Night School 26: Developing an Eye for Connection Design

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Session 6 – Connection Design Examples

August 17, 2021 | Larry Muir

Smarter. Stronger. Steel.

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Course Description

Connection Design Examples
August 17, 2021

The session will cover the basics of welded connections. This session will consist of a review of applicable welding codes, the basics of welded joints and weld types, and required weld metal strength levels. Welded connection details will be discussed. This session will also allow for an extended Q&A and requested topics from the audience, collected in advance of the session.

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Learning Objectives

1. Understand the suitability of a design example before applying it to a specific project condition in order to ensure a safe connection design.
2. Describe how design example myths can lead to misapplying them to projects.
3. Develop rational models for verifying a connection condition.
4. List answers to common questions regarding delegated connection design and explain how communication is a key component to safe and efficient outcomes in delegated design.

Night School 26: Developing an Eye for Connection Design

Session 6: Connection Design Examples
August 17, 2021

Larry Muir, PE, Consultant

Smarter. Stronger. Steel.

Design Examples

Friends or Foes

8

Design Examples

Friends ~~or~~ and Foes

9

Design Example Myths

1. I am not responsible for design decisions as long as my designs conform to published Design Examples.

From *DESIGN EXAMPLES: Companion to the AISC Steel Construction Manual* Version 15.0:

"…this information should not be used or relied upon for any specific application without competent professional examination and verification of its accuracy, suitability and applicability by a licensed engineer or architect."

10

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11

Design Example Myths

2. The procedures in Design Examples are AISC-approved or AISC-requirements.

From *DESIGN EXAMPLES: Companion to the AISC Steel Construction Manual* Version 15.0:

"These design examples are intended to demonstrate an approach to the design, and are not intended to suggest that the approach presented is the only approach. The committee responsible for the development of these design examples recognizes that designers have alternate approaches that work best for them and their projects. Design approaches that differ from those presented in these examples are considered viable as long as the AISC Specification, sound engineering, and project specific requirements are satisfied."

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13

Design Example Myths

3. The AISC Design Examples are always correct.

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17

Design Example Myths

5. Design Examples can be used as checklists, and as long as I check every limit state in the Design Example I have satisfied the *Specification*.

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18

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Suitability and Applicability

Competent professional examination and verification of suitability and applicability for specific applications.

As conditions get increasingly more complex the likelihood that a real-world condition complies sufficiently with a published design example decreases pretty quickly – significantly diminishing the potential benefits of the design example and dramatically increasing the potential risks.

My experience has been that the design examples are routinely misapplied.

20

This connection is shown in Design Guide 29.

Let's talk a little about the assumptions made.

Implicit Assumptions

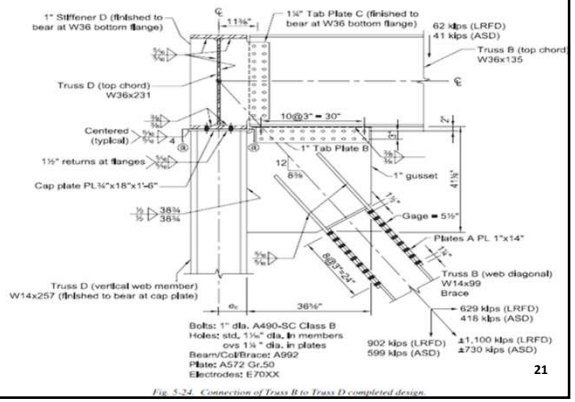
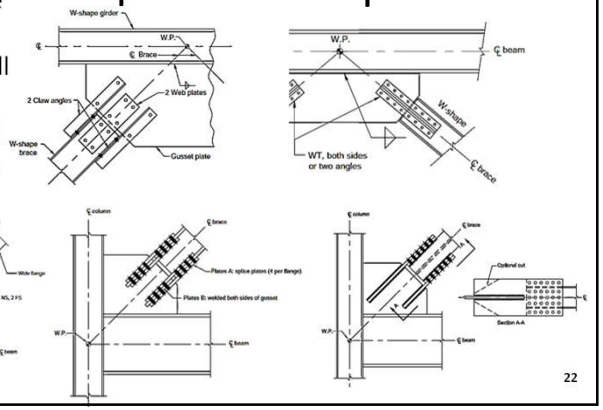


Fig. 5-24. Connection of Truss B to Truss D completed design.

21

The Design Guide states: "If the brace is subjected to compression as well as tension, plates should not be used in place of the WTs or angles."

Implicit Assumptions



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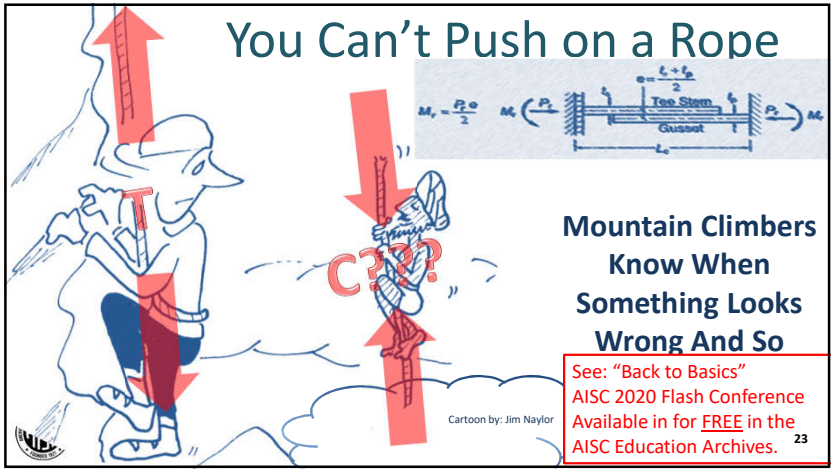

See: "Back to Basics" AISC 2020 Flash Conference Available in for FREE in the AISC Education Archives.

