

## Chapter 28

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## Chapter 28

### Shop and Erection Drawings

#### 28.1 Introduction

Shop Drawings include all drawings, diagrams, illustrations, schedules, catalog data, material certifications, fabrication procedures, storage and/or transportation procedures, test results, design calculations, etc., required by the Contract Plans and Specifications and submitted by the Contractor to define some portion of the project work. While the Contract Plans and Specifications (including Supplemental and Special Provisions) define the overall nature of the project with many specific requirements, Shop Drawings provide a method for the Contractor to propose, under specification guides and for the Department to approve or reject a particular material, product or system of accomplishing the work. Each Contractor knows best what materials and equipment can be provided more expeditiously and economically and, if an item proposed meets the contract requirements, the submission of Shop Drawings is the accepted method of approving an element of the structure while allowing flexibility in the Contractor's choice of materials and construction techniques.

It is mandatory, however, that Shop Drawings not be used to modify the construction contract time, the contract amount, the design intent nor in any way reduce the maintainability, structural integrity or load-carrying capacity of the structure or its components. Such modifications can only be administered by revised plan sheets or specifications.

Erection Drawings include all drawings, diagrams, design calculations, procedure manuals and other data required to depict in detail the proposed assembly and methods of installation of components into the project work. The work of construction is the expertise of the Contractor, who should be allowed some latitude in the use of construction means, methods, techniques, sequences and procedures as are compatible with and will result in the project being completed in accordance with the requirements of the Contract Plans and Specifications. Shop Drawings for items such as steel girders, non-standard precast/prestressed beams, miscellaneous steel, etc., usually include plan views and/or elevation views denoting the correct placement of a component in the structure. Additional Erection Drawings are required for major structures for items such as special precasting, handling and erection equipment, or the erection of concrete segmental bridges. The Engineer of Record must ensure that the Contract Plans and Special Provisions for the project clearly define all requirements for submittal of Erection Drawings.

The following are definitions used herein:

1. **Engineer:** As defined in *FDOT Standard Specifications for Road and Bridge Construction, Section 1*.
2. **Engineer of Record:** As defined in the *FDOT Standard Specifications for Road and Bridge Construction, Section 1*.
3. **Specialty Engineer:** As defined in the *FDOT Standard Specifications for Road and Bridge Construction, Section 1*.
4. **Consultant:** The Professional Engineer or Engineering Firm, or the Architect or Architectural Firm, licensed in the State of Florida and under contract to the Department to perform professional services. The consultant may be the Engineer or Architect of Record or may provide services through and be subcontracted to the Engineer or Architect of Record.
5. **Architect of Record:** The Architect or Architectural Firm registered in the State of Florida that performs services for the Department in connection with the design and construction of buildings.

Modification for Non-Conventional Projects:

Delete **Architect of Record** definition and replace with the following:

5. **Architect of Record:** As defined in the *Design-Build Division I Specifications, Section 1*.

6. **"Ballooning":** The Contractor's use of minimum 1/16 inch wide lines to "balloon" or "cloud" (encircle) notes or details on drawings, design calculations, etc., in order to explicitly and prominently call out any deviations from the Contract Plans or Specifications. The Engineer of Record may also use "ballooning" to make note of any limitations to their submittal review and disposition of shop and erection drawings.
7. **Record Shop Drawings:** The Department's official record copy of all Shop drawings, Erection Drawings, calculations, manuals, correspondence/ transmittal files and submittal activity record (logbook).
8. **FDOT Shop Drawing Review Office:** The office or other Department entity responsible for performing the Department's review, record keeping, disposition and distribution of Shop and Erection Drawings to other disciplines within the district for review as well as distribution back to the project personnel. This office is normally the District Structures Design Office.

9. **Final Review Office:** FDOT Shop Drawing Review Office or the Engineer of Record performing the final review and making final distribution of shop drawings which have been reviewed.

Modification for Non-Conventional Projects:

Expand with the following:

10. **Design-Build Firm:** As defined in the *Design-Build Division I Specifications, Section 1.*

## 28.2 Drawing Submittals Required

Generally, Shop Drawings shall be required for items which require fabrication at a location other than the project job site.

The Department requires shop drawings only for items of work not fully detailed in the plans which require additional drawings and coordination prior to constructing the item and temporary works affecting public safety. These items include, but are not limited to, bridge components not fully detailed in the plans; retaining walls systems; precast box culverts; non-standard lighting, signalization, and signing structures; building structures; non-standard drainage structures; attenuators; and temporary works affecting public safety.

Unless otherwise noted in the Special Provisions for the project, Shop Drawings are not required for reinforcing steel for cast-in-place concrete which is completely detailed and listed on the Contract Plans or on the Department's **Design Standard** Index Drawings. Components such as traffic signal equipment, steel or aluminum light poles, concrete strain poles and high mast lighting may not require submittal of Shop Drawings due to having prior certification by the Department. The Contractor may contact the Engineer (CEI) or the FDOT Shop Drawing Review Office for clarification of any item.

Material certifications, welding procedures, paint procedures and concrete mix designs are typically submitted by the Contractor to the Engineer (CEI) who forwards the certifications to the State Materials Engineer in Gainesville. These items do not need to be submitted to the FDOT Shop Drawing Review Office for review and approval. For non-standard items, the Engineer (CEI) will typically request approval by the EOR regarding applicability. Material certification for items on the Qualified Product List (QPL) is typically submitted by the Contractor to the Engineer (CEI).

Items fully detailed in the **Design Standards DO NOT** need a shop drawing submittal unless it is specifically required by a particular Standard Index.

In general, drawing submittals for any item shall follow industry standards in regard to the quantity and quality of information contained. The information shown on approved shop drawings shall be complete enough to allow for fabrication of the item without referencing any other document. The Department shall expect submittals to meet or exceed the quality level of previously approved submittals of a similar nature.

During component fabrication and construction phases of the project, the Contractor may elect to submit to the Engineer, for consideration or approval, repair procedures or

disposition requests due to errors or omissions in the work. The information required and the procedure to be followed by the Contractor in initiating such requests shall be in accordance with the FDOT **Specifications** or as determined by the Engineer (CEI).

## 28.3 Contractor Information Required

All Shop Drawings and Erection Drawings shall contain the following minimum information: the complete Financial Project Identification, drawing number, drawing title, a title block showing the name of the fabricator or producer and the Contractor for which the work is being done, the initials of the person(s) responsible for the drawing, and the date.

The drawing shall also contain, adjacent to the title block, information which describes the location of the item(s) within the project. This information may consist of the Contract Drawing number, the station at which the item is positioned (as may be the case for sign structures or handrails), or the Site at which it is to be installed. Other documents such as trade literature, catalogue information, calculations and manuals must be bound and submitted with a Table of Contents Cover.

