Thornton Tomasetti
Building Solutions

Project

ROUX INSTITUTE
REAL ESTATE DUE DILIGENCE
PORTLAND, MAINE

Prepared For

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June 8, 2021

Thornton Tomasetti

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APPENDICES

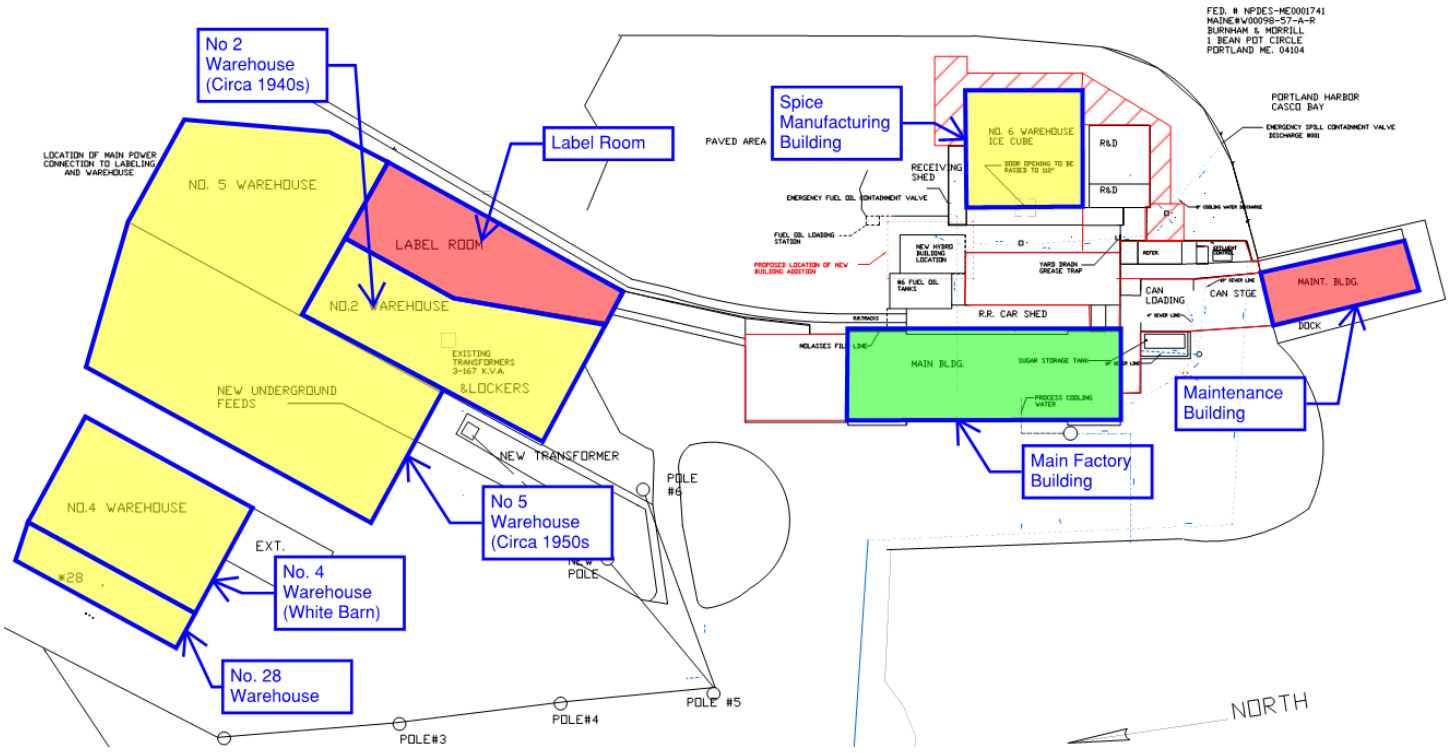
1.00 INTRODUCTION

Thornton Tomasetti (TT) has been engaged by the Institute for Digital Engineering and Life Sciences (IDEALS) to provide structural engineering consulting for a Due Diligence Real Estate Evaluation for a potential real estate transaction for the Roux Institute for a property located at One Bean Pot Circle in Portland, Maine.

The scope of work included the review of up to eleven buildings on the proposed site in order to provide a visual assessment of condition and potential high level re-use, with a focus on the historic core consisting of the main factory building and the current maintenance building.

TT visited the site on Sunday, February 21, 2021 and on Tuesday, April 27, 2021 to walkthrough the buildings and perform a high-level evaluation of the structural conditions that are readily visible and accessible. The buildings observed included the Main Factory Building, the current Maintenance Building (former Cod Fish Building located on the wharf), Warehouses No. 2, 4, 5 and 28, the Label Room, and Spice Manufacturing Building.

A key plan of the buildings reviewed is shown below.



2.00 DISCUSSION

Main Factory Building

The main factory building is the cornerstone and flagship of the food manufacturing facility. Constructed circa 1912 by Aberthaw Construction Co., Boston, MA, the building currently houses the bake bean manufacturing processes and the plant management offices. The structural system for the five story building is a reinforced concrete flat plate consisting of concrete columns with capitals supporting concrete slabs. The concrete frame is exposed on the exterior of the building with brick and masonry infill walls and glass windows. The main entry is on the 2nd floor level. The plant manager indicated that the large brick smoke stack on the westerly side of the building facing the highway is in poor condition and scheduled to be removed this year.

Documents in the data vault for the bean manufacturing building were sparse and consisted of manufacturing process drawings and one Monorail Evaluation Report. The 2011 report prepared by Mohlin & Company that documents the load capacity of the production monorails contained two pieces of insightful structural information; concrete strength test results for the 4th and 5th floors and an earlier 1980 building condition report prepared by Philip Snow Associates.

The 2011 concrete strength testing was performed by R. W. Gillespie and consisted of 3 cores from the 5th floor and 3 cores from the 4th floor. The average strength of the 5th floor core samples was 3,500 psi with a floor thickness ranging from 10½" to 12" and the average strength of the 4th floor core samples was 4,800 psi with a floor thickness ranging from 14 to 16¼". These concrete strengths are relatively high given the age of the building. Typical concrete strengths in 1912 were in the range of 2,500 psi.

The 1980 building condition study by Philip Snow Associates concluded that the live load capacities of the floors were 300 psf and the roof 100 psf. These results are based on live loads given to Philip Snow from Aberthaw in 1950 and from his own analyses. His research indicated that the reinforced concrete flat plate construction was likely one of the patented system typically used for heavy industrial buildings in the early 1900's. The report continues to state "Due to a variety of reasons the building has many cracks, spalls, and other signs of age and wear, however a program of repair could easily restore the building to acceptable levels."

The Philip Snow report does not specify where in the building the forementioned cracks were located. However, during our February 28th site visit we observed many cracks on the underside of the 4th floor slab that had been repaired by epoxy injection. The 4th floor supports the heavy bean ovens. Further investigation is recommended to determine the cause of the cracking and if the repairs have restored the structural integrity to the slabs or if additional repairs will be required. It is important to note that adaptive reuse of the 4th floor will require removal of the bean ovens which will reduce current loading on the floor which can be substantial when the ovens are full of beans.

During our April 27th site visit we visually observed the exterior building concrete from the ground. It appears to be in good condition. The plant manager noted during our visit that the exterior concrete on several sides of the building had been recently repaired, patched and coated. We could not confirm the level of deterioration prior to the repairs.

The main factory building is robust 5-story reinforced concrete building with high floor live load capacity. It appears structurally sound with minor structural modifications required. The exterior concrete surfaces were recently repaired. Building has long term value and could be used for housing, hospitality or office space

Current Maintenance Building on the Wharf (Former Cod-Fish Building)

The current maintenance building was constructed circa 1913, shortly after the main factory building was completed. Drawings prepared by Sawyer & Moulton Engineers and dated January 1913 reference the building as the Reinforced Concrete Wharf. The two-story 44' wide by 125' long building is constructed of reinforced concrete slabs, beam and columns. The head house and stairway portions of the building are three stories tall. The building sits on the 66' wide by 140' long concrete wharf that extends out over the salt water bay. The wharf serves as the first floor of the building and is constructed of reinforced concrete slabs and girders that are supported on concrete piers bearing on concrete caissons founded on ledge.

The 1980 study by Philip Snow Associates also addressed the condition of the Maintenance Building. Forty years ago the condition of the wharf was raising concerns. The study states "Checking under the building, the piers and girders are showing their age. Some repair work has been attempted but the patches are coming loose and more corrective work is needed." The study further states "I have a feeling that parts of the building were overloaded at some time in the past. Several first floor and even some second floor columns have serious cracks running vertically and in some case there is displacement of the concrete. This should be corrected as a priority. A few columns have been faced indicating distress. A few still need attention however, the urgency is not to be compared with that of the first floor structure."

Forty years later, the condition of the building has only gotten worse. Under the wharf it appears that there have been several attempts to repair the structure. The concrete piers have been coated in shotcrete but that encasement has deteriorated and portions are missing many locations. Some additional pipe piles have been driven around two sides of the perimeter of the wharf and reinforced concrete grade beams added between theses piles to shore up some of the most heavily deteriorated piers but the new concrete beams are already showing signs of cracking and rust staining indicating active rebar corrosion.

One concrete pier observed on the interior of the building had deteriorated to the point that the original 48" x 48" dimension had necked down to a current dimension of approximately 10"x10". The 95% loss of concrete area raised concerns that a sudden partial collapse of the structure could occur if the remaining concrete failed. A letter dated April 30, 2021 was sent to B&G Foods alerting them of the immediate safety concern and recommending that they

conduct their own structural evaluation as soon as possible to determine if the building is safe to occupy in its current compromised condition. This letter is attached in Appendix C.

