



Ottawa Street Station Transformation

Accident Fund Insurance Headquarters

Richard JP Renaud, AIA
Bradley Cambridge, AIA



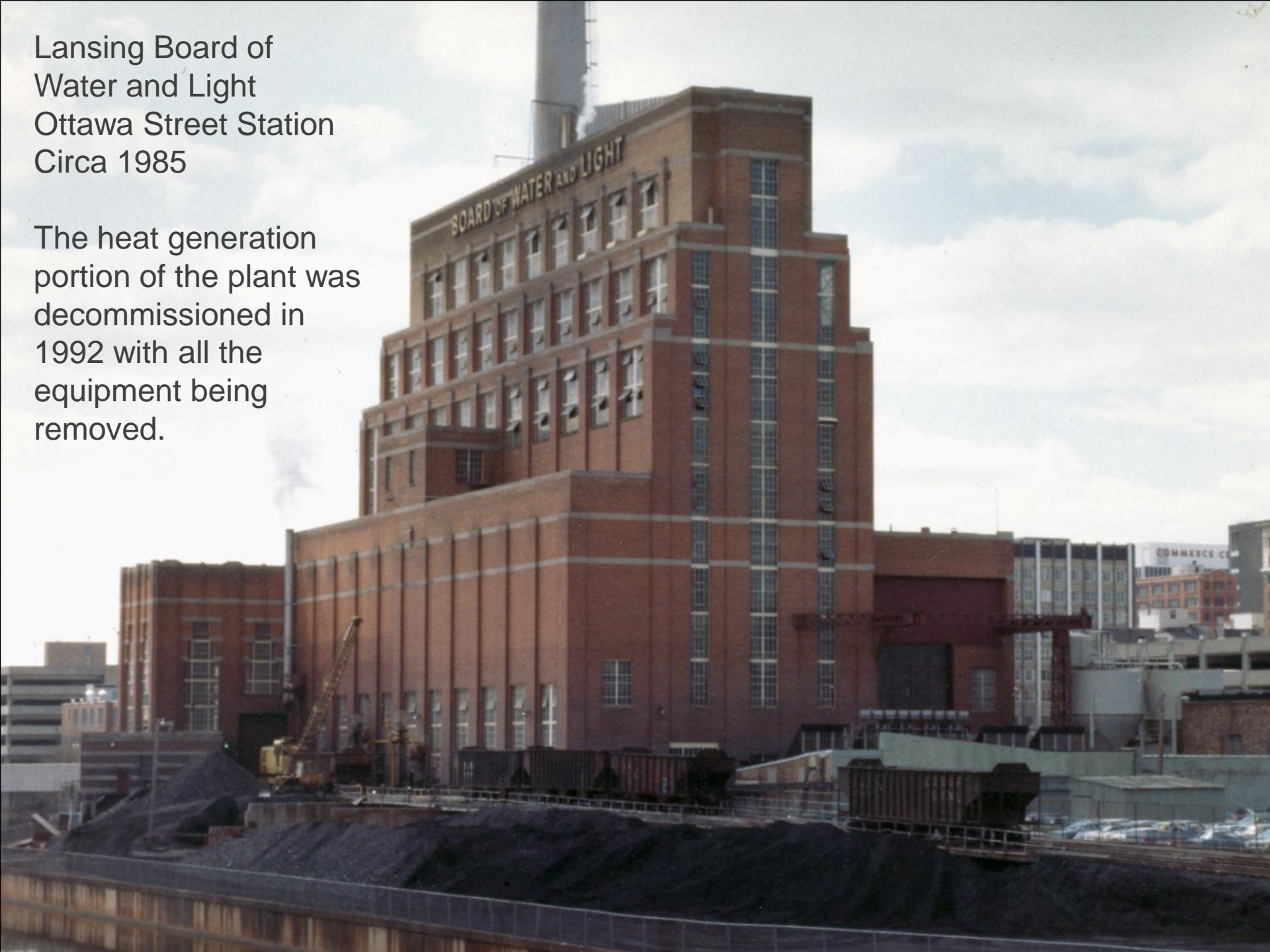
Building Enclosure Council Presentation

Lansing Board of
Water and Light
Ottawa Street Station
Circa 1960



Lansing Board of
Water and Light
Ottawa Street Station
Circa 1985

The heat generation
portion of the plant was
decommissioned in
1992 with all the
equipment being
removed.



The last operating part of the plant, the chiller plant was removed at the start of construction in 2009.



At the same time, the eastern bay of the adjacent parking garage was removed re-exposing the buildings façade to downtown Lansing.

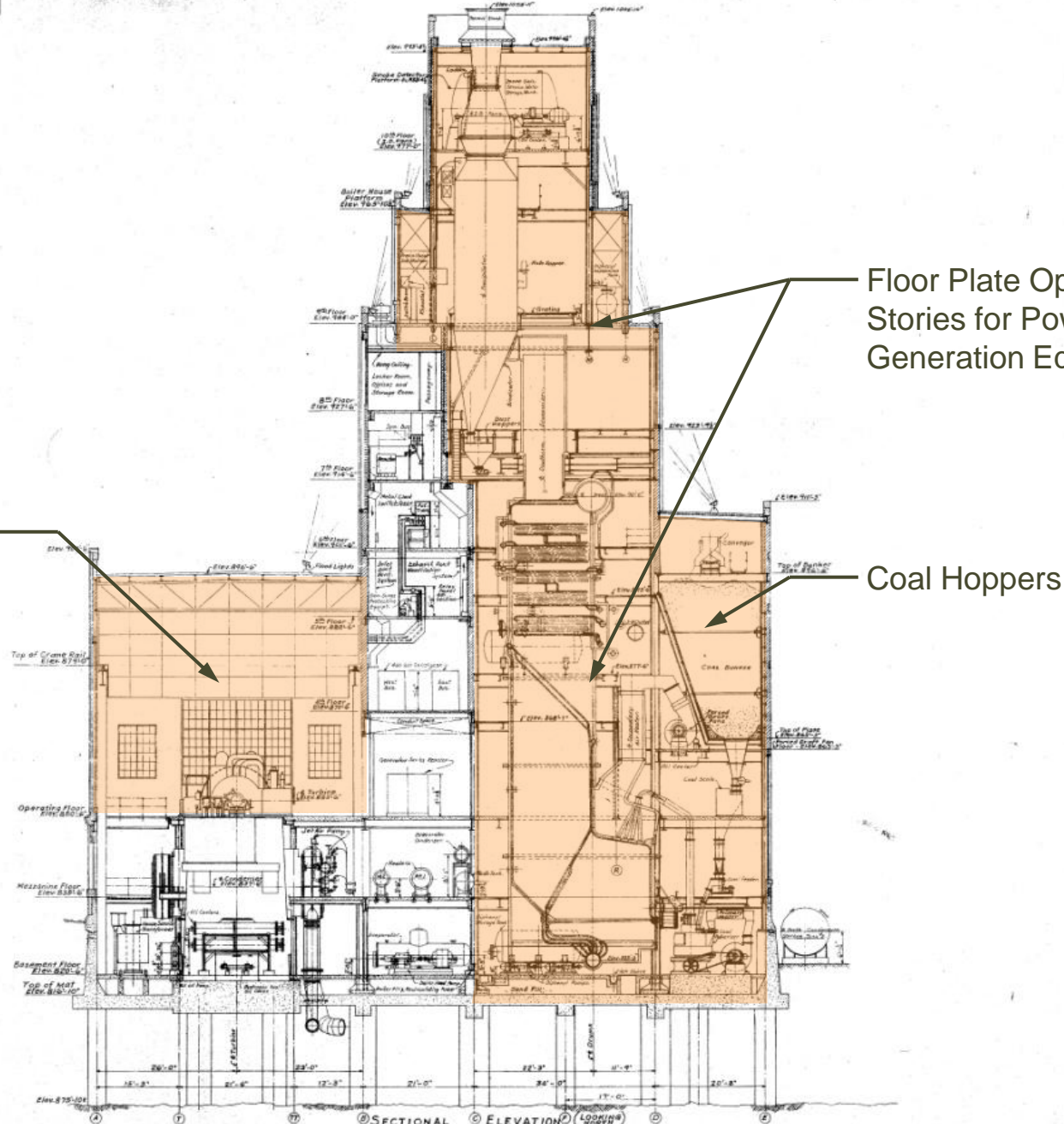


BURNS AND BROS INC.
NEW YORK

BOARD OF WATER & ELECTRICITY
LANSING, MICHIGAN

OTTAWA STREET STATION EXTENSION
— ELEVATION —

WEST - ELEVATION



Main Turbine Room

- Floor Plate Open for 11 Stories for Power Generation Equipment

- Coal Hoppers

REFERENCE DRAWINGS	
GENERAL ARRANGEMENT OF BASEMENT EL. 330'-6"	SEE DWG. LQ-1022
GENERAL ARRANGEMENT OF MEZANINE FLOOR EL. 337'-6"	SEE DWG. LQ-1022
1ST FLOOR EL. 339'-0" MEZANINE ROOM EL. 330'-6"	SEE DWG. LQ-1023
2ND FLOOR EL. 370'-0" MEN'S PLATFORM EL. 386'-3", F.D. FIN FLOOR EL. 387'-3" MEN'S PLATFORM EL. 377'-0"	SEE DWG. LQ-1024
3RD FLOOR EL. 388'-0" MEN'S PLATFORM EL. 387'-3" TURNING ROOM EL. 386'-0" MEN'S PLATFORM EL. 387'-0" ELEC. ROOM EL. 390'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1025
4TH FLOOR EL. 391'-0" MEN'S PLATFORM EL. 390'-0" TURNING ROOM EL. 388'-0" MEN'S PLATFORM EL. 390'-0" ELEC. ROOM EL. 391'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1026
5TH FLOOR EL. 394'-0" MEN'S PLATFORM EL. 393'-0" TURNING ROOM EL. 391'-0" MEN'S PLATFORM EL. 393'-0" ELEC. ROOM EL. 394'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1027
6TH FLOOR EL. 397'-0" MEN'S PLATFORM EL. 396'-0" TURNING ROOM EL. 394'-0" MEN'S PLATFORM EL. 396'-0" ELEC. ROOM EL. 397'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1028
7TH FLOOR EL. 400'-0" MEN'S PLATFORM EL. 399'-0" TURNING ROOM EL. 397'-0" MEN'S PLATFORM EL. 399'-0" ELEC. ROOM EL. 400'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1029
8TH FLOOR EL. 403'-0" MEN'S PLATFORM EL. 402'-0" TURNING ROOM EL. 400'-0" MEN'S PLATFORM EL. 402'-0" ELEC. ROOM EL. 403'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1030
9TH FLOOR EL. 406'-0" MEN'S PLATFORM EL. 405'-0" TURNING ROOM EL. 403'-0" MEN'S PLATFORM EL. 405'-0" ELEC. ROOM EL. 406'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1031
10TH FLOOR EL. 409'-0" MEN'S PLATFORM EL. 408'-0" TURNING ROOM EL. 406'-0" MEN'S PLATFORM EL. 408'-0" ELEC. ROOM EL. 409'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1032
11TH FLOOR EL. 412'-0" MEN'S PLATFORM EL. 411'-0" TURNING ROOM EL. 409'-0" MEN'S PLATFORM EL. 411'-0" ELEC. ROOM EL. 412'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1033
12TH FLOOR EL. 415'-0" MEN'S PLATFORM EL. 414'-0" TURNING ROOM EL. 412'-0" MEN'S PLATFORM EL. 414'-0" ELEC. ROOM EL. 415'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1034
13TH FLOOR EL. 418'-0" MEN'S PLATFORM EL. 417'-0" TURNING ROOM EL. 415'-0" MEN'S PLATFORM EL. 417'-0" ELEC. ROOM EL. 418'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1035
14TH FLOOR EL. 421'-0" MEN'S PLATFORM EL. 420'-0" TURNING ROOM EL. 418'-0" MEN'S PLATFORM EL. 420'-0" ELEC. ROOM EL. 421'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1036
15TH FLOOR EL. 424'-0" MEN'S PLATFORM EL. 423'-0" TURNING ROOM EL. 421'-0" MEN'S PLATFORM EL. 423'-0" ELEC. ROOM EL. 424'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1037
16TH FLOOR EL. 427'-0" MEN'S PLATFORM EL. 426'-0" TURNING ROOM EL. 424'-0" MEN'S PLATFORM EL. 426'-0" ELEC. ROOM EL. 427'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1038
17TH FLOOR EL. 430'-0" MEN'S PLATFORM EL. 429'-0" TURNING ROOM EL. 427'-0" MEN'S PLATFORM EL. 429'-0" ELEC. ROOM EL. 430'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1039
18TH FLOOR EL. 433'-0" MEN'S PLATFORM EL. 432'-0" TURNING ROOM EL. 430'-0" MEN'S PLATFORM EL. 432'-0" ELEC. ROOM EL. 433'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1040
19TH FLOOR EL. 436'-0" MEN'S PLATFORM EL. 435'-0" TURNING ROOM EL. 433'-0" MEN'S PLATFORM EL. 435'-0" ELEC. ROOM EL. 436'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1041
20TH FLOOR EL. 439'-0" MEN'S PLATFORM EL. 438'-0" TURNING ROOM EL. 436'-0" MEN'S PLATFORM EL. 438'-0" ELEC. ROOM EL. 439'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1042
21ST FLOOR EL. 442'-0" MEN'S PLATFORM EL. 441'-0" TURNING ROOM EL. 439'-0" MEN'S PLATFORM EL. 441'-0" ELEC. ROOM EL. 442'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1043
22ND FLOOR EL. 445'-0" MEN'S PLATFORM EL. 444'-0" TURNING ROOM EL. 442'-0" MEN'S PLATFORM EL. 444'-0" ELEC. ROOM EL. 445'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1044
23RD FLOOR EL. 448'-0" MEN'S PLATFORM EL. 447'-0" TURNING ROOM EL. 445'-0" MEN'S PLATFORM EL. 447'-0" ELEC. ROOM EL. 448'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1045
24TH FLOOR EL. 451'-0" MEN'S PLATFORM EL. 450'-0" TURNING ROOM EL. 448'-0" MEN'S PLATFORM EL. 450'-0" ELEC. ROOM EL. 451'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1046
25TH FLOOR EL. 454'-0" MEN'S PLATFORM EL. 453'-0" TURNING ROOM EL. 451'-0" MEN'S PLATFORM EL. 453'-0" ELEC. ROOM EL. 454'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1047
26TH FLOOR EL. 457'-0" MEN'S PLATFORM EL. 456'-0" TURNING ROOM EL. 454'-0" MEN'S PLATFORM EL. 456'-0" ELEC. ROOM EL. 457'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1048
27TH FLOOR EL. 460'-0" MEN'S PLATFORM EL. 459'-0" TURNING ROOM EL. 457'-0" MEN'S PLATFORM EL. 459'-0" ELEC. ROOM EL. 460'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1049
28TH FLOOR EL. 463'-0" MEN'S PLATFORM EL. 462'-0" TURNING ROOM EL. 460'-0" MEN'S PLATFORM EL. 462'-0" ELEC. ROOM EL. 463'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1050
29TH FLOOR EL. 466'-0" MEN'S PLATFORM EL. 465'-0" TURNING ROOM EL. 463'-0" MEN'S PLATFORM EL. 465'-0" ELEC. ROOM EL. 466'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1051
30TH FLOOR EL. 469'-0" MEN'S PLATFORM EL. 468'-0" TURNING ROOM EL. 466'-0" MEN'S PLATFORM EL. 468'-0" ELEC. ROOM EL. 469'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1052
31ST FLOOR EL. 472'-0" MEN'S PLATFORM EL. 471'-0" TURNING ROOM EL. 469'-0" MEN'S PLATFORM EL. 471'-0" ELEC. ROOM EL. 472'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1053
32ND FLOOR EL. 475'-0" MEN'S PLATFORM EL. 474'-0" TURNING ROOM EL. 472'-0" MEN'S PLATFORM EL. 474'-0" ELEC. ROOM EL. 475'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1054
33RD FLOOR EL. 478'-0" MEN'S PLATFORM EL. 477'-0" TURNING ROOM EL. 475'-0" MEN'S PLATFORM EL. 477'-0" ELEC. ROOM EL. 478'-0" MAINT. OFF OVER SUMMER EL. 396'-3" 5/8" AND 3/4" 5/8"	SEE DWG. LQ-1055</

