Stan A. Huber Consultants, Inc.
Health Physics and Radiation Safety Services

200 North Cedar Road – New Lenox, Illinois 60451-1751 – (800) 383-0468 or (815) 485-6161 – FAX (815) 485-4433 – Email sahci@sahci.com – Home Page www.sahci.com

September 9, 2016

Robert W. Acker, P.E.
GEI Consultants, Inc.
Suite 140
400 N. Lakeview Parkway
Vernon Hills, Illinois 60061

RE: Thorium Monitoring Report – 401 N. Michigan Avenue

Dear Mr. Acker:

Stan A. Huber Consultants, Inc. (SAHCI) was hired by your firm to provide thorium monitoring during excavation activities performed during the construction of a building at 401 N. Michigan Avenue in Chicago, Illinois. The monitoring was performed from May 17, 2016 – August 31, 2016, as needed.

The following construction activities were monitored for thorium during the project:

- Micropile Installation
- Excavation of Parking Level C
- Excavation of Concourse Level B
- Excavation of Riverwalk Planter Area

Instrumentation

Surface gamma scans were performed by Brian Schmidt and Steven Kowalczyk using Ludlum Model 2221 Scaled / Ratemeters (serial no. 126496 and 126497) with attached Ludlum Model 44-10 2"x2" NaI detectors (w/ 6" lead shield). The instruments were calibrated on October 15, 2015. The average background count rate for this location ranged from 1700 to 1800 counts per minute (cpm).

Each instrument has a corresponding calibrated count rate threshold equivalent to the US Environmental Protection Agency (USEPA) action level of 7.1 picocuries per gram (pCi/g) total thorium:

Ludlum Model 2221 (serial no. 126496) = 7054 cpm
Ludlum Model 2221 (serial no. 126497) = 6018 cpm

Micropile Installation

Micropiles were installed throughout the property as part of the new building construction. The depth to native material below fill varies depending on the location. The fill depth underneath Parking Level C, which is the existing parking garage for the adjacent building, is only 3 to 5 feet below the surface; whereas the fill depth in areas surrounding the parking structure is approximately 30 feet. It should be noted that Level B is street level and Level

C is basement level. Micropiles were installed on both Parking Level C and Concourse Level B. A layout of the micropile locations can be found in Figure 1 – Micropile Locations. There are three different designations for micropiles: A, B, and C.

"A" micropiles are all located in Parking Level C and were pushed in so no spoils were generated and no monitoring was performed during installation.

All "B" micropiles, with the exception of B-1, B-2, and B3, are located in the Parking Level C. Rather than monitor each individual micropile, test pits were performed prior to installation since the fill level requiring monitoring was only 5 feet deep. B-1, B-2, and B3 were monitored during installation since they are located outside of Parking Level C where the fill is 30 feet deep. Test pit monitoring is detailed in the following section, "Excavation of Parking Level C."

"C" micropiles are all located on Concourse Level B along the existing Riverwalk Area. Spoils that were generated during the drilling process were monitored in 10 foot increments since very little soil makes its way to the surface. It should be noted that there is a large 10-foot-deep utility vault underneath the Riverwalk Area. The micropiles at this location were installed at ground surface, but the initial 10 feet is void space and recorded as "Vault."

The maximum gamma count rate for each drilling interval of fill material was recorded; see Attachment A – Micropile Survey Form. The count rates for the micropile spoils ranged from 1,689 cpm to 3,285 cpm. No count rates were found at any time that exceeded the threshold limit corresponding to 7.1 pCi/g total thorium.

Excavation of Parking Level C

The initial excavations (May 2016) in Parking Level C were micropile test pits performed in two separate areas. These are identified on Figure 2 – Parking Level C Floor Plan as areas 1A and 2A (marked in blue). The test pits were located where micropiles B-7 through B16 and B-17 through B-26 were going to be installed. The maximum excavation depth in this area is 3.5 feet deep.

Once the micropiles were installed in Parking Level C, the areas surrounding them were excavated (June 2016). Test pits had only been performed on the "B" micropiles, so surveys were required to be performed during all excavation work on the remaining micropile locations. These are identified on Figure 2 – Parking Level C Floor Plan as areas 1B through 7 (marked in red).

Surface Gamma scans were performed using the survey instruments identified above, and measurements were taken on the floor and walls of each excavation in 18 inch lifts. The maximum count rates and excavation sketches are detailed in Attachment B – Parking Level C Survey Forms. No count rates were found at any time that exceeded the threshold limit corresponding to 7.1 pCi/g total thorium.

Excavation of Concourse Level B

Concourse Level B is located at street level with the Chicago River to the South, Michigan Avenue to the West, and N. Water Street to the North. Excavations were performed in this

area since existing caissons were going to be utilized to support the new building structure. Excavations were performed in this portion of the site from late June 2016 to early August 2016. They are identified on Figure 3 – Concourse Level B Floor Plan and marked as areas 8 – 20 in red. The maximum excavation depth in this area is 10 feet deep around the existing caissons, but most areas were excavated 5 feet or less.

Surface Gamma scans were performed using the survey instruments identified above, and measurements were taken on the floor and walls of each excavation in 18 inch lifts. The maximum count rates and excavation sketches are detailed in Attachment C – Concourse Level B Survey Forms. No count rates were found at any time that exceeded the threshold limit corresponding to 7.1 pCi/g total thorium.

Excavation of Riverwalk Planter Area

The Riverwalk Planter Area is on Concourse Level B, adjacent to the Chicago River. The material in this area had been previously imported as planting medium in the early 1960's, but since the origin of the material could not be determined, monitoring was performed throughout the excavation process. Excavations were performed in this portion of the site in late August 2016. They are identified on Figure 4 – Concourse Level B Floor Plan - Riverwalk and marked as areas 1 – 6 in red. The maximum excavation depth in this area is 5 feet.

Surface Gamma scans were performed using the survey instruments identified above, and measurements were taken on the floor and walls of each excavation in 18 inch lifts. The perimeter walls of this area are all concrete from previous construction. The maximum count rates and excavation sketches are detailed in Attachment D – Riverwalk Planter Area Survey Forms. No count rates were found at any time that exceeded the threshold limit corresponding to 7.1 pCi/g total thorium.

Additional Monitoring

Since no count rates were identified above the 7.1 pCi/gram threshold limit, no additional soil sampling, air monitoring, or personnel monitoring were performed.

Thank you for your assistance with this project. If you have any questions or need additional information, please call me at (815) 485-6161.

Sincerely,
Stan A. Huber Consultants, Inc.

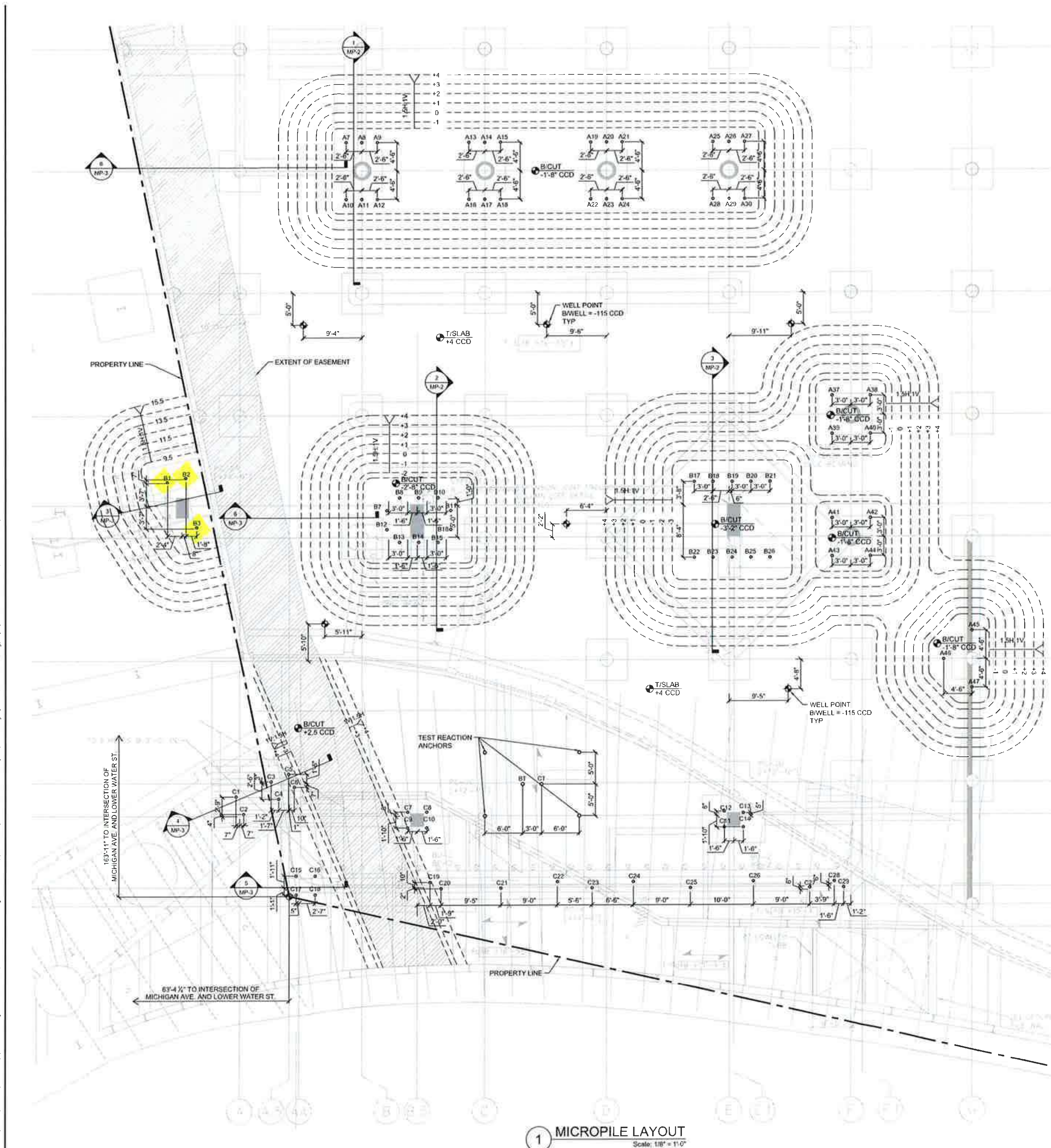
Glenn Huber, CHP
President

Figure 1

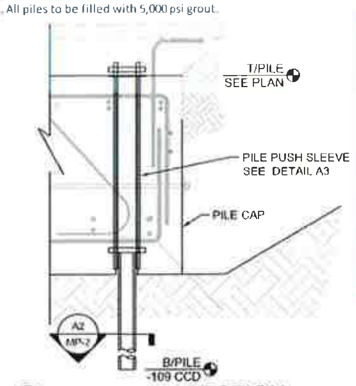
Micropile Locations

401 N. Michigan Drive Thorium Monitoring

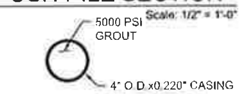
Stan A. Huber Consultants, Inc.
200 N. Cedar Road
New Lenox, IL 60451



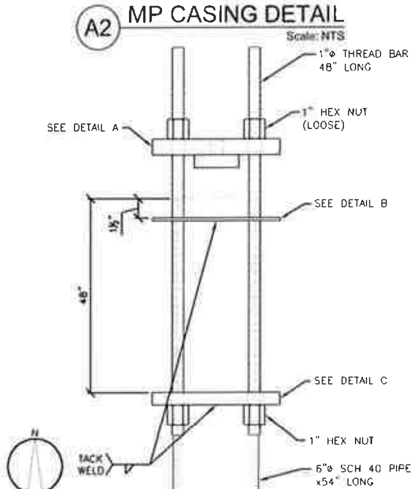
(1) MICROPILE LAYOUT
Scale: 1/8" = 1'-0"



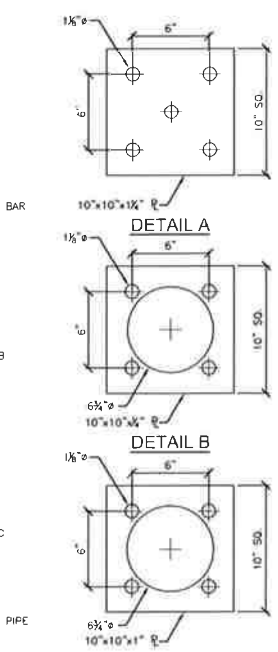
(A1) PUSH PILE SECTION
Scale: 1/2" = 1'-0"



(A2) MP CASING DETAIL
Scale: NTS



(A3) PUSH PIER SLEEVE
Scale: NTS



Construction Sequence

General

1) Establish preconstruction survey.
2) Locate, protect, and/or relocate all utilities affected by foundation installation.

Type A Piles

1) Excavate existing pile caps.
2) Construct pile cap additions, including installation of push pile sleeves.
3) Once the pile caps have gained sufficient strength, install push piles through sleeves. Push piles shall be installed to 1.5 times the design load.
4) Pre-load push piles at 30 kips (Dead load = 199 kips)
5) During construction of superstructure, add additional pre-load of 15-18 kips to account for additional dead load. (Dead load = Up to 332 kips total) Adjust pre-load as necessary, per GEI, to avoid over stressing foundation elements.

Type B & C Piles

1) Drill micropile casing to tip elevation using externally flushed drill method.
2) Grout micropile to top of casing.
3) Install pressure cap and pressure grout micropile.
4) Excavate for pile cap (by others).
5) Cut-off micropiles to proper elevation.
6) Set rebar and pour pile cap (by others).

CONSTRUCT COLUMN JACKETS INTEGRAL WITH PILE CAPS.

CONTRACTOR SHALL PROVIDE CALCS AND DESCRIPTION OF DEAD LOAD AVAILABLE AT TIME OF PRELOAD AND TESTING THAT MATCHES DEMO PLAN AND CONTROL OF SUPERIMPOSED LOADS AT THE SITE AT EACH LOCATION.

UPDATE PER RECENT DRAWINGS.

CONTRACTOR SHALL VERIFY EXCAVATION AND CONTROL OF SUPERIMPOSED LOADS ON SITE WILL NOT HARM THE INTEGRITY OR DAMAGE EXISTING STRUCTURE

CONTRACTOR SHALL UPDATE SUBMITTAL TO PERMIT PROGRESS SET DATED 19 APRIL 2016

Notes

1. All grout shall be f'c = 5,000 psi @ 28 days.
2. All micropile casing shall have a minimum yield strength, fy = 80 ksi.
3. One load test each for Type B and C shall be performed in general accordance with CBC and ASTM D1143 procedures to 2 times the design capacity.

