152 Shop Drawing Submittals

152.1 Introduction

While the Contract Plans and Specifications (including Supplemental and Special Provisions) define the overall nature of the project, a Shop Drawing submittal is the accepted method of approving a specific element of the work while allowing flexibility in the Contractor's means and methods. The Contract Plans and Special Provisions for the project are to identify the requirements for submittal of Shop Drawings.

Shop Drawing submittals must meet or exceed the quality level of previously approved submittals of a similar nature and be complete enough to allow for fabrication of an item without referencing any other document.

A Shop Drawing submittal for structural bridge components (e.g., steel girders, non-standard precast/prestressed beams) typically includes plan and elevation views denoting the placement of a component in the structure.

Unless explicitly stated, definitions shown referencing the ***Standard Specifications*** are the same for the Design-Build Division I Specifications:

(1) **Shop Drawings:** See Specifications.

(2) **Engineer:** See Specifications.

(3) **Engineer of Record (EOR):** See Specifications.

Modification for Non-Conventional Projects:
Delete **Engineer of Record (EOR)** definition and replace with the following: (3) **Engineer of Record (EOR):** See Design-Build Specifications.

(4) **Contractor’s Engineer of Record:** See Specifications.

(5) **Specialty Engineer:** See Specifications.

(6) **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.

(7) **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: (7) **Architect of Record**: The Architect or Architectural Firm registered in the State of Florida that performs services for the Design-Build Firm in connection with the design and construction of buildings.

(8) **"Ballooning"**: The Contractor's use of minimum 1/16 inch wide lines to "balloon" or "cloud" (encircle) notes or details on drawings, and design calculations, in order to explicitly and prominently call out any deviations from the Contract Plans or Specifications. The EOR may also use "ballooning" to make note of any limitations to their submittal review and disposition of Shop Drawings.

(9) **Record Shop Drawings**: The Department's official record copy of all Shop Drawings, correspondence/transmittal files and submittal activity record (logbook).

(10) **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 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.

(11) **Final Review Office**: The FDOT Shop Drawing Review Office or the EOR performing the final review and making final distribution of Shop Drawings which have been reviewed.

(12) **Demolition of Bridges with Continuous Beams or Girders Affecting Public Safety**: See Specifications.

(13) **Construction Works Affecting Public Safety**: See Specifications.

Modification for Non-Conventional Projects:
Expand the list above with the following: (14) **Design-Build Firm:** See Design-Build Specifications.

152.2 Shop Drawing Submittals Not Required

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 Approved Product List (***APL***) is typically submitted by the Contractor to the Engineer (CEI).

152.3 Contractor Information Required

A Shop Drawing submittal that omits any of the minimum requirements listed in ***Standard Specifications***, ***Section 5-1*** must be returned for resubmittal.

Modification for Non-Conventional Projects:
Delete ***FDM 152.3*** and see RFP for Shop Drawing requirements.

152.4 Submittals Requiring a Specialty Engineer or Contractor's Engineer of Record

When required, the Specialty Engineer or Contractor's Engineer of Record must provide a signed and sealed Shop Drawing submittal. The signed and sealed Shop Drawings will be retained by the Department as the official Record Shop Drawing.

Signed and sealed Shop Drawing submittals by a Specialty Engineer or Contractor's Engineer of Record typically include signed and sealed drawings and calculations.

152.5 Transmittal of Submittals

Submittal of Shop Drawings must be made by the project Contractor to the designated parties, as applicable. Submittals will not be accepted from a subcontractor or fabricator. Subcontractors and fabricators are encouraged to contact the appropriate FDOT Shop Drawing Review Office for guidance.

Figures 152.11.1 through ***152.11.3*** shown in ***FDM 152.11*** illustrate the flow of submittals during the review process. Use electronic delivery to transmit submittals between parties.

Modification for Non-Conventional Projects:
Delete the above paragraph and replace with the following: ***Figure 152.11.4*** shows the flow of critical temporary works Shop Drawings affecting public safety including erection manuals and erection plans. ***Figure 152.11.4*** also shows the flow of demolition plans of a bridge with continuous beams or girders where one span within the unit is over traffic. Use electronic delivery to transmit submittals between parties. ***Figure 152.11.5*** shows the flow of all other Shop Drawing submittals. Use electronic delivery to transmit submittals between parties. See RFP for transmittal and submittal review requirements.

