NET-ZERO ENERGY PROJECT DESIGN ASSISTANCE GRANT:

800 9TH STREET, SW

NET-ZERO DESIGN CASE STUDY

CLIENT: NBL ASSOCIATES

TEAM: HICKOK COLE, ARUP, DPR AND DOEE

SEPTEMBER 30, 2020

ARUP DPR CONSTRUCTION hickok cole

CONTENTS

NET-ZERO ENERGY PROJECT DESIGN ASSISTANCE GRANT:

800 9TH STREET, SW

PART 1: EXECUTIVE SUMMARY

CLIENT: NBL ASSOCIATES

TEAM: HICKOK COLE, ARUP, DPR AND DOEE

SEPTEMBER 30, 2020

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EXECUTIVE SUMMARY

- The Goals + the Building

1. This grant pursued two goals:

a. The first goal was to establish a cost comparison between the building systems required for a code compliant renovation of 800 9th Street SW and those which would reach either a LEED Gold level energy efficiency or attain the lowest EUI while targeting net-zero energy. This first goal acknowledges that cost drives decisions for property owners and developers. The pricing information was parsed to serve the client's pro forma needs and included initial installation cost alongside four and twenty year pay back calculations.

b. The second goal was to stand up a process that incorporates high performance design targets at the outset. A design charrette was the mechanism to frame the early conversations.

2. Because the building was vacant and required a full renovation for leasing purposes, it provided an ideal opportunity to test the cost comparison and the design process. The design services to re-postion this asset were already underway which meant that a building assessment, design options and computer models were underway. These tools jump started the design of the mechanical systems.

- The Pricing Parameters (Per Client Preference)

1. Repositioning – Bringing the building up to a Class A space. This is the baseline and meets code requirements.
2. Scenario B - LEED Gold
3. Scenario C - Net-Zero Energy
4. Additional separate summaries:
   - » Sustainable Alternates – Building elements included for sustainability reasons – Green Roof, Submeters.
   - » Energy Saving Alternates – Scenario B and C
   - » Additional Cost Considerations - Scenario B (Utility Savings and SRECS); Scenario C (Utility Savings + SRECs + Renewable Energy); Fit-out costs for Mechanical systems only

- Summary of Findings

1. Comparison of high performance design scenarios:
   - » Neither system (Scenario B or C) was capable of lowering the energy demand sufficiently for it to be offset by on-site generation by solar (PV) panels.

EXECUTIVE SUMMARY

- Summary of Findings (cont.)
  - » A VRF system is commonly used for DC projects as a means to maximize energy efficiency, but it requires additional roof space for the mechanical units.
  - » A Water Source Heat Pump system is not as commonly used due to increased ceiling plenum coordination (to maintain ceiling height). It does have a similar energy efficiency performance level as the VRF System. One significant difference: it has a smaller equipment footprint on the roof. This would allow the rooftop to be maximized for on-site PV generation which would, in turn, generate additional power and SREC income. The increased power also reduces the need to purchase renewable energy offsets (that make up the gap between on-site generation and what is needed to power the building.)
  - » The cost premium for Scenario B and C remain significant in the four year payback analysis
  - » The long term payback analysis shows that over twenty years the additional costs for the net-zero energy design is cost neutral.

THE PROCESS

CHARRETTE + PREP

- Undertake Building Systems Assessment
- Establish base, LEED Gold + NZE systems scenarios
- Frame the design issues (window to wall ratio etc)
- Determine the owner's knowledge of net-zero energy buildings
- Host charrette presentation and discussion
- Document Owner input

PRICING

- Create pricing package based on scenarios and client input
  - » Include plan and elevation diagrams
  - » Include MEP systems narrative and matrix
- Review assumptions + scope with general contractor
- Provide clarification on any open items

REVIEW

- Review initial budget pricing provided to architect and MEP engineers
- Initial clarifications completed
- Review document with owner and clairify means of organizing pricing information
- Issue revised pricing document for submission

NET-ZERO ENERGY PROJECT DESIGN ASSISTANCE GRANT:

800 9TH STREET, SW

PART 2: NET-ZERO ENERGY CHARRETTE

(PROVIDED UNDER SEPARATE COVER)

CLIENT: NBL ASSOCIATES

TEAM: HICKOK COLE, ARUP, DPR AND DOEE

JULY 12, 2020

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NET-ZERO ENERGY PROJECT DESIGN ASSISTANCE GRANT:

800 9TH STREET, SW

PART 3A: NET-ZERO ENERGY PRICING PACKAGE

CLIENT: NBL ASSOCIATES

TEAM: HICKOK COLE, ARUP, DPR AND DOEE

AUGUST 7, 2020

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INTRODUCTION

THIS PRICING EXERCISE: PURPOSE, PROCESS AND PARAMETERS

This pricing exercise is the critical second step in this Net-Zero Energy Design Assistance Grant, following step one, the Concept Charrette.

The purpose of the pricing exercise is to give the building owner an order of magnitude price differential between a code compliant renovated building and a net-zero energy building. Given that the project is in the feasibility stage, it is understood that this represents budget pricing and not the in-depth cost estimate possible from an Issued For Construction (IFC) set of drawings. Nevertheless, budget pricing is essential as a tool for the building Owner to evaluate pursuing a Net-Zero Energy Building.

The pricing package features architectural graphics that describe both the existing building as well as the proposed interventions. It is supplemented with the evaluation of the existing systems, an MEP narrative that outlines options for new HVAC equipment and a matrix intended to summarize what should be priced. The documents in the appendices include existing building documents, the MEP evaluation of the existing systems, and site photographs.

The building we are studying is a four-story office building completed in 1986. It is currently vacant. The baseline re-positioning concept calls for an enlarged ground floor lobby and an added penthouse floor. One thing to note: this pricing exercise does not require DPR to price all of the changes associated with the re-positioning. Instead, the focus is meant to be on the costs associated with getting the building to net zero energy.

Hickok Cole and Arup have established three levels of renovation. The first level brings the building energy use up to the current energy code. The second level brings the building up to (approximately) a LEED Gold building's energy use. The third level brings the building to net zero energy, in this case by using the purchase of renewable energy credits to offset the gap between what can be generated on site versus what is needed to operate at an annual net-zero energy level.

Reference Documents

APPENDIX A: Scope Matrix

APPENDIX B: Additional Building Photos

THE ARCHITECTURE

THE EXISTING BUILDING

800 9TH STREET SW

800 9th Street SW is a 4-story, free-standing building with a concrete structure, and precast concrete and ribbon window facades constructed in 1986. Portions of the ground floor occur partially below grade due to the natural slope of the site, high at the north, low towards the south.

See APPENDIX A for construction drawings

PRIMARY CORNER, MAIN AVENUE AND 9TH STREET

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THE ARCHITECTURE

THE EXISTING BUILDING

THE GROUND FLOOR

The building's entrance is centrally located, although recessed from the main facade by approximately 20 feet.

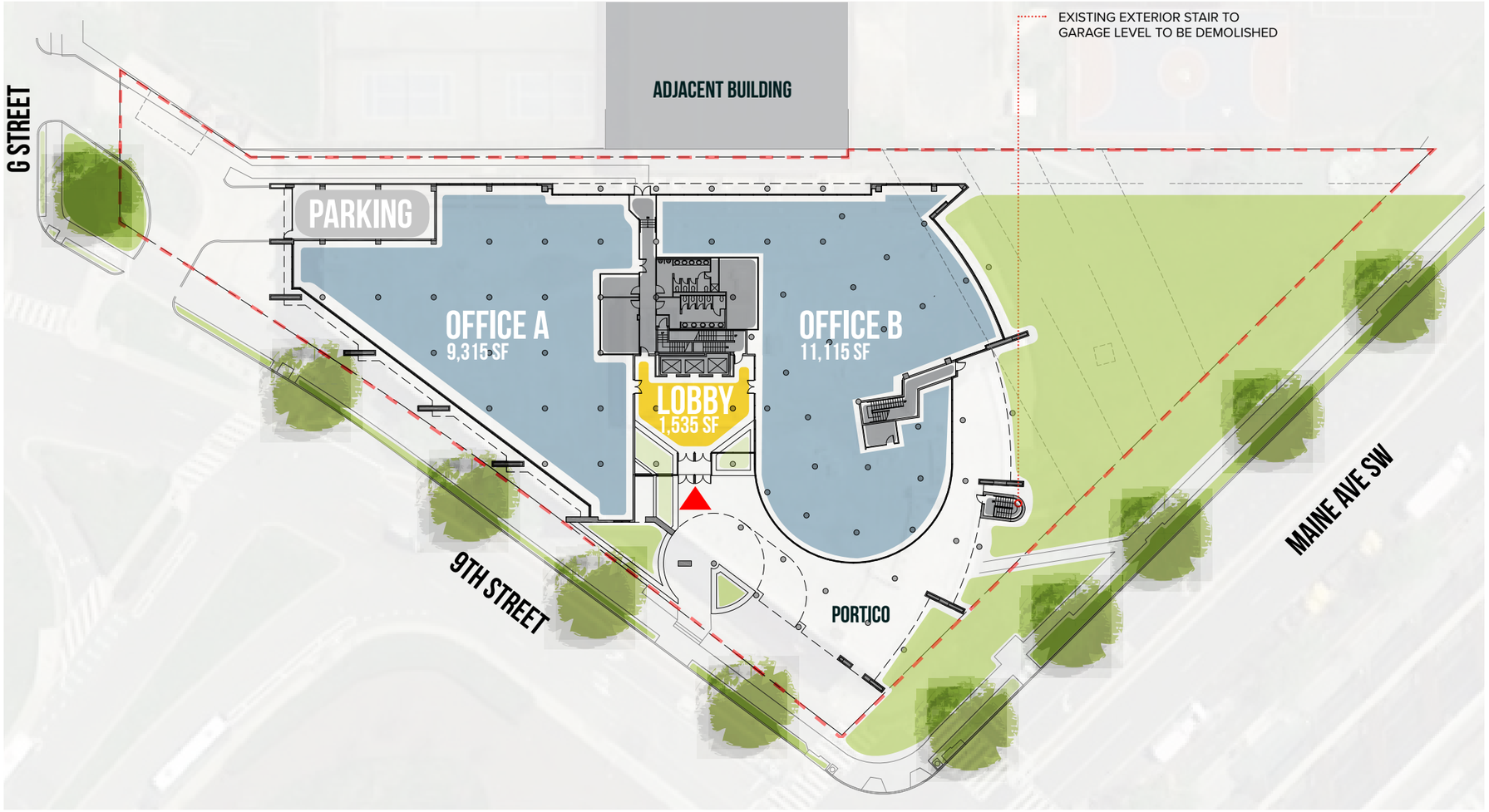
The north half of the floorplate is partially below the adjacent, sloping grade, and is surrounded by clerestory windows.

