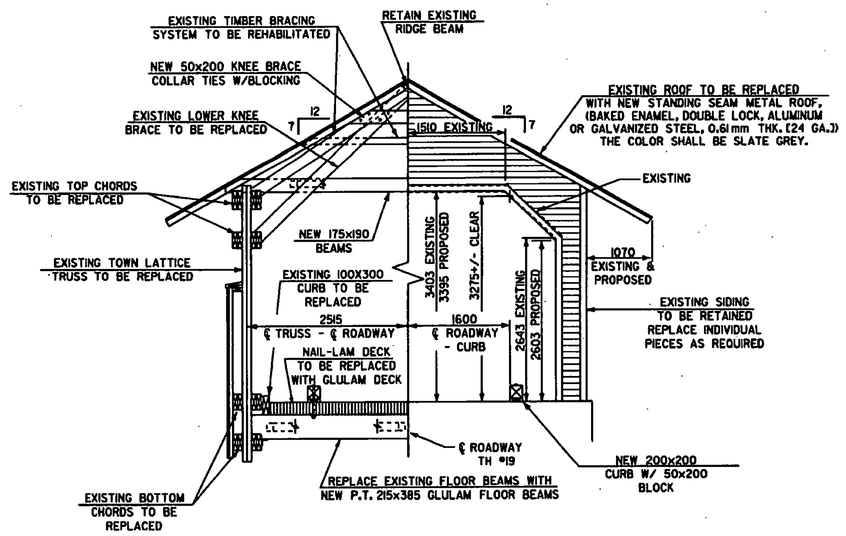


## TYPICAL BRIDGE SECTION

0 40 80 160

SCALE 1:40

**NOTES:**

1. ALL DIMENSIONS ARE IN MILLIMETERS, UNLESS OTHERWISE NOTED.
2. ALL TIMBER DIMENSIONS ARE NOMINAL.
3. ALL TIMBER IS TO BE FULL SAWN, UNLESS OTHERWISE NOTED. (FULL SAWN TIMBER IS THE SAME SIZE AS THE STATED NOMINAL SIZE.)

# FINAL HYDRAULICS REPORT

Metric

## HYDROLOGIC DATA

DRAINAGE AREA= 314.6 SQ KM
CHARACTER OF TERRAIN= HILLY AND MOUNTAINOUS
CHARACTER & TYPE OF STREAM= WELL DEFINED, MEANDERING PERENNIAL STREAM

NATURE OF STREAMBED= SILT AND SAND

| | | | |
|---|---|---|---|
| Q2.33= | 85 CMS | Q50= | 278 CMS |
| Q10= | 187 CMS | Q100= | 323 CMS |
| Q25= | 248 CMS | Q500= | 433 CMS |

DATE OF FLOOD OF RECORD= NOT AVAILABLE
WATER SURFACE ELEV.= --- ESTIMATED DISCHARGE= ---
NATURAL STREAM VELOCITY @ Q25= 1.4 MPS
ICE CONDITIONS= MINOR DEBRIS= MODERATE
DOES THE STREAM REACH MAXIMUM HIGH WATER ELEVATION RAPIDLY? YES
IS ORDINARY RISE RAPID? YES
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? YES
IF YES, DESCRIBE. PAPER MILL DAM LOCATED APPROXIMATELY 15 M DOWNSTREAM

WATERSHED STORAGE ___ HEADWATERS ___ UNIFORM THROUGHOUT WATERSHED X
1/2 IMMEDIATELY ABOVE SITE ___

## EXISTING STRUCTURE

STRUCTURE TYPE= TOWN LATTICE COVERED BRIDGE YEAR BUILT= 1840
CLEAR SPAN (NORMAL TO STREAM)= 30 M
VERTICAL CLEARANCE ABOVE STREAMBED= 4.05 M
WATERWAY OF FULL OPENING= 88.74 SQ M
DISPOSITION OF STRUCTURE= REHABILITATION

TYPE OF MATERIAL UNDER SUBSTRUCTURE= LAID UP STONE W/ CONC. CAP

| | | | |
|---|---|---|---|
| WATER SURFACE ELEV. @ Q2.33= | 170.3 M | VELOCITY= | 0.9 MPS |
| Q10= | 170.8 M | " | 1.6 MPS |
| Q25= | 171.0 M | " | 1.9 MPS |
| Q50= | 171.1 M | " | 2.1 MPS |
| Q100= | 171.2 M | " | 2.3 MPS |

