

GFAB™

NGA Glass Fabricator Conference



THE FUTURE OF GLASS
FABRICATION HAPPENS HERE

JUN 14-17, 2026

CHICAGO

ARCHITECTURAL GLASS CIRCULARITY & END OF LIFE PROJECT

Part 1 – Mayo Clinic (Damon West) Parking Garage

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NATIONAL GLASS ASSOCIATION with GANA





SOPHIE PENNETIER

Digne, Founder
SCI-Arc, Faculty

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ARCHITECTURAL GLASS CIRCULARITY & END OF LIFE PROJECT

Part 1 – Mayo Clinic (Damon West) Parking Garage

Commissioned by:

 National Glass Association

 Aluminum Extruder Council

In collaboration with:

 Infinite Recycled Technologies

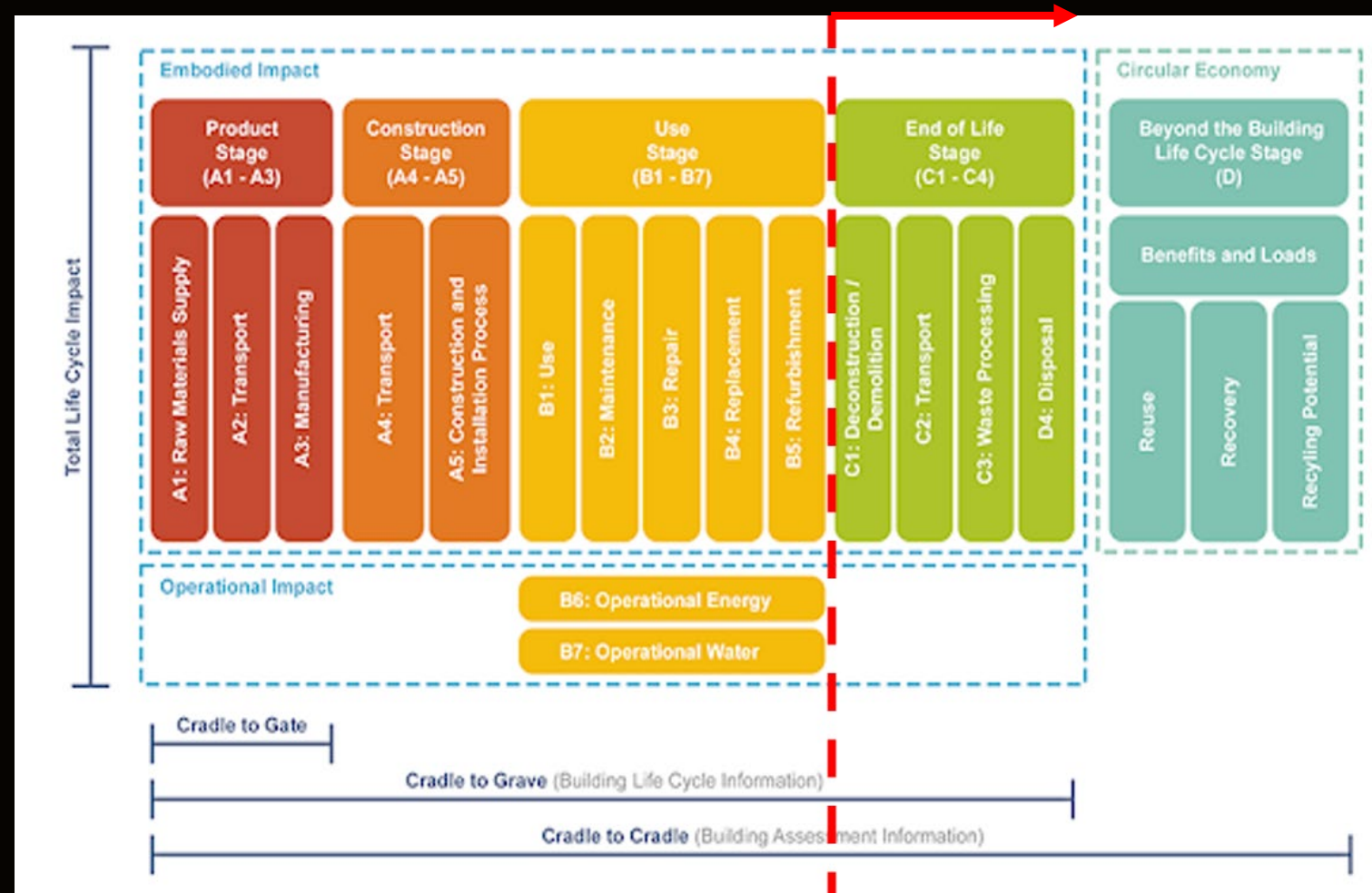
Prepared by:

 Digne



END OF LIFE / CIRCULARITY STUDY

- Together with the National Glass Association and the Aluminum Extruder Council, track both aluminum + glass recovery in real façade or building deconstruction project(s).
- Quantify recovery percentage, LCA Stage C onwards data, improving the understanding about glass and aluminum circularity.
- Similar to prior studies in Europe, but for the U.S.



END-OF-LIFE / CIRCULARITY STUDIES

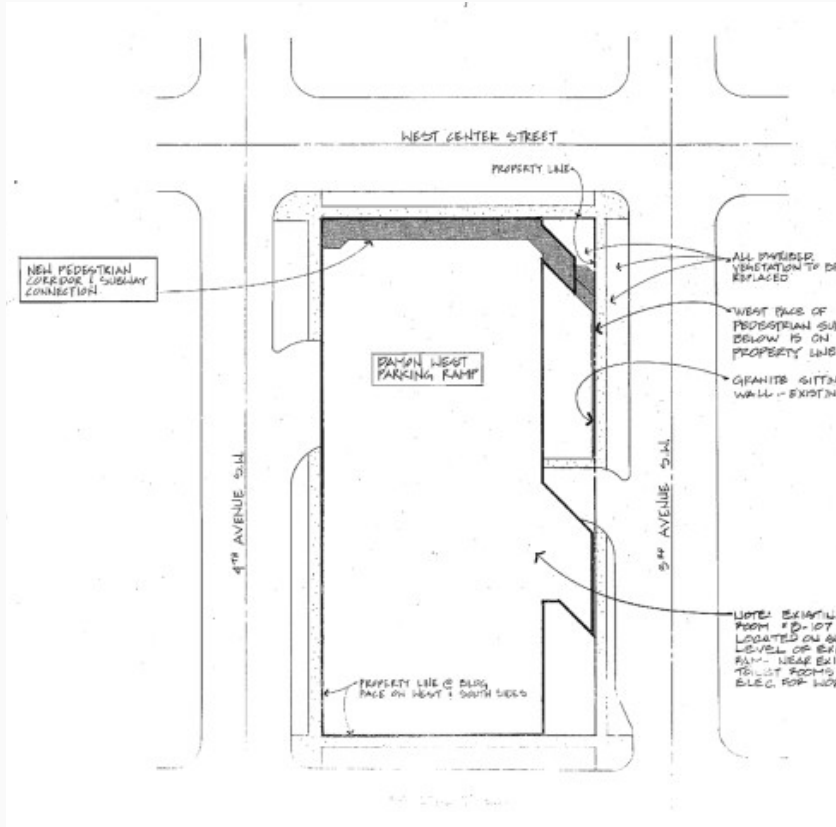
- Quantify glass and aluminum recovery in real façade or building deconstruction projects.



- Real life -- good, bad, and ugly.
Looking to pair with second project to document lessons regarding what to do / what not to do for successful projects, and tell a more complete story.

Recycling by Infinite Recycled Technologies.

Third-party LCA expertise from Digne / Sophie Pennetier



Site Plan

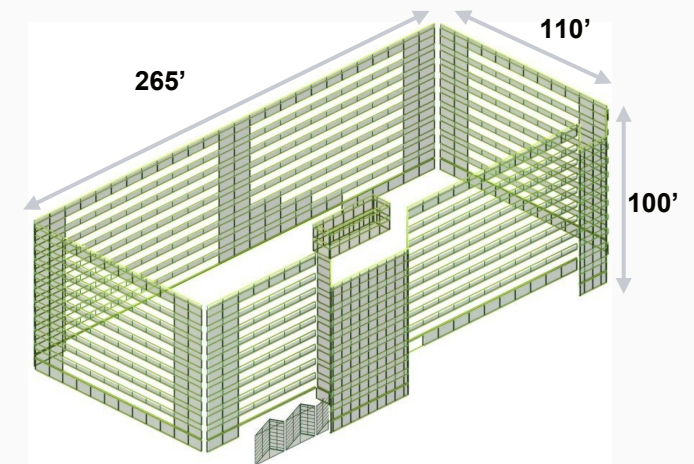


Google Maps Top View

PROJECT SUMMARY:

The façade consists of a **75,000sf** (40% open) curtain wall system of large reflective glass panels installed on a cast-in-place concrete parking structure. The main parking levels use single-pane glazing infills within continuous aluminum pressure cap horizontals and structurally glazed verticals

The vertical circulation cores (stairs and elevators), are assumed to use the same system. On the ground floor, the building features skylights assumed to be laminated IGU.



Isometric of the project glass panels & aluminum mullions

MAYO FOUNDATION

DAMON WEST PARKING RAMP

PEDESTRIAN CORRIDOR AND SUBWAY CONNECTION

ROCHESTER, MINNESOTA

OWNER

MAYO FOUNDATION
200 1st Street South West
Rochester, Minnesota 55905

ARCHITECT

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Park Square Court, Suite 500
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STRUCTURAL ENGINEER

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(612) 342-9210

MECHANICAL/ELECTRICAL ENGINEERS

MICHAUD COOLEY ERICKSON
AND ASSOCIATES
625 Fourth Avenue South, Suite 1325
Minneapolis, Minnesota 55415
(612) 339-4941

SHEET INDEX

ARCHITECTURAL

- A1 TITLE SHEET, SITE PLAN, ELEVATIONS
- A2 GROUND AND SUBWAY LEVEL PLANS, SCHEDULES
- A3 REFLECTED CEILING PLANS, SECTIONS, DETAILS
- A4 DR & FR TYPES & DETAILS, MISC DETAILS

STRUCTURAL

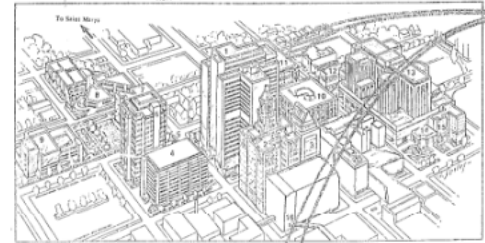
- S1 STRUCTURAL NOTES & DETAILS
- S2 STRUCTURAL PLANS & SECTIONS
- S3 STRUCTURAL DETAILS

MECHANICAL

- M1 MECHANICAL FLOOR PLANS

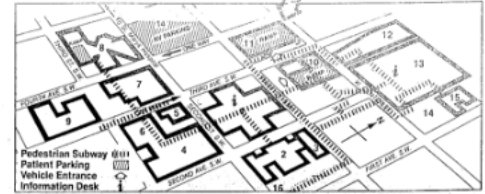
ELECTRICAL

- E1 ELEC DEMOLITION, LIGHTING, POWER & SYSTEMS

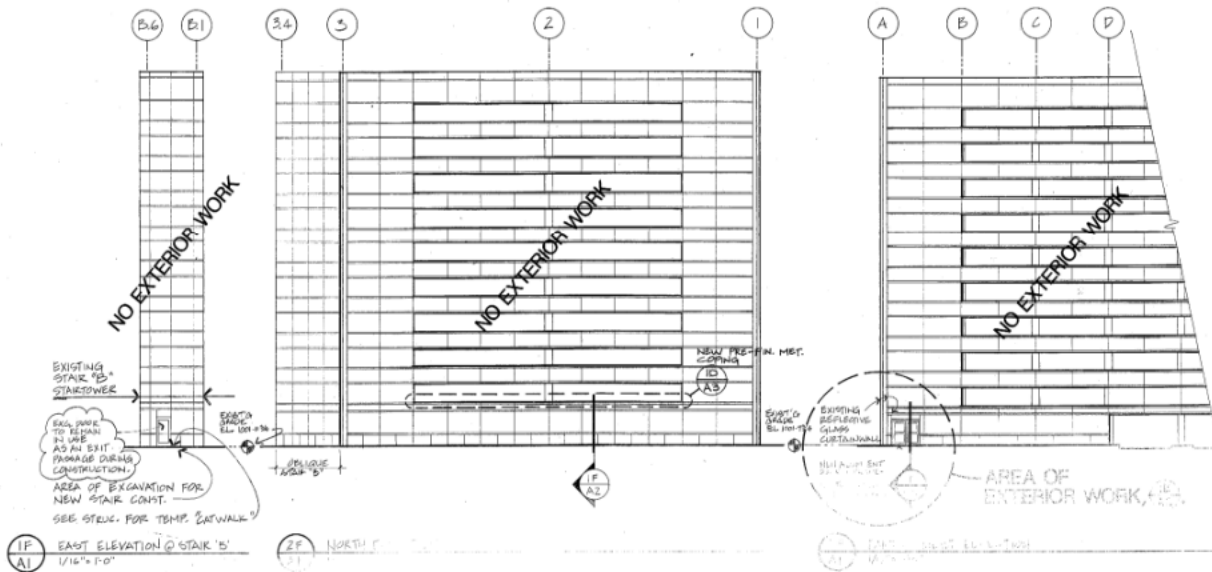


PROJECT LOCATION

1. Mayo Building
2. Plummer Building
3. Siebens Medical Education Building
4. Hilton Building
5. Mayo Medical School
6. Guggenheim Building
7. Harwick Building
8. Bakken Building
9. Medical Sciences Building
10. Damon Parkade
11. Damon West
12. Charlton Building
13. Methodist Hospital
14. Methodist Plaza
15. Colonial Building
16. Skyway Access



50 PROJECT LOCATION DIAGRAMS
A1 NO SCALE

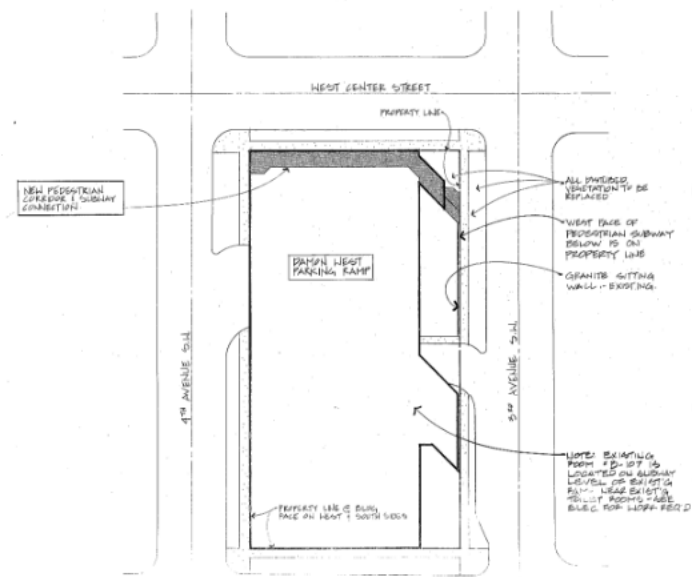


1F EAST ELEVATION @ STAIR 'B'
A1 1/16" = 1'-0"

2F NORTH

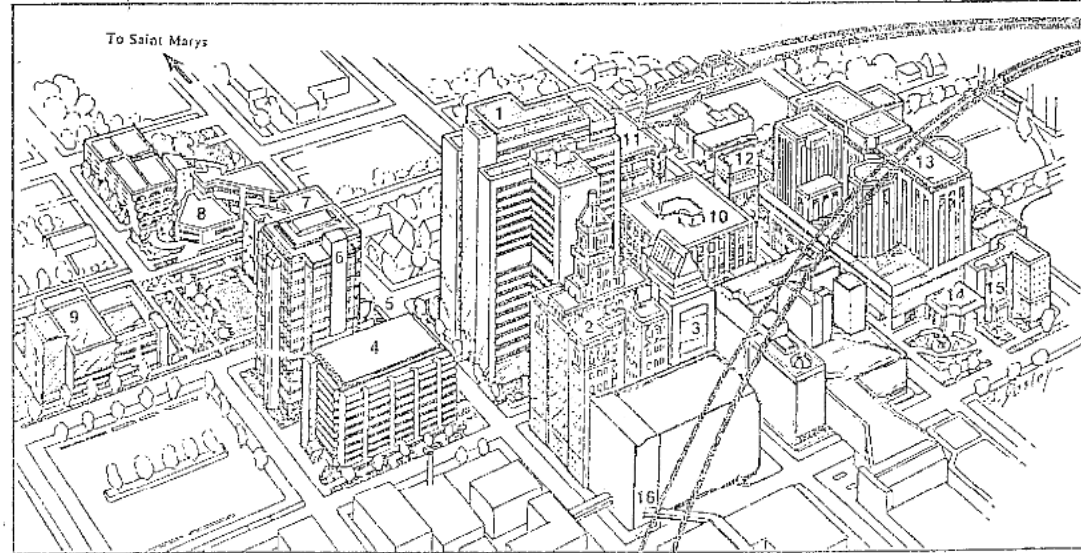
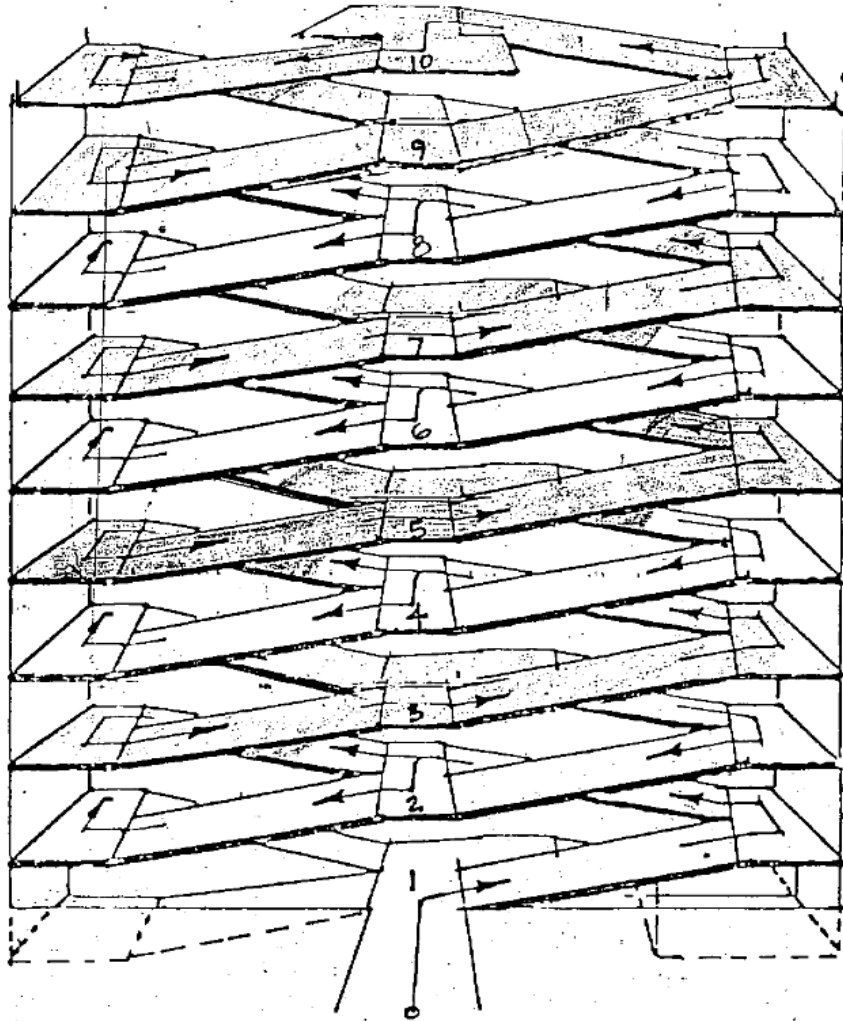
3F NORTH

4F SITE PLAN
A1 1/4" = 1'-0"



