Webinar Questions and Answers

1. **Q: How do you model the wall and column connection? Will tension in the model be considered when modelled separately?**

   A: If there is a column connected at the ends of a shear wall, you can assign the same pier label to the shear wall and column. Then, go to Design>Shear Wall Design>Define General Sections to create a Section Designer Section. You will see the column and shear wall brought in to Section Designer and will be designed together. The tension in the model will be considered when modelled in this manner. The PMM interaction diagram will be generated for the column and shear wall.

2. **Q: Why is there Importance Value and Cd value repeated in Shear Wall Design preferences when it is already assigned in the Seismic load pattern?**

   A: Users could define many different Seismic load patterns with different R and I values, therefore the Importance and Cd value can also be defined in the Shear Wall Design preferences.

3. **Q: What is the difference between "Shell thick" and "Shell Thin" when defining wall/slab sections?**

   A: The inclusion of transverse shear deformation in plate-bending behavior is the main difference between thin and thick shell formulation. Thin-plate formulation follows a Kirchhoff application, which neglects transverse shear deformation, whereas thick-plate formulation follows Mindlin/Reissner, which does account for shear behavior. Thick-plate formulation has no effect upon membrane (in-plane) behavior, only plate-bending (out-of-plane) behavior.

   Shear deformation tends to be important when shell thickness is greater than approximately $^1/_5$ to $^1/_{10}$ of the span of plate-bending curvature. Shearing may also become significant in locations of bending-stress concentrations, which occur near sudden changes in thickness or support conditions, and near openings or re-entrant corners. Thick-plate formulation is best for such applications.

   Thick-plate formulation is also recommended in general because it tends to be more accurate, though slightly stiffer, even for thin-plate bending problems in which shear deformation is truly negligible. However, the accuracy of thick-plate formulation is sensitive to mesh distortion and large aspect ratios, and therefore should not be used in such cases when shear deformation is known to be small.

4. **Q: How will the boundary element be determined for C-shaped and L-shaped walls?**

   A: ETABS will always design the boundary zone for each leg separately regardless of the shape of the shear wall. In the design report, you will see information displayed for Leg 1, Leg 2 etc.

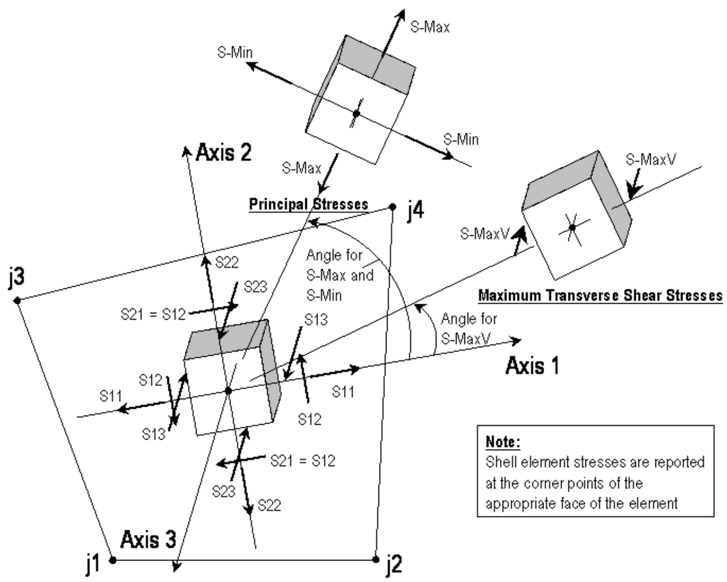
5. **Q: Will using the auto wall-opening tool and defining an opening by meshing the wall manually generate the same output results?**

   A: Yes, if you use the auto wall opening tool, you must take one extra step prior to analysis to ensure the wall is meshed properly and results will match the manually meshed wall output. Select the walls and wall openings, go to Edit>Edit Shells>Divide wall for Openings. Now the walls are meshed for properly load distribution.

6. **Q: Which stress output would be appropriate to check stresses in the walls?**

   A: The basic shell element stresses are identified as S11, S22, S12, S13, and S23.

   - **S11:** Direct stress (force per unit area) acting on the positive and negative 1 faces in the 1-axis direction.
   - **S22:** Direct stress (force per unit area) acting on the positive and negative 2 faces in the 2-axis direction.
   - **S12:** Shearing stress (force per unit area) acting on the positive and negative 1 faces *in the 2-axis direction* and acting on the positive and negative 2 faces *in the 1-axis direction*.
   - **SMax:** Maximum principal stress (force per unit area). Note that by definition principal stresses are oriented such that the associated shearing stress is zero.
   - **SMin:** Minimum principal stress (force per unit area). Note that by definition principal stresses are oriented such that the associated shearing stress is zero.
   - **SVM**: Von Mises principal stress (force per unit area).
   - **S13:** Out-of-plane shearing stress (force per unit area) acting on the positive and negative 1 faces in the 3-axis direction.
   - **S23:** Out-of-plane shearing stress (force per unit area) acting on the positive and negative 2 faces in the 3-axis direction.
   - **SMaxV:** Maximum principal shearing stress (force per unit area). Note that by definition principal shearing stresses are oriented on faces of the element such that the associated shears per unit length on perpendicular faces are zero.



7. **Q: How can we see what shear reinforcement is used?**
   A: In ETABS, shear reinforcement can be viewed in the Shear Wall Design Details. It is important to note that shear reinforcement can only be designed in ETABS, not checked. User cannot enter shear reinforcement to be checked (D/C ratio) in ETABS.

8. **Q: Inclined slab (such as stairs and ramps) appears as walls, do you use shear wall design or slab design for design of these elements?**
   A: Sloping area design is not currently available in ETABS.

9. **Q: What is the advantage of using Simplified C & T design over Uniform reinforcing approach?**
   A: It is recommended that you use the Uniform reinforcement approach for shear wall design. Simplified C & T design is primarily used for very simple planar walls.