

## MEETING AGENDA

### Firehouse Sub-Committee

Thursday, January 18, 2024 – 4:30 PM

### Zoom

1. Call to Order
2. Approval of December 21, 2023 Minutes
3. Review of Budget/Timeline – Fire Station 340
4. Fire Stations 140 and 440
  - a. Budget and State Bond funding overview
    - Attachment 1: State Bonding Summary and Timeline
  - b. Discuss Fire Department's priorities for funds
  - c. Discuss Fire Station 140 foundation and determination on need for repair or replacement
    - Attachment 1: Trinity College Analysis, dated February 27, 2019
    - Attachment 2: Macchi Engineers, LLC Structural monitoring report (2019 report data)
    - Attachment 3: Email from Chuck Eaton, CHA "2023-11-02 Sta 140 Foundation Test Pits"
5. Adjournment

#### Join Zoom Meeting

<https://us02web.zoom.us/j/82112107004?pwd=MnpMZEp4Q0hEVkVNUXZtdlR5c1BQUT09>

Meeting ID: 821 1210 7004

Passcode: 20240118

#### One tap mobile

+16468769923,,82112107004#,,,,\*20240118# US (New York)

+16469313860,,82112107004#,,,,\*20240118# US

#### Dial by your location

• +1 646 876 9923 US (New York)

*The Town of Tolland is an Affirmative Action/Equal Opportunity Employer*

### 3. Review of Budget/Timeline – Fire Station 340

# Fire Station 340 Budget Summary

Updated: 1/16/2024

## Expense Accounts

Munis Account	Line	Original Budget	Adjusted Budget	Spent	Encumbrances	Available Budget
722420	Architectural Engineering	\$ 232,415.00	\$ 232,415.00	\$ 212,961.89	\$ 19,453.11	\$ -
722440	Building Contractor	\$ 2,257,000.00	\$ 2,260,680.00	\$ 1,361,644.50	\$ 899,035.50	\$ -
722460	Testing & Inspections	\$ 9,621.33	\$ 9,621.33	\$ 9,621.33	\$ -	\$ -
722495	Contingency	\$ 451,400.73	\$ 448,574.73	-	\$ -	\$ 448,574.73
722480	Bonding/Legal Costs	\$ 72,268.00	\$ 72,268.00	\$ -	\$ -	\$ 72,268.00
722497	Insurance/Builders Risk	\$ 4,000.00	\$ 2,491.00	\$ 2,491.00	\$ -	\$ -
722410	Advertising	\$ 572.94	\$ 572.94	\$ 572.94	\$ -	\$ -
733330	Misc. Reimbursables	\$ -	\$ 655.00	\$ 655.00	\$ -	\$ -
<b>Total</b>		<b>\$ 3,027,278.00</b>	<b>\$ 3,027,278.00</b>	<b>\$ 1,587,946.66</b>	<b>\$ 918,488.61</b>	<b>\$ 520,842.73</b>

## Change Orders Log

Number	Date	Amount	Transfer to Account	Description
1	8/2/2023	\$ 3,680.00	722440 - Building Contractor	well pump

#### 4a. Fire Stations 140 and 440 - Budget and State Bond funding overview

# State Bonding Summary/Timeline

## Fire Stations 340, 440, 140

- **Revised December 15, 2020 - Scope of Work Narrative** created by Clough Harbor & Associates (CHA)
  - Project estimated at \$5 Million dollars, including Architectural/Engineering Services
  - Replacement of two stations:
    - Fire Station 440 – 107 Plains Road
    - Fire Station 340 – 247 Gehring Road
  - Foundation replacement and expansion/upgrades
    - Fire Station 140 – 64 Crystal Lake Road
- **November 29 to December 6, 2021 - Hazardous Building Materials inspections conducted**
  - All 3 sites (Eagle Environmental)
- **June 2, 2022 - Bid Opening for Stations 340/440**
  - 6 Bids received
  - CHA begins review and evaluation of bids
  - Low bidder submits using a metal building that is not accredited
  - Next lowest bidders bid exceeded allowable funds without any add alternates
  - Town staff decides to reject all bids and rebid for 340 by itself
- **November 22, 2022 - Bid Opening for Station 340**
  - The Town received five bid proposals. The lowest bidder was within the project budget. CHA reviewed references and verified bid packet is in compliance.
- **December 15, 2022 – Notice of Award**
  - Notice of Award sent to low bidder, Lawrence Brunoli, Inc., for \$2,257,000
- **August 23, 2022 - Town Council approve a Firehouse Sub-Committee;** Membership: Brian Foley, Town Manager, Scott Lappen, Public Works Director, Beverly Bellody, Human Services Director, Lisa Hancock, Finance Director, John Littell, Fire Chief/Public Safety Director, Town Council Chair, Steve Jones, Councilor Luba as Vice as Vice Chair’s Designee.
  - [Minutes](#)
  - [Recording](#)
- **December 13, 2022 – Town Council adds Megan Massa as a member to the Firehouse Sub-Committee**
  - [Minutes](#)

