DEFERRED SUBMITTALS

WHO IS RESPONSIBLE AND WHEN

MY BACKGROUND

Dean D. Brown, P.E., S.E.

- STRUCTURAL ENGINEERING DESIGN (commercial/institutional, residential, light and heavy industrial)
- MANUFACTURING (structural components)
- CONSTRUCTION (field administration/supervision, procurement, cm)

  - BSCE – Texas Tech Univ. (SE emphasis)
  - MSCE – Missouri Univ. of Science & Technology (SE and CM emphasis)
  - MBA – Centenary College of Louisiana (Entrepreneurial emphasis)

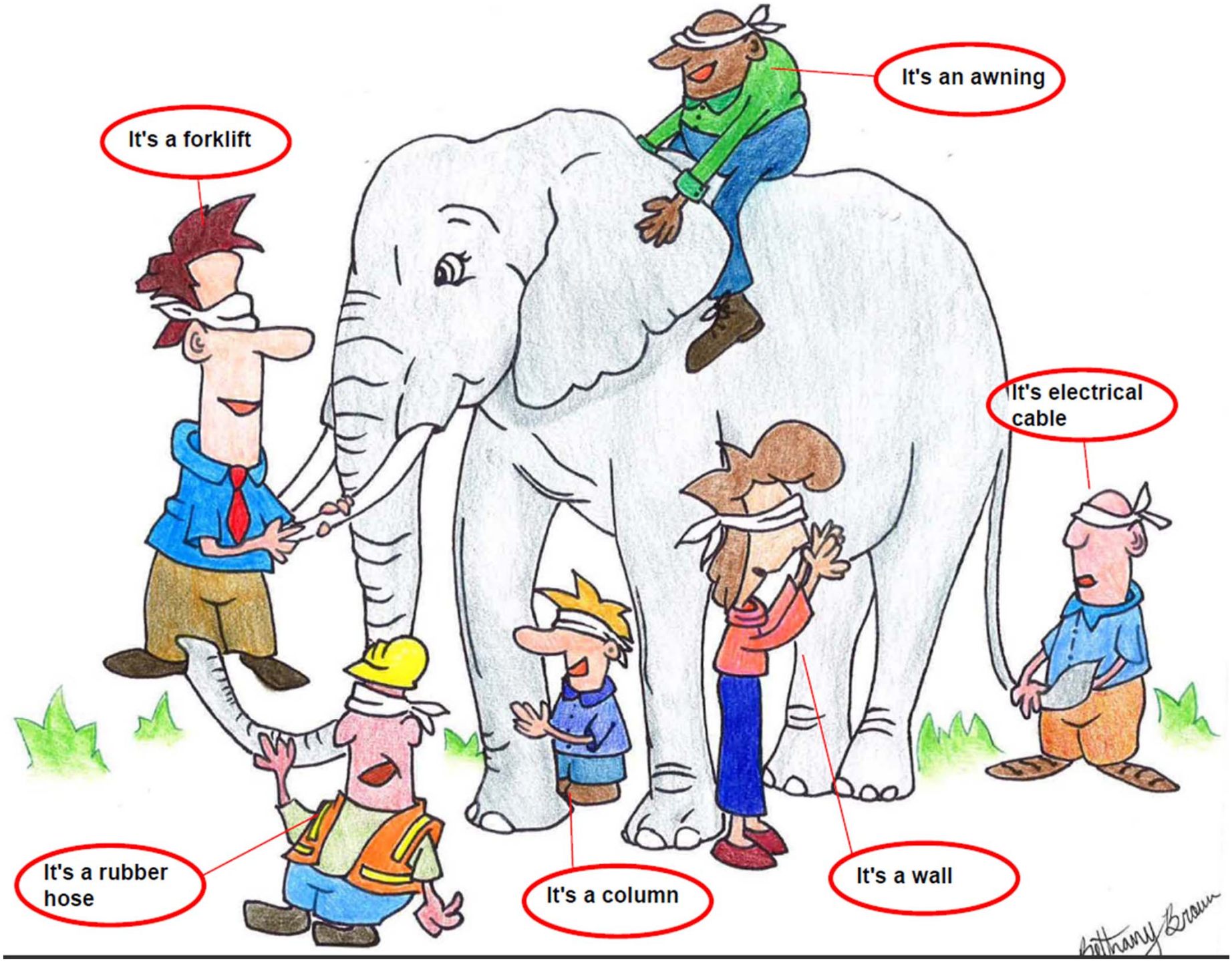
MY BACKGROUND

Takeaways:

- **Good engineering judgment** requires knowing:
  - WHAT needs to occur (i.e. understanding the scope).
  - WHO is responsible for each portion of the work (i.e. this impacts quality and completeness of scope).
  - WHEN it should occur (i.e. this time element impacts schedule).
- Many/most problems occur on **"handoffs" between trades** (i.e. a point where communication and coordination is most critical).
- Refer to my articles in Structure magazine (July, August, September 2014) and (August 2015).

What prompted me to research and write these articles?

- Too much discontinuity from one plan review to another.
- Difficulty in coordinating efforts with other stakeholders (i.e. SEOR and Contractor).
- The 2000 IBC and MSJC (ρ_{max}) rho max. (i.e. we don't work in silos any longer).


It's an awning
It's a forklift
It's electrical cable
It's a rubber hose
It's a column
It's a wall

(A) THE NEW NORMAL

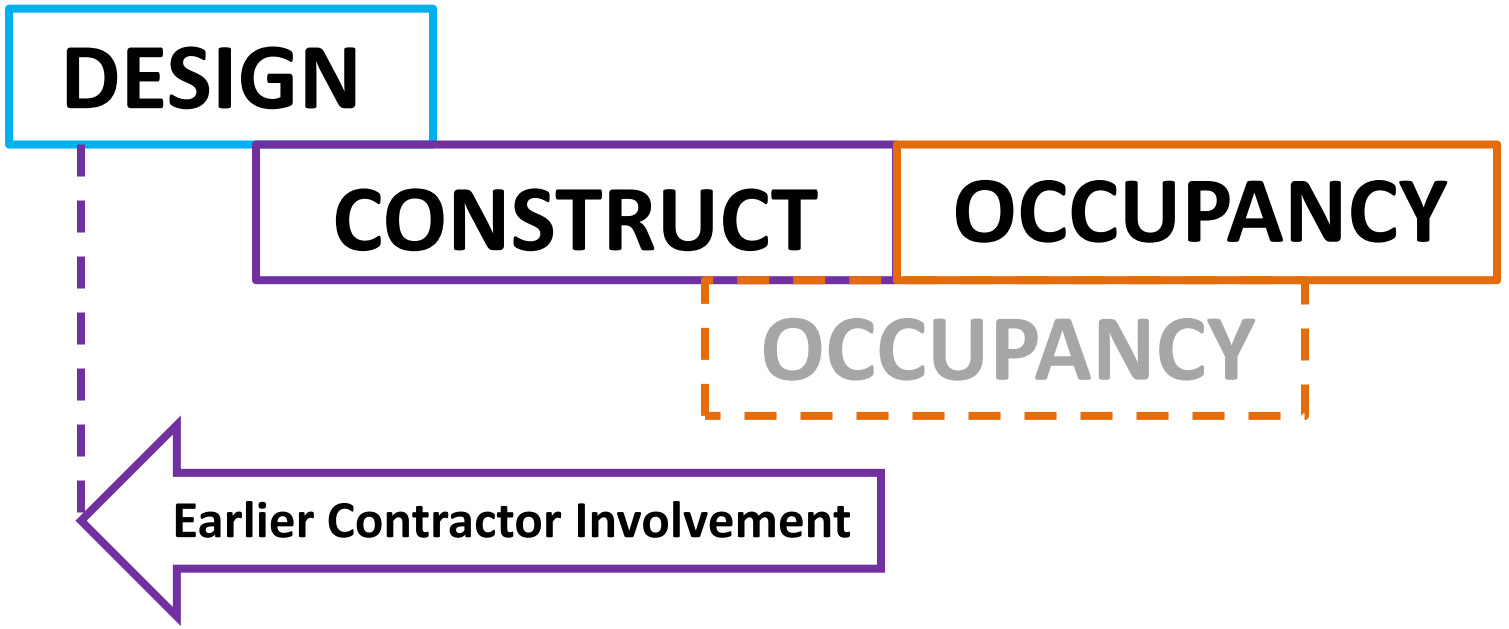
YESTERDAY'S NORMAL

Traditional Design-Bid-Build … very linear!

TODAY'S NEW NORMAL

With fast-track type project delivery … the owner can push for a release of construction documents before all interfacing designs are known.

[AISAC 2010 code of standard practice (COSP; AISC 303-10) section 3.6]



DEFERRED SUBMITTALS

Regarding Deferred Submittal Documents, this discussion will answer the following questions:

- **What** are deferred submittals documents and what is the scope of the design?
- **Who** is responsible for its design and who provides the coordination.

- **When** are these documents (i.e. designs) required during a project's life-cycle?

EXAMPLES OF DEFERRED SUBMITTAL DESIGNS

Examples of Deferred Designs:

- Metal Plate Connected Wood Trusses
  - Refer to Truss Plate Institute (TPI)
  - Refer to Structural Building Components Industry (SBCI)
- Cold-Formed Steel Trusses
  - Refer to Cold-Formed Steel Council
  - Refer to Structural Building Components Industry (SBCI)
- Steel Connections – Refer to American Institute of Steel Construction (AISC)
- Pre-Manufactured Metal Buildings – Refer to Metal Building Manufacturers Association (MBMA)
- Post-Tensioned Concrete – Refer to Post-Tensioning Institute (PTI)
- Open-web Steel Joist – Refer to Steel Joist Institute (SJI)
- Precast/Prestressed Concrete – Refer to Precast/Prestressed Concrete Institute (PCI)
- Cladding Wall Systems

GLOSSARY

- Structural Design Drawings (SDD) – {structural contract documents that consist drawings, specifications, addenda, and terms of agreement}. For this discussion, SDD need to be sealed per state statute requirements.
- Shop Drawings - {drawings prepared by manufacturers, suppliers, subcontractors, and contractors to illustrate a portion of the work}. For this discussion, shop drawings are not deferred submittal documents.
- Truss Design Drawings (TDD) – {sealed engineered documents that depict trusses in written, graphic, and pictorial fashion}. TDD are typically part of a Truss Submittal Package from the manufacturer
  - Exception: TDD do not need to be sealed under the requirements of the IRC.
- Coordination Drawings (CD) – {drawings prepared to coordinate shop drawings, deferred submittal documents, and other misc. items on a project}.
- Deferred Submittal Documents (DSD) – discussion following…

GLOSSARY

Glossary of Stakeholders:

- AHJ – Authorities Having Jurisdiction (i.e. typically the Building Official).
- Own – Owner (or Owner's Representative).
- EOR or SEOR – Structural Engineer of Record.
- SEOR – Specialty Engineer of Record (or may also be called a Delegated Engineer in some cases).
- GC – General Contractor.
- SC – Specialty Contractor.
- PDP – Prime Design Professional (A/E who coordinates all design consultants. Depending on each individual state, the PP may also be the EOR).

