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# *ADHESIVE ENGINEERING*

1411 INDUSTRIAL ROAD · SAN CARLOS, CALIFORNIA · LYtelli 1-2686

July 14, 1961

## A FLOATING BRIDGE IS "GLUED" TOGETHER

The Hood Canal Floating Bridge, which spans a treacherous channel between the Kitsap Peninsula and Jefferson County in western Washington state, is moving step by step toward completion because of ingenious reconstruction methods and a special epoxy adhesive.

Trouble first beset the original structure in December of 1958 when heavy storms and howling winds caused extensive damage during the critical construction period. This was further aggravated by subsequent storms in January and February of 1959.

Yuba Erectors, a division of Yuba Consolidated Industries, Inc., San Francisco, is the firm in charge of reconstruction, which is due to be completed by early fall. The total cost of the bridge will be slightly under 20 million dollars when finished.

The concrete pontoons, 360 ft. long, support an elevated roadway which is 20 ft. above the water to eliminate salt spray and wave splash. Reconstruction calls for these pontoons to be held in place by a series of post-tensioning cables, each which will be tensioned to a force of 154 tons, more than triple the strength of the bridge. In addition, the joints are held together with high-tensile bolts. The joint, then, which is 50 ft. wide by 14 ft. high and has a gap of approximately  $1\frac{1}{2}$  inches, is filled with a specially formulated, extremely high strength epoxy adhesive, manufactured by Adhesive Engineering, San Carlos, California.

Called Concresive #17, the two component epoxy mix is blended with coarse, dry sand, making a flowable grout. This is poured into the pre-heated joint

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FLOATING BRIDGE #2

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and is held in place, prior to setting up, by a rubber gasket, which is also bonded in place with Concresive #17.

Charles S. Nichols, engineer of toll facilities for the State Toll Bridge Authority, said tests have shown that there will be a break elsewhere before the Concresive gives way. He also stated that the adhesive application is one of the largest of its type on record. It is estimated that over 8000 gallons of Concresive #17 will be used.

The bridge is about 7500 ft. long and about 6700 ft. of this is floating. To cope with tides up to 17 ft. and strong currents, there are fixed roller connections at the anchorages as well as a transition span. There is an anchorage on each side of each pontoon and each consists of a 550 ton concrete box seated at a maximum depth of 320 ft.. The maximum depth of the channel is 340 ft.

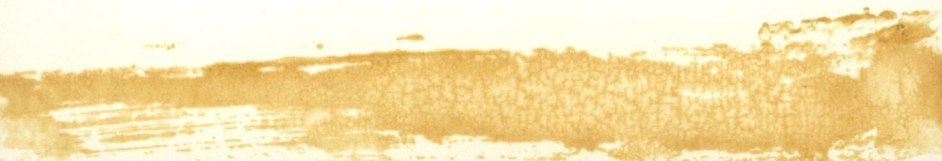
A feature of the unusual bridge is a 600 ft. draw span near the middle to provide for passage of large ships. The draw span operates by withdrawing two of the pontoons horizontally between parallel guide pontoons.

The Hood Canal Bridge will replace the Lofall-South Point ferry by forming a connection between Highways 21 and 101 through 9E leading to the northern part of the Olympic Peninsula.





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A two pontoon section of the Hood Canal Bridge is eased into position. Made of reinforced concrete, each pontoon is 360 ft. long and the entire floating span covers about  $1\frac{1}{2}$  miles. Pontoon ends are bonded together with Concresive, an extremely high strength epoxy adhesive.

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Adhesive Engineering