STATE OF VERMONT
AGENCY OF TRANSPORTATION

# PRELIMINARY INFORMATION SHEET

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LIST OF STANDARDS

| | | |
|---|---|---|
| E-100 | CONSTRUCTION APPROACH SIGNS | 1/2/2004 |
| E-102 | CONSTRUCTION SIGN DETAILS | 6/30/2003 |
| E-102A | CONSTRUCTION SIGN DETAILS | 5/1/2004 |
| E-107 | DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREAS | 6/30/2003 |
| E-107A | BREAKAWAY BARRICADE DETAILS | 8/8/1995 |
| E-121 | STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD | 8/8/1995 |
| E-134 | BRIDGE NUMBER PLAQUE | 8/8/1995 |
| E-138 | MILEMARKER DETAILS - STATE & TOWN HIGHWAYS | 5/30/2003 |
| E-143 | REGULATORY SIGN DETAILS | 6/15/2004 |
| E-146 | REGULATORY SIGN DETAILS | 9/20/1995 |
| E-152 | WARNING SIGN DETAILS | 5/1/2004 |
| E-160 | FLANGED CHANNEL STEEL SIGN POST | 5/20/1999 |
| G-1 | STEEL BEAM GUARDRAIL (50MPH & OVER)<br>HEAVY DUTY STEEL BEAM GUARDRAIL<br>TWISTED END TERMINAL<br>ANCHOR FOR STEEL BEAM RAIL | 1/3/2000 |
| G-1D | STEEL BEAM GUARDRAIL (40MPH & LESS)<br>HEAVY DUTY STEEL BEAM GUARDRAIL<br>STEEL BEAM MEDIAN BARRIER<br>ANCHOR FOR STEEL BEAM RAIL | 1/3/2000 |

## FINAL HYDRAULIC REPORT

### HYDROLOGIC DATA

Date: August 2005

DRAINAGE AREA : 4.4 sq. mi.
CHARACTER OF TERRAIN : Hilly to mountainous, mostly forested with some open areas
STREAM CHARACTERISTICS : Sinuous
NATURE OF STREAMBED : Gravel, cobbles and boulders

PEAK FLOW DATA

| | | | |
|---|---|---|---|
| Q 2.33 = | 210 cfs | Q 50 = | 610 cfs |
| Q 10 = | 410 cfs | Q 100 = | 730 cfs |
| Q 25 = | 510 cfs | Q 500 = | 1020 cfs |

DATE OF FLOOD OF RECORD: unknown
ESTIMATED DISCHARGE: unknown
WATER SURFACE ELEV.: unknown
NATURAL STREAM VELOCITY: @ Q50 = 19.2 fps
ICE CONDITIONS : Moderate
DEBRIS: Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEV. RAPIDLY? Yes
IS ORDINARY RISE RAPID? Yes
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE:

WATERSHED STORAGE: 6% HEADWATERS:
UNIFORM: X
IMMEDIATELY ABOVE SITE:

### EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: 10' corrugated galvanized metal plate pipe
YEAR BUILT: 1983
CLEAR SPAN(NORMAL TO STREAM): 10'
VERTICAL CLEARANCE ABOVE STREAMBED: 10'
WATERWAY OF FULL OPENING: 78.5 sq. ft.
DISPOSITION OF STRUCTURE: Remove
TYPE OF MATERIAL UNDER SUBSTRUCTURE: Unknown

WATER SURFACE ELEVATIONS AT:

| | | | |
|---|---|---|---|
| Q2.33 = | 1509.4' | VELOCITY= | 15.3 fps |
| Q10 = | 1511.9' | " | 18.2 fps |
| Q25 = | 1512.9' | " | 19.3 fps |
| Q50 = | 1513.9' | " | 20.1 fps |
| Q100 = | 1515.1' | " | 21.0 fps |

LONG TERM STREAMBED CHANGES: The channel appears to have scoured or degraded several feet at the pipe outlet, compared to the 1981 record plans.

