National Institute of BUILDING SCIENCES™
Building Seismic Safety Council

PUC 2019 April 16-18, 2019 Meeting Minutes

SAN FRANCISCO AIRPORT **MARRIOTT** WATERFRONT

Participants

Provisions Update Committee
David Bonneville, Degenkolb Engineers (Chair)
Pete Carrato, Bechtel Corporation
Kelly Cobeen, Wiss Janney Elstner
C.B. Crouse, AECOM
Dan Dolan, Washington State University (absent)
Anindya Dutta, Simpson Gumpertz & Heger
S.K. Ghosh, S.K. Ghosh Associates
John Gillengerten, Consulting Engineer
Ron Hamburger, Simpson Gumpertz & Heger
Jim Harris, James Harris & Associates
William Holmes, Rutherford & Chekene
John Hooper, Magnusson Klemencic Associates
Gyimah Kasali, Rutherford & Chekene
Charles Kircher, Charles Kircher & Associates
Philip Line, American Wood Council
Bret Lizundia, Rutherford & Chekene
Jim Malley, Degenkolb Engineers
Bonnie Manley, American Iron and Steel Institute (on the phone)
Robert Pekelnicky, Degenkolb Engineers
Rafael Sabelli, Walter P. Moore
John Silva, Hilti
Greg Soules, CB&I
Jonathan Stewart, University of California Los Angeles

BSSC Members and Associates
Michel Bruneau, University of Buffalo
Amit Varma, Purdue University
Ben Schafer, Johns Hopkins University
John Wallace, UCLA
Bahram Zarin-Afsar, BSSC Board
Jennifer Goupil, ASCE/SEI, BSSC Board (on the phone)
Dominic Kelly (call in)
Philip Caldwell, SE (call in)
Devin Huber, AISC
Mike Ganna, AISC
Jon-Paul Cardin, AISI
Jon Heintz, ATC

USGS
Nicolas Luco
Sanaz Rezaeian

NIST
Matthew Speicher

FEMA /NIBS
Mai Tong, FEMA
Bob Hanson, FEMA
Andrew Herseth, FEMA, 4th and 5th
Jiqiu Yuan, NIBS/BSSC, 4th and 5th

1. Call to order, David Bonneville

David Bonneville opened the meeting at 8:30 a.m. with member introductions, a reading of the anti-trust statement, and a review of the agenda (Attachment 1).

2. Approval of Last PUC Meeting Minutes, David Bonneville

The minutes were approved unanimously and the meeting minutes and attachments are posted on the BSSC website. https://www.nibs.org/?page=bssc_PUC

3. 2020 Cycle Schedule Review, Future PUC Meetings, David Bonneville

David stated that the August ballot will be the last substantive technical ballot to align with ASCE 7-22's timeline. All proposals should be sent to JQ by June 21, 2019. PUC will have another ballot on proposal modifications and resource papers for the November meeting.

	Proposal to BSSC, no later than	Post in BSSC Ballot system	PUC Ballot	Proponent Response	PUC discussion
Ballot #7	6/21/2019	Within 3 days	4 weeks	3 weeks	August 13-14, 2019

4. FEMA/BSSC Update, Mai Tong/Jiqiu Yuan

Mai: (1) thanks for everyone's effort to minimize the impact of January government shutdown on committee's schedule, (2) The 2020 NEHRP Provisions marks the 10th FEMA NEHRP publication, FEMA is planning to publish a special publication capturing the important achievements.

JQ: (1) NIBS new logo, attachment 2. All future BSSC related publications and presentations should use the new logo; (2) BSSC will develop an interface tool to show seismic design values once USGS web

service is ready to facilitate Ballot #7 on the Chapter 22 proposal; (3) FEMA/BSSC will have a 2020 NEHRP Provisions morning session at the 2019 SEAOC conference; (4) the year of 2019 is the 40th year of BSSC and NIBS is planning to have a special event later this year. BSSC may have a PUC meeting in DC in November or December. JQ will send a Doodle Pool to set the meeting date.

5. USGS NSHM update, Luco

- Summary of modifications for 2018 USGS NSHM
  - PEER NGA-East ground motions models for central and eastern us
  - Deep basin depth in LA, Seattle, San Francisco, and Salt Lake City regions, input into PEER NGA-West2 GMMs
    - ✓ Default basin depth in SF seems to be 20-30% bigger than the actual depth
    - ✓ Concerns not across the country
    - ✓ Needed for USGS to roll out long period values
  - Removing Idriss (2014) and Atkinson & Boore (2003, 2008) GMMs
  - 2013-2017 EQ and updates for smoothed seismicity sources outside California
- Subduction zone/basin effect will be taken out when calculating the short period S_s. PUC suggests to document where and why basin effects are applied and not applied
- The reduction in NY is mainly due to the NGA-East ground model, (the reduction in last cycle, 2015 vs 2010, is mainly due to EQ source characterization)
- USGS map values: 0.05 degree, grid about 5 x 5 km. With basin effect, we probably need finer grid (0.01 degree?)