GLOSSARY

Other terms:

- Pre-Eng'rd Wood Trusses – Metal Plate Connected Wood Trusses

(B) THE “WHAT” & THE “WHEN”

WHAT ARE DEFERRED SUBMITTALS DOCUMENTS AND WHAT IS THE SCOPE OF THE DESIGN?

WHO IS RESPONSIBLE FOR ITS DESIGN AND WHO PROVIDES THE COORDINATION.

DISCUSSIONS ACROSS THE COUNTRY ON THIS DEFINITION

WHAT ARE DEFERRED SUBMITTAL DOCUMENTS?

"…portions of the design that are not submitted at the time of the (permit) application and that are to be submitted to the building official within a specified period."

"Documents for deferred submittal items shall be submitted to the (EOR) who shall review them and forward them to the (AHJ) with a **notation** indicating that the deferred submittal documents have been reviewed and found to be in general conformance to the design of the building."

[2012 IBC Section 107.3.4.1]

WHAT ARE DEFERRED SUBMITTAL DOCUMENTS?

"…those portions of the design that are not complete at the time of the application for the Building Permit and that are to be submitted to the (AHJ) within a specified period in accordance with Legal Requirements."

[ANSI/TPI 1-2007: *National Design Standard for Metal Plate Connected Wood Truss Construction*.]

WHAT ARE DEFERRED SUBMITTAL DOCUMENTS?

- "Deferred approval does not mean that the A/E of Record may defer the design of the component to the contractor."
- Approval of certain aspects of the construction may be deferred until the construction contract has been awarded."

[California Division of the State Architect (DSA)]
www.dgs.ca.gov/dsa/Programs/progProject/overview/projsubmitintro.aspx]

WHAT ARE DEFERRED SUBMITTAL DOCUMENTS?

The A/E must:

- List deferred submittal components on drawing title sheet.
- Coordinate all components of the building.
- Designate points of contact of components on the structure (gravity/lateral) and verify all interactions (deflection, drift compatibility, vertical/lateral loading).

[California Division of the State Architect (DSA)]
www.dgs.ca.gov/dsa/Programs/progProject/overview/projsubmitintro.aspx]

WHAT ARE DEFERRED SUBMITTAL DOCUMENTS?

"Delegated Engineering Documents - …those engineering documents that are prepared by a delegated engineer."

[FLORIDA ADMINISTRATIVE CODE § 61G15-30.002]]

WHAT ARE DEFERRED SUBMITTAL DOCUMENTS?

Per state of Florida …

- "Delegated Engineer – a Florida (P.E.) who undertakes specialty service …regarding a portion of the engineering project."
- Prime Professional – a Florida (P.E.) … who plans, designs, and coordinates the design professionals for the project. The Prime Professional may also be the EOR.

Let's come back to this in a moment …!

[FLORIDA ADMINISTRATIVE CODE § 61G15-30.002]]

WHAT ARE DEFERRED SUBMITTAL DOCUMENTS?

Poll Question 1:

Can a Deferred Submittal Document (DSD) and a Structural Design Drawing (SDD) be under the responsible charge of the same professional engineer?

Delegated Design vs. Deferred Submittal Design

Theoretically, let's ask …

- Is a Delegated Design always a Deferred Submittal Design?
- Is a Deferred Submittal Design always a Delegated Design?

WHAT ARE DEFERRED SUBMITTAL DOCUMENTS?

SUMMARY:

- Cross the boundary between design and construction.
- They are interfacing designs.
- They are portions of the total design (EOR + SEOR = Total Design).
- May be executed after a contract has been awarded.
- Documents that are not submitted at the time of building permit.
- They are prepared by a licensed Professional Engineer ("delegated" engineer or "specialty" engineer).
- Though the deferred design falls under the contractor side of scope, the design responsibility is not deferred to the contractor.
- Depending on state laws, SDD and DSD may be produced by the same professional engineer.

WHAT ARE NOT DEFERRED DESIGNS/SUBMITTALS?

What are not Deferred Submittals?

- Shop Drawings
- Coordination Drawings
- Product Submittals

(C) WHEN TO GET INVOLVED AS A EOR

RULE OF THUMB

To fully understand Roles and Responsibilities regarding Deferred Submittal Documents, consult with respective:

- State's statutes governing P.E.'s.
- AHJ for which the project is to be located.
- Professional organizations (such as AISC, TPI, MBMA, PTI, PCI, etc.) that write document guidelines.
- Respective legal agreements between stakeholders (i.e., Owner, Prime Design Professional, EOR, Contractor).

(AISC) STEEL CONNECTIONS

"For some projects, specialty items such as open web steel joists, cold-formed steel load bearing framing, metal plate connected wood trusses, or precast, prestressed concrete members will comprise a portion of the structure. In such cases, coordination will need to occur between the (EOR) and the (SEOR). A project may have more than one (SEOR)."

[*A Guideline Addressing Coordination and Completeness of Structural Construction Documents.* (2003). Washington D.C.: American Council of Engineering Companies. CASE Doc. 962-D]

(AISC) STEEL CONNECTIONS

Role of the EOR:

- Indicate one of the following options for each connection design:

  Option 1: The complete connection design to be shown in the SDD.

  Option 2: In the SDD, designate an experienced steel detailer to complete the connection design.

  Option 3: In the SDD, designate a licensed P.E. (working for the fabricator) to design the connection.

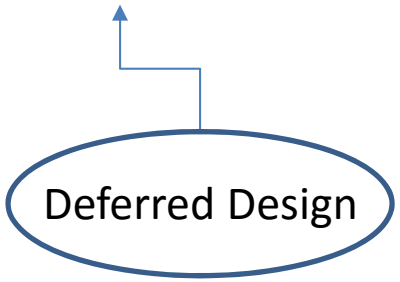
[*Code of Standard Practice for Steel Buildings and Bridges*. (2010). Chicago, IL: American Institute of Steel Construction. Section 3.1.2].

Refer also to American Institute of Steel Construction https://www.aisc.org/

(AISC) STEEL CONNECTIONS

Three Options for the EOR on designing steel connections:

- Indicate one of the three methods per Section 3.1.2.
- Indicate method of design (LRFD or ASD).
- With Option (3), confirm in writing that representative samples are consistent with contract documents.
- With Option (3), the EOR still approves shop and erection drawings. (see Section 4.4.



[*Code of Standard Practice for Steel Buildings and Bridges*. (2010). Chicago, IL: American Institute of Steel Construction. Section 3.1.2].

PRECAST & PRESTRESSED CONCRETE

- Refer also to PCI (Precast/Prestressed Concrete Institute), https://www.pci.org/
- "The primary failure in projects involving SEOR is the lack of coordination and delineation of responsibility."
- It should always be the EOR who assigns responsibility to the varying elements, via contract documents (e.g. thru the SDD).

[*National Practice Guidelines for Specialty Structural Engineers*. (1996). Washington D.C.: American Council of Engineering Companies. CASE Task Group on Specialty Engineering.]

[*PCI Design Handbook, 7th Ed.*: (2010). Chicago: Precast/Prestressed Concrete Institute. pg. 14-36]

PRECAST & PRESTRESSED CONCRETE

- "Local (AHJ's) may approve design documents for starting construction without final design of the precast concrete components. These initial design documents are typically referred to as building permit drawings or drawings for permit."
- Pertaining to the design of precast elements, the EOR should accept the "… responsibility of reviewing the designs, ensuring that the designated loading requirements have been properly interpreted and interactive forces with other construction are fully coordinated." (check with local AHJ).

[*PCI Design Handbook, 7th Ed.*: (2010). Chicago: Precast/Prestressed Concrete Institute. pg 14-35.]

PRECAST & PRESTRESSED CONCRETE

- Refer to PCI Design Handbook (Precast and Prestressed Concrete), 7th Ed. For requirements.
- The EOR should:
  - Clearly define Design Criteria with loadings (to assign component design and connections to SEOR).
  - Pay special notice to system interfaces (especially what precast component reactions will do to the base structure).
  - Consider tolerance differences between systems.
  - Pay attention to temporary loading conditions during erection, especially if the EOR provided the lateral design.
  - Coordinate, coordinate, coordinate. Consider **Coordination Drawings** by General Contractor is there are multiple systems involved. (e.g. how would a project get coordinated if it included Precast, Post-tensioned, and reinforced concrete elements)?

STEEL JOISTS and JOIST GIRDERS (SJI)

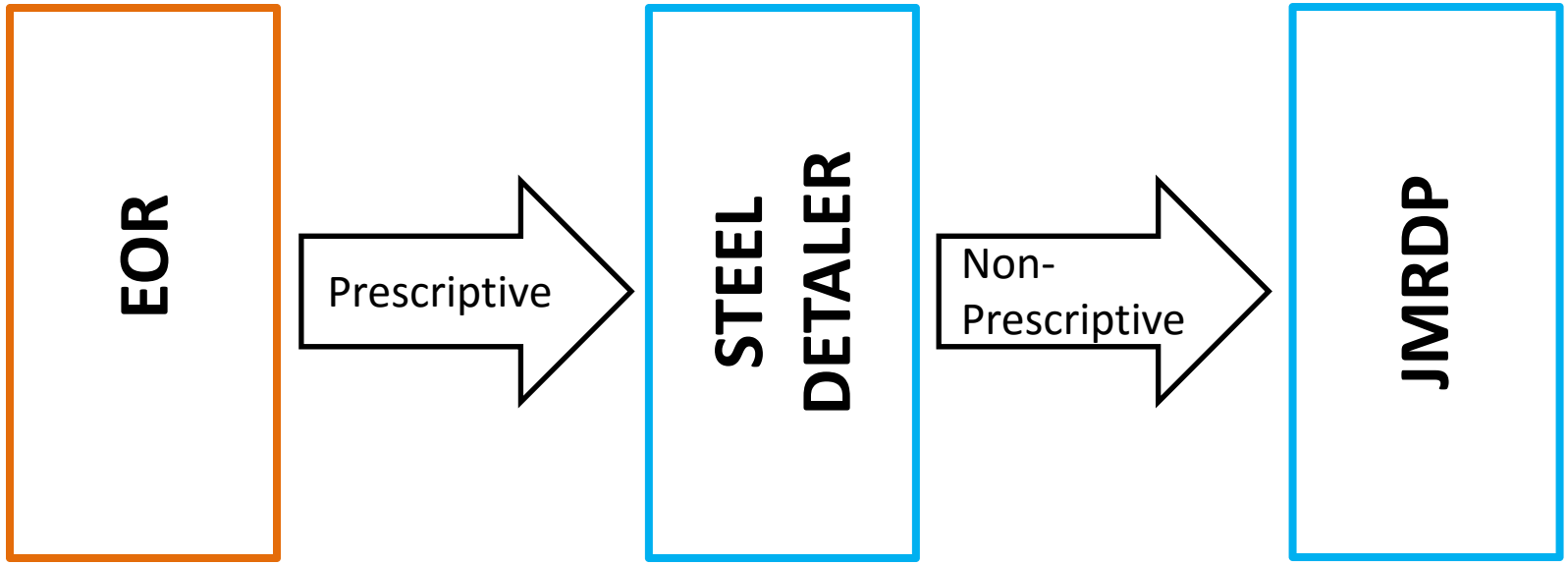
When to Involve a Joist Manufacturer Responsible Design Professional?