The Special Provisions for the project may denote the number of drawings to be submitted and the procedure to be followed. Furthermore, the office to which the Contractor must transmit the submittal and the procedure to be followed may also be defined during the preconstruction conference for the project.

152.5.1 Requirements for Department EOR

On projects where the EOR is Department in-house staff, transmit submittals 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.

The EOR must perform a thorough review of the shop drawings, implement a QA/QC Plan, provide a QA/QC check print to the Department, and ensure that all components depicted in the shop drawings are being constructed/fabricated in accordance with the RFC Plans and other Contract Documents. The shop drawing stamp (e.g., "APPROVED" or "APPROVED AS NOTED") must include language that states that the shop drawing was reviewed in accordance with ***FDM 152*** and with the Contract.

Modification for Non-Conventional Projects:
Delete ***FDM 152.5.1*** and replace with the following: **152.5.1 Review Requirements for EOR** The EOR must perform a thorough review of the shop drawings, implement a QA/QC Plan, provide a QA/QC check print to the Department, and ensure that all components depicted in the shop drawings are being constructed/fabricated in accordance with the RFC Plans and other Contract Documents. The shop drawing stamp (e.g. "APPROVED" or "APPROVED AS NOTED") must include language that states that the shop drawing was reviewed in accordance with ***FDM 152*** and with the Contract.

152.5.2 Requirements for Consultant EOR (Full Services)

152.5.2.1 Review by Engineer of Record Only

On projects where the EOR 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 must 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. The Contractor will transmit the submittals directly to the Consultant (unless otherwise noted below). Upon receipt of the submittal, the Consultant must:

- perform the review,
- note any comments on the sheets,
- indicate disposition by stamping the sheets as described hereinafter, and
- make distribution as described hereinafter.

The original submittal forms the official Record Shop Drawing submittal and must be sent by the EOR to the Department at the end of the project.

152.5.2.2 Review by Engineer of Record and the Department

On projects where the EOR is a Consultant to the Department and has been retained by the Department to review construction items, submittals (unless otherwise noted below)

must be transmitted by the Contractor directly to the Consultant. Upon receipt of the submittal, the Consultant must perform the review, note any comments on the sheets, indicate the Consultant's disposition by stamping the sheets as described hereinafter, and transmit the sheets to the FDOT Shop Drawing Review Office for review and distribution. When submittals require a Specialty Engineer, the original submittal forms the official Record Shop Drawing submittal and must be retained by the Department. Upon completion of this review, the Consultant must:

- transfer their comments to the sealed sheets,
- indicate their disposition, and
- transmit the comments to the Department as described above.

Modification for Non-Conventional Projects:

Delete ***FDM 152.5.2*** and replace with the following:

152.5.2 Review Requirements for Shop Drawings Affecting Public Safety

The EOR must perform a thorough review of the shop drawings, implement a QA/QC Plan, provide a QA/QC check print to the Department, and ensure that all components depicted in the shop drawing are being constructed, fabricated, or demolished in accordance with the RFC Plans and other Contract Documents.

An Independent Peer Review must be performed for all critical temporary works shop drawings, erection manuals, and erection plans affecting public safety. This includes demolition plans of a bridge with continuous beams or girders where one span within the unit is over traffic. This review is a comprehensive independent verification of the design of the structural elements depicted in the shop drawing. The Independent Peer Review cannot be performed by the originator of the shop drawing and must be completed by either the EOR or by an Independent Peer Reviewer. The Independent Peer Review must follow one of the processes below (depending on who performs the Review):

- The EOR performs the Independent Peer Review: The EOR will apply the shop drawing stamp (e.g., "APPROVED" or "APPROVED AS NOTED") and must include a signed and sealed certification letter stating that an Independent Peer Review was performed in accordance with ***FDM 152*** and with the Contract. The certification letter must clearly state which components (e.g., temporary works) were reviewed.

- An Independent Peer Reviewer performs the Independent Peer Review: The EOR will apply the shop drawing stamp (e.g., "APPROVED" or "APPROVED AS NOTED") and include a statement that the shop drawing was reviewed in accordance with ***FDM 152*** and with the Contract, but an Independent Peer Review was not performed. Then, an Independent Peer Reviewer qualified under ***Florida Administrative Code***, ***Rule 14-75*** (in the Work Group for the structure being constructed, fabricated, or demolished) must perform the Independent Peer Review. The Independent Peer Reviewer must sign and seal a certification letter stating that an Independent Peer Review was performed in accordance with ***FDM 152*** and with the Contract. The certification letter must clearly state which components (e.g., temporary works) were reviewed.

