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STANDARDS

A–76*	3–3–03	E–121*	8–8–95
B–5*	6–1–94	E–141*	9–20–95
B–71*	7–8–05	E–143*	6–15–04
D–3*	6–1–94	E–160*	5–20–99
D–4*	6–1–94	E–164*	5–20–99
D–6*	6–1–94	E–193*	8–18–95
D–11*	6–1–94	G–1*	1–3–00
E–100*	1–2–04	G–1d*	1–3–00
E–101*	5–30–03	G–4*	6–1–94
E–102*	6–30–03	G–18*	6–1–94
E–102A*	5–1–04		
E–108*	8–18–95		

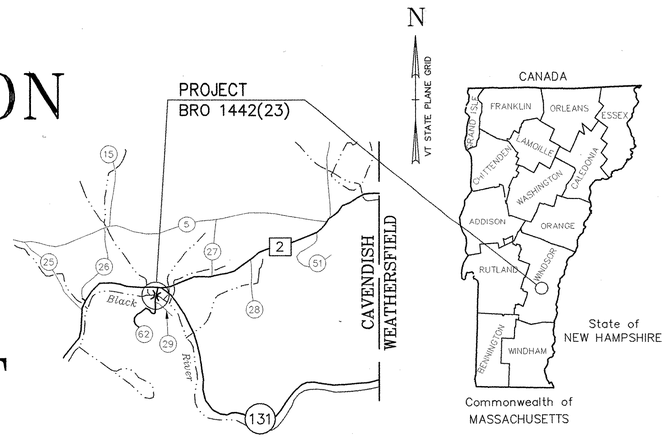
* INDICATES ENGLISH STANDARD USED

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PROPOSED IMPROVEMENT
BRIDGE PROJECT

TOWN OF CAVENDISH
COUNTY OF WINDSOR

ROUTE NO. TH 29 (CLASS 3), BRIDGE NO. 45



LOCATION MAP

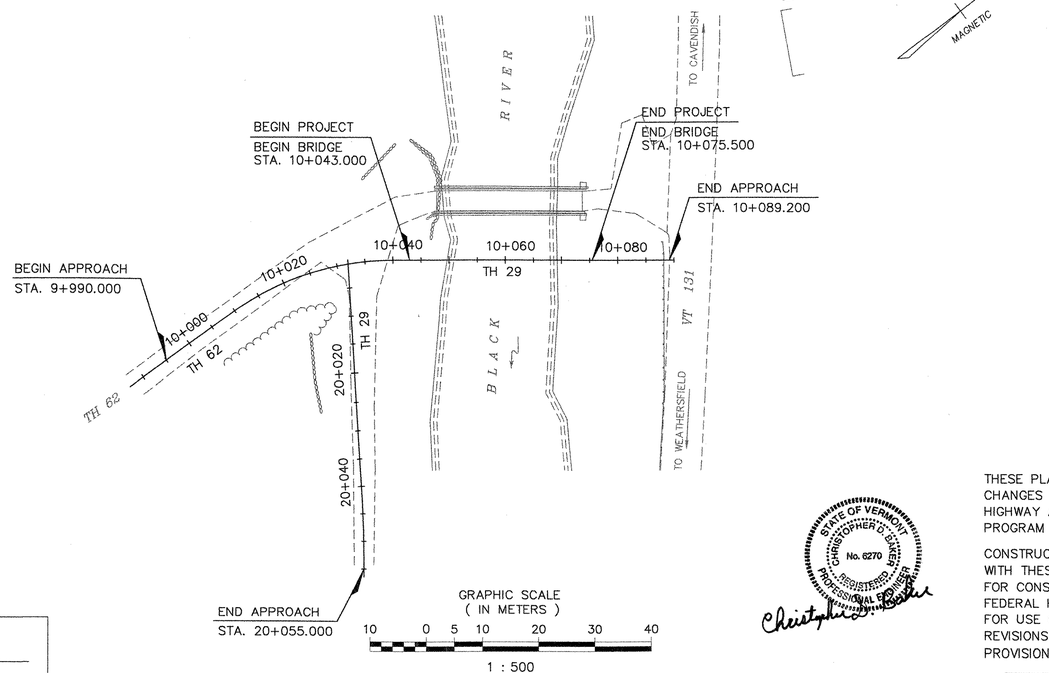
PROJECT LOCATION: BEGINNING AT A POINT 0.046 km SOUTHWEST OF THE JUNCTION OF VT 131 AND TH 29 AND EXTENDING NORTHEASTERLY 0.032 km.

PROJECT DESCRIPTION: CONSTRUCTION OF A NEW STEEL TRUSS BRIDGE, ROADWAY APPROACHES, RELATED CHANNEL WORK AND REMOVAL OF AN EXISTING STEEL TRUSS BRIDGE

LENGTH OF STRUCTURE: 32.500 m

LENGTH OF ROADWAY: –

LENGTH OF PROJECT: 32.500 m



CONVENTIONAL SIGNS

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

DATUM

VERTICAL: NGVD 1927

HORIZONTAL: ASSUMED

RECORD PLANS

CONTRACTOR: FW WHITCOMB CONSTRUCTION CORP. – WALPOLE, NH

RESIDENT ENGINEER: JACK COUTURE

CONSTRUCTION BEGAN: SEPTEMBER 25, 2006

CONSTRUCTION COMPLETE: JULY 20, 2007

RECORD PLANS BY: JACK COUTURE & C. PIERCE

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

BY Jacques D Couture. RESIDENT ENGINEER

DATE 6/2/2009

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.

STATE OF VERMONT
CHRISTOPHER D. BAKER
No. 6270
REGISTERED
PROFESSIONAL ENGINEER

Christopher D. Baker

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

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

VANASSE HANGEN BRUSTLIN, INC.

Metric

UNLESS OTHERWISE NOTED, ALL STATIONS ARE IN KILOMETERS, ALL ELEVATIONS ARE IN METERS, AND ALL DIMENSIONS ARE IN MILLIMETERS

DIRECTOR OF PROGRAM DEVELOPMENT

APPROVED Richard Stillwell DATE 6-15-06

PROJECT MANAGER: MARTHA EVANS–MONGEON

PROJECT NAME: CAVENDISH

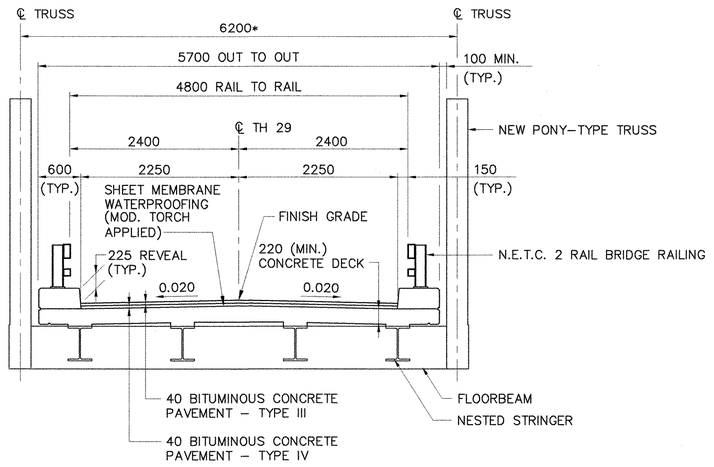
PROJECT NUMBER: BRO 1442(23)

SHEET 1 OF 47 SHEETS

PLOTTED 6/9/2006

TH 29 BRIDGE

40 BITUMINOUS CONCRETE PAVEMENT, TYPE III (PG 58–28)
40 BITUMINOUS CONCRETE PAVEMENT, TYPE IV (PG 58–28)



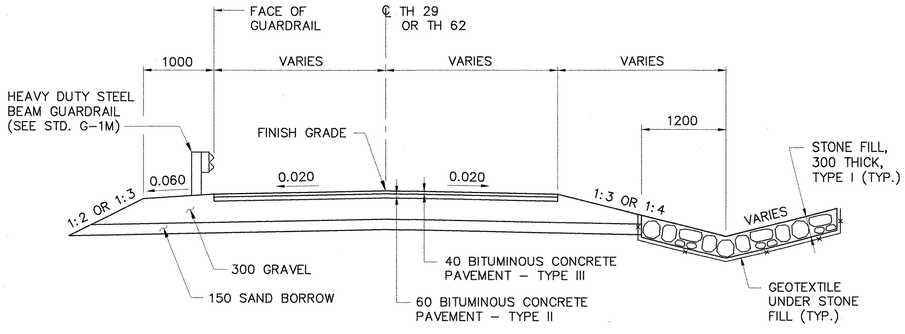
* DIMENSIONS TO BE CONFIRMED BY TRUSS MANUFACTURER

BRIDGE TYPICAL SECTION

SCALE: 1:40

TH 29 & TH 62

40 BITUMINOUS CONCRETE PAVEMENT, TYPE III (PG 58–28)
60 BITUMINOUS CONCRETE PAVEMENT, TYPE II (PG 58–28)
300 GRAVEL
150 SAND BORROW



TYPICAL WITH GUARDRAIL TYPICAL WITHOUT GUARDRAIL TYPICAL DITCH

APPROACH ROADWAY TYPICAL SECTION – PAVED

SCALE: 1:40

MATERIAL TOLERANCES	
MATERIAL ITEM	THICKNESS TOLERANCE (mm)
PAVEMENT	±5 (TOTAL THICKNESS)
AGGREGATE SURFACE COURSE	±10
GRAVEL	±30
SAND BORROW	±30

0 1000 2000 3000
SCALE IN MILLIMETERS

FINAL HYDRAULICS REPORT

VAOT Metric

HYDROLOGIC DATA

DRAINAGE AREA= 279 km²
CHARACTER OF TERRAIN: HILLY TO MOUNTAINOUS, WITH FLOODPLAIN DEVELOPMENT
CHARACTER & TYPE OF STREAM: SMALL TO MEDIUM, PARTIALLY ALLUVIAL, SINUOUS, NON–INCISED FLOODPLAIN, WITH PERENNIAL BUT FLASHY FLOW HABITAT
NATURE OF STREAMBED: GRAVEL, COBBLES, SMALL BOULDERS

Q2.33=	99 cms	Q50=	412 cms
Q10=	233 cms	Q100=	510 cms
Q25=	326 cms	Q500=	801 cms

DATE OF FLOOD OF RECORD: JULY 1973
WATER SURFACE ELEV.: UNKNOWN ESTIMATED DISCHARGE: 412 cms ±
NATURAL STREAM VELOCITY @ Q25 2.5 m/s
ICE CONDITIONS: MODERATE TO HEAVY DEBRIS: MODERATE
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEVATION RAPIDLY? YES
IS ORDINARY RISE RAPID? YES
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? YES
IF YES, DESCRIBE. CVPS DAM APPROX. 4 km UPSTREAM

WATERSHED STORAGE 1% HEADWATERS ____ UNIFORM THROUGHOUT WATERSHED X
IMMEDIATELY ABOVE SITE ____

EXISTING STRUCTURE

STRUCTURE TYPE: PRATT THROUGH TRUSS W/ TIMBER DECK YEAR BUILT: 1890
CLEAR SPAN (NORMAL TO STREAM): 25.9 m ±
VERTICAL CLEARANCE ABOVE STREAMBED: 4.6 m ±
WATERWAY OF FULL OPENING: 119 m²
DISPOSITION OF STRUCTURE: REMOVE

TYPE OF MATERIAL UNDER SUBSTRUCTURE: UNKNOWN

WATER SURFACE ELEV. (SEE NOTE 4)			
	Q2.33=	217.0	VELOCITY= 1.7 m/s
	Q10=	218.3	" 2.7 m/s
	Q25=	219.1	" 3.1 m/s
	Q50=	220.0	" 2.9 m/s
	Q100=	220.5	" 3.1 m/s

LONG TERM STREAM BED CHANGES: UNKNOWN

IS THE ROADWAY OVERTOPPED BELOW THE Q100? YES FREQUENCY: (SEE NOTE 1)
RELIEF ELEVATION: 218.8 m DISCHARGE OVER ROAD @ Q100: 115 cms

UPSTREAM STRUCTURE: TOWN: CAVENDISH DISTANCE: 2.7 km
HIGHWAY NO.: T.H. 30 STRUCTURE NO.: 44
STRUCTURE TYPE: TWO SPAN STEEL BEAM WITH CONCRETE DECK
CLEAR SPAN: 2X12.2 m=24.4 m ± CLEAR HEIGHT: 3.7 m ±
YEAR BUILT: 1974 FULL WATERWAY: UNKNOWN

DOWNSTREAM STRUCTURE: TOWN: WEATHERSFIELD DISTANCE: 6.4 km
HIGHWAY NO.: T.H. 20 STRUCTURE NO.: 66
STRUCTURE TYPE: WOODEN, COVERED BRIDGE
CLEAR SPAN: 29.3 m ± CLEAR HEIGHT: 7.3 m ±
YEAR BUILT: 1840 FULL WATERWAY: UNKNOWN

PROPOSED STRUCTURE

STRUCTURE TYPE: PONY TRUSS WITH CONCRETE DECK
CLEAR SPAN (NORMAL TO STREAM): 30.5 m
VERTICAL CLEARANCE ABOVE STREAMBED: 4 m
WATERWAY OF FULL OPENING: 125 m²

WATER SURFACE ELEV. (SEE NOTE 4)			
	Q2.33=	217.1	VELOCITY= 2.2 m/s
	Q10=	218.2	" = 3.1 m/s
	Q25=	218.9	" = 3.6 m/s
	Q50=	219.5	" = 4.0 m/s
	Q100=	220.7	" = 3.1 m/s

IS THE ROADWAY OVERTOPPED BELOW THE Q100? YES FREQUENCY: (SEE NOTE 2)
RELIEF ELEVATION: 218.8 DISCHARGE OVER ROAD @ Q100: 111 cms

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 219.4
VERTICAL CLEARANCE @ Q25 0.5 m
SCOUR: 0.8 m (Q100 CONTRACTION SCOUR)
REQUIRED CHANNEL PROTECTION: STONE FILL, TYPE IV

PERMIT INFORMATION

AVERAGE DAILY FLOW: 6 cms
ORDINARY LOW WATER: 3 cms DEPTH: 0.2 m
ORDINARY HIGH WATER: 43 cms DEPTH: 1.1 m

TEMPORARY STRUCTURE

STRUCTURE TYPE: NOT ANTICIPATED
CLEAR SPAN (NORMAL TO STREAM): N/A
VERTICAL CLEARANCE ABOVE STREAMBED: N/A
WATERWAY OF FULL OPENING: N/A

ADDITIONAL COMMENTS

1. ORIGINAL STRUCTURE (AS MODELED 25+ YEARS AGO), WITHOUT SUPPLEMENTARY SUPPORT SYSTEM, OVERTOPPED AT Q50. VT 131 OVERTOPPED AT AN EVENT BETWEEN Q25 AND Q50.
2. PROPOSED SUPERSTRUCTURE DECK IS OVERTOPPED BETWEEN Q50 AND Q100. VT 131 IS OVERTOPPED AT Q50.
3. PEAK DISCHARGES FOR 10 YEAR, 50 YEAR, 100 YEAR AND 500 YEAR EVENTS WERE OBTAINED FROM FIS (APRIL 1981). 2.33 AND 25 YEAR EVENTS WERE APPROXIMATED USING GRAPHICAL METHODS.
4. WATER SURFACE ELEVATIONS ARE AT A LOCATION APPROXIMATELY 30.8 m UPSTREAM OF PROPOSED BRIDGE. VELOCITIES ARE PROVIDED AT THE BRIDGE.

VAOT Metric

DESIGN CRITERIA:
1. DESIGN LIVE LOAD AASHTO MS 22.5
2. DESIGN SPAN 31.1 m
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL 350 kPa ON LEDGE 290 kPa
4. ALLOWABLE LOAD FOR PILING – TYPE – ESTIMATED LENGTH –
5. STRUCTURAL STEEL AASHTO GRADE 345
6. REINFORCING STEEL GRADE 420
7. CONCRETE HIGH PERFORMANCE CLASS A f'_c : 30 MPa
   CONCRETE HIGH PERFORMANCE CLASS B f'_c : 25 MPa

TRAFFIC MAINTENANCE:
1. IS TRAFFIC TO BE MAINTAINED? YES IF YES, ON EXISTING STRUCTURE YES OR ON TEMPORARY BRIDGE
2. TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY N/A TRAFFIC CONTROL SIGNALS REQUIRED NO
   MINIMUM CLEAR SPAN (NORMAL TO STREAM): N/A VERTICAL CLEARANCE ABOVE STREAMBED: N/A
   WATERWAY OF FULL OPENING: N/A
   ARE SIDEWALKS REQUIRED? N/A IF SO, ON WHAT SIDE? N/A
   STRUCTURE TYPE: N/A

*LOAD FACTOR LOAD RATING (METRIC TONNES)

LOADING LEVELS (LOAD FACTORS)	TRUCK						
	M	MS	3S2	6 AXLE	3A STR	4A STR	5A SEMI
INVENTORY A=2.17 B=1.00			■	■	■	■	■
POSTED A=1.55 B=1.40				■			
OPERATING A=1.30 B=1.67	■						■

STRENGTH RF= $\frac{\Phi M_N - 1.3M_{DL}}{A \times M_{LL+I}}$ *SERVICEABILITY RF= $B\,\frac{.95F_y S_{LL+I} - M_{DL\ S.U.} - M_{SDL\ S.U.}}{1.67\ M_{LL+I}}$

* SEE FABRICATION DRAWINGS FOR LOAD RATING.

TRAFFIC DATA
1998 ADT = 30
1998 DHV = 5
2018 ADT = 45
2018 DHV = 8
% D = 50
% T = <1.0
DESIGN SPEED = 40 km/h

VANASSE HANGEN BRUSTLIN, INC.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	

PRELIMINARY INFORMATION SHEET

Designed By S.M. HODGDON	Drawn By R.F. CLARK
Checked By S.M. GUNN Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499PIS	Sheet 2 of 47

PLOTTED 5/15/2006

Metric

SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	SUPER-STRUCTURE	ABUTMENT 1	ABUTMENT 2	BRIDGE SUBTOTAL	APPROACH ROADWAY	CHANNEL	EROSION CONTROL	FULL E & C	TOTAL	FINAL	REMARKS
201.10	CLEARING AND GRUBBING (INCL. INDV. TREES & STUMPS)	LS					1				1		
203.15	COMMON EXCAVATION	CM					320				320		
203.27	UNCLASSIFIED CHANNEL EXCAVATION	CM						1620			1620		
203.31	SAND BORROW	CM					140				140		
204.20	TRENCH EXCAVATION OF EARTH	CM					70		10		80		
204.30	GRANULAR BACKFILL FOR STRUCTURES	CM		440	355	795					795		
208.30	COFFERDAM EXCAVATION, EARTH	CM		480	155	635					635		
208.35	COFFERDAM EXCAVATION, ROCK	CM		55	75	130					130		
208.40	COFFERDAM (ABUTMENT NO. 1)	LS		1		1					1		
208.40	COFFERDAM (ABUTMENT NO. 2)	LS			1	1					1		
301.15	SUBBASE OF GRAVEL	CM					260		40		300		
401.10	AGGREGATE SURFACE COURSE	CM					25				25		
404.65	EMULSIFIED ASPHALT	KG	10			10	45				55		
406.25	BITUMINOUS CONCRETE PAVEMENT (PG 58-28)	T	25			25	145				170		
501.33	CONCRETE, HIGH PERFORMANCE CLASS A	CM	58			58					58		
501.34	CONCRETE, HIGH PERFORMANCE CLASS B	CM		164	116	280	4				284		
506.75	STRUCTURAL STEEL (PREFABRICATED TRUSS)	LS	1			1					1		
507.15	REINFORCING STEEL	KG		10870	8000	18870	180				19050		
507.17	EPOXY COATED REINFORCING STEEL	KG	4740	380	380	5500					5500		FINAL PAY QUANTITY FOR SUPERSTRUCTURE
514.10	WATER REPELLENT (MOD. - SILANE)	L	38	14	15	67					67		
516.10	BRIDGE EXPANSION JOINT (VERMONT)	M	5.7			5.7					5.7		
519.20	SHEET MEMBRANE WATERPROOFING (MOD. - TORCH APPLIED)	SM	145			145					145		
525.33	BRIDGE RAILING - NETC 2 RAIL	M	75.5			75.5					75.5		
527.10	MAINTENANCE OF TRAFFIC FOR BRIDGE PROJECTS (MOD.)	LS				1					1		
529.15	REMOVAL OF STRUCTURE (105 SM - EST.)	EA	1			1					1		ESTIMATED
529.50	REMOVE EXISTING PIPE 300mm THROUGH 600mm DIAMETER	M					23				23		
	** BEGIN PIPE OPTIONS AA**												
601.0215	450 mm CAAP 1.52 mm (68 mm x 12 mm)	M					37				37		
601.0415	450 mm PCCSP 1.63 mm (68 mm x 12 mm)	M					37				37		
601.0815	450 mm RCP CLASS III	M					37				37		
601.0915	450 mm CPEP	M					37				37		
	** END PIPE OPTIONS AA**												
	** BEGIN PIPE END SECTION OPTIONS AAA**												
601.6015	450 mm CSPES 1.63 mm (68 mm x 12 mm)	EA					1				1		
601.6215	450 mm CAAPES 1.52 mm (68 mm x 12 mm)	EA					1				1		
601.6815	450 mm RCPES CLASS III	EA					1				1		
601.7015	450 mm CPEPES	EA					1				1		
	** END PIPE END SECTION OPTIONS AAA**												

N.A.B.I. = NOT A BID ITEM

VANASSE HANGEN BRUSTLIN, INC.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
QUANTITY SHEET (1 OF 3)	
Designed By S.M. HODGDON	Drawn By B.J. MASSE
Checked By W.M. MOSHER Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499QS1	Sheet 3 of 47

PLOTTED 6/9/2006

SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	SUPER-STRUCTURE	ABUTMENT 1	ABUTMENT 2	BRIDGE SUBTOTAL	APPROACH ROADWAY	CHANNEL	EROSION CONTROL	FULL E & C	TOTAL	FINAL	REMARKS
604.45	CAST IRON GRATE WITH FRAME, TYPE A	EA					2				2		
608.25	ALL PURPOSE EXCAVATOR RENTAL, TYPE 1	HR							1		1		
609.15	DUST AND ICE CONTROL WITH CALCIUM CHLORIDE	T					0.4				0.4		
613.10	STONE FILL, TYPE I	CM					100		10		110		
613.10	STONE FILL, TYPE I (MOD. – CHECK DAMS)	CM							50		50		
613.10	STONE FILL, TYPE I (MOD. – CONSTRUCTION ENTRANCE)	CM							10		10		ESTIMATED
613.10	STONE FILL, TYPE I (MOD. – INLET PROTECTION)	CM							3		3		
613.13	STONE FILL, TYPE IV	CM						880			880		
617.10	RELOCATE MAILBOX, SINGLE SUPPORT	EA					1				1		
619.17	YIELDING MARKER POSTS	EA					5				5		
620.70	SNOW FENCE (MOD. – PDF)	M							270		270		
620.70	SNOW FENCE (MOD. – ARCH)	M							3		3		
621.21	HEAVY DUTY STEEL BEAM GUARD RAIL (GALVANIZED)	M					46				46		
621.60	ANCHOR FOR STEEL BEAM RAIL	EA					4				4		
621.72	GUARD RAIL APPROACH SECTION, NETC 2 RAIL	EA					4				4		
621.80	REMOVAL AND DISPOSAL OF GUARD RAIL	M					27				27		
630.10	UNIFORMED TRAFFIC OFFICERS	HR				100					100		ESTIMATED
630.15	FLAGGERS	HR				180					180		ESTIMATED
631.10	FIELD OFFICE – ENGINEERS	LS								1	1		
631.16	TESTING EQUIPMENT – CONCRETE	LS								1	1		
631.17	TESTING EQUIPMENT – BITUMINOUS	LS								1	1		
631.25	FIELD OFFICE – TELEPHONE (N.A.B.I.)	LU								1	1		
635.11	MOBILIZATION/DEMOBILIZATION	LS				1					1		
641.10	TRAFFIC CONTROL	LS					1				1		
646.40	DURABLE 100 mm WHITE LINE	M					7				7		
646.41	DURABLE 100 mm YELLOW LINE	M					22				22		
646.46	DURABLE 600 mm STOP BAR	M					7				7		
646.85	REMOVAL OF EXISTING PAVEMENT MARKINGS	SM					4				4		
649.31	GEOTEXTILE UNDER STONE FILL	SM					350	1015			1365		
649.51	GEOTEXTILE FOR SILT FENCE	SM							190		190		
649.61	GEOTEXTILE FOR FILTER CURTAIN	SM							490		490		
651.15	SEED	KG							20		20		
651.18	FERTILIZER	KG							50		50		
651.20	AGRICULTURAL LIMESTONE	T							0.1		0.1		
651.25	HAY MULCH	T							1		1		
651.26	HAY BALES FOR EROSION CONTROL	EA							10		10		ESTIMATED
651.35	TOPSOIL	CM							20		20		
651.40	GRUBBING MATERIAL	SM							390		390		

N.A.B.I. = NOT A BID ITEM

VANASSE HANGEN BRUSTLIN, INC.

VAOT Metric

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
QUANTITY SHEET (2 OF 3)	
Designed By S.M. HODGDON	Drawn By B.J. MASSE
Checked By W.M. MOSHER Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499QS2	Sheet 4 of 47

PLOTTED 6/9/2006

VAOT Metric

SUMMARY OF ESTIMATED QUANTITIES

ITEM NO.	ITEM DESCRIPTION	UNIT	SUPER-STRUCTURE	ABUTMENT 1	ABUTMENT 2	BRIDGE SUBTOTAL	APPROACH ROADWAY	CHANNEL	EROSION CONTROL	FULL E & C	TOTAL	FINAL	REMARKS
652.10	EROSION PREVENTION AND SEDIMENT CONTROL PLAN	LS							1		1		
652.20	MONITORING EROSION PREVENTION & SEDIMENT CONTROL PLAN	HR							100		100		ESTIMATED
652.30	MAINTENANCE OF EROSION PREVENTION & SEDIMENT CONTROL PLAN (N.A.B.I.)	LU							1		1		
654.10	EROSION MATTING	SM							200		200		
675.20	TRAFFIC SIGNS, TYPE A	SM					6				6		
	** BEGIN OPTION **												
675.301	FLANGED CHANNEL SIGN POSTS	M					70				70		
675.341	SQUARE TUBE SIGN POSTS AND ANCHOR	M					70				70		
	** END OPTION **												
675.50	REMOVING SIGNS	EA					6				6		
675.60	ERECTING SALVAGED SIGNS	EA					4				4		

TEMPORARY EROSION CONTROL (INCLUDED UNDER EROSION CONTROL)

ITEM NO.	ITEM DESCRIPTION	UNIT	TOTAL
204.20	TRENCH EXCAVATION OF EARTH	CM	10
301.15	SUBBASE OF GRAVEL	CM	40
608.25	ALL PURPOSE EXCAVATOR RENTAL, TYPE I	HR	1
613.10	STONE FILL, TYPE I	CM	10
613.10	STONE FILL, TYPE I (MOD. – CHECK DAMS)	CM	50
613.10	STONE FILL, TYPE I (MOD. – CONSTRUCTION ENTRANCE)	CM	10
613.10	STONE FILL, TYPE I (MOD. – INLET PROTECTION)	CM	3
620.70	SNOW FENCE (MOD. – PDF)	M	270
649.51	GEOTEXTILE FOR SILT FENCE	SM	190
649.61	GEOTEXTILE FOR FILTER CURTAIN	SM	490
651.15	SEED	KG	10
651.26	HAY BALES FOR EROSION CONTROL	EA	10
654.10	EROSION MATTING	SM	200

N.A.B.I. = NOT A BID ITEM

VANASSE HANGEN BRUSTLIN, INC.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
QUANTITY SHEET (3 OF 3)	
Designed By S.M. HODGDON	Drawn By B.J. MASSE
Checked By W.M. MOSHER Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499QS3	Sheet 5 of 47

PLOTTED 6/9/2006

STATE OF VERMONT
AGENCY OF TRANSPORTATION
RIGHT OF WAY PLANS
DETAIL SHEET

TABLE OF PROJECT PROPERTY ACQUISITION

PARCEL NO.	GRANTOR	SHEET NO.	BEGINNING STATION	ENDING STATION	TAKING	REM.	RIGHTS	TITLE TAKEN	DATE	TOWN OR CITY RECORDED	BK.	PG.	REMARKS
1	WALLIN, JUDITH M.	8	10+017.3 LT.	10+024.6 LT.			CONST. (T) 38 SM±	WDOE	04-05-04	CAVENDISH	61	435-436	409 S.F.±
			10+020 LT.	10+023.9 LT.			SLOPE (T) 8 SM±						86 S.F.±
			10+021 LT.	10+023.6 LT.			DITCH (P) 1 SM±						11 S.F.±
2A	HOWARD HILL ASSOCIATES	8	10+020 RT.	20+023.8 RT.	20 SM±			WDOE	04-13-04	CAVENDISH	61	459-462	215 S.F.±
2B		8	10+042.2 LT.	10+050.3 LT.	73 SM±					CAVENDISH			786 S.F.±
			20+008.4 LT.	20+019.4 LT.			CHANNEL (P) 50 SM±						538 S.F.±
			20+010.0 LT.	20+022.3 LT.			CONST. (T) 24 SM±						INCLUDES EROSION CONTROL
													258 S.F.±
			20+031.5 LT.	20+041.6 LT.			CONST. (T) 30 SM±						INCLUDES EROSION CONTROL
													323 S.F.±
			20+037.0 LT.				DRAINAGE (P)						
2C		8	10+023.6 LT.	10+028.6 LT.			DITCH (P) 2 SM±						22 S.F.±
			10+023.9 LT.	10+024.8 LT.			SLOPE (T) 1 SM±						11 S.F.±
			10+024.6 LT.	10+032.7 LT.			CONST. (T) 19 SM±						205 S.F.±
			10+039.0 LT.	10+050.2 LT.			CONST. (T) 48 SM±						INCLUDES EROSION CONTROL
													517 S.F.±
			10+039.4 LT.	10+040.5 LT.			ALL R. T. & I.						STONEWALL
			10+041.3 LT.	10+050.2 LT.			CHANNEL (P) 38 SM±						409 S.F.±
3	CENTRAL VERMONT PUBLIC SERVICE												UTILITY
4	TDS TELECOMM												UTILITY

REVISION NO.	SHEET	DESCRIPTION OF REVISION	DATE	MADE BY	APPROVED BY
1	7, 8	PARCEL NO. 1 WALLIN. REMOVE JOHN CROWLEY & GREGG CROWLEY AS OWNER. PER C.O. 9300.	05-13-03	M. J. R.	R. P. D.
2	7, 8	PARCEL NO. 1 WALLIN. CHANGE DITCH (T) TO DITCH (P) PER C.O. 9336.	02-19-04	P. J. H.	R. P. D.
3	7, 8	PARCEL NO. 2 HOWARD HILL ASSOCIATES. CHANGE DITCH (T) TO DITCH (P) PER C.O. 9337.	02-19-04	P. J. H.	R. P. D.
		PAPER PRINTS TO STRUCTURES	10-18-05		

DR. (P)- DRAINAGE RIGHT
DIT. (P)- DITCHING RIGHT
CH. (P)- CHANNEL RT.
DRIVE (T)- DRIVE RIGHT
CUL. (P)- CULVERT RIGHT
[W]- WATER SOURCES

PRESENT R.O.W.
TAKING WITHOUT ACCESS
TAKING WITHOUT ACCESS ALONG PROPERTY LINE
TAKING WITH ACCESS
(P) PERMANENT EASEMENT
(T) TEMPORARY EASEMENT

LEGEND
C&T (P) CLEARING & TRIMMING
CZ (P) CLEAR ZONE
CONST. (T) CONSTRUCTION EASEMENT
SR SR SLOPE RIGHTS
P L PROPERTY LINE
TOP OF CUT
TOE OF SLOPE
UE (P) PERMANENT UTILITY EASEMENT

APPROVED: ROGER P. DUMAS DATE: 08-24-00
CHIEF, PLANS & TITLES

R. O. W. PLANS

CAVENDISH
BRO 1442(23)
R. O. W. SHEET 7 OF 8 SHEETS
SHEET 6 OF 47

ACCT. mryan
IP_PWP:dms03551\r1013d.dgn
DATE PLOTTED 18-OCT-2005

VAOT **Metric**

CONSTRUCTION NOTES

REMOVAL AND DISPOSAL OF GUARD RAIL

STA. 10+087.9, LT 3.2 – 10+088.2, RT 23.1

REMOVE AND RESET MAILBOX

STA. 20+013.0, RT

HEAVY DUTY STEEL BEAM GUARD RAIL

STA. 20+008.9, LT – 20+035.4, LT
STA. 10+085.0, RT – 10+088.1, RT
STA. 10+084.2, LT – 10+084.2, LT

GUARD RAIL APPROACH SECTION, NETC 2 RAIL

STA. 10+033.6 – 10+040.4, LT
STA. 10+078.0 – 10+084.2, LT
STA. 20+008.9 – 10+040.5, RT
STA. 10+078.0 – 10+085.0, RT

BRIDGE RAILING – NETC 2 RAIL

STA. 10+040.4 – 10+078.0, LT
STA. 10+040.5 – 10+078.0, RT

ANCHOR FOR STEEL BEAM RAIL

STA. 10+035.5, LT
STA. 20+033.5, LT
STA. 10+086.2, RT
STA. 10+082.3, LT

TYPE I STONE FILL LINED DITCH

STA. 10+010.0, LT – 10+041.0, LT
STA. 20+008.0, RT – 20+030.0, RT
STA. 20+033.0, RT – 20+038.0, RT
STA. 40+050.0, LT – 40+085.0, LT

YIELDING MARKER POSTS

STA. 20+028, RT
STA. 20+037, LT & RT
STA. 40+075, LT, LT

DRAINAGE NOTES

1. STA. 10+083.5, RT 2.2 – VT 131 REMOVE EXISTING 300x15 M CMP
2. STA. 40+075.0, LT INSTALL NEW 450x17.0 M PCCSP OR CAAP OR RCP OR CPEP. OUTLET TO PROPOSED TYPE IV STONE FILL
3. STA. 20+028.0, RT INSTALL RCDI GRATE TYPE A
4. STA. 20+028.0, RT–20+037.0, RT INSTALL NEW 450x9 M CSP OR CAAP OR CPEP
5. STA. 20+036.0, RT– LT REMOVE EXISTING 300x8 M CMP
6. STA. 20+037.0, RT INSTALL RCDI GRATE TYPE A
7. STA. 20+037.0, RT–LT INSTALL NEW 450x10.8 M CSP OR CAAP OR CPEP. STONE FILL PAD 1800x900x300 DEEP AT OUTLET

CURVE 2 INFO
Δ = 36°–33′–18″
R = 50.000 m
T = 16.514 m
L = 31.900 m
E = 2.657 m
NO BANKING

CURVE 3 INFO
Δ = 03°–40′–00″
R = 175.000 m
T = 5.602 m
L = 11.199 m
E = 0.090 m
NO BANKING

BEGIN R.O.W. PROJECT
BRO 1442(23)
10+017.3 10M (19.7') LT.

END R.O.W. PROJECT BRO 1442(23)
STA. 10+050.3 3M (10') LT.

BEGIN PROJECT
BEGIN BRIDGE
STA. 10+043.000
F.G. EL.=220.889

END PROJECT
END BRIDGE
STA. 10+075.500
F.G. EL.=219.622

STA. 10+000.000
BEGIN APPROACH PAVEMENT

BEGIN APPROACH
STA. 9+990.000
MATCH EXISTING

END APPROACH
STA. 10+089.200
MATCH EXISTING

STA. 20+040.000
END APPROACH PAVEMENT

END APPROACH
STA. 20+055.000
MATCH EXISTING

RM 13
METAL DISK STAMPED 9 DSL 1972 719
IN TOP 2.1 m BOULDER
ELEV. = 219.213 m

BRASS DISK IN LEDGE
ST. OF VT.
1975
CAV. 5

EXISTING BRIDGE DATA
PRATT THROUGH TRUSS
DECK – WOOD PLANKS WITH RUNNERS
DRY STONE ABUTMENTS
BUILT 1890
CLEAR SPAN 26.4 m
WIDTH 3660 CLEAR

NOTES:

1. SIGNING, STRIPING AND ROADWAY WIDTH TRANSITIONS AND RADII SHOWN ON SHEET 9 OF 18.
2. CONNECTION OF THE NEW HEAVY DUTY STEEL BEAM GUARD RAIL AT STA 10+088.2, RT 23.1 m SHALL BE AT THE DIRECTION OF THE RESIDENT ENGINEER.
3. LARGE HEMLOCKS AT CHANNEL STA. 40+040±, RT SHALL NOT BE DISTURBED.

FOR ROW USE ONLY

LINES SHOWN ON THIS PLAN AS EXISTING PROPERTY LINES P/L, ARE BELIEVED TO BE ACCURATE BUT SHOULD NOT BE RELIED UPON FOR PURPOSES UNRELATED TO THE TOWN OF CAVENDISH'S ACQUISITION OF LAND AND RIGHTS FOR THIS PROJECT.

PLAN
SCALE: 1:250

GRAPHIC SCALE
(IN METERS)
5 0 5 10 15 20 25

VANASSE HANGEN BRUSTLIN, INC.

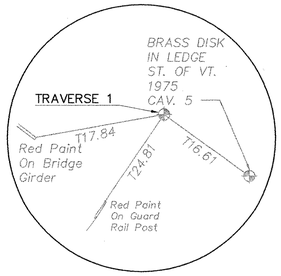
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
Highway No. T.H. 29	Log Sta. / Surv. Sta.
T.H. 29 OVER BLACK RIVER	
PLAN	
Designed By C. L. CILLEY	Drawn By C.L. CILLEY
Checked By Date	Bridge Design Supervisor Date
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	

ROW SHEET 8 OF 8 7 OF 47

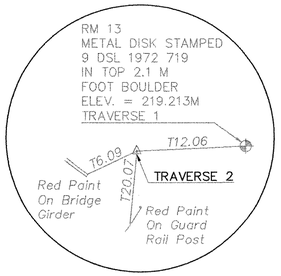
PLOTTED 5-1-2000

TRAVERSE TIES



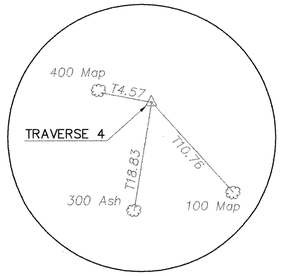
TRAVERSE #1
NORTHING = 100000.000
EASTING = 100000.000
ELEVATION = 219.213

TRAVERSE #1
NOT TO SCALE



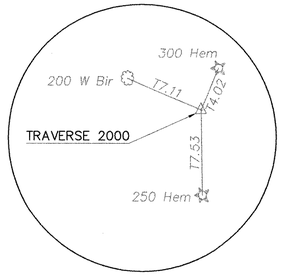
TRAVERSE #2
NORTHING = 99987.953
EASTING = 100000.526
ELEVATION = 219.234

TRAVERSE #2
NOT TO SCALE



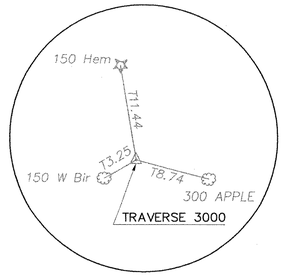
TRAVERSE #4
NORTHING = 99937.979
EASTING = 99990.555
ELEVATION = 219.937

TRAVERSE #4
NOT TO SCALE



TRAVERSE #2000
NORTHING = 99962.299
EASTING = 99957.416
ELEVATION = 222.356

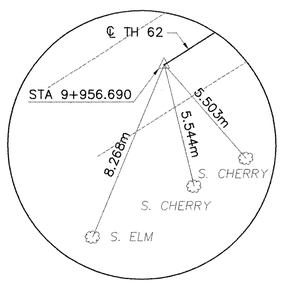
TRAVERSE #2000
NOT TO SCALE



TRAVERSE #3000
NORTHING = 99894.333
EASTING = 99987.723
ELEVATION = 225.966

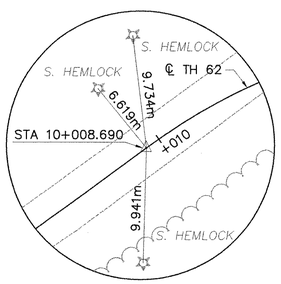
TRAVERSE #3000
NOT TO SCALE

ALIGNMENT TIES



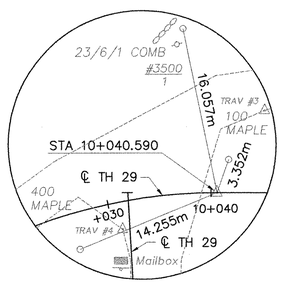
TH 62 PC
PK SET
NORTHING = 99865.6710
EASTING = 99980.9150

STA 9+956.690
NOT TO SCALE



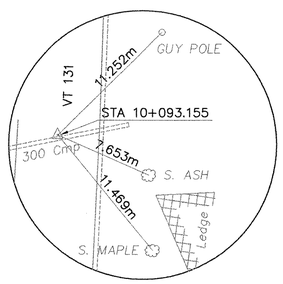
TH 62 PRC
PK SET
NORTHING = 99917.6050
EASTING = 99983.2330

STA 10+008.690
NOT TO SCALE



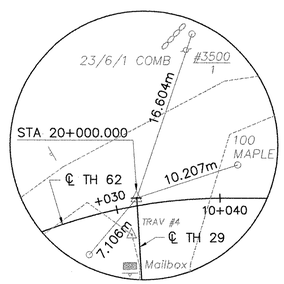
TH 29 PT
PK SET
NORTHING = 99947.3450
EASTING = 99993.1870

STA 10+040.590
NOT TO SCALE



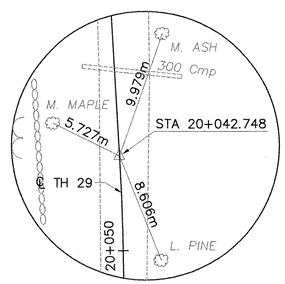
TH 29 POT
PK SET
NORTHING = 99989.4450
EASTING = 100024.6620

STA 10+093.155
NOT TO SCALE



TH 29 PT
PK SET
NORTHING = 99940.4650
EASTING = 99988.0430

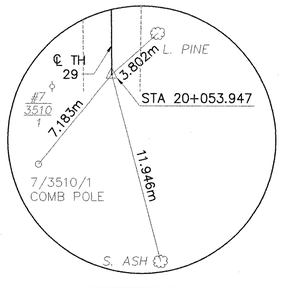
STA 20+000.000
NOT TO SCALE



TH 29 PC
PK SET
NORTHING = 99916.9540
EASTING = 100023.7460

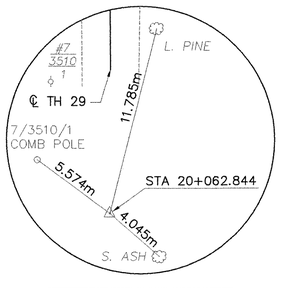
STA 20+042.748
NOT TO SCALE

ALIGNMENT TIES



TH 29 PT
PK SET
NORTHING = 99910.5000
EASTING = 100032.8950

STA 20+053.947
NOT TO SCALE



TH 29 POT
PK SET
NORTHING = 99905.1420
EASTING = 100039.9980

STA 20+062.844
NOT TO SCALE

DATUM
VERTICAL NGVD 1927
HORIZONTAL ASSUMED

STATE OF VERMONT
AGENCY OF TRANSPORTATION

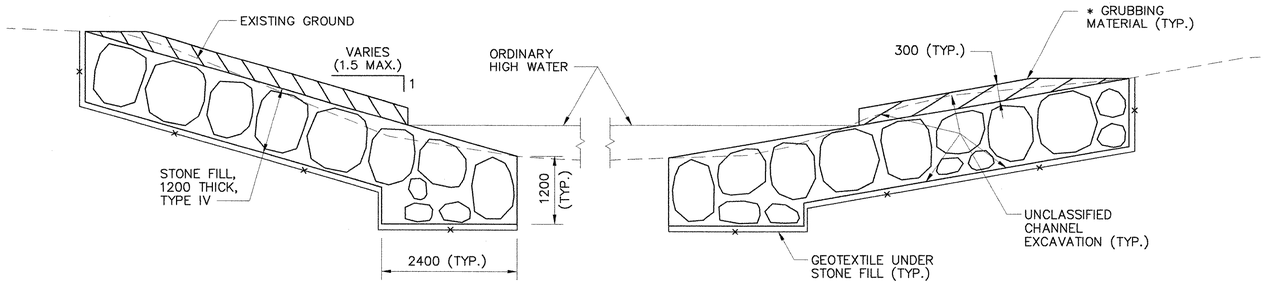
Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	

TIE SHEET

Designed By BRUNO/VTRANS	Drawn By C.L. CILLEY
Checked By S.M. HODGDON Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499TIE	Sheet 8 of 47

VANASSE HANGEN BRUSTLIN, INC.

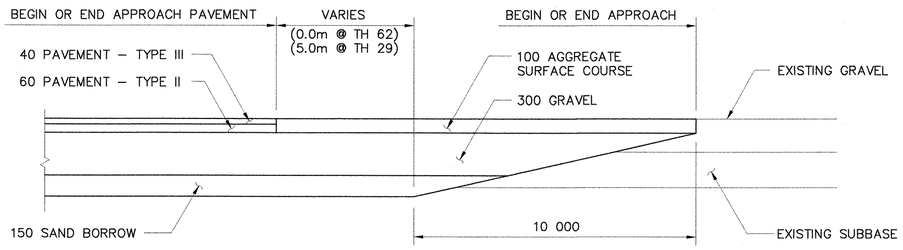
PLOTTED 5/15/2006



* 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.

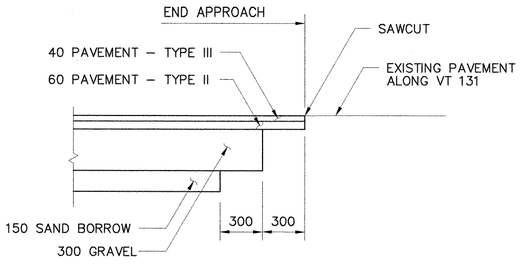
TYPICAL CHANNEL SECTION

NOT TO SCALE



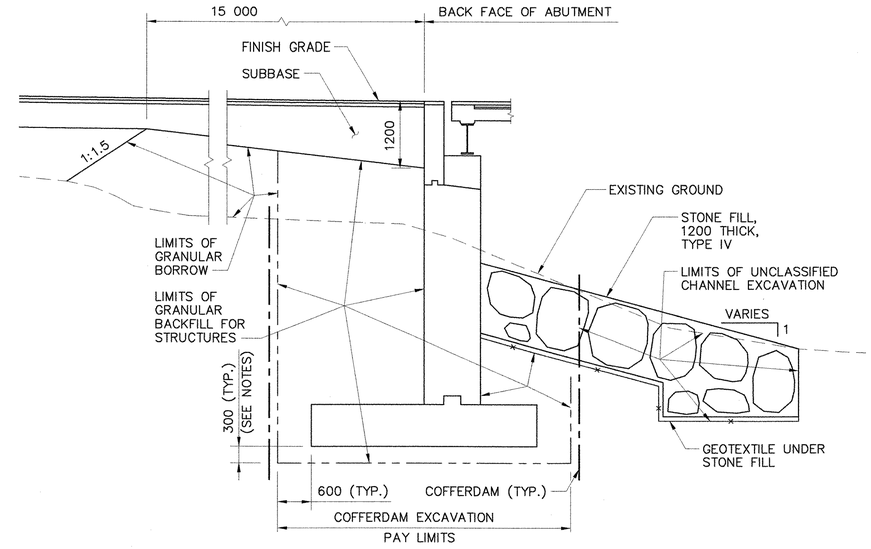
SUBBASE TRANSITION DETAIL AT GRAVEL APPROACH

NOT TO SCALE



SUBBASE AND PAVEMENT TRANSITION DETAIL AT VT 131

NOT TO SCALE

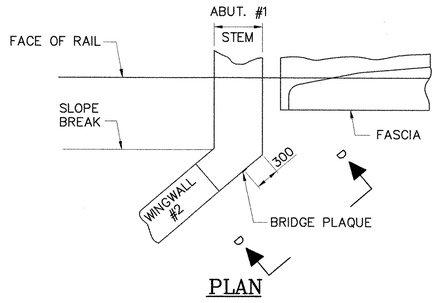


NOTES:

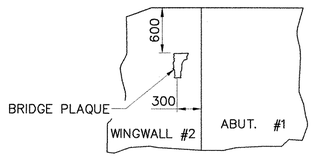
1. COFFERDAM SIZE TO BE DETERMINED BY THE CONTRACTOR.
2. THE PAY LIMITS OF "COFFERDAM EXCAVATION, EARTH" AND "COFFERDAM EXCAVATION, ROCK" SHALL BE 600 OUTSIDE THE PERIMETER OF THE FOOTING, UP TO EXISTING GROUND OR BOTTOM OF SUBBASE, WHICHEVER IS LOWER.
3. 300 UNDERCUT AS DETERMINED NECESSARY BY THE RESIDENT ENGINEER.
4. IF A COFFERDAM IS CONSTRUCTED WHICH IS LARGER THAN THE 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.

TYPICAL ABUTMENT SECTION

SCALE: 1:50



PLAN



VIEW D–D

PLAQUE NOTE:

THE BRIDGE PLAQUE WILL BE SUPPLIED BY THE AGENCY OF TRANSPORTATION AND SHALL BE INSTALLED BY THE CONTRACTOR AT ABUTMENT #1 AS SHOWN OR AS DIRECTED BY THE ENGINEER.

LOCATE BRIDGE PLAQUE

N.T.S.

DATUM	
VERTICAL	NGVD 1927
HORIZONTAL	ASSUMED

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
TYPICAL DETAILS	
Designed By S.M. GUNN	Drawn By C.L. CILLEY
Checked By S.M. HODGDON Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499TIE	Sheet 9 of 47

VANASSE HANGEN BRUSTLIN, INC.

