



NORTHEASTERN UNIVERSITY

Boston Campus

Interdisciplinary Science and Engineering Building BCDC BRIEFING PACKAGE

Submitted to

Boston Redevelopment Authority

One City Hall Square
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Prepared by

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Table of Contents

1.0	PROJECT SUMMARY/OVERVIEW	1-1
1.1	Proposed Project	1-1
1.2	Project Site	1-3
1.3	Detailed Project Description	1-4
2.0	GENERAL INFORMATION	2-1
2.1	Project Proponent / Background Information	2-1
2.2	ISEB Public Benefits.....	2-1
2.3	Compliance with Boston Zoning Code.....	2-2
	2.3.1 Current Northeastern Zoning	2-2
	2.3.2 Future Zoning Controls.....	2-2
2.4	Public Review Process	2-3
3.0	URBAN DESIGN COMPONENT	3-1
3.1	Detailed Building Design	3-1
	3.1.1 Height and Massing.....	3-1
	3.1.2 Exterior Building Materials and Architectural Expression	3-1
3.2	Detailed Site Design	3-2
	3.2.1 Vehicular Access and Egress	3-2
	3.2.2 Pedestrian Environment	3-2
	3.2.3 Other Landscaping Features/Amenities/Open Space	3-3
3.3	Sustainable Design/Energy Conservation	3-3
3.4	Project Design Drawings	3-4
4.0	PROJECT INFORMATION	4-5
4.1	List of Permits or Other Approvals Which May be Sought	4-5
4.2	Project Team Information	4-6

List of Figures

Figure 1-1: Site Locus Plan	1-2
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List of Tables

Table 1-1: Approximate Project Dimensions.....	1-4
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List of Appendices

Appendix A: Design Drawings Figures 3-1 through 3-30

1.0 PROJECT SUMMARY/OVERVIEW

1.1 Proposed Project

This Boston Civic Design Commission Briefing Package is being submitted on behalf of Northeastern University (Proponent) for the Integrated Science and Engineering Building (ISEB), a proposed new building within the Northeastern institutional master plan area on a portion of the university's 3.44 acre surface parking area (Columbus Lot) located at 795 Columbus Avenue between the Renaissance Park Parking Garage and the Columbus Parking Garage, south of the MBTA tracks within its Campus land area (Project Site).

The proposed ISEB involves development of a new building of approximately 197,000 GSF, under the Boston Zoning Code, consisting of research and office space for new faculty, interdisciplinary research clusters / collaborative space, specialized teaching labs, classrooms, and student space. There will also be a ground level café, open to the public on the Columbus Avenue side. Also included in the project is the construction of pedestrian track crossings that will span the MBTA Orange Line, Commuter Rail and Mainline AMTRAK (all referred to as the railroad tracks), thereby linking the Project Site to the academic side of the campus (Proposed Project). See **Figure 1-1. Site Locus Plan**.

Relationship of ISEB to Northeastern Institutional Master Plan

Northeastern's recently filed Institutional Master Plan (IMP), in accordance with Article 80D of the Code, includes this Proposed Project as one of Northeastern's institutional master plan projects. The IMP has been submitted under separate cover to the Boston Redevelopment Authority. The Proposed Project is consistent with the IMP's proposed build-out and open space configuration of Columbus Lot, which could ultimately consist of three to five buildings for academic, student experience, and event use (with some future underground parking) and linked connections. The project responds to the goals of the IMP by integrating the following concepts:

- Enhancing the physical environment by making significant improvements to an existing parking lot.
- Improving the Columbus Avenue landscape through the creation of an urban plaza and upgrades to the Southwest Corridor Park providing an open campus that engages with its neighbors.
- Increasing activity and vitality at the edge of campus along Columbus Avenue.
- Linking the South Campus to the Main Campus and linking the Roxbury Community to the Fenway Community across the rail corridor.
- Integrating the landscape development with the campus network and Forsyth Street Improvements.
- Developing a sustainable and innovative building and campus landscape.

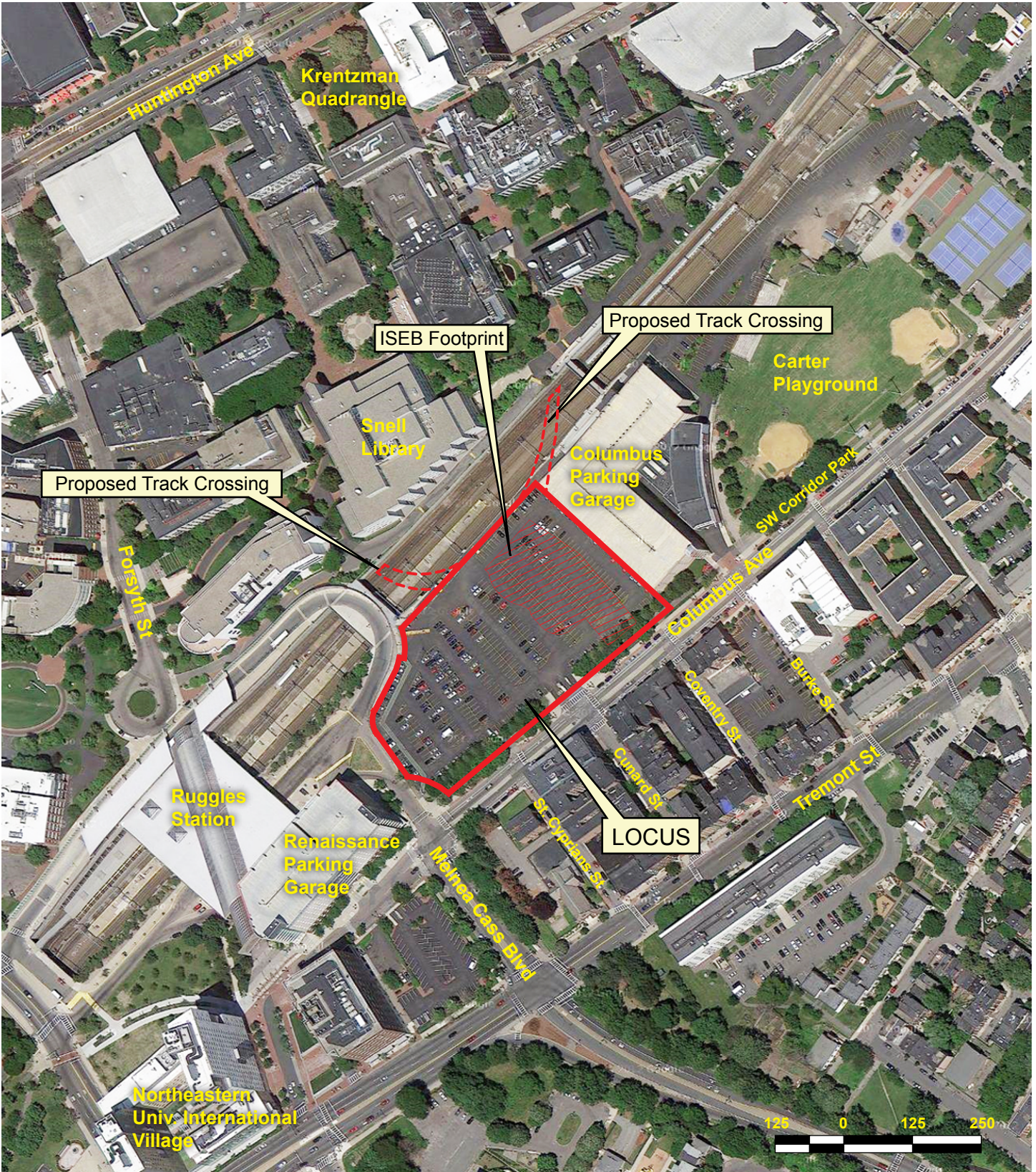


Figure 1-1.
Locus Plan
Scale: 1" = 250'-0"

1.2 Project Site

Northeastern University's proposed Interdisciplinary Science and Engineering Building (ISEB) is a new building of approximately 197,000 GSF, under the Boston Zoning Code, to support the University's long range academic plan providing improved state-of-the-science research facilities for new faculty. The new facility will support teaching and interdisciplinary research programs in four University Colleges:

- College of Science
- College of Engineering
- Bouvé College of Health Science
- College of Computer and Information Science

The building provides new open, efficient, flexible and adaptable research laboratories arranged to support the needs of proposed interdisciplinary research clusters. Office space and formal and informal meeting spaces essential to collaborative work are organized around a central atrium space defining a robust research community on the upper floors (2-6). Academic teaching space including specialized teaching labs, classrooms, and a 280-seat auditorium animate the lower floors (1-2). Research core laboratories are at the basement level.

The main concept for the development of the site is integration, connecting communities across the existing rail corridor; the Lower Roxbury Community connecting to the Fenway Community and the Northeastern South Campus connecting to the Core Campus. Development of the ISEB and its landscaped open space brings campus activity directly to Columbus Avenue and supports the Master Plan improvements for the Columbus Avenue streetscape and Southwest Corridor Park. The increased University presence on Columbus Avenue also creates an opportunity to improve pedestrian connections, open space and streetscape amenity shared with the surrounding community.

The design does not turn its back on the tracks. Instead, the design of both site and building open up to and are integrated with a new pedestrian track crossing. The construction of this pedestrian track crossing spanning the rail corridor provides an accessible landscape integrated with the campus open space network and linking the communities.

The Project brings an aggressive sustainable approach both to the building's exterior envelope design, energy efficiency in support of the demanding laboratory programs, and features integrated within the development of the site and landscape.

1.3 Detailed Project Description

The plans for the proposed ISEB include a basement, six levels above grade, and a mechanical penthouse. The first floor provides an on grade front door to the south at Columbus Avenue. The second floor provides access to the pedestrian track crossings via a new Arc Bridge and entry from the academic campus to the north and connecting Columbus Avenue and the South Campus Precinct with the main Northeastern Core Campus Precinct. (See **Table 1-1. Summary of ISEB Project Information**).

Table 1-1: Summary of ISEB Project Information	
Category	Proposed ISEB Project
Lot Area:	Approximately 150,000 square feet (approximately 3.5 Acres)
Ground Floor Building Footprint Area:	Approximately 32,115 square feet
Total (Zoning) Gross Floor Area ¹ :	Approximately 197,000 square feet
Floor Area Ratio:	Approximately 1.3
Height ¹ :	Approximately 87 feet
Maximum Number of Stories (not including penthouse):	6-stories
Parking Spaces:	0
Construction Commencement:	4th Quarter of 2013
Construction Completion:	3rd Quarter of 2016
Approximate Construction Cost:	\$165 Million

¹ Gross Floor Area and Height as defined by the Boston Zoning Code.

The development of the Columbus Lot provides an opportunity to strengthen Columbus Avenue as a main campus corridor and continues the established momentum of expanding the Northeastern campus south across the MBTA tracks. An increased University presence on Columbus Avenue also creates an opportunity to improve pedestrian connections, open space and streetscape amenity shared with the surrounding community.

2.0 GENERAL INFORMATION

2.1 Project Proponent / Background Information

Since the early 1990s, and more intensively over the last decade, Northeastern University has developed a national and even global reputation for research and academic rigor. From a one-time high of 20,000 undergraduates, mostly commuters, the university now has approximately 15,000 undergraduates, of whom more than 2,000 per semester have lived outside Boston, a trend that has held steady for several years. Graduate student enrollment, including all full- and part-time students in graduate and law programs, on campus and online, was approximately 6,700 in 2012, and is projected to increase to 10,700 by 2021; the bulk of the increase is expected to come in online programs and at satellite campuses in other cities, as the university's global reputation for research and knowledge creation rises.

While the University has had a successful trajectory of its academic reputation and achievements, it has also retained a significant stock of older academic facilities, many of which are not well suited to contemporary research and instruction. The Interdisciplinary Science and Engineering Building as the first new academic building of the 2013 Institutional Master Plan will provide crucial new academic and research space for the University. The building will provide space for new research faculty in support of the University's long range academic plan.

2.2 ISEB Public Benefits

The new ISEB Project will provide a number of benefits to the City and its residents including:

- Providing academic science and engineering space to address the needs of Northeastern;
- Providing pedestrian track crossings to connect the ISEB with the main Northeastern Campus as well as provide a better link to the Fenway Community through the Campus and over the railroad tracks from Columbus Avenue and Lower Roxbury neighborhoods;
- Enhancing community access to the Ruggles MBTA and Commuter Rail station;
- Constructing new open space and sidewalks/pathways with enhanced landscaping adjacent to the Project site along the north side of Columbus Avenue;
- Enhancing the quality of the building design and vitality of Columbus Avenue with a well-designed high performance building that will animate the Columbus Avenue streetscape;
- Providing sustainable design and green building features to promote energy conservation and to comply with the provisions of Article 37 of the Boston Zoning Code; and
- Projecting to create approximately 630 new construction jobs and approximately 700 full time (faculty, staff, other) jobs.

2.3 Compliance with Boston Zoning Code

2.3.1 Current Northeastern Zoning

Northeastern's current leased and owned facilities are located within a large area on both sides of the MBTA/ AMTRAK/ Commuter Rail tracks generally bounded by Ruggles and Gainsborough Streets, and both sides of Huntington and Columbus Avenue. The campus area north of the tracks is within the Fenway Neighborhood District (Article 66); a small area of the campus north of Parker Street is within the Mission Hill Neighborhood District (Article 59); and the campus area south of the tracks is within the Roxbury Neighborhood District (Article 50).

