2019 Smart Growth Award

ADAPTIVE REUSE

IRONSIDE NEWARK

ACTIVE DESIGN GROUP

Adaptive Reuse

IRONSIDE NEWARK, NJ

IRONSIDE NEWARK is a 450,000 square feet six-story renaissance revival built in 1907 used by the Central Railroad of New Jersey. It was known initially as the Newark Warehouse company Building. The building has 130-foot x 360-foot footprint, situated on a former Mechanic Street (now Edison Place), accommodating railroad freight storage and train deliveries entering through the second floor to support the city's elevatored track network.

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BEFORE

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In 2017 Edison properties planned to convert the warehouse to a mixed-use retail and office, including the double-story main atrium, modern-style office, penthouse, and roof terrace with inspiring 360-degree views of Newark and the Manhattan skyline.

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AFTER

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Active Design Group (ADG) had conducted an on-site investigation and studied for the penthouse expansion on the roof. Numerous field-buried construction in early 1900 was revitalized and reinterpreted, resolved in compliance with current Building Code, construction standard and practice. The extensive renovating and retrofitting to meet Class A office required the intensive field investigation, design and detailing and construction logistics. All challenges have been faced and resolved by design teams collaboratively and responsively. ADG, Engineer of Record took engineering challenges for the rebirth of Ironside Newark. Throughout the project, structural strategies have been conducted over the course of design process as follows:

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1. Search existing Documentation.
2. Probe building material and construction method.
3. Field Probe to identify structural system and measure structure member size.
4. Identify foundation system, enlarge, reinforce foundation system.
5. Identify floor framing system and as-built condition.
6. Identify lateral load resisting system and implement seismic retrofit.
7. Scan the building to build 3D Revit Model.
8. Use drone to monitor construction status.

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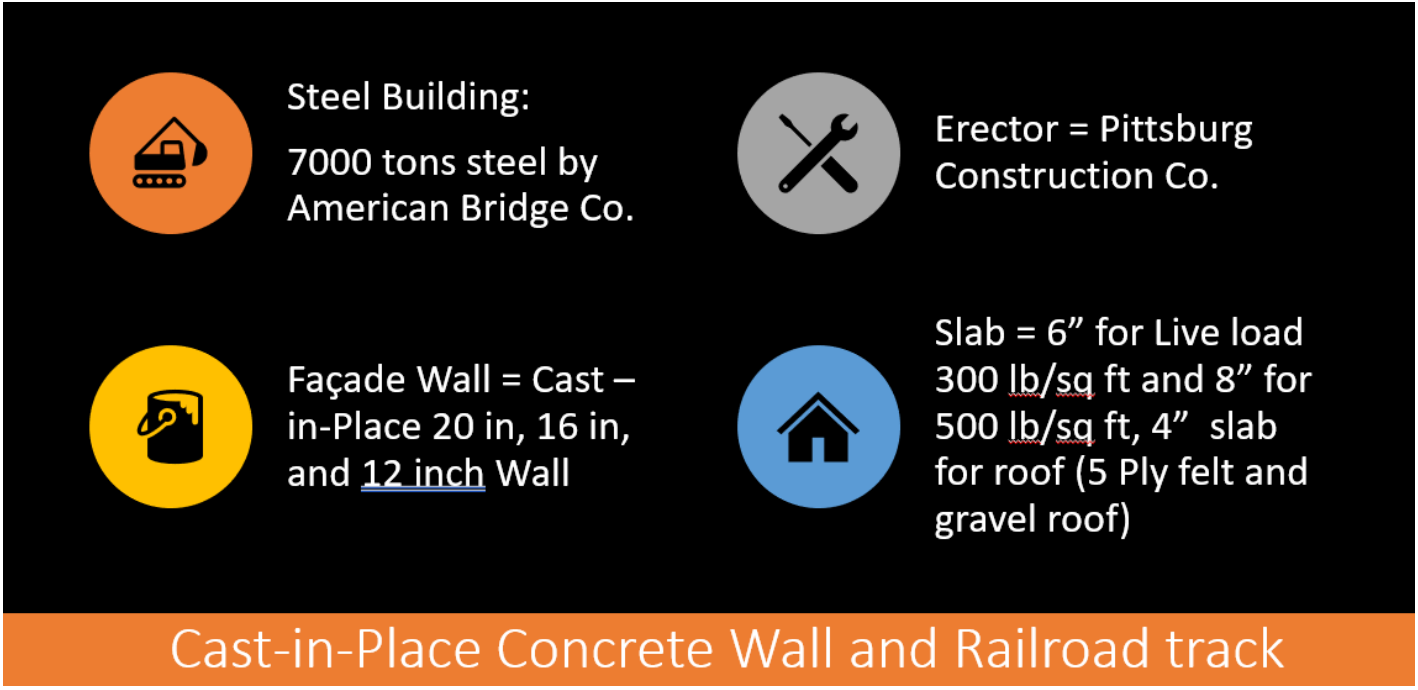

Documentation

Engineering Record article issued in August 10, 1907 was dug out in Newark public library and the engineer could find design loads, and construction material and practice in this period time. The building was constructed of steel and cinder concrete, cast-in-place concrete enclosure wall.