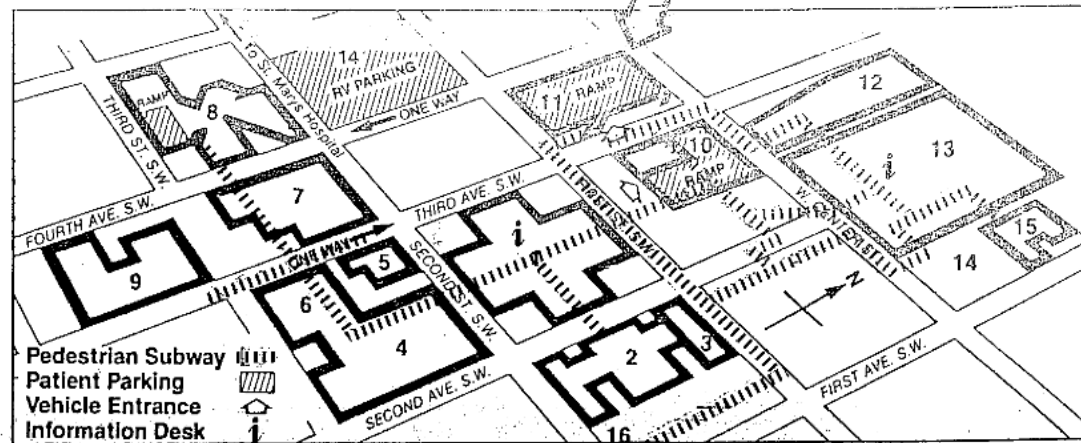
5F NORTH

MAYO FOUNDATION - DAMON WEST PARKING RAMP
 Pedestrian Corridor and Subway Connection
 ROCHESTER, MINNESOTA
 DRAWN BY: T.B.
 CHECKED BY: P.S.
 REVISION: 1
 DATE: NOV 19 1999
 CHAIR: RB9909
 TITLE SHEET
 SITE PLAN
 ELEVATIONS
 A

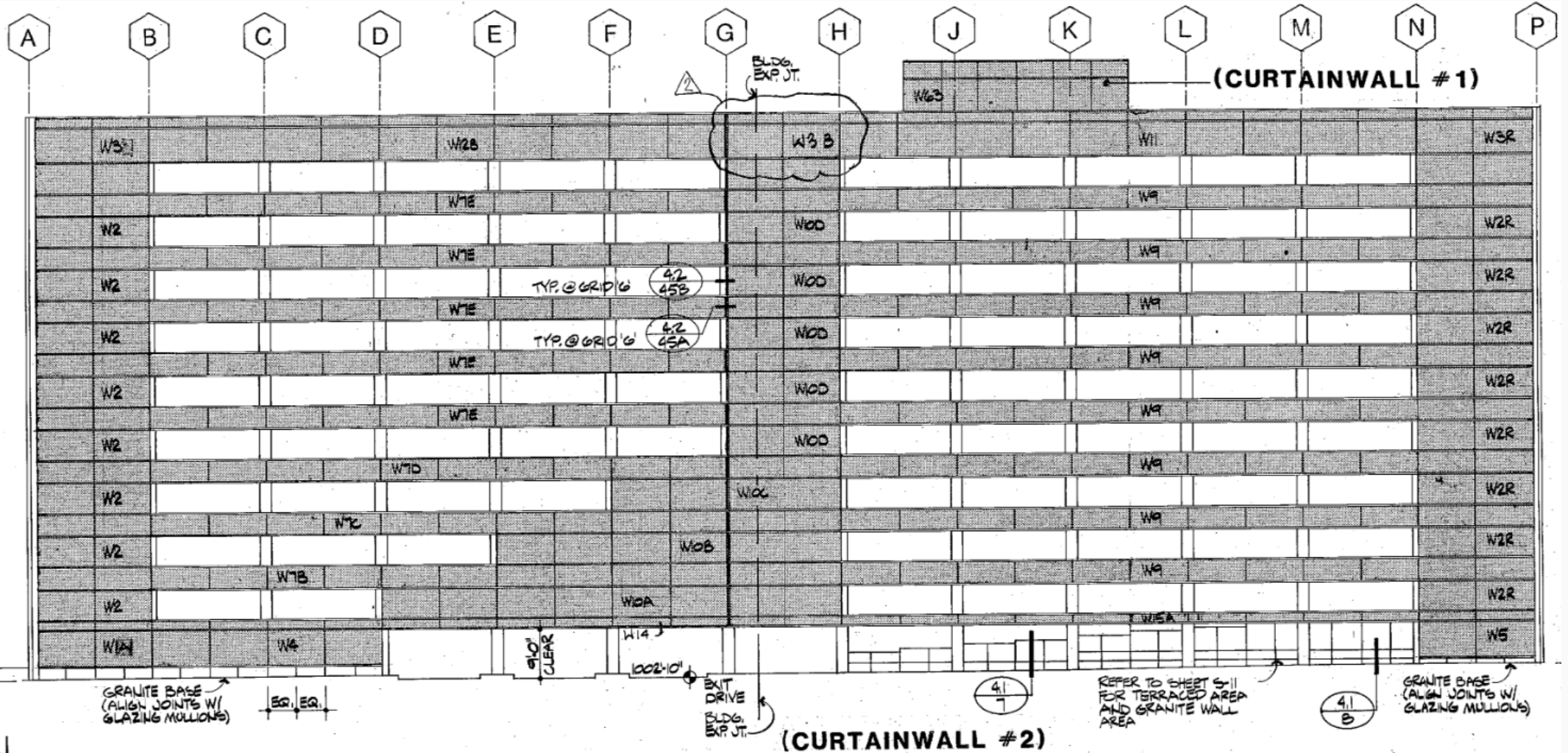


PROJECT LOCATION

1. Mayo Building
2. Plummer Building
3. Siebens Medical Education Building
4. Hilton Building
5. Mayo Medical School
6. Guggenheim Building
7. Harwick Building
8. Baldwin Building
9. Medical Sciences Building
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50 PROJECT LOCATION DIAGRAMS
A1 NO SCALE



A4 WEST ELEVATION
3 (EXIT)

REFER TO SHEET S-11 FOR TERRACED AREA AND GRANITE WALL AREA

GRANITE BASE (ALIGN JOINTS W/ GLAZING MULLIONS)

GLASS SUMMARY

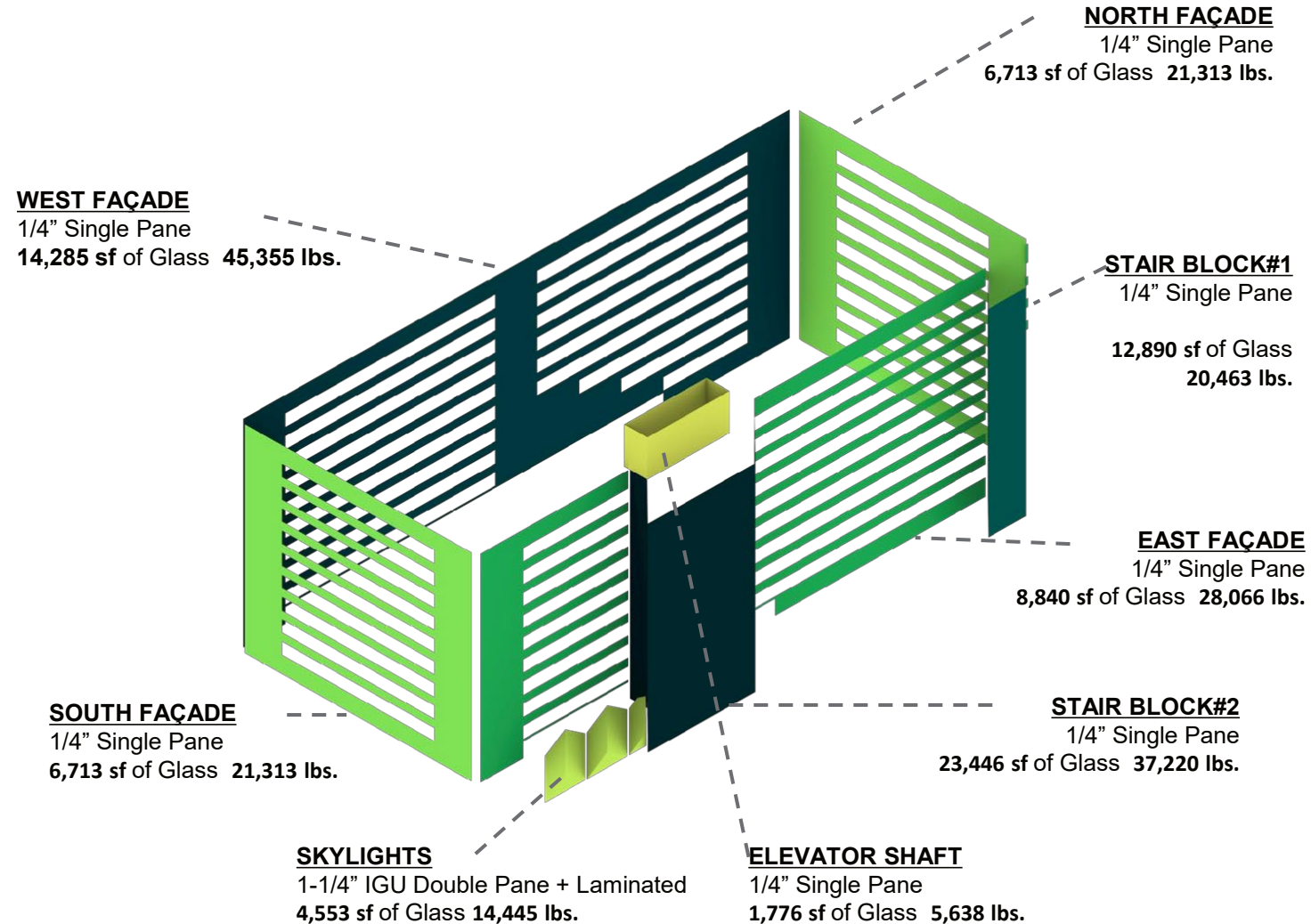
Weight Breakdown

Parking Panes = 121,748 lbs (60.9 tons)

Stairs Panes = 57,683 lbs (28.8 tons)

Skylights Lami IGU = 14,478 lbs (7.2 tons)

Total Weight of Glass: 193,909 lbs (97 tons)









FAÇADE ALUMINUM MULLIONS

Weight Breakdown

- Horizontal Mullions = 70,433 lbs (35.2 tons)
- Long Vertical Mullions = 14,660 lbs (7.3 tons)
- Short Vertical Mullions = 7,583 lbs (3.8 tons)
- Skylight = 1,685 lbs (0.8 tons)

Total Weight of Aluminum = 94,361 lbs (47.2 tons)

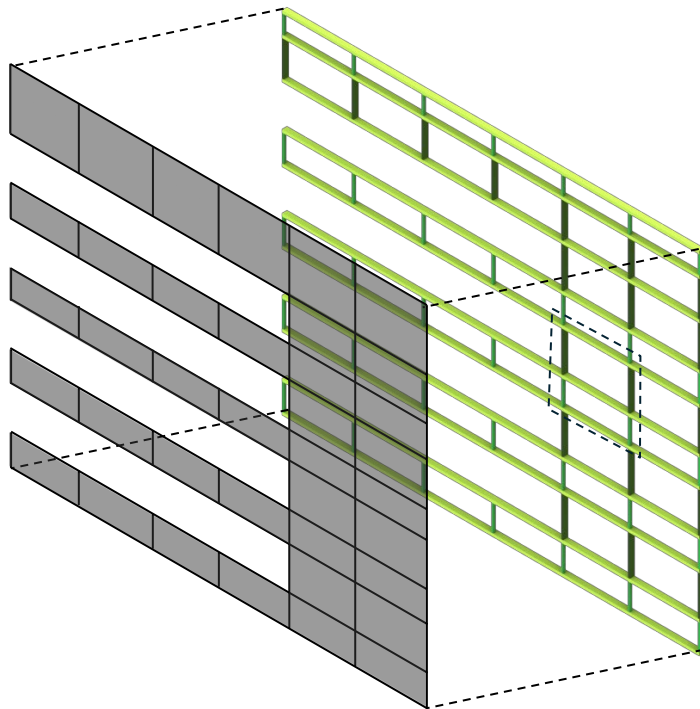
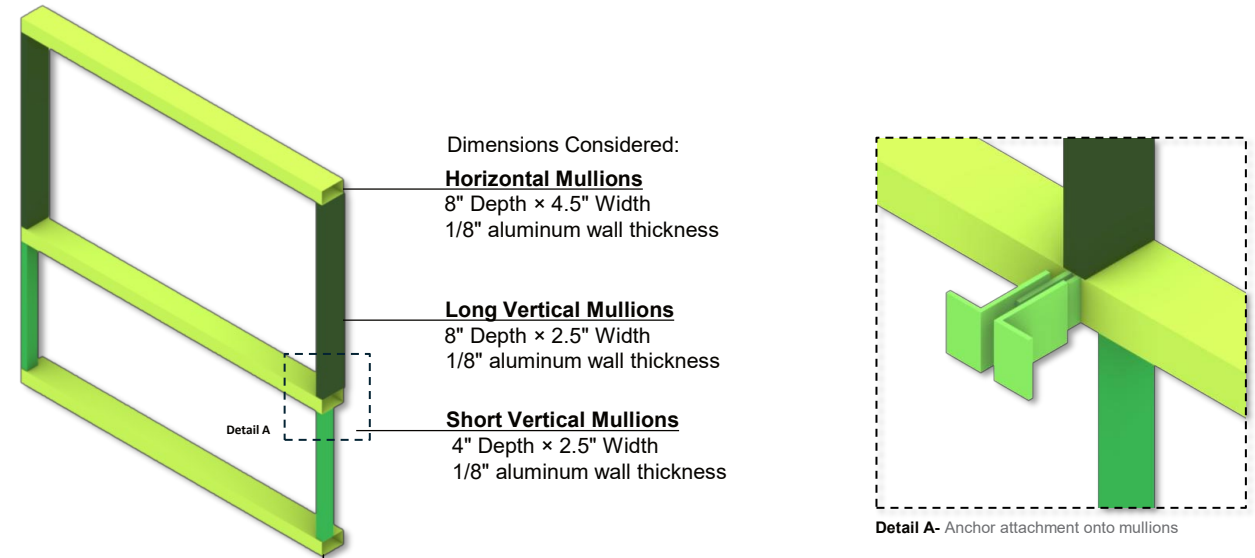


