

HYDROLOGIC DATA

DRAINAGE AREA= 39.6 km<sup>2</sup>  
 CHARACTER OF TERRAIN: MOUNTAINOUS  
 CHARACTER & TYPE OF STREAM: PERENNIAL BUT FLASHY  
 NATURE OF STREAMBED: COBBLES AND BOULDERS  
 Q2.33= 17.4 cms Q50= 41.7 cms  
 Q10= 25.0 cms Q100= 55.2 cms  
 Q25= 37.0 cms Q500=

DATE OF FLOOD OF RECORD: UNKNOWN  
 WATER SURFACE ELEV.: ESTIMATED DISCHARGE:  
 NATURAL STREAM VELOCITY @ Q 25 = 2.4 m/s  
 ICE CONDITIONS: MODERATE DEBRIS: LOW  
 DOES THE STREAM REACH MAXIMUM HIGHWATER ELEVATION RAPIDLY? YES  
 IS ORDINARY RISE RAPID? YES  
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? NO  
 IF YES, DESCRIBE:

WATERSHED STORAGE YES HEADWATERS NO UNIFORM THROUGHOUT WATERSHED YES  
 IMMEDIATELY ABOVE SITE NO

EXISTING STRUCTURE

STRUCTURE TYPE: STEEL STRINGERS SUPPORTING CONCRETE DECK YEAR BUILT: 1940  
 CLEAR SPAN (NORMAL TO STREAM): 15 m  
 VERTICAL CLEARANCE ABOVE STREAMBED: 2.6 m  
 WATERWAY OF FULL OPENING: 39 m<sup>2</sup>  
 DISPOSITION OF STRUCTURE: SUBSTANDARD WIDTH - REMOVE EXISTING SUPERSTRUCTURE  
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: UNKNOWN

WATER SURFACE ELEV. @ Q2.33= 360.72 m VELOCITY= 2.39 m/s  
 Q10= 360.90 m " 2.73 m/s  
 Q25= 361.15 m " 2.94 m/s  
 Q50= 361.23 m " 3.02 m/s  
 Q100= 361.45 m " 3.36 m/s

LONG TERM STREAM BED CHANGES: UNKNOWN  
 IS THE ROADWAY OVERTOPPED BELOW THE Q100? NO FREQUENCY: N/A  
 RELIEF ELEVATION: N/A DISCHARGE OVER ROAD @ Q100: N/A

UPSTREAM STRUCTURE: TOWN: RIPTON DISTANCE: 4.4 km  
 HIGHWAY NO.: TH 21 STRUCTURE NO.: 11  
 STRUCTURE TYPE: CONCRETE SLAB BRIDGE  
 CLEAR SPAN: 5.5 M CLEAR HEIGHT: 3 M  
 YEAR BUILT: 1975 FULL WATERWAY:

DOWNSTREAM STRUCTURE: TOWN: RIPTON DISTANCE: 1.6 km  
 HIGHWAY NO.: VT 125 STRUCTURE NO.: 14  
 STRUCTURE TYPE: TWIN CELL REINFORCED CONCRETE BOX  
 CLEAR SPAN: 12.2 M CLEAR HEIGHT: 3.7 M  
 YEAR BUILT: 1978 FULL WATERWAY: 44.6 m<sup>2</sup>

DESIGN CRITERIA:

- DESIGN LIVE LOAD AASHTO MS 22.5
- DESIGN SPAN 17.723 METERS @ BRG TO @ BRG
- ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL N/A ON LEDGE 480 kPa ESTIMATED LENGTH N/A
- ALLOWABLE LOAD FOR PILING N/A TYPE N/A TENSION 190 MPa
- ALLOWABLE STRESS FOR STRUCTURAL STEEL AASHTO M 270M/M 270 GRADE 345W 165 MPa
- ALLOWABLE STRESS FOR REINFORCING STEEL GRADE 420 TENSION 165 MPa
- ALLOWABLE STRESS FOR CONCRETE, HIGH PERFORMANCE CLASS A f<sub>c</sub>' 30 MPa f<sub>c</sub> 12 MPa  
 HIGH PERFORMANCE CLASS B f<sub>c</sub>' 25 MPa f<sub>c</sub> 10 MPa

TRAFFIC MAINTENANCE:

- TRAFFIC WILL BE MAINTAINED ON THE EXISTING STRUCTURE DURING WIDENING OF THE UPSTREAM SIDE OF THE ABUTMENTS AND CONSTRUCTION OF THE NEW WINGWALLS.
- TRAFFIC WILL BE DETOURED VIA AN ALTERNATE ROUTE FOR A MAXIMUM OF THREE (3) WEEKS DURATION DURING REMOVAL OF THE EXISTING SUPERSTRUCTURE, CONSTRUCTION OF THE NEW BRIDGE SEAT AND PLACEMENT OF THE PREFABRICATED SUPERSTRUCTURE.
- PHASE 2 PEDESTRIAN AND EMERGENCY PERSONNEL PEDESTRIAN TRAFFIC WILL BE MAINTAINED WITH A 1.5 m WIDE x 23 m LONG PEDESTRIAN BRIDGE LOCATED UPSTREAM OF THE PROPOSED VEHICLE BRIDGE (SEE PHASE 2 TRAFFIC CONTROL PLAN FOR APPROXIMATE PEDESTRIAN BRIDGE LOCATION).