Pile No.	Type	Casing Size	T/Pile	B/Pile[1]	Batter	Capacity[2]
A1 - A6	Intentionally Ommited					
A7 - A30	Pushed	4" x 0.220"	N/A	-80 CCD	None	50 kips
A31 - A36	Intentionally Ommited					
A37 - A44	Pushed	4" x 0.220"	N/A	-80 CCD	None	50 kips
A45 - A47	Pushed	4" x 0.220"	N/A	-80 CCD	None	50 kips
B1 - B3	Drilled	9.625" x 0.545"	+10 CCD	-111 CCD	None	50 kips
B4 - B6	Intentionally Ommited					
B7 - B8	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	1H:7V	394 kips
B9	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	None	394 kips
B10 - B13	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	1H:7V	394 kips
B14	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	None	394 kips
B15 - B16	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	1H:7V	394 kips
B17 - B18	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	1H:7V	394 kips
B19	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	None	394 kips
B20 - B23	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	1H:7V	394 kips
B24	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	None	394 kips
B25 - B26	Drilled	9.625" x 0.545"	-3.33 CCD	-111 CCD	1H:7V	394 kips
C1 - C6	Drilled	5.5" x 0.562"	+4.5 CCD	-111 CCD	None	175 kips
C7 - C14	Drilled	5.5" x 0.562"	+9.33 CCD	-111 CCD	None	175 kips
C15 - C18	Drilled	5.5" x 0.562"	+4.5 CCD	-111 CCD	None	175 kips
C19 - C29	Drilled	5.5" x 0.562"	+12 CCD	-111 CCD	1H:8V	175 kips

Notes:

1. B/Pile is estimated. For pile type A, piles to be pushed to 1.5 times design load. For pile types B and C, piles to be socketed 2 feet into bedrock.
2. Capacity is for axial compression of pile only.
3. All piles to be filled with 5,000 psi grout.

☐ APPROVED ☒ NOT APPROVED
☐ APPROVED AS CORRECTED
☐ REVISE AND RESUBMIT
☐ RESUBMIT FOR RECORD COPY

Checking is only for conformance with the design concept of the project and compliance with the information given in the Contract Documents. Contractor is responsible for dimensions to be confirmed and correlated at the job site, for information that pertains solely to the fabrication processes or to techniques of construction, and for coordination of the work of all trades.

BY: Tori T. Chang
DATE: 20 April 2016

SIMPSON GUMPERTZ & HEGER INC
135 S. LASALLE STREET, SUITE 3050
CHICAGO, IL 60603

INCOMPLETE WITHOUT CALCULATIONS

HAYWARD BAKER
KELLER

Midwest Region
1350 West Lake Street
Roselle, Illinois 60172
630-339-4300
www.haywardbaker.com

HBI'S DRAWINGS HAVE BEEN PREPARED BASED UPON ELECTRONIC DRAWINGS (AS REFERENCED BELOW) PROVIDED TO HBI FOR USE AS BACKGROUND INFORMATION. THE OWNER OR GENERAL CONTRACTOR SHALL IMMEDIATELY NOTIFY HBI OF ANY REVISIONS TO THE BACKGROUND DRAWINGS.

REFERENCES

S120, S121S314, S315 1/6/2015
SIMPSON GUMPERTS & HEGER

Exp 11/30/16

5	3/2/2016	DOB COMMENTS
4	2/3/2016	DESIGN SUBMITTAL
3	1/11/2016	OUC COMMENTS
2	1/8/2016	OUC COMMENTS
1	12/30/2015	OUC COMMENTS

REVISIONS

MICROPILE LAYOUT

MICHIGAN AVENUE APPLE STORE

401 MICHIGAN AVE
CHICAGO, IL

PROJECT NUMBER: OP19285
ISSUE DATE: 12/3/2015

SHEET NUMBER
MP-1

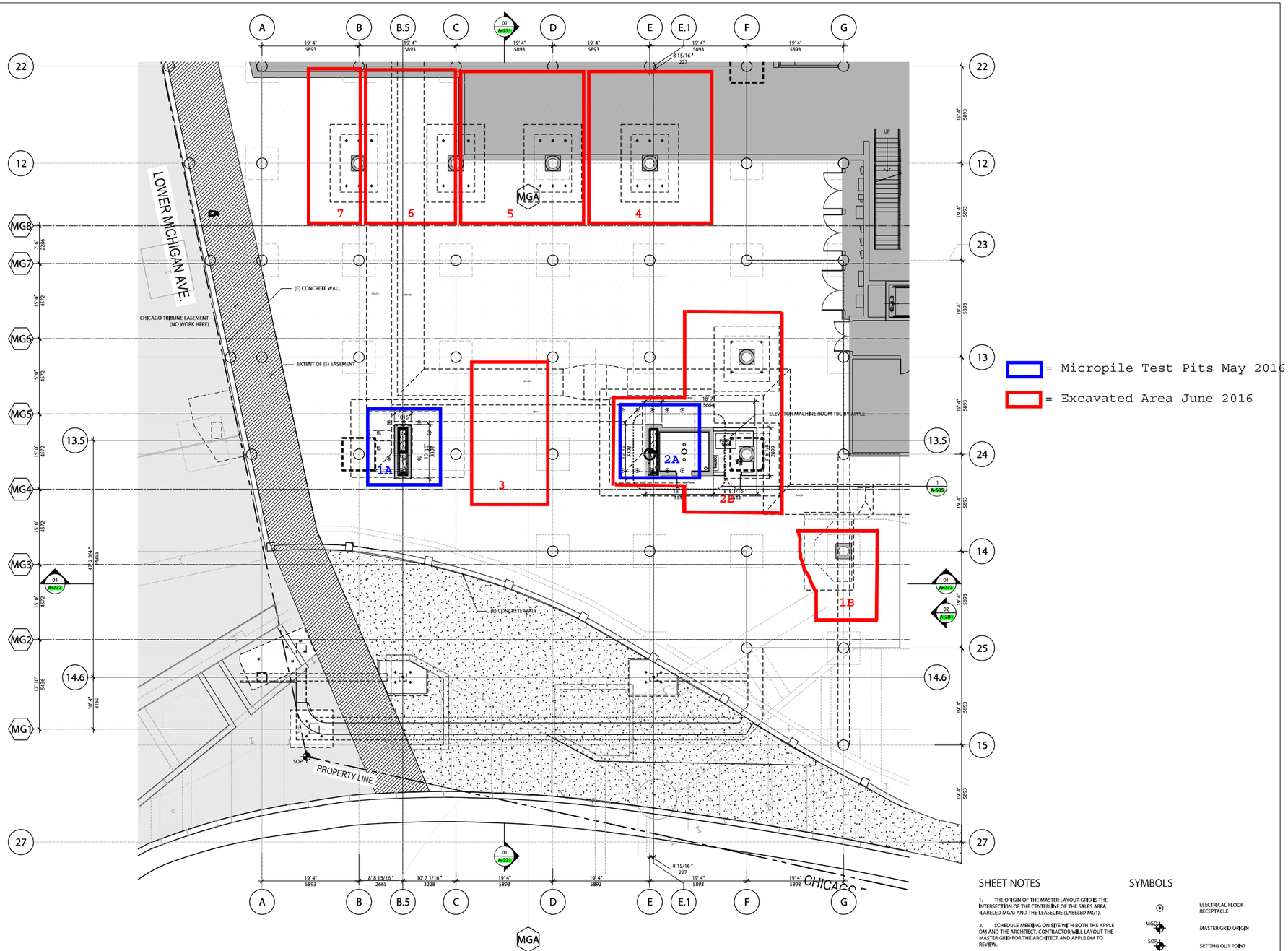
\1 - Projects (formerly A Jobs)\1 - Bidding Geotechnical\OP0019285 - Michigan Avenue Apple Store\Technical Submittal\Shop Drawings\OP19285 ERS-1.dwg; 3/3/2016 2:25:10 PM; GROENENDAL, NATHAN

Figure 2

Parking Level C Floor Plan

401 N. Michigan Drive Thorium Monitoring

Stan A. Huber Consultants, Inc.
200 N. Cedar Road
New Lenox, IL 60451



1 PARKING LEVEL C - FLOOR PLAN
1/8"=1'-0"

SHEET NOTES

1. THE ORIGIN OF THE MASTER LAYOUT GRID IS THE INTERSECTION OF THE CENTERLINE OF THE SALES AREA (LABELED MGA) AND THE LEASELINE (LABELED MG1).
2. SCHEDULE MEETING ON SITE WITH BOTH THE APPLE DM AND THE ARCHITECT. CONTRACTOR WILL LAYOUT THE MASTER GRID FOR THE ARCHITECT AND APPLE DM TO REVIEW.
3. PROVIDE SURVEY OF EXISTING CONDITIONS AND COMPARE TO CONSTRUCTION DOCUMENTS FOR DISCREPANCIES PRIOR TO LAYOUT AND APPROVAL OF FINISH PANEL SHOP DRAWINGS AND FINISH PANEL SUPPORT SYSTEM SHOP DRAWINGS.
4. VERIFY SIZE OF EXISTING STRUCTURAL COLUMNS AND NOTIFY ARCHITECT OF ANY DISCREPANCIES.
5. REVIEW FINISH PANEL SHOP DRAWINGS PRIOR TO LAYOUT AND INSTALLATION OF SUPPORT SYSTEM.
6. LOCATIONS FOR TRENCHING, SAW CUTTING AND CORING OF SLAB TO INSTALL UNDERSLAB CONDUIT & PIPING TO BE APPROVED BY LANDLORD PRIOR TO CUTTING. X-RAY SLAB PRIOR TO TRENCHING, SAW CUTTING OR CORING OF SLAB TO VERIFY STRUCTURAL INTEGRITY OF SLAB IS MAINTAINED. X-RAYING IS NOT REQUIRED IF WORK IS COORDINATED WITH LANDLORD'S STRUCTURAL ENGINEER OR EXISTING STRUCTURAL DRAWINGS ARE OBTAINED FROM LANDLORD. COORDINATE WITH LANDLORD AND TENANTS BELOW WHERE NECESSARY.

SYMBOLS

- ELECTRICAL FLOOR RECEPTACLE
- MASTER GRID ORIGIN
- SETTING OUT POINT
- WALL TYPE INDICATOR
- DOOR INDICATOR
- FINISH INDICATOR
- AREA NOT IN CONTRACT
- AREA NOT REPRESENTED BY SCOPE
- AREA TO BE FILLED
- EXISTING CONCRETE SLABES TO BE REPLACED IN KIND

Apple Inc.
1 Infinite Loop
MS 52-RD
Cupertino, CA 95014
Tel: 415-298-3045
Fax: 408-974-xxxx

Architect:
Foster + Partners
www.fosterandpartners.com

Consultant: Structural Engineer
Simpson Gumpertz & Heger
www.sgh.com

Consultant: Mechanical, Electrical, Plumbing & Fire Protection
Cosentini
www.cosentini.com

Consultant: Code
Burnham Nationwide, Inc.
www.burnhamnationwide.com

Consultant: Facade
Eckersley O'Callaghan
www.eocengineers.com

Consultant: Vertical Transportation
Edgett Williams Consulting Group, Inc.
www.ewcg.com

Site Architect
Ross Barney Architects
www.r-barc.com

Signed: xx/xx/xxxx

401 NMA Riverfront Retail
401 North Michigan Ave
Chicago, IL 60611
USA

Issued / Revised	Date
DEEP FOUNDATION PERMIT	12/14/15
50% DD	12/23/15
DEMOLITION PERMIT	01/22/16
100% DD	02/05/16
100% DD REV.1	04/08/16
50% CD	05/13/16

PARKING LEVEL C
FLOOR PLAN

A-110

Figure 3

Concourse Level B Floor Plan

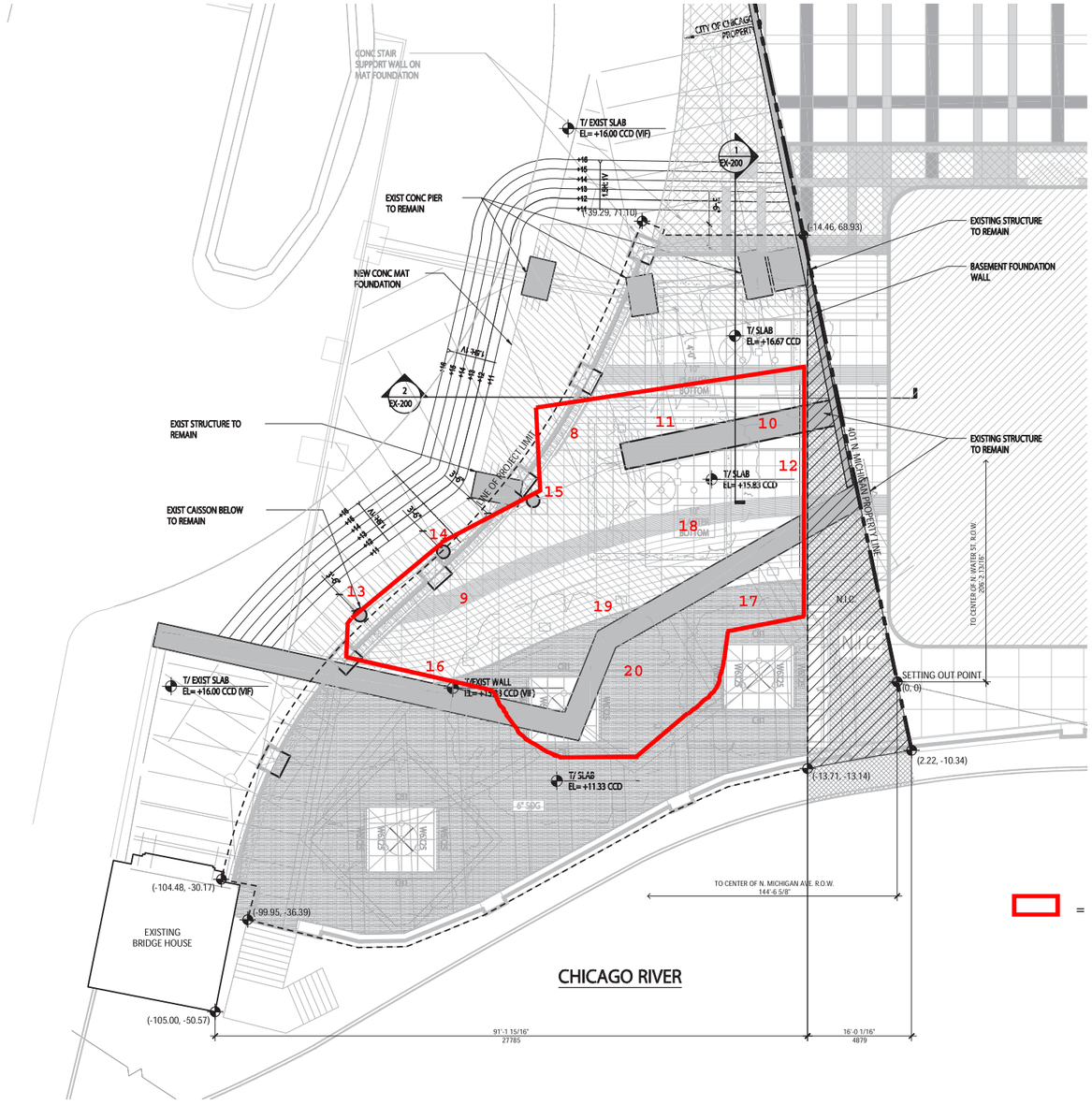
401 N. Michigan Drive Thorium Monitoring

