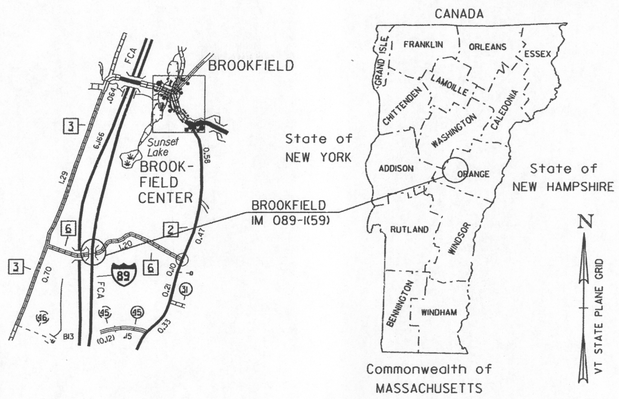
SEE SHEET 2 FOR INDEX OF SHEETS
AND LIST OF STANDARDS

STATE OF VERMONT
AGENCY OF TRANSPORTATION



PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWN OF BROOKFIELD
COUNTY OF ORANGE

ROUTE NO : INTERSTATE 89 **BRIDGE NO : 32N**

PROJECT LOCATION : IN BROOKFIELD ON INTERSTATE 89NB NEAR MILE MARKER 36.545

PROJECT DESCRIPTION : REPLACEMENT OF EXISTING BRIDGE DECK ALONG WITH RELATED ROADWAY APPROACH WORK.

LENGTH OF STRUCTURE :	69.00 FEET.
LENGTH OF ROADWAY :	240.00 FEET.
LENGTH OF PROJECT :	309.00 FEET.

QUALITY ASSURANCE PROGRAM: LEVEL I

CONVENTIONAL SYMBOLS

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

SURVEYED BY : NA
SURVEYED DATE : NA

DATUM
VERTICAL NA
HORIZONTAL NA

RECORD PLANS

CONTRACTOR: S. D. IRELAND CONC. CONST. CORP - BURLINGTON, VT
RESIDENT ENGINEER: DARYL BASSETT
CONSTRUCTION BEGAN: APRIL 30, 2012
CONSTRUCTION COMPLETE: JULY 26, 2012
RECORD PLANS BY: DARYL BASSETT & CRAIG PIERCE

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

BY Daf Bassett RESIDENT ENGINEER
DATE April 12, 2013

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.

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

CONSTRUCTION IS TO BE CARRIED ON IN ACCORDANCE WITH THESE PLANS AND THE STANDARD SPECIFICATIONS FOR CONSTRUCTION DATED 2006, AS APPROVED BY THE FEDERAL HIGHWAY ADMINISTRATION ON JUNE 15, 2006 FOR USE ON THIS PROJECT, INCLUDING ALL SUBSEQUENT REVISIONS AND SUCH REVISED SPECIFICATIONS AND SPECIAL PROVISIONS AS ARE INCORPORATED IN THESE PLANS.

02-DEC-2011

DIRECTOR OF PROGRAM DEVELOPMENT
APPROVED [signature] DATE 12.5.2011

PROJECT MANAGER : C.P. WILLIAMS

PROJECT NAME : BROOKFIELD
PROJECT NUMBER : IM 089-1(59)

SHEET 1 OF 24 SHEETS

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET (BRIDGE)

Version 05.02.03

LRFD

INDEX OF SHEETS

PLAN SHEETS

STANDARDS LIST

STRUCTURAL DETAIL SHEETS

SD-501.00	CONCRETE DETAILS AND NOTES	05-07-2010
SD-502.00	CONCRETE DETAILS AND NOTES	06-04-2010
SD-516.10	BRIDGE JOINT ASPHALTIC PLUG	05-07-2010
SD-601.00	STRUCTURAL STEEL DETAILS AND NOTES	06-04-2010

TRAFFIC DATA

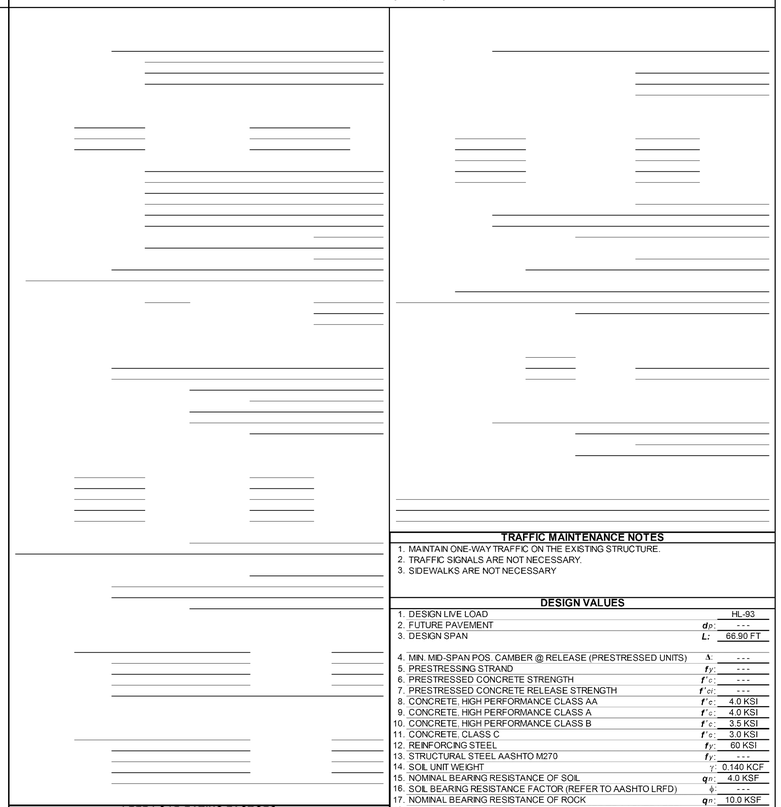
YEAR	ADT	DHV	% D	% T	ADTT
2012	6800	970	100	18.6	1700
2032	8200	1200	100	28.8	3200

20 year ESAL for flexible pavement from 2012 to 2032 : 18403000

40 year ESAL for flexible pavement from 2012 to 2052 : 47601000

Design Speed : 65 mph

FINAL HYDRAULIC REPORT



LRFR LOAD RATING FACTORS

LOADING LEVELS	TRUCK						
	H-20	HL-93	3S2	6 AXLE	3A STR	4A STR	5A SEMI
TONNAGE	**20**	**36**	**36**	**66**	**30**	**34.5**	**38**
INVENTORY	5.14	1.61					
POSTING							
OPERATING	6.68	2.09	5.64	3.7	4.73	4.25	
COMMENTS:	SERVICABILITY CONTROLS						

TRAFFIC MAINTENANCE NOTES

1. MAINTAIN ONE-WAY TRAFFIC ON THE EXISTING STRUCTURE.
2. TRAFFIC SIGNALS ARE NOT NECESSARY.
3. SIDEWALKS ARE NOT NECESSARY

DESIGN VALUES

1. DESIGN LIVE LOAD		HL-93
2. FUTURE PAVEMENT	d_P:	---
3. DESIGN SPAN	L:	66.90 FT
4. MIN. MID-SPAN POS. CAMBER @ RELEASE (PRESTRESSED UNITS)	Δ:	---
5. PRESTRESSING STRAND	f_y:	---
6. PRESTRESSED CONCRETE STRENGTH	f'_c:	---
7. PRESTRESSED CONCRETE RELEASE STRENGTH	f'_{ci}:	---
8. CONCRETE, HIGH PERFORMANCE CLASS AA	f'_c:	4.0 KSI
9. CONCRETE, HIGH PERFORMANCE CLASS A	f'_c:	4.0 KSI
10. CONCRETE, HIGH PERFORMANCE CLASS B	f'_c:	3.5 KSI
11. CONCRETE, CLASS C	f'_c:	3.0 KSI
12. REINFORCING STEEL	f_y:	60 KSI
13. STRUCTURAL STEEL AASHTO M270	f_y:	---
14. SOIL UNIT WEIGHT	γ:	0.140 KCF
15. NOMINAL BEARING RESISTANCE OF SOIL	q_n:	4.0 KSF
16. SOIL BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
17. NOMINAL BEARING RESISTANCE OF ROCK	q_n:	10.0 KSF
18. ROCK BEARING RESISTANCE FACTOR (REFER TO AASHTO LRFD)	ϕ:	---
19. NOMINAL AXIAL PILE RESISTANCE	q_p:	---
20. PILE YIELD STRENGTH ASTM A572	f_y:	---
21. PILE SIZE		---
22. EST. PILE LENGTH	L_P:	
23. PILE RESISTANCE FACTOR	ϕ:	---
24. LATERAL PILE DEFLECTION	Δ:	---
25. BASIC WIND SPEED	V_{3s}:	---
26. MINIMUM GROUND SNOW LOAD	p_g:	---
27. SEISMIC DATA	PGA: ---	S_s: ---
		S_1: ---

PROJECT NAME: **BROOKFIELD**

PROJECT NUMBER: **IM 089-1(59)**

FILE NAME: **10a074 PI Sheet.xls**
PROJECT LEADER: **C.P.WILLIAMS**
DESIGNED BY: **H.I. SALLS**
PRELIMINARY INFORMATION SHEET

PLOT DATE: 10/25/2011
DRAWN BY: **H.I. SALLS**
CHECKED BY: **R.S. YOUNG**
SHEET 2 OF 24

STATE OF VERMONT
AGENCY OF TRANSPORTATION

QUANTITY SHEET 1

SUMMARY OF ESTIMATED QUANTITIES			TOTALS		DESCRIPTIONS				DETAILED SUMMARY OF QUANTITIES		
ROADWAY	BRIDGE	FULL C.E. ITEMS	GRAND TOTAL	FINAL	UNIT	ITEMS	ITEM NUMBER	ROUND	QUANTITIES	UNIT	ITEMS
1			1		CY	TRENCH EXCAVATION OF EARTH, EXPLORATORY (N.A.B.I.)	204.22				
1013			1013		SY	COLD PLANING, BITUMINOUS PAVEMENT	210.10				
199			199		LF	MILLED RUMBLE STRIPS	213.10				
1			1		LU	PRICE ADJUSTMENT, ASPHALT CEMENT (N.A.B.I.)	406.50				
	325		325		LF	DRILLING AND GROUTING DOWELS	507.16				
	21957		21957		LB	EPOXY COATED REINFORCING STEEL	507.17				
	235		235		EACH	MECHANICAL BAR CONNECTOR (#5) (EPOXY COATED)	507.19				
	1		1		LS	SHEAR CONNECTORS (1,608 - 7/8" X 7")	508.15				
	1		1		LS	SURFACE PREPARATION, FIELD	513.41				
2.5	7.5		10		GAL	WATER REPELLENT, SILANE	514.10				
	42		42		LF	BRIDGE EXPANSION JOINT, ASPHALTIC PLUG	516.10				
	302		302		SY	SHEET MEMBRANE WATERPROOFING, TORCH APPLIED	519.20				
83	42		125		LF	JOINT SEALER, HOT POURED	524.11				
	216		216		LF	BRIDGE RAILING, GALVANIZED NETC 2 RAIL	525.33				
	1		1		EACH	PARTIAL REMOVAL OF STRUCTURE	529.20				
	1		1		CF	RAPID SETTING CONCRETE REPAIR MATERIAL WITH COARSE AGGREGATE	580.20				
2			2		EACH	CHANGING ELEVATION OF DROP INLETS, CATCH BASINS, OR MANHOLES	604.40				
160			160		LF	CAST-IN-PLACE CONCRETE CURB, TYPE B	616.28				
	119		119		LF	SNOW BARRIER	620.75				
429			429		LF	HD STEEL BEAM GUARDRAIL, GALVANIZED	621.21				
2			2		EACH	ANCHOR FOR STEEL BEAM RAIL	621.60				
4			4		EACH	GUARDRAIL APPROACH SECTION, GALVANIZED NETC 2 RAIL	621.72				
546			546		LF	REMOVAL AND DISPOSAL OF GUARDRAIL	621.80				
100			100		HR	UNIFORMED TRAFFIC OFFICERS	630.10				
600			600		HR	FLAGGERS	630.15				
		1	1		LS	TESTING EQUIPMENT, CONCRETE	631.16				
		1	1		LS	TESTING EQUIPMENT, BITUMINOUS	631.17				
1			1		LS	MOBILIZATION/DEMOBILIZATION	635.11				
400			400		LF	6 INCH WHITE LINE	646.214				
309			309		LF	6 INCH YELLOW LINE	646.215				
	94		94		CY	SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, CLASS A LOW CEMENT)	900.608				
1			1		LS	SPECIAL PROVISION (PUBLIC PROTECTION FOR BRIDGE PROJECTS)	900.645				
1			1		LS	SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)	900.645				
1			1		LU	SPECIAL PROVISION (MAT DENSITY PAY ADJUSTMENT, SMALL QUANTITY) (N.A.B.I.)	900.650				
1			1		LU	SPECIAL PROVISION (MIXTURE PAY ADJUSTMENT) (N.A.B.I.)	900.650				
207			207		TON	SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)	900.680				

PROJECT NAME: BROOKFIELD
PROJECT NUMBER: IM 089-1(59)

FILE NAME: s10a074qty.dgn
PROJECT LEADER: C.P. WILLIAMS
DESIGNED BY: H.I. SALLS
QUANTITY SHEET #1

PLOT DATE: 10/26/2011
DRAWN BY: H.I. SALLS
CHECKED BY: R.S. YOUNG
SHEET 3 OF 24

GENERAL

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION 2006 STANDARD SPECIFICATIONS FOR CONSTRUCTION, AND ITS LATEST REVISIONS, THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS FIFTH EDITION, DATED 2010 AND ITS LATEST REVISIONS, AND THE AASHTO LRFD BRIDGE CONSTRUCTION SPECIFICATIONS THIRD EDITION, DATED 2010 AND ITS LATEST REVISIONS.

2. THERE HAS BEEN NO SURVEY OF THE PROJECT LOCATION AND ONLY LIMITED EXISTING PLANS ARE AVAILABLE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS BEFORE ANY CONSTRUCTION ACTIVITIES COMMENCE. ANY CONFLICTS BETWEEN FIELD DIMENSIONS AND THESE PLANS SHALL BE BROUGHT TO THE ATTENTION OF THE RESIDENT ENGINEER PRIOR TO BEGINNING CONSTRUCTION.

3. ALL DIMENSIONS SHOWN ON THE PLANS ARE HORIZONTAL OR VERTICAL AND ARE GIVEN AT 68 DEGREES FAHRENHEIT, UNLESS NOTED OTHERWISE.

4. ITEM 529.20, "PARTIAL REMOVAL OF STRUCTURE" WILL BE FULL COMPENSATION FOR ALL MATERIAL, LABOR, EQUIPMENT AND INCIDENTALS NEEDED TO COMPLETELY REMOVE THE EXISTING DECK DOWN TO THE TOP FLANGE OF THE EXISTING BEAMS TO INCLUDE BUT NOT LIMITED TO THE CURBS, BRIDGE RAILING, SHEAR STUDS, PAVEMENT AND THE WING WALLS TO THE LIMITS SHOWN ON THE PLANS.

5. ITEM 620.75, "SNOW BARRIER, GALVANIZED" WILL BE ATTACHED TO THE BRIDGE RAIL OVER TH 6. SEE SHEET 12 FOR DETAILS.

6. THIS BRIDGE PASSES OVER TH 6 WHICH WILL NEED TO BE PROTECTED FROM CONSTRUCTION ACTIVITIES. THIS WORK WILL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (PUBLIC PROTECTION FOR BRIDGE PROJECTS)".

7. THERE ARE 2 DROP INLETS INSIDE THE PROJECT AREA; THESE WILL NEED TO BE PROTECTED DURING THE COLD PLANING AND PAVING OPERATIONS. PAYMENT FOR ANY ADJUSTMENT TO THE ELEVATION OF THE DROP INLETS TO MATCH THE NEW FINAL GRADE (IF NEEDED) WILL BE MADE UNDER ITEM 604.40, "CHANGING ELEVATION OF DROP INLETS, CATCH BASINS, OR MANHOLES". THE DROP INLETS WILL BE CLEANED AND FLUSHED AT THE END OF THE PROJECT. PAYMENT FOR CLEANING AND FLUSHING WILL BE CONSIDERED INCIDENTAL TO ALL OTHER CONTRACT ITEMS.

TRAFFIC CONTROL

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF A SITE SPECIFIC TRAFFIC CONTROL PLAN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING THE LOCAL TRAFFIC CONTROL PACKAGE IDENTIFYING THE PROJECT BEFORE, DURING AND AFTER THE CONSTRUCTION PERIOD. THE CONTRACTOR SHALL SUBMIT FOR APPROVAL A DETAILED TRAFFIC CONTROL PLAN TO THE ENGINEER FOR ALL STAGES OF CONSTRUCTION. NO WORK SHALL BEGIN UNTIL THE TRAFFIC CONTROL PLAN HAS BEEN APPROVED. SEE CONTRACT SPECIAL PROVISIONS FOR DETAILS. ALL COST SHALL BE INCLUDED IN ITEM 900.645 "SPECIAL PROVISION, (TRAFFIC CONTROL, ALL-INCLUSIVE)."

9. THE COSTS FOR ALL ITEMS REQUIRED TO IMPLEMENT THE CONTRACTOR'S TRAFFIC CONTROL PLAN; INCLUDING BUT NOT LIMITED TO TEMPORARY TRAFFIC BARRIER, TEMPORARY PAVEMENT MARKINGS, AND CONSTRUCTION SIGNS, WILL BE INCLUDED UNDER CONTRACT ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)". SEE SHEET 13 FOR DETAILS.

10. THE CONTRACTOR SHALL ADD SIGN G20-5AP TO THE TOP OF ALL TEMPORARY SPEED LIMIT SIGNS AS DETAILED IN THE MUTCD.

APPROACH WORK

11. PRIOR TO STARTING ANY EARTH WORK, ROADWAY PROFILES SHALL BE TAKEN AT 5'-0" INTERVALS ALONG THE CENTERLINE OF INTERSTATE 89 NORTH BOUND ON THE BRIDGE AND EXTENDING A MINIMUM OF 120 FEET FROM EACH END OF THE BRIDGE. THIS WORK WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT ITEMS.

12. BOTH THE DECK AND PAVEMENT THICKNESS WILL BE INCREASED 1 INCH EACH FROM THAT WHICH IS SHOWN ON THE REFERENCE PLANS. THE NEW GRADE SHALL MATCH BACK INTO EXISTING GRADE WITHIN 120 FEET FROM BEGIN AND END BRIDGE.

STEEL

13. AFTER THE EXISTING CONCRETE DECK HAS BEEN REMOVED, THE CONTRACTOR SHALL TAKE ELEVATIONS ALONG THE TOP OF THE BEAMS, AT 5'-0" INTERVALS. THE ELEVATIONS SHALL THEN BE SENT TO THE PROJECT MANAGER FOR USE IN DETERMINING THE HAUNCH DEPTHS. THE CONTRACTOR SHOULD EXPECT 4 WORKING DAYS FOR VTRANS TO PREPARE THE HAUNCH DEPTH CALCULATIONS.

14. THE EXISTING STRUCTURAL STEEL IS PAINTED WITH A MATERIAL THAT MAY CONTAIN LEAD. THE CONTRACTOR SHALL FOLLOW ALL APPLICABLE REGULATIONS WHEN HANDLING AND WORKING WITH THIS STEEL. ANY REMOVED STRUCTURAL STEEL IS THE PROPERTY OF THE CONTRACTOR. THE CONTRACTOR SHALL INDEMNIFY AND HOLD THE STATE, ITS OFFICERS, AND EMPLOYEES HARMLESS CONCERNING THE CONTRACTOR'S USE OR DISPOSITION OF THE REMOVED STRUCTURAL STEEL.

15. UPON REMOVING THE DECK, THE TOPS OF THE BEAMS SHALL BE CLEANED IN THE AREAS OF THE SHEAR STUDS IN ACCORDANCE WITH SECTION 513 PRIOR TO THE WELDING OF THE NEW SHEAR STUDS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY LEAD ABATEMENT PERMITS. THIS WORK SHALL BE PAID FOR UNDER ITEM 513.41, "SURFACE PREPARATION, FIELD"

16. SPACE FLEMING BRACKETS AS REQUIRED BY DESIGN WITH A MAXIMUM SPACING OF 4'. THE DESIGN OF FLEMING BRACKETS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.

17. THE EXISTING SHEAR STUDS SHALL BE REMOVED ABOVE THE WELD, SEE NOTE 4 ON THIS SHEET FOR PAYMENT. THE NEW SHEAR STUDS SHALL BE SPACED AS PER PLAN, SEE SHEET 7. PAYMENT FOR THE NEW STUDS WILL BE MADE UNDER ITEM 508.15, "SHEAR CONNECTORS".

REINFORCED CONCRETE

18. ALL CONCRETE SHALL CONFORM TO THE SPECIFICATIONS FOR ITEM 900.608, SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, CLASS A LOW CEMENT).

19. ALL REINFORCING STEEL SHALL BE EPOXY COATED AND MEET THE REQUIREMENTS OF SECTION 507 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION.

20. APPLY WATER REPELLENT, SILANE TO ALL EXPOSED SURFACES OF CONCRETE ON THE BRIDGE, EXCEPT THE BOTTOM OF THE DECK BETWEEN THE DRIP NOTCHES. SILANE SHALL ALSO BE APPLIED TO THE NEW WING WALL CAPS AND NEW TYPE B CURBING.

