

## SECTION 29 – SHOP DRAWINGS AND FALSEWORK PLANS

### 29.1 GENERAL *(Rev. 02-12-21)*

In order to make the review process more efficient, the Department encourages the Contractor to submit electronic copies of design calculations and shop drawings for approval in lieu of printed copies. Every submittal must include the contract number, Contractor's name, and contact person with contact information. All drawings and calculations should be submitted in the units used for the contract. Regardless of the submittal process described below, Contractors shall communicate directly with the Project Engineer/Supervisor (PE/S) to keep them informed of the status of submittals.

### 29.2 SHOP DRAWING AND FALSEWORK PLAN REVIEW *(Rev. 03-26-21)*

#### 29.2.1 LPA Contracts

For LPA contracts, review of all shop drawings and other items listed in 29.2.3 are the responsibility of the LPA or their designated representative. Contractors on LPA projects are to submit shop drawings and falsework plans as directed by the LPA. Questions about LPA procedures should be directed to the District Local Projects Administrator.

a. **Structural Members and Items**

Shop drawings for structural members and items are to be submitted to the LPA or their designated representative for review and approval. Since INDOT is responsible for fabrication inspection of structural members, upon completion of the shop drawing review, the LPA or their representative should forward an electronic copy of the approved shop drawings to INDOT Office of Bridge Design, at [BridgeDesignOffice@indot.IN.gov](mailto:BridgeDesignOffice@indot.IN.gov).

b. **Approval of Pile Driving Equipment**

The Contractor shall submit to the LPA or designated representative, a completed pile and driving equipment data form at least 15 calendar days prior to driving piles. The Engineer of Record (EOR) shall review for acceptance the pile and driving equipment data form. The pile and driving equipment data form is available on the Department's website. The Contractor will be notified by the LPA or designated representative, of the acceptance of the proposed pile driving system within 15 calendar days of the receipt of the pile and driving equipment data form. Acceptance of pile and driving equipment does not relieve the Contractor of the responsibility to provide equipment suitable for driving the specified piling to the required bearing without damage. INDOT Geotechnical Services Division at [geotech@indot.in.gov](mailto:geotech@indot.in.gov) and the Engineer will be notified by the LPA or designated representative, of the acceptance of the proposed pile driving system.

#### 29.2.2 Design-Build Contracts

For design-build contracts, responsibilities and procedures for shop drawing review and approval is typically described in the design-build contract documents.

### 29.2.3 State Contracts

For state contracts, the following procedures have been implemented for submittal and review of shop drawings, falsework plans and related items as described below. If the District has any concerns about the structural integrity of any shop drawings submitted with a P.E. stamp, they should contact their Division of Construction Management and District Support Field Engineer for further assistance.

**a. Structural Members and Items**

For State contracts, shop drawings for the following items are to be submitted by the fabricator or supplier directly to Burgess & Niple, Inc. for review and approval. Shop drawings must be in accordance with the applicable specifications. These items do not require a P.E. stamp for submittal.

- Structural steel & structural concrete members
- Modular expansion joints
- S-S joints
- Elastomeric bearings

Shop drawings are to be sent to Burgess & Niple at [shopplanreview@burgessniple.com](mailto:shopplanreview@burgessniple.com). Their office phone number is (317) 237-2760. Burgess & Niple will send approved shop drawings to the INDOT Division of Bridges at [BridgeDesignOffice@indot.IN.gov](mailto:BridgeDesignOffice@indot.IN.gov) for distribution to the District Construction office.

**b. Mechanically Stabilized Earth (MSE) Retaining Walls**

Shop drawings and design calculations for MSE retaining walls must be stamped by a P.E. and submitted by the Contractor electronically to the INDOT Geotechnical Services Division at [MSEWallShopDrawings@indot.in.gov](mailto:MSEWallShopDrawings@indot.in.gov) and the EOR for review and approval. The contract number shall be part of the subject line.

The EOR, as part of review, should complete the MSE Wall Shop Drawing Review Checklist. An editable copy of the MSE Wall Shop Drawing Review Checklist is available from the Department's [Editable Documents webpage](#), under Geotechnical. The MSE Wall Shop Drawing Review Checklist is optional for submittals made prior to May 1, 2021.