Stan A. Huber Consultants, Inc.
200 N. Cedar Road
New Lenox, IL 60451

PLAN NOTES

KEY PLAN

- EXTENTS OF NEW MAT FOUNDATION
- EXTENTS OF NEW CONCRETE SLAB ON GRADE
- NEW CONCRETE WALL
- EXISTING STRUCTURE TO REMAIN



1 CONCOURSE LEVEL (LEVEL B) STRUCTURAL PLAN

1/8" = 1'-0"

Design Architect:
Foster + Partners
www.fosterandpartners.com

Architect of Record - Site Improvements:
Ross Barney Architects
www.r-barc.com

Civil Consultant:
Infrastructure Engineering, Inc.
www.infrastructure-eng.com

Landscape Consultant:
Jacobs/Ryan Associates
www.jacobsryan.com

Electrical Consultant:
Primera Engineers, Ltd.
www.primeraeng.com

Lighting Consultant:
Schuler Shook
www.schulershook.com

Structural Consultant:
Thornton Tomasetti
www.ThorntonTomasetti.com

Signed: 12/14/2015

401 North Michigan Ave.
Riverfront Retail
Chicago, IL

Issued / Revised	Date
100% Design Development	10/20/15
Progress Set	11/20/15
CDOT Permit Set	12/18/15
CDOT Permit Set REV 1	03/29/16

Approval Date

EXCAVATION PLAN
CONCOURSE
LEVEL B

EX-100

Figure 4

Concourse Level B Floor Plan - Riverwalk

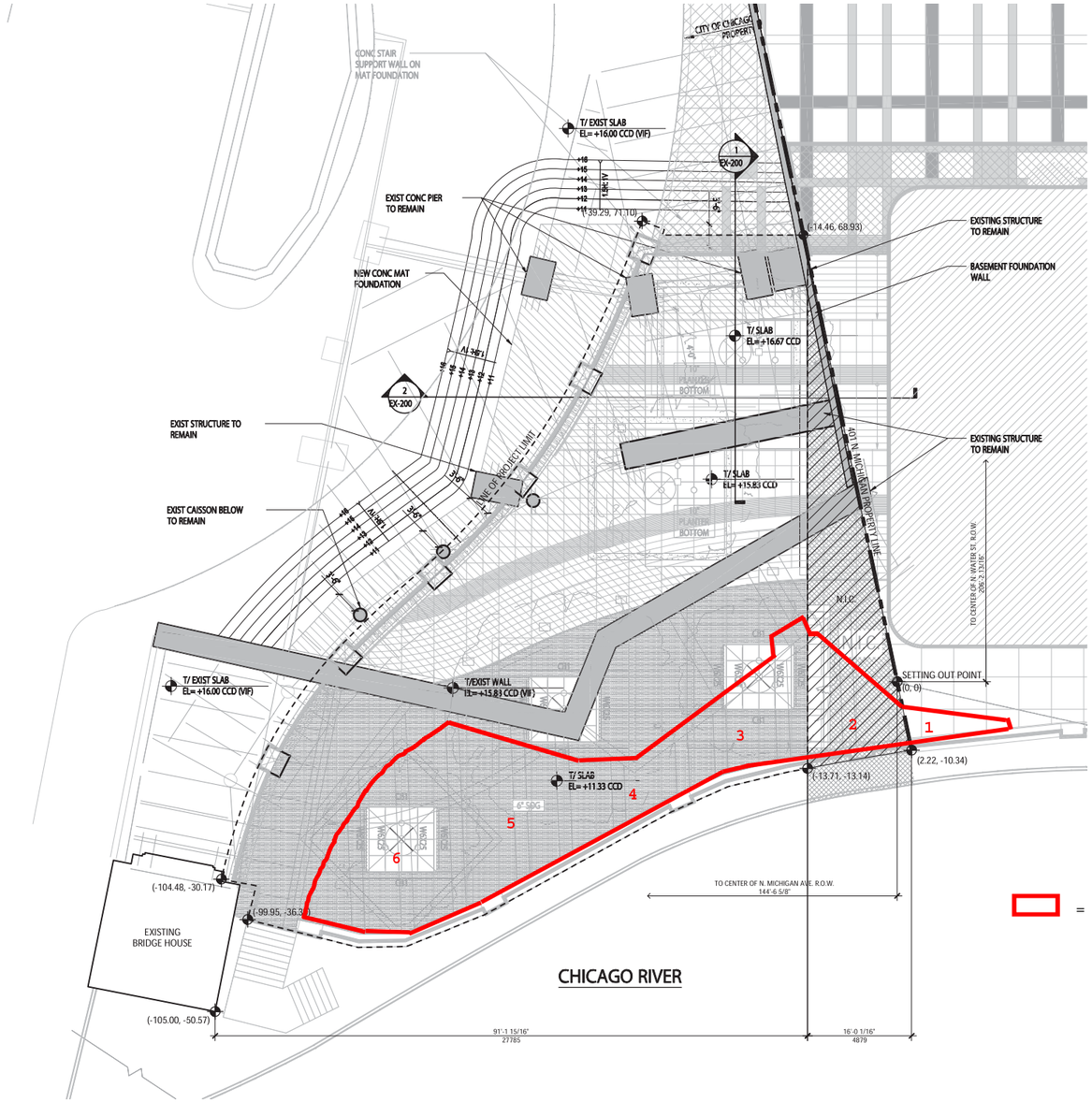
401 N. Michigan Drive Thorium Monitoring

Stan A. Huber Consultants, Inc.
200 N. Cedar Road
New Lenox, IL 60451

PLAN NOTES

KEY PLAN

- EXTENTS OF NEW MAT FOUNDATION
- EXTENTS OF NEW CONCRETE SLAB ON GRADE
- NEW CONCRETE WALL
- EXISTING STRUCTURE TO REMAIN



1 CONCOURSE LEVEL (LEVEL B) STRUCTURAL PLAN

1/8" = 1'-0"

Design Architect:
Foster + Partners
www.fosterandpartners.com

Architect of Record - Site Improvements:
Ross Barney Architects
www.r-barc.com

Civil Consultant:
Infrastructure Engineering, Inc.
www.infrastructure-eng.com

Landscape Consultant:
Jacobs/Ryan Associates
www.jacobsryan.com

Electrical Consultant:
Primera Engineers, Ltd.
www.primeraeng.com

Lighting Consultant:
Schuler Shook
www.schulershook.com

Structural Consultant:
Thornton Tomasetti
www.ThorntonTomasetti.com

Signed: 12/14/2015

401 North Michigan Ave.
Riverfront Retail
Chicago, IL

Issued / Revised	Date
100% Design Development	10/20/15
Progress Set	11/20/15
CDOT Permit Set	12/18/15
CDOT Permit Set REV 1	03/29/16

Approval Date

N

EXCAVATION PLAN
CONCOURSE
LEVEL B

EX-100

Attachment A

Micropile Survey Form

401 N. Michigan Drive Thorium Monitoring

Stan A. Huber Consultants, Inc.
200 N. Cedar Road
New Lenox, IL 60451

Radiological Soil Investigation of Micropile Drill Soil Spoils
401 N. Michigan Ave. Chicago, IL 60611

	Depth	0'-10' (bgs)	10'-20' (bgs)	20'-30' (bgs)	30'-40' (bgs)
Date	Location ID	Survey Results (counts per minute)			
5/17/2016	B-3	3131	3285	3079	3011
5/18/2016	B-1	2400	2100	2500	2500
5/18/2016	B-2	2950	2944	3000	3100
7/12/2016	BT	VAULT	1800	2000	2500
7/14/2016	CT	VAULT	2300	2300	2300
7/14/2016	TRA(NW)	VAULT	1900	2400	2800
7/26/2016	CP-26	VAULT	2400	3100	3100
7/26/2016	CP-29	VAULT	2600	2300	2100
7/27/2016	CP-28	VAULT	2400	2600	1900
7/27/2016	CP-27	VAULT	3000	2600	2800
7/27/2016	CP-13	VAULT	2100	2500	3000
7/28/2016	CP-12	VAULT	2200	2100	2600
7/28/2016	CP-14	VAULT	2900	2600	2200
7/28/2016	CP-11	VAULT	1800	2000	2100
7/29/2016	CP-25	N/S	N/S	N/S	N/S
7/29/2016	CP-24	N/S	N/S	N/S	N/S
8/1/2016	CP-21	2098	2118	2037	2456
8/2/2016	CP-23	2231	2071	2078	2281
8/2/2016	CP-22	1912	2132	2282	2356
8/3/2016	CP-20	N/S	N/S	N/S	N/S
8/3/2016	CP-9	N/S	N/S	N/S	N/S
8/3/2016	CP-10	2540	N/S	N/S	2588
8/4/2016	CP-7	2486	3068	N/S	N/S
8/4/2016	CP-8	2533	N/S	N/S	N/S
8/5/2016	CP-18	VAULT	2700	2500	2300
8/5/2016	CP-17	VAULT	2100	3000	2600
8/5/2016	CP-16	VAULT	2700	2200	2100
8/6/2016	CP-15	VAULT	2100	2600	3100
8/6/2016	CP-19	N/S	N/S	2700	3200
8/8/2016	CP-5	VAULT	2025	2098	2097
8/9/2016	CP-6	VAULT	2021	1962	2074
8/9/2016	CP-1	1965	N/S	N/S	N/S
8/9/2016	CP-2	1897	N/S	1781	1689
8/10/2016	CP-3	1935	N/S	N/S	1795
8/11/2016	CP-4	1895	1847	1813	1801

- All Micropile locations surveyed with a Ludlum-2221 Survey Meter w/ Model 44-10 Shielded 2x2 NaI Probe S/N - 126496 and 126497
- 7/1 pCi/gram Action Level S/N 126496 = 7054 CPM , S/N 126497 = 6018 CPM

N/S = Not Surveyed (No Drilling Soil Spoils Generated)
VAULT = 10' Deep Reinforced Concrete Vault Devoid of Soil

Attachment B

Parking Level C Survey Forms

401 N. Michigan Drive Thorium Monitoring

Stan A. Huber Consultants, Inc.
200 N. Cedar Road
New Lenox, IL 60451

sahci
Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave. - Micro-Pile Test Pits - Chicago, IL

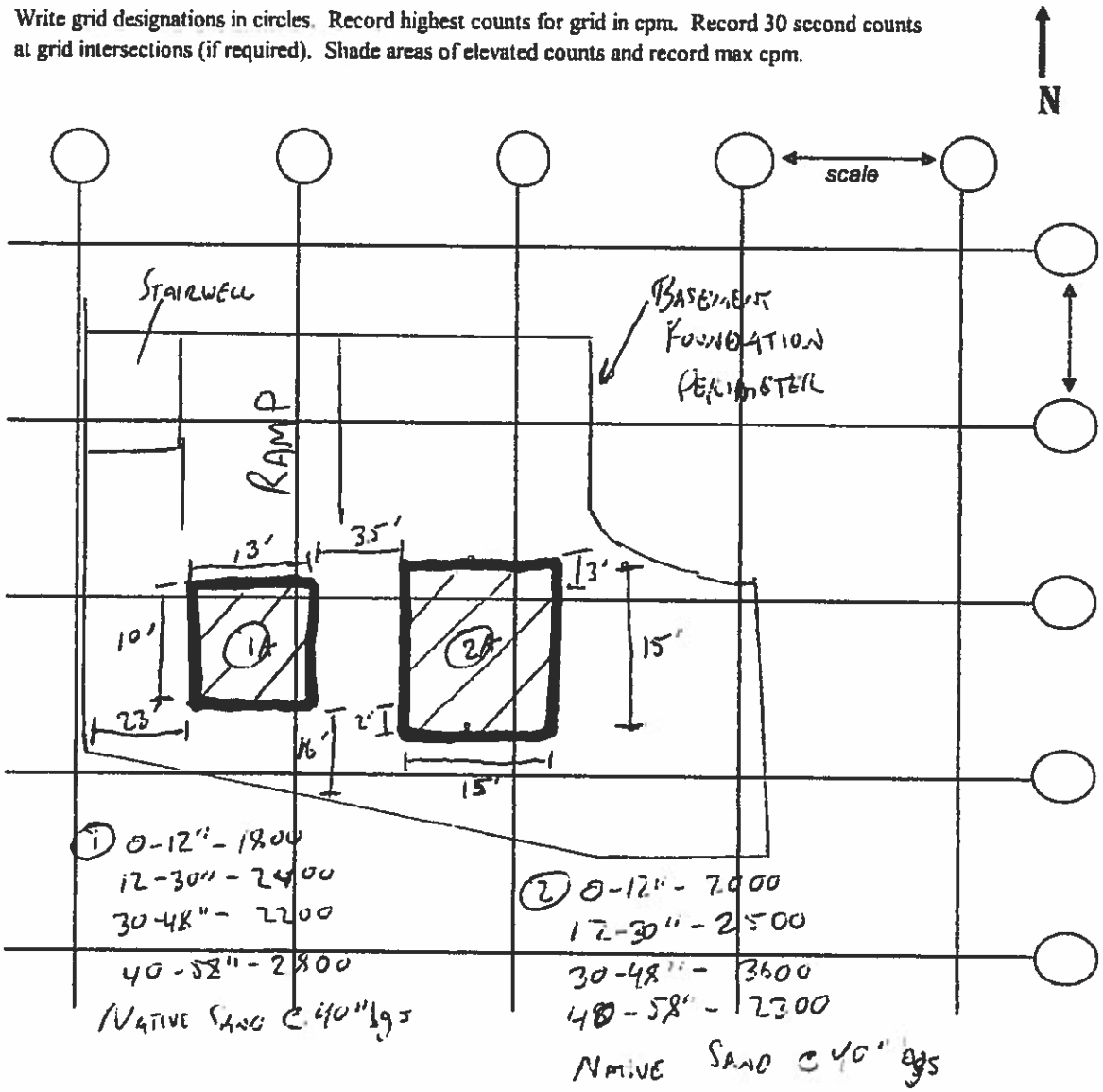
Date: 5/20-26/16 **Technician:** Brian Schmidt

Inst Model: Ludlum - 2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** ~~Proposed~~ 0 -40"

Background 1782 **cpm** **Action Level:** 7054 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



sahci
Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. MICHIGAN AVE - MICRO-PILE TEST PIT SURVEYS - CHICAGO, IL