PLOTTED 5/15/2006

CONSTRUCTION NOTES

REMOVAL AND DISPOSAL OF GUARD RAIL

STA. 10+087.9, LT 3.2 – 10+088.2, RT 23.1

REMOVE AND RESET MAILBOX

STA. 20+013.0, RT

HEAVY DUTY STEEL BEAM GUARD RAIL

STA. 20+009.2, LT – 20+035.6, LT
STA. 10+085.2, RT – 10+088.1, RT
STA. 10+084.4, LT – 10+084.2, LT

GUARD RAIL APPROACH SECTION, NETC 2 RAIL

STA. 10+032.9 – 10+040.5, LT
STA. 10+078.2 – 10+084.4, LT
STA. 20+009.2 – 10+040.5, RT
STA. 10+078.2 – 10+085.2, RT

BRIDGE RAILING – NETC 2 RAIL

STA. 10+040.5 – 10+078.2, LT
STA. 10+040.5 – 10+078.2, RT

ANCHOR FOR STEEL BEAM RAIL

STA. 10+034.8, LT
STA. 20+033.7, LT
STA. 10+086.2, RT
STA. 10+082.3, LT

TYPE I STONE FILL LINED DITCH

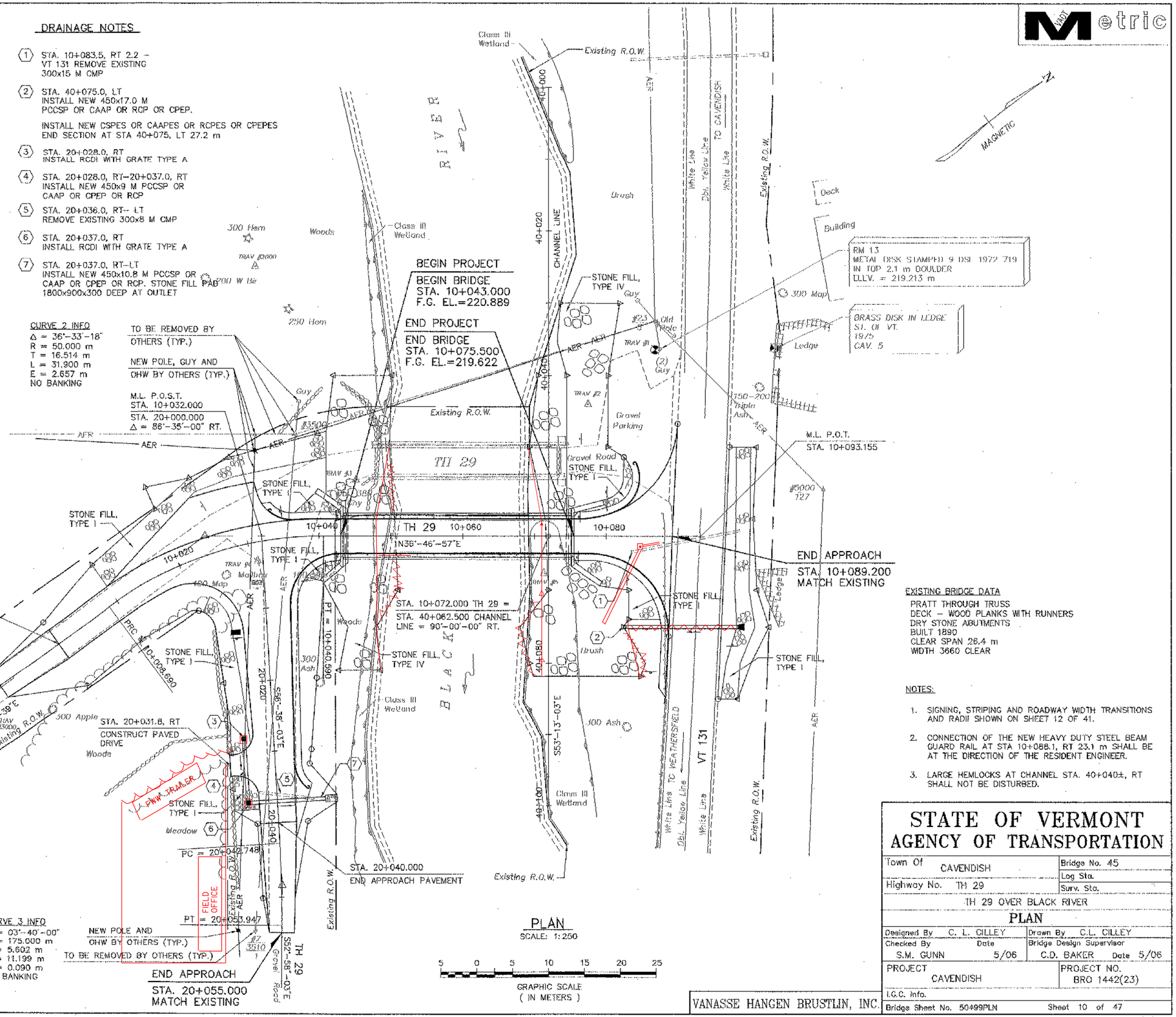
STA. 10+010.0, LT – 10+041.0, LT
STA. 20+008.0, RT – 20+030.0, RT
STA. 20+033.0, RT – 20+038.0, RT
STA. 40+050.0, LT – 40+085.0, LT

YIELDING MARKER POSTS

STA. 20+028, RT
STA. 20+037, LT & RT
STA. 40+075, LT, LT

DRAINAGE NOTES

1. STA. 10+083.5, RT 2.2 – VT 131 REMOVE EXISTING 300x15 M CMP
2. STA. 40+075.0, LT INSTALL NEW 450x17.0 M PCCSP OR CAAP OR RCP OR CPEP.
   INSTALL NEW CSPES OR CAAPES OR RCPES OR CPEPES END SECTION AT STA 40+075, LT 27.2 m
3. STA. 20+028.0, RT INSTALL RCDI WITH GRATE TYPE A
4. STA. 20+028.0, RT–20+037.0, RT INSTALL NEW 450x9 M PCCSP OR CAAP OR CPEP OR RCP
5. STA. 20+036.0, RT– LT REMOVE EXISTING 300x8 M CMP
6. STA. 20+037.0, RT INSTALL RCDI WITH GRATE TYPE A
7. STA. 20+037.0, RT–LT INSTALL NEW 450x10.8 M PCCSP OR CAAP OR CPEP OR RCP. STONE FILL PAD 1800x900x300 DEEP AT OUTLET



PLAN
SCALE: 1:250

5 0 5 10 15 20 25
GRAPHIC SCALE
(IN METERS)

DATUM
VERTICAL NGVD 1927
HORIZONTAL ASSUMED

EXISTING BRIDGE DATA

PRATT THROUGH TRUSS
DECK – WOOD PLANKS WITH RUNNERS
DRY STONE ABUTMENTS
BUILT 1890
CLEAR SPAN 26.4 m
WIDTH 3660 CLEAR

NOTES:

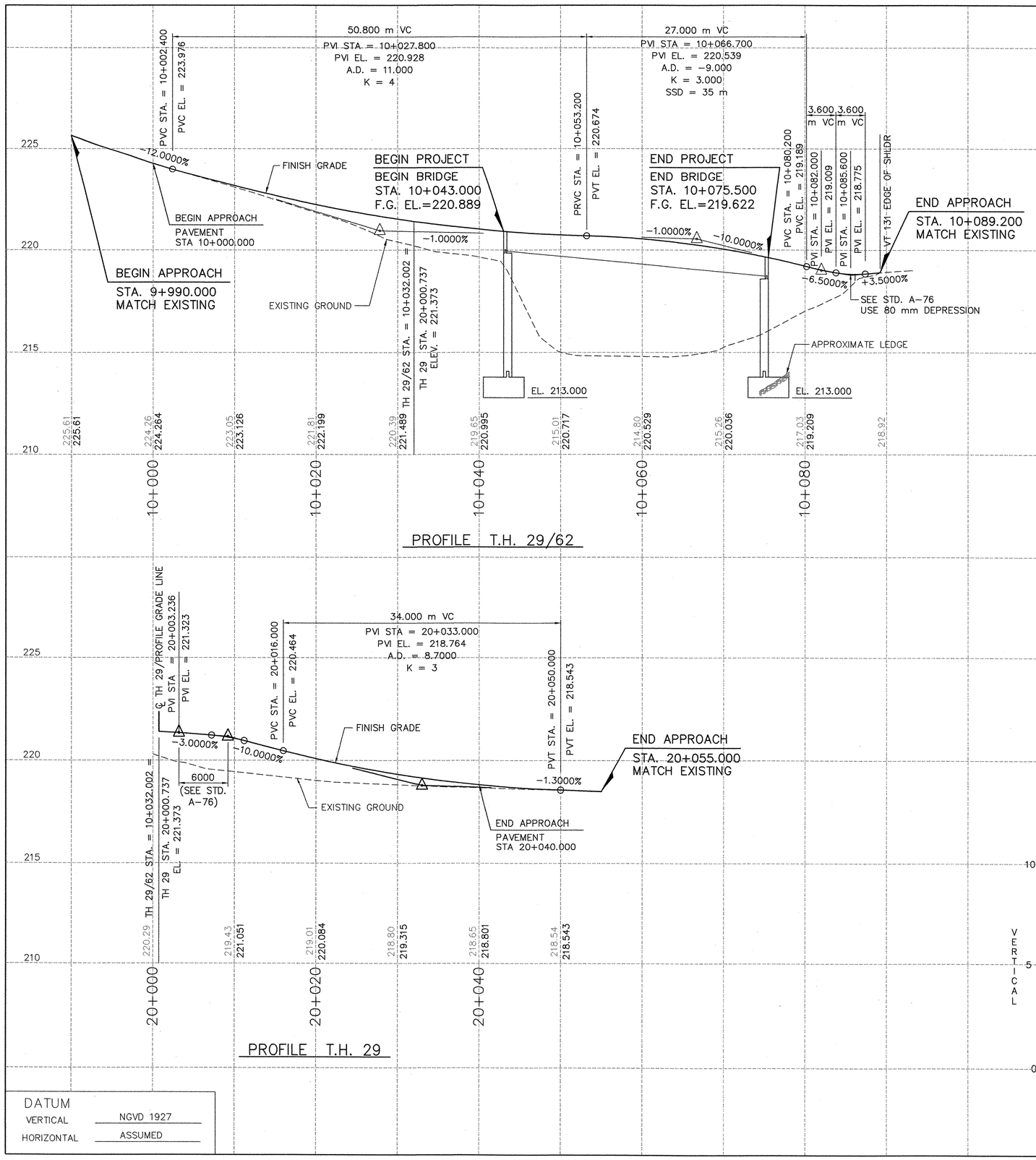
1. SIGNING, STRIPING AND ROADWAY WIDTH TRANSITIONS AND RADII SHOWN ON SHEET 12 OF 41.
2. CONNECTION OF THE NEW HEAVY DUTY STEEL BEAM GUARD RAIL AT STA 10+088.1, RT 23.1 m SHALL BE AT THE DIRECTION OF THE RESIDENT ENGINEER.
3. LARGE HEMLOCKS AT CHANNEL STA. 40+040±, RT SHALL NOT BE DISTURBED.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
PLAN	
Designed By C. L. GILLEY	Drawn By C.L. GILLEY
Checked By S.M. GUNN Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499PLN	Sheet 10 of 47

VANASSE HANGEN BRUSTLIN, INC.

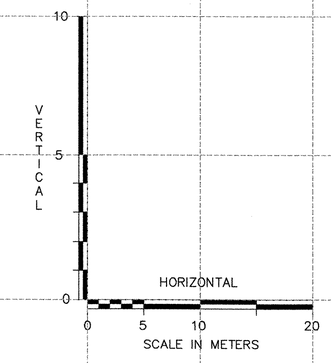
PLOTTED 6/9/2006



PROFILE T.H. 29/62

PROFILE T.H. 29

DATUM
VERTICAL NGVD 1927
HORIZONTAL ASSUMED



VANASSE HANGEN BRUSTLIN, INC.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
PROFILES	
Designed By R.F. CLARK	Drawn By R.F. CLARK
Checked By S.M. GUNN Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499PRO	Sheet 11 of 47

PLOTTED 6/9/2006

REMOVAL 100 mm WHITE LINE

STA. 10+090, 1 LT – 12 RT

REMOVAL 100 mm YELLOW LINE (DOUBLE CENTER LINE)

STA. 10+093, 6 RT – 6 LT

DURABLE 100mm WHITE LINE

STA. 10+090, 16 LT – 23 LT

DURABLE 100mm YELLOW LINE (DOUBLE CENTER LINE)

STA. 10+093, 6 LT – 17 LT

DURABLE 600mm STOP BAR

STA. 10+087.0, RT

CURVE 2 INFO
Δ = 36°-33'-18"
R = 50.000 m
T = 16.514 m
L = 31.900 m
E = 2.657 m
NO BANKING

CURVE 3 INFO
Δ = 03°-40'-00"
R = 175.000 m
T = 5.602 m
L = 11.199 m
E = 0.090 m
NO BANKING

STA. 10+000.000
BEGIN APPROACH PAVEMENT

BEGIN APPROACH
STA. 9+990.000
MATCH EXISTING

STA. 20+040.000
END APPROACH PAVEMENT

END APPROACH
STA. 20+055.000
MATCH EXISTING

STA. 10+076.0, LT

STA. 10+042.0, LT

STA. 10+042.0, RT

STA. 10+035.0, LT

STA. 20+014.0, RT

STA. 20+006.0, LT

STA. 10+042.0, RT

STA. 10+076.0, RT

BEGIN PROJECT
BEGIN BRIDGE
STA. 10+043.000
F.G. EL.=220.889

END PROJECT
END BRIDGE
STA. 10+075.500
F.G. EL.=219.622

STA. 10+072.000 TH 29 =
STA. 40+062.500 CHANNEL
LINE = 90°-00'-00" RT.

STA. 10+083.0, RT

NOT REMOVED
STA. 40+078.0, LT
CATON PATON PLACE 2 —
NACLERIO
BUILDING & REMODELING 2½ —

STA. 40+081.0, LT
WATCH FOR
LANDSLIDES
NEXT 3 MILES

STA. 10+080.0, LT
LEGAL LOAD
LIMIT
24,000
POUNDS

STA. 10+080.0, LT
ONE LANE
BRIDGE

W5-3
750x750

LEGAL LOAD
LIMIT
16000 POUNDS

STOP

DEAD
END

ONE LANE
BRIDGE

CATON PATON PLACE 2 —
NACLERIO
BUILDING & REMODELING 2½ —

WATCH FOR
LANDSLIDES
NEXT 3 MILES

RM 13
METAL DISK STAMPED 9 DSL 1972 719
IN TOP 2.1 m BOULDER
ELEV. = 219.213 m

BRASS DISK IN LEDGE
ST. OF VT.
1975
CAV. 5

END APPROACH
STA. 10+089.200
MATCH EXISTING

TH 29

TH 62

TH 131

CHANNEL LINE

BLACK R.

Class III Wetland

Existing R.O.W.

Gravel Road

Gravel Parking

Brush

Woods

Meadow

Ledge

Building

Deck

Guy

Old Pole

Trav #1

Trav #2

Trav #3

Trav #4

Trav #5

Trav #6

Trav #7

Trav #8

Trav #9

Trav #10

Trav #11

Trav #12

Trav #13

Trav #14

Trav #15

Trav #16

Trav #17

Trav #18

Trav #19

Trav #20

Trav

STATE OF VERMONT
AGENCY OF TRANSPORTATION

EROSION CONTROL NARRATIVE

Metric

DESCRIPTION OF PROJECT

This project involves the replacement of a single span truss bridge carrying Town Highway 29 over the Black River in the Town of Cavendish. The existing bridge is approximately 26 400 (87 ft) long with 3600 (11.8 ft) clear width. The existing trusses will be carefully removed and stored for potential reuse in the future. The remainder of the bridge will be completely removed. The alignment for TH 29 will shifted approximately 10 000 (33 ft) east of the existing alignment over the river. Traffic will be maintained on the existing bridge until the new bridge is constructed. It is anticipated that this project will last two construction seasons. The total length of roadway approach work is approximately 112 000 (368 ft) on TH 29 and approximately 42 000 (138 ft) on TH 62. The site is located at Latitude 43 degrees 24.3 minutes N., Longitude 72 degrees 34.5 minutes W.

Total disturbed area (excluding waste, borrow and staging areas): 0.26 ha (0.63 ac).

No "Threatened & Endangered Species" have been identified in the project area. The existing bridge is listed on the National Register of Historic Places; an agreement has been reached with the State Historic Preservation Officer on the removal and final disposition of this structure.

SITE INVENTORY & ANALYSIS

OFF SITE DRAINAGE CHARACTERISTICS:

The project area is primarily rural and undeveloped except for roads. Off-site drainage, in the vicinity of the new bridge, from north of VT 131 flows overland from moderately steep wooded slopes, collects in ditches and is carried under the roadway via two culverts. One of these culverts will be relocated to maintain this existing condition. The drainage west of TH 62 flows overland from moderately steep wooded slopes toward the road, collects in a swale above the roadway and also in the roadway ditch. These two drainage channels converge and direct flow via an open channel to the river. This ditch will be recreated adjacent to the relocated roadway to maintain the existing flow pattern. Drainage south of TH 29 flows overland through a field, collects at a culvert and is carried below the roadway. This culvert will be replaced at the same location to maintain this existing flow pattern.

DRAINAGE, WATERWAYS, BODIES OF WATER:

The Black River and its associated wetlands are located in the project area. There are no other water bodies or wetlands that are located in the impact area of the project. The drainage basin for the Black River is characterized by a narrow river valley within steeply sloped hills. This character also causes the river to rise rapidly and flow swiftly as evidenced by the rocky/cobbly bottom and the bank erosion observed along the river. The contributing drainage area at the bridge crossing is 279 sq. km.

TOPOGRAPHY, EXISTING ROADS, BUILDINGS, UTILITIES:

The topography of the project site characterized by moderately steep slopes north of VT 131 and west of TH 62 with gentle slopes and an open field east of TH 62. The river banks upstream and downstream from the proposed bridge are steeply sloped.

VT 131 parallels the Black River on the north side of the river just beyond the top of bank. One home is located in the immediate project vicinity northwest of the intersection of TH 29 and VT 131. TH 29 crosses from VT 131 to the south side of the river and then turns sharply toward the east and parallels the river just above the top of bank. TH 62 intersects with TH 29 just south of the proposed bridge and continues south up the hill. Both TH 29 and TH 62 are dead end roads.

Existing overhead utilities are located over TH 29 south of the Black River and cross the river west of the existing bridge. The utilities also run on the north side of VT 131 and cross-country to the south toward TH 62. Overhead utility service and two poles will be relocated along TH 29 to permit construction.

VEGETATION:

In general, the area between VT 131 and the Black River consists of small trees/brush. The area north of VT 131 is generally wooded. TH 62 is heavily wooded on both sides of the road. TH 29 is flanked by a line of small trees to the north along the river band and an open field to the south. Several small hardwoods will be removed immediately adjacent to TH 29 and TH 62 and a 400 maple will be removed at the intersection of TH 62 and TH 29. Following the construction of the bridge and substructures, the existing slopes will be stabilized with stone fill and/or vegetation will be reestablished with standard seed & mulch practices.

SOILS:

The Soil Conservation Service has mapped the soils throughout Windsor County. The soil type identified within the project area is Marlow. The Marlow soil is described as loamy, compact glacial till on uplands. They are very deep to bedrock, shallow to moderately deep to dense basal till and well drained. Permeability is moderate in the solum and moderately slow in the substratum. "This soil is poorly suited to cultivated crops, hay and pasture because of slope and the stones and boulders on surface". These soils have a perched water table at depths of 2.0 to 3.5 feet below the surface from late Winter through early Spring.

The listed soil erodability coefficient (K-value) is 0.20. Generally, K-value indicates the following: 0.0 – 0.23 = low erodability; 0.24 – 0.36 = moderate erodability; 0.37 and higher = higher erodability.

The majority of the roadway is "in a fill typical", meaning the roadway is higher than the surrounding mean ground elevation. Due to engineering requirements for selective fill material for the roadway, much of this fill material will need to be brought in from an outside source. Since we do not know where this source pit will be, we can not provide erodability properties for the fill. See the roadway cross sections for fill areas.

SENSITIVE RESOURCE AREAS:

No "Threatened & Endangered Species" have been identified within the project limits. The existing bridge is Historic; however, an agreement has been reached with the State Historic Preservation Officer on its removal and storage for potential reuse at another location. There will be no adverse effect to Archaeological features.

The limits of the Riparian Buffer for the Black River are identified on the following sheets. All work proposed within these limits shall be completed with extreme care so as to minimize impacts to this buffer zone.

PROXIMITY TO NATURAL OR MAN-MADE WATER FEATURES:

Disturbance of soils near natural or man-made waterways consist of that which is necessary to remove the existing abutments and to armor the banks upstream and downstream from the new structure. Stabilization of disturbances to the river banks will be accomplished with cofferdams and Stone Fill, Type IV.

TEMPORARY EROSION PREVENTION & SEDIMENT CONTROL

TEMPORARY EROSION PREVENTION MEASURES TO BE UTILIZED INCLUDE:

"Project Demarcation Fencing," denoted --PDF-- on the plans, to delineate the limits the contractor can access with construction equipment. This measure limits the area that can be disturbed and exposed to erosion.

Seeding, mulching and biodegradable erosion control matting, or an equivalent product, will be utilized on all slopes steeper than 3:1 that are not lined with stone fill. These slopes shall be stabilized within 48 hours of reaching final grade or during intermittent phases of construction activity.

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

TEMPORARY MEASURES TO CONTROL SEDIMENT TRANSPORT INCLUDE:

Silt fence will be installed a distance of 1800 (5.9') from the toe of slopes where permitted by R.O.W. or construction easements, to prevent sediment transport to down gradient areas. Each line of silt fence shall be placed along the contour with ends turned slightly uphill to create a ponding effect should water try to run along the fencing and around the ends. Silt fence shall be installed prior to any upslope earthwork.

Measures such as silt fence and sand bags shall be checked regularly for accumulation of sediment. Sediment build-up shall be removed when the level of sediment reaches one-half the height of the control measure. Sediments shall be disposed of in an approved area such that they will not be subject to erosion.

Stabilized construction entrances to the project site, staging areas, as well as entrances to waste and borrow areas shall be established. The minimum size of a stabilized construction entrance is 3700 x 15000 (12' x 50'). All surface water flowing to or diverted towards a construction entrance shall be piped under the stone. Pipes shall be appropriately sized for the contributing area, however, no pipes smaller than 6 inch diameter shall be used. See typical erosion control detail sheets for materials and construction methods to be utilized when constructing a stabilized entrance.

Temporary sediment settling basins will be utilized on this project for dewatering cofferdams.

PERMANENT EROSION CONTROL MEASURES

SEVERAL PERMANENT EROSION CONTROL MEASURES WILL BE UTILIZED:

Stone lining of the river banks with Stone Fill, Type IV is specified. This stone will protect from river bank erosion during design storm events.

Stone Fill, Type I will be utilized at ditches and culvert outlets to reduce erosion potential.

Grass or other suitable ground cover will be established outside of the roadway limits where stone lining has not been specified. These areas shall be seeded and mulched promptly upon achieving final grade.

GENERAL EROSION & SEDIMENT CONTROL GUIDELINES

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

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

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

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

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

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

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

SEDIMENT SETTLING BASIN SIZING CRITERIA

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

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
EROSION CONTROL NARRATIVE	
Designed By S.M. HODGDON	Drawn By C.L. CILLEY
Checked By S.W. JOHNSON Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
VANASSE HANGEN BRUSTLIN, INC.	I.G.C. Info.
	Bridge Sheet No. 50499ecnar Sheet 13 of 47

PLOTTED 5/15/2006

VAOT Metric

RIVER

BLACK

CLASS III WETLAND

Existing R.O.W.

EXISTING CULVERT

EXISTING CB

LIMITS OF RIPARIAN BUFFER

CLASS III WETLAND

40+000

40+020

CHANNEL LINE

40+040

40+080

40+100

BRUSH

Brush

STATE OF VERMONT

White Line

Dbl. Yellow Line

White Line

TO CAVENDISH

Existing R.O.W.

GRASS

Deck

Building

RM 13
METAL DISK STAMPED 9 DSL 1972 719
IN TOP 2.1 m BOULDER
ELEV. = 219.213 m

BRASS DISK IN LEDGE
ST. OF VT.
1975
CAV. 5

LEDGE

Ledge

300 Map

300 Hem

Woods

EXISTING DRAINAGE

TRAV #2000

200 W Bir

HARDWOOD/ SOFTWOOD TREES

HOWARD HILL ASSOCIATES

250 Hem

CONST. (T)

TRAV #1

#23
5

Old Pole

Guy

Guy

AER

TRAV #2

Gravel Parking

150-200 Triple Ash

#5000
127

#3500
1

Existing R.O.W.

P L

AER

P L

WALLIN, JUDITH M.

CONST. (T)

CONST. (T)

EXISTING DRAINAGE

TH 29

Gravel Road

EXISTING DRAINAGE

HARDWOOD/ SOFTWOOD TREES

TRAV #3

Dbl. 380
B Chy

10+040

10+060

N36°-46'-57"E

EXISTING CULVERT

10+020

TRAV #4

Mailbox

400 Map

100 Map

AER

HARDWOOD/ SOFTWOOD TREES

TRAV #5

EXISTING DRAINAGE

EXISTING DRAINAGE

PRC = 10+008.690

PT = 10+040.590

Woods

300 Ash

150 Hem

9+980

N00°-15'-39"E

TRAV #3000

Existing R.O.W.

300 Apple

HARDWOOD/ SOFTWOOD TREES

CONST. (T)

CLASS III WETLAND

S56°-38'-03"E

S53°-13'-03"E

300 Ash

STATE OF VERMONT

HOWARD HILL ASSOCIATES

PC = 9+956.690

9+960

N04°-52'-58"E

Existing R.O.W.

Gravel Road

150 Bir

Woods

NF DAVIS

P L

HOWARD HILL ASSOCIATES

LIMITS OF RIPARIAN BUFFER

CONST. (T)

CLASS III WETLAND

LIMITS OF RIPARIAN BUFFER

GRASS

Meadow

PC = 20+042.748

Existing R.O.W.

Existing R.O.W.

Existing R.O.W.

Existing R.O.W.

PT = 20+053.947

#7
3510
1

S52°-58'-03"E

Gravel Road

PLAN
SCALE: 1:250

5 0 5 10 15 20 25
GRAPHIC SCALE
(IN METERS)

MAGNETIC

N

DATUM
VERTICAL NGVD 1927
HORIZONTAL ASSUMED

VANASSE HANGEN BRUSTLIN, INC.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta.
	Surv. Sta.

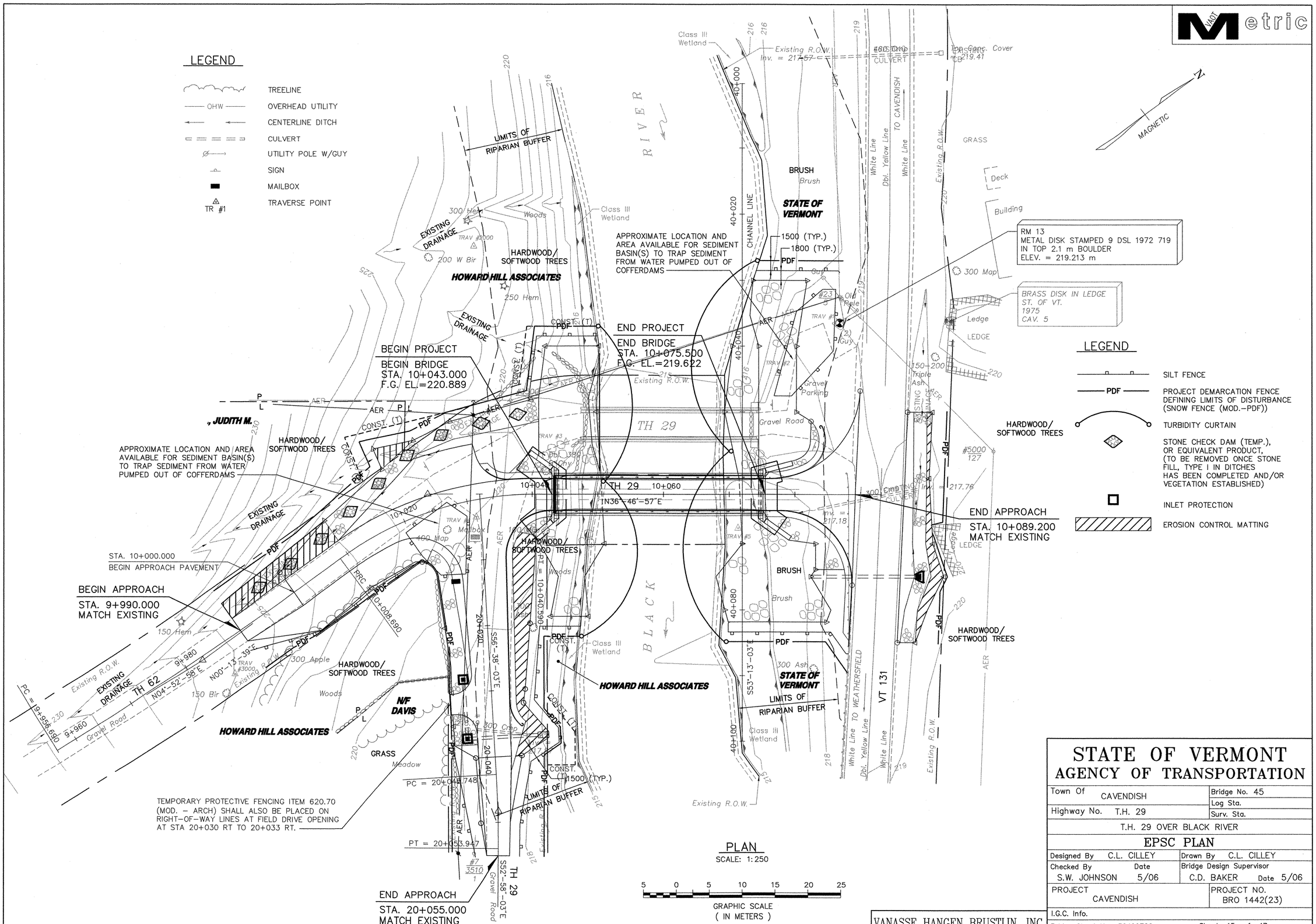
TH 29 OVER BLACK RIVER

EXISTING CONDITIONS SITE PLAN

Designed By C. L. CILLEY	Drawn By C.L. CILLEY
Checked By S.W. JOHNSON Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499EC1	Sheet 14 of 47

PLOTTED 6/9/2006

VAOT Metric



PLAN
SCALE: 1:250

5 0 5 10 15 20 25
GRAPHIC SCALE
(IN METERS)

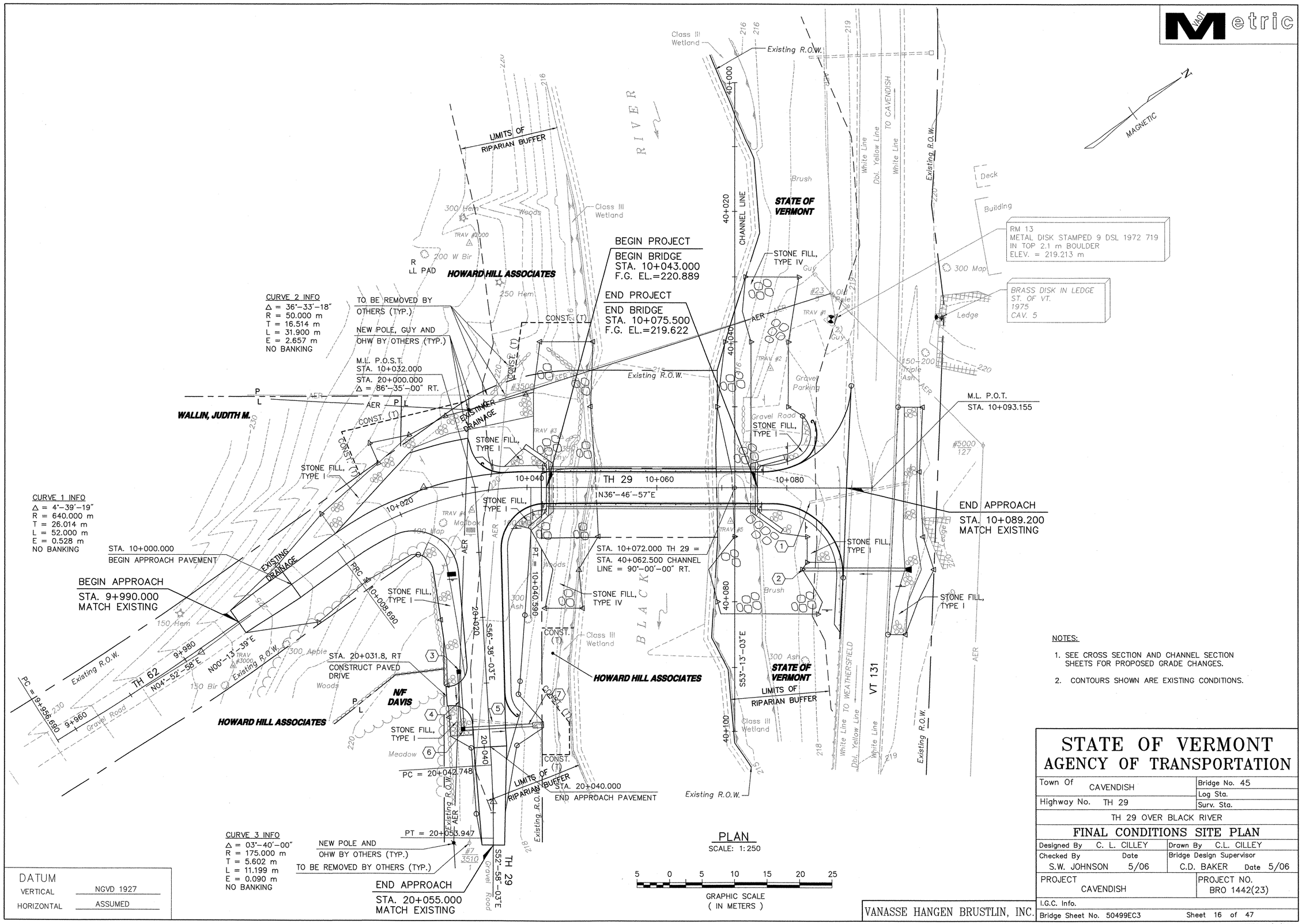
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. T.H. 29	Surv. Sta.
T.H. 29 OVER BLACK RIVER	
EPSC PLAN	
Designed By C.L. CILLEY	Drawn By C.L. CILLEY
Checked By Date S.W. JOHNSON 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499EC2	Sheet 15 of 47

VANASSE HANGEN BRUSTLIN, INC.

PLOTTED 6/9/2006

VAOT Metric



PLAN
SCALE: 1:250

5 0 5 10 15 20 25
GRAPHIC SCALE
(IN METERS)

NOTES:

1. SEE CROSS SECTION AND CHANNEL SECTION SHEETS FOR PROPOSED GRADE CHANGES.
2. CONTOURS SHOWN ARE EXISTING CONDITIONS.

DATUM
VERTICAL NGVD 1927
HORIZONTAL ASSUMED

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta.
	Surv. Sta.

TH 29 OVER BLACK RIVER

FINAL CONDITIONS SITE PLAN

Designed By C. L. CILLEY	Drawn By C.L. CILLEY
Checked By S.W. JOHNSON 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499EC3	Sheet 16 of 47

VANASSE HANGEN BRUSTLIN, INC.

PLOTTED 6/9/2006

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 kPa	CONSISTENCY
<12	Very Soft
12-24	Soft
24-48	Med. Stiff
48-96	Stiff
96-192	Very Stiff
>192	Hard

CORRELATION GUIDE OF "N" TO DENSITY/CONSISTENCY

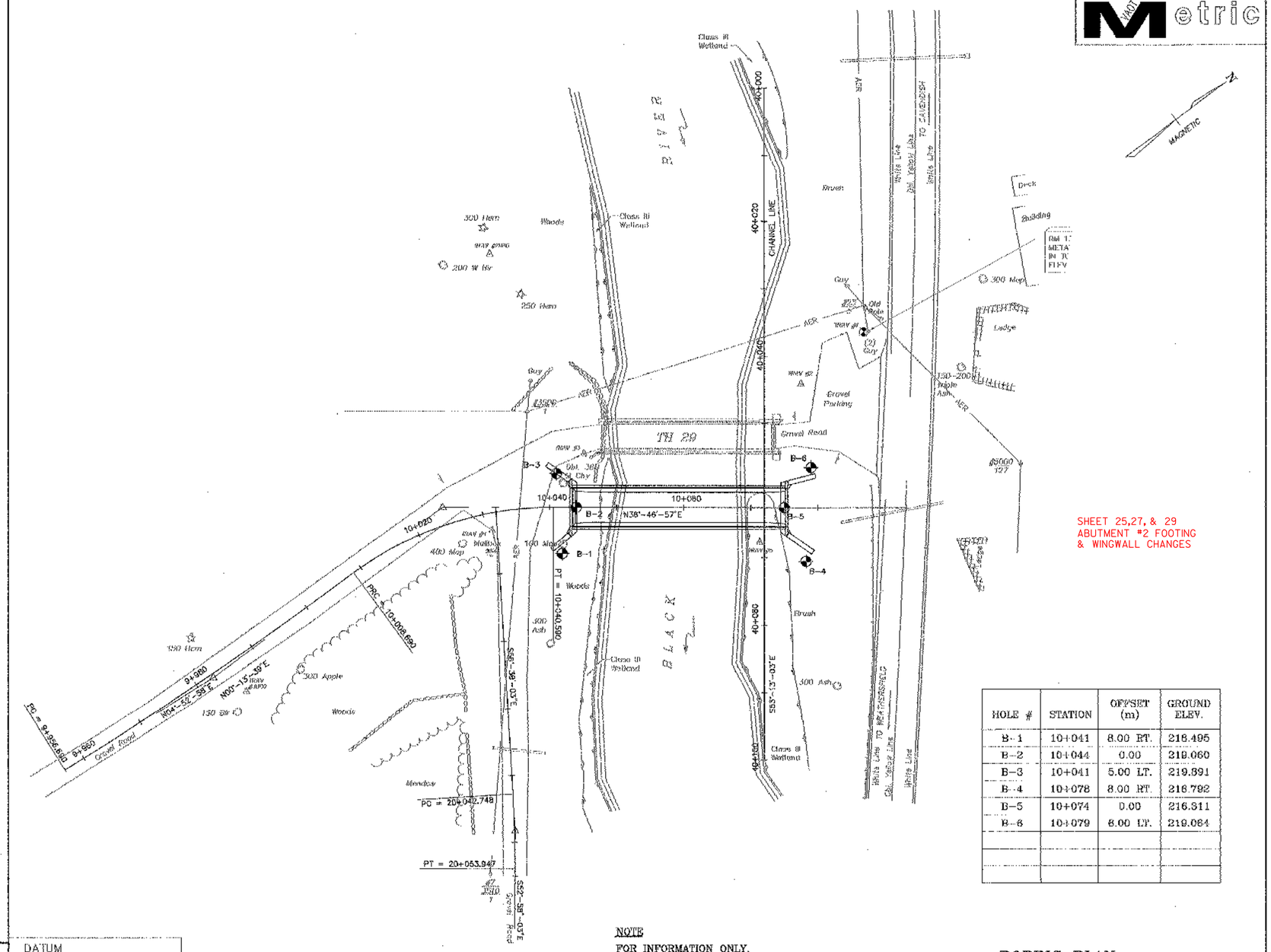
DENSITY (GRANULAR SOILS) N	DESCRIPTIVE TERM	CONSISTENCY (COHESIVE SOILS) N	DESCRIPTIVE TERM
<5	Very Loose	<2	Very Soft
5-10	Loose	2-4	Soft
11-24	Med. Dense	5-8	Med. Stiff
25-50	Dense	9-15	Stiff
>50	Very Dense	16-30	Very Stiff
		31-60	Hard
		>60	Very Hard

COMMONLY USED SYMBOLS

▽	Water Elevation
⊕	Standard Penetration Boring
⊕	Auger Boring
⊙	Rod Sounding
S	Sample
N	Standard Penetration Test Blow Count Per 300 mm For: 50.8 mm O. D. Sampler 35.0 mm I. D. Sampler Hammer Weight Of 63.5 kg. Hammer Fall Of 762 mm
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 28.5 mm
BX	Core Size 41.2 mm
NX	Core Size 52.1 mm
M	Double Tube Core Barrel Used
LL	Liquid Limit
PL	Plastic Limit
PI	Plasticity Index
NP	Non Plastic
w	Moisture Content (Dry Wgt. Basis)
D	Dry
M	Moist
MTW	Moist To Wet
W	Wet
Sat	Saturated
Bo	Boulder
Gr	Gravel
Sa	Sand
Si	Silt
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	mlte	Multicolored
or	Orange		



HOLE #	STATION	OFFSET (m)	GROUND ELEV.
B-1	10+041	8.00 RT.	218.495
B-2	10+044	0.00	219.060
B-3	10+041	5.00 LT.	219.391
B-4	10+078	8.00 RT.	216.782
B-5	10+074	0.00	216.311
B-6	10+079	5.00 LT.	219.084

SHEET 25,27, & 29
ABUTMENT #2 FOOTING
& WINGWALL CHANGES

NOTE
FOR INFORMATION ONLY.

BORING PLAN
NOT TO SCALE

DATUM
VERTICAL NGVD 1927
HORIZONTAL ASSUMED

DEFINITIONS (AASHTO)

BEDROCK (LEDGE) -- Rock in its native location of indefinite thickness.

BOULDER -- A rock fragment with an average dimension > 304.8 mm.

COBBLE -- Rock fragments with an average dimension between 76.2 and 304.8 mm.

GRAVEL -- Rounded particles of rock < 76.2 mm and > 2 mm (#10 sieve).

SAND -- Particles of rock < 2 mm (#10 sieve) and > 75μm (#200 sieve).

SILT -- Soil < 75μm (#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 3/20/01 and 4/12/01 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.
6. Terminology used on boring logs to describe the hardness, degree of weathering, and spacing of fractures, joints and other discontinuities in the bedrock is defined in the AASHTO Manual on Subsurface Investigations, 1988.

VANASSE HANGEN BRUSTLIN, INC.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
BORING PLAN	
Designed By VTRANS	Drawn By VTRANS
Checked By S.M. HODGDON Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499BOR	Sheet 17 of 47

PLOTTED 5/15/2006

VAOT Metric

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-1
SHEET 1 OF 1
DATE STARTED: 3/23/01
DATE COMPLETED: 3/29/01

PROJECT NAME: CAVENDISH
SITE NAME: BR 45
STATION: 10+041.00
GROUND EL.: 218.495

PROJECT NUMBER: BRO 1442(23)
SITE NO.: TH 29
OFFSET: 8.00
G.W. DEPTH: 4.20

BORING CREW
CREW CHIEF: TALLMAN
DRILLER: CHABOT
LOGGER: RUSSELL
ADDITIONAL CREW:

BORING RIG: TRUCK
BORING TYPE: WASH BORE
SAMPLE TYPE: SPLIT BARREL

WINGWALL #2 BOTTOM OF FOOTING EL. 213.00

DEPTH	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 0.3 m	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
	BXDC, 1.12m-1.45m, Boulder							
	A-2-4, Sa, gry-brn, Moist, Rec. = 0.33m	R	12.7	17.8	64.8	17.4		
	BXDC, 1.93m-2.39m, Boulder							
	A-1-a, SaGr, brn, Dry, Rec. = 0.25m	83	8.6	56.7	30.6	12.7		
▽								
	A-2-4, SiSaGr, Lt/gry, Dry, Rec. = 0.26m	37	9.9	39.6	32.4	28		
5								
	No Rec.	R						
	A-1-b, SiSaGr, Lt/gry, Dry, Rec. = 0.18m	89	9.1	46.1	33.6	20.3		
	No Rec.	R						
	BXDC, 9.30m-9.61m, Boulder							
10								
	BXDC, 10.01m-11.44m, Boulders							
	BXDC, 11.60m-12.15m, Boulders							
	BXDC, 12.80m-13.10m, Boulders							
	Top of bedrock @ 13.45 m							

DEPTH	CLASSIFICATION OF MATERIALS (Description)	RUN	REC%	RQD%	Dip°
	Run#1: BXMDC, 13.45m-14.82m, Rec. = 1.04m. See Geologist's Report.	1	76	66	20
15	Run#2: BXMDC, 14.82m-16.03m, Rec. = 0.91m. Geologist's Report.	2	75	30	20
16.03	Hole stopped @ 16.03m				

GEOLOGISTS REPORT:
Run#1: Gray-green plagioclase, amphibolite, granodiorite, gneiss. Moderately hard, Unweathered.
Run#2: Same as Run#1, except rock turns reddish-brown at 15.49m.

DRILLERS NOTES:
1. Pulled casing @11.60m, Bit was worn out, Replaced with diamond bit.
2. Run#2 contained many seams.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-2
SHEET 1 OF 1
DATE STARTED: 3/20/01
DATE COMPLETED: 3/21/01

PROJECT NAME: CAVENDISH
SITE NAME: BR 45
STATION: 10+044.00
GROUND EL.: 219.060

PROJECT NUMBER: BRO 1442(23)
SITE NO.: TH 29
OFFSET: 0.00
G.W. DEPTH: 4.08

BORING CREW
CREW CHIEF: TALLMAN
DRILLER: CHABOT
LOGGER: RUSSELL
ADDITIONAL CREW:

BORING RIG: TRUCK
BORING TYPE: WASH BORE
SAMPLE TYPE: SPLIT BARREL

ABUTMENT #1 BOTTOM OF FOOTING EL. 213.00

DEPTH	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 0.3 m	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
	Boulders							
	A-1-b, GrSa, gry, MTW, Rec. = 0.17m	21	21.8	24.4	63.2	12.4		
	A-2-4, Sa, brn, MTW, Rec. = 0.46m	13	22	14.8	69.4	15.8		
	A-1-a, SaGr, gry-brn, Dry, Rec. = 0.20m	R	8.1	61.8	28.1	10.1		
▽								
	A-1-a, SaGr, gry, Moist, Rec. = 0.38m	26	10.1	55.8	32.6	11.6		
5								
	A-2-4, GrSiSa, gry, Moist, Rec. = 0.26m	19	11.8	24	41.8	34.2		
	A-1-b, SiSaGr, gry, Dry, Rec. = 0.27m	46	8.3	49.5	29.2	21.3		
	A-2-4, SiGrSa, gry, Moist, Rec. = 0.41m	78	10.1	36.7	37.7	25.6		
	A-2-4, GrSiSa, gry, Moist, Rec. = 0.43m	62	13	29.1	41.4	29.5		
	A-1-b, SaGr, gry, Dry, Rec. = 0.27m	92	8.5	50.2	33.4	16.4		
10								
	BXDC, 10.25m-10.50m Boulder							
	A-1-b, SaGr, gry, Dry, Rec. = 0.16m	R	9.7	44.2	44	11.8		
	BXDC, 11.45m-12.15m, Boulder							
	Top of bedrock @ 12.64 m							

DEPTH	CLASSIFICATION OF MATERIALS (Description)	RUN	REC%	RQD%	Dip
	Run#1: BXMDC, 12.64m-14.16m, Rec. = 1.44m, See Geologist's Report.	1	95	95	20
15	Run#2: BXMDC, 14.16m-15.68m, Rec. = 1.50m, See Geologist's Report.	2	98	98	20
16	Hole stopped @ 15.68m				

GEOLOGISTS REPORT:

Run#1: Gray-green plagioclase, biotite, amphiboute, granodiorite, gneiss. Moderately hard, Unweathered, Competent.

Run#2: Same as Run#1, but less biotite and more amphibolite. Moderately hard, Unweathered, Competent.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-3
SHEET 1 OF 1
DATE STARTED: 3/29/01
DATE COMPLETED: 4/3/01

PROJECT NAME: CAVENDISH
SITE NAME: BR 45
STATION: 10+041.00
GROUND EL.: 219.891

PROJECT NUMBER: BRO 1442(23)
SITE NO.: TH 29
OFFSET: -5.00
G.W. DEPTH: 4.11

BORING CREW
CREW CHIEF: TALLMAN
DRILLER: CHABOT
LOGGER: RUSSELL
ADDITIONAL CREW:

BORING RIG: TRUCK
BORING TYPE: WASH BORE
SAMPLE TYPE: SPLIT BARREL

WINGWALL #1 BOTTOM OF FOOTING EL. 213.00

DEPTH	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 0.3 m	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
	A-4, SiSa, brn, MTW, Rec. = 0.48m	9	27.2	2.3	56.9	40.8		
	Possible Boulder, No Rec.	R						
▽								
	BXDC, 3.90m-4.50m, Boulder							
	A-4, GrSaSi, Lt/gry, Moist, Rec. = 0.30m	26	12.1	22.2	38.5	39.3		
5								
	A-2-4, GrSiSa, Lt/gry, Moist, Rec. = 0.26m	45	10.6	28.1	39.3	32.6		
	A-2-4, SiGrSa, gry, Moist, Rec. = 0.30m	R	10.2	32.2	38.6	29.2		
	BXDC, 8.75m-9.00m, Boulder							
	A-1-b, SaGr, gry, Dry, Rec. = 0.24m	R	8.6	46.1	37.7	16.2		
10								
	A-1-b, SiGrSa, gry, Dry, Rec. = 0.16m	R	9	34.3	43	22.7		
	Top of bedrock @ 11.58 m							

DEPTH	CLASSIFICATION OF MATERIALS (Description)	RUN	REC%	RQD%	Dip°
	Run#1: BXMDC, 11.58m-13.10m, Rec. = 0.97m, See Geologist's Report.	1	64	55	50
	Run#2: BXMDC, 13.10m-14.62m, Rec. = 1.30m, See Geologist's Report.	2	86	86	50
	Hole stopped @ 14.62m				

GEOLOGISTS REPORT:

Run#1: White to gray plagioclase, biotite, granodiorite, gneiss. Moderately hard, Unweathered.

Run#2: Same as Run#1, but biotite rich zone between 13.10m and 13.44m. Also between 14.30m and 14.62m, Competent.

DATUM
VERTICAL NGVD 1927
HORIZONTAL ASSUMED

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta. / Surv. Sta.
TH 29 OVER BLACK RIVER	
BORING LOGS (1 OF 2)	
Designed By VTRANS	Drawn By VTRANS
Checked By S. M. HODGDON Date 5/06	Bridge Design Supervisor C. D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499B1	Sheet 18 of 47

PLOTTED 5/15/2006

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-4
SHEET 1 OF 1
DATE STARTED: 4/11/01
DATE COMPLETED: 4/12/01

PROJECT NAME: CAVENDISH
SITE NAME: BR 45
STATION: 10+078.00
GROUND EL.: 216.792

PROJECT NUMBER: BRO 1442(23)
SITE NO.: TH 29
OFFSET: 8.00
G.W. DEPTH:

BORING CREW
CREW CHIEF: TALLMAN
DRILLER: TALLMAN
LOGGER: RUSSELL
ADDITIONAL CREW:

BORING RIG: SKID RIG
BORING TYPE: WASH BORE
SAMPLE TYPE: SPLIT BARREL

WINGWALL #4 BOTTOM OF FOOTING EL. 213.00

ABUTMENT #2 BOTTOM OF FOOTING EL. 213.00

DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 0.3 m	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
		BXDC, 1.37m-2.13m, Boulders							
		BXDC, 2.13m-2.74m, Boulders							
		BXDC, 2.74m-3.35m, Boulders							
		Top of bedrock @ 3.35 m							
			RUN	REC%	RQD%	Dip°			
		Run#1: BXMDC, 3.35m-4.87m, Rec. = 0.51m, See Geologist's Report.	1	34	18	75			
5		Run#2: BXMDC, 4.87m-6.39m, Rec. = 1.00m, See Geologist's Report.	2	66	50	50			
		Run#3: BXMDC, 6.39m-7.30m, Rec. = 0.16m, See Geologist's Report.	3	18	0	50			
		Hole stopped @ 7.30m							
10									

GEOLOGISTS REPORT:

Run#1: Light gray plagioclase, granodiorite gneiss. Moderately hard, Unweathered, Poor competency.

Run#2: Same as Run#1, but 0.17m thick black biotite rich zone at 4.95m.