In the Fenway Neighborhood District, Northeastern's facilities and land fall within an Institutional Subdistrict (IS), an Institutional Master Plan Overlay District and the Groundwater Protection District. In the Mission Hill Neighborhood District, Northeastern's Burstein Rubenstein parcels fall within an Institutional Master Plan Area. In the Roxbury Neighborhood District, Northeastern's facilities and land fall within the Greater Roxbury Economic Development Area (EDA) and Institutional Master Plan Area.

2.3.2 Future Zoning Controls

ISEB Project

The proposal for the ISEB project includes a new mixed use building of approximately 197,000 GSF consisting of research and office space for new faculty, interdisciplinary research clusters / collaborative space, specialized teaching labs, classrooms, and student space. Also included in the project is the construction of pedestrian track crossings that will span the MBTA Orange Line, Commuter Rail and Mainline AMTRAK rails. The building plans show a basement, six levels above grade, and a mechanical penthouse. The first floor provides an on grade front door to the south at Columbus Avenue, and a café, open to the public. The second floor provides access to the pedestrian track crossings and entry from the academic campus to the north. This second level pedestrian track crossing by the ISEB connects communities across the existing rail corridor; the Roxbury Community connecting to the Fenway Community and the Northeastern South Campus connecting to the Core Campus

Effect of Zoning Approval

The ISEB Project will be developed in accordance with Northeastern's IMP and is located within the Greater Roxbury Economic Development Area (EDA) and Institutional Master Plan Area.

Accordingly, provided the ISEB receives a Certification of Consistency with the IMP and a Certification of Compliance under Large Project Review, the Project will be "deemed to be in compliance with the use, dimensional, parking and loading requirements of the underlying zoning (including special purpose overlay districts established pursuant to Section 3-1A),

notwithstanding any provision of the underlying zoning to the contrary, and without the requirement of further Zoning Relief” (Zoning Code, §80D-11).

2.4 Public Review Process

The Proposed Project has been discussed with the Northeastern Community Task Force (CTF) at meetings earlier this year and the University will continue discussions with the CTF, elected officials, and interested parties during the public comment period.

3.0 URBAN DESIGN COMPONENT

3.1 Detailed Building Design

3.1.1 Height and Massing

The proposed ISEB is 6 stories (plus mechanical penthouse) with a maximum height to the roof of the highest occupied floor of approximately 87 feet as measured from grade to the top of highest occupiable floor as defined by the Boston Zoning Code, and approximately 128 feet at the highest point of the mechanical enclosure. The ISEB has a total zoning gross floor area of approximately 197,000 square feet and 228,000 GSF, including mechanical spaces.. The height and area of the ISEB is consistent with the guidelines established for the Columbus Lot within the Institutional Master Plan.

The building extends from Columbus Avenue toward the tracks along the length of the existing Columbus Avenue Parking Garage. The building massing has been organized in two main volumes; an east facing laboratory bar and a west facing office form wrapped around a central open atrium space. The east laboratory bar is a taller height structure, which includes a mechanical penthouse level. The west facing office mass is approximately 30 feet lower facing the central open landscape space.

The first floor provides an on grade front door to the south facing Columbus Avenue. Active academic teaching and conference programs on this level surround the ground floor of the atrium. This space includes a café supporting both indoor and outdoor seating. Both the site and interior atrium step up to the second floor and provide direct access to/from the pedestrian track crossing.

3.1.2 Exterior Building Materials and Architectural Expression

The architectural expression responds to this site's unique forces of connectivity and integration that extend the connected landscape of the campus across the tracks, gathering multiple campus paths together with the street patterns to the south. This collection and channeling of tributaries (similar to a watercourse) has been visually interpreted in the organic forms of the building, the arc shaped pedestrian track crossing, and the landscape development.

The building will be clad with a fully glazed curtainwall consistent with the intent to have a visually open design placing science on display. This will also bring the active visual presence of the 24/7 research laboratory operations to the site. The high performance curtainwall envelope will balance the openness with insulating spandrels to achieve the thermal performance requirements of the skin. The curtainwall will be wrapped with an outer skin of fixed solar shading responding to the building orientation. Primarily in response to the south and southwest exposure, the building is shrouded with shading devices tuned to the building exposure

configured to create the expressive soft building forms. Careful integration of the curtainwall with the shading systems will minimize thermal bridging to maintain peak performance of the systems.

3.2 Detailed Site Design

3.2.1 Vehicular Access and Egress

Vehicular access to campus and the site along Columbus Avenue will remain largely unchanged. Reduction of on-site parking associated with the development of this project is consistent with current demand profile of the University. Access to the remaining on-site parking will be accomplished through minor modifications to the existing curb cut. Access to the Columbus Avenue Garage will be maintained through the existing curb cut. The third existing curb cut will be relocated to support the proposed service access drive. This drive located east of the new building adjacent to the existing garage will provide access to the building's loading dock facility adjacent to the tracks and well concealed below the track crossing structure.

3.2.2 Pedestrian Environment

The potential for the Columbus Avenue Lot as Northeastern's largest future academic precinct is recognized through the integration of significant open space and the introduction of critical elevated track crossings to improve public connections and to integrate the campus and community on either side of the MBTA rail corridor.

Careful consideration has been given to the arrangement of the new gateway entry to the campus. Consistent with the goals of the IMP for the Columbus Lot, the proposed project provides a new open space along Columbus Avenue, which can serve as an amenity for the both the University and the broader community. This extensive urban plaza extends into the site from Columbus Ave. It creates a visual identity point for the University along the south edge of campus and a very visible entrance to the building set back from the sidewalk. This large multi-purpose space is able to accommodate a wide variety of events and is well activated by programs of the adjacent atrium. This space has the potential to be highly used by students and the community.

The open plaza together with the development of a new sloped landscape walk becomes an extension of the network of open north/south paths leading from the neighborhood streets south of Columbus Avenue to the network of landscaped walks internal to the campus and to the neighborhood streets north of Huntington Avenue beyond.

The sloped landscape creates an accessible path for pedestrians and bicycles from Columbus Avenue up approximately 14 feet to the new landscaped pedestrian track crossing level. The arc shaped track crossing structure creates a generous extension of the campus landscape and an identifiable signature from the rail corridor below. The southern sweep of the arc integrates directly with the new landscape. The two northern landings of the pedestrian track crossings are

positioned to link to existing campus paths, and include an accessible path extending to Forsyth Street completing an accessible route for pedestrians and bicycles.

3.2.3 Other Landscaping Features/Amenities/Open Space

The Proposed Project will enhance the quality of the streetscape and neighborhood by way of a visually open building design, integrated landscape design details, and a durable palette of materials. The Project will further animate Columbus Avenue through hard and soft landscaping and lighting.

The building's "24/7" occupancy will help create a safer street environment and vibrant local community. Combined with the open space design this helps to create a welcoming urban environment and safe pedestrian experience—a significant upgrade from the current parking lot.

The frontage of the site along Columbus Avenue includes an upgrade of the existing infrastructure of Columbus Avenue and Southwest Corridor Park. This parkway serves multiple modes of transportation (i.e. walking, bicycling, etc.), and is integrated into the design of the adjacent open space design.

The landscape is designed for a high level of biodiversity and sustainability. Control of stormwater is achieved by channeling water within the sloped site as a feature terminating in a bioswale rain garden. The existing mature linden trees lining the street will be supplemented with additional trees, contributing to the environment of the streetscape and providing additional carbon sequestration.

3.3 Sustainable Design/Energy Conservation

The Project team will implement sustainable design and energy conservation measures, which will be further developed as the design process continues. Careful review and evaluation of the requirements of Article 37 of the Boston Zoning Code will be undertaken relative to the City's Green Building policies and procedures. The City is actively promoting measures to encourage buildings to decrease energy and water use and cost, improve the efficiency and useful life of building systems and infrastructure, and reduce the burdens imposed by buildings on City services, the environment, and public health.

The Project architectural/engineering/construction team includes several LEED Accredited Professionals. All sustainable strategies will continue to be discussed at length to determine feasible cost-effective and schedule-wise solutions.

System design solutions will be developed in an effort to achieve the targeted LEED credits. The final design and construction of the Project will result in a sustainable building to promote the internal building environmental quality for the occupants, enhance the surrounding neighborhood locally, and reduce environmental impacts globally.

3.4 Project Design Drawings

Design drawings are provided in **Appendix A**. These drawings depicting the Project and photographs of existing conditions are illustrated in **Figures 3-1** through **3-30**.

- Figure 3-1. Site Context: Satellite Imagery
- Figure 3-2. Site Context Aerial: Photography
- Figure 3-3. Context Photograph: Site from West Across Parking Lot
- Figure 3-4. Context Photograph: Site from Southeast along Columbus Avenue from Corner of Melnea Cass Blvd
- Figure 3-5. Context Photograph: Site from Southwest Along Columbus Avenue from Corner of Cunard Street
- Figure 3-6. Context Photograph: Site from Southeast Along Columbus Avenue from Corner of Benton Street
- Figure 3-7. Context Photograph: Site from Southeast Along Columbus Avenue from Corner of Benton Street
- Figure 3-8. Context Photograph: Site from Northeast at Forsyth Circle
- Figure 3-9. Landscape Plan
- Figure 3-10. Lower Level Plan
- Figure 3-11. Level One Plan
- Figure 3-12. Level Two Plan
- Figure 3-13. Level Three Plan
- Figure 3-14. Level Four Plan
- Figure 3-15. Level Five Plan
- Figure 3-16. Level Six Plan
- Figure 3-17. Penthouse Level Plan
- Figure 3-18. Roof Plan
- Figure 3-19. Building Section
- Figure 3-20. Building Section
- Figure 3-21. Building Section
- Figure 3-22. Building Elevation - South
- Figure 3-23. Building Elevation - East
- Figure 3-24. Building Elevation - North
- Figure 3-25. Building Elevation – West
- Figure 3-26. Aerial View from South
- Figure 3-27. Aerial View from North
- Figure 3-28. Rendered View from Southwest along Columbus Avenue at Corner of Melnea Cass Blvd.
- Figure 3-29. Rendered View from Southwest along Columbus Avenue at Corner of Cunard St.
- Figure 3-30. Rendered View from Northwest on Proposed Track Crossing

4.0 PROJECT INFORMATION

4.1 List of Permits or Other Approvals Which May be Sought

<u>Agency Name</u>	<u>Permit or Action*</u>
Federal Agencies	
Federal Aviation Administration	Determination of No Hazard to Air Navigation (Crane Determination To Be Made if over 200 feet)
U.S. Environmental Protection Agency	National Pollutant Discharge Elimination System (NPDES) with associated SWPPP; General Stormwater Permit During Construction; and Temporary Construction dewatering Permit.
Amtrak	Design Review and Approval
State Agencies	
Massachusetts Department of Transportation (MDOT); MBTA/TRA	Access to Tracks; Land Transfer for the pedestrian crossings; curb-cut permit or modification, if required
Massachusetts DOT	Review of Former Railroad Right of Way Land pursuant to G.L. Ch.40, Section 54 A of the MA code. (Former Railroad Land); Curb-cut permit or modification, if required
Massachusetts Department of Conservation and Recreation (DCR)	Curb-cut permit or modification, if required
Massachusetts Department of Environmental Protection, Division of Water Pollution Control	Sewer Connection Self Certification
Massachusetts Department of Environmental Protection, Division of Air Quality Control	Fossil Fuel Utilization Permit –MGL c111 section 142A-E; Notice of Commencement of Construction WBP-AQ06
Massachusetts Historical Commission	State Register Review under 950 CMR 71.00 (May include consultation with Boston Landmarks Commission)
Massachusetts Bay Commuter Rail	Design Review and Approval
Massachusetts Water Resource Authority	Industrial Wastewater Discharge Permit

4.2 Project Team Information

Project Name: Integrated Science and Engineering Building	
Property Owner:	<p>Northeastern University 360 Huntington Avenue Boston, MA 02115</p> <p>Jim Cahill j.cahill@neu.edu, (617) 373-3415 Nancy May n.may@neu.edu, (617) 373-2700 David Navick d.navick@neu.edu, (617) 373-3848 Kathy Spiegelman k.spiegelman@neu.edu, (617) 373-6194 Stephen Spear s.spear@neu.edu, (617) 373-2582 John Tobin j.tobin@neu.edu, (617) 373-3168</p>

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<p>Code Consultant:</p>	<p>Sullivan Code Group 302 Union Street Boston, MA 02109</p> <p>Kevin Hastings, ksh@rwsullivan.com, 617-523-8227</p>
<p>Cost Estimating Consultant:</p>	<p>Vermeulens 9835 Leslie Street Toronto, ON L48 3Y4</p> <p>James Vermeulens, jvermeulens@vermeulens.com, 617-835-6823 Riv Manning, manning@vermeulens.com, 905-787-1880 x 117</p>
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<p>Wind, Reentrainment, Air Quality and Solar Glare Engineer:</p>	<p>Rowan Williams Davies & Irwin Inc. 650 Woodlawn Road West Guelph, Ontario, Canada N1K 1B8</p> <p>Ray Sinclair, Ph.D., ray.sinclair@rwdi.com, 519-823-1311 x2243 Sonia Beaulieu, M.Sc., P.Engineering, sonia.beaulieu@rwdi.com, 519-823-1311 x 2429</p>
<p>Daylight Consultant:</p>	<p>Vanasse Hangen Brustlin, Inc. (VHB) 99 High Street 10th Floor Boston, MA 02110</p> <p>Chris Gervais, cgervais@vhb.com, 617-728-7777</p>

