



RLI DESIGN PROFESSIONALS

Design Professionals Learning Event



Dreibelbis Engineering
Forensic Engineering • Building Technology

Making Engineering Ethics Live: Ethical Lessons from the Real World

DPLE 279
August 17, 2016

*RLI Design Professionals is a Registered Provider with
The American Institute of Architects Continuing Education Systems.*

*Credit earned on completion of this program will be reported to
CES Records for AIA members. Certificates of Completion
for non-AIA members are available on request.*

This program is registered with the AIA/CES for continuing professional education.

As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.



Copyright Materials

This presentation is protected by US and International Copyright laws. Reproduction, distribution, display and use of the presentation without written permission of the speakers is prohibited.

© RLI Design Professionals



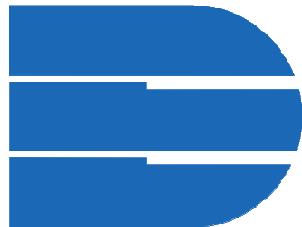
Drebabis Engineering

Course Description

As design professionals you have a responsibility to your profession and to the public. You're held to a certain standard and expected to use your authority appropriately. Ethics then impacts, and sometimes challenges, the decisions you make and the way you conduct your business.



Our Subject Matter Expert



Drebelbis Engineering

James R. Drebelbis, AIA, PE



Learning Objectives

Participants will:

- Understand professional ethics for design professionals in the context of selected managerial theory
- Learn how the standard of care and ethics interact
- Consider liability exposures and problem areas that can affect your business and the public
- Apply the lessons from others' mistakes to be more productive professionals and to better serve the public





Engineering for Design and Construction

vs.

Forensic Engineering



Engineering for Design and Construction

- Looks forward to the project at hand
- Rarely looks back at finished work

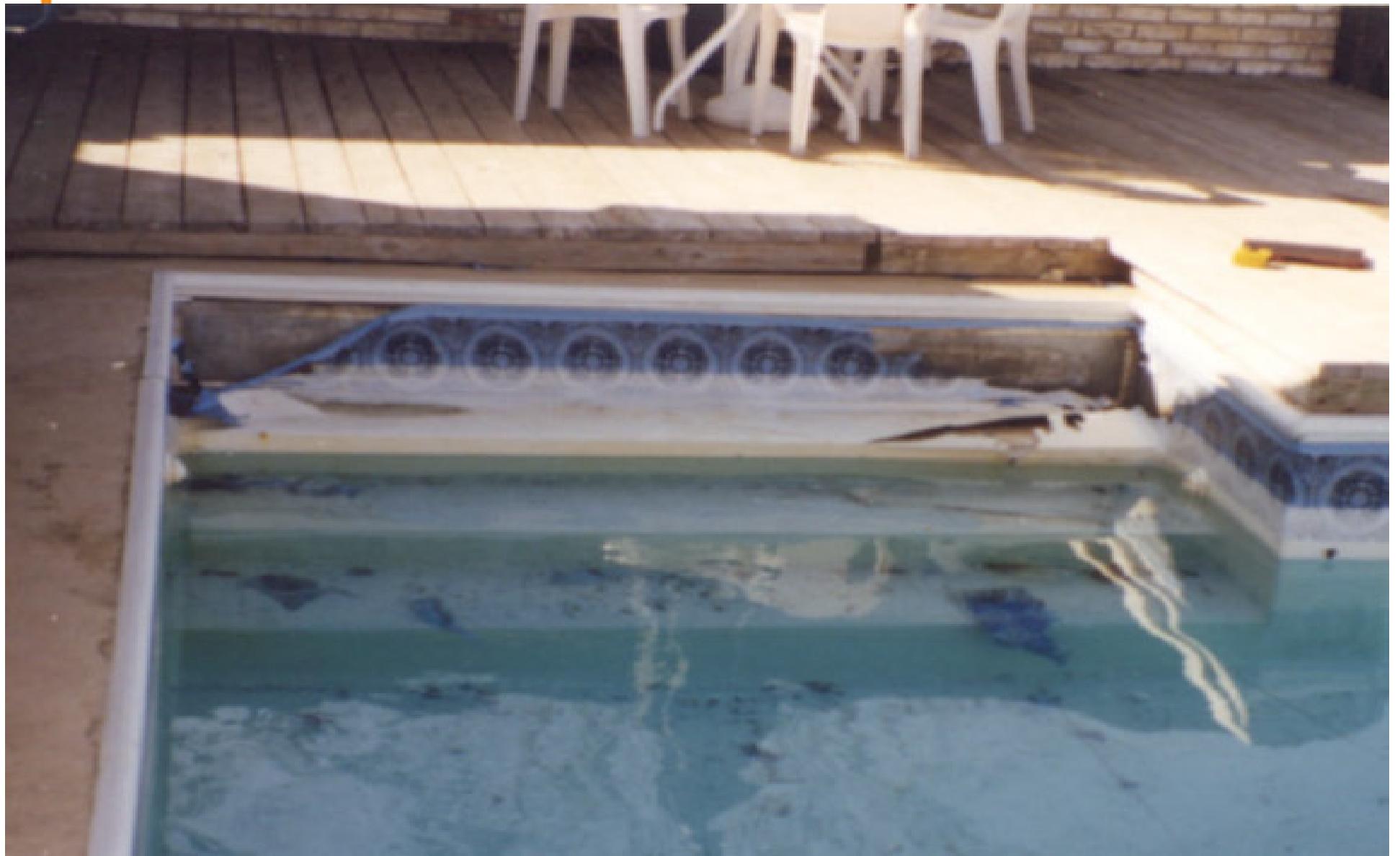


Forensic Engineering

- Focus on finished projects
- Defective construction
- Derailed projects
- Situations that don't work right



Forensic Engineering



Forensic Engineering



Forensic Engineering



Morals



“I shall not today attempt further to define [it], but I know it when I see it.”

- Justice Potter Stewart



Morals vs Ethics

Internal



Beliefs

External



Rules

Morals

- Personal belief about right and wrong
- Differ between individuals
- Differ with application



With great power there
must also come great
responsibility.

Spider-Man – Stan Lee



Engineer Practice Act

§ 1001.004. Legislative Purpose and Intent;

- (a) The legislature recognizes the vital impact that the rapid advance of knowledge of the mathematical, physical, and engineering sciences as applied in the practice of engineering has on the lives, property, economy, and security of state residents and the national defense.
- (b) The purpose of this chapter is to:
 - (1) protect the public health, safety, and welfare;



State Board of Professional Engineers

Publish and administer rules that
reflect the
Objectives of the Practice Act



Ethics

Rules that attempt to build the kind of world we want to live in based on Moral Beliefs



Professional Ethics

Competence → **Incompetence**

Truthfulness → **Deceit**

Integrity → **Gross Negligence**

Why Be Ethical?

- It's the right thing to do
- Ethical behavior elevates the profession
- Negligence is measured by the Rules of Conduct



Standard of Care

- Doing what a prudent engineer would do under the same or similar circumstances
- Not doing what a prudent engineer would not do under the same or similar circumstances.



Competence



Competence

§137.59 Engineers' Actions Shall Be Competent

- (a) Engineers shall practice only in their areas of competence.
- (b) The engineer shall not perform any engineering assignment for which the engineer is not qualified by education or experience to perform adequately and competently. However, an engineer may accept an assignment which includes phases outside of the engineer's area of competence if those other phases are performed by qualified licensed professionals, consultants, associates, or employees.

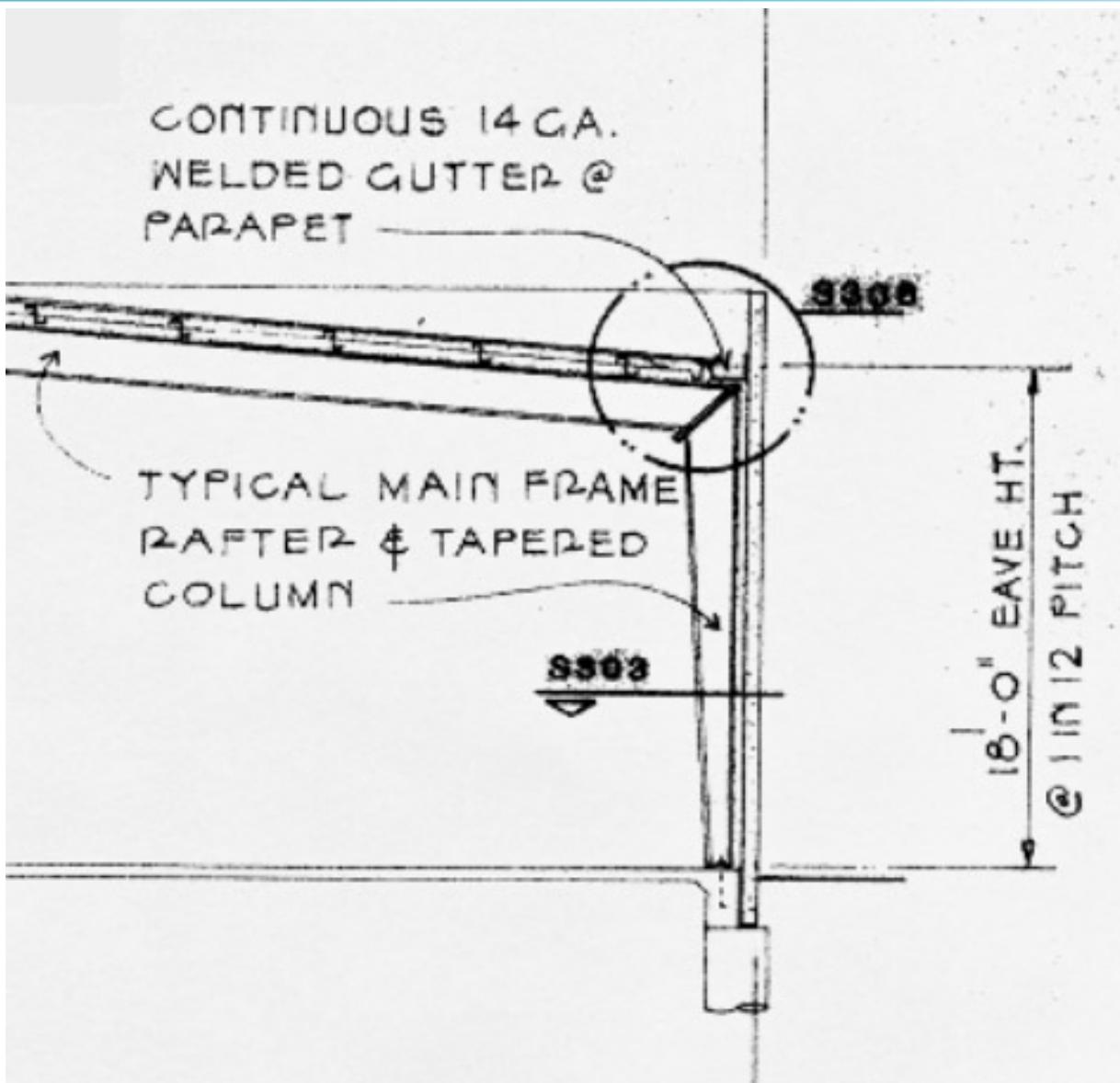
Source Note: The provisions of this §137.59 amended to be effective September 4, 2006.