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Plate lapped on plate. Is this pushing on a rope?

Implicit Assumptions

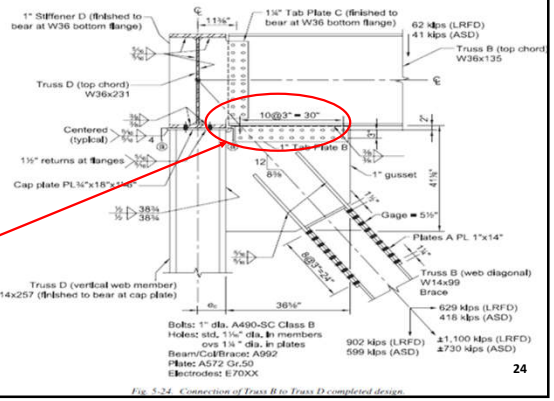
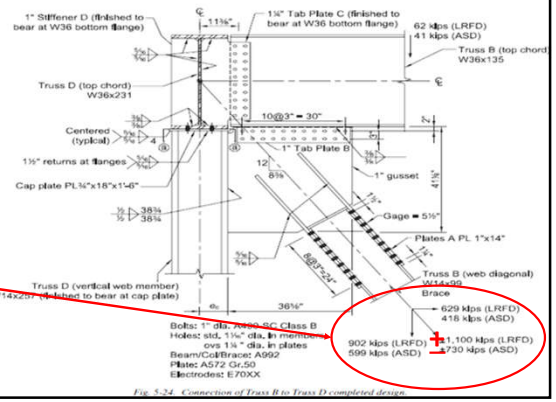


Fig. 5-24. Connection of Truss B to Truss D completed design.

24

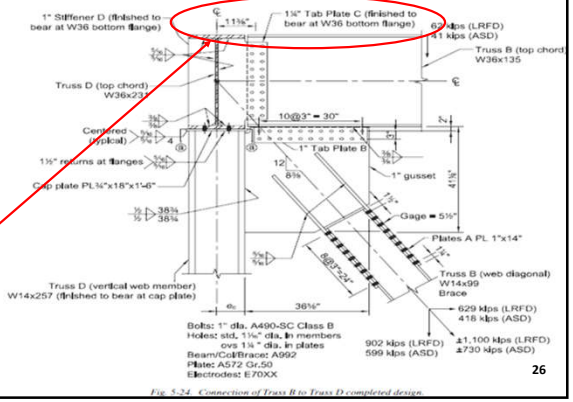
Implicit Assumptions

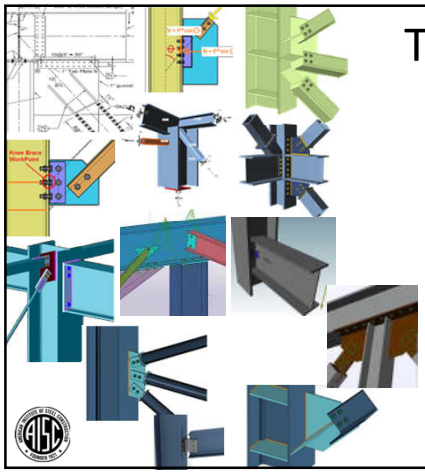
Tension Only
± is an error.
Compression
not considered
in example.



Implicit Assumptions

What if there was
no diaphragm
(slab) here?

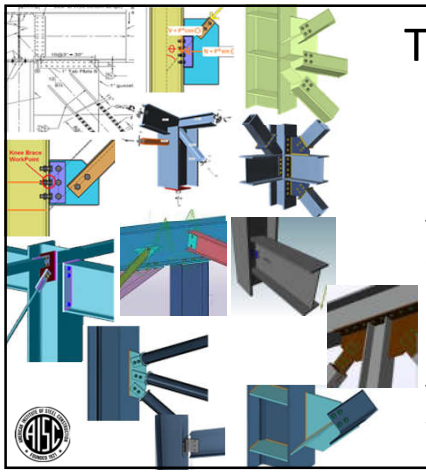




The Right Message

You cannot just look at a condition and say it is “right” or “wrong”. You can look at a condition and say “that makes sense” or “that does not makes sense” relative to some specific factors.

The Design Guide condition could be designed to resist compression. It is not intuitively well-suited to that condition.

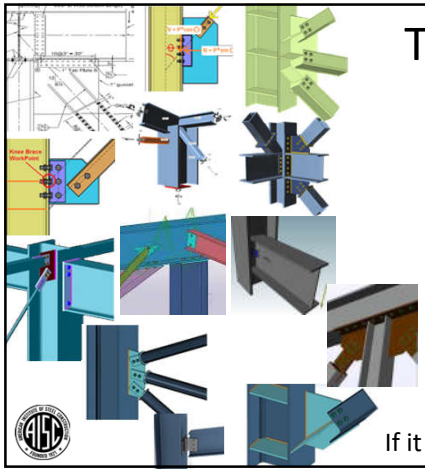


The Right Message

I look at all of the conditions shown here and say, “Man, I bet someone could really mess that one up.”

There is some aspect of the configuration that does not make sense to ME. Some aspect I would have to consider more rigorously.

That does not mean the detail is wrong or unsafe or stupid.



The Right Message

One the other hand, I have had engineers insist that AISC "must do something to STOP such software".

These statements are based on "bad" conditions that have been encountered in practice.

There is only so much we can do to protect you from yourself.

If it looks wrong… think about it more.

This connection is also shown in Design Guide 29.