The south half of the floorplate includes a covered terrace to the south that faces Maine Avenue

BOH/CORE

OFFICE

MAIN LOBBY



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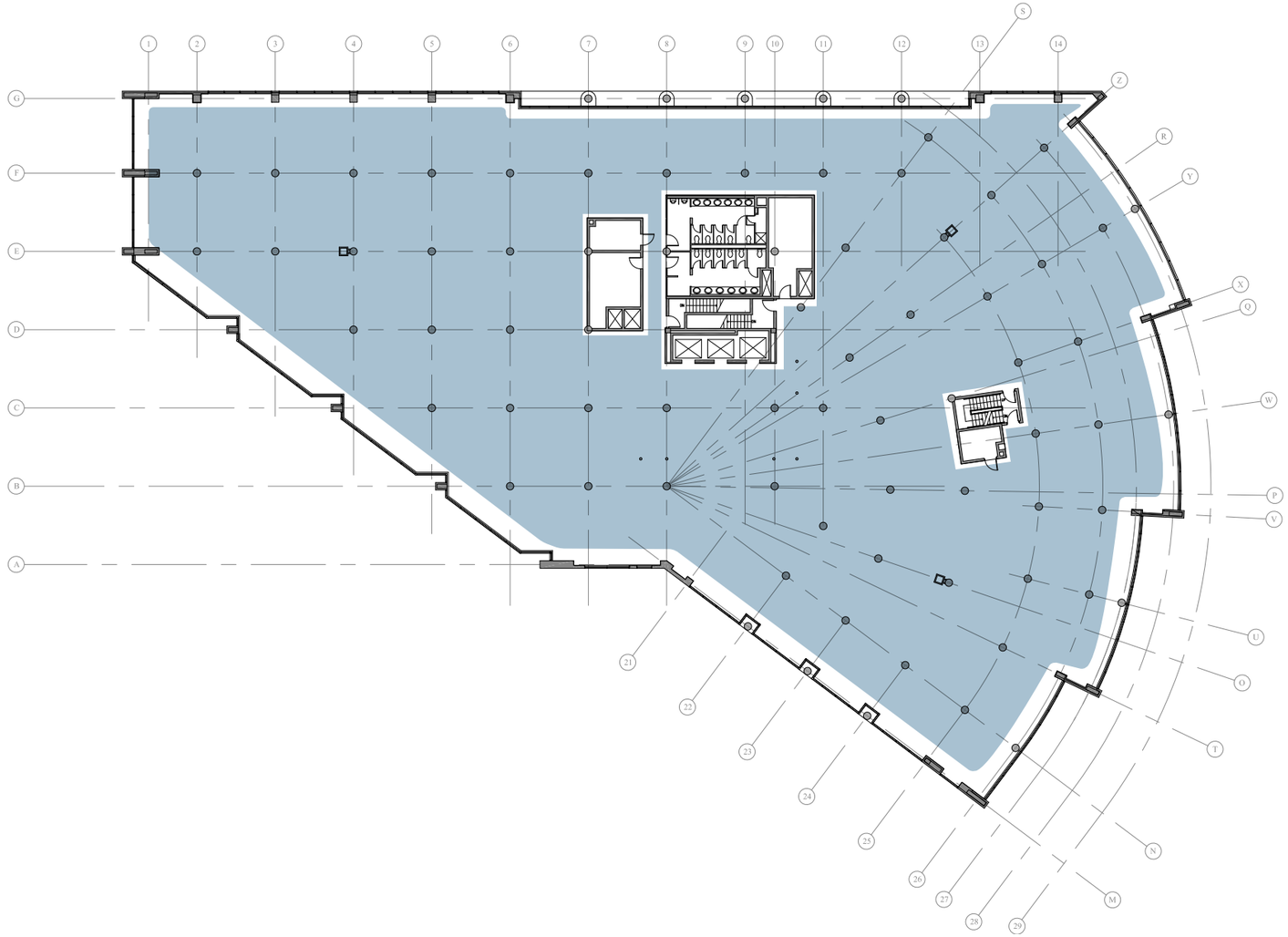
THE ARCHITECTURE

THE EXISTING BUILDING

THE TYPICAL FLOOR

The original drawings from 1981 show Stair #1 to the north between gridlines 4-5 and E-L. Apparently in subsequent drawings, this stair was eliminated, the tenant restrooms were moved east, and a new (interlocking) stair was built between the elevator bank and the new core.

OFFICE



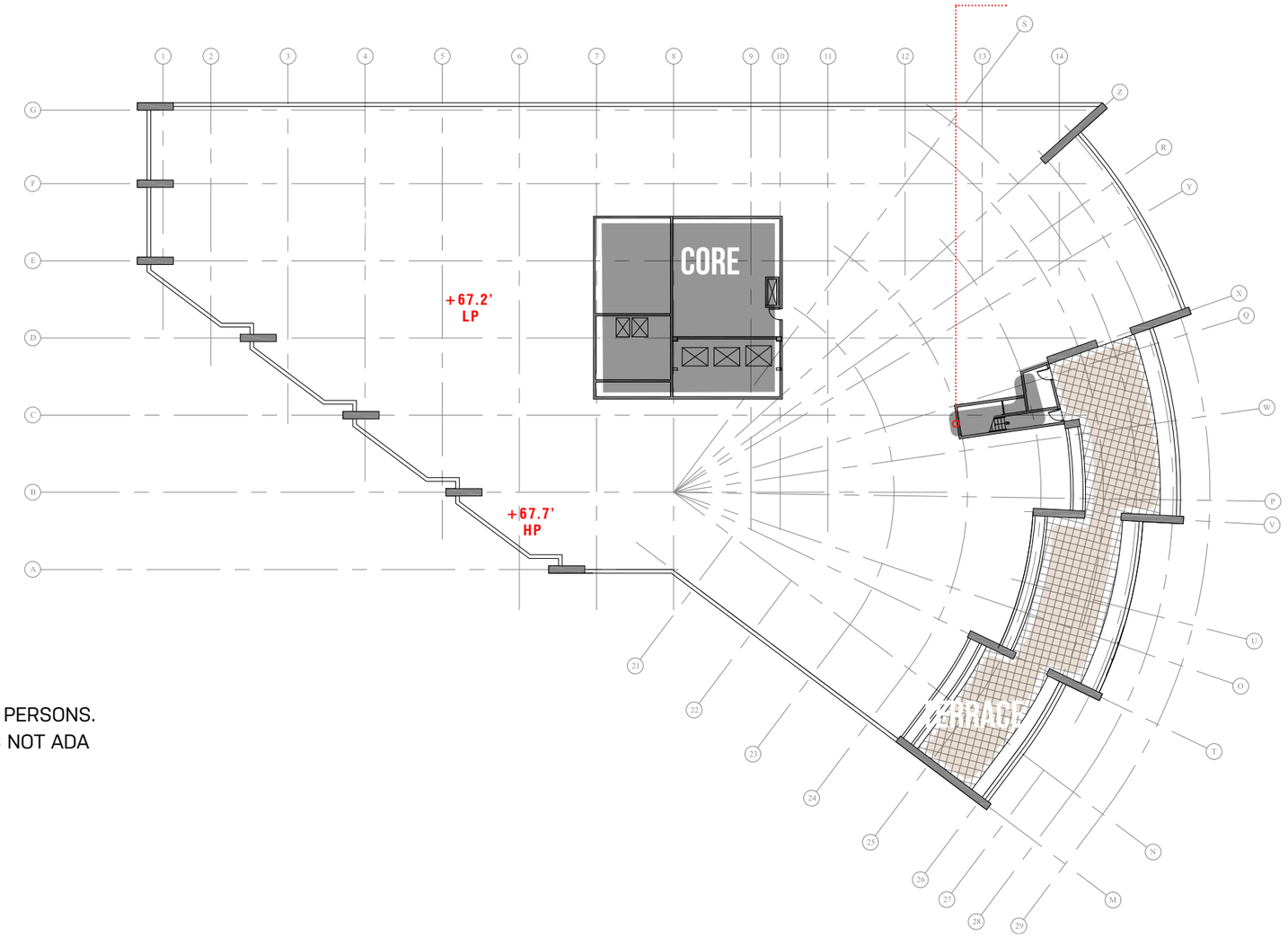
THE ARCHITECTURE

THE EXISTING BUILDING

THE ROOF

The existing penthouse structure is exclusively for mechanical space and elevator overrun.