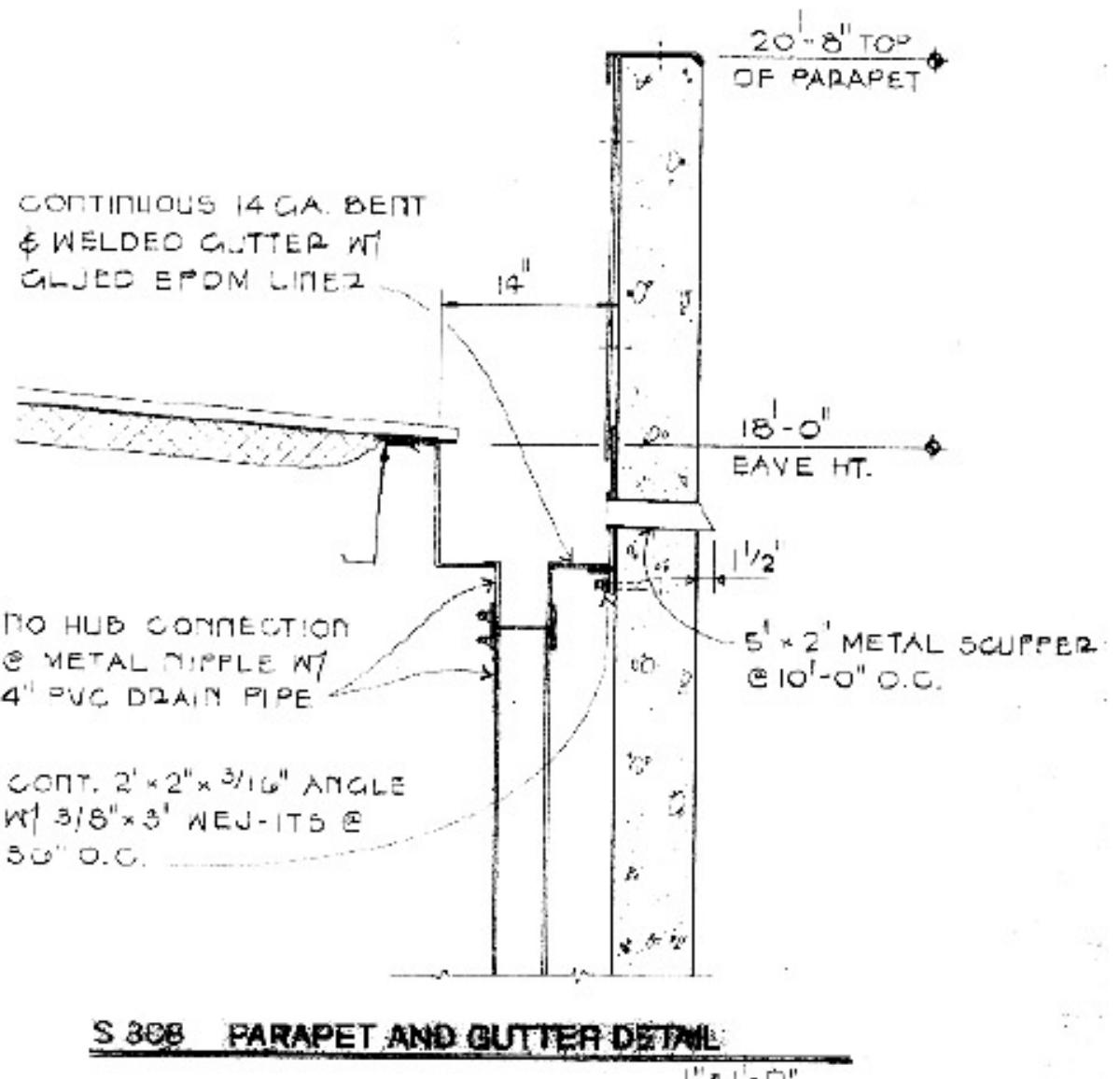
CONTINUOUS 14 GA.
WELDED GUTTER @
PARAPET

TYPICAL MAIN FRAME
RAFTER & TAPERED
COLUMN

8308

18'-0" EAVE HT.
@ 1 in 12 PITCH

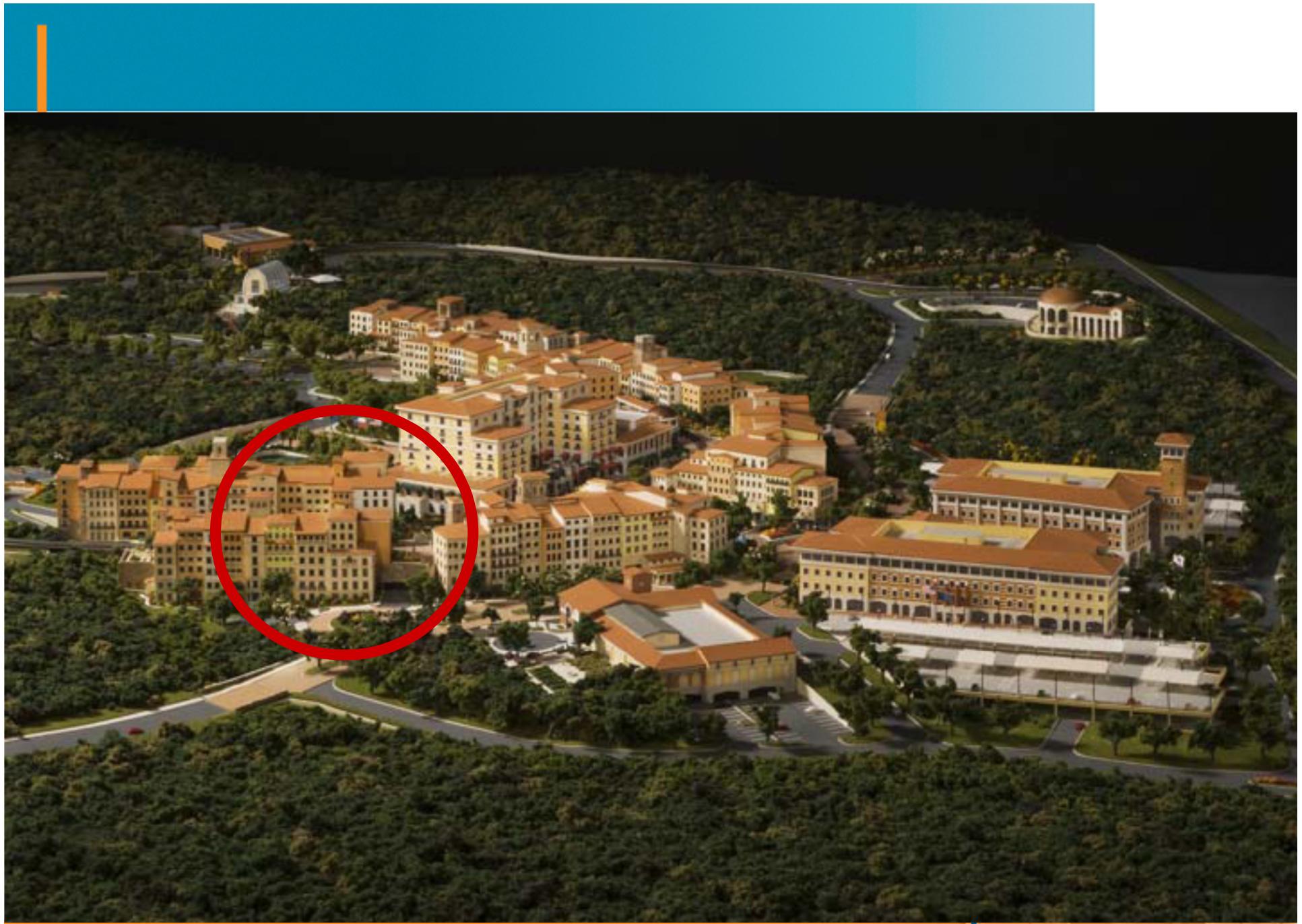


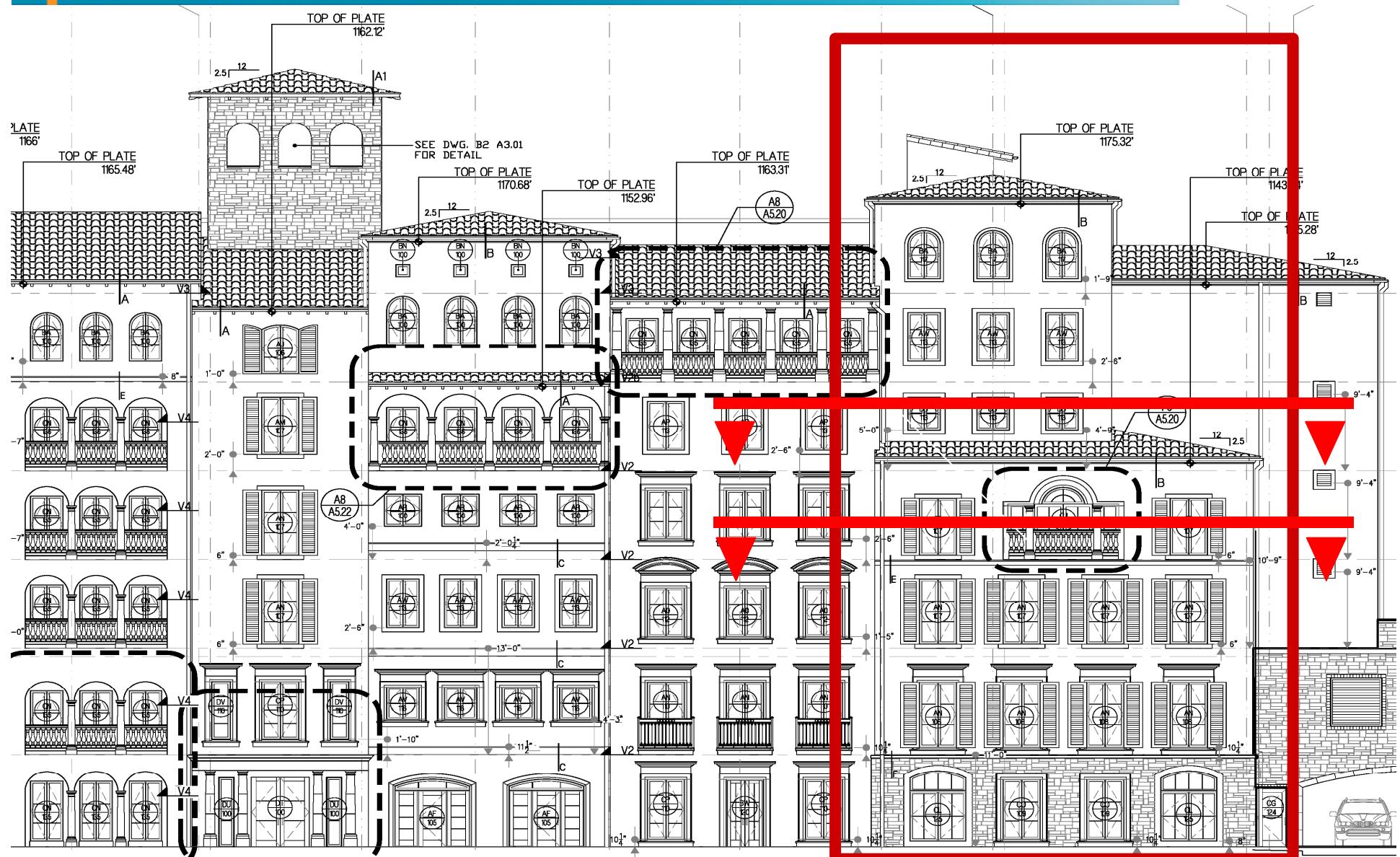


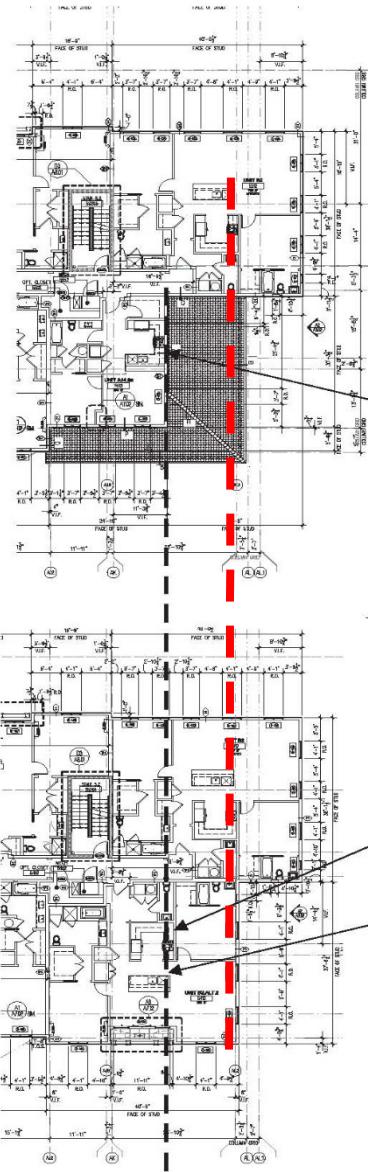


RLI DESIGN PROFESSIONALS
Design Professionals Learning Event









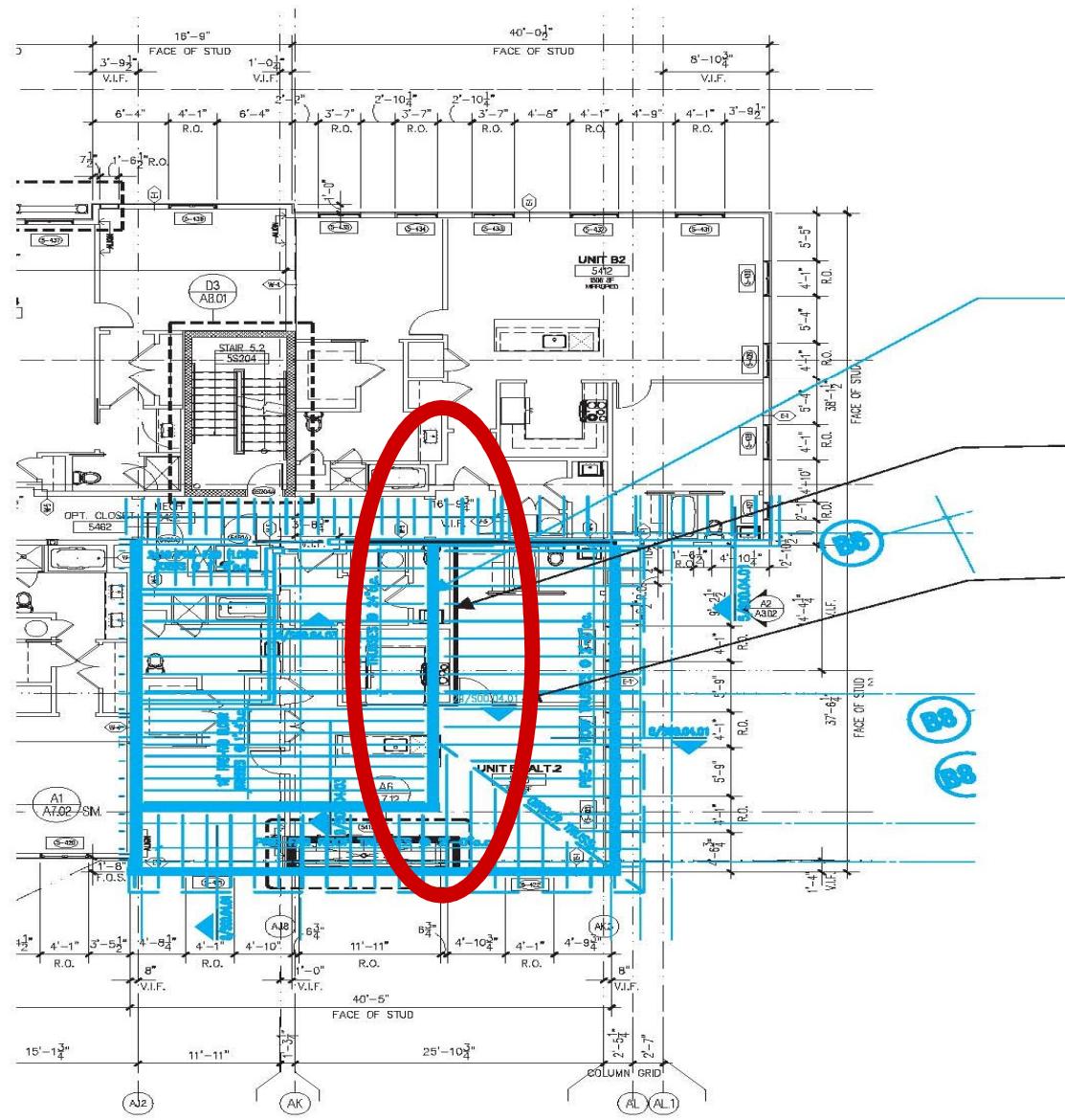
Location
Bearing Wall Above

FLR 5

Bearing Wall Below

No Bearing Wall Below

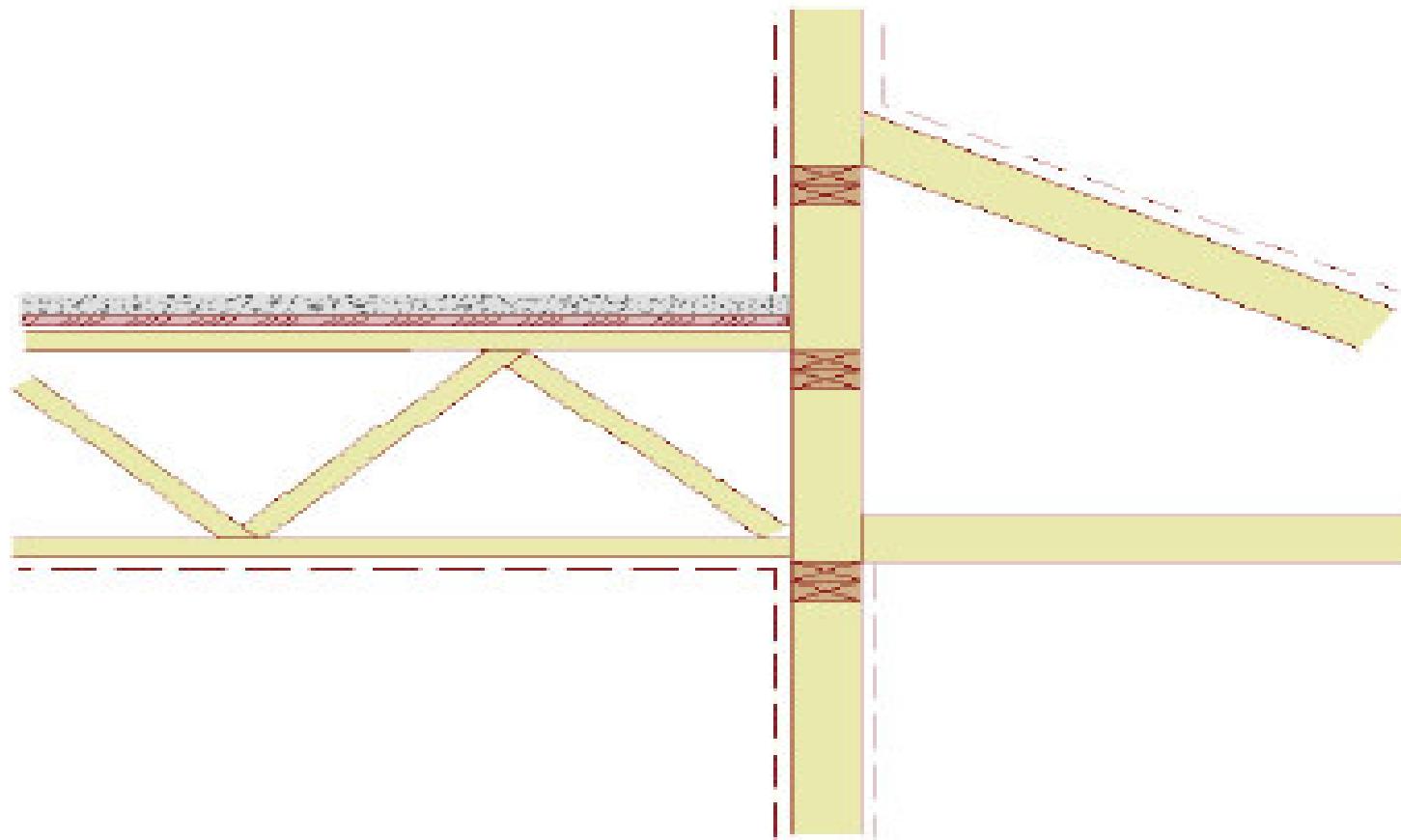
FLR 4

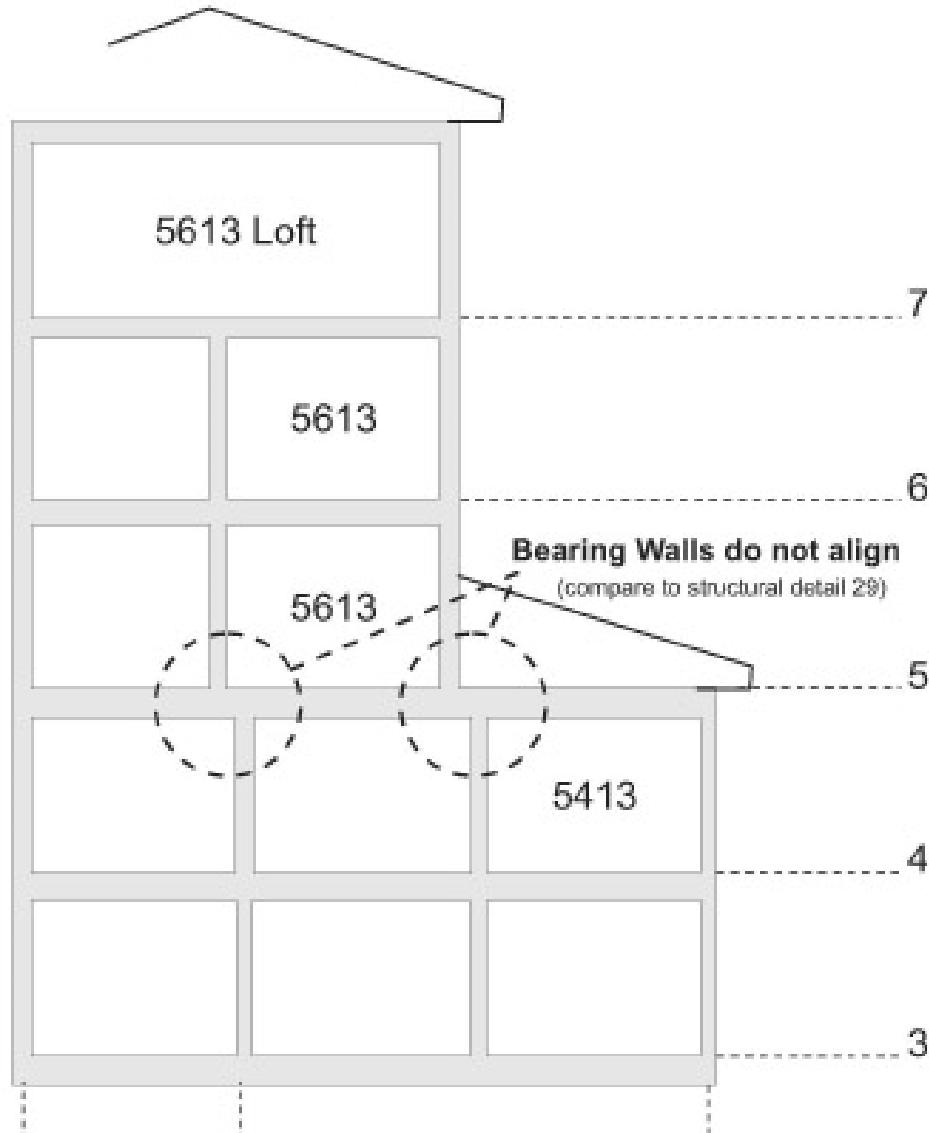


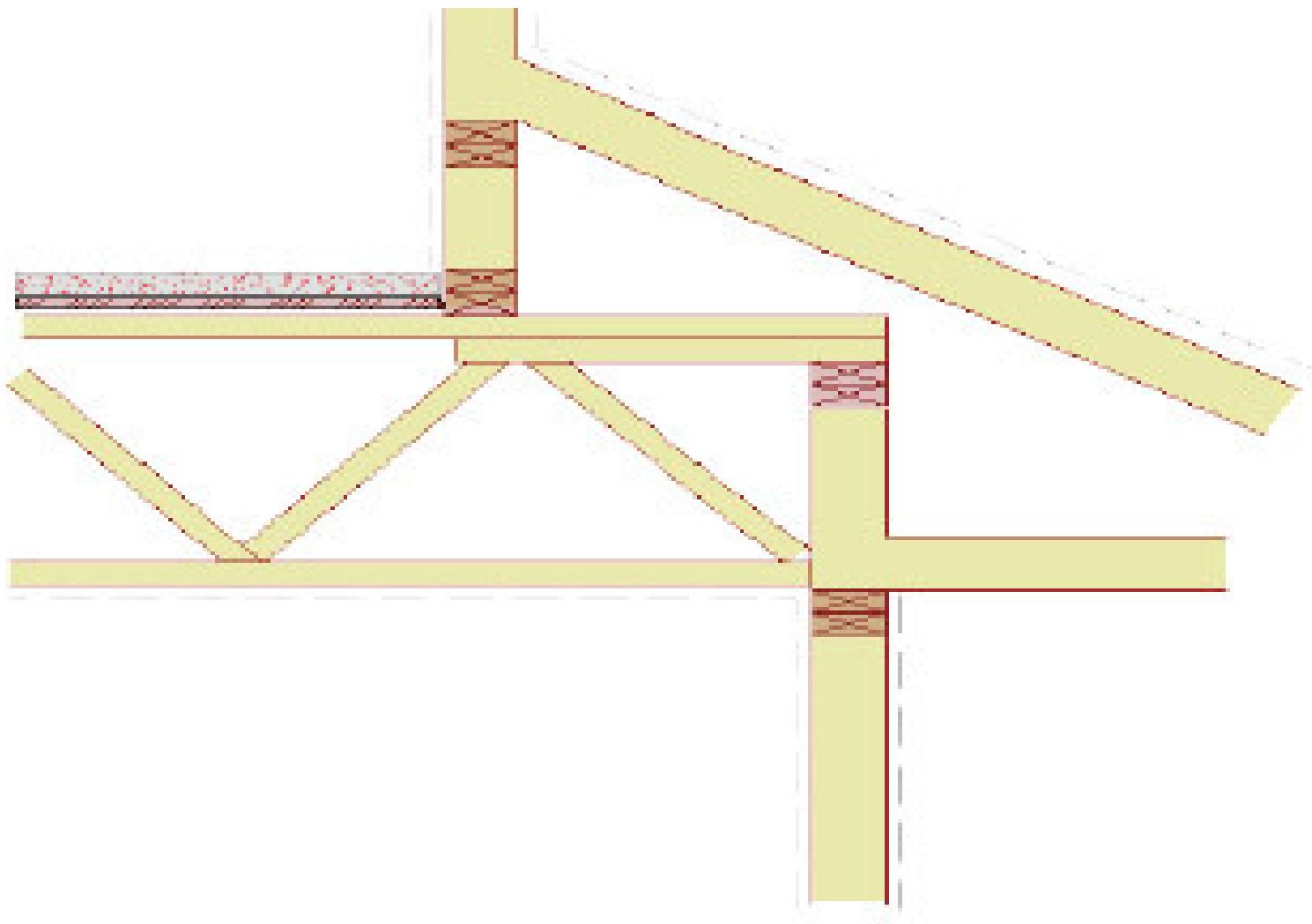
Structural drawing shows improper location of bearing wall below

Location of bearing wall below

Structural detail
29/S00.04.01









Truthfulness



Truthful

§137.57 Engineers Shall be Objective and Truthful

- (a) Engineers shall issue statements only in an objective and truthful manner. Engineers should strive to make affected parties aware of the engineers' professional concerns regarding particular actions or projects, and of the consequences of engineering decisions or judgments that are overruled or disregarded.
- (b) The issuance of oral or written assertions in the practice of engineering shall not be:
 - (1) fraudulent,
 - (2) deceitful, or
 - (3) misleading or shall not in any manner whatsoever tend to create a misleading impression.

Source Note: The provisions of this §137.57 amended to be effective December 21, 2008





You can trust me.
I'm a Professional.



Managing Principal

XXXXXX XXXXX is responsible for both the administrative and project design standards. He coordinates project assignments, establishes framing systems and manages production of engineering design, construction documents and construction administration.

MOST RECENT EXPERIENCE

Crockett Elementary School, SAISD

-Investigation and Evaluation of Existing Structures

Temple Beth El, San Antonio, Texas

-Investigation and Stabilization of Existing Structures

Tower of the Americas, San Antonio, Texas

-Structural Analysis and Evaluation of Existing Structure

San Antonio Museum of Art, San Antonio, Texas

-New Latin American Wing



REGISTRATION

Texas No.36983

New York No.55369

Colorado No.23420

Florida No.42411

Kansas No.12503

EDUCATION

Engineering educational equivalency established by
Examination of Texas State Board of
Registration for Professional Engineers.

