THE ATRIUM

1079 COMMONWEALTH AVE
BOSTON, MA

Nathan D. Boutin, P.E.

Senior Project Manager (SE | WAL)

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1 February 2024

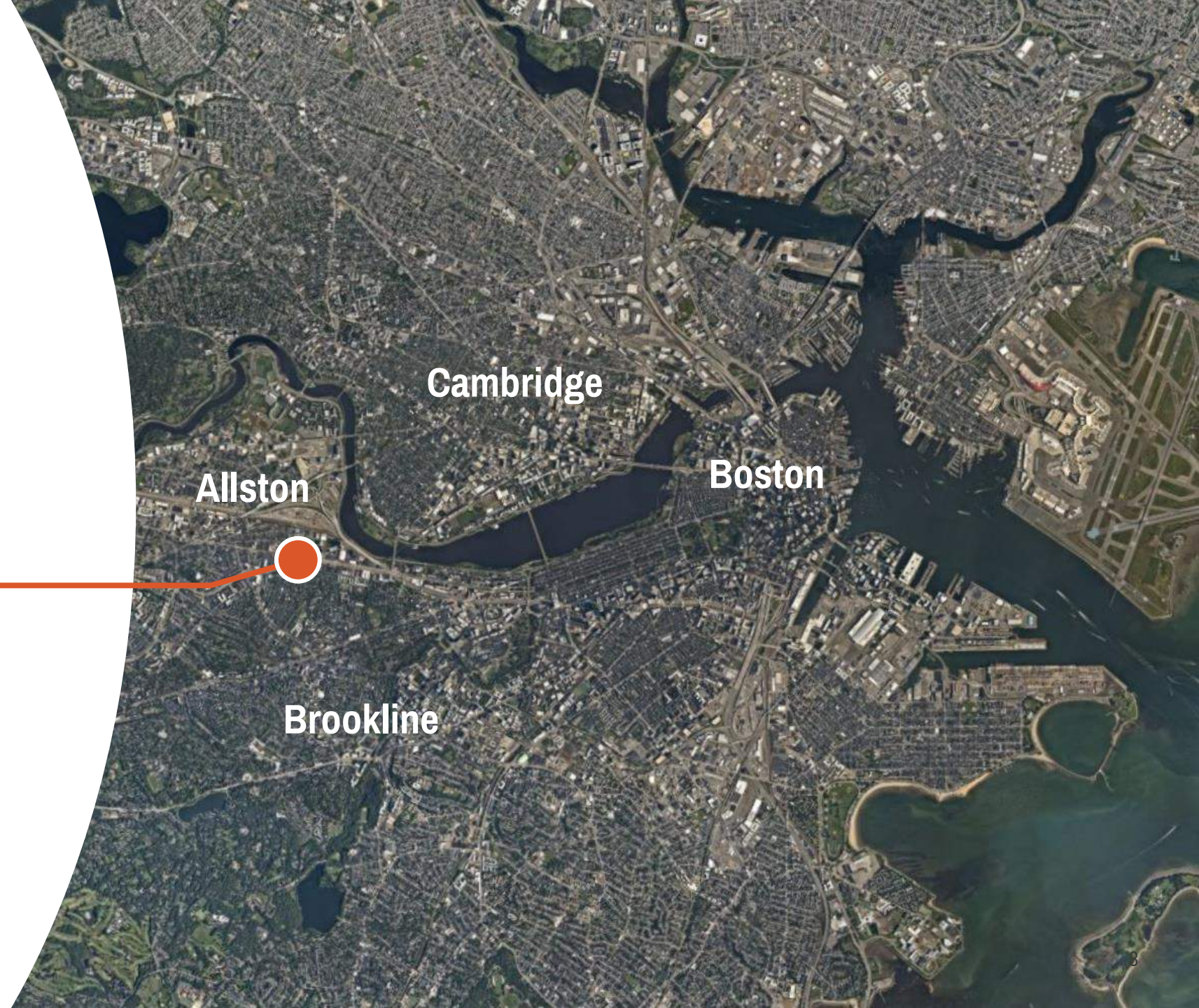
Copyright Materials

AGENDA

- Introduction
- Background
  - Neighborhood
  - Building History
- SGH Project Timeline
- Structure
- Facade Reclad
- Conclusion and Lessons Learned

Project location

Packard's Corner

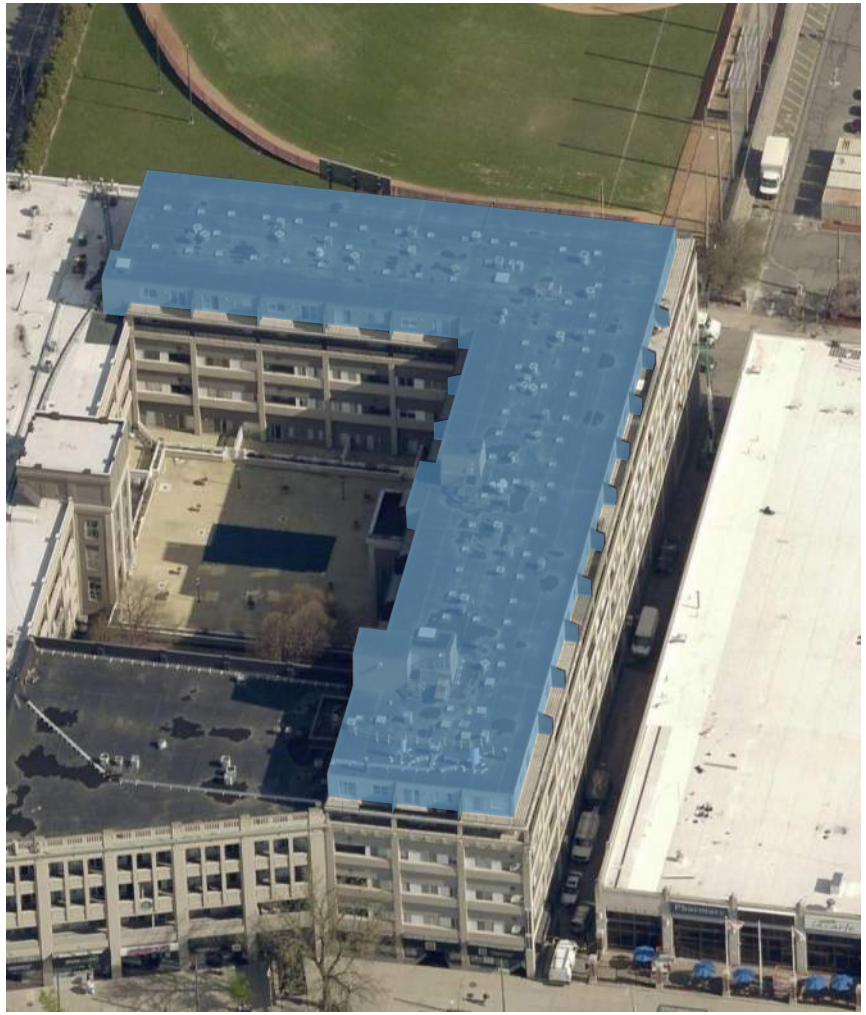


INTRODUCTION | BUILDING OVERVIEW

THREE BUILDINGS

TYPICAL CONCRETE FRAME

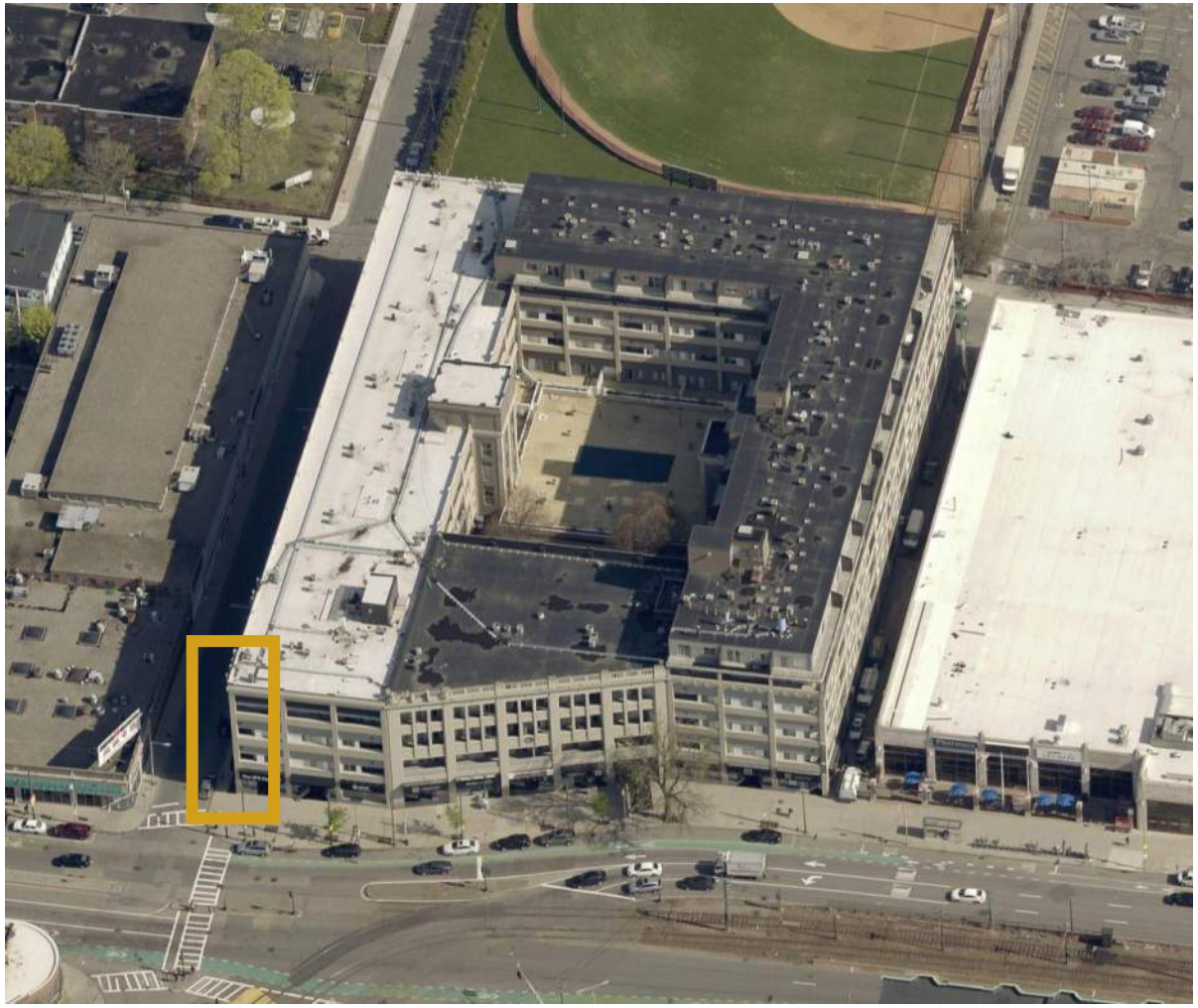
INTRODUCTION | BUILDING OVERVIEW



TWO-STORY ADDITION

WOOD-AND-STEEL-FRAMED ADDITION

INTRODUCTION | BUILDING OVERVIEW



OVERALL VIEW

TYPICAL EIFS CLADDING

INTRODUCTION | PROJECT TEAM

Founded 1954
1,500,000sf commercial
5,600 residential units

Owner

THE HAMILTON COMPANY

Exterior Design

SGH

margulies perruzzi

BIMstream

HAMILTON CONSTRUCTION MANAGEMENT

Interior Design

HAMILTON CONSTRUCTION MANAGEMENT

Mechanical Design

Crossfield Engineering

Subcontractors

I.C.R. DRYWALL INC

SG EST. 1929 SALEM GLASS

PATRIOT RESTORATION
BUILDING RESTORATION & PRESERVATION

BIMstream

BRAND SAFWAY

A-PLUS CONSTRUCTION SERVICES CORP.

G&G MECHANICAL INC. HEATING * AC * PLUMBING

TRI TITAN ROOFING, INC.

Current SGH Team


John Porter


Nathan Boutin


Jamil Bhatti


Gary Fay


Jeffry Ceruti


Christopher Grey


Matthew Colturi


Syed Najeeb Ullah Husseini

Other SGH Team Members

- Brett Holland
- James Scott
- Matthew Oostdyk
- Grant Magnuson
- Zachary Lozon
- Will Bergendahl
- Benjamin Immonen
- Melissa Hoerber
- Fernanda Brena
- David Zalcman
- Arjun Bir
- Ali Yalaz
- Kayla Seikkula
- Ahmed O.A. Ba Wazir
- Quyen Nguyen
- Michael Barone

Project Objectives

- Condition Assessment
  - Options to extend life
- Make-Safe
  - Remove immediate hazards
  - Allow continued occupancy
- Project prioritization
  - Get things done while planning
- Reclad - new lease on life
  - Design phases
  - Construction Administration

Project Challenges

- Helping client evaluate wide range of options
  - Demo to skyscraper
- Significant unforeseen conditions
- Client – owner and contractor
- Coordination (multi-faceted)
- Spread thin and leaning on each other