Before submission of each drawing, the Contractor shall determine and verify all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto, and shall review and coordinate each drawing with other Shop Drawings and with the requirements of the Contract Plans and Specifications. The Contractor shall stamp and initial each sheet indicating on the stamp that the shop drawing review and approval is for conformance with the design concept of the project and for conformance with the information given in the Contract Plans and Specifications (including Supplemental Specifications and Special Provisions).

### Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

The Design-Build Firm shall be responsible for the preparation and approval of all shop drawings and calculations. Once the shop drawings have been reviewed and approved by both the Contractor and Engineer of Record (EOR), submit Shop Drawings and calculations to the Engineer for review and approval by the Department. Before submission, the Contractor and EOR shall determine and verify all quantities, dimensions, specified performance criteria, installation requirements, materials, catalog numbers and similar data with respect thereto, and shall review and coordinate each drawing with other Shop Drawings and with the requirements of the Contract Plans and Specifications. The Contractor shall stamp

and initial each sheet indicating that the shop drawing review and approval is for conformance with the design concept of the project and for conformance with the information given in the Contract Plans and Specifications (including Supplemental Specifications and Special Provisions).

Only shop drawings stamped “APPROVED” or “APPROVED AS NOTED” shall be forwarded to the Engineer for review by the Department. Shop drawings submitted without the stamps of the Contractor and the Engineer of Record (EOR) shall be returned for re-submittal. When the Department requires a resubmittal, the drawings shall be modified by the Contractor, resubmitted to the EOR for approval, then resubmitted to the Engineer for review by the Department. In the case where the EOR generates the shop drawings for the project, another engineer within the EOR’s firm, not involved in the production of the shop drawing, shall review and stamp the drawings per the requirements stated herein.

The Contractor's approval signifies that the submittal meets the requirements of the Contract Plans and Specifications and conforms to field dimensions or other potential deviations from the established project documents. Drawing submittals received without stamping by the Contractor shall be returned for resubmittal.

At the time of each submission, the Contractor shall give specific written notice (as in the transmittal letter) of each variation the Shop/Erection Drawings may have from the requirements of the Contract Plans and Specifications. In addition, the drawings shall contain a specific notation which explicitly and prominently calls out any deviation. Approval of Shop/Erection Drawings will not constitute nor be considered grounds for approval of a variation in which the project requirements are affected unless specifically indicated in the Department’s shop drawing transmittal letter.

## 28.4 Submittals Requiring a Specialty Engineer

In general, and when so permitted in the Specifications, if a Shop/Erection Drawing submittal reflects any minor changes in the design and/or details of the Contract Plans, the Specialty Engineer shall provide a signed and sealed submittal. The Contract Plans and Specifications (including Supplemental and Special Provisions) shall contain instructions regarding requirements of a Specialty Engineer for items such as concrete segmental bridge work, loads imposed on an existing structure, or certain construction procedures and/or equipment.

### Modification for Non-Conventional Projects:

Expand the above paragraph with the following:

In the case where the Engineer of Record generates shop drawings for the project, the Engineer of Record shall seal one (1) print of each drawing affected as well as the cover sheet of one (1) copy of any design calculations required.

Submittals which introduce engineering input to the project, such as defining the configuration or structural capacity of prefabricated components or assemblies not contained in the Contract Plans, shall require the services of a Specialty Engineer.

### Modification for Non-Conventional Projects:

Expand the above paragraph with the following:

The Engineer of Record may perform as Specialty Engineer.

Drawings prepared solely as a guide for component fabrication/ installation and requiring no engineering input, such as reinforcing steel drawings and catalog information on standard products, do not require the use of a Specialty Engineer.

When required, the Specialty Engineer shall provide a signed and sealed submittal. Computer printouts are an acceptable substitute for manual computations provided they are accompanied by sufficient documentation of design assumptions and identified input and output information to permit their proper evaluation. Such information shall be signed and sealed by the Specialty Engineer.

When a submittal requires a Specialty Engineer, the sealed prints and calculations will ultimately be retained by the Department, as the official, record Shop Drawing. See also Transmittal of Submittals hereinafter.

## 28.5 Scheduling of Submittals

In general, the Contractor is required to submit a Shop Drawing schedule to the Engineer (CEI) within 60 days of the start of construction operations, and prior to the submission of any shop drawings. Adherence to the Shop Drawing schedule is intended to allow for the planning of resources and to reduce the possibility of a large number of submittals being forwarded for review concurrently.

The Contractor is required to schedule submissions such that a minimum of 45 calendar days is allowed for review by the Department for routine work of which the first 30 calendar days are allotted to prime review by the Engineer of Record. Allowance must be made for potential resubmittals, and the Contractor normally is advised by the Department to consider a 75 to 90 calendar days total lead-time for submittals prior to the need for fabrication or construction work. When voluminous shop drawings are submitted at one time such that the combined EOR and FDOT Shop Drawing Review Office 45-day review time will likely not be met, notify the Engineer (CEI).

### Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

Once the shop drawings and calculations have been reviewed and approved by both the Contractor and Engineer of Record, the Design-Build Firm is generally required to schedule submissions such that the review period given in the RFP is accommodated. Allowance must be made for potential resubmittals and the Contractor normally is advised by the Department to consider a 75 to 90 calendar days total lead-time for submittals prior to the need for fabrication or construction work. When voluminous shop drawings are submitted at one time such that the FDOT Shop Drawing Review Office review period described in the RFP will likely not be met, notify the Engineer (CEI).

Shop drawings cannot be submitted, processed, reviewed, or approved until the component plan set for the particular item is stamped "Released for Construction".

The Contractor must make submittals for approval with such promptness as to cause no delay in his fabrication and construction schedules. Only in emergency cases should special consideration be requested.

If a submittal requires resubmission, an approximate additional 30 calendar days should be scheduled by the Contractor for approval of the resubmittal of which the first 15 calendar days are allotted to prime review by the Engineer of Record.

**Modification for Non-Conventional Projects:**

Delete the above paragraph and replace with the following:

If a submittal requires resubmission, an approximate additional 15 calendar days should be scheduled by the Contractor for approval of the resubmittal by the Department.

## 28.6 Transmittal of Submittals

Submittal of Shop/Erection Drawings shall be made to the designated parties, as applicable, only by the Contractor for the project. In that the Department's legal contracts and documents are with the Contractor, submittals shall not be accepted directly from a subcontractor or fabricator. Situations may occur when a subcontractor or fabricator is allowed to make an advance submittal for review; however, the actual submittal to be stamped and approved must follow from the Contractor with the Contractor's stamp. Subcontractors and fabricators are encouraged to contact the appropriate FDOT Shop Drawing Review Office for guidance or advice at any time.