MEMBERSHIPS

National Society of Professional Engineers

Texas Society of Professional Engineers

American Society of Civil Engineers

Structural Engineers Association of Texastects.



Managing Principal

XXXXXX XXXXX is responsible for both the administrative and project design standards. He coordinates project assignments, establishes framing systems and manages production of engineering design, construction documents and construction administration.



MOST RECENT EXPERIENCE

Crockett Elementary School, SAISD

-Investigation and Evaluation of Existing Structures

Temple Beth El, San Antonio, Texas

-Investigation and Stabilization of Existing Structures

Tower of the Americas, San Antonio, Texas

-Structural Analysis and Evaluation of Existing Structure

San Antonio Museum of Art, San Antonio, Texas

-New Latin American Wing

REGISTRATION

Texas No.36983

New York No.55369

Colorado No.23420

Florida No.42411

Kansas No.12503

EDUCATION

Engineering educational equivalency established by
Examination of Texas State Board of
Registration for Professional Engineers.

MEMBERSHIPS

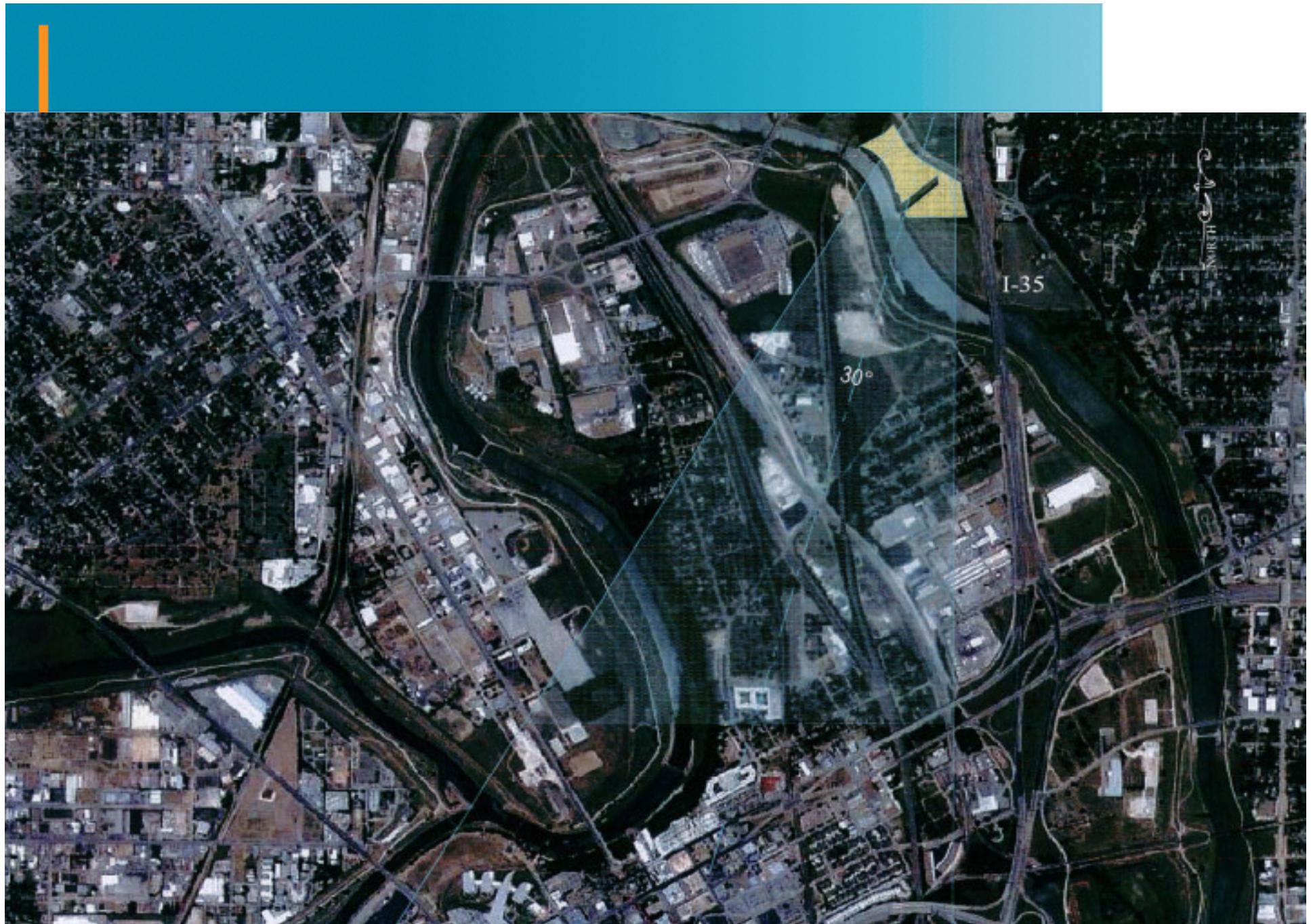
National Society of Professional Engineers

Texas Society of Professional Engineers

American Society of Civil Engineers

Structural Engineers Association of Texastects.













Integrity



Protect the Public

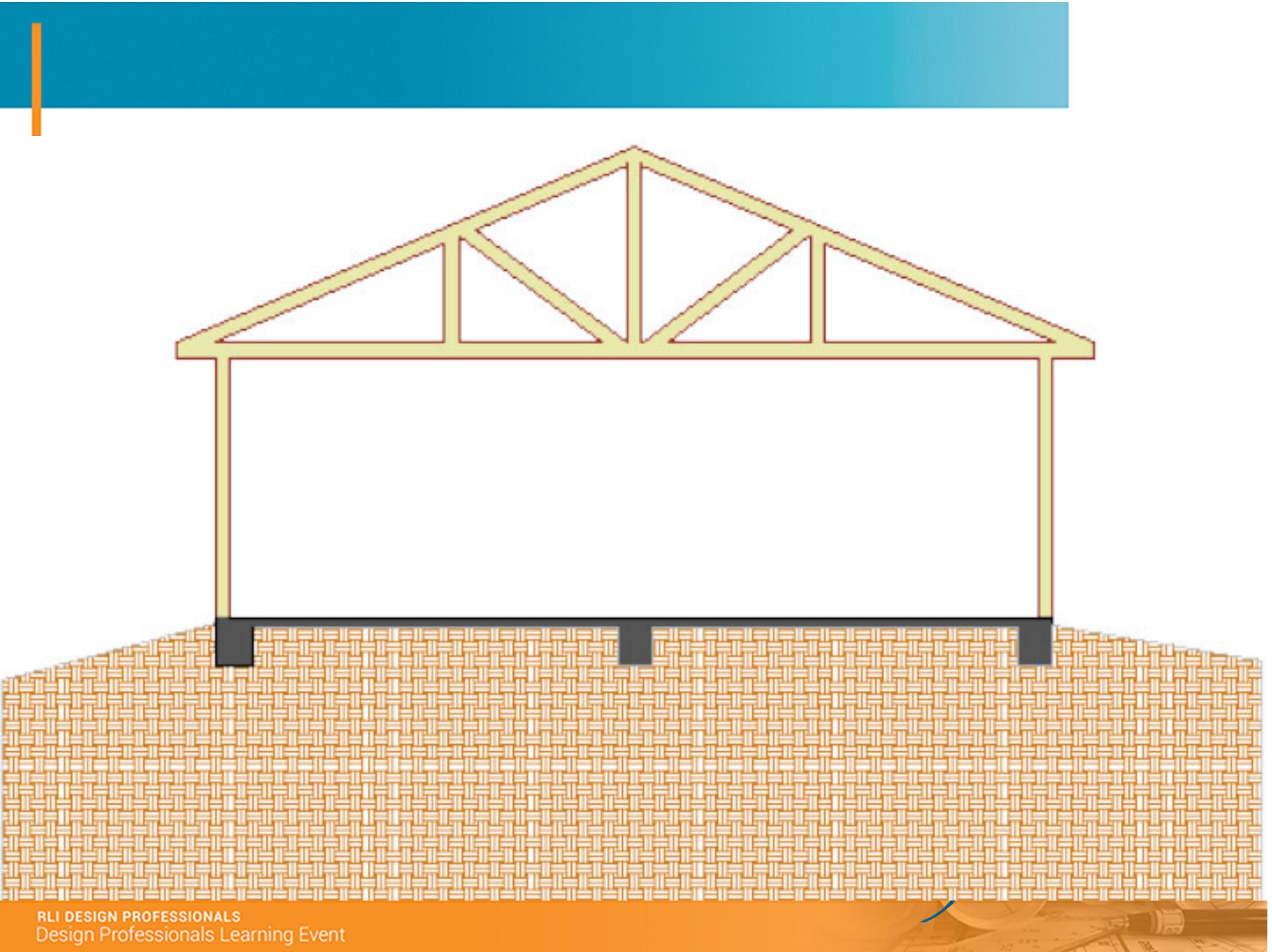
§137.55 Engineers Shall Protect the Public

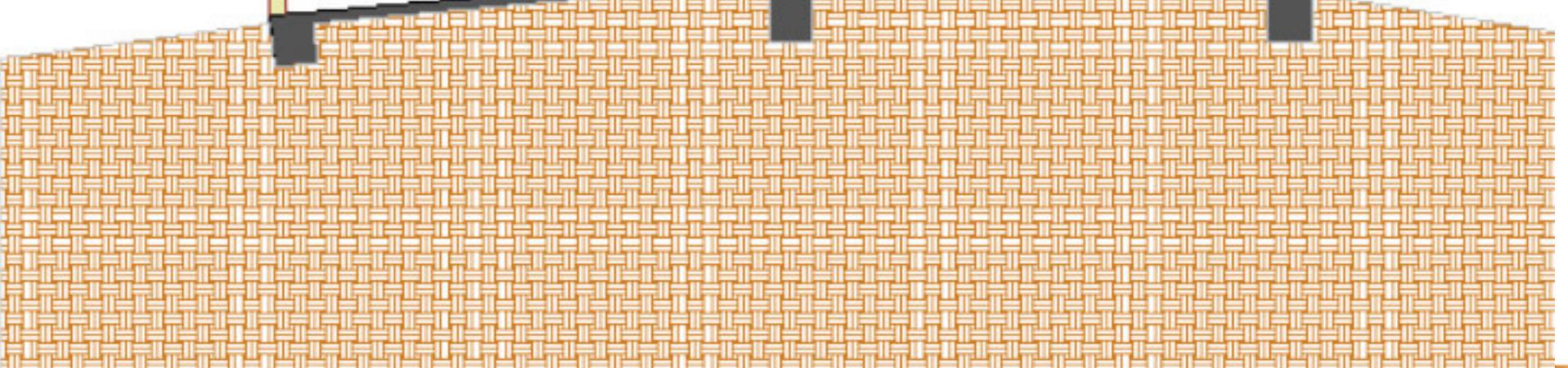
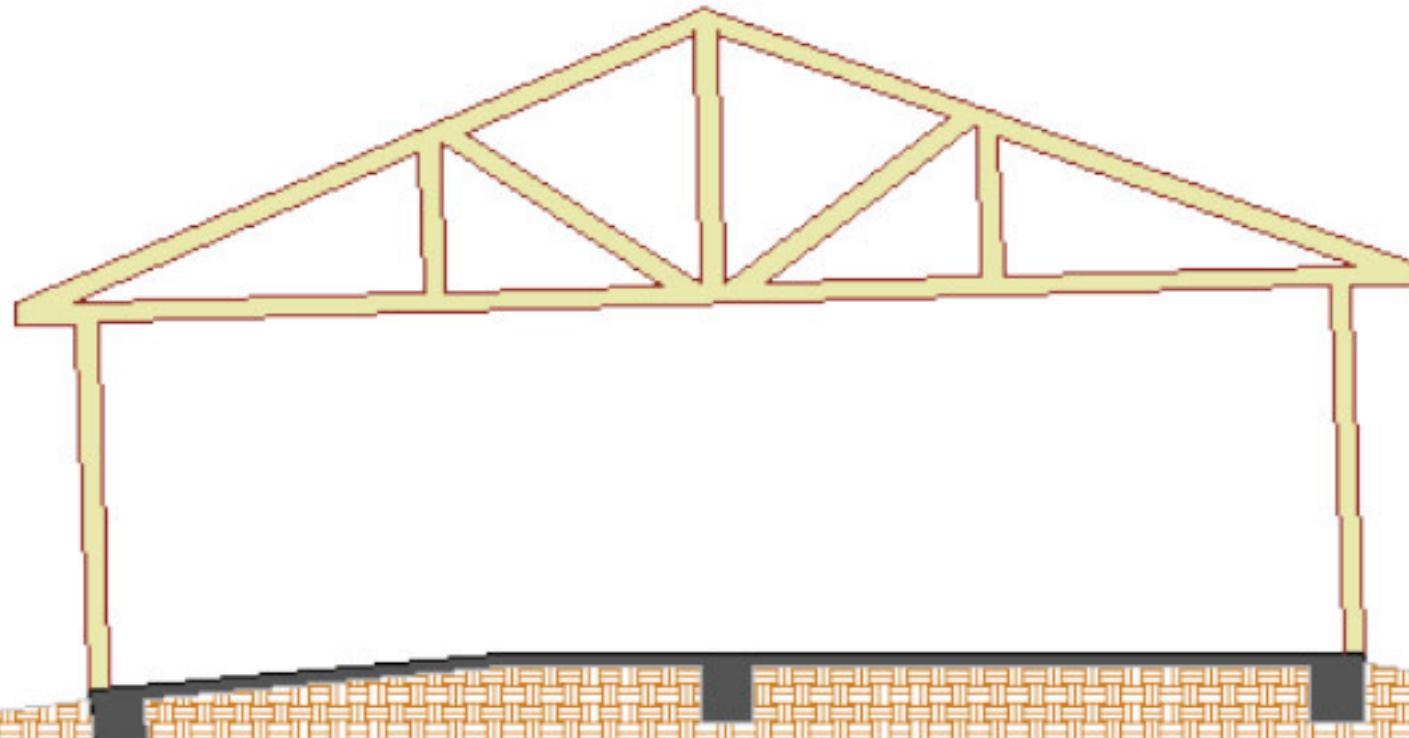
- (a) Engineers shall be entrusted to protect the health, safety, property, and welfare of the public in the practice of their profession. The public as used in this section and other rules is defined as any individual(s), client(s), business or public entities, or any member of the general population whose normal course of life might reasonably include an interaction of any sort with the engineering work of the license holder.
- (b) Engineers shall not perform any engineering function which, when measured by generally accepted engineering standards or procedures, is reasonably likely to result in the endangerment of lives, health, safety, property, or welfare of the public. Any act or conduct which constitutes incompetence or gross negligence, or a criminal violation of law, constitutes misconduct and shall be censurable by the board.



