

PRELIMINARY INFORMATION SHEET



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LIST OF STANDARDS

- E-100M CONSTRUCTION APPROACH SIGNS
- E-101M CONSTRUCTION SIGN DETAILS
- E-102AM CONSTRUCTION SIGN DETAILS
- E-102M CONSTRUCTION SIGN DETAILS
- E-107M DELINEATION, BARRICADES AND DETOURS FOR CONSTRUCTION AREA
- E-121M STANDARD SIGN PLACEMENT - CONVENTIONAL ROAD
- G-1M STEEL BEAM GUARDRAIL (50 MPH & OVER)
- T-1M TEMPORARY EROSION CONTROL DETAILS

FINAL HYDRAULIC REPORT

HYDROLOGIC DATA Date: June 2004

DRAINAGE AREA: 33.1 sq km
 CHARACTER OF TERRAIN: Mountainous and mostly forested
 STREAM CHARACTERISTICS: Sinuous, locally braided, equiwidth, low relief
 NATURE OF STREAMBED: Sand, gravel, cobble to small boulders

PEAK FLOW DATA
 Q 2.33 = 14.0 cms Q 50 = 54.0 cms
 Q 10 = 33.0 cms Q 100 = 64.0 cms
 Q 25 = 44.0 cms Q 500 = 88.0 cms

DATE OF FLOOD OF RECORD: November 1927
 ESTIMATED DISCHARGE: Unknown
 WATER SURFACE ELEV.: Unknown
 NATURAL STREAM VELOCITY: @ Q50 = 2.7 mps*
 ICE CONDITIONS: Moderate
 DEBRIS: Moderate
 DOES THE STREAM REACH MAXIMUM HIGH-WATER ELEV. RAPIDLY? No
 IS ORDINARY RISE RAPID? Yes - to Ordinary High Water
 IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? Yes
 IF YES, DESCRIBE: Bridge 78 is in the backwater of the Wrightsville Reservoir

WATERSHED STORAGE: <1% HEADWATERS: _____
 UNIFORM: _____
 IMMEDIATELY ABOVE SITE: _____

EXISTING STRUCTURE INFORMATION

STRUCTURE TYPE: Three span steel beam bridge with concrete deck
 YEAR BUILT: 1940
 CLEAR SPAN (NORMAL TO STREAM): 36 m total
 VERTICAL CLEARANCE ABOVE STREAMBED: 12 m (Avg. Bot. beams @ 207.6m)
 WATERWAY OF FULL OPENING: 285 sq m
 DISPOSITION OF STRUCTURE: Remove and replace
 TYPE OF MATERIAL UNDER SUBSTRUCTURE: Refer to boring logs.

WATER SURFACE ELEVATIONS AT:
 Q2.33 = 201.0 m** VELOCITY = 1.2 mps*
 Q10 = 205.5 m " 1.9 mps
 Q25 = 207.6 m " 2.3 mps
 Q50 = 208.8 m " 2.7 mps
 Q100 = 208.8 m " 3.1 mps

LONG TERM STREAMBED CHANGES: Channel profiles show a scour hole through the existing bridge

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: Above Q100
 RELIEF ELEVATION: 208.9 m
 DISCHARGE OVER ROAD @Q100: None

UPSTREAM STRUCTURE

TOWN: Middlesex DISTANCE: 1.7 km
 HIGHWAY #: TH-9 STRUCTURE #: 34
 CLEAR SPAN: 13.7 m CLEAR HEIGHT: 4.2 m
 YEAR BUILT: 1974 FULL WATERWAY: Unknown
 STRUCTURE TYPE: Single span steel beam bridge with concrete deck

DOWNSTREAM STRUCTURE

TOWN: N/A - Wrightsville Reservoir DISTANCE: _____
 HIGHWAY #: _____ STRUCTURE #: _____
 CLEAR SPAN: _____ CLEAR HEIGHT: _____
 YEAR BUILT: _____ FULL WATERWAY: _____
 STRUCTURE TYPE: _____

LOAD FACTOR - LOAD RATING (METRIC TONS)

LOADING LEVELS	TRUCK						
	M	MS	3S2	6 AXLE	3A STR.	4A STR.	5A SEMI
INVENTORY	25	45					
POSTED	36	64	69		61	61	67
OPERATING		76	83	90	72	73	

