ILLINOIS URBAN MANUAL
PRACTICE STANDARD

Temporary Rock Riprap Causeway

Code 956

Source: Illinois Tollway

Definition

A temporary roadway or path constructed to cross a portion of a body of water, or waterway intended to provide access for vehicles and/or construction equipment to access a construction site or perform maintenance work.

Purpose

The purpose of this practice is to minimize water quality impacts and other environmental impacts while providing a safe access for equipment or vehicles to access a work area within a body of water.

Conditions Where Practice Applies

1. This practice applies where a culvert, bridge, or other stream crossing method is inappropriate, and access is needed to perform work within a body of water, or waterway.
2. Where an existing stream crossing or other work access is not available.
3. Where no endangered or threatened species are present that would be impacted by the causeway.

4. Where the stream, overbank area or lake bed and shoreline area can support a causeway embankment. Hydric soils, etc. may be problematic.
5. Where riparian wetlands along the stream channel would not be impacted by the causeway or compensatory mitigation is provided consistent with applicable local, state, and federal regulations.
6. Where there are no underlying utilities, or where approval has been obtained from the utility.
7. Where the need to cross an entire body of water is not required. If there is a need to cross an entire stream, see IUM Practice Standard Temporary Stream Crossing 975.

Criteria

Plans and specifications shall be followed by the contractor and/or site superintendent and field personnel during the construction process.

Federal, state and/or local permits may be required for construction of a causeway in a water body (stream, lake etc.). Causeways shall be designed to withstand anticipated forces that may include high-flows, ice, overtopping, wave action, debris, and equipment loads.

The causeway shall be designed and constructed such that it will not cause erosion or damage to the streambanks due to increases in water flow and depth.

The design capacity of the causeway shall not create a damaging or potentially damaging increase in flood heights or velocities. The causeway shall be scour resistant and not subject to failure due to normal stream flow, and not significantly alter flow distribution or impact the construction site.

It shall not create a threat to public health, safety and welfare, or impair the natural hydrologic/hydraulic functions of the floodplain or

channel.

The width of the causeway shall be sized to accommodate anticipated vehicular/equipment usage, with adequate width to address safety, stability, and impacts to the aquatic environment.

Causeways shall be in service for the shortest practical period of time, not constructed during seasonal highwater conditions if practical, and shall be removed as soon as their purpose is complete to avoid the potential to cause or exacerbate flooding.

Where feasible the location of the causeway shall be selected where; erosion potential is lowest by evaluating channel geometry, slopes and stability.

Rock riprap shall be used for the causeway and be properly sized based to meet anticipated equipment loading, expected hydraulic and geotechnical site conditions and impacts to the water body. Smaller sized stone shall be used on the top of' the causeway to facilitate vehicle and foot traffic. Aggregate material shall be free of fines and soil. Material shall be placed on geotextile material meeting the Material Specification Geotextile 592, Table 2 Class 1.

Equipment, vehicles, or materials shall not be stored if rain events are predicted that would likely cause the causeway to be overtopped.

Upon removal of the causeway, the portion of the water body side slope that is above the water line shall be reinstated to the original condition.

Fish passage shall be evaluated that may require an assessment of fish species present in the stream. Timing of causeway activities shall avoid impacting fish spawning runs. Impacts to mussel beds shall be avoided.

Causeway Types-Vented, Unvented

Vented

A vented causeway has waterway openings such as culvert pipes to accommodate low flows that are otherwise blocked by the causeway embankment and not floodwaters. High flows are generally intended to overtop the causeway. Pipes shall able to withstand loads from vehicles and equipment.

The Vented water openings are not intended to be utilized where the temporary causeway will encroach the watercourse within the channel banks of rivers, or floodplain, floodway or public body of water. Pipes subject to meeting requirements of Regulatory agencies such as Illinois Department of Water Resources (i.e. Statewide Permit No.13, Authorizing Temporary Construction Activities), Illinois, Environmental Protection Agency, U.S. Army Corps of Engineers, and the U.S. Coast Guard.

Venting structure sizing and location shall consider site specific conditions and factors such as scour, flow-rate, fish/wildlife passage, and embankment stability.

Unvented

Unvented causeways usually do not have culverts to pass flows through the causeway embankment. Culverts may be necessary to avoid blocking fish/wildlife passage. This type is often used in situations where the causeway is constructed in a lake, pond, or level pool, or where the causeway does not cross or encroach upon a stream flow path, channel or floodway.

Considerations

Careful planning can minimize the need for temporary causeways. Examples are: Use existing water body crossings whenever possible in lieu of constructing a temporary causeway. Approach the construction site from the nearest water body channel bank so as to avoid crossing a stream or channel.

To the extent possible, work that requires a temporary causeway should be timed to take place during low flow conditions.

Minimizing risk to causeway embankment failure and its consequences should be carefully evaluated. Factors to be considered; Time causeway is in place, probability that the water level will be higher than the causeway surface, magnitude of probable environmental impacts in the event that the design water elevation is exceeded, potential for scour, safety to workers, and consequences to construction site and water body in the event of embankment failure.

Stream channel flow conditions, overflow areas, and surface runoff measures at the site should be evaluated before finalizing the location and type of causeway plan.

Causeway embankment located beyond the stream channel bank or shoreline of ponded water (wetlands) should be minimized. Protective practices for wetland crossings may be more suitable in those areas.

For equipment and supply staging areas, limit the area of ground disturbance and implement appropriate soil erosion and sediment control measures.

The installation and removal of causeways should be done in a manner to minimize disturbance to the stream or lake bed and adjacent areas. In some instances, the application of IUM Practice Standard 803, Cofferdam or IUM Practice 917, Silt Curtain-Floating may be required for the installation or removal of a causeway.

Plans and Specifications

Plans and specifications for causeways shall be in keeping with this standard and shall describe the requirements for applying the practice to achieve its intended purpose. At a minimum include the

following items:

1. The location of the causeway.
2. Required material specifications.
3. Causeway geometry and dimensions.
4. Design highwater elevation and stream velocities.
5. Any necessary engineering design.
6. Soil erosion, scour reduction and sediment control plan.
7. Removal and restoration plan.
8. Soil boring and geotechnical analysis to determine causeway support design/capacity as needed.

All plans shall include installation, inspection, and maintenance schedules with the responsible party identified.

Operation and Maintenance

Inspect causeways after runoff-producing precipitation events to check for blockages, including vent pipes below water, erosion of causeway sides and end, channel scour at base of causeway, riprap displacement, or piping. Make repairs immediately to prevent further damage to the structure.

Remove causeways immediately when they are no longer needed, unless design and permit conditions allow otherwise.

Restore the stream channel or lake bed to its original cross-section, and appropriately stabilize all disturbed areas.

References

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