APPENDIX A: DESIGN DRAWINGS: FIGURES 3-1 THROUGH 3-30



NORTHEASTERN UNIVERSITY
Boston Campus

Interdisciplinary Science and Engineering Building
BCDC Briefing Package

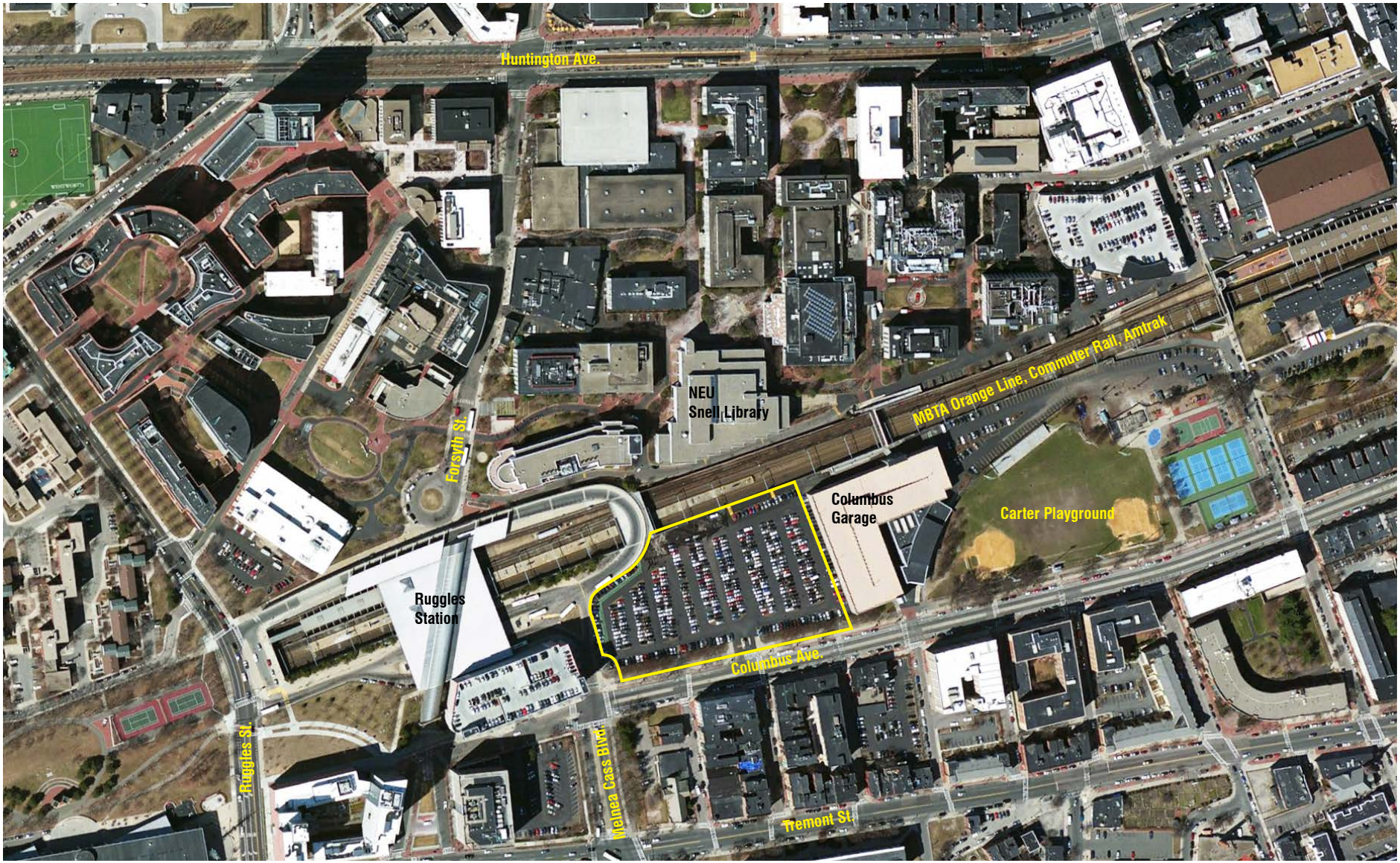


Figure 3-1.
Site Context: Satellite Imagery



NORTHEASTERN UNIVERSITY
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Interdisciplinary Science and Engineering Building
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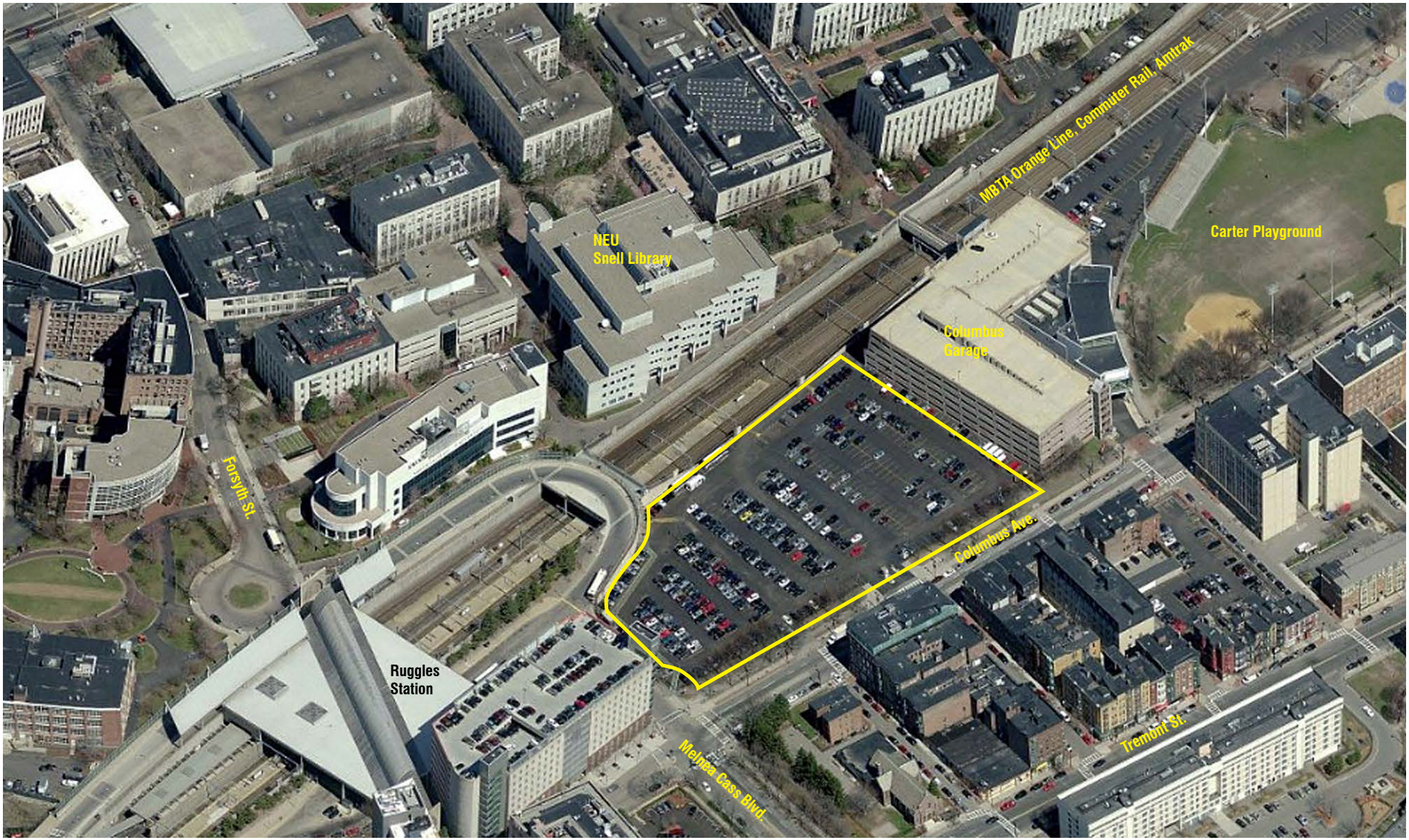


Figure 3-2.
Site Context: Aerial Photography



NORTHEASTERN UNIVERSITY
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Interdisciplinary Science and Engineering Building
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Figure 3-3.
Context Photograph
Site From West Across Parking Lot



No Build



Build



No Build



Build



No Build



Build



No Build



Build



No Build



Build



Figure 3-9.
Landscape Plan

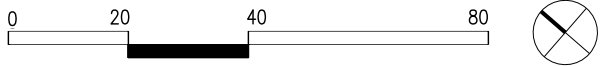


Figure 3-10.
Lower Level Plan - Core Labs / Mechanical
Scale: 1/32" = 1'-0"



NORTHEASTERN UNIVERSITY
Boston Campus

Interdisciplinary Science and Engineering Building
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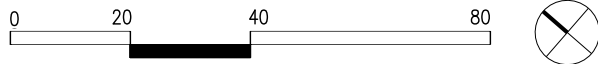
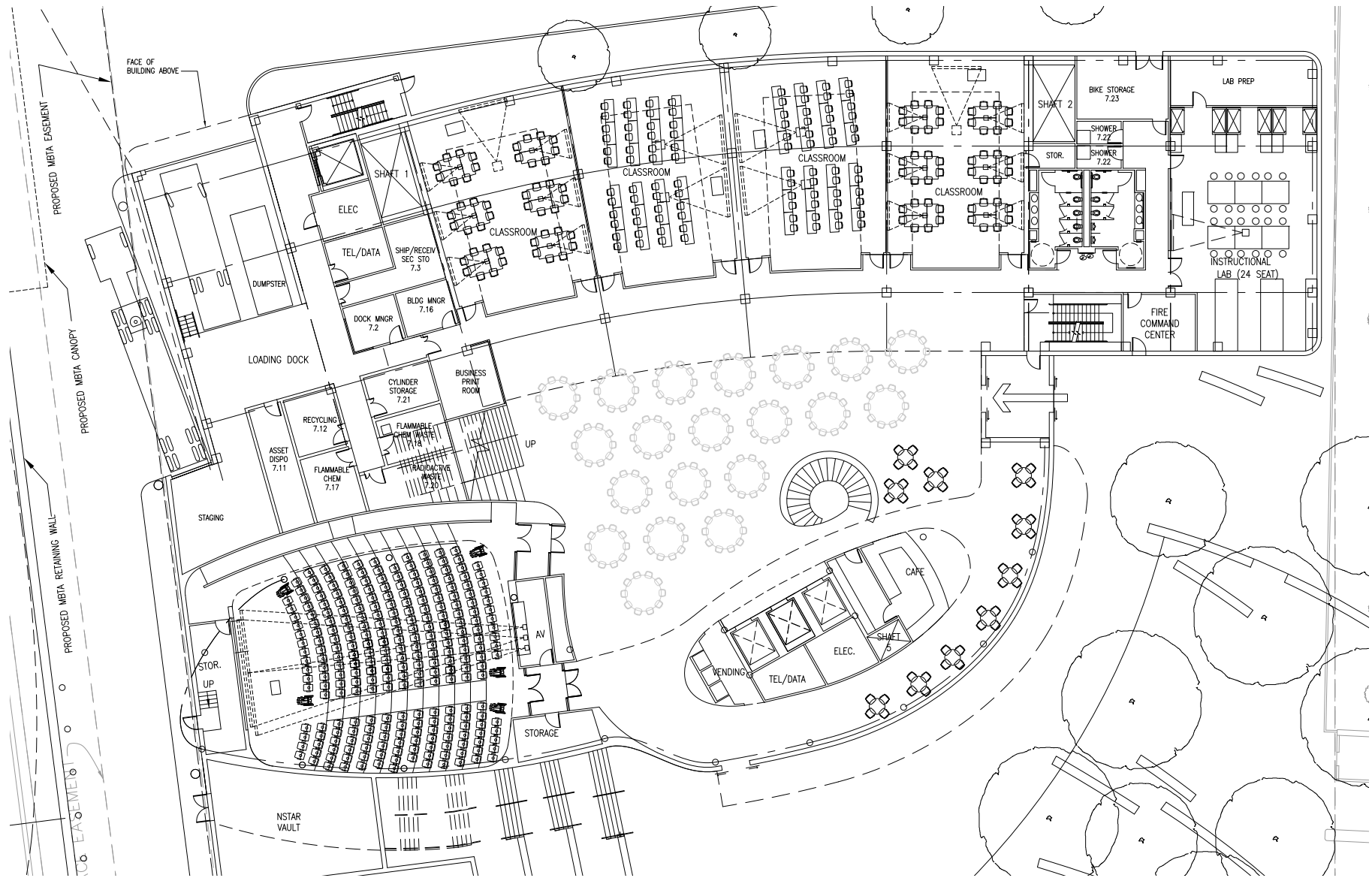


Figure 3-11.
Level One Plan - Teaching / Bldg Support
Scale: 1/32" = 1'-0"