BACKGROUND | BOSTON'S ORIGINAL AUTOMOBILE ROW

Over 117 automotive businesses

BACKGROUND | BOSTON'S ORIGINAL AUTOMOBILE ROW

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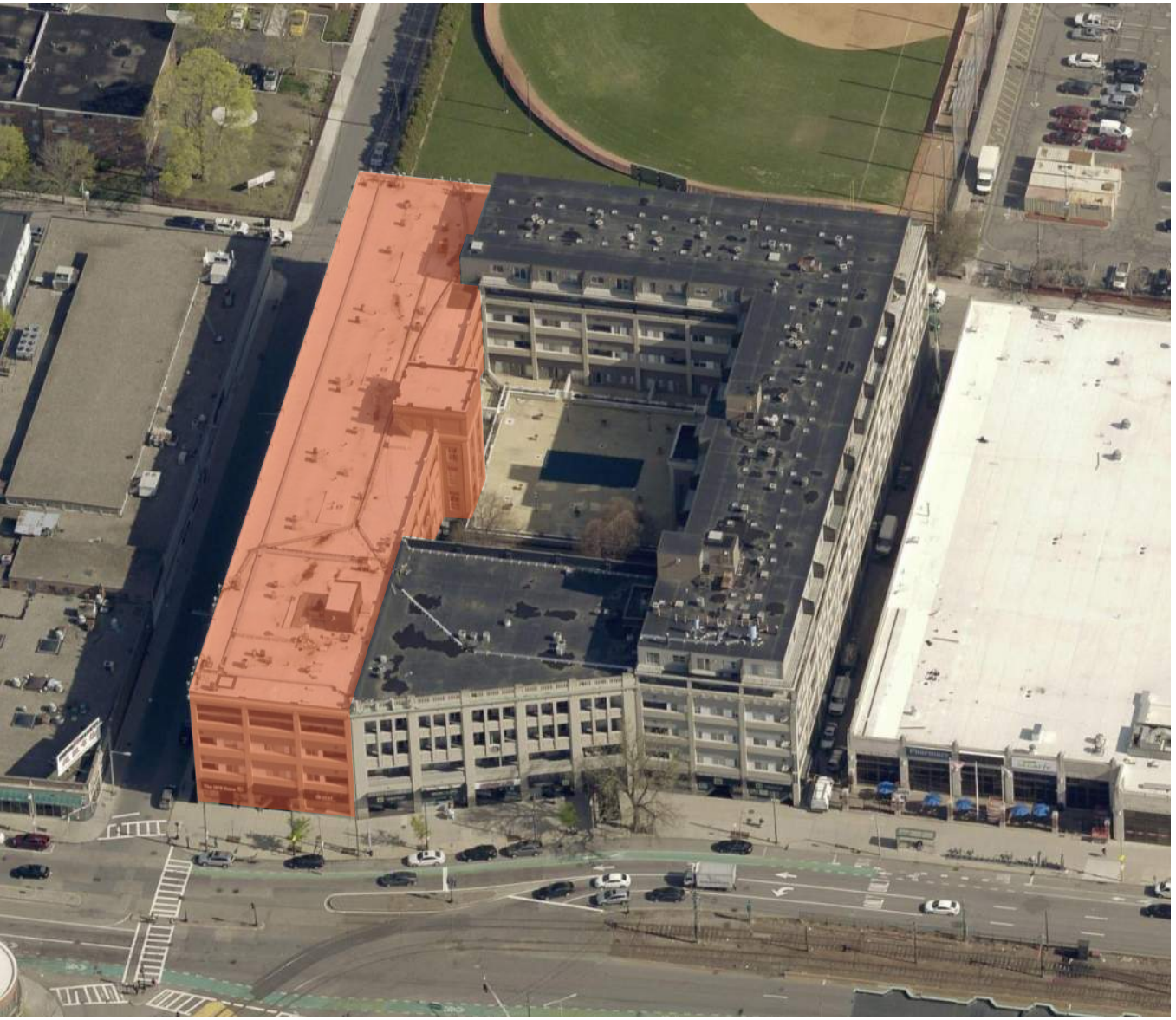
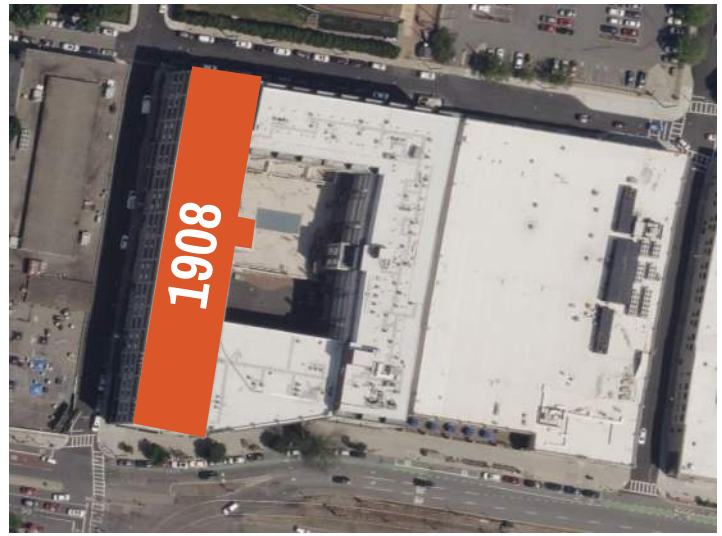
BACKGROUND | BOSTON'S ORIGINAL AUTOMOBILE ROW

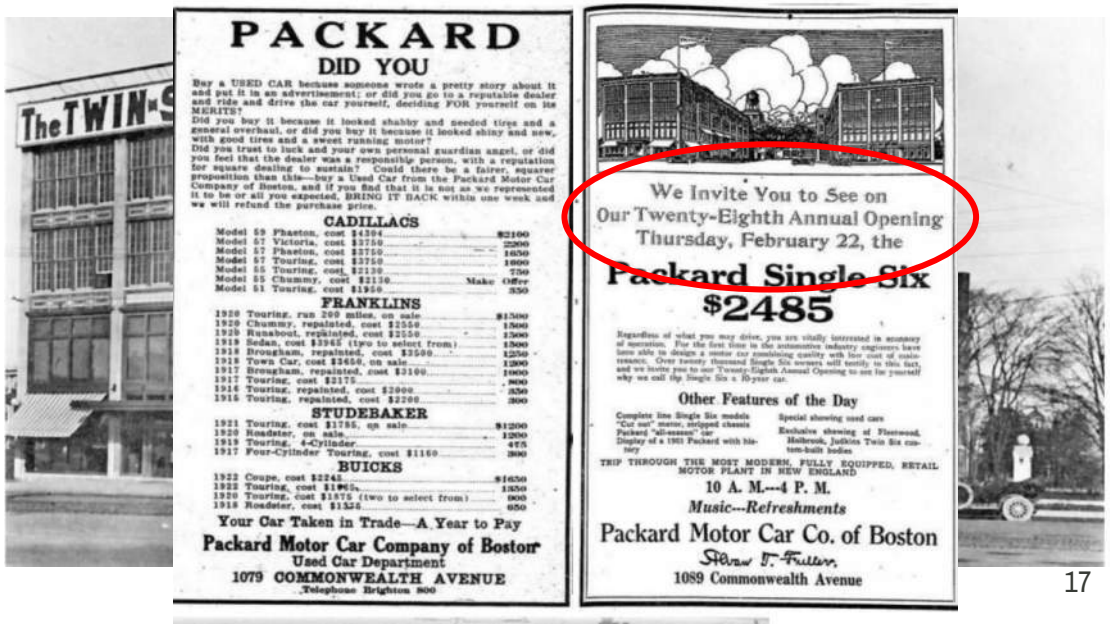
BUICK

BACKGROUND | BOSTON'S ORIGINAL AUTOMOBILE ROW

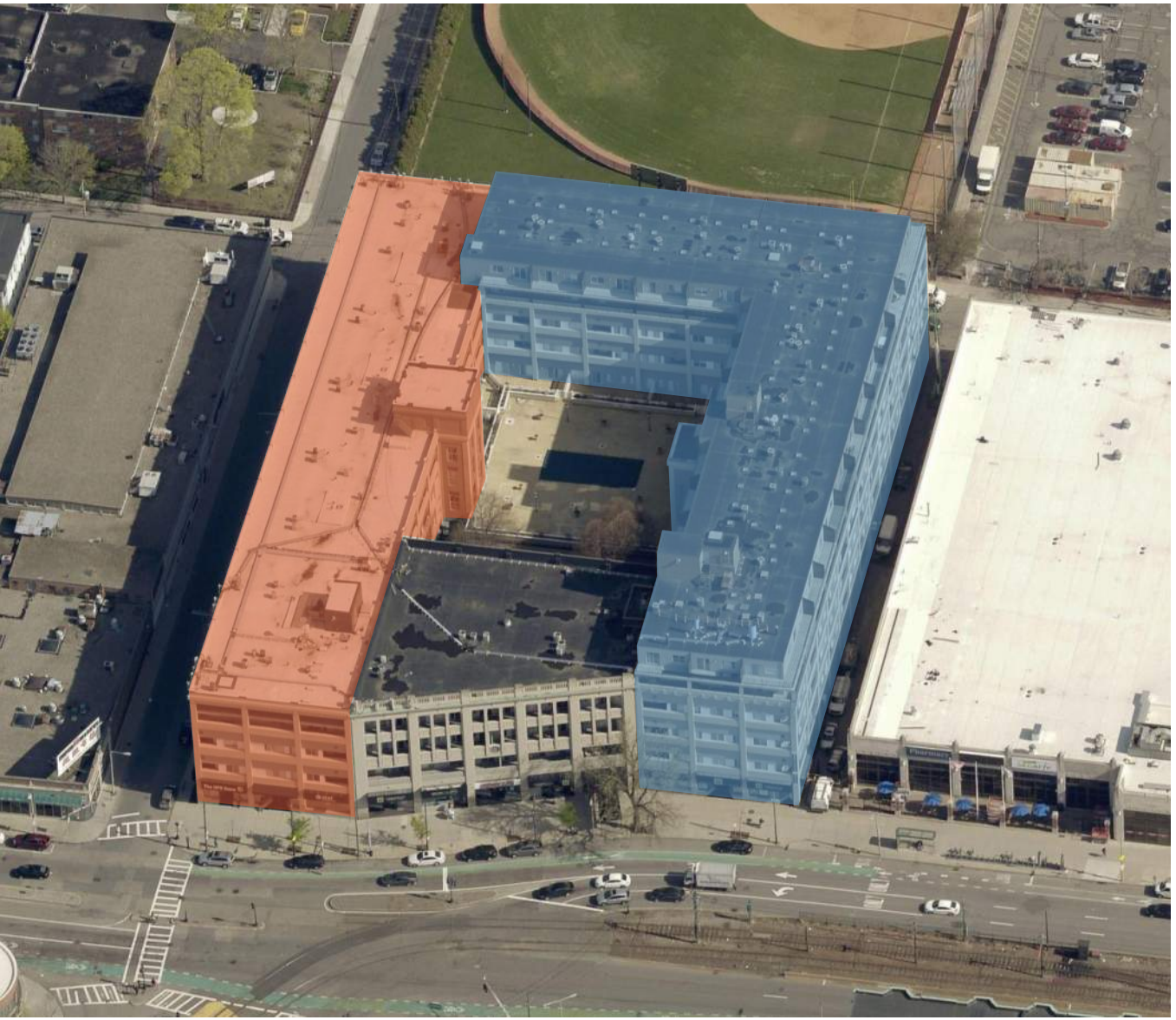


Alvan Fuller
1878





BACKGROUND | BOSTON'S ORIGINAL AUTOMOBILE ROW



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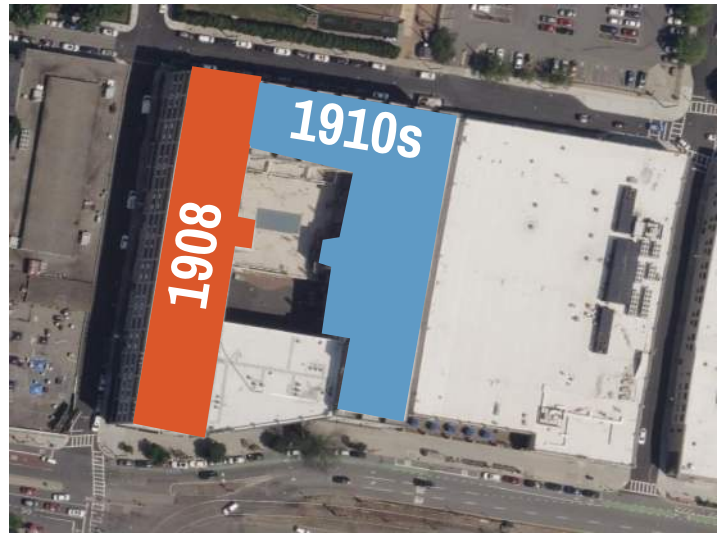
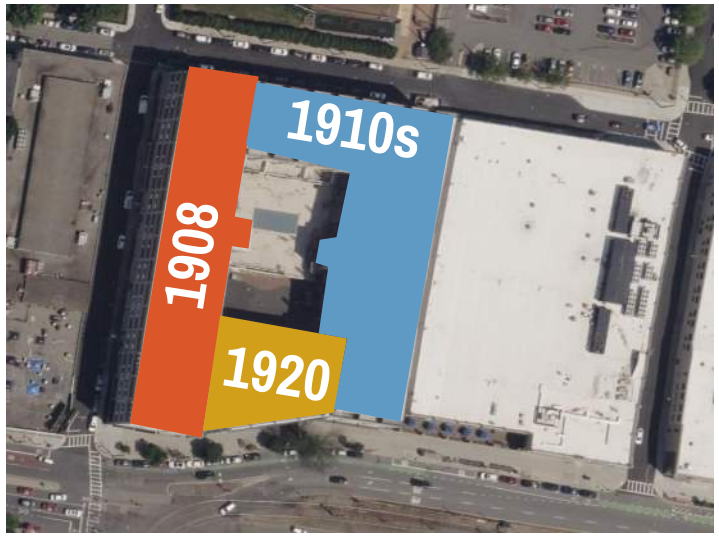



BUILDS NEW SERVICE STATION

Alvan T. Fuller to More Than Double Present Quarters on Commonwealth Av

BACKGROUND | BOSTON'S ORIGINAL AUTOMOBILE ROW

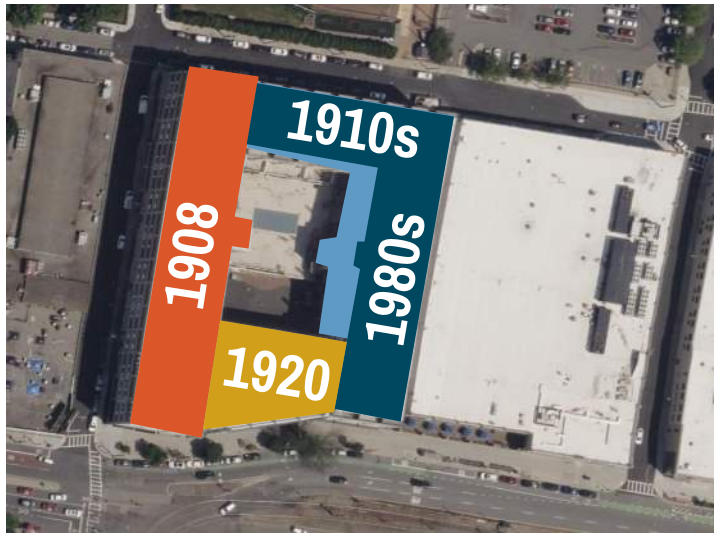
Alvan Fuller
1878



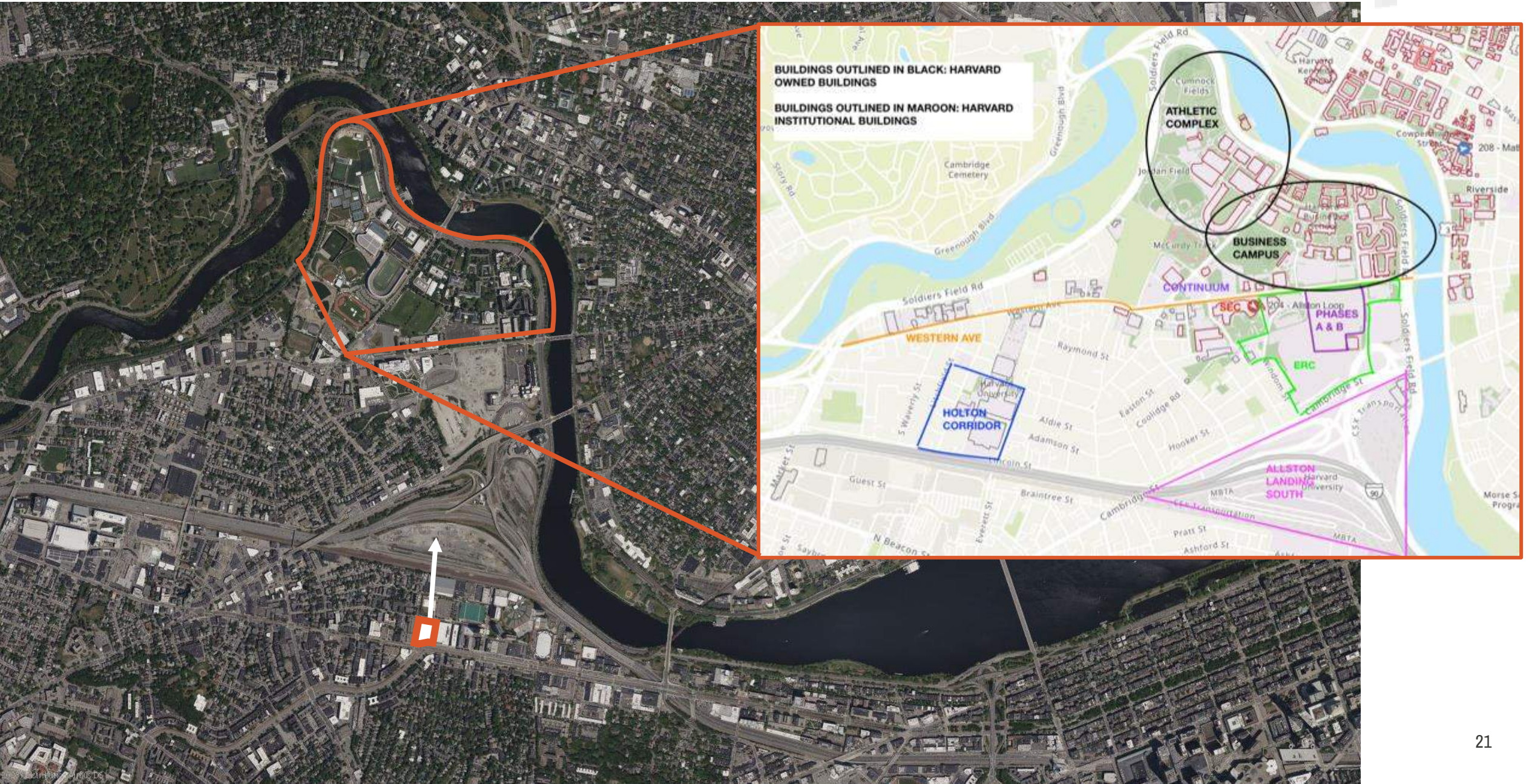
BACKGROUND | BOSTON'S ORIGINAL AUTOMOBILE ROW

Post WW2

- Automotive suburban sprawl
- City congestion
- GI Bill & education (BU)



