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BOARD OF BUILDING REGULATIONS AND STANDARDS

Geotechnical Advisory Committee (GAC) Meeting Minutes
September 8, 2021
The Division of Professional Licensure Office
1000 Washington Street - Boston, MA 02118

This was a virtual Microsoft Teams meeting.

Roll Call, by GAC Chair:

Chris Erikson, Chair	☒ present ☐ absent	Martin Rodick	☒ present ☐ absent
Scott DiFiore	☒ present ☐ absent	Jake McManus	☒ present ☐ absent
John Roma	☒ present ☐ absent	James Christensen	☒ present ☐ absent
Michael Oakland	☒ present ☐ absent	William Solberg	☐ present ☒ absent
Damian Siebert	☒ present ☐ absent	Rob Anderson	☒ present ☐ absent

General notes on format of these minutes

- *These minutes represent general points discussed during the meeting. The minutes are* ***not*** *intended to be a verbatim account of discussions.*
- *Topics as numbered may\may not be in the same order as they appear on the meeting agenda.*
- *The meeting agenda is listed as* **EXHIBIT A;** *others are listed sequentially as addresses during the meeting.*

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1. **Review minutes for the GAC August 11, 2021 meeting (EXHIBIT B).**

   On a **MOTION** by Damian Siebert, seconded by Chris Erikson, it was unanimously agreed, by **Roll Call Vote**, to approve the minutes with the following revision.

   Page 2: Correct spelling of the word ***embers***, should be ***members*** in the sentence Confinement shall include permanent steel casing conforming to 1810.3.5.3.4 or a reinforcing cage conforming with ACI 318 for composite ***embers***.

2. **Discuss proposed amendments and new content of 2021 IBC, Chapter 18, for inclusion in the Tenth Edition of the Massachusetts Building Code (780 CMR).**

   Section Review.

- **1806.4 – Liquefaction.** James Christensen reviewed his (*and M. Farren's*) memorandum with a revised date of September 7, 2021 (**EXHIBIT C**) relating to the input parameters and assumptions used in the calculation to develop revised Liquefaction Susceptibility Screening Plot in Figure 1806.4, indicating that SAC must decide whether or not to use the PGAs as suggested. Scott DiFiore indicated that the SAC has reserved space in Chapter 16 to address the issue and will ask Don Kelly to follow-up with James directly. Chairman Erikson noted that we may want to keep reference to alternate method as a precaution.

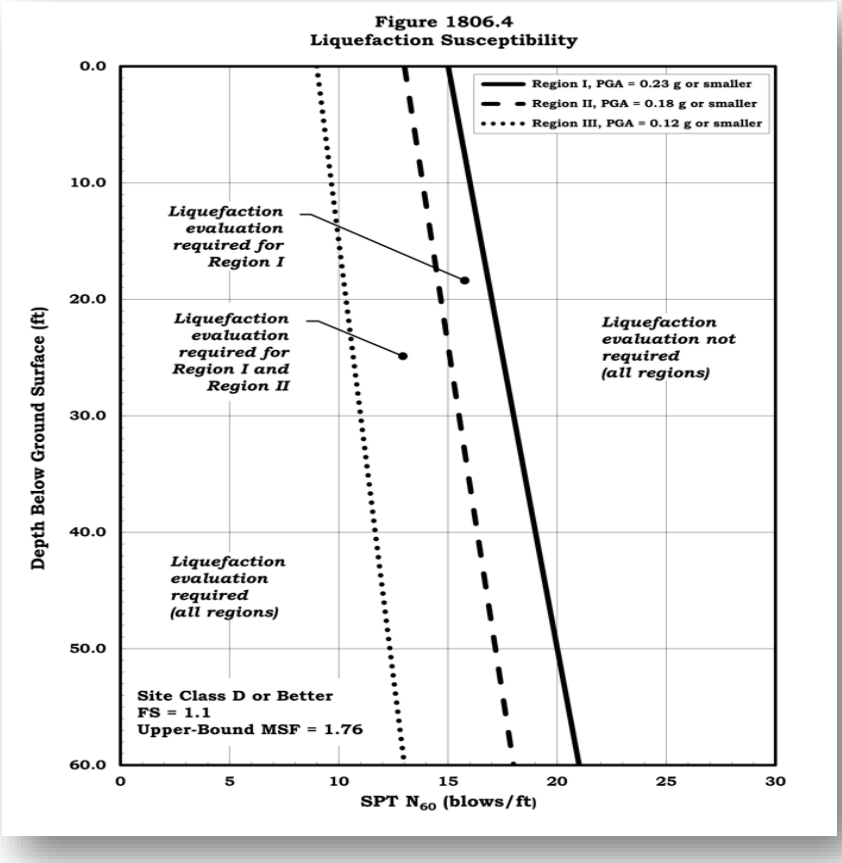
Following discussion, on a **MOTION** by Chris Erikson, seconded by James Christensen, by **Roll Call Vote**, it was unanimously voted to approve revised **Section 1806.4.1** as presented, reading:

1806.4.1 Standard Penetration Test. For cases with a generally flat ground surface, the susceptibility to liquefaction may be evaluated using Figure 1806.4 on the basis of Standard Penetration Test ("SPT") blow counts, N (blows per foot) values that have been corrected for hammer efficiency to be SPT N_{60} (blows per foot) values. N_{60}-values are intended to be used with Figure 1806.4 and SPT N-values measured in the field should only be corrected for hammer energy. Hammer type shall be as described in ASTM Standard Method D6066. If the type of hammer is not known, Figure 1806.4 may be used assuming the SPT N-values were determined using a 140-lb donut drop weight and SPT N-values shall be corrected with a hammer efficiency correction factor (C_E) of 0.75.

