



CHARLES D. BAKER
GOVERNOR

KARYN E. POLITO
LIEUTENANT GOVERNOR

MIKE KENNEALY
SECRETARY OF HOUSING AND
ECONOMIC DEVELOPMENT

Commonwealth of Massachusetts
Division of Professional Licensure
Office of Public Safety and Inspections
1000 Washington Street • Boston • Massachusetts • 02118

EDWARD A. PALLESCHI
UNDERSECRETARY OF CONSUMER
AFFAIRS AND BUSINESS
REGULATION

LAYLA R. D'EMILIA
COMMISSIONER, DIVISION OF
PROFESSIONAL LICENSURE

BOARD OF BUILDING REGULATIONS AND STANDARDS

Geotechnical Advisory Committee (GAC) Meeting Minutes

June 9, 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
Scott DiFiore
John Roma
Michael Oakland
Damian Siebert

☒ present ☐ absent
☐ present ☒ absent
☒ present ☐ absent
☒ present ☐ absent
☒ present ☐ absent

Martin Rodick
Jake McManus
James Christensen
William Solberg
Rob Anderson

☒ present ☐ absent
☒ present ☐ absent
☒ present ☐ absent
☐ present ☒ absent
☒ 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.*

1. Review minutes for the GAC May 12, 2021 meeting (EXHIBIT B).

On a **MOTION** by James Christensen, seconded by Damian Siebert, it was unanimously agreed, by **Roll Call Vote**, to approve the minutes with the following **revisions** to page 2, item 3, paragraph 2 – delete the last 2 sentences.

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 1810.3.3.1 John Roma provided an update about the **2.5 minimum safety factor** identified as a Massachusetts amendment to Section 1810.3.3.1 (*excerpted below*), reading from a memo supporting the figure. However, some have concerns that the figure is too conservative.

The allowable axial load on a deep foundation element shall be determined in accordance with Sections 1810.3.3.1.1 through 1810.3.3.1.9 11. **Where the allowable load capacity is not determined by using one of the formulas or analysis methods provided in sections 1810.3.3.1.1 through 1810.3.3.1.11, or the presumptive load-bearing values in section 1806, the allowable load capacity shall be verified by load tests. Dynamic load testing of instrumented driven piles performed in accordance with ASTM D4945 may be used in lieu of static load testing, where the testing program consists of a minimum of three**



instrumented piles tested to a **minimum factor of safety of 2.5** using an analysis procedure that matches the force and velocity traces measured at the top of the pile. Load testing may be waived by the building official based upon submittal of substantiating data prepared by a registered design professional which include load test data or performance records for the proposed deep foundation elements under similar soil and loading conditions.

Following discussion, all agreed that the matter warrants further review. John Roma will contact Les Chernauskas from Geoscience Testing Laboratory (GTL) to garner input for further consideration at the next meeting.

3. **Continued Report on Assignment Number 2 from 2/10/2021 Meeting & Follow-up Meeting(s).** As indicated during the March meeting, *“Following lengthy discussion (relating to liquefaction susceptibility figures), James suggested that the further study of the matter is warranted and suggested convening an interim (subgroup) meeting prior to the next regularly scheduled meeting on April 14th dedicated to the topic”*.

James Christensen indicated that, in order to be used effectively, PGA values should be reviewed by members of the BBRs Structural Advisory Committee (SAC). Following discussion, it was agreed that Scott DiFiore can forward a request for assistance to SAC Chair, Dominic Kelly.

Following discussion, Chairman Erikson thanked James in particular, and all involved, for their efforts and detailed analysis of the matter. Discussions will continue next meeting.

4. **Section Review: 1810 – Deep Foundations.**
 - **1810.3.3 Determination of allowable loads.** Following discussion, on a **MOTION** by Damian Siebert, seconded by Chris Erikson, it was unanimously agreed, by **Roll Call Vote**, to approve the **Section 1810.3.3** as presented in the January, 2021 draft with changes referenced below.

1810.3.3.1 Allowable axial load. The allowable axial load on a deep foundation element shall be determined in accordance with Sections 1810.3.3.1.1 through 1810.3.3.1.9 11. Where the allowable load capacity is not determined by using one of the formulas or analysis methods provided in sections 1810.3.3.1.1 through 1810.3.3.1.11, or the presumptive load-bearing values in section 1806, the allowable load capacity shall be verified by load tests. Dynamic load testing of instrumented driven piles performed in accordance with ASTM D4945 may be used in lieu of static load testing, where the testing program consists of a minimum of three instrumented piles tested to a minimum factor of safety of 2.5 using an analysis procedure that matches the force and velocity traces measured at the top of the pile. Load testing may be waived by the building official based upon submittal of substantiating data prepared by a registered design professional which include load test data or performance records for the proposed deep foundation elements under similar soil and loading conditions.