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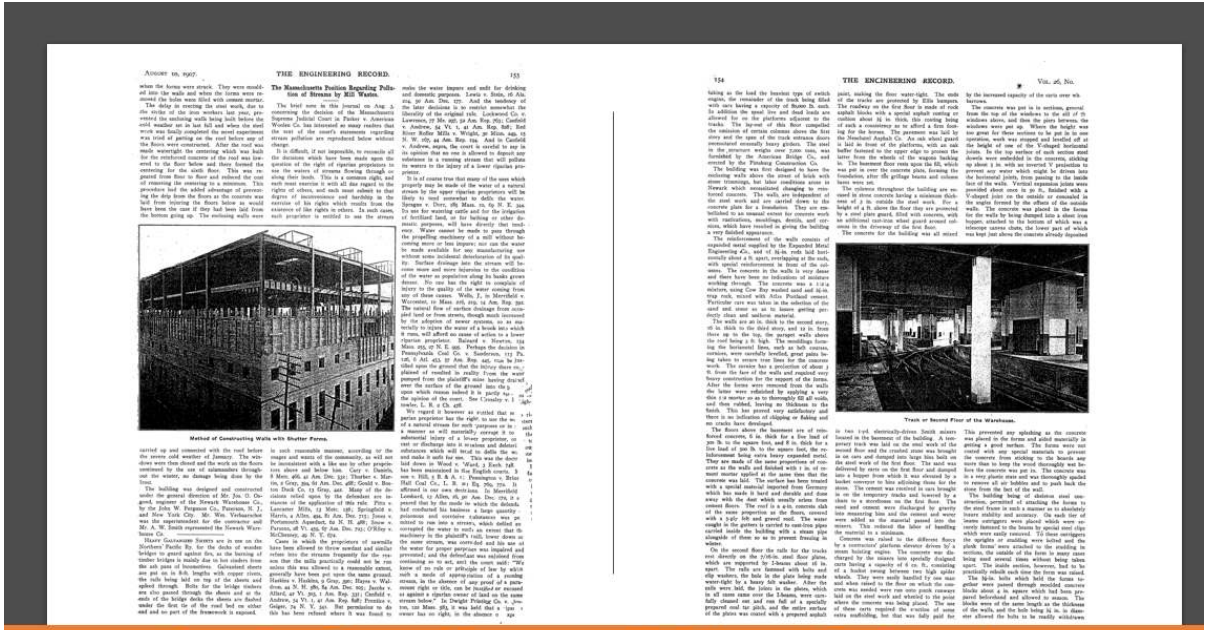

Cast-in-Place Concrete Wall and Railroad track

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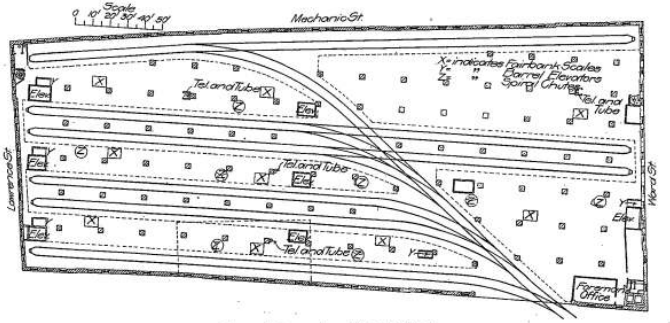
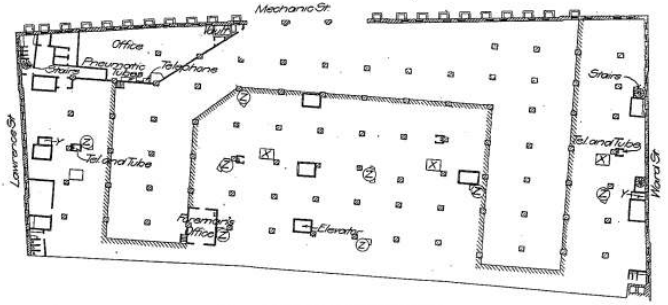


Plan of Second or Track Floor.



Plan of First or Teaming Floor.

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Track lines reflected on the lobby wall

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Foundation challenge

Foundation probe found that the existing building was constructed on 12 feet x12 feet steel grillage spread footing underlying on 1’-2” thick mat along entire building footprint. To serve class A office, design teams brought in six passenger elevators and one freight elevator, requiring 6 feet deep pits on the basement level. Due to the proximity of existing adjacent footings, grillage footings were cut partially and reinforced to accommodate the new elevator pits. In addition to elevator pits, W12 columns were added at the corner of the pit to remove an existing off-grid column interfered with a proposed architectural layout.

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Existing footing probe and verify the existing connection

Floor framing System

Original 2nd to 6th floors were constructed with various built-up and rolled steel members and 6” ~ 8” thick concrete reinforced with extra expanded metal for the live load of 300 ~ 500 square foot. The massive steel members for column and girders are built up members with rivets. The columns are encased in stone concrete with a minimum 3 in. cover.