## State Bonding

- **January 27, 2021 – Rep. Tammy Nuccio submits a 2021 House Bond Request** for the “Tolland Firehouse Capital Improvement Plan” for \$5,000,000, for the replacement of Stations 340 & 440 and significant rehab and remodel for Station 140
- **June 30, 2023 – Tolland awarded \$1,000,000 towards the Fire Station Projects by CT Bond Commission**
  - This does not increase the overall budget – only changes the *funding source* of \$1 million of the total \$5 million.
  - We cannot use the funds towards current fire station project (Station 340), because we did not (were not required to) follow CHRO guidelines and other requirements of state funded projects.
  - Can only apply the funds towards 440 and 140 and ONLY for the project scope as requested to the bond commission.
  - **Scope needs to be revised to fit in our remaining budget of \$1,737,618.33.**
- **October 11, 2023 - Received official notice of award** \$1,000,000 in funding from the State Bonding Commission, in the form of an Urban Act Grant administered by DESPP.
- **October 12, 2023 – Urban Act Grant discussion** (Kim Zigich –DESPP and Megan Massa)
  - Five years to use the funds
  - Send to OPM the list of improvements – verify projects are acceptable
  - Submit a narrow scope of work in the “Statement of Work” with grant paperwork
  - Need Town Council resolution to accept the grant award and execute contract
  - DESPP requests we take our time to put together exactly what we plan to do with accurate budget numbers. DESPP is not in a hurry to receive our documentation and prefers we submit once without revisions.

## Budget

- **March 23, 2021 - Public Hearing and Town Council Authorization to authorize appropriation, issuance of bonds and submission of bond issue to referendum.**  
*“Resolution authorizing an appropriation of \$5,000,000 for the Firehouse Improvement Project and the financing of said appropriation by the issuance of General Obligation Bonds of the Town and notes in anticipation of such bonds in an amount not to exceed \$5,000,000, or so much as may be necessary after deducting grants therefor, as well as establishing a date for a referendum on May 4, 2021.”*

- **Budget Breakdown**

<b>\$5,000,000.00</b>	<b>total budget</b>
- <u>\$3,027,278.00</u>	Station 340 budget
\$1,972,722.00	remaining budget for 140 & 440
- <u>\$ 227,840.00</u>	contract in-place with CHA for 140 (& 440)

\$1,744,882.00	
- <u>\$ 7,263.37</u>	Site testing completed at 140 & 440 (Nov-Dec 2021)
<b>\$1,737,618.63</b>	<b>Amount remaining for 140 &amp; 440</b>

\* Please note, the final amount remaining does not include a construction contingency for 140/440, nor any contingency funds potentially remaining after the Station 340 project is completed.

The \$1,000,000 grant award does not increase the total budget. It simply changes the SOURCE of \$1,000,000 of the original \$5,000,000 to be paid by State grant funding.

### 140 Foundation History

- **July 2017 – Steve Werbner, Town Manager, asks for a review of Town Buildings for potentially crumbling foundations.**
- **August 2017 – Jim Paquin, Building Official, observed map cracking at Station 140 (and Birch Grove School), consistent with defective concrete.**
- **December 14, 2017 - Visual inspection of Station 140 (and Birch Grove) foundations by Engineering Design and Testing Corps (Windsor, CT)**
  - concrete source known to be from JJ Mottes
  - Report to Town December 27, 2017
    - “The foundations of Fire Station 140 and Birch Grove Primary School Buildings functioned as intended, were not at imminent risk of falling down or caving in, and did not require immediate replacement at the time of the ED&T examination.”
- **February 2019 – Town hires Macchi Engineers to reevaluate and monitor Fire Station 140**
  - Concrete core extractions verified the presence of pyrrhotite (tested by Trinity College’s Environmental Science Program).
  - Survey monitoring was completed by JR Russo over a six-month period. No significant movement was detected during that time.
  - Cracks observed were not a structural concern.
- **November 2, 2023 – Email from CHA “tolland 140 foundation observation”**
  - Site visit to reevaluate the foundation, including test pits.
  - “Generally, the building is in good condition with no significant movement or cracking. In the southeast corner of the building, cracking in the foundation did travel up into the CMU in several locations, but it was unsure if it was from foundation settlement or pyrrhotite deterioration.
  - “Based on the data and observations we currently have, it does not appear the foundation is deteriorating at a fast rate and may last the life of the building;

however, the pyrrhotite levels are high enough in the tested cores to be of concern, so there is no guarantee that the rate of deterioration won't change."

