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LIFTING BEAMS FOR TWO CRANE LIFTS

Many years ago, I designed a lifting beam for making a two-crane lift, where the load was transferred from one crane to the other. It was 10' long and had one lug on top at each end and one lug at the center on the bottom. See the straight beam in the attached sketch. I designed all lugs for 30 tons. The project scope of work was to set 60 ton girders across a 125' wide canal that always had water in it. As it was divided highway, there were 10 girders for each bridge.

The plan for setting the girders for each highway was to set a 165-ton American truck crane configured with 140' boom on each abutment and back the lowboys and dollies with the pre-stressed girders in the median next to the cranes. The crane next to the dolly would be hooked to one top lug on the lifting beam with a 30' sling. There would be a 10' sling hanging from the lug on the bottom at the center and another 30' sling hanging from the other lug on the top. The lifting beam would be hanging at the angle shown in the sketch.

The crane would swing over the side and the 10' sling would be hooked to the dolly end of the girder. The girder would be hoisted off the dolly and as the lowboy was backing up, the crane would slowly swing that end of the girder out over the canal. When the crane ran out of capacity, which was about 10' before it reached the center of the canal, riggers in a motorboat would hook up the other 30' sling to the hook on the crane on the far side of the canal. The hook on the far crane would then be hoisted until it was carrying its share of the load and the lifting beam was level. The two cranes would then boom up/down and hoist up/down as necessary to move the end of the girder past the center of the canal until the far crane had the capacity to handle the one end of the girder by itself. The hook on the near crane would then be lowered until the riggers in the boat could unhook the 30' sling. The near crane would then hoist until its hook was clear and would then swing around over the side and be hooked up to the end of the girder on the lowboy. After hoisting the lowboy end of the girder, both cranes would swing, boom up/down and hoist up/down as required to set the girder in place on the abutments.

The far crane would then be unhooked from that girder and would be swung around and the lifting beam would be connected to the dolly end of the next girder that was already staged on its side of the canal. It would then become the near crane and the process would be repeated in the setting of each girder. By having a haul road down in the

median on both sides of the canal, the girders for both roadways could be stage there for maximum efficiency.

A few years later, a good friend of mine showed me a beam he designed for lifting with two cranes. The design and fabrication was a little more complex than my beam, but it would have worked just as well. See the triangular beam in the attached sketch. Note that during operation, all of its members would be in either tension or compression, no bending like mine. It just goes to show you that there are more than one way to skin a cat.