6. MPRS study and design parameters, Kircher

- Update on the MPRS study, which provides technical basis for USGS to develop MPRS for regions where existing GMPE's do not adequately define response at all periods and site classes
- Comparison of values of 1-second MCE_R, S_1 (ASCE 7-16, at 1s) vs S_{M1} (2020 NEHRP, largest of 1-5 s), approximately half the 34 cities go up
- Comparison of values of 1-second MCE_R, S_1 (T=1s) vs S_a (T=1s), only three sites go up
- Discussion of the spectra shape is more based on actual measured records, or based on models and predications. Suggest to include any actual proof or records to support the new spectra shape, which would be helpful when communicating with users, owners, and clients.
- Comparison of alternative near-source "triggers" and related criteria (SDC category, near field factor, minimum base shear formulas, etc.). Clarification on deterministic lower limit based on M8 (compared the lower limit based on M7 vs M8, it did not make much difference)

7. IT10-1 (No.20) Multi-Period Response Spectra Chapter 11

- Bonneville's comments
  - Locations affected by site class coefficients: in the west, not much difference in site coefficients, but more changes in the east with PGA-East
  - Chapter 12 clarification, Jim Harris will work on it.
  - Clarification that 2020 S_{D1} is different from previous S_{D1}
- SK comments: new date provided. SK withdraw his negative.
- Harris comments: Jim will provide commentary in Chapter 12 (allow ELF using multi-period spectra). Jim withdrew his negative

- Hooper's comments:
  - Section 11.4.5.1 the interpolation description. Motion by John H to use interpolation only, 2nd by SK, in favor 15, no 0, not voting 1. Motion carried.
  - Two period spectra will be kept, providing explanation in the commentary. Two options on how to use two period spectra were discussed: 1st choice (John Silva): require use MPS, unless you need to use two point spectra where info is not available. In favor: 11, oppose 2. Not voting 1. (2nd choice to keep as it is, let engineer to choose either options, and add clarification in commentary). Hooper withdraw his negative with suggested 1st option.
  - 11.4.4 commentary: John Hooper agrees it is non-responsive
  - 11.9, define Western United States. Response: need a map in chapter 22, boundary based NGA-West vs NGA East. Suggest may use vertical ground motion. Charlie will add some clarification.
- Hamburger's comments: new data provided.
- Lizundia's comments:
  - First comment: addressed responding to Hooper's comment
  - Page 16 comment: will add explanation
  - Page 13 comment: addressed
- Manley's comment: solved, add specific latitude
- Pekelnicky's comments: (1) and (2) resolved, (3) will add explanation in the commentary
- Silva's comments: resolved.

Strategic plan for MPRS proposals (Chapters 11, 12, 19, 20, 21, 22) for MO ballots: MO will see the MPRS proposals in one package after August meeting (when it is assumed that all will have passed the PUC).

Motion by Charlie Kircher to accept chapter 11 as revised, 2nd by John Hopper, in favor 17, oppose 0, not voting 0. Motion carried and the proposal will send to MO ballot in a package including Chapters 11, 12, 19, 20, 21, and 22.

8. IT10-2 (No.21) Multi-Period Response Spectra Chapter 20

- SK Ghosh negative vote: withdraw
- John Hooper: resolved
- Jim Malley negative: withdraw

Motion by Charlie Kircher to accept chapter 20 as revised, 2nd by John Hopper, in favor 18, oppose 0, not voting 0. Motion carried and the proposal will send to MO ballot in a package including Chapters 11, 12, 19, 20, 21, and 22.

9. IT10-3 (No.22) Multi-Period Response Spectra Chapter 21

- Bonneville's comment: withdraw
- Hamburger's comment: USGS should archive the data and document the interpolation rules.
- Hooper's comments:
  - deterministic lower limit concept: John withdraw and will keep the deterministic limit numbers in the commentary

- peer review requirement if less than USGS value. Motion by Charlie find it NP, 2nd by Jim Harris, in favor 3, oppose 12. Failed. Charlie will change as John suggested, retain the 80% safety net.

