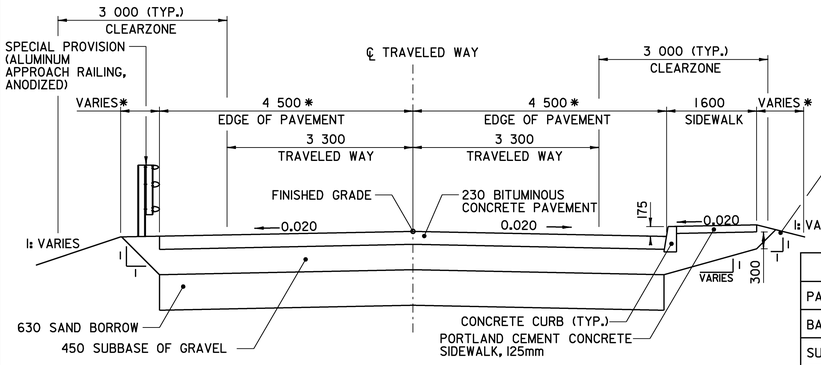
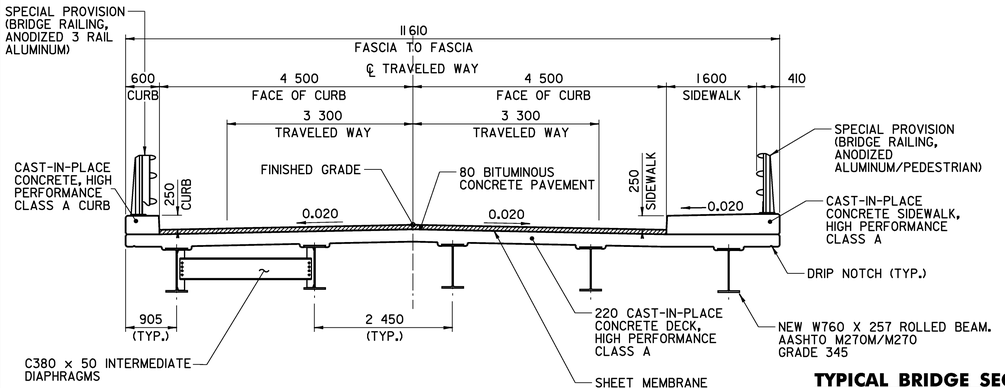


APPROACH ROADWAY SECTION

SCALE: 1:50

*WIDTH VARIES ON THE APPROACHES. REFER TO PLAN SHEETS AND ROADWAY CROSS SECTIONS FOR WIDTHS AT SPECIFIC STATIONS.

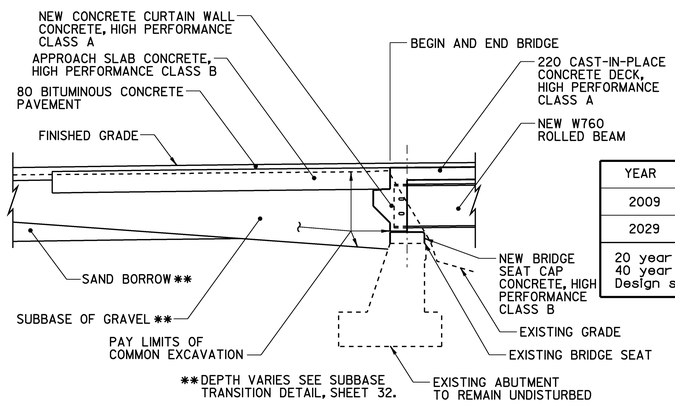


TYPICAL BRIDGE SECTION

SCALE: 1:50

TYPICAL BRIDGE SECTION

40 BITUMINOUS CONCRETE PAVEMENT TYPE IV, TOP LIFT
40 BITUMINOUS CONCRETE PAVEMENT TYPE IV, BOTTOM LIFT



TYPICAL ABUTMENT SECTION

SCALE 1:50

TYPICAL ROADWAY SECTION

40 BITUMINOUS CONCRETE PAVEMENT TYPE IV
40 BITUMINOUS CONCRETE PAVEMENT TYPE IV
75 BITUMINOUS CONCRETE PAVEMENT TYPE I
75 BITUMINOUS CONCRETE PAVEMENT TYPE I
450 SUBBASE OF GRAVEL
630 SAND BORROW

NOTE: FOR PG GRADE, SEE SECTION 406 OF THE GENERAL SPECIAL PROVISIONS.

