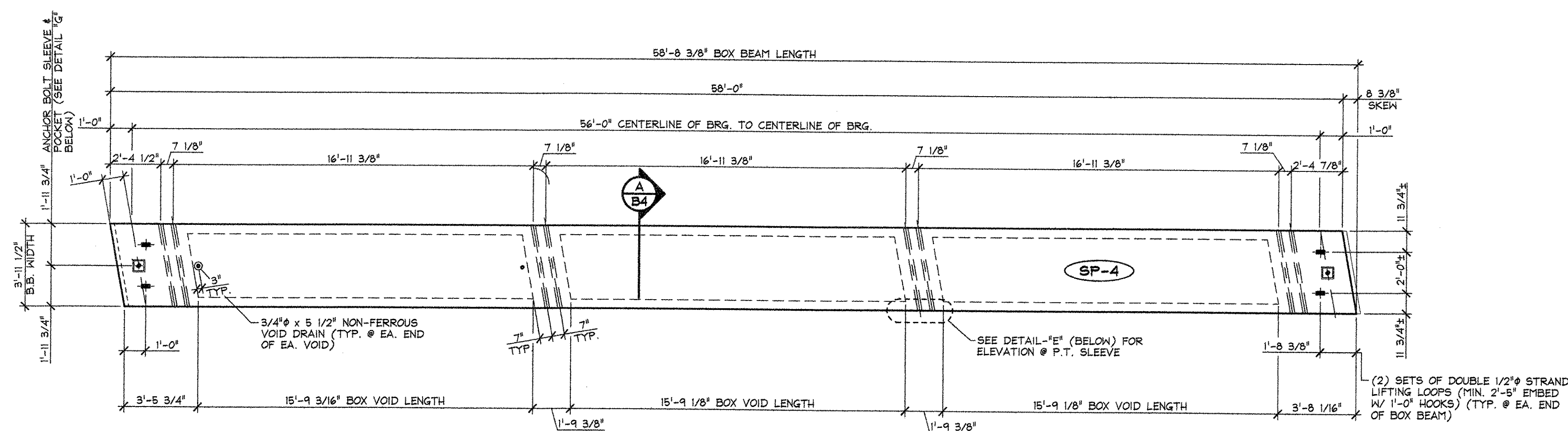
TOWN OF SPRINGFIELD
VERMONT ROUTE 11
BRIDGE NO.: 55 PROJECT NO.: ST CULV(5)

CHKD: D.F. DFTM: T.J.D.

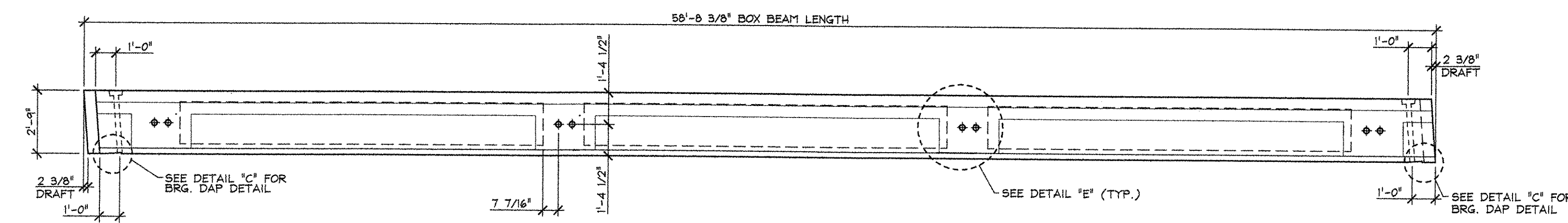
JOB NO: 23258-007

BOX BEAM SECTIONS
& DETAILS

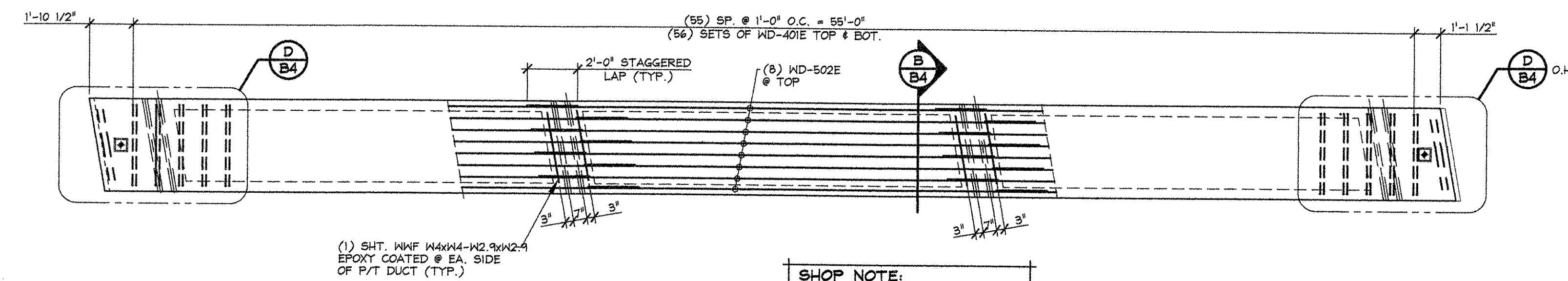
DWG. NO: B3



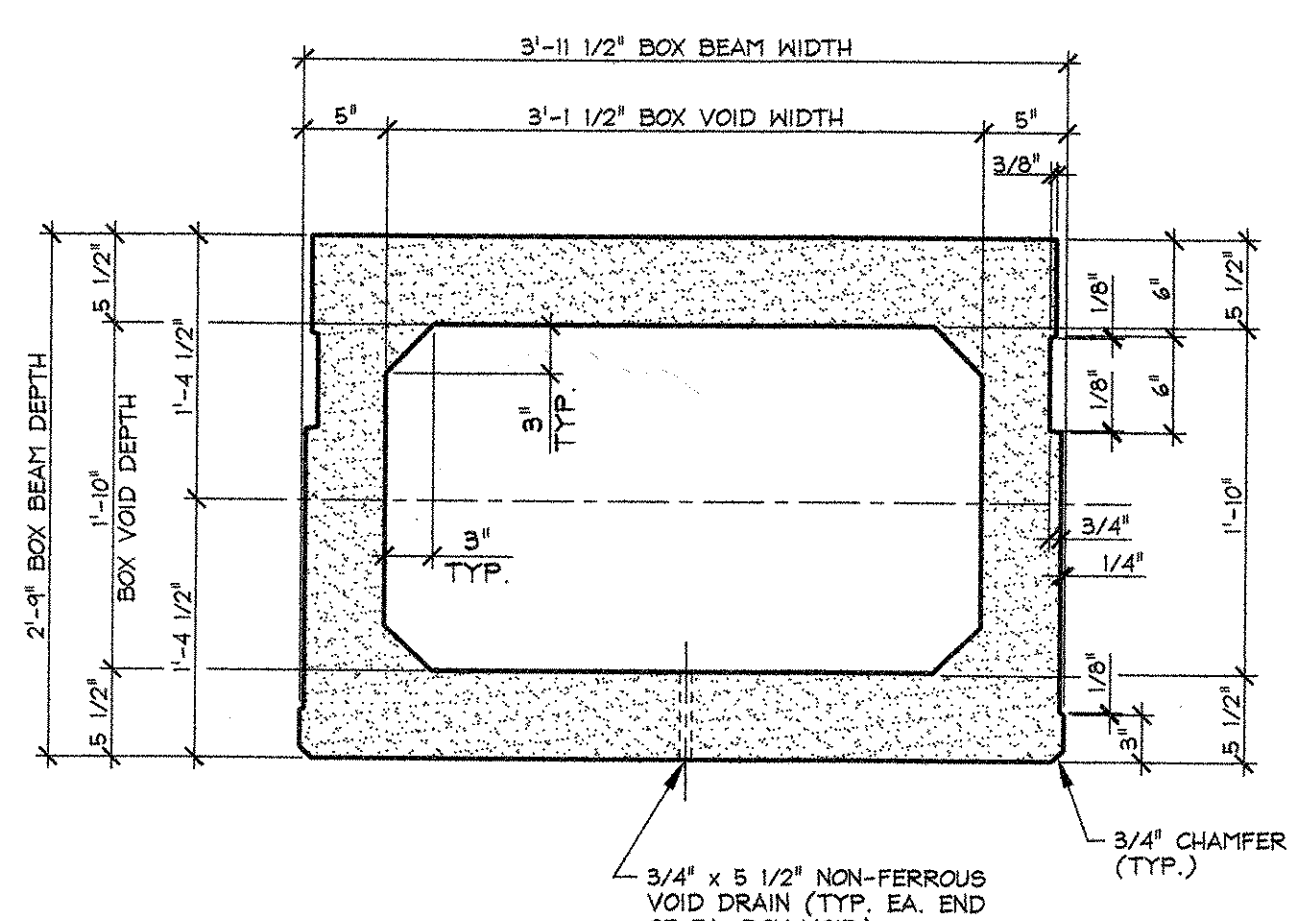
1 DIMENSIONAL PLAN VIEW IN FORM
B4
1/4" = 1'-0"