TYPE	THROWING	DATE
METALLICAL SUPERVISOR	Ballaban	2/2/76
ELECTRICAL SUPERVISOR	Ballaban	2/2/76
STRUCTURAL SUPERVISOR	Ballaban	2/2/76
CHIEF DRAFTSMAN	Ballaban	2/2/76
TYPE	THROWING	DATE
METALLICAL SUPERVISOR	Ballaban	2/2/76
ELECTRICAL SUPERVISOR	Ballaban	2/2/76
STRUCTURAL SUPERVISOR	Ballaban	2/2/76

REVISIONS:

SECTIONAL ELEVATION (LOOKING NORTH)

BURNS AND ROE, INC. NEW YORK	
ELECTRICAL ELEVATOR THROUGH SECOND STORY AND THROUGH ROOF AT 10000 100TH AVE. (NEW YORK)	
OTTAWA STREET STATION EXTENSION UNIT 10	
BOARD OF WATER & ELEC. LIGHT COMM'N LANSING, MICHIGAN	
DESIGNED BY ENGINEER DRAWN BY CHECKED BY DATE	PROJECT NO. W.O. 1194 SHEET NO. 1 OF 1 DWG. 10-2000

THE HIGHEST SUPERSTARS HAVE



Open Floor Plates Void of Equipment



Main Turbine Hall Void of Equipment

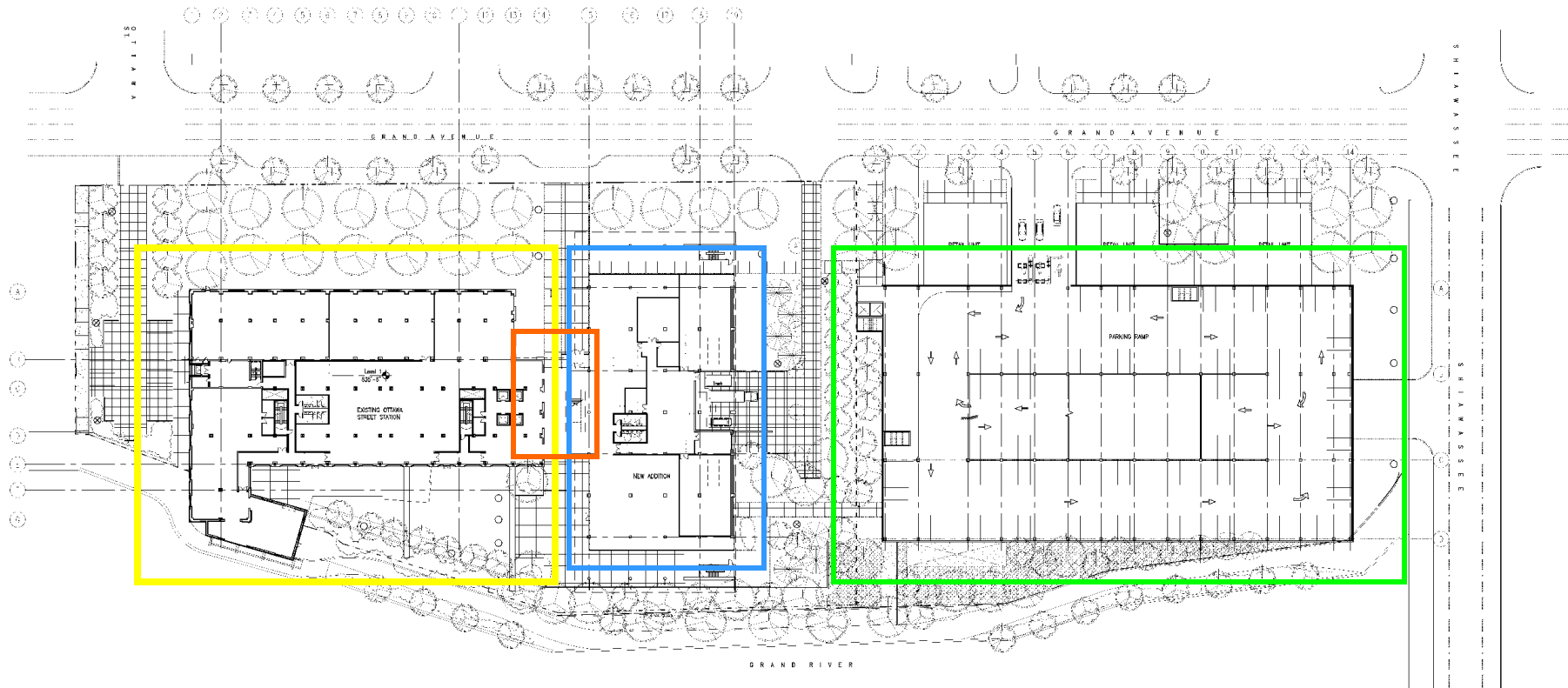


Main Entry Lobby Detailing

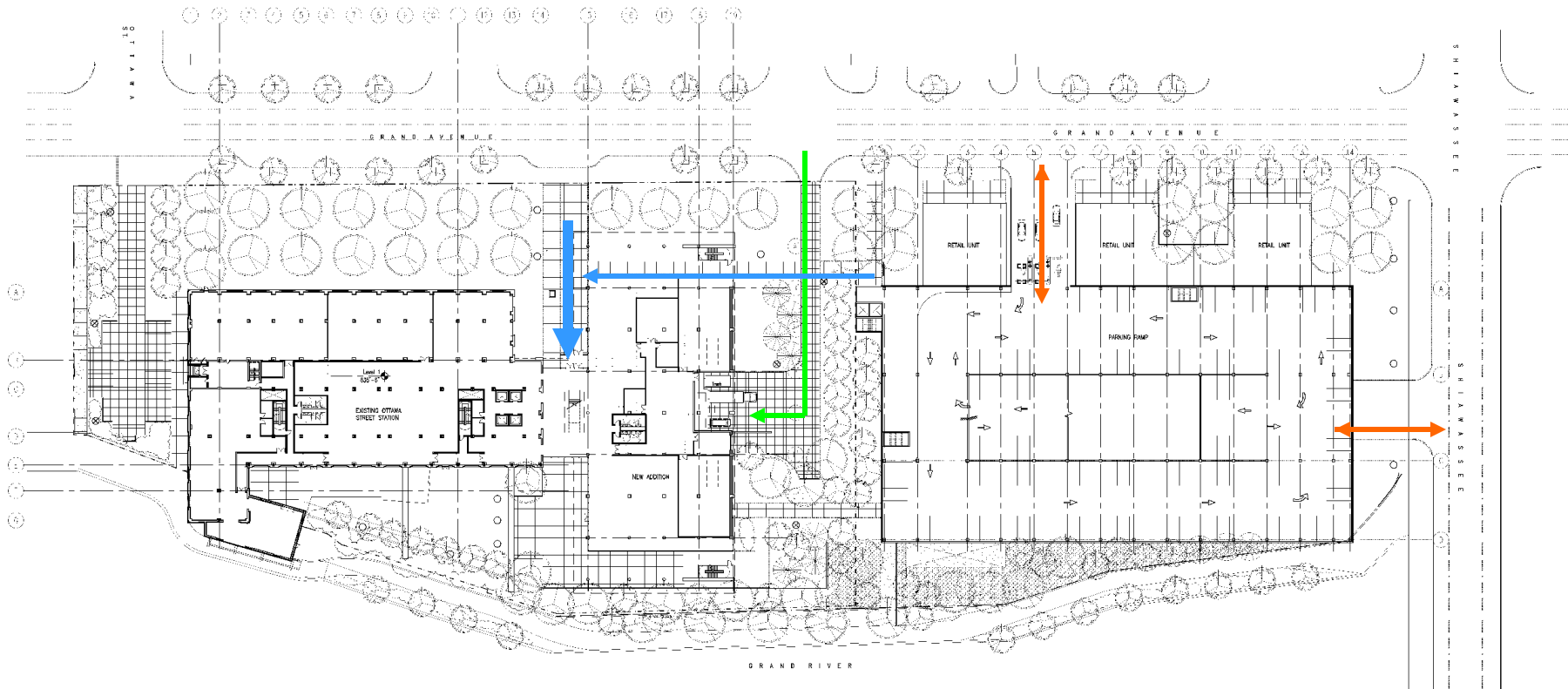




Site Development Strategy

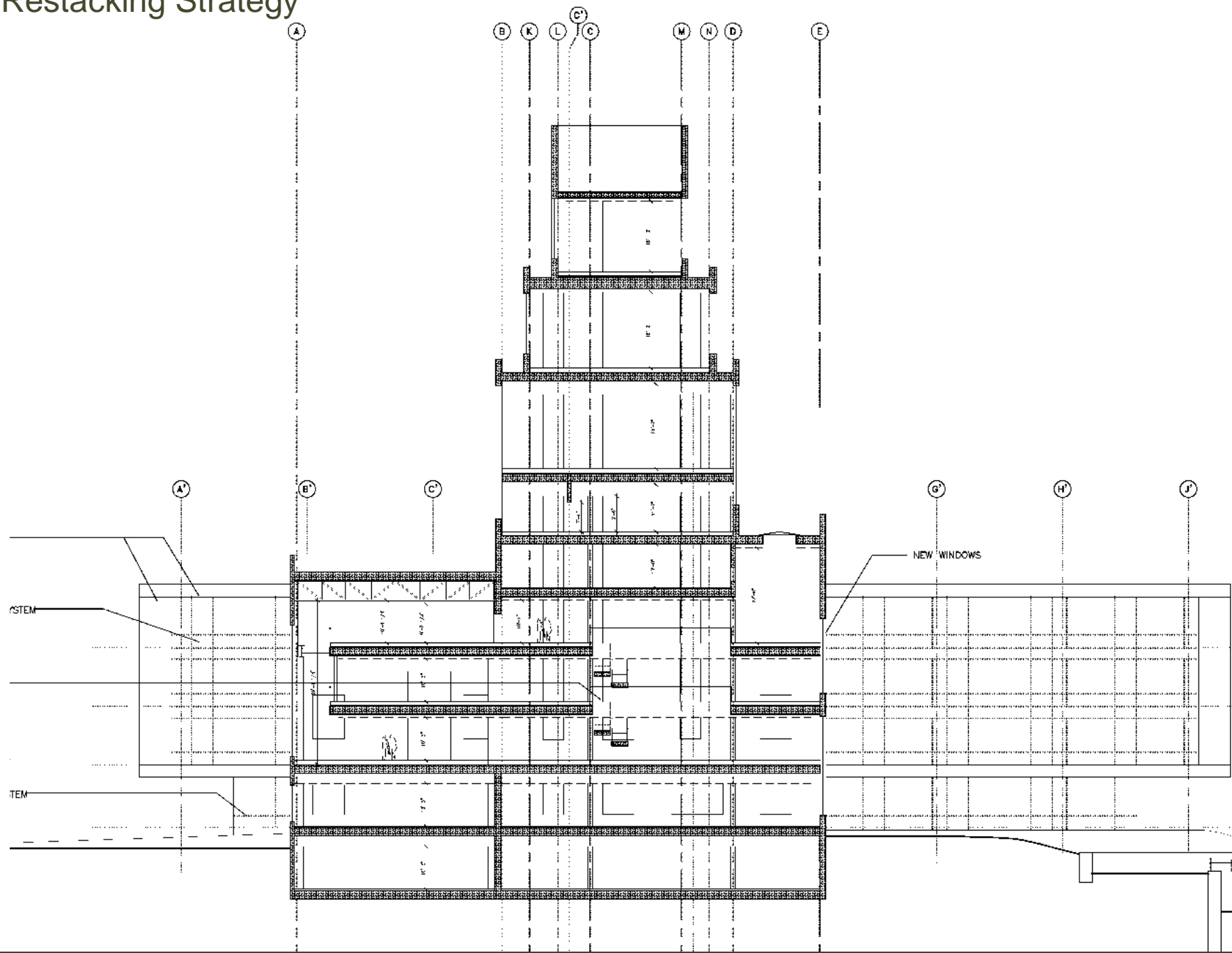


Site Circulation Strategy





Restacking Strategy



1946 Addition ← → 1938 Building

- Mortar Erosion
- Cracking
- Displacement
- Spalling
- Open Joint
- Not Visible

GUINN EVANS
ARCHITECTS
219 1/2 North Main Street
Ann Arbor, MI 48104
V 734 663 5888 F 734 663 8044
www.guinnevents.com

Accident Fund

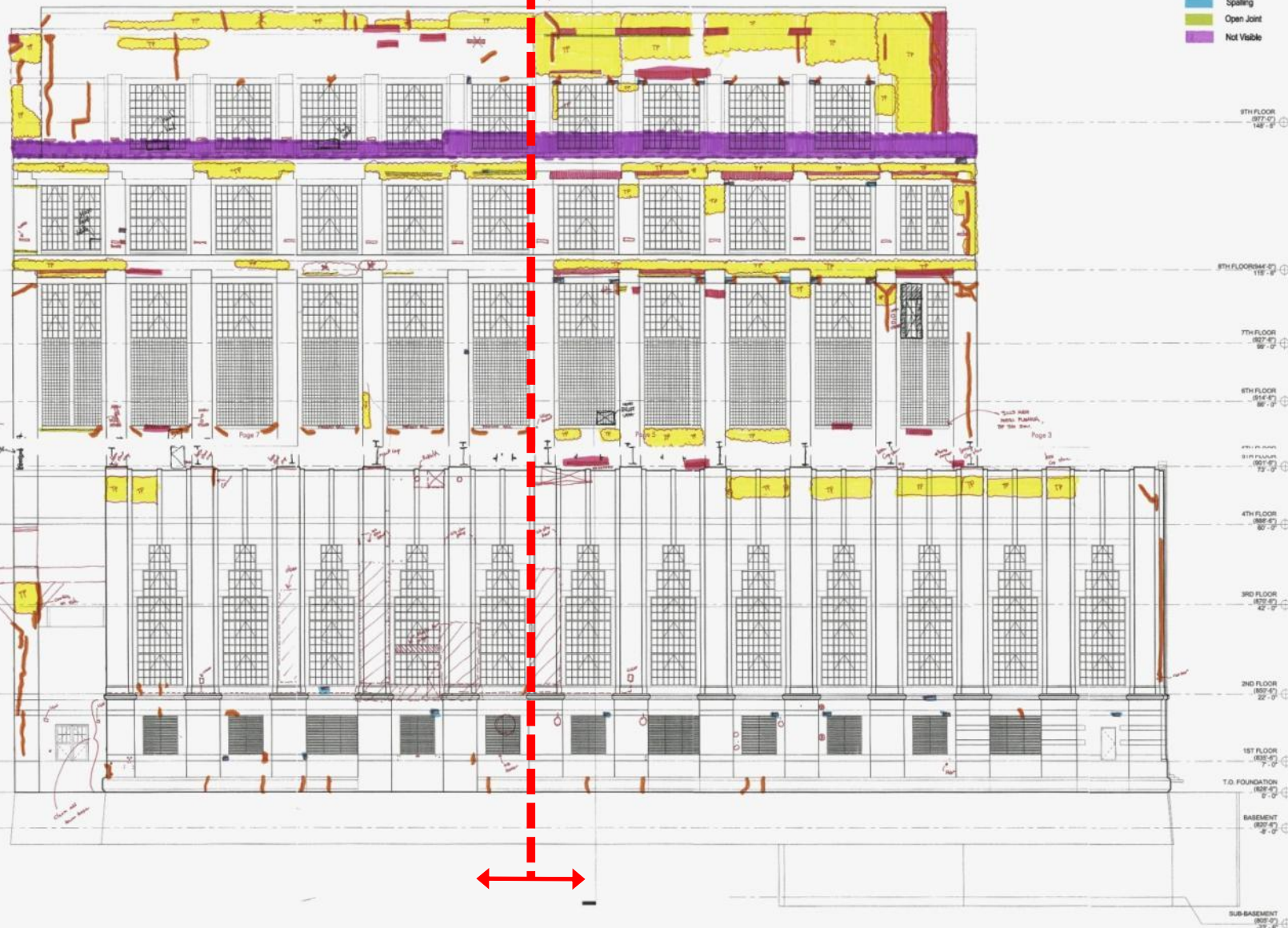
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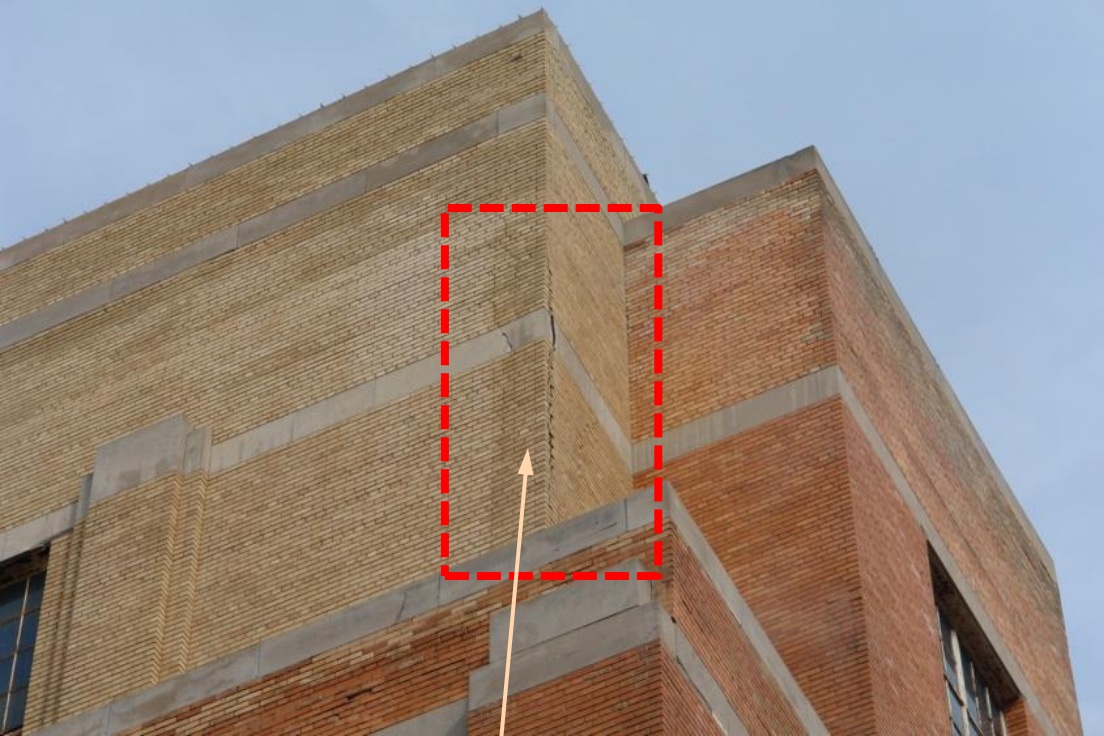
WEST ELEVATION

NO. TITLE DATE
Visual Memory Survey 3/11-3/13/2008
JEP, BRC

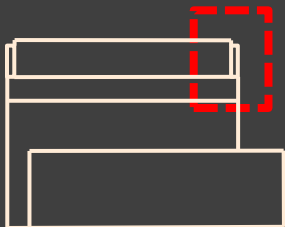
A-201



WEST ELEVATION
1/8" = 1'-0" REFERRED FROM



Crack in Masonry & Mortar
Joint with Pivoting
Displacement 2"+ Out of Plane



West Elevation

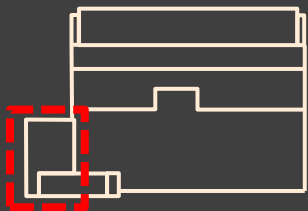
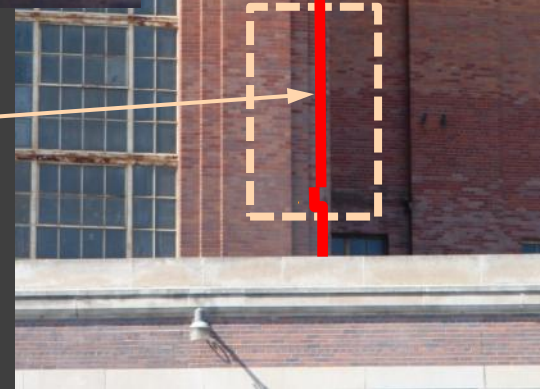


Line of Roof Surface
Behind Parapet

Crack in Masonry & Mortar
Joint with Displacement
Out of Plane



Crack in Masonry &
Mortar Joint



East Elevation



Crack and Displacement Out of Plane in the Masonry



Where "Lime-Cement Mortar" is called for it shall consist of:

