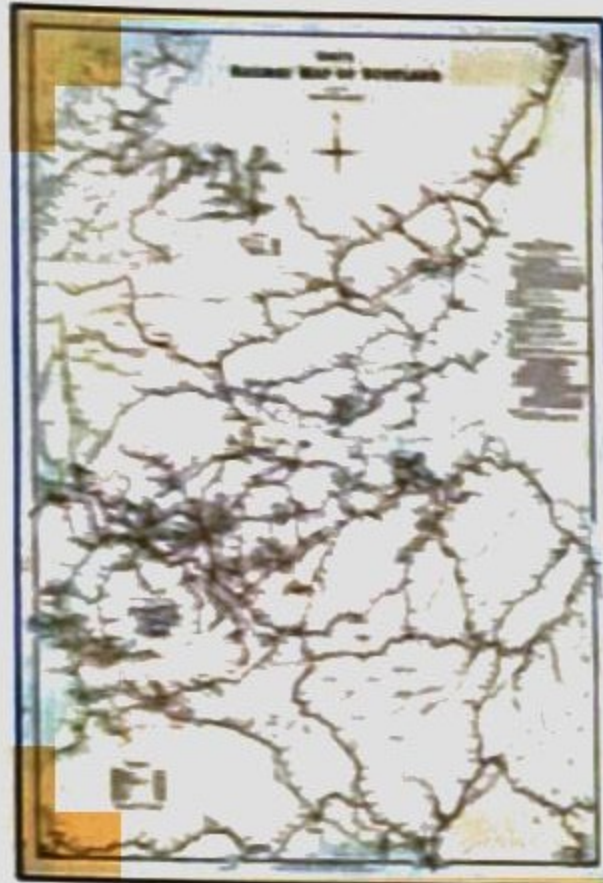


# Thomas Bouch - Blackness to Charlestown Railway Bridge, 1865

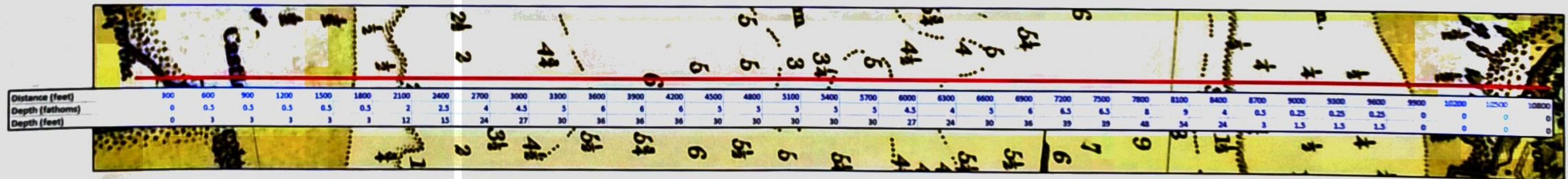
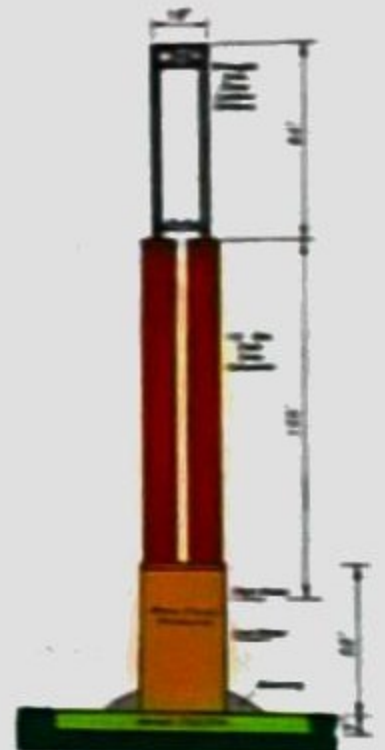
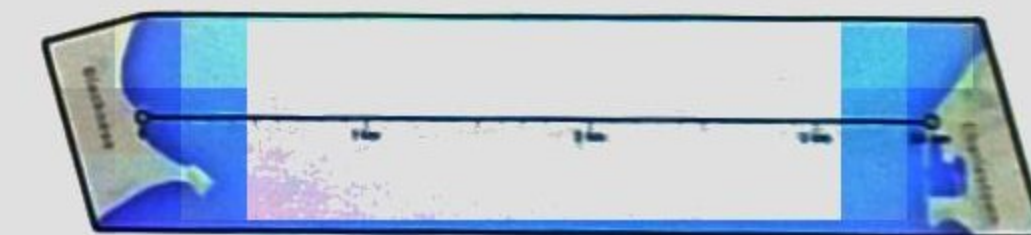
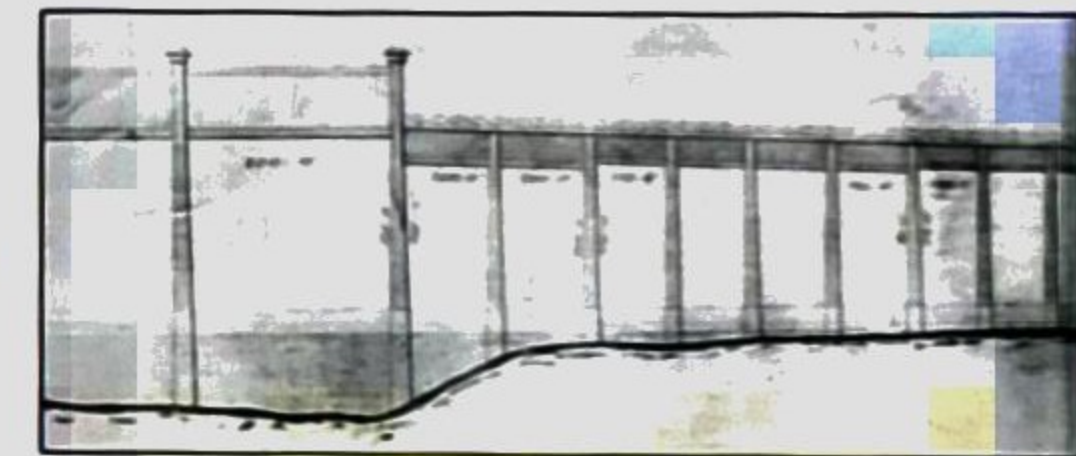