LOAD FACTOR LOAD RATING (TONS) \*

LOADING LEVELS (LOAD FACTOR)	M	MS	3S2	6 AXLE	3A.STR.	4A.STR.	5A.SEMI
INVENTORY A=2.17; B=1.00							
POSTED A=1.55; B=1.40							
OPERATING A=1.30; B=1.67							

STRENGTH RF=  $\frac{\sum M_u - 1.3 M_{DL}}{A \times M_{LL+H}}$  SERVICEABILITY RF=  $B \left[ \frac{.95 F_y S_{LL+H} - M_{DL} S_{DL}}{1.67 M_{LL+H}} - M_{DL} S_{DL} \right]$

TRAFFIC DATA

CONSTRUCTION YEAR 2010 AADT = 220 \* SEE SUPERSTRUCTURE NOTE 11 ON SHEET 16.  
 DESIGN YEAR 2030 AADT = 250  
 DESIGN YEAR 2030 DHV = 30  
 DESIGN YEAR 2030 T = 8%  
 DESIGN YEAR 2030 D = 57%  
 DESIGN YEAR 2030 V = 50 KM/H  
 2010-2030 ESAL = 41,900



PROPOSED STRUCTURE

STRUCTURE TYPE: PRECAST PRECOMPRESSED CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE

CLEAR SPAN (NORMAL TO STREAM): 15 m  
 VERTICAL CLEARANCE ABOVE STREAMBED: 2.6 m  
 WATERWAY OF FULL OPENING: 34 m<sup>2</sup>

WATER SURFACE ELEV. @ Q2.33= 360.72 m VELOCITY= 2.61 m/s  
 Q10= 360.90 m " = 2.88 m/s  
 Q25= 361.15 m " = 3.18 m/s  
 Q50= 361.23 m " = 3.27 m/s  
 Q100= 361.45 m " = 3.50 m/s

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

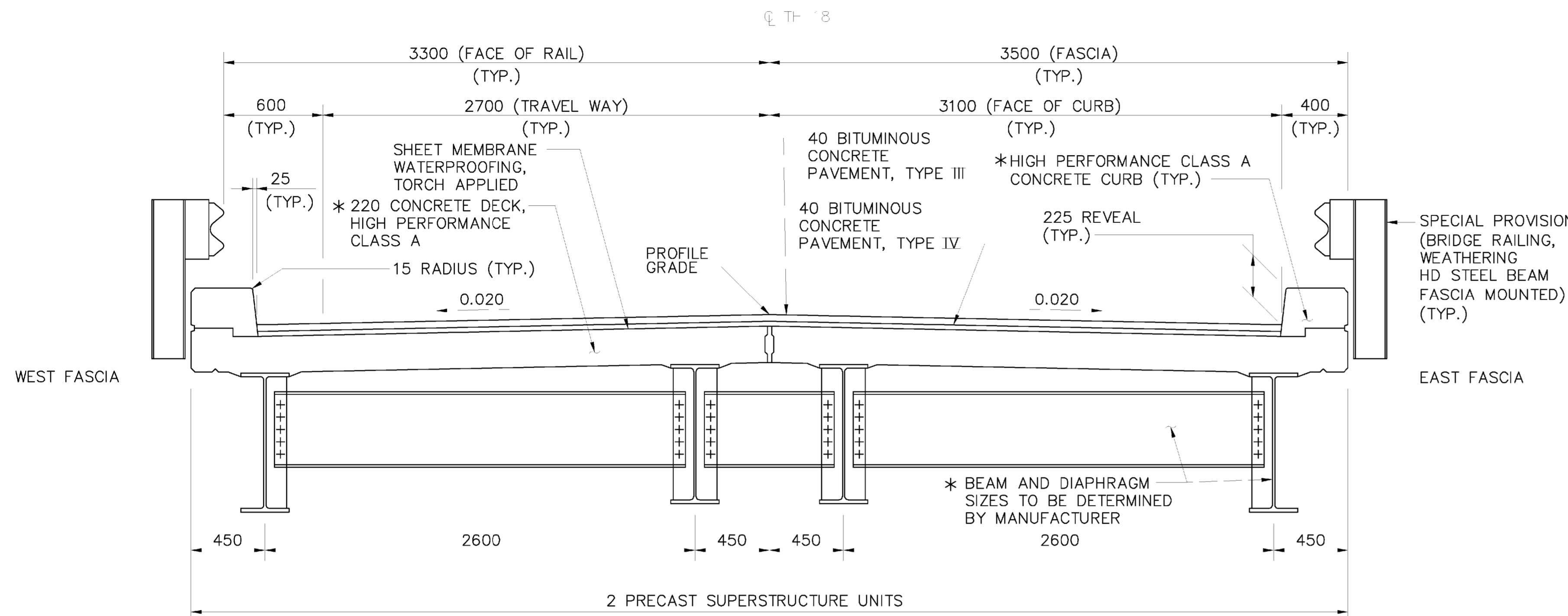
AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 363.2 m  
 VERTICAL CLEARANCE @ Q 25 = 1.3 m

