
Special Specification 4029

Detour Bridge



1. DESCRIPTION

Construct Detour Bridge. Construct detour substructures, cut existing superstructure from substructure, and move the existing superstructure to the detour location. Remove the Detour Bridge after it is no longer required.

2. MATERIALS

Furnish new or used materials required to construct substructures for the detour bridge. Furnish new or used materials for lifting and moving the existing superstructure on to the detour substructures. The contractor may use other materials than these specified with the approval of the Engineer.

- 2.1. **Structural Steel.** Provide structural steel conforming to Item 442, "Metal for Structures." ASTM A36 (Grade 36) steel may be substituted for the Miscellaneous Channels, Angles, Standard Pipes and Steel H-Piling.
- 2.2. **Fiber Board.** Full length bearing pad made from 1/2 in. thick preformed bituminous fiber board.
- 2.3. **Elastomeric Pad.** Provide elastomer formulated from previously unvulcanized 100% virgin polychloroprene rubber polymers.
- 2.4. **Shackle.** Provide Crosby type G-2130 steel anchor shackle, or equivalent, that meets the size specified in the plans.
- 2.5. **Salvageable Material.** All material required for constructing the detour substructure and moving the existing spans belongs to the contractor after it is no longer needed.

3. EQUIPMENT

Furnish all equipment required for breakback of existing concrete, cutting of dowels, hauling required structural steel, driving piling, welding structural steel and lifting/moving (including all attachment hardware) the existing concrete spans.

- 3.1. **Lifting Equipment.** All lifting equipment (including all attachment hardware, slings, cables, spreader bars, etc.) must be either designed to carry the calculated load specified in the plans with a safety factor of 2, or must have a manufacturer's safe working load in excess of the calculated load specified in the plans.

4. DESIGN ALTERNATIVES

The contractor may use an alternative to the detour substructure design and/or the lift design specified in the plans. Submit all alternatives at least 14 days before beginning work. Alternatives must be approved by the Engineer.

- 4.1. **Member Size or Material Type Alternatives.** Alternatives in member size or material type used must be approved by the Engineer. Alternative members must have strength capacities in excess to those of members specified in the plans. Altering the member sizes or material types from those specified in the plans are the only deviations permitted. Member size or material type alternatives do not require additional engineering.

- 4.2. **Design Concept or Method Alternatives.** Alternatives in design concept or method must be signed and sealed by a licensed Texas Professional Engineer and approved by the Engineer. These types of alternatives include changing anything in addition to alterations as listed in Section 4.1 of this specification. Examples of design concept or method alternatives include, but are not limited to, altering the detour pile spacing, altering the lift points or cable angles of the lift design, member lengths, or member orientations that are specified in the plans.

5. CONSTRUCTION

- 5.1. **Construct Detour Substructure.**
- 5.1.1. **Verify Dimensions.** Verify all dimensions of the existing structure. Adjust detour piling layout as necessary to match existing structure. Verify cross slopes (bottom of existing deck) at all bent locations. Construct detour bents to match cross slopes.
- 5.1.2. **Steel Piling.** Furnish and install steel piling to the tip elevations provided in the plans according to Item 407, "Steel Piling." Steel piling may be either new or used material.
- 5.1.3. **Bents and Abutments.** Furnish all materials for detour bents and abutments. Materials must be as specified in Section 2 of this specification. Construct detour bents and abutments as specified in the plans or as specified in the alternate design developed by the contractor. Alternate designs must be in accordance with Section 4 of this specification.
- 5.1.4. **Structural Field Welding.** Perform all field welding specified in the plans in accordance with Item 448, "Structural Field Welding."
- 5.2. **Relocate Existing Spans.**
- 5.2.1. **Lifting Plan.** Develop and provide lifting plan to Engineer. Do not begin lifting spans until Lifting Plan has been approved by the Engineer. Lifting Plan must identify type and sizes of materials to be used (where specified as "provided by contractor" in plans), lifting heights, dimensions and guy wire locations. Clearly describe sequence of work. Provide method to break the bond (if necessary) that may exist between existing decks and existing bent caps.
- 5.2.2. **Cut Existing Dowels.** Existing spans have dowels connecting them to the existing abutments and bents. Breakback the abutment/bent concrete as specified to expose dowels. Cut dowels flush with bottom of existing deck. Do not damage the bottom surface of the existing decks. Cut horizontal dowels connecting the existing abutment wing walls to the concrete rails. If necessary, breakback the existing wing wall to expose horizontal dowels for ease of cutting. Dowels may be cut while traffic remains on structure.
- 5.2.3. **Lift Existing Spans.** Care must be taken to ensure that the spans are not damaged during the lifting/relocating process. Begin with inner most spans (Span No 2 and Span No 3). Install lifting beams, spreader bar and bearing pads under span to be lifted. Shim interior pads as necessary to provide the specified clearance at both exterior pads. Attach lifting cables to lifting beams and raise span slowly. Additional load (in addition to lifting load specified in plans) may be required to break the bond between the existing deck and existing bent caps.
- 5.2.4. **Relocate Lifted Spans.** Relocate existing spans onto detour substructures. Begin with Span No 2 and Span No 3. Position the spans so that the joint between Span No 2 and Span No 3 is centered on Detour Bent No 3. Position the spans so that the maximum clear space between the spans is less than 1 inch. After completing Span No 2 and Span No 3, proceed to Span No 1 and Span No 4. Contractor retains lifting beam for his/her future use once Detour Bridge is complete.
- 5.3. **Remove Detour Structure.** Remove the Detour Bridge after new bridge is complete and carrying traffic. Remove all structural elements of the detour bridge in accordance with Item 496, "Removing Structures." Steel H-Piles used on the detour bents and abutments may be removed completely or cut off at a minimum

of 2 ft. below the final ground elevation as specified in Item 496. Contractor retains for future use, or disposes of, all structural steel elements of the removed detour substructure.

6. MEASUREMENT

This Item will be measured by lump sum.

7. PAYMENT

The work performed in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Constructing/Removing Detour Bridge." This price is full compensation for alternative plan preparation, lifting plan preparation, loading, hauling, disposal, stockpiling, removal of appurtenances, excavation and backfill, equipment, installation of steel piles, materials for substructures, lifting, welding, removal of Detour Bridge, labor, tools, and incidentals.