152.5.3 Requirements for Consultant EOR (Design Services Only)

On projects where the EOR is a Consultant to the Department but has not been retained by the Department to review construction items, the contractor will transmit submittals (unless otherwise noted below) directly to the FDOT Shop Drawing Review Office or as directed at the project's preconstruction conference.

Modification for Non-Conventional Projects:
Delete ***FDM 152.5.3.***

152.5.4 Requirements for Architectural or Building Structures

Submittals related to Architectural or Building Structures, such as Rest Areas, Picnic Pavilions, Offices and Warehouses, must be made by a Registered Architect licensed in the State of Florida.

152.5.5 Requirements for Roadway Submittal Items

Distribute all submittals related to roadway plans such as attenuators and non-standard drainage structures (except bridge items such as poles and bracket arms, or as noted below) in accordance with the ***Construction Project Administration Manual (CPAM)*** for the component involved or as otherwise directed at the project's preconstruction conference. Submittals related to bridge items must be transmitted to the Department as previously described in this section.

152.5.6 Requirements for Overhead Sign Structures and Nonstandard Miscellaneous Structures

Transmit submittals concerning overhead sign structures and non-standard miscellaneous structures as previously described in this section.

152.5.7 Miscellaneous Requirements and Assistance

Items not specified above or for which questions may arise regarding submittal requirements, the Contractor should be advised to contact the appropriate FDOT Shop Drawing Review Office. Regardless of submittal type, a letter of transmittal must always accompany a submittal.

152.6 Disposition of Submittals

The approval or disapproval of submittals by the Reviewer must 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 insufficient data submitted in order to perform a complete review), 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 EOR must 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 insufficient data submitted in order to perform a complete review), or "NOT APPROVED" (rejected - do not resubmit the concept or component as submitted). Only shop drawings that have been "APPROVED", or "APPROVED AS NOTED" must be submitted to the Department for review. Submit copies of QA/QC shop drawing check prints to the CEI along with the shop drawing. The Department must 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.

Indicate the disposition designation on each and every drawing sheet, or on the cover sheet of calculations, by the use of an electronic, red-colored stamp. The electronic stamp size must not exceed 3” high by 3” wide, but 1 ½” high by 3” wide stamp is preferred. Stamps must identify the approving groups, such as the EOR-Consultant, the Department's Verification Inspection Consultant and Department personnel, and the date. All notations or corrections made on the approval prints must be consistently marked on all drawings.

All Consultants reviewing submittals must red-ink-stamp and initial each item as noted above with the firm's appropriate stamp. When the EOR is a Consultant, and when a sub-consultant is retained to assist in the submittal review, the EOR must signify disposition of the submittal as noted above with the EOR’s firm's appropriate stamp prior to distribution or prior to transmitting it to the Department. In this event it is the EOR's prerogative to also require a disposition stamp by the sub-consultant.

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

Disposition of Shop Drawing submittals by the EOR for construction and erection equipment including beams and winches, launch gantry, erection trusses, forms, falsework, midspan and longitudinal closures, lifting devices, temporary bearing fixity devices, cranes, form travelers, segment carrying equipment and stability devices must be either "NOT APPROVED" if deemed to be unacceptable or, if acceptable, must 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 considered as Construction Affecting Public Safety, the EOR 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 EOR, should be immediately rerouted to the Engineer (CEI).

On projects when the EOR 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 reviewed submittal, the Department will stamp the submittal with the disposition as noted above. The primary purposes of the Department's review include: conformance with FDOT policy and standards; uniformity of disposition with similar submittals; accuracy and completeness of the Consultant's review; and attention to specific details or areas of work that have experienced recurring problems during fabrication or construction.

When the Specialty Engineer or Contractor’s Engineer of Record is required by the Contract Plans and specifications to perform a portion of the design of the project, the EOR must confirm that:

(1) The Specialty Engineer or Contractor’s Engineer of Record is prequalified with the Department as such to design and prepare the submittal.