Floor renovation works included a great deal of slab infill for existing openings, demolition of existing slab and new framing for slab openings throughout the entire floor for HVAC, atrium, stairs, and elevators along all levels. Mostly intensive structural demolition and steel works were implemented on the 2nd floor where the freight trains entered. Existing tracks rest directly on the steel floor plates, supported by I beams over the built-up girders. Throughout the occupant usage, all tracks were infilled with slab on grade on 4 feet of soil infill.

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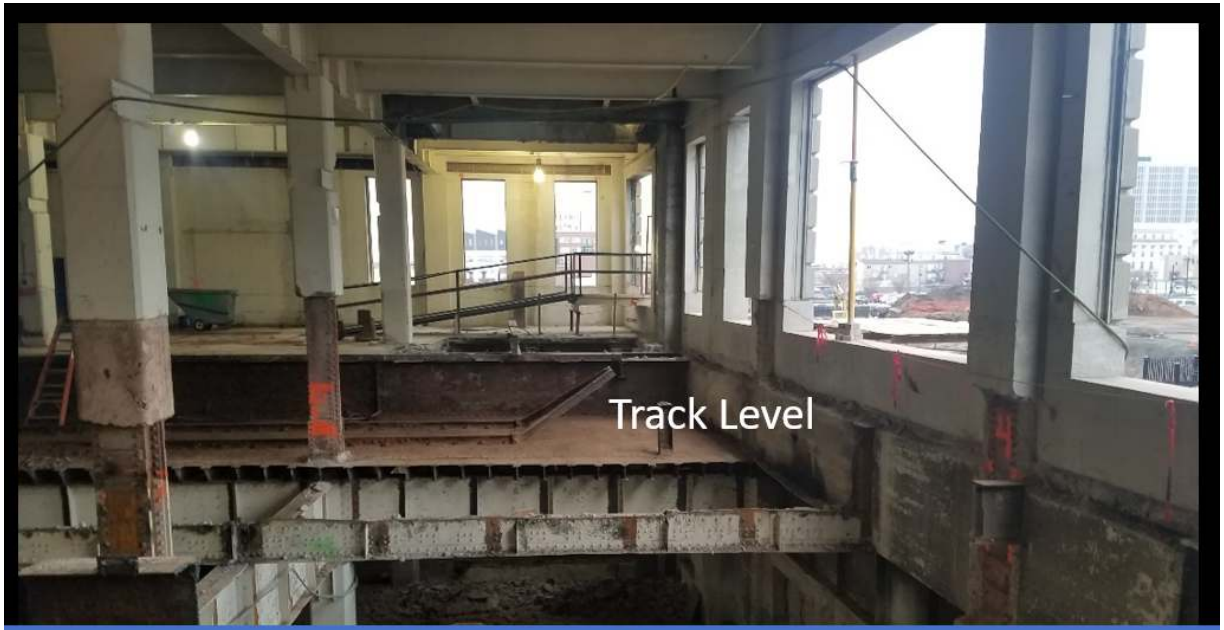

Install new floor frame

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Structural Works:
Install New Elevator opening framing, Infill slab, install new steel columns, New cantilever Canopy

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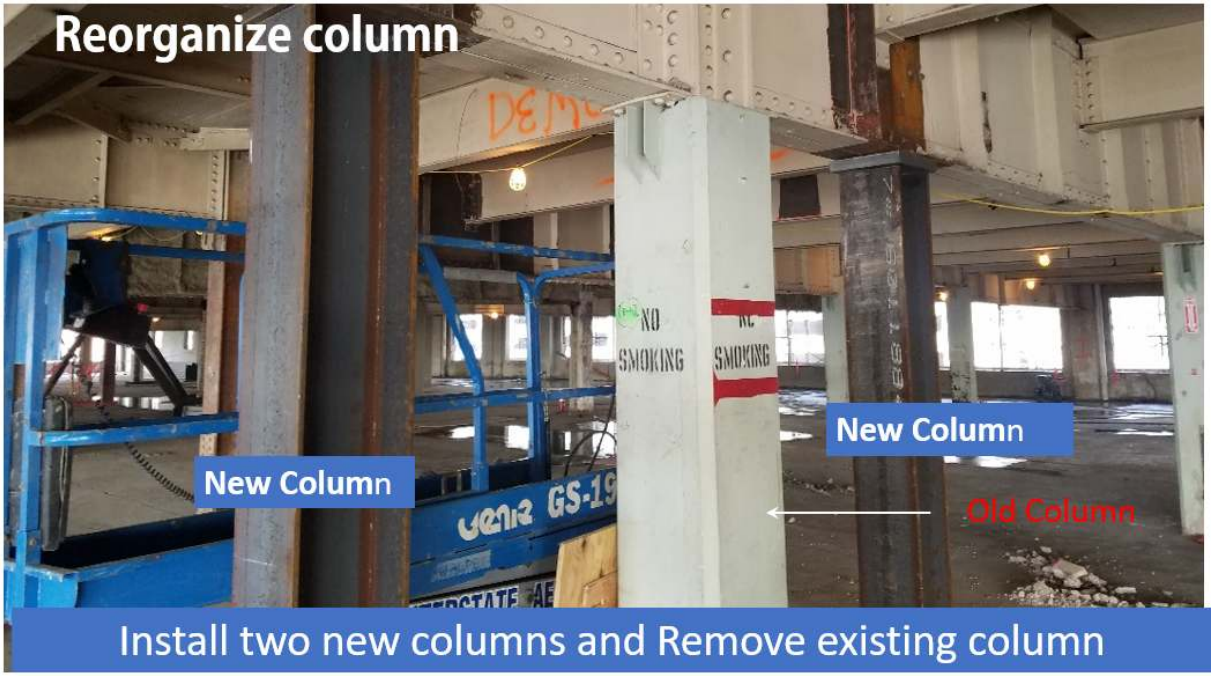