This extract from John Airey's Railway Map of Scotland shows the extent of the barrier to communications presented by the long, wide, estuary of the River Forth - the Firth of Forth. Passengers and goods travelling north from Edinburgh had to loop round by Stirling or cross by ferry, on the traditional Queensferry Passage or on Thomas Bouch's new (1850) Burntisland to Cramond "floating railway." These were slow and inconvenient; a railway bridge across the Forth would much better.

The site of the current bridges at Queensferry was deemed too difficult in the 1850's, so Thomas Bouch - Engineer of the North British, and Edinburgh and Glasgow railways looked for an alternative route across the Forth, that could be tackled using existing technology. He chose Blackness to Charlestown. It would halve the distance, and the river bed is relatively shallow, (as shown on this 1860 Admiralty chart - depths in fathoms.)



There are no detailed drawings of the complete plan, but there is enough information from two sources, to be able to create a good approximation to the complete plan. "100 years of the Forth Bridge" edited by Roland Paxton, cites two references. One is a sketch of the bridge from 1865, held by the Elgin Estates, the other is a cross section of the bridge from the Dundee Advertiser in 1881. The cross section has masonry piers standing on timber "raft" foundations, supporting cast iron pillars, topped with wrought-iron girders. The sketch shows a tall spindly affair, with masonry towers, supporting lattice-work girders. Paxton's text says the final design was a 3887 yard (11,661 feet) viaduct, with spans which rose to a clearance of 125 feet in the main navigation channel. There were 62 spans in total. From south to north these were: 14 spans of 100ft; 6 of 150 ft; 6 of 175 ft, 15 of 200 ft, 4 of 500 feet, 2 of 200 ft; 4 of 175ft; and 7 of 100ft. The Elgin sketch shows a section of the north end of the bridge, and gives heights for several of the spans. However a closer look reveals that this sketch is not to scale. The horizontal axis is compressed by about a factor of 4. Using a combination of the admiralty chart to determine river depth, and the Elgin sketch plus the Dundee Advertiser cross section, we can construct a more plausible representation. 3887 yards = 3.554 km, which is the length of the possible track as shown on this modern map. (There is some inconsistency in the accounts because the sum of the various spans gives a total of 10,750 feet or 3583 yards.) Drawing the same line across the Admiralty chart gives a river-bed profile.



So here is what the complete bridge might have looked like. It would have been the longest railway bridge in the world when completed, and of course it bears more than a passing resemblance to the original Tay Railway bridge, which failed catastrophically in the high winds of a winter storm. Bouch prepared a trial foundation platform which was floated into position off Charlestown in 1866. The railway company then abandoned the project. A sound decision with hindsight, as this bridge was under-engineered by a factor of three against wind-loading!