(2) The Shop Drawings are correctly signed and sealed by the Specialty Engineer or Contractor’s Engineer of Record.

(3) The Specialty Engineer or Contractor’s Engineer of Record understands the intent of the design and utilizes the correct specified criteria.

(4) The configuration set forth in the submittal is consistent with that of the Contract Documents.

(5) The Specialty Engineer's or Contractor's Engineer of Record's methods, assumptions and approach to the design are in keeping with accepted engineering practices.

(6) The Specialty Engineer's or Contractor's Engineer of Record's design does not contain any gross inadequacies that would jeopardize or threaten public safety.

Figures 152.11.1 through ***152.11.3*** shown in ***FDM 152.11*** illustrate 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.

Modification for Non-Conventional Projects:
Delete the above paragraph and replace with the following: ***Figures 152.11.4*** and ***152.11.5*** show the submittal and distributional flow of a shop drawing transmittal. When the Department concurs with the Design-Build Firm's EOR review and disposition of the submittal, the Department will stamp and distribute the submittal.

152.6.1 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 ***Table 152.6.1***:

Table 152.6.1 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 copy.

Modification for Non-Conventional Projects:

Delete ***FDM 152.6.1*** and replace with the following:

152.6.1 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 152.6.1***:

Table 152.6.1 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 copy.

152.6.2 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. The Department will notify the Consultant and document the notification in accordance with ***Table 152.6.2***. The submittal will be returned to the Consultant for re-review and return to the Department.

Table 152.6.2 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

Modification for Non-Conventional Projects:

Delete ***FDM 152.6.2*** and replace with the following:

152.6.2 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. The Department will notify the Design-Build Firm and document the notification in accordance with ***Table 152.6.2***. The submittal will be returned to the Design-Build Firm for re-review and return to the Department.

Table 152.6.2 FDOT Changes to Major Modifications

From	To
Approved or Approved as Noted	Resubmit

152.7 Distribution of Submittals

Figures 152.11.1 through ***152.11.3*** shown in ***FDM 152.11*** illustrate the submittal and distributional flow of shop drawings for reviews performed by Consultant EORs without FDOT review, reviews performed by Consultant EORs with FDOT review, and reviews performed by FDOT only. In the case of reviews performed by Consultant EORs and FDOT, the Consultant must transmit Shop Drawings to the appropriate FDOT Shop Drawing Review Office.

When precast/prestressed concrete components are involved, copies of the Shop Drawings are to be submitted to the Department's District Prestress Engineer and the State Materials Office (Gainesville). When structural steel components are involved, copies of the Shop Drawings are to be submitted to the Department's Verification Inspection Consultant.

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

Modification for Non-Conventional Projects:

Delete ***FDM 152.7*** and replace with the following.

152.7 Distribution of Submittals

Figure 152.11.4 shows the submittal and shop drawing flow diagram for design-build projects. The Contractor submits Shop Drawings to the Engineer (CEI).
When precast/prestressed concrete components are involved, copies of the Shop Drawings are submitted to the Department's District Prestress Engineer and the State Materials Office (Gainesville). When structural steel components are involved, copies of the Shop Drawings are submitted to the Department's Verification Inspection Consultant.

152.8 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. The State Materials Office maintains the list of the approved WPSs which may be used on all future projects by the fabricator who developed them, until their expiration. A list of the approved WPSs will be provided with the submittal of the Shop Drawings. The EOR may elect to review these documents. Shop drawings depicting plate sizes, types of welds, weld designations, weld sizes and grades of materials will continue to be reviewed by the EOR.

152.9 Submittal Activity Record (Logbook)

The Final Review Office is responsible for maintaining a Submittal Activity Record (Logbook) on each project reviewed by the office. Update the logbook each day that any Shop Drawing submittal activity occurs. Enter the following minimum data in the logbook for each submittal:

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

(2) Submittal Number.

(3) Description of Submittal.

(4) Number of Sheets in the Submittal.

(5) Number of Pages of Calculations, in Reports, and in Manuals.

(6) Date Transmitted by Contractor to the EOR.

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

(8) Date Distributed by the Final Review Office to the Contractor.

(9) 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 staff hour effort to aid in estimating and allocating future workload.

