

U. S. ARMY ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
1519 ALASKAN WAY SOUTH
SEATTLE 4, WASHINGTON

ADDRESS REPLY TO
DISTRICT ENGINEER
(NOT TO INDIVIDUALS)

REFER TO: WPSIN-PR-R

SUBJECT: Protection of South Skagit Highway

31 DEC 1962

TO: Division Engineer
U. S. Army Engineer Division, North Pacific

1. By letter dated 29 November 1962, the County Engineer of Skagit County, Washington, requested Corps of Engineers' assistance in repairing a primary county road damaged by flood flows of the Skagit River. The damaged highway follows the left bank of Skagit River between Burlington and Concrete. The highway has two 11-foot black-top traffic lanes, 6-foot shoulders and carries an average of 445 vehicles per day. It provides the only access to a large agricultural area on the south side of the Skagit River.

2. A 1000-foot reach of the road embankment adjacent to an old slough was severely damaged by the November 1962 high water. The riverward toe and nearly all of the shoulder of the roadway embankment sloughed into the slough leaving but one usable traffic lane. The damage was caused by the deepening and widening of the old slough and was augmented by a temporary bridge recently constructed by a logging contractor. A debris jam collected on the upstream side of the temporary bridge causing eddies and diversion of the flow to the left bank. Prior to the flood, the roadway embankment was in good condition and had been riprapped at various locations, including the reaches just upstream and downstream from the damaged section. There is no previous Corps of Engineers work at or near the erosion area.

3. Protection of the eroded area requires a 24-inch blanket of riprap extending a linear distance of 1000 feet and carried to the top of the roadway embankment which is below the extreme flood profile. Experience by Skagit County and this office has proved that a riprap thickness of 24 inches is required to resist the battering of the heavy drift load carried by Skagit River. The cost of providing the necessary protection is estimated as follows:

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FEDERAL COSTS

1. Riprap (Loading, hauling and placing)	13,000 Tons @ \$2.50 =	\$32,500
2. Bedding	3,400 C.Y. @ 2.00 =	6,800
3. Gravelly fill	6,800 C.Y. @ 2.00 =	13,600
4. Excavation (Sloping bank)	6,600 C.Y. @ 0.75 =	4,950
+ 25% Contingencies		\$14,050
+ 15% Engineering		10,200
+ 10% SIOH		7,200
Total		\$90,000
Less work and Cash Contribution		40,000
Net Federal Cost		\$50,000

LOCAL COSTS

1. Riprap (Royalty and shooting)	13,000 Tons @ \$.70 =	9,100
2. Bedding (Royalty only)	3,400 C.Y. @ .10 =	340
3. Gravelly Fill (Royalty only)	6,500 C.Y. @ .10 =	650
4. Rights-of-Way 3 Acres @ \$300		900
5. Engineering and Legal		1,010
6. Work and Cash Contribution		40,000
Total Local Cost		\$52,000
Grand Total		\$102,000

4. Consideration has been given to relocating the highway, as an alternative to protecting it on its present alignment; or closing the old slough by construction of a training levee to divert the flow into the main channel. A high rock bluff landward from the highway precludes any relocation away from the river, except at exorbitant cost. Diversion of the flow into the main channel would require training works involving several times the amount of rock required to riprap the 1000-foot stretch of highway.


5. The benefits would be general in nature and would accrue to Skagit County, logging interests, a large group of farmers living on the south side of the river and the general public. The benefits are not susceptible of being evaluated in monetary terms, but the importance of maintaining the highway for use by County, State and Federal officials and the general public appears well justified economically. Protection of the road appears eligible under the provisions of Section 14 of the 1946 Flood Control Act.

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6. Skagit County Commissioners have agreed to furnish the usual a.b.c. items of local cooperation and to assume responsibility for all costs in excess of \$50,000, the Federal limitation. The contribution will be a combination of work and cash as shown in paragraph 3. In view of the foregoing, it is recommended that funds and work allowance for \$50,000 be provided under authority of Section 14 of the 1946 Flood Control Act contingent on furnishing by Skagit County, Washington the usual a.b.c. items of local cooperation, and work and cash in excess of the Federal limitation.

7. Skagit County has been classed as an area of substantial and persistent unemployment. It is therefore desirable that so much as possible of the labor requirements for the project be obtained from within the county. Although the assurances of local cooperation given by the county provide for payment of all project costs in excess of \$50,000, county officials have requested informally that consideration be given to accepting such payment in the form of labor and equipment rental, thus utilizing county resources that might otherwise not be fully employed at this time of year. In view of that request, and of the need to effect the repairs as expeditiously as possible to prevent loss of the road during the present high water season, it is recommended that the work be accomplished by Government-supervised rental plant, and that we be authorized to rent equipment from Skagit County to the maximum extent practicable at rates not above going rental and labor rates in the area.


ERNEST L. PERRY
Colonel, Corps of Engineers
District Engineer

1 Incl (in trip)
Dwg E-6-6-173