21. REINFORCING STEEL PLACEMENT TOLERANCES SHALL BE:
SPACING: +/- 1"
CLEARANCE: +/- ¼"

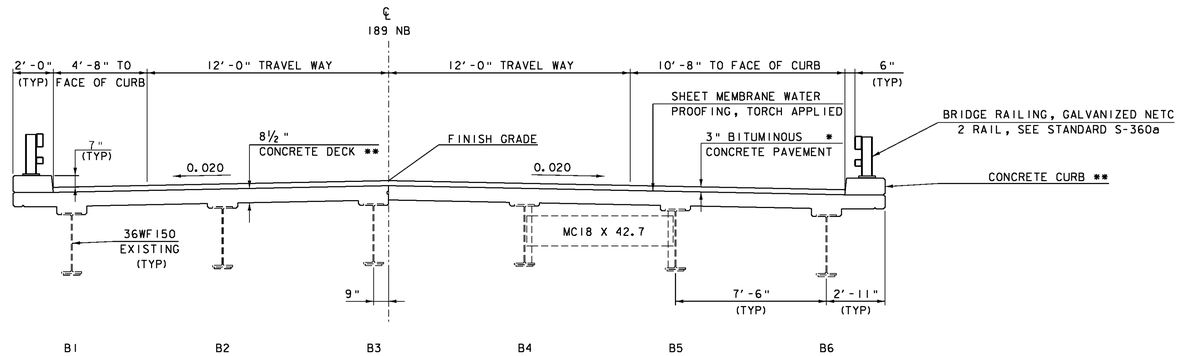
ENVIRONMENTAL

22. EROSION CONTROL MEASURES SHALL BE UTILIZED AS REQUIRED AND SHALL BE PER SECTION 105 OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION AND THE AGENCY OF NATURAL RESOURCES LOW-RISK HANDBOOK FOR CONSTRUCTION SITES. SEE SUBSECTION 105.23 FOR EROSION CONTROL PLAN REQUIREMENTS. PAYMENT FOR THIS WORK WILL BE CONSIDERED INCIDENTAL TO ALL OTHER CONTRACT ITEMS.

PROJECT NAME: BROOKFIELD
PROJECT NUMBER: IM 089-1(59)

FILE NAME: s100a074gennote.dgn
PROJECT LEADER: C.P. WILLIAMS
DESIGNED BY: H.J. SALLS
GENERAL NOTE SHEET

PLOT DATE: 25-OCT-2011
DRAWN BY: H.J. SALLS
CHECKED BY: R.S. YOUNG
SHEET 4 OF 24

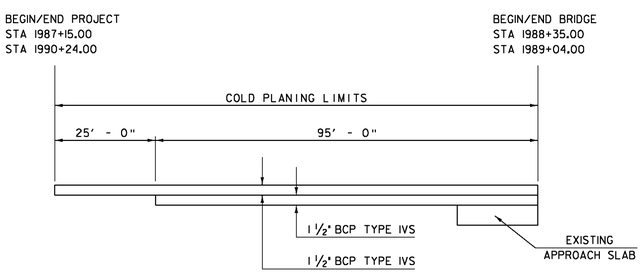


* 1½" TYPE IVS OVER 1½" TYPE IVS

** SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, CLASS A LOW CEMENT)

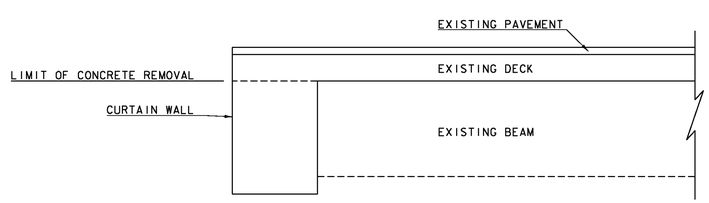
PROPOSED BRIDGE TYPICAL

SCALE: ⅜" = 1'-0"



MATERIAL TRANSITION DETAIL

(NOT TO SCALE)



END BRIDGE DETAIL

(NOT TO SCALE)

NOTES:

BCP - BITUMINOUS CONCRETE PAVEMENT

THE INTENTION IS TO ONLY COLD PLANE TO A DEPTH THAT ALLOWS FOR PLACEMENT OF THE SPECIFIED LIFTS OF NEW PAVEMENT.

NOTE:

RETAIN THE EXISTING REINFORCING STEEL FROM THE CURTAIN WALL TO SPLICE WITH THE NEW DECK REINFORCING STEEL.

PROJECT NAME: BROOKFIELD	
PROJECT NUMBER: IM 089-1(59)	
FILE NAME: sl0a074typ.dgn	PLOT DATE: 25-OCT-2011
PROJECT LEADER: C.P. WILLIAMS	DRAWN BY: H.J. SALLS
DESIGNED BY: H.J. SALLS	CHECKED BY: R.S. YOUNG
BRIDGE TYPICAL	SHEET 5 OF 24

1987+03 6 INCH WHITE LINE 1990+67
STA ~~1987+15.00~~ RT - ~~1990+24.00~~ RT
STA ~~1987+15.00~~ - ~~1990+24.00~~ CL (DASHED)
~~1987+03~~ ~~1990+67~~

6 INCH YELLOW LINE
STA ~~1987+15.00~~ LT - ~~1990+24.00~~ LT
1986+59 1990+55

MILLED RUMBLE STRIPS
STA 1987+15.00 RT - 1988+22.00 RT
STA 1989+32.00 RT - 1990+24.00 RT

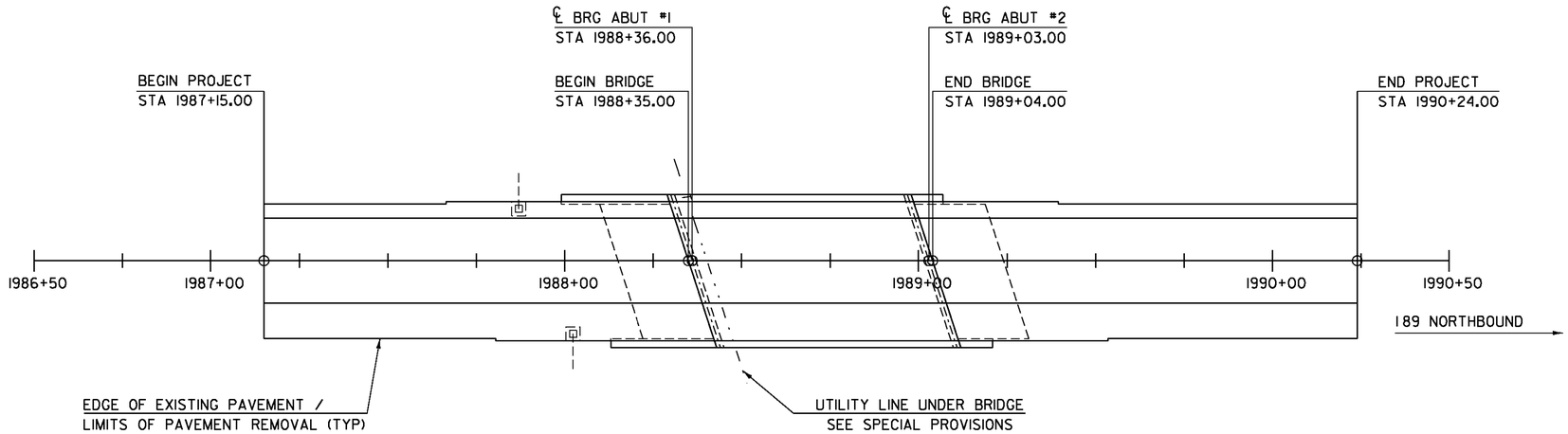
BRIDGE EXPANSION JOINT, ASPHALTIC PLUG
STA 1989+04

SAW CUT JOINT
STA 1988+15
STA 1988+35
STA 1989+24

CHANGING ELEVATION OF DROP INLETS, CATCH BASINS, OR MANHOLES
STA 1987+85 LT (EST.)
STA 1988+05 RT (EST.)

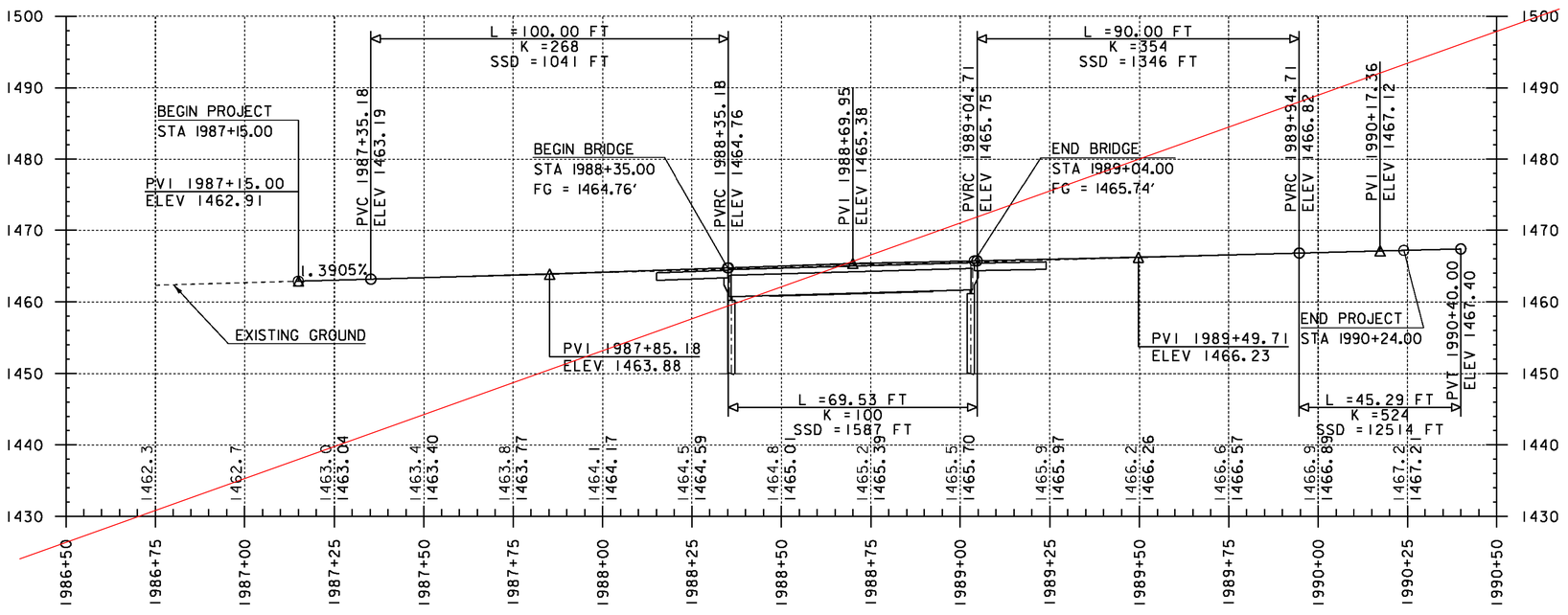
ALL DRAINAGE FEATURES ARE SHOWN IN THEIR APPROXIMATE LOCATIONS AND WILL NEED TO BE LOCATED BY THE CONTRACTOR TO ENSURE THEY ARE NOT DAMAGED. ANY DAMAGE WILL BE REPAIRED AT THE CONTRACTOR'S EXPENSE.

PAYMENT FOR SAW CUTTING EXISTING PAVEMENT WILL BE CONSIDERED INCIDENTAL TO CONTRACT ITEM 210.10, "COLD PLANING, BITUMINOUS PAVEMENT".



LAYOUT

SCALE: 1" = 20' - 0"



SEE 'LAYOUT AND PROFILE' FROM PROJECT MANAGER, CHRIS WILLIAMS, P.E.
PLOT DATE : 5-9-2012, SHEET 1 OF 1

NOTE:
ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG CENTERLINE.
ELEVATIONS SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG CENTERLINE.
ALL ELEVATIONS ARE ASSUMED AND MUST BE VERIFIED.

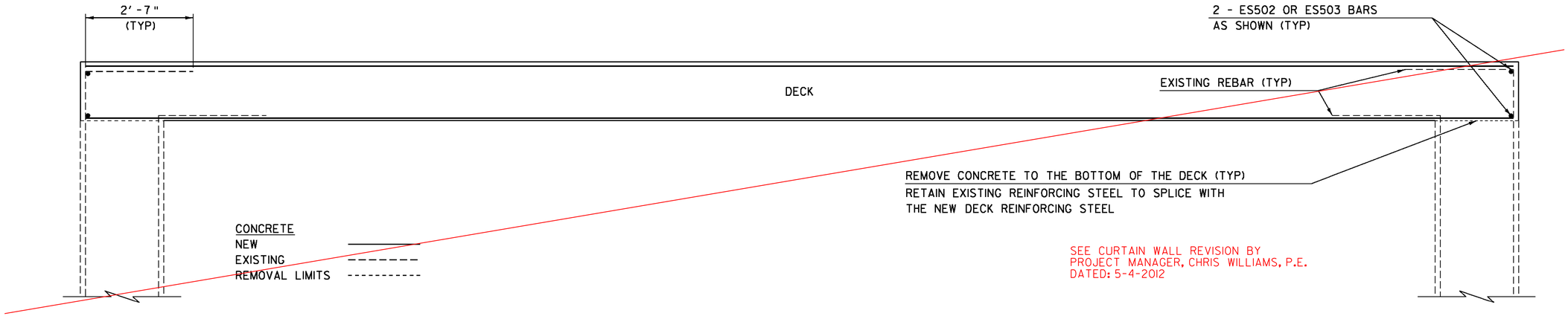
PROFILE

HORIZONTAL SCALE: 1" = 20' - 0"
VERTICAL SCALE: 1" = 10' - 0"

PROJECT NAME: BROOKFIELD
PROJECT NUMBER: IM 089-1(59)

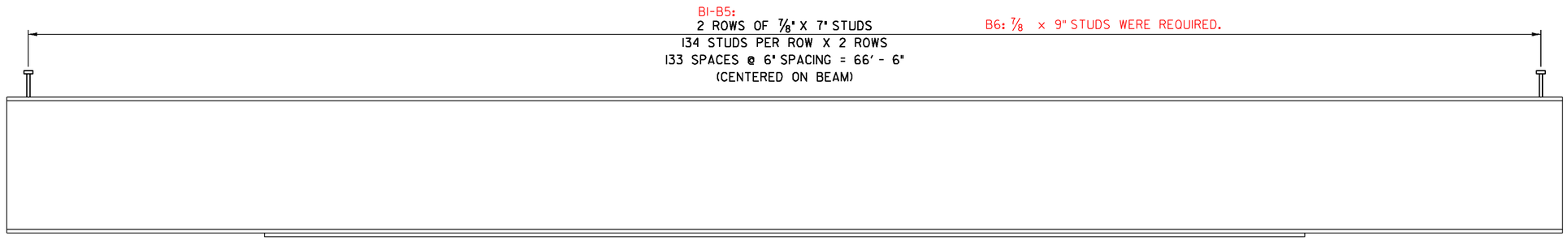
FILE NAME: sl0a074layout.dgn
PROJECT LEADER: C.P. WILLIAMS
DESIGNED BY: H.I. SALLS
LAYOUT AND PROFILE

PLOT DATE: 02-DEC-2011
DRAWN BY: H.I. SALLS
CHECKED BY: R.S. YOUNG
SHEET 6 OF 24



DECK ELEVATION

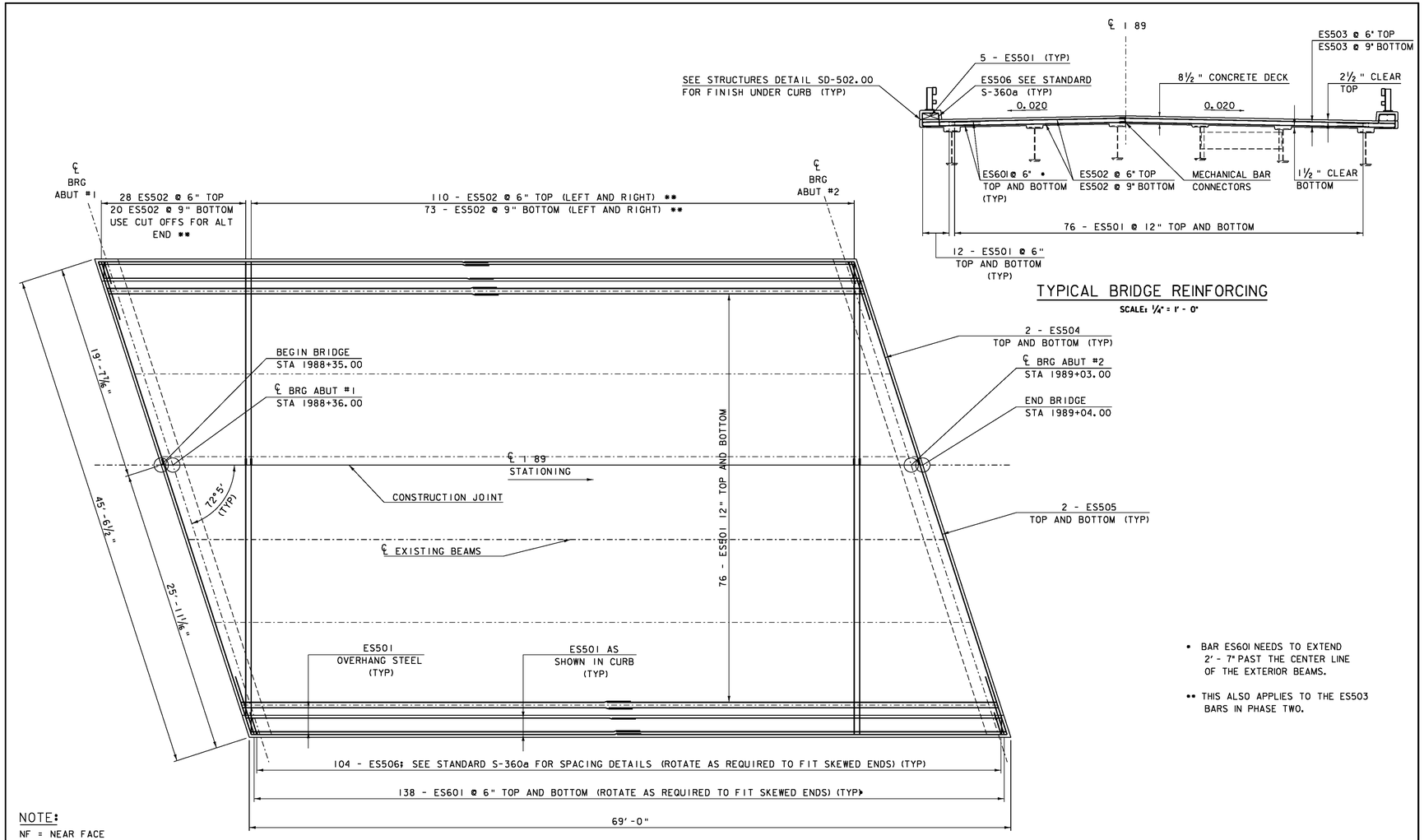
(NOT TO SCALE)



BEAM ELEVATION

(NOT TO SCALE)

PROJECT NAME:	BROOKFIELD
PROJECT NUMBER:	IM 089-1(59)
FILE NAME: s10a074shear studs.dgn	PLOT DATE: 25-OCT-2011
PROJECT LEADER: C.P. WILLIAMS	DRAWN BY: H.I. SALLS
DESIGNED BY: H.I. SALLS	CHECKED BY: R.S. YOUNG
SHEAR CONNECTOR LAYOUT	SHEET 7 OF 24



TYPICAL BRIDGE REINFORCING

SCALE: ¼" = 1' - 0"

DECK REINFORCING PLAN

SCALE: ¼" = 1' - 0"

- BAR ES601 NEEDS TO EXTEND 2' - 7" PAST THE CENTER LINE OF THE EXTERIOR BEAMS.

•• THIS ALSO APPLIES TO THE ES503 BARS IN PHASE TWO.

NOTE:

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

PROJECT NAME:	BROOKFIELD
PROJECT NUMBER:	IM 089-1(59)
FILE NAME: s10a074deck reinforcing.dgn	PLOT DATE: 25-OCT-2011
PROJECT LEADER: C.P. WILLIAMS	DRAWN BY: H.I. SALLS
DESIGNED BY: H.I. SALLS	CHECKED BY: R.S. YOUNG
DECK REINFORCING	SHEET 8 OF 24

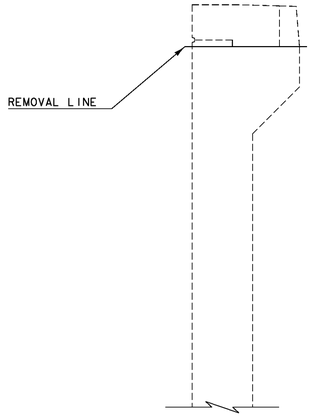
NOTE:

1) THE TOP PORTION OF THE EXISTING WINGWALLS SHALL BE REMOVED AND REPLACED WITH A NEW CAP. THE NEW CAP SHALL BE POURED USING SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, CLASS A LOW CEMENT).

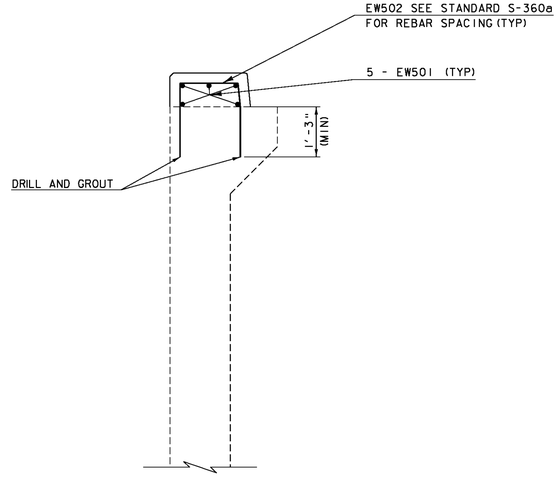
2) SEE STANDARD DRAWING S-360a FOR CURB DETAILS. THE BRIDGE CURB AND WINGWALL CURBS SHALL MATCH IN ELEVATION AND SLOPE FOR PROPER FIT OF THE BRIDGE RAIL.