- Special shape joists (i.e. scissor joist, gable joists, bowstring joists, barrel joists, etc.)?
- Field-bolted splice detail
- Joist headers
- Non-standard joist detail connections
- Non-standard bridging details
- Large web openings (larger than typical joist configurations).
- Non-standard loads
  - Uniform loads > SJI tabulated loads
  - Concentrated loads (in many cases) … depending on magnitude and location.

Refer to Steel Joist Institute (SJI), https://steeljoist.org/

STEEL JOISTS and JOIST GIRDERS (SJI)

- SJI standard specifications are accepted in the 2012 IBC 2207 (Steel Joists) do not need AHJ approval.
- Calculations are provided when situation falls under a Deferred Submittal.



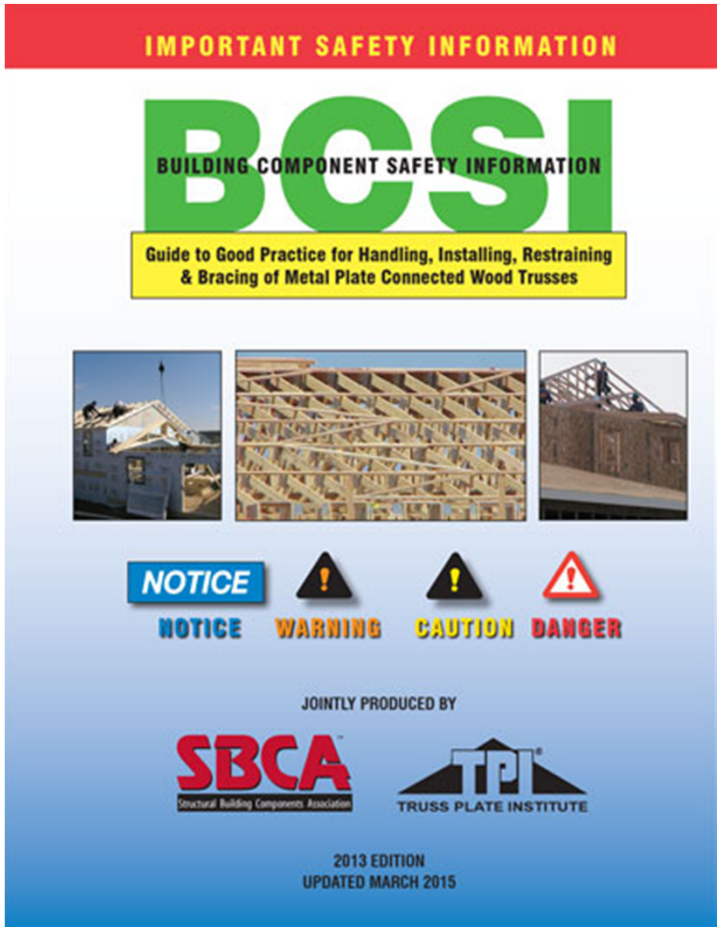
METAL PLATED CONNECTED WOOD TRUSSES

Items the EOR should be aware of:

- Establishing the Design Criteria and loading conditions.
- Coordinate permanent bracing (EOR) with truss temporary or erection bracing (SEOR).
- EOR needs to ensure trusses has proper support and anchorage (gravity and lateral).
- EOR still responsible for sheathing attachment.
- Potential lapses in coordination:
  - Gable end trusses
  - Piggy-back trusses

METAL PLATED CONNECTED WOOD TRUSSES

Consult with Building Component Safety Information by SBCA, https://www.sbcindustry.com/



METAL PLATED CONNECTED WOOD TRUSSES

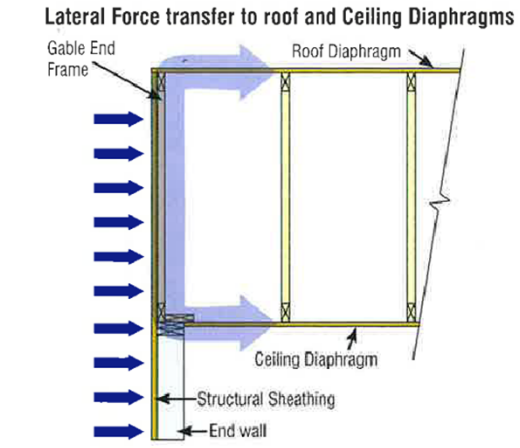


FIGURE B3-32

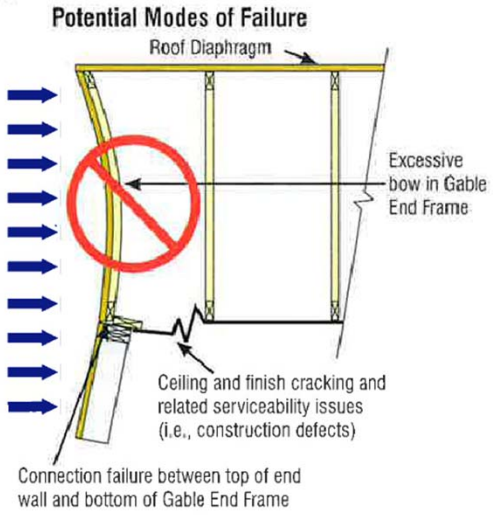


FIGURE B3-33

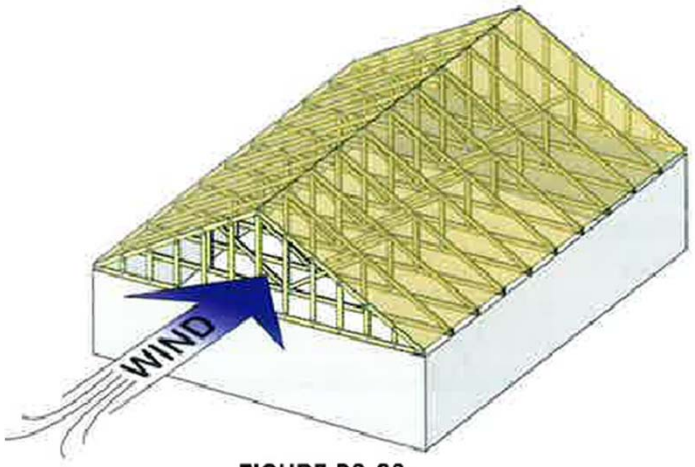
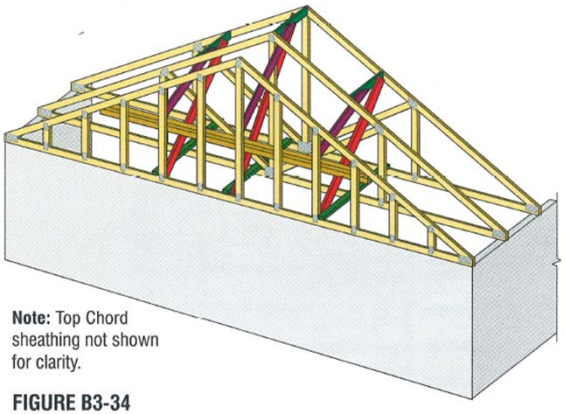


FIGURE B3-28

Building Component Safety Information, BCSI: Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses. (2013) Alexandria, VA: Truss Plate Institute.

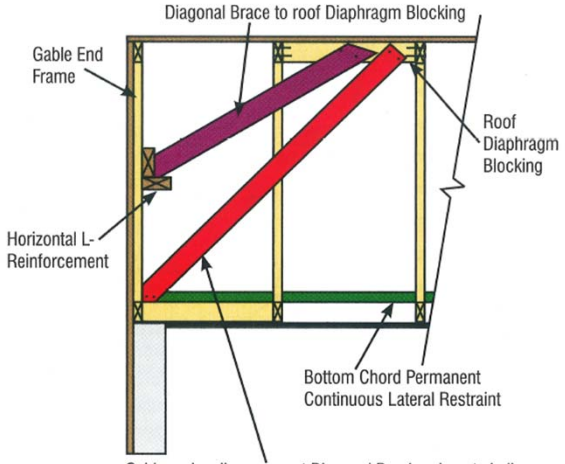
METAL PLATED CONNECTED WOOD TRUSSES

Diagonal Bracing at Gable Ends



Note: Top Chord sheathing not shown for clarity.

FIGURE B3-34



Gable end wall permanent Diagonal Bracing. Locate in line with Bottom Chord permanent CLR or as specified in the Construction Documents (see Figure B3-40, page 51).

FIGURE B3-35

Sway Bracing

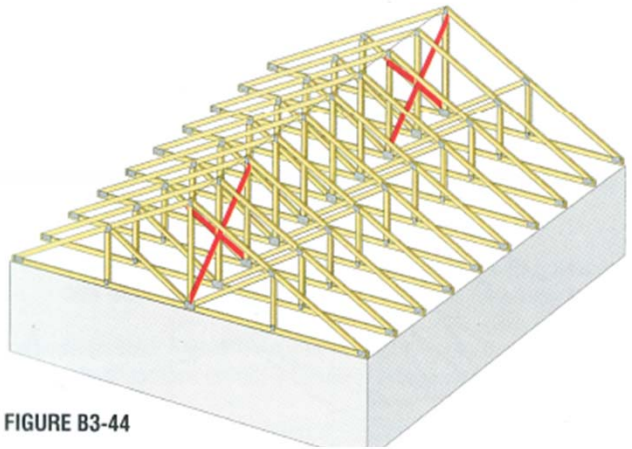
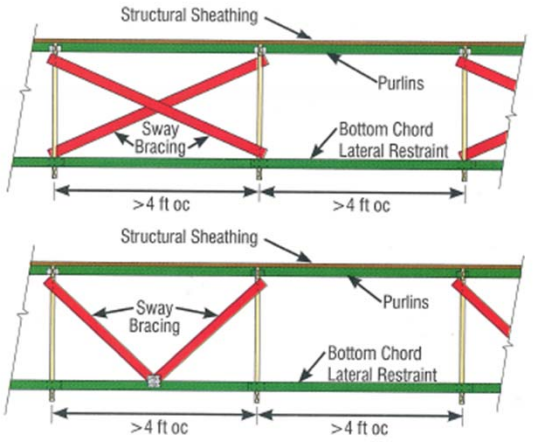


FIGURE B3-44



Note: Reinforce Lateral Restraints and Bracing, as required, for Truss Spacings greater than 4' o.c.

