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TH2-9103

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- D-2M JUNE 13, 1997
- D-3M JUNE 13, 1997
- D-4M JUNE 13, 1997
- D-15M JUNE 13, 1997
- D-16M JUNE 13, 1997
- E-100M JUNE 13, 1997
- E-108M JUNE 13, 1997
- E-121M JUNE 13, 1997
- E-131M JUNE 13, 1997
- E-136CM JUNE 13, 1997
- E-142M JUNE 13, 1997
- E-151M JUNE 13, 1997
- E-154M JUNE 13, 1997
- E-155M JUNE 13, 1997
- E-193M JUNE 13, 1997
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CONVENTIONAL SIGNS

- COUNTY LINE
- TOWN LINE
- LIMITS OF ACCESS
- POINT OF ACCESS
- FENCE LINE
- STONE WALL
- TRAVELED WAY
- GUARD RAIL
- RAILROAD
- SURVEY LINE
- CULVERT
- UNDERGROUND TEL.
- UTILITY POLE
- TREES
- HEDGE
- CONTROL OF ACCESS
- PROPERTY LINE
- R.O.W. TAKING LINE
- TOP OF CUT
- TOE OF SLOPE
- CLEAR ZONE

DATUM

- VERTICAL NGVD 1929
- HORIZONTAL NAD 1927

V: /1261/CADD/PLANS/TITLE2.DWG

TOWNS OF GRAFTON & ROCKINGHAM COUNTY OF WINDHAM ROUTE 121 RECONSTRUCTION

GRAFTON-ROCKINGHAM STP 0126(4)S-CONTRACT 2 AND ROCKINGHAM TH2-9103 CONTRACT (100%) PLANS

PROJECT LOCATION : LOCATED IN THE COUNTY OF WINDHAM IN THE TOWNS OF GRAFTON AND ROCKINGHAM.
THE PROJECT BEGINS 40 METERS EAST OF THE JUNCTION WITH ROUTE 35.
THE PROJECT ENDS 60 METERS WEST OF THE LEACH ROAD INTERSECTION.

PROJECT DESCRIPTION : WORK CONSISTS OF RECONSTRUCTION OF ROUTE 121 INCLUDING: PAVEMENT,
SUBBASE, DRAINAGE, GUARDRAIL, LANDSCAPING, BRIDGE REPLACEMENT AT
WEAVER BROOK, AND RETAINING WALL CONSTRUCTION.

LENGTH OF ROADWAY : 2800 METERS.
LENGTH OF PROJECT : 2812 METERS.

RECORD PLANS

CONTRACTOR: SCOTT'S CONSTRUCTION, INC. - NEWPORT, VT

RESIDENT ENGINEER: DAN BREER

CONSTRUCTION BEGAN: MAY 7, 2004

CONSTRUCTION COMPLETE: DECEMBER 7, 2005

RECORD PLANS BY: DAN BREER & JUDY GILMORE

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

BY DW Breer RESIDENT ENGINEER

DATE 8/23/07

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

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

THE ROUTE 121 RECONSTRUCTION CONSISTS OF TWO
PROJECTS: GRAFTON-ROCKINGHAM, STP 0126(4)S AND
ROCKINGHAM, TH2-9103. THE GRAFTON-ROCKINGHAM
PROJECT WAS DESIGNED, AND WILL BE CONSTRUCTED, IN
METRIC UNITS. THE ROCKINGHAM PROJECT WAS
DESIGNED, AND WILL BE CONSTRUCTED, IN ENGLISH
UNITS.

TRAFFIC DATA

2000 ADT: 2200
2020 ADT: 3000

2000 ADTT: 110
2020 ADTT: 100

2000 DHV: 310
2020 DHV: 420

%T: 2
%D: 50

TOTAL ESALS

2000 - 2020: 881,000
2000 - 2040: 2,198,000

DESIGN SPEED

10+048 - 10+880 50 km/h
10+900 - 12+860 60 km/h

Metric

UNLESS NOTED OTHERWISE
STATIONS ARE IN KILOMETERS
ELEVATIONS ARE IN METERS
DIMENSIONS ARE IN MILLIMETERS

STRUCTURAL PLANS PREPARED BY:

THE LOUIS BERGER GROUP, INC.
1001 ELM STREET, SUITE 300
MANCHESTER, NH 03101

BY: [Signature] DATE: 1/30/04

ROADWAY PLANS PREPARED BY:

THE LOUIS BERGER GROUP, INC.
1001 ELM STREET, SUITE 300
MANCHESTER, NH 03101

BY: [Signature] DATE: 1/30/04

PROJECT:
ROUTE 121 RECONSTRUCTION

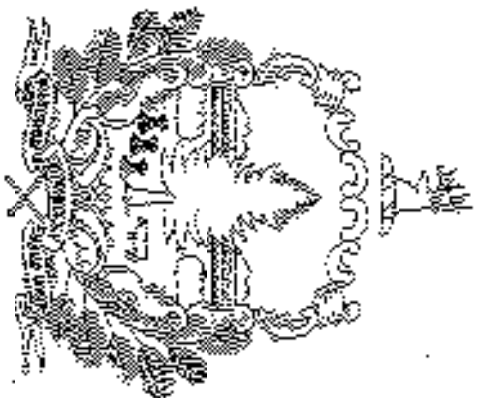
DESIGN FILE NAME:
IPARM FILE NAME:
SURVEYED BY:
SQUAD LEADER:

PROJECT NO. :
STP 0126(4) S & TH2-9103

PLOT DATE: 12/08/03
SURVEY DATE:
DRAWN BY:
SHEET: 1 OF 116

SEE SHEET 2 FOR INDEX OF SHEETS.

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWN OF ROCK INGHAM
COUNTY OF WINDHAM

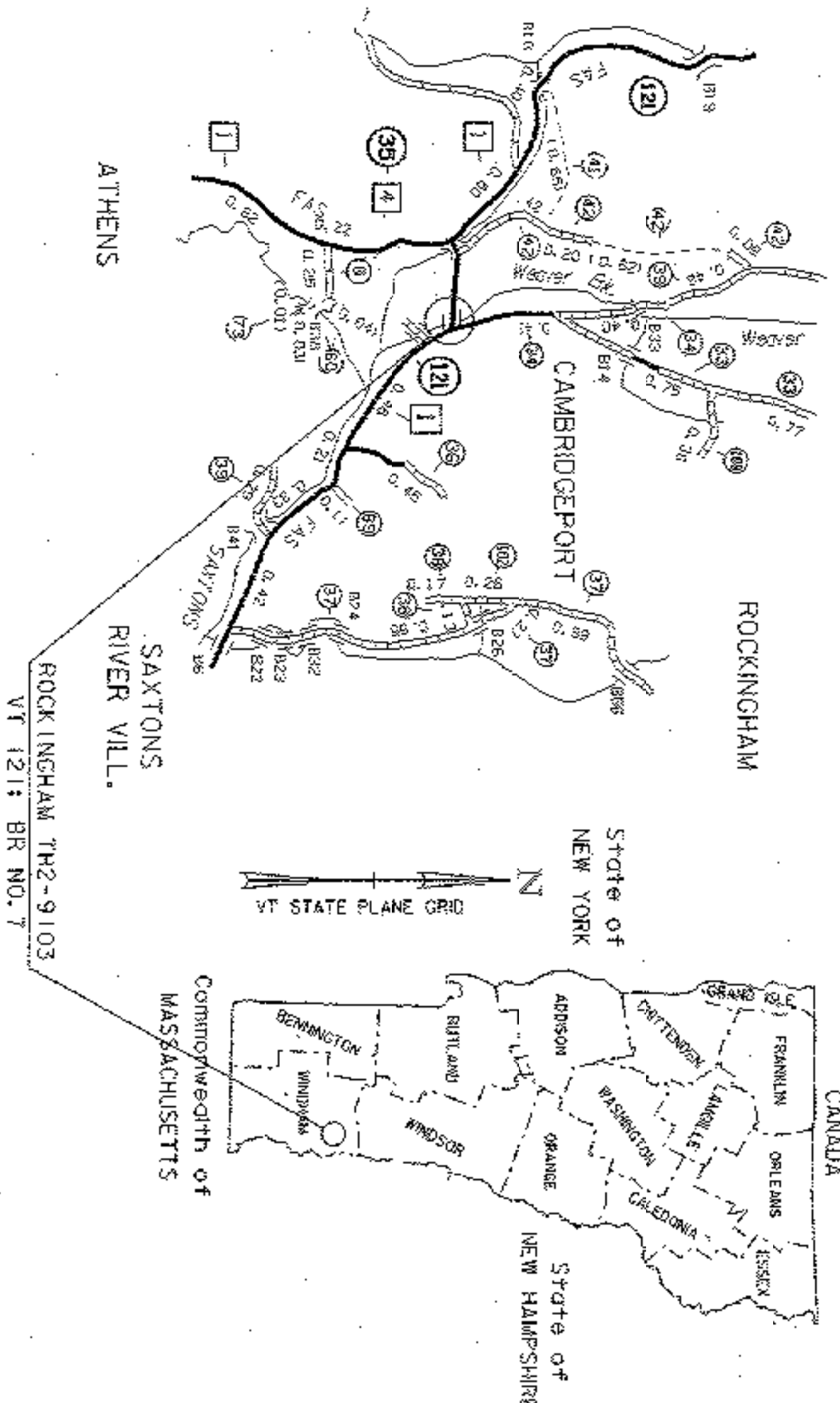
ROUTE NO: VT 121; (T.H.1 Class 2) BRIDGE NO: 7

PROJECT LOCATION : BEGIN 0.06 MILE EASTERLY FROM ROCK INGHAM - GRAFTON TOWN LINE
ALONG VT 121 AND EXTEND 0.025 MILE SOUTHEASTERLY ALONG VT121.

PROJECT DESCRIPTION : REPLACEMENT OF EXISTING BRIDGE WITH A NEW STRUCTURE,
INCLUDING ASSOCIATED CHANNEL AND APPROACH WORK.

LENGTH OF STRUCTURE : 28.21 FEET
LENGTH OF ROADWAY : 103.03 FEET
LENGTH OF PROJECT : 131.24 FEET

CONSPAN PRECAST
CONCRETE ARCH USED
VALUE ENGINEERING
SEE PAGES 040 TO 088.

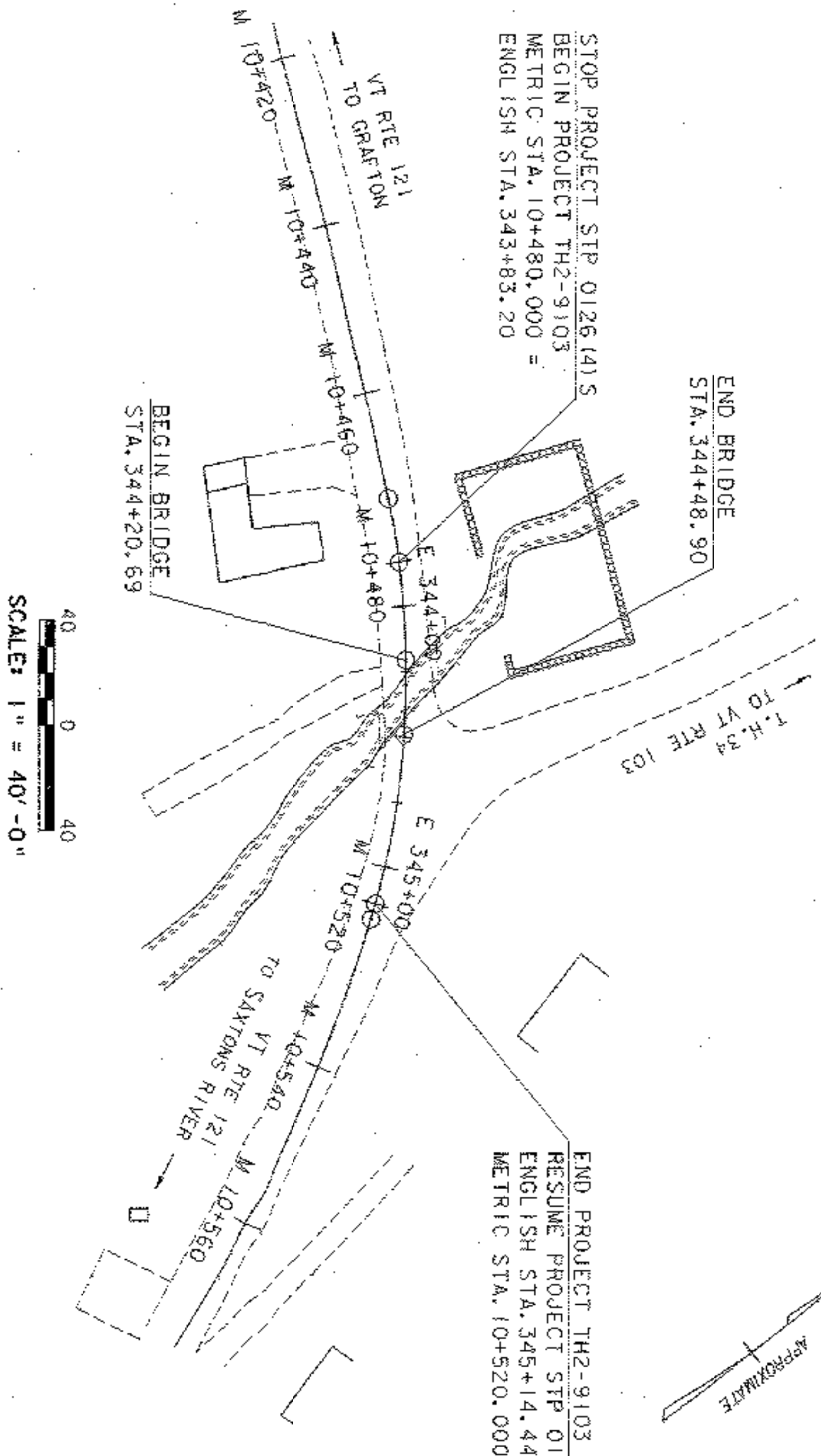


CONVENTIONAL SYMBOLS

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. MOREAU
SURVEYED DATE : 7/1991

DATUM
VERTICAL NGVD 1929
HORIZONTAL ASSUMED



SCALE: 1" = 40'-0"

STOP PROJECT STP 0126 (4) S
BEGIN PROJECT TH2-9103
METRIC STA. 10+480.000 =
ENGLISH STA. 343+83.20

END BRIDGE
STA. 344+48.90

END PROJECT TH2-9103
RESUME PROJECT STP 0126 (4) S
ENGLISH STA. 345+14.44 =
METRIC STA. 10+520.000

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 2007, AS APPROVED BY THE
FEDERAL HIGHWAY ADMINISTRATION ON JANUARY 4, 2008
FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT
REVISIONS AND SUCH REVISED SPECIFICATIONS AND
SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE
PLANS.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
FINAL PLANS
3.21.03

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED: _____ DATE: _____

PROJECT MANAGER : R. R. WHITCOMB

PROJECT NAME : ROCK INGHAM
PROJECT NUMBER : TH2 - 9103

SHEET 1 OF 38 SHEETS

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- 33-34. ROADWAY CROSS SECTIONS
- 35-38. CHANNEL CROSS SECTIONS

LIST OF STANDARDS

B-71	11/16/00
D-6	06/01/94
D-15	06/01/94
E-100	01/06/97
E-100A	01/06/97
E-101	03/10/97
E-102	08/08/95
E-102A	08/08/95
E-106	08/08/95
E-107	08/08/95
E-107A	08/08/95
E-108	08/18/95
E-110	08/08/95
E-121	08/08/95
E-140	08/30/96
E-170	11/04/99
E-171A	08/09/95
E-171B	08/09/95
E-171C	08/09/95
E-172	08/09/95
E-175	11/17/93
G-1b	06/01/94
G-18	06/01/94
T-1	06/01/94
T-2	06/01/94

Quantity Sheets for TH2-9103 are located in the beginning of the plan set.

EXISTING STRUCTURE

1. STRUCTURE TYPE SINGLE SPAN CONCRETE SLAB OVERALL LENGTH 27'-6" INVENTORY RATING X
2. SPAN LENGTH(S) CENTER TO CENTER OF BEARINGS 25'-6"
3. CLEAR SPAN LENGTH(S) NORMAL TO STREAM 10'-4"
4. WATERWAY AREA OF FULL OPENING (NORMAL TO STREAM) 67.2 sq ft VERTICAL CLEARANCE ABOVE STREAMBED 6'-6"
5. WATER SURFACE ELEVATION @ 0.2.33 595.7 WATER SURFACE ELEVATION @ 0.50 590.8
6. WATER SURFACE ELEVATION AT FLOOD OF RECORD X YEAR ESTIMATED DISCHARGE
7. DOES ALL WATER PASS THROUGH EXISTING STRUCTURE? NO IF NOT, AT WHAT FREQUENCY AND ELEVATION DOES RELIEF OCCUR? 0.50 EL 591.0
8. TYPE OF SUBSTRUCTURE FOUNDATION MATERIAL X
9. DISPOSITION OF STRUCTURE REMOVAL

NEW STRUCTURE

- STRUCTURE GEOMETRY:
1. STRUCTURE TYPE SINGLE SPAN CONCRETE SLAB OVERALL LENGTH 28'-2 1/2"
2. SPAN LENGTH(S) CENTER TO CENTER OF BEARINGS 25'-11 1/4"
3. VERTICAL CLEARANCE ABOVE STREAMBED OR ROAD UNDER 6.5 ft
4. CLEAR SPAN LENGTH(S) NORMAL TO STREAM 16'-0"
5. WATERWAY AREA OF FULL OPENING (NORMAL TO STREAM) 624 sq ft
6. ARE PROVISIONS TO BE MADE FOR PUBLIC UTILITIES? NO

- HYDRAULIC DATA:
1. Q 2.33 20 cfs WATER ELEVATION 596.5 VELOCITY 7.5 fps
- Q 18 400 cfs WATER ELEVATION 587.5 VELOCITY 9.3 fps
- Q 25 550 cfs WATER ELEVATION 588.1 VELOCITY 10.3 fps
- Q 58 700 cfs WATER ELEVATION 588.5 VELOCITY 11.2 fps
- Q 100 870 cfs WATER ELEVATION 589.4 VELOCITY 12.0 fps
2. DRAINAGE AREA 3.42 sq mi CHARACTER OF TERRAIN HILLY, MOSTLY FORESTED
3. ARE THERE OBJECTIONS TO A PIER IN THE STREAM? YES
4. DOES STREAM REACH ITS MAXIMUM HIGH WATER ELEVATION RAPIDLY? YES IS ORDINARY RISE RAPID? YES
5. NATURE OF NATURAL STREAMBED X
6. ESTIMATED SCOUR DEPTH X COMMENT ON: DRIFT X ICE SLIGHT
7. WILL ALL WATER PASS THROUGH NEW STRUCTURE? YES IF NOT, WHAT FREQUENCY AND ELEVATION WILL RELIEF OCCUR?
8. VERTICAL CLEARANCE ABOVE 0.00 10 ft
9. ALLOWABLE WATER SURFACE ELEVATION 590.4 LIMITED BY AVERAGE LOW ELEVATION OF SUPERSTRUCTURE
10. IS DESIGN STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? NO IF YES, DESCRIBE
11. ORDINARY LOW WATER 5 cfs DEPTH 0.2 ft ORDINARY HIGH WATER 90 cfs DEPTH 1.5 ft
12. AVERAGE DAILY FLOW 10 cfs STREAMBANK OR CHANNEL PROTECTION REQUIRED STONE FILL TYPE II
13. DISTANCE TO EXISTING UPSTREAM STRUCTURE 3600 ft SPAN 15 ft WATERWAY AREA OF FULL OPENING 75 sq ft 0 X
14. DISTANCE TO EXISTING DOWNSTREAM STRUCTURE N/A SPAN WATERWAY AREA OF FULL OPENING 0

- ALLOWABLE STRESSES:
1. DESIGN LIVE LOAD AASHTO HS-25-44
2. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL 4.5 KSF ABUT. NO.1 ON LEDGE 10 KSF ABUT. NO.2
3. ALLOWABLE LOAD FOR PILING N/A TYPE ESTIMATED LENGTH
4. ALLOWABLE STRESS FOR STRUCTURAL STEEL AASHTO N/A TENSION N/A
5. ALLOWABLE STRESS FOR REINFORCING STEEL GRADE 60 TENSION 24000 psi COMPRESSION 20000 psi
6. ALLOWABLE STRESS FOR HIGH PERFORMANCE CONCRETE CLASS A f_c 4000 psi HIGH PERFORMANCE CONCRETE CLASS B f_c 3500 psi

- TRAFFIC MAINTENANCE:
1. IS TRAFFIC TO BE MAINTAINED? YES IF YES, ON EXISTING STRUCTURE YES OR ON TEMPORARY BRIDGE
2. EXISTING BRIDGE REQUIREMENTS: ONE OR TWO WAY ONE WAY TRAFFIC CONTROL SIGNALS REQUIRED YES
- MINIMUM CLEAR SPAN MINIMUM CLEAR HEIGHT MINIMUM WATERWAY AREA
- ARE SIDEWALKS REQUIRED? NO IF SO, ON WHAT SIDE?
- STAGE CONSTRUCTION

NOTES: N/A - NOT APPLICABLE X - UNKNOWN

ADDITIONAL DESIGN CONSIDERATIONS

LOAD FACTOR LOAD RATING (TONS)

LOADING LEVELS (LOAD FACTOR)	TRUCK						
	H	HS	352	6 AXLE	3A. STR.	4A. STR.	5A. SEMI
INVENTORY A=2.17	28	49					
POSTED A=1.55	40	69	82		47	49	82
OPERATING A=1.30		82	98	88	56	58	

STRENGTH RF = $\frac{0.9M_N - 1.3M_{DL}}{A \times M_{LL+I}}$

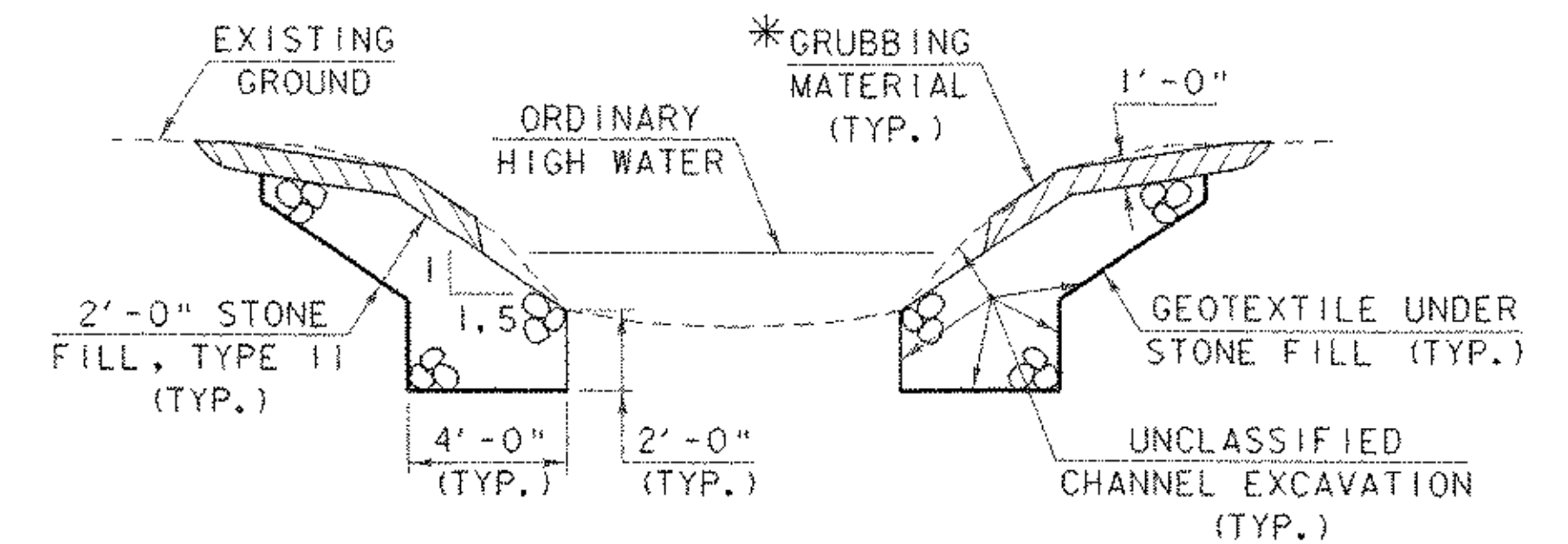
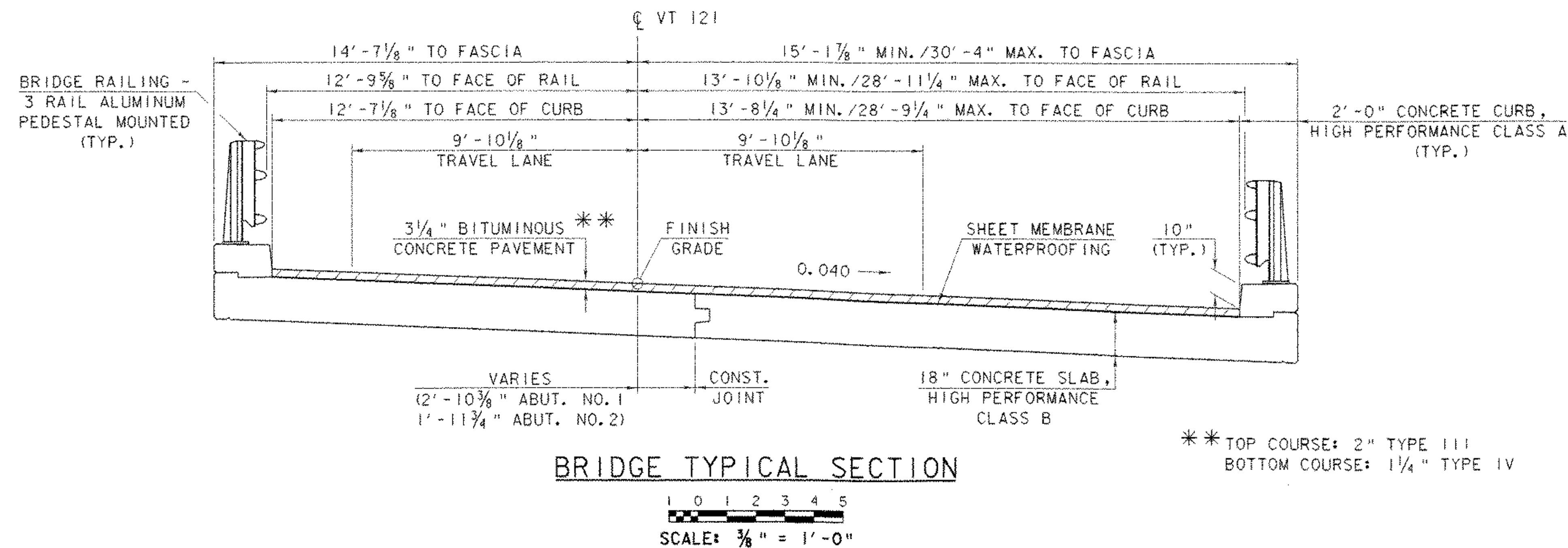
TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
1998	1830	255	51	7	130
2018	2480	350	51	6	145

18 kip ESAL for flexible pavement from 1998 to 2018: 1,946,000
18 kip ESAL for flexible pavement from 1998 to 2038: 7,088,000
Design speed: 30 mph

PRELIMINARY INFORMATION

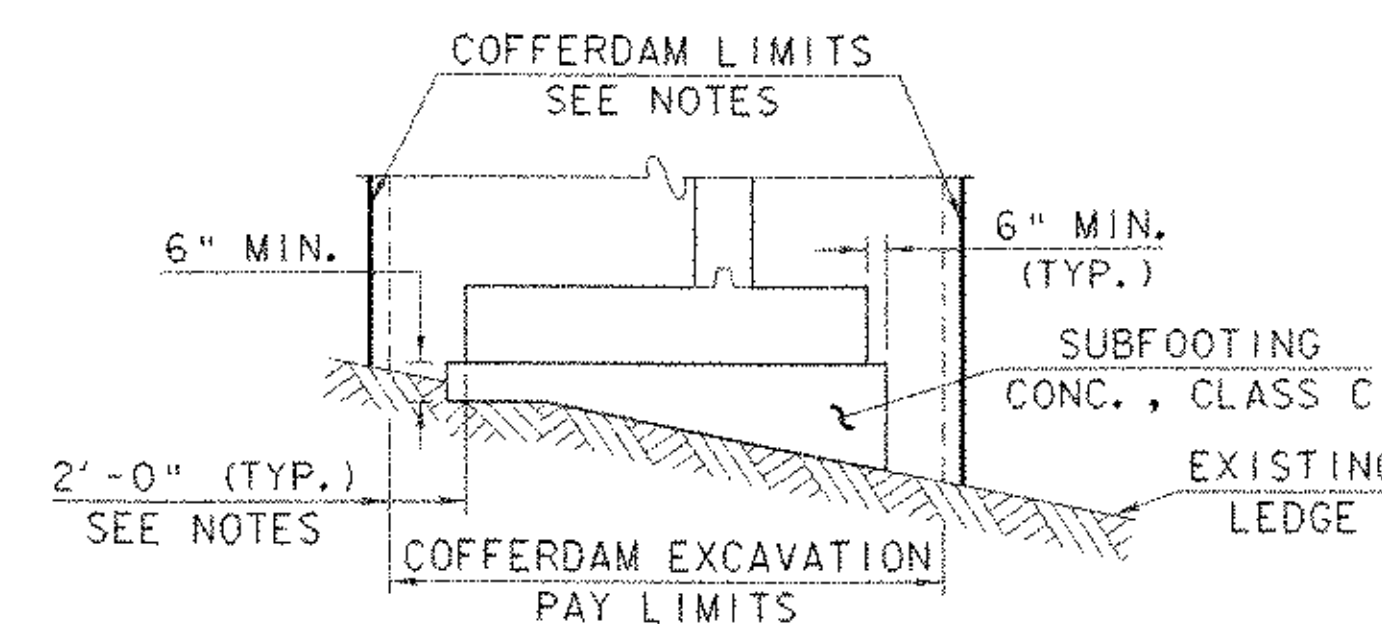
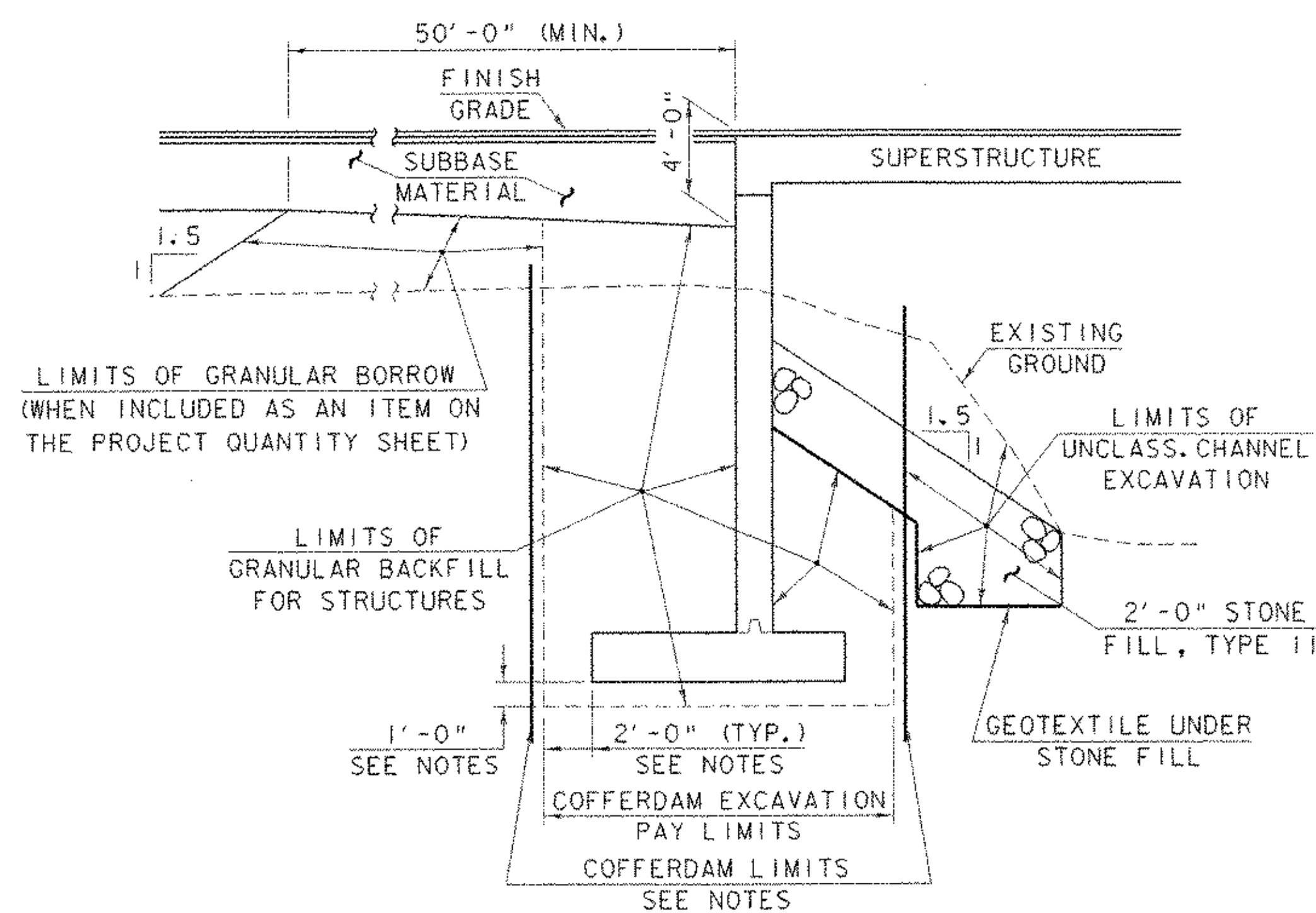
PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	90c053\structures\sc053p1.i
PROJECT MANAGER:	R.R. WHITCOMB
DESIGNED BY:	G. ROY
PLOT DATE:	20-MAR-2003
DRAWN BY:	G. ROY
CHECKED BY:	R. WHITCOMB
SHEET	2 OF 38



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

NOTES

1. SEE PROJECT STP 0126 (4)S FOR TYPICAL ROADWAY SECTION.
2. COFFERDAM LIMITS TO BE DETERMINED BY THE CONTRACTOR.
3. THE PAY LIMITS OF "COFFERDAM EXCAVATION, EARTH" AND "COFFERDAM EXCAVATION, ROCK" SHALL BE 2'-0" OUTSIDE THE PERIMETER OF THE FOOTING, UP TO EXISTING GROUND OR BOTTOM OF SUBBASE, WHICHEVER IS LOWER.
4. ONE FOOT UNDERCUT AS DETERMINED NECESSARY BY THE RESIDENT ENGINEER.
5. IF A COFFERDAM IS CONSTRUCTED WHICH IS LARGER THAN THE INDICATED COFFERDAM EXCAVATION PAY LIMITS, PAYMENT FOR ALL UNCLASSIFIED CHANNEL EXCAVATION, INCLUDING THAT PORTION WHICH IS INSIDE THE COFFERDAM BUT OUTSIDE THE COFFERDAM EXCAVATION PAY LIMITS, WILL BE MADE AT THE CONTRACT UNIT PRICE FOR UNCLASSIFIED CHANNEL EXCAVATION.



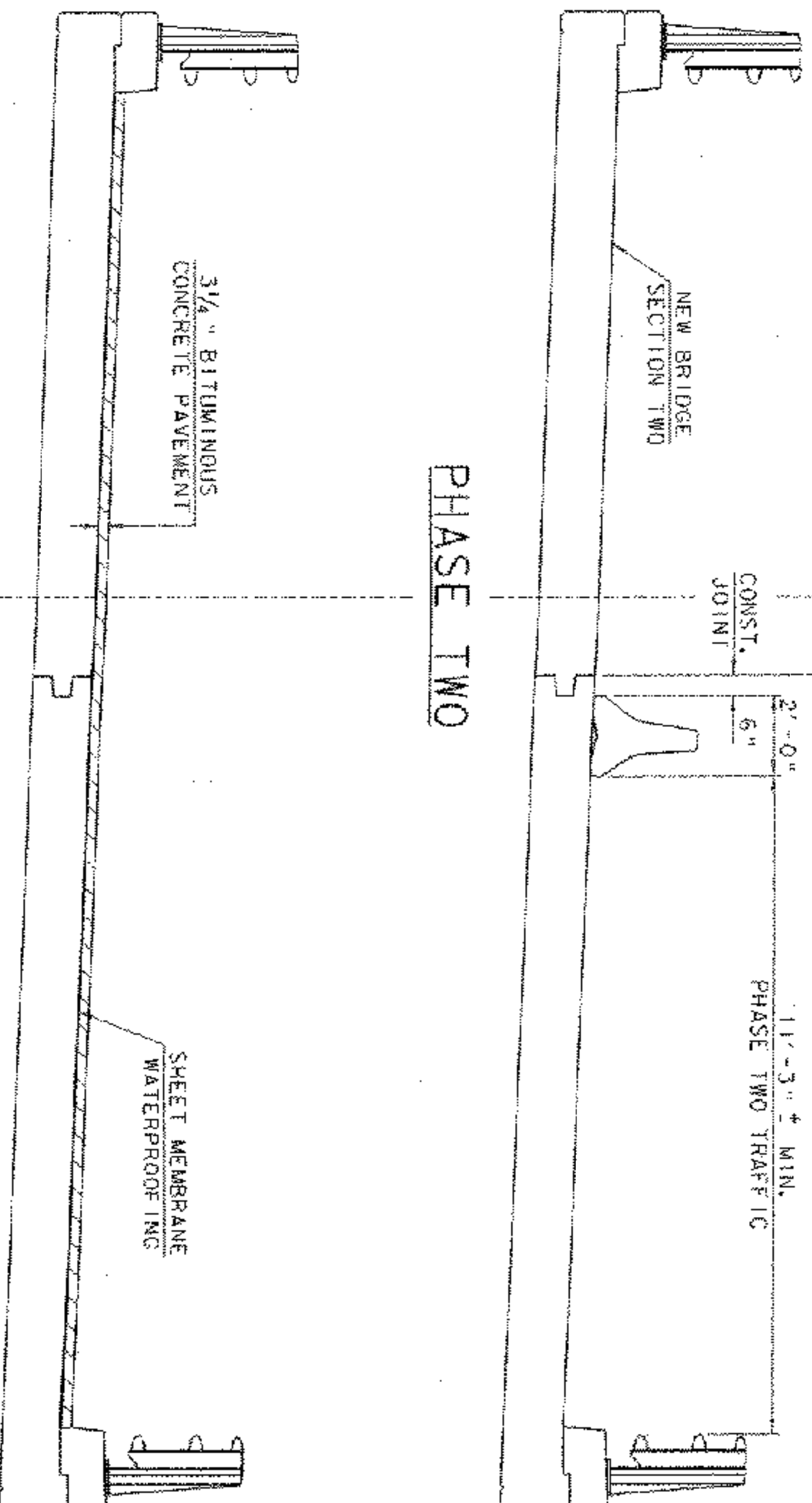
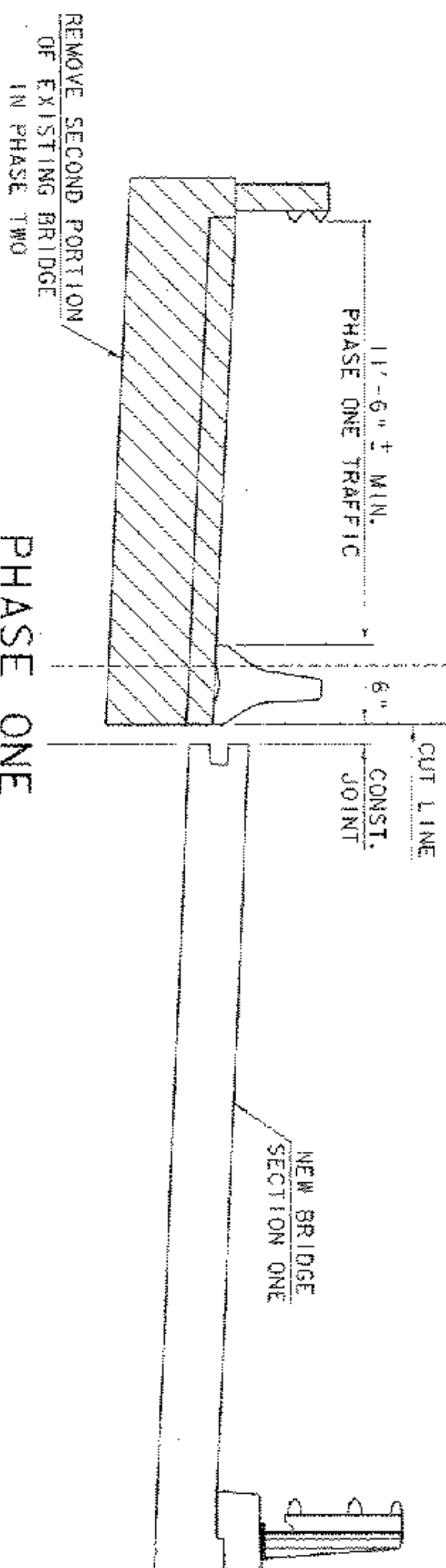
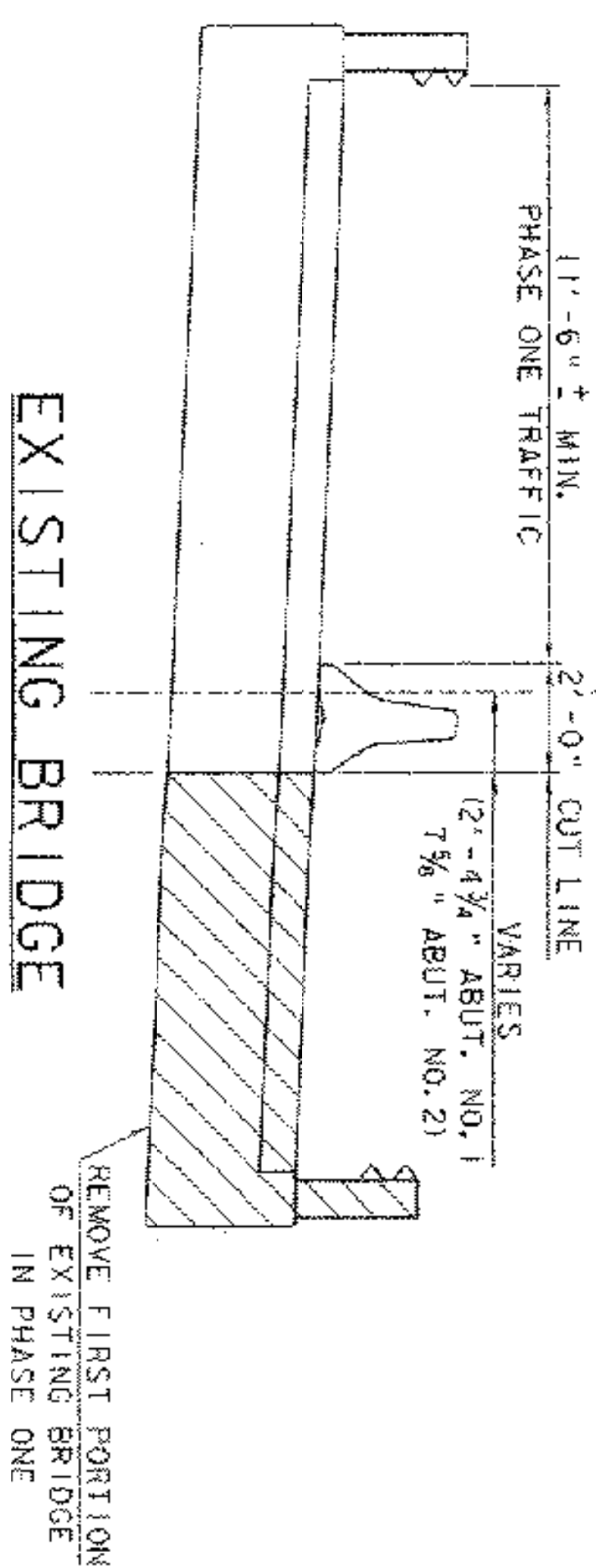
PROJECT TYPICAL SECTIONS

PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	90c053\structures\sc053typ1
PROJECT MANAGER:	R. R. WHITCOMB
DESIGNED BY:	G. ROY
PLOT DATE:	19-AUG-2003
DRAWN BY:	G. ROY
CHECKED BY:	R. WHITCOMB
SHEET	3 OF 38

STATE OF VERMONT AGENCY OF TRANSPORTATION															QUANTITY SHEET TH 2-9103										
SUMMARY OF ESTIMATED QUANTITIES															TOTALS			DESCRIPTIONS			DETAILED SUMMARY OF QUANTITIES				
ROADWAY		EROSION CONTROL		CHANNEL		ABUTMENT NO.2		ABUTMENT NO.1		APPROACH SLAB NO.1		APPROACH SLAB NO.1		SLAB		BRIDGE QUANTITY	ROUND	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	QUANTITIES	UNIT	ITEMS
310																		310		CY	COMMON EXCAVATION	203.15			
				120												120		120		CY	UNCLASSIFIED CHANNEL EXCAVATION	203.27			
30																		30		CY	SAND BORROW	203.31			
30																		30		CY	TRENCH EXCAVATION OF EARTH	204.20			
						320		350								670		670		CY	GRANULAR BACKFILL FOR STRUCTURES	204.30			
						360		350								710		710		CY	COFFERDAM EXCAVATION, EARTH	208.30			
						360		350								710		710		CY	COFFERDAM EXCAVATION, ROCK	208.35			
								1								1		1		LS	COFFERDAM @ STA. 344+ 09 LT.	208.40			
						1										1		1		LS	COFFERDAM @ STA. 344 + 38 LT.	208.40			
								1								1		1		LS	COFFERDAM @ STA. 344 + 45 RT.	208.40			
						1										1		1		LS	COFFERDAM @ STA. 344 + 75 RT.	208.40			
330																		330		CY	SUBBASE OF DENSE GRADED CRUSHED STONE	301.35			
1																		1		CWT	EMULSIFIED ASPHALT	404.65			
45										13		13		19		45		90		TON	BITUMINOUS CONCRETE PAVEMENT	406.25			
						53										53		53		CY	CONCRETE, CLASS C	501.30			
														4		4		4		CY	CONCRETE, HIGH PERFROMANCE CLASS A	501.33			
3						121		131		33		33		59		377		380		CY	CONCRETE, HIGH PERFROMANCE CLASS B	501.34			
240						15520		13510								29030		29270		LB	REINFORCING STEEL	507.15			
						82										82		82		LF	DRILLING AND GROUTING DOWELS	507.16			
						240		210		4770		4360		10640		20210		20210		LB	EPOXY COATED REINFORCING STEEL	507.17			
						38		42								80		80		EACH	MECHANICAL BAR CONNECTOR (#5 UNCOATED)	507.19			
										27		27		29		83		83		EACH	MECHANICAL BAR CONNECTOR (#5 EPOXY COATED)	507.19			
						5		5						5		15		15		GAL	WATER REPELLENT	514.10			
										74		74		105		253		253		SY	SHEET MEMBRANE WATERPROOFING	519.20			
														45		45		45		LF	BRIDGE RAILING - 3 RAIL ALUMINUM	525.22			
1																		1		LS	MAINTENANCE OF TRAFFIC FOR BRIDGE PROJECTS	527.10			
42																		42		SY	REMOVAL OF BRIDGE PAVEMENT	529.10			
1																		1		EACH	REMOVAL OF STRUCTURE	529.15			
50																		50		LF	18" RCP CLASS III	601.0815			
1																		1		EACH	CAST IRON GRATE WITH FRAME, TYPE D	604.51			
				190												190		190		CY	STONE FILL, TYPE II	613.11			
166																		166		LF	SNOW FENCE	620.70			
2																		2		EACH	ENERGY ABSORPTION ATTENUATOR	621.58			
154																		154		LF	ALUMINUM APPROACH RAILING	621.74			
390																		390		LF	TEMPORARY TRAFFIC BARRIER	621.90			
400																		400		HR	FLAGGERS	630.15			
22																		22		LF	TEMPORARY 24" STOP BAR	646.66			
200																		200		SF	REMOVAL OF EXISTING PAVEMENT MARKINGS	646.85			
				320												320		320		SY	GEOTEXTILE UNDER STONE FILL	649.31			
		120																120		SY	GEOTEXTILE FOR SILT FENCE	649.51			
																						PROJECT NAME: ROCKINGHAM			
																						PROJECT NUMBER: TH 2 - 9103			
																						FILE NAME: 190c0531structureslsc053qs.xls			
																						PLOT DATE: 08/18/2003			
																						PROJECT MANAGER: R. R. WHITCOMB			
																						DRAWN BY: G. ROY			
																						DESIGNED BY: G. ROY			
																						CHECKED BY: R. R. WHITCOMB			
																						QUANTITY SHEET #1			
																						SHEET 4 OF 38			

QUANTITY SHEET TH 2-9103

PROJECT NAME: ROCKINGHAM	
PROJECT NUMBER: TH 2 - 9103	
FILE NAME: 90c053structuresec053qs.xls	PLOT DATE: 08/18/2003
PROJECT MANAGER: R. R. WHITCOMB	DRAWN BY: G. ROY
DESIGNED BY: G. ROY	CHECKED BY: R. R. WHITCOMB
QUANTITY SHEET #2	SHEET 5 OF 38



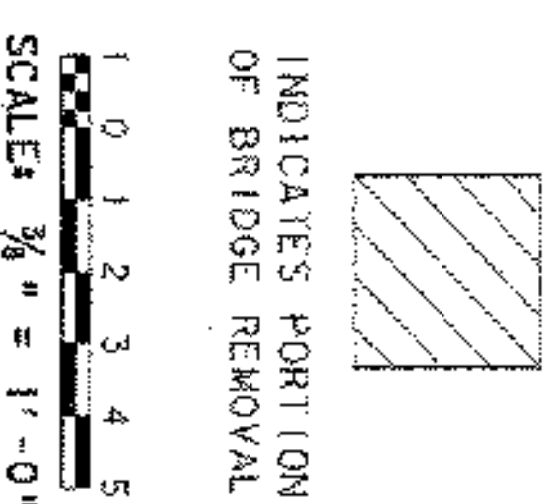
PHASE CONSTRUCTION NOTES

- PHASE ONE:** PLACE TEMPORARY BARRIER AT THE LOCATION SHOWN TO MAINTAIN ONE-WAY TRAFFIC. DIRECT ALL TRAFFIC TO UPSTREAM SIDE OF BRIDGE AS SHOWN. CUT EXISTING BRIDGE AT THE LOCATION SHOWN AND REMOVE PORTION OF EXISTING BRIDGE INDICATED BY THE HATCH LINES. WITH TRAFFIC IN PHASE ONE CONDITION, CONSTRUCT NEW BRIDGE SECTION ONE TO CONSTRUCTION JOINT AS SHOWN.
- PHASE TWO:** RESET TEMPORARY BARRIER AS SHOWN AND MOVE ONE-WAY TRAFFIC TO ONE-WAY TRAFFIC ON THE DOWNSTREAM SIDE OF BRIDGE AS SHOWN. REMOVE REMAINING PORTION OF EXISTING BRIDGE INDICATED BY THE HATCH LINES. WITH TRAFFIC IN PHASE TWO CONDITION, CONSTRUCT NEW BRIDGE SECTION TWO AS SHOWN.
- PHASE THREE:** REMOVE TEMPORARY BARRIER. WHILE MAINTAINING ONE-WAY TRAFFIC, PLACE SHEET MEMBRANE AND PERMANENT PAVEMENT. REDIRECT TO TWO-WAY TRAFFIC.

CONSPAN PRECAST
CONCRETE ARCH USED
VALUE ENGINEERING
SEE PAGES 040 TO 088.
STILL UTILIZED PHASE
CONSTRUCTION

PHASE CONSTRUCTION DETAILS

PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	900535structure91sc0303cd.d
PROJECT MANAGER:	R. R. WHITCOMB
DESIGNED BY:	G. ROY
DRAWN BY:	G. ROY
CHECKED BY:	R. WHITCOMB
SHEET	9 OF 38



CONSTRUCT FIELD DRIVE
E STA 344 + 47.75 RT.
CONSTRUCT INTERSECTION WITH T.H. 34
E STA 344 + 64.08 LT.

BRIDGE RAILING - 3 RAIL ALUMINUM
E STA 344 + 08.8 LT. - E STA 344 + 32.4 LT.
E STA 344 + 54.4 RT. - E STA 344 + 66.5 RT.

ALUMINUM APPROACH RAILING
M STA 10 + 466.0 LT. - E STA 344 + 08.8 LT.
E STA 344 + 32.4 LT. - T.H. 34 E STA 98 + 79.5 LT.
DRIVE STA 1 + 57.2 LT. - E STA 344 + 54 RT.
E STA 344 + 66.5 RT. - E STA 344 + 91.3 RT.

SNOW FENCE
M STA 10 + 470.0 LT. - E STA 344 + 00.0 LT.
E STA 344 + 10.0 LT. - M STA 3 + 032.0 LT.
E STA 344 + 30.0 RT. - E STA 344 + 36.0 RT.

SNOW FENCE LOCATES THE CONSTRUCTION LIMIT NEAR
THE MILL AREA AND ALONG THE STONE WALL NEAR
THE FIELD DRIVE. NO WORK SHALL BE PERMITTED
OUTSIDE OF THIS LIMIT.

BM NO. 2
CHISEL SQUARE
TOP CONC. CURB
UPSTREAM SIDE OF BRIDGE
ELEV. = 591.775

CHANNEL POB
STA 50 + 25.00

STOP PROJECT STP 0126 (4) S
BEGIN PROJECT TH2 - 9103
METRIC STA 10 + 480.000 -
ENGLISH STA 343 + 83.20

BM NO. 1
CHISEL SQUARE
CONC. FOUND
ELEV. = 595.094

ASSUMED EXISTING 3 ROD R.O.W.

ASSUMED EXISTING 3 ROD R.O.W.

E INDICATES ENGLISH STATIONING
M INDICATES METRIC STATIONING
--- OHW --- ORDINARY HIGH WATER
--- WETLAND BOUNDARY
--- SNOW FENCE

SCALE: 1" = 20' - 0"

END PROJECT TH2 - 9103
BEGIN PROJECT STP 0126 (4) S
ENGLISH T.H. 34 STA 99 + 08.14 -
METRIC T.H. 34 STA 3 + 020.000

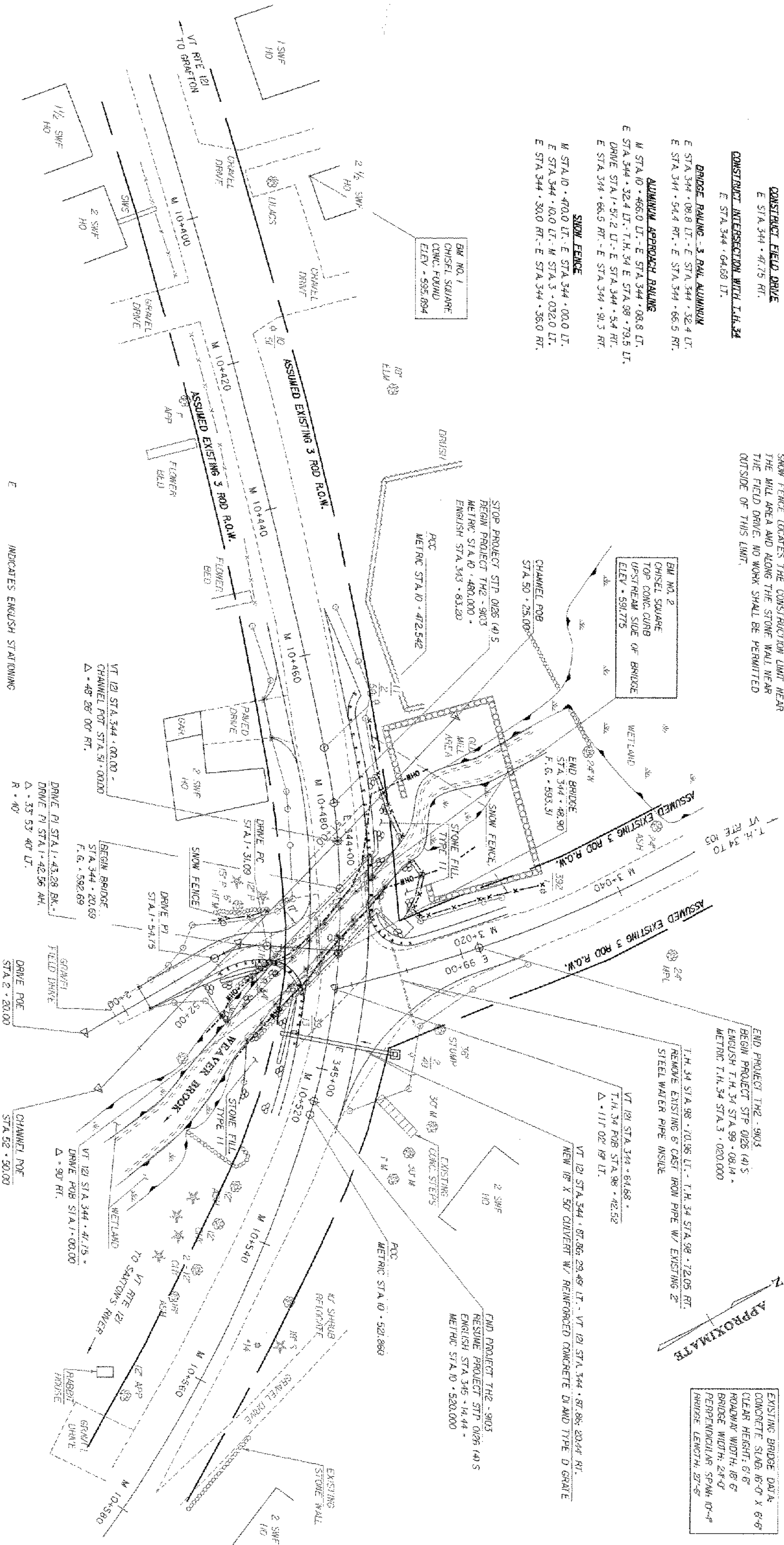
T.H. 34 STA 98 + 10.96 LT. - T.H. 34 STA 98 + 12.05 RT.
REMOVE EXISTING 6" CAST IRON PIPE W/ EXISTING 2"
STEEL WATER PIPE INSIDE

VT 121 STA 344 + 64.68 -
T.H. 34 POB STA 98 + 42.52
Δ = 111' 02" 19 LT.

VT 121 STA 344 + 87.86; 29.49 LT. - VT 121 STA 344 + 87.86; 20.44 RT.
NEW 18" X 50" CULVERT W/ REINFORCED CONCRETE DI AND TYPE D GRADE

END PROJECT TH2 - 9103
RESUME PROJECT STP 0126 (4) S
ENGLISH STA 345 + 14.44 -
METRIC STA 10 + 520.000

EXISTING BRIDGE DATA:
CONCRETE SLAB: 16'-0" X 6'-6"
CLEAR HEIGHT: 6'-6"
ROADWAY WIDTH: 16'-6"
BRIDGE WIDTH: 24'-0"
PERPENDICULAR SPAN: 10'-4"
BRIDGE LENGTH: 27'-5"

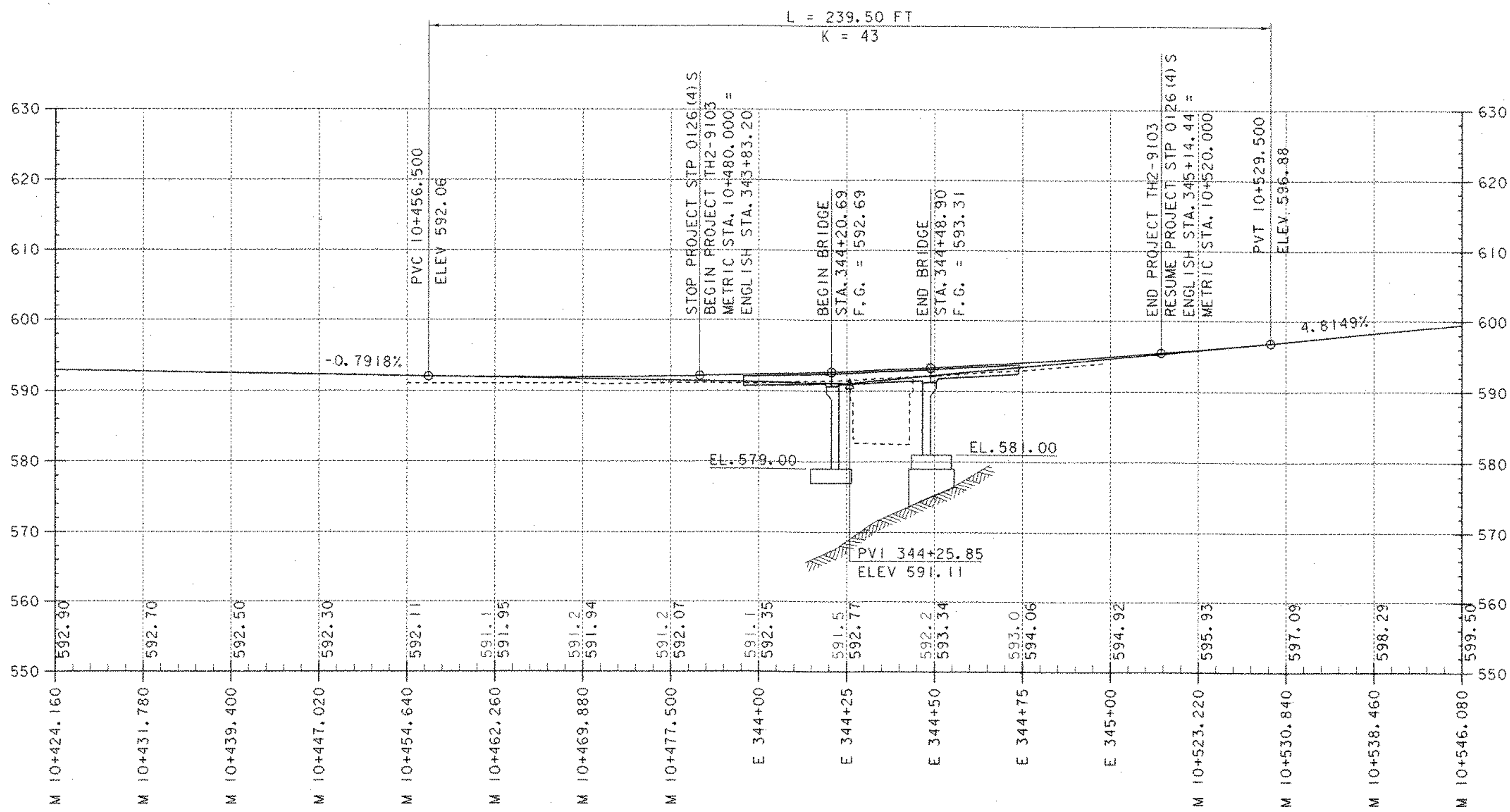


CONSPAN PRECAST
CONCRETE ARCH USED
VALUE ENGINEERING
SEE PAGES 040 TO 088.

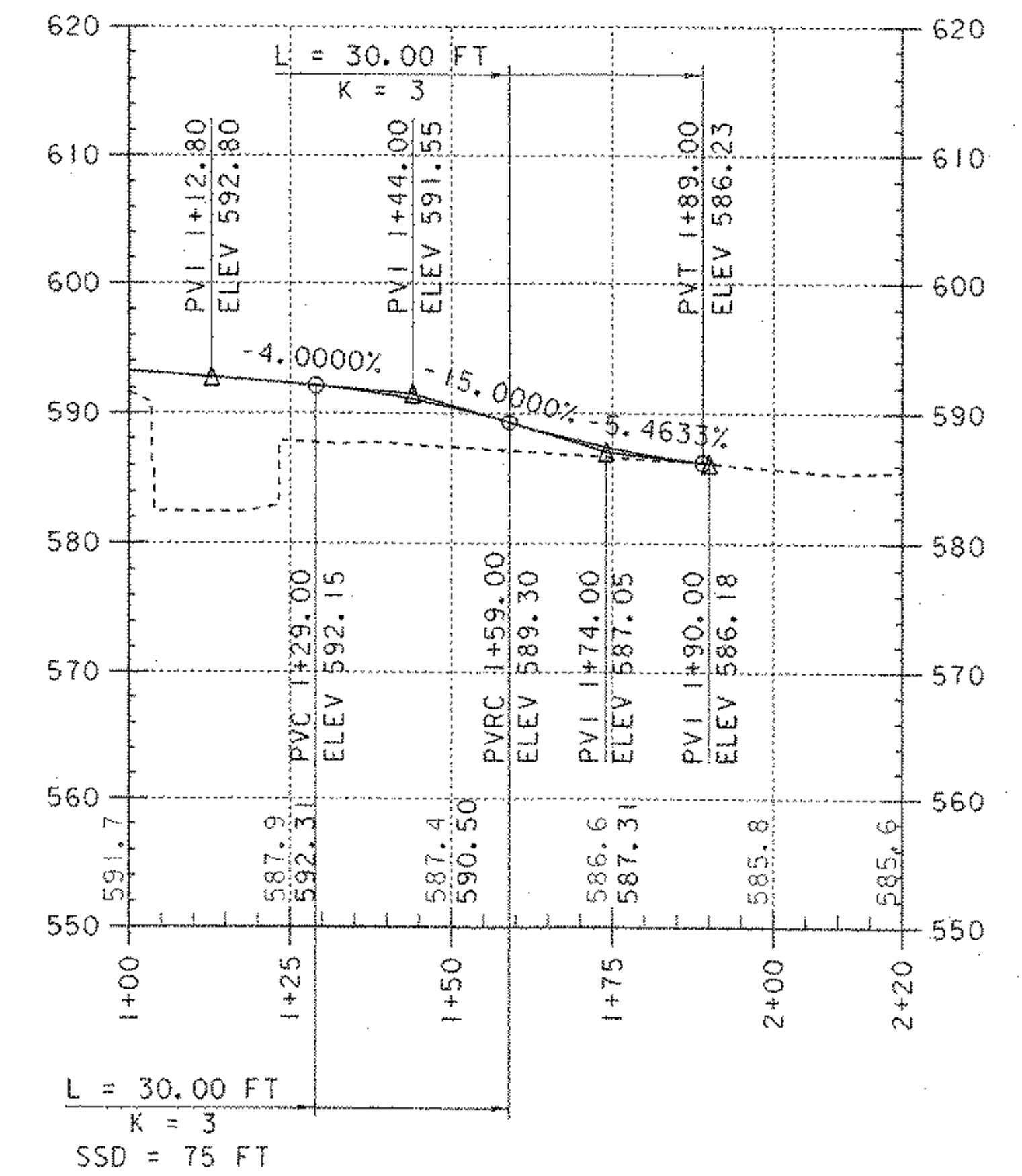
LAYOUT

PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	900003\structure\03\06\03\TH01
PROJECT MANAGER:	R. R. WHITCOMB
DESIGNED BY:	G. ROY
PLOT DATE:	19-AUG-2003
DRAWN BY:	G. ROY
CHECKED BY:	R. WHITCOMB
SHEET	1 OF 38

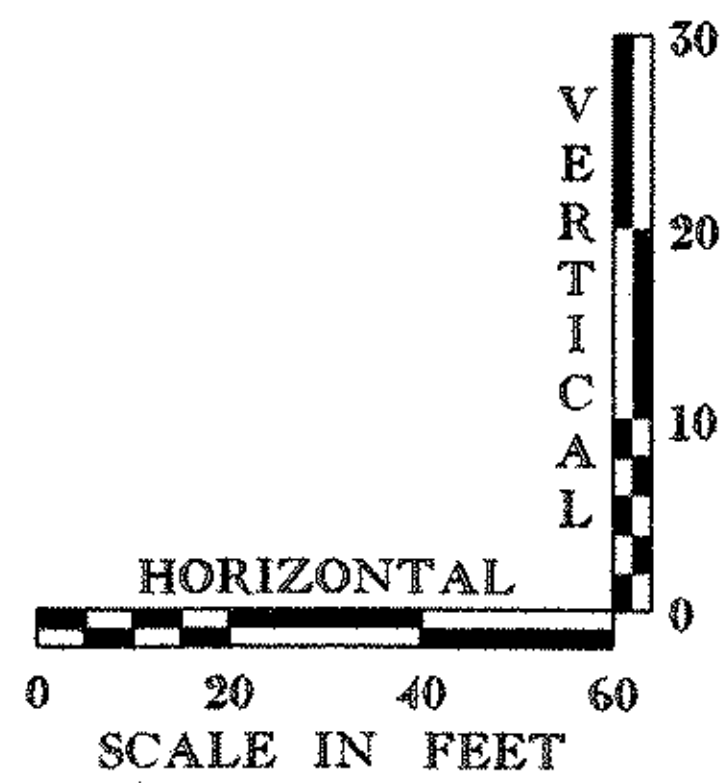
PROFILE ALONG VT RTE 121



DRIVE PROFILE @ 344+47.75 RT.



NOTE:
ELEVATIONS TO THE NEAREST TENTH ARE
EXISTING GROUND ALONG PROPOSED CENTERLINE.
ELEVATIONS TO THE NEAREST HUNDREDTH ARE
FINISH GRADE ALONG PROPOSED CENTERLINE.



PROFILES

PROJECT NAME:	ROCKINGHAM	FILE NAME:	90c053\structures\sc053pt1	PLOT DATE:	20-MAR-2003
PROJECT NUMBER:	TH2 - 9103	PROJECT MANAGER:	R. R. WHITCOMB	DRAWN BY:	G. ROY
DESIGNED BY:	G. ROY	CHECKED BY:	R. WHITCOMB	SHEET	6 OF 38

[illegible]

SPECIAL REQUIREMENTS

APPROACH	TEMPORARY VEHICLE DETECTOR	FLASHING BEACON ON ADVANCED WARNING SIGN
2	X	
6		
4	X	

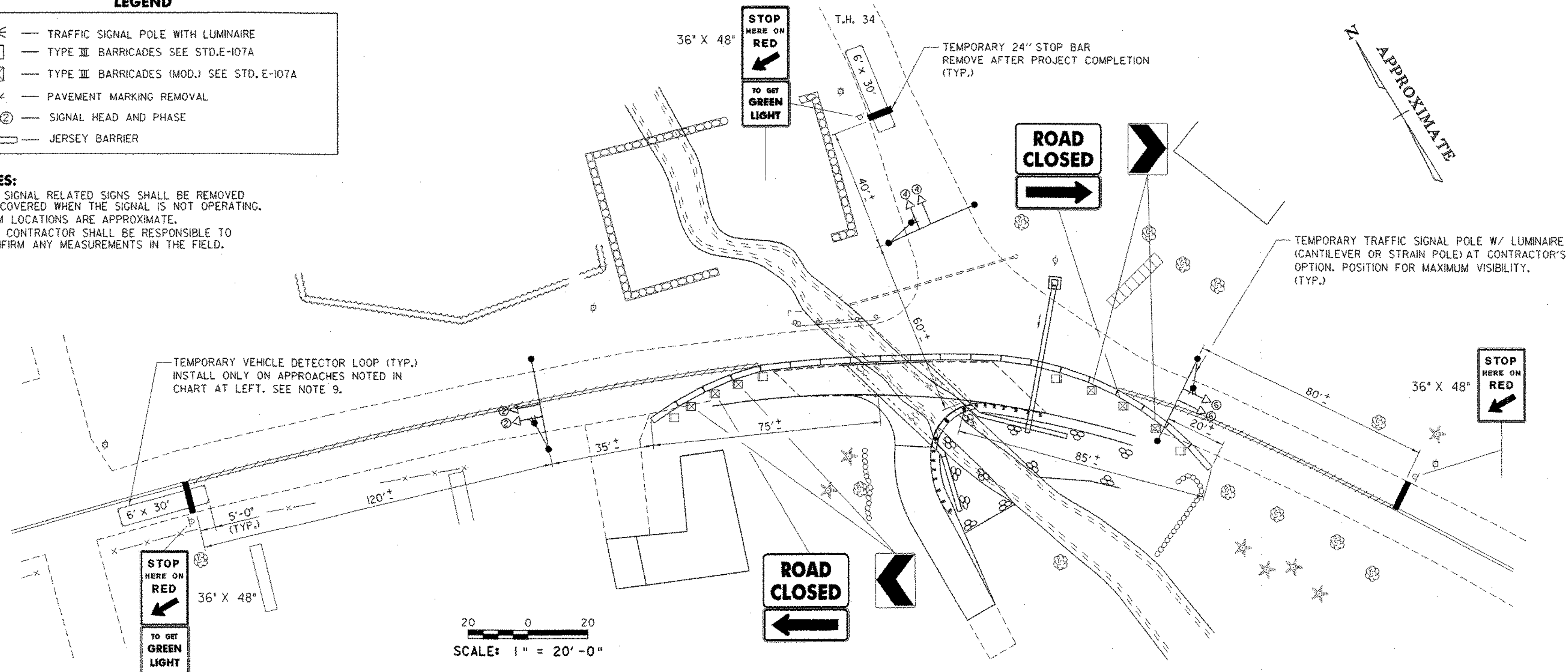
ENTER CHECK MARK IN APPROPRIATE
BOX WHEN REQUIRED ON THIS PROJECT

LEGEND

-  — TRAFFIC SIGNAL POLE WITH LUMINAIRE
 — TYPE III BARRICADES SEE STD.E-107A
 — TYPE III BARRICADES (MOD.) SEE STD.E-107A
 — PAVEMENT MARKING REMOVAL
 — SIGNAL HEAD AND PHASE
 — JERSEY BARRIER

NOTES:

1. ALL SIGNAL RELATED SIGNS SHALL BE REMOVED OR COVERED WHEN THE SIGNAL IS NOT OPERATING.
2. ITEM LOCATIONS ARE APPROXIMATE.
3. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONFIRM ANY MEASUREMENTS IN THE FIELD.



GENERAL TEMPORARY TRAFFIC SIGNAL NOTES

- | | | |
|--|--|--|
| 1. DESIGN OF THE SIGNAL SUPPORT(S) AND ANY REQUIRED GUYING IS THE RESPONSIBILITY OF THE CONTRACTOR. | 13. INTERCONNECT BETWEEN SIGNAL POLES BY WHATEVER MEANS POSSIBLE OR CONVENIENT TO PROVIDE FOR A SAFE INSTALLATION. | 27. TRAFFIC CONTROL WARNING SIGNS SHALL BE PROVIDED ON EACH APPROACH PER STANDARD E-107. ADDITIONAL PROJECT CONSTRUCTION SIGNS SHALL BE INSTALLED AS REQUIRED BY THE RESIDENT ENGINEER PER STANDARD E-100, E-101, E-102 & E-102A. PAYMENT FOR THESE SIGNS, THE REFLECTORIZED PLASTIC DRUMS, ETC. SHALL BE PAID AS A PART OF THE "MAINTENANCE OF TRAFFIC FOR BRIDGE PROJECTS" ITEM OR THE "TRAFFIC CONTROL" ITEM. |
| 2. SIGNAL TIMING/TIMING ADJUSTMENTS REQUESTED BY THE RESIDENT ENGINEER SHALL BE ACCOMPLISHED WITHIN A 48 HOUR PERIOD AND PAYMENT SHALL BE SUBSIDIARY TO THE TRAFFIC SIGNAL ITEM. THE ALL-RED CLEARANCE INTERVAL IS BASED ON AN ASSUMED SPEED OF 10-20 MPH. THE RESIDENT ENGINEER SHALL MAKE SEVERAL TRIAL RUNS TO DETERMINE THE PROPER ALL-RED CLEARANCE INTERVAL. | 14. PLACE TEMPORARY POLES BEHIND GUARDRAIL WHERE POSSIBLE. | 28. THE "TO GET GREEN LIGHT" SIGN IS TO BE USED ONLY ON APPROACHES WITH VEHICLE DETECTORS. |
| 3. SIGNAL FACES SHALL CONSIST OF 12" LENSES. (RED, YELLOW, AND GREEN) | 15. POLES SUPPORTING SPAN WIRES AND/OR MAST ARMS SHALL BE ADEQUATELY BRACED OR GUYED AND SHALL NOT BE PLACED SO AS TO CREATE A HAZARD TO THE TRAVELLING PUBLIC. | ~~29. IF BRIDGE WORK REQUIRES LANE CLOSURE ON A ROADWAY UNDERNEATH THE BRIDGE, REFER TO STD. E-110 FOR TRAFFIC CONTROL DETAILS. PAYMENT SUBSIDIARY TO "TRAFFIC CONTROL" OR "MAINTENANCE OF TRAFFIC FOR BRIDGE PROJECTS" AS IS APPROPRIATE.~~ |
| 4. THE BOTTOM OF THE HOUSING OF A SIGNAL FACE SUSPENDED OVER A ROADWAY SHALL NOT BE LESS THAN 16 1/2 FEET NOR MORE THAN 19 FEET ABOVE THE PAVEMENT GRADE AT THE CENTER OF THE ROADWAY. THE BOTTOM OF A SIGNAL FACE NOT MOUNTED OVER A ROADWAY, SHALL NOT BE LESS THAN 8 FEET NOR MORE THAN 15 FEET ABOVE THE GROUND. CAUTION SHOULD BE USED TO INSURE COMPLIANCE WITH THE HEIGHT REQUIREMENTS IN THE EVENT THE NEW APPROACH GRADES DIFFER SIGNIFICANTLY FROM THE OLD ROAD GRADE. | 16. ALL TEMPORARY SIGNAL EQUIPMENT, SIGNS, ETC., SHALL BELONG TO THE CONTRACTOR AT THE END OF THE PROJECT AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL, INCLUDING ANY TEMPORARY PAVEMENT MARKINGS, UTILITY POLES, WIRES, ETC. | 30. IN SITUATIONS WHERE EXISTING PASSING ZONES EXTEND THROUGH THE AREA BETWEEN THE STOP BAR AND THE "NO PASSING ZONE" SIGN, THEN TEMPORARY DOUBLE YELLOW LINES SHALL BE INSTALLED FROM THE STOP BAR TO THE "NO PASSING ZONE" SIGN. THESE MARKINGS SHALL BE PAID UNDER THE "TEMPORARY 4" YELLOW LINE" ITEM. |
| 5. SIGNAL FACES FOR ANY ONE APPROACH SHALL NOT BE LESS THAN 8 FEET APART MEASURED HORIZONTALLY BETWEEN CENTER OF FACES. | 17. A 250 WATT MER/150 WATT HPS LUMINAIRE AND MAST ARM SHALL BE PROVIDED ON A POLE ON EACH APPROACH AT A MOUNTING HEIGHT OF 30' ABOVE ROADWAY CENTERLINE. THE INTENT IS TO LIGHT UP THE AREA AROUND THE SIGNAL HEADS AND STOP BAR FOR INCREASED VISIBILITY. THE RESIDENT ENGINEER SHALL DETERMINE THE ADEQUACY OF THE LIGHTING AND DIRECT CHANGES IF THE LIGHTING IS INSUFFICIENT. | 31. TEMPORARY TRAFFIC BARRIER SHOULD BE SUBSTITUTED FOR THE CHANNELIZING DEVICES SHOWN WHEN ANY OF THE FOLLOWING ARE MET:
A.) THE BRIDGE DECK IS REMOVED
B.) THE BRIDGE RAIL IS REMOVED, OR
C.) IN THE JUDGEMENT OF THE RESIDENT ENGINEER TEMPORARY BARRIER IS NEEDED. |
| 6. SIGNAL HEADS MAY BE HUNG ON A SPAN WIRE OR ON A CANTILEVER MAST ARM. AT LEAST ONE SIGNAL HEAD SHALL BE UNMISTAKABLY IN LINE WITH THE CENTER OF APPROACHING TRAFFIC AT ALL TIMES. THE SECOND SIGNAL HEAD MAY BE POST MOUNTED, LOCATED AT A DISTANCE NO GREATER THAN 14 1/2 FEET FROM THE CENTER OF THE APPROACH LANE WHEN THE STOP BAR IS 40 FEET FROM THE SIGNAL HEAD. CONSULT THE M.U.T.C.D. FOR ADDITIONAL INFORMATION CONCERNING SIGNAL PLACEMENT. | 18. STOP BARS SHALL BE LOCATED A MINIMUM OF 40' AND A MAXIMUM OF 120' FROM THE NEAREST SIGNAL HEAD. | 32. WHEN TEMPORARY BARRIER IS USED, BARRIER ENDS FACING ONCOMING TRAFFIC SHALL BE TAPERED BEYOND THE CLEAR ZONE, OR PROTECTED WITH AN APPROVED END TREATMENT DESIGNED FOR THE 85TH PERCENTILE SPEED OR THE POSTED SPEED LIMIT OF THE ROAD WAY. |
| 7. SIGNAL HEAD PLACEMENT IS CRITICAL. HEADS SHALL BE ADJUSTED TO REFLECT LANE LOCATION CHANGES. | 19. PAYMENT FOR THE VEHICLE DETECTORS SHALL BE FOR EACH UNIT INSTALLED. | 33. PAYMENT FOR TEMPORARY BARRIER USED SHALL BE MADE UNDER THE APPROPRIATE ITEM. |
| 8. THE SIGNAL SYSTEM SHALL CONSIST OF POLES, SIGNS AND POSTS, WARNING SIGN, LUMINAIRES, FLASHING BEACONS, AND SIGNAL EQUIPMENT TO PROVIDE FOR AN ADEQUATE DESIGN. IT ALSO INCLUDES PERMITS AND COST ASSOCIATED WITH PROVIDING ELECTRICAL POWER. | 20. SIGNS AND POSTS AS SHOWN ON THIS SHEET AND NOTED BELOW ARE SUBSIDIARY TO THE TRAFFIC CONTROL SIGNAL ITEMS ("STOP HERE ON RED", "SIGNAL AHEAD", "NO PASSING ZONE", AND "TO GET GREEN LIGHT" ETC.) THE TEMPORARY STOP BARS SHOULD BE PAID UNDER THE TEMPORARY 24" STOP BAR ITEM. | |
| 9. THE CONTRACTOR SHALL PROVIDE AN ACTUATED CONTROLLER. THE APPROACHES NOTED SHALL HAVE A TEMPORARY VEHICLE DETECTOR. THE TYPE OF DETECTION SHALL BE AT THE OPTION OF THE CONTRACTOR. LOOPS ARE SHOWN FOR PLACEMENT PURPOSES ONLY. THE CONTROLLER, DETECTOR AND ALL OTHER SIGNAL EQUIPMENT SHALL MEET OR EXCEED ALL NEMA STANDARDS. | 21. SEE STD. E-140 FOR "STOP HERE ON RED" SIGN DETAIL AND E-101 FOR "SIGNAL AHEAD" SYMBOL SIGN. SEE STANDARD E-121 FOR SIGN PLACEMENT. SEE STANDARD E-171A AND E-172 FOR ADDITIONAL INFORMATION ON SIGNALS AND DETECTORS. | |
| 10. WHEN USED, VEHICLE DETECTOR LOOPS SHALL BE 6' X 30' FOR PRESENCE DETECTION AT THE STOP BAR WITH THE NEAR PORTION LOCATED 5 FEET BEYOND THE STOP BAR. | 22. A "SIGNAL AHEAD" SIGN SHALL BE PLACED AT LEAST 500' FROM THE SIGNAL OR AT A POSITION TO BE DETERMINED BY THE ENGINEER. | |
| 11. ON SEMI-ACTUATED SIGNAL, PARTICULARLY WITH LONG BRIDGES, THE CONTROLLER SHOULD BE LOCATED ON THE SAME SIDE OF THE BRIDGE AS THE DETECTOR. | ~~23. THE "NO PASSING" SIGN SHALL BE USED TO PREVENT PASSING FOR 750' IN ADVANCE OF THE STOP BAR. THE SIGN SHALL BE PER STANDARD E-102.~~ | |
| 12. INTERVAL TIMING SHOWN IN SECONDS. | 24. ALL ELECTRICAL WORK SHALL MEET THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE AND STATE INSPECTOR. | |
| | ~~25. TWO WAY TRAFFIC SHALL BE MAINTAINED ON THE DETOUR WHENEVER POSSIBLE. DURING TWO WAY TRAFFIC, THE SIGNALS SHALL BE SET ON FLASHING YELLOW.~~ | |
| | 26. APPROACH WIDTHS SHALL BE AS DETAILED IN SECTION 528.04(b)2 TO MINIMIZE VEHICLE DELAY. | |

PHASE ONE LAYOUT
ONE-WAY ROADWAY

PROJECT NAME: ROCKINGHAM
PROJECT NUMBER: TH2 - 9103

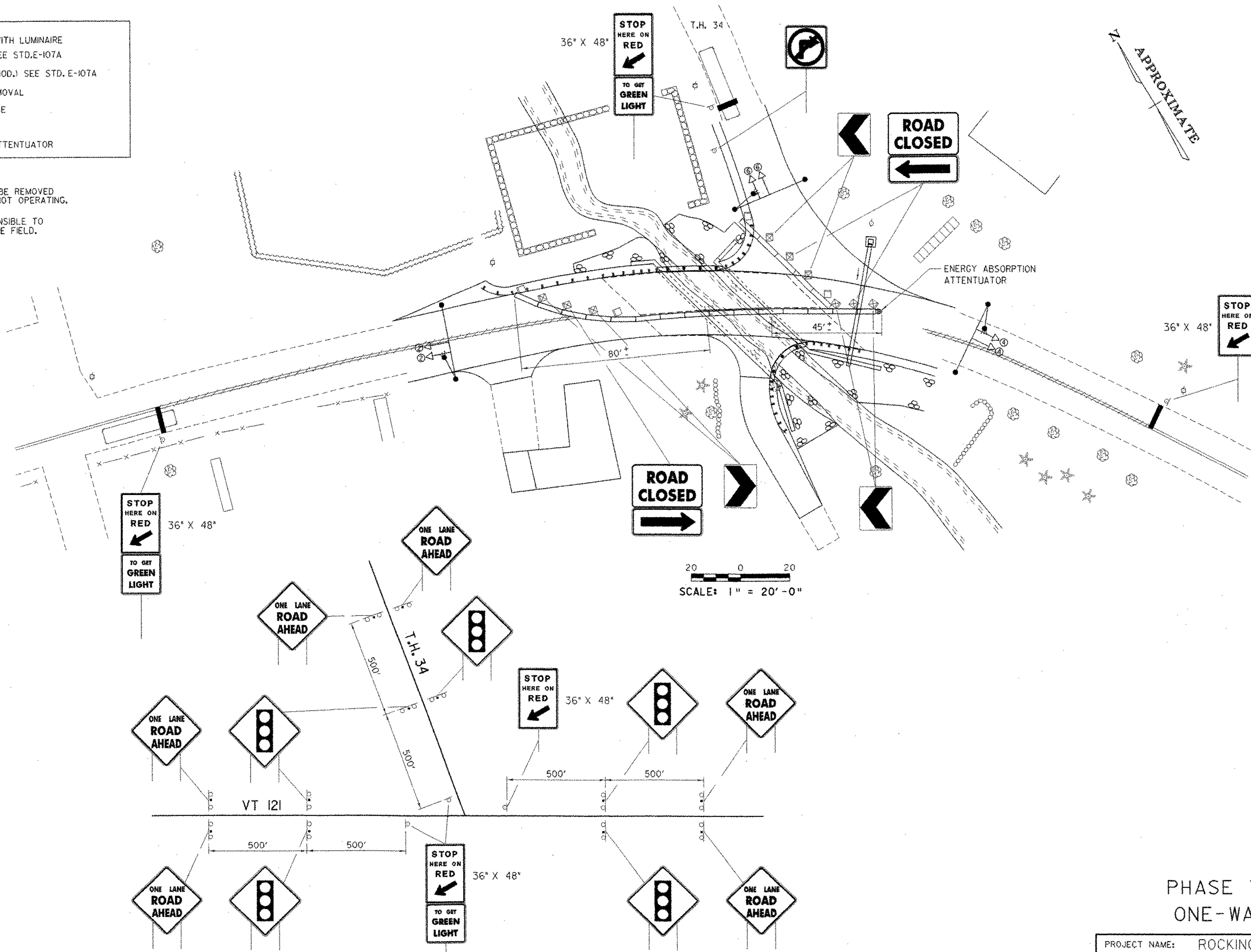
FILE NAME: 90c053\structures\sc053pol1	PLOT DATE: 20-MAR-2003
PROJECT MANAGER: R.R. WHITCOMB	DRAWN BY: G. ROY
DESIGNED BY: G. ROY	CHECKED BY: R. WHITCOMB
	SHEET 9 OF 38

LEGEND

- TRAFFIC SIGNAL POLE WITH LUMINAIRE
- TYPE III BARRICADES SEE STD.E-107A
- TYPE III BARRICADES (MOD.) SEE STD. E-107A
- PAVEMENT MARKING REMOVAL
- SIGNAL HEAD AND PHASE
- JERSEY BARRIER
- ENERGY ABSORPTION ATTENUATOR

NOTES:

- ALL SIGNAL RELATED SIGNS SHALL BE REMOVED OR COVERED WHEN THE SIGNAL IS NOT OPERATING.
- ITEM LOCATIONS ARE APPROXIMATE.
- THE CONTRACTOR SHALL BE RESPONSIBLE TO CONFIRM ANY MEASUREMENTS IN THE FIELD.



CONSTRUCTION APPROACH SIGN LAYOUT

NOT TO SCALE

PHASE TWO LAYOUT ONE-WAY ROADWAY

PROJECT NAME: ROCKINGHAM

PROJECT NUMBER: TH2 - 9103

FILE NAME: 90c053\structures\sc053pg2.i PLOT DATE: 20-MAR-2003

PROJECT MANAGER: R.R. WHITCOMB

DRAWN BY: G. ROY

DESIGNED BY: G. ROY

CHECKED BY: R. WHITCOMB

SHEET 10 OF 38

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	9-16	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

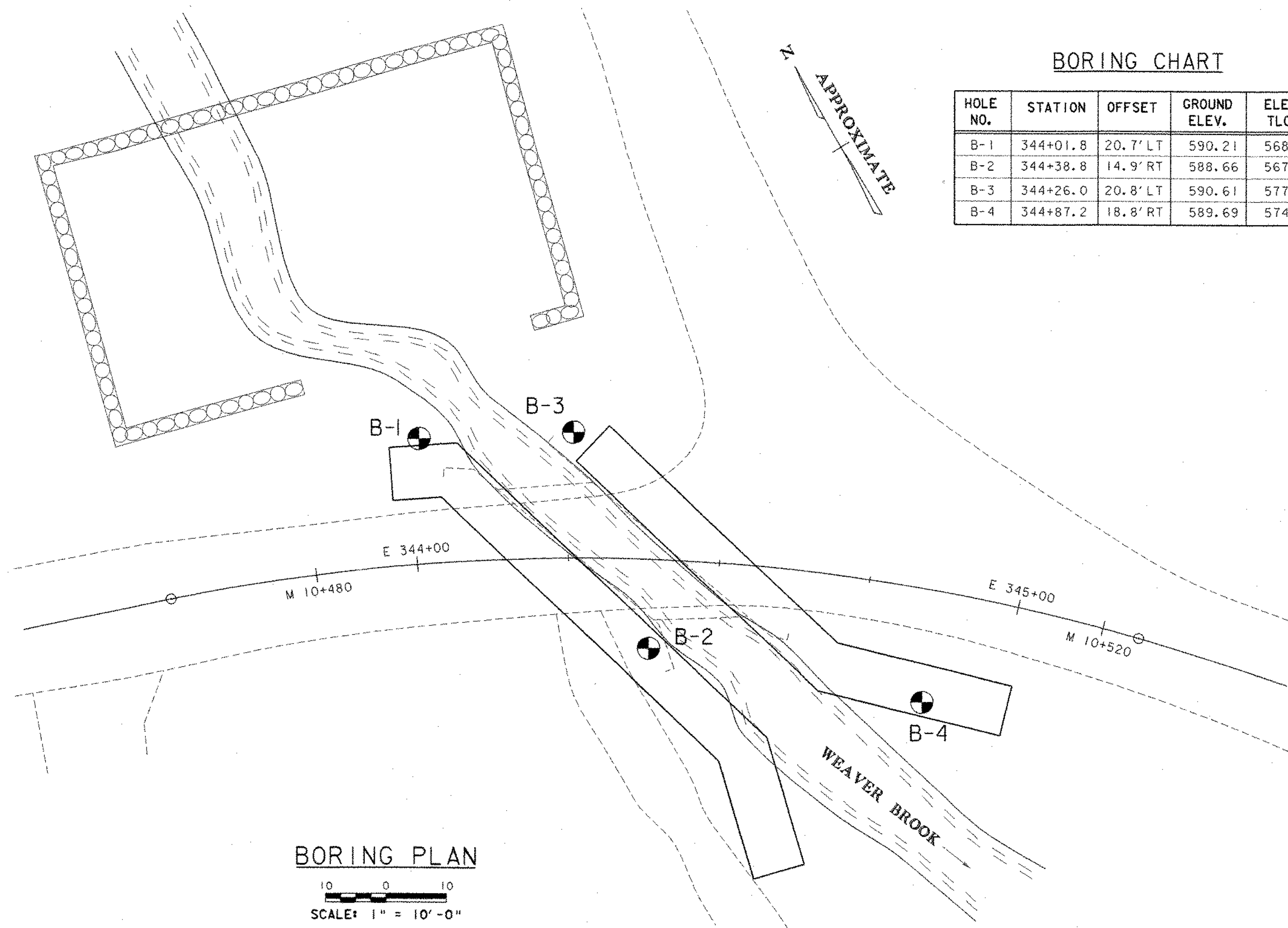
▼	Water Elevation
⊕	Standard Penetration Boring
⊗	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test
	Blow Count Per Foot For:
	2" O.D. Sampler
	1 3/8" I.D. Sampler
	Hammer Weight Of 140 Lbs.
	Hammer Fall Of 30"
VS	Field Vane Shear Test
US	Undisturbed Soil Sample
B	Blast
DC	Diamond Core
MD	Mud Drill
WA	Wash Ahead
HSA	Hollow Stem Auger
AX	Core Size 1 1/8"
BX	Core Size 1 3/8"
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
Sl	Silt
Cl	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
%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	mtc	Multicolored
or	Orange		

BORING CHART

HOLE NO.	STATION	OFFSET	GROUND ELEV.	ELEV. TLOB
B-1	344+01.8	20.7' LT	590.21	568.21
B-2	344+38.8	14.9' RT	588.66	567.16
B-3	344+26.0	20.8' LT	590.61	577.61
B-4	344+87.2	18.8' RT	589.69	574.69



BORING PLAN

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

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) - Rock in its native location of indefinite thickness.
BOULDER - A rock fragment with an average dimension > 12 inches.
COBBLE - Rock fragments with an average dimension between 3 and 12 inches.
GRAVEL - Rounded particles of rock < 3" and > 0.075" (#10 sieve).
SAND - Particles of rock < 0.075" (#10 sieve) and > 0.0029" (#200 sieve).
SILT - Soil < 0.0029" (#200 sieve), non or slightly plastic and exhibits no strength when air-dried.
CLAY - Fine grained soil, exhibits plasticity when moist and considerable strength when air-dried.

VARVED - Alternate layers of silt and clay.
HARDPAN - Extremely dense soil, cemented layer, not softened when wet.
MUCK - Soft organic soil (containing > 10% organic material).
MOISTURE CONTENT - Weight of water divided by dry weight of soil.
FLOWING SAND - Granular soil so saturated (loose) that it flows into drill casing during extraction of wash rod.
STRIKE - Angle from magnetic north to line of intersection of bed with a horizontal plane.
DIP - Inclination of bed with a horizontal plane.

GENERAL NOTES

1. The subsurface explorations shown herein were made between 3/30/94 and 4/7/94 by the Agency.
 2. 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.
 3. 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.

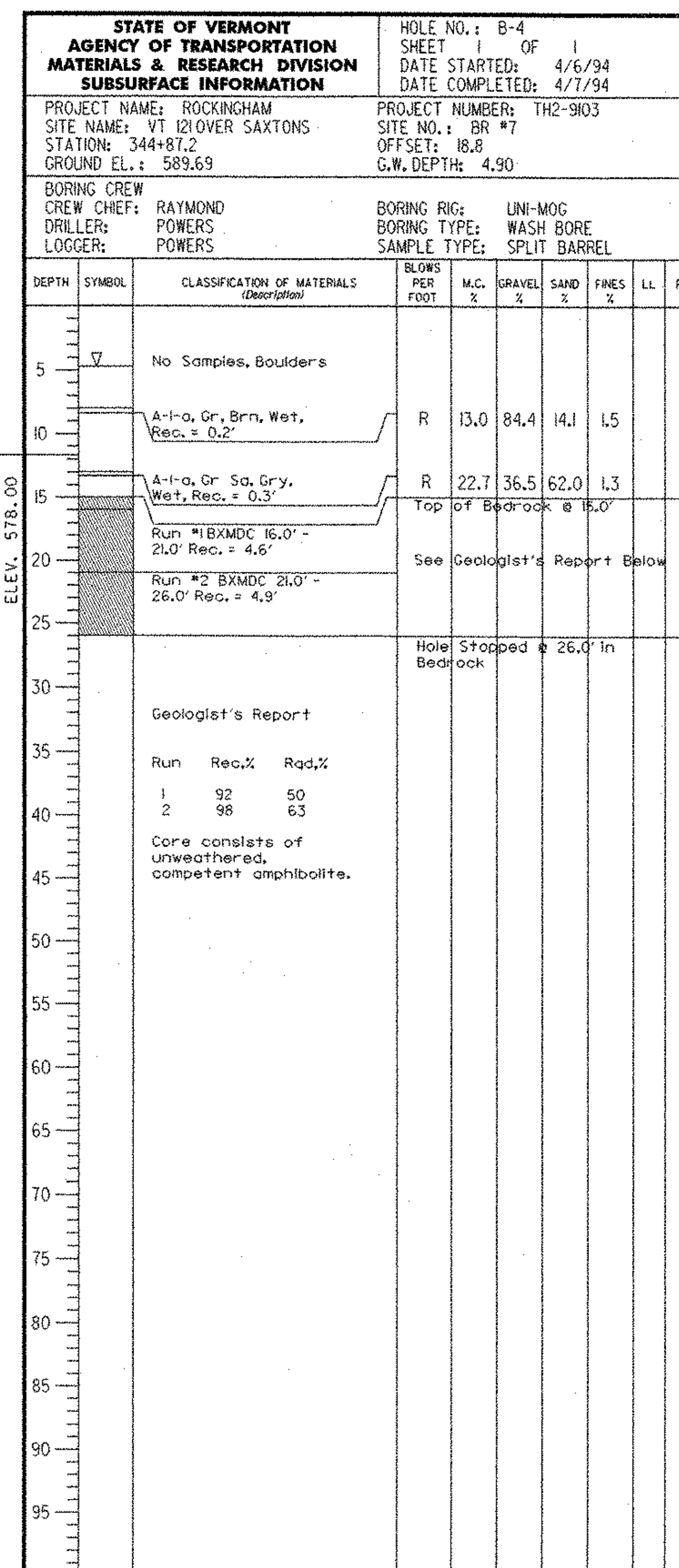
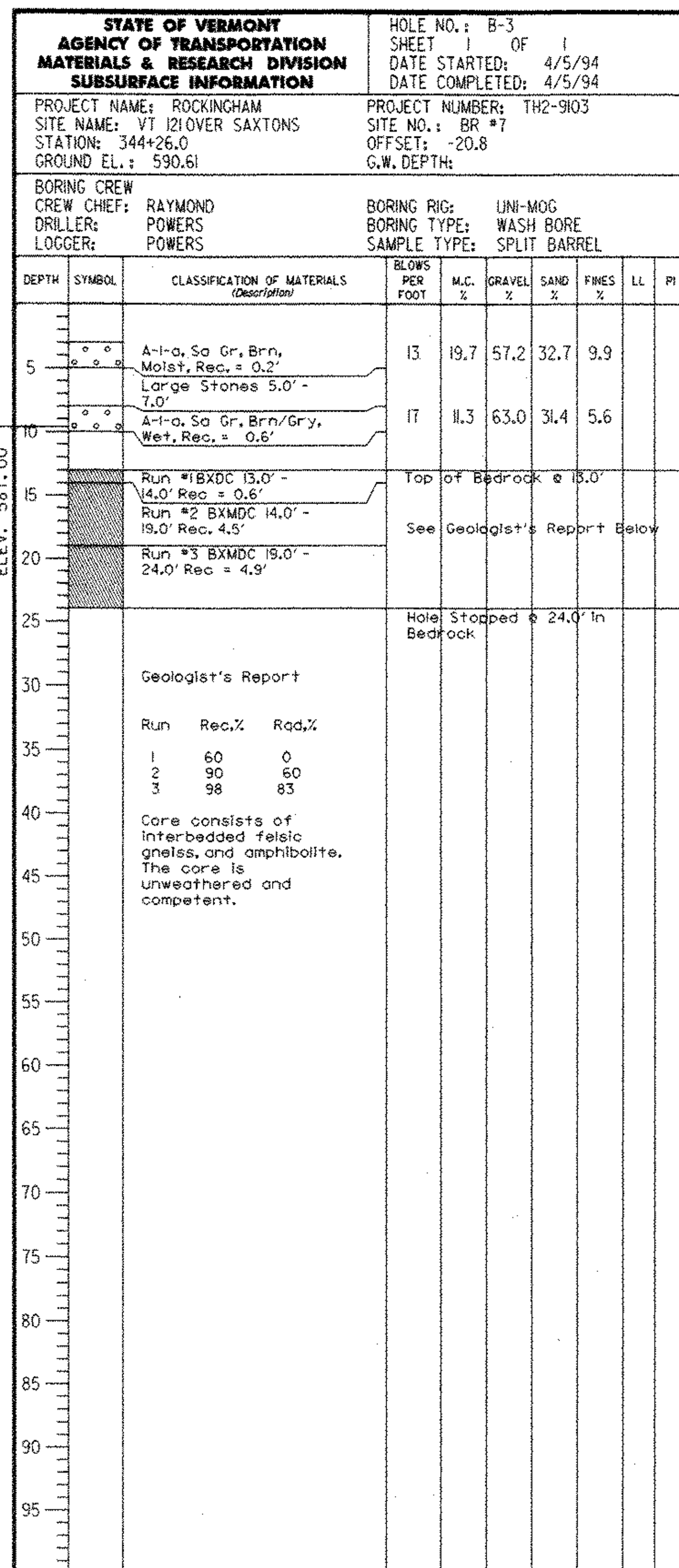
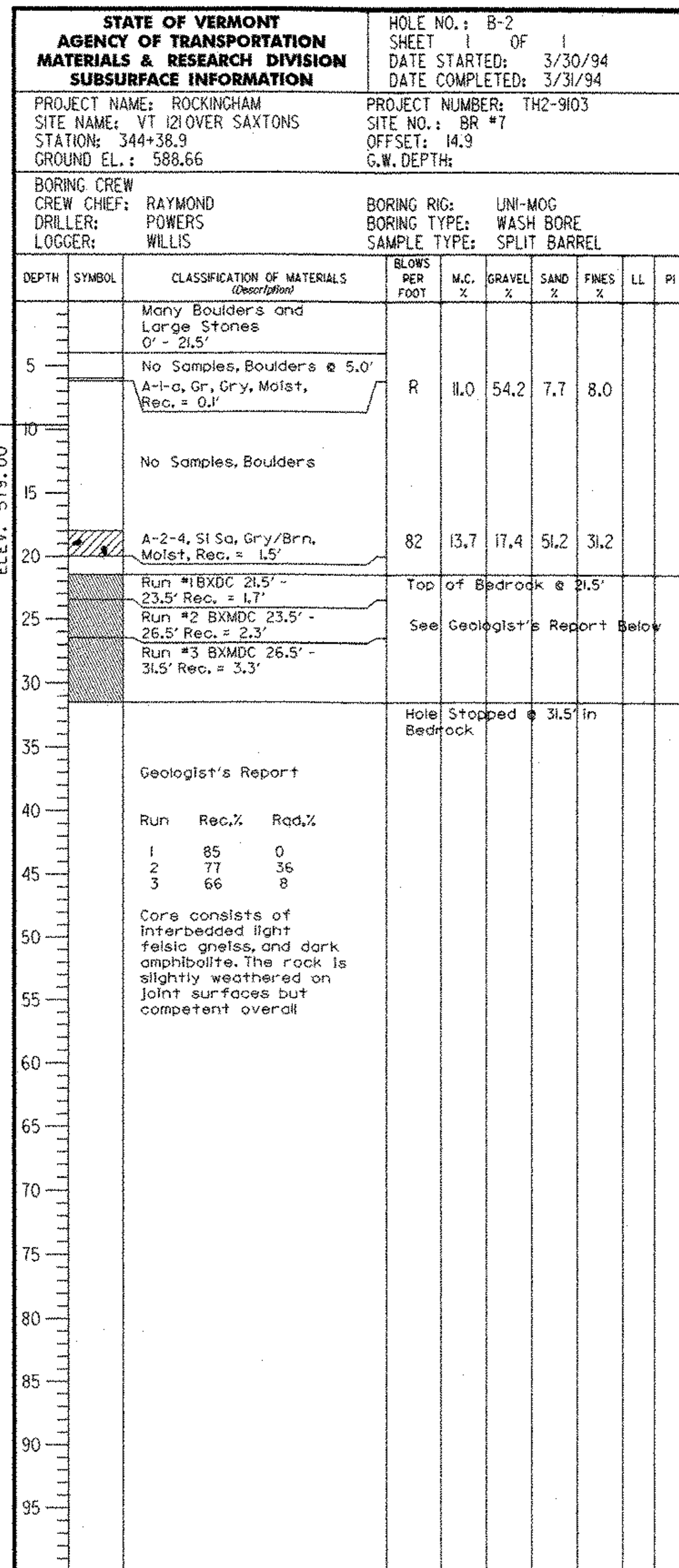
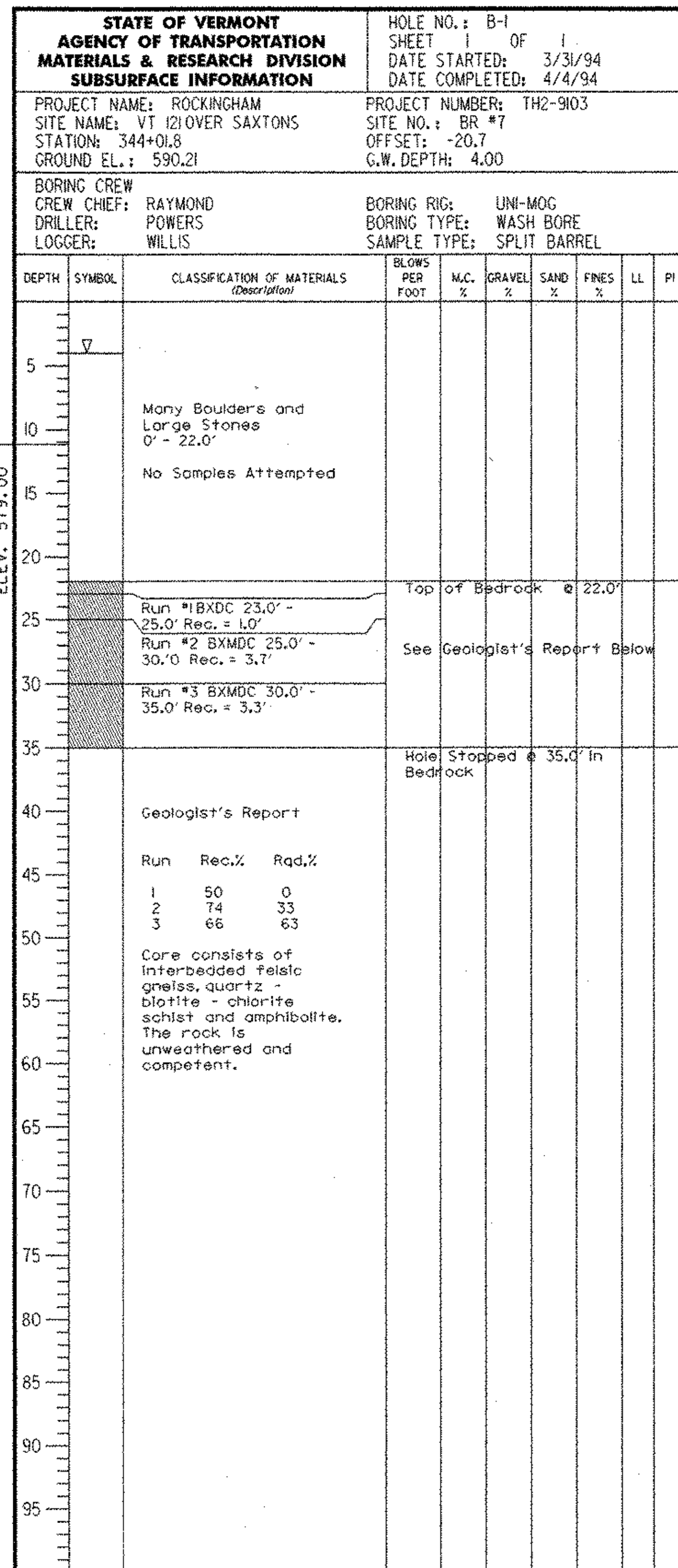
4. Engineering judgement was exercised in preparing the subsurface information presented herein. Analysis and interpretation of subsurface data was performed and interpreted for Agency design and estimating purposes. Presentation of the information in the Contract is intended to provide the Contractor 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.

5. 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.

BORING INFORMATION (1)

PROJECT NAME: ROCKINGHAM
 PROJECT NUMBER: TH2 - 9103

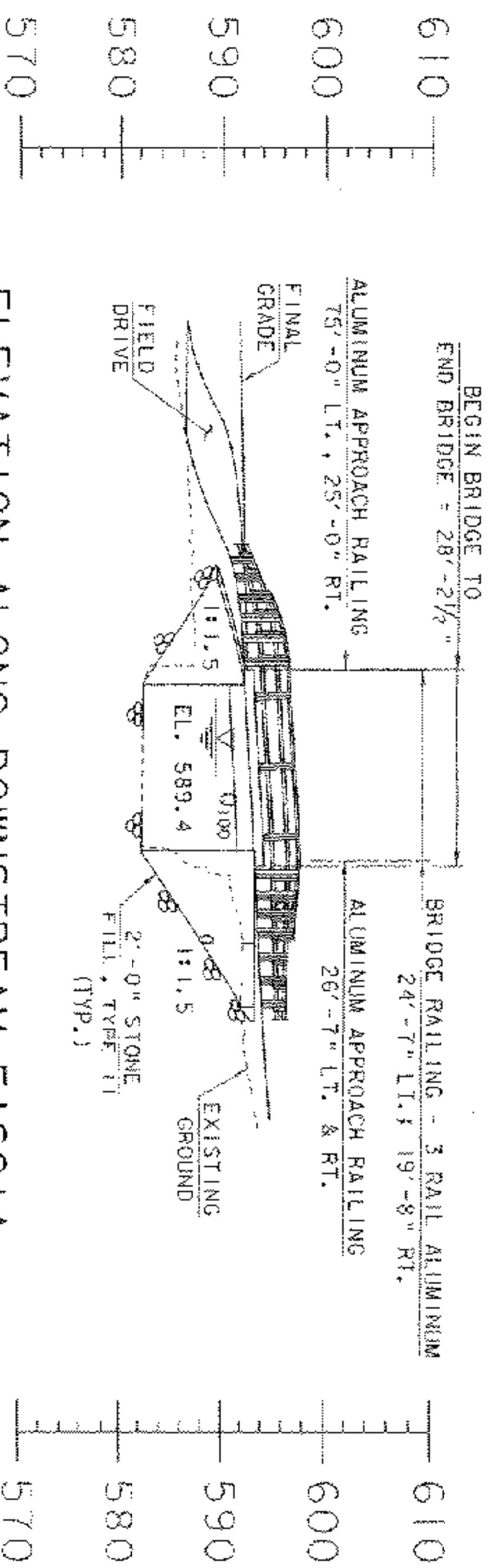
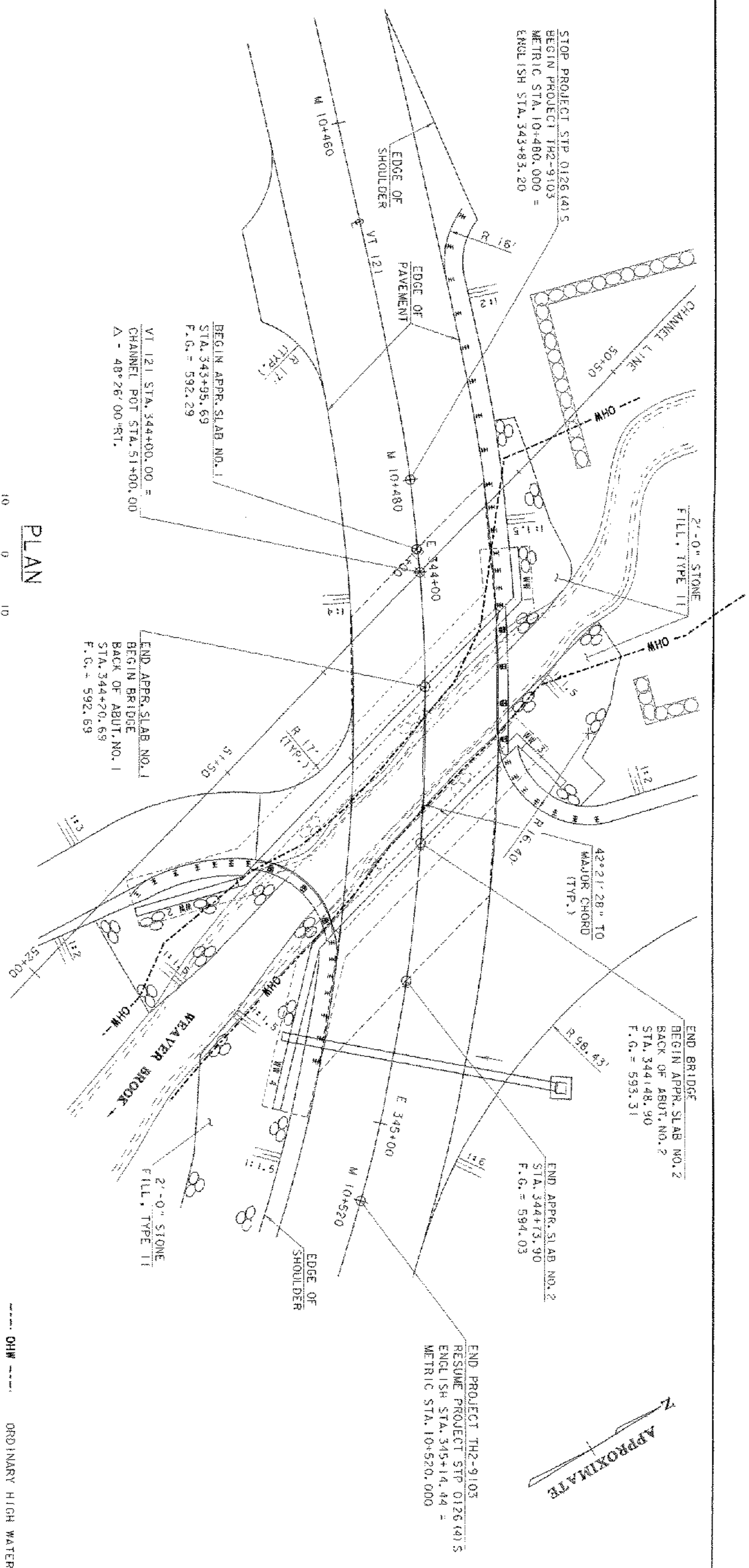
FILE NAME: 90c053\structures\sc053b01 PLOT DATE: 20-MAR-2003
 PROJECT MANAGER: R.R. WHITCOMB DRAWN BY: G. ROY
 DESIGNED BY: G. ROY CHECKED BY: R. WHITCOMB
 SHEET 11 OF 38



BORING INFORMATION (2)

PROJECT NAME: ROCKINGHAM
PROJECT NUMBER: TH2 - 9103

FILE NAME: 90c053\structures\ec053b02.j PLOT DATE: 20-MAR-2003
PROJECT MANAGER: R. R. WHITCOMB DRAWN BY: G. ROY
DESIGNED BY: G. ROY CHECKED BY: R. WHITCOMB
SHEET 12 OF 38



ELEVATION ALONG DOWNSTREAM FASCIA

PLAN AND ELEVATION

CONSPAN PRECAST
CONCRETE ARCH USED
VALUE ENGINEERING
SEE PAGES 040 TO 088.