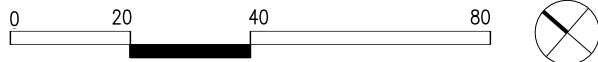
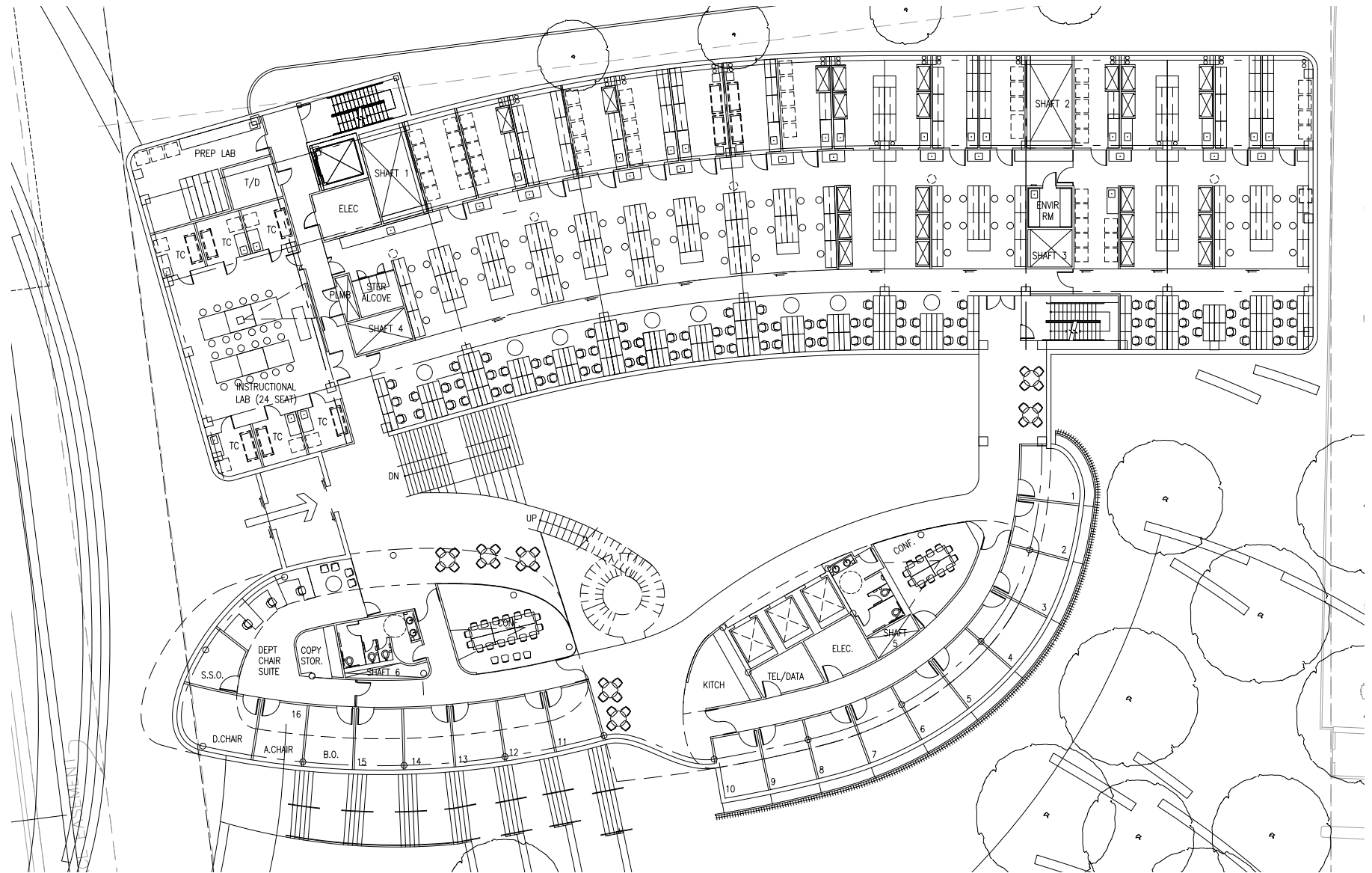
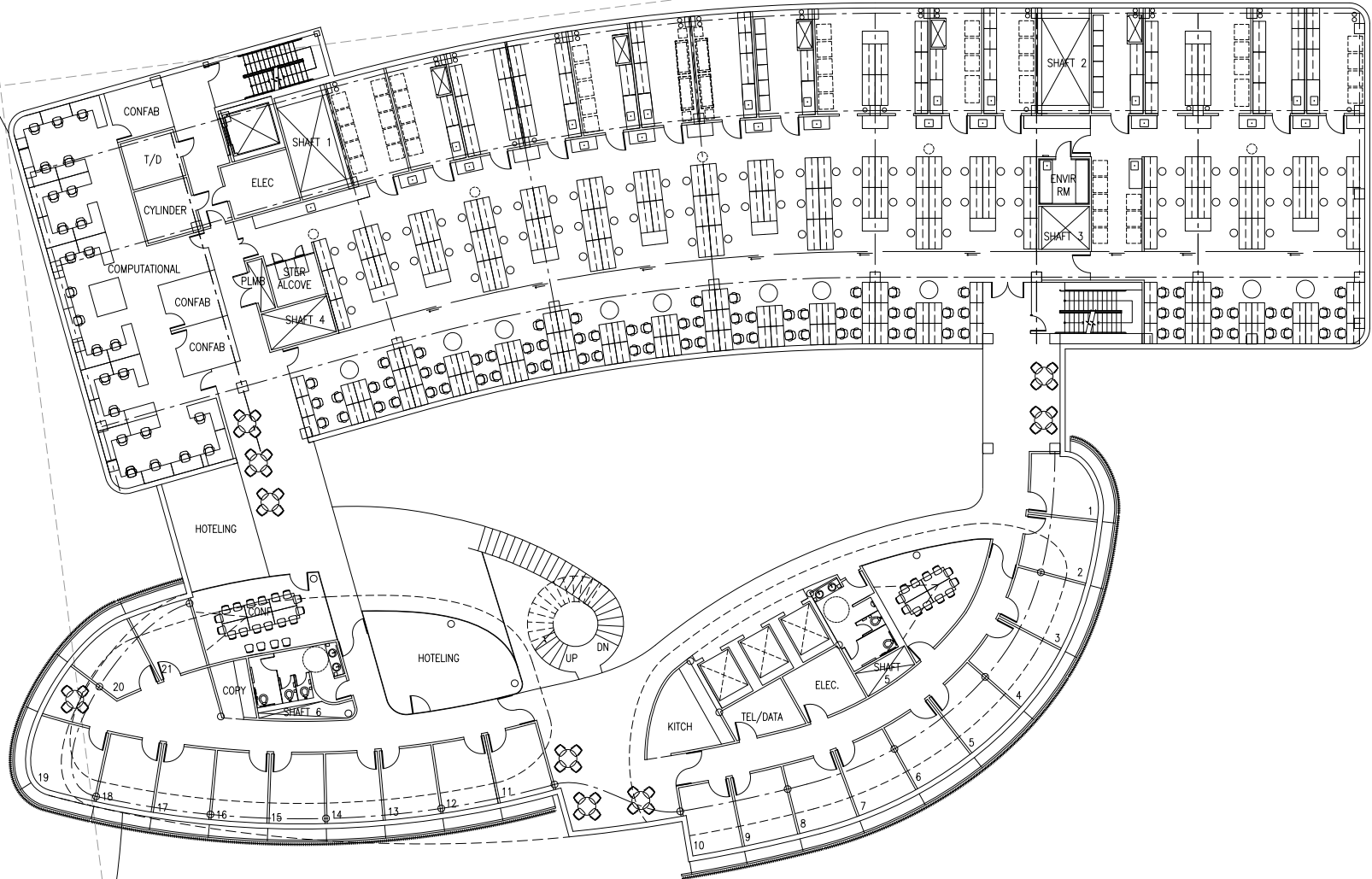


Figure 3-12.
Level Two Plan - Admin / Teaching / Research
Scale: 1/32" = 1'-0"



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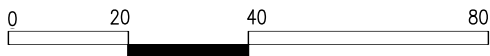


Figure 3-13.
Level Three Plan - Research
Scale: 1/32" = 1'-0"

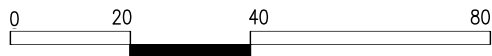
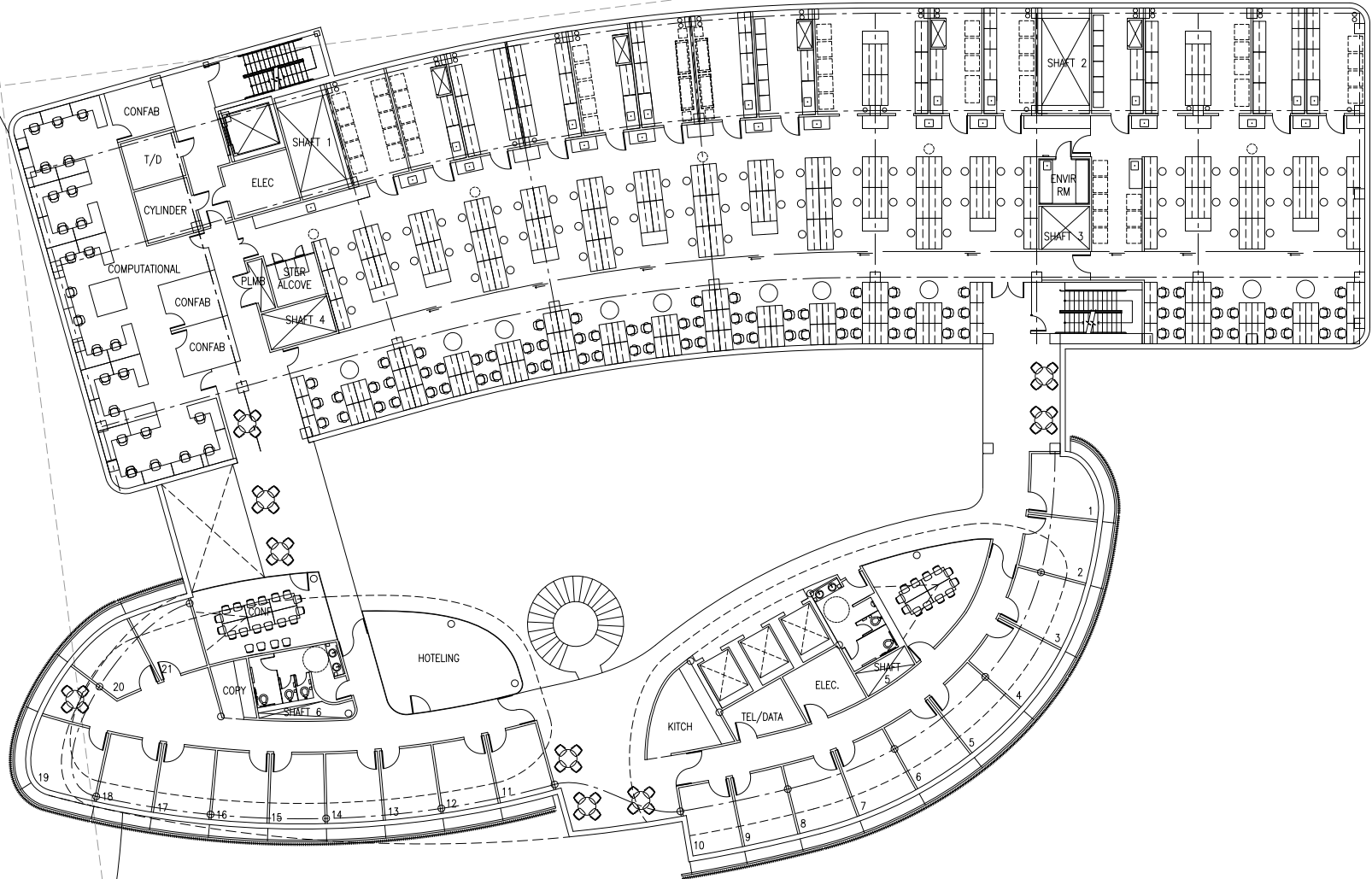
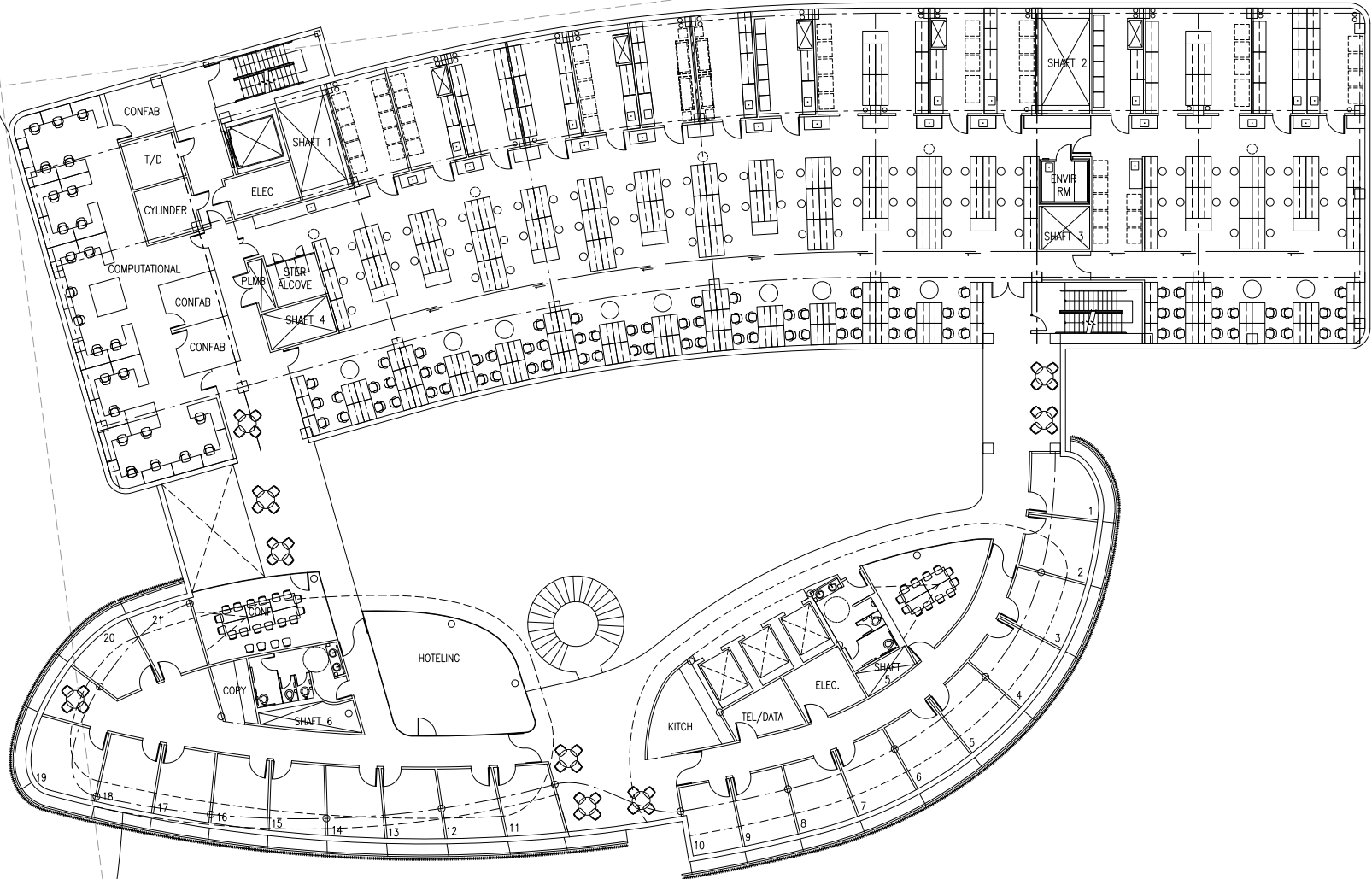


