

# ROOME & GUARRACINO, LLC

## Consulting Structural Engineers

48 Grove Street      Somerville, MA 02144  
Tel: 617.628.1700      Fax: 617.628.1711

June 26, 2012

Mr. Richard Berg  
Craig Corporation  
100 Fellsway West  
Somerville, MA 02145

Reference: 100 Fellsway West, Somerville, MA

Subject: Structural Evaluation for Renovation

Dear Richard:

This letter confirms my visits to the above referenced address at your request to perform an evaluation of existing structural conditions in consideration of proposed renovation of the existing building located at 100 Fellsway West in Somerville, Massachusetts. Except as specifically noted, my field observations are only visual surface observations, and I have not cut any holes in the building finishes to verify structure. Any testing which has been performed to determine the structures underlying conditions are specifically noted.

The building is a four story timber structure with masonry bearing walls below the second floor and a flat wood sheathed roof.

The proposed renovations include a change of use to residential, as well as repartitioning and modifying masonry openings or adding new masonry openings. Therefore, all the following discussions are based on both the *International Existing Building Code (IEBC) Change in Use Criteria and the Level 3 Work Area Method* of compliance being used. Separate and additionally required of masonry buildings in Massachusetts, is compliance with *Appendix A1: Seismic Strengthening Provisions for Unreinforced Masonry Bearing Wall Buildings. (App.A1)*

### **Existing Conditions & Structural Implications**

We begin by addressing specific existing structural conditions which have significant implication on the renovation of this building.

1. Sample existing columns were exposed below grade and it was discovered that between 40% and 100% of their cross-sections were disintegrated from rot, as noted in the geotechnical evaluation<sup>1</sup> and personally observed. Columns must be replaced.

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<sup>1</sup> McPhail Associates, Inc, "Geotechnical Engineering Evaluation", May 4 2012, page 3, & Appendix B.

2. Current Massachusetts code requires a gravity carrying capacity of 100 psf in public areas and corridors serving multi-family residences. The existing timber floor joists and girders are well below this capacity. Even framing supporting private rooms are marginally overstressed and would not be able to support the weight of additional leveling gypcrete or acoustic noise reduction floor systems, as is frequently desired. Existing timber framing can be reinforced with new timber to address capacity, but given that work already planned, in order to also address floor flatness it is recommended that the flooring be removed and floors reframed with new timber. Replacement would also esthetically and structurally address the 2<sup>nd</sup> Floor framing which is charred from prior fire damaged.
3. The existing slab on grade exhibits significant differential settlement. Based on the compressible organic deposits discovered in the geotechnical investigation, the geotechnical engineer recommends that the existing slab on grade be removed in entirety and replaced with a new structurally spanning floor slab.<sup>2</sup>
4. The *International Existing Building Code (IEBC) and Appendix A1* requires the entire building to be compliant with current wind and seismic loads. Existing connections and shearwalls lack required capacity and require replacement or supplemental reinforcing. All exterior building finishes would be removed to allow access for additional nailing and/or exterior sheathing.
5. Based on several test pits, the geotechnical engineer reported that the interior footings are eccentric to the columns and are inadequately constructed of a random arrangement of concrete, brick and cobbles and is not constructed in accordance with applicable building codes.<sup>2</sup> Additionally, the geotechnical engineer advises that current codes do not permit shallow foundation on the type of soil on this site. They recommend that the existing foundations be removed and the building underpinned to allow installation of drilled mini-piles.<sup>2</sup>
6. The exterior brick bearing walls are also supported on loose cobbles and underpinning for mini-piles is also recommended, however the cobbles and heavily deteriorated brick with widely varying mortar joint condition<sup>3</sup> near the soil grade elevation are not in sufficiently stable condition to be underpinned and would first require horizontal thru-coring and shotcreting the wall faces with concrete. Given that a cored and shotcreted wall would have little resemblance of the original wall, and that material testing indicated the compressive strength of the existing bricks to be below design standards in four of five bricks tested<sup>4</sup>, it is recommended that the existing brick walls be incrementally removed and replaced in a manner similar to as described by the geotechnical engineer<sup>2</sup>. This will also improve wind & seismic safety as current code anchorage detailing standards can be achieved if rebuilt.

### Summary & Conclusions

The majority of the most critical elements including columns, walls, and foundations require removal and replacement. Given the combined effect of these deteriorated non-compliant structural elements, safety should be a strong consideration in considering feasibility of underpinning and remediation work. Given the extensive portion of the building which is required to be removed and replaced, combined with the level of significant patchwork reinforcement that would be required elsewhere in the structure, and underpinning safety

<sup>2</sup> McPhail Associates, Inc, "Gootechnical Engineering Evaluation", May 4 2012, page 4.

<sup>3</sup> Thompson & Lichtner, "Joint Shear Strength", May 1, 2012, page 1.

<sup>4</sup> Thompson & Lichtner, "Test of Brick", May 22, 2012, page 1.

concerns, we strongly recommend consideration of complete building demolition, and construction of a new structure on new foundations.

This letter report addresses only structural observations during our walk-throughs and test results reported to us. Additional structural problems may be concealed below grade, hidden behind finishes or not visible at the time of inspection. Although care has been taken in the performance of the evaluation, no representation regarding latent or concealed defects, which may exist, is made.

Should you have any questions or require further assistance, please feel free to call me.

Very Truly Yours,  
**ROOME & GUARRACINO, LLC**



Siegmar Knebl Jr, P.E.  
Senior Engineer



Carmine Guarracino, P.E.  
Partner



Enclosures(3):  
Geotechnical Engineering Evaluation  
Tests of Bricks  
Mortar Joint Shear Strength



**GEOTECHNICAL ENGINEERING  
EVALUATION**

**100 FELLSWAY WEST**

**SOMERVILLE      MASSACHUSETTS**

for

Roome & Guarracino, LLC

June 15, 2012

Project No. 5400



June 15, 2012

Roome & Guarracino, LLC  
48 Grove Street  
Somerville, MA 02144

Attention: Mr. Carmine Guarracino, P.E.

Reference: 100 Fellsway West; Somerville, Massachusetts  
Geotechnical Engineering Evaluation

Ladies and Gentlemen:

This report documents the results of our evaluation of the subsurface and foundation conditions of the existing building located at 100 Fellsway West in Somerville, Massachusetts. This evaluation was conducted based on a proposed building renovation for the conversion of the structure into residential units. Refer to the Project Location Plan (Figure 1) for the general site location.

This report was prepared in accordance with our proposal for geotechnical engineering services dated March 19, 2012 and your subsequent authorization. These services are subject to the limitations contained in Appendix A.

### **Background**

The existing one to four-story timber-framed structure is located at the corner of Wheatland Street and Mystic Avenue in Somerville, Massachusetts. The four-story section of the building has a partial basement that extends about 4 feet below the existing ground surface. The basement contains a concrete floor slab that has undergone differential settlement. Based on observations within the building, it also appears that the structure has undergone differential settlement.

Based on a 20-scale topographic site plan prepared and provided to us by Design Consultants, Inc. entitled "Existing Conditions Plan 100 Fellsway West" and dated September 10, 2009, the existing ground surface along the sides of the building facing Mystic Avenue and Wheatland Street range from about Elevation +9 to Elevation +10. Additionally, the basement floor slab level within the building is indicated to be at about Elevation +7. It should be noted that some modifications to the site have occurred after the preparation of the referenced drawing, including the demolition of buildings located to the southeast of the subject building and some site filling. Elevations cited herein are in feet and are referenced to the 1929 National Geodetic Vertical Datum (NGVD 1929).

### **Subsurface Explorations**

Our subsurface exploration program consisted of four (4) test pits and four (4) borings. The test pits were conducted by the building owner using hand excavation methods from within the basement of the building at locations adjacent to existing columns and bearing walls. The purpose of the test pits was to observe and document the existing foundation conditions in consideration of the proposed building renovations. The borings were performed on April 2 and 3, 2012 by Carr-Dee Corp. of Medford, Massachusetts under contract to McPhail Associates, Inc. The test pit and boring locations are as indicated on the Subsurface Exploration Plan (Figure 2) which is based on the referenced 20-scale topographic site plan provided to us.

GEOTECHNICAL AND GEOENVIRONMENTAL ENGINEERS  
2269 Massachusetts Avenue  
Cambridge, Massachusetts 02140  
617 / 868-1420



Roome & Guarracino, LLC  
June 15, 2012  
Page 2

Field locations of the subsurface explorations were determined by taping from existing site features identified on the referenced topographic site plan. The existing ground surface elevation at each exploration location was determined by a level survey performed by McPhail Associates, LLC based on spot elevations indicated on the site plan.

Two of the test pits (TP-1 and TP-3) were located along the interior side of the north exterior bearing wall. The remaining two test pits (TP-2 and TP-4) were performed adjacent to timber columns located within the building basement. The test pits were conducted during the week of March 12, 2012 and observed by a representative of McPhail Associates, LLC after completion on March 16 and 20, 2012. After removal of a portion of the concrete basement floor slab, the test pits were excavated to depths of approximately 4 to 4.5 feet below the top of the floor slab. Logs and photographs of the test pits are presented in Appendix B.

The borings were conducted with truck-mounted drilling equipment and advanced through the fill deposit using 3-inch I.D. (NW) casing. Standard 2.0 inch O.D. split-spoon samples and standard penetration tests were generally obtained at minimum 5-foot intervals of depth in accordance with the standard procedures described in ASTM D1586.

The borings were terminated at depths of 42 to 52 feet below the existing ground surface, within the marine clay deposit. Boring logs prepared by Carr-Dee Corp. are presented in Appendix C.

### **Subsurface Conditions**

The borings indicate that the site is underlain by a 7- to 13-foot thick miscellaneous fill deposit. The upper portion of the fill consists of a compact to very dense, dark brown to black silt and sand with variable amounts of brick, ash, cinders and building rubble. The lower portion of the fill deposit typically consisted of a loose to compact, blue-gray silty clay varying to a silt and sand that was occasionally intermixed with the underlying organic deposit.

Underlying the fill deposit in borings B-1 and B-2, a 2.5 to 4-foot thick organic deposit was encountered that consisted of a firm dark brown fibrous peat.