BACKGROUND | FUTURE AREA DEVELOPMENT



SGH PROJECT TIMELINE

2018 — 2019 — 2020 — 2021 — 2022 — 2024 — 2025

February 2019

- Phone Call
- Falling Concrete
- Train Vibrations
- Failed Repairs

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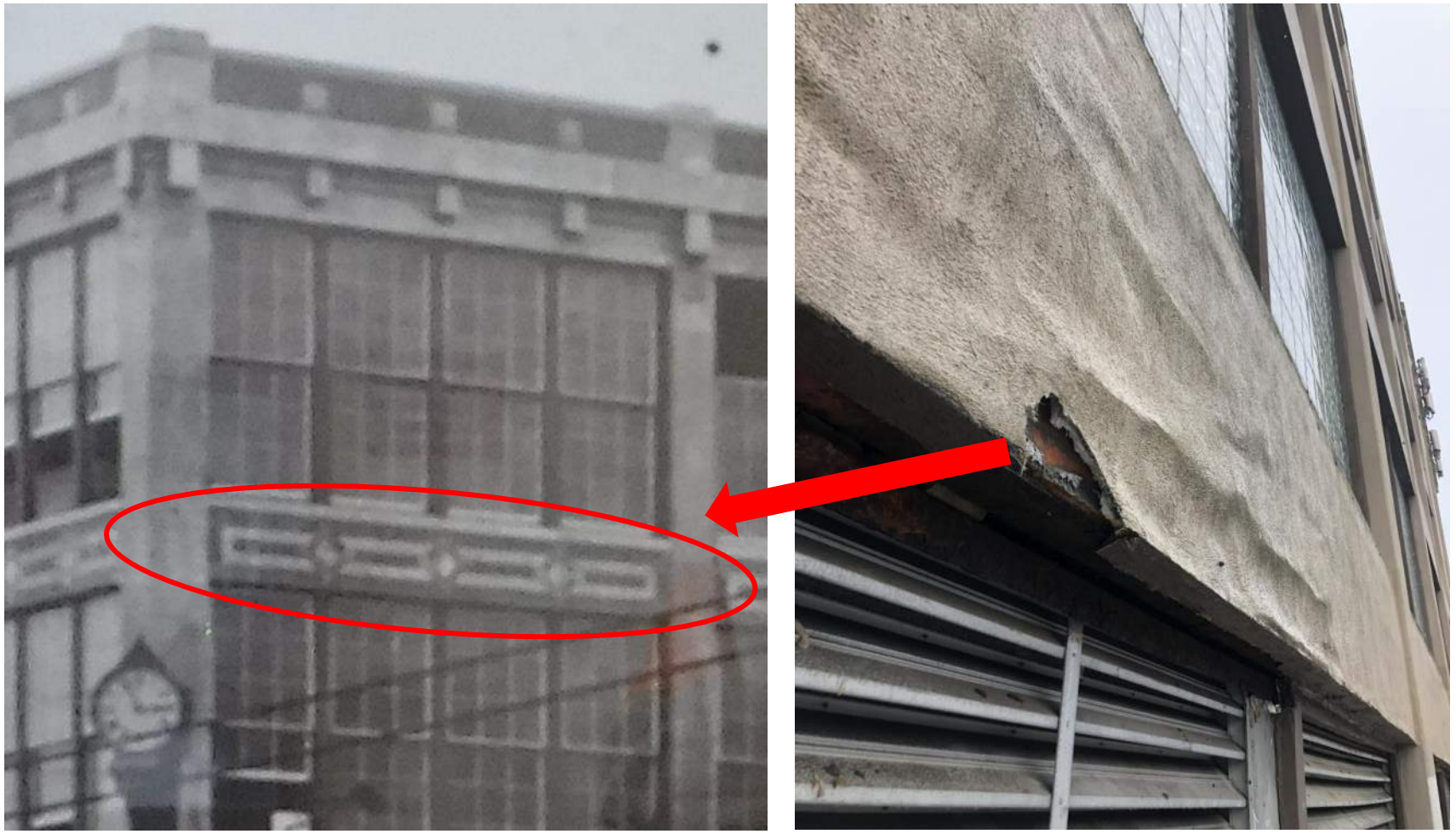

SGH PROJECT TIMELINE

2018 — 2019 — 2020 — 2021 — 2022 — 2024 — 2025

Summer 2019

---> MAKE SAFE

SGH PROJECT TIMELINE

2018 — 2019 — 2020 — 2021 — 2022 — 2024 — 2025

Condition Assessment & Long-term Planning

- Visual and hands-on
- Openings
- Concrete Testing
- Options
  - Repair
  - Reclad
  - New building within
  - Demo
- Cost Collaboration
- Reclad Selected
  - Material Choices
  - Life cycle analysis

SGH PROJECT TIMELINE

2018 — 2019 — 2020 — 2021 — 2022 — 2024 — 2025

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- Options
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	BEST Curtain Wall / Pre-Fabricated Unitized Systems / Rain Screen Panel Applications Drainable Panel Systems with dedicated air/water barrier membrane over sheathing. Pressure-equalized cladding incorporating vision glass						**GOOD** Barrier Wall Systems All water managed at surface (no redundancy in field of panel; no sheathing or air/water barrier membrane)		**FAIR - NOT RECOMMENDED** Modified Drainage Systems Bulk water managed at surface; minimal water managed at dedicated air/water barrier membrane	
Material / System Trade Name (Common Suppliers)	Aluminum-Framed Unitized Curtain Wall MegaPanel System with one of the claddings to the right. Island, Sanford, IBG	Aluminum Composite Panels Alucobond, Reynobond	Terra Cotta TerraClad	Fiber Cement Panels Taktyl, FibreC **Varying degree of quality depending on mfg. process.	Brick Masonry Veneer Traditional 4 in. brick.	Thin-Brick Veneer Corium, TruBrix **Not including "tab" systems	Precast Concrete Clark Pacific, BPDL, etc.	Laminate Panels Trespa	Cement Plaster BMI	Drainable EIFS Dryvit, Sto
General Description	Aluminum framing/mullions infilled with vision and spandrel glazing or metal panels	Two layers of aluminum sheet metal bonded to a thermoset polyethylene plastic core attached with steel or aluminum sub-frame	Terra Cotta (fired clay with glaze coating) panels hung on pre-engineered aluminum clip and sub-girt system	Manufactured sheets of hydraulic cementitious matrices	Solid brick masonry and mortar.	Metal backpan girt system with mechanically engaged thin brick.	Steel-reinforced concrete panels (generally 4"-6" thick).	Wood-based fibers and thermosetting resins manufactured under high pressures and temperatures, with hard/durable coatings for protection	Air/water barrer membrane, building paper, metal lath, 7/8" cement plaster (3-coat) with option to add drainage composite behind plaster for drainage layer	Waterproofing coating, adhered EPS insulation with drainage grooves, reinforced lamina, acrylic finished coat
Durability	Best	Best	Best	Good/Fair	Best	Good	Best	Good/Fair	Good	Fair/Poor
Track Record	Best >40 years	Best >30 years	Best >30 years	Some issues <10 years (US)	Best >50 years	Good <10 years	Best >30 years	Fair <10 years	Fair >30 years	Fair <25 years
Service Life Expectancy (Can be highly variable depending on the selected system; assumes systems properly maintained)	>40 years	>40 years	>60 years	>20 years	>75 years	>30 years	>75 years	>15 years	>20 years	>15 years
Construction Duration	Fastest	Good	Good	Good	Slowest	Good	Fastest	Good	Slow	Good
Dedicated Continuous Air/Water Barrier	Not Required	Required	Required	Required	Required	Required	Not Required	Required	Required	Required
Air/Water Performance	Best	Best	Best	Best	Best	Best	Good	Best	Fair	Fair
Approximate Weight (PSF)* (including 7 psf for stud framing, interior and exterior sheathing where applicable)	14-23	9	25	9	47	21	50-80	9	17	9
Triggers NFPA (combustible material)	No	Yes	No	No	No	No	No	Yes	No	Yes
Option for Continuous Insulation (CI)	N/A	Good	Good	Good	Good	Good	Good	Good	Fair/Poor	Good
Framing/Attachment/Lateral Support	Gravity Load at Floor Slabs	Aluminum or Steel Sub-Girt to Steel Stud Backup Wall	Aluminum or Steel Sub-Girt to Steel Stud Backup Wall	Aluminum or Steel Sub-Girt to Steel Stud Backup Wall	Relieving Angles at Slabs, and ties to Steel Stud Backup Wall	Aluminum or Steel Sub-Girt to Steel Stud Backup Wall	Gravity and Lateral Load at columns	Aluminum or Steel Sub-Girt to Steel Stud Backup Wall	Lath fasteners (and steel sub-girts if CI included) to Steel Stud Backup Wall	Troweled Adhesive to Steel Stud Backup Wall
Cladding System Cost	High	Medium	High	Medium	Medium/High	Medium	Medium	Medium	Low	Low
Glazing System Costs	$100-125 per s.f. (Schedule Savings if Unitized or Pre-Fabricated)	Aluminum Window/Window Wall ($80-100 per s.f.), Storefront Systems ($90-95 per s.f.), Punched Curtain Wall ($100-110 per s.f.)					Aluminum Window/Window Wall ($80-100 per s.f.), Storefront Systems ($90-95 per s.f.), Punched Curtain Wall ($100-110 per s.f.)		Aluminum Window/Window Wall ($80-100 per s.f.), Storefront Systems ($90-95 per s.f.), Punched Curtain Wall ($100-110 per s.f.)	
Constructability Notes	Crane: Crane or unitized crane rig off roof required to erect panels.	Crane: No crane required and work could be done off scaffolding.					Crane: Crane required to erect panels into place.	Crane: No crane required and work could be done off scaffolding.	Crane: No crane required and work could be done off scaffolding.	
	Weight: Could be a potential issue deadloading off slabs.	Weight: Light-weight compared to existing brick masonry cladding system.	Weight: Lighter than existing cladding system.	Weight: Lighter than existing cladding system.	Weight: Comparable to existing cladding weight.	Weight: Light-weight compared to existing brick masonry cladding system.	Weight: Could be a potential issue deadloading off columns.	Weight: Light-weight compared to existing brick masonry cladding system.	Weight: Lighter than existing cladding weight.	Weight: Light-weight compared to existing brick masonry cladding system.
	Slab Edge Fire Ratings: Will need fire ratings between edge of slab and back of panels (smoke seals).	Slab Edge Fire Ratings: Not required at slab edges.					Slab Edge Fire Ratings: Will need fire ratings between edge of slab and back of panels (smoke seals).	Slab Edge Fire Ratings: Not required at slab edges.	Slab Edge Fire Ratings: Not required at slab edges.	

SGH PROJECT TIMELINE

2018 — 2019 — 2020 — 2021 — 2022 — 2024 — 2025

Condition Assessment

Garage Rehabilitation

- Slab Reconstruction
- Concrete Repairs
- Coating Replacement
- Plumbing Maintenance

Roof Replacement

- Structural Deck Repairs
- Mechanical Units
- Skylights
- Roof Anchors

SGH PROJECT TIMELINE

2018 — 2019 — 2020 — 2021 — 2022 — 2024 — 2025

Condition Assessment

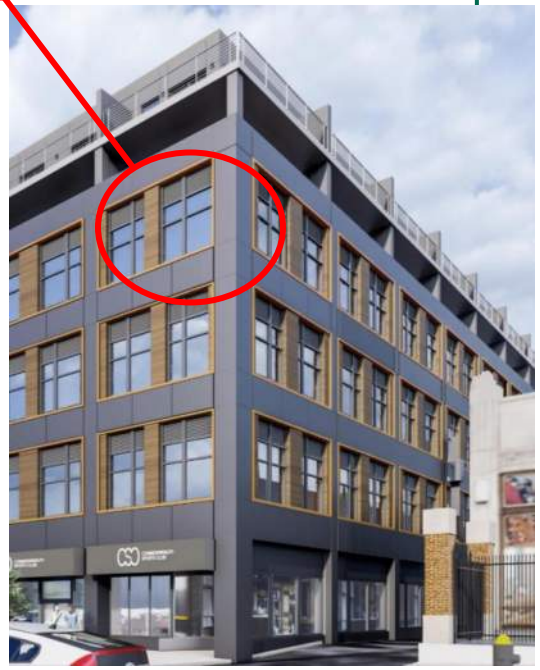
Roof

Garage

Interior renovations

Facade Reclad Design Development

- Architect subconsultant
- Rendering study with owner
- Materials selections



Facade Reclad Full Scope

- Design Assist
- Interiors and Mechanical
- Construction Administration

GARAGE REHABILITATION

GARAGE REHABILITATION

CONCRETE JOISTS

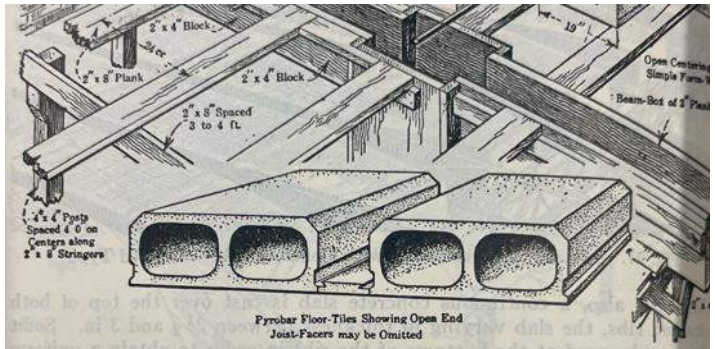
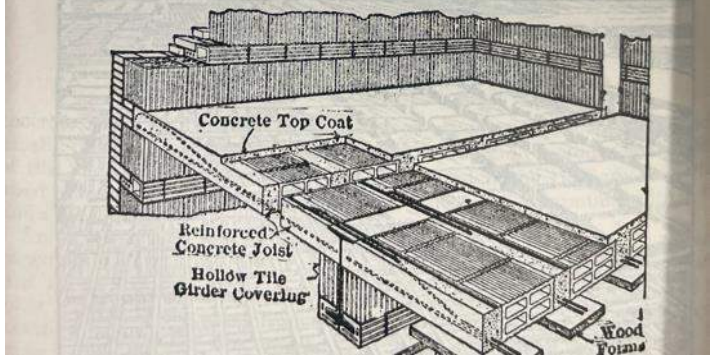


Fig. 29. Gypsum Blocks Alternating with Concrete Ribs



ONE-WAY SLABS

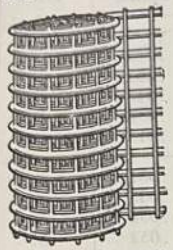


Fig. 90. Electrically Welded Wire Fabric Reinforcement

It is furnished in rolls or sheets of any desired length and in widths of 2 ft to 11 ft 6 in. Stock lengths of rolls are 100 to 300 ft.