**Exhibits 28-A** thru **28-C** show the flow of submittals during the review process. All transmittals of submittals between parties shall be accomplished by OVERNIGHT DELIVERY or by HAND DELIVERY.

Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

**Exhibit 28-E** shows the flow of submittals during the review process. All transmittals of submittals between parties shall be accomplished by OVERNIGHT DELIVERY or by HAND DELIVERY.

The Special Provisions for the project may denote the amount of drawings, etc. to be submitted and the procedure to be followed. Furthermore, the office to which the Contractor shall transmit his submittal and the procedure to be followed may also be defined during the preconstruction conference for the project. In the absence of such instructions, the following generally applies:

### 28.6.1 General Submittal Requirements

On projects where the Engineer of Record is a Consultant to the Department, and unless otherwise directed at the project's preconstruction conference, the Contractor shall submit two (2) sets of xerographic reproduces directly to the Engineer of Record. On projects where the Department is the Engineer of Record, the Contractor shall submit two (2) sets of xerographic reproduces and four (4) complete sets of design calculations including computer printouts directly to the FDOT Shop Drawing

Review Office, or as directed in the preconstruction meeting. All drawings shall be on sheets not larger than 11" x 17". The Contractor's letter of transmittal shall accompany the drawings and a copy shall be sent to the Engineer (CEI). On those projects where the Engineer of Record is a Consultant to the Department, and the Department will be reviewing the shop drawings, a second copy of the Contractor's letter shall be sent to the FDOT Shop Drawing Review Office.

Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

### **28.6.1 General Submittal Requirements**

Once the shop drawings and calculations have been reviewed and approved by both the Contractor and Engineer of Record, the Contractor shall submit two (2) sets of xerographic reproductions and four (4) complete sets of design calculations including computer printouts to the Engineer (CEI), or as directed in the preconstruction meeting. All drawings shall be on sheets not larger than 11" x 17". The Contractor's letter of transmittal shall accompany the drawings.

## **28.6.2 Requirements for Department EOR**

On projects where the Engineer of Record is Department in-house staff, submittals shall be transmitted to the FDOT Shop Drawing Review Office or as directed at the project's preconstruction conference. The FDOT Shop Drawing Review Office is the principal contact group and "clearing house" for all construction submittals and information desired by the Contractor regarding structural, mechanical or electrical items.

## **28.6.3 Requirements for Consultant EOR (Full Services)**

### **28.6.3.1 Review by Engineer of Record only**

On projects where the Engineer of Record is a Consultant to the Department and has been retained by the Department to review construction items without follow-up review by the Department, the Consultant will assume the responsibility of the owner's agent. The reviewing consultant is encouraged to communicate with fabricators, contractors, specialty engineers and the FDOT Shop Drawing Review Office to clarify concerns before returning the submittal to the Contractor. The reviewing consultant shall also contact the Department's Structures Office if unsure of the Department's position on certain issues during the review. Where possible, mark all necessary requirements on the shop drawing sheet and stamp "APPROVED AS NOTED" instead of requiring a resubmittal. Submittals (unless otherwise noted below) shall be transmitted by the Contractor directly to the Consultant. Upon receipt of the submittal, the Consultant shall perform the review, note any comments directly on the sheets, make the appropriate numbers of copies, indicate his disposition by stamping the sheets as described hereinafter, retain one set of prints for his files and, finally, make distribution as described hereinafter. The original prints and calculations form the official, record Shop Drawing submittal and must be retained by the Engineer of Record and forwarded to the Department at the end of the project.

### **28.6.3.2 Review by Engineer of Record and the Department**

On projects where the Engineer of Record is a Consultant to the Department and has been retained by the Department to review construction items, submittals (unless otherwise noted below) shall be transmitted by the Contractor directly to the Consultant. Upon receipt of the submittal, the Consultant shall perform the review, note any comments directly on the sheets, indicate his disposition by stamping the sheets as

described hereinafter, retain one set of prints for his files and, finally, transmit the original sheets to the FDOT Shop Drawing Review Office for review and distribution. When submittals require a Specialty Engineer, the original prints and calculations from the official, record Shop Drawing submittal and must be retained by the Department. Upon completion of his review, the Consultant shall transfer his comments to the sealed sheets, indicate his disposition and transmit them to the Department as described above.

#### **28.6.4 Requirements for Consultant EOR (Design Services Only)**

On projects where the Engineer of Record is a Consultant to the Department but has not been retained by the Department to review construction items, submittals (unless otherwise noted below) shall be transmitted by the Contractor directly to the FDOT Shop Drawing Review Office or as directed at the project's preconstruction conference.

#### **28.6.5 Requirements for Architectural or Building Structures**

Submittals related to Architectural or Building Structures, such as Rest Areas, Picnic Pavilions, Offices and Warehouses, shall be made according to the requirements of the Architectural Services Group, Production Support Office, Florida Department of Transportation, 605 Suwannee Street, MS 40, Tallahassee, FL 32399-0450, Phone (850) 414-4378.

#### **28.6.6 Requirements for Roadway Submittal Items**

All submittals related to roadway plans such as attenuators, non-standard drainage structures, etc. (except bridge items such as poles and bracket arms, or as noted below) shall be distributed in accordance with the ***Construction Project Administration Manual (Topic No. 700-000-000)*** for the component involved or as otherwise directed at the project's preconstruction conference. Submittals related to bridge items shall be transmitted to the Department as previously described in this section.

## **28.6.7 Requirements for Overhead Sign Structures and Nonstandard Miscellaneous Structures**

Submittals concerning overhead sign structures and non-standard miscellaneous structures shall be transmitted in accordance with the General Requirements above.

## **28.6.8 Miscellaneous Requirements and Assistance**

For items not specified above or for which questions may arise as to submittal requirements, the Contractor should be advised to contact the appropriate FDOT Shop Drawing Review Office. For submittals of any type, the Contractor shall always have transmitted a copy of the letter of transmittal to the Engineer (CEI).

## 28.7 Disposition of Submittals

The approval or disapproval of submittals by the Reviewer shall be indicated by one of the following designations: "APPROVED" (no further action required), "APPROVED AS NOTED" (make corrections noted - no further submittal required), "RESUBMIT" (make corrections noted and resubmit for approval), or "NOT APPROVED" (rejected - do not resubmit the concept or component as submitted).

### Modification for Non-Conventional Projects:

Delete the above paragraph and replace with the following:

The approval or disapproval of submittals by the Engineer of Record shall be indicated by one of the following designations: "APPROVED" (no further action required), "APPROVED AS NOTED" (make corrections noted - no further submittal required), "RESUBMIT" (make corrections noted and resubmit for approval), or "NOT APPROVED" (rejected - do not resubmit the concept or component as submitted). Only shop drawings that have been "APPROVED", or "APPROVED AS NOTED" shall be submitted to the Department for review.