The EOR will attach a cover letter and send a copy of approved shop drawings to the Contractor/submitter and to the District Construction office for further distribution.

**c. Sound Barrier Systems**

Shop drawings and calculations for sound barrier systems are to be submitted by the Contractor or fabricator directly to the EOR for review

and approval. The plans and calculations must be stamped by a P.E. The designer will attach a cover letter and send a copy of approved plans and calculations to the submitter and to the District Construction office for further distribution.

**d. Precast Concrete 3-Sided Structures and Box Culverts  
(Effective with January 2016 lettings)**

Shop drawings and design calculations are to be submitted for all precast concrete 3-sided structures and for precast concrete box culverts that have a dimension or design earth cover not listed in Table 1 of ASTM C1577. Shop drawings and design calculations must be stamped by a P.E. Shop drawings for 3-sided structures must include details to provide sufficient horizontal restraint (prior to backfill being placed) unless the design demonstrates such restraint is not required. Load rating calculations must be included for structures whose span measured along the centerline exceeds 20 ft, except where the height of cover is greater than 8 ft and exceeds the perpendicular span length.

Plans and calculations should be submitted by the Contractor to the PE/S. The PE/S should send the shop drawings directly to the EOR for review and approval and copy the Office of Roadway Review Coordinator at [coordinator7@indot.in.gov](mailto:coordinator7@indot.in.gov). For structures requiring load rating, the EOR should forward an electronic copy of the shop drawings, design calculations, load rating calculations and load rating summary (RPD 700-B-301d) to the INDOT Load Rating Engineer at [loadrating@indot.in.gov](mailto:loadrating@indot.in.gov). Load Rating Engineer will provide comments/approval back to the designer.

**e. Welded Wire Reinforcement**

Shop drawings must be stamped by a P.E. Shop drawings and design calculations are to be submitted to the PE/S for locations where the Contractor proposes to substitute welded wire reinforcement in lieu of the reinforcing bars shown on the plans.

The PE/S should send the drawings and calculations directly to the EOR for review and approval and copy the Office of Bridge Design Manager at [BridgeDesignOffice@indot.IN.gov](mailto:BridgeDesignOffice@indot.IN.gov). The EOR will send approved shop drawings to the PE/S for distribution to the Contractor.

**f. Traffic Items**

Shop drawings for Signing, Signals, and Lighting will be reviewed and approved by the INDOT Office of Traffic Design and Review. These items typically include all overhead sign structures, signal strain poles and cantilevers, high mast lighting, luminaries, and light poles. Plans and calculations should be submitted by the Contractor to the PE/S and forwarded to the Office of Traffic Design Manager at [TrafficDesignReview@indot.IN.gov](mailto:TrafficDesignReview@indot.IN.gov) for review and approval.

The Office will distribute approved shop drawings to the PE/S for distribution to the Contractor.

**g. Falsework Plans and Temporary Bridge Drawings**

Falsework plans for the following items are to be submitted to the PE/S. Each sheet must include the contract number, Contractor's name and must be stamped by a P.E.

- Cofferdams
- Deck Falsework - temporary
- Coping falsework
- Falsework for reinforced concrete slab superstructures
- Falsework for hammerhead pier caps
- Designs for temporary bridges for runarounds.

Temporary bridge design submittals must also include design calculations.

The PE/S will review drawings for compliance with the specifications and the specific job conditions only. Questions should be directed thru the Area Engineer and District Construction office.

**h. Permanent Metal Deck Forms**

Shop drawings submitted by the Contractor must be stamped by a P.E. Shop drawings for permanent metal deck forms are to be submitted by the Contractor to the PE/S for review for compliance with the specifications and the specific job conditions only. The Division of Construction Management maintains a deck form calculation spreadsheet that can assist in review of metal deck forms if concerns arise.

**i. Foundation Seals and Deck Pour Sequences**

Requests for use of foundation seals not shown in the plans are to be submitted to the INDOT Geotechnical Services Division at [geotech@indot.in.gov](mailto:geotech@indot.in.gov) for review and approval. The submittal must include the contract number, Contractor's name and indicate the location and dimensions of the seal. The Office will distribute approved requests.