3) THE EXISTING REBAR IS TO BE CUT OFF AND REPLACED WITH BAR EW502 WHICH IS TO BE DRILLED AND GROUTED INTO THE EXISTING CONCRETE.

4) THERE ARE 4 SETS OF 5 - EW501BARS. EACH SET OF BARS WILL HAVE A LENGTH THAT CORRESPONDS TO THE WINGWALL THEY ARE BEING USED IN.



WINGWALL TYPICAL
(EXISTING CAP)
(NTS)



WINGWALL TYPICAL
(NEW CAP)
(NTS)

NOTE:
NF = NEAR FACE
FF = FAR FACE
EF = EACH FACE
▲ = CUT TO FIT IN FIELD
3" CLEAR, UNLESS OTHERWISE SPECIFIED ON THE PLANS.
2'-2" BAR LAP UNLESS OTHERWISE SPECIFIED ON THE PLANS.

PROJECT NAME: BROOKFIELD
PROJECT NUMBER: IM 089-1(59)

FILE NAME: s10a074wingwall.dgn
PROJECT LEADER: C.P. WILLIAMS
DESIGNED BY: H.J. SALLS
WINGWALL SHEET

PLOT DATE: 25-OCT-2011
DRAWN BY: H.J. SALLS
CHECKED BY: R.S. YOUNG
SHEET 9 OF 24

STATE OF VERMONT
AGENCY OF TRANSPORTATION

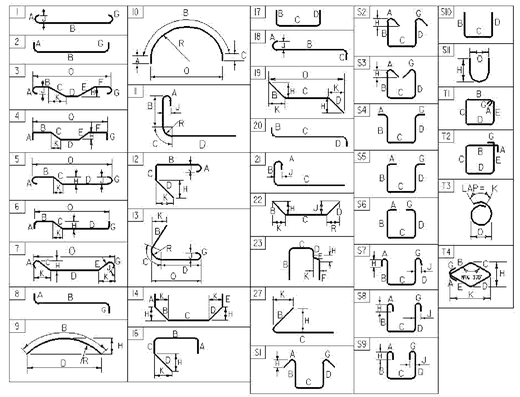
REINFORCING STEEL SCHEDULE

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O
DECK																	
	196	5	35'- 4"	ES501	STR	35'- 4"											
	231	5	18'- 2"	ES502	STR	18'- 2"											
	231	5	24'- 2"	ES503	STR	24'- 2"											
	4	5	19'- 2"	ES504	STR	19'- 2"											
	4	5	25'- 5"	ES505	STR	25'- 5"											
	208	5	4'- 10"	ES506	S5	0'- 6"	1'- 2"	1'- 6"	1'- 2"			0'- 6"					
✳	277	6	5'- 3"	ES601	STR	5'- 3"											
WINGWALL #1																	
▲	5	5	30'- 2"	EW501	STR	30'- 2"											
	49	5	5'- 2"	EW502	S10		1'- 10"	1'- 6"	1'- 10"								
WINGWALL #2																	
▲	5	5	29'- 6"	EW501	STR	29'- 6"											
	48	5	5'- 2"	EW502	S10		1'- 10"	1'- 6"	1'- 10"								
WINGWALL #3																	
✳ ▲	6	5	8'- 6"	EW501	STR	8'- 6"											
	16	5	5'- 2"	EW502	S10		1'- 10"	1'- 6"	1'- 10"								
WINGWALL #4																	
▲	5	5	9'- 2"	EW501	STR	9'- 2"											
	17	5	5'- 2"	EW502	S10		1'- 10"	1'- 6"	1'- 10"								

ITEM	EACH	SIZE	LENGTH	MARK	TYPE	A	B	C	D	E	F	G	H	J	K	R	O

~ NOTES ~

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



ASTM STANDARD REINFORCING BARS

BAR SIZE DESIGNATION	WEIGHT POUNDS PER FOOT	NOMINAL DIMENSIONS ROUND SECTION: DIAMETER INCHES	AREA INCHES^2	PERIMETER INCHES
#3	0.376	0.375	0.11	1.178
#4	0.668	0.500	0.20	1.571
#5	1.043	0.625	0.31	1.963
#6	1.502	0.750	0.44	2.356
#7	2.044	0.875	0.60	2.749
#8	2.670	1.000	0.79	3.142
#9	3.400	1.128	1.00	3.544
#10	4.303	1.270	1.27	3.990
#11	5.313	1.410	1.56	4.430
#14	7.65	1.693	2.25	5.32
#18	13.60	2.257	4.00	7.09

PROJECT NAME: **BROOKFIELD**
PROJECT NUMBER: **IM 089-1(59)**

FILE NAME: **s10a074rss.dgn**
PROJECT MANAGER: **C.P.WILLIAMS**
DESIGNED BY: **H.I.SALLS**
REINFORCING STEEL SCHEDULE

PLOT DATE: **6/28/2011**
DRAWN BY: **H.I. SALLS**
CHECKED BY: **L.J. STONE**
SHEET **10** OF **24**

CAST-IN-PLACE CONCRETE CURB, TYPE B
STA 1987+59 LT - 1987+99 LT
STA 1987+73 RT - 1988+13 RT
STA 1989+07 LT - 1989+47 LT
STA 1989+21 RT - 1989+61 RT

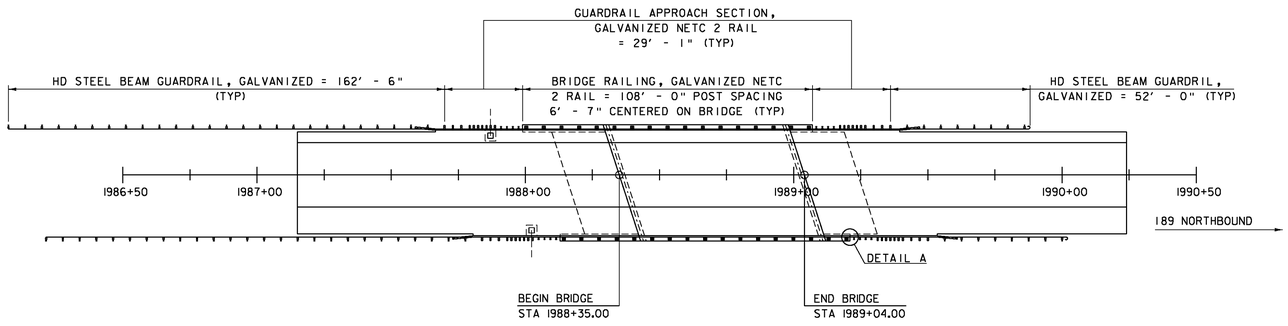
REMOVAL AND DISPOSAL OF GUARDRAIL
STA 1986+07 LT - 1987+99 LT
STA 1986+21 RT - 1988+13 RT
STA 1989+07 LT - 1989+88 LT
STA 1989+21 RT - 1990+02 RT

HD STEEL BEAM GUARDRAIL, GALVANIZED
STA 1986+07 LT - 1987+70 LT
STA 1986+21 RT - 1987+84 RT
STA 1989+36 LT - 1989+88 LT
STA 1989+50 RT - 1990+02 RT

GUARDRAIL APPROACH SECTION, GALVANIZED NETC 2 RAIL
STA 1987+70 LT - 1987+99 LT
STA 1987+84 RT - 1988+13 RT
STA 1989+07 LT - 1989+36 LT
STA 1989+21 RT - 1989+50 RT

BRIDGE RAILING, GALVANIZED NETC 2 RAIL
STA 1987+99 LT - 1989+07 LT
STA 1988+13 RT - 1989+21 RT

ANCHOR FOR STEEL BEAM RAIL
STA 1989+88 LT
STA 1990+02 RT



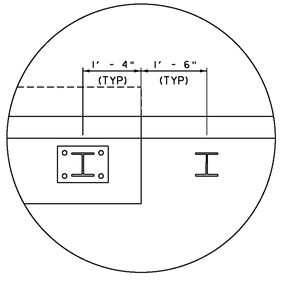
NOTE;

THE GUARDRAIL ON THE SOUTH END OF THE PROJECT WILL NEED TO BE MATCHED BACK INTO THE EXISTING GUARDRAIL.

RAILING SPLICES WILL BE NEEDED AT BEGIN AND END BRIDGE.

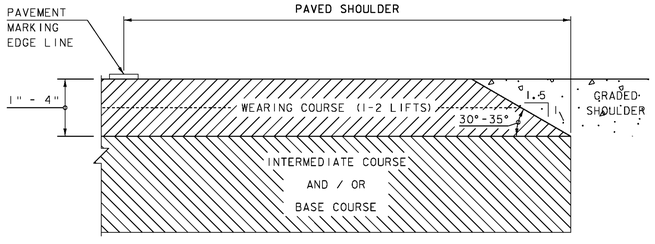
RAILING LAYOUT

SCALE: 1" = 20' - 0"



DETAIL A

NTS



SAFETY EDGE DETAIL

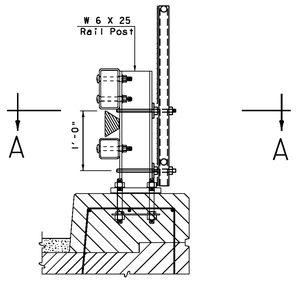
NOT TO SCALE

NOTE: LEVELING COURSE MAY INCLUDE THE "SAFETY EDGE" AT THE CONTRACTOR'S CHOICE.

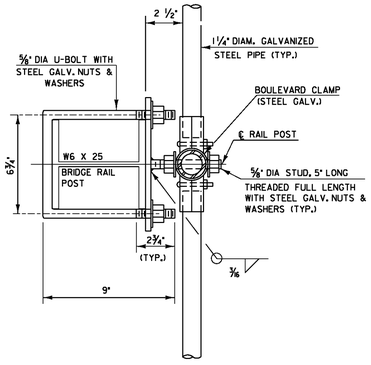
PROJECT NAME: BROOKFIELD
PROJECT NUMBER: IM 089-1(59)

FILE NAME: s10a074rail.dgn
PROJECT LEADER: C.P. WILLIAMS
DESIGNED BY: H.J. SALLS
RAILING LAYOUT

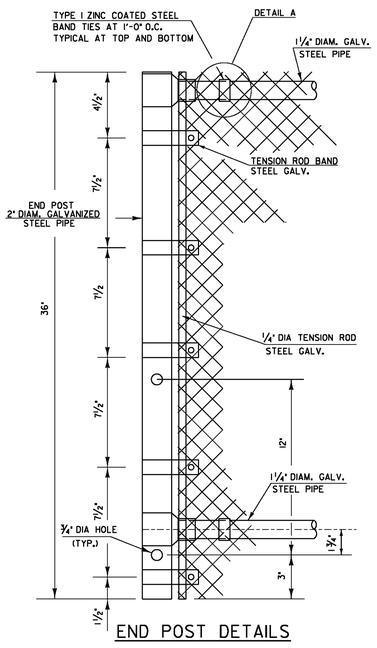
PLOT DATE: 25-OCT-2011
DRAWN BY: H.J. SALLS
CHECKED BY: R.S. YOUNG
SHEET 11 OF 24



TYPICAL SECTION



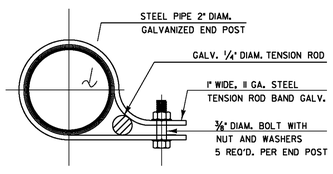
SECTION A-A



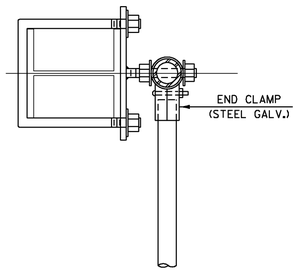
END POST DETAILS

NOTES

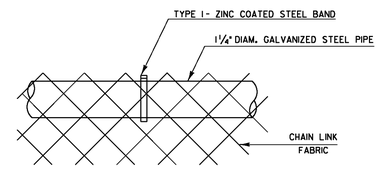
1. THREADS OF STUDS AND U-BOLTS TO BE ⅝ - 11 UNC.
2. ALL CONNECTION PLATES TO BE GALVANIZED AFTER FABRICATION.
3. 1¼" PIPE LENGTH SHALL BE FIELD CUT TO FIT POST SPACING.
4. CHAIN LINK FABRIC TO BE KNUCKLED TOP AND BOTTOM.
5. ALL BOLTS, THREADED STUDS AND WASHERS SHALL CONFORM TO THE SPECIFICATIONS FOR ASTM A325, TYPE 1. NUTS SHALL CONFORM TO AASHTO M-291.
6. ALL STEEL PLATES SHALL CONFORM TO THE SPECIFICATION FOR AASHTO M270 GRADE 36.
7. ALL GALVANIZING SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-181 WITH HARDWARE AND FITTINGS CONFORMING TO THE REQUIREMENTS OF AASHTO M-111 OR AASHTO M-232 WHICHEVER IS APPLICABLE. ALL BOLTS, NUTS AND WASHERS SHALL BE EITHER HOT-DIP GALVANIZED IN ACCORDANCE WITH THE ABOVE AASHTO REQUIREMENTS OR MECHANICALLY GALVANIZED USING A MECHANICALLY DEPOSITED PROCESS CONFORMING TO THE REQUIREMENTS OF ASTM B695, CLASS 110.
8. GALVANIZED CHAIN-LINK FABRIC SHALL BE TYPE I (ZINC) CLASS D AS SPECIFIED IN AASHTO M-181.
9. SNOW BARRIER SHALL BEGIN AT THE BRIDGE RAIL POST WHICH WILL PROVIDE A MINIMUM DISTANCE OF 20' BEFORE EDGE OF THE ROADWAY BELOW AND EXTEND TO THE FIRST POST AFTER EDGE OF THE ROADWAY BELOW IN DIRECTION OF TRAVEL OR AS DIRECTED BY THE ENGINEER.
10. ALL REFERENCES TO THE DIAMETERS OF GALVANIZED STEEL PIPE SHALL REFER TO THE OUTSIDE DIAMETER (O.D.).
11. ALL POSTS, RAILS AND HARDWARE SHALL BE ZINC COATED AND CONFORM TO THE REQUIREMENTS OF AASHTO M-181, GRADE 1 OR GRADE 2.



TENSION ROD BAND



PLAN VIEW AT END POST



DETAIL A

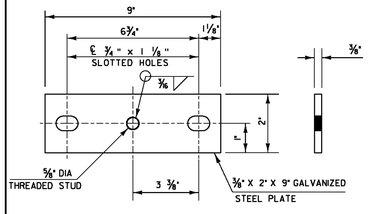
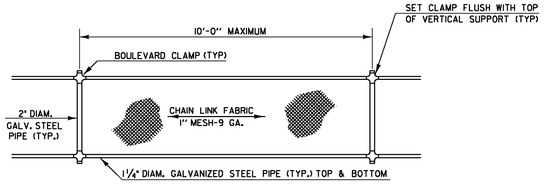
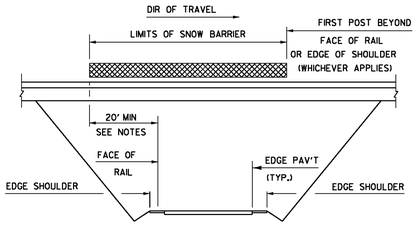


PLATE DETAILS



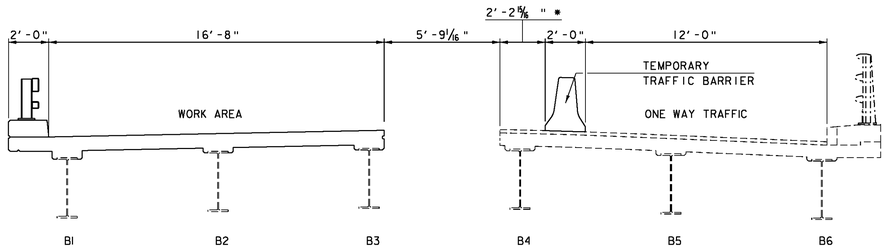
ELEVATION SNOW BARRIER



SCHEMATIC SNOW BARRIER LIMITS

PROJECT NAME: BROOKFIELD	
PROJECT NUMBER: IM 089-1(59)	
FILE NAME: s10a074snowfence.dgn	PLOT DATE: 25-OCT-2011
PROJECT LEADER: C.P. WILLIAMS	DRAWN BY: H.J. SALLS
DESIGNED BY: H.J. SALLS	CHECKED BY: R.S. YOUNG
SNOW FENCE	SHEET 12 OF 24

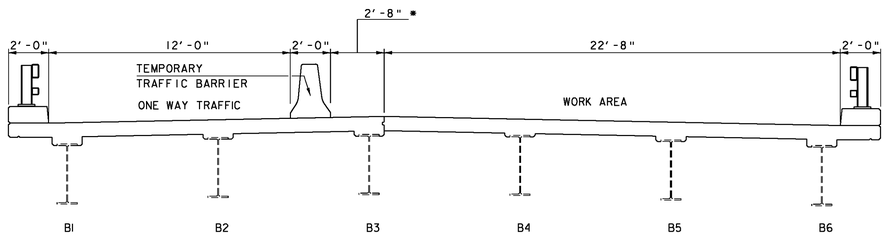
LOOKING UP STATION



PHASE ONE

SCALE: 3/8" = 1'-0"

* IF THE CONTRACTOR'S CHOSEN TEMPORARY TRAFFIC BARRIER NEEDS TO BE ANCHORED TO THE NEW DECK TO MEET NCHRP 350, TL-3. THEN STAINLESS STEEL ANCHORS SHALL BE USED. AFTER THE BARRIER HAS BEEN REMOVED ALL ANCHORS SHALL BE GROUND FLUSH WITH THE NEW DECK.

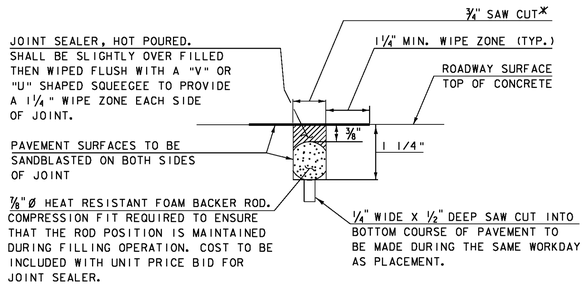


PHASE TWO

SCALE: 3/8" = 1'-0"

CONCRETE
NEW ———
EXISTING - - - - - -

NOTE: THE CONTRACTOR IS RESPONSIBLE FOR DESIGNING A SUPPORT SYSTEM FOR OVERHANGS CREATED DURING PHASING. THE SUPPORT SYSTEM SHALL BE DESIGNED AND STAMPED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF VERMONT, AND SUBMITTED PER SECTION 105.

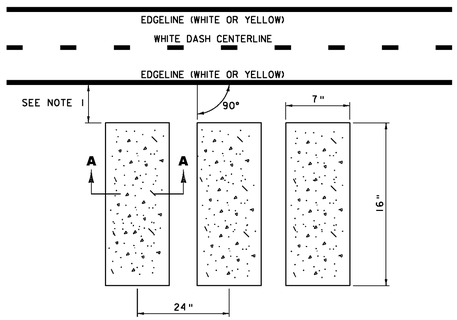


SAWED PAVEMENT JOINT DETAIL

(NOT TO SCALE)

*JOINT IS TO BE LOCATED ACCURATELY BY STRING LINING, OR OTHER MEANS, PRIOR TO PAVING, SO THAT THE SAW CUTS WILL BE MADE DIRECTLY OVER THE END OF CONCRETE DECK. JOINT SHALL BE CUT DRY IN A SINGLE PASS AND BE SEALED WITHIN 24 HOURS OR PRIOR TO EXPOSURE TO TRAFFIC. JOINT SHALL BE CLEANED PRIOR TO APPLYING THE JOINT SEALER.

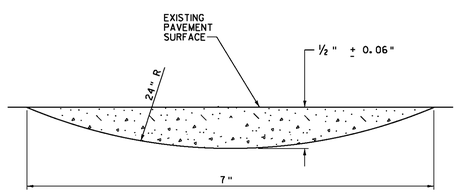
PROJECT NAME: BROOKFIELD	
PROJECT NUMBER: IM 089-1(59)	
FILE NAME: s10a074phasing.dgn	PLOT DATE: 25-OCT-2011
PROJECT LEADER: C.P. WILLIAMS	DRAWN BY: H.L. SALLS
DESIGNED BY: H.L. SALLS	CHECKED BY: R.S. YOUNG
PHASED CONSTRUCTION SHEET	SHEET 13 OF 24



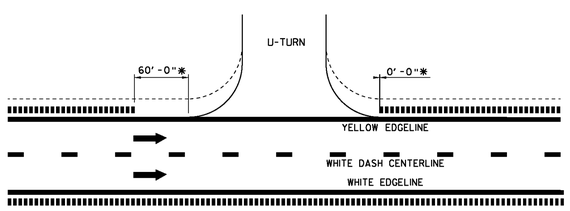
RUMBLE STRIP MILLING DETAIL

NOTES:
1. MILL RUMBLE STRIPS 30 INCHES FROM EDGELINE FOR ALL SHOULDERS 6 FEET OR WIDER; MILL RUMBLE STRIPS 6 INCHES FROM EDGELINE FOR ALL SHOULDERS LESS THAN 6 FEET WIDE.