Forty pounds of approved hydrated lime, one bag of approved Portland cement, and six cu. ft. of approved sand. Where used in exterior walls, and elsewhere waterproofed lime cement mortar is called for, four pounds of powdered aluminum stearate, calcium stearate or ammonium stearate shall be added.

It is recommended that hydrated lime and calcium stearate be well mixed dry and that the water be added to the mixture at least ten hours before use, but the cement is not to be added until the final mixture of the mortar just before it is used, or liquid ammonium stearate may be added with the water.

"The component analysis of the cementitious proportions to aggregate is presented in Table 1. Soluble chloride tests indicate a 310 ppm count of the mortar. The FTIR analysis confirmed an ammonium component in the binder. The elevated level of chloride is from the decomposition of the stearate. As the stearate degrades over time a soluble chloride is released which can accelerate corrosion of metallic imbeds and deterioration of the iron-spots in the flashed brick faces. The ammonium traces indicate the additive was an ammonium stearate as noted in the original specifications. The addition of stearates was an early version of the current integral water repellants now available for use in field mixed mortars."



Soil and Materials Engineers, Inc.
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Plymouth, MI 48170-2584
Tel: (734) 454-9900
Fax: (734) 454-9829
www.sme-usa.com

July 15, 2008

Mr. Richard Renaud
Quinn Evans Architects, Inc.
219-1/2 North Main Street
Ann Arbor, Michigan 48104

Transmitted by Email: rrenaud@QUINNEVANS.com

RE: Masonry Mortar Evaluation - Addition
Accident Fund - Ottawa Street Power Station
Lansing, Michigan
SME Project PM57570

Dear Mr. Renaud:

At your request, Soil and Materials Engineers, Inc. performed an assessment of the masonry mortar used in the 1950's construction of the Addition to the Ottawa Street Power Station located in Lansing, Michigan. The analysis was performed to assist in restoration mortar mix selection for the current restoration work converting the building into the Accident Fund Headquarters.

