APPLICATION FOR BUILDING PERMIT

THE VILLAGE OF HASTINGS-ON-HUDSON | 7 Maple Ave, Hastings-on-Hudson NY 10706

Application No.	14388	**Date**	07/01/2016
Job Location	1River St1 River Street	Parcel ID	4.30-19-1
Property owner	AERL	Property class	Manufacturing & Proc
Occupancy	Commercial	Zoning	

APPLICANT

ARCO ENVIRONMENTAL

REMEDIATION LLC

CONTRACTOR

Contractor License information

License Name	License Number	Expiration
NA		

Description of work

Type of work	Demolition	**Applicant is**	Agent
Requested by	The Owner	**In association**	
Est. cost of work	$2,850,000	**Property class**	Manufacturing & Proc

Desc. of work

Building 52, located at 1 River Street, Hastings on Hudson, NY, is to be demolished while the concrete slab will remain intact. See attached narrative for details.

Please Note: Completing the application form does not constitute a permit to commence construction. To obtain your permit follow the instructions on the instruction page provided on page 3.

1River St	4.30-19-1	Demolition

AFFIDAVIT OF APPLICANT

I, Nick Peterson, being duly sworn deposes and states, that I am the duly authorized representative of ARCO Environmental Remediation LLC (AERL), a Delaware corporation, with a principal business office at 201 Helios Way, HPL 6th Floor, Houston, TX 77079 ant that AERL is:

X The owner of the premises described herein.

☐ The ______________________________ f the New York Corporation ______________________________ with offices at:
______________________________ duly authorized by resolution of the Board of Directors, and that said Corporation is duly authorized by the Owner to make this application.

☐ A General Partner of ______________________________ ith offices at ______________________ nda that said Partnership is duly authorized by Owner to make this application.

☐ The Lessee of the premises, duly authorized by the owner to make this application.

☐ The Architect or Engineer duly authorized by the owner to make this application.

☐ The contractor authorized by the owner to make this application.

That the information contained in this application and on the accompanying drawings is true to the best of his knowledge and belief. The undersigned hereby agrees to comply with all the requirements of the New York State Uniform Fire Prevention and Building Code, the Village of Hastings-on-Hudson Building Code, Zoning Ordinance and all other laws pertaining to same, in the construction applied for, whether or not shown on plans or specify in this application.

Sworn to before me this ___12____day of _January__ of __2016____

Debbie M. Anderson

Notary Public/ Comm. of Deeds

NOTARY PUBLIC STATE OF TEXAS
DEBBIE M. ANDERSON
My Commission Expires
June 12, 2019

Nick Pet

Applicant's Signature

OWNER'S AUTHORIZATION

I: **AERL** as the owner of the subject premises and have authorized the applicant named above to submit this application on my behalf.

Sworn to before me this ____________ ay of 20_______

* Property owner's email ____

____

Notary Public/ Comm. of Deeds

____

Owner's Signature

* Property owner's email address is required and will be used only to send updates about this permit application.

INSTRUCTIONS/ CHECK LIST

Please Note: Completing the application form does not constitute a permit to commence construction.

To complete the application process, you will need to deliver to the Building Department the following:

- ❑ An application fee of; $25 up to 10,000, $50 up to 100,000, $200 up to 1 mi., $500 in excess of 1mi.
- ❑ A signed (in blue ink) / notarized application forms
- ❑ Two (2) copies of an up-to-date **survey (for any exterior work)**

  If the survey is more than one (1) year old, a notarized statement from the property owner must be written on the survey stating:
  The survey which is being submitted is "AS THE PROPERTY CURRENTLY EXISTS"

  The survey must show all the Set Backs and Dimensions of any and all existing structures as well as the proposed work.
  Lot Coverge and Structure(s) Elevations must be indicated on the application along with topograpghical, if needed
- ❑ If applicable, three (3) sets of architectural plans, stamped and signed by a NYS licensed Architect or Professional Engineer. (Required for projects with cost of work greater than $10,000)

Contractor's requirement

If the contractor's insurance and licenses were not uploaded, please submit two (2) copies of each of the following:

- ❑ Contractor's Certificate of Liability listing the Village of Hastings-on-Hudson as the Certificate Holder and Additional Insured.
- ❑ Contractor's Workman's Compensation or a Waiver of Insurance if all work to be performed by the property owner.
- ❑ Westchester County Home Improvement License.

  Note: Please be advised, under ***new*** State and Municipal Laws, the Workman's Compensation and disability benefits insurance must be submitted on separate State approved forms. The "Acord Form" are no longer acceptable proof of Workman's Compensation coverage. Further information or questions may be answered by calling the NYS Bureau of Compliance at (518) 486. 6307 or by visiting their website: www.wcb.state.ny.us or by contacting the insurance provider.

If the property owner is the contractor, then the property owner is required to submit their Homeowner's Insurance information.

Signatures and notaries must be originals. Photo copies cannot be accepted by law.

Application is reviewed by the Building Inspector and is then either approved or denied. The Building Inspector has TEN (10) WORKING DAYS to review the application. Longer time may be necessary for review if plans have to be sent to either the County or State for review and/or approval.

If the application is approved, the property owner will be notified by email, telephone call, or mail and the Building Permit shall be issued to the property owner. The fees for a Building Permit are based on the total cost of construction as stated on the permit application.

After the work has been completed it is the property owner's responsibility to contact the Building Department by telephone call for a final inspection. **The CO is mailed to the property owner only.**

Please note:
1. After a Building Permit has been issued, occupancy is prohibited until a CO has been issued.
2. Failure to obtain a CO may delay refinancing or selling the property.

Detailed Description

The proposed action is demolition of Building 52, which is an approximately 93,000 square foot building located on the northeast portion of the former 28-acre Anaconda Wire & Cable Manufacturing property situated at 1 River Street. The actual demolition project will take place on approximately 2.2 acres of the 1 River Street property (the "demolition site"). The demolition project is not expected to have any environmental impact beyond the 2.2 acre demolition site. Within the 2.2 acre site, the demolition is not expected to impact any natural resources or water supplies or to result in an increased potential for erosion, drainage, or flooding.

Part of Building 52 currently serves as storage for equipment used to implement the recovery of polychlorinated biphenyls (PCBs) from recovery wells located on other portions of the 1 River Street property -- an Interim Remedial Action (IRM) required by the New York Department of Environmental Conservation ("NYSDEC"). The remainder of Building 52 is currently unused due to concerns around structural integrity. For a further assessment of the structural condition of Building 52, please see the 2014 Building 52 Alternatives report prepared for the Atlantic Richfield Company (ARC) and submitted to the Village (attached). In 2014, the State Historic Preservation Office (SHPO) found that Building does not meet "….the criteria for listing on the State and National Registers of Historic Places." (report and letter attached).

Building 52's demolition constitutes an initial step in the planned remediation of PCBs on the overall 1 River Street property. Elevated levels of PCBs are present in soils under and adjacent to Building 52, as well as in certain structural components of Building 52 itself. Building 52 materials containing PCBs will be properly disposed of in accordance with federal regulation under the Toxic Substances Control Act. Waste characterization samples have been collected from building materials to determine appropriate segregation requirements and disposal options for waste generated during the demolition. The data set resulting from this work is not complete; preliminary data indicates the presence of PCBs greater than 50 parts per million (PPM) in building materials including paint, window glaze and caulk, and masonry. BP will work with the New York State (NYS) Department of Health (DOH) to complete a Community Air Monitoring Plan (CAMP), which will be implemented during the demolition to monitor dust and PCB levels in the air at the property boundary. Based on air monitoring implemented during previous demolition activities at the site, real time dust monitoring and 24 hour PCB air samples may be required. Portions of the Building 52 slab that contain PCBs greater than 50 PPM will be removed prior to demolition by either removing a surficial layer of the slab or removing the total thickness of the affected area of the slab. Remaining voids in the concrete slab resulting from total thickness removal will be backfilled to the surface with a low permeability cover. The remaining portion of the slab will be left in place. Demolition will generally consist of removing masonry material from the exterior of the building and then demolishing the roof and steel supports. Waste material will segregated and loaded onto trucks and removed from the site. The project duration (demolition, waste segregation, offsite disposal, and engineering controls (if required) is anticipated to require three to four months. The actual duration will be determined once a contractor is selected and a construction schedule is completed. Once Building 52 has been demolished, subslab soil will be investigated in accordance with the approved Remedial Design Work Plan (RDWP) to determine extents of PCBs above cleanup criteria. The cleaned floor slab will remain in place to provide surface cover until sub-slab soil remediation takes place. The; soil remediation under the Building 52 slab and in adjacent areas will occur as part of the overall remediation of the entire 1 River Street property and under the supervision of NYSDEC.

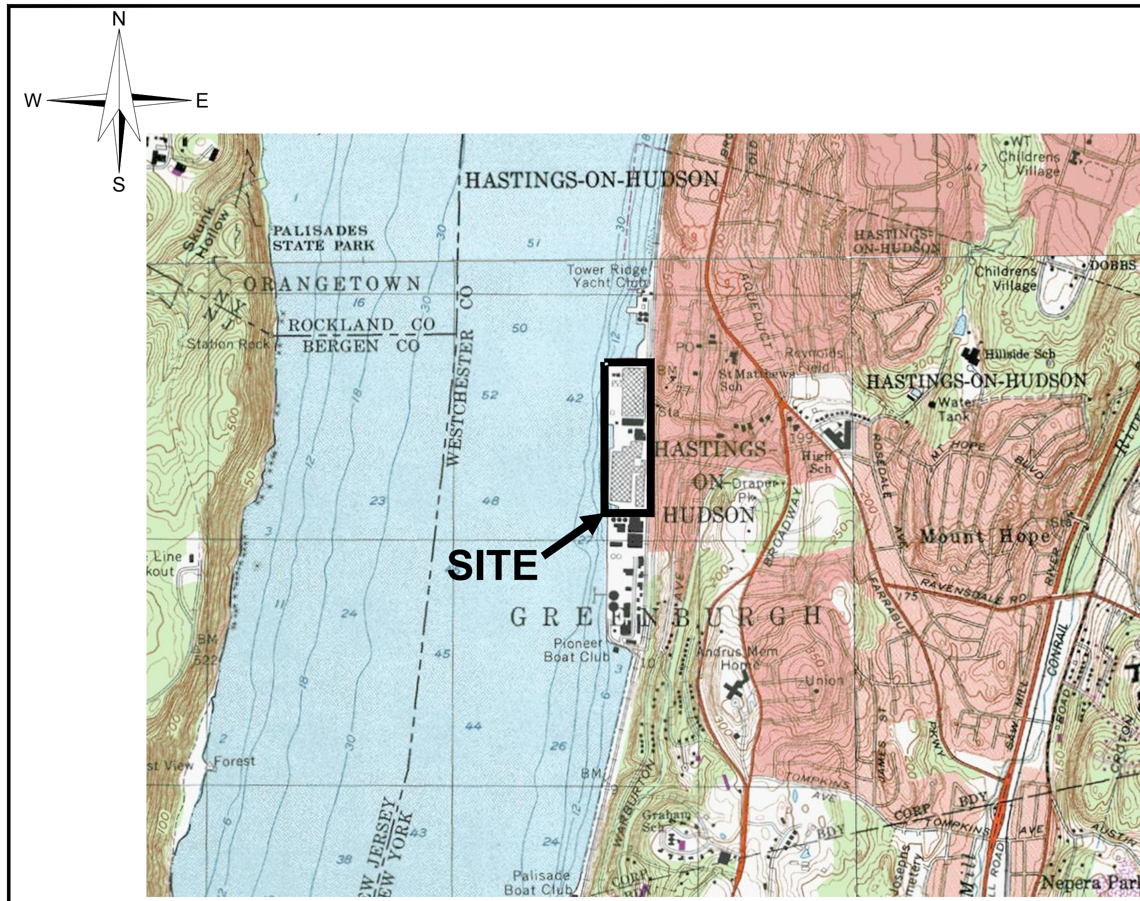
Demolition will involve several pieces of heavy equipment, including excavators and front end loaders. Because demolition activities will take place Monday through Friday during normal business hours, and because the site is not located in a residential area of Hastings, there are not likely to be significant noise impacts for Village residents. Indeed, noise impacts are not expected to exceed those related to the demolition work conducted in the past for other industrial buildings previously located on the One River Street property.

The demolition of Building 52 is not expected to have any impact on the Metro North commuter rail which is proximate to the 1 River Street property. However, due to the proximity of the site to the Metro North Rail Road (MNR) commuter station, BP will coordinate temporary road closures with the Village for the road south of the bridge and adjacent to the site to reduce potential safety concerns or incidents to the public and adjacent properties resulting from demolition activities.

Although barge removal remains an alternative for the overall remediation project, given the short duration of this project and the limited quantity of materials being removed, barge transportation of removed materials is not feasible. Prior to commencing with demolition, BP will discuss appropriate trucking routes and times of operation with the Village of Hastings-on-Hudson to reduce disturbance during completion of the work. Based on an initial contractor estimate, the demolition may result in an estimated 400 truckloads of material being removed from the demolition site. Based on previous demolition work at the site, in order to reach waste disposal facilities, trucks will need to access Interstate 287 via Route 9 during the duration of the work. The project is not expected to have any long term impact on traffic levels or transportation infrastructure.

Security of the site is currently monitored 24 hours per day and 7 days per week, which will continue during demolition activities. Currently, security and job trailers are located west of Building 52. The security trailer is located approximately 10 feet from the building. Prior to beginning demolition activities, trailers will be relocated to the east side of the former Building 51 pad. Temporary storage enclosures will be installed upon completion of the demolition to store equipment used to implement the IRM required by NYSDEC. The current plan is to install these enclosures on the Building 52 pad; an alternate location may be identified, if required.

The 1 River Street property is currently zoned commercial/industrial. Demolition of Building 52 is not expected to conflict with that zoning, nor is any change in zoning being sought. Demolition of the building will facilitate environmental remediation,



SITE LOCUS

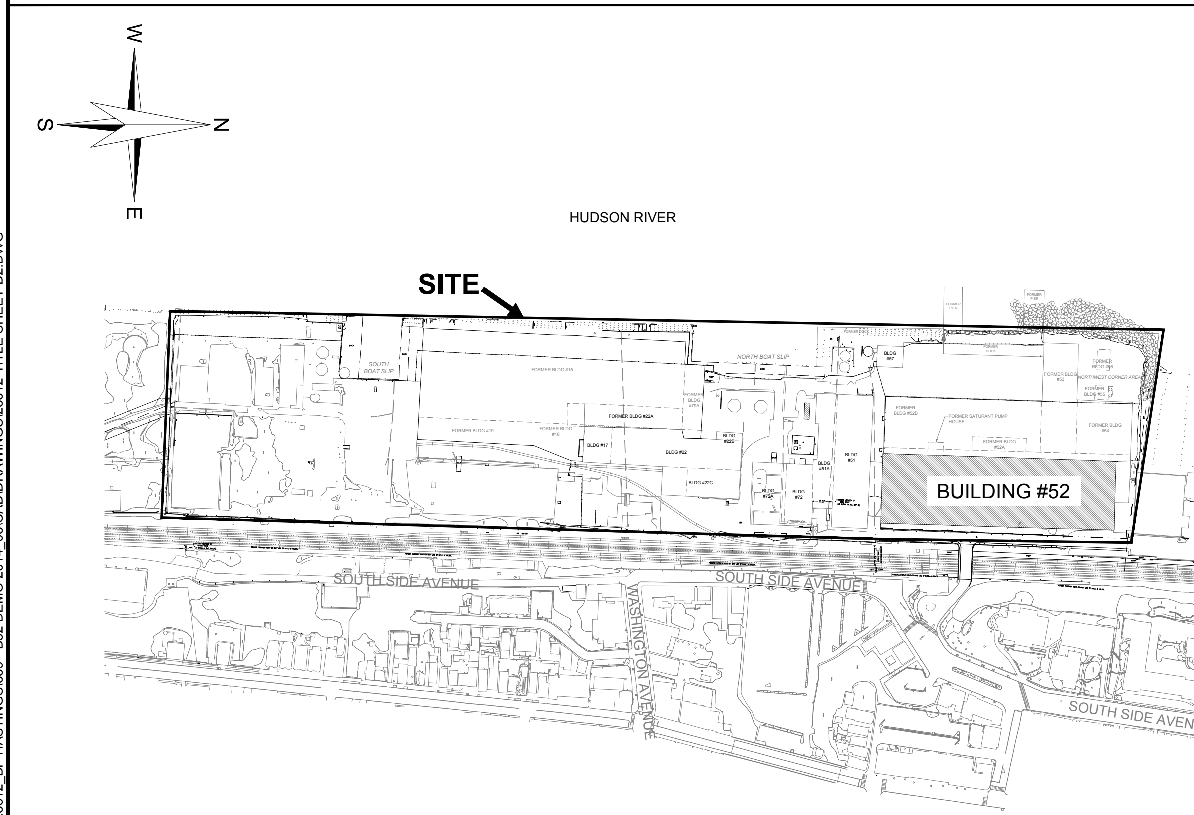
TOPO SOURCE: USGS TOPOGRAPHIC MAP

0 2000 4000 6000 8000

SCALE IN FEET

DECOMMISSIONING AND DEMOLITION OF BUILDING 52

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK



VICINITY MAP

0 250 500 750 1000

SCALE IN FEET

SHEET NO.	DRAWING NO.	SHEET TITLE
1	T-100	TITLE SHEET
2	T-101	GENERAL NOTES
3	C-100	SITE EXISTING CONDITIONS
4	C-101	DECOMMISSIONING PLAN
5	C-102	ASBESTOS LOCATIONS
6	C-103	DEMOLITION PLAN
7	C-104	SITE PLAN
8	C-105	NEW SITE GENERAL ARRANGEMENT PLAN
9	E-100	ELECTRICAL SITE PLAN, LEGEND AND ABBREVIATION
10	E-101	ELECTRICAL RISER DIAGRAMS
11	E-102	ELECTRICAL DETAILS

ENGINEER
HALEY & ALDRICH OF NEW YORK
200 TOWN CENTRE DRIVE, SUITE 2
ROCHESTER, NY 14623-4264

ELECTRICAL
DAMIANO BARILE ENGINEERS, P.C.
77 TARRYTOWN ROAD
WHITE PLAINS, NY 10607

HALEY ALDRICH

Haley & Aldrich of New York
200 Town Centre Drive, Suite 2
Rochester, NY 14623-4264
Tel: 585.359.9000
Fax: 585.359.4650
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Project No.: 28612-339
Scale: AS SHOWN
Date:
Drawn By: TSD
Designed By: BKB
Checked By: KMA
Approved By: WCH
Stamp:

Rev.	Description	By	Date
0	ISSUED FOR PERMIT	TSD	01/01/16

NYSDEC SITE #3-60-022 1 RIVER STREET HASTINGS ON HUDSON, NEW YORK

TITLE SHEET

T-100

Sheet: 1 of 11

DUNING, TIMOTHY Printed: 1/5/2016 12:22 PM Layout: TITLE-D-T1
Drawing: \\COL\COMMON\28612_BP HASTINGS\339 - B52 DEMO 2014_08\CAD\DRAWINGS\28612-TITLE SHEET-D2.DWG

GENERAL NOTES

1. CONTRACTOR SHALL COMPLY WITH REQUIREMENTS OF ALL APPLICABLE FEDERAL, STATE, AND LOCAL SAFETY AND HEALTH REGULATIONS REGARDING THE DEMOLITION OF STRUCTURES INCLUDING ANSI/NFPA 241 - BUILDING CONSTRUCTION AND DEMOLITION OPERATIONS. SOME BUILDING MATERIALS HAVE BEEN IDENTIFIED AS ASBESTOS CONTAINING MATERIAL. CONTRACTOR SHALL COMPLY WITH NEW YORK ASBESTOS ABATEMENT REGULATIONS.

2. CONTRACTOR IS RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS, LOCATIONS, DIMENSIONS, SIZES, UTILITIES, AND OBSTACLES PRIOR TO COMMENCING WORK. ANY CONFLICTS WITH DETAILS AND NOTES SHALL BE BROUGHT IN WRITING TO THE IMMEDIATE ATTENTION OF THE ENGINEER.

3. WHERE NOTES CONFLICT WITH ANY DRAWING, THE MOST RESTRICTIVE SHALL APPLY. WHERE CONFLICTS EXIST, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING. NO CHANGES OR ADDITIONS TO THE SCOPE OF WORK DEPICTED HEREIN SHALL BE MADE WITHOUT PRIOR APPROVAL OF THE ENGINEER.

4. CONTRACTOR SHALL OBTAIN AND PAY FOR ANY/ALL NECESSARY CONSTRUCTION PERMITS AND LICENSES, INCLUDING ELECTRICAL PERMITS, AND SCHEDULE ANY REQUIRED INSPECTIONS. THE CONTRACTOR SHALL MAINTAIN COPIES OF ANY PERMITS AT THE JOB SITE FOR AGENCY INSPECTION AND PROVIDE A COPY TO THE ENGINEER PRIOR TO BEGINNING WORK.

5. CONTRACTOR SUBMITTALS AND SHOP DRAWINGS SHALL BE SUBMITTED TO AND REVIEWED BY THE ENGINEER PRIOR TO PERFORMING WORK ON SITE.

6. UNLESS OTHERWISE STATED, CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, EQUIPMENT, TOOLS, AND DEVICES TO COMPLETE THE WORK.

7. ALL WORK SHALL BE PERFORMED BY LICENSED TRADESMEN AND IN ACCORDANCE WITH LOCAL CODE AND FACILITY REQUIREMENTS.

8. LOCATION OF KNOWN EXISTING UTILITY LINES SHOWN IN THIS DRAWING SET ARE APPROXIMATE. CONTRACTOR SHALL LOCATE ALL EXISTING UTILITIES (KNOWN AND UNKNOWN) WITHIN THE LIMITS OF THE WORK AREA PRIOR TO WORK. CONTRACTOR SHALL PREVENT UTILITY DAMAGE DURING WORK. THE CONTRACTOR SHALL REPAIR AND/OR REPLACE ANY UTILITIES DAMAGED BY THE CONTRACTOR, AND PROVIDE AT HIS EXPENSE FOR SERVICE CONTINUATION DURING REPAIRS.

9. UTILITY CROSSINGS WITHIN THE PARCEL BOUNDARIES ARE APPROXIMATE. THE UTILITY DEPTHS WITHIN THE PARCEL BOUNDARIES ARE UNKNOWN. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE UTILITY LOCATIONS AND DEPTHS PRIOR TO CONSTRUCTION.

10. THE CONTRACTOR SHALL MAINTAIN AN ORDERLY AND CLEAN JOB SITE. THE CONTRACTOR SHALL REMOVE AND PROPERLY DISPOSE OF ALL CONSTRUCTION RELATED TRASH, DEBRIS, AND EXCESS MATERIALS.

11. THE CONTRACTOR'S LAYDOWN AREA FOR MATERIALS SHALL BE COORDINATED WITH THE ENGINEER AND OTHER ON-SITE SUBCONTRACTORS. SECURITY FOR CONTRACTOR'S EQUIPMENT AND MATERIALS IS THE RESPONSIBILITY OF THE CONTRACTOR.

12. STOCKPILES, ROLL OFFS, TRAILERS, AND ANY OTHER PROJECT MATERIAL SHALL BE ARRANGED IN LOCATIONS DESIGNATED BY THE ENGINEER AND ATLANTIC RICHFIELD.

13. ALL EMPLOYEES WHO WILL BE WORKING IN OR NEAR CONTAMINATED SOIL, WATER OR AIR SHALL HAVE SUCCESSFULLY COMPLETED AN OSHA 40-HR. HEALTH AND SAFETY TRAINING COURSE IN COMPLIANCE WITH OSHA REGULATION 29 CFR 1910.120, AND SPECIFIC TRAINING FOR PROJECT SITE ACTIVITIES.

14. THE TERM "PROVIDE" SHALL HAVE THE SAME MEANING AS "FURNISH AND INSTALL".

15. DAMAGE TO FACILITY DURING WORK SHALL BE REPAIRED AT THE EXPENSE OF THE CONTRACTOR AND AT NO ADDITIONAL EXPENSE TO OWNER.

16. CONTRACTOR SHALL COMPLY WITH ALL ATLANTIC RICHFIELD AND HALEY & ALDRICH, NEW YORK. CONTRACT CONTROL OF WORK AND HEALTH AND SAFETY REQUIREMENTS.

17. CONTRACTOR SHALL PERFORM WORK SHOWN ON THIS DRAWING SET AND REFER TO ADDITIONAL SCOPE OF WORK REQUIREMENTS, SPECIFICATIONS, AND STANDARD TERMS AND CONDITIONS.

18. ANY CHANGE TO THE ELECTRICAL DRAWINGS SHALL BE REVIEWED AND APPROVED BY A NEW YORK STATE LICENSED ELECTRICAL ENGINEER.

19. CONTRACTOR SHALL MAINTAIN EXISTING FENCE, EXCEPT WHERE NOTED ON DRAWINGS.

20. EXISTING MONITORING WELLS SHALL BE PROTECTED AND MAINTAINED AT ALL TIMES.

21. CONTRACTOR SHALL COORDINATE TRAFFIC ROUTES AND SCHEDULE WITH LOCAL AUTHORITIES ALONG ROUTE.

HALEY ALDRICH

Haley & Aldrich of New York
200 Town Centre Drive, Suite 2
Rochester, NY 14623-4264
Tel: 585.359.9000
Fax: 585.359.4650
www.haleyaldrich.com

Project No.:	28612-339
Scale:	AS SHOWN
Date:	
Drawn By:	TSD
Designed By:	BKB
Checked By:	KMA
Approved By:	WCH

Stamp:

Wayne Hardison

Rev.	Description	By	Date
0	ISSUED FOR PERMIT	TSD	01/01/16

NYSDEC SITE #3-60-022 1 RIVER STREET HASTINGS ON HUDSON, NEW YORK

GENERAL NOTES

T-101

Sheet: 2 of 11

DUNING, TIMOTHY Printed: 1/5/2016 12:23 PM Layout: NOTES
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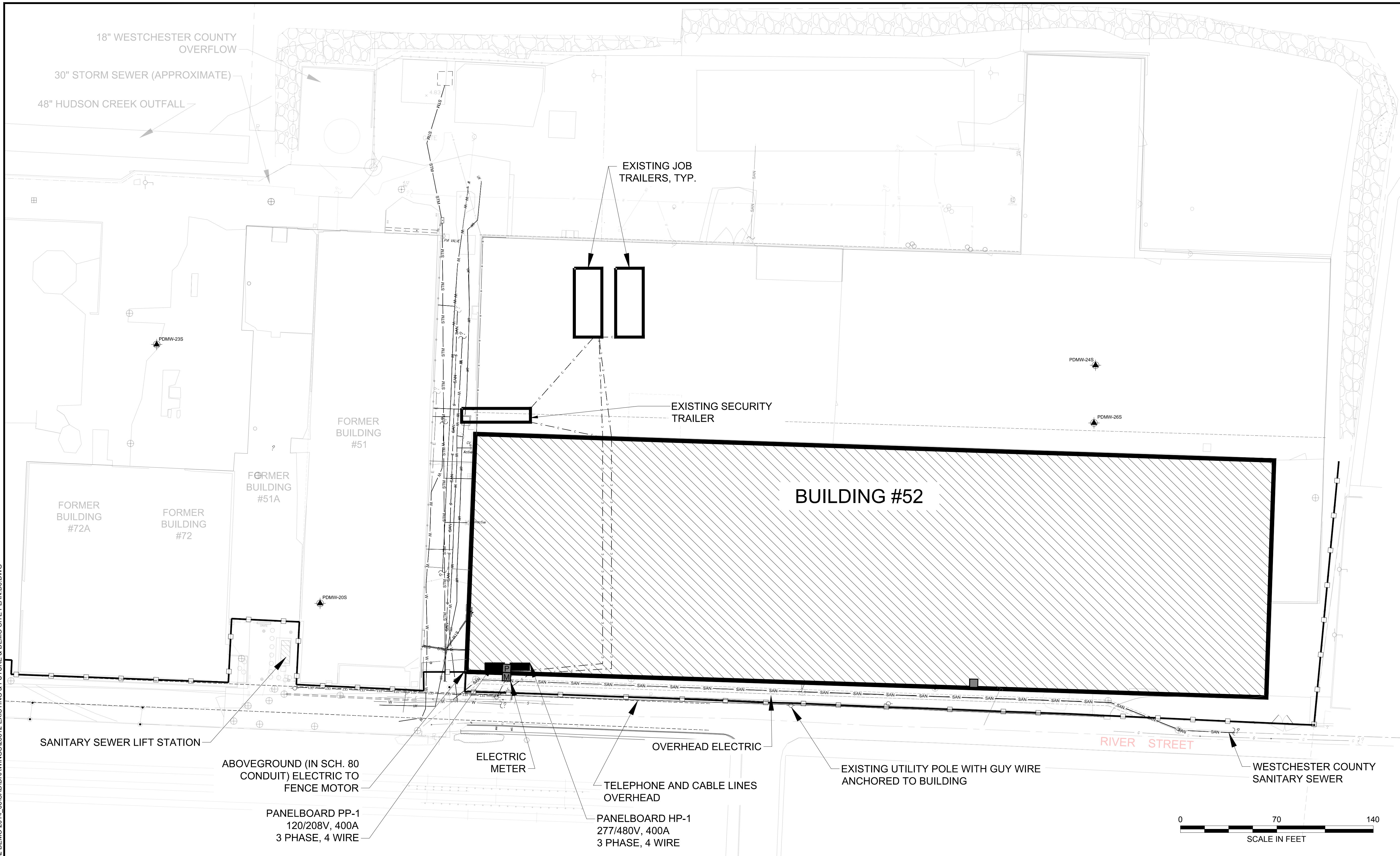

LEGEND:

STM	STORM SEWER		EXISTING MONITORING WELL LOCATION
SAN	SANITARY SEWER		EXISTING BUILDING
W	WATER LINE		MANHOLE
E	ELECTRIC (OVERHEAD)	P M	EXISTING ELECTRICAL PANEL/METER
	EXISTING FENCE LINE		

NOTES:

1. THIS PLAN BASED ON TOPO SURVEY BY WENDEL WD ARCHITECTURE, ENGINEERING, SURVEYING AND LANDSCAPE ARCHITECTURE P.C. DATED JULY 22, 2014.
2. CONTRACTOR RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS, LOCATIONS, DIMENSIONS, SIZES, UTILITIES, AND OBSTACLES PRIOR TO COMMENCING WORK.

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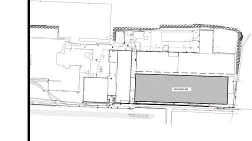

KEY PLAN (NOT TO SCALE)

Project No.:	28612-339
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Designed By:	BKB
Checked By:	KMA
Approved By:	WCH
Stamp:	

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NYSDEC SITE #3-60-022 1 RIVER STREET HASTINGS ON HUDSON, NEW YORK

SITE EXISTING CONDITIONS

C-100

Sheet: 3 of 11

LEGEND:

SU SUMP

F FIRE EXTINGUISHER

BAT BATTERY (THROUGHOUT)

MFC MISCELLANEOUS FUEL / PAINT / SOLVENT / SPRAY

EXISTING BUILDING

NOTES:

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2. CONTRACTOR RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS, LOCATIONS, DIMENSIONS, SIZES, UTILITIES, AND OBSTACLES PRIOR TO COMMENCING WORK.
3. WORK OF THIS CONTRACT SHALL COMPLY WITH ALL NATIONAL, STATE AND LOCAL LAWS, REGULATIONS AND CODES, INCLUDING REVISIONS TO DATE OF CONTRACT OR REVISIONS TO THE CONTRACT.
4. CONTRACTOR TO COORDINATE ACTIVITIES WITH OTHER SITE ACTIVITIES.
5. PROTECT ALL EXISTING MONITORING WELLS (SEE SHEET C-100).
6. REMOVE AND PROPERLY DISPOSE MATERIALS IDENTIFIED.
7. INSPECT, CLEAN AND BACKFILL SUMPS AS REQUIRED.
8. ALL LOCATIONS / AREAS ARE APPROXIMATE.
9. ALL WORK SHALL BE CONDUCTED IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS.
10. NOTES/DRAWINGS MAY BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.

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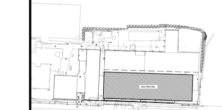

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NYSDEC SITE #3-60-022 1 RIVER STREET HASTINGS ON HUDSON, NEW YORK

DECOMMISSIONING PLAN

C-101

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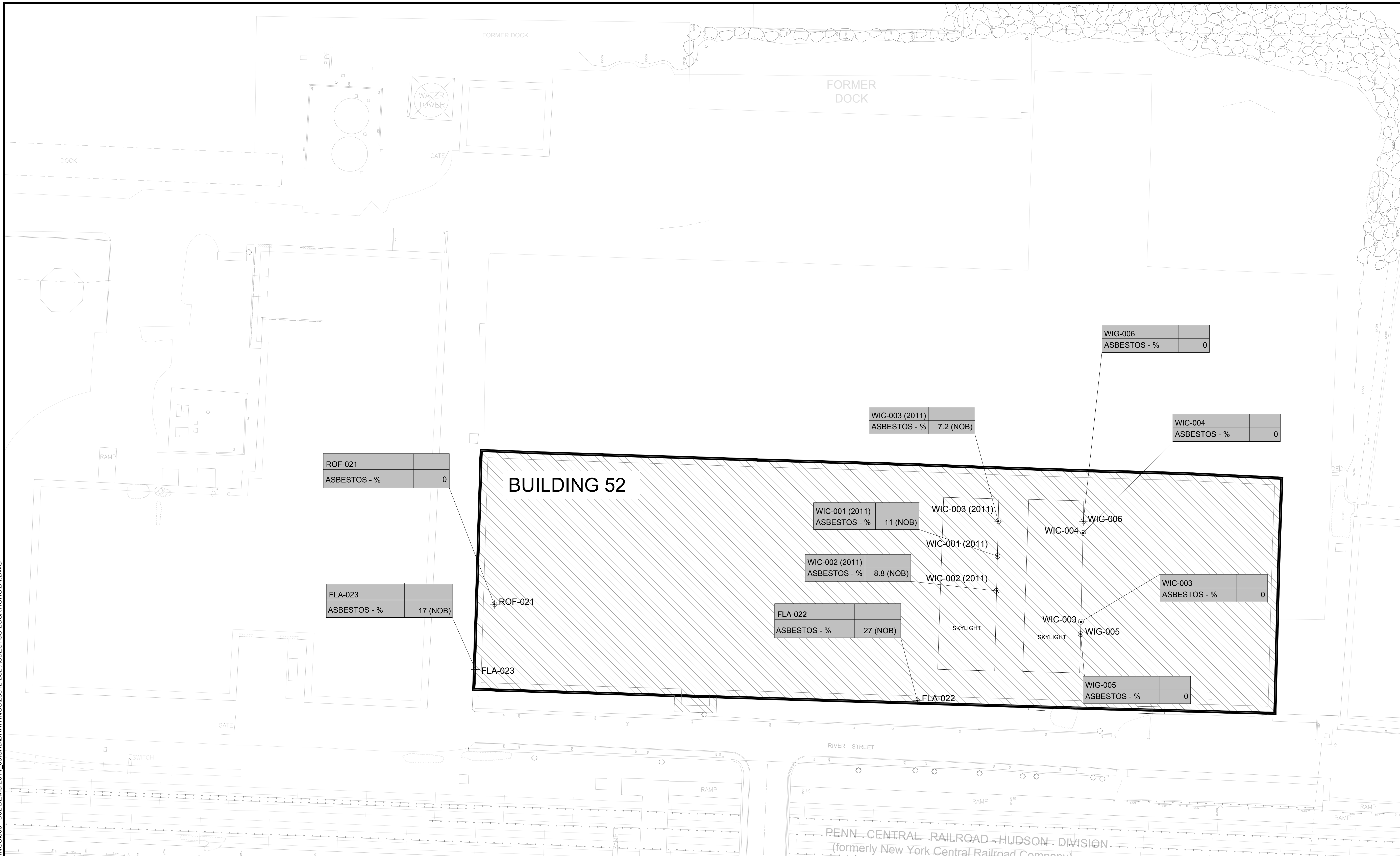

LEGEND:

STM	STORM SEWER
SAN	SANITARY SEWER
W	WATER LINE
E	ELECTRIC (OVERHEAD)
	EXISTING FENCE LINE
	OTHER SAMPLING
	EXISTING BUILDING

NOTES:
1. TYPICAL RESULTS ARE SHOWN FOR 2 SKYLIGHTS; 11 SKYLIGHTS TOTAL.
2. ABATE ASBESTOS CONTAINING MATERIAL (ACM) IN ACCORDANCE WITH NYSDOL CODE RULE 56 AND TECHNICAL SPECIFICATIONS.
3. NOB - NON FRIABLE, ORGANICALLY BOUND.
4. ROF - ROOFING MATERIAL (LOCATION APPROXIMATE)
5. FLA - ROOF FLASHING (LOCATION APPROXIMATE)
6. WIC - WINDOW CAULKING (LOCATION APPROXIMATE)
7. WIG - WINDOW GLAZING (LOCATION APPROXIMATE)
8. NOTES/DRAWINGS MAY BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.

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SCALE IN FEET

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NYSDEC SITE #3-60-022 1 RIVER STREET HASTINGS ON HUDSON, NEW YORK

ASBESTOS LOCATIONS

C-102

Sheet: 5 of 11

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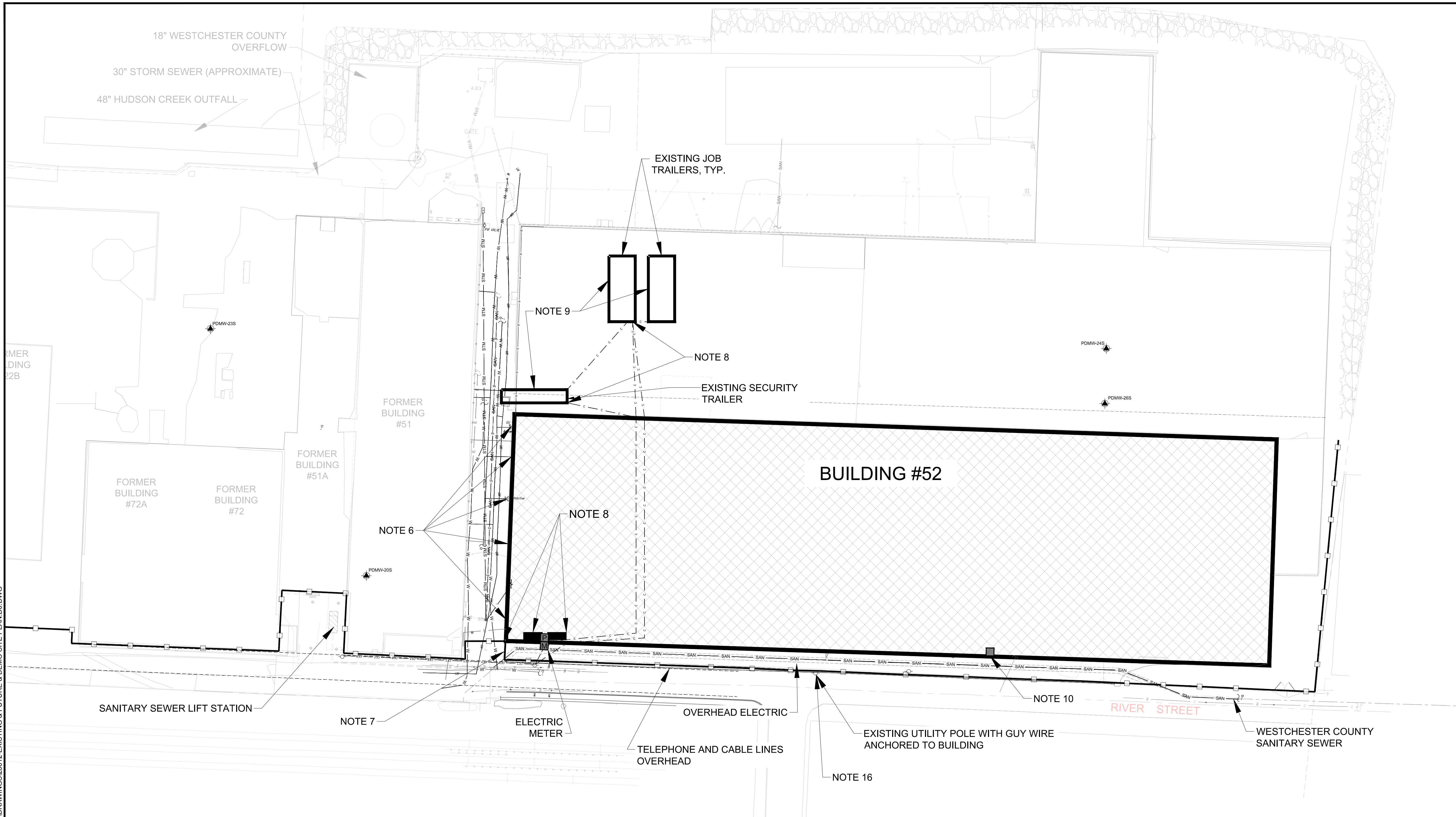

LEGEND:

- STM — STORM SEWER
- SAN — SANITARY SEWER
- W — WATER LINE
- E — ELECTRIC (OVERHEAD)
- C — CABLE/ELECTRIC
- EXISTING FENCE LINE
- DEMOLISH BUILDING (SLAB TO REMAIN)
- P/M — EXISTING ELECTRIC PANEL / METER
- EXISTING MONITORING WELL

NOTES:

1. THIS PLAN BASED ON TOPO SURVEY BY WENDEL WD ARCHITECTURE, ENGINEERING, SURVEYING AND LANDSCAPE ARCHITECTURE P.C. DATED JULY 22, 2014.
2. CONTRACTOR RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS, LOCATIONS, DIMENSIONS, SIZES, UTILITIES, AND OBSTACLES PRIOR TO COMMENCING WORK.
3. WORK OF THIS CONTRACT SHALL COMPLY WITH ALL NATIONAL, STATE AND LOCAL LAWS, REGULATIONS AND CODES, INCLUDING REVISIONS TO DATE OF CONTRACT OR REVISIONS TO THE CONTRACT.
4. CONTRACTOR TO COORDINATE ALL ACTIVITIES WITH OTHER SITE ACTIVITIES.
5. PROTECT ALL EXISTING MONITORING WELLS (SEE SHEET C-100).
6. CUT ALL ROOF CONDUCTORS FLUSH WITH SLAB AND PLUG.
7. PRIOR TO BUILDING DEMOLITION, DISCONNECT FENCE GATE ELECTRIC MOTOR. MAINTAIN FENCE ACCESS DURING DEMOLITION ACTIVITIES. SEE SHEET C-104 (SITE PLAN) FOR RESTORATION.
8. DISCONNECT AND RELOCATE ELECTRICAL AND COMMUNICATION SERVICES AND EQUIPMENT PRIOR TO DEMOLITION PER SHEET E-100.
9. RELOCATE TRAILERS PER SHEET C-104 (SITE PLAN).
10. VERIFY GAS LINE IS DISCONNECTED.
11. CONTRACTOR TO GRIND FLUSH ALL INTERIOR ANCHORS, BOLTS AND CONNECTIONS.
12. CONTRACTOR SHALL COORDINATE ALL TRUCK TRAFFIC WITH AFFECTED TOWNS AND VILLAGES.
13. ATLANTIC RICHFIELD COMPANY CONTRACTOR SHALL ABATE ALL BUILDING MATERIALS CONTAINING HAZARDOUS CONSTITUENTS IN COMPLIANCE WITH APPLICABLE FEDERAL, STATE, AND LOCAL LAWS, REGULATIONS AND CODES, INCLUDING REVISIONS TO DATE OF CONTRACT OR REVISIONS TO THE CONTRACT.
14. CLEAN THE ENTIRE REMAINING FLOOR SLAB USING AN ORGANIC SOLVENT IN WHICH PCB'S ARE SOLUBLE TO AT LEAST 5%. RINSE USING A CLEAN RINSE SOLVENT.
15. REPEAT THE CLEANING AND RINSING PROCEDURE LISTED IN NOTE 14 AS REQUIRED.
16. RELOCATE GUY WIRE PRIOR TO DEMOLITION. COORDINATE WITH UTILITY.
17. NOTES/DRAWINGS MAY BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.

0 70 140

SCALE IN FEET

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KEY PLAN (NOT TO SCALE)

Project No.:	28612-339
Scale:	AS SHOWN
Date:	
Drawn By:	TSD
Designed By:	BKB
Checked By:	KMA
Approved By:	WCH

Stamp:

Wayne Hardison

Rev.	Description	By	Date
0	ISSUED FOR PERMIT	TSD	01/01/16

NYSDEC SITE #3-60-022 1 RIVER STREET HASTINGS ON HUDSON, NEW YORK

DEMOLITION PLAN

C-103

Sheet: 6 of 11

DUNING, TIMOTHY Printed: 1/6/2016 10:41 AM Layout: DEMO PLAN-D
Drawing: G:\28612_BP HASTINGS\339 - B52 DEMO 2014_08\CAD\DRAWINGS\28612-EXISTING & FUTURE & DEMO SITE PLAN.D6.DWG

LEGEND:

STM	STORM SEWER
SAN	SANITARY SEWER
W W	WATER LINE
E E	ELECTRIC
	FENCE LINE
	FORMER BUILDING #52
P / SM	ELECTRIC PANEL / METER / SWITCH
	EXISTING MONITORING WELL

NOTES:

1. THIS PLAN BASED ON TOPO SURVEY BY WENDEL ARCHITECTURE, ENGINEERING, SURVEYING AND LANDSCAPE ARCHITECTURE P.C. DATED JULY 22, 2014.
2. CONTRACTOR RESPONSIBLE FOR FIELD VERIFYING ALL EXISTING CONDITIONS, LOCATIONS, DIMENSIONS, SIZES, UTILITIES, AND OBSTACLES PRIOR TO COMMENCING WORK.
3. WORK OF THIS CONTRACT SHALL COMPLY WITH ALL NATIONAL, STATE AND LOCAL LAWS, REGULATIONS AND CODES, INCLUDING REVISIONS TO DATE OF CONTRACT OR REVISIONS TO THE CONTRACT.
4. CONTRACTOR TO COORDINATE ALL ACTIVITIES WITH OTHER SITE ACTIVITIES.
5. PROTECT ALL EXISTING MONITORING WELLS (SEE SHEET C-100) .
6. RELOCATE JOB AND SECURITY TRAILERS AND WOODEN DECK TO FORMER BUILDING #51 PAD. ACTUAL TRAILER ORIENTATION WILL DEPEND ON FIELD CONDITIONS.
7. INSTALL EXTERIOR LIGHTING ON TRAILERS.
8. INSTALL NEW ELECTRIC METER, SWITCH, AND PANEL PER SHEET E-100 AND E-101.
9. INSTALL OVERHEAD ELECTRICAL BETWEEN TRAILERS.
10. MAINTAIN EXISTING GATE AND FENCE MOTOR THROUGHOUT DEMOLITION - IF DAMAGED, REPLACE. RECONNECT FENCE GATE ELECTRIC MOTOR.
11. RELOCATE AND RECONNECT EXISTING SECURITY SYSTEM.
12. NOTES/DRAWINGS MAY BE UPDATED AS ADDITIONAL INFORMATION IS AVAILABLE.

0 70 140
SCALE IN FEET

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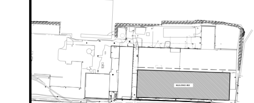


KEY PLAN (NOT TO SCALE)

Project No.:	28612-339
Scale:	AS SHOWN
Date:	
Drawn By:	TSD
Designed By:	BKB
Checked By:	KMA
Approved By:	WCH

Stamp:

Wayne Hardison

Rev.	Description	By	Date
0	ISSUED FOR PERMIT	TSD	01/01/16

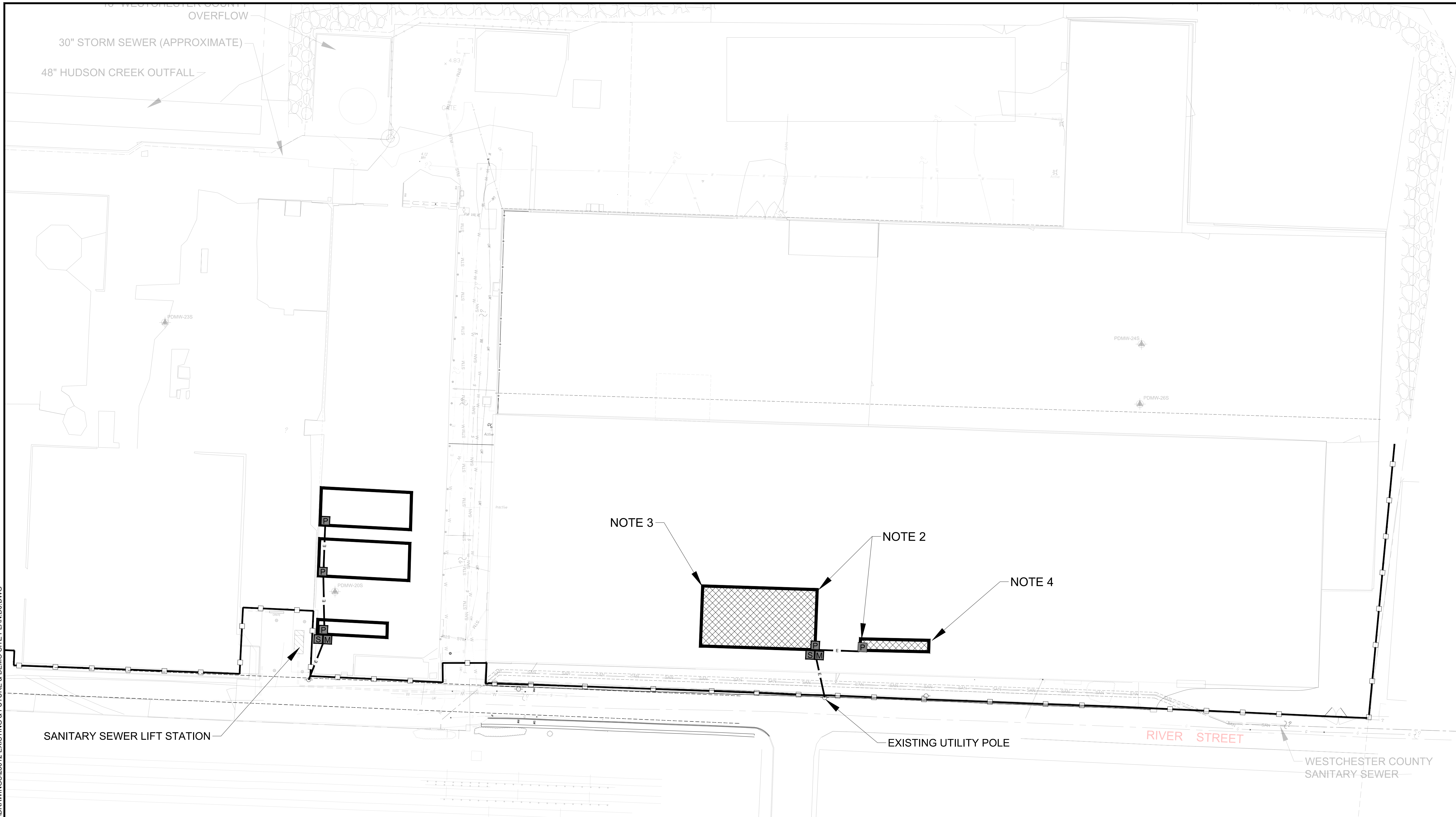
NYSDEC SITE #3-60-022 1 RIVER STREET HASTINGS ON HUDSON, NEW YORK

SITE PLAN

C-104

Sheet: 7 of 11

DUNING, TIMOTHY Printed: 1/6/2016 10:55 AM Layout: SITE PLAN-D
Drawing: G:\28612_BP HASTINGS\339 - B52 DEMO 2014_08\CAD\DRAWINGS\28612-EXISTING & FUTURE & DEMO SITE PLAN.D6.DWG



LEGEND:

STM	STORM SEWER
SAN	SANITARY SEWER
W — W	WATER LINE
E — E	ELECTRIC
	FENCE LINE
	APPROX. FUTURE BUILDING
P / S M	ELECTRIC PANEL / METER / SWITCH
	EXISTING MONITORING WELL

LEGEND:

TRAILERS IN LOCATION

NOTES:

1. THIS PLAN BASED ON TOPO SURVEY BY WENDEL ARCHITECTURE, ENGINEERING, SURVEYING AND LANDSCAPE ARCHITECTURE P.C. DATED JULY 22, 2014.
2. REPRESENTS PROPOSED APPROXIMATE FUTURE STORAGE ENCLOSURE SIZE, LOCATION, AND ORIENTATION.
3. PROPOSED CONTAINMENT SHELTER APPROXIMATE DIMENSIONS: 45 ' (W) x 80' (L) x 26' (H) .
4. PROPOSED PREFABRICATED HAZARDOUS WASTE STORAGE CONTAINER APPROXIMATE DIMENSIONS: 8' (W) X 42' (L) X 8'4" (H) .
5. NEW ENCLOSURE DIMENSIONS AND LOCATIONS MAY VARY FROM THOSE DEPICTED ON THE DRAWINGS.

0 70 140
SCALE IN FEET

Layout: NEW SITE GEN ARR PLAN-D
Printed: 1/6/2016 1:58 PM DUNING, TIMOTHY
Drawing: G:\28612_BP HASTINGS\339 - B52 DEMO 2014_08\CAD\DRAWINGS\28612-EXISTING & FUTURE & DEMO SITE PLAN D6.DWG

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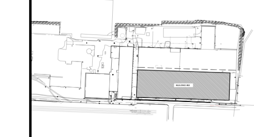


KEY PLAN (NOT TO SCALE)

Project No.:	28612-339
Scale:	AS SHOWN
Date:	
Drawn By:	TSD
Designed By:	BKB
Checked By:	KMA
Approved By:	WCH

Stamp:

Wayne Hardison

Rev.	Description	By	Date
0	ISSUED FOR PERMIT	TSD	01/01/16

NYSDEC SITE #3-60-022 1 RIVER STREET HASTINGS ON HUDSON, NEW YORK

NEW SITE GENERAL ARRANGEMENT PLAN

C-105

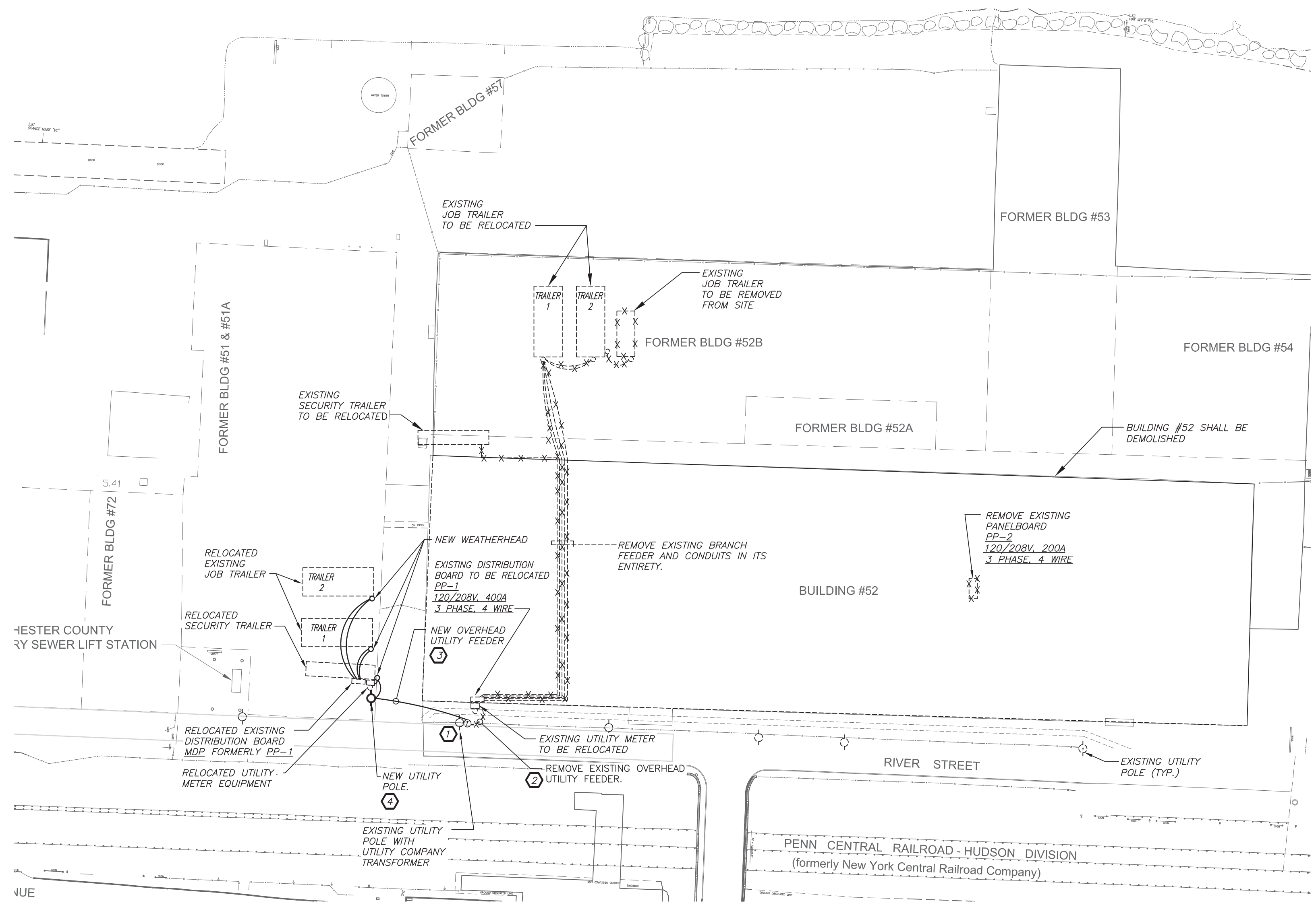
Sheet: 8 of 11

LEGEND

	UTILITY POLE
	TRANSFORMER, SEE ELECTRICAL RISER DIAGRAM FOR DETAILED INFORMATION.
	TRANSFORMER, SEE ELECTRICAL RISER DIAGRAM FOR DETAILED INFORMATION.
	EXISTING ELECTRICAL PANELBOARD.
	NEW ELECTRICAL PANELBOARD.
	EXISTING METERING EQUIPMENT.
	METERING EQUIPMENT.
	EXISTING TO REMAIN
	EXISTING TO BE REMOVED
	NEW
	TRANSFORMER, SEE ELECTRICAL RISER DIAGRAM FOR DETAILED INFORMATION.
1	TAG SYMBOL. NUMERAL DENOTES REFERENCE TO A WORK NOTE.
	DETAIL/PART PLAN NUMBER IDENTIFICATION: DETAIL/PART PLAN NUMBER DRAWING NUMBER

ABBREVIATIONS

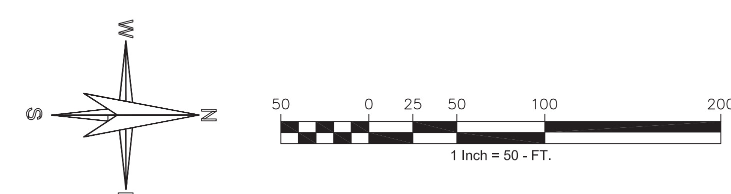
ABBV.	DESCRIPTION
A	AMP/AMPERE
A.F.F.	ABOVE FINISHED FLOOR
AIC	AMP INTERRUPTING CURRENT
AWG	AMERICAN WIRE GAUGE
C	CONDUIT
C/B	CIRCUIT BREAKER
CKT	CIRCUIT
CT	CURRENT TRANSFORMER
(E)	EXISTING TO REMAIN
E.C.	ELECTRICAL CONTRACTOR
(ER)	EXISTING RELOCATED
EXIST.	EXISTING
G,GRD	GROUND
GFI	GROUND FAULT INTERRUPTER
H	HOT (PHASE)
kcmil	THOUSAND CIRCULAR MILLS
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KW	KILOWATT
MCB	MAIN CIRCUIT BREAKER
MDP	MAIN DISTRIBUTION PANEL
MLO	MAIN LUGS ONLY
MTD	MOUNTED
N	NEUTRAL
NTS	NOT TO SCALE
PNL	PANEL
(R)	REMOVE EXISTING
RECPT	RECEPTACLE
(RR)	REMOVED, SALVAGED AND RELOCATED
TYP.	TYPICAL
U.O.N.	UNLESS OTHERWISE NOTED
W	WATT
WP	WEATHERPROOF
Y	WYE
Δ	DELTA
Ø	PHASE



PARTIAL SITE PLAN 1 E-100

WORK NOTES

1. PROVIDE NEW UTILITY SERVICE FROM EXISTING POLE MOUNTED UTILITY TRANSFORMER TO RELOCATED EXTERIOR MOUNTED SERVICE DISTRIBUTION.
2. REMOVE EXISTING OVERHEAD UTILITY WIRING AND WEATHERHEAD ONCE NEW SERVICE EQUIPMENT IS IN OPERATION.
3. PROVIDE NEW OVERHEAD BRANCH FEEDER. REFER TO RISER DIAGRAM FOR ADDITIONAL INFORMATION.
4. PROVIDE NEW UTILITY POLE. REFER TO RISER DIAGRAM FOR ADDITIONAL INFORMATION.



BEFORE FABRICATION THIS CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND CONDITIONS ON JOB AND COORDINATE HIS WORK WITH THE WORK OF ALL OTHER CONTRACTORS.

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DAMIANO BARILE ENGINEERS, P.C.
MECHANICAL ELECTRICAL CONSULTANTS

Project No.:	28612-339
Scale:	AS SHOWN
Date:	12/21/15
Drawn By:	DBE
Designed By:	DBE
Checked By:	KMA
Approved By:	WCH
Stamp:	

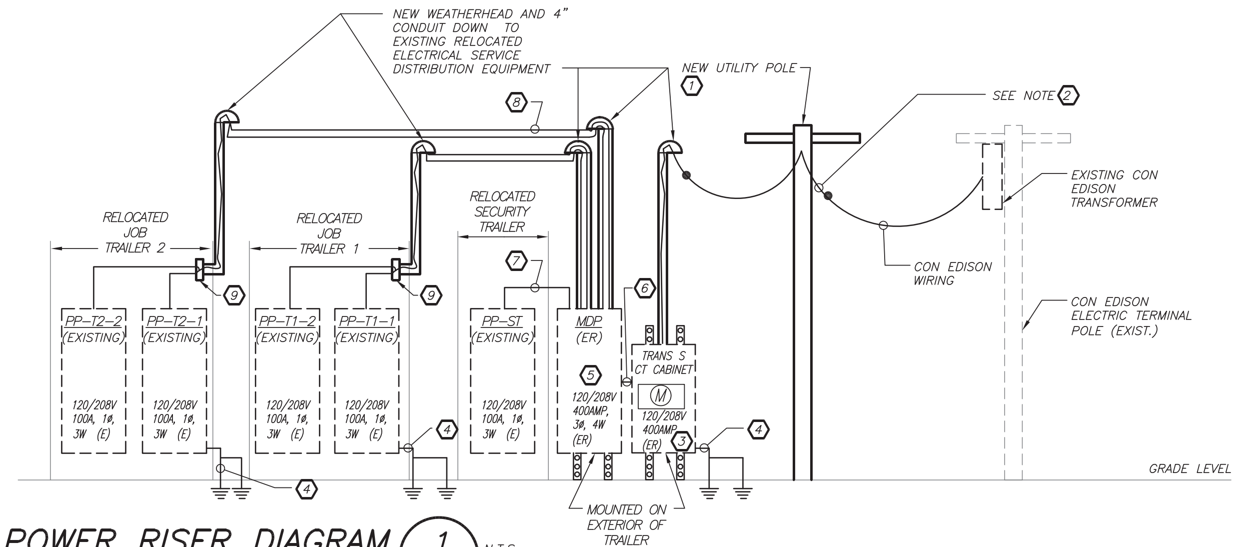
Rev.	Description	By	Date
0	ISSUED FOR PERMIT	DBE	12/21/15

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

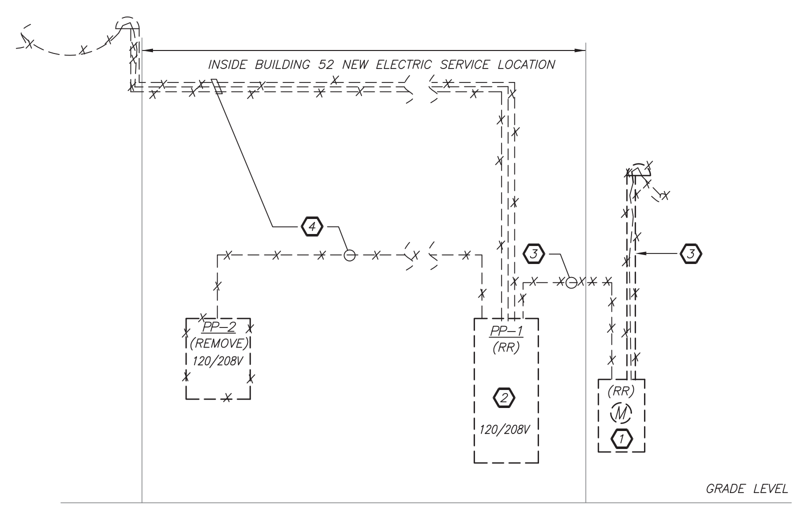
ELECTRICAL SITE PLAN, LEGEND AND ABBREVIATION

E-100

Sheet: 9 of 11



NEW POWER RISER DIAGRAM 1 E-101 N.T.S.



REMOVAL POWER RISER DIAGRAM 2 E-101 N.T.S.

POWER RISER NOTES:

1. EXISTING TRANS S CABINET SHALL BE REMOVED AND RELOCATED AS REFERENCED ON NEW POWER RISER DIAGRAM. COORDINATE WITH UTILITY COMPANY ON REQUIRED SHUTDOWN BEFORE THE START OF ANYWORK.
2. EXISTING PANELBOARD "PP-1" SHALL BE REMOVED AND RELOCATED AS REFERENCED ON NEW POWER RISER DIAGRAM. THE EXISTING NAME PLATE SHALL BE REMOVED AND NEW NAME PLATE SHALL BE PROVIDE INDICATING "MDP".
3. REMOVE EXISTING CONDUIT, WEATHER HEAD, SERVICE FEEDER IN ITS ENTIRETY. COORDINATE SHUTDOWN WITH OWNER AND UTILITY COMPANY.
4. REMOVE EXISTING CONDUIT AND FEEDERS IN ITS ENTIRETY FROM EXISTING DISTRIBUTION PANELBOARD "PP-1" TO EXISTING TRAILER LOCATIONS.