Run#3: Same as Run#1, Poor competency.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-5
SHEET 1 OF 1
DATE STARTED: 4/5/01
DATE COMPLETED: 4/10/01

PROJECT NAME: CAVENDISH
SITE NAME: BR 45
STATION: 10+074.00
GROUND EL.: 216.311

PROJECT NUMBER: BRO 1442(23)
SITE NO.: TH 29
OFFSET: 0.00
G.W. DEPTH: 0.00

BORING CREW
CREW CHIEF: TALLMAN
DRILLER: TALLMAN
LOGGER: RUSSELL
ADDITIONAL CREW:

BORING RIG: SKID RIG
BORING TYPE: WASH BORE
SAMPLE TYPE: SPLIT BARREL

WINGWALL #3 BOTTOM OF FOOTING EL. 213.00

DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 0.3 m	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
▽		BXDC, 1.06m-1.37m, Boulder							
		A-1-b, SaGr, brn, MTW, Rec. = 0.05m	R	23.2	57	34.7	8.3		
		BXMDC, 1.88m-2.80m, Boulders							
		Top of bedrock @ 3.00 m							
			RUN	REC%	RQD%	Dip°			
		Run#1: BXMDC, 3.00m-4.01, Rec. = 0.80m, See Geologist's Report.	1	60	60	—			
5		Run#2: BXMDC, 4.01m-5.22, Rec. = 0.82m, See Geologist's Report.	2	68	31	—			
		Run#3: BXMDC, 5.22m-6.43, Rec. = 0.76m, See Geologist's Report.	3	63	0	—			
		Hole stopped @ 6.43m							
10									

GEOLOGISTS REPORT:

Run#1: White granitic dike, Very hard, Unweathered.

Run#2: Same as Run#1, Poor competency.

Run#3: Same as Run#1, Poor competency.

STATE OF VERMONT
AGENCY OF TRANSPORTATION
MATERIALS & RESEARCH DIVISION
SUBSURFACE INFORMATION

HOLE NO.: B-6
SHEET 1 OF 1
DATE STARTED: 4/4/01
DATE COMPLETED: 4/4/01

PROJECT NAME: CAVENDISH
SITE NAME: BR 45
STATION: 10+079.00
GROUND EL.: 219.064

PROJECT NUMBER: BRO 1442(23)
SITE NO.: TH 29
OFFSET: -6.00
G.W. DEPTH: 4.13

BORING CREW
CREW CHIEF: TALLMAN
DRILLER: CHABOT
LOGGER: RUSSELL
ADDITIONAL CREW:

BORING RIG: TRUCK
BORING TYPE: WASH BORE
SAMPLE TYPE: SPLIT BARREL

DEPTH	SYMBOL	CLASSIFICATION OF MATERIALS (Description)	BLOWS PER 0.3 m	M.C. %	GRAVEL %	SAND %	FINES %	LL	PI
		A-1-a, Gr, brn-gry, Dry, Rec. = 0.06m	R	6.2	81.4	16.3	2.3		
		A-2-4, Sa, brn-gry, MTW, Rec. = 0.23m	2	33.6	3.6	78.8	17.6		
		Top of bedrock @ 3.96 m							
▽			RUN	REC%	RQD%	Dip°			
		Run#1: BXMDC, 3.96m-5.48m, Rec. = 1.21m, See Geologist's Report.	1	80	80	35			
5		Run#2: BXMDC, 5.48m-6.85m, Rec. = 1.26m, See Geologist's Report.	2	92	92	35			
		Hole stopped @ 6.85m							
10									

GEOLOGISTS REPORT:

Run#1: Light gray plagioclase, garnet, muscovite, granodiorite, gneiss. Moderately hard, Unweathered, Competent.

Run#2: Same as Run#1, but becoming biotite rich from 6.35m to end of Run. Competent.

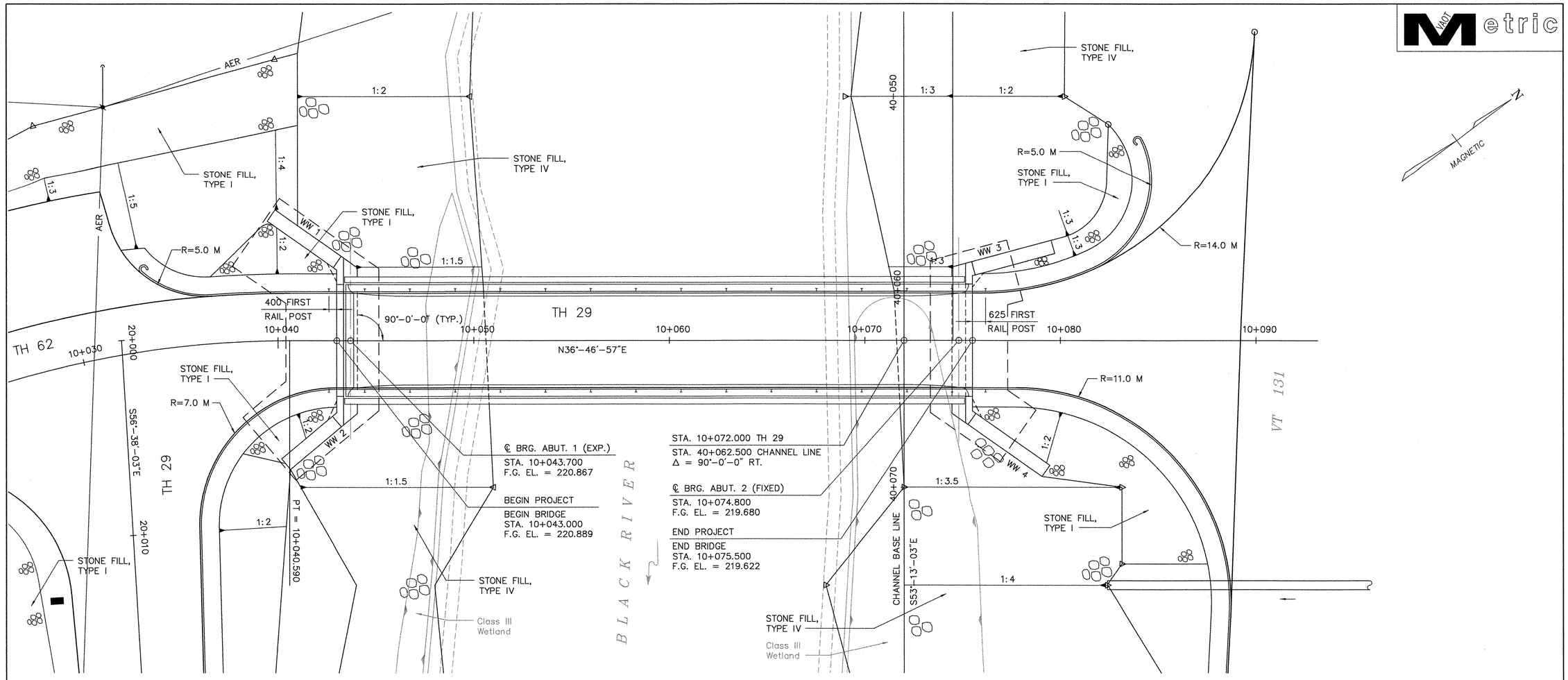
DATUM
VERTICAL NGVD 1927
HORIZONTAL ASSUMED

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
BORING LOGS (2 OF 2)	
Designed By VTRANS	Drawn By VTRANS
Checked By Date S. M. HODGDON 5/06	Bridge Design Supervisor C. D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499B2	Sheet 19 of 47

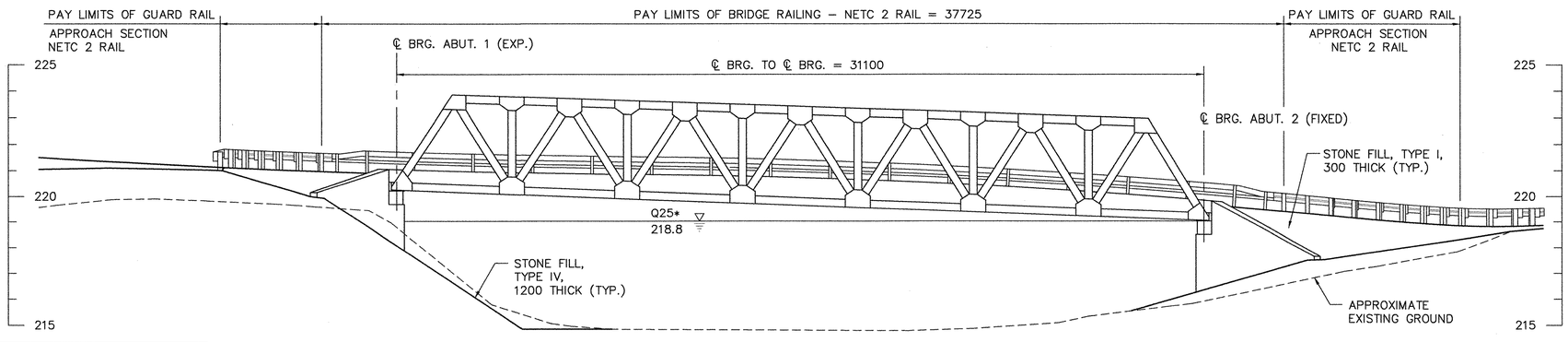
PLOTTED 5/15/2006

VAOT Metric



PLAN
SCALE: 1:100

0 2 4 6 8 10
GRAPHIC SCALE
(IN METERS)



ELEVATION
SCALE: 1:100

* WATER SURFACE ELEVATION 30.5 m UPSTREAM OF BRIDGE

NOTES:

1. SIGNING, STRIPING AND ROADWAY WIDTH TRANSITIONS AND RADII SHOWN ON SHEET 12 OF 41.
2. CONNECTION OF THE NEW HEAVY DUTY STEEL BEAM GUARD RAIL AT STA 10+088.1, RT 23.1 SHALL BE AT THE DIRECTION OF THE RESIDENT ENGINEER.
3. PAY LIMITS SHOWN FOR BRIDGE RAILING AND APPROACH SECTIONS ARE SCHEMATIC.

DATUM
VERTICAL NGVD 1927
HORIZONTAL ASSUMED

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta. / Surv. Sta.
TH 29 OVER BLACK RIVER	
BRIDGE PLAN & ELEVATION	
Designed By S.M. HODGDON	Drawn By C.L. CILLEY
Checked By W.M. MOSHER Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499GNP	Sheet 20 of 47

VANASSE HANGEN BRUSTLIN, INC.

PLOTTED 5/15/2006

GENERAL NOTES

1. ALL MATERIAL AND CONSTRUCTION SHALL CONFORM TO THE STATE OF VERMONT AGENCY OF TRANSPORTATION "STANDARD SPECIFICATIONS FOR CONSTRUCTION", 2001 AND ITS LATEST REVISIONS AND AASHTO "STANDARD SPECIFICATION FOR HIGHWAY BRIDGES", 17TH EDITION AND ITS LATEST REVISIONS.

2. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL UNLESS OTHERWISE NOTED.

3. THERE ARE NO PLANS AVAILABLE OF THE EXISTING BRIDGE.

4. THE EXISTING BRIDGE SHALL BE SAVED FOR POTENTIAL ADAPTIVE REUSE. THE CONTRACTOR SHALL CAREFULLY DISMANTLE THE TRUSS (INCLUDING ALL TRUSS MEMBERS, UPPER CHORD BRACING AND PORTALS, PINS, AND ORIGINAL FLOOR BEAM HANGERS) AND TRANSPORT THEM TO THE TOWN MAINTENANCE YARD. THE CONTRACTOR SHALL UNLOAD THE PIECES AT THE YARD AND STACK THEM FOR STORAGE AS DIRECTED. CONTACT THE TOWN MANAGER, RICHARD SVEC AT 802-226-7292 TO COORDINATE STORAGE AT THE TOWN MAINTENANCE YARD. PRIOR TO DISASSEMBLY, THE CONTRACTOR SHALL PROVIDE A DETAILED ERECTION PLAN OF THE EXISTING TRUSS AND SUBMIT IT TO THE ENGINEER FOR APPROVAL. THE PLAN SHALL CONTAIN THE NECESSARY SKETCHES, MEMBER MARKINGS, AND NOTES THAT WOULD ALLOW FUTURE REASSEMBLY OF THE COMPLETE TRUSS. THE REMAINING PIECES OF THE EXISTING BRIDGE INCLUDING THE FLOOR BEAMS, STRINGERS, LOWER LATERAL BRACING, DECKING, RAILS, AND SUPPLEMENTAL GIRDER AND FLOOR BEAMS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE. PAYMENT FOR REMOVAL, TRANSPORT, UNLOADING, ERECTION PLAN, AND OTHER ITEMS ASSOCIATED WITH BRIDGE REMOVAL SHALL BE INCIDENTAL TO ITEM 529.15, REMOVAL OF STRUCTURE.

   THE EXISTING ABUTMENT STONES AND WALL STONES SHALL REMAIN THE PROPERTY OF THE TOWN. THE CONTRACTOR SHALL REMOVE THE STONES AND LOAD THEM ONTO TOWN SUPPLIED TRUCKS AT THE SITE. CONTACT THE TOWN MANAGER, RICHARD SVEC AT 802-226-7292 TO COORDINATE TRUCKING. PAYMENT FOR REMOVAL OF THE STONES IS INCLUDED IN ITEM 203.27, UNCLASSIFIED CHANNEL EXCAVATION. PAYMENT FOR STOCKPILING AND LOADING WILL BE INCIDENTAL TO ITEM 203.27.

5. DESIGN SPECIFICATIONS:
   STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 17TH EDITION AND ITS LATEST REVISIONS BY THE AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO).

6. DESIGN LIVE LOAD: AASHTO MS 22.5 TRUCK

7. THE CONTRACTOR SHALL TAKE PRECAUTIONS TO PREVENT DEBRIS FROM FALLING INTO THE RIVER DURING CONSTRUCTION.

8. TRAFFIC DURING CONSTRUCTION SHALL BE MAINTAINED ON THE EXISTING ONE LANE BRIDGE. PAYMENT FOR THIS WORK SHALL BE MADE UNDER ITEM 527.10 MAINTENANCE OF TRAFFIC FOR BRIDGE PROJECTS (MOD.).

9. TEMPORARY PROTECTIVE FENCING SHALL BE PLACED ON RIGHT-OF-WAY LINES AT FIELD DRIVE OPENING AT STA 20+030 RT TO 20+033 RT. COST INCLUDED IN ITEM 620.70 (MOD. - ARCH).

CONCRETE NOTES

1. THE MINIMUM COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS:

FOOTINGS	80 mm
BACK FACE OF ABUTMENTS AND WINGWALLS	50 mm
OTHER SUBSTRUCTURE LOCATIONS (UNLESS NOTED)	75 mm
CURBS	75 mm
TOP OF CONCRETE DECK	65 mm
BOTTOM OF CONCRETE DECK	40 mm
OTHER SUPERSTRUCTURE LOCATIONS (UNLESS NOTED)	75 mm

2. REINFORCING PLACING TOLERANCES SHALL BE:
   SPACING +/- 25
   CLEARANCE +/- 5

3. THE KEY IN CONCRETE CONSTRUCTION JOINTS SHALL BE MONOLITHIC AND CONTINUOUS FOR THE FULL LENGTH OF THE JOINT.

4. JOINTS AND SCOREMARKS IN THE CONCRETE SHALL BE CONSTRUCTED AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

5. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 25 mm x 25 mm.

6. CONCRETE CLASSES ARE AS FOLLOWS:

CLASS	LOCATION
HPC - A	DECK AND CURBS
HPC - B	ALL OTHER CONCRETE

7. THE TOP SURFACES OF BRIDGE SEAT PEDESTALS UNDER THE BEARING DEVICES SHALL BE LEVEL. OTHER BRIDGE SEAT AREAS SHALL BE SLOPED AS SHOWN IN THE PLANS. THE ENTIRE BRIDGE SEAT SURFACE SHALL BE SMOOTH WITH A MAGNESIUM FLOAT FINISH.

8. WATER REPELLENT (MOD. - SILANE) SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES EXCEPT THE UNDERSIDE OF THE DECK BETWEEN DRIP NOTCHES.

CONCRETE NOTES CONTINUED:

9. BOTTOM OF DECK SLAB (OR TOP OF FORM) ELEVATIONS, ALONG EACH STRINGER AT ONE METER INTERVALS, SHALL BE COMPUTED BY THE TRUSS MANUFACTURER AND SHOWN ON THE FABRICATION DRAWINGS. ELEVATIONS SHALL BE PROVIDED AT EACH FLOORBEAM AND MUST CONSIDER TRUSS DEFLECTIONS DUE TO THE FULL DEAD LOAD.

10. THE CONTRACTOR MAY USE PERMANENT CORRUGATED METAL (STAY-IN-PLACE) FORMS FOR THE BRIDGE DECK IF THE CONTRACTORS DESIGN ENGINEER ALLOWS. STAY-IN-PLACE FORMS SHALL CONFORM TO THE LATEST SPECIFICATIONS OF ASTM A653/A653M, GRADES A THRU E, COATING DESIGNATION G165. FABRICATION SHALL CONFORM TO ASTM A924/A924M.

PREFABRICATED TRUSS BRIDGE NOTES

1. THE PREFABRICATED STEEL TRUSS, TO BE PROVIDED UNDER ITEM 506.75, STRUCTURAL STEEL (PREFABRICATED TRUSS), SHALL BE DESIGNED, DETAILED, FABRICATED, TRANSPORTED TO THE SITE, AND ERECTED BY THE MANUFACTURER/CONTRACTOR.

2. THE NEW BRIDGE SHALL BE A SINGLE SPAN TRUSS MEETING THE FOLLOWING GEOMETRIC CRITERIA:
   a. MUST BE A PONY TYPE TRUSS, I.E. NO CONNECTION BETWEEN THE TOP CHORDS OF THE TWO TRUSSES.
   b. MUST CONFORM TO THE LINE, GRADE, SPAN, AND WIDTH AS SHOWN ON THE PLANS
   c. FLOOR-SYSTEM MUST NOT EXTEND BELOW THE BOTTOM CHORD.
   d. LOWEST STEEL ELEVATION OF STRUCTURE (EXCLUDING BEARINGS) SHALL BE AT OR ABOVE EL. 218.8.
   e. MUST HAVE END FLOOR BEAMS AND THE END FLOOR BEAM BOTTOM FLANGE WIDTH SHALL BE LESS THAN OR EQUAL TO 250 mm.
   f. TRUSSES MUST BE CAMBERED FOR FULL DEAD LOAD WITH A RESIDUAL CAMBER OF APPROXIMATELY 30 mm.
   g. MAXIMUM CENTER TO CENTER TRUSS SPACING OF 6500 mm

3. ALL STEEL IN THE NEW TRUSS SHALL CONFORM TO AASHTO M 270M/M270 GRADE 345, GALVANIZED PER SECTION 506.15(a). HIGH STRENGTH BOLTS, NUTS, AND CIRCULAR WASHERS SHALL CONFORM TO M 164M (ASTM A325), TYPE I, GALVANIZED. GALVANIZING SHALL BE PAID UNDER ITEM 506.75. ANY SURFACES DAMAGED BEFORE ACCEPTANCE OF THE WORK SHALL BE REPAIRED AS REQUIRED BY THE SPECIFICATIONS.

4. FABRICATION DRAWINGS, DESIGN CALCULATIONS, AND WELD PROCEDURES MUST BE PROVIDED (6 WEEKS PRIOR TO FABRICATION OF THE TRUSS) TO THE STRUCTURES ENGINEER FOR HIS INFORMATION AND REVIEW. THE DESIGN CALCULATIONS FOR THE TRUSS, BEARINGS, BEAM PROFILES, DECK SLAB, AND STAY-IN-PLACE FORMS SHALL BE STAMPED AND SIGNED BY A LICENSED PROFESSIONAL ENGINEER (STRUCTURAL OR CIVIL). THE FABRICATION DRAWINGS SHALL INCLUDE ALL TRUSS DEAD LOAD DEFLECTION AND CAMBER INFORMATION AND SHALL BE STAMPED WITH THE CONTRACTOR'S DESIGN ENGINEER'S SHOP DRAWING APPROVAL STAMP OR SHALL BEAR THE ENGINEER'S STAMP AND SIGNATURE.

5. THE DECK SLAB SHALL BE DESIGNED AND DETAILED BY THE MANUFACTURER/CONTRACTOR. THE MINIMUM SLAB THICKNESS SHALL BE 220 mm AND THE MINIMUM REINFORCEMENT SHALL BE #16 @ 300 mm IN EACH DIRECTION. ADDITIONAL REINFORCING BARS SHALL BE PROVIDED FOR DECK ENDS, CURBS, AND AT RAIL POST LOCATIONS AS SHOWN ON THE PLANS. COST FOR DECK SLAB AND CURBS SHALL BE PAID UNDER ITEM 501.33, "CONCRETE, HIGH PERFORMANCE CLASS A." ALL REINFORCING STEEL IN THE DECK SLAB AND CURBS SHALL BE EPOXY COATED AND PAID UNDER ITEM 507.17, "EPOXY COATED REINFORCING STEEL." HOWEVER, FINAL QUANTITIES AND PAYMENT WILL BE BASED ON THE ESTIMATED QUANTITY SHOWN IN THE PLANS. NO MEASUREMENT OR PAYMENT WILL BE MADE FOR ADDITIONAL EPOXY COATED REINFORCING STEEL.

6. THE BEARINGS FOR THE NEW TRUSS SHALL BE SELECTED, DESIGNED, AND INSTALLED BY THE CONTRACTOR. BEARING DEVICES SHALL CONFORM TO THE APPLICABLE SUBSECTIONS OF 531 AND 731. EXPANSION BEARINGS SHALL BE ADJUSTED FOR TEMPERATURE AS SHOWN ON THE FABRICATION DRAWINGS. BEARING DEVICES SHALL BE INCIDENTAL TO ITEM 506.75.

7. ANY LOAD PLATES USED IN THE BEARING DEVICES SHALL BE A MINIMUM OF 25 mm THICK.

8. DETAILS REQUIRED FOR THE ATTACHMENT OF THE EXPANSION JOINT BRACKET PLATES TO THE TRUSS FLOORSYSTEM AT THE EXPANSION END OF THE BRIDGE SHALL BE SUPPLIED BY THE MANUFACTURER.

9. THE CONTRACTOR/MANUFACTURER SHALL FURNISH FINAL CONCRETE PEDESTAL ELEVATIONS ON THE FABRICATION DRAWINGS FOR EACH ABUTMENT BASED ON THE ACTUAL THICKNESS OF THE BRIDGE AND HEIGHT OF THE BEARINGS.

10. THE CONTRACTOR'S DESIGN ENGINEER SHALL PROVIDE STAMPED LOAD RATING CALCULATIONS AND SHALL COMPLETE THE "LOAD FACTOR RATING (METRIC TONNES)" TABLE ON SHEET 2. CONTACT THE STRUCTURES SECTION PROJECT MANAGER, MARTHA EVANS-MONGEON, AT (802) 828 - 0514, FOR INFORMATION ON TRUCK CONFIGURATIONS.

11. THE CONTRACTOR SHALL ADHERE TO ALL INSTRUCTIONS FROM THE TRUSS SUPPLIER REGARDING ERECTION AND FIELD CONNECTIONS.

12. TRANSVERSE FLOORBEAMS SHALL HAVE 19 mm X 150 mm STUD SHEAR CONNECTORS WELDED TO TOP FLANGES AT 100 mm ON CENTERS AS A MINIMUM. COST SHALL BE INCIDENTAL TO THE PREFABRICATED TRUSS ITEM.

EXPANSION JOINT NOTES:

1. THE ITEM "BRIDGE EXPANSION JOINT (VERMONT)" SHALL INCLUDE THE FABRICATION AND ERECTION OF THE COMPLETE JOINT ASSEMBLY INCLUDING ALL PLATES, BRACKETS, ANGLES, WELDED STUDS, RODS, PREFORMED FABRIC DRAIN TROUGH, BUTYL RUBBER TAPE, HOT POURED JOINT SEALANT, AND ANY OTHER MISCELLANEOUS MATERIALS NECESSARY TO COMPLETE THE WORK.

2. THE FINAL FINISH OF THE EXPANSION DEVICE SHALL BE COVERED DURING THE PLACEMENT OF THE DECK CONCRETE.

3. THE 203 X 102 SUPPORT ANGLES SHALL BE FURNISHED IN ONE CONTINUOUS PIECE EACH SIDE OF THE JOINT. THE 30 X 140 TRANSVERSE JOINT BARS SHALL BE PROVIDED IN TWO EQUAL LENGTHS EACH SIDE OF THE BRIDGE CENTERLINE.

4. FILL COUNTERBORED HOLES IN JOINT BARS WITH HOT POURED JOINT SEALER AFTER BOLT INSTALLATION. JOINT SEALER SHALL CONFORM TO SUBSECTION 707.04(a).

5. A DRIP BEAD OF POLYURETHANE JOINT SEALER SHALL BE APPLIED TO THE BOTTOM OF THE FABRIC AS SHOWN IN THE PLANS. THE DRIP BEAD SHALL BE APPLIED COMPLETELY AROUND THE CIRCUMFERENCE OF THE HOLE (AT THE CENTER OF THE TROUGH ABOVE THE HOPPER) AT A DISTANCE OF 25 mm BACK FROM THE EDGE OF THE HOLE.

6. FABRIC TROUGH ASSEMBLY SHALL BE THOROUGHLY CLEANED AND FLUSHED AFTER PAVING OPERATIONS.

VAST Metric

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta. / Surv. Sta.
TH 29 OVER BLACK RIVER	

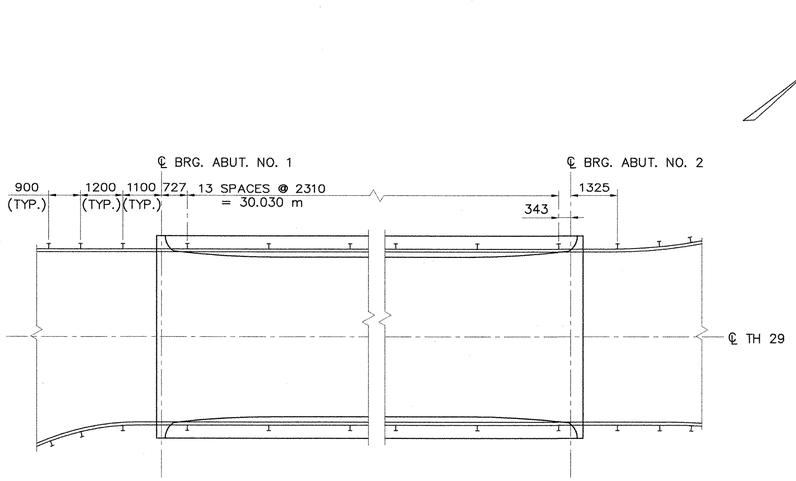
GENERAL CONSTRUCTION NOTES

Designed By S.M. HODGDON	Drawn By N.J. HOYT
Checked By S.W. JOHNSON Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499GCN	Sheet 21 of 47

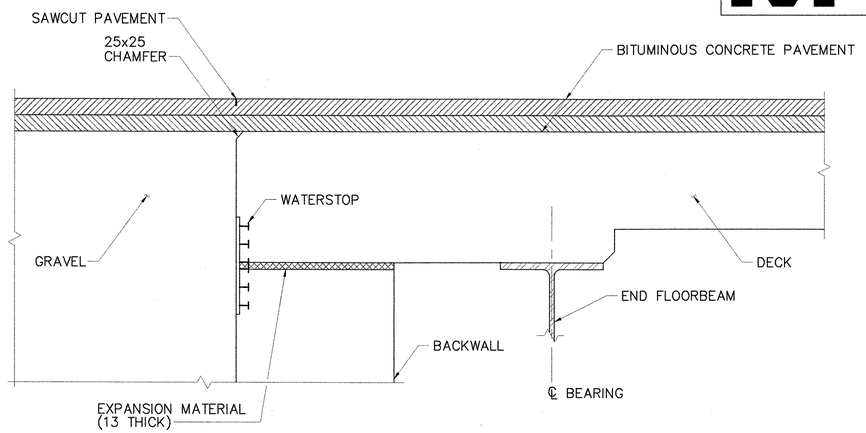
VANASSE HANGEN BRUSTLIN, INC.

PLOTTED 5/26/2006

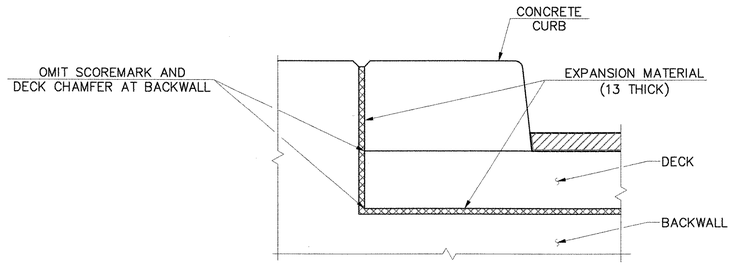
VAOT Metric



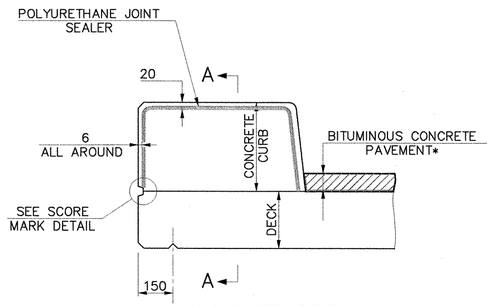
BRIDGE RAIL LAYOUT
NOT TO SCALE



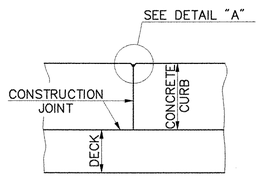
ABUTMENT NO. 2 DECK END SECTION
NOT TO SCALE



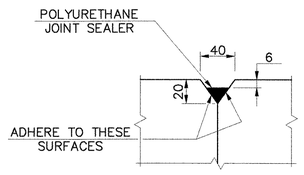
ABUTMENT NO. 2 DECK END ELEVATION
NOT TO SCALE



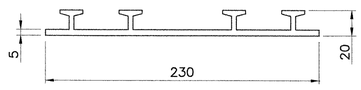
SECTION AT CURB CONSTRUCTION JOINT
NOT TO SCALE



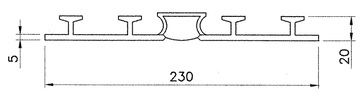
SECTION A–A
NOT TO SCALE



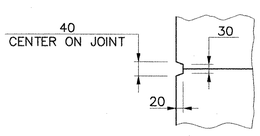
DETAIL "A"
NOT TO SCALE



P.V.C. WATERSTOP FOR CONSTRUCTION JOINTS
NOT TO SCALE



P.V.C. WATERSTOP FOR EXPANSION JOINTS
NOT TO SCALE



SCORE MARK DETAIL
NOT TO SCALE

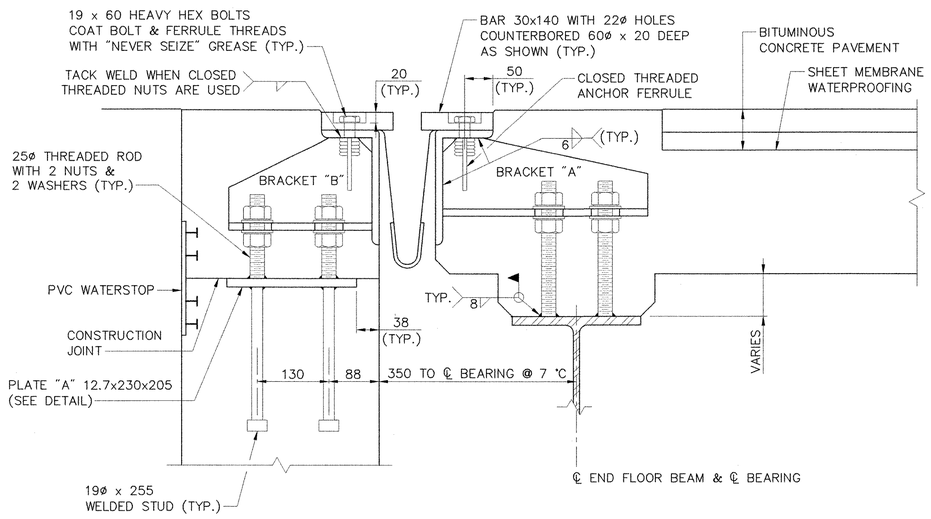
NOTES:

1. CONSTRUCTION JOINTS THROUGH CONCRETE CURBS SHALL BE PLACED OVER EVERY FLOOR BEAM AND SHALL BE SPACED MAXIMUM 4500 mm CENTER TO CENTER AND SHALL BE 450 mm MINIMUM FROM THE CENTER OF THE NEAREST BRIDGE RAIL POST. CONCRETE SHALL BE PLACED IN ALTERNATING SECTIONS WITH A MINIMUM OF 48 HOURS DELAY BETWEEN ADJACENT POURS.
2. LONGITUDINAL REINFORCING SHALL PASS THROUGH CONCRETE CURB CONSTRUCTION JOINTS.
3. POLYURETHANE JOINT SEALER SHALL BE APPLIED PER SUBSECTION 524.06D. COLOR TO MATCH CONCRETE. COST TO BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

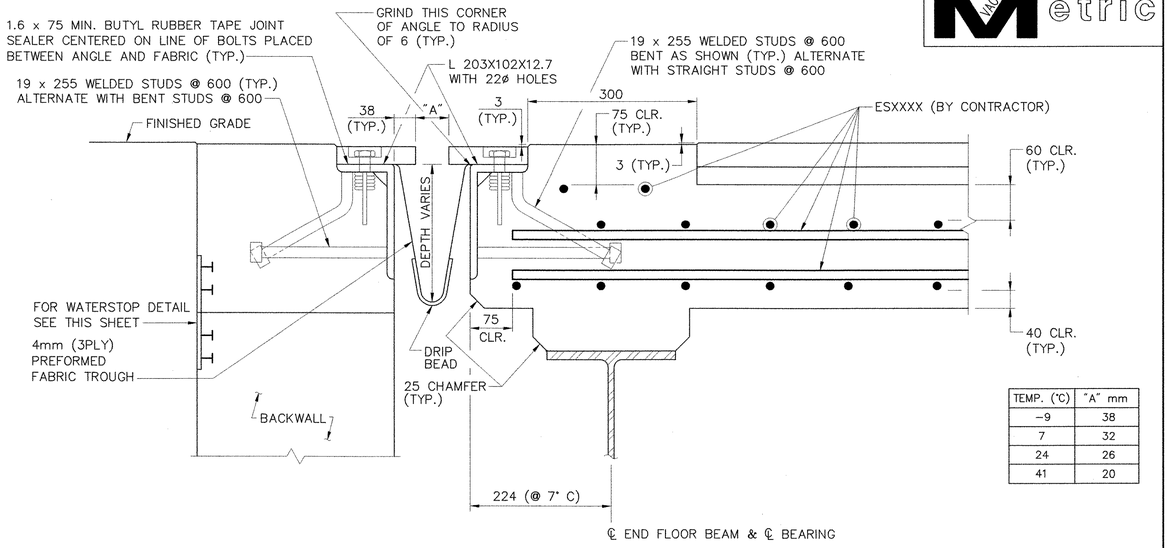
Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta. / Surv. Sta.
TH 29 OVER BLACK RIVER	
BRIDGE DETAILS SHEET	
Designed By S.M. HODGDON	Drawn By M.M. LANDREY
Checked By S.M. HODGDON Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
VANASSE HANGEN BRUSTLIN, INC.	Bridge Sheet No. 50499BDD Sheet 22 of 47

PLOTTED 5/15/2006



EXPANSION JOINT AT BRACKETS

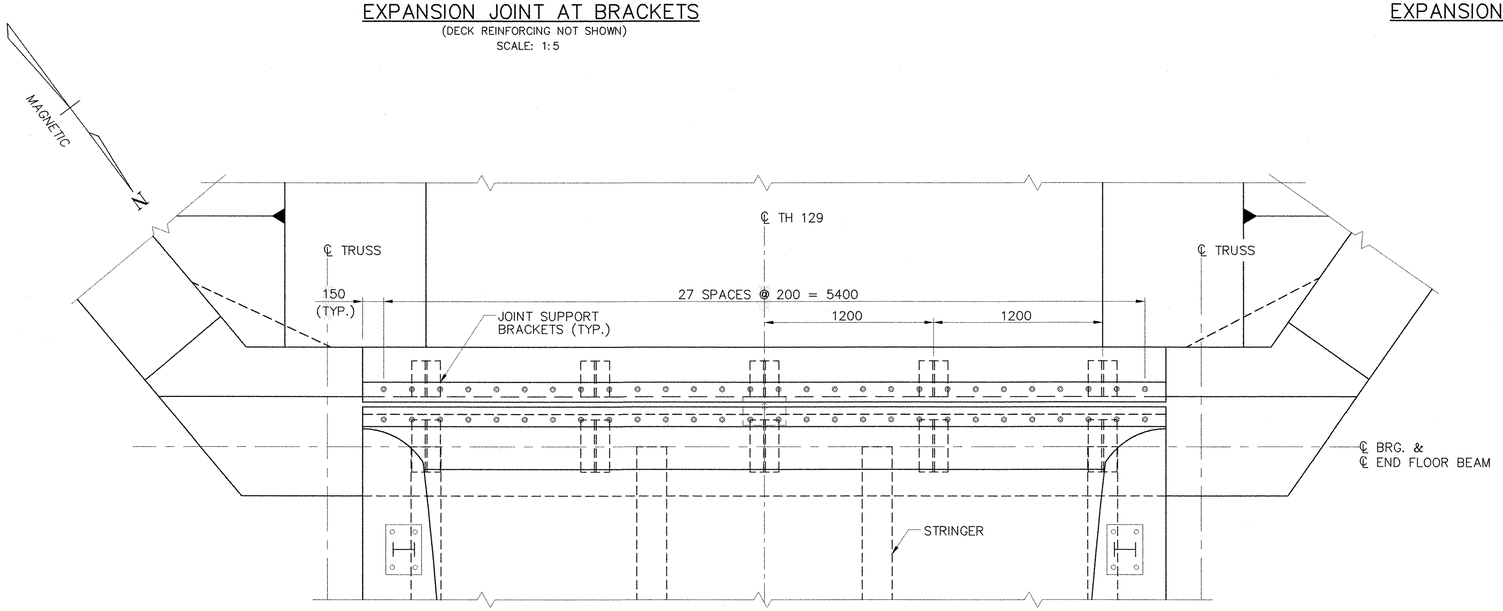
(DECK REINFORCING NOT SHOWN)
SCALE: 1:5



TEMP. (°C)	"A" mm
−9	38
7	32
24	26
41	20

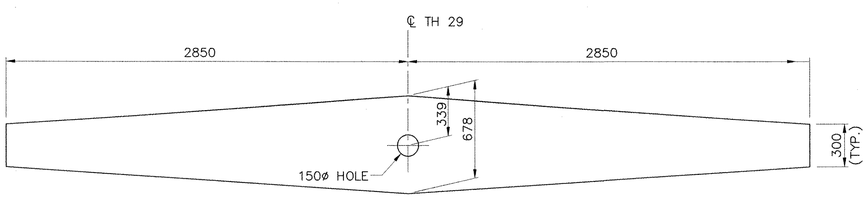
EXPANSION JOINT BETWEEN BRACKETS

SCALE: 1:5



EXPANSION JOINT PLAN

(TRUSS PEDESTALS AND RAILING NOT SHOWN)
SCALE: 1:20



PLAN VIEW OF FABRIC FOR TROUGH

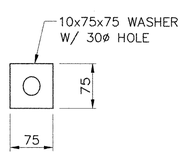
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ANCHOR FERRULE DETAIL

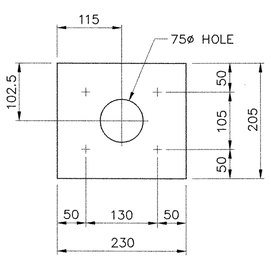
SCALE: 1:5

NOTE:
CLOSED THREADED FERRULE NUTS
WITHOUT ANCHOR LOOPS MAY BE USED.



BRACKET WASHER

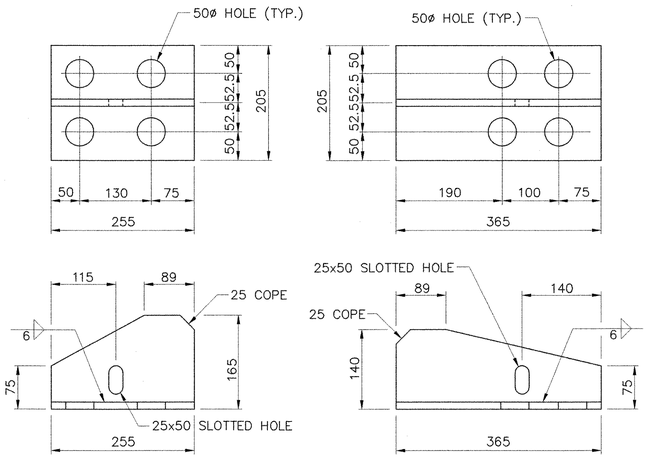
SCALE: 1:5



* DO NOT GALVANIZE THIS PLATE

PLATE "A" DETAIL*

SCALE: 1:5
(WELDED STUDS NOT SHOWN)



BRACKET "B"

BRACKET "A"

EXPANSION JOINT BRACKETS

SCALE: 1:5

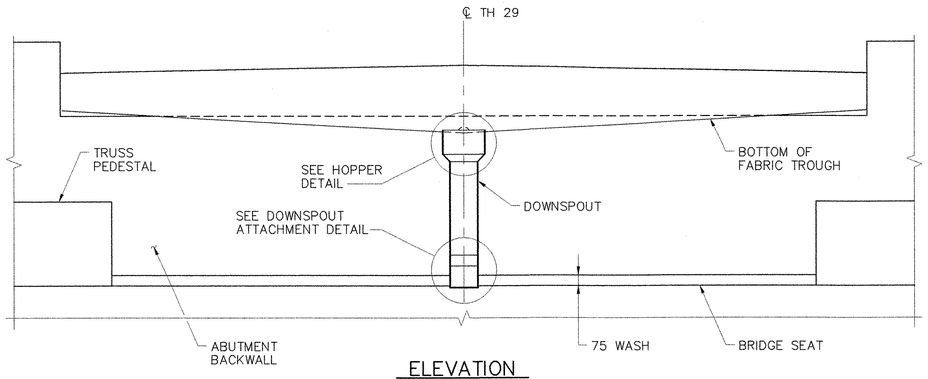
NOTE:
FOR EXPANSION JOINT NOTES, SEE SHEET 21.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
EXPANSION JOINT DETAILS	
Designed By S.M. HODGDON	Drawn By C.L. CILLEY
Checked By M.M. LANDREY Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499EJ	Sheet 23 of 47

VANASSE HANGEN BRUSTLIN, INC.

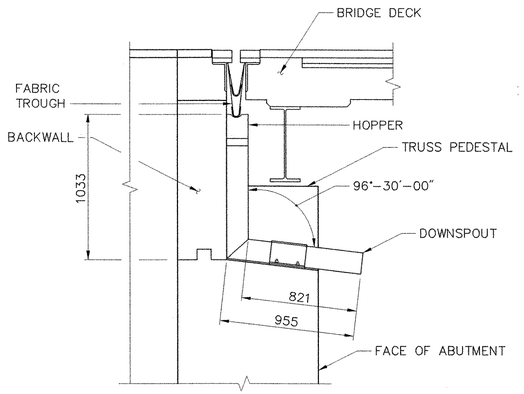
PLOTTED 5/15/2006



ELEVATION

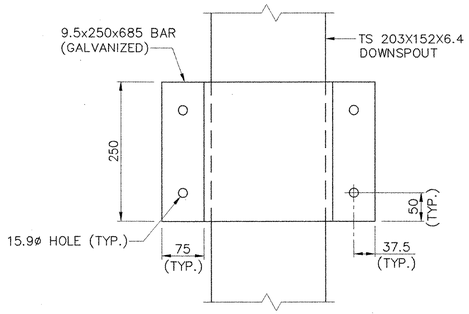
(FLOORBEAM AND DOWNSPOUT ATTACHMENT NOT SHOWN)

SCALE: 1:20

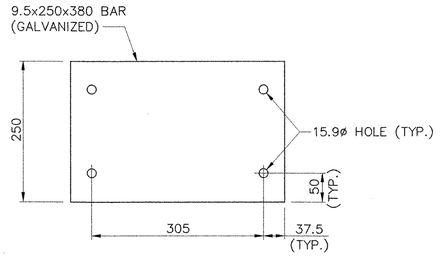


SIDE VIEW

SCALE: 1:20



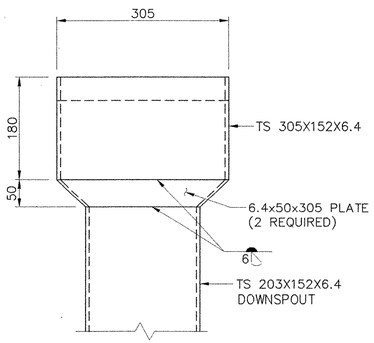
ELEVATION BAR "A"



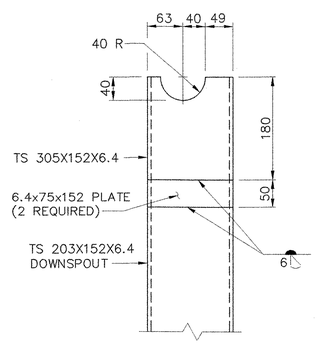
ELEVATION BAR "B"

BAR DETAILS

SCALE: 1:5



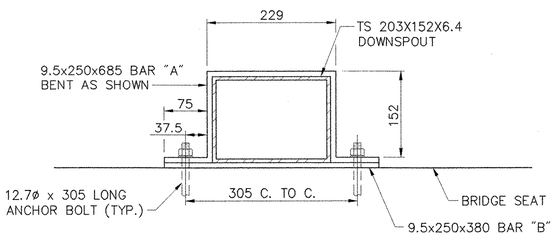
ELEVATION



SIDE VIEW

HOPPER DETAIL

SCALE: 1:5



DOWNSPOUT TO ABUTMENT ATTACHMENT DETAIL

SCALE: 1:5

DOWNSPOUTS NOTES:

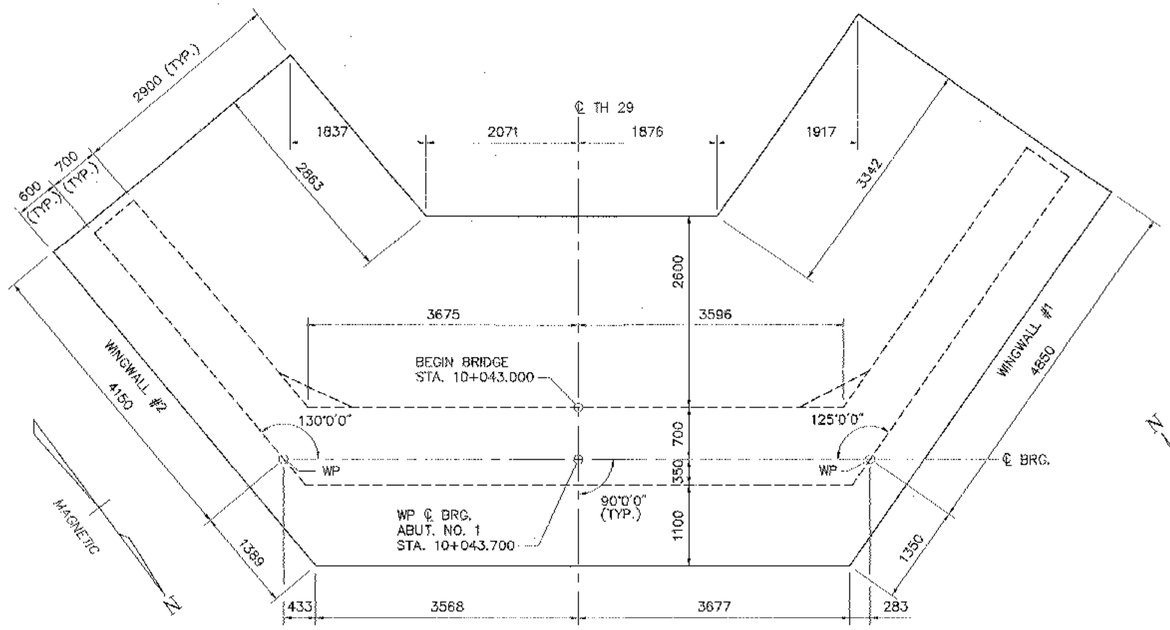
1. HOLLOW STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A-500 GRADE B.
2. ALL PLATES AND BARS SHALL CONFORM TO AASHTO M 270M/M 270 GRADE 250.
3. DOWNSPOUT COMPONENTS AND ATTACHMENT ELEMENTS SHALL BE GALVANIZED IN ACCORDANCE WITH AASHTO M 111M/M 111 OR AASHTO M 232M/M 232 AFTER FABRICATION.
4. DOWNSPOUT AND ATTACHMENT DETAILS SHALL CONFORM TO THE APPLICABLE PROVISIONS OF SECTION 506. THE COST FOR THE DOWNSPOUT AND ATTACHMENT ASSEMBLY SHALL BE INCIDENTAL TO THE EXPANSION JOINT ITEM.
5. ALL REQUIRED WELDS SHALL BE DETAILED ON SHOP DRAWINGS WHICH SHALL ALSO INCLUDE ALL APPLICABLE WELDING PROCEDURES.
6. DOWNSPOUT ASSEMBLY SHALL BE THOROUGHLY CLEANED AND FLUSHED AFTER CONCRETE AND PAVING OPERATIONS.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

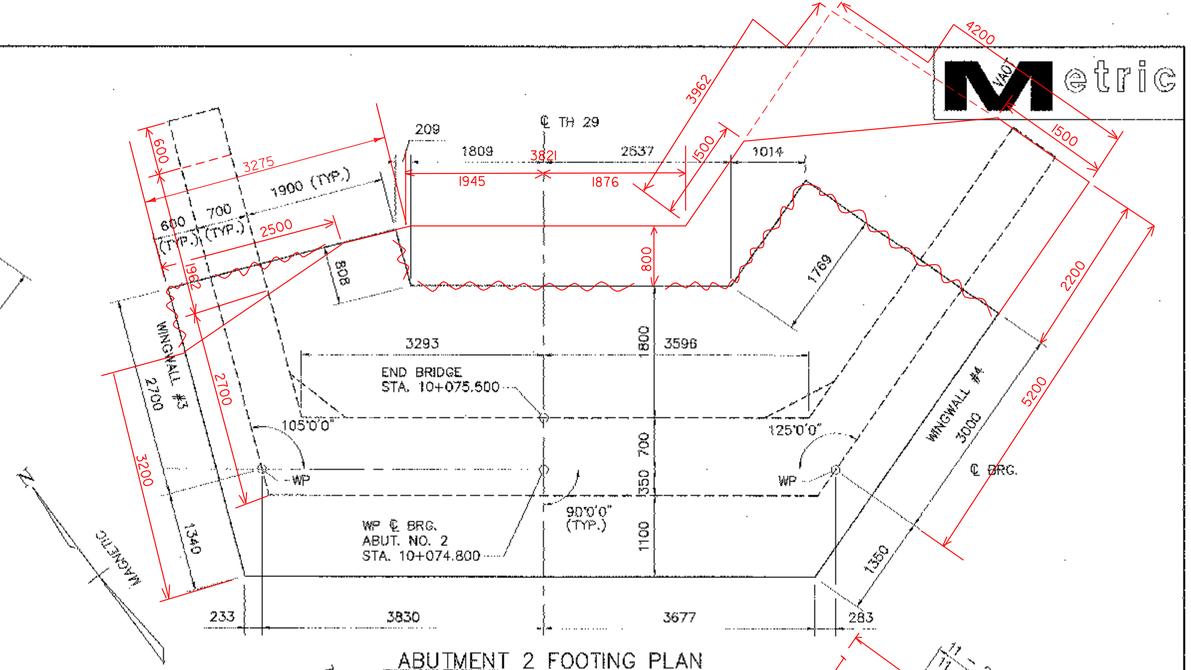
Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
DOWNSPOUT DETAILS	
Designed By S.M. HODGDON	Drawn By C.L. CILLEY
Checked By Date M.M. LANDREY 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499EJDS	Sheet 24 of 47

VANASSE HANGEN BRUSTLIN, INC.