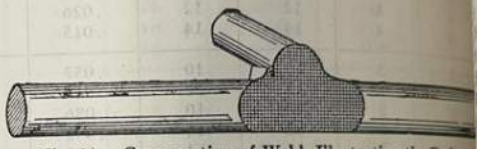
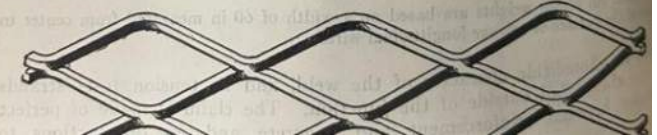


Fig. 91. Cross-section of Weld, Illustrating the Fusing Together of Longitudinal and Transverse Members

(b) **Expanded Mesh. Steelcrete.** Steelcrete reinforcing fabric is diamond mesh, cold-drawn from a solid steel plate by the Consolidated Expanded Metal Companies, Wheeling, W. Va. It possesses many of the properties of cold-drawn wire with a guaranteed theoretic elastic limit per cent higher than commercial medium steel.* STEELCRETE MESH is from mechanical and welded joints, and provides distribution of reinforcement in all directions. It is furnished in large, flat sheets and is much



TWO-WAY SLAB

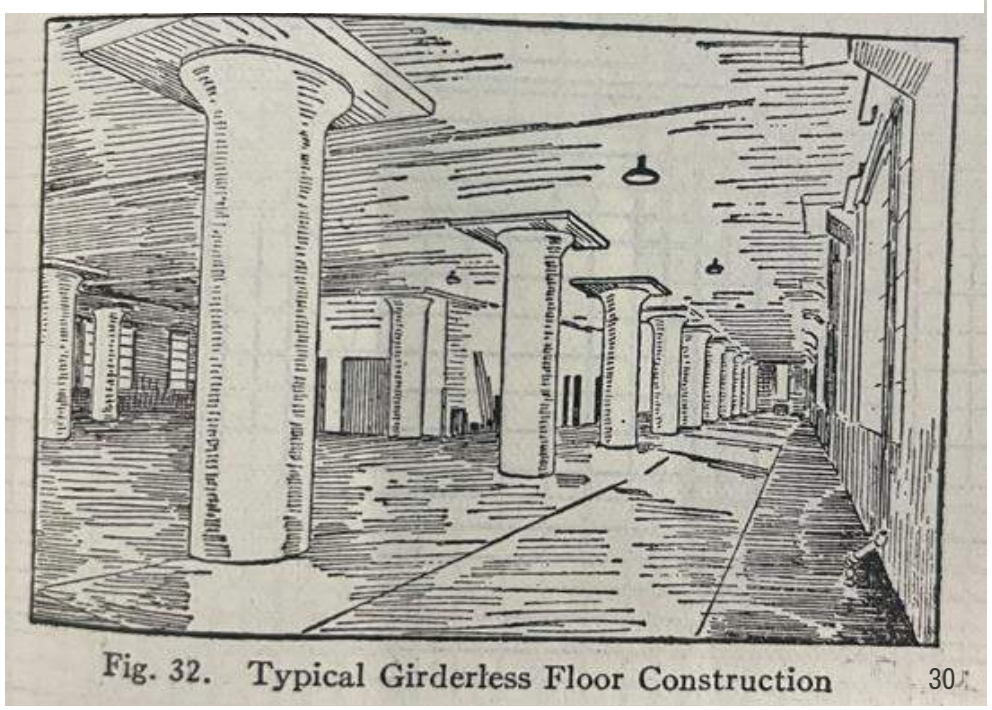


Fig. 32. Typical Girderless Floor Construction

GARAGE REHABILITATION

CORBEL AND COLUMN REPAIRS

LARGE TOPSIDE NEG. MOMENT REPAIRS

FULL-DEPTH SLAB REPAIRS

GARAGE REHABILITATION

BEAM REPAIRS

GARAGE REHABILITATION

SPANDREL REPAIRS SNEAK PEAK

FACADE RECLAD

Introduction

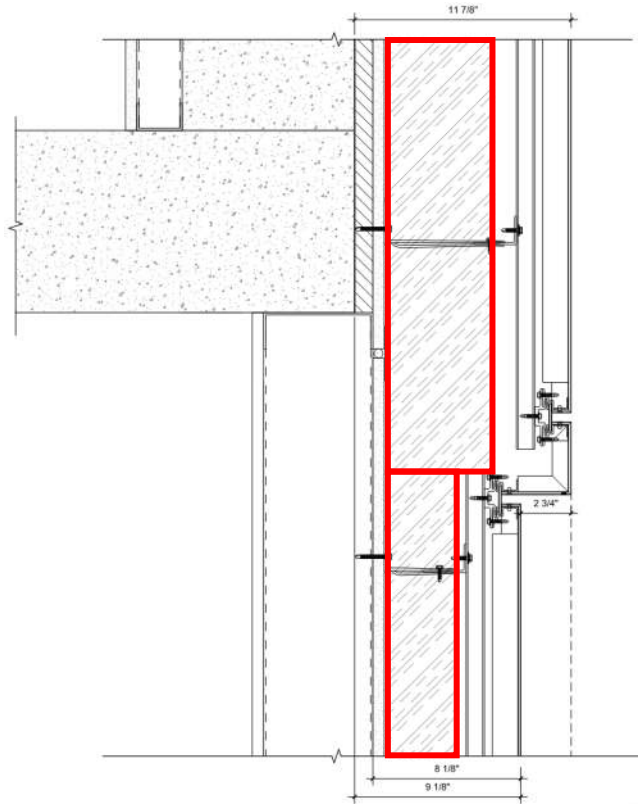
- Final Owner Selections
  - Selective Demo to Concrete Frame
  - Metal Panel Reclad w/ new LGMF
  - New Windows and Doors
- Phasing
  - Maximize Occupancy
- Sequencing
  - Access and Demo
  - Concrete and Structural Work
  - Reclad
  - Trailing

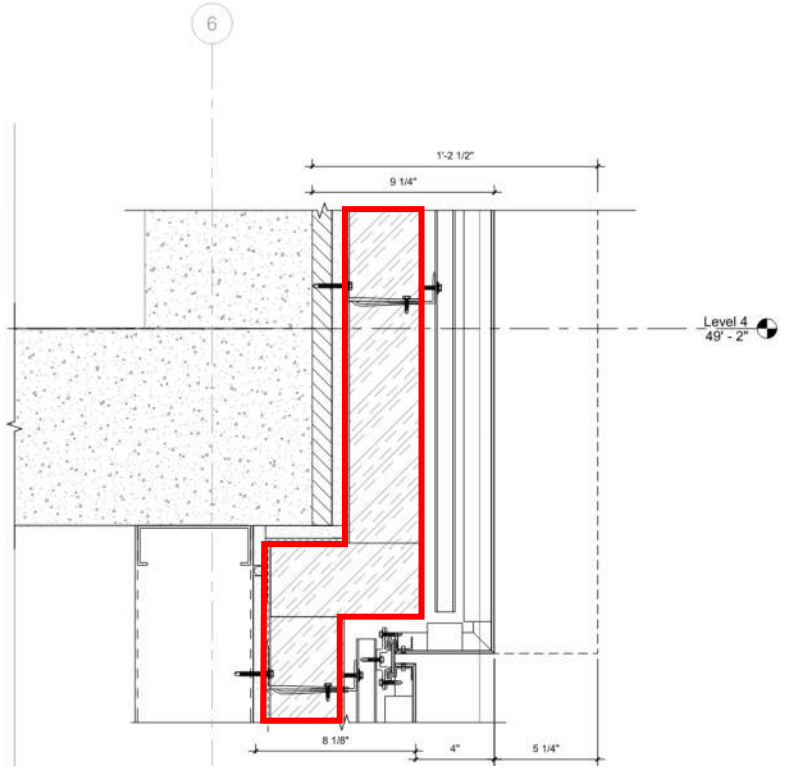
EXISTING CONDITIONS

STRUCTURAL DESIGN

BUILDING ENCLOSURE DESIGN

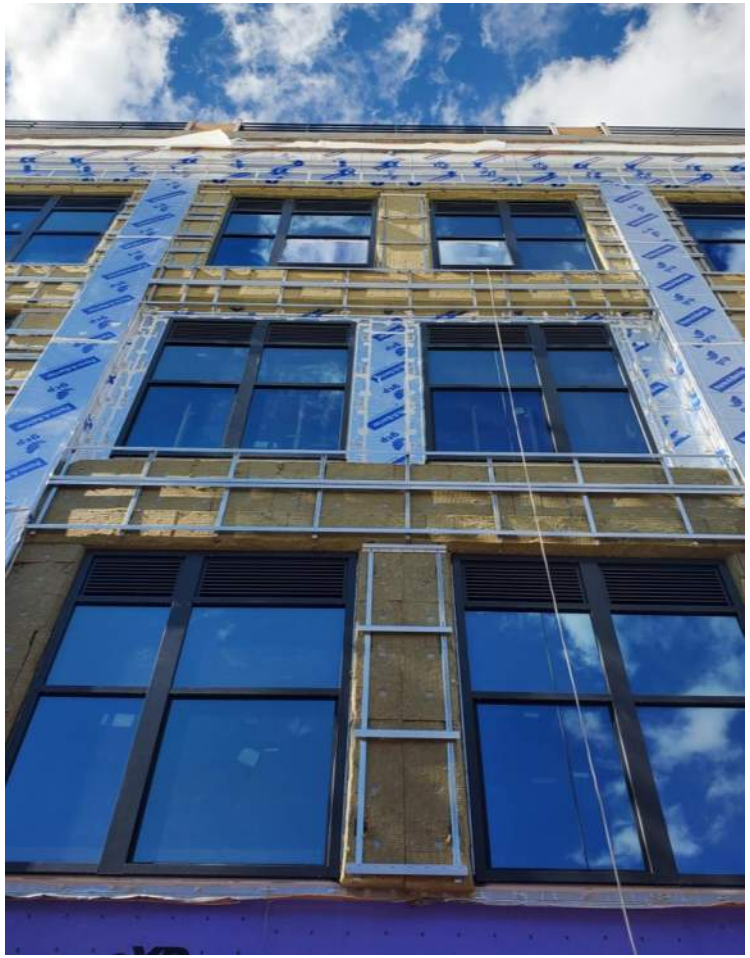
BUILDING ENCLOSURE DESIGN | INSULATION





BUILDING ENCLOSURE DESIGN | CURTAIN WALL

Integral flange for perimeter detailing



Panel width and infill variation – vision glass, spandrel, louvers

Double mullion aligns with interior partitions

FACADE RECLAD

OWNER-CONTRACTOR TEAM IS THE CLIENT

OWNER-CONTRACTOR TEAM

Challenges

1. Document management
2. Construction management
3. Contractor's delegation bandwidth

Solutions

1. Autodesk Docs / BIM360,
   Direct review with subcontractors,
   Contract document revisions
2. OAC meeting topics,
   Outstanding work and trade coordination,
   Site visit regularity
3. Diligent fee tracking and projection,
   Milestone reviews

FACADE RECLAD

COORDINATION AS DESIGNER OF RECORD

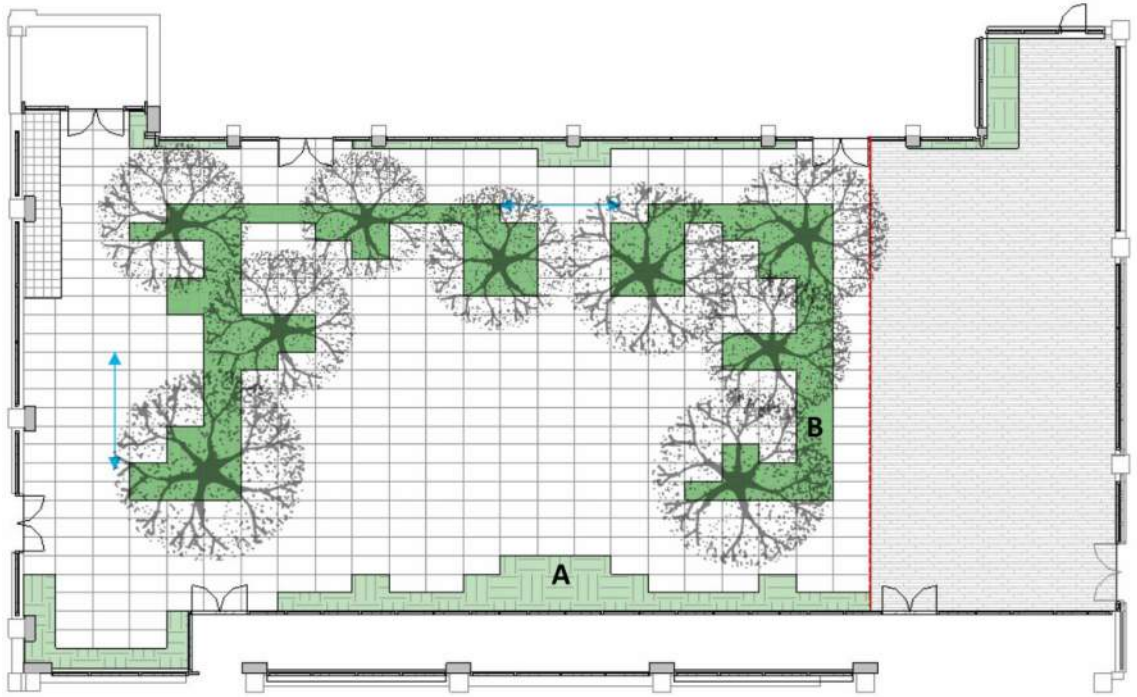
Design Iterations – Two Year Rendering Study

