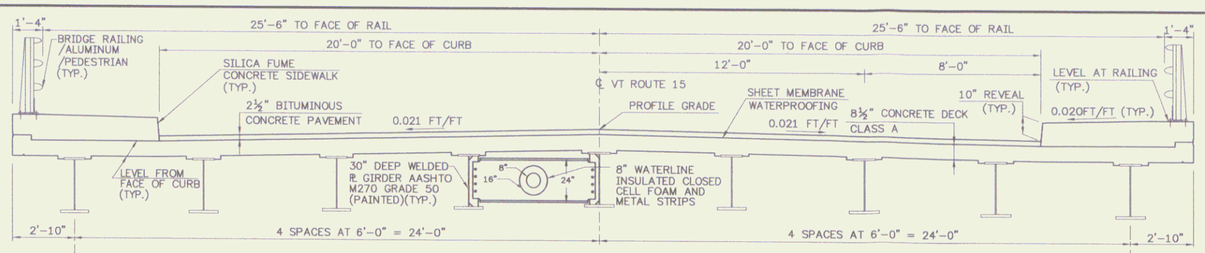
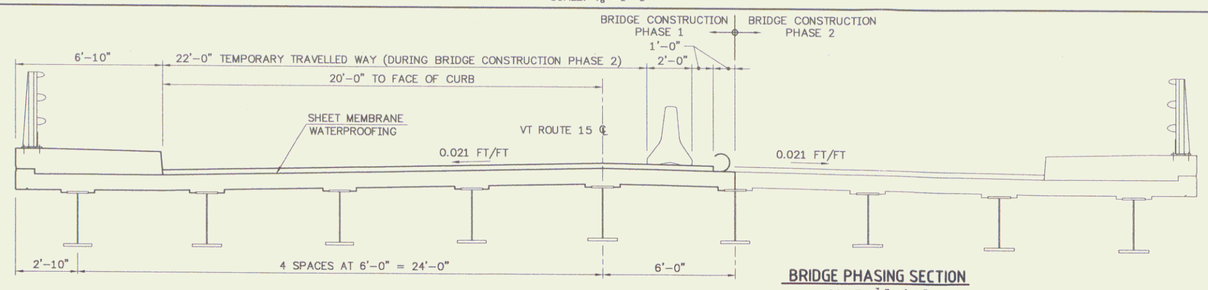


BRIDGE TYPICAL SECTION

SCALE: ⅜"=1'-0"



BRIDGE PHASING SECTION

SCALE: ⅜"=1'-0"

GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL CONFORM TO STATE OF VERMONT, AGENCY OF TRANSPORTATION, 1990 STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, AND ITS LATEST REVISIONS, AND THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, DATED 1996, WITH INTERIMS THROUGH 1997.
2. DESIGN IS BY THE ALLOWABLE STRESS DESIGN METHOD FOR HS25-44 LOADING. DESIGN DEAD LOAD INCLUDES AN ALLOWANCE FOR A ONE INCH FUTURE OVERLAY.
3. DESIGN SOIL UNIT WEIGHT = 140 PCF
4. ALL DIMENSIONS ARE HORIZONTAL OR VERTICAL, AND ARE GIVEN AT 68 DEGREES F UNLESS OTHERWISE NOTED.
5. ALL STRUCTURAL STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC).
6. THE PAINTING OF THE NEW STEEL WILL BE PAID FOR UNDER THE ITEM 513.25 "STRUCTURAL PAINTING, SHOP APPLIED". SEE SPECIAL PROVISIONS FOR THE SPECIFICATIONS PERTAINING TO THE PAINTING OF STRUCTURAL STEEL.
7. ALL FIELD CONNECTIONS SHALL BE MADE WITH 7/8" DIAMETER, ASTM A-325 (AASHTO M164) BOLTS. HOLES SHALL BE 15/16" DIAMETER. CONNECTIONS NOT DETAILED ON THE PLANS SHALL BE DETAILED BY THE FABRICATOR AND SUBMITTED TO THE STATE FOR APPROVAL.
8. MECHANICALLY GALVANIZED AND PAINTED TYPE I BOLTS ARE TO BE USED FOR PAINTED M270 GRADE 50 AND PAINTED M270 GRADE 36 STRUCTURAL STEEL CONNECTIONS. FIELD PAINTING OF BOLTS TO INCLUDE INTERMEDIATE AND FINAL COATING SYSTEMS AFTER CONNECTION APPROVAL.
9. ALL WELDING SHALL CONFORM WITH THE PROVISIONS OF SUBSECTION 506.10.
10. ANY HOLES IN FASCIA BEAMS OR FASCIA GIRDER WEBS NOT OTHERWISE FILLED SHALL BE FILLED WITH BUTTON HEAD OR HEX HEAD BOLTS. SEE STANDARD SPECIFICATION SECTION 506.19 FOR BOLT TENSIONING REQUIREMENTS.
11. INTERMEDIATE DIAPHRAGM BOLTS SHALL BE ONLY SNUG TIGHT UNTIL THE ENTIRE DECK HAS BEEN PLACED AND CURED AT LEAST SEVEN DAYS. AT THAT TIME, THE BOLTS SHALL BE TIGHTENED TO SPECIFIED TORQUE.
12. AFTER SUPERSTRUCTURE STEEL HAS BEEN ERECTED, ELEVATIONS ALONG THE TOP OF BEAMS SHALL BE TAKEN AS DIRECTED BY THE THE ENGINEER FOR USE IN DETERMINING FINAL GRADE.
13. ALL REINFORCING STEEL SHALL BE DETAILED AND FABRICATED USING PROCEDURES AND TOLERANCES IN ACCORDANCE WITH APPLICABLE PUBLICATIONS OF THE "CONCRETE REINFORCING STEEL INSTITUTE".
14. MINIMUM COVER FOR REINFORCING STEEL SHALL BE AS FOLLOWS: SUBSTRUCTURE: TWO (2) INCHES ALONG BACK FACES OF WALLS AGAINST EARTH, AND THREE (3) INCHES ELSEWHERE. FOR BRIDGE DECK: 2½" MIN. COVER FOR TOP REINFORCING, AND 1½" MIN. COVER FOR BOTTOM REINFORCING.
15. REINFORCING PLACEMENT TOLERANCES SHALL BE: SPACING +- 1" CLEARANCE +- 1/4"
16. DRILLING AND GROUTING OF REINFORCING STEEL INTO EXISTING CONCRETE SHALL BE PAID FOR UNDER ITEM 507.16.
17. DECK CONCRETE SHALL BE "CONCRETE, CLASS A". CURB CONCRETE SHALL BE "SILICA FUME CONCRETE." ALL OTHER CONCRETE SHALL BE "CONCRETE, CLASS B" UNLESS OTHERWISE DESIGNATED ON THE PLANS.
18. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED 1" BY 1".