PROJECT NAME: ROCKINGHAM	PROJECT NUMBER: TH2 - 9103
FILE NAME: 906053.structure\615605.dgn	PLOT DATE: 19-AUG-2003
PROJECT MANAGER: R. R. WHITCOMB	DRAWN BY: G. ROY
DESIGNED BY: G. ROY	CHECKED BY: R. WHITCOMB
SHEET 13	OF 38

SEEDING FORMULA
RURAL AREAS

Z. 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	BROOKSFOOT 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.
SEEDS 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.

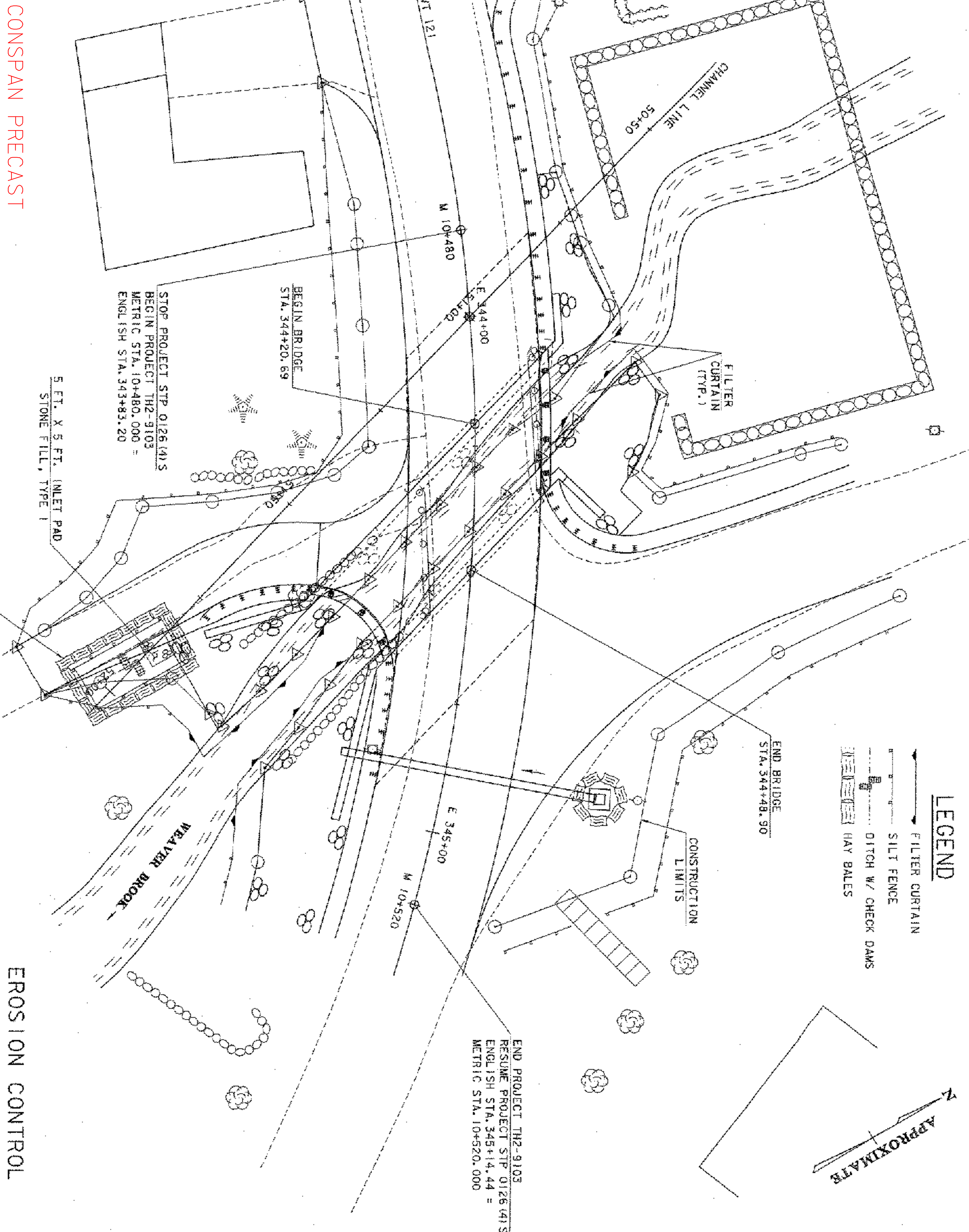
- NOTES:
1. AN ALTERNATE TEMPORARY EROSION CONTROL PLAN MAY BE SUBMITTED BY THE CONTRACTOR FOR APPROVAL BY THE RESIDENT ENGINEER.
 2. SPECIAL CONSIDERATION MUST BE GIVEN TO THE FIRST PUMP-DOWN OF THE COFFERDAMS. THIS WILL CONTAIN THE GREATEST VOLUME OF WATER WITH A HIGH SEDIMENT LOAD. THE CONTRACTOR MAY BE REQUIRED TO PROVIDE ADDITIONAL SEDIMENT TRAPS WITHIN THE RIGHT-OF-WAY OR CONTROL THE RATE OF DRAW-DOWN. ADDITIONAL SEDIMENT TRAPS MUST BE APPROVED BY THE RESIDENT ENGINEER.
 3. AS SOON AS POSSIBLE FOLLOWING COMPLETION OF THE SUBSTRUCTURE, THE SEDIMENT IN THE TRAPS SHALL BE REMOVED AND THE GROUND RESTORED TO ITS ORIGINAL SLOPES OR GRADED AS SHOWN ON THE CONSTRUCTION DRAWINGS.
 4. THE CONTRACTOR WILL USE OTHER TEMPORARY OR PERMANENT EROSION CONTROL MEASURES AS NECESSITATED BY THE SEQUENCE OF CONSTRUCTION AND AS DIRECTED BY THE RESIDENT ENGINEER. SEE SECTION 105.23 OF THE STANDARD SPECIFICATIONS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

CONSPAN PRECAST

CONCRETE ARCH USED

VALUE ENGINEERING

SEE PAGES 040 TO 088.



GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2001, AND ITS LATEST REVISIONS, AND THE ASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DATED 1996, AND ITS LATEST REVISIONS.
2. IN-STREAM CONSTRUCTION SHALL BE RESTRICTED TO THE PERIOD JUNE 1 TO OCTOBER 1. ANY DEVIATION FROM THIS TIME PERIOD SHALL BE APPROVED IN WRITING BY THE VERMONT AGENCY OF NATURAL RESOURCES.
3. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO PREVENT SITUATION OR POLLUTION, IN PARTICULAR THE DISCHARGE OF RAW CONCRETE INTO WEAVER BROOK, AS DIRECTED BY THE RESIDENT ENGINEER AND STANDARD SPECIFICATION SECTION 105.
4. ALL DIMENSIONS SHOWN IN THE PLANS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68°F.
5. THIS PROJECT WILL BE CONSTRUCTED IN CONJUNCTION WITH PROJECT GRAFTON-ROCKINGHAM STP 0126 (015). CONTRACTOR SHALL COORDINATE THE PROGRESS OF WORK SO AS TO MINIMIZE THE NUMBER OF TIMES TRAFFIC FLOW IS MODIFIED.
6. AS A MINIMUM, ONE-WAY TRAFFIC SHALL BE MAINTAINED AT ALL TIMES. THE CONTRACTOR SHALL NOTIFY BOTH THE TOWN OF ROCKINGHAM (TOWN CLERK'S OFFICE - TELEPHONE NO. (802) 463-4336) AND VADOT DISTRICT NO. 2 (DISTRICT TRANSPORTATION ADMINISTRATOR FLOYD ROBERTS - TELEPHONE NO. (802) 254-5011) A MINIMUM OF TWO WEEKS PRIOR TO RESTRICTING TRAFFIC ON VT 121 AND BRIDGE 7 TO ONE LANE. ALL MATERIALS, LABOR, EQUIPMENT, AND INCIDENTALS NECESSARY FOR MAINTAINING ONE-WAY TRAFFIC, EXCLUSIVE OF THAT PAID FOR UNDER OTHER CONTRACT ITEMS AS INDICATED ON SHEETS 4-5 OF THE PLANS, SHALL BE PAID FOR UNDER THE LUMP SUM PRICE BID FOR ITEM 527.10, "MAINTENANCE OF TRAFFIC FOR BRIDGE PROJECTS". IF THE CONTRACTOR ELECTS TO USE A TRAFFIC CONTROL METHOD DIFFERENT FROM THE PHASED CONSTRUCTION SHOWN IN THE PLANS, A DETAILED SUBMITTAL MUST BE PRESENTED TO THE ENGINEER FOR APPROVAL. ALLOW TWO WEEKS FOR THE APPROVAL PROCESS. THE TWO WEEK REVIEW PROCESS WILL BEGIN WHEN THE REVIEWER DETERMINES ALL DETAILS REQUIRED FOR THE TRAFFIC CONTROL PLAN ARE RECEIVED.
7. ACCESS TO ALL EXISTING SIDE ROADS, DRIVES, AND PARKING AREAS SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
8. ALL MATERIALS, LABOR, EQUIPMENT, AND INCIDENTALS NECESSARY FOR THE INSTALLATION OF THE TEMPORARY TRAFFIC SIGNAL SYSTEM, AS ILLUSTRATED ON SHEET 9 OF THE PLANS, SHALL BE PAID FOR UNDER THE LUMP SUM PRICE BID FOR ITEM 678.40, "TEMPORARY TRAFFIC SIGNAL SYSTEM".
9. ENERGY ABSORPTION ATTENUATORS SHALL BE PAID FOR UNDER ITEM 621.56, "ENERGY ABSORPTION ATTENUATOR", AND SHALL BE PLACED AS SHOWN ON SHEET 10 OF THE PLANS TO ALLOW THE CONTRACTOR ACCESS TO WORK AREAS. THEY SHALL MEET THE REQUIREMENTS OF THE 1989 ASHTO ROADSIDE DESIGN GUIDE, AND ITS LATEST REVISIONS, AND SHALL BE DESIGNED FOR A 4500 LB. VEHICLE TRAVELLING AT 30 MPH.
10. IF AN ATTENUATOR IS DAMAGED BY AN ERRANT VEHICLE, ANY COST TO THE CONTRACTOR FOR REPLACEMENT OF ANY PART OR ALL OF THE ATTENUATOR SHALL BE PAID FOR AS EXTRA WORK AS PER SUBSECTION 109.06 OF THE STANDARD SPECIFICATIONS.
11. FOR THE PURPOSE OF IMMEDIATE REPLACEMENT OF DAMAGED ATTENUATORS, THE CONTRACTOR SHALL PROVIDE A SPARE FOR EACH TYPE OF ATTENUATOR USED ON THE PROJECT. ONE EXTRA ATTENUATOR IS INCLUDED IN THE QUANTITY FOR THIS ITEM ON SHEET 4 OF THE PLANS. THE COST FOR ON-SITE STORAGE OF EXTRA ATTENUATORS SHALL BE PAID FOR AS SPECIFIED IN THE SPECIAL PROVISIONS.

EARTHWORK AND RELATED ITEMS

12. TEMPORARY CONSTRUCTION FILLS WITHIN THE WATERCOURSE FOR ANY PURPOSE SHALL CONSIST OF CLEAN STONE FILL ONLY. NO OTHER FILLING IN THE STREAM SHALL OCCUR WITHOUT THE APPROVAL OF THE STREAM ALTERATION ENGINEER.
13. COFFERDAMS WILL BE REQUIRED FOR THE CONSTRUCTION OF THE NEW BRIDGE ABUTMENTS. COFFERDAMS SHALL CONSIST OF STEEL SHEETING ONLY.
14. BLASTING WILL NOT BE ALLOWED FOR THE REMOVAL OF LEDGE WITHIN COFFERDAM LIMITS.
15. REMOVAL AND DISPOSAL OF EXISTING BRIDGE PAVEMENT SHALL BE PAID FOR UNDER ITEM 529.10, "REMOVAL OF BRIDGE PAVEMENT".

16. REMOVAL OF THE EXISTING SUPERSTRUCTURE AND THOSE PORTIONS OF THE EXISTING SUBSTRUCTURE NOT REMOVED UNDER ITEM 208.35, "COFFERDAM EXCAVATION, ROCK" OR ITEM 203.27, "UNCLASSIFIED CHANNEL EXCAVATION" SHALL BE PAID FOR UNDER ITEM 529.15, "REMOVAL OF STRUCTURE".

17. THE "STONE FILL, TYPE 11" SHALL BE USED AROUND THE WINGWALLS AS SHOWN IN THE PLANS AND AS DIRECTED BY THE RESIDENT ENGINEER.

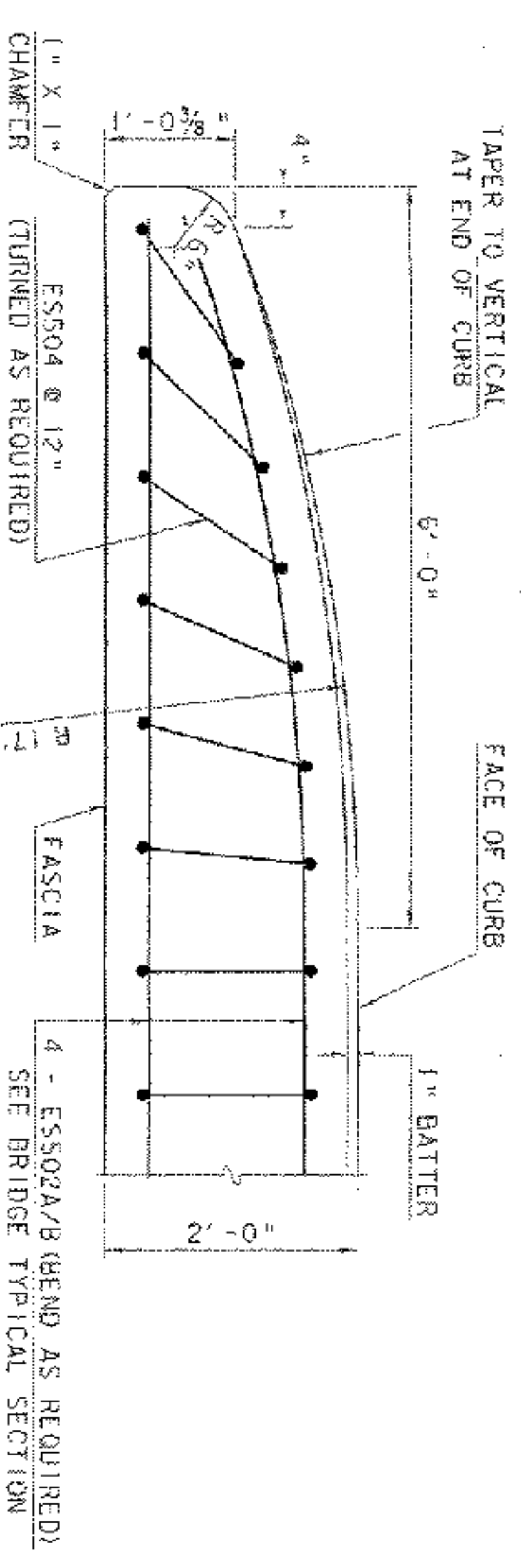
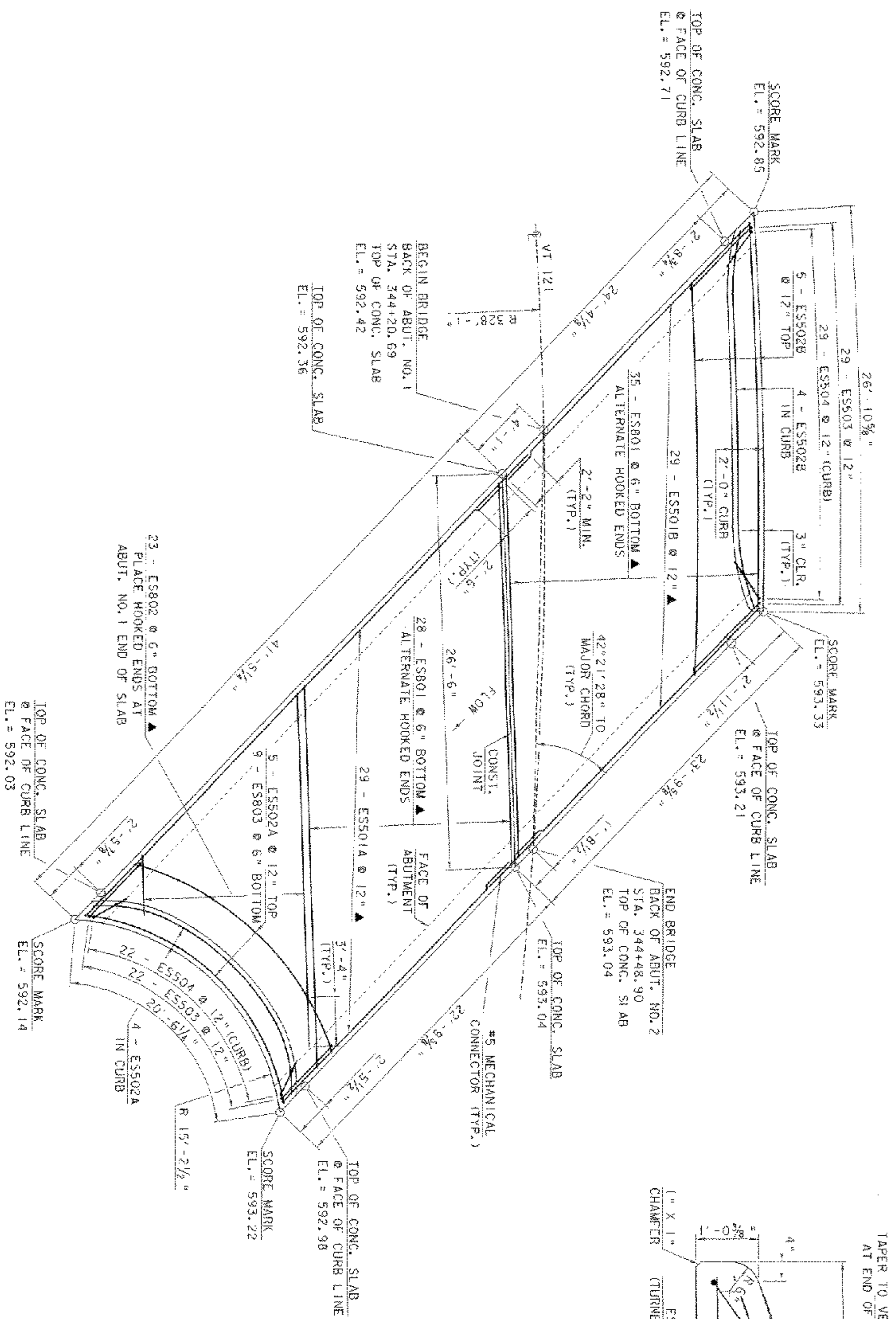
CONCRETE AND REINFORCING STEEL

18. CONCRETE FOR BRIDGE SLAB, APPROACH SLABS, ABUTMENTS AND CAST-IN-PLACE DROP INLET CONSTRUCTION SHALL BE "CONCRETE, HIGH PERFORMANCE CLASS B."
19. CONCRETE FOR CURBS SHALL BE "CONCRETE, HIGH PERFORMANCE CLASS A."
20. CONCRETE FOR ABUTMENT NO.2 SUBFOOTING SHALL BE "CONCRETE, CLASS C."
21. THE SUBSTRUCTURES HAVE BEEN DESIGNED FOR THE FOOTING ELEVATIONS SHOWN ON THE PLANS. A MINIMUM AMOUNT OF LEDGE REMOVAL IS DESIRED BECAUSE OF THE PROXIMITY OF THE HISTORIC MILL SITE. AFTER THE LEDGE HAS BEEN EXPOSED, ADJUSTMENTS TO THE BOTTOM OF FOOTING ELEVATIONS MAY BE NECESSARY TO MINIMIZE THE LEDGE REMOVAL AND/OR REDUCE THE AMOUNT OF SUBFOOTING CONCRETE. CONTACT THE PROJECT MANAGER FOR POSSIBLE REDESIGN IF THE LEDGE PROFILES DIFFER FROM THOSE SHOWN ON PLANS.
22. THE COST OF LEDGE EXCAVATION SHALL BE PAID UNDER ITEM 208.35, "COFFERDAM EXCAVATION, ROCK." ALL OVERBREAKAGE SHALL BE REPLACED WITH "CONCRETE, CLASS C." A MAXIMUM OF 6" AVERAGE OVERBREAKAGE DEPTH SHALL BE PAID FOR. ANY ADDITIONAL CONCRETE SHALL BE AT THE CONTRACTOR'S EXPENSE.
23. "CONCRETE, CLASS C" SUBFOOTINGS FOR SUBSTRUCTURES SHALL BE FOUNDED ON LEDGE WHICH HAS BEEN CLEANED OF ALL LOOSE ROCK AND DEBRIS.
24. THE TOP SURFACE OF SUBFOOTING POURS SHALL BE ROUGHENED TO A RAKE FINISH TO INCREASE SLIDING RESISTANCE AT THE FOOTING-SUBFOOTING INTERFACE.
25. TRAFFIC SHALL NOT BE ALLOWED ON NEW SLAB SECTIONS UNTIL THE CURE PERIOD IS UP AND THE 28 DAY DESIGN STRENGTH HAS BEEN ATTAINED AS EVIDENCED BY TEST CYLINDERS CURED UNDER FIELD CONDITIONS.
26. IN AREAS WHERE NEW CONCRETE WILL BE MATED TO EXISTING CONCRETE, THE EXISTING SURFACE SHALL BE PREPARED ACCORDING TO SUBSECTION 501.13(B) OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.
27. WATER REPELLENT SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES EXCEPT THE UNDERSIDE OF BRIDGE SLAB BETWEEN DRIP NOTCHES.
28. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" X 1".
29. JOINTS AND SCORE MARKS IN CONCRETE SHALL BE CONSTRUCTED AS SHOWN IN THE PLANS OR AS DIRECTED BY THE RESIDENT ENGINEER.
30. THE KEY IN CONCRETE CONSTRUCTION JOINTS SHALL BE MONOLITHIC AND CONTINUOUS FOR THE FULL LENGTH OF THE JOINT. ANY UPWARD KEY SHALL BE PLACED INTEGRALLY WITH THE CONCRETE BELOW THE JOINT.
31. A QUANTITY OF #8 BARS HAS BEEN INCLUDED FOR DOWELS WHICH SHALL BE DRILLED AND GROUTED INTO THE LEDGE UNDER THE SUBFOOTING AS SHOWN IN THE PLANS. PAYMENT FOR DRILLING AND GROUTING SHALL BE MADE UNDER ITEM 507.16, "DRILLING AND GROUTING DOWELS".
32. ALL NEW BRIDGE SLAB AND APPROACH SLAB REINFORCING STEEL SHALL BE EPOXY COATED AND PAID FOR UNDER ITEM 507.17, "EPOXY COATED REINFORCING STEEL". WHEN EPOXY COATED REINFORCING STEEL IS TO BE CUT, THE UNCOATED ENDS SHALL BE REPAIRED WITH MATERIALS AND PROCEDURES APPROVED BY THE COATING MANUFACTURER. FLAME CUTTING OF EPOXY COATED REINFORCING STEEL WILL NOT BE PERMITTED.
33. MINIMUM COVER FOR REINFORCING STEEL SHALL BE AS INDICATED IN THE PLANS.
34. REINFORCING STEEL PLACEMENT TOLERANCES SHALL BE:
SPACING: +/- 1"
CLEARANCE: +/- 1/4"

CONSPAN PRECAST
CONCRETE ARCH USED
VALUE ENGINEERING
SEE PAGES 040 TO 088.

PROJECT NOTES

PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	30605561ructur\as\605307n\
PROJECT MANAGER:	R. R. WHITCOMB
DESIGNED BY:	G. ROY
DRAWN BY:	G. ROY
CHECKED BY:	R. R. WHITCOMB
SHEET	15 OF 38



CURB END DETAIL



SLAB REINFORCING PLAN



CONSPAN PRECAST
CONCRETE ARCH USED
VALUE ENGINEERING
SEE PAGES 040 TO 088.

SLAB REINFORCING PLAN

PROJECT NAME: ROCKINGHAM
PROJECT NUMBERS: TH2 - 9103

FILE NAME: 906053\structure\ss05053\021 PLOT DATE: 19-AUG-2003
PROJECT MANAGER: R. R. WHITCOMB DRAWN BY: G. ROY
DESIGNED BY: G. ROY CHECKED BY: R. WHITCOMB

SHEET 17 OF 38

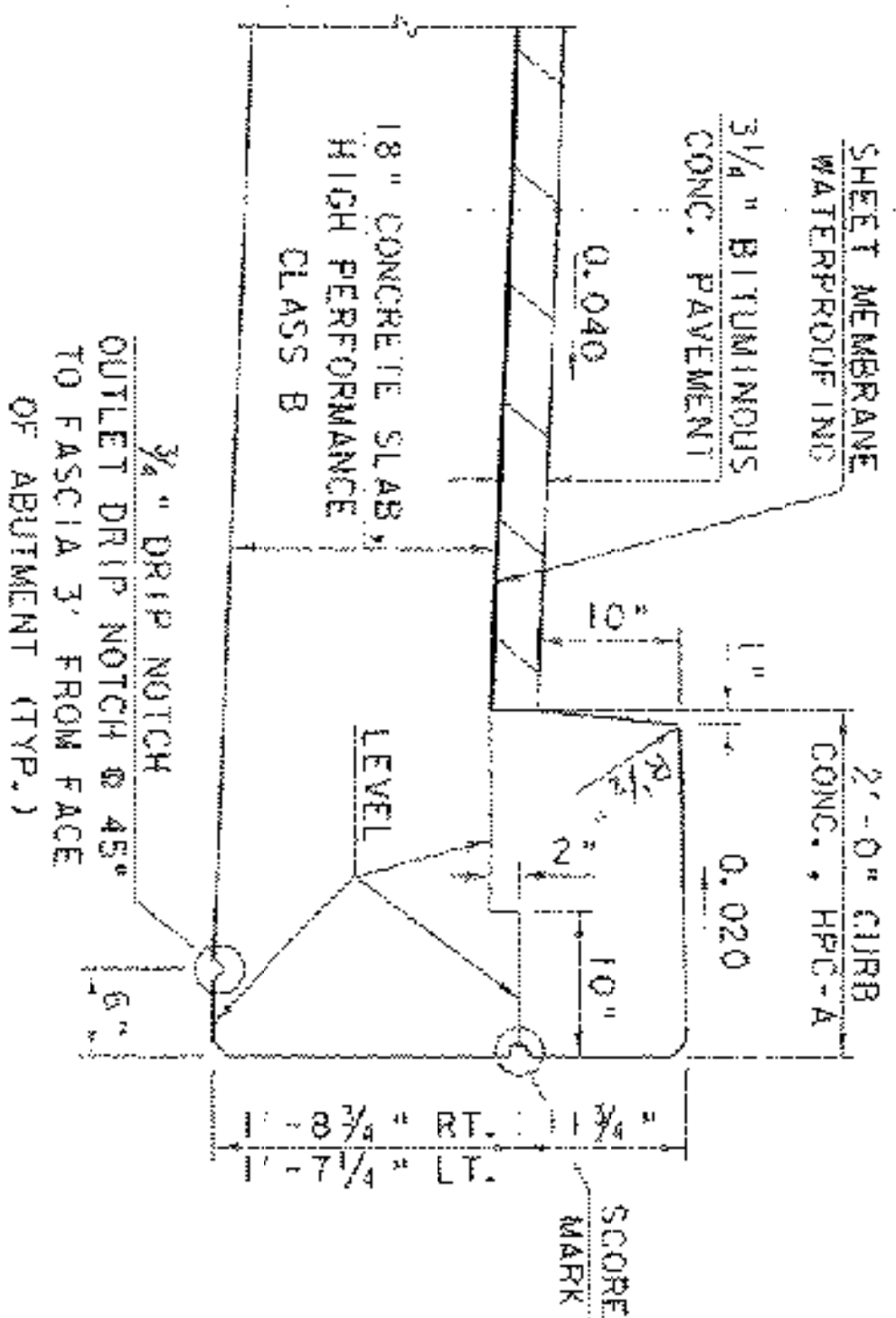
NOTE

ES501A/B SHALL BE PLACED @ 12" O.C. MEASURED
ALONG VT 121 CENTERLINE.

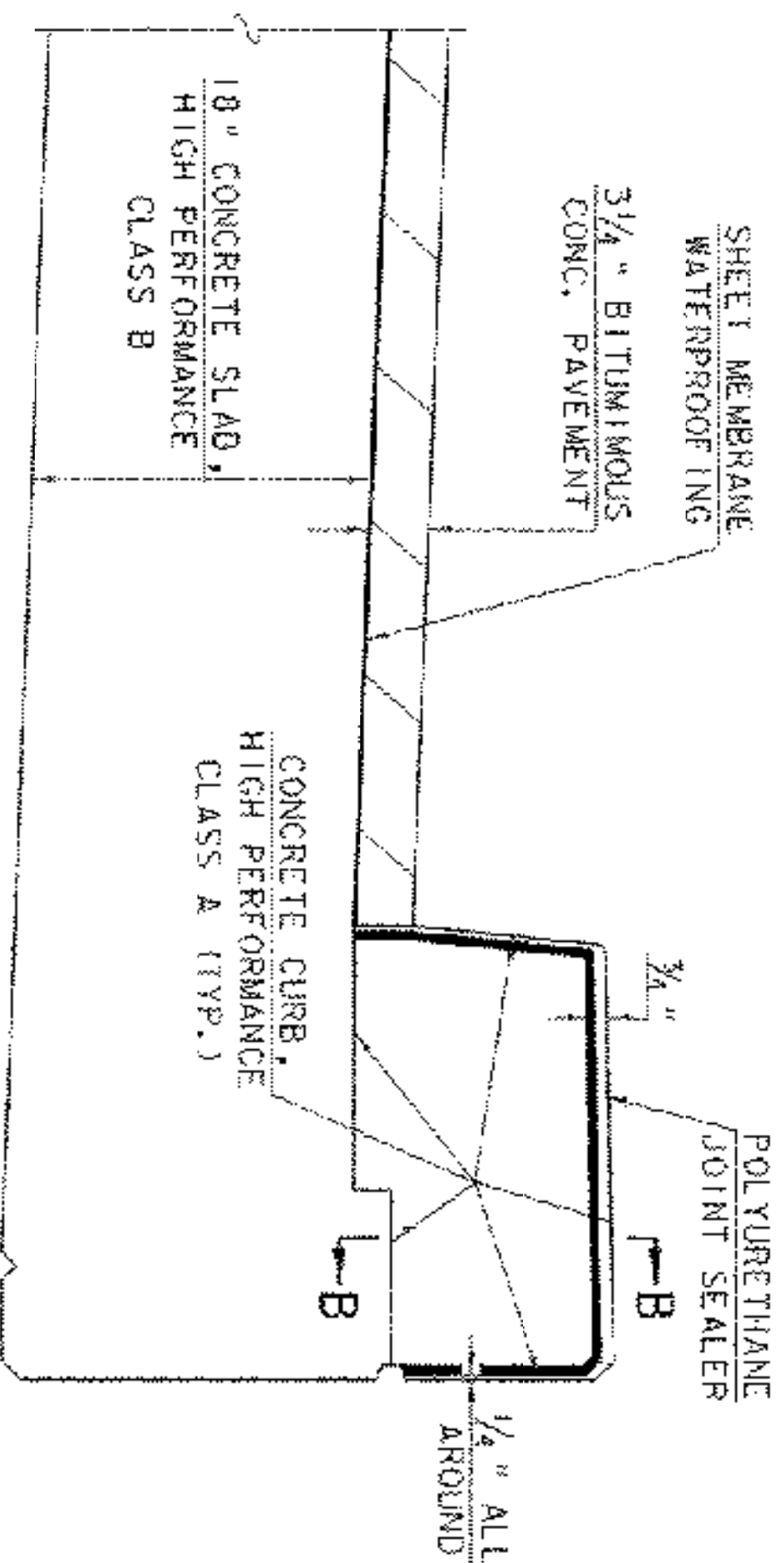
ES801 SHALL BE PLACED @ 6" O.C. MEASURED PERPENDICULAR TO CONSTRUCTION JOINT.

▲ = CUT TO FIT IN FIELD

3" CLR. UNLESS OTHERWISE NOTED



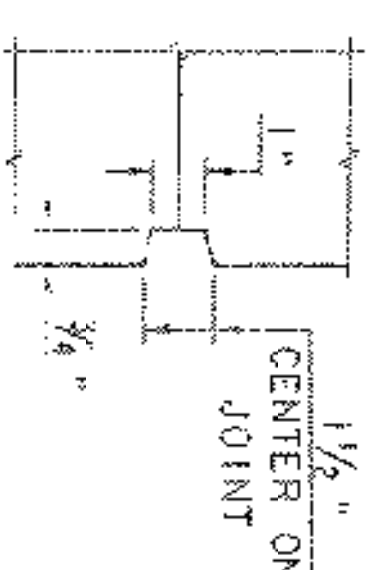
CURB DETAIL
NOT TO SCALE



**TYPICAL SECTION THROUGH
CONCRETE CURB CONSTRUCTION JOINT**
NOT TO SCALE

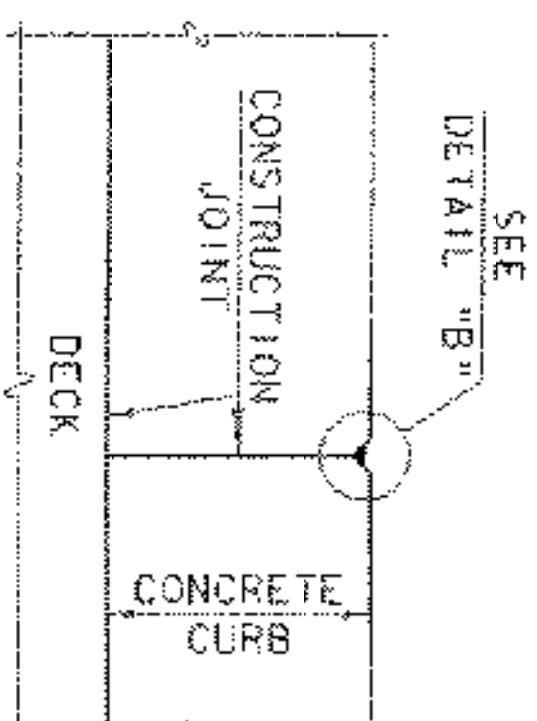
1. SHEET MEMBRANE WATERPROOFING SHALL EXTEND TO FACE OF CURB.
2. CONSTRUCTION JOINTS THROUGH CONCRETE CURBS SHALL BE SPACED A MAXIMUM OF 15'-0" CENTER TO CENTER AND SHALL BE 1'-6" MINIMUM FROM THE CENTER OF THE NEAREST BRIDGE RAIL POST. CONCRETE SHALL BE PLACED IN ALTERNATE SECTIONS WITH A MINIMUM OF 48 HOURS DELAY BETWEEN ADJACENT POURS.
3. LONGITUDINAL REINFORCING SHALL PASS THROUGH CONCRETE CONSTRUCTION JOINTS. CURB REINFORCING STIRRUP BARS SHALL BE TURNED AS REQUIRED TO FIT FLARED ENDS.

NOTES

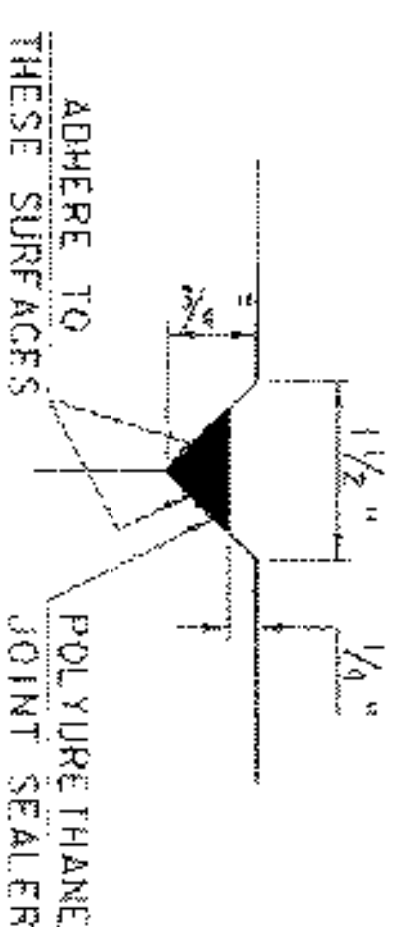


SCORE MARK DETAIL
NOT TO SCALE

CONSPAN PRECAST
CONCRETE ARCH USED
VALUE ENGINEERING
SEE PAGES 040 TO 088.

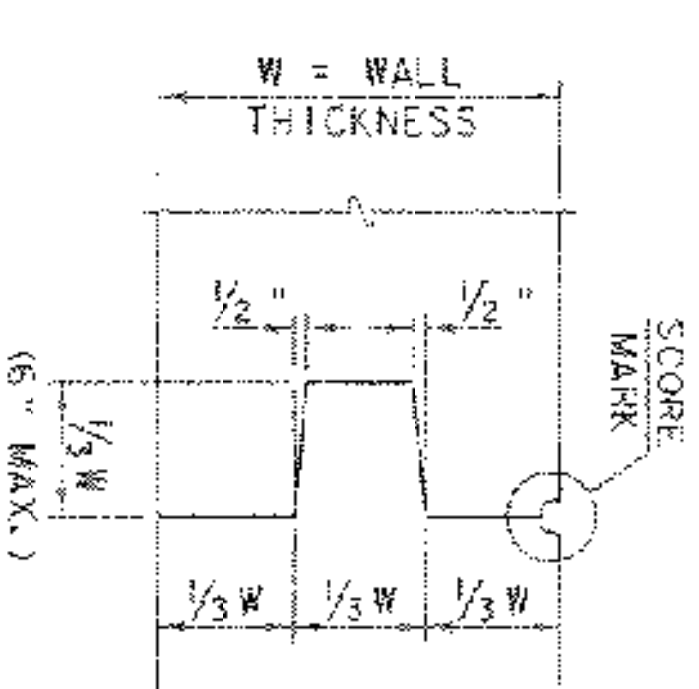


SECTION B-B
NOT TO SCALE

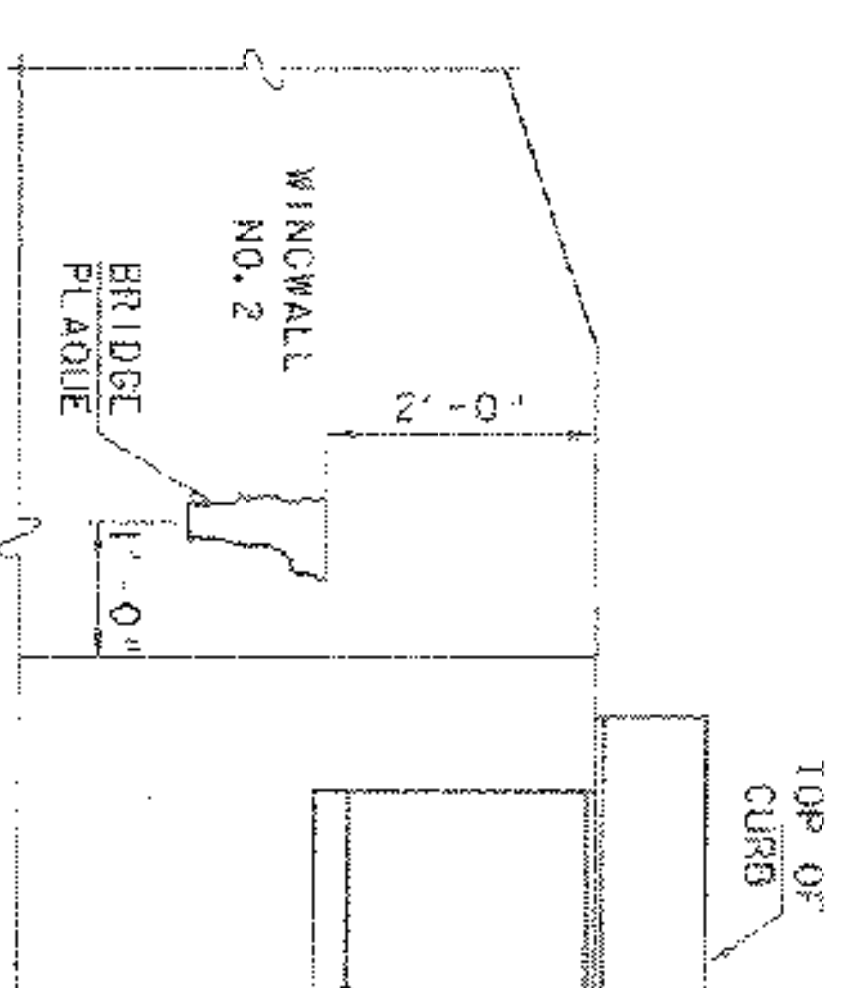


DETAIL "B"
NOT TO SCALE

NOTE:
POLYURETHANE JOINT SEALER SHALL MEET THE REQUIREMENTS OF SUBSECTIONS 524.06(G) AND 707.05 OF THE STANDARD SPECIFICATIONS. COLOR TO MATCH CONCRETE. COST TO BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 501.34, "CONCRETE, HIGH PERFORMANCE CLASS B".



**TYPICAL CONCRETE
CONSTRUCTION JOINT**
NOT TO SCALE



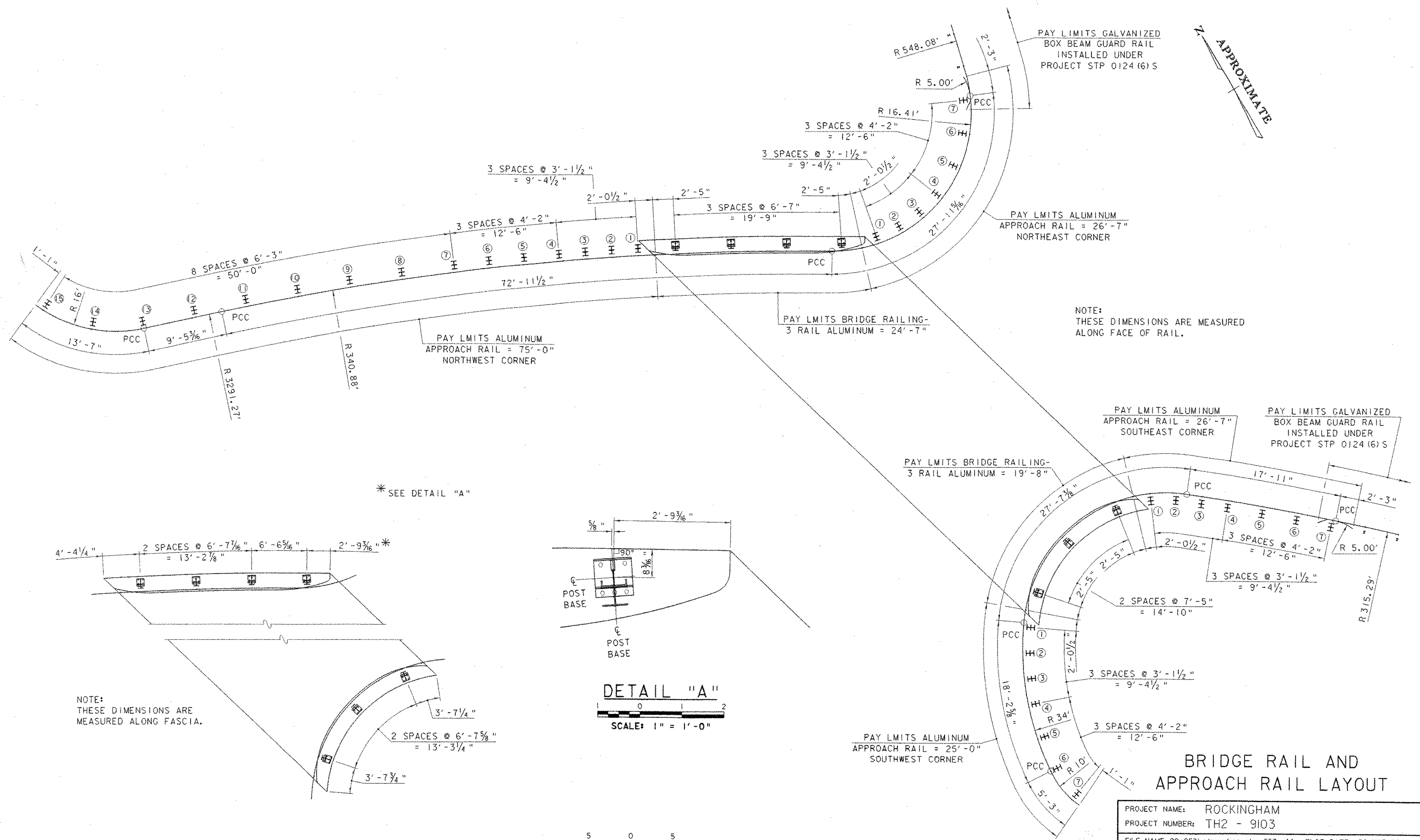
BRIDGE PLAQUE DETAIL
NOT TO SCALE

NOTE:
THE BENCH MARK AND BRIDGE PLAQUE WILL BE SUPPLIED BY THE AGENCY OF TRANSPORTATION AND SHALL BE INSTALLED BY THE CONTRACTOR AS SHOWN OR AS DIRECTED BY THE ENGINEER.

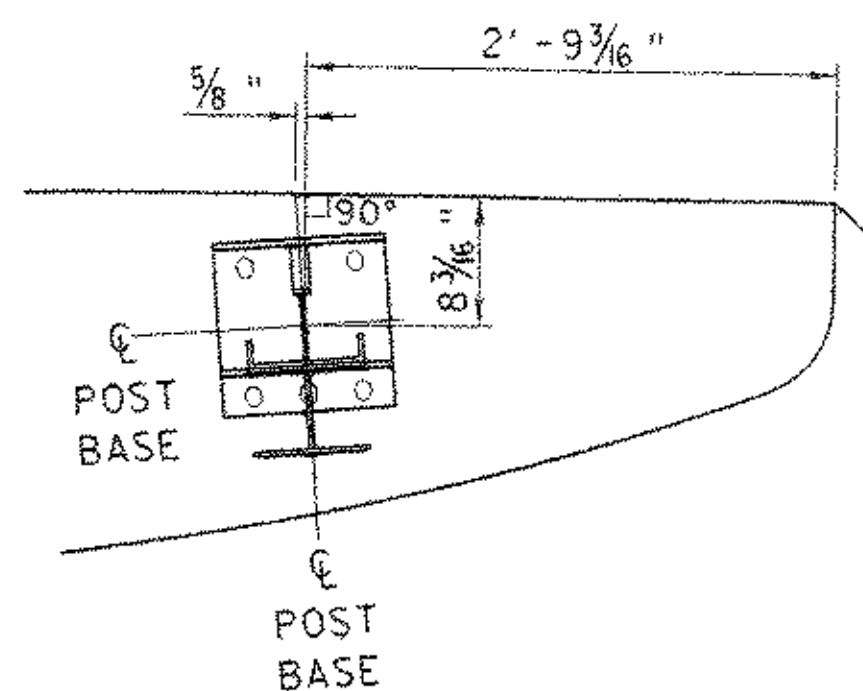
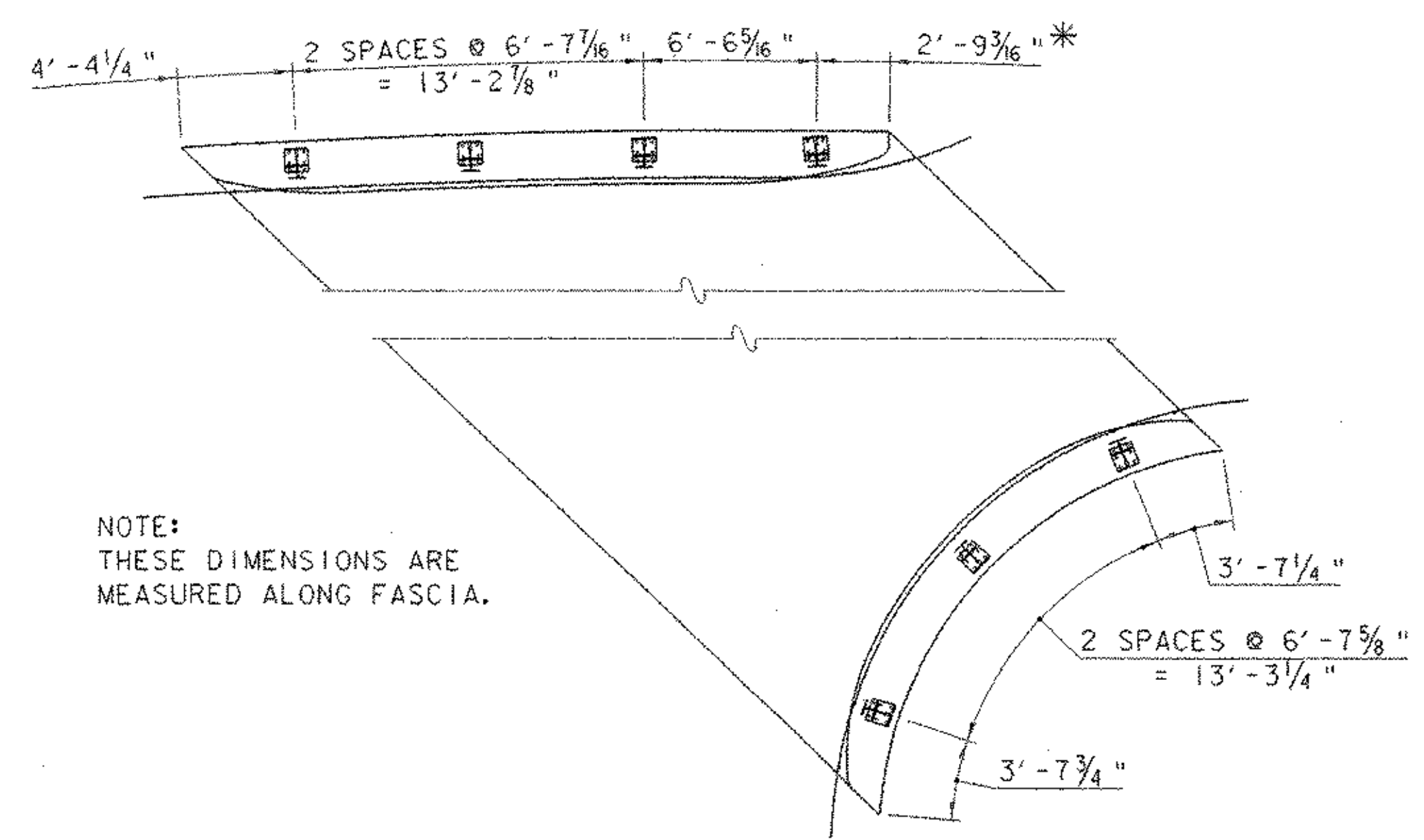
MISCELLANEOUS PROJECT DETAILS

PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	300053\structure\300053.mxd
PROJECT MANAGER:	R.R. WHITCOMB
DESIGNED BY:	G. ROY
DRAWN BY:	G. ROY
CHECKED BY:	R. WHITCOMB
SHEET:	18 OF 38

PLOT DATE: 19-AUG-2003



* SEE DETAIL "A"

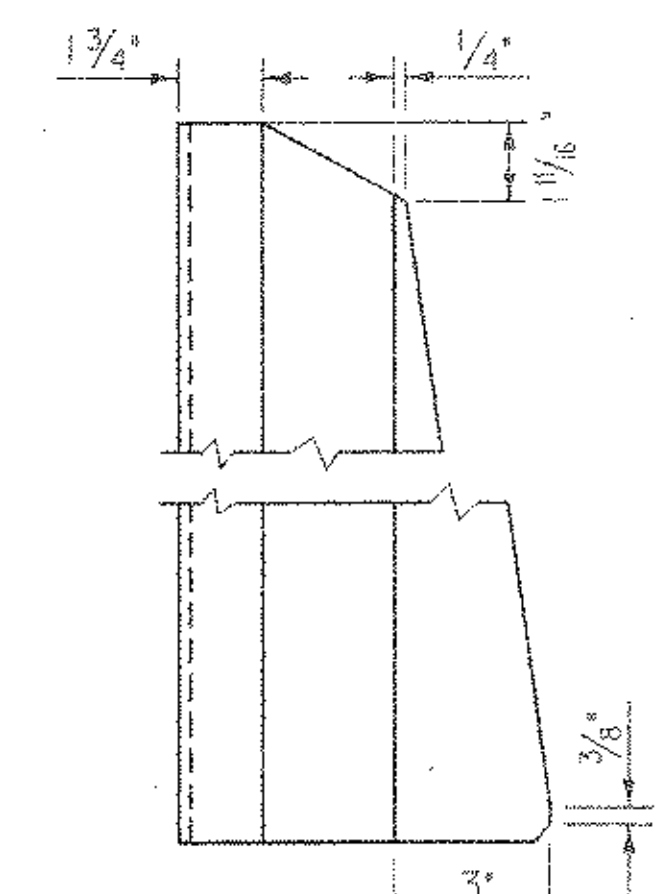


DETAIL "A"
SCALE: 1" = 1'-0"

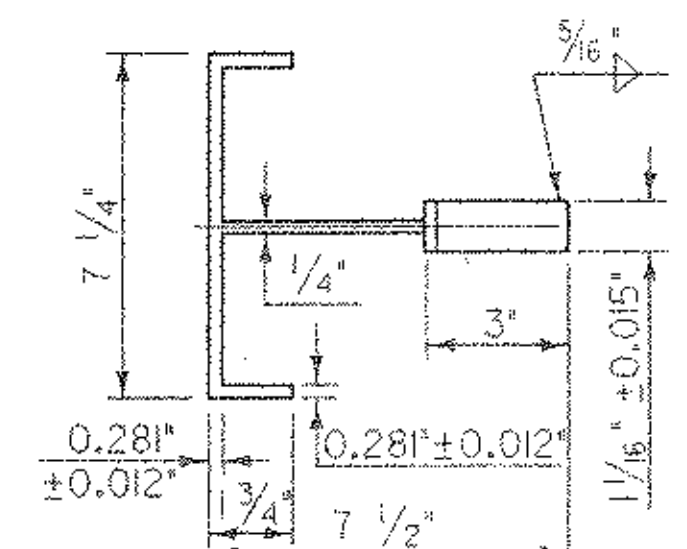
SCALE: 1" = 5'-0"

BRIDGE RAIL AND APPROACH RAIL LAYOUT

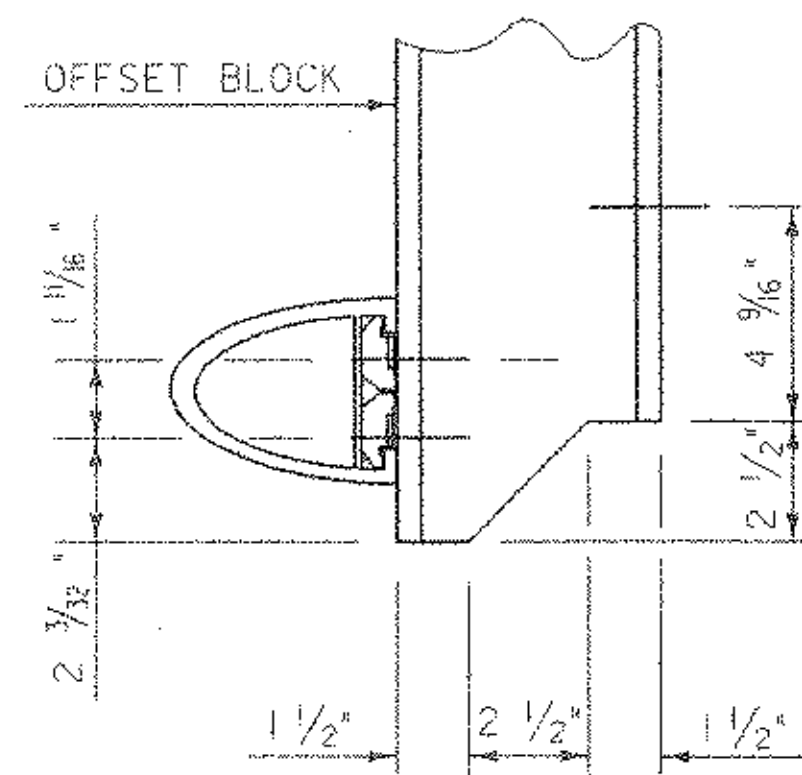
PROJECT NAME:	ROCKINGHAM	FILE NAME:	90c053\structures\sc053rail.l	PLOT DATE:	20-MAR-2003
PROJECT NUMBER:	TH2 - 9103	PROJECT MANAGER:	R. R. WHITCOMB	DRAWN BY:	G. ROY
		DESIGNED BY:	G. ROY	CHECKED BY:	R. WHITCOMB
				SHEET	20 OF 38



POST SIDE VIEW

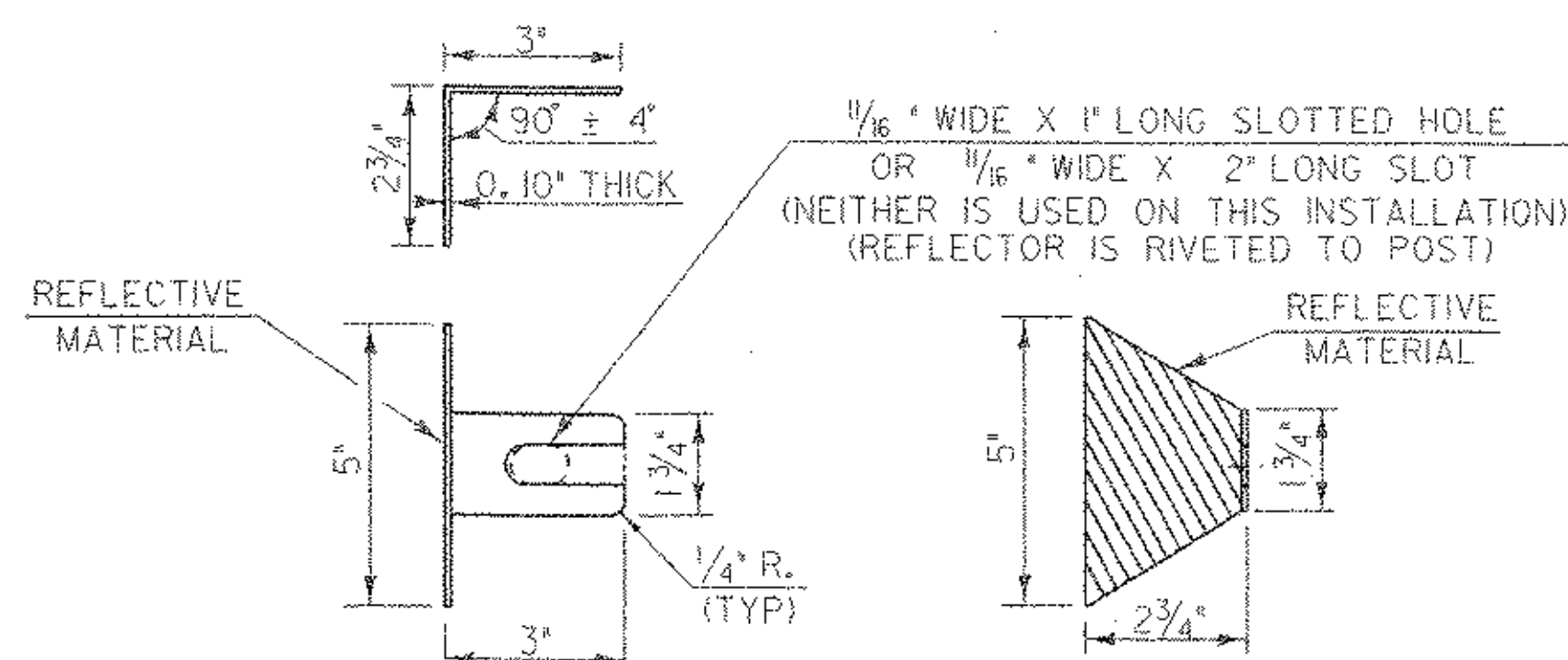


POST PLAN VIEW



COPING DETAIL

ALLOWABLE STRESSES:
RAILING : 21,000 PSI TENSION
22,000 PSI COMPRESSION
POSTS : 17,000 PSI TENSION
19,000 PSI COMPRESSION



REFLECTOR DETAILS

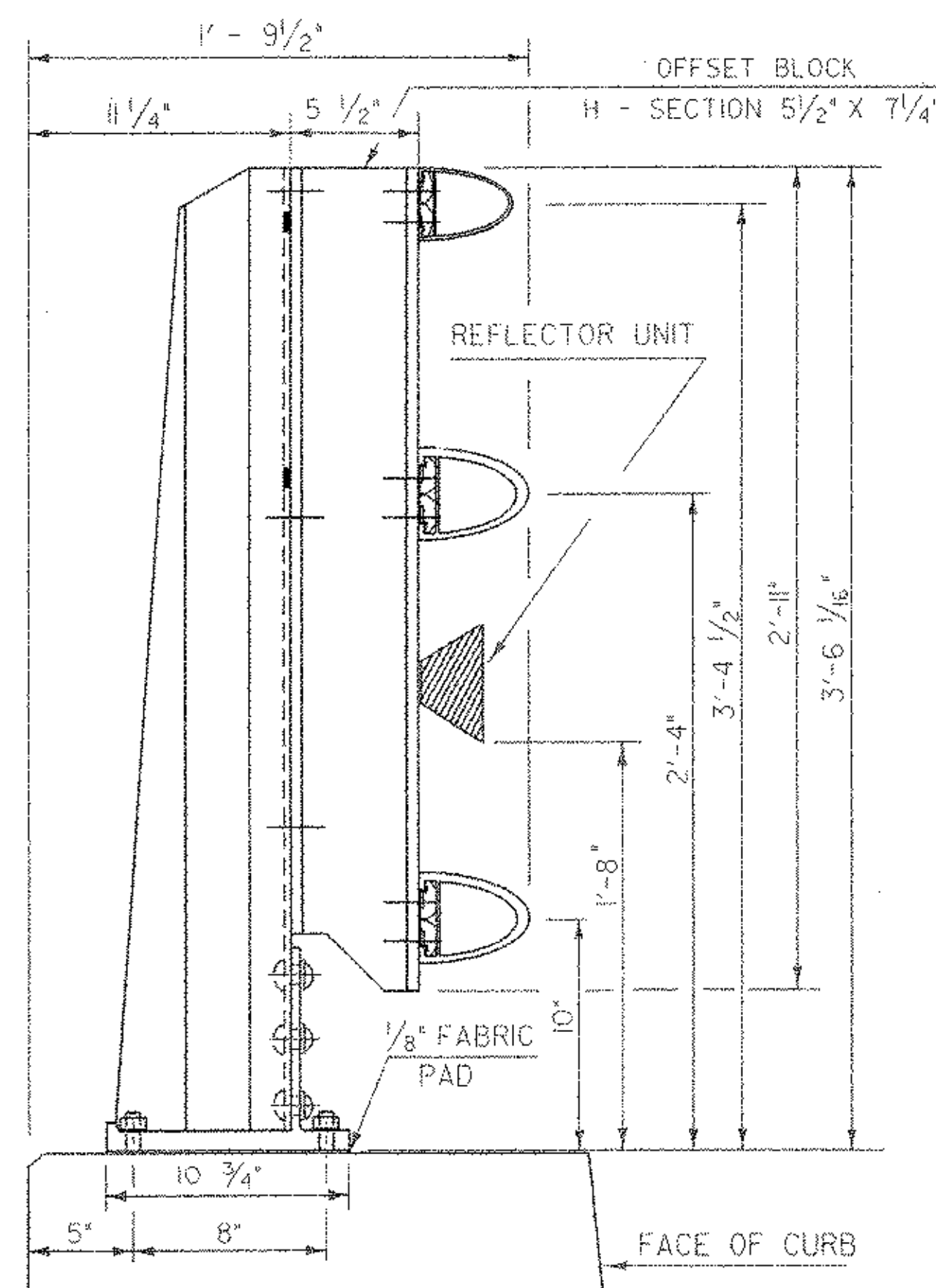
THIS REFLECTORIZED ALUMINUM DELINEATOR IS TO BE ERECTED EVERY 30 FEET (OR CLOSEST POST) WITH 2 NO. 8 X 3/4\"

DELINEATORS SHALL MEET SPECIFICATION REQUIREMENTS FOR ASTM B209 ALLOY 5052-H32.

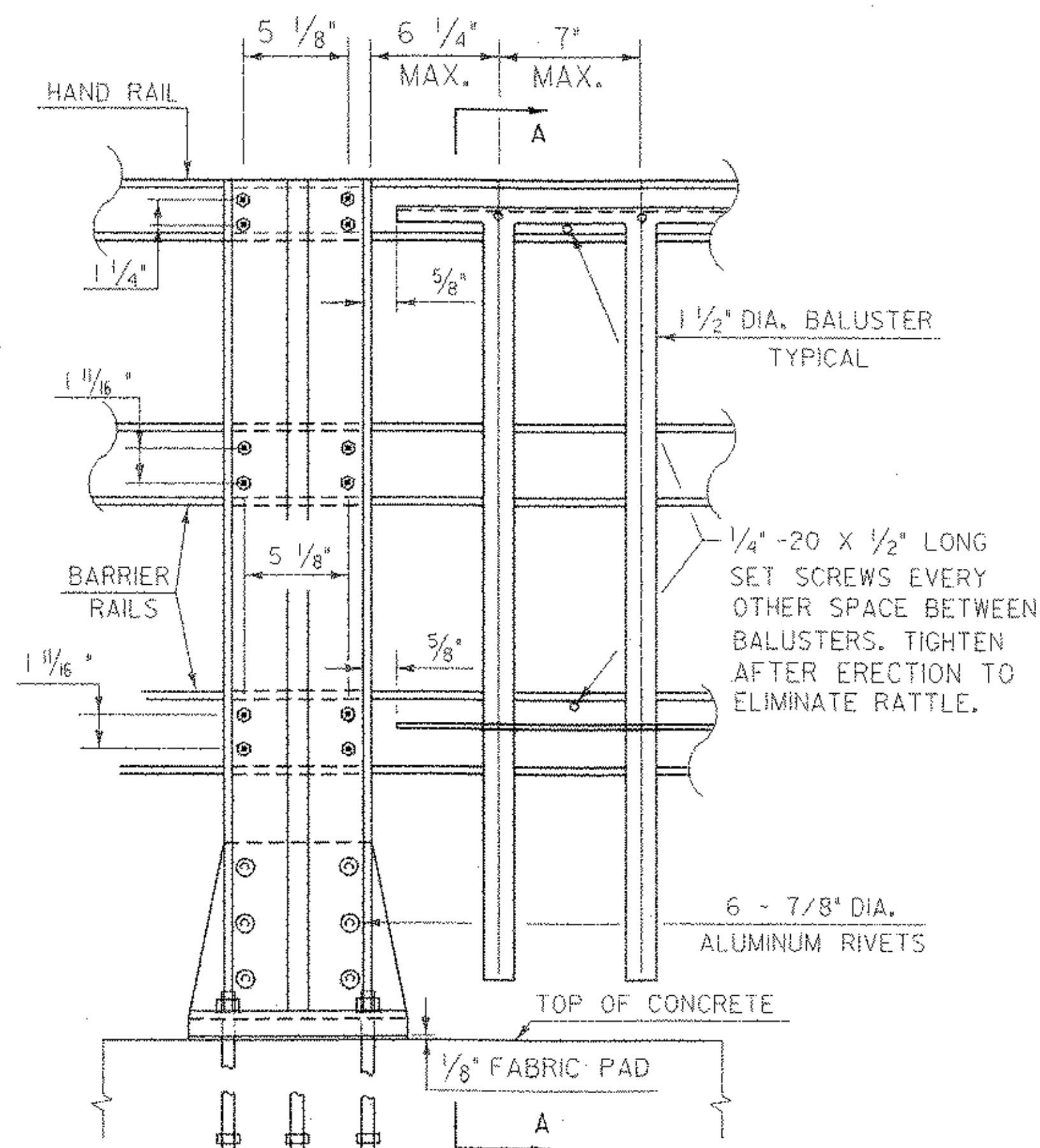
REFLECTIVE MATERIAL SHALL MEET THE REQUIREMENTS OF SUBSECTION 750.08 AND SHALL BE OF ENCAPSULATED LENS SILVER OR AMBER. AMBER IS TO BE INSTALLED ON THE DRIVER'S LEFT AND SILVER ON THEIR RIGHT.

ON BRIDGES WITH A SIDEWALK, DELINEATORS ARE NOT TO BE INSTALLED ON THE SIDEWALK SIDE OF THE BRIDGE (I.E. DELINEATORS INSTALLED ONLY ON THE CURB SIDE AND ON THE APPROACH RAIL ON THE CURB SIDE)

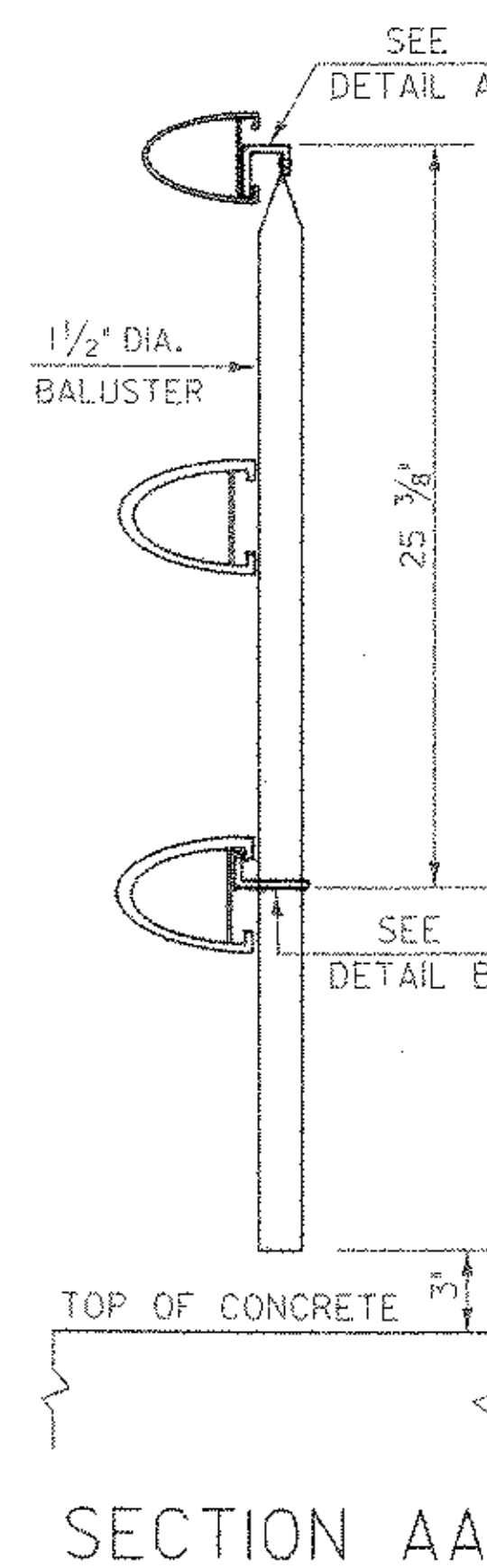
PAYMENT SHALL BE SUBSIDIARY TO ALL OTHER ITEMS.



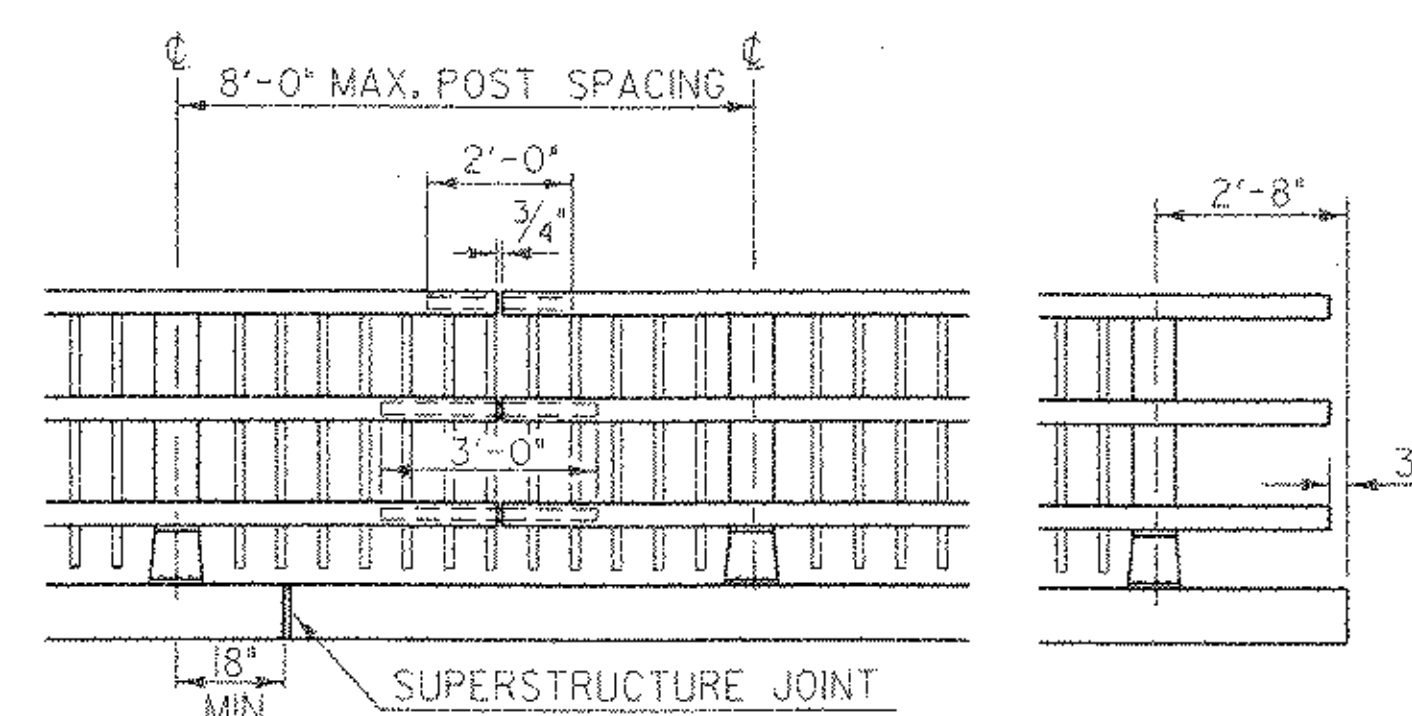
SIDE ELEVATION OF THREE RAIL TO BE USED ON CURB SIDE



OUTSIDE ELEVATION OF THREE RAIL POST & SPINDLES

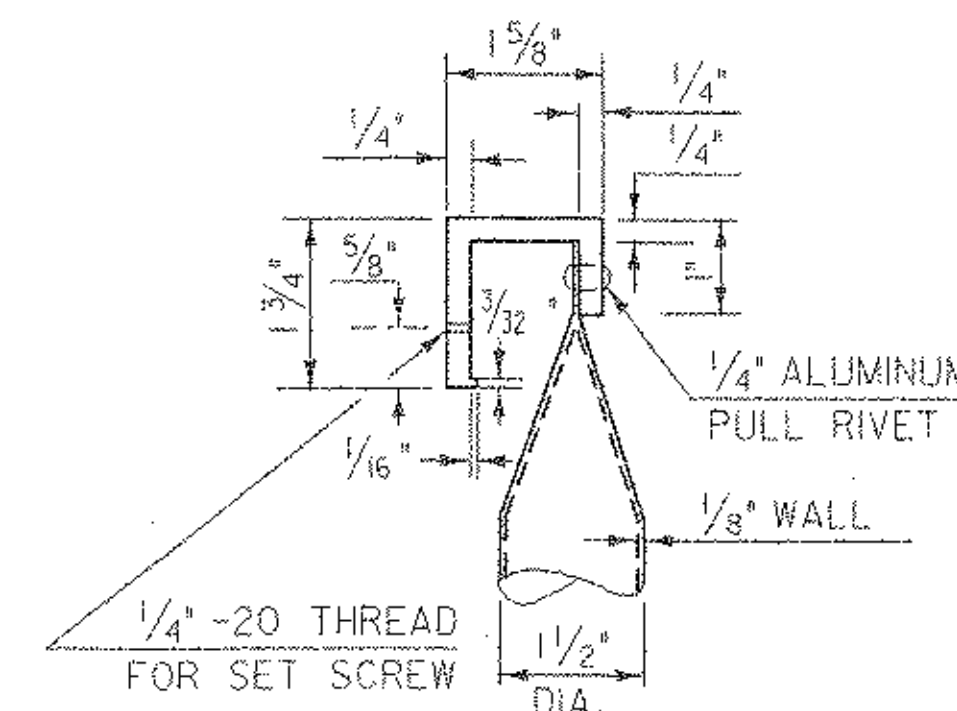


SECTION AA

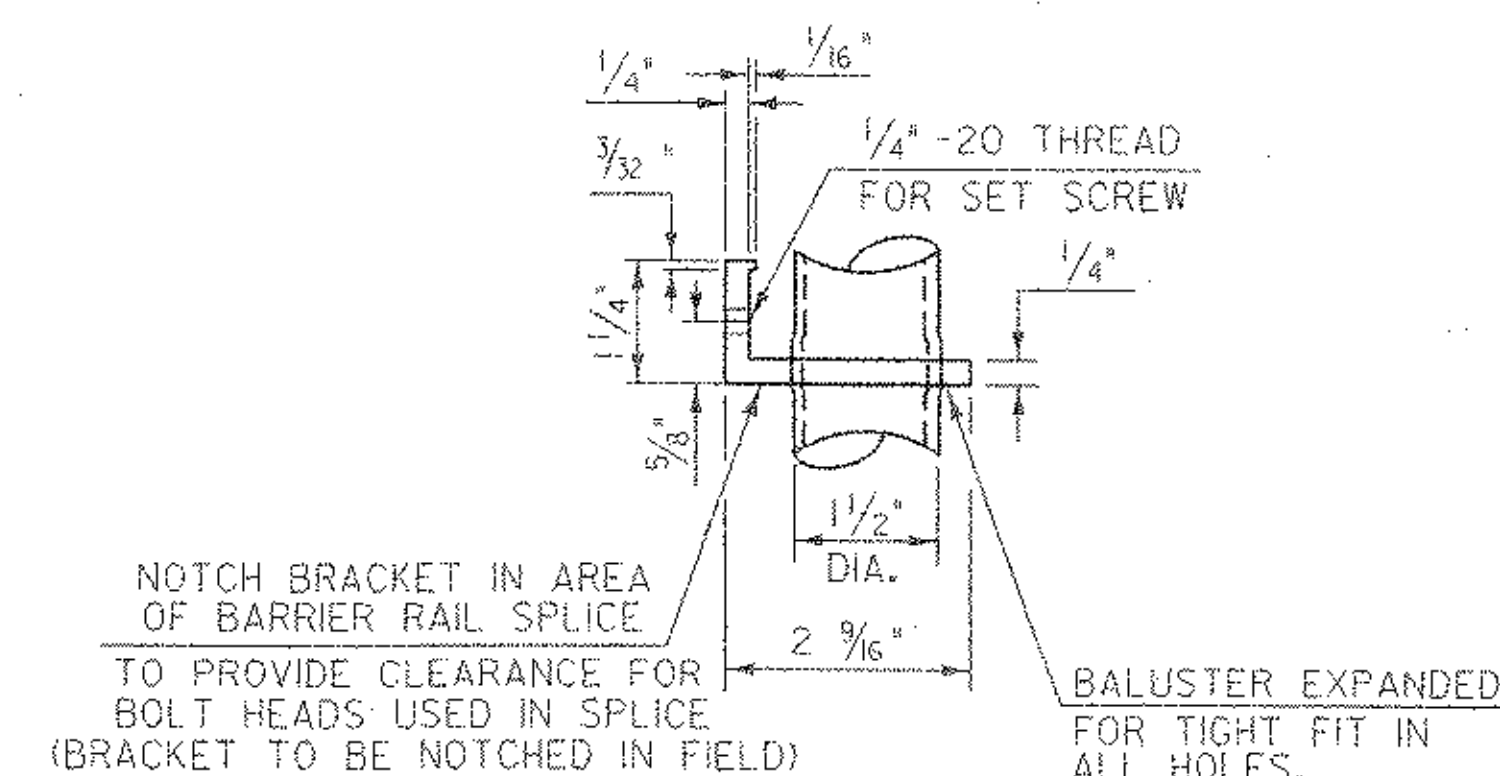


FRONT ELEVATION OF THREE RAIL WITH SPINDLES

NOTE : RAIL POSTS ARE TO BE SET NORMAL TO GRADE UNLESS OTHERWISE DESIGNATED ON BRIDGE PLANS. ALL DIMENSIONS ARE TYPICAL UNLESS OTHERWISE DESIGNATED ON BRIDGE PLANS.



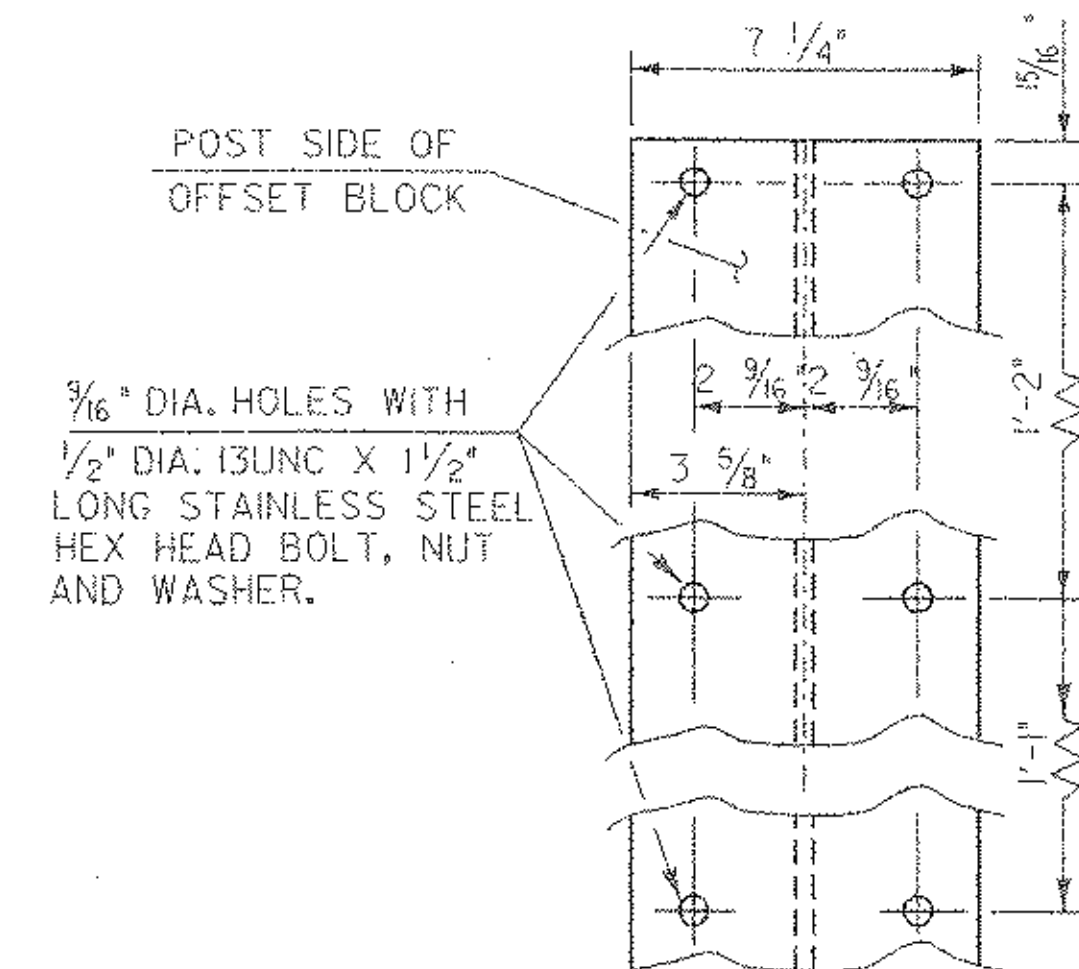
DETAIL A



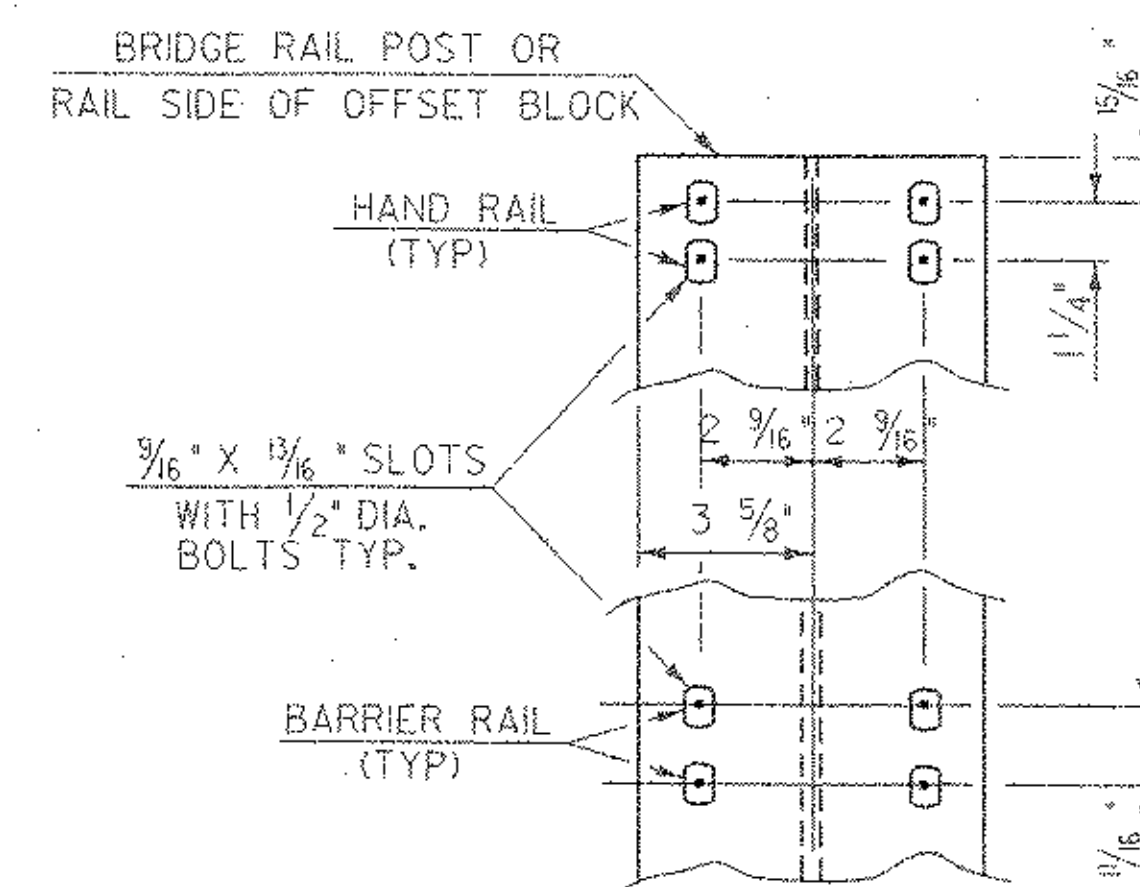
DETAIL B

NOTE:

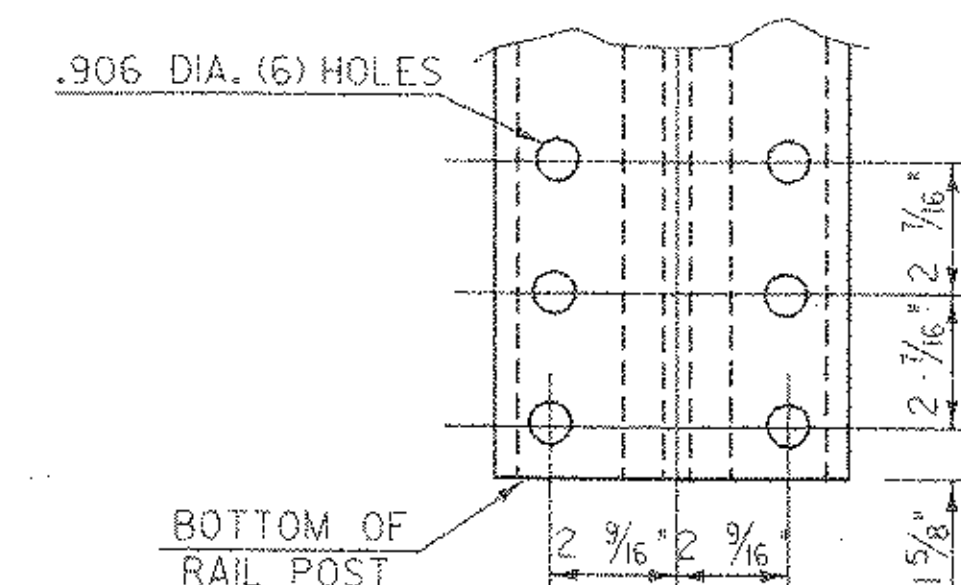
NO SPINDLES WILL BE USED ON THIS PROJECT.



OFFSET BLOCK CONNECTION



RAIL CONNECTION

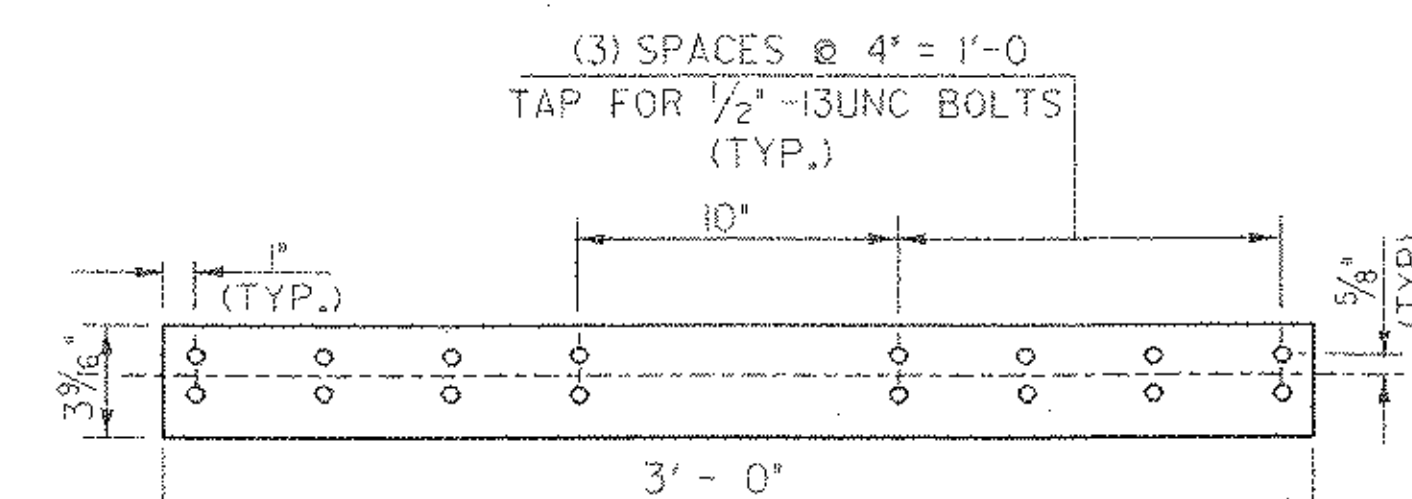
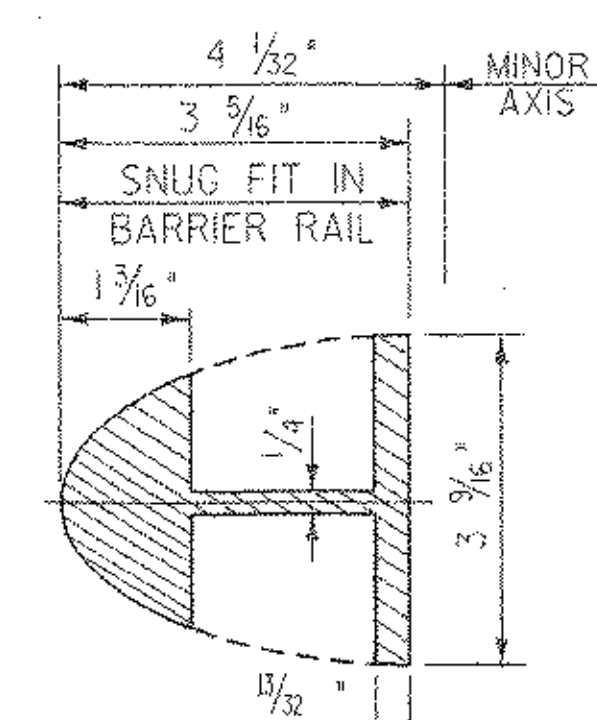
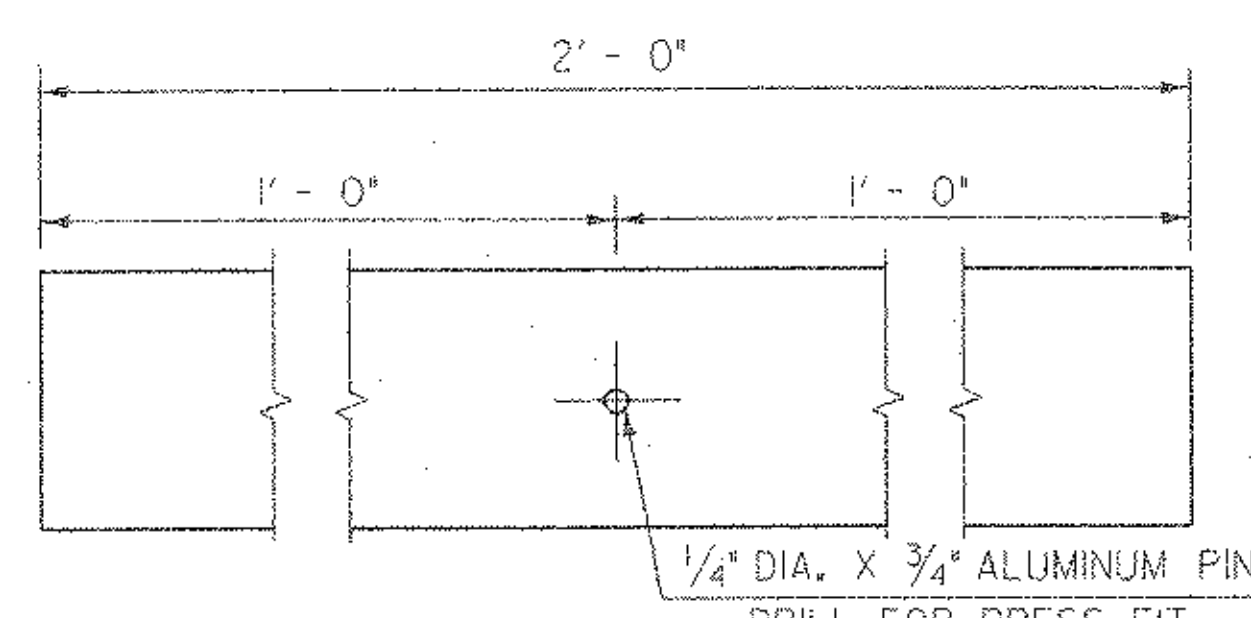
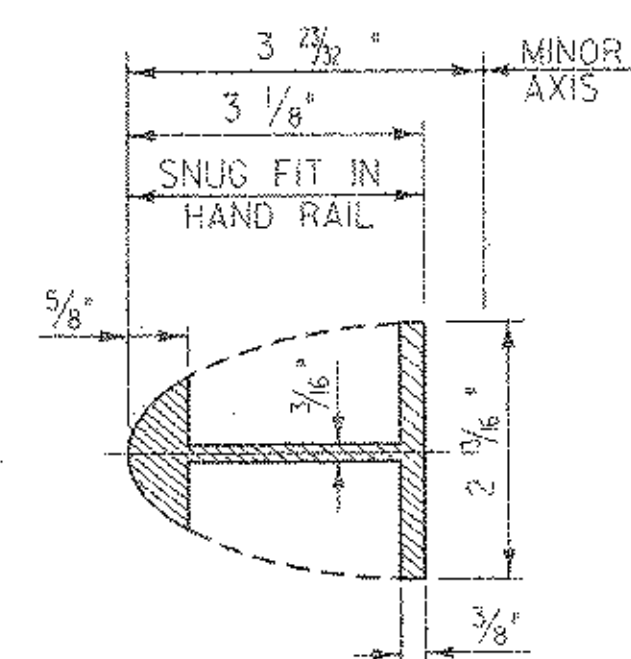
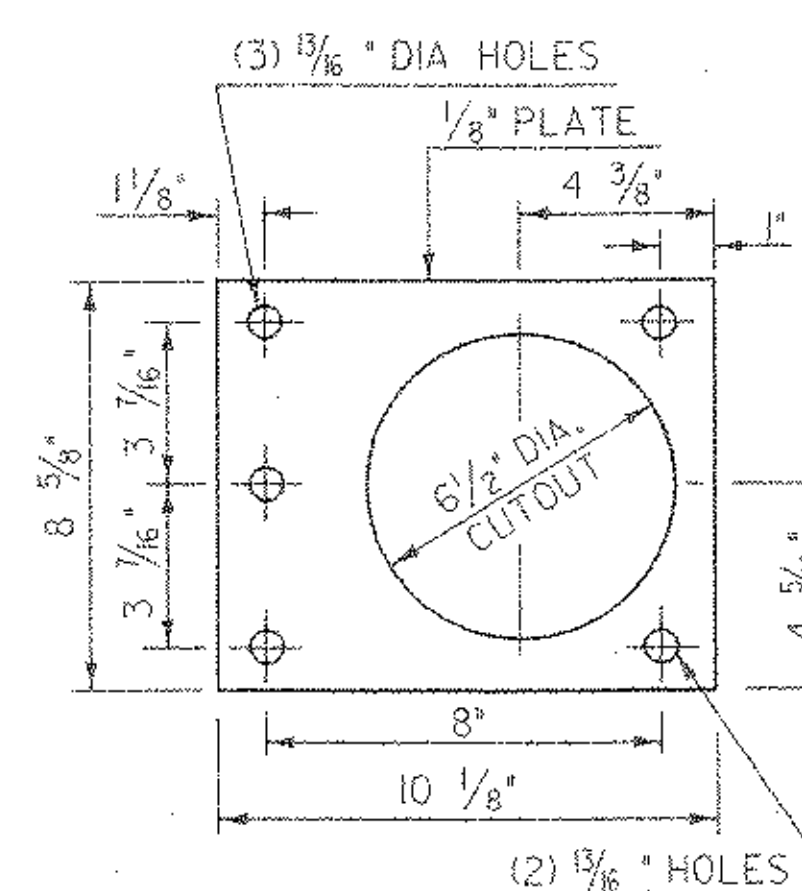
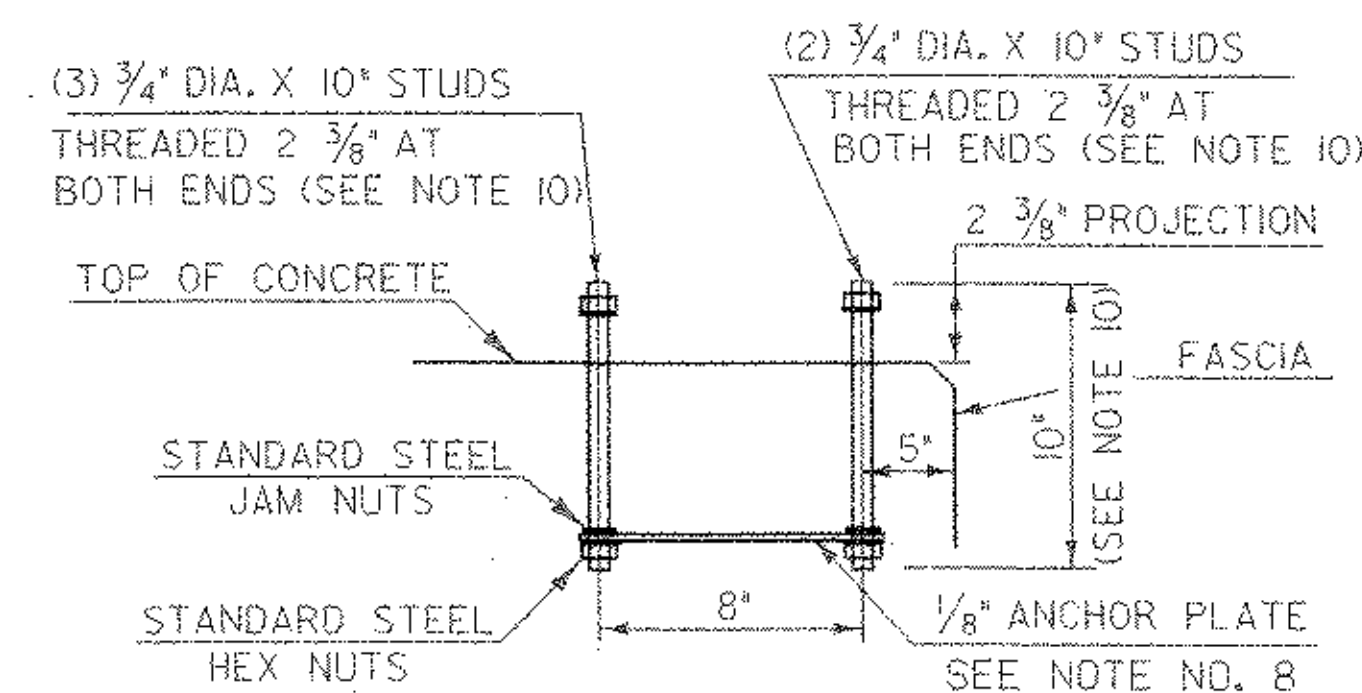
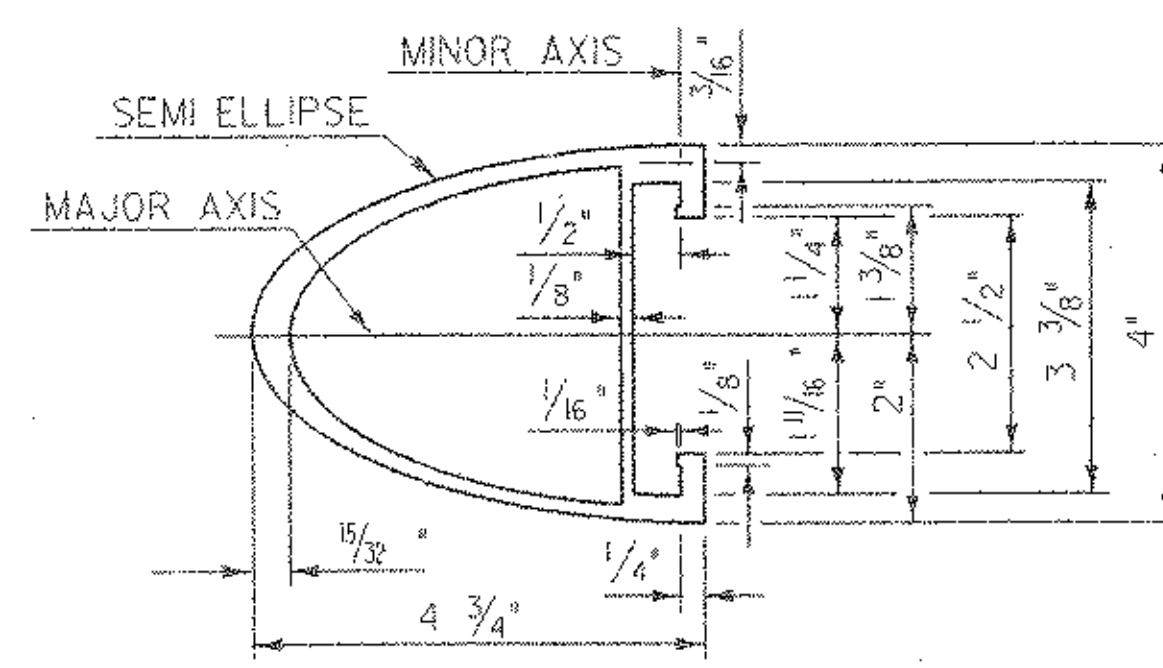
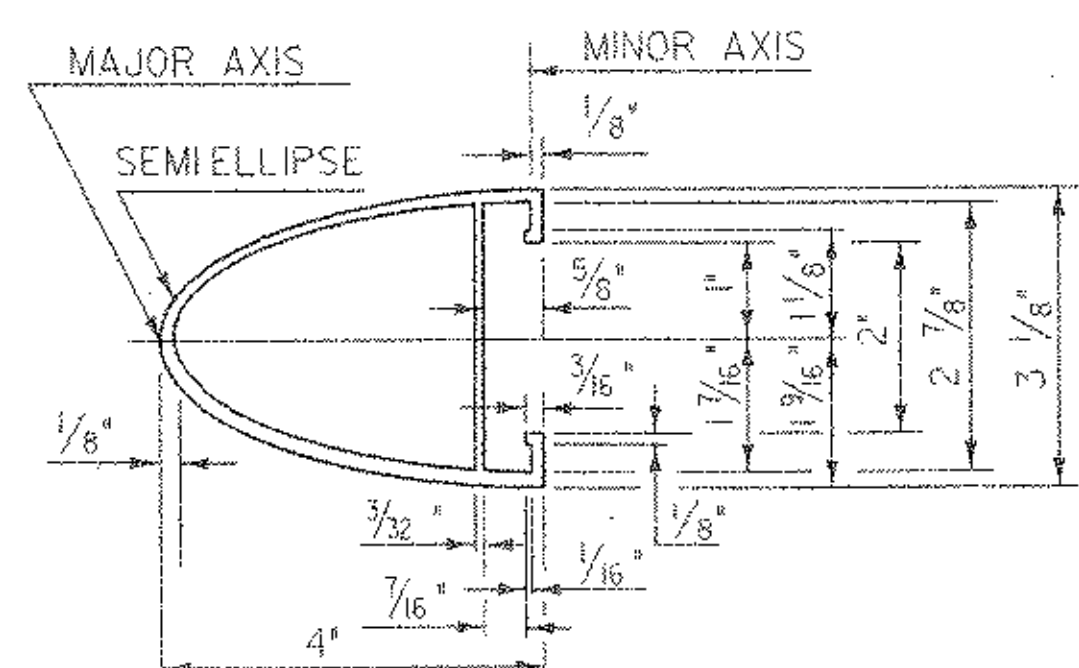
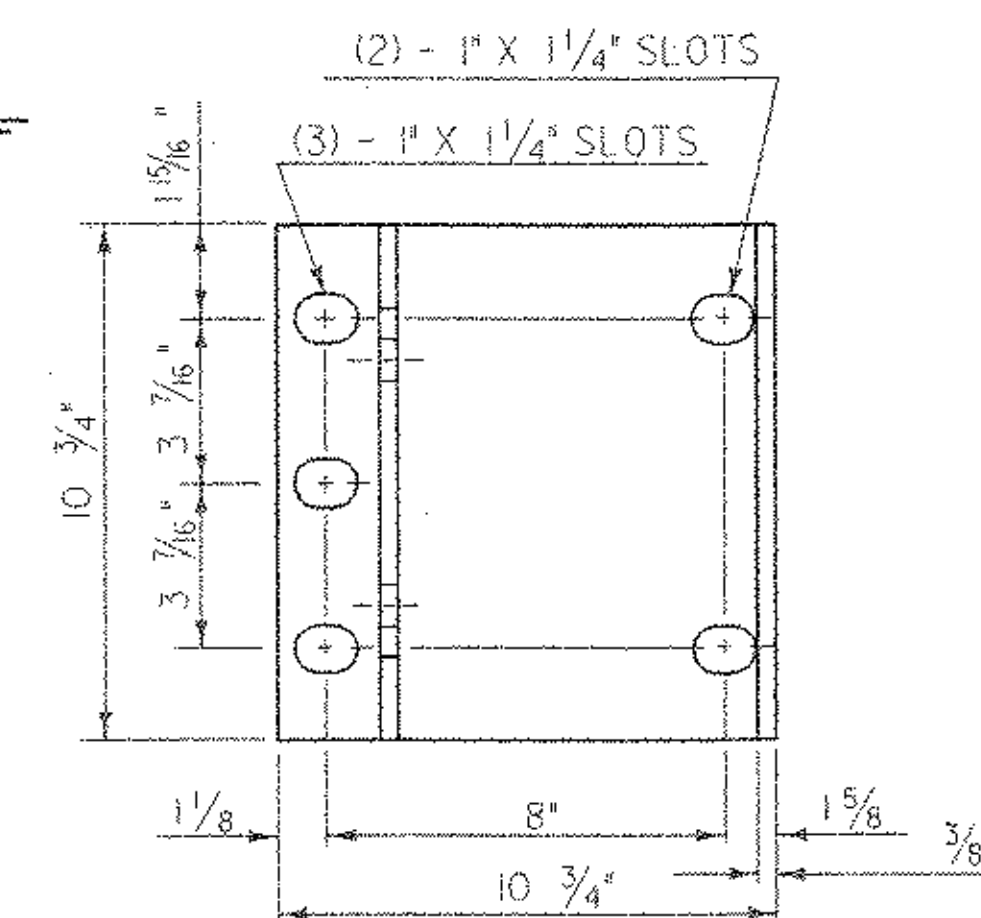
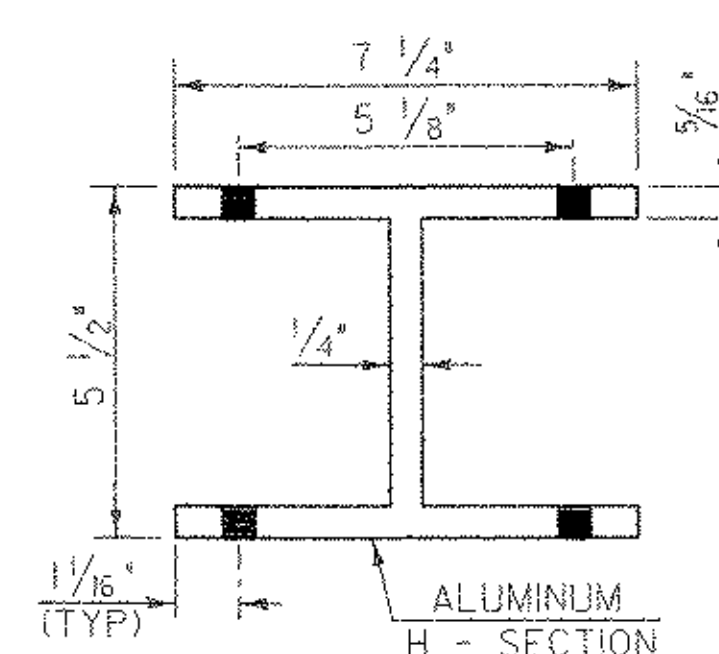
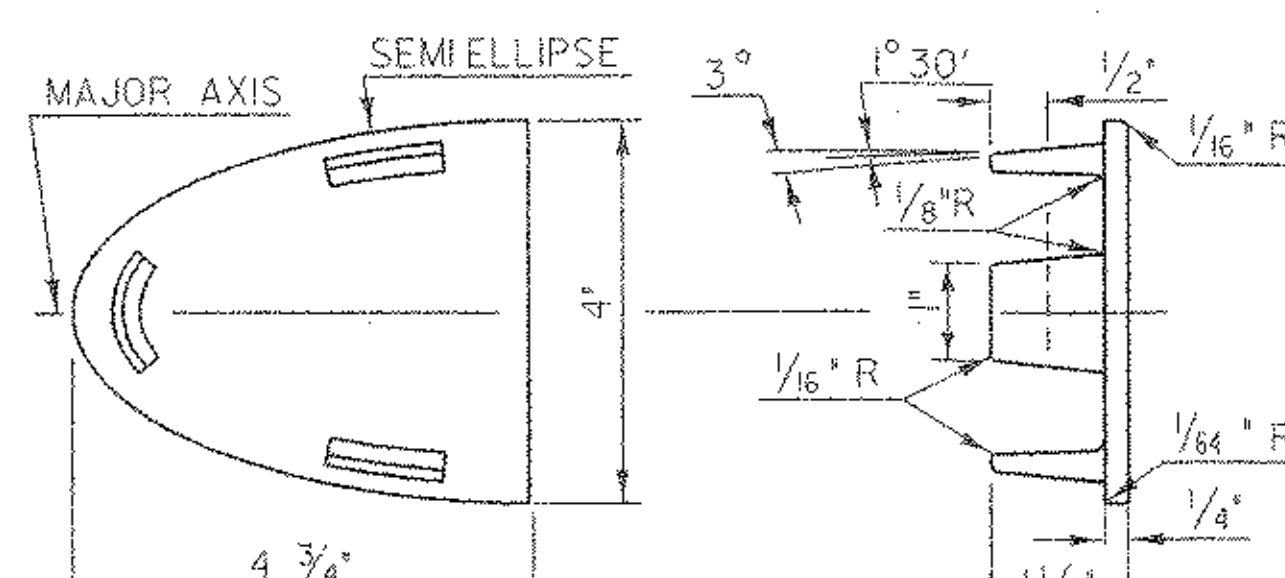
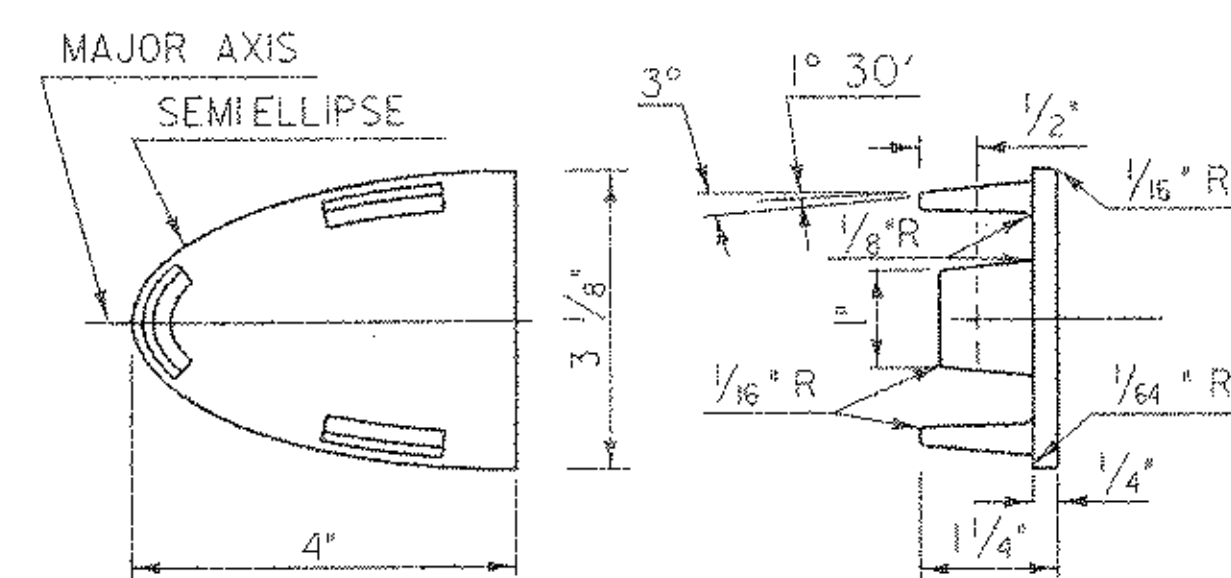
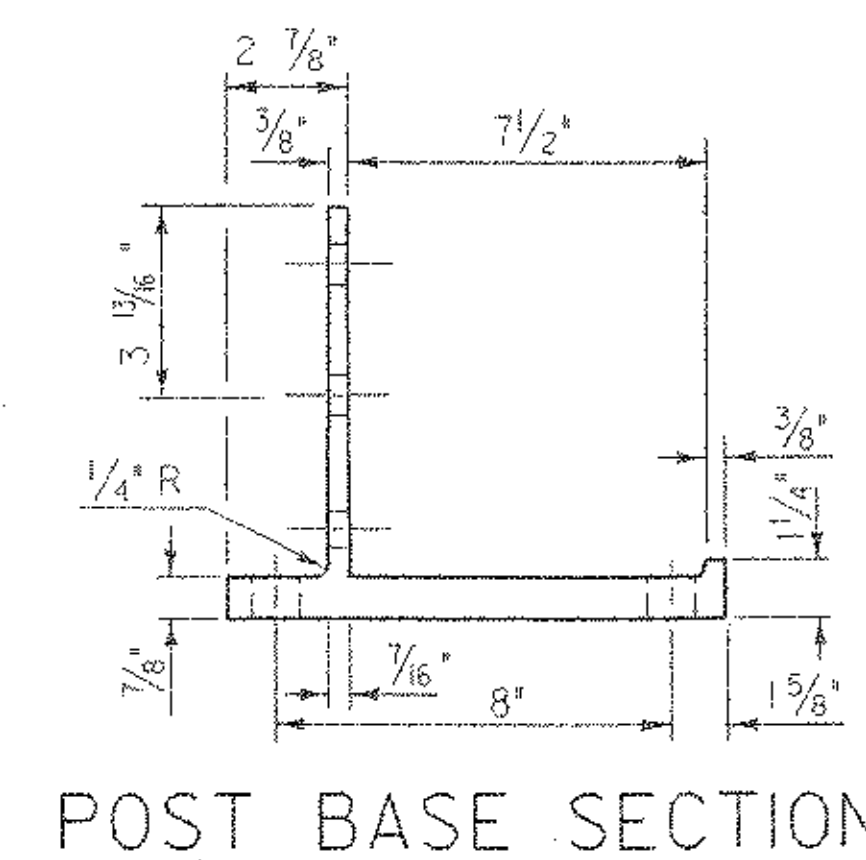
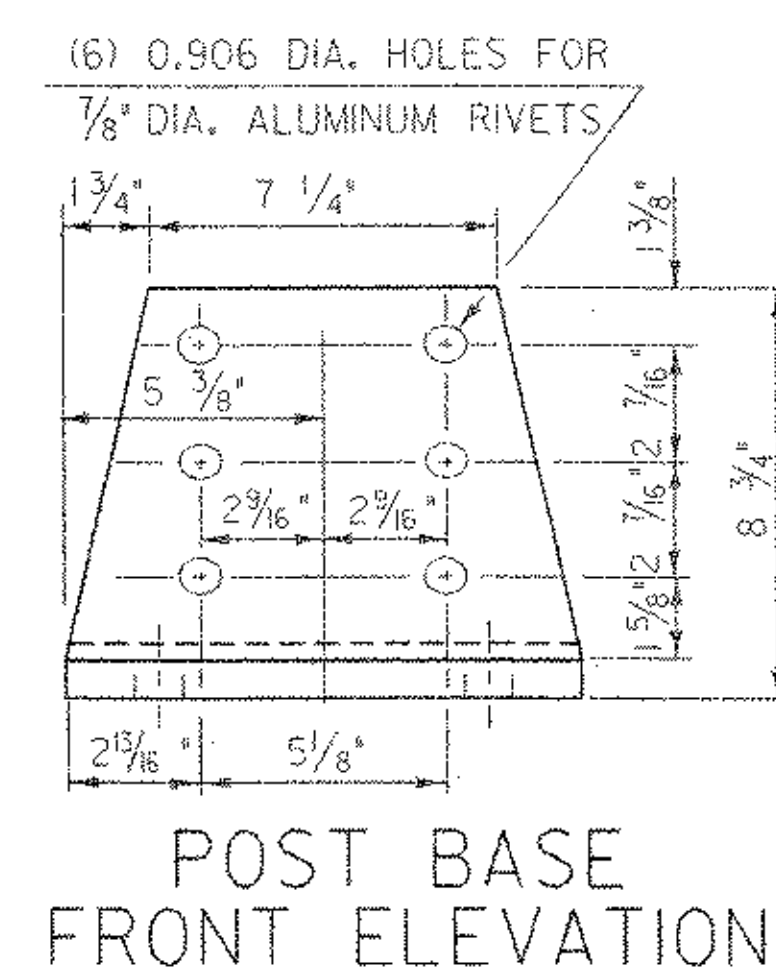
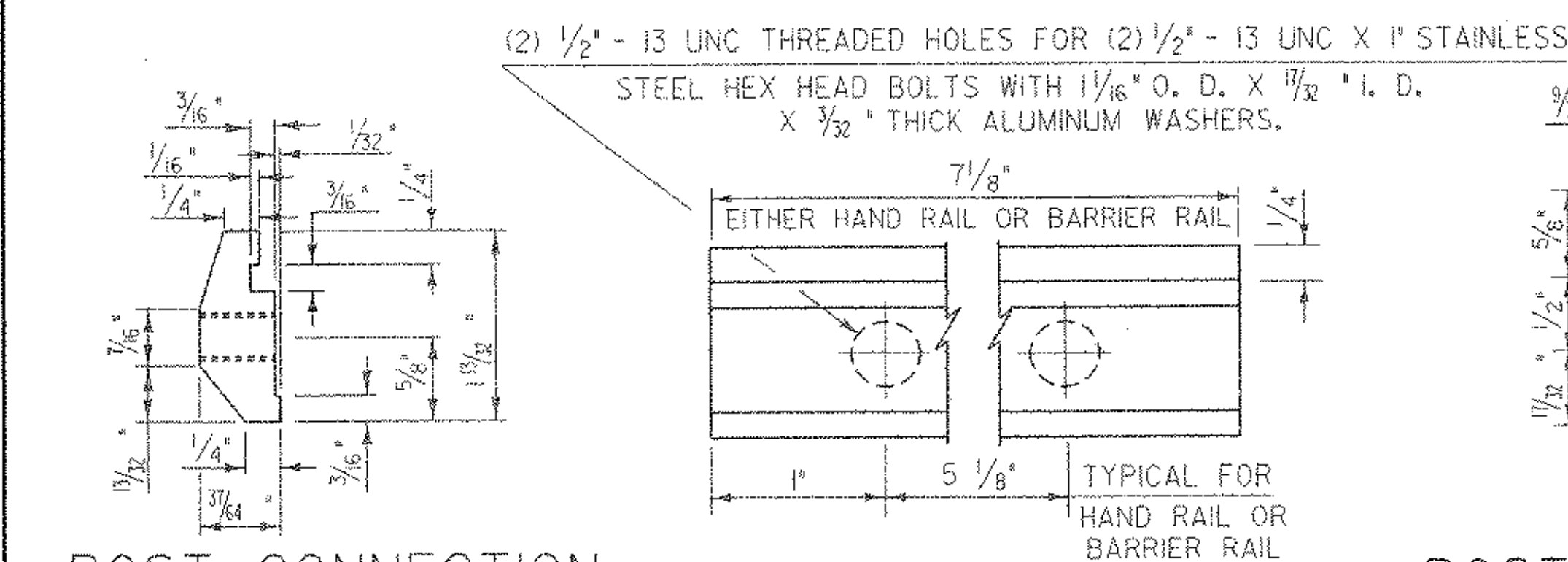


POST BASE BOLT HOLE DETAILS

ALUMINUM BRIDGE RAIL DETAILS (I)

PROJECT NAME: ROCKINGHAM
PROJECT NUMBER: TH2 - 9103

FILE NAME: 90c053\structures\sc053r01.i PLOT DATE: 20-MAR-2003
PROJECT MANAGER: R.R. WHITCOMB DRAWN BY: VAOT
DESIGNED BY: G. ROY CHECKED BY: R. WHITCOMB
SHEET (21) OF 38



NOTES

- THE FOLLOWING:
 - A. ASTM A449 GALVANIZED, OR
 - B. AASHTO M164 (ASTM A325) GALVANIZED
 - C. BOLTS AND WASHERS OF STAINLESS STEEL ASTM A276, TYPE 304 (MINIMUM ULTIMATE STRENGTH OF 100,000 PSI) WITH STAINLESS STEEL NUTS OF ASTM A194, GRADE 8A.
2. ALUMINUM POSTS, POST BASES, SPLICE BARS, CONNECTION BARS, RAILS AND BALUSTER FRAMES SHALL CONFORM TO ASTM B221 ALLOY 6061-T6 OR ALLOY 6351-T5. MINIMUM ALLOWABLE STRESS $F_y = 35,000$ PSI.
3. ALUMINUM BALUSTER TUBES SHALL CONFORM TO ASTM B210 ALLOY 6061-T5 OR 6063-T5.
4. ALUMINUM RAIL END CAPS SHALL CONFORM TO ASTM B26 ALLOY 356-T6.
5. THE POST, RAIL, AND OFFSET BLOCK CONNECTION BOLTS SHALL BE EITHER ASTM A193 OR ASTM A320. EITHER ONE SHALL BE CLASS 1, B8 GRADE AISI 304 WITH AN ULTIMATE TENSILE STRENGTH OF 75,000 PSI. NUTS FOR EITHER OF THE ABOVE BOLTS SHALL BE ASTM A194, GRADE 8, STAINLESS STEEL WITH AN ULTIMATE TENSILE STRENGTH OF 75,000 PSI.
6. SET SCREWS FOR ATTACHING BALUSTERS TO RAILING SHALL BE ASTM F880, TYPE 303 MATERIAL.
7. RIVETS SHALL BE COLD DRIVEN HIGH BUTTON HEAD "CONE POINT", CONFORMING TO ASTM B316 ALLOY 6061-T6.
8. THE ANCHOR PLATE FOR THE POST ANCHOR ASSEMBLY SHALL BE ASTM A36 STRUCTURAL STEEL.
9. WELDING SHALL CONFORM TO THE REQUIREMENTS OF SUBSECTION 506.10 USING THE GMAW-INERT GAS PROCESS AND AWS ER 5356 ELECTRODE WIRE.
10. UNLESS OTHERWISE SPECIFIED, ANCHOR BOLTS SHALL BE CAST INTO THE CONCRETE AS DETAILED.
11. WHENEVER FEASIBLE BARRIER RAIL AND HAND RAIL SECTIONS, SHALL BE FULL LENGTH SECTIONS (40' $\pm$) AND WHEN POSSIBLE SHALL BE ATTACHED TO THREE POSTS. RAILS SHALL BE SPLICED AT EACH DECK JOINT AND INTERMITTENTLY AS REQUIRED. SPLICES SHALL OCCUR WITHIN THE SAME PANEL.
12. ENDS OF RAILS SHALL BE CUT SQUARE AND GROUND FREE OF BURRS OR RAGGED EDGES. EXPOSED ENDS SHALL BE CAPPED.
13. THE CONCRETE CONTACT SURFACE AT THE POST BASE SHALL BE BUSH HAMMERED AND/OR SHIMMED AS REQUIRED FOR PROPER POST ALIGNMENT. POST HEIGHT ADJUSTMENTS LESS THAN 1/4" SHALL BE WITH 1/16" AND 1/8" SHIMS. CORRECTIONS EXCEEDING 1/4" SHALL BE WITH EPOXY MORTAR CONFORMING WITH SECTION 530. FABRIC BEARING PADS AND ANY REQUIRED SHIMS OR EPOXY MORTAR ARE SUBSIDIARY TO THE UNIT PRICE BID FOR THE RAILING.
14. SHIMS AND 1/8" FABRIC BEARING PADS SHALL BE 10 3/4" SQUARE WITH SLOTTED HOLES SIZED AND LOCATED THE SAME AS THE POST BASE DETAIL. FABRIC BEARING PADS SHALL CONFORM TO SUBSECTION 731.01 OR 731.02, SHIM MATERIAL SHALL BE ASTM B 209 ALLOY 1100-0.
15. EXTRUDED SECTIONS ARE DETAILED TO COMPLY WITH CURRENT AASHTO-AGC-ARTBA STANDARDS. MINOR VARIATIONS OF THE DETAILS SHOWN MAY BE CONSIDERED PROVIDING THEY DO NOT REDUCE THE STRENGTH CAPACITY OF THE RAIL SYSTEM.
16. ALUMINUM WASHERS SHALL BE ASTM B209 ALLOY A1624-T4.