- Options to address the foundation from CHA:
  1. Install a perimeter drain and roof gutter drain around the foundation, as well as damp proof the foundation. This would keep the foundation dry (moisture speeds up the deterioration process) and also allow a full inspection of the foundation when excavation for the perimeter drain installation is performed. This could be a project done before the bay extension to allow the Town to further evaluate the foundation and take preventive measures to hopefully prevent further cracking and deterioration of the concrete from the pyrrhotite.
  2. Do nothing. No movement or crack expansion has been observed yet. Continue to monitor. Consider proceeding with the bay extension since the structure currently does not show signs of distress. Understand there is a risk of the pyrrhotite shortening the service life of the building.
  3. Complete replacement of the foundation using underpinning to save the building structure. This is a very high cost option.

## 140 & 440 Project Priorities

- **September 12, 2023 – Bonding Meeting** (Brian Foley, Chuck Eaton, Megan Massa, John Littell, Carl Dojan, Rob Dabica)
  - Reviewed the list of repairs received from CHA in 2020
- **September 25, 2023 - Bonding Meeting** (Brian Foley, Chuck Eaton, Megan Massa, John Littell, Rob Dabica)
  - Fire Department identified priorities:
    - Station 140 – 64 Crystal Lake Road
      - Re-evaluate the foundation condition
      - Extend service bays in length – would also require the roof to be replaced over the bays
      - Add drains and holding tank to service bays
      - Add air conditioning
    - Station 440 – 107 Plains Road
      - New roof (existing roof is leaking and has poor pitch)
      - Repointing masonry where water has caused damage (due to roof leaking)
      - Add drains and holding tank to service bays
  - CHA to revise costs and reevaluate the foundation at Station 140
    - CHA re-evaluates foundation on November 2, 2023



4c. Fire Stations 140 and 440 - Discuss Fire Station 140 foundation and determination on need for repair or replacement



## Trinity Concrete Analysis

Sample from:

**Tolland Fire Department, Station 140  
64 Crystal Lake Road, Tolland, CT  
06084**

Date: February 27, 2019

ID: TLF001 A,B

Analyses performed by: Dr. Christoph Geiss and Dr. Jonathan Gourley of Trinity College's Environmental Science Program

The Trinity Concrete Analysis detects the presence of pyrrhotite through a thermo-magnetic measurement and quantifies the amount of sulfur through elemental chromatography. Pyrrhotite is an iron sulfide mineral that is believed to be responsible for the premature deterioration of concrete foundations. The two tests combined can estimate pyrrhotite in a sample to as low as 0.5% pyrrhotite. Assuming all the sulfur in the concrete sample is bound in pyrrhotite, the concentration of pyrrhotite is approximately 2.5 times the value of the concentration of sulfur. Since pyrrhotite is unlikely the only sulfur mineral present, this value should be considered a maximum estimate of pyrrhotite concentration. As of this report's date there is no State or Federal standard for pyrrhotite concentrations in concrete. This test simply confirms the presence of the mineral pyrrhotite in the sample(s) provided, estimates the maximum concentration and compares it (them) to the results obtained from other similar samples. The test cannot predict what will happen to the concrete in the future.

### Results:

SAMPLE	Loss in Magnetic Susceptibility ( $10^{-8}\text{m}^3/\text{kg}$ )	Average concentration of Sulfur (%)	Estimated Pyrrhotite max concentration (%)
TLF001A (NE wall)	41.8	0.45	1.12
TLF001B (SW wall)	72.9	0.60	1.50