COMMENTS: Strength R₁₇ = 1.3 Mpa, A = 34.1 m²

TRAFFIC DATA

YEAR	ADT	DHV	% D	% T	ADTT
2005	2800	390	66	2	80
2025	3700	520	66	1	50

20 year ESAL for feasible pavement from 2005 to 2045 : 503,000
 40 year ESAL for feasible pavement from 2005 to 2045 : 1,171,000
 Design Speed : 80 km/h

PROPOSED STRUCTURE

STRUCTURE TYPE: Single span steel beam bridge with concrete deck
 CLEAR SPAN (NORMAL TO STREAM): 42 m
 VERTICAL CLEARANCE ABOVE STREAMBED: 11 m (Avg. Bot. beams @ 207.6m)
 WATERWAY OF FULL OPENING: 315 sq m

WATER SURFACE ELEVATIONS AT:
 Q2.33 = 201.0 m** VELOCITY = 1.2 mps*
 Q10 = 205.5 m " 1.9 mps
 Q25 = 207.6 m " 2.3 mps
 Q50 = 208.8 m " 2.7 mps
 Q100 = 208.8 m " 3.0 mps

IS THE ROADWAY OVERTOPPED BELOW Q100: No
 FREQUENCY: Above Q100
 RELIEF ELEVATION: 208.8 m
 DISCHARGE OVER ROAD @Q100: None

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE: 207.6 m
 VERTICAL CLEARANCE: @ Q50 = -1.2 m**

SCOUR: 1 m of contraction scour at Q500 (used maximum velocities to compute scour)*
 REQUIRED CHANNEL PROTECTION: Type III stone fill

PERMIT INFORMATION

AVERAGE DAILY FLOW: 1.0 cms DEPTH OR ELEVATION:
 ORDINARY LOW WATER: 0.5 cms 0.2 m
 ORDINARY HIGH WATER: 6.0 cms 1.0 m

TEMPORARY BRIDGE REQUIREMENTS

STRUCTURE TYPE: Single span bridge
 CLEAR SPAN (NORMAL TO STREAM): 36 m (minimum)**
 VERTICAL CLEARANCE ABOVE STREAMBED: 205.8 m (minimum)
 WATERWAY AREA OF FULL OPENING: 285 sq. m

ADDITIONAL INFORMATION

*All velocities listed above are based on the assumption of no backwater from the reservoir.
 **All water surface elevations listed above are based on backwater from the reservoir.
 ***The temporary bridge requirements above are minimums, given the natural resources in the vicinity a longer span may be required, plans will supercede the above requirements.

DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTO HL-93
2. DESIGN SPAN 43.0 M
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL ON LEDGE N/A
4. ALLOWABLE LOAD FOR PILING TYPE HP 330 x 149 ASTM A572/A572M GR 345 ESTIMATED LENGTH
5. STRUCTURAL STEEL AASHTO M270/M270 GRADE 345W
6. REINFORCING STEEL GRADE 420
7. CONCRETE, HIGH PERFORMANCE CLASS A f_c: 30 Mpa CONCRETE, HIGH PERFORMANCE CLASS B f_c: 25 Mpa
8. DESIGN SOIL UNIT WEIGHT 22.00 kN/m³
9. DESIGN LOAD FOR SPREAD FOOTINGS ON SOIL N/A

TRAFFIC MAINTENANCE

1. IS TRAFFIC TO BE MAINTAINED? YES
- IF YES, ON EXISTING STRUCTURE? NO
- OR ON TEMPORARY BRIDGE? YES
- ONE OR TWO-WAY TRAVEL? TWO-WAY
2. TRAFFIC CONTROL SIGNALS REQUIRED? NO
3. ARE SIDEWALKS REQUIRED? NO
- IF SO, ON WHAT SIDE? N/A

PROJECT NAME: MIDDLESEX
 PROJECT NUMBER: BRF 0241(32)

FILE NAME: sa063pl.xls PLOT DATE: 04/01/2005
 PROJECT MANAGER: M. EVANS-MONGEON DRAWN BY: T. HUSK
 DESIGNED BY: S. SCRIBNER CHECKED BY: S. SCRIBNER
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