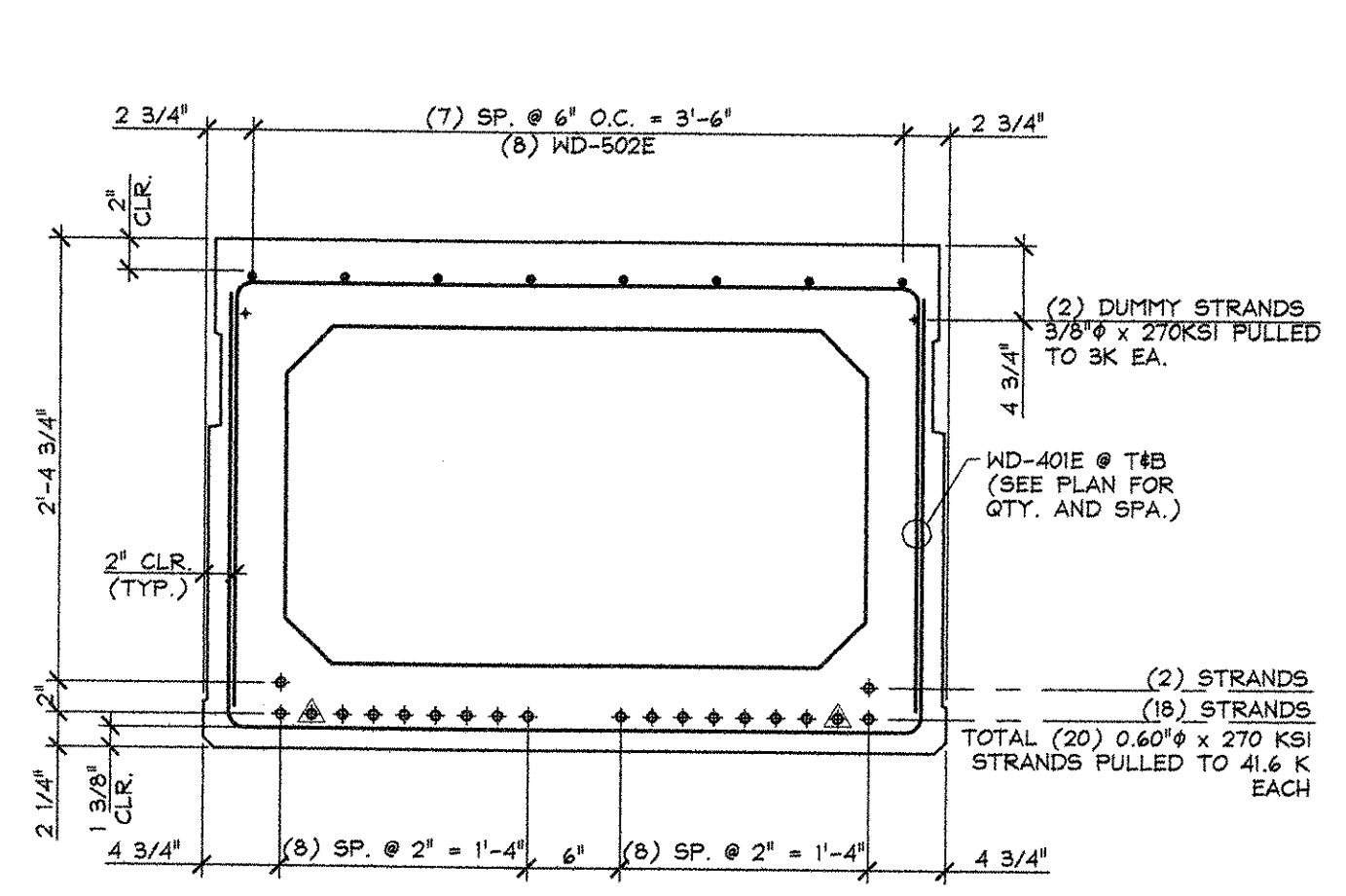
2 ELEVATION VIEW IN FORM
B4
1/4" = 1'-0"



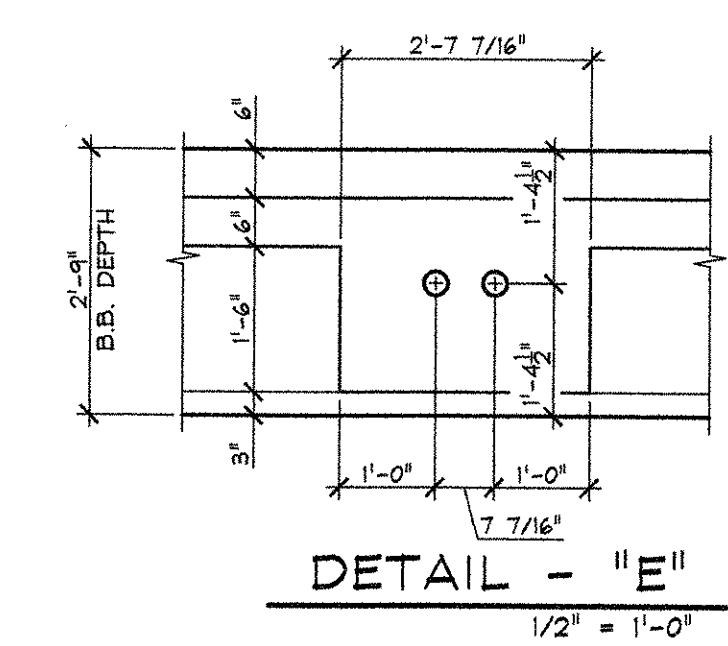
3 REINFORCING PLAN VIEW IN FORM
B4
1/4" = 1'-0"



A DIMENSIONAL SECTION
B4
1" = 1'-0"