A marine clay deposit was encountered below the fill and organic deposits at each of the boring locations. The surface of the marine clay was encountered at depths of 10 to 13 feet below the existing ground surface, corresponding to Elevation +0.3 and Elevation -3.8. The upper portion of the deposit consists of a yellow-gray to blue-gray, stiff to very stiff silty clay. With increasing depth, the marine clay deposit transitions to a firm to soft blue-gray silty clay. Occasional fine sand parting were observed throughout the marine clay deposit. The full depth of the marine clay deposit was not penetrated at any of the boring locations.

Groundwater levels observed in completed boreholes ranged from approximately Elevation -0.1 to +2.8, or about 7.5 to 8.5 feet below the existing ground surface. It is anticipated that future groundwater levels across the site may vary from those reported herein due to factors such as normal seasonal changes, periods of heavy precipitation, and alterations to existing drainage patterns.



### **Existing Foundation Conditions**

The test pit excavations conducted along the interior side of the north exterior bearing wall (TP-1 and TP-3) indicate the foundation wall to be comprised of mortared fieldstones that extend to depths of 3.3 to 3.5 feet below the bottom of the basement floor slab. No footing was present at the bottom of the wall which was observed to bear on the fill deposit. Within the two test pits, the bottom of the exterior foundation wall varied from Elevation +3.6 to Elevation +3.9.

Test pits performed adjacent to timber columns located within the building basement (TP-2 and TP-4), indicated the columns to be supported on isolated footings. The footings were observed to consist of a concrete base, varying in width from 3.5 to 4.5 feet and ranging in depth from 1.3 to 1.8 feet. At both test pits, the concrete was underlain by an unsorted mixture of cobbles and bricks varying from 10 inches to 2 feet in thickness. The bottom of the cobbles in the test pits extended to depths of 4.0 to 4.2 feet below the existing basement floor slab, corresponding to about Elevation +3.1, and were observed to terminate in the fill deposit. In general, the isolated footings exposed in the basement test pits did not appear to be "engineered" and typically consisted of a haphazard mixture of concrete, brick and cobbles.

Additionally, in both TP-2 and TP-4, the timber column was not observed to be concentric with the plan location of the underlying footing. At TP-4, the plan location of the timber column was observed to be at the outer edge of the footing concrete. It was also noted that the timber column at both test pit locations extended below the concrete floor slab and was significantly rotted to completely disintegrated within the depth that extended below the floor slab as indicated in the photographs contained in Appendix B. The cross-sectional area of the column was significantly to entirely compromised at both test pit locations.

### **Basement Floor Slab Survey**

During our subsurface exploration program, a level survey of the existing basement floor slab was conducted by a representative of McPhail Associates, LLC. The survey consisted of determining the elevation of sixteen (16) reference points spaced throughout the basement area as indicated on Figure 3. The measured elevation of each of the reference points is also presented on Figure 3.

The tabulated data presented in Figure 3 presents the difference in elevation among the reference points based on an assumed reference level of Elevation +7.5 which does not necessarily represent the original elevation of the basement floor slab. The Elevation +7.5 level was selected to evaluate the relative difference in measured elevations of the floor slab.

In consideration of the data presented in Figure 3, the existing basement slab is up to approximately 6 inches out of level. Although it cannot be determined how level the floor slab was originally constructed, based on the survey data and our observations, it appears that the floor slab has undergone several inches of differential settlement. It should also be noted that reinforcing steel was observed in the sections of floor slab removed from test pits TP-2 and TP-4 which would tend to reduce the magnitude of differential settlement across the floor slab.



### **Conclusions and Recommendations**

Based on the results of the test pit and borings conducted at the site, the existing building foundations are underlain by uncontrolled fill and compressible organic deposits that are anticipated to extend in the range of approximately 3 to 7 feet below the existing foundation bearing surface. Paragraph 1809.2 of the 8<sup>th</sup> Edition of the Massachusetts State Building Code stipulates that "Shallow foundations shall be built on undisturbed soil, compacted fill material or controlled low-strength material (CLSM)". Thus, it is our opinion that the existing building foundations were not constructed in accordance with the current provisions of the State Building Code or standard, local geotechnical engineering practice.

Further, the isolated footings supporting the timber columns within the basement area are considered to be inadequately constructed due to the random arrangement of concrete, brick and cobbles that comprise the foundations. In addition, the eccentric column location relative to the plan area of the footings and the significant deterioration of the section of the timber column that extends below the floor slab further reduce the capacity of the foundation system. During our initial observations of the test pits located adjacent to the timber columns, it was recommended to Roome & Guarracino, LLC that temporary shoring be provided at the column locations to adequately support the compromised structural condition.

In consideration of the existing foundation and subsurface conditions that underlie the building, significant differential settlement of the structure has occurred based on the survey of the basement floor slab (as discussed herein) and observed shims placed between the tops of the basement timber columns and the floor beams. Construction of the building footings above the compressible fill and organic deposits has resulted in previous building settlement that will likely continue to occur.

In order to provide proper foundation support of the existing building in accordance with the current provisions of the State Building Code, it is recommended that new foundations be installed below the unsuitable fill and organic deposits and into the top of the stiff to very stiff marine clay deposit that underlies the building. Remedial foundation support would likely consist of conventional underpinning pits and drilled mini-piles installed across the building footprint. Replacement of foundation support below the basement column locations would likely require temporary shoring and removal of the existing isolated footings. In addition, in consideration of the observed condition of the existing basement floor slab, removal of the floor slab and replacement with a structurally-supported slab is recommended.

In regard to the underpinning of the perimeter foundation walls, remedial grouting and shotcreting of the existing wall would likely be required prior to underpinning to stabilize the wall based on its observed condition. Alternatively, approximate 3- to 4-foot widths of the wall could be entirely removed in sections along the building perimeter and incrementally replaced with new reinforced concrete footings and foundation walls.

For purposes of determining parameters for a structural seismic evaluation of the existing building, this site is considered to be classified as a Site Class D as defined in Section 1613 of the State Building Code.



Roome & Guarracino, LLC  
June 15, 2012  
Page 5

We trust that the information presented herein is sufficient for your present requirements. Should you have any questions concerning the conclusions presented herein, please do not hesitate to call us.

Very truly yours,

McPHAIL ASSOCIATES, LLC.

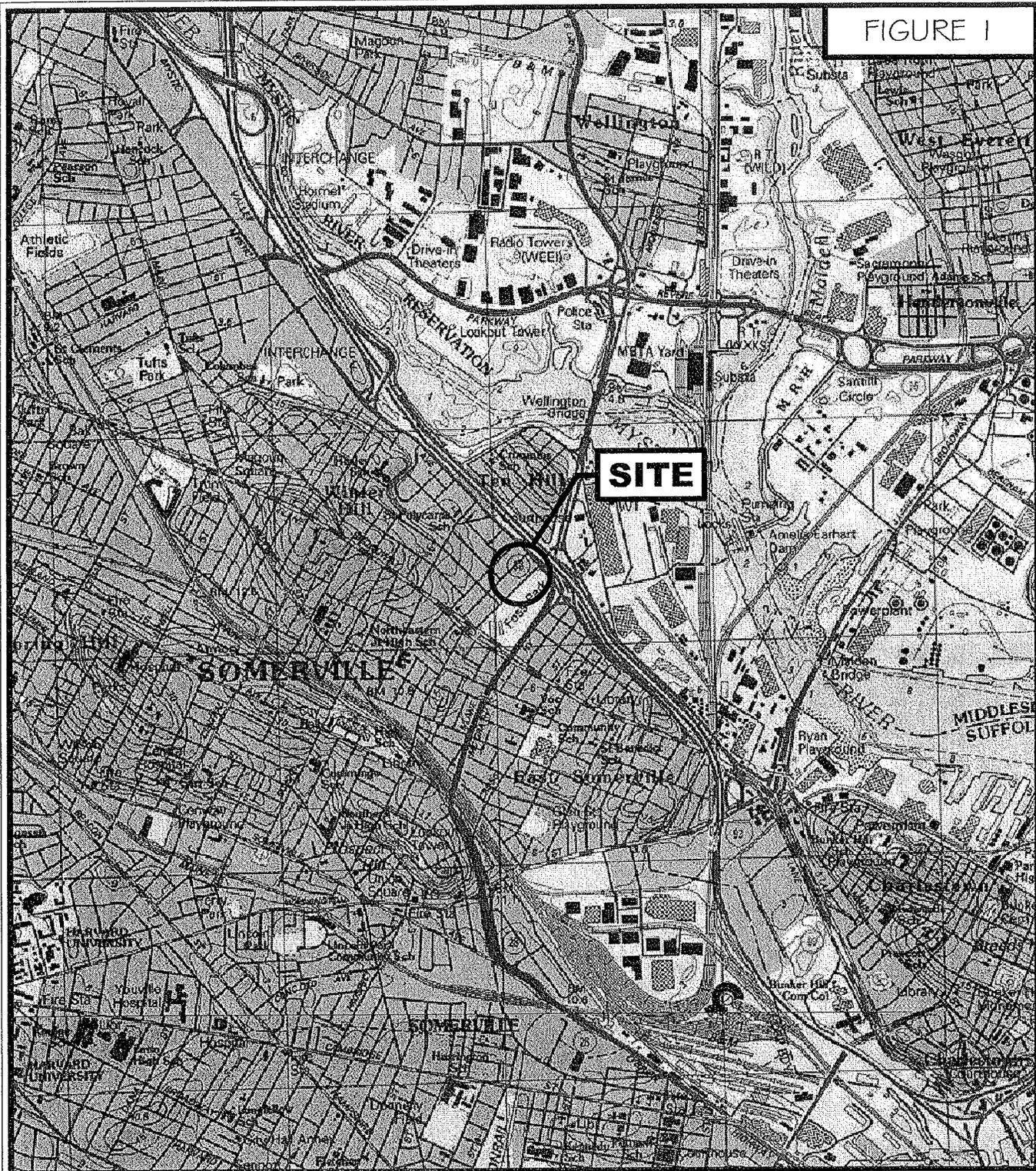
A handwritten signature in black ink, appearing to read "Chris M. Erikson".

Chris M. Erikson, P.E.

