1. John - Future studies included in FEMA P-1026
   a. Steel decks integrated - steel industry has made steps forward - need to keep in mind as we move forward with wood
   b. Out of plane wall anchorage (Lawson, Koliou paper just completed). Shorter than 100 feet - suggestion is much higher forces than current design?? - could be complex discussion.
   c. Orthogonal directions - out of plane wall anchorage assumes to remain elastic vs steel deck is used as anchorage do they work simultaneously for diaphragm anchorage plus shear? Same issue with wood might be of concern for wood diaphragms? Also connector forces with combined
   d. Stiffness of walls relative to diaphragm - at what point no longer RWFD
   e. How irregular the plan should be
   f. Forces on continuity ties (ASCE 7 continuous ties across diaphragm) orthogonal effects
   g. Instrumented buildings for comparison - are more available? Are any steel diaphragm buildings instrumented
   h. Applicable to systems that are rigid but not heavy - like braced frame?
   i. Multi-story buildings? For just roof diaphragms?

2. Matt
   a. Interaction of inelasticity in vertical system and diaphragm - probably not issue as meant only for use when inelasticity is in diaphragm. Question what sense in the R factor for the vertical system - conceptually make it clear that walls are intended to remain near elastic. Too messy with inelasticity in both vertical element and diaphragm at the same time? Does it make a difference for performance?
   b. Period determination - more data for Robert Tremblay’s work for additional items like height dependency
   c. Diaphragm deflections - P-1026 example - are their limits to drift? ASCE 7 limits for vertical system said not to be applicable. ASCE 7 p-delta effect provisions 10% force trigger - verify that gravity system can tolerate this level of drift (detail as well as force issues). Wood prying action at wood wall connection?
   d. For Rdia factors - do we need detailing provisions to go with R factor? Maybe lesser issue for current code designed diaphragms, big question for proprietary materials?
e. Diaphragm zoning assumes linear distribution of shear, Tremblay shows non-linear distribution - is there something we need to look at relative to P-1026 solution? Is it an issue

f. Transition from standard (or alternate) design methodology to RWFD - what to do with messy transition?

3. Robert - has ongoing research to look into inelastic behavior

4. Location:
   a. Where in ASCE 7 does it go - new subsection of chapter 12 (12.15)??
      i.
   b. New chapter with complete design method? Main SFRS completely defined?
      i. Pro: Stand alone for easy use
      ii. Con: Repetition of provisions, upkeep.
   c. Derivative methodology that does not belong in ASCE 7??

5. Scope - For wood based on FEMA P-1026
   a. What diaphragms
      i. Material - Sheathing, fastening, detailing per SDPWS
         1. Basic
         2. Future
      ii. Fasteners
         1. Basic
         2. Future
      iii. Proprietary?
   iv. Span
   v. Detailing to support needed
   vi. Vertical offsets
   b. What vertical elements
      i. Stiffness of vertical elements relative to diaphragms
      ii. Material
      iii. Stiffness
   c. What geometry
      i. Number of stories
      ii. Plan configuration
         1. Multiple rectangles, each with minimum required dimension
      iii. Vertical configuration

Bonnie - concerns about incentivizing

Bill - study highlighted industry practices that are not codified that committee thought needed further work.
Tasks:
1. Scope - John (& Bill) to start scope statement, collect suggestions & concerns
2. Geometry - John to collect geometries of concern
3. Other issues - Kelly list items and decide which of those we need to deal with before going forward with Part I language.

Time frame: Move forward in monthly web meetings, May 2017 target proposal to PUC.