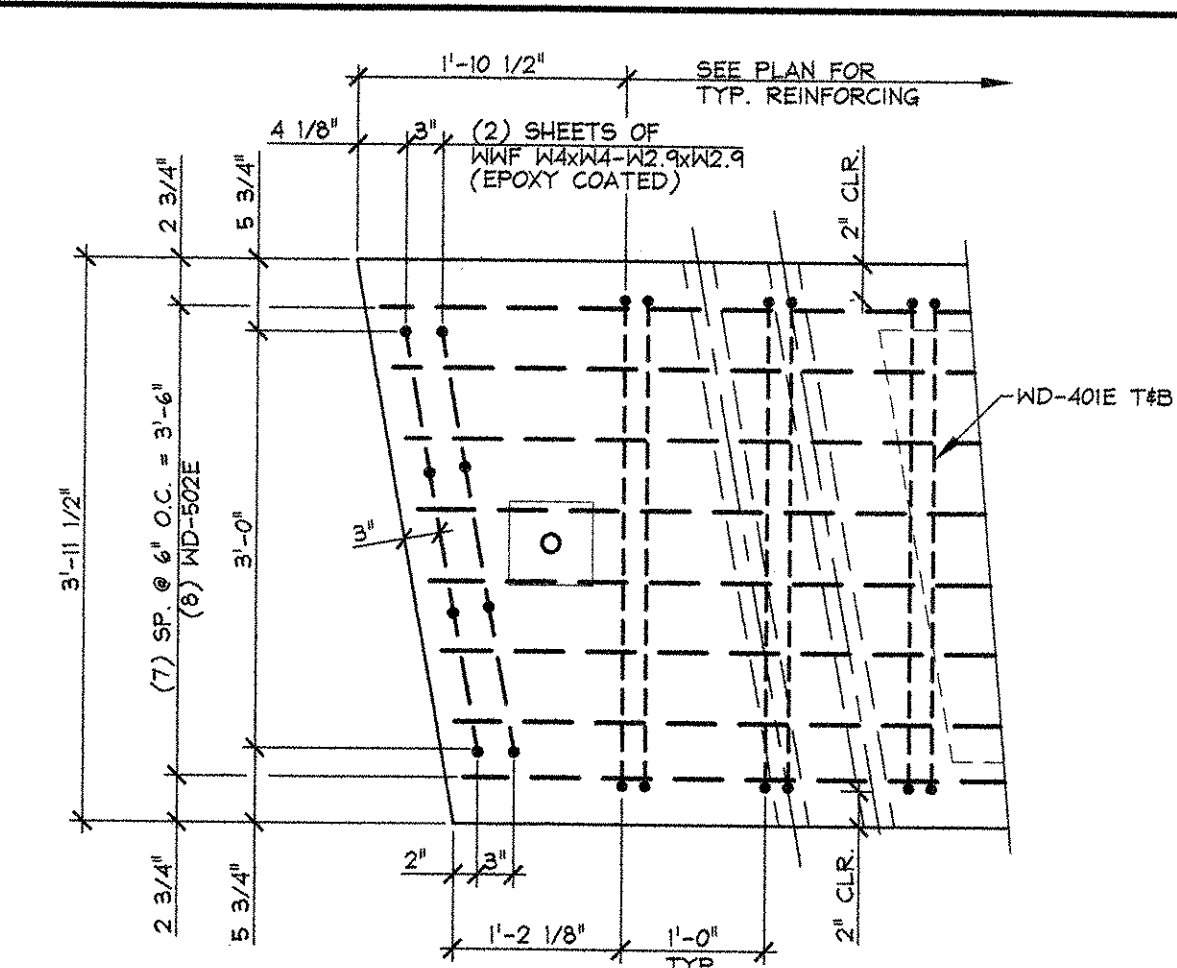
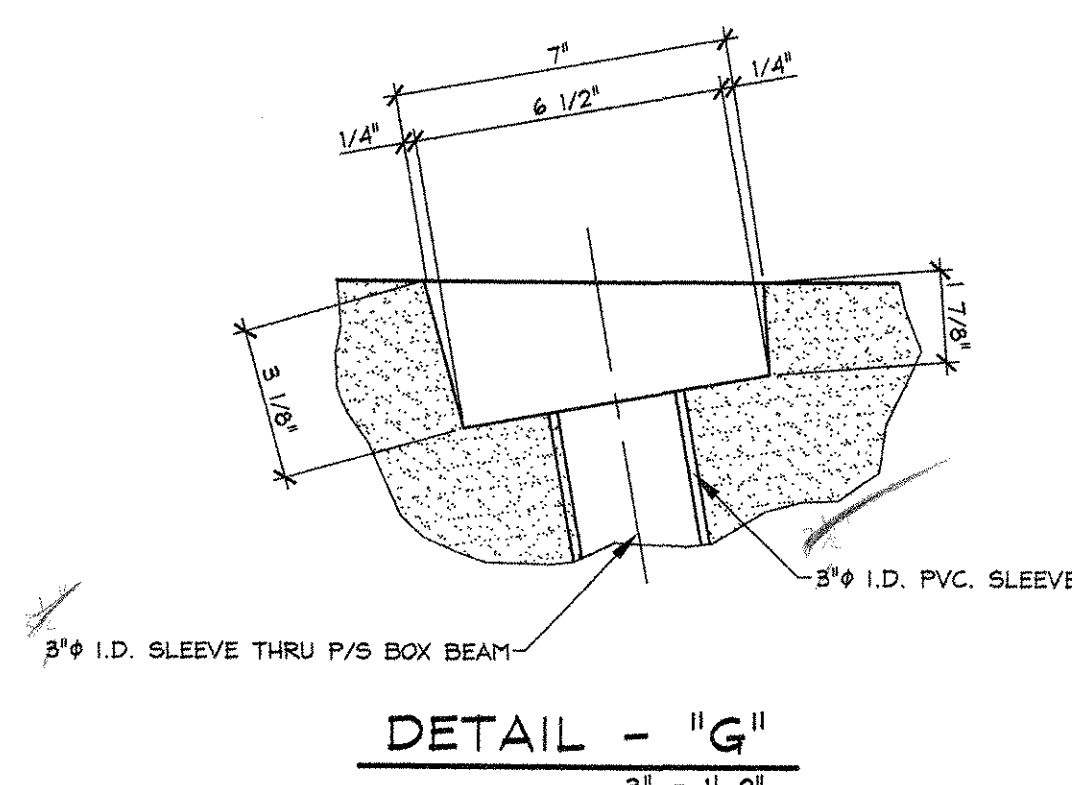
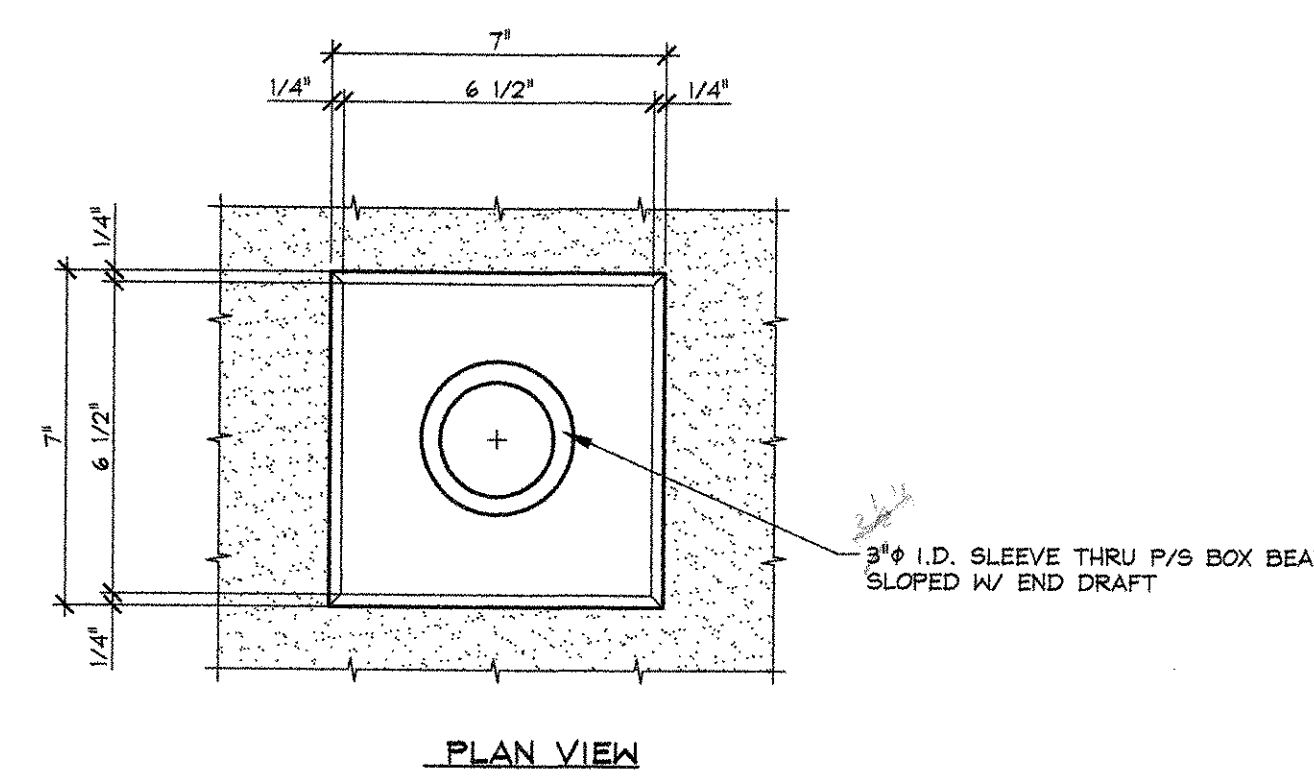


B REINFORCING SECTION
B4
1" = 1'-0"

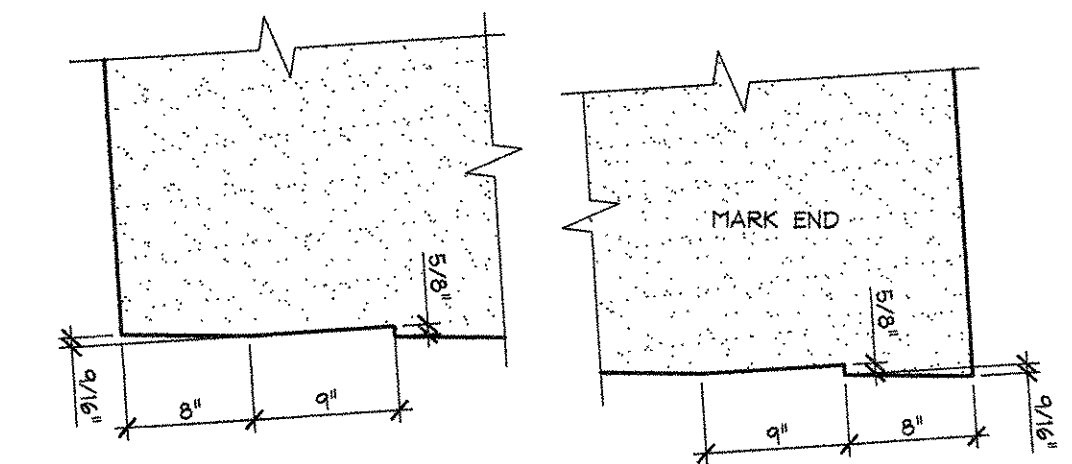


DETENSIONING SCHEDULE
N.T.S.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
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D END BLOCK REINFORCING DETAIL
B4
1" = 1'-0"



C BRG. BLOCKOUT DETAILS
B4
1" = 1'-0"

MARK:	SP-4	QTY:	6	WT.:	27.58 T	VOL.:	13.62 cy
MATERIAL LIST / VOIDED BOX BEAM							
ITEM	MARK	DESCRIPTION					QTY.
1	401	#4 BENT BAR (EPOXY COATED)					112
2	502	#8 x 57'-8" (W/ (3) 2'-0" STAGGERED LAPS)					8
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							
13							
14							
15		WNF W4XW4-W2 3XW2.9 [2'-0" x 3'-0"] (EPOXY COATED)					8
17		3'-1 1/2" x 1'-10" x 15'-9 3/16" BOX VOID					3
18		3/4" x 5 1/2" NON-FERROUS VOID DRAINS					6
19		DOUBLE 1/2" STRANDS LIFTING LOOPS					4
20							