ALUMINUM BRIDGE
RAIL DETAILS (2)

PROJECT NAME: ROCKINGHAM

PROJECT NUMBER: TH2 - 9103

FILE NAME: 90c053\structures\sc053r02.i PLOT DATE: 20-MAR-2003

PROJECT MANAGER: R. R. WHITCOMB

PLOT DATE: 20-MA
DRAWN BY: VAOT

DESIGNED BY: G. ROY

CHECKED BY: R. WHITCOMB

SHEET 22 OF 38

NOTES

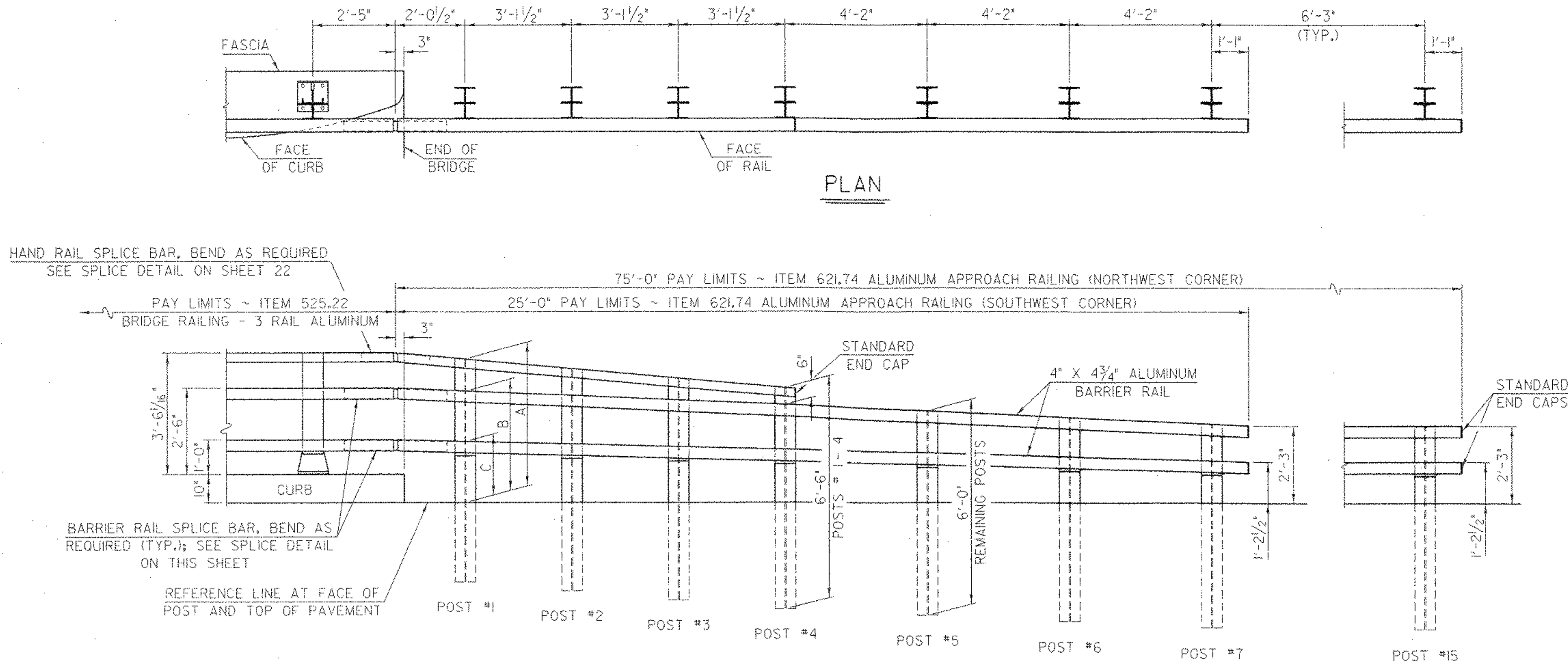
1. ALL POSTS SHALL BE EXTRUDED ALUMINUM.
2. ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 36 GALVANIZED AFTER FABRICATION.
3. ALL ITEMS NOT OTHERWISE INDICATED SHALL MEET THE SPECIFICATION REQUIREMENTS OF THE STANDARD SHEETS ON WHICH THEY ARE DETAILED.
4. SEE SHEETS 21 AND 22 FOR ALUMINUM BRIDGE RAILING DETAILS.
5. DETAILS ARE SHOWN FOR TRANSITION TO A 3 RAIL ALUMINUM BRIDGE RAILING.
6. DIMENSIONS SHOWN ARE FROM A REFERENCE LINE AT THE FACE OF POST FOR A NORMAL CROWNED SECTION. APPROPRIATE CORRECTIONS SHALL BE MADE FOR CROSS SLOPES OTHER THAN A NORMAL SECTION.

ALUMINUM APPROACH RAIL DIMENSIONS A
NORTHWEST AND SOUTHWEST CORNERS

POST NO.	RAIL HEIGHT DIMENSIONS			OFFSET BLOCK DIMENSIONS			
	A	B	C	D	E	F	G
1	4'-1 ¹¹ / ₁₆ "	3'-2 ¹ / ₁₆ "	1'-9 ³ / ₈ "	11 ¹ / ₁₆ "	1'-5 ¹ / ₁₆ "	2'-9 ¹ / ₂ "	
2	3'-10 ⁵ / ₈ "	3'-1 ¹ / ₁₆ "	1'-8 ³ / ₁₆ "	9 ³ / ₈ "	1'-4 ⁷ / ₈ "	2'-7 ¹ / ₁₆ "	
3	3'-7 ³ / ₈ "	2'-11 ¹ / ₁₆ "	1'-7 ¹ / ₂ "	8 ¹ / ₈ "	1'-4 ¹ / ₁₆ "	2'-4 ¹³ / ₁₆ "	
4	3'-4 ¹ / ₁₆ "	2'-10 ¹ / ₁₆ "	1'-6 ¹ / ₁₆ "	6 ¹ / ₁₆ "	1'-3 ¹ / ₂ "	2'-2 ¹ / ₂ "	
5		2'-7 ⁷ / ₈ "	1'-5 ¹ / ₁₆ "		1'-2 ¹ / ₁₆ "		1'-7 ³ / ₁₆ "
6		2'-5 ³ / ₄ "	1'-4 ¹ / ₁₆ "		1'-15 ³ / ₁₆ "		1'-6 ⁵ / ₈ "
7		2'-3 ¹ / ₁₆ "	1'-2 ¹ / ₁₆ "		1'-0 ³ / ₄ "		1'-5 ³ / ₄ "

ALL REMAINING POSTS ARE TO HAVE THE SAME DIMENSIONS AS POST NO. 7

ELEVATION



BARRIER RAIL
EITHER ASTM A193 OR ASTM A320
STAINLESS STEEL BOLTS
SEE DETAIL ON THIS SHEET
AND NOTE 5 ON SHEET 22

TYPICAL SECTION THROUGH
BARRIER RAIL SPLICE

STAINLESS STEEL BOLT DETAILS

ALUMINUM BRIDGE
RAIL DETAILS (3)

PROJECT NAME: ROCKINGHAM

PROJECT NUMBER: TH2 - 9103

FILE NAME: 90c053\structures\sc053r03.1 PLOT DATE: 20-MAR-2003

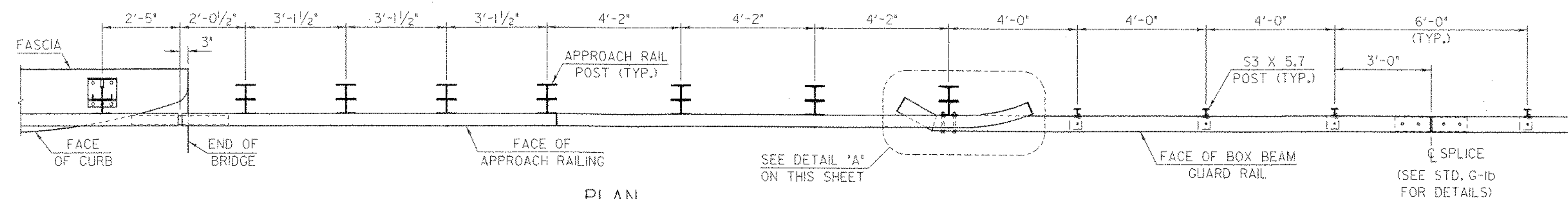
PROJECT MANAGER: R. R. WHITCOMB

DESIGNED BY: G. ROY

DRAWN BY: VAOT

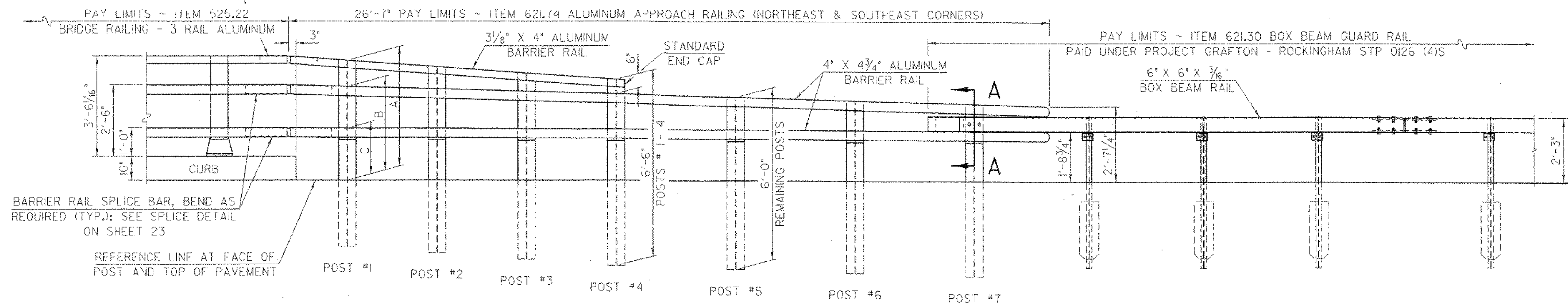
CHECKED BY: R. WHITCOMB

SHEET 23 OF 38



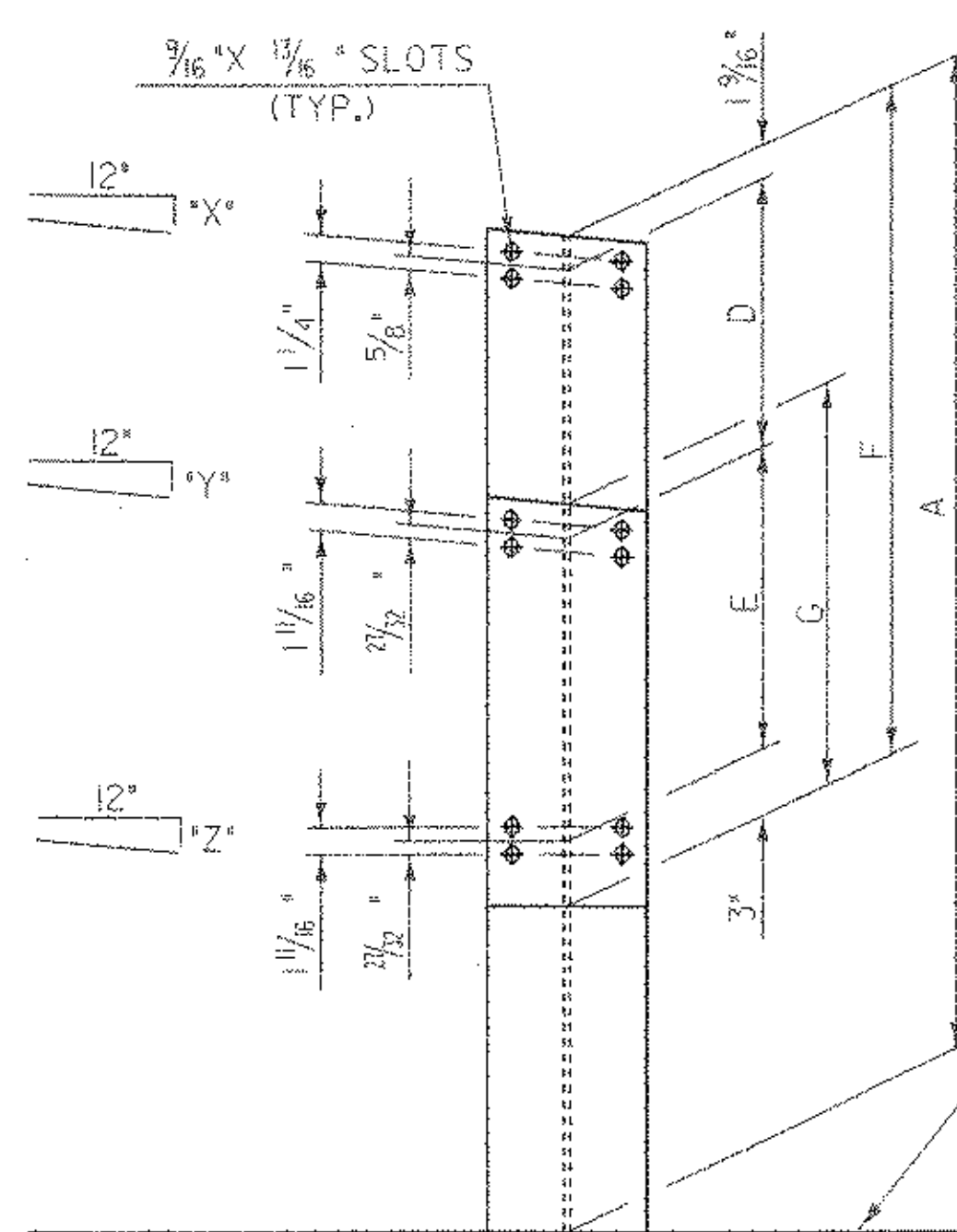
PLAN

HAND RAIL SPLICE BAR, BEND AS REQUIRED
SEE SPLICE DETAIL ON SHEET 22



ELEVATION

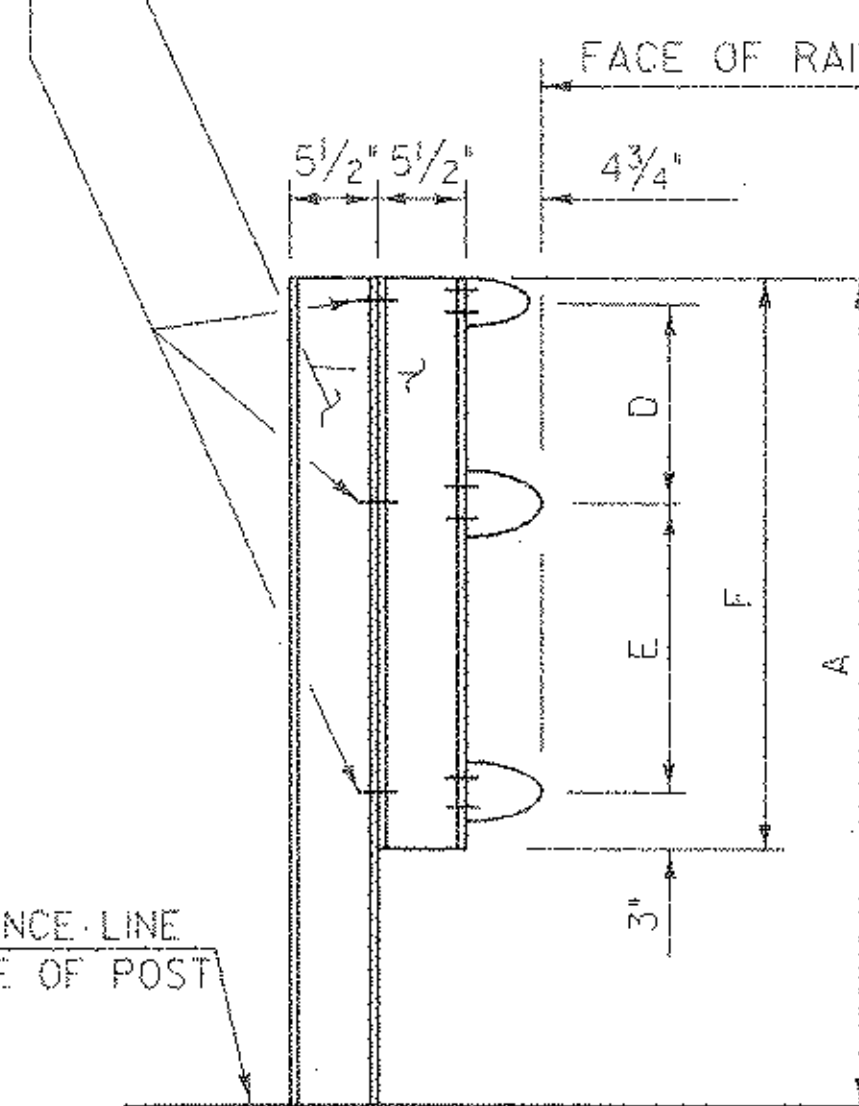
X	7/8"
Y	5/16"
Z	1/16"



FRONT ELEVATION

ATTACH OFFSET BLOCK TO POST WITH
1/2" -13 UNC X 1 1/2" LONG STAINLESS STEEL
HEX HEAD BOLTS, NUTS AND WASHERS.
6 BOLTS PER POST, POST 1 THRU 4;
4 BOLTS PER POST, POST 5 THRU 7.

ALUMINUM APPROACH RAIL POST AND OFFSET BLOCK
H - SECTION 5 1/2" X 7 1/4"

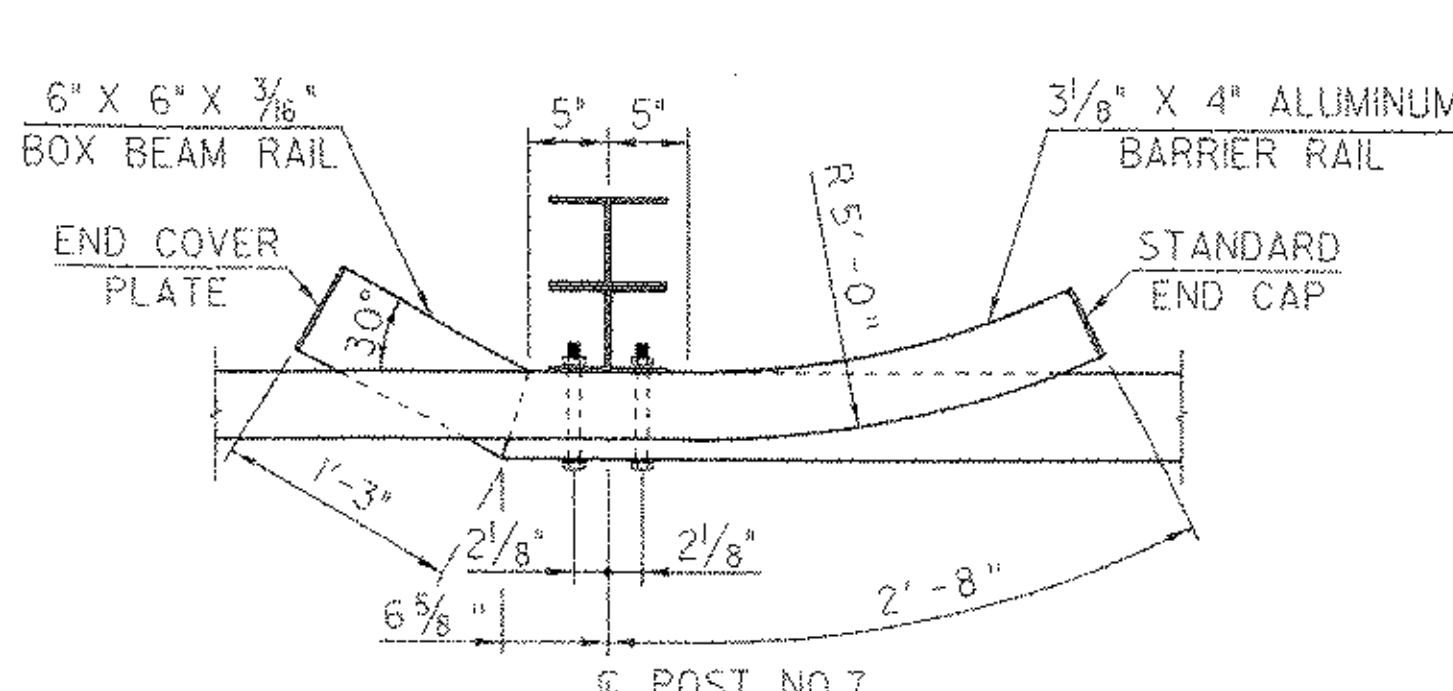


SIDE ELEVATION

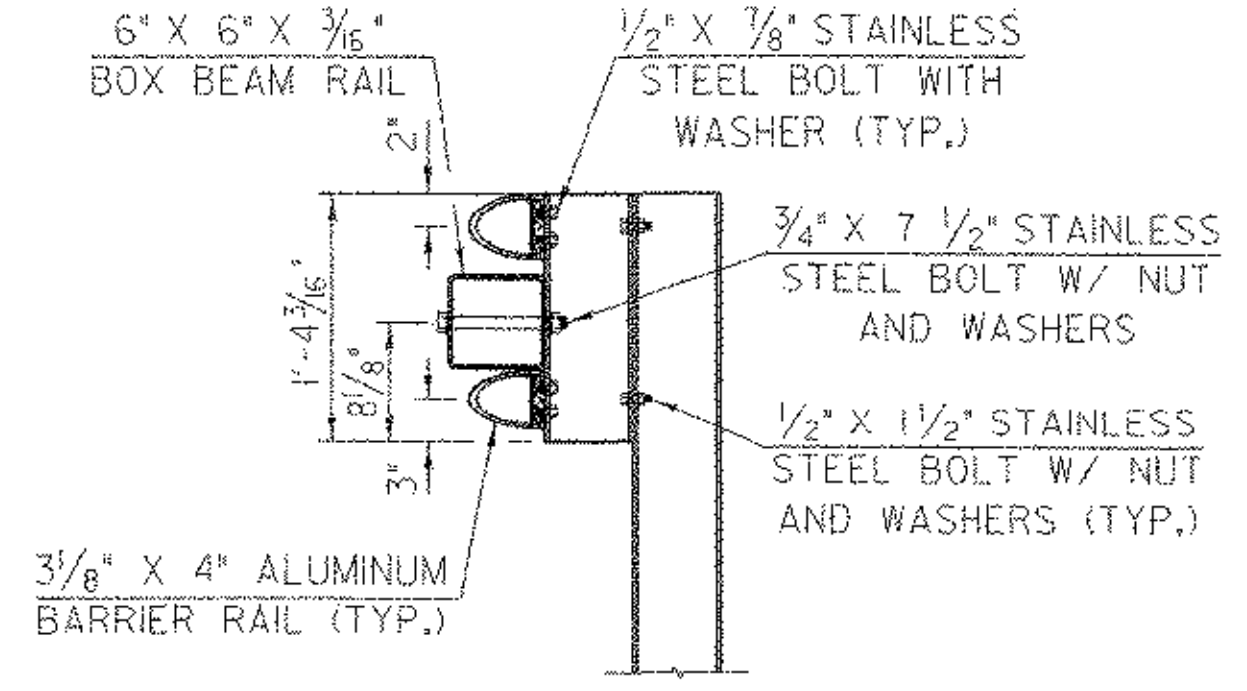
APPROACH RAIL DETAILS

ALUMINUM APPROACH RAIL DIMENSIONS AT WINGWALLS NO. 3 & 4

POST NO.	RAIL HEIGHT DIMENSIONS			OFFSET BLOCK DIMENSIONS			
	A	B	C	D	E	F	G
1	4'-2 ⁵ / ₁₆ "	3'-3 ³ / ₁₆ "	1'-9 ¹ / ₈ "	11 ¹ / ₁₆ "	1'-5 ⁵ / ₁₆ "	2'-9 ³ / ₈ "	
2	3'-11 ⁵ / ₈ "	3'-2 ⁹ / ₁₆ "	1'-9 ³ / ₄ "	9 ³ / ₄ "	1'-4 ⁹ / ₁₆ "	2'-6 ¹ / ₁₆ "	
3	3'-8 ⁵ / ₁₆ "	3'-1 ¹ / ₄ "	1'-9 ⁵ / ₈ "	8 ¹ / ₈ "	1'-3 ⁵ / ₈ "	2'-4 ⁵ / ₁₆ "	
4	3'-6 ³ / ₁₆ "	3'-0 ³ / ₁₆ "	1'-9 ¹ / ₁₆ "	6 ¹ / ₁₆ "	1'-2 ³ / ₄ "	2'-1 ³ / ₄ "	
5		2'-10 ¹ / ₁₆ "	1'-9 ¹ / ₄ "		1'-1 ¹ / ₁₆ "		1'-6 ⁵ / ₁₆ "
6		2'-9 ¹ / ₁₆ "	1'-9 ¹ / ₁₆ "		1'-0 ³ / ₈ "		1'-5 ³ / ₈ "
7		2'-8 ¹ / ₁₆ "	1'-8 ⁷ / ₈ "		11 ¹ / ₁₆ "		1'-4 ³ / ₁₆ "



DETAIL "A"



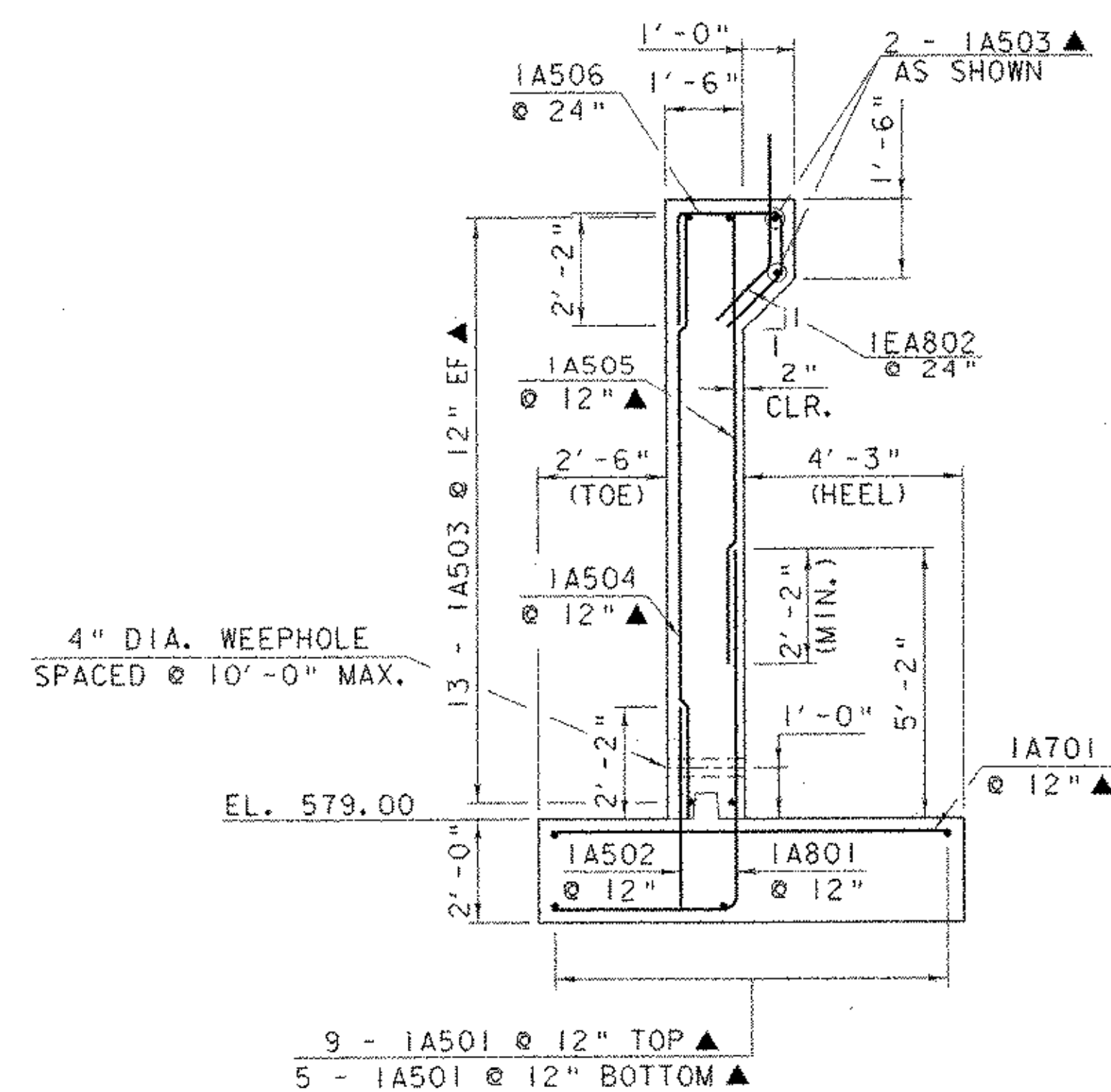
SECTION "A-A"

NOTES

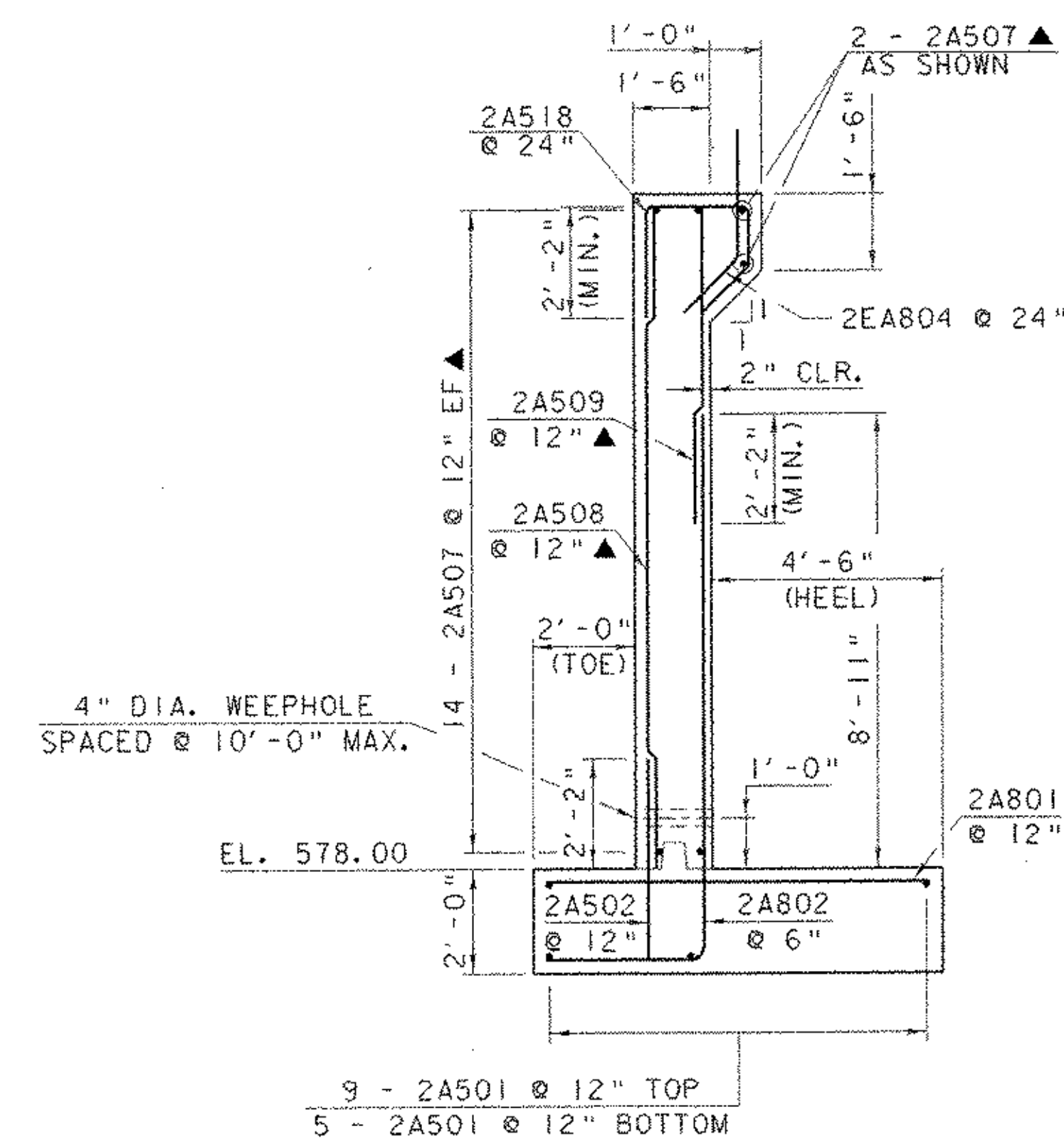
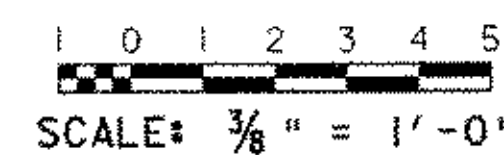
1. POST 1 THROUGH 7 SHALL BE EXTRUDED ALUMINUM.
2. ALL STRUCTURAL STEEL SHALL BE AASHTO M270 GRADE 36 GALVANIZED AFTER FABRICATION.
3. ALL ITEMS NOT OTHERWISE INDICATED SHALL MEET THE SPECIFICATION REQUIREMENTS OF THE STANDARD SHEETS ON WHICH THEY ARE DETAILED.
4. SEE STANDARD G-1b FOR BOX BEAM DETAIL, SEE SHEETS 21 AND 22 FOR ALUMINUM BRIDGE RAILING DETAILS.
5. DETAILS ARE SHOWN FOR TRANSITION TO A 3 RAIL ALUMINUM BRIDGE RAILING.
6. DIMENSIONS SHOWN ARE FROM A REFERENCE LINE AT THE FACE OF POST FOR A NORMAL CROWNED SECTION. APPROPRIATE CORRECTIONS SHALL BE MADE FOR CROSS SLOPES OTHER THAN A NORMAL SECTION.

ALUMINUM BRIDGE RAIL DETAILS (4)

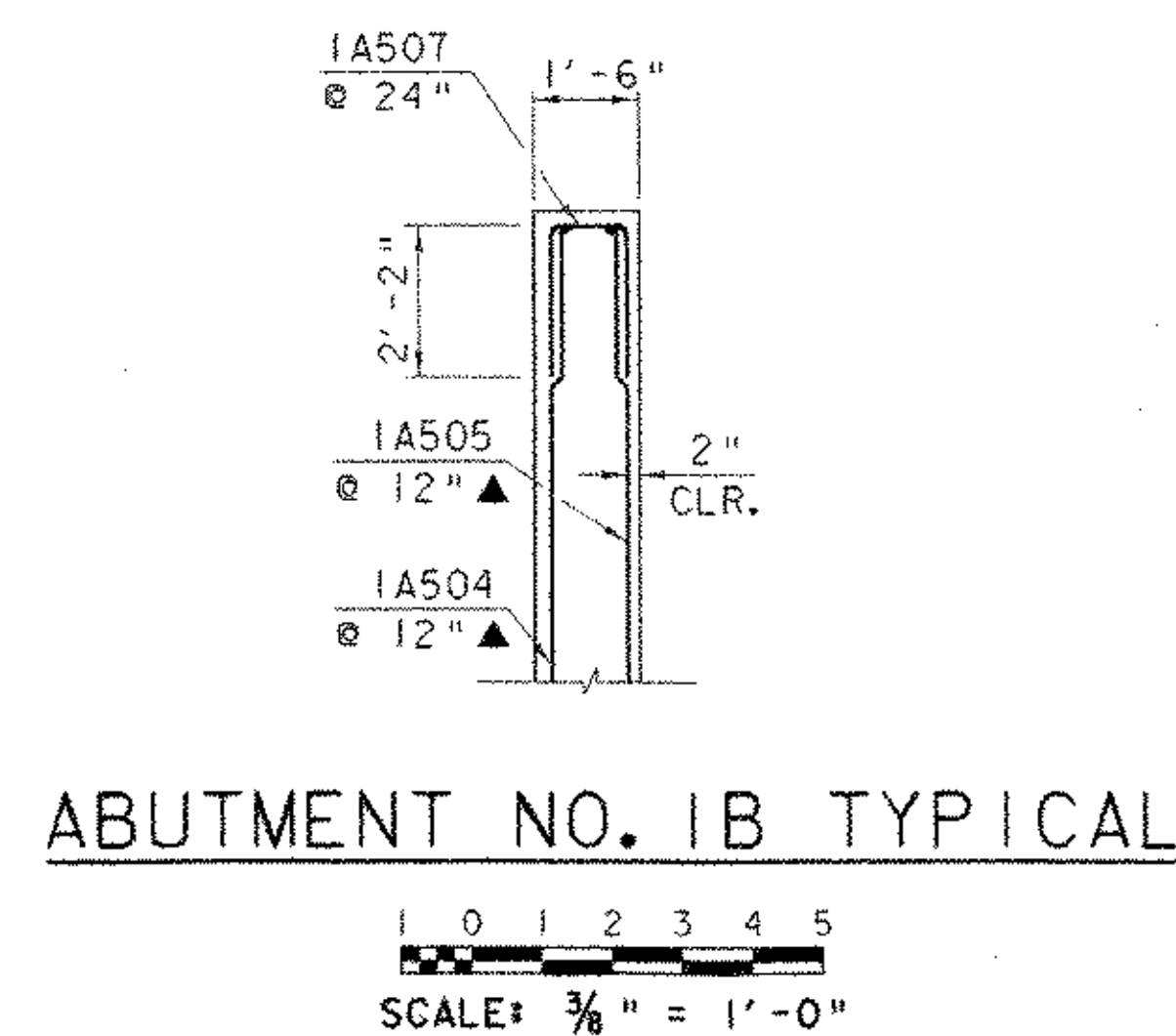
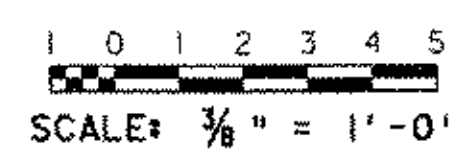
PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	90c053\structures\sc053r04.i
PROJECT MANAGER:	R. R. WHITCOMB
DESIGNED BY:	G. ROY
PLOT DATE:	20-MAR-2003
DRAWN BY:	VAOT
CHECKED BY:	R. WHITCOMB
SHEET	(24) OF 38



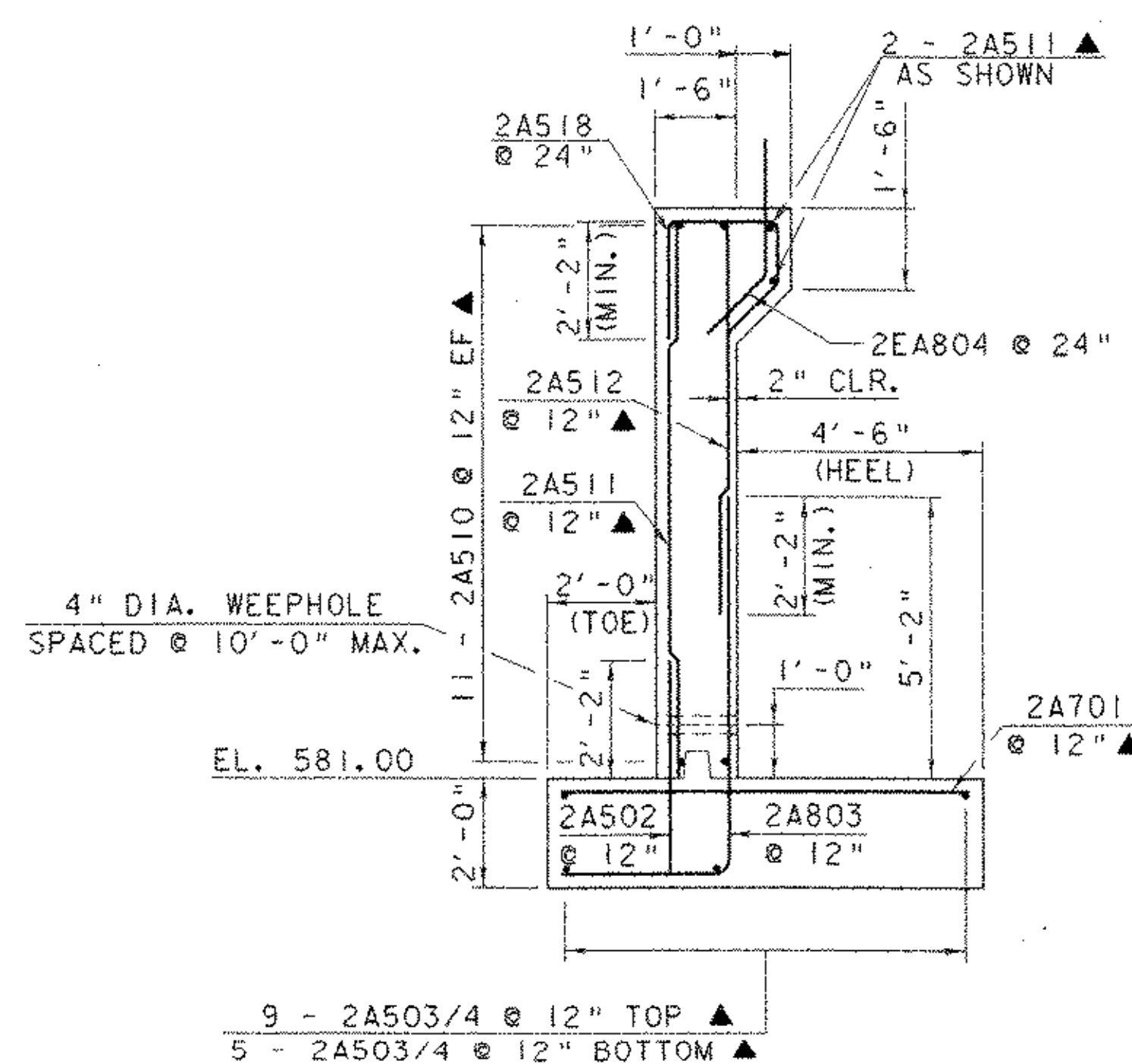
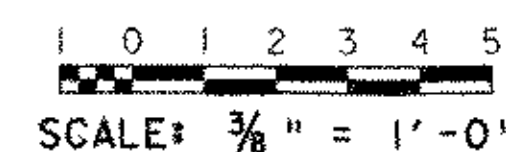
ABUTMENT NO. 1A TYPICAL



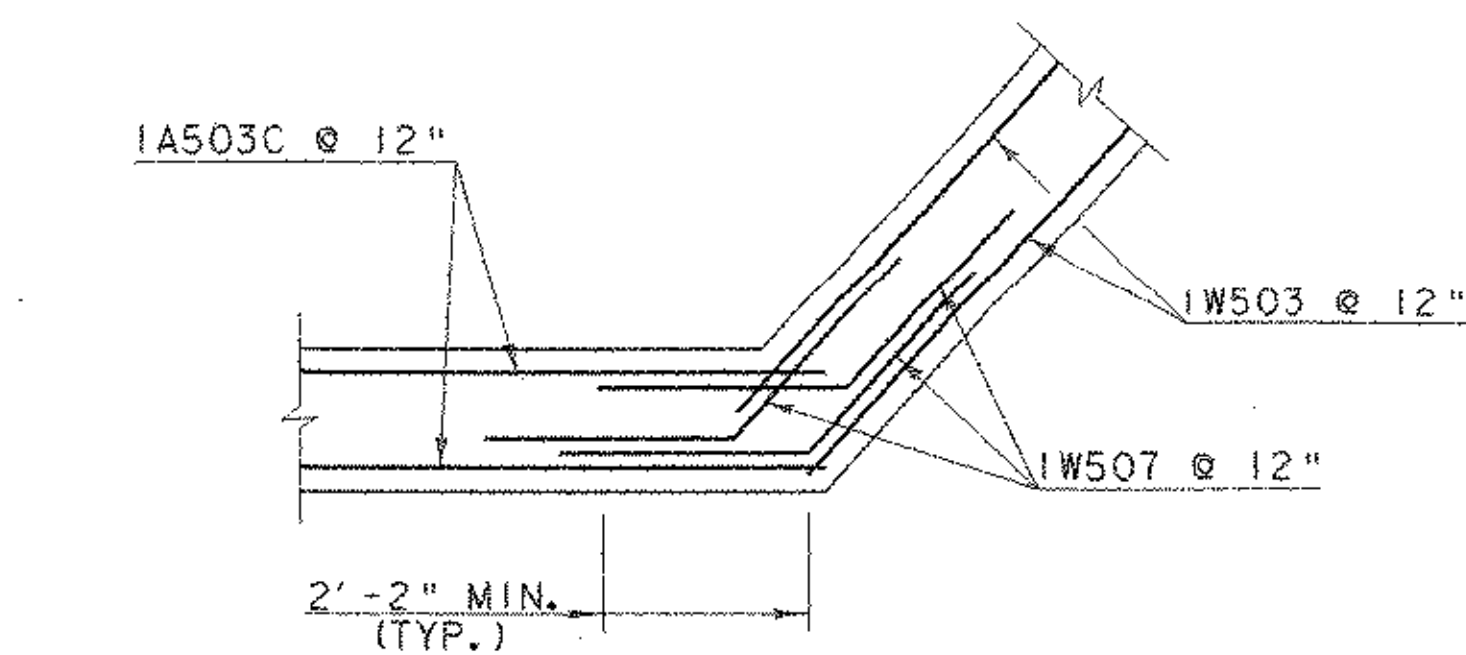
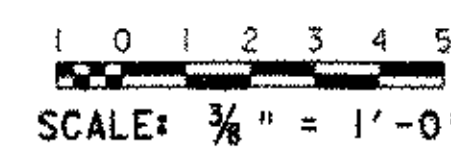
ABUTMENT NO. 2A TYPICAL



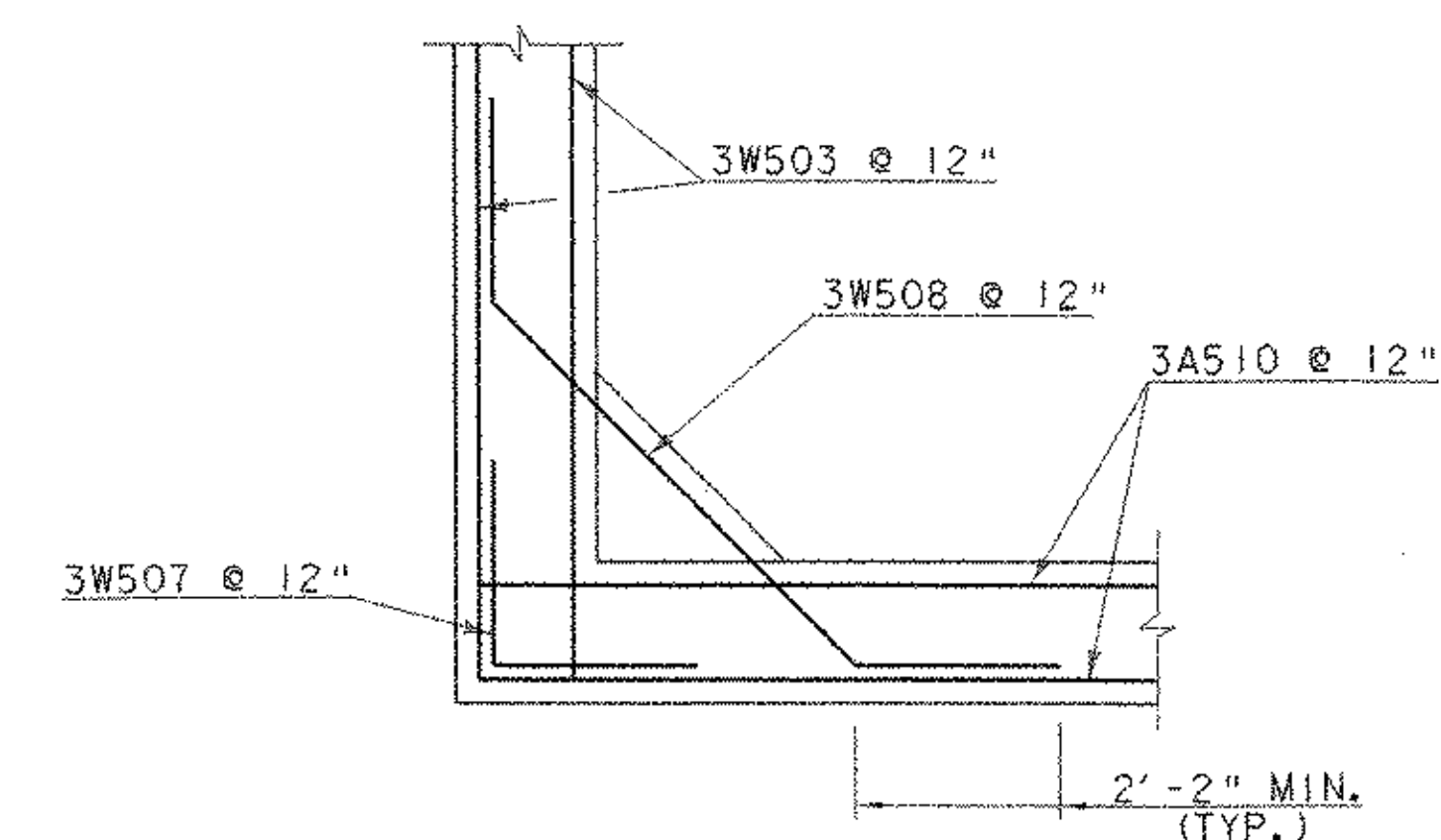
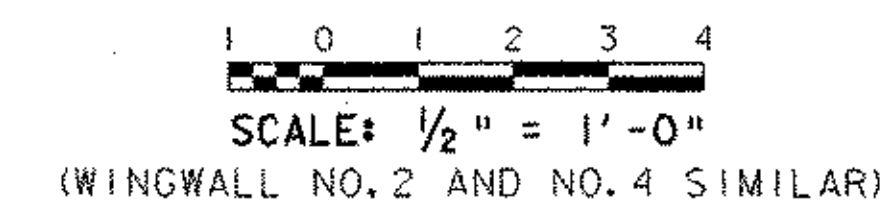
ABUTMENT NO. 1B TYPICAL



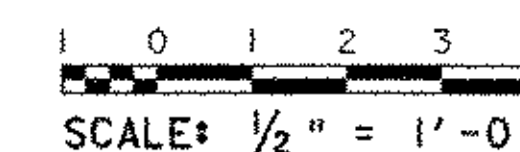
ABUTMENT NO. 2B TYPICAL



WINGWALL NO. 1
CORNER REINFORCING DETAIL



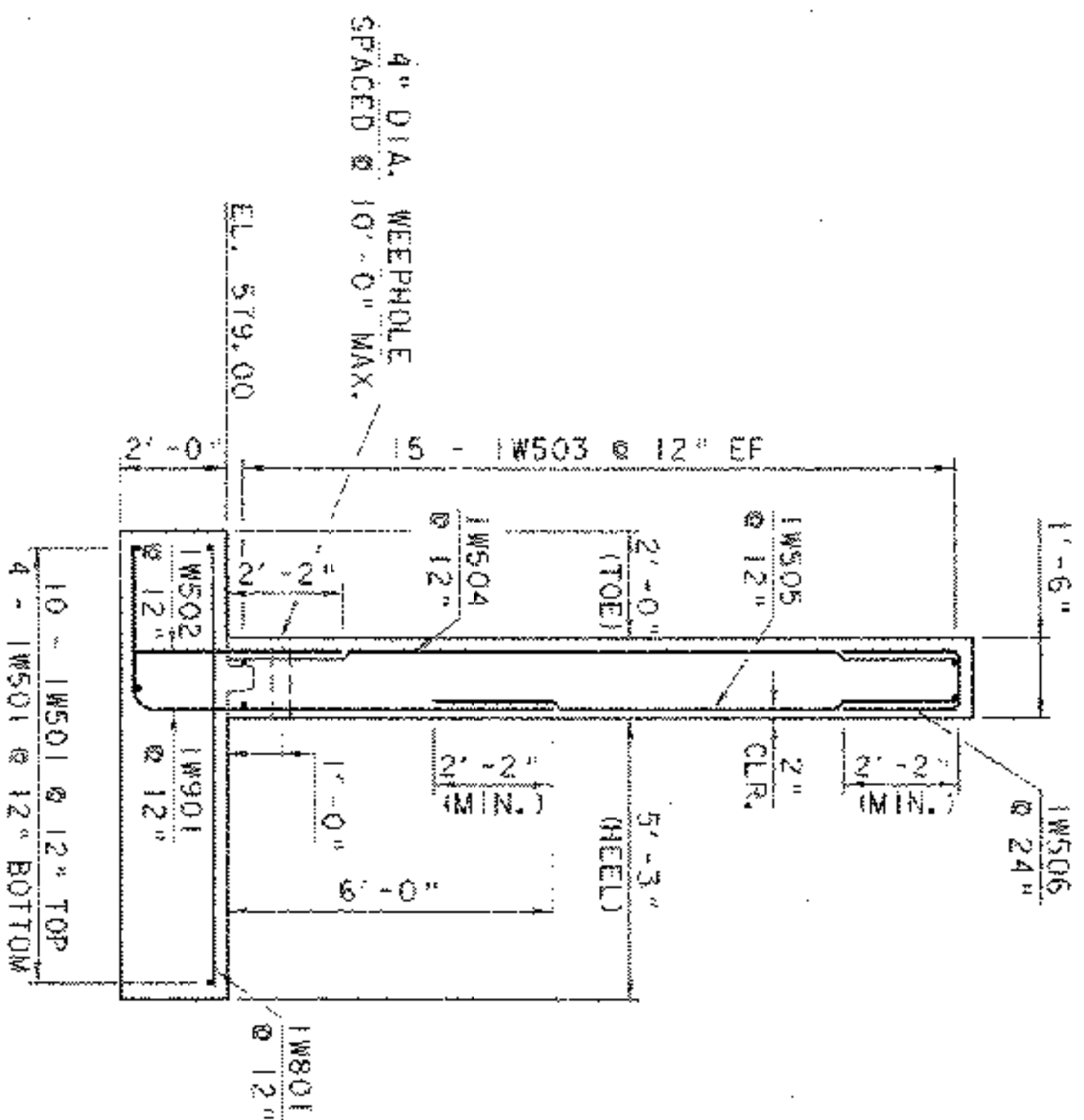
WINGWALL NO. 3
CORNER REINFORCING DETAIL



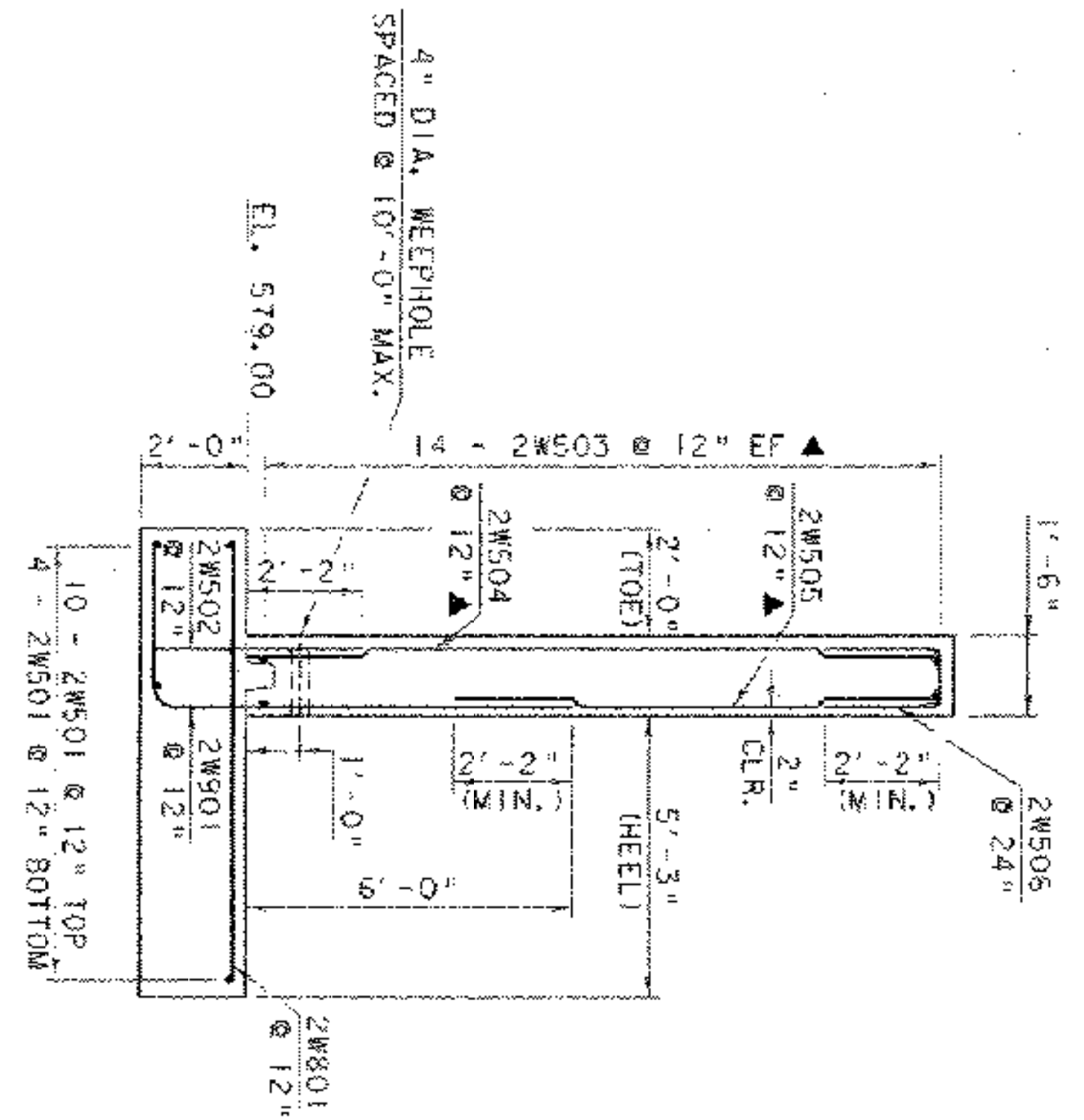
NOTE:
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLR. UNLESS OTHERWISE NOTED

ABUTMENT TYPICAL SECTIONS

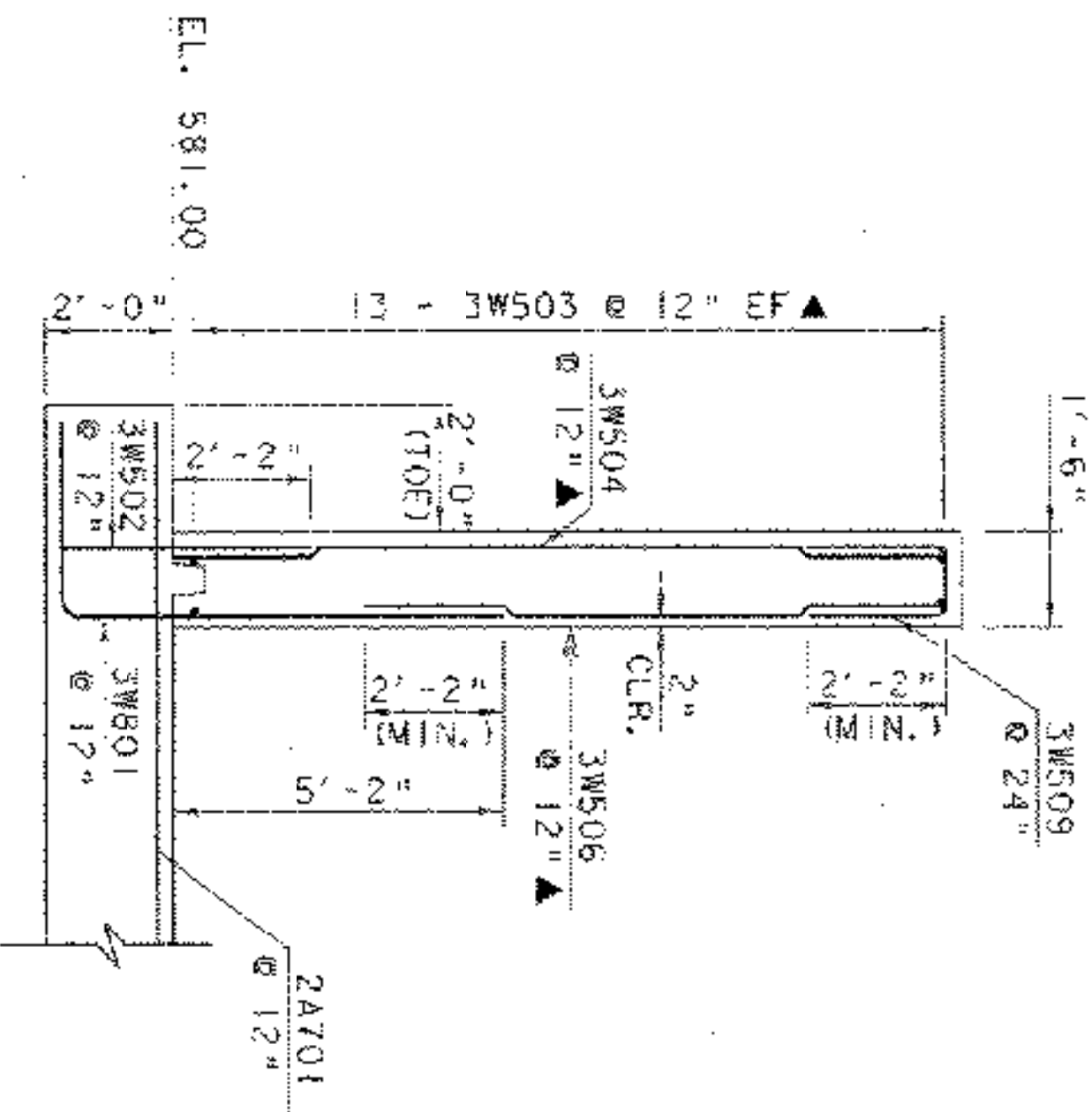
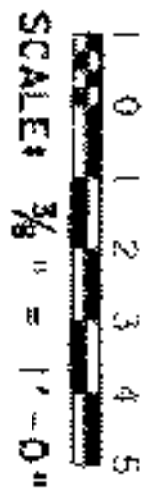
PROJECT NAME: ROCKINGHAM	PLOT DATE: 20-MAR-2003
PROJECT NUMBER: TH2 - 9103	DRAWN BY: L. BULLOCK
FILE NAME: 90c053\structures\sc053abt.1	CHECKED BY: G. ROY
PROJECT MANAGER: R.R. WHITCOMB	SHEET 25 OF 38
DESIGNED BY: G. ROY	



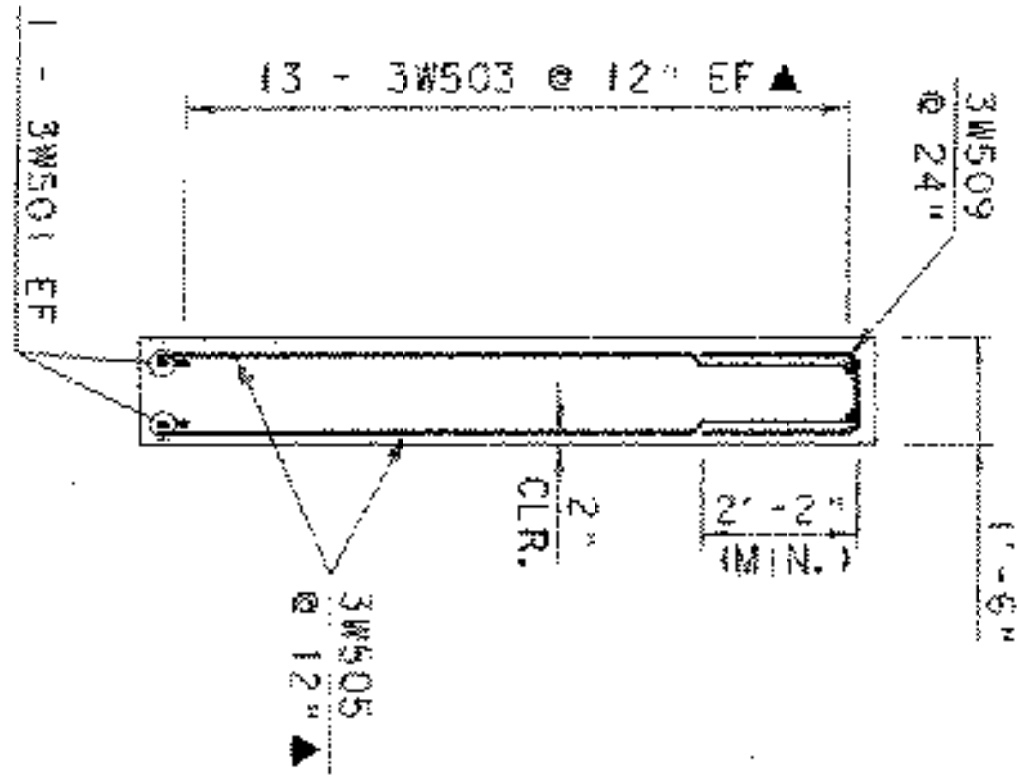
WINGWALL NO. 1 TYPICAL



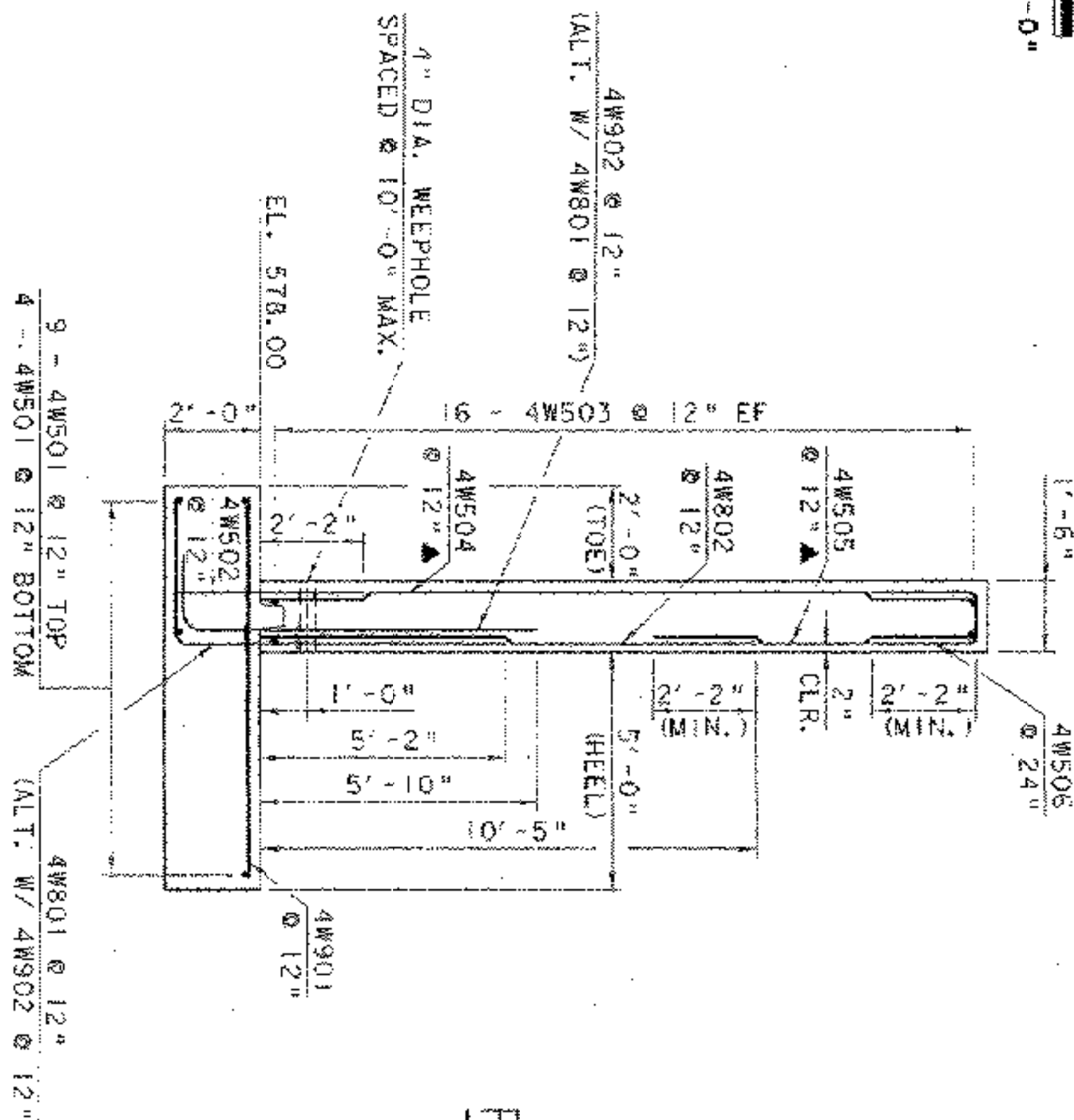
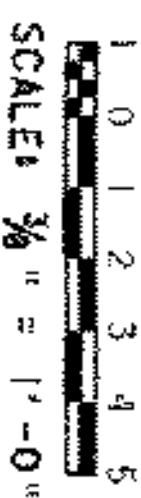
WINGWALL NO. 2 TYPICAL



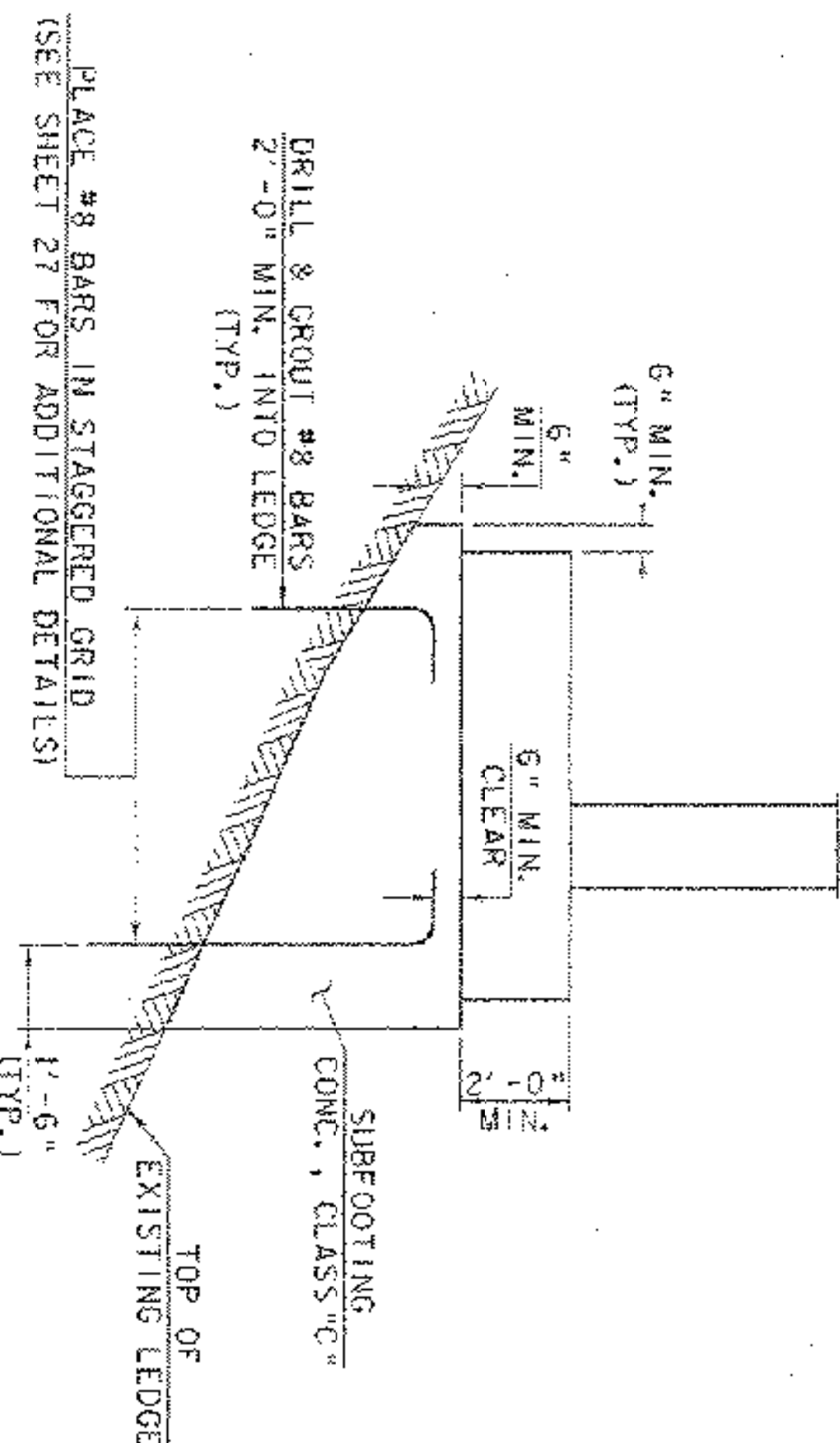
WINGWALL NO. 3A TYPICAL



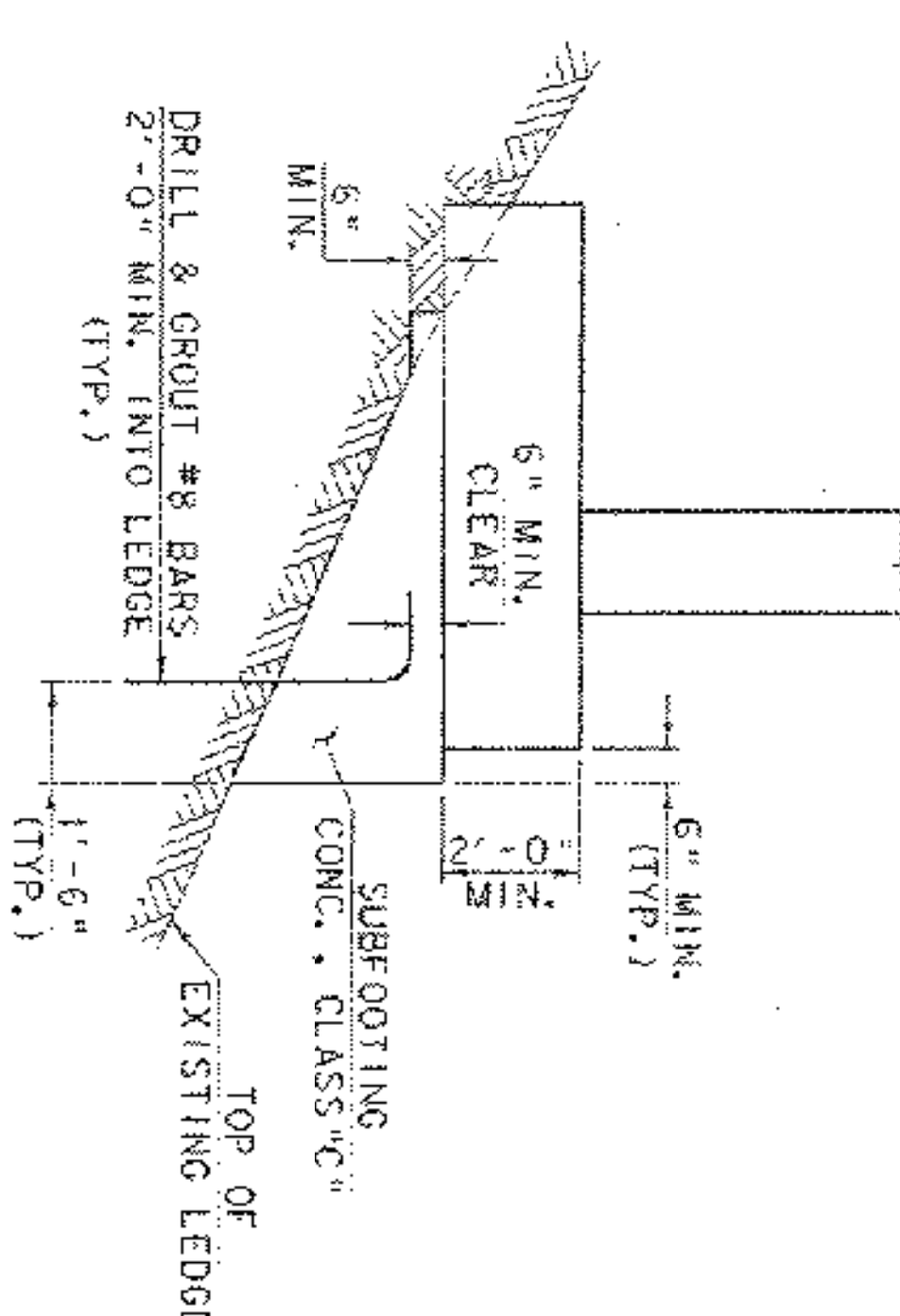
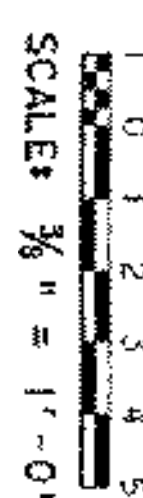
WINGWALL NO. 3B TYPICAL



WINGWALL NO. 4



FULL WIDTH SUBFOOTING



PARTIAL WIDTH SUBFOOTING

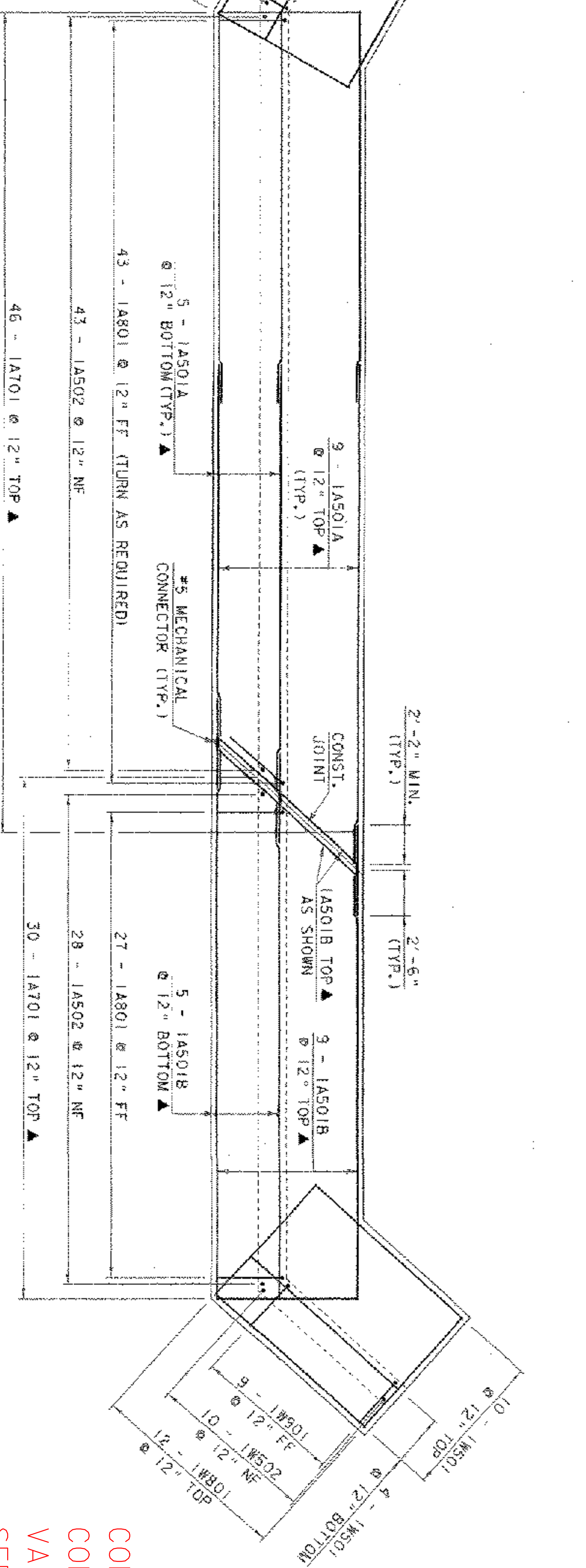


NOTE:
 NF = NEAR FACE
 FF = FAR FACE
 EF = EACH FACE
 ▲ = CUT TO FIT IN FIELD
 3" CLR. UNLESS OTHERWISE NOTED

WINGWALL TYPICAL SECTIONS

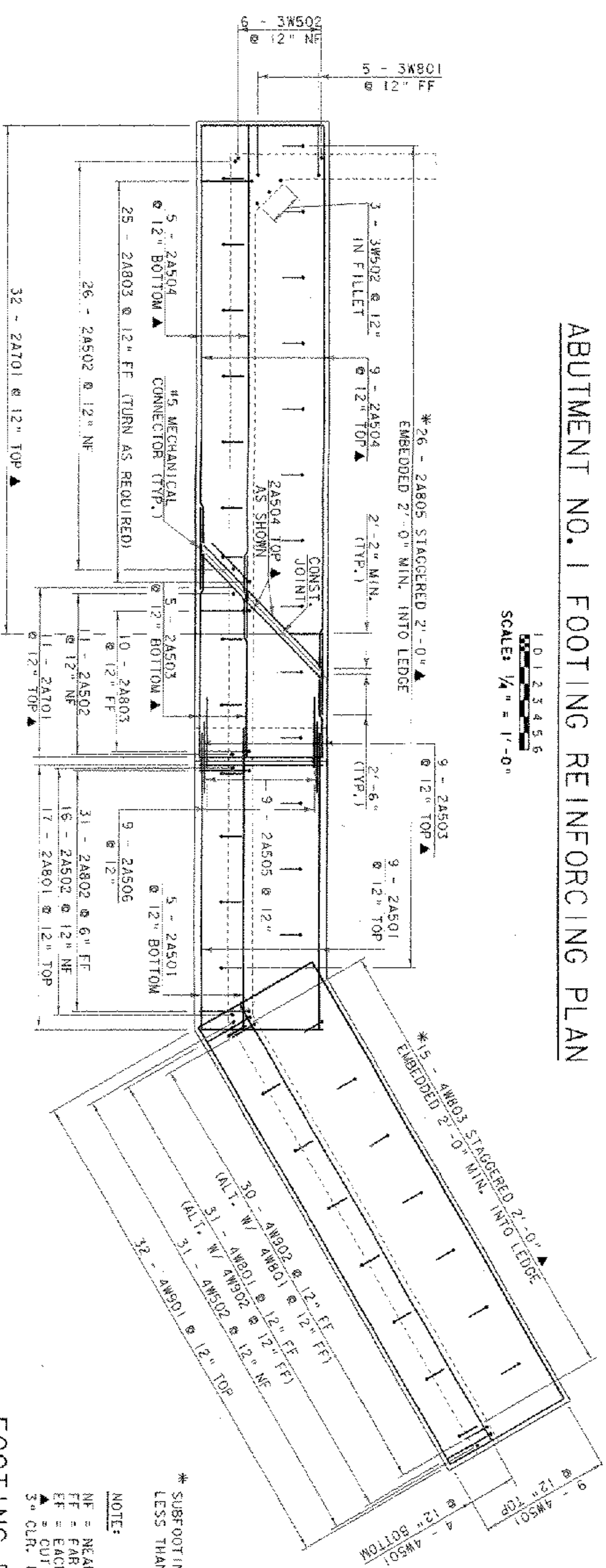
CONSPAN PRECAST
 CONCRETE WING WALLS USED
 VALUE ENGINEERING
 SEE PAGES 040 TO 088.

PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	300053\structures\30053wrt.j
PROJECT MANAGER:	R.R. WHITCOMB
DESIGNED BY:	G. ROY
DRAWN BY:	L. BULLOCK
CHECKED BY:	G. ROY
SHEET	26 OF 38



CONSPAN PRECAST
CONCRETE ARCH USED
VALUE ENGINEERING
SEE PAGES 040 TO 088.

ABUTMENT NO. 1 FOOTING REINFORCING PLAN



FOOTING REINFORCING PLAN

ABUTMENT NO. 2 FOOTING REINFORCING PLAN

* SUBFOOTING STEELS OMIT IF LEDGE IS
LESS THAN 3" BELOW BOTTOM OF FOOTING.

NOTE:
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLR. UNLESS OTHERWISE NOTED

1 0 1 2 3 4 5 6
SCALE: 1/4" = 1'-0"

PROJECT NAME: ROCKINGHAM
PROJECT NUMBER: TH2 - 9103
FILE NAME: 906053\structure\sc053\fig1
PROJECT MANAGER: R. R. WHITCOMB
DESIGNED BY: G. ROY
PLOT DATE: 20-MAR-2003
DRAWN BY: L. BULLOCK
CHECKED BY: G. ROY
SHEET 27 OF 38



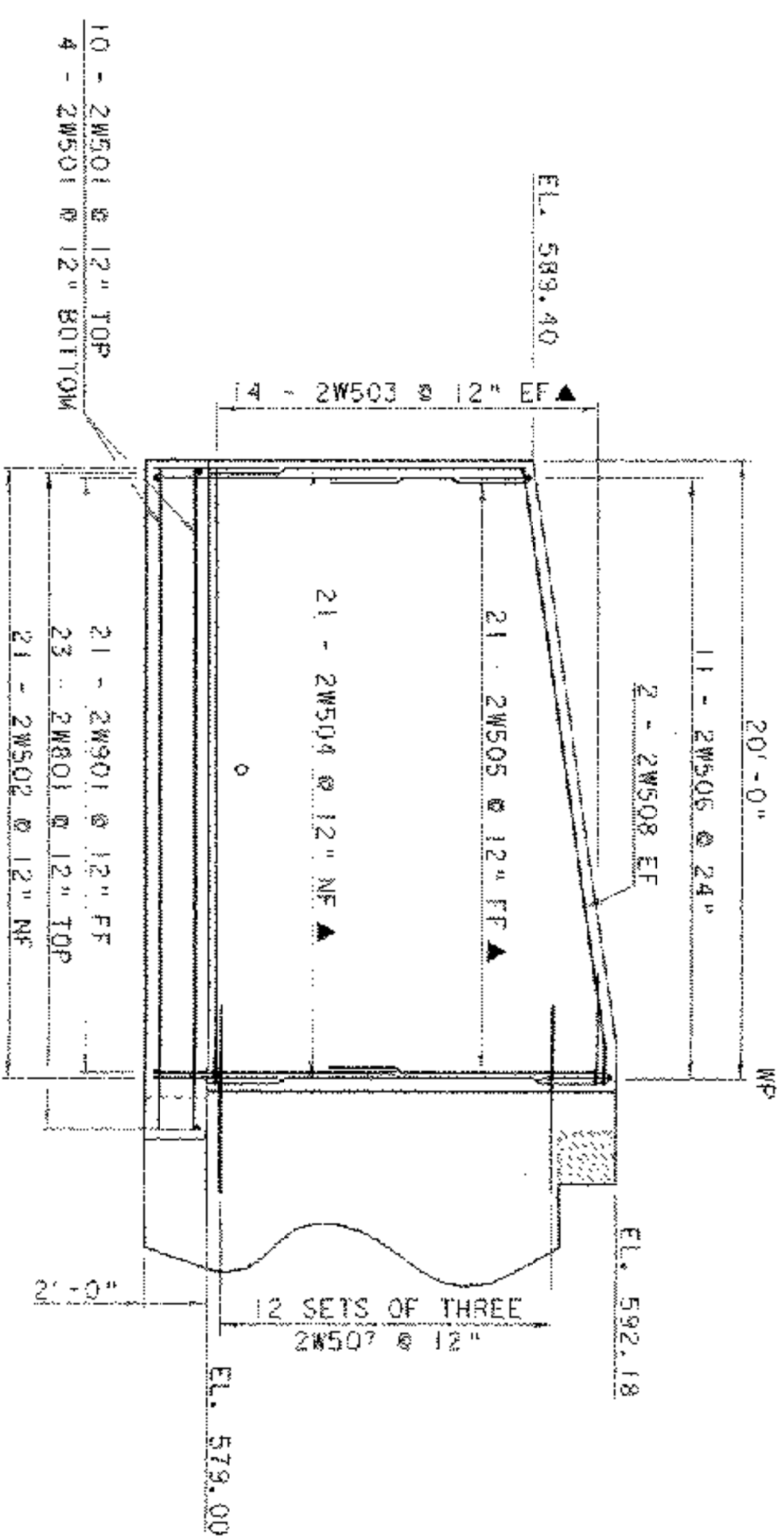
1 0 1 2 3 4 5 6

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



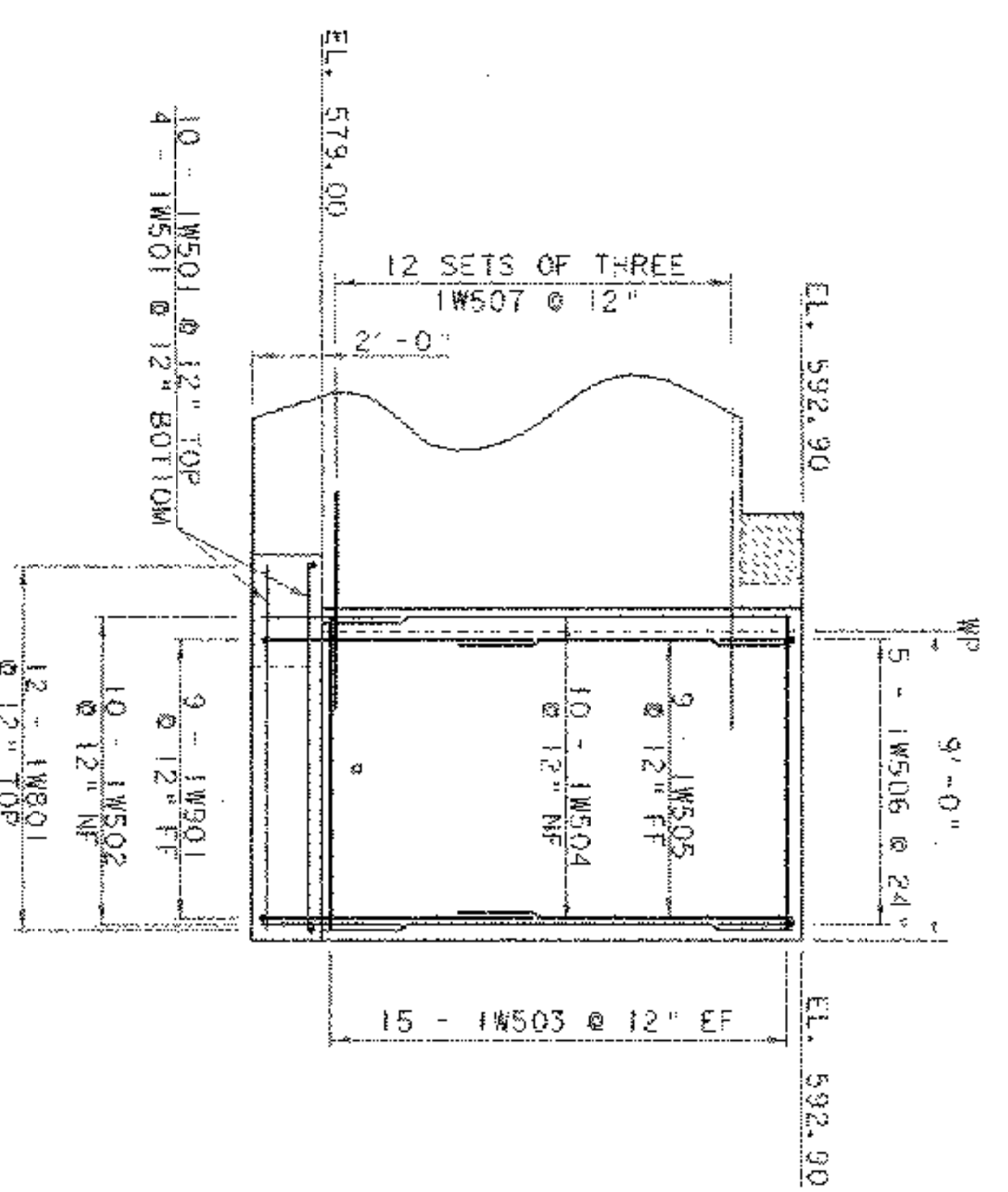
NOTE:
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLR. UNLESS OTHERWISE NOTED

PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	90-0053\structure\ss\ss053021
PROJECT MANAGER:	R. R. WILLIAMS
DESIGNED BY:	G. ROY
PLOT DATE:	19-AUG-2003
DRAWN BY:	L. BULLOCK
CHECKED BY:	G. ROY



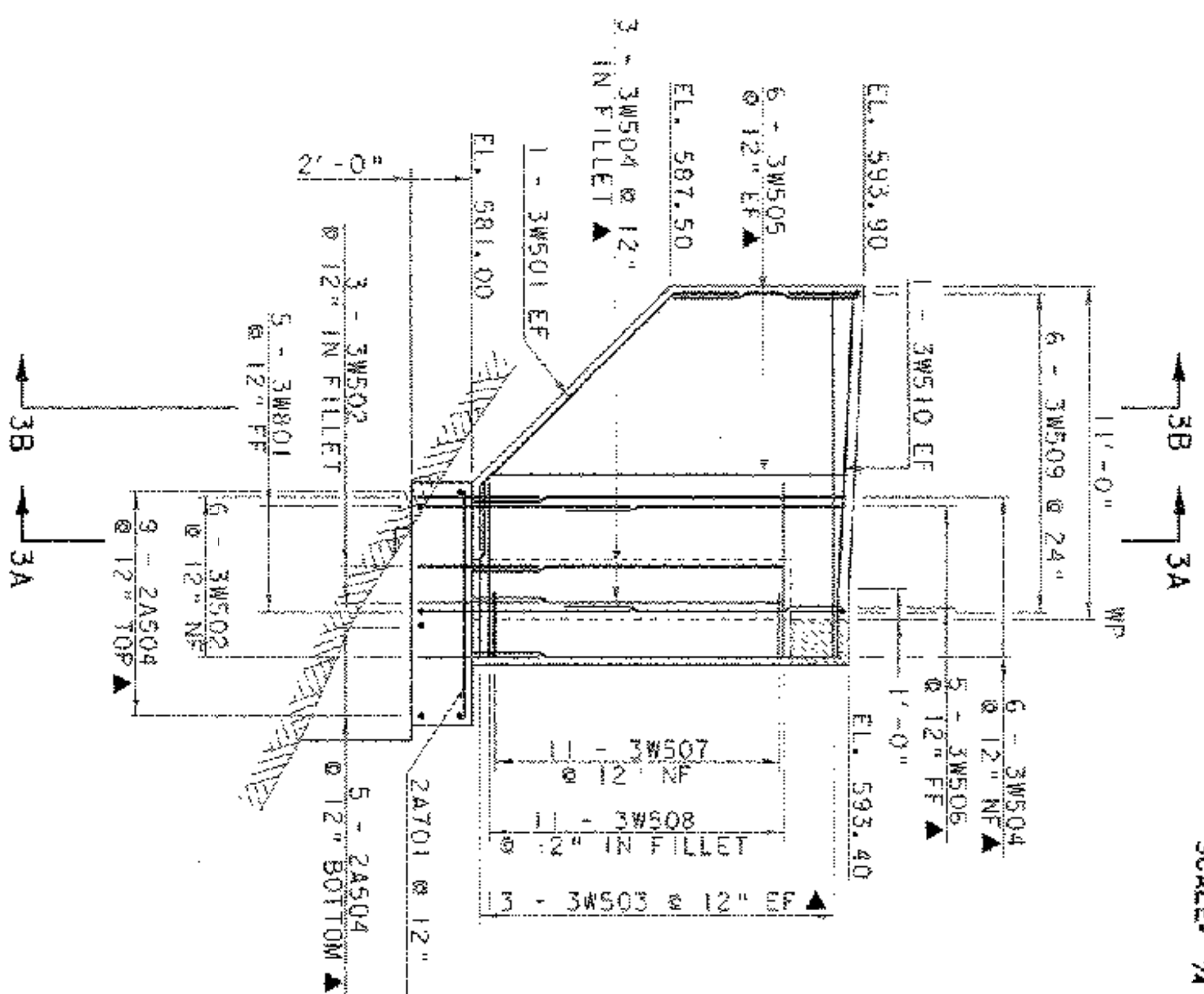
WINGWALL NO. 2 ELEVATION

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



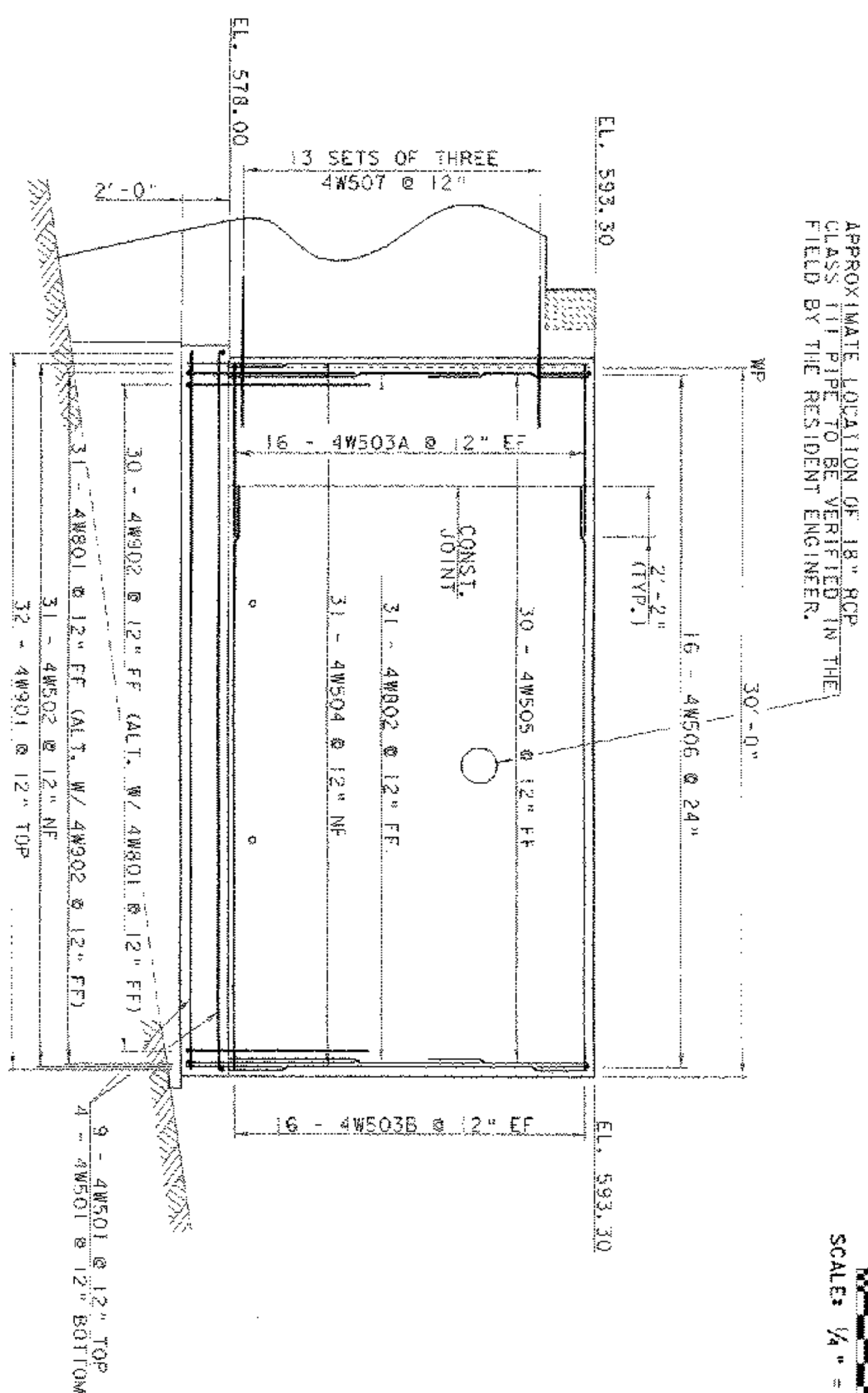
WINGWALL NO. 1 ELEVATION

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



WINGWALL NO. 3 ELEVATION

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



WINGWALL NO. 4 ELEVATION

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

CONSPAN PRECAST
CONCRETE WING WALLS USED
VALUE ENGINEERING
SEE PAGES 040 TO 088.