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REVAMPING STOREFRONT

New entrance canopy and lobby are highlighted with white-colored tapered steel beams, double-story atrium and public seating area, realized by removing 2nd-floor framings after confirming less load demand and column splice reinforcement. A canopy on Southside is also added on the 3rd floor above the access to the outdoor terrace. No major framing works were implemented except for new floor finish to meet flatness and levelness requirement on 3rd to 6th floors. The low-density Geo-fill was placed on the existing concrete slab before placing new concrete topping slab.

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For penthouse office, landscape, and terrace use, new 5-1/2” (3” metal deck and 2 ½” NW concrete) slab is placed over new steel framing at 2’-6” height above the existing roof, supported on new stub columns. Existing roof was built for only roof use.

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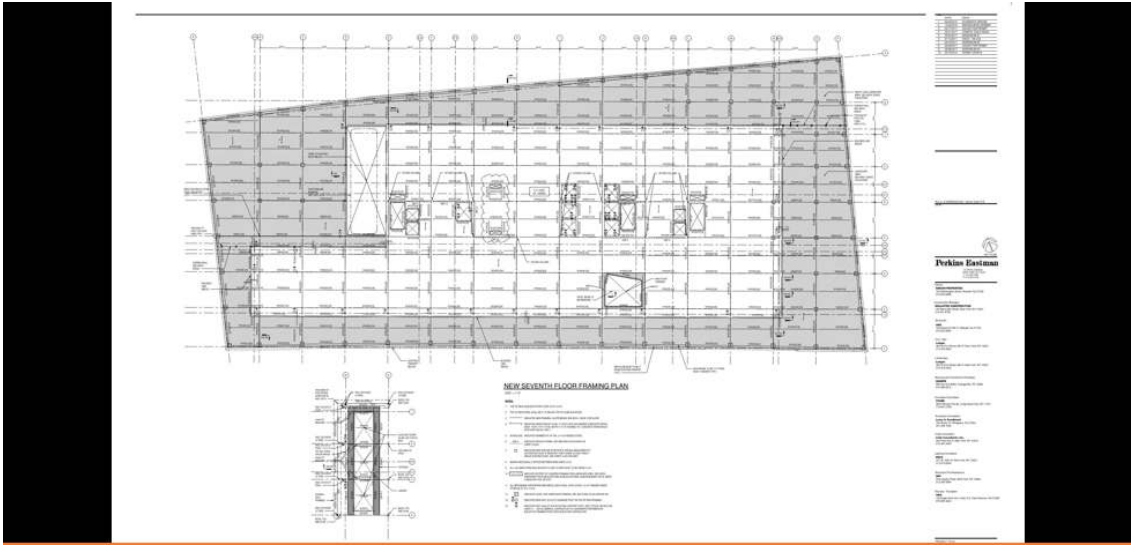

Structural Works:

Install new 7th floor above existing roof framing

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Lateral Load Resisting System

The lateral load resisting system was constructed with semi-rigid bolted moment frame system consisting of bolted top angle and bottom seat angle. The exterior concrete walls are purely envelope element as non-load bearing elements. For code compliance, the new lateral system was established by adding concentrically braced frames throughout the building from the 1st floor to the new roof. All diagonal members are HSS section, welded to gusset plate and existing beams and columns.

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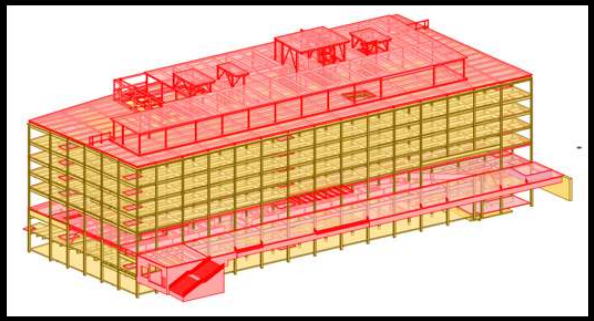
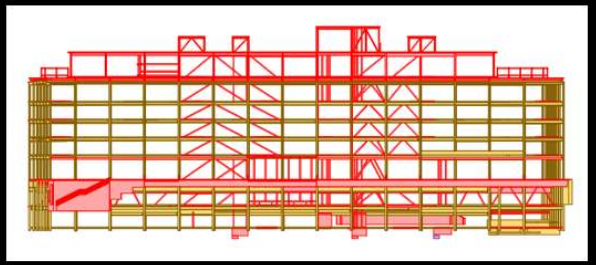
New Structural Strategy

New Structual Work: New column/foundation, New Floor Frame, Elevator frame, Roof frame above existing roof, New Lateral Load Resisting System, Window opening, floor leveling, Canitlever Canopy.