APPROVAL STAMP:

RECEIVED
CK'D BY DRP OK'D BY [Signature]
JUL 10 2007
RESUBMIT APPROVED
BY [Signature] DATE 7/10/07

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
244 ODE STR., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010

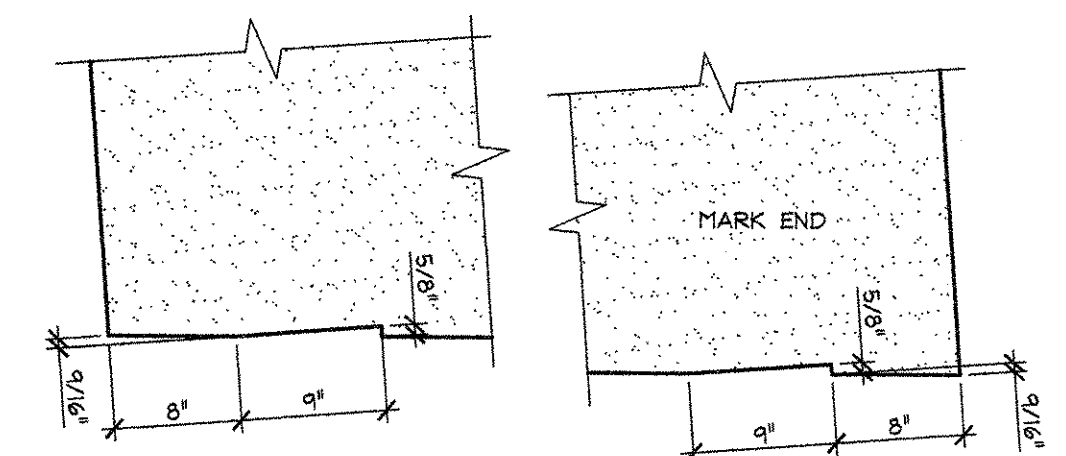
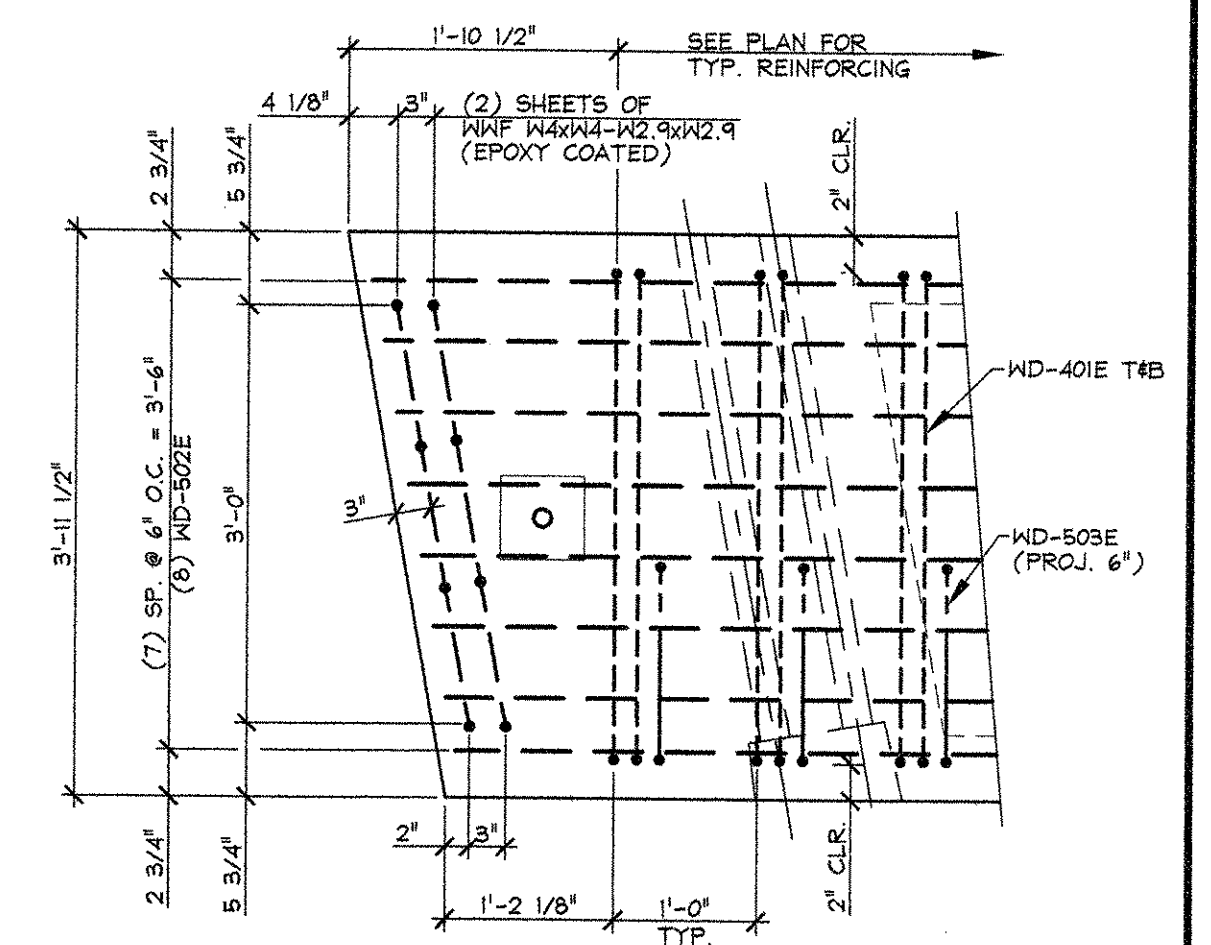
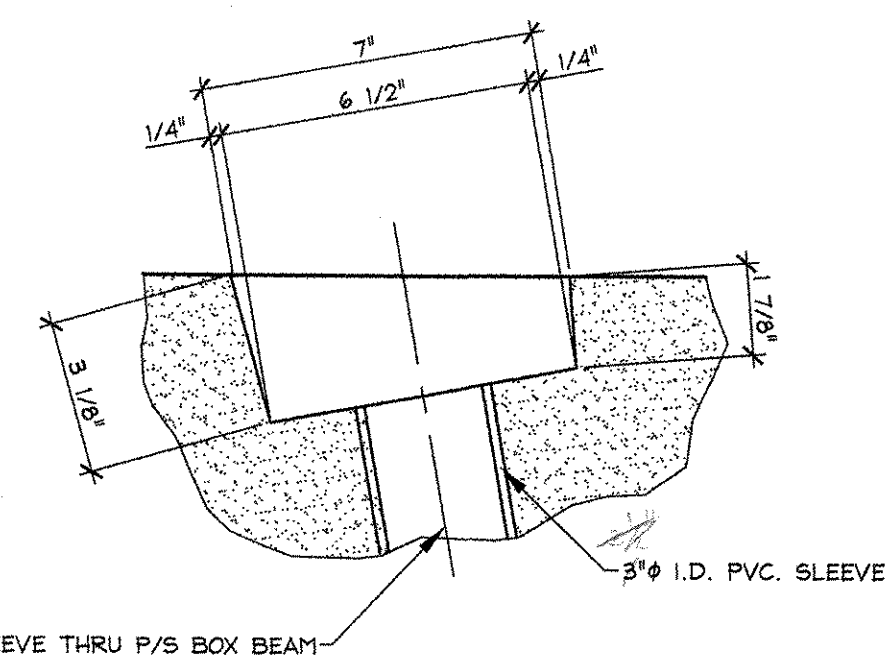
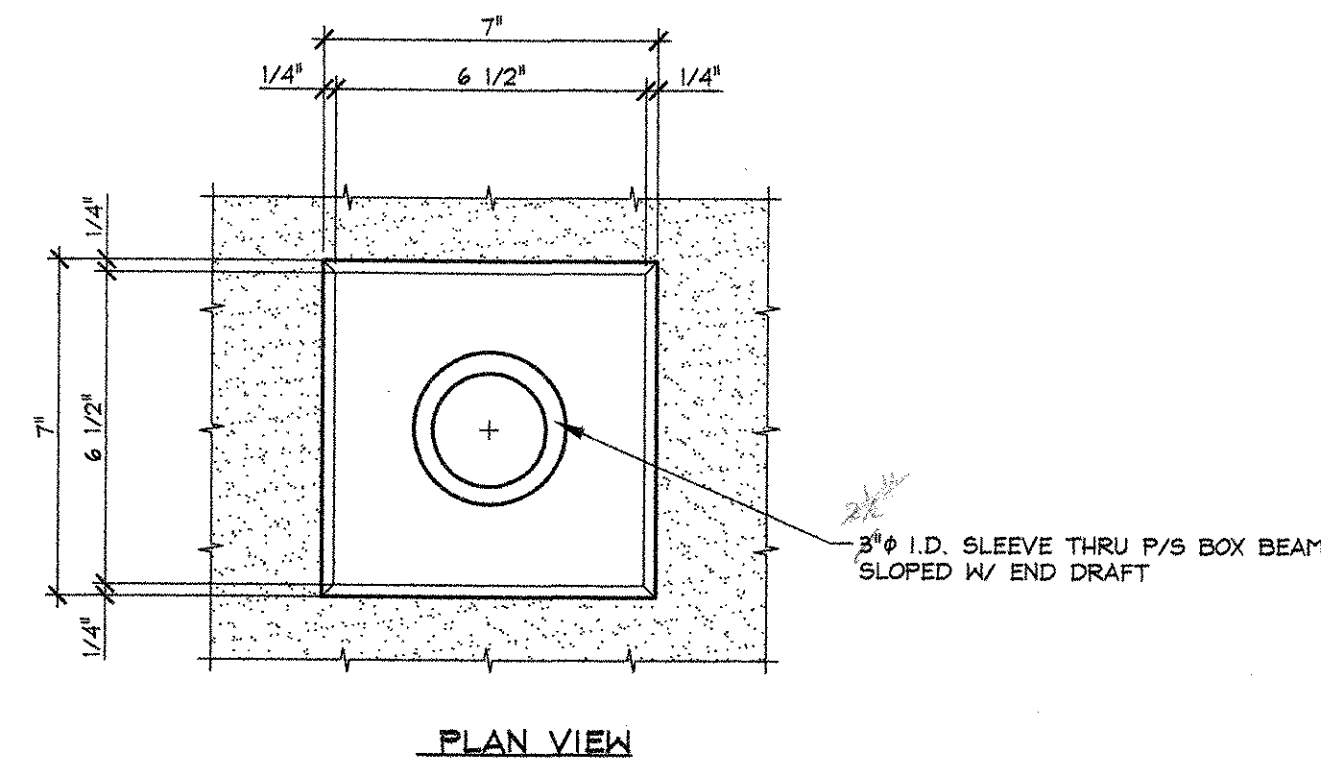
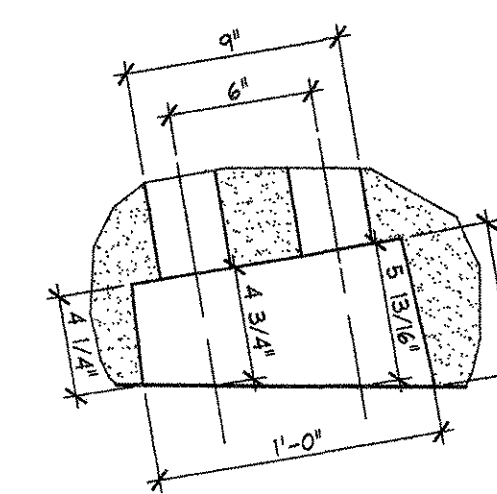
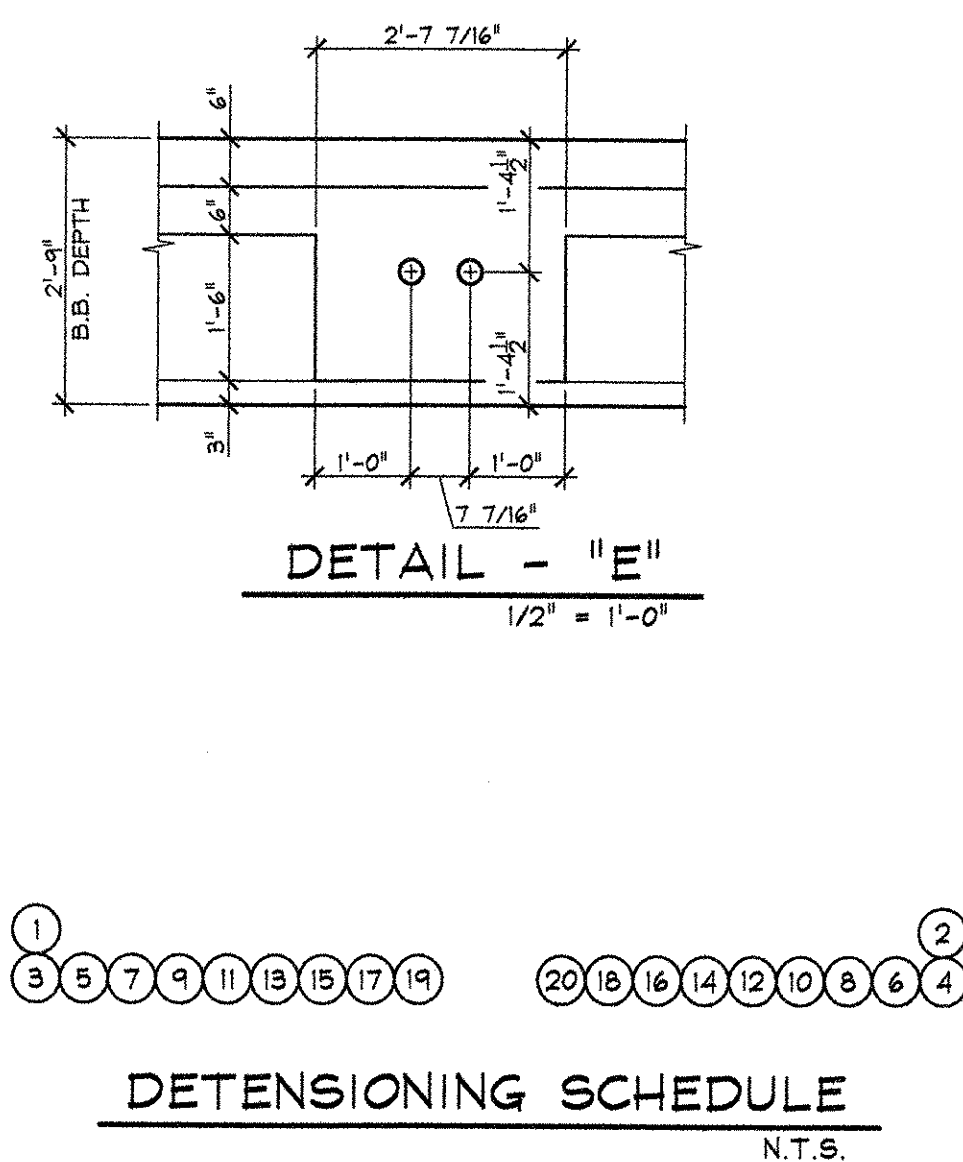