SCOUR: SCOUR DEPTH NOT CALCULATED  
 REQUIRED CHANNEL PROTECTION: STONE FILL, TYPE II

PERMIT INFORMATION

AVERAGE DAILY FLOW: 10.5 cms  
 ORDINARY LOW WATER: 1.0 cms DEPTH: 0.12 m  
 ORDINARY HIGH WATER: 22.3 cms DEPTH: 0.80 m

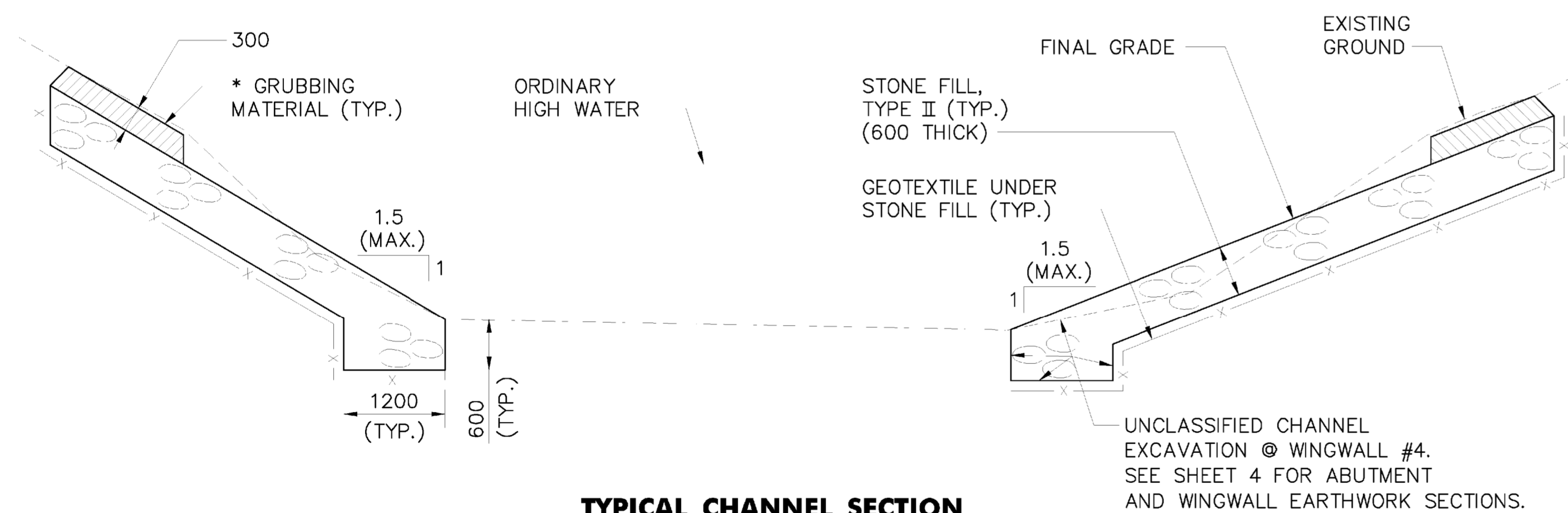
ADDITIONAL COMMENTS



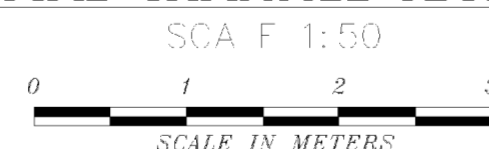
TYPICAL BRIDGE SECTION  
 (INTEGRAL BACKWALL NOT SHOWN FOR CLARITY)



\* PAYMENT INCLUDED UNDER ITEM 900.675, SPECIAL PROVISION (PRECAST PRECOMPRESSED CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE)



TYPICAL CHANNEL SECTION



\* GRUBBING MATERIAL SHALL NOT BE PLACED ON STONE FILL IN THE AREA UNDER THE BRIDGE. WHENEVER CHANNEL SLOPE INTERSECTS ROADWAY SUBBASE, GRUBBING MATERIAL SHALL BEGIN AT THE BOTTOM OF THE SUBBASE.