Diagram of the façade composition (glass + aluminum) Section of North Facade

Isometric Aluminum Structure Modules

Color Coded by Type of Mullion



Elevation Façade Glazing and Aluminum Structure Modules

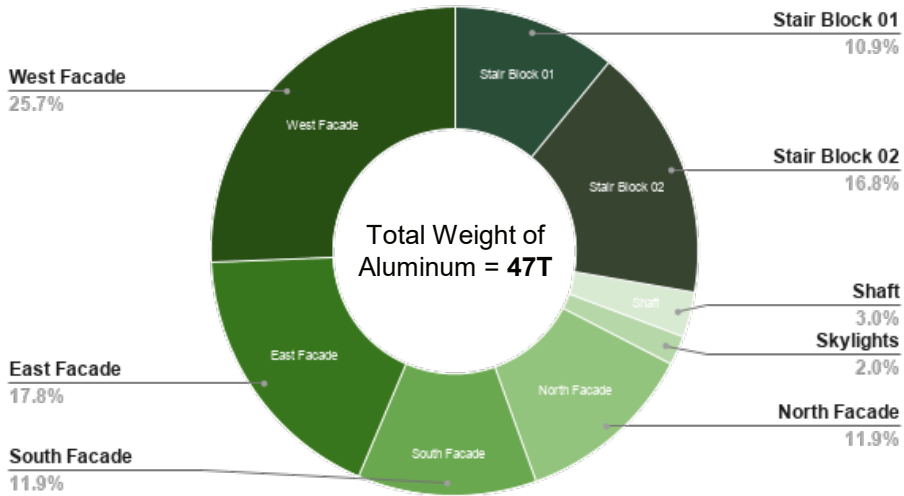
ALUMINUM SUMMARY

Weight Breakdown

Vertical Mullions = 22,074 lbs (11.0 tons)
 Horizontal Mullions = 70,433 lbs (35.2 tons)
 Skylights = 1,685 lbs (0.8 tons)

Total Weight of Aluminum = 94,192 lbs (47.1 tons)
 (approx. 1.25psf)

Quantity of Aluminum Per Zone



WEST FAÇADE 26%
 145 ft³ of Aluminum
 24,439 lbs

NORTH FAÇADE 12%
 65 ft³ of Aluminum
 10,896 lbs

STAIR BLOCK#1 11%
 63 ft³ of Aluminum
 10,532 lbs

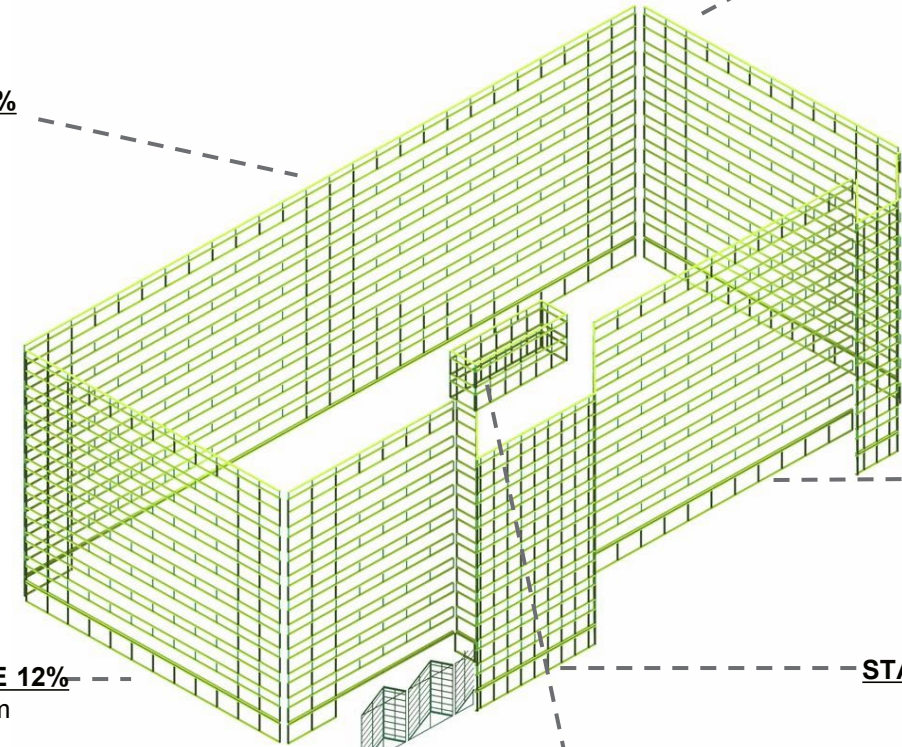
EAST FAÇADE 18%
 101 ft³ of Aluminum
 16,892 lbs