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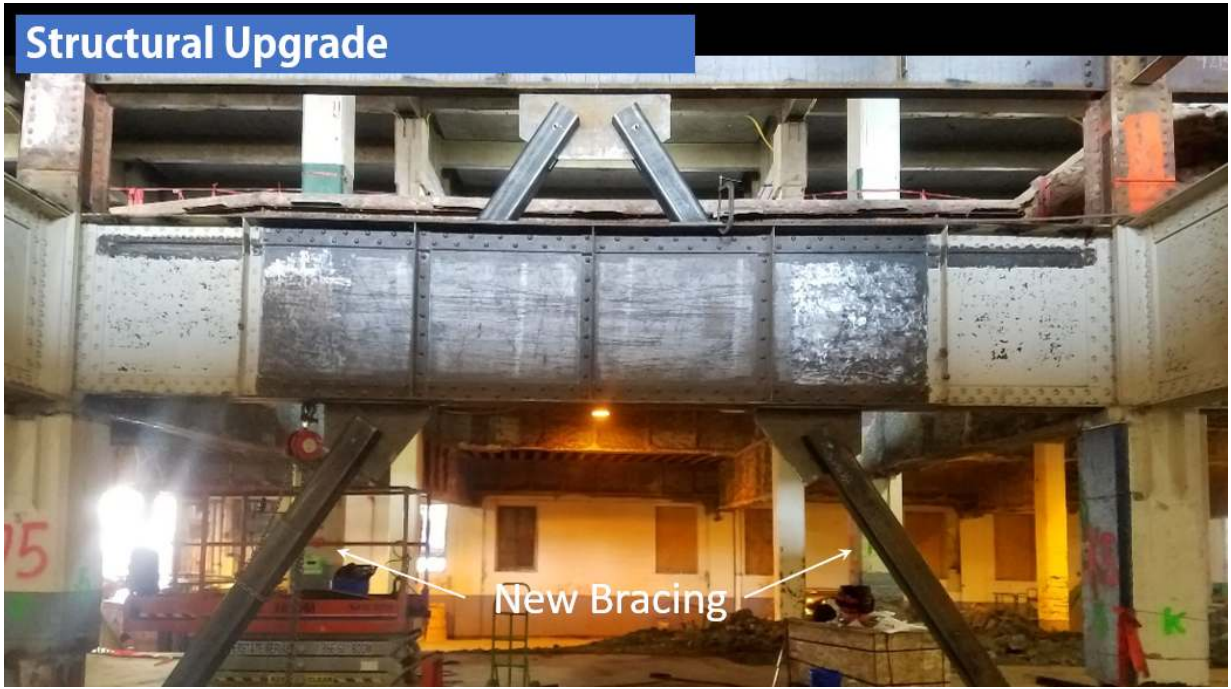

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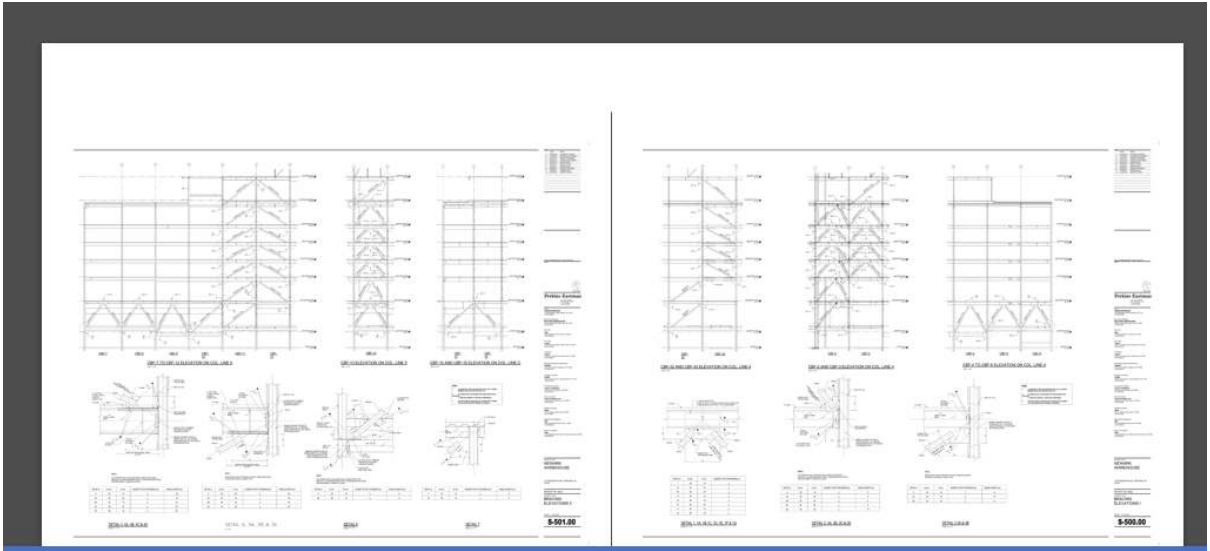