Only one stair services this level, limiting the occupancy to under 50 people.



BOH/CORE

TERRACE

* OCCUPANCY LIMITED TO 49 PERSONS.
ONLY ONE MEANS OF EGRESS NOT ADA
TERRACE

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THE ARCHITECTURE

THE INTERVENTIONS

PROPOSED DESIGN

Modifications to the building include selective demolition of the facades, window and storefront replacement, a mineral coating to refinish all facade panels, infill of ground floor overhangs, a new occupiable penthouse, and a new roof terrace. The new penthouse, as currently shown, will require the insertion of a new egress stair through the building.

THE ARCHITECTURE

THE INTERVENTIONS

GROUND FLOOR

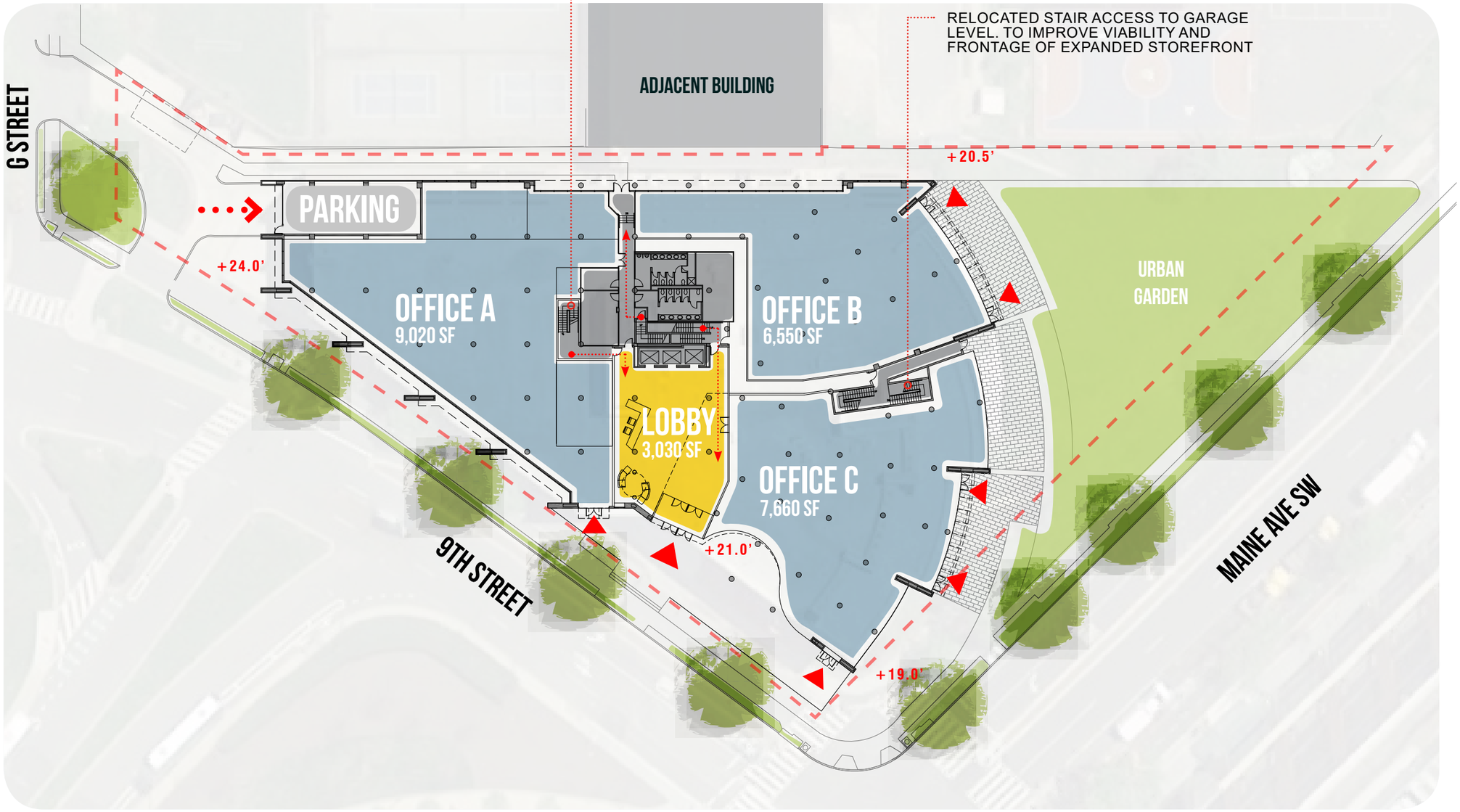
The Lobby is extended out toward the front of the building.

To the south, we extend the “conditioned space” under the overhangs to maximize the rentable area and to increase the exterior visibility of the retail.

BOH/CORE

OFFICE

MAIN LOBBY



ARUP DPR CONSTRUCTION hickok cole

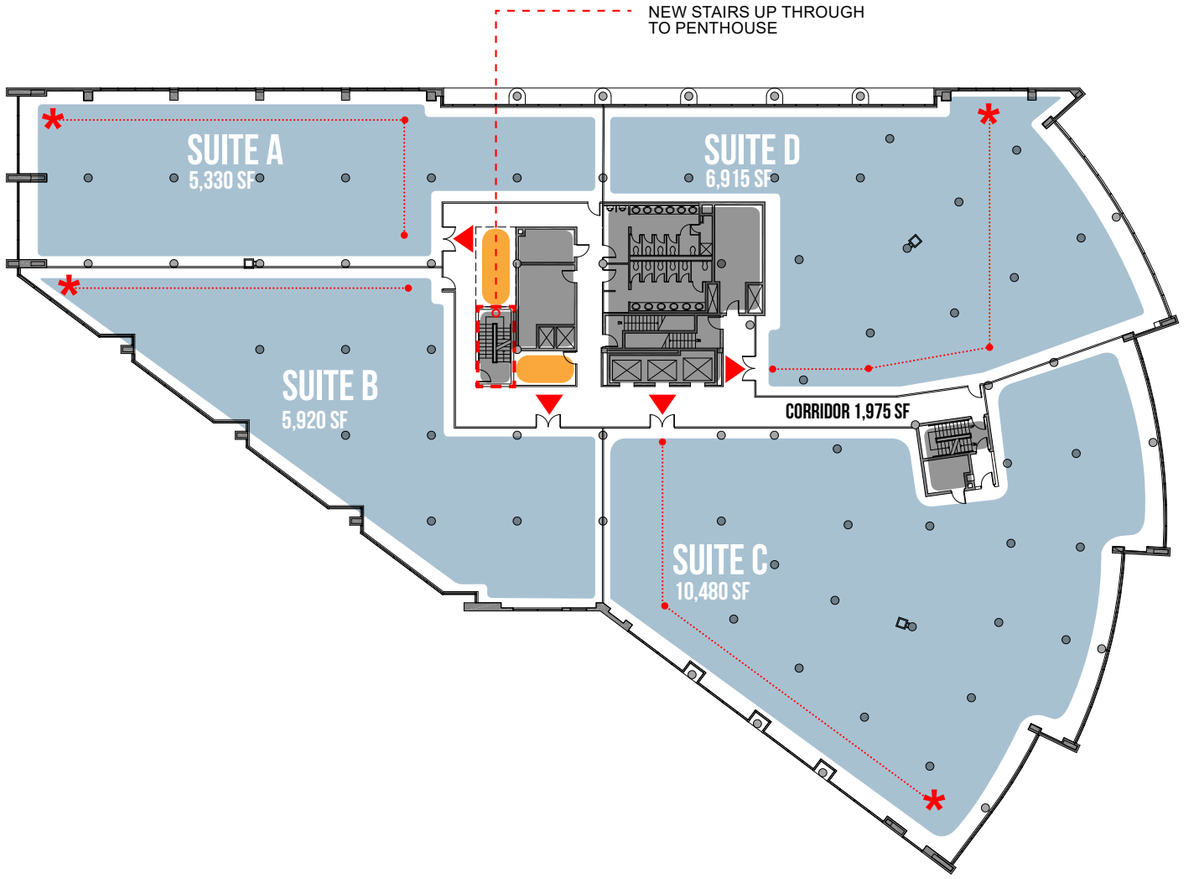
THE ARCHITECTURE

THE INTERVENTIONS

OFFICE FLOOR - DEMISED

Demising shown includes a new stair all the the way through the building and up to the Penthouse.