2. IN GUARDRAIL AREAS, STOP MILLED RUMBLE STRIPS WHEN THE SHOULDER NARROWS TO 4 FEET WIDE.

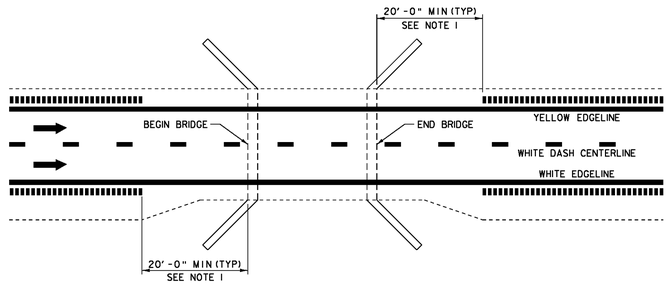


SECTION A-A



RUMBLE STRIP U-TURN DETAIL

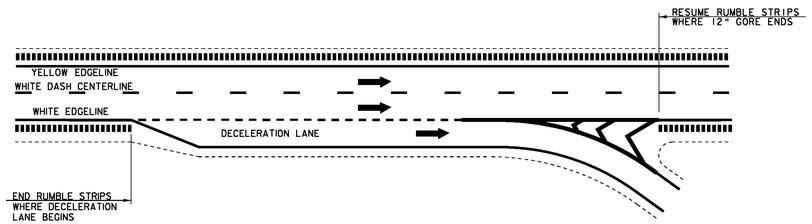
* THE DIMENSIONS MAY VARY DEPENDING ON ACTUAL FIELD CONDITIONS, AND MAY BE MODIFIED AT THE RESIDENT ENGINEER'S DISCRETION.



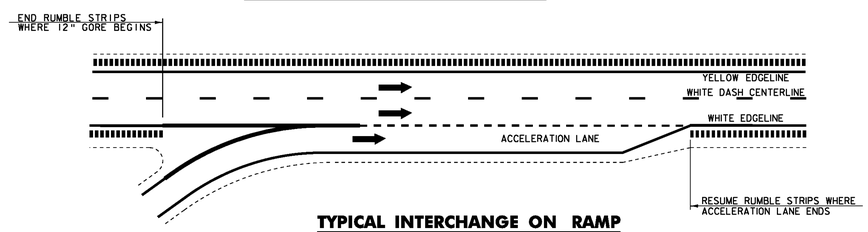
RUMBLE STRIP BRIDGE DETAIL

NOTES:
1. NO RUMBLE STRIPS SHALL BE MILLED WITHIN 20 FEET OF THE BEGIN AND END OF BRIDGE. DO NOT BEGIN RUMBLE STRIPS UNTIL THE SHOULDER IS AT LEAST 4 FEET WIDE.

2. AT NO TIME SHALL THE RUMBLE STRIPS BE MILLED INTO ANY APPROACH SLAB.



TYPICAL INTERCHANGE OFF RAMP



TYPICAL INTERCHANGE ON RAMP

LEGEND

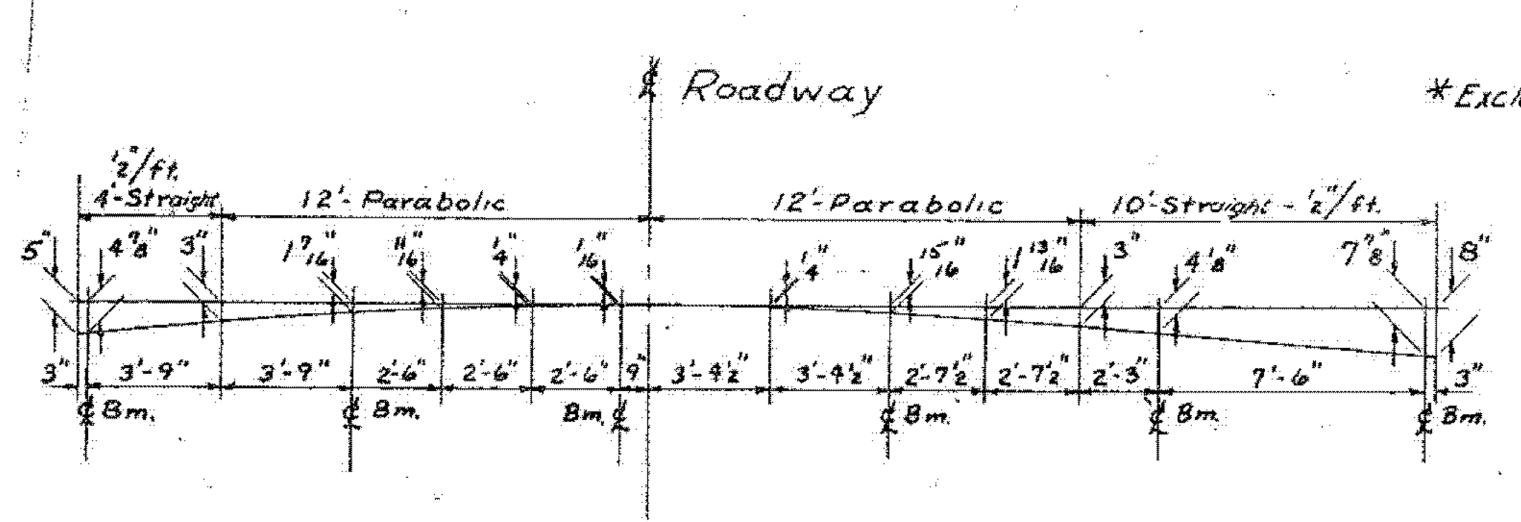
- DIRECTION OF TRAFFIC FLOW
- MILLED RUMBLE STRIPS
- EDGE OF PAVEMENT

COMPOSITE MILLED RUMBLE STRIP DETAILS

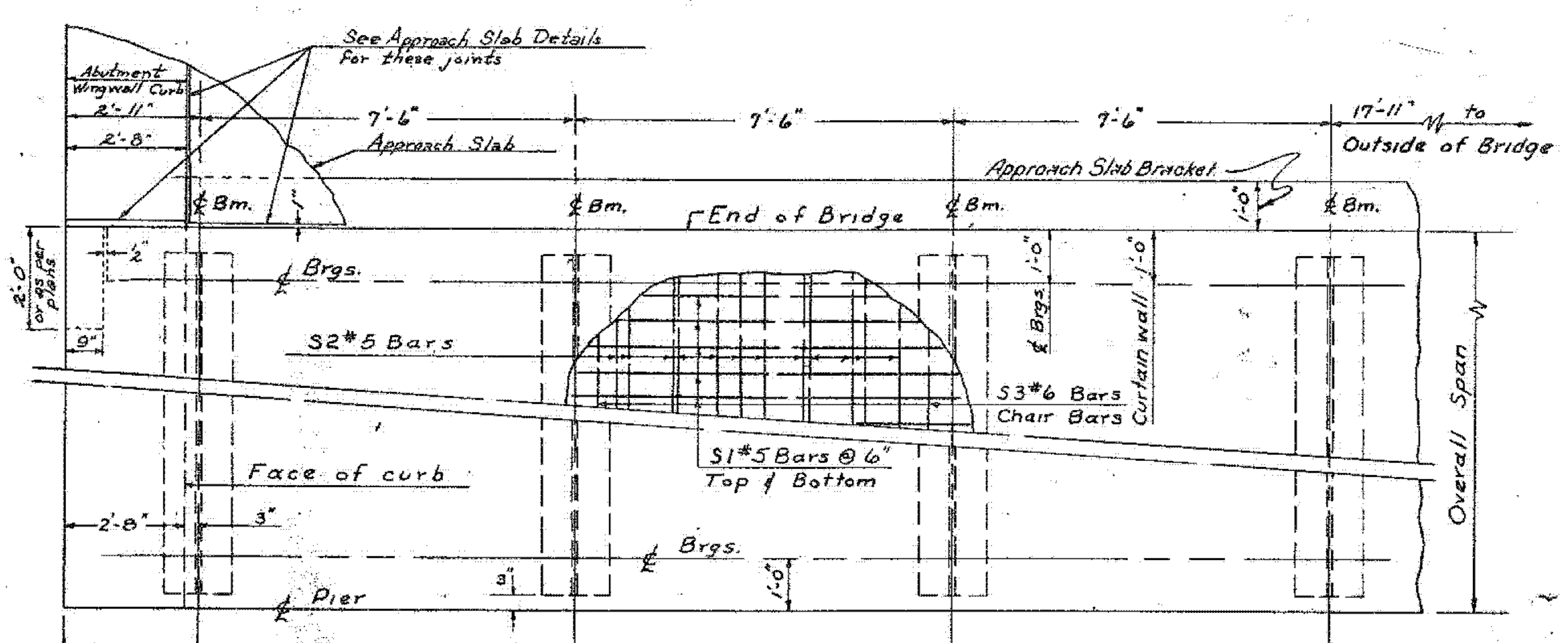
PROJECT NAME: BROOKFIELD
PROJECT NUMBER: IM 089-1(59)

FILE NAME: s10a074rumble strip.dgn
PROJECT LEADER: CPW
DESIGNED BY: JDM
RUMBLE STRIP DETAILS

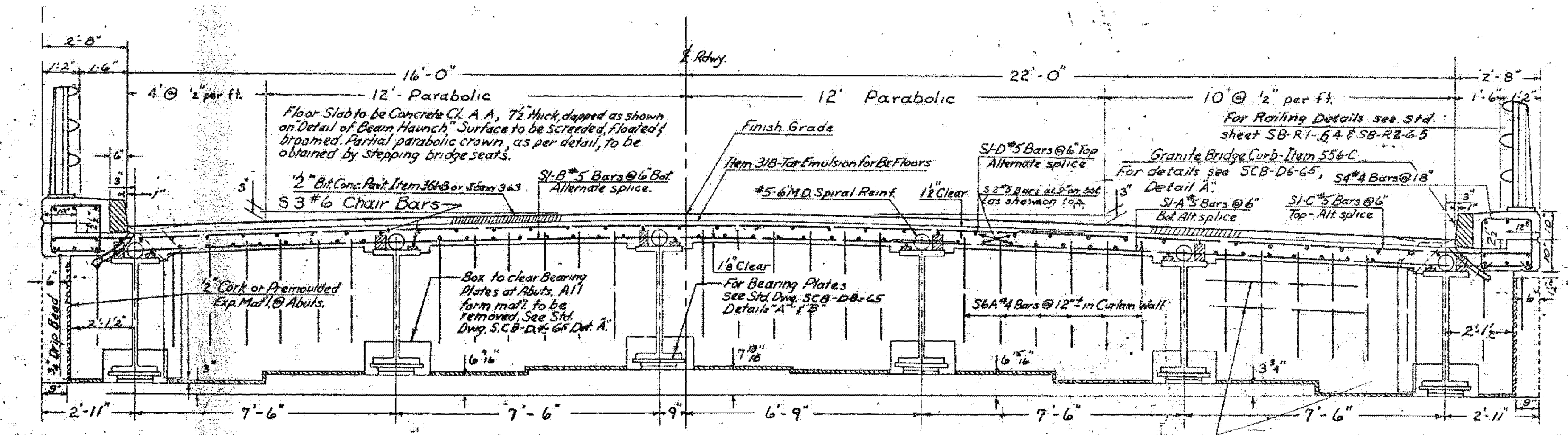
PLOT DATE: 25-OCT-2011
DRAWN BY: JDM
CHECKED BY: EPD
SHEET 14 OF 24



DETAIL OF PARTIAL PARABOLIC CROWN OF SLAB



PARTIAL PLAN



TYPICAL SECTION

TABLE OF QUANTITIES FOR SINGLE (SQUARE) SPAN (INCLUDES TWO CURTAIN WALLS)

Span- Out to Out	99'-0"	94'-0"	89'-0"	84'-0"	79'-0"	74'-0"	69'-0"	64'-0"	59'-0"	54'-0"	49'-0"	44'-0"	39'-0"	34'-0"
Span - ℄ to ℄ Bearings	97'-0"	92'-0"	87'-0"	82'-0"	77'-0"	72'-0"	67'-0"	62'-0"	57'-0"	52'-0"	47'-0"	42'-0"	37'-0"	32'-0"
Length of Beams	98'-0"	93'-0"	88'-0"	83'-0"	78'-0"	73'-0"	68'-0	63'-0"	58'-0"	53'-0"	48'-0"	43'-0"	38'-0"	33'-0"
Size WF Beams	36WF280	36WF245	36WF230	36WF230	36WF194	36WF170	36WF150	36WF135	36WF135	36WF135	36WF135	36WF135	33WF118	30WF108
Lgth. & Size - Cover PL (Bott. only)	66'-1" lg. 14"x1½"	65'-7" lg. 14"x1½"	59'-5" lg. 14"x1¼"	49'-5" lg. 14"x⅞"	49'-10" lg. 10"x1¼"	47'-1" lg. 10"x1⅛"	45'-9" lg. 10"x1"	42'-3" lg. 10"x⅞"	31'-11" lg. 10"x⅝"	27'-1" lg. [illegible]	—	—	—	—
Camber	4⅝"	4¼"	3⅞"	3½"	3⅛"	2¾"	2⅜"	2"	1⅝"	1⅜"	1⅛"	1"	1"	¾"
Dead Load Deflection	3½"	3⅛"	2⅝"	2¼"	1⅞"	1⅝"	1⅜"	1⅛"	⅞"	⅝"	½"	⅜"	¼"	¼"
Diameter of Spiral Bars	←						⅝"				→	Non	Composite	
Mean Diameter of Spiral	←						6"					"	"	"
Spiral Pitch 0'-10' From Brng.	Double @ 5½"	Double @ 5½"	Double @ 5½"	Double @ 5½"	Double @ 5"	Double @ 5"	Double @ 5"	Double @ 5"	Double @ 5"	Double @ 5½"	Double @ 5½"	Non	Composite	
" " 10'-20' or ℄ Span	Double @ 6½"	Double @ 6"	Double @ 6½"	Double @ 7"	Double @ 7"	Double @ 7½"	Double @ 7"	Double @ 7"	Double @ 7"	Double @ 7"	Double @ 7½"	"	"	"
" " 20'-30' " " "	4"	4"	4½"	4½"	4½"	4½"	4½"	5"	5½"	6"	6"	"	"	"
" " 30'-40' " " "	5"	5"	5½"	6"	6"	6"	6"	6½"	—	—	—	"	"	"
" " 40'-℄ Span	6½"	6½"	6"	6"	—	—	—	—	—	—	—	"	"	"
*Total Struct. Steel (1 Span) (lbs.)	203790	175,080	152,480	134,670	110,790	92,210	75,430	63,270	54,330	49,520	43,140	38,010	29,160	23,200
Reinforcing Bars - S1-A	198	188	178	168	158	148	138	128	118	108	98	88	78	68
" " S1-B	198	188	178	168	158	148	138	128	118	108	98	88	78	68
" " S1-C	198	188	178	168	158	148	138	128	118	108	98	88	78	68
" " S1-D	198	188	178	168	158	148	138	128	118	108	98	88	78	68
" " S2	267	267	267	267	267	267	267	178	178	178	178	178	178	89
" " S3	36	36	36	36	36	36	36	24	24	24	24	24	24	12
" " S4	134	128	120	114	108	100	94	88	80	74	68	60	54	48
" " S5	32	32	32	32	32	32	32	32	32	32	32	32	32	32
" " S6A	64	64	64	64	64	64	64	64	64	64	64	64	64	64
" " S7	54	54	54	54	54	54	54	54	54	54	54	54	54	54
Total Weight Reinf. Bars (lbs.)	31,780	30,250	28,770	27,230	25,700	24,210	22,670	20,890	19,370	17850	16,340	14,820	13,280	11,520
Approx. Weight Spiral Reinf. (lbs.)	3,150	3,050	2,850	2,620	2,590	2,450	2,390	2,230	2,040	1,860	1,730	Non	Composite	
Total Concrete Class "AA" (Cu. yds)	137	130	124	118	111	105	98	92	86	80	74	67	61	54
Total Weight Bit. Conc. Pav't (Mod) (Tons)	52	49	47	44	41	39	36	33	31	28	25	23	20	17
Tar Emulsion for Bridge Floors (Gals.)	167	159	150	142	133	125	117	108	100	91	83	74	66	57
Approx. Quantity ¾" x 7" Studs	3820	3,740	3,530	3,220	3,170	3,000	2,930	2,740	2,540	2,280	2,110	Non	Composite	
Approx. Quantity ⅞" x 7" Studs	2,540	2,500	2,350	2,140	2,110	2,000	1,950	1,820	1,700	1,520	1,410	Non	Composite	
Item 440 - Water Repellent (Gals.)	11½	10¾	10¼	9¾	9	8½	8	7¼	6¾	6¼	5¾	5	4½	4

REINFORCING STEEL SCHEDULE

S1-A #5 18'-9" Straight				S1-B #5 26'-3" Straight		
S1-C #5 15'-0" Straight				S1-D #5 30'-0" Straight		
S5 #5 21'-9" Straight						
Span	S2-#5 Str. Length	S3-#6 Str. Length	S6A-#4 B & D	S6A-#4 Total Length	S4-#4	S6A #4
34	33'-6"	33'-6"	2'-6"	6'-6"	T.L. = 5'-4" B = 1'-5 D = 1'-5 C = 1'-8" H = 3" A = 5" G = 5"	T.L. Varies A = 5" G = 5" C = 8"
39	20'-3"	20'-6"	2'-9"	7'-0"		
44	22'-9"	23'-0"	3'-0"	7'-6		
49	25'-3"	25'-6"	3'-0"	7'-6"		
54	27'-9"	28'-0"	3'-0"	7'-6"		
59	30'-3"	30'-6"	3'-0"	7'-6"		
64	32'-9"	33'-0"	3'-0"	7'-6"		
69	24'-3"	24'-6"	3'-2"	7'-10"		
74	26'-0"	26'-3	3'-2"	7'-10"	S7-#6	S6P-#5
79	27'-6"	28'-0"	3'-3"	8'-0"	T.L. = 3'-0" B = 1'-8" J = 6" A = 8" G = 8"	T.L. = 4'-2" B = 2'-6" C = 8" D = 1'-0"
84	29'-3"	29'-6"	3'-3"	8'-0"		
89	31'-0"	31'-3"	3'-3"	8'-0"		
94	32'-6"	33'-0"	3'-4"	8'-2"		
99	34'-3"	34'-6"	3'-4"	8'-2"		

Revisions & Corrections
Changed Bit. Conc. thickness from 1½" to 2" & revised wt. of Bit. Conc. Par't. W 1-21-66.
Changed SB-R3-64 to SB-R2-65. W 1-21-66

Drawn By: R.S.H. June 1960, Rev. WBT, Jan., 1965
Traced By: R.S.H. & A.B.M. June 1960, Rev., 1965
Checked By: R.T.B. & R.S.H. July 1960 Rev. Jan. '65 WHS
Recommended For Approval: [signature] Bridge Engineer 2/4/65 Date
Recommended For Approval: [signature] Asst. Chief Engineer 2/4/65 Date
Approved By: [signature] Chief Engineer Date

TYPICAL SECTION, PLAN VIEW, & QUANTITIES
38 FOOT ROADWAY WF BEAM BRIDGES
DESIGN LOADING - HS20-44 (A.S.T.M.-A36-62T STEEL)