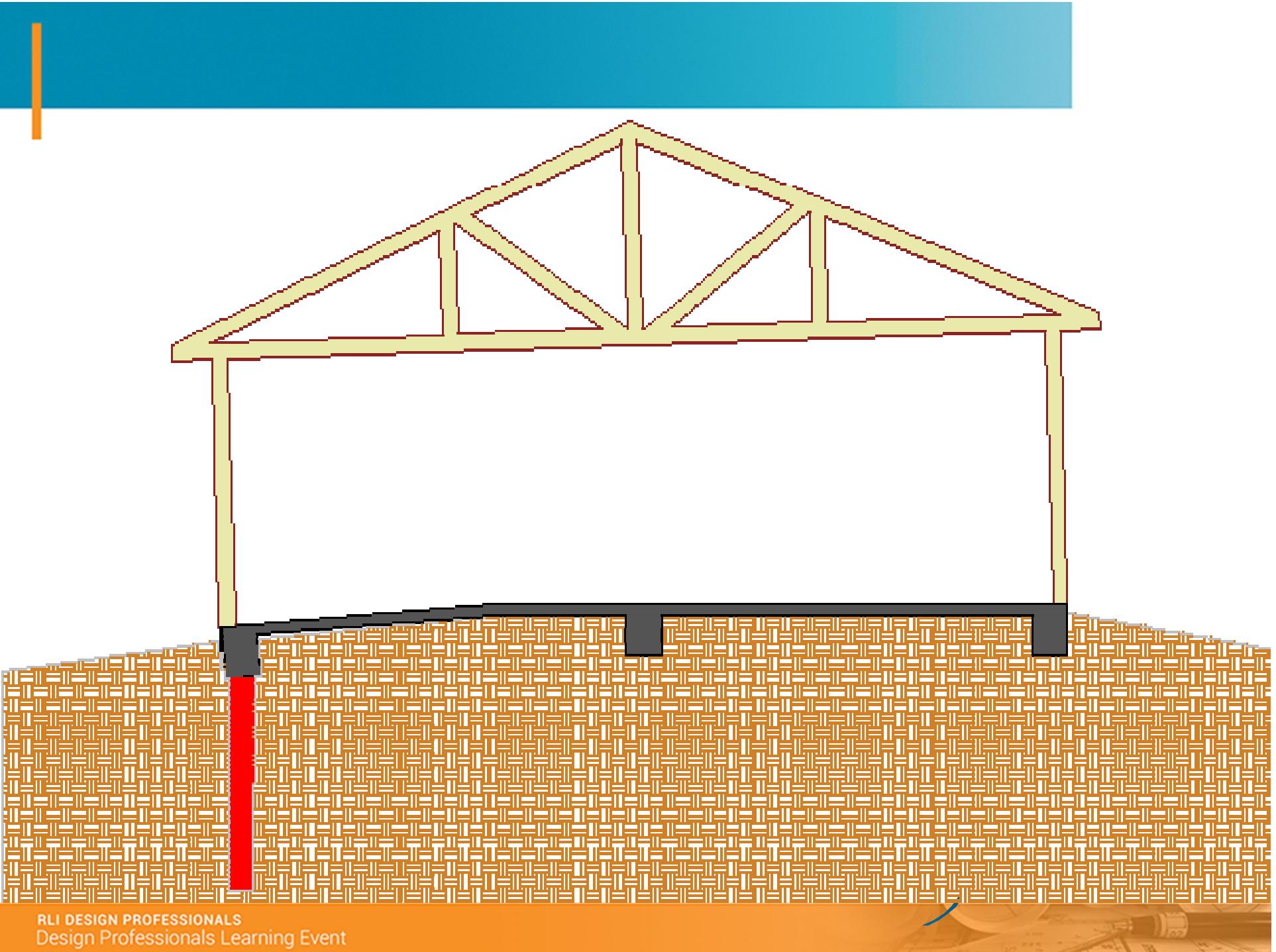
Slab on Grade Repair?