COORDINATION | ARCHITECT & OWNER

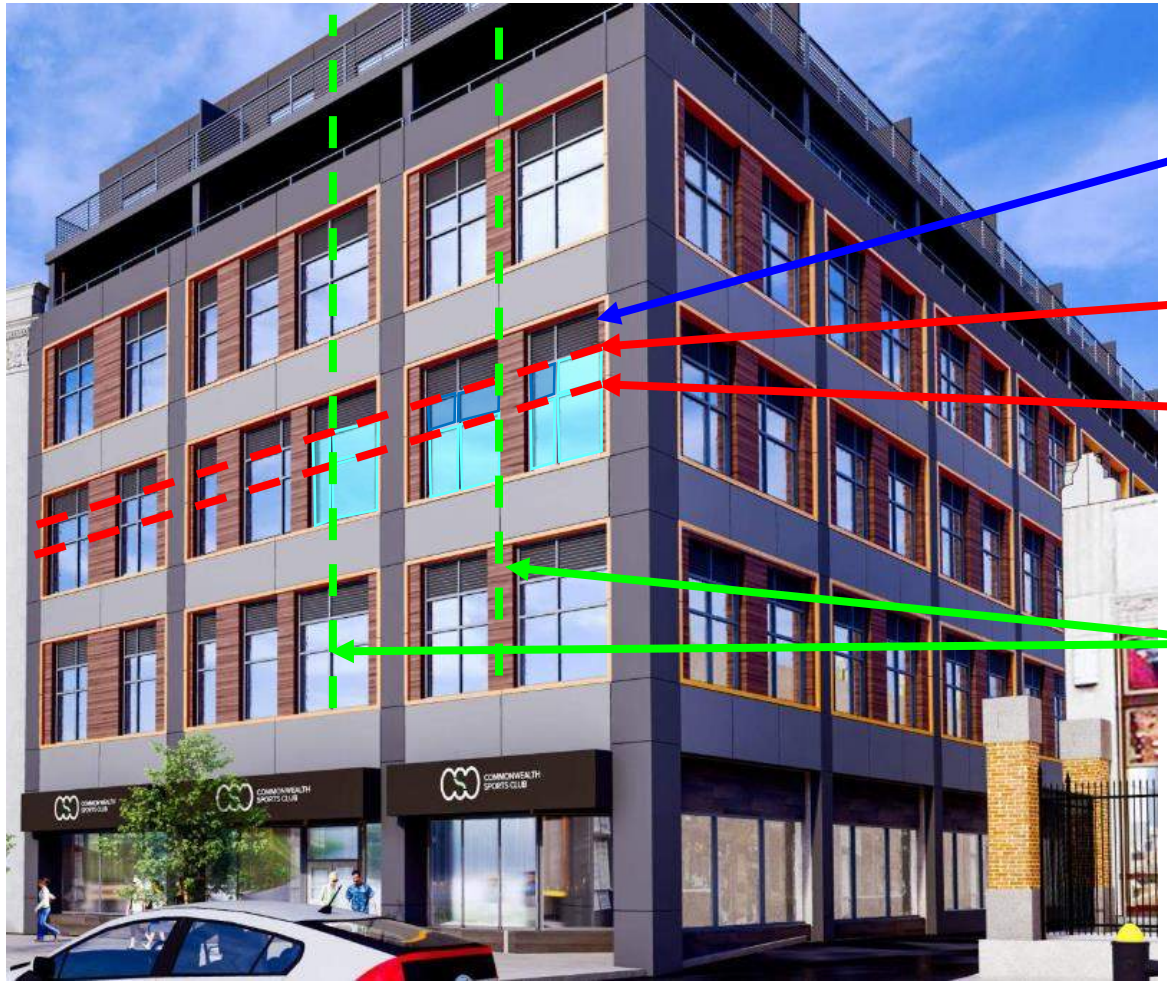
COORDINATION | ARCHITECT & OWNER

Pool Deck at Upper Courtyard

Landscaping at Lower Courtyard



Windows accommodate interior ceilings and walls, and mechanical requirements



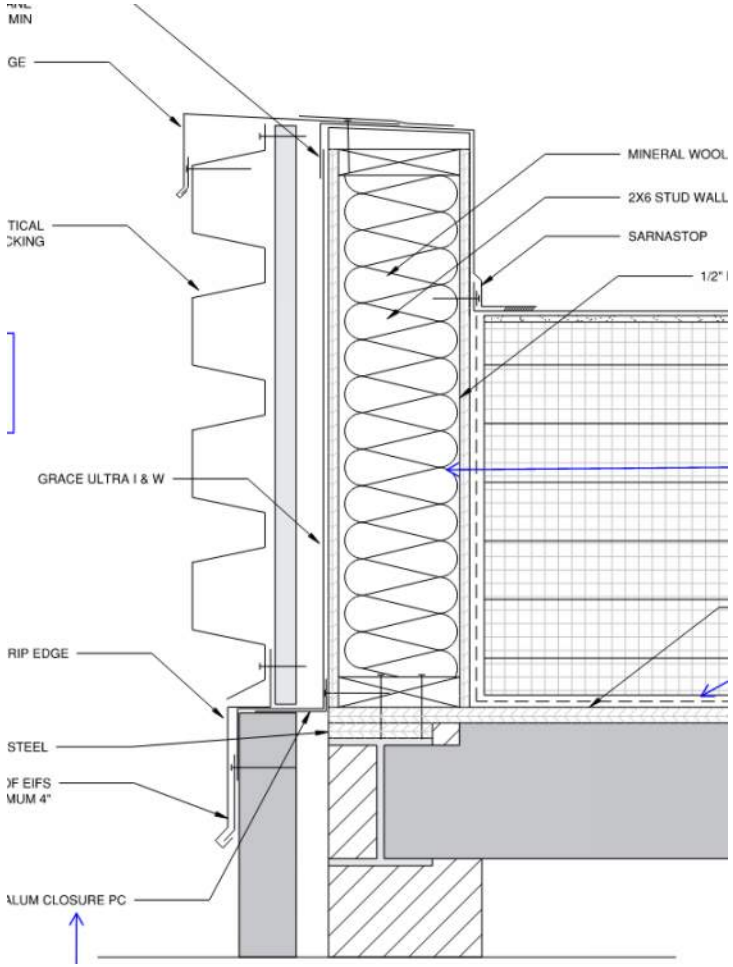
Louver for mechanical plenum above ceilings

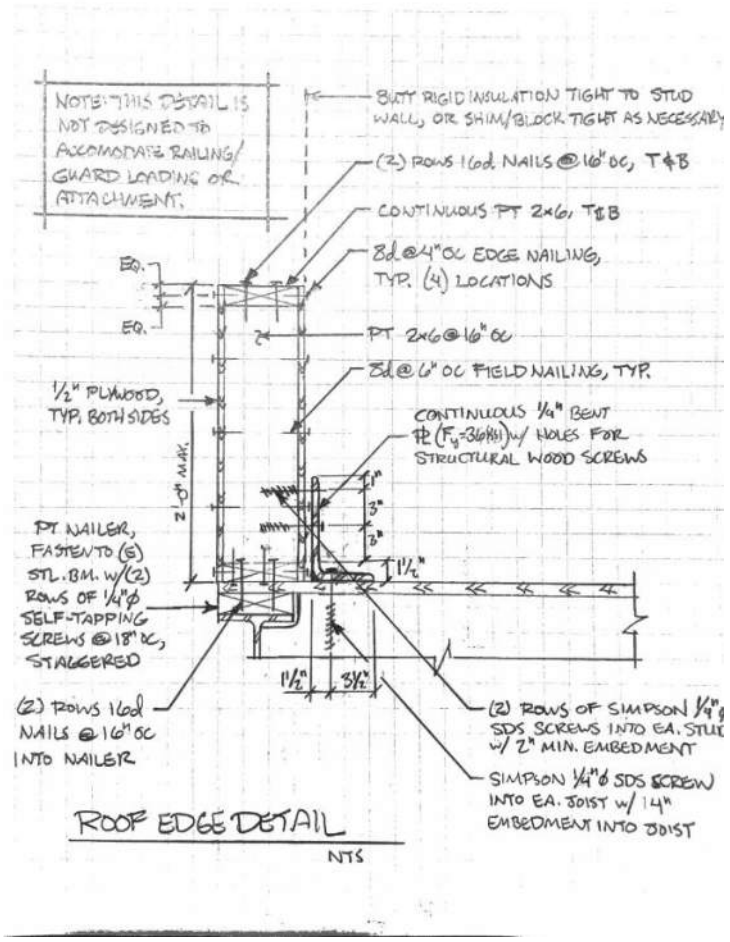
11’ ceiling height at living rooms

8’ ceiling height at living rooms

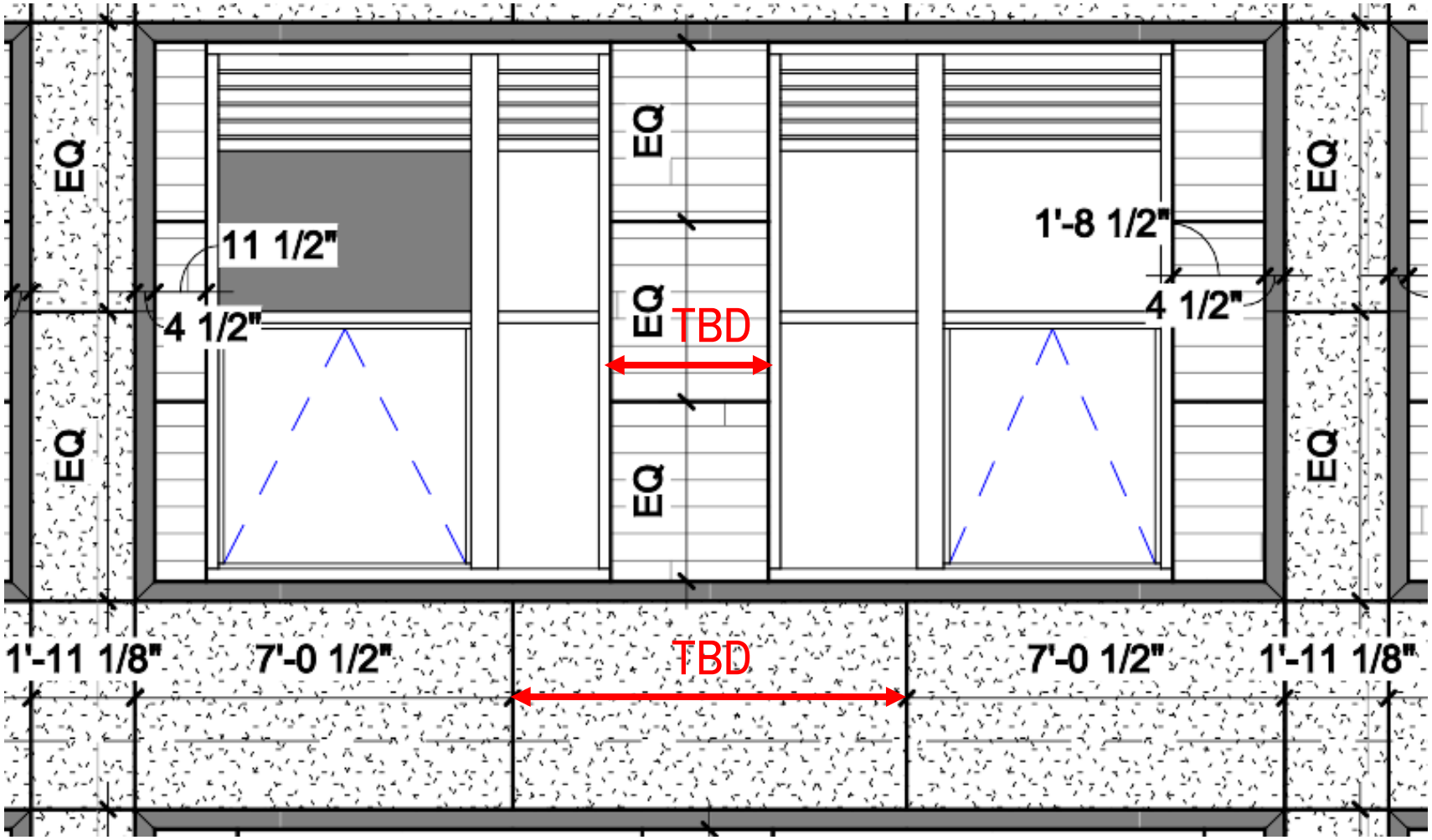
Align opaque wall and double wide mullion with interior partitions