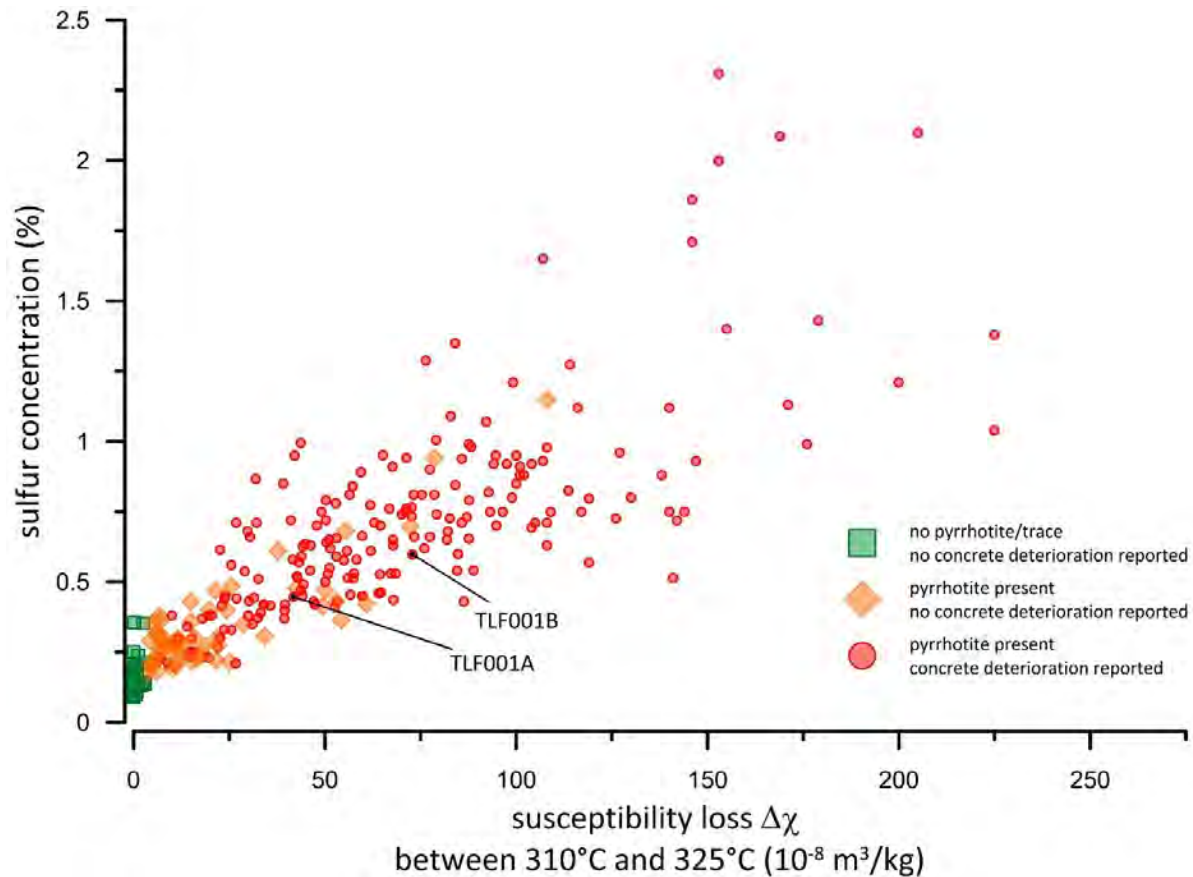
**Pyrrhotite was detected in samples TLF001A and TLF001B.**

### Graphical comparison:

Samples were plotted (see reverse side) with similar foundation samples analyzed to date. The graph shows a relationship between the amount of pyrrhotite (as measured via magnetic susceptibility) on the horizontal axis and the concentration of sulfur on the vertical axis. There are other minerals that could contain sulfur in concrete and therefore samples that are clean of

[continued on reverse]

pyrrhotite still may show some minor sulfur concentrations (as seen in the range of sulfur concentrations for samples with no magnetic signal due to pyrrhotite).



### Disclaimer and Limitation of Liability:

The analytical work performed in furtherance of this Trinity Concrete Analysis was conducted in accordance with standard laboratory practices and the data reflected in this report reflects Trinity College's ("Trinity") reasonable attempt to generate accurate results for the specific sample(s) received by Trinity on [2/21/19]. The results of this Trinity Concrete Analysis pertain only to the samples analyzed in preparation of this report and should not be used in the interpretation of any other analysis. This report may only be reproduced in full and may not be reproduced without Trinity's express written consent.

Trinity, its agents, and employees make no guarantees or warranties of any kind relating to the Trinity Concrete Analysis performed and the data furnished hereunder. Trinity hereby disclaims all warranties of any kind including, but not limited to, any express warranties, statutory warranties, and any implied warranties of merchantability or fitness for a particular purpose. Under no circumstances will Trinity, its agents, or employees be liable or responsible for any direct, indirect, incidental, consequential (including damages from loss of business, lost profits or goodwill, litigation, or the like), special, exemplary, punitive, or other damages, under any legal theory arising out of or in any way relating to the Trinity Concrete Analysis performed and the data furnished by Trinity, its agents, or employees.

The disclaimers and limitations set forth in this Trinity Concrete Analysis are an integral part of Trinity's pricing and delivery of this Trinity Concrete Analysis and the recipient accepts these terms.

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# MACCHI ENGINEERS, LLC

*Diversified Structural and Civil Engineering Services*

MICHAEL PLICKYS, P.E.  
JOHN BROCHU, P.E.  
DOUGLAS CAMP, P.E.

August 17, 2023

Mr. Scott Lappen, Tolland Director of Public Works  
Hicks Memorial Municipal Center  
21 Tolland Green, 2<sup>nd</sup> Level  
Tolland, CT 06084

Re: Structural Monitoring of Fire Station 140  
64 Crystal Lake Road  
Tolland, CT

Dear Scott,

As you are aware, concrete core extraction and testing was conducted on the foundations of the above referenced building in February 2019. Testing was completed by Trinity College and a Report was issued on 2/17/19. Test results indicated that pyrrhotite was present in the foundation concrete. At that time, the Town engaged Macchi Engineers to conduct both visual and survey monitoring of the structure to determine whether any measurable movements were occurring. The survey work was completed over an approximate 6-month period in 2019 by JR Russo, East Windsor Connecticut. A total of 19 monitoring points were set up at various locations around the building and included the following locations: See below and enclosed plans.