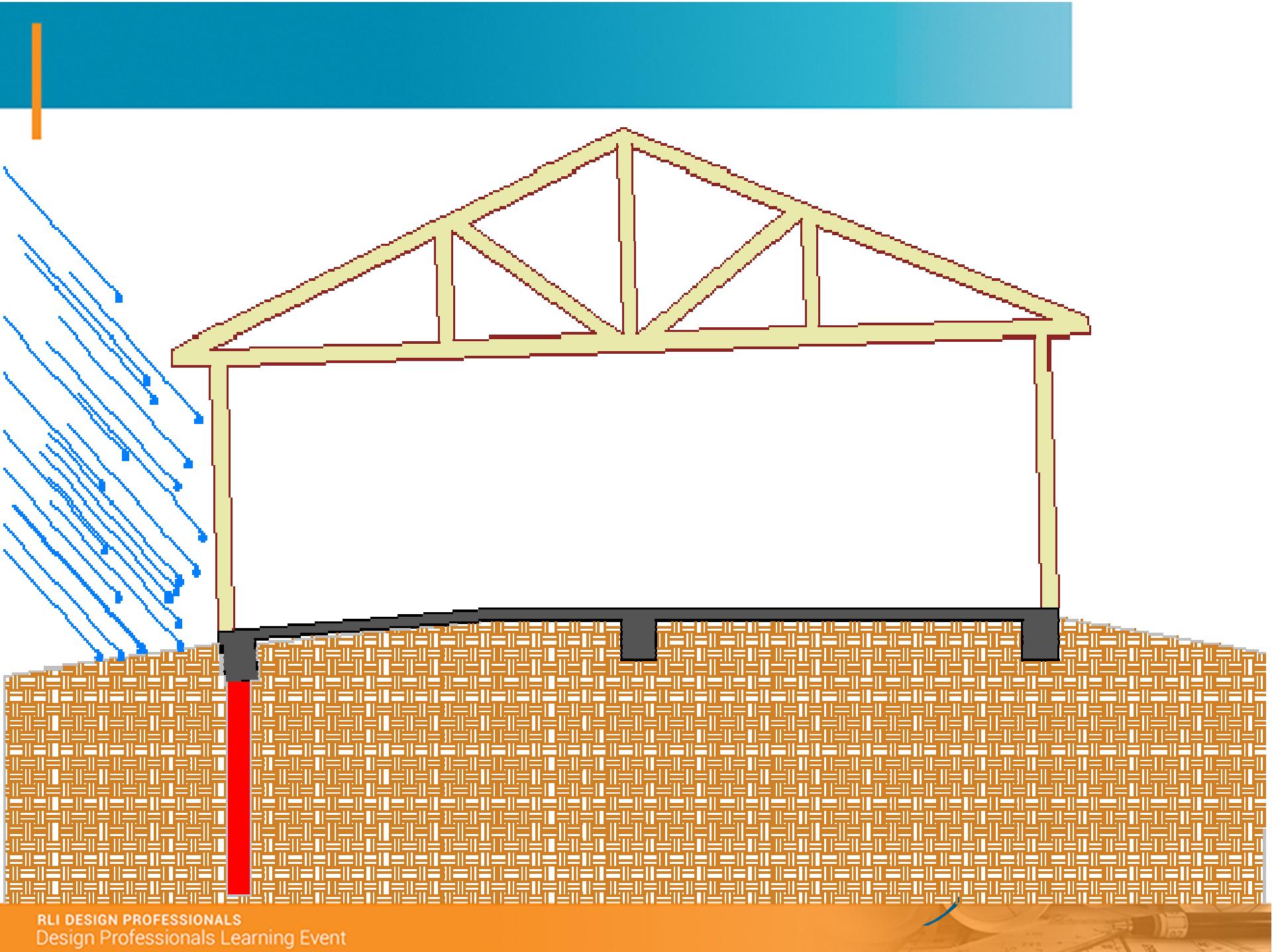


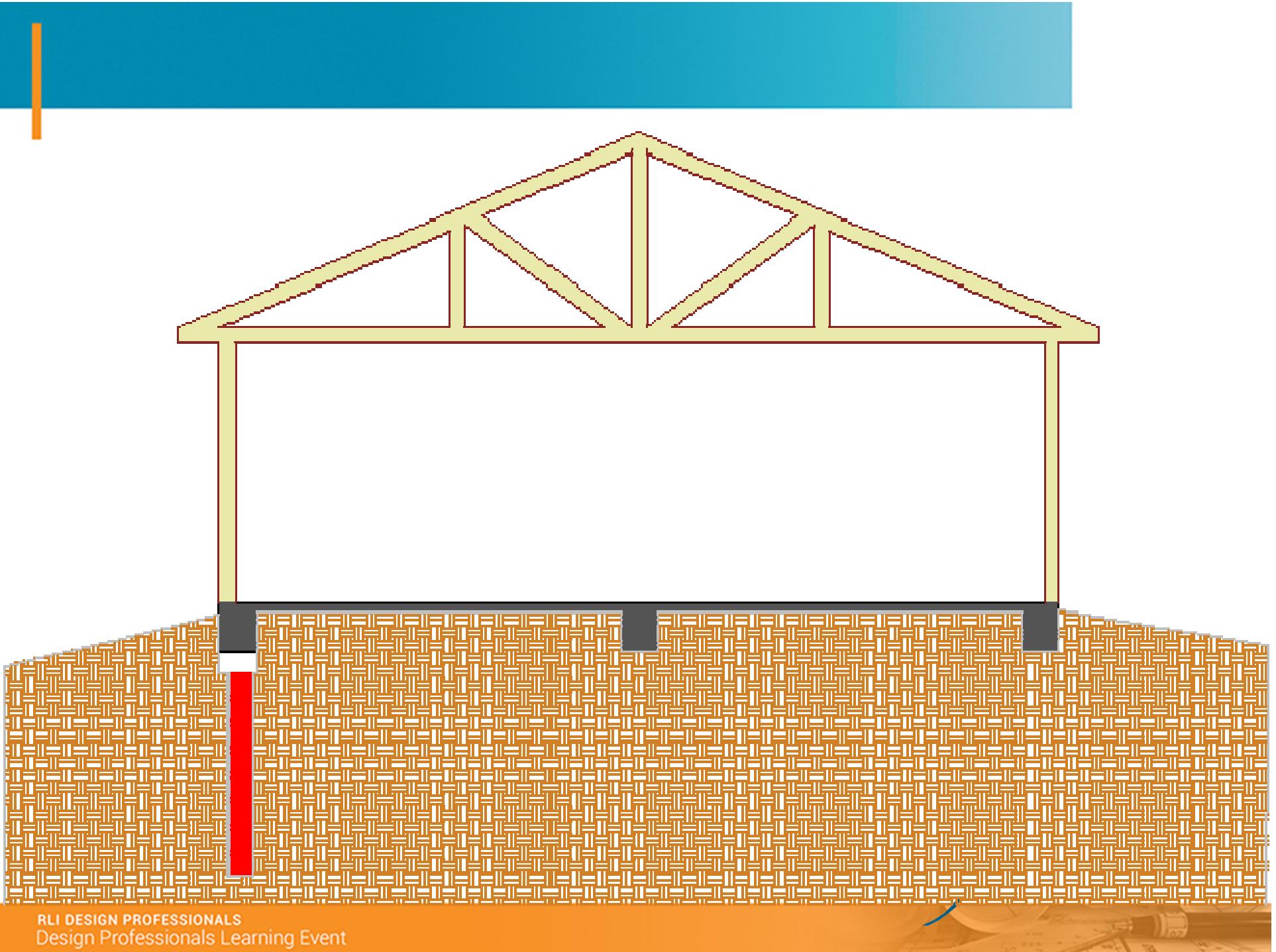


RLI DESIGN PROFESSIONALS
Design Professionals Learning Event

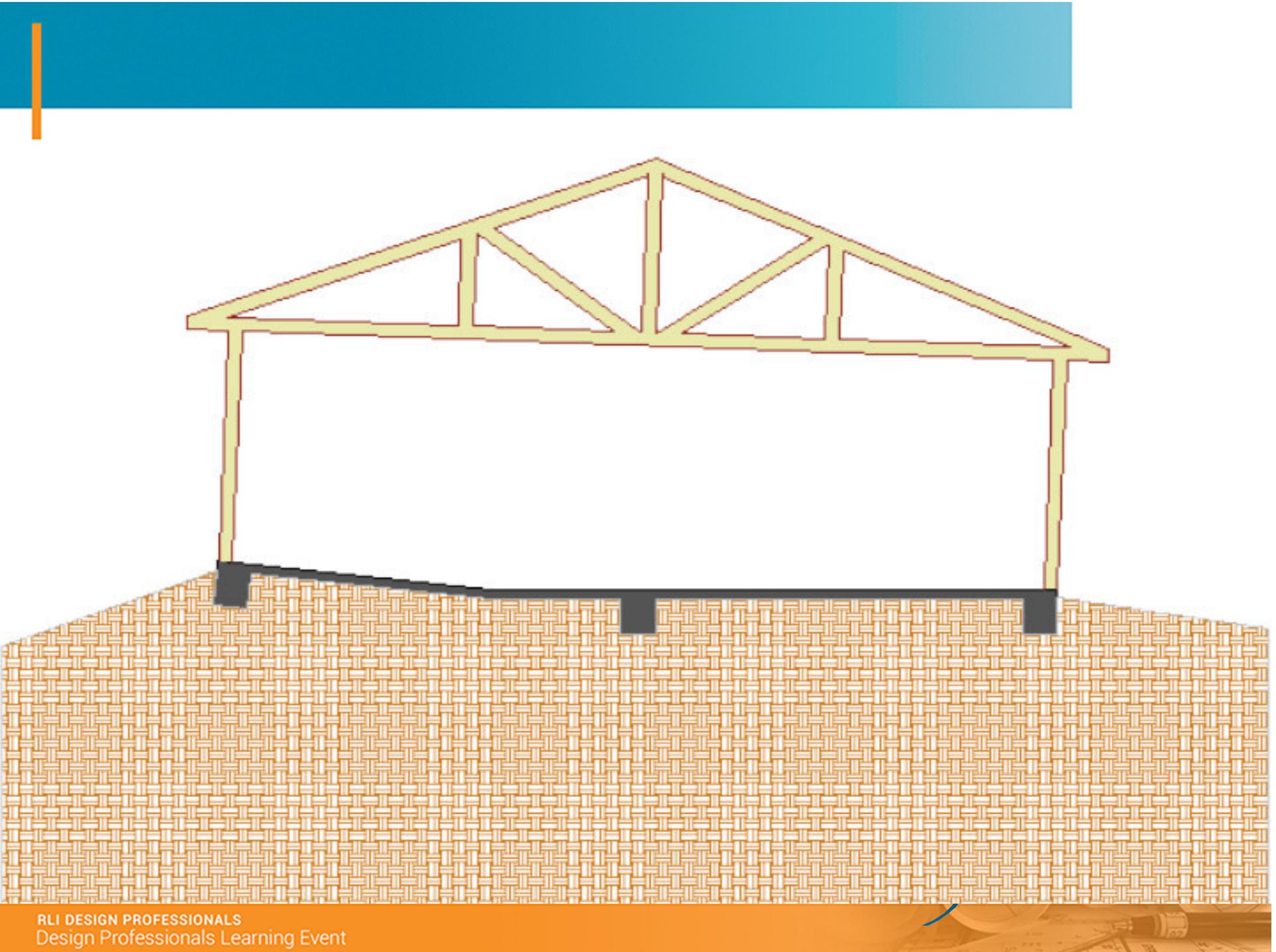


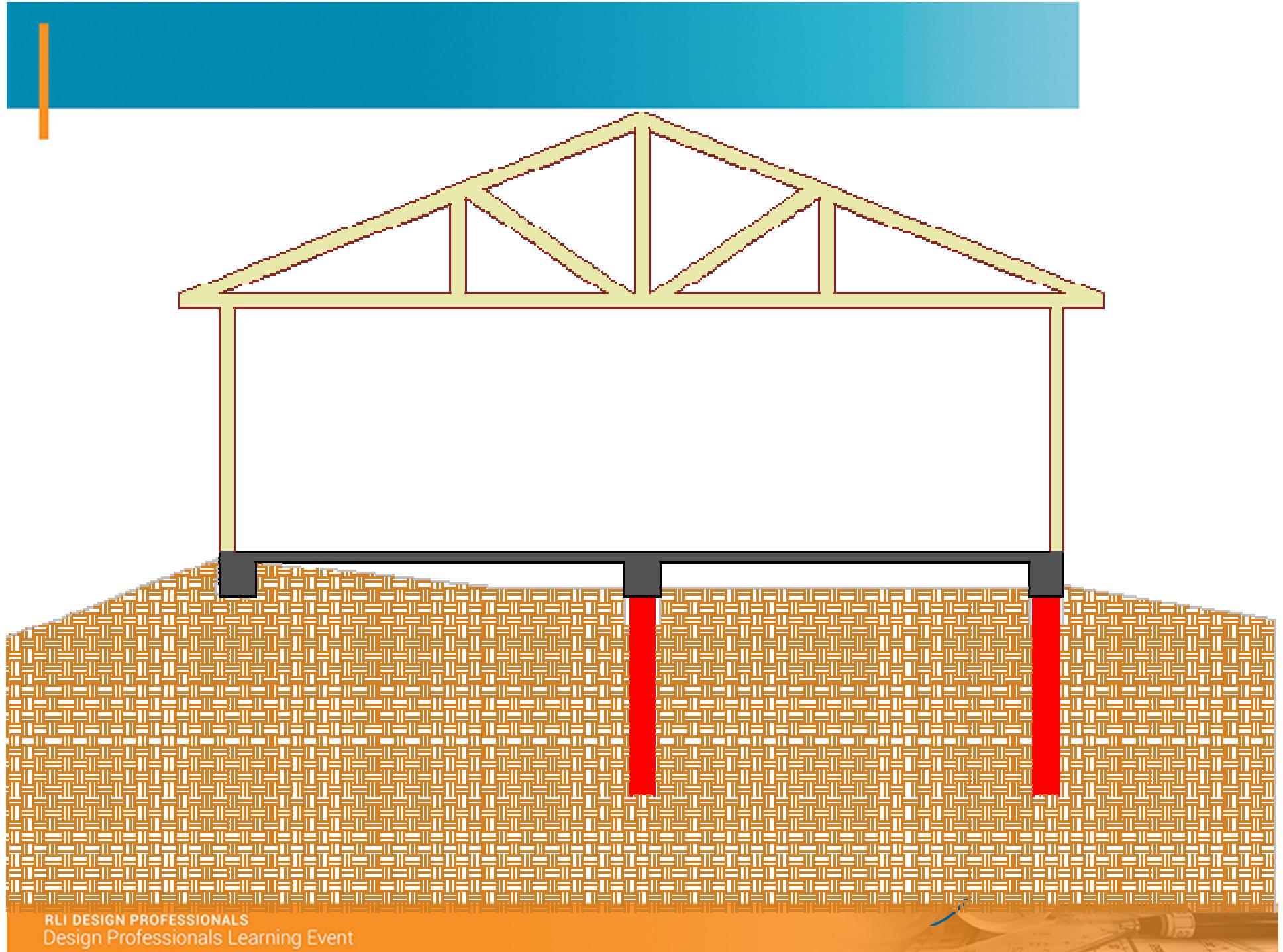
RLI DESIGN PROFESSIONALS
Design Professionals Learning Event





RLI DESIGN PROFESSIONALS
Design Professionals Learning Event





Responsibility to the Profession of Engineering

§137.63 Engineers' Responsibility to the Profession

(b) The engineer shall:

(1) endeavor to meet all of the applicable professional practice requirements of federal, state and local statutes, codes, regulations, rules, ordinances or standards in the performance of engineering services;



Building Code Requirements

2012 International Building Code

CHAPTER 16 – STRUCTURAL DESIGN

SECTION 1604 – GENERAL DESIGN REQUIREMENTS

- 1604.4 Any system or method of construction to be used shall be based on a rational analysis in accordance with well-established principles of mechanics. Such analysis shall result in a system that provides a complete load path capable of transferring loads from their point of origin to the load-resisting elements



Building Code Requirements

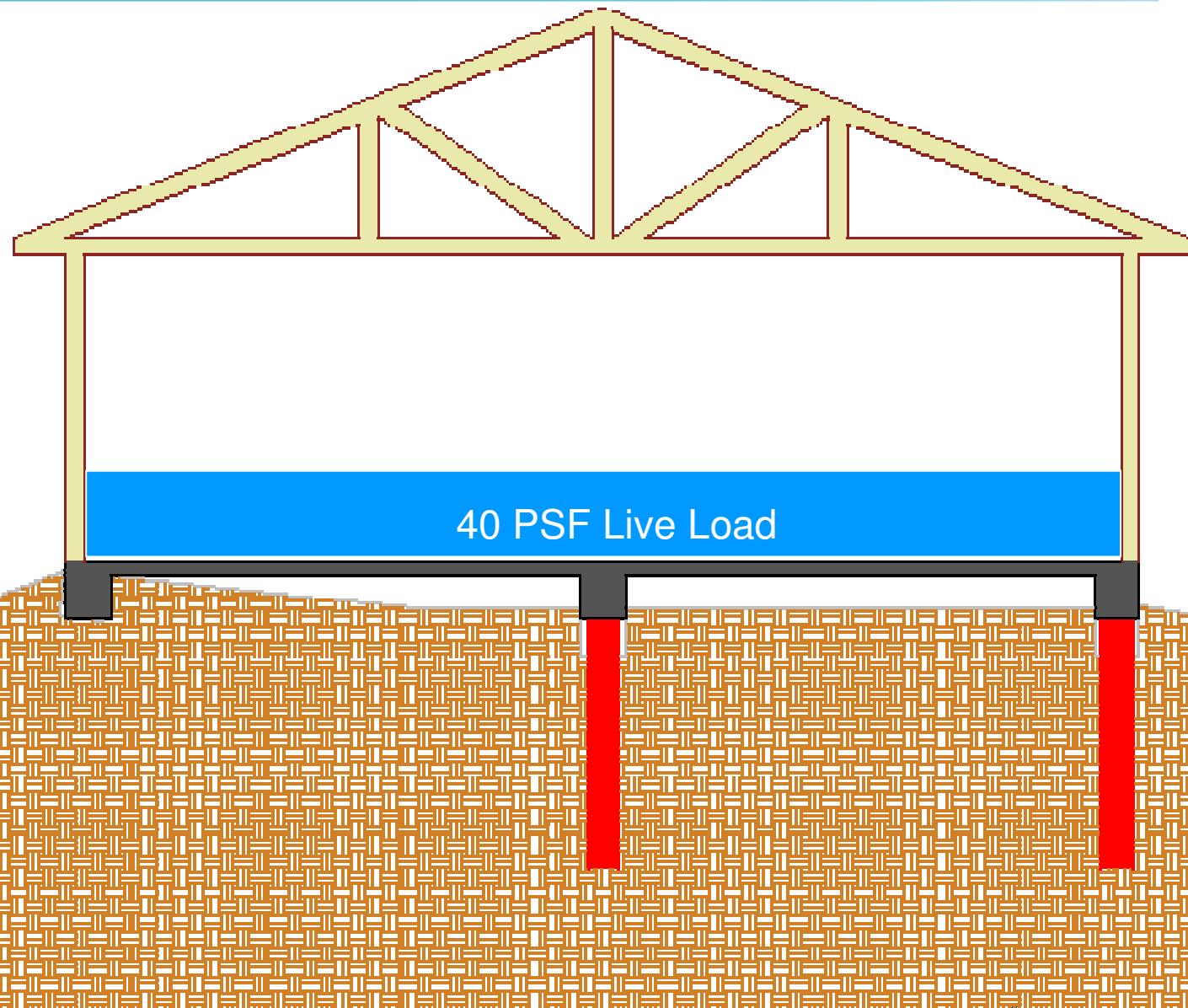
2012 International Building Code

CHAPTER 16 – STRUCTURAL DESIGN

SECTION 1604 – GENERAL DESIGN REQUIREMENTS

- 1604.4 Any system or method of construction to be used shall be based on a rational analysis in accordance with well-established principles of mechanics. Such analysis shall result in a system that provides a complete load path capable of transferring loads from their point of origin to the load-resisting elements.

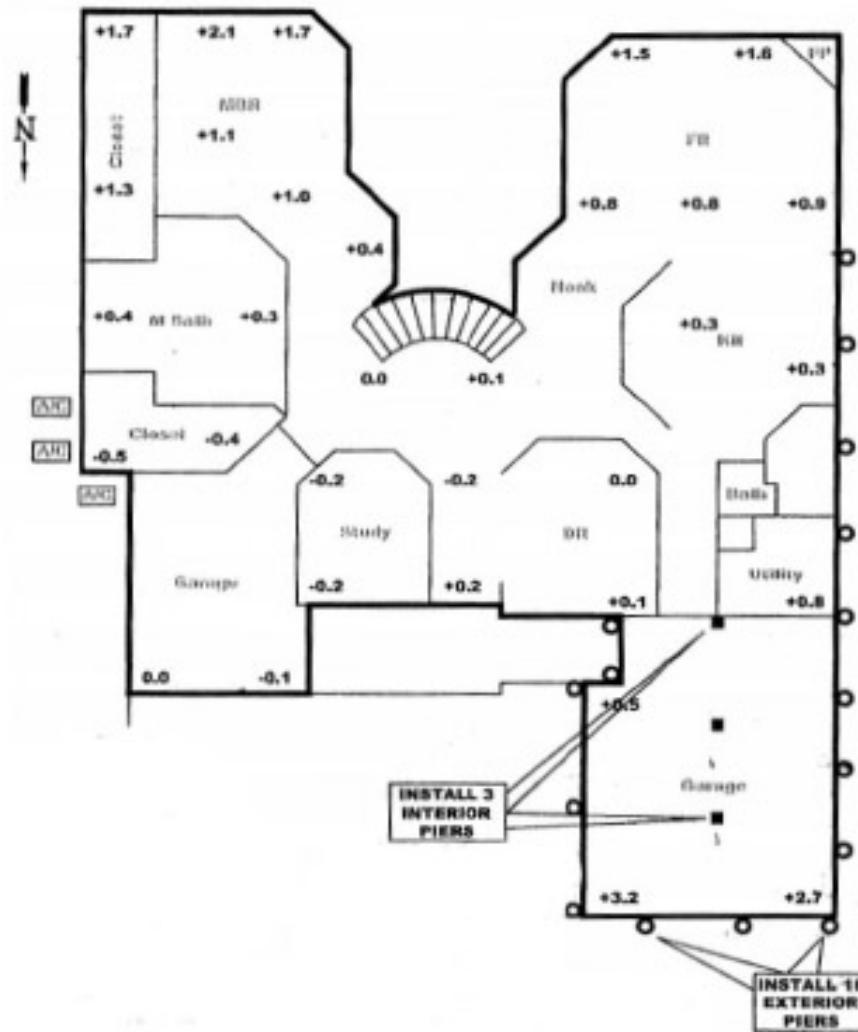




Reinforced Slab on Grade Structural Analysis

Slab on Grade Span Capacity (Feet)

Concrete Strength f_c (psi)		3000 psi			3000 psi			4000 psi			4000 psi		
Reinforcing Strength f_y (psi)		50 ksi			60 ksi			50 ksi			60 ksi		
Reinforcing		Slab Thickness			Slab Thickness			Slab Thickness			Slab Thickness		
Size	Spacing	4 inches	5 inches	6 inches	4 inches	5 inches	6 inches	4 inches	5 inches	6 inches	4 inches	5 inches	6 inches
#3	12" o.c.	5.79	6.14	6.41	6.34	6.72	7.02	5.79	6.14	6.41	6.34	6.72	7.02
	14" o.c.	5.36	5.68	5.93	5.87	6.22	6.50	5.36	5.68	5.93	5.87	6.22	6.50
	16" o.c.	5.01	5.31	5.55	5.49	5.82	6.08	5.01	5.31	5.55	5.49	5.82	6.08
	18" o.c.	4.73	5.01	5.23	5.18	5.49	5.73	4.73	5.01	5.23	5.18	5.49	5.73
	24" o.c.	4.09	4.34	4.53	4.49	4.75	4.96	4.09	4.34	4.53	4.49	4.75	4.96
#4	12" o.c.	7.52	8.28	8.64	7.52	8.45	9.30	7.81	9.06	9.30	8.08	9.06	9.46
	14" o.c.	7.20	7.63	7.96	7.52	8.36	8.72	7.20	7.00	8.72	7.89	8.36	8.72
	16" o.c.	6.76	7.17	7.48	7.41	7.85	8.19	6.76	7.17	7.48	7.41	7.85	8.19
	18" o.c.	6.30	6.67	6.96	6.90	7.31	7.63	6.30	6.67	6.96	6.90	7.31	7.63
	24" o.c.	5.52	5.85	6.11	6.05	6.41	6.69	5.52	5.85	6.11	6.05	6.41	6.69
#5	12" o.c.	7.52	8.45	9.30	7.52	8.45	9.30	8.08	9.08	9.99	8.08	9.08	9.99
	14" o.c.	7.52	8.45	9.30	7.52	8.45	9.30	8.08	9.08	9.99	8.08	9.08	9.99
	16" o.c.	7.52	8.45	9.26	7.52	8.45	9.30	8.08	8.87	9.26	8.08	9.08	9.99
	18" o.c.	7.52	8.45	8.85	7.52	8.45	9.30	8.00	8.48	8.85	8.08	9.08	9.70
	24" o.c.	6.76	7.17	7.48	7.41	7.85	8.19	6.76	7.17	7.48	7.41	7.85	8.19



Slab on Grade Repair?

Limitations of Liability: This structural inspection was conducted in accordance with generally accepted practices and procedures. The inspection of the site was limited in scope to a visual examination of the exposed interior and exterior finishes on the structure and of the adjacent ground surfaces. Destructive analysis of the foundation was not performed during this inspection. The repairs recommendations, if any, are intended to be the most cost effective and practical solution to common foundation problems. Installation of piers around a part of the foundation is intended to reinforce the areas which appear to have deflected since construction of the home. Most homes are not constructed with the ability to perform as a structurally suspended slab; therefore, installed piers will not prevent adjacent exterior or interior walls from settling. Further analysis may be performed if desired by the homeowner; our office will assist with any additional analysis desired by the homeowner. Extensive repairs may be necessary to fully reinforce the home according to applicable building codes. This option is available to the homeowner, however, it is standard practice to only repair areas which have failed and make additional repairs as necessary. Soil borings may also provide additional information regarding underlying soil conditions. This information is not provided, nor is required for a level B inspection. If further evaluation is desired, the homeowner may obtain soil data from a geotechnical testing facility and provide it to this office. Locations of existing piers if any are approximate and locations were provided by others. This report does not guarantee the quality or exact locations of any existing structural repairs. The behavior of the subject foundation and soil area was taken into consideration to up to the inspection date.

“Limitation of Liability”

- This structural inspection was conducted in accordance with generally accepted practices and procedures.
- The repairs recommendations, if any, are intended to be the most cost effective and practical solution to common foundation problems.
- Most homes are not constructed with the ability to perform as a structurally suspended slab

Gross Negligence

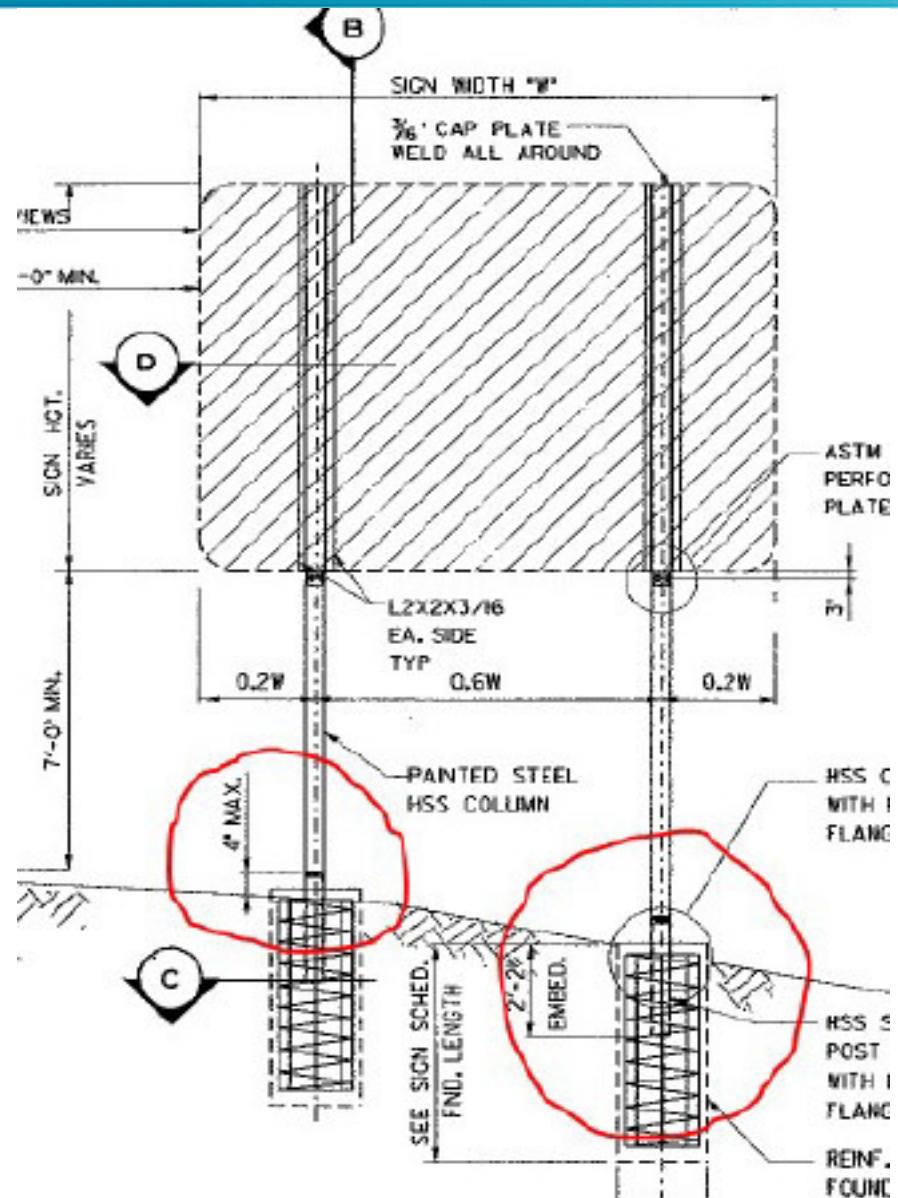
Any willful or knowing conduct, or pattern of conduct, which includes but is not limited to conduct that demonstrates a disregard or indifference to the rights, health, safety, welfare, and property of the public or clients. Gross negligence may result in financial loss, injury or damage to life or property, but such results need not occur for the establishment of such conduct.