In addition to the piers, a majority of girders and many areas of the wharf slab exhibit significant concrete deterioration, reinforcing steel corrosion, and section loss. The deterioration is the result of over a 100 years of exposure to salt water. In 2006 S.W. Cole Engineering tested the chloride content in three of the existing wharf piers. (Refer to Appendix C for test report.) The generally accepted threshold at which corrosion can begin in reinforcing steel is at a chloride ion concentration of 1.1 pounds per cubic yard of cement. Concrete samples were taken at depths of 2 to 3 inches, 3 to 4 inches and 4 to 5 inches from the outer surface to examine the depth of chloride penetration. The following table summarizes the findings:

2006 Test Results for Chloride Ion Levels in Wharf Piers

Sample No.	Depth From Surface (in)	Chloride Ion Lb/cu yd^3	Threshold Level Lb/cu yd^3	% Exceeded
#1 B9	2-3	14.29	1.1	1300
#1 B9	3-4	14.13	1.1	1300
#1 B9	4-5	8.69	1.1	800
#2 C6	2-3	15.66	1.1	1400
#2 C6	3-4	15.07	1.1	1400
#2 C6	4-5	8.26	1.1	800
2A	-	37.4	1.1	3400
2B	-	30.3	1.1	2800

The threshold level of chloride ions was exceeded at all of the test locations. The levels of chloride ions was exceptionally high, ranging from 800% to 3400% greater than the limit at which concrete reinforcing steel can begin to corrode. The test results appear to collaborate the level of deterioration observed in the wharf concrete piers, girders and slabs (Refer to photographs in Appendix B). It is likely that the chloride levels have increased in the 15 years since these tests were taken. With chloride ions at levels 800% greater than threshold levels at a depth of 4” to 5” from the surface of the concrete member, concrete repairs are not recommended. After removing the contaminated and corroded materials, little concrete and reinforcing steel would remain. The wharf slab, girders and piers are not salvageable and full replacement would be required.

Replacing the wharf structure would require shoring the building above the first floor while the deteriorated structure below was removed and replaced. The existing first floor is at Elevation 10.0’ above sea level. All new construction is required to be at Elevation 12.0’ due to current flooding and sea level rise requirements. This would require the building not only to be supported in place but to be lifted two feet higher. The process of shoring and lifting the building is complex and expensive. Some of the challenges include the following:

- Working in tidal water. Working around 12’ tides would be economically prohibitive. A cofferdam would need to be constructed around the building to allow demolition and construction to occur in the dry.
- Crane access. A crane cannot access the building from the shore. (Refer to Construction Access Sketch in Appendix C). One or possibly two cranes will need to be mounted on barges outside of the cofferdam. The barges will be sitting in the mud at low tide and cannot be move to a new position until the tide rises. Careful logical planning will be required to maximize crane time.
- Shoring frames. Shoring systems are complex. They need to be design for the gravity and wind loading with the building in a raised position on temporary supports. The taller temporary supports need to be adequately braced to provide stability all loading conditions. A preliminary concept for a shoring system is included in Appendix C. It involves threading long trusses through the building windows on both sides of each column below the second floor. The concept is to grab and lift the building by the columns. The design of the long span trusses is governed by stiffness in order to prevent excessive deflection which could lead to cracking of the building when it is lifted. The exterior first floor walls would need to be hung from the shoring system. Internal cross beams and bracing would be required throughout the building. External bracing would be required for external stability and to transfer lateral wind loads to temporary foundations.
- Shoring frame foundations. Temporary foundations will need to be constructed to support the shoring frames. The loading at each foundation element is estimated to be in the range of 150 to 300 kips. The location of ledge and the depth of overburden varies across the wharf structure. Driven H-Piles could work where adequate overburden exists to brace the H-Piles. Mini-piles drilled into ledge could be an option where overburden is shallow. It would be easier to locate the temporary foundations outside of the limits of the existing 66’ wide wharf structure but this requires longer, deeper, and more expensive trusses. Locating the temporary foundation just outside of limits of the existing 44’ wide building reduce the cost of the trusses but increase the cost of the foundations since this would require cutting holes in the existing wharf slab to install the temporary piles, building the new wharf around the temporary piles and patching holes when the temporary piles are removed. Zoning restrictions prevent temporary piles driven outside of the existing wharf footprint to become permanent.
- Lifting mechanism. Raising the building 2’ to meet flood requirements requires different and more costly equipment than shoring in place. The equipment must have motors with the ability to lift heavy structures and be synchronized to lift the building uniformly and prevent cracking from differential movement.
- Demolition. Once the building is raised, the wharf slab, girders and piers can be demolished. However, access to the area to be demolished is limited. It is not safe to work from below. The work has to be performed from above or from the side. The equipment used to perform the demolition and remove the debris is must smaller in size and the work is more labor intensive.
- Construction. Building a new wharf foundation and first floor structure underneath the raised building will be difficult and more expensive than typical new construction. Head room under the elevated building will be limited. Limited head room eliminates the

possibility of driving H-Piles. More, smaller capacity mini piles will be required and installed using smaller height limited equipment. Constructing the new concrete structure will also be more expensive since barge access to the work area is limited.

The premise for undertaking the additional expense of shoring and lifting the building is predicated on the concept that the remaining building is worth salvaging. After considering shoring and replacement of the substructure we were able to observe the interior and uppers levels of the building on April 27th. The amount of cracking and corrosion observed raised concerns about the short term structural integrity of the building, whether or not the building could be safely raised without causing substantial damage to the existing structure and more importantly, the long term durability of the building.

Cracking was observed throughout the building. The cracking in the second floor slab appears to have been from overloading but the cracking in the second floor beams and columns and the roof slab, beams and columns is from corrosion of the concrete reinforcement evident from the spalling concrete and exposed rusting reinforcement. (Refer to photographs in Appendix B). The corrosion induced cracking was not limited to the exterior beams and columns. It was observed at interior locations as well. This indicates high chloride content in the concrete throughout the building. The concrete deterioration and rebar corrosion damage could be repaired but it will continue to be an ongoing long term maintenance problem into the future. In the short term, extensive concrete and reinforcing steel repairs with some elements requiring full replacement would be necessary before the building could be safely shored and lifted.

Based on our observations of this building, it is our opinion that undertaking a structural rehabilitation will have a cost that far exceeds its replacement value and that the rehabilitation efforts carry a risk of being unsuccessful due to the poor condition of the superstructure and the probable high levels of chloride ions in the concrete which render any repairs a short-term fix at best. Unless IDEALS has a critical programmatic need, it is our opinion that the existing maintenance building located over the water is a financial and safety liability and should be removed by the current owners prior to the sale.

Warehouse No. 4

The circa 1920's warehouse, referred to as the white barn, consist of high bay wood roof trusses supported on wood columns and wood infill walls. It is our understanding that the building was initially an army barracks building that was moved the site and placed on a new foundation. The building appears to be structurally sound with minor structural modifications required. The wood columns are currently stacked on the concrete foundation. Mechanical anchorage is recommended. The building has short term value. With 19' high ceilings and a 50' wide by 130' long column free space, the building could be repurposed as a gymnasium or fitness center. There is possible salvage value in the building. The large open space provides opportunity for boat storage. The building could be sold and moved to the Maine Yacht Center next door.

Warehouse No. 28

The single story low bay building is attached to the westerly side of Warehouse No. 4. The wood framed building appears to be in good structural condition with newly framed and sheathed exterior walls. The full size 3x10 at 15" o.c. roof rafters clear span 25 feet. Integrally connected to Warehouse No. 4, the building has short term value. The 25' wide x 130' long building could provide ancillary space to a gymnasium or fitness center in Warehouse No. 4.

Warehouse No. 5

The circa 1950's warehouse is a one story steel framed building with an exterior brick veneer and CMU walls. The 40,000 sf building is L-shaped with one leg measuring 100' wide by 250' long and the other leg measuring 125' by 125'. The steel framing is laid out on a 25' by 25' column grid with 20' high exposed wood roof deck ceilings. The concrete floor slabs and the building appears to be in excellent structural condition given the age of the building. With relatively minor top of column reinforcing, the structure appears to be in move-in condition. The large open spaces provide flexibility for multiple uses. The building has short term value as an incubator or maker space.

Warehouse No. 2

The circa 1940's warehouse is a one story steel framed building located between Warehouse No. 5 and the Label Room. The building is approximately 180' long and flares from 50' wide at the northerly end of the building to 90' wide at the southerly end. The column grid and steel framing is similar to Warehouse No. 5.. The building is in excellent structural condition and has short term value as an incubator or maker space.

Spice Manufacturing Building

Constructed circa 1980's, the spice manufacturing building is a recently constructed steel framed building with large bay spacing and 22' high ceilings. The building is in good structural condition has short term value as an incubator or large meeting space.

Label Room

The Label Room building was the original warehouse and rail car unloading dock. The two-story building house warehouse facilities on the first floor and labelling operations on the second floor. The wood and steel framed building has closely spaced columns and low 9 foot high ceilings on the first floor rending the space less flexible and adaptive to reuse. The building limited has limited value and removal is recommended.

Other Miscellaneous Buildings

There were several other smaller miscellaneous buildings located on the easterly side of the complex including the receiving shed, RR car shed, R&D buildings, and can loading/staging building that would be difficult to repurpose and removal is recommended.

3.00 CONCLUSIONS

We have conducted reviews and evaluations of eleven existing buildings on site. The following is a summary of structural findings and potential reuse of the buildings.