FIGURE B3-45

METAL PLATED CONNECTED WOOD TRUSSES

Sway Bracing

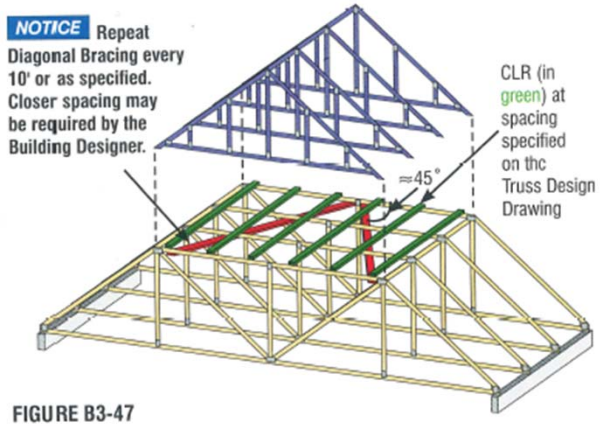


FIGURE B3-47

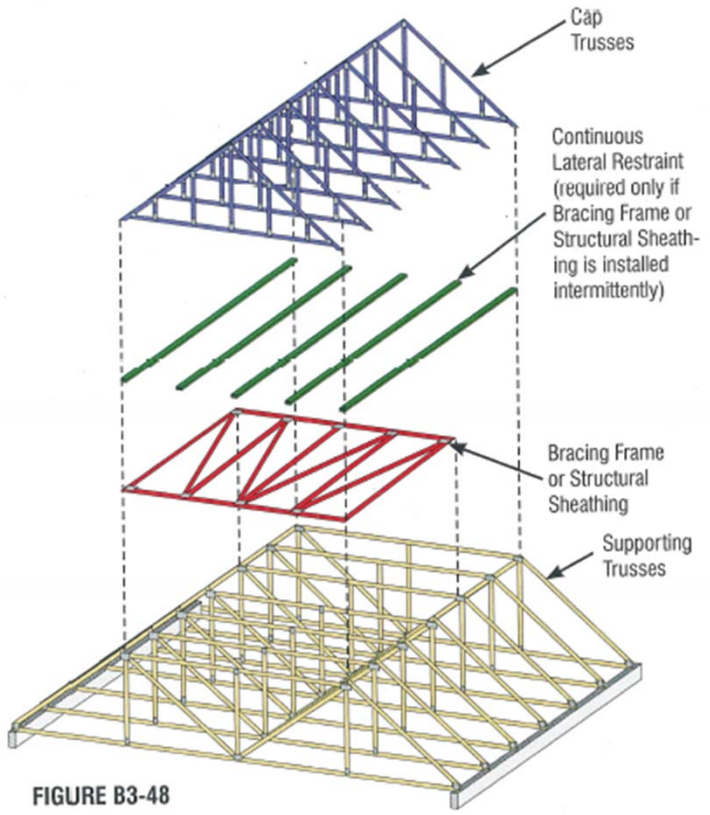


FIGURE B3-48

Building Component Safety Information, BCSI: Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses. (2013) Alexandria, VA: Truss Plate Institute.

METAL PLATED CONNECTED WOOD TRUSSES

☑ Sample detail of Gable End Frame Bracing and Reinforcement (as provided by the Building Designer).

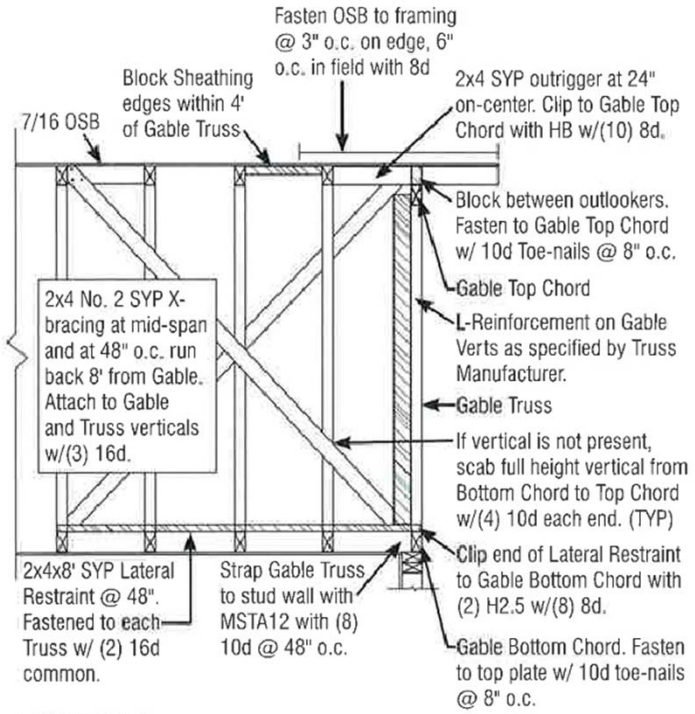


FIGURE B3-38

☑ Sample "Standard Gable End Frame Detail" (as provided by the Truss Designer)

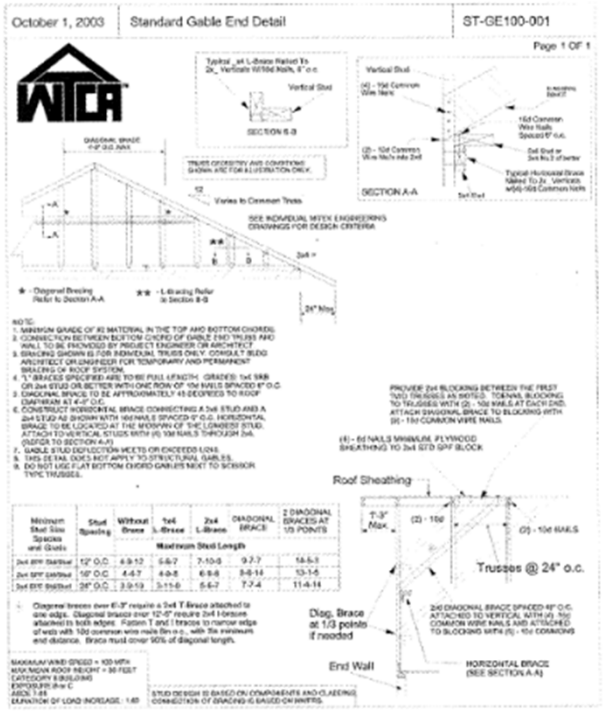


FIGURE B3-39

Building Component Safety Information, BCSI: Guide to Good Practice for Handling, Installing & Bracing of Metal Plate Connected Wood Trusses. (2013) Alexandria, VA: Truss Plate Institute.

COLD-FORMED STEEL TRUSSES

Refer to Cold-Formed Steel Council (CFSBCSI), http://cfsc.sbcindustry.com/cfsbcsi.php

POST-TENSIONED CONCRETE

- Post-Tensioning is often out-sourced to specialty engineers (via the P/T contractor), but many EOR also perform their own design.
- When P/T is incorporated as part of a structural system (e.g. floors), the EOR and SEOR need to coordinate the analysis and design of the structure.

POST-TENSIONED CONCRETE

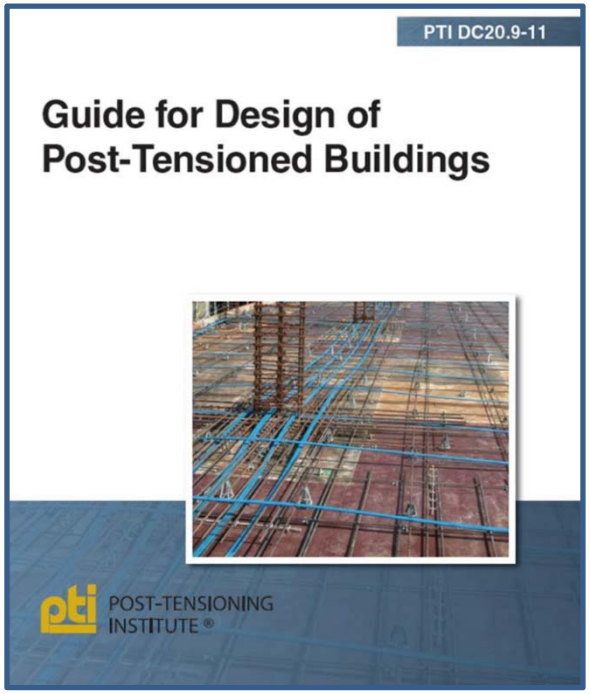
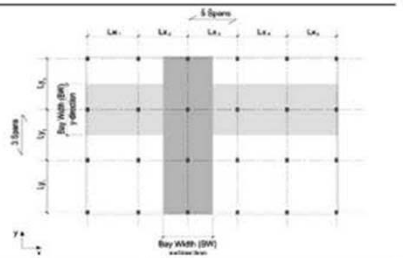


Table 6.4—Preliminary design table for two-way residential buildings (flat plate or flat slab system with no drops used in calculation)

Basic design parameters and assumptions:
- Loading: DL = self-weight + 10 lb/ft² (0.5 kN/m²) (SDL); LL = 40 lb/ft² (1.9 kN/m²) (no reduction) + 15 lb/ft² (0.7 kN/m²) (partitions) (live load reduction permitted per building code)
- Slab minimum *f/A* = 125 psi (0.9 MPa) based on ACI 318-08
- Concrete: f_c' = 5000 psi (34 MPa); f_{ci}' = 3000 psi (21 MPa)
- Assumed final effective force per 0.5 in. (12.7 mm) strand tendon = 27 kips (120 kN)
- Tendon CGS: Slab 1.5 in. (38 mm) top; 1 in. (25 mm) bottom internal span; 1.75 in. (44 mm) bottom exterior span
- Cover to nonprestressed reinforcement: Slab 1.25 in. (32 mm) top and 0.75 in. (19 mm) bottom
- Column size: 14 x 28 in. (355 x 710 mm)



Bay width (x-direction), ft	Slab spans (L_{y1}, L_{y2}, L_{y3}), ft	Slab size, in.	Span-depth ratio	Slab – banded direction X		Slab – uniform direction Y		Total*	
				Material required		Material required		Material required	
				PT, lb/ft²	Reinforcing bar, lb/ft²	PT, lb/ft²	Reinforcing bar, lb/ft²	PT, lb/ft²	Reinforcing bar, lb/ft²
20	21, 21, 21	5.5	45.8	0.236	0.170	0.284	0.186	0.52	0.36
	24, 24, 24	6.5	44.3	0.217	0.187	0.310	0.224	0.53	0.42
	27, 27, 27	7.5	43.2	0.243	0.156	0.336	0.278	0.58	0.44
	30, 30, 30	8.0	45.0	0.255	0.106	0.408	0.300	0.67	0.41
	32, 32, 32	8.5	45.2	0.273	0.114	0.434	0.358	0.71	0.48
25	21, 21, 21	7.0	42.9	0.286	0.296	0.237	0.229	0.53	0.53
	24, 24, 24	7.0	42.9	0.285	0.301	0.291	0.256	0.58	0.56
	27, 27, 27	7.5	43.2	0.273	0.300	0.349	0.279	0.63	0.58
	30, 30, 30	8.0	45.0	0.272	0.286	0.388	0.382	0.66	0.67
	32, 32, 32	8.5	45.2	0.272	0.300	0.430	0.422	0.71	0.73
28	21, 21, 21	7.5	44.8	0.363	0.303	0.234	0.235	0.60	0.54
	24, 24, 24	7.5	44.8	0.363	0.305	0.283	0.251	0.65	0.56
	27, 27, 27	7.5	44.8	0.363	0.327	0.331	0.292	0.70	0.62
	30, 30, 30	8.0	45.0	0.363	0.340	0.401	0.378	0.74	0.72
	32, 32, 32	8.5	45.2	0.323	0.346	0.436	0.420	0.76	0.77
30	21, 21, 21	8.0	45.0	0.414	0.303	0.255	0.127	0.67	0.43
	24, 24, 24	8.0	45.0	0.414	0.311	0.270	0.280	0.69	0.60
	27, 27, 27	8.0	45.0	0.413	0.329	0.330	0.338	0.75	0.67
	30, 30, 30	8.0	45.0	0.408	0.341	0.392	0.413	0.80	0.76
	32, 32, 32	8.5	45.2	0.383	0.355	0.440	0.429	0.83	0.79

*Punching shear reinforcement requirements to be determined by engineer. Allowance to be made in estimate.
Notes: 1 ft = 0.3048 m; 1 in. = 25.4 mm; 1 lb/ft² = 0.05 kN/m².