LONG TERM STREAM BED CHANGES= NONE ANTICIPATED

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

UPSTREAM STRUCTURE= TOWN= BENNINGTON DISTANCE= 480 M
HIGHWAY NO.= TH. 26 (SILK ROAD) STRUCTURE NO.= 30
STRUCTURE TYPE= TOWN LATTICE COVERED BRIDGE (SILK BRIDGE)
CLEAR SPAN= 26.8 M CLEAR HEIGHT=
YEAR BUILT= 1889 FULL WATERWAY=

DOWNSTREAM STRUCTURE= TOWN= BENNINGTON DISTANCE= 1810 M
HIGHWAY NO.= TH. 8 (MURPHY ROAD) STRUCTURE NO.= 32
STRUCTURE TYPE= TOWN LATTICE COVERED BRIDGE (HENRY BRIDGE)
CLEAR SPAN= 38.1 M CLEAR HEIGHT=
YEAR BUILT= 1840 FULL WATERWAY=

## PROPOSED STRUCTURE

STRUCTURE TYPE= TOWN LATTICE COVERED BRIDGE

CLEAR SPAN (NORMAL TO STREAM)= 30 M
VERTICAL CLEARANCE ABOVE STREAMBED= 4.1 M
WATERWAY OF FULL OPENING= 85.7 M

| | | | |
|---|---|---|---|
| WATER SURFACE ELEV. @ Q2.33= | 170.3 M | VELOCITY= | 0.9 MPS |
| Q10= | 170.8 M | " | 1.6 MPS |
| Q25= | 171.0 M | " | 1.9 MPS |
| Q50= | 171.1 M | " | 2.1 MPS |
| Q100= | 171.2 M | " | 2.3 MPS |

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

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE= 170.9 M
VERTICAL CLEARANCE @ Q 50 = -0.2 M

SCOUR= CONTRACTION SCOUR AT Q100= 1.8 M
REQUIRED CHANNEL PROTECTION= NONE

## PERMIT INFORMATION

AVERAGE DAILY FLOW= 7.1 CMS
ORDINARY LOW WATER= 3.2 CMS DEPTH= 1.5 M
ORDINARY HIGH WATER= 36.5 CMS DEPTH= 2.7 M

## ADDITIONAL COMMENTS

THE WATER SURFACE ELEVATIONS LISTED FOR BOTH THE EXISTING STRUCTURE AND THE PROPOSED STRUCTURE ARE TAKEN AT THE APPROACH SECTION (18+280). THE VELOCITIES ARE TAKEN AT THE SECTION 18+250.

Metric

DESIGN CRITERIA:
1. DESIGN LIVE LOAD AASHTO M 18
2. DESIGN SPAN 38.202 M
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 N/A TENSION N/A
6. REINFORCING STEEL GRADE 420 N/A
7. CONCRETE CLASS A $f'_c$ N/A $f_c$ N/A
   CLASS B $f'_c$ N/A $f_c$ N/A

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

## TRAFFIC DATA

| YEAR | ADT | DHV | % D | % T | % ADTT |
|---|---|---|---|---|---|
| 1997 | 625 | 90 | 50 | 2 | 2 |
| 2017 | 895 | 125 | 50 | 2 | 2 |

20 year ESAL for flexible pavement from 1997 to 2017: 65,500
40 year ESAL for flexible pavement from 1997 to 2037: 225,200
Design speed: 30 Km/Hr

# STATE OF VERMONT
## AGENCY OF TRANSPORTATION

| | |
|---|---|
| Town Of BENNINGTON | Bridge No. 31 |
| Highway No. T.H. #9 (MURPHY ROAD) | Log Sta. / Surv. Sta. |

PAPER MILL COVERED BRIDGE REHABILITATION
PRELIMINARY INFORMATION SHEET

| | |
|---|---|
| Designed By S. BAKI | Drawn By K. NICHOLS |
| Checked By S. BAKI Date 1/99 | Bridge Design Supervisor P. MALACHOWSKI Date 1/99 |
| PROJECT BENNINGTON | PROJECT NO. BHZ 1441(18) |
| LG.C. Info. | |
| Bridge Sheet No. | Sheet 2 of 22 |