- Malley's comments: withdraw
- Pekelnicky's comments:
  - Deterministic lower limit, which is based on default basin depth. A few options were debated: one is to eliminate lower limit, second is to use ASCE 7-16 lower limit, third is go as Charlie proposed, 4th is to do more studies (shallow basin depth not necessarily de-amplify the values). Motion by Charlie that Bob is non persuasive, 2nd by CB, in favor 6, oppose 5, not voting 6. No consensus.

    More discussion. Motion to revote by Bill Holmes that Bob is non persuasive, 2nd by CB, in favor 9, oppose 3, not voting 7, motion carries.

  - 2nd comment, Bob withdraw
- Jon Stewart's comments: Jon withdraw, and Jon will submit a separate proposal

Later in the meeting, Charlie proposed the following: "the parameter S_{D1} shall be taken as 90% of the maximum value of the product, TS_a, for periods from 1 to 2s…., and for periods from 1-5 s…, but not less than 100% of the value of Sa at period 1s. …"

Motion by Charlie to make the addition of 90% requirement, 2nd by John Gillengerten, in favor: 18, oppose 0, not voting 0.

Motion by Charlie Kircher that Ch 21 adopted as amended, 2nd Greg Soules, in favor 19, oppose 0, not voting 0. Motion carried and the proposal will send to MO ballot in a package including Chapters 11, 12, 19, 20, 21, and 22.

10. **IT10-4 (No.23) Multi-Period Response Spectra Chapter 22**

- Hamburger's comments: will be reballoted next time with maps
- Cobeen's comments: three options: (1) references to maps to be added to the provisions, along with commentary addressing their reasoning and intent, (2) map can be moved to the chapter 22 commentary, (3) maps can be removed altogether, refer to USGS website. (4) a pdf downloadable version
  PUC resolution: Default maps in provisions or commentary, then having the PDF version
- Soules' comments: resolved
- Carrato's comments: will add notes in the commentary
- Bonneville, Malley, Pekelnicky's comments: will make more detailed comparisons
- Kircher's comments: will show the changes from 2010, 2016, 2020 in the revised commentary
- Time frame:
  - Schedule a web meeting for Nico make the presentation on the comparisons
  - Update 34 cities table, provide more changes, clarification, in a few weeks
  - Actual map and web service will be ready in a few months
  - Potentially to offer webinar for MO (and recorded webinars)

The chapter 22 proposal will be reballotted in PUC ballot #7 (August meeting).

11. MPRS study update, Sanaz

- Need "approval" now for USGS developing values in August
- JQ will send the report out and ask for comments by May 17, 2019

12. IT 1 Report, Bob Pekelnicky

- SDC consolidation: IT 1 is looking into consolidation of SDC DEF, but w/o resounding support.
- Lowering the MEP requirement to SDC C, not supported by IT 1
- Resilience-Based Design and the *NEHRP Provisions* (Part 3 white paper)-Bonowitz. The white paper describes the potential role that PUC needs to play in the functional recovery codes. Aiming to have the proposal for PUC August meeting ballot.

13. IT 2 C_d=R white paper, Kelly Cobeen

Draft will be sent out and ask for PUC comments within next two weeks.

14. IT 3 report, Dutta

IT 3 is working on a Part III white paper for next ballot

15. IT 4 report, SK

SK provided an overview of the two shear wall proposals and reported that they are in the process of developing a shear wall white paper.

16. IT4-1 (No.29) Ductile_Coupled_Walls, Wallace

- Carrato's comments: resolved
- Gillenterten's comments: resolved
- Harris's comments: resolved.
- Malley's comments: motion by SK to add reference of ACI 318-19 in chapter 12 to resolve Malley's negative comment, 2nd by John Hooper, in favor 18, oppose 0, not voting 1. Motion carried.
- Lizundia's comments: resolved
- Kircher's comments: motion by SK to find Charlie Kircher non persuasive, 2nd by Kelly Cobeen, in favor 17, no 2, not voting 1. Motion carried.

Motion by SK to send revised proposal to MO, 2nd by Kelly Cobeen, in favor 19, oppose 0, not voting 1. Motion carried and the proposal will move to MO ballot.

17. IT 4-2 (No.30) C-PSWCF_Bruneau and Varma

- Carrato and Malley's comments on C_d=5.5: resolved, add some explanation in the commentary
- Kircher's comments: resolved
- Lizundia comments: resolved

- Pekelnicky's comments: resolved (lab test concrete strength range 5-9 ksi, in practice about 8 ksi)
- Hamburger and Hooper's comments: SK motion to find Hamburger and Hooper non persuasive, 2nd by Greg Soules, in favor 17, no 0, not voting 2

Motion by SK to move the proposal to MO ballot, 2nd by Kelly Cobeen: in favor 18, no 0, not voting 1. Motion carried and the proposal will move to MO ballot.