- 8 Robotic Prisms (these are the ones up higher on the block)
- 8 Pins (these are mounted lower on the foundation)
- 3 points on the garage floor

Enclosed please find the survey monitoring information provided by JR Russo. Based on the information provided, no significant movements were detected during that timeframe.

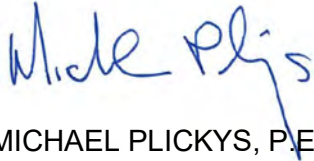
In addition to the survey monitoring, inspections of the structure were completed by our office which included visually inspecting exposed areas throughout the building and the inspection of an existing footing at the northwest corner of the building that was exposed by the town on 4/18/19. Our inspections indicated that the structure was in good overall condition with no observable signs of structural distress or map cracking as the result of pyrrhotite oxidation.

Mr. Scott Lappen  
Tolland Director of Public Works

August 17, 2023

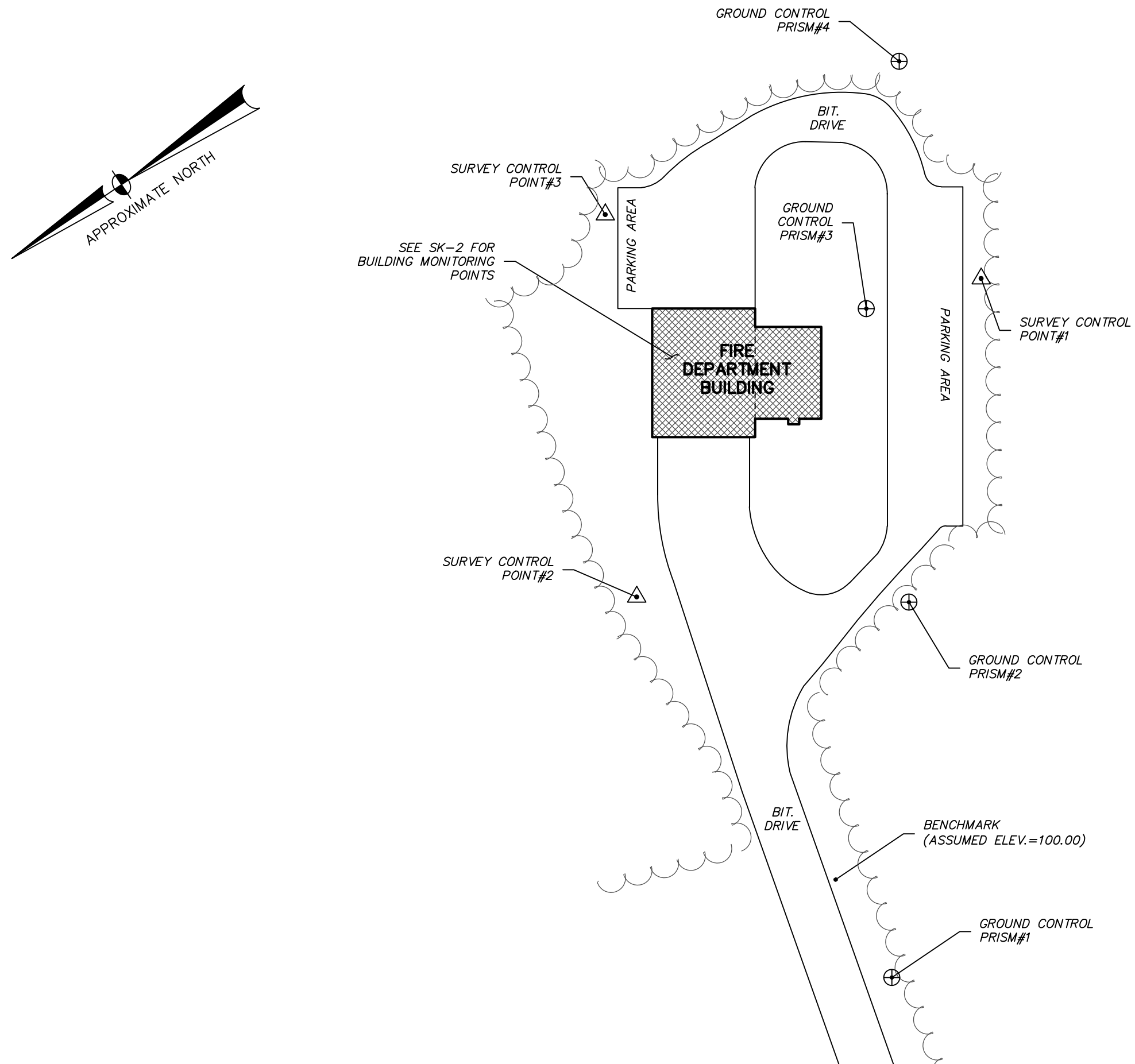
If you have any questions, please call.