EXCEPTION: The allowable frictional resistance of cast-in-place elements greater than or equal to 12 inches in diameter obtaining capacity in Material Classes 1 through 6 in Table 1806.2a may be determined by a registered design professional based on analyses incorporating results of testing in similar bearing materials.

Exception: Where approved by the building official, load testing is not required.

not permitted.

1810.3.3.1.2 Load tests. Where design compressive loads are greater than those determined using the allowable stresses specified in Section 1810.3.3.6, where the design load for any deep foundation element is in doubt, or where cast-in-place deep foundation elements have an enlarged base formed either by compacting concrete or by driving a precast base, control test elements shall be tested in accordance with ASTM D4443 or ASTM D4945. One element or more shall be load tested in each area of uniform subsoil conditions. Where required by the building official, additional elements shall be load tested where necessary to establish the safe design capacity. The resulting allowable loads shall

redundant/not needed based on the MassCode amendments.

method of analysis. Where the *deep foundation* elements in the group are placed at a center-to-center spacing less than three times the least horizontal dimension of the largest single element, the allowable uplift load for the group is permitted to be calculated as the lesser of:

1. The proposed individual allowable uplift load times the number of elements in the group.
2. Two-thirds of the effective weight of the group and the soil contained within a block defined by the perimeter of the group and the length of the element, plus two-thirds of the ultimate shear resistance along the soil block.

1810.3.3.1.7 Load-bearing capacity. *Deep foundation* elements shall develop ultimate load capacities of not less than twice the design working loads in the designated load-bearing layers. Analysis shall show that soil layers underlying the designated load-bearing layers

1810.3.3.1.9 Helical piles. The allowable axial design load, P_a , of helical piles shall be determined as follows:

$$P_a = 0.5 P_u$$

(Equation 18-4)

where P_u is the least value of:

1. Base capacity plus shaft resistance of the *helical pile*. The base capacity is equal to the sum of the areas of the helical bearing plates times the ultimate bearing capacity of the soil or rock comprising the bearing stratum. The shaft resistance is equal to the area of the shaft above the uppermost helical bearing plate times the ultimate skin resistance.
2. Ultimate capacity determined from well-documented correlations with installation torque.
3. Ultimate capacity determined from load tests where required by Section 1810.3.3.1.
4. Ultimate axial capacity of pile shaft.

2021 INTERNATIONAL BUILDING CODE®

need to correct for proper reference to the Mass amendments

18-21

- **Section 1810.3.4 – Subsiding soils or strata.** Following discussion, on a **MOTION** by Chris Erikson, seconded by Martin Rodick, it was unanimously agreed, by **Roll Call Vote**, to approve the **Section 1810.3.4** as presented in the January, 2021 draft.
- **Section 1810.3.5 – Dimensions of deep foundation elements.** Following discussion, on a **MOTION** by Damian Siebert, seconded by Martin Rodick, it was unanimously agreed, by **Roll Call Vote**, to approve the **Section 1810.3.5** as presented in the January, 2021 draft.
- **Section 1810.3.6 – Splices.** Following discussion, on a **MOTION** by Chris Erikson, seconded by Damian Siebert, it was unanimously agreed, by **Roll Call Vote**, to approve the **Section 1810.3.6** as presented in the January, 2021 draft.
- **Section 1810.3.7 – Top of element detailing at cutoffs.** Following discussion, on a **MOTION** by Chris Erikson, seconded by Damian Siebert, it was unanimously agreed, by **Roll Call Vote**, to approve the **Section 1810.3.7** as presented in the January, 2021 draft.

5. **Discuss:** **Matters not reasonably anticipated 2 business days in advance of meeting.**

None.

6. **Approve:** **Adjourning the meeting.**

On a **MOTION** by Chris Erikson seconded by Martin Rodick, by **Roll Call Vote**, it was unanimously agreed to adjourn the meeting @ approximately 11:59 pm.

Exhibits.

- A. Meeting Agenda
- B. May 12, 2021 GAC Draft Meeting Minutes.
- C. International Building Code (IBC), Chapter 18 January Draft.