Structure A-428 Wisconsin River Bridge - Sauk Subdivision - Scenario 1

Work Function - Replace missing components (span 4, and pier 4) replace Pier 3 (timber pier), repair footing pier 2, and repair concrete repair east and west abutment and pier 5. Work would include sheet pile protection of existing piers as scour protection.

Benefits - Work listed would return rail loading serviceability to west channel portion of structure, at the lowest possible cost.

Detractions - Work listed will not increase the load rating of the structure as a whole. The total replacement of span 4 and piers 3 & 4 are estimated for construction costs for an e-80 rating, however, the remainder of the repairs are to components as built, therefore the repairs/replacement described in scenario 1 would result in structure capable of handling only 263,000 lb rail cars. Additionally, work would not involve channel widening to reduce stream velocity therefore railroad fill across island between east and west structures would still be vulnerable.

Scenario 1 Repair Estimate

Function	Description	Quantity	Unit Cost	Cost	Total Cost
Replace Substructure	Remove and Replace Pier 3	1	Lump Sum	\$206,950.00	\$206,950.00
Replace Substructure	Construct Pier 4	1	Lump Sum	\$165,420.00	\$165,420.00
Repair Substructure	Repair East & West Abutment	2	Lump Sum	\$67,200.00	\$134,400.00
Repair Substructure	Repair Piers 2, 3, & 5	2	Lump Sum	\$52,900.00	\$105,800.00
Replace Superstructure	Span 4, 113 Feet	113	Lineal Feet	\$3,420.00	\$386,460.00
Engineering	Design/Construction Engineering Services	1	Lump Sum	\$38,000.00	\$38,000.00
				Total	\$1,037,030.00
				Mobilization 15%	\$155,554.50

Contingency 15%

Total Estimated Cost - Scenario 1

\$155,554.50

\$1.348.139.00

Structure A-428 Wisconsin River Bridge - Sauk Subdivision - Scenario 2

Work Function - Replace entire west channel structure A-428-B with a E-80 rated deep foundation scour protected design. Benefits - Work listed will produce a durable 100 year lifespan minimal maintenance structure over the west channel.

Detractions- Work listed will not increase the load rating of the river crossing as a whole, as the structure A-428-A over the east channel will still be capable of handling only 263,000 lb rail cars. Work would not involve west channel modification to reduce stream velocity, therefore railroad fill across island between east and west structures would still be vulnerable.

Function	Description	Quantity	Unit Cost	Cost	Total Cost
Remove Existing Structure	Remove Existing Sub and Superstructure	1	Lump Sum	\$142,600.00	\$142,600.00
Construct New Structure	Construct New E-80 Structure over West Channel	445	Lineal Feet	\$8,500.00	\$3,782,500.00
	Design/Construction Engineering Services	1	Lump Sum	\$53,250.00	\$53,250.00
				Total	\$3,978,350.00
				Mobilization 15%	\$596,752.50
				Contingency 15%	\$596,752.50
			Total Estima	ted Cost - Scenario 2	\$5,171,855.00

Structure A-428 Wisconsin River Bridge - Sauk Subdivision - Scenario 3

Work Function - Replace entire east A-428-A, and west A-428-B, channel structures with a E-80 rated deep foundation scour protected design. Benefits - Work listed will produce a durable 100 year lifespan, minimal maintenance structure over both east and west channels capable of handling 315,000 lb rail cars.

Detractions - While work would comply with overall stream opening hydrology requirements, Work would not involve west channel modification to reduce stream velocity, therefore railroad fill across island between east and west structures would still be vulnerable and stream bank/bed protection as prescribed by Army Corp Of Engineers Hydraulic Modeling 1999, would require maintenance every 10 to 15 years to ensure protection of island track fill.

Function	Description	Quantity	Unit Cost	Cost	Total Cost
Remove Existing Structure	Remove Existing Sub and Superstructure both Channels	1	Lump Sum	\$174,250.00	\$174,250.00
Construct New Structure	Construct New E-80 Structure over East Channel	548	Lineal Feet	\$8,500.00	\$4,658,000.00
Construct New Structure	Construct New E-80 Structure over West Channel	445	Lineal Feet	\$8,500.00	\$3,782,500.00
Stream Bank Protection	Construct Stream Protection per A.C.O.E. Model	1	Lump Sum	\$365,000.00	\$365,000.00
	Design/Construction Engineering Services	1	Lump Sum	\$80,710.00	\$80,710.00
				Total	\$9,060,460.00
				Mobilization 15%	\$1,359,069.00
				Contingency 15%	\$1,359,069.00

Total Estimated Cost - Scenario 3

\$11,778,598.00

Structure A-428 Wisconsin River Bridge - Sauk Subdivision - Scenario 4

Work Function - Replace entire east A-428-A, and west A-428-B channel structures, and add 150 feet new structure to east end of A-428-B with a E-80 rated deep foundation scour protected design.