152.10 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 will transmit the Record Shop Drawings to the appropriate offices within thirty (30) days, as dictated by 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 (including all relevant data as set forth in the Specifications)

(2) Project Files of Shop Drawing transmittal letters

(3) Submittal Activity Record

The Final Review Office must complete the Record Shop Drawing Transmittal (see ***Form 152-A***, located in ***FDM 103***), and transmit 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 Drawings transmitted. Other transmitted material such as project files and samples should be listed individually on the Transmittal shown in ***Form 152-A***.

Upon receipt of the Record Shop Drawings, the offices receiving the transmittal will verify the documents and material transmitted, sign and date the Record Shop Drawing Transmittal, and return a copy to the Final Review Office.

The Final Review Office will maintain a file of Record Shop Drawing Transmittals (***Form 152-A***) 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.

152.11 Shop Drawing Flow Diagrams

Figures 152.11.1 through ***152.11.5*** show the submittal and distributional flow of shop drawing reviews.

Figure 152.11.1 Shop Drawing Flow Diagram for Reviews with Consultant EORs without FDOT Review

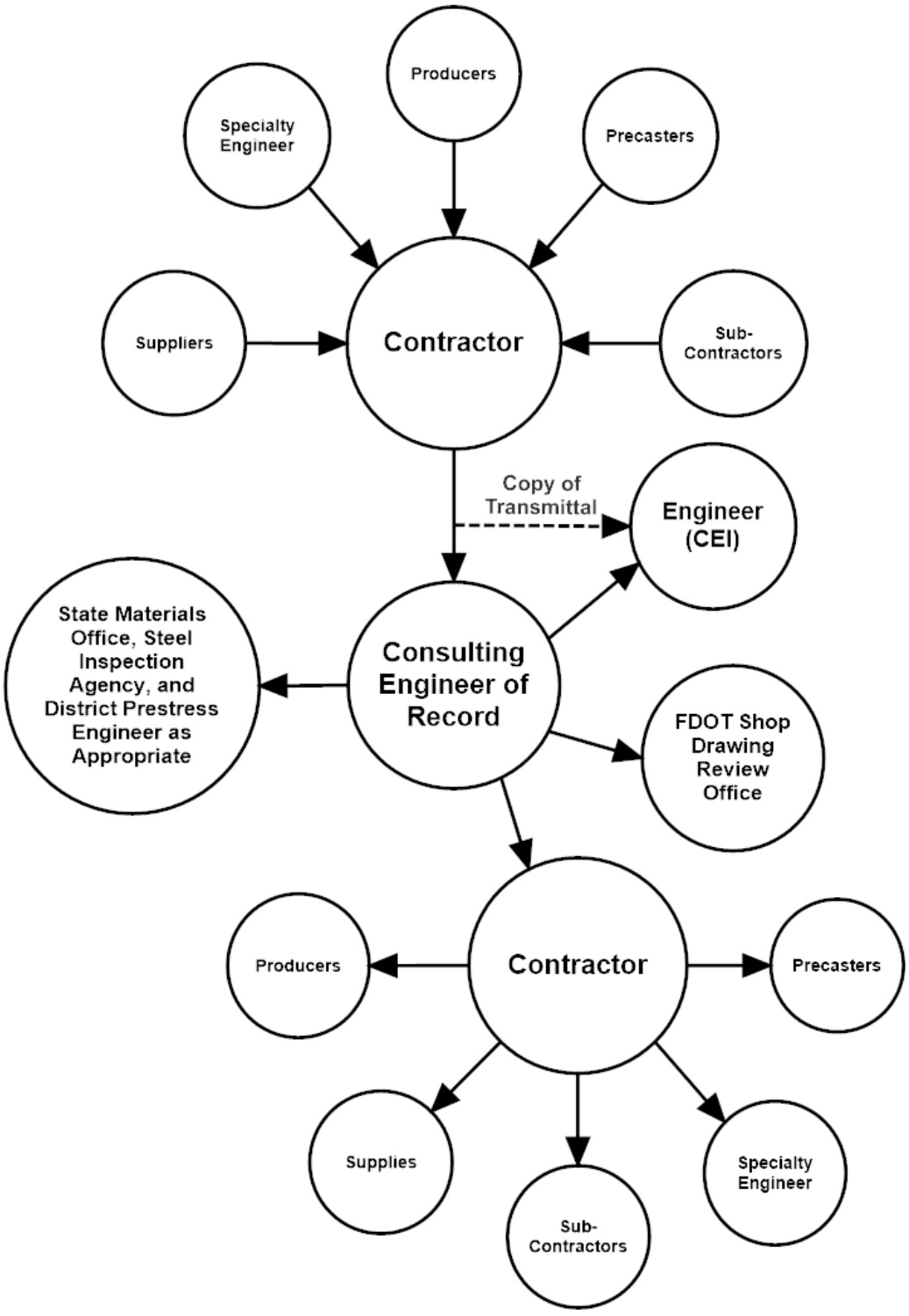


Figure 152.11.2 Shop Drawing Flow Diagram for Reviews Performed by Consultant EOR with FDOT Review