34-44 NON COMPOSITE, 49-99 COMPOSITE

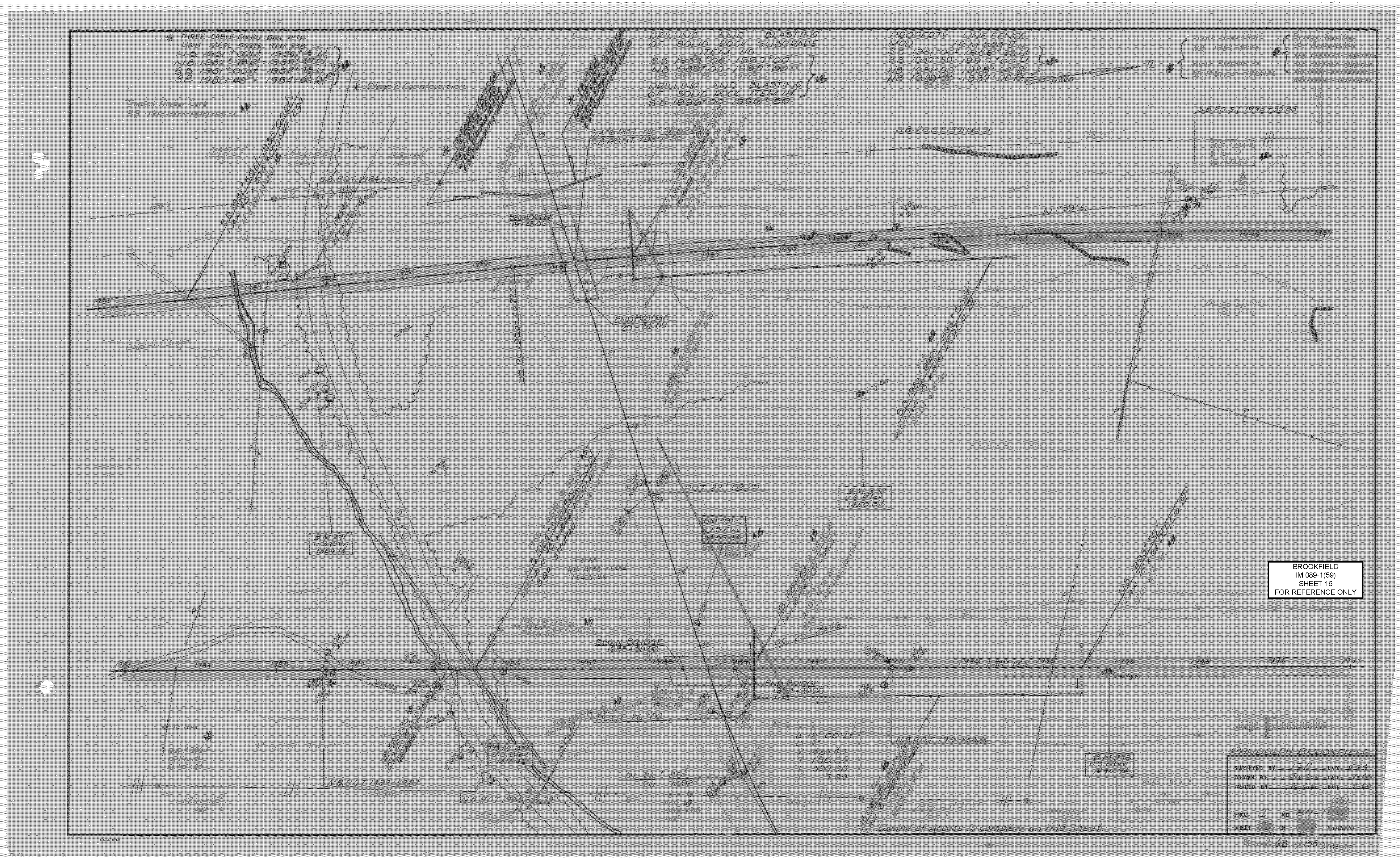
FOR ADDITIONAL DETAILS SEE STANDARDS SCB-D1 THRU D9-65

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
STANDARD STRUCTURES

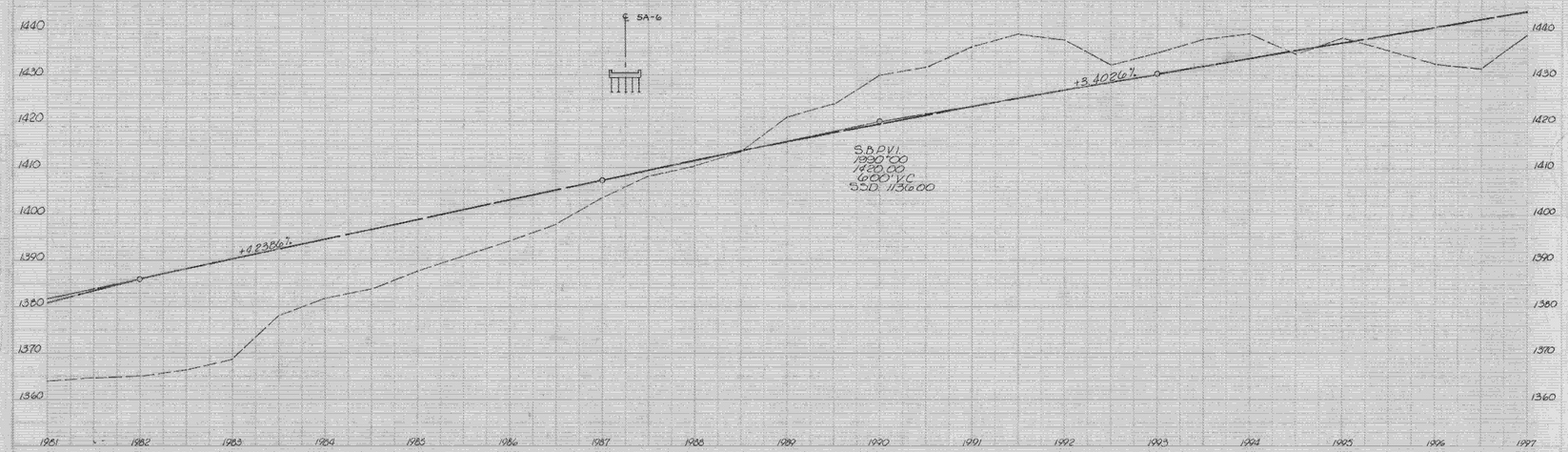
Rev. 2-21-66

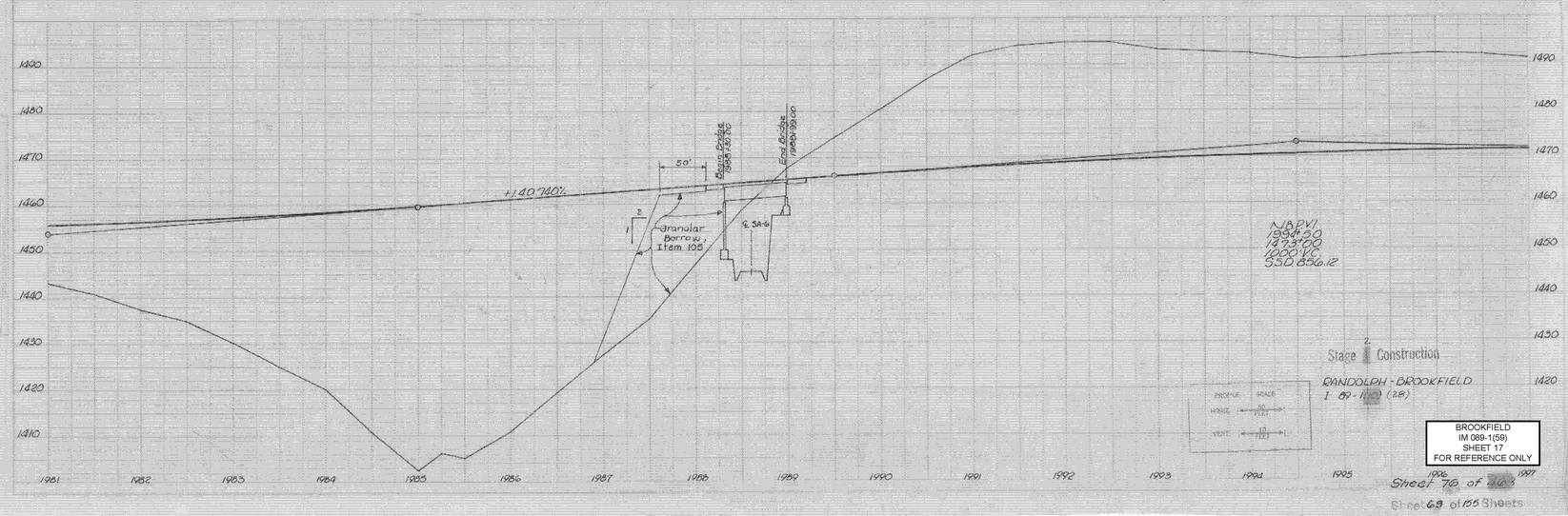
SCB-38-6

BROOKFIELD
IM 089-1(59)
SHEET 15
FOR REFERENCE ONLY



* THREE CABLE GUARD RAIL WITH
LIGHT STEEL POSTS, ITEM 538
N.B. 1981+00 Lt - 1986+16 Lt
N.B. 1982+78 Rt - 1986+30 Rt
S.B. 1981+00 Lt - 1982+78 Lt
SB 1982+40 - 1984+00 Rt
* = Stage 2 Construction.
Treated Timber Curb
S.B. 1981+00 - 1982+05 Lt.
DRILLING AND BLASTING
OF SOLID ROCK SUBGRADE
ITEM 115
S.B. 1989+00 - 1997+00
N.B. 1989+00 - 1997+00
DRILLING AND BLASTING
OF SOLID ROCK, ITEM 114
S.B. 1996+00 - 1996+50
PROPERTY LINE FENCE
MOD ITEM 583-II
S.B. 1981+00 - 1986+25 Lt
S.B. 1987+50 - 1997+00 Lt
N.B. 1981+00 - 1988+60 Rt
N.B. 1989+50 - 1997+00 Rt
Plank Guard Rail
Muck Excavation
Bridge Railing
S.B. P.O.T. 1984+00.0
S.B. P.O.S.T. 1991+43.91
S.B. P.O.S.T. 1995+35.85
SA P.O.T. 19+72.62
S.B. P.O.S.T. 1987+25
BEGIN BRIDGE 19+25.00
END BRIDGE 20+24.00
N 1°39' E
Kenneth Taber
Dense Spruce Growth
B.M. 392 U.S. Elev 1450.34
B.M. 391-C U.S. Elev
B.M. 391 U.S. Elev
P.O.T. 32+09.25
T.B.M.
BEGIN BRIDGE 1988+30.00
END BRIDGE 1988+99.00
POST 26+00
PC 23+29.46
N.B. P.O.T. 1991+03.96
N.B. P.O.T. 1989+19.82
N.B. P.O.T.
Andrew LaRocque
B.M. 393 U.S. Elev 1490.74
Stage 2 Construction
Control of Access is complete on this Sheet.
PLAN SCALE
RANDOLPH-BROOKFIELD
SURVEYED BY Fall DATE 5-64
DRAWN BY Buxton DATE 7-64
TRACED BY R.L.C. DATE 7-64
PROJ. I NO. 89-1 (28)
SHEET 75 OF SHEETS
Sheet 68 of 155 Sheets
BROOKFIELD
IM 089-1(59)
SHEET 16
FOR REFERENCE ONLY





Stage 2 Construction

RANDOLPH - BROOKFIELD
I 89-1(50) (28)

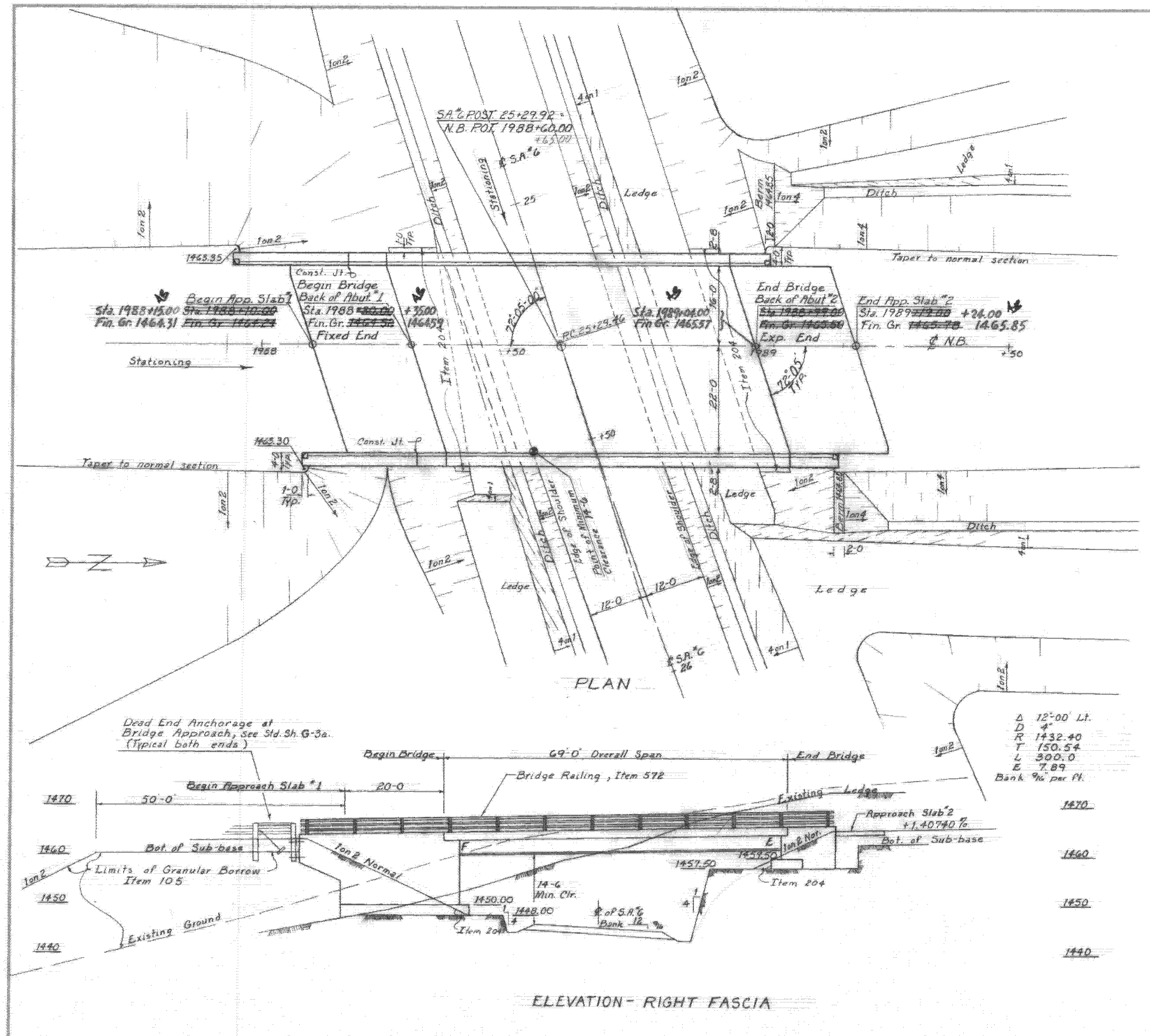
PROFILE SCALE
HORIZ. 50 FEET
VERT. 10 FEET

BROOKFIELD
IM 089-1(59)
SHEET 17
FOR REFERENCE ONLY

Sheet 76 of 240 Sheets

Sheet 69 of 155 Sheets

Sheridan 8.64



NOTES - NORTHBOUND

1. For General Notes see SCB-D1-65.
2. For Superstructure Details see SCB-38-65.
3. Item 440, Water Repellent shall consist of furnishing and applying water repellent on exterior concrete surfaces on top of the safety walks, on the fascias and back to the drip bead under the slab, and on the exposed areas of Abutments not otherwise treated.
4. Welding shall conform to Specifications for Welded Highway and Railway Bridges, of the American Welding Society, AWS. D2.0-66.
5. For details of Dead End Anchorage see Std. Sh. G-3a.
6. For location of Bench Mark and Bridge Marker see SCB-D1-65.
7. List of Bridge Sheets, Standards, and Reference Sheets are shown on Sheet BR-200.
8. For quantities of the Northbound Bridge see Sheet BR-201.
9. Boring Logs for the Northbound Bridge are plotted on Sheet BR-203.
10. Abutment footings are designed for a maximum bearing pressure of five (5) tons per square foot.
11. The 1" diameter plastic pipe drains at the curb shall be placed to drain inside of the fascia beams rather than outside.
12. Details of Granite Bridge Curb shall be submitted to the Bridge Division for approval.

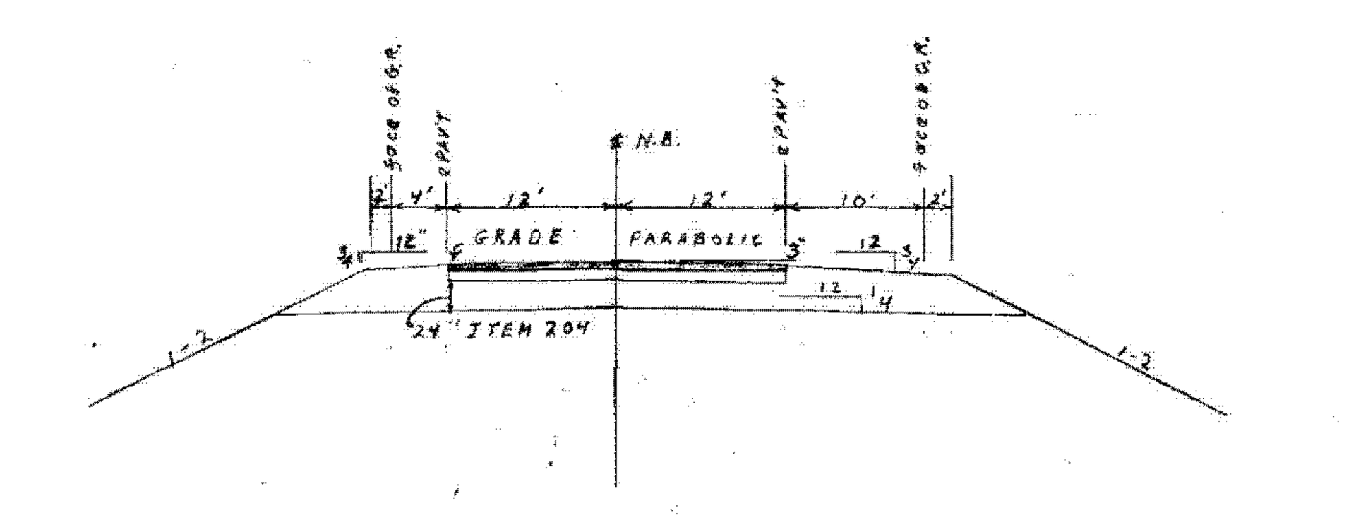
BROOKFIELD
IM 089-1(59)
SHEET 18
FOR REFERENCE ONLY

Stage 2 Construction.

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

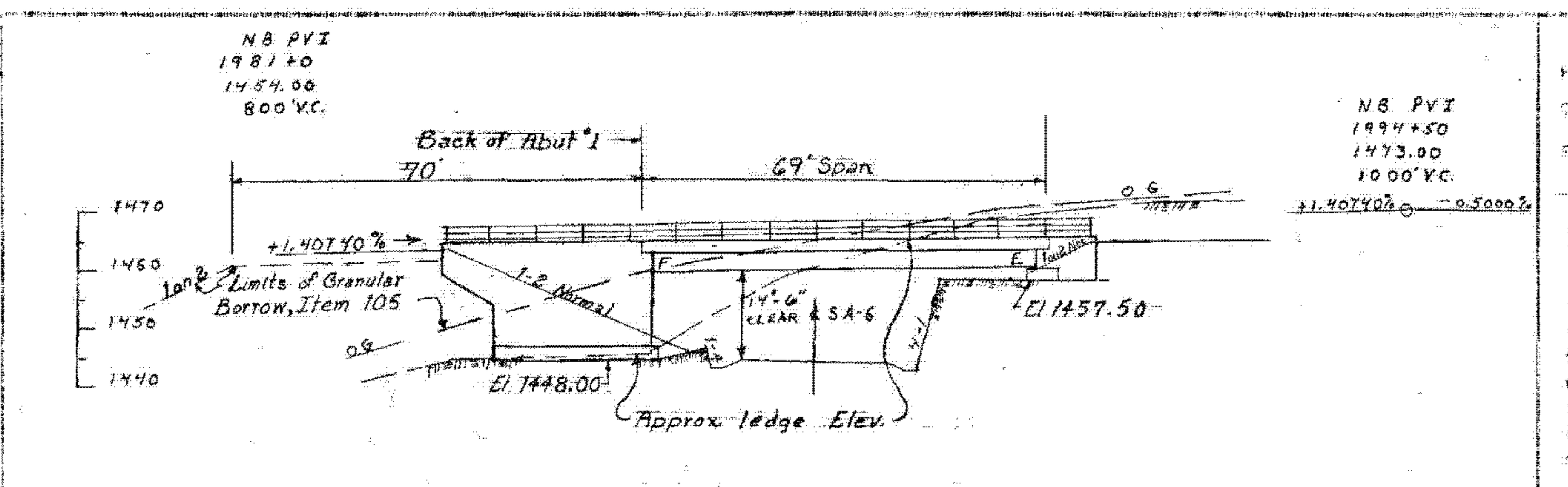
PROJECT: RANDOLPH-BROOKFIELD
TOWN OF BROOKFIELD
ROUTE No I89 STA. 1988+60 NB
I89 NB over S.A. 6
PLAN and ELEVATION
SCALE 1"=10'
IN CHARGE F.W. Bolkum
DRAWN BY R. Gendron 28 Jan 66 CHECKED BY Cunningham
PROJECT No I89-1(10)
SHEET 112 of 153 BR-206

Sheet 87 of 155 Sheets



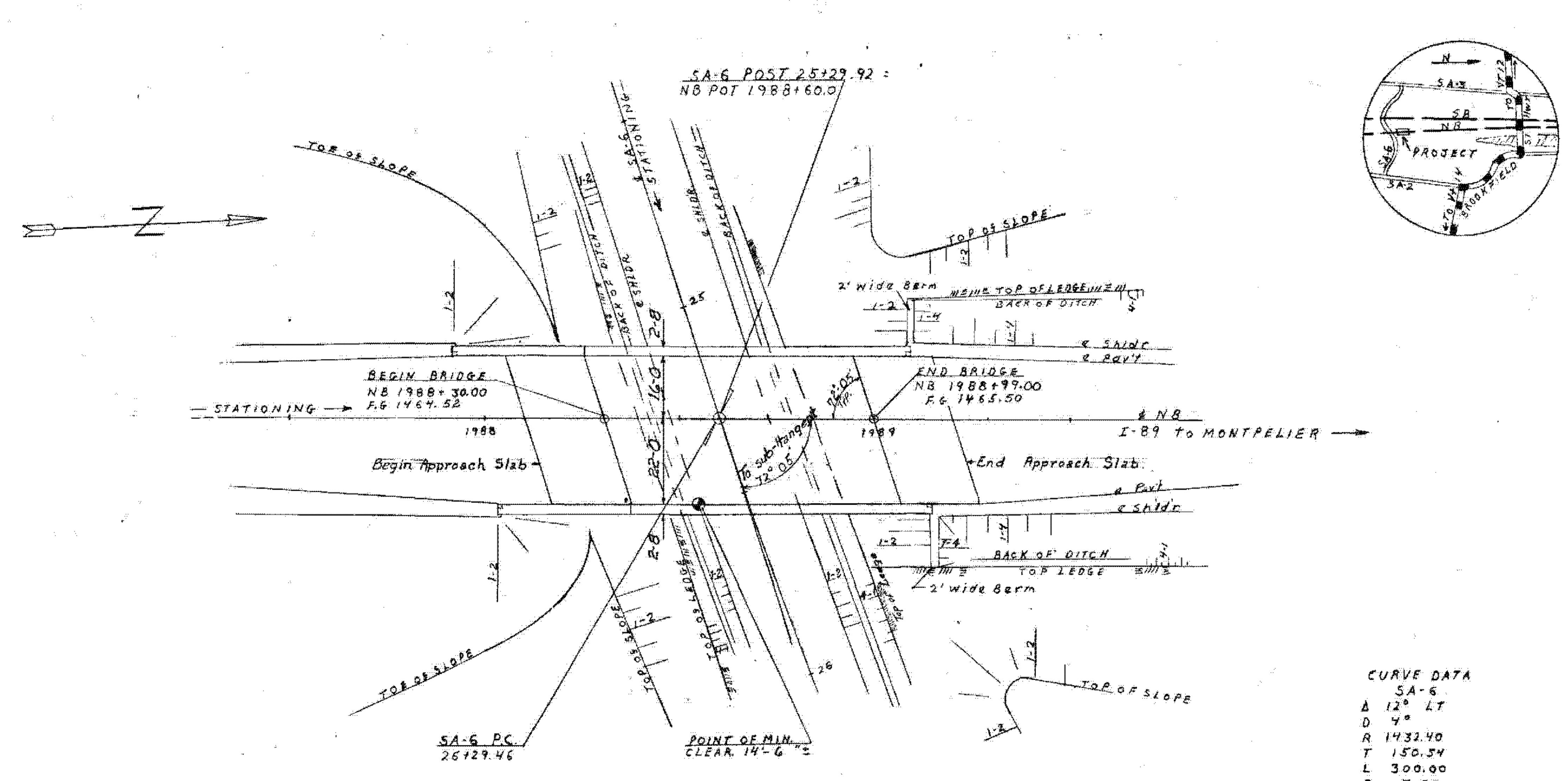
NEW HIGHWAY SECT. STA. 1988+0 NB

SCALE 1"=10'