WINGWALL DETAILS

NOTE:
NF = NEAR FACE
EF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CIR. UNLESS OTHERWISE NOTED

PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	D06053\structure\88\88\5053\WJ
PROJECT MANAGER:	R. R. WHITCOMB
DESIGNED BY:	G. ROY
PLOT DATE:	19-AUG-2003
DRAWN BY:	L. BULLOCK
CHECKED BY:	G. ROY
SHEET	30 OF 38

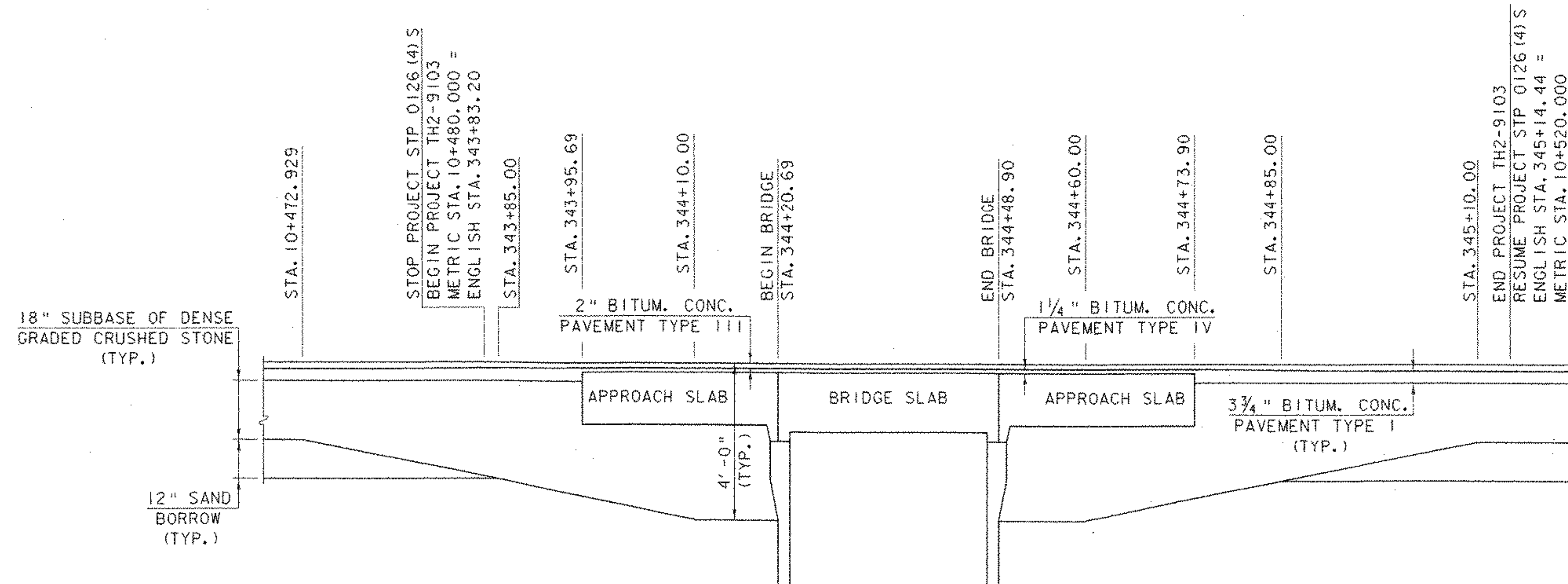
STATE OF VERMONT
AGENCY OF TRANSPORTATION

REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O	ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O			
SLAB																		ABUTMENT NO. 2																				
▲	29	5	40'- 3"	ES501A	STR														14	5	18'- 1"	2A501	STR															
▲	29	5	23'- 9"	ES501B	STR														53	5	3'- 11"	2A502	STR															
*	10	5	19'- 10"	ES502A	STR														▲	14	5	12'- 4"	2A503	STR														
	9	5	26'- 4"	ES502B	STR														▲	16	5	33'- 0"	2A504	STR														
	61	5	7'- 9"	ES503	S6	0'- 10"	1'- 0"	4'- 1"	1'- 0"										▲	30	5	28'- 7"	2A507	STR														
	51	5	7'- 1"	ES504	S5	0'- 10"	2'- 0"	1'- 5"	2'- 0"									*	▲	12	5	13'- 0"	2A508	STR														
																			▲	15	5	6'- 4"	2A509	STR														
																			▲	24	5	26'- 10"	2A510	STR														
▲	63	8	30'- 7"	ES801	1	1'- 4"	29'- 3"												▲	34	5	10'- 3"	2A511	STR														
*	▲	24	8	28'- 10"	ES802	1	1'- 4"	27'- 6"											▲	31	5	7'- 3"	2A512	STR														
	9	8	19'- 6"	ES803	9		19'- 6"													4	5	15'- 1"	2A513	STR														
APPROACH SLAB NO.1																		2	5	8'- 4"	2A514	STR																
*	▲	28	5	13'- 9"	1EAS501	STR													▲	8	5	3'- 0"	2A515	STR														
▲	27	5	21'- 3"	1EAS502	STR														▲	3	5	12'- 2"	2A516	STR														
																			▲	4	5	9'- 2"	2A517	STR														
*	▲	15	9	25'- 0"	1EAS901	1	1'- 3"	23'- 9"												9	5	8'- 8"	2A505	20		2'- 2"	4'- 4"	2'- 2"										
▲	23	9	26'- 6"	1EAS902	1	1'- 3"	25'- 3"													9	5	7'- 4"	2A506	20		2'- 2"	3'- 0"	2'- 2"										
																				22	5	7'- 3"	2A518	16	2'- 2"	2'- 1"	1'- 6"	1'- 6"										
																				7	5	5'- 5"	2A519	17		2'- 2"	1'- 1"	2'- 2"										
APPROACH SLAB NO.2																		△	45	7	7'- 6"	2A701	STR															
*	▲	28	5	23'- 11"	2EAS501	STR													*	18	8	7'- 6"	2A801	STR														
▲	27	5	20'- 5"	2EAS502	STR															31	8	13'- 9"	2A802	17		10'- 8"	3'- 1"											
																				35	8	10'- 0"	2A803	17		8'- 11"	3'- 1"											
▲	20	9	27'- 4"	2EAS901	1	1'- 3"	26'- 1"													22	8	4'- 0"	2EAS804	19		1'- 6"	2'- 6"					1'- 1"	1'- 1"					
*	▲	20	9	24'- 0"	2EAS902	1	1'- 3"	22'- 9"											▲	26	8	8'- 10"	2A805	17		7'- 8"	1'- 4"											
ABUTMENT NO.1																		WINGWALL NO. 3																				
▲	28	5	24'- 8"	1A501A	STR															9	5	3'- 11"	3W502	STR														
▲	16	5	30'- 3"	1A501B	STR														▲	26	5	12'- 0"	3W503	STR														
	71	5	3'- 11"	1A502	STR														▲	9	5	12'- 3"	3W504	STR														
▲	28	5	33'- 2"	1A503A	STR														▲	12	5	11'- 9"	3W505	STR														
	26	5	12'- 10"	1A503B	STR														▲	5	5	9'- 4"	3W506	STR														
▲	28	5	27'- 9"	1A503C	STR															2	5	13'- 4"	3W501	22		2'- 2"	9'- 0"	2'- 2"				1'- 6"	1'- 6"	1'- 6"	1'- 6"			
▲	63	5	11'- 9"	1A504	STR															11	5	4'- 4"	3W507	17		2'- 2"	2'- 2"											
*	▲	67	5	8'- 10"	1A505	STR														11	5	10'- 1"	3W508	22		2'- 2"	6'- 9"	2'- 2"				1'- 6"	1'- 6"	1'- 6"	1'- 6"			
▲	8	5	13'- 8"	1A508	STR															6	5	5'- 5"	3W509	S10		2'- 2"	1'- 1"	2'- 2"										
▲	4	5	10'- 8"	1A509	STR															2	5	12'- 0"	3W510	19			9'- 9"	2'- 3"				0'- 1"		2'- 3"				
▲	8	5	3'- 4"	1A510	STR															5	8	10'- 0"	3W801	17			6'- 11"	3'- 1"										
	19	5	7'- 3"	1A506	16	2'- 2"	2'- 1"	1'- 6"	1'- 6"																													
	17	5	5'- 5"	1A507	S10	2'- 2"	1'- 1"	2'- 2"																														
△	▲	78	7	7'- 9"	1A701	STR																																
	70	8	10'- 6"	1A801	17		6'- 11"	3'- 7"													13	5	30'- 7"	4W501	STR													
	19	8	4'- 0"	1EA802	19		1'- 6"	2'- 6"													31	5	3'- 11"	4W502	STR													
WINGWALL NO. 1																		WINGWALL NO.4																				
	14	5	10'- 10"	1W501	STR																32	5	7'- 6"	4W503A	STR													
*	10	5	3'- 11"	1W502	STR																32	5	24'- 9"	4W503B	STR													
	31	5	9'- 3"	1W503	STR																31	5	15'- 0"	4W504	STR													
	10	5	13'- 8"	1W504	STR														*	31	5	6'- 10"	4W505	STR														
	9	5	9'- 10"	1W505	STR																																	
	5	5	6'- 5"	1W506	S10		2'- 2"	1'- 1"	2'- 2"												16	5	5'- 5"	4W506	S10		2'- 2"	1'- 1"	2'- 2"									
	36	5	6'- 2"	1W507	19		3'- 1"	3'- 1"													39	5	7'- 10"	4W507	19		3'- 11"	3'- 11"					1'- 11"	3'- 4"				
*	13	8	8'- 3"	1W801	STR														*	32	8	10'- 5"	4W802	STR														
*	10	9	10'- 10"	1W901	17		7'- 9"	3'- 1"													31	8	10'- 0"	4W801	17		6'- 11"	3'- 1"										
																				▲	15	8	7'- 4"	4W803	17		6'- 0"	1'- 4"										
																			*	33	9	8'- 0"	4W901	STR														
																			*	31	9	9'- 2"	4W902	17		7'- 7"	1'- 7"											
WINGWALL NO. 2																		ASTM STANDARD REINFORCING BARS																				
	14	5	21'- 7"	2W501	STR																																	
	21	5	3'- 11"	2W502	STR																																	
▲	28	5	20'- 0"	2W503	STR																																	
▲	21	5	12'- 11"	2W504	STR																																	
▲	21	5	9'- 2"	2W505	STR																																	
	11	5	5'- 5"	2W506	S10		2'- 2"	1'- 1"	2'- 2"																													

~ NOTES ~

- 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 6



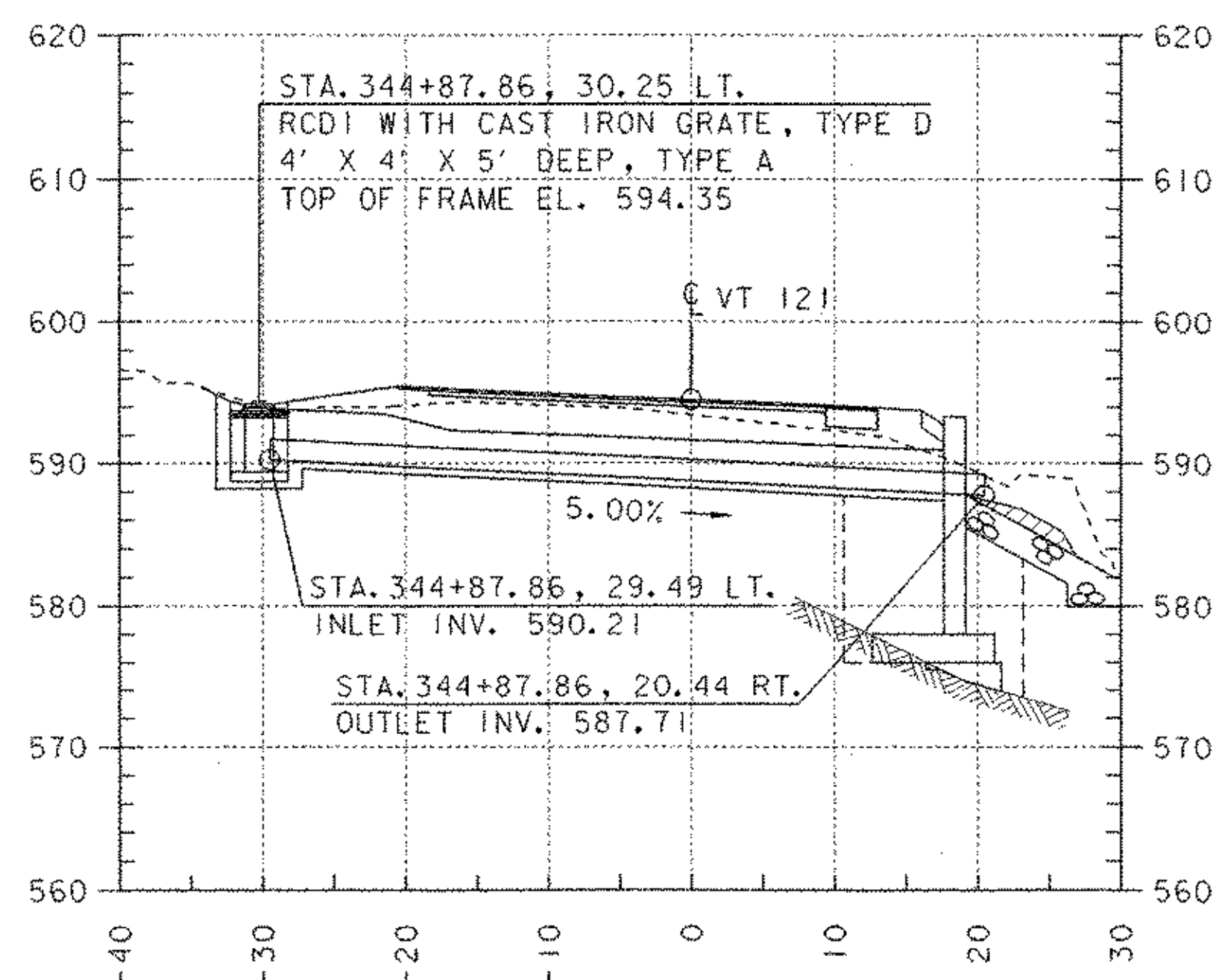
MATERIAL TRANSITION DETAIL

HORIZONTAL SCALE: 1" = 10'-0"

VERTICAL SCALE: 1" = 2'-0"

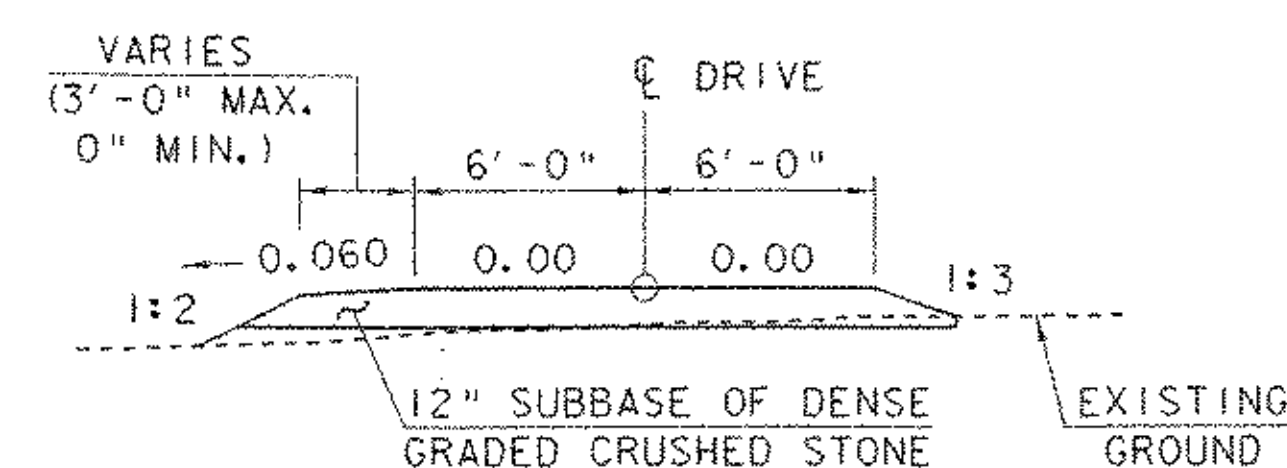
NOTES:

1. SEE MAINLINE CROSS SECTIONS TO DETERMINE CUT OR FILL.
2. SEE SHEET 5 OF THE PLANS FOR ADDITIONAL ABUTMENT EARTHWORK DETAILS.
3. SEE APPROACH SLAB END DETAIL ON SHEET 19 OF THE PLANS FOR PAVEMENT DETAILS AT THE END OF APPROACH SLABS.



NEW 18" X 50' CULVERT PROFILE STA. 344+87.86 LT. - STA. 344+87.86 RT.

HORIZONTAL & VERTICAL SCALE: 1" = 10'-0"

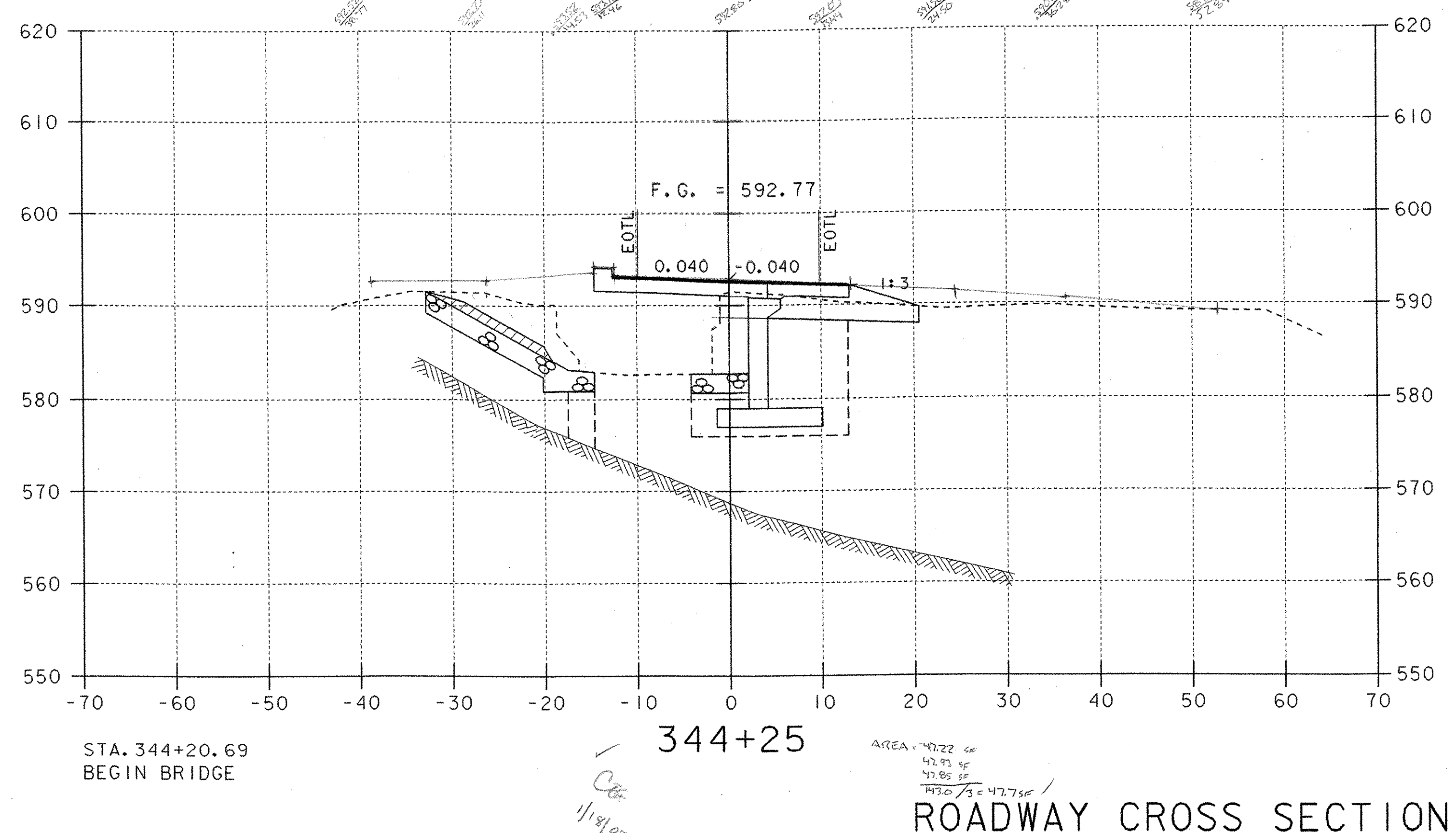
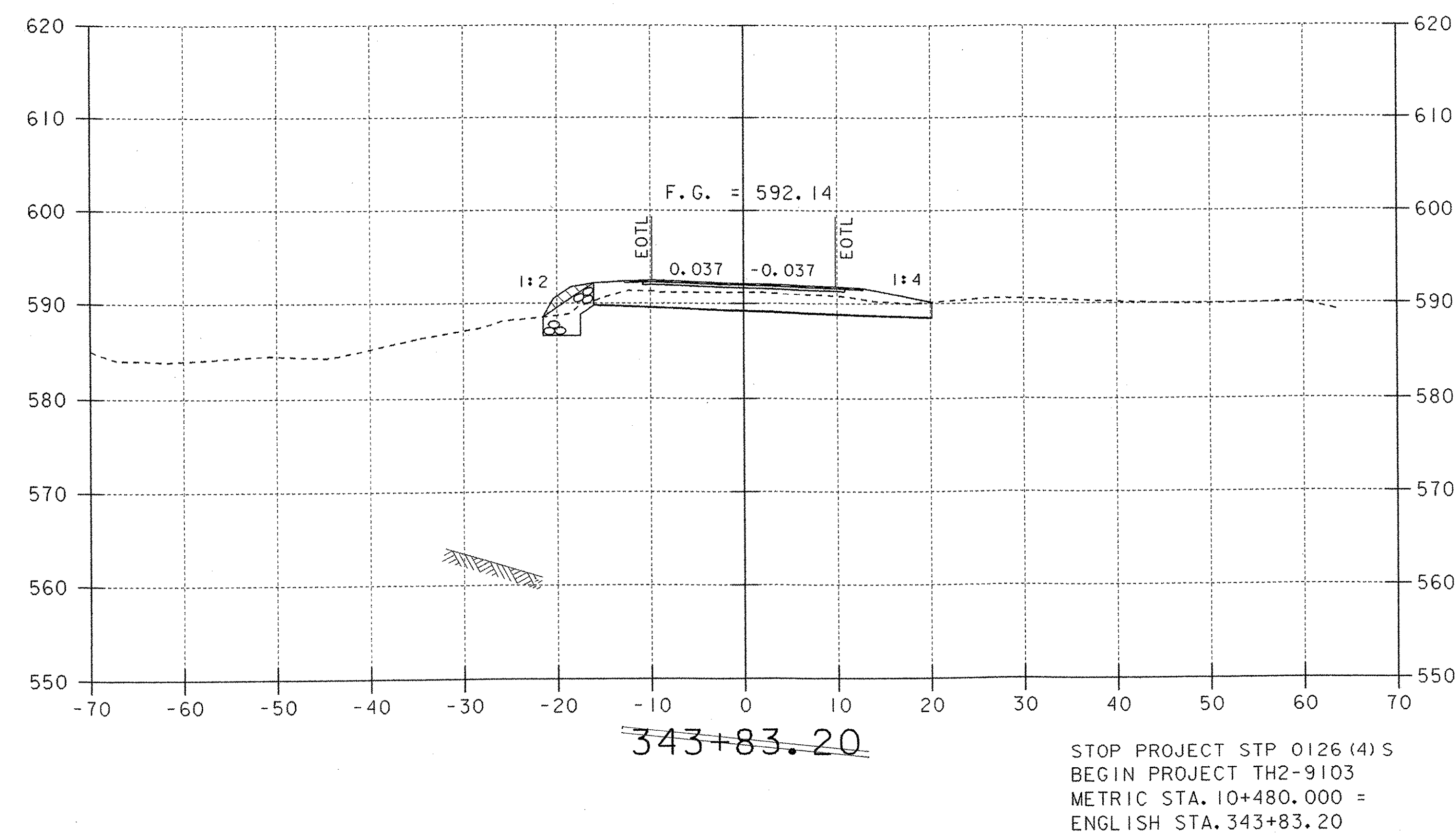
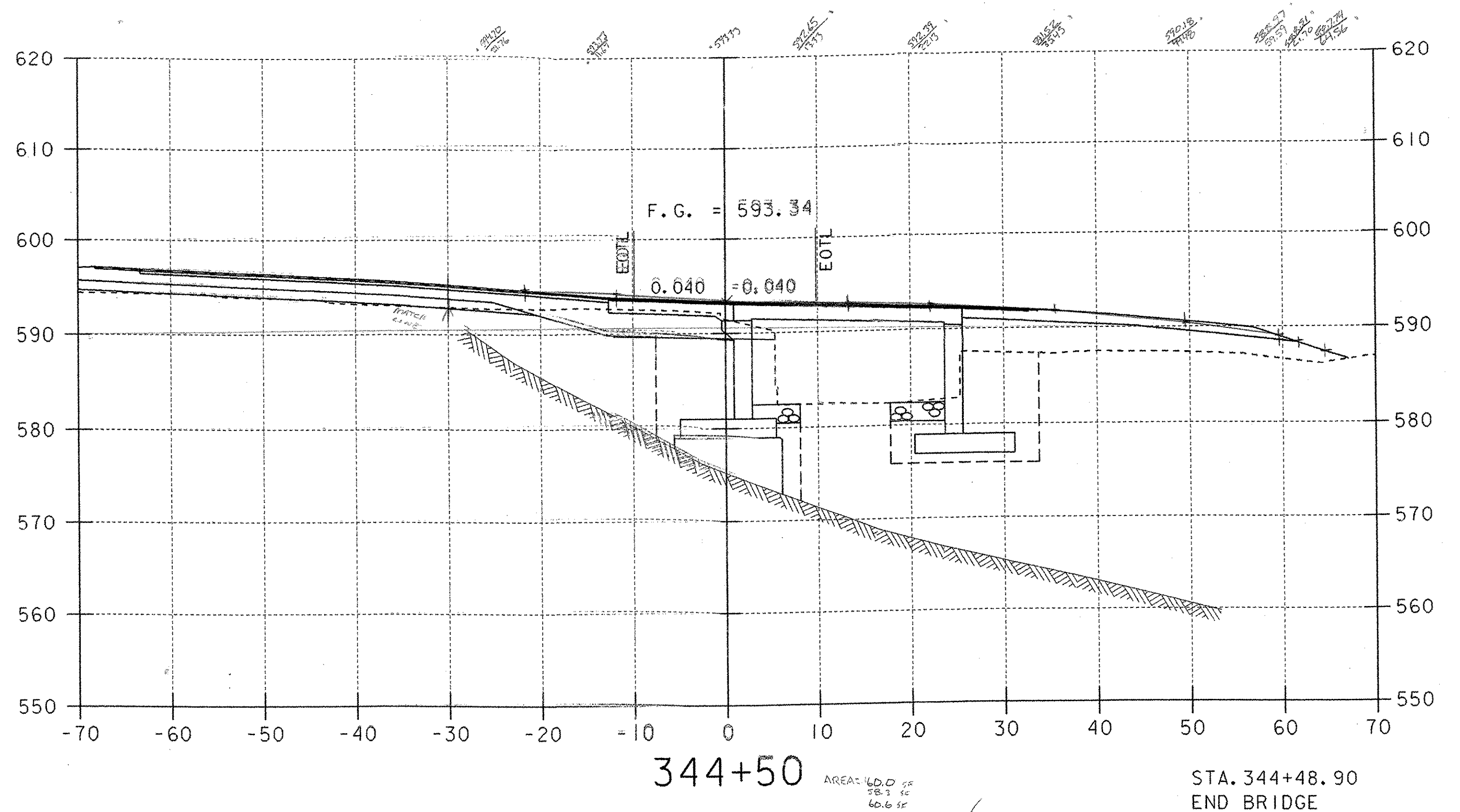
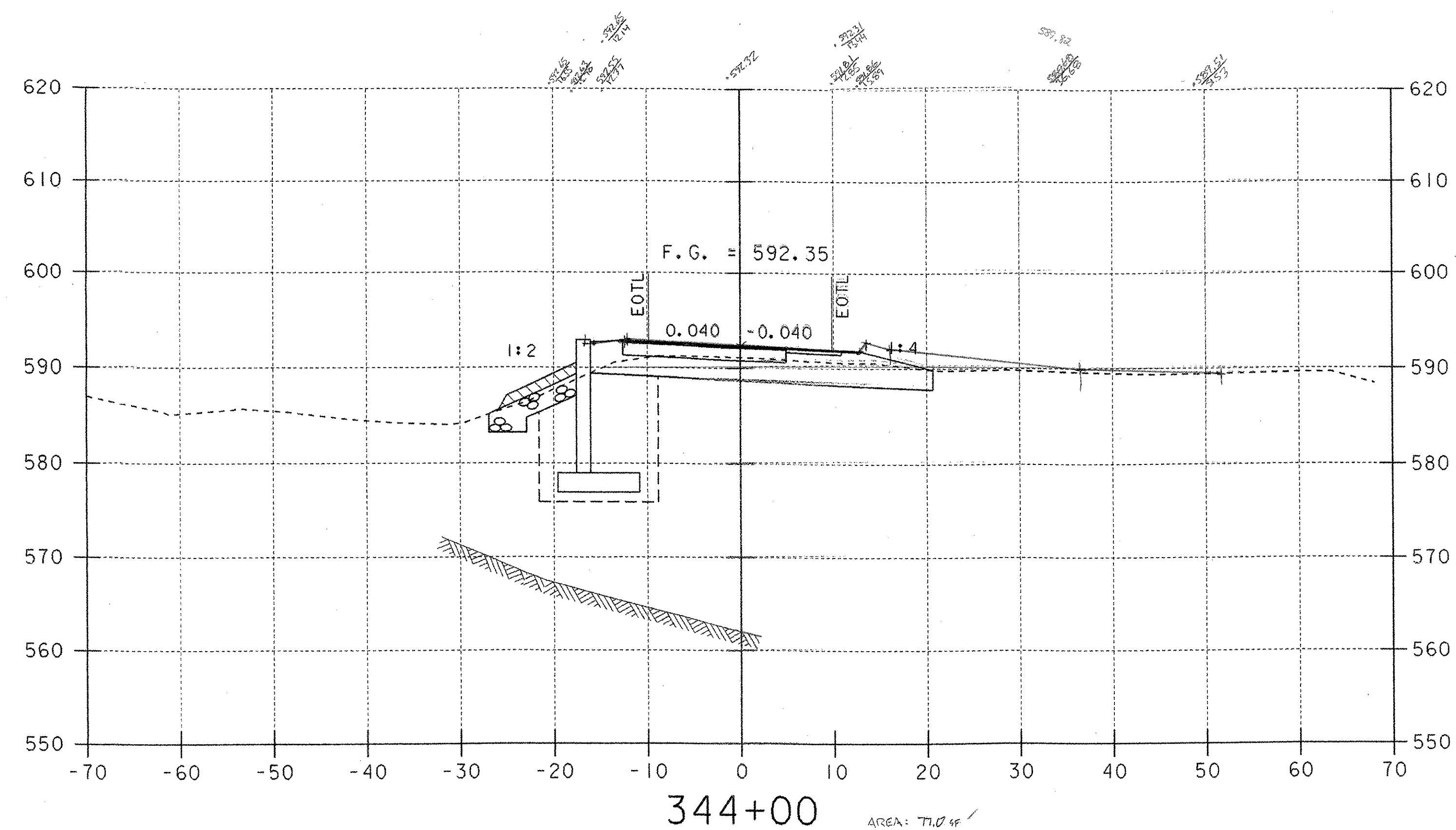


DRIVE TYPICAL SECTION STA. 344+47.75 RT.

SCALE: 1" = 5'-0"

ADDITIONAL ROADWAY DETAILS

PROJECT NAME:	ROCKINGHAM
PROJECT NUMBER:	TH2 - 9103
FILE NAME:	90c053\structures\sc053ord.i
PROJECT MANAGER:	R. R. WHITCOMB
DESIGNED BY:	G. ROY
PLOT DATE:	20-MAR-2003
DRAWN BY:	G. ROY
CHECKED BY:	R. WHITCOMB
SHEET	32 OF 38



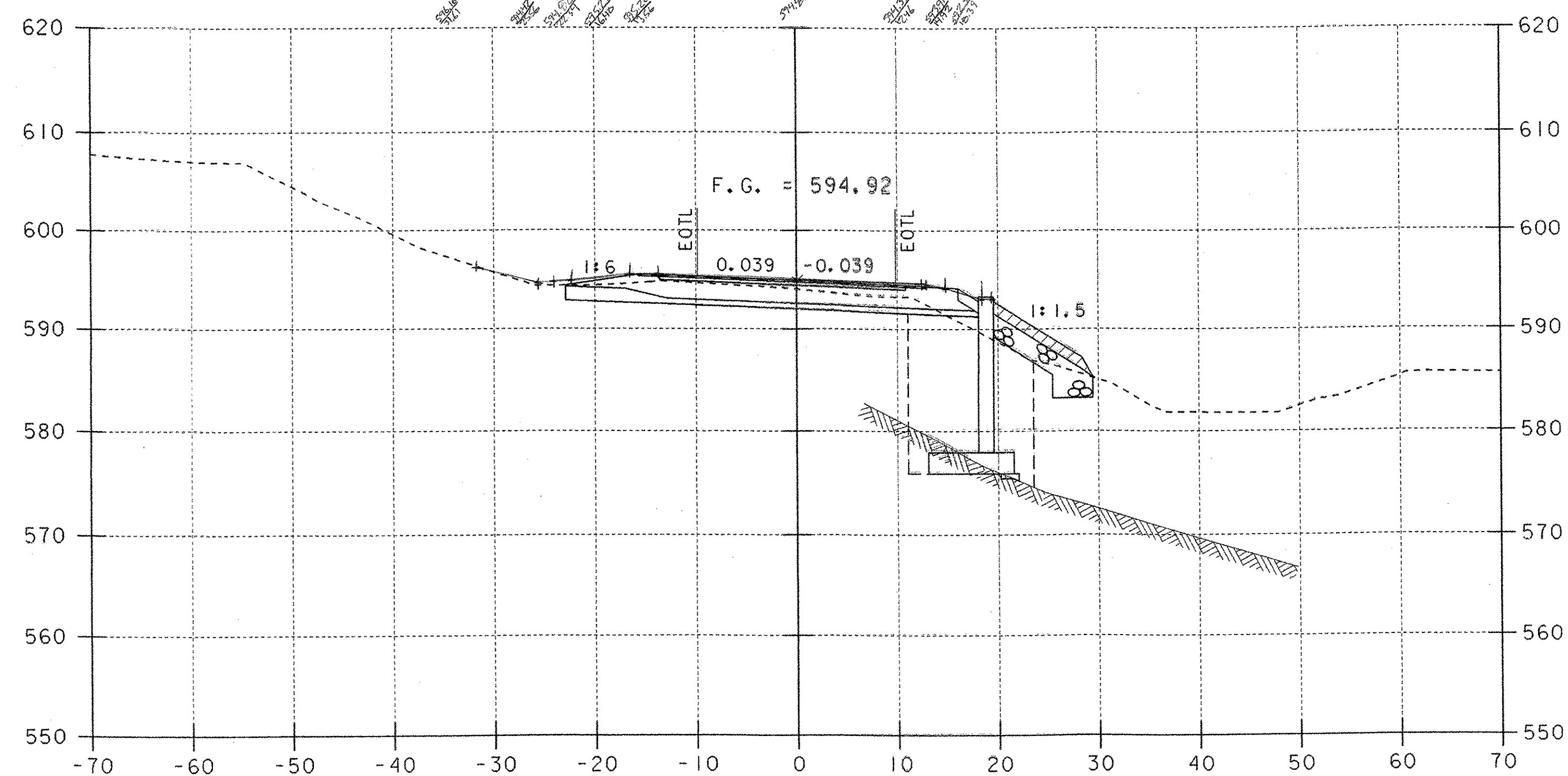
10 0 10
SCALE: 1" = 10'-0"

ROADWAY CROSS SECTION (1)

PROJECT NAME: ROCKINGHAM
PROJECT NUMBER: TH2 - 9103

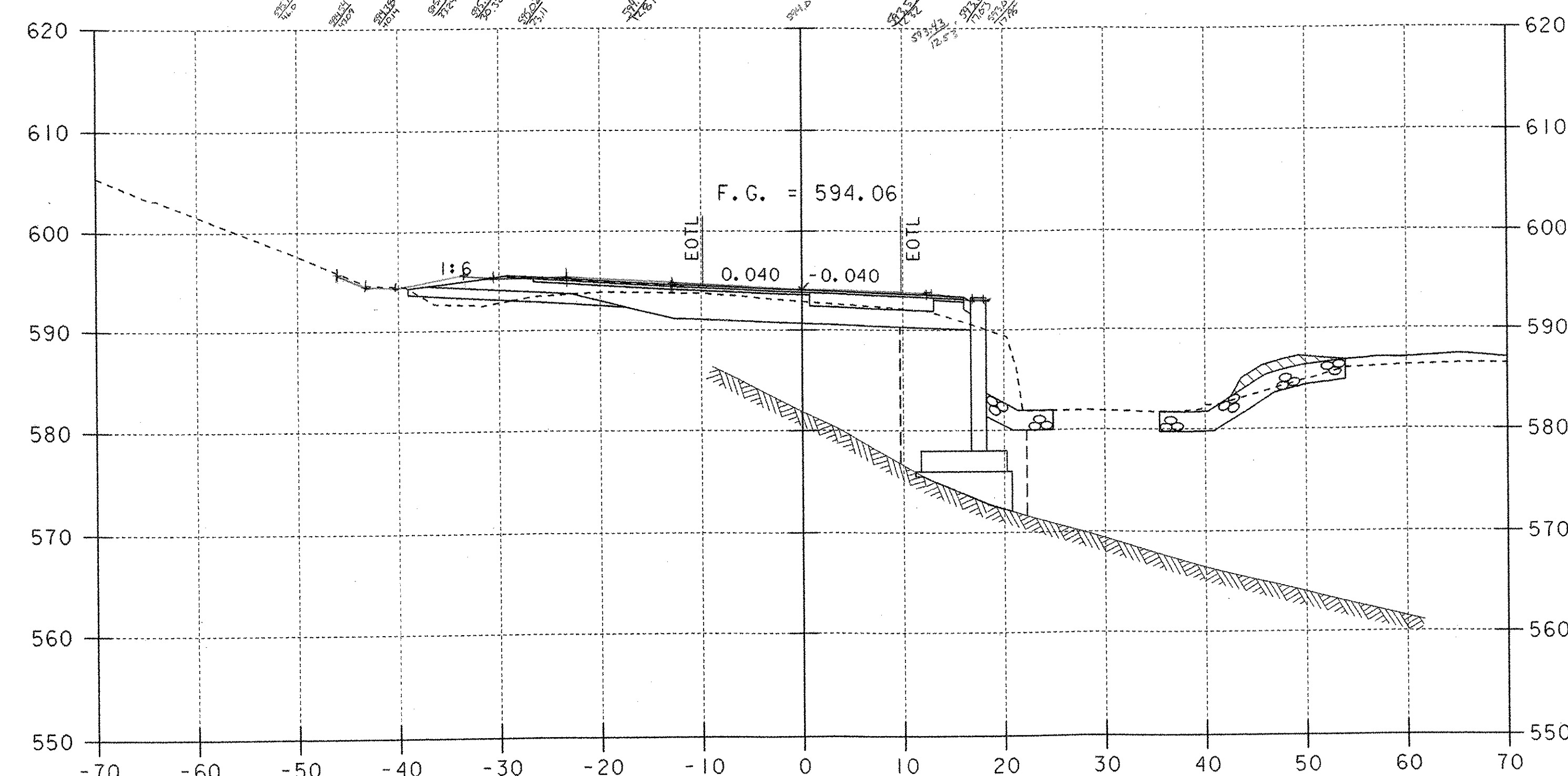
FILE NAME: 90c053\structures\sc053m01.i PLOT DATE: 20-MAR-2003
PROJECT MANAGER: R.R. WHITCOMB DRAWN BY: G. ROY
DESIGNED BY: G. ROY CHECKED BY: R. WHITCOMB
SHEET 33 OF 38

1/1/2006



345+00

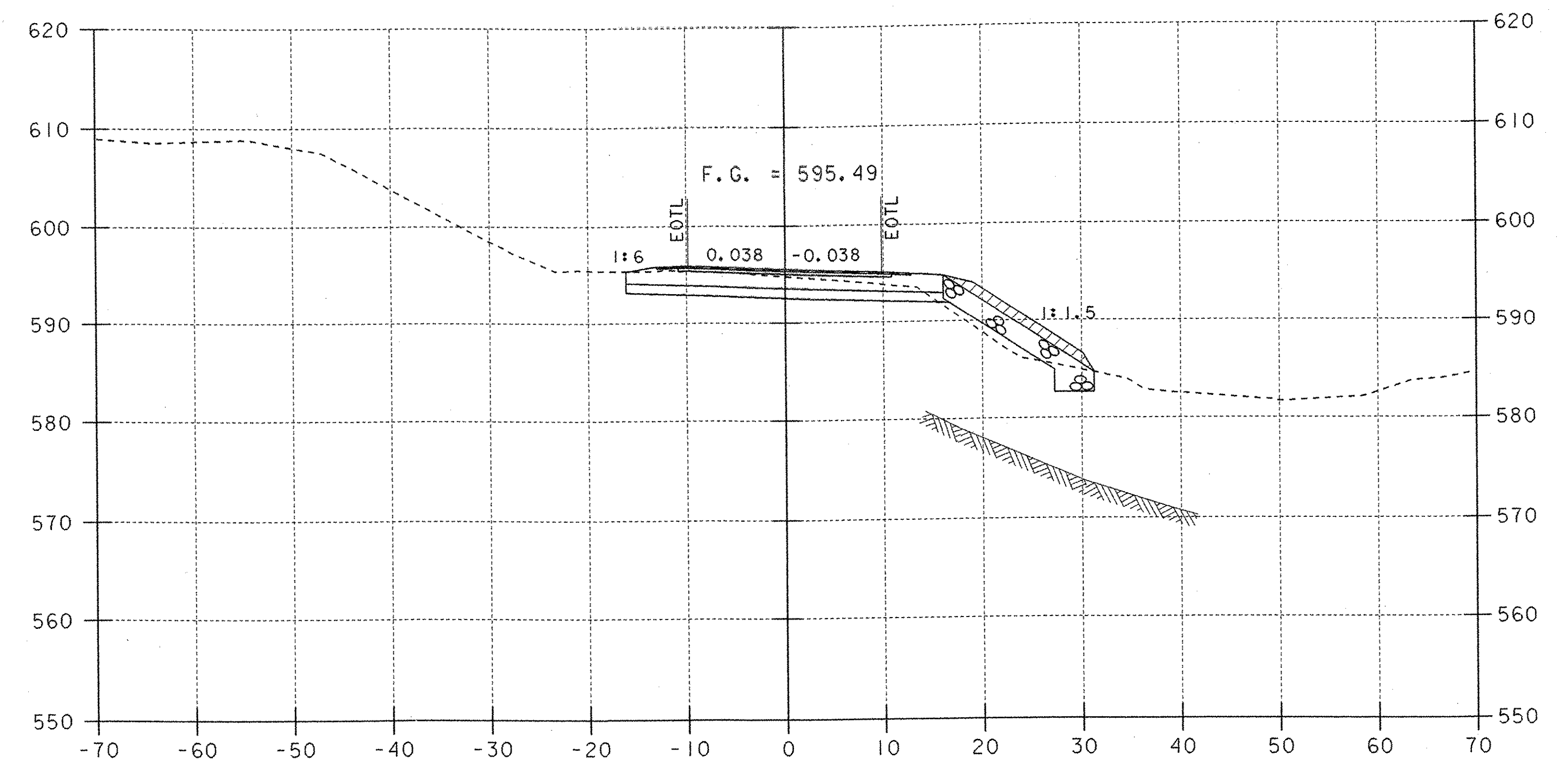
AREA: 67.53
68.96
68.96
201.41/3 = 67.14



344+75

AREA: 77.54
78.00
78.00
232.41/3 = 77.47

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



345+14.44

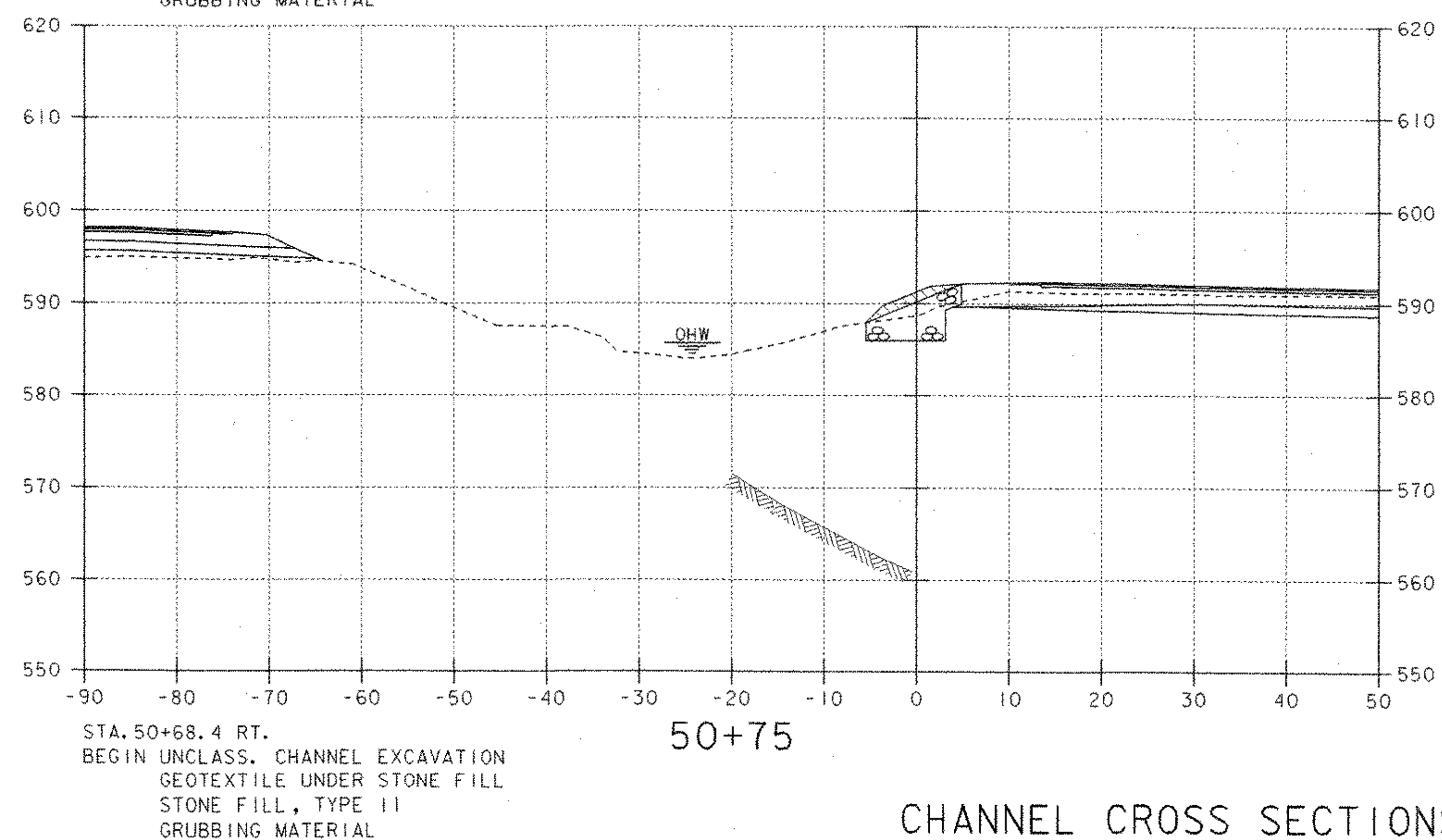
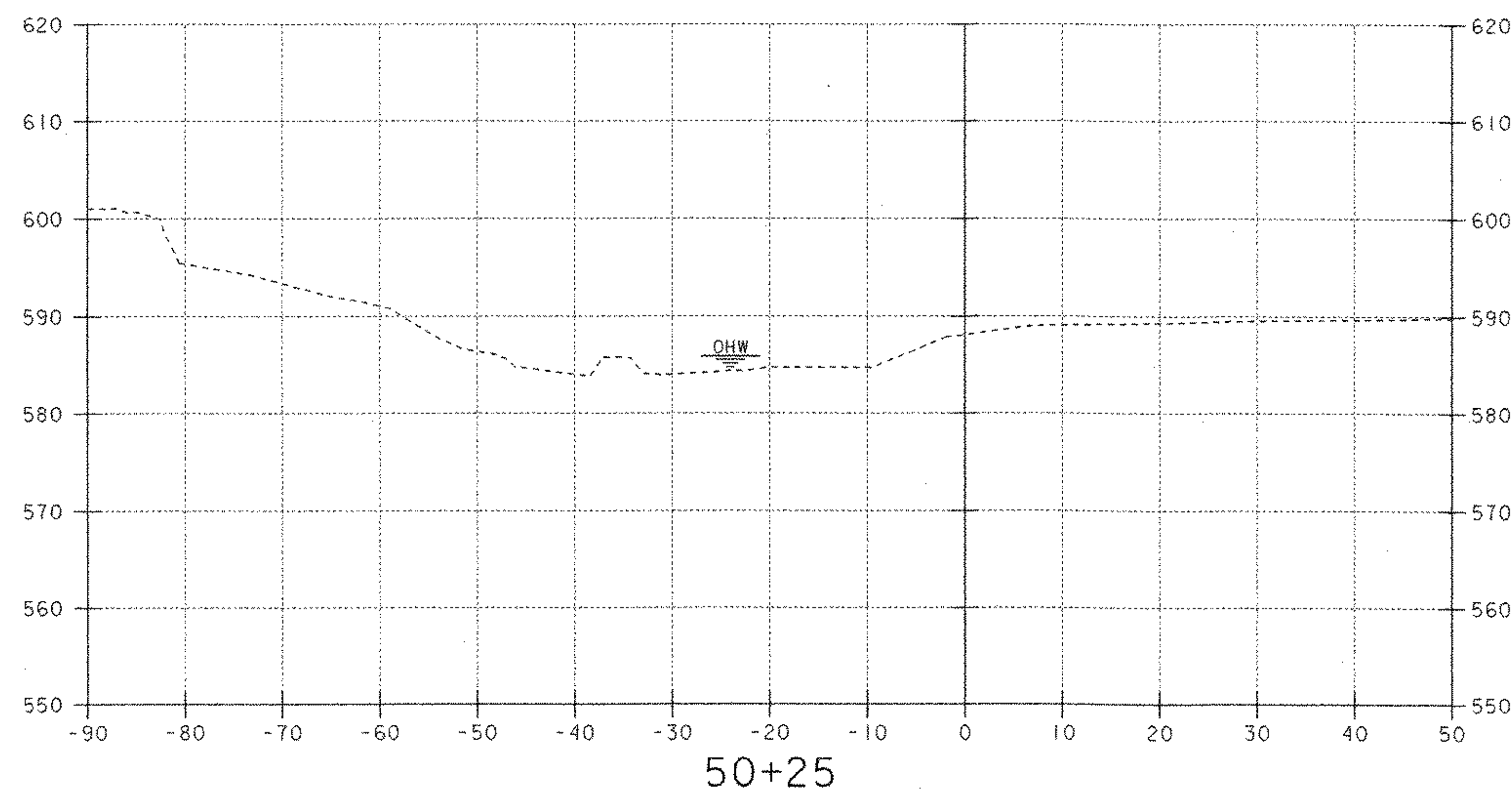
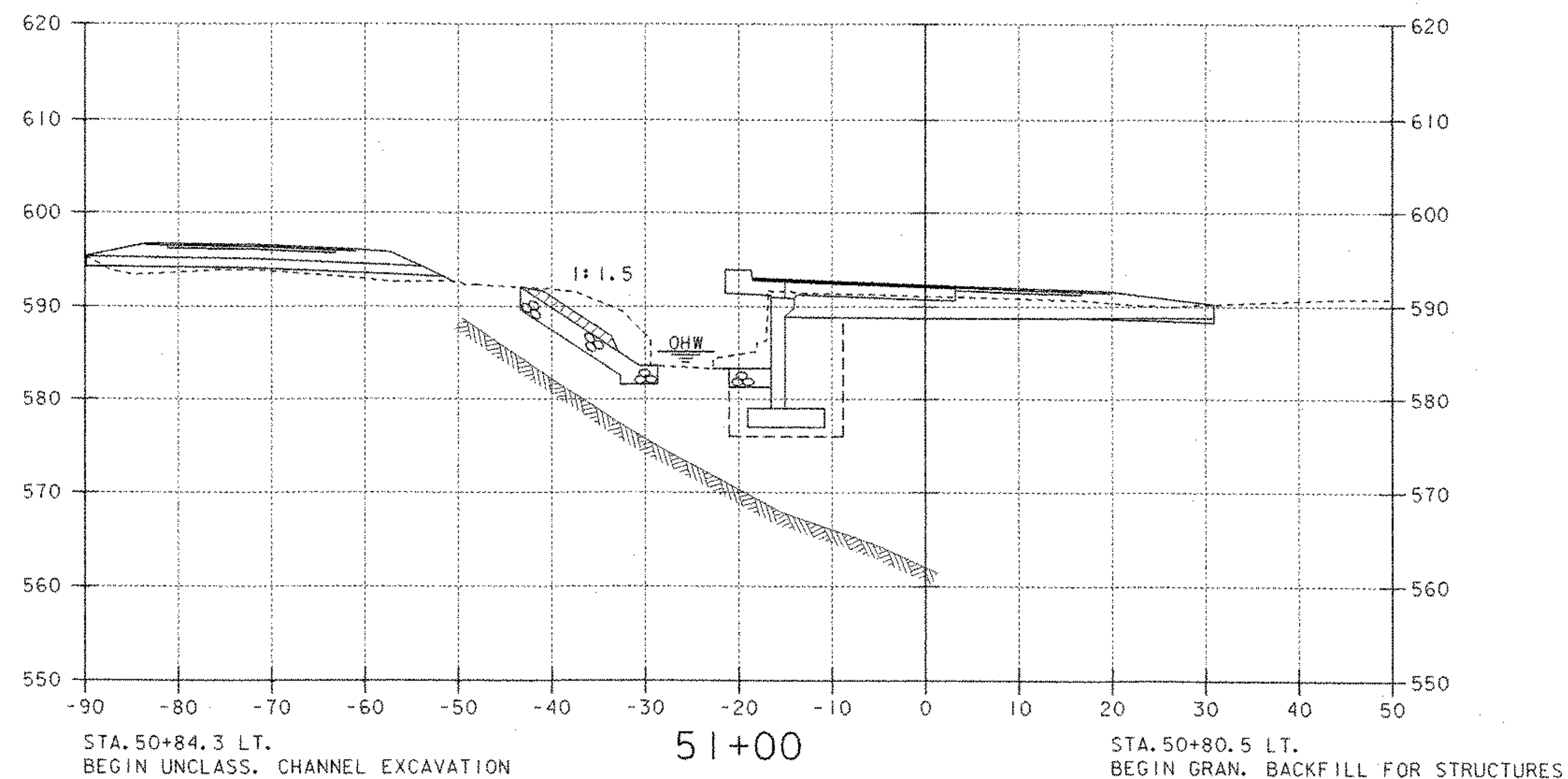
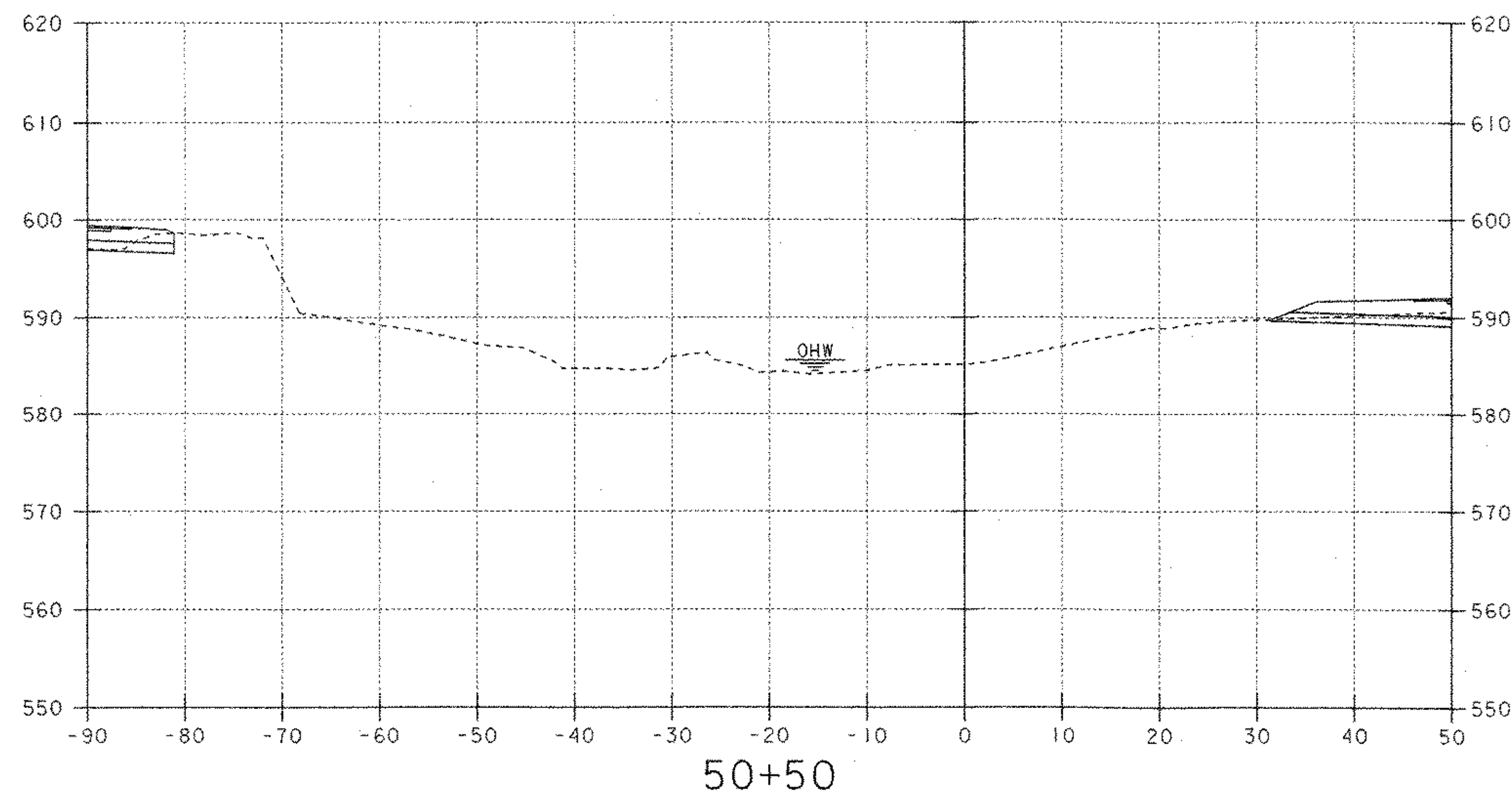
END PROJECT TH2-9103
RESUME PROJECT STP 0126 (4) S
ENGLISH STA. 345+14.44 =
METRIC STA. 10+520.000

ROADWAY CROSS SECTION (2)

PROJECT NAME: ROCKINGHAM
PROJECT NUMBER: TH2 - 9103

FILE NAME: 90c053\structures\sc053m02.1 PLOT DATE: 20-MAR-2003
PROJECT MANAGER: R. R. WHITCOMB DRAWN BY: G. ROY
DESIGNED BY: G. ROY CHECKED BY: R. WHITCOMB
SHEET 34 OF 38

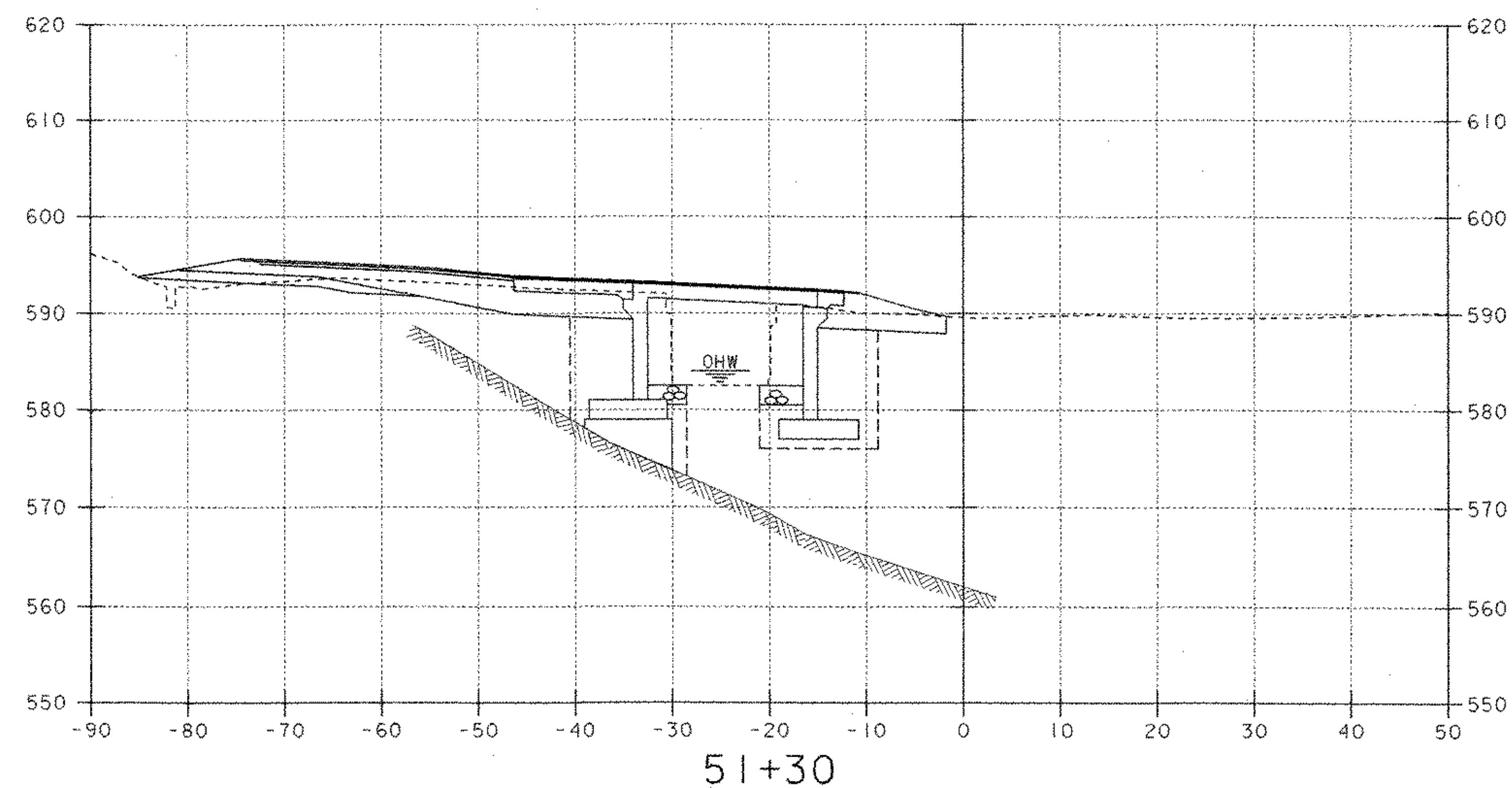
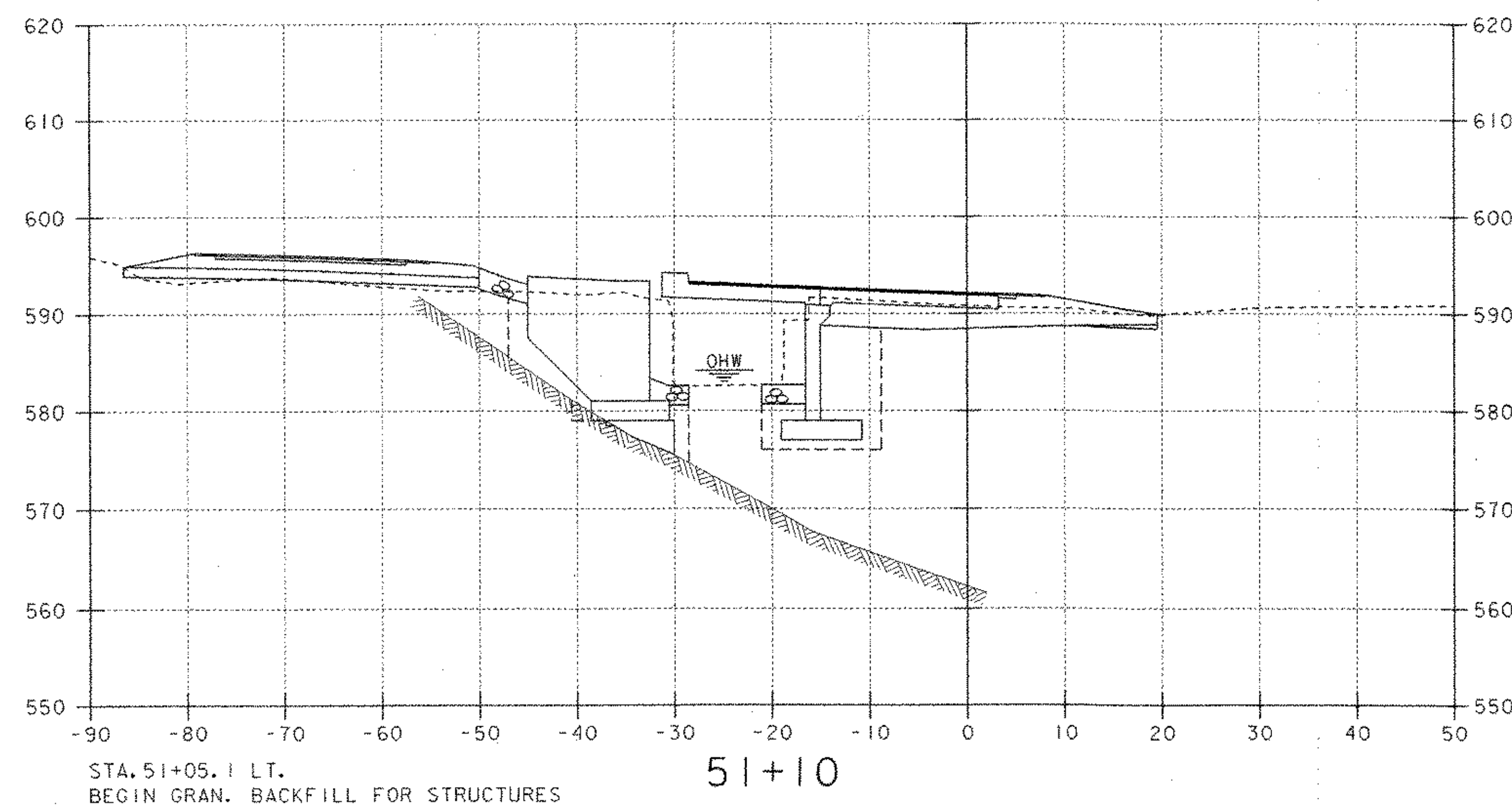
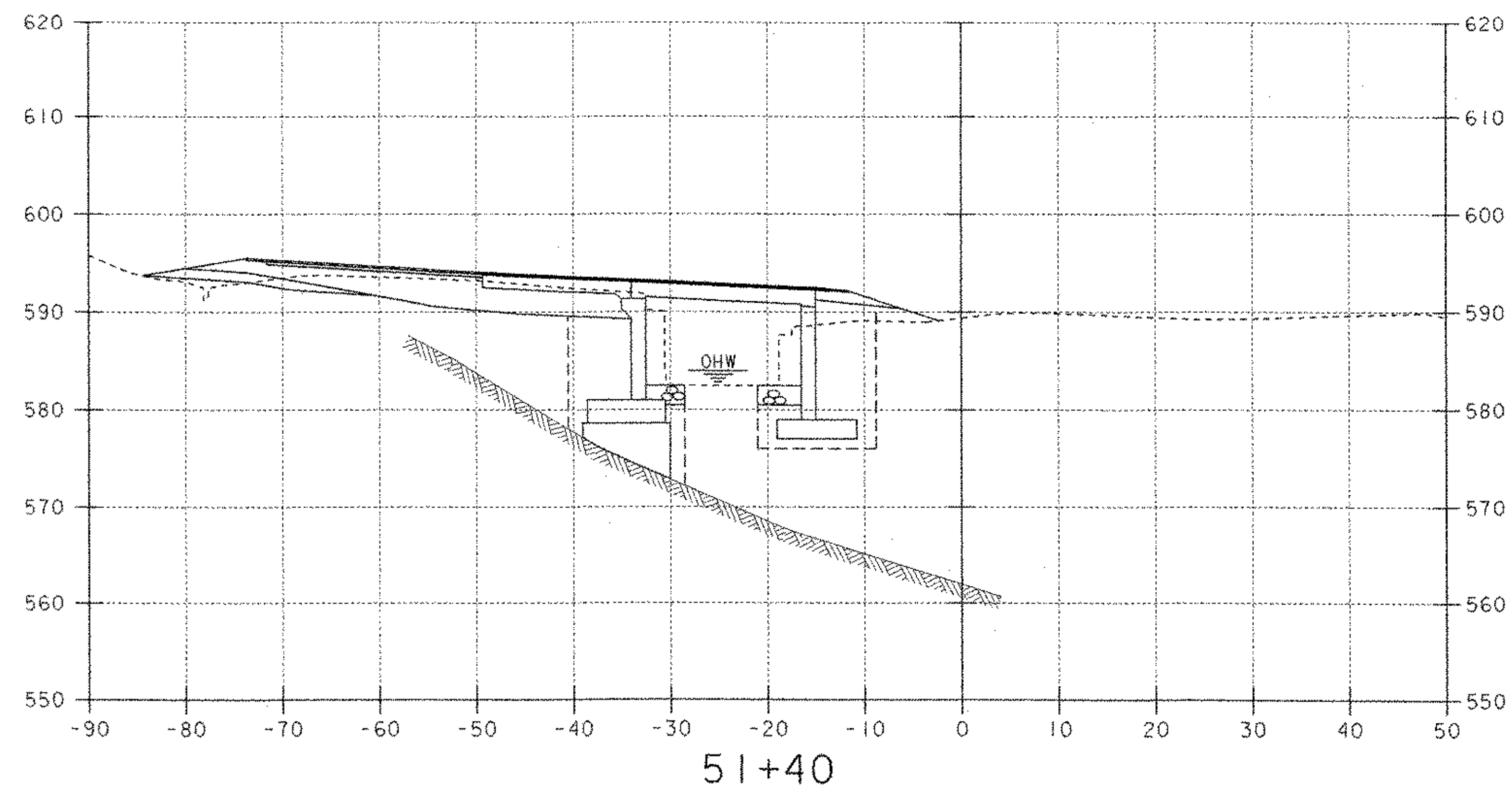
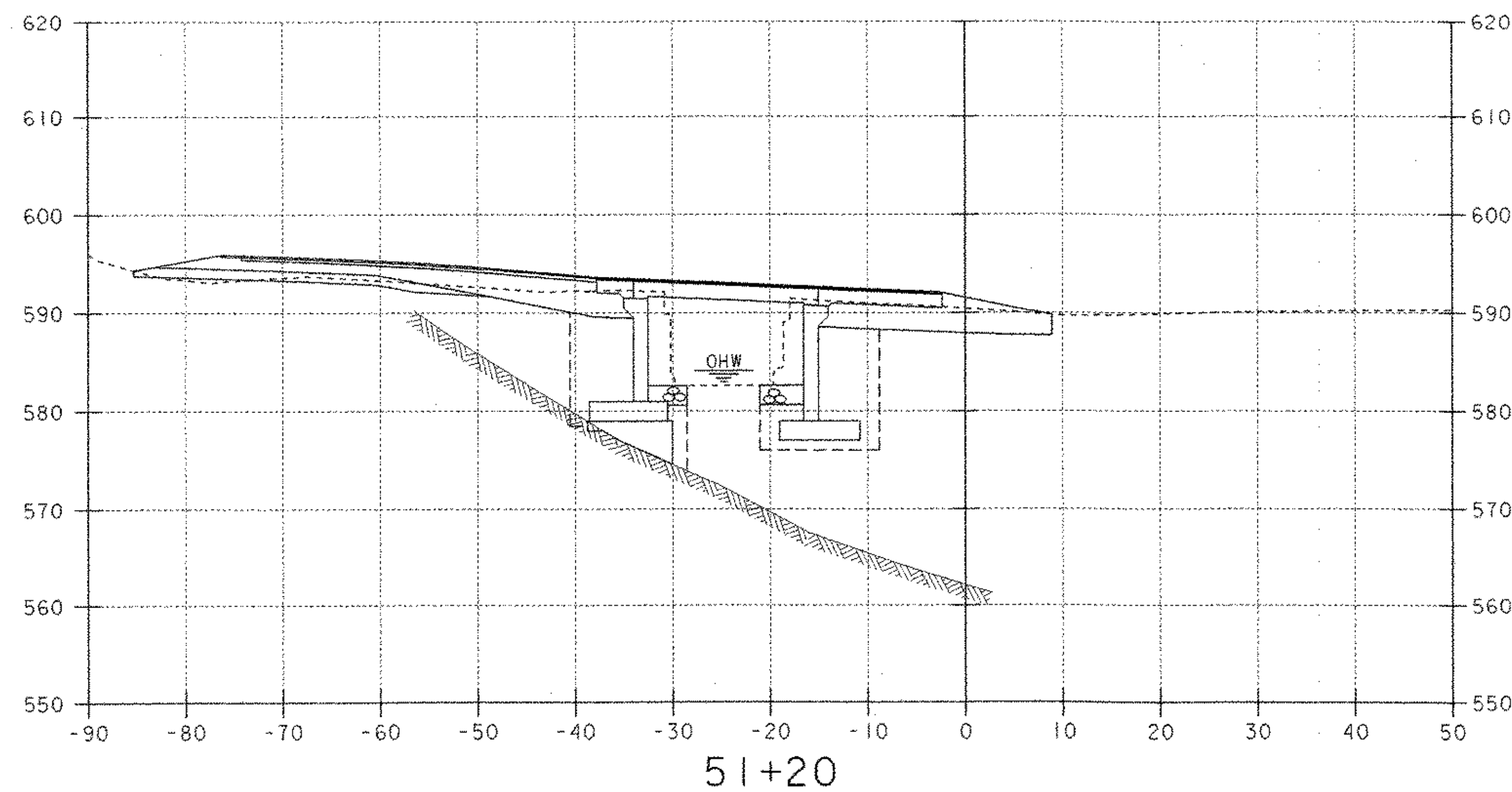
GT 1/1/2003



CHANNEL CROSS SECTIONS (1)

PROJECT NAME: ROCKINGHAM	PLOT DATE: 20-MAR-2003
PROJECT NUMBER: TH2 - 9103	DRAWN BY: G. ROY
FILE NAME: 90c053\structures\sc053c01	CHECKED BY: R. WHITCOMB
DESIGNED BY: G. ROY	SHEET 35 OF 38

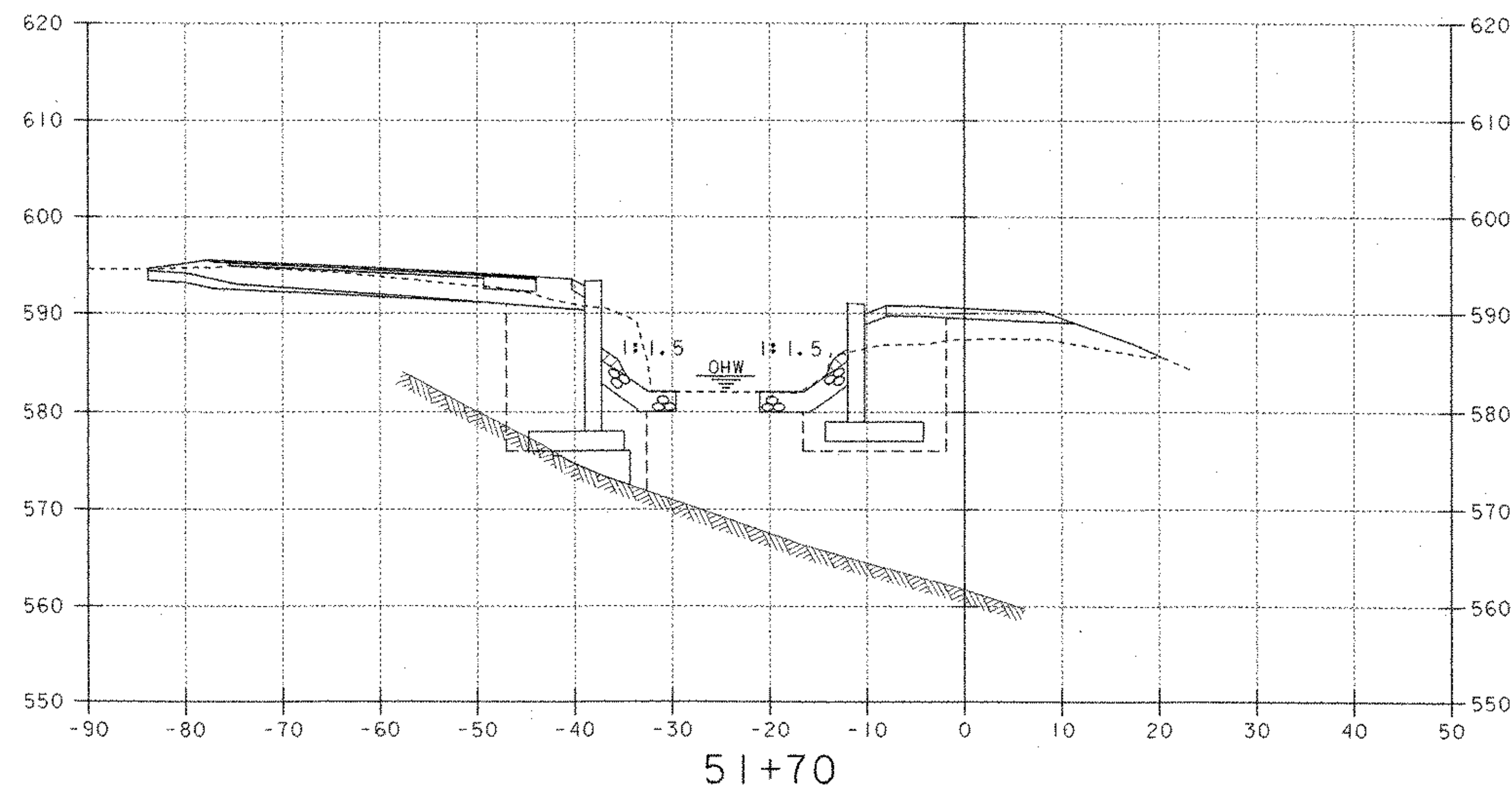
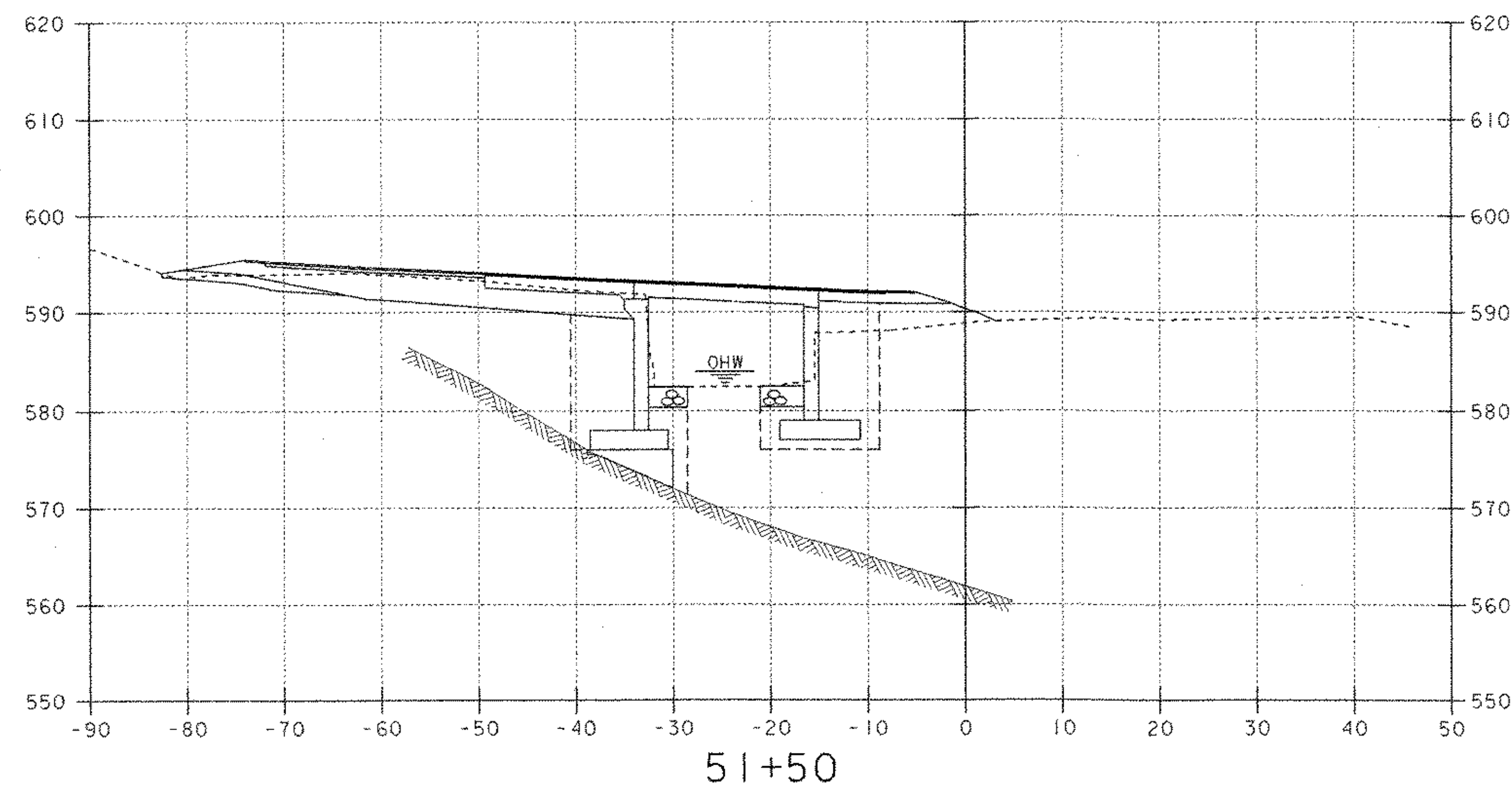
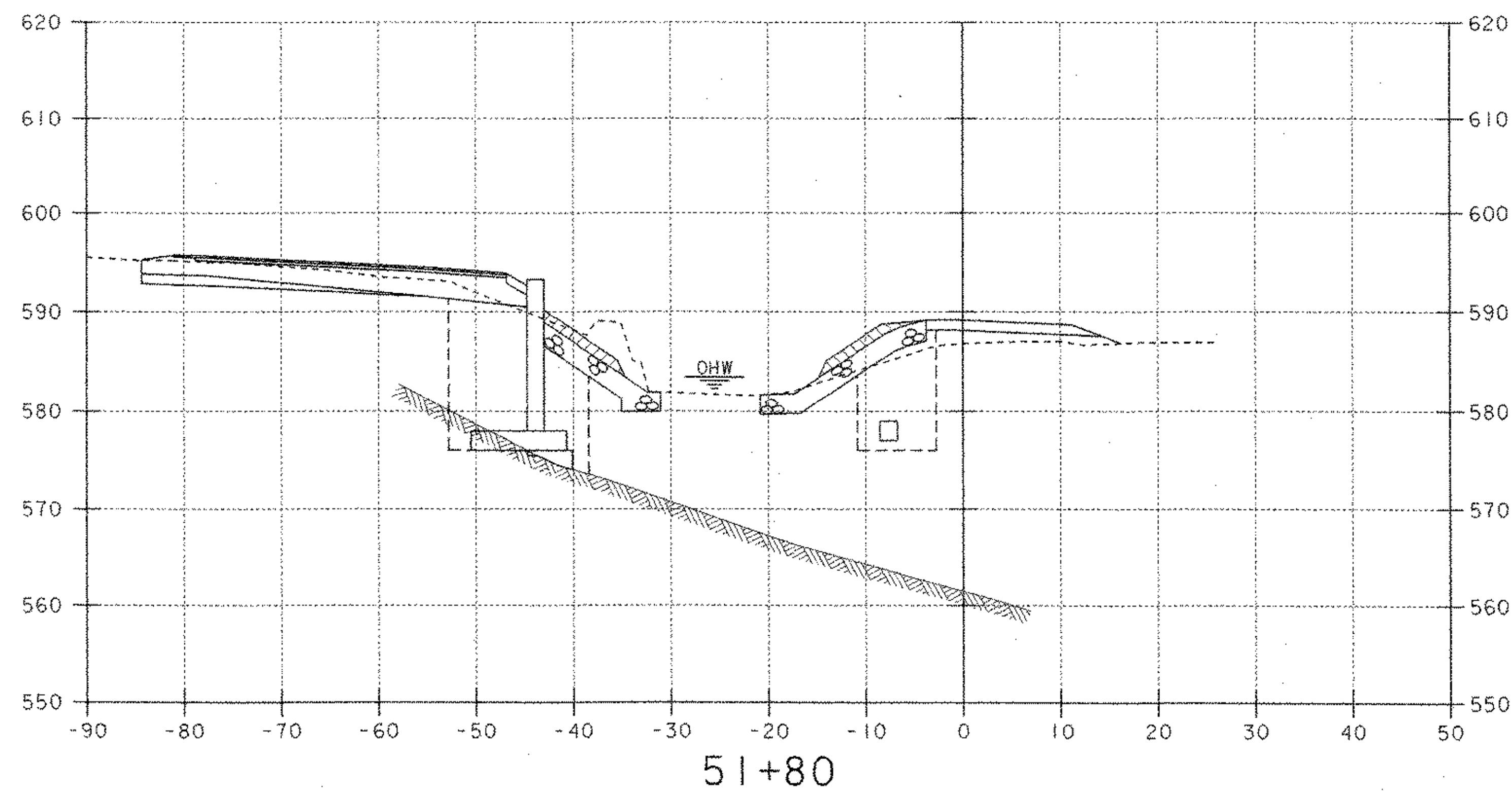
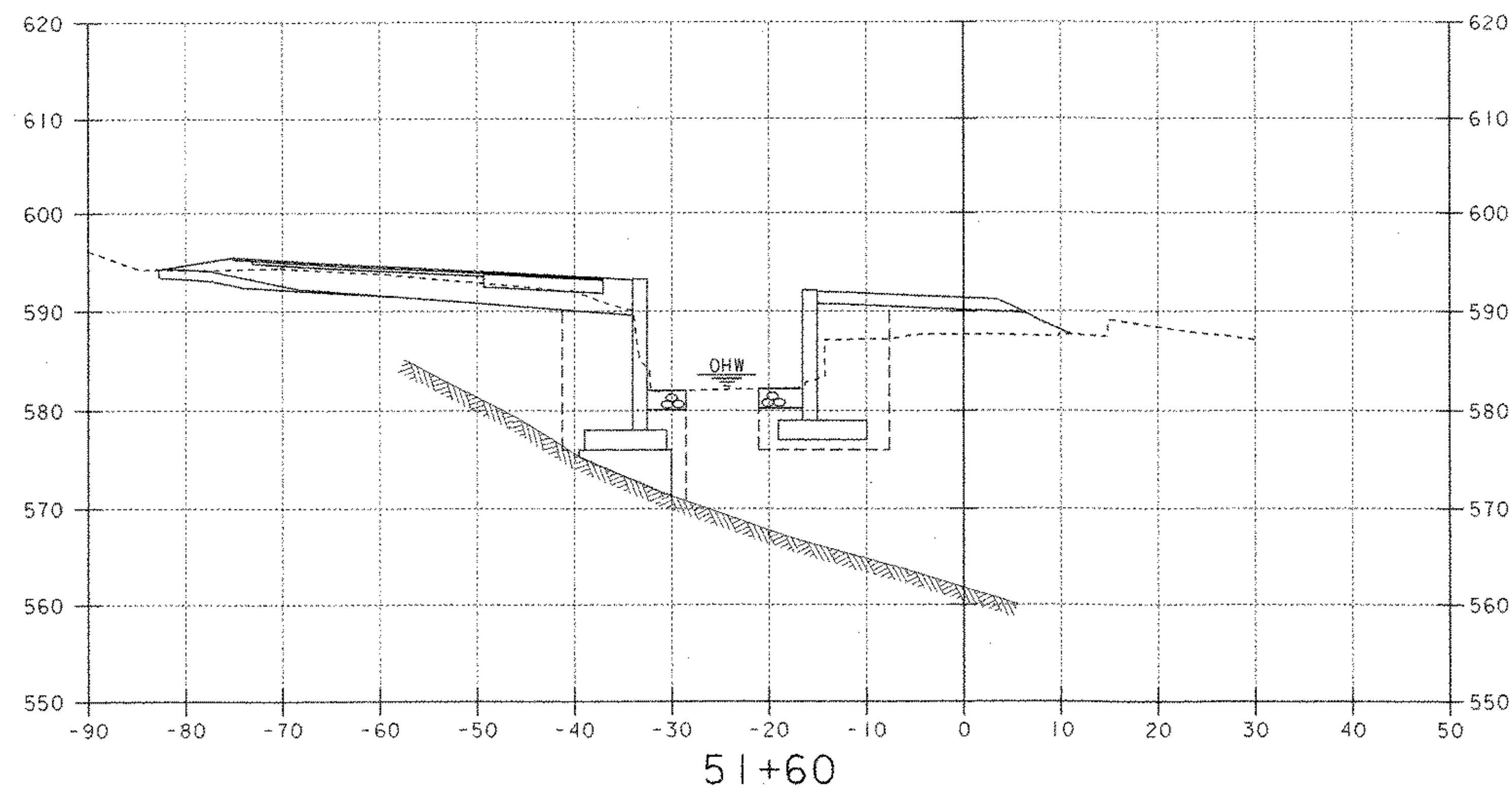
10 0 10
SCALE: 1" = 10'-0"



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

CHANNEL CROSS SECTIONS (2)

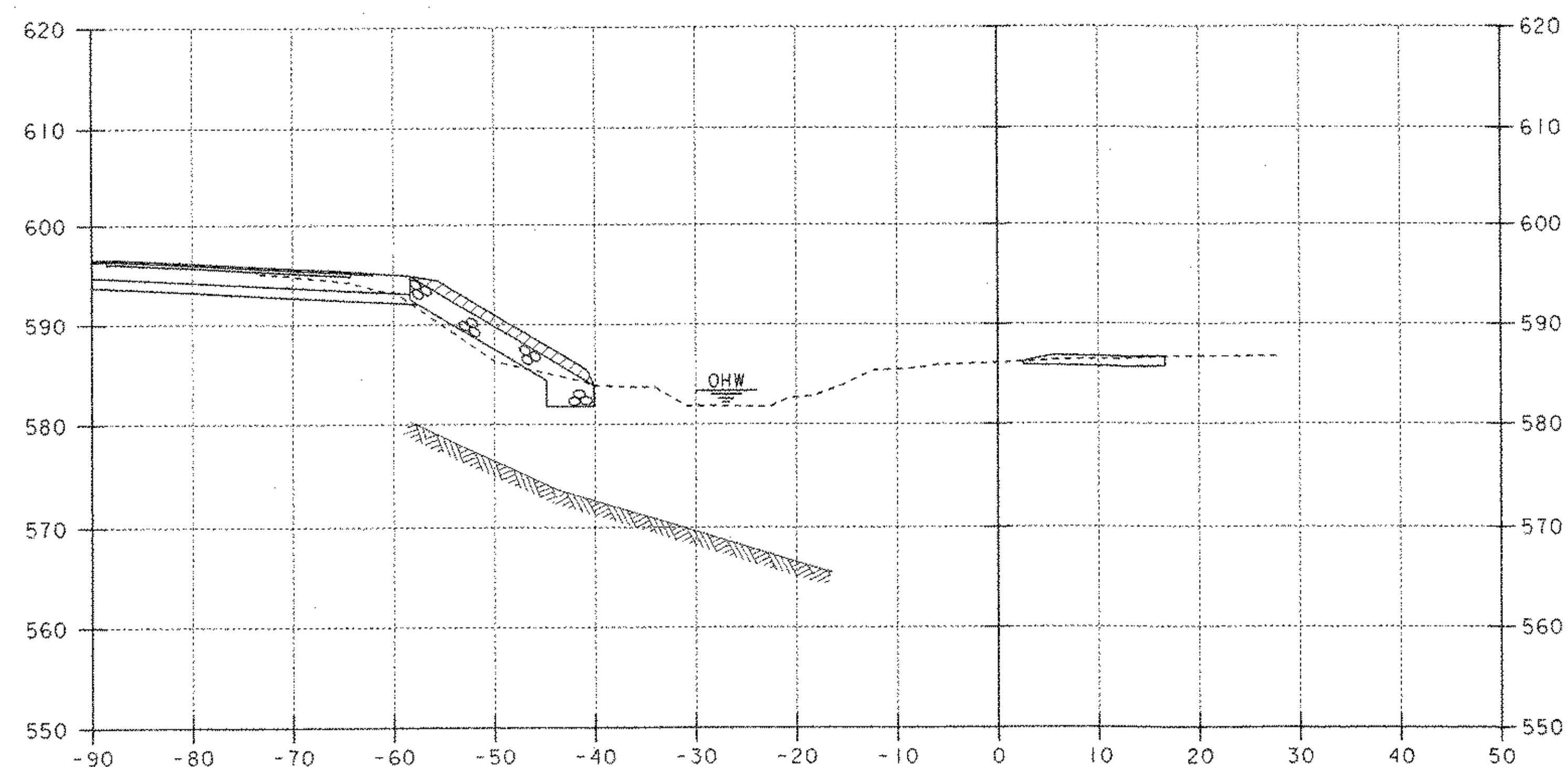
PROJECT NAME: ROCKINGHAM	PLOT DATE: 20-MAR-2003
PROJECT NUMBER: TH2 - 9103	DRAWN BY: G. ROY
FILE NAME: 90c053\structures\sc053c02.1	CHECKED BY: R. WHITCOMB
DESIGNED BY: G. ROY	SHEET 36 OF 38



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

CHANNEL CROSS SECTIONS (3)

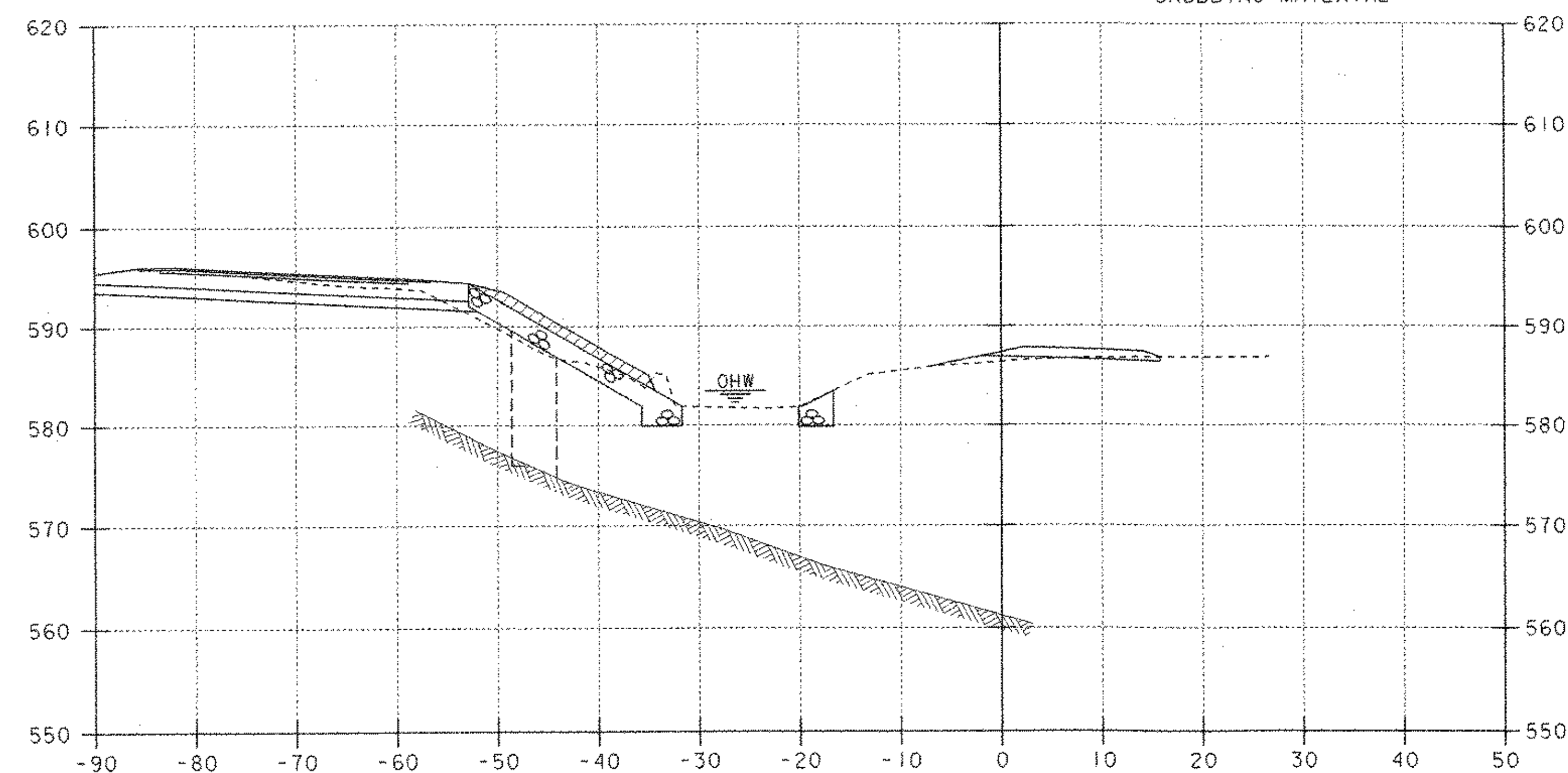
PROJECT NAME: ROCKINGHAM	PLOT DATE: 20-MAR-2003
PROJECT NUMBER: TH2 - 9103	DRAWN BY: G. ROY
FILE NAME: 90c053\structures\sc053c03.i	CHECKED BY: R. WHITCOMB
DESIGNED BY: G. ROY	SHEET (37) OF 38



STA. 51+91.9 LT.
END GRAN. BACKFILL FOR STRUCTURES

52+00

STA. 51+90.9 LT.
END UNCLASS. CHANNEL EXCAVATION
GEOTEXTILE UNDER STONE FILL
STONE FILL, TYPE II
GRUBBING MATERIAL



51+90

STA. 51+83.5 LT.
END GRAN. BACKFILL FOR STRUCTURES

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

CHANNEL CROSS SECTIONS (4)

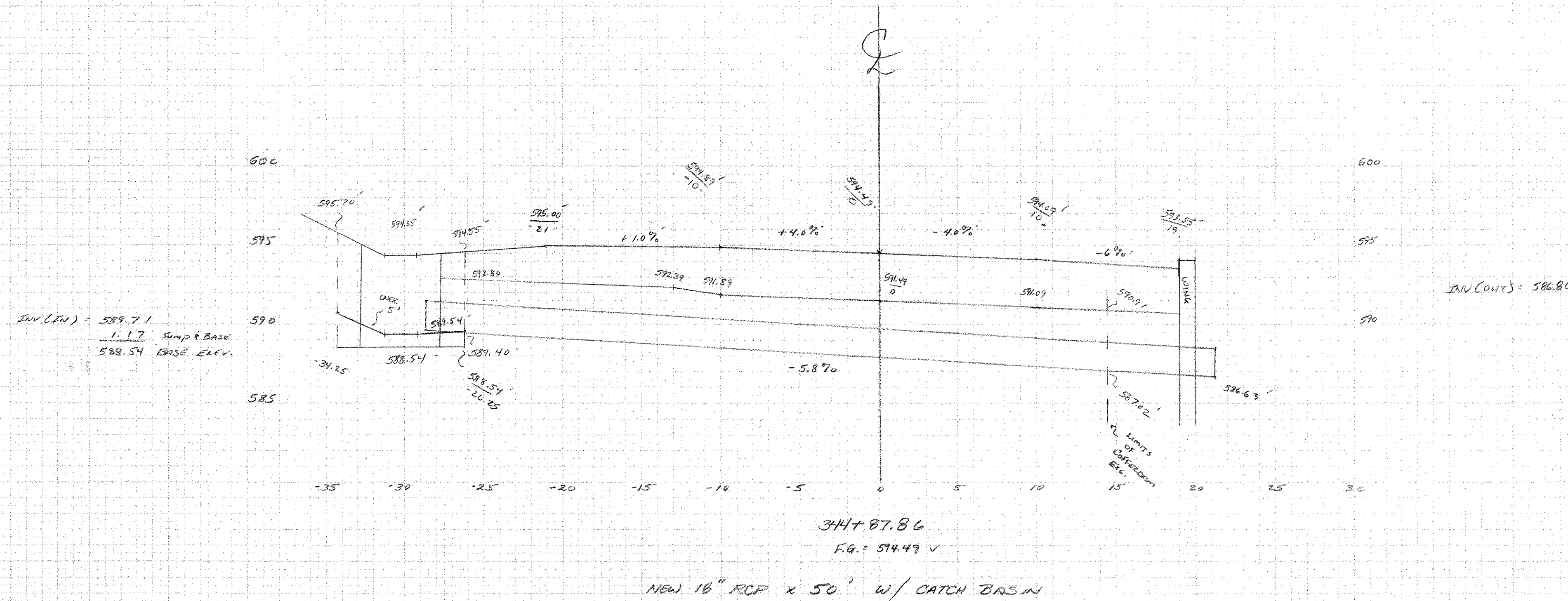
PROJECT NAME: ROCKINGHAM
PROJECT NUMBER: TH2 - 9103

FILE NAME: 90c053\structures\sc053c04.i PLOT DATE: 20-MAR-2003
PROJECT MANAGER: R. R. WHITCOMB DRAWN BY: G. ROY
DESIGNED BY: G. ROY CHECKED BY: R. WHITCOMB
SHEET 38 OF 38

FINAL	DATE
SURVEY	BY
NOTES	REVISIONS
NO.	DATE

ORIGINAL	DATE
SURVEY	BY
NOTES	REVISIONS
NO.	DATE

DRAINAGE SYSTEM #7



204.20 TRENCH EXCAVATION OF EARTH

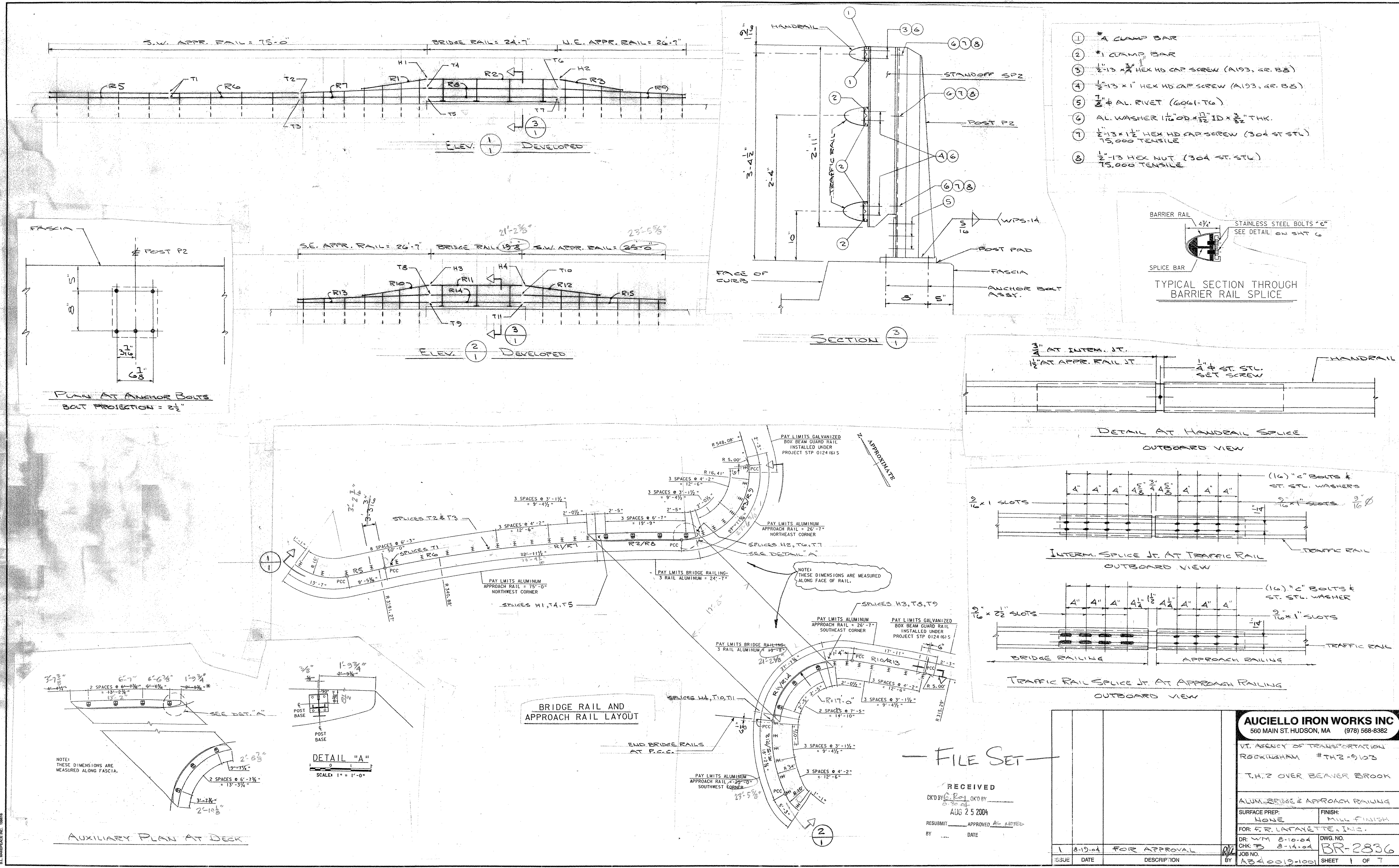
CATCH BASIN:		PIPE:	
ABOVE 5'	BELOW 5'		
-34.15' 595.70'	-34.25' 590.70'	-26.25' 589.40'	
-34.25' 590.70'	-34.25' 588.54'	14.5' 587.02'	
-31.25' 589.35'	-26.25' 588.54'	0' 590.91'	
-29.25' 589.35'	-26.25' 589.35'	-10' 591.49'	
-26.25' 589.35'	-26.25' 589.35'	-18' 592.39'	
-26.25' 594.53'	-31.25' 589.35'	-26.25' 592.80'	
-29.25' 594.35'	-34.25' 590.70'	-26.25' 589.40'	
-31.25' 594.35'			
-34.25' 595.70'			
A ₁ = 40.0 SF X 8 FT = 320 CF		A ₂ = 8.81 SF X 8 FT = 70.48 CF	
Total = 1138.13 CF + 27 = 42.15 CY		A ₃ = 148.05 SF X 5.05 FT = 747.65 CF	
Exc. = 42.2 CY			

601.0815 18" RCP CLASS III
50 FT

604.20 PRECAST CONCRETE CATCH BASIN
1 EA.

CCE
1/5/06

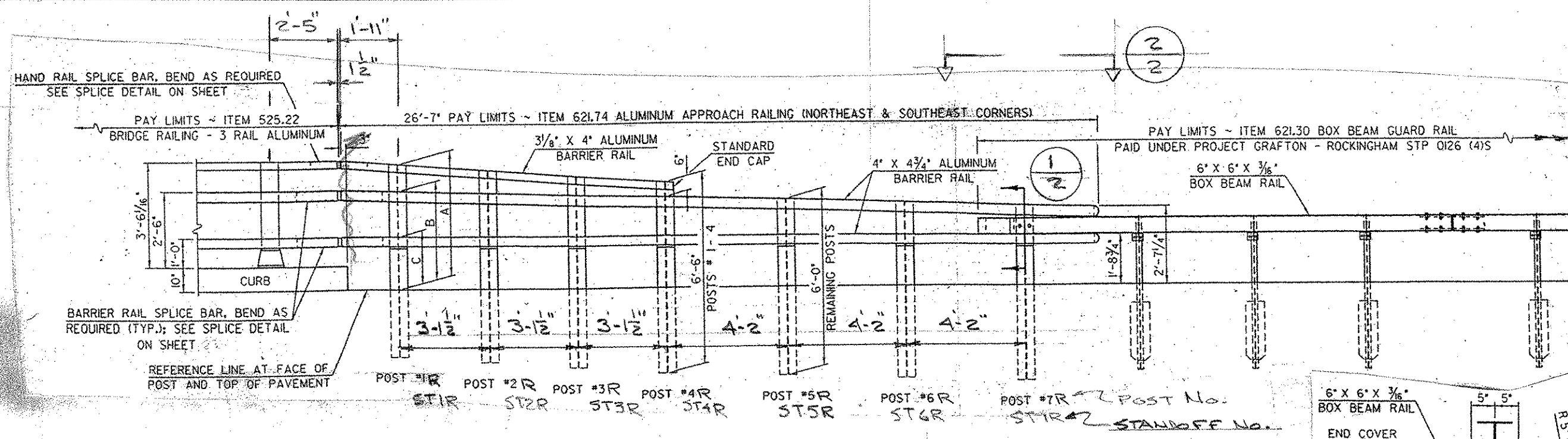
RECKINGHAM TH 2-9103
DATE: JANUARY 5, 2006
DRAWN: C. GREENWOOD
CHECKED BY: P. PERRY



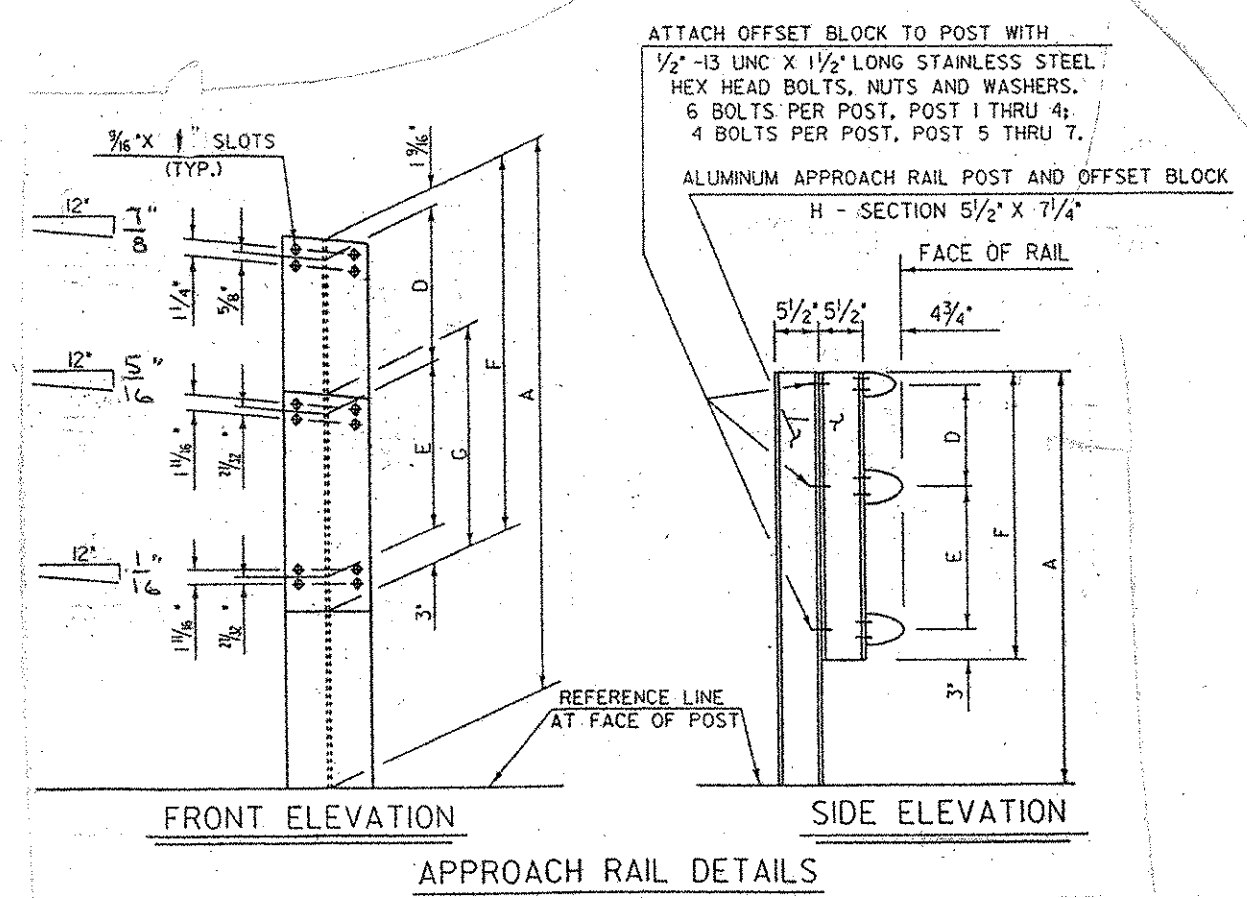
— FILE SET —

RECEIVED
 CKD BY: [Signature] OKD BY: [Signature]
 AUG 25 2004
 RESUBMIT: [] APPROVED: [] NOTED: []
 BY: [] DATE: []

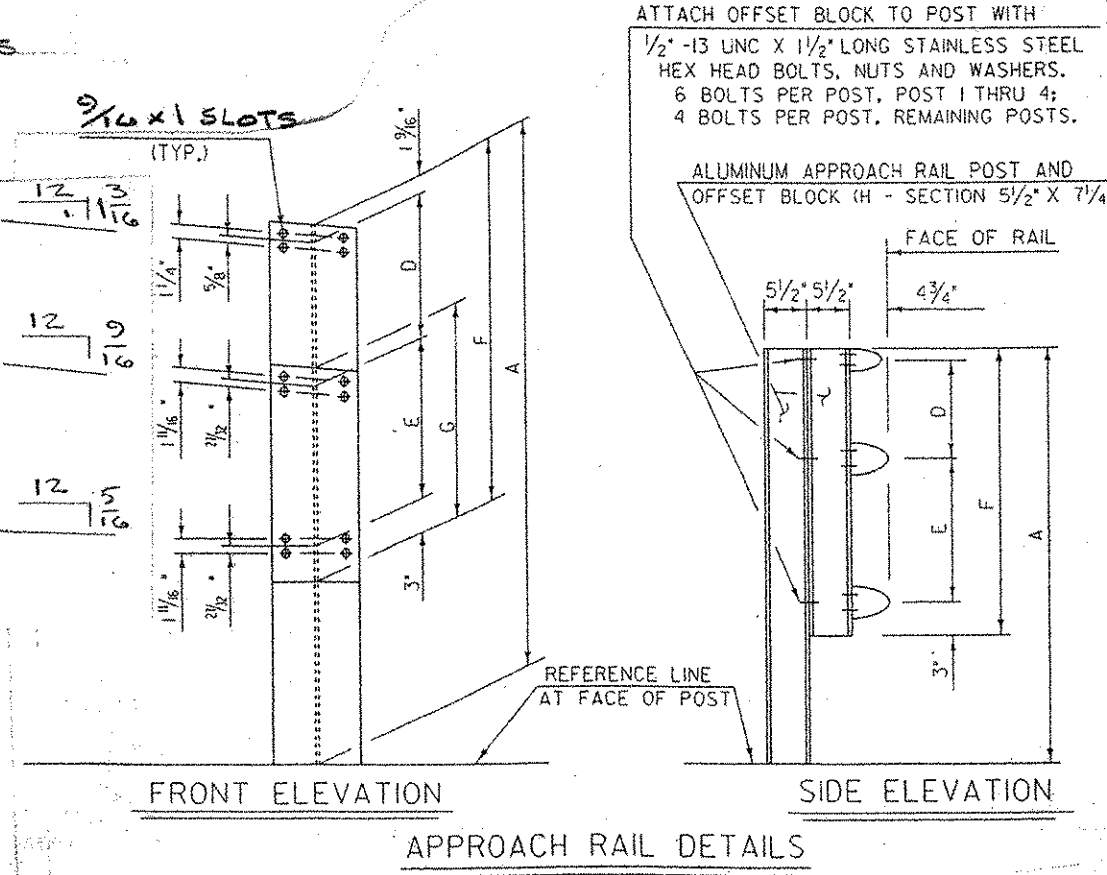
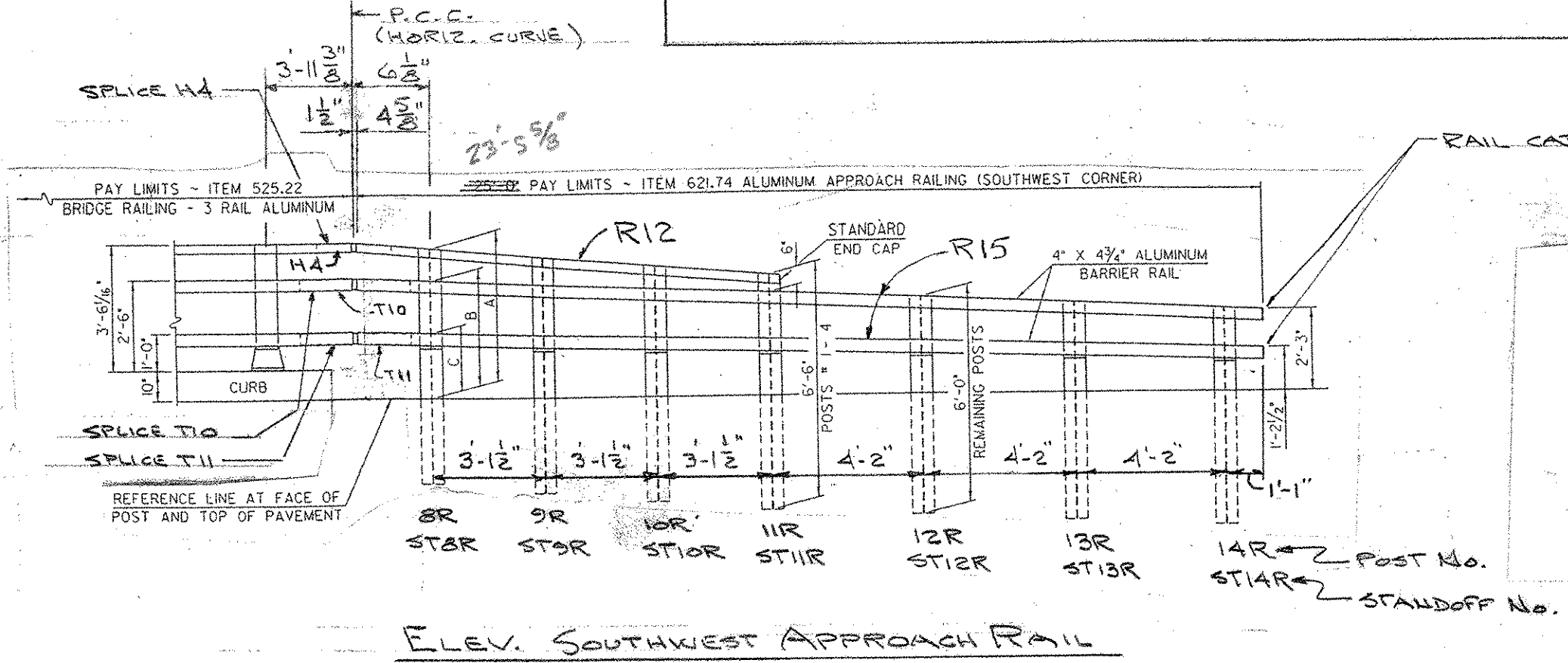
AUCIELLO IRON WORKS INC 560 MAIN ST. HUDSON, MA (978) 568-8382	
VT. AGENCY OF TRANSPORTATION ROCKINGHAM #TH2-9103 T.H.2 OVER BEAVER BROOK	
ALUM. BRIDGE & APPROACH RAILING	
SURFACE PREP:	FINISH:
NONE	MILL FINISH
FOR: E.R. LAFAYETTE, INC.	
DR: WM 8-10-04 CHK: B 8-14-04 JOB NO: 1340019-1001	DWG. NO: BR-2836 SHEET 1 OF 7



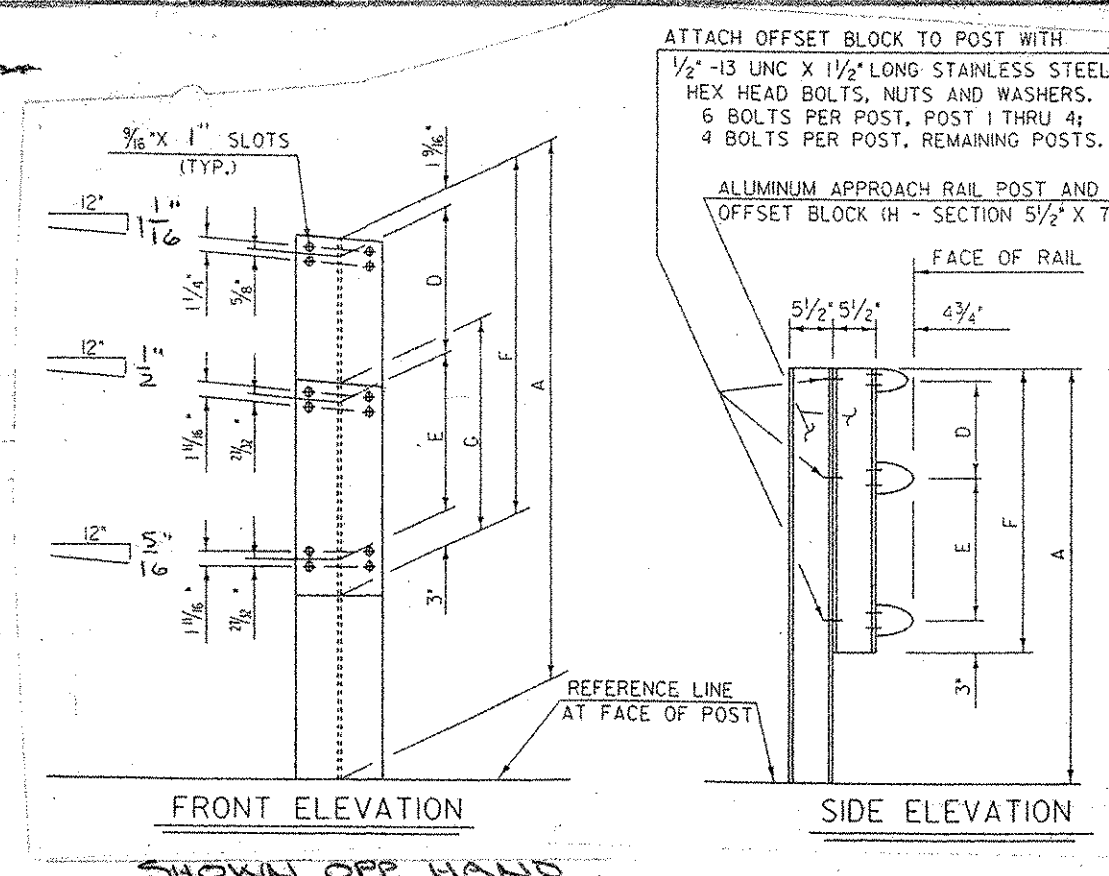
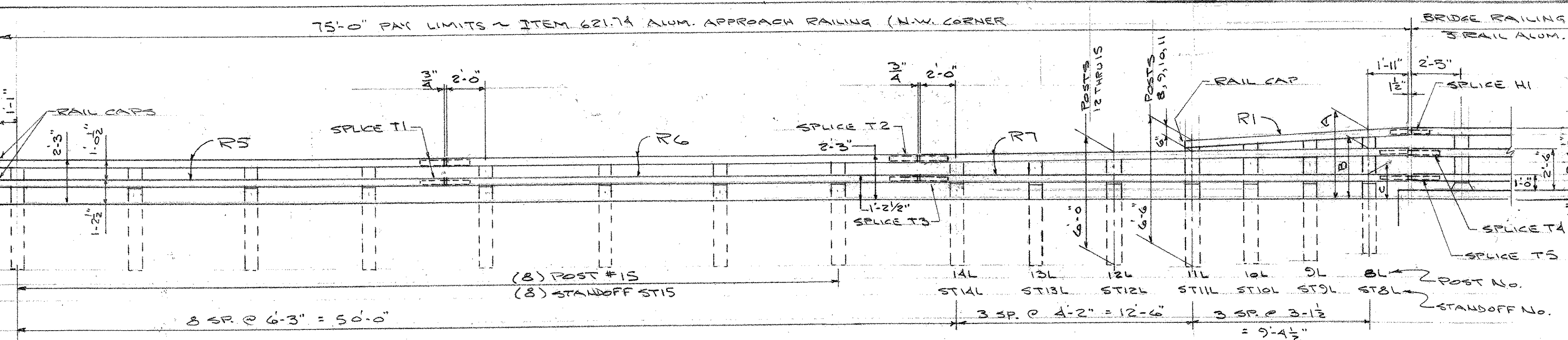
ALUMINUM APPROACH RAIL DIMENSIONS				OFFSET BLOCK DIMENSIONS			
POST NO.	A	B	C	D	E	F	G
1	4'-2 1/2"	3'-3 3/8"	1'-9 3/8"	11 1/2"	1'-5 1/2"	2'-9 3/8"	
2	3'-10 3/8"	3'-2 3/8"	1'-9 3/8"	9 3/4"	1'-4 3/8"	2'-6 3/8"	
3	3'-10 3/8"	3'-11 1/4"	1'-9 3/8"	8 3/4"	1'-3 3/8"	2'-4 3/8"	
4	3'-6 3/8"	3'-0 3/8"	1'-9 3/8"	6 3/4"	1'-2 3/8"	2'-4 3/8"	
5	2'-10 3/8"	1'-9 3/8"	1'-9 3/8"	1'-1 3/8"	1'-6 3/8"		
6	2'-9 3/8"	1'-9 3/8"	1'-9 3/8"	1'-0 3/8"	1'-5 3/8"		
7	2'-8 3/8"	1'-8 3/8"	1'-8 3/8"	11 1/2"	1'-4 3/8"		



NOTE - DIM'S GIVEN ALONG FACE OF RAIL (TYP.)