Post-Tensioning Institute (PTI), *Guide for Design of Post-Tensioned Buildings*
http://www.post-tensioning.org/

PREFABRICATED METAL BUILDINGS

The role of the Manufacturer:

- Responsible only for the structural design of the system it sells to the builder.
- Not the EOR for the construction project.
- Not responsible for the design of any components or materials not sold by them.
- Not responsible for the interface and connection of other components … unless specifically established by order documents.
- Provides loading criteria, reactions for which EOR can design foundation system.
- Provide plans and elevations (including dimensions) of building system and structural components.

Refer to Manufacturers Building Manufacturers Association (MBMA), http://www.mbma.com/

PREFABRICATED METAL BUILDINGS

The role of the EOR:

- Specify
  - Design Criteria for the metal building system.
  - Geometric requirements.
  - All applicable codes and/or design loads.
  - Site and construction conditions that affect the design of the metal building.
  - Serviceability Criteria (EOR is in better position to evaluate owner's needs).

[Shoemaker, W. Lee (2007, March). The Case for an EOR for a Metal Building System. *Structure* magazine.]

PREFABRICATED METAL BUILDINGS (Example)

Per City of Portland Oregon (Building Requirements for Prefabricated Metal Buildings):

- Option 1 – Provide complete project submittal
- Option 2 – Delayed submittal of structural design of metal building … but there are no partial permits issued.
  - Allows for early start on review of non-structural items (fire, zoning, life/safety, transportation, etc.)
  - EOR designs foundation early (with assumptions)
  - Metal building design required before permit is issued.

(cont.)

PREFABRICATED METAL BUILDINGS

Per City of Portland Oregon (Building Requirements for Prefabricated Metal Buildings):

- Option 3 – Delayed submittal of foundation & structural design of metal building. (same as Option 2 – permit not issued until final structural documents submitted).

- Option 4 – (Main permit) with Prefabricated Metal Building as a Deferred Submittal.
  - Limited to roof height of 35 ft. and 15 psf on ext. cladding.
  - Complete set of architectural submitted before permit.
  - EOR (in main permit) submits a Foundation Plan and submits:
    - Anchor Bolt design
    - Calculations on foundation (including any frame analysis performed from lateral loads).
    - Lists assumptions (including base reactions for ea. column/frame).

WHAT ARE DELEGATED DESIGNS?

Per state of Florida …

- "Delegated Engineer – a … (P.E.) who undertakes specialty service …regarding a portion of the engineering project."
- Prime Professional – a … (P.E.) … who plans, designs, and coordinates the design professionals for the project. The Prime Professional may also be the EOR.

For the purpose of this discussion, because Delegated Designs can be submitted before a building permit, they do not always qualify as Deferred Submittal Designs.

[FLORIDA ADMINISTRATIVE CODE § 61G15-30.002]

(D) THE RUB

Glossary

- (seal) or (sealed) = seal, signature and date.
- (agency) = government or public agency.
- (documents) = drawings , specifications, plots, reports, plats, land surveys, papers, design information, calculations or documents.
- (life/safety) = life, health and property.
- (PE) = Professional Engineer.
- (PLS) = Land Surveyor or Professional Land Surveyor.

WHEN ARE THESE DOCUMENTS (DESIGNS) REQUIRED DURING A PROJECT'S LIFE-CYCLE?

WHEN

The takeaways:

- Good engineering judgment involves knowing WHAT needs to occur (scope), WHO is responsible for the what (quality and completeness), and WHEN it should occur (time).
  - **The problem with the latter … "when" involves means and methods … which involves the GC and SC (or fabricator).**
- Many/most problems occur on "handoffs" between trades (i.e. a point where communication and coordination is most critical).

WHEN

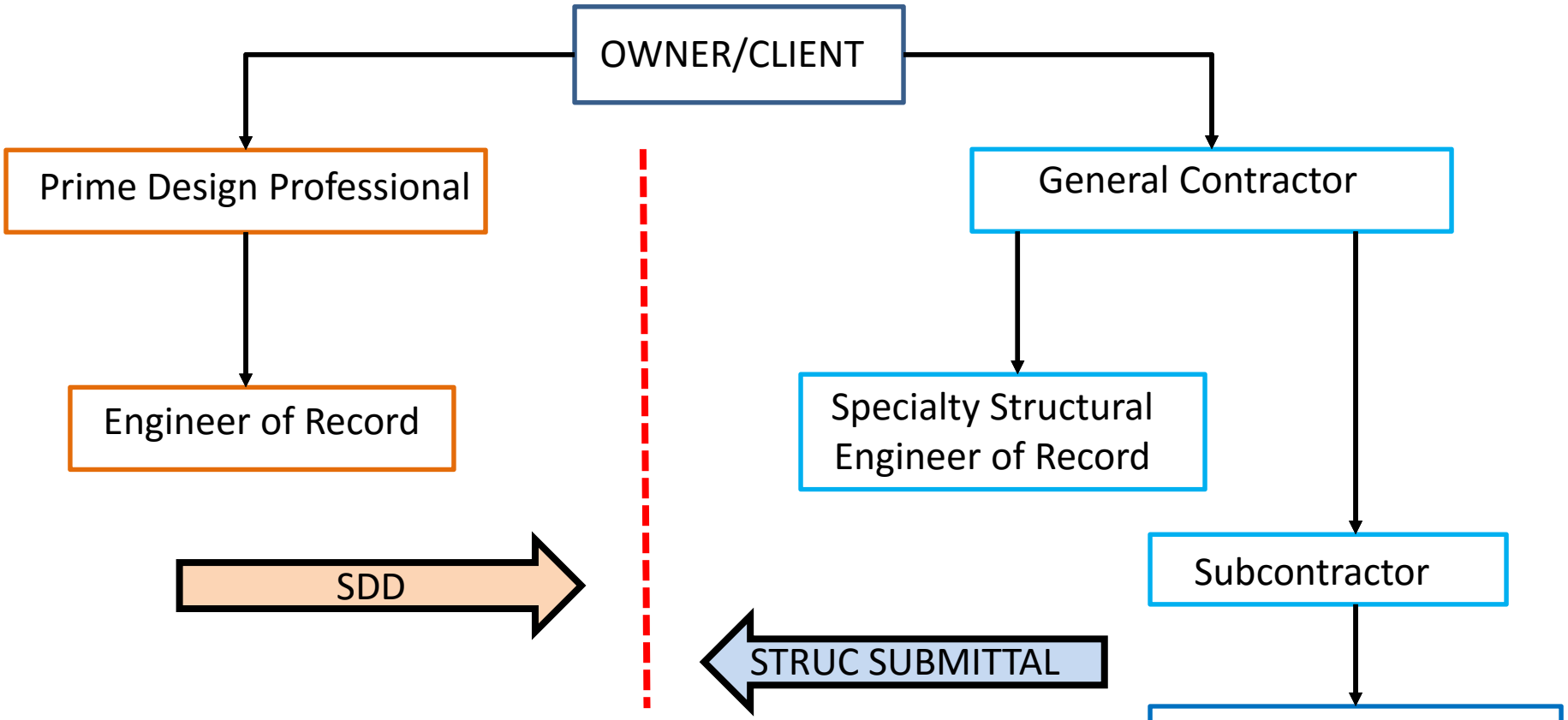
- "…as it is often impractical … for the Truss designer to provide input at the time of the Building Structural System Documents are prepared, many engineering assumptions will need to be made in the design of the structure. Accordingly, the (TDD), when produced, may not match exactly match with the assumptions used."
- "For this reason, it is essential that the (TDD) be reviewed and approved by the … Building Designer…"

[*Metal Plated Connected Wood Truss Handbook, Third Ed.* (2002) Madison, WI: Truss Plate Institute.]

WHEN

The structural design process between the EOR and the SEOR is iterative, requiring both to coordinate their designs.

DESIGN-BID-BUILD (DBB)



Remember … in many/most cases there is no direct contractual relationship btwn/ EOR and SEOR. This is a contract issue.

Deferred Submittal - PreEngineered Trusses

When is a design Final for EOR? ... Step 2? ... Step 5? ... Step 8?

Step	Task Description	Use of the Seal: EOR	Use of the Seal: SEOR
1	Structural EOR designs **proposed** Roof Framing Plan (Deferred Submittal) and **proposed** Structural Wall layout as part of SDD (Structural Design Drawings). SDD will reference Deferred Submittals as part of engineering design. As a condition of granting a building permit, the Building Official requires SDD to be stamped by EOR.		
2	Stamped SDD submitted to building official for review	Final?	
3	Building Permit is issued once all questions have been resolved by Building Official.		
4	Contractor installs foundation and load bearing walls. This may also be the stage the Contractor finalizes the P.O. with a truss manufacturer.		
5	Truss Manufacturer may come out to verify jobsite conditions (i.e., field measure actual wall layout) and engineer the Truss Design Documents (TDD). In other words, the Specialty Engineer of Record (SEOR) stamps and seals the TDD.		Final?
6	Contractor forwards the stamped TDD to the EOR for review.		
7	A copy of the stamped TDD are forwarded to the EOR for review. The EOR checks for differences between SDD assumptions with the conditions of the TDD. The TDD may have girders in different locations, temporary bracing is verified and compared to permanent bracing, truss overbuild or piggyback loactions are noted, truss supports are verified (for proper bearing and anchorage).		
8	The EOR makes needed corrections to SDD and resubmits to Building Official for record (or contractor).	Final?	
9	TDD documents are approved by Building Official and approved documents routed back to contractor.		
10	Contractor maked needed structural corrections (per updated SDD) and Trusses are fabricated.		
11	Trusses are shipped and erected.		
12	Building Official (using latest TDD and SDD documents), makes field inspection, typically performing spot checks on framing and framing connections.		

3 Governing Conditions on the Use of a Seal (State of Idaho):
(1) {FINAL} Seal shall be used on all **final** specs, drawings, plans, design information and calculations presented to a client or public or gov't agency.
(2) {NOT FINAL w/o a SEAL ==> mark as DRAFT} Any document presented to a client or public or gov't. agency that is not final **and** does not contain seal shall be marked "draft," "not for construction" to distinguish from final document.
(3) {PRELIMINARY ==> use SEAL for PUBLIC POLICY} If the final work product is preliminary in nature, the final work product shall be sealed as a final document if document is intended to make public policy decisions.