19. SURFACES OF BRIDGE SEATS UNDER BEARING DEVICES SHALL BE LEVEL. OTHER BRIDGE SEAT AREAS SHALL BE SLOPED 1/2" PER FOOT. ABUTMENT SEATS SHALL BE SLOPED FULL WIDTH TOWARD CENTER SPAN. THE ENTIRE BRIDGE SEAT SURFACE SHALL BE SMOOTH WITH EITHER A WOOD OR MAGNESIUM FLOAT FINISH.
20. FOR EACH CONSTRUCTION PHASE, THE DECK SHALL BE PLACED IN A SINGLE OPERATION WITHIN AN 8 HOUR PERIOD. IF THIS CAN NOT BE ACCOMPLISHED DUE TO CIRCUMSTANCES BEYOND THE CONTRACTOR'S CONTROL, A NEAT (DAMMED) CONSTRUCTION JOINT SHALL BE USED. A NINETY-SIX HOUR DELAY BETWEEN PLACEMENTS SHALL BE OBSERVED.
21. WATER REPELLENT SHALL BE APPLIED TO ALL EXPOSED CONCRETE SURFACES EXCEPT THE UNDERSIDE OF DECK BETWEEN DRIP BEADS.
22. TRAFFIC SHALL BE ALLOWED ON THE NEW BRIDGE ONLY AFTER THE SPECIFIED CURE PERIOD HAS EXPIRED AND 28 DAY DESIGN STRENGTH HAS BEEN ATTAINED AS EVIDENCE BY TEST CYLINDERS CURED UNDER FIELD CONDITIONS.
23. JOINTS AND SCORE MARKS IN CONCRETE SHALL BE CONSTRUCTED AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
24. THE KEY IN CONCRETE CONSTRUCTION JOINTS SHALL BE MONOLITHIC AND CONTINUOUS FOR THE FULL LENGTH OF THE JOINT. ANY UPWARD KEY SHALL BE PLACED INTEGRALLY WITH THE CONCRETE BELOW THE JOINT.
25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND SPACING OF FASCIA OVERHANG BRACKETS; HOWEVER, SPACING SHALL NOT EXCEED FOUR (4) FEET.
26. NO CONCRETE ABOVE THE BRIDGE SEATS SHALL BE PLACED UNTIL THE FINAL FINISHED GRADE OF THE DECK HAS BEEN ESTABLISHED, OR AS OTHERWISE PERMITTED BY THE ENGINEER.
27. ABUTMENTS ARE DESIGNED FOR HP 14X73 BEARING PILES DRIVEN TO REFUSAL ON ROCK.
28. ALL PILES SHALL BE FURNISHED WITH A REINFORCED PILE TIP OF PREFABRICATED CAST STEEL MEETING THE REQUIREMENTS OF ASTM A-27. SEE SUBSECTION 505.04 (e).
29. FILL IN AREAS THROUGH WHICH PILES ARE TO BE DRIVEN SHALL HAVE A MAXIMUM STONE SIZE OF NINE (9) INCHES.
30. THE ITEM 204.40 "COFFERDAM" SHALL BE USED FOR CONSTRUCTION OF BOTH ABUTMENTS. THE DESIGN AND SUBMITTAL PROCEDURES SHALL BE AS PER SUBSECTION 204.07
31. FOR EACH CONSTRUCTION PHASE, THE STONE FILL TYPE IV SHALL BE PLACED IN FRONT OF THE ABUTMENTS PRIOR TO ERECTING THE STRUCTURAL STEEL.
32. THE EXISTING BRIDGE TO BE REMOVED IS FOUNDED ON TIMBER PILES. PORTIONS OF THE SUBSTRUCTURE ARE TO BE REMOVED AS INDICATED ON THE DRAWINGS.
33. IN STREAM CONSTRUCTION SHALL BE PERFORMED BETWEEN JUNE 1 AND OCTOBER 1 , UNLESS THE CONTRACTOR OBTAINS WRITTEN PERMISSION FROM THE AGENCY OF NATURAL RESOURCES TO PERFORM SUCH WORK OUTSIDE OF THAT TIME FRAME.
34. TEN CUBIC YARDS OF STONE FILL TYPE IV HAS BEEN INCLUDED IN THE PROJECT FOR CONSTRUCTION OF A FISH HABITAT BOULDER CLUSTER. THIS CLUSTER SHALL BE LOCATED IN A HIGH VELOCITY PORTION OF THE STREAM A MINIMUM OF 25 FEET DOWNSTREAM OF THE EXISTING BRIDGE. FINAL LOCATION OF BOULDERS TO BE AS DIRECTED BY THE ENGINEER, BASED ON THE RECOMMENDATIONS OF THE DISTRICT FISHERIES BIOLOGIST AND/OR THE AGENCY OF NATURAL RESOURCES STREAM ALTERATION ENGINEER. CLUSTER SHALL CONSIST OF THREE BOULDERS, EACH 5 FOOT TO 6 FOOT IN DIAMETER, SPACED AT 10 FEET TO 15 FEET AND BURIED 1/3 DIAMETER BELOW STREAMBED.

