Index 102-201 Temporary Detour Bridge Series 700

Design Criteria

AASHTO LRFD Bridge Design Specifications; ***Structures Design Guidelines*** **(*SDG*)**; ***Acrow Panel Bridging Series 700XS Technical Handbook***

Design Assumptions and Limitations

Temporary bridges on limited access facilities with design speeds greater than 45 mph require the use of the 700 Series ACROW bridges.

These Standards are based on the FDOT current inventory of temporary ACROW bridge components which are manufactured in accordance with ACROW Series 700 Refer to "***Acrow Panel Bridging Series 700XS Technical Handbook***" for temporary bridge dimensions, capacities and component designations. Contact the Structures Design Office to obtain a copy of this handbook.

The FDOT Office of Maintenance maintains the inventory of FDOT owned temporary bridge components. Contact the Office of Maintenance to coordinate the availability of temporary bridge components for a given project.

Establish temporary bridge length to accommodate project geometric needs, environmental permits, drainage requirements, etc..

Details presented in the standards show the basic layout of the Truss configuration (Single or double high) and double or triple truss. Type of truss configuration is based on span length and loading, work with ACROW on project specific requirements. Temporary bridge is designed to be launched from one end.

Vary span lengths in increments of 10' with 30' minimum. For continuous spans, the ratio of adjacent span lengths shall not be less than 6:10 to prevent the shorter span from lifting off its bearings under live load. Specify Distribution Beams at all intermediate supports for all span lengths.

The Approach Span and Ramp Span are to be simple spans, each 5' -0" in length, to eliminate Live Load uplift at the backwall bent and grade beam support.

Do not place the temporary bridge on a vertical curve. A constant grade is acceptable. Refer to "***Acrow Panel Bridging Series 700 Technical Handbook***" for maximum grade and elevation tolerance from constant grade (Bent to Bent and Cross-Slope) for final cap elevations.

Do not use the temporary bridge on a horizontal curve. The temporary bridge is to have a zero cross-slope. Provide asphalt buildup transitions to a zero cross slope outside the limits of the temporary bridge. ACROW railings are TL-4 rated with a maximum of 5” of asphalt at the gutterline.

To accommodate debris drift clearances, set Low Member Elevation as follows:

For single span bridges, at the bottom of the Transom.

For multiple span bridges, at the bottom of the Distribution Beam.

Design the pile cap connection to pile assuming the truss reaction with a minimum of 3" eccentricity. Design of this connection detail is the responsibility of the Engineer of Record.

Select a pile type considering the driving capacity requirements of the production piles on the permanent bridge, free standing height, water levels if present and soil conditions.

Design the substructure according to current ***AASHTO LRFD Bridge Design Specifications*** and the ***SDG*** for Strength Limit States III & V and Service Limit State I.

Calculate wind force on superstructure (WS) assuming a superstructure height of 5'-0". Use factors for trusses with sharp-edged members to select the drag coefficient (C_D) and skew coefficients (***LRFD*** Tables 3.8.1.2.1-2 and 3.8.1.2.3a-1 respectively).

The treatment of the approach and trailing ends shall consist of the Thrie-Beam guardrail. Appropriate guardrail treatments beyond the begin/end of approach slab shall be determined by the Roadway Engineer. As a minimum, if no other hazards are present, an End Anchorage Assembly Type II shall be provided on the trailing end. On approach ends utilizing the Thrie-Beam Approach Transition, a Transition Block or Curb is required at the end of the bridge. A Transition Block is not required on trailing ends of bridges with no opposing traffic; however, a curb may be required due to drainage needs. An Index 520-001, Type D Concrete Curb is generally suitable for this application.

Plan Content Requirements

Plans for temporary bridge shall, as a minimum, cover the following:

1. General Note Sheet.
2. Simple span bearing details if non-continuous spans are selected.
3. Grade change details at the extremities of the bridge.
4. Plan and elevation sheets with span lengths, stationing, alignment, grade and boring locations.
5. Foundation layout sheet including pile spacing & bent stationing.
6. Temporary Bridge Pile Data Table as shown below in accordance with ***SDG*** 3.5 and ***SDM*** 11.4 included in the contract plans with the Foundation Layout sheets. Modify table and notes as required to accommodate the required number of piles and bents. When not enough space is available on one plan sheet, continuation of the Data Table is acceptable. See ***FDM*** 115 for more information regarding use of Data Tables.
7. Bent detail sheet.
8. The appropriate site-specific approach and trailing end treatments.

TEMPORARY BRIDGE PILE DATA TABLE												Table Date 07/01/13
INSTALLATION CRITERIA						DESIGN CRITERIA						
BENT NUMBER	PILE SIZE and TYPE (in.)	NOMINAL BEARING RESISTANCE (tons)	MINIMUM TIP ELEVATION (ft.)	REQUIRED JET ELEVATION (ft.)	REQUIRED PREFORM ELEVATION (ft.)	FACTORED DESIGN LOAD (tons)	DOWN DRAG (tons)	TOTAL SCOUR RESISTANCE (tons)	NET SCOUR RESISTANCE (tons)	DESIGN SCOUR ELEVATION (ft.)	Ø COMPRESSION (0.45 = default)	PILE CUT-OFF ELEV.

$$\frac{\text{Factored Design Load} + \text{Net Scour Resistance} + \text{Down Drag}}{\text{Ø}} \leq \text{Nominal Bearing Resistance}$$

TOTAL SCOUR RESISTANCE – An estimate of the ultimate static side friction resistance provided by the scourable soil.

NET SCOUR RESISTANCE – An estimate of the ultimate static side friction resistance provided by the soil from the required preformed or jetting elevation to the scour elevation.

DESIGN SCOUR ELEVATION – Estimated elevation of scour due to the design storm event.

PILE INSTALLATION NOTES:

Contractor to verify location of all utilities prior to any pile installation activities.

Minimum Tip Elevation is required for lateral stability.

When a required jetting elevation is shown, the jet shall be lowered to the elevation and continue to operate at this elevation until the pile driving is completed. If jetting or preforming elevations differ from those shown on the table, the Specialty Engineer shall be responsible for determination of the required driving resistance.

No jetting will be allowed without the approval of the Engineer.

The Contractor should not anticipate being allowed to jet piles below the design scour elevation or required jet elevation, whichever is deeper.

At each Bent, pile driving is to commence at the center of the Bent and proceed outward.

Payment

Item number	Item Description	Unit Measure
102-2-AA	Special Detour	LS
102-71-14	Barrier Wall, Temporary, F&I, Type K	LF
102-71-24	Barrier Wall, Temporary, Relocate, Type K (if required)	LF
102-73	Temporary Guardrail	LF