Is the EOR engineering design Final at this stage?

Is the SEOR engineering design Final at this stage?

Is the EOR engineering design Final at this stage?

IDAHO – Use of the Seal

3 Governing Conditions on the Use of a Seal (State of Idaho)

1. (FINAL) ➔ *Seal shall be used on all final specs, drawings, plans, design information and calculations presented to a client or public or gov't agency*.
2. (NOT FINAL) without a seal, mark as DRAFT ➔ *Any document presented to a client or public or gov't agency that is not final and does not contain a seal shall be marked "draft". "not for construction" to distinguish from a final document.*
3. (PRELIMINARY) use seal for public policy ➔ *If the final work product is preliminary in nature, the final work product shall be sealed as a final document if document is intended to make public policy decisions.*

At which step do you (seal)?

Poll Question 2:

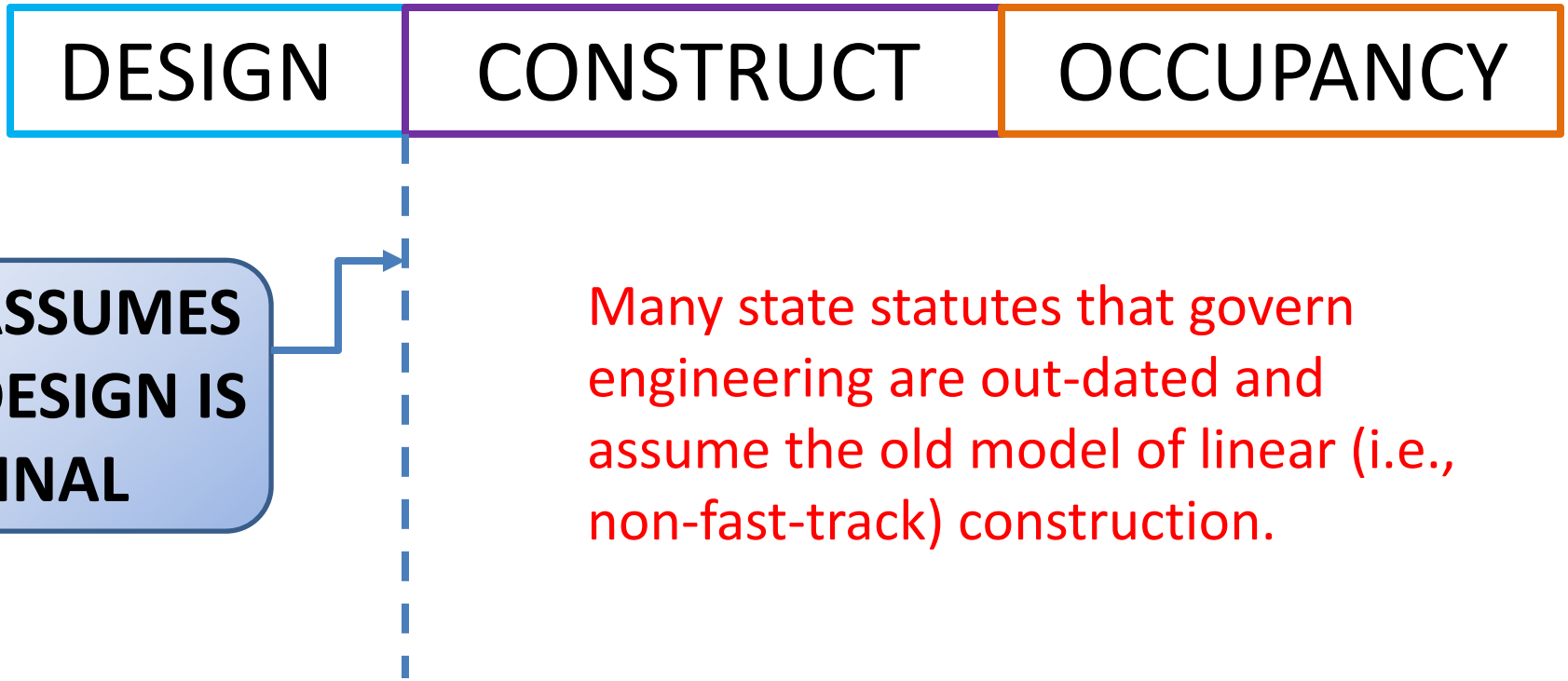
STEPS of Review:

1. EOR (seals) SDD (w/ deferred submittal) to AHJ for permit.
2. After permit issued, SEOR (seals) TDD (i.e. truss design).
3. The SEOR routes the TDD to the EOR for review and approval.
4. EOR reviews TDD, makes adjustments to SDD and restamps before submitting back to AHJ.
5. AHJ, makes final inspection of erected trusses and approves construction.

3 Governing Conditions of the (Seal)

- Final – (Seal) all final (documents) when submitting to AHJ.
- Not-final – If (document) not final and has no seal … mark as "draft", "not for construction" to distinguish from final document.
- Preliminary – If work preliminary in nature, the final work shall be sealed as a final document if intended to make public policy decisions.

TRADITIONAL (DBB)

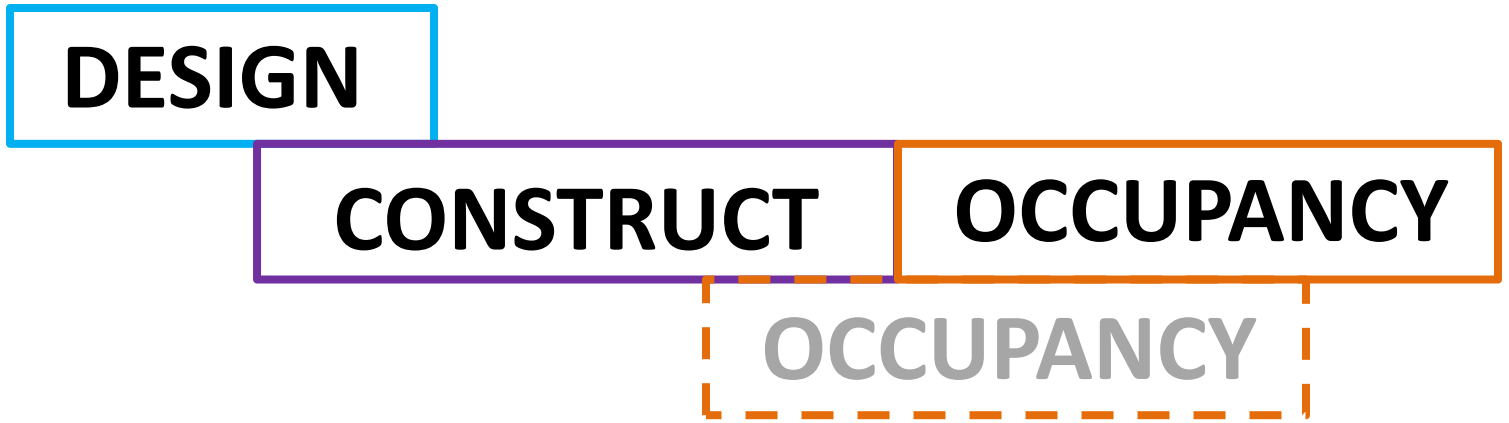


Many state statutes that govern engineering are out-dated and assume the old model of linear (i.e., non-fast-track) construction.

PREFABRICATED METAL BUILDINGS

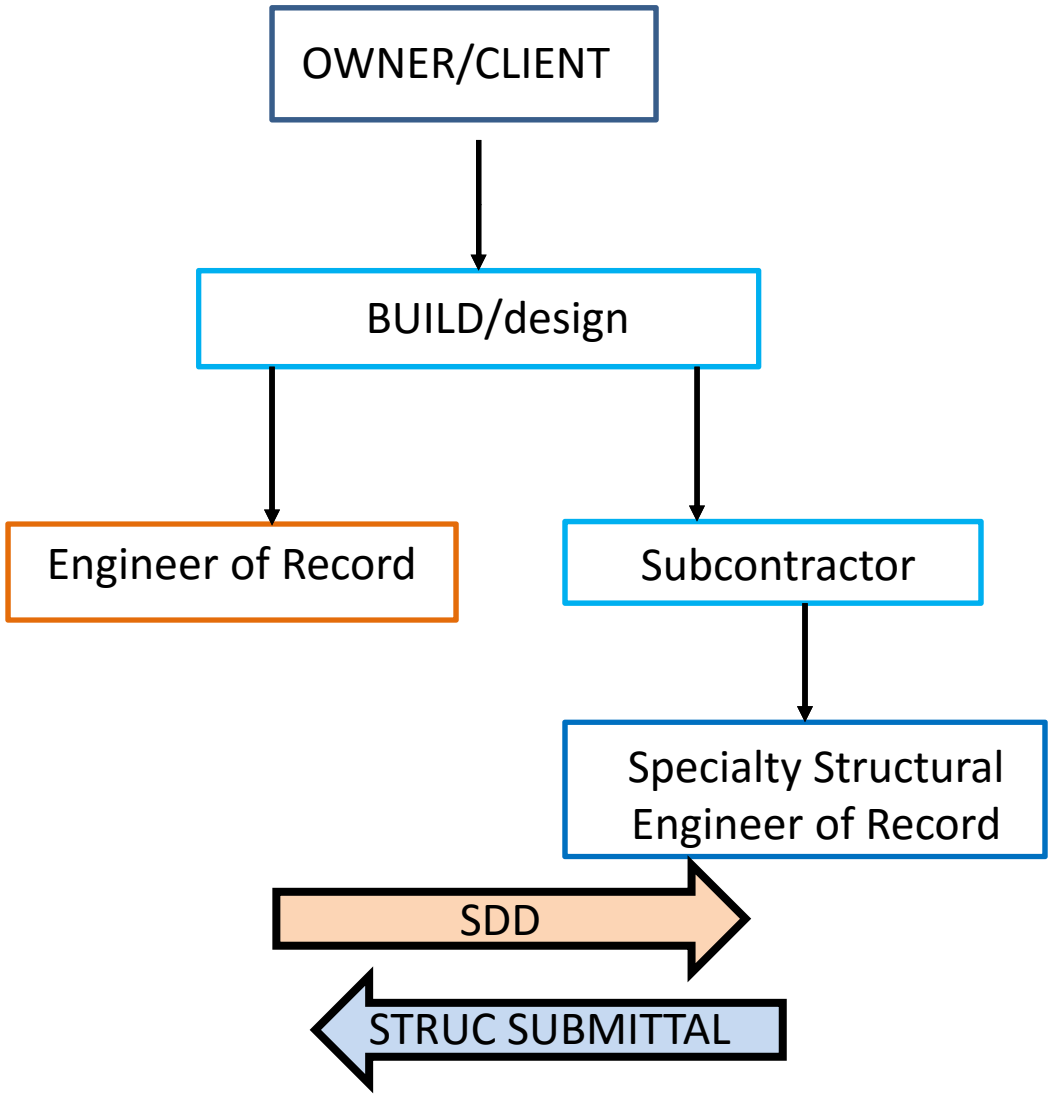
http://www.mbma.com/default.asp

CONSTRUCTION MGMT (CM) (DB)



Fast-Track Construction

DESIGN-BUILD (DB)



(E) WHEN IS FINAL …FINAL?