Parapet for Roof Assembly Thickness and Future Facade

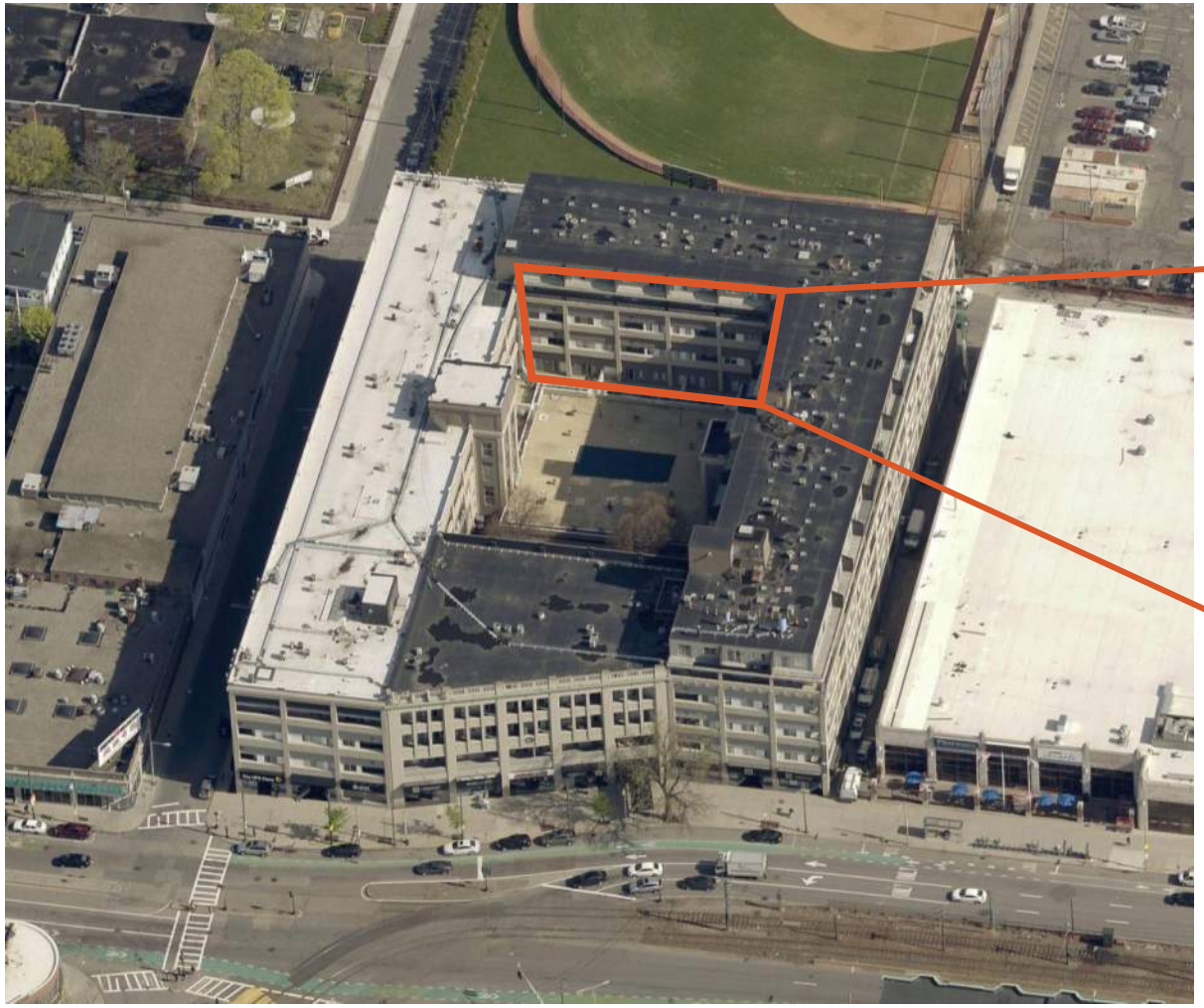




Façade Design Accommodates Existing Conditions



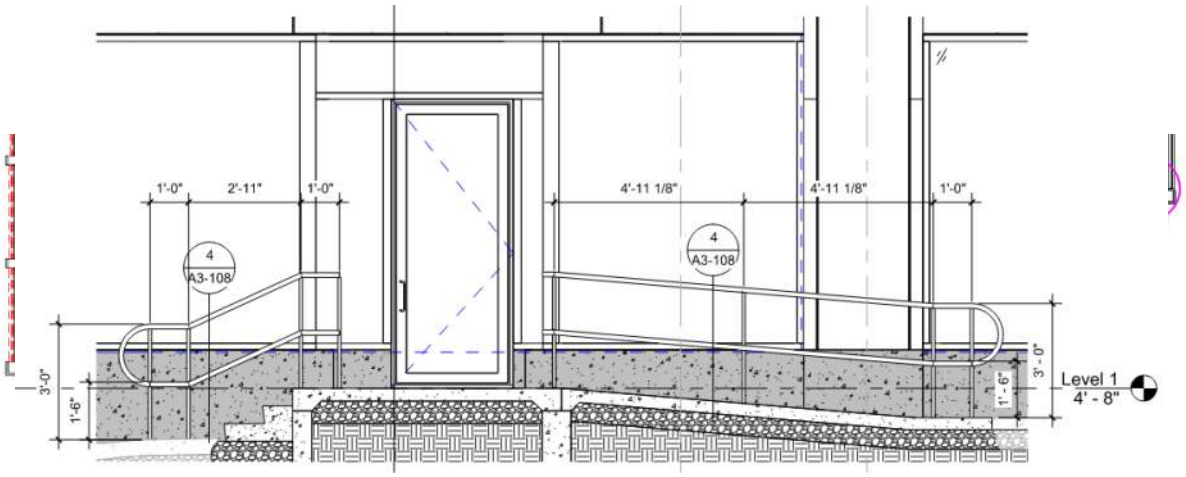
COORDINATION | ONGOING



EXISTING BUILDING

CODE COMPLIANCE REVIEW

COORDINATION | ONGOING



EXISTING BUILDING

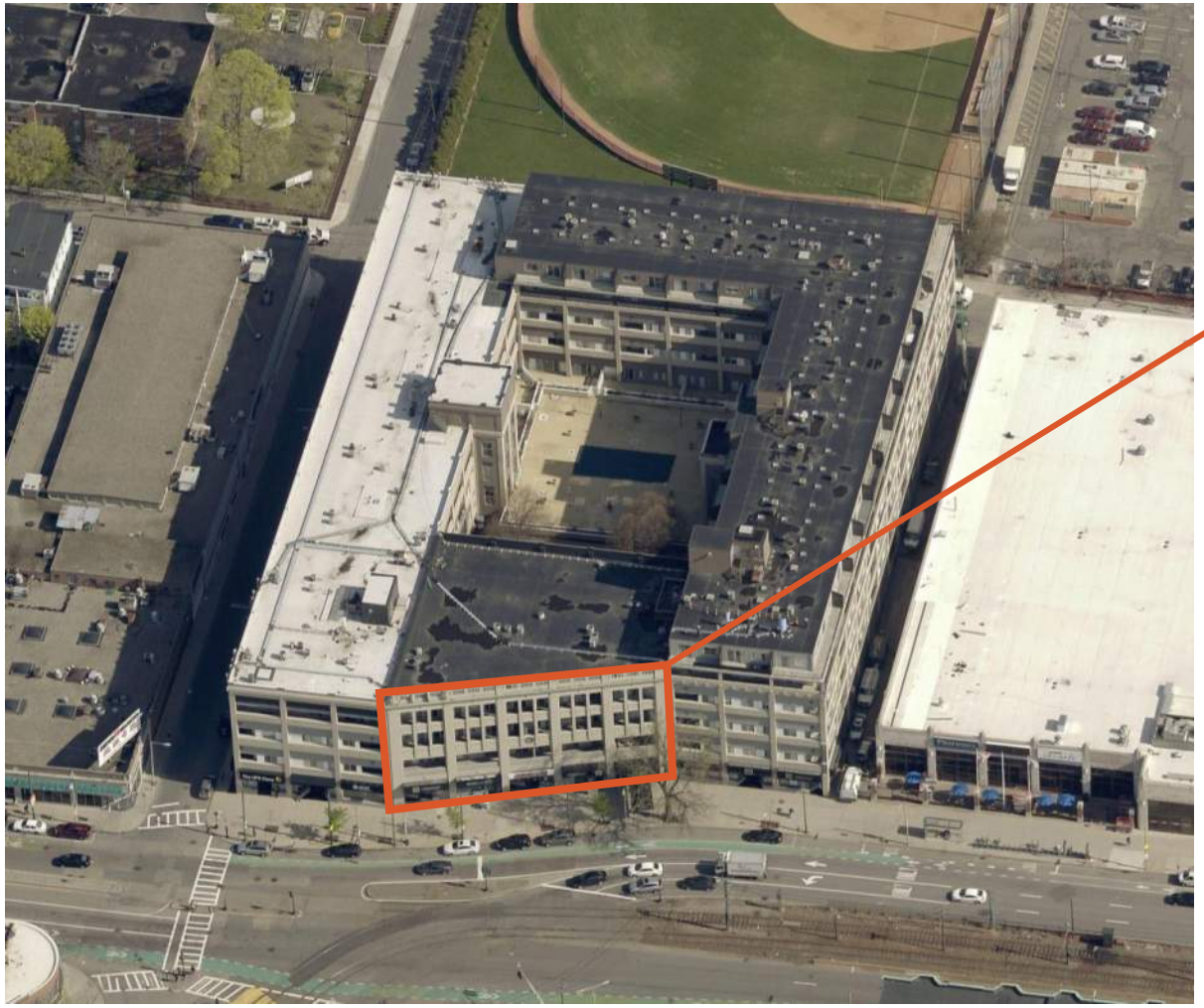
RETAIL ENTRANCES

COORDINATION | ONGOING

EXISTING BUILDING

NONRESIDENTIAL SPACES

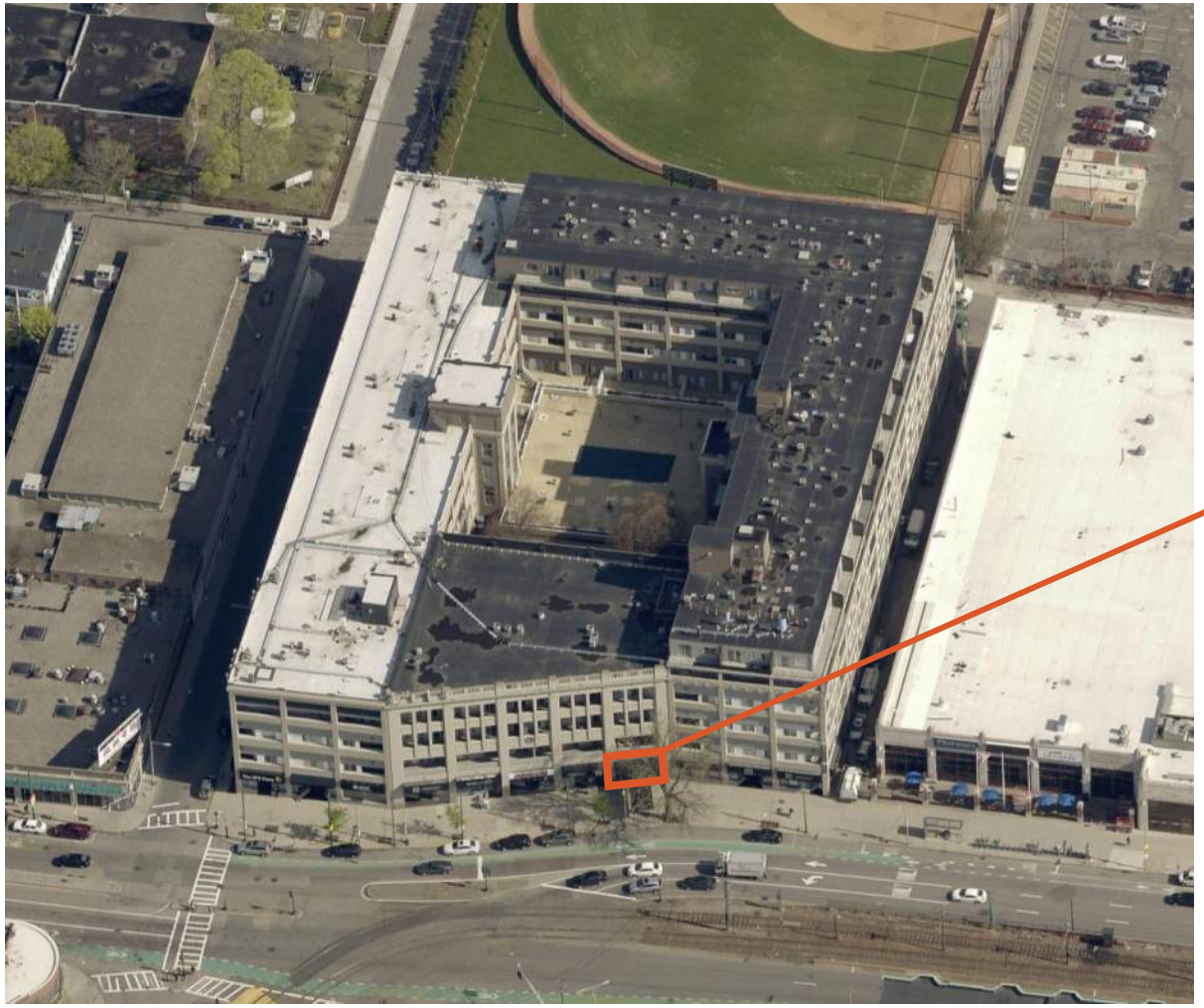
COORDINATION | ONGOING



EXISTING BUILDING

HISTORIC ARCHITECTURAL FEATURES

COORDINATION | ONGOING



EXISTING BUILDING

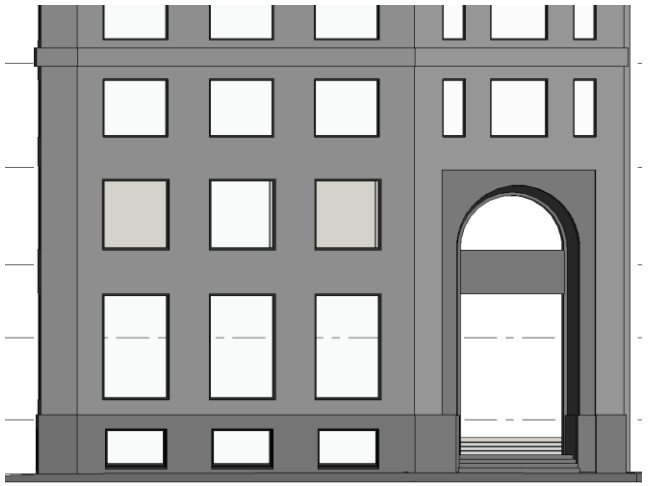
MAIN ENTRY

FACADE RECLAD

BIM CHALLENGES

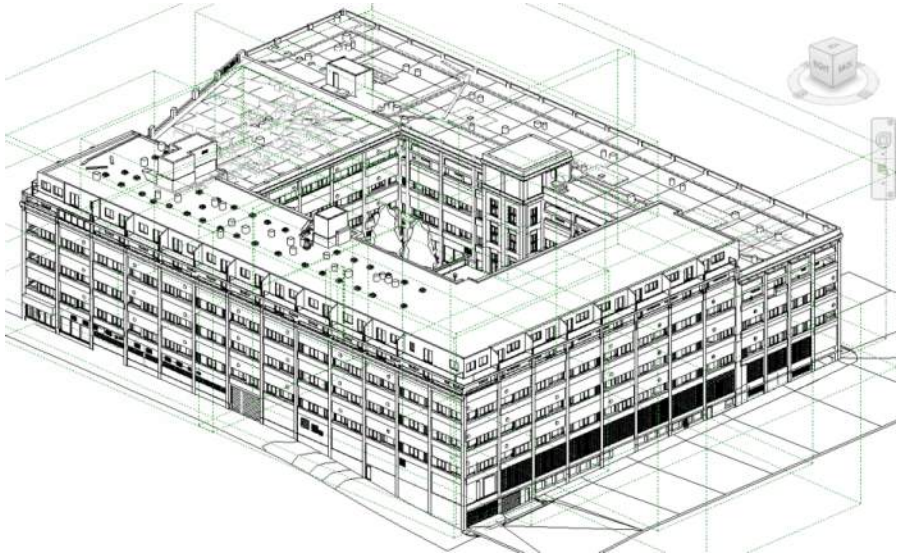
Scanning and Model Development

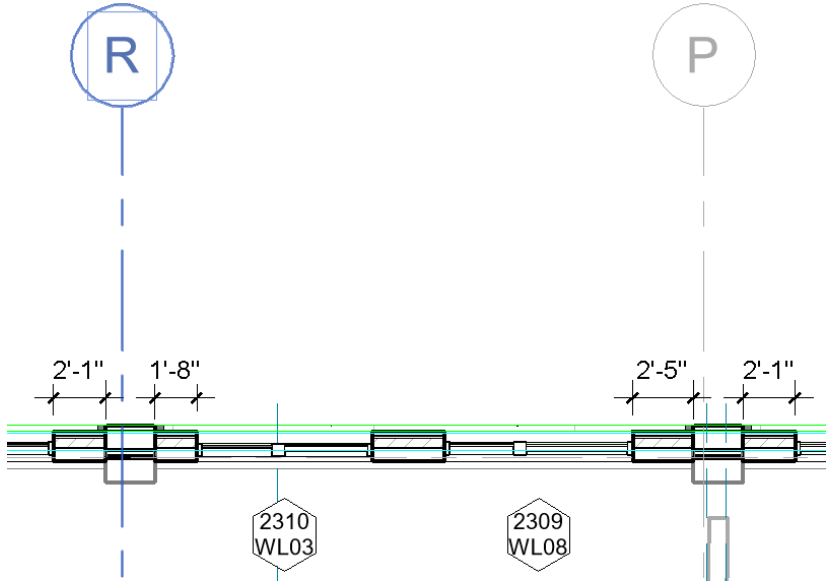
- Existing drawings ca. 1920s and 1980s
- Lidar scanning by Bimstream (formerly Aerial Genomics) of existing building
- Point cloud interpreted by modeler and converted into Revit
- Level of detail (LOD)



Building Model Challenges

- Scanning performed prior to demolition
- Modeled components (walls, floors, parts)
- Architect owns modeling, SGH owns detailing
- Columns not modeled on column grid
- Solution: Reference planes!