The Department shall stamp the drawings "RELEASE FOR CONSTRUCTION", "RELEASE FOR CONSTRUCTION AS NOTED", OR "RESUBMIT". Where possible, mark all necessary requirements on the shop drawing sheet and stamp "RELEASE FOR CONSTRUCTION AS NOTED" instead of requiring a resubmittal.

The disposition designation shall be indicated on each and every drawing sheet, or on the cover sheet of calculations, by the use of a red ink stamp. The stamp size shall not exceed 3" high by 3" wide, but 1 ½" high by 3" wide stamp is preferred. Stamps shall identify the approving groups, such as the Engineer of Record - Consultant, the Department's assigned commercial inspection agency and/or Department personnel, and the date. All notations or corrections made on the approval prints shall be consistently marked on all drawings.

All Consultants reviewing submittals shall red ink stamp and initial each item as noted above with the firm's appropriate stamp. Consultants must declare any limitations to the extent of their review and approval by the terminology of their standard stamp and/or by additional written and "ballooned" notes on the submittal items. When the Engineer of Record is a Consultant, and when a Subconsultant is retained to assist in the submittal

review, the Engineer of Record shall signify disposition of the submittal as noted above with the EOR's firm's appropriate stamp prior to distribution or prior to transmitting it by overnight delivery to the Department. In this event it is the Engineer of Record's prerogative to also require a disposition stamp by the Subconsultant.

When a submittal contains deviations from the Contract Plans and Specifications, the Consultant and the Department shall determine as to whether or not a Supplemental Agreement or Cost Savings Initiative Proposal (CSIP) is required. If either procedure is required to be initiated, the submittal shall not be reviewed until a decision is finalized.

When the Engineer of Record receives a submittal that is not in accordance with the requirements of this chapter, the Contractor shall be advised to resubmit immediately with the corrections or additions necessary.

Review and approval by the Engineer of Record (Consultant and/or Department) shall be for conformance with the design concept of the project and for compliance with the information given in the Contract Plans and Specifications (including Supplemental and Special Provisions). The review and approval shall not extend to means, methods, techniques, sequences or procedures of construction (except where a specific means, method, technique, sequence or procedure of construction is indicated in or required by the Contract Plans and Specifications) or programs incident thereto. The review and approval of a separate item as such will not indicate approval of the assembly in which the item functions.

Disposition of Shop Drawing submittals by the Engineer of Record for construction and erection equipment including beams and winches, launch gantry, erection trusses, forms, falsework, midspan and/or longitudinal closures, lifting devices, temporary bearing fixity devices, cranes, form travelers, segment carrying equipment and stability devices shall be either "NOT APPROVED" if deemed to be unacceptable or, if acceptable, shall be "APPROVED AS NOTED" with the following note included on the submittal drawings:

"Drawings are acceptable for coordination with, relationship to, and effects upon the permanent bridge; but have not been reviewed for self-adequacy. Adequacy and intended function remain the sole responsibility of the Contractor."

Unless otherwise specifically designated in a Consultant's Scope of Services or required by the Department, the Engineer of Record is not responsible for accepting or reviewing calculations or drawings pertaining to construction formwork. These documents should

normally be submitted to the Engineer (CEI) or, in the event they are erroneously transmitted to the Engineer of Record, should be immediately rerouted to the Engineer (CEI).

On projects when the Engineer of Record is a Consultant to the Department and the Department will also be reviewing shop drawings the Department will perform a second, confirmation review of the submittal upon receipt of the Consultant's transmittal of reviewed drawings are stamped for disposition as noted above. The primary purposes of the Department's review include: conformance with FDOT policy, standards, etc.; uniformity of disposition with similar submittals; accuracy and completeness of the Consultant's review; and attention to specific details, areas of work, etc. that have experienced recurring problems during fabrication and/or construction.

When the Specialty Engineer is required by the Contract Plans and specifications to perform a portion of the design of the project, the Engineer of Record shall confirm that:

1. The Specialty Engineer is qualified to design and prepare the submittal.
2. The specified number of submittals are furnished.
3. A minimum of one (1) set of Shop Drawings and the cover sheet of one (1) set of calculations are correctly sealed by the Specialty Engineer.
4. The Specialty Engineer understands the intent of the design and utilizes the correct specified criteria.
5. The configuration set forth in the submittal is consistent with that of the Contract Documents.
6. The Specialty Engineer's methods, assumptions and approach to the design are in keeping with accepted engineering practices.
7. The Specialty Engineer's design does not contain any gross inadequacies that would jeopardize or threaten public safety.

A detailed review of design calculations is not required, and a detailed review of dimensions (other than at interface areas with other work) is not required.

When a submittal has been returned as "RESUBMIT", the Contractor shall make corrections as required and shall return the required number of corrected copies for review. All revisions to a drawing, etc., shall be noted with a symbol consisting of the revision number within a triangle located next to revised area. The Contractor must direct specific attention in writing to revisions other than the corrections called for by the Department on previous submittals.

**Exhibits 28-A** thru **28-C** show the submittal and distributional flow of a shop drawing transmittal. When the Department concurs with the Consultant's review and disposition of the submittal, the Department will stamp and distribute the submittal including a record copy for the Consultant. Should the Department's review and/or disposition of the submittal differ from that of the Consultant, the final disposition of the submittal will be resolved in accordance with the following procedures:

**Modification for Non-Conventional Projects:**

Delete the above paragraph and replace with the following:

**Exhibit 28-E** shows the submittal and distributional flow of a shop drawing transmittal. When the Department concurs with the Design-Build Firm's Engineer of Record review and disposition of the submittal, the Department will stamp and distribute the submittal. Should the Department's review and/or disposition of the submittal differ from that of the Design-Build Firm's Engineer of Record, the final disposition of the submittal will be resolved in accordance with the following procedures:

## 28.7.1 Minor Modifications

The submittal will be processed when notations not involving design decisions are added, modified or deleted and when the disposition of the submittal remains unchanged or changed only in accordance with the following **Table 28.1**:

**Table 28.1 FDOT Changes to Minor Modifications**

From	To
Approved	Approved as Noted
Approved as Noted	Approved
Resubmit	Not Approved
Not Approved	Resubmit

In this event, the Department will notify the Consultant of the modifications, document the notification in the project's shop drawing file, process and distribute the submittal and furnish the Consultant with a record copy.