The ten story structure was constructed in 1942-43 with the addition added in the mid-1950's. SME has performed a laboratory analysis of the mortar used in construction of the brick work for the Addition, which has been removed under the direction of your firm from bedding joints of the masonry.

CEMENTITIOUS ANALYSIS

Composition was performed using ASTM C 1324-03 for Examination and Analysis of Hardened Mortar. Microscopic evaluation as referenced per ASTM C 1324-03, indicates the mortar has a distinct formulation of aggregates by volume. The cementitious material exhibited 30% carbonation with the composition of the binder. The component analysis of the mortar to aggregate is presented in Table 1. Soluble chloride tests indicate a 310 ppm count of the mortar. The FTIR analysis confirmed an ammonium component in the binder. The elevated level of chloride is from the decomposition of the stearate. As the stearate degrades

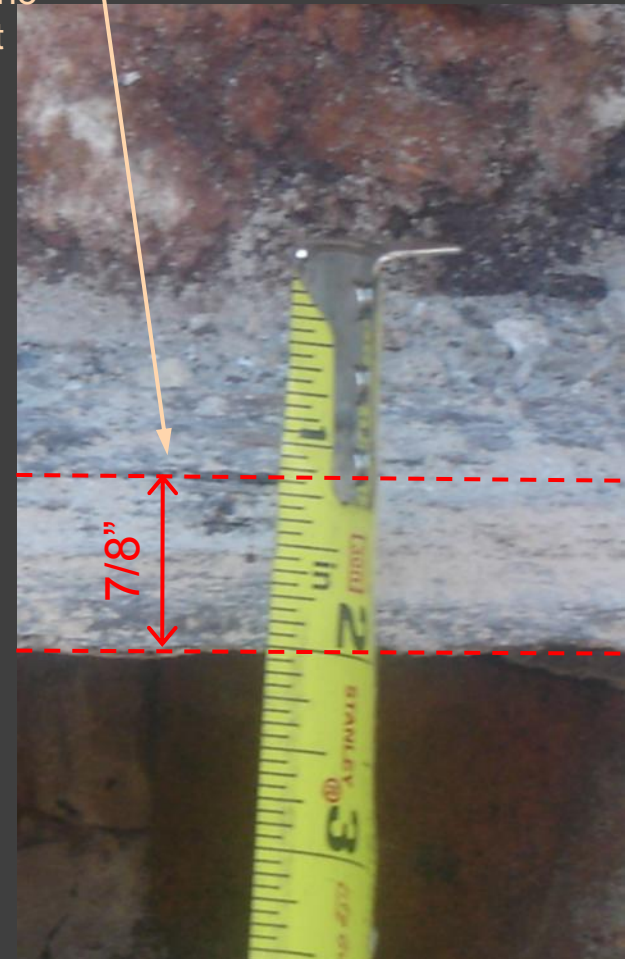
Soil and Materials Engineers, Inc.
Soil sciences, materials, and the environment



4"x16"x56" Limestone Section
Dislodged from the Masonry



Sever Delamination of Steel
Angles Supporting Limestone
& Laterally Bracing Parapet



7/8"

Hygrothermal Analysis: A tool to study of heat, air & moisture fluctuations in building materials. It includes the study of movement of water vapor through an material or assembly of material over time with varying conditions on each side of the material(s) / assembly.

HYDRO =



HYGRO =



HYGROTHERMAL ANALYSIS

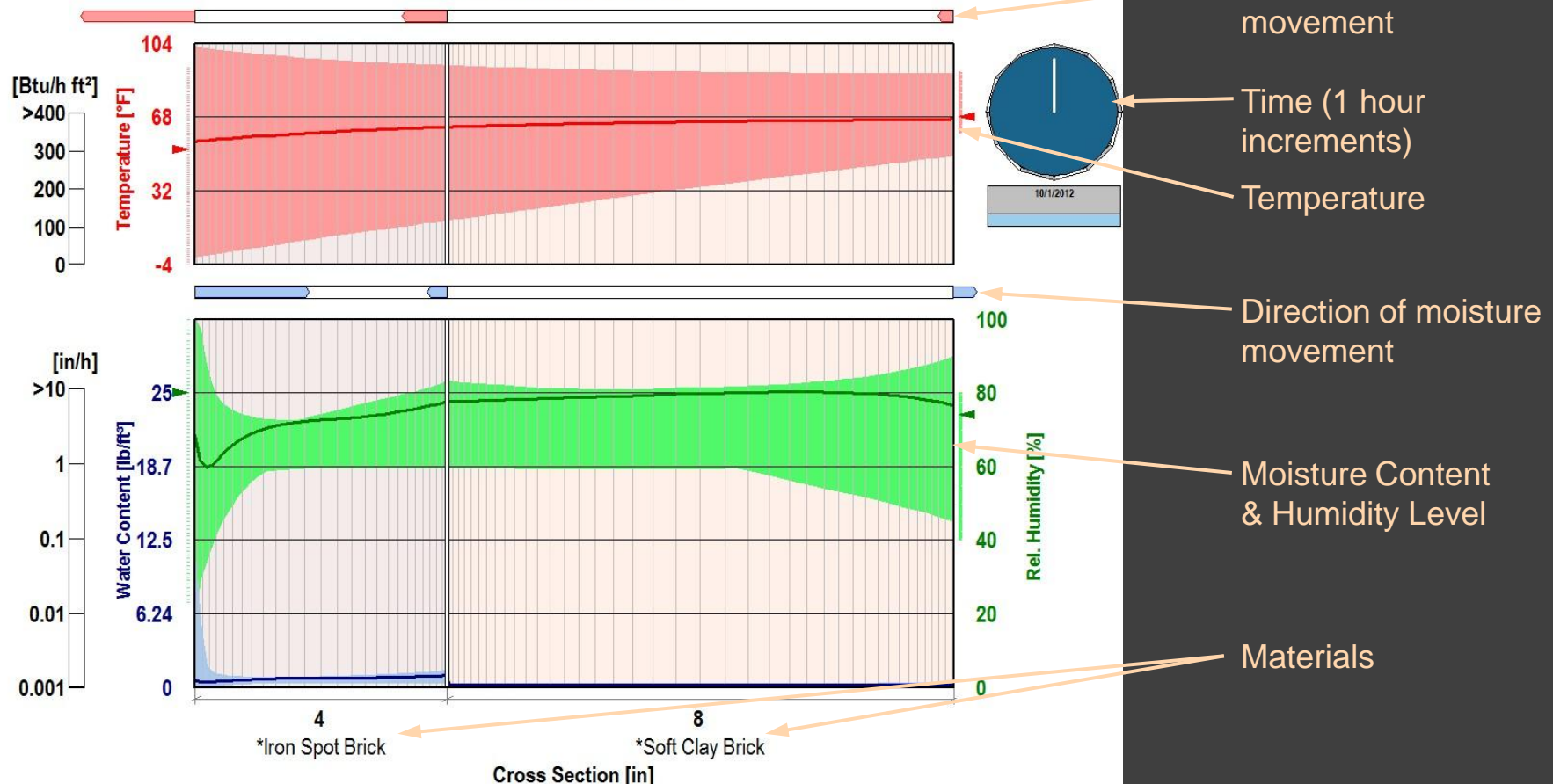
WUFI® 1D (Wärme und Feuchte instationär; Transient Heat and Moisture)

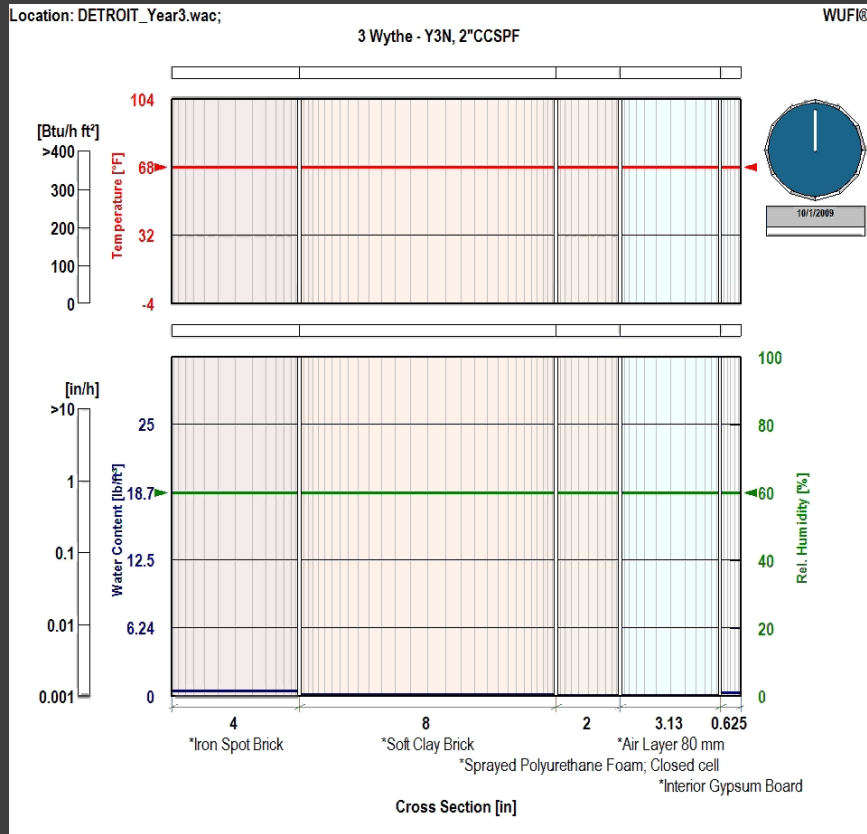
Developed by Oak Ridge National Laboratory's Buildings Technology Center (Oak Ridge, Tennessee, USA) in conjunction with the Fraunhofer Institute for Building Physics (Holzkirchen, Germany)

Location: DETROIT_Year3.wac;

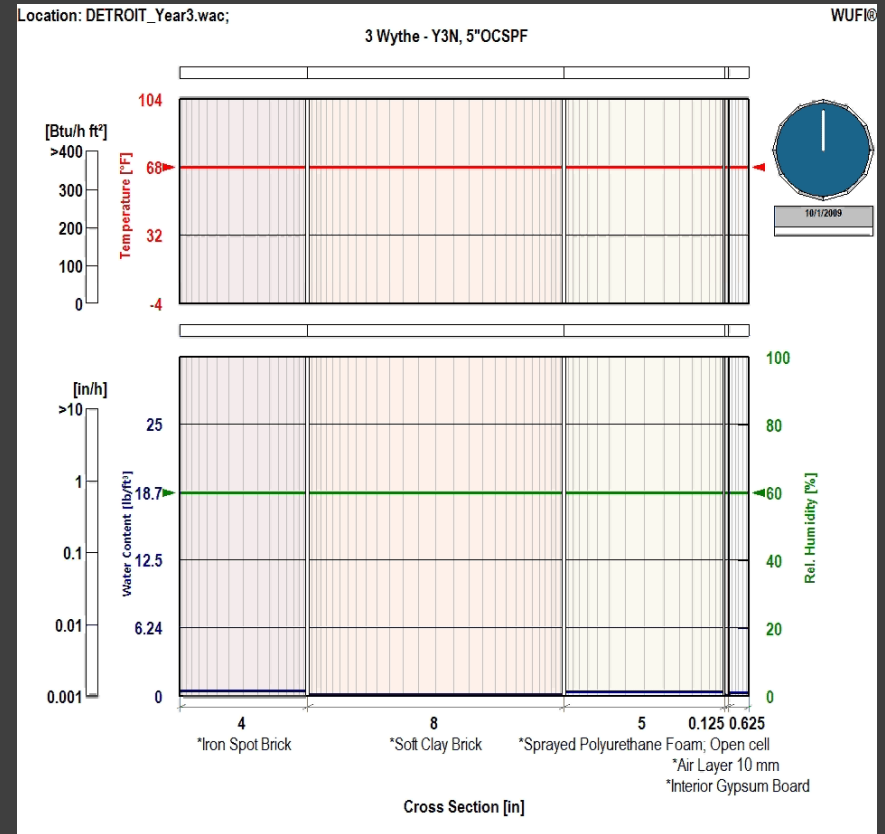
3 Wythe - Y3N Initial Condition

WUFI®





2" Closed Cell SPF



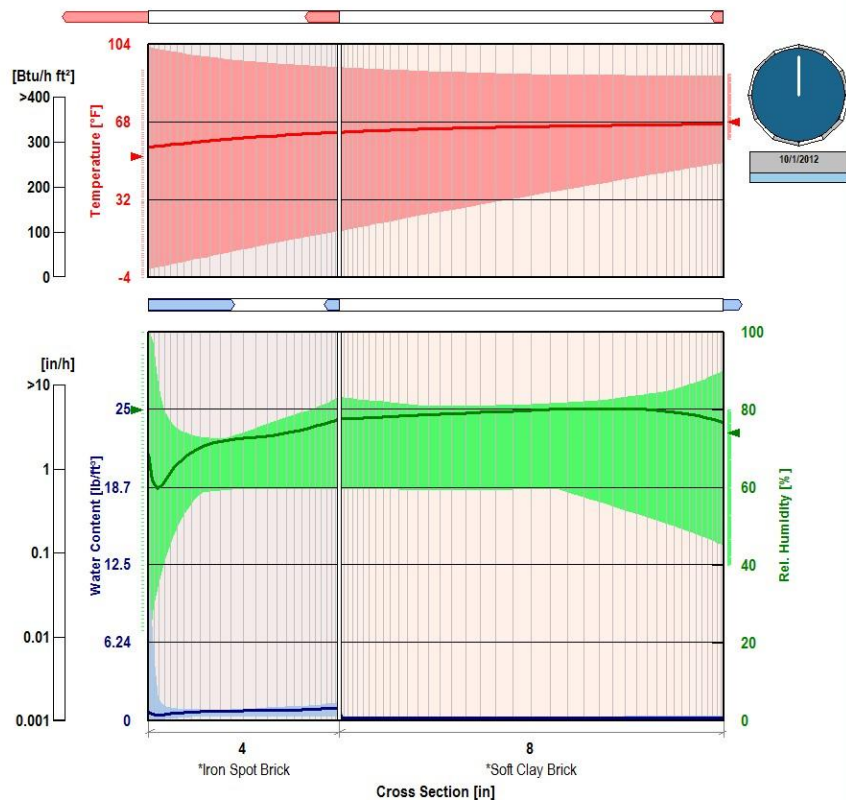
5" Open Cell SPF

Dynamic Comparison

Location: DETROIT_Year3.wac;