ALUM. APPROACH RAIL DIMENSIONS							
POST NO.	A	B	C	D	E	F	G
8R	4'-3 3/8"	3'-3 3/8"	1'-9 3/8"	1'-0 3/8"	1'-5 1/2"	2'-10 3/8"	5 1/2"
9R	3'-11 3/8"	3'-2 3/8"	1'-8 3/8"	10 5/8"	1'-5 3/8"	2'-8 3/8"	
10R	3'-8 3/8"	3'-0 3/8"	1'-7 3/8"	8 3/8"	1'-4 1/2"	2'-5 3/8"	
11R	3'-4 3/8"	2'-10 3/8"	1'-6 3/8"	6 7/8"	1'-3 3/8"	2'-2 3/8"	
12R		2'-8 3/8"	1'-5 1/2"		1'-2 3/8"		1'-7 3/8"
13R		2'-5 1/2"	1'-4 1/2"		1'-1 3/8"		1'-6 3/8"
14R		2'-3 3/8"	1'-2 3/8"		1'-0 3/8"		1'-5 3/8"



RAIL HEIGHT DIMENSIONS				OFFSET BLOCK DIMENSIONS			
POST NO.	A	B	C	D	E	F	G
8L	4'-1 3/8"	3'-2 3/8"	1'-8 3/8"	8 3/4"	1'-5 1/2"	2'-9 3/8"	
9L	3'-10 3/8"	3'-1 3/8"	1'-8 3/8"	9 3/4"	1'-4 3/8"	2'-7 3/8"	
10L	3'-7 3/8"	2'-11 3/8"	1'-7 3/8"	8 3/4"	1'-4 3/8"	2'-4 3/8"	
11L	3'-4 3/8"	2'-10 3/8"	1'-6 3/8"	6 3/4"	1'-3 3/8"	2'-2 3/8"	
12L		2'-8 3/8"	1'-5 1/2"		1'-2 3/8"		1'-7 3/8"
13L		2'-5 1/2"	1'-4 1/2"		1'-1 3/8"		1'-6 3/8"
14L		2'-3 3/8"	1'-2 3/8"		1'-0 3/8"		1'-5 3/8"
15	2'-3"	1'-0 3/8"	1'-0 3/8"		1'-5 1/2"		

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OK'D BY G. BOY OK'D BY
8-30-04
AUG 25 2004
RESUBMIT APPROVED AS NOTED
BY DATE

PK	QUAN	DESCRIPTION	PK	QUAN	DESCRIPTION
P2	7	BRIDGE POST	SP2	7	STANDOFF
1R	1	APPR. POST	ST1R	1	
1L	1		ST1L	1	
2R	1		ST2R	1	
2L	1		ST2L	1	
3R	1		ST3R	1	
3L	1		ST3L	1	
4R	1		ST4R	1	
4L	1		ST4L	1	
5R	1		ST5R	1	
5L	1		ST5L	1	
6R	1		ST6R	1	
6L	1		ST6L	1	
7R	1		ST7R	1	
7L	1		ST7L	1	
8R	1		ST8R	1	
8L	1		ST8L	1	
9R	1		ST9R	1	
9L	1		ST9L	1	
10R	1		ST10R	1	
10L	1		ST10L	1	
11R	1		ST11R	1	
11L	1		ST11L	1	
12R	1		ST12R	1	
12L	1		ST12L	1	
13R	1		ST13R	1	
13L	1		ST13L	1	
14R	1		ST14R	1	
14L	1		ST14L	1	
15	3		ST15	3	
				7	POST PAD
H1	1	HANDRAIL		7	ANCHOR BOLT
H2	1		#4	46	HANDRAIL CLAMP BAR
H3	1		#1	172	HANDRAIL CLAMP BAR
H4	1			4	HANDRAIL CAP
				3	BARRIER RAIL CAP
T1	2	BARRIER RAIL SPICE		92	1/2" X 1" LONG STAINLESS STEEL HEX HEAD BOLTS, NUTS AND WASHERS
T2	1			344	1/2" X 1" LONG STAINLESS STEEL HEX HEAD BOLTS, NUTS AND WASHERS
T3	1			192	1/2" X 1" LONG STAINLESS STEEL HEX HEAD BOLTS, NUTS AND WASHERS
T4	1			218	1/2" X 1" LONG STAINLESS STEEL HEX HEAD BOLTS, NUTS AND WASHERS
T5	1			218	1/2" X 1" LONG STAINLESS STEEL HEX HEAD BOLTS, NUTS AND WASHERS
T6	1			192	1/2" X 1" LONG STAINLESS STEEL HEX HEAD BOLTS, NUTS AND WASHERS
T7	1			436	1/2" X 1" LONG STAINLESS STEEL HEX HEAD BOLTS, NUTS AND WASHERS
T8	1			4	1/2" X 1" LONG STAINLESS STEEL HEX HEAD BOLTS, NUTS AND WASHERS
T9	1		R1	1	HANDRAIL
T10	1		R2	1	
T11	1		R3	1	
			R10	1	
			R11	1	
			R12	1	
			R5	2	BARRIER RAIL
			R6	2	
			R7	2	
			R8	2	
			R9	2	
			R13	2	
			R14	2	
			R15	2	

AUCIELLO IRON WORKS INC
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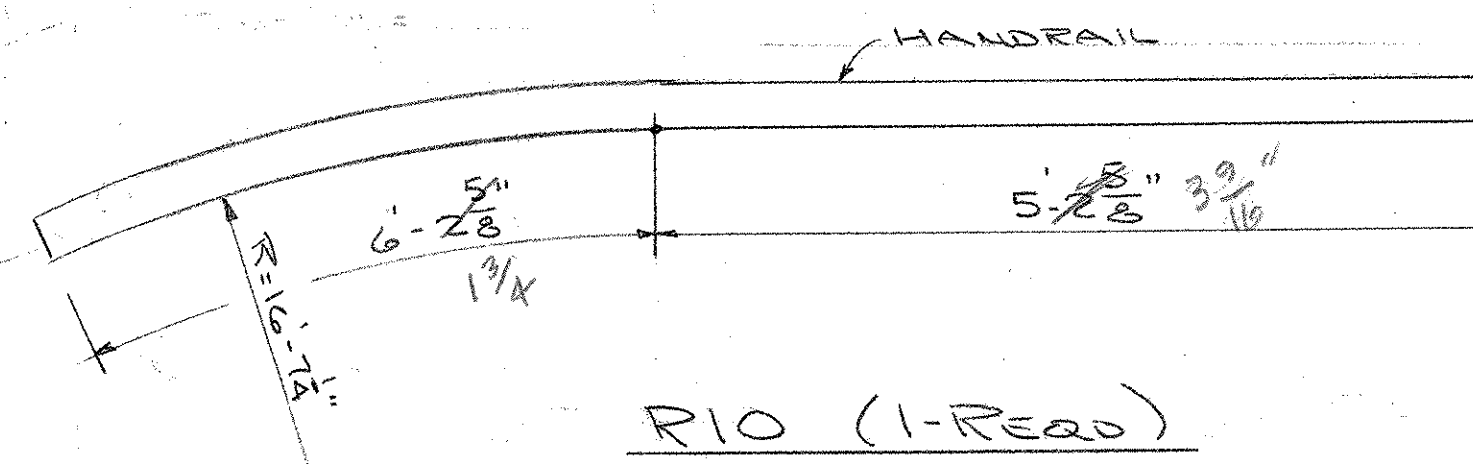
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ROCKINGHAM #TH2-0103
TH.2 OVER BEAVER BROOK

ALUM. BRIDGE & APPROACH RAILING

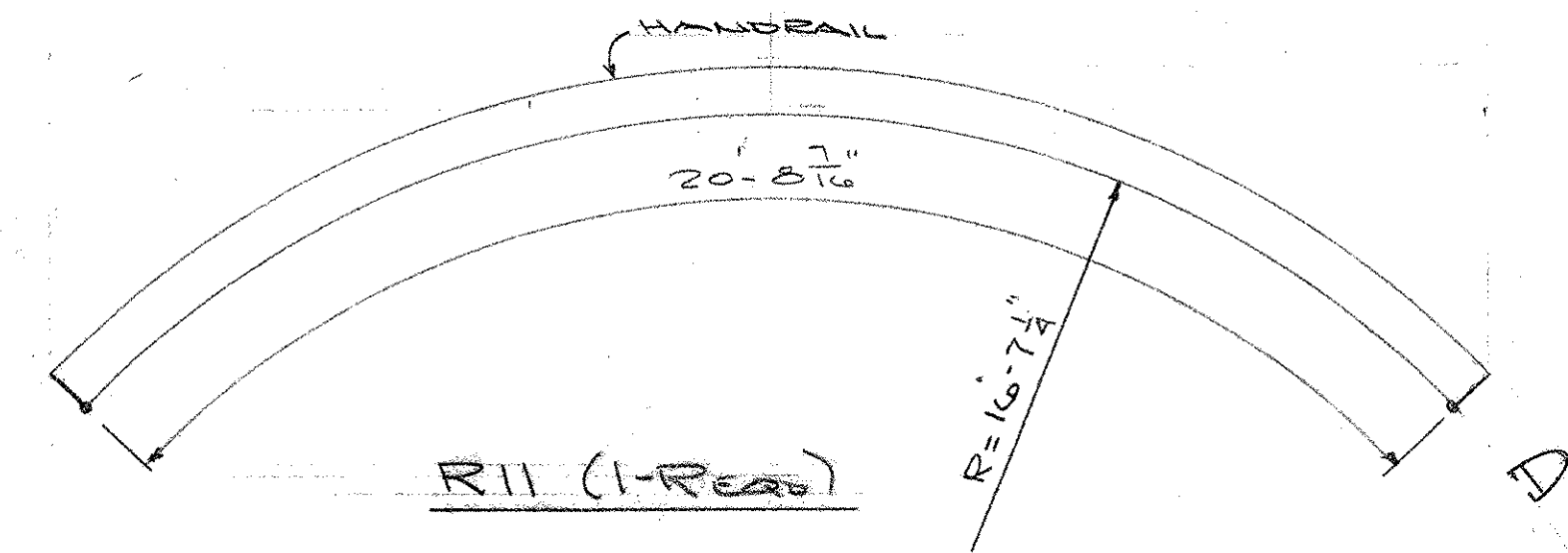
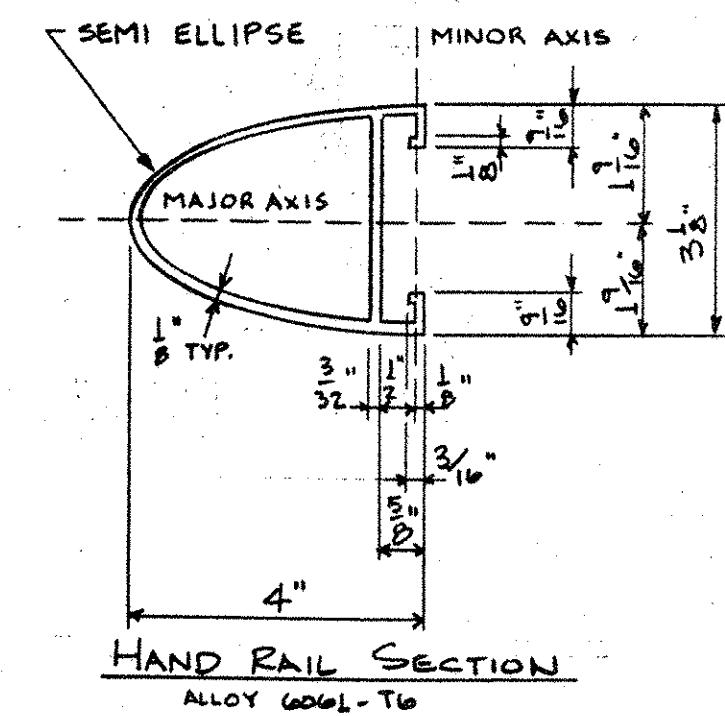
SURFACE PREP: NONE FINISH: MILL FINISH

FOR: R. LAFAYETTE, INC.
DR: WM 8-2-04 DWG. NO.
CHK: 8-18-04 BR-2836
JOB NO. AS0019-1001 SHEET 2 OF 7

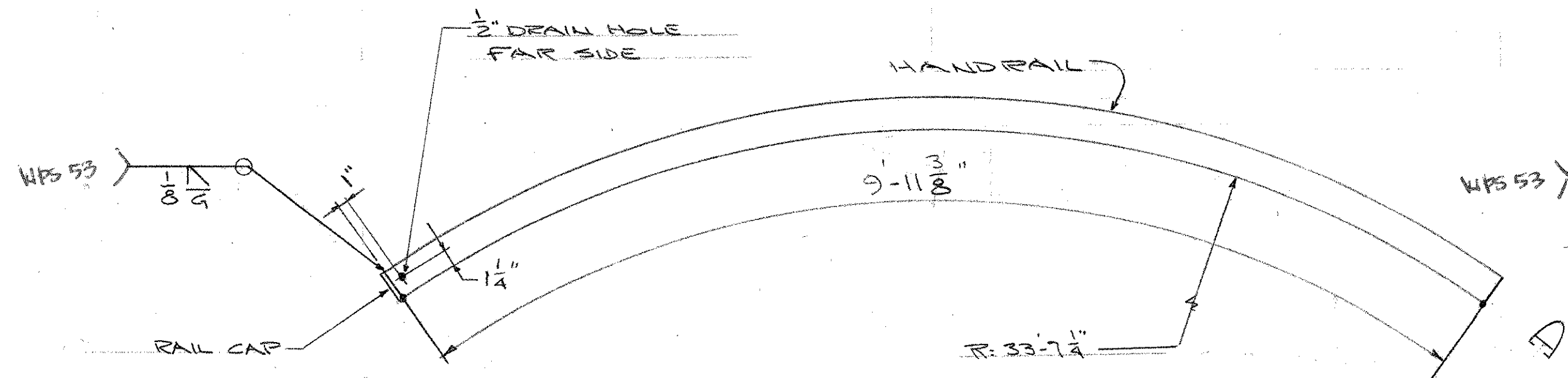
1 8-19-04 FOR APPROVAL
ISSUE DATE DESCRIPTION



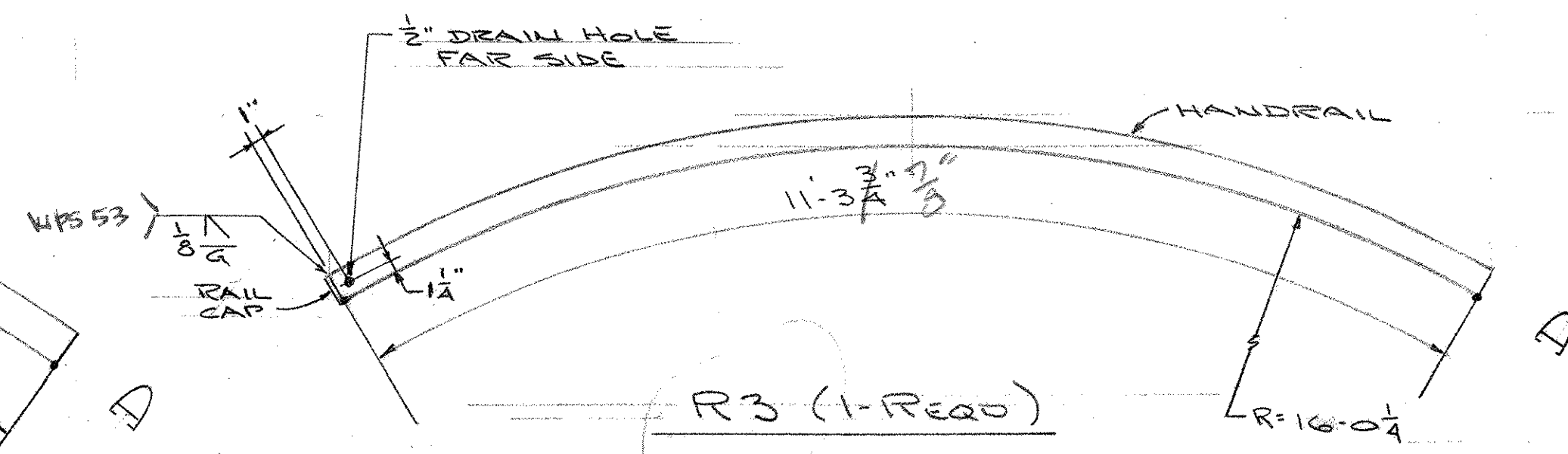
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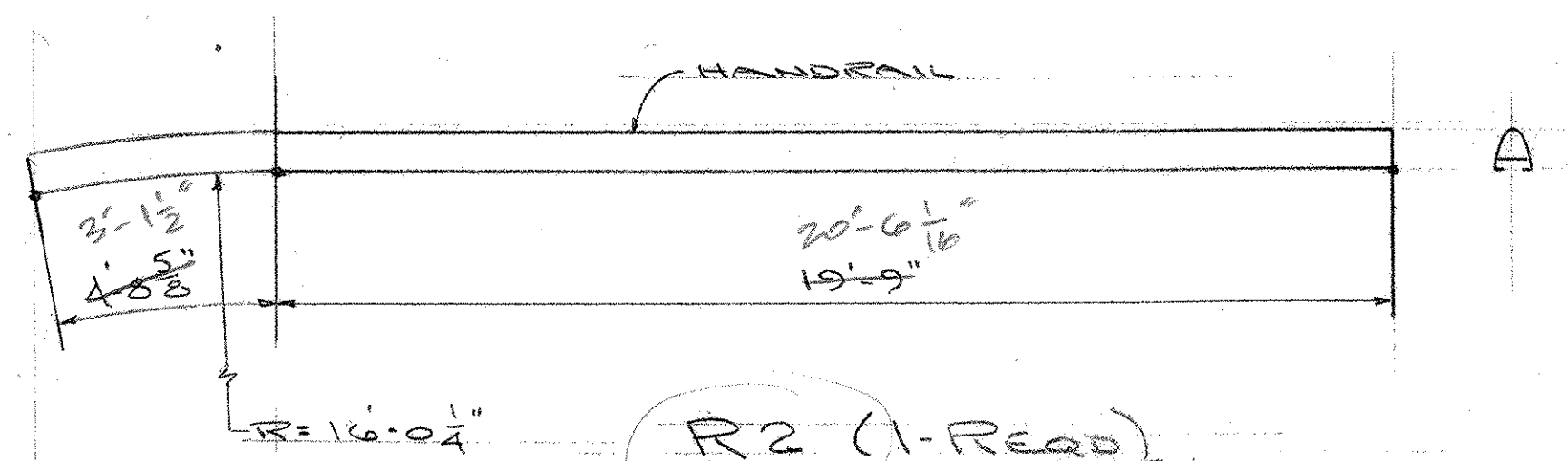
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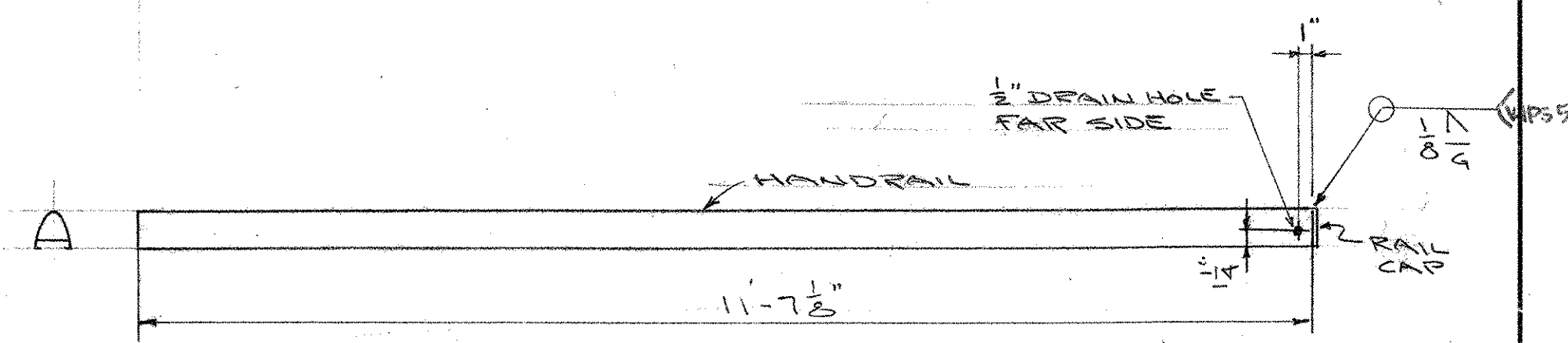
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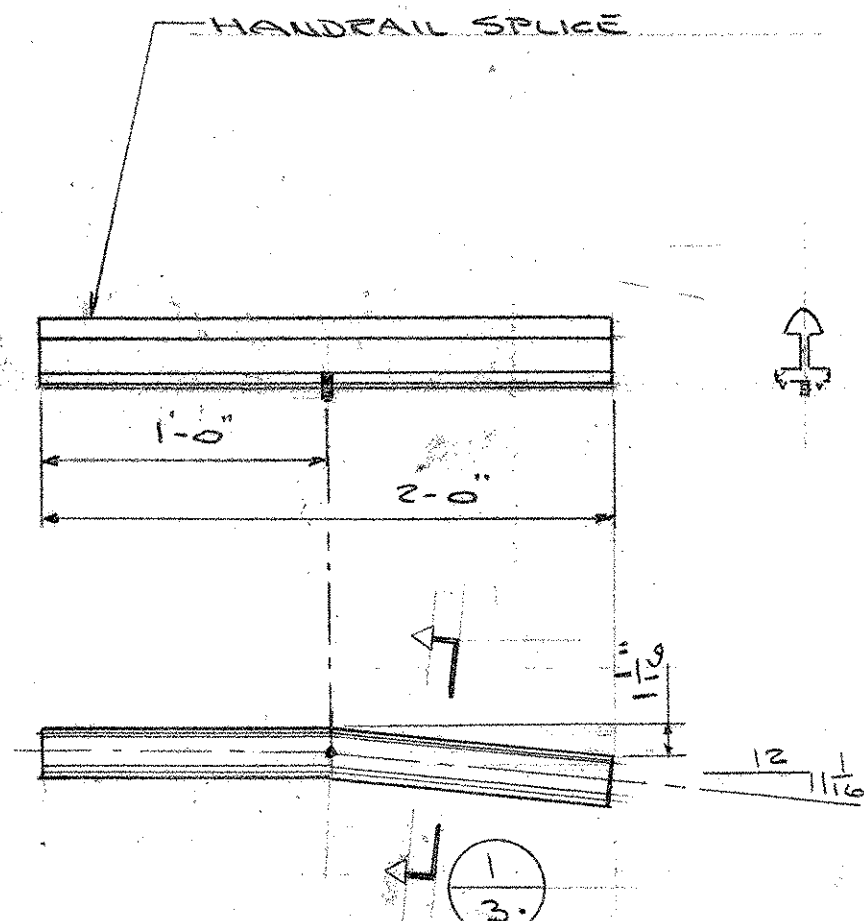
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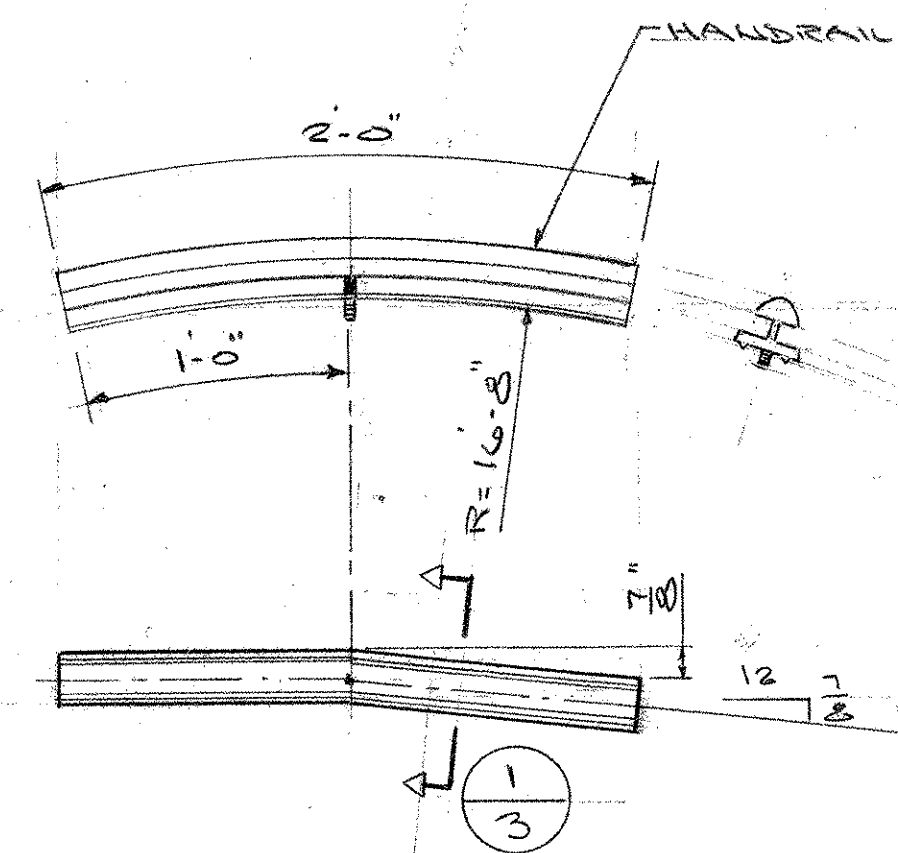
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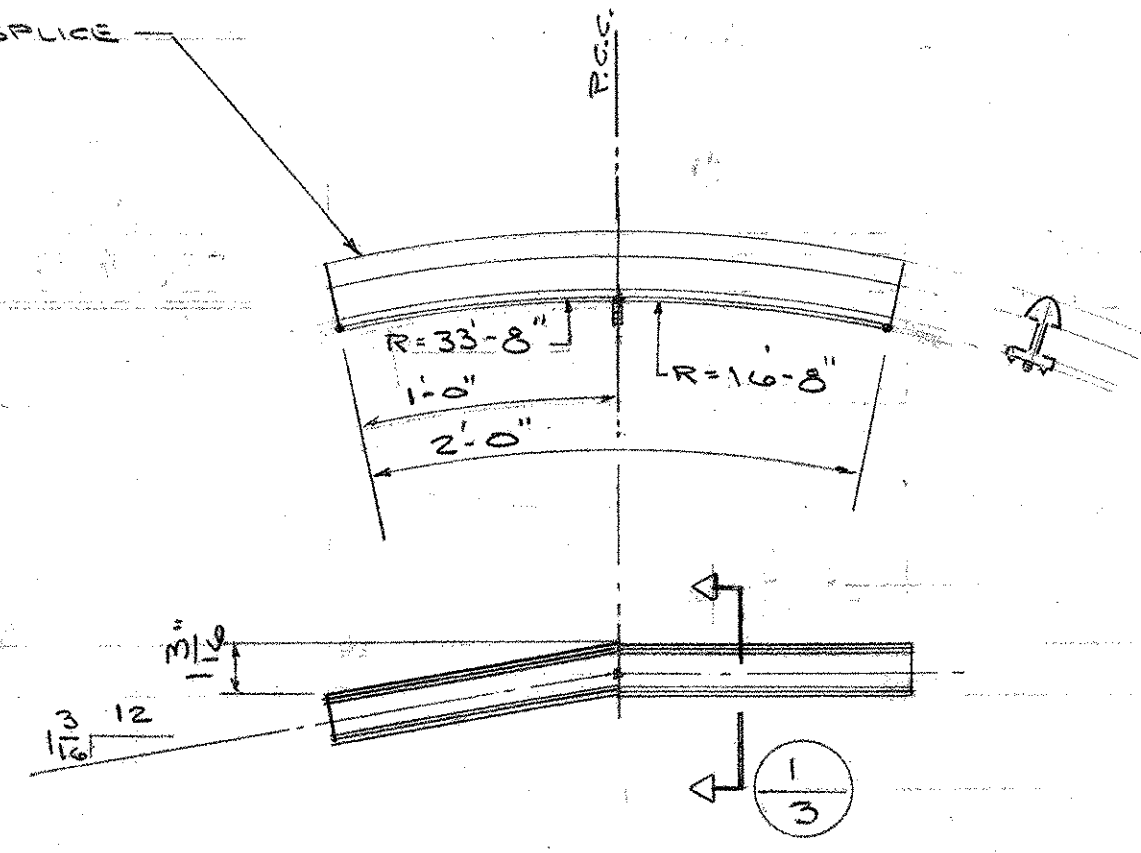
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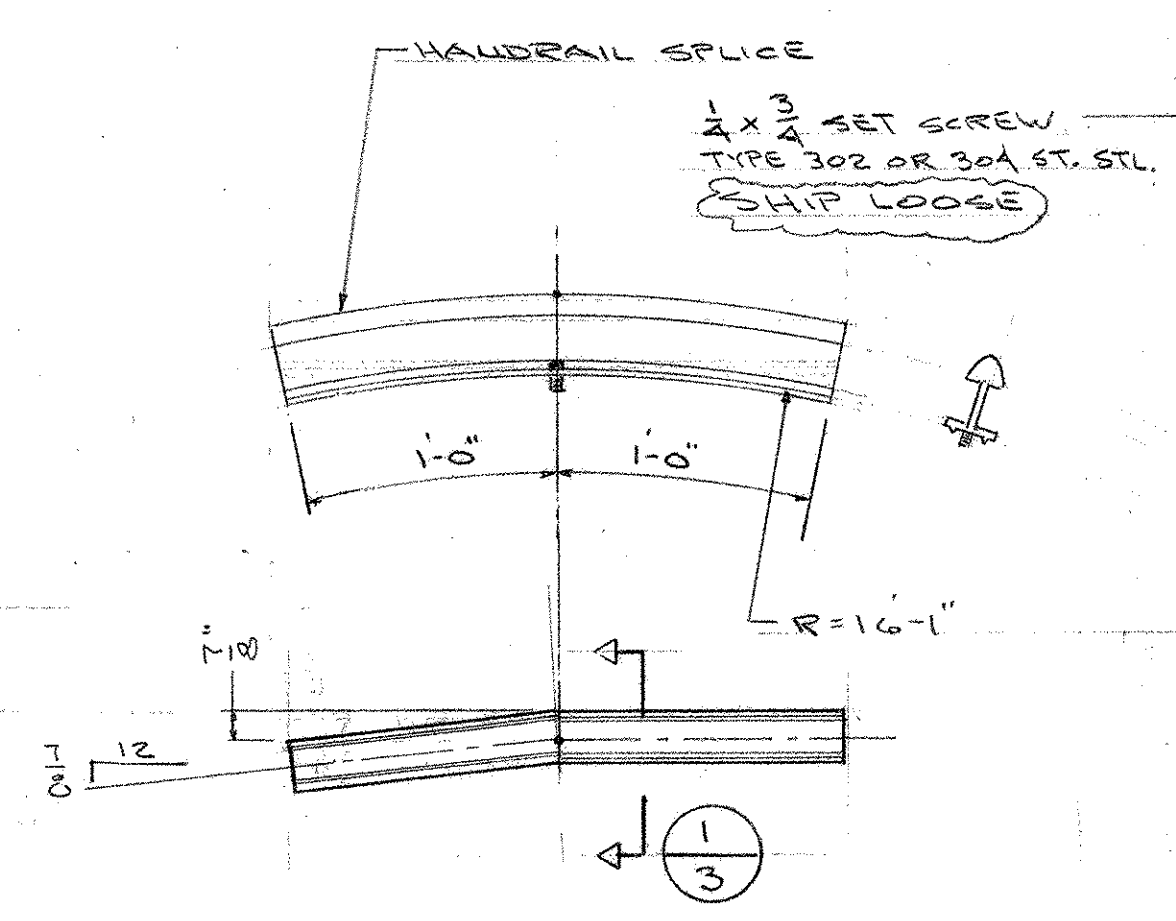
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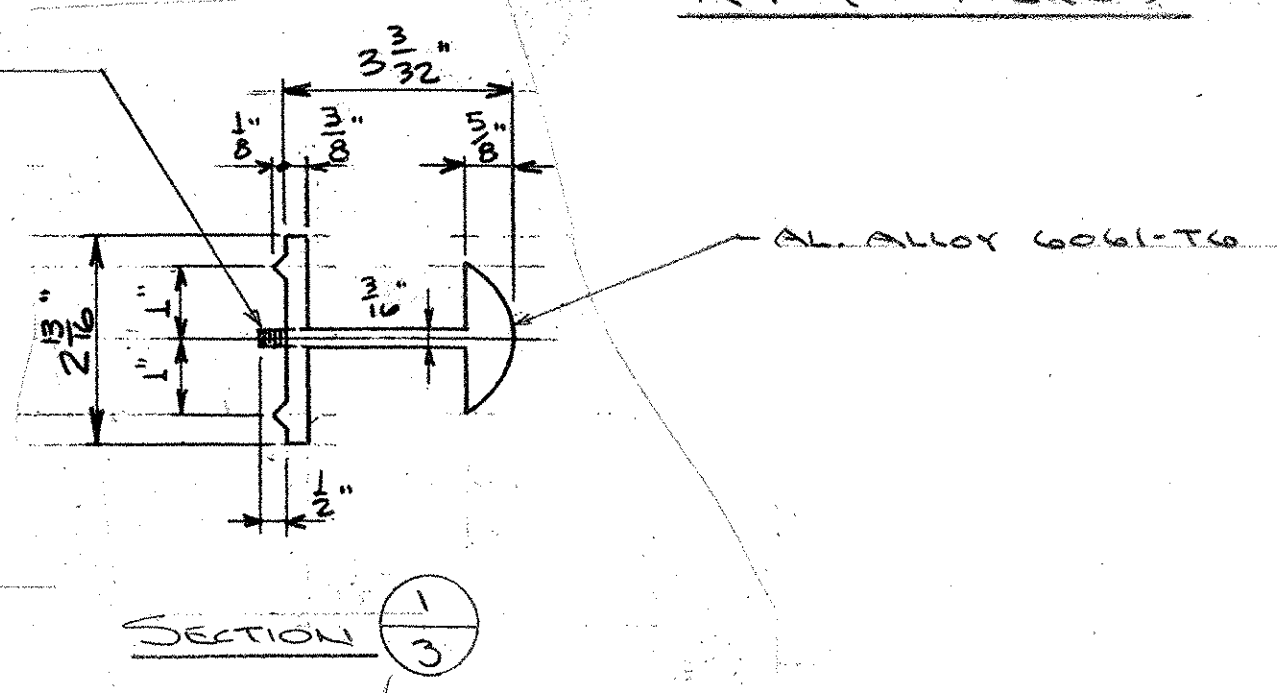
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H4 (1-Reqd)



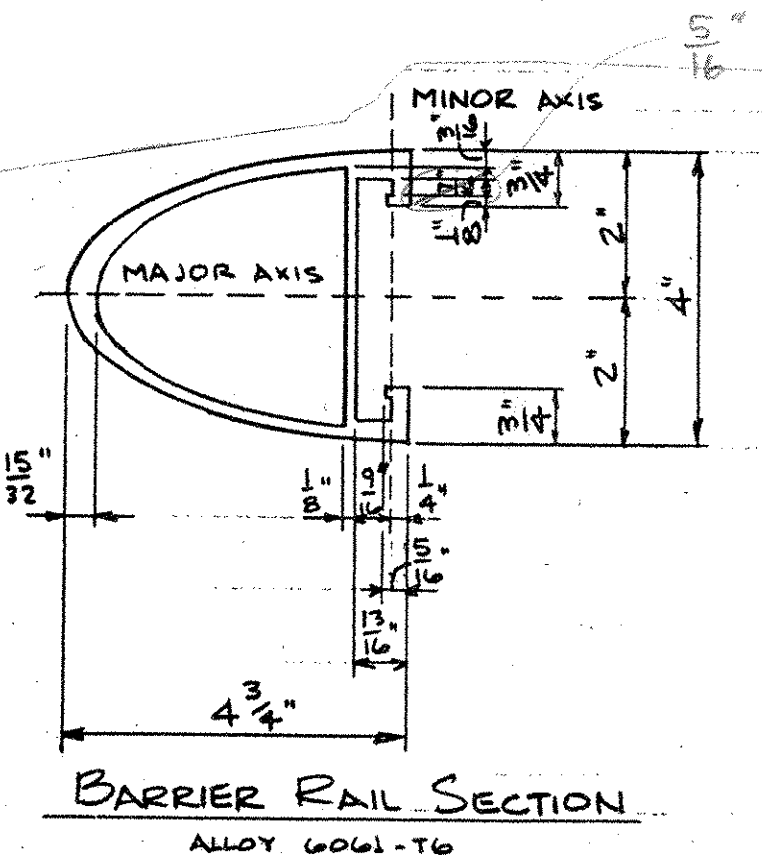
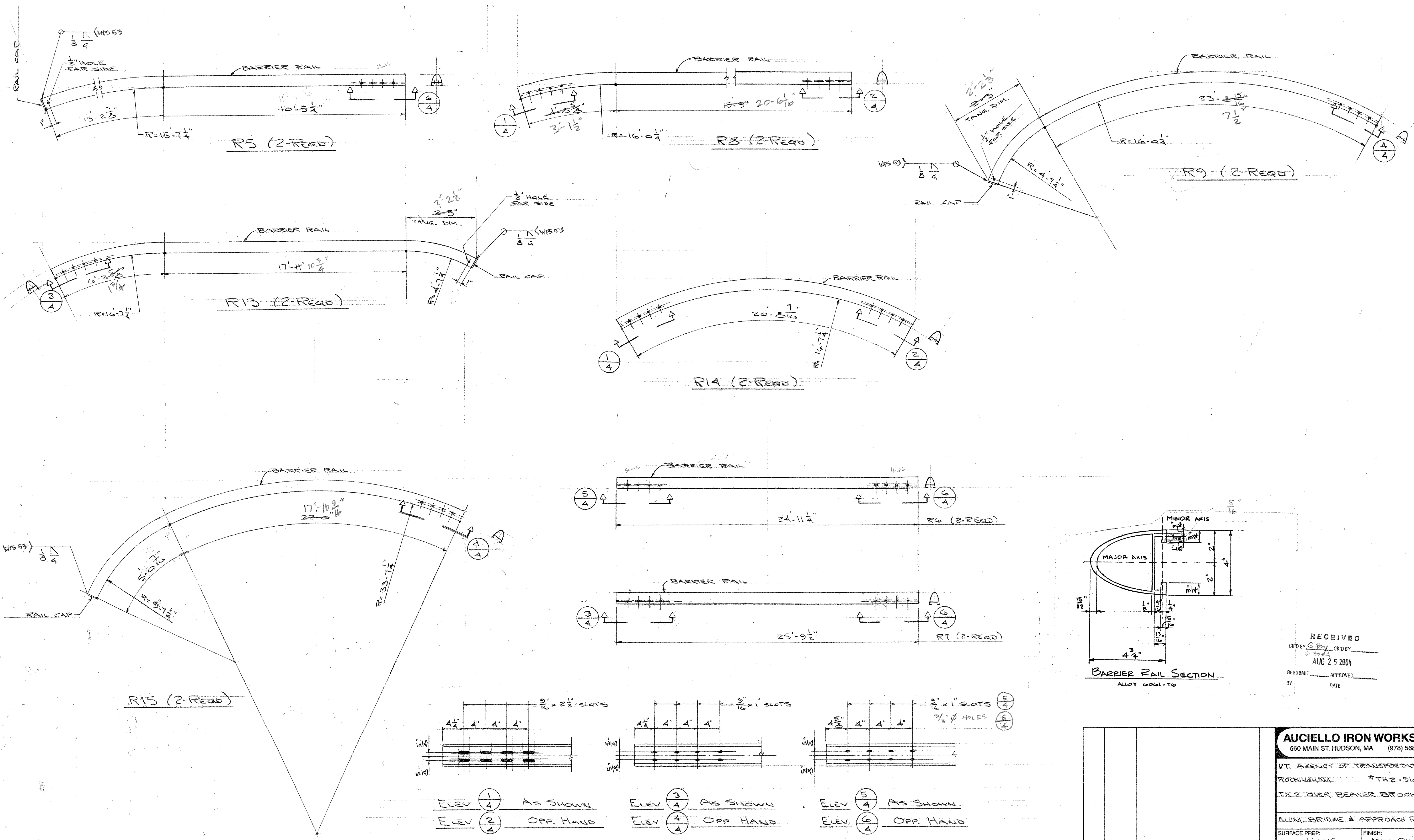
H2 (1-Reqd)



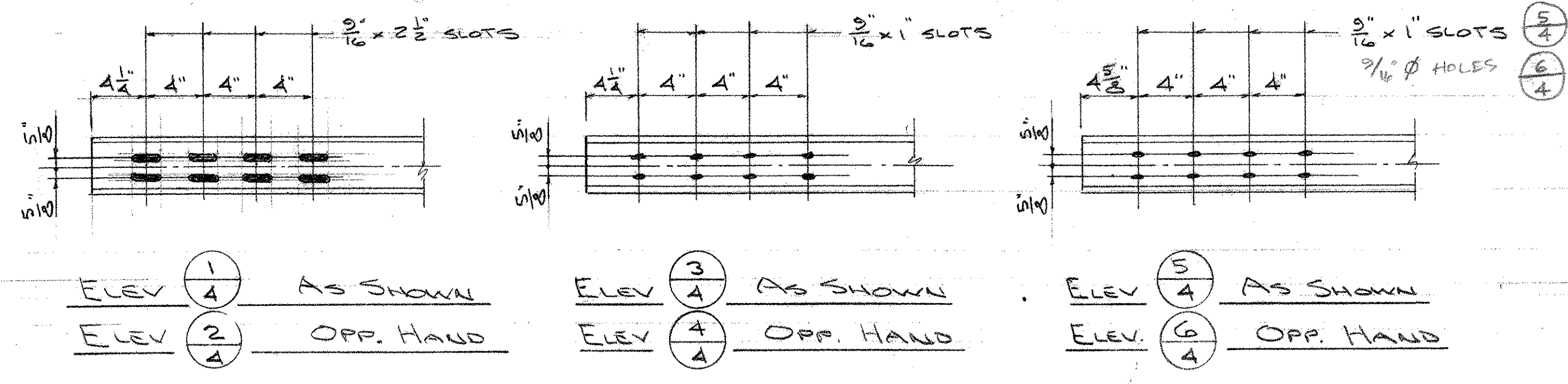
SECTION 1/3

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 OK'D BY 6/1 OK'D BY 8/20/14
 AUG 25 2014
 RESUBMIT AS SHOWN APPROVED AS SHOWN
 BY DATE

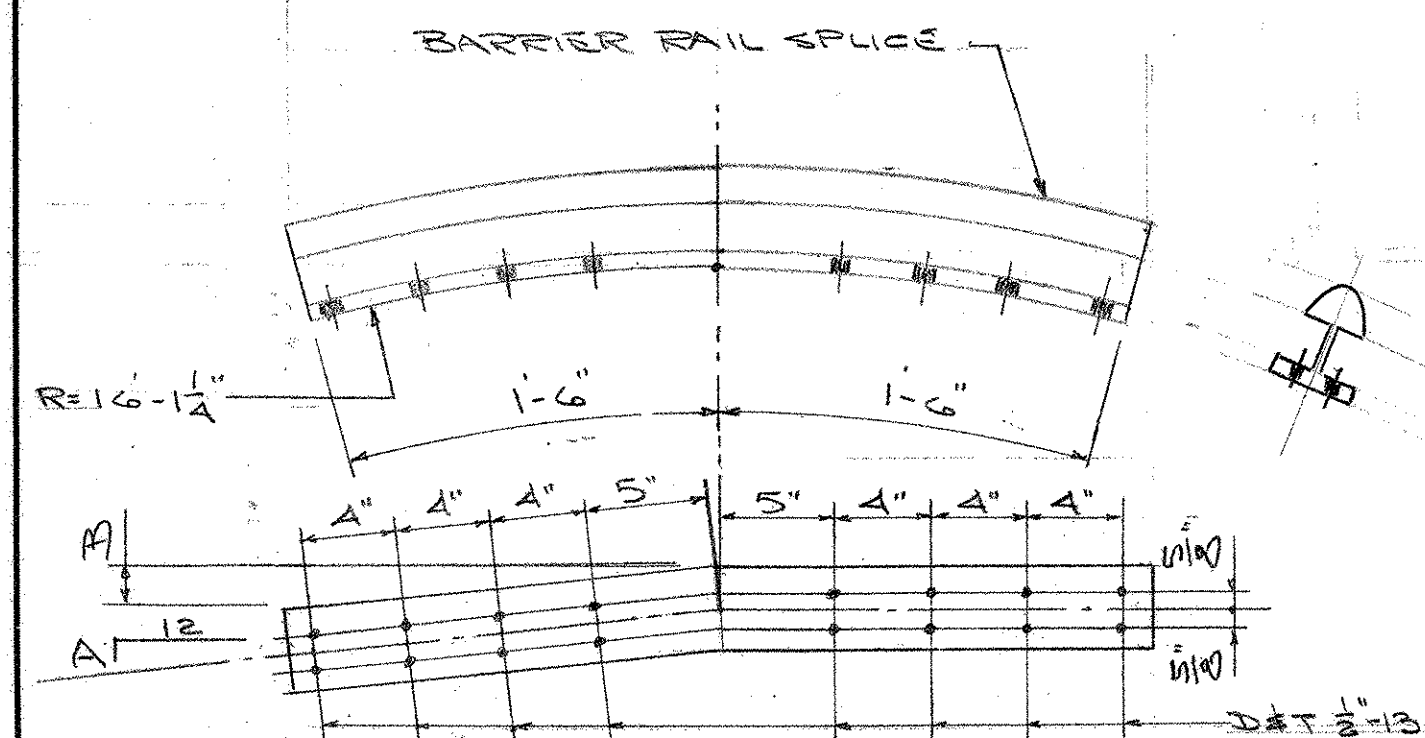
AUCIELLO IRON WORKS INC 560 MAIN ST. HUDSON, MA (978) 568-8382	
VT. AGENCY OF TRANSPORTATION ROCKINGHAM #TH2-9103 T.H. 2 OVER BEAVER BROOK	
ALUM. BRIDGE & APPROACH RAILING	
SURFACE PREP: NONE	FINISH: MILL FINISH
FOR: FR. LAFAYETTE, INC.	
DRAWN 8-10-04 CHK'D 8-18-04 JOB NO. AB40019-1001	DWG NO. BR-2836 SHEET 3 OF 7



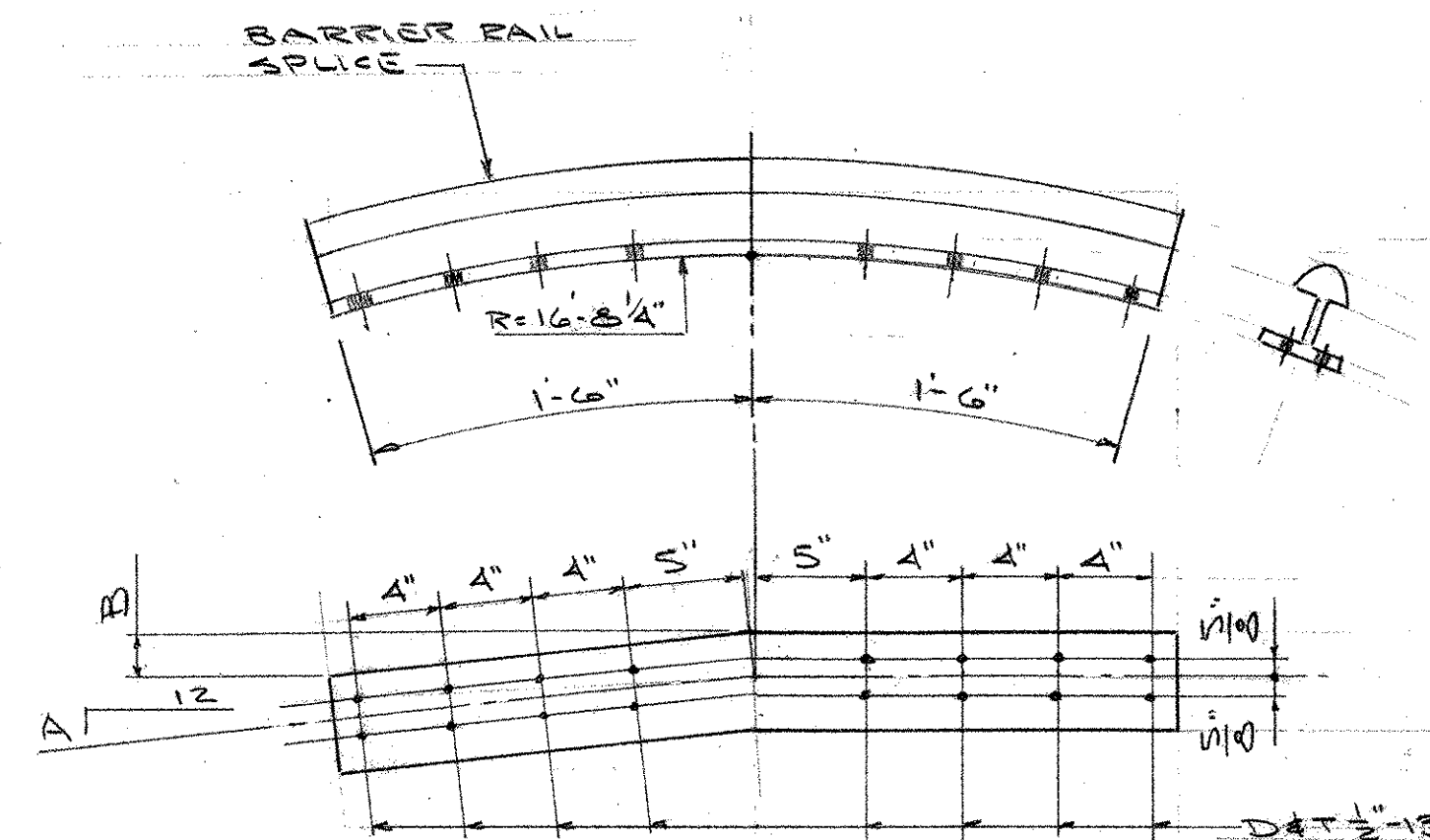
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 OK'D BY CB OK'D BY B. 2004
 AUG 25 2004
 RESUBMIT _____ APPROVED _____
 BY _____ DATE _____



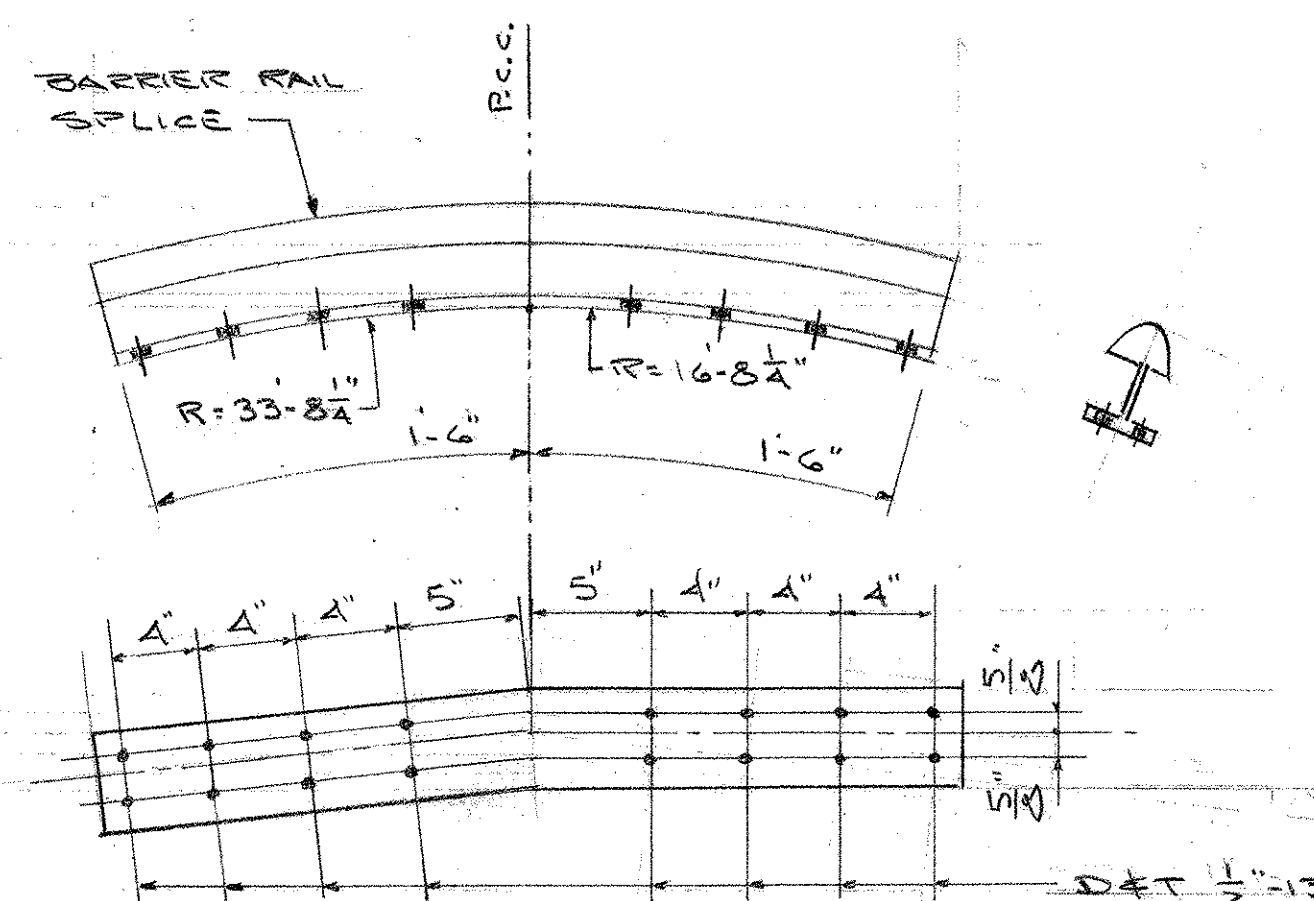
AUCIELLO IRON WORKS INC 560 MAIN ST. HUDSON, MA (978) 568-8382			
VT. AGENCY OF TRANSPORTATION ROCKINGHAM #TH2-9103 ILL. 2 OVER BEAVER BROOK			
ALUM. BRIDGE & APPROACH RAILING			
SURFACE PREP: NONE		FINISH: MILL FINISH	
FOR: R. LAFAYETTE, INC.		DR: WM 8-11-04 DWG NO.	
CHK: S 8-18-04		BR-2836	
JOB NO.		SHEET 4 OF 7	
1	8-19-04	FOR APPROVAL	BY
ISSUE	DATE	DESCRIPTION	DATE



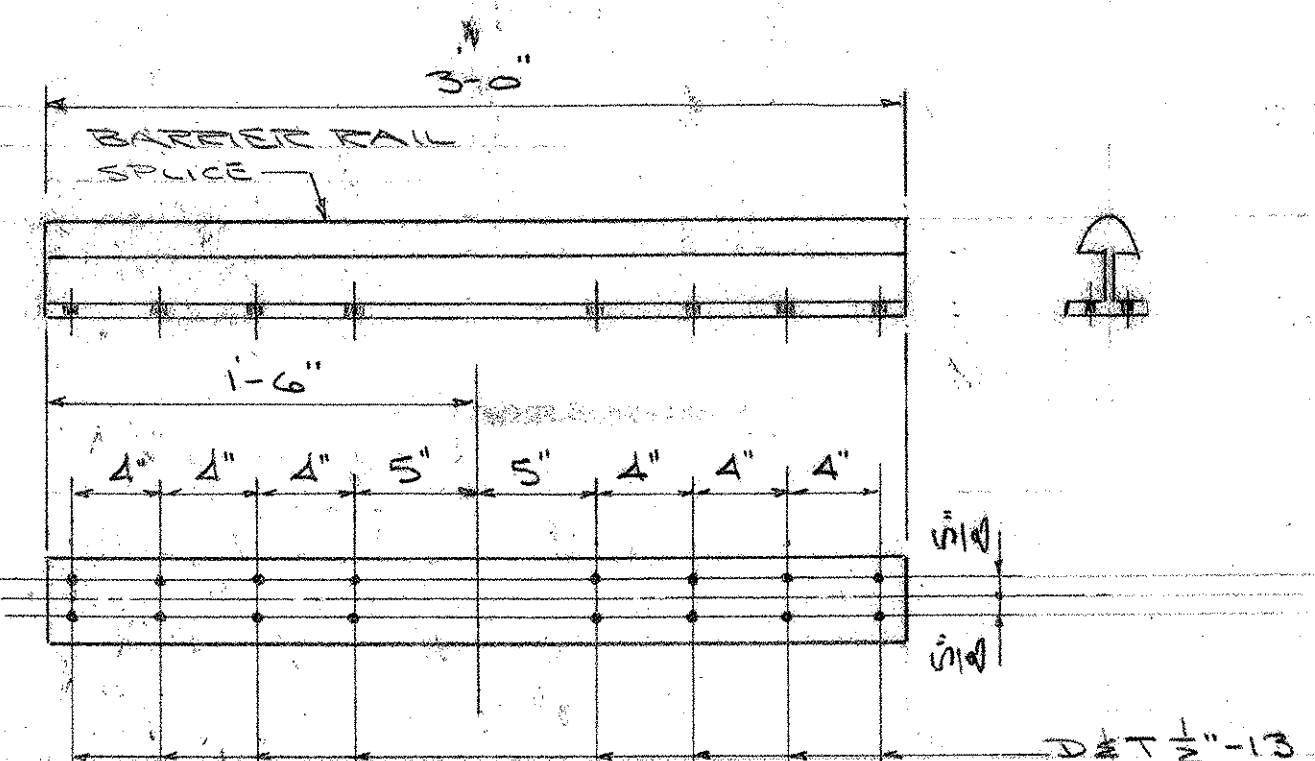
	MK	QUAN	A	B
TOP	T6	1	5/16"	7/16"
BOT	T7	1	1/16"	1/8"



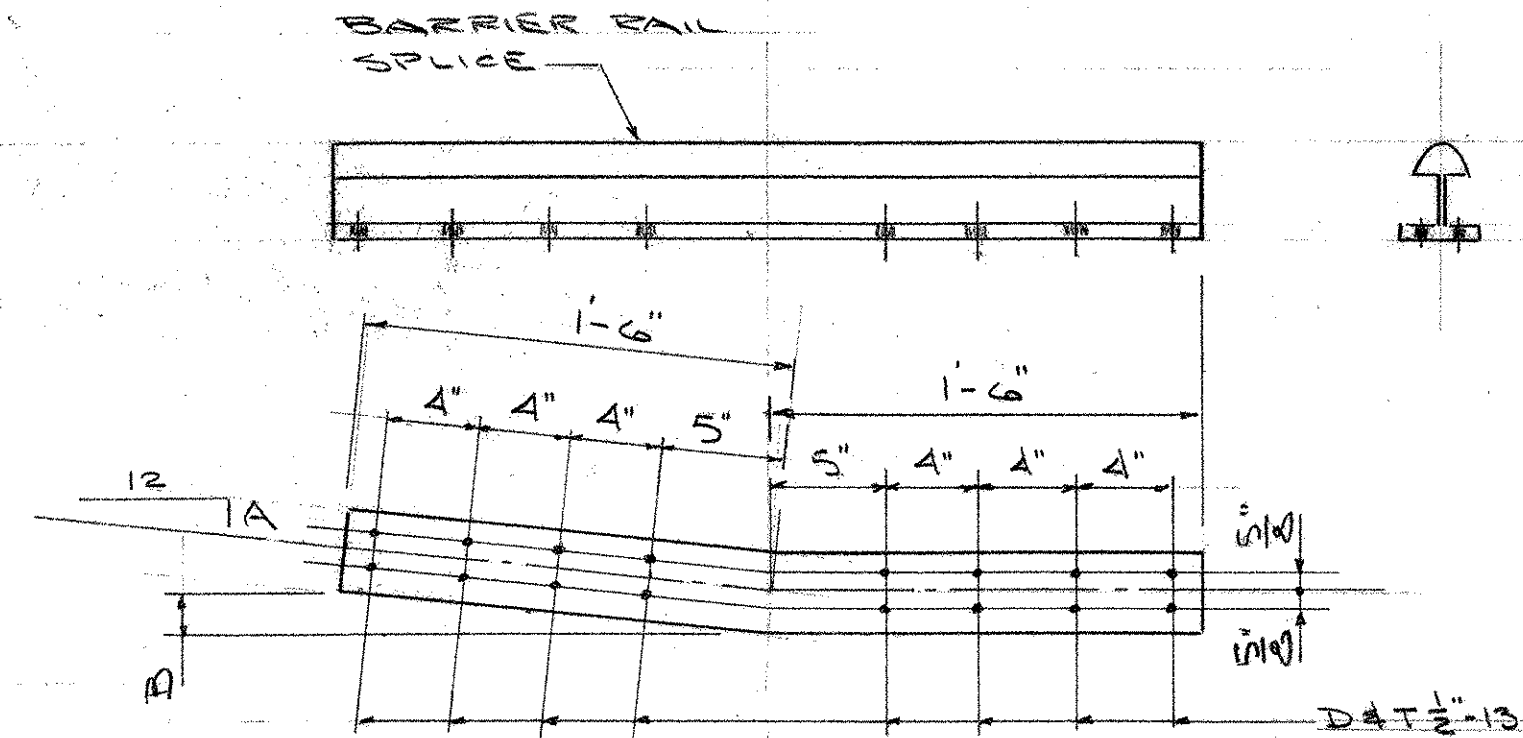
	MK	QUAN	A	B
TOP	T8	1	5/16"	7/16"
BOT	T9	1	1/16"	1/8"



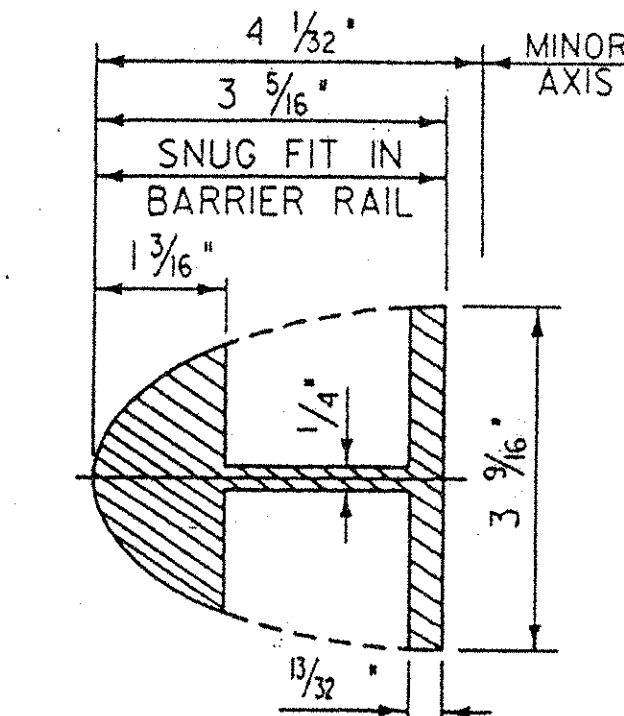
	MK	QUAN	A	B
TOP	T10	1	3/16"	13/16"
BOT	T11	1	3/16"	7/16"



T1 (2-Repd)



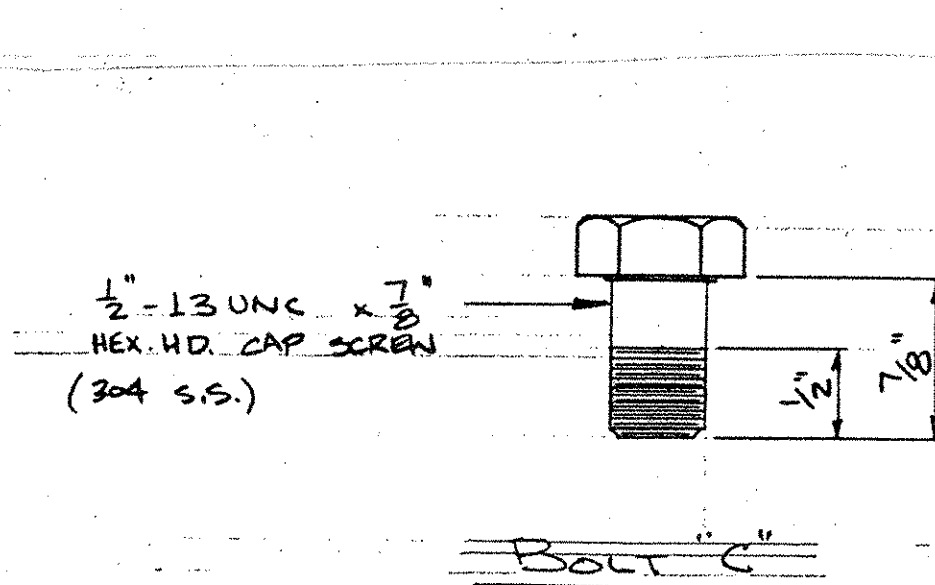
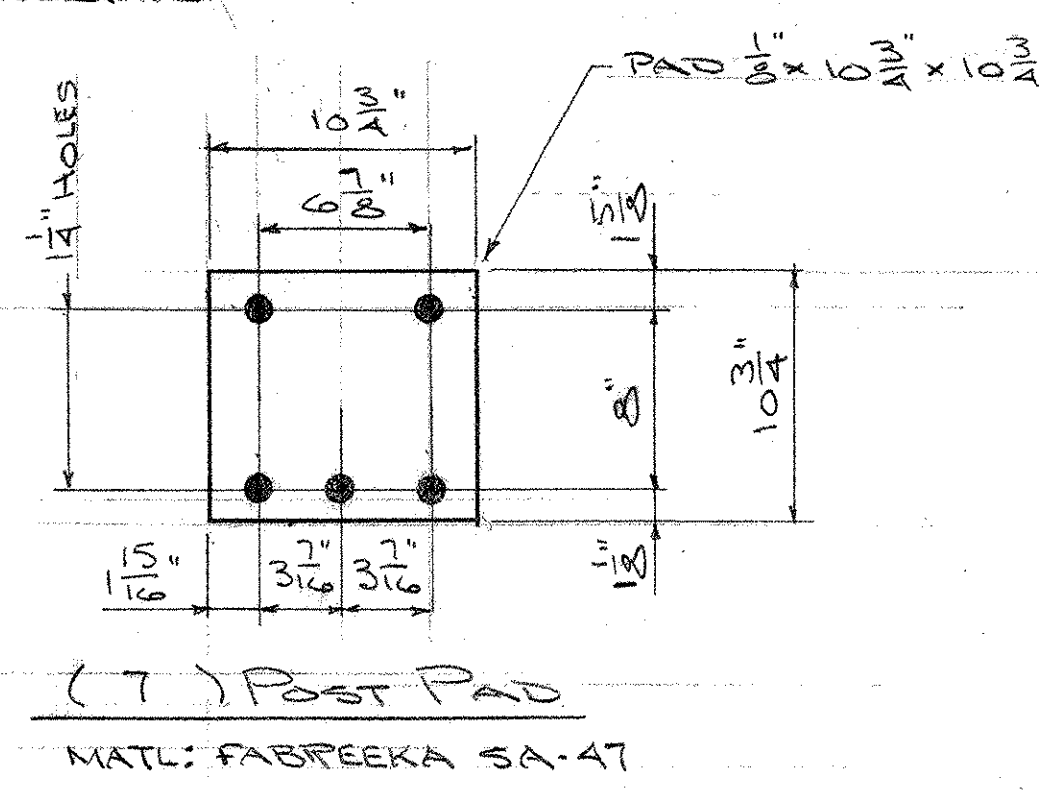
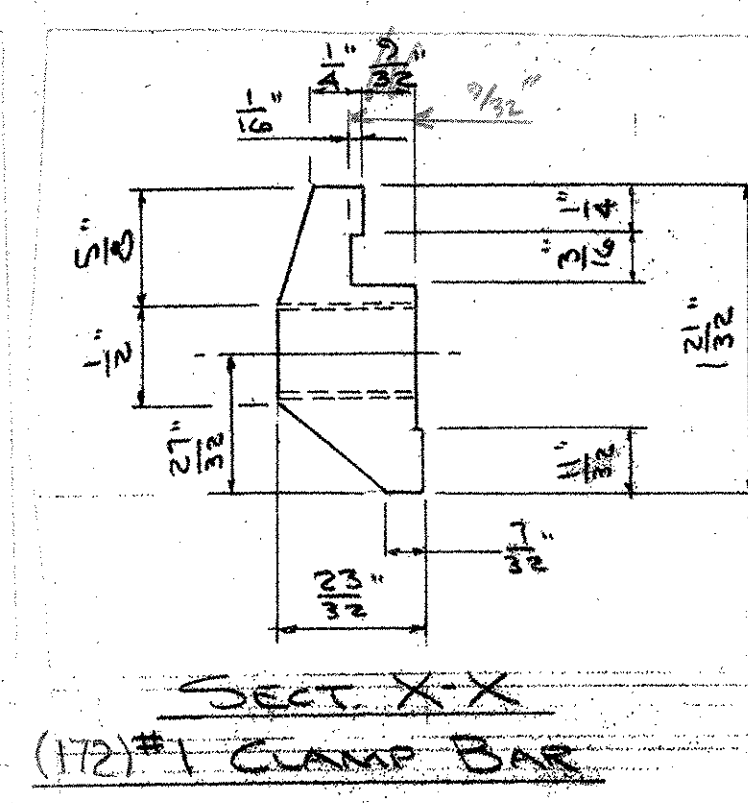
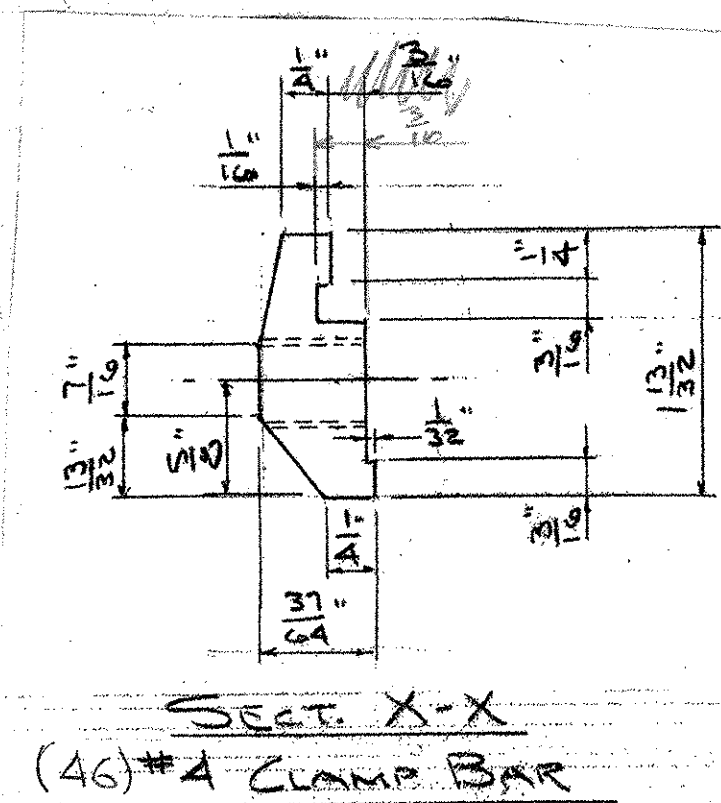
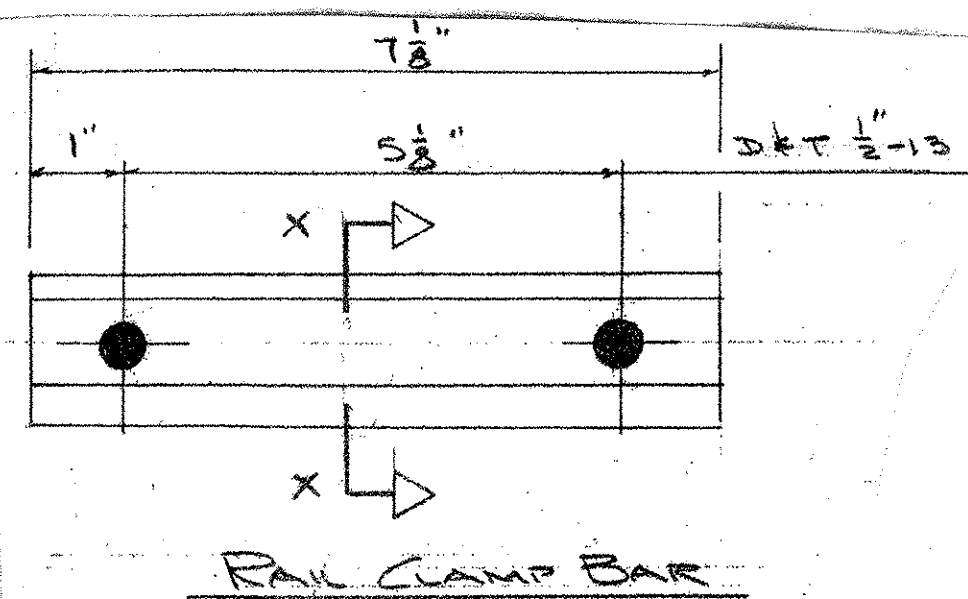
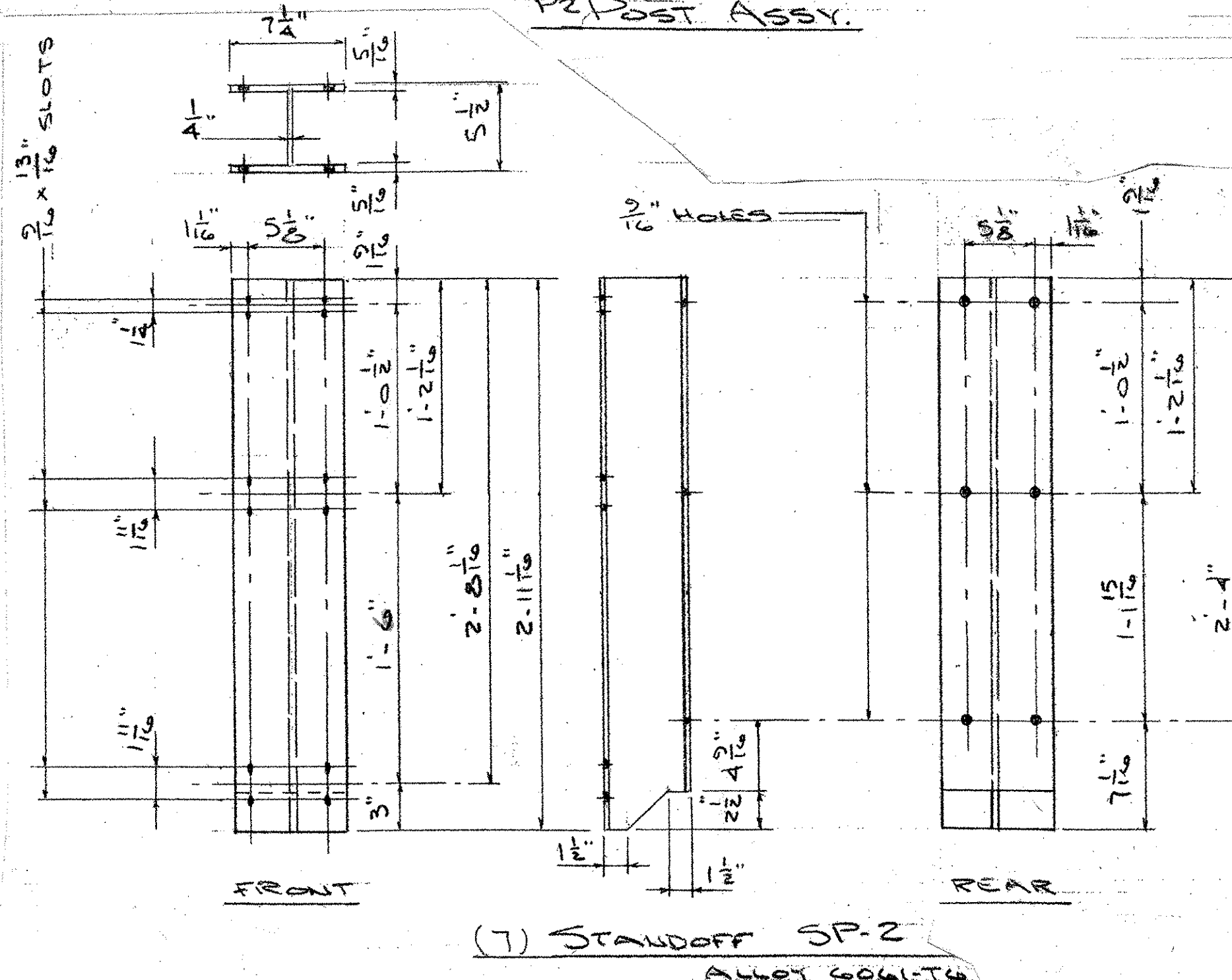
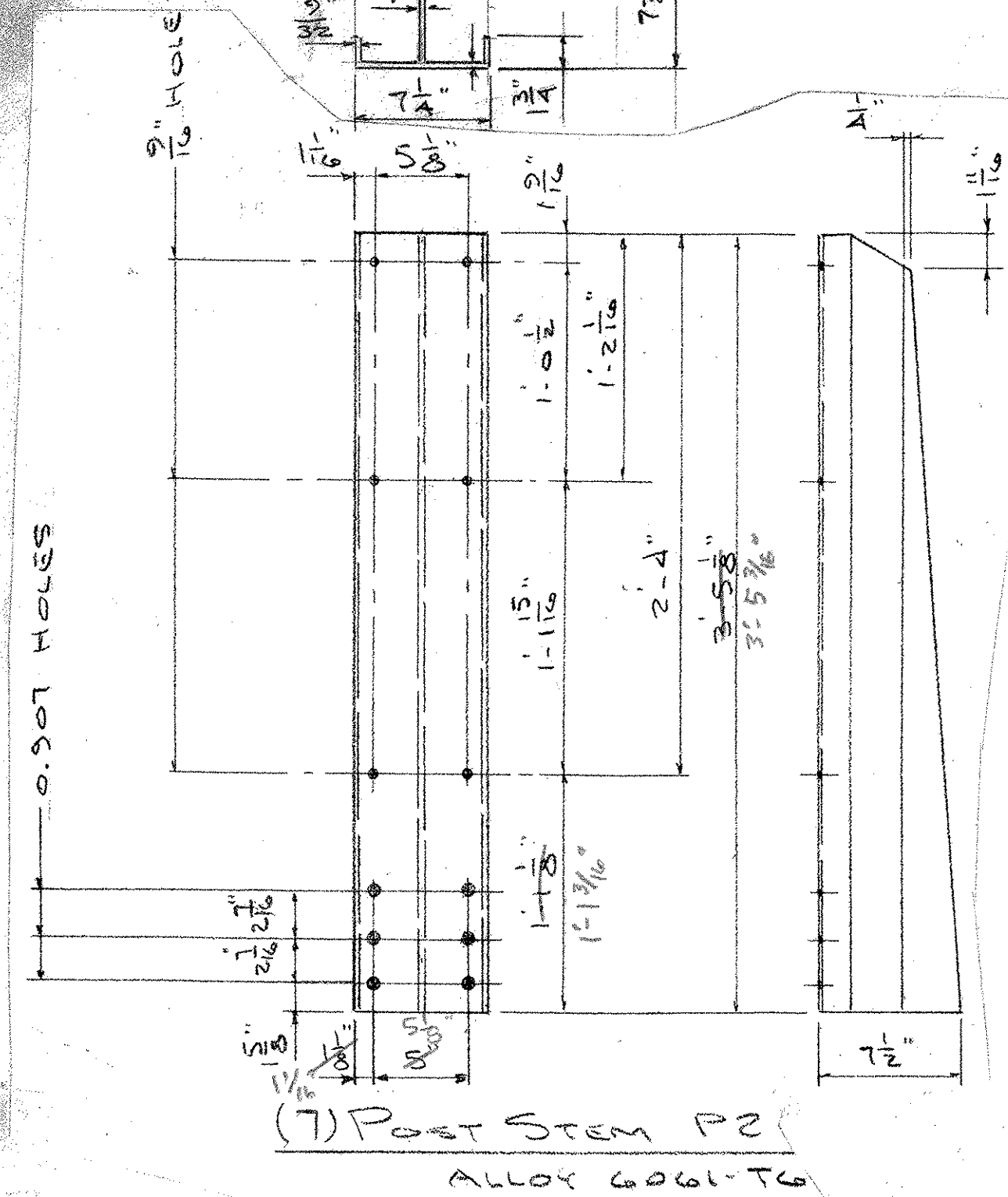
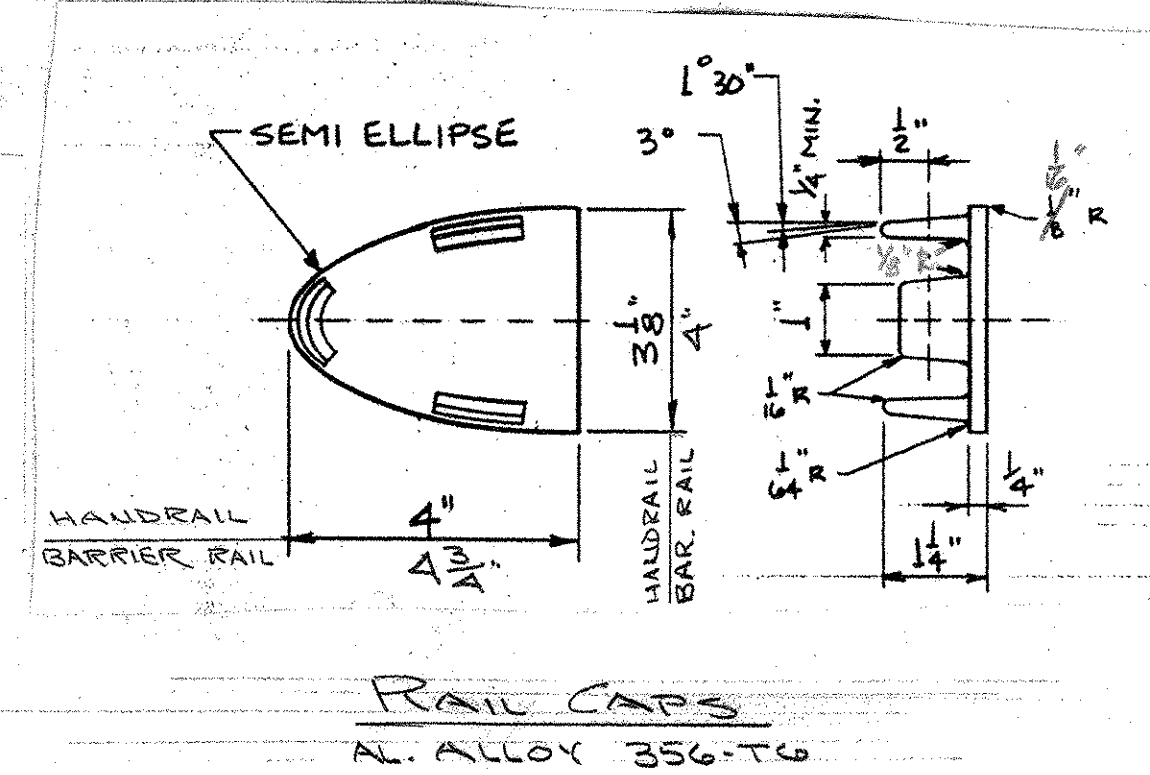
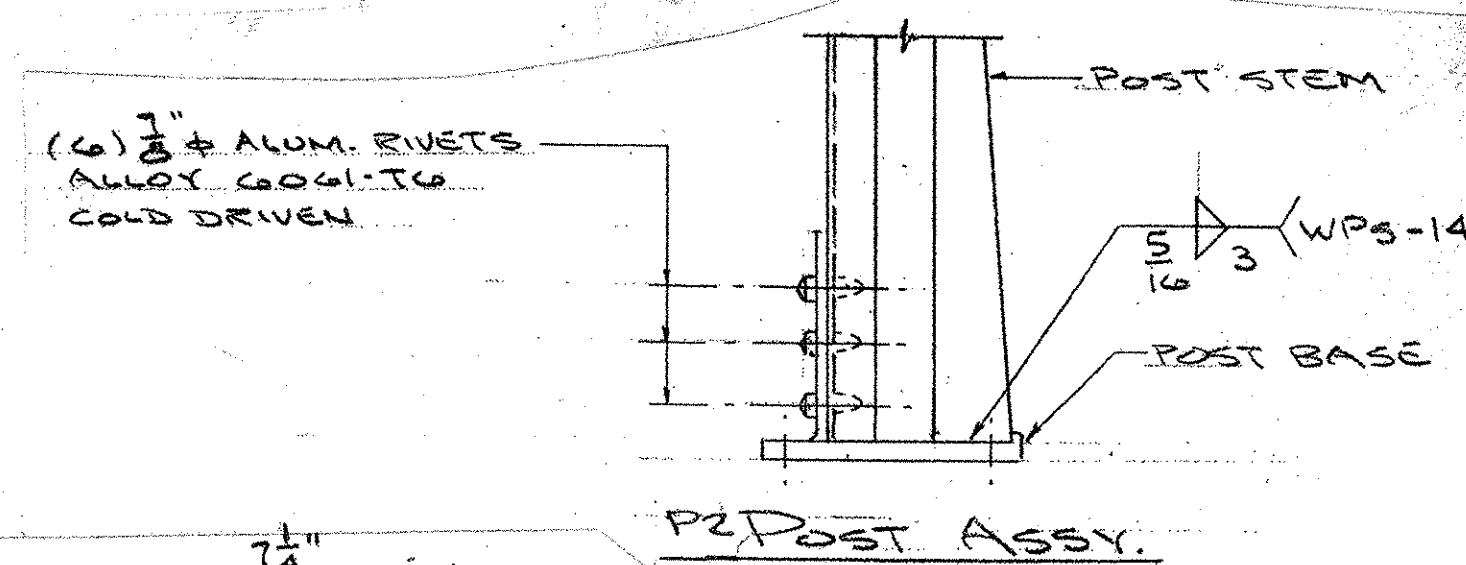
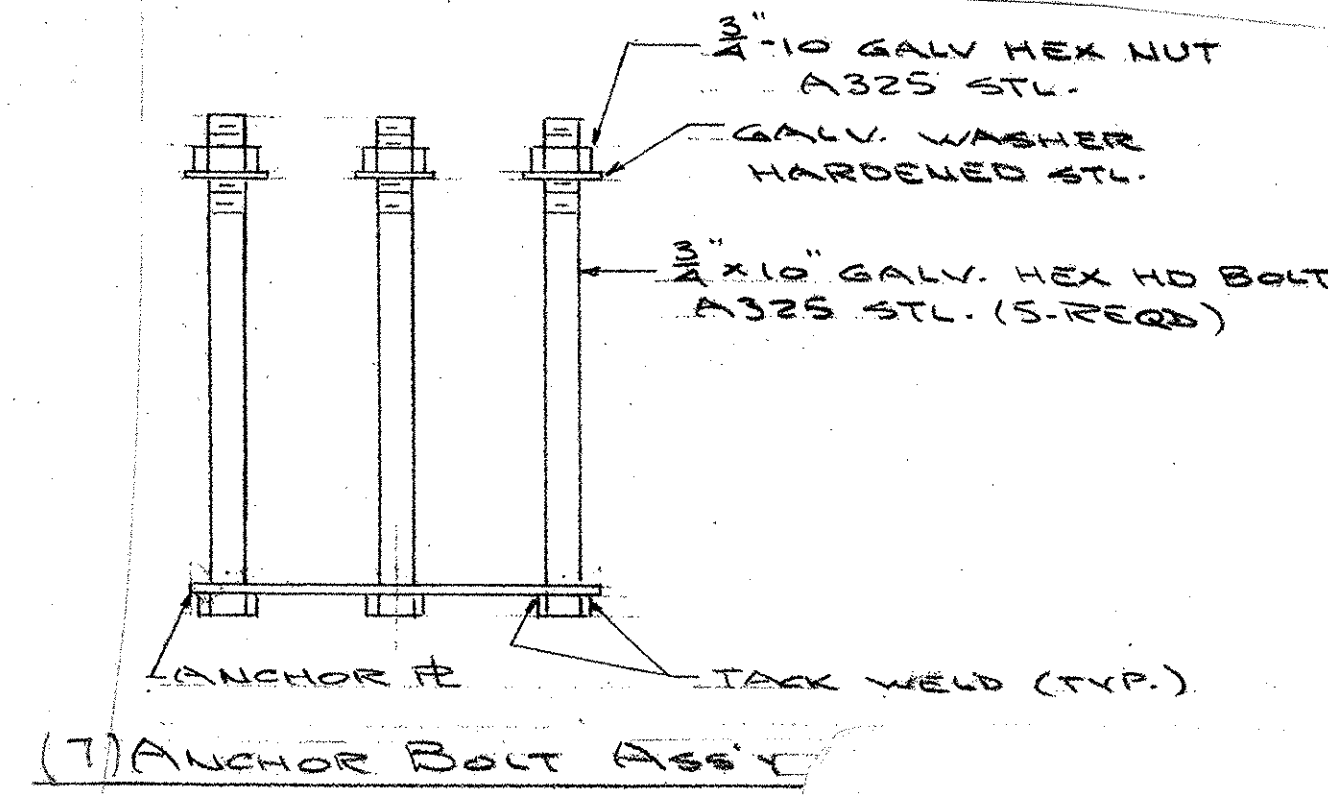
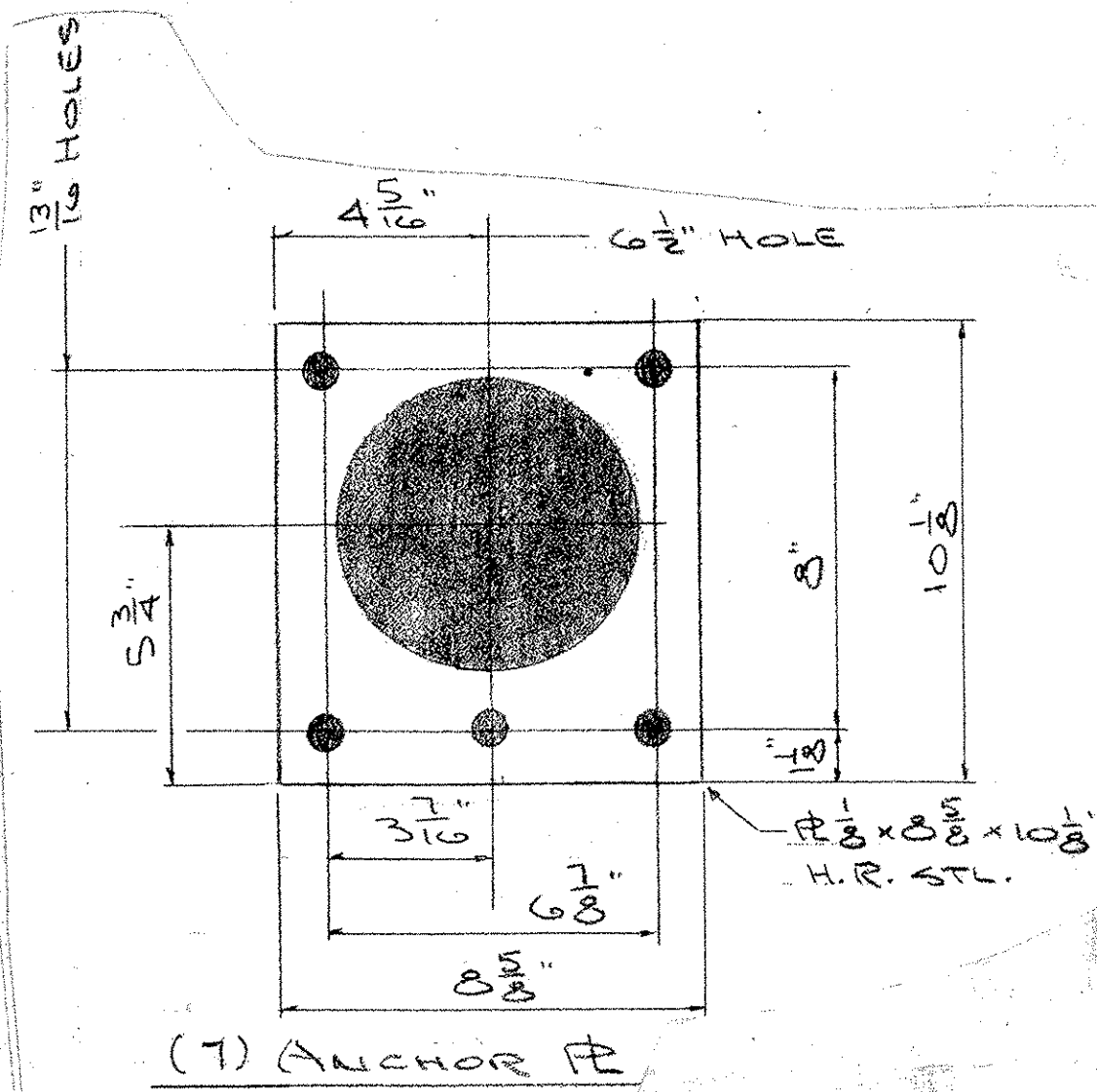
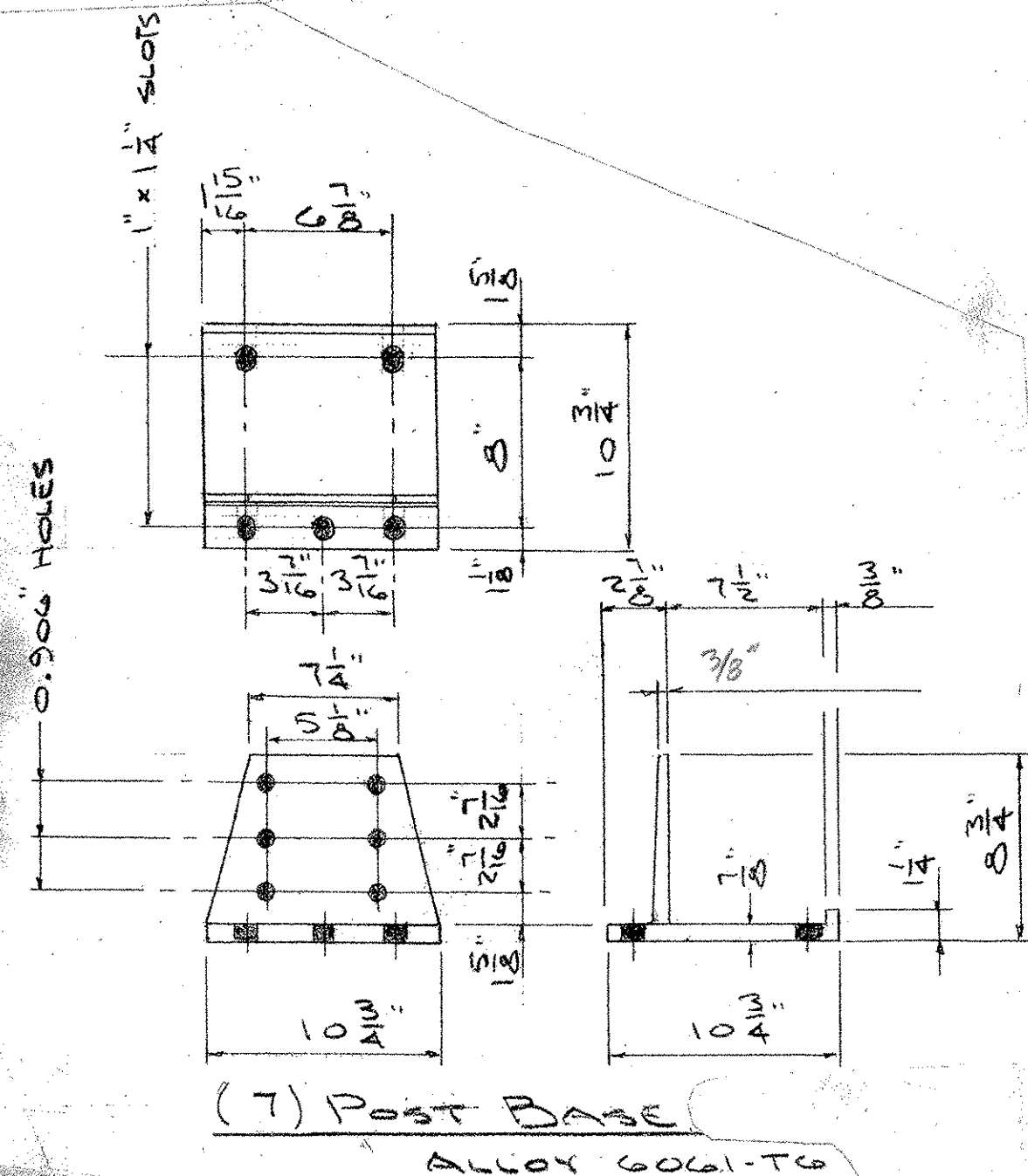
	MK	QUAN	A	B
TOP	T2	1	1/2"	3/4"
BOT	T3	1	5/16"	7/16"
TOP	T4	1	1/2"	3/4"
BOT	T5	1	5/16"	7/16"



BARRIER RAIL
SPlice SECTION

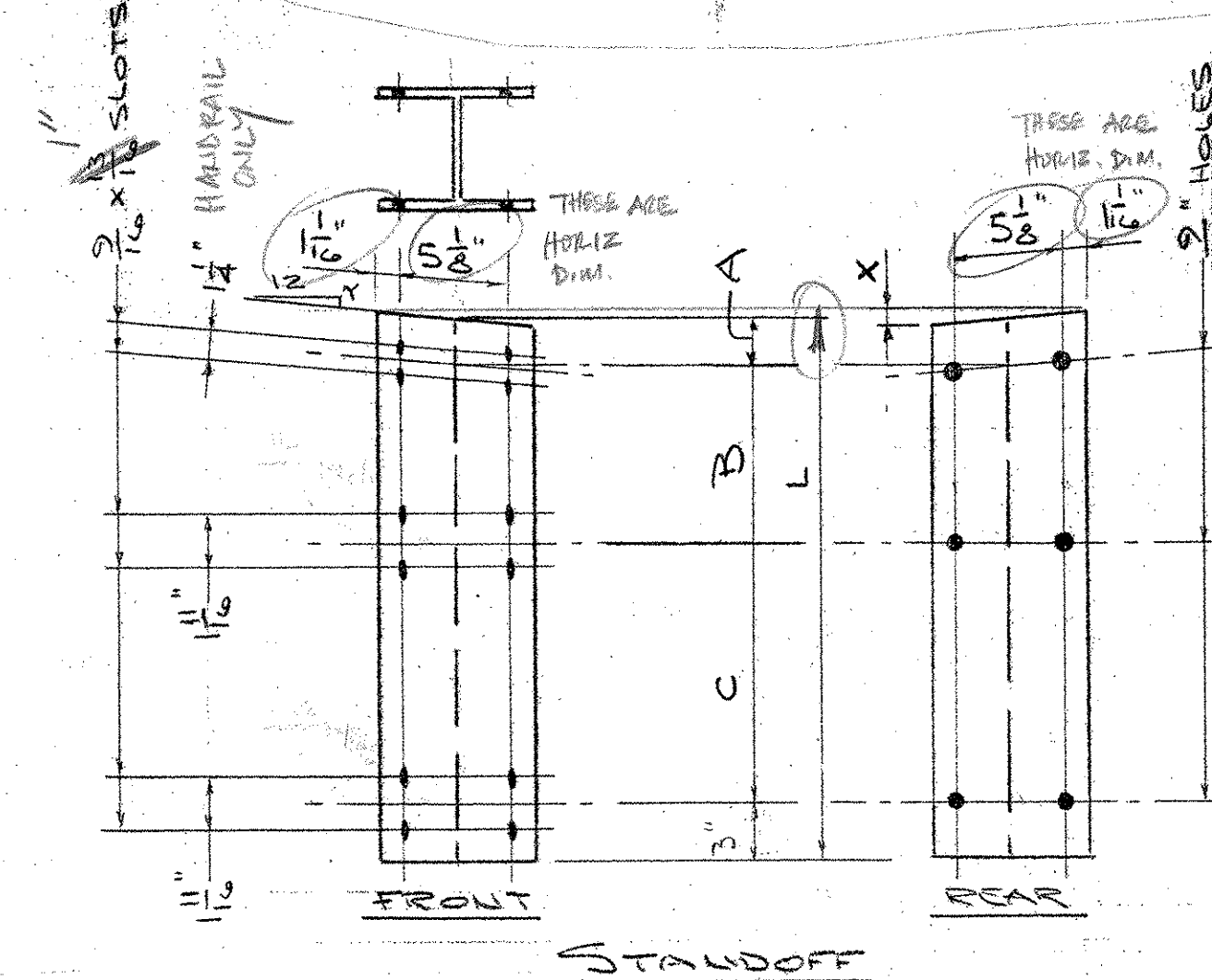
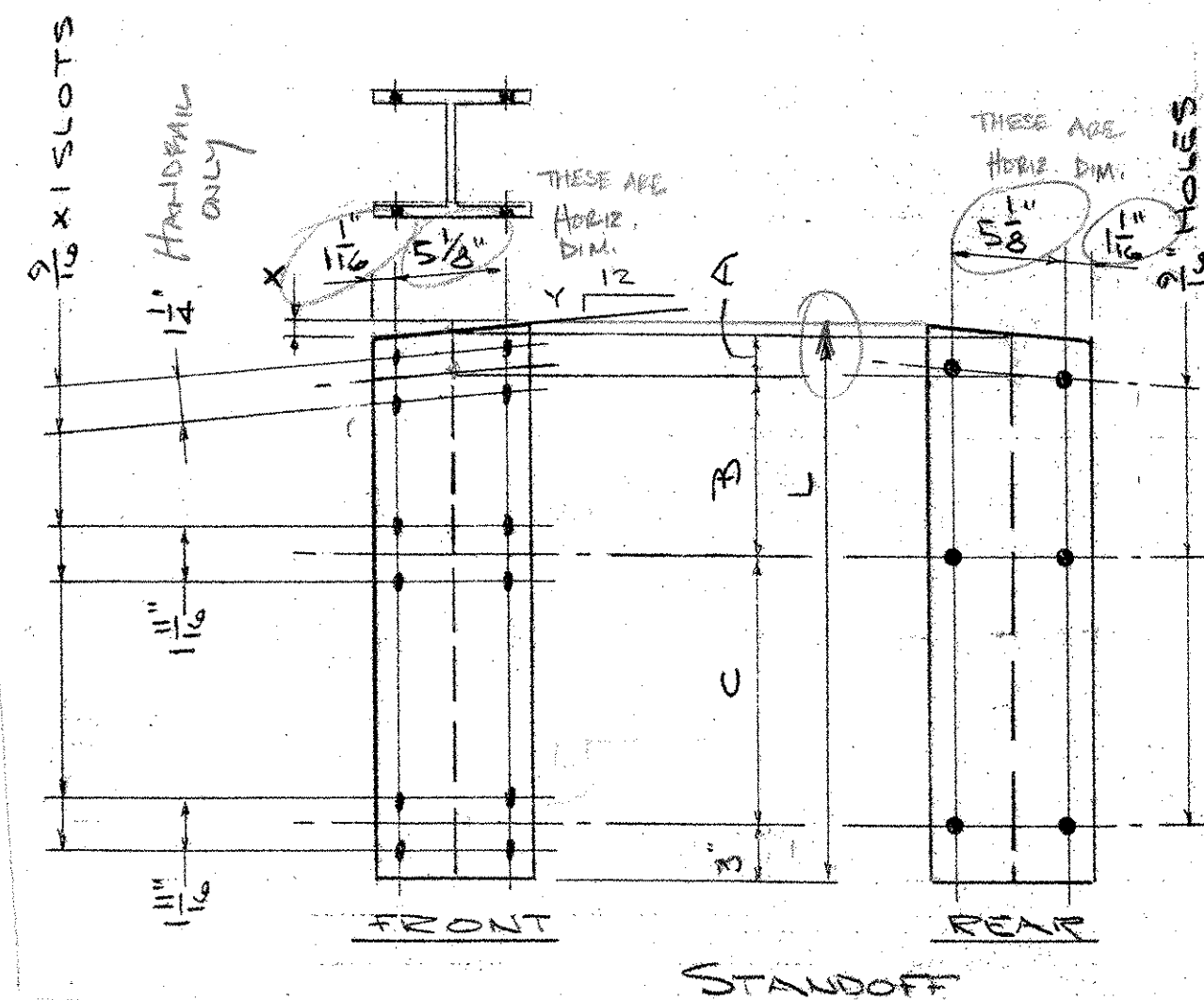
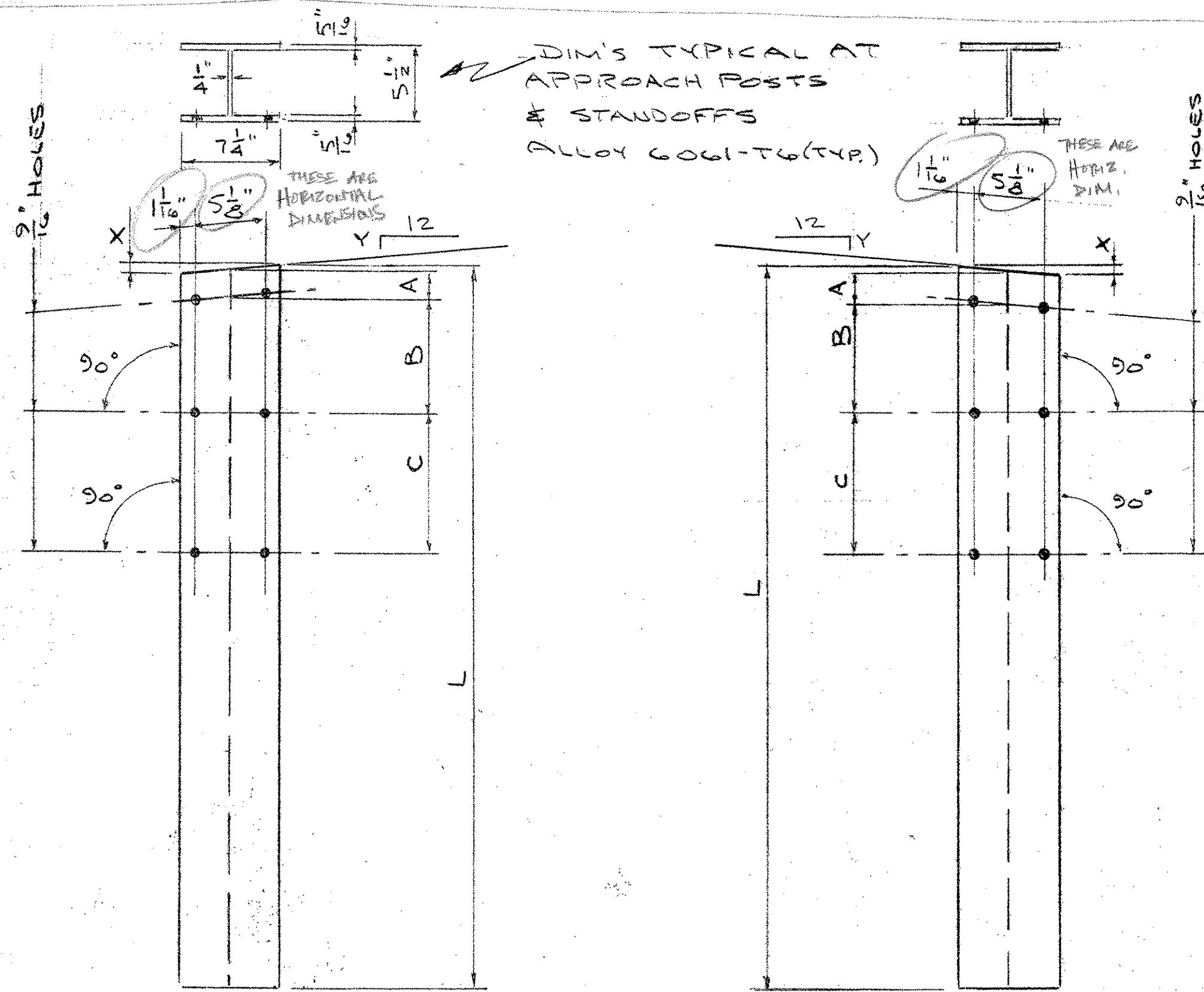
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AUG 25 2004
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BY X DATE

AUCIELLO IRON WORKS INC 560 MAIN ST. HUDSON, MA (978) 568-8382	
VT. AGENCY OF TRANSPORTATION ROCKINGHAM #TH2-5103 I.H.2 OVER BEAVER BROOK	
ALUM. BRIDGE & APPROACH RAILING SURFACE PREP: NONE FINISH: MILL FINISH FOR: F.R. LAFAYETTE, INC. DR. WA 8-11-04 DWG. NO. CHK 5 8-18-04 BR-2836 JOB NO. 0820019-1001 SHEET 5 OF 7	
1 ISSUE DATE 8-19-04	FOR APPROVAL DESCRIPTION BY



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 BY: AS NOTED DATE: AS NOTED

AUCIELLO IRON WORKS INC 560 MAIN ST. HUDSON, MA (978) 568-8382	
VT. AGENCY OF TRANSPORTATION ROCKINGHAM #TH2-9103 T.H. 2 OVER BEAVER BROOK	
ALUM. BRIDGE & APPROACH RAILING	
SURFACE PREP: <u>NONE</u>	FINISH: <u>MILL FINISH</u>
FOR: F.R. LAFAYETTE, INC.	
DR: <u>Wm 8-13-04</u> CHK: <u>8-13-04</u> JOB NO: <u>AP40019-1001</u>	DWG. NO: <u>BR-2836</u> SHEET <u>6</u> OF <u>7</u>



APPROACH POSTS

MK	QUAN	L	X	Y	A	B	C
1L	1	6'-6"	2/16"	7/8"	1 9/16"	11 7/16"	1-5 7/16"
2L	1					9 3/4"	1-4 1/16"
3L	1					8 1/8"	1-3 5/8"
4L	1					6 7/16"	1-2 3/4"
5L	1	6'-0"	3/16"	5/16"	2"	1-1 9/16"	0
6L	1					1-0 3/8"	
7L	1					11 3/16"	
8L	1	6'-6"	5/8"	1 1/16"	1 1/16"	11 7/16"	1-5 9/16"
9L	1					9 3/4"	1-4 7/8"
10L	1					8 1/8"	1-4 1/16"
11L	1					6 7/16"	1-3 1/2"
12L	1	6'-0"	3/8"	1/2"	2"	1-2 3/4"	0
13L	1					1-1 5/8"	
14L	1					1-0 3/4"	
15	8		0	0		1-0 1/2"	

MK	QUAN	L	X	Y	A	B	C
1R	1	6'-6"	2/16"	7/8"	1 9/16"	11 7/16"	1-5 7/16"
2R	1					9 3/4"	1-4 1/16"
3R	1					8 1/8"	1-3 5/8"
4R	1					6 7/16"	1-2 3/4"
5R	1	6'-0"	3/16"	5/16"	2"	1-1 9/16"	0
6R	1					1-0 3/8"	
7R	1					11 3/16"	
8R	1	6'-6"	5/8"	1 1/16"	1 1/16"	11 7/16"	1-5 9/16"
9R	1					9 3/4"	1-5 3/8"
10R	1					7 5/8"	1-4 1/16"
11R	1					6 7/16"	1-3 3/4"
12R	1	6'-0"	3/8"	1/2"	2"	1-2 3/4"	0
13R	1					1-1 5/8"	
14R	1					1-0 3/4"	

MK	QUAN	L	X	Y	A	B	C
ST1L	1	2-9 7/16"	3/16"	1/8"	1 9/16"	11 7/16"	1-5 7/16"
ST2L	1	2-6 7/8"				9 3/4"	1-4 1/16"
ST3L	1	2-4 5/16"				8 1/8"	1-3 5/8"
ST4L	1	2-1 3/4"				6 7/16"	1-2 3/4"
ST5L	1	1-5 5/8"	3/16"	5/16"	2"	1-1 9/16"	0
ST6L	1	1-5 3/8"				1-0 3/8"	
ST7L	1	1-4 3/16"				11 3/16"	
ST8L	1	2-9 7/16"	3/16"	1/8"	1 9/16"	11 7/16"	1-5 7/16"
ST9L	1	2-7 3/16"				9 3/4"	1-4 1/16"
ST10L	1	2-4 7/16"				8 1/8"	1-4 1/16"
ST11L	1	2-2 1/2"				6 7/16"	1-3 1/2"
ST12L	1	1-7 7/16"	3/16"	1/2"	2"	1-2 3/4"	0
ST13L	1	1-6 5/8"				1-1 5/8"	
ST14L	1	1-5 3/4"				1-0 3/4"	
ST15L	8	1-5 1/2"				1-0 1/2"	

MK	QUAN	L	X	Y	A	B	C
ST1R	1	2-9 7/16"	3/16"	1/8"	1 9/16"	11 7/16"	1-5 7/16"
ST2R	1	2-6 7/8"				9 3/4"	1-4 1/16"
ST3R	1	2-4 5/16"				8 1/8"	1-3 5/8"
ST4R	1	2-1 3/4"				6 7/16"	1-2 3/4"
ST5R	1	1-5 5/8"	3/16"	5/16"	2"	1-1 9/16"	0
ST6R	1	1-5 3/8"				1-0 3/8"	
ST7R	1	1-4 3/16"				11 3/16"	
ST8R	1	2-9 7/16"	3/16"	1/8"	1 9/16"	11 7/16"	1-5 7/16"
ST9R	1	2-7 3/16"				9 3/4"	1-4 1/16"
ST10R	1	2-4 7/16"				7 5/8"	1-4 1/16"
ST11R	1	2-2 1/2"				6 7/16"	1-3 1/2"
ST12R	1	1-7 7/16"	3/16"	1/2"	2"	1-2 3/4"	0
ST13R	1	1-6 5/8"				1-1 5/8"	
ST14R	1	1-5 3/4"				1-0 3/4"	

RECEIVED
 OK'D BY: G. P. L. OK'D BY: _____
 AUG 25 2004
 RESUBMIT: _____ APPROVED: AS SHOWN
 BY: _____ DATE: _____

AUCIELLO IRON WORKS INC
 560 MAIN ST. HUDSON, MA (978) 568-8382

VT. AGENCY OF TRANSPORTATION
 ROCKINGHAM #TH2-9103
 TH2 OVER BEAVER BROOK

ALUM. BRIDGE & APPROACH RAILING

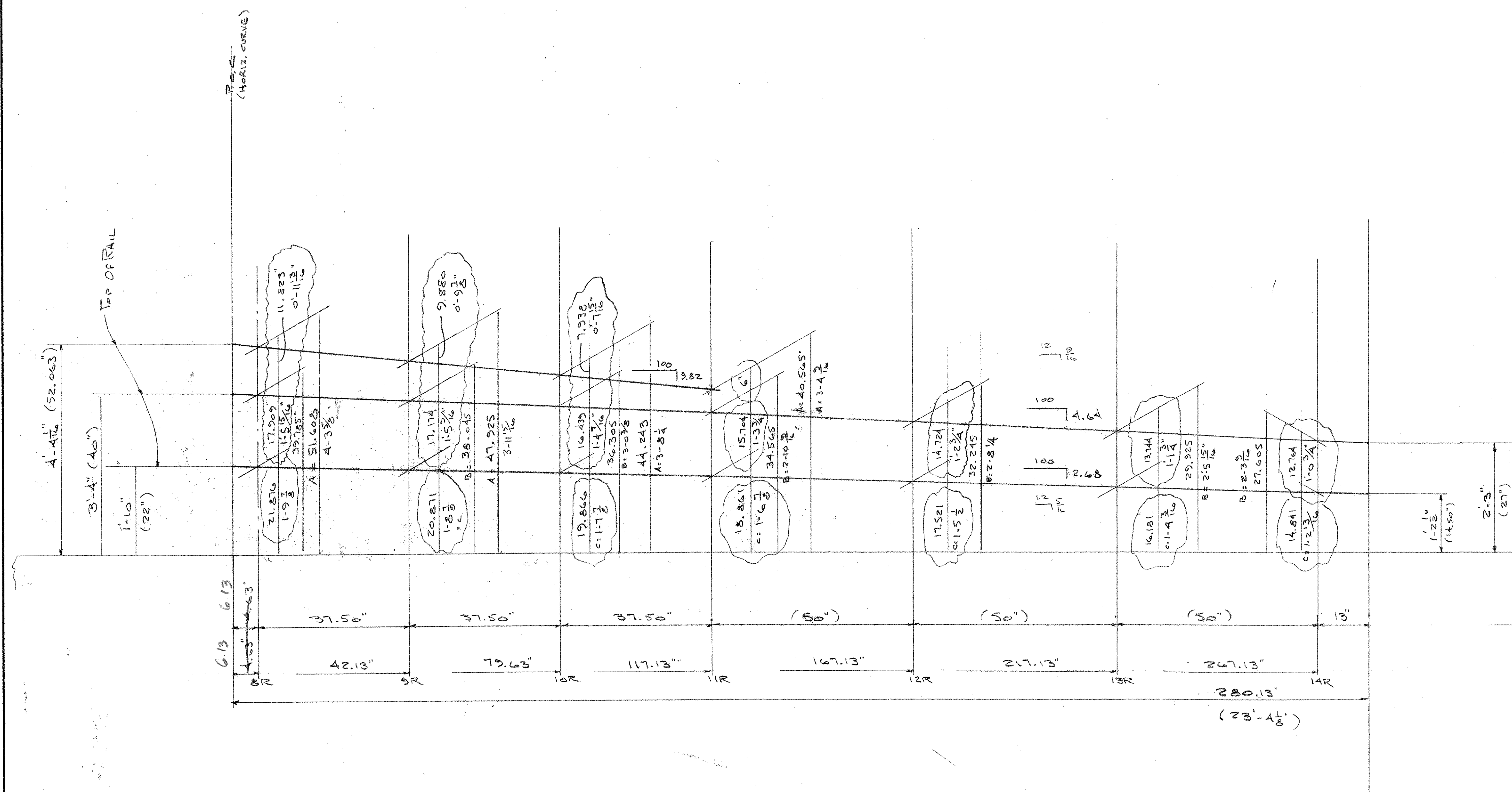
SURFACE PREP: NONE FINISH: MILL FINISH

FOR: F. R. LAFAYETTE, INC.