Ask … when is the appropriate time to seal SDDs that contain deferred submittals?

Typically, the EOR (seals) the SDD upon application for a building permit.

WHEN

"There are no clear-cut answers as to what documents must be sealed and who is responsible for their sealing. Engineers need to consult the specific state registration act, administrative rules of the licensing body, and rules and practices of the particular building authority."

[Bender, W. (2007). Defining and Allocating 'Design Responsibility' in Complex Projects. *Skellerbender*.]

2012 IBC Section 104.2

"The building official shall

- receive applications,
- review construction documents and issue permits for the erection, and alteration
- demolition and moving of buildings and structures,
- inspect the premises for which such permits have been issued and
- enforce compliance with the provisions of this code."

THE IBC DOES NOT REQUIRE A (SEAL) TO GAIN A BUILDING PERMIT! WHAT, THEN IS THE PURPOSE OF THE (SEAL)?

"The purpose of the seal is to demonstrate what was done by the licensee or under the responsible charge of the licensee."

[Bender, W. (2007). Defining and Allocating 'Design Responsibility' in Complex Projects. *Skellerbender*.]

- "Currently, the coordination and completeness of Documents varies substantially within the structural engineering profession. The SER's goal should be meeting the owner's and contractor's needs by producing a complete and coordinated set of Documents."

- The (Seal) demonstrates the EORs Responsible Charge in meeting client needs:
  - Coordinated documents
  - Completeness of documents

[*A Guideline Addressing Coordination and Completeness of Structural Construction Documents.* (2003). Washington D.C.: American Council of Engineering Companies. CASE Doc. 962-D].

"The NCEES Model Act and Model Rules have clear and specific requirements as to … when an (EOR) is authorized to seal a document. Section 240.20 specifies a long list of documents that must be stamped by an (EOR). The Model Rules contain only one narrow exception for documents that do not need to be sealed:

> *Working drawings or unfinished documents … If the working or preliminary drawings contains a statement to the effect "PRELIMINARY, NOT FOR CONSTRUCTION, RECORDING PURPOSES OR IMPLEMENTATION."*

[Bender, W. (2007). Defining and Allocating 'Design Responsibility' in Complex Projects. *Skellerbender*.]

THREE CATEGORIES OF SEAL LAW

1. "FINAL" (AK, AR, CT, DE, FL, IA, ID, LA, NC, ND, NJ, NY, PA, RI, UT, VA, WV)
2. "RESPONSIBLE CHARGE' (AL, AZ, CO, GA, HI, IL, IN, KS, KY, MA, MD, ME, MS, MN, MT, NH, NM, NY, OH, OK, SC, TN, TX, VT)
3. "INTERIM" (CA, MO, NE,OR, SD, TX, WA)

FLORIDA – Final

'All final (documents) prepared or issued by the licensee and being filed for public record and all final documents provided to the owner or the owner's representative shall be signed by the licensee, (sealed) with said seal. Such (sealing) shall be evidence of the authenticity of that to which they are affixed."

"No licensee shall affix or permit to be affixed his or her seal, name … to any (document) that depicts work which he or she is not licensed to perform or which is beyond his or her profession or specialty therein."

[Florida Title XXXII, Chapter 471 § 471.025]

CONNECTICUT - Final

" Each (agency) … of the state or political subdivision of the state shall accept, subject to review for conformance with all approved policies and standards, any final (documents) relative to the practice of a licensed (PE) or (PLS) when sealed and submitted on behalf of an employer by a licensed (PE) or (PLS)."

[Connecticut Chapter 391 § 20-304].

IDAHO – Final

"The (seal) should be placed on all final (documents), whenever presented to a client or (agency). Any such document presented to a client or (agency) … that is not final and does not contain a (seal) shall be clearly marked as 'draft', 'not for construction', or with similar wording to distinguish the document from a final document. In the event the final work is preliminary in nature or contains the word 'preliminary', such as 'preliminary engineering report', the final work product shall be (sealed) as a final document is the document is intended to … make policy decisions important to (life/safety) …"

MISSISSIPPI – Responsible Charge

1. "The (seal) on a document constitute a certification that the document was prepared by the licensee or under his direct supervision."
2. Each sheet of (documents) for engineering practice and of maps, plats, charts shall be (sealed) by the licensee preparing them, prepared under his direct supervisory control, or reviewed by him in sufficient depth to fully coordinate and assume responsibility for documents prepared by another (PE)."

[MS Title 30; Part 901; Rule 14.3].

ALABAMA - Responsible Charge

"Whenever the seal is applied, the document must be signed by the licensee thereby certifying that he or she is competent in the subject matter and is responsible for the work product."

[Alabama Code Title 34, Professions and Businesses § 34-11-7].

HAWAII – Responsible Charge

"All (documents) prepared by or under the supervision of a licensed engineer … shall be stamped with such seal or stamp when filed with (agency)."

"No official of the State nor of any political subdivision thereof, charged with the enforcement of laws or ordinances relating to the construction … of building structures, shall accept or approve any (documents) that are not stamped with the seal of … a (PE) …"

[Hawaii Chapter 464, (PE), Architects, Surveyors and Landscape Architects § 464-11].

ILLINOIS – Responsible Charge

"The use of a (PE) seal on technical submissions constitutes a representation by the (PE) that the work has been prepared by or under the personal supervision of the (PE) or developed in conjunction with the use of accepted engineering standards. The use of the seal further represents that the work has been prepared and administered in accordance with the standard of reasonable professional skill and diligence."

CALIFORNIA – Interim

"All civil (including structural and geotechnical) engineering (documents) shall be prepared by, or under the responsible charge of, a licensed engineer and shall include his or her name and license number. Interim documents shall include a notation as to the intended purpose of the document, such as 'preliminary', 'not for construction', 'for plan check only', or 'for review only'. All civil engineering (documents) that are permitted or are released for construction shall bear the signature and seal or stamp of the licensee and the date of the signing and sealing or stamping. All final civil engineering (documents) shall bear the signature and seal or stamp of the licensee, and the date of signing and sealing or stamping."

OREGON – Interim/final

"(1) In addition … final documents include plats, design information, and calculations. All final documents will bear the seal and signature of the registrant under whose supervision and control they were prepared."

"(2) Documents that are not final documents must be marked as "preliminary", "not for construction", "review copy", "draft copy, subject to change", or with similar wording … to indicate that the documents are not intended to represent the final work product of the registrant. Documents submitted to a client, customer, public entity, or any other person, are final documents and must bear the seal and signature of the registrant … unless such document is clearly marked as not a final document."

[Oregon Administrative Rules, Division 25 § 820-025-0015].

(F) DO AHJs & STATE PE BOARDS GET AN “F”?

SURVEY STATE – Survey Activities

- State-wide survey among Building Officials (in the major jurisdictions) to ascertain their interpretation of Deferred Submittals.
- Correspondence with the state's respective state board of professional engineers.
- Correspondence with political representatives:
  - Primarily one city mayor.
  - A state senator.
- Others

QUESTIONAIRE TO SURVEY STATE (AHJ)

Questions:

1. As a condition of granting a building permit, does your dept. require the EOR to list deferred submittal design items on the SDD?
2. Does the EOR ever notate (next to the engineering stamp) that the roof layout plan is preliminary (or not final)?
3. With designs that contain deferred submittals, are Truss Submittal Packages submitted at the time of a building permit?
4. For projects containing deferred submittals, does the EOR ever make any amendments to their design once they have reviewed a Truss Submittal Package?

RESPONSES FROM SURVEY STATE (AHJ)

Question 1: As a condition of granting a building permit, does your dept. require the EOR to list deferred submittal design items on the SDD?

- Most respondents indicated 'Yes'
- One respondent indicated that their city does not allow deferred submittals on engineered plans. Truss Submittal Package is required at time of building permit.

RESPONSES FROM SURVEY STATE (AHJ)

Question 2: Does the EOR ever notate (next to the engineering stamp) that the roof layout plan is preliminary (or not final)? [I received a wide response].

- No … the SDDs must be 'construction ready'.
- Yes … a note is provided that the submitted design is 'for design purpose only.'
- No … the Truss Submittal Package is submitted under separate cover.
- No … no notation is provided. Any revisions to SDD would require a resubmittal of changes.

RESPONSES FROM SURVEY STATE (AHJ)

Question 3: With designs that contain deferred submittals, are Truss Submittal Packages submitted at the time of a building permit?

- Preliminary Truss Submittal Package is required to be submitted upon building permit application.
- No … the Truss Submittal Package is provided at the time of the framing inspection.
- No … Truss Submittal Packages are never provided upon permit application. Framing inspections will not occur until all deferred submittal documents have been received. [Note: PE stamps from SEOR are not typically provided on Truss Package until the trusses are paid for … which is typically after the permit is issued.

RESPONSES FROM SURVEY STATE (AHJ)

Question 4: For projects containing deferred submittals, does the EOR ever make any amendments to their design once they have reviewed a Truss Submittal Package?

- No
- The EOR is required to re-review the original design.
- There are very few instances where the EOR makes changes to the stamped SDD.
- The City generally has the structural inspector briefly review the truss engineering and then the inspector compares it to the EOR's stamped drawings. In cases … where it doesn't appear to be compatible or correct, the inspector would notify the plan reviewer and the EOR.

SURVEY STATE (City Mayor)

Statement from City Mayor:

"One improvement referenced in your letter (i.e. the EOR is to provide the City with a notation which indicates that deferred submittal documents received by the City have been reviewed and found to be in general conformance to the design of the building), we have asked all of our building plan reviewers and inspectors to now require that a letter be stamped by the EOR indicating that the deferred submittals from truss manufacturers (and others) are in general conformance to the design of the building before any Certificate of Occupancy is issued."