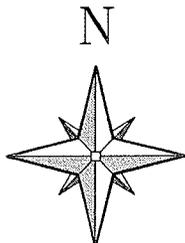
Enclosures

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FIGURE 1



**M'PHAIL ASSOCIATES, LLC**  
 Geotechnical and  
 Geoenvironmental Engineers  
 2269 Massachusetts Avenue  
 Cambridge, MA 02140  
 617/868-1420  
 617/868-1423 (Fax)



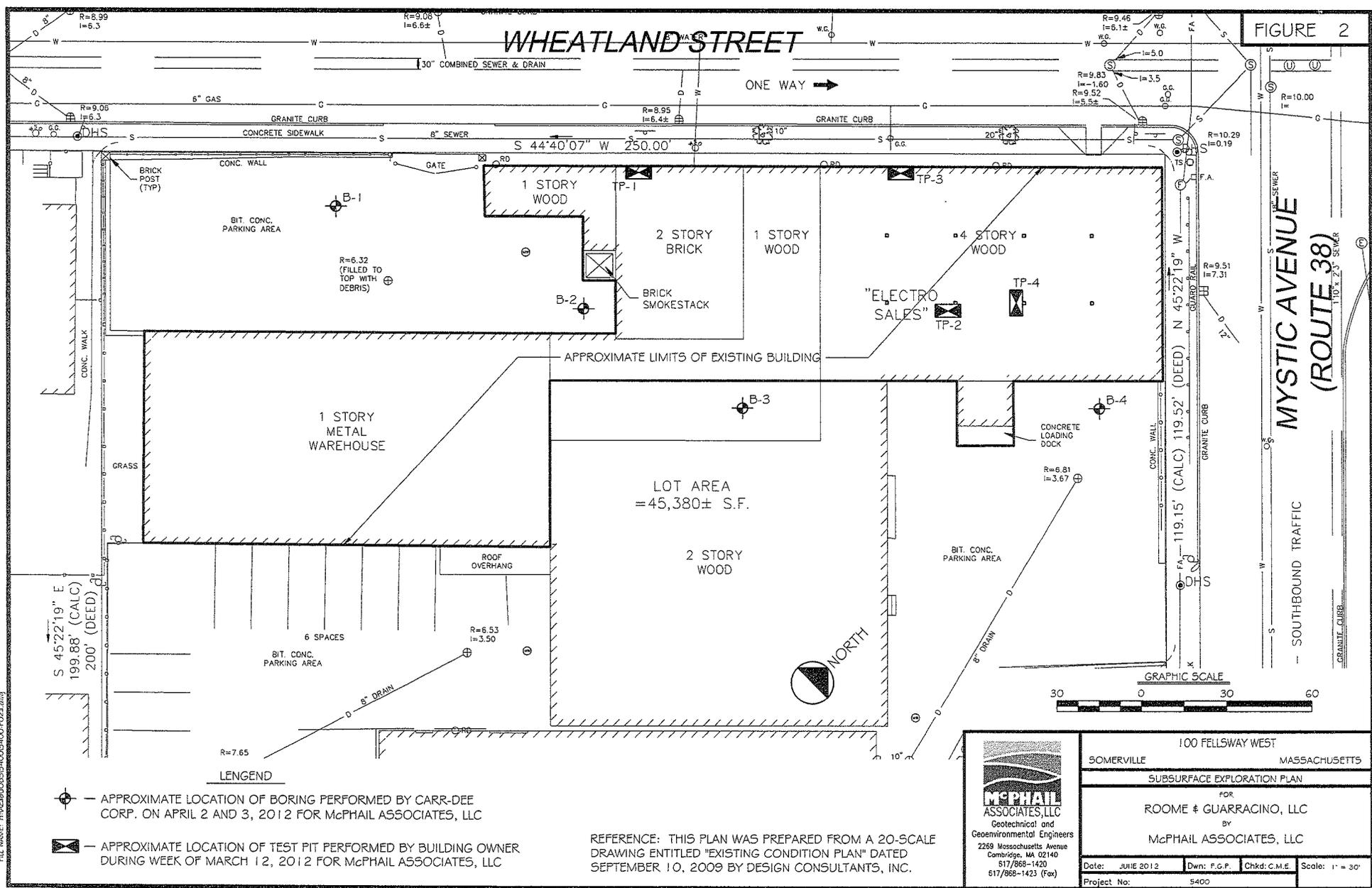
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# PROJECT LOCATION PLAN

100 FELLSWAY WEST

SOMERVILLE

MASSACHUSETTS



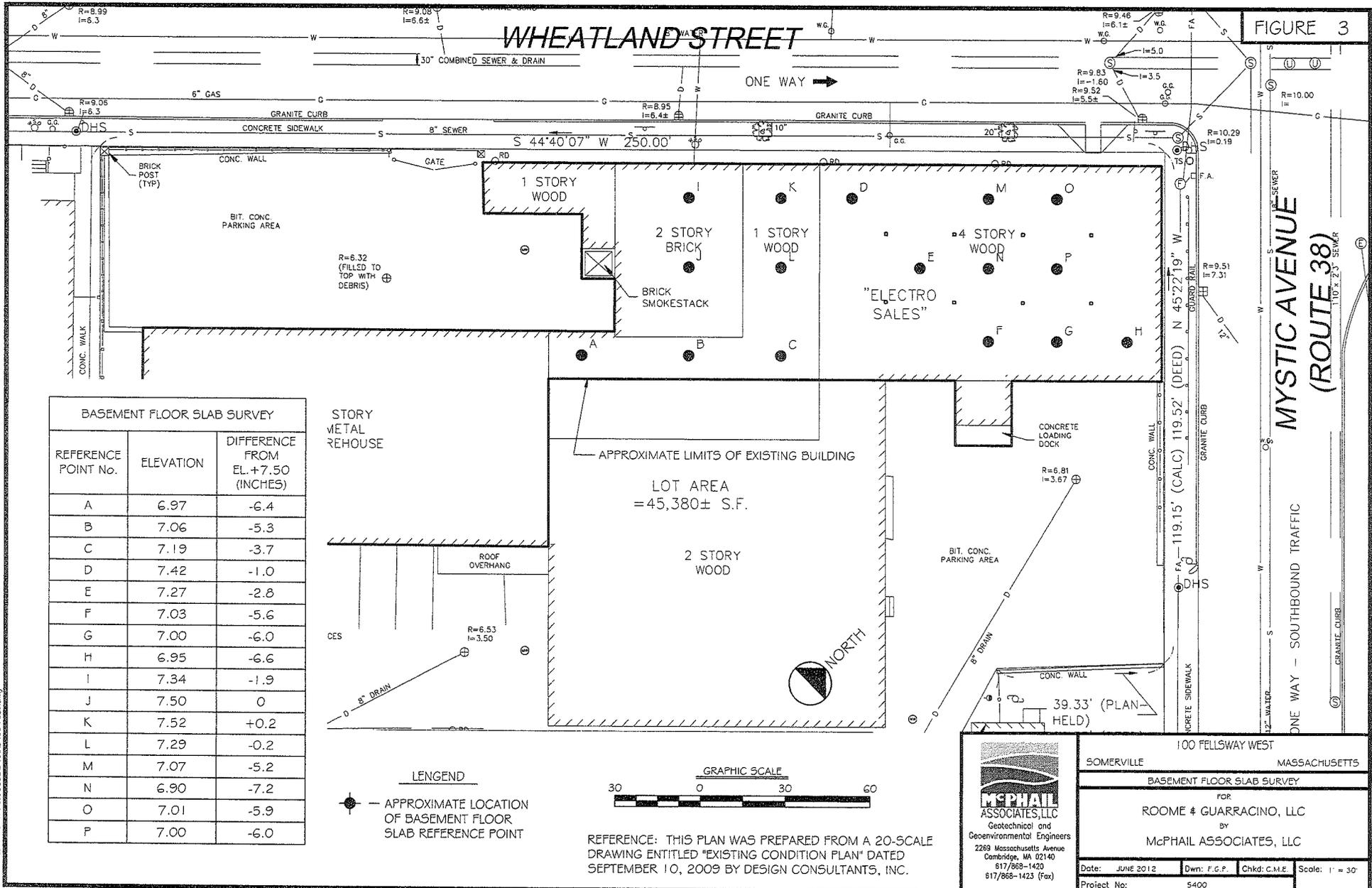
FILE NAME: H:\A\2012\0515-4005-100-FO2.dwg

- LENGEND**
- APPROXIMATE LOCATION OF BORING PERFORMED BY CARR-DEE CORP. ON APRIL 2 AND 3, 2012 FOR McPHAIL ASSOCIATES, LLC
  - APPROXIMATE LOCATION OF TEST PIT PERFORMED BY BUILDING OWNER DURING WEEK OF MARCH 12, 2012 FOR McPHAIL ASSOCIATES, LLC

REFERENCE: THIS PLAN WAS PREPARED FROM A 20-SCALE DRAWING ENTITLED "EXISTING CONDITION PLAN" DATED SEPTEMBER 10, 2009 BY DESIGN CONSULTANTS, INC.

**McPHAIL ASSOCIATES, LLC**  
 Geotechnical and Environmental Engineers  
 2269 Massachusetts Avenue  
 Cambridge, MA 02140  
 617/868-1420  
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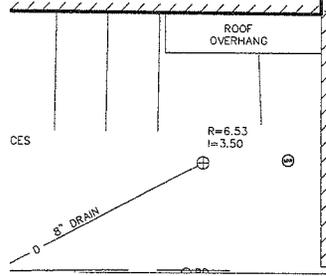
100 FELLSWAY WEST			
SOMERVILLE		MASSACHUSETTS	
SUBSURFACE EXPLORATION PLAN			
FOR			
ROOME & GUARRACINO, LLC			
BY			
McPHAIL ASSOCIATES, LLC			
Date: JULIE 2012	Dwn: F.G.P.	Chkd: C.M.E.	Scale: 1" = 30'
Project No: 5400			



BASEMENT FLOOR SLAB SURVEY

REFERENCE POINT No.	ELEVATION	DIFFERENCE FROM EL. +7.50 (INCHES)
A	6.97	-6.4
B	7.06	-5.3
C	7.19	-3.7
D	7.42	-1.0
E	7.27	-2.8
F	7.03	-5.6
G	7.00	-6.0
H	6.95	-6.6
I	7.34	-1.9
J	7.50	0
K	7.52	+0.2
L	7.29	-0.2
M	7.07	-5.2
N	6.90	-7.2
O	7.01	-5.9
P	7.00	-6.0

STORY METAL REHOUSE



REFERENCE: THIS PLAN WAS PREPARED FROM A 20-SCALE DRAWING ENTITLED "EXISTING CONDITION PLAN" DATED SEPTEMBER 10, 2009 BY DESIGN CONSULTANTS, INC.