WUFI®

3 Wythe - Y3N Initial Condition

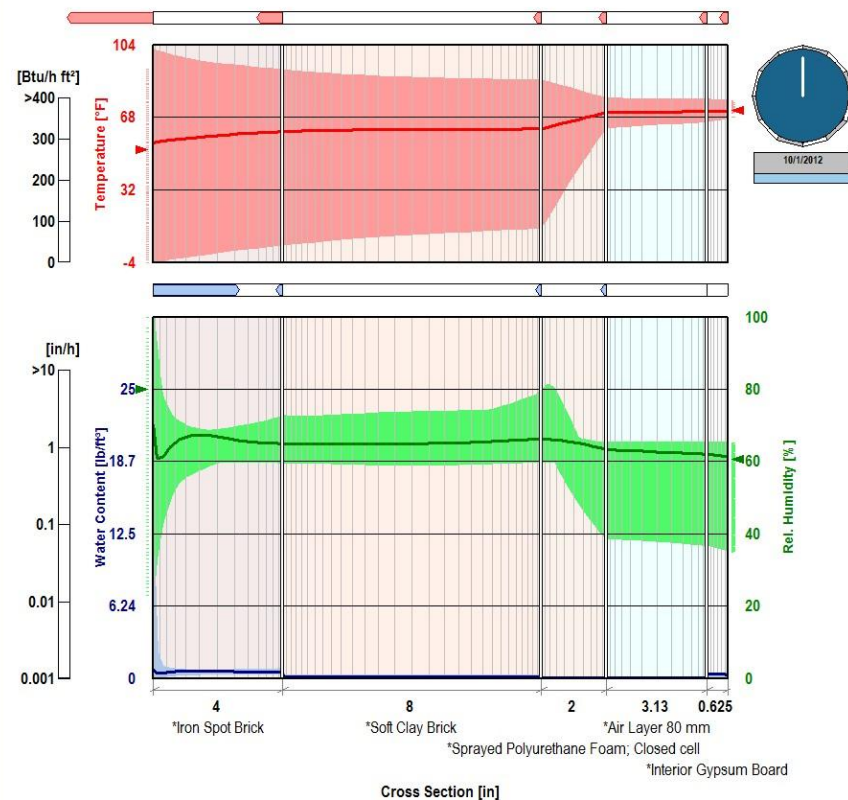


Initial Condition

Location: DETROIT_Year3.wac;

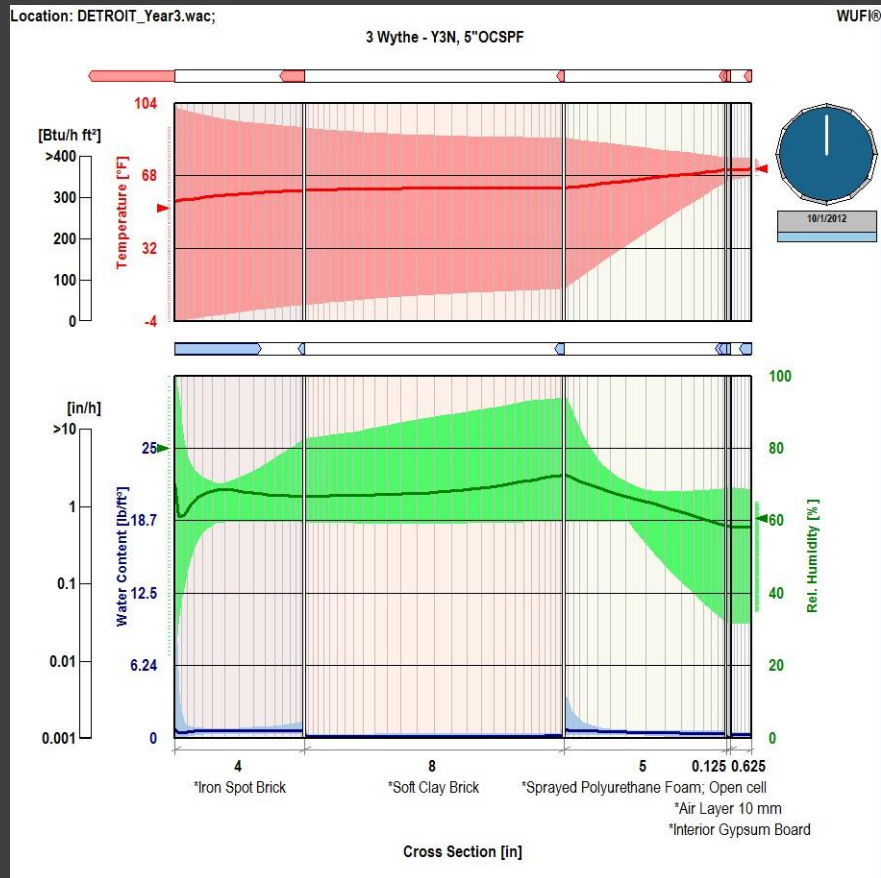
WUFI®

3 Wythe - Y3N, 2"CCSPF

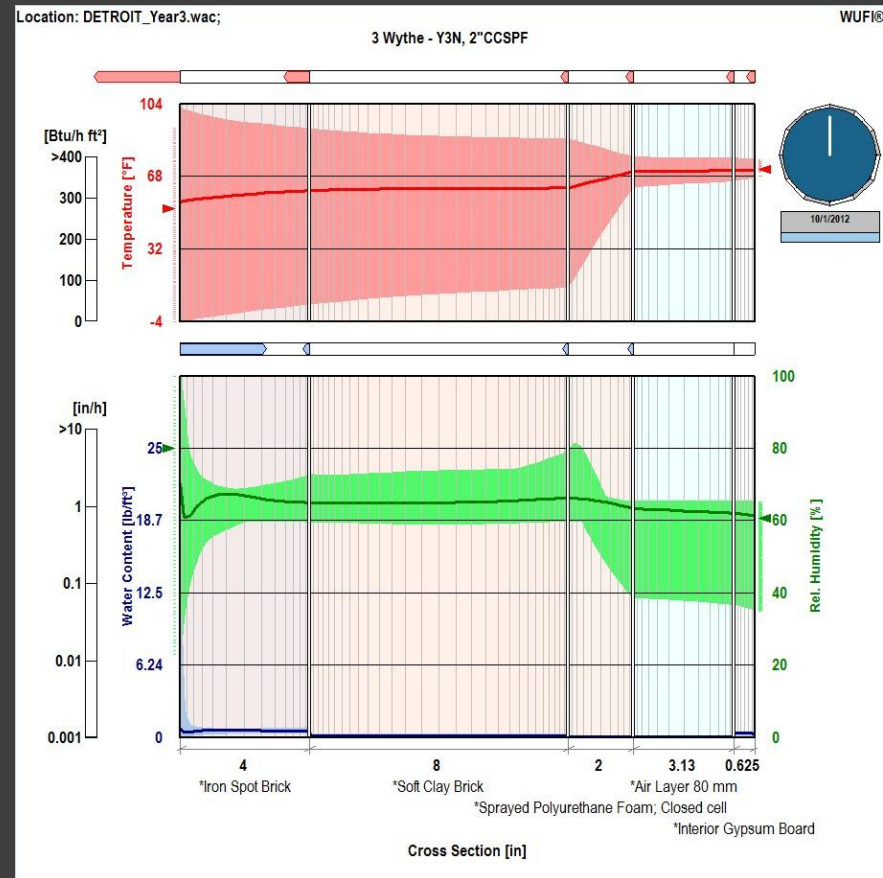


2" Closed Cell SPF

COMPARISON OF RESULTS



5" Open Cell SPF

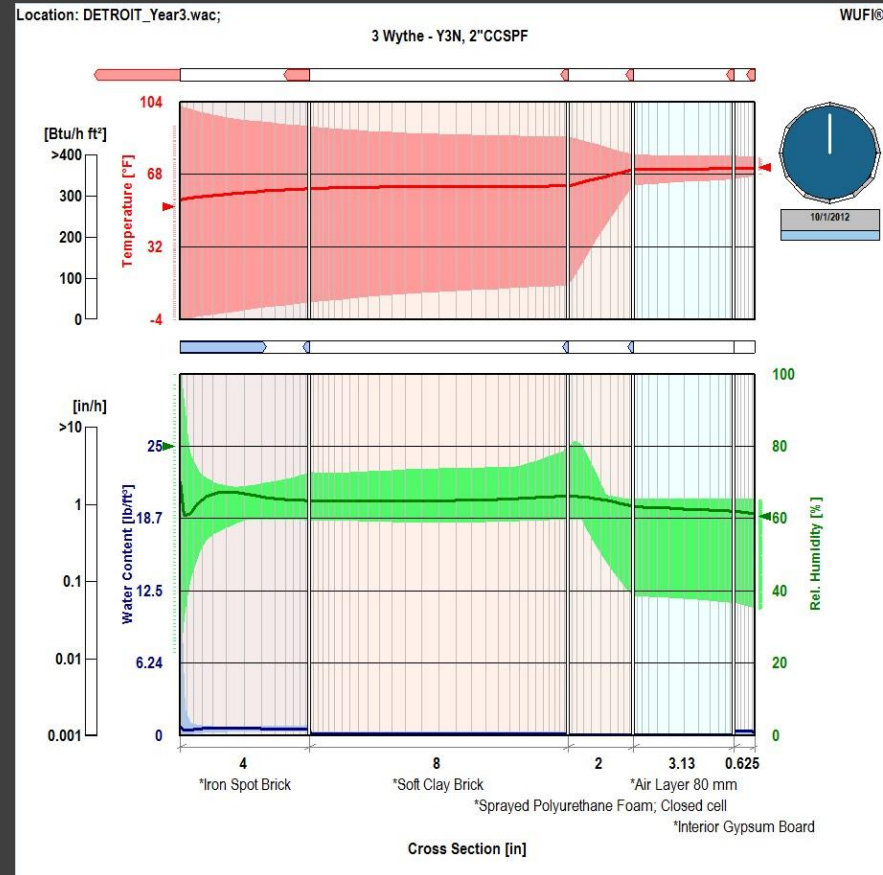
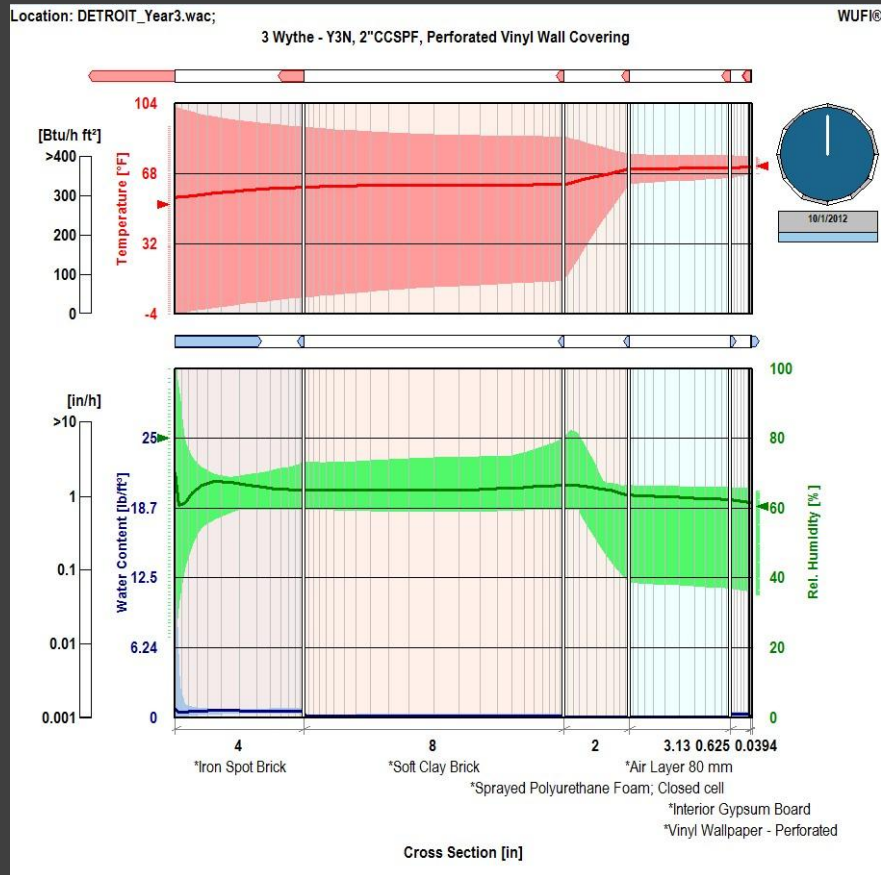


