YORK
BRIDGE CONCEPTS
The Professional Bridge Company

Deck-Level Construction of Timber Bridges through Wetlands

General outline for the method and system of constructing a timber boardwalk without driving construction vehicles in wetlands

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Preparations / Setup

The only major aspect of preparing to build from deck level, verses ground level, has to do with the deployment of materials. All lumber is staged at the end of the bridge, and accessed as the backhoe travels back and forth on the bridge. No equipment or materials will be deployed within the limits of the wetlands.

Layout and Staking

As with any bridge, the workmen will layout the centerline of the bridge by using stakes and string to determine the flow and location of the structure. The workmen will need access to the wetlands floor for this. The construction vehicles do not enter the wetlands for this process.

Abutment

The abutment is generally located a minimum of five feet behind the wetlands limit. This will help to assure that any digging, or ground disturbance will not occur in the wetlands. A small trench is dug to allow the bottom of the abutment to be located underground. Once the wall is constructed, fill is placed in front of the wall. The backside of the wall is then backfilled, which allows the backhoe to get onto the bridge deck without causing damage to the bridge end.

First Section

Once the abutment is constructed, the boom of the backhoe reaches out, carrying a piling to its approximate location (10' from the abutment). A crewman guides the piling to its correct location and alignment, while the backhoe operator uses the machine to vibrate the piling into the ground to the required depth and refusal. Once the first two pilings are installed, undersupports and stringers are framed in and decking is installed. At this point, the structure just completed will support the weight of a backhoe. (NOTE: Only qualified personnel should attempt to drive a backhoe on top of a timber structure like this.)

Build as you go

With the first section serving as a platform for the backhoe to drive on, the next section of bridge can be constructed in the same way. This method will allow the bridge to be constructed over almost any obstacle, or deck elevation. The timeframe in which the bridge is constructed will increase, due to the slower pace cause by this method and the back and forth the backhoe will have to travel to obtain the lumber. Note: the longer (or higher) a bridge is, the longer it will take to construct.

Scaffolding

If the bridge being constructed is more than six feet off of the ground, or being constructed over water, temporary scaffolding may be added to give the crewmen a platform to work from.

Foot Traffic

The primary concern is usually to keep construction vehicles from driving in the wetlands. In most cases this will be due to the rutting and destruction of vegetation that the vehicles can cause. The crewmen do not cause anywhere near the same amount of damage, although they will restrict themselves to a six foot area immediately adjacent to the structure.

Underground obstacles

Deck level construction relies on the same conditions as building from the ground. If obstructions, such as rock, prevent the pilings being driven with standard methods, there are several methods for resolution.

- Concrete Footers – To even consider this method, you must be able to drain any water that might be in the area where the footer would be built. In the case of bodies of water where removal of water is not an option, concrete footers are not a practical solution. In most cases, construction vehicles do not need to drive on the wetlands floor in order to construct the concrete footers.
- Auguring or Drilling – For the type of equipment that can drive on the structure as it is built there is auguring and drilling attachments available. Because of the wide range of potential density of the rock, this method will rely heavily on the nature of the rock being drilled. This is a very time consuming method.
- Structure Design – Depending on the nature of the rock and its depth below the mudline, there are several revisions in design to add strength to the framework of the structure. Ordinarily, we're relying on the piling in the ground for foundation strength. By adding bracing, blocking, or additional members, the structural support can be compensated for.

  Regardless of the course of action taken, it is recommended that each of methods listed above be addressed on a case-by-case basis as they occur. Without question, it makes good sense to have some sort of idea what the ground conditions are at the location of any bridge. Soils reports, or any geo-technical data, taken in the path of a bridge can give a good idea of the likelihood of underground obstacles. Although this information will be of great value, it still needs to be understood that the actual need for the other methods listed above will be best determined as the structure is being built.