HYDRAULIC DATA

1. DRAINAGE AREA 65 SQ.MI.
CHARACTER OF TERRAIN STEEPLY SLOPED FORESTED UPLANDS ; MODERATELY DEVELOPED FLOOD PLAIN
NATURE OF STREAMBED GRAVEL OVER DEEP SANDY SILT
Q 2.33 2000 CFS Q 50 6550 CFS
Q 10 3750 CFS Q 100 8200 CFS
Q 25 5100 CFS Q 500 14200 CFS
DATE OF FLOOD OF RECORD 1927 WATER SURFACE ELEVATION 512 ESTIMATED DISCHARGE
NATURAL STREAM VELOCITY @ Q 10 = 6.2 fps (approach section) ICE CONDITIONS MODERATE TO HEAVY DRIFT MODERATE
DOES THE STREAM REACH MAX. HIGHWATER ELEVATION RAPIDLY? YES
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? DOWNSTREAM
IF YES, DESCRIBE: CONFLUENCE OF THE LAMOILLE RIVER IS APPROX. 0.35 MILES DOWNSTREAM
WATERSHED STORAGE 2% HEADWATERS X UNIFORM THROUGHOUT WATERSHED IMMEDIATELY ABOVE SITE

EXISTING STRUCTURE

1. STRUCTURE TYPE: STEEL THROUGH GIRDER YEAR BUILT: 1928
2. SPAN NORMAL TO STREAM: 66'
3. VERTICAL CLEARANCE ABOVE STREAMBED: 13.8'
4. WATERWAY AREA OF FULL OPENING (NORMAL TO STREAM): 810 SF
5. DISPOSITION OF STRUCTURE: SUPERSTRUCTURE AND PORTIONS OF SUBSTRUCTURE TO BE REMOVED
6. TYPE OF SUBSTRUCTURE FOUNDATION MATERIAL: WOODEN PILES THROUGH SANDY SILT
7. WATER SURFACE ELEVATION @ Q 2.33 486.17 @APPROACH AREA VELOCITY= 6.9 fps
Q 10 488.53 (491.56) *2 = 8.7 fps (5.7 fps)
Q 25 489.98 = 10.4 fps
Q 50 491.42 (496.27) = 12.3 fps (7.8 fps)
Q 100 493.16 (497.72) = 5.7 fps (8.1 fps)
8. LONG TERM STREAM BED CHANGES: SINUOUS STREAM
9. IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO FREQUENCY: *3
10. RELIEF ELEVATION: *3 DISCHARGE OVER ROAD @Q100: 61.4 cfs (43.2 cfs) 0.75%

PROPOSED STRUCTURE

STRUCTURE GEOMETRY:
1. STRUCTURE TYPE REINFORCED CONCRETE SLAB ON STEEL GIRDERS
2. CLEAR SPAN LENGTH(S) NORMAL TO STREAM: 71'
3. VERTICAL CLEARANCE ABOVE STREAMBED: 12.8'
4. ARE PROVISIONS TO BE MADE FOR PUBLIC UTILITIES? YES WATER LINE ON BRIDGE & BURIED SEWER LINE UNDER RIVER

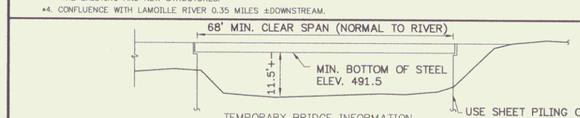
HYDRAULIC DATA:
1. WATERWAY AREA OF FULL OPENING (NORMAL TO STREAM): 780 SF
2. WATER SURFACE ELEVATION @ Q 2.33 486.38 @APPROACH AREA VELOCITY= 7.3 fps
Q 10 488.71 (491.56) *2 = 8.8 fps (5.5 fps) *2
Q 25 490.15 = 10.4 fps
Q 50 491.55 (496.38) = 12.2 fps (8.1 fps)
Q 100 493.11 (497.71) = 14.3 fps (8.1 fps)
3. IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO FREQUENCY: *3
4. RELIEF ELEVATION: *3 DISCHARGE OVER ROAD @Q100: 24.5 fps (43.2 fps)
5. AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 492.7' (LIMITED BY LOW STEEL)
6. VERTICAL CLEARANCE @Q100: 0
7. SCOUR: 5'
8. REQUIRED CHANNEL PROTECTION: STONE FILL, TYPE IV