DR: W. B. B. B. DWG. NO. DR-2836

CHK: W. B. B. B. JOB NO. 1001

ISSUE: 1 DATE: 8-19-04 FOR APPROVAL: _____ SHEET 7 OF 7



ISSUE	DATE	DESCRIPTION	BY	SHEET	OF
			AB40019		

NOTES

GENERAL NOTES:

1. This bridge has been designed for general site conditions. The project engineer shall be responsible for the structure's suitability to the existing site conditions and for the hydraulic evaluation -- including scour and confirmation of soil conditions.
2. Prior to construction, contractor must verify all elevations shown through the engineer.
3. Only CONCRETE SYSTEMS, INC. the CON/SPAN® approved precaster in Vermont may provide the structure designed in accordance with these plans.
4. The use of another precast structure with the design assumptions used for the CON/SPAN® structure may lead to serious design errors. Use of any other precast structure with this design and drawings voids any certification of this design and warranty. CON/SPAN® Bridge Systems Ltd. assumes no liability for design of any alternate or similar type structures.
5. Alternate structures will be considered, provided that signed and sealed design drawings (and calculations) are submitted to the engineer 2 weeks prior to the bid date for review and approval.

DESIGN DATA

Design Loading:

Bridge Units: MS22.5 [HS25-44]

Headwalls: Earth Pressure Only

Wingwalls: Earth Pressure Only

Design Fill Height: 610 [2'-0"] max.

from top of crown to top of pavement.

Design Method: Load factor per AASHTO Specification

Assumed Allowable Soil Bearing: 144 KPa [3000 PSF] (Verify)

MATERIALS

Precast units shall be constructed and installed

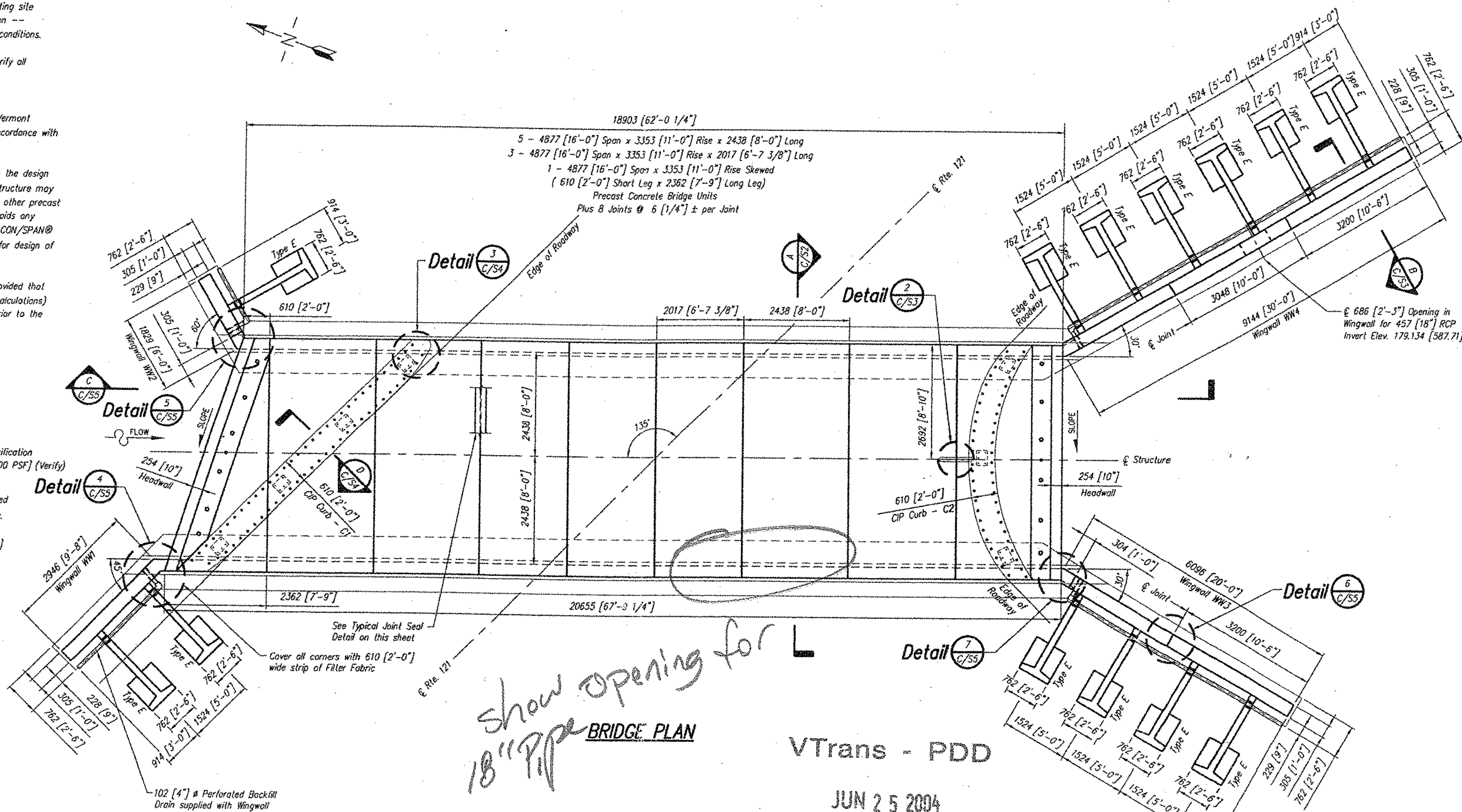
in accordance with CON/SPAN® Specifications.

Concrete for Footings shall have a minimum

compressive strength of 27.6 MPa. [4000 psi.]

Reinforcing steel for Footings shall conform to

ASTM 615, A616 or A617-Grade 60.



show opening for
18" Pipe

BRIDGE PLAN

VTrans - PDD

JUN 25 2004

Structures Design
Section

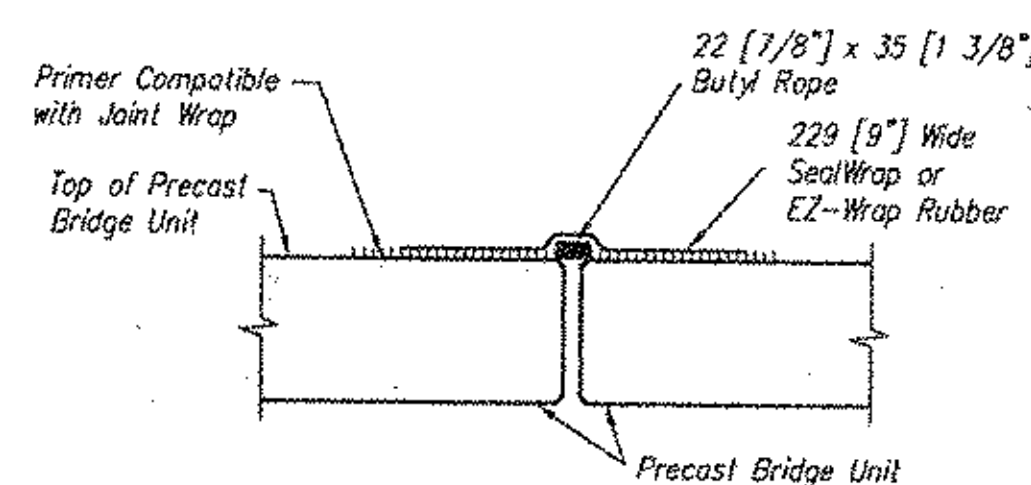
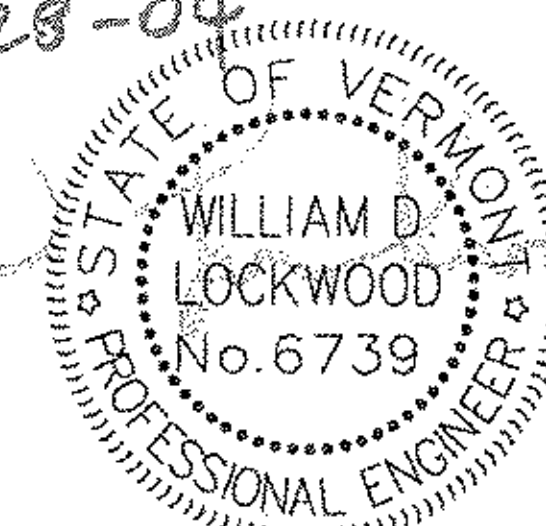
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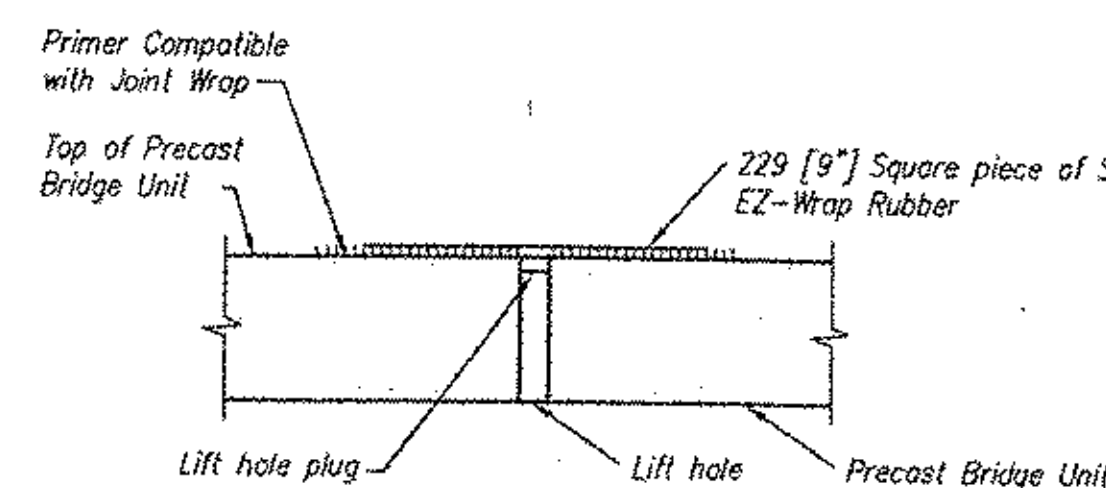
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BY *RLW* DATE *6-28-04*



TYPICAL JOINT SEAL DETAIL

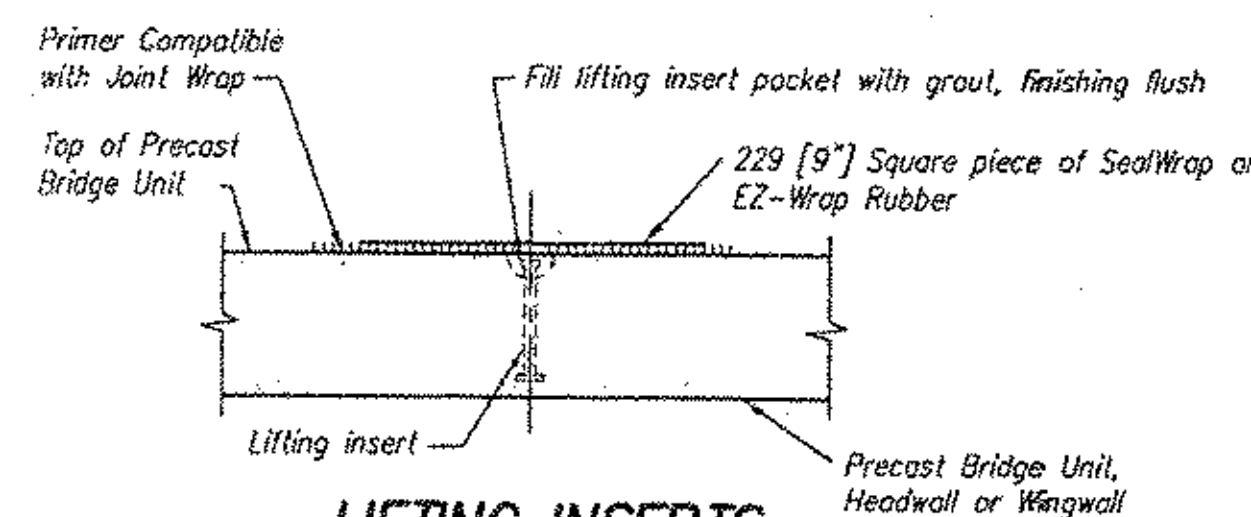
not to scale



LIFTING HOLES

TYPICAL LIFT POINT SEALING DETAIL

not to scale



LIFTING INSERTS

Note: All Metric dimensions are given in millimeters and all elevations are given in meters unless noted otherwise.

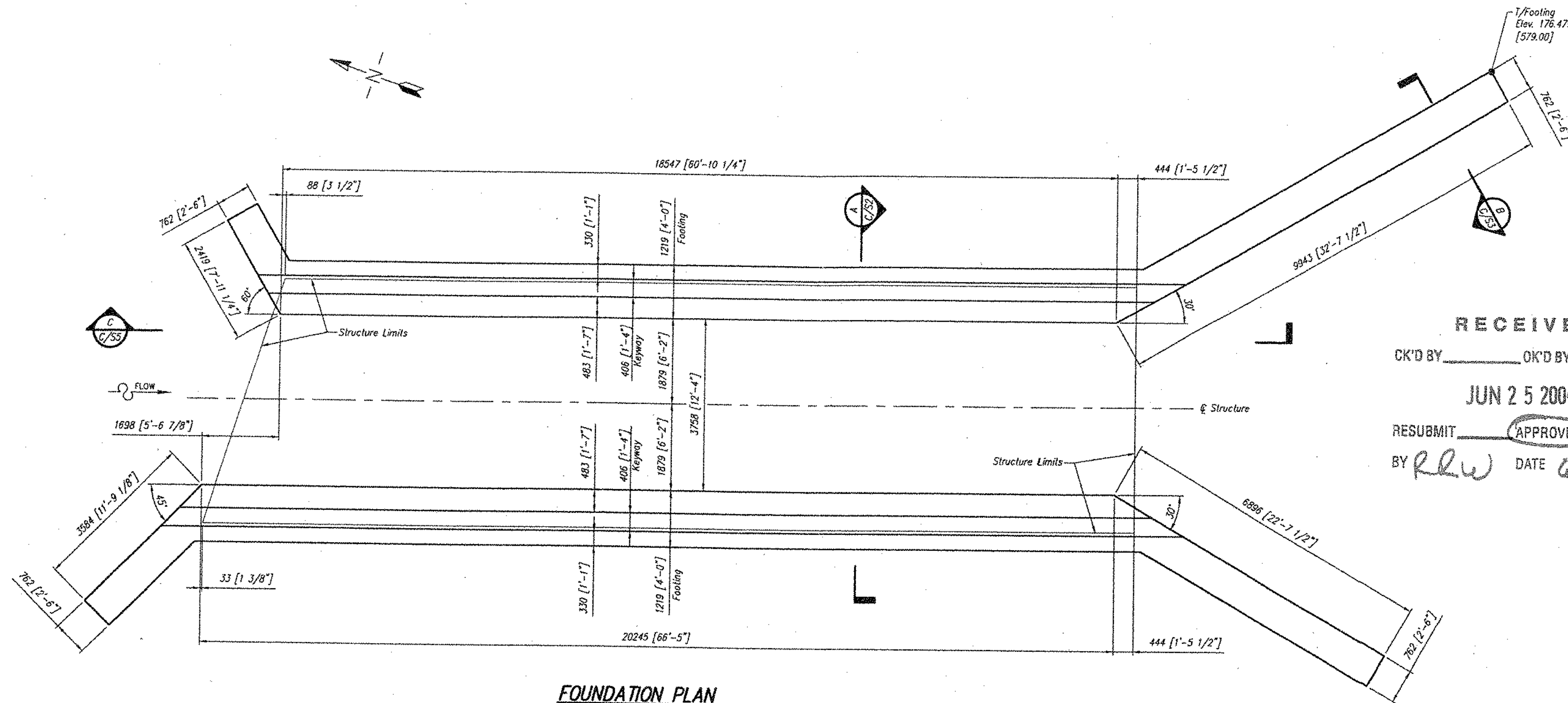
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NO.	REVISIONS
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CONCRETE SYSTEMS, INC.
NEW ENGLAND
800-342-3374

CON/SPAN®
BRIDGE SYSTEMS
3100 Research Blvd., P.O. Box 20266 Dayton, Ohio 45420-0266
Dayton, OH (937) 354-4985 FAX (937) 354-4986 FAX
Dayton, OH (937) 354-4985 FAX (937) 354-4986 FAX
Dayton, OH (937) 354-4985 FAX (937) 354-4986 FAX
Dayton, OH (937) 354-4985 FAX (937) 354-4986 FAX

VERMONT
VT. RTE. 121
BRIDGE NO: 7
ROCKINGHAM
Designed KUG
Drawn JLL
Checked JVP
Date 6/18/04
11415
C/S1



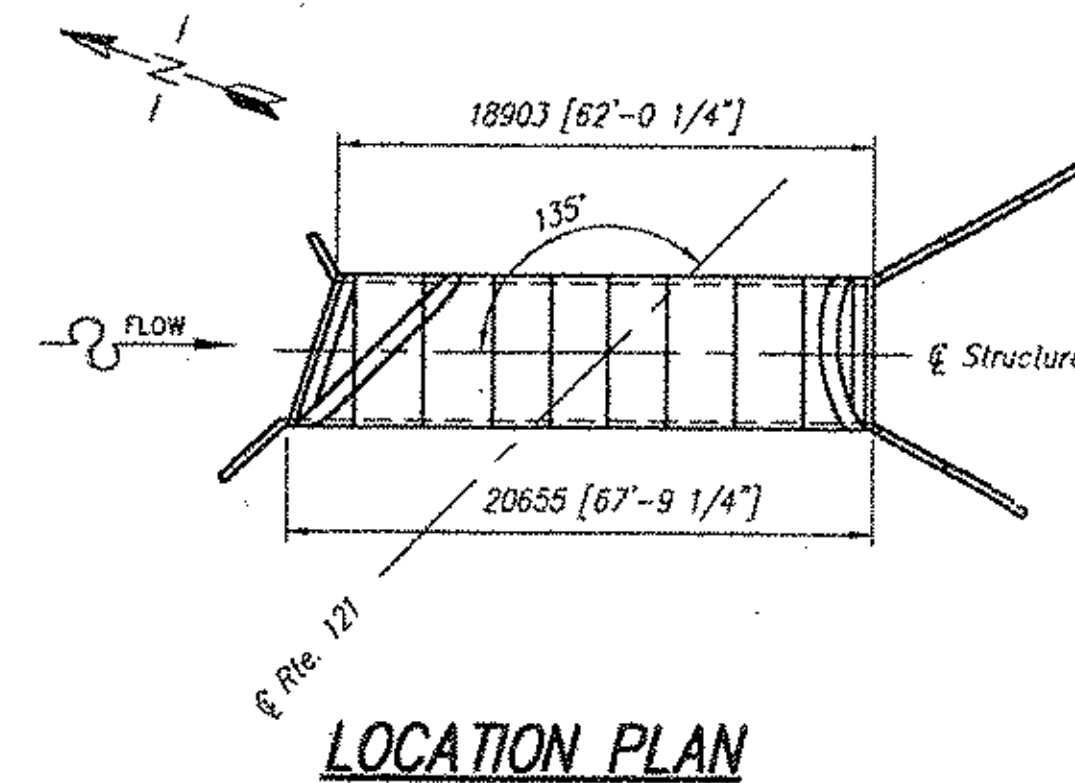
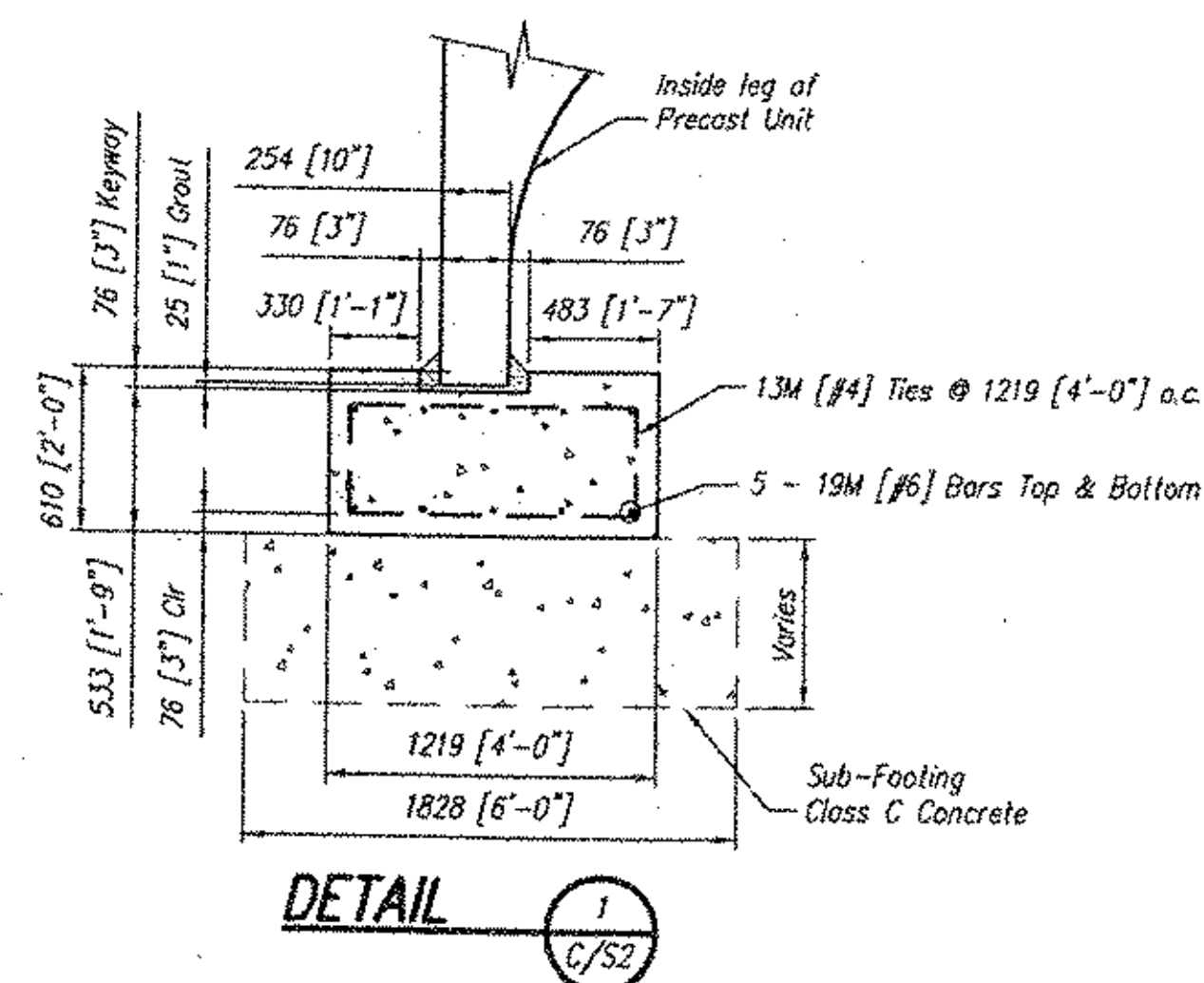
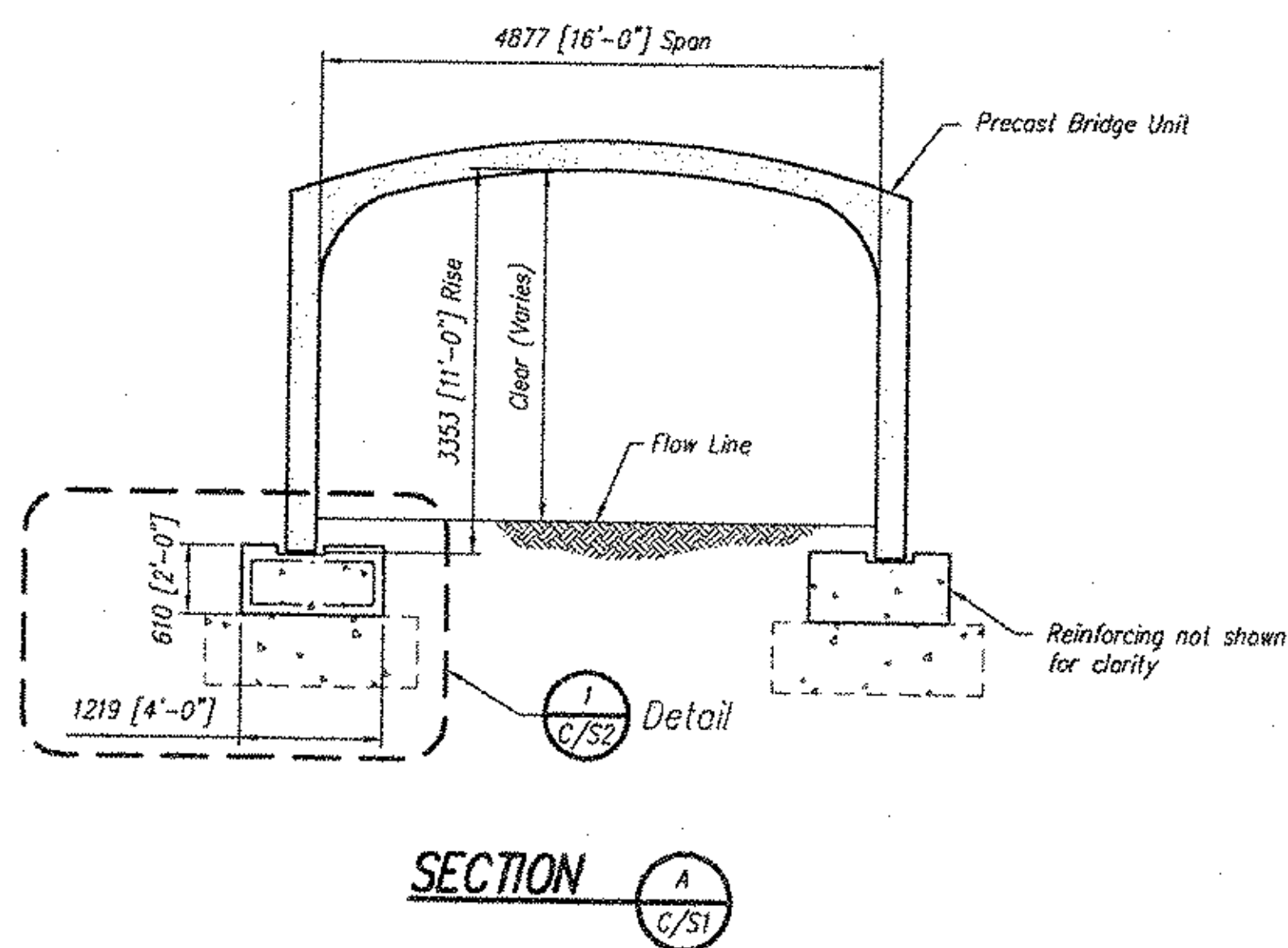
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JUN 25 2004

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BY *RHW* DATE *6-28-04*



Note: All Metric dimensions are given in millimeters and all elevations are given in meters unless noted otherwise.

Note: Lap (914) [3'-0"] 19M (#6) Longitudinal Bars in Wingwall and Bridge Footings to make continuous

STATE OF VERMONT

WILLIAM D. LOCKWOOD

No. 6739

PROFESSIONAL ENGINEER

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The CONSPAN® Bridge System is produced by one or more patents, patents pending and trademarks.

REVISIONS	
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1	8/22/04
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CONCRETE SYSTEMS, INC.

NEW ENGLAND

800-342-3374

CONSPAN® BRIDGE SYSTEMS

3100 Rockwell Blvd., P.O. Box 20286 Dayton, Ohio 45420-0286

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Charlotte, NC (803) 254-2233

Stamford, CA (714) 549-4420

Albany, NY (518) 797-4201

FAX:

Dayton, Ohio 45420-0286 (937) 254-3885

Charlotte, NC (704) 549-8888

Stamford, CA (916) 797-4233

Albany, NY (518) 371-3871

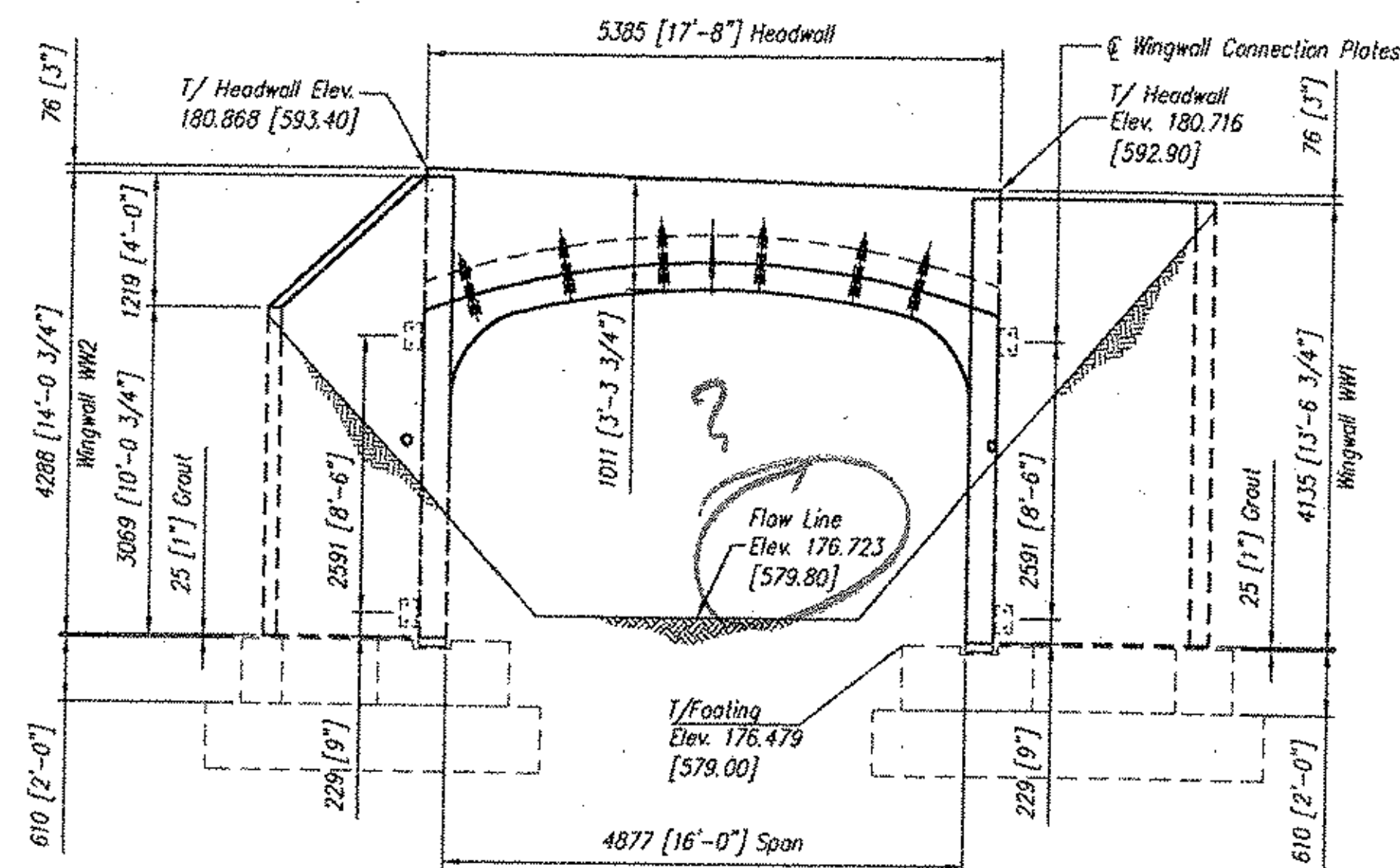
VERMONT

VT. RTE. 121

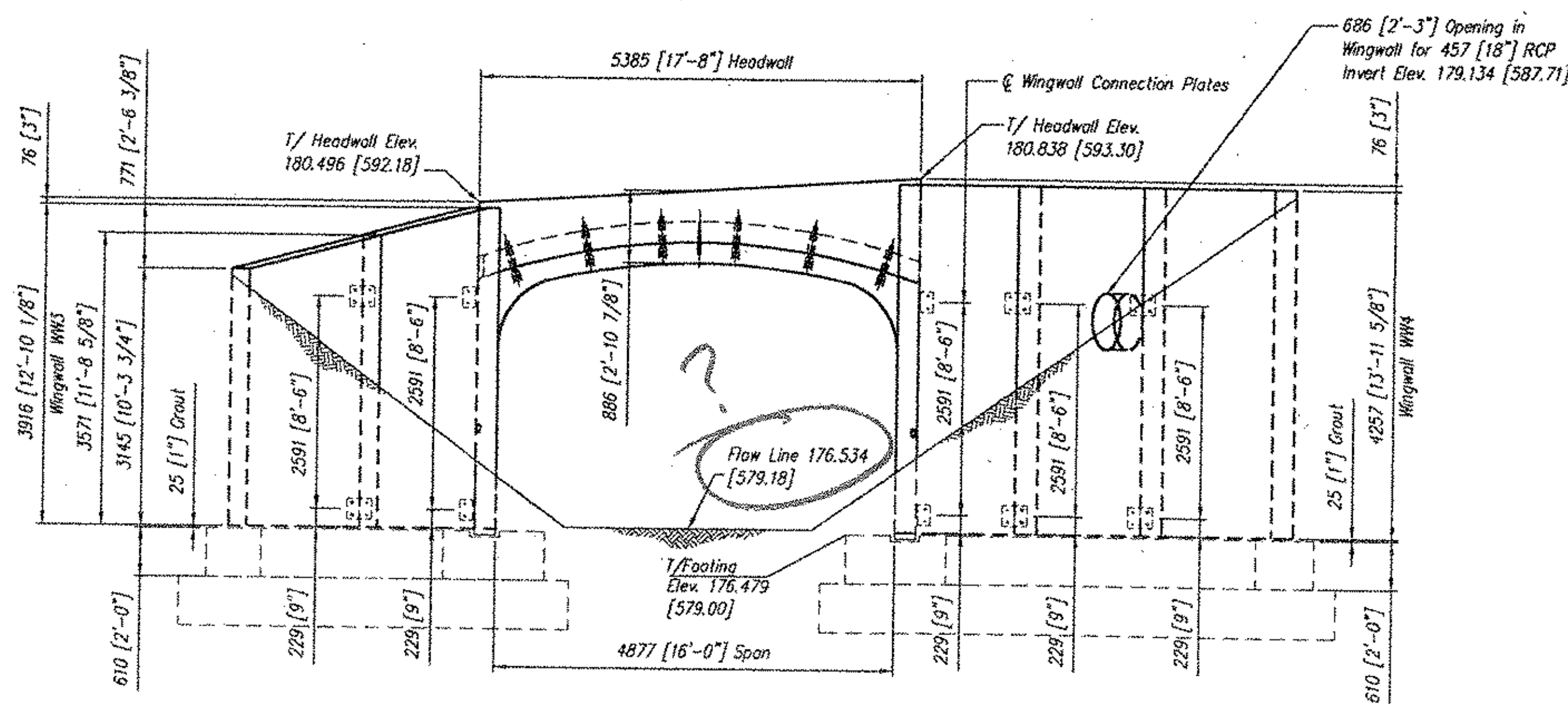
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Design	K/G	CS Project No.
Drawn	JLL	11415
Checked	JVP	Sheet No.
Date	6/18/04	C/S2

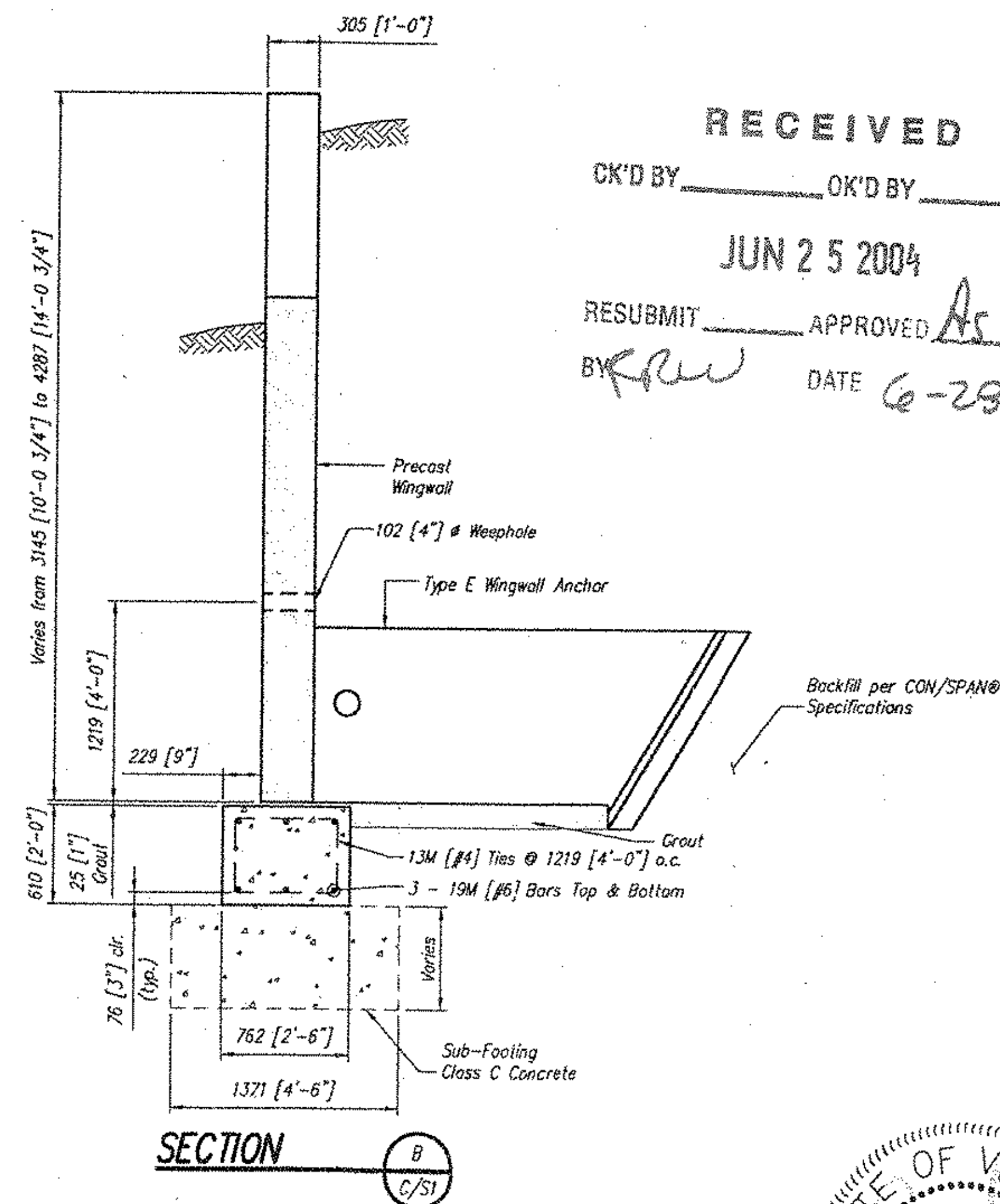
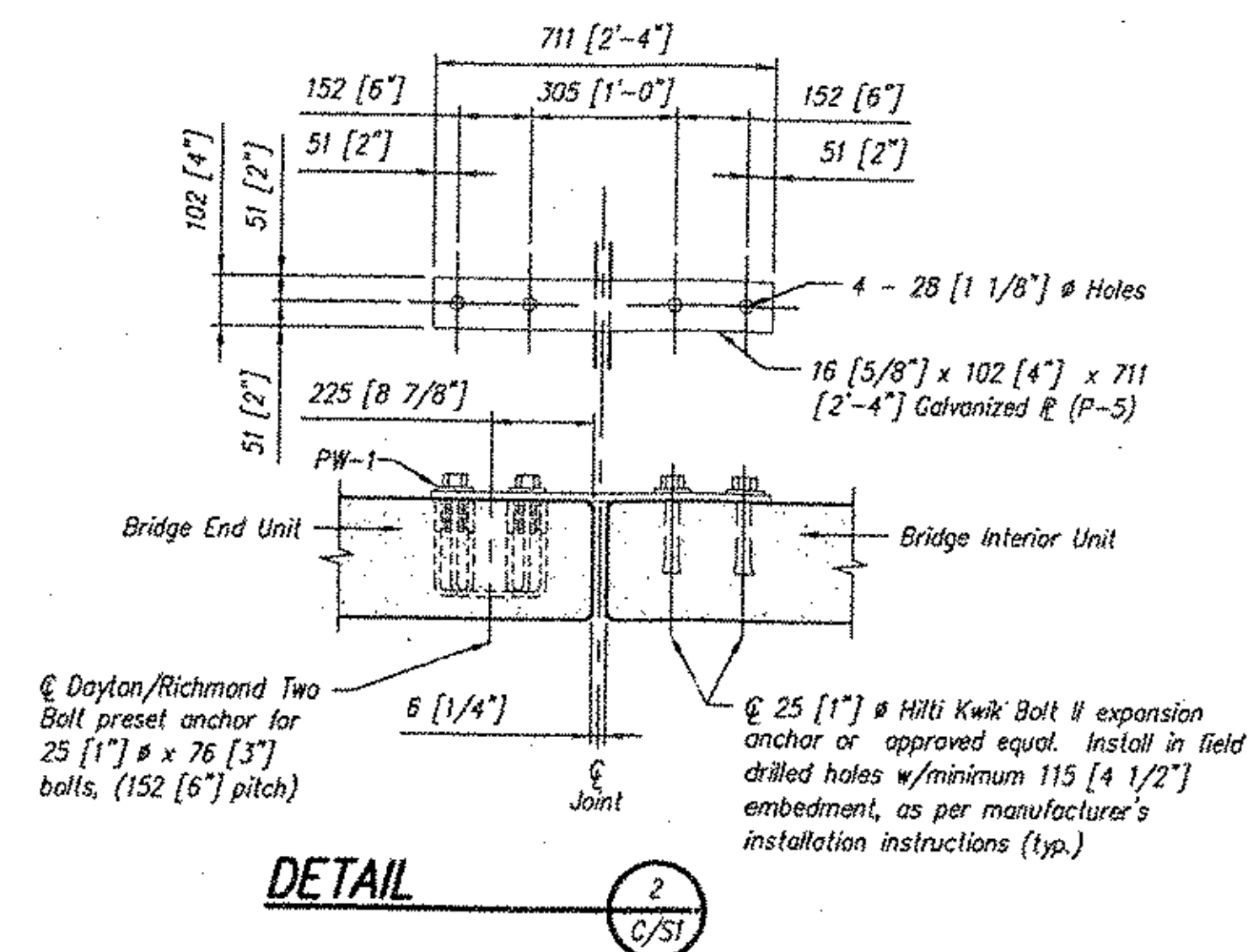
051



UPSTREAM END ELEVATION



DOWNSTREAM END ELEVATION



Note: All Metric dimensions are given in millimeters and all elevations are given in meters unless noted otherwise.

STATE OF VERMONT
WILLIAM D. LOCKWOOD
No. 6739
PROFESSIONAL ENGINEER

052

CONCRETE SYSTEMS, INC. NEW ENGLAND

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CONSPAN® BRIDGE SYSTEMS

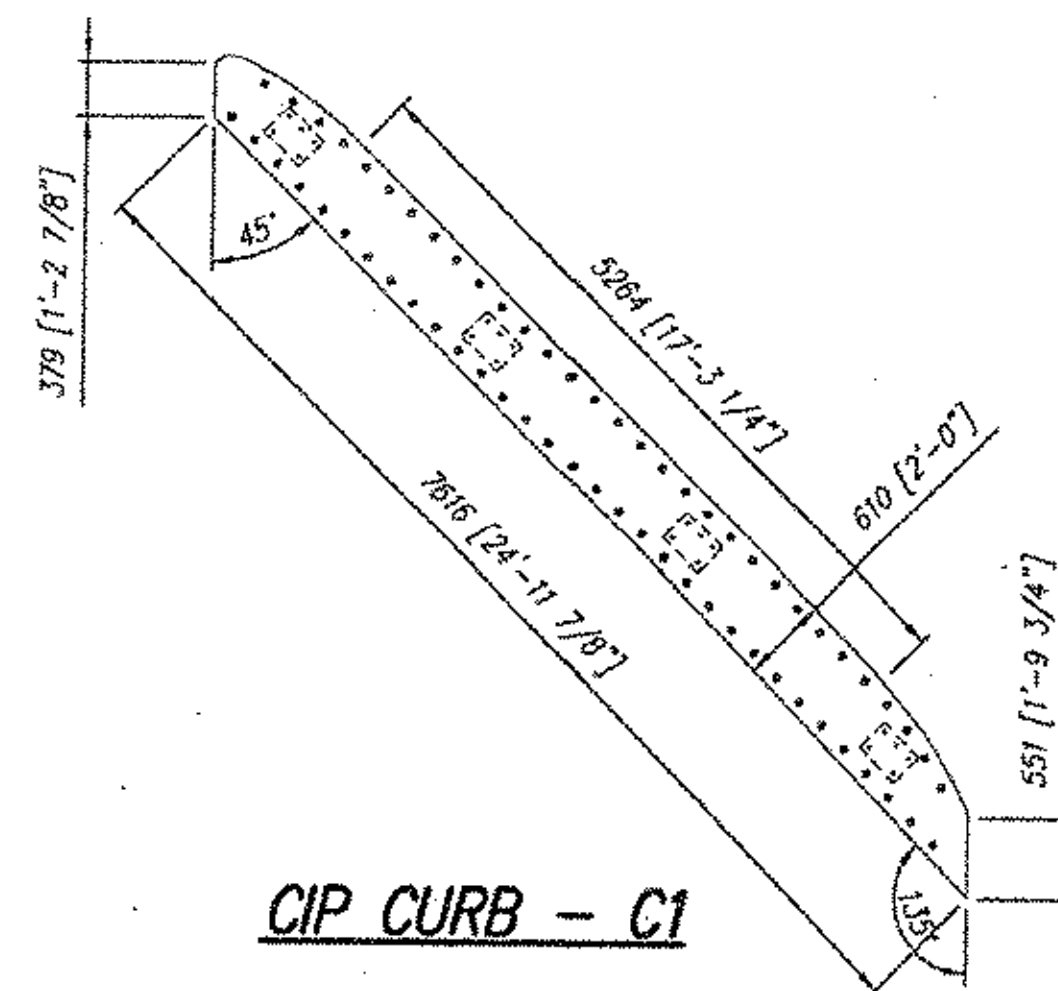
3100 Research Blvd., P.O. Box 20286, Dayton, Ohio 45420-0286

Offices:

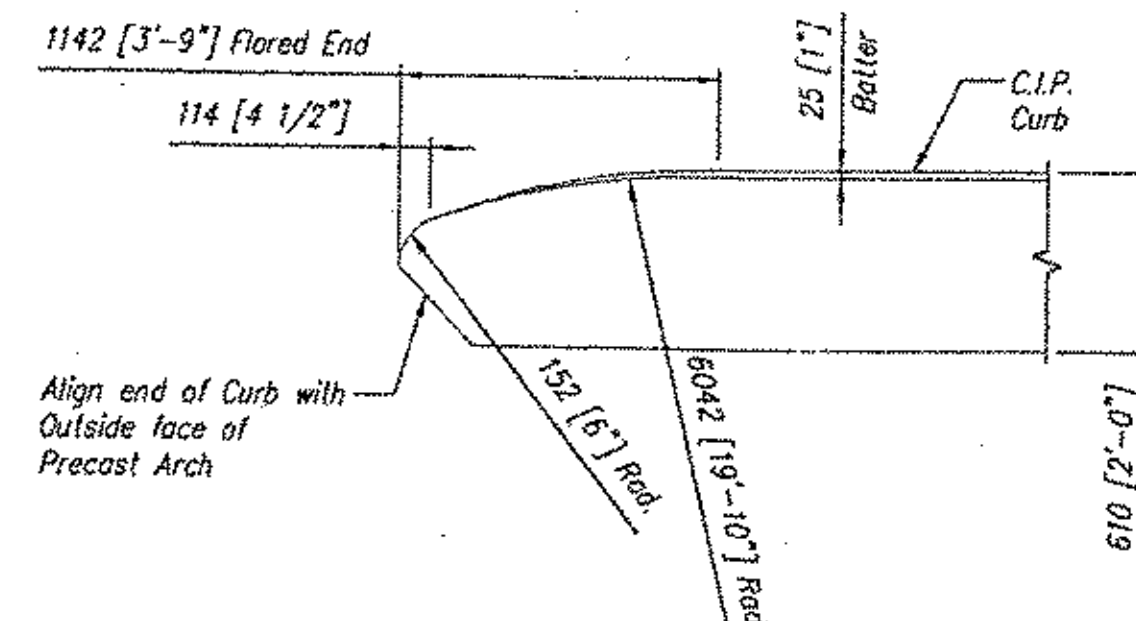
- Dayton, OH (937) 254-2233
- Charlotte, NC (704) 546-8558 FAX
- Sacramento, CA (916) 781-2723 FAX
- Albany, NY (518) 371-5871

VT. RTE. 121 BRIDGE NO: 7

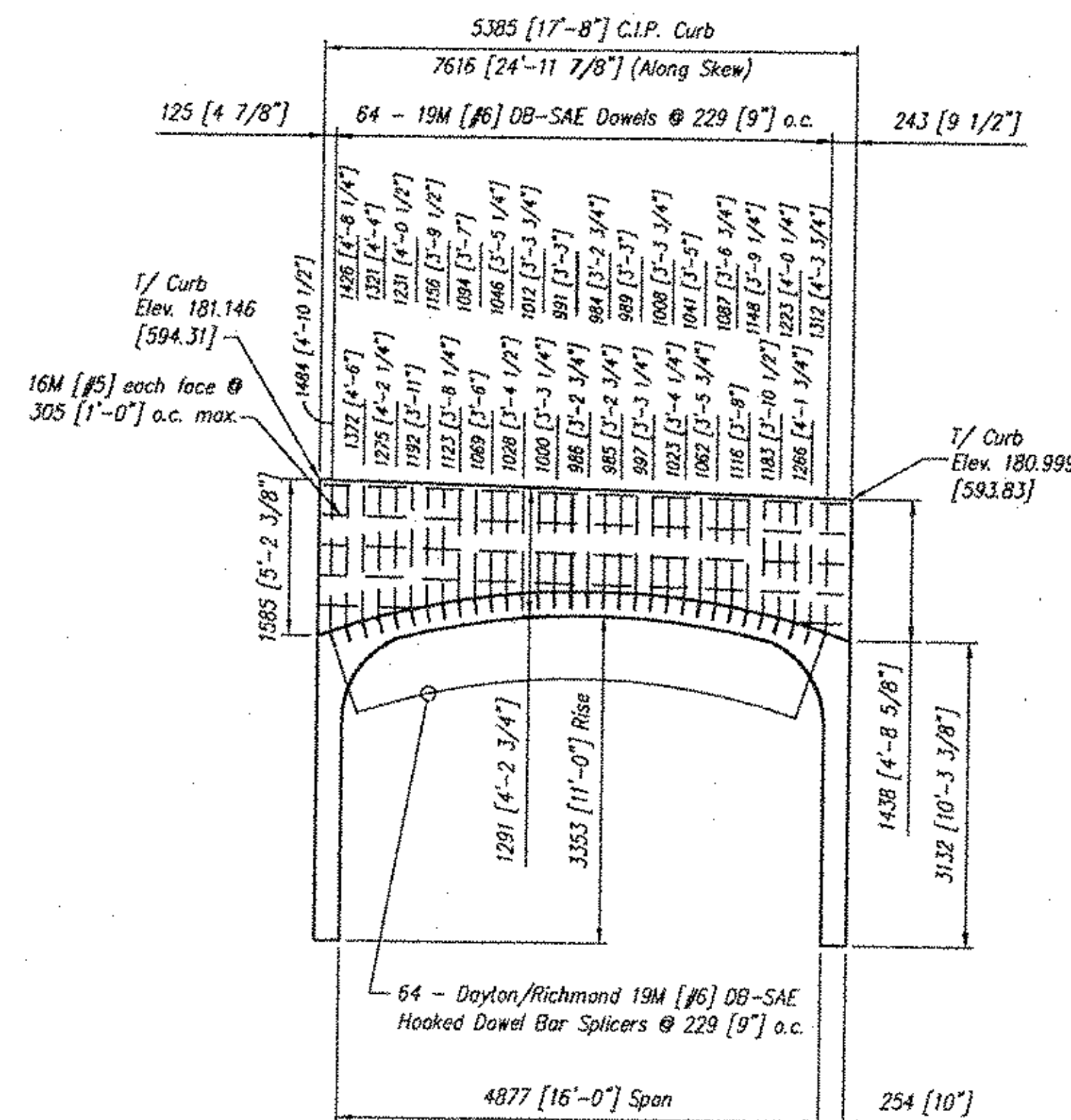
Designed: K/JG, Drawn: JLL, Checked: J/P, Date: 6/18/04, C/S Project No.: 11415, Sheet No.: C/S3



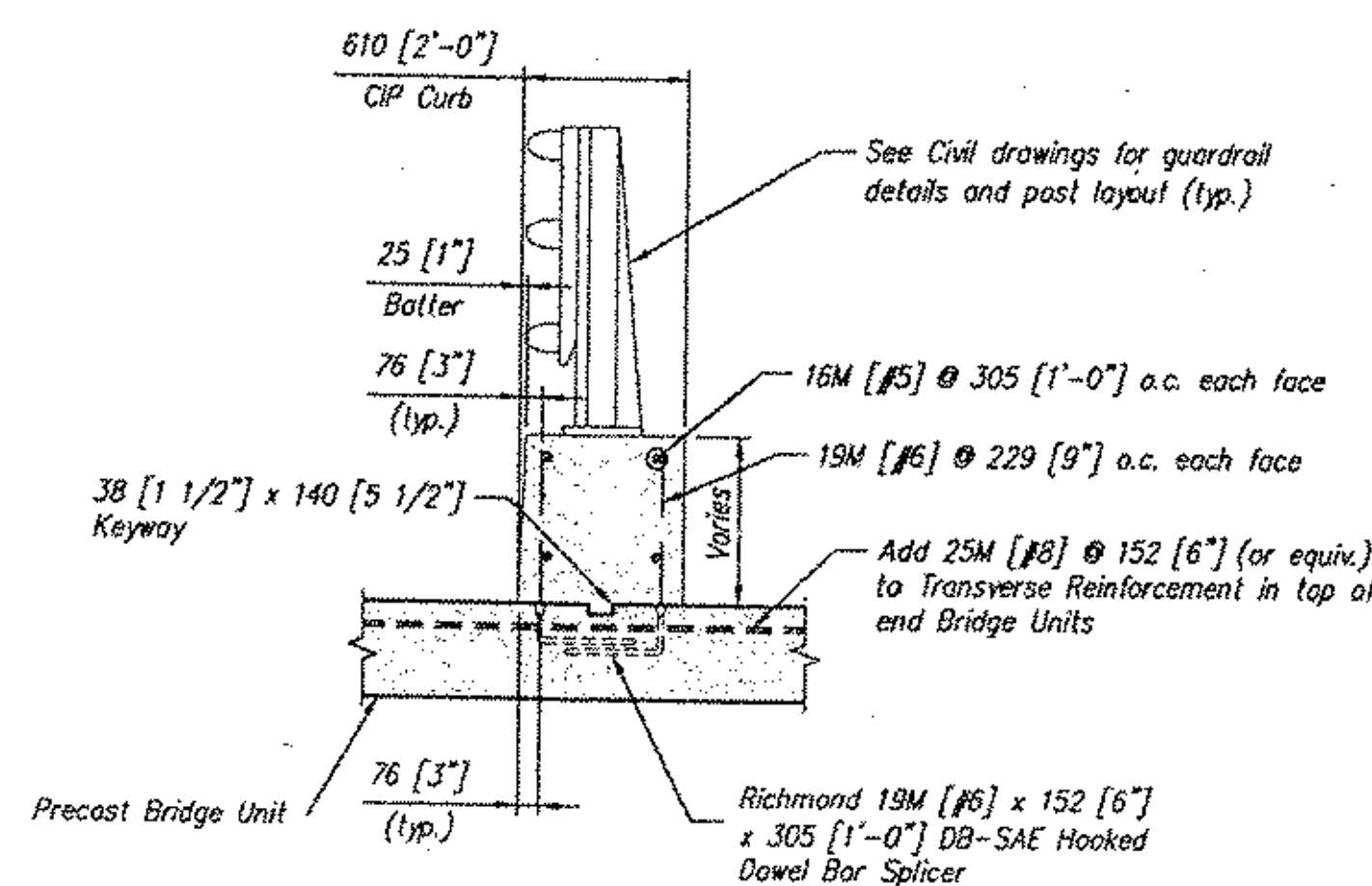
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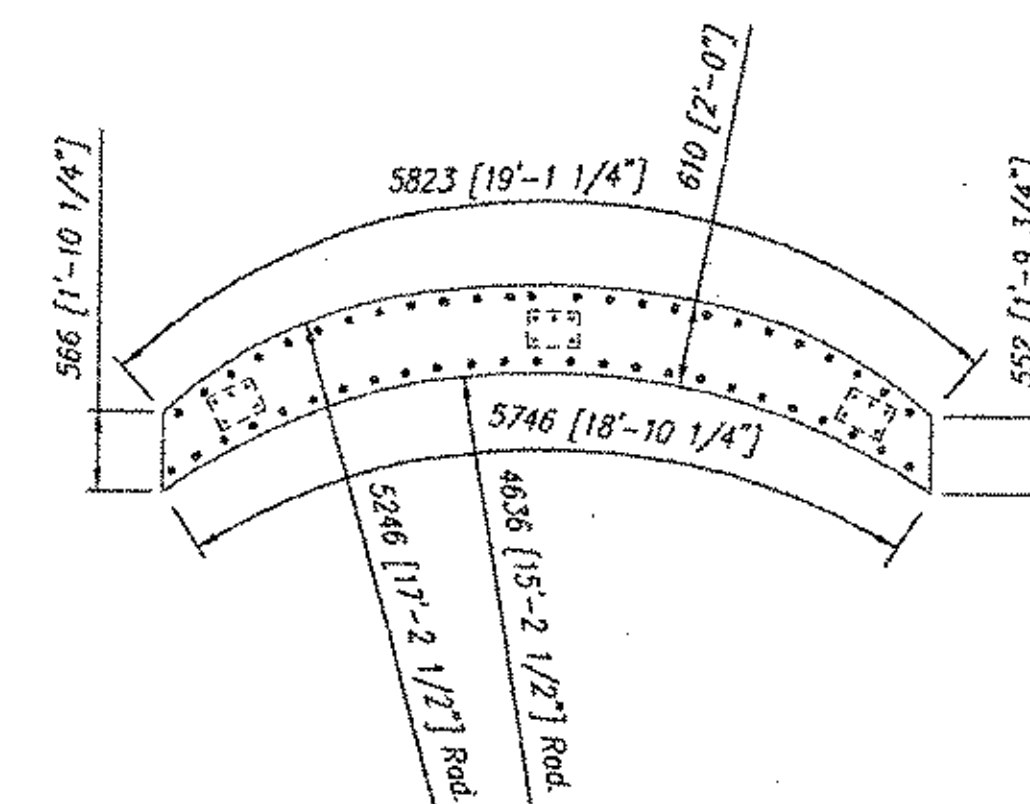
DETAIL



CIP CURB - C1 REINFORCING ELEVATION (Looking South)

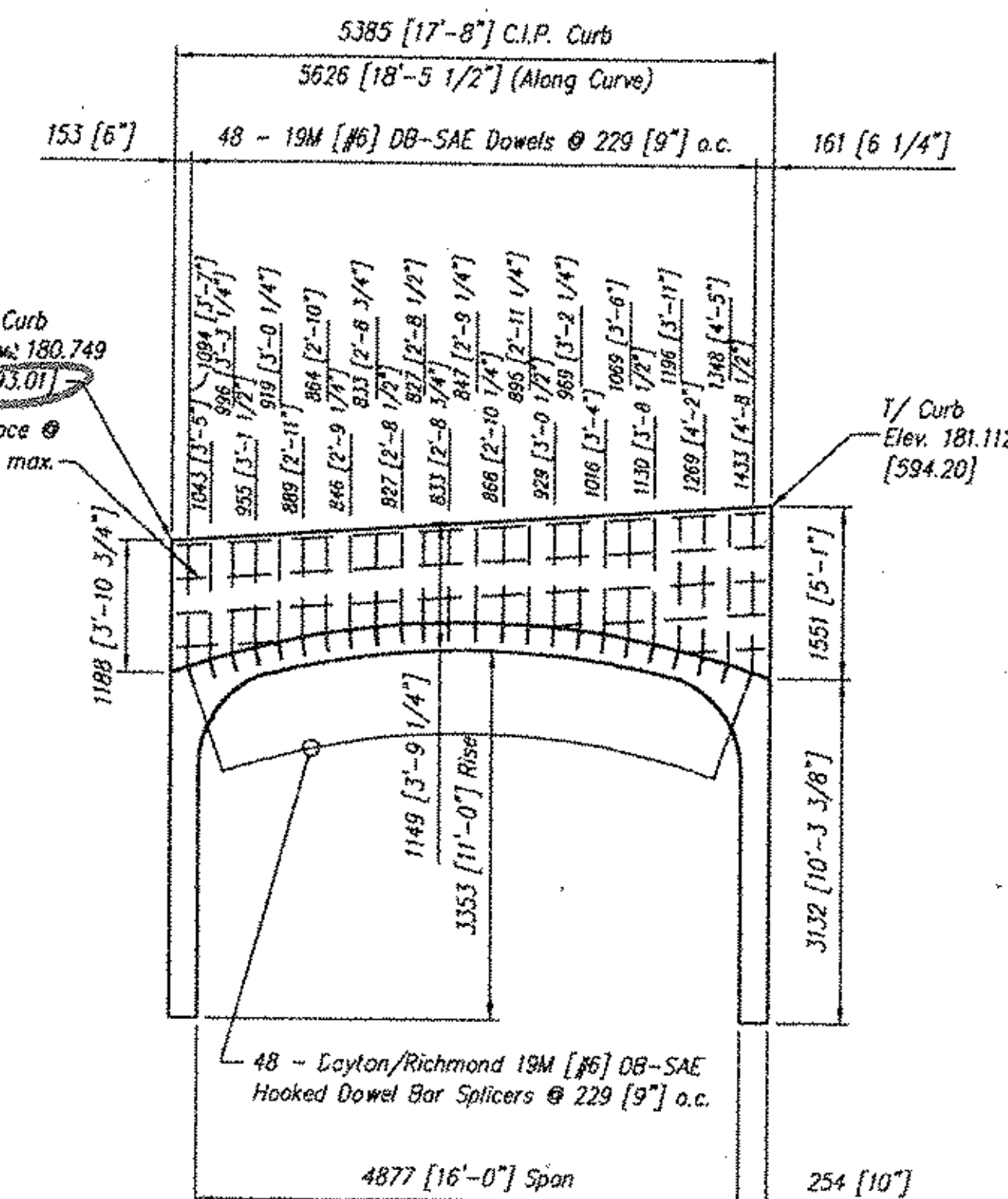


SECTION



CIP CURB - C2

593.12
T/ Curb
Elev. 180.749
[593.01]
16M [#5] each face @
305 [1'-0\"] o.c. max.



CIP CURB - C2 REINFORCING ELEVATION (Looking North)

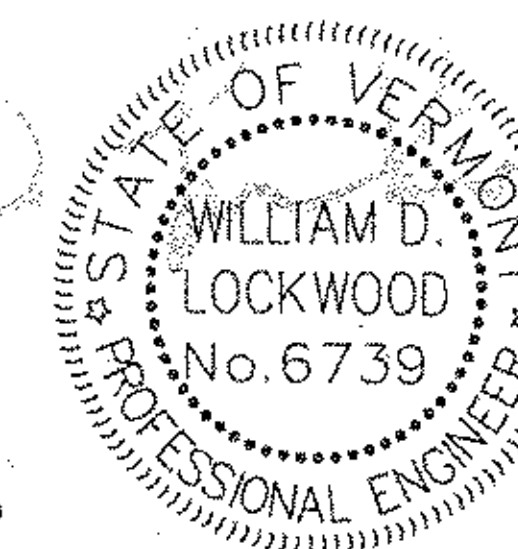
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JUN 25 2004

RESUBMIT _____ APPROVED _____

BY *Rlw* DATE *6-28-04*



053

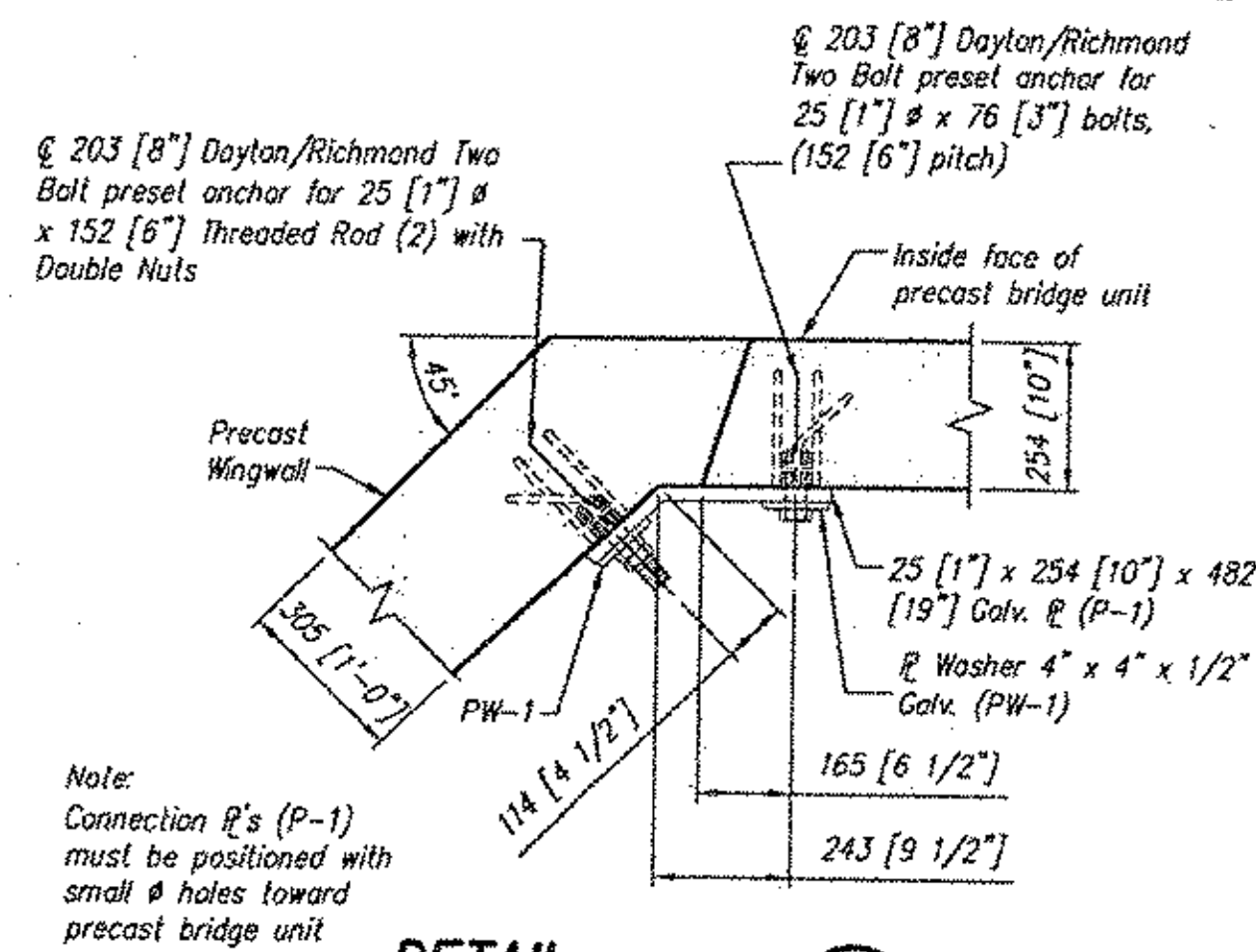
NOTICE: The design and information shown on this drawing is provided as a service to the project owner, engineer and contractor. It is the responsibility of the project owner, engineer and contractor to verify the accuracy of the information shown on this drawing. The project owner, engineer and contractor shall be responsible for the design and construction of the project. The project owner, engineer and contractor shall be responsible for the design and construction of the project. The project owner, engineer and contractor shall be responsible for the design and construction of the project.

REVISIONS	DATE	DESCRIPTION
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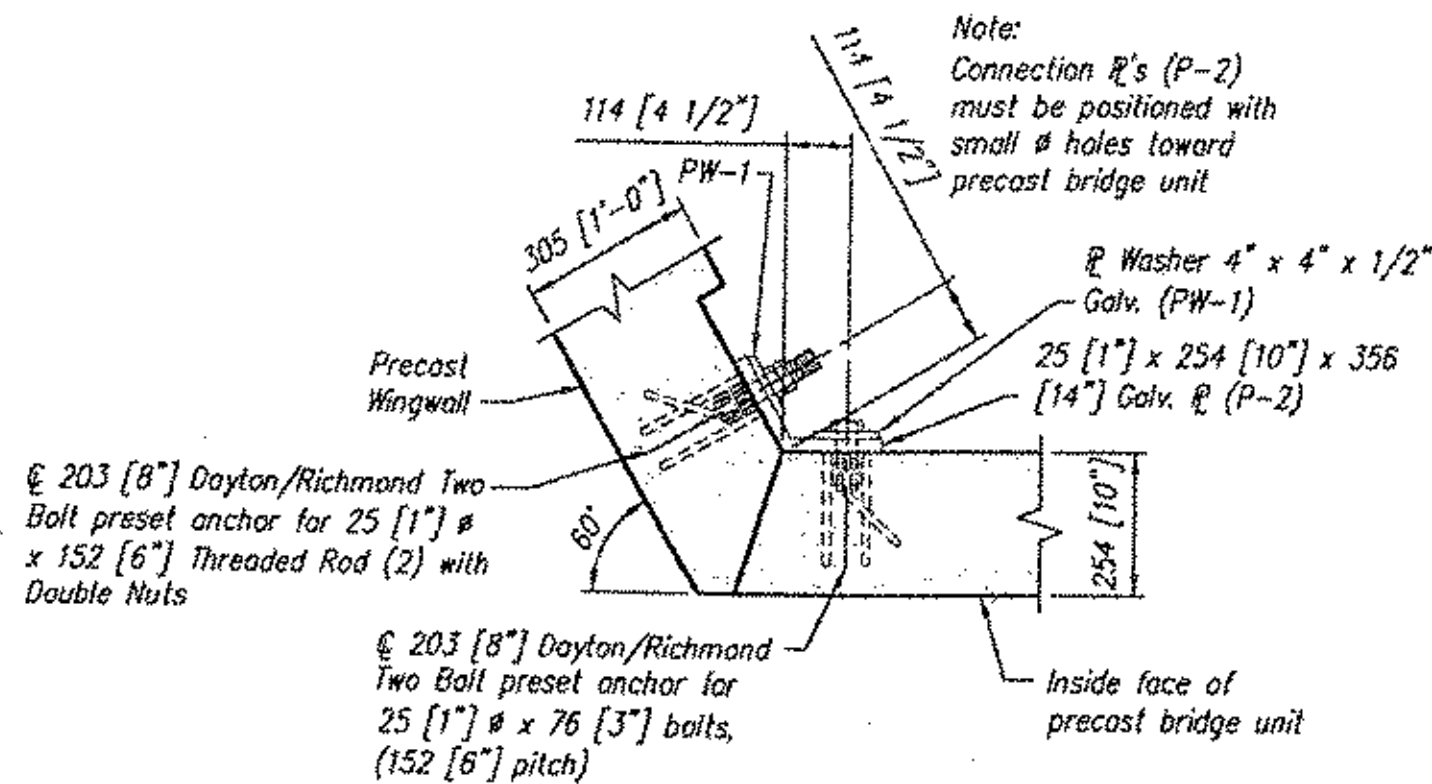
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CONSPAN®
BRIDGE SYSTEMS
3100 Research Blvd., P.O. Box 2028
Dayton, OH 45424-0208
(937) 254-3956
(937) 254-2233
(704) 546-5420
(916) 721-4223 FAX
(916) 721-5201
(916) 371-0271
Offices:
Dayton, OH (937) 254-3956
Chicago, IL (704) 546-5420
Sacramento, CA (916) 721-4223 FAX
Phoenix, AZ (916) 371-0271

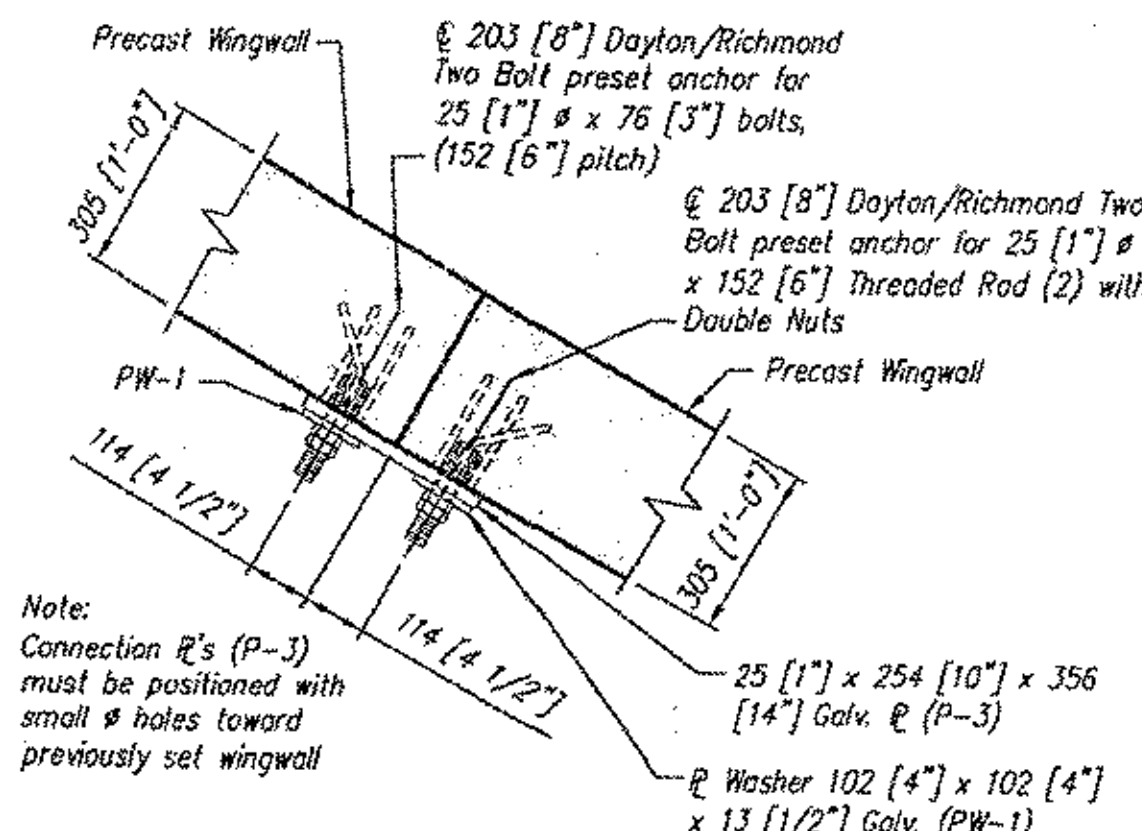
VERMONT
ROCKINGHAM
VT. RTE. 121
BRIDGE NO: 7
Designed: KJG
Drawn: JLL
Checked: JVP
Date: 6/18/04
C/S Project No.: 11415
Sheet No.: C/S4



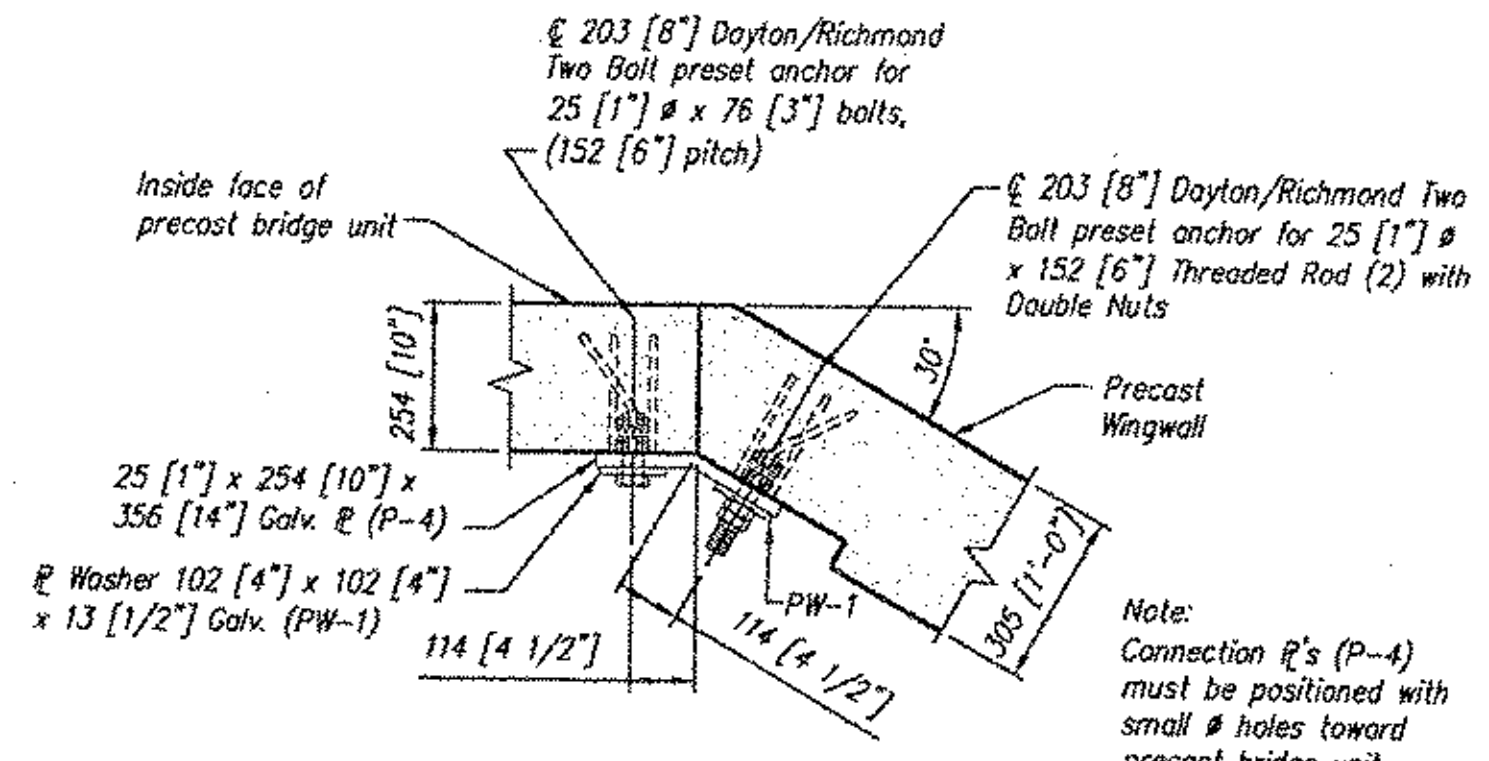
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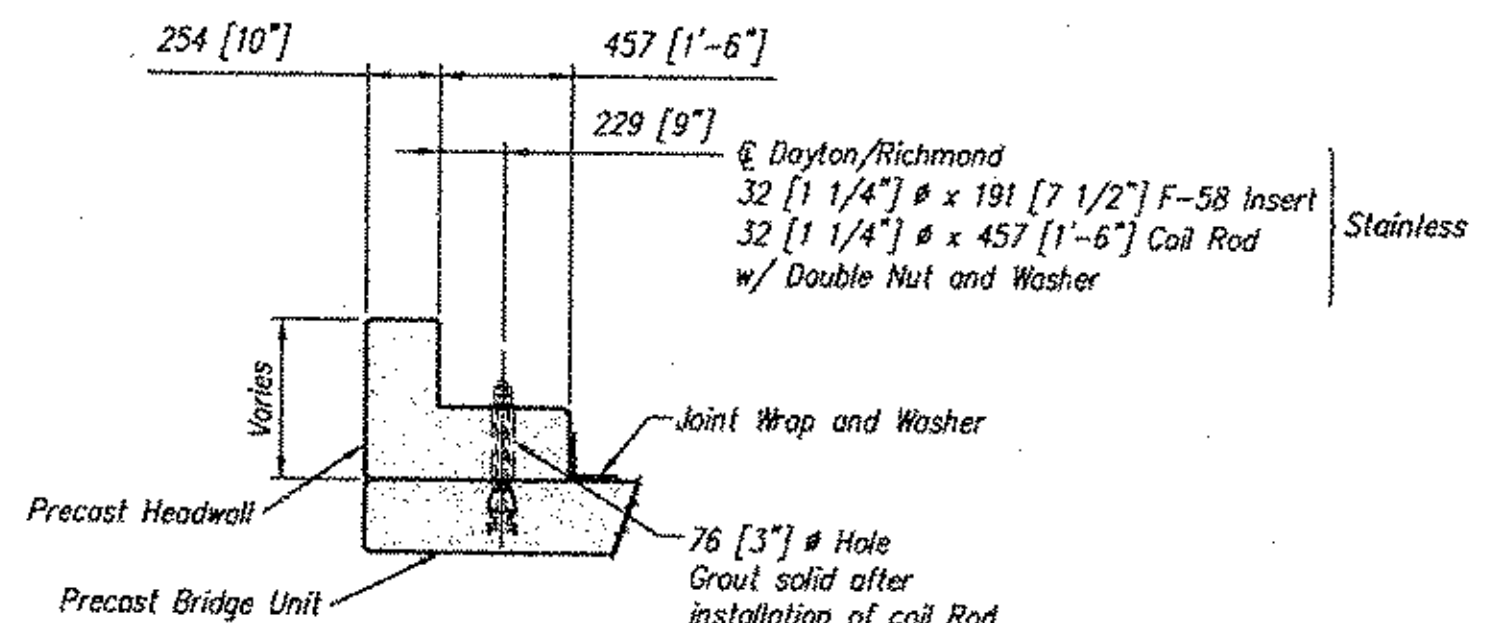
DETAIL 5 C/S1



DETAIL 6 C/S1

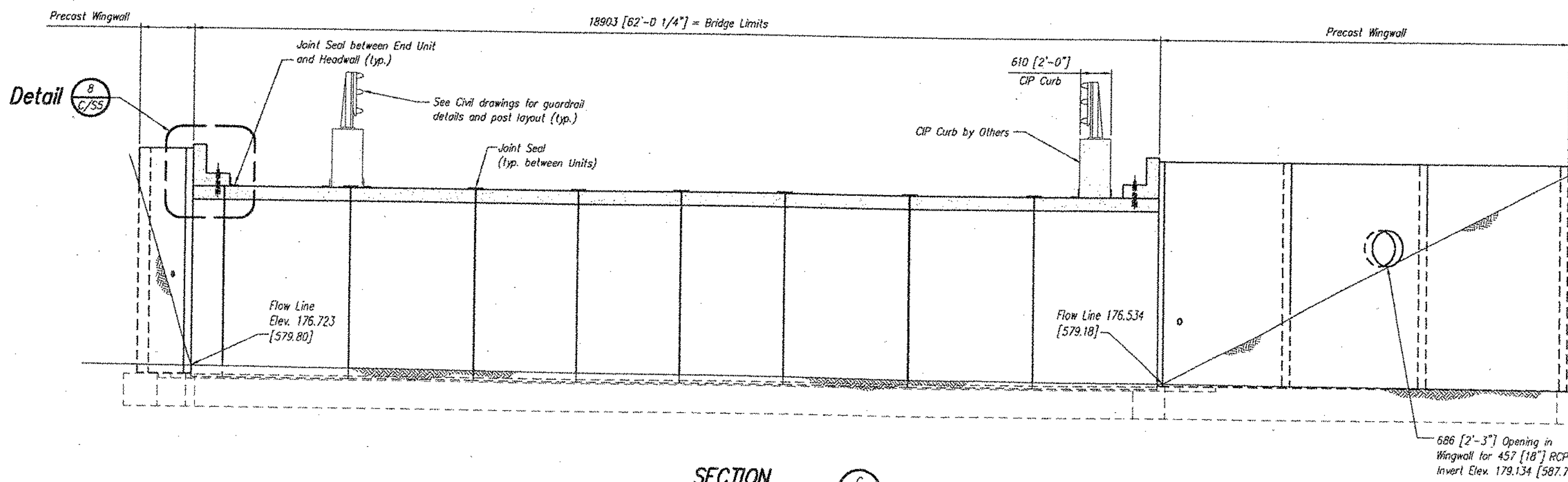


DETAIL 7 C/S1



DETAIL 8 C/S5

Note: All Metric dimensions are given in millimeters and all elevations are given in meters unless noted otherwise.



SECTION C C/S1

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CK'D BY _____ OK'D BY _____

JUN 25 2004

RESUBMIT _____ APPROVED _____

BY RW DATE 6-28-04

STATE OF VERMONT

WILLIAM D. LOCKWOOD

No. 6739

PROFESSIONAL ENGINEER

CONCRETE SYSTEMS, INC. NEW ENGLAND 800-342-3374

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3100 Research Blvd., P.O. Box 20268 Dayton, Ohio 45420-0268

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VERMONT

VT. RTE. 121 BRIDGE NO: 7

Designed: K/JG Drawn: JLL Checked: JVP Date: 6/18/04

11415

C/S5

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

1. DESCRIPTION

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

2. TYPES

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

3. MATERIALS - CONCRETE

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

- 3.1 Portland Cement - Shall conform to the requirements of ASTM Specifications C150-Type I, Type II, or Type III cement.
- 3.2 Coarse Aggregate - Shall consist of stone having a maximum size of 25mm (1"). Aggregate shall meet requirements for ASTM C33.
- 3.3 Water Reducing Admixture - The manufacturer may submit for approval by the Engineer, a water-reducing admixture for the purpose of increasing workability and reducing the water requirement for the concrete.
- 3.4 Calcium Chloride - The addition to the mix of calcium chloride or admixtures containing calcium chloride will not be permitted.

4. MATERIALS - STEEL REINFORCEMENT AND HARDWARE

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

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

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

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

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

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

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

Inserts for detached headwall connections shall be AISI Type 304 stainless steel, F-59 Expanded Coil Inserts as manufactured by Dayton/Richmond Concrete Accessories, Mansburg, Ohio, (800) 745-3700. Coil rods and nuts used in headwall connections shall be AISI Type 304 stainless steel. Washers used in headwall connections shall be either AISI Type 304 stainless steel plate washers or AASHTO M 270 (ASTM A 709) Grade 36 plate washers hot dip galvanized as per AASHTO M 111 (ASTM A 123).

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

5. MANUFACTURE

- 5.1 Mixture - The aggregates, cement and water shall be proportioned and mixed in a batch mixer to produce a homogeneous concrete meeting the strength requirements of this specification. The proportion of portland cement in the mixture shall not be less than 564 pounds (5 sacks) per cubic yard of concrete.
- 5.2 Curing - The precast concrete culvert units shall be cured for a sufficient length of time so that the concrete will develop the specified compressive strength in 28 days or less. Any one of the following methods of curing or combinations thereof shall be used:
 - 5.2.1 Steam Curing - The culverts may be low pressure, steam cured by a system that will maintain a moist atmosphere.
 - 5.2.2 Water Curing - The culverts may be water cured by any method that will keep the sections moist.
 - 5.2.3 Membrane Curing - A sealing membrane conforming to the requirements of ASTM Specification C 309 may be applied and shall be left intact until the required concrete compressive strength is attained. The concrete temperature at the time of application shall be within ± 10 degrees F of the atmospheric temperature. All surfaces shall be kept moist prior to the application of the compounds and shall be damp when the compound is applied.
- 5.3 Forms - The forms used in manufacture shall be sufficiently rigid and accurate to maintain the exact dimensions within the permissible variations given in Section 7 of these specifications. All casting surfaces shall be of a smooth material.
- 5.4 Handling - Handling devices or hoists shall be permitted in each culvert for the purpose of handling and setting.

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

6. DESIGN

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

- 6.2 The precast elements are designed in accordance with the "Standard Specifications for Highway Bridges" 16th Edition, adopted by the American Association of State Highway and Transportation Officials, 1986, as amended by the 1997, 1998, 1999, and 2000 Interim Revisions. A minimum of one foot of cover above the crown of the bridge units is required in the installed condition. Unless noted otherwise on the shop drawings and designed accordingly.

- 6.3 Placement of Reinforcement in Precast Bridge Units - The cover of concrete over the outside circumferential reinforcement shall be 2 inches minimum. The cover of concrete over the inside circumferential reinforcement shall be 1 1/2 inches minimum, unless otherwise noted on the shop drawings. The minimum steel yield strength of circumferential wires shall not be less than one inch nor more than two inches from the ends of each section. Reinforcement shall be assembled utilizing single or multiple layers of welded wire fabric (not to exceed 3 layers), supplemented with a single layer of deformed billet steel bars, when necessary. Welded wire fabric shall be composed of circumferential and longitudinal wires meeting the spacing requirements of 6.6, below, and shall contain sufficient longitudinal wires extending along the bridge unit to maintain the shape and position of the reinforcement. Longitudinal distribution reinforcement may be welded wire fabric or deformed billet steel bars and shall meet the spacing requirements of 6.7, below. The ends of the longitudinal distribution material shall not be more than 3 inches and not less than 1 1/2 inches from the ends of the bridge unit.

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

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

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

- 6.7 Laps, Welds, and Spacing for Precast Wingwalls and Headwalls - Splices in the reinforcement shall be made by lapping. Laps may be lap welded together for assembly purposes. For smooth welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.2 and 8.32.6. For deformed welded wire fabric, the overlap shall meet the requirements of AASHTO 8.30.1 and 8.32.5. The spacing center-to-center of the wires in a wire fabric sheet shall be not less than 2 inches nor more than 4 inches.

7. PERMISSIBLE VARIATIONS

7.1 Bridge Units

- 7.1.1 Internal Dimensions - The internal dimension shall vary not more than 1% from the design dimensions nor more than 1-1/2 inches whichever is less. The haunch dimensions shall vary not more than 3/4 inch from the design dimension.
- 7.1.2 Slab and Wall Thickness - The slab and wall thickness shall not be less than that shown in the design by more than 1/4 inch. A thickness more than that required in the design shall not be cause for rejection.
- 7.1.3 Length of Opposite Surfaces - Variations in laying lengths of two opposite surfaces of the bridge unit shall not be more than 1/2 inch in any section, except where beveled ends for laying of curves are specified by the purchaser.
- 7.1.4 Length of Section - The underpin in length of a section shall not be more than 1/2 inch in any bridge unit.
- 7.1.5 Position of Reinforcement - The maximum variation in position of the reinforcement shall be $\pm 1/2$ inch. In no case shall the cover over the reinforcement be less than 1 1/2 inches for the outside circumferential steel or be less than 1 inch for the inside circumferential steel as measured to the external or internal surface of the bridge. These tolerances or cover requirements do not apply to mating surfaces of the joints.

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

7.2 Wingwalls and Headwalls

- 7.2.1 Wall Thickness - The wall thickness shall not vary from that shown in the design by more than 1/2 inch.
- 7.2.2 Length/Height of Wall Sections - The length and height of the wall shall not vary from that shown in the design by more than 1/2 inch.
- 7.2.3 Position of Reinforcement - The maximum variation in the position of the reinforcement shall be $\pm 1/2$ inch. In no case shall the cover over the reinforcement be less than 1 1/2 inches.
- 7.2.4 Size of Reinforcement - The permissible variation in diameter of any reinforcing shall conform to the tolerances prescribed in the ASTM Specification for that type of reinforcing. Steel area greater than that required shall not be cause for rejection.

8. TESTING AND INSPECTION

- 8.1 Type of Test Specimen - Concrete compressive strength shall be determined from compression tests made on cylinders or cones. For cylinder testing, a minimum of 4 cylinders shall be taken during each production run. For cone testing, one cone shall be cut from each of 3 precast elements selected at random from each production group. A production group shall be defined as 16 or fewer bridge units (of a particular size), wingwalls or headwalls in a continuous production run. For each continuous production run, each production group or fraction thereof shall be considered separately for the purpose of testing and acceptance. A production run shall be considered continuous if not interrupted for more than 3 consecutive days.

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

- 8.3 Acceptability of Cylinder Tests - When the average compressive strength of all cylinders tested is equal to or greater than the design compressive strength, and not more than 10% of the cylinders tested have a compressive strength less than the design concrete strength, and no cylinder tested has a compressive strength less than 80% of the design compressive strength, then the lot shall be accepted. When the compressive strength of the cylinders tested does not conform to this acceptance criteria, the acceptability of the lot may be determined as described in section 8.4, below. Failure of any of the 28-day test cylinders to meet 90 percent of the minimum compressive strength requirement can be cause for rejection.

Acceptability of Core Tests - The compressive strength of the concrete in each production group as defined in 8.1 is acceptable when the average core test strength is equal to or greater than the design concrete strength. When the compressive strength of the core tested is less than the design concrete strength, the precast element from which that core was taken may be rejected. Two precast elements from the remainder of the group shall be selected at random and one core shall be taken from each. If the compressive strength of both cores is equal to or greater than the design concrete strength, the compressive strength of the remainder of that group is acceptable. If the compressive strength of either of the two cores tested is less than the design concrete strength, the remainder of the group shall be rejected or, at the option of the manufacturer, each precast element of the remainder of the group shall be core and accepted individually, and any of these elements that have cores with less than the design concrete strength shall be rejected.

- 8.4.1 When the compressive strength of any core is less than the design concrete strength, the precast element from which that core was taken shall be rejected. Two precast elements from the remainder of the group shall be selected at random and one core shall be taken from each. If the compressive strength of both cores is equal to or greater than the design concrete strength, the compressive strength of the remainder of that group is acceptable. If the compressive strength of either of the two cores tested is less than the design concrete strength, the remainder of the group shall be rejected or, at the option of the manufacturer, each precast element of the remainder of the group shall be core and accepted individually, and any of these elements that have cores with less than the design concrete strength shall be rejected.

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

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

9. JOINTS

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

10. WORKMANSHIP AND FINISH

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

11. REPAIRS

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

12. INSPECTION

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

13. REJECTION

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

- 13.1 Fractures or cracks passing through the wall, except for a single end crack that does not exceed one half the thickness of the wall.
- 13.2 Defects that indicate proportioning, mixing, and molding not in compliance with Section 5 of these specifications.
- 13.3 Honeycombed or open textures.
- 13.4 Damaged ends, where such damage would prevent making a satisfactory joint.

14. MARKING

Each bridge unit shall be clearly marked by waterproof paint. The following shall be shown on the inside of the vertical leg of the bridge section:

- Bridge Span X Bridge Rise
- Date of Manufacture
- Name or trademark of the manufacturer

15. CONSTRUCTION REQUIREMENTS

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

- 15.2 Placement of the Bridge Units, Wingwalls, and Headwalls - The bridge units, wingwalls, and headwalls shall be placed as shown on the Engineer's plan drawings. Special care shall be taken in setting the elements to the true line and grade. The bridge units and wingwalls shall be set on 6" X 6" masonry or steel skids. A minimum of 1/2 inch gap shall be provided between the footing and the bottom of the bridge's vertical legs or the wingwall. The gap shall be filled with cement grout (Portland cement and water or cement mortar composed of one part Portland cement and three parts of sand, by volume, and water).

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

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

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

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

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

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

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

Lightweight dozers and graders may be operated over bridge units having one foot of compacted cover, but only when the equipment is equipped with a 2'-4" Dzer weighing in excess of 12 tons and having track pressures of eight psi or greater shall require two feet of cover unless the design load (HS20 or HS25) be permitted over the bridge units unless approved by CON/SPAN®.

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

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

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

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

16. QUALITY ASSURANCE

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

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

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

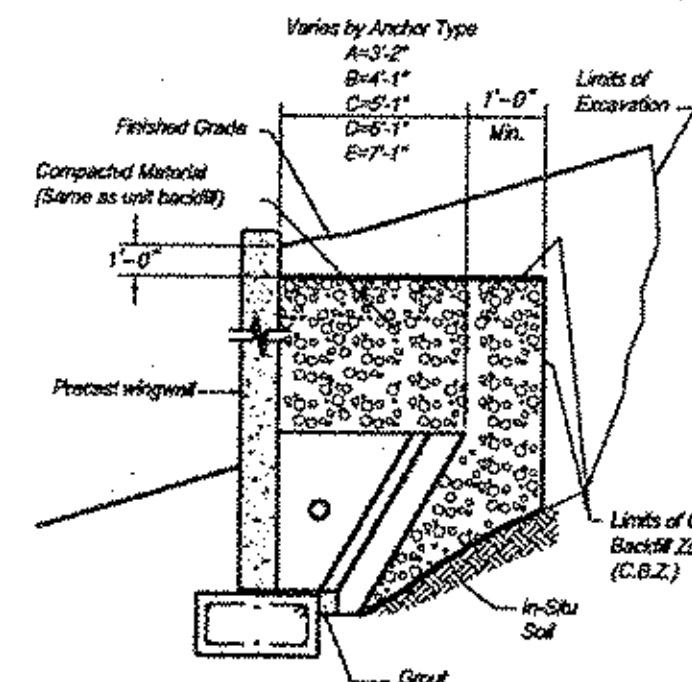
- 16.2.2 The Precaster shall show that the following tests are performed in accordance with the ASTM standards indicated. Tests shall be performed for each 150 cubic yards of concrete placed, but not less frequently than once per production run, as defined in §3 of these specifications.

- 16.2.2.1 Air Content: C231 or C173

- 16.2.2.2 Compressive Strength: C39, C497

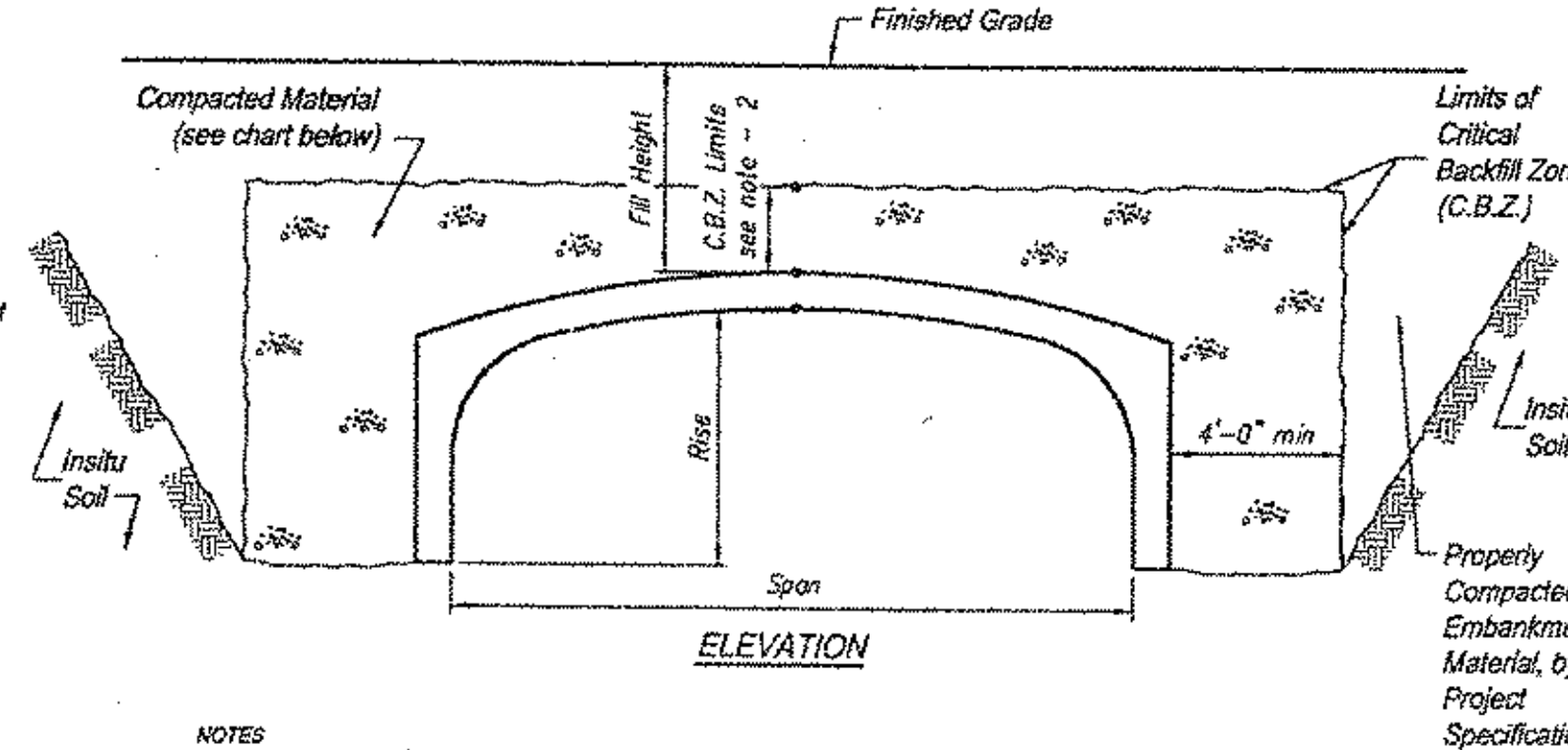
- 16.2.3 The Precaster shall provide documentation demonstrating compliance with this section to CON/SPAN® Bridge Systems at regular intervals or upon request.

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



WINGWALL BACKFILL REQUIREMENTS

BACKFILL DESCRIPTION (AASHTO M 145-91)									
Group Classification	A-1	A-1-b	A-3	A-2	A-2-b	A-2-c	A-2-d	A-2-e	A-4
Sieve Analysis, Percent Passing (100% Passing 3" Sieve)									
No. 10	50 max.	50 max.	51 min.	35 max.	35 max.	35 max.	35 max.	36 min.	
No. 40	30 max.	30 max.	31 min.	35 max.	35 max.	35 max.	35 max.	36 min.	
No. 200	15 max.	25 max.	10 max.	35 max.	35 max.	35 max.	35 max.	36 min.	
Characteristics of Fraction Passing									
No. 40				40 max.	41 min.	40 max.	41 min.	40 max.	
Liquid Limit	6 max.		N.P.	10 max.	10 max.	11 min.	11 min.	10 max.	
Plasticity Index									
Usual Types of Significant Constituent Materials	Stone Fragments, Gravel & Sand		Fine Sand	Silty or Clayey Gravel and Sand				Silty Soils	
General Rating as Subgrade			Excellent to Good					Fair to Poor	



- NOTES
1. SEE CON/SPAN® SPECIFICATIONS SECTION 15.4 FOR BACKFILL SPECIFICATIONS.
 2. FOR FILL HEIGHTS GREATER THAN 2'-0", C.B.Z. LIMIT SHALL BE 2'-0" ABOVE ARCH CROWN. FOR FILL HEIGHTS LESS THAN 2'-0", THE FINISHED GRADE SHALL BE THE BOUNDARY LINE FOR THE C.B.Z.
 3. BACKFILLING OPERATIONS WITHIN THE C.B.Z. SHALL BE PERFORMED IN LIFTS OF 8" OR LESS (LOOSE DEPTH).
 4. MAXIMUM DRY DENSITY SHALL BE DETERMINED BY AASHTO T-99 OR OTHER APPROVED METHODS.
 5. BACKFILL SHALL BE COMPACTED IN LAYERS UNTIL THE DENSITY IS NOT LESS THAN 95% OF THE MAXIMUM DRY DENSITY.

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

EMBANKMENT MATERIAL PER PROJECT SPECIFICATIONS

BACKFILL REQUIREMENTS

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Notes:

- All edges of Precast to have a 19 [3/4"] chamfer.

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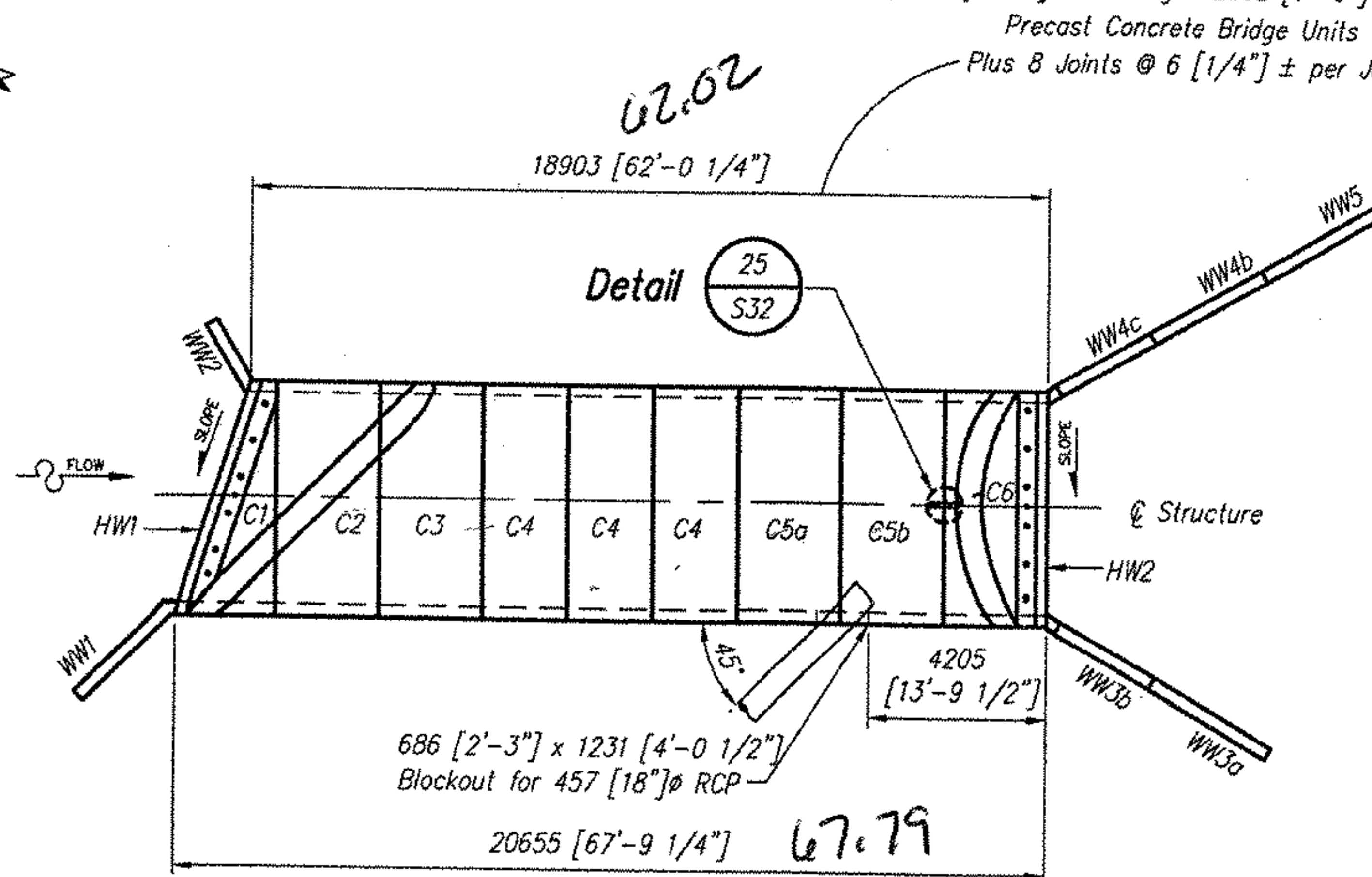
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1		07/28/04
2		
3		
4		

Sheet Title:
KEY PLAN
SHOP DRAWING
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VERMONT
VT. RTE. 121
BRIDGE NO. 7

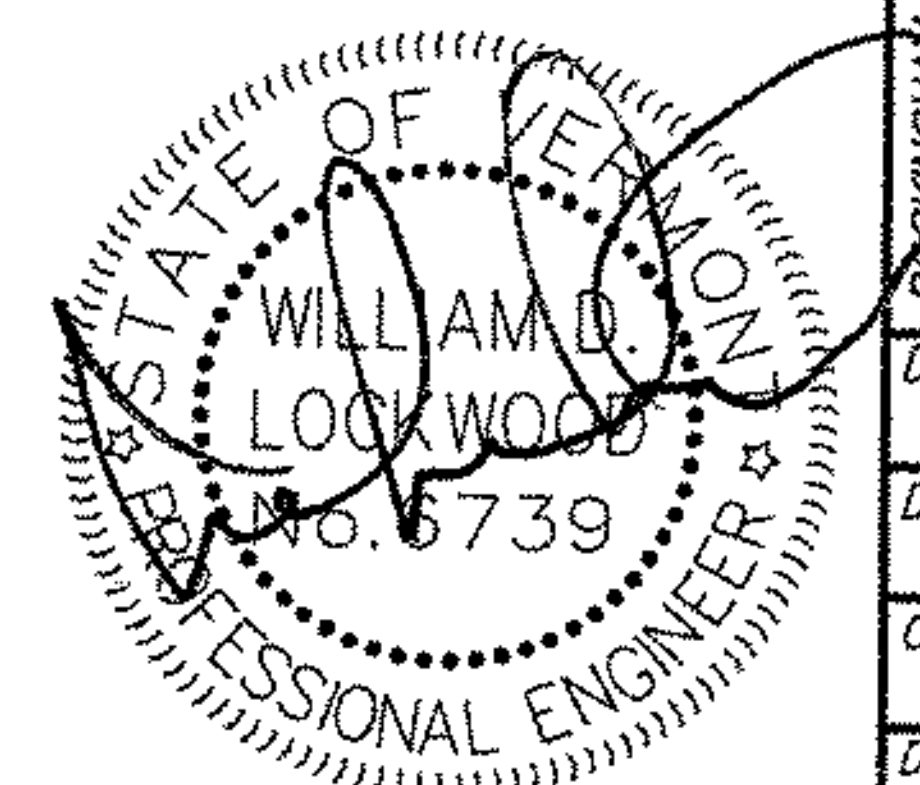
Des. By:
KJG
Job No.
11415
Drawn By:
JLL
Sheet No.
S1
Chk'd By:
JVP
Date:
6/22/04
056

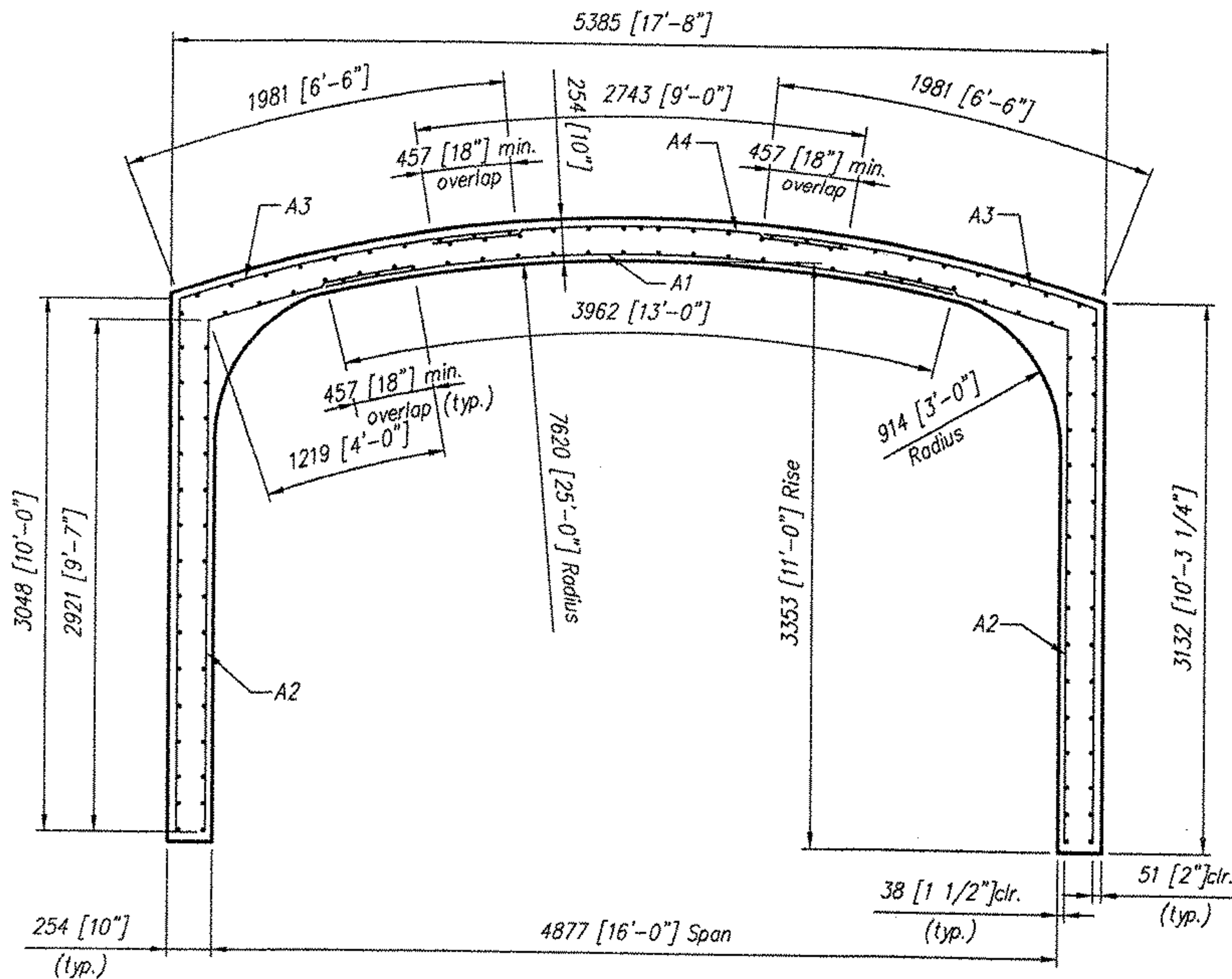
5 - 4877 [16'-0"] Span x 3353 [11'-0"] Rise x 2438 [8'-0"] Long
3 - 4877 [16'-0"] Span x 3353 [11'-0"] Rise x 2017 [6'-7 3/8"] Long
1 - 4877 [16'-0"] Span x 3353 [11'-0"] Rise Skewed
(610 [2'-0"] Short Leg x 2362 [7'-9"] Long Leg)
Precast Concrete Bridge Units
Plus 8 Joints @ 6 [1/4"] ± per Joint



KEY PLAN

07/28/04	Blockout for 18" RCP in Units	S1, S14, S14a Added	KJG
Date	Description	Sheets Revised	By
REVISIONS			





Weight of Required Reinforcement = 259 Kg/m [174 lbs/ft]

Sheet no.	Circumferential Area Req'd mm/m [in ² /ft]	Longitudinal Area Req'd mm/m [in ² /ft]	Mesh Size	Length mm [ft]	Circumferential Area Supl'd mm/m [in ² /ft]	Longitudinal Area Supl'd mm/m [in ² /ft]
1	A1 = 1778 [0.84]	445 [0.21]		3962 [13'-0"]		
2	A2 = 508 [0.24]	275 [0.13]		4140 [13'-7"]		
3	A3 = 1270 [0.60]	275 [0.13]		5029 [16'-6"]		
4	A4 = 508 [0.24]	508 [0.24]		2743 [9'-0"]		
5						
6						
7						

Design Loading: MS22.5 [HS25-44]

Cover = 610 [2'-0"] max.

