

Final Report of Special Inspections

Project: 16-063
Location: 23 Ocean Ave
Owner: Ocean Ave Associates LLC
Owner's Address: PO Box 1397
Portland ME, 04104
Architect of Record: Kevin Moquin Architect
Structural Engineer of Record: Casco Bay Engineering
Portland ME, 04101

To the best of my information, knowledge and belief, the Special Inspections required for this project, and itemized in the *Statement of Special Inspections* submitted for permit, have been performed and all discovered discrepancies have been reported and resolved other than the following:

Comments: *As of Casco Bay Engineering's final inspection, completed on 6.15.18, all discrepancies previously noted in Casco Bay Engineering's report dated 3.15.18 and S.W. Cole Engineering INC on 4.19.18 had been addressed and satisfactorily corrected.*

(Attach continuation sheets if required to complete the description of corrections.)

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,
Special Inspector

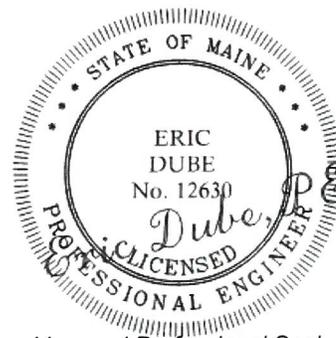
Eric Dube P.E.
(Type or print name)



Signature

9.24.18

Date



Licensed Professional Seal

Final Report of Special Inspections

Agent's Final Report

Project: 16-063

Agent: Casco Bay Engineering

Special Inspector: Eric Dube P.E.

To the best of my information, knowledge and belief, the Special Inspections or testing required for this project, and designated for this Agent in the *Statement of Special Inspections* submitted for permit, have been performed and all discovered discrepancies have been reported and resolved other than the following:

Comments: Special inspections have been conducted and found to be satisfactory and that previously noted deficiencies from Casco Bay Engineering's report on 3.15.18 have been corrected and deemed satisfactory as of 6.15.18.

(Attach continuation sheets if required to complete the description of corrections.)

Interim reports submitted prior to this final report form a basis for and are to be considered an integral part of this final report.

Respectfully submitted,
Agent of the Special Inspector

Eric Dube P.E.

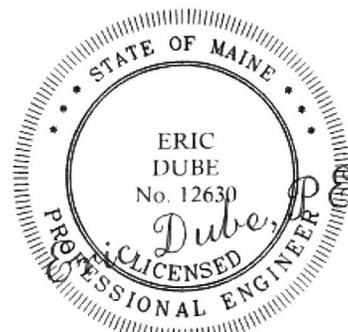
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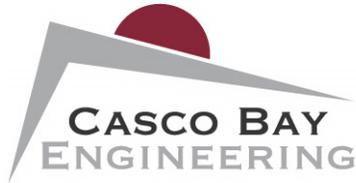
Signature

9.24.18

Date



Licensed Professional Seal or Certification



CIVIL & STRUCTURAL ENGINEERING
www.cascobayengineering.com

424 Fore St., Portland, ME 04101 Phone 207.842.2800 Fax 207.842.2828

Aug 31, 2017

Adam Cope
23 Ocean Avenue Associates LLC.
PO Box 1397
Portland, ME 04104

Re: Foundation Observation
23 Ocean Ave
Portland, Maine

Project Number: 16-063

Dear Adam:

Casco Bay Engineering made a site visit to observe the foundation anchor bolts at 23 Ocean Ave in Portland, Maine on August 31st, 2017. The owner of the existing building is concerned that the anchor bolts placed in the foundation are not in accordance with the structural drawings and specifications.

Site Conditions: Aug 31 2017 at 7:30 AM. The weather was sunny and calm and the air temperature was 54 degrees. The foundation was poured, damp proofed and partially back filled at the plan East wall with a sand mix. A crew was on site and preparing to complete the backfill on all sides of the foundation. 2 representatives from NS Giles Foundation arrived on site as I was leaving at 8:15 AM.