2" Closed Cell SPF

COMPARISON OF RESULTS



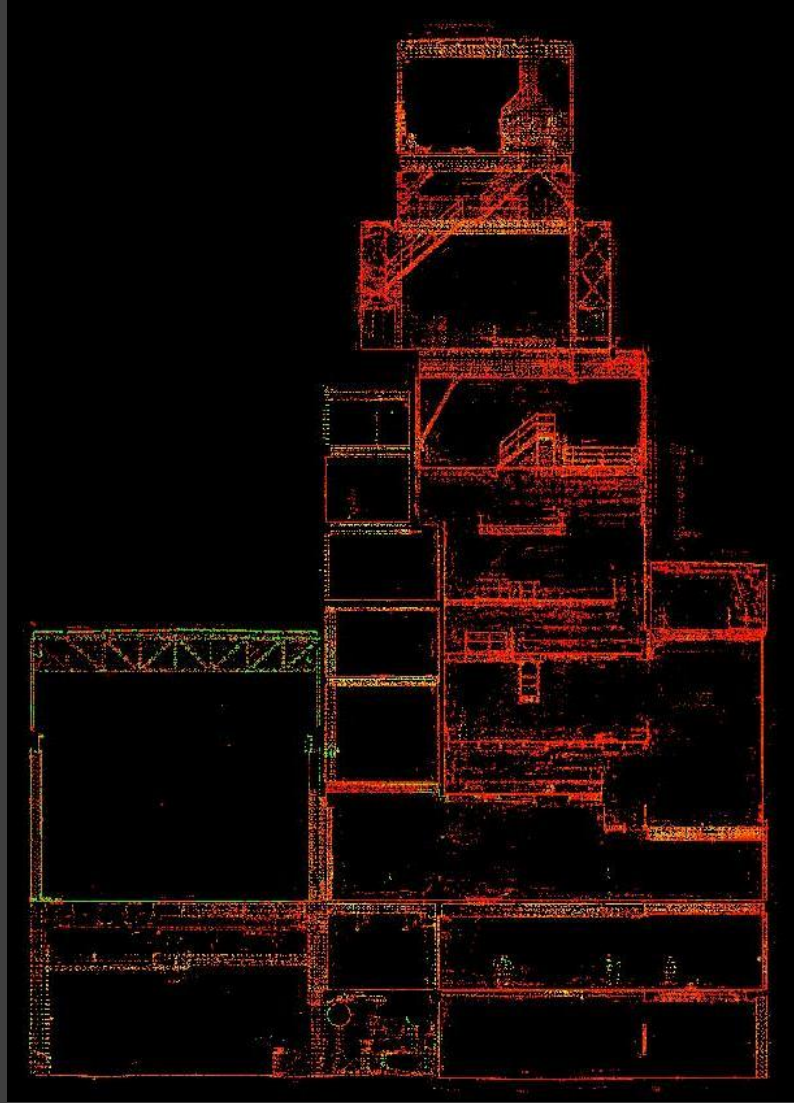
VINYL WALL COVERING AND MOLD



2" Closed Cell SPF with
Perforated Vinyl Wall Covering

2" Closed Cell SPF

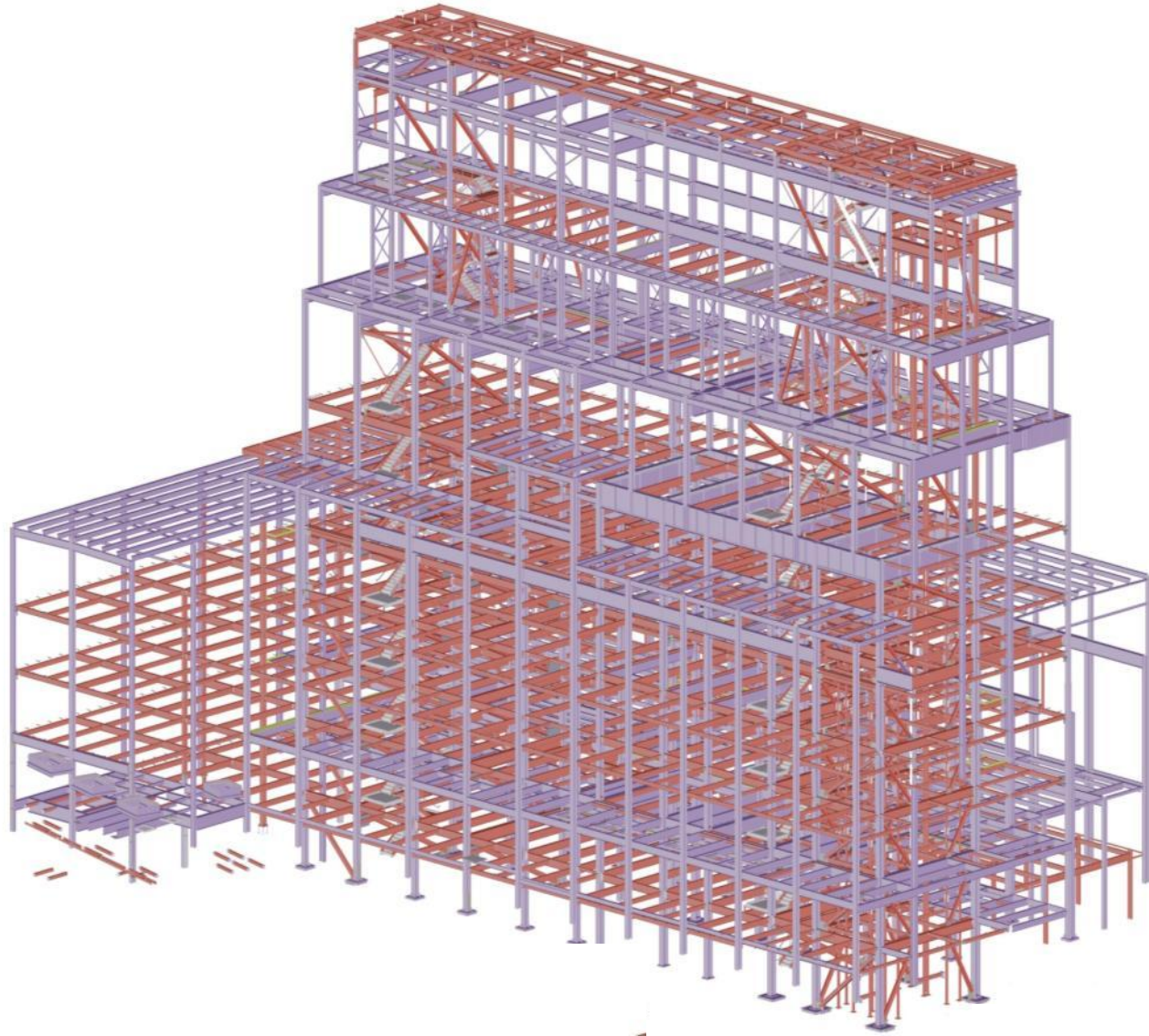
COMPARISON OF RESULTS



Due to the dangerous conditions in the building, the Revit model was created from a laser point cloud and the original historic drawings—an early demonstration of the potential of point clouds to facilitate the restoration of historic buildings where access is difficult or dangerous.

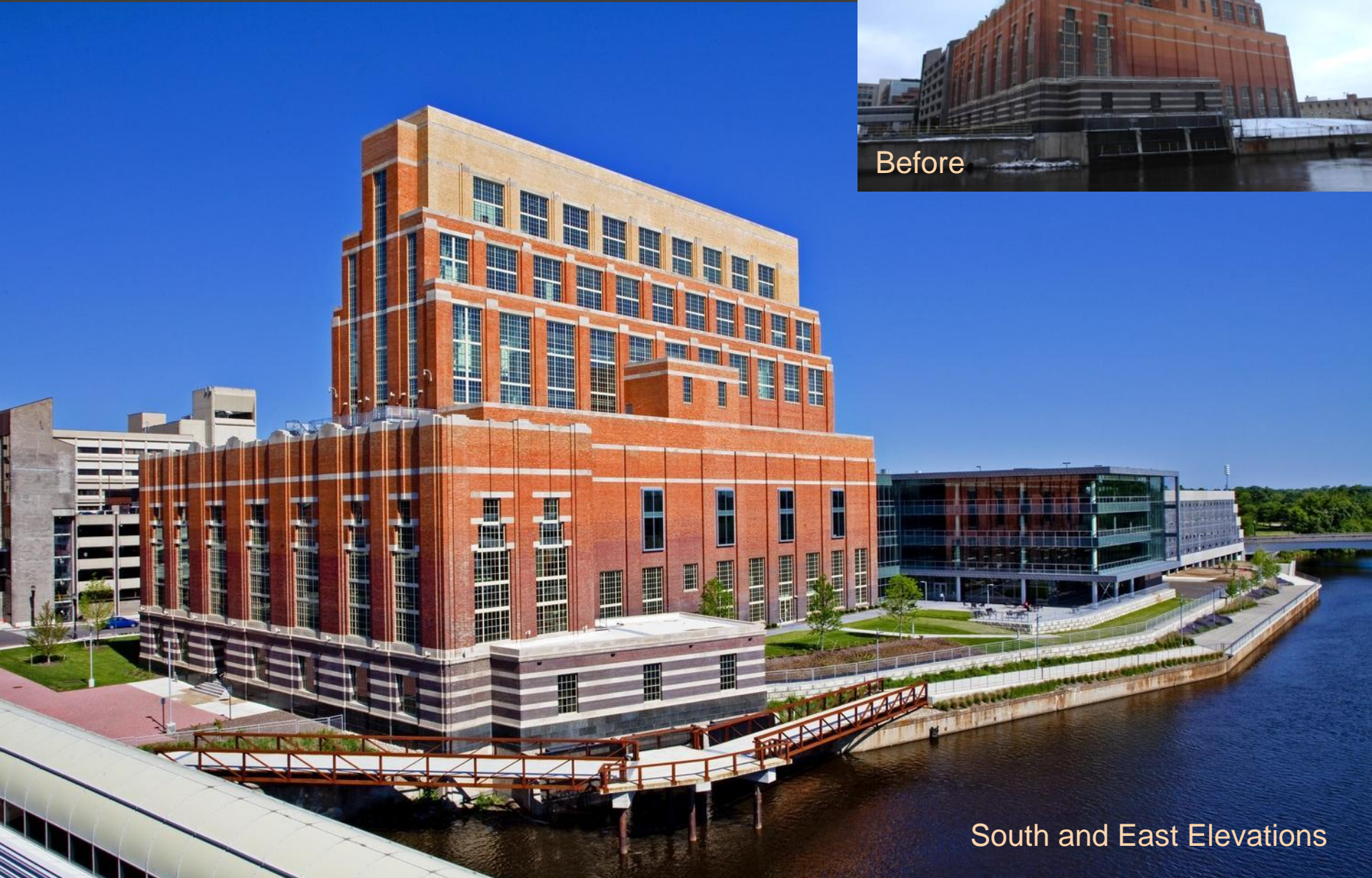


The project team was recognized by the American Institute of Steel Construction's prestigious Presidential Award, in part for using structural models originating from point clouds to engineer the installation of new steel and remove unnecessary existing steel without disturbing the historic masonry walls. The process permitted much of the design work to be completed without dangerous field work.