Modification for Non-Conventional Projects:

Delete **PPM** 28.7.1 and replace with the following:

### 28.7.1 Minor Modifications

The submittal will be processed when notations not involving design decisions are added, modified or deleted and when the disposition of the submittal remains unchanged or changed only in accordance with the following **Table 28.1**:

**Table 28.1 FDOT Changes to Minor Modifications**

From	To
Approved	Released for Construction as Noted
Approved as Noted	Released for Construction

In this event, the Department will notify the Design-Build Firm of the modifications, document the notification in the project's shop drawing file, process and furnish the Design-Build Firm with a record copy.

## 28.7.2 Major Modifications

The submittal will be returned to the Consultant for re-review when notations involving significant design decisions must be added, deleted or modified, when the submittal's review is deemed by the Department to be incomplete or require significantly more work or when the disposition of the submittal requires one of the following **Table 28.2**:

**Table 28.2 FDOT Changes to Major Modifications**

From	To
Approved or Approved as Noted	Not Approved or Resubmit
Not Approved or Resubmit	Approved or Approved as Noted

As above, the Department will notify the Consultant and document the notification. The submittal will be returned to the Consultant for re-review and return to the Department.

Modification for Non-Conventional Projects:

Delete **PPM** 28.7.2 and replace with the following:

## 28.7.2 Major Modifications

The submittal will be returned to the Design-Build Firm for re-review when notations involving significant design decisions must be added, deleted or modified, when the submittal's review is deemed by the Department to be incomplete or require significantly more work or when the disposition of the submittal requires one of the following **Table 28.2**:

**Table 28.2 FDOT Changes to Major Modifications**

From	To
Approved or Approved as Noted	Resubmit

As above, the Department will notify the Design-Build Firm and document the notification. The submittal will be returned to the Design-Build Firm for re-review and return to the Department.

## 28.8 Segmental Bridges - Shop Drawing Checklist

See the *FDOT Specifications* and the *Structures Manual* for Shop Drawing Checklist information.

## 28.9 Distribution of Submittals

**Exhibits 28-A** thru **28-C** show the submittal and distributional flow of shop drawings for reviews performed by Consultant EORs without DOT review, reviews performed by Consultant EOR with DOT review, and reviews performed by DOT only. In the case of reviews performed by Consultant EORs and DOT, the Consultant shall retain one (1) set of materials for his files and transmit the prints (or other sets of calculations or multiple sets of prints) to the FDOT Shop Drawing Review Office.

Distribution by overnight delivery is made in accordance with the following **Table 28.3**:

**Table 28.3 Shop Drawing Distribution Schedule**

DISTRIBUTION	FDOT - EOR	Reviews Performed by Consultant EOR with DOT Review,	Consultant – EOR Without Department Review
FDOT Shop Drawing Review Office File	1 Set Original Prints + 1 Set Calcs	1 Set Original Prints + 1 Set Calcs	1 Set Prints + 1 Set Calcs
Engineer of Record	N/A	1 Set Prints + 1 Set Calcs	1 Set Original Prints + 1 Set Prints + 1 Set Calcs
Engineer (CEI)	2 Sets Prints	2 Sets Prints	2 Sets Prints
Contractor	3 Sets Prints + 1 Set Calcs	3 Sets Prints + 1 Set Calcs	3 Sets Prints + 1 Set Calcs

When precast/prestressed concrete components are involved, the Department's District Prestress Engineer is furnished two (2) sets and the State Materials Office (Gainesville) is furnished one (1) set of prints. When structural steel components are involved, the Department's Assigned Commercial Inspection Agency (ACIA) is furnished two (2) sets.

The Contractor shall be responsible for transmitting a copy of the returned submittal to the appropriate subcontractor or fabricator.

When approval of a submittal is denied ("RESUBMIT" or "NOT APPROVED"), distribution of the submittal shall be made to the FDOT Shop Drawing Review Office's File, when the Department is reviewing shop drawings, and the Contractor only, with a copy of the transmittal letter to the Engineer (CEI).

Modification for Non-Conventional Projects:

Delete **PPM** 28.9 and replace with the following.

## 28.9 Distribution of Submittals

**Exhibit 28-E** shows the submittal and shop drawing flow diagram for design-build projects. The Contractor shall retain at least one (1) set of materials for file retention and transmit the prints (or other sets of calculations or multiple sets of prints) to the FDOT Shop Drawing Review Office with a copy of the transmittal to the Engineer (CEI).

Distribution by overnight delivery is made in accordance with the following **Table 28.3**:

**Table 28.3 Shop Drawing Distribution Schedule**

DISTRIBUTION	Documents
FDOT Shop Drawing Review Office File	1 Set Original Prints + 1 Set Calcs
Engineer of Record	1 Set Original Prints + 1 Set Calcs
Engineer (CEI)	2 Sets Prints + 1 Set Calcs
Contractor	3 Sets Prints + 1 Set Calcs

When precast/prestressed concrete components are involved, the Department's District Prestress Engineer is furnished two (2) sets and the State Materials Office (Gainesville) is furnished one (1) set of prints. When structural steel components are involved, the Department's Assigned Commercial Inspection Agency (ACIA) is furnished two (2) sets. When mechanical/electrical components of movable bridges are involved, the Mechanical/Electrical Section of the State Structures Design Office (SSDO) is furnished one (1) set of prints and one (1) set of calculations.

The Contractor shall be responsible for transmitting a copy of the returned submittal to the appropriate subcontractor, specialty engineer, ENGINEER OF RECORD or fabricator.

## 28.10 Review of Prequalified Joint Welding Procedures

In accordance with **Section 11.2** of the *Materials Manual*, the approval of all joint welding procedures specification (WPS) will be the responsibility of the Department's Verification Inspection Consultant, which is the Department's Assigned Commercial Inspection Agency (ACIA). The State Materials Office maintains the list of the approved WPS which may be used on all future projects by the fabricator who developed them, until their expiration. A list of the welding procedures to be used on any individual project will be forwarded to the Engineer of Record (EOR) prior to the start of fabrication. The EOR may elect to review these documents, but it is the responsibility of the Verification Inspection Consultant to assure the proper welding procedure is used at the correct location. Shop drawings depicting plate sizes, types of welds, weld designations, weld sizes, grades of materials, etc. will continue to be reviewed by the EOR.

The fabricators of the following products are only required to include their approved Welding Procedure Specification as part of their quality control plan:

1. Overhead cantilevered sign supports with cantilevered arms less than or equal to 41 feet,
2. Overhead span sign supports,
3. Aluminum light poles,
4. High mast light poles,
5. Expansion joints,
6. Open grid decking,
7. Bearings,
8. Monotube Assemblies,
9. Mast arm assemblies,
10. Drainage items,
11. Stay-in-place forms,
12. Casing pipes,
13. Steel strain poles,
14. Pedestrian/Bicycle Railings
15. Any other items that are not designated as items requiring commercial inspections.