Demising into 4 or 5 tenants is possible with or without the stair, although the tenant corridor size increases.



BOH/CORE

OFFICE

AMENITY

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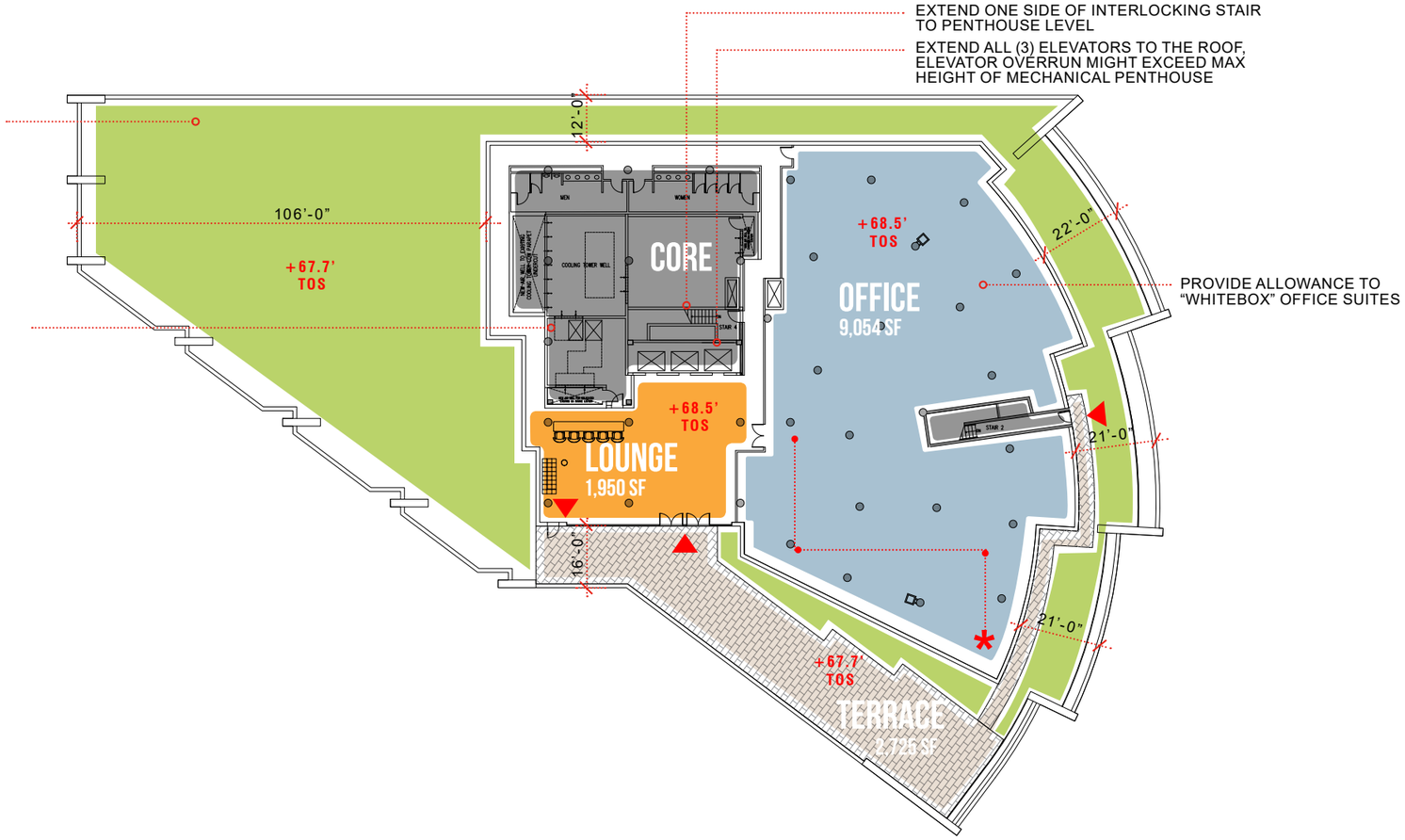
THE ARCHITECTURE

THE INTERVENTIONS

NEW ROOF - OPTION B

Pricing for the LEED Gold/ Platinum roof should include the items noted.

See Systems Narrative for more information



ARUP DPR CONSTRUCTION hickok cole

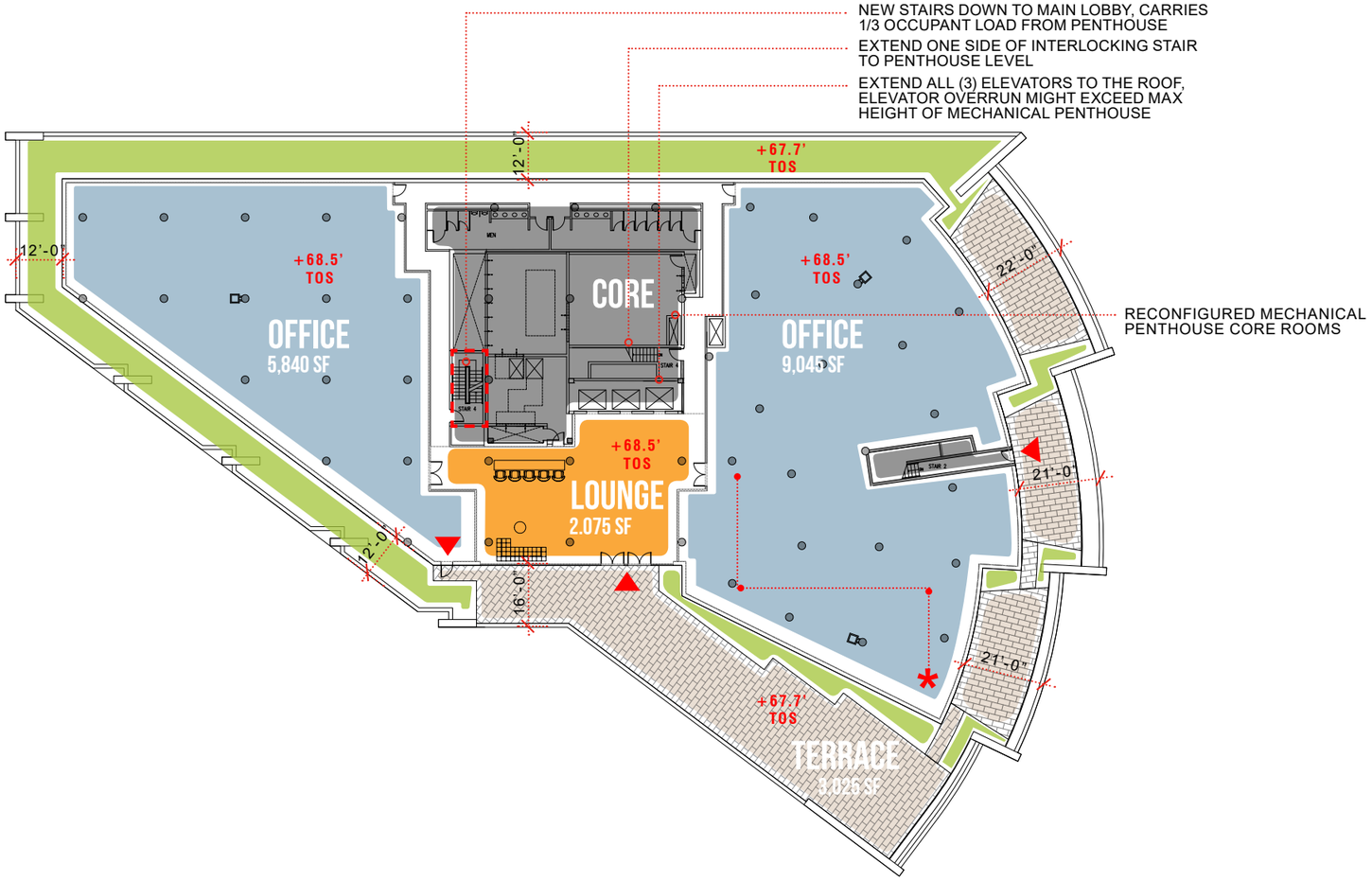
THE ARCHITECTURE

THE INTERVENTIONS

NEW ROOF - OPTION C

Pricing for the LEED Gold/ Platinum roof should include the items noted.