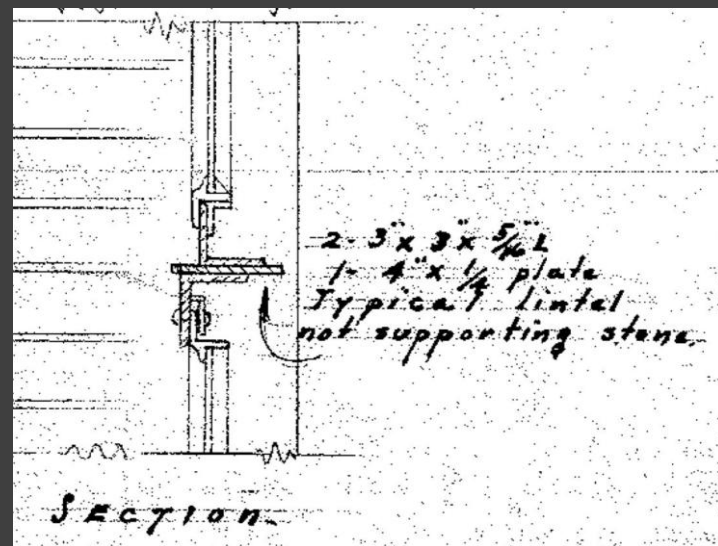
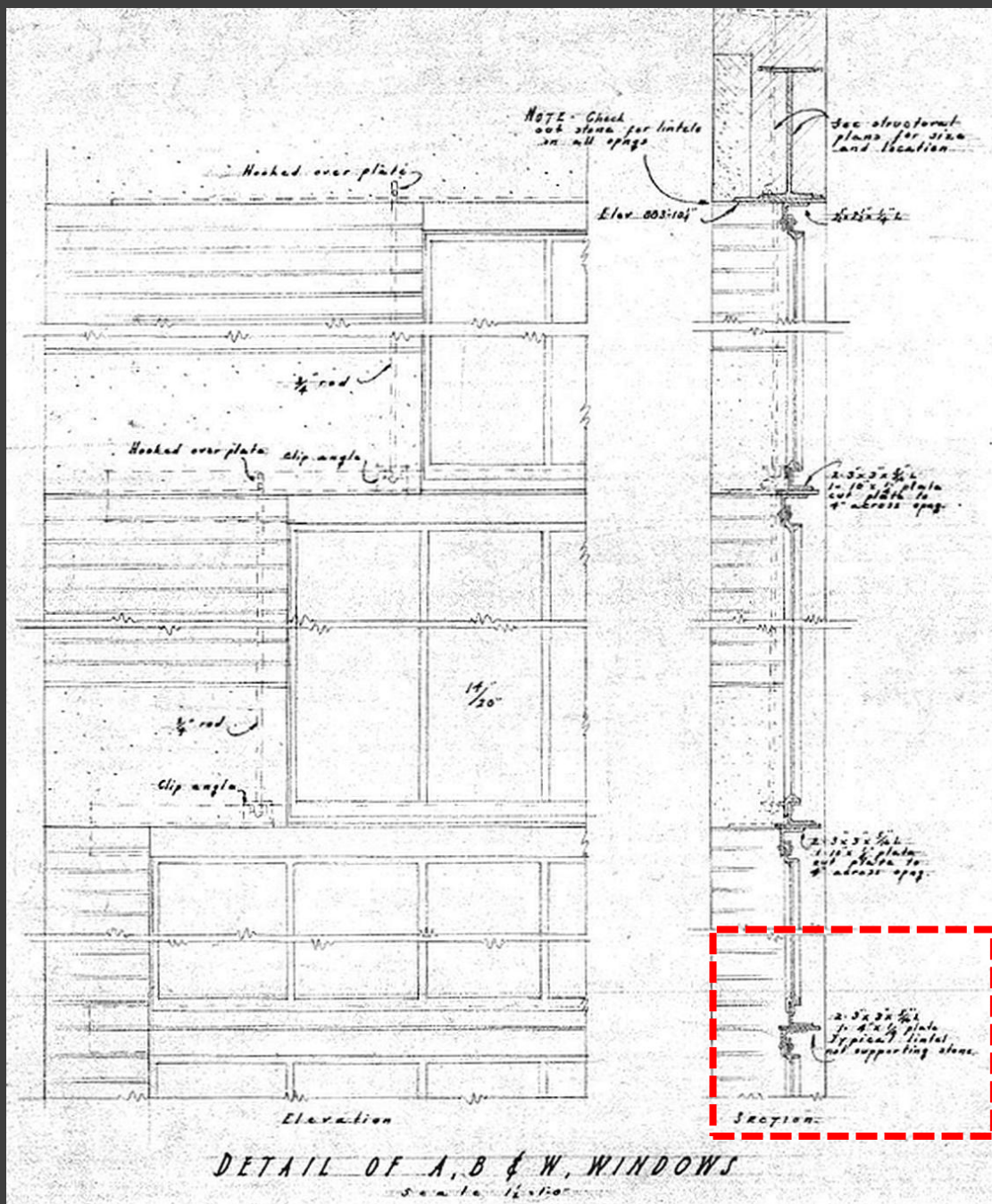
Before

