Russell Voigt
Construction Option
Advisor Ed Gannon
Louis at 14th
Washington, D.C.
16 September 2013
Technical Report #1

Executive Summary

Located in northwest Washington, D.C. at the corner of 14th St & U St, JBG Companies has proposed a nine-story LEED Silver certified concrete high-rise with retail spaces at street level and 268 luxury apartment units throughout the majority of the building.

-rendering provided by JBG Companies

JBG Companies is the primary owner of the building receiving consulting services from Georgetown Strategic Capital. It is the main business model of JBG Companies to develop real estate into profitable opportunities that enhance the community of the Washington Metropolitan Area. The schedule is the most critical element of their priorities because the sooner they can turn over the residential spaces to their tenants, the sooner they can begin leasing space. JBG Companies also prides itself in providing the highest quality products in the community, with the budget the most flexible of these critical elements. The retail spaces shall be turned over to the tenants first as warm & lit spaces only, no finishes or interior work is required for this contract. It was originally scheduled that two floors at a time would be turned over per completion, but recent events suggest that the residential spaces will be turned over on two separate dates reliant on the completion of each floor.

This job was delivered via design-bid-build, Eric Colbert & Associates being the head architect and Balfour Beatty Construction acting as the construction manager-at-risk. Balfour Beatty Construction was awarded the guaranteed maximum price contract after conducting their best & final offer with the other low bidder. Their subcontractors were hired based mainly on their low bid and scope of work, although their past

relationships with Balfour Beatty, their prequalifications, financial strength, and bonding capacity were strongly considered, as well.

On the design team is Bowman Consulting acting as the civil engineer, SK & A Group as the structural engineer, Summit Engineers as the MEP engineer, and Cecconi Simone as the interiors consultant. Balfour Beatty Construction awarded Miller & Long Concrete Construction the concrete contract, TD Industries the HVAC contract, Berlin Steel the metals contract, Inspiration Plumbing Company the plumbing contract, and Electric General Corp the electrical contract.

The management team of Balfour Beatty Construction is headed by one project executive directing one project accountant, three superintendents, and one project manager. The project manager leads a team of two assistant project managers and one project engineer who have assumed responsibilities primarily based on trades of work. The proposed building is located on a challenging lot, as occupied buildings crowd three sides of the proposed building footprint and is restricted by 14th street on the east side. Due to these adjacent buildings, piles supporting excavation work were required to be drilled instead of driven because of noise & vibration concerns. Potential complaints constantly threaten the temporary shutdown of operations on a day-by-day basis. The proposed 9-story building will tie into the existing historic preservation area on the north side in which the Balfour Beatty Construction field office is located.

Temporary jobsite parking on the NW corner of the property can be accessed through the public alley, but once work has sufficiently progressed in the parking garage on the south side, it will be used for parking to allow work to continue on the northern footprint. All adjacent buildings are three stories or less, so potential tower crane interferences are minimal; however, space is needed east of the building footprint on the existing sidewalk (as pictured), so the municipality shall be paid to close the sidewalk and parking meters to utilize that space and redirect pedestrian traffic through the street parking spaces with overhead protection. The primary entrance & exit shall be on 14th street with flagmen directing pedestrians and traffic for deliveries or as needed.

The R.S. Means SF estimate yielded a higher cost than the original construction budget, but this is likely due to the primary wall construction of the actual building being less labor intensive than that available in R.S. Means Square Foot Costs 2012. For 8-24 story apartment buildings, the closest exterior wall type was “Face brick with Concrete Block Backup.” Although there are CMUs on the actual building, they only continue from the foundation up to just above grade, not the entirety of the building height, which

is a poured-in-place concrete frame with a combination of glazing systems, metal panels, and masonry veneer. Another likely inaccuracy, especially pertaining the mechanical systems, is the mixed-use aspect of the proposed building, as a good portion of the ground floor is made up of retail space, not residential apartments. It should be noted that the actual construction cost has exceeded the original budget mainly due to unforeseen dewatering challenges and concrete work delays.