100 FELLSWAY WEST  
SOMERVILLE MASSACHUSETTS

**McPHAIL ASSOCIATES, LLC**  
Geotechnical and Geoenvironmental Engineers  
2289 Massachusetts Avenue  
Cambridge, MA 02140  
617/868-1420  
617/868-1423 (Fax)

FOR  
ROOM # GUARRACINO, LLC  
BY  
McPHAIL ASSOCIATES, LLC

Date: JUNE 2012 Dwn: F.G.F. Chkd: C.M.E. Scale: 1" = 30'  
Project No: 5400

FILE NAME: I:\Users\A085154\0015\F001\F03a.dwg



### **Limitations**

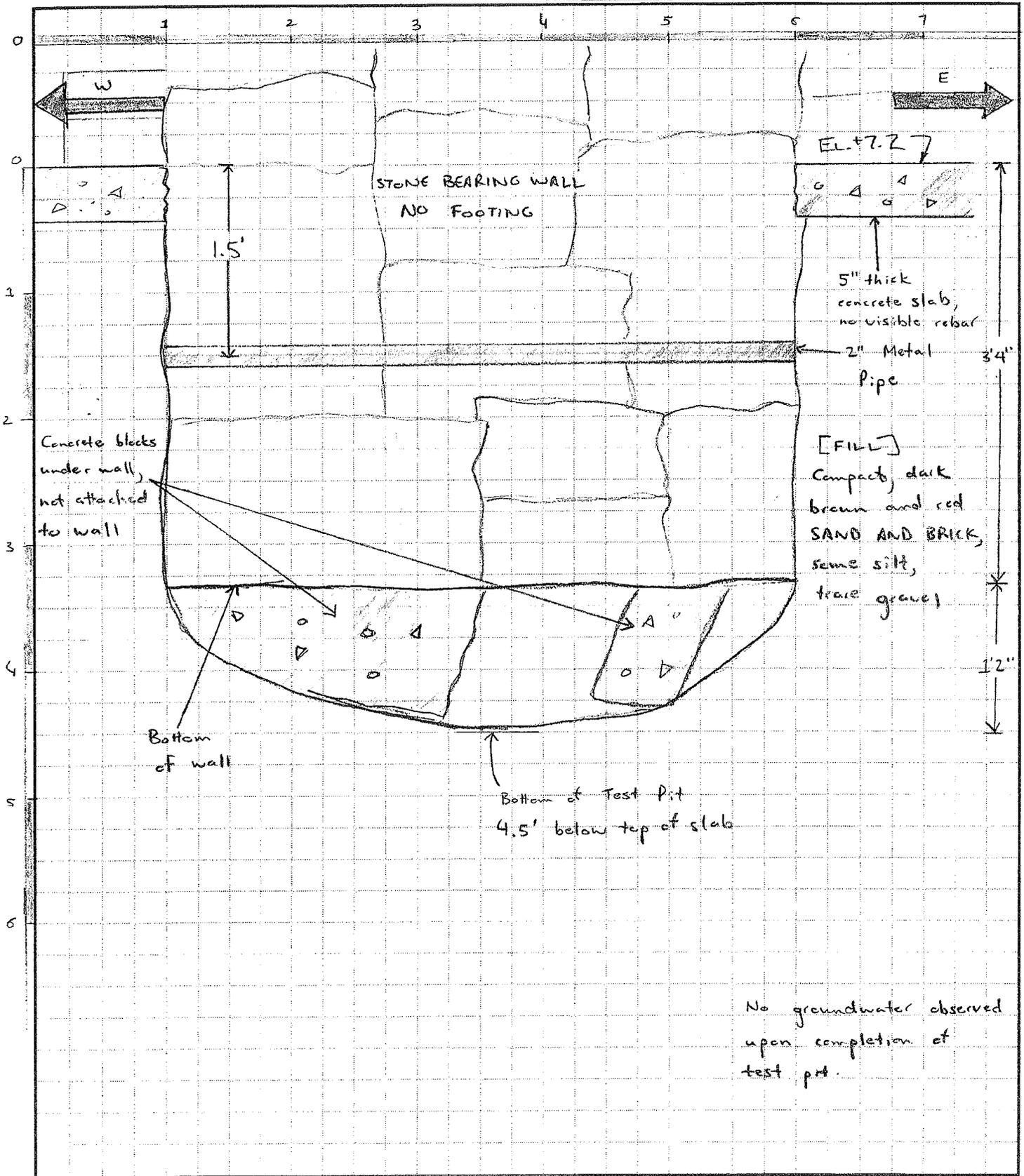
This report has been prepared on behalf of and for the exclusive use of Roome & Guarracino, LLC for specific application to the evaluation of the existing structure located at 100 Fellsway West in Somerville, Massachusetts in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

The conclusions and recommendations presented in this report are based upon the data obtained from the explorations performed at the approximate locations indicated on the enclosed subsurface exploration plan. If variations in the nature and extent of subsurface or foundation conditions between the widely spaced explorations become evident in the future, it may be necessary for a re-evaluation of the recommendations presented in this report after performing a review of the information obtained.