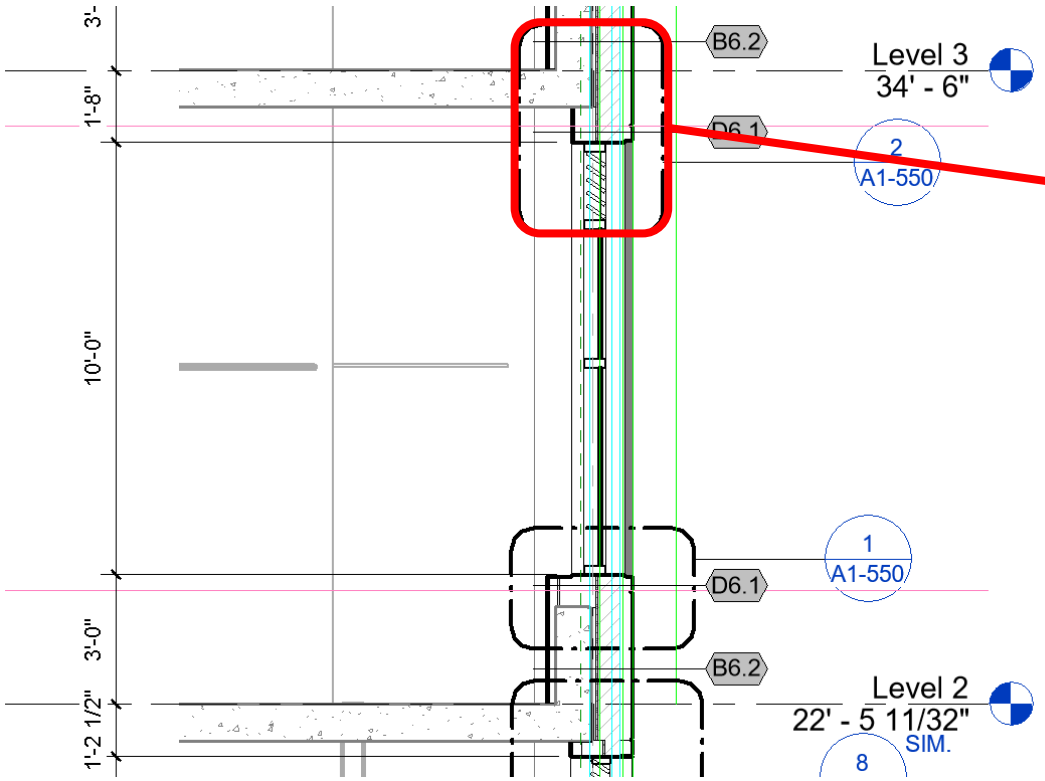


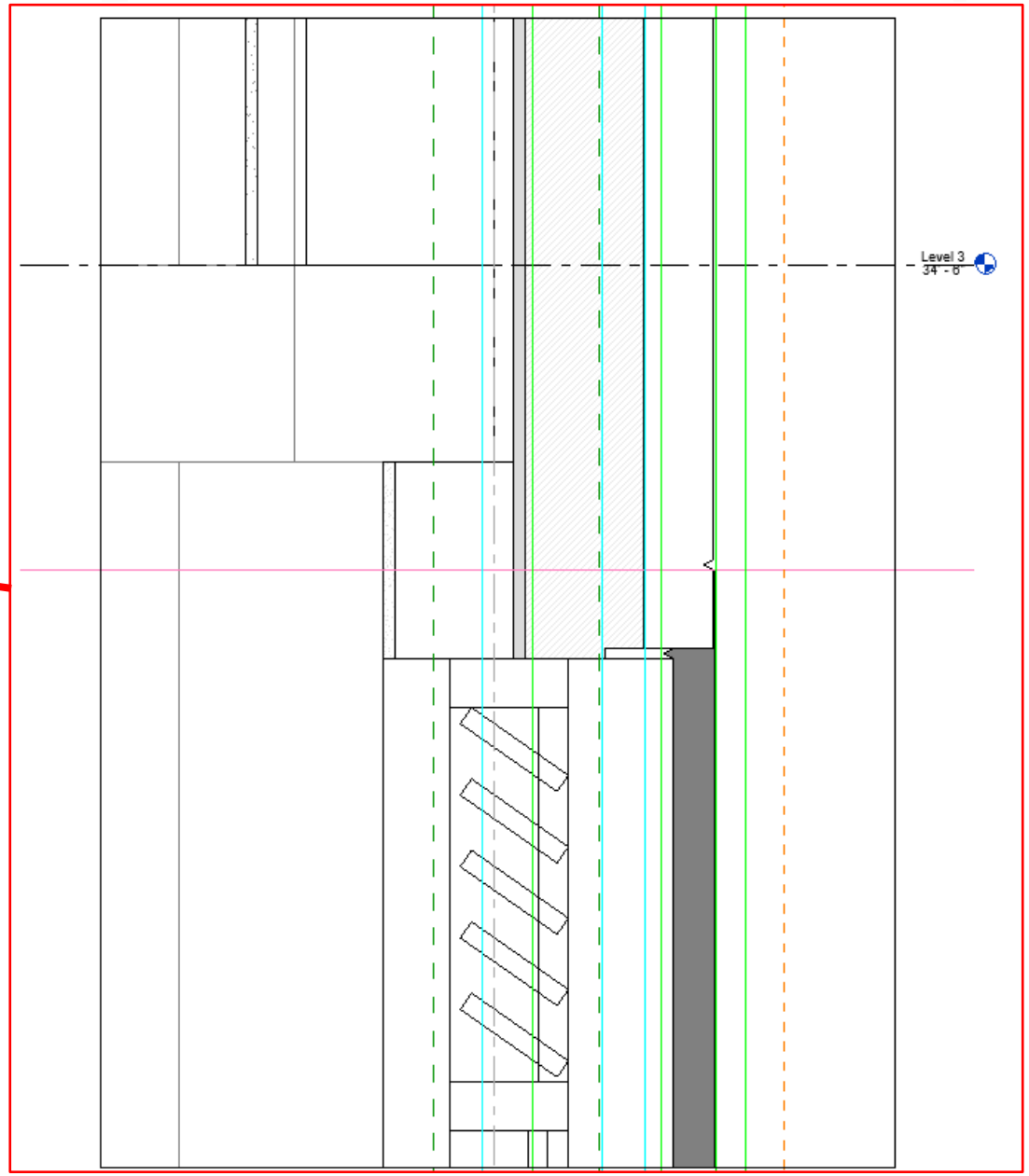
DRAFTER'S POINT OF VIEW

Reference Planes:

= existing structure reference plane

= face of cladding reference plane





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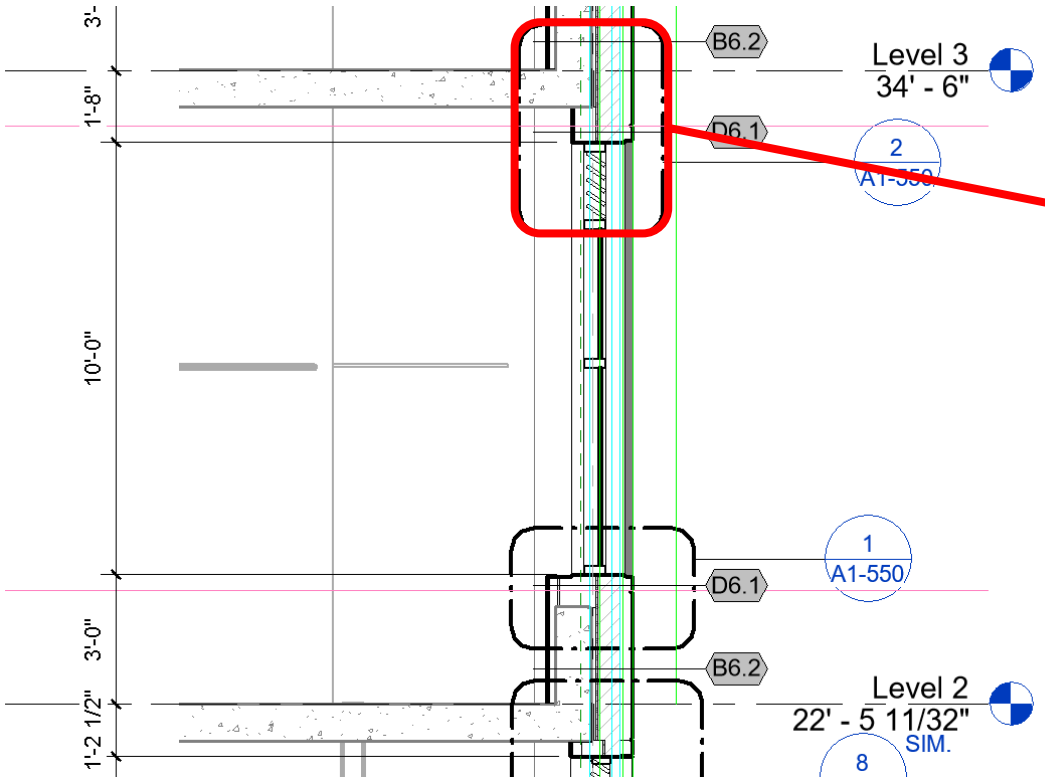
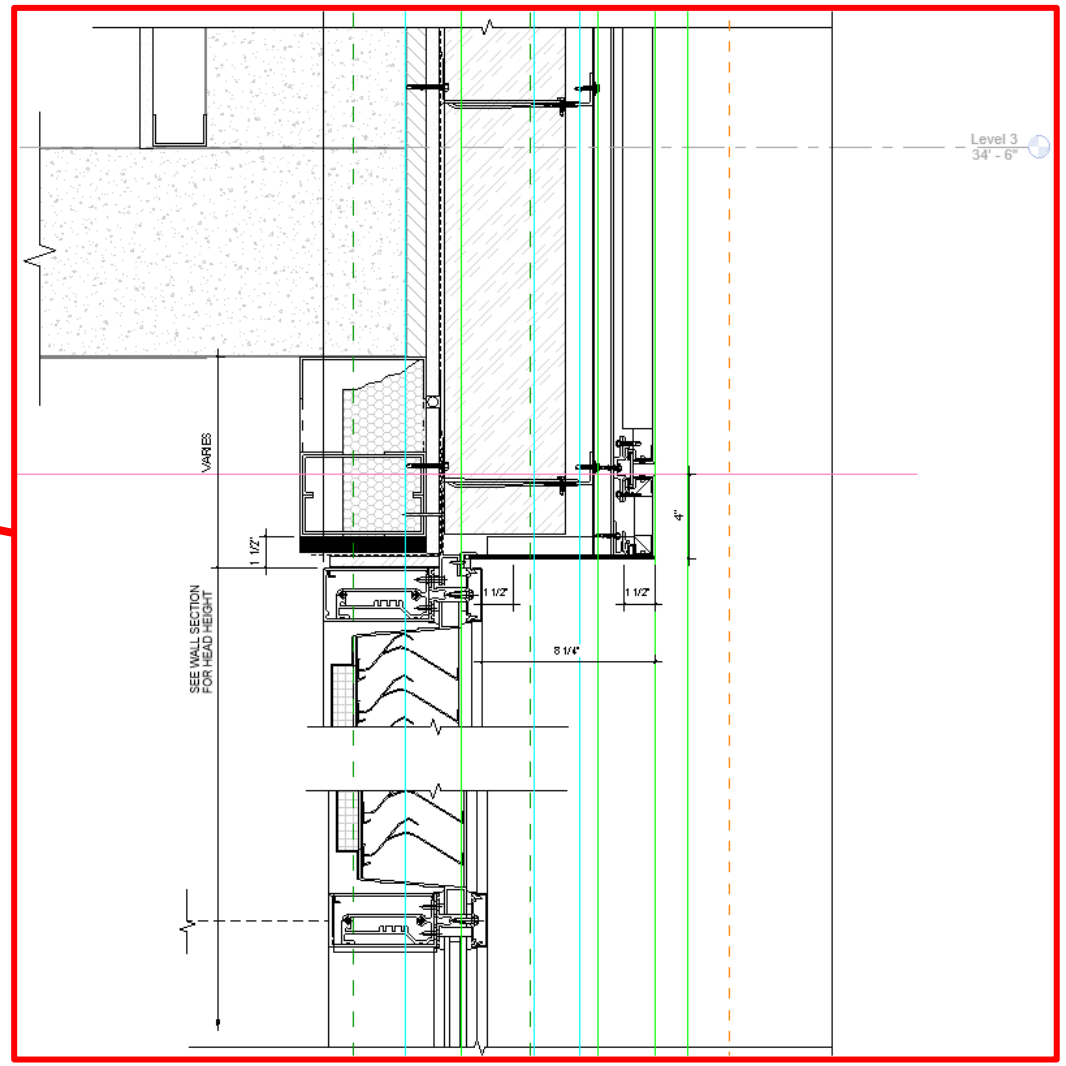




OH %*@#& MOMENTS... THEY COME FULL CIRCLE

Phase 1 (CD Set due August 8)

August 7, 2020 4:02 pm
To: Matthew Colturi
Subject: 1079

It seems like somewhere along the way this afternoon the exterior wall on the alley side got deleted. We luckily had a local file that he hadn't sync'd yet so we are saving out his local file and are going to try and copy the wall and all the windows back into the cloud model.

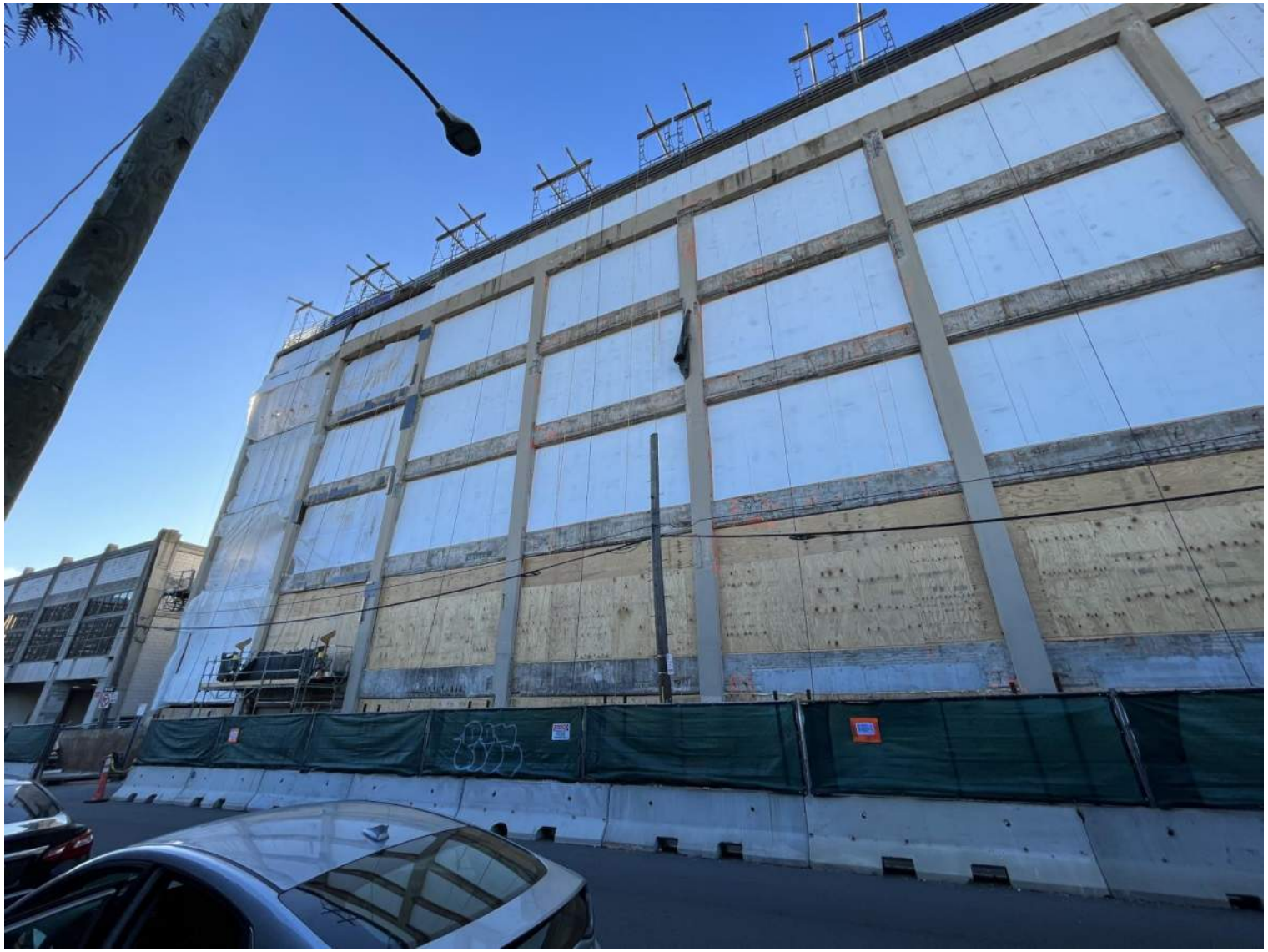
I'm not sure when the last time you sync'd was but if we can't copy the wall, we may need to overwrite the cloud model. Fingers crossed. I'll keep you posted.

Phase 3 (Permit Set due August 11)

August 7, 2023 10:06 pm
From: Matthew Colturi
Subject: 1079 MODEL – DELETED FLOOR

Did someone delete Level 4C completely from the model? I am not seeing any floors, windows, walls, or doors at this Level of Building 2 – see elevations A3-205 and A3-208, and associated wall sections and details.