Figure 3-14.
Level Four Plan - Research
Scale: 1/32" = 1'-0"



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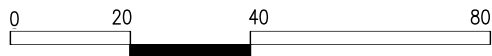


Figure 3-15.
Level Five Plan - Research
Scale: 1/32" = 1'-0"

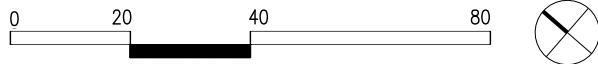
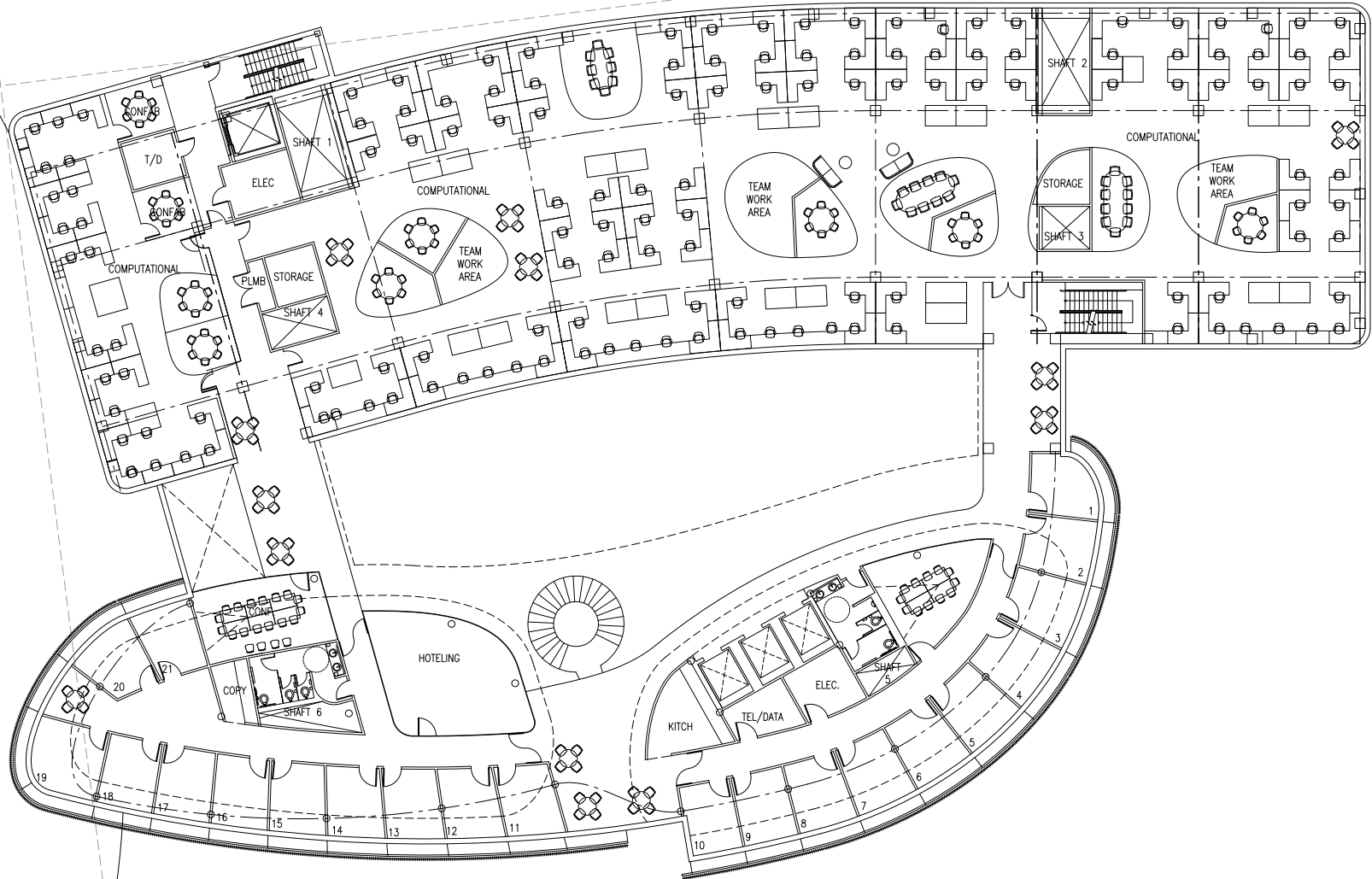


Figure 3-16.
Level Six Plan - Research
Scale: 1/32" = 1'-0"

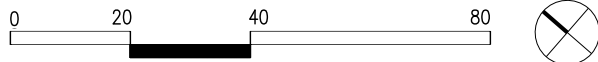
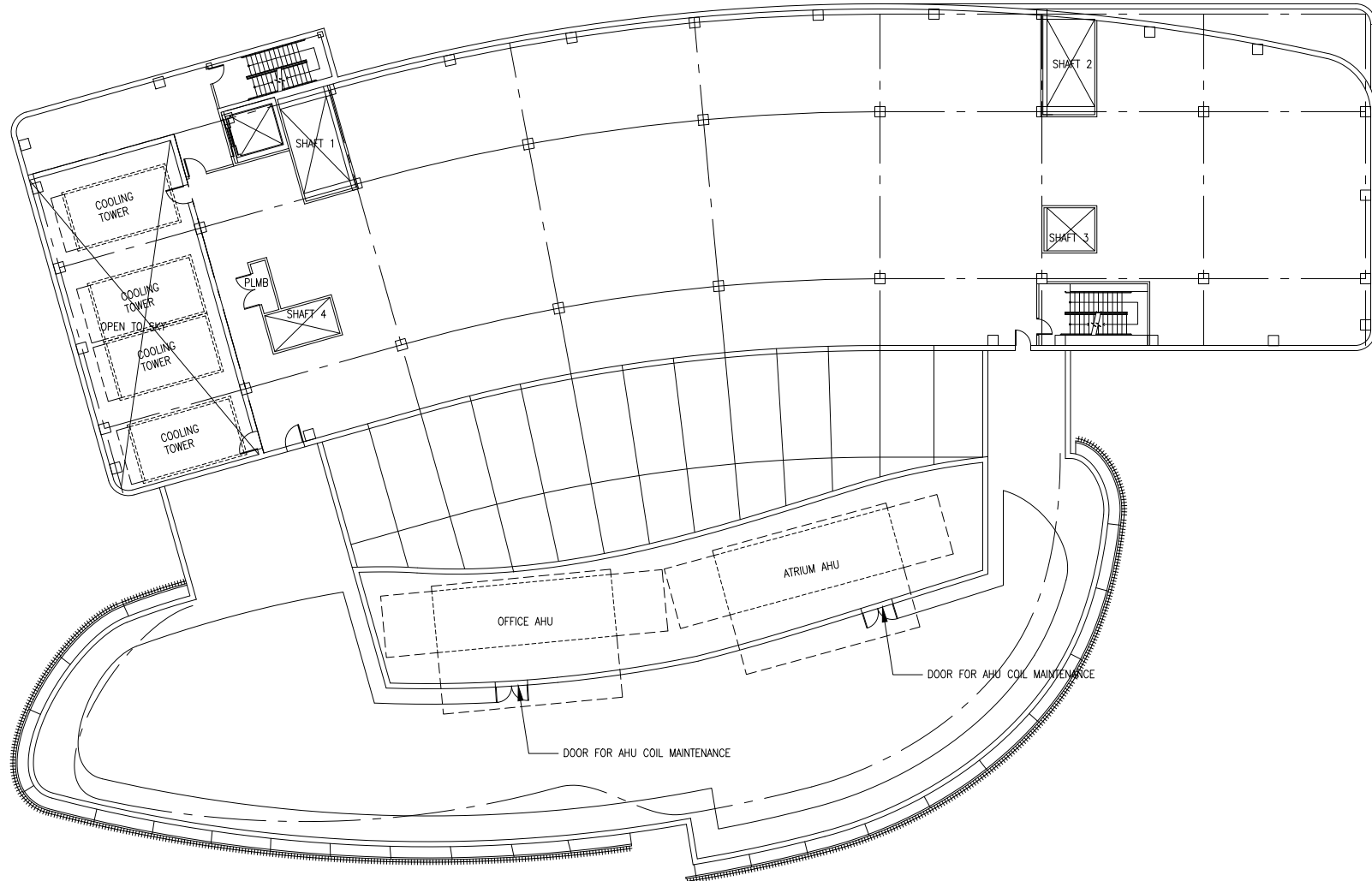


Figure 3-17.
Penthouse Level Plan - Mechanical
Scale: 1/32" = 1'-0"

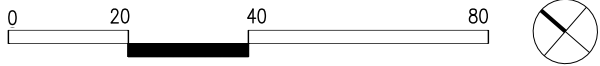
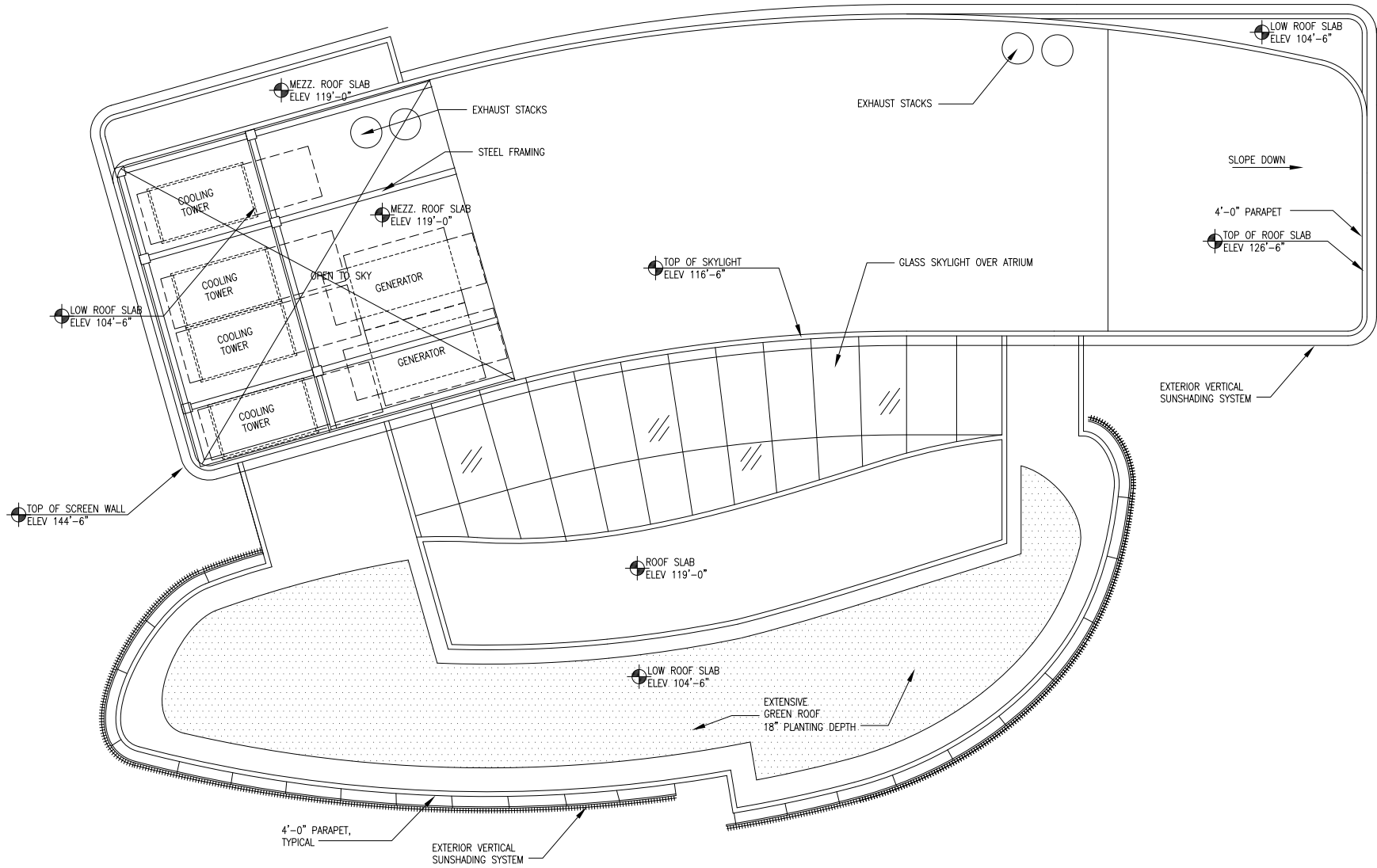


