SDII Workshop – Participant Questionnaire on *C H A L L E N G E S*

(Feel free to write more broadly on the general response page provided at the end)

Participant Information

Name:

Specialty/Practice Area (e.g., warehouse buildings, mid-rise buildings, product manufacturer):

Feedback on Challenges

C1. Thinking broadly about the *design* of diaphragms for steel buildings, particularly under seismic demands, what are key challenges engineers face from your perspective?

C2. For your design/analysis workflow tell us about how you *model* building diaphragms:

C3. When *modeling* the diaphragm of a steel building, what challenges do you face? What challenges do you face/perceive when interpreting your model results to your satisfaction?

C4. To what extent do *non-structural* constraints/demands (e.g., fire, acoustics, aesthetics) drive your floor or roof assembly and ultimately your diaphragm design? What challenges do you face with respect to meeting non-structural demands as they relate to the diaphragm?

C5. Considering the most prominent available floor diaphragm system: *steel deck diaphragms with headed shear studs and concrete fill*, what challenges do you face in making this specific system meet your design constraints?

C6. Again considering *steel deck diaphragms with headed shear studs and concrete fill*, do you include supplemental reinforcement/rebar (beyond temperature and shrinkage steel) in the fill to meet diaphragm demands or serve as chords/collectors? Please explain why/why not.

C7. Again for *steel deck diaphragms with studs and fill*, what is your typical slab edge detail?

Pour stop? Internal reinforcing at slab edge?

C8. Considering a roof diaphragm system utilizing *bare steel deck diaphragms*, what challenges do you face in making this specific system meet your design constraints?

C9. Considering *chords and collectors* specifically, what challenges do you face in the design and detailing of these members? (clarify if you are addressing floor or roof diaphragms specifically)

C10. Please make any *additional comments* you would like with respect to challenges as related to diaphragms for steel buildings (e.g. codes and standards disconnects, modular buildings, large openings, floor plate shape, transfers, stiffness-mass eccentricities, etc.):

SDII
Steel Diaphragm Innovation Initiative

SDII Workshop – Participant Questionnaire on *I N N O V A T I O N*

(Feel free to write more generally on the last page)

Participant Information

Name:

Specialty/Practice Area (e.g., warehouse buildings, mid-rise buildings, product manufacturer):

Feedback on Innovation

N1. Thinking broadly, what innovations would you suggest to improve the design, detailing, construction, or behavior of diaphragms in steel buildings under seismic demands?

N2. What is your reaction to the idea of having targeted seismic energy dissipation systems (e.g. replaceable *shear fuses*) in floors/roofs instead of, or in addition to, the vertical LFRS?

N3. Based on your understanding of current seismic steel building design (ASCE 7-16, AISC 341-16) do you expect inelastic demands in your building diaphragms at DBE level? MCE level?

N4. Commonly, diaphragms are treated separately from the vertical LFRS. What is your reaction to design of buildings as 3D structures with seismically designed and detailed components in both the vertical and horizontal planes? What challenges do you see in this approach?

N5. Today, code-based design (ELF, RSA, RHA) considers only the vertical system in establishing R, C_d, Ω_o for buildings. What benefit (greater accuracy, greater flexibility in building configuration, reduced demands, consideration of diaphragm effects, etc.) would potentially be great enough to shift design to considering the combined vertical and horizontal systems?

N6. If seismic diaphragm demands could be directly predicted from a building model, would that be attractive? If the following were required by codes, how would each affect your decision to use a more *analysis/model-based design*: 3D models, semi-rigid diaphragm modeling, response-history analysis, nonlinear analysis?

N7. In considering innovations to support new technologies – how important do you think the principles of modular construction will be in the future? From your perspective, what innovations are needed to make modular systems have an effective diaphragm?

N8. In considering innovations to support future performance of buildings – how important do you think the principles of "design for deconstruction" will be in the future? What opportunities for innovation do you perceive in floor and roof systems that are designed for deconstruction?

N9. Please make any additional comments you would like with respect to innovation as related to diaphragms for steel buildings (incorporating high strength steel rebar; or high performance steel for members, deck, studs, etc.; dry floor systems with concrete board; 2-way steel systems, etc.):

SDII Workshop – Participant General Response

Name:

The questions are great, but what you really need to know is:

and you should know this too!

Do you have specific suggestions of how SDII can help overcome the challenges, or develop the innovations, you have detailed above? If yes, please provide that feedback here: