August 7, 2015

113 Newbury Street LLC
2730 Transit Rd.
West Seneca, NY 14224

CBL: 020 D013001 (020-D-13-14-15-32)
Located At: 101-121 Newbury St, and 40-46 Hancock St
RE: Lifting of Stop Work Order

Dear 113 Newbury Street LLC:

The City is in receipt of the June 24, 2015 report, authored by Haley & Aldrich, Inc., evaluating the retaining wall movements and damage to properties adjacent to 101-121 Newbury Street. As you know, the submission of that report and its recommendations for continuing construction was done at the City's request and as a condition to the City lifting the Stop Work Order, issued on May 19, 2015. After reviewing the Haley & Aldrich report and receiving numerous questions from abutting property owners about the report's adequacy, the City opted to have the Haley & Aldrich report further reviewed by a third-party, independent engineer in order to assess whether Haley & Aldrich's recommendations are in accord with the Maine Uniform Building and Energy Code and include sufficient safeguards to warrant the lifting of the Stop Work Order. That third-party review was conducted by Stantec.

The City has now received and reviewed the final report from Stantec in which Stantec's engineers certify that Haley & Aldrich's recommendations are in fact appropriate, therefore, the City is satisfied that there is a sufficient basis to lift the Stop Work Order. As of today, 113 Newbury Street LLC is permitted to continue construction activities at 101-121 Newbury Street in accordance with the terms and conditions of: the Maine Uniform Building and Energy Code, Building Permit(s) # 2014-01349, 2015-00072, Site Plan # 2013-179, and the Haley & Aldrich report.

It is the City's expectation that all remaining work will comply in all respects with Haley & Aldrich's recommendations including design revisions and corrective actions. Construction activity may only continue if it is done in accord with that report and all other applicable regulations.

Furthermore, any deferred submittals of construction documents shall be submitted to the appropriate design professional. The registered design professional in

responsible charge shall list the deferred submittals on the construction documents and submit them electronically to the City for review and approval(s).

Please contact Jonathan Rioux at (207) 874-8701 with any questions regarding the contents of this notice.

Sincerely,

Jonathan Rioux,
Deputy Director of Inspection

cc: Barbara Barhydt, Development Review Manager

Attachment*

Stantec

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
Phone: (603) 206-7552 Direct Line
Fax: (603) 669-7636
Trey.Dykstra@stantec.com

Nicholas D'Agostino, PE
Senior Associate/Geotechnical Engineer
Phone: (978) 577-1440
Fax: (978) 692-4578
Nicholas.Dagostino@stantec.com

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

Stantec

July 27, 2015
File: 191711607

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

Dear Ms. Donaldson,

Reference: Peer Review of Geotechnical Reports
Newbury Street/Seaport Loft Development Project
Newbury Street, Portland, Maine

In accordance with our proposal date July 17, 2015 and change order dated July 23, 2015 we have completed a review of two engineering reports listed below. As part of our scope of work we made a site visit on July 17 to observe the ground movement and distress caused to the adjacent structures. As per our scope of we did not enter into the adjacent structures but did make observations of the exterior of the structures and surrounding ground surface. We also spoke with several of the owners of the adjacent structures who were present at the time of our site visit. Both reports were prepared to address the retaining wall and slope movement at the above referenced site. In summary, a newly constructed retaining wall, several adjacent structures, and the ground surface behind the retaining wall experienced movement related to construction activities on the 113 Newbury Street property (Site). The movement and distress first occurred on April 9, 2015. The following reports were reviewed:

- "Geotechnical Engineering Services, Evaluation of Apparent Slope Movement, Seaport Lofts, 113 Newbury Street, Portland, Maine," dated April 30, 2015 and prepared by SW Cole Engineering, Inc.
- "Results of Independent Technical Evaluation, Retaining Wall Movement, Newbury Street/Seaport Lofts Development Project, Newbury Street, Portland, Maine," dated June 24, 2015 and prepared by Haley & Aldrich, Inc.

Our scope was to review the reports and provide comments regarding the following items:

- The cause of the ground movements presented in the reports;
- Global Stability of the Site;
- Recommendations for proceeding with the construction activities; and
- Compliance with the International Building Code (2009);

SW Cole Report

We offer the following comments regarding the report prepared by SW Cole.

Reference: **Peer Review of Geotechnical Reports**
Newbury Street/Seaport Loft Development Project

Cause of the Ground Movement

The SW Cole report was prepared for Landry/French Construction shortly after the movement had occurred. In summary the report indicates that the soft clay below the new retaining wall footing was disturbed by the installation of the vibro stone columns and grouted columns. The vibro stone columns and grouted stone columns were intended to be a ground improvement treatment to strengthen the soft clay soil and to allow the wall to be founded on a spread footing. The report discusses the difficulty that the Contractor had installing the vibro stone columns due to cold temperatures. In order to facilitate the installation, the Contractor switched to the grouted columns to complete the ground improvement.

This report concludes that the disturbance to the underlying soft clay deposit below the wall has resulted in the clay becoming completed remolded. As a result of the remolding, the clay is significantly weaker compared to its pre-construction condition. The report indicates that the loss of strength has adversely impacted the bearing capacity of the soil and global stability. The analysis in the report indicates the as-built condition has a factor of safety of less than 1.0 and that the sheet piles in front of the wall which are currently in place and the unexcavated earth in front of the wall are currently stabilizing the wall and minimizing further movement.

Global Stability Analysis

As part of the report, a global stability analysis was conducted at three cross sections located along the new retaining wall. One section cuts through the wall in the area of the Federal Street Townhouses, one cuts through the new wall in the area of 48 Hancock Street (blue house), and the third section cuts through the area beyond the end of the wall. The analyses included the existing conditions, the as-permitted condition, and remediation options. Static and seismic conditions are included in the analyses. The report indicates a factor of safety of 1.5 should be used as the criteria because the wall supports structures. The International Building Code (IBC) does not provide criteria for global stability, but a factor of safety equal to 1.5 is typically used in practice.

Based on the results from the computer software, the soil strength input parameters appear to be conservative. In particular the shear strength of the clay in the zone outside of the ground improvement zone is 500 pounds per square foot (psf). SW Cole used remolded shear strength of 50 psf for the clay within the ground improvement zone below the new retaining. The analysis does not include a strength increase due to the ground improvement treatment. These values are conservative and likely resulted in low factors of safety.

Additionally, the surcharges used in the analyses for the townhouse building on Federal Street, 36 Federal Street (white house) and 48 Hancock Street (blue house) appear to be excessively large. A surcharge of 2,000 pounds per linear foot was used for the townhouse and the white house. A surcharge of 1,000 pounds per linear foot was used for the blue house. These values convert to an

Reference: **Peer Review of Geotechnical Reports**
Newbury Street/Seaport Loft Development Project

average pressure applied by the footprints of the buildings of 2,000 psf and 1,000 psf. Based on typical floor and roof loadings modern apartment buildings and wood-framed buildings the surcharge pressures of 600 psf and 250 psf, respectively, as was used in the Haley & Aldrich (H&A) analysis are more appropriate. The reduction in the surcharge loads will increase the factor of safety. Without running the actual analysis we cannot determine the actual amount of increase.

In general it is our opinion that the global stability analysis performed in the SW Cole report may be overly conservative due to the low shear strength and high surcharges used in the analysis. Without running the actual analysis we cannot determine if the factor of safety would increase above a factor of safety of 1.5.

Recommendations for Proceeding with Construction Activities

The report provides two options for stabilizing the Site. Option 1 involves reinstalling steel sheet piles in front and in back of the new wall to increase the global factor of safety above 1.5. However, there is a note in the report that indicated this option is not desirable due to constructability issues. Option 2 involves the installation of two rows of H-piles to bedrock and supporting the new wall on the H-piles. It also involves installing new sheet piles behind the new wall between column lines 20 and 21. For slope stabilization, the report recommends installing sheets in front of the wall from column line 12 to 20.