The original condition was also a truss

Implicit Assumptions

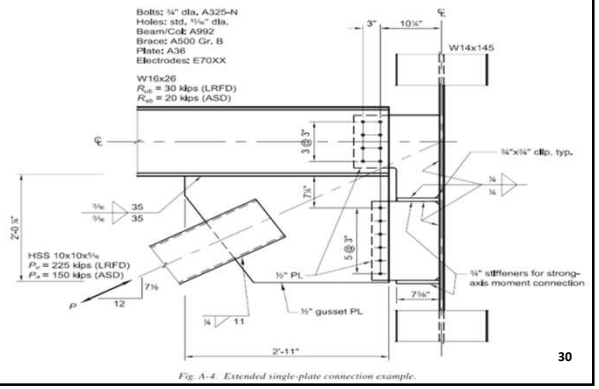


Fig. A-4. Extended single-plate connection example.

30

Implicit Assumptions

Plate lapped on plate. Is this pushing on a rope?

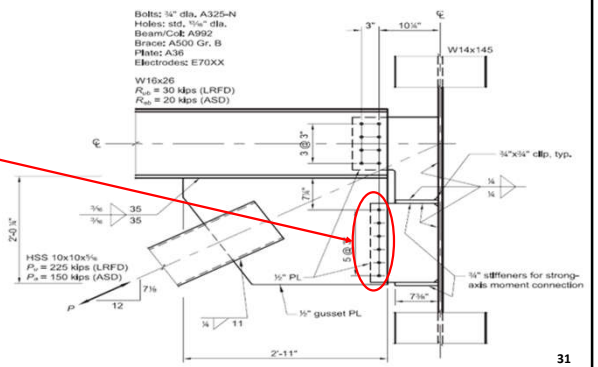


Fig. A-4. Extended single-plate connection example.

31

Implicit Assumptions

Load shown as tension & compression. Was this a mistake?

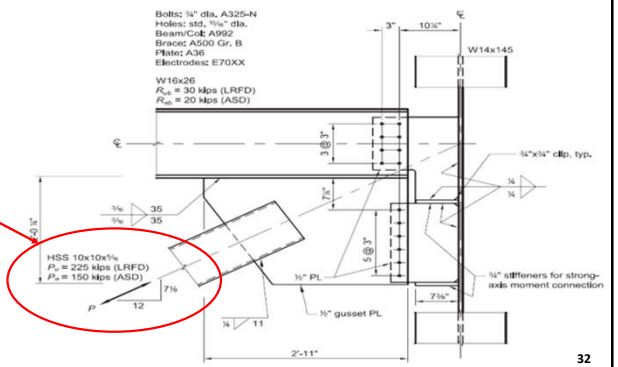
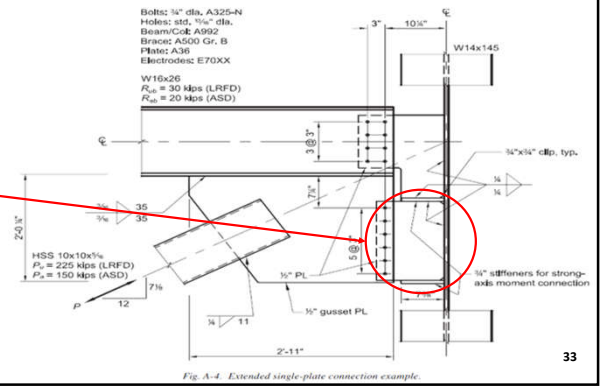


Fig. A-4. Extended single-plate connection example.

32

Implicit Assumptions

What difference do the stiffeners make?



33

Fig. A-4. Extended single-plate connection example.

Check compression buckling of beam-to-column single plate

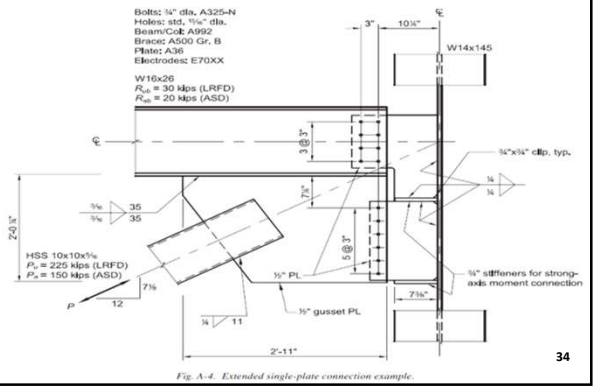
Check the compression buckling strength of the plate due to the horizontal load.

Conservatively assume $K = 1.2$:

$$r = \frac{t_p}{\sqrt{12}} = \frac{\frac{1}{2}\ in.}{\sqrt{12}} = 0.144\ in.$$

$$\frac{KL}{r} = \frac{1.2(10.25\ in.)}{0.144\ in.} = 85.4$$

Implicit Assumptions



34

Fig. A-4. Extended single-plate connection example.

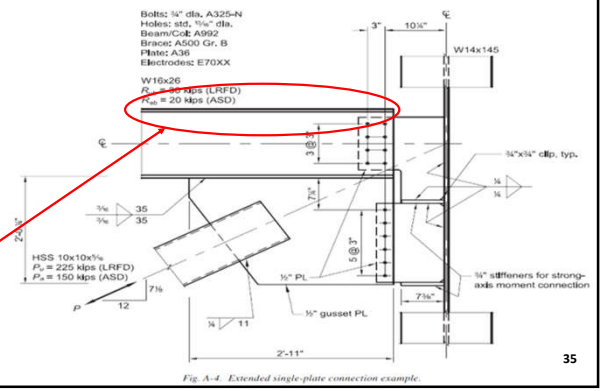
Check compression buckling of beam-to-column single plate

Check the compression buckling strength of the plate due to the horizontal load.

Conservatively assume $K = 1.2$:

Is it really necessary to assume K=1.2, if a slab is present?

Implicit Assumptions



35

Fig. A-4. Extended single-plate connection example.