Date: 5/20-26/16 **Technician:** BRIAN SCHMIDT

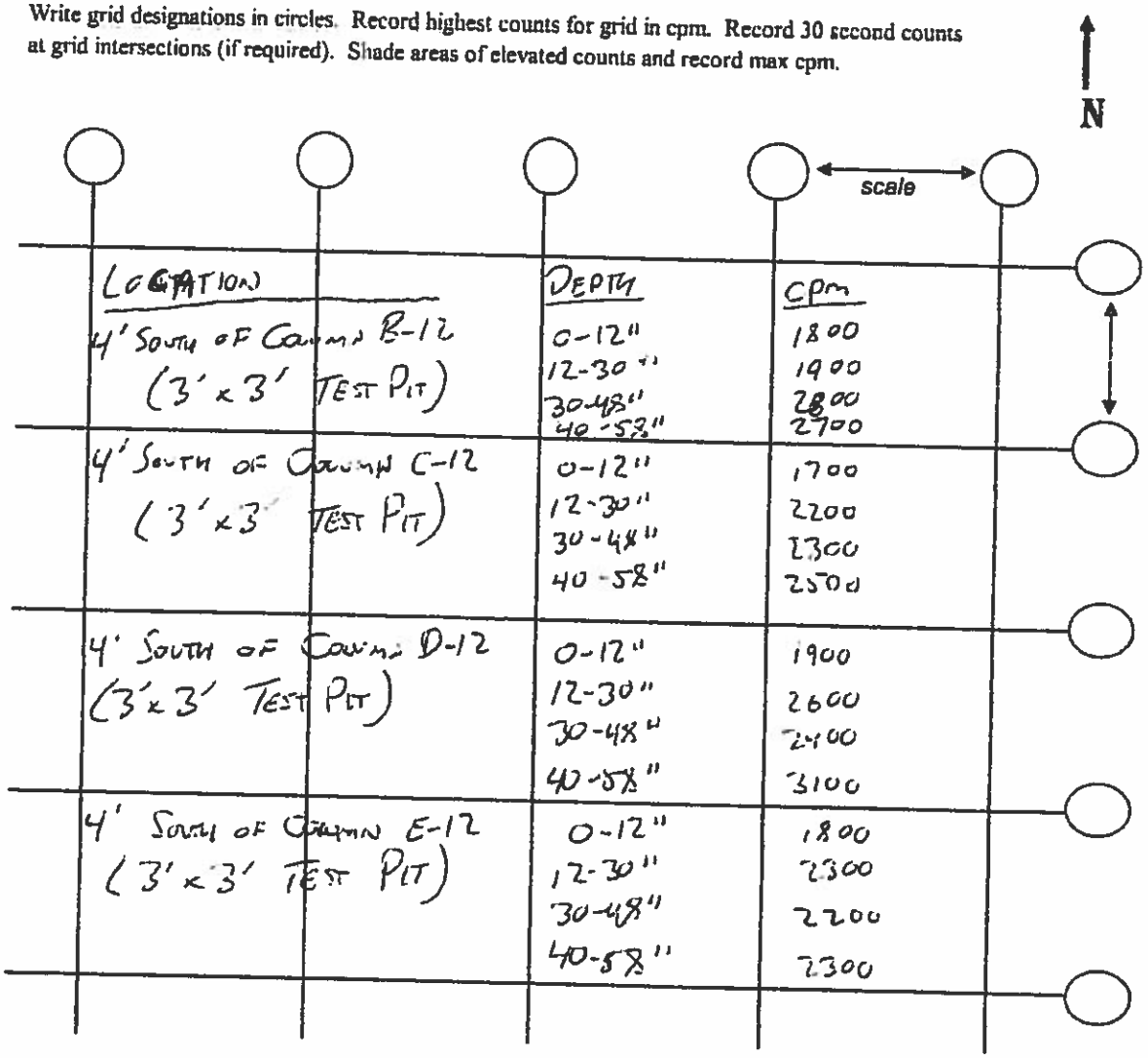
Inst Model: LUDLUM -2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / (2"x2" NaI) **Lift Elevation:** 0-40"

(Shielded) / Not Shielded

Background 1782 cpm **Action Level:** 7054 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



LOCATION	DEPTH	CPM
4' SOUTH OF COLUMN B-12 (3'x3' TEST PIT)	0-12"	1800
	12-30"	1900
	30-48"	2800
	40-58"	2700
4' SOUTH OF COLUMN C-12 (3'x3' TEST PIT)	0-12"	1700
	12-30"	2200
	30-48"	2300
	40-58"	2500
4' SOUTH OF COLUMN D-12 (3'x3' TEST PIT)	0-12"	1900
	12-30"	2600
	30-48"	2400
	40-58"	3100
4' SOUTH OF COLUMN E-12 (3'x3' TEST PIT)	0-12"	1800
	12-30"	2300
	30-48"	2200
	40-58"	2300

sahci
Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave. - Micro-Pile Test Pit Survey - Chicago, IL

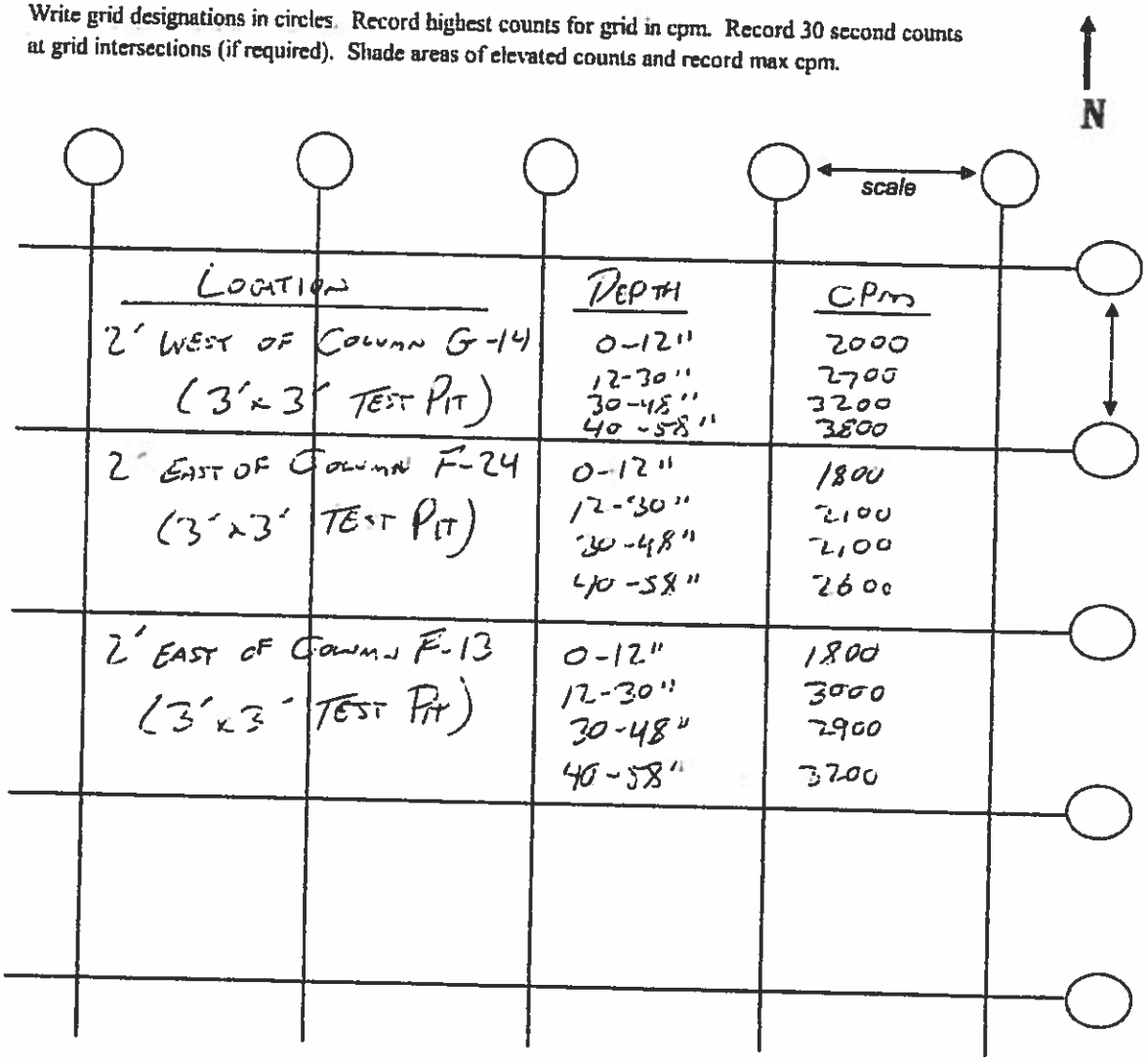
Date: 5/20-26/16 **Technician:** Brian Schmidt

Inst Model: Ludlum - 2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / (2"x2" NaI) **Lift Elevation:** 0-40"
(Shielded) / Not Shielded

Background 1782 **cpm** **Action Level:** 7054 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



Location	Depth	CPM
2' West of Column G-14 (3'x3' Test Pit)	0-12"	2000
	12-30"	2700
	30-45"	3200
	40-58"	3800
2' East of Column F-24 (3'x3' Test Pit)	0-12"	1800
	12-30"	2100
	30-48"	2100
	40-58"	2600
2' East of Column F-13 (3'x3' Test Pit)	0-12"	1800
	12-30"	3000
	30-48"	2900
	40-58"	3200

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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - Basement Caisson Excavation - Soil Survey (Radiological)

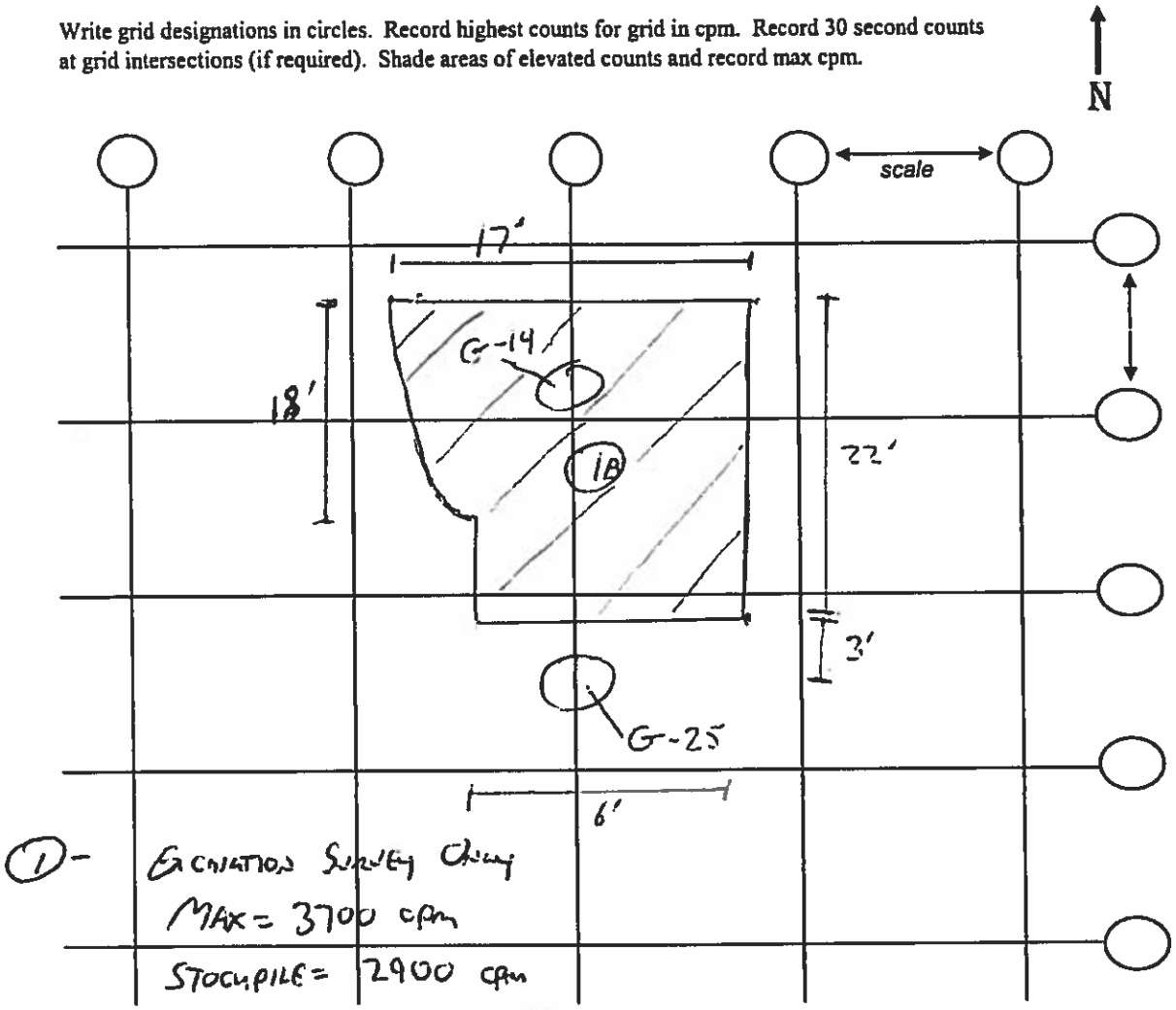
Date: 6/9/2016 Technician: Brian Schmidt

Inst Model: Ludlum - 2221 Serial No. : 126496

Probe Type: 1"x1" NaI / 2"x2" NaI (Shielded) / Not Shielded Lift Elevation: 0-40"

Background 1782 cpm Action Level: 7054 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



(1) - Excavation Survey Chart
MAX = 3700 cpm
STOCKPILE = 2900 cpm
NATIVE SAND @ 40" bgs

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Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - Basement Caisson Excavation - Radiological Soil Survey