The report provides a sequence for the overall stabilization of the site and an installation sequence specific to Option 2. While the H-pile option could potentially support the new retaining wall, the biggest concern is the effect that the vibration induced from the sheet pile and H-pile installation will have on the surrounding soil and adjacent structures. It is likely that the vibrations will cause some additional slope movement and potentially cause additional movement of the adjacent structures.

Compliance with Building Code

The SW Cole report provided recommendations for proceeding with the construction activities and indicated that the new wall as proposed would have a factor of safety of 1.5. If properly designed and constructed a new wall supported on H-piles together with the installation of additional sheet piles could increase the global factor of safety to 1.5 which would meet typical industry practice. We do not see any reason that this approach would not meet the requirements of the IBC.

Reference: **Peer Review of Geotechnical Reports**
Newbury Street/Seaport Loft Development Project

Haley and Aldrich Report

Cause of the Ground Movement

The Haley & Aldrich (H&A) report was prepared for Travelers Insurance Company. In summary the report indicates that the movement of the adjacent structures was caused by either the settlement of the newly constructed retaining wall, or by construction related vibrations, or a combination of both. The report states that the movement was not caused by a global instability. The report does indicate that the installation of the vibro stone columns disturbed the soft clay soils that underlie the new wall. During the extraction of temporary excavation support system (steel sheet piles) the vibrations caused the retaining wall to settle and caused the ground movement observed behind the walls. The report suggests that the vibrations from the sheeting removal were more intense than normally expected because the concrete wall footings were poured directly against the sheet piles. No bond breaker was placed between the sheet piles and the concrete making the removal of the sheet piles difficult resulting in excessive vibrations induced into the underlying soil.

The report mentions a tension crack located on the townhouse properties located at 38, 40, 42, and 44 Federal Street. The crack was reported to be 12 to 14 feet behind the location of the uphill row of sheet piles. The report indicates that this crack is associated with soil moving within the active zone behind the new retaining wall. During our site visit on July 17 we could see, with the help of some of the residents, remnants of the tension crack in several of the properties. The location of the crack was measured to be approximately 12 feet from the former location of the uphill row of sheets piles. We estimated the location of the active plane behind the retaining wall daylighting approximately 10 feet horizontally behind the wall. The location of the tension crack seems to indicate that the failure was not a global stability failure but rather confined to the active zone behind the wall. However, during our site visit evidence of settlement and horizontal movement of the ground surface between the tension crack and the townhouses was observed. We observed patio blocks that had settled and moved horizontally downhill towards the location of the new wall. Fences and fence post were also distorted. The H&A report does not mention distress between the tension crack and the townhouses. These areas should be monitored by the residents living in the townhouse units for any on-going movement. Additionally, serviceability issues with the houses should also be noted such as windows and doors that do not operate properly or cracking of dry wall.

Global Stability Analysis

As part of the report, a global stability analysis was conducted at two cross sections along the new retaining wall. One section cuts through the wall in the area of the Federal Street townhouses and the other section through the new retaining wall in the area of 48 Hancock Street (blue house). The report presents the soil strength parameters used in the report. In particular the parameters used for the clay soil located below the wall are discussed. H&A used a soil profile

Reference: **Peer Review of Geotechnical Reports**
Newbury Street/Seaport Loft Development Project

based on data obtained from multiple reports that had been previously prepared for the Site. H&A calculated global stability factors of safety that varied based upon which parameters were selected for clay shear strength, live load from the Federal Street townhouses, and the presence/strength of the stone column zone of ground improvement below the retaining wall footing. The H&A stability analyses used shear strength of the clay ranging from 450 to 700 psf for the area below the new wall based upon the range in actual in-situ shear vane strength measurements. This range of values assumed no strength increase in the clay directly below the wall from the installation of the vibro stone/vibro grout columns.