POWER RISER NOTES:

1. FOR NEW 40'-0" UTILITY POLE INSTALLED AS PART OF THESE DOCUMENTS. COORDINATE WITH OWNER AND UTILITY COMPANY BEFORE THE START OF ANY WORK.
2. PROVIDE NEW 4#500 KCMIL FEEDER IN 4" RIGID GALVANIZED CONDUIT WITH WEATHERHEAD TO SERVE EXISTING RELOCATED 120/208V, 400AMP, 3 PHASE, 4 WIRE SERVICE TO TRAILERS. PROVIDE ALL REQUIRED AND NECESSARY SUPPORTS, CLAMPS, ETC. LEAVE A MINIMUM 2'-0" PIGTAIL TO ALLOW CON. ED. TO SPLICE THEIR FEEDER TO BUILDING FEEDER.
3. EXISTING RELOCATED 120/208V, 400 AMP, 3 PHASE, 4 WIRE "TRANS S" TYPE COMBINATION CT CABINET AND UTILITY METER ENCLOSURE. PROVIDE KINDORF SUPPORT TO MOUNT ADJACENT TO EXTERIOR OF TRAILER WALL AND PROVIDE ALL REQUIRED AND NECESSARY ACCESSORIES.
4. REFER TO GROUNDING DETAIL FOR ADDITIONAL INFORMATION.
5. EXISTING RELOCATED PANELBOARD "PP-1". PROVIDE NEW NAME PLATE TO INDICATE "MDP". PROVIDE KINDORF SUPPORT TO MOUNT ADJACENT TO EXTERIOR WALL AND ALL REQUIRED AND NECESSARY ACCESSORIES.
6. PROVIDE NEW COPPER 4#500 KCMIL + 1#2GRD IN 4" RIGID GALVANIZED STEEL CONDUIT. PROVIDE ALL REQUIRED AND NECESSARY ACCESSORIES.
7. PROVIDE ALUMINUM 3#1/0+1#6 GROUND WITH COMPRESSION FITTINGS IN 1-$\frac{1}{4}$" CONDUIT. PROVIDE ALL WEATHERPROOF SEAL FOR CONDUIT PENETRATION INTO TRAILER. CONNECT TO DESIGNATED C/B THAT PREVIOUSLY FED THIS TRAILER. PROVIDE ALL REQUIRED AND NECESSARY ACCESSORIES.
8. PROVIDE ACSR ALUMINUM QUADPLEX WITH POLYPROPYLENE JACKET 3#1/0+1#1/0 GROUND OVERHEAD FEEDER WITH COMPRESSION FITTINGS AND CONNECT TO EXISTING PANELBOARD IN THE RELOCATED TRAILERS. CONNECT TO EXISTING DESIGNATED C/B THAT PREVIOUSLY FED TRAILERS. PROVIDE ALL REQUIRED AND NECESSARY ACCESSORIES.
9. PROVIDE ALL WEATHERPROOF SEAL FOR CONDUIT PENETRATION INTO TRAILER INCLUDING PULLBOX AS REQUIRED AND NECESSARY.

BEFORE FABRICATION THIS CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND CONDITIONS ON JOB AND COORDINATE HIS WORK WITH THE WORK OF ALL OTHER CONTRACTORS.

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PHONE: 914.328.6060 FAX: 914.328.9304

Project No.:	28612-339
Scale:	AS SHOWN
Date:	12/21/15
Drawn By:	DBE
Designed By:	DBE
Checked By:	KMA
Approved By:	WCH
Stamp:	

Rev.	Description	By	Date
O	ISSUED FOR PERMIT	DBE	12/21/15

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

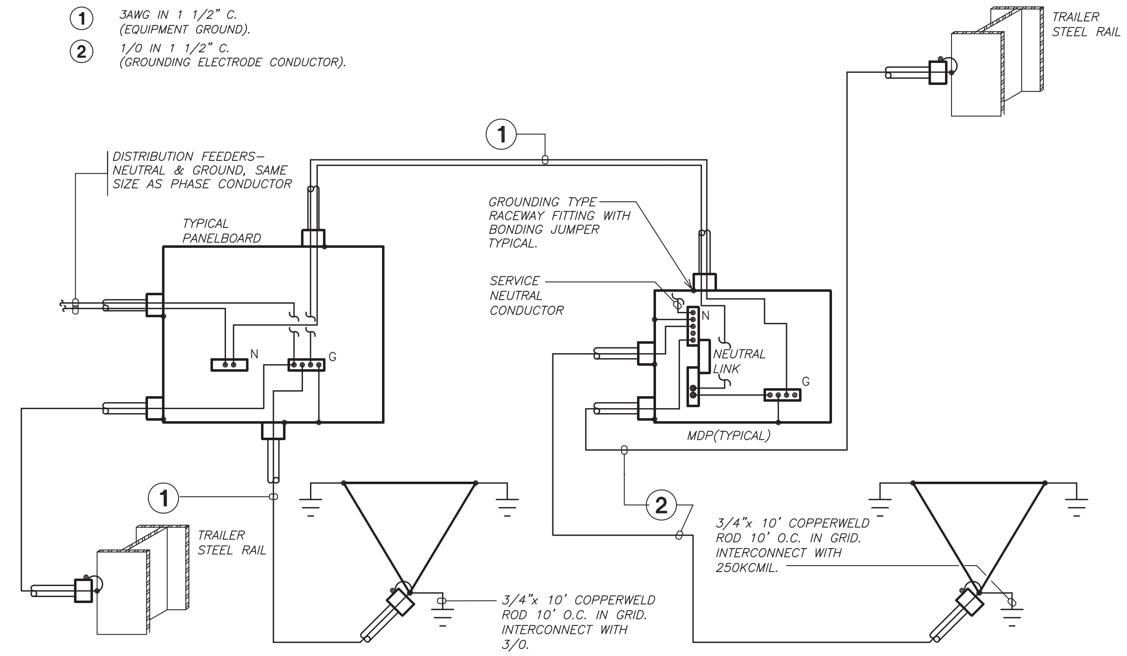
ELECTRICAL RISER DIAGRAMS

E-101

Sheet: 10 of 11

NOTES:

1. 3AWG IN 1 1/2" C. (EQUIPMENT GROUND).
2. 1/0 IN 1 1/2" C. (GROUNDING ELECTRODE CONDUCTOR).



SCHEMATIC SERVICE GROUNDING SYSTEM

1 / E–102 N.T.S.

BEFORE FABRICATION THIS CONTRACTOR SHALL VERIFY ALL MEASUREMENTS AND CONDITIONS ON JOB AND COORDINATE HIS WORK WITH THE WORK OF ALL OTHER CONTRACTORS.

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PHONE: 914.328.6060 FAX: 914.328.9304

Project No.:	28612-339
Scale:	AS SHOWN
Date:	12/21/15
Drawn By:	DBE
Designed By:	DBE
Checked By:	KMA
Approved By:	WCH

Stamp:

STATE OF NEW YORK · LAWRENCE J. BARILE · 067730 · LICENSED PROFESSIONAL ENGINEER

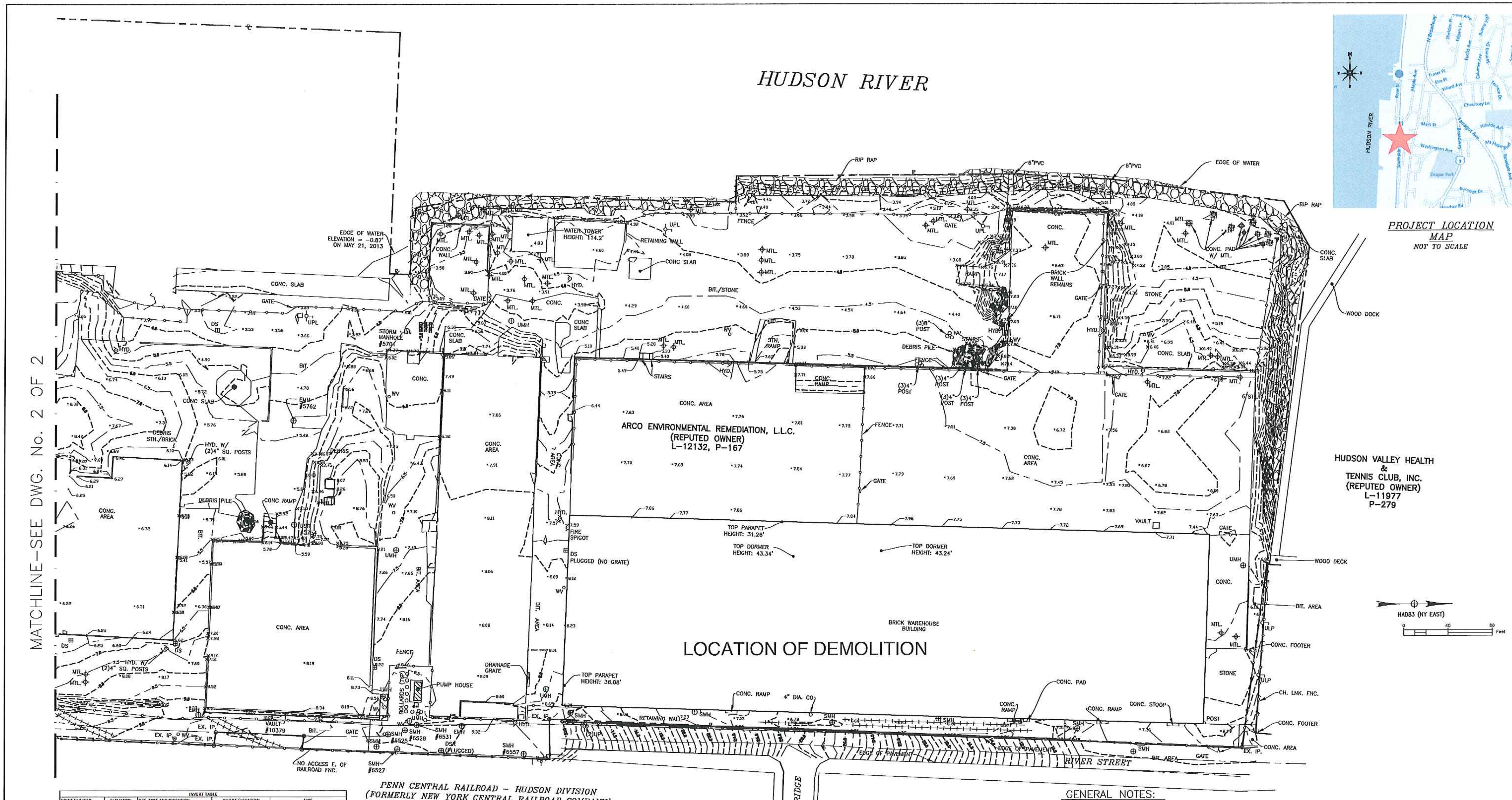
Rev.	Description	By	Date
O	ISSUED FOR PERMIT	DBE	12/21/15

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON,
NEW YORK

ELECTRICAL DETAIL

E-102

Sheet: 11 of 11



INVERT TABLE				
POINT NUMBER	ELEVATION	SIZE, TYPE AND DIRECTION	INVERT ELEVATION	TYPE
5701	4.51	30", EAST	-2.72	STORM MANHOLE
		SUMP, WEST	-2.90	
		TOP OF WATER	0.07	
5754	5.04	48" CONC., EAST	-1.94	DRAINAGE STRUCTURE, ROUND
		48" CONC., WEST	-2.11	
		SUMP	-2.20	
5762	5.19	4" CIP, NORTH	-2.43	ELECTRIC MANHOLE
		4" PVC, NORTH	0.29	
		4" CIP, SOUTH	-2.43	
		48" CONC., EAST	-2.63	
		6" CIP., EAST	-0.31	
		TOP OF WATER	0.94	
		SUMP	-2.76	
6525	8.85	8" CIP, SOUTHEAST	-3.83	SANITARY MANHOLE
		8" CIP, NORTHWEST	-3.95	
		8" CIP, WEST	-1.51	
6527	8.84	EAST CHANNEL	3.14	SANITARY MANHOLE
		WEST CHANNEL	3.14	
6528	8.81	4" STEEL, NORTH	4.28	SANITARY MANHOLE
		4" STEEL,SOUTH	4.28	
6531	8.60	8" CIP, SOUTHEAST	-3.96	SANITARY MANHOLE
		8" CIP, NORTHEAST	-4.11	
		12" CIP, WEST	-4.31	
6557	9.33	6" CIP, NORTHEAST	4.56	SANITARY MANHOLE
		6" CIP, SOUTHWEST	4.56	
		24" CIP, EAST	2.43	
		24" CIP, WEST	2.43	
		SUMP	-1.67	
10379	9.58	4" CIP, NORTH	6.25	CONC. VAULT
		4" CIP, SOUTH	6.25	
		8" CIP, EAST	2.24	
		8" CIP, WEST	2.24	
		SUMP	-4.01	

The survey which is being submitted is "AS THE PROPERTY CURRENTLY EXISTS"

Nick Pet...

Debbie M. Anderson

NOTARY PUBLIC STATE OF TEXAS
DEBBIE M. ANDERSON
My Commission Expires
June 12, 2019

GENERAL NOTES:

- HORIZONTAL DATUM IS NAD83, NEW YORK STATE PLANE, EAST ZONE, US SURVEY FEET AS ESTABLISHED FROM A MAP PREPARED BY BOSWELL ENGINEERING DATED: 1/27/2006, REVISED 5/04/2006. JOB NUMBER 04-209, DRAWING No. 04-209-MW.
- VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)/ US SURVEY FEET
- AS DIRECTED BY THE CLIENT, HALEY & ALDRICH, ONLY CERTAIN STRUCTURES WERE MEASURED AS INDICATED BY THE INVERT TABLE.
- TOPOGRAPHIC MAP ONLY. EASEMENTS, RIGHT OF WAYS, AND TITLE INFORMATION IS NOT SHOWN.
- DATA SHOWN ON THIS MAP WAS GATHERED BY WENDEL SURVEY BETWEEN 2009 AND 2014.

HALEY & ALDRICH

HALEY AND ALDRICH OF NEW YORK

PROJECT SITE:

ONE RIVER STREET,
TOWN OF GREENBURGH,
VILLAGE OF
HASTINGS–ON–HUDSON,
COUNTY OF WESTCHESTER.
STATE OF NEW YORK

DRAFT 7/22/2014

wendel

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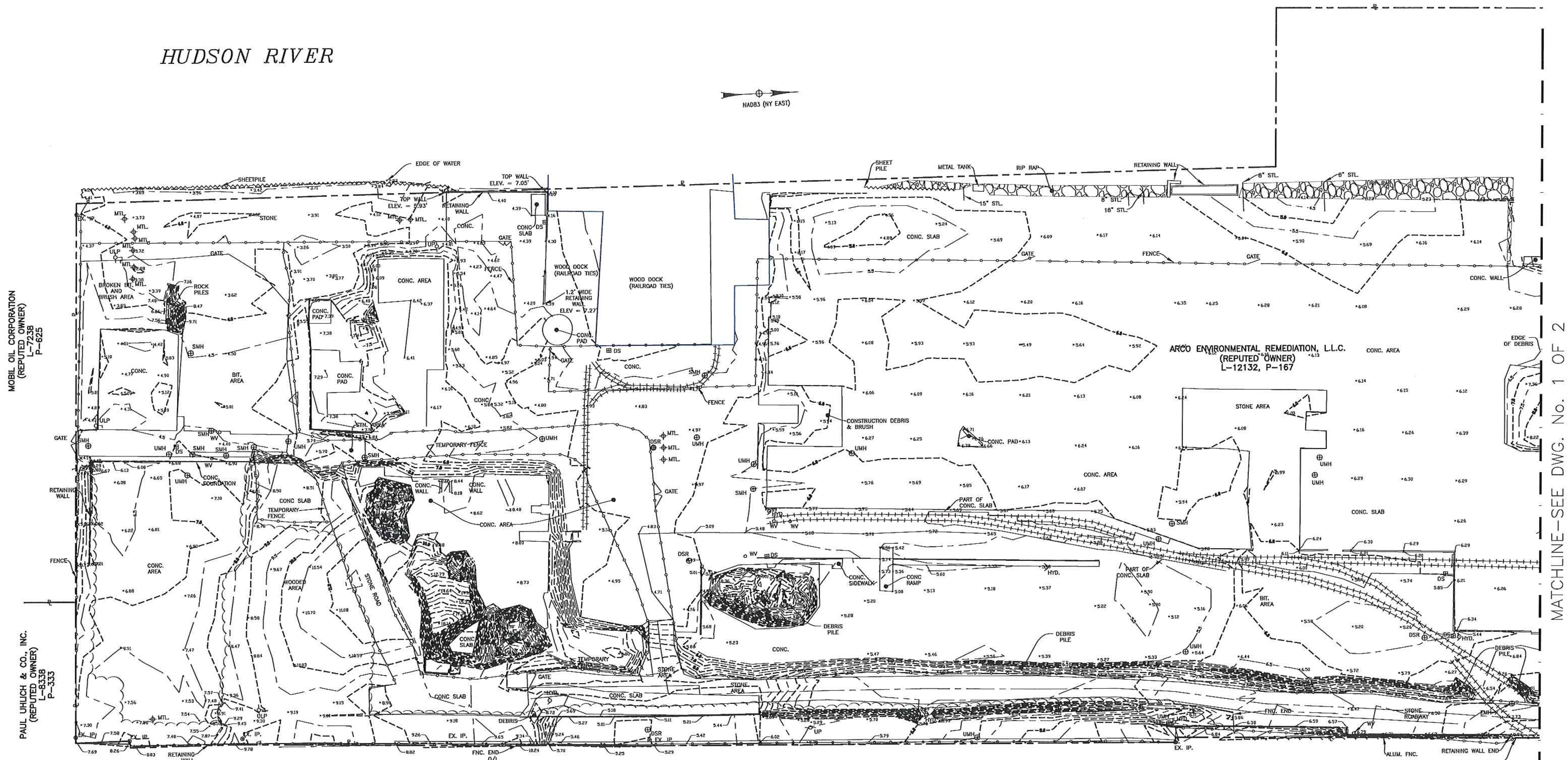
Wendel WD Architecture, Engineering, Surveying and Landscape Architecture P.C.

NO. BY	REVISIONS	DATE

DWG. TITLE

TOPOGRAPHIC SURVEY

DATE	6/23/2014
SCALE	1"=40'
DWN.	BSS CHK. KSK
PROJ. No.	438505
DWG. No.	1 OF 2



LEGEND:

ALUM.	ALUMINUM	FNC.	FENCE	UPL/ULP	UTILITY POLE WITH LIGHT
APPROX.	APPROXIMATE	HYD.	HYDRANT	UP	UTILITY POWER POLE
BLDG.	BUILDING	IP.	IRON PIPE/ IRON PIN	W	WEST
BIT.	BITUMINOUS	L–	LIBER	WV	WATER VALVE
℄	CENTERLINE	MTL.	MONITORING WELL	W/	WITH
CO	CLEAN OUT	MS.	MEASURE		
CONC.	CONCRETE	N	NORTH		
COR.	CORNER	No.	NUMBER		
CP	COVER PAGE	P–	PAGE		
CH. LNK. FNC.	CHAIN LINK FENCE	PST	POST		
D.	DEED	PVC	POLYVINYL CHLORIDE		
DIA.	DIAMETER	S	SOUTH		
DS	DRAINAGE STRUCTURE	SMH	SANITARY MANHOLE		
DSR	DRAINAGE STRUCTURE ROUND	STL.	STEEL PIPE		
E	EAST	STN.	STONE		
ELEV.	ELEVATION	SQ.	SQUARE		
EMH	ELECTRIC MANHOLE	TYP.	TYPICAL		
EX.	EXISTING	UMH	UTILITY MANHOLE		

BOUNDARY/PROPERTY LINE
CHAIN LINK FENCE (UNLESS OTHERWISE NOTED)
SHEET PILE
RAILROAD TRACKS
WOODED AREA
12.00 MAJOR CONTOURS INTERVAL
12.50 MINOR CONTOUR INTERVAL

0 40 80 Feet

The survey which is being submitted is "AS THE PROPERTY CURRENTLY EXISTS"

Nick Pet[illegible]
Debbie M. Anderson

NOTARY PUBLIC STATE OF TEXAS
DEBBIE M. ANDERSON
My Commission Expires
June 12, 2019

NOTE:
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HALEY & ALDRICH
HALEY AND ALDRICH OF NEW YORK

PROJECT SITE:
ONE RIVER STREET,
TOWN OF GREENBURGH,
VILLAGE OF
HASTINGS–ON–HUDSON
COUNTY OF WESTCHESTER.
STATE OF NEW YORK

DRAFT 7/22/2014

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Wendel WD Architecture, Engineering, Surveying and Landscape Architecture P.C.

NO. BY REVISIONS DATE

DWG. TITLE
TOPOGRAPHIC SURVEY

DATE	6/23/2014
SCALE	1"=40'
DWN.	BSS CHK.
PROJ. No.	438505
DWG. No.	2 OF 2

Short Environmental Assessment Form
Part 1 - Project Information

Instructions for Completing

Part 1 - Project Information. The applicant or project sponsor is responsible for the completion of Part 1. Responses become part of the application for approval or funding, are subject to public review, and may be subject to further verification. Complete Part 1 based on information currently available. If additional research or investigation would be needed to fully respond to any item, please answer as thoroughly as possible based on current information.

Complete all items in Part 1. You may also provide any additional information which you believe will be needed by or useful to the lead agency; attach additional pages as necessary to supplement any item.

Part 1 - Project and Sponsor Information
Project: Building 52 Demolition; Sponsor: ARCO Environmental Remediation, LLC. (AERL), see attached narrative for ownership details.

Name of Action or Project:
Demolition of Building 52

Project Location (describe, and attach a location map):
1 River Street, Hastings on Hudson, NY

Brief Description of Proposed Action:
Demolish Building 52. See attached narrative.

Name of Applicant or Sponsor: AERL	Telephone: 832-664-2372 E-Mail: nick.peterson@bp.com

Address:
201 Helios Way, HPL, 6th Floor

City/PO:	State:	Zip Code:
Houston	TX	77079

	NO	YES
1. Does the proposed action only involve the legislative adoption of a plan, local law, ordinance, administrative rule, or regulation? If Yes, attach a narrative description of the intent of the proposed action and the environmental resources that may be affected in the municipality and proceed to Part 2. If no, continue to question 2.	☑	☐
2. Does the proposed action require a permit, approval or funding from any other governmental Agency? If Yes, list agency(s) name and permit or approval: Demolition of Building 52 will require a building permit issued by the Village of Hastings-on-Hudson; in addition, a 30 day notification will be submitted to the EPA (761.61(a))	☐	☑

3.a. Total acreage of the site of the proposed action? 2.2 acres
b. Total acreage to be physically disturbed? N/A acres
c. Total acreage (project site and any contiguous properties) owned or controlled by the applicant or project sponsor? 28 acres

4. Check all land uses that occur on, adjoining and near the proposed action.
☑ Urban ☐ Rural (non-agriculture) ☐ Industrial ☑ Commercial ☐ Residential (suburban)
☐ Forest ☐ Agriculture ☑ Aquatic ☑ Other (specify): Transportation (railroad)
☐ Parkland

	NO	YES	N/A
5. Is the proposed action,			
a. A permitted use under the zoning regulations?	☐	☑	☐
b. Consistent with the adopted comprehensive plan?	☐	☑	☐

	NO	YES
6. Is the proposed action consistent with the predominant character of the existing built or natural landscape?	☐	☑
7. Is the site of the proposed action located in, or does it adjoin, a state listed Critical Environmental Area? If Yes, identify: Name: Hudson River, Reason: Exceptional or unique character, Agency: Westchester County, Date: 1-31-90.	☐	☑
8. a. Will the proposed action result in a substantial increase in traffic above present levels?	☑	☐
b. Are public transportation service(s) available at or near the site of the proposed action?	☐	☑
c. Are any pedestrian accommodations or bicycle routes available on or near site of the proposed action?	☐	☑
9. Does the proposed action meet or exceed the state energy code requirements? If the proposed action will exceed requirements, describe design features and technologies:	☐	☑
10. Will the proposed action connect to an existing public/private water supply? If No, describe method for providing potable water: Vendor (Poland Springs)	☑	☐
11. Will the proposed action connect to existing wastewater utilities? If No, describe method for providing wastewater treatment: Portable restrooms	☑	☐
12. a. Does the site contain a structure that is listed on either the State or National Register of Historic Places?	☑	☐
b. Is the proposed action located in an archeological sensitive area?	☑	☐
13. a. Does any portion of the site of the proposed action, or lands adjoining the proposed action, contain wetlands or other waterbodies regulated by a federal, state or local agency?	☐	☑
b. Would the proposed action physically alter, or encroach into, any existing wetland or waterbody? If Yes, identify the wetland or waterbody and extent of alterations in square feet or acres:	☑	☐

14. Identify the typical habitat types that occur on, or are likely to be found on the project site. Check all that apply:

☐ Shoreline ☐ Forest ☐ Agricultural/grasslands ☐ Early mid-successional

☐ Wetland ☑ Urban ☐ Suburban

	NO	YES
15. Does the site of the proposed action contain any species of animal, or associated habitats, listed by the State or Federal government as threatened or endangered?	☑	☐
16. Is the project site located in the 100 year flood plain?	☐	☑
17. Will the proposed action create storm water discharge, either from point or non-point sources?	☑	☐

If Yes,

a. Will storm water discharges flow to adjacent properties? ☐ NO ☐ YES

b. Will storm water discharges be directed to established conveyance systems (runoff and storm drains)? If Yes, briefly describe: ☐ NO ☐ YES

	NO	YES
18. Does the proposed action include construction or other activities that result in the impoundment of water or other liquids (e.g. retention pond, waste lagoon, dam)? If Yes, explain purpose and size:	☑	☐
19. Has the site of the proposed action or an adjoining property been the location of an active or closed solid waste management facility? If Yes, describe: Former Building 15, now demolished, was located south of Building 52 and served as a waste transfer station in the 1980's (prior to acquisition by AERL).	☐	☑
20. Has the site of the proposed action or an adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If Yes, describe: See attached narrative.	☐	☑

I AFFIRM THAT THE INFORMATION PROVIDED ABOVE IS TRUE AND ACCURATE TO THE BEST OF MY KNOWLEDGE

Applicant/sponsor name: Nick Peterson Date: January 6, 2016

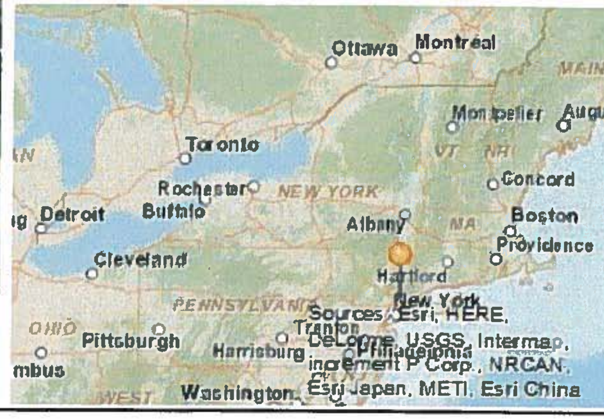
Signature: Nick Peterson

PRINT FORM

EAF Mapper Summary Report

Saturday, December 26, 2015 9:56 PM

Disclaimer: The EAF Mapper is a screening tool intended to assist project sponsors and reviewing agencies in preparing an environmental assessment form (EAF). Not all questions asked in the EAF are answered by the EAF Mapper. Additional information on any EAF question can be obtained by consulting the EAF Workbooks. Although the EAF Mapper provides the most up-to-date digital data available to DEC, you may also need to contact local or other data sources in order to obtain data not provided by the Mapper. Digital data is not a substitute for agency determinations.



Part 1 / Question 7 [Critical Environmental Area]	Yes
Part 1 / Question 7 [Critical Environmental Area - Identify]	Name:Hudson River, Reason:Exceptional or unique character, Agency:Westchester County, Date:1-31-90
Part 1 / Question 12a [National Register of Historic Places]	No
Part 1 / Question 12b [Archeological Sites]	No
Part 1 / Question 13a [Wetlands or Other Regulated Waterbodies]	Yes - Digital mapping information on local and federal wetlands and waterbodies is known to be incomplete. Refer to EAF Workbook.
Part 1 / Question 15 [Threatened or Endangered Animal]	Yes *
Part 1 / Question 16 [100 Year Flood Plain]	Yes
Part 1 / Question 20 [Remediation Site]	Yes

* The NYS database, which contains information regarding threatened or endangered species, indicated that endangered or threatened flowering plants were last observed in the area in 1898 (based on a search conducted on 1/5/2016). The IPaC database (federal) did not indicate the presence of threatened or endangered species (accessed on 1/5/2016) at the site of proposed action. The site of proposed action (Building 52) is developed and does not contain natural habitat for listed rare, threatened or endangered species.

Project and sponsor Information

Project: Building 52 Demolition; Sponsor: ARCO Environmental Remediation, LLC. (AERL), which is a wholly owned subsidiary of the Atlantic Richfield Company (ARC).

Brief Description of Proposed Action

The proposed action is demolition of Building 52, which is an approximately 93,000 square foot building located on the northeast portion of the former 28-acre Anaconda Wire & Cable Manufacturing property situated at 1 River Street. The actual demolition project will take place on approximately 2.2 acres of the 1 River Street property (the "demolition site"). The demolition project is not expected to have any environmental impact beyond the 2.2 acre demolition site. Within the 2.2 acre site, the demolition is not expected to impact any natural resources or water supplies or to result in an increased potential for erosion, drainage, or flooding.

Part of Building 52 currently serves as storage for equipment used to implement the recovery of polychlorinated biphenyls (PCBs) from recovery wells located on other portions of the 1 River Street property -- an Interim Remedial Action (IRM) required by the New York Department of Environmental Conservation ("NYSDEC"). The remainder of Building 52 is currently unused due to concerns around structural integrity. For a further assessment of the structural condition of Building 52, please see the 2014 Building 52 Alternatives report prepared for the Atlantic Richfield Company (ARC) and submitted to the Village (attached). In 2014, the State Historic Preservation Office (SHPO) found that Building does not meet "….the criteria for listing on the State and National Registers of Historic Places." (report and letter attached).

Building 52's demolition constitutes an initial step in the planned remediation of PCBs on the overall 1 River Street property. Elevated levels of PCBs are present in soils under and adjacent to Building 52, as well as in certain structural components of Building 52 itself. Building 52 materials containing PCBs will be properly disposed of in accordance with federal regulation under the Toxic Substances Control Act. Waste characterization samples have been collected from building materials to determine appropriate segregation requirements and disposal options for waste generated during the demolition. The data set resulting from this work is not complete; preliminary data indicates the presence of PCBs greater than 50 parts per million (PPM) in building materials including paint, window glaze and caulk, and masonry. BP will work with the New York State (NYS) Department of Health (DOH) to complete a Community Air Monitoring Plan (CAMP), which will be implemented during the demolition to monitor dust and PCB levels in the air at the property boundary. Based on air monitoring implemented during previous demolition activities at the site, real time dust monitoring and 24 hour PCB air samples may be required. Portions of the Building 52 slab that contain PCBs greater than 50 PPM will be removed prior to demolition by either removing a surficial layer of the slab or removing the total thickness of the affected area of the slab. Remaining voids in the concrete slab resulting from total thickness removal will be backfilled to the surface with a low permeability cover. The remaining portion of the slab will be left in place. Locations of portions of the floor slab that exceed 50 PPM PCBs are presented in the attached figure, which was included with the 2014 Building 52 Alternatives report. In addition, there are approximately five areas of the slab where further delineation is required. Demolition will generally consist of removing masonry material from the exterior of the building and then demolishing the roof and steel supports. Waste material will segregated and loaded onto trucks and removed from the site. The project duration (demolition, waste segregation, offsite disposal, and engineering controls (if required) is anticipated to require three to four months. The actual duration will be determined once a contractor is selected and a construction schedule is completed. Once Building 52 has been demolished, subslab soil will be investigated in accordance with the approved Remedial Design Work Plan (RDWP) to determine extents of PCBs above remedial action goals specified in the ROD.. The cleaned floor slab will remain in place to provide surface cover until sub-slab soil remediation takes place. The; soil remediation under the Building 52 slab and in adjacent areas will occur as part of the overall remediation of the entire 1 River Street property and under the supervision of NYSDEC.

Demolition will involve several pieces of heavy equipment, including excavators and front end loaders. Because demolition activities will take place Monday through Friday during normal business hours, and because the site is not located in a residential area of Hastings, there are not likely to be significant noise impacts for Village residents. Indeed, noise impacts are not expected to exceed those related to the demolition work conducted in the past for other industrial buildings previously located on the One River Street property.

The demolition of Building 52 is not expected to have any impact on the Metro North commuter rail which is proximate to the 1 River Street property. However, due to the proximity of the site to the Metro North Rail Road (MNR) commuter station, BP will coordinate temporary road closures with the Village for the road south of the bridge and adjacent to the site to reduce potential safety concerns or incidents to the public and adjacent properties resulting from demolition activities.

Although barge removal remains an alternative for the overall remediation project, given the short duration of this project and the limited quantity of materials being removed, barge transportation of removed materials is not feasible. Prior to commencing with demolition, BP will discuss appropriate trucking routes and times of operation with the Village of Hastings-on-Hudson to reduce disturbance during completion of the work. Based on an initial contractor estimate, the demolition may result in an estimated 400 truckloads of material being removed from the demolition site. Based on previous demolition work at the site, in order to reach waste disposal facilities, trucks will need to access Interstate 287 via Route 9 during the duration of the work. The project is not expected to have any long term impact on traffic levels or transportation infrastructure.

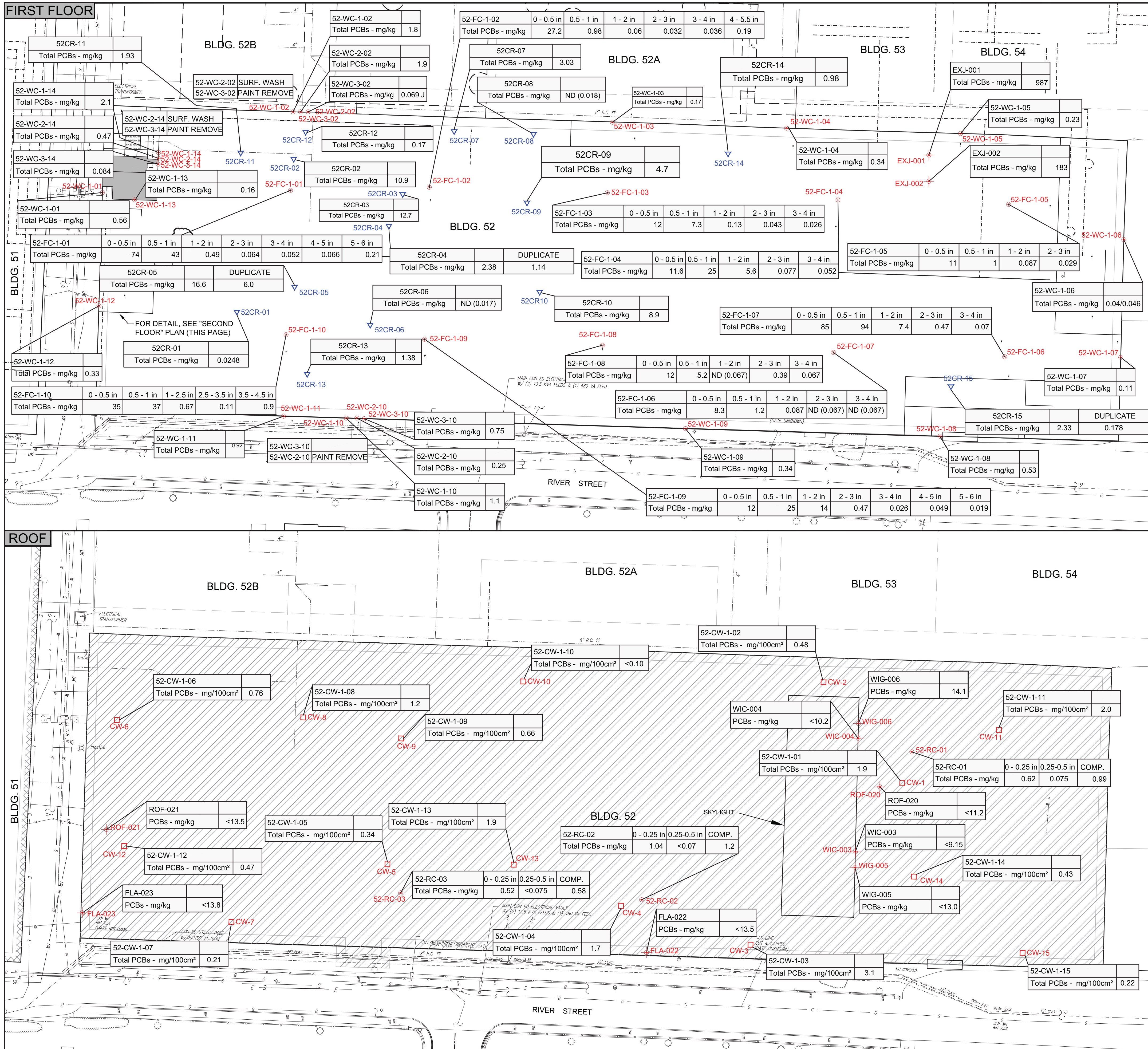
Security of the site is currently monitored 24 hours per day and 7 days per week, which will continue during demolition activities. Currently, security and job trailers are located west of Building 52. The security trailer is located approximately 10 feet from the building. Prior to beginning demolition activities, trailers will be relocated to the east side of the former Building 51 pad. Temporary storage enclosures will be installed upon completion of the demolition to store equipment used to implement the IRM required by NYSDEC. The current plan is to install these enclosures on the Building 52 pad; an alternate location may be identified, if required.

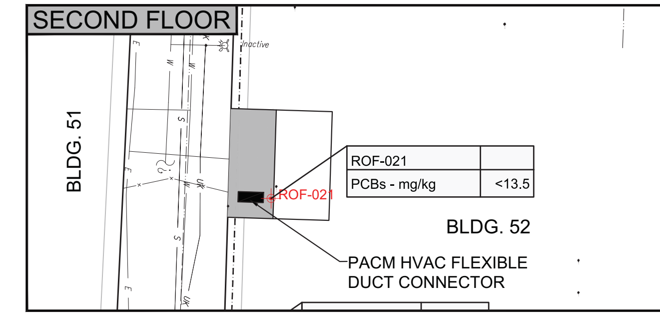
The 1 River Street property is currently zoned commercial/industrial. Demolition of Building 52 is not expected to conflict with that zoning, nor is any change in zoning being sought. Demolition of the building will facilitate environmental remediation,

#20. Has the site of the proposed action or adjoining property been the subject of remediation (ongoing or completed) for hazardous waste? If yes, describe:

The entire 1 River Street property (including the demolition site) is in the NYS Superfund program (Harbor at Hastings Site 360022). The primary contaminants of concern are PCBs and lead. In 2013, the New York Department of Environmental Conservation issued a Modified Record of Decision ("ROD") for Operable Unit 1 (OU-1) addressing the upland portions of the property and a ROD for Operable Unit 2 (OU-2) addressing the adjacent Hudson River sediments. The upland, or OU-1, ROD requires substantial remediation consisting of (a) recovery of liquid PCBs through the operation of on-site recovery wells; (b) excavation of impacted soils; (c) capping and containment in the northwest corner of the property; and (d) institutional controls for the upland portions of the Site. The sediment, or OU-2, ROD requires a combination of dredging and capping of the Hudson River sediments. The Atlantic Richfield Company (ARC) has entered into both a Consent Order with the New York Department of Environmental Conservation (“NYSDEC”) and a Consent Decree with the Village of Hastings and Riverkeeper, Inc. requiring ARC to conduct the remediation on the entire 1 River Street Property. A TSCA Risk Based Disposal Application was also submitted to the USEPA (October 2015) to secure EPA approval of future remedial work.

In 2015, ARC completed the Pre-Design Investigation (PDI) required by NYSDEC under its Consent Order and a PDI Data Summary Report was submitted to NYSDEC (August 2015). ARC has begun the process of designing the remedy. Upon acceptance of the PDI Data Summary Report by NYSDEC, ARC will be required to submit remedy design documents to NYSDEC and the Village.



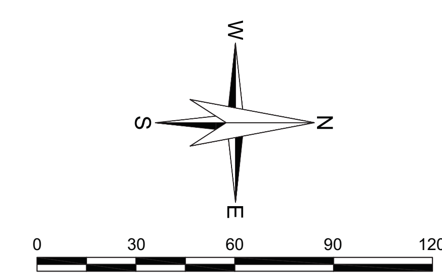


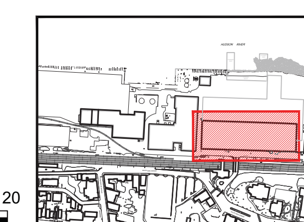
LEGEND:

W	WATER		FOUNDATION CORE WALL
G	GAS		CORE
E	ELECTRIC		ROOF CORE
S	SANITARY		OTHER SAMPLING LOCATIONS
UK	UNKNOWN UTILITY		CEILING WIPE
			FLOOR CORE (PARSONS)

SAMPLE NAMING:
WC - WALL CORE
FC - FLOOR CORE
CR - FLOOR CORE (PARSONS)
CW- CEILING WIPE - CEILING IS UNDERSIDE OF ROOF DECK (LOCATION APPROXIMATE)
RC - ROOF CORE - CORED FROM TOP OF ROOF (LOCATION APPROXIMATE)
ROF - ROOFING MATERIAL (LOCATION APPROXIMATE)
FLA - ROOF FLASHING (LOCATION APPROXIMATE)
WIC - WINDOW CAULKING (LOCATION APPROXIMATE)
WIG - WINDOW GLAZING (LOCATION APPROXIMATE)
EXJ - EXPANSION JOINT CAULK (LOCATION APPROXIMATE)

NOTES:
1. DURING SUBSURFACE INVESTIGATIONS IN 2006, COMPOSITE CONCRETE CORES WERE ANALYZED BY PARSONS. SCREENING OF THE CORES, USING WIPES, WAS COMPLETED PRIOR TO COMPOSITING.
2. SAMPLES OF VARIOUS BUILDING MATERIALS WERE COLLECTED BETWEEN 2009 AND 2010 FOR PRELIMINARY WASTE STREAM DETERMINATION.
3. IN PREPARATION FOR BUILDING STRUCTURAL INSPECTIONS IN 2010, WIPE SAMPLES OF THE UNDERSIDE OF THE ROOF DECK WERE COMPLETED AS PART OF HEALTH AND SAFETY PLANNING TO SCREEN FOR POTENTIAL PCB EXPOSURE.
4. BASE PLAN PROVIDED BY BOSWELL ENGINEERING DRAWING NO. 04-209-MW (JANUARY 2006).
5. HISTORICAL SURVEY INFORMATION PROVIDED BY PARSONS IN JULY 2005.
6. INTERIOR BUILDING FEATURES BASED ON DRAWINGS PROVIDED BY PARSONS IN NOVEMBER 2004.
7. QUALIFIERS:
   - ND - NOT DETECTED
   - J OR B - ESTIMATED RESULT
   - NA - NOT AVAILABLE
8. RESULTS SEPARATED BY A SLASH (/) SHOW A SAMPLE AND THE CORRESPONDING FIELD DUPLICATE RESULT.
9. "SURF WASH" AND "PAINT REMOVE" DENOTE HOW THE SAMPLE WAS PREPARED PRIOR TO BEING ANALYZED.





SITE KEY: NTS

HALEY & ALDRICH

NYSDEC SITE #3-60-022
1 RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

BUILDING 52 SCREENING & SAMPLING LOCATIONS

SCALE: AS SHOWN
MAY 2014

FIGURE 1

\\DTR\COMMON\28612_HASTINGS\238 DEMOLITION SUPPORT\BUILDING 52 MATERIALS\28612-SEGREGATION_GUIDANCE_B52_3.DWG

New York State Department of Environmental Conservation
Division of Environmental Remediation
Remedial Bureau C, 11th Floor
625 Broadway, Albany, New York 12233-7014
Phone: (518) 402-9662 • **Fax:** (518) 402-9679
Website: www.dec.ny.gov

Joe Martens
Commissioner

June 4, 2014

Mr. Allen Peterson, P.E.
Strategy Manager
Atlantic Richfield Company
Remediation Management
150 W. Warrenville Road
MC 200 1N
Naperville, Illinois 60563

Dear Mr. Peterson:

Re: Harbor at Hastings Site 360022
Building 52 Alternatives Report

This letter pertains to the "Building 52 Alternatives Analysis " report submitted to the New York State Department of Environmental Conservation (Department) by your cover letter dated April 11, 2014. The letter requests the Department to agree with the report's conclusion that Building 52 at the subject site be demolished to allow for effective remediation of the site in accordance with a 2012 Record of Decision issued by the Department and a 2013 Consent Order between the Department and Atlantic Richfield.

The Department requested the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) to review the report regarding the report's assertion that Building 52 fails to achieve state or national significance due to its periodic alternate use, loss of its contextual setting, and its loss of integrity.

The OPRHP has completed its evaluation of the report based on the Department's request and concludes that Building 52 no longer meets the criteria for listing on the State and National Registers of Historic Places. The OPRHP evaluation report is enclosed for your records. The Atlantic Richfield Company may use the OPRHP evaluation as applicable to evaluate its options regarding Building 52 with respect to applicable federal, state and local requirements.

Please contact me if you have any questions or concerns at (518) 402-9662.

Sincerely,

William T. Ports

William T. Ports, P.E.
Project Manager
Remedial Bureau C

Enclosure

ec: P. Johnson ARCO
J. Lucari ARCO
Peter Swiderski, Village of Hastings-On-Hudson
Philip Musegass, Hudson Riverkeeper Fund, Inc.
M. Daneker Arnold & Porter
W. Hardison Haley & Aldrich
J. Bonafide OPRHP
K. Howe OPRHP
M. Schuck DOH
N. Walz DOH
C. Gosier DEC
R. Quail DEC
W. Rosenbach DEC
C. Vandrei DEC

New York State Office of Parks, Recreation and Historic Preservation

Andrew M. Cuomo
Governor

Rose Harvey
Commissioner

Division for Historic Preservation, PO Box 189, Waterford, New York 12188-0189
518-237-8643 fax 518-233-9049
www.nysparks.com

RESOURCE EVALUATION

DATE: May 23, 2014 STAFF: Kathy Howe

PROPERTY: Former Anaconda Conduit & Cable Building 52 MCD: Hastings-on-Hudson

ADDRESS: 1 River Street COUNTY: Westchester

PROJECT REF: 14PR01931 USN: 11955.000299

I. ☐ Property is individually listed on SR/NR:
name of listing:
☐ Property is a contributing component of a SR/NR district:
name of district:

II. ☐ Property meets eligibility criteria.
☐ Property contributes to a district which appears to meet eligibility criteria.
Pre SRB: ☐ Post SRB: ☐ SRB date

III. X **Property does NOT meet NR eligibility criteria.**

Summary Statement

Building 52 of the former National Conduit & Cable Company, American Brass Co., and Anaconda Wire & Cable Company, Hastings-on-Hudson, is not individually eligible for the National Register of Historic Places. Once part of a complex of industrial buildings, the building no longer tells the story of its functional relationship to the larger site. With the loss of the other buildings and structures on the site, Building 52 is unable to convey the sense of place and historic development of the former industrial complex.

At the peak of its development, the Hastings-on-Hudson industrial waterfront consisted of dozens of buildings on the 32-acre property. The complex represented the emergence and success of the cable and wire industry in the early twentieth century, and its important role in the manufacturing of munitions and wire during World Wars I and II. Built ca. 1911, Building 52 originally housed a sheet mill and was first owned by the National Conduit Cable Company and later the American Brass Company. The plant, including Building 52, was bought by Ananconda Wire & Cable in 1929 and used to produce cables. The building has been vacant since 1974 when the Anaconda Cable & Wire Company ceased operations at this site. Building 52 played a part in the history of the industrial site for some of its 100-year existence, this significance is no longer apparent after the loss of the other components of the complex.

Continued

This determination of non-eligibility reverses OPRHP's 2007 National Register determination of eligibility for the former "Anaconda Complex," then consisting of Buildings 51, 52, and 57. During the past six years, due to their advanced states of decay, Buildings 51 and 57 were demolished with the approval of the Village of Hastings, compromising the basis on which the original evaluation was made.

In order to be eligible for listing on the National Register of Historic Places, a property must not only be historically or architecturally significant, but it also must retain integrity, defined by the National Park Service (NPS) as "the authenticity of a resource's historic identity, evidenced by the survival of physical characteristics that existed during the property's . . . historic period." The retention of a property's historic appearance, physical materials, design features, and aspects of construction allows the resource to illustrate significant aspects of its past. While Building 52 retains integrity of location and materials, it is the opinion of OPRHP that the structure lacks integrity of setting, design, workmanship, feeling, and association.

Setting is one of the most important aspects of integrity that is required to tell the story of a property. Setting is the character of the place in which the property played its historical role. The setting of Building 52 has been severely compromised by the demolition of virtually all other industrial buildings at the site. When Building 52 was constructed, the National Conduit & Cable Company consisted of numerous brick and wood-frame structures, smokestacks, and industrial equipment. Today, Building 52 is the last remaining industrial building on the site. It served as the location of one aspect of a complex manufacturing process, and the loss of other buildings eliminates an understating of that complexity. Standing alone, Building 52 no longer retains integrity of setting that existed on the Hastings-on-Hudson waterfront for over a century.

The **design** of Building 52 is typical of the materials and construction technologies of industrial buildings in the early years of the twentieth century with its steel frame structural system covered by common bond brick, veneer; brick pilasters; sawtooth roof; and open interior plan. The building's integrity of design is severely diminished due to the removal of all lower windows on the north, south, and west elevations and the upper windows on the south elevation. Openings have been filled with masonry units, significantly altering a design element of an industrial building of this period. A number of windows are covered with plywood and their condition is unknown. Doorway openings have also been modified. Removal of a c.1960 addition has also resulted in changed fenestration and exposure of some structural elements to weathering and deterioration. The sawtooth roof, which once allowed abundant natural diffused north light to enter the building, has been altered by the removal of one of the twelve monitors due to structural failure and removal of many of the character-defining steel windows.

Alterations have diminished the integrity of **workmanship**, including the removal of one of the roof monitors and several of the brick piers on the west elevation. Entrance transoms have been removed in all cases but one, 75 percent of the window openings have been sealed and the qualities of workmanship evident in the original building have continued to deteriorate because of lack of maintenance.

The surrounding built environment of Building 52 no longer conveys the **feeling** of the former industrial nature of the area. The interrelationship among the dozens of structures was critical to the interpretation of this industrial site. The razing of all of the industrial buildings and structures over the last twenty years has irreparably diminished the site's integrity of feeling.

While Building 52 was associated with the National Conduit & Cable Company and its subsequent occupant, the Anaconda Wire & Cable Company, it is not sufficiently intact to convey that relationship to an observer and, thus, does not retain integrity of **association**. Although Building 52 retains some features of an industrial building, it is no longer associated with any other industrial structures, either with the Anaconda Wire & Cable Company or with the large industrial developments that once characterized the Hastings-on-Hudson waterfront. The cable and conduit complex may have had historic significance; however, no individual building aptly represents the density and spatial relationships essential to understanding its place and importance within the Hudson River Valley industrial and commercial corridor.

On its own, Building 52 fails to represent the complexity of a site that once employed over 2,000 individuals and no longer retains the historic integrity to qualify as an individual building eligible for listing. The conclusion is that OPRHP is withdrawing its original assessment of eligibility and declaring that Building 52 no longer meets the criteria for listing on the State and National Registers of Historic Places.

If you have any questions concerning this Determination of Eligibility, please call Kathy Howe at (518) 237-8643, ext. 3266.

BUILDING 52 ALTERNATIVES

FORMER ANACONDA WIRE & CABLE COMPANY
1 RIVER STREET
HASTINGS-ON-HUDSON, NY
NYSDEC SITE #360022

by

Haley & Aldrich of New York
Rochester, New York

for

Atlantic Richfield Company
Naperville, IL

File No. 28612-305
11 April 2014

HALEY& ALDRICH

Haley & Aldrich of New York
200 Town Centre Drive
Suite 2
Rochester, NY 14623

Tel: 585.359.9000
Fax: 585.359.4650
HaleyAldrich.com

HALEY& ALDRICH

11 April 2014
File No. 28612-305

Mr. Allen Peterson
Atlantic Richfield Company
150 W. Warrenville Road
MC 200-1N
Naperville, Illinois 60563

Subject: Building 52 Alternatives
Former Anaconda Wire & Cable Company Site
1 River Street
Hastings on Hudson, New York
NYSDEC Site #3-60-022

Dear Mr. Peterson:

Enclosed is the Building 52 Alternatives report, dated 11 April 2014. Feel free to contact us if you have any questions.

Sincerely yours,
HALEY & ALDRICH OF NEW YORK

Keith M. Aragona — Wayne Hardison

Keith M. Aragona, P.E. — Senior Project Manager
Wayne C. Hardison, P.E. — Program Manager

Enclosure

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EXECUTIVE SUMMARY

Building 52 is a vacant, former industrial building located within the northeast corner of the Anaconda Wire & Cable Company (Anaconda) State Superfund Site #360022 at 1 River Street in Hastings-On-Hudson, NY (Site). This building is one of several factory buildings that once operated on the 28-acre Anaconda complex. All buildings except Building 52 have since been removed.

Building 52 was built in 1911 by the National Conduit & Cable Company and the National Brass & Copper Tube Company for original housing of a sheet mill. Anaconda acquired the facility in 1929. During World War II, a fire-resistant electrical cable was manufactured under a contract with the US Navy. Components of the cable included polychlorinated biphenyls (PCBs) which impacted the building's interior and subsurface. The facility was closed in 1974; Atlantic Richfield purchased the Anaconda companies in 1977 which resulted in their ownership of the site. As such, Atlantic Richfield became responsible for environmental remedies associated with Anaconda's former operation.

Multiple environmental investigations have been completed at the Site (including within and adjacent to the building) to determine the nature and extent of contamination. Investigations determined that chemicals used in the manufacturing process are present in soil adjacent to Building 52, beneath the floor slab (sub-slab), and on or within building materials. PCBs are the primary contaminants in sub-slab soil and PCBs, lead, and asbestos have been observed on and within building materials. Samples collected to screen soil and building materials for the presence of contaminants indicates extensive contamination is present; however, additional sampling is necessary to define the full extents.

Based on findings of investigations within and around Building 52, primary concerns regarding Building 52 and underlying contaminated soil include:

- Safety of on-Site workers and the public when in proximity of the decaying building that, without significant maintenance, will eventually collapse;
- Soil that is inaccessible and exceeds PCB removal criteria will be left in place for future removal;
- PCBs, lead, and asbestos within the interior of the building must be addressed prior to reuse, and;
- Increased complexity of removing soil beneath or in the vicinity of the building, as required by the Site remedy, while the building remains in place.

Current Physical Condition:

Deterioration of building elements, (e.g., sawtooth roof monitors, brick pilasters, and the roofing system) has been observed and their condition continues to worsen. The roof membrane, originally designed to protect the roof deck, has been significantly deteriorating over the past several years and large sections of the concrete roof deck are exposed to solar radiation, precipitation, and freeze-thaw cycles which further reduces structural integrity. Extensive work to the roof and brick masonry elements would be required to reduce water infiltration and slow deterioration should the building be preserved for future reuse.

Historic Significance:

A historic research and integrity analysis was completed in accordance with guidelines established by the National Park Service (NPS). This analysis concluded that Building 52 fails to achieve state or national significance due to its periodic alternate use, loss of its contextual setting, and its loss of integrity. Specifically, Building 52 fails to achieve historic significance due to its lack of architectural integrity as the building lacks a bevy of unique architectural features and does not aptly represent the density and spatial relationships essential to understanding its place and importance within the Hudson River Valley's industrial and commercial corridor. Additionally, Building 52 fails to convey its particular function or suggest the products that were once created within its walls and lacks architectural integrity due to alterations to its original minimalist design.

Based on the historical research and integrity analysis, Building 52 fails to achieve state or national significance due to the loss of contextual setting and integrity. Additionally, Building 52 fails to achieve historic significance due to a lack of architectural integrity.

Sub-Slab Soil and Building:

In March 2012, the New York State Department of Environmental Conservation (NYSDEC) issued a Record of Decision (ROD) Amendment to address PCBs in the soil for the entire Site, including those under Building 52. An Amended Order on Consent was signed in November 2013 which obligates Atlantic Richfield to design and implement the remedy. Concentrations in sub-slab soil exceed the established removal criteria. Therefore, in addition to soil outside the Building 52 area, soil beneath and adjacent to the building must be addressed at some point in time.

The design process began in 2013 and the degree to which Building 52 will be integrated into the final design must be resolved in order to complete the design and proceed with the remedy, which provides urgency and necessity to resolving the future of Building 52.

Additionally, PCBs, lead (in paint, window glazing, and caulk), and asbestos have been documented within Building 52 at concentrations that may pose a potential risk to human health. These contaminants must be addressed prior to building reuse.

Building 52 Alternatives Evaluation:

Various alternatives to address safety and the presence of PCBs and other contaminants were evaluated and compared to a "no action" alternative. Evaluated alternatives included options to stabilize and decontaminate the interior for reuse but excluded specific actions required for code compliance and remodeling.

Several alternatives were evaluated for Building 52 and sub-slab soil. Alternatives evaluated were:

Alternative 1 - No Action
Alternative 2 - Building Stabilization and Decontamination, Future Sub-slab Soil Removal
Alternative 3 - Building Stabilization and Decontamination, Sub-slab Soil Removal
Alternative 4 - Building Demolition, Sub-slab Soil Removal
Alternative 5 - Partial Building Demolition, Sub-slab Soil Removal

Alternatives which leave some or all of the Building 52 structure in place pose an increased risk to workers and the public due to the following:

- An increased risk exists when excavating impacted sub-slab soil with all or portions of the deteriorating building remaining;

- The potential exists for human exposure to dust containing PCBs during future required mitigation on a site that has already been redeveloped;

- The potential for inadvertent exposure to contaminants in the building remains regardless of efforts to remove them, and;

- Any residual contamination requires ongoing maintenance and monitoring to mitigate human exposure.

Additionally, alternatives which leave some or all of Building 52 in place add significant cost to Site remediation and reduces reuse flexibility.

Recommendations:

Based on the alternatives evaluation, Alternative 4 - Building Demolition, Sub-slab Soil Removal is recommended because it:

- Reduces the safety risk to on-Site workers and the public by demolishing the deteriorating building;

- Provides enhanced access to more thoroughly remove soil containing PCBs that exceed removal criteria beneath and adjacent to the building;

- Addresses PCBs, lead, and asbestos within the building materials;

- Avoids the increased complexity of removing soil beneath or in the vicinity of the building, as required by the Site remedy, while the building remains in place;

- Provides increased flexibility for Site reuse by completing remediation activities before commencement of reuse, and;

- Provides the least costly alternative that fulfills the requirements of the ROD Amendment.

If requested, preserving the heritage of Building 52 can be supported through a cooperative endeavor between Atlantic Richfield and the Village of Hastings-on-Hudson by preserving photographic records, drawings, or other historical information related to the building.

TABLE OF CONTENTS

TABLE OF CONTENTS
(Continued)

1. INTRODUCTION

In March 2012, the New York State Department of Environmental Conservation (NYSDEC) issued a Record of Decision (ROD) Amendment to address PCBs on land (OU-1). The ROD Amendment requires Site-wide excavation of soil containing PCBs greater than 10 ppm (parts per million), to a maximum depth of 9 to 12 feet. In November 2013 Atlantic Richfield signed an Amended Order on Consent with NYSDEC which requires design and implementation of the environmental remedy to address PCBs and lead. A Pre-Design Investigation (PDI) to collect data for the remedial design began in 2013.

The purpose of this report is to provide governmental agencies and the public an evaluation of the current physical and environmental condition of Building 52 and the alternatives for remediation of contaminants present at concentrations that exceed removal criteria located within building components and in soil located beneath the floor slab (sub-slab).

Primary concerns regarding Building 52 and contaminated soil include:

- Safety of on-Site workers and the public when in proximity of the decaying building that, without significant maintenance, will eventually collapse;
- Soil that is inaccessible and exceeds PCB removal criteria will be left in place for future removal;
- PCBs, lead, and asbestos within the interior of the building must be addressed prior to reuse;
- Increased complexity of removing soil beneath or in the vicinity of the building, as required by the Site remedy, while the building remains in place.

1.1 Background

Building 52 is a vacant, former industrial building located within the northeast corner of the Anaconda Wire & Cable Company (Anaconda) State Superfund Site #360022 at 1 River Street in Hastings-On-Hudson, NY (Site). This building is one of several factory buildings that once operated on the 28-acre Anaconda complex. All buildings except Building 52 have since been removed.

Building 52 was built in 1911 by the National Conduit & Cable Company and the National Brass & Copper Tube Company for original housing of a sheet mill. Anaconda acquired the facility in 1929. During World War II, a fire-resistant electrical cable was manufactured under a contract with the US Navy. Components of the cable included polychlorinated biphenyls (PCBs) which impacted the building's interior and subsurface. The facility was closed in 1974; Atlantic Richfield purchased the Anaconda companies in 1977 which resulted in their ownership of the site. As such, Atlantic Richfield became responsible for environmental remedies associated with Anaconda's former operation.

PCBs and lead are present inside Building 52 at concentrations that exceed criteria established to protect human health. If Building 52 is retained, restored, and returned to beneficial reuse, these contaminants must be addressed prior to occupancy. Specifically, PCBs are present in the concrete floor slab, the underside of the concrete roof, and paint and window caulk at concentrations that exceed safe human exposure criteria. Additionally, lead based paint has been identified on surfaces throughout the building and lead is contained within window glazing and caulk.

PCBs are present in sub-slab soil at concentrations that exceed removal criteria established in the 2012 ROD Amendment which dictates remedial activities in OU-1 (upland). The presence of PCBs in sub-slab soil is likely related to former trenches, drains, pits, sumps, and piping which once conveyed process waste. The highest concentration of PCBs documented in sub-slab soil is 657 ppm (compared to the removal criterion of 10 ppm).

Additional soil and building materials sampling and analysis will be required to determine the extent of contaminants present at concentrations that exceed removal criteria.

1.2 Evaluation Methodology

The evaluation of alternatives addresses:

- Current physical condition
- Historic significance
- Removal of contaminated sub-slab soil and building materials considering:
  - Protection of human health
  - Protection of the environment
  - Overall structural condition of the building
  - Removal of impacted sub-slab soil that exceeds Site-wide removal criteria
  - Compatibility of the building with an overall Site reuse strategy

2. CURRENT PHYSICAL CONDITION

Robert Silman Associates (RSA) completed an evaluation of Building 52 in 2011 to examine the structural condition of the primary components (roof, columns and slab) with respect to potential stabilization and reuse. The information presented below is a summary of RSA's findings; the full report is included in Appendix A.

2.1 Summary

Building 52 is a one-story building 576 feet in length in the north-south direction and 170 feet in width in the east-west direction. Based on a review of historic building drawings, the building consists of a concrete slab floor underlain by wood piles.

The roof is supported by steel columns, which extend along the perimeter of the building on 16 foot centers within the east and west walls and on 17 foot centers in the north and south walls. A center row of columns, which provides roof support to steel trusses that extend east-west, is oriented north-south and are on 48 foot centers. The trusses support smaller steel infill beams, which support a cinder concrete roof slab. The exterior walls are masonry and do not appear to be load bearing.

2.1.1 Roof

The roof of Building 52 was constructed with monitors (also known as sawtooth), which was common of buildings constructed in this era. Monitors are evenly spaced along the length of the building, which contains concrete on the south facing slope and previously contained glass skylights on the steeper north facing slope. Each monitor occupies three structural bays of the building length and spans most of the building width. Skylight assemblies are deteriorated beyond the point of being able to be repaired; the glass has been removed from the window frames and covered with plywood and roofing shingles. There were originally 12 roof monitors (one of the roof monitors deteriorated, was removed, and not replaced).

RSA accessed the underside of the concrete roof from a man lift and observed a peeling and flaking coating, which was likely used as a moisture barrier. This barrier may have been manufactured with PCBs and will require additional sampling and evaluation. Spalled concrete or areas of cracked concrete, due to corroded reinforcing, were not observed. Thermal imaging of the roof was performed from inside the building to evaluate roof areas that contain elevated moisture levels. Long term exposure of the concrete roof deck will lead to corroded reinforcement, debonding concrete, and voiding. The infrared thermal camera generally detected these conditions in the vicinity of roof drains and at other compromised areas of the roof slab.

Intrusive sampling of the roof deck was completed by cutting and removing 12 inch by 12 inch sections for testing. This testing indicated the roof deck is constructed of a cinder aggregate concrete, which was a common material buildings constructed in New York during this era. Visible, exposed, corroded mesh was also observed on the roof deck within areas of damaged concrete exposing the reinforcement to precipitation. At least one location contained a large crack (up to one inch wide and approximately ten feet long) in the roof slab.

Analysis of concrete testing data indicates the concrete roof deck cannot adequately protect against ongoing corrosion of interior steel reinforcing due to the lack of an alkaline buffer often present in steel-reinforced concrete applications. Due to the small diameter of the reinforcing, ongoing exposure to precipitation will promote corrosion and a potential serious long term adverse effect on the strength of the roof.

Triangular end walls of the monitors are in very poor condition and have deteriorated beyond repair, which can be observed from the finished floor. Failures of the end walls include loss of coatings, cracking, and deformation of the wall surface. There are several areas within the building in which concrete originating from the monitor end walls is observed on the floor due to de-bonded concrete from the metal lath, creating an unsafe condition. Access to areas beneath monitor end walls has been restricted due to an ongoing safety hazard.

The roof membrane is in poor condition and is missing in many locations on the southern portion of the building. Failure of the top layer of the membrane occurs across extensive areas near the middle of the building and at the southern end of the building. At a number of locations, roofing membrane is missing and the concrete deck is completely exposed and many active roof leaks are present. Infiltration of water through the roof deck will accelerate corrosion of reinforcement and reduce the structural capacity of the structure.

2.1.2 Exterior Walls

Observations of exterior walls consisted of both probes and visual inspections. Probes were performed to observe column base plate conditions located behind the masonry pilasters. In many locations, eroded masonry (mortar joints) between bricks was observed. Additionally, evidence of pilaster failure on the building exterior due to water infiltration has been observed creating an unsafe condition due to the potential of falling bricks. Access to these areas has been restricted due to an ongoing safety hazard. These observations are critical to determine locations in which water will infiltrate resulting in further deterioration of the structural capacity of the building.

2.1.3 Concrete Building Slab

The floor consists of exposed concrete and is in fair to good condition, containing one layer of steel reinforcing with an average thickness of approximately eight inches. There is evidence of trenches which were likely installed at various times in the history of operations to convey waste water from the manufacturing floor. All trenches inside the building appear to be filled with concrete.

In 2010, RSA completed an evaluation of the slab condition by removing 36 inch by 36 inch sections to evaluate the structural conditions of sub-slab soil, reinforcement, and concrete. The results of this evaluation indicate the overall condition of the concrete slab is good and reinforcement showed little signs of corrosion in probe locations.

2.1.4 Limited Foundation Investigation

A foundation investigation program was conducted by RSA in 2010 and was based on historic drawings that indicated the presence of wood piles beneath 75% of the building. The initial goal of the investigation was to identify the locations of pile caps and complete testing to determine the capacity of the piles. Nondestructive testing (ground penetrating radar), limited concrete removal, and concrete cores/probes were used to locate piles. Evidence of piles or pile caps was not observed during these evaluations and further evaluation of the foundation was not completed. Based on this information and an understanding of practices at the time of original construction, piles may have been used as a ground improvement technique and may not support the building slab. Interior and exterior steel columns appear to be located over (and may be supported by) groupings of wood piles (four piles beneath interior steel columns and two piles beneath exterior steel columns). Supplemental foundation and geotechnical investigations will need to be performed prior to completion of excavation shoring design and the required column and perimeter wall shoring.