NEW HIGHWAY PROFILE ALONG RT. FASCIA NB

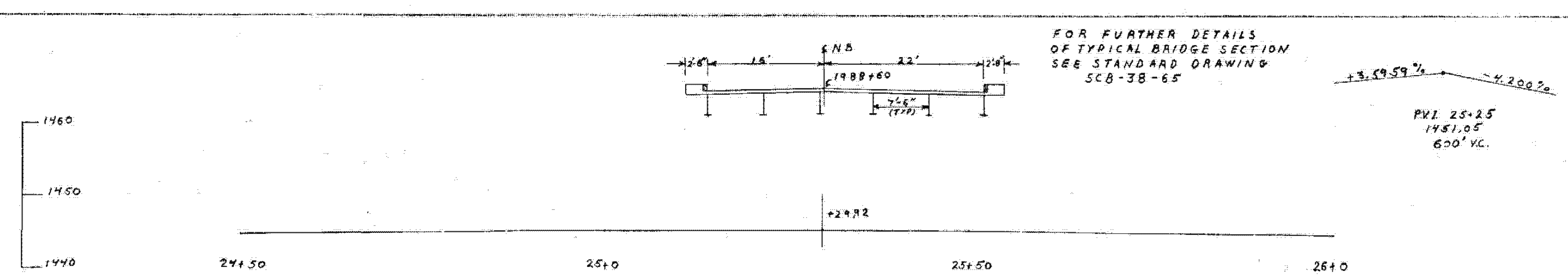
SCALE 1"=20'



PLAN

SCALE 1"=20'

FOR FURTHER DETAILS OF TYPICAL BRIDGE SECTION SEE STANDARD DRAWING SCB-38-65



PROFILE OF PROPOSED SA-6

SCALE 1"=10'

HIGHWAY NO. I-89 NAME OF HIGHWAY INTERSTATE

STRUCTURE NO. ~~SE-B4~~ COUNTY ORANGE TOWN BROOKFIELD

PROJECT NO. I-89-1(10) LOCATION I-89 NORTHBOUND OVER SA-6

EXISTING STRUCTURE

1. RATED LOADING OF EXISTING STRUCTURE
2. TYPE OF EXISTING STRUCTURE
3. UNDERCLEARANCE ELEVATION OF EXISTING STRUCTURE
4. WHAT DISPOSITION SHOULD BE MADE OF EXISTING STRUCTURE? COST OF REMOVAL
5. SHOULD EXISTING STRUCTURE BE USED TO MAINTAIN TRAFFIC DURING CONSTRUCTION OF NEW STRUCTURE?
6. SHOULD NEW TEMPORARY STRUCTURE BE BUILT?
7. ORDINARY HIGH WATER SURFACE ELEV AT EXISTING STRUCTURE WATERWAY TO ORDINARY H.W.
8. EXTREME HIGH WATER AT EXISTING STRUCTURE
9. SPAN OF EXISTING BRIDGE UPSTREAM WATERWAY TO EXTREME H.W.
   SPAN OF EXISTING BRIDGE DOWNSTREAM WATERWAY TO EXTREME H.W.
10. TYPE OF FOUNDATION UNDER EXISTING ABUTMENTS
11. DOES ALL WATER AT FLOOD ELEVATION PASS THROUGH EXISTING STRUCTURE?
12. IF NOT AT WHAT ELEVATION IS RELIEF AFFORDED?
13. ADDITIONAL WATERWAY AREA PROVIDED

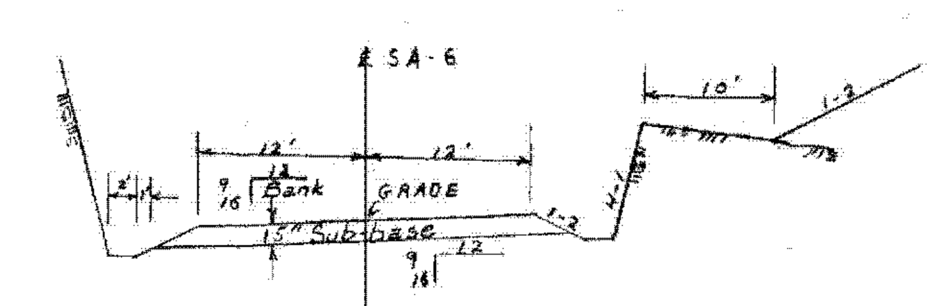
NEW STRUCTURE

1. RECOMMENDED TYPE OF STRUCTURE SIMPLE SPAN - COMPOSITE - WF BEAM
2. RECOMMENDED SPAN OR SPANS 69' Overall
   MEASURED PARALLEL TO ℄ NEW HIGHWAY 64.80 Clear
   MEASURED AT RIGHT ANGLES TO ℄ SA-6 61.66 Clear
3. ARE THERE OBJECTIONS TO A PIER IN THE STREAM? ANSWER YES OR NO
4. ORDINARY HIGH WATER ELEVATION AT NEW STRUCTURE
5. EXTREME HIGH WATER ELEVATION AT NEW STRUCTURE SOURCE OF INFORMATION
6. IS ALL WATER INTENDED TO PASS THROUGH NEW STRUCTURE?
7. DOES STREAM REACH ITS MAXIMUM HIGH WATER ELEVATION RAPIDLY? IS ORDINARY RISE RAPID?
8. LOW WATER ELEVATION AT NEW STRUCTURE
9. DRAINAGE AREA IN ACRES ABOVE STRUCTURE CHARACTER OF TERRAIN
10. IS STREAM EVER DRY
11. VELOCITY OF STREAM AT HIGH WATER STAGE ESTIMATED DISCHARGE
12. AREA FULL OPENING AREA BELOW ORDINARY H.W.
13. CHARACTER OF SCOUR DRIFT ICE
14. ESTIMATED DRAINAGE AREA ABOVE NATURAL OR ARTIFICIAL STORAGE
15. VERTICAL CLEARANCE ABOVE FLOOD ELEVATION
16. ARE SIDEWALKS REQUIRED? IF SO ON WHAT SIDE? NO BOTH SIDES
17. RECOMMENDED TYPE OF PAVEMENT 2" BITUMINOUS CONCRETE
18. TRAFFIC TO BE MAINTAINED UNDER ITEM NO. NA ONE OR TWO WAYS PROBABLE COST
19. PROBABLE COST OF CLEARING AND GRUBBING STREAM CHANNEL AT STRUCTURE SITE NA
20. SHOULD PROVISIONS BE MADE FOR PUBLIC UTILITIES? NO
21. ESTIMATED ALLOWABLE LOAD ON FOUNDATIONS 10K/SF SHOULD PILES BE USED? NO EST. LGTH.

FOUNDATION INFORMATION

OBTAINED FOR DESIGN PURPOSES ONLY, AND THE STATE ASSUMES NO RESPONSIBILITY WHATSOEVER FOR THE SUFFICIENCY OR ACCURACY OF THE INFORMATION SHOWN. BOULDERS MAY BE ENCOUNTERED AT ANY PIER OR ABUTMENT LOCATION. SEE BORING LOGS SHEET BR-203

ALLOWABLE DESIGN STRESSES
CONCRETE f'c 3000 PSI fc 1200 PSI
STRUCTURAL STEEL fs 20,000 PSI (A36) OTHER STEEL AS PER AASHO SPECS.
REINFORCING STEEL fs 20,000 PSI (Tension) fs 16,000 PSI (Comp)
DESIGN LOADING HS20-44



SA-6 TYPICAL SECTION
STA 24+50 - STA 26+0

SCALE 1"=10'

BROOKFIELD
IM 089-1(59)
SHEET 19
FOR REFERENCE ONLY

RECOMMENDED FOR APPROVAL	E. H. Stickney, CONST. ENGINEER	12/22/65 DATE
RECOMMENDED FOR APPROVAL	[signature]	12/23/65
RECOMMENDED FOR APPROVAL	R. H. Arnold	12/23/65
APPROVED BY	A. D. Bishop	12/23/65

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

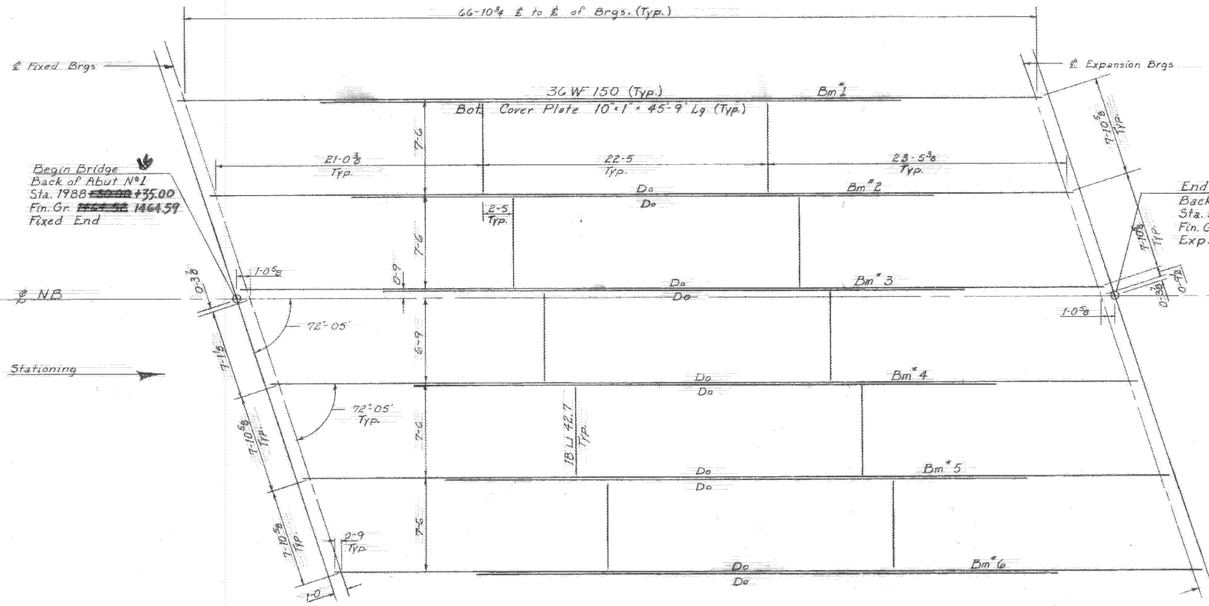
I-89 IN THE TOWNS OF RANDOLPH - BROOKFIELD
ROUTE NO. I-89 STA 1988+60 NB
I-89 NB OVER SA-6

PRELIMINARY INFORMATION

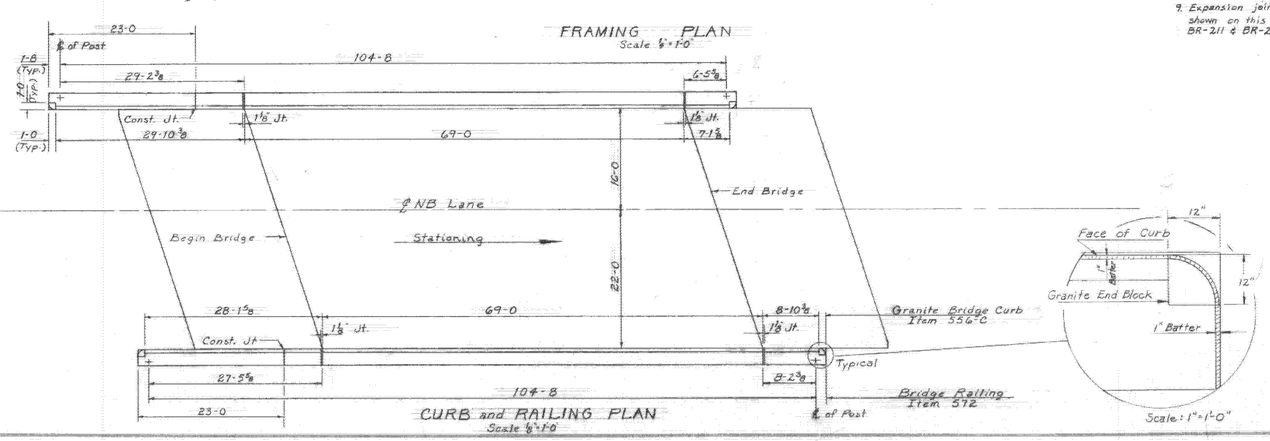
DRAWN BY FALL CHECKED BY CRO SCALE AS NOTED
DESIGNED BY DFM IN CHARGE RLM DATE 2 DEC. 1965
PROJECT NO. I-89-1(10) SHEET 1__ OF 163

I-89-1(28) Sheet 88 of 155 sheets

Stage 2 Construction BR-209



FRAMING PLAN
Scale ⅛"=1'-0"



CURB and RAILING PLAN
Scale ⅛"=1'-0"

Scale: 1"=1'-0"

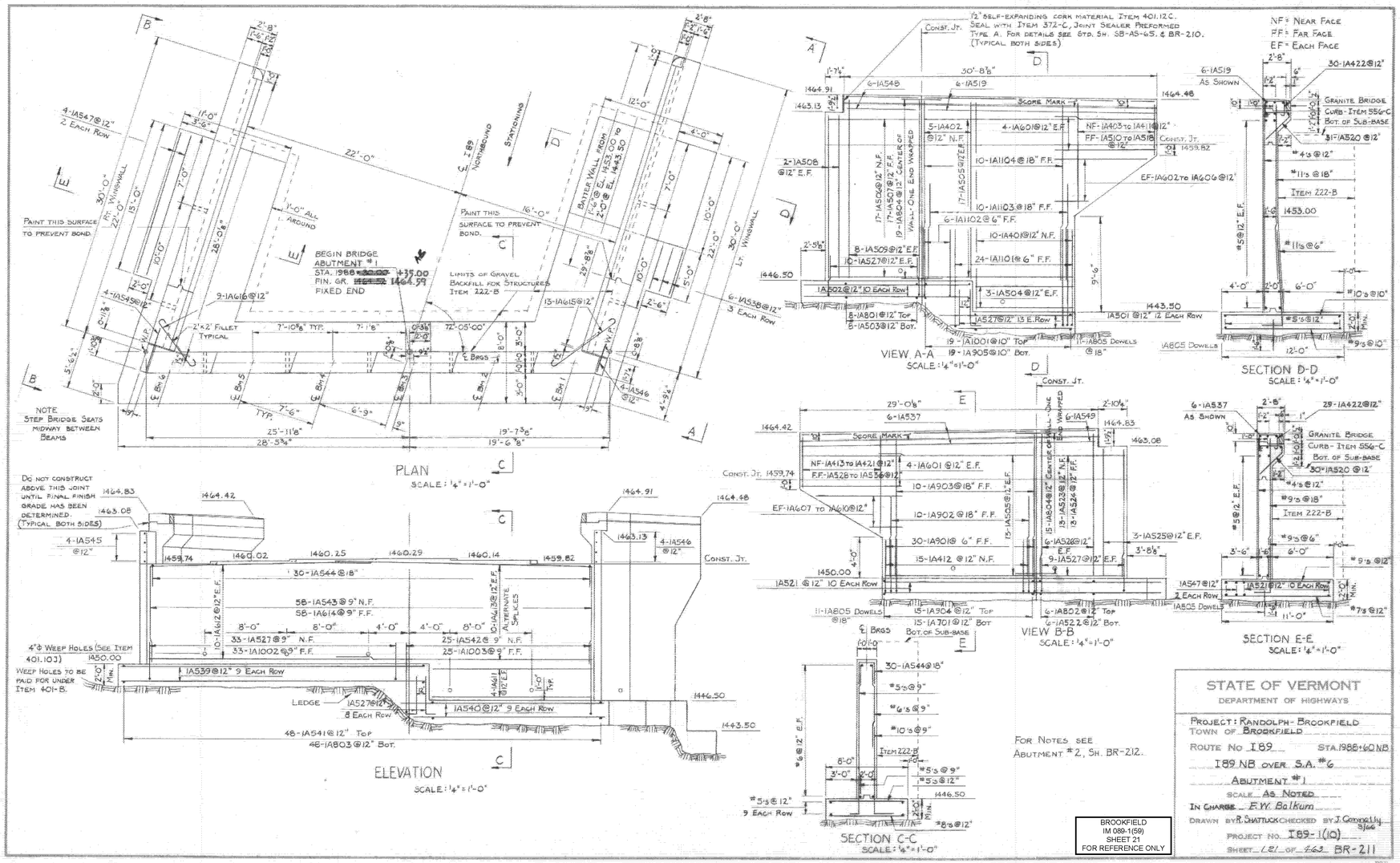
NOTES

1. For General Notes see Std Sh. SCB-D1-65.
2. For a Typical Bridge Section see Std. Sh. SCB-38-65.
3. For details of curtain wall, approach slab bracket, shear connectors and beam haunch see Std. Sh. SCB-D2-65 Det. A, B, & C. & SCB-38-65.
4. For plan and reinforcement layout at abutment see Std. Sh. SCB-D4-65.
5. For curb details see Std. Sh. SCB-D6-65 Det. A.
6. For diaphragm and cover plate details see Std. Sh. SCB-D7-65 Det. C, D, & E.
7. For bearing device details see Std. Sh. SCB-D8-65 Det. A and Std. Sh. SCB-D9-65 Det. A.
8. For Bridge Railing details see Std. Sh. SB-R1-64 Sheets 1 & 2 and Std. Sh. SB-R2-65.
9. Expansion joint details in the curb sections at the abutments not shown on this sheet are shown on Std. Dwg. SB-A5-65, Sheets BR-211 & BR-212.

BROOKFIELD
IM 089-1(59)
SHEET 20
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

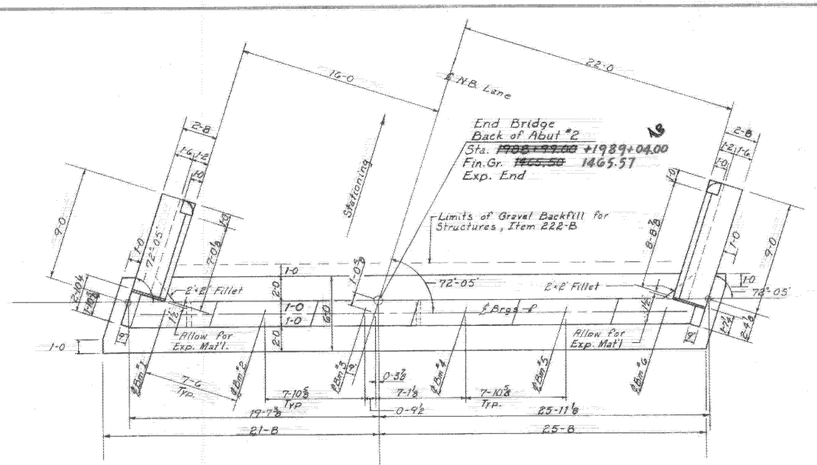
PROJECT: RANDOLPH-BROOKFIELD
TOWN OF BROOKFIELD
ROUTE NO 089 STA. 1988+60 NB
089 NB over S.A. "6
SUPERSTRUCTURE DETAILS
SCALE As shown
IN CHARGE E.W. Balkum
DRAWN BY R. Gendron CHECKED BY Cunningham
PROJECT NO. IM 089-1(59) 3166
SHEET 20 OF 43 BR 210
Stage 2 Construction Sheet 84 of Sheets



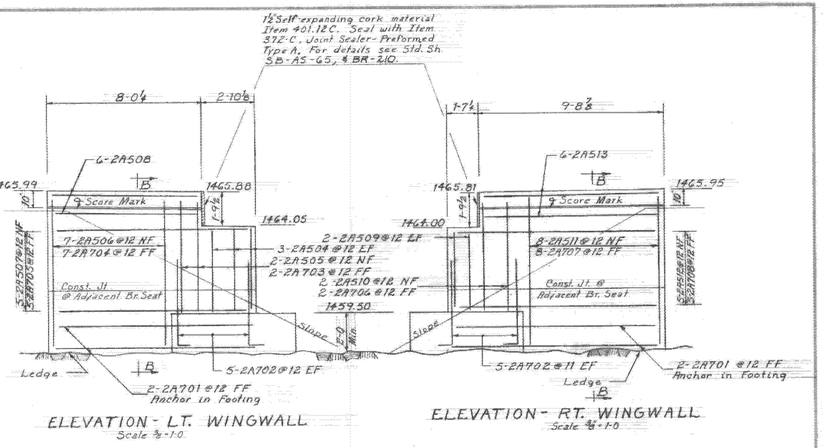
STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

PROJECT: RANDOLPH - BROOKFIELD
TOWN OF BROOKFIELD
ROUTE NO I89 STA. 1988+60 NB
I89 NB OVER S.A. #6
ABUTMENT #1
SCALE AS NOTED
IN CHARGE E.W. Balkum
DRAWN BY R. SMITH CHECKED BY J. Connolly 3/66
PROJECT NO. I89-1(10)
SHEET 121 OF 263 BR-211

