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Continuing Education Course #296  
Repair Techniques for Metal Plated Wood Trusses  
Part 3: Complex Truss Repairs

1. Which of the following materials is more susceptible than the others to internal defects, handling issues, and long term deterioration?
  - a. Concrete
  - b. Wood
  - c. Steel
2. The number 5-2-10 provided in f-i-s notation, what is an equivalent way to write that dimension?
  - a. 52.10" (1.323 m)
  - b. 52'-10" (16.10 m)
  - c. 5'- 2 5/8" (1.591 m)
  - d. 521.0" (13.23 m)
3. For the purposes of this course, what are the differences between a scab truss and a spider truss?
  - a. The scab truss is a one piece truss whereas the spider truss is fabricated as multiple pieces and must be field spliced together.
  - b. The scab truss is designed to work with the original truss whereas the spider truss largely replaces the structural function of the original truss.
  - c. The scab truss is often shorter than the span of the original truss whereas the spider truss usually must span from one bearing to another.
  - d. All of the above.
4. Which of the following is NOT a common reason for volume ceiling modifications?
  - a. Shipping and handling of the trusses.
  - b. Design Errors.
  - c. Lack of communication at the design or sales phase.
  - d. Confusion over whether the detail was a standard feature for the community or an option.
5. In Example 10-1, why were scab trusses used instead of adding new members and OSB gussets?
  - a. The truss was too large and the forces too high for OSB gussets.
  - b. OSB gussets were impractical because of the geometric constraints.
  - c. The cost of OSB gusset repairs would have been prohibitively high.
  - d. Larger repair trusses were already being supplied and the scab trusses provided a quicker resolution.
6. Which of the following is NOT a constraint in determining the geometry of a scab truss?
  - a. The size of the volume ceiling plus the development length of each member connection.
  - b. Location of key webs for the connection.
  - c. The square footage of the structure
  - d. Clearances for delivery to repair area such as the height of a standard door opening.

7. What is the key concept with the Truss Sections method as discussed in Example 10-2?
- a. Some forces are applied to the scab truss to make the scab truss behave like it is part of a larger truss.
  - b. The lumber and plate sizes of the scab truss do not matter because it will be nailed to a larger truss.
  - c. The weight of the scab truss is to be maximized to make sure that it is structurally sufficient.
  - d. The length of the scab truss does not need to exceed the size of the volume ceiling.
8. What is the recommended distance to lower the top chord of the scab truss?
- a. The top chord of the scab should match the top chord of the original truss exactly.
  - b. 0.75" (19 mm)
  - c. 2" (51 mm)
  - d. 6" (152 mm)
9. What is the final step in the Truss Sections method?
- a. Visit the jobsite to confirm the dimensions of the scab truss.
  - b. Locate the center of gravity of the scab truss.
  - c. Design the truss upside down to increase the size of the plates for shipping.
  - d. Apply a load back into the original truss to determine if any member or joint needs to be reinforced due to the effects of the scab truss.
10. What is the first step in designing a scab truss using the Truss Model Method as discussed in Example 10-2?
- a. Determine the bracing requirements of the scab truss.
  - b. Locate the joint with the largest plate size within the repair area.
  - c. Create a composite design using the scab truss as part of the original truss.
  - d. Size the scab truss to allow for attic storage within the truss.
11. Which statement best describes the advantages or disadvantages of the Truss Sections Method and the Truss Model Method for scab truss design?
- a. The Model Method is a little better at predicting the final behavior of the composite truss.
  - b. The Sections Method is a little better at assuring that the desired plate sizes are maintained through fabrication.
  - c. It is a little easier to design a scab truss for multiple truss designs using the Sections Method rather than the Model Method.
  - d. All of the above.
12. When is a spider truss a good alternative to a scab truss repair?
- a. The volume ceiling modification is very small.
  - b. The volume ceiling modification encompasses a significant percentage of the truss span.
  - c. There is damage to the original truss at a key joint location.
  - d. When there are more than 8 members at one joint.
13. In Example 10-5, why was the replacement truss designed with a lower heel than the original truss at the right end?
- a. To fit under the existing top chord to maintain most of the sheathing connection.
  - b. To increase the bearing area.
  - c. To reduce the required number of plies to be installed.
  - d. To provide wood at the required height for the hanger connection.
14. What standard approach is presented in Chapter 11 for complex girder repairs?
- a. The Heavy Truss Method.
  - b. The Cricket Truss Method.
  - c. The Truss Deflection Method.
  - d. There is no standard approach for complex girder truss repairs.