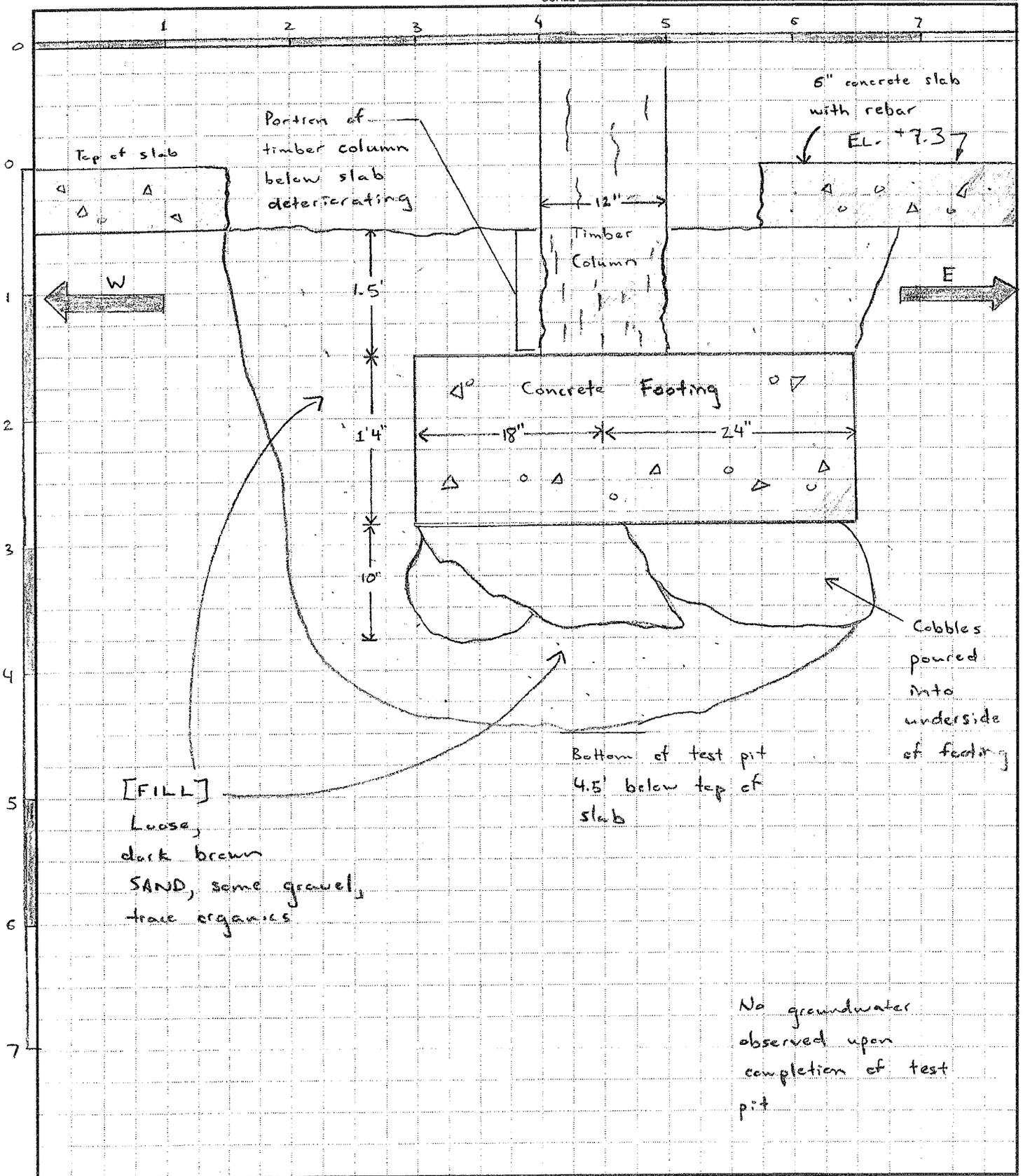


## **APPENDIX B**

Test Pit Logs and Photographs  
Prepared by McPhail Associates, LLC

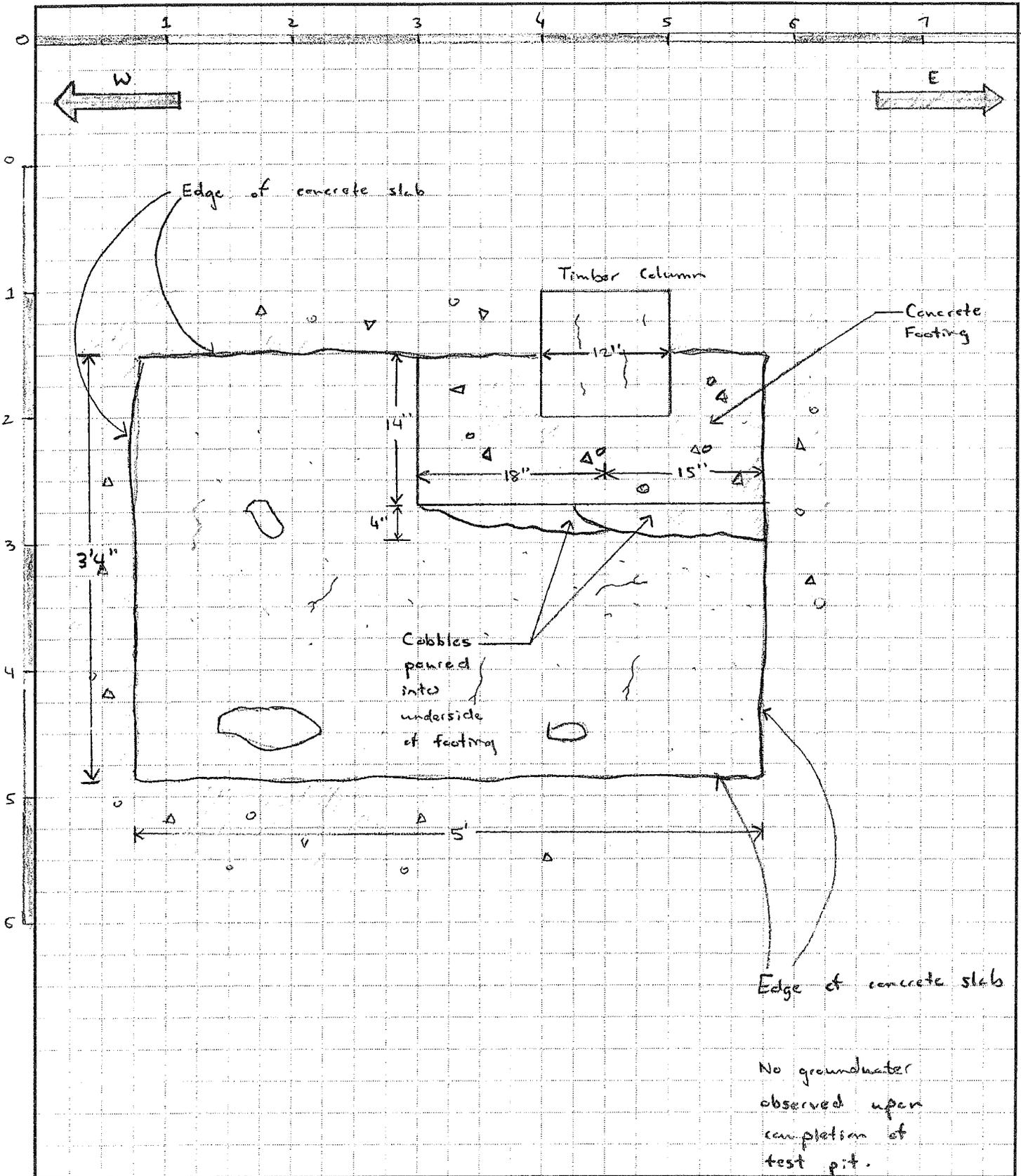


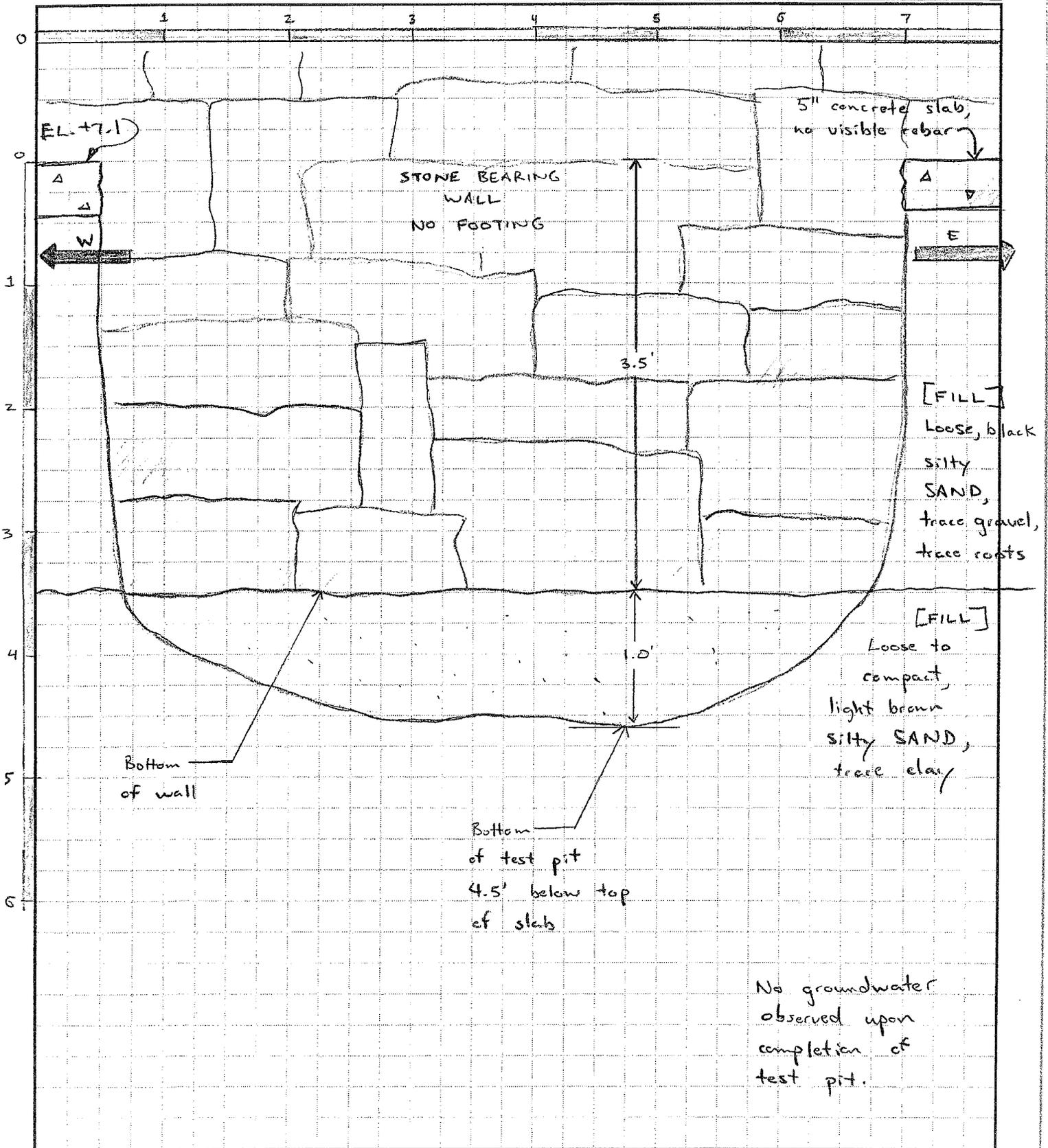
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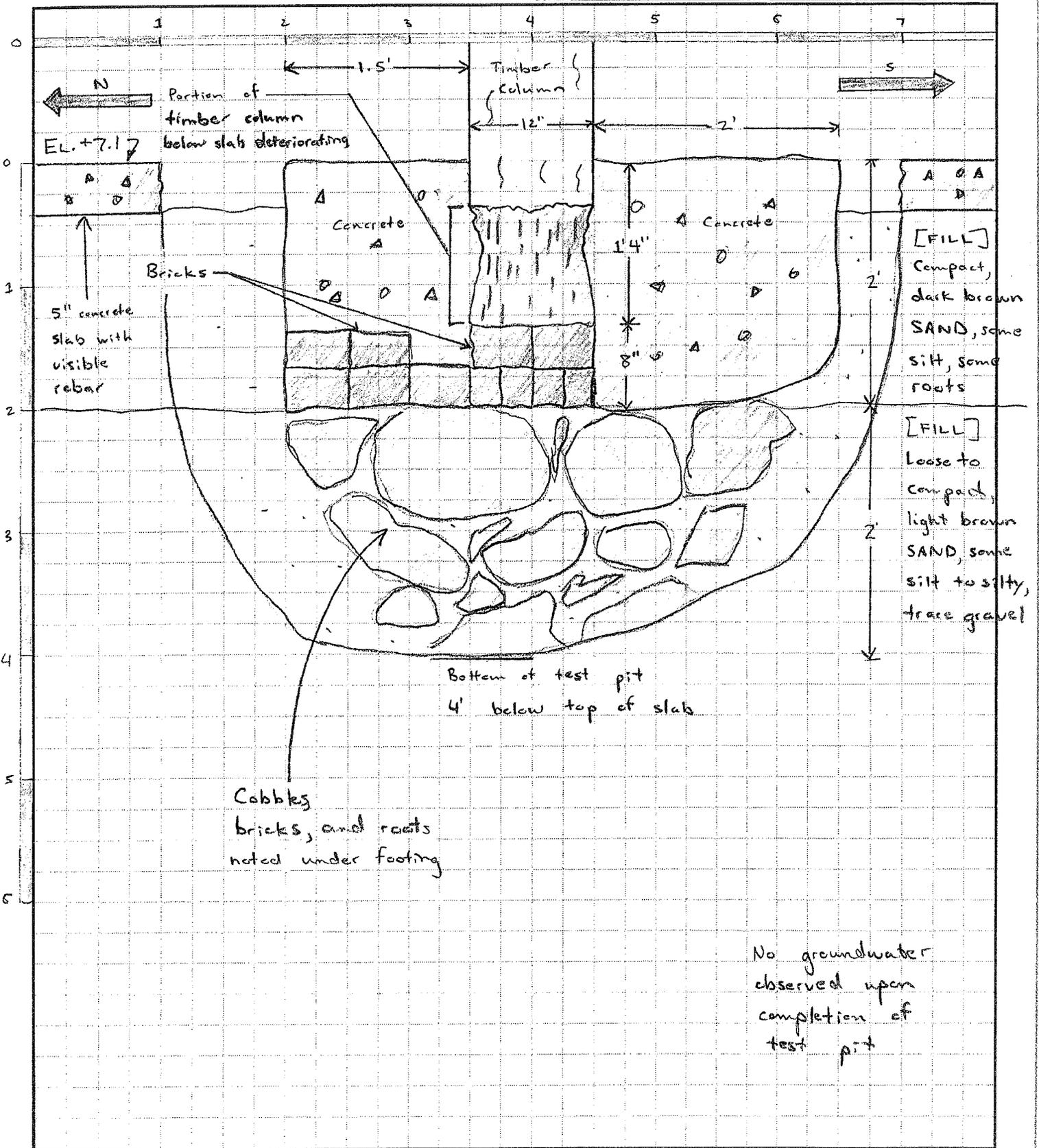