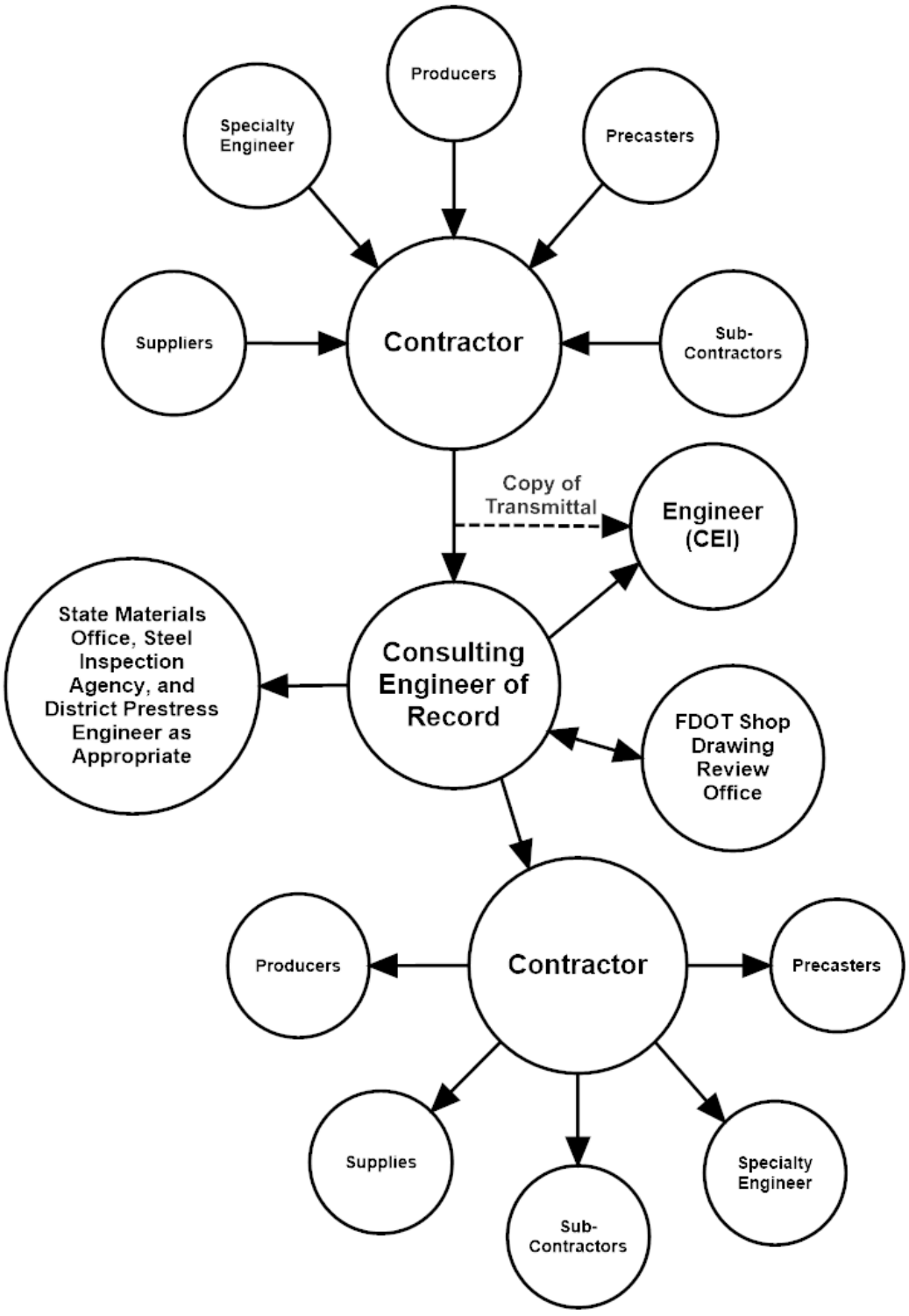


Figure 152.11.3 Shop Drawing Flow Diagram for Reviews Performed by FDOT Only