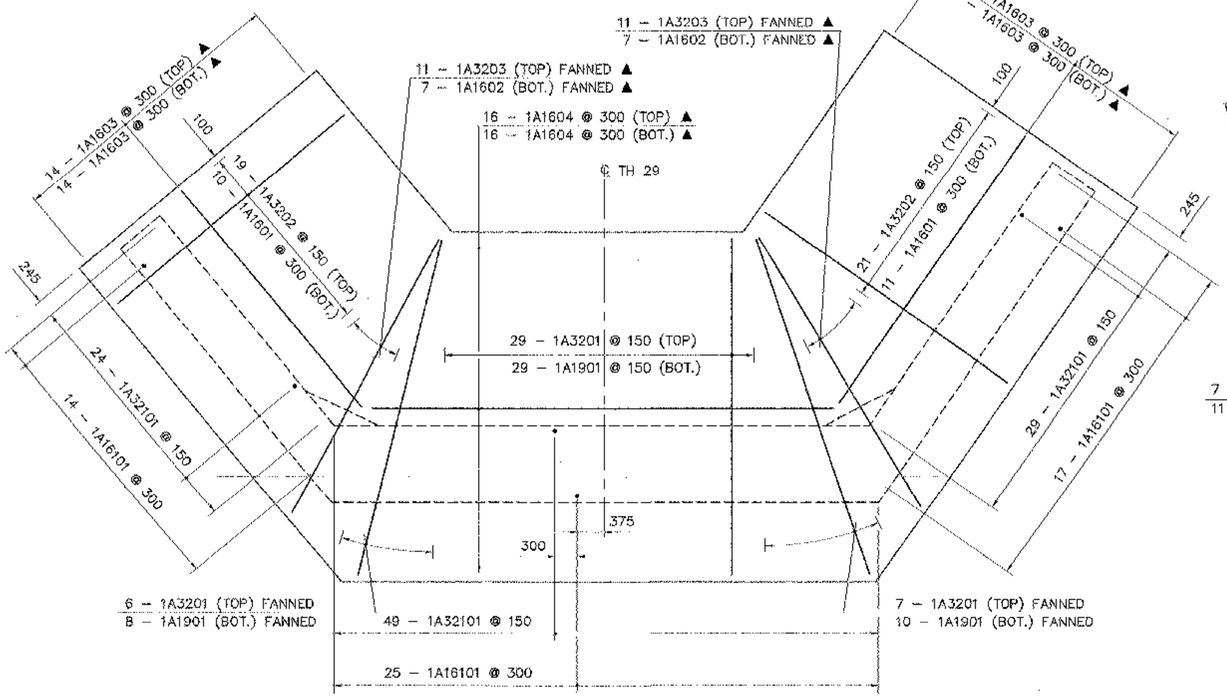
PLOTTED 6/9/2006



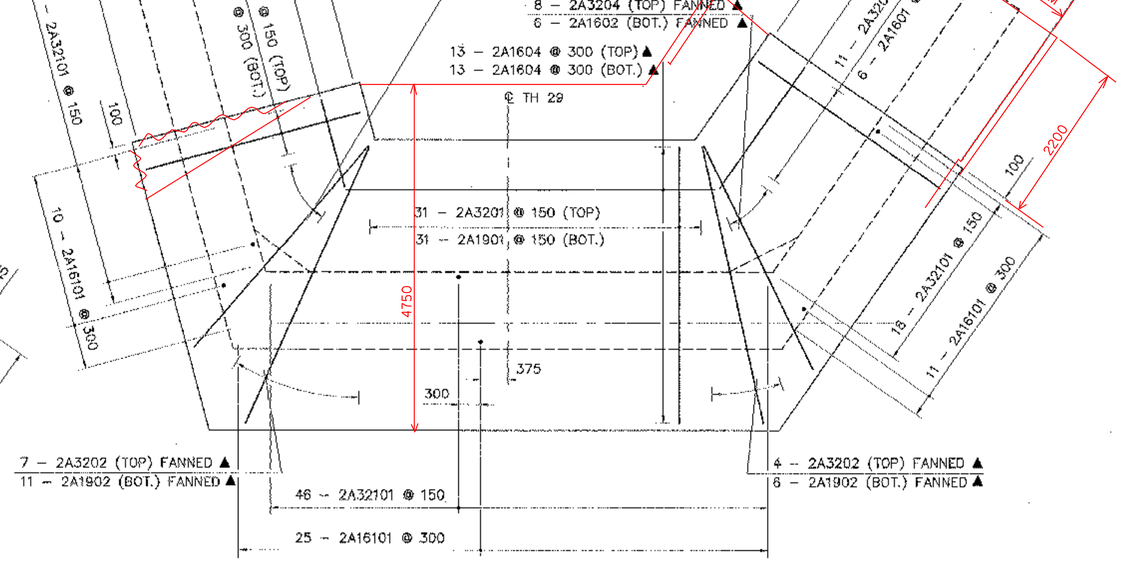
ABUTMENT 1 FOOTING PLAN
SCALE: 1:40



ABUTMENT 2 FOOTING PLAN
SCALE: 1:40



ABUTMENT 1 FOOTING REINFORCEMENT
SCALE: 1:40



ABUTMENT 2 FOOTING REINFORCEMENT
SCALE: 1:40

KEY
E.F. = EACH FACE
N.F. = NEAR FACE
F.F. = FAR FACE
▲ CUT TO FIT IN THE FIELD

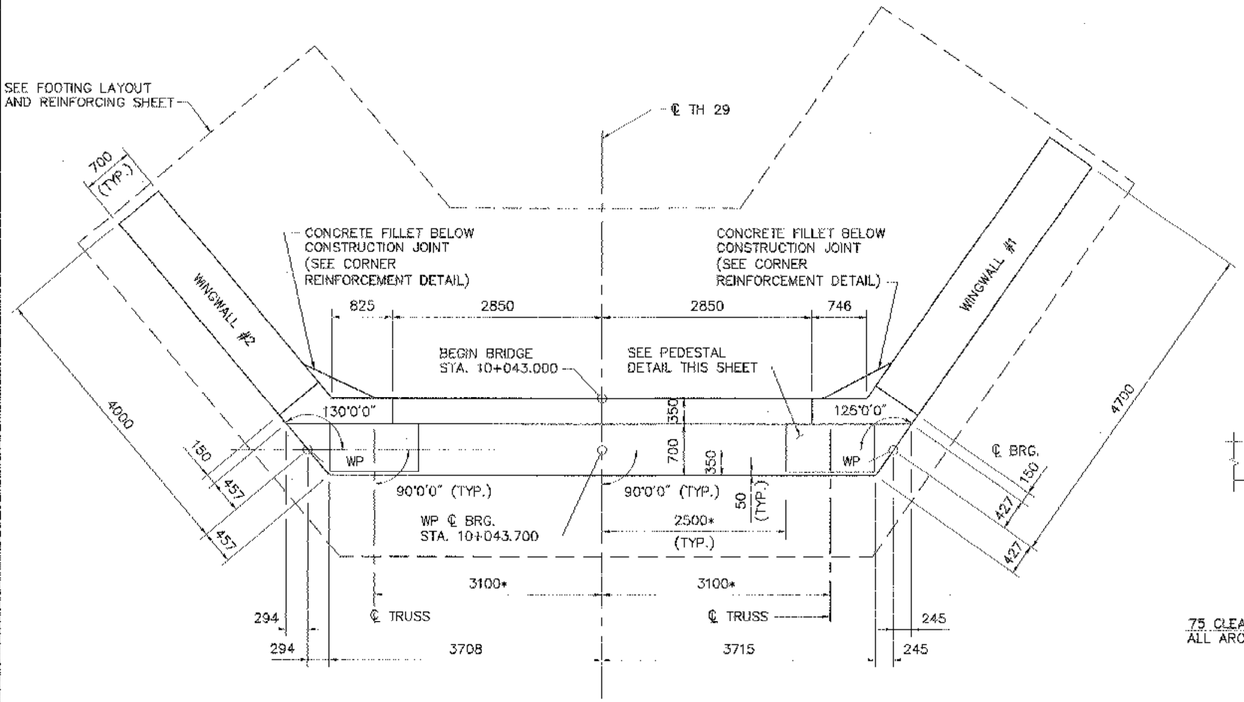
STATE OF VERMONT
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Town Of CAVENDISH	Bridge No. 45
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Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	

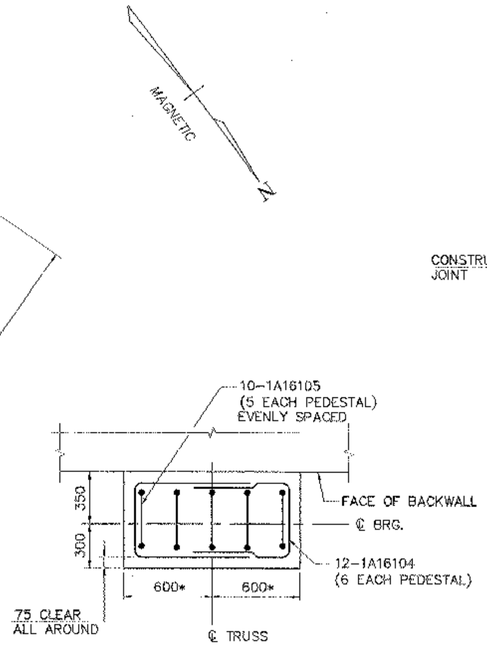
FOOTING LAYOUT & REINFORCEMENT

Designed By S.M. HODGDON	Drawn By C.L. CILLEY
Checked By W.M. MOSHER Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499FTG	Sheet 25 of 47

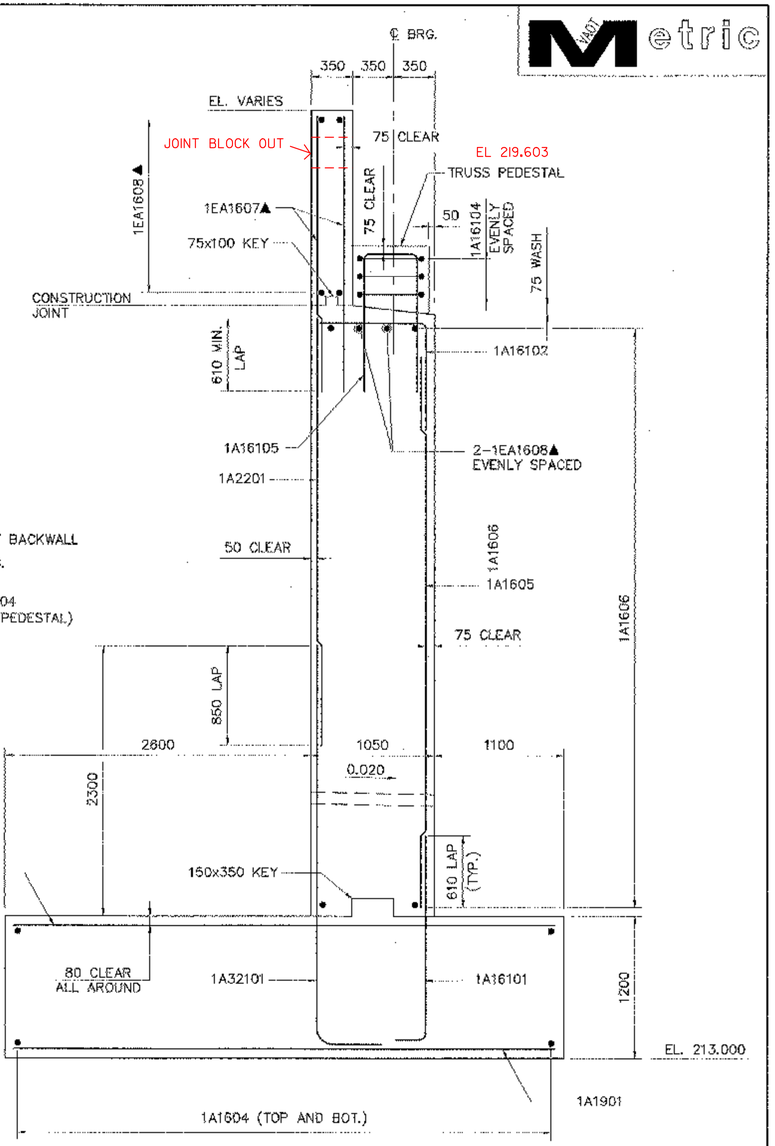
VANASSE HANGEN BRUSTLIN, INC.

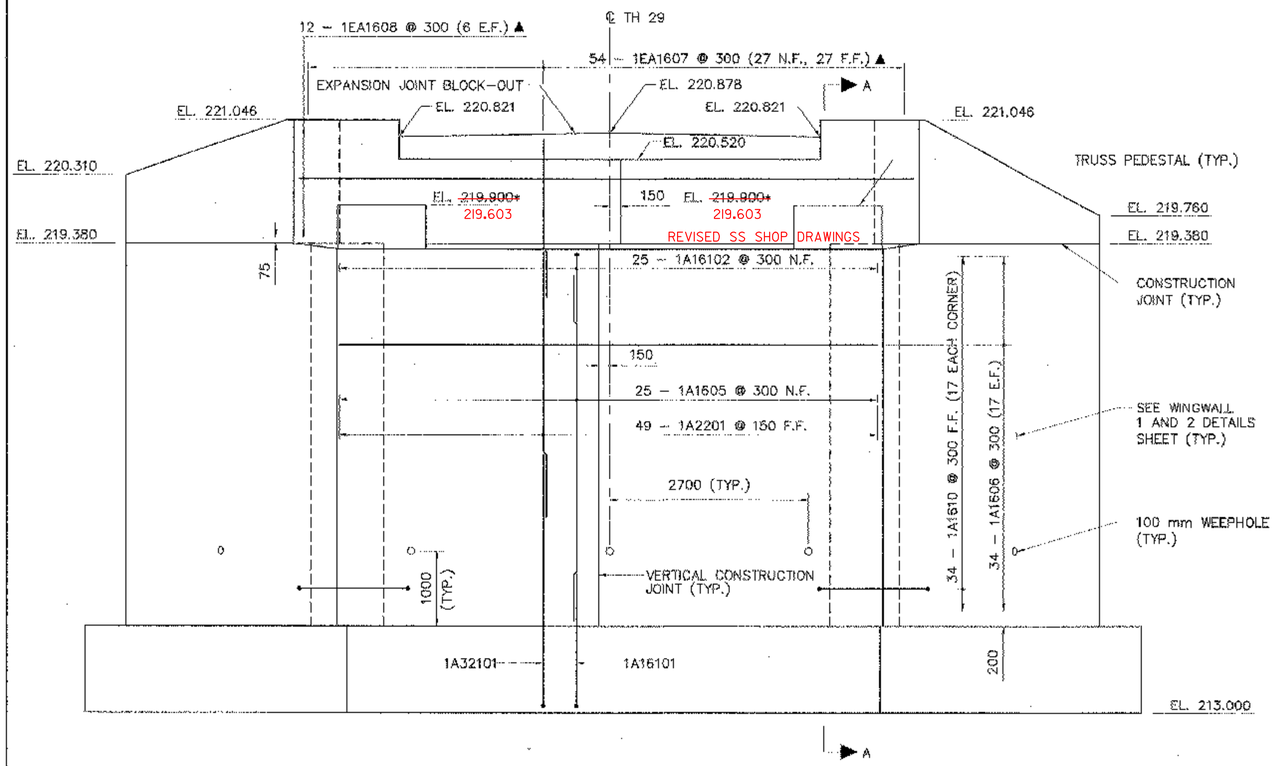


PLAN
SCALE: 1:40



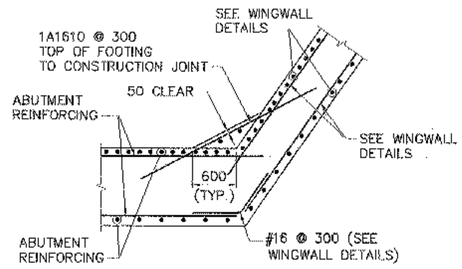
TYPICAL PEDESTAL PLAN DETAIL
(PLACE PEDESTAL REINFORCING TO AVOID ANCHOR RODS)
SCALE: 1:20





ELEVATION
SCALE: 1:40

* DIMENSION OR ELEVATION TO BE CONFIRMED BY THE TRUSS MANUFACTURER



CORNER REINFORCEMENT DETAIL
SCALE: 1:40

SECTION A–A
SCALE: 1:25

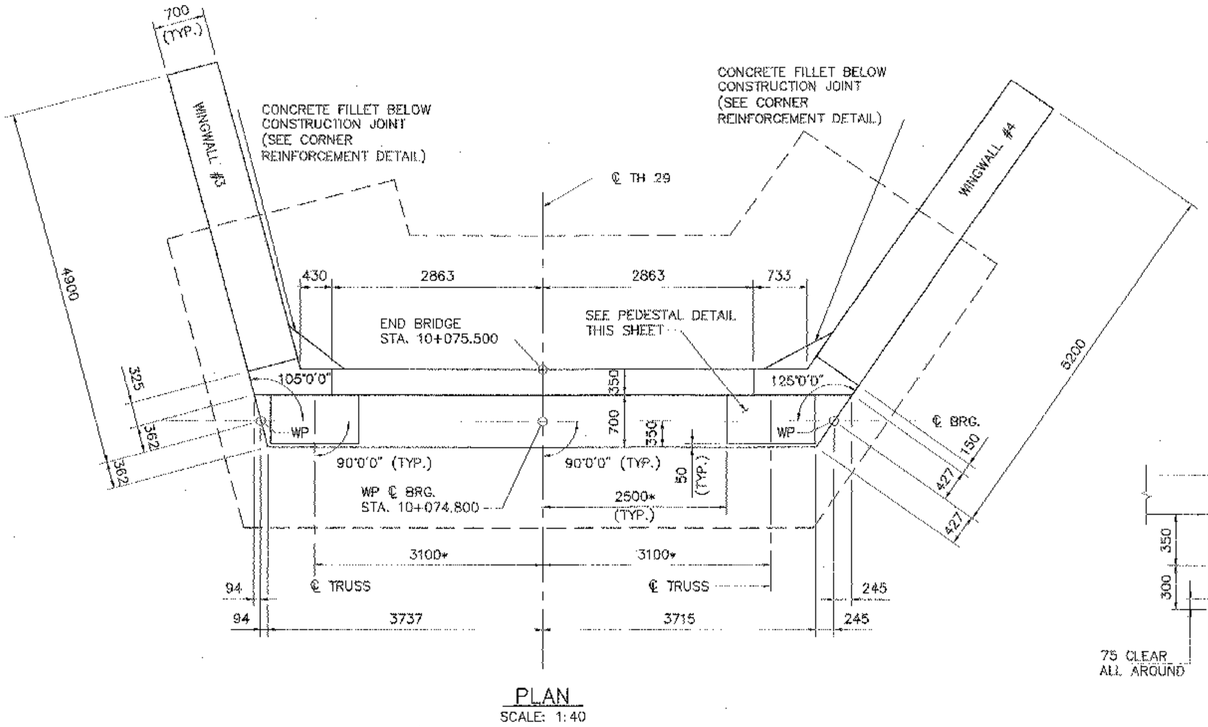
NOTE:
1. SEE SHEET 28 FOR TYPICAL WEEPHOLE DETAIL.

KEY
E.F. = EACH FACE
N.F. = NEAR FACE
F.F. = FAR FACE
▲ CUT TO FIT IN THE FIELD

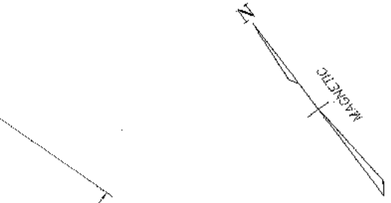
STATE OF VERMONT
AGENCY OF TRANSPORTATION

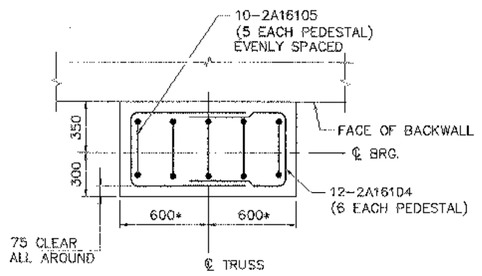
Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta. / Surv. Sta.
TH 29 OVER BLACK RIVER	
ABUTMENT 1 DETAILS	
Designed By S.M. HODGDON	Drawn By M.M. LANDREY
Checked By W.M. MOSHER Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
VANASSE HANGEN BRUSTLIN, INC.	Bridge Sheet No. 50499AB1 Sheet 26 of 47

PLOTTED 5/15/2006

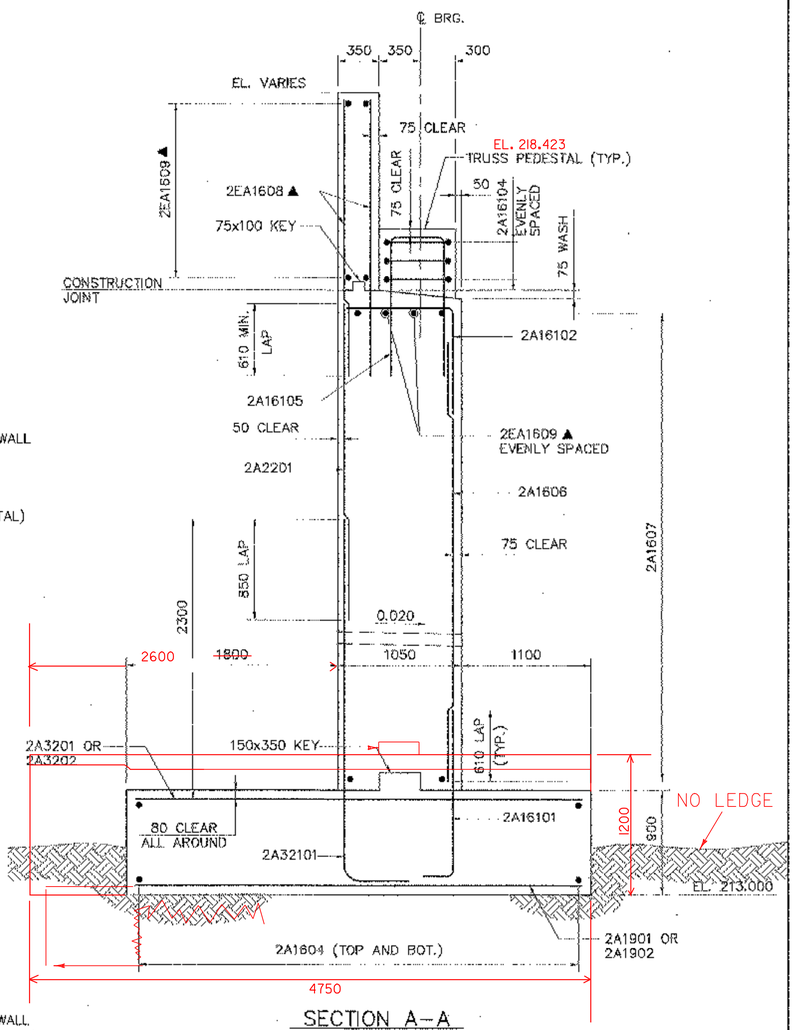


PLAN
SCALE: 1:40

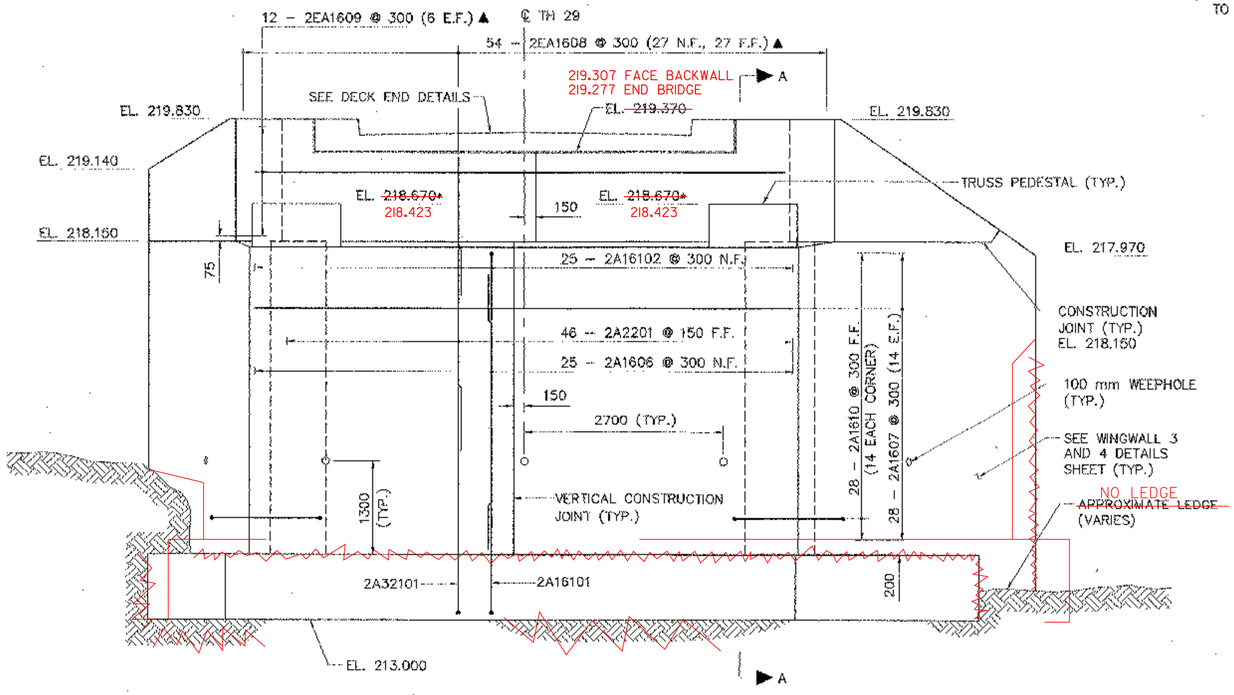




TYPICAL PEDESTAL PLAN DETAIL
(PLACE PEDESTAL REINFORCING TO AVOID ANCHOR RODS)
SCALE: 1:20

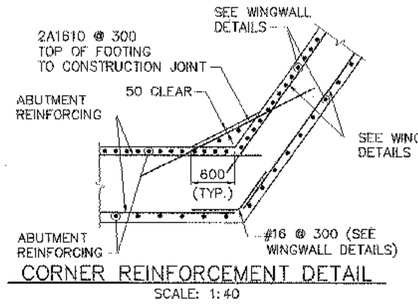


SECTION A-A
SCALE: 1:25



ELEVATION
SCALE: 1:40

* DIMENSION OR ELEVATION TO BE CONFIRMED BY THE TRUSS MANUFACTURER



CORNER REINFORCEMENT DETAIL
SCALE: 1:40

KEY
E.F. = EACH FACE
N.F. = NEAR FACE
F.F. = FAR FACE
▲ CUT TO FIT IN THE FIELD

NOTE:
1. SEE SHEET 28 FOR TYPICAL WEEPHOLE DETAIL.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta.
	Surv. Sta.

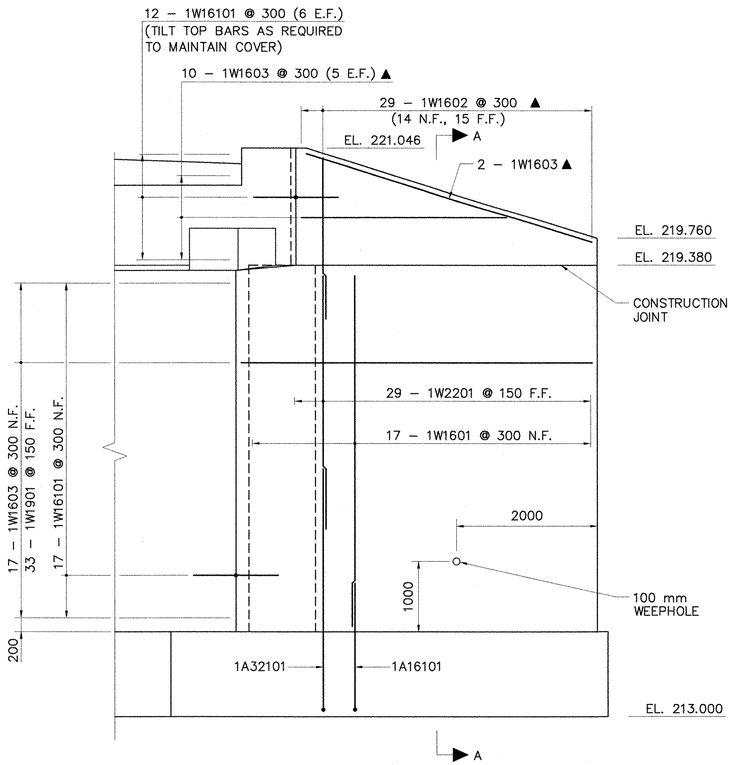
TH 29 OVER BLACK RIVER

ABUTMENT 2 DETAILS

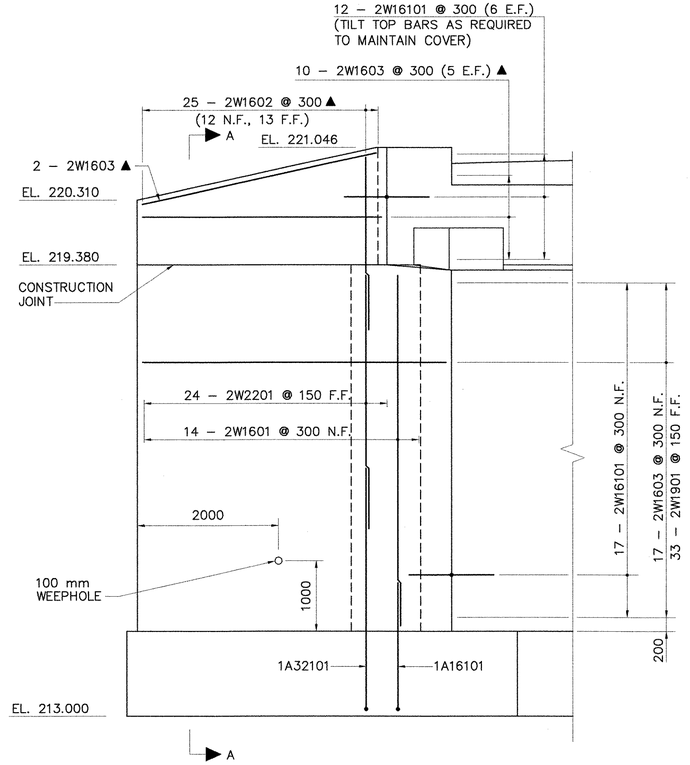
Designed By S.M. HODGDON	Drawn By M.M. LANDREY
Checked By W.M. MOSHER Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499AB2	Sheet 27 of 47

VANASSE HANGEN BRUSTLIN, INC.

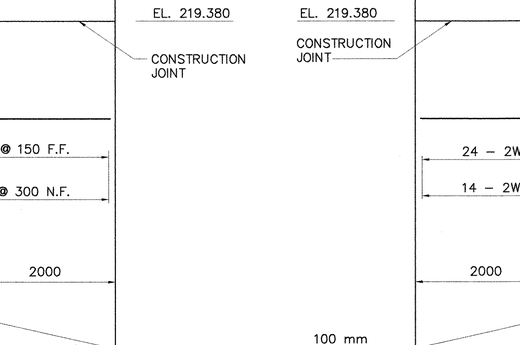
PLOTTED 5/26/2006



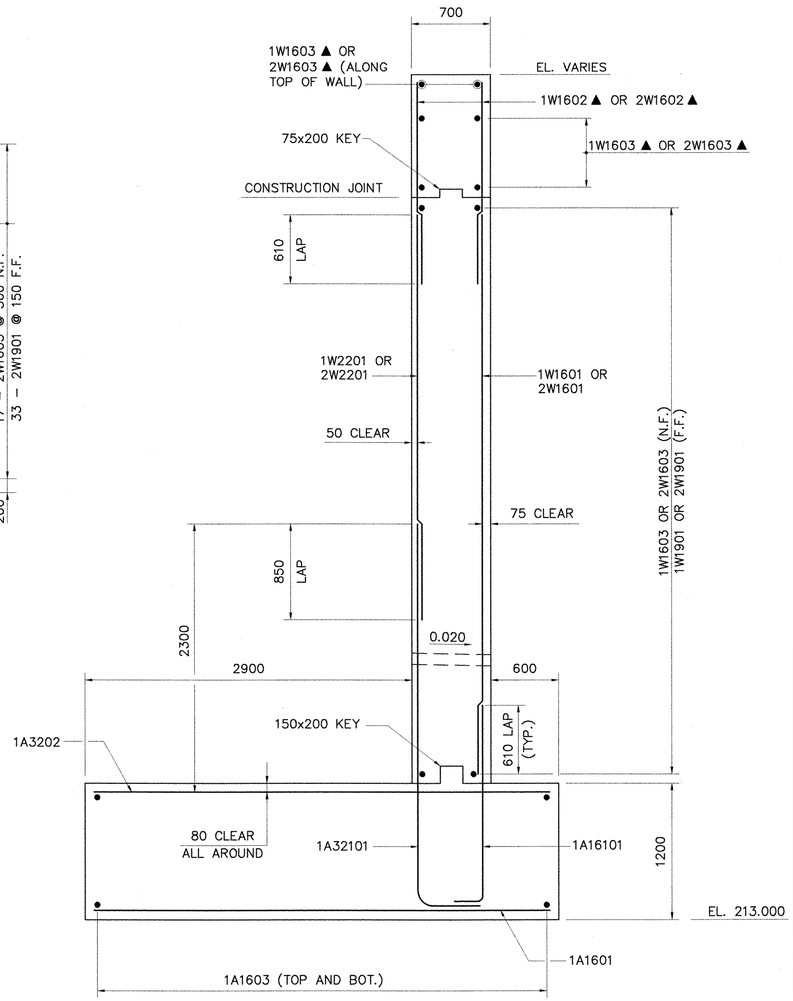
WINGWALL 1 ELEVATION
SCALE: 1:40



WINGWALL 2 ELEVATION
SCALE: 1:40



TYPICAL WEEPHOLE DETAIL
NOT TO SCALE



SECTION A–A
SCALE: 1:25

KEY
E.F. = EACH FACE
N.F. = NEAR FACE
F.F. = FAR FACE
▲ CUT TO FIT IN THE FIELD

VANASSE HANGEN BRUSTLIN, INC.

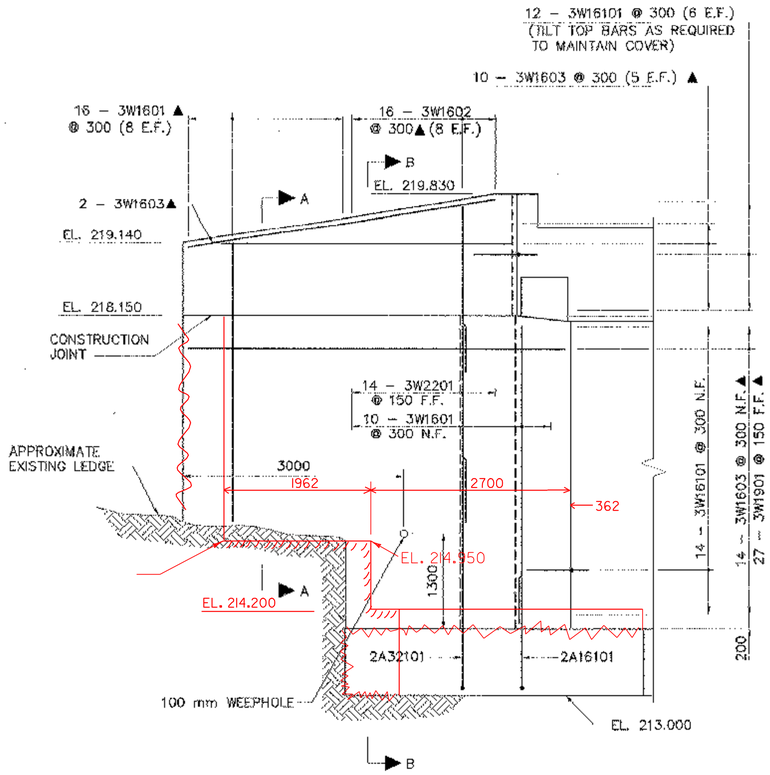
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	

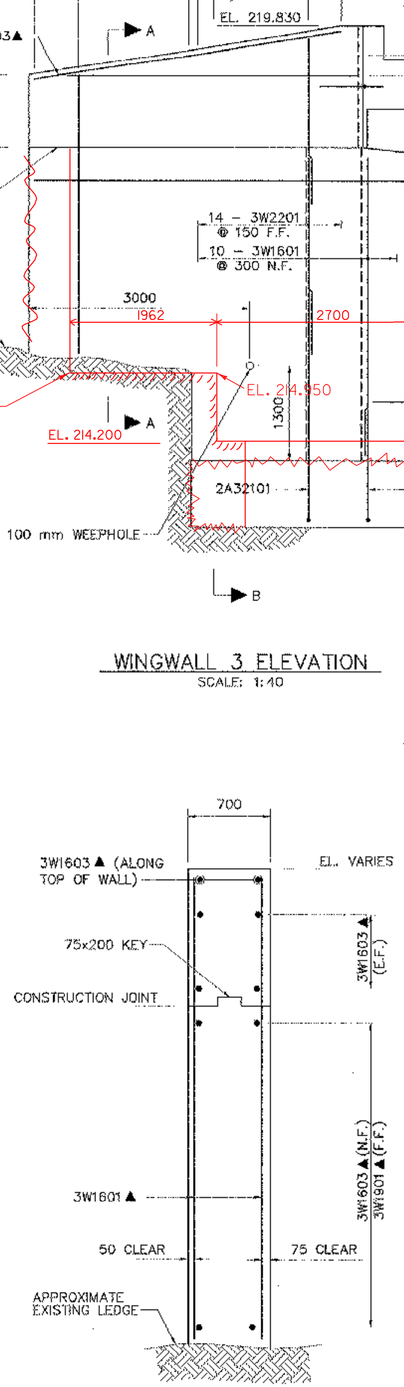
WINGWALL 1 & 2 DETAILS

Designed By S.M. HODGDON	Drawn By M.M. LANDREY
Checked By W.M. MOSHER Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499WDT1	Sheet 28 of 47

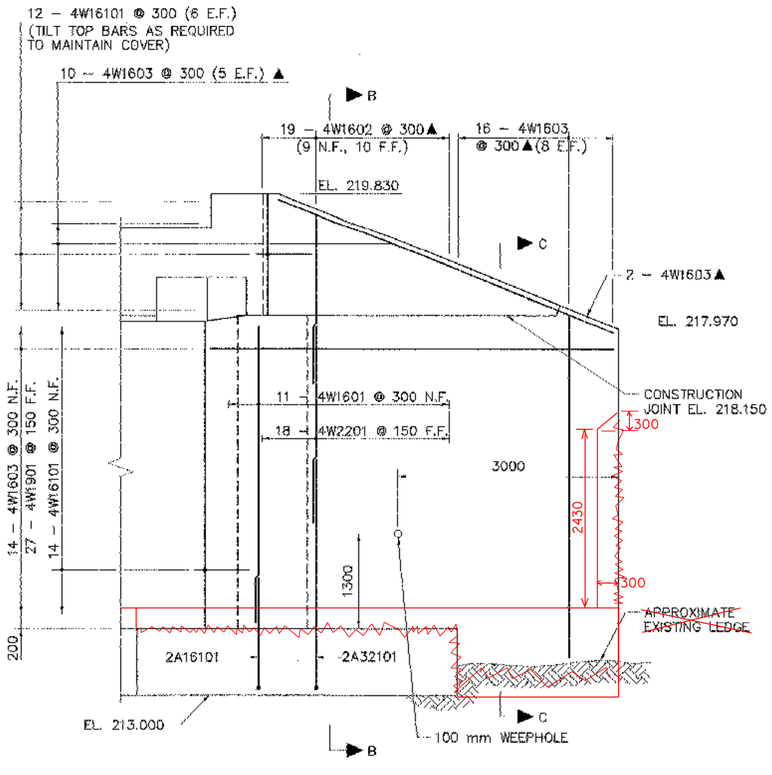
PLOTTED 5/15/2006



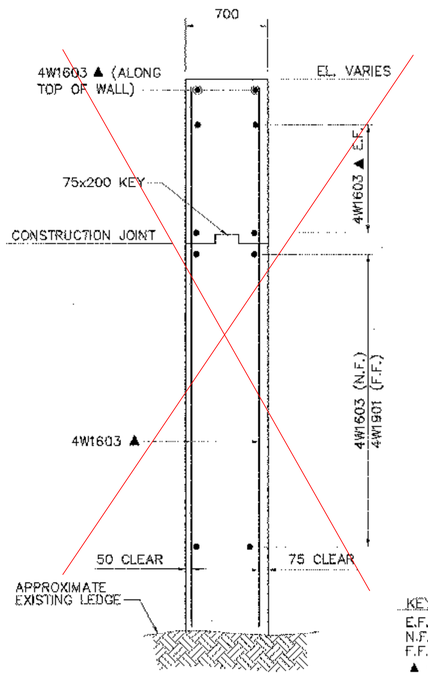
WINGWALL 3 ELEVATION
SCALE: 1:40



SECTION A–A
SCALE: 1:25

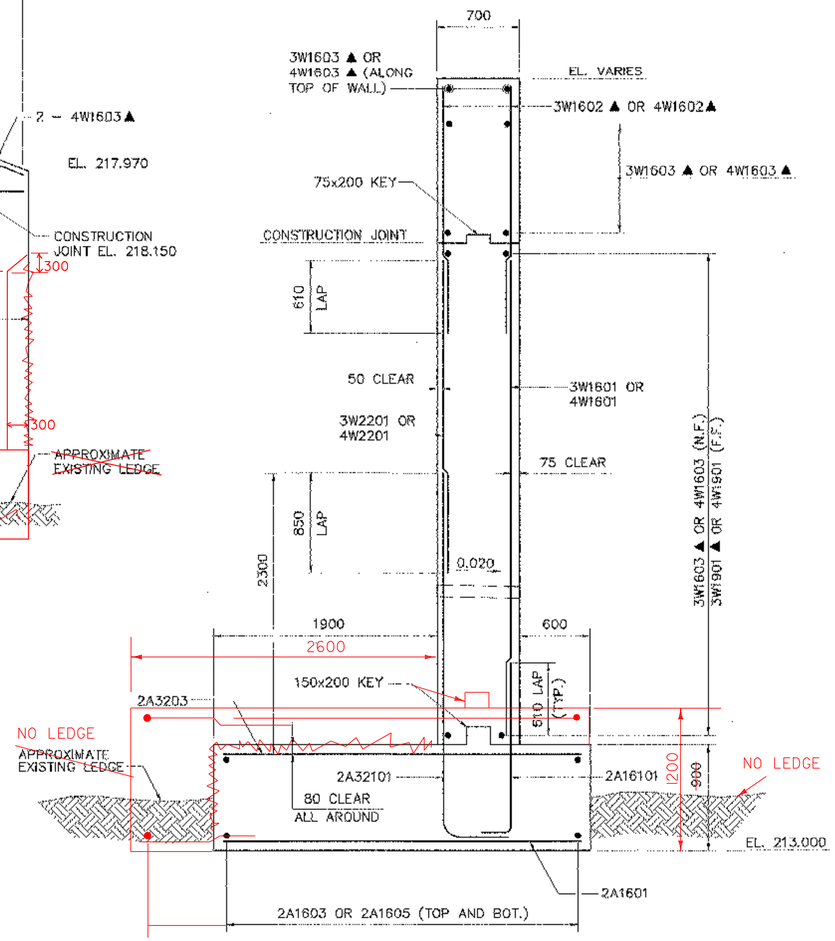


WINGWALL 4 ELEVATION
SCALE: 1:40



SECTION C–C
SCALE: 1:25

KEY
E.F. = EACH FACE
N.F. = NEAR FACE
F.F. = FAR FACE
▲ CUT TO FIT IN THE FIELD



SECTION B–B
SCALE: 1:25

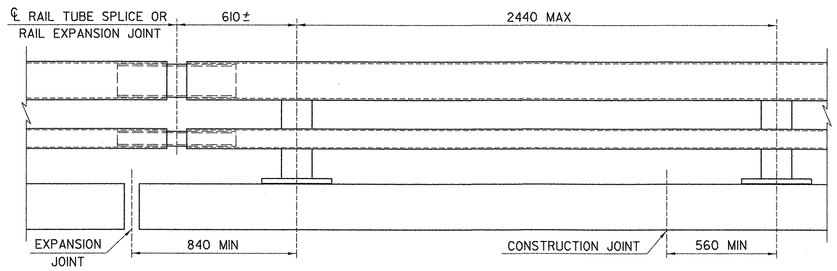
NOTE:
1. SEE SHEET 28 FOR TYPICAL WEEPHOLE DETAIL.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

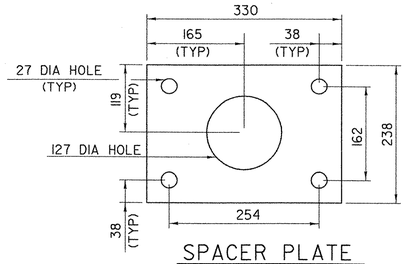
Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta. / Surv. Sta.
TH 29 OVER BLACK RIVER	
WINGWALL 3 & 4 DETAILS	
Designed By S.M. HODGDON	Drawn By M.M. LANDREY
Checked By W.M. MOSHER Date 5/06	Bridge Design Supervisor C.D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499WDT2	Sheet 29 of 47

VANASSE HANGEN BRUSTLIN, INC.

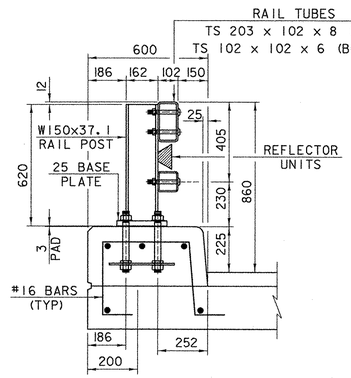
PLOTTED 5/15/2006



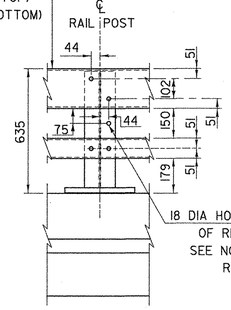
BRIDGE RAILING ELEVATION



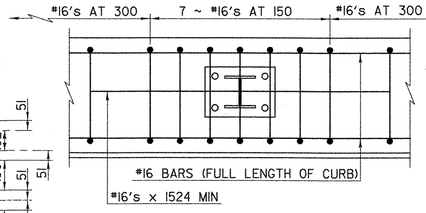
SPACER PLATE



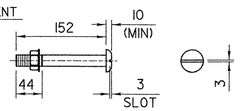
TYPICAL SECTION

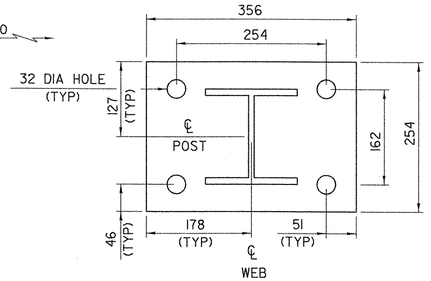


ELEVATION

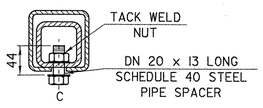


CURB REINFORCING PLAN





POST AND BASE PLATE



M20 DIA M164 (TYPE 1) ROUND HEAD BOLT

(WITH WASHER AND PREVAILING TORQUE TYPE LOCK NUT)
(SEE NOTE #9)
ONLY FULL DIAMETER BODY BOLTS WILL BE ALLOWED.

L
16 DIA TAPPED HOLE IN SPLICE TUBE AND 29 x 'C' SLOT IN RAIL TUBE FOR M16 BOLT AND PLAIN HARDENED WASHER

EXPANSION JOINT SECTION

FOR DETAILS NOT SHOWN SEE "RAIL TUBE SPLICE SECTION"

NOTES

1. ALL WORK AND MATERIALS SHALL CONFORM TO THE PROVISIONS OF SECTION 525, "RAILINGS OF THE STANDARD SPECIFICATION FOR CONSTRUCTION."
2. TUBING AND POSTS SHALL MEET THE REQUIREMENTS OF SECTION 732, "RAILING MATERIALS OF THE STANDARD SPECIFICATIONS FOR CONSTRUCTION," EXCEPT THAT THE DROP-WEIGHT TEAR TEST IN SECTION 732 SHALL NOT APPLY TO THE STRUCTURAL TUBING IN THIS STANDARD.
3. ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 2mm RADIUS AND BE FREE OF BURRS.
4. RAIL POSTS SHALL BE SET NORMAL TO GRADE.
5. SECTIONS OF RAIL TUBE SHALL BE ATTACHED TO A MINIMUM OF TWO (2) RAIL POSTS AND PREFERABLY TO AT LEAST FOUR (4) POSTS.
6. RAIL TUBE EXPANSION JOINTS SHALL BE PROVIDED IN ANY RAIL BAY SPANNING A SUPERSTRUCTURE EXPANSION JOINT. EXPANSION JOINT WIDTH SHALL BE "X" AT 7°C AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES. THE TOTAL DESIGN MOVEMENT FOR THE BRIDGE EXPANSION JOINT IS 38mm.
7. ALL PARTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111M, EXCEPT THAT HARDWARE SHALL MEET THE REQUIREMENTS OF AASHTO M232M.
8. RAIL POSTS ANCHORING NUTS SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL ONE-EIGHTH TURN.
9. RAIL TUBES SHALL BE ATTACHED USING M20 FULL DIAMETER BODY AASHTO M164 (TYPE 1) ROUND HEAD BOLTS INSERTED THROUGH THE FACE OF THE TUBE. HOLES HOLES IN POSTS SHALL BE 2mm LARGER THAN THE BOLT SIZE.
10. HOLES IN RAILS FOR RAIL TUBE ATTACHMENT MAY BE FIELD-DRILLED. HOLES SHALL BE COATED WITH AN APPROVED ZINC-RICH PAINT PRIOR TO ERECTION.
11. NOTE NOT USED.
12. ANY BENDING OF RAIL SHALL BE BY SHOP PROCEDURE ONLY.
13. THE FABRICATOR SHALL SUBMIT SHOP DRAWINGS INCLUDING WELDING PROCEDURES TO THE STRUCTURES SECTION FOR APPROVAL IN ACCORDANCE WITH THE PROVISION OF 506.04, SHOP DRAWINGS. ALL WELDING SHALL CONFORM WITH SECTION 506.10.
14. RAIL POST AND BASE PLATES SHALL BE TESTED FOR IMPACT PROPERTIES IN ACCORDANCE WITH ASTM A370 CHARPY IMPACT TESTING USING TYPE A SPECIMENS.

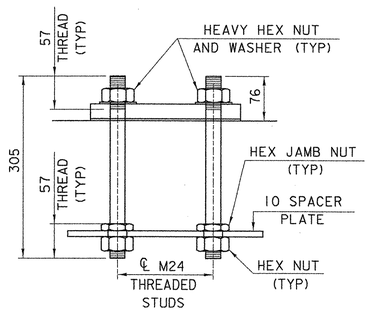
MATERIALS

RAIL TUBES.....ASTM A500, GRADE B OR ASTM A501
RAIL POSTS AND BASE PLATE.....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 M164M, TYPE 1

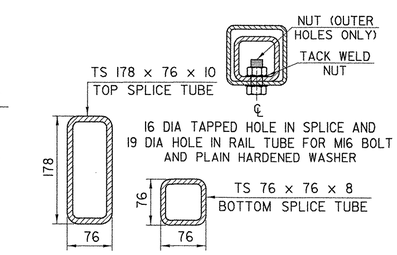
NUTS FOR AASHTO M164 BOLTS AND ANCHOR STUDS SHALL COMPLY WITH AASHTO M291M (ASTM A563M).

