Estimate Request 12031 Kansas City, Kansas - Drexel - Removal of Cables from 12th Street Bridge over the Kansas River during its Reconstruction.

Est 5049

OUTLINE OF PLAN

This estimate provides for the temporary removal of cables serving the Argentine section from the 12th Street Bridge over the Kansas River during its reconstruction.

On April 17, 1945 one of the bridge piers collapsed during a period of high water and turned over, throwing the adjacent spans of the steel structure into the river. Two cables, a 909 pair 22 gauge cable and a 707 pair composite cable, 202 pair 19 gauge and 505 pair 22 gauge, were attached to the under side of the steel structure on messenger strands.

The falling of the bridge tore down two sections, 400 feet of each cable, and did some damage to adjacent sections of the cables which could be repaired. To replace the missing 400 feet of each cable, messenger strands were placed across the gap and three pieces of cable, one 606 and two 505 pairs, were used to make the original 1600 pairs good.

The collapse of the bridge was reported to have been due to the piers being built originally on piling and not carried down to bed rock. The high water is thought to have undermined the piles and allowed the pier to topple over.

The County has decided to replace the missing sections of the bridge. The pier that collapsed will be replaced with a new one to be carried down to bed rock. During high water the next pier north is subject to wash and they propose to replace it with a new one, also carried down to bed rock. The third pier north is not subject to wash during high water since the river bed has filled in to a large extent with silt and the water is only a few feet deep at flood stage. It is not planned to do anything with this pier.

The replacing of the second pier necessitates the removal of our cables since the sag of the cables will interfere with the erection of the new steel as well as the danger of damage to the cables while the new piers are being constructed.

It is impracticable to span the river from the north dike to the south bank of the river at the railroad bracks, a distance of about 870 feet with long span construction for two maximum size cables.

It is believed that the bridge when reconstructed will be perfectly safe and the problem then becomes one of temporary removal from the bridge during reconstruction or permanent removal at this time. Permanent removal at this time involves the placing of submarine cables at the required depth of the War Department, 15 feet below low water mark or 7 feet

below the bed of the river. It would also be necessary to carry this level under the north dike which would necessitate a deep excavation through the piled up silt. On the south bank it would be necessary to tunnel under the railroad tracks and up the south bank above these tracks to the level of the street. When the Municipal Water Department placed a water main under the river in 1942, hard-pan was encountered just below the silt in the river bed and the cost of cutting through this was enormous.

Before rejecting the submarine plan we consulted a contracting firm who have had considerable experience in laying submarine cables for the American Telephone & Telegraph Company at Rock Island, Illinois and pipe line crossings under streams. After considerable study they submitted a proposal for $74,317.00. A copy of this proposal is attached.

We also secured the opinion of the contractor who is installing the submarine cables for us on the Topeka-Salina-Wichita Inter-city cables. After viewing the site and without making a detailed study he stated it would cost approximately $65,000. for the submarine part of the job exclusive of the cost of pipes and materials included in the other proposal. We feel that both estimates are fairly close on this basis.

The cables can be removed temporarily from the bridge and returned in a permanent manner after its reconstruction for a considerably lesser amount. The proposed plan for the temporary removal is as follows: Submarine light wire armored cables will be placed from the manhole at the north dike down the face of dike and behind the stone riprap until the level of ground or silt at the north dike is reached. Then the cables will be buried in a trench about three feet deep extending west to a point about 150 feet west of the bridge. From this point the trench will be dug south paralleling the bridge until the water's edge is reached. At normal stages there is a bank about five feet high at the north side of water and it will be necessary to slope the trench down below the level of the water as the trench approaches the water.

Due to the debris in the river below the piers the width of the water at normal depth is about 400 feet and in line with the second pier to be replaced. After the cables enter the water they will be laid in a long curve upstream an additional 50 feet to secure sufficient slack to enable the cables to seat themselves in the silt in the river bed. At the south bank the cables will be brought up out of the water at a point in line with the trench on the north bank and between two jetties that have been built out into the river to protect the south bank. As the slope of the bank is quite steep from the water's edge to the level of the railroad tracks the cables will be cut back into the bank to secure protection.

The submarine cables will end at the railroad track level and each cable will be in two pieces. In crossing the river the longer section about 835 feet will be loaded on a barge and will be sufficient to reach from the railroad tracks to a point about 330 feet north of the water. A shorter section of 375 feet will extend from this splice to the manhole in the north dike. It seems advisable to handle each cable in two sections on account of the weight and the soft ground on the north side of the water. Also the splice being made such a distance from the water would be anchored by the weight of the earth in the trench between the splice and the water.

Since this installation will be only for the period of bridge reconstruction, permission can be obtained from the War Department to deviate from their depth requirements for permanent installation. As the bridge will not be completed before next summer it will be necessary for these cables to pass through the high water season of 1946. However the armour protection and the probability the cables will bury themselves in the bed of the river insures continuity of service.

The submarine cables will terminate at the railroad track level and will be spliced to plain lead cables placed in pipes buried in the ground north of the railroad tracks. These pipes will be placed only a foot below the surface to avoid cutting into the railroad embankment. They would be placed on the surface of the ground but would be a hazard to the railroad workmen walking along the track.

These pipes will extend east 150 feet to the concrete pier supporting the bridge approach over the tracks where they will turn up the pier to meet the cables in the pipes in the bridge. When the bridge was rebuilt in 1942 after the fire, four pipes were placed in the girders from this pier to the manhole on Metropolitan Avenue.

Arrangements have been made with the engineers designing the two new spans for leaving corresponding holes in the new girders and it is proposed to place pipes through these holes from this pier to the manhole at the north dike. Manhole cages for splicing are proposed at this pier and at the 3rd pier north making a section length of about 500 feet. This arrangement will eliminate the hazard to the workmen maintaining the cables from messenger strands high above the water or ground.

It is proposed that 909 pair 22 gauge cables be used on this estimate to avoid the delay in securing a composite cable. The substitution of 22 gauge for the 202 pairs of 19 gauge in the original cable will not affect seriously the transmission or signalling on the longer loops in these cables and will make additional pairs available in the Argentine section to Held Applications if they should be required.

A comparison of the cost of permanent submarine cables and the plan as proposed on this estimate is as follows:

Permanent Submarine Plan

Contractor's estimate		$74,317.
Cable - Submarine		8,700.
Cable - Lead		3,000.
	Total	$86,017.

Permanent Bridge Plan

Removal temporarily (This Est.Req.)		$16,760.
Pipes in bridge structure		7,830.
Cable on bridge		7,500.
	Total	$32,090.

This work is not included in the 1945 Provisional Estimate but will be charged to Division Project 11.3.