Figure 3-18.
Roof Plan
Scale: 1/32" = 1'-0"



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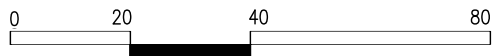
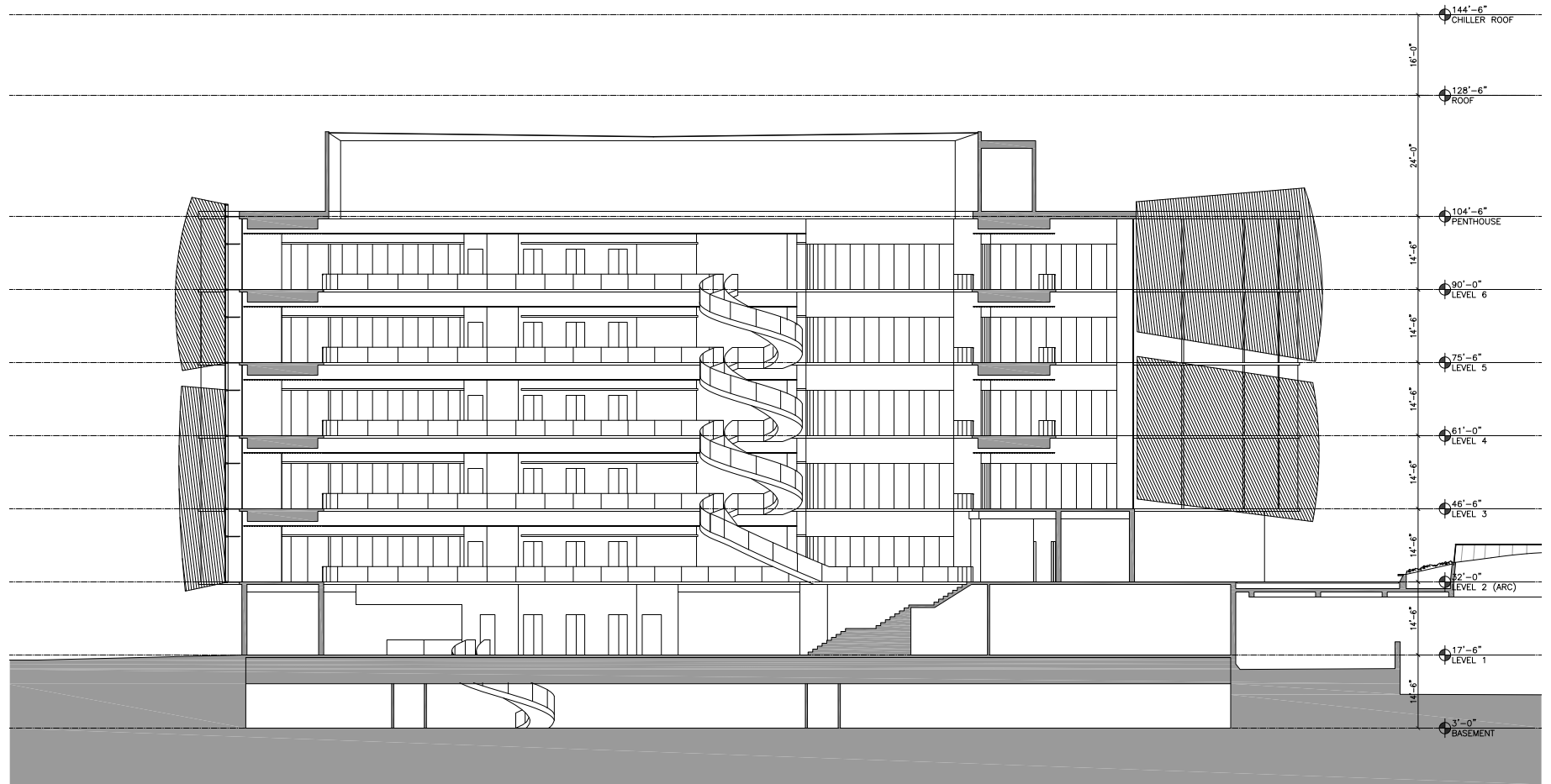
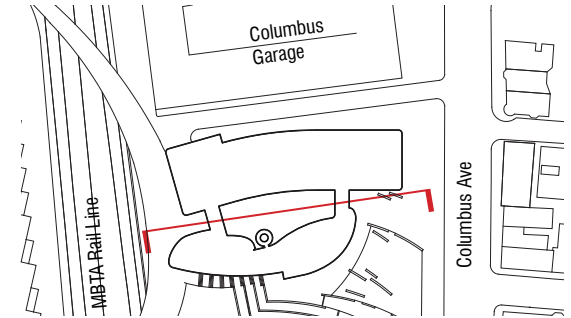


Figure 3-19.
Building Section
Scale: 1/32" = 1'-0"



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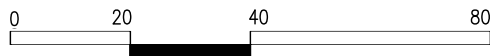
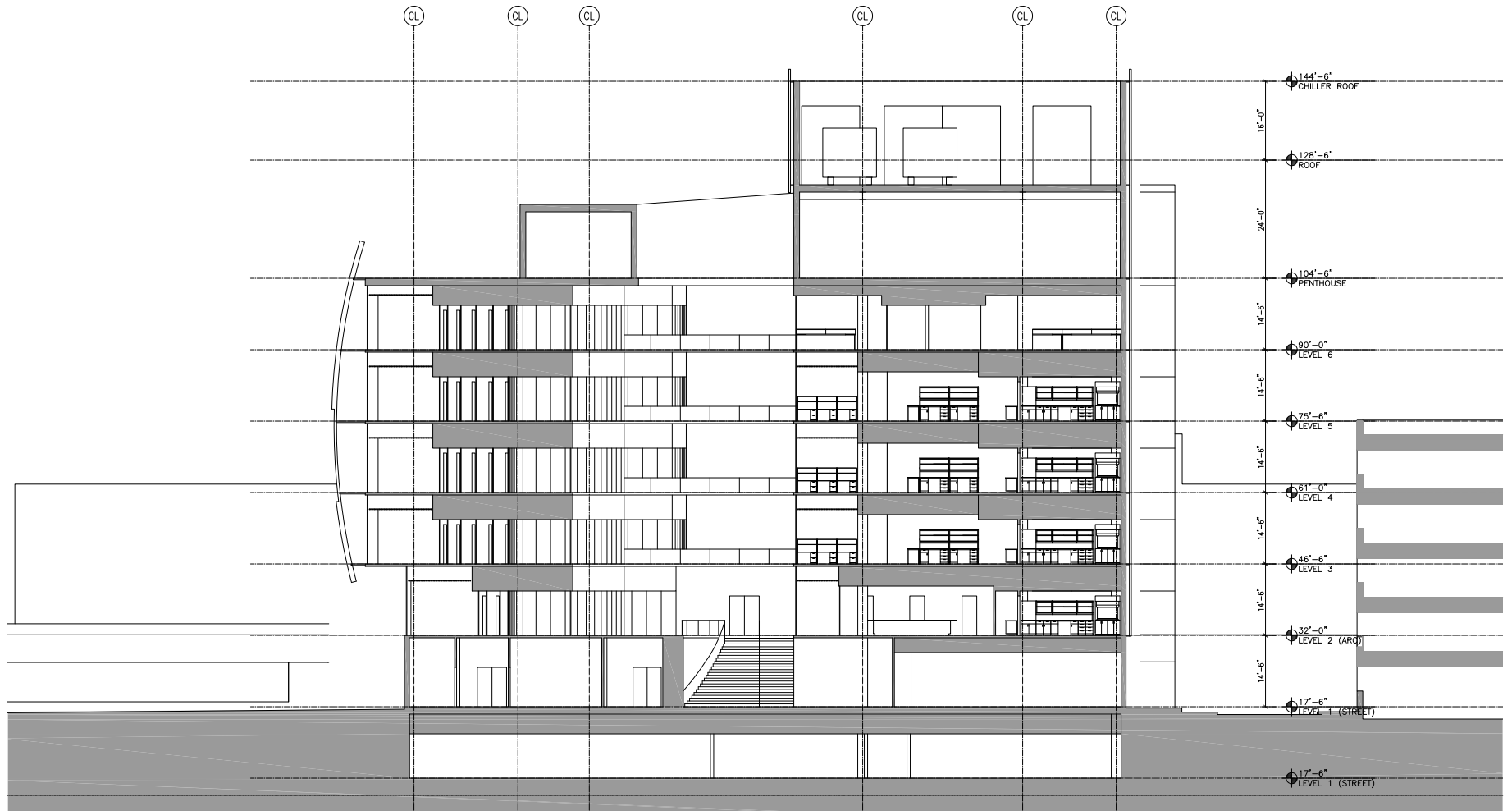
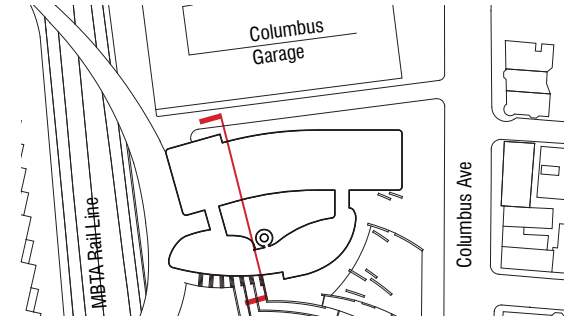


Figure 3-20.
Building Section
Scale: 1/32" = 1'-0"