Date: 6/9/2016 **Technician:** Brian Schmidt

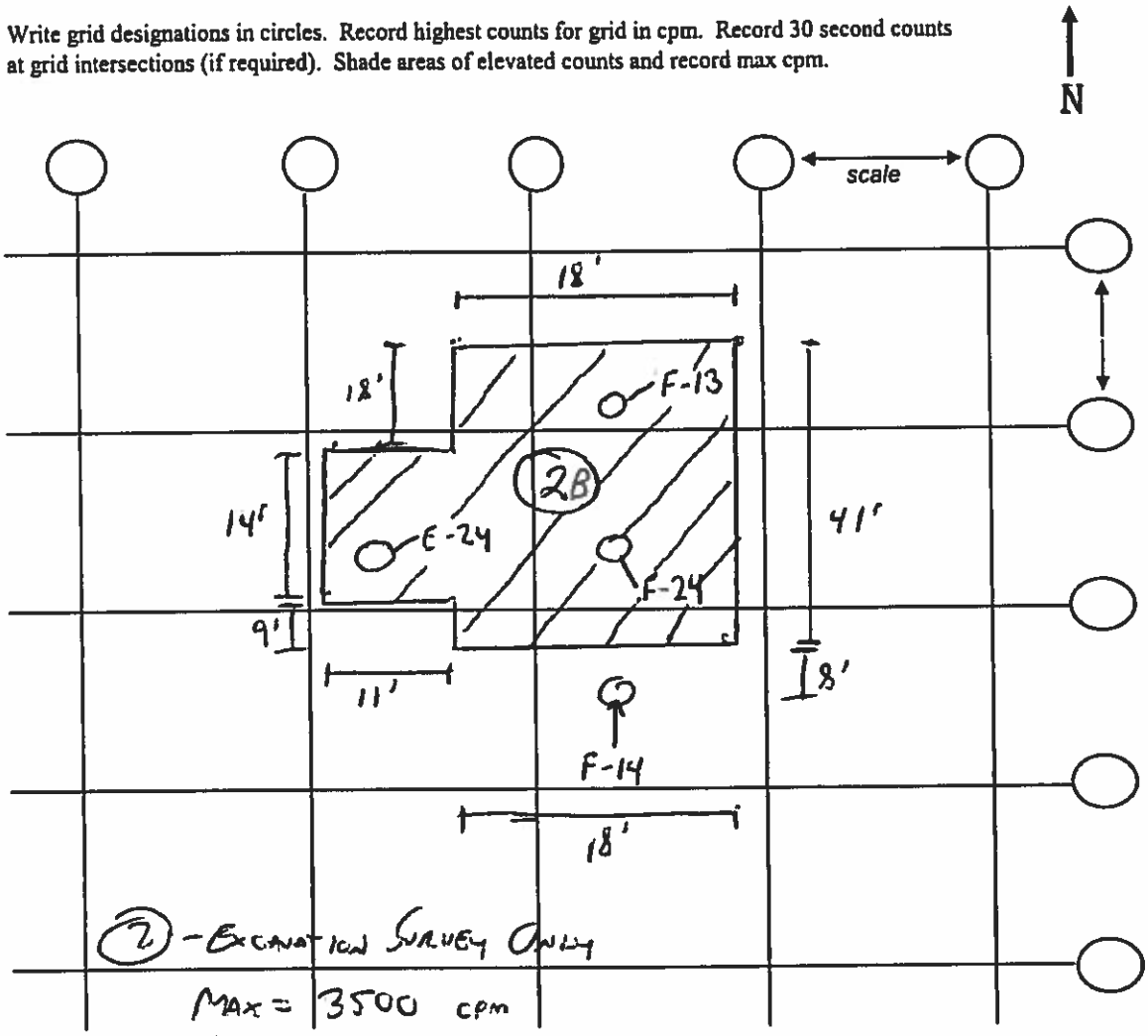
Inst Model: Ludlum-2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / 2"x2" NaI (circled) **Lift Elevation:** 0-40"

Shielded (circled) / Not Shielded

Background 1782 cpm **Action Level:** 7054 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



(2) - Excavation Survey Only

Max = 3500 cpm

Stockpile = 2900 cpm

Native Sand @ 40" bgs

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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - Basement Caisson Excavation - Radiological Soil Survey

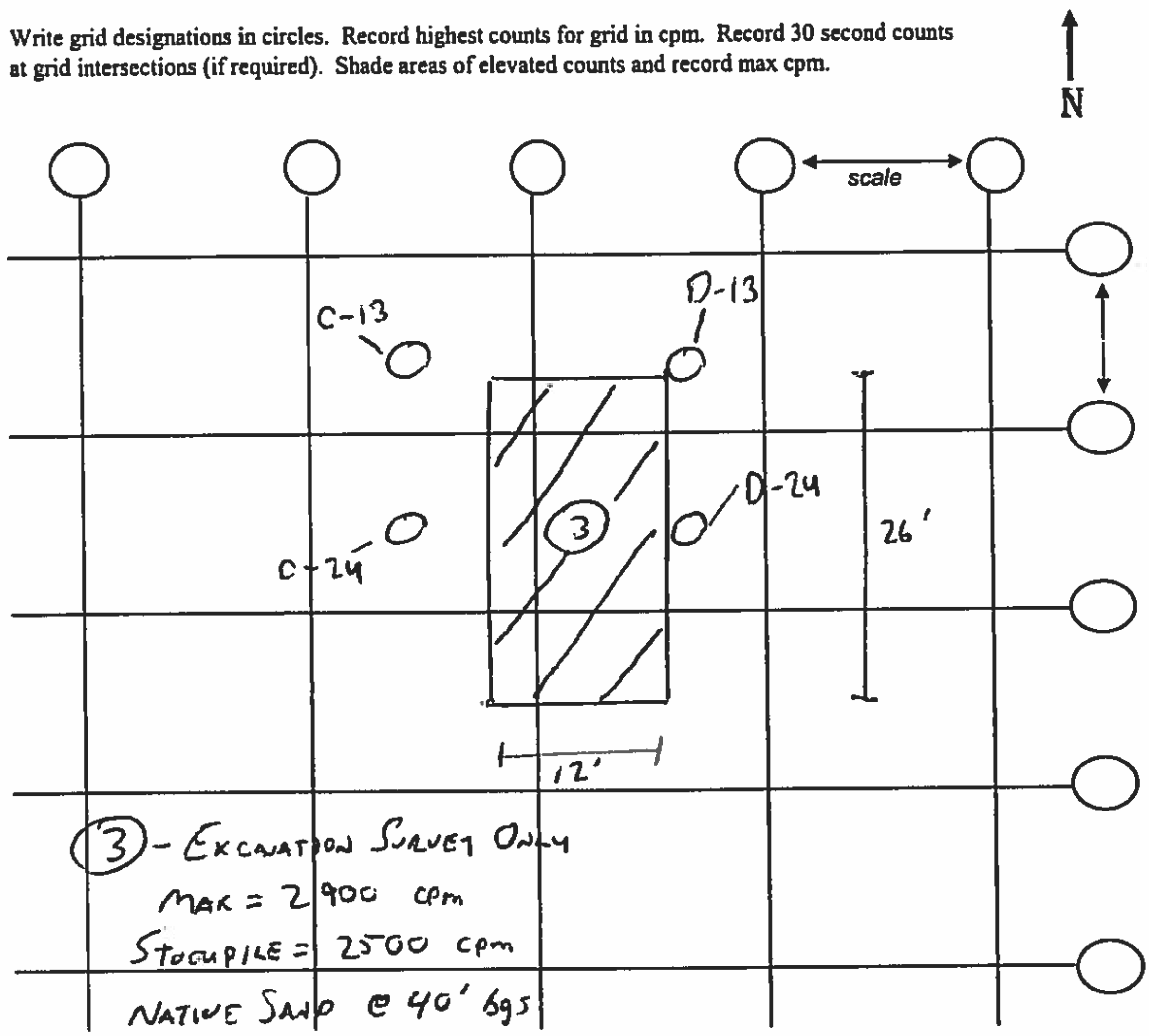
Date: 6/9/2016 **Technician:** Brian Schmidt

Inst Model: Ludlum-2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / 2"x2" NaI (circled) **Lift Elevation:** 0-40"
Shielded (circled) / Not Shielded

Background 1782 **cpm** **Action Level:** 7054 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



(3) - Excavation Survey Only
Max = 2900 cpm
Stockpile = 2500 cpm
Native Sand @ 40' bgs

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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - Basement Caisson Excavation - Radiological Soil Survey

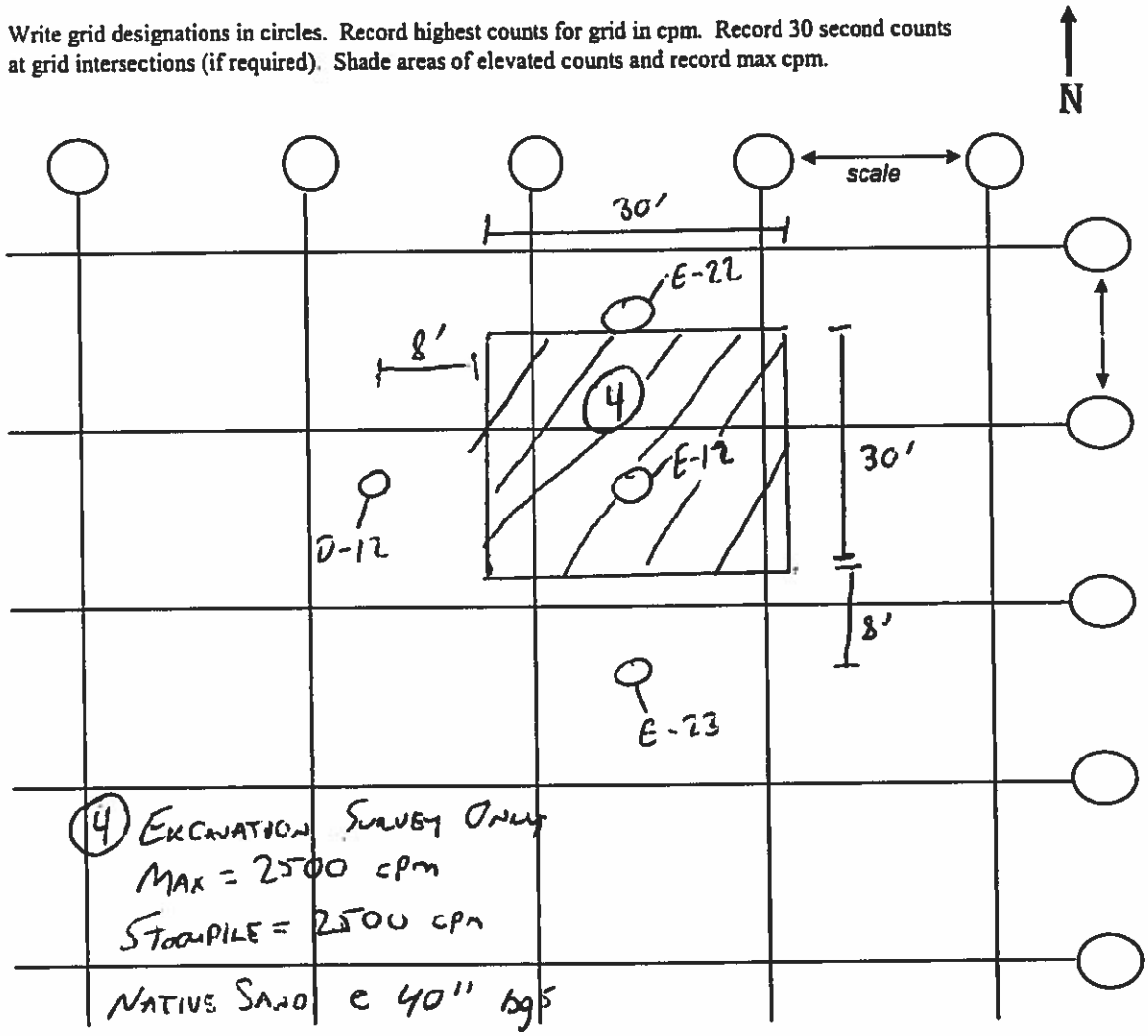
Date: 6/9/2016 **Technician:** Brad Schmidt

Inst Model: Ludlum - 2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / ~~2"x2" NaI~~ **Lift Elevation:** 0 - 40"
~~Shielded~~ / Not Shielded

Background 1782 cpm **Action Level:** 7054 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - Basement Caisson Excavation - Radiological Soil Survey

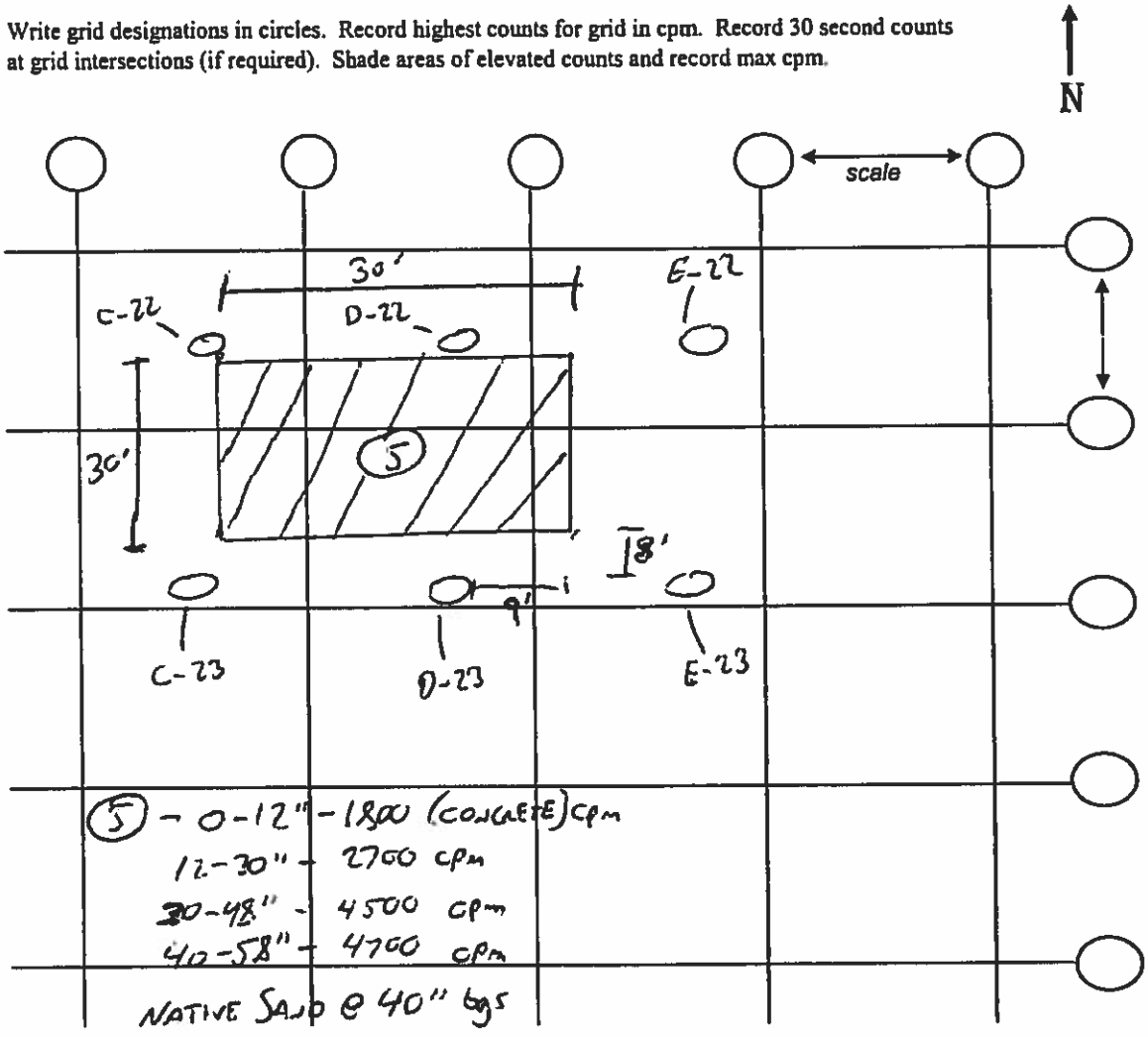
Date: 6/10/2016 **Technician:** Brian Schmidt