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: Above Q500
RELIEF ELEVATION: 1520.0'
DISCHARGE OVER ROAD @Q100: None

### UPSTREAM STRUCTURE

TOWN: Whitingham DISTANCE: 1,000'
HIGHWAY# : Vt 100 STRUCTURE #: 30
CLEAR SPAN: 16' CLEAR HEIGHT: 7'
YEAR BUILT: 2005 FULL WATERWAY: 112 sq. ft.
STRUCTURE TYPE: Precast concrete box

### DOWNSTREAM STRUCTURE

TOWN: N.A. - Harriman Reservoir 350' downstream DISTANCE:
HIGHWAY# : STRUCTURE #:
CLEAR SPAN: CLEAR HEIGHT:
YEAR BUILT: FULL WATERWAY:
STRUCTURE TYPE:

### LOAD FACTOR - LOAD RATING (TONS)

| LOADING LEVELS | TRUCK | | | | | | |
|---|---|---|---|---|---|---|---|
| | H | HS | 3S2 | 6 AXLE | 3A. STR. | 4A. STR. | 5A. SEMI |
| INVENTORY | N/A | N/A | | | | | |
| POSTED | N/A | N/A | N/A | | N/A | N/A | N/A |
| OPERATING | | N/A | N/A | N/A | N/A | N/A | |

COMMENTS:

### TRAFFIC DATA

| YEAR | ADT | DHV | %D | %T | ADTT |
|---|---|---|---|---|---|
| 2007 | 890 | 250 | 58 | 6 | 70 |
| 2027 | 1100 | 280 | 58 | 9 | 120 |

20 year ESAL for flexible pavement from 2007 to 2027 : 361,000
40 year ESAL for flexible pavement from 2007 to 2047 : 820,000
Design Speed : 50 mph

### PROPOSED STRUCTURE

STRUCTURE TYPE: Precast concrete box: Length = 154' along centerline

CLEAR SPAN(NORMAL TO STREAM): 12.0'
VERTICAL CLEARANCE ABOVE STREAMBED: 9.0'
WATERWAY OF FULL OPENING: 108 sq. ft.

WATER SURFACE ELEVATIONS AT:

| | | | |
|---|---|---|---|
| Q2.33 = | 1508.7' | VELOCITY= | 9.7 fps |
| Q10 = | 1509.6' | " | 12.5 fps |
| Q25 = | 1510.8' | " | 13.6 fps |
| Q50 = | 1511.8' | " | 14.6 fps |
| Q100 = | 1512.8' | " | 15.6 fps |

IS THE ROADWAY OVERTOPPED BELOW Q100: No
FREQUENCY: Above Q500
RELIEF ELEVATION: 1520.0'
DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 1514.0' at inlet
VERTICAL CLEARANCE: @ Q50 = 2.2'

SCOUR: N/A - Box

REQUIRED CHANNEL PROTECTION: Stone Fill, Type IV

### PERMIT INFORMATION

| | | |
|---|---|---|
| AVERAGE DAILY FLOW: | 10 cfs | DEPTH OR ELEVATION: |
| ORDINARY LOW WATER: | 5 cfs | Depth < 0.5' |
| ORDINARY HIGH WATER: | 90cfs | Depth = 2.0' |

### TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: A temporary bridge is already in place over the existing pipe. *
CLEAR SPAN (NORMAL TO STREAM):
VERTICAL CLEARANCE ABOVE STREAMBED:
WATERWAY AREA OF FULL OPENING:

### ADDITIONAL INFORMATION

* A 66" diameter pipe, with 24 sq. ft. of waterway area, is the minimum size recommended as a temporary diversion structure to carry flows through the construction site. This size pipe will carry a Q2.33 flow with 7.8' of headwater.

### DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTO HS 25
2. DESIGN SPAN
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL
   ON LEDGE
4. ALLOWABLE LOAD FOR PILING
   TYPE
   ESTIMATED LENGTH
5. STRUCTURAL STEEL AASHTO M270M/M270 GRADE
6. REINFORCNG STEEL GRADE
7. CONCRETE, HIGH PERFORMANCE CLASS A f'c:
   CONCRETE, HIGH PERFORMANCE CLASS B f'c:
8. DESIGN SOIL UNIT WEIGHT 140 pcf
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL

### TRAFFIC MAINTENANCE

1. IS TRAFFIC TO BE MAINTAINED? yes
   IF YES, ON EXISTING STRUCTURE?
   OR ON TEMPORARY BRIDGE? Temporary (see note above)
   ONE OR TWO-WAY TRAVEL? One way travel
2. TRAFFIC CONTROL SIGNALS REQUIRED? yes (currently in place)
3. ARE SIDEWALKS REQUIRED? no
   IF SO, ON WHAT SIDE?

PROJECT NAME: WHITINGHAM
PROJECT NUMBER: ST CULV(6)

FILE NAME: s96j286excel.dgn
PROJECT MANAGER: C.P.WILLIAMS
DESIGNED BY: E.L.RUSTAY
PRELIMINARY INFORMATION SHEET #1

PLOT DATE: 1/13/2006
DRAWN BY: M.FESSEL
CHECKED BY: M.GAGULIC