NOTES:

1. Minimum 28-Day Concrete Compressive Strength shall be 34.5 MPa [5000 psi].
2. Overlap Length shall be measured from last crosswire.
3. Dimensions shown are for form system "A".
4. Minimum yield strength for welded wire fabric shall be 448 MPa [65,000 psi].
5. Reinforcing shall be limited to a maximum of three layers of reinforcing (WWF or bars) per area (A1, A2, A3 or A4).
6. All reinforcing shall be epoxy coated.
7. All edges of Precast to have a 19 [3/4"] chamfer



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Revisions:

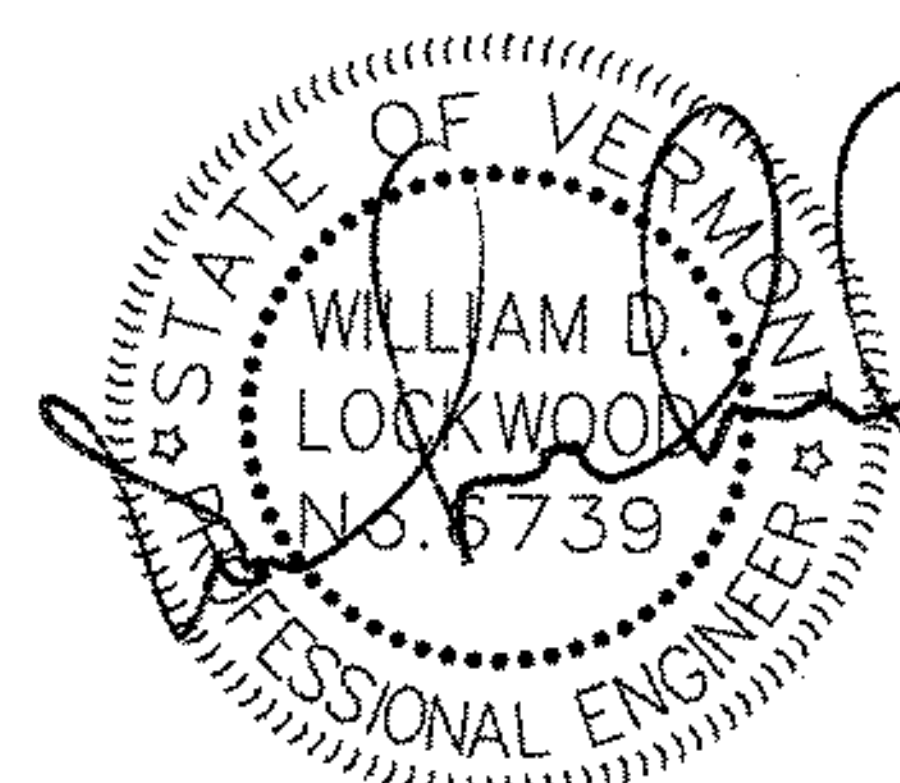
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Sheet Title:
PRECAST UNIT REINFORCEMENT
SHOP DRAWING

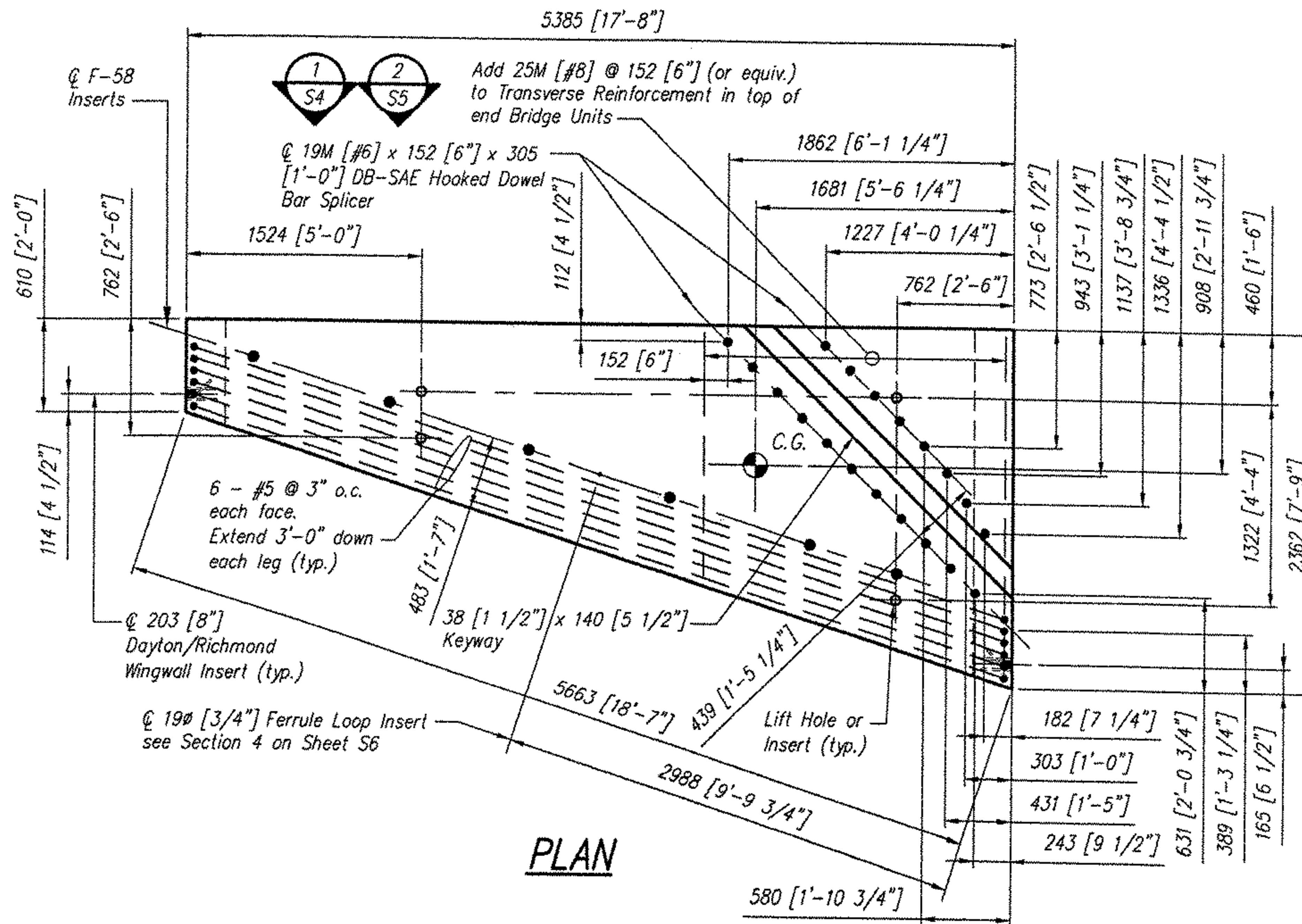
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VERMONT

VT. RTE. 121
BRIDGE NO. 7



Des. By: KJG
Drawn By: JLL
Chk'd By: JVP
Date: 6/22/04
Job No. 11415
Sheet No. S2
057



Notes:

- Bridge Unit will not hang level. Adjust cable lengths as required
- See Sheet S4 for Lift Points
- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

Total Weight = 10.9 Metric Tons [12.0 Tons]

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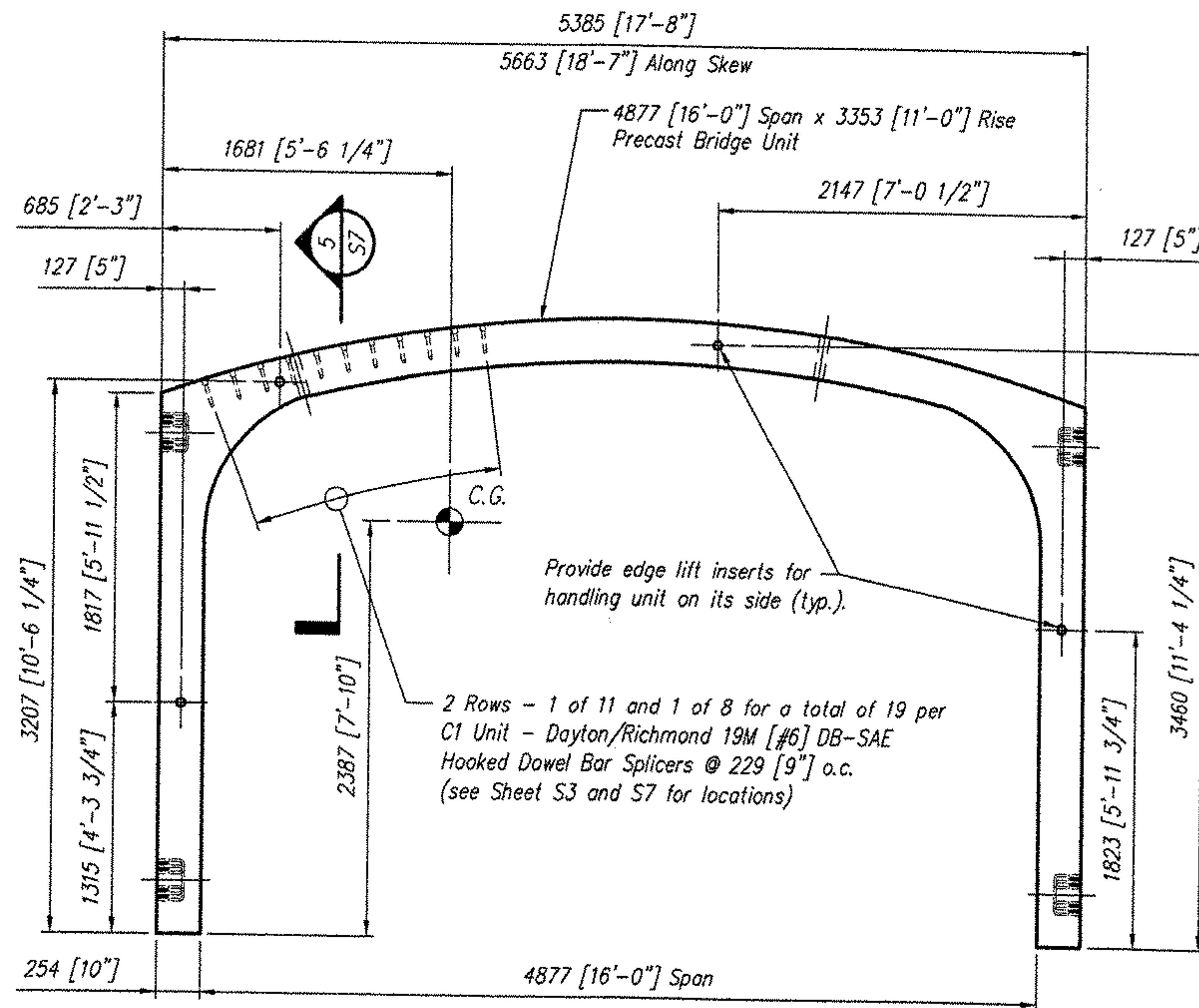
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Sheet Title:	HEADWALL END UNIT - C1
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VERMONT	VT. RTE. 121
ROCKINGHAM	BRIDGE NO. 7

Des. By:	KJG	Job No.	11415
Drawn By:	JLL	Sheet No.	S3
Chk'd By:	JVP		
Date:	6/22/04		058



ELEVATION 1
S3

Notes:

- Bridge Unit will not hang level. Adjust cable lengths as required
- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

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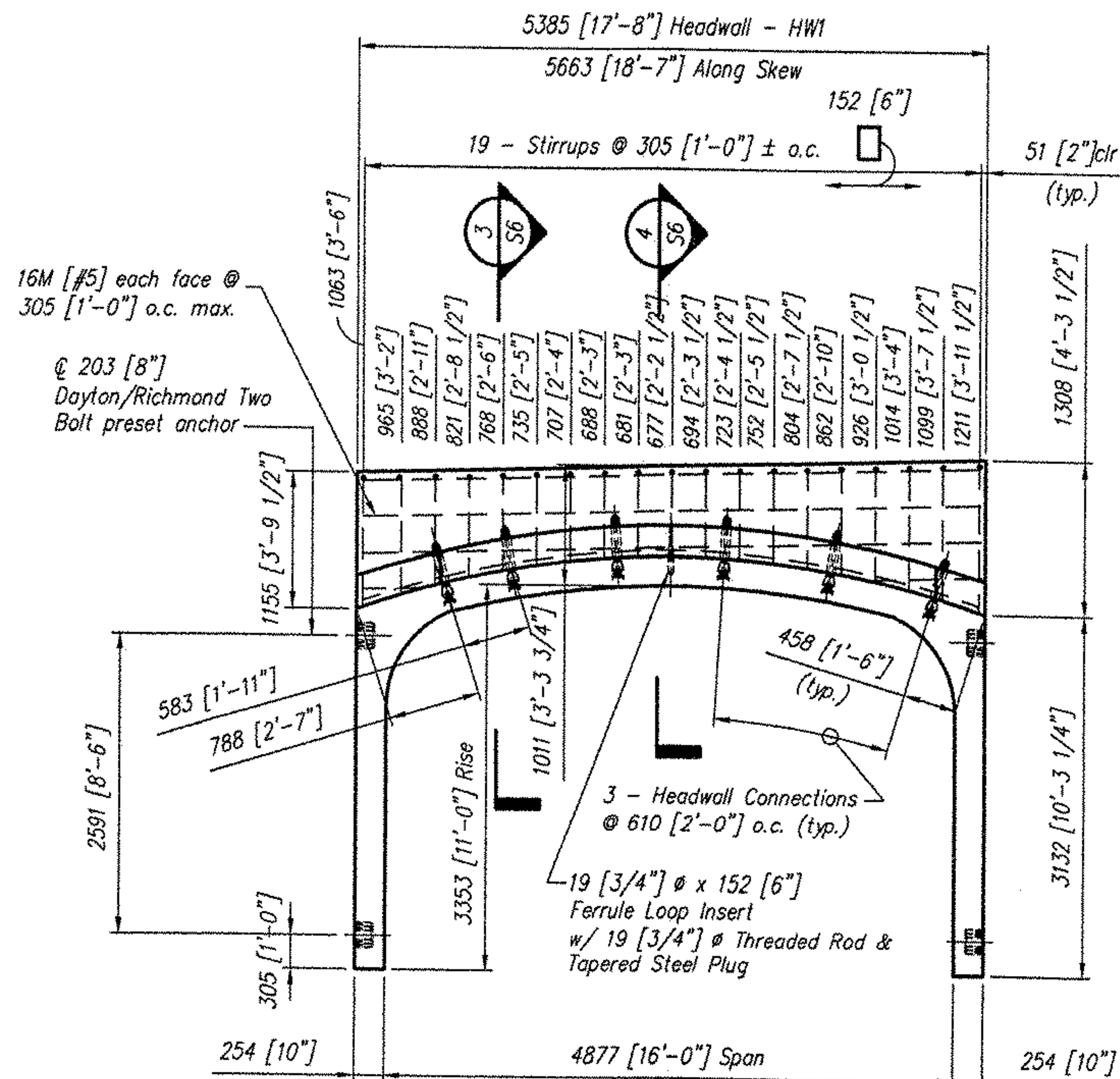
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No.		1	2	3	4

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VERMONT	VT. RTE. 121 BRIDGE NO. 7
ROCKINGHAM	

Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
Chk'd By: JVP	S4
Date: 6/22/04	059



Headwall		Arch Unit		
Concrete	Reinf. Steel	Concrete	Reinf. Steel	WWF
28-day: 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated	28-day: 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated	448.0 MPa [65,000 psi] epoxy coated

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

Notes:

- Elevation is looking at back face of Headwall
- Headwall to be cast against bridge unit
- Units must be grouted or braced when setting precast headwalls
- All edges of Precast to have a 19 [3/4"] chamfer

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Sheet Title:

HEADWALL REINFORCING - HW1
SHOP DRAWING

VERMONT

VT. RTE. 121
BRIDGE NO. 7

ROCKINGHAM

Des. By:

KJG

Job No.

11415

Drawn By:

JLL

Sheet No.

S5

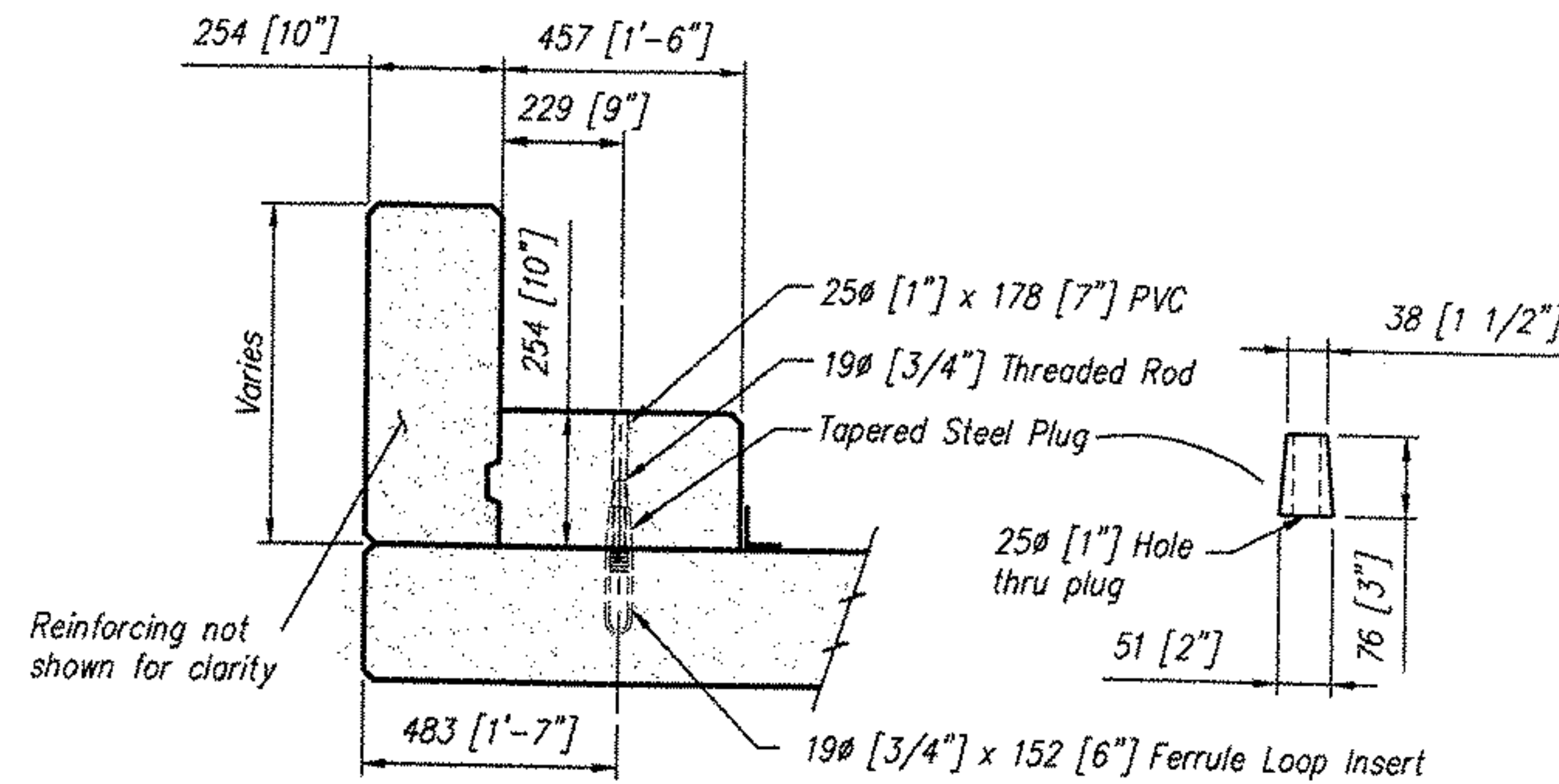
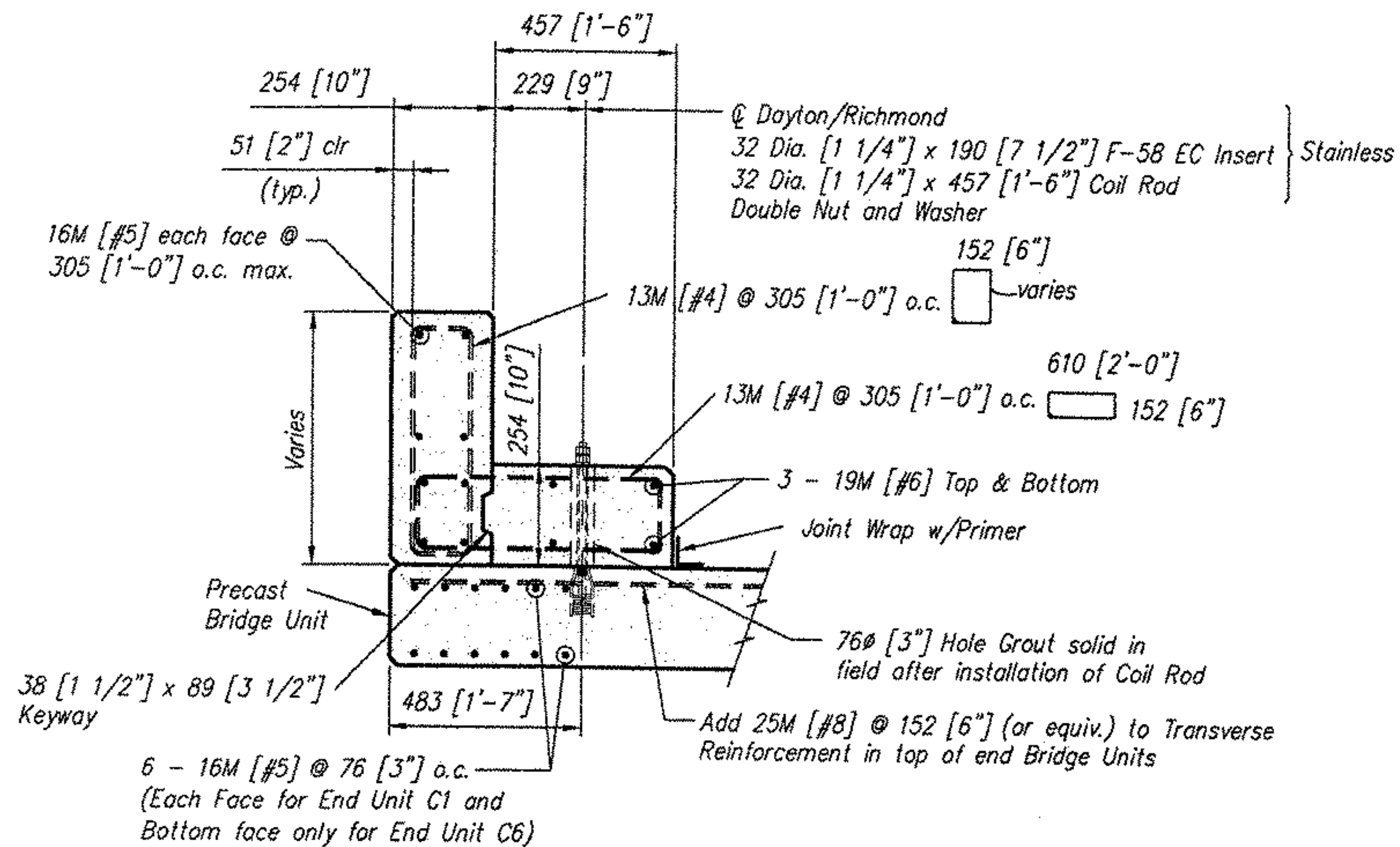
Chk'd By:

JVP

Date:

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060



Notes:

- Headwall to be cast against bridge unit
- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated



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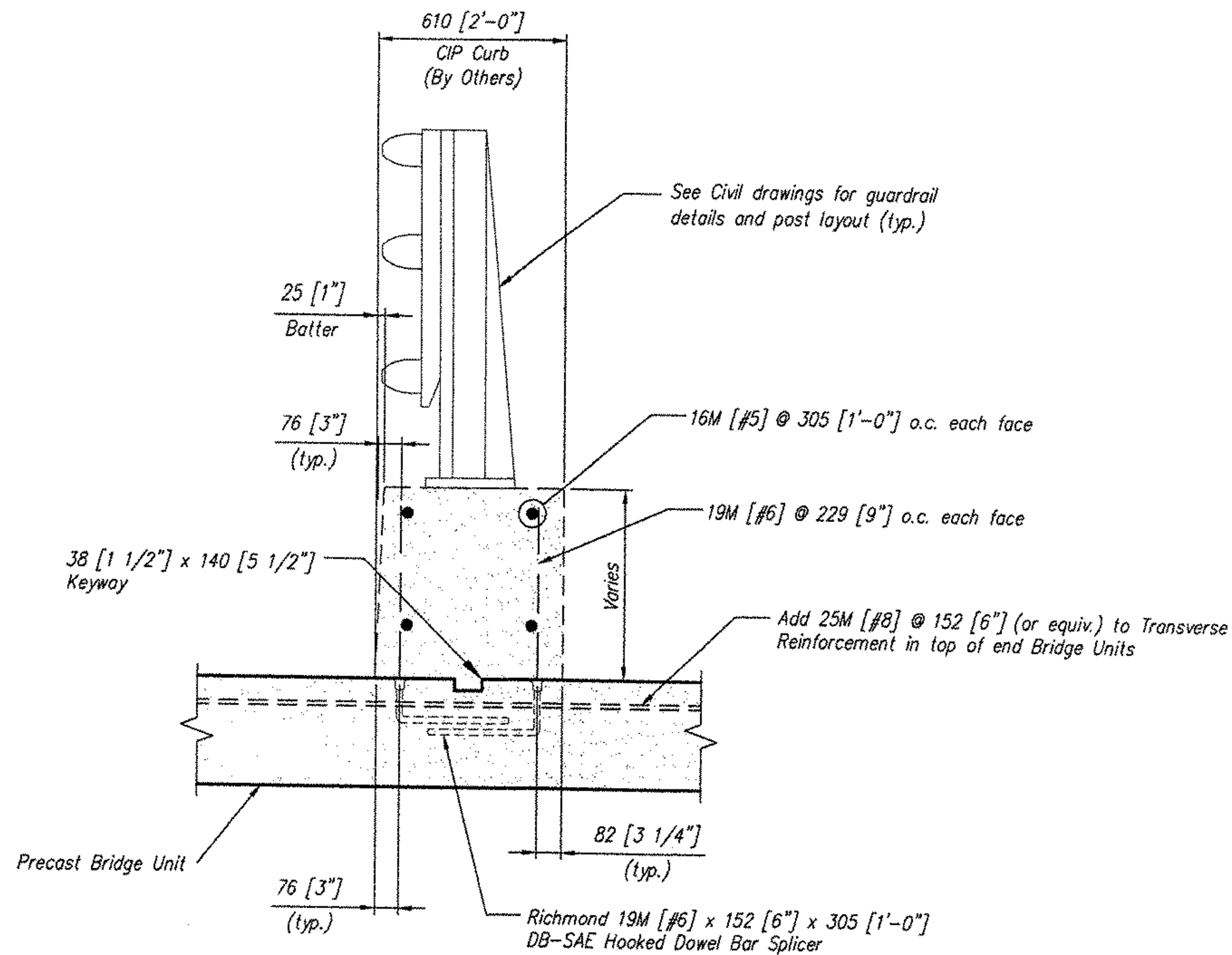
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Sheet Title: HEADWALL SECTIONS SHOP DRAWING
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BRIDGE NO: 7

Des. By: KJG Job No. 11415
Drawn By: JLL Sheet No.
Chk'd By: JVP S6
Date: 6/22/04 061



SECTION 5
S4, S10,
S12, S17

Notes:

- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

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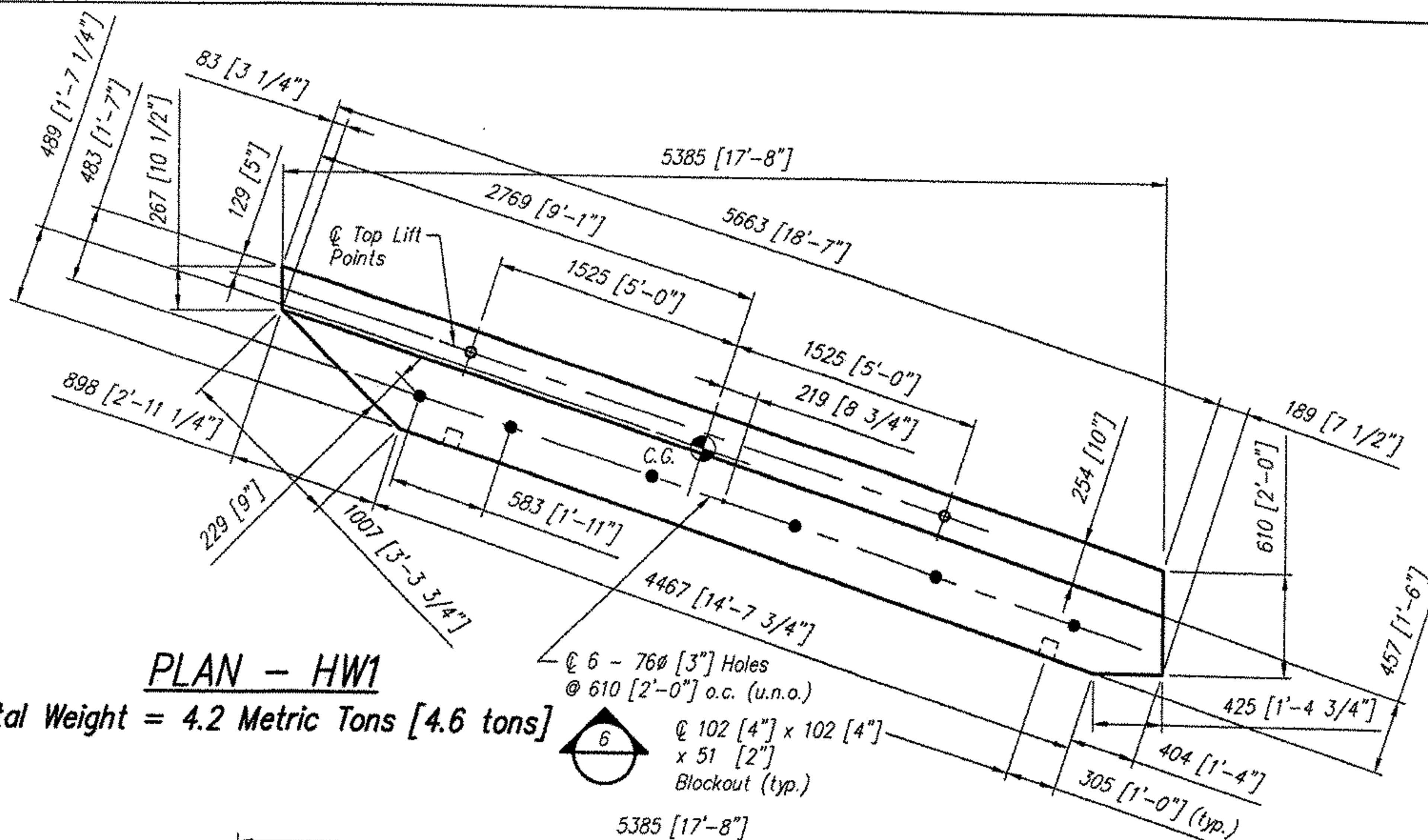
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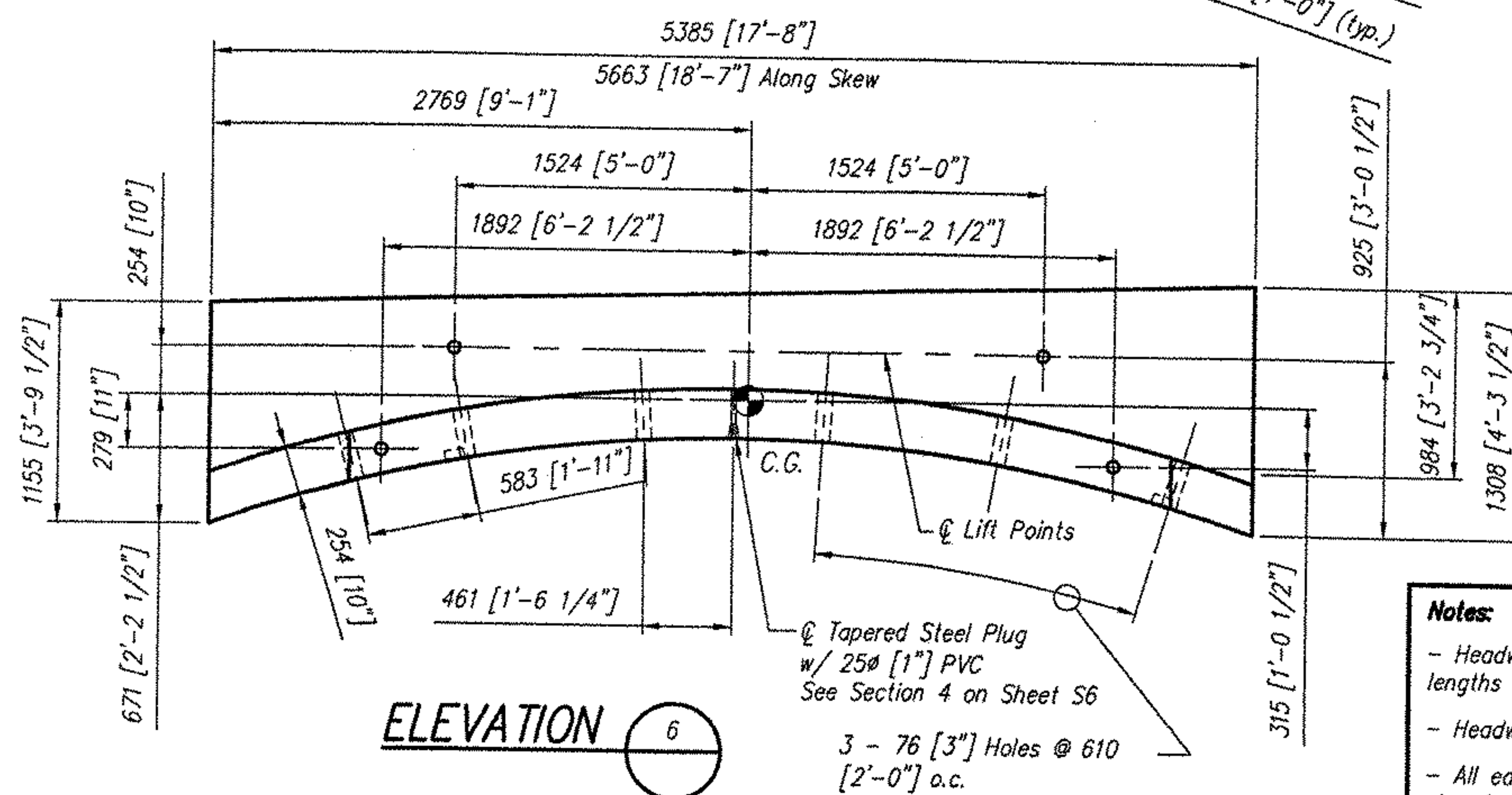
VERMONT	VT. RTE. 121 BRIDGE NO: 7
ROCKINGHAM	

Des. By:	KJG	Job No.	11415
Drawn By:	JLL	Sheet No.	S7
Chk'd By:	JVP		
Date:	6/22/04		062



PLAN - HW1
Total Weight = 4.2 Metric Tons [4.6 tons]

6
 6 - 76 [3"] Holes
 @ 610 [2'-0"] o.c. (u.n.o.)
 102 [4"] x 102 [4"]
 x 51 [2"]
 Blockout (typ.)



ELEVATION

6

3 - 76 [3"] Holes @ 610
 [2'-0"] o.c.
 Tapered Steel Plug
 w/ 25 [1"] PVC
 See Section 4 on Sheet S6

Notes:

- Headwall will not hang level. Adjust cable lengths as required
- Headwall to be cast against bridge unit
- All edges of Precast to have a 19 [3/4"] chamfer

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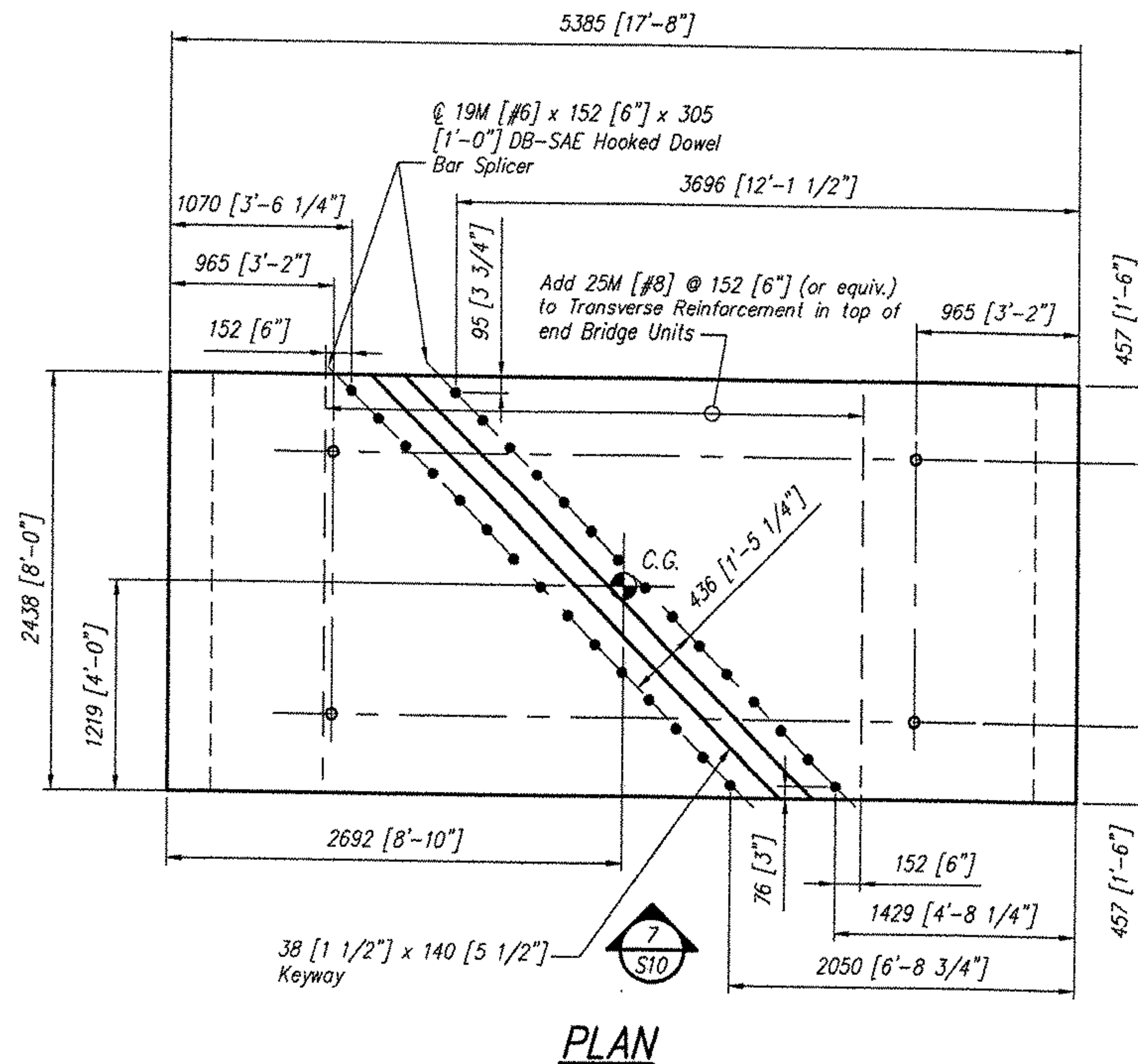
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Sheet Title:
 C.G. & LIFT POINTS - HW1
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Des. By:
 KJG
Job No.
 11415
Drawn By:
 JLL
Sheet No.
S8
Chk'd By:
 JVP
Date:
 6/22/04
063



Notes:

- Bridge Unit will not hang level. Adjust cable lengths as required
- See Sheet S10 for Edge Lift Points
- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

Total Weight = 17.8 Metric Tons [19.6 Tons]

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Sheet Title:

INTERIOR UNIT - C2
SHOP DRAWING

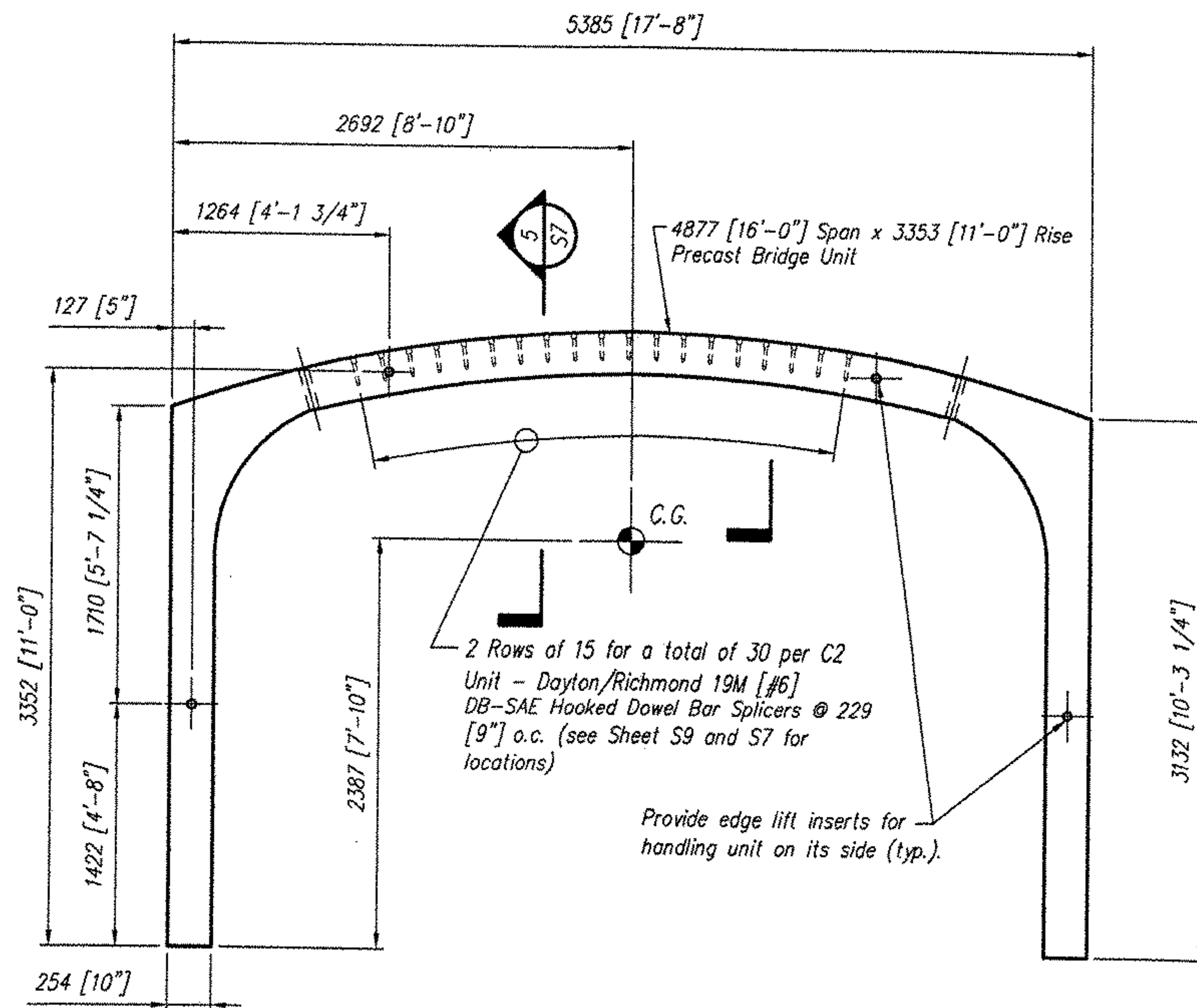
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Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
Chk'd By: JVP	S9
Date: 6/22/04	064



ELEVATION 7
S9

Notes:

- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

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INTERIOR UNIT - C2
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BRIDGE NO: 7

ROCKINGHAM

Des. By:
KJG

Job No.
11415

Drawn By:
JLL

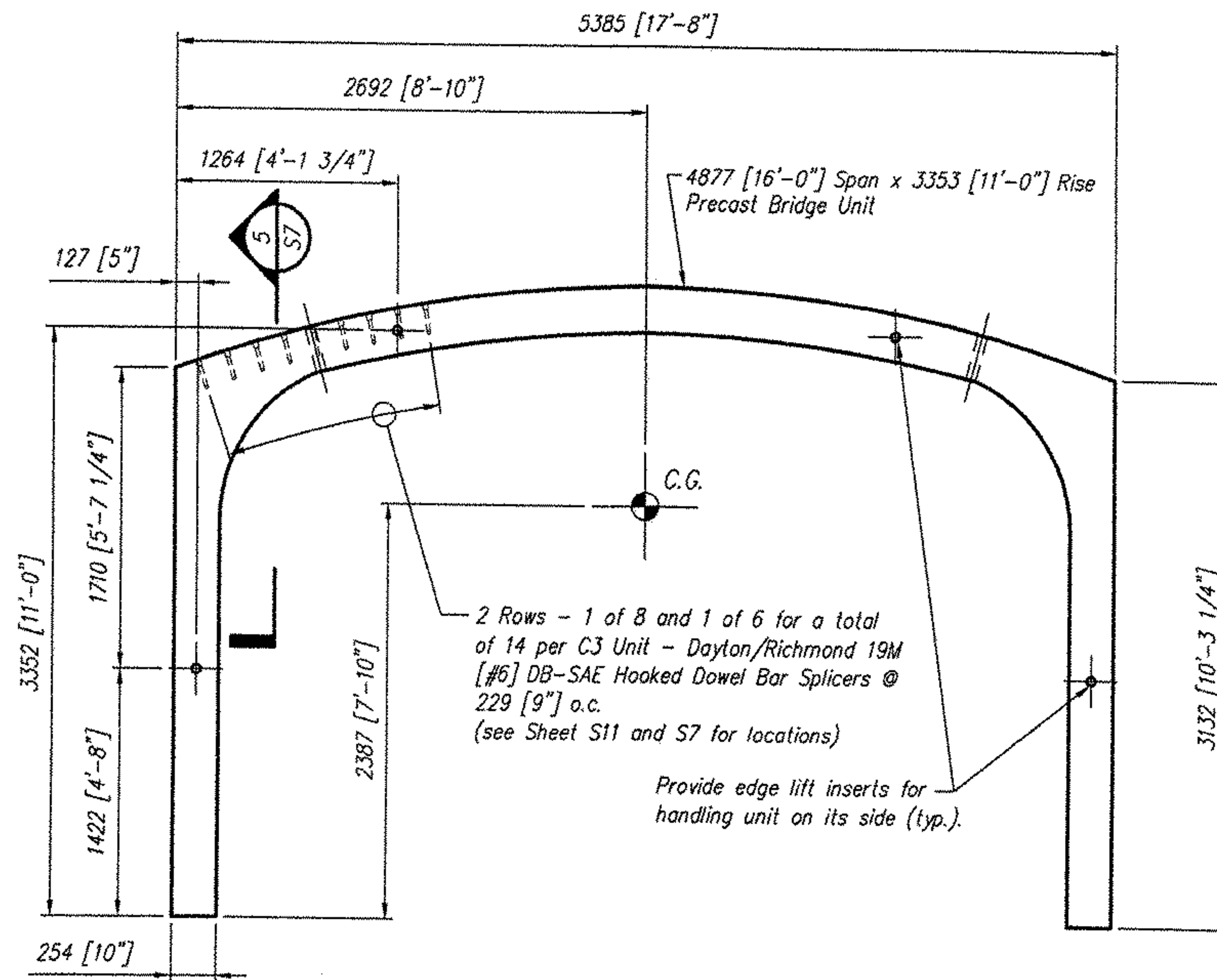
Sheet No.

Chk'd By:
JVP

S10

Date:
6/22/04

065



ELEVATION 8
S11

Notes:

- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

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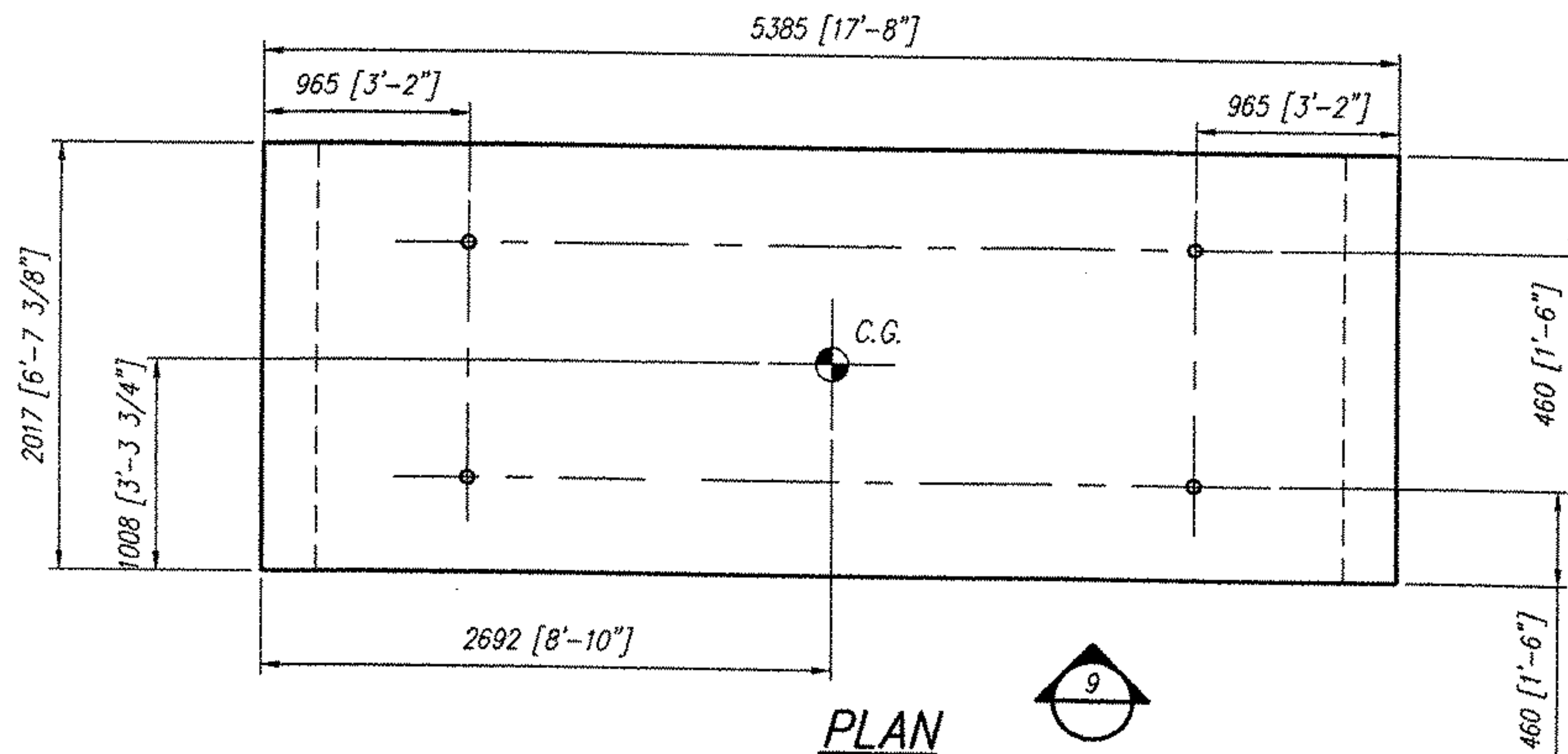
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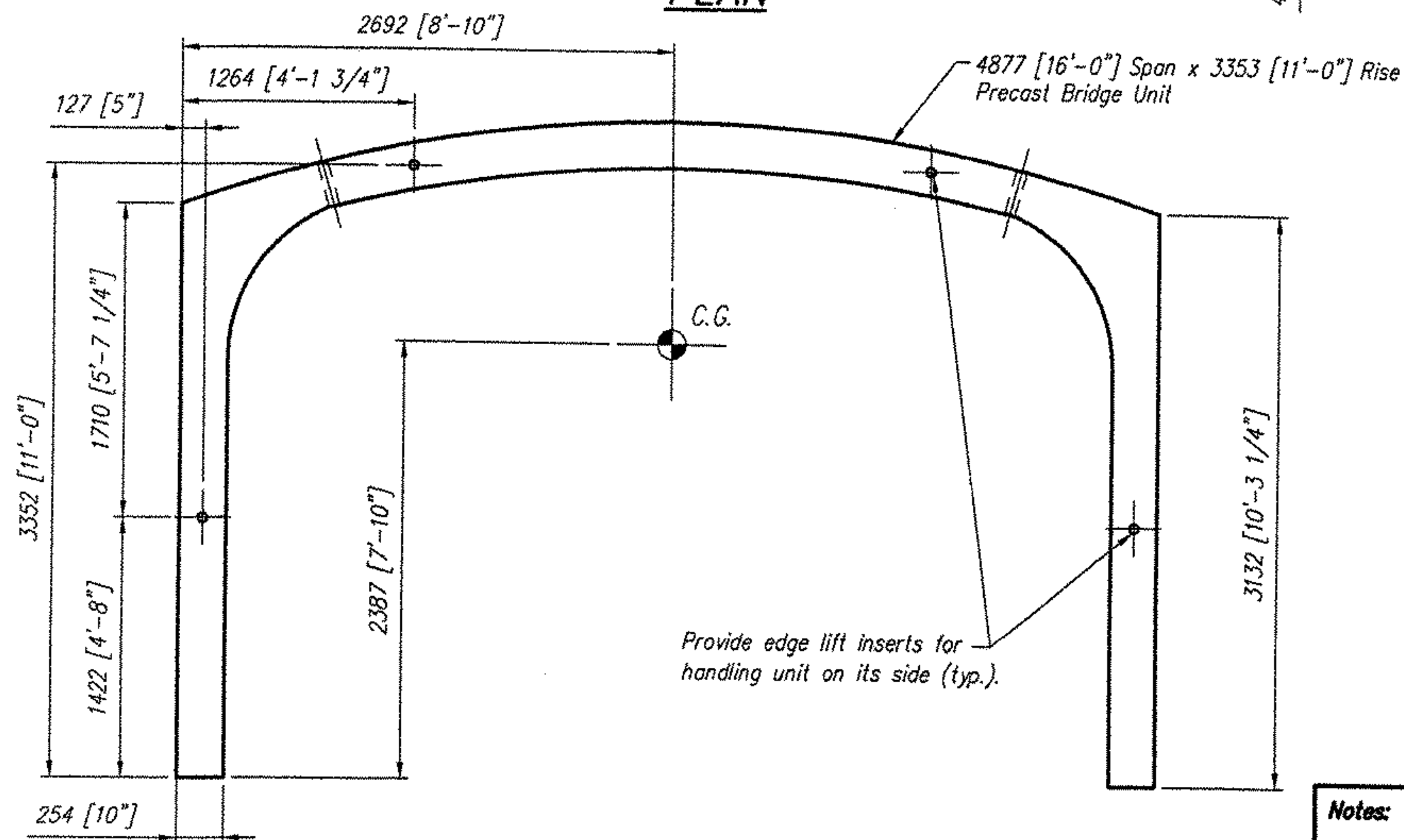
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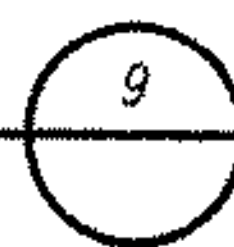
Des. By: K.J.G.	Job No. 11415
Drawn By: J.L.L.	Sheet No. S12
Chk'd By: J.V.P.	
Date: 6/22/04	067



PLAN



ELEVATION



Provide edge lift inserts for handling unit on its side (typ.).

Notes:

- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

Total Weight = 14.7 Metric Tons [16.2 Tons]

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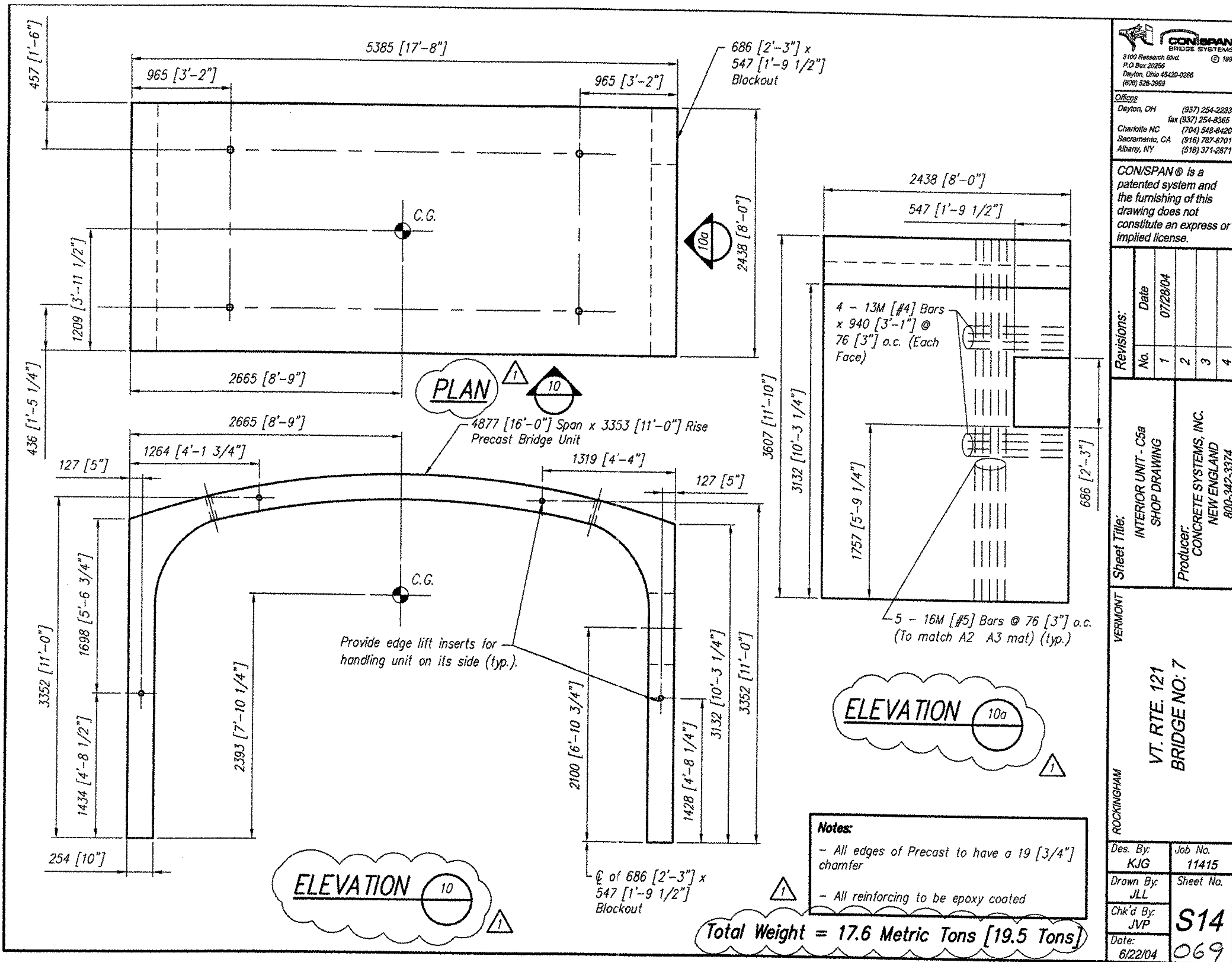
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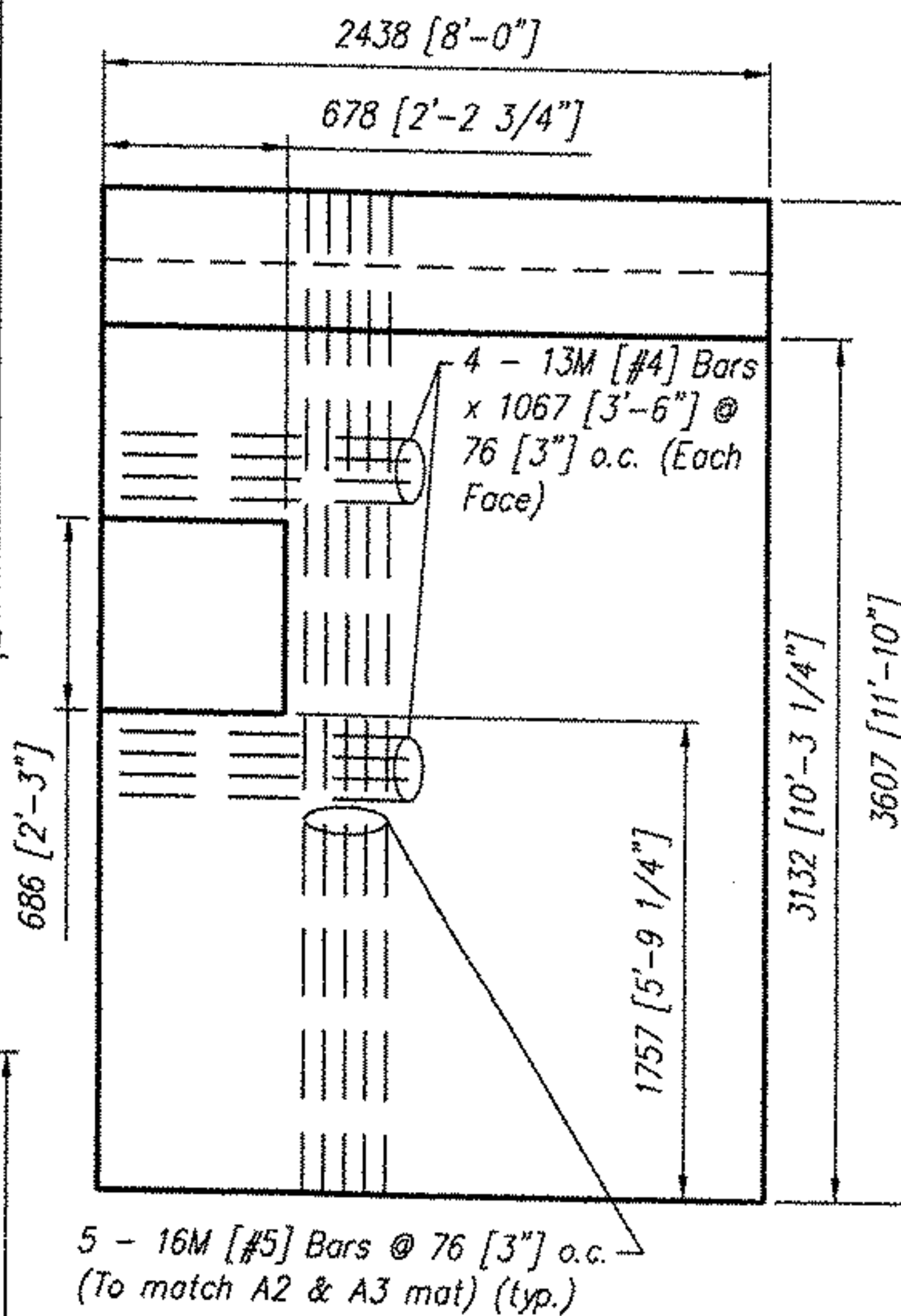
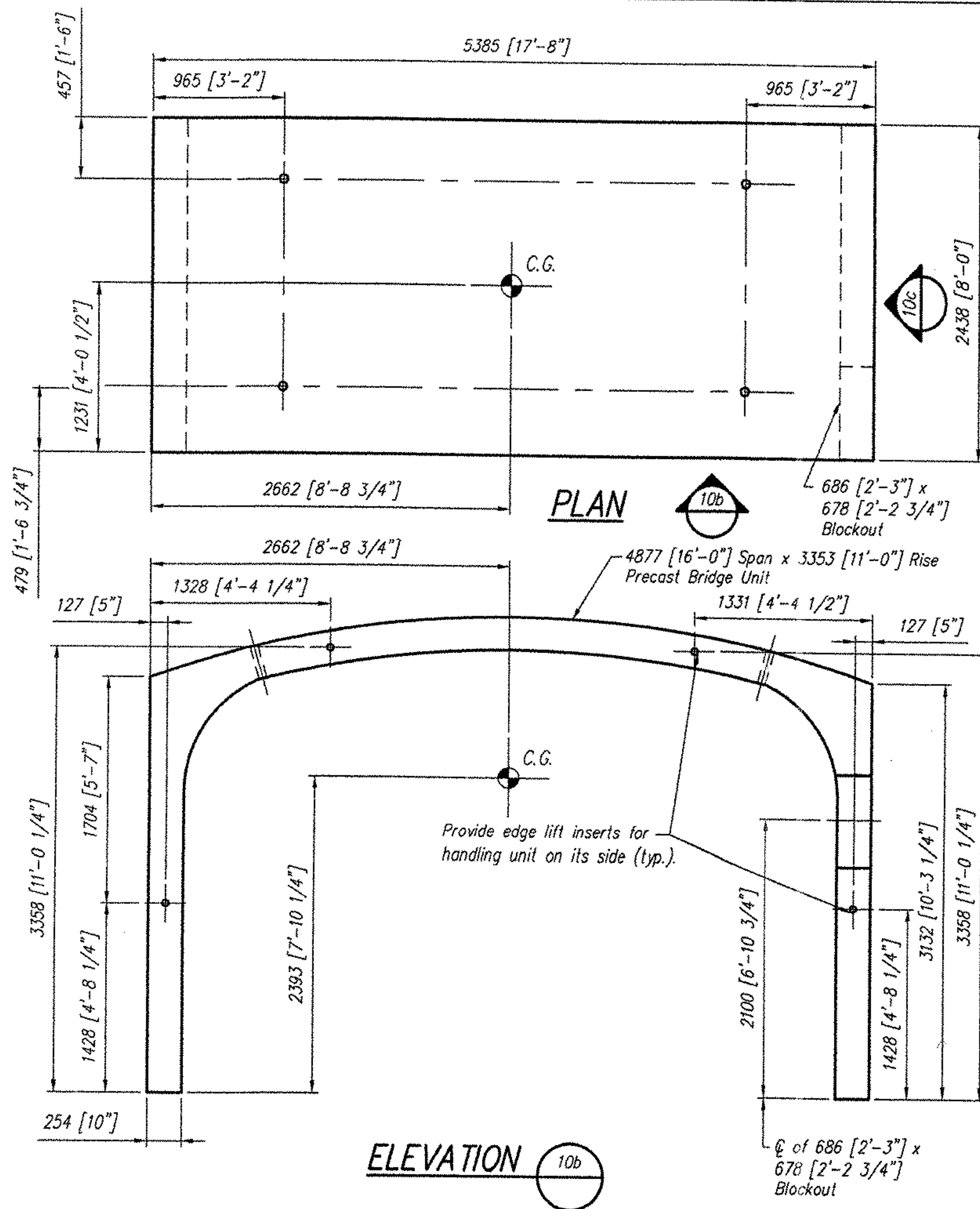
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Sheet Title:
INTERIOR UNIT - C4
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Des. By: KJG
Job No. 11415
Drawn By: JLL
Sheet No.
Chk'd By: JVP
S13
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068





Notes:

- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

Total Weight = 17.6 Metric Tons [19.4 Tons]

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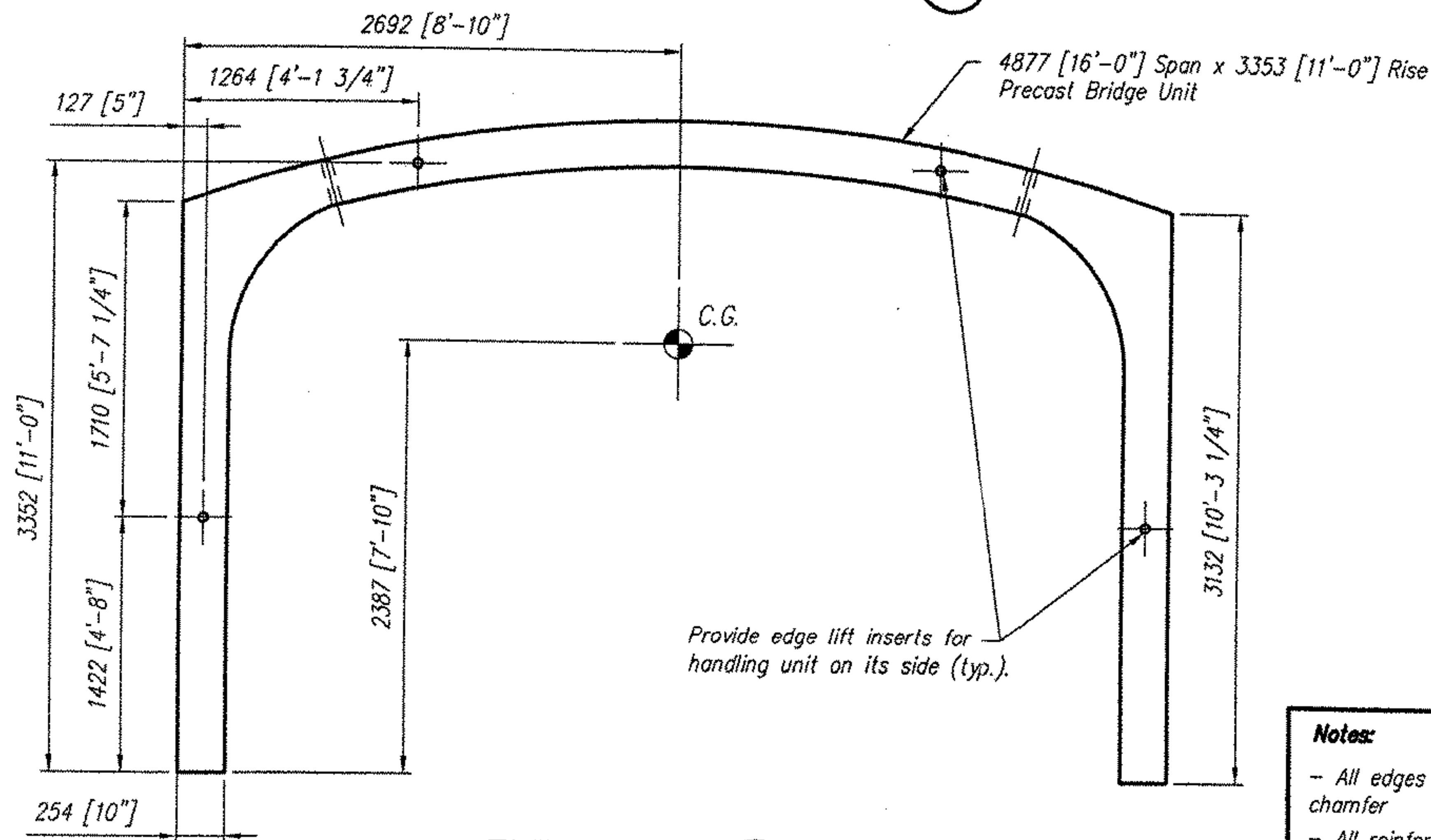
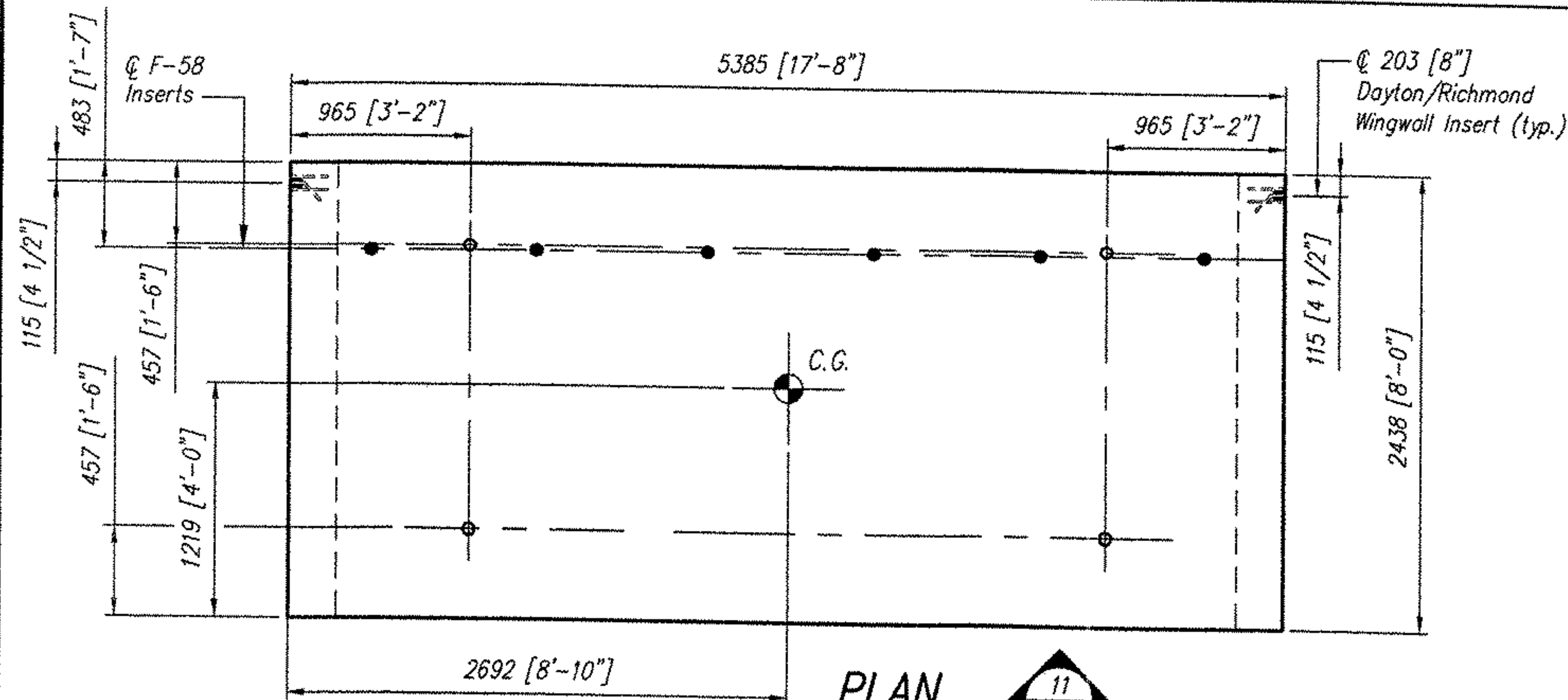
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No.	3	
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INTERIOR UNIT - C5b
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Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
Chk'd By: JVP	S14a
Date: 6/22/04	070



ELEVATION 11

Notes:

- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

Total Weight = 17.8 Metric Tons [19.6 Tons]



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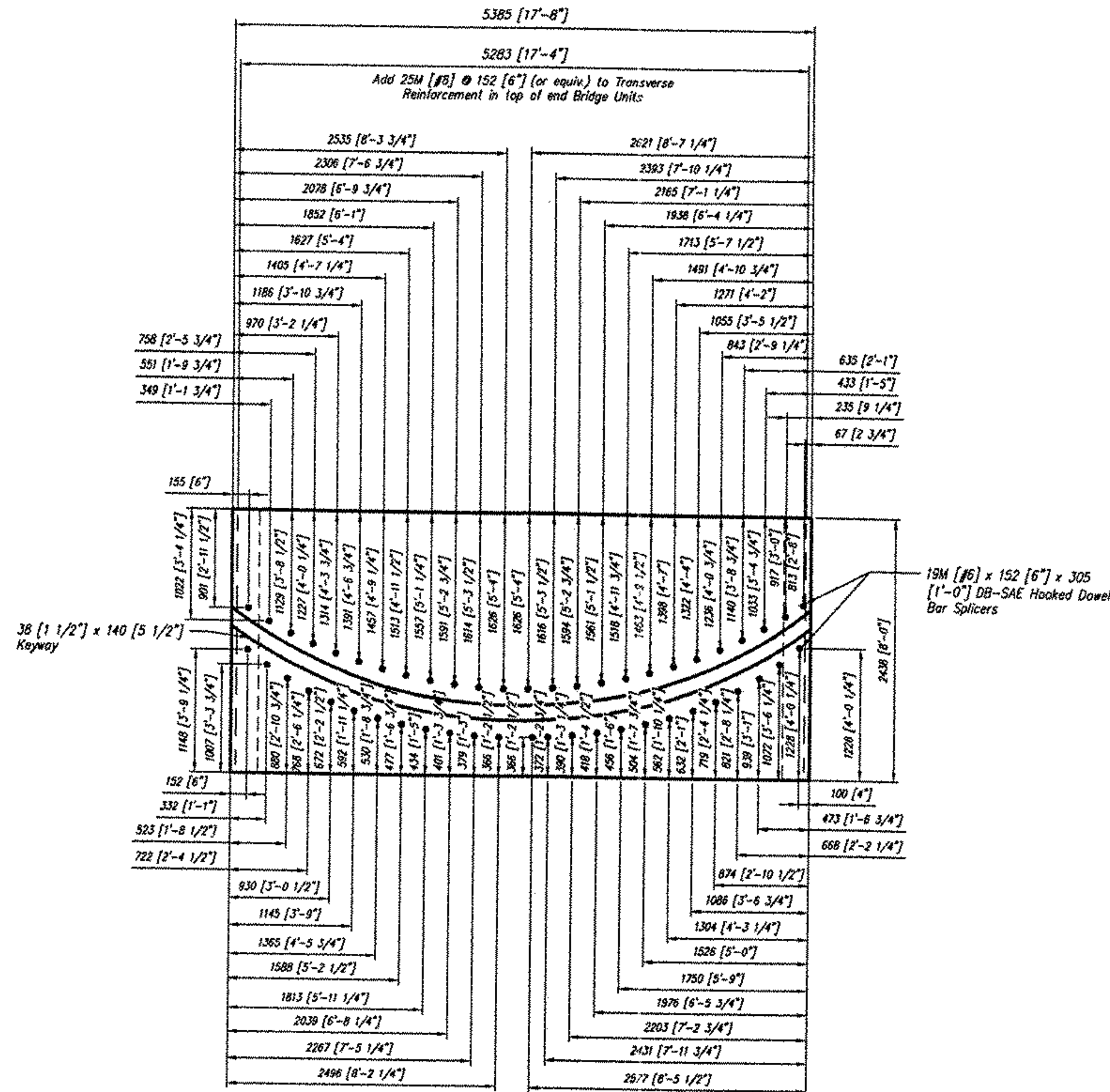
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HEADWALL END UNIT - C6
SHOP DRAWING

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Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
Chk'd By: JVP	S15
Date: 6/22/04	07/



PLAN

Notes:

- All edges of Precast to have a 19 (3/4") chamfer
- All reinforcing to be epoxy coated

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Drawn By:
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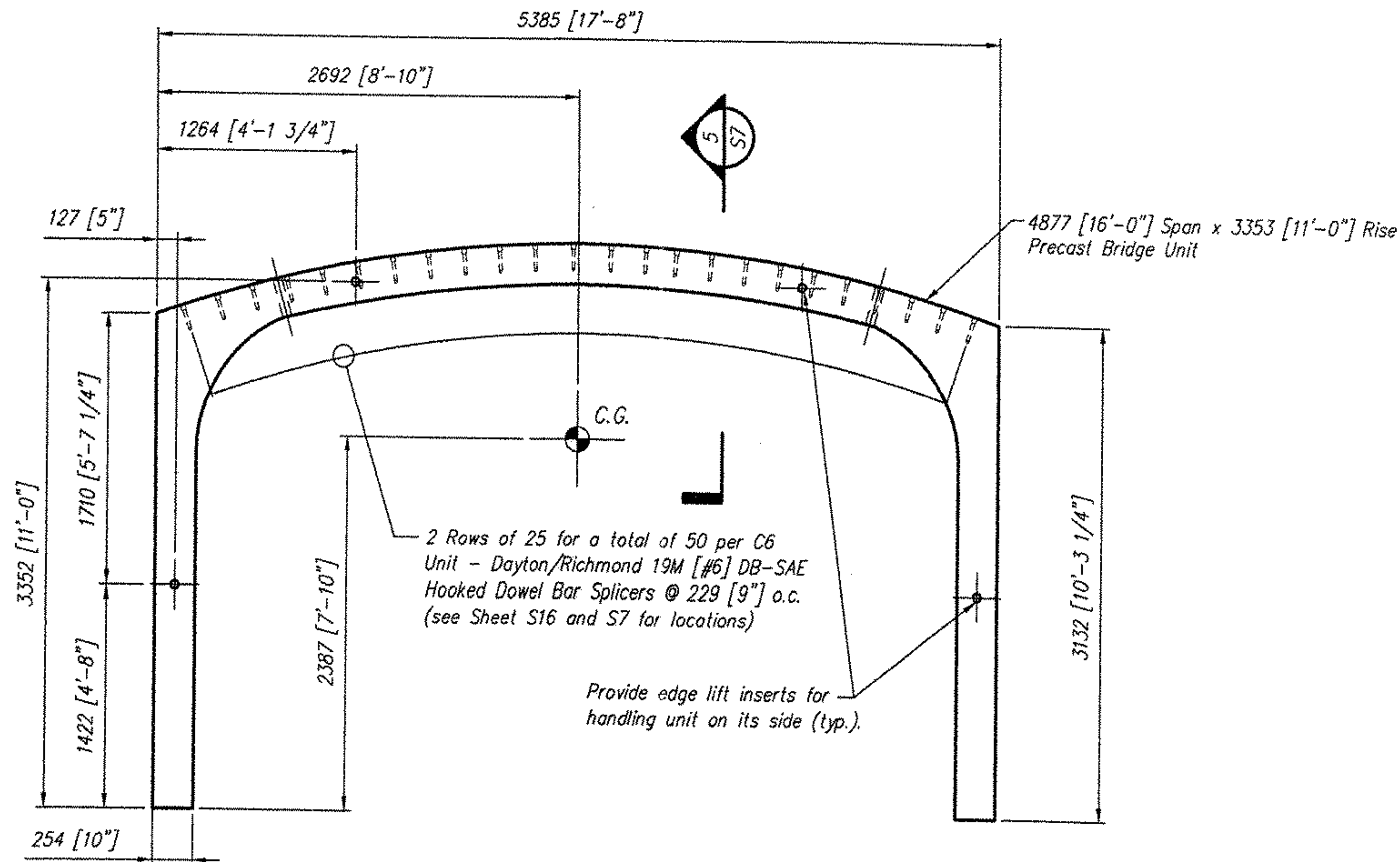
Sheet No.

Chk'd By:
JVP

S16

Date:
6/22/04

072



ELEVATION 13
S16

Notes:

- Bridge Unit will not hang level. Adjust cable lengths as required
- All edges of Precast to have a 19 [3/4"] chamfer
- All reinforcing to be epoxy coated

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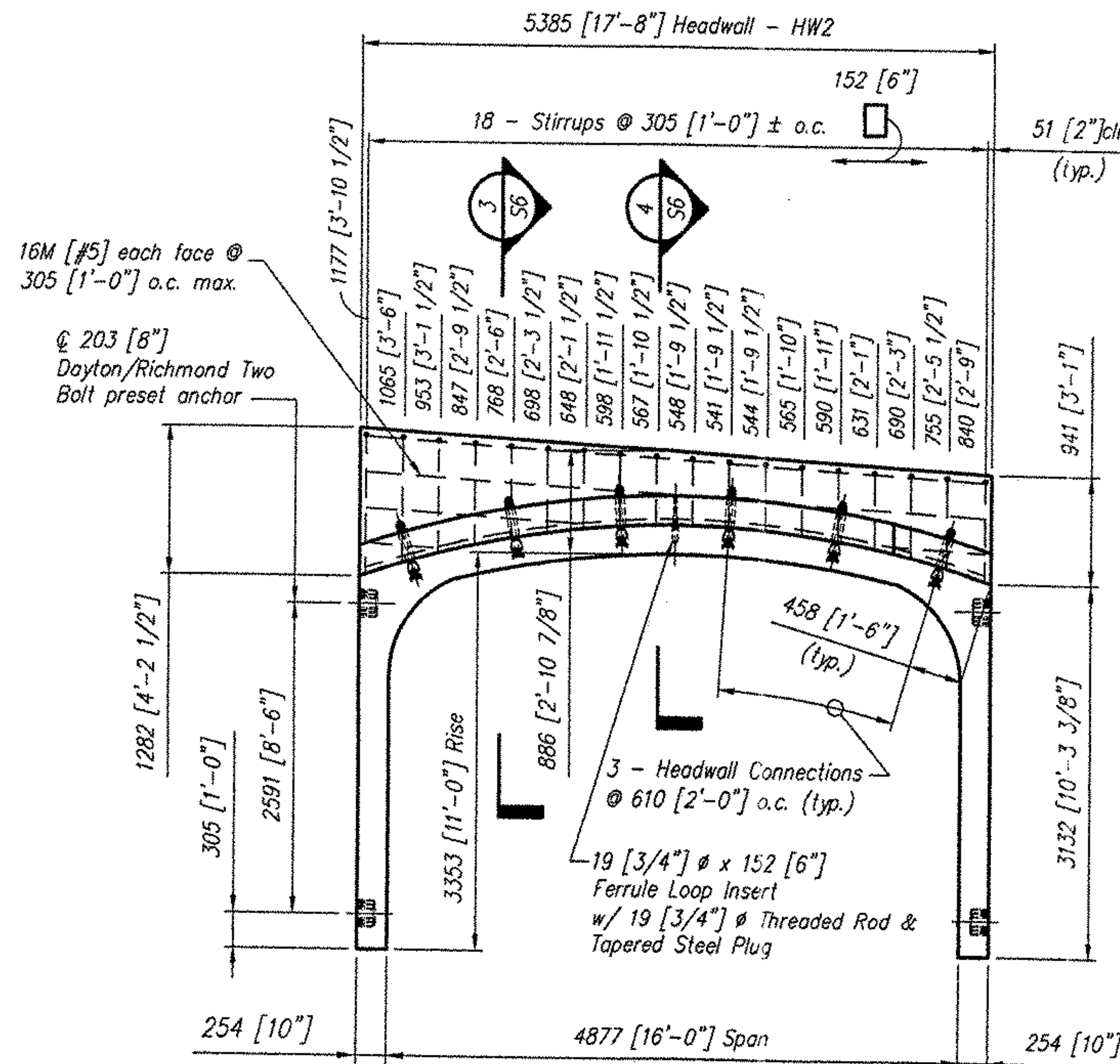
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Drawn By: JLL	Sheet No. S17
Chk'd By: JVP	Date: 6/22/04
	073



ELEVATION 13
S16

Headwall		Arch Unit		
Concrete	Reinf. Steel	Concrete	Reinf. Steel	WWF
28-day: 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated	28-day: 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated	448.0 MPa [65,000 psi] epoxy coated

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

Notes:

- Elevation is looking at back face of Headwall
- Headwall to be cast against bridge unit
- Units must be grouted or braced when setting precast headwalls
- All edges of Precast to have a 19 [3/4"] chamfer

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HEADWALL REINFORCING - HW2
SHOP DRAWING

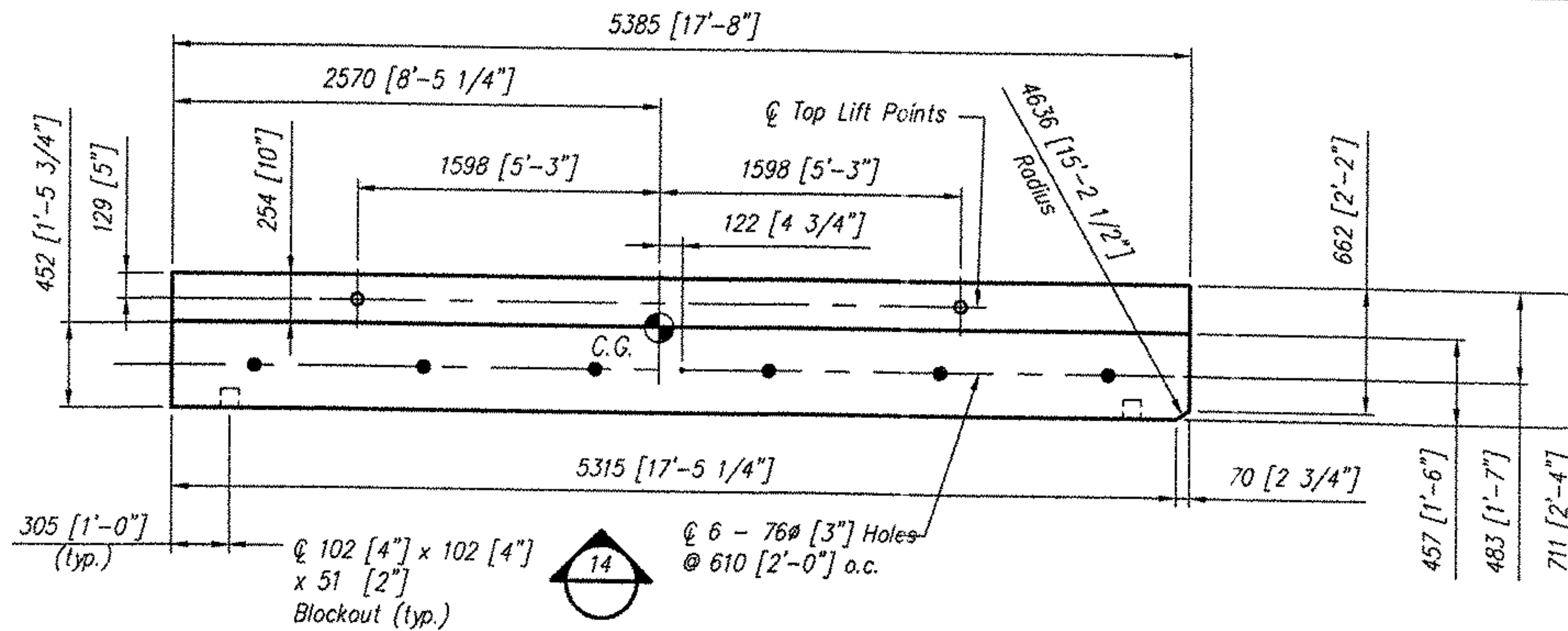
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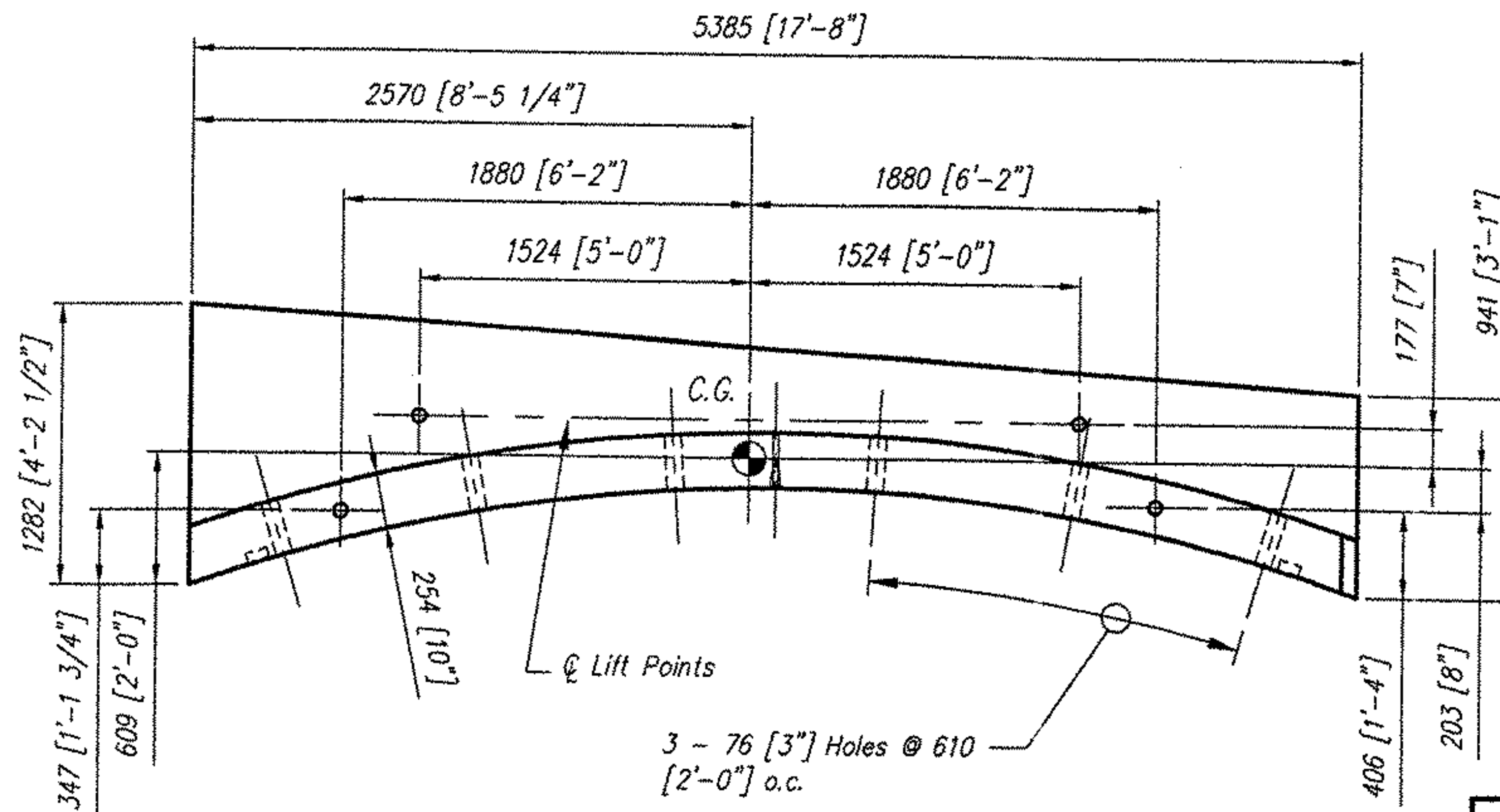
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Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
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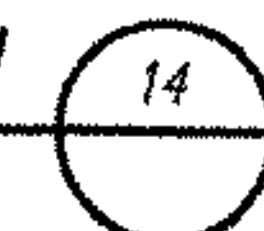


PLAN - HW2

Total Weight = 4.1 Metric Tons [4.5 tons]



ELEVATION



Notes:

- Headwall will not hang level. Adjust cable lengths as required
- Headwall to be cast against bridge unit
- All edges of Precast to have a 19 [3/4"] chamfer

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C.G. & LIFT POINTS - HW2
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Job No.
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Drawn By:
JLL

Sheet No.

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S19

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Horizontal Bars:
16M [#5] @ 305
[1'-0"] o.c. max.
each face (typ.)

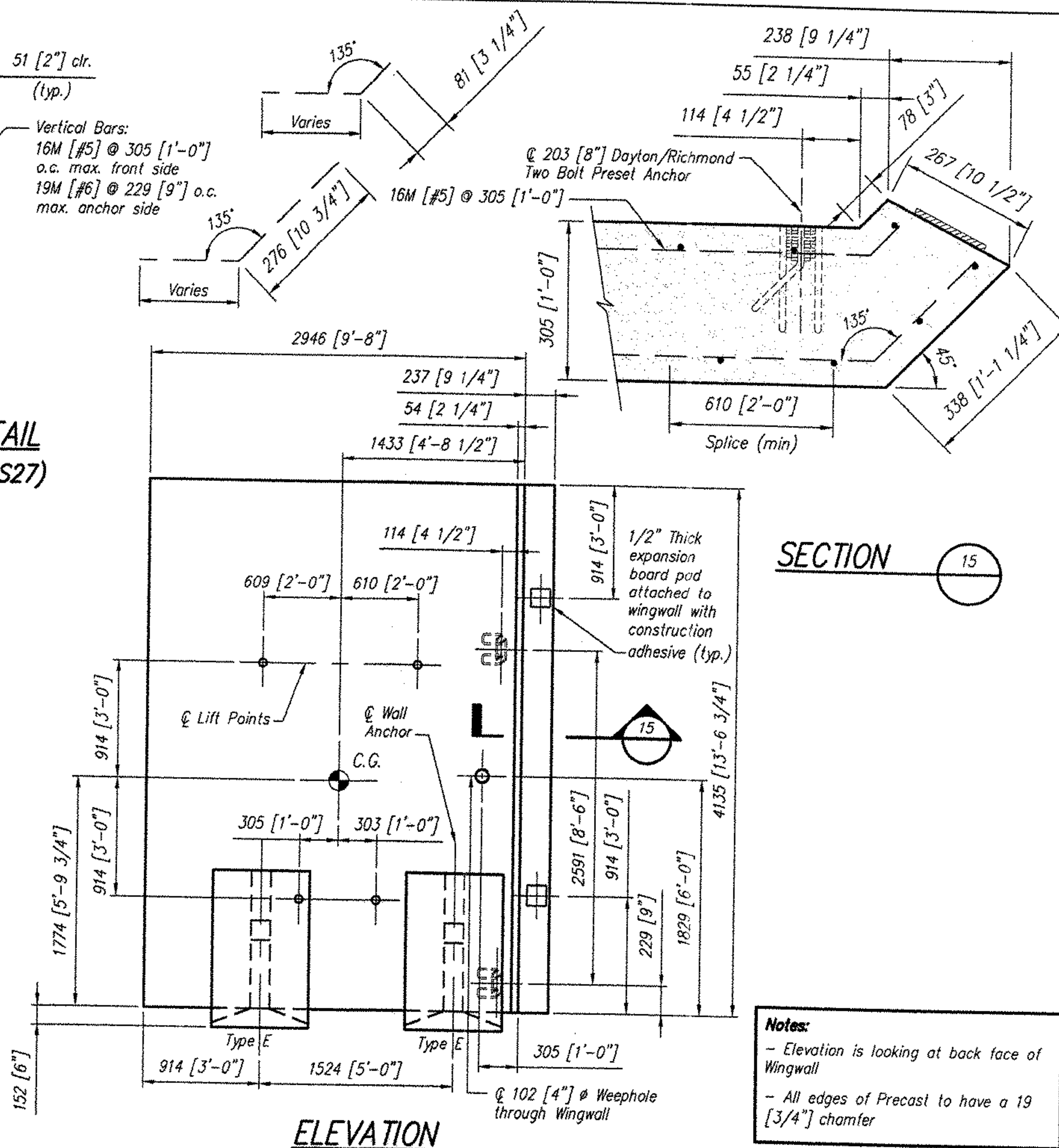
- Vertical Bars:
16M [#5] @ 305 [1'-0"]
o.c. max. front side
19M [#6] @ 229 [9"] o.c.
max. anchor side

REINFORCING DETAIL

(See Section - Sheet S27)

Wingwall	
Concrete	Reinf. Steel
28-day: 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated

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



Notes:

- Elevation is looking at back face of Wingwall
- All edges of Precast to have a 19 [3/4"] chamfer

Total Weight = 11.0 Metric Tons [12.1 Tons]



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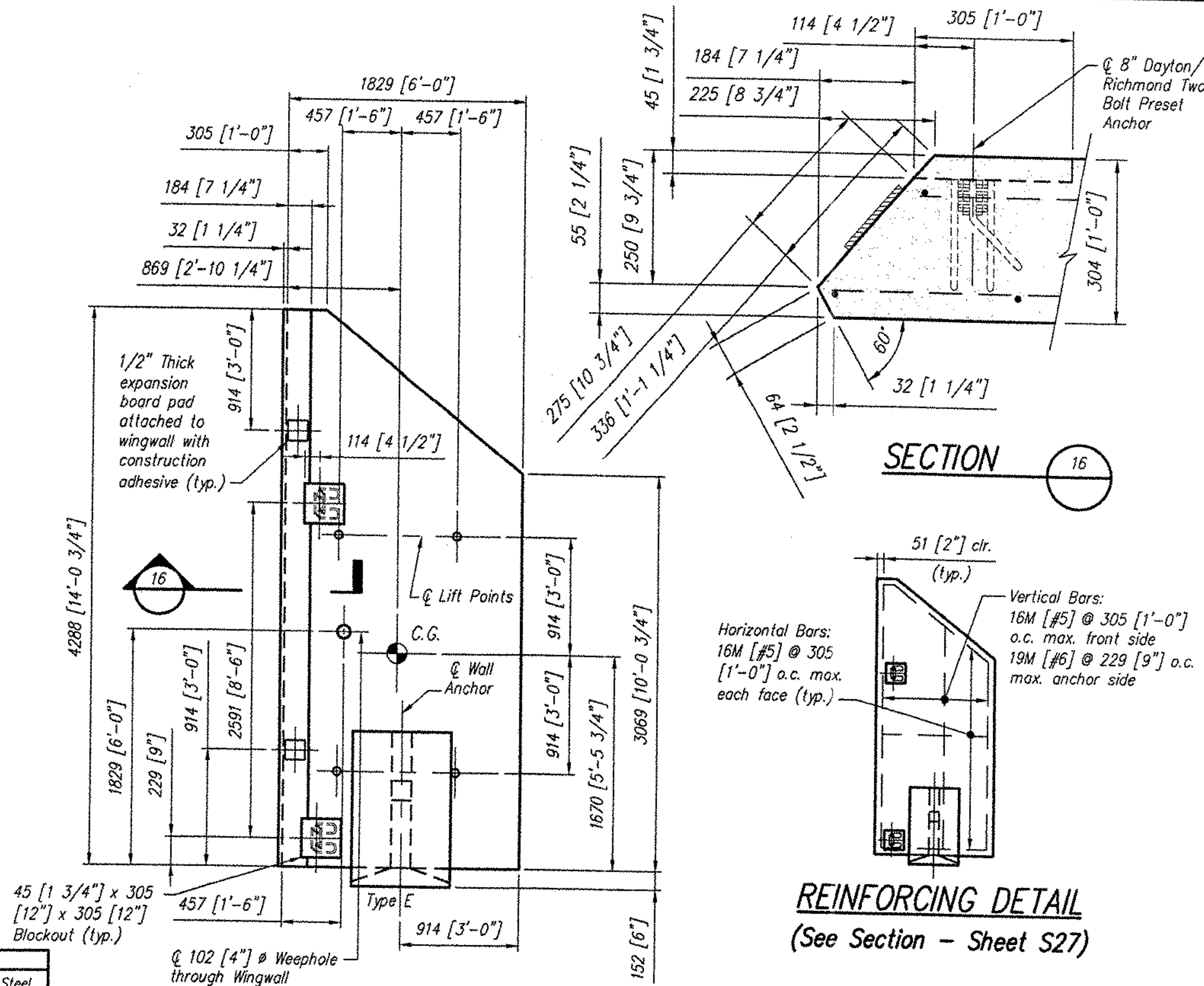
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Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
Chk'd By: JVP	S20
Date: 6/22/04	



Wingwall	
Concrete	Reinf. Steel
28-day: 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated

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

ELEVATION

REINFORCING DETAIL (See Section - Sheet S27)

Notes:

- Elevation is looking at back face of Wingwall
- All edges of Precast to have a 19 [3/4"] chamfer

Total Weight = 6.1 Metric Tons [6.7 Tons]

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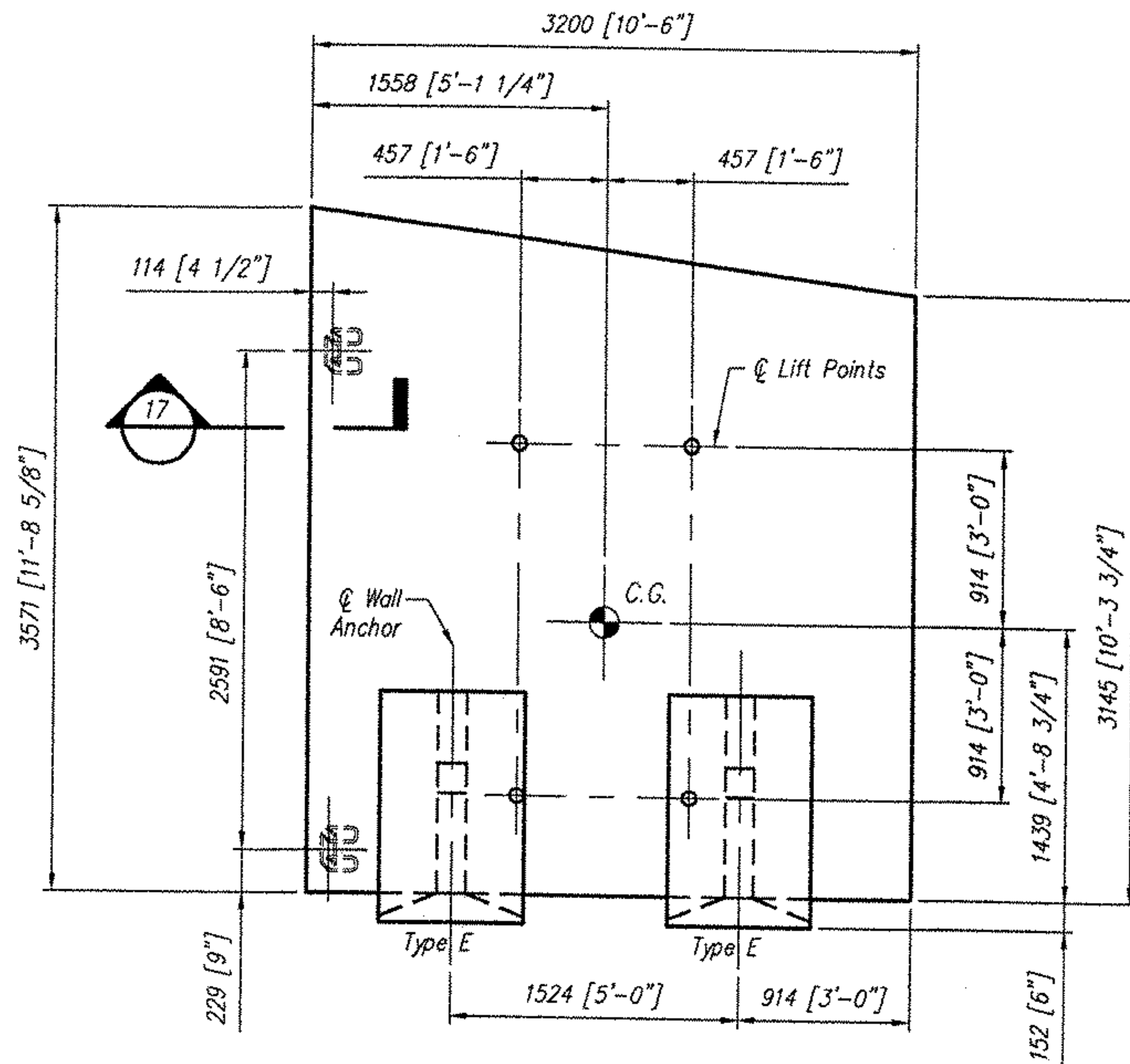
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VERMONT

VT. RTE. 121
BRIDGE NO. 7

ROCKINGHAM

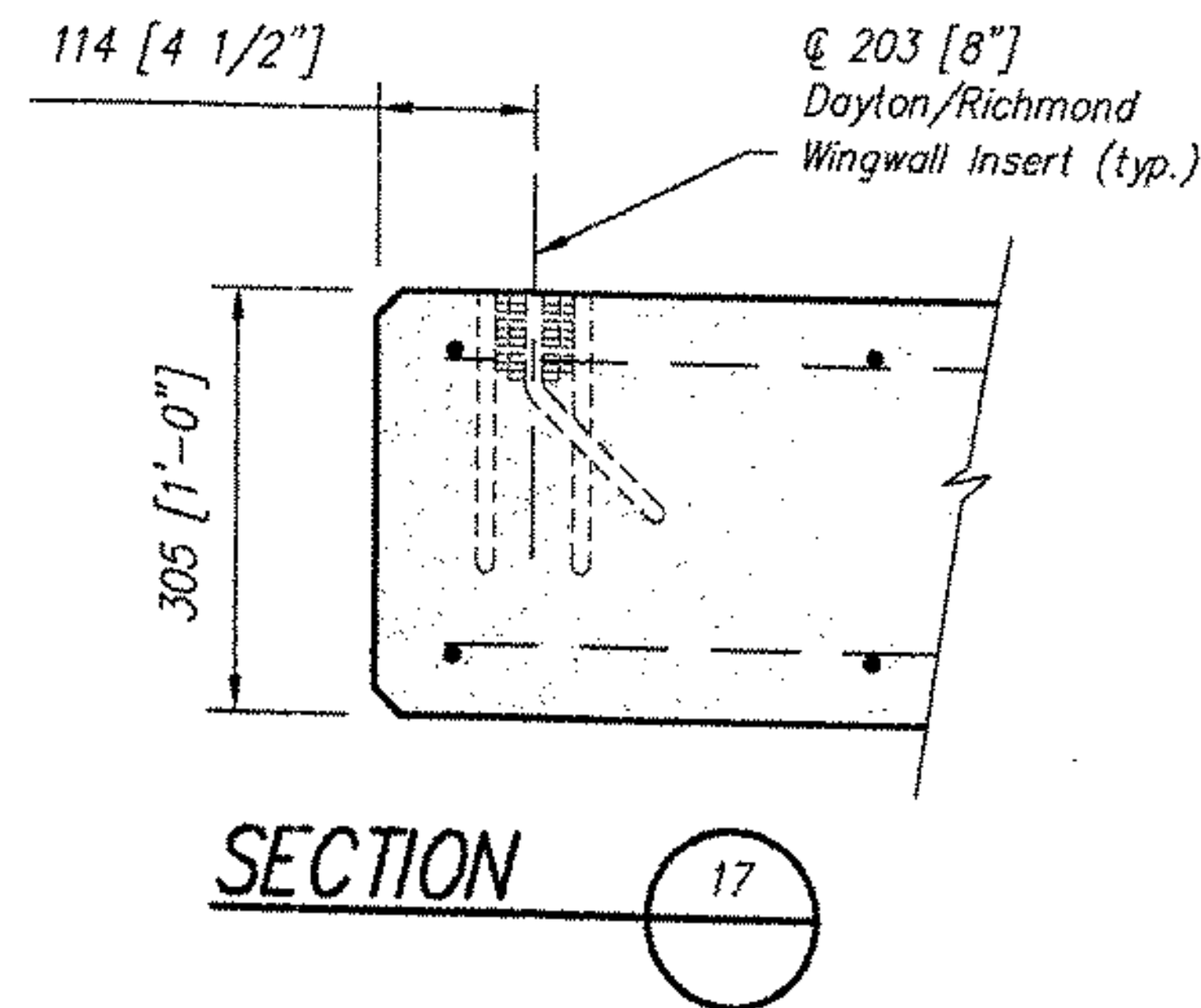
Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
Chk'd By: JVP	S21
Date: 6/22/04	077



ELEVATION

Wingwall	
Concrete	Reinf. Steel
28-day 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated

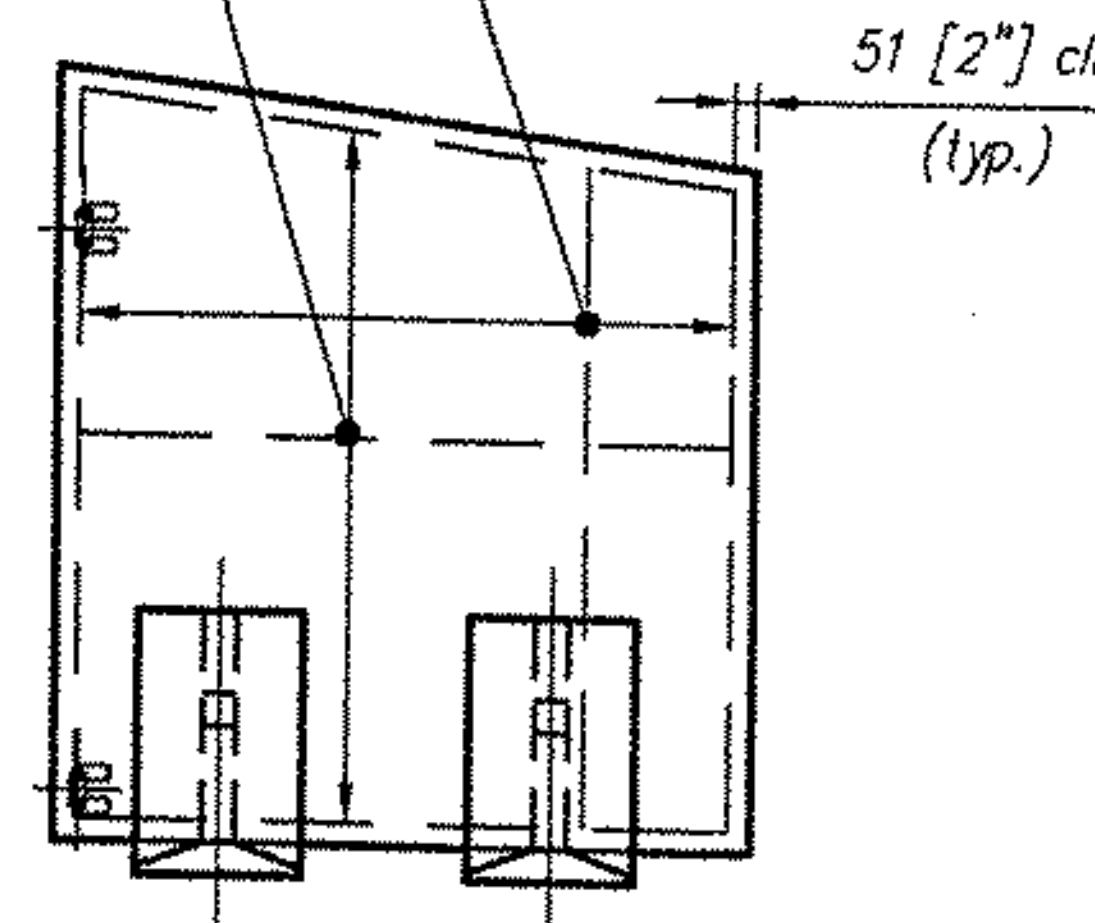
Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on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



SECTION

Horizontal Bars:
16M [#5] @ 305
[1'-0"] o.c. max.
each face (typ.)