22 Texas Administrative Code §131.81 Definitions (19)

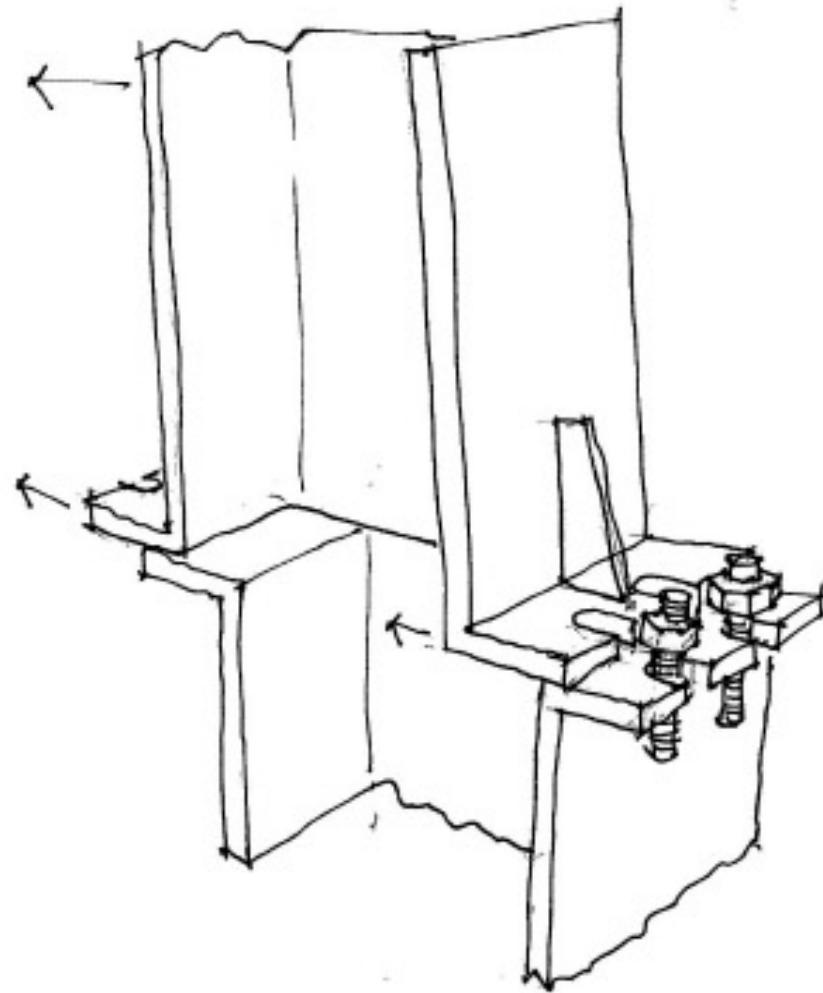
Beware the “No-Brainer”

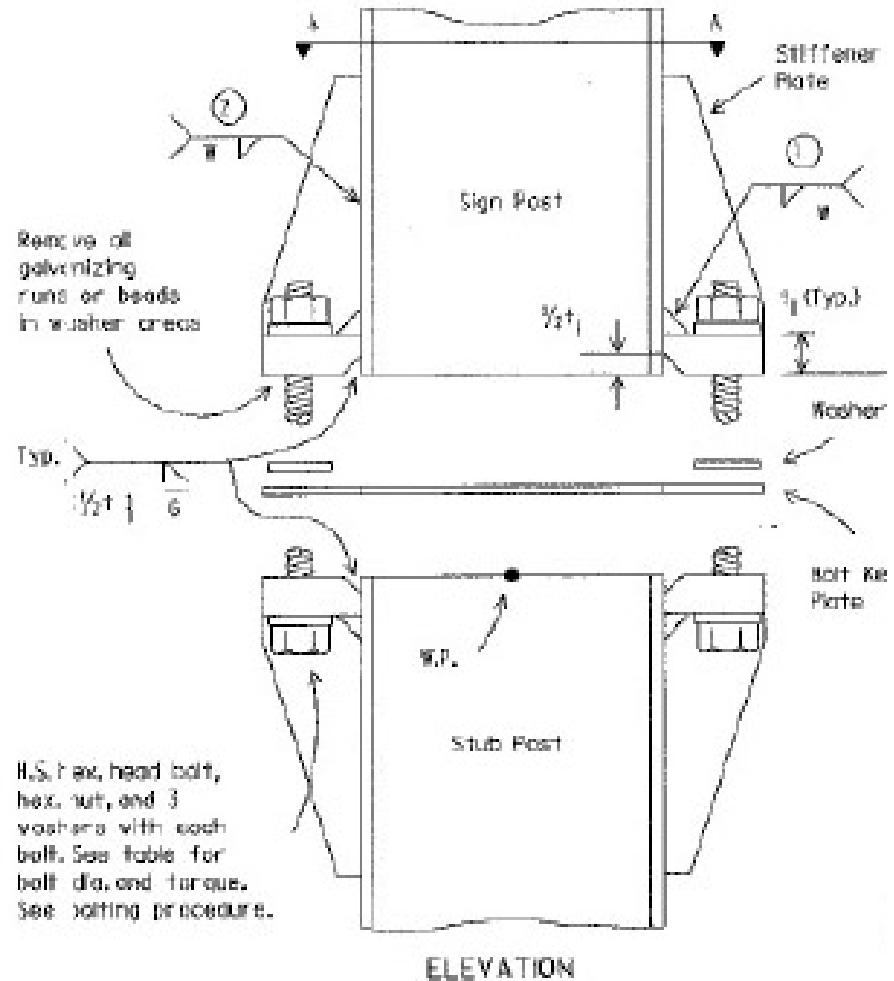
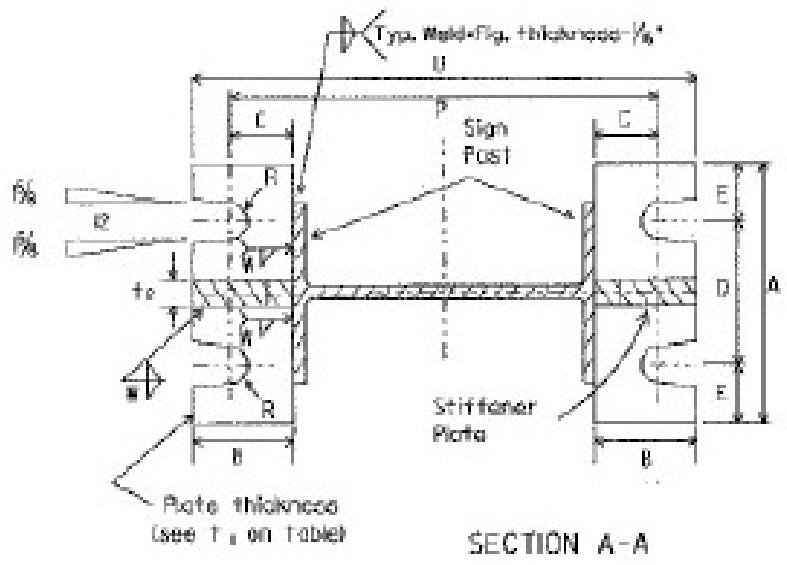


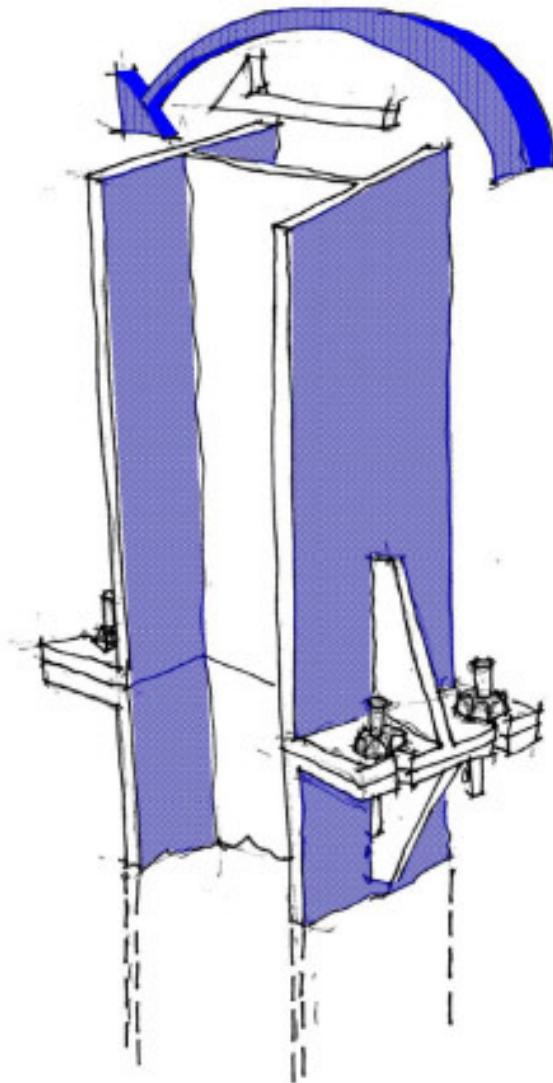


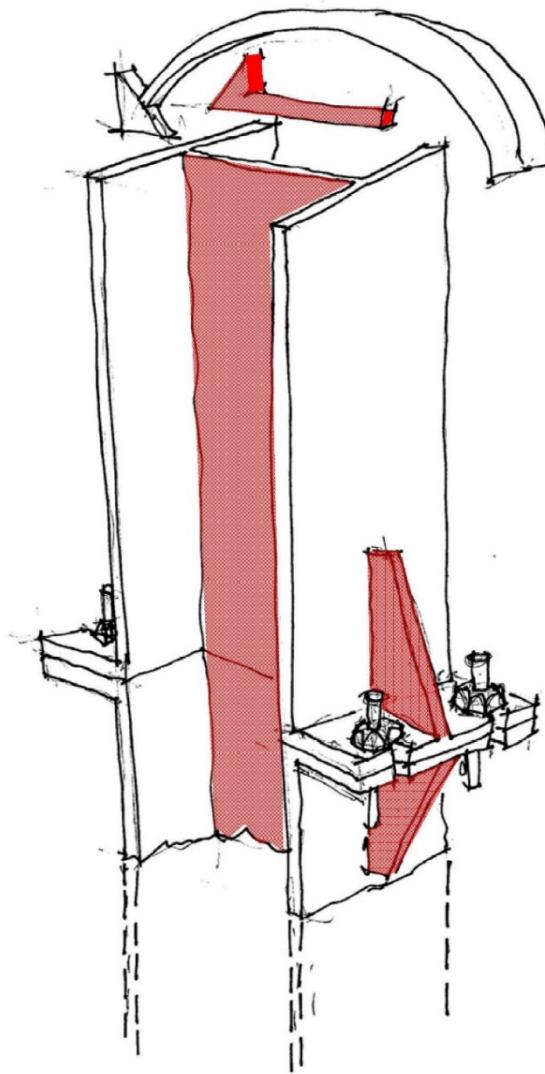


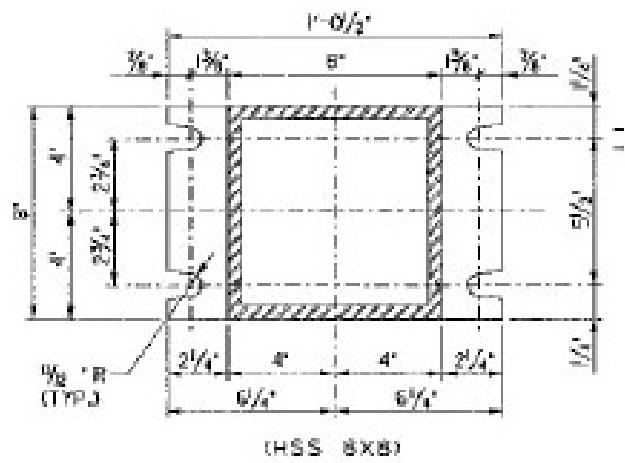




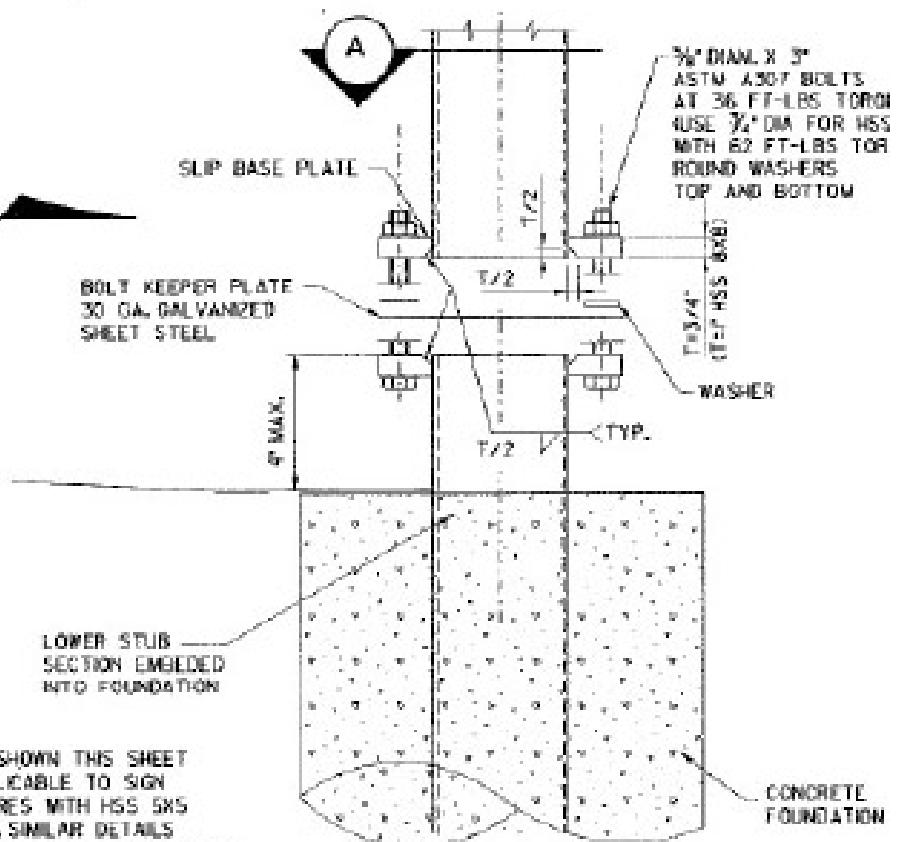








**TRAFFIC
DIRECTION**

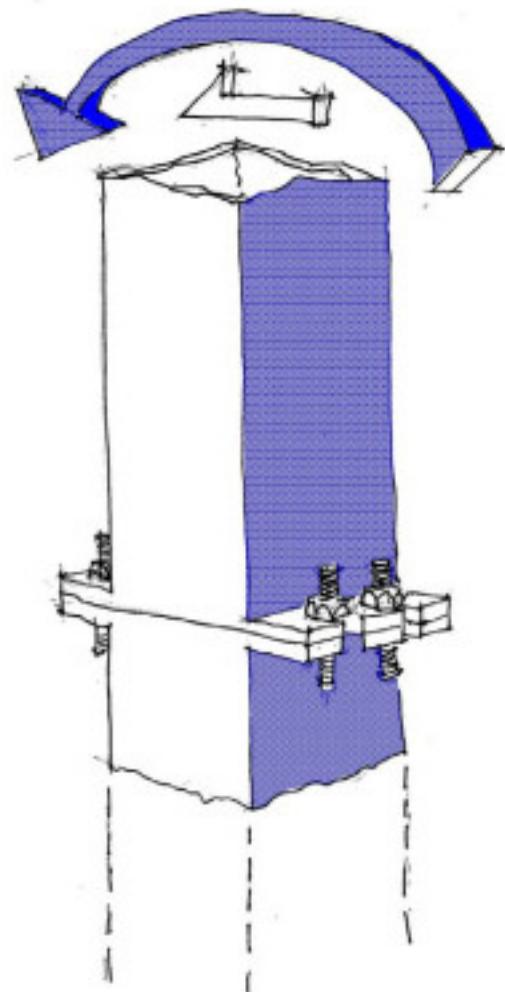


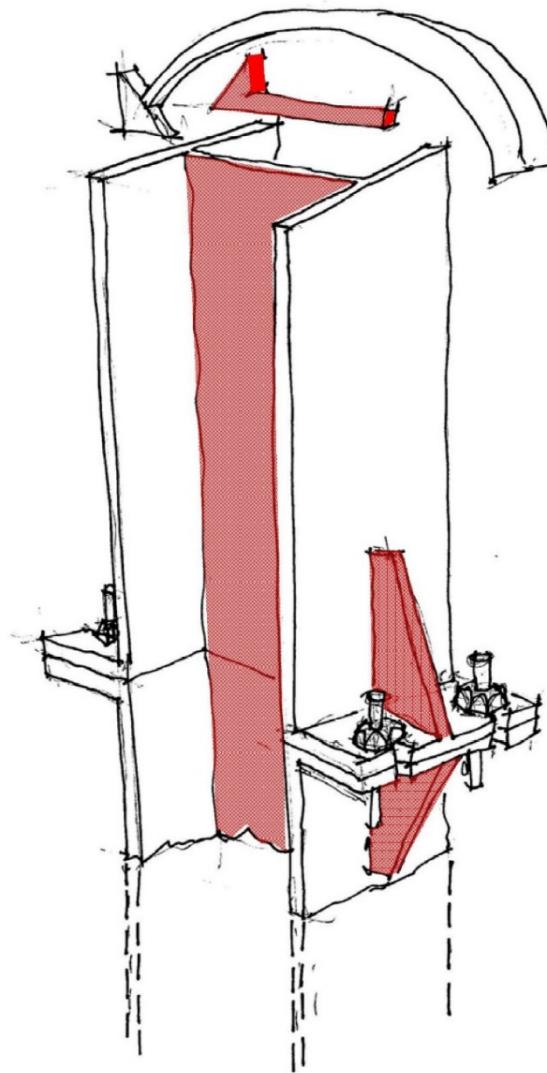
**NOTE: DETAILS SHOWN THIS SHEET
ARE APPLICABLE TO SIGN
STRUCTURES WITH HSS 5X5
MEMBERS. SIMILAR DETAILS
ARE TO BE USED FOR HSS 4X4
AND HSS 6X6 MEMBERS. CONTRACTOR
SHALL PROVIDE SHOP DRAWINGS FOR
EACH STRUCTURE.**

