

STATE OF VERMONT
AGENCY OF TRANSPORTATION

PRELIMINARY INFORMATION SHEET

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SCOPE OF WORK

1. INSTALLATION OF TEMPORARY TRAFFIC DETOUR AND TEMPORARY SIGNAL. MODIFICATIONS OF EXISTING SIGNAL TIMING AT THE MEMORIAL/BAILEY INTERSECTION. INSTALLATION OF PEDESTRIAN DETOURS. EXISTING WATER MAIN TO BE DISCONNECTED FROM SERVICE.

2. REHABILITATION OF EXISTING ABUTMENT 1 WITHIN THE TAYLOR STREET RIGHT-OF-WAY.

3. REHABILITATION OF EXISTING ABUTMENT 2 AND WINGWALLS WITHIN THE TAYLOR STREET RIGHT-OF-WAY.

4. REHABILITATION OF EXISTING ABUTMENT 1 BEARINGS. REPLACEMENT OF EXISTING ABUTMENT 2 BEARINGS.

5. COMPLETE REPLACEMENT OF EXISTING TRUSS FLOOR SYSTEM, INCLUDING NEW CAST-IN-PLACE CONCRETE DECK AND SIDEWALK, STRINGERS, FLOORBEAMS AND CONNECTIONS.

6. REHABILITATION OF EXISTING TRUSS, INCLUDING PARTIAL REPLACEMENT OF EXISTING VERTICALS AND COMPLETE REPLACEMENT OF EXISTING BRIDGE RAIL, LOWER LATERAL BRACING AND CONNECTIONS.

7. BLAST CLEANING AND PAINTING OF ALL REMAINING EXISTING STEEL.

8. RELATED MINOR APPROACH WORK, INCLUDING NEW CAST-IN-PLACE CONCRETE APPROACH SLABS.

9. REMOVAL OF EXISTING WATER MAIN TIMBER INSULATION BOX AND EXISTING WATER MAIN. INSTALLATION OF NEW PREINSULATED, HANGER SUPPORTED WATER MAIN. CONNECTION OF NEW WATER MAIN TO EXISTING SERVICE.

LIST OF STANDARDS

A-80 03-31-04

C-10 02-11-08

C-3A 03-10-08

D-9 06-01-94

D-15 06-01-94

E-100 01-02-04

E-100A 01-02-04

E-101 05-30-03

E-102 06-30-03

E-102A 05-01-04

E-106 03-01-04

E-107 06-30-03

E-107A 06-08-09

E-108 06-08-09

E-110 08-08-95

E-111 03-11-97

E-121 08-08-95

E-138 05-30-03

E-164 06-08-09

E-171A 08-09-95

E-172 08-09-95

E-193 08-18-95

G-1 01-03-00

G-1D 01-03-00

G-16 06-01-94

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA

Date: Sept. 2007

DRAINAGE AREA : 394 sq. mi.

CHARACTER OF TERRAIN : Hilly to mountainous

STREAM CHARACTERISTICS : Straight and stable through the bridge reach.

NATURE OF STREAMBED : Silt/sand on the banks, with cobbles and ledge in the channel.

PEAK FLOW DATA

Q 2.33 = 6,000 cfs

Q 10 = 13,000 cfs

Q 25 = 17,000 cfs

Q 50 = 20,700 cfs

Q 100 = 24,900 cfs

Q 500 = 37,200 cfs

DATE OF FLOOD OF RECORD : November 1927

ESTIMATED DISCHARGE: 57,000 cfs at the Montpelier gaging station

WATER SURFACE ELEV.: Not Available

NATURAL STREAM VELOCITY : @ Q25 = 8.5 fps

ICE CONDITIONS : Heavy

DEBRIS: Moderate

DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? No

IS ORDINARY RISE RAPID? No

IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No

IF YES, DESCRIBE:

WATERSHED STORAGE: 2%

HEADWATERS: UNIFORM: X

IMMEDIATELY ABOVE SITE:

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Single span steel truss bridge

YEAR BUILT: 1929

CLEAR SPAN(NORMAL TO STREAM): 162.5 ft.

VERTICAL CLEARANCE ABOVE STREAMBED: 20 ft.

WATERWAY OF FULL OPENING: 2568 sq. ft.

DISPOSITION OF STRUCTURE: Rehabilitate

TYPE OF MATERIAL UNDER SUBSTRUCTURE: Abutments founded on ledge.

WATER SURFACE ELEVATIONS AT:

Q2.33 = 512.7 ft.

Q10 = 519.9 ft.

Q25 = 522.1 ft.

Q50 = 524.2 ft.

Q100 = 525.7 ft.

VELOCITY = 8.4 fps

" 7.7 fps

" 8.5 fps

" 9.0 fps

" 9.8 fps

LONG TERM STREAMBED CHANGES: None noted.

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes

FREQUENCY: Below Q50

RELIEF ELEVATION: 523.3 ft.