Structural Works:
New Bracing Installation for seismic requirement

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Exterior wall opening

Existing concrete enclosure walls had a small series of window openings with rustications, dentils, and cornices. For new office environment requiring wide windows to allow natural light, all small wall openings had to be cut opened widely with steel post in mid-span.

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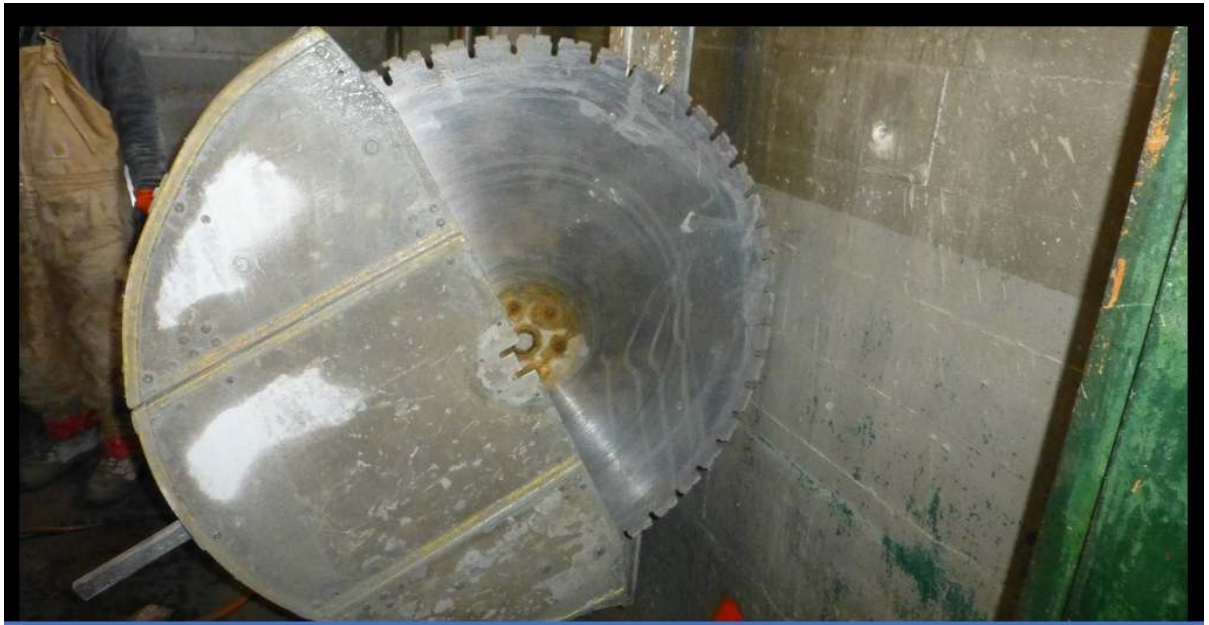

Cut concrete wall for widening window

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3D Scanning and Revit Model

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3D Drone View for. New roof framing and penthouse roof

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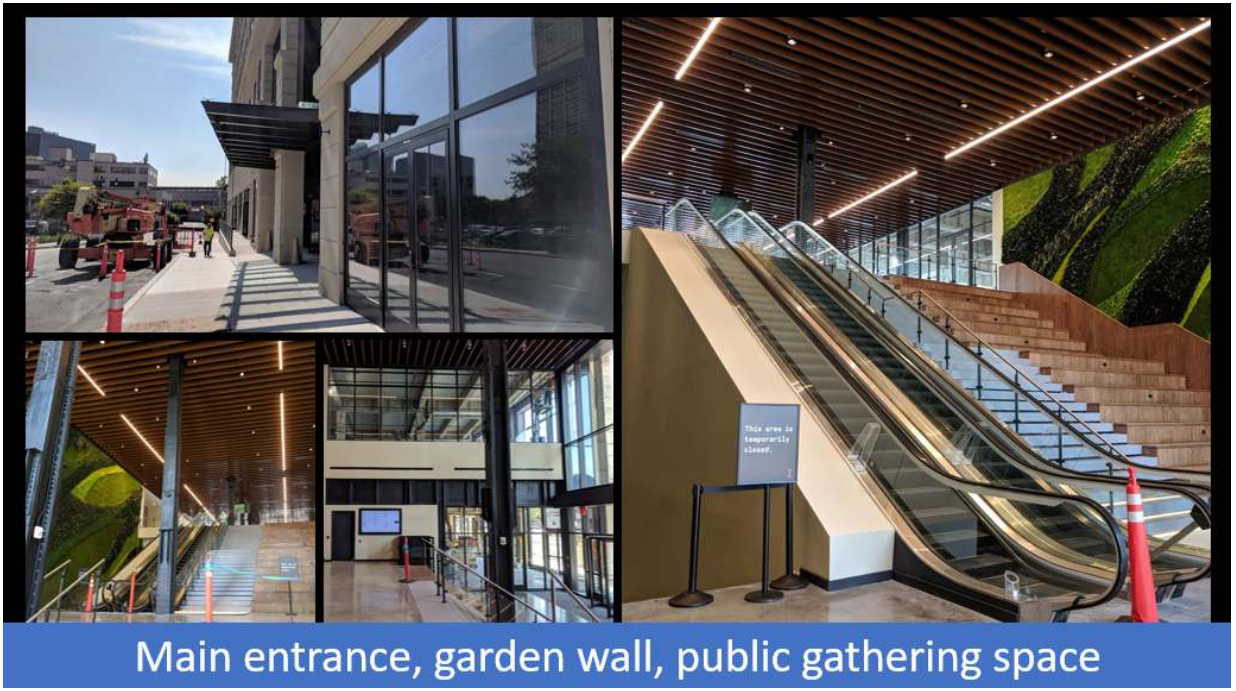

