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E-107	06/30/03
E-107A	08/08/95
E-108	12/08/08
E-121	08/08/95
E-154	05/01/04
E-155	05/01/04
E-164	05/20/99
E-191	02/01/99
E-193	08/08/95
G-1b	06/01/94
SB-R6-82	01/06/95

REHABILITATED BRIDGE TYPICAL SECTION

NOT TO SCALE

✱ NEW UTILITY SUPPORT ASSEMBLIES TO MATCH LOCATION AND TYPE OF EXISTING HANGERS, IN ACCORDANCE WITH ITEM 900.620 SPECIAL PROVISION (UTILITY SUPPORT ASSEMBLY, SEWER) AND ITEM 900.620 SPECIAL PROVISION (UTILITY SUPPORT ASSEMBLY, WATER).

ASSEMBLY TO BE COOPER B-LINE ADJUSTABLE STEEL YOKE AND PIPE ROLL (PART NO. B3801, COOPER B-LINE W/ 1" DIA. ASTM A 307 THREADED ROD AND STEEL BEAM CLAMP (PART NO. B3055-R OR EQUIVALENT ASSEMBLY.

CONTACTOR SHALL TAKE NECESSARY MEASUREMENTS TO ORDER APPROPRIATE HARDWARE.

✱✱ REFER TO SPECIAL PROVISIONS.

FINAL HYDRAULICS REPORT

HYDROLOGIC DATA

DRAINAGE AREA= 946.0 square miles
CHARACTER OF TERRAIN= Hilly to mountainous drainage basin
CHARACTER & TYPE OF STREAM= Sinuous with sharp bends upstream
NATURE OF STREAMBED= Silt, sand, gravel, cobbles, and some ledge
Q2.33= 17,600 cfs — Q50= 46,900 cfs
Q10= 32,100 cfs — Q100= 54,300 cfs
Q25= 40,000 cfs — Q500= 75,000 cfs
DATE OF FLOOD OF RECORD= November 1927
WATER SURFACE ELEV.= 311.5' ESTIMATED DISCHARGE= Unknown
NATURAL STREAM VELOCITY @ Q25 = 6.0 fps
ICE CONDITIONS= Moderate to heavy DEBRIS= Moderate
DOES THE STREAM REACH MAXIMUM HIGHWATER ELEVATION RAPIDLY? No
IS ORDINARY RISE RAPID? No
IS STAGE AFFECTED BY UPSTREAM OR DOWNSTREAM CONDITIONS? No
IF YES, DESCRIBE:
WATERSHED STORAGE (.03 HEADWATERS) ____ UNIFORM THROUGHOUT WATERSHED X IMMEDIATELY ABOVE SITE ____

EXISTING STRUCTURE

STRUCTURE TYPE= Single span steel truss bridge
YEAR BUILT= 1928, rehabilitated in 1977
CLEAR SPAN (NORMAL TO STREAM)= 225' (185' effective from old abutment)
VERTICAL CLEARANCE ABOVE STREAMBED= 37' maximum
WATERWAY OF FULL OPENING= 5,200 sq. ft
DISPOSITION OF STRUCTURE= Rehabilitate
TYPE OF MATERIAL UNDER SUBSTRUCTURE= Ledge South, unknown North

WATER SURFACE ELEV. @ Q2.33= 298.0 ft — VELOCITY= 7.9 fps
Q10= 306.0 ft — " 7.0 fps
Q25= 307.3 ft — " 7.8 fps
Q50= 308.6 ft — " 8.3 fps
Q100= 309.9 ft — " 8.8 fps

LONG TERM STREAM BED CHANGES= None noted
IS THE ROADWAY OVERTOPPED BELOW THE Q100? Yes FREQUENCY= Below Q10
RELIEF ELEVATION= 303.9 ft DISCHARGE OVER ROAD @ Q100= 2115 cfs

UPSTREAM STRUCTURE= TOWN= Richmond — DISTANCE= 18,300 ft
HIGHWAY NO.= T.H.3 — STRUCTURE NO.= 10
STRUCTURE TYPE= 2 span steel girder bridge
CLEAR SPAN= 236 ft — CLEAR HEIGHT= 27.5 ft
YEAR BUILT= 2003 — FULL WATERWAY= 5,670 sq. ft

DOWNSTREAM STRUCTURE= TOWN= Richmond — DISTANCE= 13,400 ft
HIGHWAY NO.= I89 — STRUCTURE NO.= 58 S
STRUCTURE TYPE= 3 span steel girder bridge
CLEAR SPAN= 541 ft — CLEAR HEIGHT= 65 ft
YEAR BUILT= 1962 — FULL WATERWAY= 20,700 sq. ft