18. IT 5 Non Structural Force Proposal, John Gillengerton

- Presentation on the near-final proposal to revise the seismic force equation for nonstructural components
  - Brief history of the evolution of the force equation
  - Brief summary of the ATC-120 project and findings
  - Overview of the proposed changes to the force equation
  - Comparisons between lateral forces generated by the proposed equation and ASCE/SEI 7-16
  - Final steps in development process
- Proposal introduces a building global ductility, R_μ to consider the observation that lateral forces experienced by nonstructural components likely to be in resonance are higher in strong, low-ductility structures and lower in ductile structures with lower overstrength.
- Potential issues:
  - Design when limited information on structure is available
  - Use for existing building
  - Change an established design procedure
  - Treatment of nonbuilding structures
  - Mapping of existing nonstructural design coefficients to proposed coefficients
  - Calibration of revised component design procedures with EQ experience
- Workshop to be held on May 21, 2019 at R&C, San Francisco
- Straw Poll on submit this as a part I proposal: 12 in favor; to submit as a part III proposal: 2 in favor

19. IT 6-8 PROPOSAL (No.31) Coupled Analysis Requirements, Soules

- Proponent's response to Bonneville's, Carrato's, and Cobeen's "yes with reservation" votes and John Silva's "no" vote are discussed and accepted by PUC.
- SK' negative comment: Pete will provide clarification in the commentary. Negative was withdrawn by SK.

Motion by Greg Soules to move the proposal to MO ballot (after Pete write clarifying commentary), 2nd John Hooper, yes 15, No 0, not voting 0. Motion carried and the proposal will be moved to MO ballot.

20. IT 6 P-delta proposals

Will let ASCE SSC TC look into evaluating the P-Delta requirements.

21. IT 6 discussion to add CMU wall system to Table 15.4.1

Discussion: could refer to rules in chapter 12. It is not needed to add it to Table 15.4.1.

22. IT 7-1 (No.33) Chapter 20 Site Classification Procedure

- Bonneville's comments: resolved.
- Carrato's comments: motion by Charlie Kircher that Pete's comment is non persuasive, 2nd by Jon Stewart, in favor 12, no 0, not voting 1. Motion carried.
- Cobeen's comments: withdrawn by Kelly.
- Harris' comments: resolved.
- Hooper's comments: resolved
- Kircher's comments: resolved
- Manley's comments: resolved

Motion by Gymah Kasali to approve as revised, 2nd by Ron Hamburger, in favor 14, no 0, not voting 0. Motion carried and the proposal will send to MO ballot in a package including Chapters 11, 12, 19, 20, 21, and 22.

23. Proposal_IT_7-2 (No.34) _Chapter 11 Multi-Period Response Spectra

- Carrato's comments: resolved
- Cobeen's comments: withdraw
- SK's comments: resolved
- Hopper's comments: resolved
- Kircher's comments: withdraw.
- Manley's comments: resolved
- Soules's comments: resolved.

Motion by Gymah Kasali to approve as revised, 2nd by Greg Soules, in favor 12, no 0, not voting 0. Motion carried and the proposal will send to MO ballot in a package including Chapters 11, 12, 19, 20, 21, and 22.

24. IT-7-4 (No.36) Part 3 wall pressures, Stewart

No negative votes and all comments resolved. Motion by Jon Stewart to accept the paper as revised, 2nd Greg Soules, in favor: 17, oppose, 0, not voting 0. Motion carried and the proposal will move to MO ballot.

25. IT9-3 (No.26) Steel Deck Diaphragm Detailing

- Bonneville comments: editorial persuasive, will go through all the new terms more comprehensively.
- Carrato comments: about special inspection: add reference to existing IBC inspection criteria. Resolved.
- Hamburger's comments:
    - WR term, editorial persuasive.
    - Peer review: better wording to require the peer review? Certification process? May use language in ASCE 13.2.5. Languages for peer review or 3rd party review were added during the meeting. See new language in F3.5.2.1 lines 20-23 and F3.5.2.2 lines 41-43. Resolved.
- Harris' comments:

- Number of tests, persuasive
- Peer review, the same as Hamburgers.
- Prequalified structural connectors: discussed.