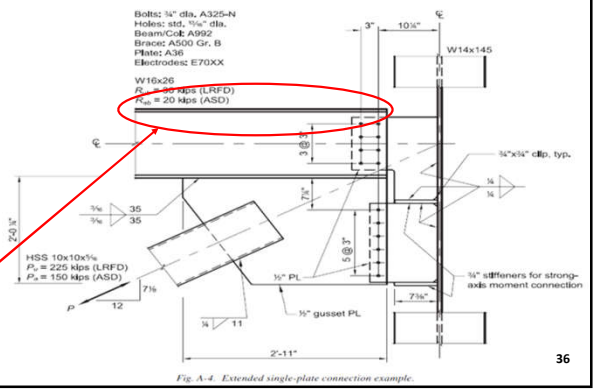
Check compression buckling of beam-to-column single plate

Check the compression buckling strength of the plate due to the horizontal load.

Conservatively assume $K = 1.2$:

Is it still conservative to assume K=1.2, if no diaphragm is present?

Implicit Assumptions



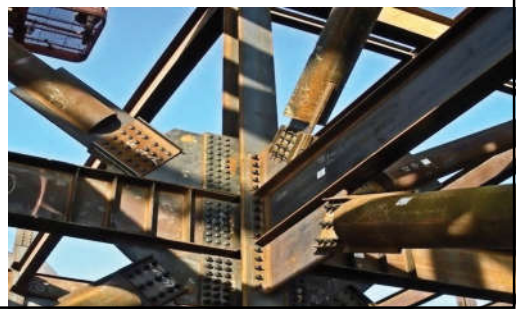
36

Fig. A-4. Extended single-plate connection example.

Implicit Assumptions

This connection is shown on the cover of Design Guide 29.

The Design Guide states: "Channel braces can be either back-to-back… or toe-to-toe… The back-to-back arrangement has little out-of-plane buckling strength."



Public Enemy #1

Manual Equations (9-2) & (9-3)

$$t_{min} = \frac{0.60F_{EXX}\left(\frac{\sqrt{2}}{2}\right)\left(\frac{D}{16}\right)}{0.6F_u}$$

38

Public Enemy #1

Manual Equations (9-2) & (9-3)

$$t_{min} = \frac{0.60F_{EXX}\left(\frac{\sqrt{2}}{2}\right)\left(\frac{D}{16}\right)}{0.6F_u}$$

In my opinion these are the most misused and overused equations in our industry.

These equations do not directly reflect any *Specification* requirement.

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Public Enemy #1

Manual Equations (9-2) & (9-3):

"In many cases, the load path from a weld to the connecting element is such that the strength of the connecting element can be evaluated directly… However, in some cases, the available strength of the connecting element is not directly calculable…. In cases such as these, it is often convenient to calculate the minimum base metal thickness that will match the available shear rupture strength of the base metal to the available shear rupture strength of the weld(s)."

40

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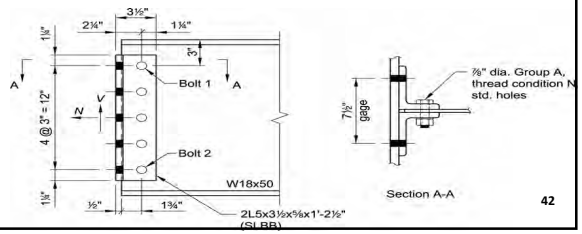
41

This connection is provided in the Manual Design Examples.

The beam end axial load is noted as "Axial tension". The example is silent relative to buckling checks on the angles.

Implicit Assumptions

EXAMPLE II.A-1B ALL-BOLTED DOUBLE-ANGLE CONNECTION SUBJECT TO AXIAL AND SHEAR LOADING



42

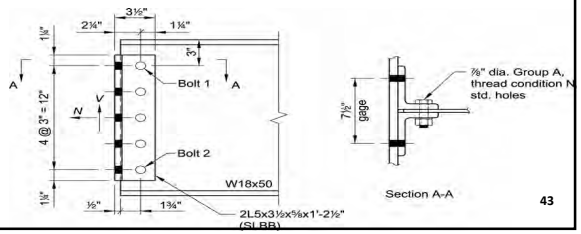
Check the compression buckling strength of a single angle due to the horizontal load.

Conservatively assume $K = 1.2$:

Implicit Assumptions

$$r = \frac{t_p}{\sqrt{12}} = \frac{\frac{5}{8}\ in.}{\sqrt{12}} = 0.180\ in.$$

$$\frac{KL}{r} = \frac{1.2(3.5\ in. - 1.25\ in.)}{0.180\ in.} = 15 \leq 25$$



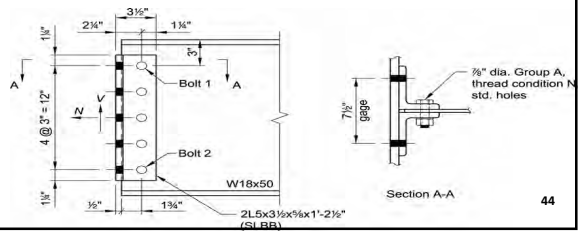
43

Implicit Assumptions

For this particular case even a very conservative check will indicate that buckling will not govern the strength of the end connection.

A lot of engineers would judge buckling "okay by inspection", but this should not be inferred due to the absence of a buckling check in the example.

It is often not necessary to find the "correct" answer. It is often sufficient to only prove a condition is "okay".



44

Implicit Assumptions

This connection is included in AISC Design Guide 13.