Short Term Value

These buildings are in good structural condition present short term value but may not fit into the long-term masterplan for the site:

- Warehouse No 4 - could be repurposed as a gymnasium or fitness center.
- Warehouse 28 – could provide ancillary space to a gymnasium or fitness center in Warehouse No. 4.
- Warehouse No 5 – could be used as incubator or maker space.
- Warehouse No 2 - could be used as incubator or maker space.
- Spice Manufacturing Room – could be used for incubator or large meeting space.

Long Term Value

These buildings in good structural condition and may fit into the long-term masterplan for the site:

- Main Factory Building – could be used as housing, hospitality or office space.

Limited Value

These buildings are in poor condition or have structural limitations which make re-use ineffective:

- Current Maintenance (Wharf) Building – Cost of structural rehabilitation cost far exceeds the replacement value and removal is recommended.
- Label Room Building – limited use and difficult to repurpose , removal is recommended.
- Other Miscellaneous Buildings– limited use and difficult to repurpose , removal is recommended.

4.00 LIMITATIONS AND ASSUMPTIONS

Thornton Tomasetti's professional services have been performed in accordance with the standards of skill and care generally exercised by other professional consultants acting under similar circumstances and conditions at the time the services were performed.

Thornton Tomasetti's findings, conclusions and opinions are based on Thornton Tomasetti's visual observations, professional experience, interviews with those knowledgeable with the conditions pertinent to the subject investigation, evaluation of documentation and sound investigation practices.

Observations were limited to readily visible and accessible conditions. Thornton Tomasetti did not perform any destructive material testing. Limited drawings of existing buildings were provided. After review of available documents in the Data Vault, a request for all previous condition assessments of the main factory and wharf buildings were made but no additional information was provided.

While Thornton Tomasetti's findings are summarized as of the date of issuance, should new information or additional documentation become available, Thornton Tomasetti may amend or revise its opinions and recommendations accordingly.

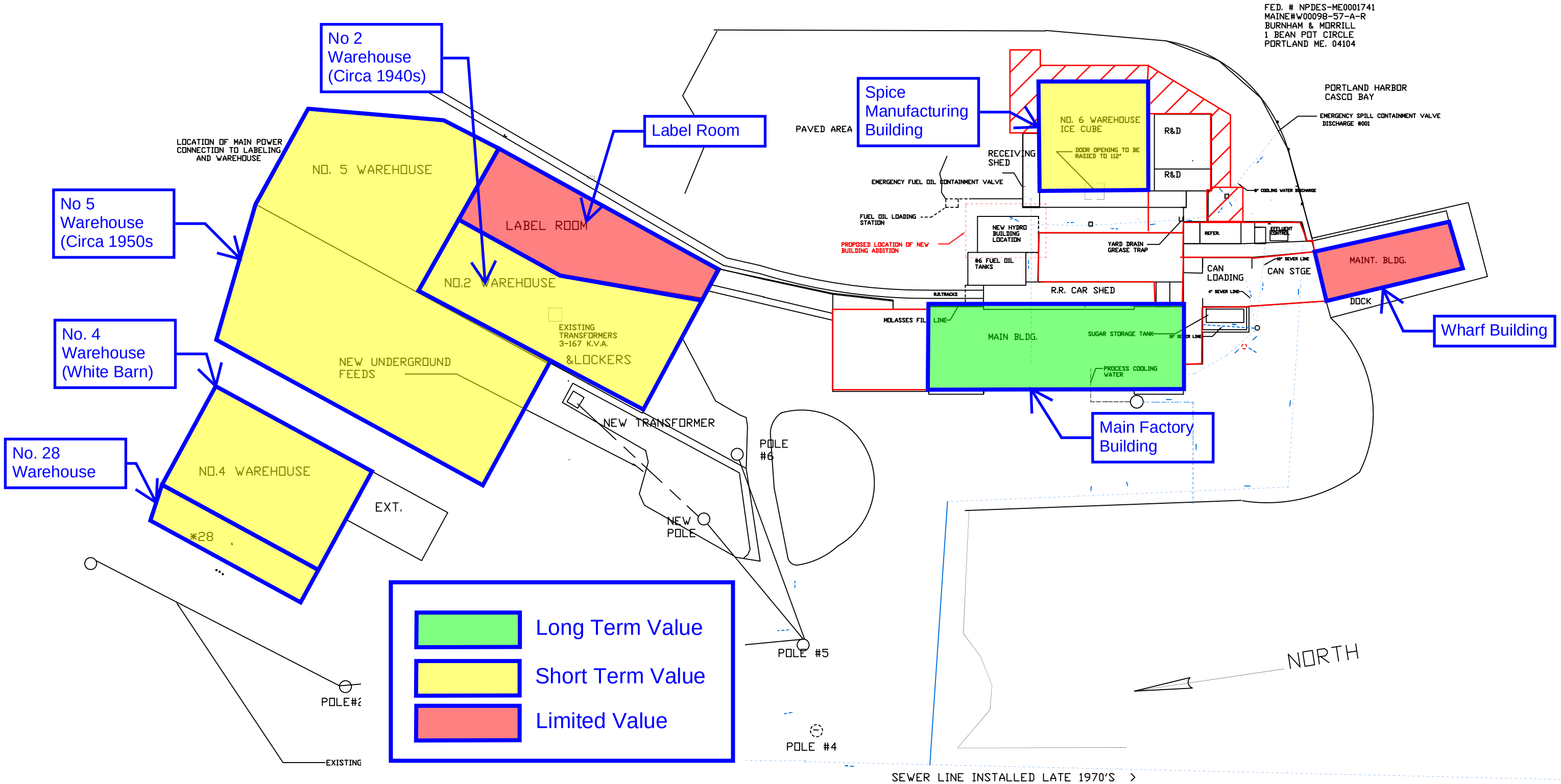
This report shall not be construed to warrant or guarantee the building and/or any of its components under any circumstances. Thornton Tomasetti shall not be responsible for latent or hidden defects that may exist, nor shall it be inferred that all defects have been either observed or recorded. Thornton Tomasetti's visual observations include no specific knowledge of concealed construction or subsurface conditions at the subject property. Comments pertaining to concealed construction or subsurface conditions are professional opinion of Thornton Tomasetti based on relevant experience, judgment and current standards of practice.

Conditions noted in this report are as of the time of observation only. It can be expected that the subject building will undergo changes and additional deterioration subsequent to that date.

No other warranty, express or implied, is made as to the professional advice presented in this report.

APPENDIX A SITE KEY PLAN

PORTLAND PLANT, PILLSBURY



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APPENDIX B PHOTOGRAPHS

Photo 1. Main Factory Building. Constructed circa 1912, the building has long term value as housing, hospitality or office space.

Photo 2. Main Factory Building. Exterior concrete surfaces have been recently repaired.

Photo 3. Main Factory Building. Heavy bean ovens located on the fourth floor.

Photo 4. Main Factory Building. Epoxy injected crack repairs on the underside of the fourth floor.

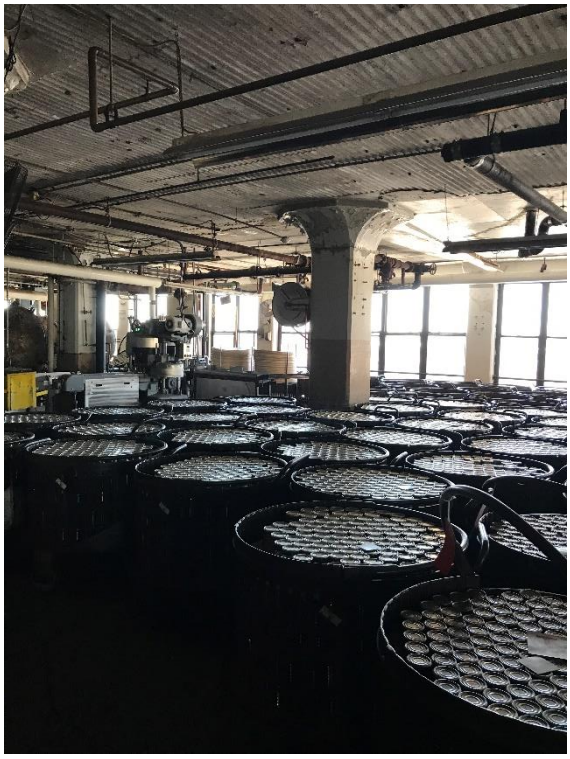

Photo 5. Main Factory Building. Reinforced concrete flat plate construction consisting of concrete columns with capitals supporting concrete slabs.

Photo 6. Main Factory Building. Robust reinforced concrete building with high floor load capacity.

Photo 7. Maintenance Building on the Wharf (Former Cod-Fish Building). Constructed circa 1913.

Photo 8. Maintenance Building. Exterior building condition.

Photo 9. Maintenance Building. Deteriorated concrete girders and pier under the wharf.

Photo 10. Maintenance Building. Concrete deterioration and reinforcing steel corrosion in the girders and piers.

Photo 11. Maintenance Building. Deteriorated concrete floor slab and girders under the wharf.

Photo 12. Maintenance Building. Deterioration has reduced the size of a concrete pier from 48" by 48" to 10" by 10". The owner was alerted of safety concerns.