ALLOWABLE STRESSES:
1. DESIGN LIVE LOAD AASHTO HS25
2. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL --- ON LEDGE ---
3. ALLOWABLE LOAD FOR PILING 192.6 KIPS TYPE HP 14 X 73 ESTIMATED LENGTH Abutment no.1 = 35 ft, Abutment no.2 = 40 ft
4. ALLOWABLE STRESS FOR STRUCTURAL STEEL AASHTO M 270 GR50 TENSION 27 KSI
5. ALLOWABLE STRESS FOR REINFORCING STEEL GRADE 60 TENSION 24000 PSI COMPRESSION 20000 PSI
6. ALLOWABLE STRESS FOR CONCRETE CLASS A f_c 4000 PSI f_c 1400 PSI
CLASS B f_c 3500 PSI f_c 1400 PSI
SILICA FUME f_c 5000 PSI f_c 2000 PSI

TRAFFIC MAINTENANCE:
1. IS TRAFFIC TO BE MAINTAINED? YES IF YES, ON EXISTING STRUCTURE ___ OR ON TEMPORARY BRIDGE X
2. TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY TWO WAY TRAFFIC CONTROL SIGNALS REQUIRED NO (SEE SKETCH BELOW)
MINIMUM CLEAR SPAN SEE SKETCH BELOW MINIMUM CLEAR HEIGHT SEE SKETCH BELOW MINIMUM WATERWAY AREA
ARE SIDEWALKS REQUIRED? YES IF SO, ON WHAT SIDE? SEPARATE STRUCTURE

PERMINT INFORMATION
AVERAGE DAILY FLOW: 134 cfs ORDINARY LOW WATER : 61 cfs DEPTH: 1 ft
ORDINARY HIGH WATER : 858 cfs DEPTH: 4 ft

NOTES:
*1. ESTIMATED FROM 1928 PLANS OF EXISTING BRIDGE.
*2. WATER SURFACE ELEVATION AND FLOW VELOCITY VALUES SHOWN FIRST ARE FOR LOW LAMOILLE RIVER CASE. VALUES SHOWN SECOND (IN PARENTHESES) ARE FOR HIGH LAMOILLE RIVER CASE. ALL WATER SURFACE ELEVATIONS ARE FOR THE WSPRO APPROACH SECTION.
*3. FOR BOTH THE EXISTING AND NEW STRUCTURES, ROADWAY OVERTOPPING WILL OCCUR ABOVE A 100 YEAR FLOOD FOR THE LOW LAMOILLE RIVER CASE AND AT ABOUT THE 50 YEAR FLOOD FOR THE HIGH LAMOILLE RIVER CASE. ROAD GRADE IS ABOUT 496.2 FOR BOTH THE EXISTING AND NEW STRUCTURES.
*4. CONFLUENCE WITH LAMOILLE RIVER 0.35 MILES ±DOWNSTREAM.



TEMPORARY BRIDGE INFORMATION
(FOR ROADWAY AND PEDESTRIAN STRUCTURES)
NTS

LOAD RATING (TONS)

STRESS LEVELS	TRUCK						
	H	HS	3S2	6 AXLE	3A. STR.	4A. STR.	5A.SEMI
INVENTORY 0.55Fy= 27 ksi							
POSTED 0.67Fy= 33.5 ksi							
OPERATING 0.75Fy=37.5 ksi							

REVISIONS

NO.	DESCRIPTION	BY & DATE

CLD Consulting Engineers
Costello Lomasney & de Nopoli, Inc.
Consulting Engineers
540 Commercial Street
Manchester, NH 03101
(603)668-8223 FAX(603)668-8802

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of	JOHNSON	Bridge No.	37
		Log Sta.	
Highway No.	VT ROUTE 15	Surv. Sta.	

VT ROUTE 15 OVER THE GIHON RIVER

PRELIMINARY INFORMATION

Designed By E. M. STUMPH	Drawn By. G. F. BONIN
Checked By Date	Bridge Design Supervisor Date
PROJECT JOHNSON	PROJECT NO. BRF 030-2(17)S
I.G.C. Info.	

R.O.W. SHEET 4 OF 9 SHEETS

(1=32)

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