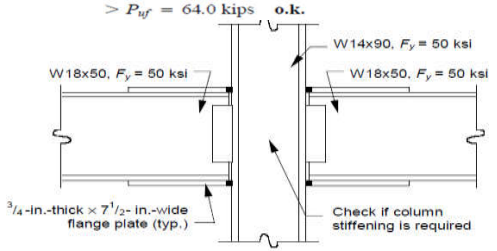
From Table B-1, with $N = 3/4$ in.,

$\phi R_n = 506$ kips(T) $> P_{uf} = 224$ kips **o.k.**

$= 506$ kips(C) $> P_{uf} = 224$ kips **o.k.**

$= 1{,}640$ kips (**compression buckling**)

$> P_{uf} = 64.0$ kips **o.k.**

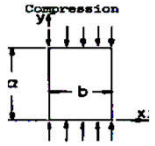


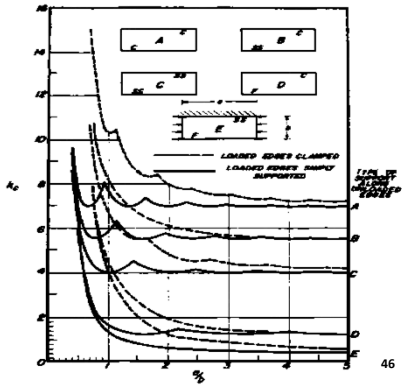
45

Figure 6-5 Framing arrangement for Example 6-4.

Implicit Assumptions

The *Specification* Section J10.5 Web Compression Buckling check models the column web as a square plate (a=b) simply supported on all sides and loaded in compression along two sides. Plate buckling coefficient, *k*, = 4.0.





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The *Specification* Section J10.5 Web Compression Buckling check is applicable as long as the two beams cannot move in-or-out of the screen (i.e. no side-sway).

For common conditions the slab and the beam web connections can be assumed to prevent side-sway.

Implicit Assumptions

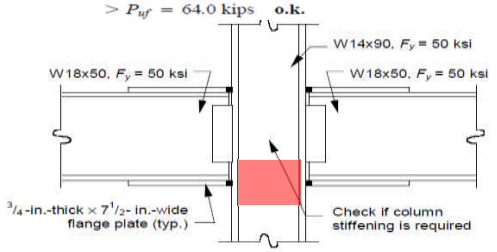
From Table B-1, with $N = 3/4$ in.,

$\phi R_n = 506$ kips(T) $> P_{uf} = 224$ kips **o.k.**

$= 506$ kips(C) $> P_{uf} = 224$ kips **o.k.**

$= 1{,}640$ kips (**compression buckling**)

$> P_{uf} = 64.0$ kips **o.k.**

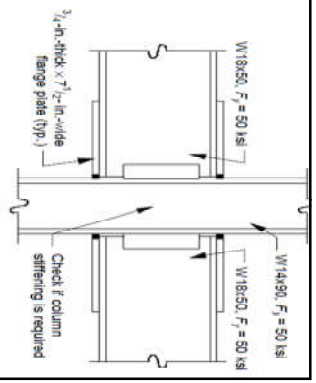


47

Figure 6-5 Framing arrangement for Example 6-4.

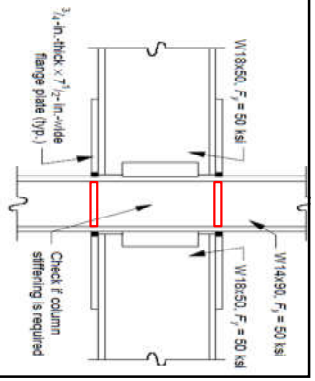
Implicit Assumptions

If the condition is turned 90-degrees such that the vertical "columns" are compressing on the horizontal "beam" web, then it might be less clear that the *Specification* Section J10.5 Web Compression Buckling check is applicable. Even if the beam "top" flange is restrained there may not be enough stiffness to prevent side-sway.



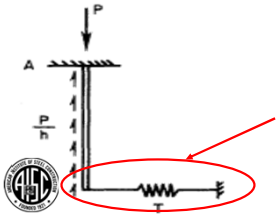
Implicit Assumptions

Providing stiffeners would tend to ensure restraint relative to side-sway at both flange but it would also eliminate the need for the web compression buckling check.

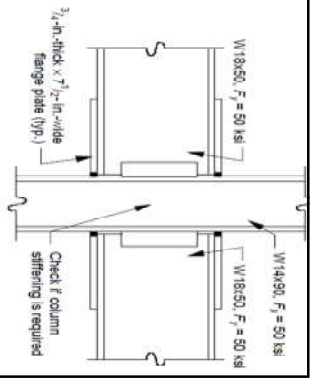


Implicit Assumptions

Specification Appendix 6 could also be used to determine whether or not sufficient restraint exists to justify the use of the Section J10.5 Web Compression Buckling check.



A bunch of "springs" in series and parallel… i.e. Weak-axis flexure of the bottom "column".



Implicit Assumptions

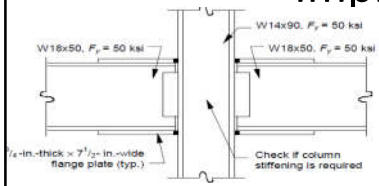
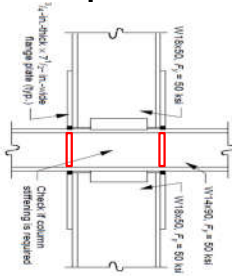


Figure 6-3 Framing arrangement for Example 6-4.

Sufficient restraint by inspection



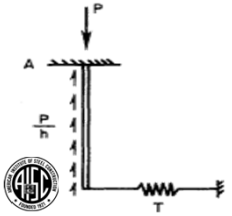
Sufficient restraint by inspection & It doesn't matter.

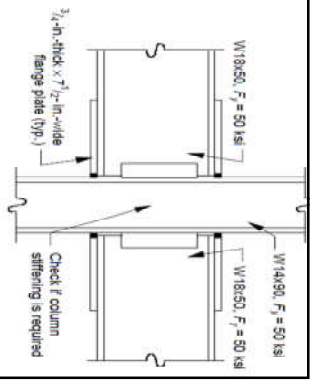
51

Implicit Assumptions

Okay "by inspection" or "based on engineering judgement" indicates you know the answer without even having to run the numbers.