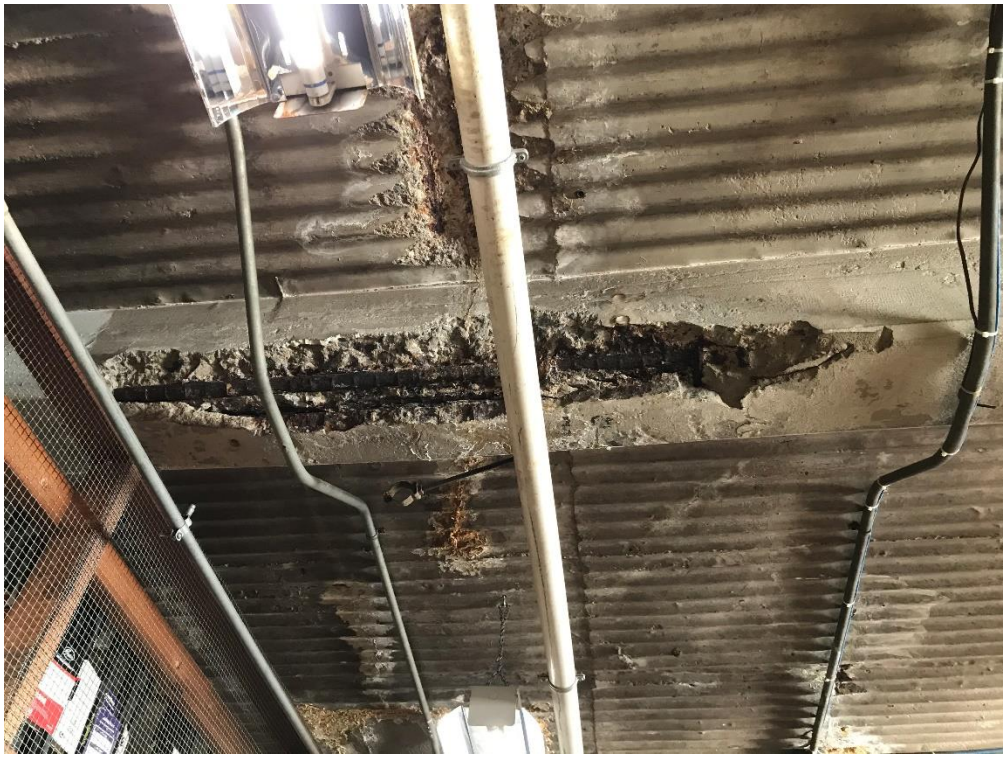

Photo 13. Maintenance Building. Concrete deterioration and reinforcing steel corrosion in roof beam.

Photo 14. Maintenance Building. Concrete deterioration and reinforcing steel corrosion in roof slab.

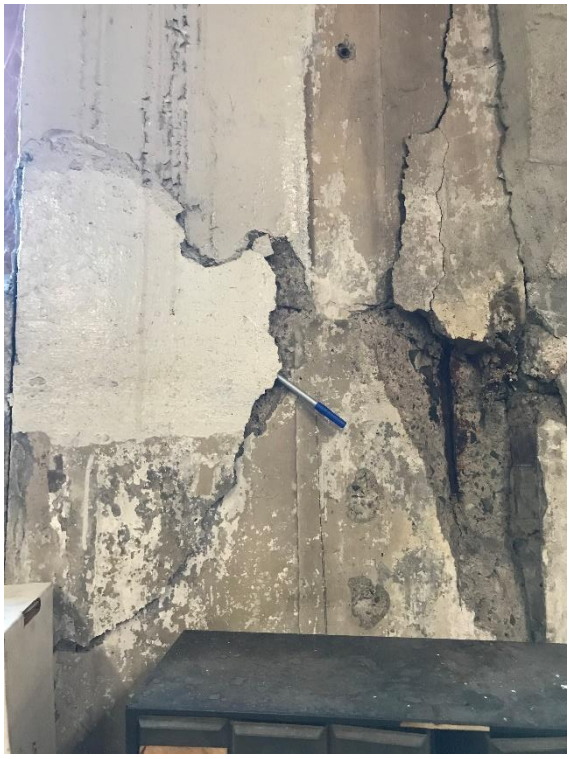

Photo 15. Maintenance Building. (Before removing spall) Concrete cracking in second floor column.

Photo 16. Maintenance Building. (After removing spall) Corroding reinforcing steel caused column spall.

Photo 17. Maintenance Building. Concrete cracking in second floor column.

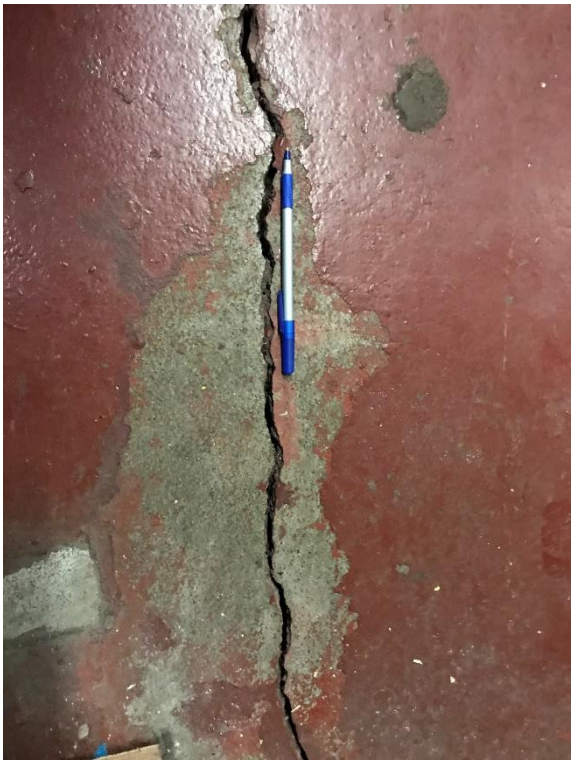

Photo 18. Maintenance Building. Concrete cracking in second floor slab.

Photo 19. Warehouse No. 4 (White Barn) and Warehouse No 28 (Low bay attachment).

Photo 20. Warehouse No. 4. High bay wood roof trusses.

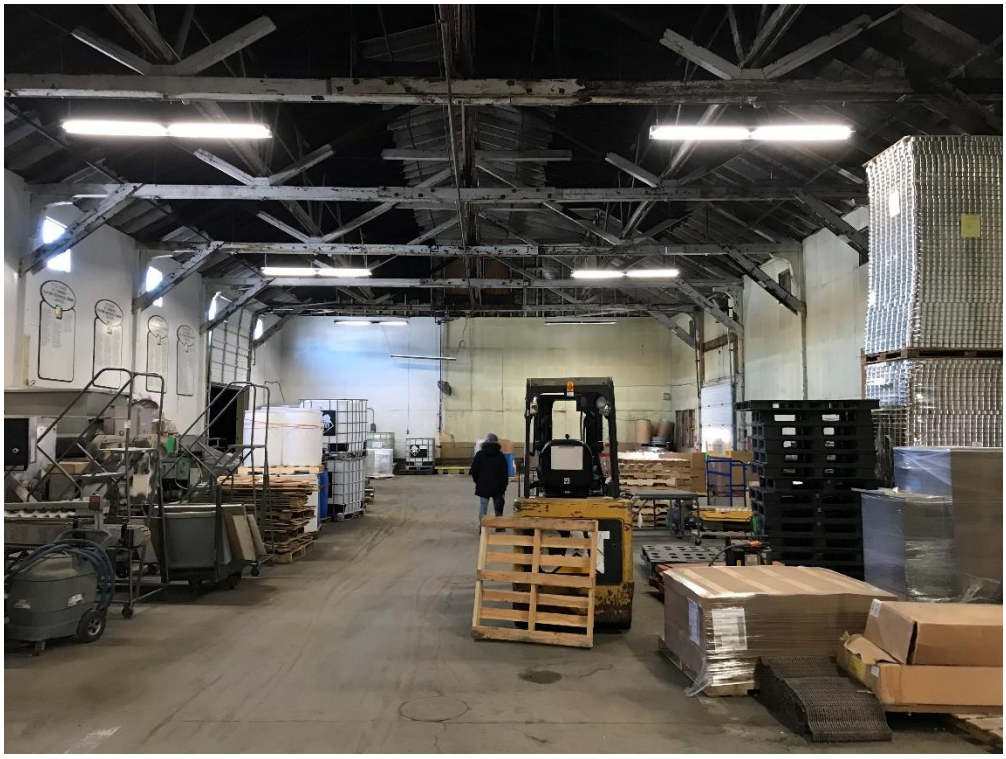

Photo 21. Warehouse No. 4 (White Barn). 50' wide by 130' long column free space with potential reuse as gymnasium or fitness center.

Photo 22. Warehouse No. 28. Low bay wood framed structure with newly framed exterior wall could provide ancillary space to gymnasium or fitness center located in attached Warehouse No. 4.

Photo 23. Warehouse No 5. Circa 1950's one story steel framed building with exterior brick veneer and CMU walls.