BROOKFIELD
IM 089-1(59)
SHEET 21
FOR REFERENCE ONLY

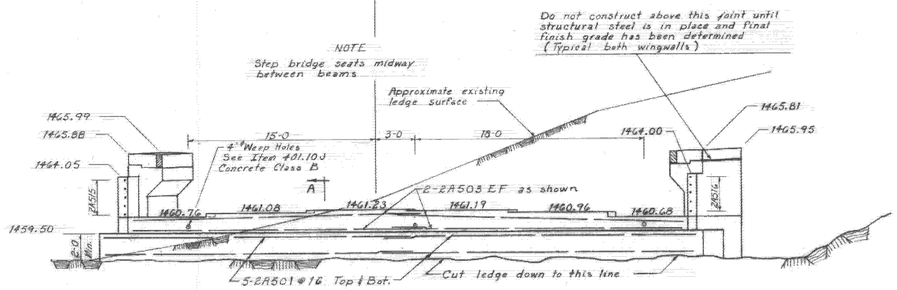


PLAN
Scale ¼"=1'-0

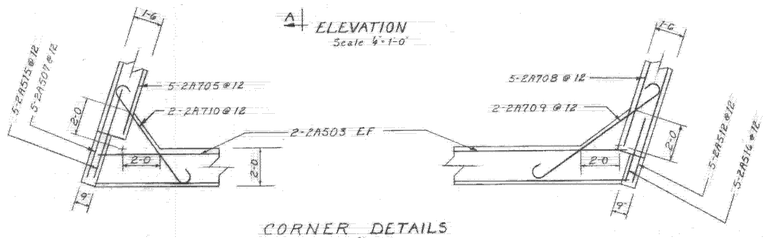


ELEVATION - LT. WINGWALL
Scale ⅜"=1'-0

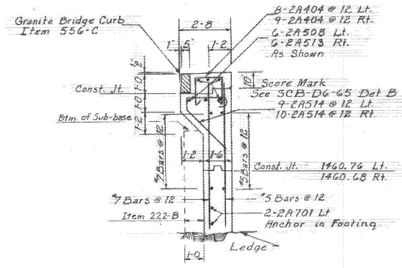
ELEVATION - RT. WINGWALL
Scale ⅜"=1'-0



ELEVATION
Scale ¼"=1'-0



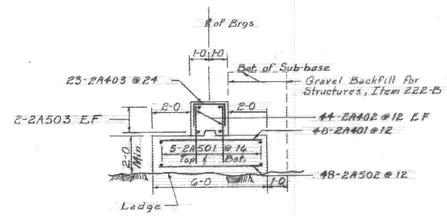
CORNER DETAILS
Scale ⅜"=1'-0



SECTION B-B
Scale ⅜"=1'-0

NOTES

1. Minimum clear distance from reinforcing bars to face of concrete shall be 3" in footings and 2" elsewhere.
2. All footings shall be poured on sound, clean ledge capable of safe bearing pressures of 5 Tons per sq. ft.
3. For details of score marks, construction joints, curb section, see Std. Dwg. SCB-DG-65 Det. A & B.
4. For Curb Joint Details see Std. Dwg. SB-AS-65, & BR-210.
5. For location of bench mark, bridge marker and, fill lines see Std. Dwg. SCB-D1-65.
6. For limits of Solid Rock Excavation, Modified, Item 103-B, at Abutment # 2 end, see S.A. # 6 sections, Sta. 25+50.

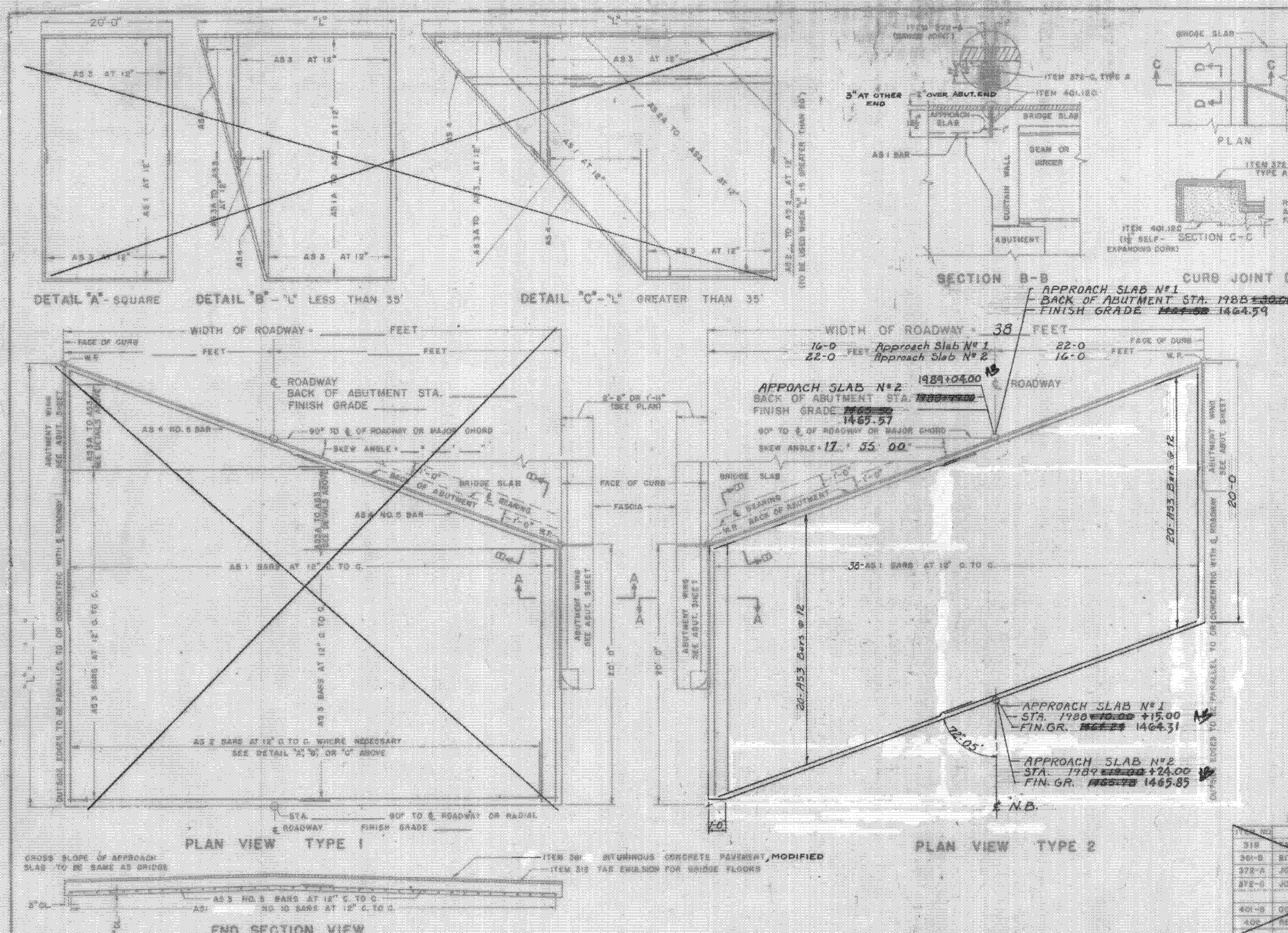


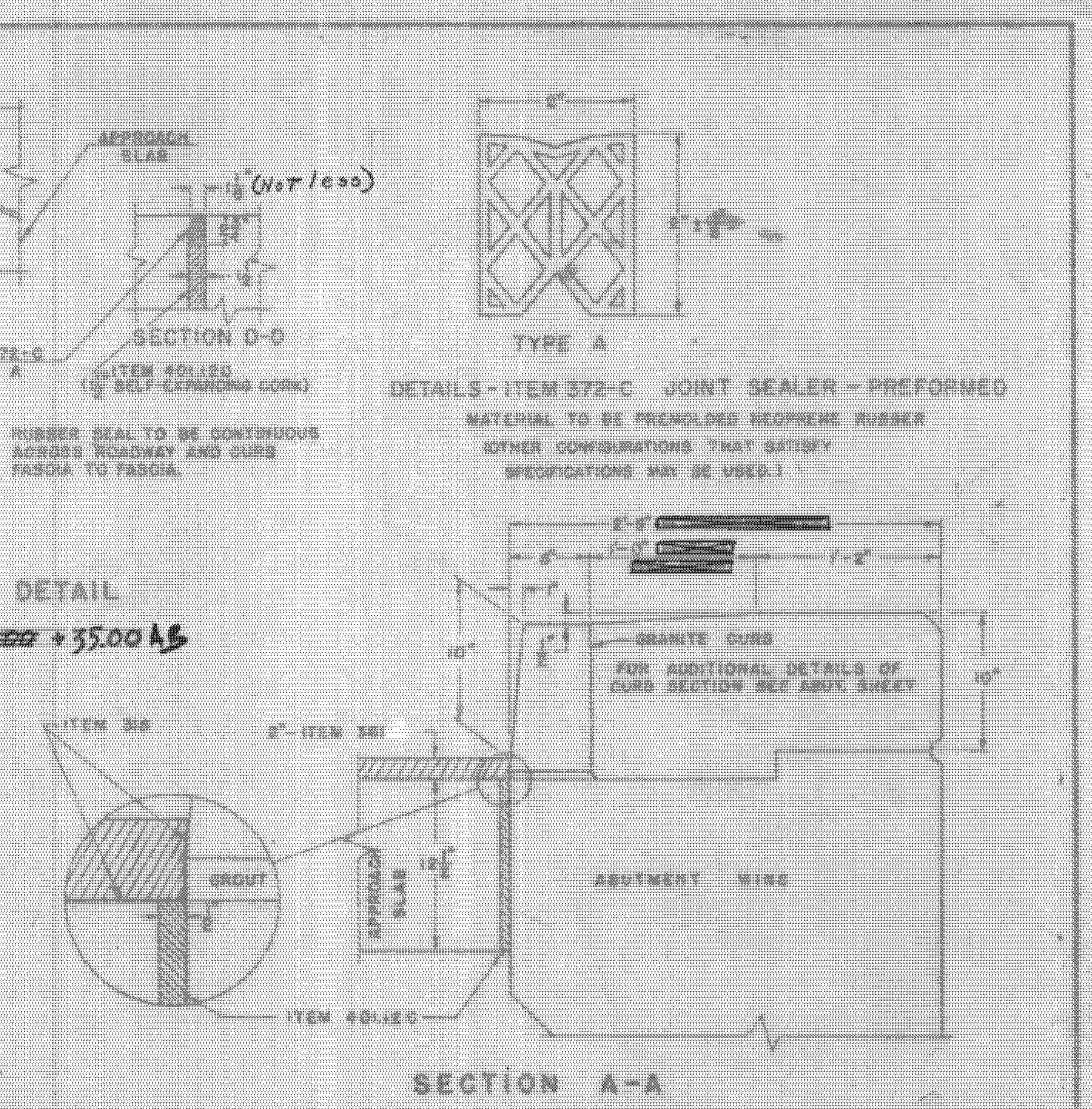
SECTION A-A
Scale ⅜"=1'-0

BROOKFIELD
IM 089-1(59)
SHEET 22
FOR REFERENCE ONLY

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS

PROJECT: RANDOLPH-BROOKFIELD
TOWN OF BROOKFIELD
ROUTE No I89 STA 1988+60 NB
I89 NB over S.A.# 6
ABUTMENT No 2
SCALE As Shown
IN CHARGE F.W. Balkum
DRAWN BY R.Gretton CHECKED BY J.Connelly
PROJECT NO I89-1(10)
SHEET 122 OF 463 BR-212





GENERAL NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE STATE OF VERMONT, DEPARTMENT OF HIGHWAYS, STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION DATED APRIL 1964, AND THE A.A.S.H.O. SPECIFICATIONS DATED 1961. DESIGNED FOR HS20-44 LOADING.
2. ALL REINFORCING STEEL SHALL BE DETAILED ON THE REINFORCING STEEL SCHEDULE. ALL SPLICES SHALL BE A MINIMUM OF 40 BAR DIAMETERS.
3. APPROACH SLABS SHALL HAVE 2" OF BITUMINOUS CONCRETE PAVEMENT AT THE ABUTMENT END OF THE SLAB AND TAPER TO 3" OF BITUMINOUS CONCRETE PAVEMENT AT THE OTHER END.

LIST OF QUANTITIES

ITEM NO.	ITEM	UNIT
318	TAR EMULSION FOR BRIDGE FLOORS	GAL.
361-B	BITUMINOUS CONCRETE PAVEMENT	TONS
372-A	JOINT SEALER - HOT POURED	L.F.
372-C	JOINT SEALER - PREFORMED, TYPE A	L.F.
401-B	CONCRETE CLASS B	CY.
406	REINFORCING STEEL	LB.

BROOKFIELD
IM 089-1(59)
SHEET 23
FOR REFERENCE ONLY

PROJECT: RANDOLPH - BROOKFIELD
TOWN OF BROOKFIELD
ROUTE NO. I89 STA. 1988+60 NB
I89 NB over SA. #6
APPROACH SLABS Nº 1 & 2
NOT TO SCALE
IN CHARGE F. W. Balkum
DESIGNED BY R. Gendron CHECKED BY Cunningham
PROJECT NO. I89-1(
SHEET OF BR-213

REVISIONS AND CORRECTIONS
1. DIMENSIONS OF JOINT FOR SEALER TYPE A REVISED. 4/6/65 W.B.T.
2. DIMENSIONS OF JOINT SEALER TYPE B REVISED 5/25/65 W.B.T.
3. JOINT BETWEEN CURB AND SLAB REVISED, BITUMINOUS CONCRETE REVISED TO 2", QUANTITY TOTALS REMOVED. 12/7/65 W.B.T.

DRAWN BY: W.B.T. Jan 1965
TRACED BY: W.B.T. Jan 1965
CHECKED BY: W.H.S. Feb 1965
RECOMMENDED FOR APPROVAL: [signature] BRIDGE ENGINEER 2/4/65 DATE
RECOMMENDED FOR APPROVAL: R. H. Arnold ASSISTANT CHIEF ENGINEER 2/4/65 DATE
APPROVED BY: [signature] CHIEF ENGINEER 2/4/65 DATE

DETAILS OF APPROACH SLAB FOR 38' (WIDTH) FOOT BRIDGE

TO BE USED FOR BRIDGE AT STATION 1988+60 NB

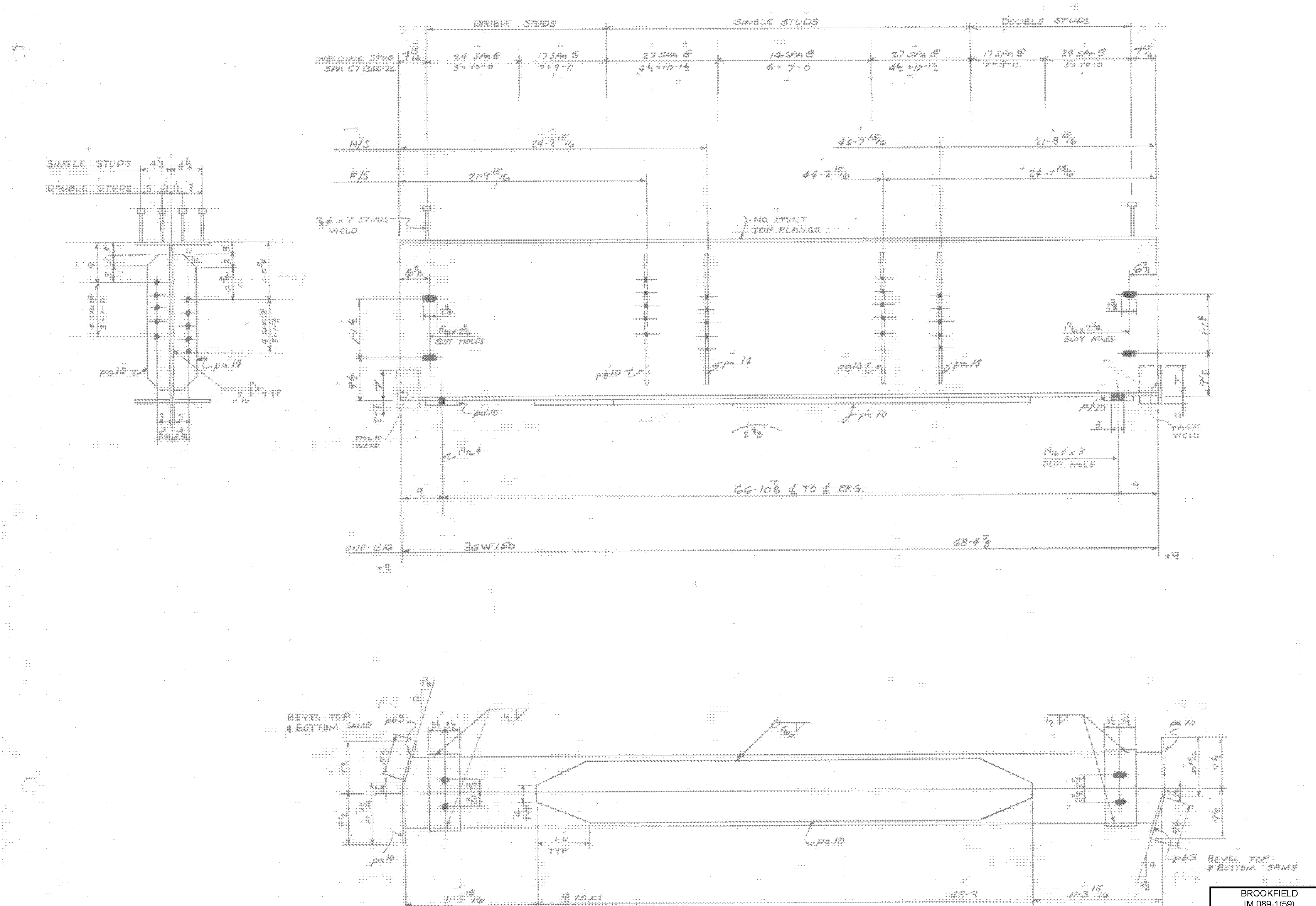
LOCATION I89 NB over S.A. #6

APPROACH SLABS Nº 1 & 2

STATE OF VERMONT
DEPARTMENT OF HIGHWAYS
STANDARD STRUCTURE

SB-AS-65

Stage 2 Construction Sheet 89 of 155 Sheets



BROOKFIELD
IM 089-1(59)
SHEET 24
FOR REFERENCE ONLY

PAINT NOTE
NO PAINT WITHIN 3" OF ALL HOLES

BILL OF MATERIAL

JOB NO. SHEET NO.

ASTM-A36 (17)

BILL OF MATERIAL

NO. PIECES	MARK	DESCRIPTION	LENGTH FT.	LENGTH IN.		WEIGHT	
		~ONE BEAM B16~					
1	B16	36 WF 150	68	4 3/8	P.O.B.# 93688	10,264	
2	pa10	Pℓ 9 x 1/4	0	10 15/16	REQ'D @ 72 x 20-0		
2	pb3	Do	0	8 1/2		25	
1	pc10	Pℓ 10 x 1	45	9	P.O.B.# 93287	1556	
1	pd10	BAR 7 x 1	1	1	REQ'D @ 20-0		
1	pf10	Do	1	1		52	
2	pg10	BAR 5 x 1/2	2	6	REQ'D @ 20-0		
2	pa14	Do	2	6		85	
		5/16 φ WELD	112	3 1/2		28	
		1/2 φ WELD	2	4		1	
							12,008
		WELDING STUDS					
		CONT. 67-1366-26					
470		7/8 φ WELD STUDS	0	7		619	619

VERMONT STRUCTURAL STEEL CORPORATION
BURLINGTON, VT.

REV. PER APP. 1-7-69 L.Z.
PROJ. I 89-1(10)

		DATE
DRAWN BY	Z	12-15-68
CH'K'D BY	(initials)	12-29

PROJECT: RANDOLPH - BROOKFIELD I89 OVER SR. #2 N.B.
LOCATION: BROOKFIELD, VT.
CUSTOMER: W. W. WYMAN CO.
ARCHITECT: VT. STATE HIGHWAY DEPT.
JOB NO. 67-1366 STR. ST. 67-1366-26 WELDING STUDS
SHEET NO. 14

HOLES: 15/16 φ AS NOTED
BOLTS:
PAINT: RL (VT. SPECS)

PRINT RECORD

NO.	FOR	DATE
5	P.I.F.	1-2-69
4	3 W.S. & P.	1-8-69
2	STATE	1-19

VERMONT

State of Vermont *Agency of Transportation*
PDD/Structures Design Section
One National Life Drive [phone] 802-828-2621
Montpelier, VT 05633-5001 [fax] 802-828-3566
www.aot.state.vt.us [tll] 800-253-0191

April 13, 2012

Highway Safety Corp.
P.O. Box 358
Glastonbury, CT 06033

Re: Brookfield IM 089-1(59) I-89, Bridge 32N

We have reviewed the Bridge Railing details [Item #525.33, Bridge Railing, Galvanized NETC 2 Rail] for the above project (Vendor's Job #1868) received in this office via email on 4/13/12.