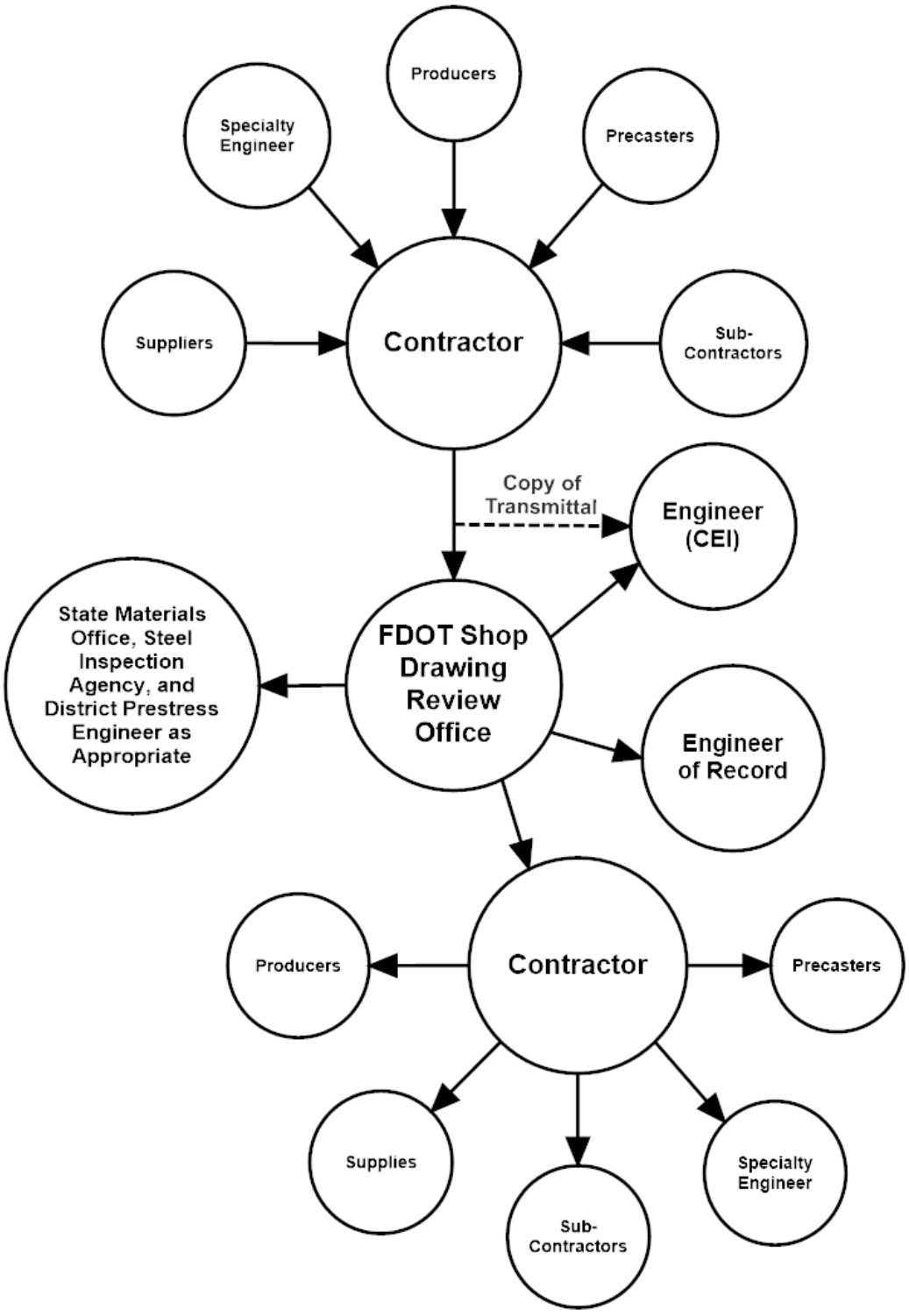


Figure 152.11.4 Shop Drawing Flow Diagram for Design-Build Project- Shop Drawings Affecting Public Safety