Main Lobby and Green wall

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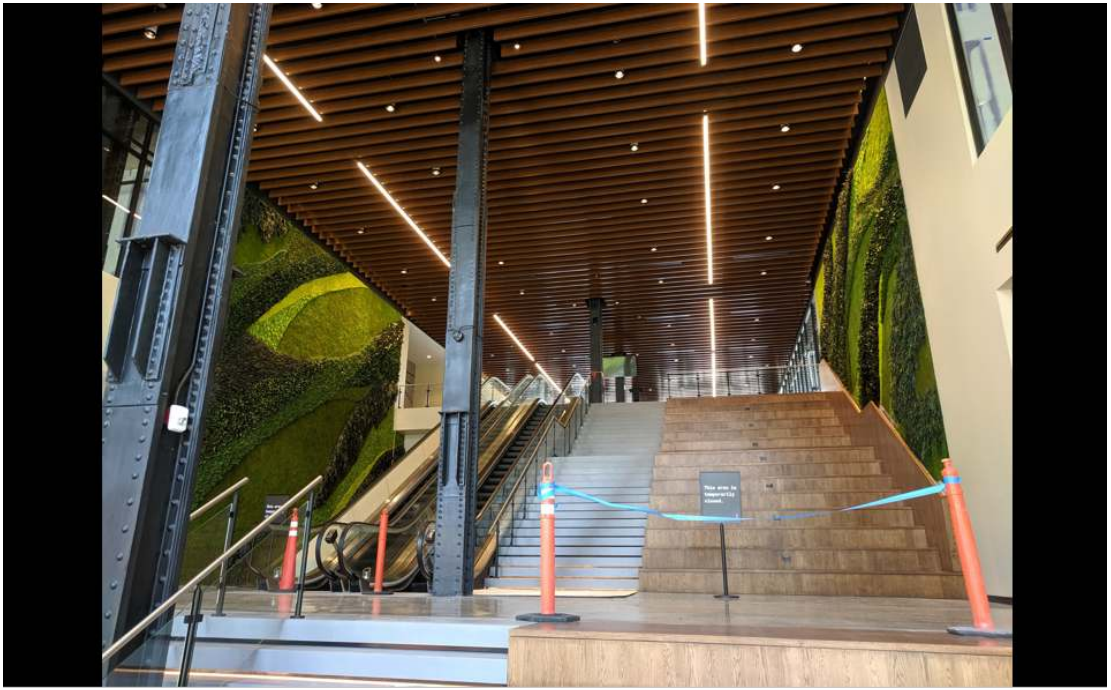

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Preservation of historical features; Safe and Railway