Inst Model: Ludlum - 2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / 2"x2" NaI (circled) **Lift Elevation:** 0 - 40"
Shielded (circled) / Not Shielded

Background 1782 **cpm** **Action Level:** 7054 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - Basement Caisson Excavation - Radiological Soil Survey

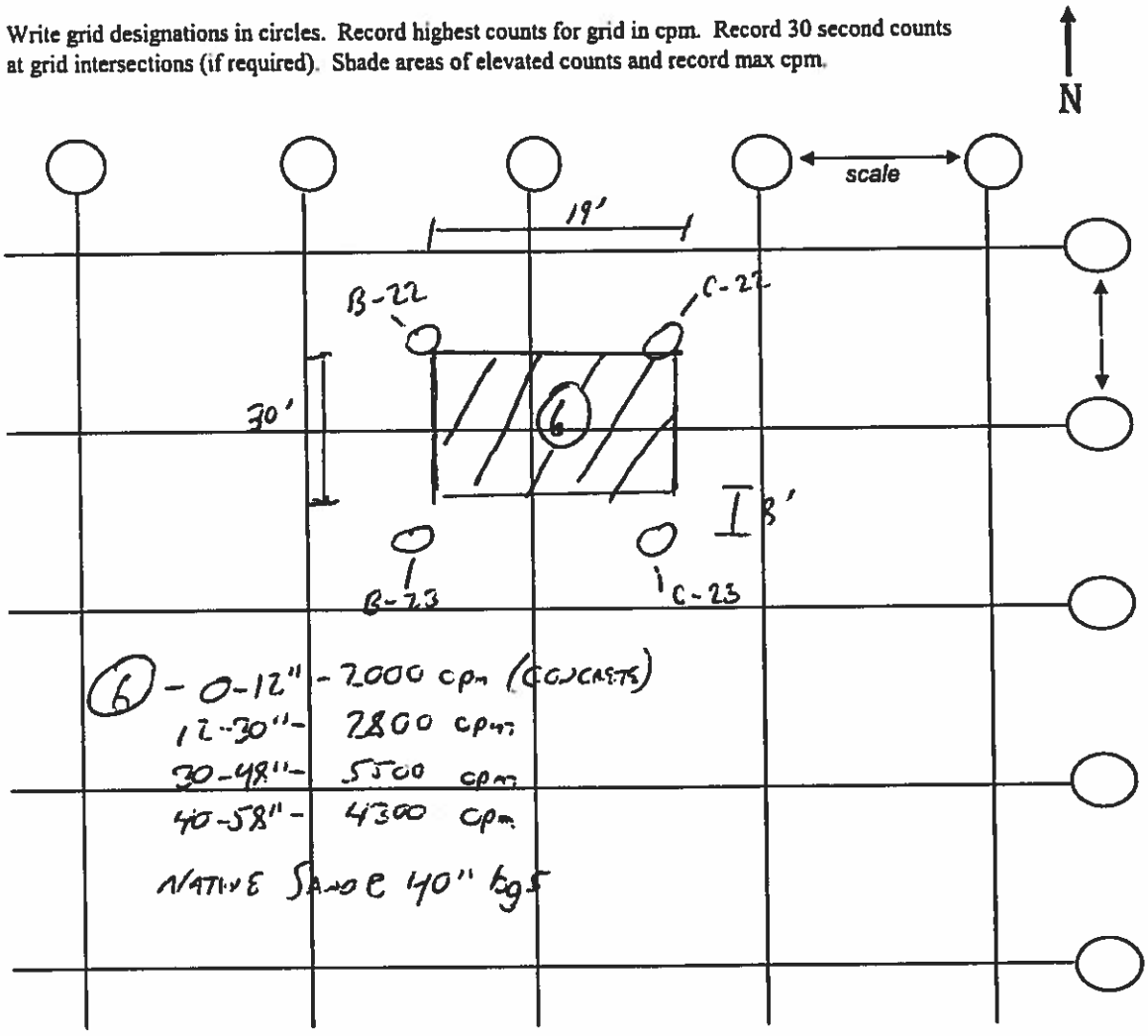
Date: 6/11/2016 **Technician:** Brian Schmidt

Inst Model: Ludlum -2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / ~~2"x2" NaI~~ (Shielded) / Not Shielded **Lift Elevation:** 0-40"

Background 1782 cpm **Action Level:** 7054 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. MICHIGAN AVE - BASEMENT CAISSON EXCAVATION - RADIOLOGICAL SOIL SURVEY

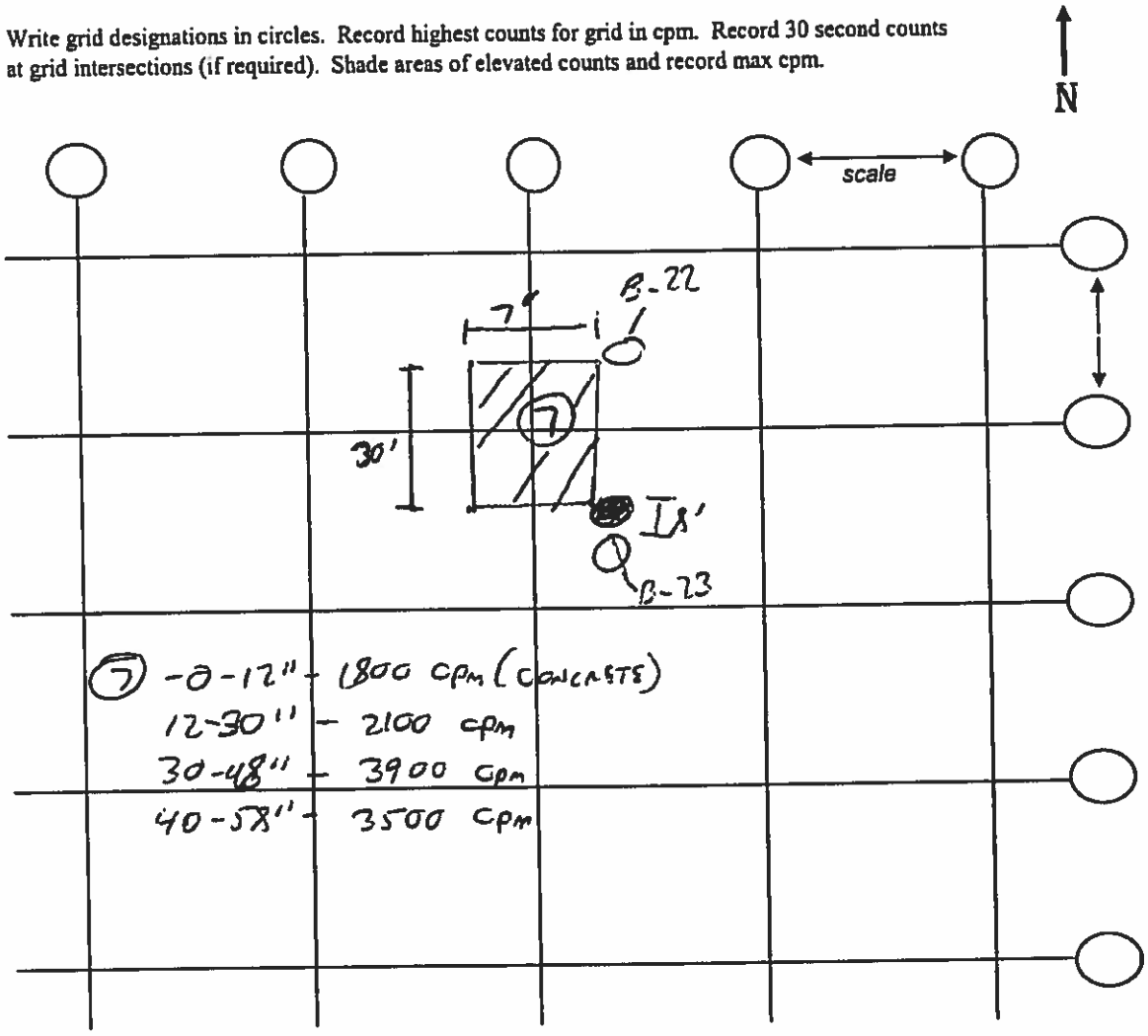
Date: 6/18/2016 **Technician:** BRIAN SCHMIDT

Inst Model: LUDLUM - 2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / (2"x2" NaI) **Lift Elevation:** 0-40"
(Shielded) / Not Shielded

Background 1782 **cpm** **Action Level:** 7054 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



Attachment C

Concourse Level B Survey Forms

401 N. Michigan Drive Thorium Monitoring

Stan A. Huber Consultants, Inc.
200 N. Cedar Road
New Lenox, IL 60451

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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - 1st Level - Column Excavation - Radiological Soil Survey

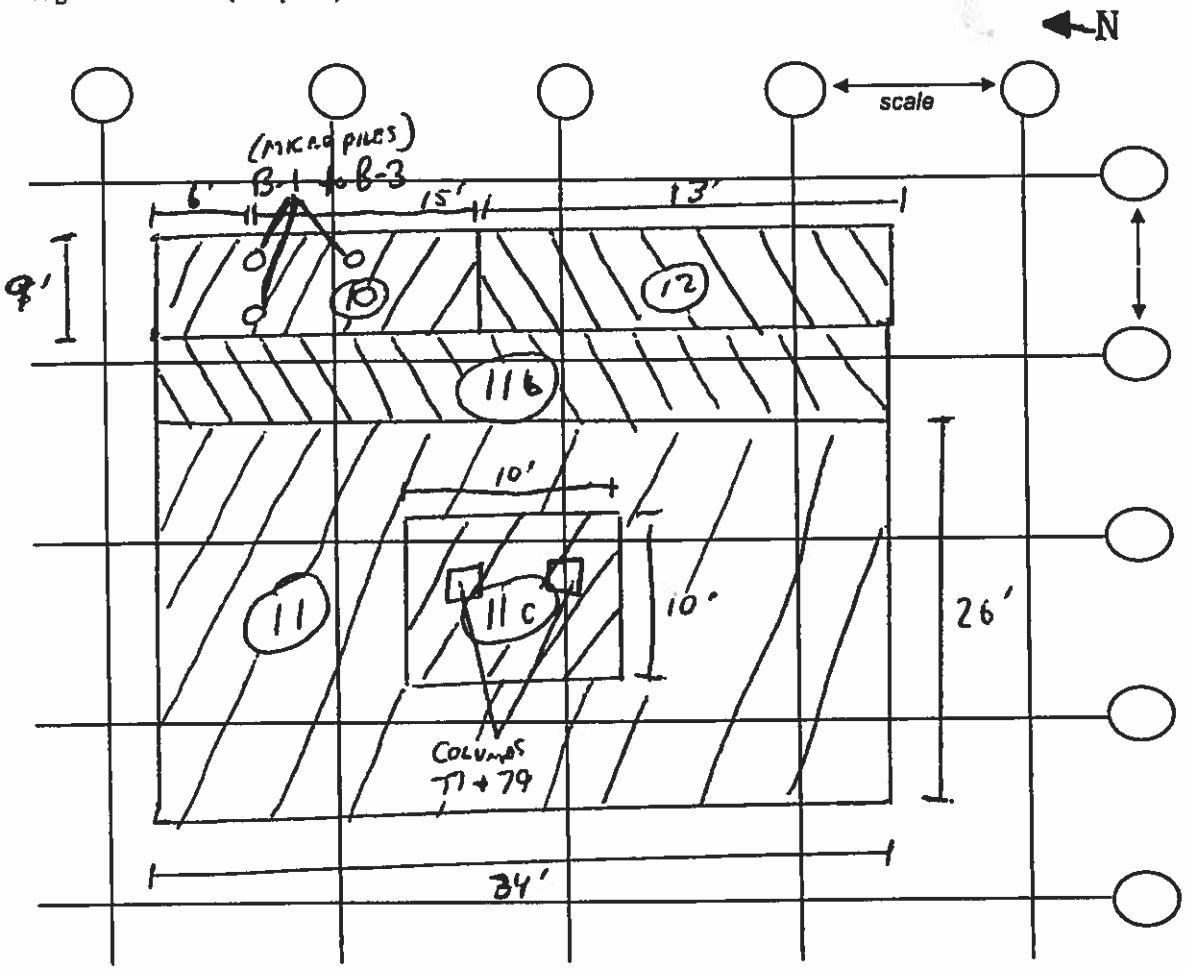
Date: 6/22/2016 - 7/8/2016 **Technician:** Brian Schmidt

Inst Model: Ludlum-2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / ~~2"x2" NaI~~ (Shielded) / Not Shielded **Lift Elevation:** 0-120"

Background 1782 cpm **Action Level:** 7054 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - 1st Level - Column Excavation - Radiological Soil Survey