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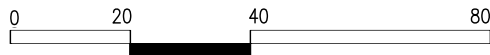
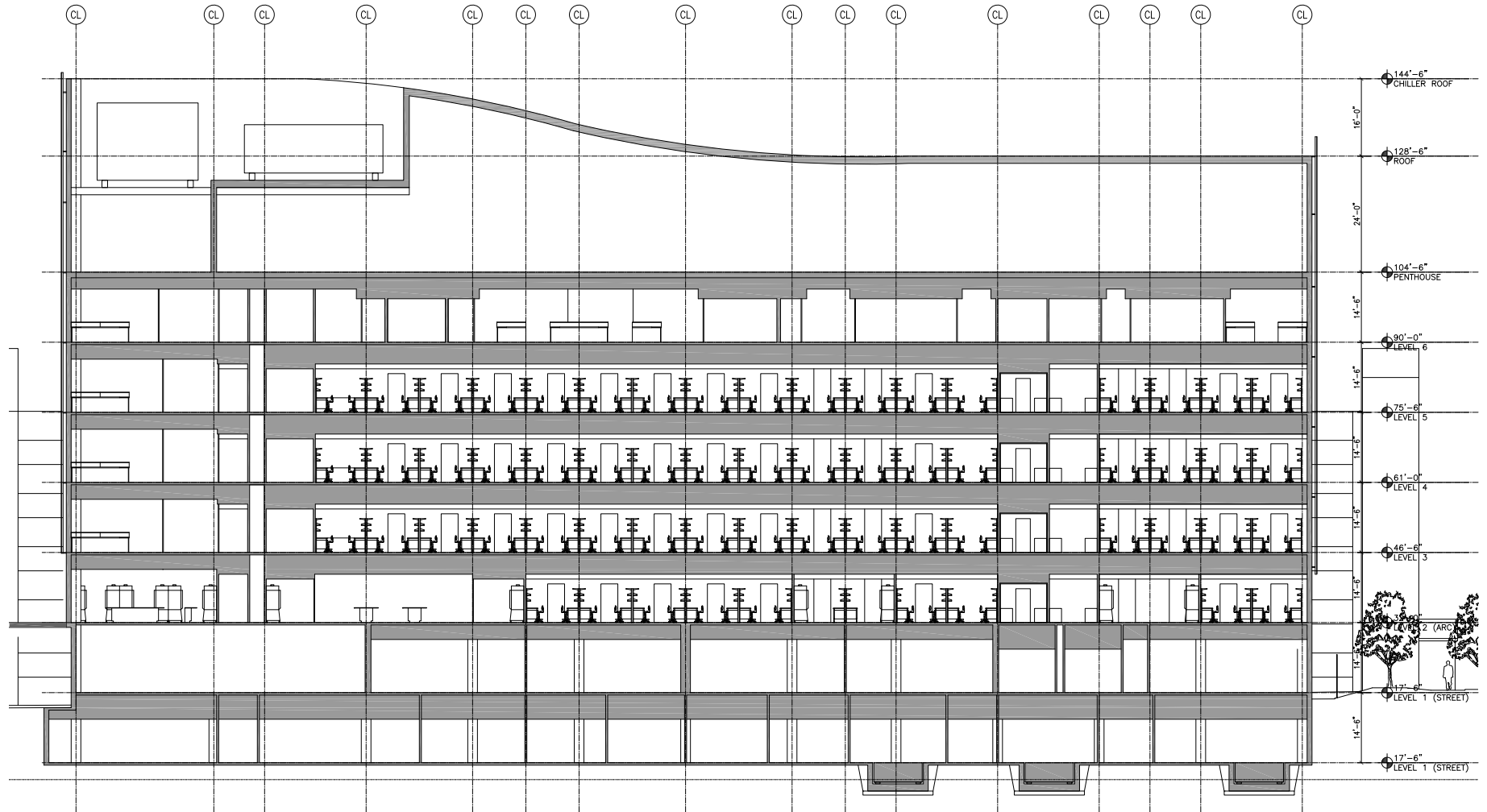
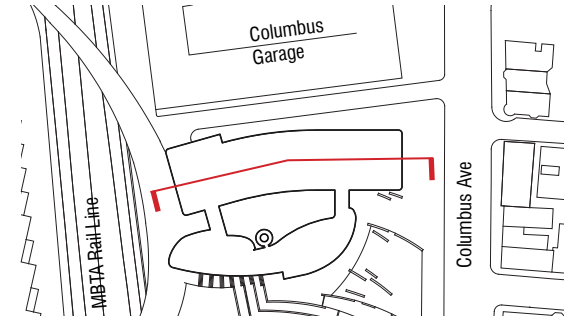


Figure 3-21.
Building Section
 Scale: 1/32" = 1'-0"

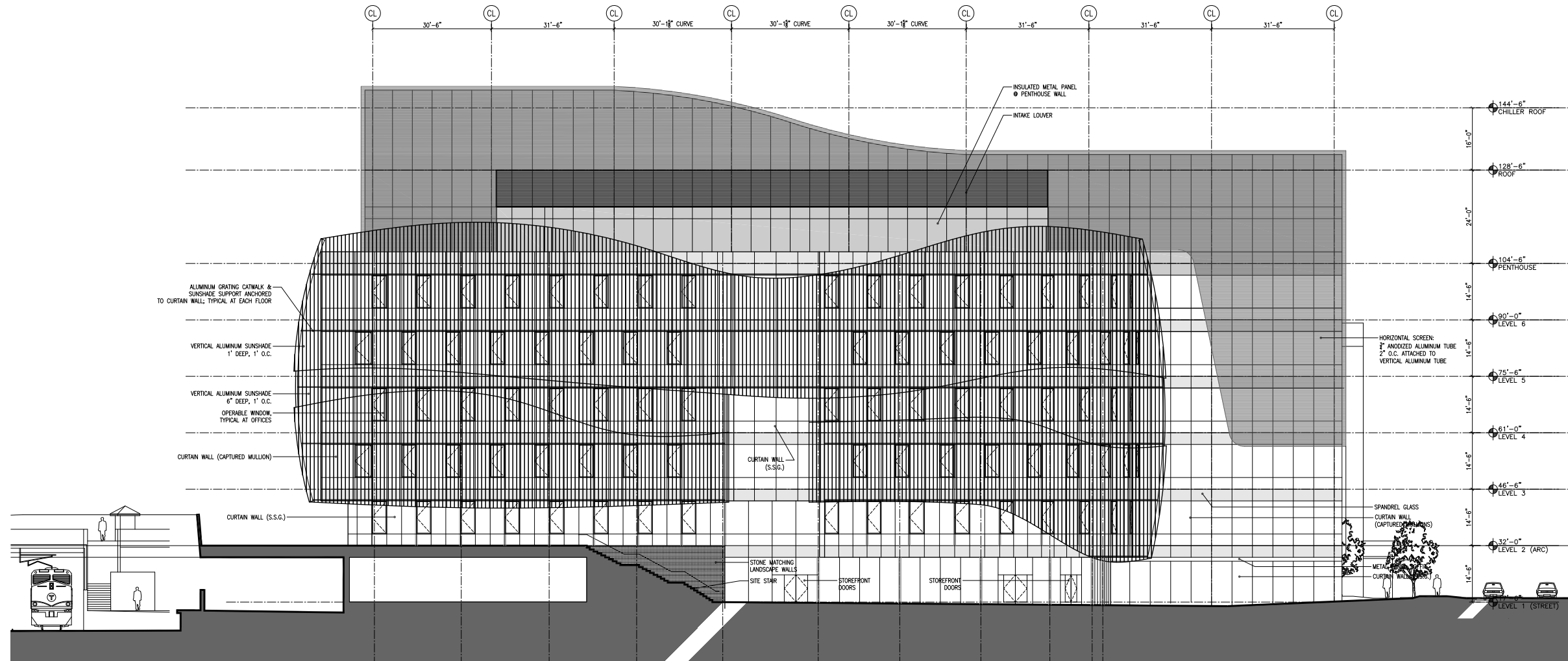
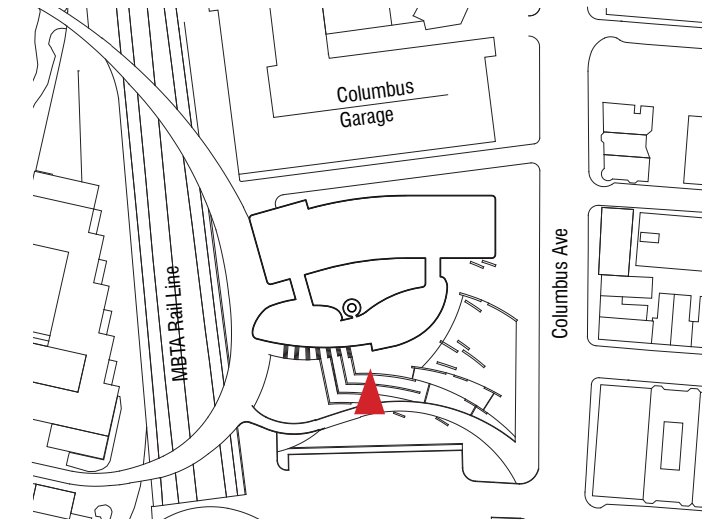


Figure 3-22.
Building Elevation - South
 Scale: 1/32" = 1'-0"

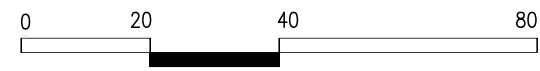
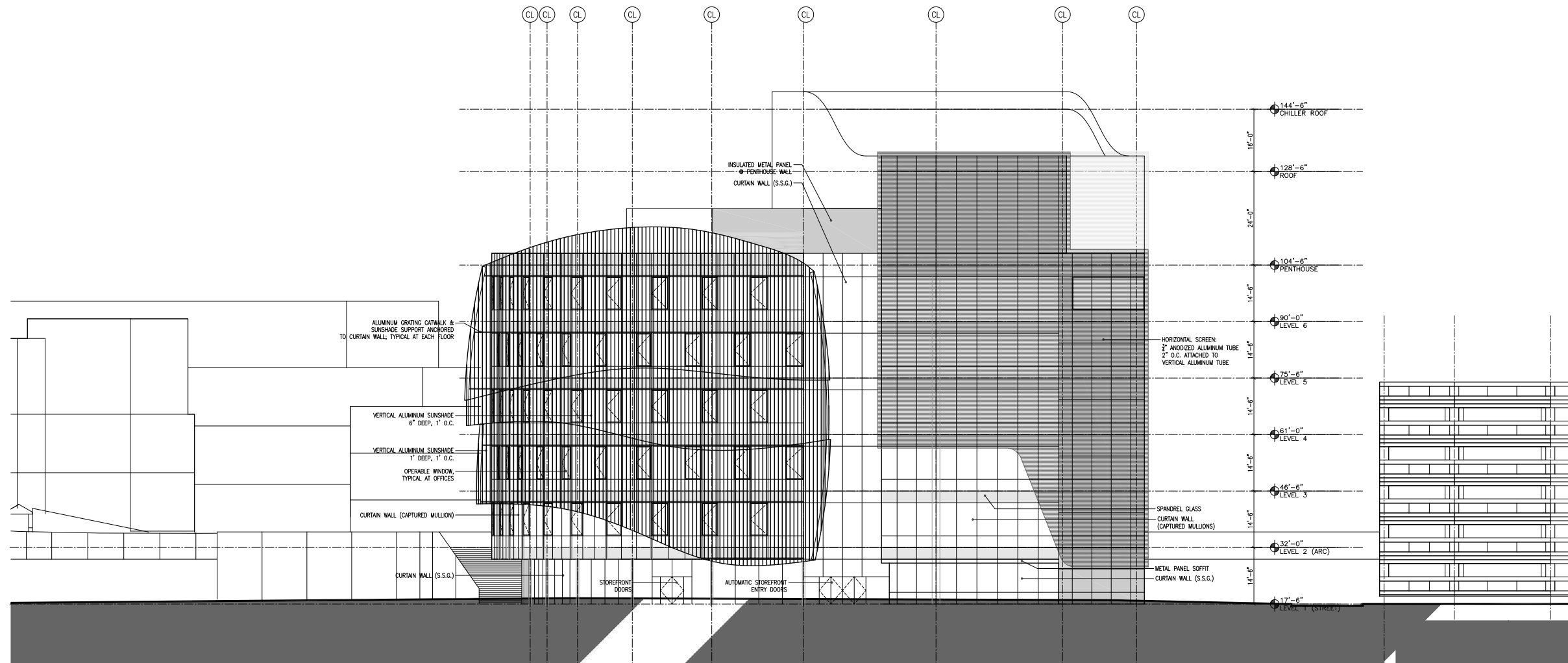
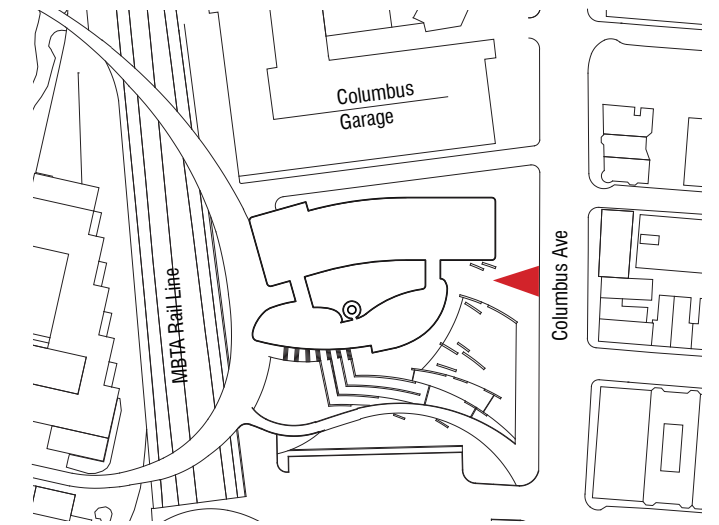


Figure 3-23.
Building Elevation - East
Scale: 1/32" = 1'-0"