Yours truly,  
MACCHI ENGINEERS, LLC

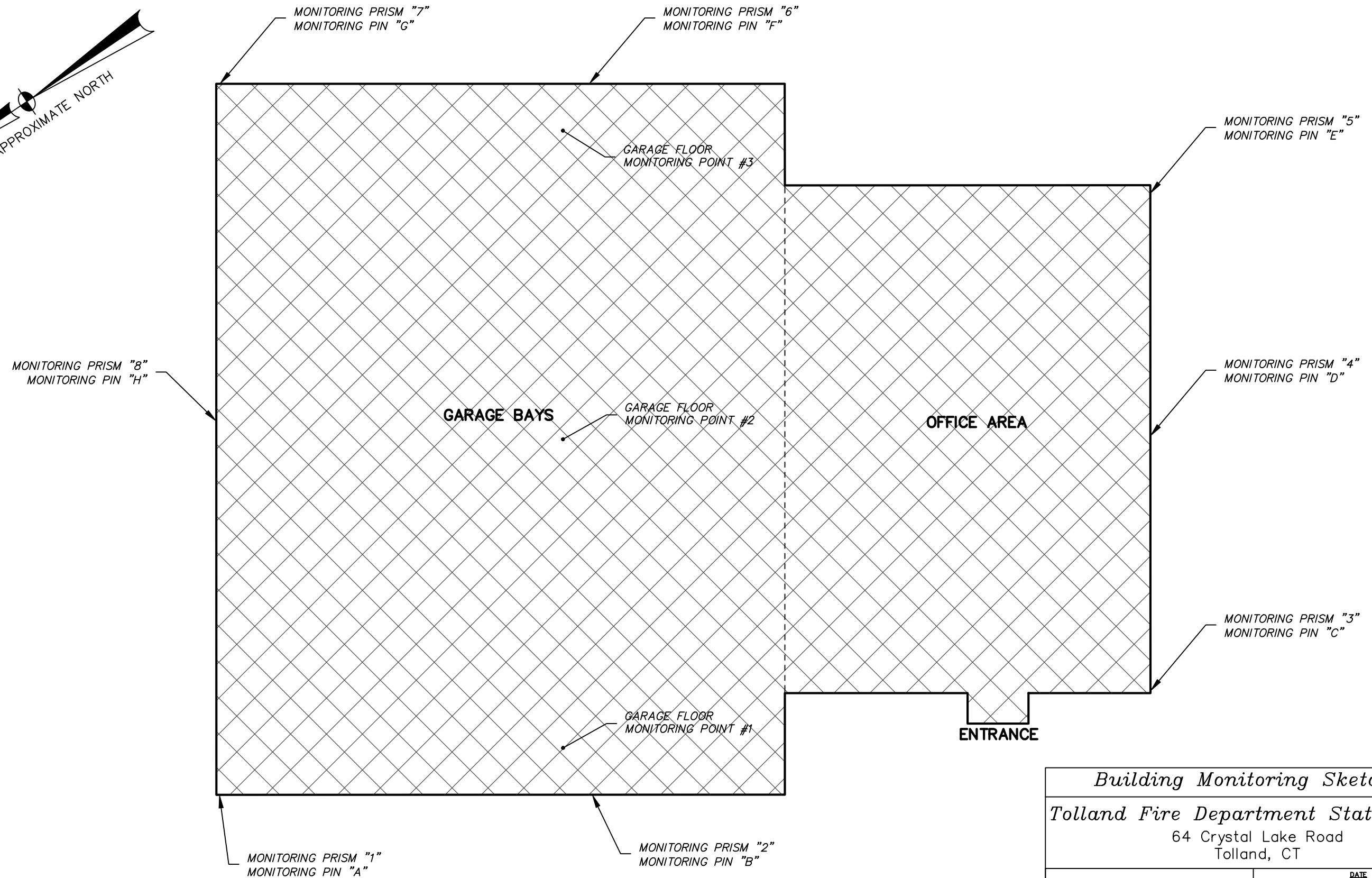
A handwritten signature in blue ink that reads "Mike Plickys". The signature is written in a cursive, flowing style.

MICHAEL PLICKYS, P.E.  
Principal in Charge  
g:\Tolland Fire House\8/17/23 Letter.doc

Encl.