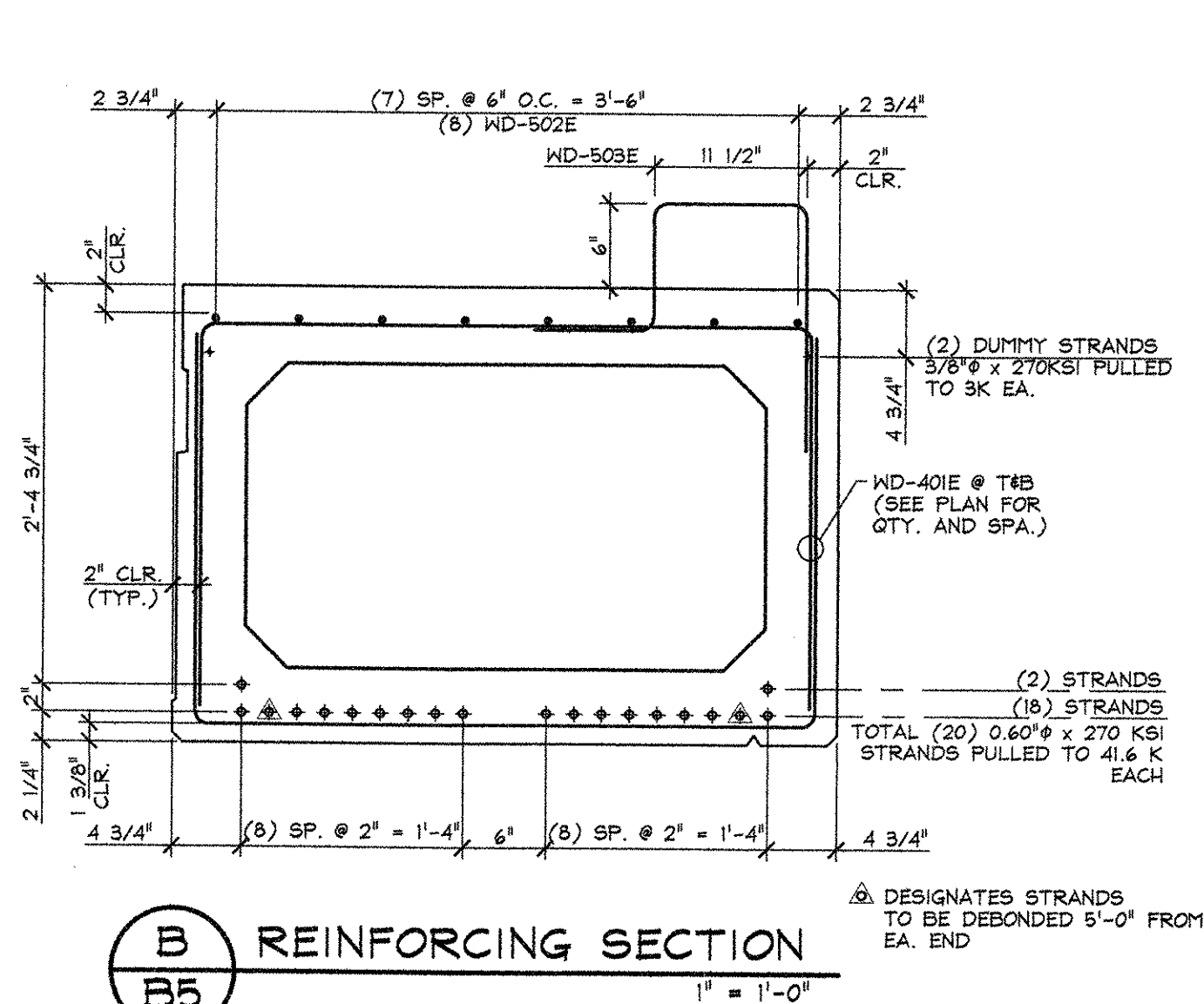
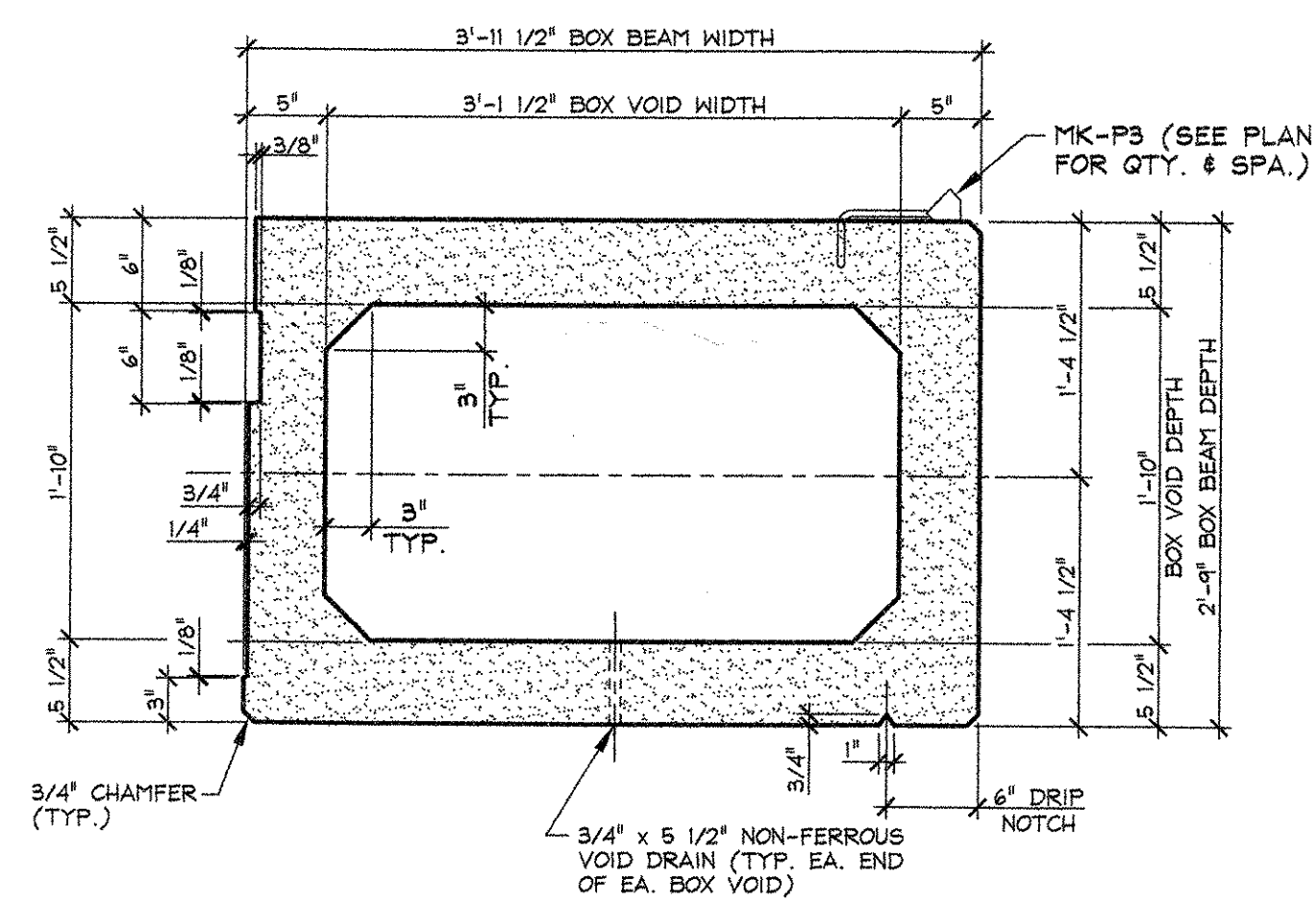
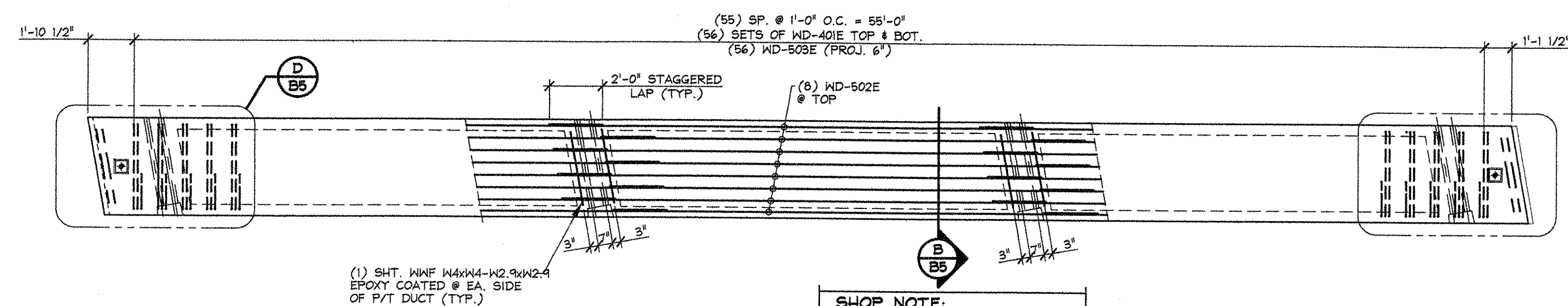
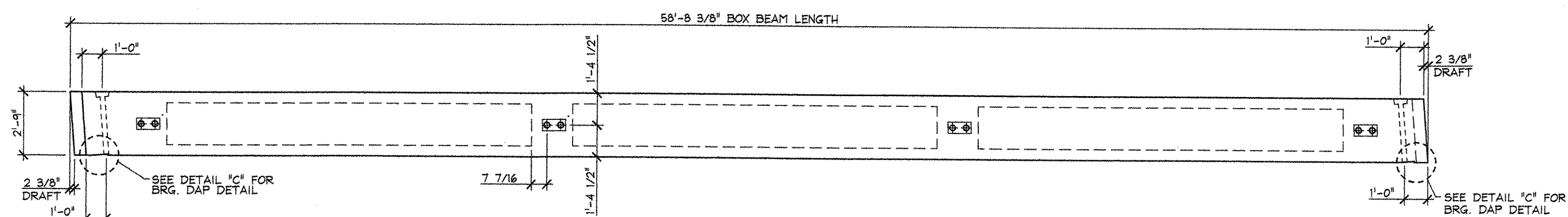
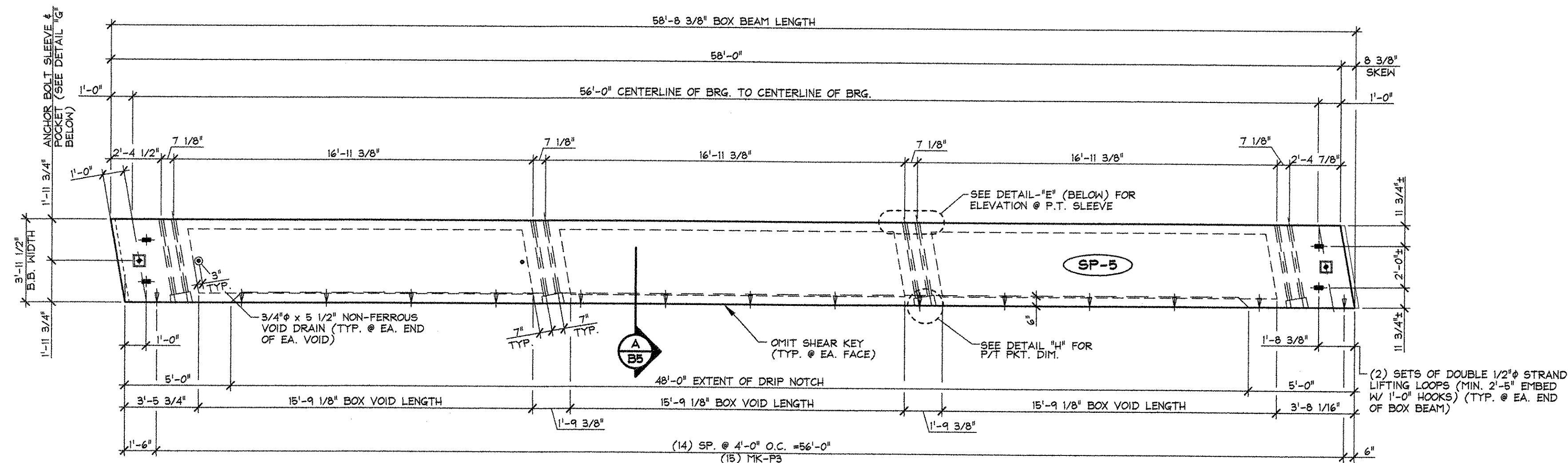
J.A. McDONALD, INC.
CONTRACTOR
LYNDON, VERMONT