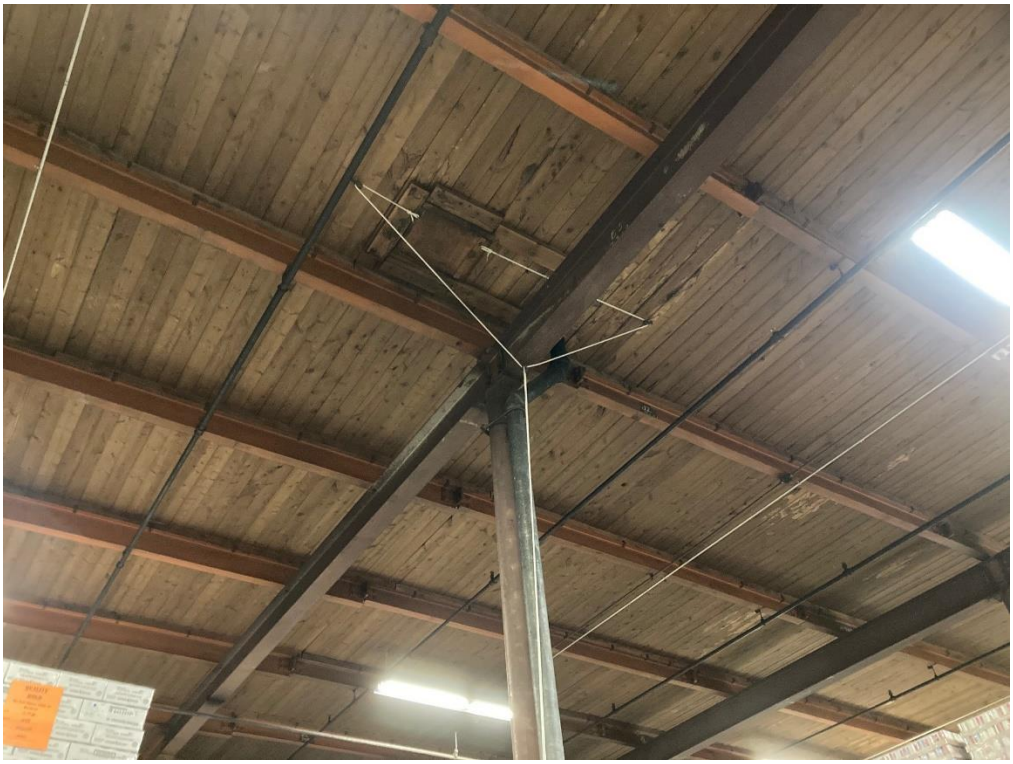

Photo 24. Warehouse No. 5. Steel framing is laid out on 24' by 25' column gird with 20' high exposed wood roof deck ceilings. The building is in excellent structural condition.

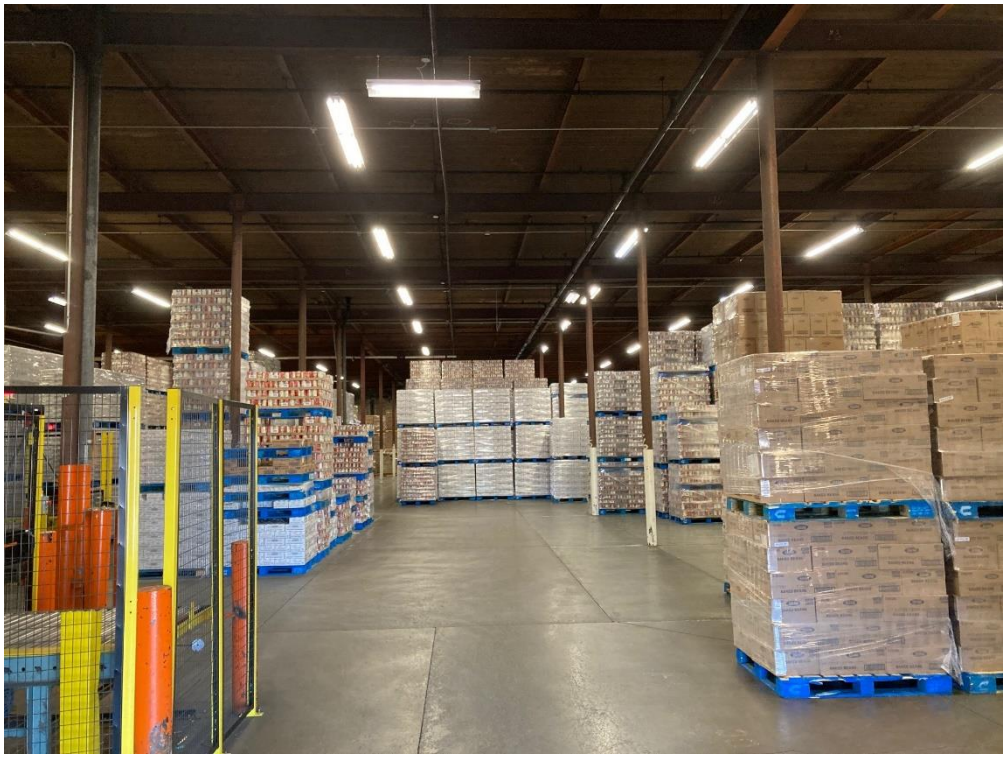

Photo 25. Warehouse No. 5. The warehouse buildings have short term value as incubator or maker space.

Photo 26. Warehouse No. 2. Similar to Warehouse No. 5, the one story steel framed building is in excellent structural condition with short term value as incubator or maker space.

Photo 27. Spice Manufacturing Building. The circa 1980's steel framed building has large column gird and 22' high ceilings. The building is in excellent structural condition and has short term value as large meeting or incubator space.

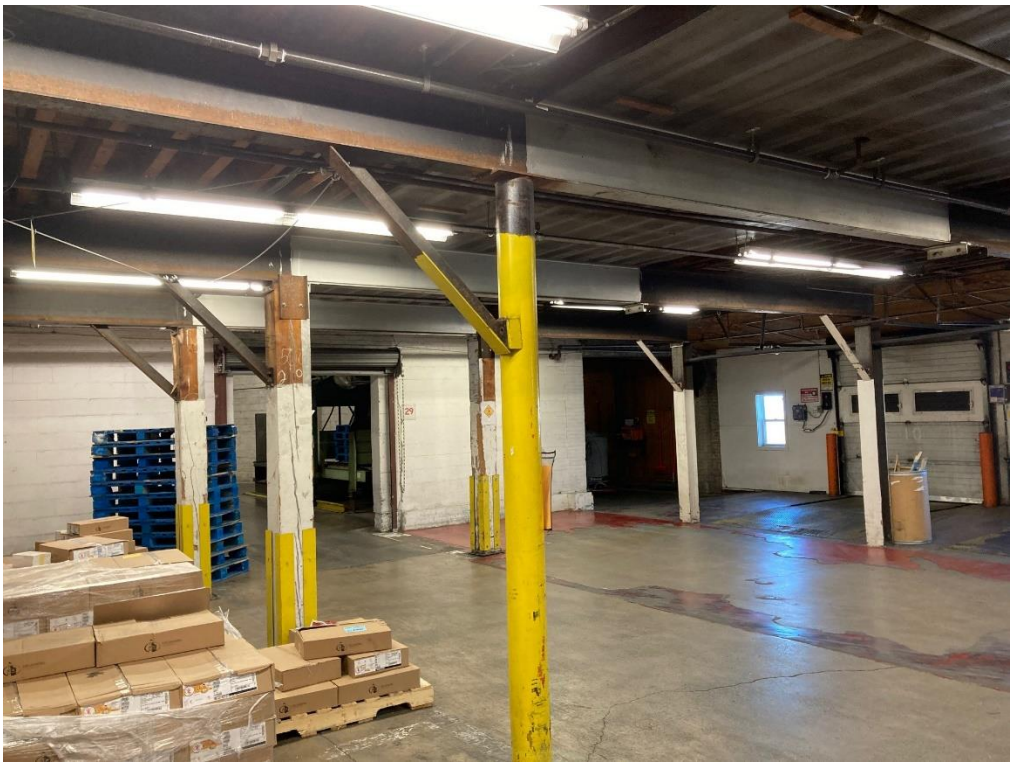

Photo 28. Label Room Building. Original warehouse and rail car unloading dock. The wood and steel framed structure has closely spaced columns that limit building reuse options.

APPENDIX C REFERENCE DOCUMENTS

- Letter Dated April 30, 2021
- Letter Dated May 4, 2021
- 2006 SW Cole Report
- Construction Access to Wharf Building Sketch
- Preliminary Shoring Concept Sketches

Thornton Tomasetti

Sent via email; chuck.hewett@ideals.org

April 30, 2021

Charles E. Hewett, Ph.D.
Executive Director
Institute for Digital Engineering and Life Sciences (IDEALS)
100 Commercial Street
Portland, Maine. 04101 USA

RE: CONFIDENTIAL REAL ESTATE REVIEW
B & G Foods, Portland, Maine

In accordance with our agreement we have been conducting structural evaluations of the existing buildings on the subject site. In the course of our work we have noted that the condition of the existing fish house (maintenance shop) located over the water is in poor condition with advanced corrosion and deterioration of the concrete structure. This deterioration is most significant at the concrete piers below the building, concrete beams and first floor slab which function as the substructure or "base for the second floor and roof structure.

Of immediate concern is the condition of one particular concrete pier below the building at column line C10. This concrete pier supports the first floor slab and second floor and roof column loads. The concrete pier is severely deteriorated and the cross section has been necked down from an original dimension of 48" x 48" to a current dimension of approximately 10" x 10". The actual concrete strength and condition is unknown but clearly the quality of the concrete has been greatly diminished. Our evaluation of the remaining concrete section indicates the capacity of the pier at column line C10 to be significantly lower than required and presents a very high risk of a sudden partial structural collapse.

We recommend that B&G Foods conduct their own structural evaluation as soon as possible to address this condition and the overall condition of the fish house to determine if the building is safe to occupy in its current compromised condition.

Very truly yours,
THORNTON TOMASETTI, INC.

Paul B. Becker, P.E.
Senior Principal

Thornton Tomasetti

Sent via email; chuck.hewett@ideals.org

May 04, 2021

Charles E. Hewett, Ph.D.
Executive Director
Institute for Digital Engineering and Life Sciences (IDEALS)
100 Commercial Street
Portland, Maine. 04101 USA

RE: CONFIDENTIAL REAL ESTATE REVIEW
B & G Foods, Portland, Maine

Dear Chuck,
In accordance with our agreement we have conducted structural reviews and evaluation of the existing structures on the site. We are particularly concerned with the condition of the former fish pier which now serves as the maintenance shop for the plant. In our letter of April 30, 2021 we identified an immediate structural concern regarding the concrete pier at grid line C-10 which in its compromised condition presents a risk of sudden structural collapse. Further, we recommended B&G Foods to conduct an independent evaluation of the structure to determine if it the building is safe to occupy in its current compromised condition.