STAIR BLOCK#2 17%
 65 ft³ of Aluminum
 10,896 lbs

SOUTH FAÇADE 12%
 65 ft³ of Aluminum
 10,896 lbs

SKYLIGHTS 2%
 10 ft³ of Aluminum
 1,685 lbs

ELEVATOR SHAFT 2%
 16 ft³ of Aluminum
 2,749 lbs



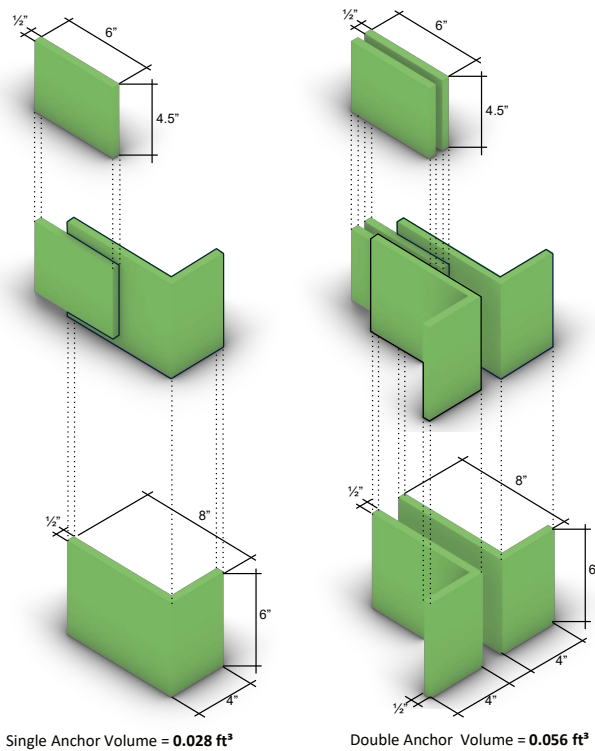
STEEL ANCHOR DETAILS

Weight Breakdown

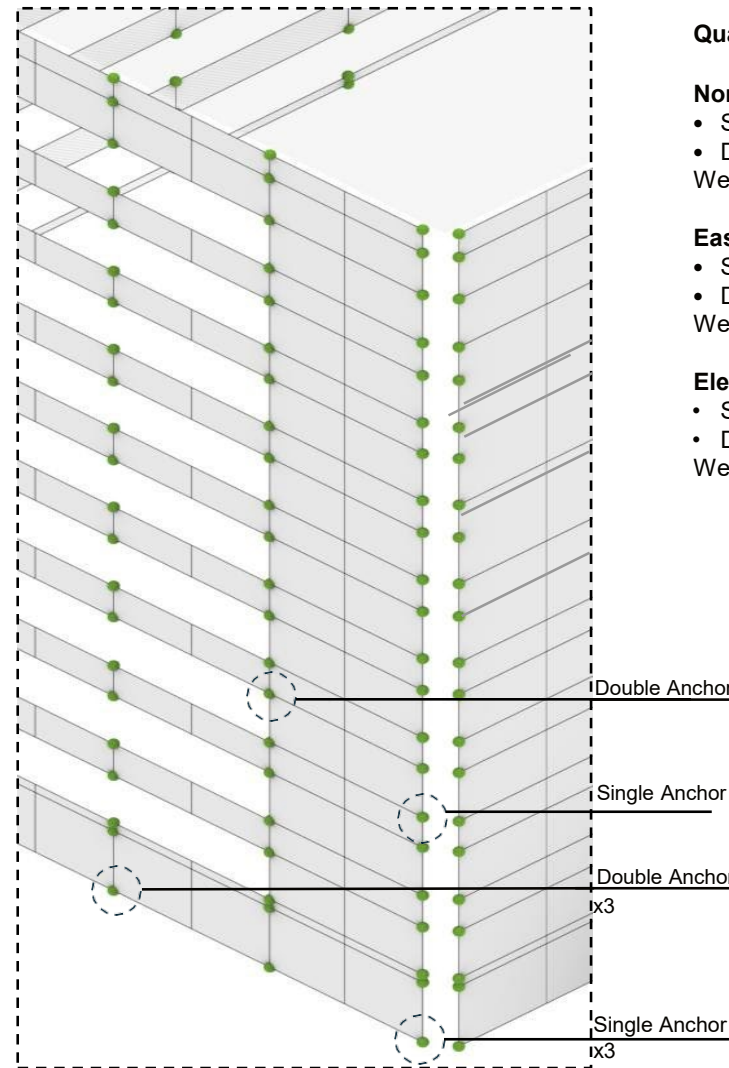
Double Anchors (731) = 19,894 lbs (9.9 tons)

Single Anchors (298) = 4,067 lbs (2.0 tons)

Total Weight of Anchors = 23,961 lbs (12.0 tons)



Types of Anchors Considered



Quantity per Zone:

North Facade

- Single Anchors: 46
- Double Anchors: 115
- Weight = 3,920 lbs (2.0 tons)

East Facade

- Single Anchors: 109
- Double Anchors: 198
- Weight = 7,154 lbs (3.6 tons)

Elevator Shaft

- Single Anchors: 40
- Double Anchors: 20
- Weight = 1,078 lbs (0.5 tons)

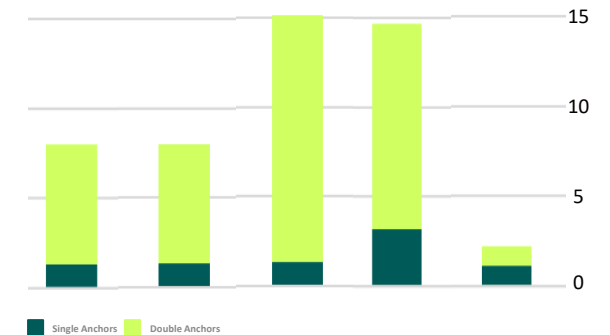
South Facade

- Single Anchors: 46
- Double Anchors: 115
- Weight = 3,920 lbs (2.0 tons)

West Facade

- Single Anchors: 46
- Double Anchors: 252
- Weight = 7,840 lbs (3.9 tons)

**Total Weight Anchors
23,961 lbs (12 tons)**





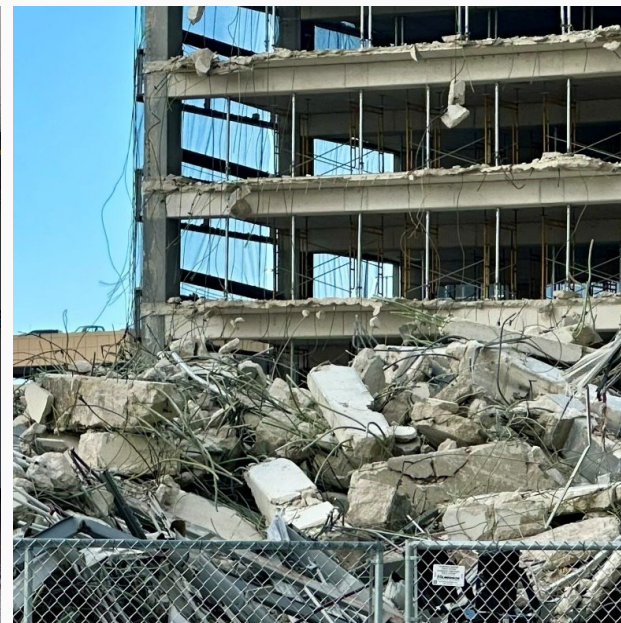
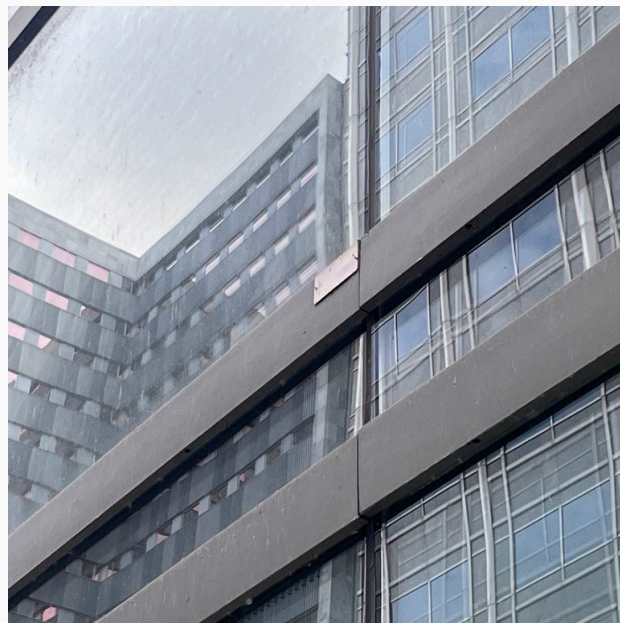
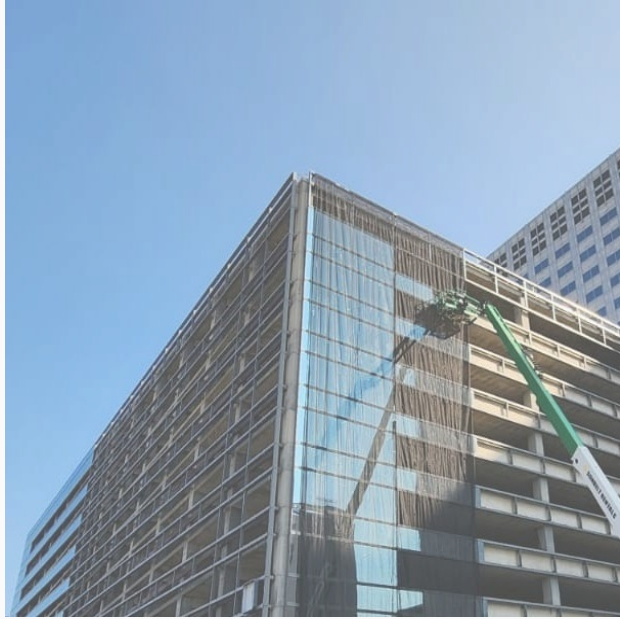