The resulting factor of safety was estimated to be 1.5. As previously mentioned, the IBC 2009 does not provide criteria for global factors of safety for retaining walls. The H&A report correctly notes that the AASHTO LRFD code requires a minimum factor of safety of 1.5 for walls that support structures. Since the new wall does retain earth which in turn supports structure, H&A recommended using a minimum factor of safety of 1.5.

Because the IBC does not provide criteria for a factor of safety for global stability, we agree that a factor of safety of 1.5 should be used as the target factor of safety for the new retaining wall at the Site. We recognize that estimating the strength of the clay is difficult because it has been disturbed during the ground improvement. The strength parameters do seem reasonable based on the available data. However having data from the test borings drilled within the zone directly below the footing of the new wall would be helpful in better defining the strength properties of the clay deposit. Based on our site observations there is enough space between in front of the new wall to accommodate a boring rig to drill through the wall footing and obtain samples of the underlying soil. We recommend at least two additional test borings be drilled in front of the retaining wall to further evaluate the shear strength of the clay in the zone below the new wall which may have been disturbed by either the vibro columns or sheeting removal process. It is also possible that the stone columns have assisted in pore water pressure dissipation and aided in the strengthening of the underlying clay. Samples should be obtained continuously through the clay deposit and field vane shear tests should be conducted if possible.

Recommendations for Proceeding with Construction Activities

The report provided 14 bullet points regarding proceeding with construction activities at the Site. The recommendations appear to be conservative and address the issues at the Site. The recommendations also provide limiting values for settlement and horizontal movement of the existing survey points. We agree with the recommendations in the report and recommend they be followed once construction is started again.

Compliance with Building Code

The H&A report provides recommendations for proceeding with the construction activities and indicate that the new wall has a factor of safety of 1.5. Assuming the shear strength of the clay in

Reference: **Peer Review of Geotechnical Reports**
Newbury Street/Seaport Loft Development Project

the zone below the new wall footing can be confirmed, it is our opinion that the recommendations for proceeding with construction provided in the report meet the requirements of the IBC 2009. Given that the IBC 2009 does not provide criteria for global stability, we agree that a factor a safety of 1.5 should be used.

Conclusions

Based upon our review of the two reports, it is our opinion that the settlement of the new retaining wall was caused by the excessive vibration generated by the extraction of the support of excavation (SOE) temporary steel sheet piles. It is also our opinion 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. Global instability is not the likely cause of the ground movement and settlement at the site.

Although, the H&A report indicates the final geometry at the Site will have a global factor of safety of 1.5, we feel there is uncertainty in the shear strength parameters used for the clay in the ground improvement zone located below the retaining wall. As discussed above, we recommend two additional test borings be drilled through the existing wall footing and in-situ field testing and laboratory testing be conducted. This additional data should be used to develop a more accurate model for the clay stratum as it currently exists.

Please do not hesitate to call the undersigned if we can provide any additional information or answer any questions.

Sincerely,

Stantec Consulting Services, Inc.

Trey Dykstra, PE
Project Manager/Geotechnical Engineer
Phone: (603) 206-7552 Direct Line
Fax: (603) 669-7636
Trey.Dykstra@stantec.com

Nicholas D'Agostino, PE
Senior Associate/Geotechnical Engineer
Phone: (978) 577-1440
Fax: (978) 692-4578
Nicholas.Dagostino@stantec.com

c. Jonathan Rioux, City of Portland

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

Haley & Aldrich, Inc.
T: 207.482.4609
C: 857.498.1215
wchadbourne@haleyaldrich.com

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

Trey Dykstra, PE
Project Manager/Geotechnical Engineer
Stantec
5 Dartmouth Drive Suite 101 Auburn NH 03032-3984
Phone: (603) 206-7552 Direct Line
Cell: (603) 289-6068
Fax: (603) 669-7636
Trey.Dykstra@stantec.com

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.