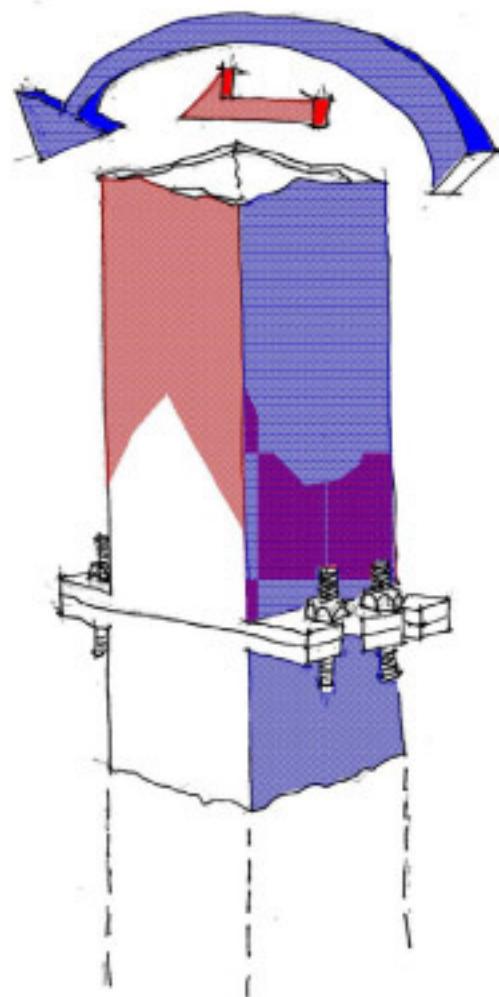
ELEVATION

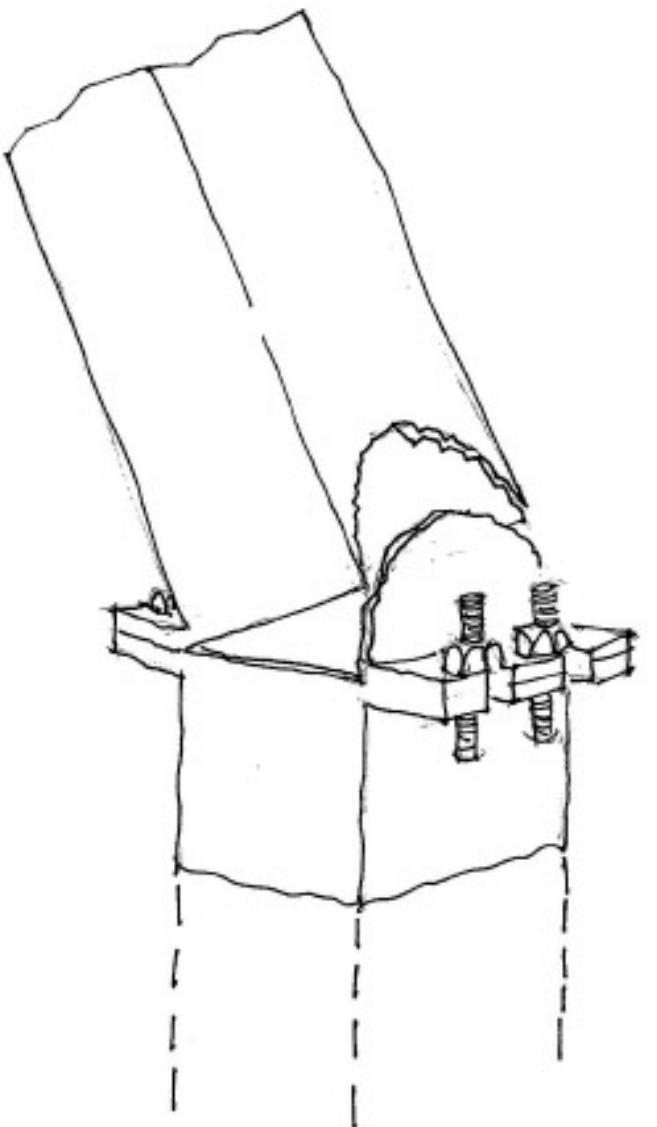
SCALE 3" = 1-0

SCALE: 1/2" = 1'-0"









Observation

There is no such thing as
a No-Brainer.



Competence

§137.59 Engineers' Actions Shall Be Competent

- (a) Engineers shall practice only in their areas of competence.
- (b) The engineer shall not perform any engineering assignment for which the engineer is not qualified by education or experience to perform adequately and competently. However, an engineer may accept an assignment which includes phases outside of the engineer's area of competence if those other phases are performed by qualified licensed professionals, consultants, associates, or employees.

Source Note: The provisions of this §137.59 amended to be effective September 4, 2006.

Fayol's 14 Principles of Management



Henry Fayol
1841-1925

Parity of Authority and Responsibility



Fayol's 14 Principles of Management

1. **Division of Work** – When employees are specialized, output can increase because they become increasingly skilled and efficient.
2. **Authority** – Managers must have the authority to give orders, but they must also keep in mind that with authority comes responsibility.
3. **Discipline** – Discipline must be upheld in organizations, but methods for doing so can vary.
4. **Unity of Command** – Employees should have only one direct supervisor.
5. **Unity of Direction** – Teams with the same objective should be working under the direction of one manager, using one plan. This will ensure that action is properly coordinated.
6. **Subordination of Individual Interests to the General Interest** – The interests of one employee should not be allowed to become more important than those of the group. This includes managers.
7. **Remuneration** – Employee satisfaction depends on fair remuneration for everyone. This includes financial and non-financial compensation.
8. **Centralization** – This principle refers to how close employees are to the decision-making process. It is important to aim for an appropriate balance.
9. **Scalar Chain** – Employees should be aware of where they stand in the organization's hierarchy, or chain of command.
10. **Order** – The workplace facilities must be clean, tidy and safe for employees. Everything should have its place.
11. **Equity** – Managers should be fair to staff at all times, both maintaining discipline as necessary and acting with kindness where appropriate.
12. **Stability of Tenure of Personnel** – Managers should strive to minimize employee turnover. Personnel planning should be a priority.
13. **Initiative** – Employees should be given the necessary level of freedom to create and carry out plans.
14. **Esprit de Corps** – Organizations should strive to promote team spirit and unity.

Fayol's 14 Principles of Management

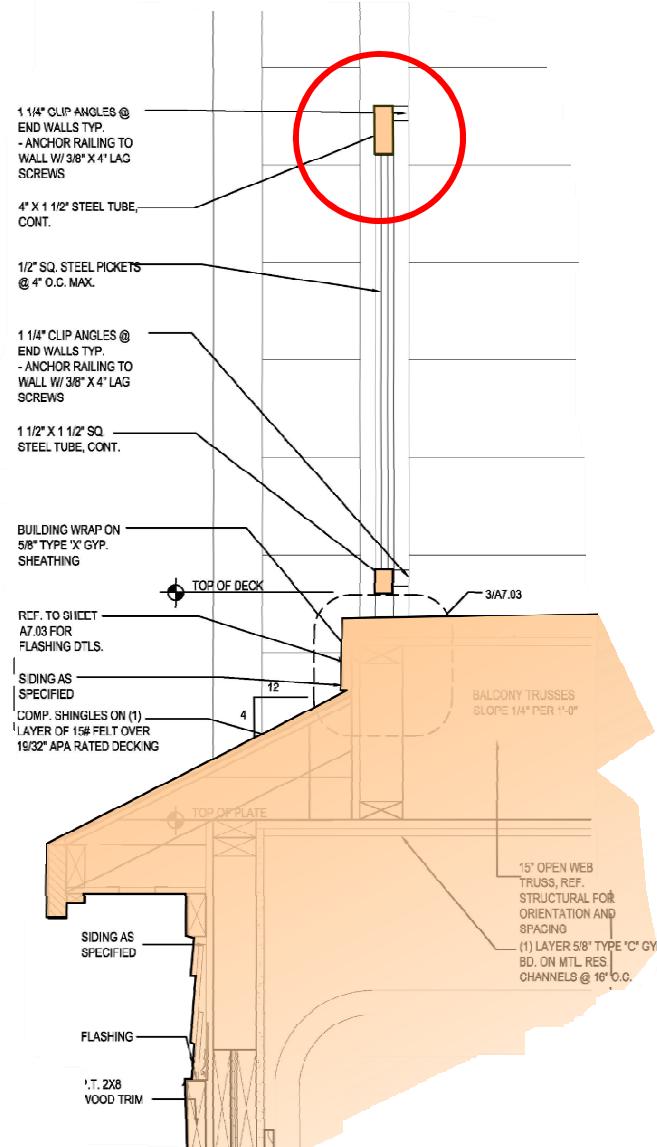
2. Authority – Managers must have the authority to give orders, but they must also keep in mind that with authority comes responsibility or, Parity of Authority and Responsibility

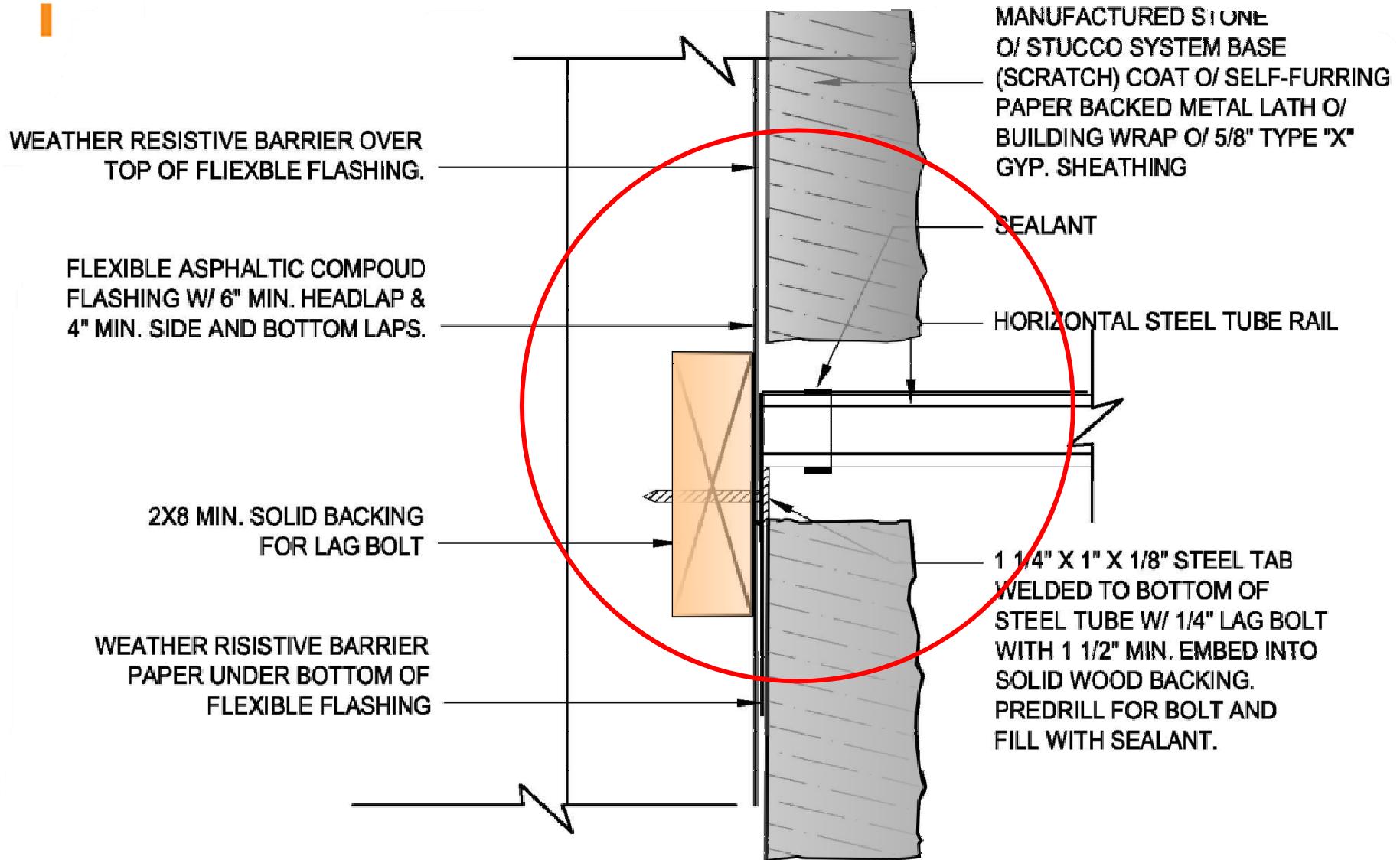


Management

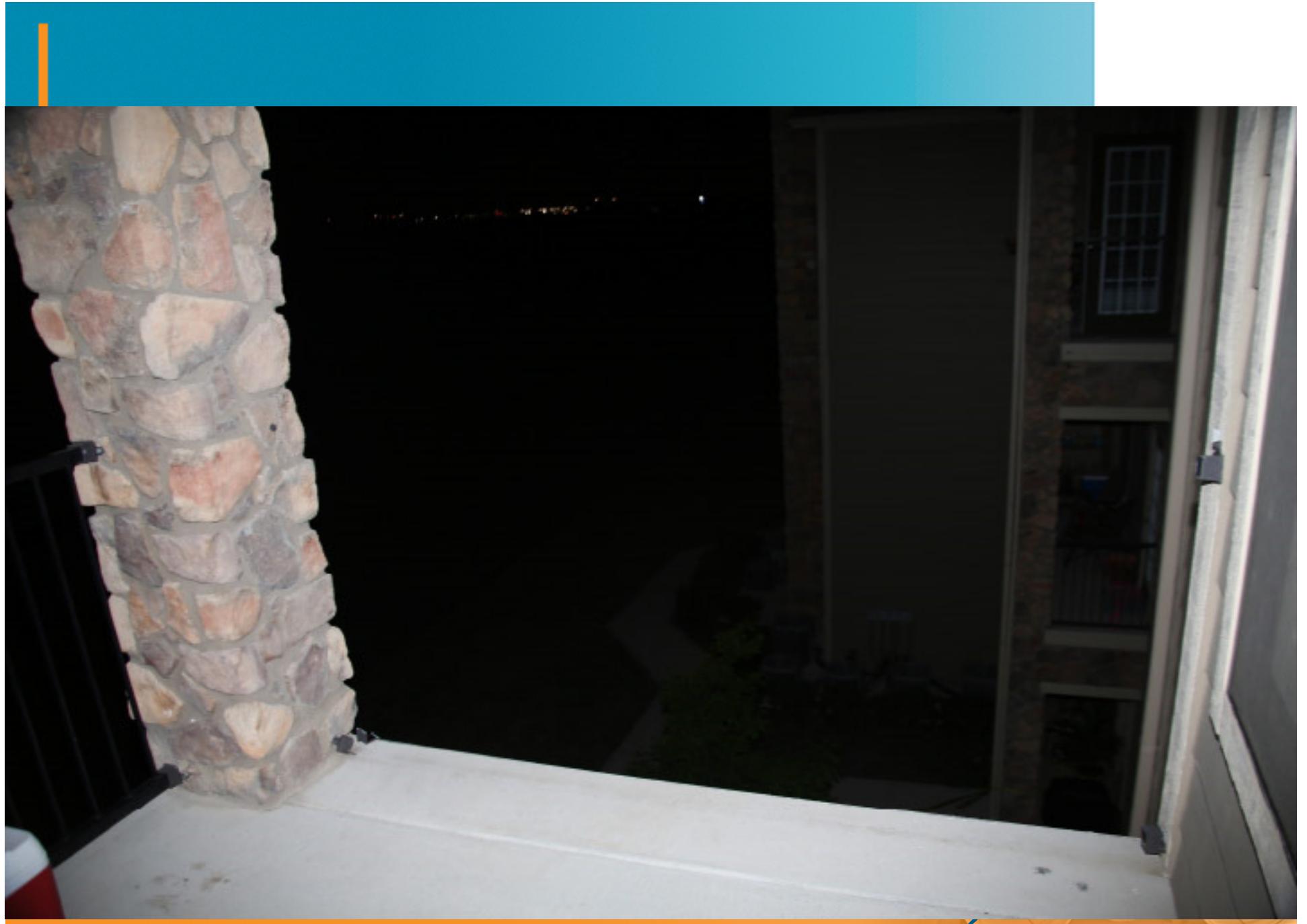
- You delegate authority, not responsibility.
- You assign as much responsibility as the authority that you delegate.
- You retain responsibility for the authority that you have delegated.