- Pekelnicky's comments on referencing to AISI 400: resolved

PUC resolution: New language about peer review regarding Hamburger and Harris' negative comments was added during the meeting. Motion by Jim Harris to move to MO ballot, 2nd by Bonnie Manley, in favor 16, oppose 0, not voting 0. Motion carried and the proposal will be moved to MO ballot.

26. IT9-4 (No.27) Steel Deck R_s

- Harris' comment (vote: N): clarified that R_s=1 not 1.5 for welds. Harris withdrew his comment.

PUC resolution: Motion by Kelly Cobeen to move forward No.27 to MO ballot, 2nd by Bret Lizundia, 14 yes, 0 no, and 1 not vote. Motion carried and the proposal will be moved to MO ballot.

27. IT9-5 (No.28) RWFD R_{diaph} for Steel Deck

- Dominic Kelly called in and provided a few comments:
  - Should R_{diaph}=4.5, or should R_{diaph}=3 with consideration of strengthened zone along the perimeter
  - Detailing: consideration of rotation between the wall and roof deck, not only plane shear loads, but distortion. Important to have the deformation compatibility requirement in the commentary.
  - Appropriate force design level for connector, how to deal the combined effect of in-plane shear (R_s) and out of plane force? Suggest to develop a design guide.

Schafer response: will push some of the detailing to AISI side, further specify the special seismic detailing. Will look more on the anchorage issue, which is a broader issue but out of the scope of this proposal.

- Carrato's comments: R_{diaph} is for a classic set of buildings recognizing the different performance, R_s is for any type of buildings. IT 9 will add more description in the commentary. Resolved.
- Harris' comments: Clarified in responses to IT9-3 proposal. Withdrawn by Harris.
  2nd comment on where 1.5 applies. Concerns that R factor can be bigger than 1 for welded steel deck diaphragm. Outside this ballot.
- Lizundia's comments: editorial persuasive. Modified commentary.
- Pekelnicky's comments about mandating the special detailing requirement in high seismic areas: Discussed. Motion by Kelly Cobeen that Pekelnicky is non persuasive and IT 9 does not have enough information to solve it, but will look into the potential solution, 2nd by Greg Soules, in favor 12, no, 0, not voting 5. Motion carried.

PUC resolution: Motion by Kelly Cobeen to move to MO ballot with revising commentary (Lizundia's commentary), 2nd John Gillengerten, in favor 12 no 0, not voting 3. Motion carried and the proposal will be moved to MO ballot.

28. IT 9 Report, Kelly Cobeen

- RWFD with wood diaphragm proposal (Part 1) -passed ballot and moved to ASCE 7, some further discussion of Omega factor
- Three bare steel deck diaphragm proposals (Part 1)
- Development of R_s factors (Part 3 white paper), plan for PUC June ballot

29. JPS-1 (No.32) Part 3 Risk Based Alternatives to Deter Caps, Stewart

Part 3 paper: Jon will revise the paper per the comments and resubmit for next ballot.

30. RS-1 (No.11) Drift and Deformation, Sabelli

- Bonneville's comments: resolved
- Manley's comments: resolved
- Harris's comments: Resolved
- Kircher's comments: Resolved
- SK's negative vote: resolved
- Gillengerten's negative vote: persuasive and will revise the proposal and resubmit.
- Pekelnicky negative vote: Motion by Rafael find Pekelnicky's 2nd and 3rd comments not persuasive, 2nd Greg, in favor 16, oppose 0, not voting 0. Motion carried.
- Hamburger's negative vote: Motion by Rafael to find Hamburger non persuasive, 2nd Greg Soules, in favor 16, oppose 0, not voting 0. Motion carried.

  Motion by Sabelli to accept changes in Chapter 13 in concept, 2nd by Greg Soules, in favor 14, oppose 0, not voting 3. Motion carried. This proposal will be withdrawn, revise per Gillengerten's comments, and resubmitted for next ballot.

31. Chapter 24 discussion

- The Chapter 24 (SDC B buildings), which refers to FEMA 1091, is currently in 2015 NEHRP, in part 1. This will need continued maintenance.
- Jim Malley's motion to sunset chapter 24, 2nd by John Hooper, discussion: there may be some other groups to update Chapter 24 and it is still valid for next 7-8 years; suggest including it in commentary of chapter 12.1.1 alternative permissible system. The final decision is to include it in the commentary of chapter 12.1.1. John Hooper will follow up with Sandy.

32. Other business

Phil Line stated that there is a potential a new CLT shear wall proposals (with R = 3 or 4). Potentially we will schedule a PUC webinar to review the proposal.

33. Future Meetings

PUC will have its next meeting on August 13-14, 2019 in Burlingame.