Overall Monitoring Sketch	
Tolland Fire Department Station 140	
64 Crystal Lake Road Tolland, CT	
 <p><b>RUSSO</b> SURVEYORS • ENGINEERS SERVING CT &amp; MA</p> <p>J.R. Russo &amp; Associates, LLC 1 Shoham Rd East Windsor, CT 06088 • CT 860.623.0569 • MA 413.785.1158 www.jrusso.com • info@jrusso.com</p>	DATE 5-6-19
	SCALE 1"=60'
	JOB NUMBER 2019-030
	SHEET SK-1



### Building Monitoring Sketch

**Tolland Fire Department Station 140**

64 Crystal Lake Road  
Tolland, CT



J.R. Russo & Associates, LLC  
1 Shoham Rd East Windsor, CT 06038 • CT 860.623.0569 • MA 413.785.1158  
www.jrusso.com • info@jrusso.com

DATE  
5-6-19

SCALE  
1"=10'

JOB NUMBER  
2019-030

SHEET  
SK-2

**MONITORING CHART**      **Prepared For: Macchi Engineers LLC****Job Location: Tolland Fire Department Station 140**      **Prepared By: J.R. Russo & Associates, LLC**

POINT ID	BASELINE VALUE	MONITORING SESSION #1 5/21/2019	MONITORING SESSION #2 6/28/2019	MONITORING SESSION #3 7/26/2019	MONITORING SESSION #4 8/29/2019	MONITORING SESSION #5 10/18/2019
PRISM 1	122.07	122.07	122.08	122.09	122.07	122.08
PIN A	113.71	113.71	113.72	113.73	113.72	113.71
PRISM 2	122.07	122.08	122.07	122.08	122.07	122.07
PIN B	113.76	113.77	113.78	113.78	113.77	113.77
PRISM 3	122.13	122.13	122.12	122.13	112.13	122.12
PIN C	114.24	114.23	114.25	114.24	114.24	114.24
PRISM 4	122.15	122.16	122.15	122.15	122.15	122.15
PIN D	114.29	114.29	114.30	114.28	114.30	114.30
PRISM 5	122.26	122.26	122.25	122.26	122.25	122.26
PIN E	114.38	114.39	114.39	114.39	114.39	114.38
PRISM 6	122.10	122.10	122.09	122.10	122.10	122.09
PIN F	113.77	113.76	113.77	113.75	113.76	113.77
PRISM 7	122.15	122.15	122.14	122.14	122.14	122.13
PIN G	113.80	113.79	113.80	113.79	113.79	113.80
PRISM 8	122.17	122.18	122.17	122.19	122.19	122.17
PIN H	114.20	114.21	114.22	114.20	114.20	114.21
GAR. FLR. #1	113.85	113.85	113.85	113.85	113.85	113.86
GAR. FLR. #2	114.53	114.53	114.52	114.52	114.52	114.52
GAR. FLR. #3	113.86	113.86	113.85	113.85	113.85	113.86
GRND. CONTROL #1	100.75	100.76	100.75	100.75	100.75	100.75
GRND. CONTROL #2	112.95	112.95	112.95	112.95	112.95	112.94
GRND. CONTROL #3	114.85	114.85	114.85	114.85	114.85	114.85
GRND. CONTROL #4	121.94	121.94	121.94	121.94	121.94	121.93
SRVY. CONTROL #1	116.18	116.18	116.18	116.18	116.18	116.18
SRVY. CONTROL #2	107.64	107.66	107.65	107.64	107.65	107.65
SRVY. CONTROL #3	113.09	113.09	113.10	113.09	113.09	113.10
BM	100.00	100.00	100.00	100.00	100.00	100.00



**From:** [Eaton, Chuck](#)  
**To:** [Megan Massa](#); [Jim Paquin](#)  
**Cc:** [Cooley, Ryan](#); [Reed, Chad](#); [O'Hara, Alec](#); [Olsted, Daniel](#); [Carpentier, Becky](#)  
**Subject:** [EXTERNAL]tolland 140 foundation observation  
**Date:** Thursday, November 2, 2023 3:54:35 PM  
**Attachments:** [140 foundation test pit locations.pdf](#)  
[2023-11-02 Sta 140 Foundation Test Pits.pdf](#)

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Hi Megan,

Ryan Cooley and I observed test pits at station 140 this afternoon (2023-11-02).  
 Two test pits were excavated by DPW as shown on the attached plan.

The excavation was as deep as the foundation footing.  
 The test pit on the west side of the building (parking lot side) did not show any cracking.  
 The test pit on the east side had a vertical crack with a few horizontal cracks starting from the vertical one. It is worth noting that this side of the building does show more horizontal cracking at the top of the foundation above grade. This side of the building also appeared wetter than the west side.

Generally, the building is in good condition with no significant movement or cracking. In the southeast corner of the building, cracking in the foundation did travel up into the CMU in several locations, but it was unsure if it was from foundation settlement or pyrrhotite deterioration.

Ryan and I discussed different options given the unknown life span of pyrrhotite concrete:

1. Install a perimeter drain and roof gutter drain around the foundation, as well as damp proof the foundation. This would keep the foundation dry (moisture speeds up the deterioration process) and also allow a full inspection of the foundation when excavation for the perimeter drain installation is performed. This could be a project done before the bay extension to allow the Town to further evaluate the foundation and take preventive measures to hopefully prevent further cracking and deterioration of the concrete from the pyrrhotite.
2. Do nothing. No movement or crack expansion has been observed yet. Continue to monitor. Consider proceeding with the bay extension since the structure currently does not show signs of distress. Understand there is a risk of the pyrrhotite shortening the service life of the building.
3. Complete replacement of the foundation using underpinning to save the building structure. This is a very high cost option.