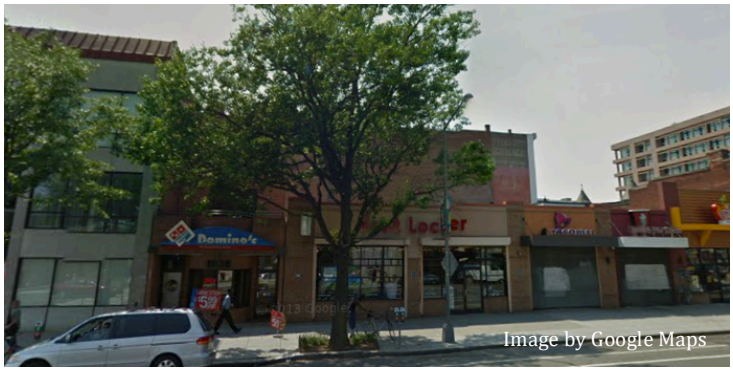
The project was delivered as design-bid-build, the notice to proceed being issued in March of 2012. Excavation posed to be most variable in the schedule as geotechnical reports suggested likely dewatering work would be necessary, which ended up delaying the actual schedule significantly since more groundwater was encountered than expected. The concrete pours would also play a varying factor until top-out due to usual complications and weather delays. As the superstructure would near completion, interior MEP rough-ins, carpentry, finishes, and all other trades would follow from the ground up in accordance with their proposed turnover date. Ground floor retail spaces would be turned over with only core & shell work completed as specified by the contract. Retail tenants would then be responsible for their own interior work.

The proposed building is supported by a reinforced concrete frame (cast-in-place) resting on a foundation of drilled piles. The slab-on-grade is a regular 8" flat slab of normal weight concrete with unbonded two-way post-tensioned suspended slabs above. Plywood sheeting & shoring was used for curing each floor. A tower crane & bucket was used for concrete placement.

The mechanical system is water-to-air with 14 water source heat pumps with a ductless split system throughout the building with 6 rooftop air handling units, two of which are direct outdoor air systems. Two boilers are located in the parking garage below grade with a fire pump service room and water meter room.

The electrical system is fed by 3 utility ductbanks tying into three 4000A switchboards, two 120/208V 3ϕ's for the residential apartments and one 265/460V 3ϕ for the ground floor retail spaces. Minimal redundancy is incorporated into the building, as only one diesel engine driven emergency generator (300 KW/375 KVA 265/460V 3ϕ) is proposed to mainly serve the fire pump service room as required. The main electrical room is located in the parking garage level, while 2 electrical closets accompany each floor.

Demolition included <2-story retail spaces, and restaurants along with paving areas on the west side of the property. During excavation, adjacent building foundations, although extremely close to the building footprint, were not deep enough to prevent the use of tie-backs supporting the soldier pile support system. Dewatering wells were also strongly recommended and installed as needed since the geotechnical report suggested a strong likelihood of significant groundwater presence.



The curtain wall glazing system anchored onto structural steel at the edge of suspended slab entails much of the façade sheltering each apartment up to rooftop. Most units are accompanied by a protruding balcony.

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The JBG Companies + Georgetown Strategic Capital

It is the mission of The JBG Companies to be a world-class investor, owner, developer and manager of real estate properties in the Washington Metropolitan Area.

TIME QUALITY COST

16 Energy Star Buildings
73 LEED Certified & Registered Projects

SUSTAINABILITY

TURNOVER 1 Retail core & shell (ground floor)
TURNOVER 2 Residential Floors 1-4
TURNOVER 3 Full Building (floors 5-9 + patio)

THE JBG COMPANIES®

DESIGN – BID - BUILD

*GMP

Architect: **Eric Colbert & Associates**

CECCONI SIMONE

Bowman CONSULTING

The SK&A Group

Balfour Beatty Construction

Miller&Long CONCRETE CONSTRUCTION ESTABLISHED 1947

TDIndustries

Summit Engineers, Inc.

BERLIN STEEL Fabricator and Erector

IPC

EGC

14TH & U PROJECT TEAM

Balfour Beatty Construction

Project Executive

Project Accountant

Superintendent(1)

Superintendent(2)