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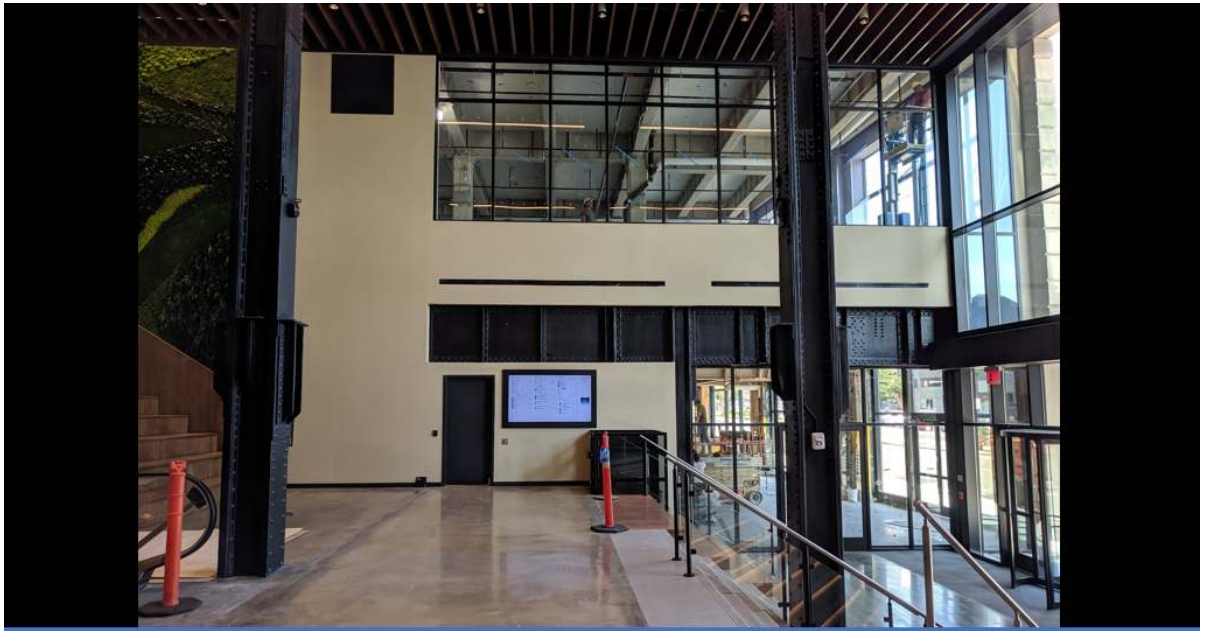

New Main entrance lobby

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Mulberry Common Park

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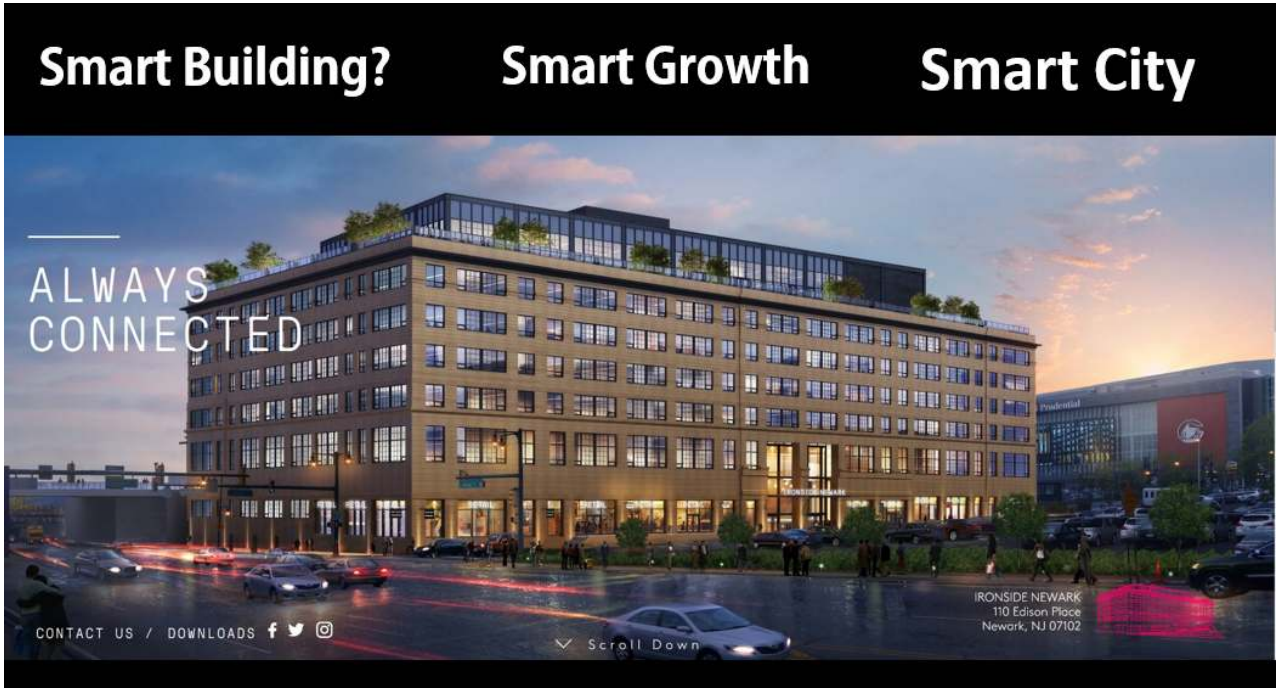

Courtesy of Edison Properties and Perkins Eastman Architect

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IRONSIDE NEWARK is a 450,000 square foot six-story renaissance revival built in 1907. It accommodated railroad freight storage and train deliveries entering through the second floor. The conversion from a warehouse to a mixed-use retail, and office space is to foster innovative, modern-style office spaces, private penthouse, and roof terrace with 360-degree views of Newark and the Manhattan skyline. Being reinterpreted, resolved, and revitalized in compliance with current Building Code, standard and practice, all challenges have been faced by design teams collaboratively and responsively.

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