**MCPHAIL ASSOCIATES, LLC**  
 Consulting Geotechnical Engineers  
 2269 MASSACHUSETTS AVENUE  
 CAMBRIDGE, MA 02140

JOB 5400 TP-2 Plan View  
 SHEET NO. 3 OF \_\_\_\_\_  
 CALCULATED BY Scott Dennis DATE March 16, 2012  
 CHECKED BY CME DATE 3/30/12  
 SCALE 1" = 1'

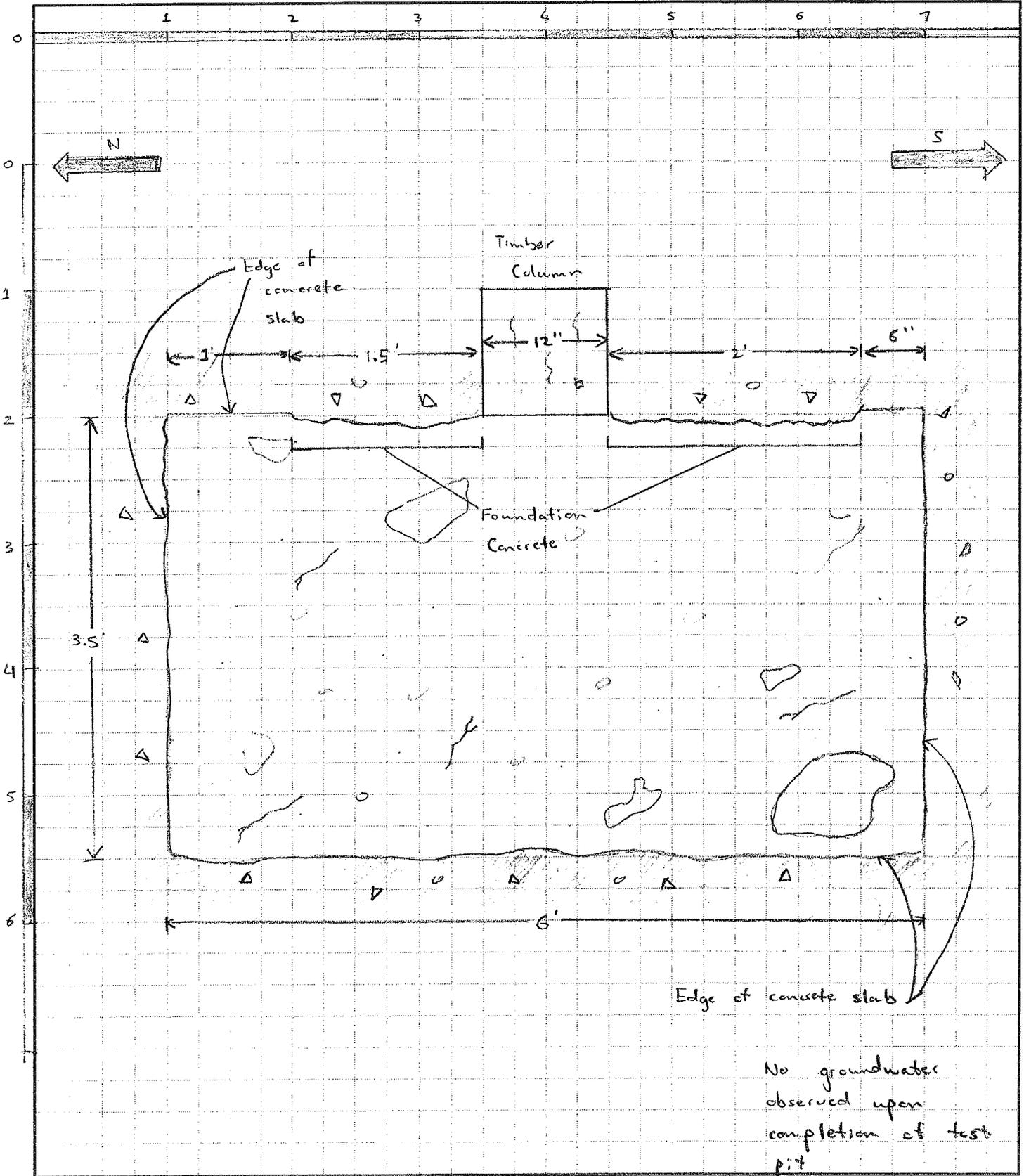






**MCPHAIL ASSOCIATES, LLC**  
Consulting Geotechnical Engineers  
2269 MASSACHUSETTS AVENUE  
CAMBRIDGE, MA 02140

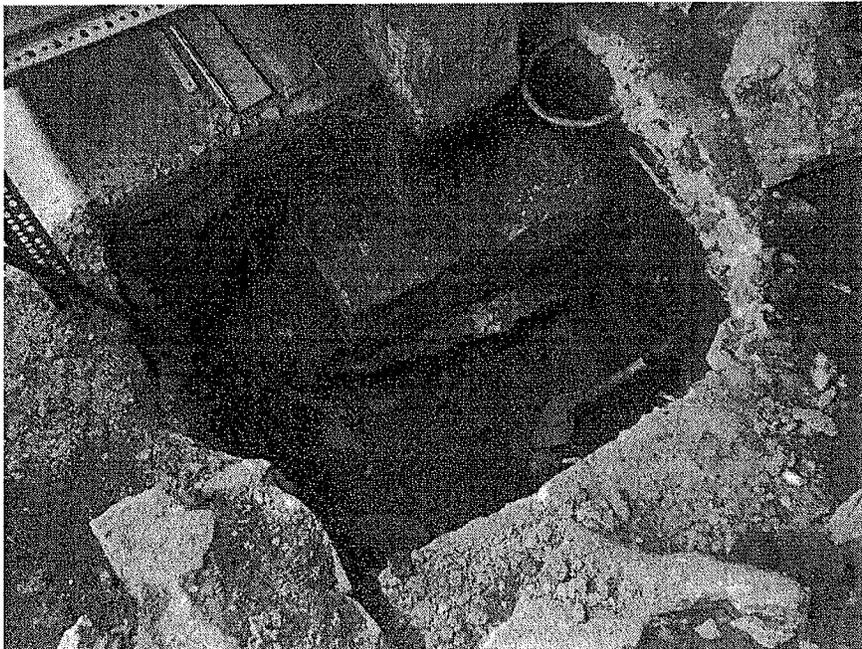
JOB 5400 TP-4 Plan View  
SHEET NO. 5 OF \_\_\_\_\_  
CALCULATED BY Scott Dennis DATE March 16, 2012  
CHECKED BY CME DATE 3/30/12  
SCALE 1" = 1'



**Photo #1: TP-1 – Plan View**



**Photo #2: TP-2 – Plan View**



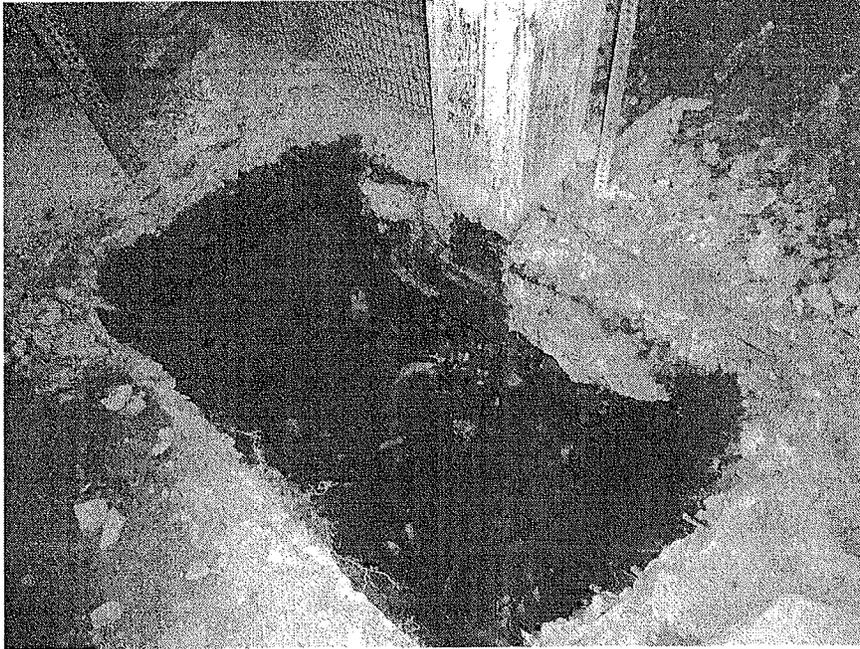
**Photo #3: TP-2 – Timber Column**



**Photo #4: TP-3 – Plan View**



**Photo #5: TP-4 – Plan View**



**Photo #6: TP-4 – Timber Column**





**APPENDIX C**

Carr-Dee Corp. Boring Logs

# CARR-DEE CORP.

37 LINDEN STREET

P.O. BOX 67

MEDFORD, MA 02155-0001

Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, LLC 2269 MASS. AVE. CAMBRIDGE, MA