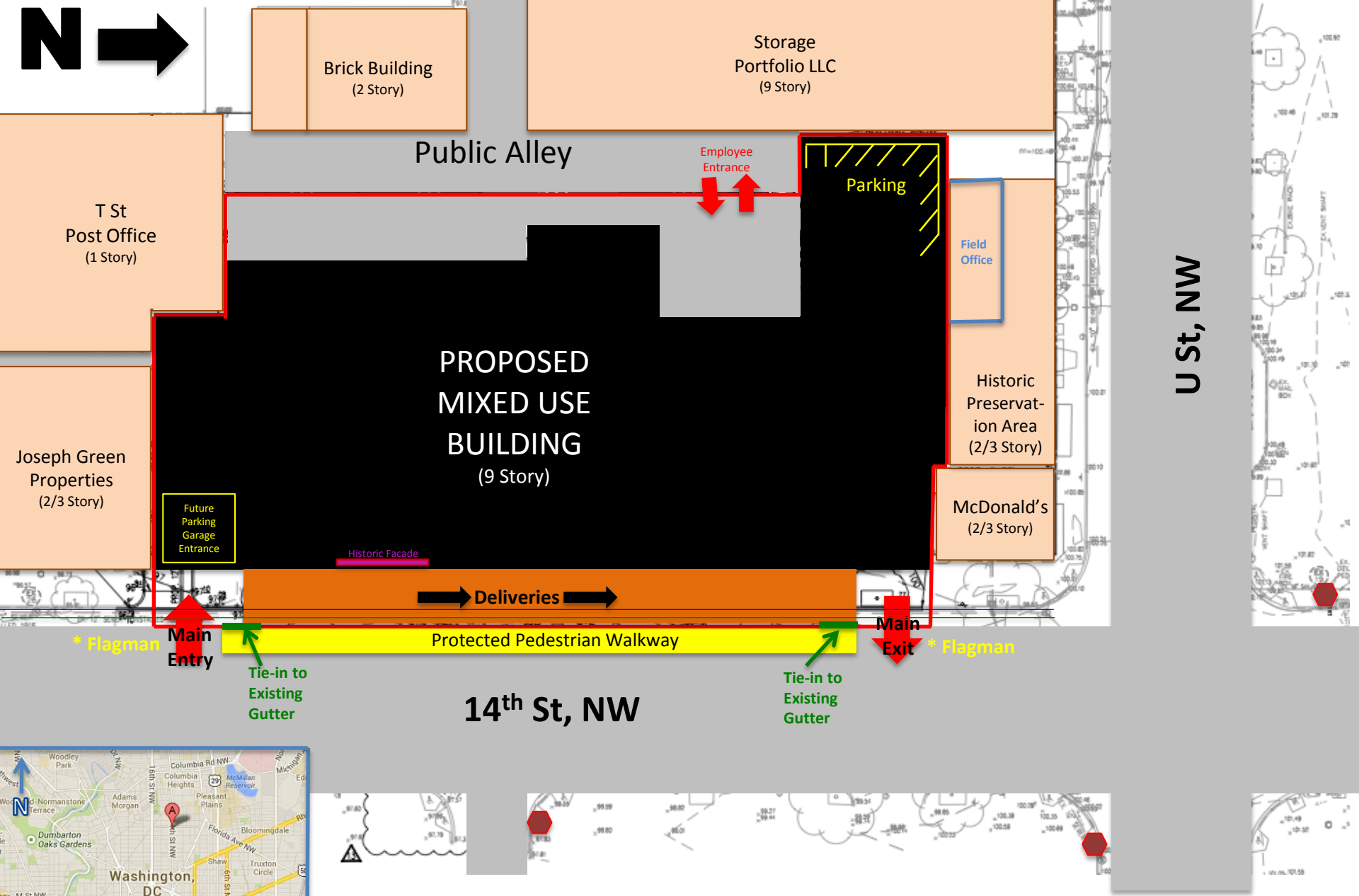
Superintendent(3)

Project Manager

Assistant Project Manager(1)

Assistant Project Manager(2)

