August 4, 2015
File: 191711607

Attention: Helen Donaldson
City of Portland Planning Division
389 Congress Street
Portland, Maine 04101

Dear Ms. Donaldson,

Reference: Additional Information and Review
Newbury Street/Seaport Loft Development Project
Newbury Street, Portland, Maine

This letter provides a revision to our letter dated July 27, 2015 regarding the above referenced project. In the conclusion of the letter we indicated that the cause of that the ground surface movement behind the wall (tension cracks) and settlement that caused the distress to the adjacent properties is likely due to a combination of the wall settlement and vibration from the extraction of the sheet piles densifying the granular soils above the clay. We also indicated that global instability is not the likely cause of the ground movement and/or settlement at the Site. Our letter did recommend the drilling of two additional test borings to further refine the shear strength parameters for the clay in the ground improvement zone located beneath the retaining wall. Since our letter was issued, we participated in a conference call on July 28th with various parties involved with the project including personnel from the City of Portland, the developer (113 Newbury Street), Haley & Aldrich (H&A), and GEI Consultants. The main point of the conference call was to discuss the need for the drilling of the proposed additional test borings.

Based upon the discussions made during the conference call, H&A provided additional data to include the calculated global factors of safety varying strength parameters for the clay; the results of which are highlighted in the attached Table 1. Further explanation of the results is provided in the attached email prepared by H&A. In summary the table indicates a range of the factor of safety that varies from 1.2 to 1.9 for the soil Profile No. 1, depending on the strength of the soil in the ground improvement zone below the wall. It is our opinion that the friction angle (strength) of soil is in the 15 degree to 20 degree range which corresponds to a global factor of safety that varies between 1.5 and 1.6. As mentioned in our July 27th letter, a global factor of safety of 1.5 is considered to be appropriate for this Site. In consideration of this additional information and global stability analyses results provided by H&A, it is our opinion that the additional test borings are not needed.

Reference:

Newbury Street/Seaport Loft Development Project

Please do not hesitate to contact the undersigned to provide additional information or respond to additional questions/concerns.

Sincerely,

Stantec Consulting Services, Inc.

Trey Dykstra, PE
Project Manager/Geotechnical Engineer
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cc. Jonathan Rioux, City of Portland

Attachment: email from Wayne Chadbourne of Haley & Aldrich, dated July 31, 2015
Revised Table 1 prepared by Haley & Aldrich

TABLE I

NORTH RETAINING WALL ROTATIONAL STATIC STABILITY EVALUATIONS (SECTION A-A)

SEAPORT LOFTS

NEWBURY STREET, PORTLAND, MAINE

Marine Clay Undrained Shear Strength Profile	Ground Improvement (Y/N, Strength)	Calculated Factor of Safety			
		Surcharge Loading			
		0 psf	250 psf	500 psf	600 psf
Profile No. 1	N	1.5	1.5	1.5	1.5
	Y, 0°	1.2	--	--	1.2
	Y, 15°	--	--	--	1.5
	Y, 20°	1.6	--	--	1.6
	Y, 40°	2.0	2.0	1.9	1.9
Profile No. 2	N	1.4	--	1.4	1.4
Profile No. 3	N	1.4	--	1.3	1.2
	Y, 0°	--	--	--	1.1
	Y, 20°	--	--	--	1.3
	Y, 40°	--	--	--	1.6

Notes:

1. Approximate location of cross section used in rotational stability evaluations shown on the attached Figure 1.
2. Subsurface soil and groundwater conditions modeled based on conditions encountered in test borings completed on site by Geotechnical Services, Sebago Technics and SW Cole.
3. Refer to Figure 2 for marine clay undrained shear strength profile details. Undrained shear strength values shown taken from in-situ vane shear and laboratory unconfined compressive strength tests completed by Geotechnical Services, Sebago Technics and SW Cole within and from test borings drilled on site.
4. Range in surcharge loading and marine clay undrained shear strength were varied to evaluate overall sensitivity as it relates to the calculated factor of safety since actual values are unknown.
5. Rotational stability evaluations completed using Slide v. 6.035 computer program developed by Rocscience, Inc. using Simplified Bishop and Janbu methodology.

From:	Chadbourne, Wayne
To:	Dykstra, Trey
Cc:	Helen Donaldson (HCD@portlandmaine.gov); Jonathan Rioux (JRIOUX@portlandmaine.gov); Joe Dasco (joedasco@comcast.net) (joedasco@comcast.net); Steinert, Bryan; Yako, Mike (MYako@geiconsultants.com)
Subject:	RE: Stability Analysis - Newbury Street, Portland
Date:	Friday, July 31, 2015 12:51:50 PM
Attachments:	DOC047.pdf

Trey.

Per our discussion/conference call on Wednesday, attached is the information you requested in the email below. The attached summary table (found in Appendix C of our 26 June report) has been revised to include calculated global factors of safety for soil profile no. 1 (450 psf/700 psf shear strength in clay) and parametric results for varying strength of the ground improved area below the wall and surcharge at the Federal St. townhouses.

Takeaways:

- surcharge loading doesn't significantly impact FS
- the material in the ground improvement zone needs to have an aggregate strength of phi=15 degrees to achieve a FS of 1.5 (the in-situ material is likely a "c-phi" material; we are ignoring the cohesion)
- blow counts from borings that would be needed to confirm a phi of 15 degrees would likely be less than 4 bpf (very loose classification)

Recall that we are not modeling the presence of the sheets and grouted columns which are both currently present along/beneath some portions of the wall. Also the shear strength profile in the clay is still in our opinion conservative, especially in the upper clay zone (450 psf in profile no. 1) as all of the data collected by the design team for the project had shear strengths in excess of 450 psf in this zone. Also shear strength profiles do not take into account the likely increase in strength adjacent to the improved zone due to dissipation of pore pressure caused by presence of the crushed stone in the improved area.

Please call me after you have reviewed so we can discuss. I am in a meeting until 1 pm and will be available after that time.

Thank you.

Wayne.

Wayne A. Chadbourne, P.E.
Geotechnical Engineer/Vice President

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From: Dykstra, Trey [mailto:Trey.Dykstra@stantec.com]
Sent: Wednesday, July 29, 2015 4:52 PM
To: Chadbourne, Wayne
Cc: Helen Donaldson (HCD@portlandmaine.gov); Jonathan Rioux (JRIOUX@portlandmaine.gov)
Subject: Stability Analysis - Newbury Street, Portland

Wayne,

Here is the summary table from your report. I agree with the strength parameters (450 and 700psf) for the undisturbed clay in Profile No. 1. Under the Ground Improvement column for Profile No. 1, I would like to see the same the parametric study that was performed for Profile No. 3.

Thanks for your help.

Trey

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