STATE OF VERMONT A.O.T.
COUNTY OF WINDSOR

TOWN OF SPRINGFIELD
VERMONT ROUTE 11
BRIDGE NO.: 55 PROJECT NO.: ST CULV(5)

BOX BEAM SECTIONS & DETAILS

DATE: JUNE 20, 2007
SCALE: NOTED
CHKD: D.F. DFTM: T.J.D
JOB NO: 23258-007
DWG. NO: B4



MARK:	SP-5	QTY.:	1	WT.:	27.58 T	VOL.:	13.62 cy
MATERIAL LIST / VOIDED BOX BEAM							
ITEM	MARK	DESCRIPTION					QTY.
1	401	#4 BENT BAR (EPOXY COATED)					112
2	502	#5 x 57'-8" (W/ (3) 2'-0" STAGGERED LAPS)					8
3	503	#5 BENT BAR (EPOXY COATED)					56
4							
5							
6							
7							
8							
9							
10							
11							
12							
13		WKF W4XW4-W2 9XW2.9 (2'-0"X3'-0") (EPOXY COATED)					8
14	MK-PB	DAYTON C-24 TYPE 4-APR PRESS-STEEL PRECAST HALF HANGER (GALV.)					15
15		3'-1 1/2" x 1'-10" x 15'-9 1/8" BOX VOID					3
16		3/4"φ x 5 1/2" NON-FERROUS VOID DRAINS					6
17		DOUBLE 1/2"φ STRANDS LIFTING LOOPS					4
18							

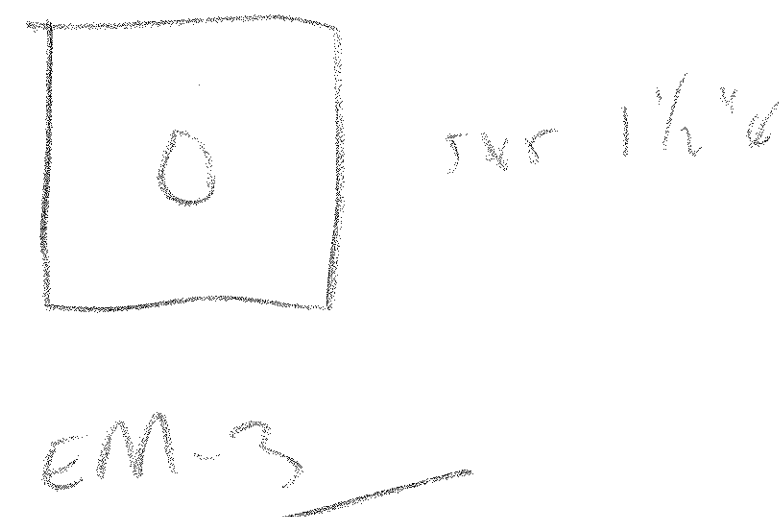
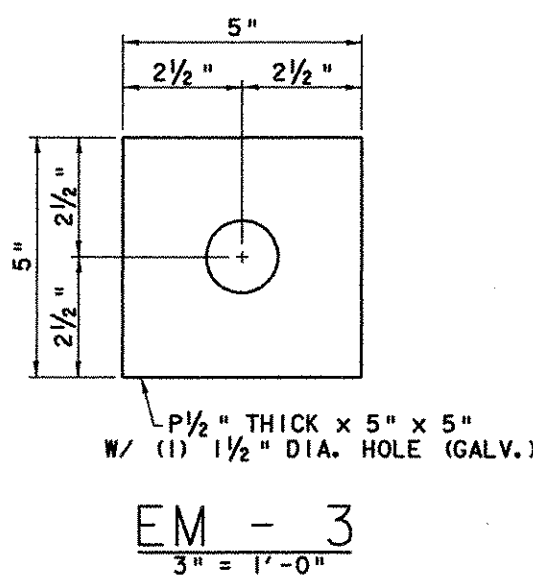
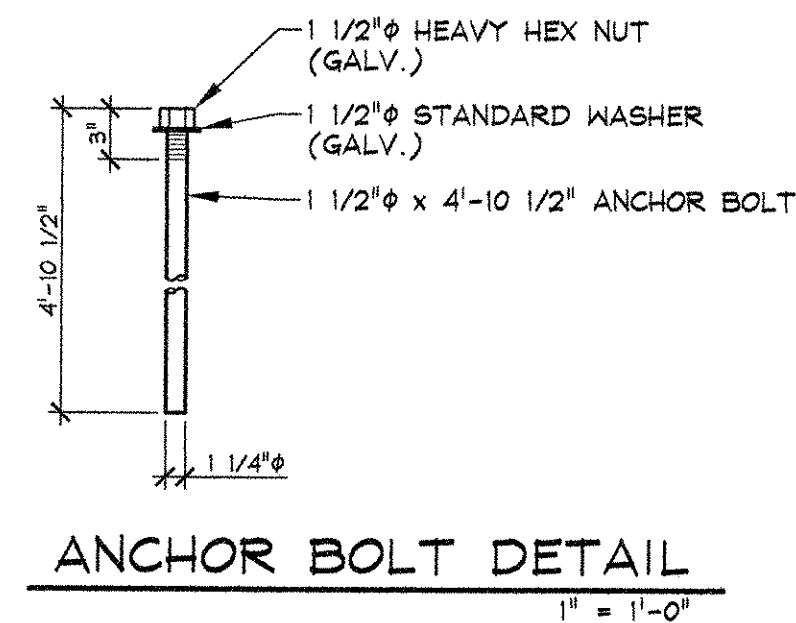
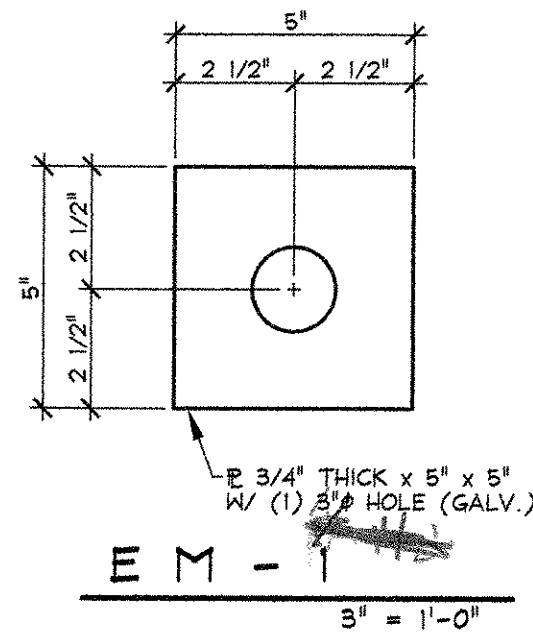
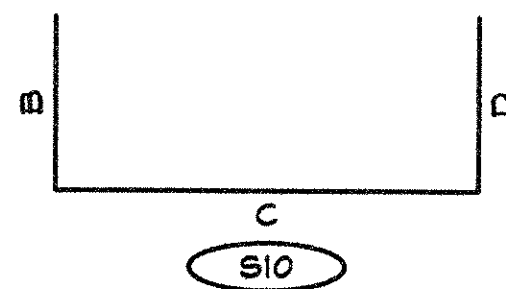
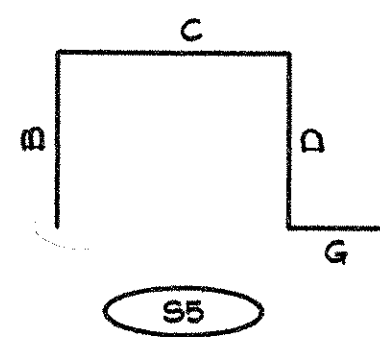
APPROVAL STAMP: RECEIVED CK'D BY <u>DRP</u> CK'D BY <u>CWC</u> JUL 10 2007 RESUBMIT <u>✓</u> APPROVED <u>✓</u> BY <u>RAW</u> DATE <u>7/12/07</u>	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2" style="text-align: center; padding: 5px;"> J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2464 CASE ST., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010 </td> <td style="text-align: center; padding: 5px;"> J.A. McDONALD, INC. CONTRACTOR LYNDON, VERMONT </td> </tr> <tr> <td style="text-align: center; padding: 5px;"> STATE OF VERMONT A.O.T. COUNTY OF WINDSOR </td> <td colspan="2" style="padding: 5px;"> DATE: JUNE 20, 2007 SCALE: NOTED </td> </tr> <tr> <td style="text-align: center; padding: 5px;"> TOWN OF SPRINGFIELD VERMONT ROUTE 11 BRIDGE NO.: 55 PROJECT NO.: ST CULV(5) </td> <td colspan="2" style="padding: 5px;"> CHKD: D.F. DFTM: T.J.D. JOB NO: 23258-007 </td> </tr> <tr> <td style="text-align: center; padding: 5px;"> BOX BEAM SECTIONS & DETAILS </td> <td colspan="2" style="padding: 5px;"> DWG. NO: B5 </td> </tr> </table>	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2464 CASE ST., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010		J.A. McDONALD, INC. CONTRACTOR LYNDON, VERMONT	STATE OF VERMONT A.O.T. COUNTY OF WINDSOR	DATE: JUNE 20, 2007 SCALE: NOTED		TOWN OF SPRINGFIELD VERMONT ROUTE 11 BRIDGE NO.: 55 PROJECT NO.: ST CULV(5)	CHKD: D.F. DFTM: T.J.D. JOB NO: 23258-007		BOX BEAM SECTIONS & DETAILS	DWG. NO: B5	
J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2464 CASE ST., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010		J.A. McDONALD, INC. CONTRACTOR LYNDON, VERMONT											
STATE OF VERMONT A.O.T. COUNTY OF WINDSOR	DATE: JUNE 20, 2007 SCALE: NOTED												
TOWN OF SPRINGFIELD VERMONT ROUTE 11 BRIDGE NO.: 55 PROJECT NO.: ST CULV(5)	CHKD: D.F. DFTM: T.J.D. JOB NO: 23258-007												
BOX BEAM SECTIONS & DETAILS	DWG. NO: B5												