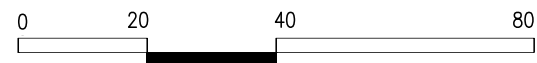
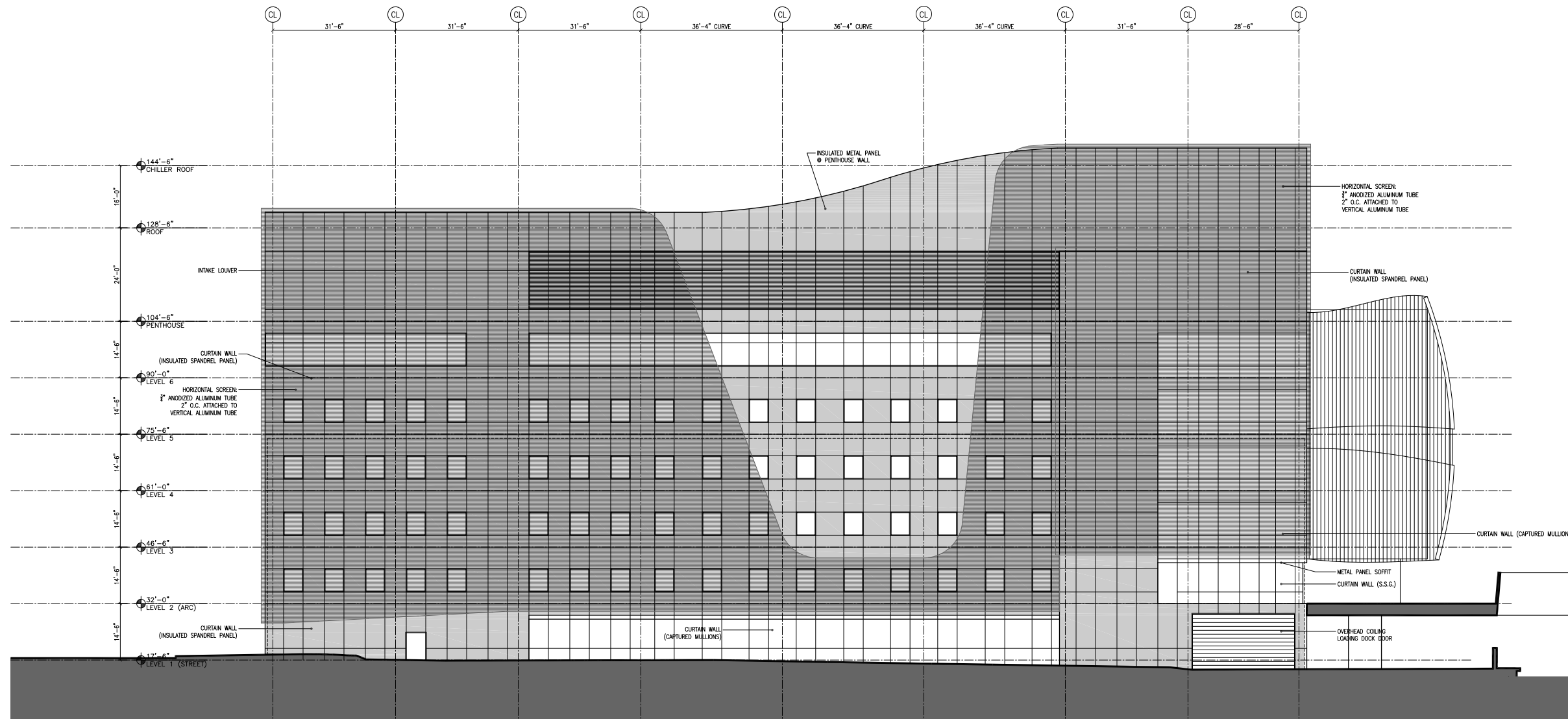
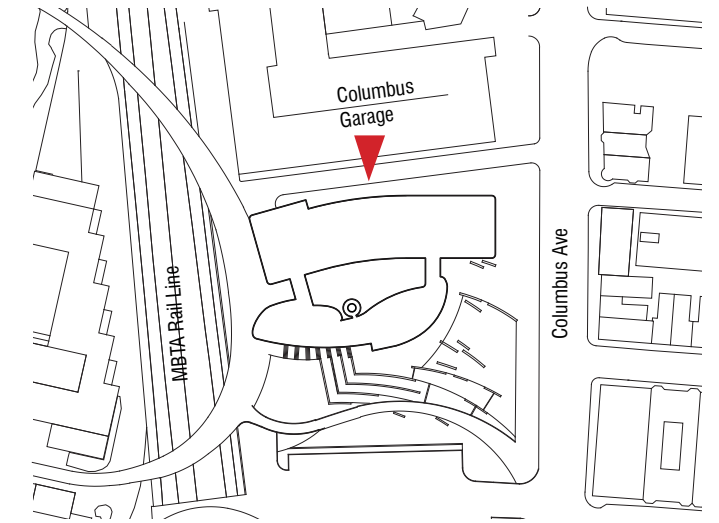


Figure 3-24.
Building Elevation - North
 Scale: 1/32" = 1'-0"

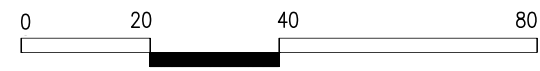
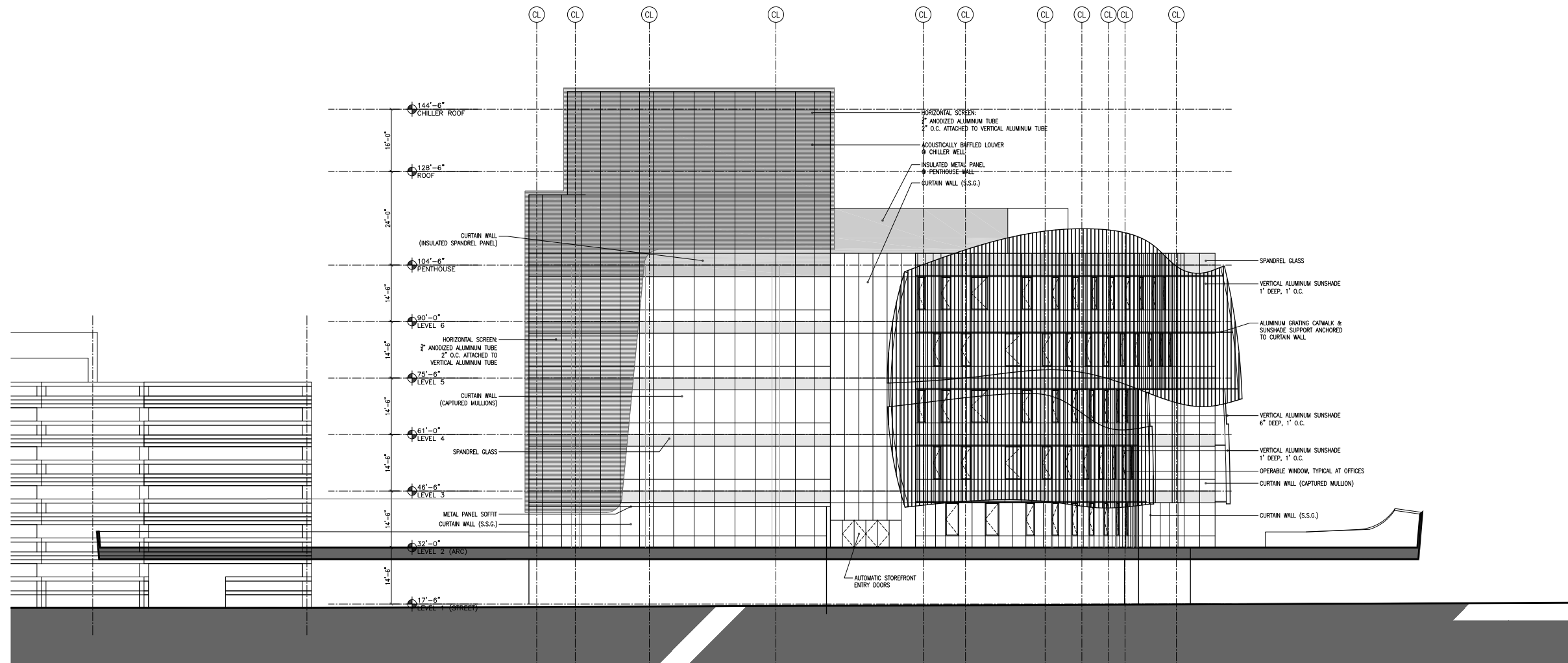
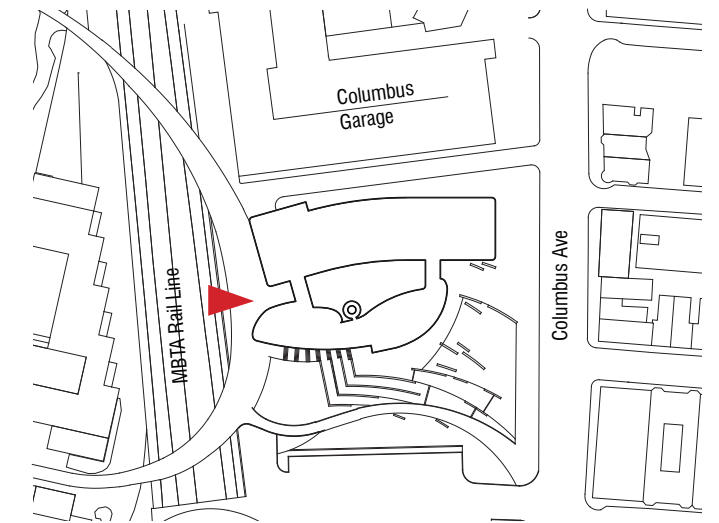


Figure 3-25.
Building Elevation - West
 Scale: 1/32" = 1'-0"



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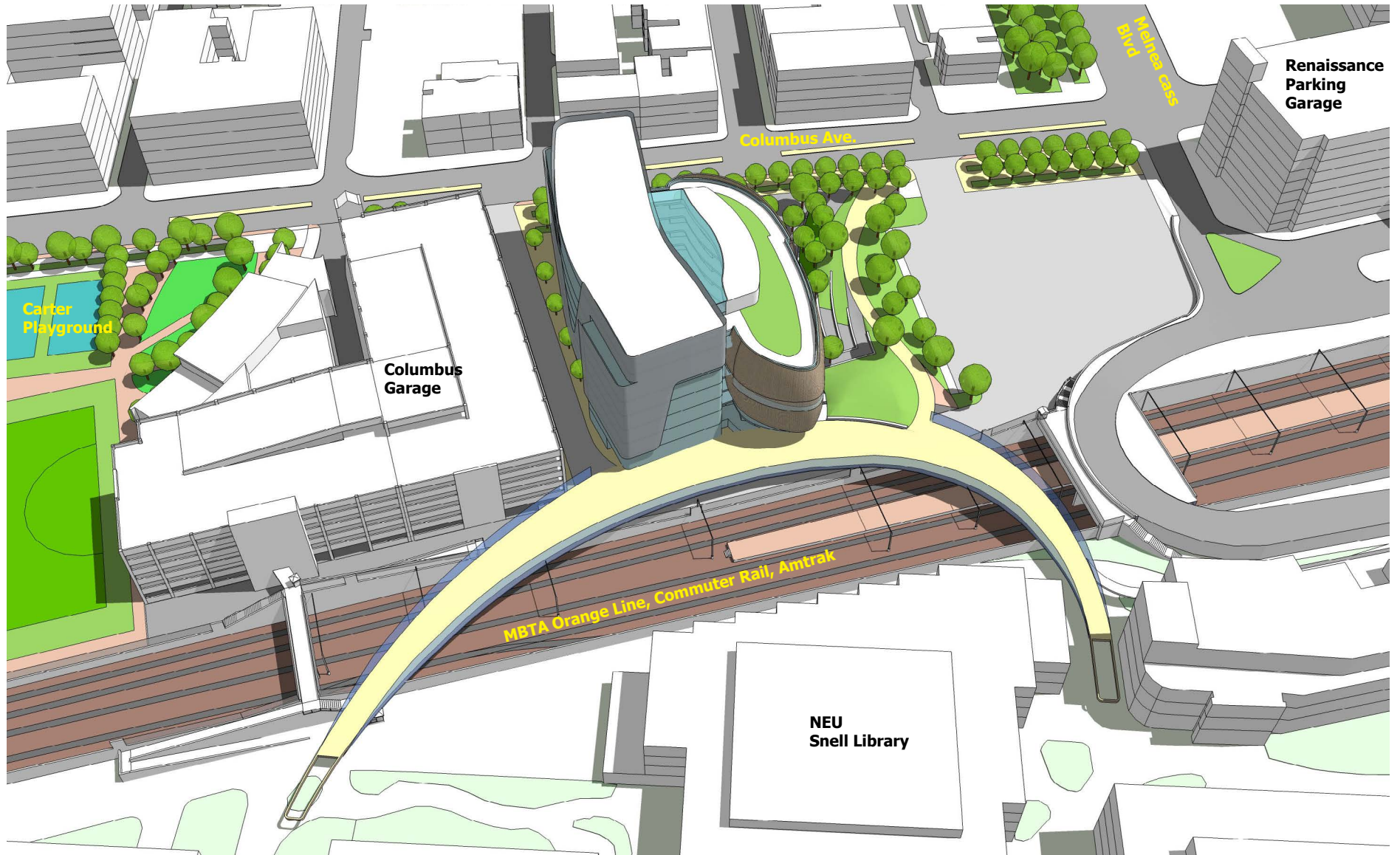
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Figure 3-28.
Rendered View from Southwest along Columbus
Ave at corner of Melnea Cass Blvd.



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Figure 3-29.
Rendered View from Southwest along
Columbus Ave at corner of Cunard St.

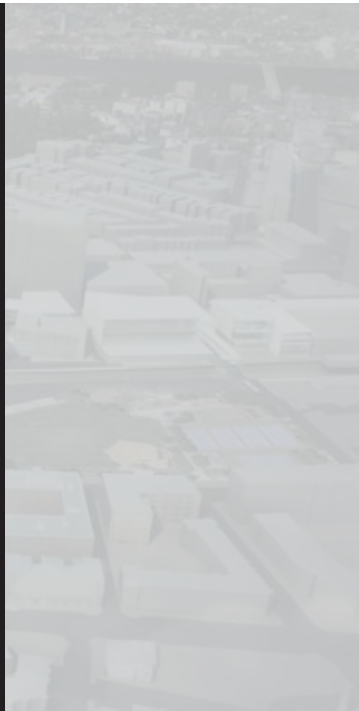


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Figure 3-30.
Rendered View from Northwest
on Proposed Track Crossing



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