WASHERS SHALL COMPLY WITH AASHTO M293M (ASTM F436M) SPECIFICATIONS.

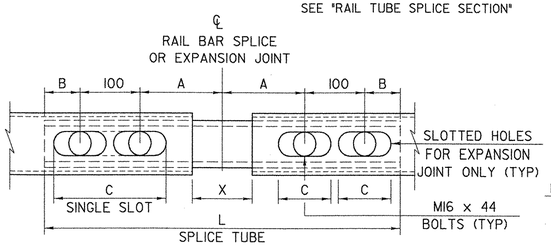
3mm PAD SHALL COMPLY WITH STANDARD SPECIFICATION SUBSECTION 731.01 OR 731.02.



RAIL POST ANCHORAGE

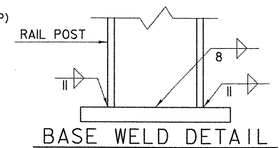


RAIL TUBE SPLICE SECTION



RAIL TUBE SPLICE AND RAIL EXPANSION JOINT DETAIL

(BOTTOM VIEW)



BASE WELD DETAIL

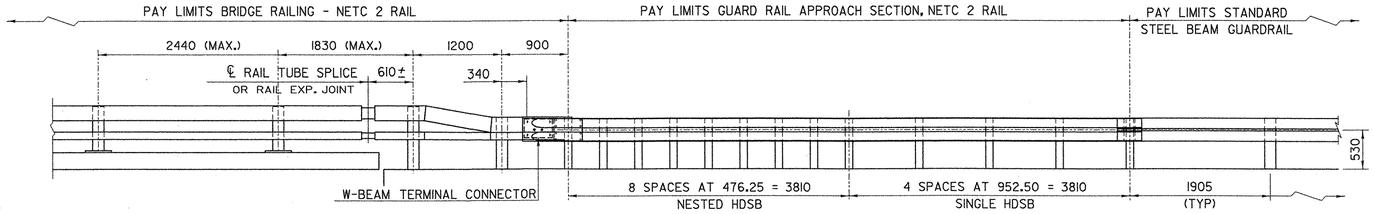
SPLICE TABLE					
T	A	B	C	L	X
NA	100	50	--	510	20
EXPANSION JOINT TABLE					
<100	100	50	65	510	65

T = TOTAL MOVEMENT BETWEEN BRIDGE EXPANSION JOINTS. SEE NOTE 6

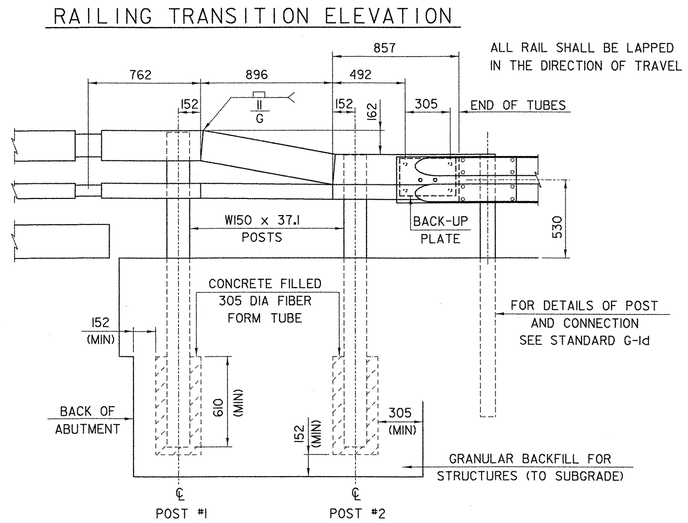
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
NETC 2 RAIL - BRIDGE RAILING	
Designed By VTRANS	Drawn By VTRANS
Checked By Date S. M. HODGDON 5/06	Bridge Design Supervisor C. D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442(23)
I.G.C. Info.	
Bridge Sheet No. 50499BR1	Sheet 30 of 47

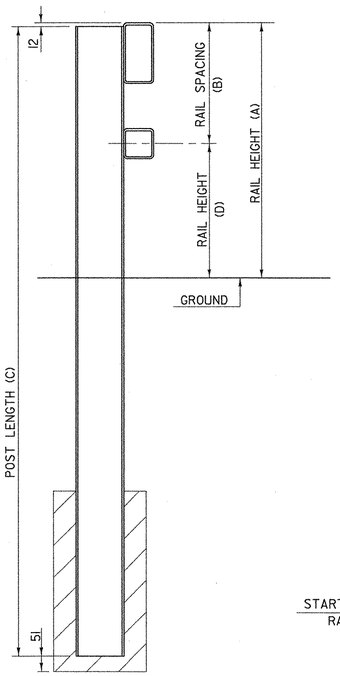
PLOTTED 6/9/2006



RAILING TRANSITION ELEVATION

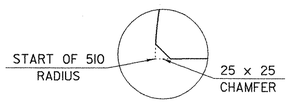


ELEVATION

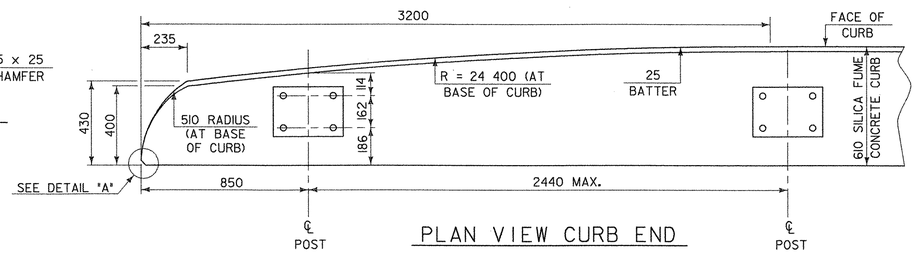


TYPICAL SECTION

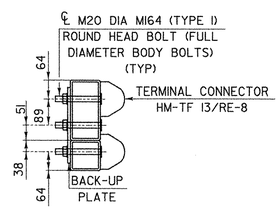
POST NUMBER	RAIL HEIGHT (A)	RAIL SPACING (B)	POST LENGTH (C)	RAIL HEIGHT (D)
1	860	405	2134	455
2	702	254	1956	448



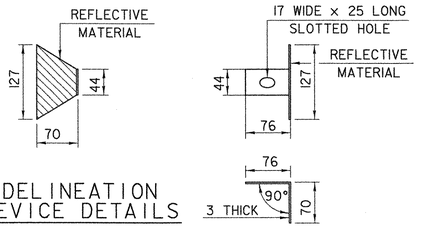
DETAIL "A"



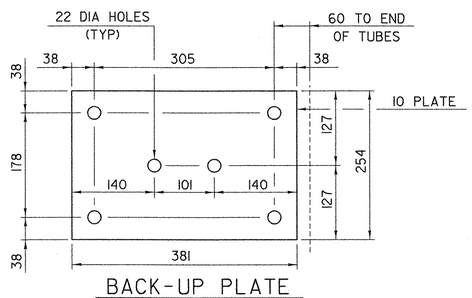
PLAN VIEW CURB END



SECTION THROUGH GUARDRAIL CONNECTION AT TERMINAL CONNECTOR



DELINEATION DEVICE DETAILS



BACK-UP PLATE

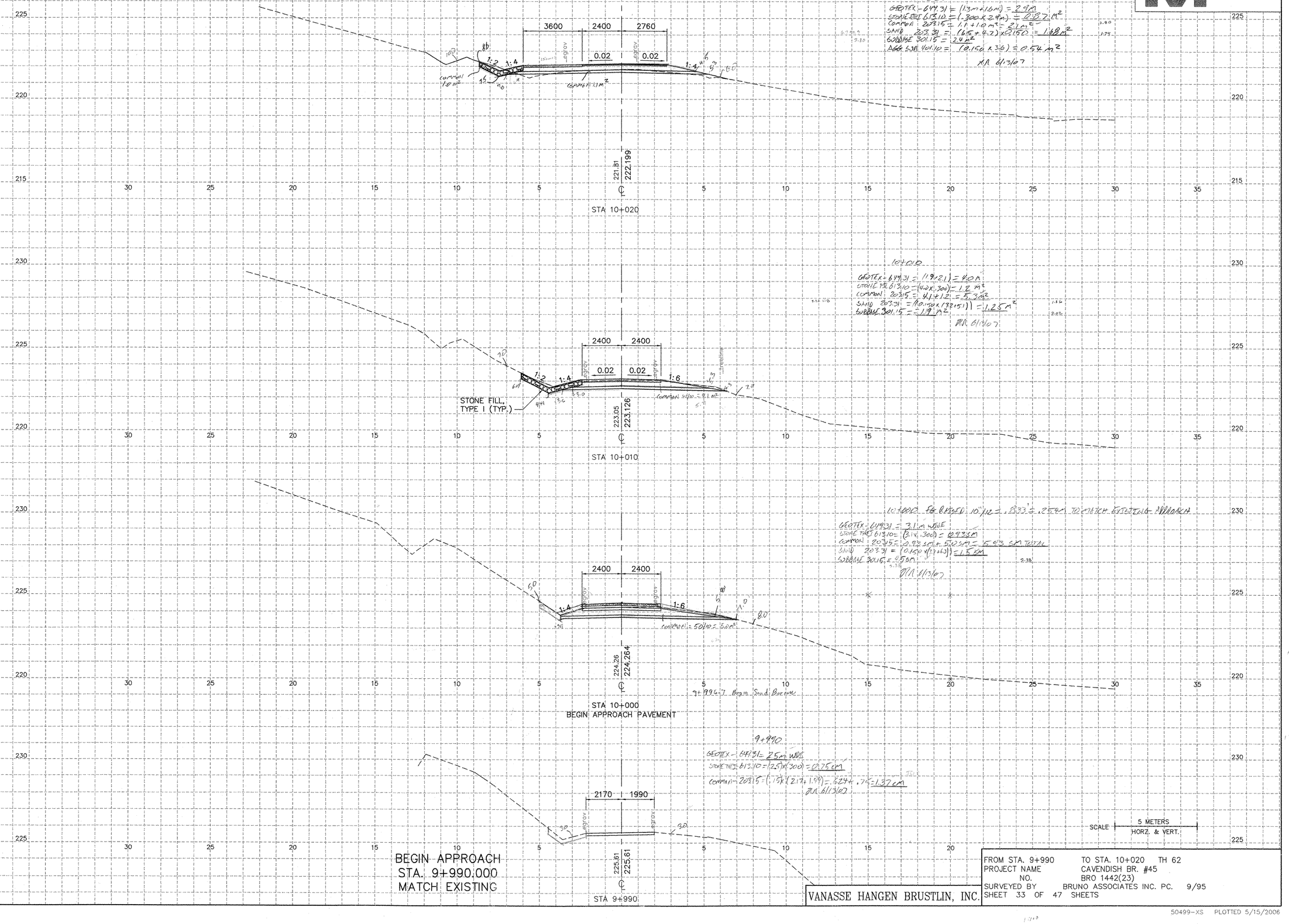
NOTES:

1. REFER TO NETC 2 RAIL - BRIDGE RAILING SHEET FOR ADDITIONAL DETAILS, NOTES AND MATERIAL SPECIFICATIONS.
2. TO FACILITATE FIELD FIT - UP OF THE TRANSITION RAILING, POSTS SHALL BE SET LOOSELY INTO FIBER FORM TUBES WHILE TRANSITION PARTS ARE BEING ASSEMBLED. POST HOLES SHALL BE BACKFILLED WITH A CONCRETE MIX APPROVED BY THE ENGINEER. PAYMENT FOR COMPONENTS, INCLUDING BACKUP PLATE AND END TERMINAL CONNECTOR FOR GUARD RAIL, AUGERING, FIBER FORM TUBES AND CONCRETE, AND INSTALLATION SHALL BE CONSIDERED INCIDENTAL TO BRIDGE RAILING, N.E.TC. 2 RAIL.
3. THE REFLECTORIZED ALUMINUM DELINEATION IS TO BE ERECTED EVERY 9m (OR CLOSEST POST) WITH A M16 BOLT. DELINEATORS SHALL MEET SPECIFICATION REQUIREMENTS FOR ASTM B209 ALLOY 5052-H32.
4. REFLECTIVE MATERIAL SHALL MEET 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.
5. NOTE NOT USED.
6. ALL APPROACH RAIL SPLICES SHALL BE LAPPED IN THE DIRECTION OF TRAFFIC FLOW.
7. SEE STANDARD G-1 AND G-1d FOR ADDITIONAL INFORMATION.

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
NETC 2 RAIL - APPROACH RAILING	
Designed By VTRANS	Drawn By VTRANS
Checked By Date S. M. HODGDON 5/06	Bridge Design Supervisor C. D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442 (23)
I.G.C. Info.	
Bridge Sheet No. 50499BR2	Sheet 31 of 47

PLOTTED 6/9/2006

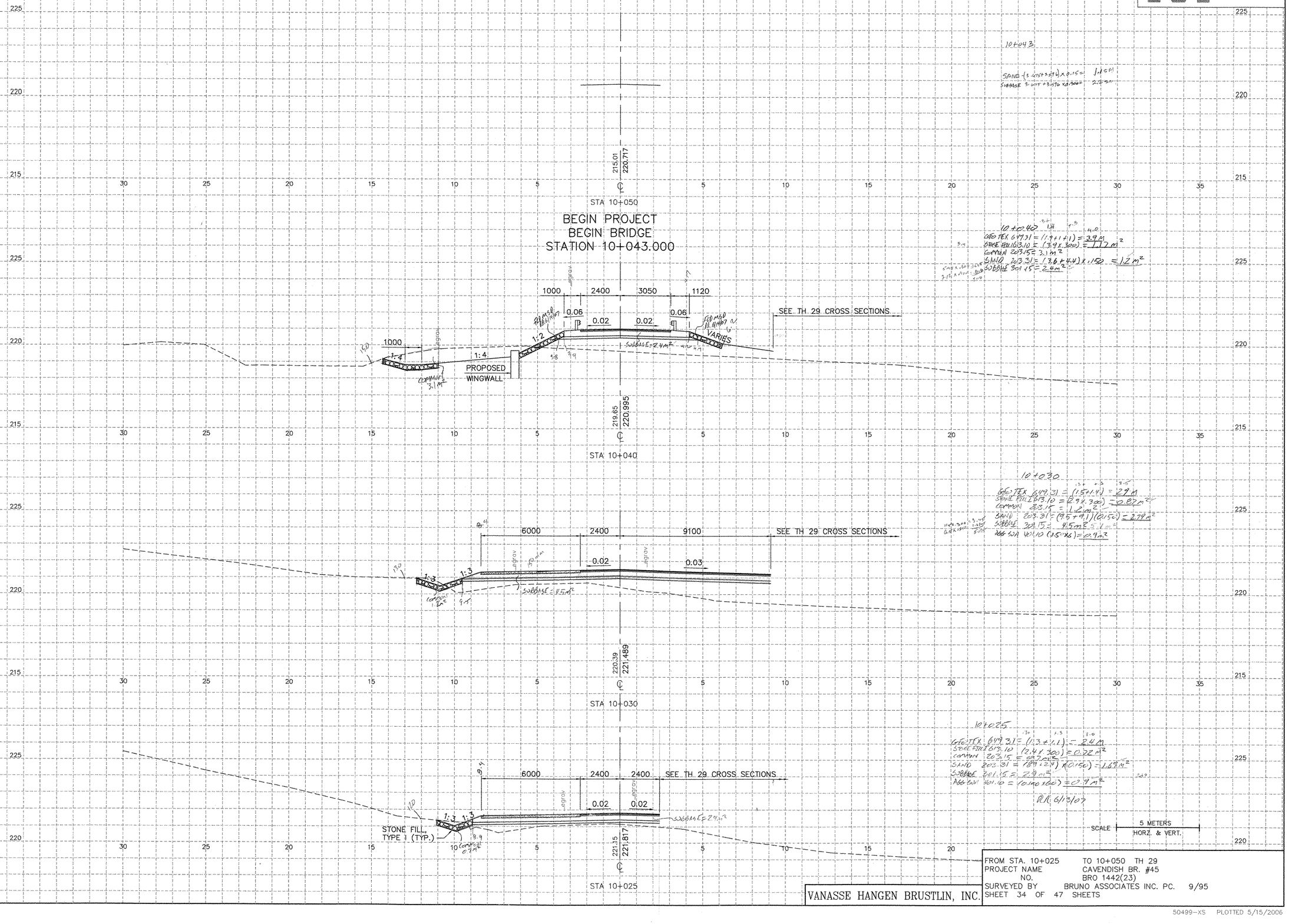


VANASSE HANGEN BRUSTLIN, INC.

FROM STA. 9+990	TO STA. 10+020 TH 62
PROJECT NAME	CAVENDISH BR. #45
NO.	BRO 1442(23)
SURVEYED BY	BRUNO ASSOCIATES INC. PC. 9/95
SHEET 33 OF 47 SHEETS	

50499-XS PLOTTED 5/15/2006

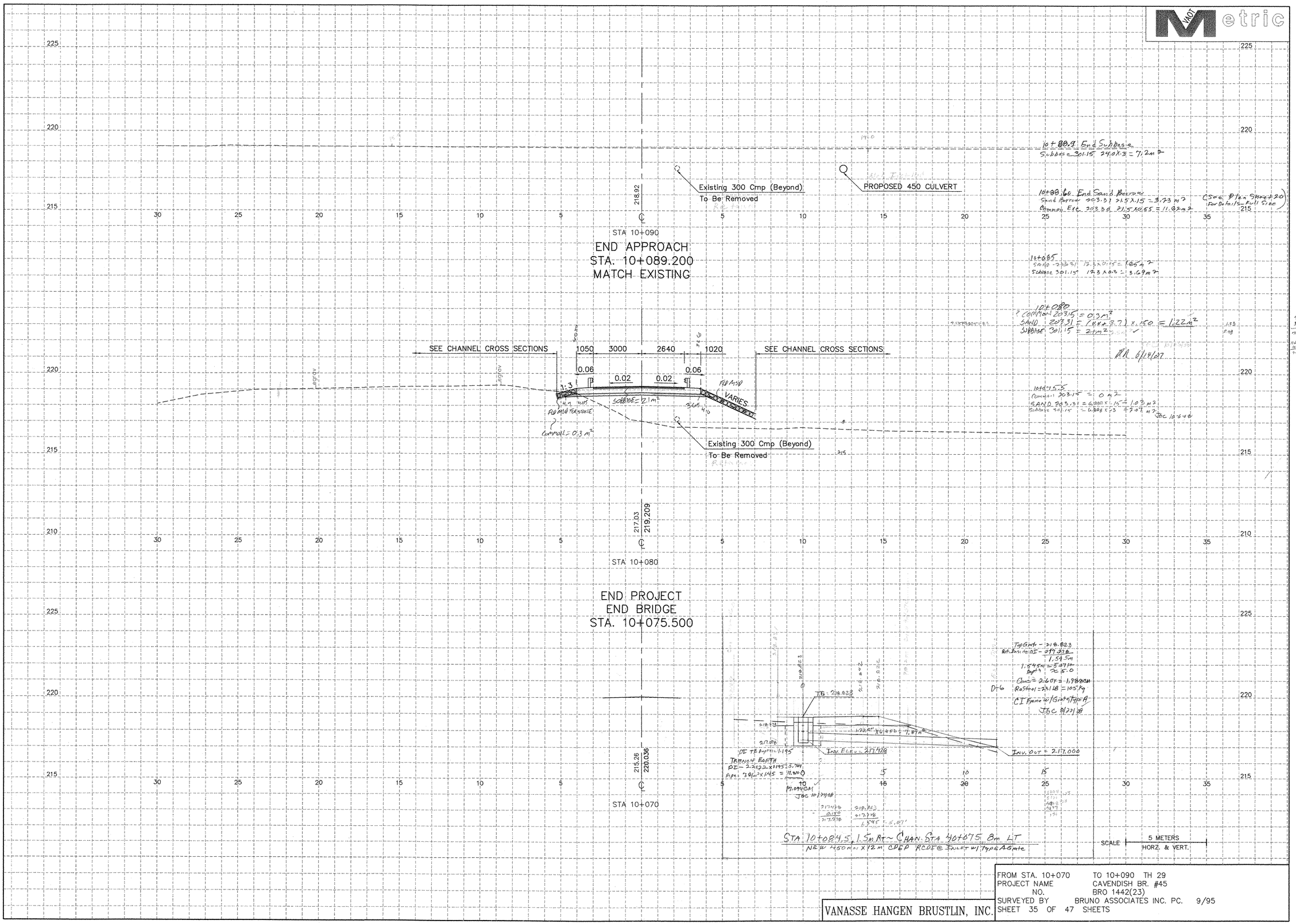
VAOT Metric



FROM STA. 10+025	TO 10+050 TH 29
PROJECT NAME	CAVENDISH BR. #45
NO.	BRO 1442(23)
SURVEYED BY	BRUNO ASSOCIATES INC. PC. 9/95
SHEET 34 OF 47 SHEETS	

VANASSE HANGEN BRUSTLIN, INC.

VAOT Metric

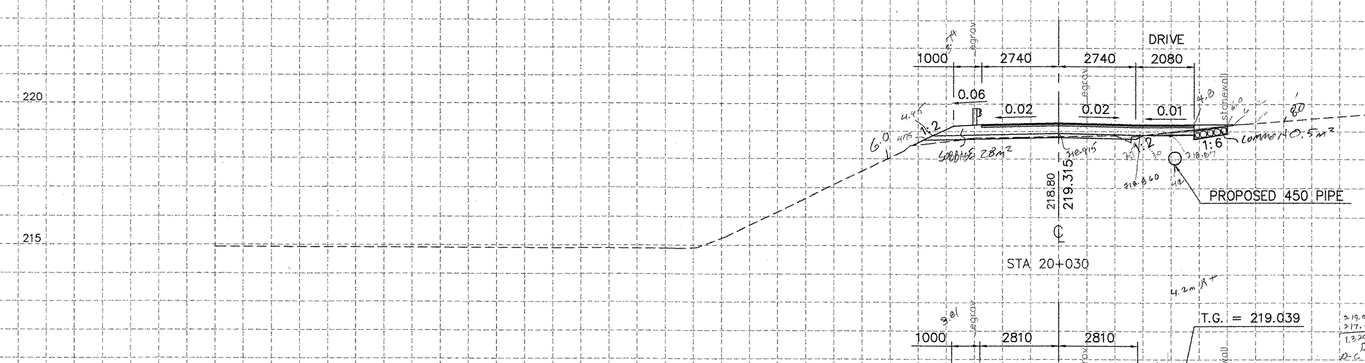


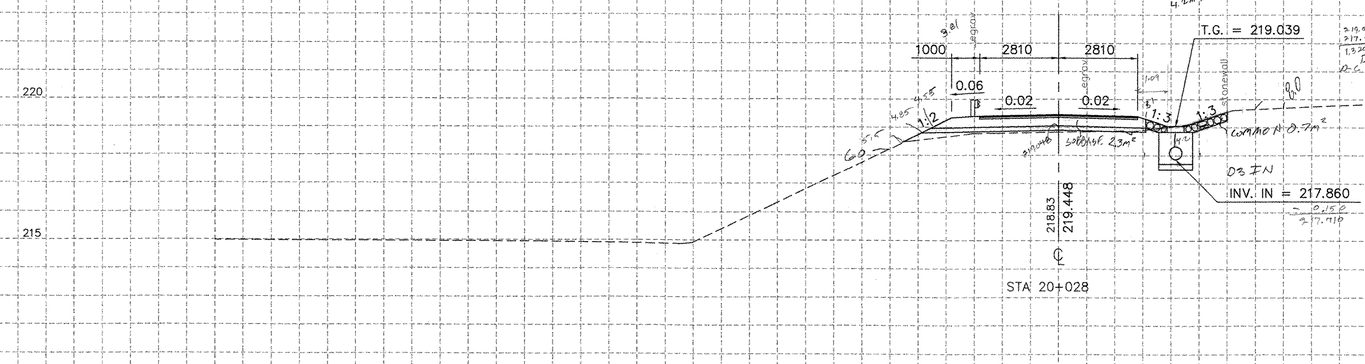
FROM STA. 10+070	TO 10+090	TH 29
PROJECT NAME	CAVENDISH BR. #45	
NO.	BRO 1442(23)	
SURVEYED BY	BRUNO ASSOCIATES INC. PC.	9/95
SHEET 35 OF 47 SHEETS		

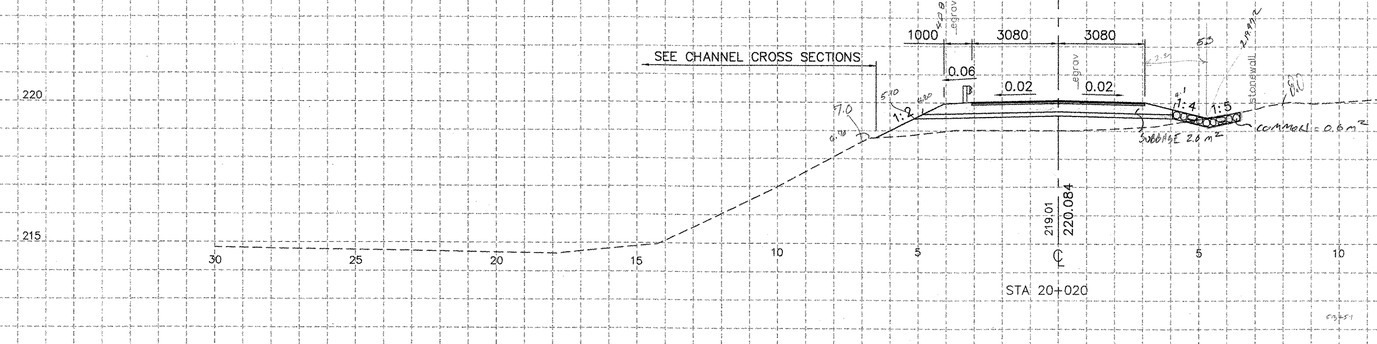
VANASSE HANGEN BRUSTLIN, INC.

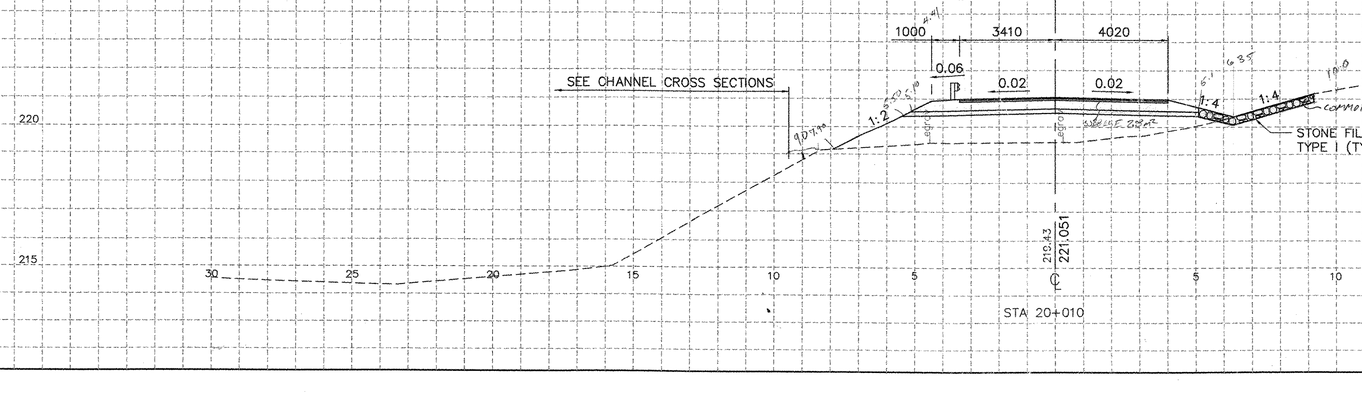
50499-XS PLOTTED 5/15/2006

VAOT Metric









FROM STA. 20+010	TO STA. 20+030 TH 29
PROJECT NAME	CAVENDISH BR. #45
NO.	BRO 1442(23)
SURVEYED BY	BRUNO ASSOCIATES INC. PC. 9/95
SHEET 36 OF 47 SHEETS	

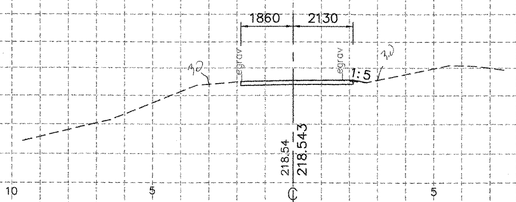
VANASSE HANGEN BRUSTLIN, INC.

SCALE 5 METERS HORZ. & VERT.

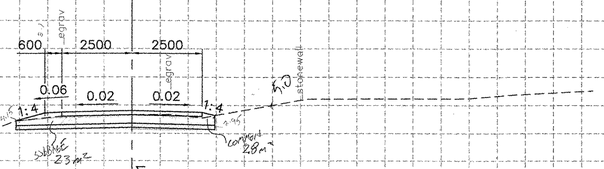
50499-XS PLOTTED 5/15/2006

VAOT Metric

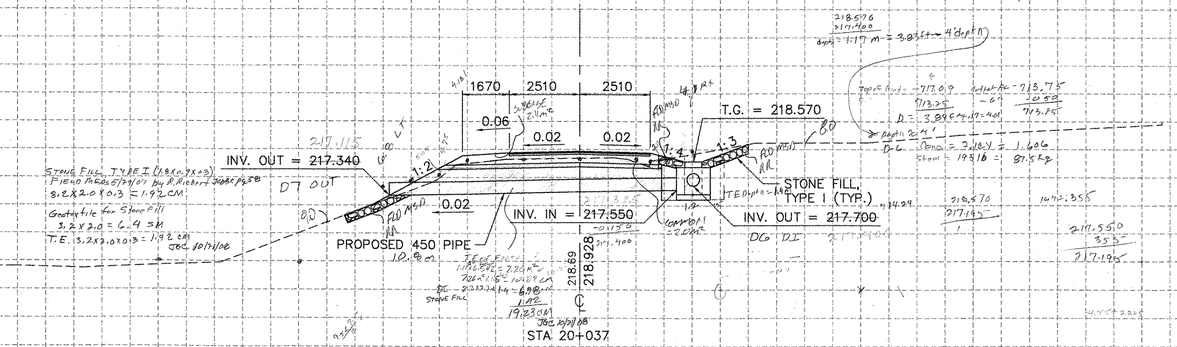
STA. 20+055.000
END APPROACH
MATCH EXISTING



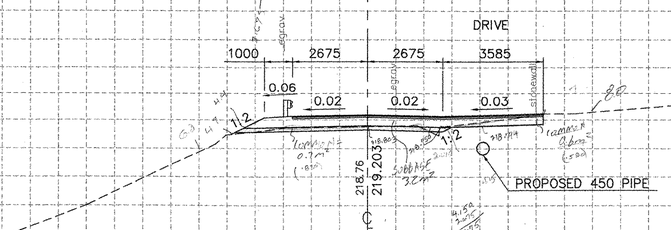
STA 20+050



STA 20+040
END APPROACH PAVEMENT



STA 20+037



STA 20+031.8
DRIVE

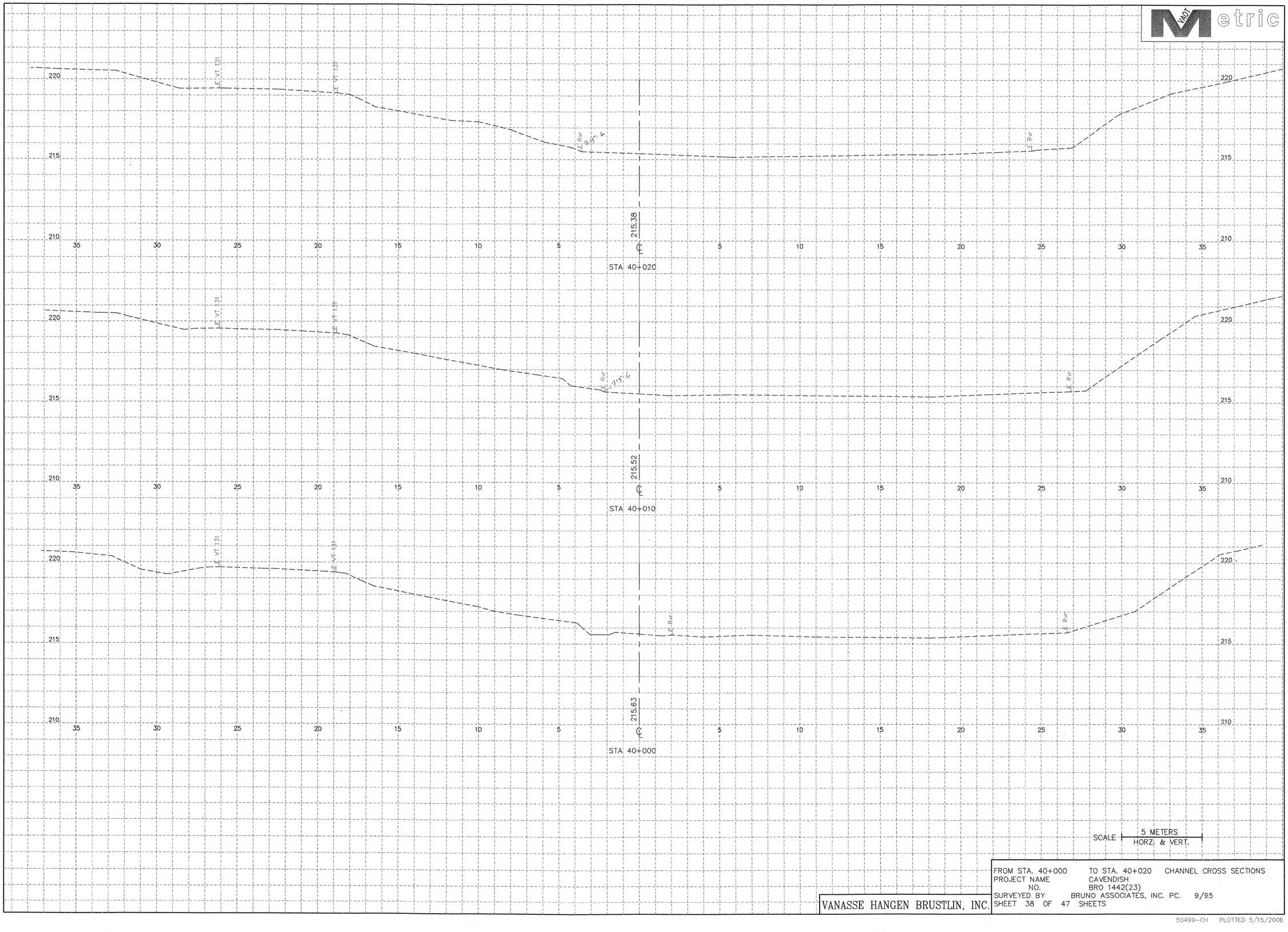
SCALE 5 METERS HORZ. & VERT. 1:50

FROM STA. 20+031.8	TO STA. 20+050 TH 29
PROJECT NAME	CAVENDISH BR. #45
NO.	BRO 1442(23)
SURVEYED BY	BRUNO ASSOCIATES INC. PC. 9/95
SHEET 37 OF 47 SHEETS	

VANASSE HANGEN BRUSTLIN, INC.

50499-XS PLOTTED 5/15/2006

VAOT Metric



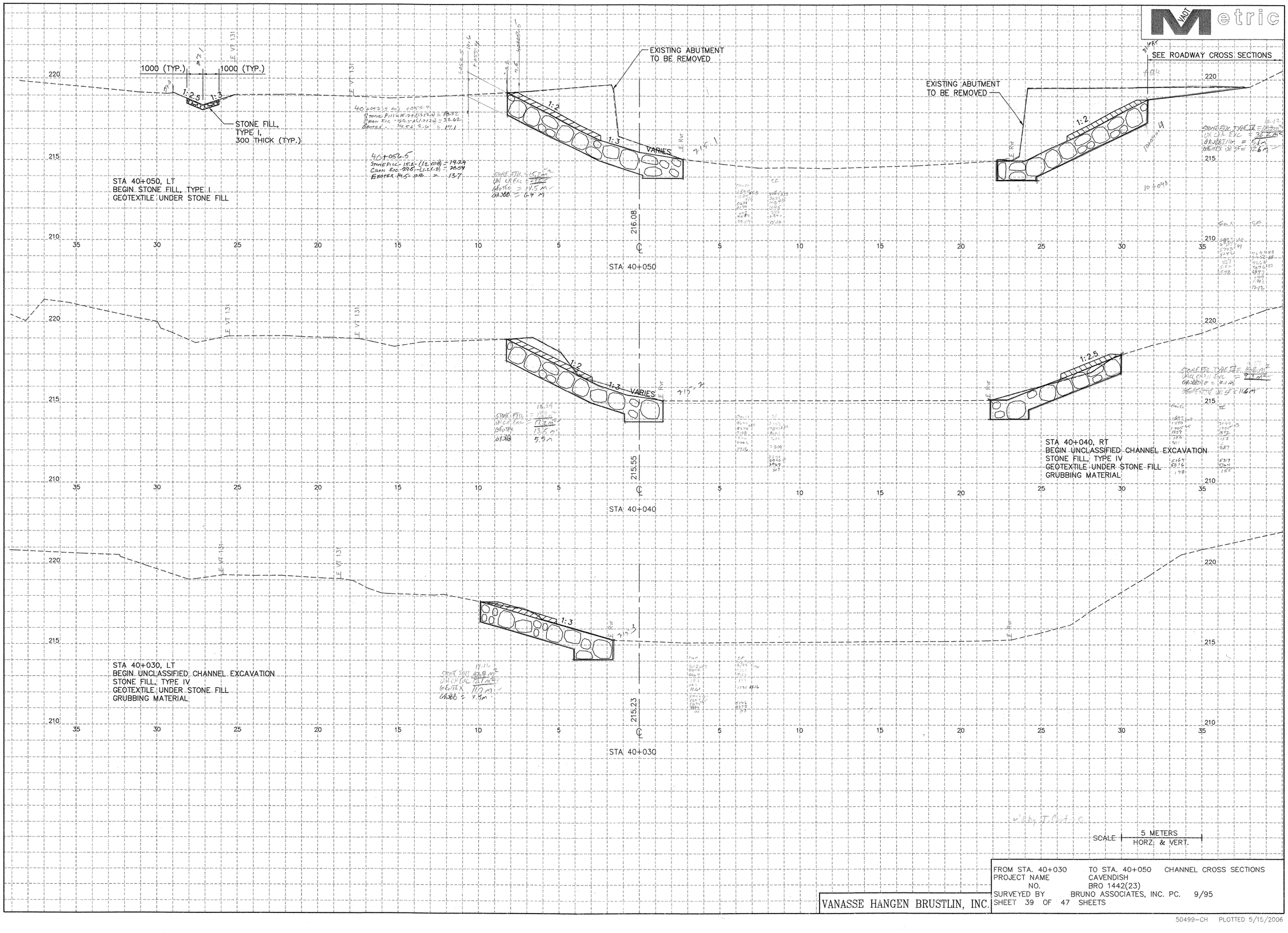
SCALE 5 METERS HORZ. & VERT.

FROM STA. 40+000 TO STA. 40+020 CHANNEL CROSS SECTIONS
PROJECT NAME CAVENDISH
NO. BRO 1442(23)
SURVEYED BY BRUNO ASSOCIATES, INC. PC. 9/95
SHEET 38 OF 47 SHEETS

VANASSE HANGEN BRUSTLIN, INC.

50499-CH PLOTTED 5/15/2006

VAOT Metric



FROM STA. 40+030 TO STA. 40+050 CHANNEL CROSS SECTIONS
PROJECT NAME CAVENDISH
NO. BRO 1442(23)
SURVEYED BY BRUNO ASSOCIATES, INC. PC. 9/95
SHEET 39 OF 47 SHEETS

VANASSE HANGEN BRUSTLIN, INC.

50499-CH PLOTTED 5/15/2006

VAOT Metric

STA 40+075

INV. OUT = 217.400

INV. IN = 217.800

500

PROPOSED 450 PIPE
X.I.T.M.

TREES

SEE ROADWAY CROSS SECTIONS

STONE FILL, TYPE I, 300 THICK (TYP.)

STA 40+070

STA 40+067, LT
BEGIN GRUBBING MATERIAL

STA 40+067, RT
BEGIN GRUBBING MATERIAL

1000 (TYP.)

1000 (TYP.)

STONE FILL, TYPE I, 300 THICK (TYP.)

PROPOSED ABUTMENT #2

PROPOSED ABUTMENT #1

GRANULAR BACKFILL FOR STRUCTURES

APPROXIMATE LEDGE

STA 40+060

STA 40+057, LT
END GRUBBING MATERIAL

STA 40+057, RT
END GRUBBING MATERIAL

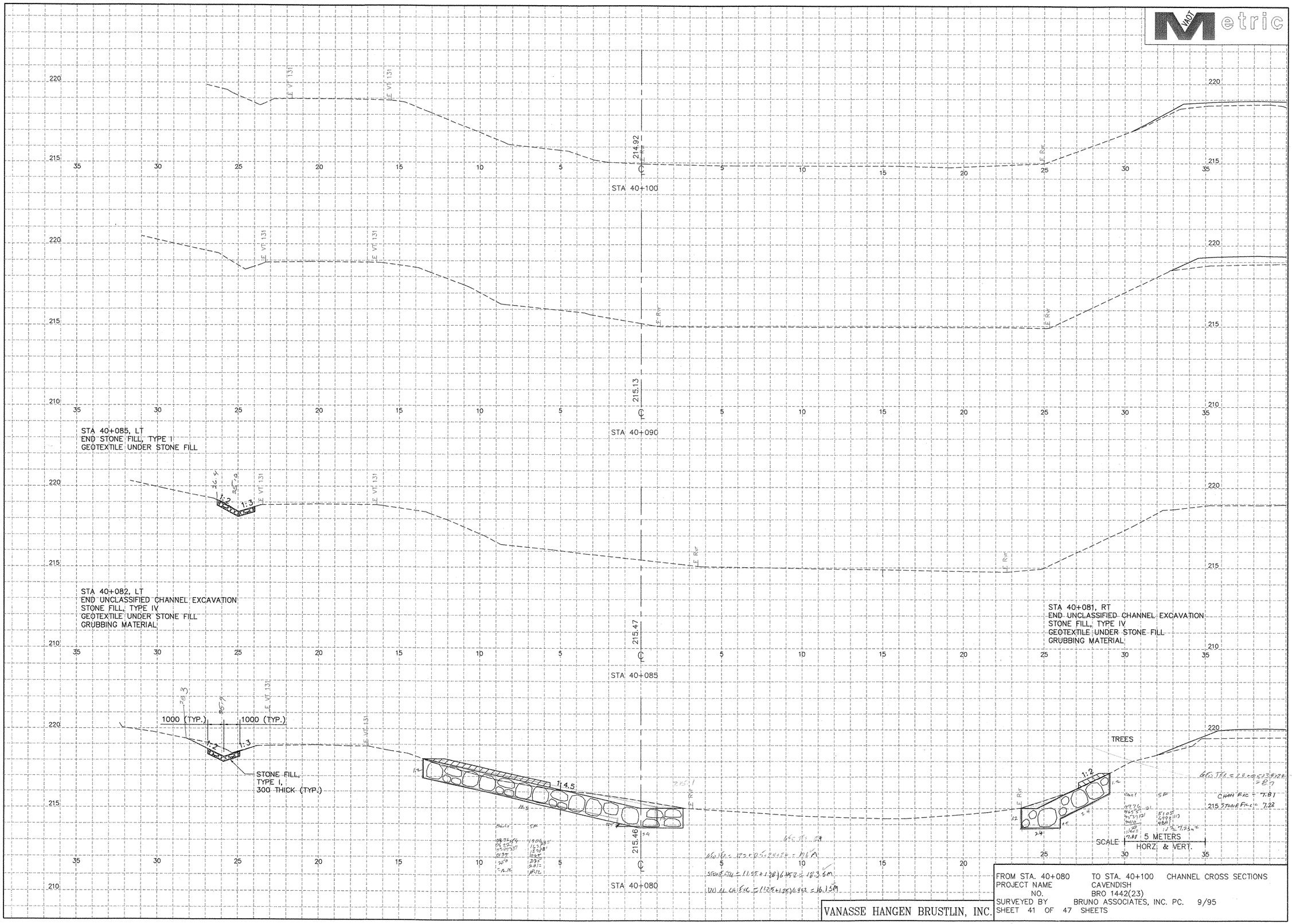
SCALE 5 METERS
HORZ. & VERT.

FROM STA. 40+060 TO STA. 40+075 CHANNEL CROSS SECTIONS
PROJECT NAME CAVENDISH
NO. BRO 1442(23)
SURVEYED BY BRUNO ASSOCIATES, INC. PC. 9/95
SHEET 40 OF 47 SHEETS

VANASSE HANGEN BRUSTLIN, INC.

50499-CH PLOTTED 5/15/2006

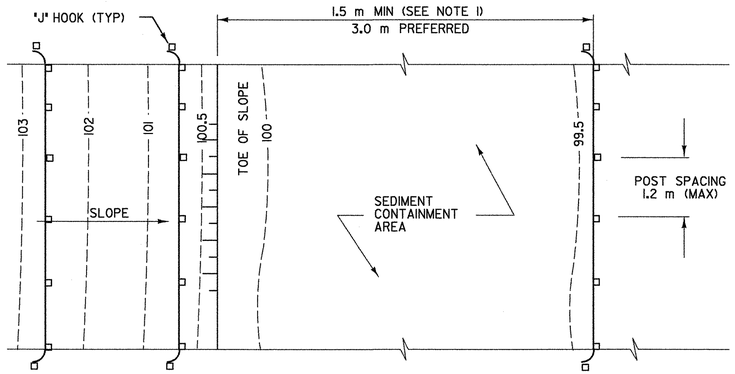
VAOT Metric



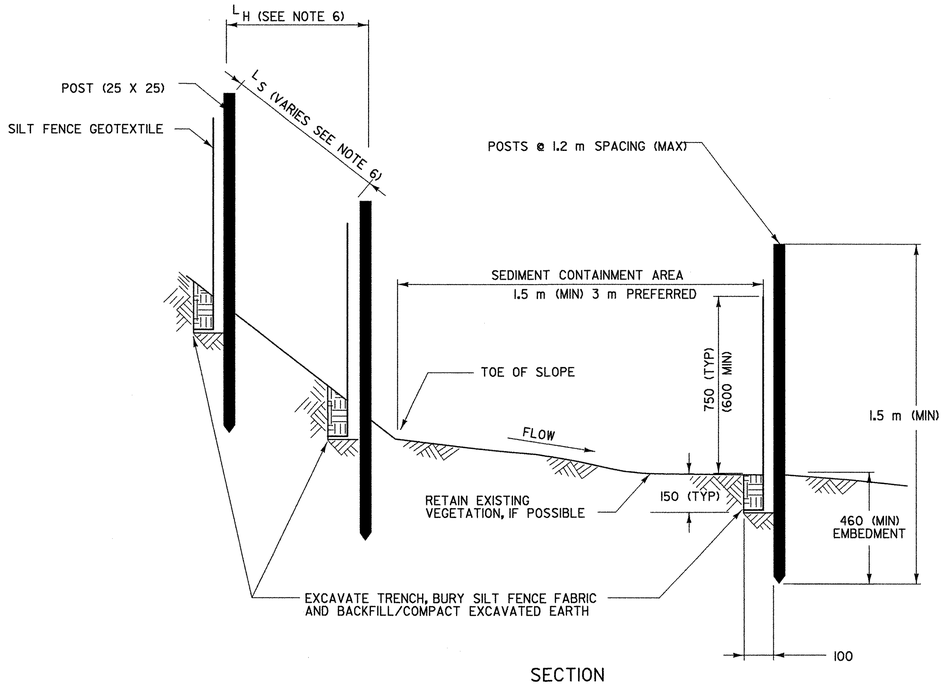
FROM STA. 40+080	TO STA. 40+100	CHANNEL CROSS SECTIONS
PROJECT NAME	CAVENDISH	
NO.	BRO 1442(23)	
SURVEYED BY	BRUNO ASSOCIATES, INC. PC.	9/95
SHEET 41 OF 47 SHEETS		

VANASSE HANGEN BRUSTLIN, INC.

50499-CH PLOTTED 5/15/2006



PLAN



SECTION

SILT FENCE - TEMPORARY

SILT FENCE

APPLICATION NOTES:

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

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

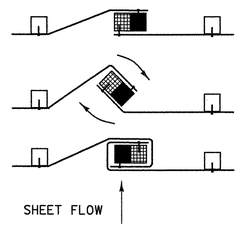
C. SILT FENCE SHALL NOT BE USED ACROSS CONCENTRATED FLOW.

GENERAL NOTES:

1. SILT FENCE SHALL GENERALLY BE PLACED A MINIMUM OF 1.5 m BEYOND TOE OF SLOPE, 3 m PREFERRED, TO PROVIDE ADEQUATE AREA FOR SEDIMENT STORAGE AND FACILITATE MAINTENANCE OF SEDIMENT CONTAINMENT AREA.
2. ALL ENDS SHALL BE 'J' HOOKED TO TRAP SEDIMENT.
3. IN AREAS WITH TWO SLOPES, SILT FENCE SHALL BE USED TO ERECT A DAM AND TRAP SEDIMENT AT THE BASE OF THE STEEPER SLOPE.
4. THE BOTTOM EDGE OF SILT FENCE SHALL BE BURIED A MINIMUM OF 150 mm BELOW GROUND, AND KEYED IN 100 mm. THE FENCE SHALL BE INSTALLED WITH THE POSTS ON THE DOWNSTREAM SIDE OF THE FABRIC.
5. MAXIMUM DRAINAGE AREA TRIBUTARY TO 30 m OF SILT FENCE SHALL BE 0.1 Ha.
6. THE FOLLOWING ARE MAXIMUM SLOPE LENGTHS FOR THESE MEASURES:

CONSTRUCTED SLOPE	SLOPE LENGTH (LS) m	HORIZONTAL LENGTH (LH) m
3 : 1	25	24
4 : 1	40	39
5 : 1	60	60
> 5 : 1	80	80

7. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
8. MEASURES SHALL BE CLEANED AND REPAIRED AS NEEDED. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.
9. SILT FENCE SHALL BE REMOVED WHEN THE AREA HAS BEEN STABILIZED. AT TIME OF REMOVAL OF THE SILT FENCE, THE DISTURBED AREA SHALL BE REPAIRED AND STABILIZED.
10. PAYMENT FOR INSTALLATION AND REMOVAL OF SILT FENCE SHALL BE MADE UNDER THE GEOTEXTILE FOR SILT FENCE ITEM.
11. PAYMENT FOR MONITORING SILT FENCE SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
12. PAYMENT FOR MAINTAINING SILT FENCE SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.