Our visual observations of the fish house structure note the following;

1. Advanced corrosion and section loss of concrete piers with prior repairs to wrap them in wire mesh and reinforce them with shotcrete. Much of this shotcrete reinforcement has failed, exposing section loss and corroded reinforcing steel.
2. First floor beams with complete section loss of bottom reinforcing steel with significant section loss of the concrete beams.
3. First floor slabs with significant concrete spalling and complete loss of reinforcing steel.
4. First floor topside surfaces with significant cracks of 0.25”- 0.375” width.
5. First and second floor interior columns with vertical cracking caused by corroding reinforcing steel.
6. First and second floor exterior columns with spalled and de-bonded concrete caused by corroding reinforcing steel.
7. Second floor beams with significant longitudinal cracking caused by corrosion of reinforcing steel.
8. Chloride ion concentrations within the concrete establish that any repairs will be ineffective.

In our further review of the fish house we have evaluated the potential methods and costs to structurally rehabilitate the building. Our evaluation of the original construction drawings of the fish house indicate that the current level of reinforcing steel loss due to corrosion is significant. Our initial consideration was to shore the superstructure in order to demolish and reconstruct the first floor slab and substructure in-kind. We developed a shoring concept which requires construction of a cofferdam surrounding the building, installation of temporary piles to support lifting jacks and supplemental steel to shore and secure the superstructure. Based on our most recent investigation of the superstructure condition, we noted significant damage to structural concrete members caused by corroding reinforcing steel likely due to high levels of

chloride ions in the concrete. Our conclusion is that the structural condition of the existing concrete superstructure frame has been compromised enough that it is uncertain the superstructure would survive a shoring and jacking operation necessary to enable repairs. Further, given the visible cracking and rebar corrosion on the upper levels, even if short-term structural repairs were successful to enable jacking and lifting of the superstructure, the superstructure will require ongoing concrete and reinforcing steel repairs as the deterioration of the superstructure concrete is likely to continue.

Based on our observations of this building, it is our opinion that undertaking a structural rehabilitation will have a cost that far exceeds its replacement value and that the rehabilitation efforts carry a risk of being unsuccessful due to the poor condition of the superstructure and the probable high levels of chloride ions in the concrete which render any repairs a short-term fix at best. Unless IDEALS has a critical programmatic need, it is our opinion that the existing fish house located over the water is a financial and safety liability and should be removed by the current owners prior to the sale. I am available to further discuss our findings and opinions and answer any questions you may have.

Very truly yours,
THORNTON TOMASETTI, INC.

Paul B. Becker, P.E.
Senior Principal

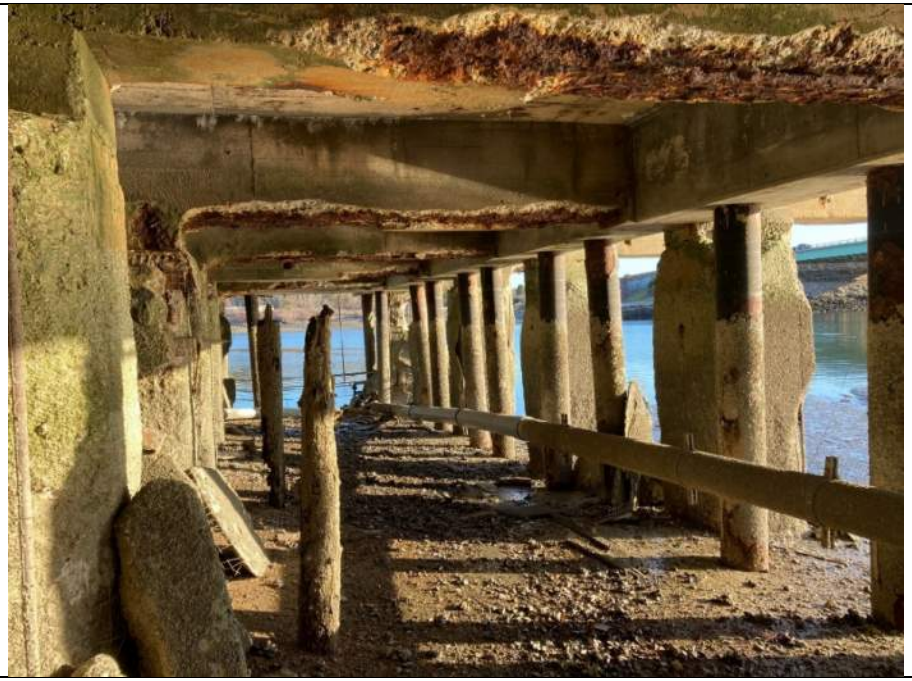

Photo 1 – First Floor Beam Corrosion Deterioration

Photo 2 – First Floor Beam Corrosion Deterioration

Photo 3 – First Floor Slab Corrosion Deterioration

Photo 4 – First Floor Concrete Pier Deterioration

Photo 5 – First Floor Concrete Beam and Pier Corrosion Deterioration

Photo 6 – Previous Repairs to On Going Deterioration are Already Rusting

Photo 7 – Second Floor Slab and Beam Corrosion Deterioration

Photo 8 – Second Floor Slab Cracking

Photo 9 – Roof Slab Corrosion Deterioration

Photo 10 – Exterior Roof Column Corrosion Deterioration

Photo 11 – Interior Roof Column Cracking

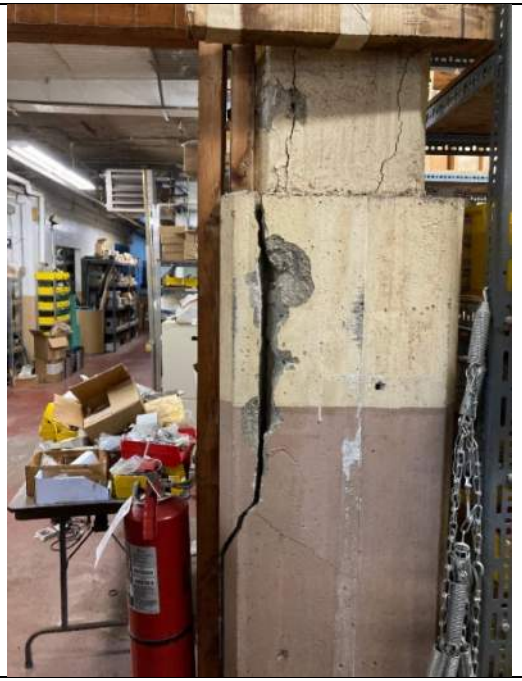

Photo 12 –Interior Roof Column Cracking

S.W.COLE ENGINEERING, INC.
• Geotechnical Engineering • Field & Lab Testing • Scientific & Environmental Consulting

05-1401

January 10, 2006

Gagnon Engineering, Inc.
Attention: Roger Gagnon
198 Main Street
Gorham, ME 04038

Subject: Concrete Pier Explorations
B & M Baked Beans Building
Portland, Maine

Dear Mr. Gagnon:

As requested, we made a site visit on December 27, 2005 to the above-mentioned site. The purpose of our visit was to provide field observations and obtain concrete core samples from three of the existing concrete piers for laboratory testing.

OBSERVATIONS

We observed and logged three explorations (C-1 through C-3) made into existing concrete piers. The explorations were made by S. W. COLE ENGINEERING, INC. using a four inch diameter core barrel. The exploration locations were selected jointly in the field by you and S. W. COLE ENGINEERING, INC. The approximate exploration locations are shown on the attached Sheet 1. Laboratory test results are attached as Sheet 2.

The concrete piers support an elevated building. Previous repair work was observed on all of the existing piers. The repair included the application of a grout jacket and welded wire reinforcing. The grout jacket thickness varied at each sample location and all repair work exhibited some degree of deterioration.

Piers A¹ / 1, C / 6 and B / 9 were chosen as the exploration locations. Exploration C-1 was made in pier A¹ / 1. Pier A¹ / 1 is located on the southeast corner of the building, it is submerged during high tides. The concrete appears to be in relatively good condition for the age of the structure. Exploration C-1 was made at pier C / 6. Pier C / 6 is located in the middle of the building left of center-line, it is only partially submerged during high tides and appears to be in poor condition (the jacket repair has separated from the surface of the pier). Exploration C-3 was made at pier B / 9. B / 9 is located near the in the middle of

the Pier structure right of center-line, it is only partially submerged during high tides and appears to be in relatively good condition. All core samples were taken below high water mark and in the approximate center of the piers. Exploration depths varied from approximately 8 inches to 12 inches in depth. Prior to making the explorations, an electronic r-meter was used to scan the immediate area around the exploration location in an attempt to locate reinforcing steel. The reinforcing steel for the piers appears to be located in the four corners approximately 3 inches from the outside face of the original piers. No reinforcing steel was encountered during the coring.

LABORATORY TESTING

We performed compressive strength tests on each of the concrete core samples obtained. The laboratory strengths ranged from 7290 psi to 7940 psi.

Observed Concrete Core Characteristics:

C-1: Good consolidation of the concrete. Aggregate appears relatively clean, angular, and ¾" in size.

C-2: Good consolidation of the concrete. Aggregate appears to be unwashed (aggregate pop-outs), angular, and ¾" in size.

C-3: Good consolidation of the concrete. Aggregate appears to be unwashed, angular, and ¾" in size.

We trust that the information presented herein will be useful to you in planning. Please call us if you have any questions regarding this report, or if we may be of further assistance.