Benefits - Work listed will produce a durable 100 year lifespan, minimal maintenance structure over both east and west channels capable of handling 315,000 lb rail cars, and widen west channel 150', removing island track fill extension into river as prescribed by Army Corp Of Engineers Hydraulic Modeling 1999. Stream velocity would be reduced making river behave more natural through area lowering scour threat of island track fill and reducing amount of stream bed/bank protection maintenance.

Detractions - Streambed/bank protection as prescribed by A.C.O.E. would have to be maintained in functional state (approximately every 15 to 25years) to protect railroad fill across island between east and west channels.

Function	Description	Quantity	Unit Cost	Cost	Total Cost
Remove Existing Structure	Remove Existing Sub and Superstructure both Channels	1	Lump Sum	\$174,250.00	\$174,250.00
Construct New Structure	Construct New E-80 Structure over East Channel	548	Lineal Feet	\$8,500.00	\$4,658,000.00
Construct New Structure	Construct New E-80 Structure over West Channel	445	Lineal Feet	\$8,500.00	\$3,782,500.00
Construct New Structure	Construct 150' New E-80 Structure E. Side of W Channel	150	Lineal Feet	\$8,500.00	\$1,275,000.00
Remove Track Fill	Remove 150' Track Fill Extension from W. Channel	150	Lineal Feet	\$1,150.00	\$172,500.00
Stream Bank Protection	Construct Stream Protection per A.C.O.E. Model	1	Lump Sum	\$365,000.00	\$365,000.00
	Design/Construction Engineering Services	1	Lump Sum	\$92,550.00	\$92,550.00
				Total	\$10,519,800.00
				Mobilization 15%	\$1,577,970.00

Contingency 15%

Total Estimated Cost - Scenario 4

\$1,577,970.00

\$13.675.740.00

Structure A-428 Wisconsin River Bridge - Sauk Subdivision - Scenario 5

Work Function - Replace entire east A-428-A, and west A-428-B, channel structures with a E-80 deep foundation scour protected design, and replace track fill across island with a E-80 deep foundation scour protected design structure.

Benefits - Work listed will produce a durable 100 year lifespan minimal maintenance structure over both east and west channels and island capable of handling 315,000 lb rail cars. This scenario would allow river to flow/ scour at will with out affecting railroad structures, and preclude need of stream bed control structure construction and maintenance.

Detractions - Railroad fill material would have to be moved out of floodway for disposal.

Function	Description	Quantity	Unit Cost	Cost	Total Cost
Remove Existing Structure	Remove Existing Sub and Superstructure both Channels	1	Lump Sum	\$174,250.00	\$174,250.00
Construct New Structure	Construct New E-80 Structure over East Channel	548	Lineal Feet	\$8,500.00	\$4,658,000.00
Construct New Structure	Construct New E-80 Structure over West Channel	445	Lineal Feet	\$8,500.00	\$3,782,500.00
Construct New Structure	Construct New E-80 Structure Across Island	525	Lineal Feet	\$8,500.00	\$4,462,500.00
Remove Track Fill	Remove Island Track Fill from Floodway & Restore	525	Lineal Feet	\$410.00	\$215,250.00
	Design/Construction Engineering Services	1	Lump Sum	\$87,450.00	\$87,450.00
				Total	\$13,379,950.00
				Mobilization 15%	\$2,006,992.50
				Contingency 15%	\$2,006,992.50

Total Estimated Cost - Scenario 5

\$17,393,935.00

Structure A-428 Wisconsin River Bridge - Sauk Subdivision - Scenario 6

Work Function - Replace entire east A-428-A and west A-428-B channel structures with a E-80 deep foundation scour protected design, and related running line track structures in totally new alignment to the southwest.

Benefits - Work listed will produce a durable 100 year lifespan minimal maintenance structure over both east and west channels and island capable of handling 315,000 lb rail cars, and create a new track alignment to the southwest for westward extension to preclude expensive land disruption through Village of Sauk City Industrial Park.

Detractions - Railroad fill material would have to be moved out of floodway for disposal.

Function	Description	Quantity	Unit Cost	Cost	Total Cost
Remove Existing Structure	Remove Existing Sub and Superstructure both Channels	1	Lump Sum	\$174,250.00	\$174,250.00
Construct New Structure	Construct New E-80 Structure East and West Channels and Island on New Alignment	1950	Lineal Feet	\$8,500.00	\$16,575,000.00
Construct New Fill Structure	Construct New Track Fill East of East Channel on New Alignment	360	Lineal Feet	\$3,500.00	\$1,260,000.00
Remove Track Fill	Remove Island Track Fill from Floodway & Restore	840	Lineal Feet	\$610.00	\$512,400.00
	Design/Construction Engineering Services	1	Lump Sum	\$165,450.00	\$165,450.00
				Total	\$18,687,100.00
				Mobilization 15%	\$2,803,065.00
				Contingency 15%	\$2,803,065.00
			Total Estima	ted Cost - Scenario 5	\$24,293,230.00