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

SPLICING DETAIL

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

REVISIONS AND CORRECTIONS

MAY 18, 2004 N. GARBACIK

EROSION PREVENTION & SEDIMENT CONTROL DETAILS SILT FENCE

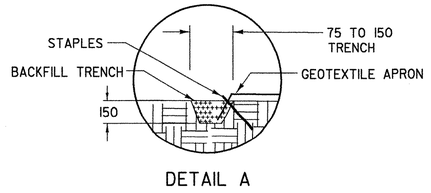
VERMONT AGENCY OF TRANSPORTATION

VAOT Metric DETAIL EPSC-1M

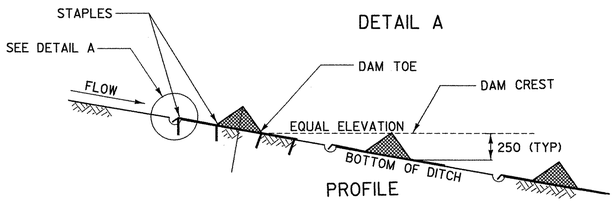
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
EPSC-1M	
Designed By VTRANS	Drawn By VTRANS
Checked By VTRANS Date	Bridge Design Supervisor C. D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442 (23)
I.G.C. Info.	
Bridge Sheet No.	Sheet 42 of 47

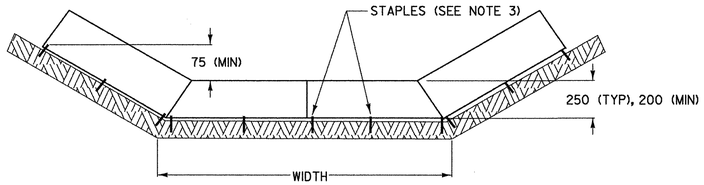
VHB NO. 50499



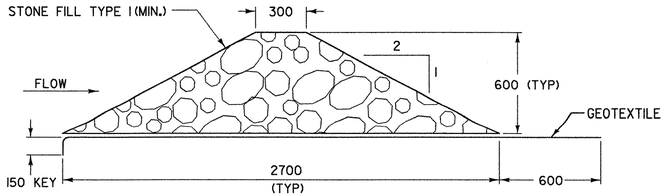
DETAIL A



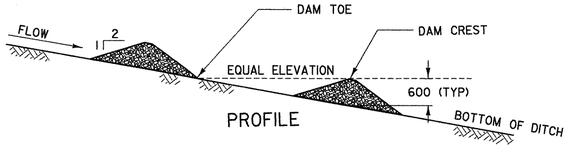
PROFILE



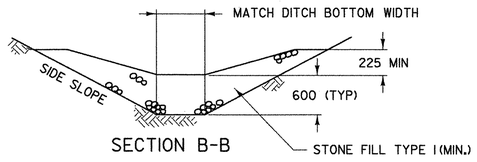
SECTION A-A



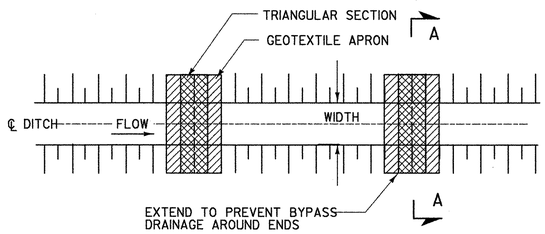
CROSS SECTION



PROFILE

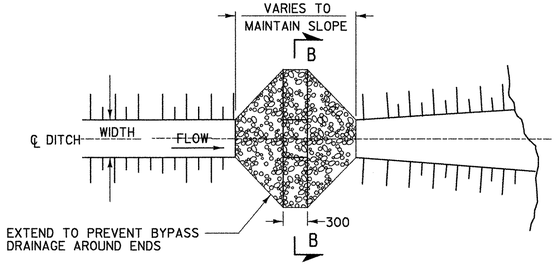


SECTION B-B



PLAN

CHECK DAM - TEMPORARY
(PREFABRICATED)



PLAN

CHECK DAM - TEMPORARY
(STONE)

PREFABRICATED CHECK DAM PLACEMENT INTERVAL	
DITCH SLOPE	PLACEMENT INTERVAL ••
1%	15 m
2 %	12 m
3 %	8 m
4 %	6 m
5 %	5 m

•• BASED ON 0.25 m TYPICAL HEIGHT

STONE CHECK DAM PLACEMENT INTERVAL	
DITCH SLOPE	PLACEMENT INTERVAL ••
1%	60 m
2 %	30 m
3 %	20 m
4 %	15 m
5 %	12 m
6 %	10 m
8 %	7.5 m
10 %	6 m

•• BASED ON 0.6 m TYPICAL HEIGHT

CHECK DAMS

APPLICATION NOTES:

A. THE PRIMARY PURPOSE OF A CHECK DAM IS TO REDUCE EROSION IN A CHANNEL BY REDUCING FLOW VELOCITY.

B. CHECK DAMS WILL CAPTURE SEDIMENT THAT FALLS OUT OF SUSPENSION BEHIND THE CHECK DAM DUE TO DECREASED VELOCITY.

C. CHECK DAMS ARE NOT INTENDED TO FILTER SEDIMENT FROM TURBID WATER.

D. DETAILS SHOWN SHALL BE USED FOR TEMPORARY INSTALLATION ONLY.

E. PREFABRICATED DAMS ARE NOT TO BE USED ON SLOPES GREATER THAN 5% OR PER MANUFACTURER'S SPECIFICATIONS.

F. PREFABRICATED DAM SPECIFICATIONS SHALL BE PROVIDED TO THE ENGINEER FOR APPROVAL PRIOR TO USE.

GENERAL NOTES:

1. GEOTEXTILE SHALL BE INSTALLED UNDER STONE FILL. IT SHALL BE KEYED IN ON THE UP HILL END AND SHALL EXTEND 0.6 m BEYOND THE STONE ON THE DOWN HILL END.

2. CORE MATERIAL FOR THE STONE CHECK DAM SHALL MEET THE GRADATION REQUIREMENTS OF STONE FILL TYPE I (MIN.). STONE SIZE SHOULD BE INCREASED WITH INCREASED SLOPE AND VELOCITY.

3. THE UPHILL END OF THE APRON FOR THE PREFABRICATED CHECK DAM SHALL BE STAPLED AND BURIED AS SHOWN IN DETAIL "A" OR AS RECOMMENDED BY THE MANUFACTURERS LITERATURE.

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

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

6. AT TIME OF REMOVAL OF THE CHECK DAMS, THE DISTURBED AREA SHALL BE REPAIRED AND STABILIZED.

7. PAYMENT FOR INSTALLATION AND REMOVAL OF CHECK DAMS SHALL BE MADE UNDER APPLICABLE ITEMS INCLUDED IN THE CONTRACT PLANS OR UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM.

8. PAYMENT FOR MONITORING CHECK DAMS SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.

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

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

REVISIONS AND CORRECTIONS

MAY 15, 2004 N. GARBACIK

EROSION PREVENTION & SEDIMENT CONTROL DETAILS CHECK DAMS

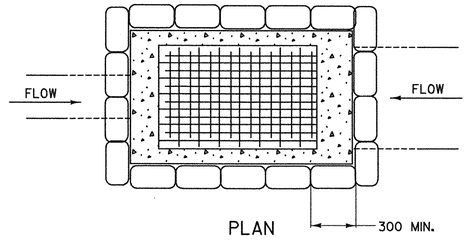
VERMONT AGENCY OF TRANSPORTATION

VAOT Metric DETAIL EPSC-2M

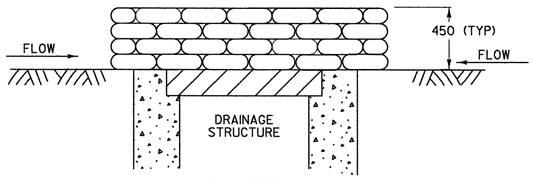
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
	Log Sta.
Highway No. TH 29	Surv. Sta.
TH 29 OVER BLACK RIVER	
EPSC-2M	
Designed By VTRANS	Drawn By VTRANS
Checked By VTRANS Date	Bridge Design Supervisor C. D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442 (23)
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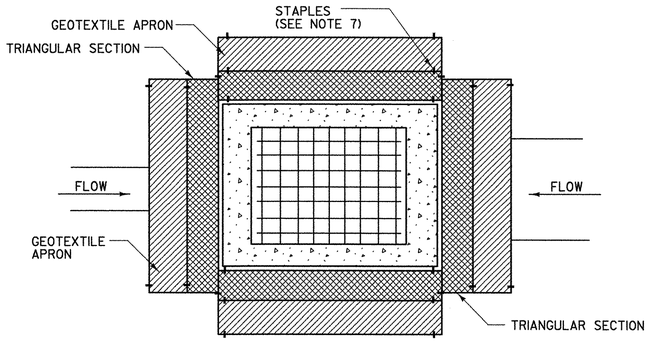


PLAN

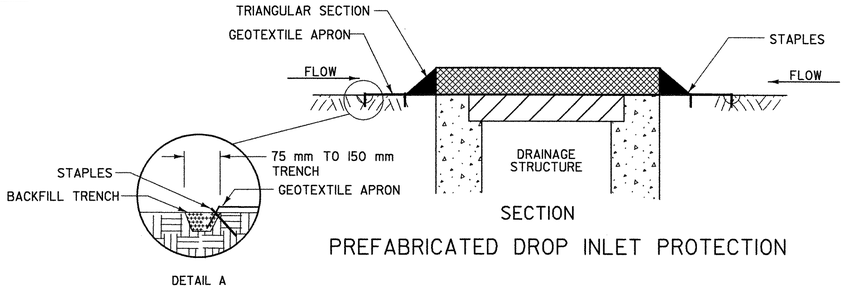


SECTION

GRAVEL BAG DROP INLET PROTECTION

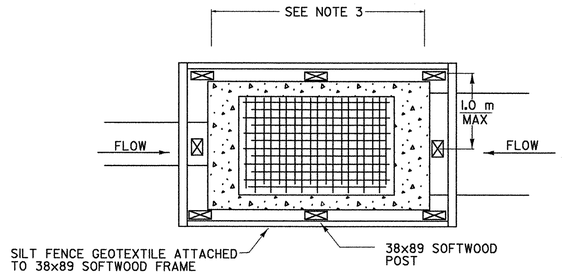


PLAN

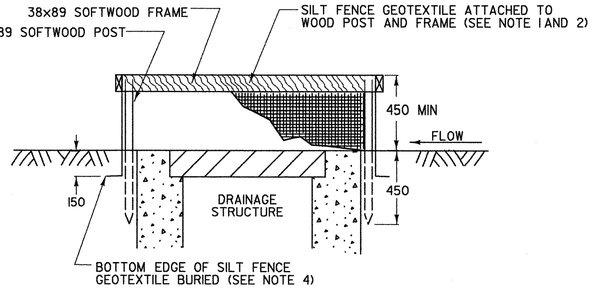


SECTION

PREFABRICATED DROP INLET PROTECTION

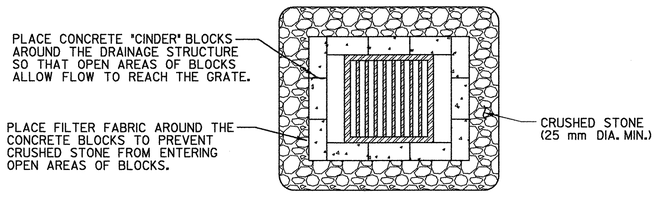


PLAN

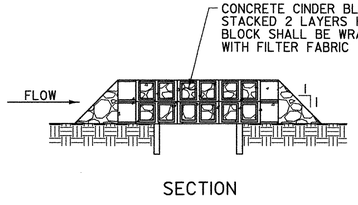


SECTION

SILT FENCE DROP INLET PROTECTION

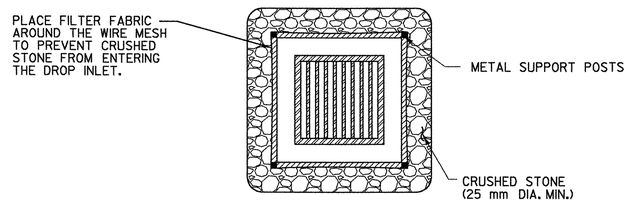


PLAN

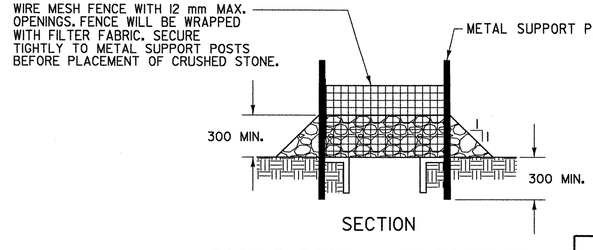


SECTION

ROCK BARRIER DROP INLET PROTECTION
TEMPORARY PAVED AREAS



PLAN



SECTION

ROCK BARRIER INLET PROTECTION
TEMPORARY UNPAVED AREAS

DROP INLET PROTECTION

APPLICATION NOTES:

A. THE PRIMARY PURPOSE OF DRAINAGE STRUCTURE INLET PROTECTION IS TO PREVENT SEDIMENT FROM ENTERING A DRAINAGE SYSTEM BY PONDING WATER WHICH ALLOWS SEDIMENT TO FALL OUT OF SUSPENSION.

B. THESE EXAMPLES OF DROP INLET PROTECTION ARE NOT INTENDED FOR USE ON GRADES. ON GRADE THEY MAY CAUSE WATER TO BYPASS THE STRUCTURE, CREATING ADDITIONAL EROSION OR FLOODING.

C. POSSIBLE MODIFICATIONS FOR USE ON GRADE INCLUDE ADDING A BERM DOWNSTREAM OF THE INLET TO CREATE PONDING. CHECK DAMS MAY ALSO BE USED UPSTREAM OF THE INLET TO SLOW VELOCITIES.

D. PREFABRICATED DROP INLET PROTECTION SPECIFICATIONS SHALL BE PROVIDED TO THE ENGINEER FOR APPROVAL PRIOR TO USE.

GENERAL NOTES:

1. THE TOP OF THE INLET PROTECTION SHALL BE SET AT THE MAXIMUM DESIRED WATER LEVEL, BASED ON FIELD LOCATION AND CONDITIONS.
2. SILT FENCE GEOTEXTILE SHALL BE A SINGLE CONTINUOUS PIECE TO ELIMINATE JOINTS.
3. SPACE SILT FENCE POSTS EVENLY AROUND INLET WITH A MAXIMUM SPACING OF 1.0 m. DRIVE POSTS A MINIMUM OF 450 mm INTO GROUND. WIRE MESH MAY BE REQUIRED BEHIND GEOTEXTILE TO PROVIDE SUPPORT.
4. SILT FENCE GEOTEXTILE SHALL BE EMBEDDED A MINIMUM OF 150 mm AND BACKFILLED. GEOTEXTILE SHALL BE SECURELY FASTENED TO POSTS AND FRAME.
5. GRAVEL BAGS SHALL BE FILLED WITH CLEAN STONE, RATHER THAN SAND, TO PREVENT SEDIMENT FROM ENTERING A DRAINAGE SYSTEM IF BAGS ARE DAMAGED DURING USE.
6. GRAVEL BAGS SHALL BE INDIVIDUALLY TIED, DOUBLE BAGGED AND INVERSELY INSERTED. GRAVEL BAGS SHALL LAP THE JOINTS BETWEEN THE BAGS IN THE LAYER BELOW.
7. SECURE THE ENDS OF THE APRON FOR THE PREFABRICATED DRAINAGE STRUCTURE INLET PROTECTION WITH STAPLES AS DETAILED IN THE PLAN VIEW OR AS RECOMMENDED BY THE MANUFACTURERS LITERATURE.
8. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
9. MEASURES SHALL BE CLEANED AND REPAIRED AS NEEDED. SEDIMENT SHALL BE REMOVED WHEN ACCUMULATION REACHES ONE-HALF OF THE MEASURE HEIGHT. SEDIMENT SHALL BE DISPOSED OF AS UNSUITABLE MATERIAL.
10. PAYMENT OF INLET PROTECTION SHALL BE MADE UNDER APPLICABLE ITEMS INCLUDED IN THE CONTRACT PLANS OR UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM.
11. PAYMENT FOR MONITORING INLET PROTECTION SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
12. PAYMENT FOR MAINTAINING INLET PROTECTION SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

REVISIONS AND CORRECTIONS

MAY 18, 2004 N. GARBACIK

EROSION PREVENTION & SEDIMENT CONTROL DETAILS DROP INLET PROTECTION

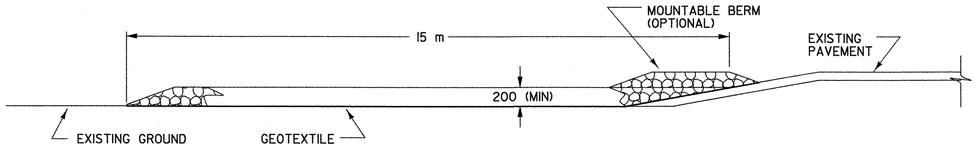
VERMONT AGENCY OF TRANSPORTATION

VAOT Metric DETAIL EPSC-3M

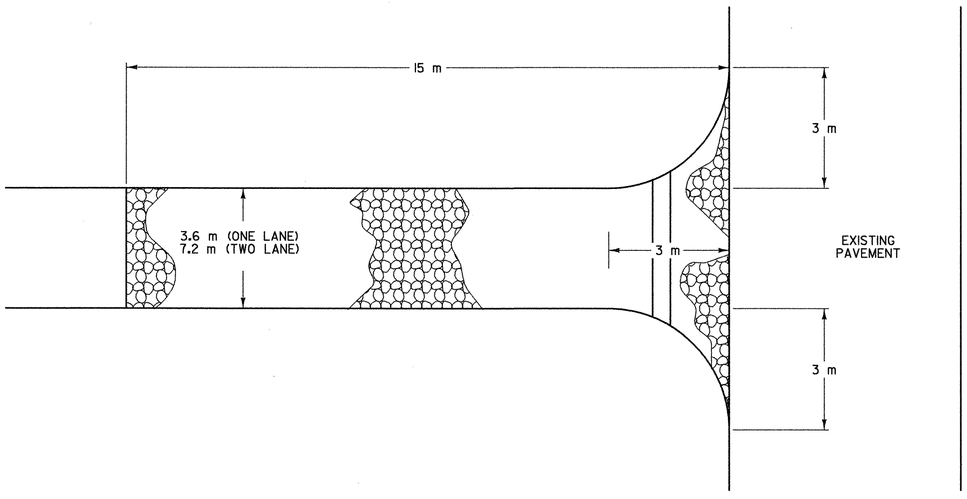
STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta. / Surv. Sta.
TH 29 OVER BLACK RIVER	
EPSC-3M	
Designed By VTRANS	Drawn By VTRANS
Checked By VTRANS Date	Bridge Design Supervisor C. D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442 (23)
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TYPICAL CONSTRUCTION ENTRANCE PROFILE
(CUT AND DITCH SECTIONS)



TYPICAL CONSTRUCTION ENTRANCE PLAN
(CUT/DITCH AND FILL SECTIONS)

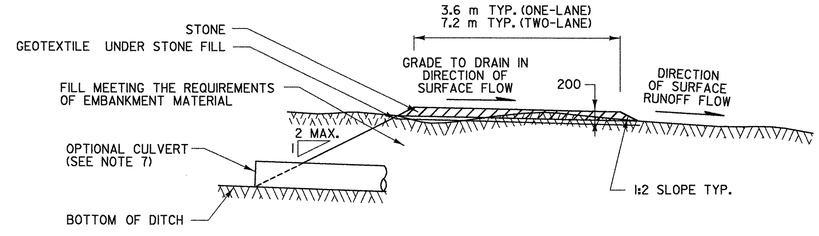
STABILIZED CONSTRUCTION ENTRANCE

APPLICATION NOTES:

A. THE PURPOSE OF A STABILIZED CONSTRUCTION ENTRANCE IS TO REDUCE OR ELIMINATE THE TRACKING OF SEDIMENT ONTO PUBLIC RIGHTS OF WAY OR STREETS.

GENERAL NOTES:

1. STONE SIZE - USE CLEAN STONE WITH GRADATION BETWEEN 50 mm AND 100 mm.
2. LENGTH - 15 m (MIN)
3. THICKNESS - 200 mm (MIN)
4. WIDTH - 3.6 m (MIN)
5. GEOTEXTILE UNDER STONE WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE AS DIRECTED BY THE ENGINEER. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 5:1 SLOPES WILL BE PERMITTED.
7. PROPOSED DRAINAGE PIPES SHALL BE SIZED WITH SUFFICIENT CAPACITY TO CARRY DITCH FLOWS. ALTERNATIVE WAYS OF TRANSPORTING DITCH DRAINAGE ACROSS CONSTRUCTION ENTRANCES MAY BE PROPOSED BY THE CONTRACTOR FOR APPROVAL BY THE ENGINEER.
8. WHEN WASHING OF VEHICLE IS NECESSARY, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. MEASURES SHALL BE INSPECTED EVERY SEVEN (7) CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT GREAT ENOUGH TO CAUSE WATER TO LEAVE THE CONSTRUCTION SITE.
10. MAINTENANCE- THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
11. AT THE TIME OF REMOVAL OF THE STABILIZED CONSTRUCTION ENTRANCE THE DISTURBED AREA SHALL BE REPAIRED AND STABILIZED.
12. PAYMENT OF THE STABILIZED CONSTRUCTION ENTRANCE SHALL BE MADE UNDER APPLICABLE ITEMS INCLUDED IN THE CONTRACT PLANS OR UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM.
13. PAYMENT FOR MONITORING STABILIZED CONSTRUCTION ENTRANCES SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
14. PAYMENT FOR MAINTAINING STABILIZED CONSTRUCTION ENTRANCES SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MAINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.



TYPICAL CONSTRUCTION ENTRANCE SECTION

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

REVISIONS AND CORRECTIONS

MAY 18, 2004 N. GARBACIK

EROSION PREVENTION & SEDIMENT CONTROL DETAILS CONSTRUCTION ENTRANCE

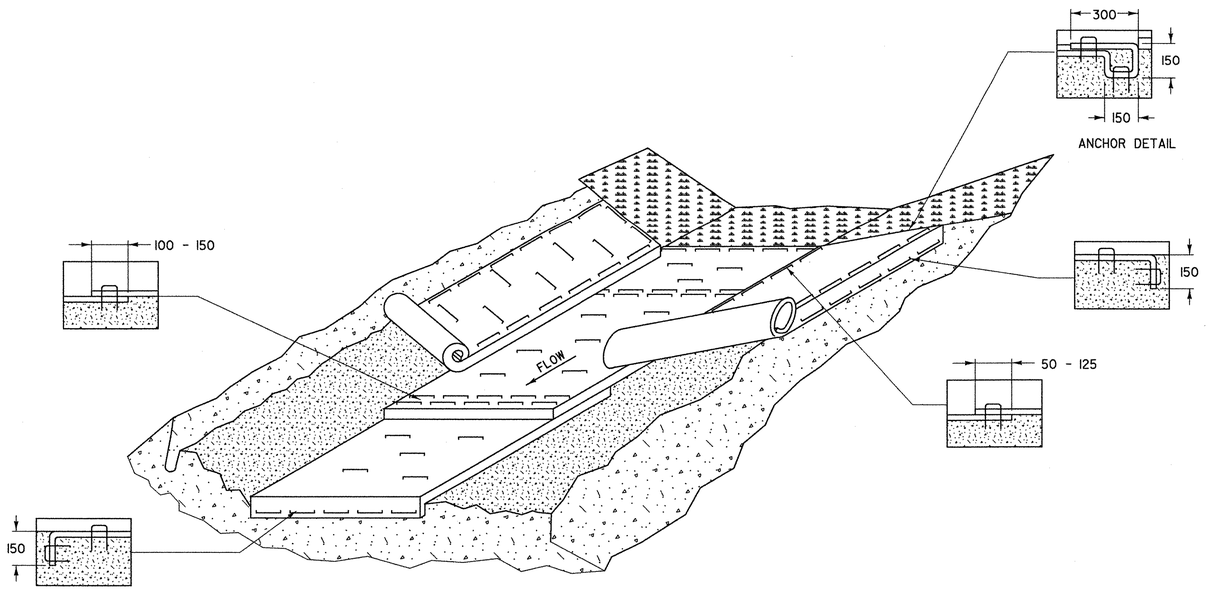
VERMONT AGENCY OF TRANSPORTATION

VAOT Metric DETAIL EPSC-4M

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of CAVENDISH	Bridge No. 45
Highway No. TH 29	Log Sta. / Surv. Sta.
TH 29 OVER BLACK RIVER	
EPSC-4M	
Designed By VTRANS	Drawn By VTRANS
Checked By VTRANS Date	Bridge Design Supervisor C. D. BAKER Date 5/06
PROJECT CAVENDISH	PROJECT NO. BRO 1442 (23)
I.G.C. Info.	
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VHB NO. 50499



EROSION PROTECTION FOR DITCHES

APPLICATION NOTES:

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

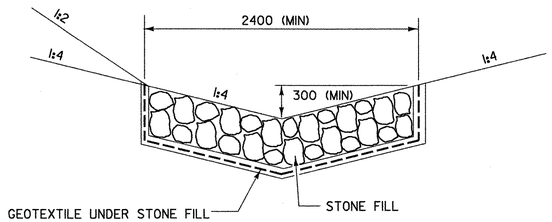
B. THE FOLLOWING CHARTS SHALL BE USED TO DETERMINE THE APPROPRIATE EROSION CONTROL MEASURE:

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

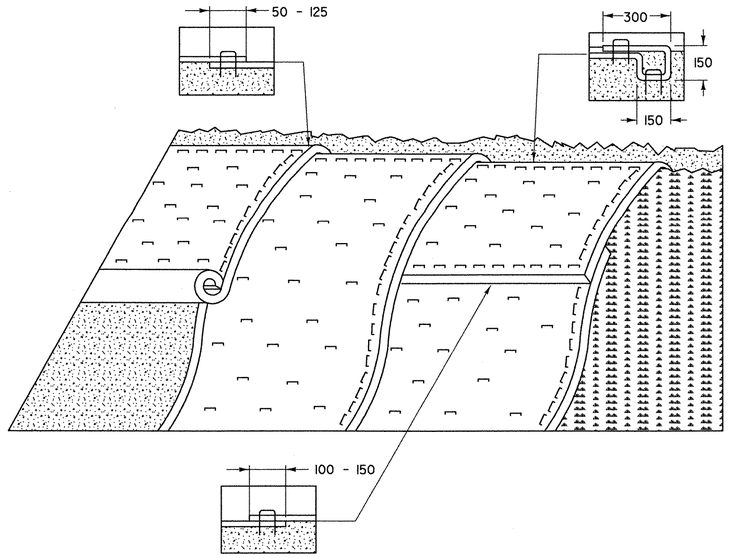
STONE FILL THICKNESS	
STONE FILL TYPE	THICKNESS
TYPE I	0.3 m
TYPE II	0.6 m

GENERAL NOTES:

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



TEMPORARY
STONE LINED
DITCH



EROSION PREVENTION FOR SIDE SLOPES

APPLICATION NOTES:

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

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

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

GENERAL NOTES:

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

NOTE: ALL DIMENSIONS ARE IN MILLIMETERS (mm) EXCEPT WHERE NOTED.

REVISIONS AND CORRECTIONS

MAY 18, 2004 N. GARBACIK

EROSION PREVENTION & SEDIMENT CONTROL DETAILS DITCH & SIDE SLOPE PROTECTION

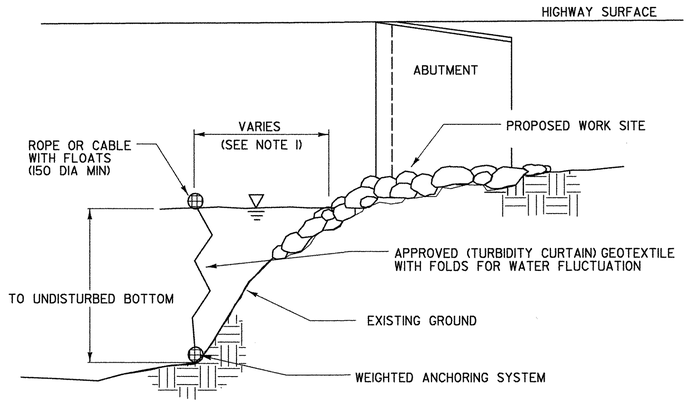
VERMONT AGENCY OF TRANSPORTATION

VAOT Metric DETAIL EPSC-5M

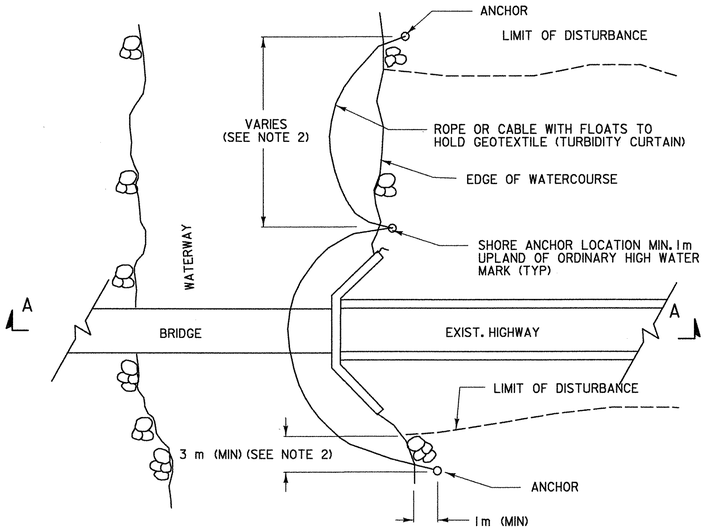
STATE OF VERMONT
AGENCY OF TRANSPORTATION

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TH 29 OVER BLACK RIVER	
EPSC-5M	
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Checked By VTRANS Date	Bridge Design Supervisor C. D. BAKER Date 5/06
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SECTION A-A



PLAN

TURBIDITY CURTAIN - TEMPORARY

TURBIDITY CURTAIN

APPLICATION NOTES:

A. THE PURPOSE OF A TURBIDITY CURTAIN IS TO SEPARATE WORK AREAS IN OR ADJACENT TO WATERS, TO PREVENT SEDIMENT FROM ENTERING THE WATERS.

B. TURBIDITY CURTAIN SHALL NOT BE PLACED ACROSS A FLOWING WATERWAY, OR IN A WATERWAY WITH STREAM VELOCITIES GREATER THAN 0.5m/SEC.

C. TURBIDITY CURTAIN SHALL NOT BE PLACED AT THE OUTLET OF A CULVERT OR DITCH UNLESS THE VELOCITY DOES NOT EXCEED 0.5 m/SEC.

D. THE DETAIL DEPICTS WORK AT A BRIDGE LOCATION, BUT TURBIDITY CURTAIN MAY BE APPLIED AT OTHER LOCATIONS.

GENERAL NOTES:

1. THE TURBIDITY CURTAIN SHALL BE PLACED AS CLOSE TO THE WORK AS POSSIBLE WITHOUT INTERFERING WITH CONSTRUCTION OPERATIONS.
2. THE TURBIDITY CURTAIN SHALL BE A MAXIMUM OF 30 m LONG BETWEEN ANCHORS. LAST SECTION SHALL TERMINATE A MINIMUM OF 3 m BEYOND THE LIMIT OF DISTURBANCE.
3. THE CONTRACTOR SHALL MONITOR THE TURBIDITY CURTAIN, TAKING INTO ACCOUNT WEATHER PATTERNS AND PREVAILING WIND DIRECTIONS THAT MAY AFFECT WATER LEVELS, VELOCITY AND MOVEMENT OF THE TURBIDITY CURTAIN.
4. THE TURBIDITY CURTAIN SHALL BE REMOVED BY SLOWLY PULLING TOWARD THE SHORE TO MINIMIZE ESCAPE OF SEDIMENTS INTO THE WATERWAY.
5. THE WEIGHTED ANCHOR SYSTEM SHALL BE A TYPE THAT ALLOWS THE CURTAIN TO CONFORM TO THE CONTOUR ON THE BOTTOM OF THE WATERWAY.
6. PAYMENT FOR INSTALLATION AND REMOVAL OF THE TURBIDITY CURTAIN SHALL BE MADE UNDER THE GEOTEXTILE FOR FILTER CURTAIN ITEM.
7. PAYMENT FOR MONITORING TURBIDITY CURTAIN SHALL BE MADE UNDER THE MONITORING EROSION & SEDIMENT CONTROL PLAN ITEM.
8. PAYMENT FOR MAINTAINING TURBIDITY CURTAIN SHALL BE MADE UNDER THE FIELD MAINTENANCE OF EROSION & SEDIMENT CONTROL PLAN ITEM, UNLESS MINTENANCE IS REQUIRED DUE TO POOR INSTALLATION PRACTICES.

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REVISIONS AND CORRECTIONS

MAY 18, 2004 N. GARBACIK

EROSION PREVENTION & SEDIMENT CONTROL DETAILS TURBIDITY CURTAIN

VERMONT AGENCY OF TRANSPORTATION

VAOT Metric DETAIL EPSC-6M

STATE OF VERMONT
AGENCY OF TRANSPORTATION

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	Log Sta.
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TH 29 OVER BLACK RIVER	
EPSC-6M	
Designed By VTRANS	Drawn By VTRANS
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Metric

220

219

218

217

216

220 m

219 m

218 m

217 m

STA 20+037 7mLT - 20+037 4m RT
11M - 6

TH 29

STA 20+037
20M 20 TRENCH EXCAVATION OF EARTH
D.I = 4' T 219 m (95x2) = 2.219 m
FIRST 1.5M @ 1.0 PAY FACTOR R = 2.219/2 = 1.11 = RADIUS
A = πr^2 = $\pi(1.11)^2$ = 3.87 m^2
V = $\pi r^2 h$ (3.87 m^2 X1.5) = 5.81 cm^3
BELOW 1.5M @ 1.5 PAY FACTOR
AVE DEPTH = 0.31 + 0.28 + 0.42 = (1.01/3) = 0.337 m
V = $\pi r^2 h$ = (3.87 x 0.337 x 1.5) = 1.96 cm^3

TOTAL = 5.81 + 1.96 = 7.77 cm ⩚ 11/21/07

STA 20+028
20M 20 TRENCH EXCAVATION OF EARTH
D.I = 4' = 1.219 m T (1.5x2) = 2.219 m
FIRST 1.5M @ 1.0 PAY FACTOR R = 2.219/2 = 1.11 = RADIUS
A = πr^2 = $\pi(1.11)^2$ = 3.87 m^2
V = $\pi r^2 h$ = (3.87 m^2 x 1.5m) = 5.81 cm^3
BELOW 1.5M @ 1.5 PAY FACTOR
AVE DEPTH = (0 + 0.3)/3 = 0.1 m
(3.87 m^2 x 0.1m x 1.5) = 0.581 cm^3

TOTAL = 5.81 + 0.581 = 6.39 cm ⩚ 11/26/07

AVE HT FROM BOTTOM OF DITCH = 0.85 M

217.700

217.555

Common Exc. Limit

STA 20+028 - 20+037
AVE HT FROM BOTTOM OF DITCH = (1.40 + 1.51 + 1.40 + 1.33 + 1.34 + 1.32 + 1.29 + 1.19) = 1.36 M AVE

STA 20+028 - 20+037 4.2 M RT

VOLUME = LxWxH
AVE HT = 1.36M
WIDTH = 1.50m
LENGTH = 28m
(1.36 x 1.5 x 28) = 13.87 CM TOTAL
⩚ 11/26/07

CHECK EXCAVATION OUT

217.803

AVE DEPTH: 21.910

217.860

T.E: DI - 2.2x2.2x15 = 726
Ap.: = 1.45 x 7.8 x 0.85+1.07/2 = 11.42
18.68 CM JGC 10/31/08

218

217

1.760

PROJECT: CAVENDISH	PROJECT NO.: BRO 1447(23)
DESIGN FILE NAME: DRAINAGE SHEET #1 IPARM FILE NAME:	PLOT DATE: 01-MAY-1996
DRAWN BY: P. RICHERT CKD BY J. COUTURE	
	SHEET: 043 OF

218537 - DITCH EXCV

1-100 6 another block

VERMONT

State of Vermont
PDD/Structures Design Section
National Life Building – Drawer 33
Montpelier, VT 05633-5001
www.aot.state.vt.us

[phone] 802-828-2621
[fax] 802-828-3566
[tnd] 800-253-0191

Agency of Transportation

DATE: Jan. 04, 2007

Ohio Bridge Corp.
201 Wheeling Avenue
Cambridge, OH 43725

Project Name: Cavendish **Project #: BRO 1442 (23)**

Structure Identification: Bridge # 45 on TH 29 over the Black River

The following Structural Steel details [Item #506.75, Name (Structural Steel, (Prefabricated Truss)] for the above project (Vendor's Job #Cavendish_Metric) transmitted with your letter dated Dec. 14, 2006 have been reviewed and are being returned herewith.

Sheets: 1 through 4 of 5
are approved

Sheet: 5 of 5
is approved "as noted"

The welding procedures were approved previously. The bearing device bonding procedures are also approved and are included with this letter. 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.

Sincerely,

Martha Evans-Mongeon
Project Manager, Structures

Attachments
cc: [X] Resident Engineer w/prints, Jacques Couture
[X] Shop Inspector w/prints, Jeff Clark
[X] Contractor w/prints, F. W. Whitcomb Construction
[X] Subcontractor – letter only , John Dopp, Dopp and Dopp
[X] Construction Division – letter only
[X] Materials & Research Section (C&IA Unit) – letter only
[X] Files (Structures & Central)

VTrans Working to Get You There! Vermont Agency of Transportation

049-SC

ORD BY _____ ORD BY JWK

NOV 0 2 2006

JOINT WELDING
PROCEDURE SPECIFICATION

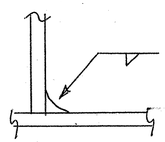
RESUBMIT _____ APPROVED ✓
BY _____ DATE 11-14-06

MATERIAL SPECIFICATION ASTM A572 GR 50 & ASTM A36
WELDING PROCESS FLUX CORED ARC WELDING (FCAW)
MANUAL OR MACHINE MANUAL
POSITION OF WELDING FLAT (1F) OR HORIZONTAL (2F)
FILLER METAL SPECIFICATION AWS D5.20
FILLER METAL CLASSIFICATION LINCOLN ELECTRIC ULTACORE 71C E71T-1
FLUX NA
SHIELDING GAS CO^2 FLOW RATE 40 CFH
SINGLE OR MULTIPLE PASS BOTH
SINGLE OR MULTIPLE ARC SINGLE
WELDING CURRENT DC
POLARITY DCEP (DIRECT CURRENT ELECTRODE POSTIVE)
WELDING PROGRESSION NA
ROOT TREATMENT NA
PREHEAT AND INTERPASS TEMPERATURE AS PER TABLE 4.4 OF AWS D1.5-95
POSTHEAT TREATMENT NA

WELDING PROCEDURE

REFERENCED TO
PQR OB#7 7-10-06

PASS NO.	ELECTRODE SIZE	WELDING CURRENT AMPERES	WELDING CURRENT VOLTS	TRAVEL SPEED	FILLET SIZE	JOINT DETAIL
1	.052	256-320	26-30	330-380	8	
2	.052	256-320	26-30	330-380	8	
OPTIMUM		290	29	330 mm/min		



THIS PROCEDURE MAY VARY DUE TO FABRICATION SEQUENCE, FIT-UP, PASS SIZE, ETC., WITHIN THE LIMITATION OF VARIABLES GIVEN IN SECTION 5.

PROCEDURE NO. 24 LM
REVISION NO. _____
CONTRACTOR U.S. BRIDGE
AUTHORIZED BY David Morgan
DATE 10-20-06

BRIDGE No. 45
CAVENDISH, VERMONT

050 55

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. No 1003

DESCRIPTION:
Preparation of stainless steel sheet for bonding.

EFFECTIVE DATE: January 1, 1979

Q.C. APPRVD.: R.P.

SHT. 1 **OF** 1

REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	Sandblast surface to be bonded to a near white color.	
2.	Wipe surface to be bonded with a clean rag and a solvent prior to spreading adhesive.	

RECEIVED
DEC 15 2006

CK'D BY _____ OK'D BY _____

RESUBMIT _____ APPROVED ✓

BY _____ DATE 01-05-07

051 SS

CON-SERV INC

STANDARD OPERATING PROCEDURE

SOP NO 1002

EFFECTIVE DATE: January 1, 1979

Q.C. APPRVD.: R.E.

DESCRIPTION:

Preparation of carbon steel or stainless steel plate for bonding.

SHT. 1 **OF** 1

REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	For carbon steel plates not requiring painting: Sandblast side to be bonded to a uniform clean appearance removing all mill scale. For carbon steel plates to be painted: Sandblast all sides of plate as above. For stainless steel plates: Sandblast surface to be bonded to a uniform appearance.	
2.	Check edges or slots and holes for any burrs. Deburr with file or disc grinder.	
3.	Wipe surface to be bonded with a clean rag and a solvent prior to spreading adhesive.	

RECEIVED
DEC 15 2006
CK'D BY _____ OK'D BY _____
RESUBMIT _____ APPROVED
BY _____ DATE 01-05-07

052 SS

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. Nº 1001

DESCRIPTION:
Preparation carbon steel sheet for bonding.

EFFECTIVE DATE: January 1, 1979

Q.C. APPRVD.: R.C.

SHT. 1 **OF** 1

REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	Check sheet for excessive burrs from shearing. Ifpresent, deburr with file or disc sander.	
2.	Wipe both surfaces of sheet with clean rags soaked in a solvent or if small pieces, soak in a solvent and wipe dry. For either cold-rolled or hot-rolled sheet, no oil must be present on surface after this step.	
3.	Place pieces in dunk racks for etching.	
4.	Lower into pre-heated etching tanks. Tanks to be preheated to 100°F.	
5.	Etch sheets in tank for 45 minutes at 100°F.	
6.	Remove rack from etching tnak and rinse plates thoroughly with hose spray clean water on all sides while still in rack.	
7.	Allow all plate surfaces to dry.	
8.	Prior to applying and adhesive, make a final wipe on bond side with a clean rag and a solvent. This will remove any finger oil or oxidation contaminants.	

RECEIVED
DEC 15 2006

OK'D BY _____ OK'D BY _____

RESUBMIT _____ APPROVED ✓

BY _____ DATE 01-05-07

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. Nº 1011

DESCRIPTION:

Manufacturing steps for fabrication of typical slide bearings

EFFECTIVE DATE: January 1, 1979

Q.C. APPRVD.: R.C.P.

SHT. 1 **OF** 1

REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	Prepare steel per appropriate S.O.P. depending on gauge and type.	
2.	Prepare adhesive per appropriate S.O.P., either standard or hi-temperature.	
3.	Prepare the tape for bonding using the appropriate S.O.P.	
4.	Apply the adhesive either to the steel or the etched surface of the tape as is appropriate for the size and number of bearing plates. Apply with a toothed trowel blade so that a thin (5 to 10 mils) layer of adhesive is uniformly spread over the entire bondable surface.	In summer conditions a flat blade may be appropriate.
5.	Place steel and tape together and slide into bonding press.	
6.	Set bonding pressure appropriate as follows: 1000 psi. gauge for 24" x 48" sheet.	If the area is less, reduce the gauge pressure according directly proportional to the area.
7.	Close pre-heated press on the steel and tape.	Check for slippage of the tape.
8.	Cure the adhesive per the S.O.P.	

RECEIVED

CK'D BY _____ OK'D BY _____

DEC 15 2006

RESUBMIT _____ APPROVED ✓

BY _____ DATE 01-05-07

05455

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. Nº 1011

DESCRIPTION:
Manufacturing steps for fabrication of typical slide bearings.

EFFECTIVE DATE: January 1, 1979
Q.C. APPRVD.: R.C.
SHT. 2 **OF** 2
REVISED DATE: October 28,1996

STEP	PROCEDURE	COMMENTS
9.	Remove the plates from the press and trim the excess tape from the edges.	
10.	Clean TFE with solvent.	
11.	Check the job quantities and mark items as required.	
12.	Package with tape surfaces together.	

ORIGINAL
TEF 1252

RECEIVED
O'K'D BY _____ O'K'D BY _____
DEC 15 2006
RESUBMIT _____ APPROVED ✓
BY _____ DATE 01-05-07

055 55

CON-SERV INC

STANDARD OPERATING PROCEDURE

O.P. NO 1000

DESCRIPTION:
Preparation of etched TFE tape for bonding.

EFFECTIVE DATE: January 1, 1979
Q.C. APPRVD.: R.C.
SHT. 1 **OF** 1
REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	Cut tape to appropiate size.	
2.	Wipe the etched side with a clean rag soaked in a solvent. Wipe to remove any contaminants (oil, dirt, finger-prints, etc.)	
3.	Stack clean TFE with etched surfaces together.	

RECEIVED
OK'D BY_____ OK'D BY_____
DEC 15 2006
RESUBMIT_____ APPROVED_____
BY DATE 01-05-07

056 55

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. Nº 1010

DESCRIPTION:

Peel Test on bonded TFE sheet to steel. (This test will be performed at the beginning of a job lot or if the adhesive lot changes).

EFFECTIVE DATE: January 1, 1979

Q.C. APPRVD.: R.C.

SHT. 1 **OF** 1

REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	Clamp the bonded piece and/or sample in a vice.	
2.	Cut with a Stanley knife a 1" wide strip. Cut through the TFE until the knife hits the steel back-up.	
3.	With a small chisel, start the edge to peel at 90° to the back-up plate.	
4.	Peel with pliers about 1" of material until a hole can be put in the material and the spring load indicator placed in the hole.	
5.	Pull slowly reading the minimum load to peel the TFE.	
6.	Record this load.	
7.	Note if the etch was left on the TFE sheet.	Ideally the etch should be stripped away from the TFE by the strength of the bond to the steel surface.

RECEIVED

CK'D BY _____ OK'D BY _____

DEC 15 2006

RESUBMIT _____ APPROVED ✓

BY _____ DATE 01-05-07

05755

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. Nº 1009

DESCRIPTION:
Test check on etching solution.

EFFECTIVE DATE: January 1, 1979
Q.C. APPRVD.: R.C.
SHT. 1 **OF** 1
REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	Fill the plastic tube to the 4 ml. mark with the solution to be tested.	
2.	Add 2 to 3 drops of the M.O. Indicator.	
3.	Slowly add Turco Scale Test Solution dropwise until, after shaking, the color changes from red-pink to orange-yellow. Count the number of drops.	Hold plastic dropper bottle verticaly.
4.	The approximate % by volume of W.O. #1 is 1/3 of the number of drops of test solution added.	

RECEIVED
OK'D BY _____ OK'D BY _____
DEC 15 2006
RESUBMIT _____ APPROVED _____
BY _____ DATE 01-05-07

05855

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. Nº 1008

DESCRIPTION:

Preparation of hi-temperature adhesive.

EFFECTIVE DATE: January 1, 1979

Q.C. APPRVD.: R.E.

SHT. 1 **OF** 1

REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	Use the instructions for Duralco 4700 as a reference.	
2.	Mix 1 pint increments at a time. 1 pint will cover approximately 8 1/2 sq. feet.	
3.	If mixing in 800 ml. tri-pour polyethylene beaker, mix as follows: Add 12 1/2 oz. of part (A) paste to beaker (1 1/2 oz.) for a total weight 14 oz. Then set balance at 1 lb. 1 1/2 oz. and add 3 1/2 oz. of part (B) powder.	Use a balance scale. Set at 14 oz. for part (A) and then set at 1 lb. 1 1/2 oz. for addition of part (B) Caution: Part (B) powde must be stirred thoroughly before weighing out desired amount.
4.	Stir thoroughly for 10 minutes, warm mixture for ease in stirring.	
5.	Spread using a small toothed trowel.	
6.	Cure as follows: 2 Hours at 220°F. And 4 Hours at 350°F.	This time is required to fully react polymer

RECEIVED
DEC 15 2006

CK'D BY____ OK'D BY____

RESUBMIT____ APPROVED ✓

BY DATE 01-05-07

05755

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. Nº 1007

DESCRIPTION:

Preparation of standard adhesive

EFFECTIVE DATE: January 1, 1979

Q.C. APPRVD.: R.C.

SHT. 1 **OF** 1

REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	Add 1 part of hardener (B) to 2 parts of resin (A) in a clean beaker.	
2.	Stir until the mixture takes on a uniform creamy color. Stir at least 1 minute.	
3.	Do not mix more than 3 or 4 stock sheet sheet quantities.	Depending on the ambient temperature in the shop, the spread adhesive will start to cure chemically outside the press.
4.	Cure the adhesive as follows: 15 minutes at 200°F. or 10 minutes at 250°F.	This is the approximate time/temperature relationship based on 10 gauge steel. For thicker steel more dwel time will be required Approximately 30 min. for 1" steel.

RECEIVED
DEC 15 2006

CK'D BY _____ OK'D BY _____

RESUBMIT _____ APPROVED ✓

BY _____ DATE 01-05-07

D60 55

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. NO 1006

EFFECTIVE DATE: January 1, 1979

DESCRIPTION:
Preparation of laminated silicone hi-temp sheet (G-7) for bonding.

Q.C. APPRVD.: R.E.

SHT. 1 **OF** 1

REVISED DATE: October 28,1996

STEP	PROCEDURE	COMMENTS
1.	Abrade both sides of the sheet with a coarse paper with an oscillating hand sander. The surface should feel rough to the touch and glaze removed.	
2.	Wipe the surfaces with a clean rag and a solvent prior to applying adhesive.	

RECEIVED
CK'D BY _____ OK'D BY _____
DEC 15 2006
RESUBMIT _____ APPROVED ✓
BY _____ DATE 01-05-07

061 55

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. NO 1005

DESCRIPTION:
Preparation of neoprene and steel for bonding.

EFFECTIVE DATE: January 1, 1979
Q.C. APPRVD.: R.C.
SHT. 1 **OF** 1
REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	Chemically etch steel or sandblast depending on thickness.	
2.	Wipe surface of neoprene with a solvent. Then with stub-bristled paint brush apply Chemlok #7701 chlorination solvent. Let dry approximately 15 minutes.	
3.	Apply adhesive to neoprene and compress to 10% compression in press and cure bond line using the following schedule.	
4.	10 to 15 minutes at 200°F.	

RECEIVED
OK'D BY ____ OK'D BY ____
DEC 15 2006
RESUBMIT ____ APPROVED ✓
BY ____ DATE 01-05-07

CON-SERV INC

STANDARD OPERATING PROCEDURE

S.O.P. NO 1004

DESCRIPTION:

Preparation of preformed fabric for bonding.

EFFECTIVE DATE: January 1, 1979

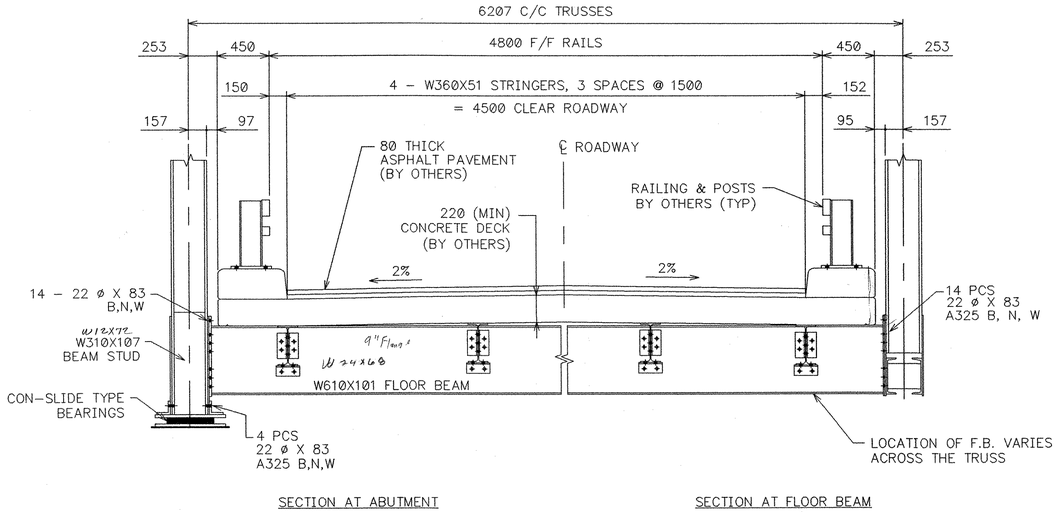
Q.C. APPRVD.: R.E.