DISCHARGE OVER ROAD @Q100: 3,325 cfs

UPSTREAM STRUCTURE

TOWN: Montpelier

HIGHWAY #: T.H. 2 (Main Street)

CLEAR SPAN: 2 spans at 69' each = 138' total

YEAR BUILT: 1976

STRUCTURE TYPE: Two-span steel beam bridge

DISTANCE: 1,000 ft.

STRUCTURE #: 2

CLEAR HEIGHT: 19 ft.

FULL WATERWAY: 2,110 sq. ft.

DOWNSTREAM STRUCTURE

TOWN: Montpelier

HIGHWAY #: Bike Path

CLEAR SPAN: 167'

YEAR BUILT: 1998

STRUCTURE TYPE: Single span pedestrian truss bridge

DISTANCE: 400 ft.

STRUCTURE #:

CLEAR HEIGHT: 21 ft.

FULL WATERWAY: N.A.

LOAD FACTOR LOAD RATING (TONS)

LOADING LEVELS

H

HS

3S2

6 AXLE

3A STR.

4A. STR.

5A SEMI

INVENTORY (A=2.17;B=1.00)

21

37

POSTED (A=1.55;B=1.40)

29

52

OPERATING (A=1.30;B=1.67)

28

51

COMMENTS:

Strength RF = $\phi M_N - 1.3 M_{DL} / A \times M_{LL+I}$

TRAFFIC DATA

YEAR

ADT

DHV

% D

% T

ADTT

2007

3300

340

60

1

33

2027

3700

380

60

1

37

20 year ESAL for flexible pavement from N/A to N/A : N/A

40 year ESAL for flexible pavement from N/A to N/A : N/A

Design Speed : 25 mph

PROPOSED STRUCTURE

STRUCTURE TYPE: Rehabilitate existing single span truss bridge

CLEAR SPAN(NORMAL TO STREAM): 162.0 ft.

VERTICAL CLEARANCE ABOVE STREAMBED: 20 ft.

WATERWAY OF FULL OPENING: 2566 sq. ft.

WATER SURFACE ELEVATIONS AT:

Q2.33 = 512.7 ft.

Q10 = 519.9 ft.

Q25 = 522.1 ft.

Q50 = 524.2 ft.

Q100 = 525.7 ft.

VELOCITY= 8.4 fps

" 7.7 fps

" 8.5 fps

" 9.0 fps

" 9.8 fps

IS THE ROADWAY OVERTOPPED BELOW Q100: Yes

FREQUENCY: Below Q50

RELIEF ELEVATION: 523.3 ft.

DISCHARGE OVER ROAD @Q100: 3,330 cfs

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 523.2 ft.

VERTICAL CLEARANCE: @ Q25 = 1.1 ft.

SCOUR: No contraction scour calculated in the main channel up to Q500. Abutments are set back from the channel and founded on ledge. Scour will be limited by ledge.

REQUIRED CHANNEL PROTECTION: Stone Fill, Type II, as needed

PERMIT INFORMATION

AVERAGE DAILY FLOW: 800 cfs

ORDINARY LOW WATER: 350 cfs

ORDINARY HIGH WATER: 2600 cfs

DEPTH OR ELEVATION: Elev. 506.0'

Elev. 509.0'

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: No temporary bridge required.

CLEAR SPAN (NORMAL TO STREAM):

VERTICAL CLEARANCE ABOVE STREAMBED:

WATERWAY AREA OF FULL OPENING:

ADDITIONAL INFORMATION

The hydrology and hydraulics in this Final Hydraulics Report are based on information in the 1981 Flood Insurance Study for Montpelier.

DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTO HS -20

2. DESIGN SPAN 165'-0"

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 M270M/M270 GRADE 50 PAINTED (NEW STEEL)

F_y=30 KSI (ASSUMED) (EXIST. STEEL TO REMAIN)

6. REINFORCING STEEL GRADE 60

7. CONCRETE, HIGH PERFORMANCE CLASS A f_c: 4000 psi

CONCRETE, HIGH PERFORMANCE CLASS B f_c: 3500 psi

8. DESIGN SOIL UNIT WEIGHT 140 pcf

9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL N/A

TRAFFIC MAINTENANCE

1. IS TRAFFIC TO BE MAINTAINED? NO (OFF-SITE DETOUR)

IF YES, ON EXISTING STRUCTURE? N/A

OR ON TEMPORARY BRIDGE? N/A

ONE OR TWO-WAY TRAVEL? N/A

2. TRAFFIC CONTROL SIGNALS REQUIRED? YES (AT OFF-SITE INTERSECTION)

3. ARE SIDEWALKS REQUIRED? NO

IF SO, ON WHAT SIDE? N/A

PROJECT NAME: MONTPELIER

PROJECT NUMBER: BHF 6400(31)

FILE NAME: 14506_PRELIM_INFO.XLS

PROJECT LEADER: S. SCRIBNER

DESIGNED BY: D. D'AMATO

PRELIMINARY INFORMATION SHEET

PLOT DATE: 6/26/2008

DRAWN BY: D. D'AMATO

CHECKED BY: P. HALSTEAD

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CLOUGH HARBOUR & ASSOCIATES LLP