BRIDGE SLAB (WITH TRANSPARENT FORMS) 8/20/25

**1.0 Description.** This work shall consist of constructing the concrete bridge slab in accordance with the contract plans and Sec 703 and Sec 706 except that permanent transparent forms shall be used to the extent possible in accordance with the contract plans and the details below.

**1.1** The use of precast panels or non-transparent permanent forms will not be considered.

**2.0 Materials and Fabrication Requirements.**

**2.1** The steel for the structural joists and tracks shall be in accordance with the requirements of ASTM A653 with a minimum yield strength of 33 ksi and shall be galvanized.

**2.2** The steel for the structural support angles shall be in accordance with the requirements of ASTM A653 with a minimum yield strength of 36 ksi and shall be galvanized.

**2.3** All materials used for connections of transparent formwork to the girders/beams shall be shown on the shop drawing submittal for the review and approval from the engineer.

**2.4** The transparent acrylic plastic sheet for the fabricated formwork shall be in accordance with the requirements of ASTM D4802. Dimensions of the sheet shall be specified in the approved shop drawings.

**2.5** The permanent transparent forms and ancillary items associated with the pay item shall be supplied by the following:

 ClearCast Forms by Contech Engineered Solutions LLC

 9100 Centre Pointe Drive

 West Chester, OH 45069

 [www.conteches.com](https://www.conteches.com/)

**2.6** All permanent forms shall be fabricated with the following tolerances:

 Form Dimensions: 1/4 inch

 Form Squareness: The difference between the two diagonals shall not exceed 1/2 inch

**2.7** All fabricated permanent transparent forms delivered to the contractor shall be stored on pallets at least three inches off the ground with one end elevated to allow for drainage. Binding on permanent transparent forms shall remain in place until immediately prior to installation. Care shall be taken to avoid damage to the transparent forms during handling and installation. Forms shall be lifted from beneath the steel track, not the plastic sheet. Any forms that are damaged shall be replaced at no additional cost as directed by the engineer.

**2.8** The bridge deck concrete and admixtures shall contain no calcium chloride. All concrete admixtures shall be reviewed for compatibility with the acrylic sheeting of the forms.

1. **Construction Requirements.**

**3.1 Shop Drawings and Design.**

**3.1.1** Shop drawings and design calculations shall be submitted to the engineer for review and approval. Submittals shall show complete details of all elements required for proper construction of the system, including complete material specifications.

**3.1.2** The forms shall be designed on the basis of dead load of form, reinforcing bars, and plastic concrete plus 50 psf for construction loads. The allowable design pressure shall be shown on the shop drawings. Deflection under the weight of the forms, the plastic concrete and reinforcing bars shall not exceed 1/180 of the form span or 1/2 inch, whichever is less, for spans equal to or less than 10 feet; and shall not exceed 1/240 of the form span or 3/4 inch, whichever is less, for spans greater than 10 feet. However, the deflection loading shall not be less than 120 psf total. The allowable form camber shall be based on the actual dead load condition. Camber shall not be used to compensate for deflection in excess of the foregoing limits. The design span of the form sheets shall be the clear span between the edges of the girders less the minimum bearing length specified by the manufacturer.

**3.1.3** The design, materials and construction shall be in accordance with the AASHTO LRFD Bridge Design Specifications, 8th Edition; the AASHTO Guide Design Specifications for Bridge Temporary Works, 1st Edition; AISI S100-12, North American Specification for Cold-Formed Steel Structural Members; ACI 318-14, Building Code Requirements for Structural Concrete; and AISC 360-10, Specification for Structural Steel Buildings.

**3.2 Installation.**

**3.2.1** A qualified representative of the form manufacturer shall be present at the beginning of the form installation work.

**3.2.2** The masking, provided on the top surface of the transparent form, shall be left in place during installation operations to provide protection of the transparent surface. Only plastic putty knives or scrapers shall be used to remove masking. Care shall be taken to not scratch the surface of the transparent form. Masking shall be removed immediately prior to setting reinforcing steel.