See Systems Narrative for more information



THE ARCHITECTURE

THE INTERVENTIONS

FACADES

NEW PENTHOUSE, SEE SCHEME B FOR DETAILS

CC-1 AND CC-2: MINERAL COATING ON PRECAST AND EXTERIOR STONE, KEIM, GRANITAL, TWO CUSTOM COLORS

RW-1: KAWNEER TRIFAB 451UT, WITH WINDOW SHADE POCKET, 3-COAT FLUOROPOLYMER SYSTEM
IGU 3: 1" VNE 24-63 HS, VIRACON (1/4" OPTIWHITE HS + VNE-63 #2 + 1/2" AIRSPACE BLACK + 1/4" CLEAR HS)

CW-2: KAWNEER 1600 SS SYSTEM 2, WITH INTEGRAL CANOPY SUPPORTS WHERE SHOWN, WINDOW SHADE POCKET, 3-COAT FLUOROPOLYMER SYSTEM

IGU-2: 1" VNE 24-63 INSULATING FT, VIRACON (1/4" OPTIWHITE FT, VNE-63 #2 + 1/2" AIRSPACE BLACK + 1/4" OPTIWHITE FT)

THE ARCHITECTURE

THE INTERVENTIONS

ENTRY FACADE

CC-1

CW-1: KAWNEER 1600 SS SYSTEM 2,WITH WINDOW SHADE POCKET, 3-COAT FLUOROPOLYMER SYSTEM
IGU-3, FT

MTL-1: FACTORY-FORMED, COLD-ROLLED COPPER SHEET METAL RAINSCREEN, WEIGHT - 16 OZ./SF (0.0216" THICK), PRE-OXIDIZED ON BOTH FACES, COLOR - TECU OXID, WITH CLEAR COATING, BY KME - TECU.
STRUCTURAL TUBE STEEL FRAMING, INSULATION AND WEATHERPROOFING. ALLOWANCE FOR LED RECESSED LINEAR LIGHTING

DR-1: SOLID ALUMINUM NARROW PROFILE RAIL STILE DOOR, CRL-BLUMCRAFT 150 SERIES (9'-0" TALL), BRUSHED SS, LADDER-TYPE PULLS, TEMPERED LOW-IRON GLASS

CW-1
IGU-2, FT

THE ARCHITECTURE

THE INTERVENTIONS

SOLAR GENERATION

A sizeable area of roof could be available for solar panels.

Additional BPV's can be added on the south and west facades.

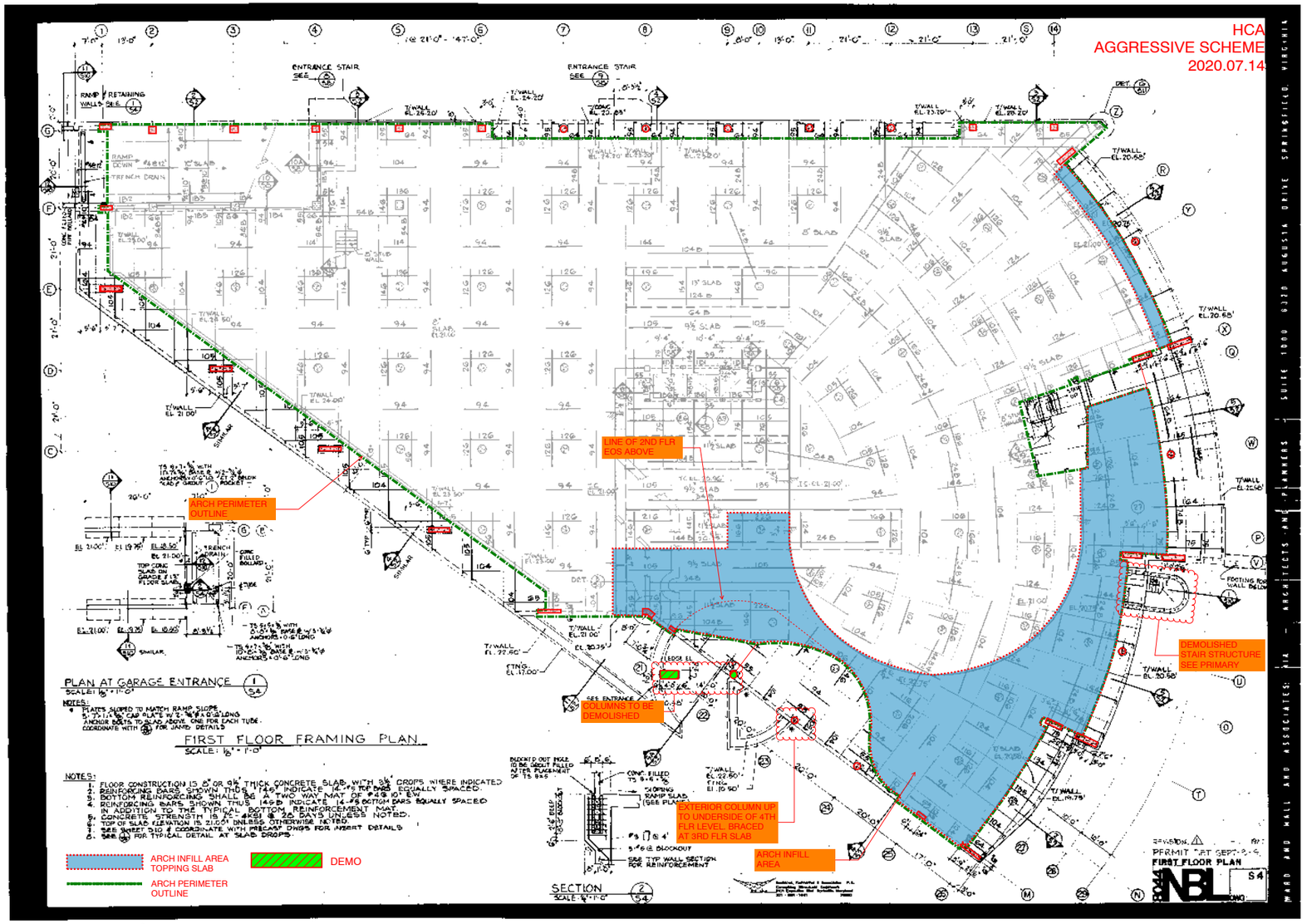
This image is for illustration purposes only. See the systems narrative and facade notes for more specific information.

THE ARCHITECTURE

THE INTERVENTIONS

GROUND FLOOR - STRUCTURE

The SK&A diagram included here indicates the necessary structural changes for the new ground floor configuration



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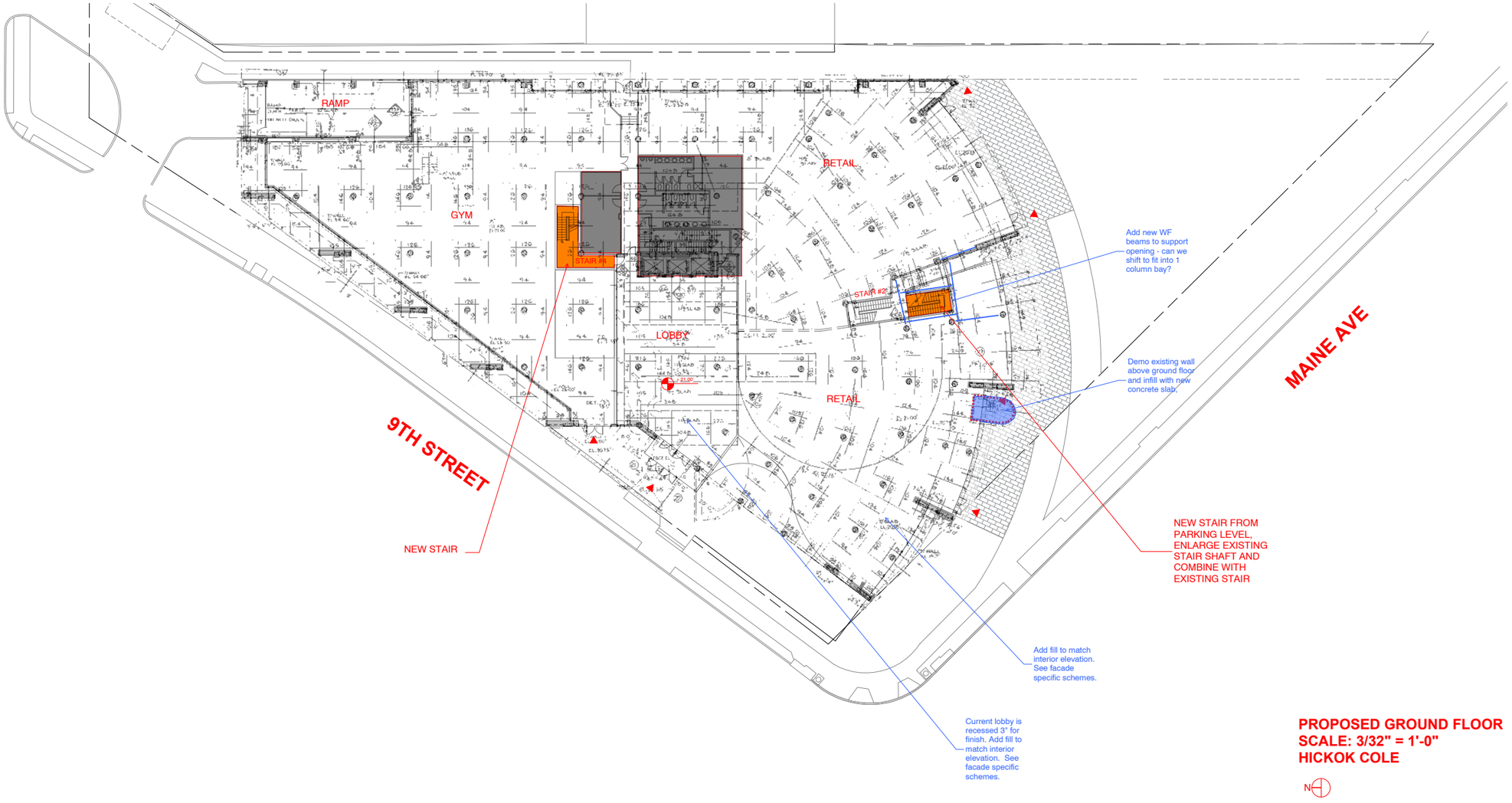
THE ARCHITECTURE