Figure 1806.4 is intended to be a screening tool for Site Classes A through D, determined in accordance with section 1613.5.2. The figure is based on Maximum Considered Geometric Mean Earthquake (MCE_G) Peak Ground Accelerations (PGAs) at outcropping Site Class B rock of 0.23 g, 0.18 g, and 0.12 g and site amplification factors (F_{PGA}) of 1.37, 1.44, and 1.56, respectively for Site Class D, and a factor of safety of 1.1. Refer to Table 1604.11 or USGS earthquake hazard data for PGA specific to where the site is located. This figure is based on observed behavior of clean sand, and is conservative for other (more silty) materials. Soils that do not screen out using Figure 1806.4 shall be evaluated for liquefaction per section 1803.5.12.

If the SPT N_{60}-values plot above or to the right of the applicable line in Figure 1806.4, the soil shall be considered not susceptible to liquefaction. Liquefaction for soils below a depth of 60 feet (18 m) from final grade need not be considered for level ground. For pressure-injected footings, the ten-foot (3-m) thickness of soil immediately below the bottom of the driven shaft shall be considered not susceptible to liquefaction.

Additionally, on a **MOTION** by James Christensen, seconded by Chris Erikson, by **Roll Call Vote**, it was unanimously voted to approve revised **Figure 1806.4** as presented, reading:



Chairman Erikson thanked James for all his efforts regarding this issue. Mike Oakland noted that the revision is a great improvement. All members agreed.

- **1810.3.3.1 Allowable axial load.** James Christensen indicated that he discussed the 2.5 factor of safety issue with Les Chernauskas but is still having difficulty concluding that the figure should be revised to a lesser figure. John Roma expressed that he too had discussed the issue with Les and was of the impression that both Les and James were considering that the figure could be reduced to 2.25. John asked if Les could join the conversation. All agreed.

  Les joined the meeting @ 10:55 am indicating that he had first taken a look at reducing the factor of safety to 2, but could not easily justify the number. After much consideration, he determined that the 2.25 was more reasonable. James was concerned that the data analyzed may not account for site variations\uncertainty. Mike Oakland suggested that it may be better to continue with the 2.5 factor of safety and leave any requested modification of the number to an appeal where project specifics can be addressed.

  Following discussion, it was agreed that Les would take a closer look at the issue and committee members would review a bit further at the next meeting before making a final determination.

  Scott DiFiore reviewed the following sections with particular attention to structural issues and made observations\suggestions noted below for each.

- **1810.3.8 Precast Concrete Piles**. IBC 2021 gets rid of IBC 2018 1810.3.8.1 to 1810.3.8.4, which related to reinforcement and seismic reinforcement guidelines for concrete piles. Alternatively, IBC 2021 points to ACI 318-19, which covers these guidelines. **No action needed for MA 10th Edition Amendments.**

- **1810.3.9 Cast-In-Place Deep Foundations**. IBC 2021 replaced the reference for load combinations. Rather than referring to 1605.2, it points to ASCE 7 Section 2.3, which covers the same combinations. **No action needed for MA 10th Edition Amendments (other than those already proposed).**

- **1810.3.10 Micropiles**. No changes in IBC 2021.

- **1810.3.11 Pile Caps.** IBC 2021 adds a reference saying that pile caps shall conform with ACI 318 and this section. **No action needed for MA 10th Edition Amendments.**

- **Section 1810.3.11.1** (Seismic Design Categories C through F) removes discussion of development length, lateral confinement, toughness, and ductile-behavior and instead references ACI 318. **No action needed for MA 10th Edition Amendments.**

- **Section 1810.3.11.2** (Seismic Design Categories D through F) adds a subsection (1810.3.11.2.3) which is entirely new; it addresses tensile connection between pile caps and H-piles or unfilled pipe piles. **No action needed for MA 10th Edition Amendments.**

- **1810.3.12 Grade Beams.** IBC 2021 makes a simple modification that clears up references. It points to ACI 318 and the load combinations of ASCE 7. **No action needed for MA 10th Edition Amendments.**

- **1810.3.13 Seismic Ties.** IBC 2021 replaces the details of the first paragraph and instead points to ACI 318. **No action needed for MA 10th Edition Amendments.**

  Also, committee members agreed that Les Chernauskas would make a nice addition to the committee and would so ask consideration of his appointment by members of the BBRS.

3. John Roma asked if there is time to study and present recommendations to the BBRS regarding ground improvements for inclusion in the tenth edition. Rob Anderson indicated that BBRS members are still reviewing other chapters and have not called an end to the committee review process, so there is still a bit of time. Committee members agreed to convene a meeting on October 6th @ 10am to continue review discussions.

Consequently, John asked if some industry professionals could be invited to the meeting to discuss. Chairman Erikson agreed and John indicated he would reach-out to invite a few representatives to the next meeting.

Scott DiFiore suggested that it must be clear as to the properties that we are attempting to improve with the requirements and what test would be used in demonstration before and after the fact.

4. **Discuss: Matters not reasonably anticipated 2 business days in advance of meeting.**
None.

5. **Approve: Adjourning the meeting.**

On a **MOTION** by Chris Erikson seconded by Damian Siebert, **by Roll Call Vote**, it was unanimously agreed to adjourn the meeting @ approximately 11:58 pm.

Exhibits.

A. Meeting Agenda
B. July 14, 2021 GAC Draft Meeting Minutes.
C. International Building Code (IBC), Chapter 18 January Draft (*modified as a **WORD** document for clarity*).
D. Dynamic Load Testing Update Memorandum from Samuel Paikowsky, Sc.D., dated July 6, 2021.