Q: Do you use Y for height and elevation?

A: Yes, RISAFloor uses the Global Y axis as vertical. In RISA-3D the Global Y axis is vertical by default, but you can change that in the Model Settings.

Q: With RISA-3D alone, what types of diaphragm could we model?

A: RISA-3D by itself has only Rigid Diaphragms. You can manually model a semi-rigid diaphragm using plate elements though. For flexible diaphragms you can manually perform the load attribution, or use RISAFloor for automatic flexible diaphragm load attribution.

Q: What is most practical for modeling a concrete floor: rigid or semi-rigid diaphragm? Also, what is the benefit of modeling a concrete floor in one case or the other?

A: Rigid diaphragms are simpler and easier. Most engineers prefer to use Rigid diaphragms where allowed. ASCE 7 and IBC provide guidance on when a floor system may be idealized as Rigid.

Q: What different types of plate elements can be used for semi-rigid diaphragms and what do you use for plate properties? Same question for rigid diaphragms.

A: When using RISAFloor ES there is no need to define plate elements, the program automatically creates them. When using RISA-3D alone you would use the standard plate elements, and specify the material yourself. Plates are not required for rigid diaphragms.

Q: Is there any way to address the accidental torsion requirements?

A: Currently the program does not account for accidental torsion. We are working on a way to address this. In the meantime you can manually add counteracting loads to induce torsion into the slab.

Q: How would you define out-of-plane stiffness of the diaphragm built with plate assembly?

A: If you manually build plates in RISA-3D then the out-of-plane stiffness will be the stiffness of the plate elements based on the thickness and modulus of elasticity that you specify. Otherwise, plates modeled as "Plane stress" have no out of plane stiffness.

Q: Can non-horizontal semi-rigid diaphragms be used? Like a gabled roof?

A: Currently we are only able to generate flat semi-rigid diaphragms. However you can manually create sloped semi-rigid diaphragms in RISA-3D using the technique outlined in this article: http://risa.com/news/howto-model-semi-rigid-diaphragm-risa3d/

Q: Could the diaphragm edge loading be simplified using area or line loads rather than node loads?

A: Joint Loads and Surface Loads are the only types of loads which may be applied to plate elements. You can manually apply surface loads if you'd prefer.

Q: How would one apply the appropriate stiffness to plates based on the flexibility factors from a metal deck manufacturer which are based on span, deck thickness and fastener type/layout?

A: I would recommend contacting the deck manufacturer for their recommendations on stiffness values. Also, bear in mind that RISA's plate elements are isotropic, not orthotropic. Therefore our plates have the same stiffness in both directions.

Q: How do you input the stiffness for a semi-rigid diaphragm, such as metal deck?

A: RISAFloor ES automatically calculates the stiffness for concrete slab floors. For all other floor types such as metal deck, you would model plates in RISA-3D. You can enter a thickness and modulus of elasticity for the plate elements to match your deck's properties.

Q: Does RISAFloor ES work for modeling unfilled metal deck using the automated procedure demonstrated, or would one have to use the manual procedure demonstrated first?

A: For metal deck you must currently manually model the plate elements. We plan to eventually automate this semi-rigid design for metal deck to match what we already do for concrete slab floors.

Q: Can you verify that when using RISA-3D alone and you are creating the seismic loads, you divide the rigid diaphragm generated seismic load by the number of plates in your model and then apply the surface load to each plate in the x and z directions?

A: That is the approach that we used in this example. The program is not automatically doing it, so you may choose any method that you would like to apply the loads. As long as the seismic mass is relatively uniform on the floor then this approach is valid.