3. HISTORIC SIGNIFICANCE

RTKL Associates Inc. performed an evaluation of the historic significance of Building 52 which is included as Appendix B. This section provides an overview of the methodology and findings from RTKL's evaluation.

3.1 History of Manufacturing in Building 52

Below is a general overview of the history of use of Building 52. A more detailed evaluation of the history of the river front industry and Building 52 is included in Appendix B.

- Building 52 was constructed in 1911.
- Copper and brass components for munitions to support World War I efforts were manufactured prior to 1915 through approximately 1920.
- Used as auto dead storage (where automobiles or parts are stored for an indefinite length of time) between approximately 1920 and 1942.
- Fire-resistant electrical cable was manufactured under a US Navy contract between 1942 and 1945.
- Telephone wire was manufactured between 1945 and the early 1970s.
- Operations at the Hastings-On-Hudson Plant ceased in 1974 and the Site was acquired by Atlantic Richfield in 1978 through the purchase of copper mining assets from the Anaconda Company.

3.2 Historic Integrity Assessment Methodology

The historic integrity of a resource is defined by the National Park Service (NPS) as "the authenticity of a resource's historic identity, evidenced by the survival of physical characteristics that existed during the property's prehistoric or historic period." Assessment of historic integrity uses the following seven aspects or qualities.

1. Location: The place where the historic property was constructed or the place where the historic event occurred.
2. Setting: The physical environment of a historic property.
3. Design: The composition of elements that create the form, plan, space, structure, and style of the property.
4. Materials: The physical elements that were combined or deposited during a particular period of time in a particular pattern or configuration to form a historic property.
5. Workmanship: The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.

6. Feeling: A property’s expression of the aesthetic or historic sense of a particular period.

7. Association: The direct link between an important historic event or person and a historic property.

3.3 Historic Significance Evaluation

Building 52 fails to achieve state or national significance due to the periodic alternate use and the loss of contextual setting and integrity. At the peak of development, Hastings-On-Hudson industrial waterfront consisted of dozens of buildings on the 32-acre property. This “complex" was part of the emergence and success of the cable and wire industry in the early twentieth century and played an important role in munitions and wire manufacturing during World Wars I and II. The cable and conduit complex may have had historic significance; however, no individual building aptly represents the density and spatial relationships essential to understanding its place and importance within the Hudson River Valley industrial and commercial corridor. On its own, Building 52 fails to represent the complexity of a site that once employed over 2,000 individuals. Further, the key relationship between Building 52 and the Hudson River and railroad is not readily apparent due to the absence of other industrial structures.

Building 52 fails to achieve historic significance due to a lack of architectural integrity. Alterations to the minimalist design severely diminish the overall integrity as the building lacks a bevy of unique architectural features. The deterioration of one of the sawtooth roof monitors, removal and infill of over 75 percent of the triple-hung windows, and removal of a number of the character-defining sawtooth roof monitor windows lessens the architectural significance of the building. Moreover, Building 52 fails to convey its particular function or suggest the products that were once created within. The historic significance of Building 52 is further hindered by the apparent period of disuse between approximately 1920 and 1942. After World War I, Building 52 was utilized for dead storage and was not used in a manufacturing role until the onset of World War II. As a result, Building 52 served in a manufacturing capacity for less than one half of the years of active industrial activity on the waterfront.

Local significance of Building 52 is diminished due to the lack of other industrial resources on the Hastings-On-Hudson waterfront. The building is the last remnant of the riverfront industries that played a central role in Hastings-On-Hudson, from the opening of the sugar refineries circa 1850 to the closing of Anaconda Cable & Wire Company in 1974. Building 52, however, retains limited association with the former sprawling industrial waterfront of Hastings-On-Hudson and allows conveyance of the importance of such industries to the development of the Village.

3.4 Historic Significance Conclusion

Based on the historical research and integrity analysis, Building 52 fails to achieve state or national significance due to periodic alternate use, the loss of contextual setting, and loss of architectural integrity. Additionally, Building 52 fails to achieve historic significance due to a lack of architectural integrity.

4. SUB-SLAB SOIL AND BUILDING MATERIALS

4.1 Building 52 Sub-Slab Soil

As noted in Section 1.0, Atlantic Richfield is required by a ROD Amendment and an Amended Order on Consent to remove PCBs Site-wide in soil that exceeds removal criteria, including soil beneath Building 52 (herein referred to as "sub-slab"). Previous preliminary subsurface investigations, although limited in extent, have identified PCBs present in sub-slab soil at concentrations that exceed removal criteria. The extent of PCB-impacted sub-slab soil has not been fully delineated beneath the building. Impacts have been identified at depths up to 8 feet in the vicinity of floor drains, pipes and former floor trenches which conveyed process wastewater.

Existing data was used to approximate concrete and soil removal quantities. Estimated removal quantities are likely the minimum required and are expected to increase upon collection of additional data. Large portions of the existing slab must be removed in order to excavate known exceedances.

Estimated soil removal includes:

- 400 linear feet of exterior excavation (adjacent to the building) at depths of up to and may exceed 6 feet
- 500 lf of interior excavation at depths of up to 6 feet
- 300 lf of interior excavation at depths of up to 9 feet

Excavations greater than four feet in depth are expected to require temporary shoring and excavations greater than six feet in depth will require shoring, active dewatering, and water treatment. Groundwater generated during dewatering activities will be managed by pumping, temporary on-Site storage/treatment, and then discharged.

Excavations greater than four feet in depth are expected to require temporary shoring and excavations greater than six feet in depth will require shoring, active dewatering, and water treatment. Groundwater generated during dewatering activities will be managed by pumping, temporary on-Site storage/treatment, and then discharged.

4.2 Evaluation of Building Materials

Potential reuse or demolition of Building 52 requires additional evaluations of the interior and exterior to determine whether contaminants are present at concentrations that must be addressed through in – place mitigation (i.e. leave in place and cover) or removal. Previous evaluations were completed and presented publically on 5 March 2013 using an approach that would mitigate these contaminants. However, in order to reduce future risk to receptors and liability to Atlantic Richfield, alternatives that include building reuse assume contaminant removal rather than in-place mitigation.

The presence of these contaminants within the interior will dictate decontamination for reuse or waste streams during demolition. The primary environmental contaminants of concern located within Building 52 are PCBs, lead, and asbestos. A detailed summary of each constituent is provided below

4.2.1 PCBs

Screening level data indicates the presence of PCBs in the concrete floor, interior brick walls, and underside of the concrete roof. Additional sampling will be required to refine areas that exceed high occupancy reuse thresholds or to determine waste streams. The presence of PCBs within various building materials and on surfaces is likely the result of manufacturing operations during World War II. Additionally, a common historical practice was to add PCBs to building materials (such as expansion joints and window caulk) to enhance plasticity; PCBs within these materials are commonly observed at significant concentrations.

As summarized below, sampling indicates the presence of PCBs in a variety of building materials at concentrations that exceed criteria. For reference, the regulatory standard established by the Environmental Protection Agency (EPA) for PCBs is <1 ppm for accessible building materials that remain in areas of high occupancy use.

- Concrete Floor Slab – Cores from the concrete floor were collected for screening purposes to determine the presence of PCBs; PCBs were present in each sampling location. Cores have identified PCB concentrations up to 94 ppm in the top one inch of concrete. Eliminating the direct contact human exposure pathway must be addressed prior to reuse and is expected to require removal of the top one to two inches of the concrete floor slab and may be followed by installation and long-term maintenance of a cover. This approach would require regulatory approval.

- Interior Wall Paint – The majority of the interior walls of the building are painted and in relatively poor condition (many areas contain loose and peeling paint). Paint samples identified PCBs present at concentrations of up to 2 ppm. Painted surfaces will likely require sand blasting to remove the paint.

- Underside of the Concrete Roof – Wipe samples were collected to determine the presence of PCBs; detections were positive at all 14 locations. In addition, roof cores were collected at three locations and analyzed for the presence of PCBs; PCBs detections ranged between 0.58 and 1.2 ppm. The presence of PCBs on the underside of the roof may be a result of manufacturing operations or may have been a component of the observed coating. Additional data may be required to assess the extent of PCB contamination and any required remediation. Based on existing data, surfaces that contain this coating will likely require sand blasting or removal of a portion of the roof may be required.

- Brick – Cores from the brick walls were collected from the building interior at approximately 15 locations for screening purposes to determine the presence of PCBs. At three locations, additional samples were collected upon washing the wall surface and removing the paint at locations adjacent to the initial sampling location. Elevated concentrations of PCBs were detected at these three locations prior to washing and removal of the paint. Prior to use of the building, additional sampling would be required to determine the extent of PCB contamination of the brick.

- Other Building Materials – Based on preliminary screening, window glazing and window and floor caulk contain PCBs which will require abatement and disposal. PCBs were detected at concentrations between 14 and 987 ppm in these materials. Other building substrate materials in contact with glazing or caulk may require abatement prior to reuse or demolition. Additional investigation will be required to delineate these areas.

Any sampling program to evaluate the extent of PCBs may require EPA approval under the Toxic Substances Control Act (TSCA). Appendix B contains a summary of the data with respect to PCBs present in building materials.

4.2.2 Lead

Preliminary screening of window glazing and caulk indicates the presence of lead. Based on screening level data, a majority of the building interior (brick and structural steel) appears to be coated with lead based paint in poor condition (e.g., loose and peeling) at concentrations up to 2,000 ppm. Lead containing materials must be addressed prior to building reuse and is expected to require removal of paint, window glazing, and caulk. Painted surfaces will likely require sand blasting to remove paint.

4.2.3 Asbestos

Significant asbestos removal has already been completed within Building 52 and most asbestos-containing building materials (ACBM) have been evaluated and abated. Remaining ACBM is related to in-use building materials including roof flashing located along roof edges, penetrations, and along interior parapet walls. Based on preliminary screening, window glazing and caulk also contain asbestos along with floor tiles in a portion of the building. Additional sources of asbestos may be encountered and require additional investigation. ACBM must be addressed prior to building reuse and is expected to require abatement and disposal.

5. ALTERNATIVES ANALYSIS

Various alternatives to address safety and the presence of PCBs and other contaminants were evaluated and compared to a "no action" alternative. Evaluated alternatives included options to stabilize and decontaminate the interior for reuse but excluded specific actions required for code compliance and remodeling. Alternatives evaluated were:

Alternative 1 - No Action
Alternative 2 - Building Stabilization and Decontamination, Future Sub-slab Soil Removal
Alternative 3 - Building Stabilization and Decontamination, Sub-slab Soil Removal
Alternative 4 - Building Demolition, Sub-slab Soil Removal
Alternative 5 - Partial Building Demolition, Sub-slab Soil Removal

Each alternative is described in detail hereafter and includes the following:

- Opinion of Probable Cost
- Other Considerations
- Advantages and Disadvantages

5.1 Alternative 1: No Action

Alternative 1 "No Action" serves as a baseline for comparison of the other remedial alternatives. As described in detail below, without repair and preventative maintenance of the building, the building will ultimately collapse. While the cost was not evaluated in this alternative, sub-slab soils would then need to be removed to fulfill the requirements of the ROD Amendment.

5.1.1 No Action taken to Stabilize, Decontaminate or Demolish the Building

This alternative evaluates taking "no action" which includes no further maintenance of the building. The building would continue deteriorating due to water infiltration and freeze/thaw cycles and lead to eventual collapse. This alternative includes:

Limit access to workers in the vicinity of the building:

The approximate duration until the design and implementation of the environmental remedy around the building is eight years. Therefore, this evaluation selected eight years for considering reoccurring costs prior to Site or building reuse.

Currently, several exterior wall areas show evidence of deterioration such as bricks on the ground or pilasters separating from columns. Providing no further maintenance increases the potential for significant exterior wall damage or collapse. Access to these areas will be restricted because of the potential for physical harm to Site workers. The cost of this effort is not separately significant since Site security is currently provided and needed for all alternatives. Eventually, the building would collapse due to neglect; the collapsed building and sub-slab soils would need to be addressed during a subsequent and separate future remedial activity.

Relocation of storage and electrical service:

- Safe areas inside Building 52 are currently used to store equipment and supplies related to completion of remedial activities. As the building further deteriorates, all storage must be relocated to an alternate safe location to protect on-Site workers.

- The electrical service is currently located on the east wall of the building and must be relocated to new utility poles to protect it from damage as the building further deteriorates.

Spring and fall roof material cleanup:

Roofing material will continue to deteriorate as the membrane separates from the deck and will present a safety concern for on-Site workers and the public during high wind events. Yearly cleanup of dislodged roof materials on the ground will continue to be performed. Proactively removing membrane material from the roof would present an unacceptable safety issue due to the unknown integrity of the deteriorating roof deck.

5.1.2 Approach to Sub-slab Soil Removal

This alternative takes no actions to address the sub-slab soil and therefore would not comply with the Amended Order on Consent or fulfill the requirements of the ROD Amendment and therefore is not feasible. The presence of the building allows for sub-slab soil that exceeds removal criteria to remain in place for the short term while the building remains potentially functional, but does not alter the requirement of the ROD Amendment to remove them when the status of the building changes.

5.1.3 Opinion of Probable Cost

A summary of probable costs, including allowances for engineering as required, is provided below:

	Cost ($ million)
Relocation of storage and electrical service	$0.2
Spring and fall roof material cleanup (8 years)	$0.3
Total:	$0.5

5.1.4 Other Considerations

Implementation of this alternative may negatively impact reuse and does not provide for any historical preservation. While the opinion of probable cost does not include the cost for removing the sub-slab soil, this cost would be incurred at some point in the future in order to comply with the Amended Order on Consent and fulfill the requirements of the ROD Amendment. Additionally, no allowance for was included for debris removal when the structure fails.

5.1.5 Advantages and Disadvantages

Advantages:

- Lowest cost

Disadvantages:

- This option would not comply with the Amended Order on Consent or fulfill the requirements of the ROD Amendment and is not feasible to implement.

- While not detailed in this “no action” alternative, inaction would only defer completion of the remediation of sub-slab soil to a future date.

- Continued deterioration would lead to the ultimate collapse of the building

- Once the building has collapsed removal of the remnants and sub-slab soil will ultimately be required. Additionally, once collapsed, determining appropriate disposal for building materials will be difficult since contaminated and non-contaminated materials will be comingled.

- Deferring removal of soil impacted with PCBs to the future creates a complication for the Site owner. Specifically, completion of excavation and remediation on a site that has been returned to beneficial reuse would result in a significant disruption to the Site and increased exposure of the public.

- A large exterior safety perimeter would need to be established to prevent exposure to falling debris including roofing materials during high wind events and would impair the ability to complete remediation near the building.

- Without decontamination, impacted building materials may be exposed to the environment and storm water runoff as the building continues to deteriorate.

- A deteriorating structure poses a significant impediment to future Site reuse and increases Site reuse costs if the building remains in place beyond the end of Site-wide remediation.

5.2 Alternative 2: Building Stabilization and Decontamination, Future Sub-slab Soil Removal

This alternative preserves Building 52 and makes the structure available for future preparations for reuse. Stabilization for future reuse would include sealing the building from precipitation to reduce deterioration. In addition, Building 52 would require decontamination or removal of materials that contain PCBs, lead and asbestos exceeding regulatory criteria or other safe thresholds prior to reuse. This alternative would leave soil containing PCBs that exceeds removal criteria in place assuming that EPA’s TSCA program could be petitioned and approval obtained to have the existing building and slab act as a cover to defer soil removal to the future.

5.2.1 Building Stabilization and Decontamination

Structural Stabilization/Repairs:

Stabilization requires significant repairs to the building to reduce water infiltration and to preserve the structure for future reuse. The general scope of work includes:

- Engineering design
- Repair/replace existing roof covering
- Repair of sections of the concrete roof deck
- Repair and/or replace monitor end walls
- Repair masonry (i.e., repoint, rebuild pilasters, fill cracks in masonry, replace concrete sills and headers)
- Remove metal protrusions (i.e., conduits, vents, etc.)
- Repair/replace and reseal window coverings

Building Maintenance:

Retaining the building requires maintenance to prevent further deterioration prior to reuse. The approximate duration until the design and implementation of the environmental remedy at the Site is complete is eight years. This represents the assumed minimum required duration that maintenance will be required after stabilization is complete. Yearly Maintenance includes:

- Bi-annual roof inspections
- Roof repairs
- Miscellaneous additional repointing

Decontamination and additional investigation:

Decontamination of the structure is required prior to building reuse. The general scope of work includes addressing PCBs, lead and asbestos for high occupancy use as described in Section 4.2. In order to reduce long term liability and increase the flexibility of building reuse, the presence of PCBs, lead (in paint and window caulk and glazing), and ACBM would be addressed though removal. Decontamination may generally include the following:

- Complete detailed investigations to determine extents
- Remove the top surface of the concrete floor slab (scabble the top 1-2 inches to address PCBs)
- Remove interior wall paint (sand blast approximately half of the interior walls to address lead based paint and surface PCBs)

- Abate or remove portions of the of the concrete roof (sand blast approximately half of underside of the roof to address PCB containing coating)

- Remove other building materials including glazing, expansion joint caulk and impacted adjacent substrate materials

- Remove remaining ACBM

Upon completion of decontamination activities, PCBs, lead and asbestos will likely remain on and within building materials which may result in unintentional exposure and human health risk in a reuse scenario.

Modifications due to the Site-wide cover system:

A cover system will be placed on the Site upon completion of the remedy that will significantly interfere with integration of the building with the Site and would require additional considerations (e.g., a retaining wall around the perimeter of the building to avoid loading on exterior walls, drainage of stormwater in a building footprint that will be depressed below Site-wide grades, etc.).

Upgrades prior to building reuse:

A detailed evaluation of foundation conditions will be required before the building can be renovated for occupancy. Mechanical, electrical, fire protection, storm water, and sanitary systems will need to be upgraded or installed to meet current code requirements. Costs associated with these tasks are expected to be significant, but are considered part of reuse and are not included in this evaluation.

5.2.2 Approach to Sub-slab Soil Removal

This alternative would retain Building 52 and the floor slab as is, leave the soil with PCBs exceeding removal criteria in place, use the existing slab as a cover, and defer soil removal to the future. In order to implement this approach, the floor slab would require extensive scabbling (removal of top layers of the concrete) to remove surface PCB impacts and potentially require installing concrete over the remaining slab to restrict exposure to residual PCBs.

Post-remedy mitigation systems:

For any ownership scenario, due to the presence of contaminants in sub-slab soil, a deed restriction and cover system (i.e., building slab, etc.) will be required during the life of the building. Additionally, long term maintenance, monitoring, and reporting will be required for the purpose of ensuring the effectiveness of systems that separate the occupants from exposure. An assumed duration of 30 years was selected for this evaluation.

Future Sub-Slab Soil Excavation:

The presence of the building does not alter the requirement to ultimately remove the sub-slab soil that exceeds removal criteria; if the building is retained, then sub-slab removal will be deferred to a future date. Therefore, upon future demolition or change in footprint of Building 52, the slab will need to be removed and sub-slab soil excavated in accordance with the ROD

Amendment. This approach would require approval from regulatory agencies (NYSDEC and EPA under TSCA). Since soil removal would eventually be required, the cost to complete future excavations is included in the cost evaluation.

5.2.3 Opinion of Probable Cost

A summary of probable costs, including allowances for engineering as required, is provided below:

	Cost ($ million)
Structural Stabilization/Repair	$3.2
Building Maintenance (8 years)	$0.3
Decontamination and additional investigation	$5.0
Modifications due to the Site-wide cover system	$0.2
Post-remedy mitigation systems (30 years)	$0.5
Future Sub-Slab Soil Excavation (in current dollars)	$2.7
Total (nearest million):	$12

5.2.4 Other Considerations

Additional work required to make the building suitable for reuse (after stabilization):

Once the building has been stabilized to prevent further deterioration and the Site environmental remedy is complete, significant additional work will be required prior to occupancy for any beneficial reuse scenario. While the building does not achieve state or national significance, the building restoration would likely include architectural restoration of character-defining elements. The cost of restoration and build-out required to make the building suitable for reuse will be the responsibility of a developer and are not included in this analysis. Additional work that may be required includes (but may not be limited to):

- Architectural restoration of the building to restore character-defining elements (i.e., repair parapets, restoration of skylight windows in monitors, rebuilding missing monitor, etc.).

- Upgrades to conform to modern building codes (i.e., mechanical, electrical, sanitary, etc.) ranging between $9 and $23 million for reuse options that range from a one level parking garage to a commercial, office, retail or community space.

- Analysis of the existing foundation to determine loading capacity. These costs may be between $0.5 and $1.0 million, depending on whether the building is pile supported and does not include the cost for any repairs or modifications.

- Build-out of the structure interior will be required and is dependent upon the reuse strategy of the building.

- Integrating the post-remedy mitigation systems into building components and build-out.

Required code upgrades are largely dependent on planned future use. Code requirements may include:

- Steel columns/trusses – Apply fireproofing to exposed steel columns, which could include a combination of concrete/masonry encasement and/or spray-on fireproofing.

- Building accessibility, egress, and mechanical/electrical/plumbing – code upgrades will be required for any intended use

- Energy Code – for occupied building uses (excluding a parking garage) – all exterior walls must be insulated to meet current ratings

- Seismic upgrades – must be evaluated for intended use. Our estimates do not include additional work for seismic upgrading of the building's structure.

- Sprinkler system – required for all future uses

The Opinion of Probable Cost for this alternative does not include any of the work required to make the building suitable for reuse and any additional interior improvements that will be the responsibility of the developer. These costs cannot be accurately determined at this time due to their dependence on the end use.

5.2.5 Advantages and Disadvantages

Advantages:

- The existing structure remains in place and, based on results of Atlantic Richfield's risk management evaluations, potentially becomes available for restoration and reuse.

- Excavation of sub-slab soil is deferred to the future once the building has been removed due to a change in building footprint or the end of service life. This will result in a significant reduction in risk and cost since sub-slab excavations will be completed after the building is removed as compared to shoring the building and excavating from within while the existing building is in place.

Disadvantages:

- Deferring removal of soil impacted with PCBs to the future results in exposure risks that must be managed and will limit options when returning the site to beneficial reuse. Completion of remediation (excavation) in the future, once the site is commercially or residentially reoccupied, would result in significant disruption and an increased risk of human exposure to dust to while completing the work.

- NYSDEC and EPA approval to allow for deferring removal of sub-slab soil to the future is unknown.

- PCBs, lead and asbestos will likely remain on and within building materials after decontamination activities are complete. The potential for inadvertent human exposures must be carefully considered prior to returning Building 52 to beneficial reuse.

- Significant cost for structural stabilization and decontamination that still requires a large investment to upgrade the building to conform to modern building codes.

- Potential limits on building reuse options include:
  - Foundation investigations may discover integrity and functionality issues;
  - Installation of the Site cover system will raise the Site elevation and imposes additional costs and/or constraints; and
  - The location and size of Building 52 limits reuse layout options.
- Long term maintenance and monitoring of cover systems (e.g., concrete slab) will be required and become the responsibility of any future owner or developer.

5.3 Alternative 3: Building Stabilization and Decontamination, Sub-slab Soil Removal

This alternative is similar to Alternative 2 in that it preserves the Building 52 structure for future use. However, this alternative would remove the soil with PCBs exceeding removal criteria to the extent feasible concurrent with excavations that will be completed Site-wide and defer removal of the residual to the future.

5.3.1 Building Stabilization and Decontamination

This alternative is the same as Alternative 2 (see section 5.2.1) with the exception that decontamination (i.e., removing the top surface of the concrete floor slab) and additional investigation is unnecessary in areas where the slab will be removed to excavate sub-slab soil.

5.3.2 Approach to Sub-slab Soil Removal

This alternative would retain Building 52 and remove sub-slab soil that exceeds removal criteria to the extent feasible with the building in place. This will require that large portions of the concrete slab be removed allowing access to excavate sub-slab soil. Shoring of interior and exterior columns will be required to prevent collapse of the structure in areas where the column foundations are exposed. With the building left in place, there is a risk that some future PCB excavations would still be required since preservation of the structure may limit access to some impacted soil.

Based on the building foundation, as discussed in Section 2.1.3, and for the purpose of completing an analysis of costs associated with excavating inside the building, the following assumptions were made:

- Interior steel columns are located over a grouping of four wood piles (based on historical drawings).
- Exterior steel columns are located over a grouping of two wood piles (based on historical drawings).
- The majority of the slab located in the southern portion of the building does not contain piles, and the majority of the slab located in the northern portion of the building contains piles.

- Additional evaluations will be required to further evaluate the feasibility of removing sections of the building slab without undermining the overall stability of the building.

Sub-Slab Soil Excavation:

Implementation of Alternative 3 will necessitate removal of large portions of the concrete floor slab to access sub-slab impacted soil. The approach used to estimate the location and quantity of concrete and soil removal is described in Section 4.

The anticipated locations and horizontal and vertical extents of excavations will vary since complete data is not available. In general, two types of excavations have been identified.

- In open areas of the building;
  - Assuming the piles do not provide structural support to the slab, piles encountered during excavation would be cut and disposed of and would not be replaced.
  - Upon completion of the work, excavations will be backfilled with structural granular fill (placed and compacted) to an elevation that coincides with pre-excavation grades.
  - Replacement of concrete slabs will be deferred until a future use of the building has been identified and implemented.
- Beneath interior columns and perimeter walls.
  - All excavations that extend beneath interior columns and perimeter walls will require temporary shoring to maintain the structural stability and reduce settlement and damage to the building, prevent collapse, and provide a safe work environment for the construction workers.
  - Upon completion of the work, excavations will be backfilled using control density fill (CDF) placed around remaining wood piles to an elevation that coincides with pre-excavation grades.
  - Wood piles located beneath columns will be restored and new pile caps and/or column footings will be constructed.

Future Sub-Slab Soil Excavation:

In this alternative, sub-slab soil will be excavated from within the building but soil removal may be limited near foundations and shoring. Upon future demolition or a change in the footprint of Building 52, soil not previously removed will need to be excavated in accordance with the ROD Amendment. This approach would require approval from NYSDEC and EPA under TSCA. Since soil removal would eventually be required, the cost to complete future excavations is included in the cost evaluation.

Modifications due to the Site-wide cover system:

See the associated description from Section 5.2.1.

5.3.3 Opinion of Probable Cost

A summary of probable costs, including allowances for engineering as required, is provided below:

	Cost ($ million)
Structural Stabilization/Repair	$3.2
Building Maintenance (8 years)	$0.3
Decontamination and additional investigation	$4.8
Modifications due to the Site-wide cover system	$0.2
Sub-Slab Soil Excavation	$3.9
Future Sub-Slab Soil Excavation (in current dollars)	$0.3
Total (nearest million):	$13

The above costs represent the minimum required to complete Alternative 3. Additional costs are likely due to the following:

- Additional sampling of the building slab and concrete roof may indicate a greater extent of PCB impact exceeding removal criteria, which would necessitate additional removal or decontamination.

- Supplemental soil sampling to determine extents of PCB impacts will likely result in increased lateral and vertical extent of excavation areas.

5.3.4 Other Considerations

Additional work to make the building suitable for reuse (after stabilization):

See the associated description in Section 5.2.4.

Consistent with other alternatives, the Opinion of Probable Cost for this alternative does not include any of the work required to make the building suitable for reuse and any additional interior improvements that will be the responsibility of the developer. These costs cannot be accurately determined at this time due to their dependence on the end use.

5.3.5 Advantages and Disadvantages

Advantages:

- The existing structure remains in place and, based on results of Atlantic Richfield's risk management evaluations, potentially becomes available for restoration and reuse.

- A majority of soil with PCBs exceeding removal criteria would be removed as required in the ROD Amendment.

Disadvantages:

- Since complete removal may not be feasible with the building in place, deferring removal of residual soil impacted with PCBs to the future creates a complication for the Site owner. Additionally, long term maintenance of the floor, institutional controls and/or monitoring may be required for the life of the building.

- Increases the risk to on-Site workers and increases the cost of excavating sub-slab soil while the existing building is in place (e.g., the need for shoring building columns and exterior walls) compared to excavating after the building is removed.

- Results in a significant cost to complete structural stabilization, decontamination, and upgrades to conform to modern building codes.

- PCBs, lead and asbestos will likely remain on and within building materials after decontamination activities are complete. The potential for inadvertent human exposures must be carefully considered prior to returning Building 52 to beneficial reuse.

- Potential limits on building reuse options include:

  - Foundation investigations may discover integrity and functionality issues;

  - Installation of the Site cover system will raise the Site elevation and imposes additional costs and/or constraints; and

  - The location and size of Building 52 limits reuse layout options.

5.4 Alternative 4: Building Demolition, Sub-slab Soil Removal

This alternative fully demolishes Building 52 and addresses materials that contain PCBs, lead and asbestos exceeding regulatory criteria or other safe thresholds (brick, paint, caulk, asbestos, etc.). Soil with PCBs exceeding removal criteria are removed in accordance with the ROD Amendment.

5.4.1 Building Demolition

Relocation of storage and electrical service:

See the associated description in Section 5.1.1.

Building decontamination/demolition:

The entire building including all above grade features would be demolished. As described in Section 4, some building decontamination prior to demolition would be required.

5.4.2 Approach to Sub-slab Soil Removal

This alternative removes Building 52 which allows sub-slab soil to be removed concurrent with excavations that will be completed Site-wide. Once the building has been demolished, portions of the concrete slab will be removed to access impacted soil as described in Section 4.1.

5.4.3 Opinion of Probable Cost

A summary of probable costs, including allowances for engineering as required, is provided below:

	Cost ($ million)
Relocation of storage and electrical service	$0.1
Building decontamination/demolition	$4.5
Sub-Slab Soil Excavation	$2.8
Total (nearest million):	$7

5.4.4 Other Considerations

Completion of Alternative 4 will require application for and approval of a demolition permit through the Village of Hastings-on-Hudson.

5.4.5 Advantages and Disadvantages

Advantages:

- Removal of sub-slab soil containing PCBs at concentrations that exceed removal criteria in accordance with the ROD Amendment.

- Avoids significant future disruption to future Site owners (as discussed in other alternatives) because all Site remediation activities will be completed prior to returning the Site to beneficial reuse
- Investigation and removal of impacted soil can be completed with a greater degree of certainty of achieving remedial goals.

- Protection of workers from building collapse using engineered shoring systems would not be required and safety risks to workers would be significantly reduced.

- Decreases the risk to on-Site workers and decreases the cost of excavating sub-slab soil compared to excavating while the building is in place.

- Removal of Building 52 will significantly increase flexibility for Site reuse and reduces limitations on Site reuse options.

Disadvantages:

- The existing structure will not become available for restoration and reuse.

5.5 Alternative 5: Partial Building Demolition, Sub-slab Soil Removal

This alternative only partially demolishes Building 52 in order to retain a portion of the building façade for future architectural restoration. Soil with PCBs exceeding removal criteria is removed to the extent feasible concurrent with excavations that will be completed Site-wide and defers removal of any residual to the future.

5.5.1 Partial Building Demolition

This alternative assumes that the majority of the eastern and southern perimeter walls can be stabilized and preserved during demolition and excavation and therefore allow some recognizable elements of the building to be retained.

Relocation of storage and electrical service:

See the associated description in Section 5.1.1.

Decontamination and additional investigation (façade):

As described in Alternative 4, building decontamination prior to demolition would be required. Stabilization and decontamination of the façade will be addressed as described in Alternative 2.

Partial Building Deconstruction:

Alternative 5 includes removal of the majority of the building with the exception of the south and east facades. In order for these two facades to remain, the following is required:

- Design and construct temporary structural bracing, shoring and long-term façade structural bracing. The long-term bracing would be anchored to a new foundation. This bracing would:
  - Provide temporary support during demolition of the adjacent floor slab, walls and roof.
  - Provide long-term support for the walls to stand and resist wind loads until such time that the walls can be incorporated into a future Site reuse plan.
  - Require a foundation to adequately support the loads. A deep foundation consisting of piles to support the frame and to resist uplift would likely be required due to poor soil conditions (e.g., shallow footings would not be sufficient).
- Building Deconstruction (selective demolition and deconstruction of the roof and adjoining walls) would commence once structural bracing and shoring is in place. This deconstruction process will require a slower and more methodical process to separate building elements that will remain from building elements that will be demolished.

Façade Stabilization/Repairs:

Stabilization requires repairs to the building façade to reduce water infiltration and to preserve the structure for future reuse. The general scope of work includes:

- Engineering design
- Repair masonry (i.e., repoint, rebuild pilasters, fill cracks in masonry, replace concrete sills and headers)
- Remove metal protrusions (i.e., conduits, vents, etc.)
- Repair/replace and reseal window coverings (as necessary)
- Yearly Maintenance (8 years prior to reuse)
  - Bi-annual wall inspections
  - Miscellaneous additional repointing

Modifications due to the Site-wide cover system:

The remaining façades may be able to accommodate the Site-wide elevation increase since any new construction can be adequately designed to accommodate these grade changes. No cost for additional modifications has been included.

5.5.2 Approach to Sub-slab Soil Removal

This alternative removes most of Building 52 which allows sub-slab soil to be removed concurrent with excavations that will be completed Site-wide as described in Alternative 4. Once the building has been demolished, portions of the concrete slab will be removed to access impacted soil. As described in Alternative 3, this alternative includes excavation of sub-slab soil beneath perimeter walls that remain (i.e., the façade) to the extent feasible. A portion of the excavations will be completed in close proximity to wall supports. With the building façade left in place, there is a risk that some future PCB excavations would still be required since preservation of the structure may limit access to some soil.

Future Sub-Slab Soil Excavation:

In this alternative, sub-slab soil will be excavated from within the building but soil removal may be limited near foundations and shoring. Upon future demolition or a change in the footprint of Building 52, soil not previously removed will need to be excavated in accordance with the ROD Amendment. This approach would require approval from NYSDEC and EPA under TSCA. Since soil removal would eventually be required, the cost to complete future excavations is included in the cost evaluation.

5.5.3 Opinion of Probable Cost

A summary of probable costs, including allowances for engineering as required, is provided below:

	Cost ($ million)
Relocation of storage and electrical service	$0.1
Decontamination and additional investigation (façade)	$1.2
Façade Stabilization/Repair	$1.0
Partial Building Deconstruction (including Façade structural bracing)	$6.8
Sub-Slab Soil Excavation	$3.1
Façade Maintenance	$0.2
Future Sub-Slab Soil Excavation (in current dollars)	$0.2
Total (nearest million):	$13

The cost for architectural restoration of the facades is not included.

5.5.4 Other Considerations

The remaining façade may not be compatible with future reuse scenarios.

5.5.5 Advantages and Disadvantages

Advantages:

- Decreases the risk to on-Site workers and decreases the cost of excavating sub-slab soil compared to excavating while the entire building is in place.
- Retains some recognizable elements of the building which become available for restoration and reuse.
- A majority of soil with PCBs exceeding removal criteria would be removed as required in the ROD Amendment.
- Removal of the majority of Building 52 will increase flexibility for Site reuse and reduces limitations on Site reuse options.

Disadvantages:

- Significant costs will be required for structural stabilization and decontamination of interior building surfaces of the facades that will remain will be required.
- Remaining facades will require significant restoration and incorporation into reuse scenarios.
- Since a comprehensive reuse plan has neither been proposed nor approved, the feasibility of reusing the preserved building facades is unknown and may reduce flexibility of reuse scenarios.
- Facades are likely to incur additional damage during the demolition process.
- Demolition cost will be higher due to the selective demolition, façade bracing, and the installation of foundations that will be required to support the facades.

6. COMPARISONS AND RECOMMENDATIONS

The following provides a review and comparison of the alternatives with the intent of identifying the most feasible.

6.1 Comparisons

Evaluated alternatives are summarized in the table below. Evaluations of PCBs in soil included deferring sub-slab soil removal to a later date once the building is removed, performing sub-slab soil removal with or without the building in place, or a combination of both. Evaluations of Building 52 included stabilization for reuse or partial/complete demolition.

Alt	Sub-slab Soil Removal	Building 52	Cost ($ million)
1	No Action	No Action	$0.5
2	Deferred	Stabilize for reuse	$12
3	Concurrent (residual deferred)	Stabilize for reuse	$13
4	Concurrent	Demolish	$7
5	Concurrent (residual deferred)	Demolish except façade	$13

<u>Rejected Alternatives:</u>

- Alternative 1
  - This option is not feasible because it impedes implementation of the Amended ROD. The presence of the building may allow for of sub-slab soil that exceeds removal criteria to remain in the short term, but does not alter the requirement to ultimately remove them. If the building is retained, then sub-slab soil removal will be deferred until the building collapses to the extent that it no longer acts as a cover under TSCA. Therefore this alternative is rejected.
- Alternative 2
  - Compared to Alternative 3, which differs only by deferring sub-slab soil removal, there is no significant advantage to delaying removal of sub-slab soil that exceeds removal criteria. There is however an advantage to excavation concurrent with other Site remediation. Furthermore there is no obligation to retain the structure since the historic research and analysis concluded that Building 52 fails to achieve state or national significance. Therefore this alternative is rejected.
- Alternative 5
  - There is no significant advantage to retaining only a façade of the building. While this may reduce some of the reuse limitations imposed by the entire structure, this alternative is not cost effective. Walls supported by bracing poses an increased risk to workers and the public until the remedy is complete and the walls are integrated into a new structure. Additionally, removal of residual soil, if present, will be required in the future. Therefore this alternative is rejected.

Evaluation of risk to workers and the public for Remaining Alternatives:

- Alternative 3

  – In order to complete excavations within and around the building, shoring will be required to maintain the structural integrity of the interior and exterior columns. This will result in an increased risk of injury due to the potential failure of the roof that could result from exposing portions of the foundation. Additionally, due to the presence of the building, some PCB impacted soil will likely remain resulting in a risk that future excavations will be required. Future excavations on a site that has been returned to beneficial reuse will result in significant complication for a future Site owner due to the potential for exposing the Site to dust and PCBs during future excavations (once the structure is eventually removed). Lastly, residual contamination requires ongoing maintenance and monitoring to avoid inadvertent exposure, which may remain regardless of efforts to remove it.

- Alternative 4

  – Implementation of Alternate 4 presents the lowest risk option for worker safety and removal of contaminants. With the building removed, engineered shoring systems are not required to prevent failure of the building while column foundations are exposed, which significantly reduces risk to worker safety during excavations. Additionally, without the need to protect building foundations, the extents of PCB impacted soil (as defined by additional investigations) and contaminants that reside in building materials (e.g., PCBs, lead, and asbestos) can be completely removed, which significantly reduces the risk resulting from future excavations and complications for future Site owners.

Comparison of Remaining Alternatives:

- Alternative 3

  – The key advantage of this alternative is that the existing structure remains in place and becomes available for restoration and reuse. However, the historic research and analysis concluded that Building 52 fails to achieve state or national significance. In addition to the significant cost for structural stabilization and decontamination (which may not fully mitigate exposure risks), a large investment to upgrade the building to conform to modern building codes is required to realize the benefits of this alternative. There are currently no known funding sources identified for this upgrading or restoration and no regulatory obligation to retain the building for future reuse.

  – The key disadvantage of this alternative is the potential limitations placed on building reuse options including:

    - Deferring removal of soil impacted with PCBs to the future, creates a complication for the Site owner.

    - PCBs, lead and asbestos will likely remain on and within building materials after decontamination activities are complete resulting in potential for inadvertent human exposures.

- Foundation investigations may discover integrity and functionality issues;
- Installation of the Site cover system will raise the Site elevation and imposes additional costs and/or constraints;
- The location and size of Building 52 limits reuse layout options;

- Alternative 4
  - The key advantage of this alternative is that all Site remediation activities will be completed in accordance with the ROD Amendment prior to implementation of reuse scenarios. This avoids significant future disruption to future Site owners and thereby decreases the risk to public health and the environment. Additionally, this alternative:
    - Reduces the safety risk for the on-Site workers and the public by demolishing the building
    - Removes soil containing PCBs that exceed removal criteria beneath and adjacent to the building
    - Addresses PCBs, lead, and asbestos within the building materials;
    - Avoids the increased complexity of removing soil beneath or in the vicinity of the building, as required by the Site remedy, while the building remains in place;
    - Provides increased flexibility for Site reuse by completing remediation activities before commencement of reuse;
    - Provides the least costly alternative that fulfills the requirements of the ROD Amendment.
  - The key disadvantage of this alternative is that Building 52 is not available for restoration and reuse.

6.2 Recommendations

Based on the above, the recommendation is that "Alternative 4: Building Demolition, Sub-slab Soil Removal" be implemented.

If requested, preserving the heritage of Building 52 can be supported through a cooperative endeavor between Atlantic Richfield and the Village of Hastings-on-Hudson by preserving photographic records, drawings, or other historical information related to the building.

APPENDIX A

Building 52 Stabilization Evaluation
27 May 2011, Robert Silman Associates

Building 52
Stabilization Evaluation
One River Street
Hastings-on-Hudson, NY

27 May 2011

ROBERT SILMAN ASSOCIATES
STRUCTURAL ENGINEERS

Building 52
Stabilization Evaluation

One River Street
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Table of Contents

NARRATIVE

APPENDICES

NARRATIVE

EXECUTIVE SUMMARY

Robert Silman Associates (RSA) has completed the stabilization evaluation for Building 52 and found that, with appropriate maintenance, the structure is capable of being stabilized for a period of at least ten years. This should provide adequate time to determine the appropriate future use. The work of this report does not include any hazardous material abatement issues; these are to be dealt with by others.

The stabilization is designed as and designed to achieve the following:

- Removal of safety hazards relative to structural condition of building
- Repair of conditions that, if left unrepaired, might cause further deterioration in the structure, including providing resistance against water infiltration

Further, the stabilization recommendations are not in basic conflict with permanent repairs that might be made once a permanent use is decided upon.

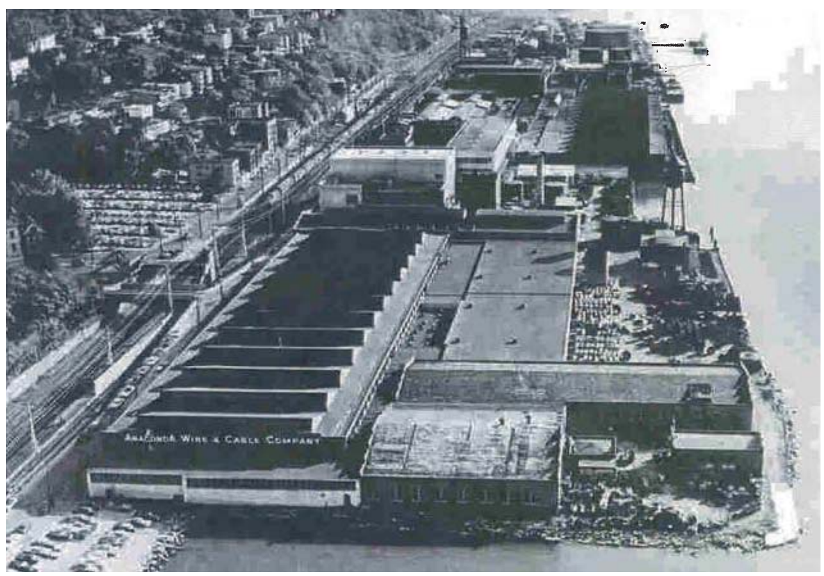
Basic major features of the stabilization include:

- A new roof with a minimum 20 year life
- Repairs to the roof slab
- Repairs to the end walls of the existing roof monitors
- Repair and repointing of the brick masonry perimeter walls

In addition, this report outlines the upgrades to the building that would be required by the New York State Building Code for three potential future use schemes.

INTRODUCTION

Building 52 is a former factory building, and was one of many buildings that made up the Anaconda Wire & Cable Plant. It is located in Hastings-on-Hudson, New York. It lies approximately 100 yards east of the Hudson River and directly to the west of the Hastings-on-Hudson Metro North train station. The building was most likely built in 1918 and was originally owned by The National Conduit & Cable Company and The National Brass & Copper Tube Company. It was used as a sheet mill. The plant, including Building 52, was later bought by Anaconda Wire & Cable and was used to produce cables. During World War II, Building 52 was used to produce fire-resistant copper cables to be used on US Naval vessels.



Historic site photo showing its many buildings (Building 52 is at lower left)

Building 52 is a one-story building that is 576 feet long in the north-south direction and 170 feet wide in the east-west direction. It consists of a concrete slab floor that is either a grade supported slab or possibly spans to piles. The roof is supported by steel columns, which run along the perimeter of the building at 16 feet on center in the east and west walls, and 17 feet on center in the north and south walls. There is another row of columns that runs from north to south down the middle of the building at 48 feet on center. The steel columns support steel trusses which run east to west. The trusses support smaller steel infill beams, which support a cinder concrete roof slab. The roof is a sawtooth roof that originally consisted of twelve roof monitors that contained concrete on the south facing slope and glass skylights on the steeper north facing slope. The exterior walls are masonry and do not appear to be load bearing.

Robert Silman Associates was retained by Haley & Aldrich to determine what would be necessary to stabilize Building 52.

ASSUMPTIONS

The observations of the steel structure were primarily limited to the existing condition of the column bases and their base plates. The steel columns, trusses, and filler beams were not documented nor assessed; they did not appear to exhibit structural distress or significant deterioration.

Limited structural drawings were available for RSA's use. There is a pile layout drawing, but it is not certain whether it represents what was actually installed on the site. There are also several drawings from the 1940s that show general equipment layout and plumbing layouts, but they contributed limited information for purposes of this study.

OBSERVATIONS

MODES OF OBSERVATION

In the months of August to November 2010, RSA visited the site several times in order to visually assess the conditions of Building 52. In many instances we were joined by James Gainfort Architects (JGA) who are the consultant for the roofing, skylights, and windows.

Additional visual observations were conducted by Abraham Joselow, PE, PC for electrical, plumbing, HVAC and fire protection systems and by Stephen Tilly, Architects, for comments on future potential uses of the building.

Our visual observations were aided by a nondestructive evaluation by GB Geotechnics (GBG) who visited the site in July 2010 and performed Infrared Thermal Imaging, Impulse Radar, and Metal Detection. See **Appendix D** for their full report.

RSA also requested floor and roof probes be performed so that we could better understand the make-up of the floor and roof slabs. We visited the site in October to observe these probes. See **Appendix C** for probe plan and documentation.

Our last method for obtaining information about the building was through concrete cores that were sent to Kemron Environmental Services to be tested. They were tested for compressive strength and chloride content. Two of the cores were petrographically analyzed. See **Appendix F** for full test results.

A. Floor Slab

The floor is exposed concrete and based on visual observations appears to be in fair to good condition [**photo 1**]. There are various trenches that may have housed pipes or rails, which have been filled in with concrete, most likely at a later date than when the slab was poured. [**photo 2**]. The surface is somewhat uneven across the entire floor. There is an existing pile layout drawing, which led us to assume that the majority of the floor consists of a spanning slab.


Photo 1: Overall interior


Photo 2: Trenches in floor

Using a combination of Impulse Radar and Metal Detection over 5 sample areas of the slab, GB Geotechnics (GBG) was able to determine that average thickness of the slab was 8 inches. In all areas investigated, they found one layer of reinforcing in each direction, which was typically closer to the bottom of the slab than the top. The spacing of the reinforcing varied from 6 inches to 12 inches on center. Bar size could not be determined. Our original assumption was that the slab was supported on pile caps that tied into the piles below. RSA requested that GBG try to locate possible pile cap locations. Because nothing was known about the pile cap thicknesses or reinforcing, GBG determined possible pile caps based on areas where data indicated thicker concrete or localized changes in reinforcement. GBG marked these areas on the slab with paint and included them in the report as well. RSA modified a few of the originally proposed probe locations based on GBG's results.

In addition to the work performed by GBG, five probes in the floor slab were made. Probes 1, 2, and 4 were performed towards the middle of the slab (away from columns), while probes 3 and 5 were performed closer to the base of steel columns. None of the probes was moved more than 10 feet from its original position. The locations of these probes can be found on **drawing SP-1** in **Appendix C**. Based on visual observations of the floor slab probes, RSA was able to confirm GBG's findings that the slab was typically 8 inches thick (+/- ½ inch) and that all reinforcing was found at the bottom of the slab only. The bottom layer of reinforcing was typically 1½ inch above the bottom of slab (+/- ½ inch). In three of the five probes, the reinforcing consisted of #6 bars at 10 inches on-center, each way (see **probe sketch FP-1** in **Appendix C**) [**photo 3**]. The two remaining probes were found to contain #4 bars at 6 inches on-center, each way (see **probe sketch FP-2** in **Appendix C**) [**photo 4**]. Neither pile caps nor piles were encountered at any of the five probe locations. This was inconsistent with data collected by GBG's non-destructive testing and therefore should be investigated further in the future.

At all probe locations, the concrete appeared to be in good condition. In general, there were no noticeable voids or cracks, nor were there any signs of separation between the paste and aggregate. Probe #4 showed the most signs of poor concrete placement with some voids and separation in the layer of concrete below the reinforcing [**photo 5**]. The reinforcing typically showed little signs of corrosion, however, at probe 4 the reinforcing had corroded slightly more. This may be a localized problem due to the above-mentioned concrete voids/separation.

Photo 3 (top): Floor probe #2
cross section with reinforcing

Photo 4 (middle): Floor probe #5
cross section with reinforcing

Photo 5 (bottom): Floor probe #4

The original scope of work included the structural analysis of the ground floor slab to determine how much live load it might be able to support. This in turn would give a clue as to the allowable occupancies. The scope of work was created before any probes were conducted on site.

From an early original drawing called "Pile Layout", it was assumed that piles would be revealed in the probes spaced approximately 8 feet on center. Instead the probes found no indications of piles or pile caps anywhere. In addition, the reinforcement in the ground floor slab was limited to bottom bars only; there was no top reinforcement found in any of the four probes. In a normal pile supported slab, there are top bars present that are actually slightly larger than the bottom bars. This is because of the effects of continuity in the concrete slab, with the negative (or top) bending moment being larger than the positive (bottom) bending moment.

In the absence of observed piles, calculations were prepared (see **Appendix G**) to determine what the slab capacity might be if there were actually piles beneath it. The following assumptions were made:

1. The slabs were simply supported at every pile because there were no top bars to resist any negative bending moment that would result from continuity.

2. The slabs functioned as "slab bands" rather than as a two way flat slab. The width of the slab band was equivalent to the width of a column strip, had the slab been designed like a flat slab. The load of the middle strip was assumed to be carried 100% by the slab band in each direction, thus providing some redundancy.

3. Three different pile spacings were investigated: 6'-0", 8'-0" and 10'-0" in each direction. For each spacing, the slab capacity for two different reinforcing patterns was calculated, based on the findings in the probes.

The live load capacity of the slab for the three different pile spacings and two different reinforcing patterns is as follows:

Pile Spacing	**#4 @ 6" on center**	**#6 @ 10" on center**
6'-0"	481 psf	643 psf
8'-0"	238 psf	329 psf
10'-0"	125 psf	183 psf

It is recommended that in the early stages of any future adaptive reuse design that a much more comprehensive slab, pile, and subsurface exploration program be conducted. If piles are found, their capacity should be determined, their condition determined, and, if it is found to be necessary, repairs specified. If no piles are found, then an analysis of the allowable subgrade bearing capacity should be determined.

RSA was asked if the concrete slab of the ground floor could have two inches of concrete removed or scarified from its top surface. This would presumably allow the removal of any surface contaminants such as PCBs. In addition, the removal of the top two inches would eliminate the zone of carbonated concrete and would also eliminate portions of the slab that might be contaminated with chloride salts.

As explained above, no piles have been located as of the date of the writing of this report. However if piles were to be found, RSA has analyzed the slab and found that two inches could be removed from the top surface, leaving a remaining capacity to support superimposed temporary construction loads of about 70 psf for the widest pile spacing studied (10'-0" o.c.). The weight and distribution of the load of any machinery required to perform this concrete removal would have to be calculated to see if it met these loading restrictions.

In replacing the top two inches with new concrete, there would be real benefit to the ultimate load-carrying capacity of the repaired slab. If the new two inch topping were properly bonded to the remaining six-inch-deep base slab and if reinforcing bars were placed within this two inch layer of concrete, then the slab could be considered to be a continuous two way flat slab rather than a series of discontinuous simple spans as has been assumed in the analysis presented above. This sort of continuous slab will yield a much higher load-carrying capacity than the tabulated loads for the simply supported slab shown above.

All of this information is conjectural and needs to be verified at the time of a future adaptive resuse design.

Four concrete samples were cored from the floor slab and sent to a laboratory where they were tested for compressive strength and percent chloride content. An additional floor core was analyzed using petrographic examination (see **Appendix F**). The compressive strength of the four floor cores ranged from 4970 pounds per square inch (psi) to 5820 psi, resulting in an average compressive strength of 5380 psi. In contemporary practice, it is typical to design both spanning floor slabs and slabs on grade for a minimum compressive strength, so average compressive strength of the cores is acceptable.

The percent chloride in the cores ranged from .027% to .142%. Chloride concentrations greater than .050% greatly increase the possibility that the reinforcing steel in the concrete will corrode. Four out of the five concrete cores had chloride content higher than .050%. We recommend that, when additional testing is performed on the concrete roof slab prior to any adaptive reuse design, that a corrosion risk assessment be performed on the floor slab as well.

According to the petrographic analysis, the floor slab consists of normal weight concrete containing coarse aggregate in the form of crushed stone and fine aggregate in the form of sand. The cementitious paste in the concrete ranged in color, which is an indication that the concrete was not thoroughly mixed when placed in the field. Visual observation of the polished concrete sample and phenolphthalein staining indicated that the top of the concrete slab was carbonated. The carbonation extended ¾ inch to 1 inch into the slab. There did not appear to be indications of chemical attack in the slab. It did not appear that entrained air was added to the concrete mix. Air content was estimated at between 1% and 2%. There were a few small vertical cracks in the core that was petrographically analyzed. These cracks are not significant.

In **Appendix F,** Kemron's subcontractor–Testing, Engineering and Consulting Service, Inc.–ventures an opinion at the bottom of page six of their report. They state that "if the slab was to be structural,...it is not adequate because the reinforcing steel is not well embedded and corroded." RSA does not agree with this statement based on our observation of the probes cut into the floor where, at all locations observed, the reinforcing showed no signs of corrosion and was properly embedded. The testing lab had only a tiny sample of a core on which to base their conclusion and this was not representative of RSA's observations.

B. Roof

1. STRUCTURAL SLAB

During one site visit RSA was able to observe the underside of the roof slab from a scissor lift in various locations throughout the building. RSA personnel were not allowed to touch this surface due to the potential of environmental impact. RSA was only to observe it visually and direct the environmental contractor, Envirocon, to perform soundings on the slab. From the ground, looking up at the underside of the roof, the slab appeared mottled, as if there was possibly a large amount of moisture infiltration in many areas. Once up in the lift however, it was clear that what had looked like mold or other indicators of moisture infiltration was actually due to peeling and flaking of some sort of coating that had been applied to the underside of the slab [**photo 6**]. It is not clear what the coating was intended for but it is likely that moisture has caused it to flake off.

From the lift the concrete itself appeared to be in fair condition. No spalled concrete or areas of concrete that had cracked due to corroded reinforcing were observed. In some instances, the wire mesh was quite close to the bottom surface, and its outline was visible. In other cases, a portion of this exposed mesh was corroded [**photos 7 & 8**]. Around the roof drains, there were often more instances of water infiltration and the slab was generally in worse condition [**photo 9**]. There was at least one location where there was a large crack (up to one inch wide and approximately ten feet long) in the roof slab running in the east-west direction [**photo 10**]. The crack had been previously filled with a patching material, but still appeared to be a quick route for moisture into the building. This crack did not appear to be indicative of a global problem of the slab.

Along with looking at the slab from the lift, RSA also listened on the ground while two Envirocon employees tapped the underside of the roof slab with a hammer in a sampling of areas in the building [**photo 11**]. In general the tapping sounded consistent. There were no areas where tapping emitted a more hollow or dull sound that would have indicated spalled, delaminated, or deteriorated concrete. These findings agreed consistently with the visual observations.

GBG conducted thermal imaging of the roof slab from different points along the floor in July 2010.


Photo 6: Underside of roof slab - surface


Photo 7: Underside of roof slab - mesh close to surface and corroded


Photo 8: Underside of roof slab - corroded mesh

Photo 9 (top): Underside of roof slab - moisture by drain

Photo 10 (middle): Crack in roof slab

Photo 11 (bottom): Sounding in lift

Photo 12: Roof probe #6 - *cross ection with reinforcing*

Photo 13: Roof probe #2 - *corrosion on reinforcing*

The goal of the thermal imaging was to determine areas with elevated moisture levels that might indicate corroded reinforcing, debonding concrete, and voiding. See **Appendix D** for a full explanation of their method and assumptions. In general their findings of elevated moisture corresponded to our visual observations made several weeks later. The infrared thermal camera detected colder areas around roof drains and at the crack mentioned above, which indicate moisture infiltration in those areas.

Seven roof probes were observed by RSA to further confirm the make-up, reinforcing and condition of the roof slab. From the probes, the thickness of the slab was measured at approximately 4 inches (+/- ½ inch) with a layer of W2 (0.159-inch diameter) wire mesh located ¾ inch (+/- ¼ inch) from the bottom side of the slab [**photo 12**]. The wire mesh spanning parallel to the slab (east-west) was spaced at 3 inches on-center. This spacing was consistent at all seven probes. The mesh perpendicular to the slab span (north-south) was minimal and a definitive spacing could not be determined as there was typically only one piece of wire per probe. This would indicate a spacing, for what is commonly called the temperature reinforcing, of 12 inches or larger. A sketch of the typical roof probe findings can be found on **RP-1** in **Appendix C**.

The probes at the roof also allowed for visual observation of the type of concrete used as well as the general condition of the slab. A cinder aggregate concrete, common for the age of this building, was found at all probes. The concrete was well consolidated and no real voids were noticed (above those that are typically found due to the cinder material being porous). The wire mesh generally showed little signs of corrosion, however, a few locations showed moderate corrosion. In particular, probe 2 had reinforcing that had moderate corrosion and rust staining of the concrete around the mesh. This was not surprising as this probe was performed near an existing roof drain where other visual observations had determined that water damage had been occurring for some time [**photo 13**].

Samples of the roof concrete were sent to a testing lab for structural analysis (see **Appendix F**).

The roof slab is constructed using a system that was very popular in its time because it was economical. Structural steel supports were provided for the roof slab approximately 7 feet-3 inches on center. The bottom of the slab was formed with wood boards hung from these steel members. Then wire mesh was draped over the top of the steel at the supports and permitted to curve down toward the bottom of the slab between the steel supports. Finally the concrete was poured into the forms, approximately 4 inches thick, for the total depth of slab.

The design of these slabs was empirical because the wire mesh was felt to be a continuous catenary. The coarse aggregate for the concrete in the New York area was often cinders obtained from the local utility company that burned coal in its power plants. Often, the cinder used for aggregate was free for the taking, so that the power company could get rid of it. The quality of the concrete, particularly its ultimate compressive strength was allowed to be very low, sometimes below 1,000 psi. The allowable live load was determined by an empirical formula and the surviving formula most often used is found, even today, in the latest version of the New York City Building Code. We applied this formula to the roof of Building 52 and found that the slabs were capable of supporting the code required snow loading.

However the results of the laboratory tests have cast some doubt on the ultimate quality of the roof slabs. The tests found the concrete to be fully carbonated. This means that atmospheric carbon dioxide has permeated for the full depth of the roof slab, four inches, and has reacted with moisture present in the slab. This reaction forms a weak acid and thus reduces the original highly base, alkaline environment found in the concrete surrounding the reinforcing mesh. It is this alkaline environment that provides a passive barrier against corrosion and once it has been destroyed, the slab is more vulnerable to ongoing corrosion of the reinforcing. In the roof slab of Building 52, because the reinforcing is such a small diameter, any corrosion might have a serious adverse effect. Thus additional testing is required before any stabilization at the roof is undertaken. A corrosion audit that can predict the remaining service life of the slab should be conducted prior to any adaptive reuse design. For purposes of this report, it is assumed that 25% of the roof slab would require replacement; this number is purely conjectural at this point.

2. ARCHITECTURAL

INTRODUCTION

The roof, a "saw-tooth" type commonly used on industrial buildings of the era, is an extension of the highly rational layout of the building's floor plan. North-facing glazed areas in the skylight "monitors" of the saw-tooth design allowed diffused, non-direct natural light to the interior. The height of the glazing area was divided between two lites; remnants of internal mechanical devices at the frames suggest the glazing was operable. Originally, the roof configuration had a dozen monitors spaced evenly across the length of the building. Each monitor occupies three structural bays of the building's length; the low side of every monitor coinciding with one of the twelve columns along the building's central column line. A typical monitor spans much of the building's width, with its triangular end set back about 24 feet from the east and west façade walls [**photo 14**].

Photo 14: Overall of roof looking south

There are three lines of drains on the roof, each parallel to the length of the building. One line is at the building's center; the other two each align with either east or west parapets. Between each monitor, low slope crickets formed in the roof deck direct water to a central drain or toward one of the other two drain lines. The remaining area along the long edges of the building consists of low slope roof, incorporating crickets to pitch water toward the drains. Drain locations coincide with the space between monitors, at every third column line.

The brick exterior walls of the building terminate in parapet walls with terra cotta coping. The top of coping is only inches above the roof deck along the long east and west elevations; at the north and south elevations, parapet height variations, typically a dozen brick courses or more above the roof surface, contribute definition to the facades.

The roof deck, including skylight monitor roof and curb, is board formed, poured in place concrete. End walls of skylight monitors are composed of light metal framing with cement plaster applied directly to metal lath. The primary membrane appears to be a coal tar built up roof (based on odor and appearance, without confirmation by testing). A limited amount of copper counter-flashing is visible beneath roofing material where the roof membrane terminates at the north parapet wall. Copper edging is typical along the raking edge of the monitor roofs.

OBSERVATIONS

The roof is in poor condition, the membrane partially blown off at several locations. Failure of the top layer of the membrane occurs across extensive areas near the middle of the building, from column lines 19 to 26 [**photo 15**], and at the southern end of the building. At a select number of locations, the concrete deck is completely exposed. There are hundreds of square feet of various sheet and trowel applied roof patches from multiple attempts to address localized membrane failures. These patches are primarily at low slope roof areas surrounding the monitors. Standing water was observed during an October 2010 site visit, when no precipitation had occurred during the previous 24 hours. Presently, there are several active leaks (these leaks, observed at the interior, are un-documented).

Photo 15: Roof membrane failure, column line 19, looking west.

The steeply sloped, formerly glazed portion of the skylight monitors presently have wood structure infill, oriented strand board (OSB) covering, building paper and asphalt roofing shingles. Shingles are approaching the end of their service life and are missing at limited areas. During a single up close observation, conducted by lift from the interior, the existing remaining metal skylight frames were examined. All glazing has been removed; broken remnants of glass are visible along the edges of the frames. Based on the observed skylight frame, we assume all steel frames to be deteriorated beyond repair [**photo 16**].

Photo 16: Interior view of skylight frame

The triangular end walls of the monitors are in very poor condition, deteriorated beyond repair. During a site visit, the construction of the side walls was observed through a hole that was formed by a recently fallen piece of cement plaster. These walls consist of 1 ½ inches x 1 inch "T"-shaped vertical light metal-framing members, spaced approximately 22 inches on center. Expanded metal lath, fastened with metal wire ties, had a 1 ½ inch application of cement plaster on each side; total wall thickness of approximately 3 inches. Various coating remnants observed on the exterior cement plaster surface suggest that at some time the walls were white. The presence of a black asphaltic top coat is indicative of a previous attempt to limit water infiltration. More recently, cracks have been dressed with trowel grade roof patching mastic.

Failures at these walls include loss of coatings, cracking, and deformation of the wall surface due to deterioration of the metal framing. Bulging typically occurs more toward the south end of the building, at both the east and west end walls. The deformation, increasing proportionally to the height of the triangular wall, is greatest at the bottom [**photo 17**]. A potentially dangerous condition exists where large pieces of cement plaster, having de-bonded from the metal lath, could fall into the building.

The roof monitor between column lines 22-25, including the concrete deck, much of the curb, and associated supporting steel, no longer exists. The monitor has been replaced by low slope roof on metal deck [**photo 18**]. The roof membrane over the metal deck differs from most of the building. At this area, the deteriorated membrane appears to be some sort of a glass fiber reinforced top sheet covered with a bitumen flood coat.

Photo 17: Cement plaster side wall at roof monitor

Photo 18: Low slope roof at former roof monitor

The parapet walls vary in height. At east and west façades, where the coping is just inches above the deck, the membrane terminates beneath the terra cotta coping [**photo 19**]. At north and south facades, where the parapet height varies between two to three feet above the roof deck, the roof membrane terminates at copper counter-flashing some eight inches above the roof deck. Most of the counter-flashing has been covered with successive layers of roofing mastic.

At east and west façade parapets, there are two shapes of terra cotta coping, both 16 inches wide, suggesting some coping units are replacements. At north and south facades, the terra cotta coping is 20 inches wide [**photo 20**]. The brick mortar joints on the roof side of these parapets are eroded. Coping is loose or missing at all parts of the building.

The existing drainage system is partially functional. The drains serve as the sole method for water to exit most of the roof surface; the roof is surrounded by parapet, with only two overflows both at the low East parapet near the northeast corner. More than half of the drains at the east line are covered with roofing. The center drain at column line 16 is clogged and holds water [**photo 21**].

CONCLUSIONS

The existing roof membrane, including perimeter and penetration flashings, cannot be effectively repaired. Roof replacement is mandatory. One approach to roof replacement first requires the total removal of the existing membrane system. This would then allow a detailed inspection and repair of the concrete decking before application of a new roof system. However, this approach is very expensive and is not required in order to stabilize the roof enclosure.

Instead, a new membrane system can be installed over the existing roof assembly without incurring much of the cost associated with removals and deck repair. Mechanically fastened polyisocyanurate insulation and cover boards under the membrane will bring the roof into compliance with prescriptive method requirements (continuous insulation, R-value of 20) of the current NYS energy code. Additional tapered insulation will be required to re-establish good drainage.

The choices for replacement roofing membranes should be limited to those that can be applied over tapered insulation to provide a lightweight, effective and durable protection against the elements. While a number of systems are available (modified-bitumen, built-up asphalt, spray-applied foam, and single-ply) we believe single-ply membranes offer the most value for money spent. Large sheets that minimize the number of field seams can be fully adhered to the cover board. Of the various forms of single ply membranes, thermoplastic membranes (TPO and PVC) offer welded seams, a white reflective color, and wide availability among applicators. We had good experience with a TPO membrane manufactured by Carlisle Syntec Systems.