## **28.11 Submittal Activity Record (Logbook)**

The Final Review Office is responsible for maintaining a Submittal Activity Record (Logbook) on each project reviewed by the office. The logbook shall be updated each day that any Shop Drawing submittal activity occurs.

The following minimum data shall be entered in the logbook for each submittal:

Financial Project ID and State Project Number (if assigned).

Submittal Number.

Description of Submittal.

Number of Sheets in the Submittal.

Number of Pages of Calculations, in Reports, in Manuals, etc.

Date Transmitted by Contractor to the Engineer of Record.

Date Transmitted by Engineer of Record (when EOR is not the final reviewer) to the Final Review Office.

Date Distributed by the Final Review Office to the Contractor.

Disposition as either "A" (Approved), "AN" (Approved as Noted), "R" (Resubmit) or "NA" (Not Approved).

The Logbook is an historical record of the activity devoted to an individual submittal as well as that for the project as a whole. It can serve as a verification of review time, to respond to inquiries of a particular submittal's status and as a record of manpower effort to aid in estimating and allocating future workload.

## 28.12 Archiving Record Shop Drawings

Upon completion and acceptance of a construction project by the Department (usually by receipt of a written Notice of Acceptance), the Final Review Office, within thirty (30) days, shall transmit the Record Shop Drawings to the appropriate offices, as dictated by district practice in the District in which the project is located. The Record Shop Drawings may include some or all of the following documents:

1. Shop Drawings
2. Erection Drawings
3. Calculations
4. Manuals
5. Project Files of Shop Drawing transmittal letters, etc.
6. Submittal Activity Record (Logbook printout)

The Final Review Office shall complete the Record Shop Drawing Transmittal (see **Exhibit 28-D**), in triplicate, retaining one (1) copy and transmitting two (2) copies, along with the Record Shop Drawings described above, to the appropriate office. The Record Shop Drawing Transmittal describes all the Record Shop Drawing documents being transmitted.

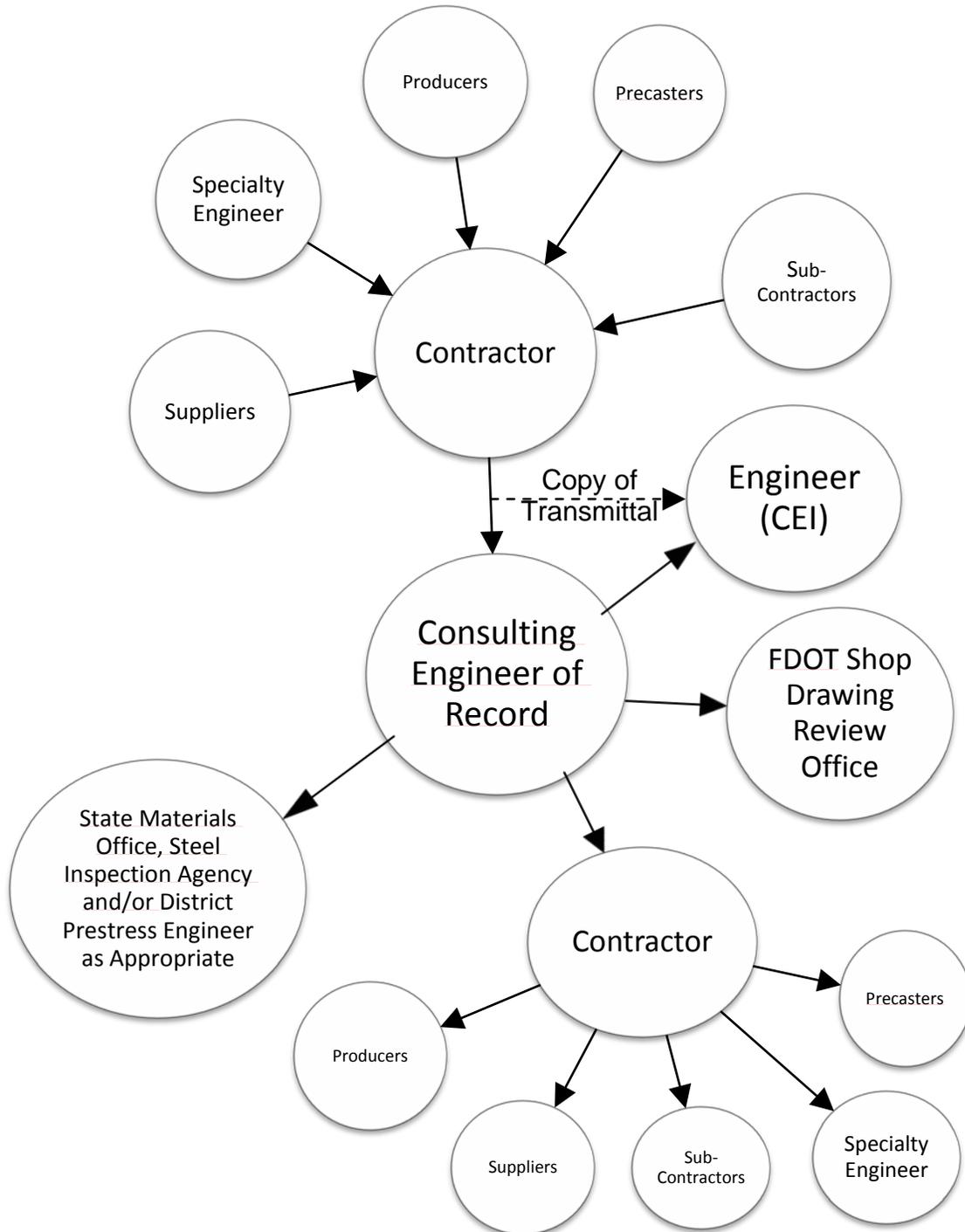
The Submittal Activity Record (logbook) is intended to serve as the listing of all Shop and Erection Drawings transmitted. Other transmitted material such as project files, samples, etc. should be listed individually on the Transmittal shown in **Exhibit 28-D**.

Upon receipt of the Record Shop Drawings, the offices receiving the transmittal shall verify the documents, material, etc. transmitted, sign and date both copies of the Record Shop Drawing Transmittal, retain one (1) copy for his files and return the second signed copy to the Final Review Office.