Planned deck pour sequences are to be submitted by the Contractor to the PE/S. The PE/S should send the deck pour sequence directly to the EOR for review and approval and copy the Office of Bridge Design at [BridgeDesignOffice@indot.IN.gov](mailto:BridgeDesignOffice@indot.IN.gov).

The EOR will distribute approved requests.

**j. Approval of Pile Driving Equipment**

The Contractor shall submit to the INDOT Geotechnical Services Division, a completed pile and driving equipment data form at least 15 calendar days prior to driving piles. A copy shall also be furnished to the Engineer. The pile and driving equipment data form is available on the Department's website. The Contractor will be notified of the acceptance of the proposed pile driving system within 15 calendar days of the receipt of the pile and driving equipment data form. Acceptance of pile and driving equipment does not relieve the Contractor of the responsibility to provide equipment suitable for driving the specified piling to the required bearing without damage.

**k. Stream Crossings and Work Bridges**

Proposals for stream crossings and work bridges for construction traffic are to be submitted to the District Construction office for review and approval. If the proposal varies from any of the contract's waterway permit conditions, the Contractor must obtain approval for the change from the appropriate agency.

**l. Miscellaneous**

Shop drawing submittals for miscellaneous items not covered by the above (post tensioning plans, non-standard manholes, etc.), should be submitted thru the PE/S. The PE/S should work thru the District Construction office and the Division of Construction Management and District Support to determine the approval process for these items.

**29.3 MECHANICALLY REINFORCED EARTH (MSE) WALL INSTALLATION**

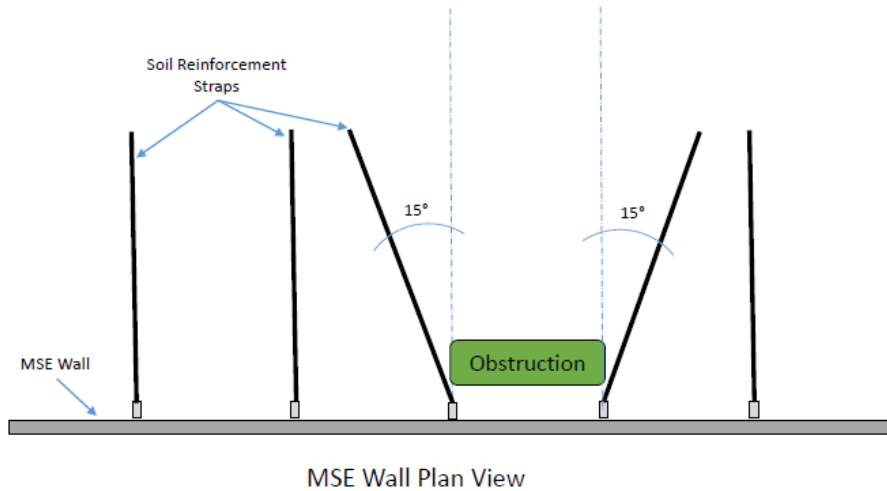
*(Add. 09-29-20)*

**29.3.1 Design Components**

Internal, external, and compound stability design components are the responsibility of the Contractor. The Contractor shall submit working drawings and design calculations. The design factors used shall be current and acceptable to the Department. The design will be approved prior to the construction of the wall. Questions on wall design information, including working drawings and design calculations should be directed to the EOR and the INDOT Geotechnical Services Division.

**29.3.2 Reinforcing Straps**

Reinforcement straps should be straight and level when placed. There should not be vertical gaps between the wall connection and its strap end. Straps should be the correct length for the location. Contractor supplied shop drawings and working drawings should be checked for information concerning the reinforcement strap location, type, and length. Soil reinforcement should splay no more than 15° from a line perpendicular to the wall face. This angling of soil reinforcement is typically used to avoid obstructions, such as drainage structures, which may be located just inside the MSE wall structure. Field changes to reinforcement to avoid obstructions should not be made unless shown on the approved drawings. The figure below illustrates the concept.



Grading around and backfilling of the wall should be carefully inspected to ensure proper, uniform, and level lift placement. Improper grading around the wall can cause component failures. Careless placement and improper compaction methods used in constructing the backfill can cause undesirable wall deflections and reduce overall retaining capacity.

A comprehensive instructional presentation of MSE installation is located at <http://www.in.gov/dot/div/contracts/tutorial/MSEWall.pptx>