BENT BARS, TIES, & STIRRUPS

ITEM	MARK	QTY.	SIZE	LENGTH	TYPE	A	B	C	D	E	F/R	G	H	J	K	O	GRADE	REMARKS
1	401E	1680	#4	8'-1 1/2"	S/O		2'-4"	3'-7 1/2"	2'-4"								60	EPOXY COATED
2	502E	120	#5	57'-6"	STR.												60	E.C. W/ (3) 2'-0" STAGGERED LAPS
3	503E	112	#5	3'-8 1/2"	S5		1'-6"	11 1/2"	9 3/8"			9"					60	EPOXY COATED
4																		
5																		
6																		
7																		
8																		
9																		
10																		
11																		
12																		
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26																		
27																		
28																		
29																		
30																		

MISCELLANEOUS MATERIALS

ITEM	MARK	QTY.	DESCRIPTION	REMARKS
1	EM-1	16	E 3/4" x 5" x 5" W/ (1) 3/8" HOLE (GALV.)	FOR ERECTION, SEE DETAIL THIS SHEET
2		4	1/2" POLYSTRAND x 36'-0"	FOR ERECTION
3		4	1/2" POLYSTRAND x 64'-0"	FOR ERECTION
4		1620	1 1/2" x 4'-10 1/2" GALV. ANCHOR BOLT	FOR ERECTION, SEE DETAIL THIS SHEET
5	EM-3	30	E 1/4" x 5" x 5" W/ (1) 1/2" HOLE (GALV.)	
6	MK-PB	30	DAYTON C-24 TYPE 4-APRESS-STEEL HALF HANGER	GALVANIZE
7				
8				
9				
10		21	3'-1 1/2" x 1'-10" x 16'-4 5/16" BOX VOID	
11		24	3'-1 1/2" x 1'-10" x 15'-9 1/8" BOX VOID	
12				
13		90	3/4" x 5 1/2" NON-FERROUS VOID DRAIN	
14		60	DOUBLE 1/2" STRAND LIFTING LOOPS	
15		120	W4F W4XW4-W2.9XW2.9 [2'-0" x 3'-0"]	EPOXY COATED
16				
17				
18				
19				
20				
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				



RECEIVED
CK'D BY DRP OK'D BY JAC
JUL 10 2007
RESUBMIT APPROVED BY JAC
BY RHW DATE 7/6/07

APPROVAL STAMP:

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
2464 CASE ST., MIDDLEBURY, VERMONT 05753 Phone: (802) 388-6361 Fax: (802) 388-9010

J.A. McDONALD, INC.
CONTRACTOR
LYNDON, VERMONT

STATE OF VERMONT A.O.T.
COUNTY OF WINDSOR

DATE: JUNE 20, 2007

SCALE: NOTED

TOWN OF SPRINGFIELD
VERMONT ROUTE 11
BRIDGE NO.: 55 PROJECT NO.: ST CULV(5)

CHKD: D.F. DFTM: T.J.D.

JOB NO: 23258-007

MATERIALS LIST

DWG. NO: M1

RECEIVED

CHK'D BY: _____

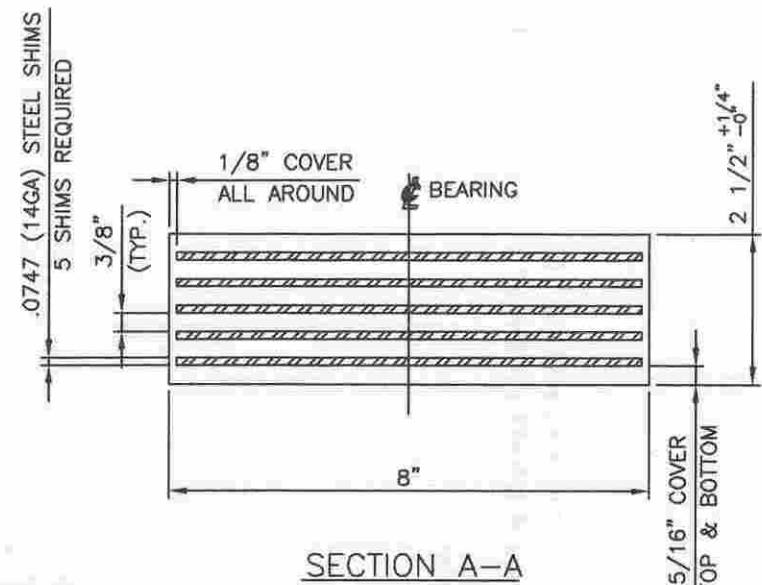
JUN 28 2007

RESUBMIT: _____

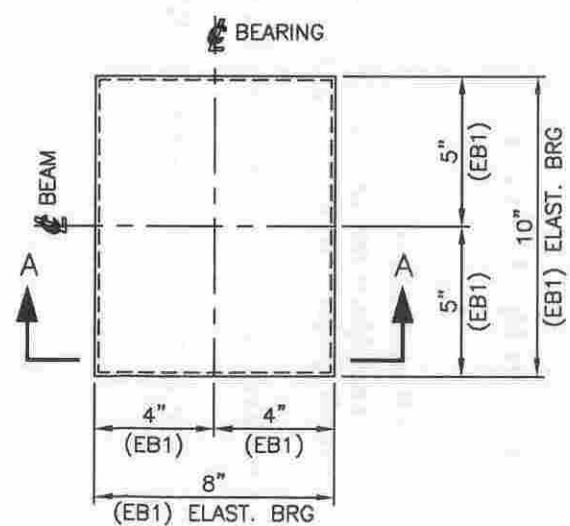
APPROVED: *AS*

BY: *RBW*

DATE: 6/29/07



SECTION A-A



60 LAMINATED ELASTOMERIC BEARING PADS, EB1

LAMINATED ELASTOMERIC BEARING 2 1/2" x 8" x 10"
IN ACCORDANCE WITH SECTION 731.03 OF THE STATE OF
VERMONT AGENCY OF TRANSPORTATION STANDARD
SPECIFICATION FOR CONSTRUCTION AND MAINTENANCE OF
HIGHWAYS, STREETS AND BRIDGES.
ELASTOMER - 60 DUROMETER NEOPRENE GR. 3
SHIMS - ASHTO M270 GR 50

Design Load/Brg = 59K

ELASTOMERIC BEARINGS
TYPE: LAMINATED

STATE	COUNTY	PROJECT NAME
VT	N/A	SPRINGFIELD

PROJECT NO.: ST CULV(5)

DYNAMIC RUBBER
A DIVISION OF COSMEC, INC. 1501 ROCKY RIDGE RD.
ATHENS, TX 75751

SCALE: NONE	DRAWN BY: SWT	CHECKED BY: KYW
DATE: 6/26/2007	DATE: 6/26/2007	DATE: 6/26/2007

SHEET 1 OF 1
DRP NO. 9516

CUSTOMER	DRAWING NUMBER	REV.
J.A. McDONALD, INC.	9516-D1	0