SHT. 1 **OF** 1

REVISED DATE: October 28, 1996

STEP	PROCEDURE	COMMENTS
1.	PRIOR TO APPLYING THE ADHESIVE, Wipe surface of preformed fabric with a solvent. Then with a stub-bristled paint brush apply Chemlok #7701 solvent. Let dry approximately 15 minutes.	

RECEIVED
CK'D BY ____ OK'D BY ____
DEC 15 2006
RESUBMIT ____ APPROVED ✓
BY ____ DATE 01-05-07



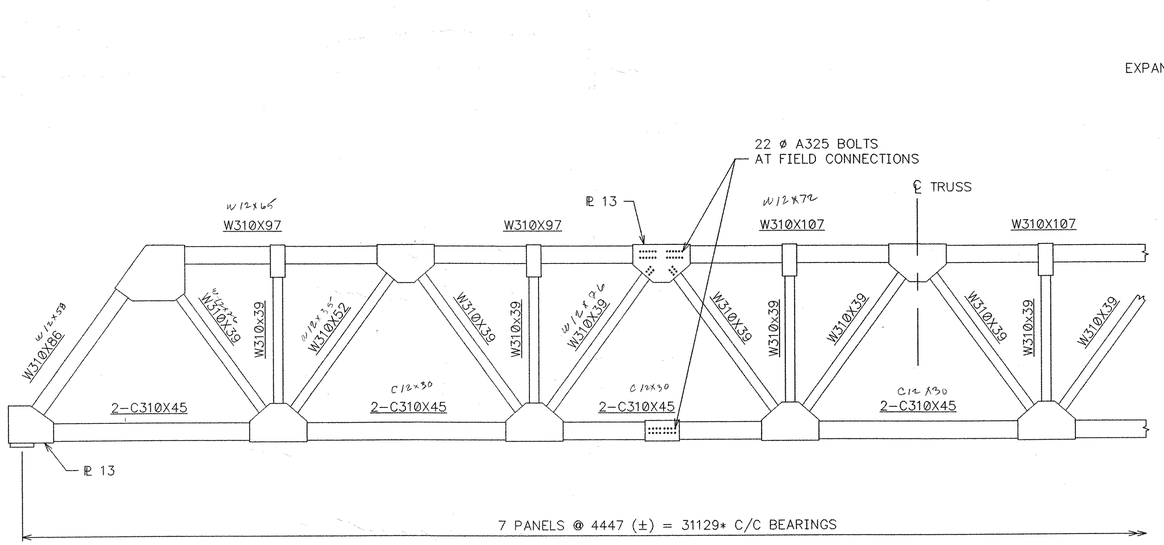
SECTION AT ABUTMENT

SECTION AT FLOOR BEAM

TRUSS BRIDGE SECTION VIEWS

DESIGN DEAD LOADS

CONCRETE DECK	537 kg/m²	(110 PSF)
FUTURE SURFACE	122 kg/m²	(25 PSF)
DECK (OPTIONAL)	73 kg/m²	(15 PSF)
ASPHALT	195 kg/m²	(40 PSF)
TOTAL	927 kg/m²	(190 PSF)



*NOTE– BRIDGE LENGTH AS MEASURED ALONG SLOPE.

TRUSS BRIDGE DETAIL

TRUSS LIFTING WEIGHT – 102.3 kN
(23,000 LBS)

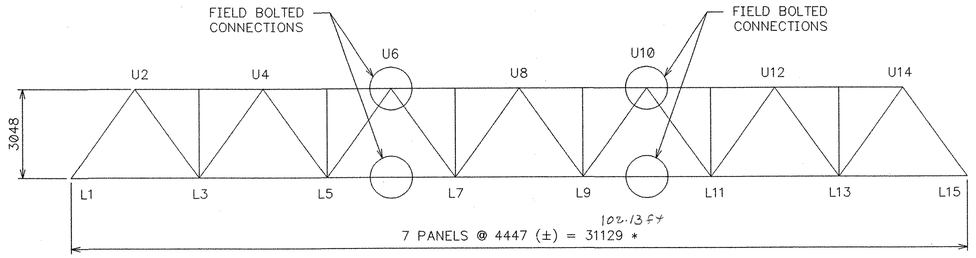
Total 7262 lbs

TRUSS SHOE REACTION

LIVE LOAD	245 kN	(55.0 K)
IMPACT	54 kN	(12.1 K)
DEAD LOAD	523 kN	(117.6 K)
TOTAL	822 kN	(184.7 K)

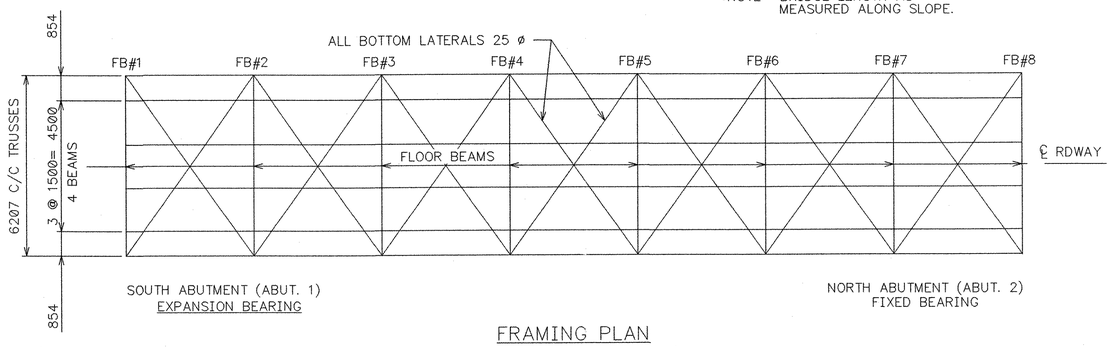
WELD MEMBERS TO GUSSET PLATES WITH MINIMUM 8mm FILLET WELDS AT EACH END OF EACH MEMBER.
ALL GUSSET PLATES 10mm THICK EXCEPT AS NOTED WITH SUFFICIENT FLAT AREAS TO RESIST STRESSES AND SO SHAPED TO PRODUCE AN AESTHETIC ARCHITECTURAL APPEARANCE.

NOTE: DRAWINGS RELATIVE DO NOT SCALE



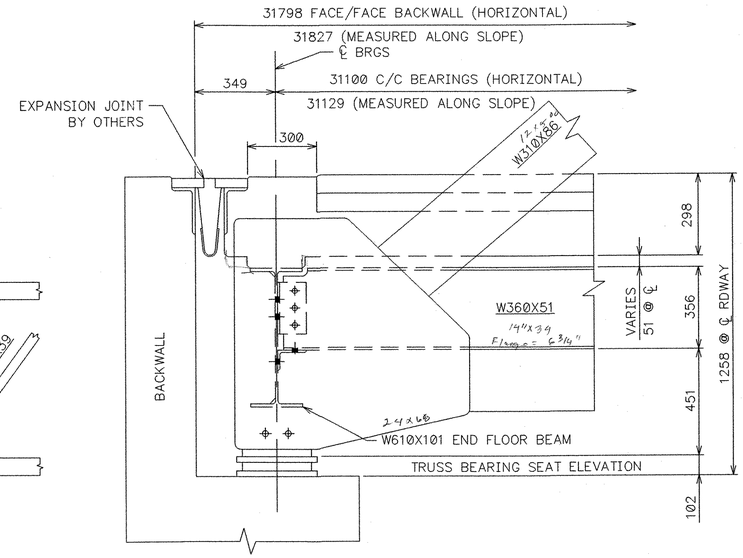
ELEVATION

*NOTE– BRIDGE LENGTH AS MEASURED ALONG SLOPE.



FRAMING PLAN

CAMBER: 49 (DEAD LOAD CAMBER)
49 (TOTAL CAMBER)



ABUTMENT DETAIL

RECEIVED
CK'D BY _____ OK'D BY MEM
DEC 15 2006
RESUBMIT _____ APPROVED ✓
BY _____ DATE 01-05-07

DESIGN SPECIFICATIONS
AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, 17th EDITION (2001), DIVISION I, WITH ALL INTERIM SPECIFICATIONS IN EFFECT.

LIVE LOAD
AASHTO ML 22.5 (HS25–44)

MATERIAL
ALL STRUCTURAL STEEL , INCLUDING BEARINGS, SHALL SHALL BE ASTM A709, GRADE 345 (A572, 50 ksi). ALL STEEL GALVANIZED AFTER FABRICATION. ALL CONTACT SURFACES SHALL BE LIGHTLY BRUSHED OR BLASTED PRIOR TO ASSEMBLY TO A DULL GRAY APPEARANCE.

ALL FASTENERS UNLESS NOTED OTHERWISE, SHALL BE 22 ø HIGH STRENGTH BOLTS, ASTM A325M TYPE 1 (GALV) WITH ASTM A563 GRADE C NUT AND ONE ASTM F436 WASHER PER BOLT. FASTENERS SHALL BE FURNISHED WITH ROTATIONAL CAPACITY TESTS.

CONSTRUCTION/FABRICATION
AASHTO STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, 17th EDITION (2001), DIVISION II, WITH ALL INTERIM SPECIFICATIONS IN EFFECT

WELDING
SEAL WELD ALL CONNECTIONS, WHEN POSSIBLE, PRIOR TO GALVANIZING. ALL WELDING SHALL BE IN ACCORDANCE WITH AASHTO/AWS D1.5 BRIDGE WELDING CODE AND THE AASHTO FRACTURE CONTROL, WHERE APPLICABLE.
NON–DESTRUCTIVE TESTING OF WELDS SHALL BE PERFORMED AS FOLLOWS:
FILLET WELDS – VISUAL. 100%
– MT 10% (300mm IN EVERY 3000mm)

ALL DIMENSIONS ARE IN MILLIMETERS

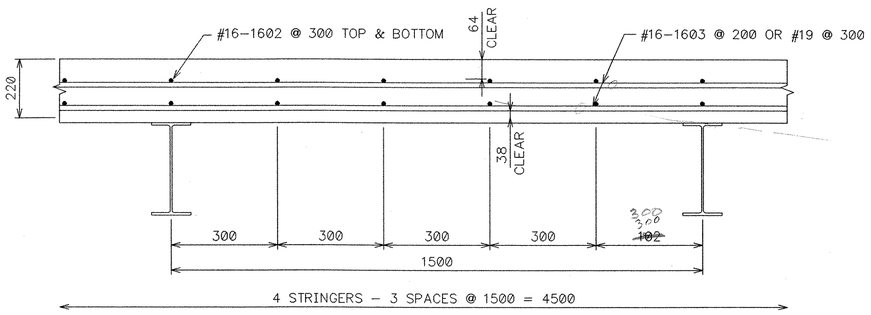
NO:	DATE:	REVISIONS:	BY:
1	12/8/06	GENERAL NOTES REVISED	JEC
2	12/8/06	SECTION VIEW REVISED	JEC
3	12/8/06	C/C BEARINGS REVISED	JEC

Richard L. Ahearn 12/12/06

31.10M TRUSS BRIDGE 4.50M ROADWAY
BRIDGE NO. 45, TOWN OF CAVENDISH
WINDSOR COUNTY, VERMONT

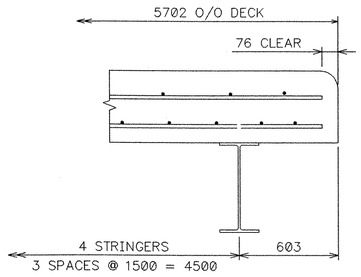
DESIGN:	DRAWN:	DATE:	DRAWING NO:	SHEET
AG	DMK	09/08/06	Cavendish_Metric 102X14_FlatTruss.dwg	1 OF 5
CHECK/DATE 10/05/06	FABRICATOR OHIO BRIDGE CORP.			

06455



REBAR SPACING FOR CONCRETE DECK BETWEEN STRINGERS

REBAR GRADE 60



REBAR SPACING FOR CONCRETE DECK AT THE OUTSIDE STRINGERS

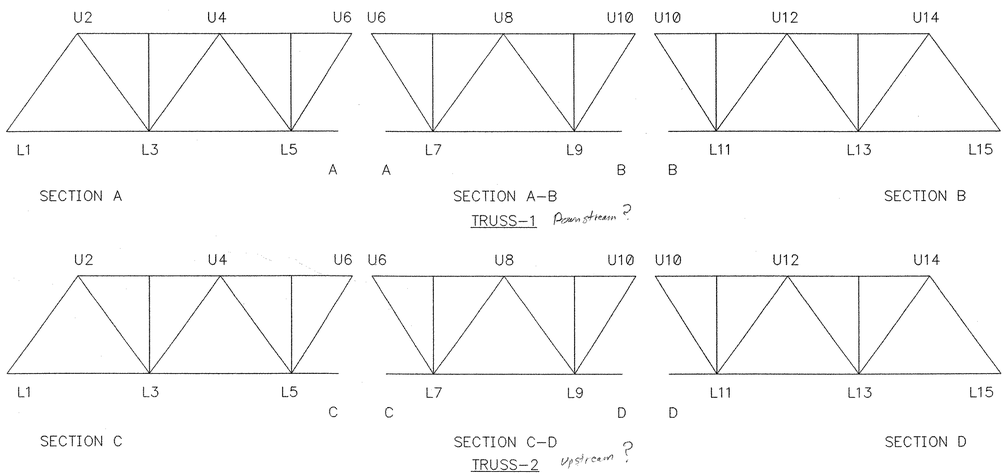
REBAR GRADE 60

DECK FORMS NOT INCLUDED IN DESIGN SINCE THE CONTRACTOR WILL FORM DECK WITHOUT DECK EDGE FORMS

REBAR BY OTHERS

17115.5 kg
6246.8 lcs
10977.3
24201 lbs

219.335



TRUSS MARKING DIAGRAM

NOTE: DRAWINGS RELATIVE DO NOT SCALE

BOLT CHART	BOLT TYPE–22 Ø A325 TYPE 1 GALVANIZED				
LOCATION	57mm 2¼"	64mm 2⅝"	70mm	76mm	83mm 3¼"
STRINGER TO SEAT ANGLE	16	160			
STRINGER TO CONNECTION ANGLE	32	264			
U6, U10 GUSSET PLATES	96	368			
L5–L7, L9–L11 SPLICE CONNECTION				272	
FLOOR BEAM END PLATE					224
TRUSS TO BRGS					16
TOTAL REQ'D	144	792		272	240
TOTAL ORDERED	154	832		286	252

MATERIAL SCHEDULE	
QTY.	DESCRIPTION
1 PC	TRUSS – SECTION A GALV.
1 PC	TRUSS – SECTION A–B GALV.
1 PC	TRUSS – SECTION B GALV.
1 PC	TRUSS – SECTION C GALV.
1 PC	TRUSS – SECTION C–D GALV.
1 PC	TRUSS – SECTION D GALV.
8 PCS	SHIM PLATE ℙ10x121x254
6 PCS	INTERIOR FLOOR BEAM – W610X101 @ 5836 GALV. 2 PCS – END PLATE – 19 X 254 X 707 GALV. 4 PCS – LATERAL ROD ANCHOR PLATE – ℙ 19 X 152 X 221 GALV. 58 PCS 19 Ø X 152 STUDS GALV.
2 PCS	EXTERIOR FLOOR BEAM – W610X101 @ 5836 GALV. 2 PCS – END PLATE – 19 X 254 X 707 GALV. 2 PCS – LATERAL ROD ANCHOR PLATE – ℙ 19 X 152 X 221 GALV. 58 PCS 19 Ø X 152 STUDS GALV.
28 PCS	STRINGERS – W360X51 @ 4385 GALV.
112 PCS	STRINGER CONNECTION ANGLE – L127 X 89 x 10 @ 228 GALV.
56 PCS	STRINGER SEAT ANGLE – L127 X 89 X 10 X 203 GALV.
16 PCS	BOTTOM CHORD SPLICE PLATE – ℙ 13 X 229 X 1219 GALV.
14 PCS	LATERAL ROD – 25 Ø X 6858 ROD WITH 2 NUTS AND 2 WASHERS GALV.
4 ASSYS	TRUSS BEARING ASSEMBLY GALV.
8 PCS	TRUSS BEARING ANGLE – L152 X 152 X 19 @ 432 GALV.
8 PCS	38 Ø X 559 A449 GALV ALL THREAD ANCHOR BOLT, NUT & WASHER GALV.
154 PCS	22 Ø X 57 A325 TYPE 1 GALV. B, N, W 2¼
832 PCS	22 Ø X 64 A325 TYPE 1 GALV. B, N, W 2½
286 PCS	22 Ø X 76 A325 TYPE 1 GALV. B, N, W 3"
252 PCS	22 Ø X 83 A325 TYPE 1 GALV. B, N, W 3¼ Floor Beam Nuts

7/8"

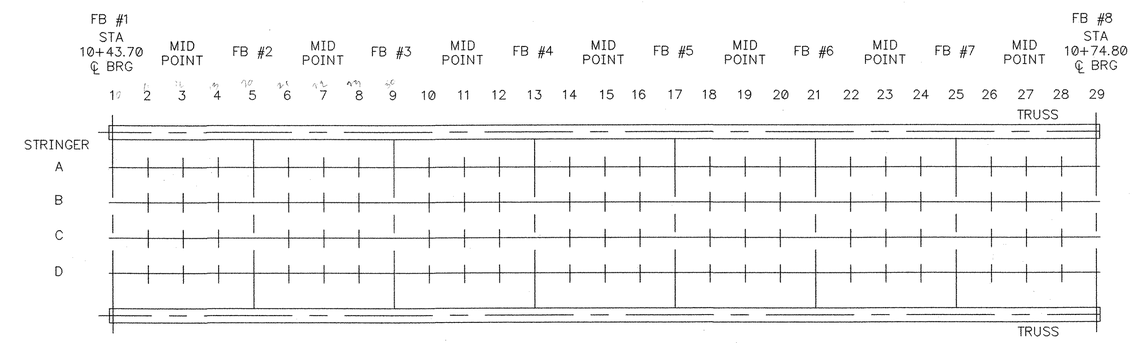
30

Elevations from Job Book Pg 37

STRINGER TOP STEEL ELEVATIONS						
STRG	POINT	ELEVATION	STRG	POINT	ELEVATION	LOCATION
A & D	1	220.522	B & C	1	220.552	℄ BRG 10+43.70
	2	.489		2	.519	
	3	.459		3	.489	MID POINT
	4	.432		4	.462	
	5	.407		5	.437	FB #2
	6	.385		6	.415	
	7	.366		7	.396	MID POINT
	8	.349		8	.379	
	9	.336		9	.366	FB #3
	10	.324		10	.354	
	11	.309		11	.339	MID POINT
	12	.290		12	.320	
	13	.266		13	.296	FB #4
	14	.239		14	.269	
	15	.208		15	.238	MID POINT
	16	.172		16	.202	
	17	.132		17	.162	FB #5
	18	.088		18	.118	
	19	.041		19	.071	MID POINT
	20	219.989		20	.019	
	21	.932		21	219.962	FB #6
	22	.872		22	.902	
	23	.808		23	.838	MID POINT
	24	.739		24	.769	
	25	.667		25	.697	FB #7
	26	219.590		26	219.620	
	27	.509		27	.539	MID POINT
	28	.424		28	.454	
	29	.335		29	.365	℄ BRG 10+74.80

.503 –.019
.378
.375 +.039
.414 +.007
.324 +.058
.174 +.042
.962 +.028
.950 +.018
.660 –.007
.330 –.005

NOTE: STRINGER TOP STEEL ELEVATIONS ARE SHOWN FOR BRIDGE UNDER FULL DEAD LOAD



PLAN – STRINGER TOP STEEL ELEVATIONS

RECEIVED
OK'D BY mem OK'D BY
DEC 15 2006
RESUBMIT APPROVED
BY DATE 01-05-07

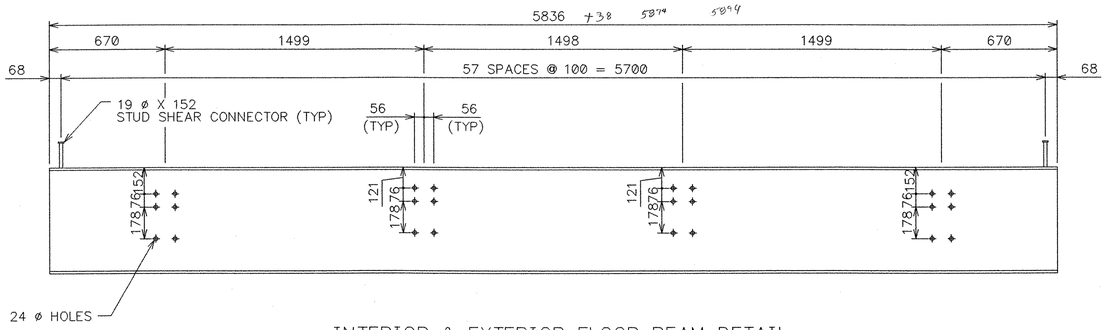
ALL DIMENSIONS ARE IN MILLIMETERS

NO:	DATE:	REVISIONS:	BY:
1	12/8/06	STEEL ELEVATIONS REVISED	JEC
2	12/8/06	REBAR SPACING REVISED	JEC
3	12/8/06	MATERIAL SCHEDULE REVISED	JEC

31.10M TRUSS BRIDGE 4.50M ROADWAY
BRIDGE NO. 45, TOWN OF CAVENDISH
WINDSOR COUNTY, VERMONT

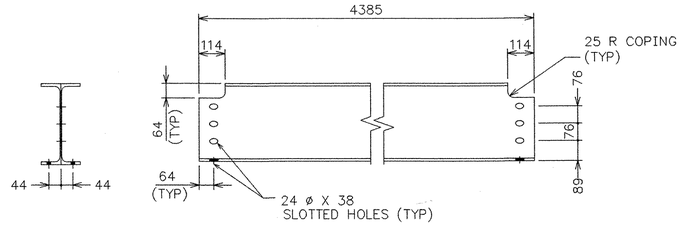
DESIGN:	DRAWN:	DATE:	DRAWING NO:	SHEET
AG	DMK	09/08/06	Cavendish_Metric 102X14_FlatTruss.dwg	2 OF 5
CHECK/DATE 10/05/06	FABRICATOR OHIO BRIDGE CORP.			

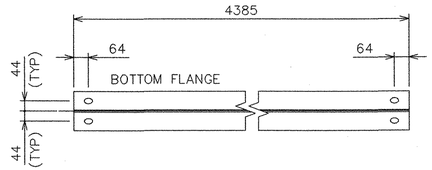
P6555



INTERIOR & EXTERIOR FLOOR BEAM DETAIL

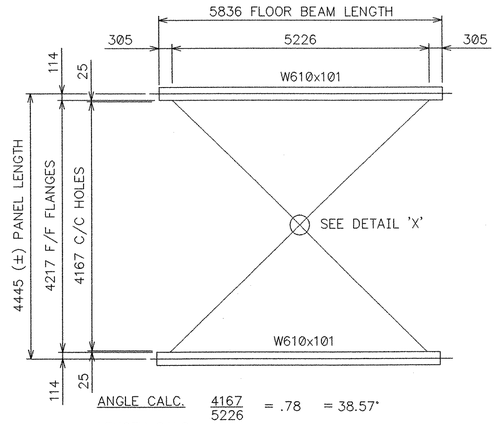
W610X101
8 REQ'D
(EXTERIOR FLOOR BEAM TO HAVE ONLY 2 LATERAL ROD PLATES)





W360X51 STRINGERS (TYP)

28 REQ'D

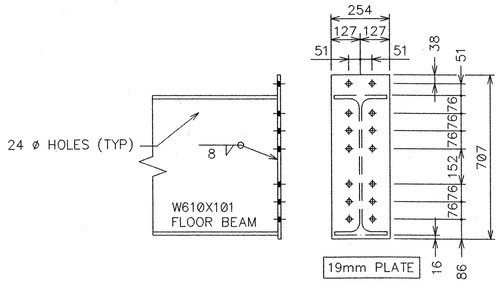


ANGLE CALC. $\frac{4167}{5226} = .78 = 38.57°$

LENGTH CALC. $\frac{5226}{\cos 38.536°} = 6685$

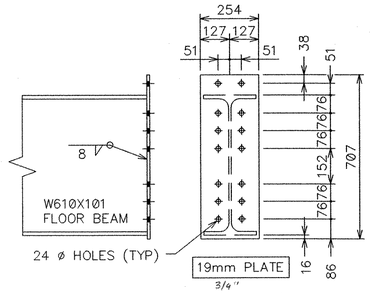
LATERAL ROD LENGTHS

14 PCS – 25 ø ROD
6858 WITH 152 THREAD, NUT AND WASHER EACH END



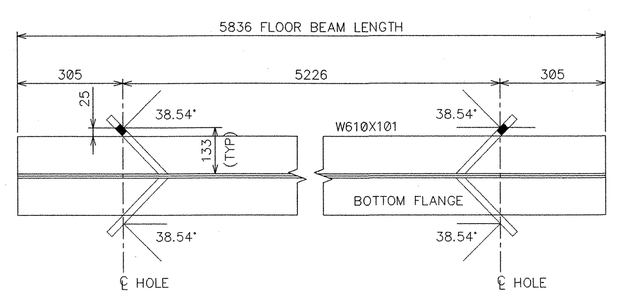
FLOOR BEAM END PLATE DETAIL
FLOOR BEAM #1 & #8

4 REQ'D



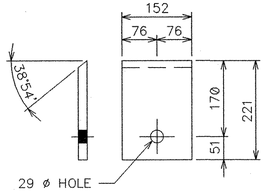
FLOOR BEAM END PLATE DETAIL
FLOOR BEAM #2 & #7

4 REQ'D



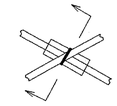
INTERIOR FLOOR BEAM LATERAL ROD ANCHOR LAYOUT

(FB# 2,3,4,5,6,7)
6 REQ'D

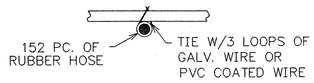


LATERAL ROD PLATE

℄ 19 X 152 X 221
28 REQ'D

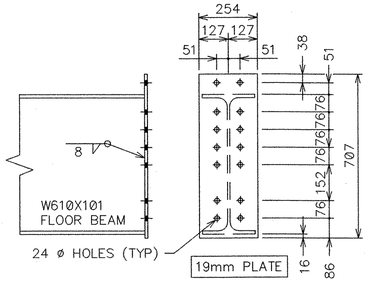


PLAN



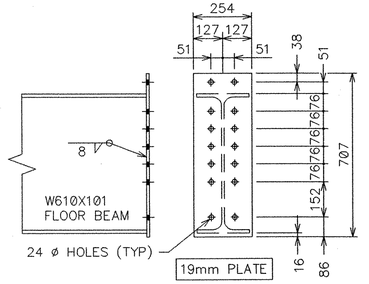
SECTION

DETAIL X



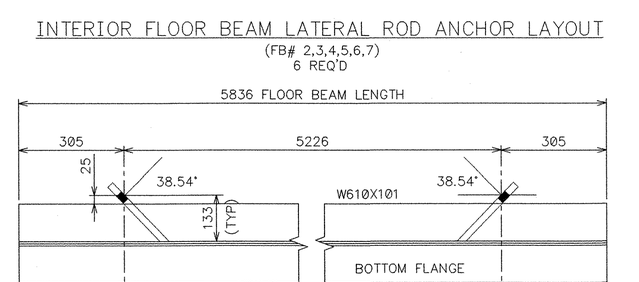
FLOOR BEAM END PLATE DETAIL
FLOOR BEAM #3

2 REQ'D



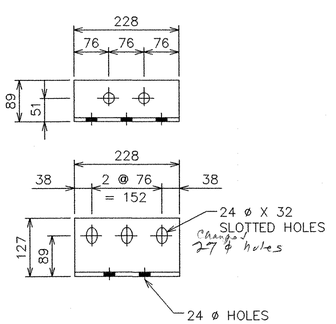
FLOOR BEAM END PLATE DETAIL
FLOOR BEAM #4 & #5

4 REQ'D



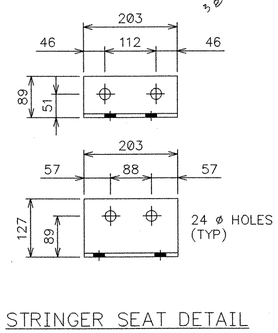
EXTERIOR FLOOR BEAM LATERAL ROD ANCHOR LAYOUT

(FB# 1 & FB# 8)
2 REQ'D



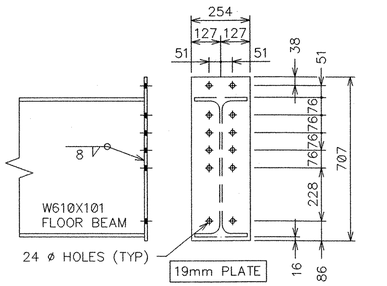
STRINGER CONNECTION ANGLE DETAIL

L127 X 89 X 10
3 112 REQ'D
(TYP)



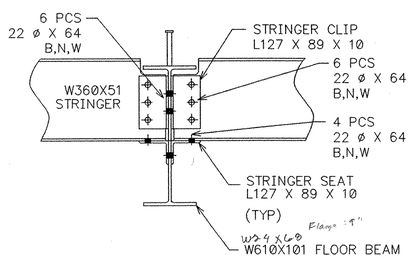
STRINGER SEAT DETAIL

L127 X 89 X 10
56 REQ'D
(TYP)

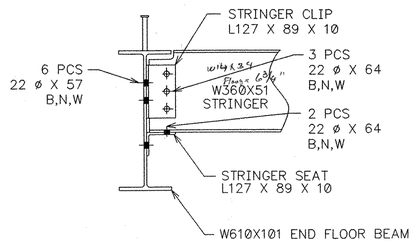


FLOOR BEAM END PLATE DETAIL
FLOOR BEAM #6

2 REQ'D



STRINGER CONNECTION
@ INTERIOR FLOOR BEAM



STRINGER CONNECTION
@ EXTERIOR FLOOR BEAM

NOTE: DRAWINGS RELATIVE DO NOT SCALE

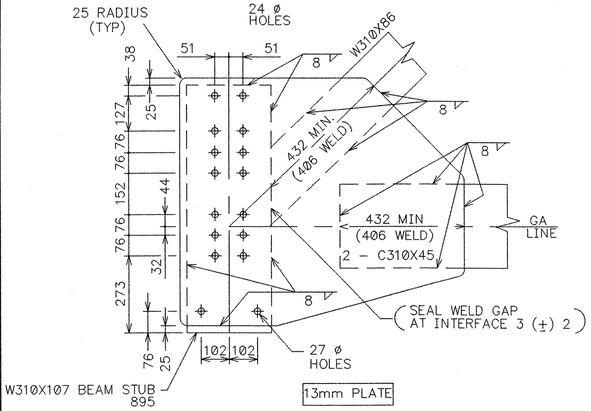
ALL DIMENSIONS ARE IN MILLIMETERS

NO:	DATE:	REVISIONS:	BY:
1	12/8/06	STRINGER SEAT REVISED	JEC
2	12/8/06	FLOOR BEAM DETAIL REVISED	JEC

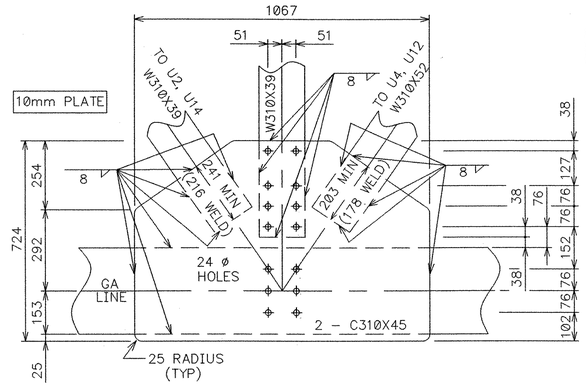
31.10M TRUSS BRIDGE 4.50M ROADWAY
BRIDGE NO. 45, TOWN OF CAVENDISH
WINDSOR COUNTY, VERMONT

DESIGN:	DRAWN:	DATE:	DRAWING NO:	SHEET
AG	DMK	09/08/06	Cavendish_Metric 102X14_FlatTruss.dwg	3 OF 5
CHECK/DATE 10/05/06	FABRICATOR OHIO BRIDGE CORP.			

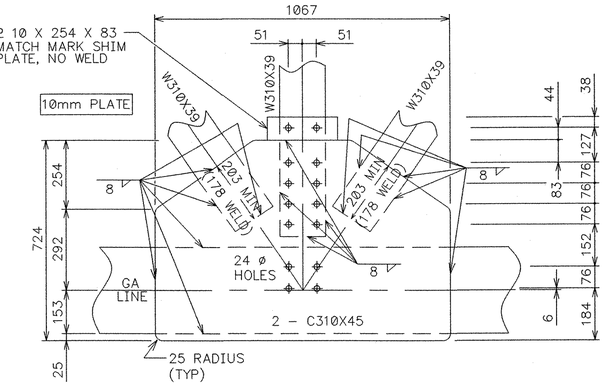
RECEIVED
CK'D BY _____ CK'D BY mem
DEC 15 2006
RESUBMIT _____ APPROVED ✓
BY _____ DATE 01-05-067



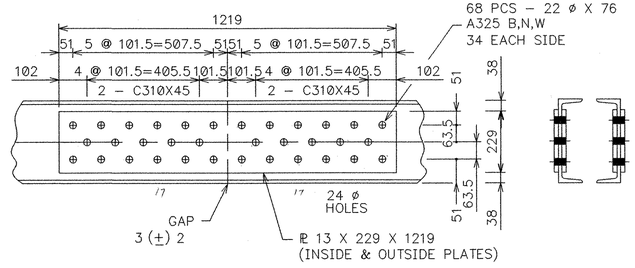
L1 GUSSET PLATE– 4 REQ'D



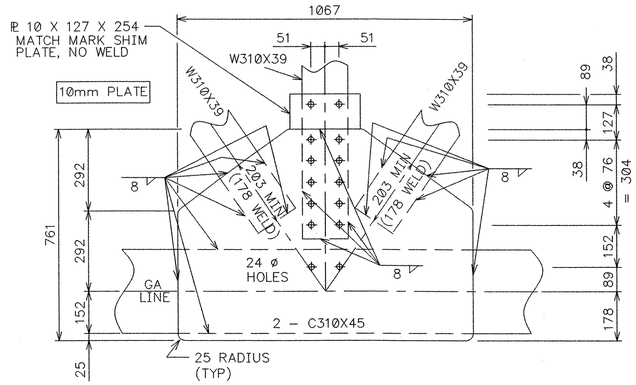
L3 & L13 GUSSET PLATES – 8 REQ'D



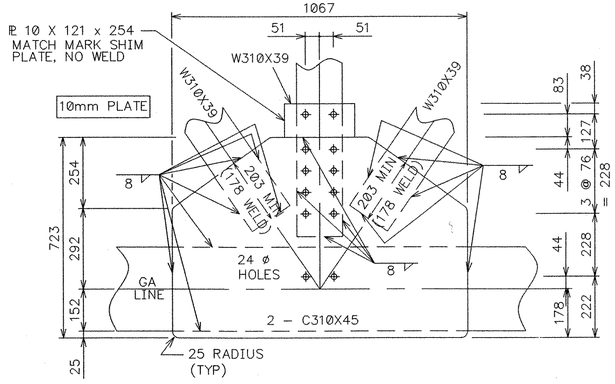
L5 GUSSET PLATES – 4 REQ'D



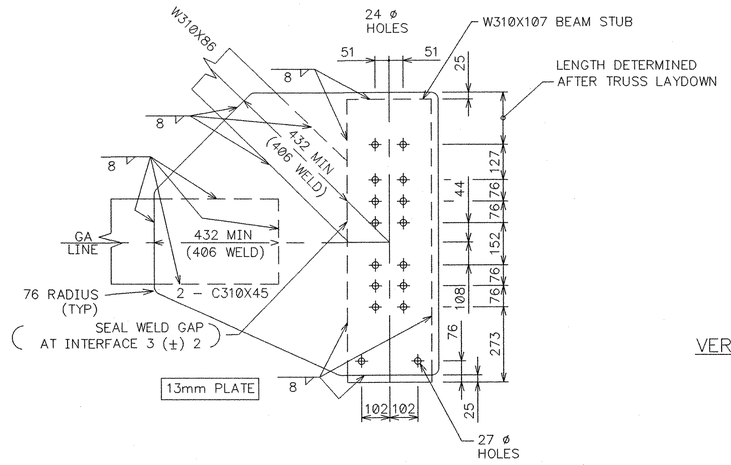
L5–L7, L9–L11 SPLICE DETAIL – 4 REQ'D



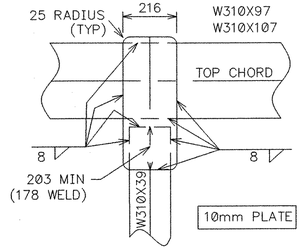
L7 & L9 GUSSET PLATES – 8 REQ'D



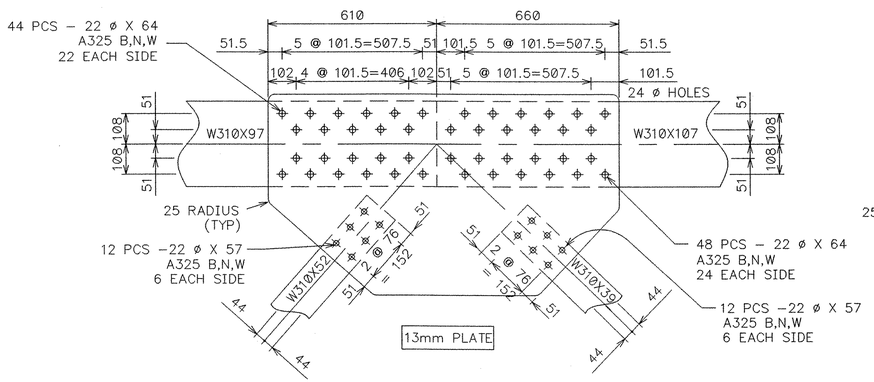
L11 GUSSET PLATES – 4 REQ'D



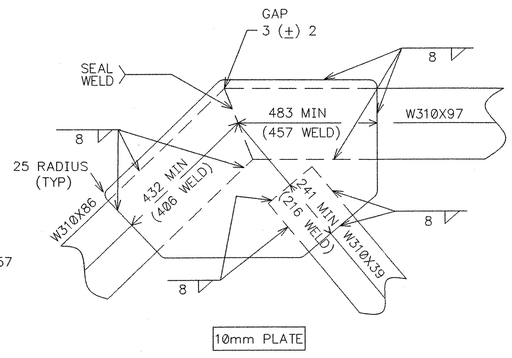
L15 GUSSET PLATE– 4 REQ'D



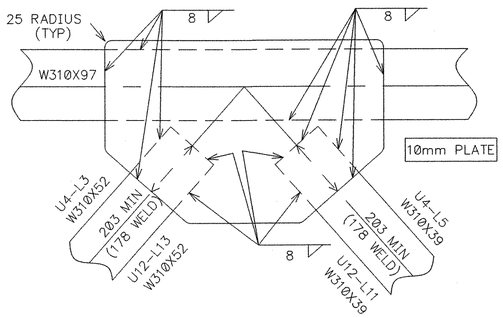
VERTICAL GUSSET PLATES – 24 REQ'D



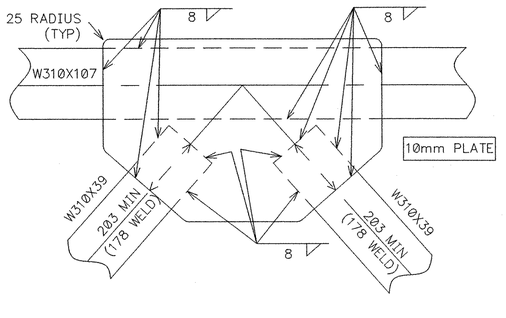
U6 AND U10 GUSSET PLATES – 8 REQ'D



U2 AND U14 GUSSET PLATES– 8 REQ'D



U4 AND U12 GUSSET PLATES – 8 REQ'D



U8 GUSSET PLATE – 4 REQ'D

RECEIVED
ORD BY
DEC 15 2006
RESUBMIT APPROVED
BY DATE 01-05-07

ALL DIMENSIONS ARE IN MILLIMETERS

6 (±) 3 HOLD BACK ON EACH WELD ON EACH SIDE AT EACH CORNER

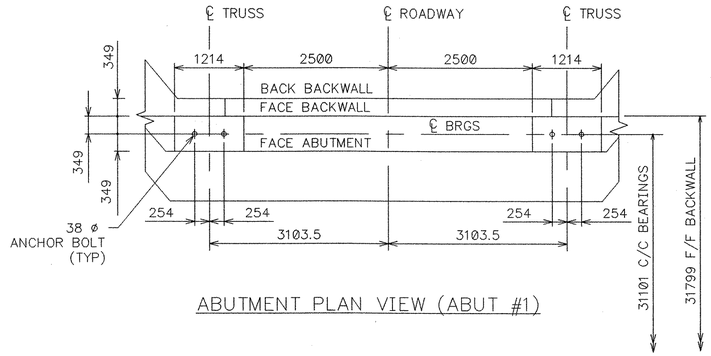
NOTE: DRAWINGS RELATIVE DO NOT SCALE

NO:	DATE:	REVISIONS:	BY:
1	12/11/06	SHIM PLATE NOTE ADDED	JEC

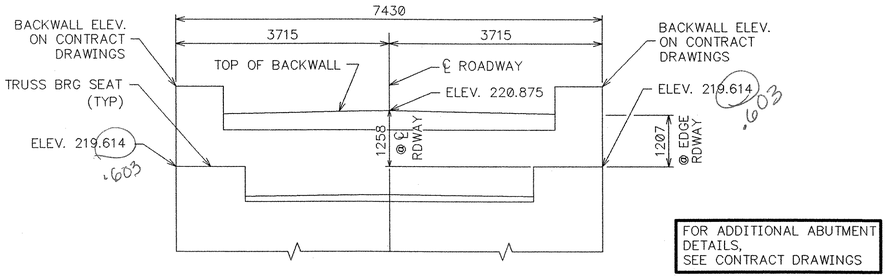
31.10M TRUSS BRIDGE 4.50M ROADWAY
BRIDGE NO. 45, TOWN OF CAVENDISH
WINDSOR COUNTY, VERMONT

DESIGN:	DRAWN:	DATE:	DRAWING NO:	SHEET
AG	DMK	09/08/06	Cavendish_Metric 102X14_FlatTruss.dwg	4 OF 5
CHECK/DATE 10/05/06	FABRICATOR OHIO BRIDGE CORP.			

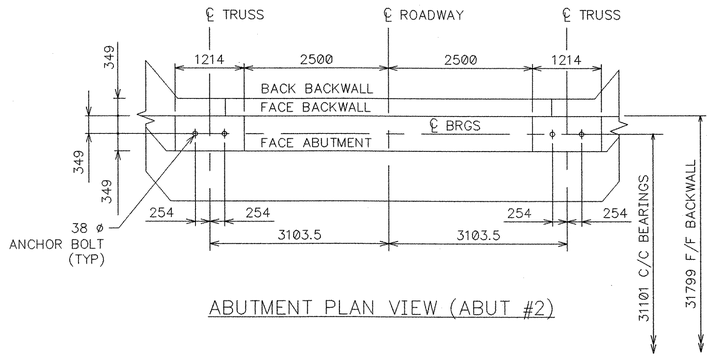
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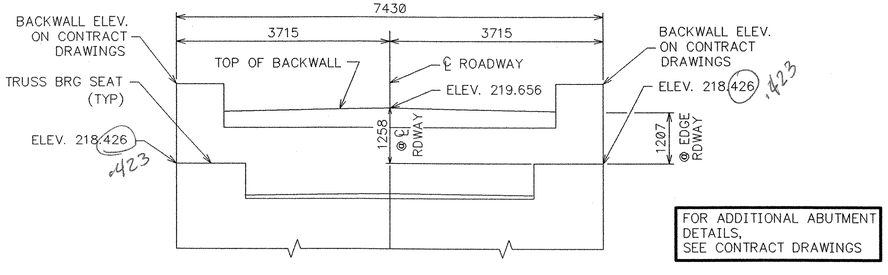
ABUTMENT PLAN VIEW (ABUT #1)



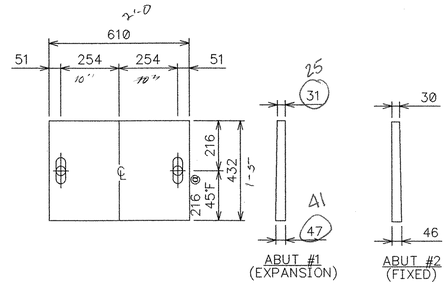
ABUTMENT ELEVATION VIEW (ABUT #1)



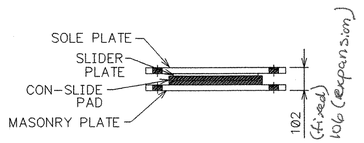
ABUTMENT PLAN VIEW (ABUT #2)



ABUTMENT ELEVATION VIEW (ABUT #2)



SIDE VIEW OF SOLE PLATE

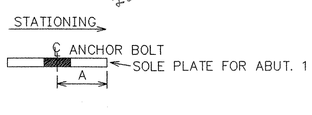


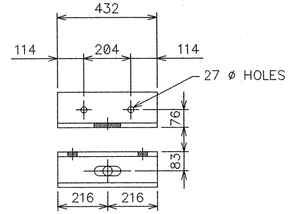
TRUSS BEARING PLATES

FIXED BEARINGS
SOLE PLATE – 2 PCS – ℙ (25) X 432 X 610 WITH 44 ø HOLES
CON-SLIDE PADS – 2 PCS – 38 X 381 X 368
MASONRY PLATE – ℙ (46) X 432 X 610 ~~BEVELED~~ WITH 44 ø HOLES

EXPANSION BEARINGS
SOLE PLATE – 2 PCS – ℙ (25) X 432 X 610 WITH
44 ø X 114 SLOTTED HOLES
SLIDING PLATE – 2 PCS – ℙ 10 X 419 X 406 WITH 20 GA
STAINLESS STEEL PLATE BONDED TO
THE BOTTOM OF THE PLATE
CON-SLIDE PADS – 2 PCS – 38 X 381 X 368 WITH
PTFE SURFACING, BONDED TO ONE SURFACE
MASONRY PLATE – 2 PCS – ℙ (47) X 432 X 610 ~~(BEVELED)~~
WITH 44 ø HOLES

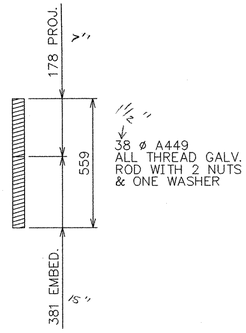
AT	A
15°F	222
30°F	219
45°F	216
60°F	213
75°F	210
90°F	207





TRUSS BEARING ANGLES

L152 X 152 X 19
4 WITH 44 X 114 SLOTTED HOLES (ABUT. 1)
4 WITH 44 ø HOLES (ABUT. 2)



TRUSS ANCHOR BOLT

8 REQ'D

RECEIVED
DEC 15 2006
BY
APPROVED As Noted
DATE 1-05-07

ALL DIMENSIONS ARE IN MILLIMETERS

NO:	DATE:	REVISIONS:	BY:
1	12/11/06	TRUSS BEARING REVISED	JEC

31.10M TRUSS BRIDGE 4.50M ROADWAY
BRIDGE NO. 45, TOWN OF CAVENDISH
WINDSOR COUNTY, VERMONT

DESIGN:	DRAWN:	DATE:	DRAWING NO:	SHEET
AG	DMK	09/08/06	Cavendish_Metric 102X14_FlatTruss.dwg	5 OF 5
CHECK/DATE 10/05/06	FABRICATOR OHIO BRIDGE CORP.			

NOTE: DRAWINGS RELATIVE DO NOT SCALE

06858

VERMONT

State of Vermont
PDD/Structures Design Section
National Life Building – Drawer 33
Montpelier, VT 05633-5001
www.aot.state.vt.us

Agency of Transportation

[phone] 802-828-2621
[fax] 802-828-3566
[ttd] 800-253-0191

Merrimack Sheet Metal
119 Hall Street
Concord, NH 03301

DATE: April 3, 2007

Project Name: Cavendish **Project #:** BRO 1442 (23)

Structure Identification: **Bridge # 45, TH 29 Over the Black River**

The following expansion joint and downspout details, Item #516.10, Bridge Expansion Joint (Vermont), for the above project (Vendor's Job #1422) have been reviewed and are being returned herewith.

Sheets: E1 and F1 Are approved
F2 is approved as noted (length of mark T1)

We have received welding procedures. These are also approved and are attached with the prints.

You must provide notice to our fabrication inspector, Jeff Clark, as to the date fabrication represented by these drawings will begin. That notice must be received and acknowledged at least seven days prior to that date, as per Specification 506.03. Jeff may be contacted by phone at (802)828-0044 or email at jeff.clark@state.vt.us. Any material fabricated prior to the notification date is subject to rejection without further cause.

Sincerely,

Martha Evans-Mongeon

Attachments
cc: [x] Resident Engineer, Jacques Couture w/prints
[x] Shop Inspector, Jeff Clark w/prints
[x] Contractor, F. W. Whitcomb Construction, Inc. w/prints
[ ] Subcontractor – letter only
[x] Construction Divison – letter only
[x] Materials & Research Section (C&IA Unit) – letter only
[x] Files (Structures & Central)

069-B5

VTrans Working to Get You There! Vermont Agency of Transportation

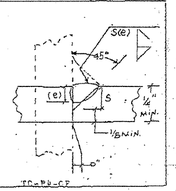
PROJECT NAME

QUALIFIED JOINT WELDING PROCEDURE PROJECT NUMBER
PROCEDURE SPECIFICATION

Material specification A36:A572.65RR
Welding process FCAW
Manual or machine SEMI-AUTOMATIC
Position of welding FLAT for groove welds' Horizontal for filler welds 1G, 2F
Filler metal specification AWS 5.20
Filler metal classification ALLOY RODS DUAL SHIELD T1 T1 ULTRA (E71T-1)
Flux N/A
Shielding gas CO2 Flow qty 35 CFH
Single or multiple pass SINGLE AND MULTIPLE
Single or multiple arc SINGLE ELECTRICAL STICK-OUT 3/8" - 3/4"
Welding current DC
Polarity REVERSE
Welding progression N/A
Root treatment NONE
Preheat and interpass temperature 50° to 3/8"THCL, 70° to 1"THCL, 150° to 23° THCL
Posthest treatment NONE
Supported by PQR 007 and 008

WELDING PROCEDURE

Pass no.	Electrode size	Welding current Amperes	Welding current Volts	Travel speed I P M	Weld Size (t)	Joint detail
		GROOVE WELDS				
1	.045	220-240	26-28	16-18	3/16"	
1	.045	220-240	26-28	10-12	1/4"	
all	.045	220-240	26-28	14-16	5/16"	
		FILLET WELDS				
FILLET WELDS SHALL EQUAL 1/4 OF t BUT NOT MORE THAN 3/8"						
SEE PROCEDURE DS-16 FOR PARAMETERS OF FILLET WELDS						



This procedure may very due to fabrication sequence, fit-up, pass size, etc., within the limitation of variables given in Section 5.