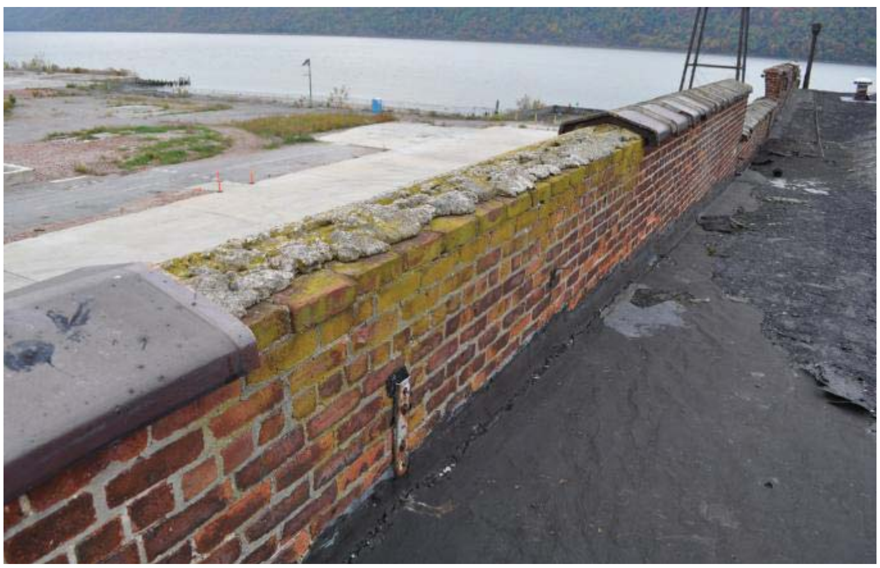


Photo 19 (top): Coping at east façade wall. Note overflow opening and presence of standing water.

Photo 20 (middle): Coping at south façade wall. Note missing coping.

Photo 21 (bottom): Standing water above center drain, column line 21

The skylight assemblies are too deteriorated to be renovated and reglazed. For purposes of stabilization, this report recommends that a stable condition over the current skylights can be achieved by removing the existing deteriorated shingles from the current OSB sheathing and recovering it with a new membrane. If a decision were ever made to reactivate the skylights, a wholly new metal and glass system would have to be installed in place of the current steel framing.

RECOMMENDATIONS

The following actions should be performed to stabilize the roof enclosure:

Main and Monitor Roofing Surfaces: First, scrape all loose and excessively built-up material from all roof surfaces, including the skylight monitors. Remove all flues, penetrations and miscellaneous pipes; patch all abandoned penetrations at concrete roof deck.

Install 4 inches of new rigid insulation over entire roof area consisting of two staggered layers of mechanically attached two-inch thick polyisocyanurate insulation. Additional tapered insulation boards will also be required at locations where the existing pitch to drains is insufficient.

Over the insulation, fasten a half-inch thick cement cover board, to which a new white, fully adhered TPO membrane (Spectro-Weld Reinforced TPO Membrane, by 'Carlisle Syn-Tec', 60-mil thickness) can be adhered.

Replace drain bodies and leader piping from the roof surface to existing interior storm water main laterals, which shall remain. Each existing drain must be broken out of the existing concrete deck, along with associated tailpiece, elbows and horizontal piping. The new drain body must be set slightly below the existing concrete roof surface and be "cast in" to the surrounding decking with new concrete. Reconnect the new drains to the main storm water laterals below.

At skylight portions of the existing monitors, remove all shingles, and all deteriorated OSB sheathing. Replace the deteriorated sheathing with new OSB, and then cover the entire skylight cover with rigid insulation, cover board and fully adhered TPO membrane following many of the procedures required for the main roof.

Demolish the two cement plaster end walls of each skylight monitor, including light metal framing. Remove existing metal flashings from the base and from the edge of the rake over these end walls. Install new metal framing and sheathing to accept base flashings from the new roof assembly. Cover the sheathing with insulating metal panels, and seal the top edges of these panels against the monitor roof rakes with new TPO-clad metal flashing.

If a decision is made to replace the skylights, then remove the entire existing wood cover. Cut out the existing metal skylight frames and the internal substructure used to operate these units. Inspect and repair the primary steel angles forming the sill and head of each skylight, as well as the exposed faces of existing steel truss members. Install new skylights, including frames, glazing, and associated flashing. Aluminum, thermally broken frames should be used, as should insulating glass with a maximum U-value of 0.30 Btu/sf/hr/degF. Flashing can be aluminum to match the windows. Note that skylight glazing is susceptible to damage from vandalism; consider providing protection for all glazed areas near public right of way.

If a decision is made to rebuild the missing monitor between column lines 22-25, provide new sheathing, vapor barrier, insulation, cover board and white TPO membrane on new metal deck.

Parapet Walls: Roof parapets require extensive masonry work to stabilize them. First, remove all existing terra cotta coping sections and inspect the exposed top courses of masonry. Reconstruct the top courses (assume top two courses of brick) as required to ensure their stability. Install a new plywood substrate to cap the repaired masonry. Provide new self-adhered sheet waterproof membrane and new TPO clad sheet metal coping over the plywood substrate, and tie each to the TPO roof membrane.

At the north and south façades, remove the coping, and inspect the remaining masonry. Reconstruct as much of the top courses of masonry as needed to establish a stable wall, then cap with plywood. Sheath the interior side of the parapet with cement board. Then extend fully adhered TPO membrane up the entire vertical face of cement board and tie this flashing into the main roof membrane. Cover the plywood coping sheathing with a waterproof membrane, then cap the wall with a TPO-clad sheet metal coping cover and heat weld it to the TPO wall flashing.

CLOSING REMARKS

The recommended roof membrane, available with a twenty-year warranty, should remain reliable for more than two decades. A maintenance program for the building should include a semi-annual examination of the roof membrane to check for damage and to verify all drains are clear of debris.

The white TPO membrane specified is an Energy Star qualified product that lowers the roof surface temperature and decreases the amount of heat transferred into the building. The four inches of insulation currently specified beneath the TPO membrane complies with the 2010 Energy Conservation Construction Code of New York State, under the prescriptive requirements of Section 502. As this report is prepared, the 2010 version of the Energy Conservation Code of New York State becomes effective at the conclusion of the 2010 calendar year.

The building's fenestration area, including the skylights, exceeds 40% of the total wall area, making the building not eligible for future compliance through a prescriptive path. For code compliance, a future change of use in the building would require compliance using "total building performance", which includes heating and cooling system, service water heating, fan system, lighting, process and plug loads for determination of the total building energy use. The path to code compliance for this building requires coordinated efforts of the future design team, including building enclosure, mechanical system and lighting designers. One approach to compliance may include installation of photovoltaic panels on the monitors; the south orientation of the sloped roof surfaces is an ideal location for such an installation.

Any building that is unconditioned (an unheated parking garage) need not comply with the requirements of the Energy Code. Determination of the building's future use in advance of stabilization would help to define exact roof insulation and skylight glazing requirements.

C. Exterior Walls

The observations of the exterior walls consisted of both probes and visual inspection over multiple visits to the site. The probes were performed at four column bases (see **SP-1** in **Appendix C** for locations). The probes were performed to observe the condition of the column base plates behind the masonry pilasters as these areas are prime locations for trapped moisture to collect and cause corrosion.

The visual inspection of the exterior wall consisted of personnel from RSA walking around the entire perimeter of the building and noting various conditions that need to be corrected in order to stabilize the building. These conditions typically consisted of re-pointing masonry, replacing masonry, protecting exposed steel from corrosion and helping to seal the building from further water damage.

1. COLUMN BASES

The four column base probes uncovered built-up steel columns atop base plates which were anchored into concrete piers (see **sketch WP-1B** through **WP-3** in **Appendix C**). The columns consisted primarily of angles and plates that were riveted together which is consistent with construction practices at the time the building was erected. Some of the columns have trapezoidal plates parallel to their flanges, however, these were not found at all locations [**photo 22**]. It is unclear what these additional plates were for, but they may have been used to transfer additional forces into the foundations.

The column bases observed generally showed little signs of corrosion. Any corrosion found was typically on the lower 12-18 inches of the column and did not appear to be aggressive. The column probe that had the largest amount of corrosion was wall probe 1A [**photo 23**]. The increased amount of corrosion was not found to be a surprise as this column was located behind a pilaster that had shown signs of deterioration (both cracking and separation from the wall) which would allow for increased amounts of water to reach the column. All of this being said, the corrosion of the column was not significant enough to cause concern for the stability of the building.

Photo 22: Wall probe #3 - *column base*

2. WALL CONDITIONS

As mentioned above, work on the exterior walls of the building also involved visual observation of the existing condition of the walls. All four walls presented a myriad of different conditions which are documented on drawings **S-100** through **S-102** in **Appendix B**.

WEST WALL

The west wall provided the most diverse range of conditions on the entire building and was mostly due to previous building extensions that have since been removed. The building previously had one shed-style addition that extended from grid 1 to grid 13. The remnants of this addition are still visible as T-shaped pieces of steel protruding from the masonry pilasters as well as painted masonry and a flashing reglet [**photo 24**]. In order to help seal the building and prevent deterioration of the exterior walls in this area, it is recommended that the steel T's be removed. At all sides, the steel lintels over windows should be scraped and painted and the reglet be removed.

Photo 23: Wall probe #1A - *column base*

Between grids 15 and 22 there is evidence of another extension which has since been mostly removed. It appears that this was once a bathroom for the building. Below the lowest windows, there were numerous abandoned beam pockets and paint and ceramic tiles on the masonry wall [**photo 25**]. There was also a large stretch of various tile materials adhered to the exterior slab on grade. As indicated on drawing S-100, the removal of all finishes (i.e., paint and tiles) is recommended from this area and any beam pockets should be filled with new masonry.

The last portion of the west wall (grid 23-37) had various exposed steel columns and painted CMU [**photo 26**]. In order to stabilize the building from further deterioration, it is recommended that all exposed steel (this includes steel lintels at all openings) be scraped and painted and that all CMU have existing paint removed and a breathable sealant be applied. There are also many areas over the surface where masonry needs to be repointed, or even replaced, and where other objects, such as conduit, should be removed (see drawing S-100 for full scope of work).

Photo 24: T-shapes at west wall

Photo 25: West wall beam pockets and paint

EAST WALL

Observation of the east wall found much more uniform conditions over the length of the wall. As the east side faces the train station and an elevated local roadway, there was no space for the original owner to construct building extensions, and thus, the required repairs are primarily masonry repair and replacement. All windows along this wall have been covered with plywood, which was most likely installed to prevent vandalism to the windows [**photo 27**]. All plywood should be removed and all existing windows be blocked in with CMU in order to provide a more long term solution to this problem.

The two other main repairs to this side of the building are to scrape and paint all exposed steel lintels to prevent further corrosion and to repoint large portions of the existing masonry. The repointing primarily occurs at the base of the wall and just below the upper windows. The base of the wall may need extensive repointing due to the fact that the "alley" created by the building and elevated roadway does not allow for a long window of time when sunlight can help dry out any trapped moisture (especially any snow drifts against the building) [**photo 28**]. A similar condition may be the cause of the deteriorated mortar joints below the upper windows.

NORTH WALL

Similar to the shed that had existed on the west wall, the north wall also once had a building extension. The only remaining pieces of this addition are T-shaped pieces of steel extending from the masonry pilasters along the wall and a flashing reglet just below the upper windows [**photo 29**]. Both the steel T's and flashing reglet shall be removed and the masonry repaired to help prevent additional moisture from entering the building. The remaining work on the north wall is primarily repointing of the existing masonry and the scraping/painting of the exposed steel lintels. It is thought that, like the east wall, the north wall saw little sunlight and thus did not have the

Photo 26 (top): Exposed steel columns at west wall

Photo 27 (middle): East wall windows

Photo 28 (bottom): Repointing at base of east wall

Photo 29: T-shapes at north wall

Photo 30: Southeast pilaster

opportunity to dry out as well as the south or west face. This increased length of moisture exposure may have led to the mortar joints deteriorating more than elsewhere on the building.

SOUTH WALL

The south wall contained many of the same conditions found elsewhere on the building, but had a diversity similar to the west wall. Masonry repointing and replacement, as well as steel lintel scraping/painting, were the most common repair found on this wall. There was also some removal of various conduits and pipe penetrations, though these were minimal compared to the west wall. The south wall did contain two pilasters that needed significant rebuilding [**photo 30**]. These pilasters were in such poor shape due to water becoming trapped behind the brick and not only eroding the mortar but also expanding upon freezing and jacking the pilaster away from the rest of the building. As noted previously, this water infiltration did not have large detrimental effects on the steel columns behind the pilasters.

FUTURE USE POSSIBILITIES

RSA had been requested by Haley & Aldrich to consider what upgrades might be required by the New York State Building Code for three possible future uses for the building. Although this exercise is not strictly within the realm of "stabilization", the owner had requested a brief investigation. The three potential uses that RSA was asked to investigate are:

Use 1 Parking: covered, nonheated, non-occupied, single level
Use 2 Commercial: offices and/or retail occupants
Use 3 Commercial/assembly: offices, retail and community meeting spaces

All uses are to be one floor only, with no mezzanines or partial additional floors.

There are no special provisions required because of the building being located in a flood plain. Reference to the FEMA Flood Insurance Rate Map 36119C0307F. Panel 0307, Village of Hastings-on-Hudson, Number 360913 shows Building 52 to be in Zone X. This zone does not require any special provisions for resistance to floods.

For all potential uses except retail stores, if the columns are fire-protected to a height of twenty feet above the floor, there would be no requirement for a fire separation wall inside the building. The allowable floor area would become unlimited. The columns could be encased in concrete, masonry or spray on fireproofing (with an architectural finish applied as desired) at a very reasonable cost and there are relatively few of them. Therefore we recommend this for all columns for parking, office and community space use.

The maximum exit travel distances and the minimum number of exits will depend on the use classification, the number of occupants and the actual layout of the space. In general, it appears that for this building these requirements will not be overly restrictive regarding potential uses.

For retail store use, unless the entire roof structure as well as the columns were to be fire protected, there is a limit to the floor area between fire separation walls. However this floor area becomes quite large for a one story fully sprinklered building – 69,000 sq. ft. with possible additional increases depending on how much public frontage is planned for the final building.

For **Use 1** we have assumed that the garage would be classified as an Open Garage so that mechanical ventilation would not be required. For the building to qualify as an Open Garage the Code requires that at least 50% of the interior face of the exterior wall area on all four sides of the building be open and that the openings be distributed uniformly. Thus most of the present window openings would be converted to some sort of open entity – louvres or grating – that would permit natural ventilation.

For **Use 2** it is difficult to contemplate an architectural layout for one floor of offices in such a high ceilinged space. However if it were a large open area with the windows left in place but considered fixed glazing and the space fully conditioned, then offices might work. For retail we have assumed the possibility of large box retail or supermarket (an ideal use for this large building) and/or for smaller stores partitioned as in a small mall.

For **Use 3**, a mixed use possibility, the retail assumptions would be the same as Use 2 above. The community space portion might include large spaces such as a gym or an auditorium or a multi-function space or smaller meeting rooms. The two uses would be separated by a full height fire-rated partition.

For specific requirements, see the table that follows.

REQUIREMENTS FOR PROPOSED USES			
	Use 1: Parking Garage, Natural Ventilation, not heated	**Use 2: Commercial: Office and/or Retail**	**Use 3: Commercial/ Assembly: Office, Retail or Community Center**
Code Use Classification	S-2	M	M/A-3
Allowable Square Feet of Floor Area Between Fire Separations	Unlimited if columns are fireproofed for a height of 20 feet	69,000 sq. ft.	Use M: 69,000 sq. ft. Use A-3: Unlimited if columns are fireproofed for a height of 20 feet
Meet new Code Requirements for Accessibility, Egress, MEP	Required	Required	Required
Upgrade to meet new energy code	Not required	Required: Furr out walls and insulate to meet R-value; upgrade glazing.	Required: Furr out walls and insulate to meet R-value; upgrade glazing.
Seismic upgrade	Not required: no member receives more than 5% increase in seismic load nor has seismic resistivity reduced by more than 5%	Not required: no member receives more than 5% increase in seismic load nor has seismic resistivity reduced by more than 5%	Not required: no member receives more than 5% increase in seismic load nor has seismic resistivity reduced by more than 5%
Sprinklers	Dry automatic ordinary hazard	Wet automatic light hazard	Wet automatic light hazard
Electric Service	1000 ampere, 120/208 V 3 phase 4 wire	4000 ampere, 120/208 V 3 phase 4 wire	3000 ampere, 120/208 V 3 phase 4 wire
Water	Min. 1 ¼" service	Min. 2" service	Min. 2" service
Sanitary sewer	Lift station on south side of building force feeds main	Lift station on south side of building force feeds main; check to see if lift station and main have capacity for this increased use	Lift station on south side of building force feeds main; check to see if lift station and main have capacity for this increased use
HVAC	Not required	Roof mounted heating/ cooling units; allow 400 sq. ft./ ton of air conditioning	Roof mounted heating/ cooling units; allow 400 sq. ft./ ton of air conditioning
Other	At least 50% of wall area must be open for ventilation		Fire separation wall required between different occupancies
Live load capacity required by NYS Building Code	50 psf (for automobiles)	50 psf (+20 psf for partitions) for office 100 psf for retail	100 psf for community center 50psf (+20 psf for partitions for office) 100 psf for retail

CONCLUSIONS

In summary, based on our experience with similar types of buildings, RSA feels that Building 52 is a very good candidate for a future adaptive reuse. Minor repair issues do not affect this opinion. Thus, until it is determined what its future use might be, a ten-year stabilization effort is a logical choice to undertake at this time. We recommend that an annual inspection be conducted in the spring of each year to insure that no new defects have emerged. Since the building will require a new roof no matter what its future use, new roofing and flashing that will last at least 20 years is recommended. The other repairs will be shorter term in their effectiveness, but will allow time for decision making. And, should it become necessary to extend the stabilization period beyond ten years, there is no reason why a future assessment of the building, similar to this one, cannot be made at that time and further repairs recommended if required.

APPENDICES

A. Original Drawings

B. Field Observations

C. Probe Documentation

D. Non Destructive Evaluation
GBG

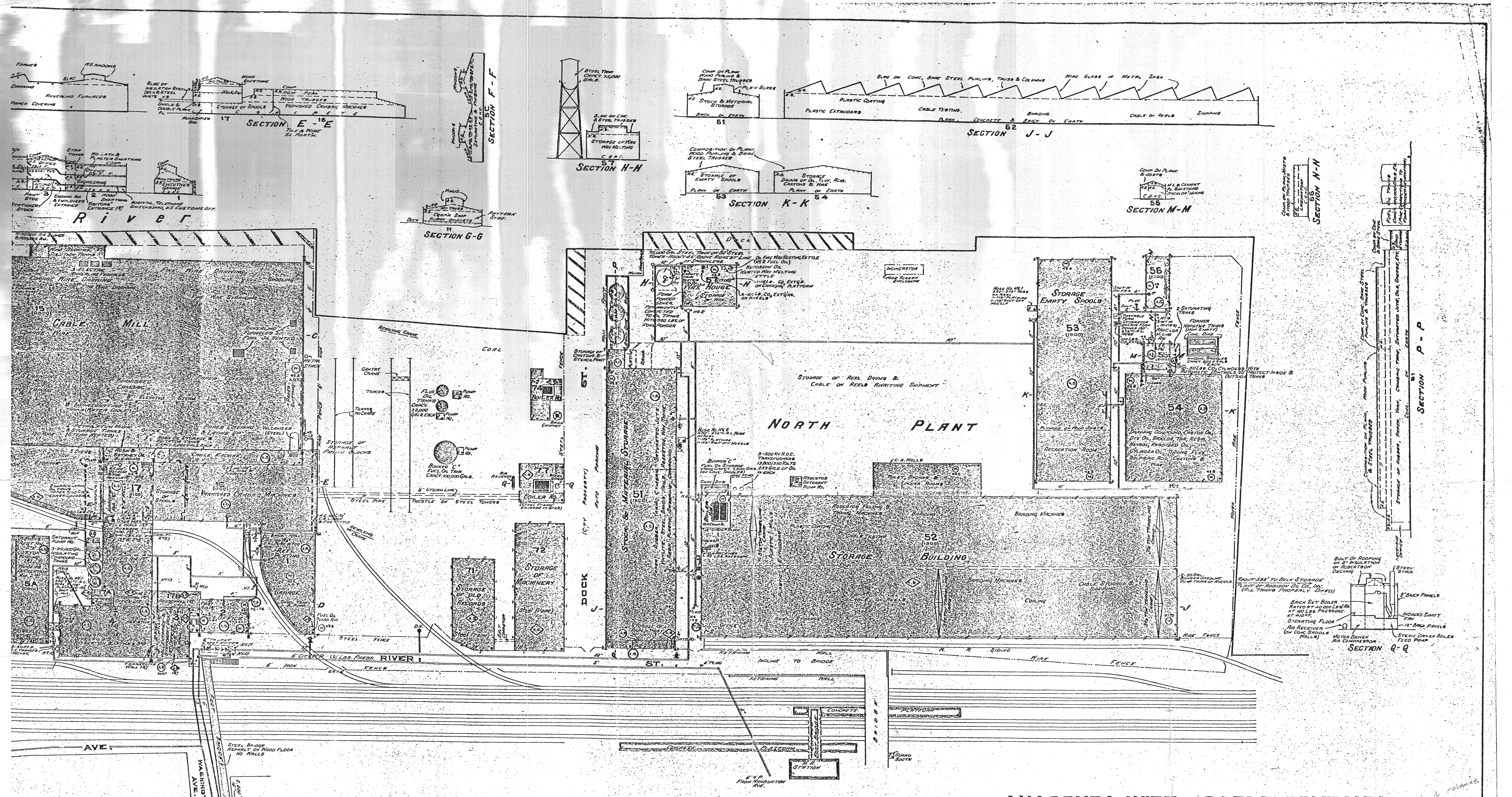
E. Roof Repair Drawings
James R. Gainfort, Architect

F. Concrete Testing Results
Kemron

G. Calculations

APPENDIX A

Original Drawings



ANACONDA WIRE & CABLE COMPANY
HASTINGS-ON-HUDSON, N.Y.

THIS PLAN IS SUPPOSED TO REPRESENT CONDITIONS ONLY AT DATE SHOWN HEREON, AND IS FOR INFORMATION ONLY.

INSPECTED BY
JOHNSON AND HIGGINS
INSURANCE BROKERS
NOV. 21, 1946

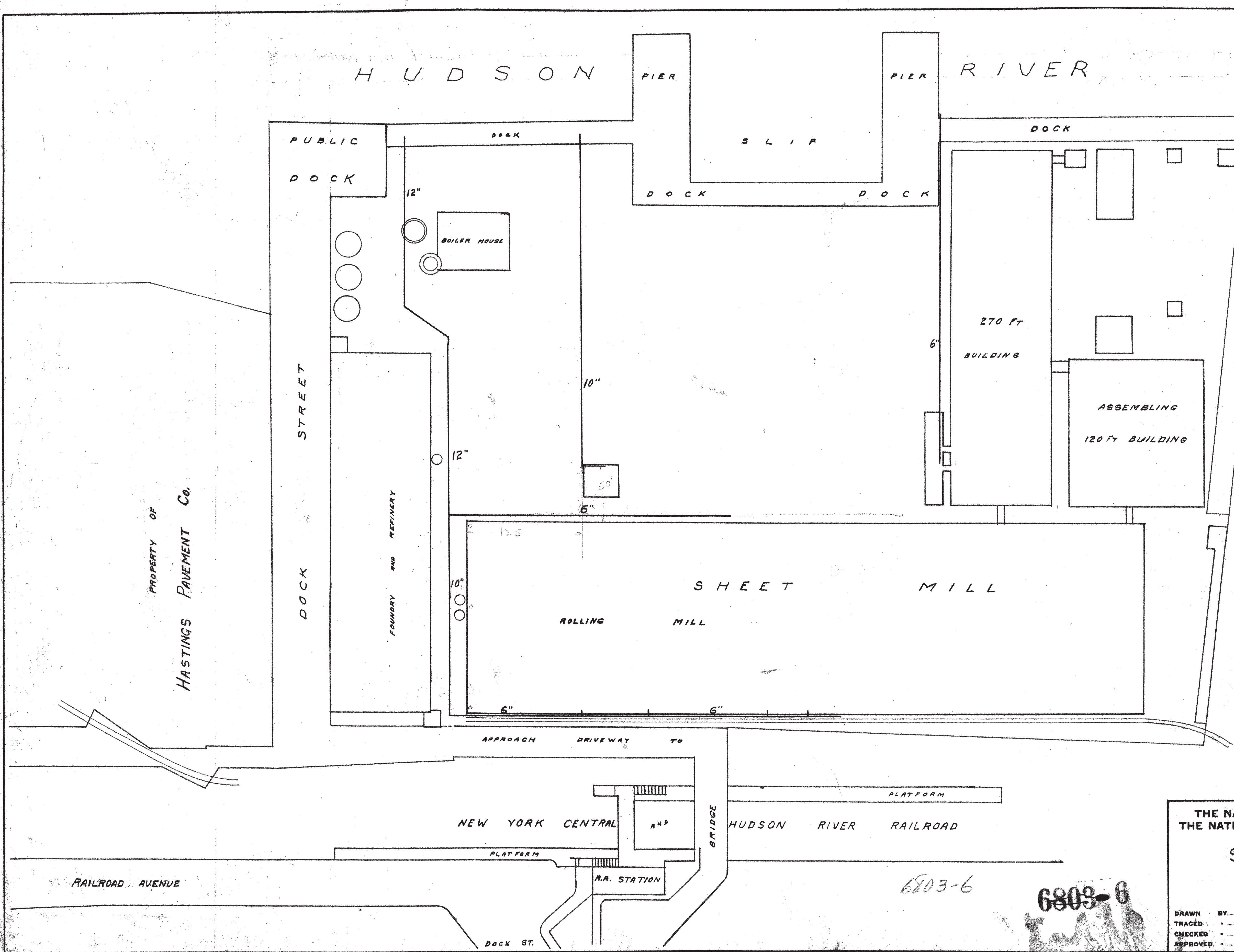
4 = 6 columns

HGG 6-50 —

WWB 00008

105'

SCALE ONE INCH TO 50 FEET.



WWB 00020

THE NATIONAL CONDUIT & CABLE CO.
THE NATIONAL BRASS & COPPER TUBE CO.
HASTINGS-ON-HUDSON, N.Y.

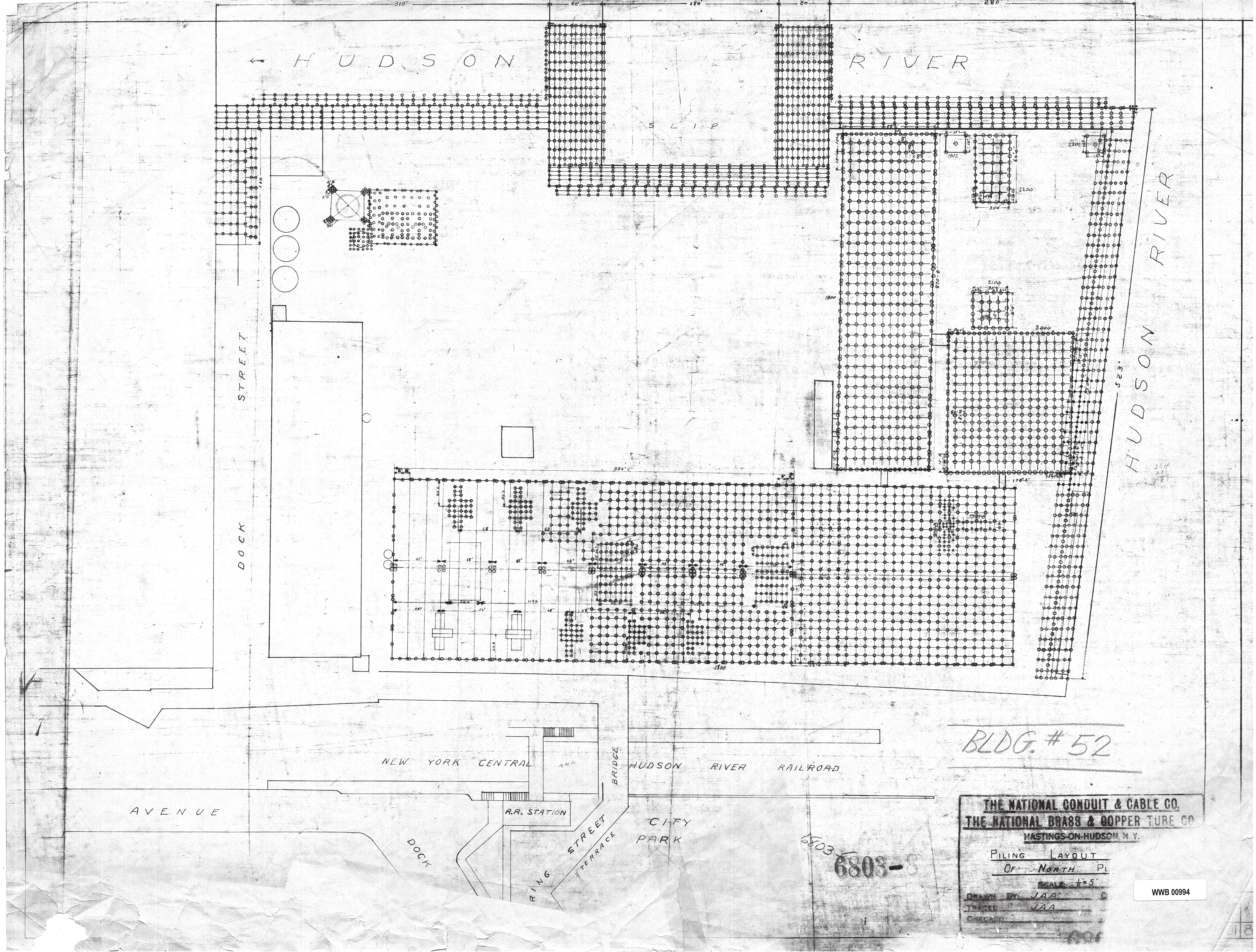
SEWERAGE LINES
NORTH PLANT

SCALE: 1" = 10'

	BY	DATE
DRAWN		
TRACED	J.A.A.	12-10-18
CHECKED		
APPROVED		

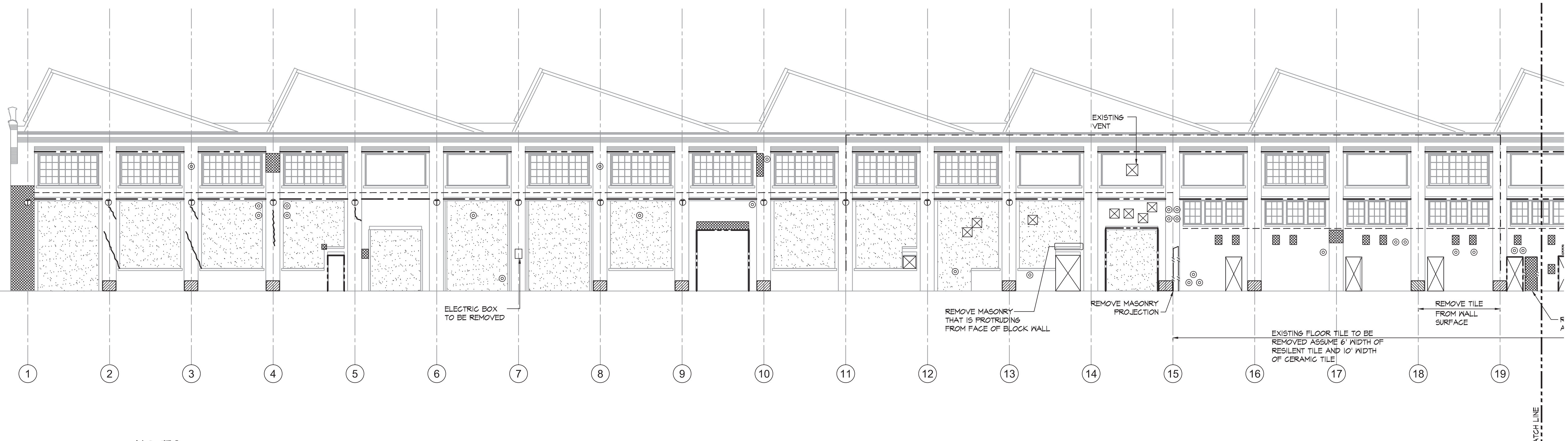
52478

6803 — 6


HUDSON RIVER
SLIP
HUDSON RIVER
DOCK STREET
NEW YORK CENTRAL AND HUDSON RIVER RAILROAD
AVENUE
R.R. STATION
DOCK
RING STREET
TERRACE
BRIDGE
CITY PARK
BLDG. # 52
6803-S
THE NATIONAL CONDUIT & CABLE CO.
THE NATIONAL BRASS & COPPER TUBE CO
HASTINGS-ON-HUDSON, N.Y.
PILING LAYOUT
OF NORTH PL
SCALE 1/8" = 5'
DRAWN BY: J.A.A.
TRACED: J.A.A.
CHECKED:

APPENDIX B

Field Observations



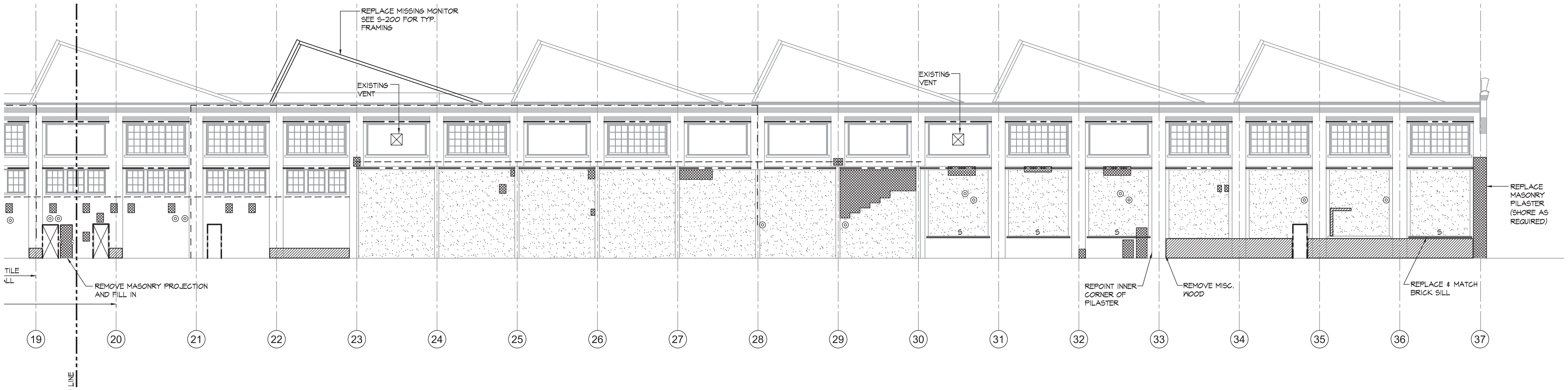
WEST ELEVATION
SCALE: 3/32"=1'-0"

NOTES:

1. ALL EXISTING STEEL LINTELS AND SIDE JAMBS TO BE SCRAPED CLEAN OF CORROSION AND PAINT AND PAINTED W / TNEMEC 530 OMNITHANE. CONTRACTOR TO FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR PREPARATION OF STEEL.
2. FOR THIS ELEVATION, ASSUME 100 EXISTING BOLT & WASHER ASSEMBLIES THAT MUST BE PREPARED & PAINTED IN A SIMILAR MANNER TO THE LINTELS.
3. FOR THIS ELEVATION, ASSUME 200 1" DIAMETER HOLES THAT MUST BE PATCHED WITH NON-SHRINK GROUT.
4. FROM GRID #15 TO GRID #23 AND FROM GROUND LEVEL TO FLASHING, REMOVE EXISTING PAINT W/ WIRE BRUSH.
5. FROM GRID # 23 TO GRID #37, ALL EXPOSED STEEL COLUMNS TO BE SCRAPED CLEAN OF CORROSION AND PAINT AND PAINTED W / TNEMEC 530 OMNITHANE. CONTRACTOR TO FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR PREPARATION OF STEEL.
6. ALL MASONRY PILASTERS ALONG WEST WALL TO HAVE PAINT REMOVED W / WIRE BRUSH.
7. FROM GRID #23 TO GRID #26, ALL PAINT ON EXISTING CMU TO BE REMOVED W / WIRE P\ BRUSH.
8. AT ALL EXISTING MONITORS, ASSUME SIDEWALLS TO BE REPLACED W / 6SW20 @ 16" O.C. STUDS BY MARIONWARE (OR EQUAL). SEE ARCH'L DWGS FOR ADDITIONAL INFORMATION.
9. FOR AREAS NEEDING REPOINTING, CONTRACTOR TO REMOVE ¾" TO 1" OF MORTAR AND REPLACE. SEE NOTES ON S-200 FOR ADDITIONAL INFORMATION.

LEGEND:

- INDICATES STEEL T-SHAPE TO BE REMOVED AS WELL AS REPLACEMENT OF BRICK FROM ONE COURSE BELOW T TO LINE OF EXISTING FLASHING FOR FULL WIDTH OF PILASTER
- INDICATES PIPE OR CONDUIT PENETRATION. REMOVE PIPE OR CONDUIT & PATCH WITH BRICK OR CMU
- INDICATES EXISTING OPENING TO BE FILLED SOLID WITH NEW CMU
- INDICATES CRACK IN MASONRY TO BE FILLED W / SIKADUR 33
- INDICATES CRACK IN MASONRY WHERE BRICK TO BE REMOVED AND NEW MASONRY STITCHED IN PER TYP. DETAIL ON S-200
- INDICATES MASONRY TO BE REPOINTED
- INDICATES MASONRY TO BE REPLACED U.O.N.
- INDICATES EXISTING FLASHING + REGLET TO BE REMOVED AND REPOINTED AS REQUIRED
- L INDICATES EXISTING STEEL LINTEL TO BE REPLACED WITH NEW STEEL CHANNEL OF SAME DEPTH
- S INDICATES REPLACEMENT OF CONCRETE SILL U.O.N.
- INDICATES STEEL LINTEL, JAMB OF COLUMN TO BE SCRAPED + REPAINTED (SEE NOTES FOR ADD'L INFORMATION)
- INDICATES EXISTING CONDUIT OR PIPE TO BE REMOVED
- INDICATES MASONRY TO BE REMOVED
- INDICATES EXISTING CMU INFILL TO BE SEALED W / SIKAPROOF SEAL.



WEST ELEVATION
SCALE: 3/32"=1'-0"

NOT FOR CONSTRUCTION

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BUILDING 52 STABILIZATION

ONE RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SEAL

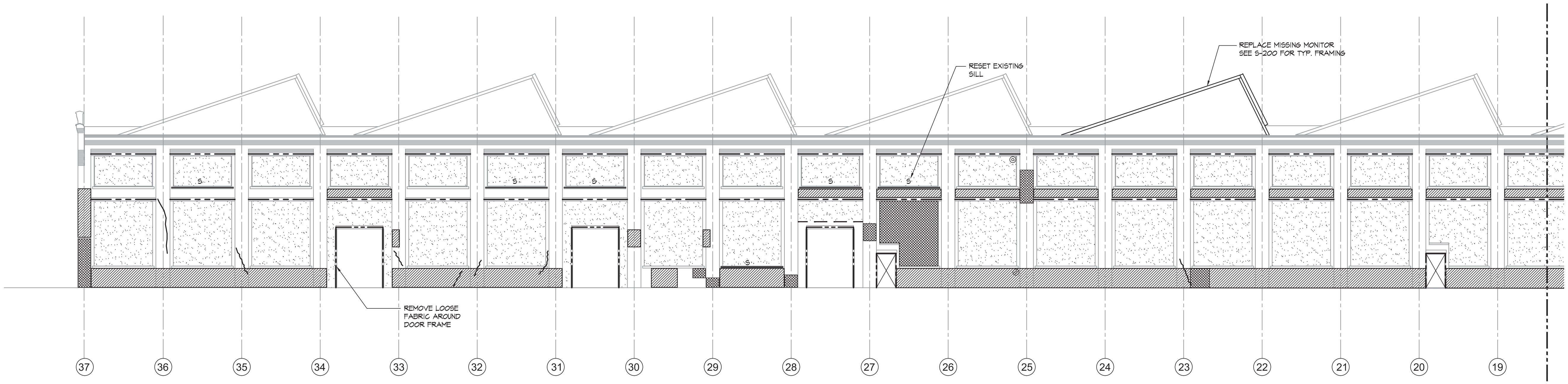
REVISIONS

REV. NUMBER	REVISION NAME
2	FINAL REPORT
1	PRELIMINARY ESTIMATE

TITLE
WEST ELEVATION

SHEET NO.
S-100

SCALE: 3/32"=1'-0"
DATE: 11/9/10
RSA NO.: JOB 12900.02



EAST ELEVATION
SCALE: 3/32"=1'-0"

NOTES:

1. ALL EXISTING STEEL LINTELS AND SIDE JAMBS TO BE SCRAPED CLEAN OF CORROSION AND PAINT AND PAINTED W / TNEMEC 530 OMNITHANE. CONTRACTOR TO FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR PREPARATION OF STEEL.
2. FOR THIS ELEVATION, ASSUME 100 EXISTING BOLT & WASHER ASSEMBLIES THAT MUST BE PREPARED & PAINTED IN A SIMILAR MANNER TO THE LINTELS.
3. FOR THIS ELEVATION, ASSUME 200 1" DIAMETER HOLES THAT MUST BE PATCHED WITH NON-SHRINK GROUT.
4. AT ALL EXISTING MONITORS, ASSUME SIDE WALLS TO BE REPLACED W / 6SW20 @ 16" O.C. STUDS BY MARINOWARE (OR EQUAL). SEE ARCH'L DWGS FOR ADDITIONAL INFORMATION.
5. FOR AREAS NEEDING REPOINTING, CONTRACTOR TO REMOVE ¾" TO 1" OF MORTAR AND REPLACE . SEE NOTES ON S-200 FOR ADDITIONAL INFORMATION.

LEGEND:

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- ◎ INDICATES PIPE OR CONDUIT PENETRATION. REMOVE PIPE OR CONDUIT & PATCH WITH BRICK OR CMU
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- INDICATES MASONRY TO BE REPOINTED
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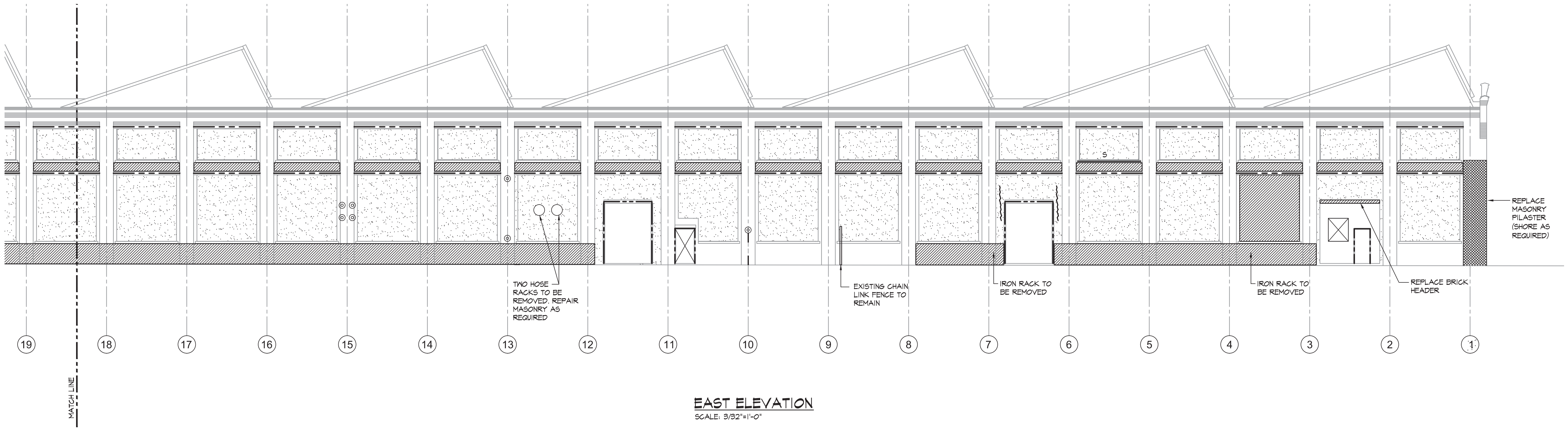
- S INDICATES REPLACEMENT OF CONCRETE SILL U.O.N.
- INDICATES STEEL LINTEL, JAMB OR COLUMN TO BE SCRAPED + REPAINTED (SEE NOTES FOR ADD'L INFORMATION)
- INDICATES EXISTING CONDUIT OR PIPE TO BE REMOVED
- INDICATES MASONRY TO BE REMOVED
- INDICATES EXISTING CMU INFILL TO BE SEALED W / SIKAPROOF SEAL. ASSUME ALL AREAS TO HAVE EXISTING PLYWOOD REMOVED AND 100% OF AREAS TO NEED NEW CMU INFILL.



EAST ELEVATION
SCALE: 3/32"=1'-0"

NOT FOR CONSTRUCTION

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Consulting Architects pc
building exterior diagnostics + design
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New York, New York 10001-6207
v 212 736 3344 f 212 736 4466

BUILDING 52 STABILIZATION

ONE RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SEAL

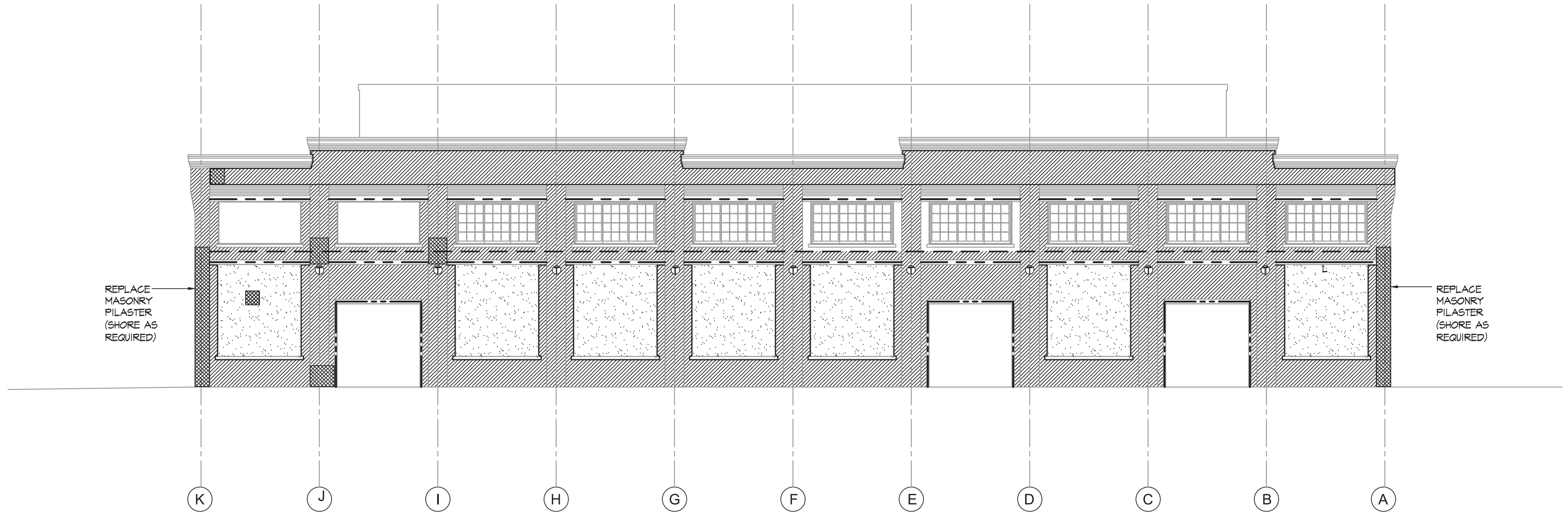
REVISIONS

REV. NUMBER	REVISION NAME
2	FINAL REPORT
1	PRELIMINARY ESTIMATE

TITLE
EAST ELEVATION

SHEET NO.
S-101

SCALE: 3/32"=1'-0"
DATE: 11/9/10
RSA NO.: JOB 12900.02



NORTH ELEVATION
SCALE: 3/32"=1'-0"

NOTES:

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2. FOR THESE TWO ELEVATIONS, ASSUME 100 TOTAL EXISTING BOLT & WASHER ASSEMBLIES THAT MUST BE PREPARED & PAINTED IN A SIMILAR MANNER TO THE LINTELS.
3. FOR THESE TWO ELEVATIONS, ASSUME 200 TOTAL 1" DIAMETER HOLES THAT MUST BE PATCHED WITH NON-SHRINK GROUT.
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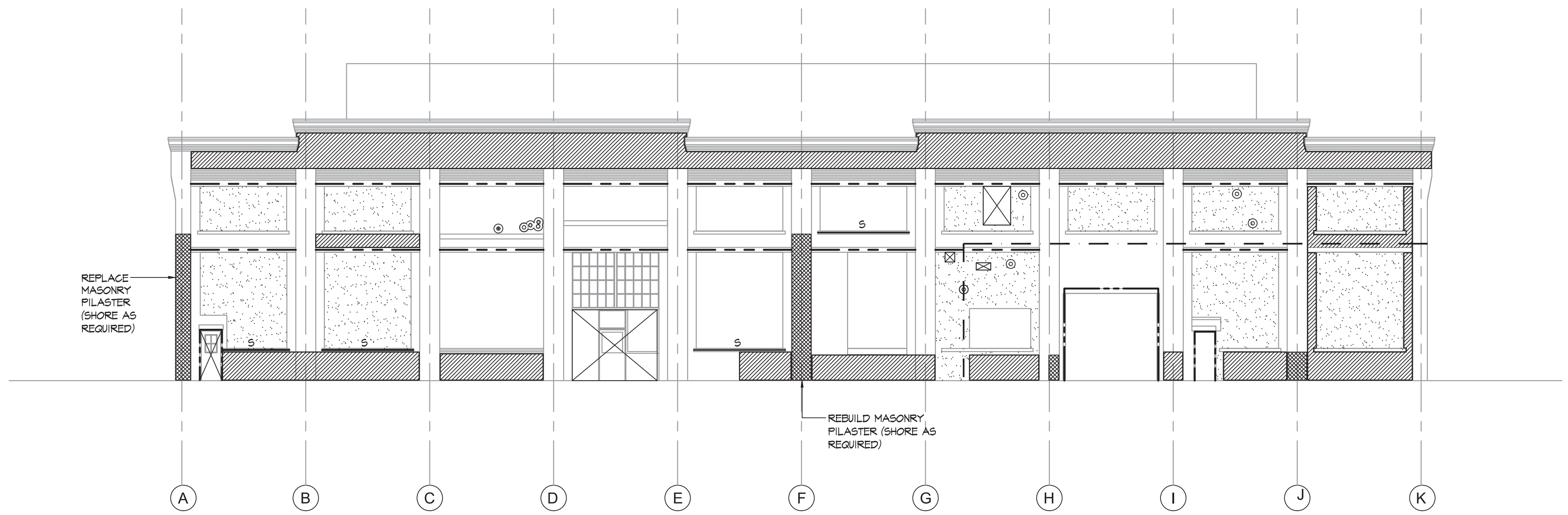

SOUTH ELEVATION
SCALE: 3/32"=1'-0"

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BUILDING 52 STABILIZATION

ONE RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SEAL

REVISIONS

REV. NUMBER	REVISION NAME
2	FINAL REPORT
1	PRELIMINARY ESTIMATE

TITLE
NORTH ELEVATION
SOUTH ELEVATION

SHEET NO.
S-102

SCALE: 3/32"=1'-0"
DATE: 11/9/10
RSA NO.: JOB 12900.02

GENERAL NOTES

1. ALL STRUCTURAL WORK SHALL BE COORDINATED WITH ARCHITECTURAL AND MECHANICAL DRAWINGS AND SHALL CONFORM TO THE PROJECT SPECIFICATIONS, INCLUDING THE STATE OF NEW YORK BUILDING CODE, 2008 EDITION.

2. CONTRACTOR SHALL PROVIDE TEMPORARY SHORING, BRACING, SHEETING AND MAKE SAFE ALL FLOORS, ROOFS, WALLS AND ADJACENT PROPERTY AS PROJECT CONDITIONS REQUIRE. SHORING AND SHEETING SHALL BE DESIGNED BY A STATE OF NEW YORK LICENSED PROFESSIONAL ENGINEER HIRED BY THE CONTRACTOR, WHO SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR THE OWNER'S REVIEW.

3. DIMENSIONS AND ELEVATIONS OF EXISTING CONSTRUCTION GIVEN IN STRUCTURAL DRAWINGS ARE BASED ON INFORMATION CONTAINED IN VARIOUS ORIGINAL DESIGN AND CONSTRUCTION DOCUMENTS PROVIDED BY THE OWNER, AND LIMITED FIELD OBSERVATIONS AND MEASUREMENTS. THE CONTRACTOR SHALL VERIFY ALL INFORMATION PERTAINING TO EXISTING CONDITIONS BY ACTUAL MEASUREMENT AND OBSERVATION AT THE SITE. ALL DISCREPANCIES BETWEEN ACTUAL CONDITIONS AND THOSE SHOWN IN THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE ENGINEER OF RECORD FOR HIS EVALUATION BEFORE THE AFFECTED CONSTRUCTION IS PUT IN PLACE.

CONCRETE BLOCK

1. ALL CONCRETE BLOCK WORK SHALL CONFORM TO THE "NATIONAL CONCRETE MASONRY ASSOCIATION SPECIFICATIONS," LATEST EDITION.

2. CONCRETE BLOCK SHALL BE OF LIGHTWEIGHT AGGREGATE AND CONFORM TO THE FOLLOWING STANDARDS:
   SOLID/HOLLOW BLOCK: ASTM C90, GRADE N1.

NET AREA COMPRESSIVE STRENGTH OF CONCRETE MASONRY UNIT, PSI	NET AREA COMPRESSIVE STRENGTH OF MASONRY ASSEMBLY, F'm, PSI USING TYPE S MORTAR
1900	1500
2800	2000
3750	2500
4800	3000

UNLESS OTHERWISE NOTED ON PLANS AND/ OR ELEVATIONS, CONCRETE BLOCK UNIT STRENGTH SHALL BE 1900 PSI MIN.
NOTE: CONCRETE BLOCK WITH UNIT STRENGTH HIGHER THAN 1900 PSI REQUIRE LONGER DELIVERY LEAD TIMES.

3. ALL MORTAR SHALL BE ASTM C270, TYPE S.

4. ALL GROUT FOR FILLING CELLS SHALL BE ASTM C 476 WITH MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI BUT NOT LESS THAN THE COMPRESSIVE STRENGTH OF THE MASONRY ASSEMBLY, F'M".

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL WORK SHALL CONFORM TO THE FOLLOWING GOVERNING STANDARDS:
   A. AISC "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS, "LATEST EDITION.
   B. THE AMERICAN WELDING SOCIETY (AWS D1.1) "CODE FOR WELDING IN BUILDING CONSTRUCTION," LATEST EDITION.

2. ALL STRUCTURAL STEEL SHALL CONFORM TO THE FOLLOWING ASTM SPECIFICATIONS:
   A. WIDE FLANGE BEAMS, COLUMNS AND STRUCTURAL TEES: ASTM A992
   B. HOLLOW STRUCTURAL SECTIONS: ASTM A500, GRADE B
   C. STRUCTURAL PIPE SECTIONS: ASTM A501 OR ASTM A53, GRADE B.
   D. CHANNELS, ANGLES AND PLATES: ASTM A36 UNLESS OTHERWISE NOTED
   E. BOLTED CONNECTIONS OF BEAMS OR GIRDERS ARE TO BE MADE WITH ASTM A325-SC BOLTS (3/4" DIA.)
   F. ANCHOR BOLTS: ASTM F1554, GRADE 36.

3. STEEL CONNECTIONS SHALL BE STANDARD AISC FRAMED BEAM CONNECTIONS.
   A. FOR NON-COMPOSITE MEMBERS. PROVIDE CONNECTIONS BASED ON REACTION AS DETERMINED FROM AISC UNIFORM LOAD TABLE. (UNLESS OTHERWISE NOTED ON PLANS.)
   B. CONNECTIONS SHALL BE DESIGNED FOR SHEAR AND ECCENTRICITY, CONSIDERING THAT THE CONNECTION IS AN EXTENSION OF THE BEAM AND GIRDERS.

4. ALL BEAMS EXCEPT CANTILEVER BEAMS SHALL BE FABRICATED WITH NATURAL CAMBER UP. CANTILEVER BEAMS SHALL BE FABRICATED SO THAT NATURAL CAMBER RAISES CANTILEVER END.

5. WELDING SHALL BE PERFORMED BY CERTIFIED LICENSED, AWS-QUALIFIED WELDERS.
   ELECTRODES SHALL BE AWS 5.1, CLASS E70XX (USE LOW HYDROGEN ELECTRODES FOR A572, GRADE 50 STEEL).

6. SHOP PAINT EXPOSED STEEL MEMBERS, STEEL MEMBERS NOT ENCASED IN CONCRETE OR SPRAY FIREPROOFED, AND ALL STEEL MEMBERS AT THE EXTERIOR WALL WITH TNEMEC #10-99. FIELD PAINT ALL EXPOSED MEMBERS WITH TNEMEC 530 OMNITHANE OR APPROVED EQUAL.

7. MASONRY ANCHORS SHALL BE HILTI "HIT" ADHESIVE ANCHORS AS MANUFACTURED BY HILTI FASTENING SYSTEMS, INC., OR APPROVED EQUAL, THE SIZE AS INDICATED ON THE DRAWINGS. THEY SHALL BE INSTALLED AS PER MANUFACTURER'S INSTRUCTIONS.

8. SHOP AND ERECTION DRAWINGS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW AND APPROVAL. NO FABRICATION OF STEEL SHALL COMMENCE WITHOUT APPROVED SHOP DRAWINGS.

STEEL DECK

1. ALL METAL DECK WORK SHALL CONFORM TO THE AISI "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS," LATEST EDITION.

2. ALL METAL DECK UNITS AND ACCESSORY ITEMS SHALL BE FORMED FROM STEEL SHEETS CONFORMING TO ASTM A611 OR A653 WITH A MINIMUM YIELD STRENGTH OF 33,000 PSI. BEFORE FORMING, THE STEEL SHEET SHALL RECEIVE A PROTECTIVE COATING CONFORMING TO ASTM A653, GRADE 90.

3. ALL METAL DECK SHALL BE SHORED AS REQUIRED BY PLANS OR BY SPAN AND LOAD CONDITIONS TO SUPPORT WET WEIGHT OF CONCRETE AND ALL CONSTRUCTION LOADS.

4. EXCEPT AS OTHERWISE NOTED, EDGE LAPS SHALL BE CONNECTED WITH 3/4" DIAM. FUSION WELDS AT A SPACING TO PROVIDE SUFFICIENT DIAPHRAGM STRENGTH TO MAINTAIN BUILDING ALIGNMENT AND TO SUSTAIN LOCAL CONSTRUCTION LOADS WITHOUT DISTORTION OR SEPARATION, MAXIMUM SPACING SHALL BE 3' -0" o/c.

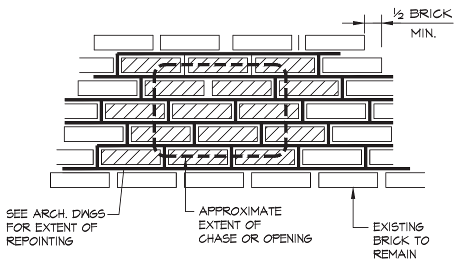
5. EXCEPT AS OTHERWISE NOTED, DECK SHALL BE ATTACHED TO STRUCTURAL STEEL BY 3/4"Φ FUSION WELDS @12"o/c. AT END AND INTERIOR SUPPORTS PERPENDICULAR TO THE DECK SPAN AND AT EDGE AND INTERIOR SUPPORTS PARALLEL TO THE DECK SPAN. WELDS MAY BE OMITTED IN RIBS IN WHICH SHEAR CONNECTORS ARE TO BE APPLIED, EXCEPT THAT EACH DECK SECTION SHALL HAVE SUFFICIENT WELDS TO ADEQUATELY SECURE THE DECK, BRING THE DECK INTO DIRECT CONTACT WITH THE SUPPORTING STEEL AND TO PROVIDE SUFFICIENT DIAPHRAGM STRENGTH TO MAINTAIN BUILDING ALIGNMENT.

LIGHT GAUGE STEEL FRAMING

1. ALL LIGHTWEIGHT STEEL FRAMING WORK SHALL COMPLY WITH THE AISI "SPECIFICATION FOR THE DESIGN OF COLD FRAMED STEEL STRUCTURAL MEMBERS" AS WELL AS ANSI A42-4 AND THE METAL LATH ASSOCIATION "SPECIFICATIONS FOR METAL LATHING AND FURRING.

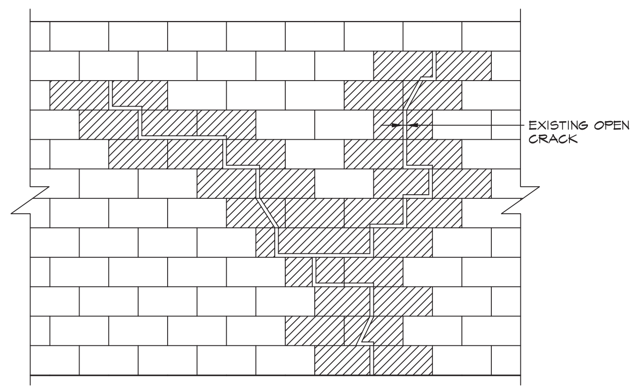
2. ALL PLYWOOD APPLIED TO METAL JOISTS SHALL BE SCREWED AND GLUED TO THE JOISTS. THE ADHESIVE SHALL BE AN APA APPROVED ELASTOMERIC ADHESIVE.

3. INSTALL METAL FRAMING IN ACCORDANCE WITH MANUFACTURER'S WRITTEN INSTRUCTIONS AND RECOMMENDATIONS, UNLESS OTHERWISE INDICATED. ALL MATERIALS SHALL BE GALVANIZED.



NOTES:
1. PROVIDE (1) BRICK ANCHOR BETWEEN BACK UP AND FACE BRICK FOR EACH (1) SF OF FACE BRICK. MIN. (1) ANCHOR PER INFILL.
2. REPLACE EXISTING BRICK WITH NEW SOUND BRICK TO MATCH COLOR, TEXTURE AND DIMENSIONS OF ADJACENT SOUND BRICK.
3. REBUILD HEADERS AT LOCATION OF EXISTING HEADERS ADJACENT TO CHASE OR OPENING.
4. REPLACE LOOSE OR CRACKED BRICKS ADJACENT TO CHASE OR OPENING.
5. KEY NEW BRICKS INTO EXISTING BRICK ADJACENT TO CHASE OR OPENING.

TYPICAL DETAIL BRICK INFILL AT ABANDONED CHASE OR OPENINGS



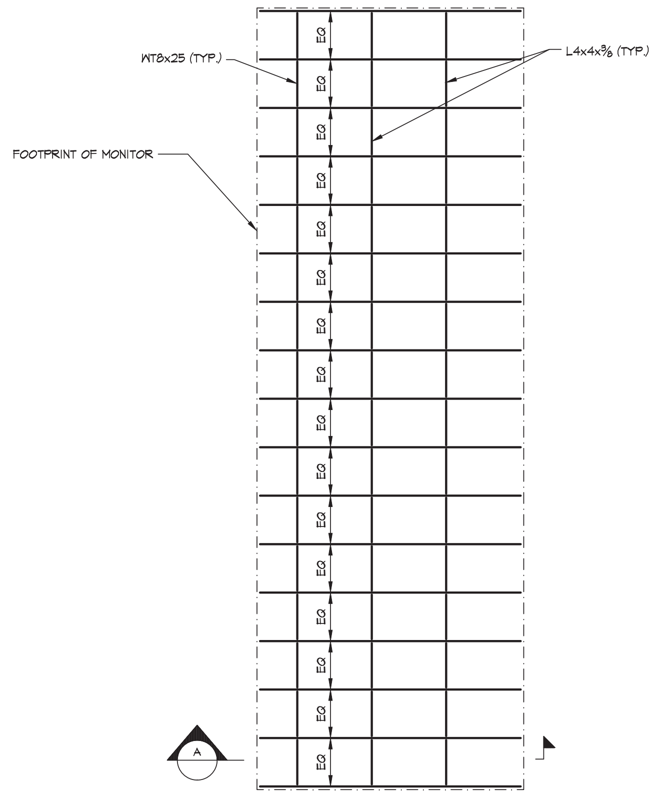
NOTES:

1. DENOTES BRICK TO BE REPLACED. WHERE CRACK IS THRU WALL, REPLACE ALL WYTHES OF BRICK ON EACH SIDE OF CRACK TO 1ST MORTAR JOINT. REPLACE EXISTING HEADERS WITH NEW HEADERS. REPLACE LOOSE AND CRACKED BRICKS. WHERE CRACK IS ONLY IN OUTER WYTHE, REPLACE ONLY OUTER WYTHE.

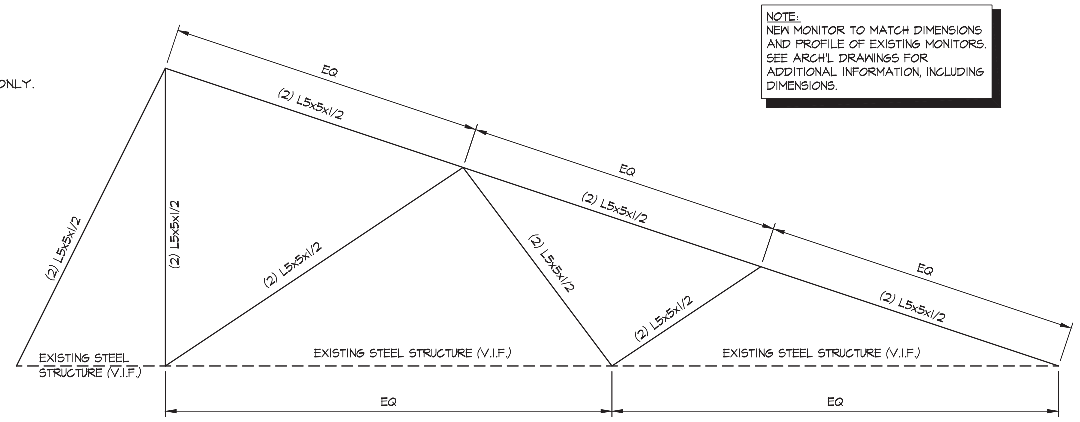
2. WHERE CRACK IS OPEN AND ¼" OR LESS AND IS PRESENT ONLY IN THE OUTER WYTHE AND ONLY IN JOINTS, RAKE AND REPOINT JOINTS ONLY.

TYPICAL DETAIL REPAIR IN BRICK MASONRY

SCALE:N.T.S.



NOTE:
NEW MONITOR TO MATCH DIMENSIONS AND PROFILE OF EXISTING MONITORS. SEE ARCH'L DRAWINGS FOR ADDITIONAL INFORMATION, INCLUDING DIMENSIONS.