When your engineering judgement is questioned you should be prepared to run the numbers.

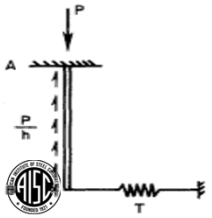


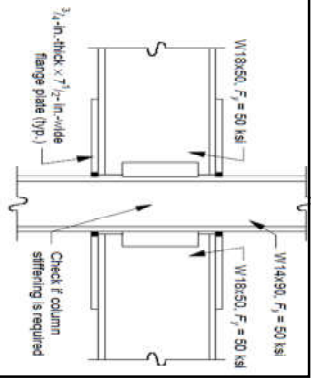


Implicit Assumptions

Designs should not rely on luck.

Being able to develop rational models and run the numbers can go a long way towards convincing others that you know what you are doing.





OH NO!!! HOMEWORK!!!

To prepare for Session 7 please print and have available Manual Design Examples –Example II.A-19B.

Hint: You should have already reviewed it as homework from Session 3.

54

Delegated Design

Based on attendee questions and comments.

55

Attendee-based Content

We received quite a few questions and comments up to this point. Thank you for participating in our experiment.

The discussion that follows addresses attendee questions related to delegated connection design.

There are not definitive answer for many of the questions submitted. I will express my opinions. Some of my opinions may be controversial.

The intent is to provide my perspective in hopes that it will be useful at least to the extent that the issues are brought to light and considered.

56

Blame Sharing

Question: Is delegated connection design only intended to share the legal (and financial?) obligation ("blame") should there be a failure or incident?

Answer: No.

57

Blame Sharing

Question: Is delegated connection design only intended to share the legal (and financial?) obligation ("blame") should there be a failure or incident?

Answer (cont.): Structural failures are rare. Structural issues are less rare, but still rare.

I do not think that blame sharing is or should be a primary reason for delegating connection design.

58

Blame Sharing

Question: Is delegated connection design only intended to share the legal (and financial?) obligation ("blame") should there be a failure or incident?

Answer (cont.): In my experience connection design is often delegated to:

- Reduce the EoR's fee by outsourcing the connection design.
- Increase the efficiency of the connections.

59

Blame Sharing

Question: Is delegated connection design only intended to share the legal (and financial?) obligation ("blame") should there be a failure or incident?

Answer (cont.): In the case of a failure or incident I suspect the fabricator, the fabricator's engineer and the EoR will all share blame and the financial impacts.

Theoretically blame will be apportioned based on how well design objectives were communicated and then satisfied.

60

Polling Question

If you delegate connection design, why do you do so?

a) To reduce your fees
b) To allow the fabricator to use more efficient connections
c) To reduce liability by sharing blame with the fabricator
d) To tap into the connection engineer's expertise
e) Other

61

Benefits

Question: What are the primary benefits of delegating connection design despite the fact that the fabricator's engineer will not know the structure as well as the EoR?

Answer: In my experience the primary perceived benefits are:

- Reduction in the EoR's fee by outsourcing the connection design.
- Increase in the efficiency of the connections.

62

Benefits

Question: What are the primary benefits of delegating connection design despite the fact that the fabricator's engineer will not know the structure as well as the EoR?

Answer (cont.): I suspect that in some parts of the country and for some range of projects EoRs simply cannot compete without delegating connection design.

63

Benefits

Question: What are the primary benefits of delegating connection design despite the fact that the fabricator's engineer will not know the structure as well as the EoR?

Answer (cont.): Allowing the fabricator more control over the configuration of the connections can lead to increased economy.

EoRs generally do not understand fabrication and erection well enough to design efficient connections.

64

Benefits – The Tradeoff

Question: What are the primary benefits of delegating connection design despite the fact that the fabricator's engineer will not know the structure as well as the EoR?

Answer (cont.): Option 1 (engineer mandated connections) may be less efficient but if connections are designed sufficiently it eliminates uncertainty during bidding.

Option 3 (delegated connection design) may be more efficient but can increase uncertainty during bidding.

65

Benefits – The Only Option

Question: What are the primary benefits of delegating connection design?

Answer (cont.): In some cases the EoR simply may not have the expertise to design complex connections in a manner that is safe, economical, and practical.

66

Benefits – In My View

Question: What are the primary benefits of delegating connection design?

Answer (cont.):The interaction involved in two engineers working to solve a problem can result in a better solution.

Though there is no peer-review aspect to delegated connection design, the "deeper dive" into the project often required by connection design can bring to light issues that could otherwise be overlooked and could lead to problems.

67

Benefits – In My View

Question: What are the primary benefits of delegating connection design?

Answer (cont.): Some of the issues that have been caught:

- Lack of a diaphragm to distribute loads to the LFRS.
- Missing transfer forces.
- Errors in modelling that assume load paths or restraints that do not exist in the actual structure.
- Design errors resulting from changes late in the project.

68

Benefits – In the View of Attendees

Question: What are the primary benefits of delegating connection design?

Answer (cont.): Some attendees wanted me to emphasize that the delegated connection engineer (the fabricator's engineer) can be a significant asset on projects since they often have a deeper understanding of the fabrication and erection process.

I strongly agree with this position.

69

Allowing Alternatives

Question: Is it better to delegate connection design or to provide connections in the contract documents and allow alternatives to improve fabrication and erection efficiency? The latter seems less efficient since it requires additional time and effort to "redevelop" connections that have already been designed once.

Answer: Either option can work. Each has its benefits and detriments.

70

Allowing Alternatives

Question: Is it better to delegate connection design or to provide connections and allow alternatives?

Answer (cont.): Delegating connection design leaves some of the work undone and adds uncertainty. Uncertainty adds risk. Risk must be managed.

Risk is sometimes managed by increasing the bid price or excluding items.

71

Allowing Alternatives

Question: Is it better to delegate connection design or to provide connections and allow alternatives?