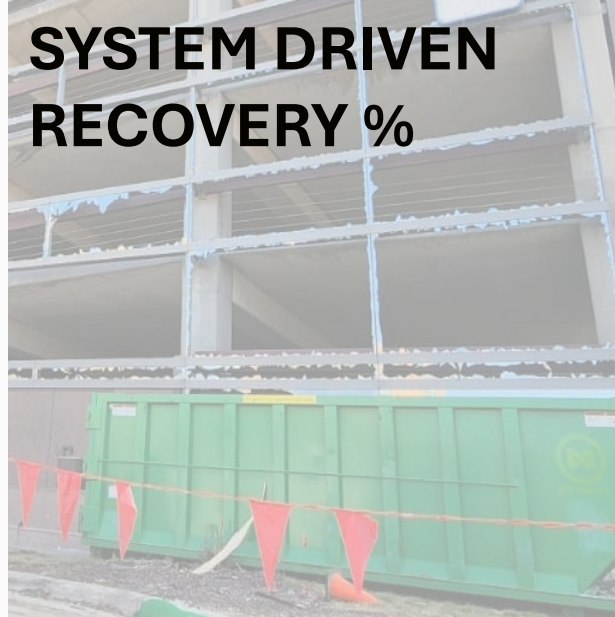




**EARLY OWNER+GC
M&M SUPPORT**



**SYSTEM DRIVEN
RECOVERY %**



SAFETY



**GASKETED vs.
CAULKING**

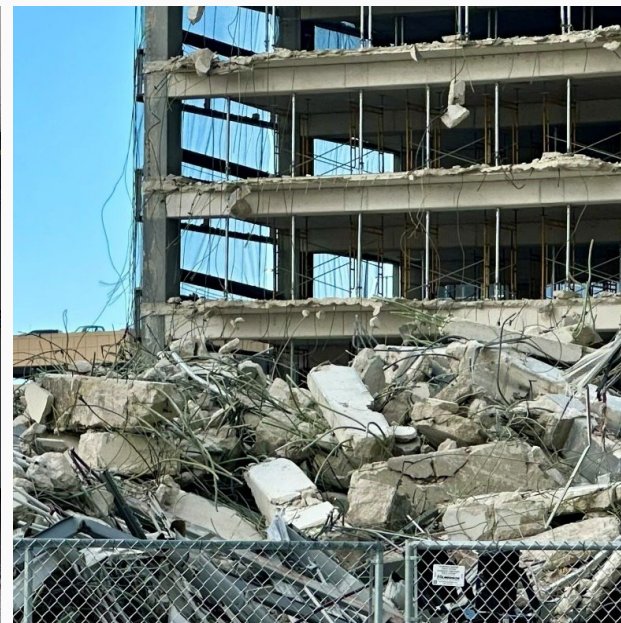
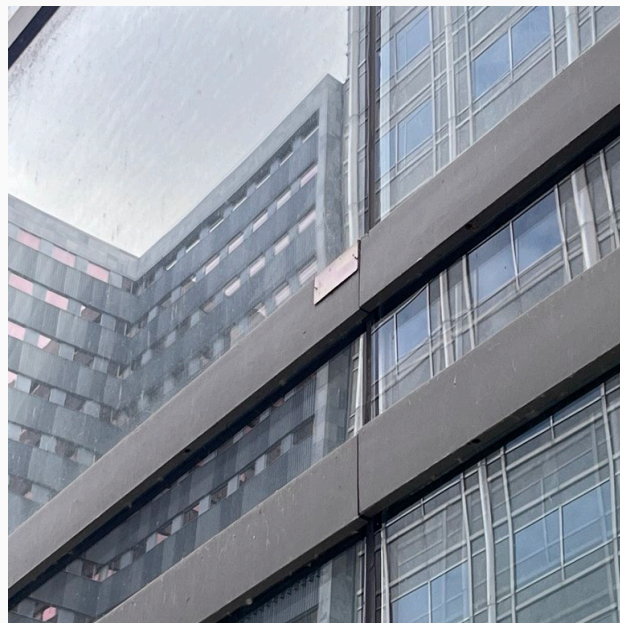
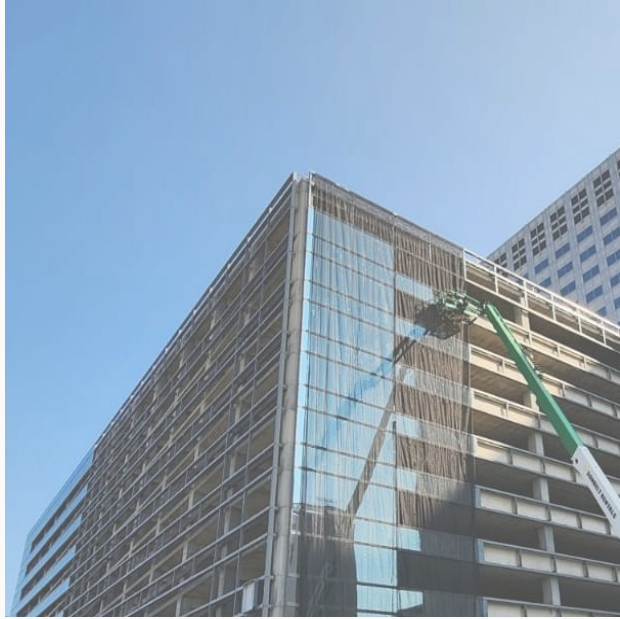


**TEMPERED/NOT
+ WEIGHTS**



**JOBSITE
CONTEXT**







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