MATERIALS TOLERANCE TABLE

MATERIAL ITEM	TOLERANCE
PAVEMENT	± 5 mm TOTAL THICKNESS
BASE COURSE	± 15 mm
SUBBASE	±30 mm
SAND BORROW	±30 mm

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2009	8400	940	59	6.7	690
2029	10300	1100	59	10.8	1400

20 year ESAL for flexible pavement from 2009 to 2029 : 6,082,000
40 year ESAL for flexible pavement from 2009 to 2049 : 14,762,000
Design speed: 50 km/h

LOAD FACTOR LOAD RATING (METRIC TONS)

LOADING LEVELS (LOAD FACTOR)	TRUCK						
	M	MS	3S2	6 AXLE	3A.STR.	4A.STR.	5A.SEMI
INVENTORY A=2.17; B=1.00	42	53					
POSTED A=1.55; B=1.40	58	74	94		66	68	84
OPERATING A=1.30; B=1.67		89	112	135	78	81	

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

SERVICEABILITY RF= $B\left[\frac{.95\,F_y S_{LL+I} - M_{DL}\frac{S_{LL+I}}{S_{DL}} - M_{SDL}\frac{S_{LL+I}}{S_{SDL}}}{1.67\,M_{LL+I}}\right]$

PLOTTED 05-MAY-2009

FINAL HYDRAULICS REPORT

Metric

HYDROLOGIC DATA

DRAINAGE AREA= 44 SQ KM
CHARACTER OF TERRAIN: RURAL HILLS
CHARACTER & TYPE OF STREAM:

NATURE OF STREAMBED: GRAVEL AND COBBLES

Q2.33= Q50= 57 CMS
Q10= 34 CMS Q100= 69 CMS
Q25= Q500= 100 CMS

DATE OF FLOOD OF RECORD: -
WATER SURFACE ELEV.: - ESTIMATED DISCHARGE: -
NATURAL STREAM VELOCITY @ Q
ICE CONDITIONS: DEBRIS:
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEVATION RAPIDLY?
IS ORDINARY RISE RAPID?
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? YES
IF YES, DESCRIBE. BACKWATER FROM THE LAMOILLE RIVER

WATERSHED STORAGE HEADWATERS UNIFORM THROUGHOUT WATERSHED
IMMEDIATELY ABOVE SITE

EXISTING STRUCTURE

STRUCTURE TYPE: SINGLE SPAN STEEL BEAM YEAR BUILT: 1935
CLEAR SPAN (NORMAL TO STREAM): 18 300
VERTICAL CLEARANCE ABOVE STREAMBED: 1825
WATERWAY OF FULL OPENING: 28 SM
DISPOSITION OF STRUCTURE: EXISTING SUPERSTRUCTURE TO BE REMOVED AND DISPOSED OF BY THE CONTRACTOR
TYPE OF MATERIAL UNDER SUBSTRUCTURE:

WATER SURFACE ELEV. @ Q2.33= VELOCITY=
Q10= 244.6, 244.9* m 1.3 MPS
Q25= m
Q50= 245.0, 245.5* m 1.7 MPS
Q100= 245.2, 245.8* m 1.7 MPS

* NOTE: FIRST ELEVATION IS RESULT OF COOPER BROOK DRAINAGE AREA, SECOND ELEVATION IS RESULT OF LAMOILLE RIVER BACKWATER.