Answer (cont.): If all of the connections are provided, then there should be little uncertainty and little risk.

However, the fabricator may be locked into "inefficient" details and this may result in an unnecessarily higher bid.

72

Allowing Alternatives

Question: Is it better to delegate connection design or to provide connections and allow alternatives?

Answer (cont.): Providing connections but allowing alternatives is a way to have one's cake and eat it too – to get some of the benefits of both options.

There will be little inherent risk since at least one type of connection is defined, so the fabricator may accept a little additional risk associated with gambling that more beneficial connections will be accepted

73

Allowing Alternatives

Question: Is it better to delegate connection design or to provide connections and allow alternatives?

Answer (cont.): The "additional time and effort" will only be expended if the lost efficiency in design effort is made up for in increased efficiency in terms of construction.

Note that alternatives will require "additional time and effort" on the part of both the fabricator and the EoR.

74

Design Responsibility

Question: Please expound upon the EoR being responsible for the structure. It appears some EoRs consider delegated connection design to absolve themselves from responsibility. If the EoR is responsible for the structural adequacy of the design of the structure, are they also responsible for the connection design adequacy?

75

Design Responsibility

Question: Some EoRs consider delegated connection design to absolve EoRs from responsibility. Is this correct?

Answer: No.

76

Design Responsibility

Question: Some EoRs consider delegated connection design to absolve EoRs from responsibility. Is this correct?

Answer (cont.): I am not a lawyer or a legal expert, but I think the evidence that exists indicates that EoRs cannot entirely absolve themselves from responsibility by delegating connection design.

Historically courts have tended to assign more responsibility to the EoRs and less to the fabricators than I would expect.

77

Design Responsibility

Question: Some EoRs consider delegated connection design to absolve EoRs from responsibility. Is this correct?

Answer (cont.): Document 962 from the Council of American Structural Engineers indicates that when the design of some element of the primary structural system is left to someone other than the *structural engineer of record*, "…such elements… should be reviewed by the *structural engineer of record*. He [or she] should review such designs and details, accept or reject them and be responsible for their effects on the primary structural system."

78

Design Responsibility

Question: Some EoRs consider delegated connection design to absolve EoRs from responsibility. Is this correct?

Answer (cont.): The CoSP and the rules and laws in NY State and other jurisdictions assign specific responsibilities to the EoR when design is delegated.

The EoR has responsibilities and likely retains considerable responsibility and liability when connection design is delegated.

79

Design Responsibility

Question: Some EoRs consider delegated connection design to absolve EoRs from responsibility. Is this correct?

Answer (cont.): The only way to know for sure how responsibility will be apportioned will be to see how courts rule when bad things happen.

It is probably best to overestimate rather than underestimate your own responsibility and liability.

80

Design Responsibility

Question: If the EoR is responsible for the structural adequacy of the design of the structure, are they also responsible for the connection design adequacy?

Answer: When I design connections, I assume I am responsible for ensuring the connections perform in a manner consistent with the information I am provided by the EoR.

When I design connections, I am not providing a peer-review.

81

Design Responsibility

Question: If the EoR is responsible for the structural adequacy of the design of the structure, are they also responsible for the connection design adequacy?

Answer (cont.): It is not unusual to discover problems with either the connection design criteria or the overall design.

I have a professional responsibility as an engineer and a moral responsibility as a human being to act on problems I discover.

82

Design Responsibility

Question: If the EoR is responsible for the structural adequacy of the design of the structure, are they also responsible for the connection design adequacy?

Answer (cont.): The EoR must:

- Provide sufficient (accurate and useful) design criteria
- Consider the impact of the connections on the overall performance of the structure
- Assess the competency of the connection engineer

83

Design Responsibility

Question: If the EoR is responsible for the structural adequacy of the design of the structure, are they also responsible for the connection design adequacy?

Answer (cont.): I do not expect (and frankly do not want) the EoR to “check my numbers” or to nitpick.

I expect the EoR to provide the information I require, to review and approve the work to ensure adequate communication, and to consider the overall performance based on information that the EoR has but I do not.

84

Providing Loads

Question: Sometimes loads are not provided by the EoR. “General parameters" (%UDL, full member capacity, etc.) may not be conservative. Therefore, should the connection design engineer only design connections for which the loads are provided?

Answer: The connection design engineer should only design connections for which sufficient criteria (including loads) is provided.

If you do not have sufficient information, request more information.

85

Providing Loads

Question: Sometimes loads are not provided by the EoR. “General parameters" (%UDL, full member capacity, etc.) may not be conservative. Therefore, should the connection design engineer only design connections for which the loads are provided?

Answer (cont.): Do not assume. Verify.

If the EoR provides inaccurate criteria that is nonetheless sufficient to design connections, then you are (likely) contractually obligated to design based on the criteria provided.

86

Providing Loads

Question: Sometimes loads are not provided by the EoR. “General parameters" (%UDL, full member capacity, etc.) may not be conservative. Therefore, should the connection design engineer only design connections for which the loads are provided?

Answer (cont.): If you suspect you have been provided with inaccurate and unsafe criteria, then you have a professional responsibility as an engineer and a moral responsibility as a human being to act.

87

Member Reinforcing

Question: Sometimes the members provided are sufficient to resist the “global” loads but are such that connections cannot be designed without member reinforcement. This is especially a problem encountered with HSS members. Should the fabricator bear the burden of additional connection cost or increasing the member sizes?

Answer: No.

88

Member Reinforcing

Question: Should the fabricator bear the burden of additional connection cost or increasing the member sizes?

Answer (cont.): The CoSP states: "The structural design documents shall clearly show or note the work that is to be performed… to accurately convey the quantity and complexity of the structural steel to be fabricated…"

Fabricators bid what they see.

Fabricators who bid more than what they see lose work to fabricators who bid what they see.