Based on the data and observations we currently have, it does not appear the foundation is deteriorating at a fast rate and may last the life of the building; however, the pyrrhotite levels are high enough in the tested cores to be of concern, so there is no guarantee that the rate of deterioration won't change.

Please let us know if you would like to have a meeting to discuss this further.

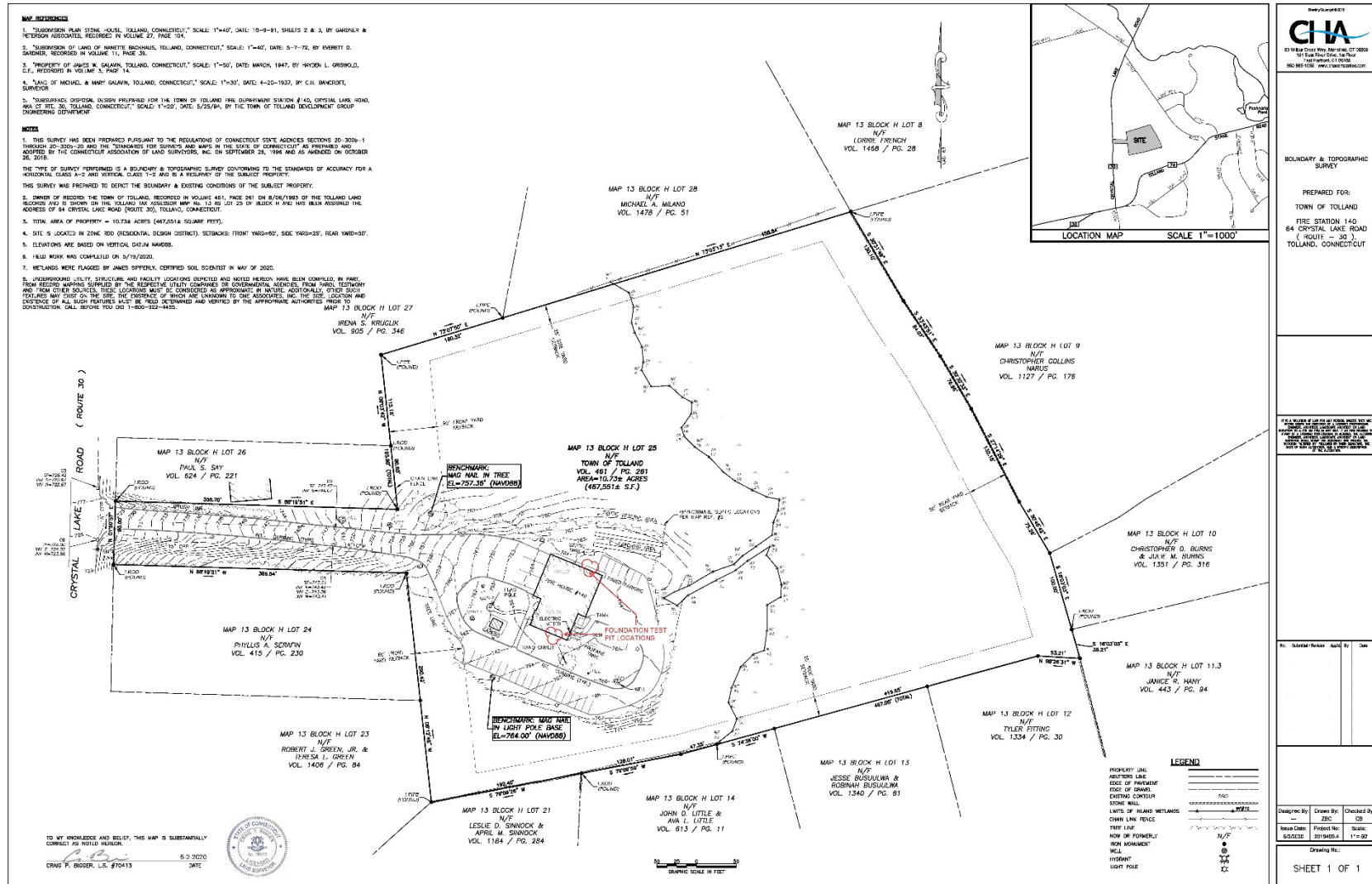
Thanks  
 Chuck

**Chuck Eaton, PE, LEED-AP, NICET, NETTCP**

Tolland Town Engineer

(860) 214-2294

[ceaton@chasolutions.com](mailto:ceaton@chasolutions.com)







November 2, 2023  
Tolland Fire Station 140  
Foundation test Pit  
Observations

Southeast Foundation Corner of Vehicle Bay



Eastern Foundation Wall (Vertical Crack with Horizontal Crack at the Top)