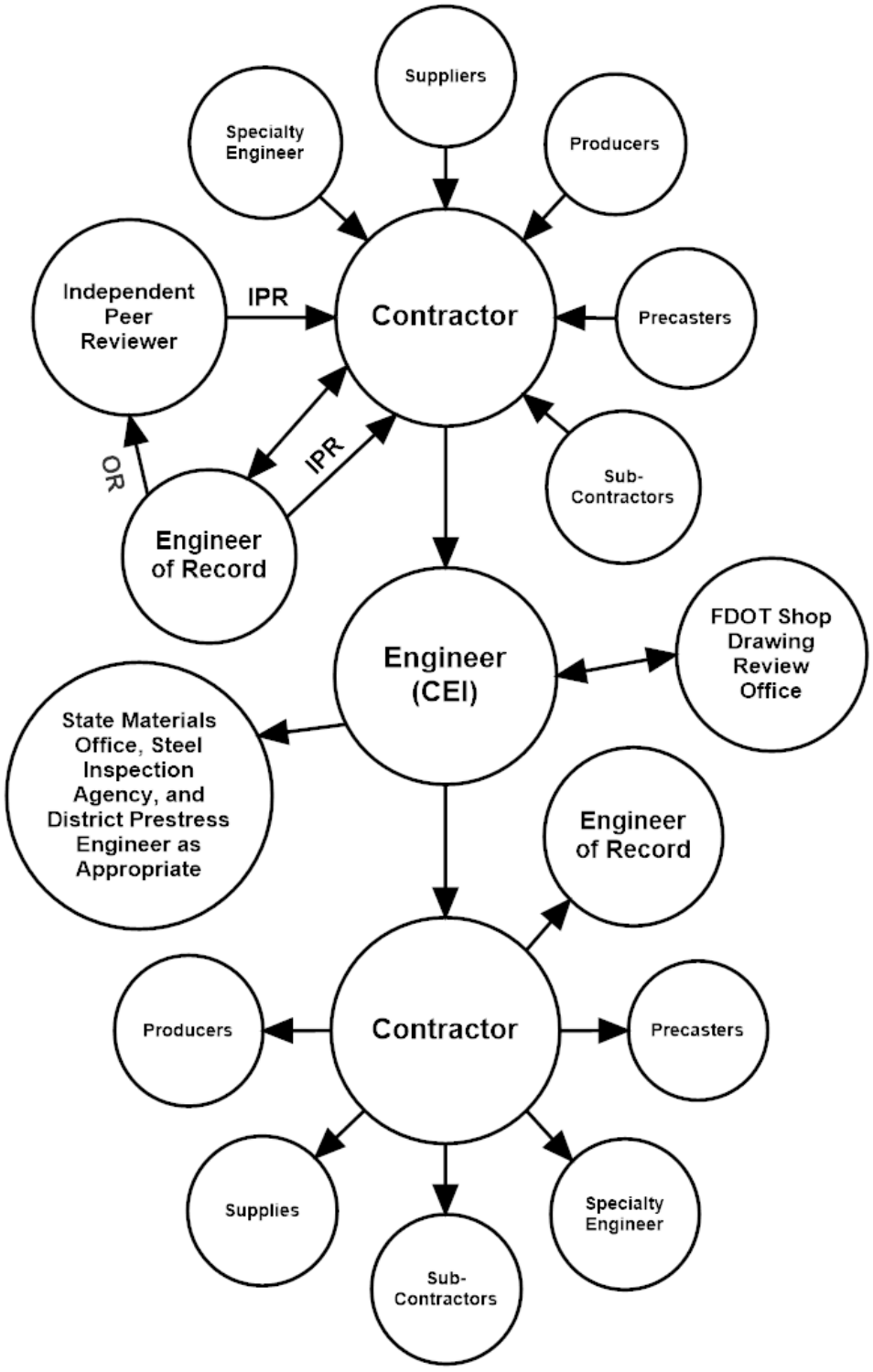


Figure 152.11.5 Shop Drawing Flow Diagram for Design-Build Projects-Shop Drawings Not Affecting Public Safety