Sincerely,

S. W. COLE ENGINEERING, INC.

Roger Domingo
Construction Services Manager

RED-MJH:mjh/pfb

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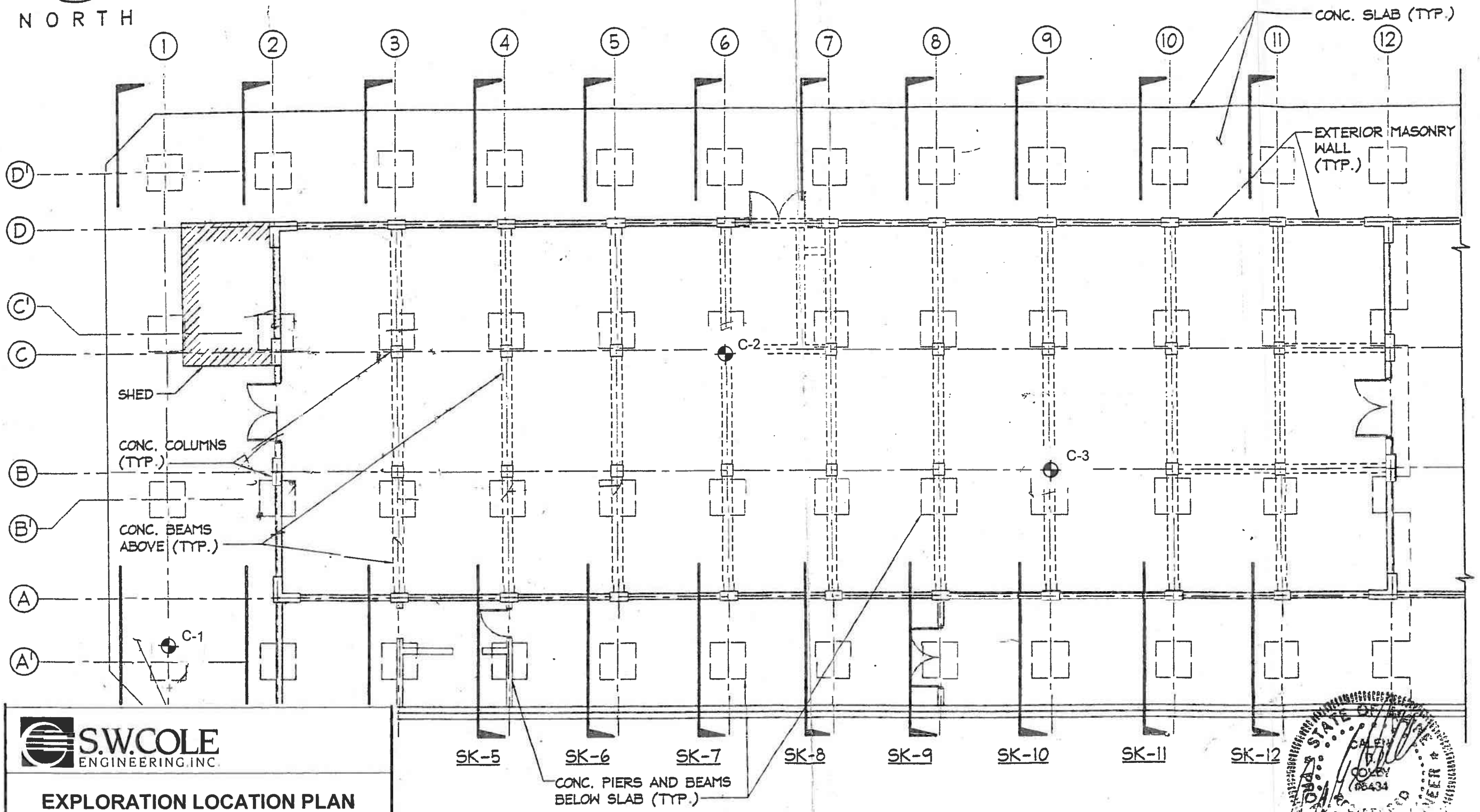
PROJECT

NORTH



KEY PLAN (1st FLOOR)

SCALE: N.T.S.

LEGEND

Approximate Core Exploration Location

S.W.COLE ENGINEERING, INC.

EXPLORATION LOCATION PLAN
PIER EXPLORATIONS
B&M BAKED BEANS
PORTLAND, MAINE

PROJECT NO. 05-1401	SCALE: nts
DATE: January 9, 2006	SHEET: 1

STATE OF MAINE — CALEB T. COLBY — 15434 — REGISTERED PROFESSIONAL ENGINEER

9-15-04

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BG FOODS
Portland, Maine

STRUCTURAL ANALYSIS – B&M BUILDING
Portland, Maine

KEY PLAN (FIRST FLOOR)

SCALE: AS NOTED
DATE : 7-9-04
DES BY: J. Walker
DWN BY: T. Goulet
CHK BY: C. Colby

PROJECT NO.
431.01.01

SHEET 1 OF 14

DRAWING NO.
SK-1

Cadd:4310101_SK-1.dwg

CONCRETE CORE COMPRESSIVE STRENGTH TEST
ASTM C42

Project Number: 05-1401

Project Name: Pier Rehabilitation

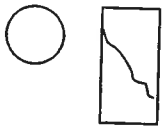
Client: Gagnon Engineering

Project Location: B&M Baked Beans – Portland, Maine

Date Sampled: 12/27/2005

Date Tested: 12/29/2005

Tested By: MJH

Core Number	C-1	C-2	C-3
Sample Location	A[1] / 1	C / 6	B / 9
Diameter (inches)	3.70	3.70	3.70
Length Capped (inches)	5.3.9	4.27	3.69
Area (in^2)	10.75	10.75	10.75
Load (kips)	80.34	86.20	98.10
Initial Strength (psi)	7473	8020	9126
Length/Diameter	1.46	1.15	1.01
Strength (psi) Adj. for L/D<2	**7435**	**7290**	**7940**
Moisture Condition	Moist	Moist	Moist
Size Aggregate (inches)	3/4	3/4	3/4
Fracture and Reinforcement Location			

REMARKS: No reinforcing steel observed in samples. Concrete appeared to be well consolidated. Aggregate is angular and appears sound.

Reviewed By: RED

GRAY, ME OFFICE
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Other offices in Augusta, Bangor and Caribou, Maine & in Somersworth, New Hampshire

Simpson Gumpertz & Heger Inc.
Consulting Engineers
Boston
Los Angeles
New York
San Francisco
Washington, DC

5 January 2006

LABORATORY REPORT

BY BB Widger

PROJECT 060008 – Chloride Ion Analysis for S.W. Cole Engineering, Inc

SUBJECT Tests to Determine Chloride Ion Contents in Hardened Concrete

SAMPLES Two concrete powdered samples identified as Sample 2A and 2B were submitted by PC Scheiner and Mauro Scali on 4 January 2006.

PROCEDURES

The powdered specimens were analyzed in accordance with AASHTO T-260-97 – The Standard Method of Sampling and Testing the Total Chloride Ion in Concrete and Concrete Raw Materials. The following summarizes the test procedures used.

- The powdered samples are oven dried at 150°F for a minimum of 24 hrs.
- A 3 g sample of the powdered concrete is added to a tared 100 ml flask and weighed to the nearest 0.1 mg.
- Ten milliliters of distilled water is added to the sample and swirled while in suspension.
- Three milliliters of nitric acid is pipetted into the beaker and allowed to digest for 4 min.
- The beaker is filled to 50 ml with hot distilled water and stirred again.
- Three milliliters of hydrogen peroxide (30%) is added and then allowed to digest for 3 min.
- Five drops of methyl orange indicator are added to the solution. When needed, nitric acid is added drop wise until a slight red color is observed.
- The 100 ml beaker is covered with a watch glass and placed on a hot plate. The sample is brought to a boil and maintained at temperature for 1 min.
- While hot, the sample is filtered through a set of double filter papers (No. 41 on top of No. 40) into a 250 ml flask. The filters are washed ten times with hot distilled water. The funnel and the outside of the filter papers are rinsed with hot distilled water. The final sample volume is approximately 150 ml.
- The sample is covered with a watch glass and allowed to cool to room temperature (1.5 hrs).

- The sample solution is weighed (0.1 g) on an Ohaus balance.

- The sample is titrated (Gran Plot Method) using an Orion chloride-selective electrode and an Orion Model 702 Conductivity Meter.

- Silver nitrate (0.0141 N) is added to produce a reading of 225 ± 5 mV, and the amount of silver nitrate is recorded. Additional silver nitrate is added five times in 0.5 ml increments, and the resulting mV readings are recorded after each increment. A linear regression analysis of the data, the "Gran Plot Method," is then used to determine the end point and the corresponding percent chloride which is calculated per AASHTO T260-97 – Section 5.4.2.1.

- **RESULTS**

The calculated chloride ion content for the powdered samples is summarized below:

Sample No.	Chloride Ion	
	%	Lb/cu yd
2A	0.955	37.4
2B	0.775	30.3

Calculated chloride ions based on assumed unit weight of 145.0 lbs/cu ft.

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PROJECT NORTH

CONC. SLAB (TYP.)

EXTERIOR MASONRY WALL (TYP.)

SHED

CONC. COLUMNS (TYP.)

CONC. BEAMS ABOVE (TYP.)

BELOW SLAB (TYP.)