Date: 6/22/2016 - 7/8/2016 **Technician:** Brian Schmidt

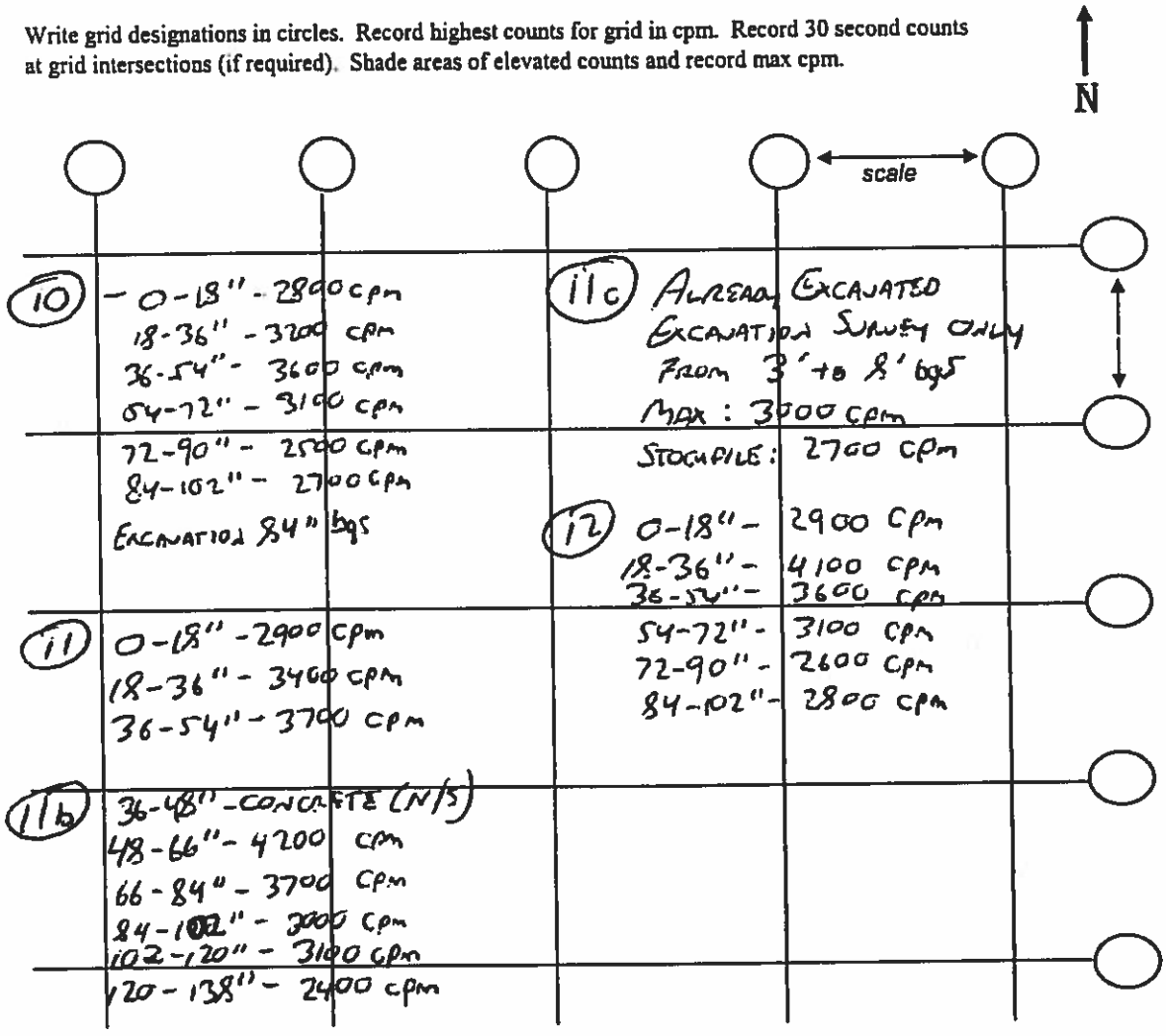
Inst Model: Ludlum - 2221 **Serial No. :** 126 496

Probe Type: 1"x1" NaI / (2"x2" NaI) **Lift Elevation:** 0 - 120"

(Shielded) / Not Shielded

Background 1782 cpm **Action Level:** 7054 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - 1st Level - Column Excavation - Radiological Soil Survey

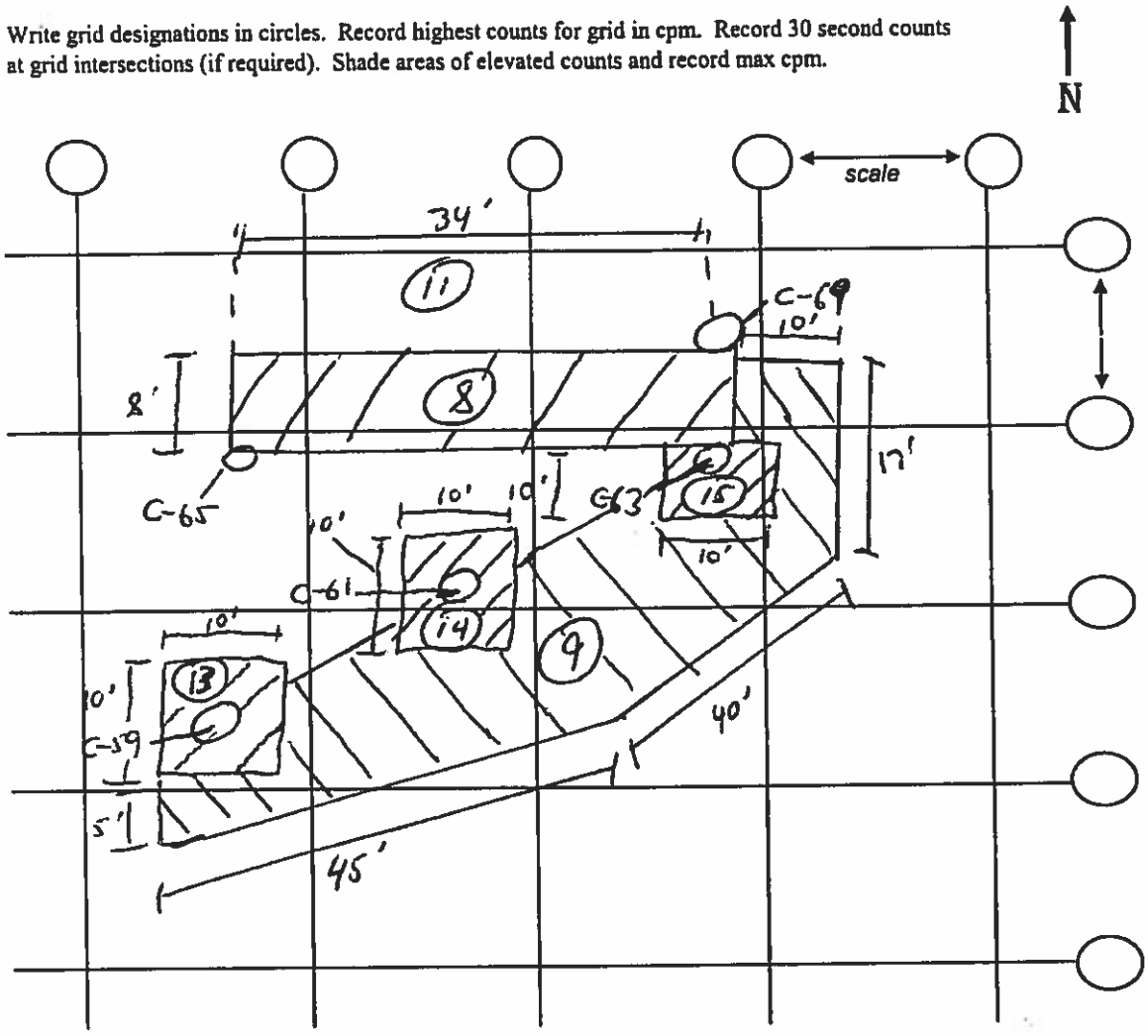
Date: 6/29/16 - 8/6/16 **Technician:** Brian Schmidt

Inst Model: Ludlum -2221 **Serial No. :** 126496

Probe Type: 1"x1" NaI / 2"x2" NaI (Shielded) / Not Shielded **Lift Elevation:** 0-66"

Background 1782 cpm **Action Level:** 7054 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Ave - 1st Level - Column Excavation - Radiological Survey

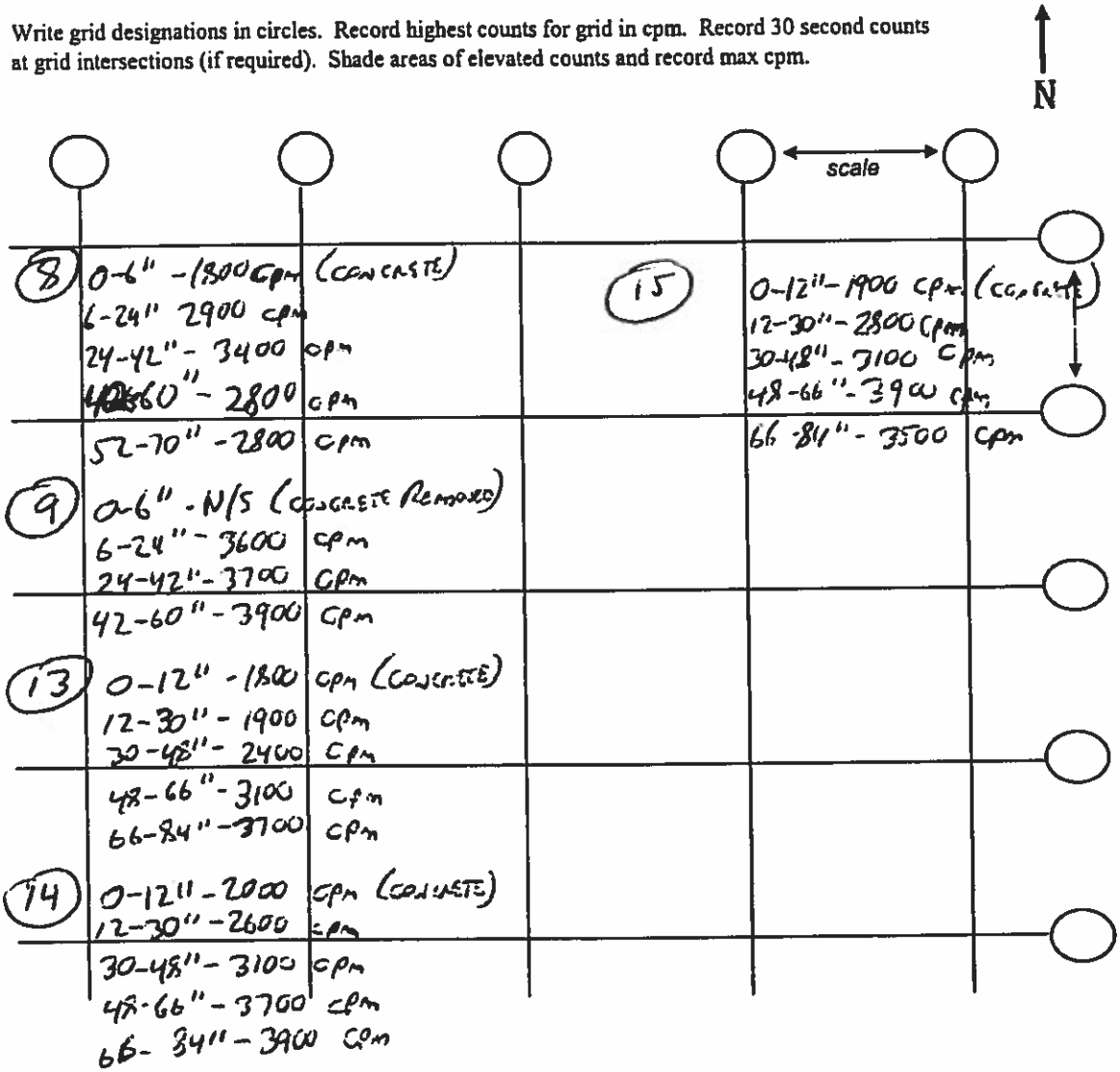
Date: 6/29/16 - 8/6/16 **Technician:** Brian Schmidt

Inst Model: Ludlum - 2221 **Serial No. :** 126494

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** 0-66"

Background 1782 cpm **Action Level:** 7054 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Stan A. Huber Counsultants, Inc.

Radiation Survey Form

Location/ Project ID:

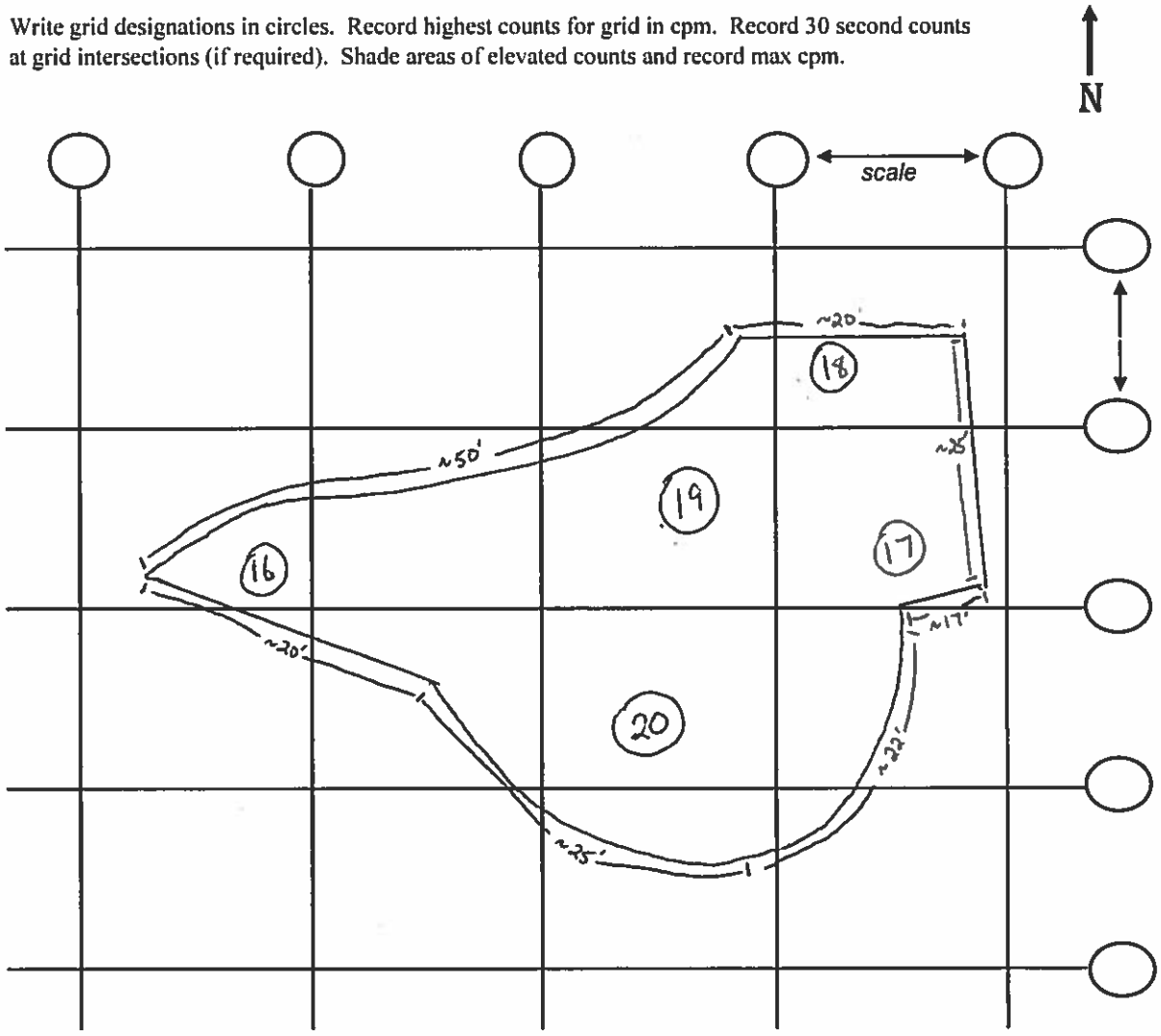
Date: 7/19/16 - 8/10/16 **Technician:** Steven Kowalczyk

Inst Model: Cudlum 2221 **Serial No. :** 138244

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** -5'

Background 1800 **cpm** **Action Level:** 2018 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID:

Date: 7/19/16 - 8/4/16 **Technician:** Steven Kowalczyk

Inst Model: Ludlum 2221 **Serial No. :** 138244

Probe Type: 1"x1" NaI (2"x2" NaI) **Lift Elevation:** -5'
(Shielded) / Not Shielded

Background 1800 **cpm** **Action Level:** 6018 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.