SURVEY STATE (The Board of PE)

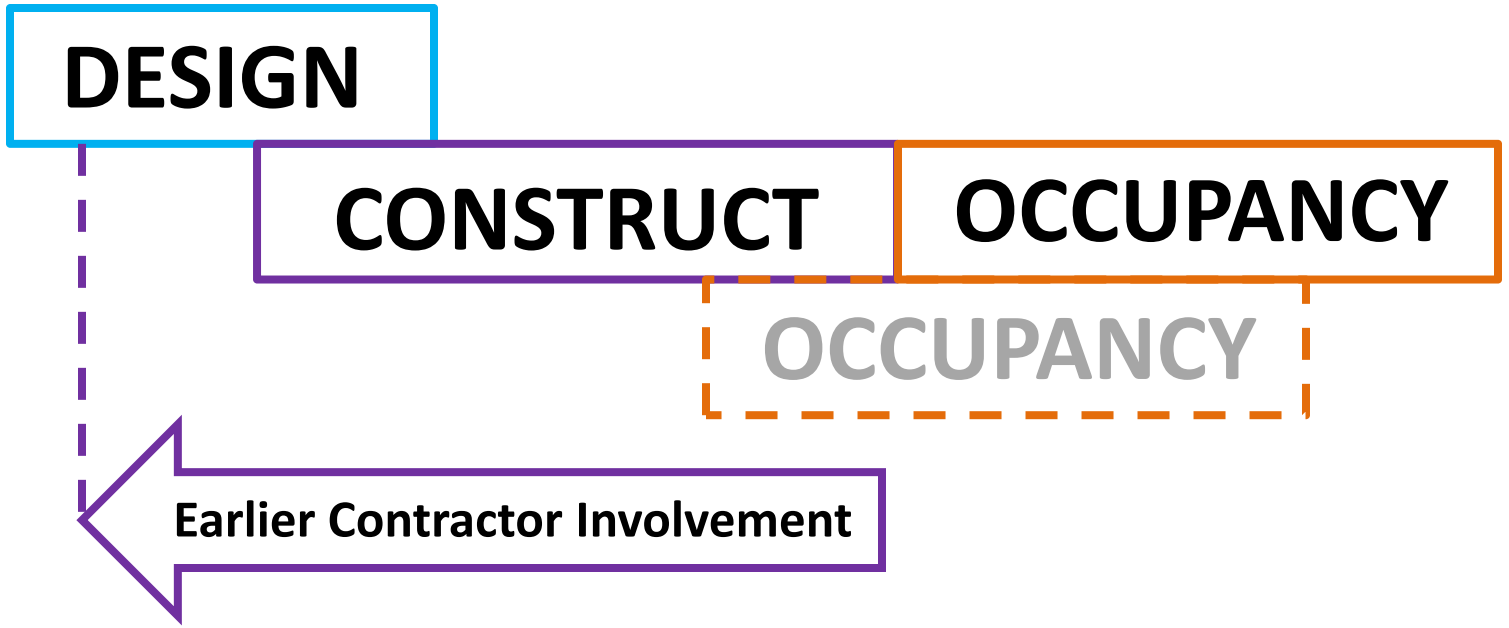
Statement from State Survey (Board of PE)

"The Board is under no obligation to inform a building official of any conflict. This is so because the building official, in and of itself, does not practice engineering. The processes, practices, or methodology that the building official employs regarding plan approval … for metal or wood trusses or any other matter has nothing to do with practice of engineering by engineers. If there are discrepancies in plan approvals, those discrepancies are the policy of the building official. Further, there was no information that exists suggesting … that the health, safety or welfare was a risk due to a systematic failure of the review process."

(G) SUMMARY AND HOMEWORK ASSIGNMENT

CONCLUSION

Fast-Track or Design-Build project delivery model

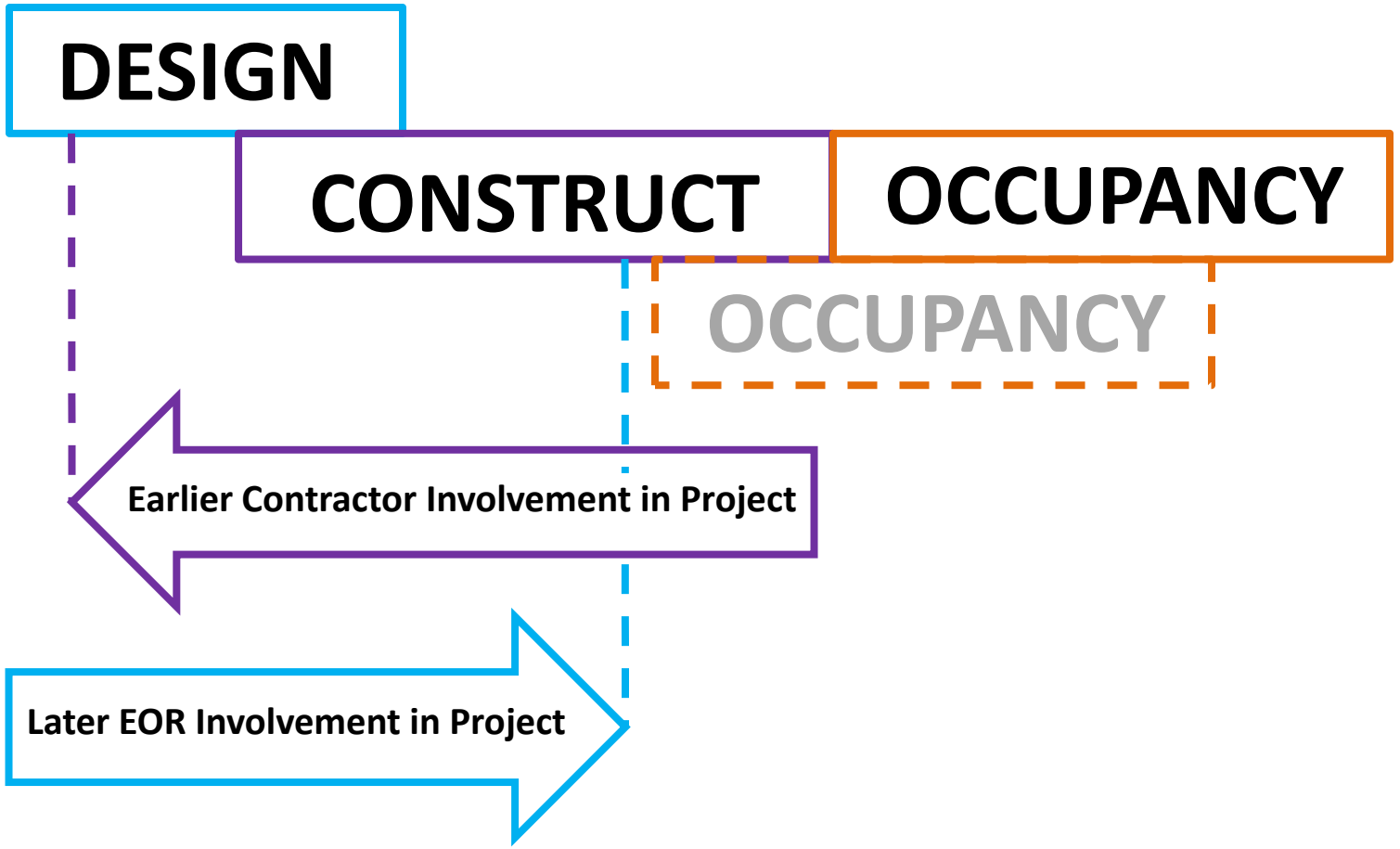


"The Whole Building Design Guide also recommends that the SER remain involved in the project until completion of construction to address the review of submittals and 'conflicts between disciplines or misinterpretations by the contractor at a point in when it is still possible to correct them with minimal cost and schedule impacts."

[Bender, W. (2007). Defining and Allocating 'Design Responsibility' in Complex Projects. *Skellerbender*.]

CONSTRUCTION MGMT (CM) (DB)

Fast-Track or Design-Build project delivery model

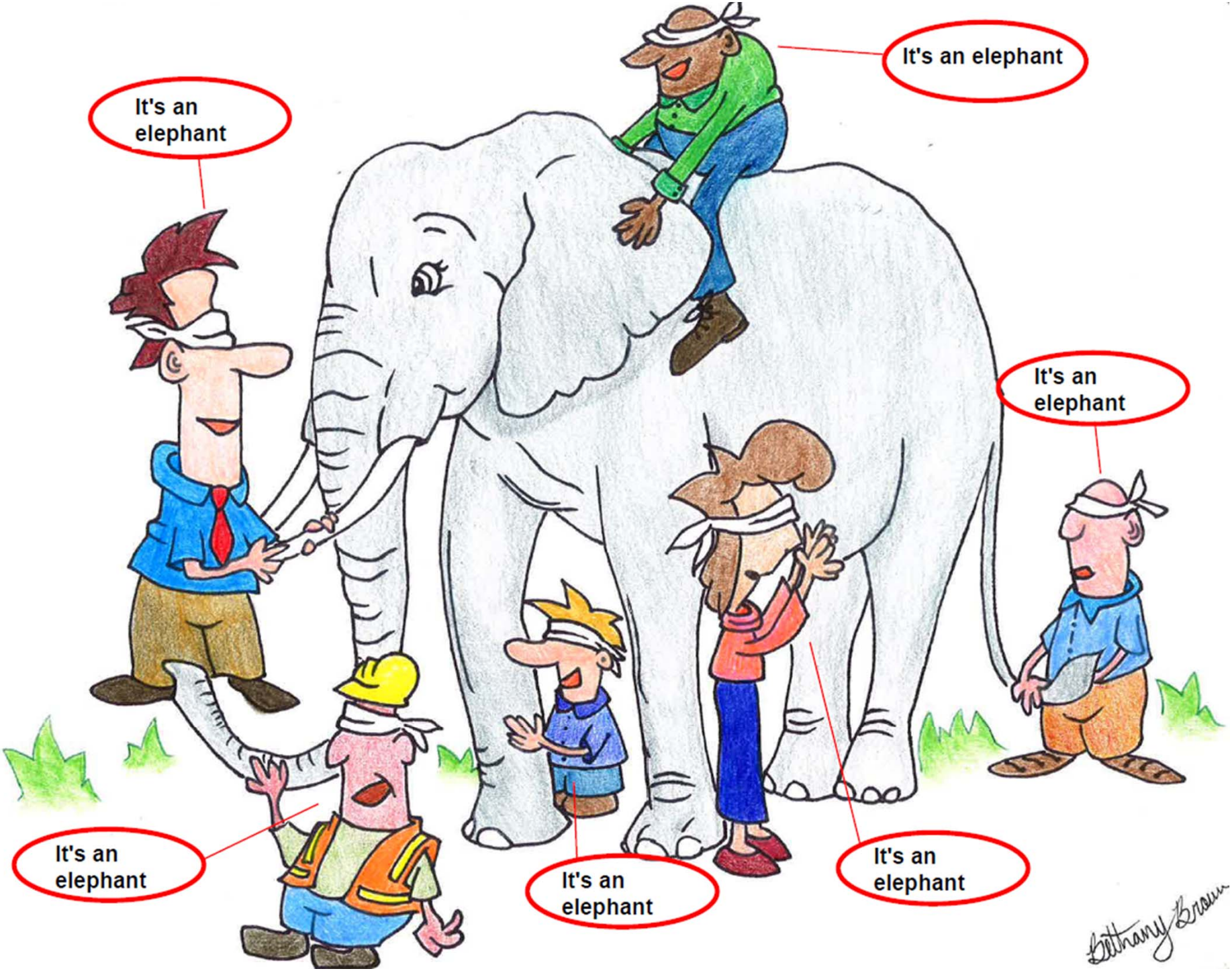


Proposed survey with State Boards

- Question 1: In the case that a EOR is (sealing) a SDD containing a deferred submittal for building permit, how should that EOR indicate that the design is not finalized (or complete) nor preliminary?

Proposed survey with State Boards

- Question 2: Regarding Question 1, at what point would The Board consider a design final (or complete)?


It's an elephant
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Bethany Braun

THE END