89

Member Reinforcing

Question: Should the fabricator bear the burden of additional connection cost or increasing the member sizes?

Answer (cont.): The CoSP states:

"When Option 1 or 2 in Section 3.1.1 is specified for a connection, these items shall be designed by the [EoR] and shown in the structural design documents issued for bidding so that the quantity, detailing and fabrication requirements for member reinforcement at connections can be readily understood."

90

Member Reinforcing

Question: Should the fabricator bear the burden of additional connection cost or increasing the member sizes?

Answer (cont.): The CoSP states:

- When Option 3… is specified… [the EoR can either show designed] member reinforcement at connections… or… provide a bidding quantity
- Subsequently, member reinforcement at connections… shall be designed… by the licensed engineer in responsible charge of the connection design.

91

Member Reinforcing

Question: Should the fabricator bear the burden of additional connection cost or increasing the member sizes?

Answer (cont.): The CoSP states:

- When the actual quantity and/or details of any of the foregoing items differ from the bidding quantity and/or details, the contract price and schedule shall be adjusted…"

92

Member Reinforcing

BLACK A WHOLE BUNCH OF GRAY WHITE

Answer (cont.): Connections can be chosen that accentuate the positive features of the member and eliminate the negative.

Connections can be chosen that ignore the ability to accentuate the positive.

93

Member Reinforcing

BLACK A WHOLE BUNCH OF GRAY WHITE

Answer (cont.): Be honest about how much of the reinforcing is due to undersized members and how much is due to choosing connection types that emphasize potential shortcomings of the members.

94

Thank you!

AISC | Questions

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Individual Session Registrants

PDH Certificates

- All WFH individuals associated with a group registration will be issued a certificate.
- All individuals attending at your connection: you will receive an email on how to report their attendance from: registration@aisc.org.
  - Be on the lookout: Check your spam filter! Check your junk folder!
  - Completely fill out online form. Don't forget to check the boxes next to each attendee's name!

8-Session Registrants

PDH Certificates

One certificate will be issued at the conclusion of all 8 sessions.

8-Session Registrants

Access to the quiz

Information for accessing the quiz will be emailed to you by Thursday. It will contain a link to access the quiz. EMAIL COMES FROM NIGHTSCHOOL@AISC.ORG.

Quiz and attendance records

Posted Thursday mornings. www.aisc.org/nightschool -- Click on Current Course Details.

Reasons for quiz

- EEU – You must take all quizzes and the final exam to receive EEU.
- PDHs – If you watch a recorded session, you must pass quiz for PDHs.
- REINFORCEMENT – Reinforce what you learn tonight. Get more out of the course.

Note: If you attend the live presentation, you do not have to take the quizzes to receive PDHs

8-Session Registrants

Access to the recording

Information for accessing the recording will be emailed to you by Thursday. The recording will be available for four weeks. (For 8-session registrants only.) EMAIL COMES FROM NIGHTSCHOOL@AISC.ORG.

PDHs via recording

If you watch a recorded session, you must take *and pass* the quiz for PDHs.

8-Session Registrants

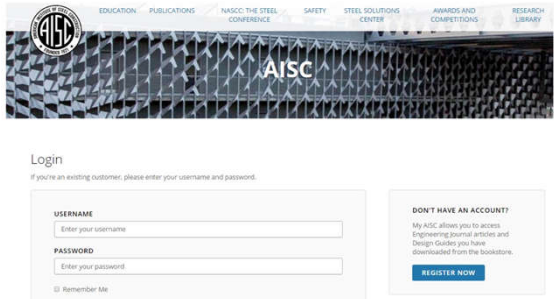
Night School Resources

Find all your handouts, quizzes and quiz scores, recording access, and attendance information all in one place!

8-Session Registrants

Night School Resources

Go to www.aisc.org and sign in.



8-Session Registrants

Night School Resources

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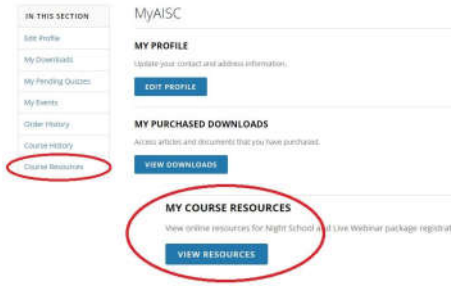


8-Session Registrants

Night School Resources

Course Resources

8-Session Registrants

Night School Resources

Night School 13: Design of Industrial Buildings

8-SESSION PACKAGE RESOURCES

8-Session Registrants

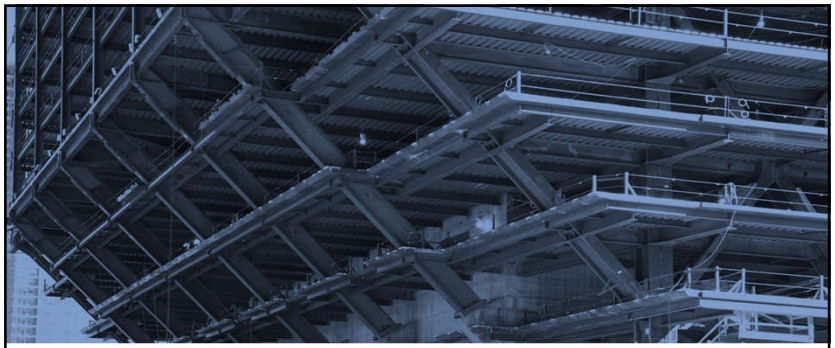
Night School Resources

- Weekly "quiz and recording" email.
- Weekly updates of the master quiz and attendance record, found at www.aisc.org/nightschool26. Scroll down to Quiz and Attendance records.
    - Updated on Friday mornings.

8-Session Registrants

Night School Resources

- Webinar connection information
    - Reminder email sent out Tuesday mornings
- Links to handouts also found here



AISC | Thank you

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