Procedure no. DS-13
Revision no.
Form E-2

Contractor Merrimack Sheet Metal, Inc.
Authorized by Scott Blanchette
Date 11/26/01

TRANS
RECEIVED
MAR 30 2007

CK'D BY JWC
RESUBMIT APPROVED
BY DATE 4-3-07

070-B3

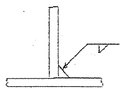
PROJECT NAME_____

PREQUALIFIED JOINT WELDING PROCEDURE PROJECT NUMBER_____
PROCEDURE SPECIFICATION

Material specification A36;A572-A588
Welding process FCAW
Manual or machine SEMI-AUTOMATIC
Position of welding FLAT OR HORIZONTAL
Filler metal specification AWS 5.20
Filler metal classification ALLOY RODS DUAL SHIELD II 71 ULTRA (E71T-1)
Flux N/A
Shielding gas CO_2 Flow rate 35 CFH
Single or multiple pass SINGLE AND MULTIPLE
Single or multiple arc SINGLE ELECTRICAL STICK-OUT 3/8"-3/8"
Welding current DC
Polarity REVERSE
Welding progression N/A
Root treatment NONE
Preheat and interpass temperature 50° to 3/8"THCK, 70° to 1"THCK, 150° to 2½" THCK
Postheat treatment NONE
Supported by WPS 007 and 008

WELDING PROCEDURE

Pass no.	Electrode size	Welding current: Amperes	Welding current: Volts	Travel speed (IPM)	Weld Size (S)	Joint detail
1	.045	220-240	26-28	16-18	3/16"	
1	.045	220-240	26-28	12-13	1/2"	
All	.045	210-230	25-27	9-10	5/16"	
1	.045	220-240	26-28	16-18		
2	.045	220-240	26-28	16-18	3/8 (3 passes)	
3	.045	220-240	26-28	16-18		
1	.045	210-230	25-27	9-11		
2	.045	210-230	25-27	9-11	7/16 (3 passes)	
3	.045	210-230	25-27	9-11		



This procedure may vary due to fabrication sequence, fit-up, pass size, etc., within the limitation of variables given in Section 5.

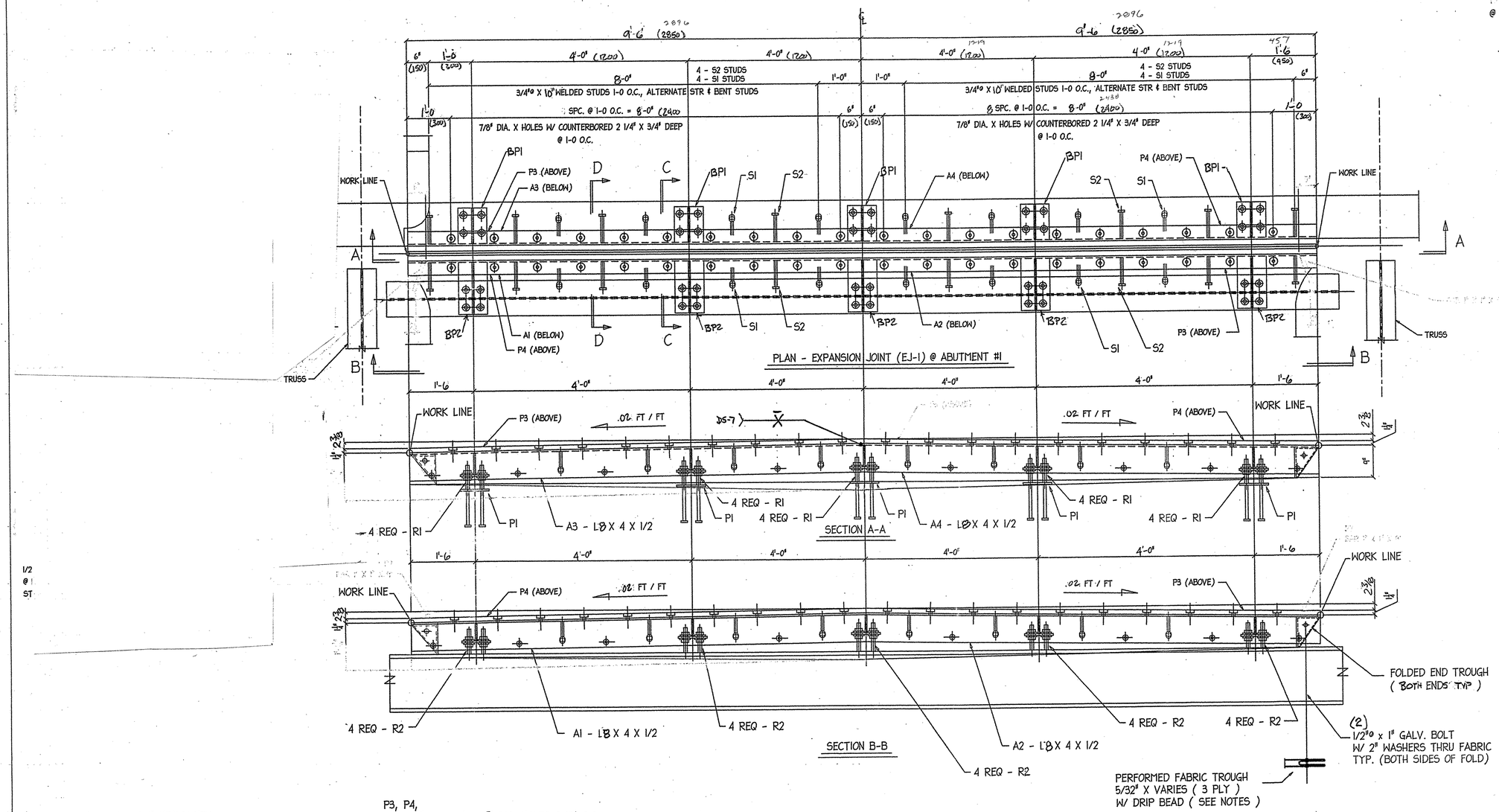
Procedure no. DS-16 V-TRANS
Revision
Form E-2

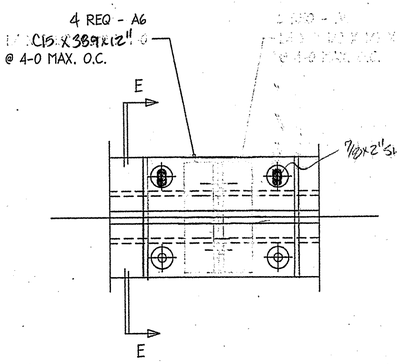
RECEIVED
MAR 30 2007

OK'D BY_____ OK'D BY TCVC
RESUBMIT_____ APPROVED_____
BY DATE 4-3-07

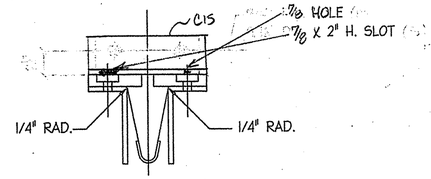
Contractor Merrimack Sheet Metal, Inc.
Authorized by Scott Blanchette
Date 11/26/07

071-BJ



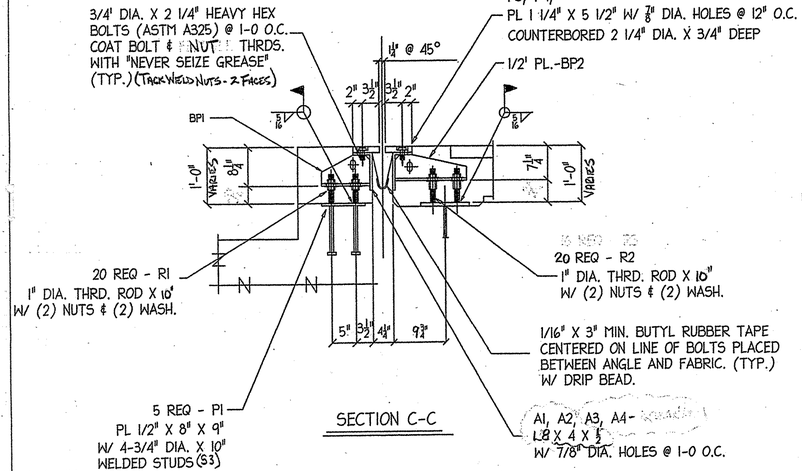


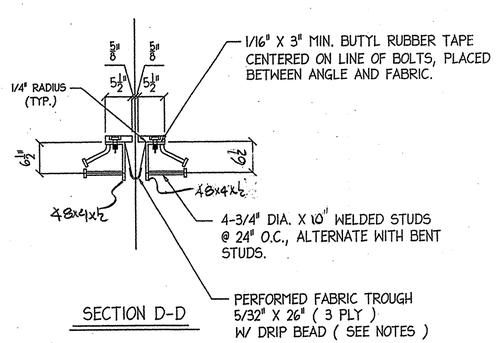
PLAN-SHIPPING DEVICE



SECTION E-E

TEMP	"A" DISTANCE	"B" DISTANCE
0°F	1 13/16"	1 9/16"
15°F	1 5/8"	1 3/8"
30°F	1 7/16"	1 3/16"
45°F	1 1/4"	1"
60°F	1"	3/4"
75°F	3/4"	1/2"
90°F	9/16"	5/16"





NOTES:

1.) PREFORMED FABRIC MATERIAL SHALL BE CONTINUOUS AND SHALL CONFORM TO SUBSECTION 707.07.
2.) BUTYL RUBBER TAPE SHALL CONFORM TO AASHTO SPEC. M-198, TYPE II.
3.) ALL STEEL COMPONENTS SHALL BE AASHTO M270, GRADE 36, GALVANIZED OR METALIZED AS PER SUBSECTION 506.15 (a) OR (b) UNLESS OTHERWISE NOTED.
4.) THE L8 X 4 X 1/2 ANGLES SHALL BE FURNISHED AS ONE CONTINUOUS PIECE. THE 1 1/4" X 5 1/2" BARS EACH SIDE OF THE JOINT SHALLBE PROVIDED IN TWO EQUAL LENGTHS.
5.) A DRIP BEAD OF 1/4" X 7" STRIP OF PREFORMED MATERIAL SHALL BE CEMENTED TO THE BOTTOM OF THE FABRIC TROUGH USING AN ADHESIVE APPROVED BY THE MANUFACTURER. THE DRIP BEAD SHALL BE APPLIED 1" FROM THE DOWNSPOUT END OF THE TROUGH.
6.) THE EXPANSION JOINT SHALL BE SHOP ASSEMBLED AND SHIPPED AS ONE UNIT.
7.) ALL BOLTS, STUDS, AND RELATEDHARDWARE EXCEPT AS NOTED SHALL BE ASTM A307 AND SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 (AASHTO M232).

REV. NO.	DATE	DESCRIPTION
1	3/22	PER E.N.

HOLES: 13/16"ø (U.N.O.) DATE: 1-24-06
PAINT: GALVANIZED

RECEIVED
OK'D BY NBM OK'D BY
MAR 28 2007
RESUBMIT APPROVED
BY DATE 3/30/07

PROJECT NO. = CAVENDISH, VT. BRO 1442 (23)

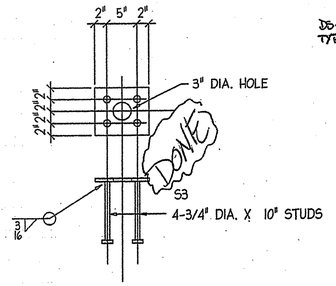
EXPANSION JOINT (EJ-1) @ ABUTMENT #1

DATE SUB.	PROJECT	CAVENDISH, VT. BRIDGE
	LOCATION	CAVENDISH, VT.
	ARCHITECT	
DATE APP.	ENGINEER	
DATE DIST.	CUSTOMER	F.W. WHITCOMB

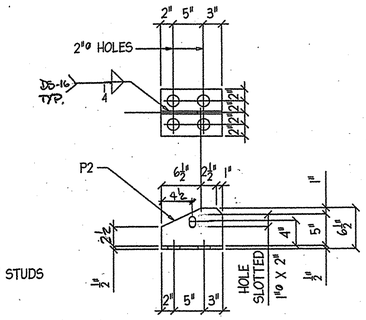
MERRIMACK
MISCELLANEOUS IRON STRUCTURAL STEEL FABRICATORS

MERRIMACK SHEET METAL
119 HALL ST.
CONCORD, N.H., 03301
TEL. (603) 224-7766
FAX. (603) 224-7925

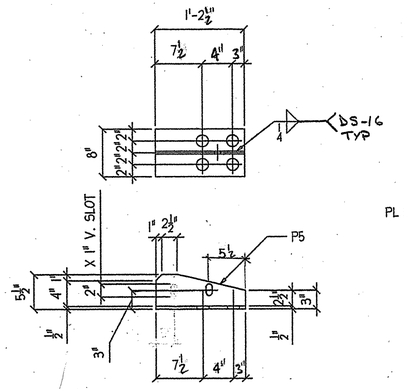
DR BY	KJM
REV BY	JD
JOB NO.	1422
DWG NO.	E1



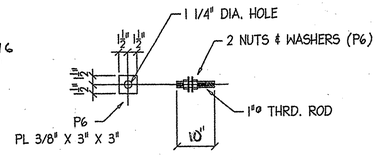
5 REQ - P1



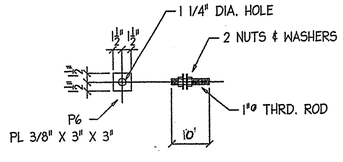
5 REQ - BP1



5 REQ - BP2

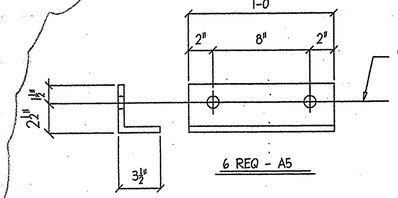


20 REQ - R1

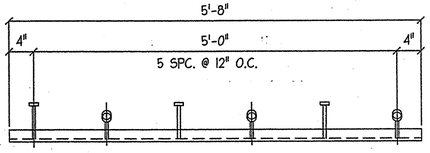


REQ - R2

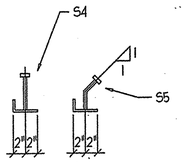
LONG POINT TO LONG POINT @ WORK LINE TO WORK LINE

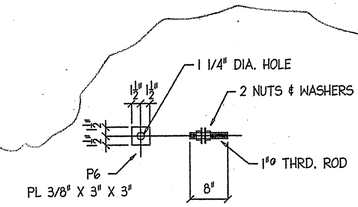


6 REQ - A5

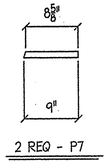


ONE REQ - A7





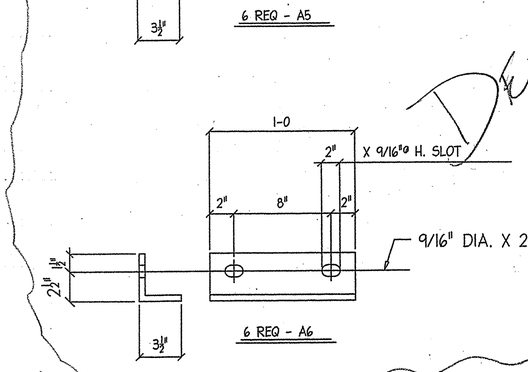
4 REQ - R3



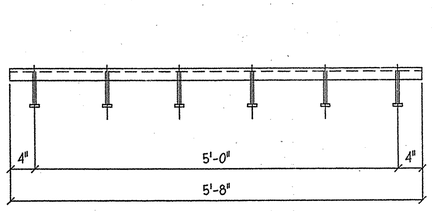
2 REQ - P7

BAR 1" X 1" X 9"

DELETE



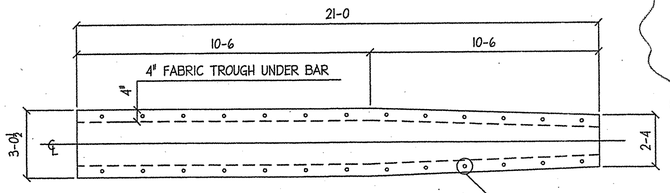
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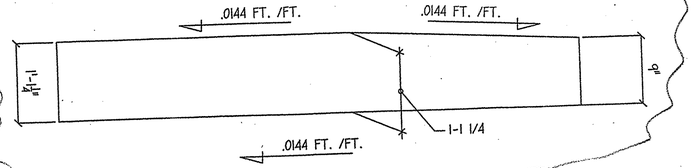
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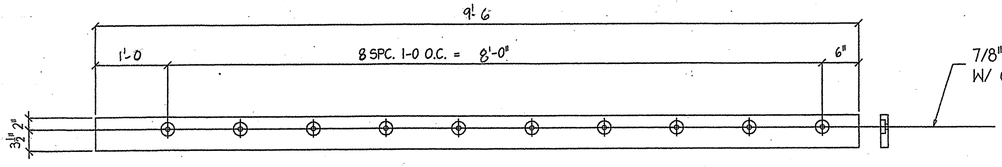


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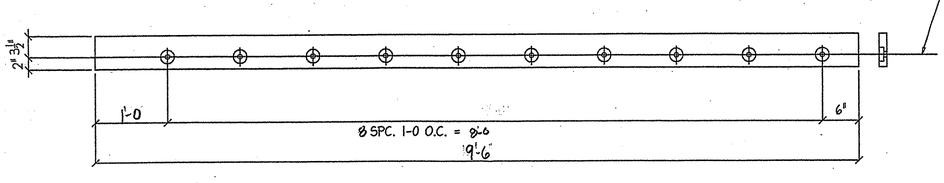


FABRIC TROUGH PLAN





2 REQ - P3



2 REQ - P4

BILL OF MATERIAL

QTY	MARK	SHAPE	LENGTH		REMARKS
1	A1	L 8 x 4 x 1/2	9	6	
1	A2	L 8 X 4 X 1/2	9	6	
1	A3	L 8 X 4 X 1/2	9	6	
1	A4	L 8 X 4 X 1/2	9	6	
36	S3	3/4ø STUDS	0	10	
1	A5	L 8 X 4 X 1/2	9	6	DELETE
1	A6	L 8 X 4 X 1/2	9	6	DELETE
1	A7	L 8 X 4 X 1/2	9	6	DELETE
1	A8	L 8 X 4 X 1/2	9	6	DELETE
5	P1	PL 1/2" X 8"	0	9	
20	S3	3/4ø STUDS	0	10	
5	BP1	PL 1/2" X 8"	0	10	
5	P2	PL 1/2" X 6"	0	10	
5	BP2	PL 1/2" X 8"	1	2 1/2	
5	P5	PL 1/2" X 5"	1	2 1/2	
2	P3	PL 1 1/4" X 5 1/2"	9	6	
2	P4	PL 1 1/4" X 5 1/2"	9	6	
20	R1	1"ø THRD. ROD	0	10	2 NUTS
40	P6	PL 3/8" X 3"	0	3	WASHER
20	R2	1"ø THRD. ROD	0	10	2 NUTS
40	P6	PL 3/8" X 3"	0	3	WASHER
1		FABRIC TROUGH			SEE PLAN
		FIELD BOLTS			
12		3/4" DIA. X 2 1/4" A325 BOLTS (@ SHIPPING DEVICE)			
40		3/4" DIA. X 2 1/4" A325 BOLTS (@ JOINT)			
4		1/2" DIA. X 1" A325 BOLTS W/ N+ZW (TROUGH)			

RECEIVED
CK'D BY VMZM CK'D BY
MAR 28 2007
RESUBMIT APPROVED
BY DATE 3/30/07

PROJECT NO. = CAVENDISH, VT. BRO 1442 (23)

EXPANSION JOINT (EJ-1) @ ABUTMENT #1

DATE SUB.	PROJECT	CAVENDISH VT. BRIDGE
	LOCATION	CAVENDISH, VT.
	ARCHITECT	
DATE APP.	ENGINEER	
DATE DIST.	CUSTOMER	F.W. WHITCOMB

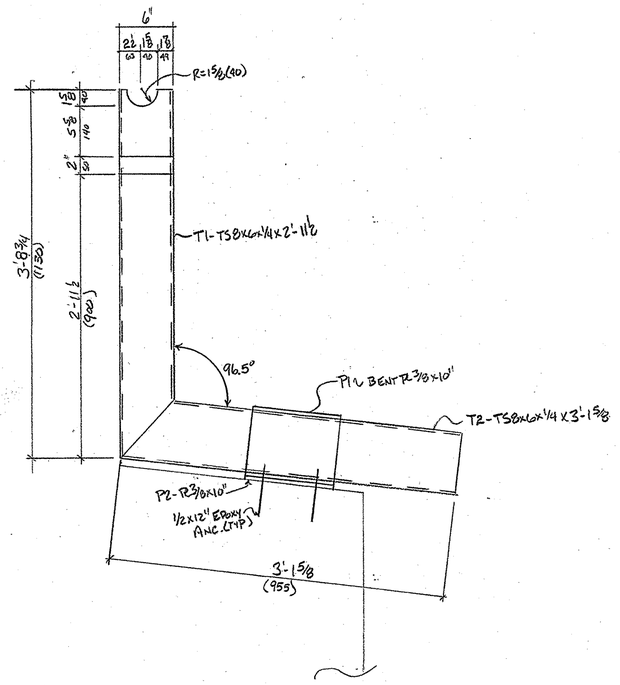
REV. NO.	DATE	DESCRIPTION
1	3/22	PIER ENL.

HOLES: 13/16ø (U.N.O.) DATE: 1-24-06
PAINT: GALVANIZED

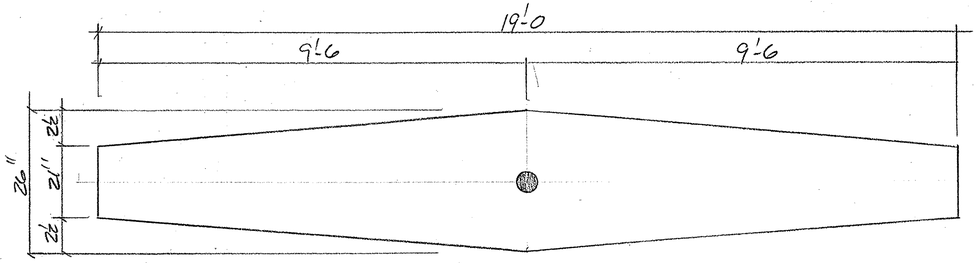
MERRIMACK
MISCELLANEOUS IRON STRUCTURAL STEEL FABRICATORS

MERRIMACK SHEET METAL
119 HALL ST.
CONCORD, N.H., 03301
TEL. (603) 224-7766
FAX. (603) 224-7925

DR BY KJM
REV BY
JOB NO. 1422
DWG NO. F1
023-BJ

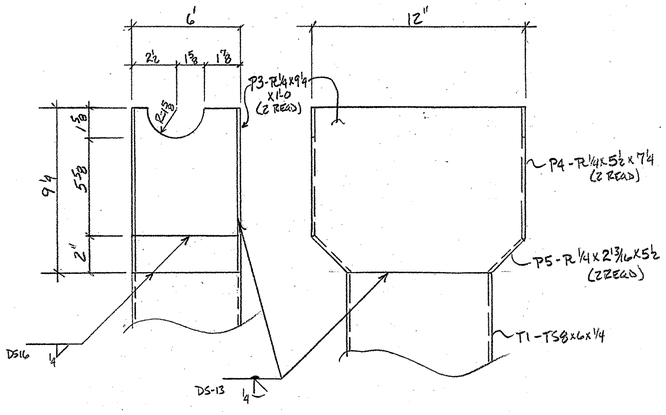


(ONE) ~ D1 - DOWNSPOUT

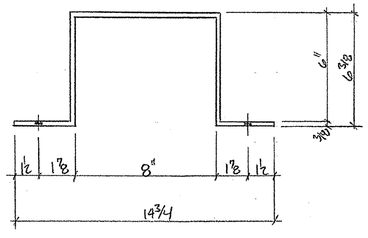


ENG. NOTE - PLEASE VERIFY DROP FROM TOP OF ANGLE L8X4 TO BOTTOM OF TROUGH @ CENTER + ENDS

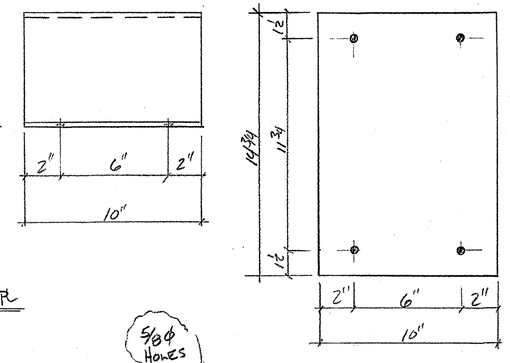
(ONE) ~ T1 - TROUGH
3 PLY FABRIC



HEAD DETAIL



(ONE) ~ P1 - 3/8 BENT R



5/8ϕ HOLES

(ONE) ~ P2 - R3/8X10 X14¾

BILL OF MATERIAL

QTY.	MARK	SHAPE	LENGTH		REMARKS
1	D1	DOWNSPOUT			19'0
1	T1	TS8X6X1/4	2	7½	A500 GRB
1	T2	TS8X6X1/4	3	1⅝	A500 GRB
2	P3	R1/4X9 1/4	1	0	M270-GR250
2	P4	R1/4X5½	0	7¼	
2	P5	R1/4X2 13/16	0	5½	
1	P1	BENT R 3/8X10	2	1¼	
1	P2	R3/8X10	1	2¾	M270-GR250
4	-	½"ϕ RODS	1	0	W/NUT W/WASH GALV
1		TROUGH			

RECEIVED
CK'D BY MEM OK'D BY As Noted
MAR 28 2007
RESUBMIT ____ APPROVED As Noted
BY ____ DATE 3/30/07

DRAWING COVERS: DOWNSPOUT / TROUGH

DATE SUB.	PROJECT	CAVENDISH, BRO-1442(23)
	LOCATION	CAVENDISH, VT
	ARCHITECT	
DATE APP.	ENGINEER	
DATE DIST.	CUSTOMER	F.W. WHITCOMB

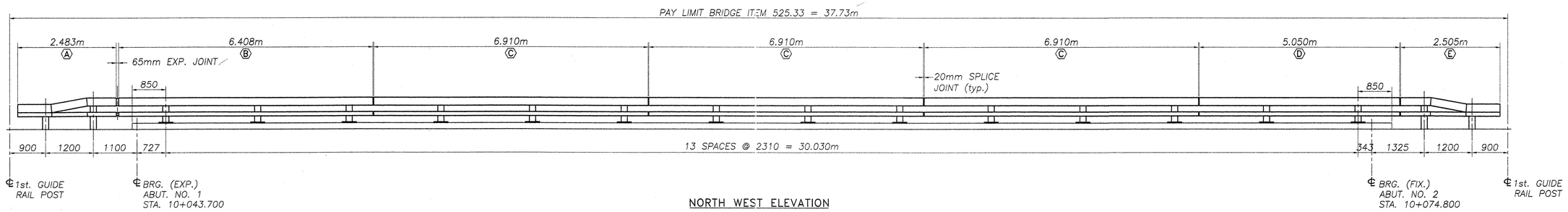
REV NO.	DATE	DESCRIPTION
1	3/03	Per Bill
HOLES		
PAINT GALV - A123		

MERRIMACK SHEET METAL
119 HALL ST.
CONCORD, NH
03301
Tel: (603) 224-7766
Fax: (603) 224-7925

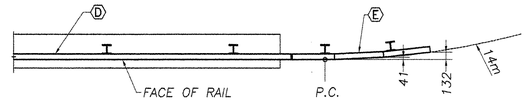
DRAWN BY JD
CK'D. BY PC
JOB NO. 1422
DWG. NO. PC

074-DS

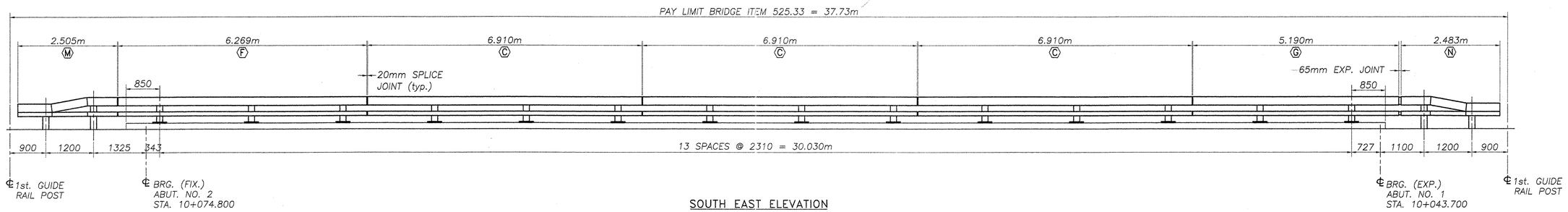
11120



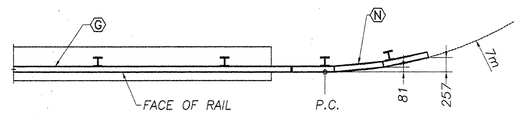
NORTH WEST ELEVATION



PARTIAL PLAN



SOUTH EAST ELEVATION



PARTIAL PLAN

BILL OF MATERIAL (BOTH SIDES OF BRIDGE)

Mark #	Qty.	Description	Material
	28	W150x37.1 POST W/BASEPLATE (620mm) OAL	A709M Gr. 50
	4	W150x37.1 DRIVEN POST (2.134m) OAL	A709M Gr. 50
	4	W150x37.1 DRIVEN POST (1.956m) OAL	A709M Gr. 50
Ⓑ	1	TS 203 x 102 x 8 (6.408m) OAL	A500 Gr. B
	1	TS 102 x 102 x 6 (6.408m) OAL	A500 Gr. B
Ⓒ	6	TS 203 x 102 x 8 (6.910m) OAL	A500 Gr. B
	6	TS 102 x 102 x 6 (6.910m) OAL	A500 Gr. B
Ⓓ	1	TS 203 x 102 x 8 (5.050m) OAL	A500 Gr. B
	1	TS 102 x 102 x 6 (5.050m) OAL	A500 Gr. B
Ⓕ	1	TS 203 x 102 x 8 (6.269m) OAL	A500 Gr. B
	1	TS 102 x 102 x 6 (6.269m) OAL	A500 Gr. B
Ⓖ	1	TS 203 x 102 x 8 (5.190m) OAL	A500 Gr. B
	1	TS 102 x 102 x 6 (5.190m) OAL	A500 Gr. B
Ⓐ	1	TS 203 x 102 x 8 (2.483) UPPER DROP END TUBE	A500 Gr. B
	1	TS 102 x 102 x 6 (2.483) LOWER DROP END TUBE	A500 Gr. B
Ⓔ	1	TS 203 x 102 x 8 (2.505) UPPER DROP END TUBE	A500 Gr. B
	1	TS 102 x 102 x 6 (2.505) LOWER DROP END TUBE	A500 Gr. B
Ⓜ	1	TS 203 x 102 x 8 (2.505) UPPER DROP END TUBE	A500 Gr. B
	1	TS 102 x 102 x 6 (2.505) LOWER DROP END TUBE	A500 Gr. B
Ⓝ	1	TS 203 x 102 x 8 (2.483) UPPER DROP END TUBE	A500 Gr. B
	1	TS 102 x 102 x 6 (2.483) LOWER DROP END TUBE	A500 Gr. B
	12	TS 178 x 76 x 10 SPLICE TUBE 500 LONG	A500 Gr. B
	12	TS 76 x 76 x 8 SPLICE TUBE 500 LONG	A500 Gr. B
	28	3mm BEARING PAD	NEOPRENE
	4	BACK UP PLATE	A709M Gr. 36
	4	TERMINAL CONNECTOR	M180 B2
	168	M20 ROUND HEAD BOLT, 152 LONG	M164M
	168	M20 HEX NUT	A563 DH
	168	M20 WASHER	F436M
	96	M16 SPLICE BOLT, 44 LONG	M164M
	96	M16 PLAIN HARDENED WASHER	F436M
	48	M16 NUT WELDED TO SPLICE TUBE	A563A
	16	M20 x 13 SCH. 40 PIPE SPACER	A53 Gr. B
	112	M24 ANCHOR STUD, 305 LONG	A449 *
	112	M24 WASHER	F436M *
	112	M24 JAMB NUT	A563 DH *
	224	M24 HEX NUT	A563 DH *
	28	SPACER PLATE	A709M Gr. 36

NOTES:
1. ITEMS MARKED "*" ARE NOT SUPPLIED BY HIGHWAY SAFETY CORPORATION, AND THEY ARE SHOWN ONLY FOR REFERENCE.

REVISIONS		
No.	Remarks	Date
0	Initial submittal	10-5-06

TOTAL PAY LIMIT BRIDGE ITEM 525.33 = 75.5m

RECEIVED
CK'D BY _____ OK'D BY UBS
OCT 11 2006
RESUBMIT _____ APPROVED As Noted
BY _____ DATE 10-31-06

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

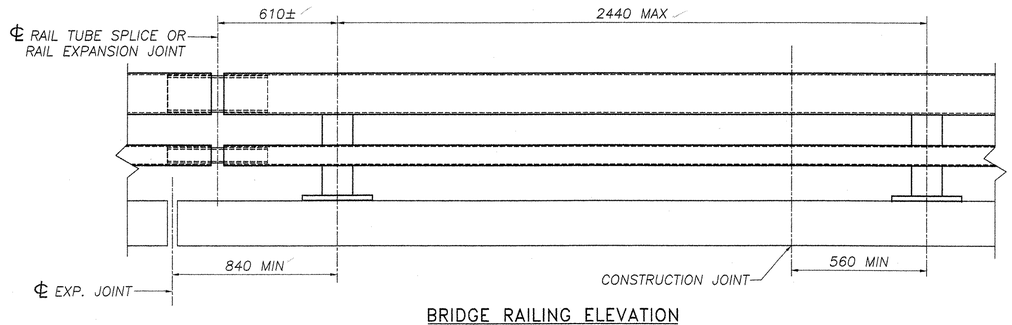
ITEM 525.33 – BRIDGE RAILING–NETC 2 RAIL
PROJECT No. BRO 1442(23)
TOWN OF CAVENDISH BRIDGE NO. 45
WINDSOR COUNTY, ROUTE: TH 29 (CLASS 3)

GENERAL CONTRACTOR

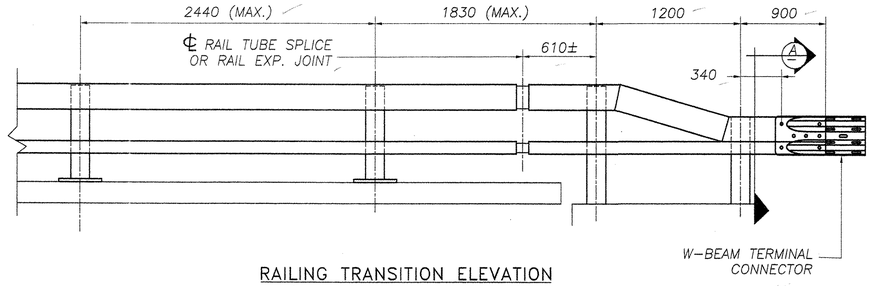
SUB CONTRACTOR F.R. LAFAYETTE, INC.

DRAWN MHM
CHECKED
DATE 9-22-06
SCALE NONE
HSC REFERENCE NO. 1576
SIZE D REVISION 0
SHEET NO. 1 of 2

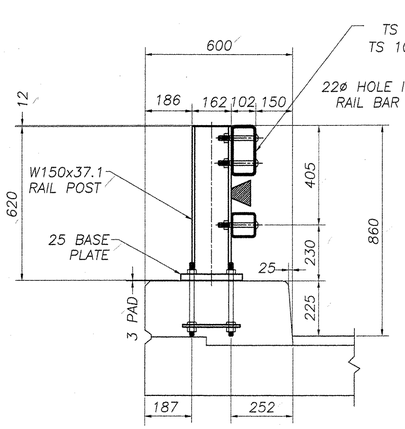
D75-BR



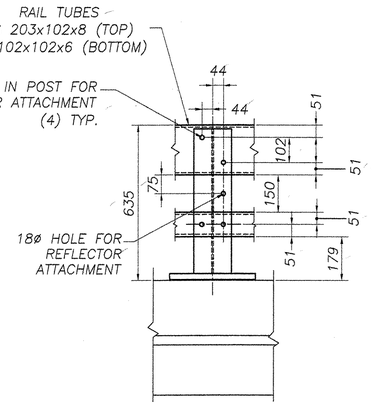
BRIDGE RAILING ELEVATION



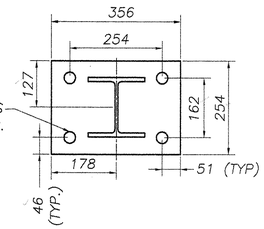
RAILING TRANSITION ELEVATION
(BOTH ENDS OF BRIDGE)



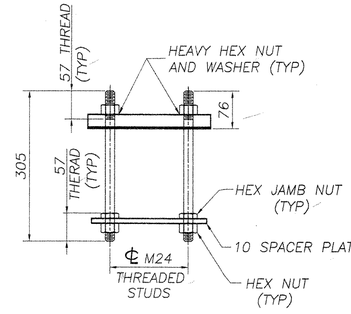
TYPICAL SECTION



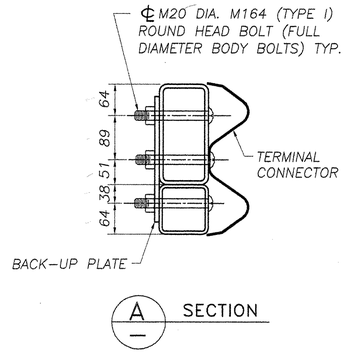
ELEVATION



POST AND BASE PLATE



RAIL POST ANCHORAGE
(BY OTHERS)



NOTES:

1. ALL RAILINGS AND MATERIALS SHALL CONFORM TO THE PROVISION OF SECTION 525, "RAILINGS OF THE STANDARD SPECIFICATION FOR CONSTRUCTION".

2. TUBING AND POSTS SHALL MEET THE REQUIREMENTS OF SECTION 732, "RAILING MATERIALS OR THE STANDARD SPECIFICATIONS FOR CONSTRUCTION," EXCEPT THAT THE DROP-WEIGHT TEAR TEST IN SECTION 732 SHALL NOT APPLY TO THE STRUCTURAL TUBING SHOWN ON THIS SHEET.

3. PRIOR TO GALVANIZING, ALL EXPOSED CUT OR SHEARED EDGES SHALL BE ROUNDED TO A 2mm RADIUS AND BE FREE OF BURRS.

4. RAIL POSTS SHALL BE SET NORMAL TO GRADE.

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

6. RAIL TUBE EXPANSION JOINT SHALL BE PROVIDED IN ANY RAIL BAY SPANNING A SUPERSTRUCTURE EXPANSION JOINT. EXPANSION JOINT WIDTH SHALL BE "X" AT 7°C AND WILL BE ADJUSTED IN THE FIELD BY THE ENGINEER FOR OTHER TEMPERATURES.

7. ALL PARTS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH AASHTO M111M, EXCEPT HARDWARE, WHICH SHALL MEET THE REQUIREMENTS OF AASHTO M232M.

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

9. RAIL TUBES SHALL BE ATTACHED USING M20 FULL DIAMETER BODY AASHTO M164M (TYPE 1) ROUND HEAD BOLT INSERTED THOUGH THE FACE OF THE TUBE. HOLES IN POSTS SHALL BE 2mm LARGER THAN THE BOLT SIZE.

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

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

12. ANY BENDING OF RAIL SHALL BE BY SHOP PROCEDURE ONLY.

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

14. RAIL POSTS AND BASE PLATES SHALL BE TESTED FOR IMPACT PROPERTIES IN ACCORDANCE WITH ASTM A370 CHARPY IMPACT TESTING USING TYPE A SPECIMENS.

15. TO FACILITATE FIELD FIT – UP OF THE TRANSITION RAILING, POSTS SHALL BE SET LOOSELY INTO FIBER FORM TUBES WHILE TRANSITION PARTS ARE BEING ASSEMBLED. POST HOLES SHALL BE BACKED FILLED WITH A CONCRETE MIX APPROVED BY THE ENGINEER. PAYMENT FOR COMPONENTS, INCLUDING BACKUP PLATE AND END TERMINAL CONNECTOR FOR GUARD RAIL, AUGERING, FIBER FORM TUBES AND CONCRETE , AND INSTALLATION SHALL BE CONSIDERED INCIDENTAL TO ITEM 525.33, "BRIDGE RAILING – NETC 2 RAILING".

16. ALL APPROACH RAIL SPLICES SHALL BE LAPPED ON THE DIRECTION OF TRAFFIC FLOW.

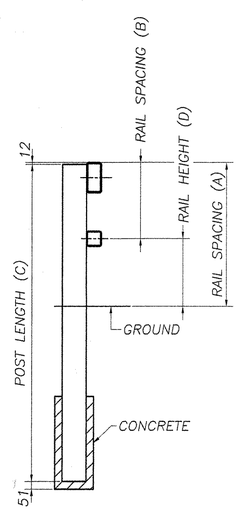
MATERIALS

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 M164M, TYPE1

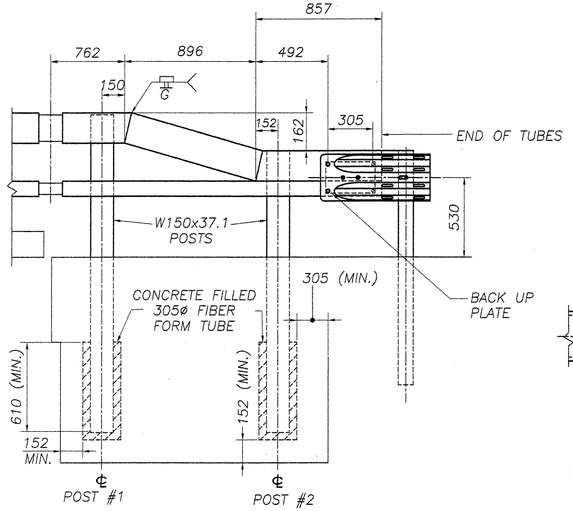
NUTS FOR AASHTO M164M (ASTM A325M) BOLTS AND ANCHOR STUDS SHALL COMPLY WITH AASTHO M291M (ASTM A563M).

WASHERS SHALL COMPLY WITH AASHTO M293M (ASTM F436M) SPECIFCATIONS.

3mm PAD SHALL COMPLY WITH STANDARD SPECIFICATION SUBSECTION 731.01 OR 731.02.

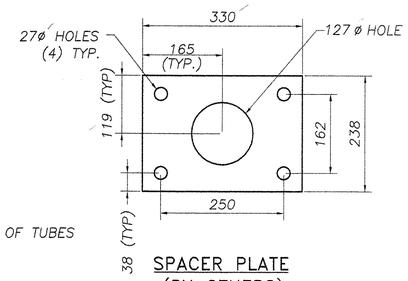


TYPICAL SECTION

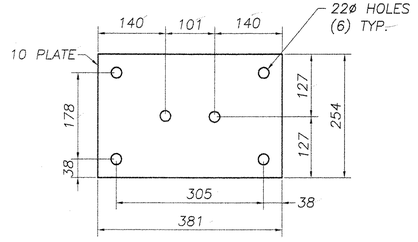


ELEVATION

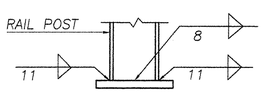
POST NUMBER	RAIL HEIGHT (A)	RAIL SPACING (B)	POST LENGTH (C)	RAIL HEIGHT (D)
1	860	405	2134	455
2	702	254	1956	448



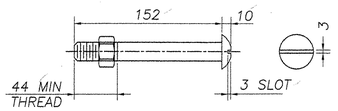
SPACER PLATE
(BY OTHERS)



BACK-UP PLATE

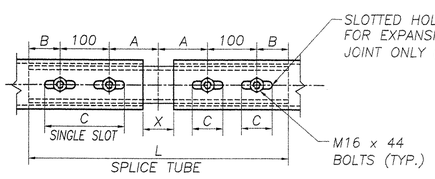


BASE WELD DETAIL



M20 DIA. M164M (TYPE 1)
ROUND HEAD BOLT

(WITH WASHER AND PREVAILING TORQUE TYPE LOCK NUT)
(SEE NOTE #9)
ONLY FULL DIAMETER BODY BOLTS WILL BE ALLOWED.

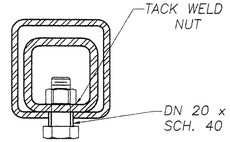


RAIL TUBE SPLICE AND RAIL
EXPANSION JOINT DETAIL

SPLICE TABLE					
T	A	B	C	L	X
N/A	100	50	--	500	20
EXPANSION JOINT TABLE					
<100	100	50	65	500	65

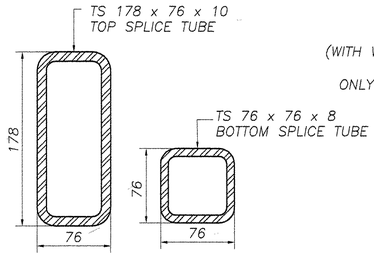
T = TOTAL MOVEMENT BETWEEN BRIDGE EXPANSION JOINTS. SEE NOTE 6

* = SINGLE SLOT

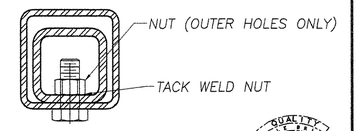


16ø TAPPED HOLE IN SPLICE TUBE AND 29 x 'C' SLOT IN RAIL TUBE FOR M16 BOLT AND PLAIN HARDENED WASHER

EXPANSION JOINT SECTION
FOR DETAILS NOT SHOWN, SEE "RAIL TUBE SPLICE SECTION."



RAIL TUBE SPLICE SECTION



16ø TAPPED HOLE IN SPLICE TUBE & 19 ø HOLE IN RAIL TUBE FOR M16 BOLT & PLAIN HARDENED WASHER

REVISIONS		
No.	Remarks	Date
0	Initial submittal	10-5-06

RECEIVED
CK'D BY _____ OK'D BY UBS
OCT 11 2006
RESUBMIT _____ APPROVED ✓
BY _____ DATE 10-31-06

HIGHWAY SAFETY CORP.
GLASTONBURY, CT

ITEM 525.33 – BRIDGE RAILING-NETC 2 RAIL
PROJECT No. BRO 1442(23)
TOWN OF CAVENDISH BRIDGE NO. 45
WINDSOR COUNTY, ROUTE: TH 29 (CLASS 3)

GENERAL CONTRACTOR
SUB CONTRACTOR F.R. LAFAYETTE, INC.

DRAWN MHM
CHECKED
DATE 9-22-06
SCALE NONE
HSC REFERENCE NO. 1576
SIZE D REVISION 0
SHEET NO. 2 of 2

026-RR

VERMONT

State of Vermont
PDD/Structures Design Section
National Life Building – Drawer 33
Montpelier, VT 05633-5001
www.aot.state.vt.us

[phone] 802-828-2621
[fax] 802-828-2556
[tld] 800-253-0191

Agency of Transportation

October 31, 2006

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

Project Name: Cavendish **Project #: BRO 1442(23)**

Structure Identification: TH 29 BR. 45

The following Bridge Railing details Item # 525.33 for the above project (Vendor's Job # 1576) transmitted with your letter dated 10/10/2006 have been reviewed and are being returned herewith.

Sheets: 1 & 2 of 2 for Job # 1576 **are approved "as corrected"**

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.

Sincerely,

Martha Evans-Mongeon
Project Manager

Attachments
cc: [X] Resident Engineer w/prints, Jacques Couture
[X] Shop Inspector w/prints, Jeff Clark
[X] Contractor w/prints, Frank W. Whitcomb
[X] Subcontractor – letter only F.R. Lafayette
[X] Construction Divison – letter only
[X] Materials & Research Section (C&IA Unit) – letter only
[X] Files (Structures & Central)

VTrans Working to Get You There

77 ER

Highway Safety Corporation

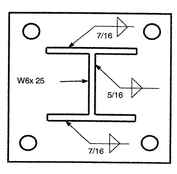
Glastonbury, CT

Welding Procedure Specification

Material specification **A572 gr 50, A709 Gr 50**
Welding process **Gas Metal Arc Welding (GMAW)**
Manual, semi-automatic, or automatic **Semi-Automatic**
Position of welding **Flat (1F) or Horizontal (2F)**
Filler metal specification **AWS A5.18**
Filler metal classification **ER70S-3**
Electrode and manufacturer **Lincoln Electric Lincoln Weld L-50**
Flux and manufacturer **N/A**
Shielding gas **85% Argon / 15% CO2** Flow rate **19-27 L / min**
Single or multiple pass **Single or Multiple**
Single or multiple arc **Single or Multiple**
Welding current **DCEP**
Polarity **Reverse - electrode positive**
Welding progression **Stringers**
Root treatment **clean base metal**
Preheat and interpass temperature **base metal up to 3/4" (50ºF) ; over 3/4 thru 1-1/2" (150ºF) : over 1-1/2" thru 2-1/2" (225ºF)**
Postheat treatment **None**
Electrode extension **3/4" ± 1/4"**

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters Amperes	Welding parameters Volts	Travel speed	Joint detail
8mm	**1**	**2 mm**	**275 A ± 25**	**25 V ± 2**	**200-250 mm / min**	
5/16"	**1**	**0.062"**	↓	↓	**8-10 lpm**	
12 mm	**1 & 2**	**2 mm**	↓	↓	**200-250 mm / min**	
7/16"	**1 & 2**	**0.062"**	↓	↓	**8-10 lpm**	



VTRANS RECEIVED OCT 11 2006
CK'D BY
OK'D BY JWC
RESUBMIT BY
APPROVED
DATE 10-31-06

This procedure may vary due to fabrication sequence, fit-up, pass size, etc. within the limitation of variables given in section 5 of latest edition AWS D1.5

AWS QC 1 PAUL A. RADICE 9807822 CWI

WPS no. **W-1576-A**
Revision no. **0**
Supporting PQR no. **Pre-Qualified**
Project Name **Cavendish, VT**

Fabricator **Highway Safety Corporation**
Authorized by **Paul Radice**
Date **10/5/06**
Project Number **BRO 1442(23)**

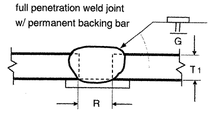
Highway Safety Corporation

Glastonbury, CT

Welding Procedure Specification

Material specification **ASTM A500 Gr B**
Welding process **Shielded Metal Arc Welding (SMAW)**
Manual, semi-automatic, or automatic **Manual**
Position of welding **Flat (1G)**
Filler metal specification **AWS A5.1**
Filler metal classification **ER7018**
Electrode and manufacturer **Lincoln Electric Jet LH 78 MR**
Flux and manufacturer **N/A**
Shielding gas **N/A** Flow rate **N/A**
Single or multiple pass **Multiple**
Single or multiple arc **Single**
Welding current **AC**
Polarity **N/A**
Welding progression **Stringers**
Root treatment **clean base metal**
Preheat and interpass temperature **50ºF (min)**
Postheat treatment **None**
Electrode extension **N/A**

WELDING PROCEDURE

Weld size	Pass no.	Electrode size	Welding parameters Amperes	Welding parameters Volts	Travel speed	Joint detail
	ALL	**5/32"**	**150 A to 220 A**		**VARIES**	B-LIa full penetration weld joint w/ permanent backing bar  **T 1 = 1/4" (max)** **R = T 1**

VTRANS RECEIVED OCT 11 2006

CK'D BY _____ OK'D BY JUK
RESUBMIT _____ APPROVED V
BY _____ DATE 10-31-06

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WPS no. **W-1576-B**
Revision no. **0**
Supporting PQR no. **Pre-Qualified**
Project Name **Cavendish, VT**

Fabricator **Highway Safety Corporation**
Authorized by **Paul Radice**
Date **9/21/06**
Project Number **BRO 1442(23)**

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