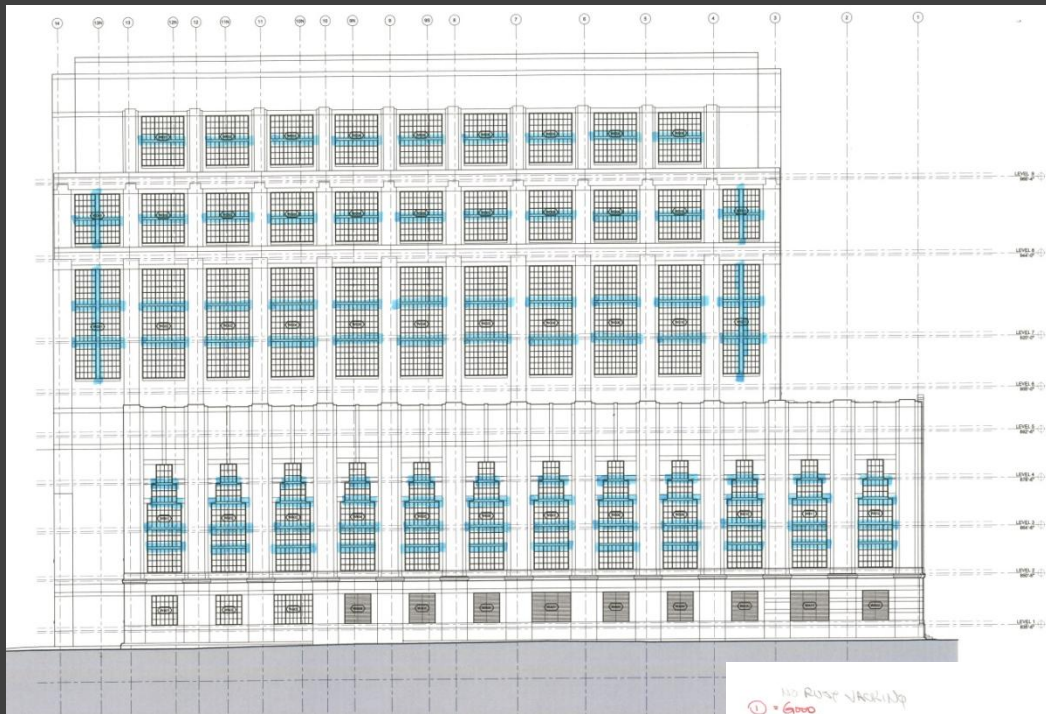


South and East Elevations

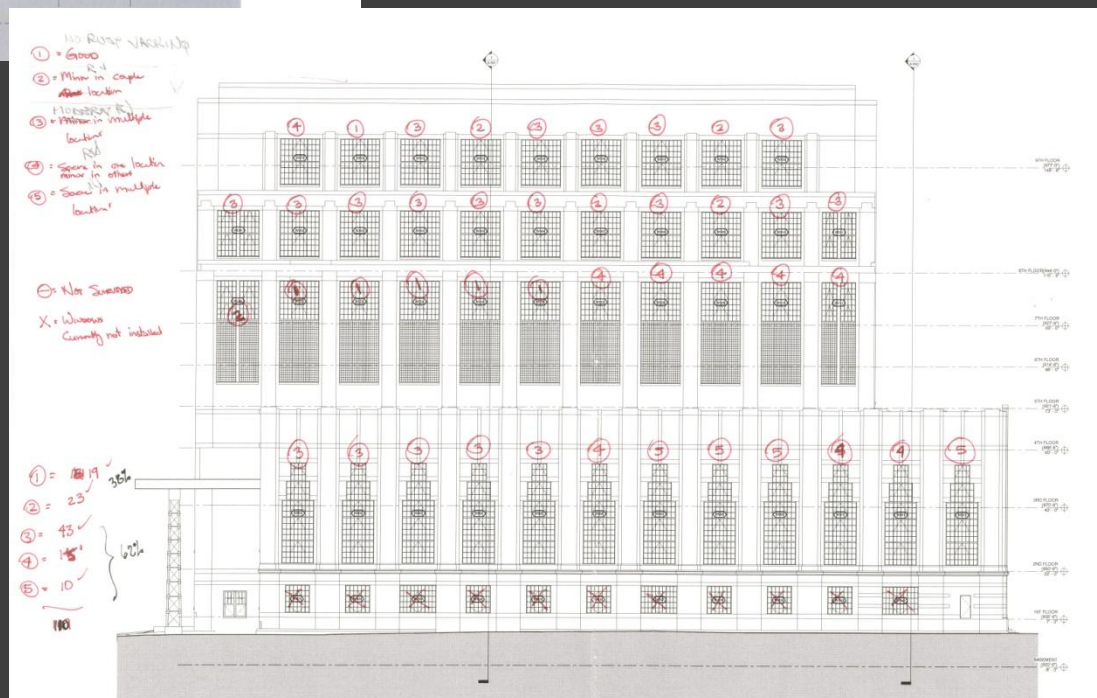


Historic Steel Windows

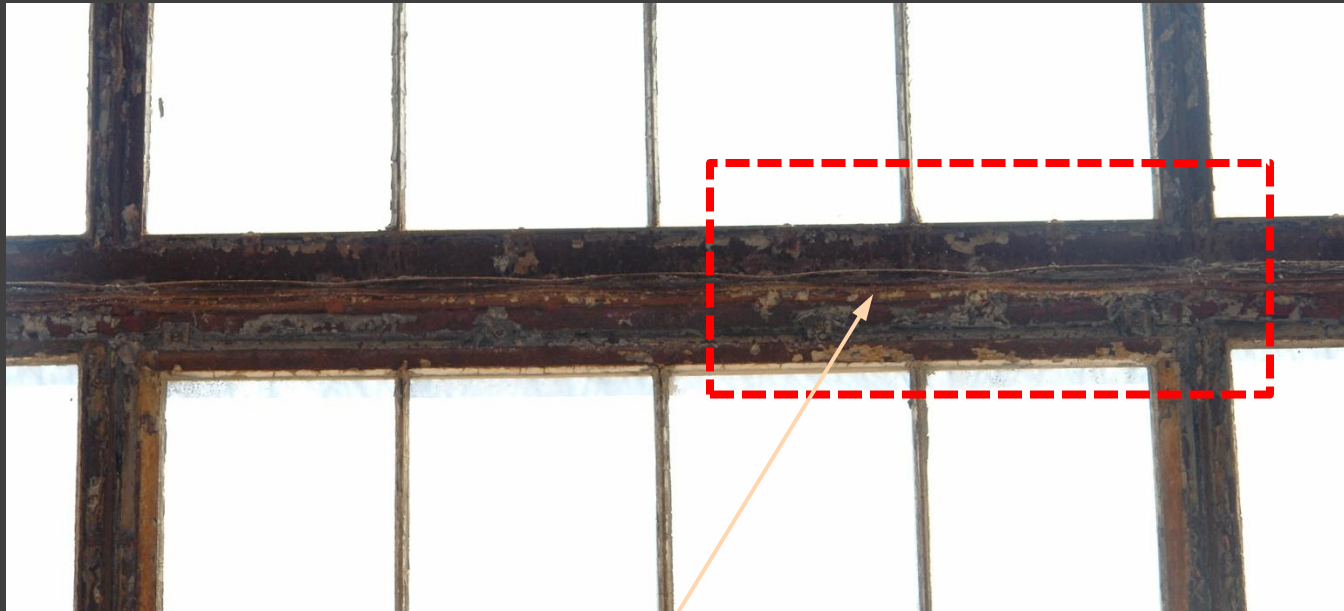




Locations of structural steel framing for the windows

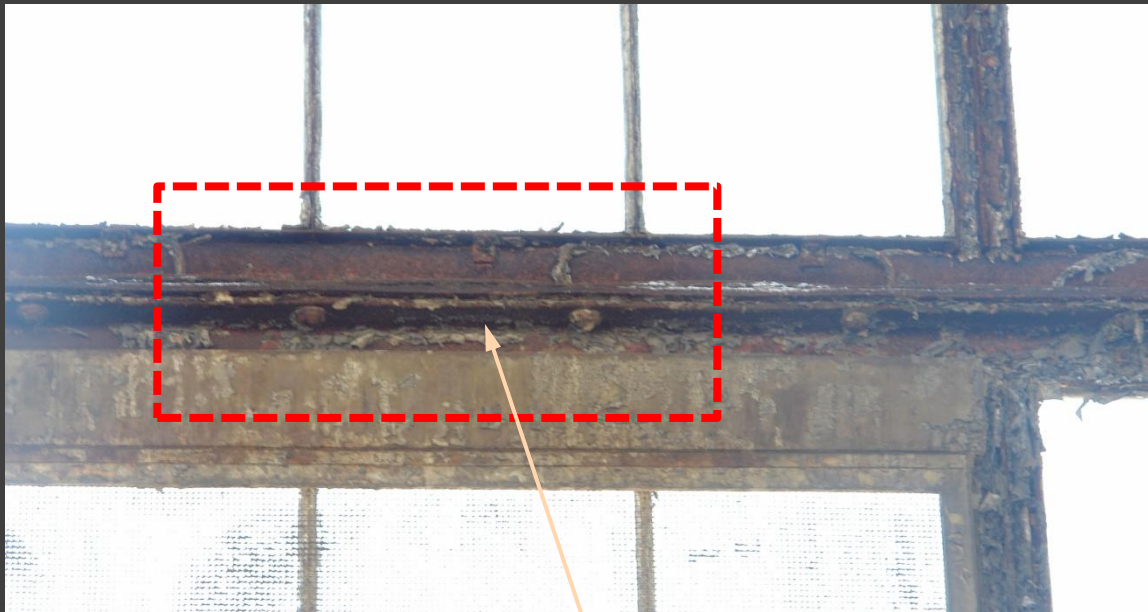


Survey of severity of steel deterioration



Rust jacking of steel
window angles





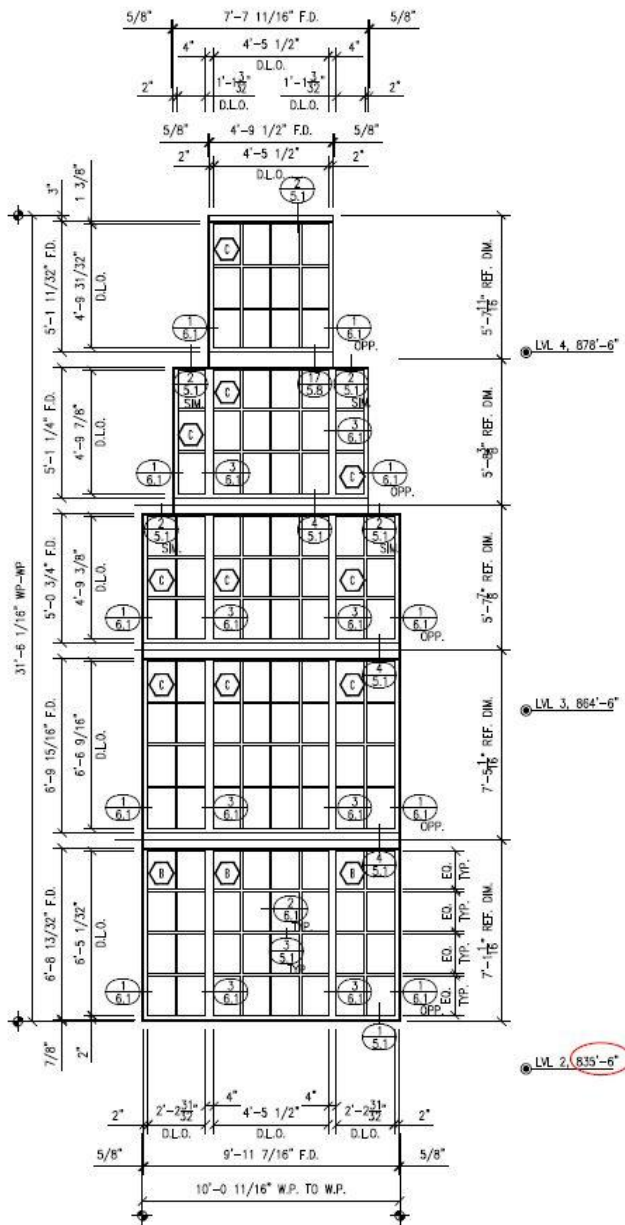
Rust jacking of steel
window angles





Damage at masonry jambs and sills due to steel angles rusting



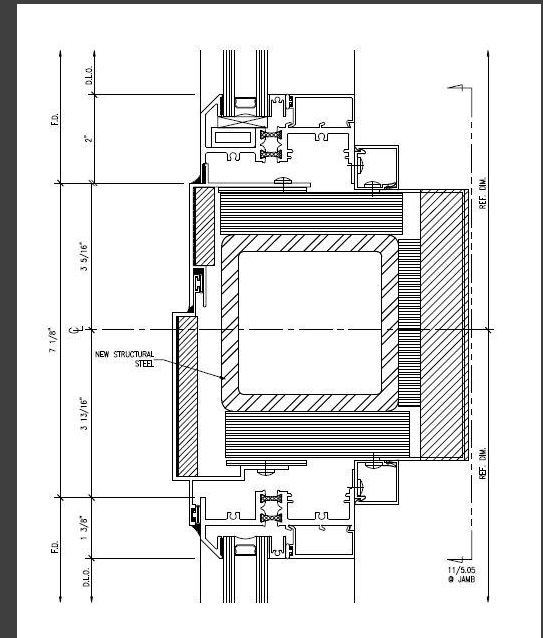
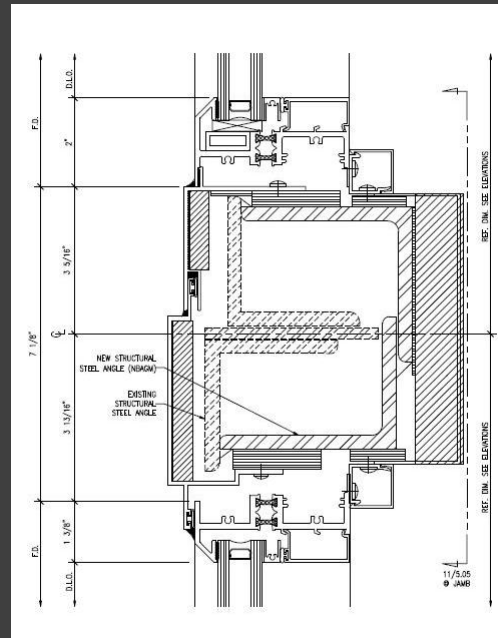


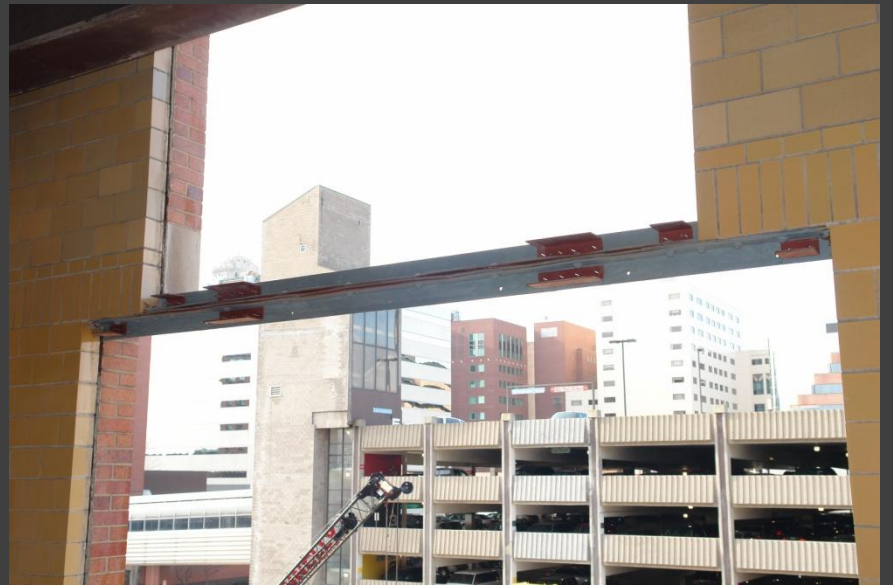
ELEVATION NE-1.2

GRAHAM WINDOWS

(1) REQ'D AT 2ND FLR
(1) THUS REQ'D.

ARCH. REF: 1/HP-602
SCALE: 3/8\"=1'-0\"







Strengthening of existing
structural steel

Addition of the windows









Before



After



Before



After



The original building retains its distinctive historic features. The Art Deco lobby with its unique steel doors was carefully restored to its historic appearance.

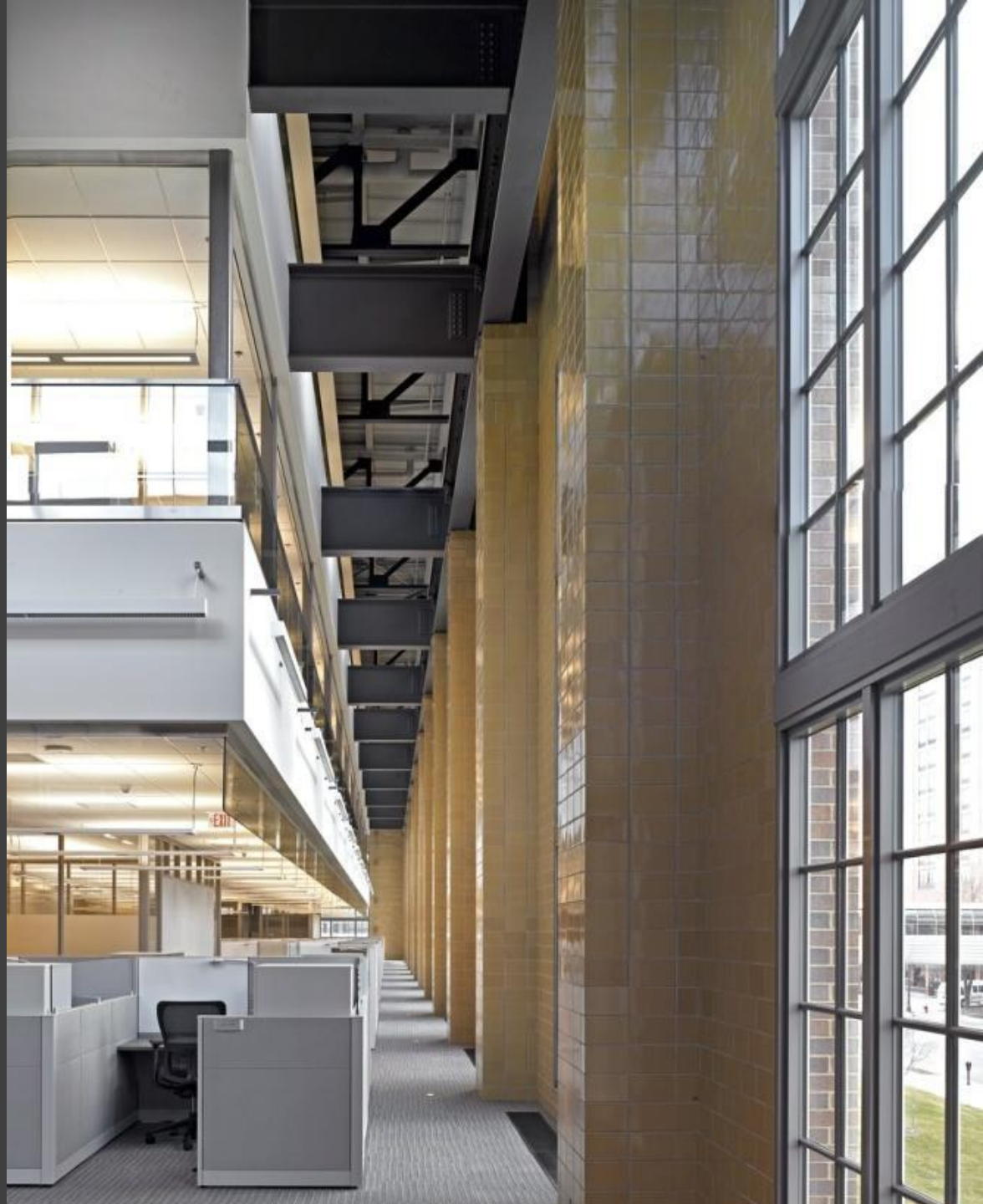




Careful detailing of the new and old beam intersections avoided damage to decorative elements of the historic glazed terra cotta walls.



New floors provide necessary additional office space, but maintain the original turbine hall's sense of scale by hanging from new beams spanning the original bearing beams for the hall's historic crane.



A large industrial crane and steel doors are reminders of the building's original use, imparting visual interest in an employee break out area at one end of the former turbine hall overlooking the entry court.



Brick walls and exposed original steel framing throughout the building are reminders of its original industrial use.



Before





Before



North and East Elevations



Questions



QUINN EVANS
ARCHITECTS

Ottawa Street Station Transformation
Accident Fund Insurance Headquarters