Project Engineer



Site Layout

Property Line

Fire Hydrant

Existing Gas Line

Existing Telephone Line

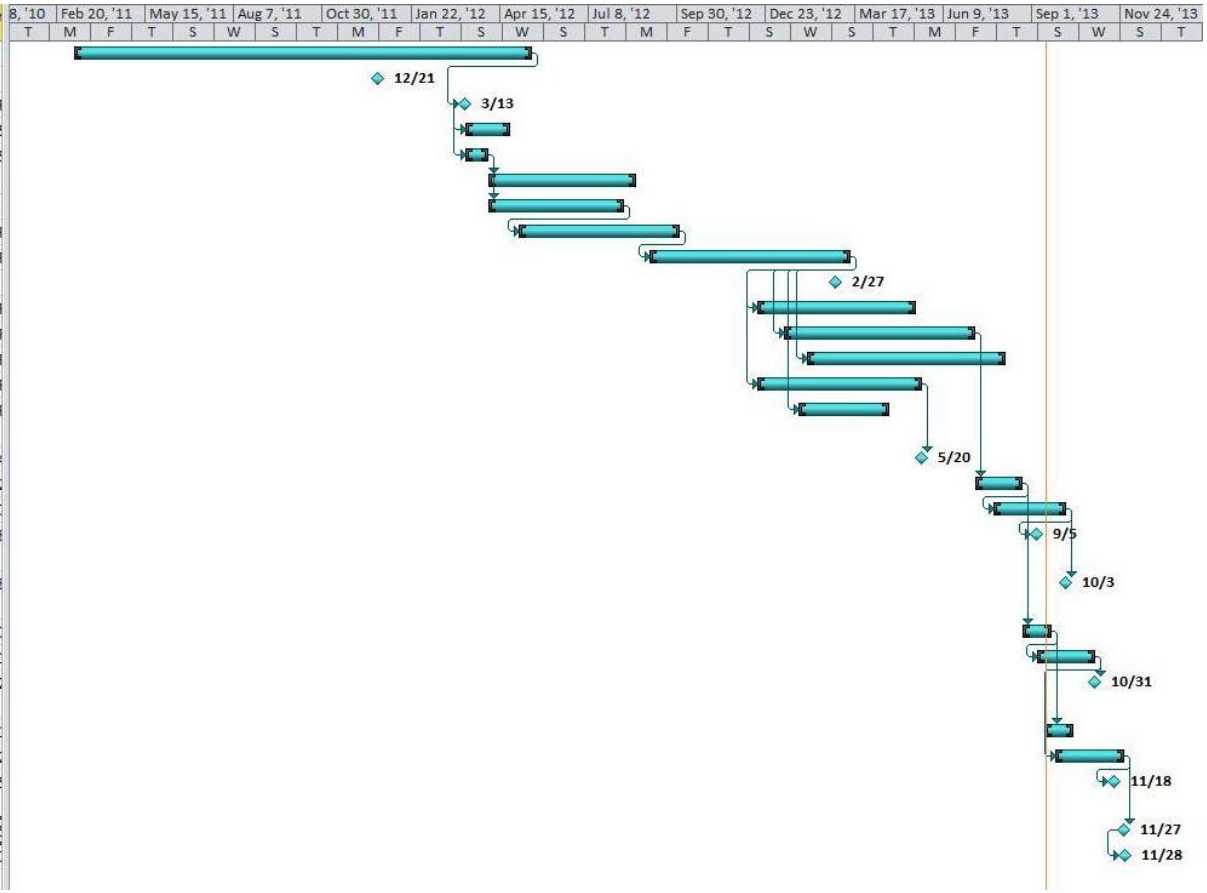
Projected Costs

Construction Budget:	**SF Estimate (R.S. Means):**
$47M	**$56M**
$176/SF	**$210/SF**
Electrical Systems	
$4,242,000	$4,256,000
Mechanical Systems	
$8,771,000	$5,656,000
Foundation + Superstructure Cast-in-Place Concrete	
$7,090,000	$9,520,000

Primary Differences:
1. Typical wall construction simpler than R.S.M.
2. Ground floor retail spaces