PROPOSED STRUCTURE

STRUCTURE TYPE= Rehabilitate existing truss bridge
CLEAR SPAN (NORMAL TO STREAM)= 225 ft (185 ft effective from old abut.)
VERTICAL CLEARANCE ABOVE STREAMBED= 37' maximum
WATERWAY OF FULL OPENING= 5,200 sq. ft

WATER SURFACE ELEV. @ Q2.33= 298.0 ft — VELOCITY= 7.9 fps
Q10= 306.0 ft — " 7.0 fps
Q25= 307.3 ft — " 7.8 fps
Q50= 308.6 ft — " 8.3 fps
Q100= 309.9 ft — " 8.8 fps

IS THE ROADWAY OVERTOPPED BELOW THE Q100? Yes FREQUENCY= Below Q10
RELIEF ELEVATION= 303.9' DISCHARGE OVER ROAD @ Q100= 2115 cfs

AVERAGE LOW ELEVATION OF SUPERSTRUCTURE= 312.0 ft
VERTICAL CLEARANCE= @ Q25 = 6.7 ft average (3.7 ft minimum)

SCOUR= Bridge is stable for scour. South abutment is on ledge. North abutment is behind and protected by an older abutment.

REQUIRED CHANNEL PROTECTION= Stone fill, Type IV as needed

PERMIT INFORMATION

AVERAGE DAILY FLOW= 2,000 cfs
ORDINARY LOW WATER= 800 cfs — DEPTH= EL. 287'
ORDINARY HIGH WATER= 7,600 cfs — DEPTH= EL. 293'

ADDITIONAL INFORMATION

All elevations are based on NAVD88 vertical datum.
Velocities listed are the average velocities for the entire section, channel and floodplain.
Velocities within the channel are higher.
Hydraulics is based on limited project survey and FIS water surface elevations.

DESIGN CRITERIA

1. DESIGN LIVE LOAD AASHTO= MS-18
2. DESIGN SPAN= 229' - 10.5"
3. ALLOWABLE LOAD FOR SPREAD FOOTINGS ON SOIL= N/A — ON LEDGE= N/A
4. ALLOWABLE LOAD FOR PILING= TYPE — ESTIMATED LENGTH=
5. STRUCTURAL STEEL AASHTO GRADE= SEE PROJECT GENERAL NOTES
6. REINFORCING STEEL GRADE 60
   CONCRETE, HIGH PERFORMANCE CLASS AA f'_c = 4000 PSI f_y=1600 psi
   CONCRETE, HIGH PERFORMANCE CLASS B f'_c = 3500 PSI f_y=1400 psi

TRAFFIC MAINTENANCE:
1. IS TRAFFIC TO BE MAINTAINED? NO — IF YES, ON EXISTING STRUCTURE= N/A — OR ON TEMPORARY BRIDGE= N/A
2. TEMPORARY BRIDGE REQUIREMENTS: ONE OR TWO WAY= N/A — TRAFFIC CONTROL SIGNALS REQUIRED= NO
   MINIMUM CLEAR SPAN (NORMAL TO STREAM) — MINIMUM CLEAR HEIGHT= N/A
   MINIMUM WATERWAY AREA=
   ARE SIDEWALKS REQUIRED? N/A — IF SO, ON WHAT SIDE? N/A
   STRUCTURE TYPE

WORKING STRESS LOAD RATING (TONS)

LOADING LEVELS (WORKING STRESS)	TRUCK: H	HS	3S2	6 AXLE	3A.STR.	4A.STR.	5A.SEMI
INVENTORY 0.55 Fy	17	30					
POSTING 0.75 Fy	26	47	42		28	35	26
OPERATING 0.75 Fy		60	54	84	36	45	34

MEMBER W8 AND W25 ARE THE CONTROLLING MEMBERS. REFER TO TRUSS ELEVATION FOR MEMBER LOCATIONS.

WORKING STRESS RF= $\frac{F_{ALLOW} - F_{DL}}{F_{LL+I}}$

TRAFFIC DATA

YEAR	AADT	DHV	% D	% T	ADTT
2009	5800	650	66	4.2	270
2029	7100	800	66	7.0	550

20 year ESAL for flexible pavement 2009 to 2029 = 1,752,000
40 year ESAL for flexible pavement 2009 to 2049 = 4,626,000
Design speed= 45 mph

Stantec

PROJECT NAME: RICHMOND
PROJECT NUMBER: BHF 0209(5)

FILE NAME: ...\drawing\z08j132_pl.dgn — PLOT DATE: 1/9/2009
PROJECT LEADER: C. WILLIAMS — DRAWN BY: J. SOTER
DESIGNED BY: T. KNIGHT — CHECKED BY: G. BOGUE
PRELIMINARY INFORMATION SHEET — SHEET 2 OF 50