Observations: Based on our observations of the foundation it was determined that the only anchor bolts installed were 5/8" diameter and set in the stem wall at varying distances apart around the entire perimeter of the foundation and at corner locations. On average, these bolts were set at approximately 4 feet apart from one another (pic 1). We also observed that these anchor bolts had been wet set (Pic 12) and could possibly interfere with the location / installation of the 1" diameter hold down bolts (pic 2-6). Also, the 3/4" column base plate bolts and pier bolts were not preset / installed (Pic 7-11) per the specifications and drawings.

Pic 1



Pic 2



Pic 3



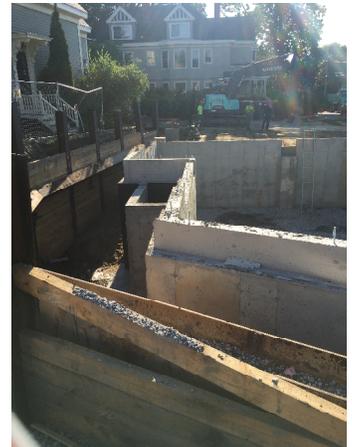
Pic 4



Pic 5



Pic 6



Pic 7



Pic 8



Pic 9



Pic 10



Pic 11



Pic 12



Please note that our observations of the structure integrity of the foundation or anchor bolts were not observed or analyzed. Our report is based on visual observations and should any unforeseen conditions present themselves, our conclusions may change accordingly.

Recommendations:

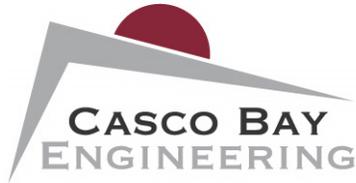
- Install 1" diameter hold down bolts as specified in the sheet notes section on sheet S1.0 at the hold down locations shown on the structural drawings dated 6-26-17. If the locations of the existing 5/8" diameter bolts interfere with the placement of the hold downs they should be cut off and the location of the 1" diameter hold down bolts can be adjusted as required.
- Install 3/4" diameter column bolts at footing locations F6 and at column locations located at the corners on the foundation stem wall using the Hilti HIT-HY 200 epoxy system with a min 9" embedment.
- Install 3/4" diameter column bolts at pier locations F4 using the Hilti HIT-HY 200 epoxy system with a min 12" embedment.
- Install 3/4" diameter column bolts at pier locations F11 install the 3/4" diameter bolts using the Hilti HIT-HY 200 epoxy system with a min 15" embedment.

If you have any questions regarding the content of this report, please do not hesitate to contact us.

Sincerely,

Christopher Dornbach

Christopher Dornbach
Project Designer
Casco Bay Engineering



CIVIL & STRUCTURAL ENGINEERING
www.cascobayengineering.com

424 Fore St., Portland, ME 04101 Phone 207.842.2800 Fax 207.842.2828

Mar 15, 2018

Adam Cope
23 Ocean Avenue Associates LLC.
PO Box 1397
Portland, ME 04104

Re: Special Inspections
23 Ocean Ave
Portland, Maine

Project Number: 16-063

Dear Adam:

Casco Bay Engineering made a site visit to 23 Ocean Ave on 3.15.18 to execute the wood and structural steel special inspections.

Site Conditions: March 15 2018. The weather was partially sunny and breezy and the air temperature was approximate 36 degrees. The building was mostly framed and sheathed.