THE INTERVENTIONS

GROUND FLOOR - STRUCTURE

The diagram included here indicates the necessary structural changes for the new penthouse configurations



PROPOSED GROUND FLOOR
SCALE: 3/32" = 1'-0"
HICKOK COLE

N

THE SYSTEMS

A narrative for code compliant, high performance and NZE systems

MEP Systems Narrative

MECHANICAL (+ BMS)

Option A: Code Compliant Package

Considering the state of the current equipment, the code compliant package involves minor updates to existing equipment in the building.

1. Replace all pump motors with new, VFD-rated motors. Provide VFDs.
2. Update BMS system to allow for variable speed flow of closed-loop condenser water throughout building.
3. Provide provision for louvers to be installed in ground floor façade to accommodate potential increased ventilation requirements from a retail/café tenant

Option B: LEED Gold/Platinum

The HVAC systems described for this package are industry standard, but due to more stringent controls requirements and higher equipment costs carry a price premium over baseline systems. They're also significantly more energy efficient -up to 40% more efficient than a traditional system, depending on the building type and operations. The Option B fitout assumes a single office and lounge addition on the penthouse per the architectural documents.

VRF System

Equipment List

1. Rooftop, air-cooled condensing plant, 375 tons of condensing capacity, heat recovery type
2. Branch selectors – one per four interior direct expansion units
3. Provide interior units totaling 450 tons for the entire building
    a. Ceiling cassettes for individual offices
    b. Ducted units for exterior space, one per 400 SF
4. Provide rooftop, packaged, variable-volume DOAS unit with:
    a. Energy recovery wheel and economizer bypass
    b. 13,500 CFM
    c. ECM fans
    d. Provide VAV at each floor to control outside air levels for each floor
    e. Provide VAV at each floor to control exhaust air levels for each floor
5. Linear diffusers throughout building. Ventilation air will be provided through independent ductwork distribution system separate from VRF indoor units.

General Controls Requirements:

1. Provide one new temperature sensor per indoor unit
2. Provide one BMS control panel for each tenant suite to allow for future tenant control of HVAC system setpoints
3. One CO2 sensor per outside air VAV unit, then one per conference room. Assume roughly 10% conference and 90% office for each office fit-out where fit-out is not provided by the architect.

4. Digital scroll or staged compressors capable of ramping down to 10% of peak capacity
5. VRF system shall be provided with manufacturer controls package for operation of entire system

Option C: Net Zero Energy

The HVAC systems described for this package are industry standard, but due to more stringent controls requirements and higher equipment costs carry a price premium over baseline systems. They're also significantly more energy efficient -up to 40% more efficient than a traditional system, depending on the building type and operations. The Option C assumes a dual office and lounge addition on the penthouse per the architectural documents.

WSHP With Energy Recovery

Equipment List:

1. Central hydronic pumps with VFD
2. Crossflow, dual-intake cooling tower with min 100 GPM/HP efficiency
3. Outside Air Option A: Central, packaged, water-cooled DOAS air handler with
    a. Provide ERV wheel with economizer bypass
    b. 14,250 CFM
    c. ECM fans
    d. VAV at each floor to control outside air levels for each floor
    e. VAV at each floor to control exhaust air levels for each floor
4. Outside Air Option B: Central air-air heat exchanger with variable volume supply and exhaust fans for outside air pre-treatment at each floor with:
    a. ECM fans
    b. 2,250 CFM for penthouse; 3,000 CFM for Levels 2-4; 4,000 CFM for Level 1
5. Heat pumps
    a. One per 400 SF open floorplate space, or
    b. One per conference room, whichever is smaller
6. Linear diffusers throughout building

Controls Requirements:

1. VFDs for all pumps
2. ECM fans for all heat pumps
3. Digital scroll or staged compressors for each heat pump unit
4. SCR controls for all electric heating coils
5. Provide control valves for condenser coils in each heat pump unit
6. One CO2 sensor per outside air VAV unit, then one per conference room. Assume roughly 10% conference and 90% office for each office fit-out where fit-out is not provided by the architect.

ELECTRICAL / ENERGY

Option A: Code Compliant

Solar

Following 2017 DC ECC Requirements – 25% of roof space will be set aside and clear for future solar PV installation. Infrastructure for electrical conduit run from the roof to PEPCO service meter will be added to building core.

Energy Meters

2017 DC ECC requires floor level energy meters. Minimum of 5 meters required in floor electrical panel.

Option B: LEED Gold/Platinum

Solar

PV array on south penthouse roof only. 248 – Sunpower 360W commercial panels on roof mount racking system with microinverters. Electrical conduit from roof through core to main electrical panel and pepco meter.

Energy Meters

Similar to option A, 5 meters required in main electrical panel on each floor. Should have capacity for tenant to add end use meters at fitout.

Option C: Net Zero Energy

Solar

PV arrays maximized on roof. All panels modeled in Helioscope for NZE calcs were Sunpower 360W commercial panels with microinverters. Electrical conduit from roof through core to main electrical panel and PEPCO meter.

- Penthouse roof: 582 –panels on roof mount racking system
- Mechanical Roof: 582 –panels on roof mount racking system
- Roof terrace PV Canopy: 103 –panels on overhead steel structure
- South Façade mounted panels (like louvers): 8 x string of 9 panels mounted above ribbon windows

Energy Meters

Tenant level end use energy meters and end use submeters on all core/BOH spaces.

Elevators

New elevators with regenerative drives, ability to be connected to demand control BMS.

PLUMBING (+ DHW)

Option A: Code Compliant

- High efficiency core restroom fixtures (1.28 gfp WC, pint flush urinals)
- Garage cistern storage for DC stormwater compliance
- 5 floor by floor electric water heaters (20 gal)

Option B: LEED Gold/Platinum

- High efficiency core restroom fixtures, non-potable flushing from stormwater cistern.
    - Additional purple pipe riser, pumps, cistern filtration, cistern flow meter and potable makeup water connection
- Garage cistern storage
- 5 floor by floor electric water heaters (20 gal), if possible – higher efficiency than Option A

Option C: Net Zero Energy

- Ultra High efficiency core restroom fixtures (1.0 gpf WC, pint flush urinals)
- Garage cistern storage
- Central DHW heat pump (12kW @ 240V, single phase – state water heaters CHP-120 or similar) for core restrooms

THE PEOPLE

Extra elements priced for energy saving and wellness

THE PEOPLE

MAKE ‘EM WANT TO WALK UP THE STAIRS!

VERTICAL CIRCULATION

Increase the use of the egress stairs as a primary means of ciruclation. Price a large area of fire rated glass (21 sf) at the lobby and smaller windows (12 sf) for both stairs for each floor. Price a full vision panel in each of the stair doors in the project.