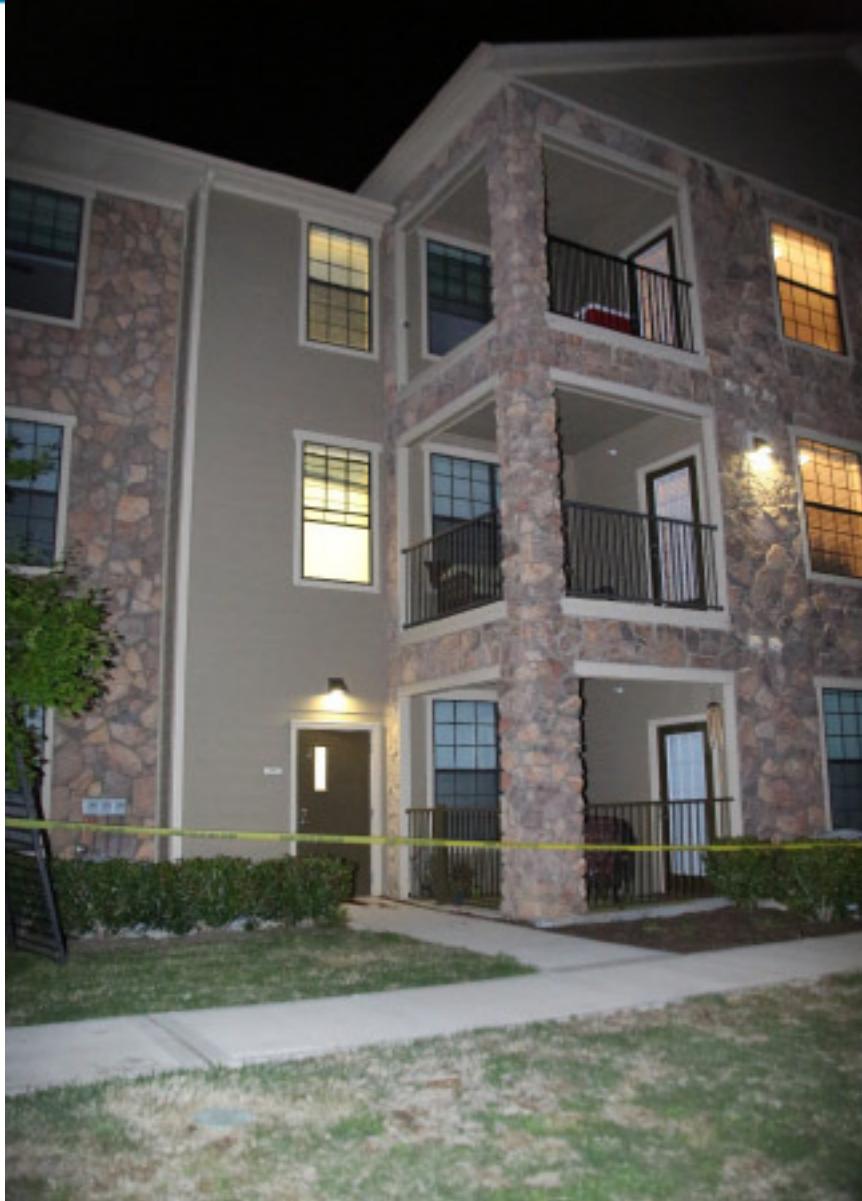












RLI DESIGN PROFESSIONALS
Design Professionals Learning Event



Column

Top, Left



Wall

Top, Right



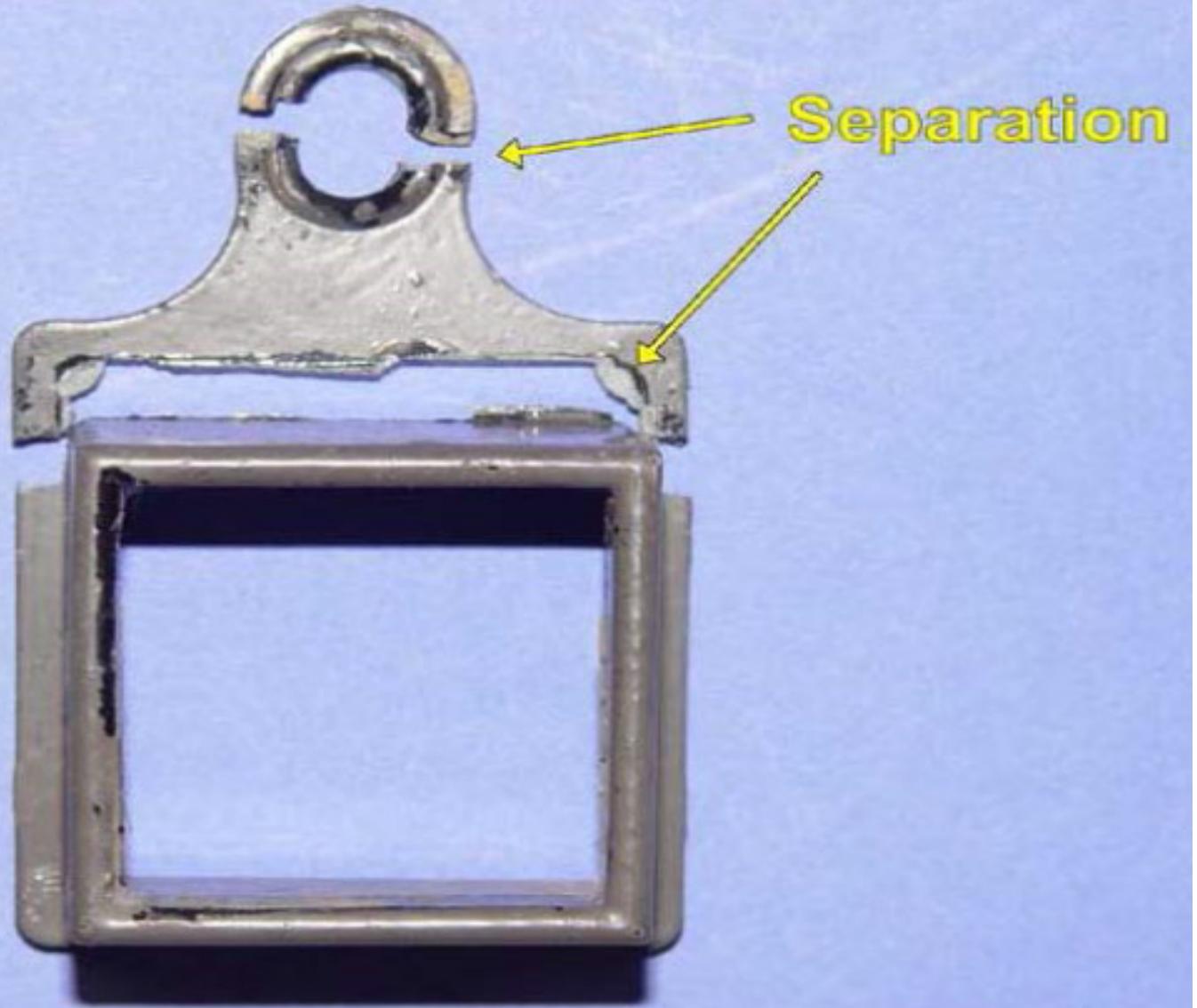
**Bottom,
Left**



**Bottom,
Right**



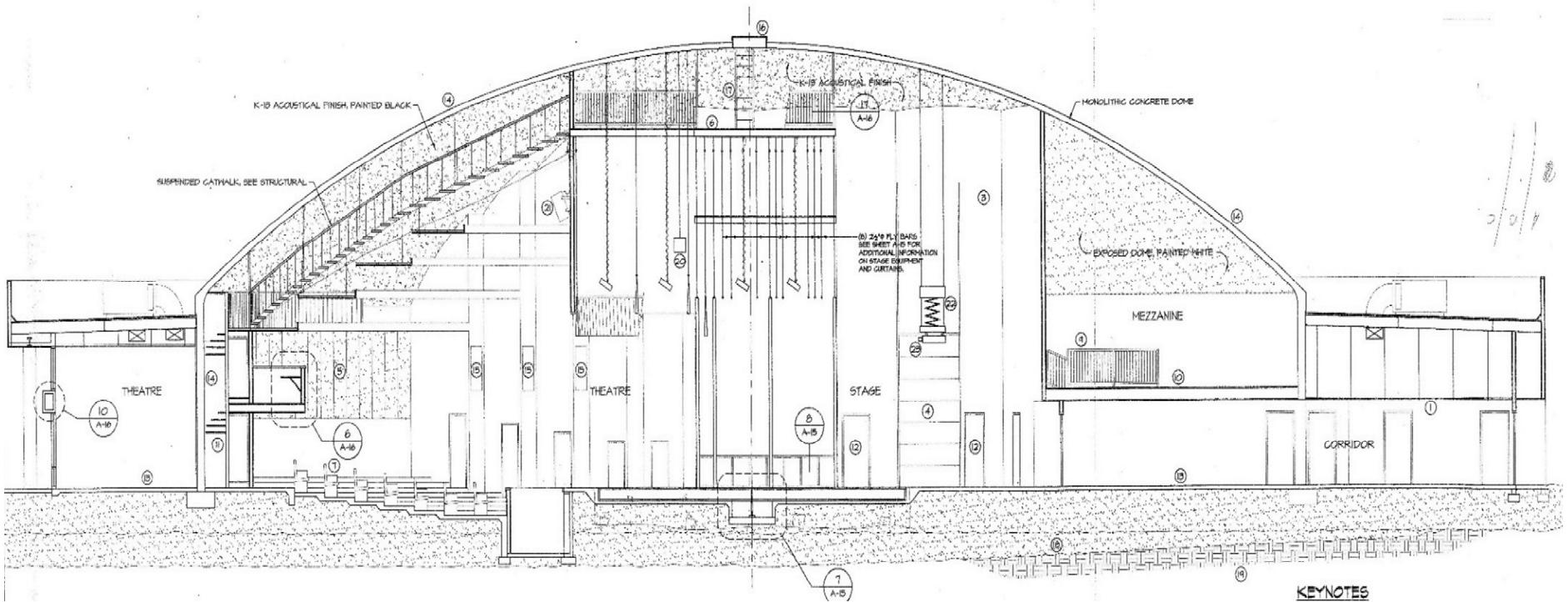
7 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33

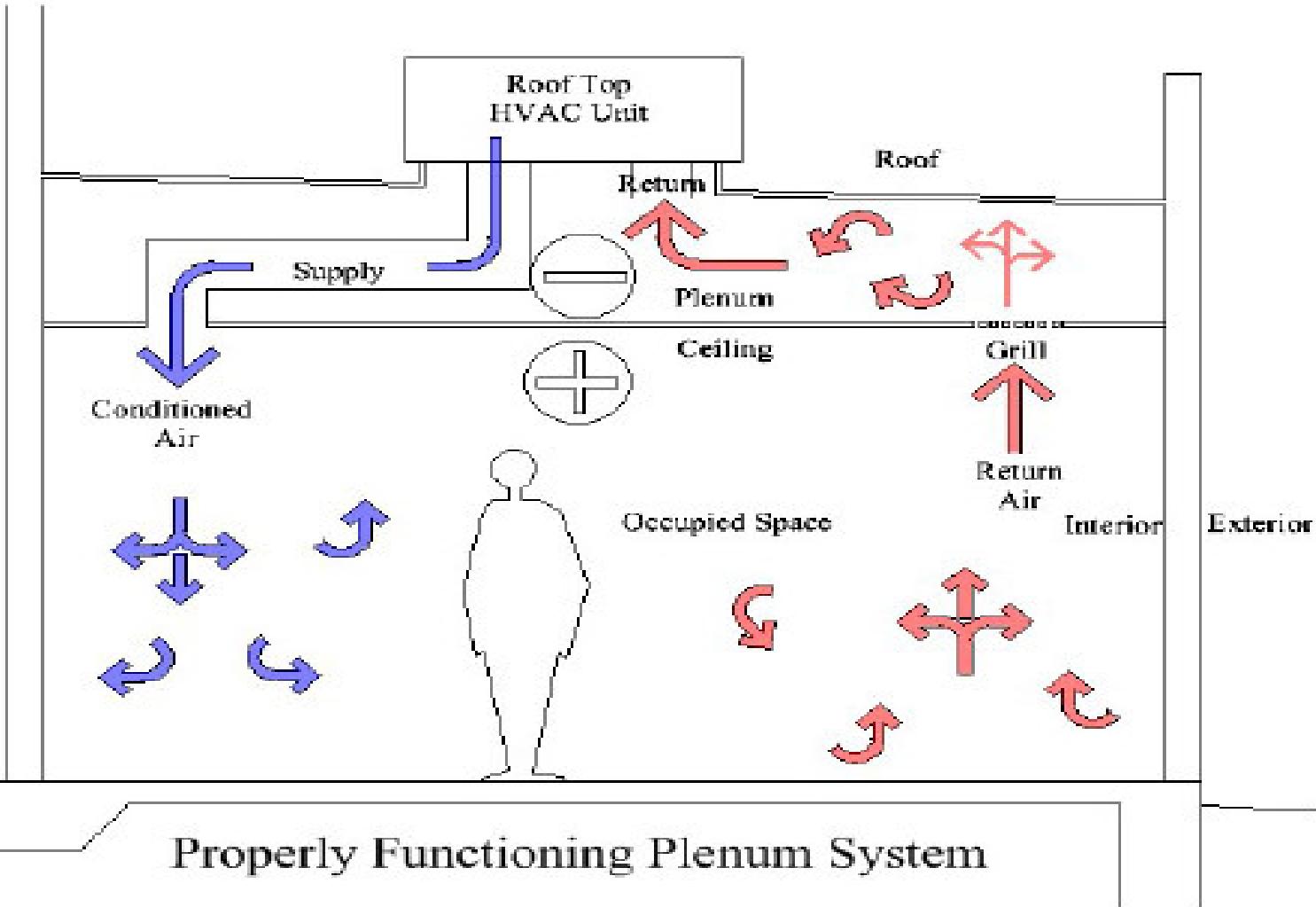


Coordination with other Professionals

Everybody's responsibility is still
YOUR responsibility!

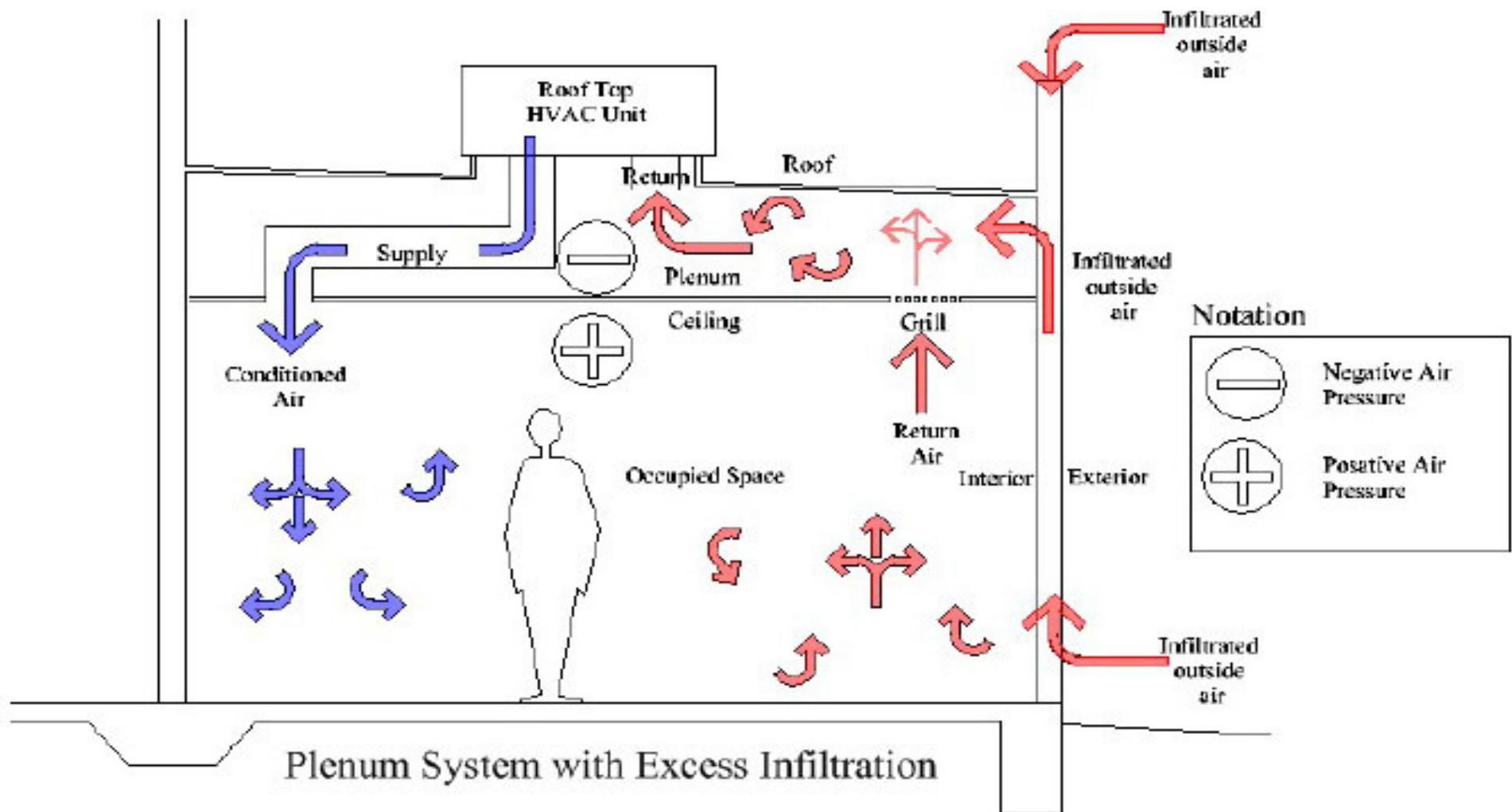












Observations

- Law suits cost time and \$\$\$\$\$
- Design errors often involve a breach in the Standard of Care
- The Rules of the Engineering Licensing Boards are our best Standard of Care



In Review

Competence

Truthfulness

Integrity

Responsibility

Delegating authority

Beware the no-brainer

Coordination with other disciplines

The Dark Side of Ethics





“Be sure you’re right,
and then go ahead.”

- Davy Crockett

I Won't Back Down

by Tom Petty
and the Heartbreakers
as sung by
Johnny Cash



**Thank you for your time!
QUESTIONS??**

This concludes The American Institute of Architects
Continuing Education Systems Program

Alayne McDonald, Professional Development Coordinator

Alayne.McDonald@rlicorp.com

Abbey Brown, Client Solutions Manager

Abbey.Brown@rlicorp.com