N

scale

(18) Depth	Counts Per Minute	(19) Depth	Counts Per Minute
1'	2358	1'	1910
2'	2519	2'	1927
3'	2276	3'	1805
4'	2697	4'	1951
5'	2592	5'	1999

(17) Depth	Counts Per Minute	(17+19) Depth	Counts Per Minute
1'	2391	1'	2192
2'	2276	2'	2231
3'	2152	3'	2357
4'	2330	4'	2463
5'	2479	5'	2654

(19) Depth	Counts Per Minute	(17+19) Depth	Counts Per Minute
1'	2298	1'	2229
2'	2421	2'	2301
3'	2301	3'	2342
4'	2208	4'	2217
5'	2199	5'	2297

(16+19) Depth	Counts Per Minute	(16+17+19) Depth	Counts Per Minute
1'	2221	1'	2236
2'	2369	2'	2379
3'	2346	3'	2412
4'	2299	4'	2215
5'	2302	5'	2303

Page _____ of _____

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Stan A. Huber Counsultants, Inc.

Radiation Survey Form

Location/ Project ID:

Date: 8/4/16 - 8/10/16 **Technician:** Steven Kowalczyk

Inst Model: Ludlum 2221 **Serial No. :** 126497

Probe Type: 1"x1" NaI / (2"x2" NaI) **Lift Elevation:** -5'
Shielded / Not Shielded

Background 1800 **cpm** **Action Level:** 6018 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.

N

scale

(20) Depth	Counts Per Minute	(16) Depth	Counts Per Minute
1'	2509	1'	2054
2'	2499	2'	2015
3'	2781	3'	2087
4'	2668	4'	2189
5'	2662	5'	1987
(20) Depth	Counts Per Minute	(20) Depth	Counts Per Minute
1'	2161	1'	1759
2'	2460	2'	1777
3'	2265	3'	1689
4'	2008	4'	1674
5'	2058	5'	1801

Attachment D

Riverwalk Planter Area Survey Forms

401 N. Michigan Drive Thorium Monitoring

Stan A. Huber Consultants, Inc.
200 N. Cedar Road
New Lenox, IL 60451

sahci
Stan A. Huber Counsultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan - Riverwalk

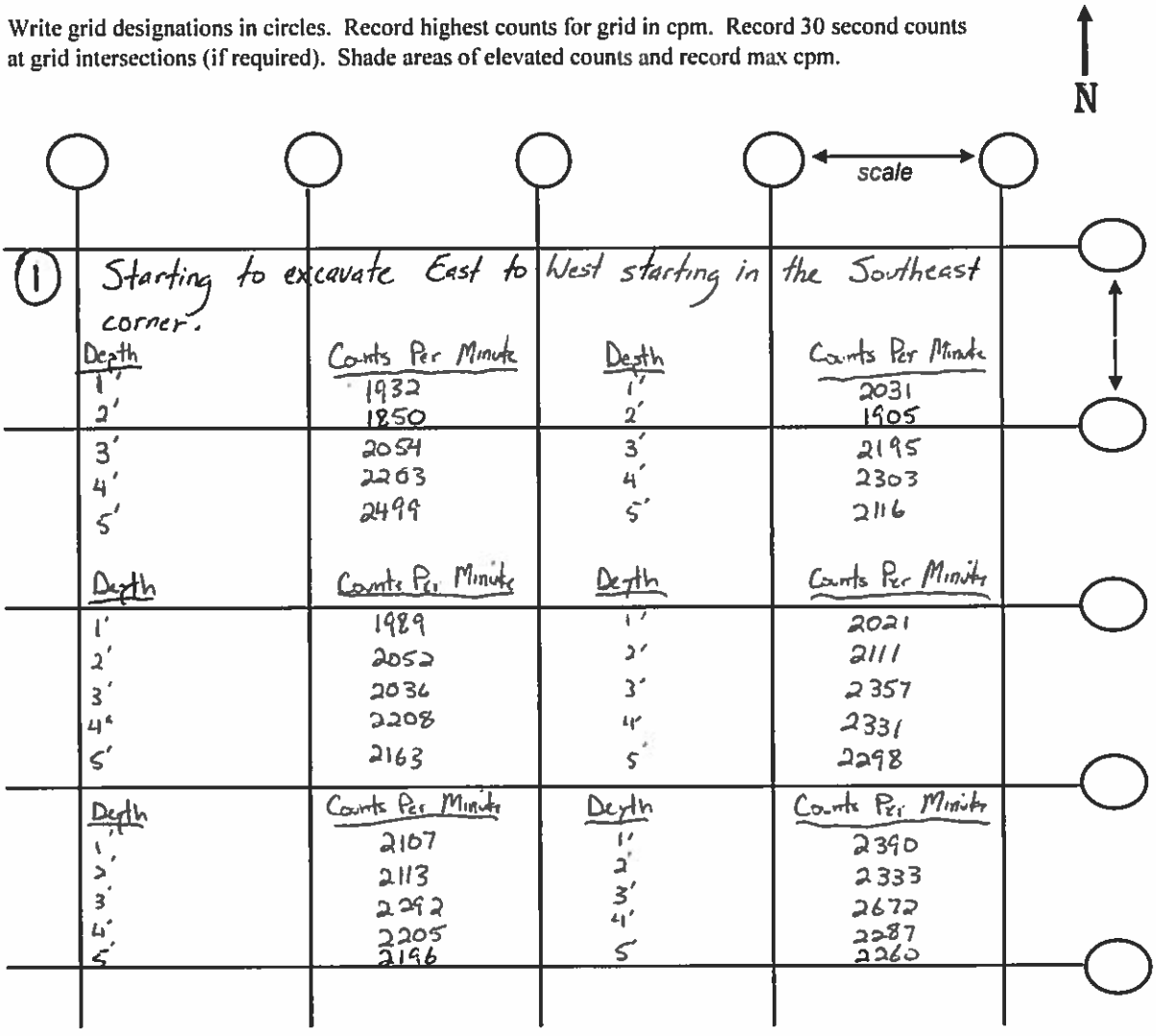
Date: 8/25/16 **Technician:** Steven Kowalczyk

Inst Model: Ludlum 2221 **Serial No. :** 126497

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** -5'

Background 1800 **cpm** **Action Level:** 6018 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



Starting to excavate East to West starting in the Southeast corner.

Depth	Counts Per Minute	Depth	Counts Per Minute
1'	1932	1'	2031
2'	1850	2'	1905
3'	2054	3'	2195
4'	2263	4'	2303
5'	2499	5'	2116

Depth	Counts Per Minute	Depth	Counts Per Minute
1'	1989	1'	2021
2'	2052	2'	2111
3'	2036	3'	2357
4'	2208	4'	2331
5'	2163	5'	2298

Depth	Counts Per Minute	Depth	Counts Per Minute
1'	2107	1'	2390
2'	2113	2'	2333
3'	2292	3'	2672
4'	2205	4'	2287
5'	2196	5'	2260

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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan - Riverwalk

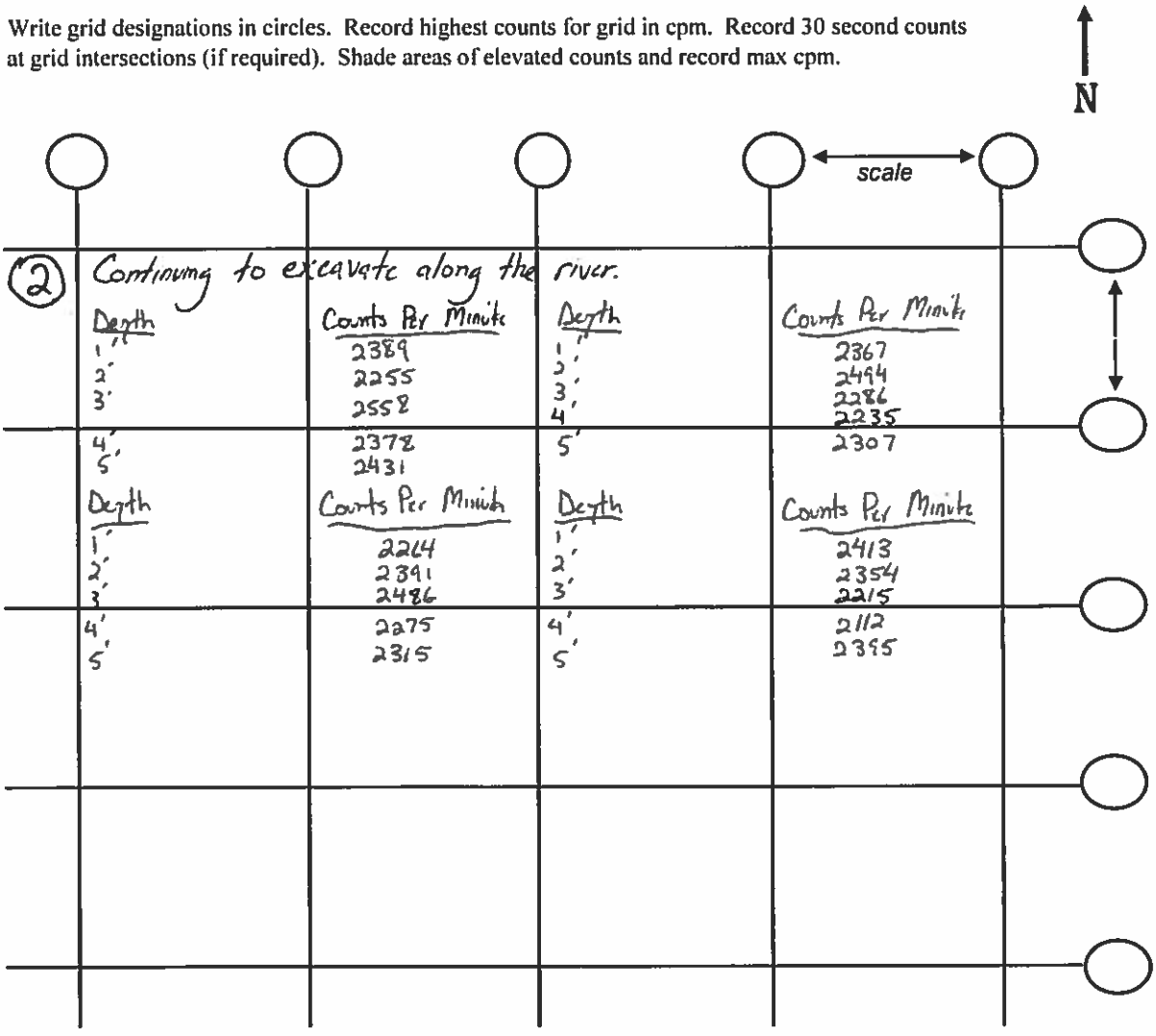
Date: 8/26/16 **Technician:** Steven Kowalczyk

Inst Model: Ludlum 2221 **Serial No. :** 126497

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** -5'

Background 1800 **cpm** **Action Level:** 6018 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.



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Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan - Riverwalk

Date: 8/27/16 **Technician:** Stavin Kowalczyk

Inst Model: Ludlum 2221 **Serial No. :** 126497

Probe Type: 1"x1" NaI / (2"x2" NaI) **Lift Elevation:** -5'

(Shielded) / Not Shielded

Background 1800 cpm **Action Level:** 6018 cpm

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.

N

scale

Continuing to excavate along the river.

(3) Depth	Counts Per Minute	Depth	Counts Per Minute
1'	2074	1'	2415
2'	2379	2'	2527
3'	2288	3'	2055
4'	2091	4'	2174
		5'	2143
~~5'~~	2200	1'	1850
~~1'~~	2483	2'	2077
2'	2289	3'	2235
3'	2077	4'	2006
4'	2319	5'	2405
5'	1979		
~~5'~~			
1'	2070	1'	2282
2'	2394	2'	2175
3'	2019	3'	2090
4'	2117	4'	2109
~~5'~~	1884	5'	2013
1'	2709		
2'	2574	1'	2313
3'	2083	2'	2536
4'	2254	3'	2391
5'	2167	4'	2376
		5'	2498

sahci
Stan A. Huber Counsultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan - Riverwalk

Date: 8/29/16 **Technician:** Steven Kowalczyk

Inst Model: Ludlum 2221 **Serial No. :** 126497

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** -5'

Background 1800 **cpm** **Action Level:** 6018 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.

N

scale

Continuing to excavate along the river.

(4)

Depth	Counts Per Minute	Depth	Counts Per Minute
1'	2017	1'	2056
2'	1993	2'	2412
3'	2023	3'	2236
4'	2082	4'	2110
5'	2143	5'	2262

Depth	Counts Per Minute	Depth	Counts Per Minute
1'	1976	1'	2252
2'	1882	2'	1919
3'	2002	3'	2216
4'	1990	4'	2057
5'	2388	5'	2051

Depth	Counts Per Minute	Depth	Counts Per Minute
1'	2220	1'	2200
2'	1973	3'	2210
3'	2183	3'	2141
4'	2134	4'	2230
5'	2271	5'	2057

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Stan A. Huber Counsultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan - Rurulk

Date: 8/30/16 **Technician:** Steven Kowalczyk

Inst Model: Ludlum 2221 **Serial No. :** 126497

Probe Type: 1"x1" Nal / 2"x2" Nal
Shielded / Not Shielded

Lift Elevation: -5'

Background 1800 **cpm** **Action Level:** 6018 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.

N

scale

(5) Continuing to excavate along the river

Depth	Counts Per Minute	Depth	Counts Per Minute
1	1987	1	2595
2	2010	2	2641
3	2137	3	2457
4	1999	4	2362
5	2015	5	2378

Depth	Counts Per Minute	Depth	Counts Per Minute
1'	2430	1'	2601
2'	2531	2'	2542
3'	2386	3'	2530
4'	2392	4'	2487
5'	2402	5'	2522

Depth	Counts Per Minute
1'	2045
2'	1932
3'	2280
4'	2171
5'	1960

sahci
Stan A. Huber Consultants, Inc.

Radiation Survey Form

Location/ Project ID: 401 N. Michigan Riverwalk

Date: 8/30/16 **Technician:** Steven Kowalczyk (CH)

Inst Model: Ludlum 2221 **Serial No. :** 226497

Probe Type: 1"x1" NaI / (2"x2" NaI) (Shielded) / Not Shielded **Lift Elevation:** -5'

Background 1800 **cpm** **Action Level:** 6018 **cpm**

Write grid designations in circles. Record highest counts for grid in cpm. Record 30 second counts at grid intersections (if required). Shade areas of elevated counts and record max cpm.

N

scale

	Depth	Counts Per Minute	Depth	Counts Per Minute
(6)	1'	2107	1'	1980
	2'	2366	2'	2045
	3'	2332	3'	1998
	4'	2401	4'	2015
	5'	2553	5'	2131