Baseline Schedule

	Task Mode	Task Name	Duration	Start	Finish
1		Design Phase	310 days	Tue 3/8/11	Mon 5/14/12
2		Contract Awarded	0 days	Wed 12/21/11	Wed 12/21/11
3		Notice to Proceed	0 days	Tue 3/13/12	Tue 3/13/12
4		Procurement	30 days	Tue 3/13/12	Mon 4/23/12
5		Mobilization	16 days	Tue 3/13/12	Tue 4/3/12
6		Demolition	100 days	Wed 4/4/12	Tue 8/21/12
7		Excavation	92 days	Wed 4/4/12	Thu 8/9/12
8		Foundations	108 days	Thu 5/3/12	Mon 10/1/12
9		Superstructure	137 days	Mon 9/3/12	Tue 3/12/13
10		Top-Out	0 days	Wed 2/27/13	Wed 2/27/13
11		Floors 1-3 MEP	107 days	Fri 12/14/12	Mon 5/13/13
12		Floors 4-6 MEP	129 days	Wed 1/9/13	Mon 7/8/13
13		Floors 7-9 MEP	135 days	Wed 1/30/13	Tue 8/6/13
14		Building Enclosure	112 days	Fri 12/14/12	Sat 5/18/13
15		Parking Levels MEP & Finishes	61 days	Wed 1/23/13	Wed 4/17/13
16		Watertight	0 days	Mon 5/20/13	Mon 5/20/13
17		Floors 1-3 Carpentry	33 days	Tue 7/9/13	Thu 8/22/13
18		Floors 1-3 Finishes	49 days	Fri 7/26/13	Wed 10/2/13
19		Turnover Retail Core & Shell	0 days	Thu 9/5/13	Thu 9/5/13
20		1st, 2nd, 3rd Floor Occupancy	0 days	Thu 10/3/13	Thu 10/3/13
21		Floors 4-6 Carpentry	19 days	Fri 8/23/13	Wed 9/18/13
22		Floors 4-6 Finishes	40 days	Thu 9/5/13	Wed 10/30/13
23		4th & 5th Floor Occupancy	0 days	Thu 10/31/13	Thu 10/31/13
24		Floors 7-9 Carpentry	20 days	Thu 9/12/13	Wed 10/9/13
25		Floors 7-9 Finishes	47 days	Mon 9/23/13	Tue 11/26/13
26		6th & 7th Floor Occupancy	0 days	Mon 11/18/13	Mon 11/18/13
27		9th Floor Occupancy	0 days	Wed 11/27/13	Wed 11/27/13
28		Final Completion	0 days	Thu 11/28/13	Thu 11/28/13



*dewatering & CIP concrete = likely delays

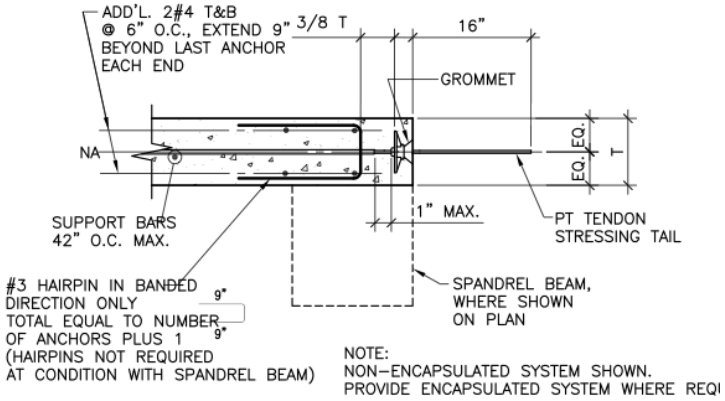
*separate retail space turnover (warm & lit)

*apartments to be occupied per floor completion

Building Systems

Structural:

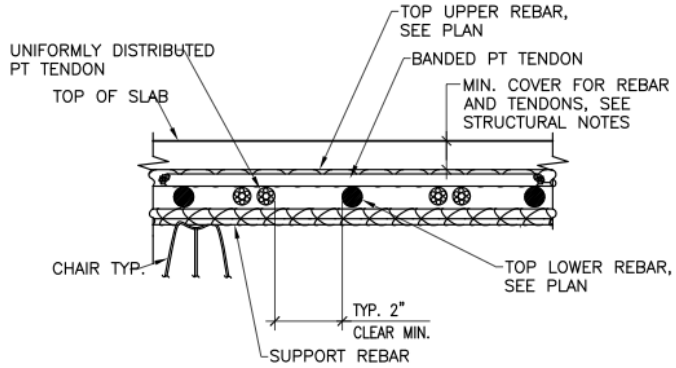
- *cast-in-place concrete frame*
- *two-way post-tensioned suspended slabs* (as pictured to the right)
- *traditional sheeting & shoring*



TYPICAL STRESSING END AT BANDED TENDONS

Mechanical:

- *water-to-air*
- *290 ton cooling capacity*
- *1425 MBH heating capacity*
- *Mechanical room in penthouse*



TYPICAL ENLARGED DETAIL THROUGH DISTRIBUTED TENDONS AT COLUMN

Building Systems (cont'd)

Electrical:

- *(2) 120/208V 3ϕ and (1) 265/460V 3ϕ switchboard*
- *Emergency generator (265/460V 3ϕ)*
- *Main electrical room in parking garage* (as pictured left)
- *2 electrical closets per floor*

Other:

- *Excavation: •soldier piles & tiebacks •dewatering wells*
- *Demolition: existing 1-2 story retail & restaurant spaces* (no existing hazardous materials)
- *Curtain wall glazing system (pictured right)*