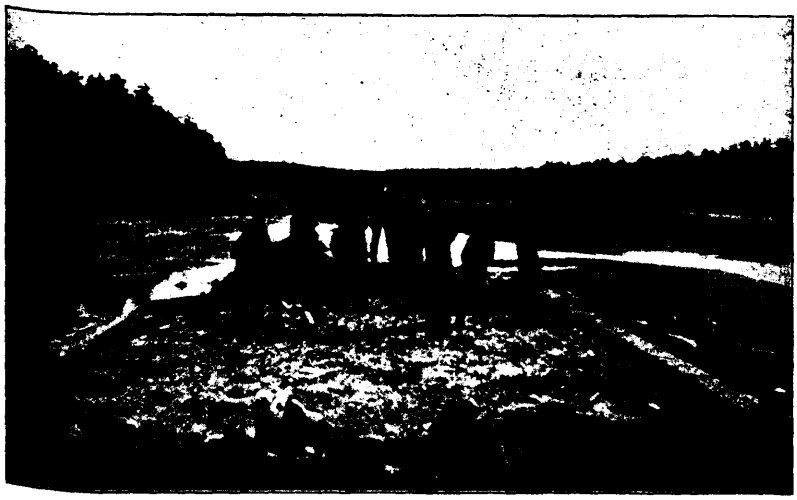

FIGURE 3.—PIER 6, TEMPORARY ROOF REMOVED.

found it was better to keep the concrete close up to our cribbing, thus preventing the scouring action of the water falling over the top of the crib. By watching the changes of the current in the river, I was enabled to so place my direct cables as to hold this caisson that had once got away from me. It certainly was a very trying and anxious time. The men who stood by me through the placing and sinking of those caissons did their full duty, and I assure you it was a very nerve-trying position. The plan adopted by me to locate those caissons was, first, to take the caisson down from the building yard to the mouth of the five-mile river, which was about 300 yards above the centre line of the bridge. In order to do this, we had to start at certain periods on the tide, there being so many changes of the current in this river. The distance from the building yard to the bridge site was only a mile, but there were so many swirls and eddies we had to keep lines on shore the whole distance and check up on the cable at the lower end. Another strange feature of those tides is, that the body of water would be falling and still a very strong current on the surface running up; and at a certain time of each tide, without any notice, the whole river would be running out with apparently irresistible force, and if not prepared for this you would move down stream with it. We were taught more than one lesson this way. There is absolutely not over 30 minutes on the top of high water when you can handle any floating stock at the site of the Shubenacadie bridge. I saw this upon my first visit to the bridge site, and concluded to use a cableway across the river, the distance being about 1,400 ft. I put up two towers. The one on the west side was built on the marsh bank, and was about 85 ft. above low water, while the one on the east side was built on the bluff, and was about the same height above the water, though the tower being on higher ground was shorter in the posts. Those towers were very strongly built. I also took the precaution of putting some wire guys to the heads of the towers. We did this to guard against the wind strain which came up with the flood tide, sometimes with considerable force. We used a 2½-in. diameter cable with the ordinary working steel wire ropes. The main cable was anchored back in the ground, the end on the west side being held in marsh mud. With this we had to be very careful, and to overcome any possible chance of its giving way, we used as an anchor four very large hemlock logs buried in a deep trench, the front of the trench being planked up with 3-in. plank. The main sheave for passing the main cable through was securely lashed to those four logs with ⅞-in. flexible steel wire rope, each part being brought to a proper bearing, and giving each part its share of the load. We loaded the surface of the ground with field stone. This cable never moved or gave me any trouble, and we have handled between tides as high as 116 buckets of concrete, each bucket containing 32 cubic feet.

The machinery never gave me any trouble further than the ordinary wear and tear of machinery driven under such hard work as this was. I cannot speak too highly of the cable system. I would not say this work could not have been done in any other way, but I would not like to try any other way known to me. We had quite a time getting the main cable over, as the ever-present tide came on us when we were about two-thirds way across; but we completed our task without accident. We also experienced great difficulty in getting our supplies for the work. The stone for concrete was quite a problem. We used large quantities of small boulders which had been washed down the river, and we also found a vein of about 5 ft. of quartzite on the river bank, which we quarried when the tide would allow. You see the tide enters into all our arrangements.

The cement selected by the Dominion Government engineer was manufactured in England and shipped to Halifax by steamer, and from Halifax to Stewiacke siding by rail, unloaded again and taken down to the bridge site in small scows, the distance being about 12 miles.

The sand-bars are so numerous and change so often one cannot take up a boat with more than 2 ft. draft, and this has to be handled with sweep oars and only make from three to four trips per week, up on one tide and down on the next, if you are not nipped or caught. You see the tide is omnipresent. The sand for our concrete was another problem for the same reason. We had to go 50 miles to Five Island Point to get a good and acceptable sand; and this we had to get in schooners, as it is sometimes very rough on the bay. The gravel which entered into the concrete largely had to be boated on the tide from De Bert beach, about 16 miles down the bay, and only small barges could go after this on account of sand-bars. We had a small tug we sent several times, but we generally had complaints from the captain about the risk. Our coal was quite an item, as this had to be brought either from Passboro or over the Intercolonial Ry. to Stewiacke, and then barged down to the bridge site. It was a common occurrence to see the barge with coal or cement pass the site, going down stream, the tide being so strong it could not make a landing. Even the water for the boilers had to be boated to the site, about 2 miles, in barges, and only one trip could be made with each barge on a tide. We had to stop sinking the caissons on more than one occasion on account of lack of fresh water for the boilers.

We moored the caissons with not less than six steel wire cables on each, those being not shorter than from 600 to 1,000 ft. each, and fastened to either large anchor cribs filled with rock on a sand-bar, or to anchor bolts put into the rock in the river bed. The cables were fastened with clips to those and attached to the caisson by a specially devised mooring gear. After the caisson had been properly weighted with concrete we would put our machinery barge alongside, mooring it in a similar manner. We would take our water barge alongside the machinery barge and pump the water out as rapidly as possible. We lost all of the barge load of fresh water on several occasions by the tide breaking in over the water scow. We tried on one occasion to bring coal off on a barge and use it from this barge, but the incoming tide settled this point by standing the barge on end, dumping the coal, then fouling the moorings and breaking the barge into two parts. After this I ran all the coal out by the cable way, which added much more work to our already hard worked cable.

Machinery, derricks and barges were built by us as strong as wood and iron could make them, knowing as I did the rough usage they would have to encounter. In the barges I used hardwood frames and spruce sides, strongly trussing them throughout; they were 80 ft. long and 22 ft. wide, and 7½ ft. deep, with a good flare at each end. The mooring timbers were very strong, of 14 by 14 in. hardwood, and with a very heavy warping chock on each end. All of which

FIGURE 4.—PIER 1 AND WORKING ON PIER 2 FOR DRAW SPAN.