All sheets are Approved or Approved as Noted. Please note comments in red on sheet 3 and make sure they are addressed appropriately. The weld procedures were previously approved. **Note, these drawings supersede the drawings that were previously approved on March 16, 2012.**

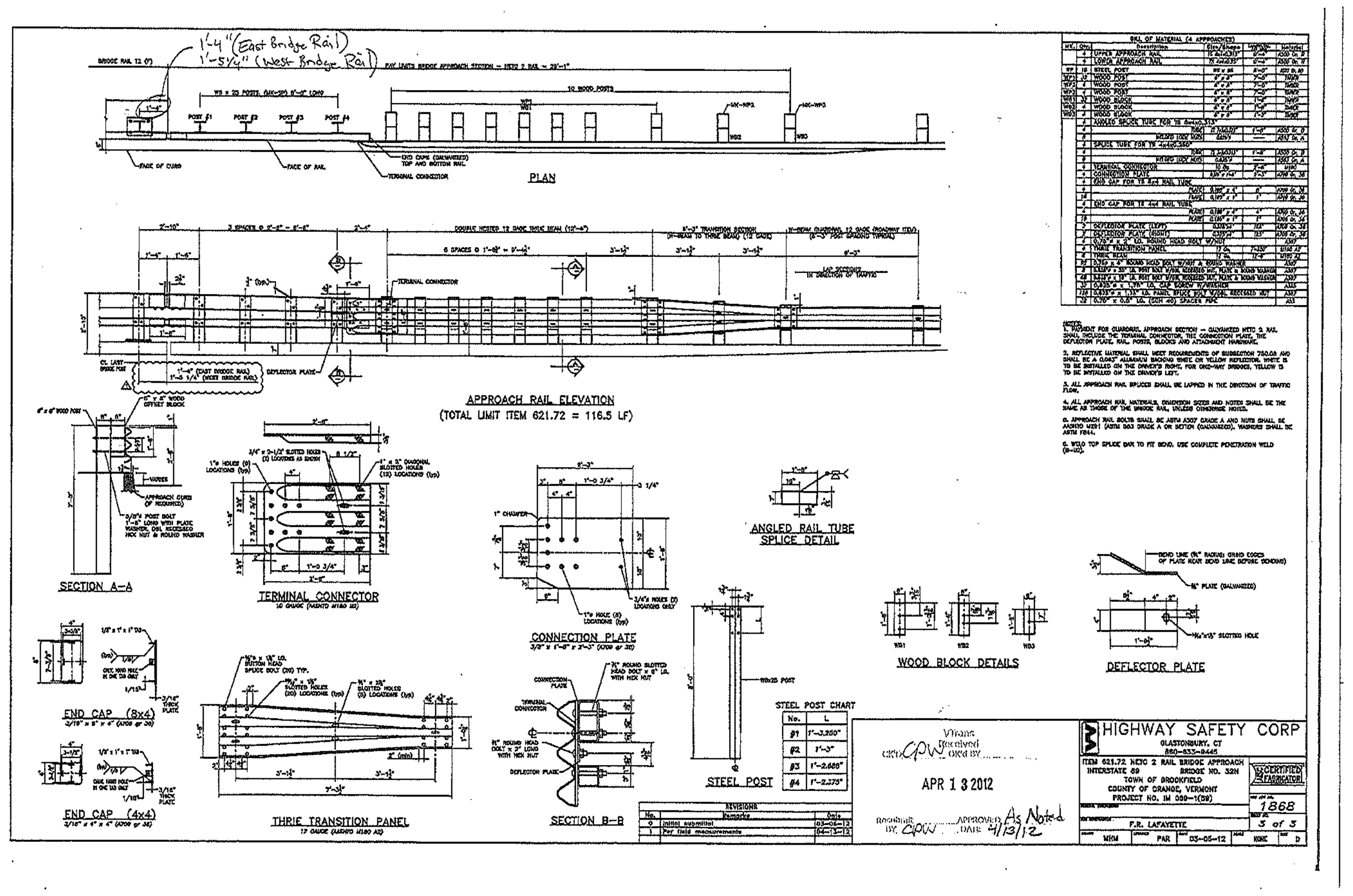
You must provide written notice to this office as to the date fabrication represented by these drawings will begin. That notice must be received at least seven days prior to that date, as per Specification 506.03. Any material fabricated prior to the notification date is subject to rejection without further cause.

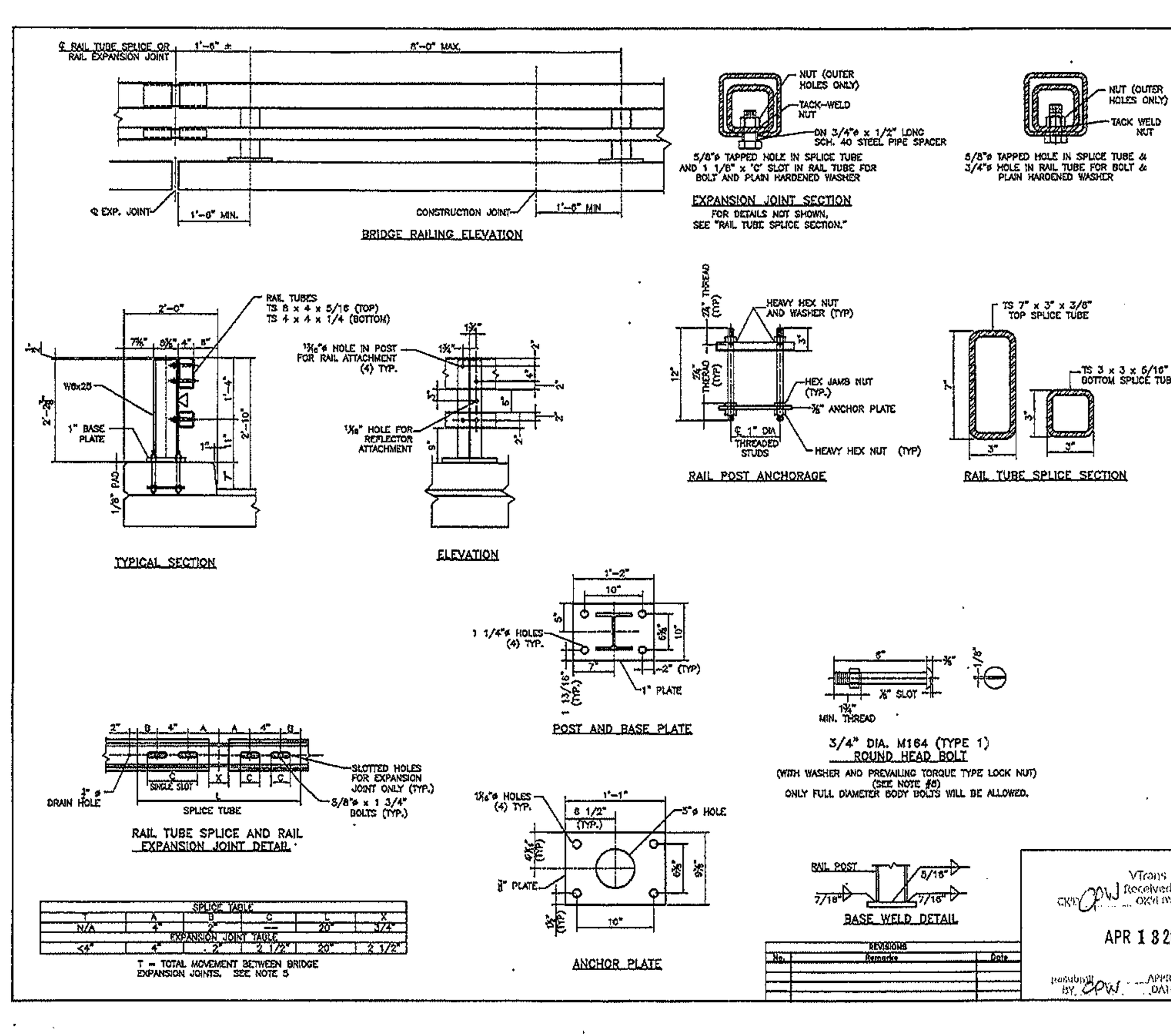
Please let me know if you have questions.

Sincerely,
Christopher P. Williams, P.E.
Structures Project Manager

Attachments
cc: [X] Resident Engineer – Daryl Bassett
[X] Steel Inspector – Jeff Clark
[X] Contractor – S. D. Ireland
[X] Subcontractor – F. R. Lafayette
[X] Materials & Research (C&IA Unit) - letter only
[X] Construction Division - letter only
[X] Files (CPW)

VTrans Working to Get You There! Vermont Agency of Transportation


1'-4" (East Bridge Rail)
1'-5 1/4" (West Bridge Rail)
PLAN
APPROACH RAIL ELEVATION
(TOTAL LIMIT ITEM 621.72 = 116.5 LF)
SECTION A-A
TERMINAL CONNECTOR
CONNECTION PLATE
ANGLED RAIL TUBE SPLICE DETAIL
WOOD BLOCK DETAILS
DEFLECTOR PLATE
END CAP (8x4)
END CAP (4x4)
THRIE TRANSITION PANEL
SECTION B-B
STEEL POST
STEEL POST CHART
No. L
#1 1'-3.250"
#2 1'-3"
#3 1'-2.688"
#4 1'-2.375"
BILL OF MATERIAL (4 APPROACHES)
NOTES:
1. PAYMENT FOR GUARDRAIL APPROACH SECTION — GALVANIZED NETC 2 RAIL SHALL INCLUDE THE TERMINAL CONNECTOR, THE CONNECTION PLATE, THE DEFLECTOR PLATE, RAIL, POSTS, BLOCKS AND ATTACHMENT HARDWARE.
2. REFLECTIVE MATERIAL SHALL MEET REQUIREMENTS OF SUBSECTION 750.08 AND SHALL BE A 0.063" ALUMINUM BACKING WHITE OR YELLOW REFLECTOR. WHITE IS TO BE INSTALLED ON THE DRIVER'S RIGHT. FOR ONE-WAY BRIDGES, YELLOW IS TO BE INSTALLED ON THE DRIVER'S LEFT.
3. ALL APPROACH RAIL SPLICES SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW.
4. ALL APPROACH RAIL MATERIALS, DIMENSION SIZES AND NOTES SHALL BE THE SAME AS THOSE OF THE BRIDGE RAIL, UNLESS OTHERWISE NOTED.
5. APPROACH RAIL BOLTS SHALL BE ASTM A307 GRADE A AND NUTS SHALL BE AASHTO M291 (ASTM A563 GRADE A OR BETTER (GALVANIZED). WASHERS SHALL BE ASTM F844.
6. WELD TOP SPLICE BAR TO FIT BEND. USE COMPLETE PENETRATION WELD (B-U2).
VTrans Received
CKD CPW OK'd BY
APR 1 3 2012
Received BY CPW APPROVED As Noted DATE 4/13/12
HIGHWAY SAFETY CORP
GLASTONBURY, CT
860-633-9445
ITEM 621.72 NETC 2 RAIL BRIDGE APPROACH
INTERSTATE 89 BRIDGE NO. 32N
TOWN OF BROOKFIELD
COUNTY OF ORANGE, VERMONT
PROJECT NO. IM 089-1(59)
CERTIFIED FABRICATOR
1868
3 of 3
F.R. LAFAYETTE
MKM PAR 03-05-12 NONE D



NOTES:

1. ALL RAILINGS AND MATERIALS SHALL CONFORM TO THE STANDARD SPECIFICATION FOR CONSTRUCTION SECTION 525, METAL RAILING.

2. PRIOR TO GALVANIZING, ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 1/16" RADIUS AND BE FREE OF BURRS.

3. RAIL POSTS SHALL BE SET NORMAL TO GRADE.

4. SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO (2) RAIL POSTS AND PREFERABLY TO AT LEAST FOUR (4) POSTS.

5. RAIL TUBE EXPANSION JOINT SHALL BE PROVIDED IN ANY RAIL BAY SPANNING A SUPERSTRUCTURE EXPANSION JOINT. EXPANSION JOINT WIDTH SHALL BE "X" AT 45°F AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES.

6. ALL PARTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111, EXCEPT HARDWARE, WHICH SHALL MEET THE REQUIREMENTS OF AASHTO M232.

7. RAIL POST ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.

8. RAIL TUBES SHALL BE ATTACHED USING 3/4" FULL DIAMETER BODY AASHTO M164 (TYPE 1) ROUND HEAD BOLT INSERTED THROUGH THE FACE OF THE TUBE. HOLES IN POSTS SHALL BE 1/16" LARGER THAN THE BOLT SIZE.

9. HOLES IN RAILS FOR RAIL TUBE ATTACHMENT SHALL BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AN APPROVED ZINC-RICH PAINT PRIOR TO ERECTION.

10. IF THERE IS A CONFLICT BETWEEN THE DETAILS SHOWN ON THIS SHEET AND THE DESIGN, THE REQUIREMENTS OF THE DESIGN DRAWINGS SHALL BE FOLLOWED.

11. ANY BENDING OF RAIL SHALL BE BY SHOP PROCEDURE ONLY, AND SHALL BE DONE AT THE FABRICATION PLANT.

12. THE FABRICATOR SHALL SUBMIT SHOP DRAWINGS, INCLUDING WELDING PROCEDURES TO THE STRUCTURES SECTION FOR APPROVAL IN ACCORDANCE WITH SUBSECTION 506.04 OF THE STANDARD SPECIFICATIONS. ALL WELDING SHALL CONFORM WITH SUBSECTION 506.10.

13. RAIL POSTS AND BASE PLATES SHALL BE TESTED FOR IMPACT PROPERTIES IN ACCORDANCE WITH ASTM A-370 CHARPY IMPACT TESTING USING TYPE A SPECIMEN

14. EXPANSION JOINT HARDWARE, REFLECTORS AND REFLECTOR HARDWARE PROVIDED BY OTHERS.

MATERIALS
RAIL TUBES....................ASTM A500, GRADE B OR ASTM A501
RAIL POSTS AND BASE PLATES....................ASTM A709/A709M, GRADE 50
ALL OTHER SHAPES AND PLATES....................ASTM A709/A709M, GRADE 36
ANCHOR STUDS....................ASTM A449
ALL OTHER BOLTS (UNLESS NOTED)....................AASHTO M164, TYPE1

NUTS FOR AASHTO M164 BOLTS AND FOR ANCHOR STUDS SHALL COMPLY WITH AASHTO M291 (ASTM A563).

WASHERS SHALL COMPLY WITH AASHTO M293 (ASTM F436) SPECIFICATIONS.

1/8" PAD SHALL COMPLY WITH STANDARD SPECIFICATION SUBSECTION 731.01 OR 731.02.

VTrans Received
CKD CPW OK'D BY CPW
APR 1 8 2012
Returned BY CPW APPROVED CPW ✓ DATE 4/18/12

HIGHWAY SAFETY CORP
GLASTONBURY, CT
860-633-9445

ITEM 525.33 NETC 2 RAIL BRIDGE RAIL
INTERSTATE 89 BRIDGE NO. 32N
TOWN OF BROOKFIELD
COUNTY OF ORANGE, VERMONT
PROJECT NO. IM 089-1(69)

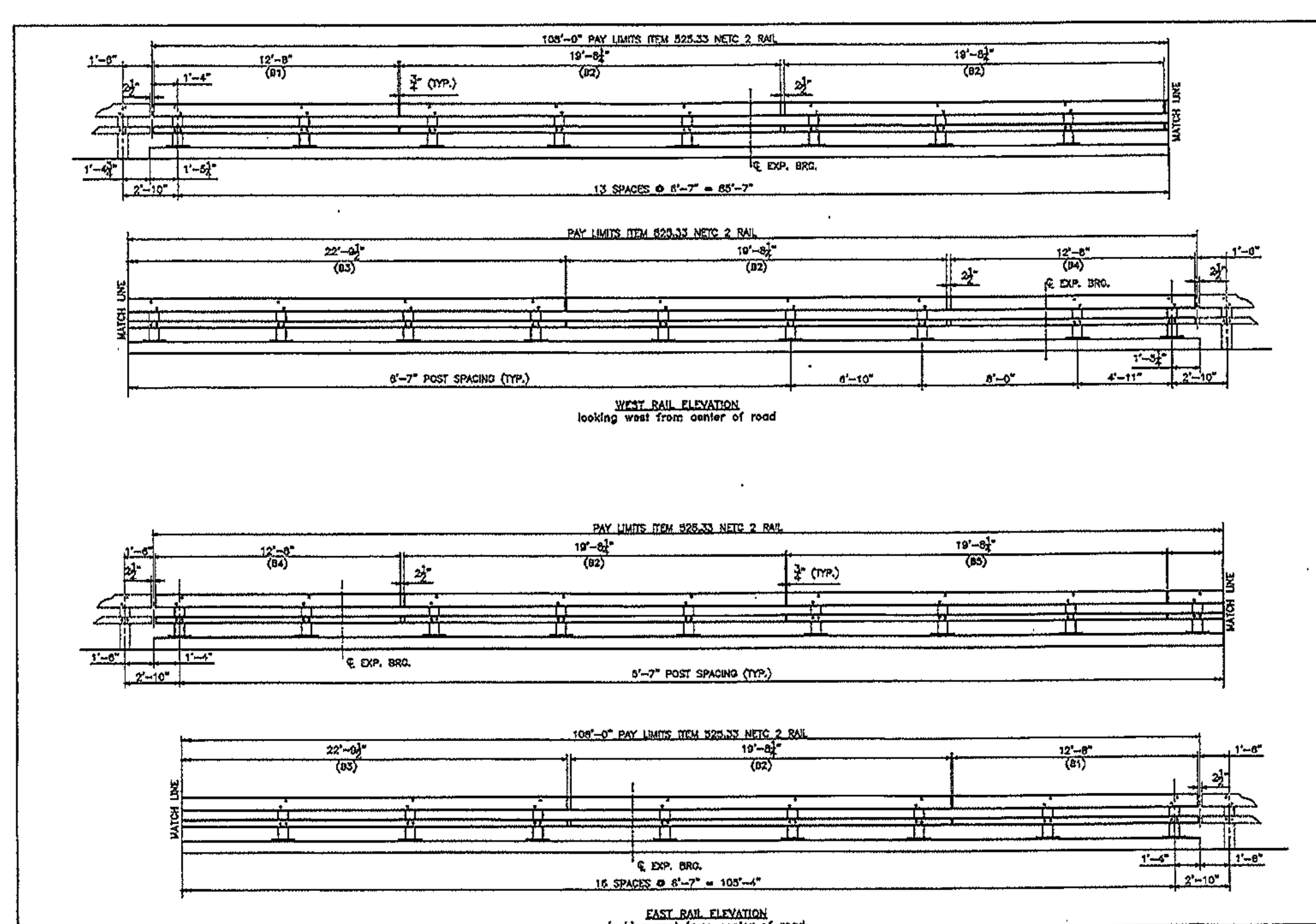
CERTIFIED FABRICATOR

1868

F.R. LAFAYETTE

2 of 3

MHM | PAR | 03-05-12 | NONE | D



BILL OF MATERIAL (BOTH SIDES)

Mk#	Qty.	Description	Size/Shape	Length	Material
		POST			
	34	BRIDGE RAIL PED POST 2'-2 3/8" OAH W/ BASE PLATE			
	34	POST UPRIGHT	W8 x 25	2'-1 3/8"	A709 Gr. 50
	34	POST BASE PLATE	10" x 1"	1'-2"	A709 Gr. 50
		SPLICE			
	10	UPPER SPLICE TUBE FOR 8 x 4 RAIL			
	10	TUBE	TS 7x3x3/8	1'-8"	A500 Gr. B
	20	WELDED LOCK NUT (OUTER HOLES ONLY)	5/8"	---	A563
	10	LOWER SPLICE TUBE FOR 4 x4 RAIL			
	10	TUBE	TS 3x3x5/16	1'-8"	A500 Gr. B
	20	WELDED LOCK NUT (OUTER HOLES ONLY)	5/8"	---	A563
		RAIL			
B1	2	UPPER RAIL	TS 8x4x5/16	12'-8"	A500 Gr. B
	2	LOWER RAIL	TS 4x4x1/4	12'-8"	A500 Gr. B
B2	6	UPPER RAIL	TS 8x4x5/16	19'-8 1/4"	A500 Gr. B
	6	LOWER RAIL	TS 4x4x1/4	19'-8 1/4"	A500 Gr. B
B3	2	UPPER RAIL	TS 8x4x5/16	22'-9 1/2"	A500 Gr. B
	2	LOWER RAIL	TS 4x4x1/4	22'-9 1/2"	A500 Gr. B
B4	2	UPPER RAIL	TS 8x4x5/16	12'-8"	A500 Gr. B
	2	LOWER RAIL	TS 4x4x1/4	12'-8"	A500 Gr. B
B5	1	UPPER RAIL	TS 8x4x5/16	19'-8 1/4"	A500 Gr. B
	1	LOWER RAIL	TS 4x4x1/4	19'-8 1/4"	A500 Gr. B
		HARDWARE			
	34	ANCHOR PLATE	8 3/8" x 3/8"	1'-1"	A36
	136	ANCHOR STUD	1" DIA.	12"	A449
	136	JAMB NUT	1" DIA.	---	A563
	272	HEAVY HEX NUT	1" DIA.	---	A563DH
	136	WASHER	1" DIA.	---	F436
	136	ROUND HEAD BOLT	3/4" DIA.	6"	M164 type 1
	136	LOCK NUT	3/4" DIA.	---	A563DH
	136	WASHER	3/4" DIA.	---	F436
	80	CAP SCREW	5/8" DIA.	1 3/4"	A325
	80	WASHER	5/8" DIA.	---	F436
	40	PIPE SPACER (SCH. 40)	3/4" DIA.	1/2"	A53
	37	BEARING PAD	10" x 1/8"	1'-2"	M251

REVISIONS

No.	Remarks	Date
1	Added expansion joints per field measure	04-13-12
0	Initial submittal	03-06-12

VTrans Received
CK'D. CPW OK'd BY CPW
APR 1 3 2012
Resubmit BY CPW APPROVED DATE 4/13/12

HIGHWAY SAFETY CORP
GLASTONBURY, CT
860-633-9445

ITEM 525.33 NETC 2 RAIL BRIDGE RAIL
INTERSTATE 89 BRIDGE NO. 32N
TOWN OF BROOKFIELD
COUNTY OF ORANGE, VERMONT
PROJECT NO. IM 089-1(59)

CERTIFIED FABRICATOR

F.R. LAFAYETTE

1868

1 of 3

MHM | PAR | 03-06-12 | N.T.S. | 0