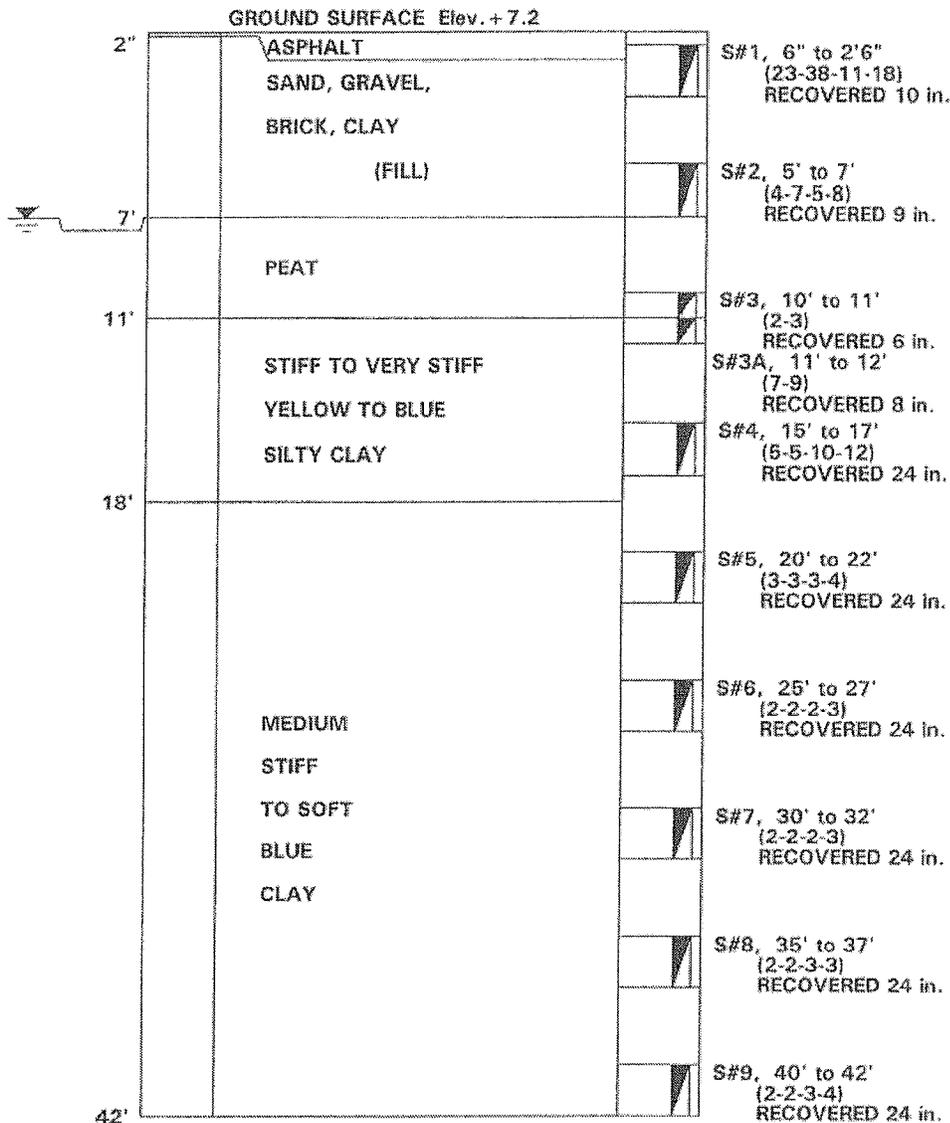
Date: 4-4-2012

Job No.: 2012-57

Location: 360 MYSTIC AVE. SOMERVILLE, MA

Scale: 1 in. = 7 ft.

## BORING 1



WATER LEVEL 7'  
 SIZE OF CASING NW LENGTH 12'0"  
 DRILLER: G.SMITH, INSPECTOR: T.CORMICAN  
 DATE STARTED & COMPLETED 4-3-2012

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches (±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

# CARR-DEE CORP.

37 LINDEN STREET

P.O. BOX 67

MEDFORD, MA 02155-0001

Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, LLC 2269 MASS. AVE. CAMBRIDGE, MA

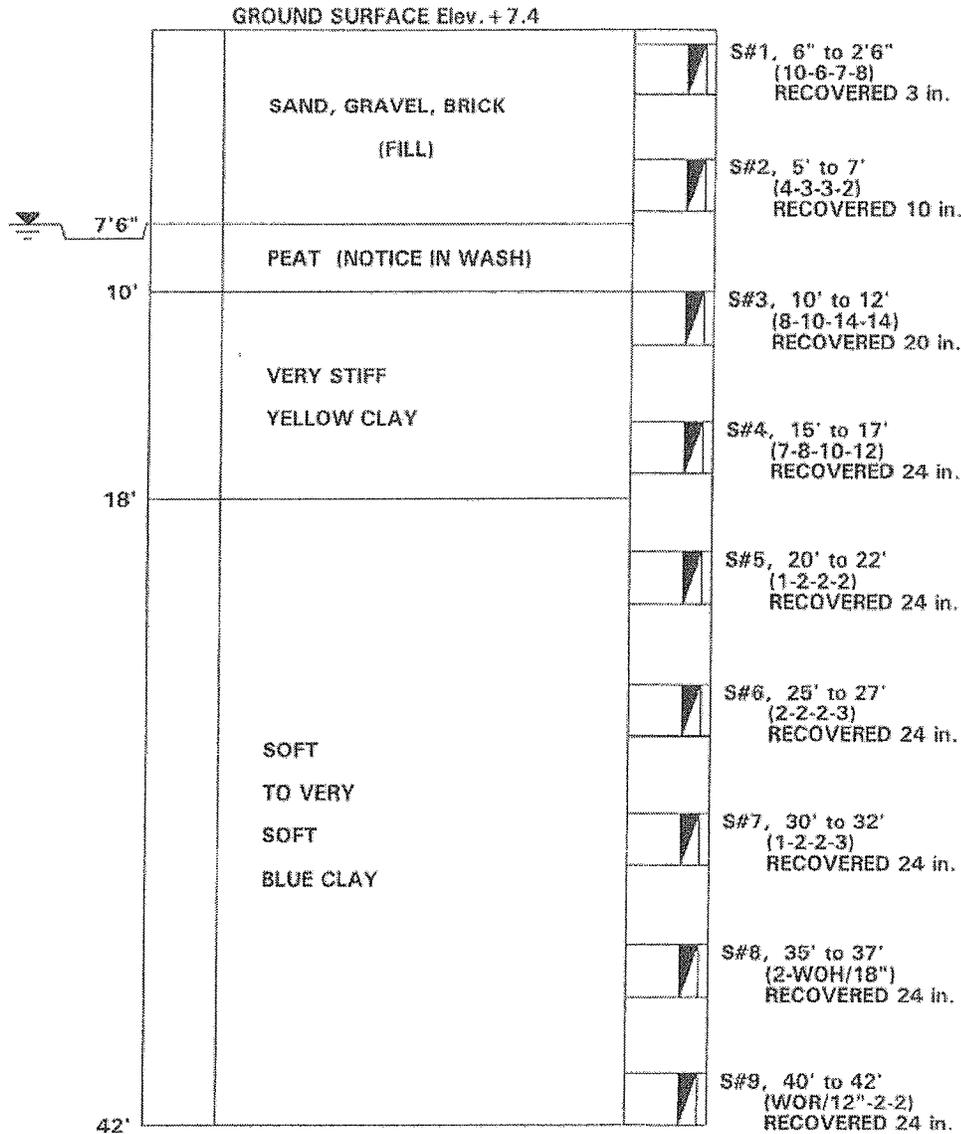
Date: 4-4-2012

Job No.: 2012-57

Location: 360 MYSTIC AVE. SOMERVILLE, MA

Scale: 1 in. = 7 ft.

## BORING 2



WATER LEVEL 7'6"  
 SIZE OF CASING NW LENGTH 18'0"  
 DRILLER: G. SMITH, INSPECTOR: T. CORMICAN  
 DATE STARTED & COMPLETED 4-3-2012

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches (±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

# CARR-DEE CORP.

37 LINDEN STREET

P.O. BOX 67

MEDFORD, MA 02155-0001

Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, LLC 2269 MASS. AVE. CAMBRIDGE, MA