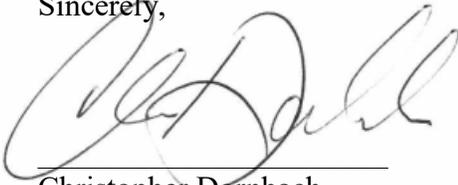
Observations: Based on our observations of the wood framing and structural steel: Floor joist were noted on plans as 11 7/8" TrusJoist 360 series joists at 16" o.c. In their place was Nordic Joist N1-80. The 1st, 2nd, and 3rd floors were missing shear walls, 2 on the plan North exterior walls for all levels and the shear walls at the interior stairwell for all but the 3rd floor. Also, the shear wall in the stairwell at the 3rd floor was not properly nailed / fastened as described in the shear wall schedule. Solid blocking was missing as noted in the second floor on drawing S1.2 in the area noted as "Floor Diaphragm". Solid blocking was missing under a several columns in the exterior walls in the 2nd and 3rd floor framing package. It was also observed that 2 of the header sizes below the 3rd floor framing and 1 header under the roof faming packages varied from those labeled on S1.3 and S1.4 and the sizes were found to be insufficient.

Recommendations:

- Install solid blocking in area described as “Floor Diaphragm” per the description on S1.2.
- Install solid blocking under all columns and insure a continuous load path / solid bearing to foundation below.
- Install sheathing, fasteners, columns, and hold downs as required by the structural drawings and shear wall schedule on S1.2.
- Remove insufficient headers and replace with correct header sizes as described and shown on S1.3 and S1.4

If you have any questions regarding the content of this report, please do not hesitate to contact us.

Sincerely,



Christopher Dornbach
Project Designer
Casco Bay Engineering

18-0462

April 19, 2018

23 Ocean Avenue Associates, LLC
Attn: Adam Cope
PO Box 1398
Portland, ME 04104

Subject: Report of Findings
Forensic Materials Investigation
23 Ocean Avenue
Portland, Maine

Adam,

In accordance with our Agreement dated April 13th, 2018, we made a site visit on April 18th, 2018 to the building located at 23 Ocean Avenue to perform the requested forensic materials work.

PROJECT HISTORY

We understand insufficient materials testing and inspections were performed during construction of the subject project to satisfy the requirements in the project specific Schedule of Special Inspections contained on structural drawing sheet S0.1 dated 6-26-17.

We understand Casco Bay Engineering (project structural engineer of record) was consulted and has provided direction regarding scope and extent of forensic work required.

FIELD WORK

Our investigation included visual observations of the exposed portions of the bolted steel frame, mapping reinforcing steel on an exposed 8 feet by 8 feet portion of the cast-in-place concrete foundation wall and obtaining two drilled concrete core specimens from the basement wall section in the same area the scanning was performed.

The scanning was performed with a ground penetrating radar unit (*Structure Scan Mini XT* manufactured by GSSI) within the investigation area to locate reinforcing steel as well as to help position drilled cores in locations that wouldn't compromise the reinforcing.

Core specimens were obtained using a wet cut diamond drill equipped with a 3 inch barrel. Drilled cores specimens extracted were approximately 2.75 inches in diameter and 8 inches in length. Specimens were transported to our laboratory in Gray, Maine for testing in accordance with ASTM C-42.

OBSERVATIONS AND FINDINGS

Structural steel framing, where exposed generally appeared consistent with the available approved structural construction documents dated 6-27-17 with the exception of the following items that require corrective action or approval by the engineer of record:

- Interior HSS column bearing on first floor framing beam W12x53 does not have stiffener plates as specified in detail 6 on sheet S3.2.
- Bolts at east end of second floor framing member W12x58 by stairwell were not sufficiently tightened.
- Bolts at west end of second floor framing member W21x55 (exterior face of above referenced column) were loose.
- Connections on second level framing near northeast and southeast building corners called out as “slip critical” on detail 4 on S3.0 were hand tightened but did not appear to have been tightened using any specific procedure.
- Column to plate connection at slip critical locations referenced above were field welded as opposed to shop welded as detailed (weld appeared to exceed the ¼ inch requirement)

The GPR scans performed showed the basement foundation wall inside face reinforcing in the area investigated. Reinforcing appeared to consist of #5 bar installed in general accordance with the requirements contained on the applicable structural detail (detail 1 on S2.1). Bar spacing was found to range from 16 to 22 inches on center for the verticals and 22 to 24 inches on center for the horizontals with depth of coverage about 1.8 inches for the horizontals and 2.4 inches for the verticals. A brief scan was also performed on the top 18 inches of the exterior pier located at the southeast corner of the building and general findings appeared consistent with detail 6 on S2.1.

