SCOUR SUMMARY SHEET

BR. NO: 162/6 **WATERWAY:** PUYALLUP RIVER SCOUR CODE: 5

OWNER: WSDOT SID: 000000JD

Q100: 19,575 cfs WATER SURFACE EL: 119.00 ft.

Q500: 26,425 cfs WATER SURFACE EL: ft.

SUPERSTRUCTURE LOW POINT (PT OBSTRUCTS WATER FLOW) EL: ft.

Q WHEN HIGH WATER TOUCHES BOTTOM OF BRIDGE (IF < Q500): N/A cfs

ANGLE OF ATTACK: 0 deg THALWEG ELEVATION: 106.75 ft.

VELOCITY: V100: ft/sec V500: ft/sec

PIER NUMBER	BOTTOM OF FOUNDATION ELEVATIO	CALCULATED SCOUR ELEVAT	MONITOR (U/W, R, F)	INSPECTION FREQUENCY
2	est 80			
3	est 80			

NOTE: 1. UNDER MONITOR; U/W-UNDERWATER, R-ROUTINE, F-FATHOMETRIC
2. MONITOR AND INSPECTION FREQUENCY-FILLED OUT BY WSDOT
3. ALL ELEVATIONS SHALL BE IN FEET

MITIGATION: IN PLACE AND FUNCTIONING: N

DESC. OF MITIGATION:

COMMENTS: PILE FOUNDATION WITH OVER 20' OF PILE PENETRATION.

FREQUENCIES (FILLED OUT BY BRIDGE SCOUR ENGINEER):

TYPE OF INSPECTION	FREQUENCY(YEARS)	YEAR FREQ. ESTABLISHED
STREAM CROSS SECTION U/S RAIL		
UNDERWATER		
FATHOMETRIC		

DATE OF PHASE II ANALYSIS: 12-11-91 REPAIR (R/C) W/ DATE:

ANALYZED BY: WSDOT B/C CONCUR:

DATA FILES:

printed 7/17/97

WASHINGTON DEPARTMENT OF TRANSPORTATION

Scour Evaluation Spreadsheet

Bridge	Puyallup River	**Bridge No**	162/6	**By**					
County		**Hwy No**		**Date**					
District		**Hwy Name**		**Q (cfs)**					
Region		**M.P.**		**Storm (yr)**	100	19575	500	26425	

Contraction Scour Calculations - Live Bed

Main Chan. (Y or N)	OvBnk (Y or N)	Y2 (ft)	Y1 (ft)	Qmc2 (cfs)	Qmc1 (cfs)	Wc1 (ft)	Wc2 (ft)	K1	N2	N1	K2
		?									
		?									
		?									

Contraction Scour Calculations - Clear Water

Main Chan. (Y or N)	OvBnk (Y or N)	Y2 (ft)	Y1 (ft)	Qob2 (cfs)	D50 (ft)	Dm (ft)	Wset (ft)	
		?				?		----------->>>>>>>>>>
		?				?		----------->>>>>>>>>>
		?				?		----------->>>>>>>>>>

	Main Channel Ys (ft)	OvBnk Ys (ft)
TOTAL CONTRACTION SCOUR	0.0	0.0

Pier Scour Calculations

Pier or Bent I.D.	Main Chan (M)	Overbank (B)	a (ft)	L (ft)	K1	K2	K3	Y1 (ft)	V1 (ft)	FR		Main Channel Ys (ft)	OvBnk Ys (ft)
Pier 1		b	4.0	39.0	1.0	1.1	1.0	0.1	4.0	2.23	----------->>>		3.4
Pier 2	Main		10.5	39.0	1.0	1.1	1.0	11.0	12.3	0.65	----------->>>	19.6	
Pier 3	Main		10.5	39.0	1.0	1.1	1.0	11.0	12.3	0.65	----------->>>	19.6	
Pier 4		b	4.0	39.0	1.0	1.1	1.0	0.1	4.0	2.23	----------->>>		3.4
Pier 5										?	----------->>>		
Pier 6										?	----------->>>		
										?	----------->>>		
										?	----------->>>		
										?	----------->>>		
										?	----------->>>		
										?	----------->>>		
										?	----------->>>		
										?	----------->>>		
										?	----------->>>		
										?	----------->>>		

Notes:

Flood waters do not reach the Piers; therefore no pier scour. If the channel migrated to one of the main piers, the maximum pier scour would still leave almost 10' of pile embedment.

TOTAL SCOUR

Pier or Bent I.D.	Main (ft)	OvBnk (ft)
Pier 1		3.4
Pier 2	19.6	
Pier 3	19.6	
Pier 4		3.4
Pier 5		
Pier 6		

Normal Depth Calculation

Stream	**Puyallup River**
Bridge	**162/6**
Site	**At Bridge**
by	**hdr**
Date	**1-Feb-11**

100-yr Flood

Channel Discharge	19575 cfs	Water Surface Elevation	119.0 ft
Bed Elevation	108.5 ft	Froude Number	0.67
Channel Bottom Width	120 ft	Normal Depth	10.5 ft
Bed Slope	0.00785 ft/ft	Flow Area	1590.7 sq ft
Side Slope (h/v)	3.00000	Average Velocity	12.3 fps
Manning's N	0.04500	Critical Depth	8.3 ft

Computed Overbank Flow	378	assuming overland flow in overbank areas
Residual flow		(Q total - Q channel)
Overbank Velocity	3.2 fps	

500-yr Flood

Channel Discharge	26425 cfs	Water Surface Elevation	121.0 ft
Bed Elevation	108.5 ft	Froude Number	0.67
Channel Bottom Width	120 ft	Normal Depth	12.5 ft
Bed Slope	0.00785 ft/ft	Flow Area	1968.7 sq ft
Side Slope (h/v)	3.00000	Average Velocity	13.4 fps
Manning's N	0.04500	Critical Depth	9.9 ft

Computed Overbank Flow	1046	assuming overland flow in overbank areas
Residual flow		(Q total - Q channel)
Overbank Velocity	4.6 fps	