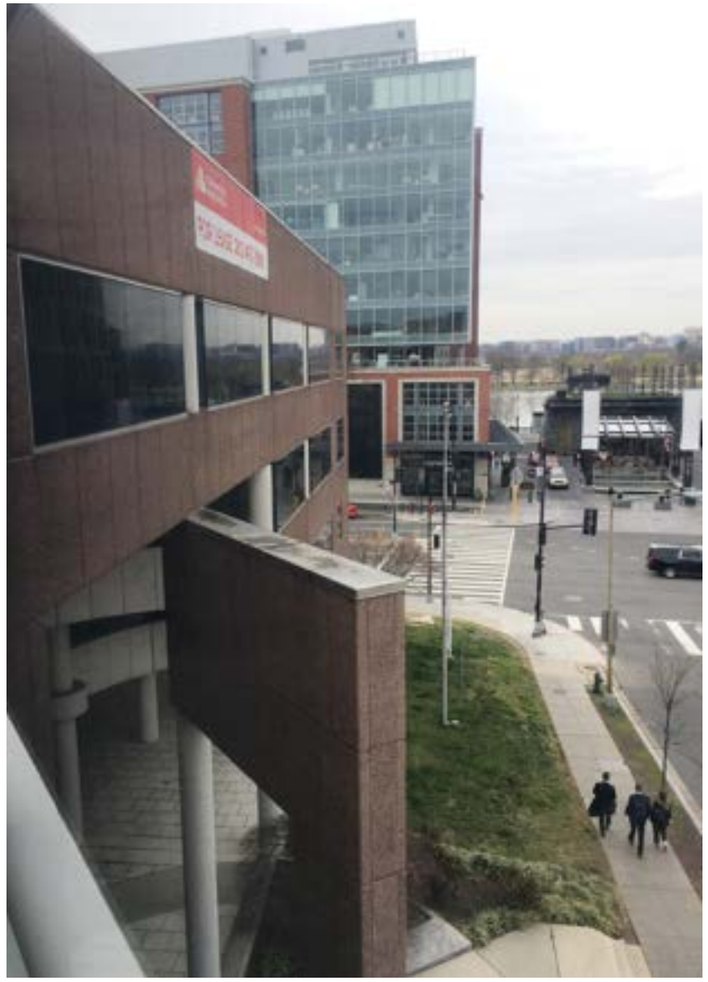
Image: AGU lobby with egress stair enhanced with images of galaxies on the glass

APPENDIX A: THE PRICING MATRIX

APPENDIX B - SCOPE MATRIX			
	Scenario A - Code Required ($)	**Scenario B LEED Gold ($$)**	**Scenario C - NZE ($$$)**
Building Envelope			
New curtain wall at 9th st entrance	90% WWR	90% WWR	60% WWR
Penthouse Curtain wall	90% WWR	75% WWR	50% WWR
Glazing	New double paned ribbon windows. U=0.33/SHGC=0.36	New double paned ribbon windows, argon filled, higher performance U=0.30/SHGC=0.36	Triple paned ribbon windows - max window-to-wall ratio of 55%. U=0.24/SHGC=0.30
Shading & Daylighting	No external shading devices, manual shades. Daylighting per code reqs.	combination fixed shading devices and automated shades tied to daylighting / glare controls	fixed PV for external shading. Automatic shades tied to daylight controls and light shelves for deep floor plate.
Roof	Full replacement	Full replacment with 50% intensive green roof area	Full replacement with maximized intensive green roof area
Roof (R-value)	Code compliant (DC 2017 Energy Code R-33)	R-33	R-35
Opaque Walls (R-value)	Code compliant (DC 2017 Energy Code R-11)	R-20	R-30
MEP systems			
Rooftop PV Array: Sunpower 360W panels	25% of roof area "solar ready" for future array. Electrical conduit infrastructure from roof to PEPCO meter.	Partial penthouse roof mount array - 248 panels. Electrical conduit infrastructure from roof to PEPCO meter.	100% penthouse rooftop array - 582 panels Mech rooftop mounted array - 72 panels PV canopy structure over west roof patio - 103 panels Façade mounted PV shading - 8 x 9 panel mounts Electrical conduit infrastructure from roof to PEPCO meter.
HVAC	Existing system with pump motor replacement (new motor to have VFD)	VRF + DOAS	Water Source Heat Pump with energy recovery
Hot Water	Floor by floor electric water heater	Floor by floor electric water heater	DHW heat pump
Plumbing	Rainwater Storage for DC Water Compliance	Rainwater storage + purple pipe flushing	Rainwater storage (no flush reuse) + ultra lowflow fixtures
Storm Drainage	2nd storm drain required for current code	Integrated stormwater/rainwater storage/greenroof system	2nd storm drain
BMS Control	Existing system	Upgrade controllers on central plant equipment; add graphics	New BMS with complete controls system upgrade (lighting/hvac)
Energy Meters	Floor level (as required by DC 2017 Energy Code)	Floor level and compatible for tenant added submeters	Floor level + End Use Submeters
Emergency Power	Diesel generator (life safety loads and stand by only)	Grid and PV fed batteries for emergency power backup; fire pump to be supplemented with tank	Grid and PV fed battery inverter w/ AC coupling; fire pump to be supplemented with tank
Core building elements			
Replacing / Upgrading elevators	MRL replacement elevator	MRL replacement elevator	MRL replacement elevator
Bringing elevators up to roof	None	Bring one elevator up to roof	Bring one elevator up to roof
Bringing egress stair up to roof	Existing to remain	Bring stair #2 to roof	Bring stair #2 to roof
Occupiable space on the roof	See Roof Plan	See Roof Plan	See Roof Plan
Greenroof	Partial penthouse roof extensive greenroof	Partial penthouse roof extensive greenroof	no green roof, larger garage cistern
Concrete repair in garage	As required	As required	As required
Third party certifications			
LEED	Silver	Gold	Platinum
Net Zero Energy	None	None	On site and off-site generation
Living Building Challenge	None	None	Net Zero energy petal
Program			
NIC			
Workplace			
NIC			

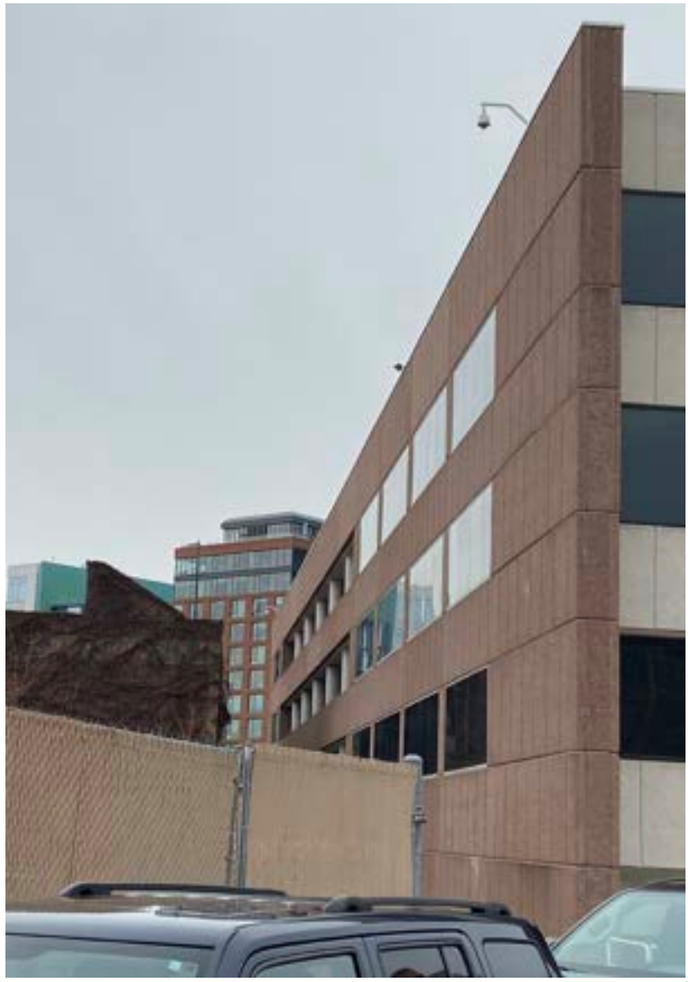
APPENDIX B: SITE PHOTOS

SITE PHOTOS



PRIMARY CORNER, MAIN AVENUE AND 9TH STREET, FROM ABOVE

VIEW TOWARD NORTH ELEVATION FROM G STREET, SW



EAST FACADE VIEWED FROM G STREET, SW

SITE PHOTOS

VIEW TOWARDS MAINE AVENUE, UNDER OVERHANG

VIEW WEST FROM FIRST FLOOR OFFICE SPACE, NOTE THE BELOW GRADE FLOOR PLATE

NET-ZERO ENERGY PROJECT DESIGN ASSISTANCE GRANT:

800 9TH STREET, SW

PART 3B: CONCEPT ESTIMATE

CLIENT: NBL ASSOCIATES

TEAM: HICKOK COLE, ARUP, DPR AND DOEE

SEPTEMBER 17, 2020 (REVISION NO. 1)

Concept Estimate – Revision 1

800 9th Street SW

Net Zero Energy Project
Washington, DC | September 17, 2020

DPR CONSTRUCTION

We Exist to Build Great Things.®

Concept Estimate – Revision 1

800 9th Street SW

Net Zero Energy Project
Washington, DC | September 17, 2020

Contents

1. Executive Summary

EXECUTIVE SUMMARY

Net Zero Energy Project

Concept Estimate - Revision 1

Project Information

Client	**NBL Associates, LP**
Project	Net Zero Energy Project
	Washington, DC
	Concept Estimate - Revision 1
	NZE Pricing Package dated Aug 7, 2020
Architect	hickok cole
Estimator	MD, MC, RF
Estimate Id	Rev 01
Project Duration	12 Mo
Date	September 17, 2020
Building Type	Corporate Office