**3.2.3** The installed transparent forms shall be protected from any cleaning solutions, solvents such as acetone, gasoline, alcohol or thinners. Any forms that are damaged according to the engineer shall be replaced by the contractor at no additional cost to the Department. Any permanently exposed steel on the forms with damaged galvanized coating shall be cleaned and repaired as directed by the engineer with the zinc alloy stick method in accordance with ASTM A 870.

**3.2.4** When forms are cut or drilled, methods shall be submitted to both the supplier and to the engineer for approval prior to work. Cutting by torch or burning will not be allowed.

**3.2.5** The form supports shall be set to meet the required screed elevations, deck thickness and plan profile. All dimensions and form support elevations shall be checked and adjusted as required prior to installing the transparent forms.

**3.2.6** The welding of form support to tension flanges or to non-weldable grades of steel is not permitted. If field welding is required, it must be in accordance with Sec 712.

**3.2.7** The permanent transparent forms shall be placed on form supports to meet the minimum bearing lengths shown on the plans. Forms shall not be set and attached directly on the top of beam flanges. All attachments for form supports shall be made by welds, bolts, clips, or other approved means. The vertical leg of angles used as form supports shall not extend higher than 1/4 inch above the top of the permanent transparent form.

**3.2.8** Form supports for steel girder bridges shall be placed in direct contact with the top flange of the girder and shall be adjusted to maintain the required deck thickness. Where straps are used on the top flanges, the straps shall be No. 10 gage thick (min.), fit tight, and may be galvanized at the manufacturers’ discretion.

**3.2.9** Form supports for prestressed concrete girder/beam bridges shall be placed in direct contact with the edge of the girder flange or the exterior face of the adjacent web of the beam and shall be adjusted to maintain the required deck thickness. The form supports may be attached to steel inserts cast into the top of the girder or beam, to straps extending across the top of the flange or beam, to hangers mechanically attached to reinforcing bars extending from the top of the flange or beam, or by other approved means. Where straps are used across the top of the flange or beam, they shall be No. 10 gage thick, fit tight, and may be galvanized at the manufacturer’s discretion. Attachments shall not be welded directly to girder/beam reinforcement. The use of recesses cast into the prestressed girder/beam to serve as a form support will not be allowed.

**3.2.10** Transparent forms shall be connected to the form supports immediately upon placement to prevent movement or uplift, before applying any load or walking on the form, and before the end of each work shift.

**3.2.11** Joints between adjacent transparent forms and the support angle shall be mortar tight. Joints larger than 1/2 inch shall be sealed with an approved material to prevent leakage of the concrete.

**3.2.12** All screws shall be placed such that there is a minimum distance of 0.29 inches between the center of the screw and material edge.

**3.2.13** All reinforcing bars shall have a minimum clearance of 1 inch from the forms and be placed in accordance with Sec 706.

**3.2.14** Prior to pouring concrete, all debris and extraneous matter shall be removed from the forms. The placement and thickness of concrete shall be controlled such that the pressure applied does not exceed the allowable design pressure.

**3.2.15** Concrete shall be placed in accordance with Sec 703, and concrete shall not be dropped from a height greater than 10 inches above the transparent forms. Care shall be taken to avoid contact of equipment, tools, and vibrators with the top of forms. Vibrators shall be rubber tipped.

**3.3 Areas Where Transparent Forms Cannot Be Used.** Where transparent forms cannot be used due to restrictive geometry or where shown on the plans, the contractor may use wood or metal forms in accordance with Sec 703.

**4.0 Method of Measurement.** Final measurement will not be made unless changes from contract plans are authorized by the engineer during construction, or appreciable errors are found in the contract quantity. The revision or correction will be computed and added to or deducted from the contract quantity. Where required, quantities for concrete masonry will be computed from dimensions shown on the plans, or as revised in writing by the engineer because of changes to the contract plans or due to appreciable errors, and will be computed to the nearest square yard for each structure.

**5.0 Basis of Payment.** Payment for the above described work, including all material, equipment, labor and any other incidental work necessary to complete this item, will be considered completely covered by the contract unit price for Slab on \_\_\_\_\_ (with Transparent Forms) per square yard.