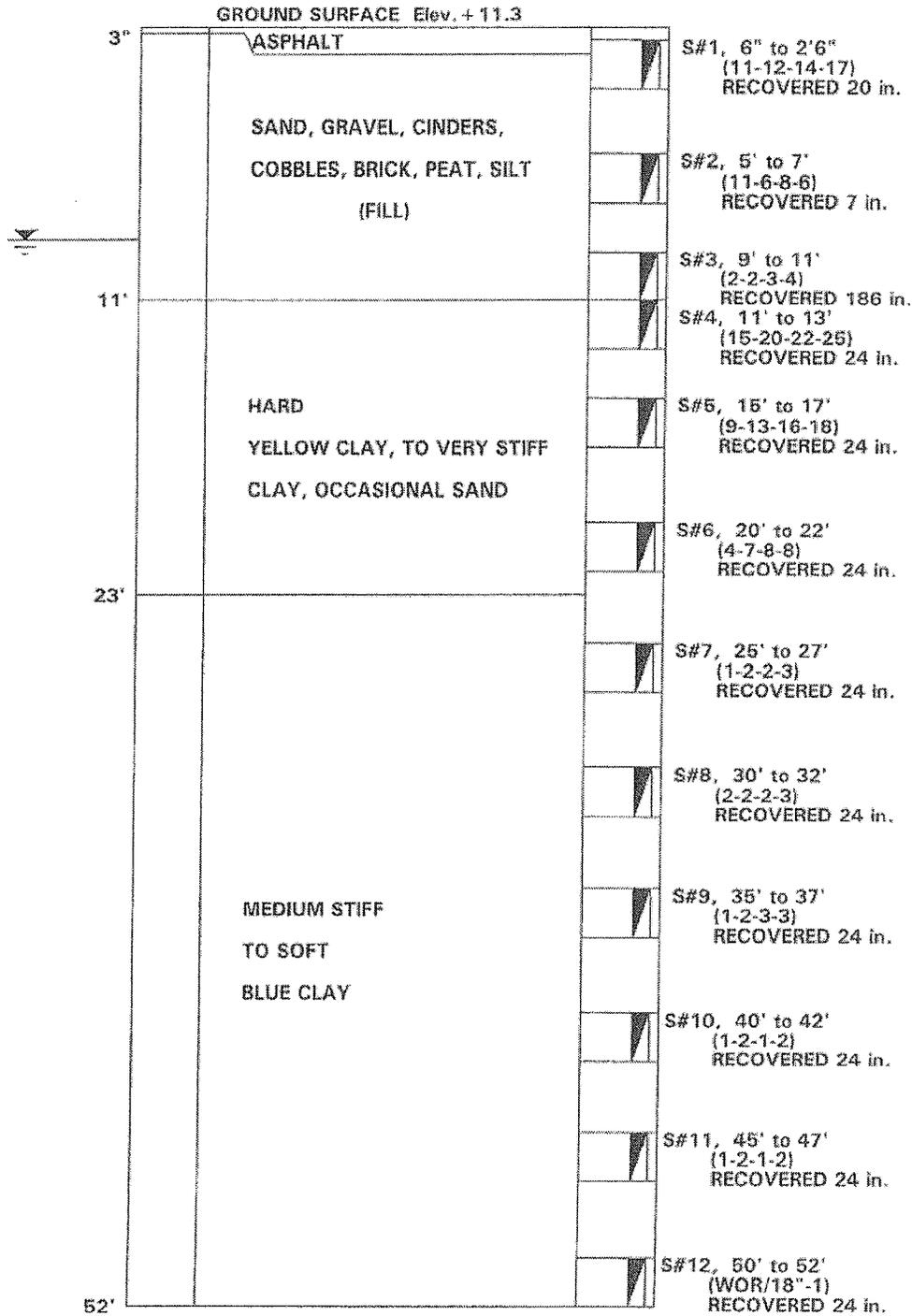
Date: 4-4-2012

Job No.: 2012-57

Location: 360 MYSTIC AVE. SOMERVILLE, MA

Scale: 1 in. = 7 ft.

## BORING 3



All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches (±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).

# CARR-DEE CORP.

37 LINDEN STREET

P.O. BOX 67

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Telephone (781) 391-4500

To: McPHAIL ASSOCIATES, LLC 2269 MASS. AVE. CAMBRIDGE, MA

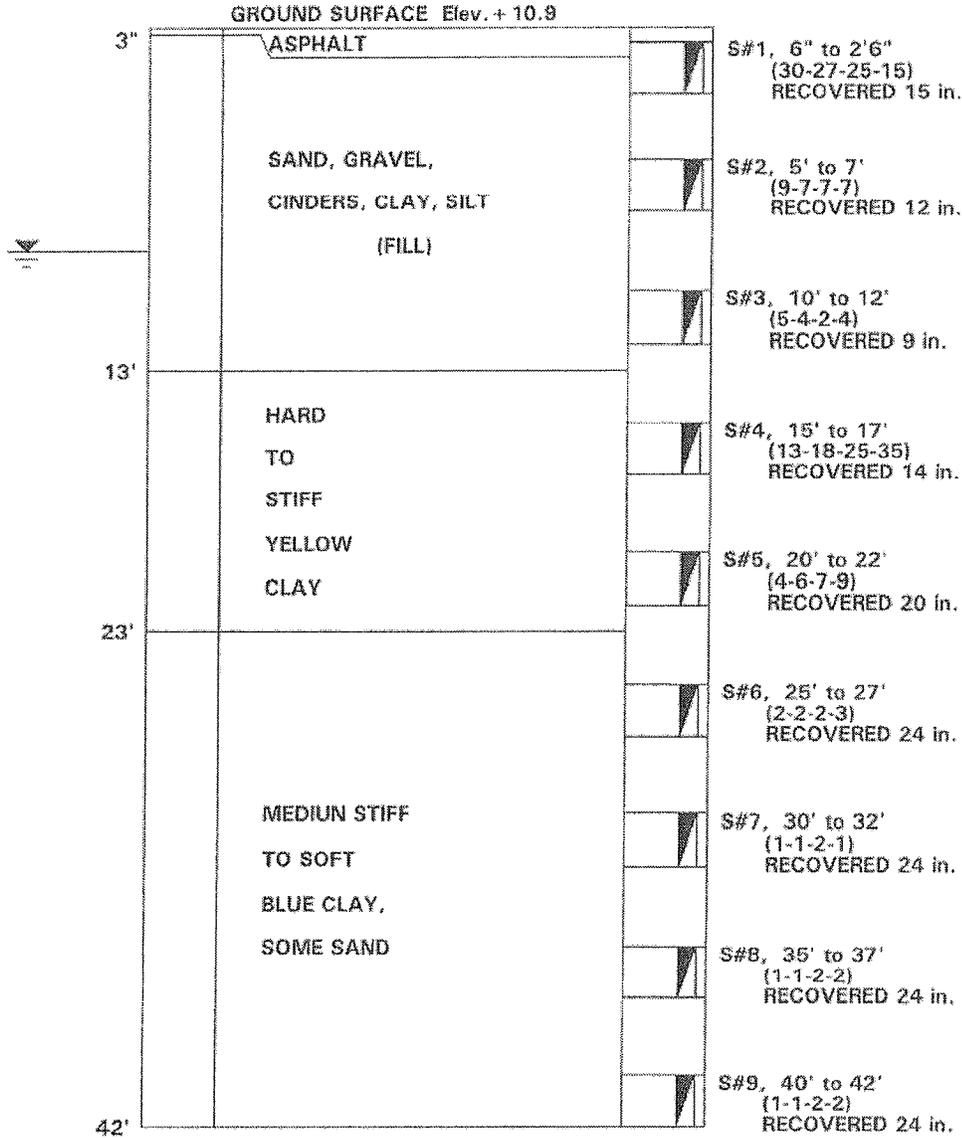
Date: 4-4-2012

Job No.: 2012-57

Location: 360 MYSTIC AVE. SOMERVILLE, MA

Scale: 1 in. = 7 ft.

## BORING 4



WATER LEVEL 8'6"  
 SIZE OF CASING NW LENGTH 15'0"  
 DRILLER: J. DESIMONE, INSPECTOR: T. CORMICAN  
 DATE STARTED & COMPLETED 4-2-2012

All samples have been visually classified by DRILLER. Unless otherwise specified, water levels noted were observed at completion of borings, and do not necessarily represent permanent ground water levels. Figures in parenthesis indicate the number of blows required to drive Two-inch Split Sampler 6 inches using 140 lb. weight falling 30 inches (±). Figures in column to left (if noted) indicate number of blows to drive casing one foot, using 300 lb. weight falling 24 inches (±).



May 22, 2012

ROOME & GUARRACINO, LLC  
SOMERVILLE, MASSACHUSETTS  
TEST OF BRICK  
360 MYSTIC AVENUE  
SOMERVILLE, MASSACHUSETTS

Test Number -- HH 230  
Date Received -- 5-1-12 Date Tests completed 5-9-12  
Source -- Picked up by T&L at the site from north wall.  
Specimens -- Five in place red solid brick.  
  
Test Procedure -- The brick was cleaned off the mortar by us prior to testing.  
ASTM C 67-04: "Sampling and Testing of Brick" methods as applicable for absorption and compression.  
  
Results -- The following data have been obtained:

SAMPLE MARK	DIMENSIONS, INCHES					COMPRESSIVE STRENGTH, PSI	ABSORPTION, %		SATURATION COEFFICIENT
	W	x	H	x	½ L		24-HOUR SOAK	5-HOUR BOIL	
#1	3.76		2.45		4.00	3,090	10.3	15.3	0.67
#2	3.77		2.38		4.07	2,280*	10.9	16.2	0.67
#3	3.71		2.37		4.07	2,280*	11.3	15.8	0.72
#4	3.70		2.37		4.04	2,110*	10.0	15.3	0.65
#5	3.74		2.36		4.04	<u>2,400*</u>	<u>11.2</u>	<u>16.2</u>	<u>0.69</u>
Averages						2,430*	10.7	15.8	0.68

ASTM DESIGNATION: C 62 – STANDARD SPECIFICATION FOR BUILDING BRICK

Class SW	2,500 Ind. Min.	20 Ind. Max.	0.80 Ind. Max.
	3,000 Avg. Min.	17 Avg. Max.	0.78 Avg. Max.

Class SW specs not met for the tests conducted where noted \* .

THE THOMPSON & LICHTNER COMPANY, INC.

Evan Karalolos  
Laboratory Director

**THE THOMPSON & LICHTNER COMPANY, INC.**

Consulting Engineers

Engineering and Testing Laboratories

111 First Street Cambridge, Massachusetts 02141 Tel (617) 492-2111

Fax (617) 492-5448

**JOINT SHEAR STRENGTH**

May 1,

2012

FOR Roome &amp; Guarracino, LLC, Somerville, Massachusetts

PROJECT NO. \_\_\_\_\_

PROJECT 360 Mystic Avenue, Somerville, Massachusetts

REPORT NO. \_\_\_\_\_ 1

SUBJECT In-Situ Measurement of Masonry Mortar Joint Shear Strength

SHEET NO. \_\_\_\_\_ 1 of 1

On the above date, as requested, the writer and our Mr. Robert Bearfield were assigned to the referenced project to conduct in-situ measurement of the brick mortar joint shear strength.

Testing was conducted in accordance with ASTM C 1531 (Method B).

The areas had been prepared by others accordingly at the basement inside the building

The testing was done on the interior brick wall.

The following results were obtained.

TEST NO.	LEVEL	WALL	GROSS AREA OF UPPER & LOWER BED JOINT, IN <sup>2</sup>	HORIZONTAL FORCE LOAD, LBS	AVERAGE BED JOINT SHEAR STRENGTH INDEX	CAUSE OF FAILURE / COMMENTS
1	Basement	North wall west section	56.7	5,082	89.6	Bed Joint Shear
2	Basement	West wall north section	56.7	5,929	104.6	Bed Joint Shear
3	Basement	South wall west section	56.7	3,872	68.3	Bed Joint Shear
4	Basement	North wall middle section	56.7	2,904	51.2	Diagonal Bed Joint Shear and brick fracture
5	Basement	North wall east section	56.7	5,203	91.8	Bed Joint Shear and brick fracture
6	Basement	East wall north section	56.7	7,260	128.0	Bed Joint Shear

Weather: Rain

THE THOMPSON & LICHTNER COMPANY, INC.

\_\_\_\_\_  
D. E. Owen

\_\_\_\_\_  
R. T. Bearfield