Drilled cores extracted consisted of ¾ inch diameter aggregate and where visible, the concrete surfaces appeared uniform and appropriately consolidated with no signs of cold joints, excessive voids or atypical cracking.

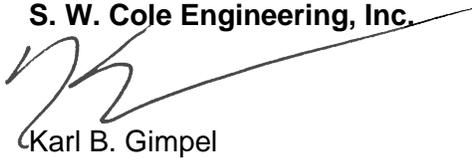
Laboratory testing performed on the concrete core specimens obtained indicate a compressive strength range of 2830 to 3680 psi with an average strength of 3255 psi.

See attached for detailed laboratory compressive strength results and photographs of the areas discussed above.

Thank you for allowing us to work with you on this project, if we can be of any further assistance, please feel free to contact either Roger Domingo or Karl Gimpel at our Gray, Maine office.

Sincerely,

S. W. Cole Engineering, Inc.



Karl B. Gimpel
Construction Services Manager



Roger E. Domingo
Vice President of Construction Services

Report of Drilled Concrete Core Compressive Strength

ASTM C42

Project Name: 23 Ocean Avenue
Project Location: Portland, ME
Client: 23 Ocean Avenue Associates, LLC
Material Description: Drilled Concrete Core
Material Source: Basement Wall

Project Number: 18-0462
Lab ID: 23661G, 23662G
Date Received: 04/18/18
Date Completed: 04/18/18
Tested By: A. Boyce

Sample Info:

Core ID	23661G	23662G
Date Drilled:	4/18/2018	4/18/2018
Date prepared for testing (wet cut of core ends)	4/18/2018	4/18/2018
Date Tested:	4/18/2018	4/18/2018
Date Concrete was Placed	unknown	unknown
Nominal Max. Agg Size	3/4	3/4

Dimensions:

Diameter (in)	3.72	3.73
Ave. Received Length (in)	8.00	7.75
Ave. Trimmed Length (in)	7.1	7.1
Ave. Capped Length (in)	7.49	7.32
Weight (lbs)	6.95	6.8
Density (lbs/ft3)	156	151

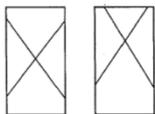
Reinforcement:

Type	N/A	N/A
Location	N/A	N/A

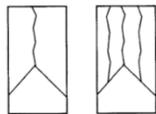
Break Results:

Direction of load application	Perpendicular	Perpendicular
Max Load (kips)	30.8	40.2
Break Type (see Figure 1)	4	4
Strength (psi)	2830	3680

Figure 1:



Type 1
Reasonably well-formed cones on both ends, less than 1 in. [25 mm] of cracking through caps



Type 2
Well-formed cone on one end, vertical cracks running through caps, no well-defined cone on other end



Type 3
Columnar vertical cracking through both ends, no well-formed cones



Type 4
Diagonal fracture with no cracking through ends; tap with hammer to distinguish from Type 1



Type 5
Side fractures at top or bottom (occur commonly with unbonded caps)