LONG TERM STREAM BED CHANGES:

IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO FREQUENCY:
RELIEF ELEVATION: DISCHARGE OVER ROAD @ Q100:

UPSTREAM STRUCTURE: TOWN: HARDWICK DISTANCE: 0.762 KM
HIGHWAY NO.: 368 STRUCTURE NO.: 42

NOTE:

DOWNSTREAM STRUCTURE: TOWN: DISTANCE:
HIGHWAY NO.: STRUCTURE NO.:

NOTE:

PROPOSED STRUCTURE

STRUCTURE TYPE: SINGLE SPAN STEEL BEAM

CLEAR SPAN (NORMAL TO STREAM): 18 300
VERTICAL CLEARANCE ABOVE STREAMBED: 2045
WATERWAY OF FULL OPENING: 32 SM

WATER SURFACE ELEV. @ Q2.33= VELOCITY=
Q10= 244.6, 244.9* m 1.3 MPS
Q25= m
Q50= 245.0, 245.5* m 1.7 MPS
Q100= 245.2, 245.8* m 1.7 MPS

* NOTE: FIRST ELEVATION IS RESULT OF COOPER BROOK DRAINAGE AREA, SECOND ELEVATION IS RESULT OF LAMOILLE RIVER BACKWATER.

IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO FREQUENCY:
RELIEF ELEVATION: DISCHARGE OVER ROAD @ Q100:

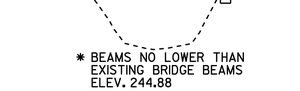
AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 245.1 m
VERTICAL CLEARANCE @ Q 50 = 0.1 m

SCOUR:
REQUIRED CHANNEL PROTECTION:

PERMIT INFORMATION

AVERAGE DAILY FLOW:
ORDINARY LOW WATER: DEPTH:
ORDINARY HIGH WATER: DEPTH:

ADDITIONAL COMMENTS



TEMPORARY BRIDGE SKETCH

DESIGN CRITERIA:
1. DESIGN LIVE LOAD AASHTO MS 22.5
2. DESIGN SPAN 18 900 ℄ BRG TO ℄ BRG
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL N/A ON LEDGE N/A
4. ALLOWABLE LOAD FOR PILING N/A TYPE N/A ESTIMATED LENGTH N/A
5. STRUCTURAL STEEL AASHTO GRADE AASHTO M270M / M270 GRADE 345
6. REINFORCING STEEL GRADE 420
7. CONCRETE HIGH PERFORMANCE CLASS A f'_c 30 MPa
HIGH PERFORMANCE CLASS B f'_c 25 MPa

TRAFFIC MAINTENANCE:
1. IS TRAFFIC TO BE MAINTAINED? YES IF YES, ON EXISTING STRUCTURE NO OR ON TEMPORARY BRIDGE YES
2. TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY TWO WAY TRAFFIC CONTROL SIGNALS REQUIRED NO
MINIMUM CLEAR SPAN (NORMAL TO STREAM): 15 000 * VERTICAL CLEARANCE ABOVE STREAMBED: 1825 *
WATERWAY OF FULL OPENING:
ARE SIDEWALKS REQUIRED? YES IF SO, ON WHAT SIDE? UPSTREAM
STRUCTURE TYPE: SINGLE SPAN BRIDGE

* SEE TEMPORARY BRIDGE SKETCH ABOVE

DuBois & King inc.
engineering planning management development

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of HARDWICK	Bridge No. 67
Highway No. VT 15	Log Sta.
	Surv. Sta.

VT 15 OVER COOPER BROOK

PRELIMINARY INFORMATION SHEET

Designed By A.P. GUYETTE	Drawn By S.J. BIJOLLE
Checked By Date	Bridge Design Supervisor
E. P. DETRICK 1/09	J.W.TUCKER Date 1/09
PROJECT HARDWICK	PROJECT NO. BHF 030-2 (18) S
I.G.C. Info. M:\Projects\95J306\Structures\04-13-09 updates\z95J3	
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