Vertical Bars:
16M [#5] @ 305 [1'-0"]
o.c. max. front side
19M [#6] @ 229 [9"] o.c.
max. anchor side



REINFORCING DETAIL

(See Section - Sheet S27)

Notes:

- Elevation is looking at back face of Wingwall
- All edges of Precast to have a 19 [3/4"] chamfer

Total Weight = 10.0 Metric Tons [11.0 Tons]

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Sheet Title:

WINGWALL WW3a
SHOP DRAWING

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BRIDGE NO: 7

ROCKINGHAM

Des. By:
KJG

Job No.
11415

Drawn By:
JLL

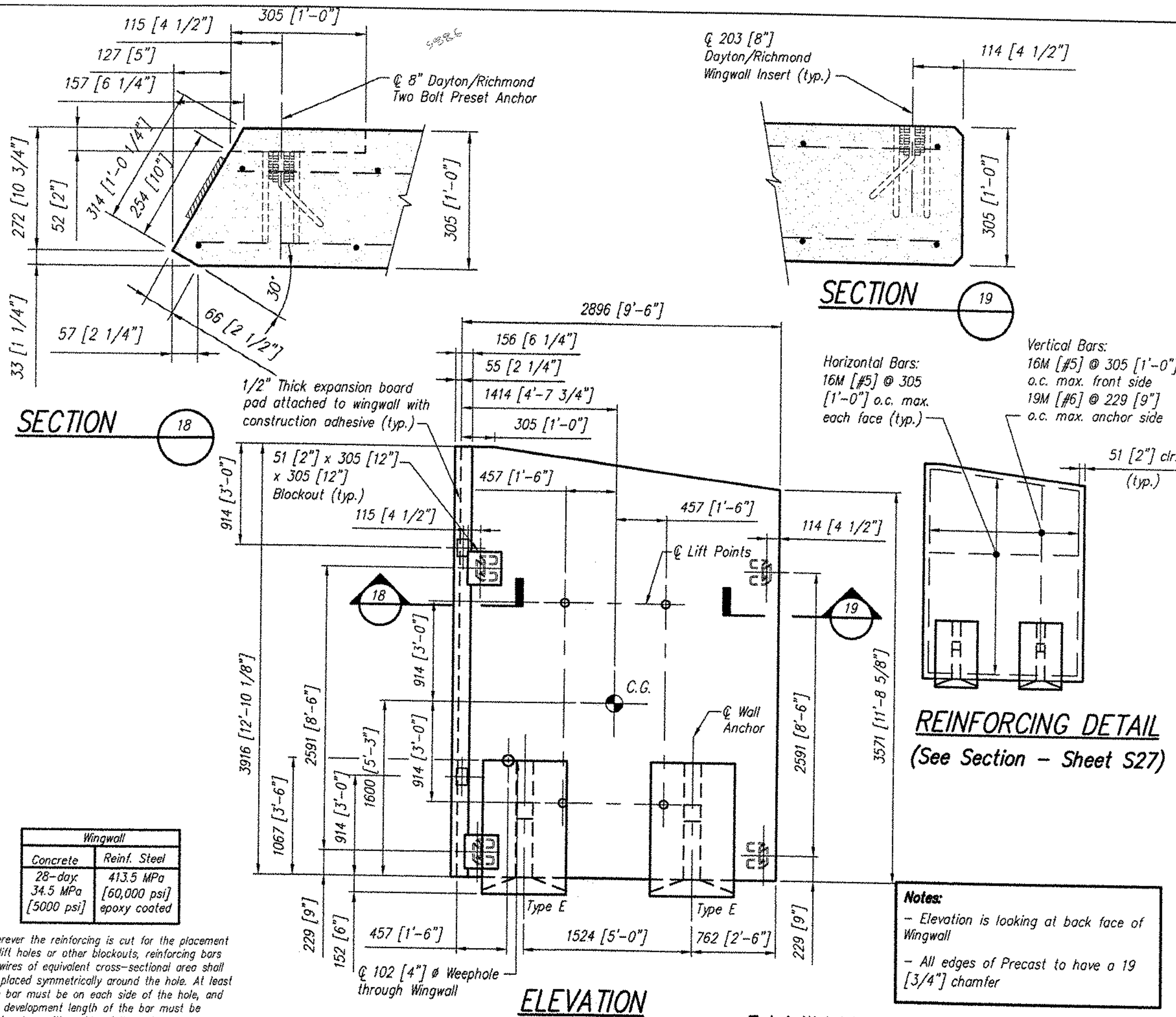
Sheet No.

Chk'd By:
JVP

S22

Date:
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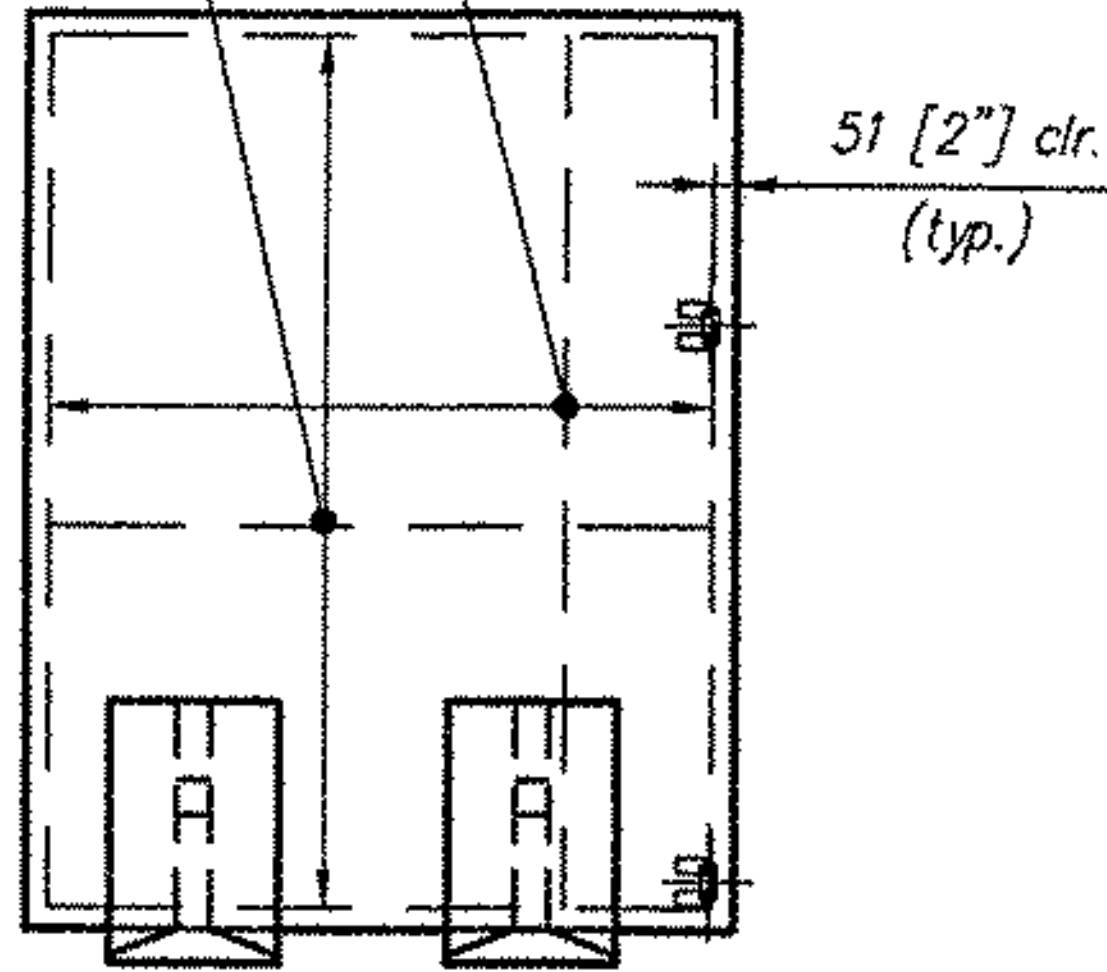
VT. RTE. 121
BRIDGE NO. 7

ROCKINGHAM

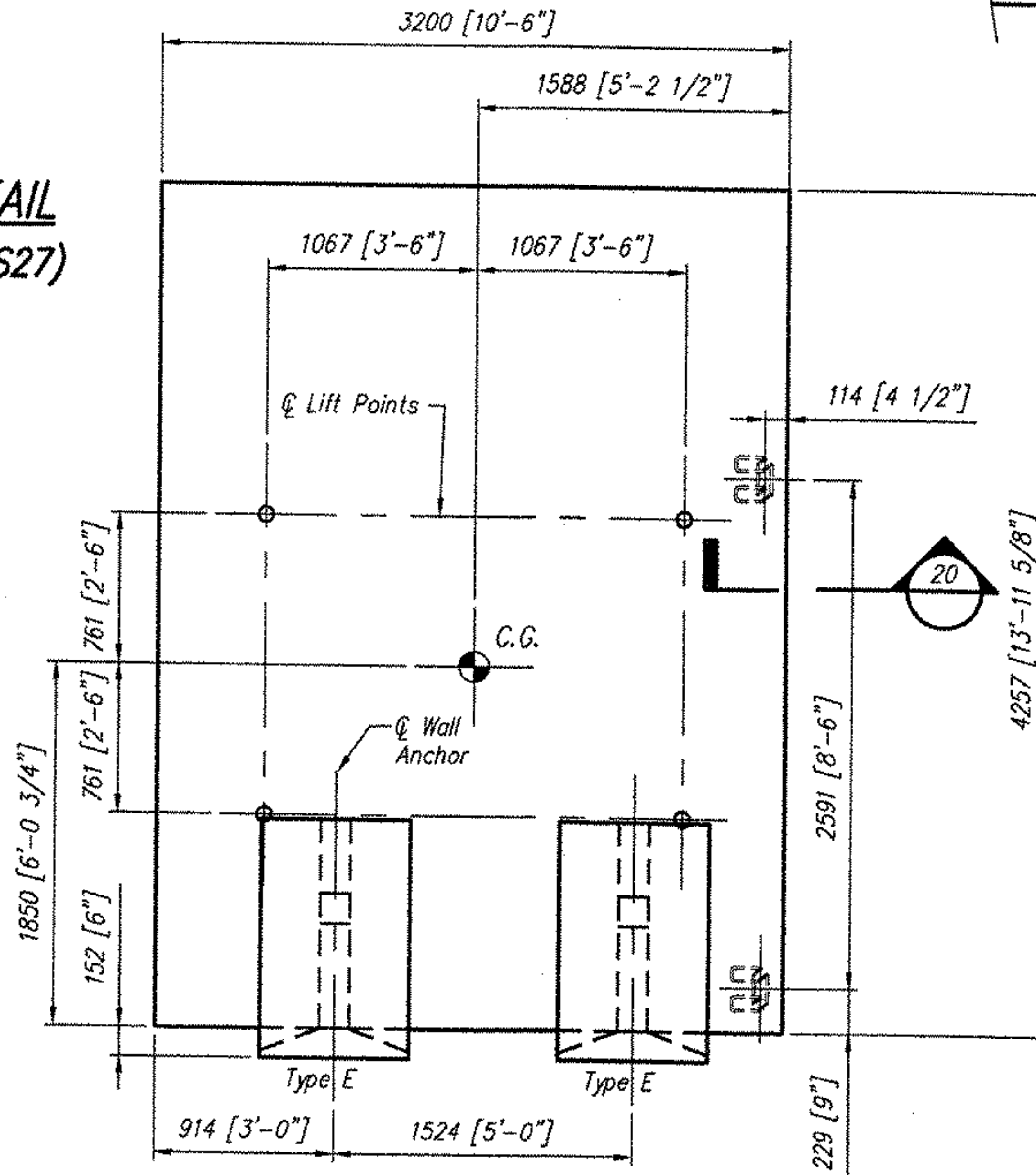
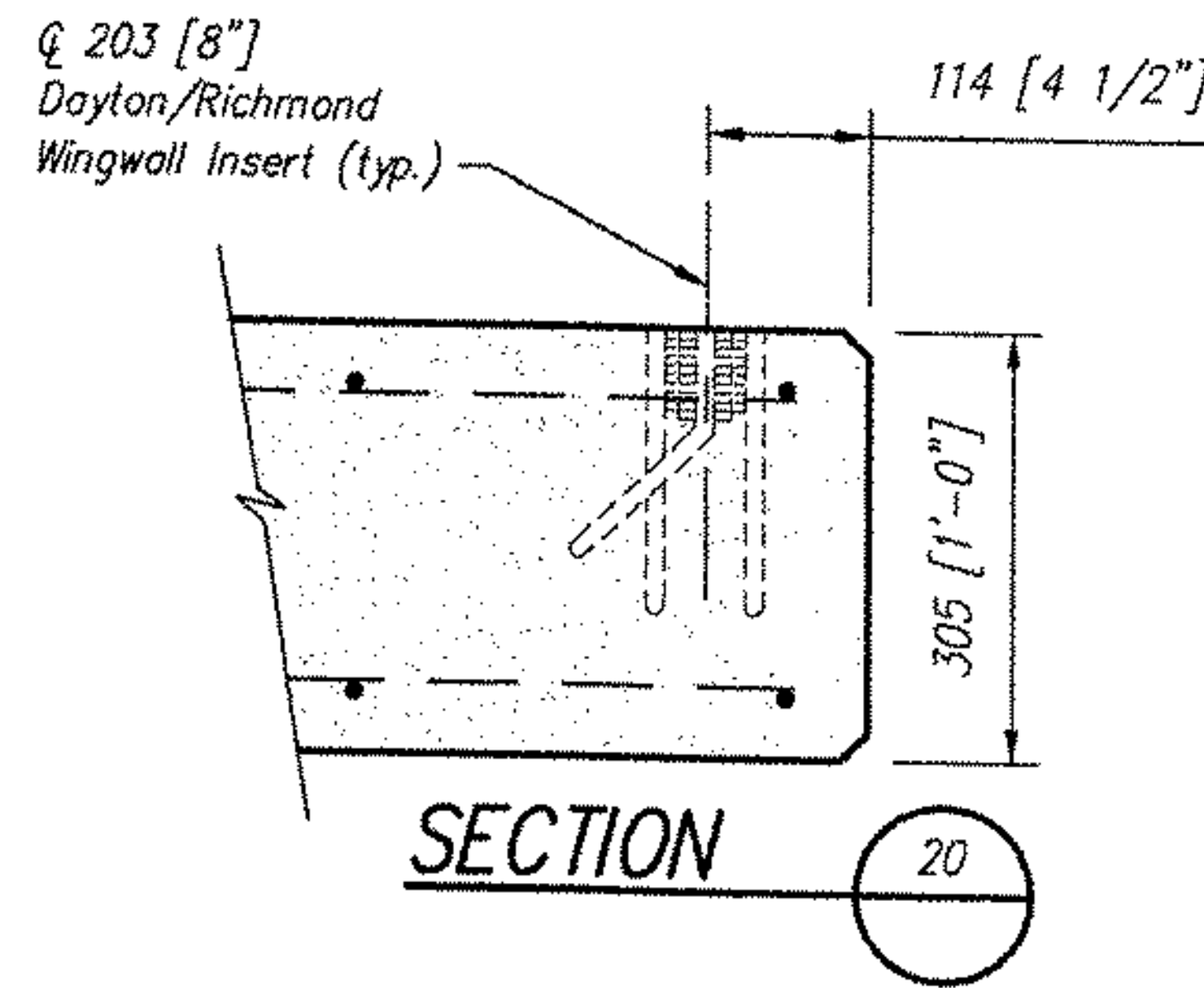
Des. By:	Job No.
KJG	11415
Drawn By:	Sheet No.
JLL	S23
Chk'd By:	
JVP	
Date:	
6/22/04	079

Horizontal Bars:
16M [#5] @ 305
[1'-0"] o.c. max.
each face (typ.) -

Vertical Bars:
16M [#5] @ 305 [1'-0"] o.c.
max. front side
19M [#6] @ 229 [9"] o.c.
max. anchor side



REINFORCING DETAIL
(See Section - Sheet S27)



ELEVATION

Wingwall	
Concrete	Reinf. Steel
28-day: 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated

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

Notes:

- Elevation is looking at back face of Wingwall
- All edges of Precast to have a 19 [3/4"] chamfer

Total Weight = 12.1 Metric Tons [13.3 Tons]



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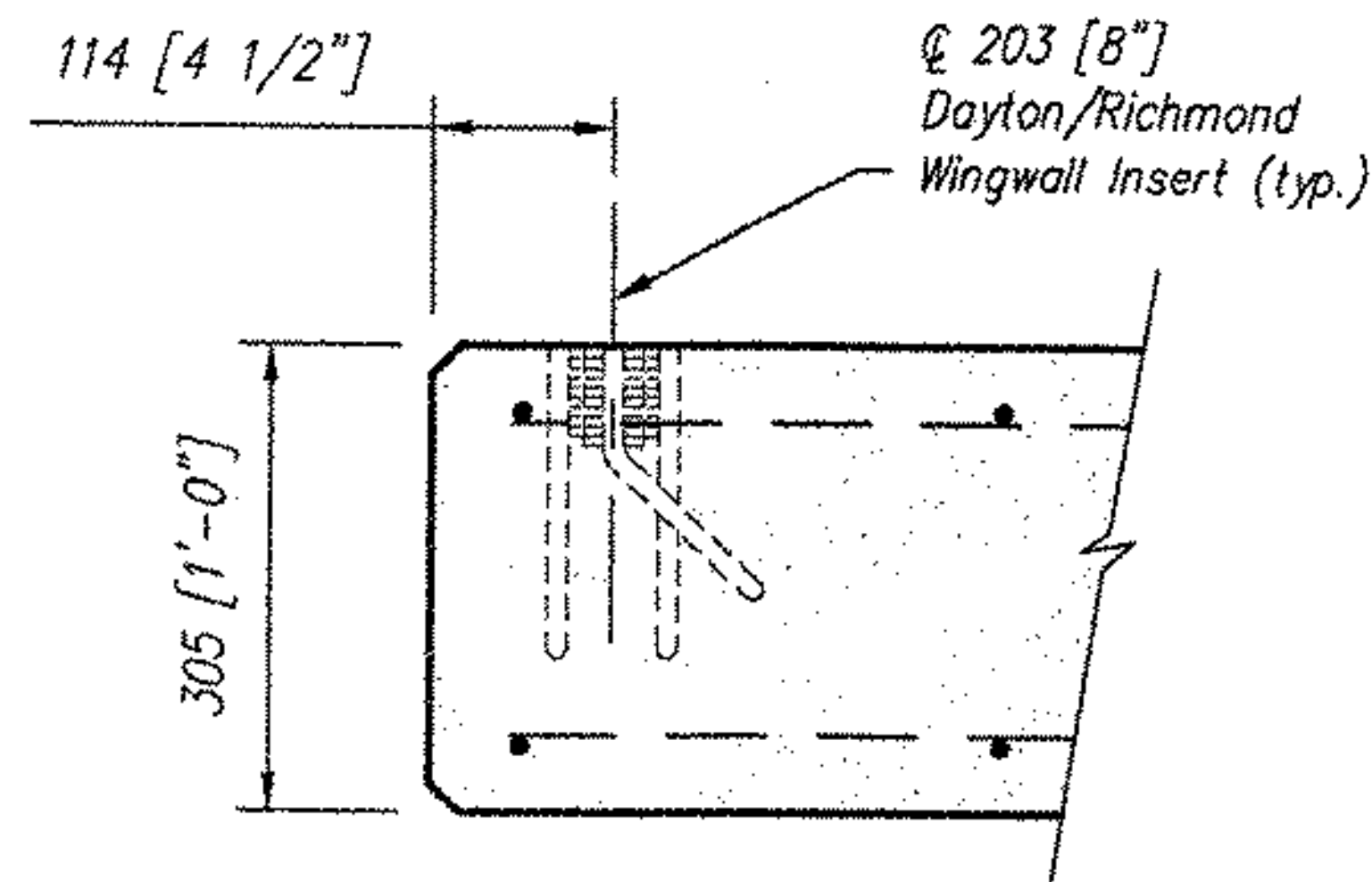
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ROCKINGHAM VERMONT
VT. RTE. 121
BRIDGE NO: 7

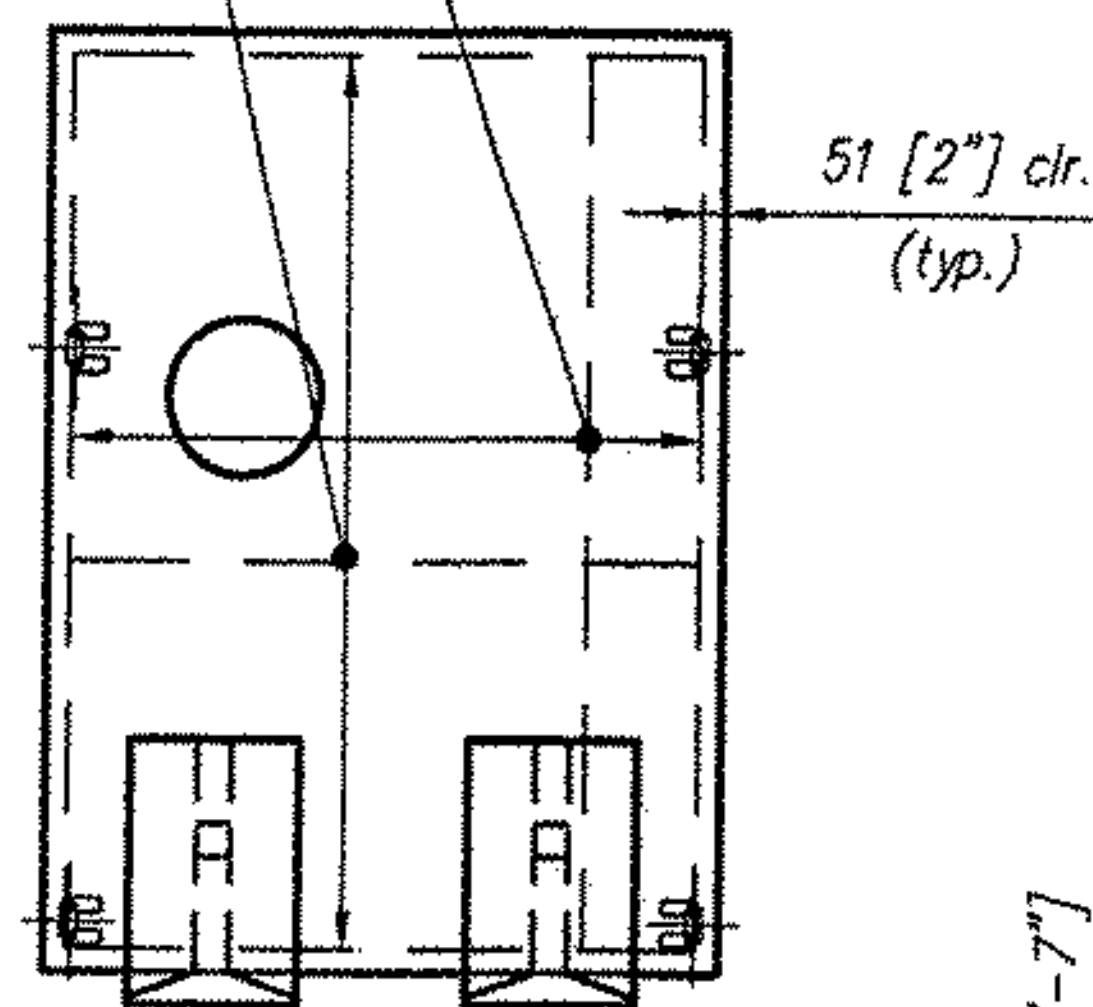
Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
Chk'd By: JVP	S24
Date: 6/22/04	



SECTION 21

Horizontal Bars:
16M [#5] @ 305
[1'-0"] o.c. max.
each face (typ.)

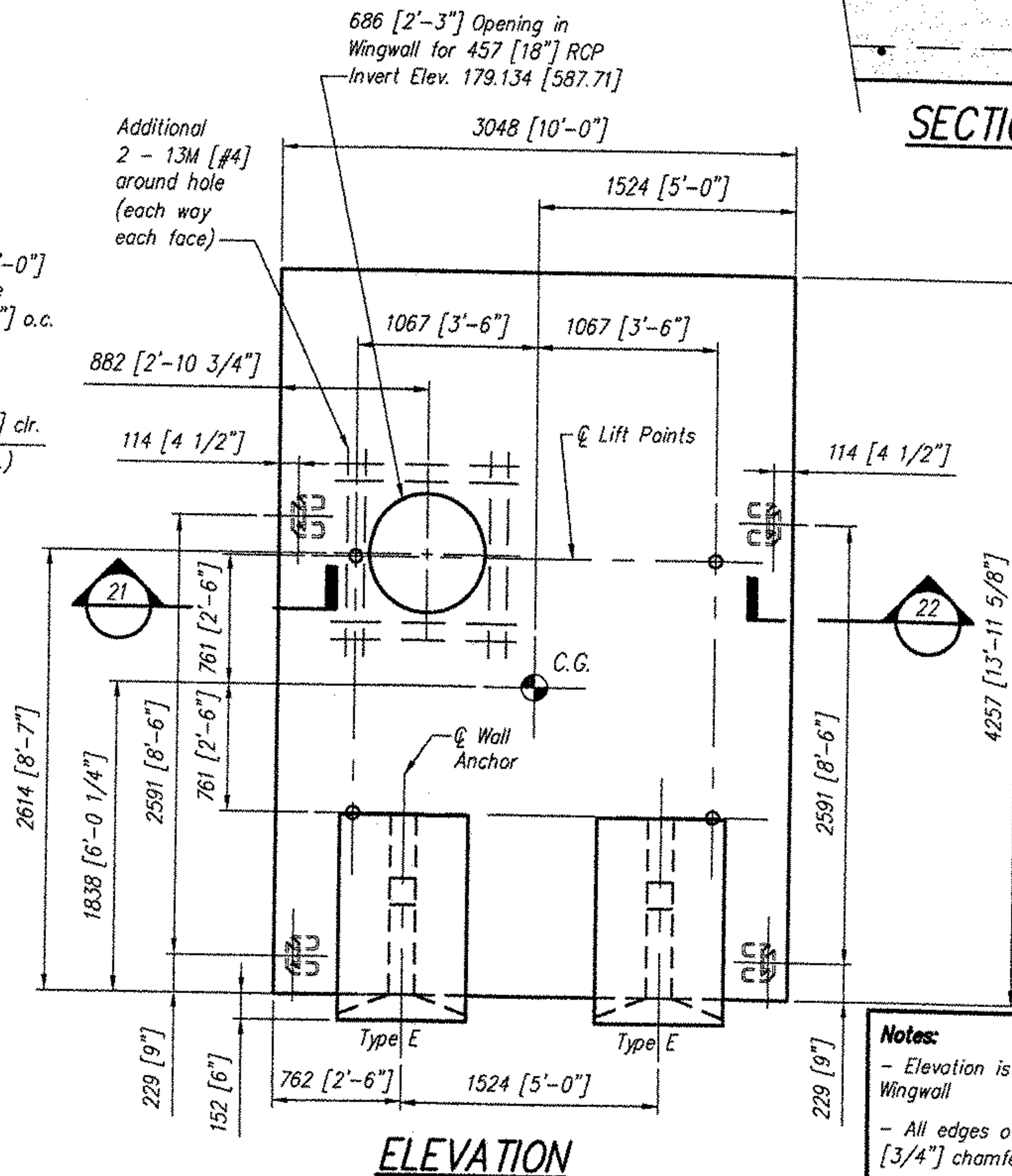
Vertical Bars:
16M [#5] @ 305 [1'-0"]
o.c. max. front side
19M [#6] @ 229 [9"] o.c.
max. anchor side



REINFORCING DETAIL
(See Section - Sheet S27)

Wingwall	
Concrete	Reinf. Steel
28-day: 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated

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



Notes:

- Elevation is looking at back face of Wingwall
- All edges of Precast to have a 19 [3/4"] chamfer

Total Weight = 11.6 Metric Tons [12.8 Tons]



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WINGWALL WW4b
SHOP DRAWING

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VERMONT
VT. RTE. 121
BRIDGE NO. 7
ROCKINGHAM

Des. By:
KJG

Job No.
11415

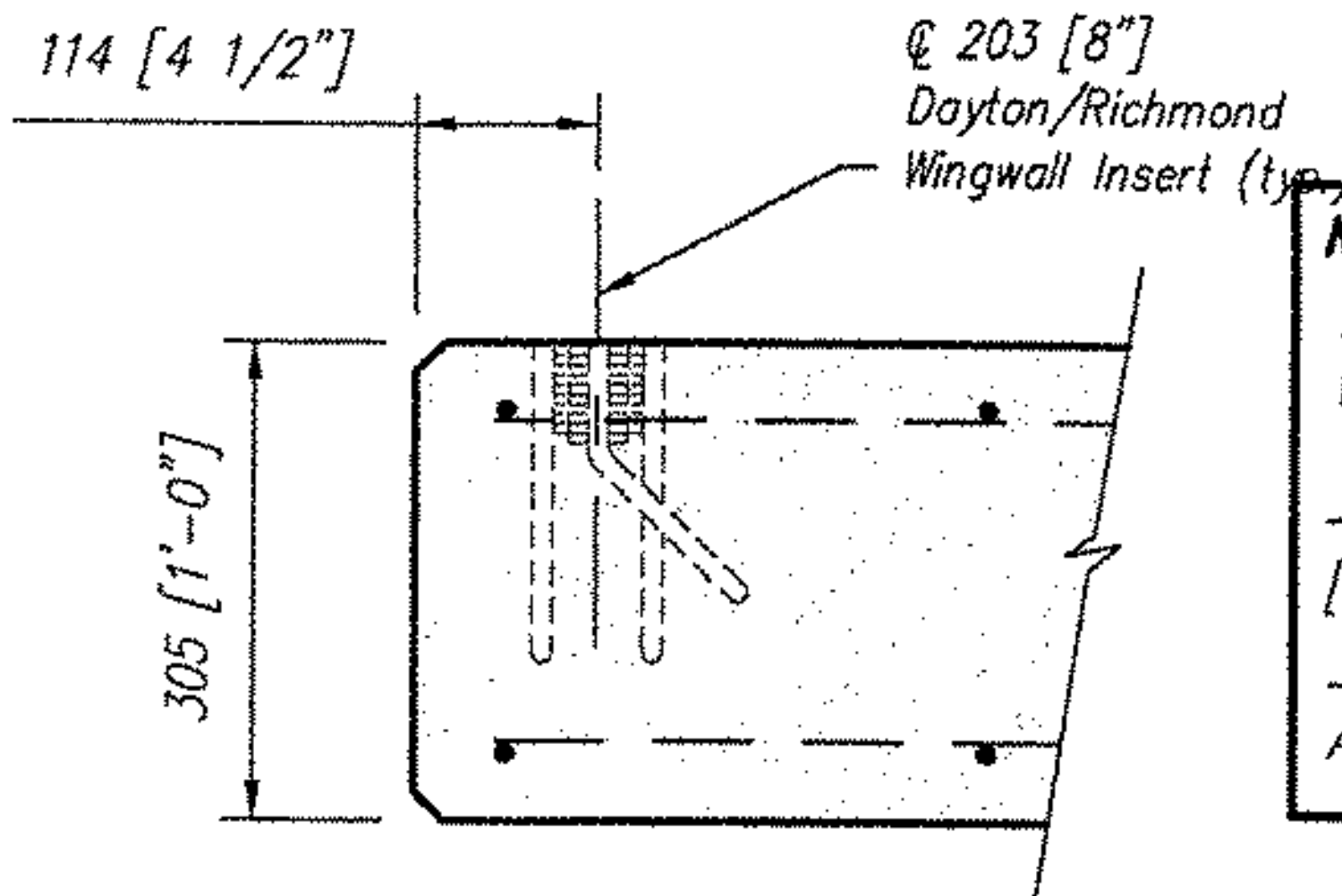
Drawn By:
JLL

Sheet No.
S25

Chk'd By:
JVP

Date:
6/22/04

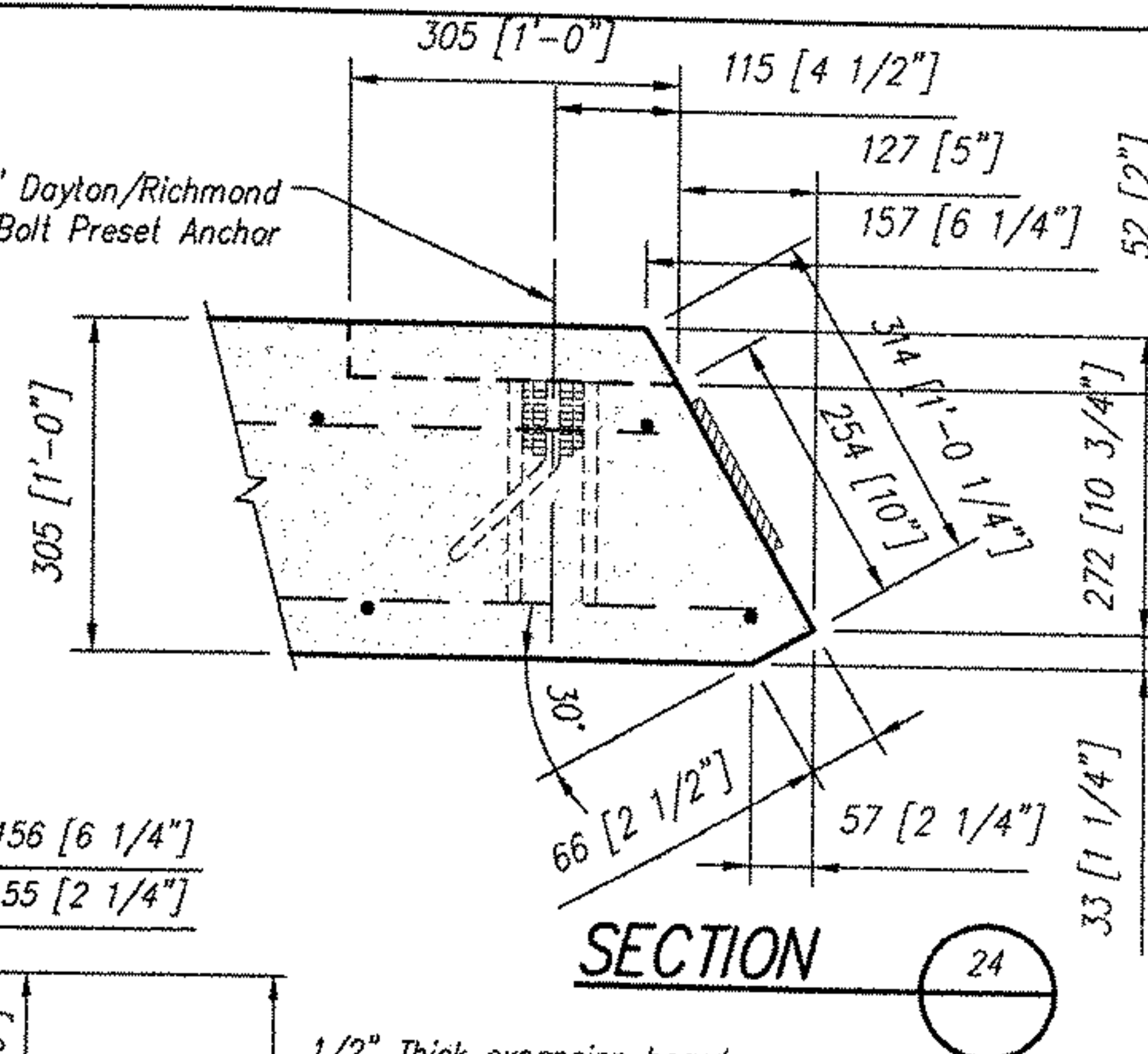
081



Notes:

- Elevation is looking at back face of Wingwall
- All edges of Precast to have a 19 [3/4"] chamfer
- Wingwall will not hang level. Adjust cable lengths as required

8" Dayton/Richmond Two Bolt Preset Anchor



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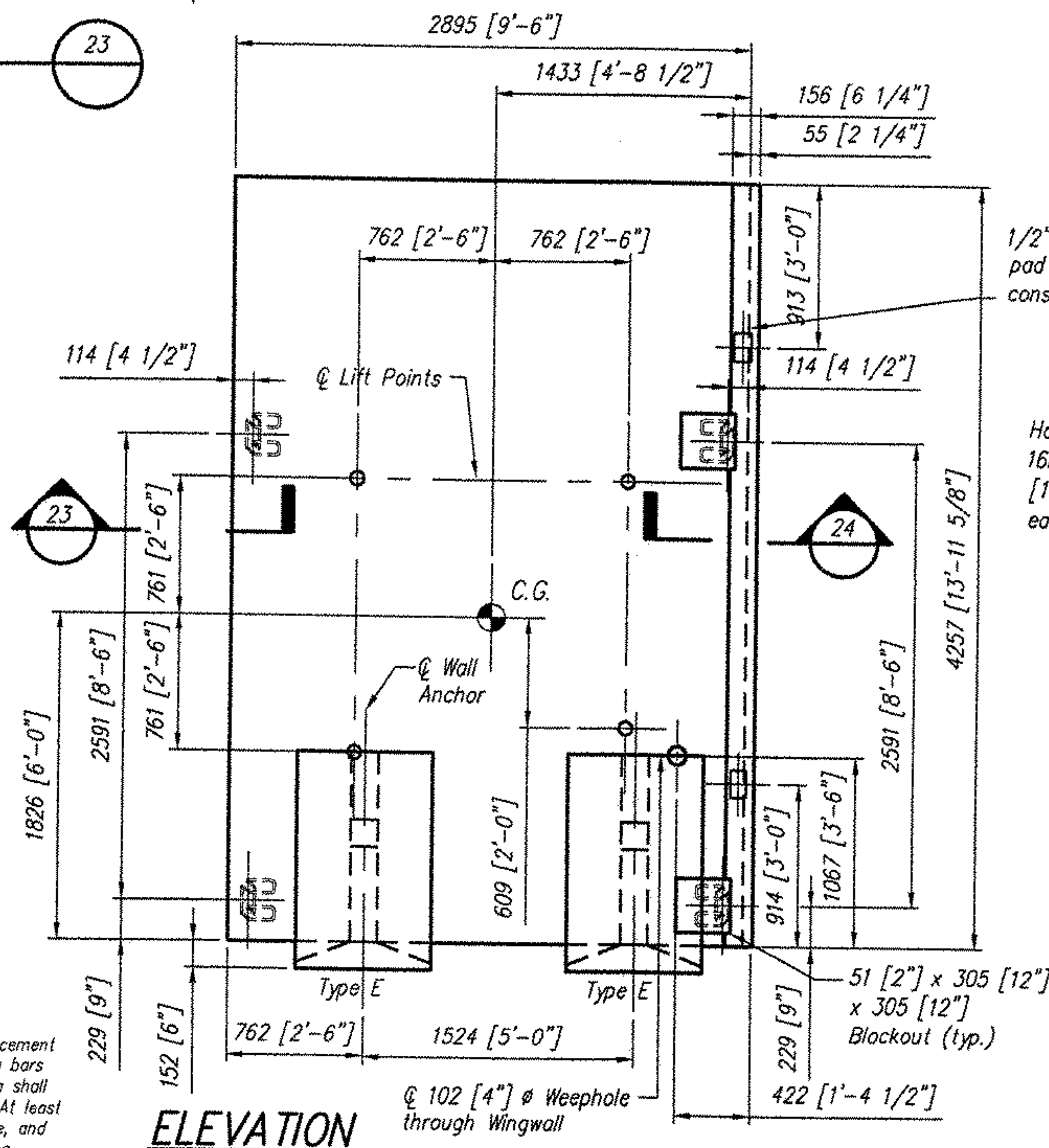
Sheet Title: WINGWALL WW4c SHOP DRAWING
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BRIDGE NO: 7
ROCKINGHAM

Des. By: K/JG Job No. 11415
Drawn By: JLL Sheet No.
Chk'd By: JVP
Date: 6/22/04

Wingwall	
Concrete	Reinf. Steel
28-day: 34.5 MPa [5000 psi]	413.5 MPa [60,000 psi] epoxy coated

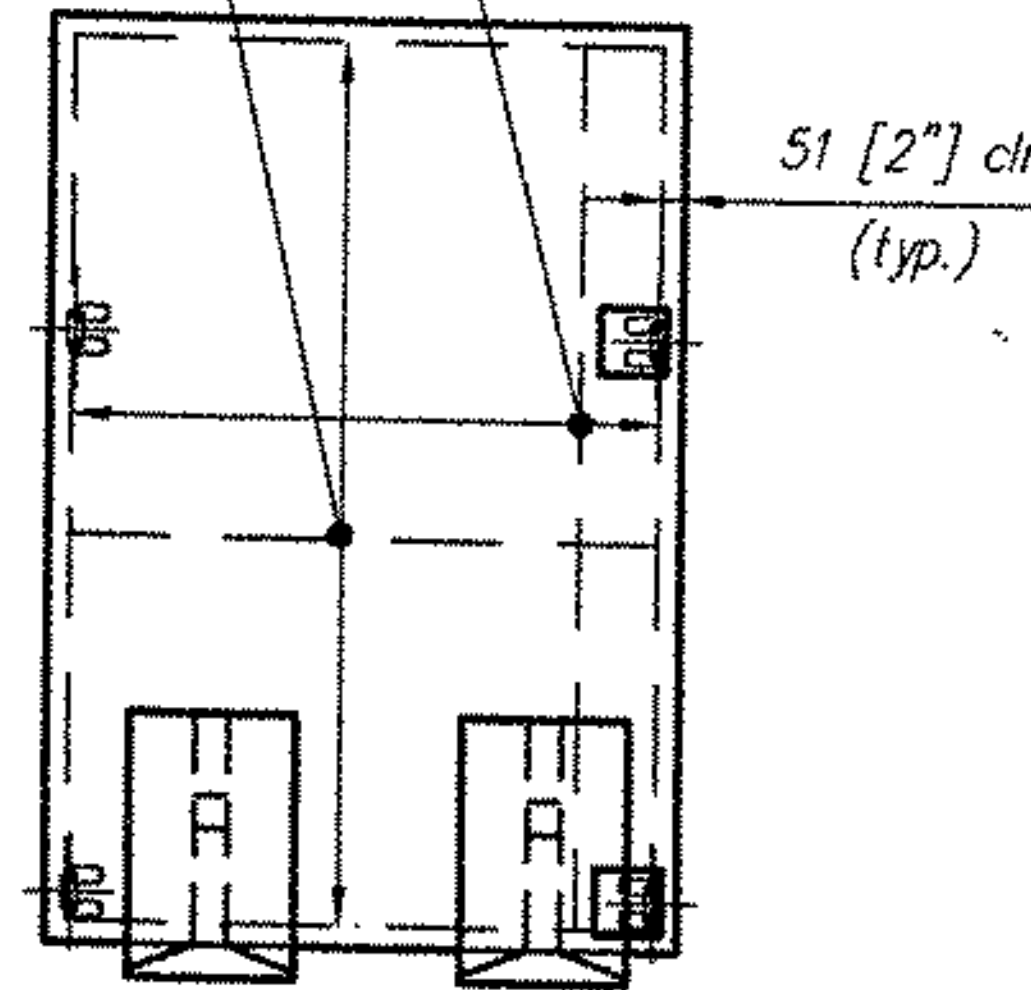
Wherever the reinforcing is cut for the placement of lift holes or other blockouts, reinforcing bars or wires of equivalent cross-sectional area shall be placed symmetrically around the hole. At least one bar must be on each side of the hole, and the development length of the bar must be achieved on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



1/2" Thick expansion board pad attached to wingwall with construction adhesive (typ.)

Horizontal Bars:
16M [#5] @ 305 [1'-0"] o.c. max. each face (typ.)

Vertical Bars:
16M [#5] @ 305 [1'-0"] o.c. max. front side
19M [#6] @ 229 [9"] o.c. max. anchor side



REINFORCING DETAIL
(See Section - Sheet S27)

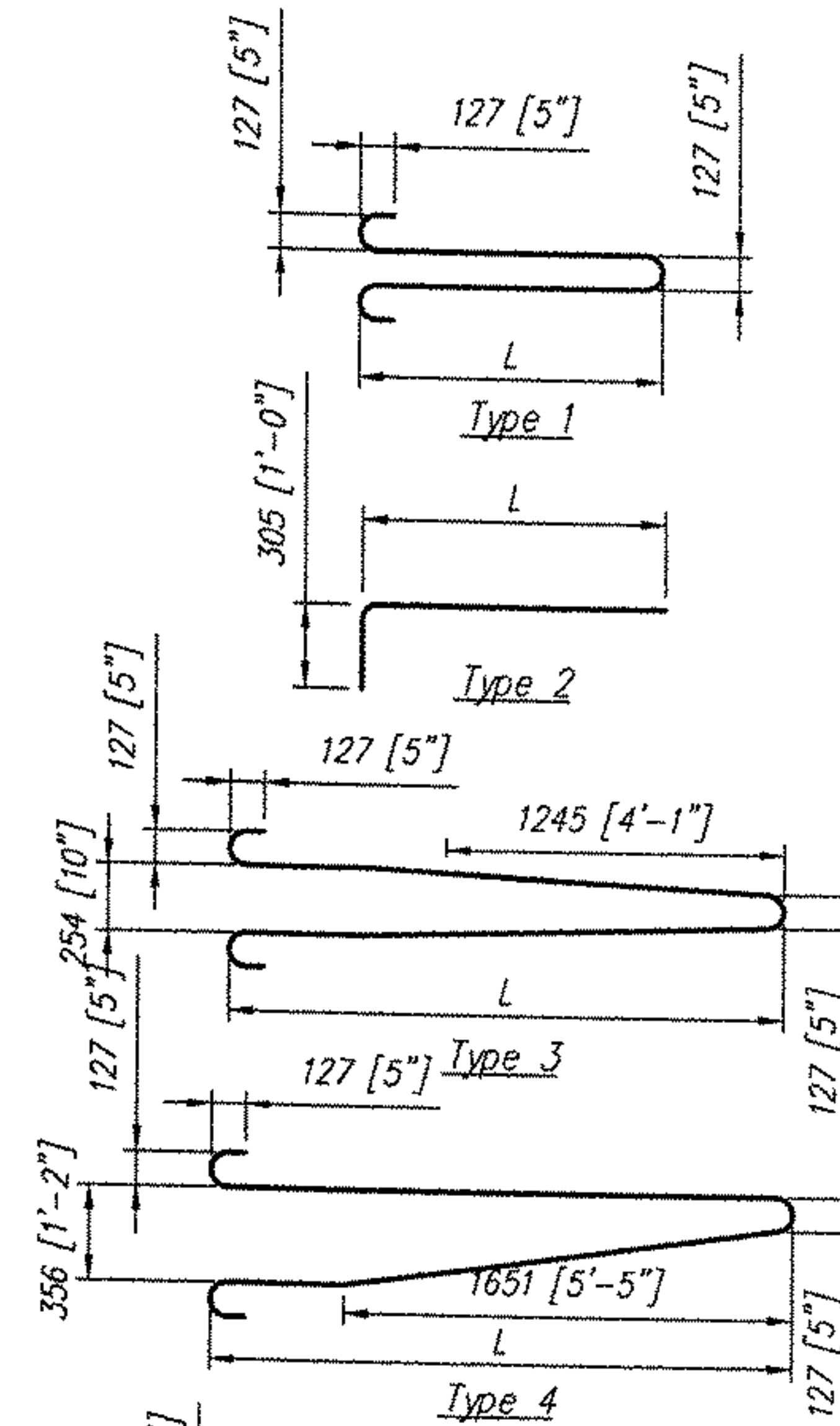
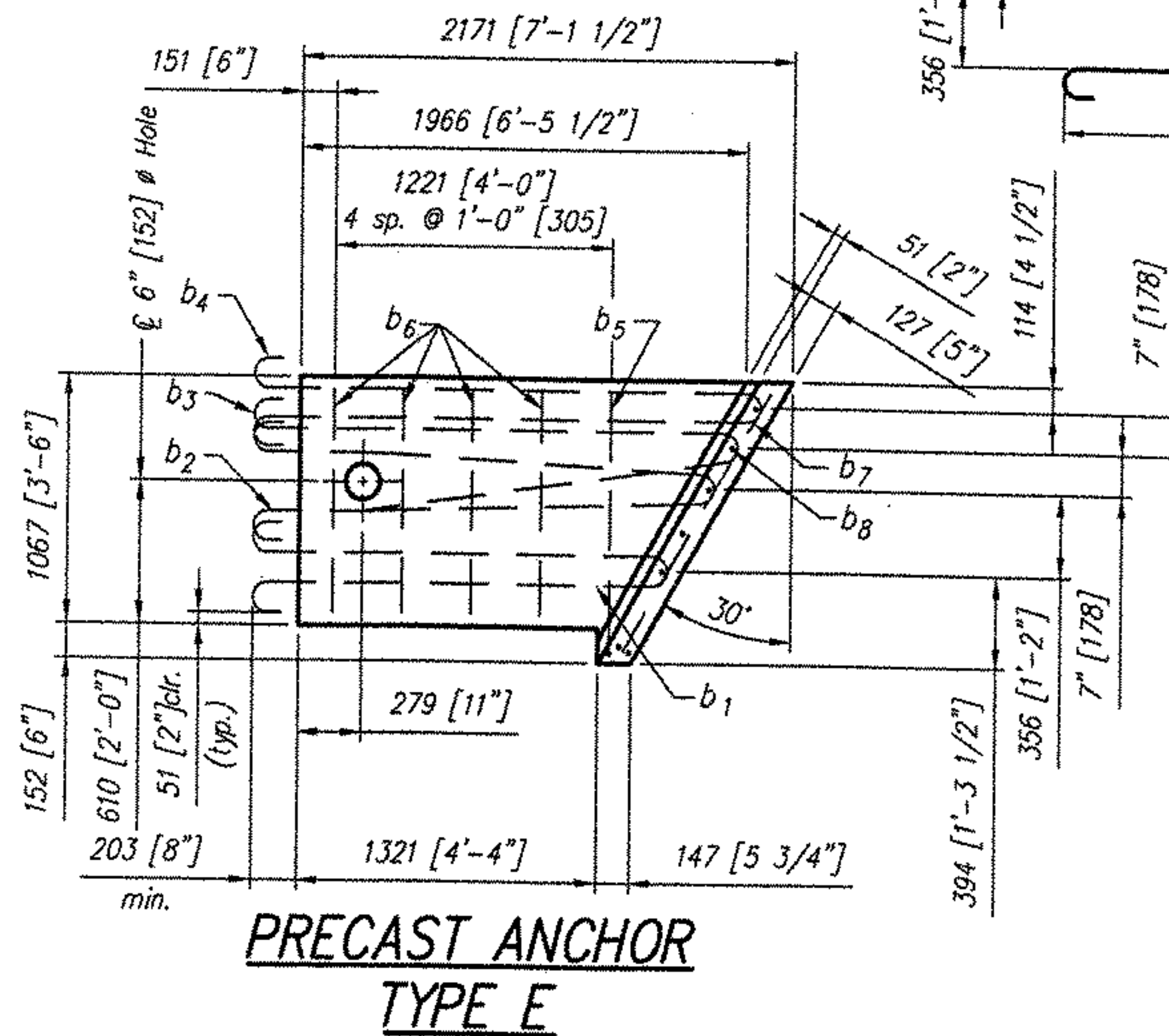
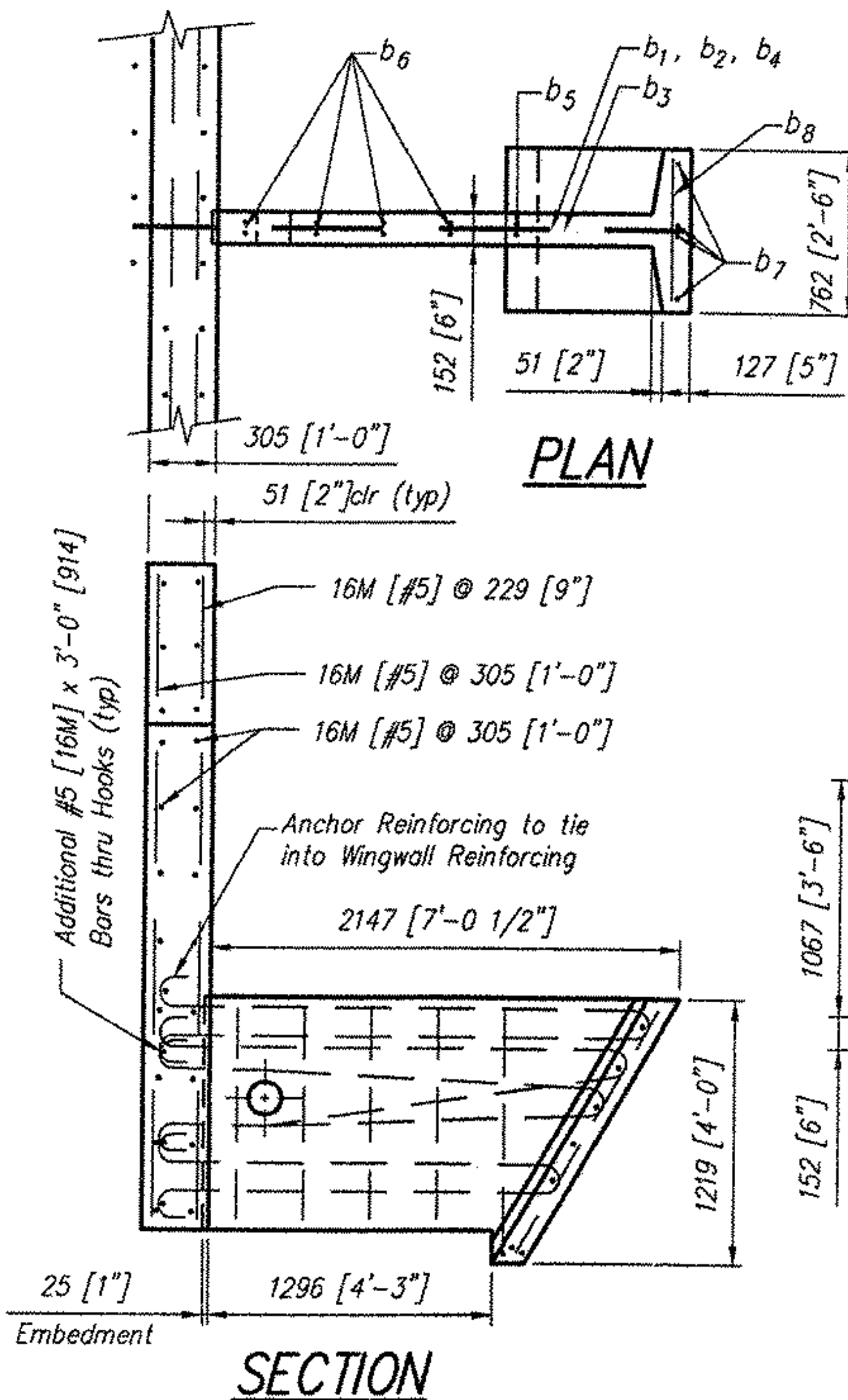
Total Weight = 11.2 Metric Tons [12.3 Tons]

BAR LIST					
MARK	QTY.	SIZE	L	Type	LENGTH
b ₁	1	#5	6'-0"	1	—
b ₂	1	#5	6'-8"	3	—
b ₃	1	#5	7'-0"	4	—
b ₄	1	#5	7'-4"	1	—
b ₅	2	#5	3'-8"	2	—
b ₆	8	#5	—	Str.	3'-2"
b ₇	4	#5	—	Str.	4'-2"
b ₈	7	#5	—	Str.	2'-2"

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

BAR LIST					
MARK	QTY.	SIZE	L	Type	LENGTH
b ₁	1	16M	1829	1	—
b ₂	1	16M	2032	3	—
b ₃	1	16M	2134	4	—
b ₄	1	16M	2235	1	—
b ₅	2	16M	1118	2	—
b ₆	8	16M	—	Str.	965
b ₇	4	16M	—	Str.	1270
b ₈	7	16M	—	Str.	660

Note: "Str." denotes straight bar. Standard Clearance = 51



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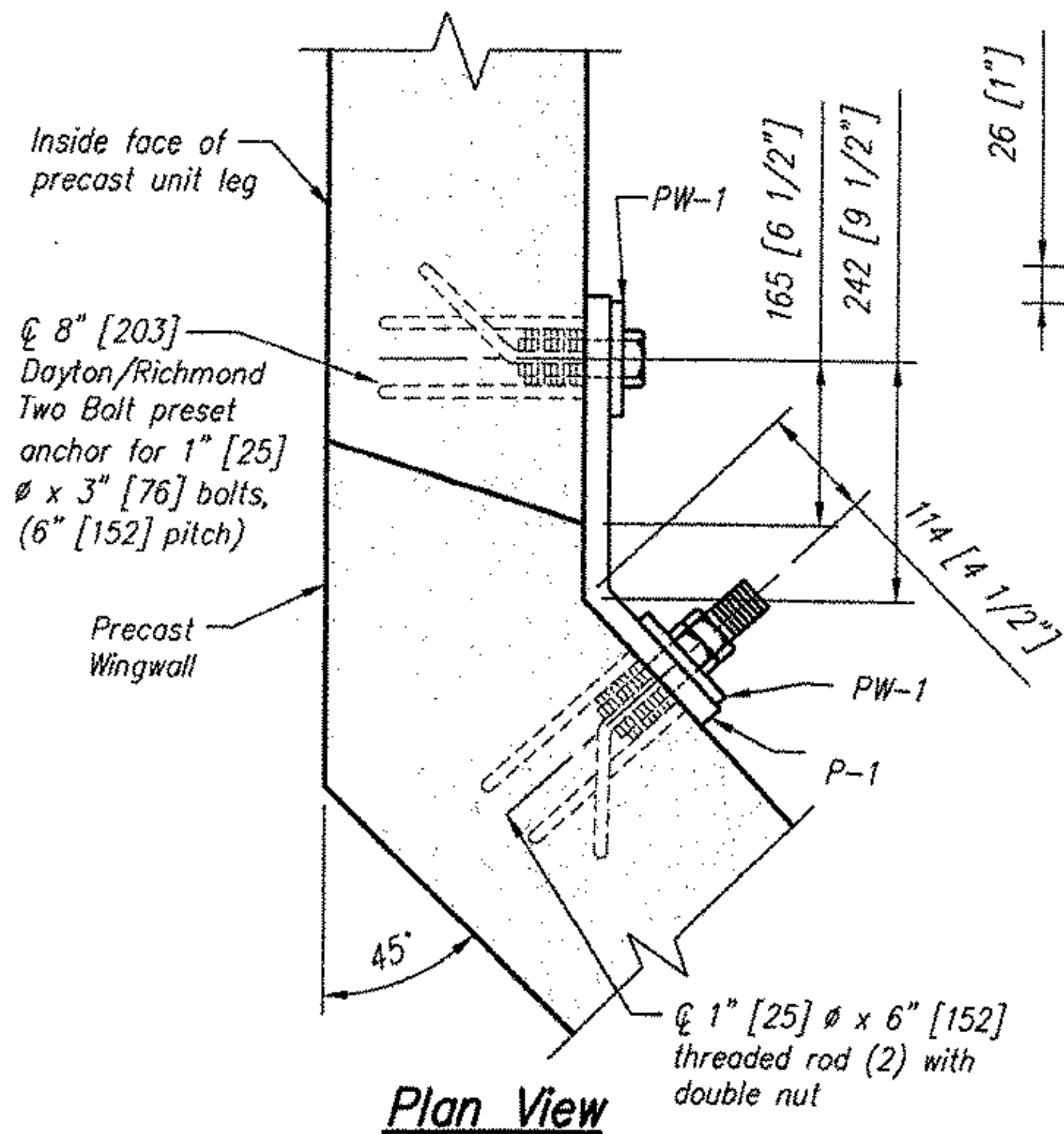
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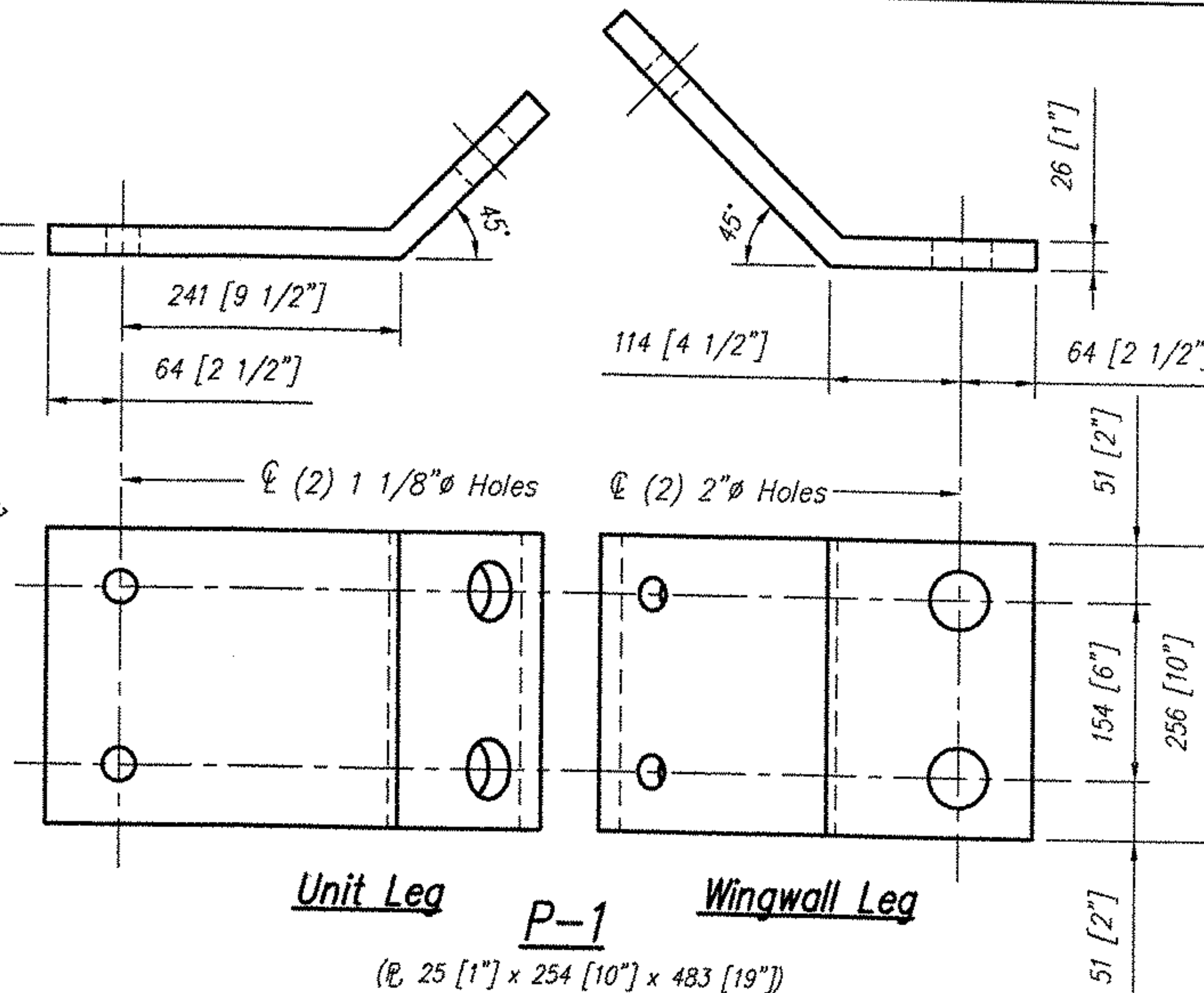
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BRIDGE NO: 7

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Drawn By: JLL	Sheet No.
Chk'd By: JVP	S27
Date: 6/22/04	083



Plan View

Typical Connection Detail

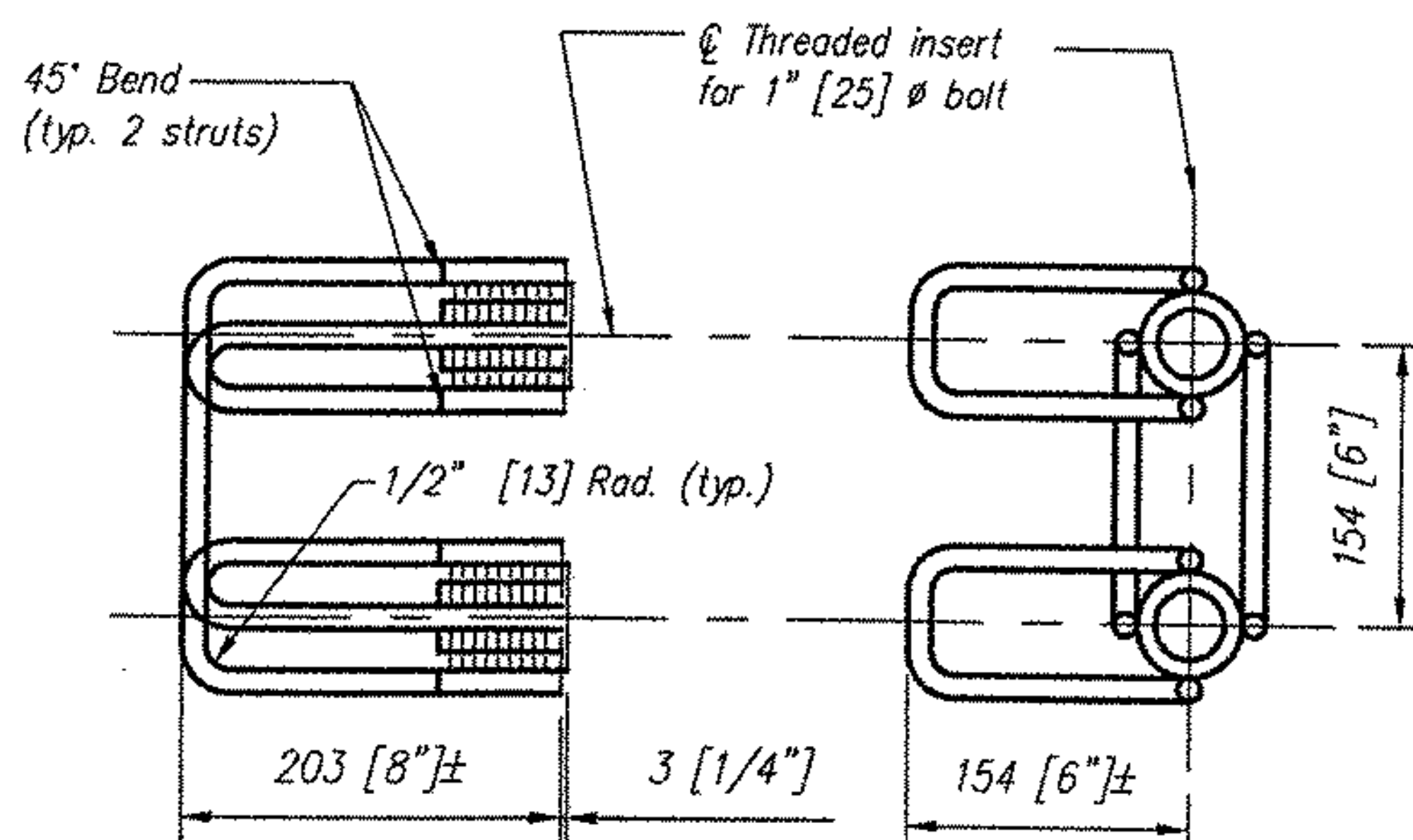


Unit Leg

P-1

Wingwall Leg

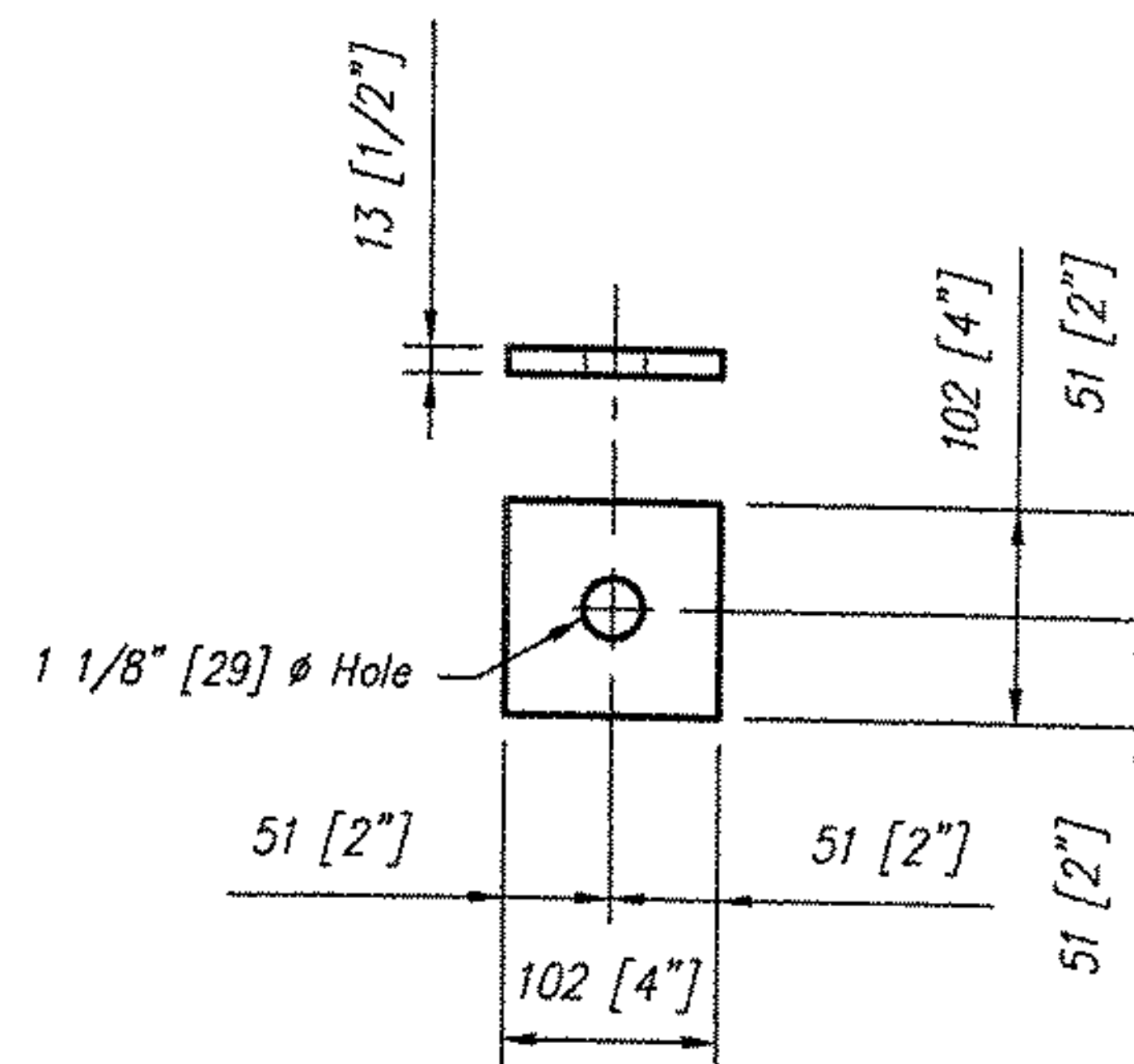
(⌀ 25 [1"] x 254 [10"] x 483 [19"])
(Galvanized as per ASTM A153)



Side View

Front View

Dayton/Richmond Two Bolt Preset Anchor



PW-1

(⌀ washer, 1/2" [13] x 4" [102] x 4" [102])
(Galvanized as per ASTM A153)

PLATE P-1

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

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Job No.
11415

Drawn By:
JLL

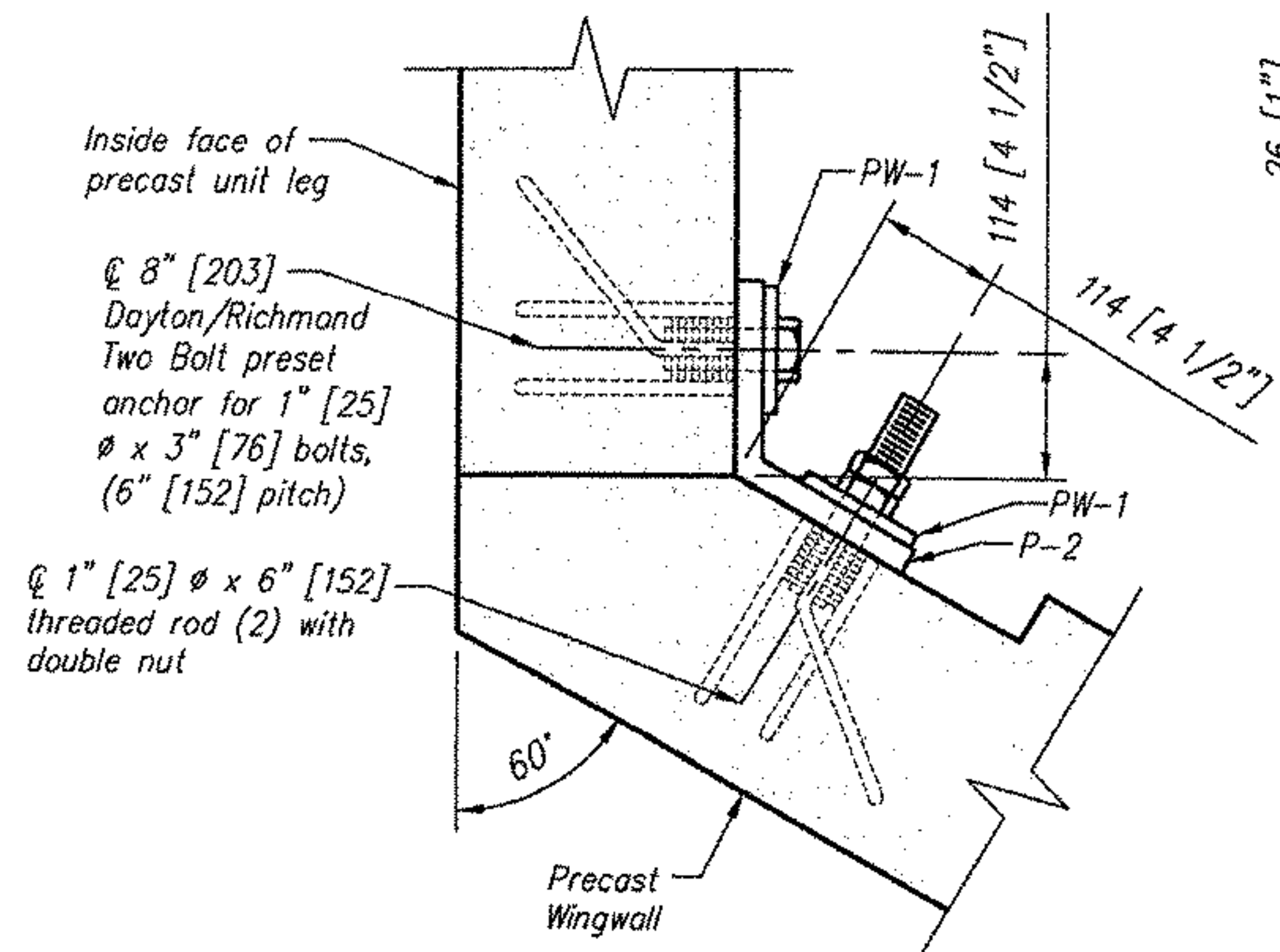
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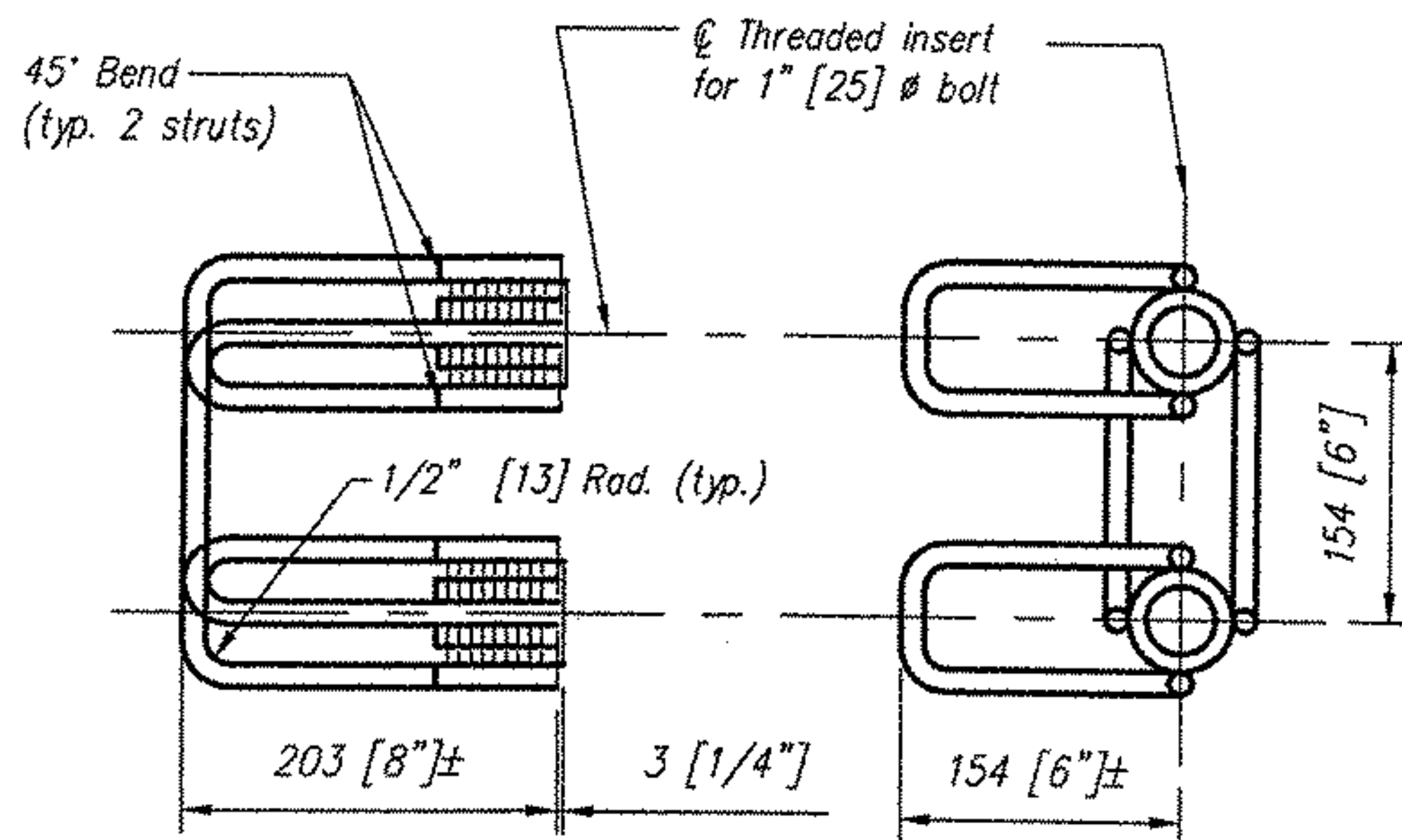
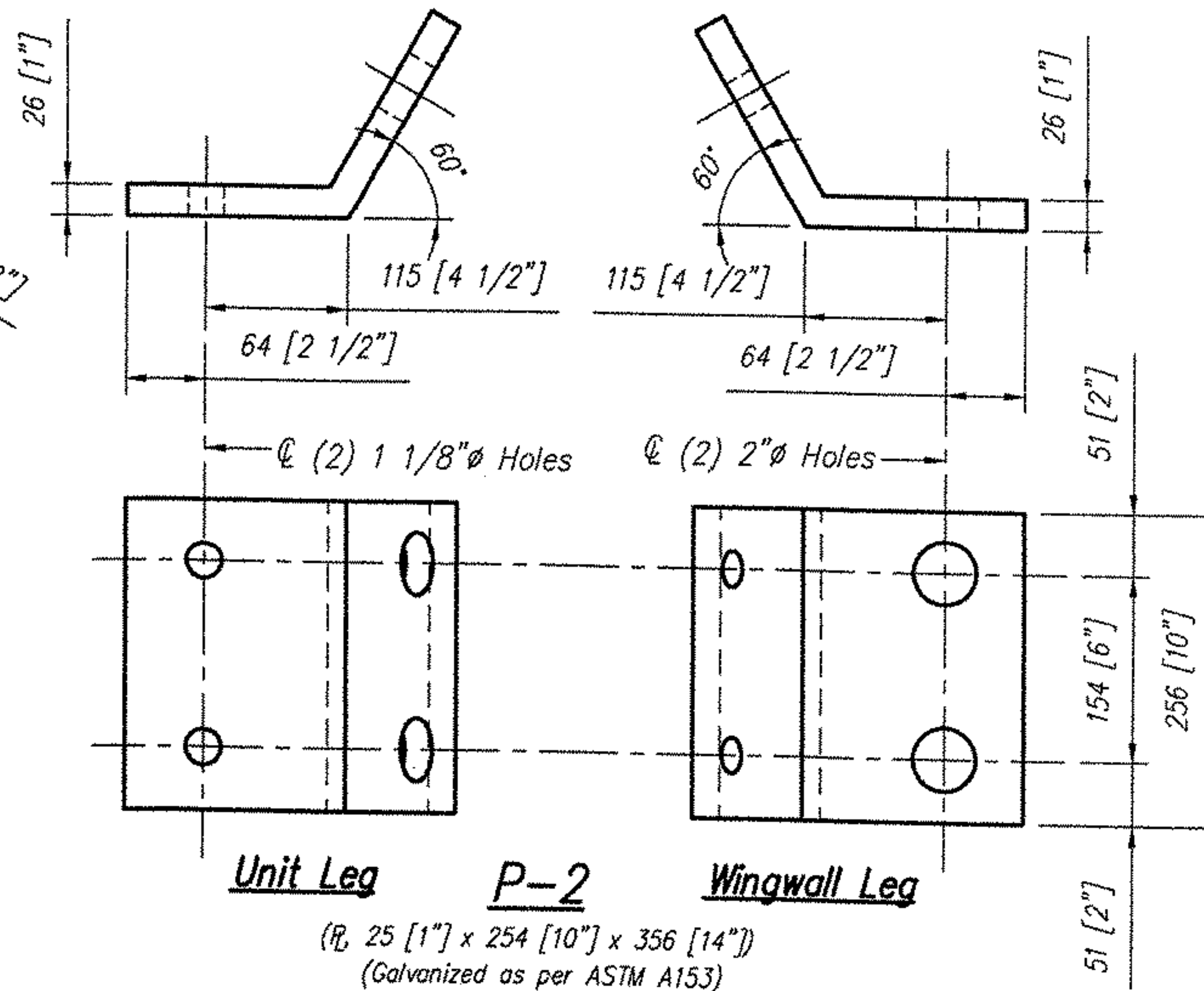
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Plan View

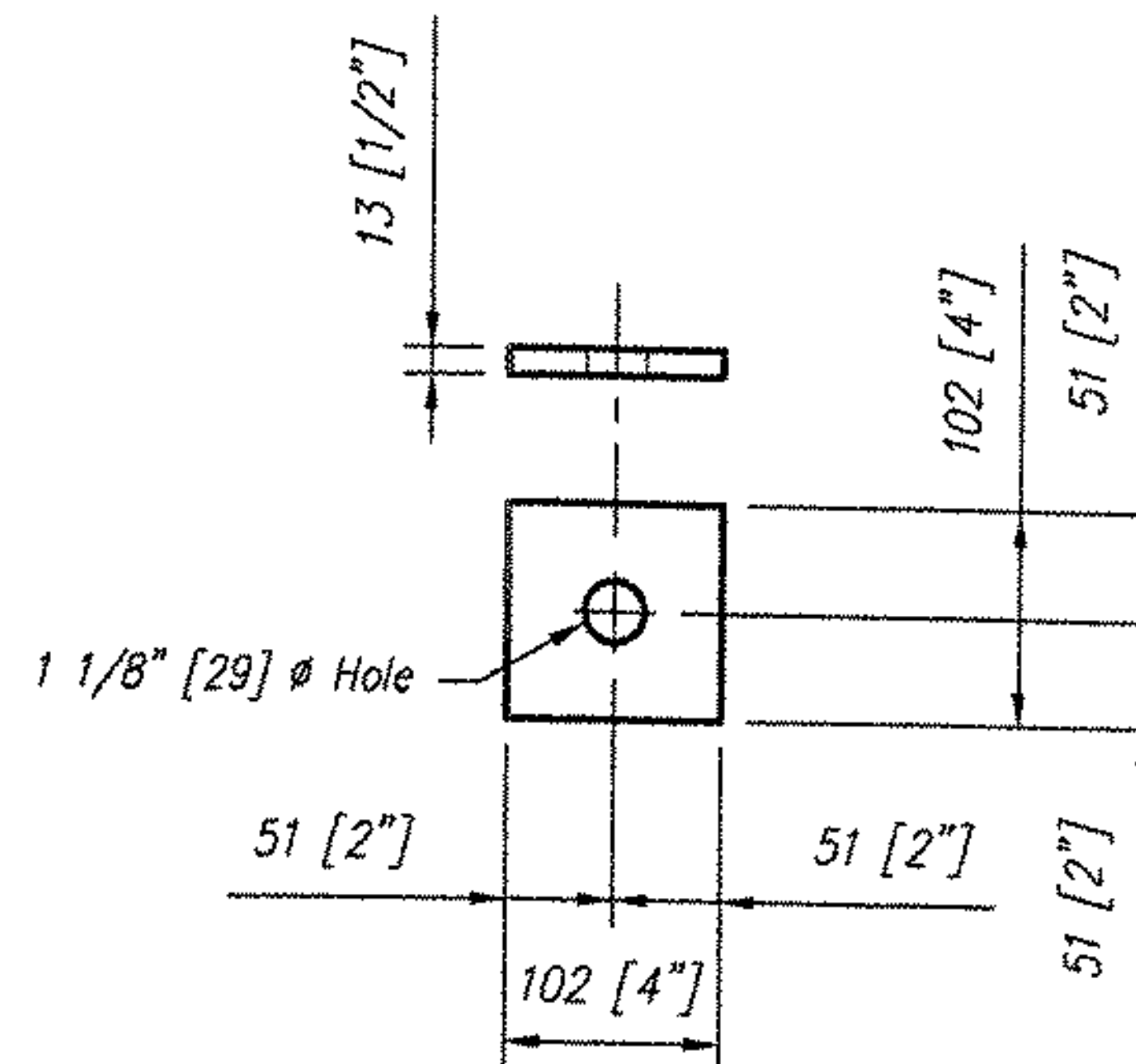
Typical Connection Detail



Side View

Front View

Dayton/Richmond Two Bolt Preset Anchor



(Ø washer, 1/2" [13] x 4" [102] x 4" [102])
(Galvanized as per ASTM A153)

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

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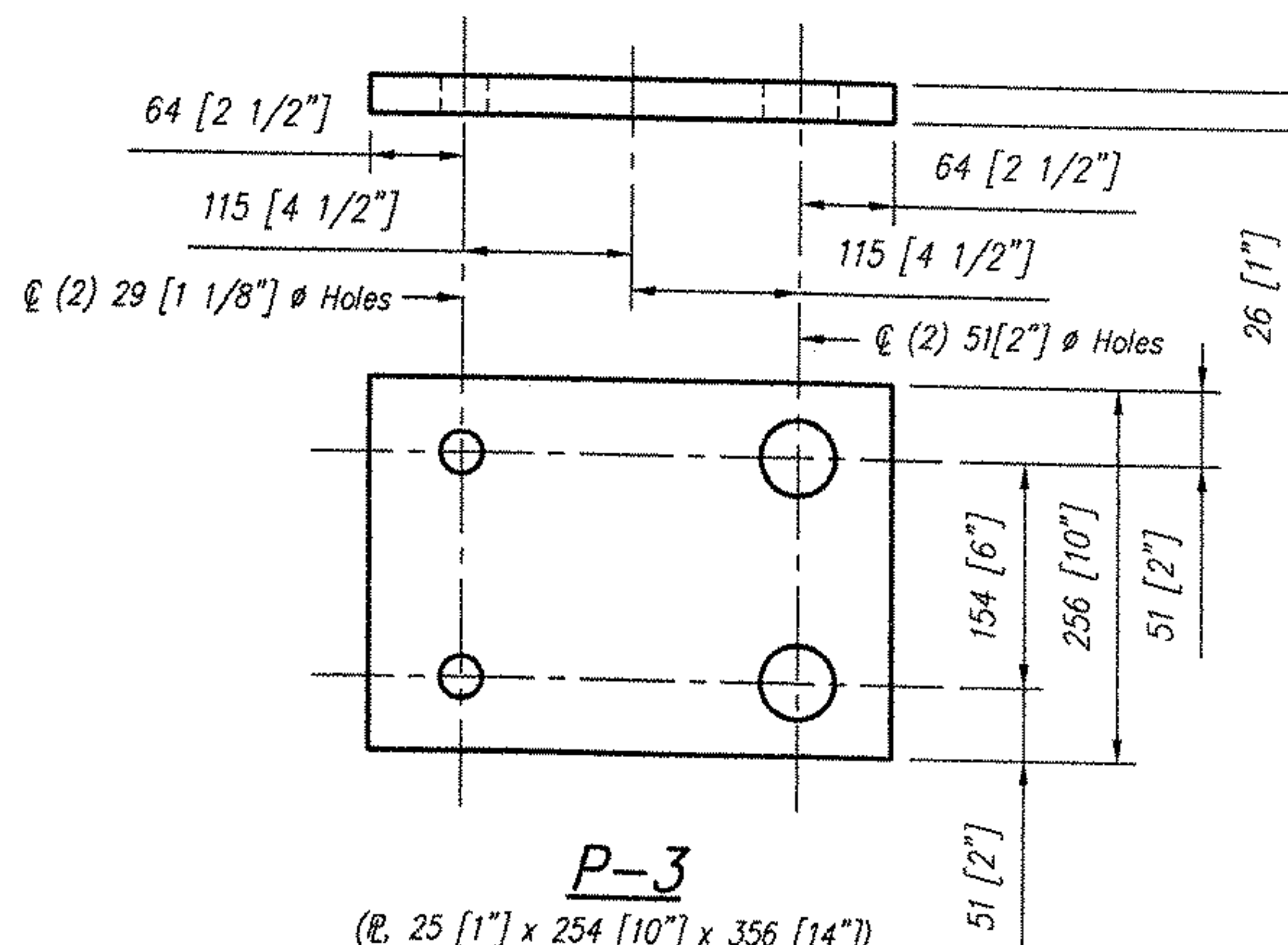
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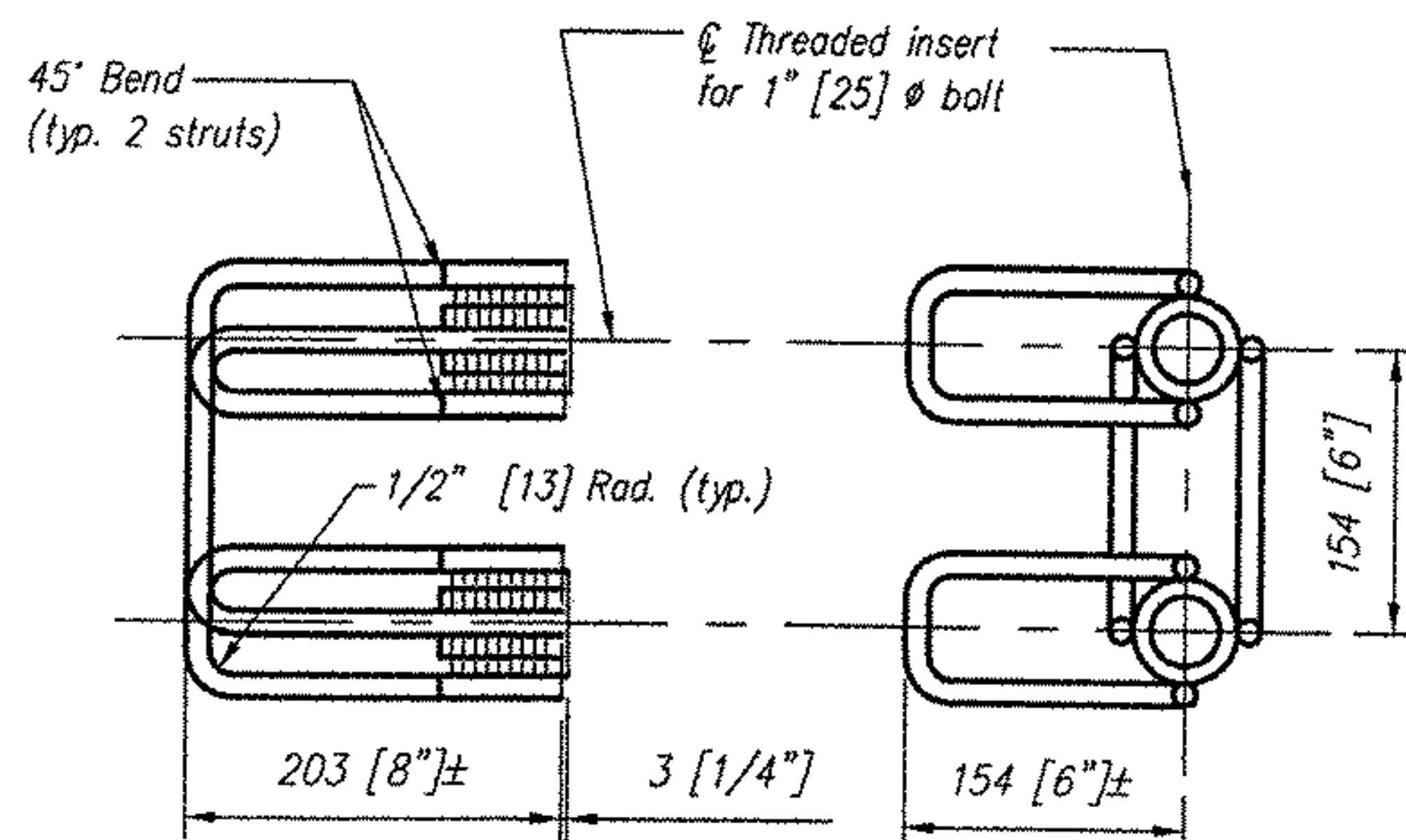
Plan View

Typical Connection Detail



P-3

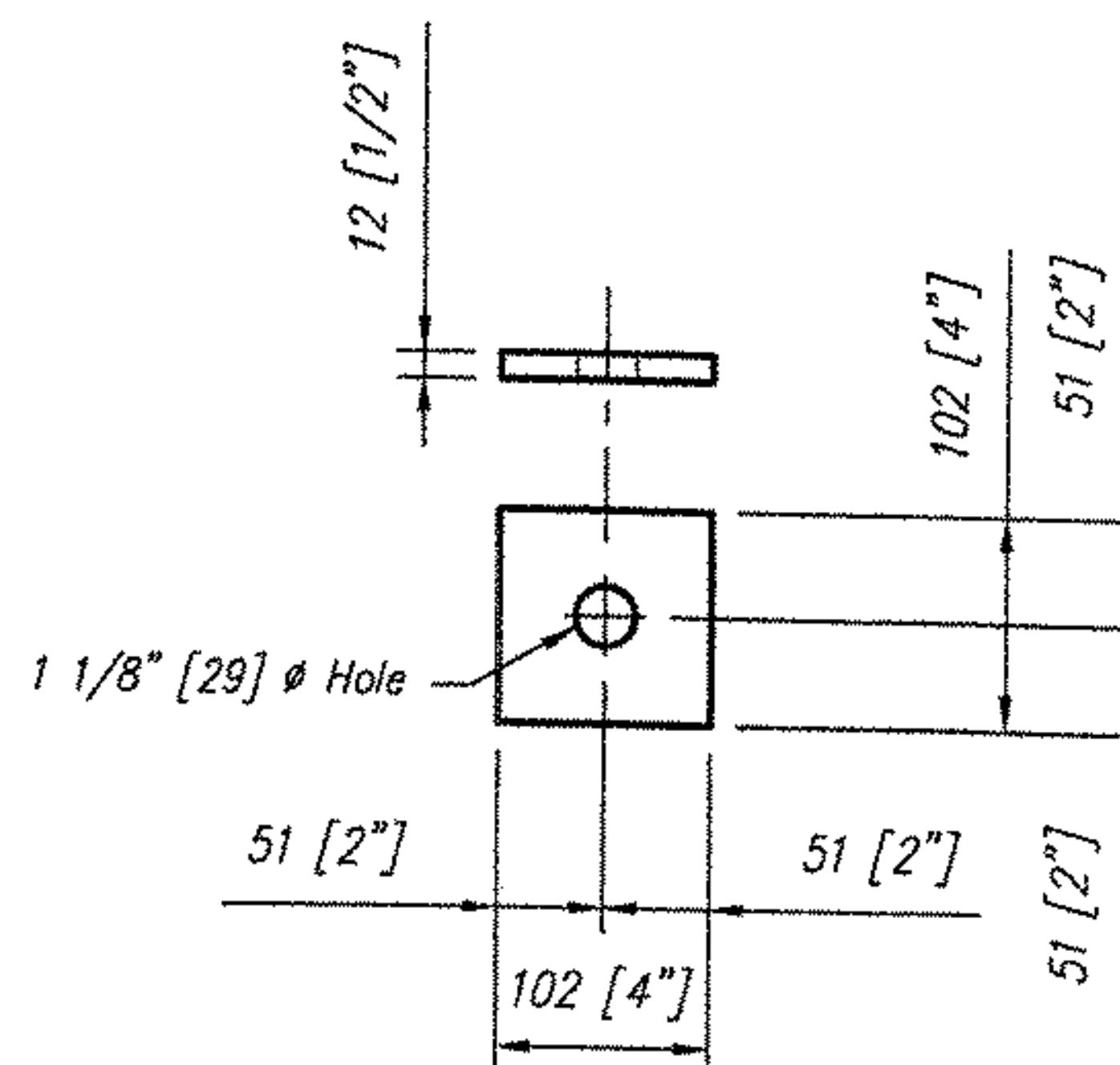
(Pl. 25 [1"] x 254 [10"] x 356 [14"])
(Galvanized as per ASTM A153)



Side View

Front View

Dayton/Richmond Two Bolt Preset Anchor



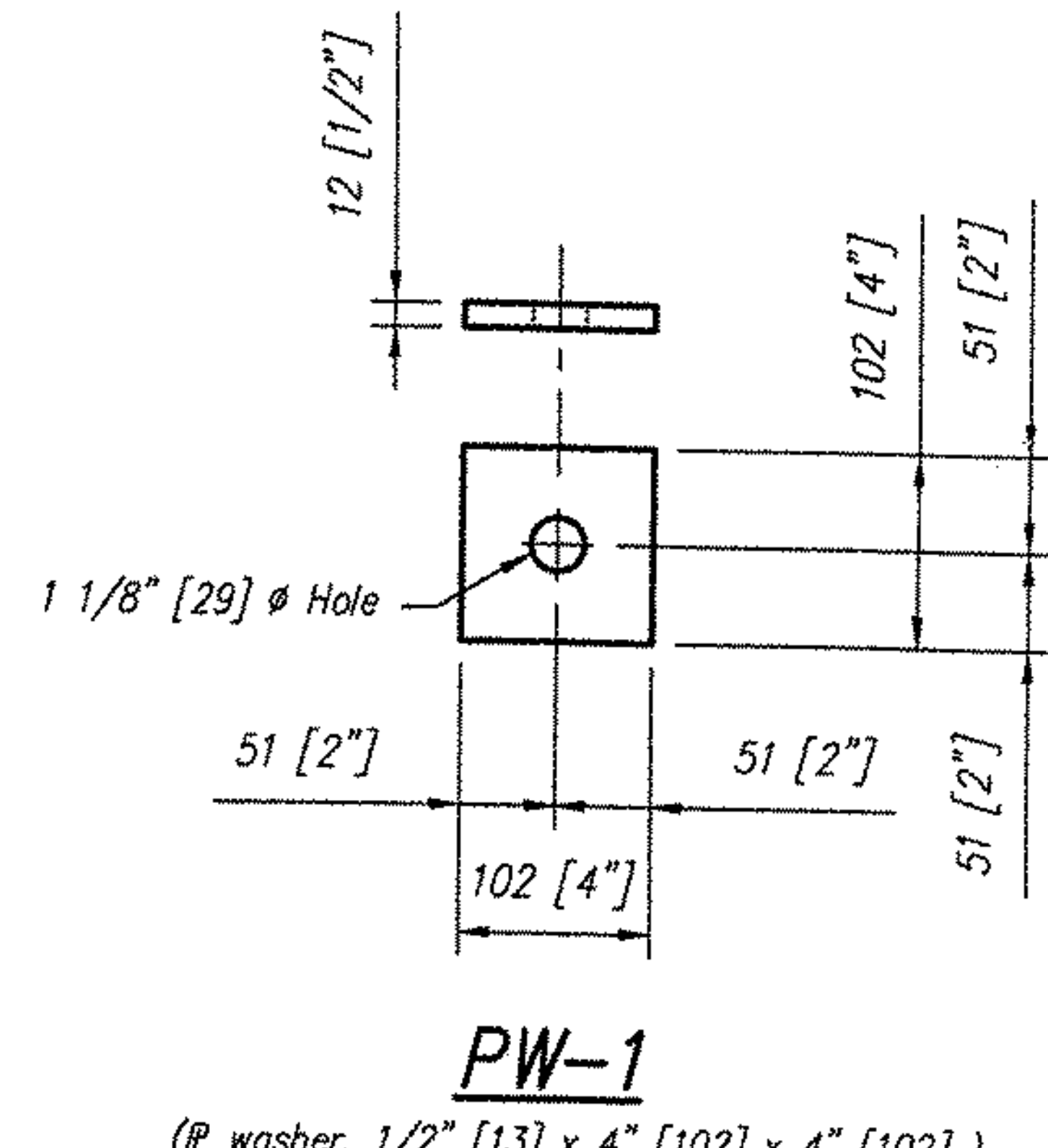
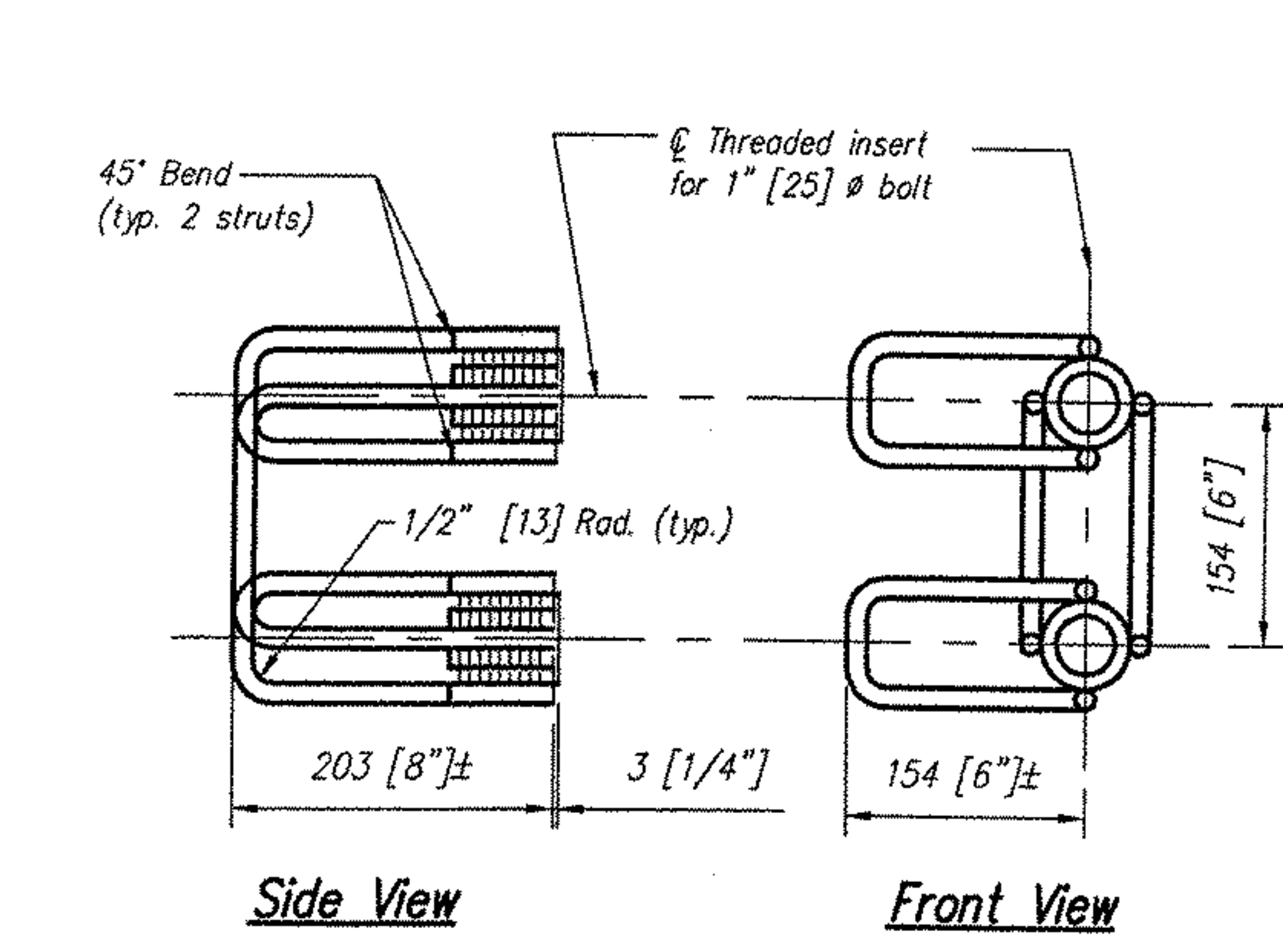
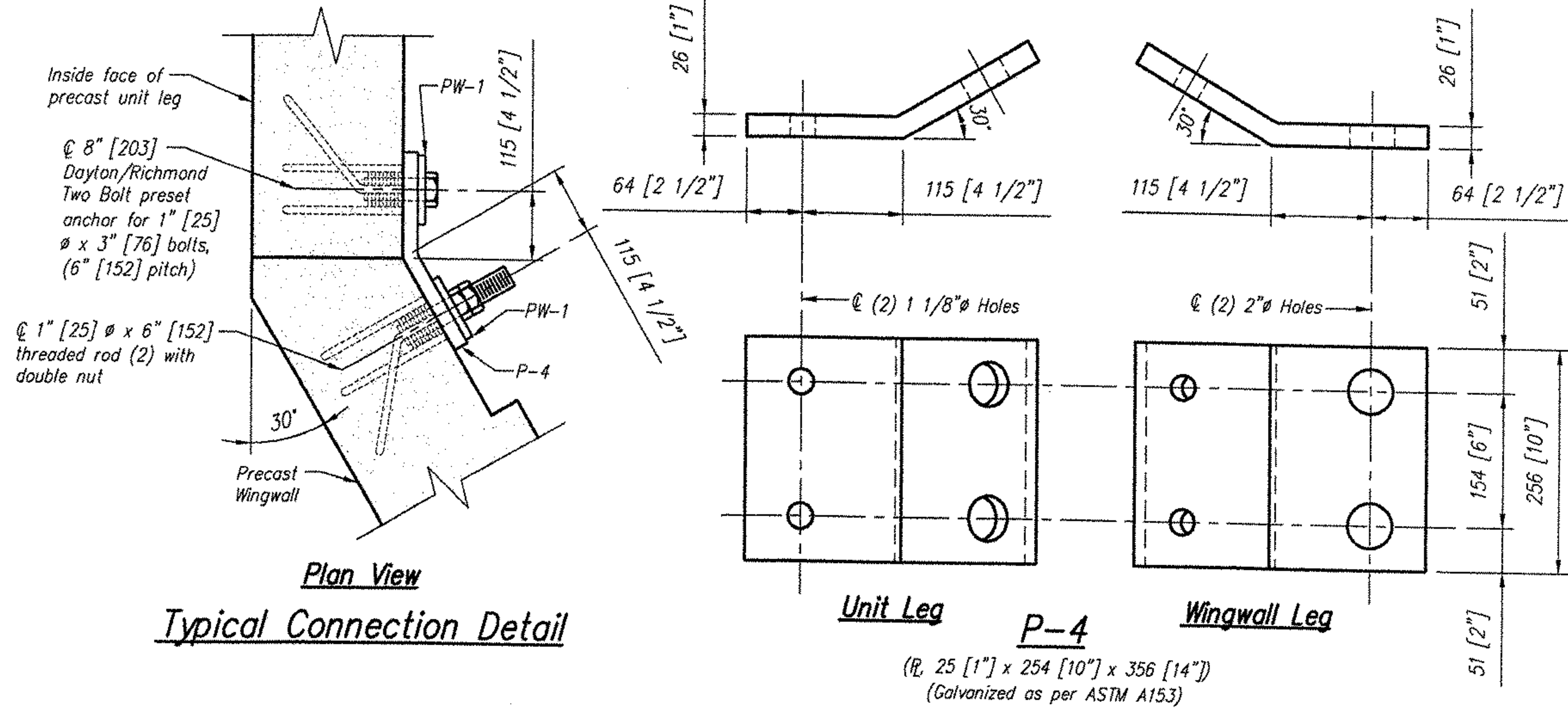
PW-1

($\frac{1}{2}$ " washer, 1/2" [13] x 4" [102] x 4" [102])
(Galvanized as per ASTM A153)

PLATE P-3

Total Required = 6
(4) PW-1 Req'd. per Plate

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Dayton/Richmond Two Bolt Preset Anchor

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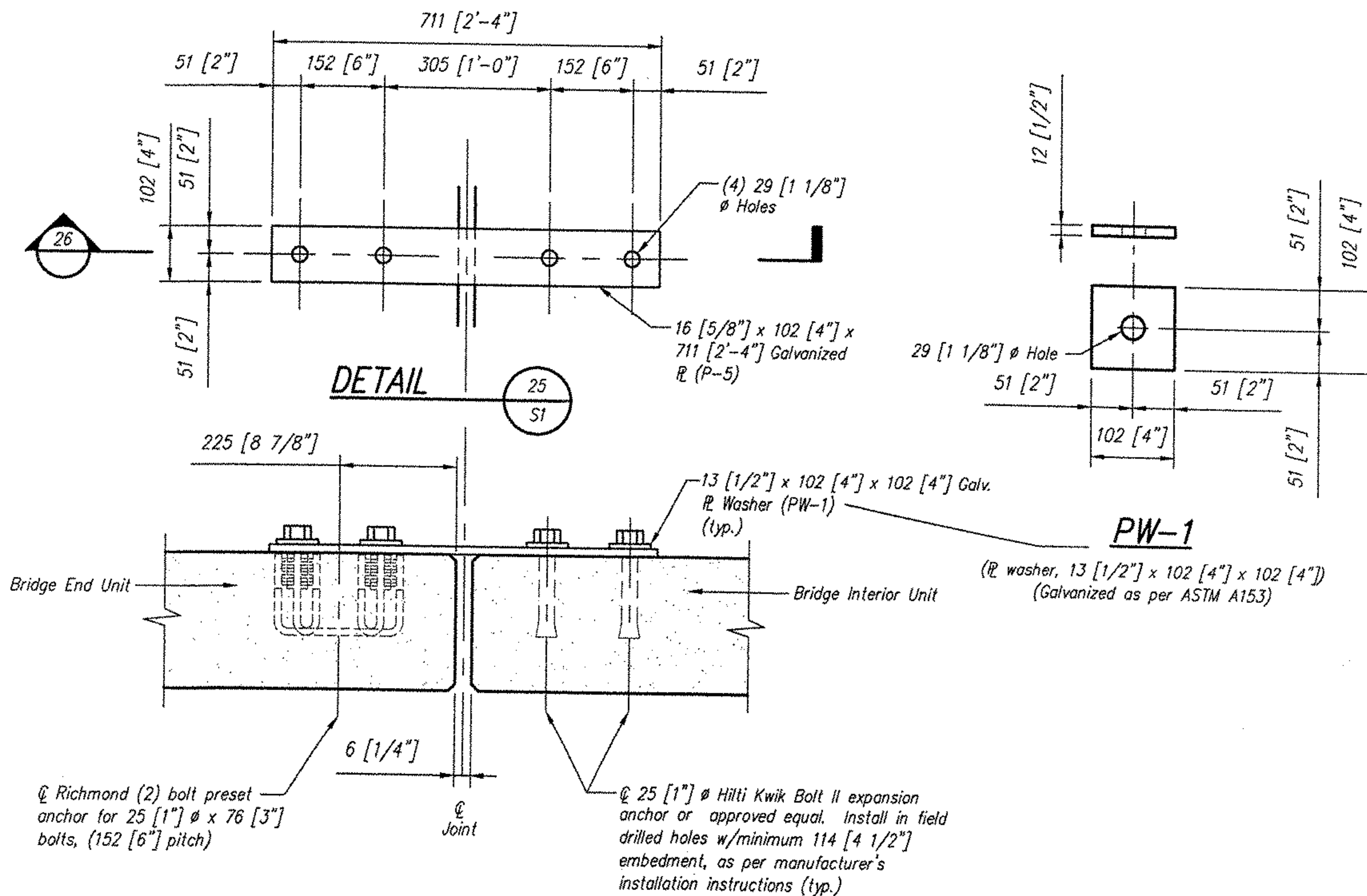
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BRIDGE NO. 7

ROCKINGHAM

Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
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PLATE P-4

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



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VT. RTE. 121
BRIDGE NO: 7

Des. By: KJG	Job No. 11415
Drawn By: JLL	Sheet No.
Chk'd By: JVP	S32
Date: 6/22/04	088

PLATE P-5

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