Type 6
Similar to Type 5 but end of cylinder is pointed

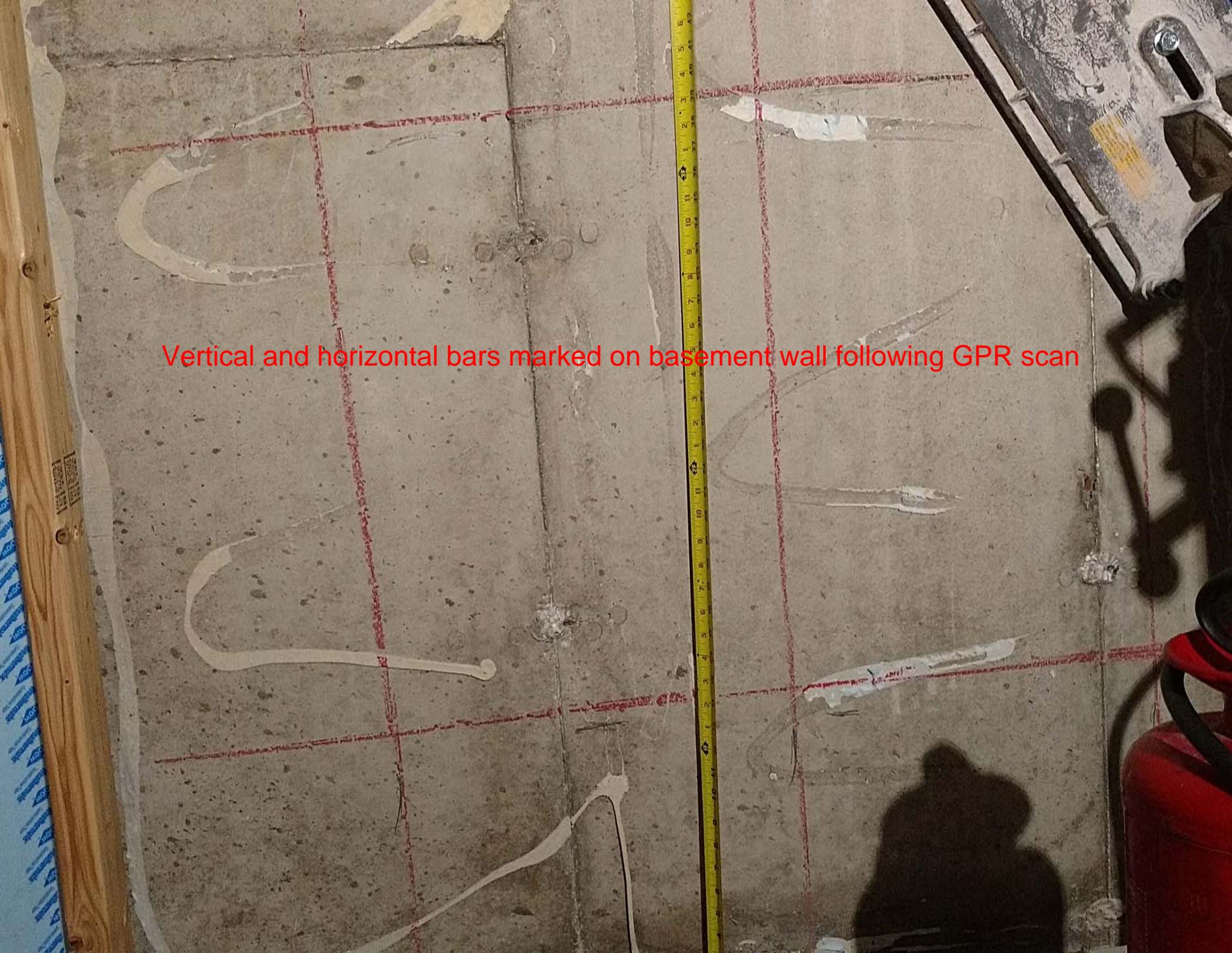
Comments:

Reviewed By: 

Loose bolts at west end of second floor framing member W21x55



Vertical and horizontal bars marked on basement wall following GPR scan



Basement wall section investigated





Missing stiffener plates in first floor framing beam W12x53 under column

A close-up photograph of a steel beam connection. A dark, rusted steel beam is shown in the foreground, with a smaller, lighter-colored steel plate attached to its top flange. Two bolts are visible on this plate, one of which is loose and protruding. The background shows wooden framing, including a large wooden beam with a label that reads "2x12 S-P-F No. 1". The scene is dimly lit, highlighting the textures of the steel and wood.

Loose bolts east end of second floor framing W21x55



Slip critical connection marked hand tight

Field welded connection



Drilled core specimens extracted from basement wall section