SECTION A

TYPICAL DETAIL NEW MONITOR FRAMING

NOT FOR CONSTRUCTION

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Consulting Architects pc
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v 212 736 3344 f 212 736 4466

BUILDING 52 STABILIZATION
ONE RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SEAL

REVISIONS

REV. NUMBER	REVISION NAME
2	FINAL REPORT
1	PRELIMINARY ESTIMATE

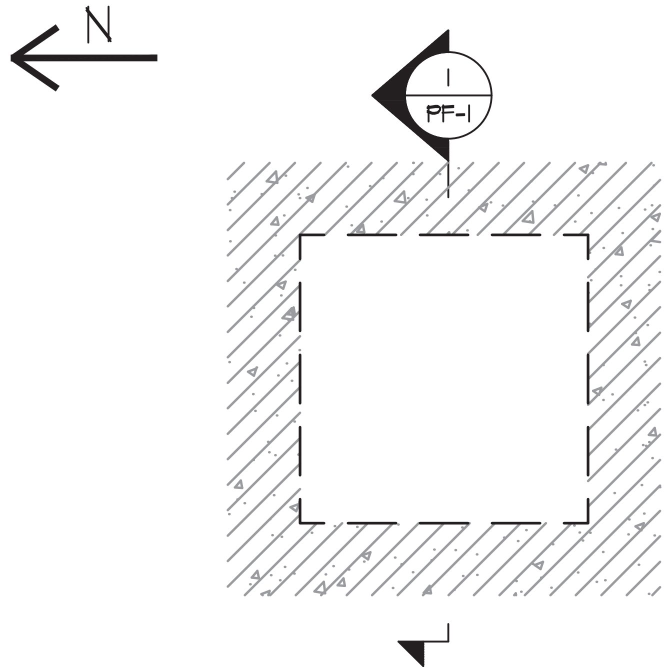
TITLE
GENERAL NOTES
TYPICAL DETAILS

SHEET NO.
S-200

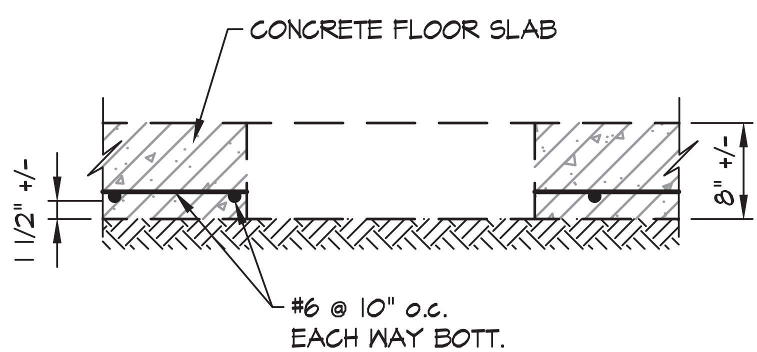
SCALE: AS NOTED
DATE: 11/9/10
RSA NO.: JOB 12900.02

APPENDIX C

Probe Documentation



PLAN VIEW



SECTION 1

Title: FLOOR PROBES 1-3

Date: 12/13/10
Scale: 3/4" = 1'-0"

ROBERT SILMAN ASSOCIATES
STRUCTURAL ENGINEERS
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New York, NY 10003
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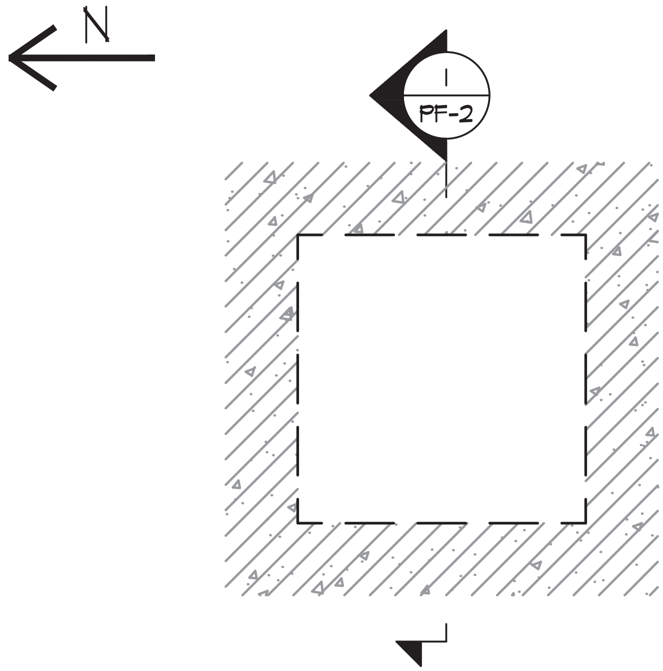
Reference number:

Job Title: BUILDING 52 STABILIZATION

Job Number: 12900.02

FP-1



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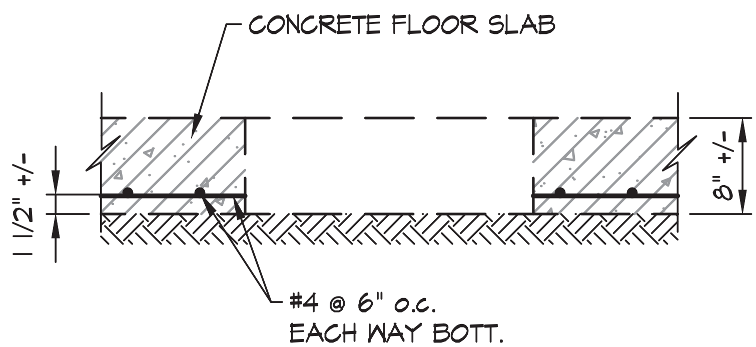
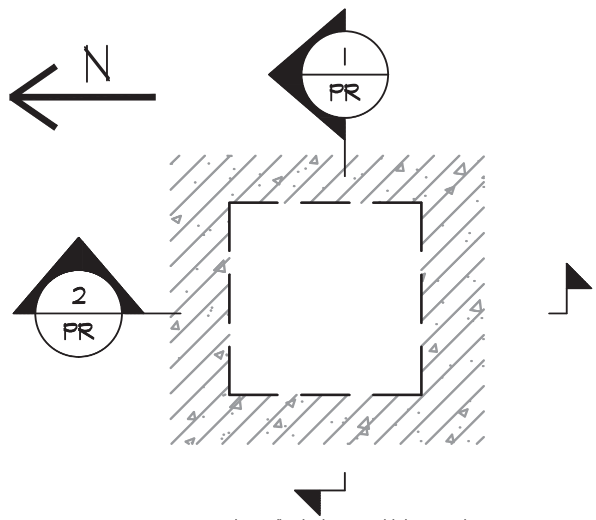


SECTION 1

Title: FLOOR PROBES 4-5		Date:	12/13/10
		Scale:	3/4" = 1'-0"
ROBERT SILMAN ASSOCIATES STRUCTURAL ENGINEERS 88 University Place New York, NY 10003 P 212.620.7970 F 212.620.8157 Reference number:	Job Title: BUILDING 52 STABILIZATION	Job Number:	12900.02
		FP-2	



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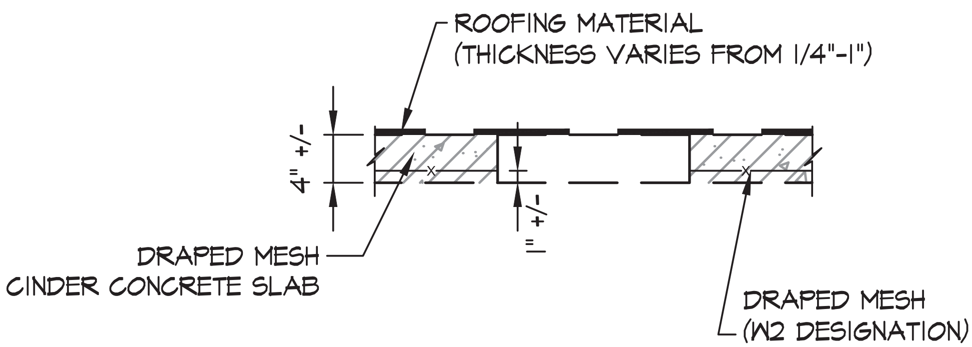
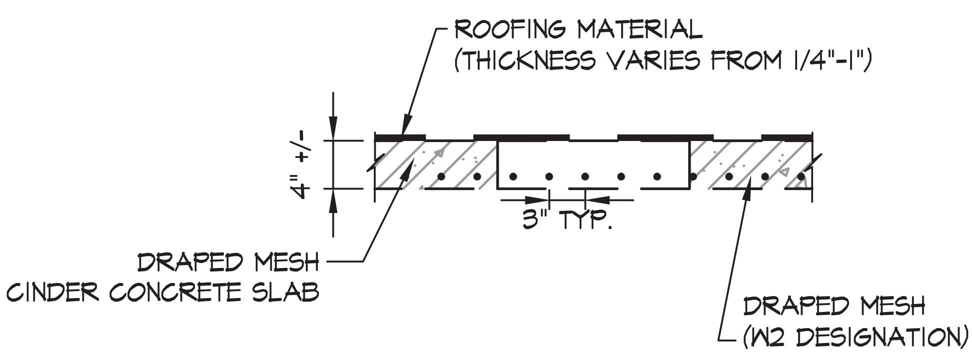


SECTION 1



SECTION 2

Title: TYPICAL ROOF PROBE DETAILS

Date: 12/13/10

Scale: 3/4" = 1'-0"

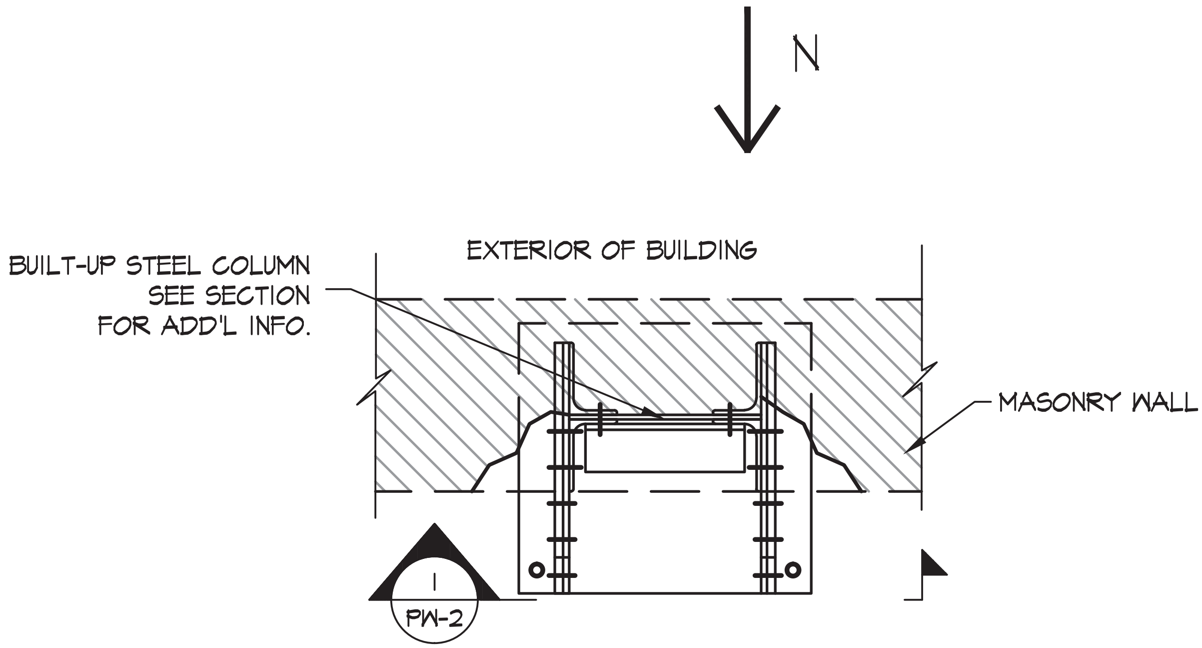
ROBERT SILMAN ASSOCIATES
STRUCTURAL ENGINEERS
88 University Place
New York, NY 10003
P 212.620.7970 F 212.620.8157

Reference number:

Job Title: BUILDING 52 STABILIZATION

Job Number: 12900.02

RP



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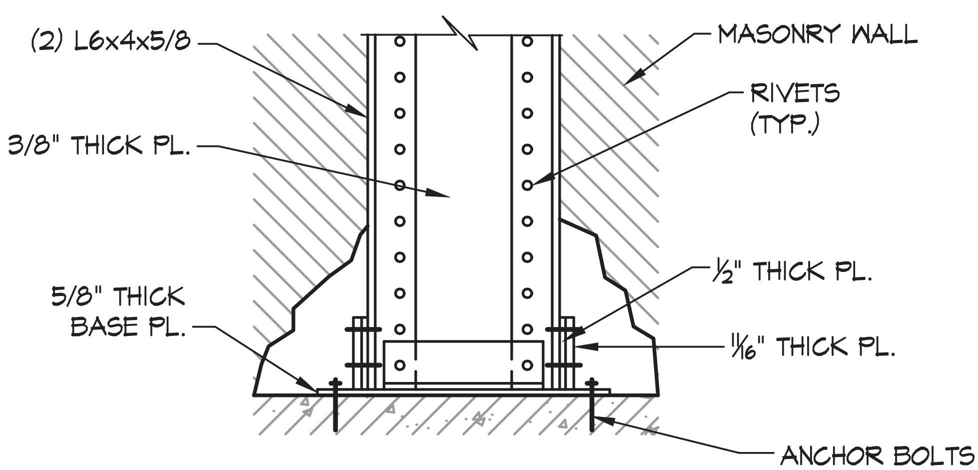
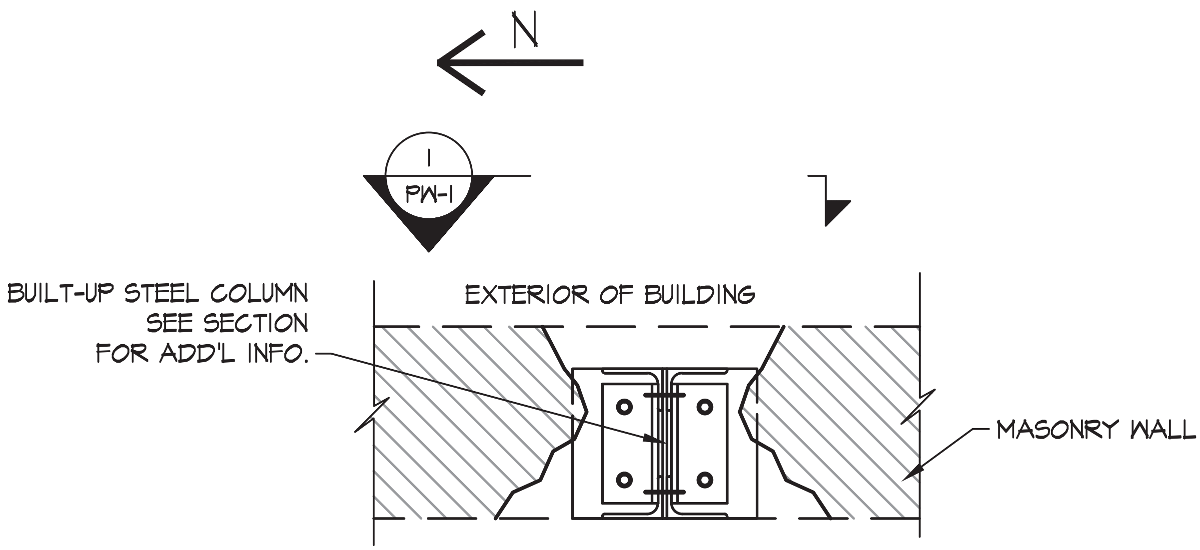
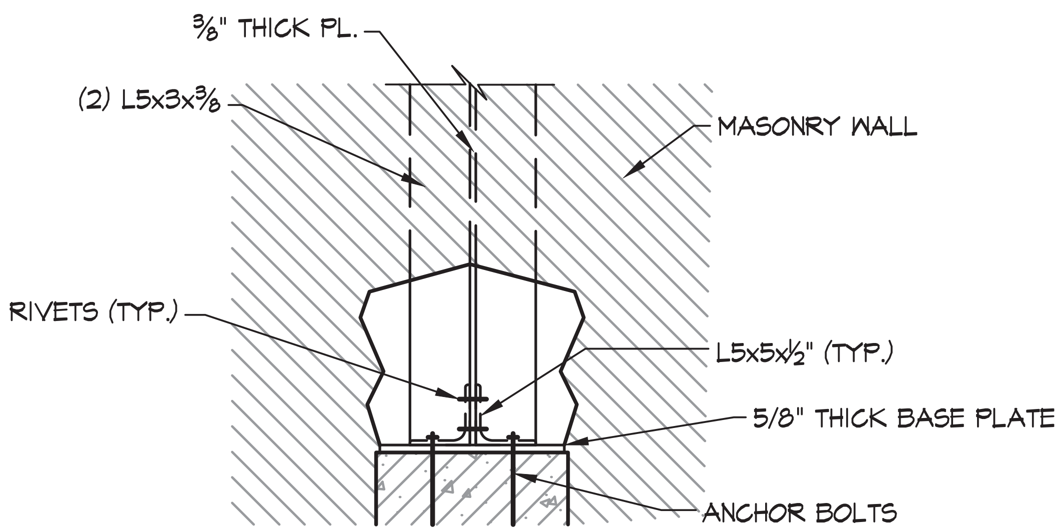


SECTION 1

Title: WALL PROBE 1B		Date:	12/13/10
		Scale:	3/4" = 1'-0"
ROBERT SILMAN ASSOCIATES STRUCTURAL ENGINEERS 88 University Place New York, NY 10003 P 212.620.7970 F 212.620.8157 Reference number:	Job Title: BUILDING 52 STABILIZATION	Job Number:	12900.02
		WP-1B	



PLAN VIEW



SECTION 1

Title: WALL PROBE 2	Date: 12/13/10
	Scale: 3/4" = 1'-0"
Job Title: BUILDING 52 STABILIZATION	Job Number: 12900.02
	WP-2

ROBERT SILMAN ASSOCIATES
STRUCTURAL ENGINEERS
88 University Place
New York, NY 10003
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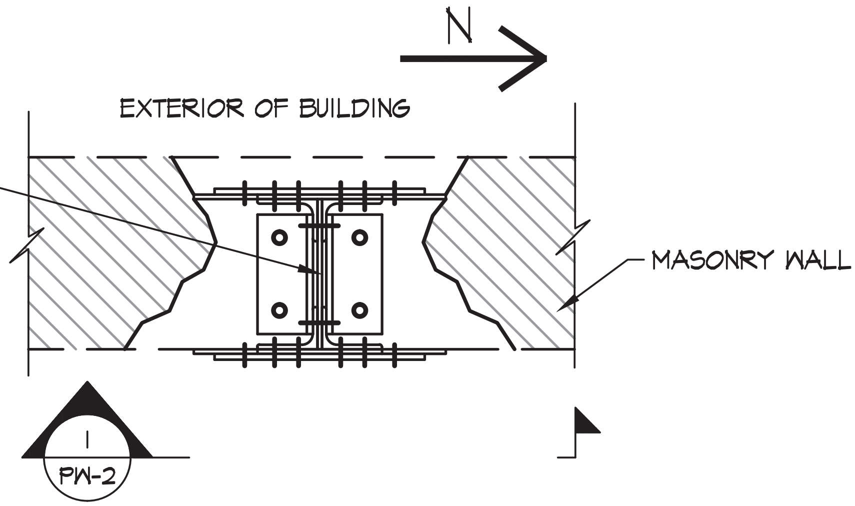
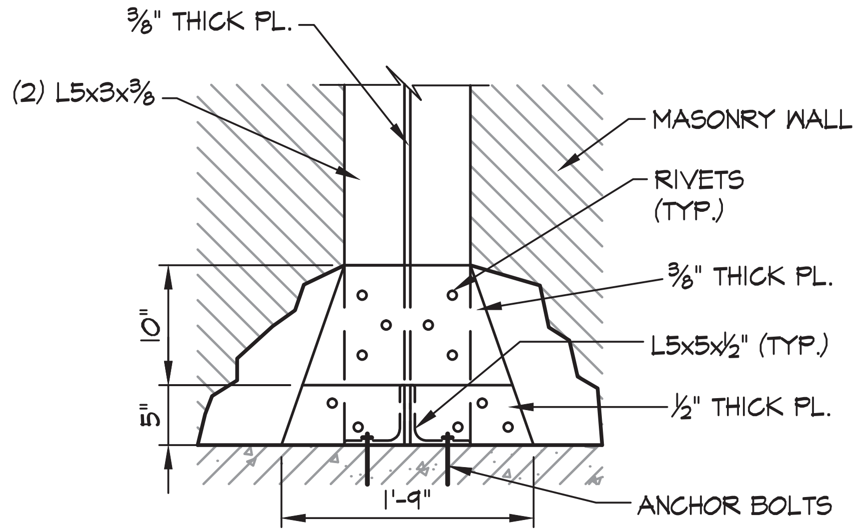
Reference number:

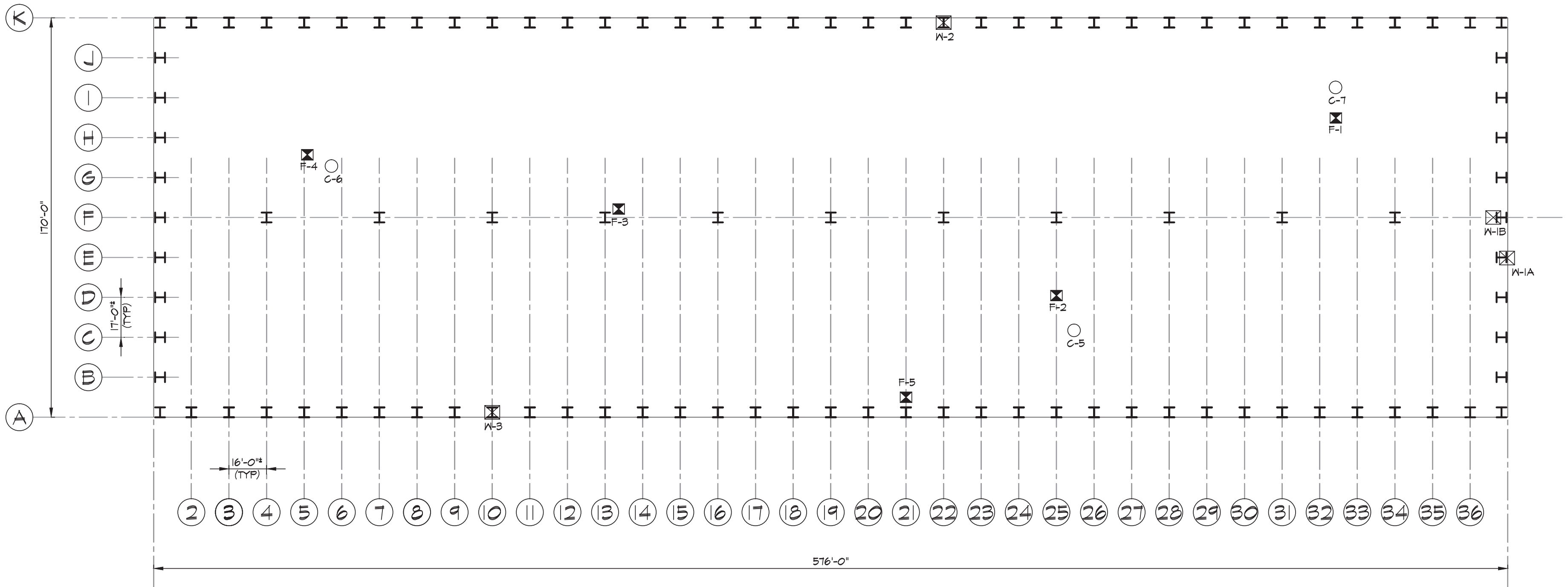


PLAN VIEW



SECTION 1

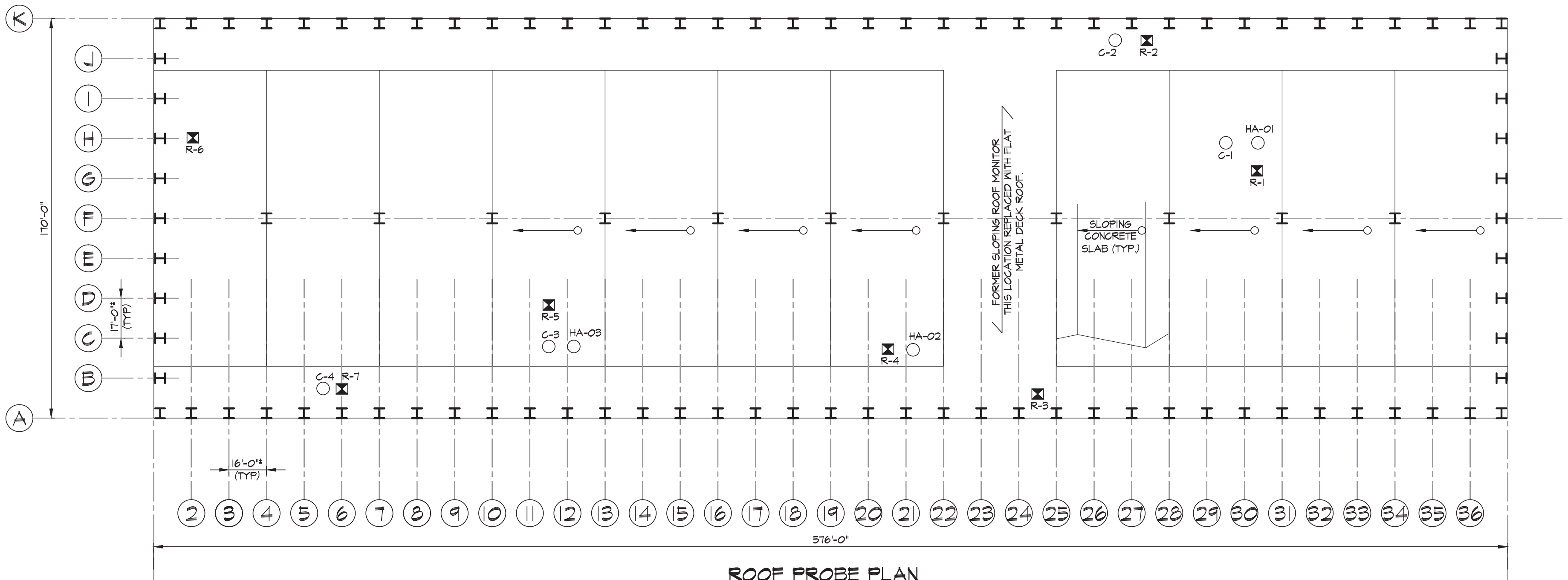
Title: WALL PROBE 3		Date:	12/13/10
		Scale:	3/4" = 1'-0"
ROBERT SILMAN ASSOCIATES STRUCTURAL ENGINEERS 88 University Place New York, NY 10003 P 212.620.7970 F 212.620.8157 Reference number:	Job Title: BUILDING 52 STABILIZATION	Job Number:	12900.02
			WP-3



FIRST FLOOR PROBE PLAN

SCALE: $\frac{1}{32}$"=1'-0"

N



ROOF PROBE PLAN

SCALE: $\frac{1}{32}$"=1'-0"

PROBE NOTES

1. PROBES MARKED THUS R-** ARE TO BE APPROXIMATELY 12 INCHES BY 12 INCHES AND TO PENETRATE COMPLETELY THROUGH THE BUILT UP ROOFING, ANY ROOF FILL AND THE CONCRETE ROOF SLAB. THE PURPOSE OF THESE ROOF PROBES IS TO ALLOW OBSERVATION OF THE COARSE AGGREGATE; DETERMINATION OF THE SIZE, TYPE AND SPACING OF REINFORCEMENT; CONDITION OF REINFORCEMENT; AND CHARACTERISTICS OF EXISTING BUILT UP ROOFING. REMOVE THE 12-INCH-SQUARE SAMPLE IN AS LARGE A SINGLE PIECE AS IS PRACTICABLE, USING SAW CUTS AT THE PERIMETER TO MINIMIZE DESTRUCTION OF THE CONCRETE BY PERCUSSION EQUIPMENT SUCH AS HAMMER DRILLS OR CHIPPING HAMMERS. RETAIN ALL OF THE REMOVED SAMPLE AND PLACE IN A SEALED BAG OR OTHER CONTAINER, LABELED TO SHOW ITS ORIGINAL LOCATION. AT THE CONCLUSION OF OBSERVATION BY THE ENGINEER, BEVEL CUT EDGES TO 30 DEGREES, PATCH ROOF WITH CONCRETE THE SAME THICKNESS AS REMOVED AND INSTALL A WATERPROOF BITUMINOUS ROOF PATCH.

2. PROBES MARKED THUS F-** ARE TO BE APPROXIMATELY 3'-6" X 3'-6" CUT INTO THE GROUND FLOOR SLAB AND TO PENETRATE COMPLETELY THROUGH ANY FLOOR FILL AND THE ENTIRE CONCRETE SLAB TO THE SUBGRADE SOIL BELOW. THE PURPOSE OF THESE FLOOR PROBES IS TO ALLOW OBSERVATION OF THE COARSE AGGREGATE; DETERMINATION OF THE SIZE, TYPE AND SPACING OF REINFORCEMENT; CONDITION OF REINFORCEMENT; AND THICKNESS OF FILL. CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE THE BUTT END OF ANY PILES THAT MAY BE ENCOUNTERED WHILE MAKING THE PROBE. IF NO PILES ARE ENCOUNTERED, EXCAVATE SUBSOIL APPROXIMATELY ONE FOOT BELOW BOTTOM OF SLAB AND ATTEMPT TO LOCATE PILES BY INSERTING A HORIZONTAL STEEL PROBE BAR IN ALL DIRECTIONS. ANY TYPE OF CONCRETE REMOVAL EQUIPMENT IS PERMISSIBLE TO USE. RETAIN APPROXIMATELY 50 POUNDS OF THE REMOVED CONCRETE SAMPLE AND PLACE IN A SEALED BAG OR OTHER CONTAINER, LABELED TO SHOW ITS ORIGINAL LOCATION. AT THE CONCLUSION OF OBSERVATION BY THE ENGINEER, FILL ENTIRE SOIL EXCAVATION AND CONCRETE REMOVAL WITH NEW CONCRETE PATCH, FLOATED LEVEL WITH EXISTING TOP OF FLOOR.

3. PROBES MARKED THUS W-** ARE WALL PROBES IN WHICH BRICK MASONRY IS TO BE REMOVED ALL AROUND THE BASE OF THE EXTERIOR STEEL COLUMN FOR A HEIGHT OF 12 INCHES ABOVE THE SLAB. REMOVE BRICK CAREFULLY TO ALLOW MAXIMUM REUSE OF ORIGINAL UNITS. PURPOSE OF THESE PROBES IS TO EXPOSE THE BASE OF THE STEEL COLUMN AND THE BASE PLATE TO CHECK FOR CORROSION DAMAGE. AT THE CONCLUSION OF OBSERVATION BY ENGINEER, PATCH WITH NEW BRICK MASONRY, COURSING TO MATCH EXISTING. DURING THE REMOVAL OF THE BRICK MASONRY, TEMPORARILY PROP OR SHORE THE BRICK ENCASEMENT ABOVE AS REQUIRED WHILE STILL ALLOWING FOR ALL OBSERVATIONS TO BE CONDUCTED.

4. PROBES MARKED THUS C-** ARE 4-INCH NOMINAL DIAMETER CONCRETE CORES TO BE EXTRACTED IN ACCORDANCE WITH ASTM C-42. ROOF CORES ARE TO BE EXTRUDED FROM ADJACENT 12 INCH BY 12 INCH MINIMUM SIZE SAMPLES ONCE THESE HAVE BEEN REMOVED FROM ROOF AND ARE ON THE GROUND. CLAMP SAMPLE FIRMLY IN PLACE TO ALLOW SUCCESSFUL EXTRACTION OF CORE. TAKE CARE TO EXTRACT CORES WITHOUT CRACKING OR OTHERWISE DAMAGING THE SAMPLES. PURPOSE OF THESE CORES IS TO SEND TO THE LABORATORY FOR FURTHER TESTING. LABEL CORES TO SHOW THEIR ORIGINAL LOCATION, PROTECT FROM DAMAGE AND PACK FOR SHIPPING TO A LABORATORY TO BE DESIGNATED BY THE ENGINEER.

5. EXACT LOCATIONS OF PROBES AND CORES ARE SUBJECT TO CHANGE BASED ON FURTHER UP-CLOSE SITE OBSERVATIONS (e.g. FROM PERSONNEL LIFT) OR ON RESULTS OF NON-DESTRUCTIVE TESTING.

6. COORDINATE WITH ENVIRONMENTAL ENGINEERING CONSULTANT ON ADDITIONAL PROBES OR ON ADDITIONAL INFORMATION OR SAMPLES THAT MAY BE REQUIRED FROM DESIGNATED PROBES.

7. ALL CONCRETE FOR PATCHING SHALL BE NORMAL WEIGHT AGGREGATE. MINIMUM COMPRESSIVE STRENGTH AT 28 DAYS, F'c = 3000 psi.

8. HA-01 INDICATES ROOF CORE FOR ENVIRONMENTAL SAMPLING AS DIRECTED BY HALEY & ALDRICH.

RECORD DRAWING OF WORK COMPLETED

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v 212 736 3344 f 212 736 4466

BUILDING 52 STABILIZATION

ONE RIVER STREET
HASTINGS-ON-HUDSON, NEW YORK

SEAL

REVISIONS

REV. NUMBER	REVISION NAME
3	DECEMBER 20, 2010
2	AUGUST 13, 2010
1	JULY 12, 2010

TITLE

PROBE LOCATION PLAN

SHEET NO.

SP-1

SCALE: 1/32"=1'-0"
DATE: 7/7/10
RSA NO.: JOB 12900.02

APPENDIX D

Non Destructive Evaluation

GBG Inc

NON-DESTRUCTIVE ASSESSMENT OF FLOOR AND ROOF CONDITION
ANACONDA BUILDING 52 - HASTINGS ON HUDSON, NY

GBG

FIG. 1: FIRST FLOOR - SHOWING FLOOR SLAB SURVEY AREAS (PROBES F1 -F5)

FIG. 1a: FIRST FLOOR - PLAN   SCALE 1/32":1'

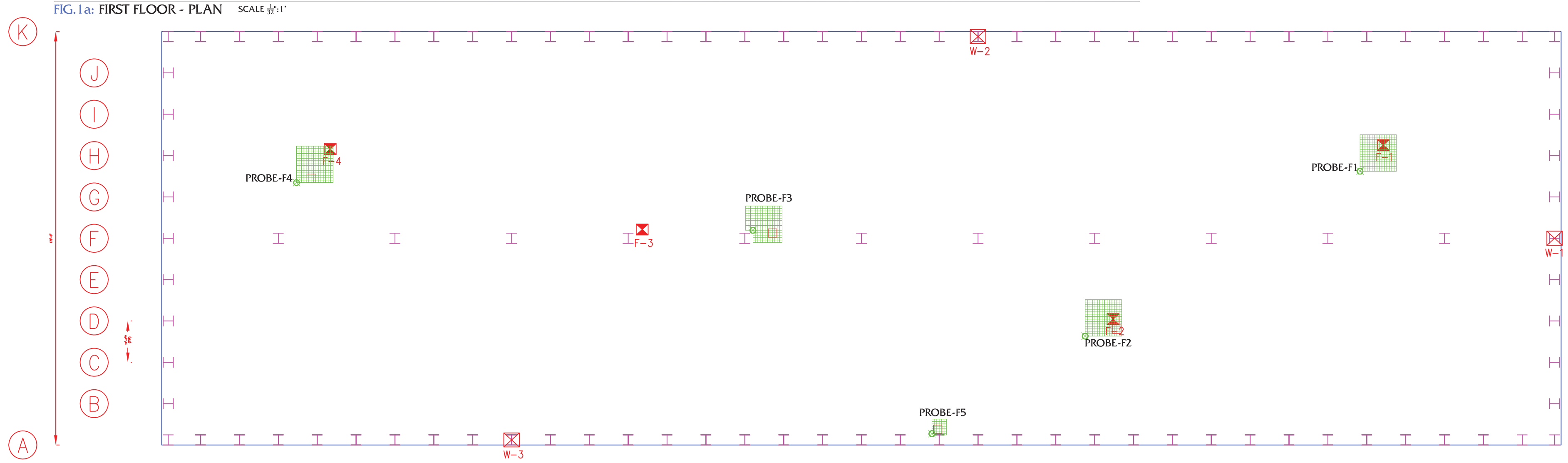
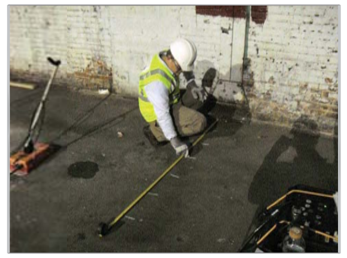
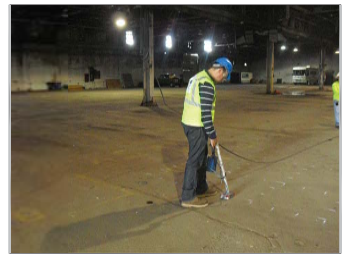


FIG. 1b: FIRST FLOOR - PROBE AREAS   SCALE 1/8":1'

FIG. 1c: FIRST FLOOR - IMAGES   SCALE 1/32":1'



P1a: MARKING OUT

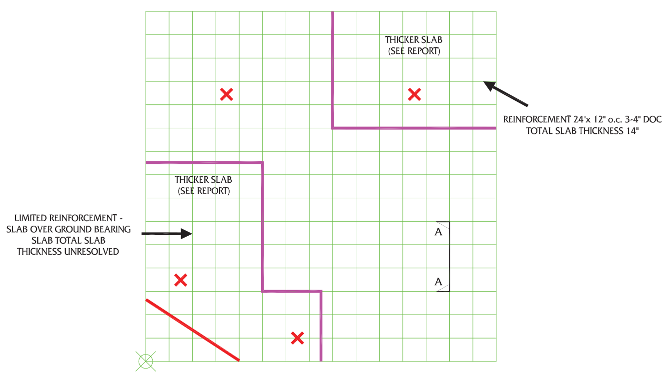


P1b: RADAR INVESTIGATION IN PROCESS

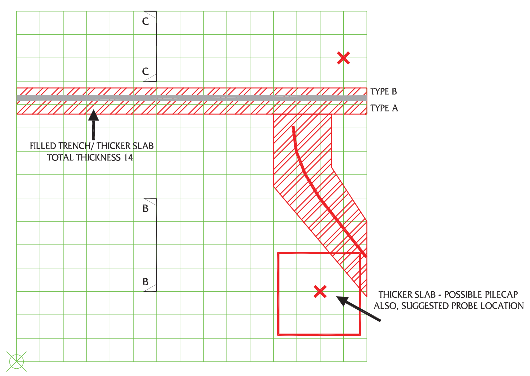
P1c: FIELD NOTES

P1d: SUSPECTED PILE LOCATIONS

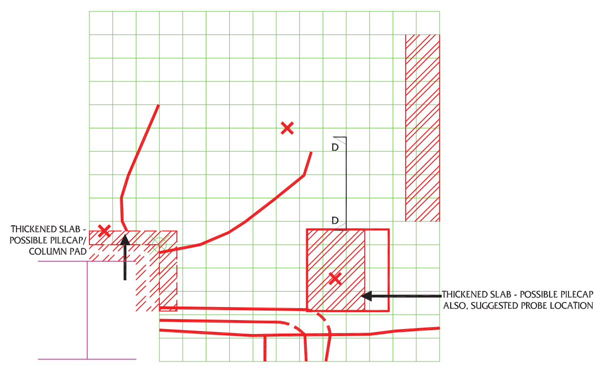
PROBE F-1



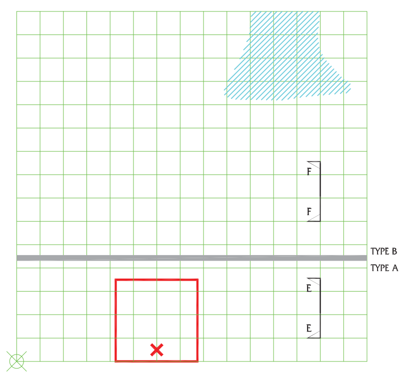
PROBE F-2



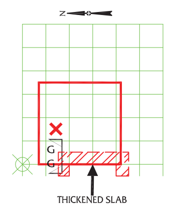
PROBE F-3



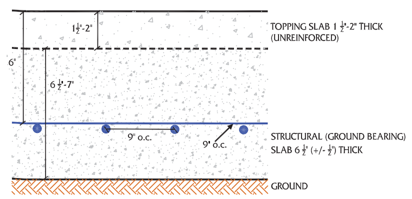
PROBE F-4



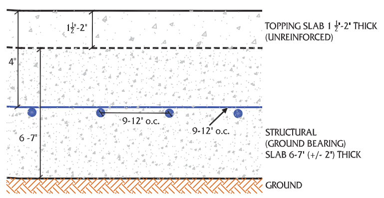
PROBE F-5



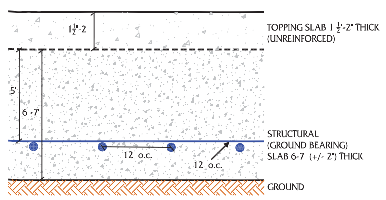
SCHEMATIC SECTION A-A



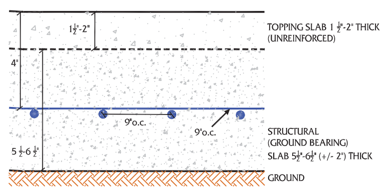
SCHEMATIC SECTION B-B



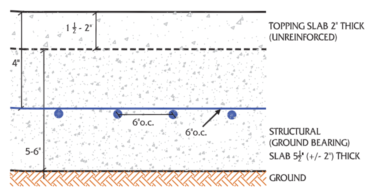
SCHEMATIC SECTION C-C



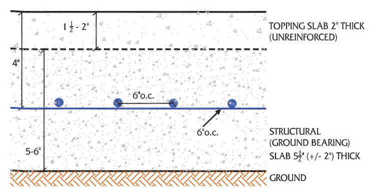
SCHEMATIC SECTION D-D



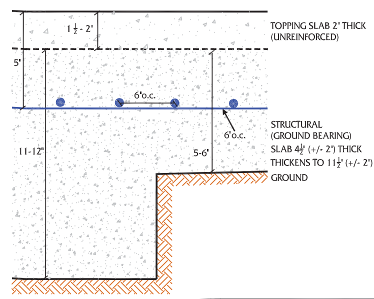
SCHEMATIC SECTION E-E - TYPE A



SCHEMATIC SECTION F-F - TYPE A



SCHEMATIC SECTION F-F - TYPE B



SYMBOLS USED

SURVEY DETAILS

- ZERO DATUM
- LOCATION OF IMPULSE RADAR SURVEY LINE
- AREA NOT SURVEYED
- P1a: PHOTOGRAPH/PLATE NUMBER
- NUMBER AND DIRECTION OF VIEW
- DATA RESPONSE CONSISTENT WITH PILE CAP
- RECOMMENDED PROBE LOCATION (3'6"X 3'6")
- CHANGE IN FLOOR CONSTRUCTION
- RESPONSE CONSISTENT WITH ELEVATED MOISTURE LEVELS IN STRUCTURAL SLAB (SEE REPORT)
- REINFORCEMENT BARS
- REINFORCEMENT BARS POORLY RESOLVED/ INFERRED IN DATA
- GROUND (ASSUMED RECLAIMED)
- FILLED TRENCH
- SHALLOW BURIED CONDUIT/ SERVICE
- POORLY RESOLVED SHALLOW BURIED CONDUIT/ SERVICE
- DEEP BURIED / SERVICE (DRAIN, FILLED TRENCH OR THICKENED SLAB)
- THERMAL ANOMALY CONSISTENT WITH MOISTURE

PROJECT DETAILS
GBG REPORT No. 10-030 ACCOMPANIES THIS DRAWING.
A TOTAL OF 2 DRAWINGS ARE INCLUDED WITH THIS REPORT, Dwg. No's 10-030-1 TO -2.

STRUCTURE INVESTIGATED	ANACONDA BUILDING 52
LOCATION	HASTINGS-ON-HUDSON
PURPOSE OF INVESTIGATION	TO ASSESS FLOOR AND ROOF CONSTRUCTION

SCALE BAR
0 10 FEET 50
AT A SCALE OF 1/32"= 1ft - ORIGINAL DWG SIZE 22X34

REFD	REVISIOND	DATED
REFC	REVISIONC	DATEC
REFB	REVISIONB	DATEB
REFA	REVISIONA	DATEA
REF.	REVISION	DATE

ALL ORIGINAL DRAWINGS ARE PRODUCED IN COLOUR

Project: ANACONDA BUILDING 52
Client: ROBERT SILMAN ASSOCIATES
Title: NON-DESTRUCTIVE ASSESSMENT OF FLOOR AND ROOF CONDITION - FIRST FLOOR PROBE AREAS
Dwg. No. 10-030-1

Drawn	Date	Scale
KA	AUG'10	AS_SHOWN
CAD	PM	APP

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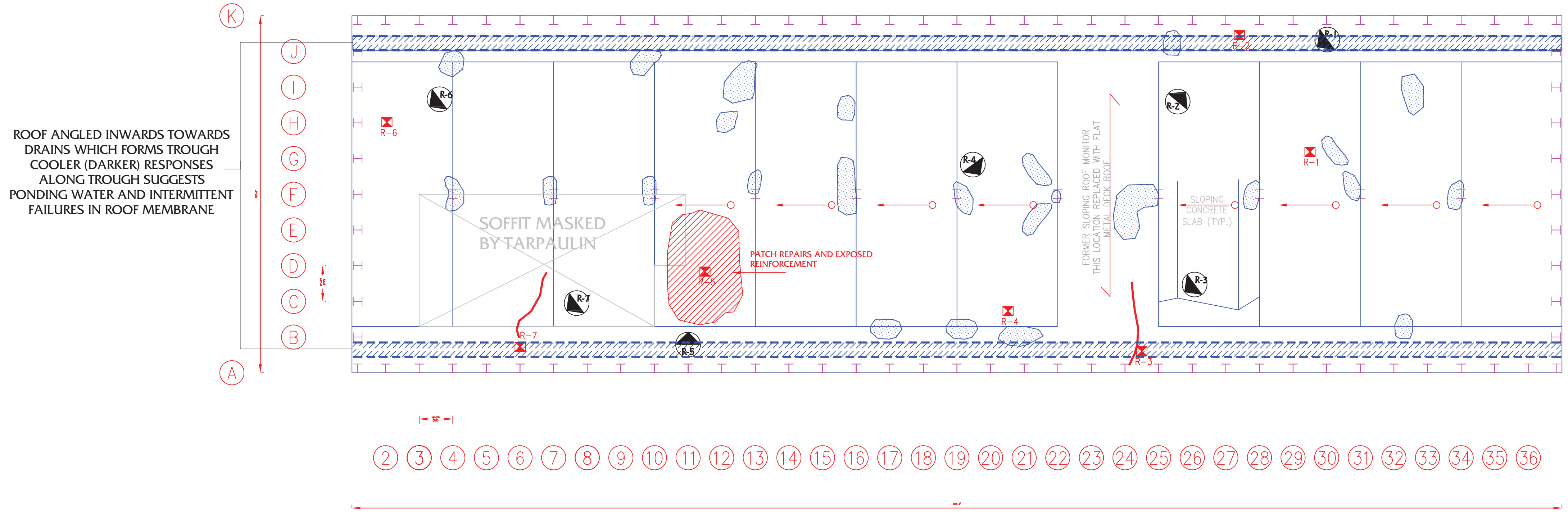
File 010-030

NON-DESTRUCTIVE ASSESSMENT OF FLOOR AND ROOF CONDITION
ANACONDA BUILDING 52 - HASTINGS ON HUDSON, NY

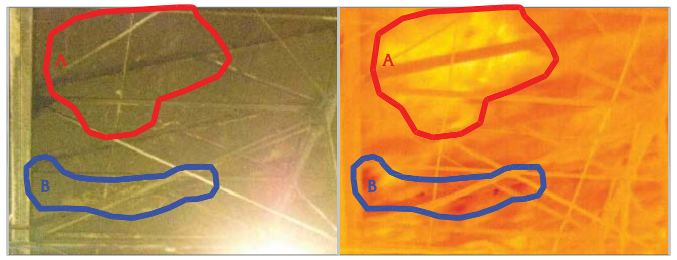
FIG.2: ROOF PLAN

FIG.2a: RESULTS OF THERMAL ASSESSMENT AND THERMAL IMAGE LOCATIONS SCALE 1/32":1'

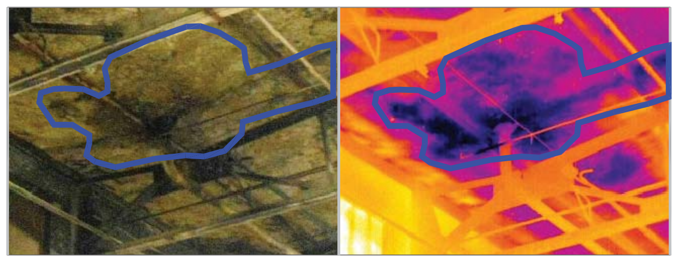


THERMAL SURVEY IN PROGRESS

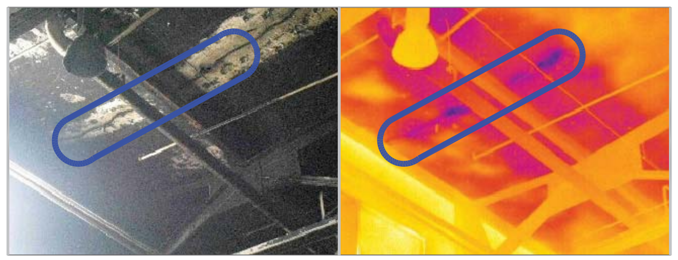
FIG.2b: IMAGES



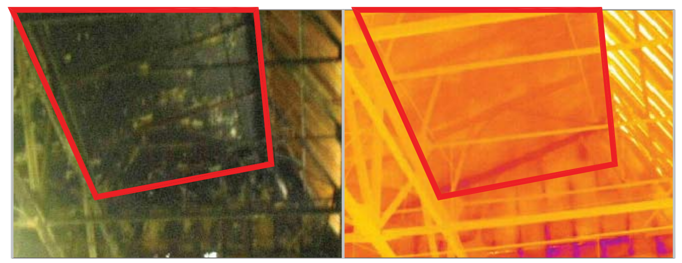
P2a: **PROBE R-1,** VIEWED WEST: VISUAL AND THERMAL IMAGES HIGHLIGHTED AREAS OF LIKELY DELAMINATING CONCRETE (A) AND DAMP (B)



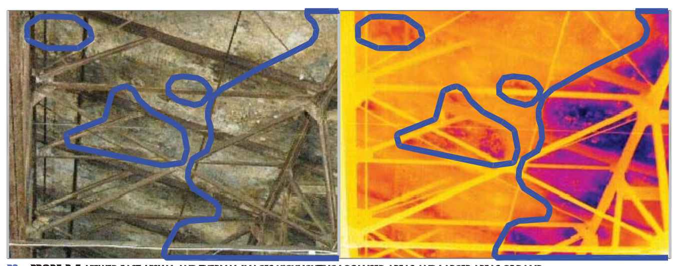
P2b: **PROBE R-2,** VISUAL AND THERMAL IMAGES HIGHLIGHTING AREAS OF DAMP PROPAGATING FROM AROUND ROOF DRAIN VIEWED SE



P2c: **PROBE R-3,** VIEWED NORTH WEST: VISUAL AND THERMAL IMAGES HIGHLIGHTING AN AREA OF DAMP AROUND A CRACK EXTENDING EAST - WEST.

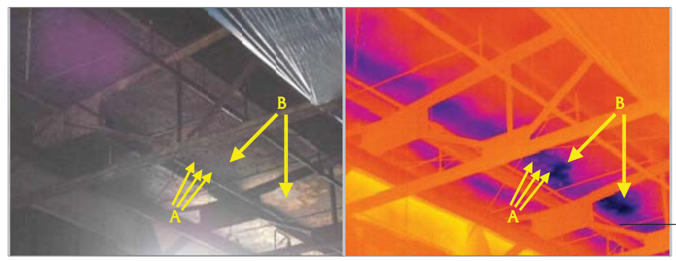


P2d: **PROBE R-4,** VIEWED EAST: VISUAL AND THERMAL IMAGES SHOWING AN AREA OF LIMITED THERMAL DIFFERENTIAL SUGGESTING LIMITED OR NO DAMAGE TO THE VISIBLE STRUCTURE.



P2e: **PROBE R-5,** VIEWED EAST: VISUAL AND THERMAL IMAGES HIGHLIGHTING LOCALISED AREAS AND LARGER AREAS OF DAMP; THE EXPOSED REINFORCEMENT IS NOT VISIBLE IN THERMOGRAPHS

P2f: **PROBE R-6** VIEWED NORTH WEST: VISUAL AND THERMAL IMAGES HIGHLIGHTING A LOCALISED AREA OF DAMP WITHIN AN AREA OF SEVERAL (ASSUMED) PATCH AREAS



NOTE: EXTENT OF TROUGH SHOWN IN THERMAL IMAGE

P2g: **PROBE R-7,** VIEWED NORTH WEST: VISUAL AND THERMAL IMAGES HIGHLIGHTING INDIVIDUAL (ASSUMED) PATCH REPAIRS (A) AND LOCALISED AREAS OF DAMP (B)

SYMBOLS USED

SURVEY DETAILS

- ZERO DATUM
- LOCATION OF IMPULSE RADAR SURVEY LINE
- NS — AREA NOT SURVEYED
- P1a: PHOTOGRAPH/PLATE NUMBER
- NUMBER AND DIRECTION OF VIEW
- DATA RESPONSE CONSISTENT WITH PILE CAP
- RECOMMENDED PROBE LOCATION (3'6"X 3'6")
- CHANGE IN FLOOR CONSTRUCTION
- RESPONSE CONSISTENT WITH ELEVATED MOISTURE LEVELS IN STRUCTURAL SLAB (SEE REPORT)
- REINFORCEMENT BARS
- REINFORCEMENT BARS POORLY RESOLVED/ INFERRED IN DATA
- GROUND (ASSUMED RECLAIMED)
- FILLED TRENCH
- SHALLOW BURIED CONDUIT/ SERVICE
- POORLY RESOLVED SHALLOW BURIED CONDUIT/ SERVICE
- DEEP BURIED / SERVICE (DRAIN, FILLED TRENCH OR THICKENED SLAB)
- THERMAL ANOMALY CONSISTENT WITH MOISTURE
- CRACK

PROJECT DETAILS
GBG REPORT No. 10-030 ACCOMPANIES THIS DRAWING.
A TOTAL OF 2 DRAWINGS ARE INCLUDED WITH THIS REPORT, Dwg. No's 10-030-1 TO -2.

STRUCTURE INVESTIGATED: ANACONDA BUILDING 52
LOCATION: HASTINGS-ON-HUDSON
PURPOSE OF INVESTIGATION: TO ASSESS FLOOR AND ROOF CONSTRUCTION

SCALE BAR
0 10 FEET 50
AT A SCALE OF 1/32"= 1ft - ORIGINAL DWG SIZE 22X34

REFD	REVISIOND	DATED
REFC	REVISIONC	DATEC
REFB	REVISIONB	DATEB
REFA	REVISIONA	DATEA
REF.	REVISION	DATE

ALL ORIGINAL DRAWINGS ARE PRODUCED IN COLOUR

Project: ANACONDA BUILDING 52
Client: ROBERT SILMAN ASSOCIATES
Title: NON-DESTRUCTIVE ASSESSMENT OF FLOOR AND ROOF CONDITION - ROOF PLAN AND IMAGES
Dwg. No. 10-030-2

Drawn	Date	Scale
KA	AUG'10	AS_SHOWN
CAD	PM	APP

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File 010-030

Anaconda Building 52, Hastings-on-Hudson, NY

Non Destructive Assessment Of Floor and Roof Condition

Final Report – 10-030

Robert Silman Associates PC

PROJECT: Anaconda Building 52, Hastings-on-Hudson, New York

TITLE: Non Destructive Assessment of Floor and Roof Condition

CLIENT: Robert Silman Associates PC

GBG Report No: 10-030

Compiled By: A. White BEng &
C.S.A. Bransby-Zachary BSc MRICS

Issued on: 26th August 2010

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GBG Inc

Anaconda Building 52, Hastings-on-Hudson, New York
Non Destructive Assessment of Floor and Roof Condition

1.0 INTRODUCTION

1.1 Terms of Reference

Structure:	Anaconda Building 52
Location:	Hastings-on-Hudson, New York
Consultants:	GB Geotechnics USA Inc. (GBG)
Instructed by:	Robert Silman Associates (RSA)
Survey Dates:	14th – 15th July 2010

1.2 General

Further to your instructions, we attended the above referenced property to carry out a non-destructive evaluation (NDE) specifically to achieve the following:

1. Determine construction arrangement of the concrete floor in selected areas
2. Identify likely pile positions beneath the floor slab
3. Map the existence and extent of elevated moisture and/or delamination within the concrete roof slab

We have now completed analysis of the data collected to date and have pleasure in providing our report of the investigation (GBG ref: 10-030) which should be read in conjunction with GBG Drawings 10-030-01 and 02. Please note that this is the final report of our findings and therefore supersedes any previous reports whether written or oral.

1.3 Background Details

Anaconda Building 52 is one of the last remaining buildings on the former site of the Anaconda Cable Company. It is understood that the current owners are undertaking works to 'make the building good' before passing ownership to the township.

Building 52, viewed North-East

In order to determine the full scope of work required to bring the building up to the required standard, information is required regarding construction arrangement and condition.

Much of the information for such a basic feasibility study could typically be acquired through traditional probing / coring; however as a result of the heavy usage of PCB's and subsequent contamination of the site, and in an effort to understand the construction and condition on a more global basis throughout the site, data was also collected using non destructive testing methods.

GBG was commissioned to carry out a non destructive evaluation (NDE), which would establish the basic construction arrangement and condition of the floor and roof slabs, and would help determine the most appropriate locations for destructive probes (organised and documented by RSA).

2.0 THE SURVEY

2.1 General

Following an on-site safety training session on the 13th of July 2010 (attended by the GBG survey team) the NDE survey was carried out by GB Geotechnics USA Inc. over 2 survey sessions with a two person team on the 14th & 15th of July 2010.

In conjunction with the owner, the Client arranged permission for the survey team to access the building for the duration of the survey. Prior to our arrival on site the Client provided floor and roof plans (including preliminary RSA probe locations) for relocation on site and for use in the presentation of our results.

2.2 Methods

On site, the investigation was carried out using non destructive testing methods: these included Infrared Thermal Imaging, Impulse Radar and Metal Detection (Pachometer); a brief explanation of each NDE technique is given below, but further technical information is available on request.

As the main investigative techniques used are non-destructive, many of the findings given in this report are based on indirect measurements and the interpretation of electrical signals, electromagnetic signals and infra red thermal images. The findings represent the best professional opinions of the authors, based on their experience of similar investigations carried out on numerous other buildings over the past 30 years; and also the results of destructive methods of coring, drilling and probing carried out elsewhere on similar materials. Such tests have substantiated many of the conclusions that have been drawn.

2.2.1 Impulse Radar

Impulse radar was used to assess the construction arrangement of the floor (on a sample basis), specifically confirming slab thicknesses, reinforcement detailing and likely pile / pile cap locations beneath.

Impulse Radar Data Collection

The recording equipment was linked via a 60ft cable to the antenna and was powered by 12V DC batteries. Recovered signals were recorded both digitally and in analogue, as a paper record, enabling both on site interpretation and a more detailed analysis of the data off site.

All survey areas were investigated using various antennae with center frequencies between 1.6GHz and 400MHz; control settings were set to obtain information through the full thickness of the floor investigated and also near surface information.

Survey grids marked in chalk on ground

Areas scanned using radar were selected by RSA, based on initially proposed probe locations and also the areas most likely to vary in construction or contain piles beneath. Typically, each area surveyed measured 15ft x 15ft; each was centered approximately over each the probe locations. A grid of measurements (1ft o.c.) were marked out in each survey area to reference all data collected.

2.2.2 Metal Detection / Pachometers

Metal detection was used in combination with impulse radar, primarily to confirm the existence and location of embedded metalwork (reinforcement) within the floor slabs surveyed in conjunction with impulse radar.

The method can positively identify that an object located is metallic and/or ferrous.

Typical Pachometer used

For the purposes of this survey it was used as a rapid scanner, allowing the presence of reinforcement or buried conduit to be found and therefore assisted in planning the radar profiles and helped to identify buried metallic objects. Metal Detectors are hand held and responses are noted by an audio signal, which is matched to a visual display of amplitude. Findings are recorded manually.

2.2.3 Thermal Imaging

A long wave infra red thermal camera was used to assess thermal variations over the exposed interior surface of the roof slab.

Changes in temperature identified through the use of thermography can be directly attributed to conditions such as:

- elevated moisture levels (damp),
- de-bonding concrete,
- voiding
- variations in construction

The thermal output of the various surfaces was recorded in high-resolution, still thermo-graphic images; these were recorded in digital format and assessed both on site and off site.

Ground Based Thermal imaging

For the purposes of this survey, we were specifically hoping to locate and map the extent of water ingress and resultant areas of elevated moisture ingress and, if possible, confirm whether spalling / delaminating concrete could also be resolved using this method.

3.0 FINDINGS

3.1 Overview

The findings and the conclusions reached have been derived from thorough data analysis using the various NDE techniques described above.

The findings are discussed briefly below are also presented on Drawings 10-030-01 and 02, which should be read in conjunction with this report. The two main phases of work (floor and roof slab surveys) are discussed separately below:

3.2 Floor Slab Survey

The results of the warehouse floor survey are presented on Drawing 10-030-1; this includes the location of all NDE survey areas, proposed probe locations, results in plan (for each survey area) and schematic sections through each section of floor surveyed.

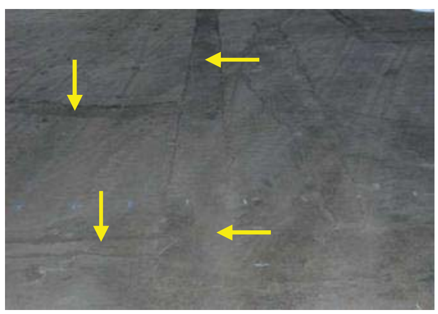
The floor slab construction has been assessed in detail over 5 areas (F-1 to F-5) using impulse radar and metal detection. Data was collected through the full thickness of the floor slab and into the supporting materials beneath.

Calibration through the concrete was not possible as the slab is ground bearing and, as such, no direct transmission could be taken through a known thickness of concrete. As calibration was not possible depth estimates through the slab and to reinforcement layers have been made using an assumed material wave speed of 10cm/ns which is typical for a well compacted concrete and normal levels of moisture.

Note: Once cores have been taken through the slab, they should be measured and the slab thickness compared to the radar data depth estimates. Any percentage error in material velocity identified and subsequent changes in concrete thickness estimates can then be adjusted for all survey areas.

3.2.1 Slab Construction

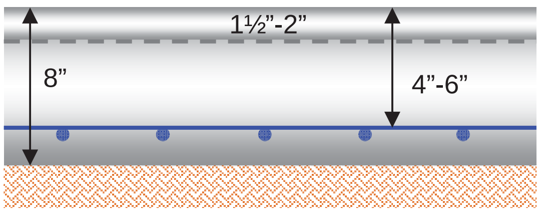
The overall floor slab construction is similar throughout; however variations in thickness and reinforcement placement were identified, which tend to relate to concrete filled service / pipe trenches (typically visible at the surface), repaired sections of slab (again typically visible at the surface), possible machine bases, changes in construction and likely pile cap locations beneath.



Visible service / pipe trenches

The typical floor slab arrangement appears to consist of an 8” thick reinforced concrete slab. The slab may incorporate a 1½ - 2” thick topping or screed; however any boundary between the two layers was poorly resolved therefore the screed could not be confirmed. The main slab contains reinforcement placed transverse and longitudinal to the warehouse walls at 9” o.c and at a depth of 4-6” deep. In some locations reinforcement is placed as tightly as 6” o.c. and as lightly as 24” o.c.; the placement depth also varies in places (See section below).

Note: bar sizes could not be provided as part of the NDE as the typical placement depth of 6” exceeded that required to obtain reliable sizing results using a Pachometer. As a result, bar sizes must be recovered during the probing phase.



Schematic section through floor slab showing typical Slab Construction

Schematic sections through the slab are provided for each area surveyed (Areas F1 to F5); these include concrete thickness, reinforcement spacing, conduits, trenches and likely pile locations (*See Sections A-A to G-G, Figure 1b*). The results from each area are also described in detail below:

- ***Probe (Survey Area) F-1*** – Data collected through Area F-1 identified 3 different slab designs. The central section of slab (extending NE to SW through survey area) represents the typical slab construction explained above. The NW and SE corners of the area however revealed thicker sections of slab, which appear to be at least 14” thick and contain reinforcement that is placed 12” o.c. in one direction and sparsely at 24” o.c. in the other.

  Other items resolved in the data were one near surface diagonal conduit or pipe and 4 possible pile locations (see ‘X’ symbols on drawing), which were selected due to an anomaly in the data (*See Section 3.2.2 for detailed explanation of pile cap data analysis*).

- ***Probe (Survey Area) F-2*** – Data collected through Area F-2 identified 2 different slab designs. Type A Construction (See Section B-B) represents the typical slab design; however Type B (See Section C-C), although being the same overall thickness (8” approx) contains reinforcement placed 12” o.c. in both directions. The bars are also placed deeper into the slab at approx 6-7” from the finished surface.

Visible changes in construction (See Red hatched areas) were confirmed as representing either a service trench (*note:* near surface pipe / conduit traced through center of diagonal trench) or occurred either side of a change in construction (between Type A and B construction).

Two potential pile cap locations were identified at Probe F-2. The data response at the SW corner identified a significant localised change in construction (reinforcement), therefore a probe was considered a likely pile location.

- ***Probe (Survey Area) F3*** – Data collected through Area F-3 identified only the typical slab design throughout.

  Three localised sections of slab were however confirmed as being thicker. One linear section is assumed to be a concrete filled trench; however the remaining two thicker sections could represent pile cap locations as one extends around a column and the other is coincident with the adjacent column line.

  One probe location has been recommended in the SW corner of Area F-3, where a pile cap may exist. Finally, a number of near surface linear features (pipes or conduits) extend along the west boundary of the survey area. *Note:* Care should be taken to avoid these features if adjacent probing is carried out as recommended.

- ***Probe (Survey Area) F4*** – Data collected through Area F-4 identified 2 different slab designs. Type A Construction (See Section E-E) & Type B (See Section F-F). The slab designs are essentially the same (typical slab design); however the transverse and longitudinal reinforcement for each area is placed in opposing directions.

  Area F-4 contained the only section of concrete which appears to contain increased moisture levels. *Note:* the apparent increase in moisture has been detected through analysis of radar data only. The response is restricted to this area only and is therefore unlikely to represent a widespread problem (probing in other locations will confirm whether a problem of moisture infiltration exists).

  One probe location has been recommended along the East boundary of Area F-4, where a pile cap may exist. At this location the slab did not appear to be thicker; however a localised increase in reinforcement might represent a pile cap and was therefore deemed to be an area of interest for probing purposes.

- ***Probe (Survey Area) F5*** **–** Area F-5 was much smaller than Areas F1-F4; the slab construction was found to be of typical design. One probe has however been recommended in this area where the concrete appears to thickens to approx 11”-12” around a column base and may therefore represent a pile cap location (See Section G-G, which illustrates the apparent thicker concrete at this location).

3.2.2 Pile Caps

We understand that the warehouse is built over reclaimed land (adjacent to the Hudson River) and is therefore likely to be supported over piles; these are believed (by RSA) to be spaced at approximately 8ft o.c. Documentation available is however only limited and only represents the original design; the actual location of the piles therefore remains unknown.