15. What is an advantage to using metal strapping over lumber scabs?
- a. It has a higher compression rating than lumber scabs.
  - b. It looks better than lumber scabs.
  - c. It can develop a tension connection in less space than lumber scabs.
  - d. It serves as a deterrent to deterioration due to insect infestations.
16. What criteria should be used when doing a tooth count inspection per ANSI/TPI-1?
- a. There is less than 1/32" (0.8 mm) gap between the plate and the wood member at the tooth.
  - b. The tooth is more than 1/4" (6.4 mm) from any wood edge.
  - c. The tooth is not bent over but goes straight into the wood without defects.
  - d. All of the above.
17. When designing a repair where the truss loading changes and the truss is undamaged, what is the minimum force that may be used to design the connection?
- a. The original force in the member.
  - b. The change in forces.
  - c. The full revised force in the member.
  - d. The original force plus the full revised force.
18. What was the solution to the girder truss with no support at one end in Example 11-5?
- a. Add a column below the girder designed for the eccentric load.
  - b. Add a cantilevered beam to support the girder.
  - c. Extend the girder truss using a scab truss.
  - d. Fabricate a custom steel column cap.
19. How was the floor truss repaired that had an invalid continuous bearing in Example 11-6?
- a. The load was shared with adjacent trusses through the use of multiple strong-backs.
  - b. The truss was stubbed off and hung from a beam that was supported on adjacent trusses.
  - c. A 2-ply truss was fabricated to fit below the floor truss inside the non-bearing wall.
  - d. LVL scabs were applied to both faces of the truss.
20. For the 4-ply truss repair in Example 11-7, what considerations went into the design of the steel plate?
- a. Reinforce every joint on the entire truss with the steel plate.
  - b. Meet the geometric constraints, transfer the required force, and reinforce the top chord lumber at joint 2.
  - c. The plies were to be separated so the steel plates could be placed between the plies.
  - d. Increase the bearing capacity of the truss.
21. Which statement best describes the process for calculating the resultant force on each screw in an eccentrically loaded bolt or screw group?
- a. Calculate the polar moment of inertia of the bolt or screw group, then the horizontal and vertical force components on each connector, and then the resultant force.
  - b. Divide the axial force by the thickness of the steel plate and by the diameter of the bolt or screw.
  - c. Divide the moment by the length and by the width of the bolt or screw group.
  - d. Divide the shear and axial forces by the total length of all connectors in group.
22. What was the goal of the repair where an interior bearing was removed in Example 11-8.?
- a. Install LVL scabs beside the girder truss to strengthen the girder.
  - b. Install a new beam to replace the missing bearing.
  - c. Remove all load from the girder truss so that it only had to carry its own weight.
  - d. Create a composite truss with an increased moment of inertia sufficient to carry the design load without opening either the roof or ceiling.

23. In Example 11-8, how many truss pieces were used to complete the repair?

- a. 1.
- b. 4.
- c. 7.
- d. 10.

24. What was the repair solution to the volume ceiling change to the flat girder truss in Example 11-9?

- a. Replace the 4 ply girder and the mono trusses that it supported.
- b. Two sets of 2-ply spider trusses with lumber scabs.
- c. 5 unique plies (Each ply was different than the others).
- d. 3 plies of lumber scabs on each face.

25. The structural screws used Example 11-9 are a valuable tool for truss repairs. However, which of the following statements does NOT match one of the hindrances encountered in this repair example?

- a. The cost
- b. The installation time
- c. The screws would shear off between the 2nd and 3rd ply when installed through the truss plates
- d. The large diameter of the screws caused substantial splitting in the wood members.

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