C-1

C-2

C-3

Compressive Strength Test = 7,290 psi
Chloride Threshold of 1.1 Lb/cu yd **exceeded** in all test samples

Sample No.	Depth From Surface (in.)	Chloride Ion	
		%	Lb/cu yd*
#2 C6	2 - 3	0.400	15.66
#2 C6	3 - 4	0.385	15.07
#2 C6	4 - 5	0.211	8.26

Compressive Strength Test = 7,435 psi
Chloride Threshold of 1.1 Lb/cu yd **exceeded** in all test samples

Need to verify this is the correction location for these test results

Sample No.	Chloride Ion	
	%	Lb/cu yd
2A	0.955	37.4
2B	0.775	30.3

Compressive Strength Test = 7,940 psi
Chloride Threshold of 1.1 Lb/cu yd **exceeded** in all test samples

Sample No.	Depth From Surface (in.)	Chloride Ion	
		%	Lb/cu yd*
#1 B9	2 - 3	0.365	14.29
#1 B9	3 - 4	0.361	14.13
#1 B9	4 - 5	0.222	8.69

SK-8 SK-9 SK-10 SK-11 SK-12

KEY PLAN (1st FLOOR)
SCALE: N.T.S.

LEGEND
Approximate Core Exploration Location

S.W.COLE ENGINEERING INC.

EXPLORATION LOCATION PLAN
PIER EXPLORATIONS
B&M BAKED BEANS
PORTLAND, MAINE

PROJECT NO. 05-1401 | SCALE: nts
DATE: January 9, 2006 | SHEET: 1

STATE OF MAINE — CALEB P. COLBY #5434 — REGISTERED PROFESSIONAL ENGINEER
9-15-04

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BG FOODS
Portland, Maine

STRUCTURAL ANALYSIS – B&M BUILDING
Portland, Maine

KEY PLAN (FIRST FLOOR)

SCALE: AS NOTED
DATE : 7-9-04
DES BY: J. Walker
DWN BY: T. Goulet
CHK BY: C. Colby

PROJECT NO. 431.01.01

SHEET 1 OF 14

DRAWING NO. SK-1

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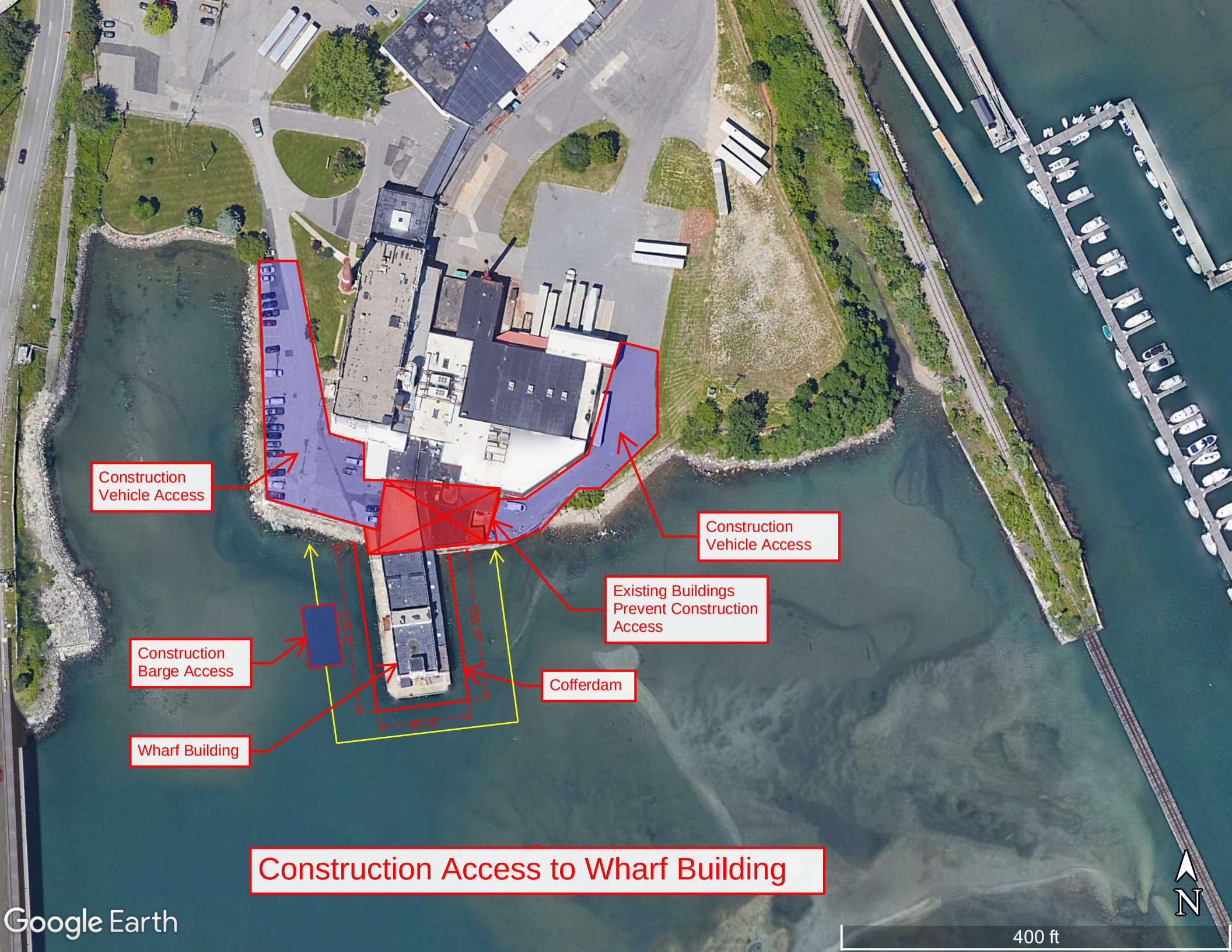
Construction Vehicle Access
Construction Vehicle Access
Existing Buildings Prevent Construction Access
Construction Barge Access
Cofferdam
Wharf Building
155'-0"
155'-0"
95'-0"
Construction Access to Wharf Building
Google Earth
400 ft
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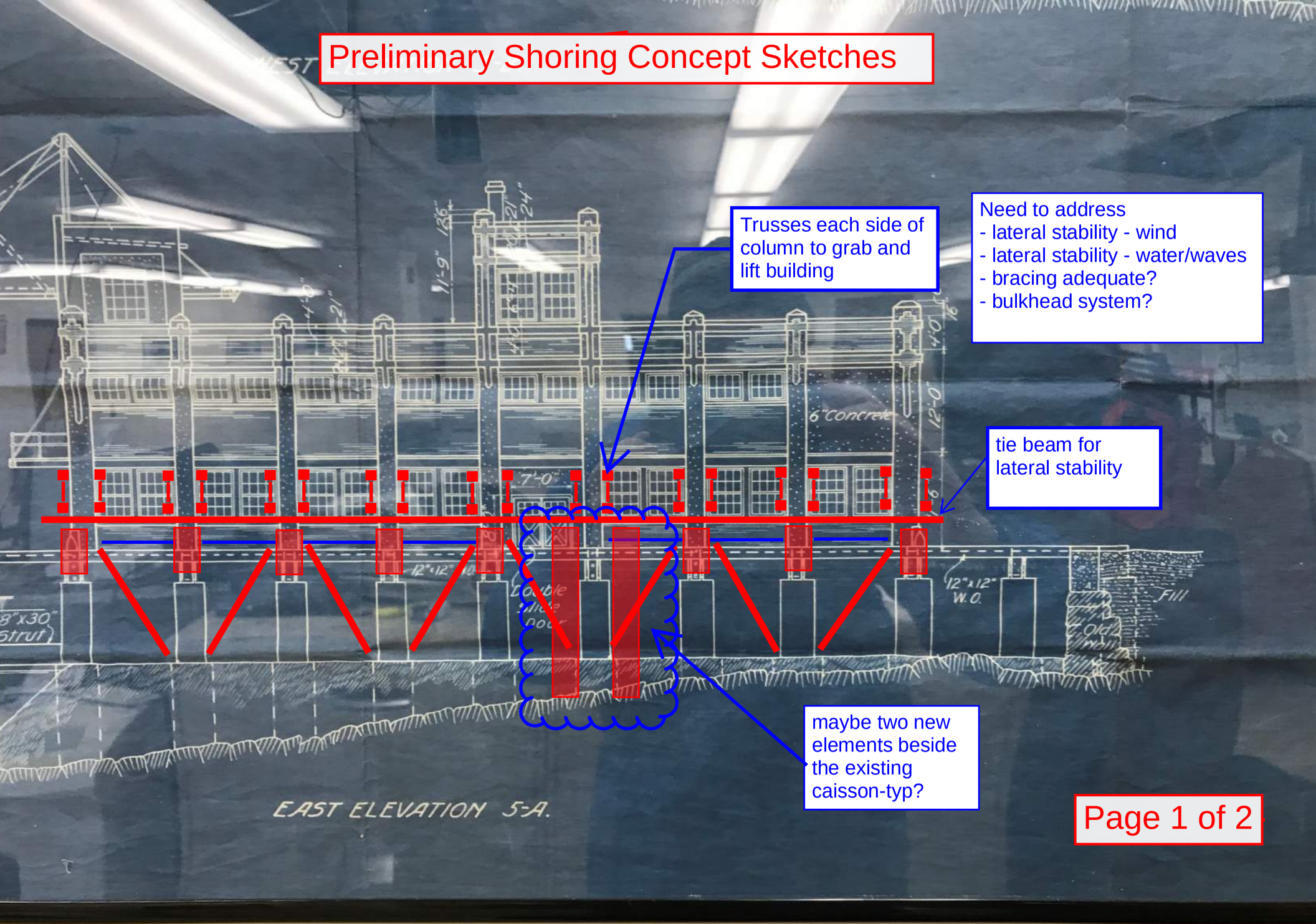
Preliminary Shoring Concept Sketches



Preliminary Shoring Concept Sketches