Typical red ‘X’ marked on site to denote the potential location of a pile cap

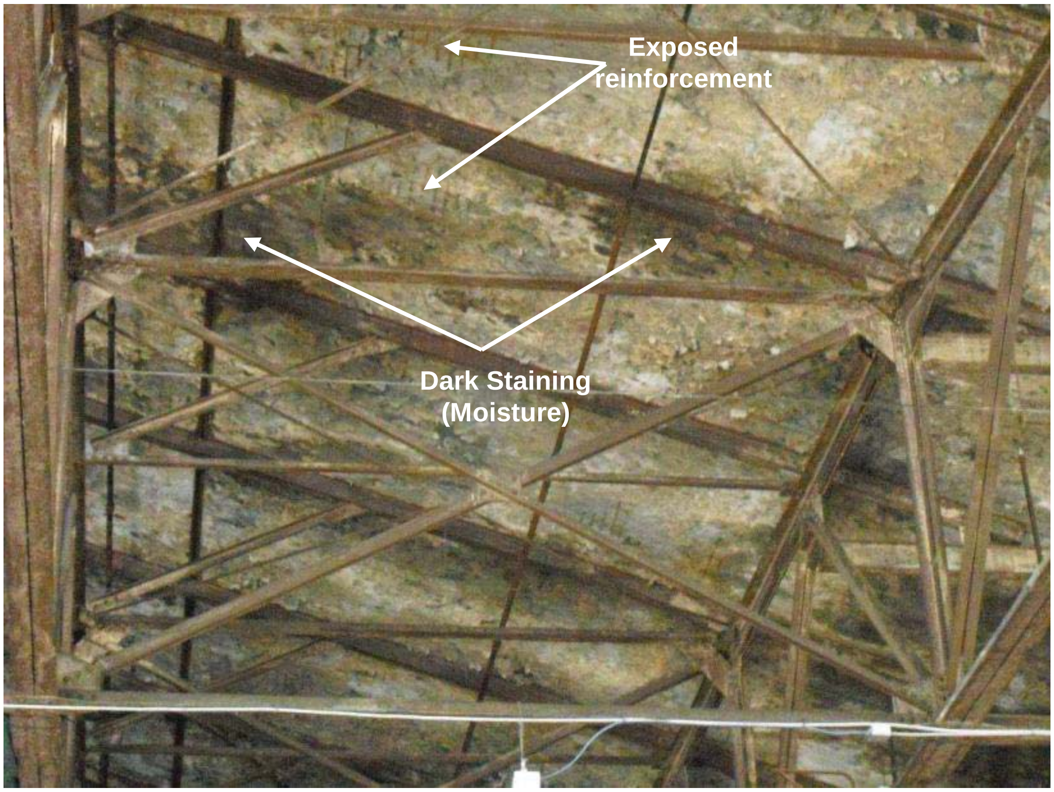
As part of this survey GBG were asked to locate pile caps; however as the pile cap design (assumed thicker concrete with timber pile beneath) is unknown, radar data was scanned for anomalies in the form of apparent localised variations in reinforcement (typically increases) or sections of slab which were thicker than others and did not appear to relate to services trenches or other construction changes / repairs.

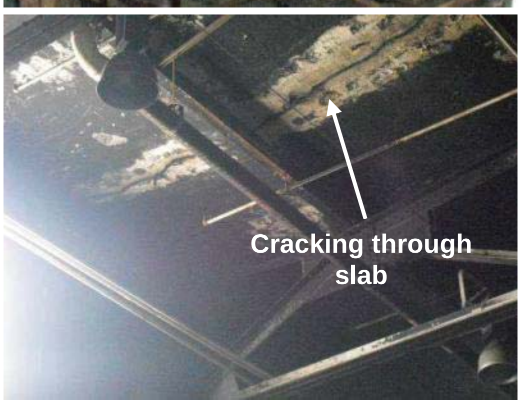
The data collected in each of the areas has been analysed in detail, which has included plotting of any anomalies that could represent pile cap locations. Where a localised variation in construction has been identified in the data an ‘X’ has been placed on the drawings (and painted on site - See photo above) to denote a possible pile cap position.

Where the data responses and variations are significant a probe location has also been recommended. Taking the above description into consideration, there is no guarantee that a 'X' symbol and associated probe will reveal a pile cap; however without excavating the entire slab, they do currently represent potential positions.

3.3 Roof Slab Survey

The roof structure is a 'saw tooth' design with continuous troughs on each side of the building, extending North – South (rainwater discharge into drains). A system of exposed steel trusses provides support to the structure between the column locations indicated on the plans. The interior finish of the roof is generally exposed concrete, with some areas clad in metal sheet and some painted.





Images of Roof Soffit
Top – Showing spalling concrete and exposed reinforcement
Bottom Left – showing cracking through slab and section coated in black paint
Bottom Right – showing complex truss arrangement through which scanning took place

Visual inspection from ground level shows the warehouse roof slab to be in poor condition; although little is known about the embedded reinforcement condition. Parts of the soffit are covered in dark staining, suggesting an active water ingress problem (the roof is known to leak); other parts of the roof are cracked and in places the reinforcement is clearly visible suggesting a problem of spalling concrete most likely associated with long term water infiltration through the slab. *Note:* All these conditions are shown in the example photos of the soffit on the previous page.

Large sections of the soffit are also covered in small light patches, which could a number of things: including localised repairs, spalls or perhaps the remnants of an adhesive, which used to hold interior finishes to the exposed concrete. The origin or reasons for the patches is not known.

The soffit surface is therefore highly variable in its finish and visible condition. We understand that probes are to be taken through the roof slab (organised by RSA) to better understand its general construction and condition. In order to help target these probes and to provide more widespread information across the slab GBG carried out a thermal review of the soffit from ground level.

3.3.1 Thermal Review

The results of the thermal review are presented on Drawing 10-030-2; this includes thermal images taken at each of the recommended probe locations through the soffit and also annotation and explanation of each image used.

A long wave infra red thermal camera was used to assess thermal variations over the soffit. Variations in surface temperature can be attributed to a number of different factors such as retained moisture, damaged / spalling masonry and concrete, and also major changes in material thickness and voiding.

It is variations from the ambient temperature which are mapped as part of the thermal review, therefore an understanding as to the likely reasons for any variations and also the survey conditions are critical to the results collected and the analysis provided.

Mapping Moisture - For the purposes of this survey cooler (darker) responses were most likely to represent increased near surface moisture as the moisture itself would be cooler than the slab and evaporative cooling across the surface would increase the thermal contrast making them relatively straight forward to plot using this method.

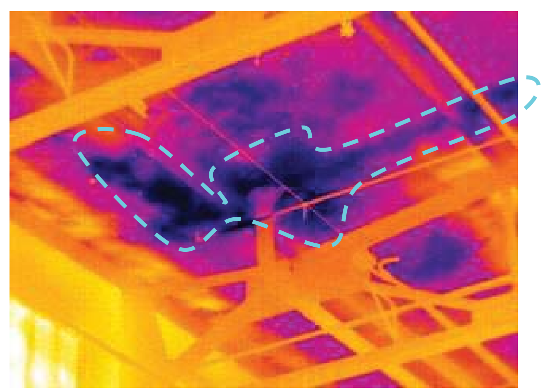
Mapping Spalling - Typically identification of a spall relies on that spall cooling or heating more rapidly than the surrounding concrete as it becomes detached from the main body of the surrounding concrete. The heating and cooling cycle however relies on the slab heating or cooling. A secondary method of mapping spalls would be to look for discontinuities in thermal transfer through the slab, where sections of concrete that were delaminating or cracked should transfer heat through the slab at different rates to sections of good condition (well bonded and well compacted) slab.

For the purposes of this survey, GBG was hoping to confirm whether tracking of a spall was indeed possible from ground level so that if the NDE results correlated with probe results then a more extensive scan (at closer proximity to the roof slab) might be of significant use to the client in mapping the extent of spalls throughout the warehouse, without the need for time consuming and logistically challenging sounding work.

Note: It is important to understand that the remote thermal scanning as described above cannot provide structural information regarding the slab (thickness, rebar arrangement etc); it can only provide a comparative condition assessment of surface condition that focuses on areas of increased moisture and potentially of delaminating and spalling concrete.

3.3.2 Increased Moisture / Water Ingress

Immediately prior to carrying out the site survey work a significant amount of rain had fallen (two days of heavy rain); this provided ideal conditions for mapping water ingress at the slab soffit.



Example Thermal Image – Cooler (darker) responses across the soffit surface revealed increased moisture

An initial set of images were collected focussing only on the 7 locations (R-1 to R-7), which had been selected by RSA as potential probe locations (See Figure 2a for locations). Areas of increased moisture ingress were first mapped and a thermal image taken at each of these locations is presented and annotated on the drawings provided (See Fig 2b).

Following the initial review of the probe locations, a more general survey was undertaken of the soffit. Thermal images were collected within each of the bays from a number of vantage points in order obtain the best possible coverage of the roof slab. Due in part to the previous heavy rainfall, identification of moisture was relatively straightforward. The areas have been plotted in plan on Drawing 10-030-02, Fig 2a.

Note: As areas of increased near surface moisture were widespread, only the most significant of these areas has been plotted onto the drawings. A more detailed thermal scan would be required to plot all areas of increased moisture.

The most significant areas of increased moisture were identified around roof drains suggesting that the waterproofing around the drain penetrations have deteriorated and failed. The design of the roof includes for longitudinal troughs, which channel rainwater towards the drains; standing water occurring over long periods, (perhaps due to blockages in the drains or build up of vegetation), also may have deteriorated the roof as increased moisture was also apparent along the trough lines (See Drawing 10-030-2 for extent of troughs and comments on likely problems associated with them).

One additional observation was that water ingress tends to occur around the columns along the center line of the building.

3.3.3 Mapping of Spalling / Delaminating Concrete

Identification of delamination and spalling using this technique was a more difficult task. The surface condition of the soffit was highly variable therefore it was not possible to identify smaller localised spalls from ground level. Instead, the analysis focussed on identifying larger areas of slab which looked like they might be spalling / delaminating.

A large proportion of the images collected contained sections of localised hotter responses; which could suggest a widespread problem of spalling and delaminating concrete.

It is also possible however that the hotter responses may also relate to changes in surface coating such as the black (presumably waterproof) coatings, the small patches observed almost everywhere or even sunlight reflecting back to the soffit from steel trusses and girders.

Example Thermal Image - of numerous hotter (lighter) thermal responses that ‘could’ represent spalling and

As a result of the various analysis considerations explained above, our recommendation is to confirm the accuracy of the thermal imaging results collected during the probing phase. Documentation of probing and ideally localised sounding work in the area surrounding the probes will identify whether delaminating or spalling sections of concrete exists. With this information available the thermal images for each of the probe locations R-1 to R-7 can be reanalysed to see whether the thermal variations correlate with the physical sounding assessment.

As the results were so variable and will require calibration through probing / sounding (as discussed above is necessary) the hotter responses have not been plotted in plan; only one example is shown (See Fig 2b, Probe R-1, response A) on the drawings provided.

4.0 SUMMARY

The program of NDE has provided construction related information for the concrete floor slab and comparative condition related information for the roof slab, which has helped to target planned probing work and has provided generalized information regarding the warehouse construction and condition that would not be possible if only probing had been carried out.

4.1 Floor Slab Construction

As expected the warehouse slab has a typical design throughout, but has numerous repaired sections, service trenches, construction changes (including variable reinforcement designs) and thicker sections, which might either relate to original machine bases or pile cap locations. A suitable sample of these different conditions will be included within the probing scope in order to better understand the floor slab arrangement, and hopefully to locate some of the piles to confirm both their design and approximate placement pattern.

If individual piles are located during probing (based on the NDE results), then this should provide calibration to the existing data and should ultimately allow for impulse radar to map the locations of other piles, should the client request this information.

Although the survey was limited to just 5 small areas, no evidence of any underground rooms or significant voiding was resolved. It should however be remembered that the warehouse is extremely large therefore a more extensive survey would be required to confirm whether any large open voids actually exist beneath the site.

Typically, the radar data collected was consistent throughout each of the survey areas scanned. The data transmission was relatively good through the slab and also of the reinforcement, suggesting that the concrete is likely to be typically well compacted through the full depth of the slab and around the reinforcement. Little evidence of any voiding was identified within the supporting materials.

Information recovered during the probing phase should be well documented and if requested GBG would be happy to adjust depth estimates (which are currently based on assumed material velocities of radio waves through concrete) and add an addendum to this report for explanation.

Should additional work be required to map more accurately the locations of piles (based on probe results) or to scan additional areas of slab, which may be of specific interest (perhaps to identify voiding within and/or beneath the slab, then GBG would be happy to provide proposals for this work.

4.2 Roof Slab Condition

Infrared thermal images of the roof slab soffit have confirmed that water infiltration is a significant problem, which may have caused lasting damage to the embedded reinforcement and concrete. Active water leaks occur during heavy rainfall (confirmed at time of survey) and are focussed around the linear troughs, which extend along each side of the roof and which help channel water to the roof drains (which themselves leak). Water ingress (increased moisture in the concrete) was also identified around the columns located along the center line of the building.

Planned probing through the roof will provide additional information on construction arrangement and importantly will confirm the condition of both the concrete and the reinforcement. Close visual inspection should also resolve the reasons for the numerous small patches all over the roof surface.

In order to calibrate the thermal review results, specifically with regard to potential thermal responses to spalling and separation, sounding work is recommended adjacent to the planned probes. If documented during the probing phase, GBG would be happy to use this information and review the existing thermal data available. This process would help to calibrate the thermal data and provide a better understanding as to whether the existence and extent of spalling and delaminating concrete can be mapped using this method.

If the information can be collected remotely (using thermal imaging), then it should be considered for use in a more extensive survey across the soffit (*as an alternative to traditional sounding*) using a mobile scissor lift which would allow for more detailed thermal images to be collected. This would improve the quality of images collected and would allow for accurate mapping and plotting of all spalling and areas of increased moisture.

Finally, based on the results of the probes taken, additional NDE work could be considered in order to provide more widespread information regarding the construction and condition of the roof. On a comparative basis for example the condition of embedded reinforcement (including depth of cover, placement and size) can be established using non destructive methods. Hand access to the soffit however would need to be provided in order to achieve this.

APPENDIX E

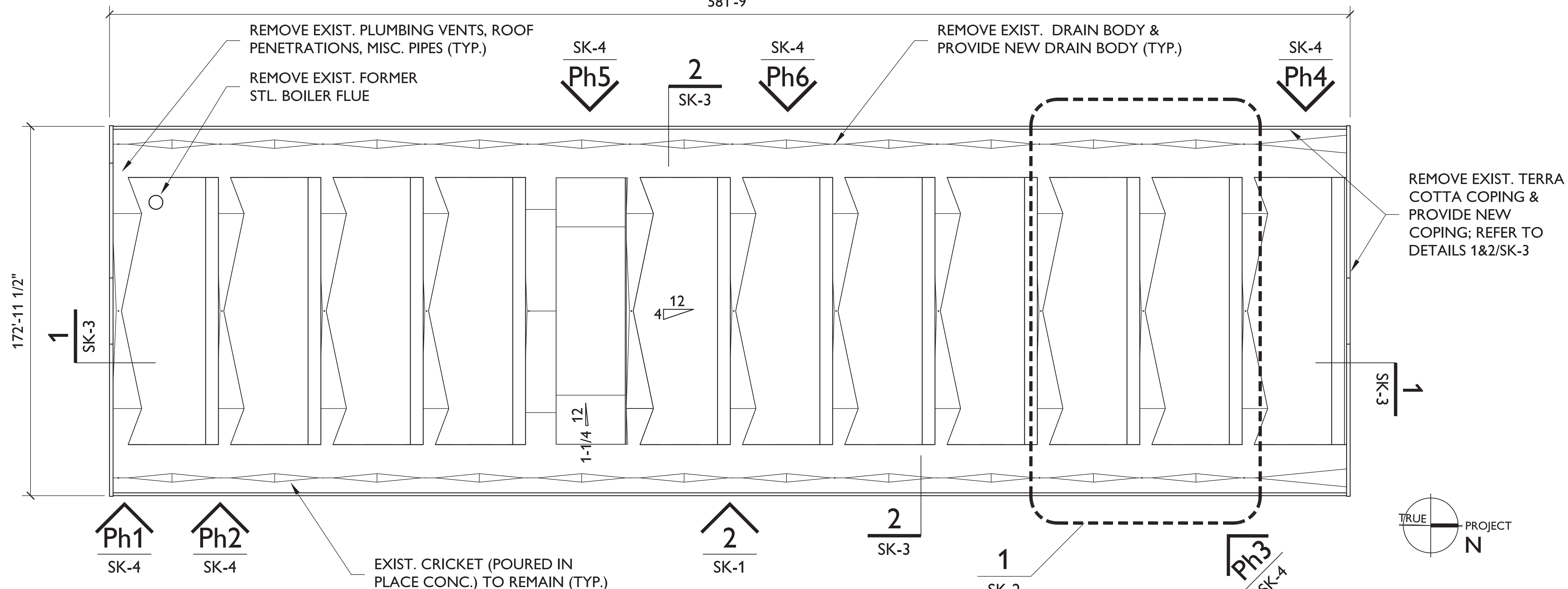
Roof Repair Drawings

James R. Gainfort, Architect

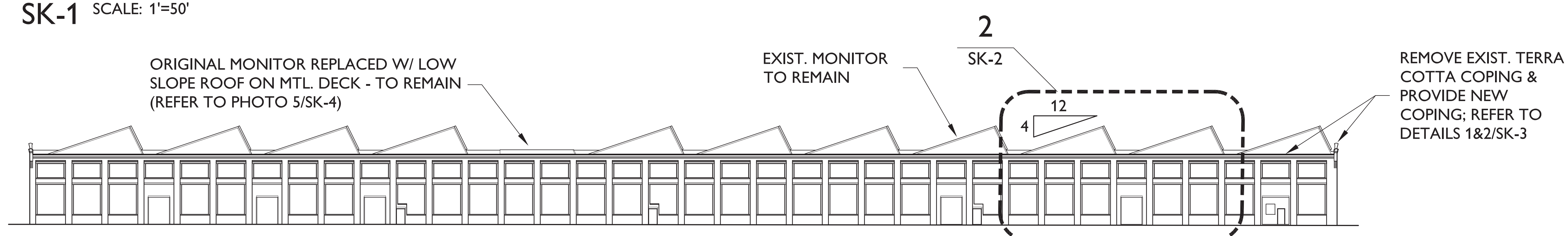
HASTINGS ON HUDSON - BUILDING 52
PRELIMINARY SCOPE OF WORK

ROOF AREA:

SKYLIGHT MONITOR	4,500 sf + 1,450 sf = 5,950 sf	x (11) =	65,450 sf
SKYLIGHT CRICKETS	350 sf + 350 sf = 700 sf	x (11) =	7,700 sf
TOTAL AREA (11) SKYLIGHT MONITORS / CRICKETS:			73,150 sf
AREA OF ROOF (NOT INCL. SKYLIGHT MONITORS):			35,800 sf
TOTAL ROOF AREA:			108,950 sf



1 ROOF PLAN
SK-1 SCALE: 1'=50'



2 EAST ELEVATION
SK-1 SCALE: 1'=50'

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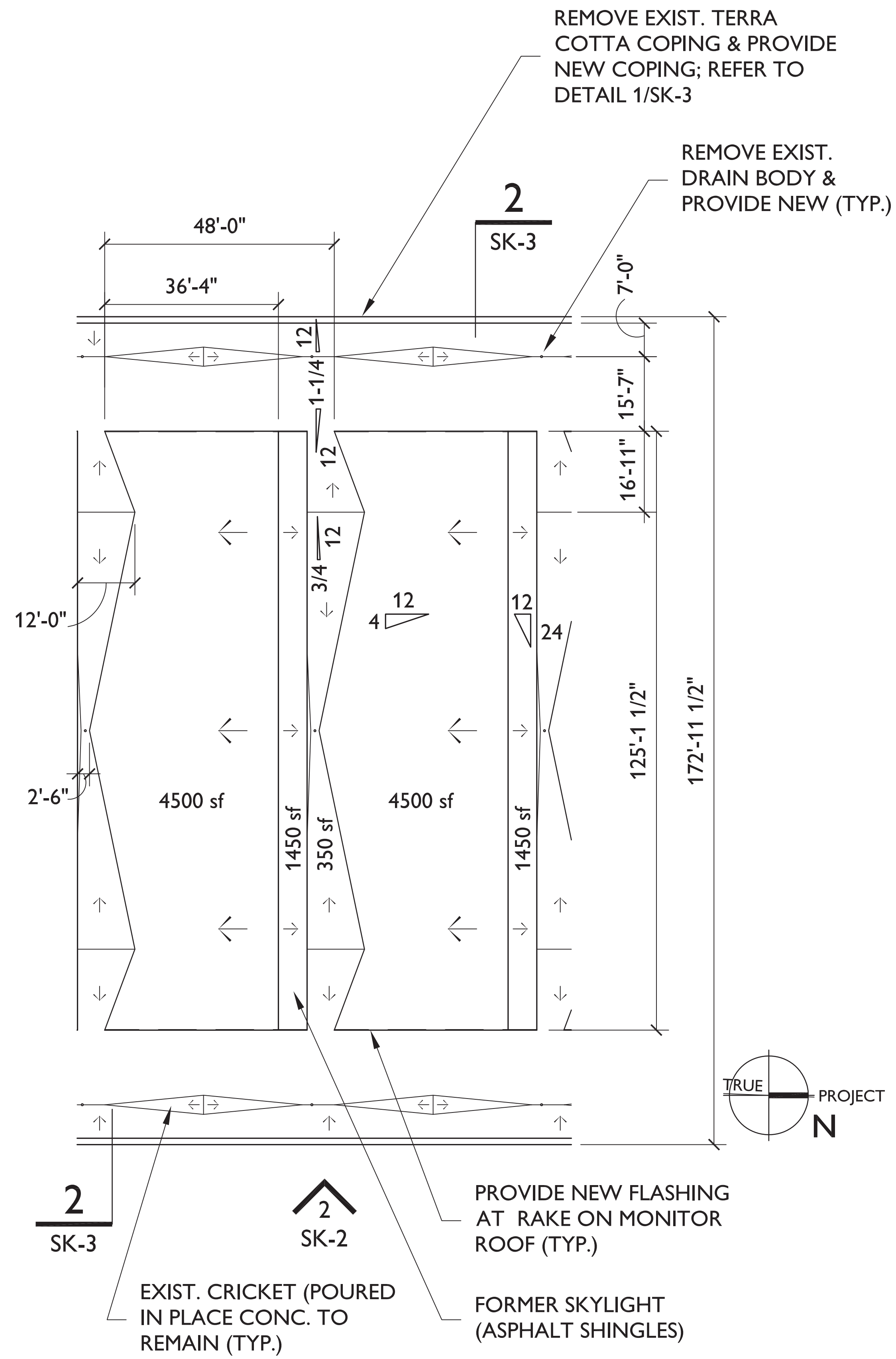
Title Roof Plan & East Elevation - Preliminary S.O.W.

Project Hastings on Hudson Building 52

Date 8 Nov 2010
Scale 1" = 50'
Job No. 1010
Dwg No. SK-1

James R. Gainfort AIA, Consulting Architects PC
121 W 27th St, Suite 803 New York, NY 10001-6207
vox 212 736 3344 fax 212 736 4466



1 ROOF PLAN DETAIL

SK-2 SCALE: 1/32" = 1'-0"

ROOF S.O.W. NOTES:

DEMOLITION:

1. SCRAPE LOOSE / EXCESSIVELY BUILT-UP MAT'L AT MAIN ROOF & MONITOR SURFACES.
2. REMOVE ASPHALT SHINGLES AT EXIST. SKYLIGHT COVERS.
3. DEMO. CEM. PLASTER SIDE WALLS OF MONITORS, INCL. ASSOC. LIGHT MTL. FRAMING.
4. REMOVE ALL DRAIN BODIES, FLASHING, TERRA COTTA COPING, FLUES, PENETRATIONS & MISC. PIPEs.

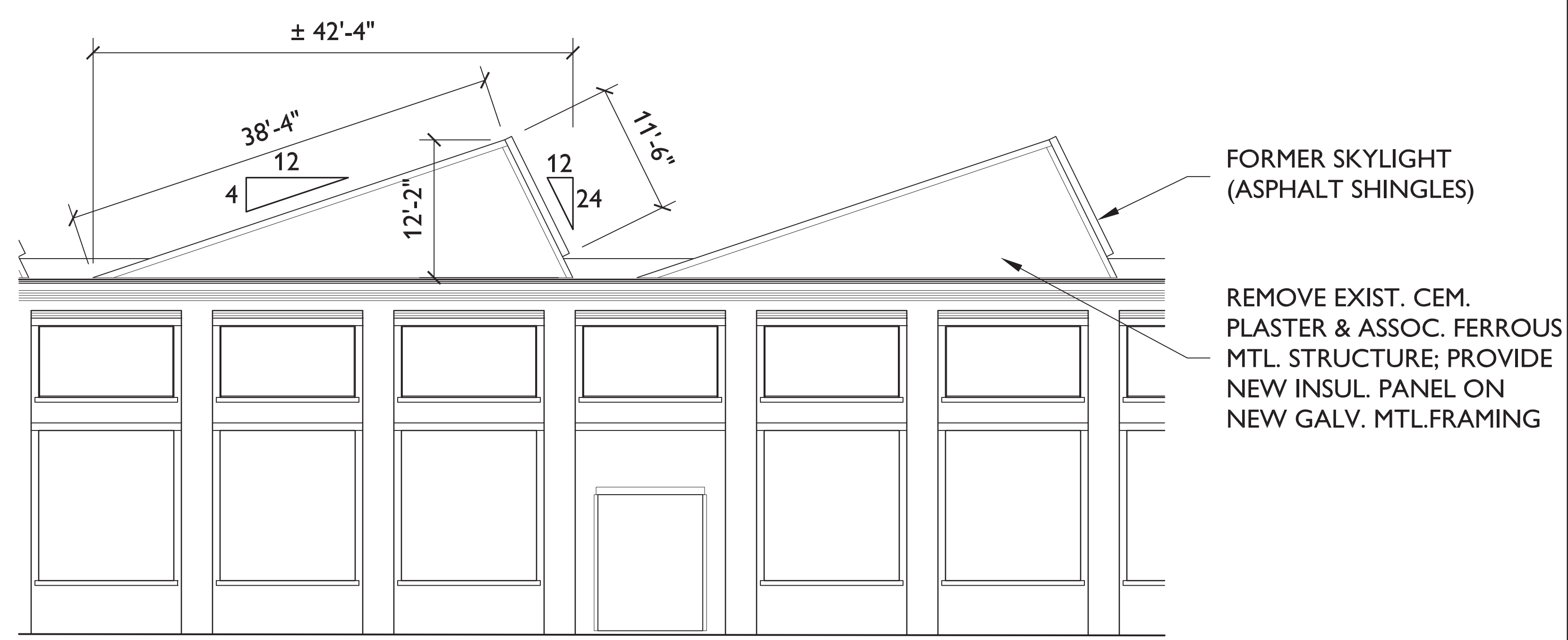
WHERE ROOF DECK BECOMES EXPOSED, REVIEW CONDITION OF CONC. & REPAIR IF REQ'D., REFER TO STRUCT'L ENGR'S S.O.W. WHERE CONC. MUST BE REPAIRED, ASSUME 100% REMOVAL OF EXIST. MEMBRANE.

MAIN & MONITOR ROOFS:

5. PROVIDE NEW (2) 2" LAYERS (4" TOT.) RIGID POLYISO. INSUL. BD., MECH'LY ATTACHED. STAGGER LAYERS & USE TAPERED INSUL. WHERE NEC. TO CORRECT / IMPROVE PITCH. PROVIDE NEW 1/2" CEM. BD. COVER OVER INSUL., MECH'LY ATTACHED. PROVIDE NEW WHITE, FULLY-ADHERED 60-MIL TPO (SPECTRO-WELD REINFORCED TPO MEMBRANE BY 'CARLISLE SYN-TEC').
6. PROVIDE NEW DRAIN BODIES; IF NEC., REPLACE LENGTHS OF DRAIN TAILPIECES / ELBOWS, ETC BELOW.
7. PROVIDE NEW RAKE FLASHING AT MONITOR SIDE WALLS.
8. AT EXIST. SKYLIGHT COVERS, PROVIDE NEW (2) 2" LAYERS (4" TOTAL) RIGID POLYISO. INSUL. BD., MECH'LY ATTACHED (STAGGER LAYERS). PROVIDE NEW WHITE, FULLY-ADHERED 60-MIL TPO (SPECTRO-WELD REINFORCED TPO MEMBRANE BY 'CARLISLE SYN-TEC').
9. PROVIDE NEW GALV. STL. FRAMING & INSUL. MTL PANELS AT MONITOR SIDE WALLS.

MASONRY PARAPETS:

10. REVIEW CONDITION OF MAS.; REBUILD TO INSURE STABILITY.
11. NORTH & SOUTH FACADE PARAPET WALLS: SHEATH ROOF SIDE FACE OF PARAPET W/ CEM. BD.; ADHERE TPO TO FACE OF BDS. PROVIDE NEW PLYWD., SELF-ADHERED SHT. WATERPROOFING & TPO-CLAD SHEET MTL. COPING; HEAT WELD TO VERT. TPO. REFER TO 1/SK-3.
12. EAST & WEST FACADE PARAPET WALLS: PROVIDE NEW PLYWD., SELF-ADHERED SHT. WATERPROOFING & TPO-CLAD SHEET MTL. COPING; HEAT WELD TO TPO FIELD MEMBRANE. REFER TO 2/SK-3



2 EAST ELEVATION DETAIL

SK-2 SCALE: 1/16" = 1'-0"

Title Roof & East Elevation Details / S.O.W. Notes

Project Hastings on Hudson Building 52

Date 8 Nov 2010
Scale As Noted
Job No. 1010
Dwg No. SK-2

James R. Gainfort AIA, Consulting Architects PC 121 W 27th St, Suite 803 New York, NY 10001-6207 vox 212 736 3344 fax 212 736 4466

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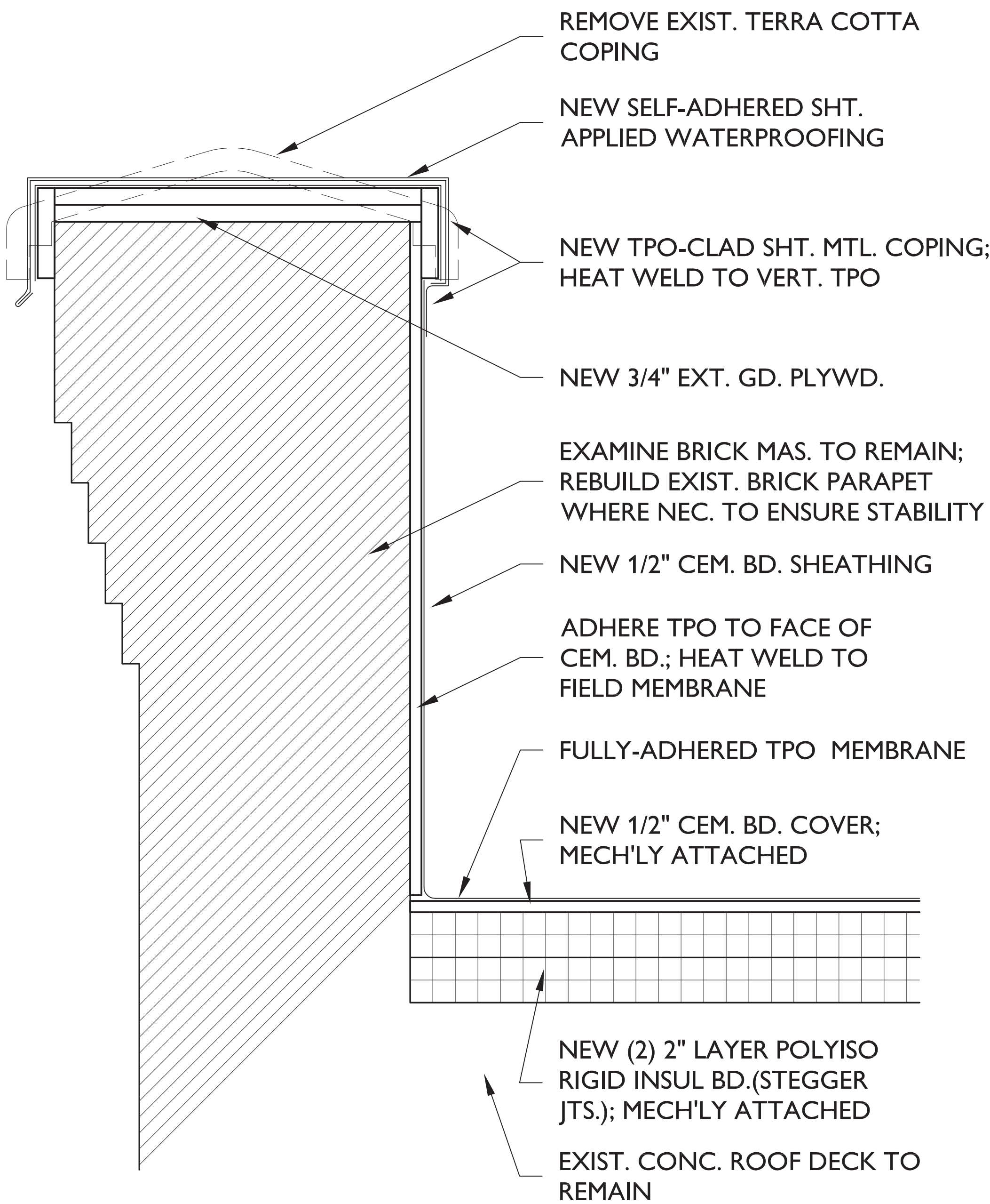
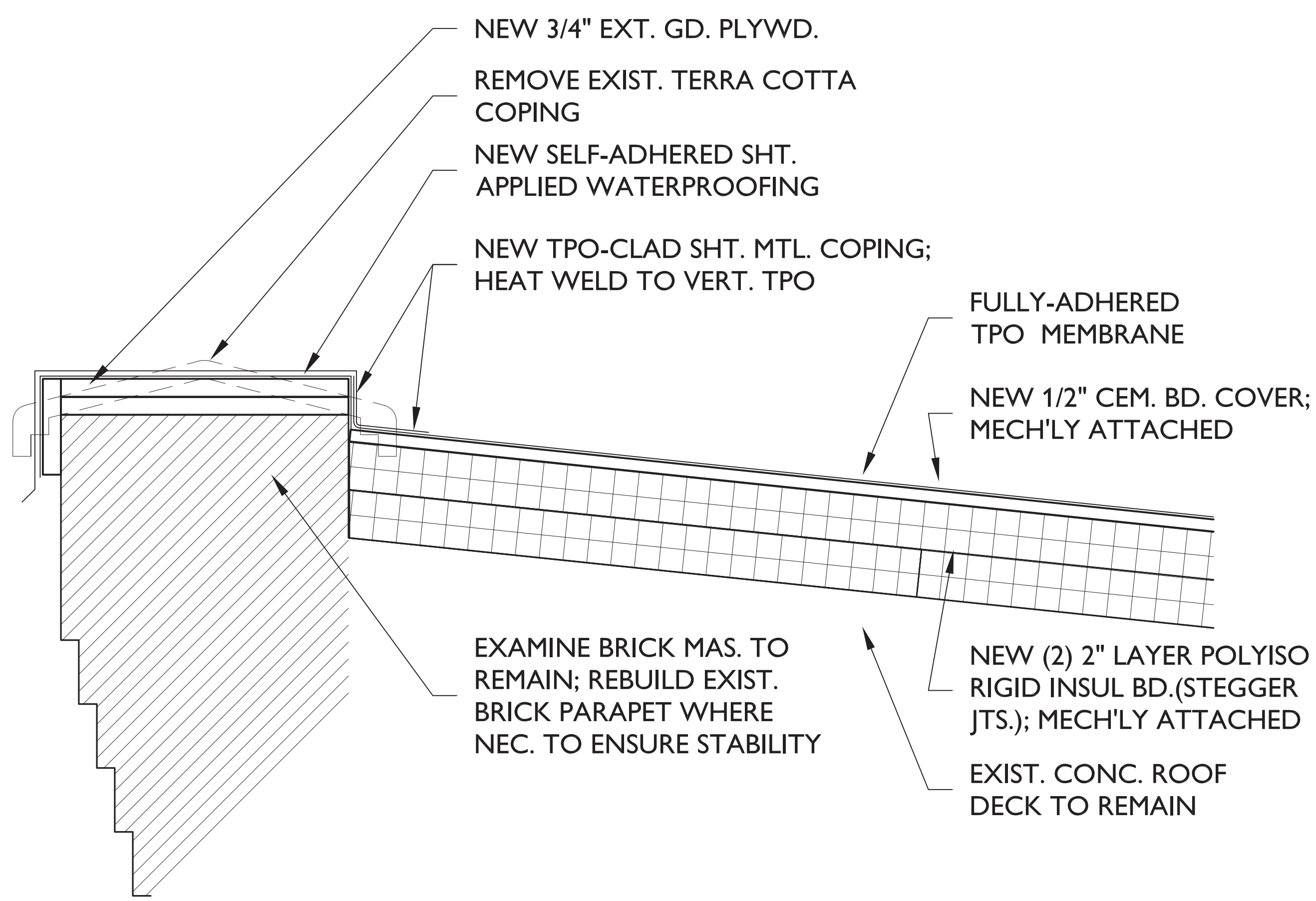


1 NORTH & SOUTH PARAPET DETAIL

SK-3 SCALE: 1-1/2" = 1'-0"



2 EAST & WEST PARAPET DETAIL

SK-3 SCALE: 1-1/2" = 1'-0"

Title: Coping / Roof Details - Preliminary S.O.W.

Project: Hastings on Hudson Building 52

James R. Gainfort AIA, Consulting Architects PC
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vox 212 736 3344 fax 212 736 4466

Date: 8 Nov 2010
Scale: 1-1/2" = 1'-0"
Job No.: 1010
Dwg No.: SK-3

1 SOUTH PARAPET

SK-4

2 CRICKET BETWEEN MONITORS

SK-4

3 MONITOR SIDE WALLS & SKYLIGHT COVERS

SK-4

4 NORTH PARAPET

SK-4

5 AREA AT FORMER MONITOR

SK-4

6 MONITOR SIDE WALLS & ROOF MEMBRANE

SK-4

Title **Roof Photos - Preliminary S.O.W.**

Project Hastings on Hudson Building 52

James R. Gainfort AIA, Consulting Architects PC
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Date 8 Nov 2010
Scale N.T.S.
Job No. 1010
Dwg No. SK-4

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APPENDIX F

Concrete Testing Results
Kemron

KEMRON
ENVIRONMENTAL SERVICES

1359-A Ellsworth Industrial Blvd • Atlanta, GA 30318 • TEL 404-636-0928 • FAX 404-636-7162

November 23, 2010

Sara Steele, P.E.
Robert Silman Associates
88 University Place
New York, NY 10003

Re: Letter Report
Hastings-on-Hudson Concrete Evaluation
KEMRON ATG Project #SE-0366-001

Dear Ms. Steele:

KEMRON is please to provide the attached report for the above reference property. The study consisted of performing Unconfined Compressive Strength (UCS) of the concrete by ASTM C42, petrographic evaluation by ASTM 856, and acid soluble chloride testing by ASTM 1152.

The attached report was prepared by Testing and Engineering Consulting Services, Inc. located in Lawrenceville, Georgia.

KEMRON Environmental Services, Inc. appreciates this opportunity to provide our services to Robert Silman Associates. If you have any questions, or require additional information, please contact us at (404) 601-6927.

Sincerely,

KEMRON Environmental Services, Inc.

Tommy A. Jordan, P.G.
Program Manager

M LE CH IN- F-CU T Y RECOR

ENVIRONMENTAL SERVICES

KEM N ENVIR NMENTAL SE VICES, INC.
1359-A Ellsworth Industrial Boulevard
ATLANTA, GEORGIA 30318
(404) 636-0928 FAX (404) 636-7162
WWW.KEMRON.COM

PROJECT NAME:	PROJECT #:
Hastings-on-Hudson, NY	H&A# 28612-248

TAT or DUE DATE:	CONTACT:	PROJECT MANAGER:	
Standard	RSA:Sara Steele / H&A:Shawn Poff	Tommy Jordan	
	PHONE#: EXT.	RECEIVING LAB:	PO#:
	212.620.7970 / 860.989.9418	(404) 601 - 6908	

SAMPLED BY: PRINTED NAME		SIGNATURE
	Shawn W. Poff (Haley & Aldrich)	

ANALYSES (indicate target list)

SAMPLE NUMBER	SAMPLE DESCRIPTION	SAMPLE DATE	Sample	Preservative	# / Size of Cont.	ANS 16.1 Modified 5 Day	Petrographic Analysis ASTM 856	Strength Testing ASTM C42	Chloride Analysis ASTM 1152
C-5 (a)	Concrete slab core at F-2	10/2/2010		None	approx 4in x 8in		X		
C-5 (b)	Concrete slab core at F-2	10/4/2010		None	approx 4in x 8in			X	
C-6 (a)	Concrete slab core at F-4	10/2/2010		None	approx 4in x 8in			X	
C-6 (b)	Concrete slab core at F-4	10/2/2010		None	approx 4in x 8in			X	
C-7	Concrete slab core at F-1	10/2/2010		None	approx 4in x 8in			X	
C-1	Concrete roof core at R-1	10/9/2010		None	approx 4in x 4in			X	
C-2	Concrete roof core at R-2	10/9/2010		None	approx 4in x 4in			X	
C-3	Concrete roof core at R-5	10/8/2010		None	approx 4in x 4in			X	
C-4	Concrete roof core at R-7	10/2/2010		None	approx 4in x 4in		X		

SAMPLES RELINQUISHED BY:	DATE/TIME	SAMPLES ACCEPTED BY:	DATE/TIME
Shawn Poff [signature]	10/18/2010 1630	[signature]	10/19/10 11:15
[signature]			

COMMENTS:

Samples contain low levels of PCBs - wear disposable gloves and safety glasses when handling

TEC Services

Testing • Engineering • Consulting

November 19, 2010

Mr. Tommy Jordan
Kemron Environmental Services, Inc.
1359A Ellsworth Industrial Boulevard
Atlanta, Georgia 30317

Phone: 404-601-6908
Fax: 404-636-7162
e-mail: tjordan@kemron.com

Subject: **Report of Concrete Materials Testing**
Concrete Floor and Roof Slab Cores
Hastings-on-Hudson, New York
TEC Services Project No. TEC 10-0808.02

Dear Mr. Jordan:

Testing, Engineering and Consulting Services, Inc. (TEC Services), is pleased to submit this report of our concrete materials testing. Our testing was performed on concrete cores obtained from a facility located in Hastings-on-Hudson, New York. The purpose of our services was to perform materials testing to determine the general quality of the concrete. Our report includes background information, test results, petrographic observations and conclusions. Our services were performed in accordance with the terms and conditions of our Service Agreement dated May 29, 2009.

BACKGROUND INFORMATION

The following background information was obtained from Kemron Environmental Services, Inc. (Kemron) representative Mr. Tommy Jordan. Please contact us if this information is incorrect so that we may revise our report as deemed necessary.

The provided concrete cores were obtained from a facility in Hastings-on-Hudson, New York. The facility was previously used to produce cable and wire and is approximately 90 years old. During World War II the facility produced cables coated in pcbs which were used on Navy vessels. Cores were obtained by others from the concrete roof deck and floor slab. The top surface of the roof slab is covered by a roof membrane. The floor slab was placed on grade, but it is unknown at this time if the slab is structural or was to be supported by the grade. For the past few years the facility has been vacant and has been exposed to the environment via roof leaks and windows missing glass.

Testing performed by Kemron indicates that the concrete contains pcbs. The pcbs are likely a result of the previous manufacturing practices of the cable factory. These pcbs require slab remediation. Prior to performing the slab remediation the ultimate client requested that Kemron determine the quality of the concrete. Kemron provided TEC Services with 4 cores from the roof slab and 5 cores from the floor slab of the facility. Kemron requested TEC Services test the cores to determine the compressive strength, chloride content and quality.

COMPRESSIVE STRENGTH TESTING

Compressive strength testing was performed on Cores 1, 2, 5B, 6A, 6B and 7 in accordance with ASTM C42, *Standard Test Method for Obtaining and Testing Drilled Cores and Sawn Beams of Concrete*. Core 3 fractured into pieces and did not remain intact when we sawcut the ends. As a result we were unable to test Core 3. However, the fracturing of the sample from sawcutting indicates a low compressive strength. Cores 1 and 2 were from the roof slab. Cores 5B, 6A, 6B and 7 were from the floor slab. The results of our testing indicate that the 90 year old concrete from the roof slab has an average compressive strength of 2380 psi with a range from 1640 to 3120 psi. The floor slab has an average compressive strength of 5380 psi with a range from 4970 to 5820 psi. The results of our compressive strength testing are reported within Table 1 at the end of our report.

ACID SOLUBLE CHLORIDE TESTING

Acid-Soluble chloride testing was performed on (9) powder samples from portions of the provided cores in accordance with ASTM 1152, *Standard Test Method for Acid-Soluble Chloride in Mortar and Concrete*. The testing was performed by Wyoming Analytical Laboratories. The chloride test samples from Cores 1, 2, 3, 5B, 6A, 6B and 7 were obtained by crushing portions of the cores into a powder after the compressive strength testing was performed. Both ends of the cores were sawcut and the ends were not included in the powder samples. Cores 4 and 5A were not tested in compression, but the ends were also sawcut. The middle portion of the cores was then sawn in half perpendicular to the top surface. One half of this middle portion from each core was crushed into the testable powder sample. In summary the tested powder samples represent a blend of the middle portion of each core.

The results of our chloride testing indicate chloride contents in the roof slab cores which vary from 0.004 to 0.011% per mass of concrete. The chloride contents in the roof slab cores are insignificant. The chloride contents of floor slab cores 5A, 5B, 6A, 6B and 7 were 0.142, 0.122, 0.027, 0.134 and 0.123% per mass of concrete respectively. The chloride contents in 4 of the 5 floor slab cores are excessively high. Chloride concentrations of 0.050% and higher per mass of concrete significantly increase the potential for reinforcing steel corrosion. The results of our testing are provided within Table 2 at the end of our report.

PETROGRAPHIC EXAMINATIONS

Core 4 from the roof slab and Core 5A from the floor slab were selected for petrographic examination by Kemron. The cores had a diameter of 3¾”. The ends of both cores were inadvertently sawcut parallel to the top surface. Approximately ¼ to ½” was removed from each end of Core 4. These thin portions were saved, but were too thin to cut and polish. Approximately ⅛ to ¼” was removed from the top of Core 5A. This sawcut was so close to the top surface that it simply shaved the top surface not yielding a thin removed portion. The sawcut at the other end of Core 5A removed the bottom 2” of the core. This portion was cut and polished. The examined polished planes were obtained by sawcutting perpendicular to the top surface of the slabs. One half of each core was ground and polished in preparation for petrographic examination (Photos 1 – 2). The prepared polished plane sections were examined in accordance with the applicable sections of ASTM C856, *Standard Practice for Petrographic Examination of Hardened Concrete*, using a digital microscope at magnifications from 20X to 200X. Our significant petrographic observations are provided below. Our conclusions for each core are based on the provided background information, petrographic observations and our experience with similar evaluations.

Core 4*: (Roof Slab)*

General: The side of the core was labeled by others in its as received condition. The labeling indicated that the top of the core was at the end closest to the wire reinforcing inclusion. This appears to be incorrect. We observed a roof membrane on the top of one sawn end portion (Photo 3). The roof membrane indicates the top surface of the core. Beneath the roof membrane the paste of the concrete is a light tan (Photo 4). This light tan paste could be matched up with paste at the end of the core labeled as the bottom. This did not match the paste labeled as the top. As a result the sample appears labeled incorrectly. Also, it is not often that wire reinforcing is located so close to the top surface. It is typically located near the bottom of the slab. Our report will note that the end closest to the wire reinforcing is the bottom.

Coarse Agg: The coarse aggregate was a lightweight aggregate comprised of boiler slag and bottom ash (Photo 5). Boiler slag and bottom ash were commonly used to produce lightweight concrete prior to the development of the modern lightweight shale and clay aggregates. The maximum aggregate size typically appeared to be approximately ¾", but we observed a 2" lightweight aggregate at the side of one core. The surfaces of the coarse aggregate varied from angular to subrounded. The coarse aggregate particles were typically equidimensional in shape. The coarse aggregate was evenly distributed in the cores with no indications of segregation. We observed some paste with the voids of the lightweight aggregate (Photo 6). This is an indication that the lightweight aggregate was not adequately saturated prior to mixing. We did not observe indications of deleterious aggregate reactions.

Fine Agg: The fine aggregates appeared to be a natural sand comprised primarily white and tan colored quartz. The maximum fine aggregate size was approximately ¼ inch. The fine aggregate was evenly distributed within the core. The surfaces of the fine aggregate varied from subangular to subrounded. The fine aggregate particles were equidimensional in shape. We did not observe indications of deleterious aggregate reactions.

Paste: The matrix (hardened cement paste) of the cores was light gray in coloration (Photo 7). The overall coloration appeared relatively uniform with the exception of the previously noted tan paste beneath the roof membrane. The light tan paste is likely a result of carbonation. A portion of the sample which was not polished or tested for chlorides was freshly sawn and the sawn surface was sprayed with phenolphthalein. The phenolphthalein test indicates that the full depth of the core is carbonated. Carbonation of concrete occurs when carbon dioxide in the air reacts with the calcium hydroxide in the concrete to produce calcium carbonates. This reaction results in lowering the pH (alkalinity) of the concrete. The high alkalinity of concrete provides passive protection for the reinforcing steel from corrosion. Without the high alkalinity of the concrete the reinforcing steel will corrode readily in the presence of oxygen and moisture.

Core 4*: (Roof Slab) continued…*

Paste: The matrix does not appear to contain supplemental cementitious materials such as fly ash or slag. We observed some occasional particles resembling fly ash cenospheres, but these were likely from the bottom ash lightweight aggregate (Photo 8). The paste of the concrete was very soft as it could be easily scratched and gouged with a steel point. The paste also eroded significantly during sample preparation (Photo 9 & 10). We estimate the water to cement ratio to be in the range of 0.60 to 0.65. The porosity of the paste varied, but generally appeared to be high. The soft eroded paste appeared to simply be a result of a high water cement ratio and not some form of deterioration such as aggregate reactions or chemical attack.

Air Voids: The concrete does not appear to contain entrained air. We estimate the total air content of the concrete to be in the range of 1 to 2%. We observed numerous voids at the periphery of the aggregate particles, but it is difficult to determine if these voids are a result of the eroded soft paste or bleed water channels and trapped voids. Bleed water channels and trapped voids beneath the aggregate typically indicate an excess water content.

Surfaces: As mentioned previously the ends of the core were sawn, but both thin portions were saved. A black roof membrane material was observed on the top surface of the core. The thickness of the membrane varied from approximately 1/16” to 3/16” thick. The bottom surface of the core was difficult to interpret. It did not appear to be wood formed (Photo 11). The bottom surface also appeared to have been painted 2 or 3 different colors.

Void Deposits: We observed occasional secondary deposits within the voids of the concrete. The deposits appeared to be secondary ettringite formations (Photo 12). These formations are not detrimental to the concrete and are common in concrete subjected to wetting and drying cycles. This is an indication that the roof membrane may not have been in place for the life of the structure.

Reinforcing: We observed a piece of wire reinforcing near the bottom of the core. The diameter of the wire was approximately 3/16”. We estimate the bottom cover to be approximately ½ to ¾”. The wire reinforcement appeared to be corroding. The corrosion of the wire reinforcement appeared relatively significant (Photo 13). The corrosion bleed into the paste, but it had not produced cracking in the concrete.

Cracking: We did not observe significant cracking within the paste of the sample.

Conclusions: The concrete within the core from the roof slab is of poor quality and may have exceeded its useful life as a structural slab. Phenolphthalein staining indicates the concrete has carbonated through the full section. As a result the wire mesh has corroded and will continue to corrode in the presence of oxygen and moisture. Additionally, our compressive strength testing indicates low strengths (1640 psi).

<u>Core 5A</u>: *(Floor Slab)*

General: The direction to the top surface of the core was labeled correctly on the side by others. As mentioned previously the removed bottom portion was also polished. The portion missing from the top surface of the core was approximately ⅛ to ¼" thick.

Coarse Agg: The coarse aggregate appeared to be a crushed stone comprised primarily of limestone. The limestone did not react excessively with dilute hydrochloric acid, but it did dull the surface of the aggregate. This indicates the limestone is likely dolomitic. The maximum aggregate size was approximately ¾". The surfaces of the coarse aggregate varied from subangular to subrounded. The coarse aggregate particles were typically equidimensional in shape with a few elongated particles. The coarse aggregate was evenly distributed in the cores with no indications of segregation. We did not observe indications of deleterious aggregate reactions.

Fine Agg: The fine aggregates appeared to be a natural sand comprised primarily white and tan quartz. The sand appeared similar to the sand within the roof slab. The maximum fine aggregate size was approximately ¼ inch. The fine aggregate was evenly distributed within the cores. The surfaces of the fine aggregate varied from subangular to subrounded. The fine aggregate particles were equidimensional in shape. We did not observe indications of deleterious aggregate reactions.

Paste: The matrix (hardened cement paste) of the cores varied significantly in coloration. The majority of the middle portion of the core was gray, but the gray coloration was not uniform. Zones of relatively darker and lighter gray paste were observed (Photo 14). This is a result of not thoroughly mixing the concrete and is not uncommon in concrete from this era. The non-uniform paste coloration however, does not appear to have significantly affected the strength of the concrete (5380 psi AVG). Additionally, the upper ½ to ¾" of the paste was light tan in coloration (Photo 15). This is a result of carbonation. If we add the approximate ¼" missing from the top surface the depth of carbonation is approximately ¾ to 1" deep. This amount of carbonation is excessive and is likely a result of the manufacturing process of the factory. Utilizing phenolphthalein staining we confirmed that the carbonation ended at the transitions from tan to gray paste. We also observed isolated light tan zones within the middle of the core and near the bottom surface. The isolated zone of carbonation within the middle of the core appears to have been a result of interconnected voids providing a pathway for the carbon dioxide beneath the slab (Photo 16).

The matrix does not appear to contain supplemental cementitious materials such as fly ash or slag (Photos 17 & 18). The hardness of the paste varied with the coloration of the paste. In general it appeared relatively hard. We estimate the water to cement ratio to be in the range of 0.45 to 0.50. The porosity of the paste varied, but generally appeared to be relatively high. We did not observe indications of chemical attack.

Core 5A: *(Floor Slab) continued…*

Air Voids: The concrete does not appear to contain entrained air (Photo 19). We estimate the total air content of the concrete to be in the range of 1 to 2%. We observed some occasional trapped voids and bleed water channels, but the concrete did not appear to have a high water content. Large voids, which appear a result of poor consolidation, were observed near the bottom at the unpolished side of the core. These voids were more excessive at the bottom of the other floor slab cores around the reinforcing steel (Photo 20).

Reinforcing: We observed a steel reinforcing bar at the side of the core with approximately 1¼" bottom surface cover. ACI recommends 3" of cover for concrete placed against a subgrade. The rebar was not included in the polished section. The reinforcing bar appeared to be a #6 bar and showed signs of significant corrosion. The corrosion bleed into the nearby paste, but had not produced cracking in the concrete. The bottom portion of the other floor slab cores also contained reinforcing with excessive corrosion. The corrosion in these cores has progressed to the point of producing exfoliation (corrosive layering) of the steel (Photo 21). The excessive corrosion in the other cores is a result of the reinforcing not being embedded within the concrete. The diameter of the bars with excessive corrosion is approximately 0.6". The diameter of a clean bar with no corrosion was measured to be 0.75" (Photo 22). This indicates either significant section loss in the corroded bars or different bar sizes.

Surfaces: The top surface of polished core was sawn, but we observed the remaining top portion of another floor slab core. Indications of minimal surface erosion were observed, but the top surface generally appeared to be in good condition considering the age and previous use (Photo 23). This top portion from another slab core was cut perpendicular to the top surface and polished (Photo 24). The portion was approximately ½" thick. We did not observe indications of freezing damage, cracking or other detrimental microstructural features. The bottom surface appeared to have been placed on a stone base.

Cracking: We observed a few vertical cracks beneath the top surface of the core (Photo 25 & 26). These cracks likely extend from the top surface. The cracks were not prevalent across the top surface and do not appear to be significantly detrimental.

Conclusions: The paste of the concrete within the floor slab cores appears to be of relatively good quality. We did not observe indications of significant deterioration excluding the corroding reinforcing steel. The corroding reinforcing steel is likely a result of the high chloride contents, carbonation and insufficient embedment. The slab will likely remain effective if it is designed as a slab on grade. However, if the slab was to be structural, as the large reinforcing bars indicate, it is not adequate because of the reinforcing steel is not well embedded and corroded.

Closing

Testing, Engineering and Consulting Services, Inc. appreciates the opportunity to provide our professional services for this important project. If you have any questions regarding this report, or if we can be of further assistance please contact us at 770-995-8000.

Sincerely,

TESTING, ENGINEERING AND CONSULTING SERVICES, INC.

Brian J. Wolfe
Project Engineer

Robert S. Jenkins, P.E.
Senior Concrete Petrographer

Attachments: Photo Pages (Photos 1 – 26)
Table 1: Results of Compressive Strength Testing of Concrete Cores C42
Table 2: Results of Acid-Soluble Chloride Testing C1152

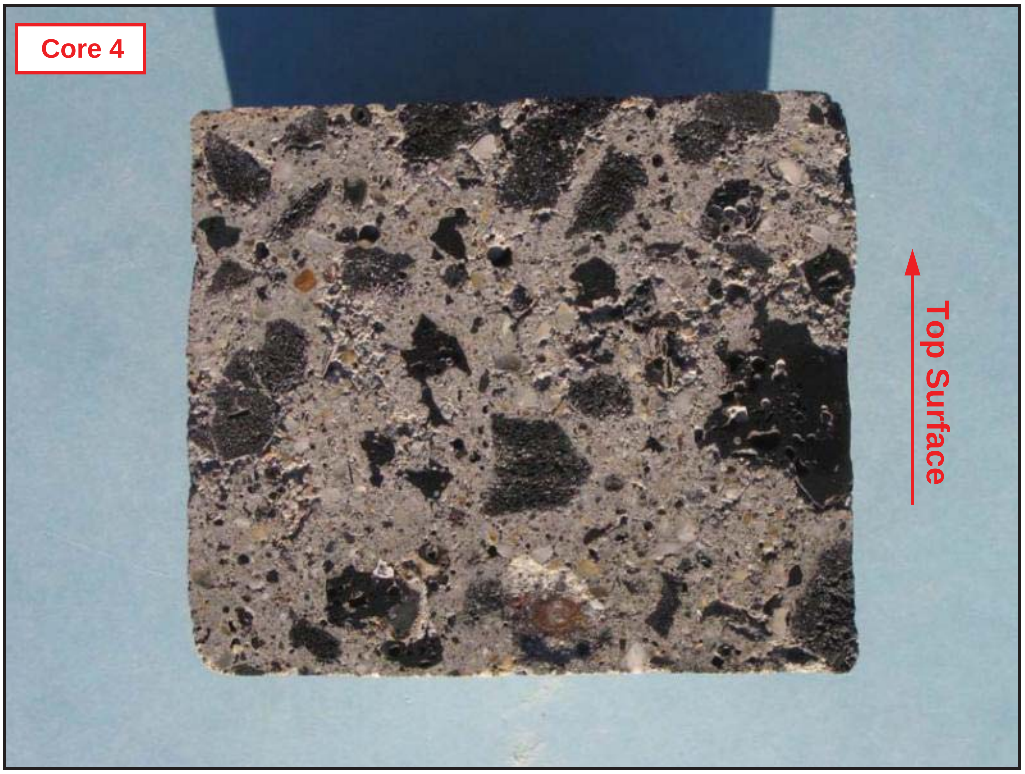


Photo 1. Overall of polished section of Core 4 in natural light.

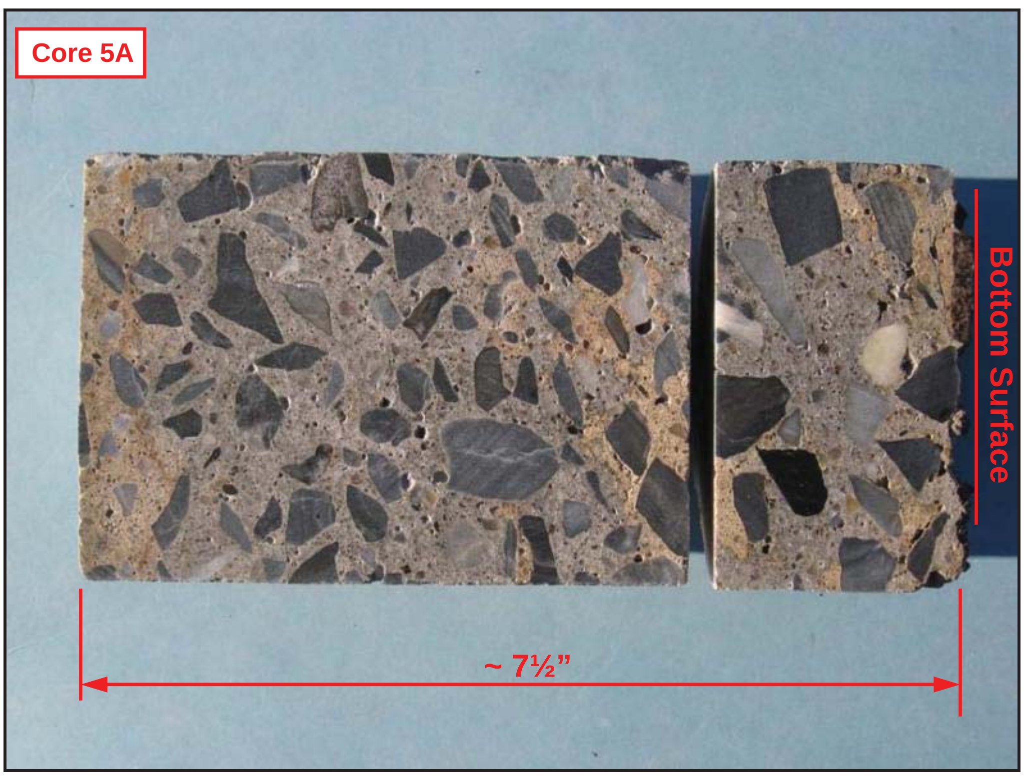


Photo 2. Overall of polished section of Core 5A in natural light.

Photo 3. Roof membrane observed on top surface of Core 4.

Photo 4. Light tan paste observed at underside of roof membrane.

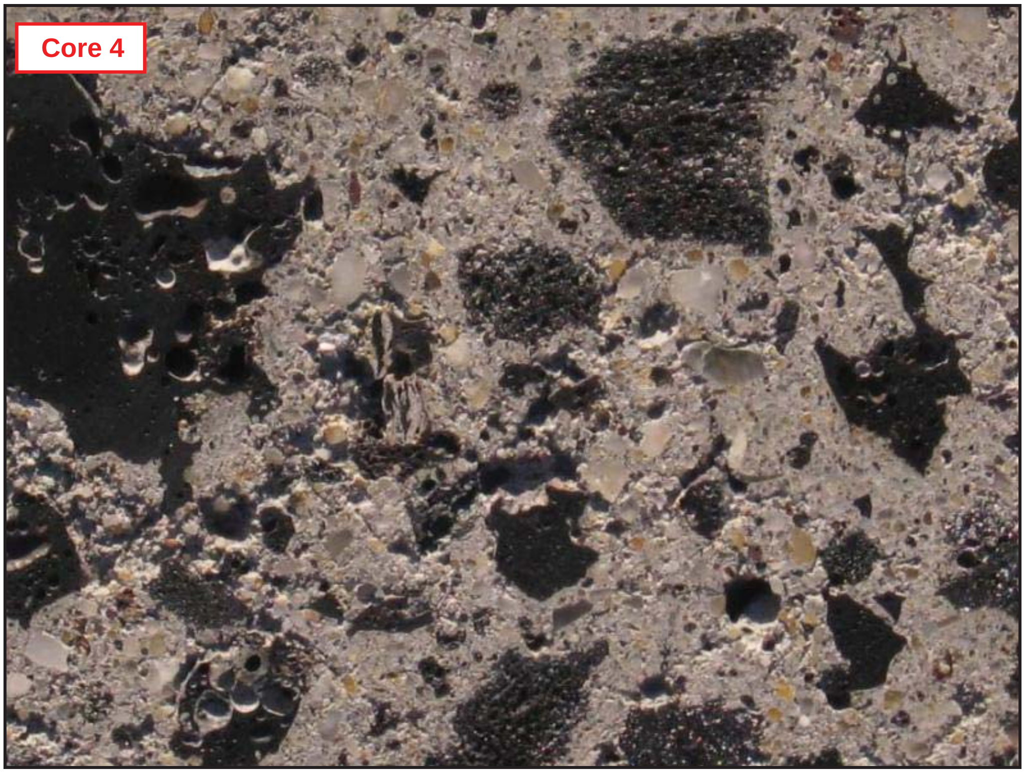
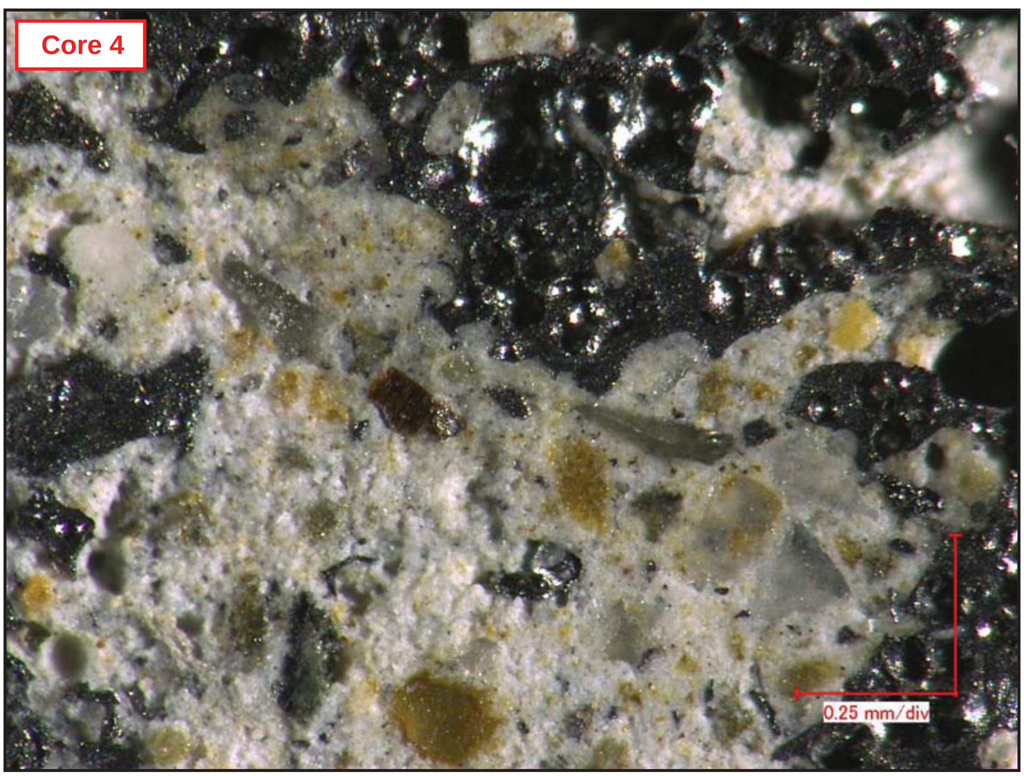
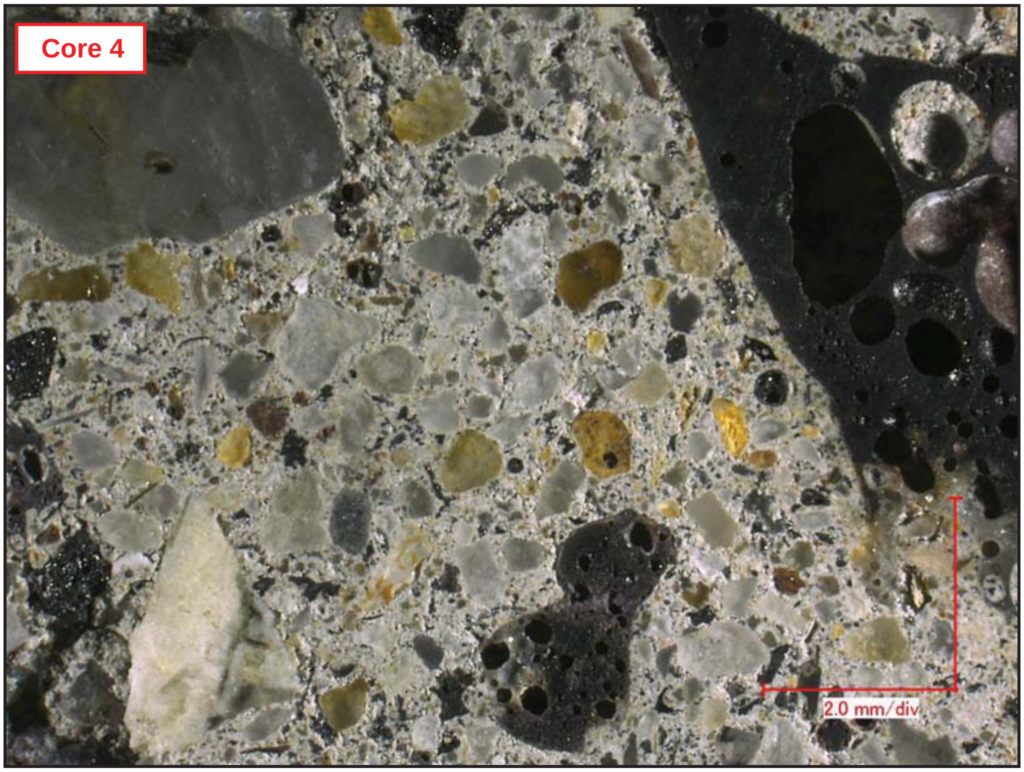


Photo 5. Boiler slag and bottom ash lightweight aggregate observed in Core 4.



