

SHOP & PLACEMENT DRAWINGS and OTHER SUBMITTALS : DO's & DON'Ts

SUBMITTALS :

The purpose of shop and placement drawings and other submittals is as follows :

- 1.) To accurately detail the size, location, distribution, grades of materials, ingredients and finishes of all the structural elements shown in the Design Drawings.
- 2.) To represent the materials to be supplied along with fabrication and installation details, such as bends, anchors, clearances, connections, laps, joints, fasteners, mixtures, tolerances, etc.
- 3.) To demonstrate the general contractor's, erectors' and material suppliers' understanding of the project scope and design intent.
- 4.) To verify the acceptability of structural elements before fabrication and assembly begins.
- 5.) To provide working documents approved by the Structural Engineer of Record (SER) for use by the Special Inspector of Record (SIR) in the verification of the materials and installation of the structural elements.
- 6.) To provide a level of detail that will ensure a coordinated interface between the installations of all trades.

OUR POLICY :

Certain contractors price and bid on an assumption of leniency and flexibility by design professionals during the submittal review process; and assess what items might avoid close scrutiny for compliance with the requirements of the project documents. While other firms may be casual in verifying a contractor's obligation to deliver exactly what has been contracted, our firm is very thorough and verifies compliance with all provisions of a project's specifications. The acceptance of substitutions, alternates and other variances from the requirements of the project documents invites unsuccessful bidders to file unfair-trading lawsuits against the Architect and/or their consultants. We feel thorough enforcement is not only fair to the Owner, who hired the design professionals to determine and select the components specified in the project documents, but to all the bidders who priced strictly in accordance with the requirements specified.

Understandably, some bidders, particularly those that have chosen to overlook certain submittal requirements, do not care for our 'HOLDING THE FEET TO THE FIRE' approach and our insistence on full compliance. However, we strongly believe it is in the best interest of the Owner and OUR CLIENT, THE ARCHITECT, to require contractors, suppliers and sub-contractors to provide all that they have contractually promised. Whereas allowing inferior work, products and/or materials is clearly of direct financial benefit to those interested in shortcutting, it will be detrimental to the work of other trades and suppliers, and to the project as a whole, to allow submittals that are either unclear, incomplete and/or uncoordinated. Rangaswamy and Associates, Inc. always strives to fully cooperate with the Construction team and we consider full compliance to be a part of this effort.

DESIGN DRAWINGS AS BASE SHEETS :

Generally, structural drawings are produced from information supplied by architectural base sheets. At times, last-minute changes and project modifications may result in the base sheets being 'NOT-TO-SCALE', or to contain other unintended inaccuracies. In some instances, in order to arrive at a bid-price within the projected budget, the design

team will split a project into a 'BASE-BID' item and one, or more, 'ADD and/or DEDUCT ALTERNATE' items. Once bids are opened, the Owner and Architect select which ADDS and DEDUCTS to accept and establish a final scope for construction. This can be a protracted process, especially when additional funding is necessary, and RAI are generally not a part of the deliberations. Mostly, the Owner/Architect determinations are relayed to the Design Consultants but composite drawings, incorporating the final selections, may not be issued. Hence, Design Drawings can be inadequate in comprehensively and conveniently describing a project's final scope and exact dimensions. Moreover, RAI's Design Drawings are derived from the project requirements contained in the documents of other disciplines and are intended to generally specify the properties and disposition of products and materials necessary for a building's structural integrity. They are not prepared to the accuracy a SHOP DRAWING demands. Shop Drawings must be prepared to a much higher Standard of Care since their accuracy will determine the fit and acceptability of materials at the project site without modification. Design Drawings prepared by other disciplines often contain information that is not sensitive to layout-accuracy, and their use as a base for shop drawings may not have very much impact on the final installation of pipes, cables, ducts and the like. However, the use of Structural Design Drawings as the base for Shop Drawings is not permitted since the possible transfer of dimensional inaccuracies will have a direct impact on the overall and local layout of the building's foundations, walls, beams and columns, etc.