9:00 Goals and next steps for Rs Factors (All)

Notes:
1. S.K. Ghosh - steel should look at precast concrete diaphragms and see if this works for steel deck - ATC-19 is a reference of interest with possible simpler approach
2. S.K. Ghosh - proprietary systems need to be addressed
3. S.K. - Is FEMA P-695 necessary or not in this case?
4. Bonnie - methodology for establishing Rs needs to be developed, maybe revisit materials already tabulated
5. Matt - most concrete filled steel deck diaphragms appear to be remaining essentially elastic -
6. Materials
   a. Steel deck, topped, untopped
   b. WSP on CFS framing
   c. Proprietary
7. Matt - two methods stand out - ATC-19 deformation based and FEMA P-695 have very different goals, collapse probability. Hard to combine
8. Matt - Using P-695, many possible vertical elements generates many possible analyses. ATC-19 may be simpler method.
9. Ron - Are Rs factors intended over time to supplant traditional method? Feedback cycle is slow because not in implemented code yet. No need to supplant at this time.
10. Pat - Do we need to talk about what diaphragms can be used in combination with which vertical systems?

Next Steps:
1. Get ATC-19
2. Start next meeting with presentations on ATC-19, FEMA P-695, and what precast did in testing and analysis (precast - distill out what they did, maybe create outline)

10:00 Break
10:15 Goals and next steps for steel deck diaphragms (All)
1. Steel RWFD - more comprehensive presentation for next meeting, project should be moving rather quickly. Goal is modeling/methodology concept end of first quarter 2017. Goal is to have something this cycle for steel industry, so progresses into code.
2. Bonnie to revisit ATC RWFD effort and provide update if needed
3. Steel Rs - steel will be looking to bring forward proposed steel Rs factors, along with substantiating data. Will work from what Jeff and Bill put together. Anticipated time frame - approx. Sept. 2017. Challenge is in standardizing detailing for diaphragm system - Rs factors need to be tied to specific detailing provisions.

Notes:
1. S.K. - derivation and basis of Rs, and variable ways now defined

Approximate timing
2. Steel RWFD - est. from ATC 4th quarter 2017, to IT9 early 2018
3. Steel Rs - est. to IT9 mid 2018

11:15 Assignments
11:45 Next meeting Web meeting starting week of Oct 31 - will doodle 2 hr meeting, continue meeting every 4 weeks (look into standing monthly meetings). In-person meeting March 2017;
12:00 Adjourn, lunch provided
More Detailed Discussion
Scope - For wood based on FEMA P-1026

a. What diaphragms
   i. Material - Sheathing, fastening, detailing per SDPWS
      1. Basic - wood structural panel
      2. Future -
   ii. Fasteners -
      1. Basic - nails
      2. Future - staples
   iii. Proprietary - future
   iv. Span - minimum diaphragm span? No - period separation takes care of the.
   v. Detailing to support needed
   vi. Vertical offsets - essentially level diaphragm within each section, but can vary section to section

b. What vertical elements
   i. Stiffness of vertical elements relative to diaphragms - period formula
   ii. Material - concrete, masonry walls, steel braced frame on interior - as stiff as wall in plane. Don’t think expansion joints are going into wood diaphragm
   iii. Stiffness,
      1. Perforated walls - loading dock wall - many have distributed solid panels with pedestrian doors. Look into this - how should we deal with this? Simplified rules.
      2. Steel moment frames - period rules should be eliminating these.
      3. Strength differentiation between walls and diaphragm to make sure wall is stronger? Similar to weak-story check for multi-story building. What was relationship of strength of wall to diaphragm in analytical studies.

c. What geometry
   i. Number of stories - single story
   ii. Plan configuration
      1. Multiple rectangles, each with minimum required dimension
   iii. Vertical configuration

1. Does not apply where vertical elements are anticipated to experience significant yielding under design level EQ
2. Rectangular shape or can be separated into multiple diaphragms rectangular in shape
3. All four edges of rectangular segment need to be laterally separated
4. Wood structural panels nailed to wood members (15/32 WSP, 10d nails used)
5. Vertical lateral force resisting system concrete or masonry shear walls
6. Diaphragm period at least 3x vertical system
7. Interior braced frame element is acceptable (would have to stay elastic) to divide into multiple rectangular

Appendix A p. 106 spells out

1. Single story buildings
2. Flexible diaphragms
3. Designed per SDPWS
4. Vertical elements intermediate or special concrete, special reinforced masonry shear walls
5. Without horizontal structural irregularities except type 2
6. Period calculated per P-1026 formula
7. Period falling on plateau of response spectrum
8.