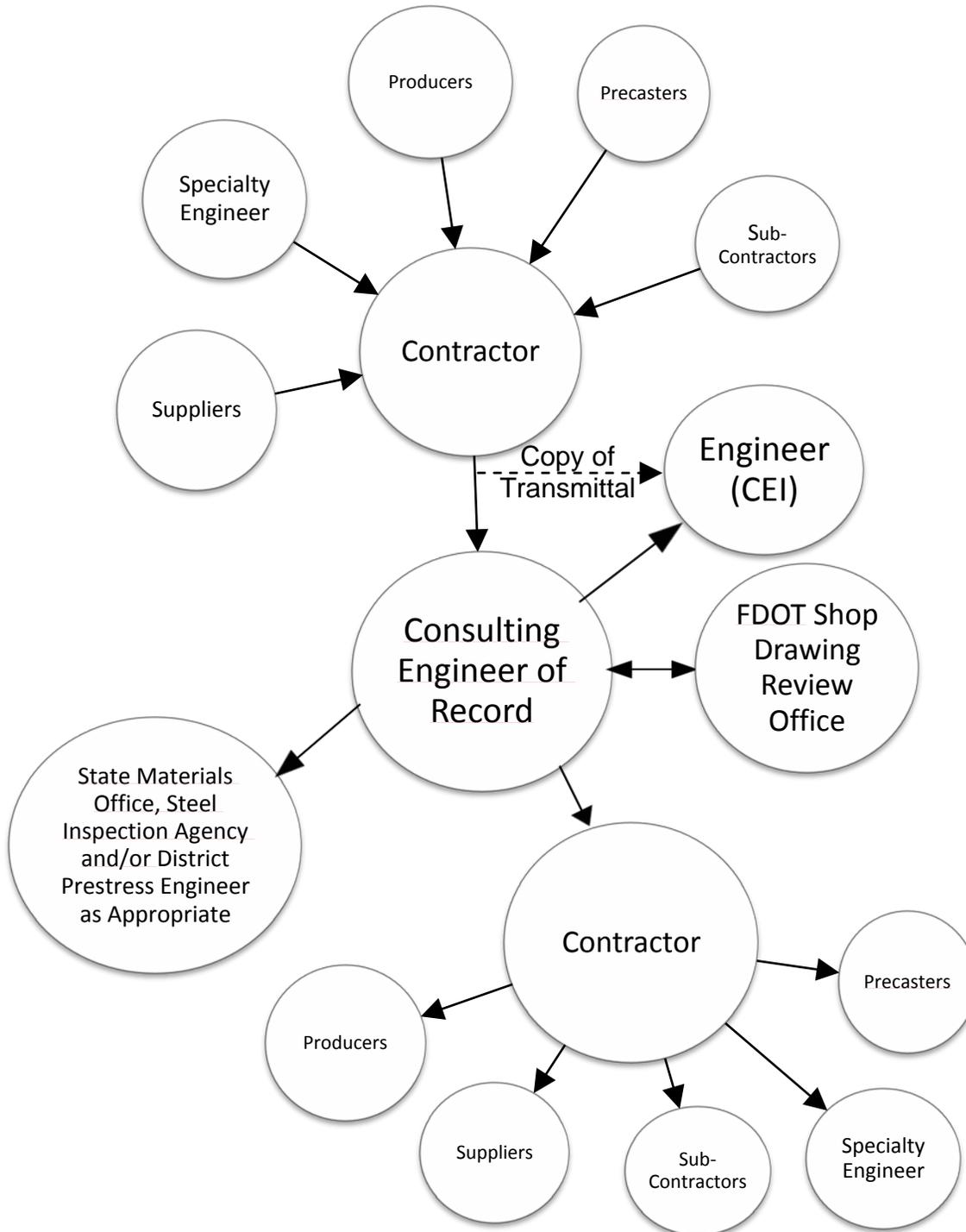
The Final Review Office shall maintain a file of Record Shop Drawing Transmittals (**Exhibit 28-D**) for future reference and use. Once the signed copy of the Record Shop Drawing Transmittal is received, the Final Review Office's initially retained Record Shop Drawing Transmittal may be discarded.

It should be noted that for Shop Drawing submittals requiring a Specialty Engineer, the Record Shop Drawing submittal normally will consist of sealed prints.

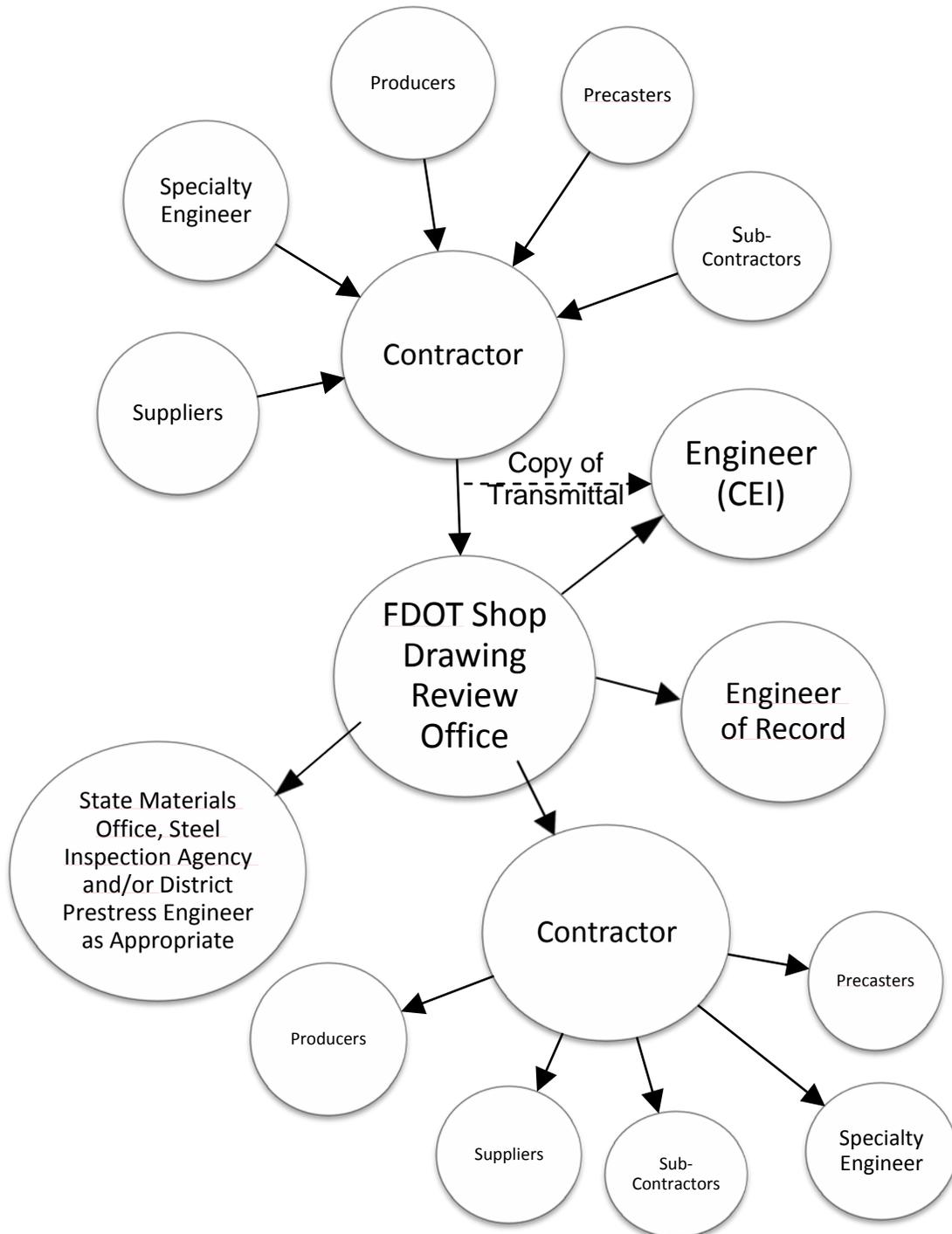
### Exhibit 28-A Shop Drawing Flow Diagram for Reviews with Consultant EORs without DOT Review



**Exhibit 28-B Shop Drawing Flow Diagram for Performed by Consultant EOR with DOT Review**



### Exhibit 28-C Shop Drawing Flow Diagram for Reviews Performed by DOT Only



**Exhibit 28-D Record Shop Drawing Transmittal**

(Letterhead of Final Review Office)

**RECORD SHOP DRAWING TRANSMITTAL**

Date \_\_\_\_\_

TO: (Destination Office)

FROM: \_\_\_\_\_

(Final Review Office)

PROJECT NAME \_\_\_\_\_

FINANCIAL PROJECT ID \_\_\_\_\_

FEDERAL AID PROJECT NO. \_\_\_\_\_

CONTRACT ID NUMBER \_\_\_\_\_

COUNTY (SECTION) \_\_\_\_\_

STATE ROAD NUMBER \_\_\_\_\_

BRIDGE NUMBER \_\_\_\_\_

CONTRACTOR \_\_\_\_\_

ENGINEER OF RECORD \_\_\_\_\_

We are transmitting herewith the following Record Shop Drawings for archiving:

1. Shop and Erection Drawing Submittals per attached Logbook.

2. Submittal Activities Record (Logbook)

3. \_\_\_\_\_

4. \_\_\_\_\_

5. \_\_\_\_\_

6. \_\_\_\_\_

For the Final Review Office: \_\_\_\_\_

(Signature)

(Date)

For the Receiving Office:

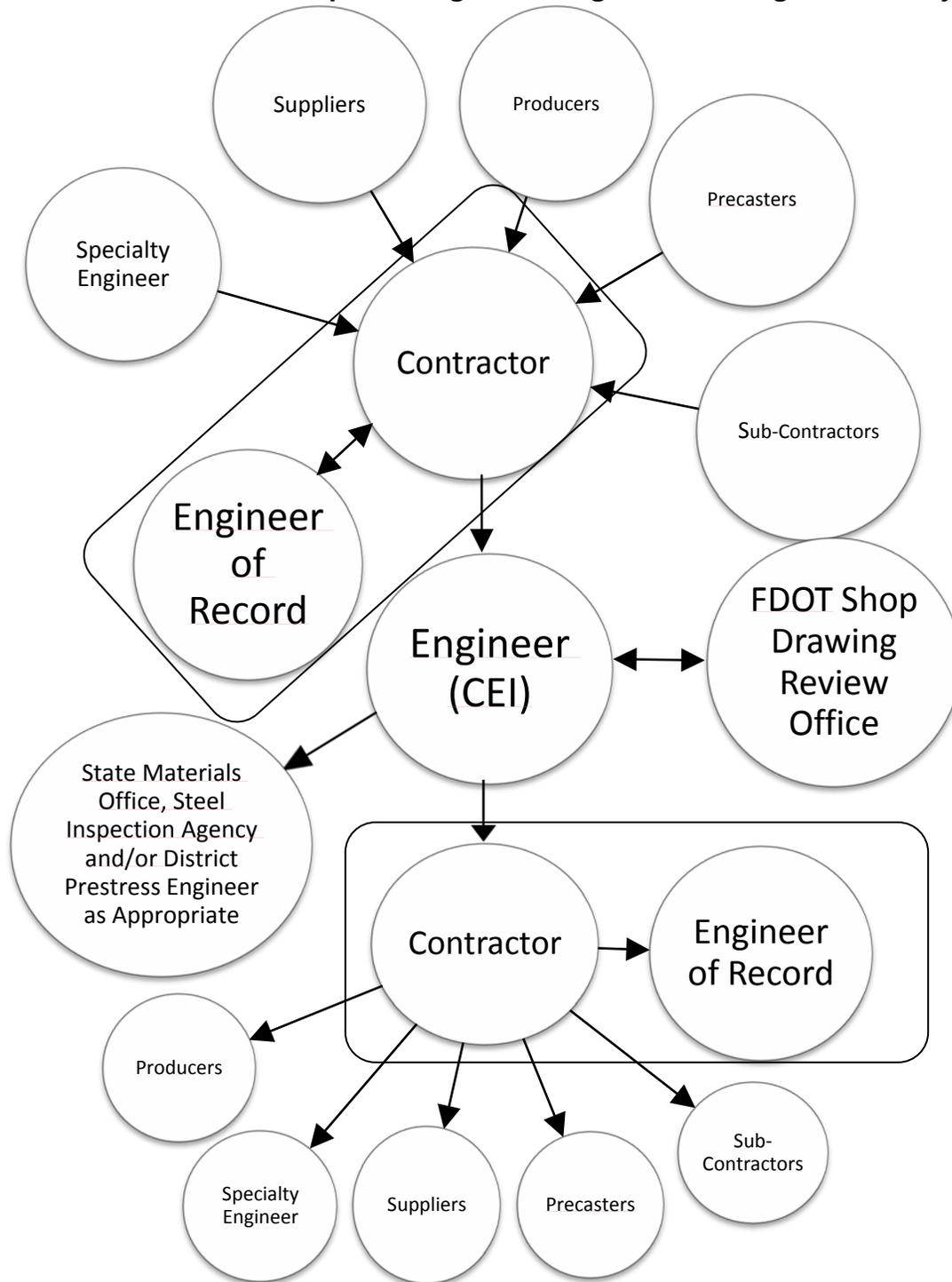
\_\_\_\_\_

(Signature)

\_\_\_\_\_

(Date)

### Exhibit 28-E Shop Drawing Flow Diagram for Design-Build Projects



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