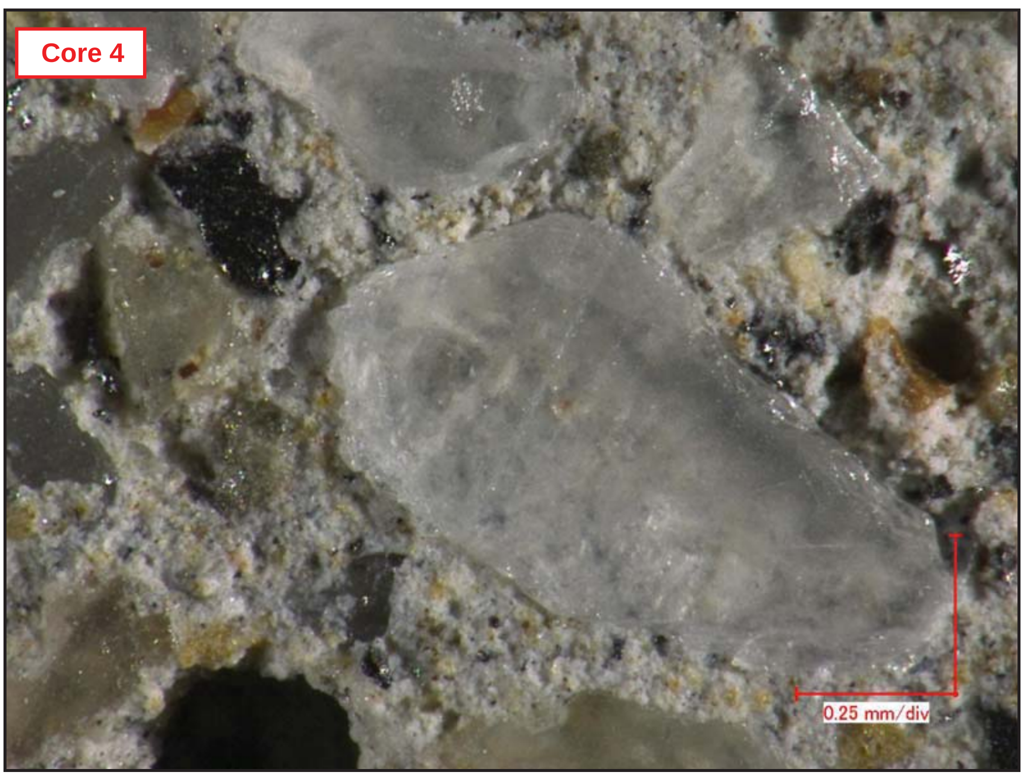
Photomicrograph 6. Paste observed within lightweight aggregate.



Photomicrograph 7. Light gray paste observed in Core 4.

Photomicrograph 8. Fly ash cenospheres observed in paste.

Photomicrograph 9. Eroded paste observed in Core 4.



Photomicrograph 10. Eroded paste observed in Core 4.

Photo 11. Bottom surface of Core 4.

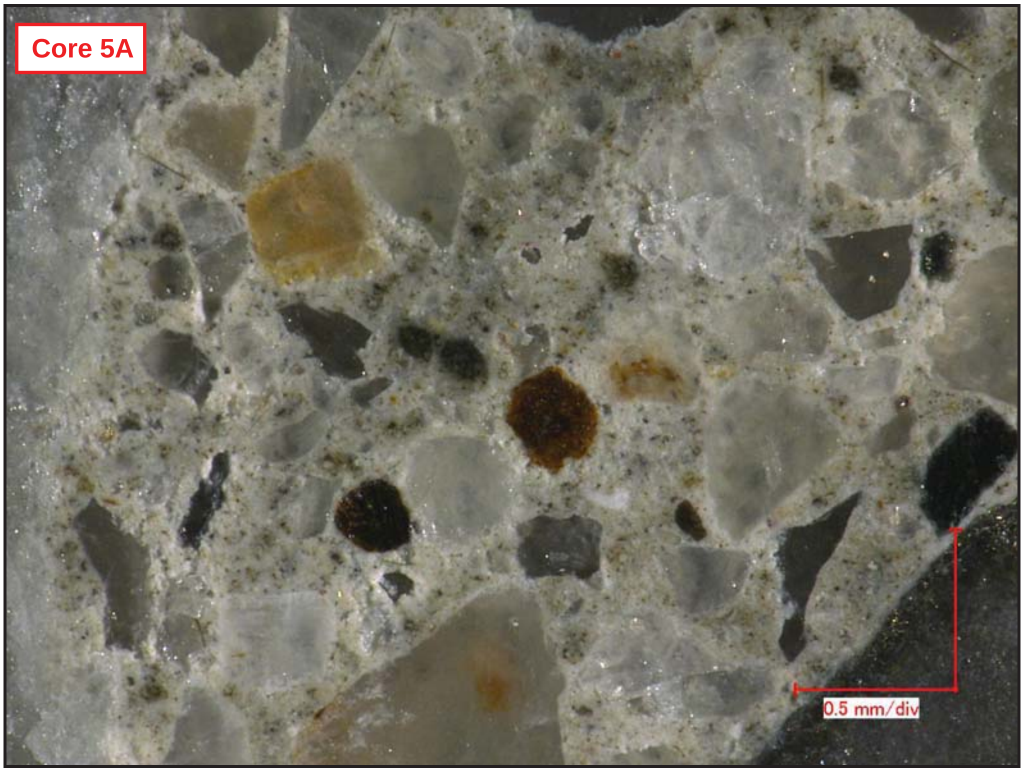
Photomicrograph 12. Secondary deposits observed within void.

Photomicrograph 13. Close up of corroded wire reinforcing. Corrosion observed in nearby paste.

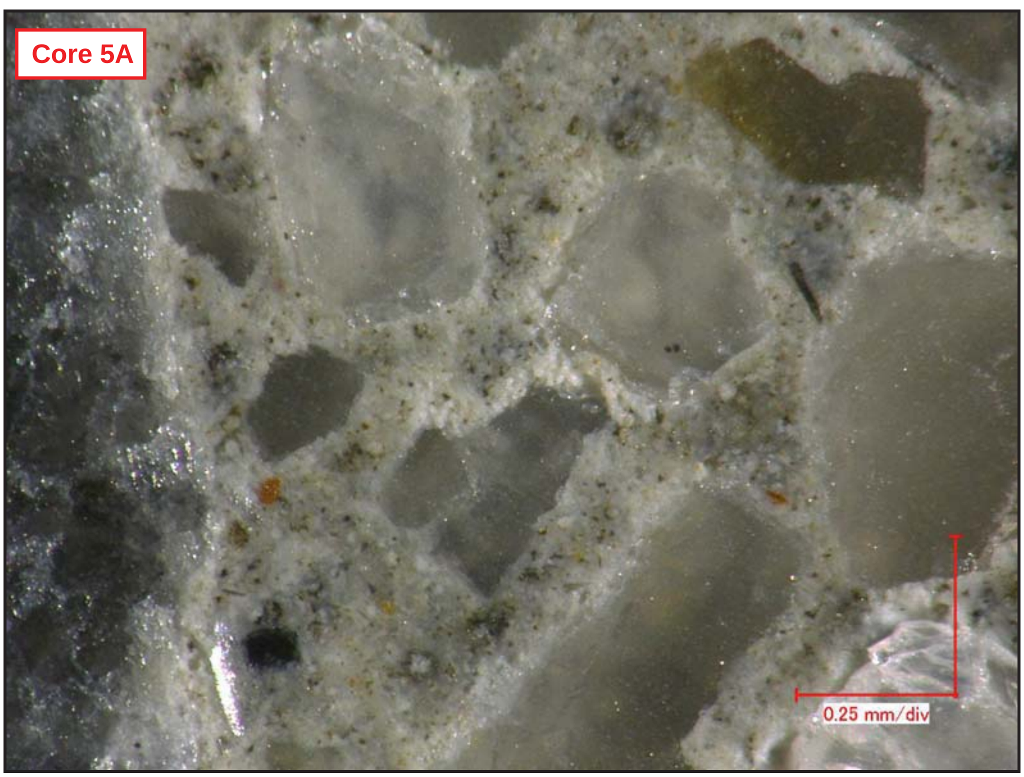
Photo 14. Uneven distribution of paste color observed.

Photo 15. Depth of carbonation approximately ¾ to 1" deep.

Photo 16. Isolated zone of carbonated paste observed within Core 5A.



Photomicrograph 17. Paste of floor slab Core 5A.



Photomicrograph 18. Paste of Floor slab Core 5A.

Photomicrograph 19. No entrained air voids observed in Core 5A.

Photo 20. Poor consolidation of concrete observed around reinforcing steel bars.

Photo 21. Excessively corroded rebar observed at bottom of core.

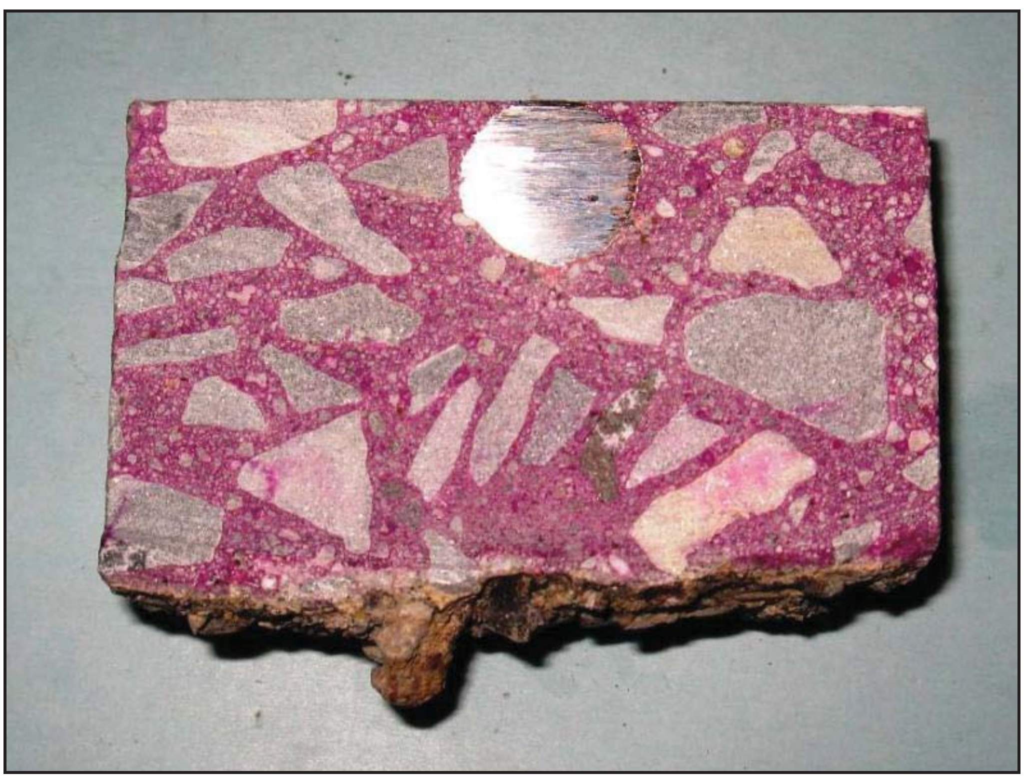


Photo 22. No corrosion observed in steel, paste stained with phenolphthalein (pink staining = high pH).

Photo 23. Top surface of other core.

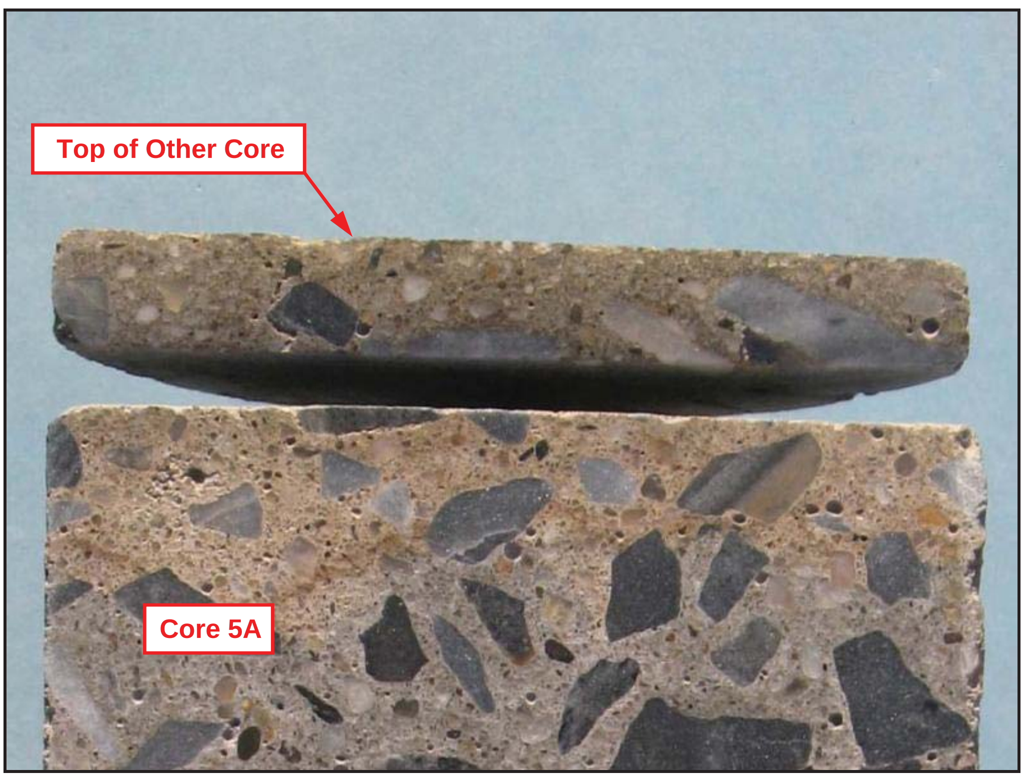


Photo 24. Polished section obtained from top ½" of other floor slab core.

Photomicrograph 25. Vertical cracks observed in Core 5A.

Photomicrograph 26. Vertical cracks observed in Core 5A.

Table 1: Results of Compressive Strength Testing of Concrete Cores ASTM C42

CORE NO.	Age (years)	Diameter (in)	Sawn Length (in)	Capped Length (in)	Area, (in^2)	Maximum Load (lbs)	Fracture Type	L/D Ratio	Correction Factor	Adjusted Compressive Strength (psi)
1	~90	2.75	2.9	3.0	5.94	20,770	2	1.09	0.892	3120
2		2.75	3.0	3.1	5.94	10,820	2	1.13	0.901	1640
3		Sample crumbled and did not remain intact when ends were sawcut								
Roof Slab Average										**2380**
5B	~90	3.70	6.4	6.5	10.75	61,440	3	1.76	1.000	5720
6A		3.70	5.1	5.2	10.75	56,300	3	1.41	0.949	4970
6B		3.70	4.8	4.9	10.75	66,680	3	1.32	0.938	5820
7		3.70	5.7	5.8	10.75	55,730	3	1.57	0.966	5010
Floor Slab Average										**5380**

Notes:
(1) The cores were tested on 10/26/10. Slabs were constructed in the 1920s.
(2) The cores were drilled and loaded perpendicular to the top surface of the slabs.
(3) The maximum aggregate size was approximately ¾" in the floor slab cores.
(4) The coarse aggregate in the roof slab cores was comprised of bottom ash and boiler slag.
(5) The maximum aggregate size was typically about ¾", but we observed a 2" piece in one core.
(6) No reinforcing was included in the tested portions.
(7) No significant defects were observed in the tested portions.

Table 2: Results of Acid Soluble Chloride Testing ASTM C1152

Core No.	Depth	Slab Construction	% chlorides (2)
1	Blend of tested middle portion (1)	Roof Slab	0.005
2			0.004
3			0.007
4	Middle portion of petrography (2)		0.011
5A		Floor Slab	***0.142***
5B	Blend of tested middle portion (1)		***0.122***
6A			0.027
6B			***0.134***
7			***0.123***

Notes:
(1) The chloride test samples were obtained by crushing portions of the cores into a powder after the compressive strength testing was performed. The ends were sawcut and were not included in the tested portion.
(2) Cores 4 and 5A were selected for petrographic examination. The chloride test sample was obtained from the middle portion, of the other half of the core, which was not polished. The ends of the cores were sawcut and were not included in the
(3) The percentage of chlorides is provided per mass of concrete.
(4) The testing was performed by Wyoming Analytical Laboratories

APPENDIX G

Calculations

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PROJECT ANACONDA JOB NO. 12900.02 PAGE 1

SUBJECT ROOF SLAB CAPACITY BY GMS DATE 11/12/10

- ASSUME W2 MESH @ 3" O.C.
  - → $A_s = .08$
- SLAB SPAN = 7.25'
- ASSUME C = 20,000

$$w = \frac{3CA_s}{L^2} = \frac{3(20{,}000)(.08)}{(7.25')^2} = 91.3 \text{ PSF}$$

4" SLAB	=	36 PSF
BUILT UP ROOF	=	10 PSF
DL	=	46 PSF

→ LL_{CAP} = 45 PSF

weight and temperature. Compression strength test specimens shall be molded only by a licensed concrete testing laboratory or by a person certified by the American Concrete Institute as qualified to perform such function. Attestation shall be executed by the person superintending the use of the material in accordance with the requirements of subdivision (b) of section 27-132 of article seven of subchapter one of this chapter.
***Local Law 65-1990.**

***§[C26-1004.6] 27-608 Admixtures.** -Admixtures may be used in the concrete only where included in the preliminary test mixes made in accordance with paragraph three of subdivision (a) of section 27-605 or mixes proportioned in accordance with the provisions of reference standard RS 10-3. In the case of mixes proportioned in accordance with subdivision (c) of section 27-605, there shall be no reduction of the cement content called for in table 10-3A because admixtures are used in the mix. Where admixtures are used, the provisions of reference standards RS 10-3 and RS 10-44 shall apply. In addition, no anti-freeze agents shall be used. Admixtures shall be added in measured quantities in conformance with the accepted mix design.
***Local Law 65-1990.**

***§[C26-1004.7] 27-609 Licensed concrete testing laboratories.**- All strength tests of concrete and testing of concrete materials required by the provisions of this section shall be performed by concrete testing laboratories licensed in accordance with the requirements of article nine of subchapter two of chapter one of title twenty-six of the administrative code and rules promulgated by the commissioner. The licensed concrete testing laboratory shall, among other things, analyze, evaluate and test concrete materials; determine whether the materials comply with specifications and pertinent referenced national standards in reference standard RS 10-3; select mix proportions for preliminary tests; recommend the mix proportions to be used on the project for which the tests were made; analyze data from previous projects and compute the standard deviation; and recommend the mix proportions to be used based on such field experience data. At the batch plant or at the job site, the licensed concrete testing laboratory shall, among other things, sample concrete and test for slump, entrained air content, unit weight and temperature, mold compression test specimens; store and cure such specimens on the job site; remove, transport and deliver such specimens to the laboratory; demold, store, cure, cap and test such specimens at the laboratory and furnish written reports of the results of all tests of the materials and concrete to the architect or engineer designated for controlled inspection and to the concrete producer. When tests of the hardened concrete are required, they shall be made by the licensed concrete testing laboratory in accordance with reference standard RS 10-3 and the national standards for making tests for penetration resistance, rebound number, pullout strength and of drilled cores. The architect or engineer designated for controlled inspection is authorized either to dismiss or to employ a particular licensed concrete testing laboratory at any time during the progress of the work.
***Local Law 65-1990.**

§[C26-1004.8] 27-610 Short-span concrete floor and roof construction supported on steel beams. -In lieu of analysis, the following empirical procedures may be used for the design of short-span concrete floor and roof slabs containing draped reinforcement and supported on steel beams. The empirical equations described in subdivisions (c) and (d) of this section shall apply only where the steel beams are placed, or are encased, in a manner that will provide section for the transfer of shear from slabs to beams equivalent to, or in excess of, the slab thickness required by said equations.
(a) Concrete.- The concrete shall have a minimum compressive strength at twenty-eight days of seven hundred psi.
(b) Reinforcement. -Reinforcement shall consist of steel fabric, rods, or other suitable shapes that shall be continuous or successively lapped to function as a continuous sheet. The main reinforcement shall be at least 0.15% of the gross cross section where continuous steel fabric is used and at least 0.25% of the gross cross section where other forms of steel reinforcement are used. All reinforcing shall be draped, with the center of the reinforcement at the center of the span one inch above the bottom of the slab and the center of reinforcement over the support one inch below the top of the slab.
(c) Minimum slab thickness. -The minimum total thickness of concrete floor and roof construction shall be determined by the following formula, but shall not be less than four inches:

$$t = \frac{L}{2} + \frac{w-75}{200}$$

Where: t = total thickness (in.)
L = clear span between steel flanges (ft.)
W = gross uniform load (dead load plus reduced live load) (psf)

(d) Allowable load. -The allowable load shall be determined by the following formula:

$$w = \frac{3CA_s}{L^2}$$

Where: w = gross uniform load (psf)
A_S = cross sectional area of main reinforcement (sq. in. per ft. of slab width)
L = clear span between steel flanges in feet. (L shall not exceed ten feet in any case, and when the gross floor load exceeds two hund-red psi shall not exceed eight feet)

C = the following coefficient for steel having an ultimate strength of at least fifty-five thousand psi;

1. For lightweight aggregate concrete:

a. twenty thousand when reinforcement is continuous.

b. fourteen thousand when reinforcement is hooked or attached to one or both supports.

2. For stone concrete:

a. twenty-three thousand when reinforcement is continuous.

b. fifteen thousand when reinforcement is hooked or attached to one or both supports.

(1) When the above formula is used the reinforcement shall be hooked or attached to one or both supports or be continuous.

(2) If steel of an ultimate strength in excess of fifty-five thousand psi is used, the above coefficient may be increased in the ratio of the ultimate strength to fifty-five thousand but at most by thirty percent.

(e) Openings in floors and roofs. -Openings more than one foot six inches on a side shall be framed. All areas encompassing multiple openings aggregating more than one foot six inches in any ten foot width or span of floor or roof slab shall be framed.

§[C26-1004.9] 27-611 Pneumatically placed concrete.- Construction methods shall conform to the applicable provisions and recommendations of reference standard RS 10-15.

***§27-611.1 Conveying concrete by pumping methods.-** All classes and strengths of concrete may be conveyed by pumping methods. All materials and methods used shall conform to the rules promulgated by the commissioner for conveying concrete by pumping methods.
Local Law 65-1990.

***§[C26-1004.10] 27-612 Formwork, slip form construction, lift method construction, precast and prestressed construction.-** The provisions of subchapter nineteen of this chapter shall apply.
Local Law 65-1990.

§[C26-1004.11] 27-613 Concrete utilizing preplaced aggregate. -The use of concrete formed by the injection of grout into a mass of preplaced coarse aggregate will be permitted where it can be demonstrated by successful prototype installation that the proposed mix, materials, and method of placement will produce a concrete of the specified strength and free of areas or inclusions of uncemented aggregate.

(a) Prototypes. -At least two prototypes, from either previous work or samples prepared for the proposed project shall be prepared. The forms shall be stripped, and a minimum of six cores recovered and tested to demonstrate the strength of the concrete produced by the proposed materials and methods of installation. In addition, the homogeneity of the prototypes shall be demonstrated by demolishing the prototypes.

(b) In-place concrete. -The concrete, as finally placed in the work, shall be prepared using the same materials, mix, equipment, and procedures utilized to prepare the successful prototype installations.

***(c) Inspection.** -All preparation and placement of structural concrete utilizing preplaced aggregates shall be subject to controlled inspection. Compression test specimens shall be prepared and tested as required for premixed concrete, except that the specimens shall be prepared under conditions that will simulate the conditions under which the concrete in the work is installed.
Local Law 65-1990.

***§27-613.1 Precast and prestressed concrete. –** The provisions of reference standard RS 10-3 shall apply.
Local Law 65-1990.

***§27-613.2 Thin-section precast concrete construction.-** The provisions of reference standard RS 10-4 shall apply.
Local Law 65-1990.

ARTICLE 6 STEEL

§[C26-1005.1] 27-614 General requirements. - Materials, design, and construction methods shall meet the requirements of the following reference standards:

(a) Structural steel. -Reference standard RS 10-5.

(b) Light gage [*sic*] **cold formed steel. -** Reference standard RS 10-6.

(c) Open web steel joists. -Reference standard RS 10-7.

§[C26-1005.2] 27-615 Identification. -Structural steel that is required to have a minimum yield point greater than thirty-six thousand psi shall at all times in the fabricator's plant, be marked, segregated, or otherwise handled so that the separate alloys and tempers are positively identified, and after completion of fabrication, shall be marked to identify the alloy and temper. Such markings shall be affixed to completed members and assemblies or to boxed or bundled shipments of multiple units prior to shipment from the fabricator's plant. Open web steel joists shall have identification affixed to each bundle or lift showing size and type.

§[C26-1005.3] 27-616 Quality control. -

(a) Reference. -The provisions of tables 10-1 and 10-2 shall apply.

(b) Welding operations. -

(1) Welding work shall be performed only by persons who have obtained a license from the commissioner.

(2) Where manual welding work is not performed in the city of New York, welds shall be made by welders qualified under the provisions of appendix D, parts II and III, of the AWS code for welding in building construction. Qualification with any of the steels permitted by the AWS code shall be considered as qualification to weld any of the other steels permitted by the code.

PROBES @ GROUND FLOOR WERE INCONCLUSIVE –
1. NO PILES WERE LOCATED
2. NO THICKENED SLABS OR PILE CAPS WERE LOCATED
3. NO TOP SLAB REINFORCING WAS FOUND

HOWEVER, HISTORIC DRAWING WWB 00994, "PILING LAYOUT," SHOWS PILES BENEATH SLAB @ ≈8'-0" o.c. FOR MOST OF BLDG. 52

FOLLOWING ANALYSIS IS BASED ON ASSUMPTIONS:
1. THERE ARE PILES (INVESTIGATE SPACINGS OF 6'-0", 8'-0", 10'-0")
2. THERE ARE NO TOP BARS. THEREFORE ALL SPANS ARE DESIGNED AS SIMPLY SUPPORTED, WITH CRACKING PERMITTED OVER ℄ OF SPANS.

RESULTS OF FLOOR PROBES:
$t = 8''$ SLAB THICKNESS
COVER TO BOTTOM OF REINF. = $1\frac{1}{2}''$, $d = 6''$ MEAN ℄ OF 2 LAYERS
TWO REINFORCING PATTERNS:
A. #4 @ 6" o.c. E.W., $A_s = 0.40\ in^2/FT$, $\rho = .0056$
B. #6 @ 10" o.c. E.W., $A_s = 0.53\ in^2/FT$, $\rho = .0073$

ASSUME: $F_y = 40{,}000\ psi$, $F'_c = 4000\ psi$

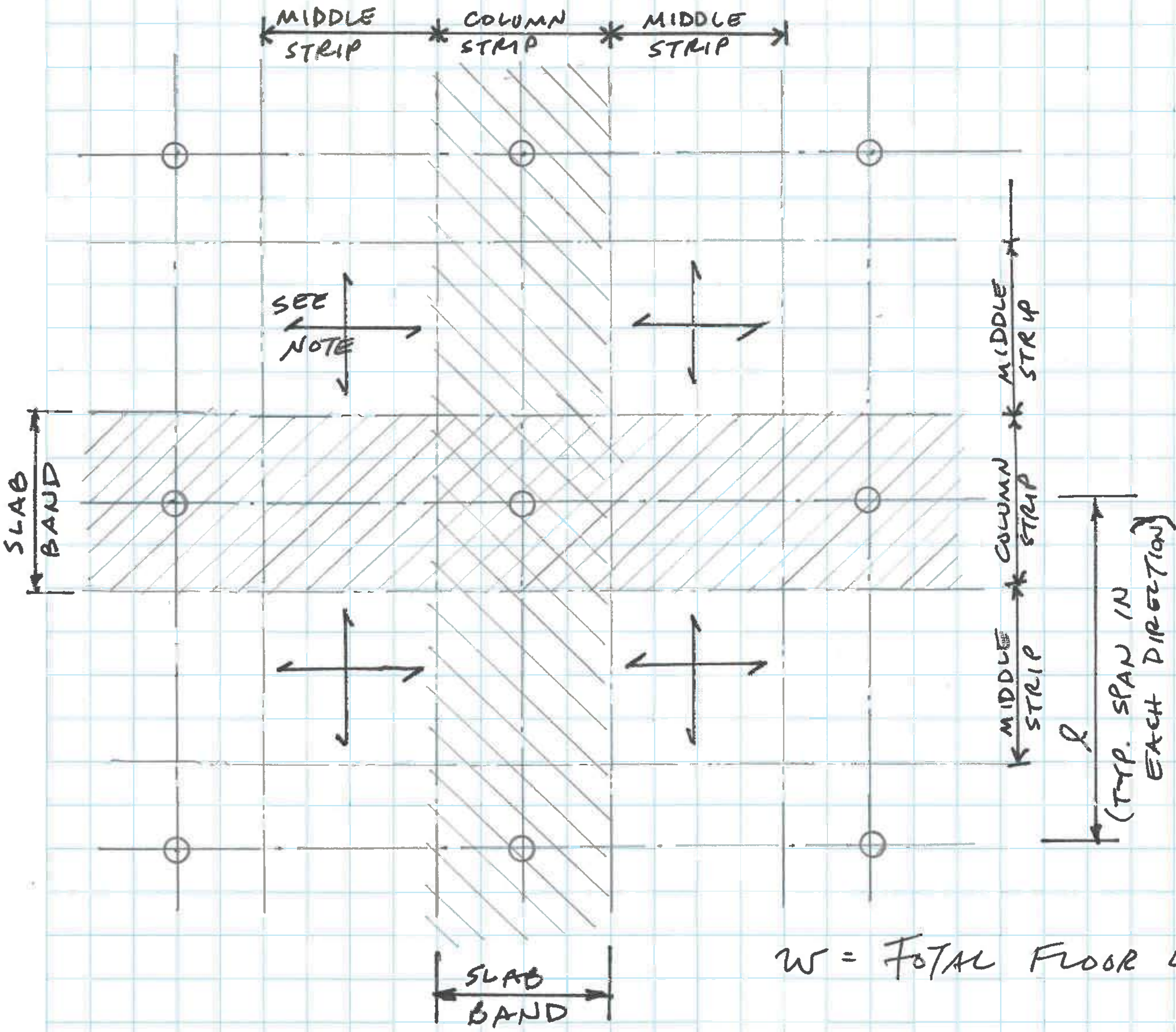
$$\left.\begin{aligned} M_{U_A} &= 7.02^{1k} \\ M_{U_B} &= 9.06^{1k} \end{aligned}\right\}$$ FROM ACI DESIGN HANDBOOK

ASSUME: BECAUSE ~~THERE~~ IS NO TOP REINFORCEMENT, THIS DOES NOT BEHAVE AS A TWO-WAY SLAB AS DEFINED BY ACI.
∴ FLOOR IS ANALYZED AS A 4'-0" WIDE "SLAB BAND" SIMPLY SUPPORTED ON PILES. SLAB BAND SUPPORTS, IN ADDITION TO ITSELF, 2'-0" OF SLAB ON EACH SIDE FROM THE MIDDLE STRIP ONLY. THAT PORTION OF SLAB ⊥ TO SLAB BAND THAT FORMS PART OF COL. STRIP OR SLAB BAND RUNNING ⊥ TO SLAB BAND BEING DESIGNED, IS ASSUMED TO BE SUPPORTED BY SLAB BAND IN THE ⊥ DIRECTION.
(SEE PG. 1-2 FOR DIAGRAM)

ROBERT SILMAN ASSOCIATES
STRUCTURAL ENGINEERS
88 University Place, New York, NY 10003

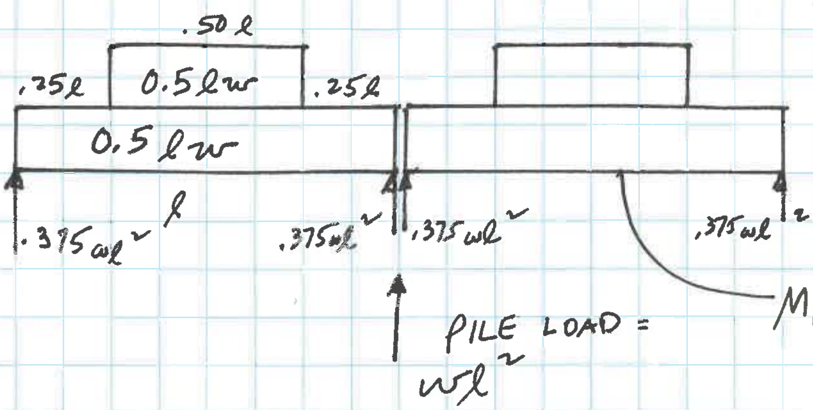
PROJECT BUILDING 52 JOB NO. 12900.02 PAGE 1-2

SUBJECT GROUND FLOOR BY [illegible] DATE 12/2010



w = TOTAL FLOOR LOAD (psf)

NOTE: LOAD FROM MIDDLE STRIP SUPPORTED BY SLAB BAND.
USE 100% OF " " LOAD IN EACH DIRECTION



$M_{max} = .375wl^2 \times \frac{l}{2} - .5wl \times .5l \times .25l - .5wl \times .25l \times .125l =$
$= .1094\ wl^3$

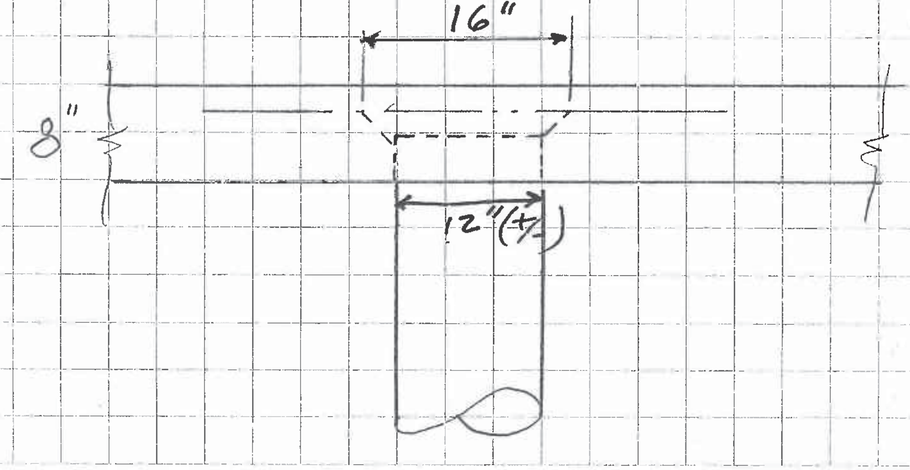
M_{CAP} (BASED ON REINF.) $= \phi b d^2 f'_c \omega(1-0.59\omega)$ [SEE ACI DESIGN MANUAL, TABLE 6.2]

for $d = 6"$, #4@6", $\rho = .0055$, $M_{CAP} = 7.02^{1K}$

, #6@10", $\rho = .0073$, $M_{CAP} = 9.06^{1K}$

PILE SPACING	SLAB BAND/FT. $M_U = \frac{.1094 w l^3}{l/2} = .2188 w l^2$	$M_U = M_{CAP}$, $w_{TL} = \frac{M_{CAP}}{.2188 l^2}$		w_{LL} (FACTORED) = $w_{TL} - 0.120$		w_{LL} (UNFACTORED) = w_{LL}(FACT.)/1.6	
		A (7.02) #4@6"	B (9.06) #6@10"	A #4@6"	B #6@10"	A #4@6"	B #6@10"
6'-0"	7.8768 w	.891	1.150	.771	1.03	.481	.643
8'-0"	14.0032 w	.501	.646	.381	.526	.238	.329
10'-0"	21.88 w	.320	.414	.200	.294	.125	.183

CHECK PUNCHING SHEAR:



$V = 4\sqrt{f'_c}\, b_o d = 4 \times \sqrt{4000} \times \pi \times 16 \times 4 =$
50.83^K (FACTORED) $\div 1.5 \approx 34^K$ (UNFACTORED)

6'-0" SPACING $= (.643 + .100) \times 6^2 = 26.7^K$
8'-0" $= (.329 + .100) \times 8^2 = 27.5^K$
10'-0" $= (.183 + .100) \times 10^2 = 28.3^K$

ALL $< 34^K$

ALSO ALL LESS THAN 40^K, LIKELY CAPACITY OF A TIMBER PILE.

CAN 2" BE TEMPORARILY REMOVED FROM TOP SURFACE OF GROUND FLR. SLAB - SCARIFY TO REMOVE PCBs (ALSO WILL REMOVE CARBONATED CONCRETE & ANY CHLORIDE CONTAMINATION).

THIS WILL REDUCE "d" FROM 6" to 4" (SEE TABLE 6.2, ACI)

#4 @ 6" o.c. = $A_s = .40 in^2$, $\rho = .40/4 \times 12 = .00833$, $M_u = 4.46^{1k}$

#6 @ 10" o.c., $A_s = .53 in^2$, $\rho = .53/4 \times 12 = .011$, $M_u = 5.80^{1k}$

CHECK LOWEST LOAD, PILES @ 10'-0" o.c.

$$w_{TL} = \frac{M_{CAP}}{.2188 \ell^2} = \frac{4.46}{21.88} = .204^{KSF}$$

LESS FACTORED DL of 6" SLAB $= -.090$ $= .075 \times 1.2$

FACTORED $v_{CAP} = .114^{KSF}$

UNFACTORED $\div 1.6 = .071^{KSF}$

SLAB WILL SUPPORT CONST. LOAD OF 71 psf MIN. DURING WORK. HOW HEAVY IS SCARIFYING MACHINE?

ADVANTAGE IS THAT NEW 2" TOPPING SLAB CAN BE BONDED TO BASE 6" SLAB & CAN HAVE TOP REINF. INSTALLED. THUS SLAB CAN BE DESIGNED AS CONTINUOUS 2-WAY FLAT PLATE (IF THERE ARE INDEED PILES) WHICH WILL HAVE A MUCH GREATER LOAD CARRYING CAPACITY.

APPENDIX B

Historic Context for Building 52
RTKL Associates Inc.

RTKL
AN ARCADIS COMPANY

RTKL Associates Inc.
2101 L Street, NW
Suite 200
Washington, DC 20037
202 833 4400
RTKL.COM

March 10, 2014

Mr. Allen Peterson, P.E.
Strategy Manager
Atlantic Richfield Company, a BP Affiliate
150 W Warrenville Rd. MC 200-1N
Naperville, IL 60563

Subject: **Building 52, Historic Assessment**
Anaconda Wire & Cable Corporation, Hastings on Hudson

Dear Mr. Peterson:

RTKL is pleased to present the report documenting the historic assessment of Building 52, located on the site of the former Anaconda Wire & Cable Corporation at Hastings-on-Hudson, New York.

At the request of Haley & Aldrich, RTKL has investigated the history of Building 52, including its function on the site of the Anaconda Wire and Cable Corporation and its role in the surrounding community. RTKL has prepared the following report to document these findings and provide a comprehensive historic assessment of the building as it exists today.

We look forward to continuing work on the future of this site.

Kind regards,

Douglas McCoach
Vice President
RTKL Associates Inc.

Attachment: Anaconda Wire & Cable Corporation, Hastings-on-Hudson | Building 52, Historic Assessment

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2101 L Street, NW
Suite 200
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202 833 4400
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Anaconda Wire & Cable Corporation, Hastings-on-Hudson

Building 52, Historic Assessment

10 March 2014

RTKL
AN ARCADIS COMPANY

Historic Context for Building 52,
Anaconda Wire & Cable Corporation, Hastings-on-Hudson

Bound by Putnam County to the north, Bronx to the south, Long Island Sound and Connecticut to the east, and the Hudson River to the west, Westchester County prospered due to its geographic location. The county's multiple waterways, including the Croton, Saw Mill, and Bronx Rivers, provided early transportation within the county and to nearby New York City. The county's advantageous location propelled the region's land development and agricultural and industrial based economies.[1] Hastings-on-Hudson is an incorporated village in the town of Greensburg and located immediately north of Yonkers within Westchester County. The cable and wire industry started production in Hastings-on-Hudson in 1888 and continued until the close of the Anaconda Wire & Cable Corporation in 1974.

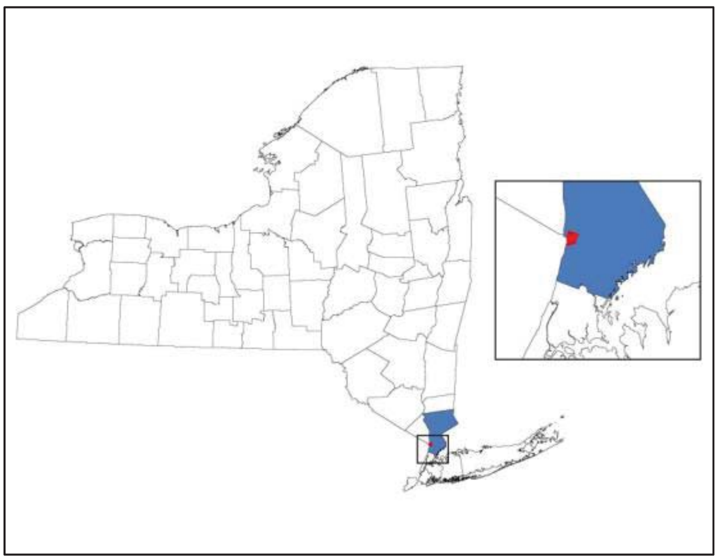

Figure 1: Location of Westchester County and Hasting-on-Hudson within New York State (EHT Traceries)

Hastings-on-Hudson in the Seventeenth Century

Hastings-on-Hudson originated as part of the vast land holdings acquired by Frederick Philipse. Born in Bolsward, Friesland, Holland, in 1626, Philipse immigrated to New Amsterdam (New York) in 1647 to serve as a master builder/carpenter for the Dutch West India Company. In 1657, he acquired the "Small Burgher Right of New Amsterdam" that allowed him to become a public merchant and hold political office. He continued to amass wealth by means of his marriage to Margaret de Vries and entrepreneurial efforts including commercial ventures, colonial trade routes, and land acquisition. Philipse and two business partners purchased part of Adriaen van der Dock's former patroonship—Dutch manorial land—near present-day northern Yonkers in 1672. Between 1680 and 1686, he bought out his partners and continued to acquire land in the Hudson River Valley from the Wiechquaskeck and Sinsink tribes. Extending to the Croton River, Philipse's land holdings included Hastings-on-Hudson and extended more than 20 miles along the east bank of the Hudson River and comprised approximately 156,000 acres. Philipse died in 1702. His land holdings

[1] Robert Panetta, "Westchester, the American Suburb: A New Narrative," in *Westchester: The American Suburb* (New York: Fordham University Press, 2006), 8.

passed to his heirs who developed the region as an agricultural center constructing grist and saw mills, wharfs, and manor houses. By the mid-eighteenth century, approximately 1,000 tenants inhabited the lands.[2] Hastings-on-Hudson had a number of tenant farmers who grew wheat and corn, raised cattle, and shipped their goods to markets on small sloops down the Hudson River.[3] At the onset of the American Revolution, Philipse III remained loyal to the British crown and all of the family's property was confiscated and sold at auction.[4] The tenant farms were primarily purchased by men who resold the lots to small farmers or wealthy New York professionals who desired to establish a country estate.[5] By 1790, the town of Greenburg had a population of 1,400 including 122 slaves.[6] The population continued to slowly increase. In 1850, Greenburg had 4,190 Caucasians and 101 free African-Americans.

<u>Early Eighteenth Century Industry – Marble Quarries</u>

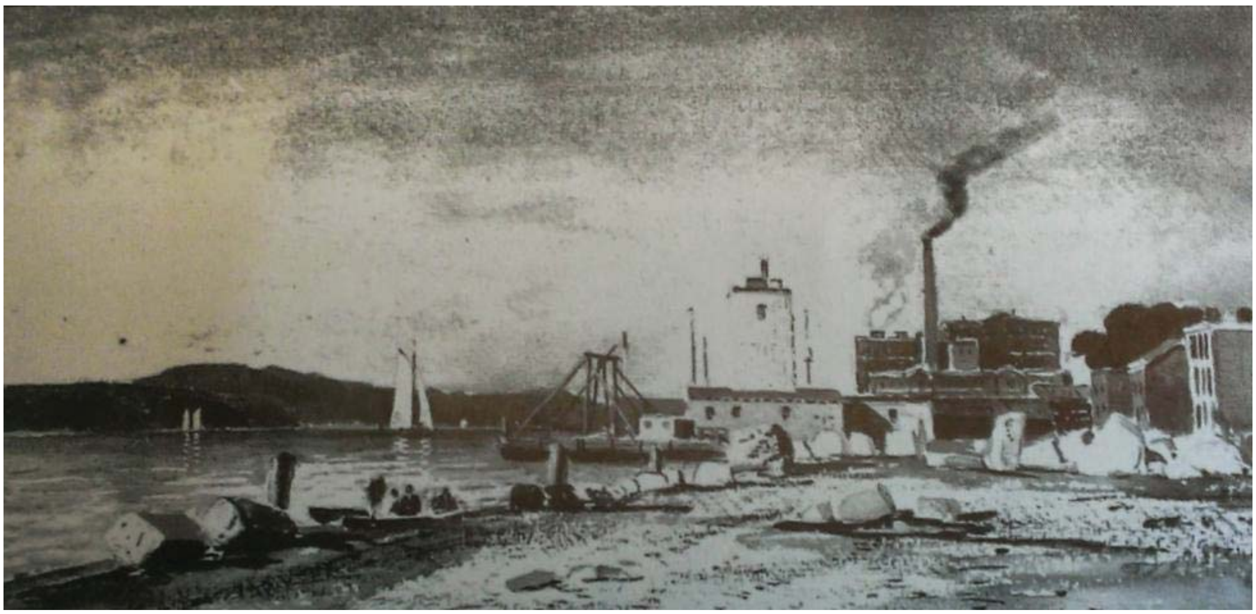

Figure 2: c.1860 "Quarry Works, Hastings-on-Hudson" Watercolor by Samuel Colman *(Images of America: Hastings-on-Hudson)*

Industrial and manufacturing remained limited in Hastings-on Hudson until the mid-nineteenth century. In 1828, Philip Van Brugh Livingston opened a marble quarry, the first notable industrial activity in the village. Six years later, in 1834, he sold the 15-acre property and quarry to George Harvey. The property included a stone wharf accessed by a railroad that carried rough marble blocks to the Hudson River to be shipped. Harvey leased the quarry to Elisha Boomer who subleased it to various other individuals. Harvey sold the Hastings property in 1846 to Henry R.

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[2] J.T. White Company, *The National Cyclopedia of American Biography* (New York: James T. White & Company, 1910), 275; Tom Lewis, *The Hudson: A History* (New Haven, Connecticut: Yale University Press, 2007), 120-123; Peter R. Eisendtadt, ed., *The Encyclopedia of New York State* (Syracuse, New York: Syracuse University Press, 2005), 1199; National Park Service, "Philipse Manor Hall, New York," http://www.cr.nps.gov (accessed July 31, 2013).

[3] Hastings Historical Society, *Images of America: Hastings-on-Hudson* (Charleston, South Carolina: 2008), 18.

[4] Peter R. Eisendtadt, ed., *The Encyclopedia of New York State* (Syracuse, New York: Syracuse University Press, 2005), 1199.

[5] Karolyn Wrightson, "From Ellis Island to Hastings: The Effect of Immigration on the Hudson River Village," *The Westchester Historian* 63 no. 3 (Summer 1987): 67.

[6] Bureau of the Census, *First Census of the United States: 1790*, http://www.census.gov.

Wilson (later owned by James Wilson). [7] The 1850 United States Census records two quarrymen in Greenburg: Francis Bayles and Thomas Booth who employed a total of 41 employees.[8] Many of these employees were Irish immigrants who were listed as laborers in the census.[9] Quarrying operations continued in Hastings-on-Hudson into the late 1800s.

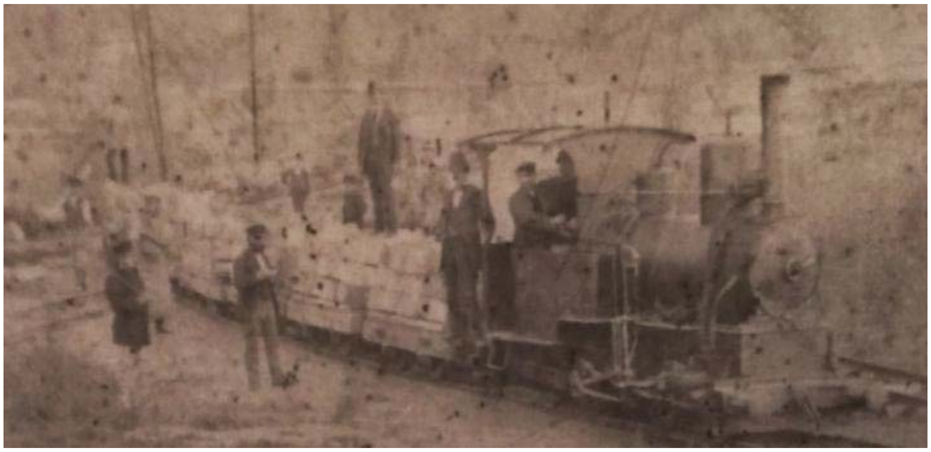

Figure 3: c.1860 Image of the quarry steam engine moving slabs of marble to the waterfront
(Images of America: Hastings-on-Hudson)

Industrial Development in the Mid-Nineteenth Century

The completion of the Hudson River Railroad in 1849 spurred the industrial development of the Hudson River Valley, including Hastings-on-Hudson. The rail line ran from New York City north along the Hudson River to Albany. In conjunction with an accessible labor force, these transportation systems attracted manufacturers to Westchester County. Iron industries were established in Peekskill and Croton, Mobile Company for America in Tarrytown, Lord and Burnham Greenhouse Manufacturing Co. in Irvington, Hudson River Brewing in Dobbs Ferry, and Otis Elevator and Alexander Smith Carpet Company in Yonkers.[10]

Similar to other Hudson River cities and villages, Hastings-on-Hudson's desirable waterfront location and proximity to the newly installed rail line led to the opening of numerous factories and refineries. One industry that took advantage of the waterfront location was sugar refineries. The riverfront location allowed for the unloading of large amounts of coal necessary to run the refinery furnaces and the nearby railroad allowed for the distribution of goods to additional markets.[11]. The railroad also facilitated the movement of German and Irish immigrants to these industrial sites where they were hired as laborers.

In 1853, Henry Kattenhorn—a German immigrant who moved from New York City to Hastings-on-Hudson circa 1850—acquired a refinery site on the waterfront. In 1861, Kattenhorn entered into a joint business venture with Eide F. and Mathias Hopke and established a six-story, brick refinery

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[7] Mary L. Allison, "The Quarry," *Hastings Historian* 35 no. 1 (Winter 2005): 3-4.
[8] Ancestry.com, *United States Federal Census: Industry Schedule*, http://www.ancestry.com.
[9] Ancestry.com, *United States Federal Census*, http://www.ancestry.com; Karolyn Wrightson, "From Ellis Island to Hastings: The Effect of Immigration on the Hudson River Village," *The Westchester Historian* 63 no. 3 (Summer 1987): 69.
[10] Susan Cochran Swanson and Elizabeth Green Fuller, *Westchester County: A Pictorial History* (New York: Donning Company Publisher, 1998), 88.
[11] Karolyn Wrightson, "Sugar Time on the Hudson," *The Westchester Historian* 65 no. 1 (Winter 1989): 6.

known as the Hudson River Steam Sugar Refinery. Mathias Hopke separated from the larger company and constructed his own smaller sugar refinery on the southern end of Hastings-on-Hudson waterfront.[12]

Figure 4: c. 1860 postcard of Hudson River Sugar Refinery (Westchester County Archives)

Other industrial development continued during this period. F.W. Beers' *Atlas of New York and Vicinity: Town of Greenburg* (1868) shows a number of commercial buildings to the west of the Hudson Valley Railroad along the waterfront including: J.M. Schlosser Coal and Wood, Ferguson & Hillman Wood Coal & Lumber, Hudson River Sugar Refinery, G.E. Munson & Son's Wood & Coal Yard, P.H. Wagner & Co. Chemical Works, and NY Steam & Vacuum Oil Co. In addition, Beers recorded the Steam Boat Dock, Crummells Dock, and Betts Dock. [13]

The *New York Tribune* described the town in 1869:

> Hastings has a population of about 1,200. It contains two hotels, four stores, one bakery, a large sugar refinery, five churches, two schools, one large distillery, a rock candy and India rubber factory, and an axe manufactory. There is a good water-power here, which is used by the factories. The inhabitants are mostly mechanics, though a wealthier class of people lives back from the river. The land is high and rolling, and there are several fine residences…. A large sugar refinery is about going up. Large quantities of marble are quarried from the hills in the neighborhood, and shipped to New York and other places. Considerable lime is also exported.[14]

The Hastings-on-Hudson industrial-orientated waterfront, however, suffered a substantial setback in 1875. The Hudson River Sugar Refinery burned resulting in a $500,000 loss of property and material. Approximately 150 men lost their jobs due to the fire.[15] Later fires led to the subsequent ruin for the remaining waterfront industries at Hastings-on-Hudson. J. Thomas Scharf noted that:

[12] Karolyn Wrightson, "Sugar Time on the Hudson," *The Westchester Historian* 65 no. 1 (Winter 1989): 6-7.
[13] F.W. Beers, *Atlas of New York and Vicinity: Town of Greenburg* (New York: Beers, Ellis & Soule).
[14] New York Tribune, "Hastings," *New York Tribune*, April 12, 1869, Chronicling America.
[15] New York Times, "Loss by Fire: The Hudson River Sugar Refinery Burned Loss $500,000," *New York Times*, December 28, 1875, Proquest Historical Newspapers.

"Accordingly, almost every industry of that kind in the village has been now abandoned, a result which was probably hastened by the fire which, in 18[75], laid the large sugar refinery in ashes."[16] The industrial depression in Hastings-on-Hudson would be short lived as numerous new enterprises were established towards the end of the nineteenth century.

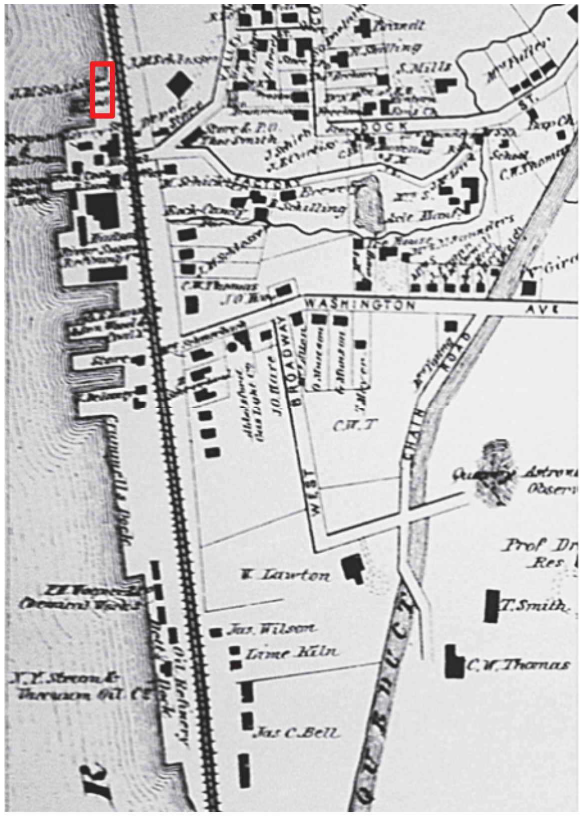
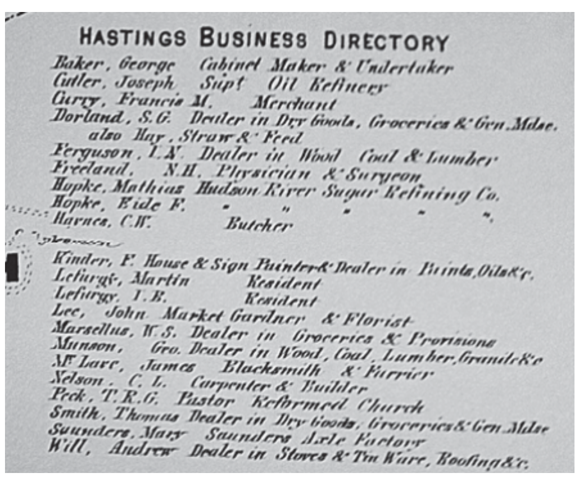


Figure 5: Detail of commercial area of Hastings-on-Hudson from F.W. Beers' Atlas of New York and Vicinity: Town of Greenburg (1868) showing the approximate location of the future site of Building 52.
(Hastings-on-Hudson Historical Society)



HASTINGS BUSINESS DIRECTORY

Baker, George Cabinet Maker & Undertaker
Cutler, Joseph Supt Oil Refinery
Curry, Francis M. Merchant
Dorland, S.G. Dealer in Dry Goods, Groceries & Gen. Mdse.
also Hay, Straw & Feed
Ferguson, I.N. Dealer in Wood Coal & Lumber
Freeland, N.H. Physician & Surgeon
Hopke, Mathias Hudson River Sugar Refining Co.
Hopke, Eide F. " " " " ".
Harnes, C.W. Butcher
Kinder, F. House & Sign Painter & Dealer in Paints, Oils &c.
Lefurgy, Martin Resident
Lefurgy, I.B. Resident
Lee, John Market Gardner & Florist
Marsellus, W.S. Dealer in Groceries & Provisions
Munson, Geo. Dealer in Wood, Coal, Lumber, Granite &c
McLare, James Blacksmith & Farrier
Nelson, C.L. Carpenter & Builder
Peck, T.R.G. Pastor Reformed Church
Smith, Thomas Dealer in Dry Goods, Groceries & Gen. Mdse
Saunders, Mary Saunders Axle Factory
Will, Andrew Dealer in Stoves & Tin Ware, Roofing &c.

Figure 6: Detail of Business Directory for Hastings-on-Hudson from F.W. Beers' Atlas of New York and Vicinity: Town of Greenburg (1868)
(Hastings-on-Hudson Historical Society)

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16 J. Thomas Scharf, *History of Westchester County, New York, including Morrisania, Kings Bridge, and West Farms, which have been annexed to New York City* Vol. II (Philadelphia: L.E. Preston & Co., 1886), 183.

Industrial Development in the Late Nineteenth Century

In the 1880s, Hastings-on-Hudson underwent substantial industrial development that set the stage for the village's future prosperity. Hastings Pavement Company was established in 1885.[17] Noted for their high quality product, the company made hexagonal and oblong paving blocks utilized throughout the county.

Shortly thereafter, in 1888, C.H. Jackson incorporated the National Conduit Manufacturing Company of Hastings, N.Y., with a capital stock of $100,000.[18] J.E. Crawford's *Insurance Map of the Hastings on the Hudson, Westchester County, New York* (1889) records the company towards the southern end of the waterfront property.[19] The plant consisted of a one-story brick building with a wood-frame monitor roof and multiple smaller buildings.[20] The company was noted for their production of wrought iron riveted pipe lined with cement.[21]

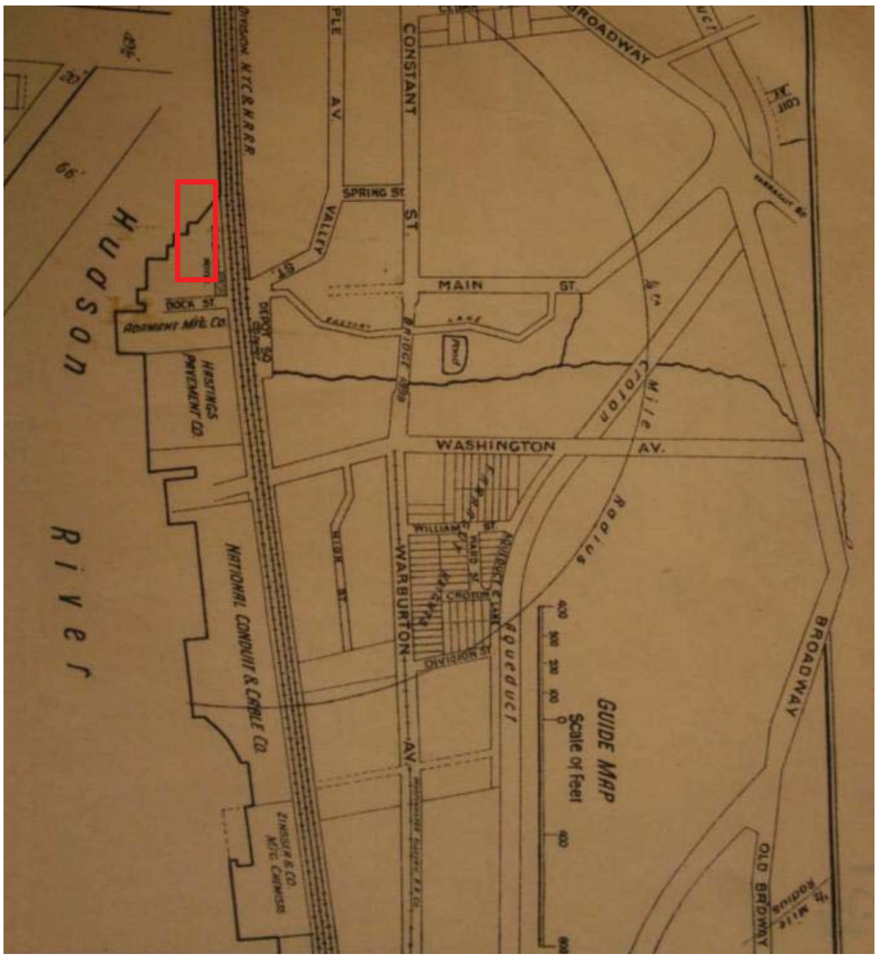

Figure 7: 1889 Detail of J.E. Crawford's *Insurance Map of the Hastings on the Hudson, Westchester County, New York* showing riverfront of Hastings-on-Hudson (Hastings-on-Hudson Historical Society) showing the approximate location of the future site of Building 52.

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[17] The Sun, "Hastings Pavement Company," *The Sun*, October 04, 1885, Chronicling America.
[18] Electrical World, "Miscellaneous Notes," Vol. 11-12 (September 22, 1888): 167.
[19] J.E. Crawford, *Insurance Maps of Hastings on the Hudson*
[20] Hastings Historical Society, *Images of America: Hastings-on-Hudson* (Charleston, South Carolina: 2008), 56.
[21] Karolyn Wrightson, "From Ellis Island to Hastings: The Effect of Immigration on the Hudson River Village," *The Westchester Historian* 63 no. 3 (Summer 1987): 72.