POST DEMO SURVEY & FIELD LAYOUT



024119 Selective Demolition

B. After completion of selective demolition, provide a field verification survey of the existing structure to document the existing structural concrete framing and other existing structural elements to remain within the work extents.

1. Survey shall be performed by a surveyor licensed in the Commonwealth of Massachusetts, including the following minimum survey data:

Vertical (openings) → Top and bottom elevations of beams at both ends (where they intersect columns) and every 5 ft max along their length.

Horizontal (columns) → Side faces and centerline of columns at each floor level.

Depth (structural backup) → Exterior face of columns at each floor level.

Depth (structural backup) → Exterior face of all concrete beams at both ends (where they intersect with columns) and every 5 ft max along their length.

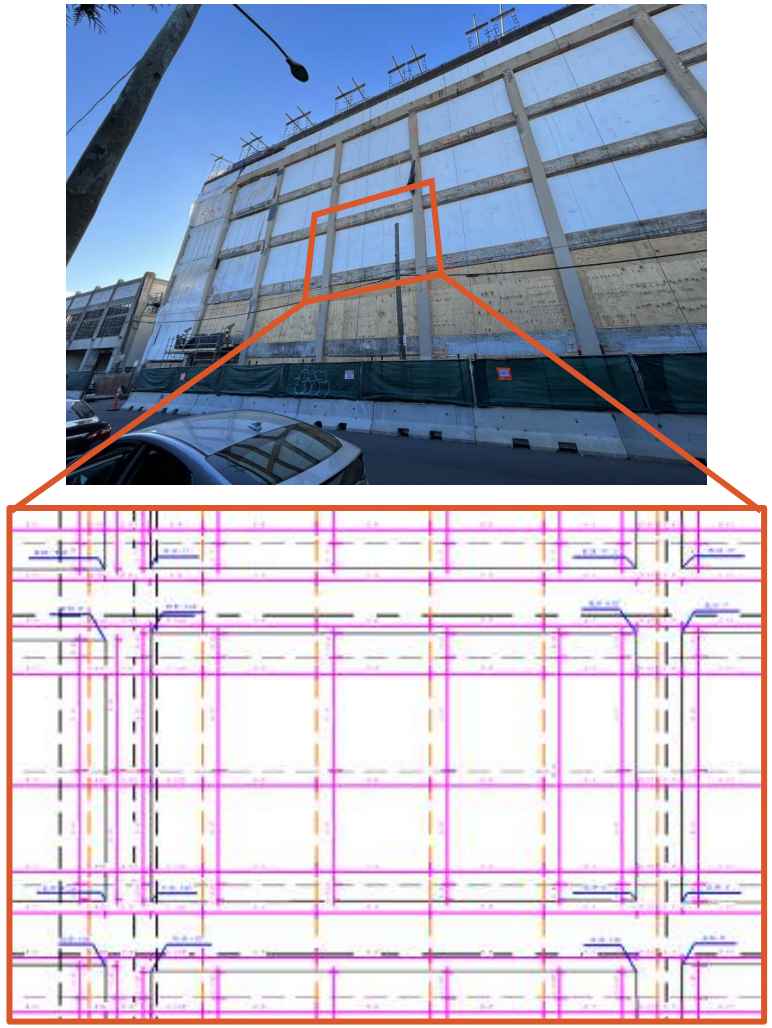
e. Floor slab elevations.

f. Roof and top of parapet elevations.

g. Door threshold elevations.

h. Dimensions for openings to remain.

2. Provide plan and elevation drawings, showing the results of the field verification survey and using the Contract Drawings as a background showing the required information.

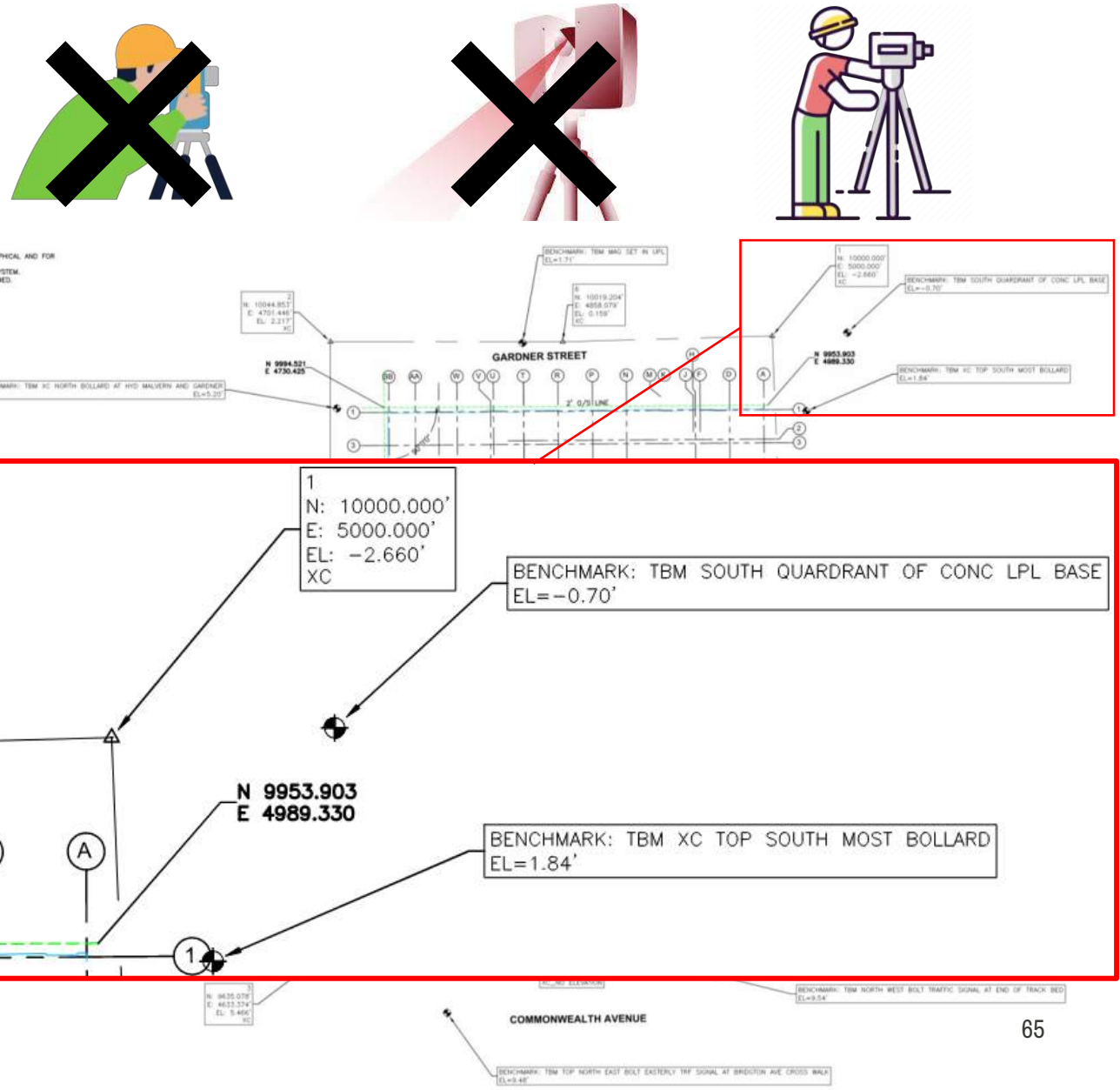


POST DEMO SURVEY & FIELD LAYOUT

POST DEMO SURVEY & FIELD LAYOUT

How it's going

- Phase 1 – Land surveyor attempted
  - Field measurements
  - No control → significant delays
- Phase 2 – Full survey provided by lidar scan
  - Survey data interpretation
  - Conflicting survey and site control info
  - Significant delay
- Phase 3 – To be performed
- LESSON: Establish building control with contractor as early as possible



Lessons Learned and Tips for Future Success

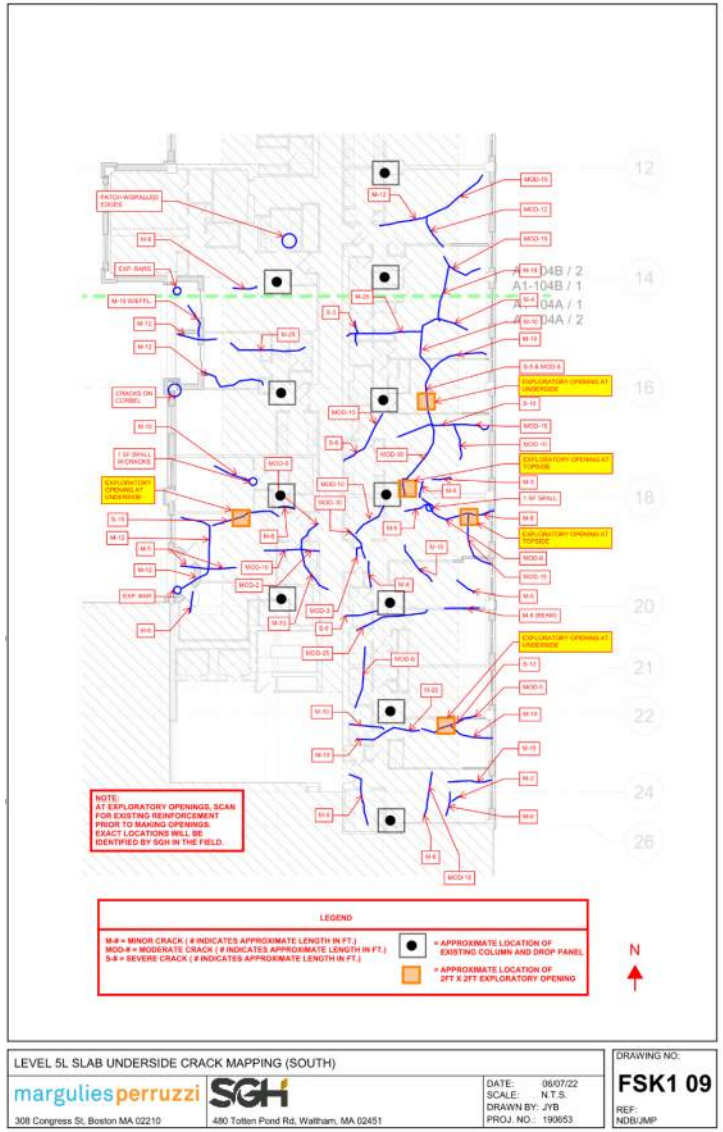
- Initial Model Development:
  - Establish site control
  - Set model expectations
- General:
  - BIM workflow and roles
  - Revit model linking
  - Drawings for phased projects
- Design Recommendations:
  - Wall assembly depths and survey
  - Working points

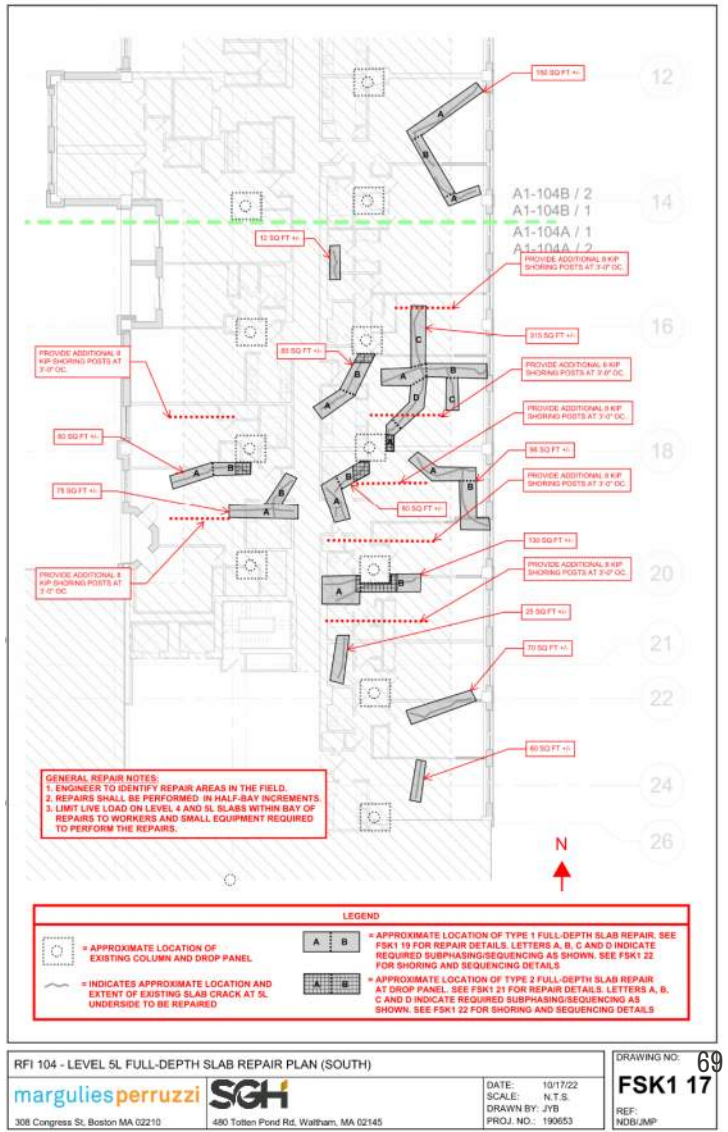
FACADE RECLAD

STRUCTURAL REPAIRS

Unique Repair Conditions – Beam Repairs

Unique Repair Conditions – Original Roof Deck





Unique Repair Conditions – Corner Column

Unique Repair Conditions – Corner Column

Unique Repair Conditions – Slab Reconstruction

HRC

Quotation

QE23-045

Headed Reinforcement Corp. EAST
402 Vulcan Street, Suite 104
Buffalo, NY 14207
Tel: 716-983-1545
ed@hrc-usa.com
www.hrc-usa.com

To:

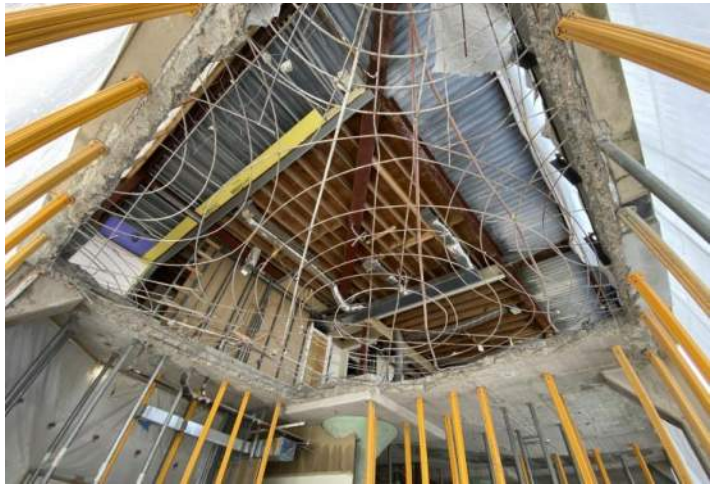
1079 Commonwealth Ave
Simpson, Gumpertz & Heger
800 Boylston Street Suite 2320
Boston, MA 02199

Phone: (781) 267-5513

SGH CONTRACTING

Quote Date: 11/17/2023

Project: 1079 Commonwealth Ave



CONCLUSIONS OVERARCHING LESSONS

CONCLUSIONS

- Tackle Exciting Project
  - Moving parts
  - Large Teams (SGH prime)
- Handle many surprises
- New life to an old structure for decades of future use
  - Sustainability
- Combined Contractor and Owner
- BT and SE - lean on and learn from each other
- Modeling lessons for old structures
- Fee management – cradle to grave
  - All from one phone call
  - $2.5M
  - Several other major projects

QUESTIONS