UNINTENDED CONSEQUENCES :

Over the years, several lawsuits have been filed against design professionals by sub-contractors regarding misfits in steel fabrication in instances where Design Drawings were used as the base for Shop Drawings, and these were decided in favor of the Sub-Contractor. Basically, the arguments presented were to justify that the sub-contractor's 'Designs and Drawings' were clearly those of the Structural Engineer, and that the Sub-Contractor merely used them, without any modifications, in preparing the Shop Drawings. By extension, they further argued that since the Design Drawings prepared by the Structural Engineer were not accurate the Structural Steel did not fit in the field. All other arguments, contending that the sub-contractor is solely responsible for the shop drawings and the fit in the field, are in vain. Though the design team was not at fault for the sub-contractors' lack of concern, damages were assigned to the design team. Hopefully, this highlights the implications of using the Design Drawings as base for Shop Drawings.

GOOD DEEDS NEVER GO UNPUNISHED :

In the latest software applications designed to prepare shop drawings ACAD design files are generally required as input for preparing the shop drawings. However, even a minor discrepancy in dimensioning input may result in a significant change-order claim. RAI's 'Errors and Omissions' insurance carrier advises on the "HAZARDS of COOPERATING" on this matter and recommends against the practice. As a direct result, our General Provision notes specifically state that the 'Design Drawings in whole or in part shall NOT be used as shop drawings'. This is not a denial to be viewed within the scope of COOPERATION, or not, but, rather, a necessary measure to prevent costly lawsuits and major damages associated with the procedure from being brought against Owners and their agents.

Our 'General Provisions' explicitly state that the design drawings shall not be used as the base for preparing the Shop Drawings. Possibly, the second lowest bidder fully observed the requirement and added some amount to prepare an accurate base sheet for his/her use. This dollar amount may be the killer that put him/her in the second place.

Providing the base sheet/design drawings to the successful bidder, who may be successful by having chosen to ignore the terms of the project documents, further aids that bidder and gives him/her undue advantage. Clearly, this is in violation of the spirit of non-collusory, competitive bidding and opens the door for a lawsuit by one, or all, of the unsuccessful bidders.

PLACING DRAWINGS :

1. Definition

Placing drawings are working drawings that show the number, size, length, and location of the reinforcing steel, structural and light-gauge steel, wood trusses and other members, precast concrete elements and all other structural components necessary for the placement and fabrication of material. Placing drawings can comprise plans, details, elevations, schedules, material lists, and bending details. They can be prepared manually or by computer.

2. Scope

Placing drawings are intended to convey the A/E's intent as covered in the contract documents, plus any additions, such as addenda issued by the A/E (per terms agreed on in the contract if issued after the contract is made), and constitute the sole authority for information regarding the final placement and installation of products and materials. The placing drawings must include all information necessary for complete fabrication, placement and attachment.

3. Procedure

Placing drawings are prepared by a trained detailer, in accordance with the A/E's instructions contained in the contract documents. Any necessary, additional information concerning field conditions, field measurements, construction joints and sequences, and the like must be coordinated with and by the General Contractor and/or Construction Manager. After review and acceptance by the A/E, including necessary revisions, the drawings may be used by fabricators, erectors and installers.

IT IS ESSENTIAL TO NOTE THAT RANGASWAMY AND ASSOCIATES, INC. IS NOT THE DESIGN PROFESSIONAL RESPONSIBLE FOR A BUILDING'S LAYOUT. THIS IS THE FUNCTION OF THE ARCHITECT. LIKewise, OTHER THAN DIMENSIONAL INFORMATION SPECIFICALLY NECESSARY TO DETAIL LOCAL CONNECTION AND PLACEMENT CONDITIONS, RAI WILL NOT REVIEW LAYOUT AND OTHER DIMENSIONS. DIMENSIONAL DISCREPANCIES MUST BE DIRECTED TO THE ARCHITECT.

STANDARDS :

CONCRETE : American Concrete Institute ACI 315, "ACI Detailing Manual", SP-66 (04)

STRUCTURAL STEEL : American Institute of Steel Construction, "Structural Steel Detailing"

DO's :

- 1.) Retain a detailer who is experienced in detailing the type of structural elements anticipated, with at least five years of experience.
- 2.) Keep a copy of the reference standards listed and follow the reference standards.

- 3.) Review the sample drawings furnished for reference and comply with the detailing requirements.
- 4.) Call RAI's Project Manager immediately to clarify any details or doubts.
- 5.) Follow the Specifications and General Provisions on Shop Drawing Requirements
- 6.) Submit drawings to the Architect at least six weeks before production schedule date.

Thank you for your cooperation.

Rangaswamy & Associates, Inc.

Project Manager

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