In 1893, Joseph Rudolf Bien's *Village of Hastings* (1893) records the following businesses: Ferguson Livery & Lumber, Adamant Plaster Company, Hastings Pavement Co., J. Bonnet Lumber & Coal, J.J. & F.P. Treanor North River Blue Stone Works, and Platts Pipe Works (not in operation). In total, there were 23 wood-frame and 6 brick buildings lining the Hudson River.[22] Four years later, in 1897, the Zinsser Chemical Company opened to the south of the National Conduit Manufacturing Company, then the National Cable & Conduit Company. Zinsser produced tannic acid, wood alcohol, photographic chemicals, and dyes.[23] By the end of the century, the three companies (National Cable & Conduit Company, Hastings Pavement Company, and Zinsser Chemical Company) employed over 172 employees.[24]

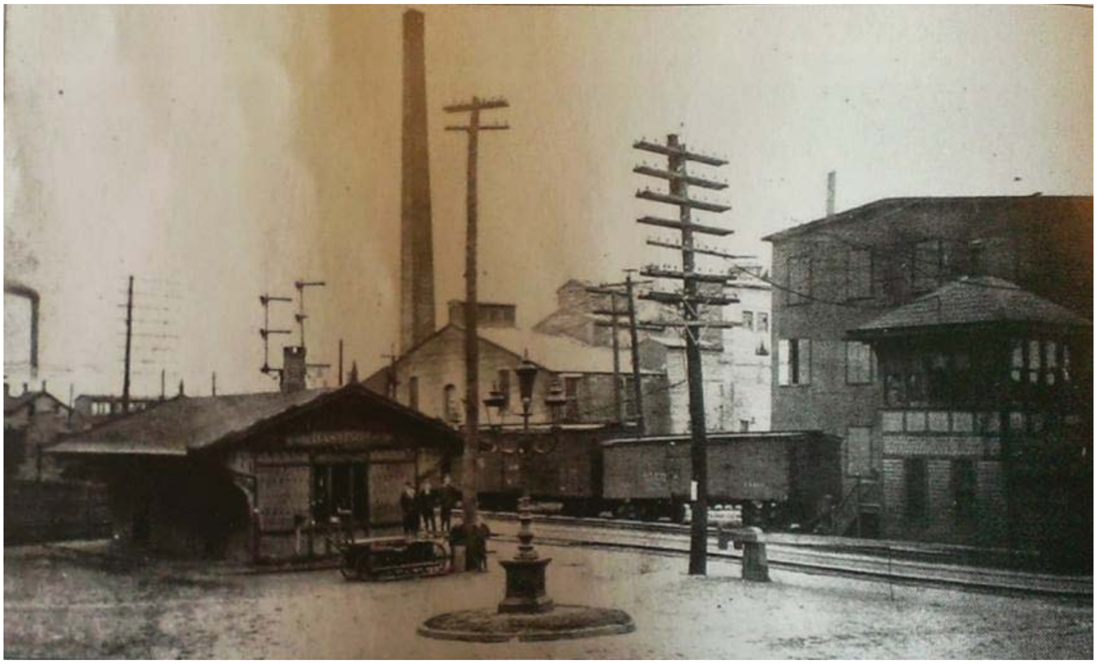

Figure 8: c.1900 Photograph of industrial buildings and train station along Hastings-on-Hudson waterfront
(Images of America: Hastings-on-Hudson)

National Conduit & Cable Company – Construction of Building 52

The National Conduit Manufacturing Company and the National Underground Cable Company consolidated under the name of the National Conduit & Cable Company in 1896. According to *Electrical Engineer*:

> The new organization is the sole owner of patents for paper insulated wires and cables for telephones and telegraph, electric light and power service, and wrought iron cement lined tubes for electric subways. It also contracts for complete subway systems. The mills of the new company are at Hastings-on-Hudson, with its New York office in the Times Building….[25]

[22] Joseph R. Bien, *Village of Hastings* (New York: Julies Bien & Co., 1893), 21.
[23] Hastings Historical Society, *Images of America: Hastings-on-Hudson* (Charleston, South Carolina: 2008), 19.
[24] Office of Factory Inspector, *Thirteenth Annual Report of the Factory Inspector of the State of New York* (New York: Wynkoop Hallenbeck Crawford Co., 1899), 375.
[25] Electrical Engineer, "Report of Companies," *Electrical Engineer* 23 no. 468 (1897): 436.

The National Conduit & Cable Company produced cables for numerous industries, including the Chicago Electric Light Company, New York Metropolitan Traction Company, and European organizations. At the time of the merger, the company had completed a factory on the site measuring 100' x 400' and capable of producing 40,000 feet of complete cable per day.[26] Capitalizing on the global need for cables and conduits that could transmit electrical current, the National Conduit & Cable Company quickly replaced buildings, expanded operations, and infilled the Hudson River to accommodate new construction. The 1902 *Sanborn Fire Insurance Map* records nineteen one and two-story brick and wood-frame buildings (a number of which adjoin to form one larger unit), demonstrating the company's dramatic growth since its establishment in 1888.[27]

Between 1902 and 1907, National Cable & Conduit Company purchased the buildings owned by Adamant Plaster Company on a nearby waterfront parcel. As a result, the complex was divided by the Hastings Pavement Company into a north plant and a south plant. The Tompkins & Bevers' Coal, Wood, and Masons complex—the future site of Building 52—was located to the north of National Conduit & Cable Company's northern plant.[28] In 1908, the National Conduit & Cable Company had over 1,000 employees and was one of the largest plants in New York State.[29]

[26] Street Railway Journal, "Among the Manufacturers," *The Street Railway Journal* 13 (March 1897): 185.
[27] Sanborn Fire Insurance Company, "Hastings-on-Hudson," (1902): 3-4.
[28] Sanborn Fire Insurance Company, "Hastings-on-Hudson," (1907): 3-4.
[29] Electrical World, "Industrial and Commercial News," *Electrical World* 51 no. 4 (January 25, 1908): 202.

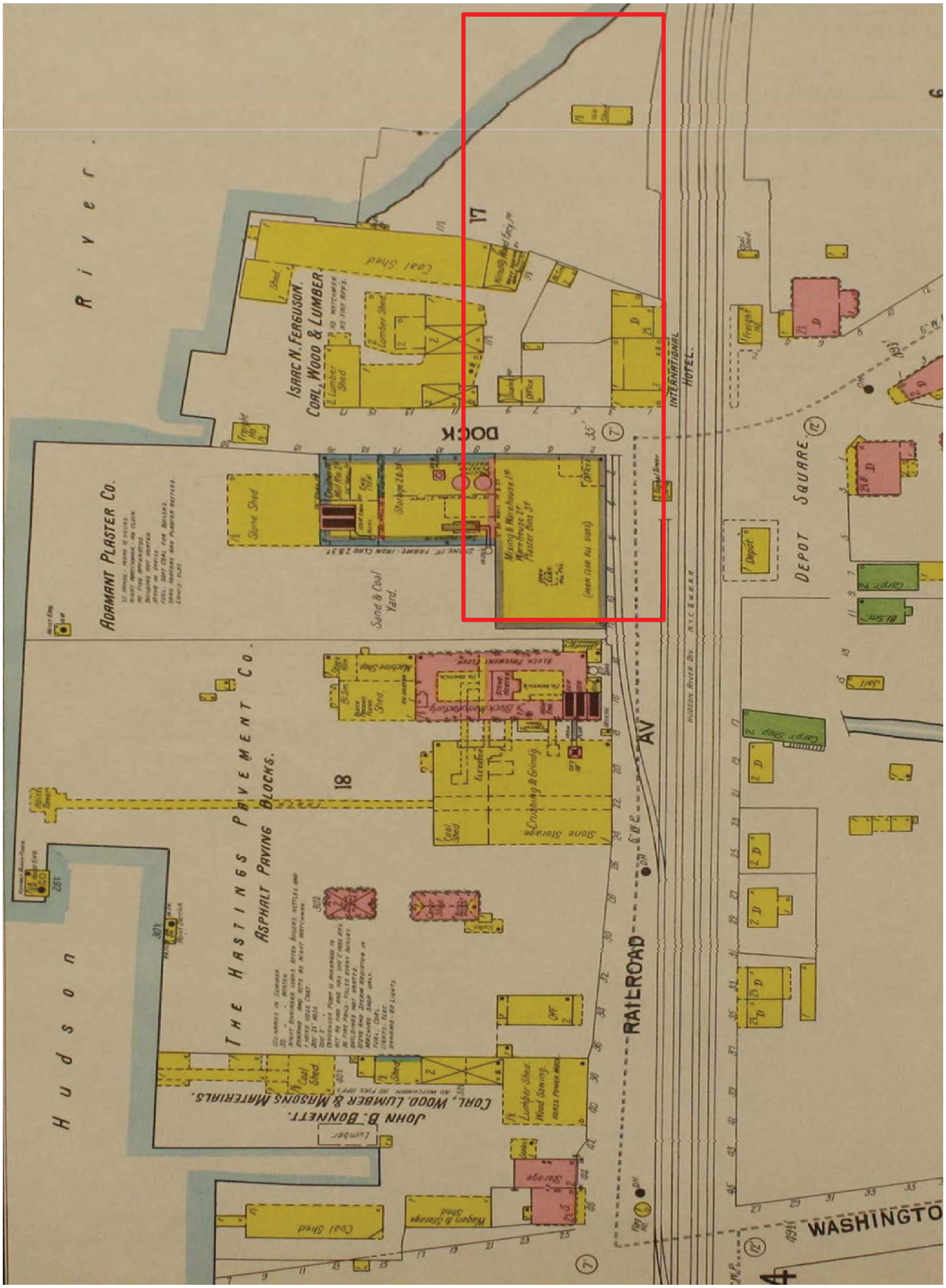

Figure 9: 1902 Sanborn Map of future location of Building 52 (approximate location outlined) Map details ownership of waterfront property by Adament Plaster Company, Issac N. Ferguson Coal, Wood, & Lumber, and The Hastings Pavement Company.

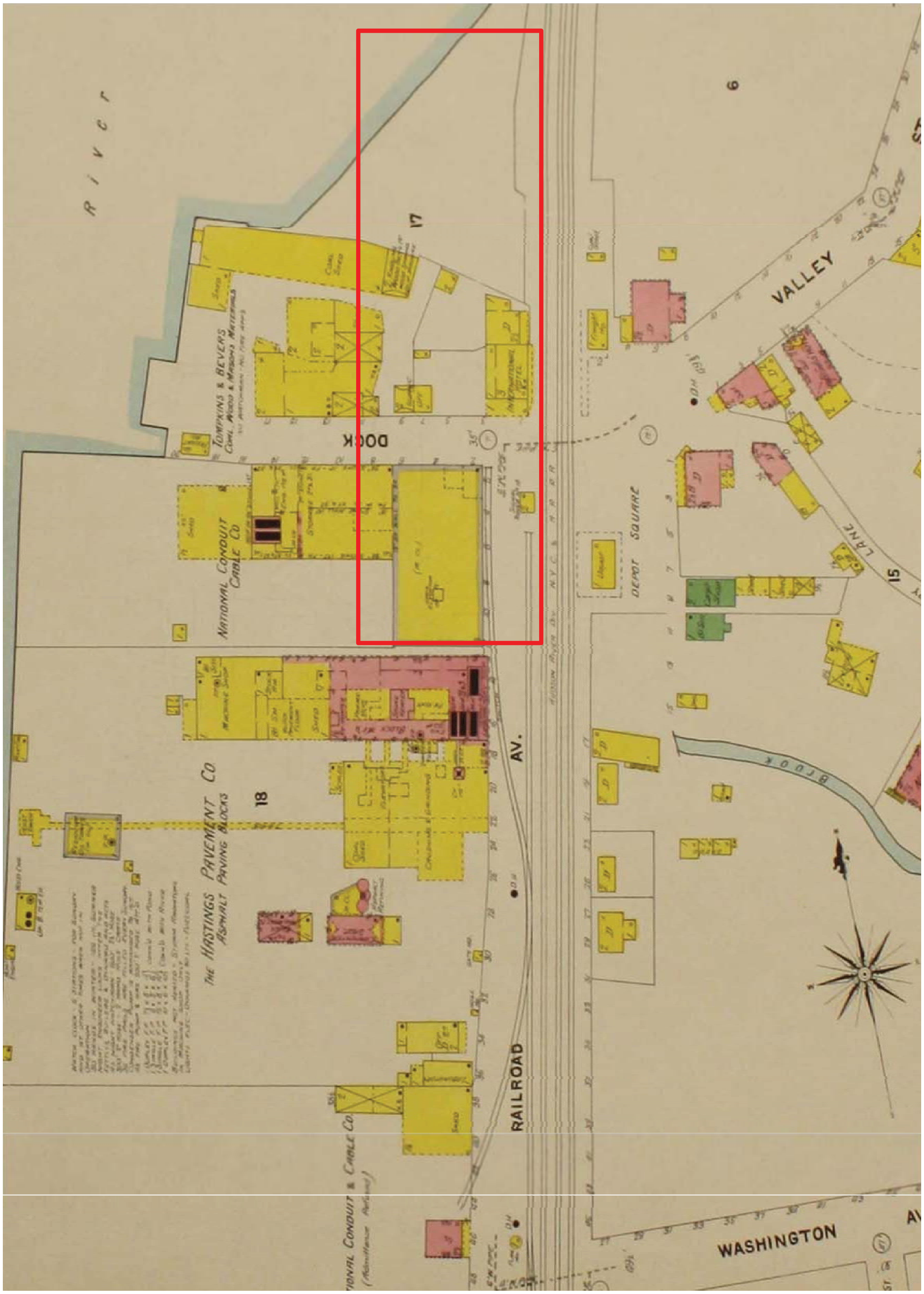

Figure 10: 1907 Sanborn Map of future location of Building 52 (approximate location outlined) showing ownership of waterfront property by the National Conduit and Cable Company to the north and south of The Hastings Pavement Company.

Coupled with advances in the field, damage caused by multiple fires, and a thriving business, the National Cable & Conduit Company significantly expanded operations following its purchase of the Adamant Plaster Company site. In 1908, a fire damaged the main building and spread with such ferocity that it caused more than $300,000 in damage during the first hour.[30] Such occurrences contributed to the construction of multiple new industrial buildings. Of particular interest in this study are the two large single-story buildings constructed on newly filled land in 1911.[31] The larger of the two buildings (deteriorated to the point of failure and removed from the site) was constructed on the south plant. The smaller building, present-day Building 52, was built on the north plant. Both buildings consisted of brick masonry bearing walls with steel columns embedded in the brick piers. The structural systems supported sawtooth roofs.[32] A railroad siding ran from the main tracks along the eastern elevation of Building 52 in order to facilitate the movement of material in and out of the building.[33]

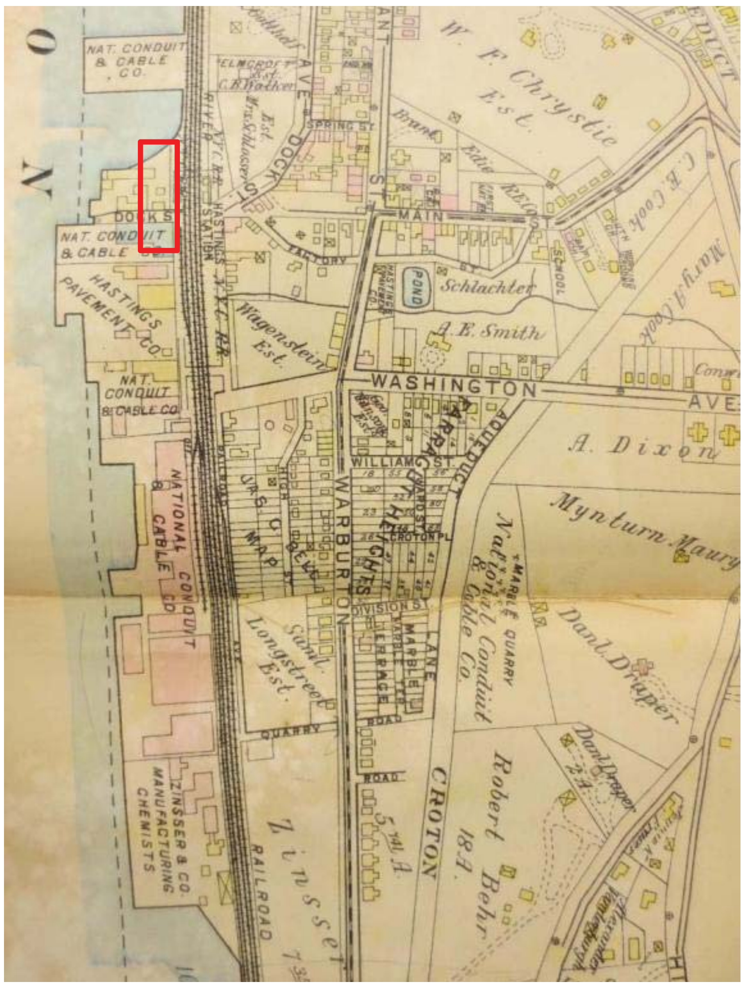

Figure 11: 1911 Atlas of New York State showing the future location of Building 52

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[30] Washington Times, "Plant Explosion Fires Building; Damage $300,000," *Washington Times*, January 16, 1908, Chronicling America.
[31] The date of construction was ascertained by the evaluation of historic maps. The buildings are not evident on maps from 1911, but are shown on maps from 1912. George W. Bormley, *Village of Hastings-on-Hudson, Town of Greenburg* (New York: George W. Bromley and Walter S. Bromley, 1911); Sanborn Fire Insurance Company, "Hastings-on-Hudson," (1912): 5,9.
[32] Sanborn Fire Insurance Company, "Hastings-on-Hudson," (1912): 5, 9.
[33] Sanborn Fire Insurance Company, "Hastings-on-Hudson," (1912): 5, 9.

(Westchester County Archives)

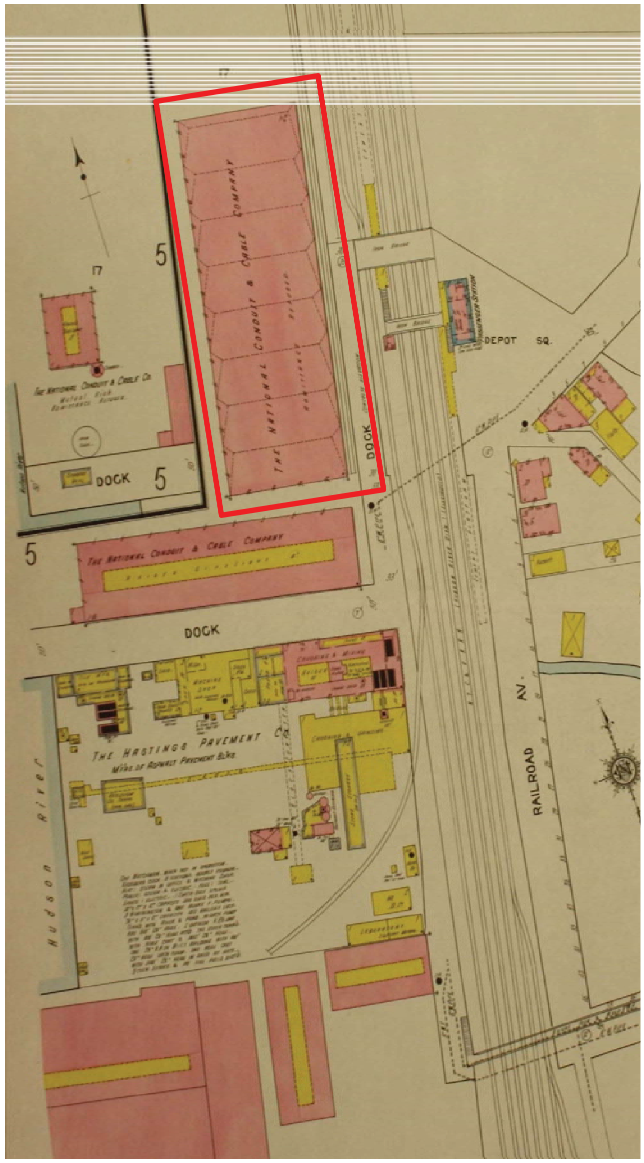

Figure 12: 1912 Sanborn Map showing the newly constructed Building 52 (Library of Congress)

At the turn of the twentieth century, sawtooth roofs were considered the pinnacle of industrial design. The roof system consisted of a series of parallel one-sided skylights that typically allowed for the admittance of only northern light. This allowed for industrial complexes to obtain light while omitting direct sunlight and its inherent heat. The sawtooth component was a skylight with a cross section similar to a 30-60-90 degree triangle. The shorter, vertical length contained windows and the longer, diagonal leg was treated with traditional roofing materials. American architects adopted the roof system, but introduced double systems of trusses—called "modified sawtooth roof"—to the interior in order to limit the number of columns in sawtooth-roofed building. This alteration allowed for greater flexibility in the interior space; however, the complicated framing, considerable flashing, and internal gutter system required by sawtooth-roofed buildings resulted in higher construction and maintenance costs than flat roof and monitor-roofed buildings.[34]

[34] Betsy H. Bradley, *The Works: The Industrial Architecture of the United States* (1999): 191-197.

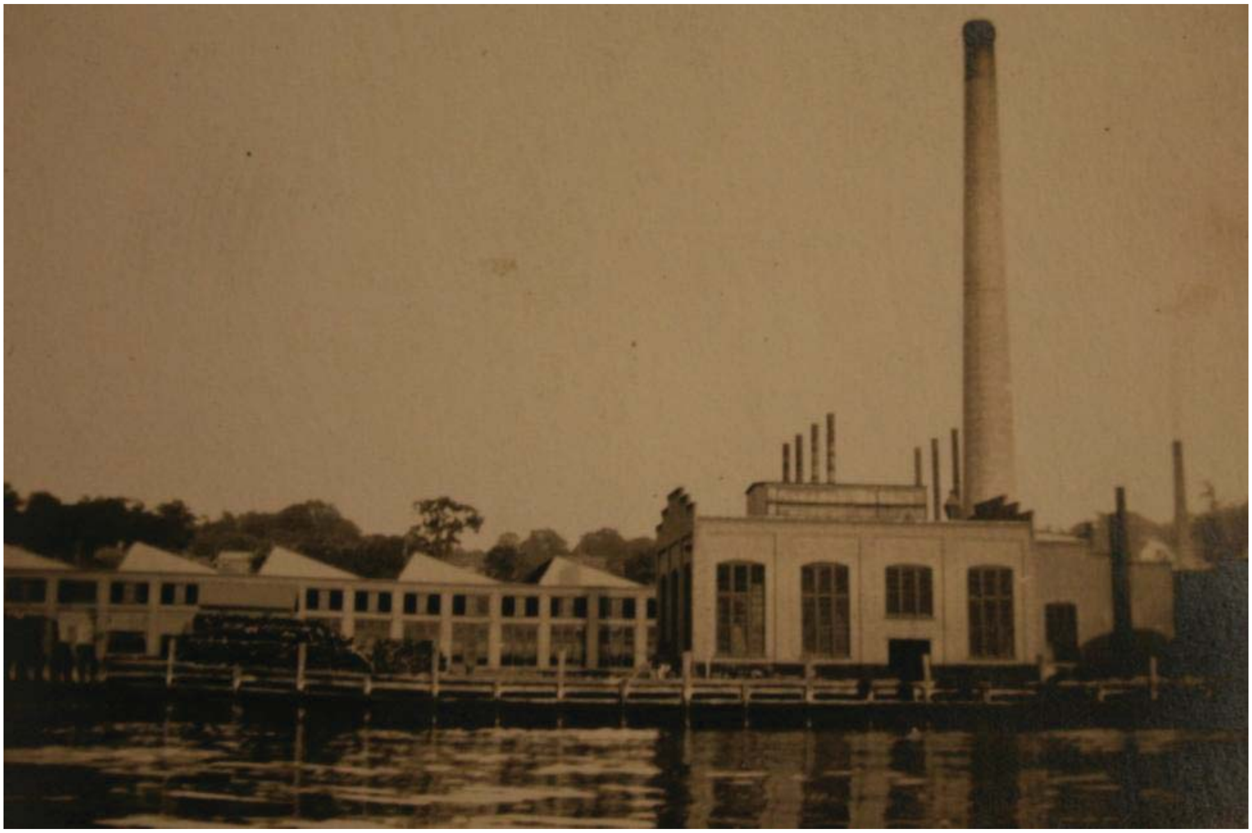
Figure 13: c.1914 photograph of Building 52 (to left) as viewed from the Hudson River.

National Conduit & Cable Company – Labor Movement and World War I

The National Conduit & Cable Company at Hastings-on-Hudson was representative of the turn of the twentieth century national labor movement and strife of American workers. During this period, federation and numerous unions, such as the American Federation of Labor (AFL), fought for favorable labor laws and workers' rights. During this period, poor conditions in the workplace, low wages, and the replacement of manual labor with new machinery were prevalent and contributed to a number of strikes that often turned to violence.

In June of 1912, the 1,200 employees of the National Conduit & Cable Company went on strike to have their wages increased by 25 cents a day. During the strike, police officers and special deputies called in by the company to protect its assets fired 100 shots into a crowd wounding four individuals. Four days later, a confrontation between strikers and laborers trying to access the plant led to the death of a woman. Later that same day, the workers settled for a 5 cent a day increase and recognition of the AFL.[35]

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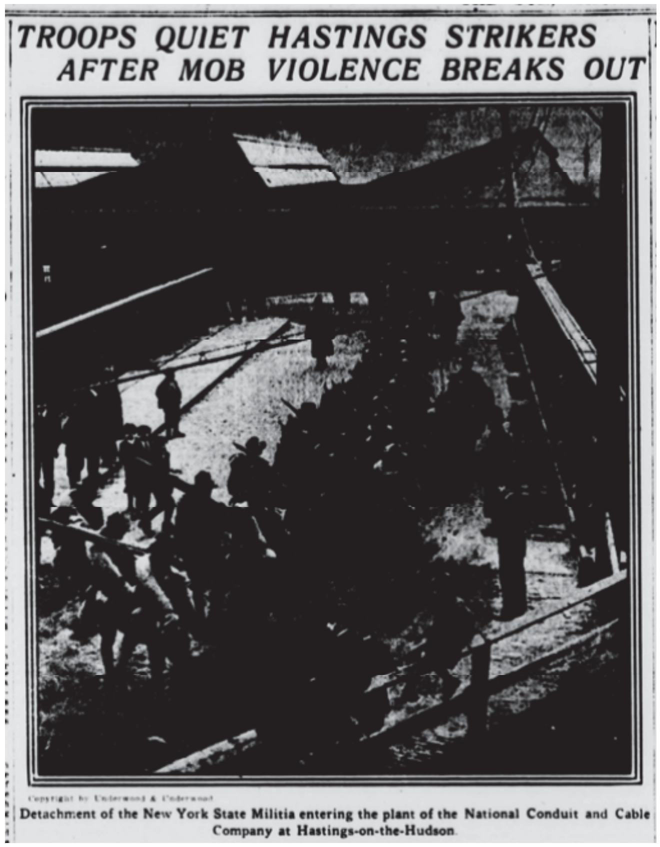
[35] New York Times, "Deputy's Gun Kills Women at Hastings," *New York Times*, June 30, 1912, Proquest Historical Newspapers;


TROOPS QUIET HASTINGS STRIKERS AFTER MOB VIOLENCE BREAKS OUT

Copyright by Underwood & Underwood
Detachment of the New York State Militia entering the plant of the National Conduit and Cable Company at Hastings-on-the-Hudson.

Figure 14: Headline from an April 20, 1916 article from The Sun detailing labor movement efforts. (Proquest)

During World War I, the National Cable & Conduit Company's buildings were utilized as a munitions plant that manufactured metal disks of brass or copper that were pressed into cartridges/shells.[36] As the American economy improved due to Allies' wartime purchases of military equipment, skilled and unskilled workers grew further agitated with the state of the workplace and wages. According to historian Sean Cashman:

> In the summer of 1915, a series of munitions strikes swept across the northern states in defiance of directives from many AFL unions who disowned the stoppages. In the following year unemployment dropped, from [approximately] 15 percent to, possibly 9 percent of the labor force and the number of strikes reached 3,789, a record for the twentieth century.[37]

On April 16, 1916, the *New York Times* reported fear of a strike at the National Conduit & Cable Company's munitions plant as the supervisors refused to increase the wages of workers. The sheriff sent a force of 20 deputies to reinforce the company's own guard of 100 armed police. Three days later, at least 1,200 of the 3,000 workers went on strike and violently attacked guards, co-workers, and other residents. In addition, the strikers broke every window along the east elevation of

[36] New York Times, "Explosion Burns 6 in Munitions Plant," *New York Times*, September 2, 1915, Proquest Historical Newspapers.
[37] Sean Dennis Cashman, *America in the Age of Titans: The Progressive Era and World War I* (New York: New York University Press, 1988), 228.

Building 52 fronting the railroad tracks. The workers took control of both bridges accessing the plant, thereby closing operations. As a result of the general disorder and the plant's important role in the manufacturing of munitions, four companies of the New York National Guard were sent to Hastings-on-Hudson to quell the riot. Each soldier carried 150 pounds of ammunitions and three days of rations. The military placed the town under martial law and setup searchlights on the company's buildings and a safety zone of 1,000 feet surrounding the plant. The National Conduit & Cable Company and the workers reached an agreement raising wages ending the strike.[38]

American Brass Company

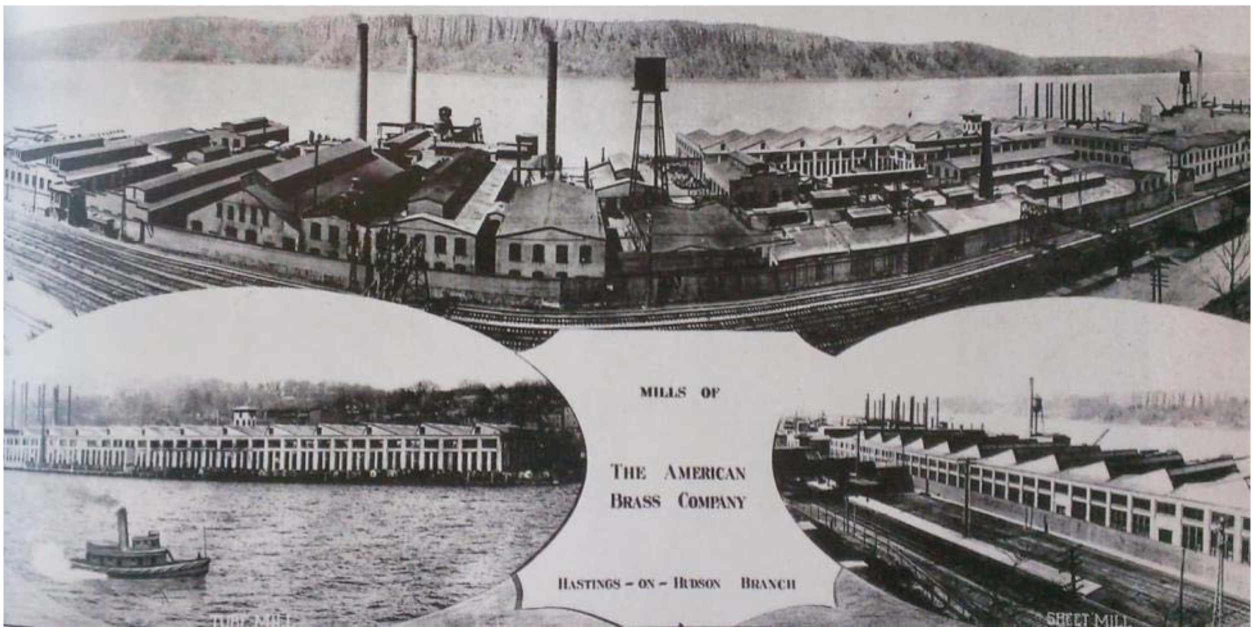


Figure 15: 1920s Image of Hastings-on-Hudson waterfront compiled by the American Brass Company. Building 52 is visible in the lower right hand corner. The other images show the other building featuring a sawtooth roof. (Hastings-on-Hudson Historical Society)

After World War I, the National Conduit & Cable Company experienced a period of economic decline. Factors contributing to its demise include numerous strikes and the loss of government contracts at the conclusion of the war effort. An evaluation of the company's financial state appeared in the *Financier:*

> These bonds are secured by first mortgage upon the 35-acre plant which the company owns, located at Hastings-on-Hudson on the Hudson River, completely

[38] The Sun "Troops Quiet Hastings Strikers After Mob Violence Breaks Out," *The Sun*, April 20, 1916, Proquest Historical Newspapers; New York Times, "Four Shot in Riot in Hastings Strike," *New York Times*, June 25, 1912, Proquest Historical Newspapers; New York Times, "Deputy's Gun Kills Woman at Hastings," *New York Times*, June 30, 1912, Proquest Historical Newspapers; New York Times, "Fear a Strike Riot at Munitions Plant," *New York Times*, April 16, 1916, Proquest Historical Newspapers; New York Times, "Mob Stones Trains; 2,000 In Service Out," *New York Times*, April 19, 1916, Proquest Historical Newspapers; New York Times, "Militia Quells Riot in Munitions Strike," *New York Times*, April 20, 1916, Proquest Historical Newspapers; New York Times, "Hastings Strikers Quiet," *New York Times*, April 22, 1916, Proquest Historical Newspapers.

> equipped with modern machinery for the manufacture of plain and insulated copper and brass wire, high voltage and subaqueous cable, brass tubing, rods, and sheets. The business has been in successful operation for thirty years. The plant, building, machinery and floating equipment have been appraised by examining engineers at $6,500,000. In addition, net quick assets as of February 28, 1917, after adding $1,500,000 of the proceeds from this financing, will amount to $6,951,823, making total tangible net assets of $13,501,823.[39]

In 1917, the National Conduit & Cable Company was reorganized and acquired by the National Conduit & Cable Company, Incorporated. Unable to satisfy debts or stock holders, the company was placed into an equity receivership in 1921.[40] On October 9, 1923, the American Brass Company—acting on behalf of the Anaconda Copper Mining Company—completed the purchase of the National Conduit and Cable Company, Inc., for $3,000,000. The acquisition included all the real estate, factory buildings, and equipment. The plant was renamed the American Brass Company, Hastings-on-Hudson Branch. At the time, the plant had 1,000 employees and the capacity to produce 10,000,000 lbs. of copper wire per month. In addition, it manufactured conduits, cables, insulated, and bare wires.[41]

In 1923, the *Hastings News* described the north plant including Building 52:

> The North Plant comprises ten acres, docks, buildings and equipment. This plant is served by a New York Central Railroad siding, and has 1,400 feet of deep water bulkhead on the Hudson River. There are 15 brick and frame buildings, which contain about 180,330 square feet of floor space, with complete sprinkler system. There are also five 3-ton traveling cranes included in the equipment.[42]

At the time of purchase, the American Brass Company noted that a rolling mill at the complex had not been in operation.[43] The 1924 *Sanborn Fire Insurance Map* records that the south plant of the American Brass complex is in full operation; however, the north plant had three of its four major buildings, including Building 52, utilized as automobile dead storage (items in a warehouse for an indefinite period of time). While modernization efforts were completed at the plant in 1928, Building 52 may have remained idle until World War II.[44] In 1939, a reporter for the Hastings Press stated, "In 1911, the North Mill, which played an important part during the war, was erected. It stands idle today, a tax burden, on the site of the old Adamant factory."[45] Factors leading to Building

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[39] The Financier, "News of Bonds," *Financier* 109 (April 14, 1917): 962.
[40] Electrical World, "Receiver Appointed for National Conduit and Cable," *Electrical World* 78 no.4 (July 23, 1921): 197.
[41] Archives & Special Collections, American Brass Company Records, University of Connecticut, Thomas J. Dodd Research Center, 1997.0996, Subseries B, Box 2:10, Excepts form *Metal Industry* (November 1923): 460.
[42] "North Mill to be Sold at Auction by Joseph P. Day," *Hastings News*, 1923, Hastings Historical Society Vertical Files, Hastings-on-Hudson, New York.
[43] Archives & Special Collections, American Brass Company Records, University of Connecticut, Thomas J. Dodd Research Center, 1997.0996, Subseries B, Box 2:10, Excepts form *Metal Industry* (November 1923): 460.
[44] Modernization efforts included completely redesigning the facility and installing new equipment in order to produce the highest degree of vacuum considered unattainable for commercial-scale cable impregnating process. Archives & Special Collections, American Brass Company Records, University of Connecticut, Thomas J. Dodd Research Center, 1997.0996, Subseries B, Box 2:10, Excepts form a Condensed History of Anaconda Wire & Cable Company (September 9, 1959): 460.
[45] Adam F. Downar, "The Advent of Growth of Industry in a Village of the Hudson Valley," *Hastings Press*, July 27, 1939. Westchester County Archives, Elmsford, New York.

52's vacancy include a slowdown in production as evident in the decrease of the number of employees.

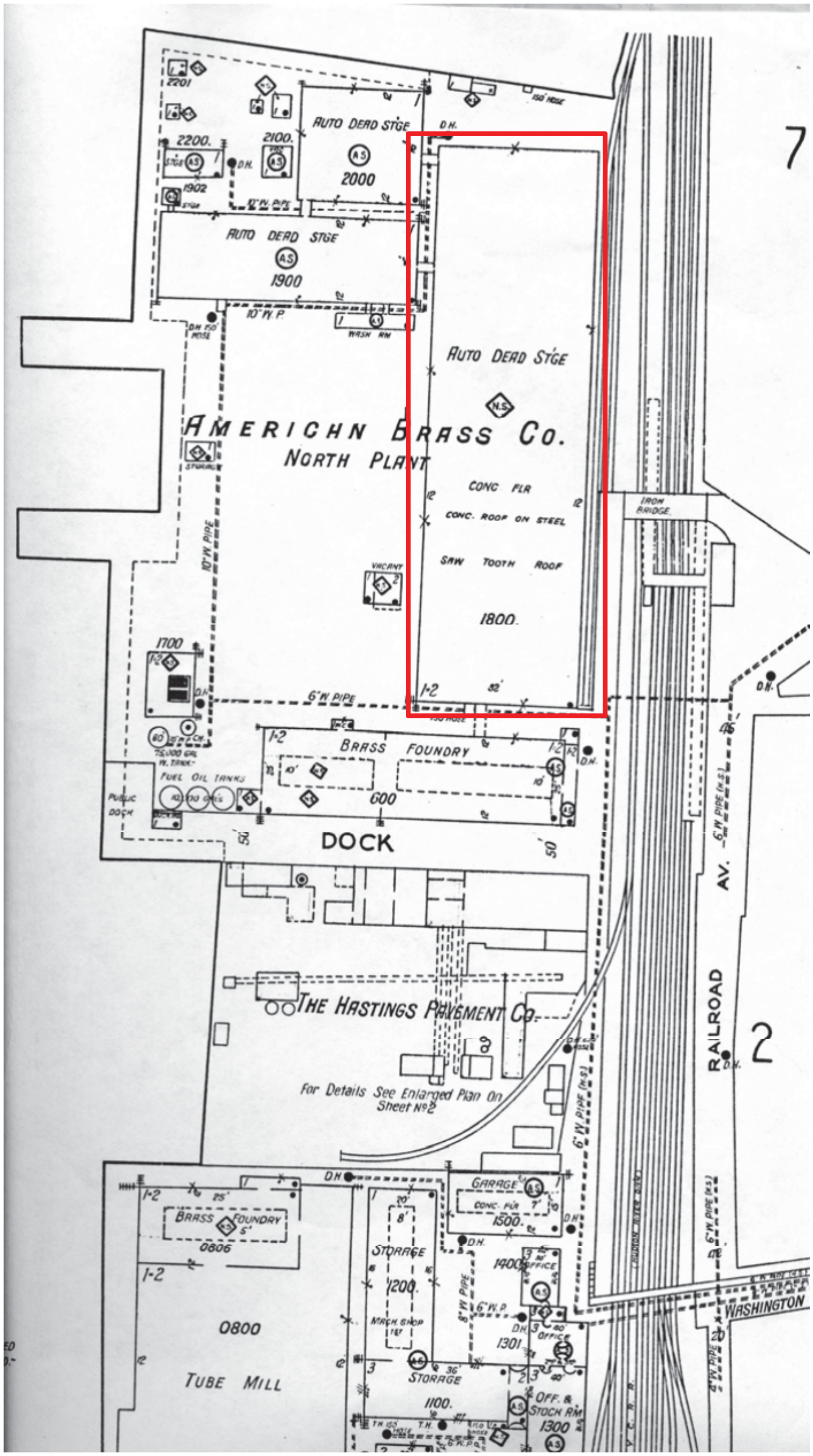

Figure 16: 1924 Sanborn Map showing use of Building 52 (shown in red) as Auto Dead Storage.

The American Brass Company transferred the property, facilities, and assets to the Hastings Wire & Cable Company, a subsidiary of the American Brass Company on April 12, 1929.[46] Two months later, on June 12, 1929, Hastings Wire & Cable Company sold the plant to Anaconda Wire & Cable Corporation, a subsidiary of The Anaconda Copper Mining Company.[47]

Anaconda Wire & Cable Company

Figure 17: 1931 Image of Anaconda Wire and Cable Company Site with Building 52 to the right, (Hastings-on-Hudson Historical Society)

The Anaconda Gold and Silver Mining Company started when Marcus Daly purchased the Anaconda mine in Butte, Montana in 1882. The company discovered copper, established a plant to process the metal, and quickly expanded assets. In 1895, the company reincorporated at $30,000,000 as the Anaconda Copper Mining Company. Company leaders, however, recognized the economic shortcoming of depending on other organizations to fabricate their products. In order to bypass such intermediaries and capitalize on production costs, Anaconda Copper Mining Company consolidated with American Brass Company, the largest fabricator of non-ferrous metals.[48] At a cost of $45,000,000 to Anaconda Copper Mining Company, the merger allowed them to create products "From Mine to Consumer."[49] Anaconda's second major move into fabrication was the creation of the Anaconda Wire & Cable Company in 1929. The company combined its own wire manufacturing

[46] Archives & Special Collections, American Brass Company Records, University of Connecticut, Thomas J. Dodd Research Center, 1997.0996, Subseries B, Box 2:10, Excepts form a Condensed History of Anaconda Wire & Cable Company (September 9, 1959): 460.
[47] Archives & Special Collections, American Brass Company Records, University of Connecticut, Thomas J. Dodd Research Center, 1997.0996, Subseries B, Box 2:10, Excepts form a Condensed History of Anaconda Wire & Cable Company (September 9, 1959): 460.
[48] Isaac F. Marcosson, *Anaconda* (New York: Dodd, Mead & Company, 1957), 167-168.
[49] Isaac F. Marcosson, *Anaconda* (New York: Dodd, Mead & Company, 1957), 9.

capacity with two departments of American Brass and five independent wire and rubber insulation manufacturers.[50] The inclusion of the Hastings Wire & Cable Corporation in the merger allowed Anaconda Wire & Cable Corporation to have complete facilities for the manufacture of all bare and insulated wire products with the exception of underground power cables.[51] The Hastings-on-Hudson plant served as the headquarters of Anaconda Wire & Cable as it was the largest of the seven plants merged. In addition, the location served as the principal research and development laboratories and contained the executive division of the manufacturing branch.[52]

Anaconda Wire & Cable purchased the former site of the Hastings Pavement Company who vacated Hastings-on-Hudson in 1936.[53] Thereby, the Anaconda Cable & Wire connected the north and south mill for the first time. As previously noted, Building 52 (the north mill) remained vacant, but possibly still utilized as dead storage, until the onset of World War II.[54]

<u>Anaconda Wire & Cable Company – World War II</u>

In 1942, President Roosevelt stated to the United States War Production Board:

> The urgency of tomorrow must be felt in every shop and factory producing war goods, in every home and on every farm. Then we shall achieve the vigor of thought and cooperative action that carries a team to victory.[55]

Responding to the industrial needs of the war effort, the Hastings-on-Hudson branch of Anaconda Wire & Cable increased production of materials to support the United States and its allies in World War II. Early defense program efforts by the company included the replacement of tin—a resource noted for its limited supply—in its coating of wires. Named "Anacondalay", the substitute coatings consisted of lead with antimony and cadmium as alloying elements.[56] Other accomplishments included the production of water impermeable cables for naval ships, buoyant cables utilized to produce a magnetic field that would detonate German magnetic mines, magnetic mine search coils, and special cables for missiles.[57]

At the Hastings-on-Hudson plant, Building 52's use was changed from storage to manufacturing in order to support increased production. Workers utilized the space to impregnate cables with polychlorinated biphenyl (PCB) mixtures.[58]

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[50] Charles K. Hyde, *Copper for America: The United States Copper Industry from Colonial Times to the 1990s* (Arizona: University of Arizona Press, 1998), 161-162.
[51] Engineering & Mining Journal, "Anaconda Wire and Cable Company," *Engineering & Mining Journal* 128 (August 24, 1929): 335.
[52] Isaac F. Marcosson, *Anaconda* (New York: Dodd, Mead & Company, 1957), 186-187.
[53] Mary L. Allison, "City Dwellers Still Set Foot on Paving Blocks," *New York Times*, July 29, 1994, Proquest Historical Newspapers.
[54] Adam F. Downar, "The Advent of Growth of Industry in a Village of the Hudson Valley," *Hastings Press*, July 27, 1939. Westchester County Archives, Elmsford, New York.
[55] Amanda Graham, "Copper Commando and the Anaconda Company's Wartime Production," *Montana: The Magazine of Western History* 59 no. 4 (Winter 2009): 67.
[56] Isaac F. Marcosson, *Anaconda* (New York: Dodd, Mead & Company, 1957), 188.
[57] Isaac F. Marcosson, *Anaconda* (New York: Dodd, Mead & Company, 1957), 190-191.
[58] Hastings Historical Society, *Images of America: Hastings-on-Hudson* (Charleston, South Carolina: 2008), 62.

Anaconda Wire & Cable – World War II, Army-Navy E Award

Figure 18: 1944 Image of Building 52 decorated for Army-Navy E Award Ceremony
(Hastings-on-Hudson Historical Society)

On July 1, 1942, the United States granted the workers of the Hastings Plant of the Anaconda Wire & Cable the Army–Navy "E" Award for their excellence in war time production.[59] The government utilized the program as a way to promote industrial efficiency, support production on the home front, and link the individual worker to the military. Even if viewed as a propaganda campaign, the prestigious award reflects the receivers' importance to the military. Only 4,283 facilities accounting for five percent of the wartime plants in the United States earned the award. Determination factors included: 1) quality and quantity of production; 2) overcoming production obstacles; 3) avoidance of work stopages; 4) maintenance of fair labor standards; 4) training of additional labor forces; 5) effective management; 6) record on accidents, health, sanitation, and plant protection; 7) utilization of sub-contracting facilities; 8) cooperation between management and labor as it affected production; and 9) conservation of critical and strategic materials. The award consisted of a flag for the plant and emblems for all of the employees. Plants with continued excellence for six months after receiving the original award were awarded stars. The Hastings Plant received a total of four stars. Only one-quarter of all awarded plants received four or more stars.[60]

[59] U.S. Navy Department, "Presentation of Navy "E" to Anaconda Wire & Cable Company," July 1, 1942, Hastings Historical Society, Hastings-on-Hudson, New York.
[60] War Department, "For Release to P.M.'s of December 5, 1945: Army-Navy "E" Award Termination Press Sees Award Granted to 5% of Eligible Plants," December 5, 1945.

Anaconda Cable & Wire – Post World War II to the Present

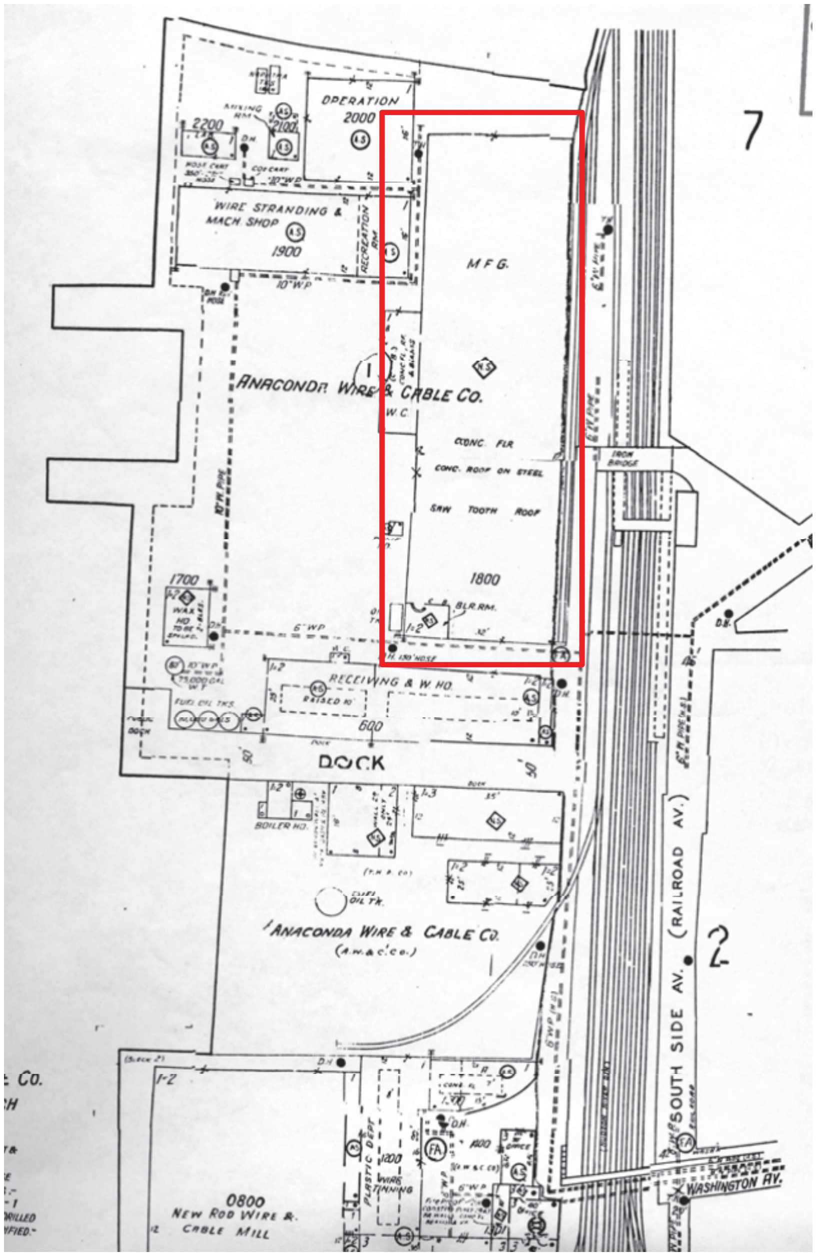

Figure 19: 1950 Sanborn Map of Anaconda Cable and Wire Company (Building 52 outlined in red)

Following World War II, Anaconda Wire & Cable continued to prosper. When the Anaconda Copper Mining Company changed its name to the Anaconda Company in 1955, the company's total assets exceeded $911,000,000 and shareholders' equity was $701,000,000.[61] At the Hastings-on-Hudson plant, the 1955 *Sanborn Fire Insurance Map* records Building 52 as engaged in manufacturing. The footprint of the building remained relatively unchanged except for a small addition on the west elevation constructed between 1924 and 1955.[62] Improvements to Building 52 and the overall site,

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[61] Isaac F. Marcosson, *Anaconda* (New York: Dodd, Mead & Company, 1957), 9.
[62] Sanborn Fire Insurance Company, "Hastings-on-Hudson," (1955): 3, 7.

however, were forthcoming. Between 1955 and 1964, Building 52's small addition was demolished and a large addition extended from the west elevation. Based on aerial photographs, the location of the original small addition became an interior courtyard within the larger complex. These improvements were likely made simultaneous to the construction of the high-voltage research laboratory, located to the south of Building 52, and completed in 1959.[63]

In 1960, Anaconda Cable & Wire stated the following information in a community advertising series:

> One of the busiest thirty-two acres in Westchester is along the Hudson River at Hastings. There, copper and aluminum are made into rod and wire, and then into complex scientifically-engineered wires and cables for electrical power and communications. Engineers, production men, skilled operators, and office people form a winning combination in the Anaconda Wire & Cable Company. Fourteen hundred men and women carry home a bundle of cash each week… [64]

The Anaconda Company precipitously declined in the 1970s. Fiber optic cable was replacing copper in phone lines, environmental laws were strengthening, and the Chilean mines were nationalized by the government resulting in a substantial economic loss.[65] The Hastings-on-Hudson plant was closed in 1974 and the site sold to Atlantic Richfield in 1978. Over the last twenty years, the industrial buildings were removed in phases. Building 52 is one of only two extant above-ground resources remaining on the former Anaconda & Wire Cable site.

[63] "Anaconda Steps Up Research," *Hastings News*, 1959, Hastings Historical Society Vertical Files, Hastings-on-Hudson, New York.
[64] Anaconda Wire and Cable Company, *Live Right… and tell people about it* (1960), Westchester County Archives, Elmsford, New York.
[65] Andrea Merrill-Maker, *Montana Almanac* (United States: Morris Book Publishing, 2006), 103.

Figure 20: c.1960 Image from a community advertising series completed for the Anaconda Wire and Cable Company

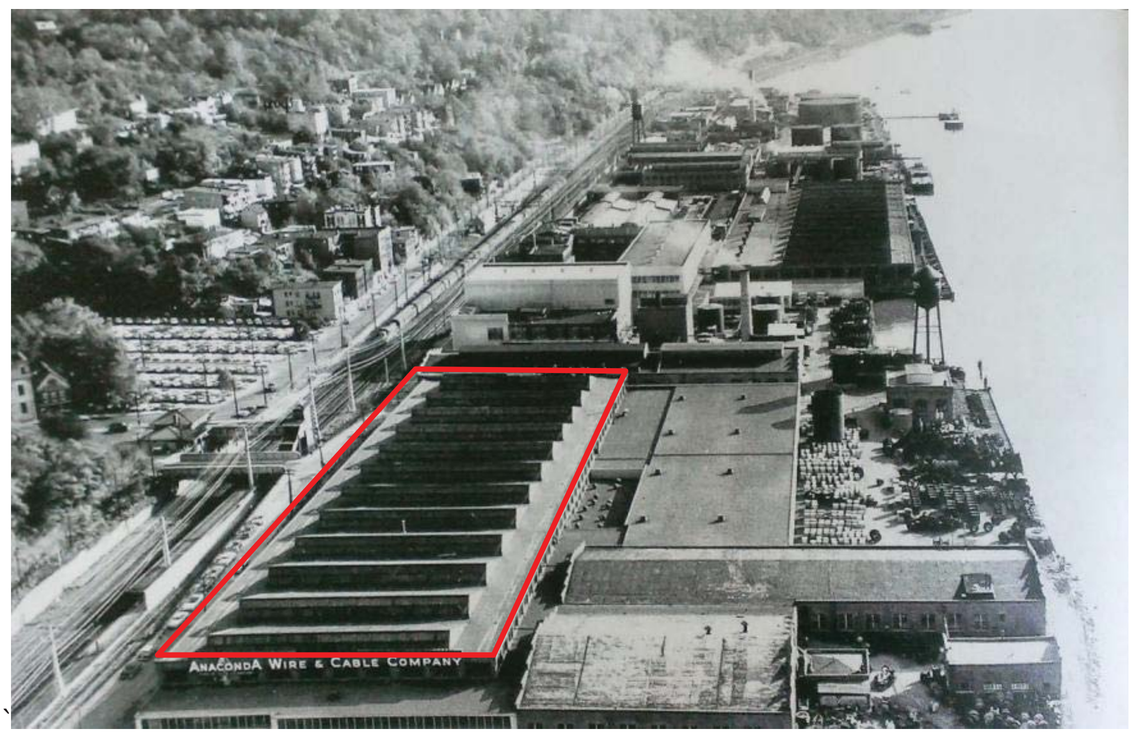

Figure 21: 1960s Aerial photograph of Anaconda Wire and Cable Company site showing Building 52 outlined in red. The no longer extant west additions are visible to the right of Building 52.

General Description

Building 52 is a rectangular single-story masonry building that measures 170' wide and 577' long and features a steel frame structural system encased by a six-row common bond brick veneer. The north and south elevations feature 10 bays, and the east and west elevations consist of 36 bays, all of which are divided by brick pilasters.

Historically, at each bay, the lower field consisted of a band of three, tall 9/9/9 triple-hung, steel sash windows. The upper field featured a band of three 9-light steel sash, slider windows. Both the upper and lower windows had concrete sills and steel lintels. The building is capped with a character defining sawtooth roof and an undulating brick parapet wall at the north and south elevations.

Since its vacancy the building has deteriorated greatly, a condition amplified by the 1980s removal of the 1950s west additions, and the subsequent exposure of the steel columns. Additionally, the removal or covering of many of the windows has severely altered the original configuration.

Integrity Assessment

In order to be listed on the National Register of Historic Places, a property must not only be historically significant, but it also must have integrity.[66] The integrity of a resource is defined by the National Park Service (NPS) as "the authenticity of a resource's historic identity, evidenced by the survival of physical characteristics that existed during the property's prehistoric or historic period."[67] The retention of a property's historic appearance, physical materials, design features, and aspects of construction allows the resource to illustrate significant aspects of its past. The NPS assessment of the integrity of a property is based on the following seven criteria: location, setting, design, workmanship, materials, association, and feeling.

The below evaluation provides the NPS definition for each aspect of integrity and evaluates Building 52, Hastings-on-Hudson, under this criteria[68].

Building 52

Location: The place where the historic property was constructed or the place where the historic event occurred.

Building 52 remains in its original location on the waterfront of Hastings-on-Hudson, New York. The building's location is reflective of the village's industrial history as the area served multiple enterprises since the establishment of sugar refineries along the river's edge in the mid-nineteenth century. The loss of all of the surrounding industrial buildings associated with or in proximity to Building 52 diminishes the building's integrity of location.

Therefore, Building 52 has reduced integrity of location.

Setting: The physical environment of a historic property.

Building 52 retains its views of the Hudson River and the Palisades. The setting along the Hudson River reflects one of the key transportation elements utilized by industry on Hastings-on-Hudson. Remnants of docks on the Hudson River, railroad siding along the east elevation of Building 52, and a vehicular bridge crossing the railroad tracks, recall the critical role transportation played in the distribution of products to and from the site.

The surrounding built environment, however, has been severely compromised. In the early twentieth century, the Hastings-on-Hudson waterfront consisted of multiple industrial complexes, including the National Conduit & Cable Company, the Hastings Pavement Company (which divided the cable company into two separate sites), and the Zinsser Chemical Company. When the National Conduit & Cable Company constructed Building 52 in 1911, the north mill alone consisted of numerous brick and wood-frame structures, smokestacks, and industrial equipment. Today, Building 52 is the last remaining industrial buildings on the entire 32-acre site. The loss of all the buildings from the once densely developed waterfront has removed the industrial setting and key spatial relationships crucial to the comprehension of Building 52. On its own merit, Building 52 fails

[66] National Park Service, *National Register Bulletin; How to Apply the National Criteria for Evaluation* (1998), 44, http://www.nps.gov (accessed September 5, 2013).
[67] National Park Service, *National Register Bulletin; How to Apply the National Criteria for Evaluation* (1998), 4, http://www.nps.gov (accessed September 5, 2013).
[68] National Park Service, *National Register Bulletin; How to Apply the National Criteria for Evaluation* (1998), 44-45, http://www.nps.gov (accessed September 5, 2013).

to convey the industrial setting that existed on the Hastings-on-Hudson waterfront for over a century.

Moreover, Building 52 served as the location of a single aspect in a large production process for the manufacturing of cables, conduits, and wires. The loss of the other buildings eliminates the multifaceted nature of this manufacturing process. The single building fails to represent the complexity and density of a site that once employed over 2,000 individuals.

Therefore, Building 52 does not have integrity of setting.

Design: The combination of elements that create the form, plan, space, structure, and style of the property.

The design of Building 52 was a conscious effort by the National Conduit & Cable Company to modernize and expand operations at Hastings-on-Hudson. Building 52 represents the material and construction technologies embraced by architects at the turn of the twentieth century. Alteration to the minimalist design, however, severely diminishes the building's overall integrity as few elements have unique architectural features.

Measuring 170' wide and 577' long, the single-story building has a masonry and steel frame structural system covered by a six-row common bond brick veneer. The north and south elevations feature 10 bays and the east and west elevations consist of 36 bays, all of which are divided by brick pilasters. Historically, at each bay, the lower field consisted of a band of three, tall 9/9/9 triple-hung, steel sash windows. The upper field featured a band of three 9-light steel sash, slider windows. Both the upper and lower windows had concrete sills and steel lintels. The building is capped with a character defining sawtooth roof flanked by brick parapet walls on the north and south elevations.

The exterior brick walls are generally intact; however, settlement cracks, general cracks, spalling, delamination of bricks, missing masonry, and a lack of mortar are evident on all elevations to varying extents.

The building's integrity of design is severely diminished due to the loss of historic material from the demolition, and subsequent brick and concrete block infill, of all the lower field windows on the north, south, and west elevations. Similarly, the upper filed windows on the south elevation were removed and infilled with brick and concrete block. On the north and west elevations, the upper field windows are generally intact, but suffer from different levels of deterioration (rusting steel sashes, broken sashes, and missing panes). A number of these windows have been covered with plywood due to their poor condition and lack of functionality. All the windows on the east elevation are covered with plywood. These windows may be intact, but close inspection was not permissible due to safety concerns regarding the deterioration of the east wall and sawtooth roof monitors. While the plywood-covered windows could be repaired and exposed, the brick and concrete block infilled windows disrupt the modular fenestration pattern, a key component to the design of the industrial building.

In addition to the loss of the windows, other aspects of fenestration along the south elevation (façade) are no longer intact. Original doorways have been modified. A single 40-light transom remains, but the associated entryway consists of non-historic replacement materials partially covered with plywood.

The west elevation has the largest amount of changes due to the removal of a circa 1960 addition that changed its fenestration and removed original materials. The later demolition of this addition resulted in the exposure of eight structural steel columns. The structural columns remain exposed to weathering.

At the time of construction, Building 52's sawtooth roof was considered the pinnacle of industrial design and allowed for maximum light while omitting direct sunlight and heat. One of the twelve character defining sawtooth monitors was removed due to a lack of structural integrity. All of the remaining monitors are covered with plywood and asphalt shingles due to the deterioration and lack of functionality of the monitor windows. In addition, the steel window sashes were removed from a number of monitors. As a result, the deterioration and subsequent removal of the building's focal design element diminishes its integrity of design.

The building's interior contains a concrete floor. The lack of partitions reflects the openness associated with its structural system and design. Steel columns run north to south dividing the space into two long bays. In the northern end of the building, a substructure of steel beams and rails for a traversing crane remains relatively intact. Similarly, the character defining truss system and sawtooth roof monitors are still visible; however, the removal of a number of the monitor's skylights—the key component of the system—diminishes its integrity of design.

Therefore, Building 52 does not have a sufficient degree of integrity of design.

Materials: The physical elements that were combined or deposited during a particular period of time in a particular pattern or configuration to form a historic property.

The original materials of the buildings reflected the National Conduit & Cable Company's preference for a large open space with sufficient exterior light provided by the windows and sawtooth roof monitors. As stated previously, one sawtooth monitor, numerous sawtooth monitor windows, lower and upper field windows, and entryways are missing, infilled, or covered. Except for the interior traversing crane, all equipment utilized or associated with the production of cables and wire is no longer evident.

Therefore, Building 52 does not have a sufficient degree of integrity of materials.

Workmanship: The physical evidence of the crafts of a particular culture or people during any given period in history of prehistory.

Aspects of Building 52 continue to present the skills and workmanship of the original architectural firms. The six-row common bond brick walls, including the corbelled, brick capped, upper-field windows and cornices, and the parapet walls on the north and south elevations, reflect a degree of ornamentation to the otherwise utilitarian building. While sections are deteriorated, these elements remain generally intact.

Alterations to the minimalist design, however, severely diminish the building's overall integrity of workmanship as few elements have unique architectural features. Two such alterations include the removal of one of the twelve sawtooth monitors and the brick piers on the west. Except for one remaining transom, the original entries were modified. All of the lower field windows were removed on the north, south, and west elevations. While the 9-light steel-sash slider windows are generally intact, an advanced state of deterioration further diminishes their quality of workmanship. The loss of these elements diminishes the industrial site's overall integrity of workmanship as these aspects of the building were integral to its design and function.

Therefore, Building 52 does not have a sufficient degree of integrity of workmanship.

Feeling: A property's expression of the aesthetic or historic sense of a particular period.

Individually, Building 52 conveys its industrial use based on its design and form. The surrounding built environment, however, no longer retains a sufficient level of physical features to convey the former industrial nature of the area. The interrelationship between the dozens of structures, particularly the larger sawtooth-roofed building located on the plant to the south of Building 52, was critical to its interpretation as an industrial site. The razing of all of the industrial buildings and structures over the last twenty years has irreparably diminished the site's integrity of feeling. Moreover, the critical relationship between Building 52, the railroad, and the river are no longer readily evident as the railroad siding and docks are derelict and not in use.

Therefore, Building 52 does not have a sufficient degree of integrity of feeling.

Association: The direct link between an important historic event or person and a historic property.

Building 52 does not maintain a direct association with either the National Conduit & Cable Company or its subsequent occupant the Anaconda Wire & Cable Company. In addition, the building is no longer utilized for industrial or commercial purposes. Building 52's form and massing conveys its original use as an industrial building, albeit in a limited fashion due to alterations and deterioration of character defining features that diminish its integrity of design, workmanship, and materials. In addition, the demolition of the waterfront's historic industrial setting removed spatial relationships to such an extent that Building 52 fails to adequately represent Hastings-on-Hudson's waterfront industry or period of construction.

Therefore, Building 52 does not have a sufficient degree of integrity of association.

Previous Determination of Historic Significance

In 2007, the New York State Office of Parks, Recreation and Historic Preservation (OPRHP) determined that the "Anaconda Complex," consisting of Building 51, 52, and 57, were eligible for inclusion on the National Register of Historic Places. The evaluation stated that the complex, not an individual building, was representative of early 20th century industrial architecture in Westchester County and noted for its association with an important industry in the village of Hastings-on-Hudson. Due to their advanced states of decay, both Building 51 and 57 were removed with the approval of the Village of Hastings, subsequent to the 2007 evaluation. Consequently, the integrity of the historic context from which the 2007 evaluation based the resources' eligibility is compromised. As a result, Building 52's continued eligibility for the National Register of Historic Places is no longer apparent.

Historic Significance

Part of the former National Cable & Conduit Company, American Brass, and Anaconda Wire & Cable Company, Building 52, Hastings-on-Hudson fails to achieve state or national significance due to its periodic use, loss of its contextual setting, and the loss of its integrity. At the peak of its development, Hastings-on-Hudson industrial waterfront consisted of dozens of buildings on the 32-acre property. The complex represented the emergence and success of the cable and wire industry in the early twentieth century, and its role in the manufacturing of munitions and wire during World War I and II. As stated in the previous evaluation, the cable and conduit "complex" had historic significance; however, no individual building aptly represents the density and spatial relationships essential to understanding its place and importance within the Hudson River Valley's industrial and commercial corridor. On its own, Building 52 fails to represent the complexity of a site that once employed over 2,000 individuals. Further, the building's key relationship with the Hudson River and railroad is not easily apparent due to the deterioration and removal of the other industrial structures.

Building 52 fails to achieve greater significance due to its lack of architectural integrity. Alterations to the minimalist design severely diminish the building's overall integrity as the building lacks a bevy of unique architectural features. The deterioration and subsequent failure of one of the sawtooth roof monitors, the removal and infill of over 75 percent of the triple-hung windows, and the removal of a number of the character-defining sawtooth roof monitor windows lessens the building's architectural significance. Moreover, the building fails to convey its particular function or suggest the products that were once created within its walls. Building 52's historic significance is further hindered by its apparent period of disuse between ca. 1920 and ca. 1942. After World War I, Building 52 was utilized for dead storage and was not used in a manufacturing role until the onset of World War II. As a result, Building 52 served in a manufacturing capacity for less than one half of the years of active industrial activity on the waterfront.

In regards to local significance, the shortcomings of these structures are ceded by the lack of any other industrial resources on Hastings-on-Hudson's waterfront. The building is the last remnant of the riverfront industries that played a central role in Hastings-on-Hudson, from the opening of the sugar refineries circa 1850 to the closing of Anaconda Cable & Wire Company in 1974. Building 52, however, retains limited association with Hastings-on-Hudson's former sprawling industrial waterfront to allow it to convey the importance of such industries to the development of the village.

Image 1: View of south and west elevations of Building 52

Image 2: View of south elevation of Building 52


Image 3: View of north elevation of Building 52


Image 4: View of east elevation of Building 52, directly adjacent to the bridge and ramping roadway

Image 5: View of sawtooth roof with asphalt shingles from adjacent bridge.

Image 6: Detail of upper field sliding windows showing corbeled brick detailing


Image 7: Detail of damage to north and west elevations of Building 52

Image 8: View of interior of southern room in Building 52 looking north

Image 9: View of central steel structure of Building 52


Image 10: View of north room in Building 52 looking north


Image 11: View of covered windows at northern end of south room