Construction Area 154,681 SF

Project Costs Summary

00 BUILDING REPOSITIONING	$16,152,783
00.A Exterior Skin - 9th Street	$141,000
00.B Exterior Skin - Remainder (Exist Bldg)	$3,233,019
00.C New Penthouse (incl Elev, Stair, etc.)	$5,343,690
00.D Restroom Upgrades	$1,200,000
00.E Lobby Upgrade & New Structure	$1,512,199
00.F Roof Replacement	$1,058,564
00.G Rainwater Storage Code Reqmt	$131,130
00.H Warm Dark Shell / Other Repositiong Upgrades	$2,468,921
00.I Upgrade Existing MEP Systems	$737,308
00.J Emergency Power	$326,952
01 SUSTAINABLE ALTERNATES	**$254,224**
01.A 50% Extensive Green Roof	$121,797
01.C End Use Submeters	$132,427
02B ENERGY SAVING ALTERNATES - SCENARIO B	**$4,929,570**
02.A Premium/Savings for 75% WWR at PH	($8,350)
02.B Premium/Savings for Higher Performance Glazing	$113,720
02.C R-20 Insulation	$343,065
02.D Fixed Shading	$408,250
02.E Automatic Shades with Ltg Controls	$318,071
02.F VRF Mechanical System	$3,349,813
02.G 90 kWp PV System	$405,000
02C ENERGY SAVING ALTERNATES- SCENARIO C	**$5,032,378**
02.H Premium/Savings for 60% WWR at 9th Street	$455,500
02.I Premium/Savings for 50% WWR at PH	($24,100)
02.J Premium/Savings for Triple Paned Glazing	($176,500)
02.K R-30 Insulation	$468,320
02.L PV Shading (see 299 kWp PV System)	$0
02.M Automatic Shades with Ltg Controls	$166,512
02.N WSHP Mechanical System	$2,712,747
02.O 299 kWp PV System	$1,429,900

ADDITIONAL COSTS TO CONSIDER

	4 YEAR INVEST	20 YEAR INVEST
Additional Costs / Savings - SCENARIO B	**($597,213)**	**($3,355,481)**
PV Array - Utility Savings - 90 kWp	($48,000)	($240,000)
Mechanical System - Utility Savings - VRF	($338,804)	($2,084,189)
SREC from PV Array - 90 kWp	($210,409)	($1,031,292)
Renewable Energy Purchase Agreement (with 90 kWp)	N/A	N/A
	4 YEAR INVEST	**20 YEAR INVEST**
Additional Costs / Savings - SCENARIO C	**($797,866)**	**($4,059,251)**
PV Array - Utility Savings - 299 kWp	($128,000)	($640,000)
Mechanical System - Utility Savings - WSHP	($451,378)	($2,776,704)
SREC from PV Array - 299 kWp	($561,092)	($2,750,113)
Renewable Energy Purchase Agreement (with 299 kWp	$342,604	$2,107,566

Fit-Out Costs for HVAC Systems	OFFICE AREA	COST / SF
Scenario B - VRF	$4,500,000	$36.28
Scenario C - WSHP	$4,100,000	$33.05

*Utility consumption costs are assumed to be $0.10 / kWh with an annual increase of 2.5%

**Renewable Energy Purchase is based on an agreement of $0.07 / kWh at an annual increase of 2.5%

***SRECs are included as reimbursed at $440 / MWh with an annual degradation of 0.25%

*** Costs for 00 Building Repositioning, 01 Sustainable Alternate, and 02 Energy Savings Alternates are additive. Note that 02B and 02C are not additive.**

2. Summaries of Options

LOCATION BY GROUP CROSSTAB REPORT

Net Zero Energy Project

Washington, DC

Net Zero Energy Project

Concept Estimate - Revision 1

NZE Pricing Package dated Aug 7, 2020

Estimate No.: Rev 01

Date: September 17, 2020

Construction Area: 154,681 SF

Division	00 BUILDING REPOSITIONING 154681 SF		01 SUSTAINABLE ALTERNATES 154681 SF		02B ENERGY SAVING ALTS - SCEN B 154681 SF		02C ENERGY SAVING ALTS - SCEN C 154681 SF	
	Amount	Cost/Unit	Amount	Cost/Unit	Amount	Cost/Unit	Amount	Cost/Unit
01-DEMOLITION	$627,308	$4.06	$0	$0.00	$0	$0.00	$0	$0.00
02-SITEWORK	$28,823	$0.19	$0	$0.00	$0	$0.00	$0	$0.00
04-SUBSTRUCTURE	$17,717	$0.11	$0	$0.00	$0	$0.00	$0	$0.00
05-SUPERSTRUCTURE	$3,355,548	$21.69	$0	$0.00	$0	$0.00	$6,800	$0.04
06-EXTERIOR SKIN	$4,507,055	$29.14	$0	$0.00	$856,685	$5.54	$748,820	$4.84
07-ROOFING	$939,707	$6.08	$119,196	$0.77	$0	$0.00	$0	$0.00
08-INTERIOR CONSTRUCTION	$3,694,661	$23.89	$0	$0.00	$318,072	$2.06	$166,512	$1.08
09-CONVEYING	$346,200	$2.24	$0	$0.00	$0	$0.00	$0	$0.00
11-PLUMBING/PROCESS PIPING	$333,714	$2.16	$2,601	$0.02	$0	$0.00	$0	$0.00
12-FIRE PROTECTION	$177,160	$1.15	$0	$0.00	$0	$0.00	$0	$0.00
13-MECHANICAL	$283,079	$1.83	$0	$0.00	$3,031,873	$19.60	$2,401,203	$15.52
14-ELECTRICAL	$1,841,812	$11.91	$132,427	$0.86	$722,940	$4.67	$1,709,043	$11.05
SUB TOTAL	$16,152,783	$104.43	$254,224	$1.64	$4,929,570	$31.87	$5,032,378	$32.53
GCs, GRs, and Indirects	$2,422,917	$15.66	$38,134	$0.25	$739,435	$4.78	$754,857	$4.88
PROJECTED CONSTRUCTION COSTS	$18,575,701	$120.09	$292,357	$1.89	$5,669,005	$36.65	$5,787,235	$37.41
TOTAL	$18,575,701	$120.09	$292,357	$1.89	$5,669,005	$36.65	$5,787,235	$37.41

LOCATION BY GMP CROSSTAB REPORT

Net Zero Energy Project

Washington, DC

Net Zero Energy Project

Concept Estimate - Revision 1

NZE Pricing Package dated Aug 7, 2020

Estimate No.: Rev 01

Date: September 17, 2020

Construction Area: 154,681 SF

GMP	00 BUILDING REPOSITIONING 154681 SF		01 SUSTAINABLE ALTERNATES 154681 SF		02B ENERGY SAVING ALTS - SCEN B 154681 SF		02C ENERGY SAVING ALTS - SCEN C 154681 SF	
	Amount	Cost/Unit	Amount	Cost/Unit	Amount	Cost/Unit	Amount	Cost/Unit
00.A Exterior Skin - 9th Street	$141,000	$0.91	$0	$0.00	$0	$0.00	$0	$0.00
00.B Exterior Skin - Remainder (Exist Bldg)	$3,233,019	$20.90	$0	$0.00	$0	$0.00	$0	$0.00
00.C New Penthouse (incl Elev, Stair, etc.)	$5,343,690	$34.55	$0	$0.00	$0	$0.00	$0	$0.00
00.D Restroom Upgrades	$1,200,000	$7.76	$0	$0.00	$0	$0.00	$0	$0.00
00.E Lobby Upgrade & New Structure	$1,512,199	$9.78	$0	$0.00	$0	$0.00	$0	$0.00
00.F Roof Replacement	$1,058,564	$6.84	$0	$0.00	$0	$0.00	$0	$0.00
00.G Rainwater Storage Code Reqmt	$131,130	$0.85	$0	$0.00	$0	$0.00	$0	$0.00
00.H Warm Dark Shell / Other Repositiong Upgrad	$2,468,921	$15.96	$0	$0.00	$0	$0.00	$0	$0.00
00.I Upgrade Existing MEP Systems	$737,308	$4.77	$0	$0.00	$0	$0.00	$0	$0.00
00.J Emergency Power	$326,952	$2.11	$0	$0.00	$0	$0.00	$0	$0.00
01.A 50% Extensive Green Roof	$0	$0.00	$121,797	$0.79	$0	$0.00	$0	$0.00
01.C End Use Submeters	$0	$0.00	$132,427	$0.86	$0	$0.00	$0	$0.00
02.A Premium/Savings for 75% WWR at PH	$0	$0.00	$0	$0.00	($8,350)	($0.05)	$0	$0.00
02.B Premium/Savings for Higher Performance Gla	$0	$0.00	$0	$0.00	$113,720	$0.74	$0	$0.00
02.C R-20 Insulation	$0	$0.00	$0	$0.00	$343,065	$2.22	$0	$0.00
02.D Fixed Shading	$0	$0.00	$0	$0.00	$408,250	$2.64	$0	$0.00
02.E Automatic Shades with Ltg Controls	$0	$0.00	$0	$0.00	$318,072	$2.06	$0	$0.00
02.F VRF Mechanical System	$0	$0.00	$0	$0.00	$3,349,813	$21.66	$0	$0.00
02.G 90 kWp PV System	$0	$0.00	$0	$0.00	$405,000	$2.62	$0	$0.00
02.H Premium/Savings for 60% WWR at 9th Street	$0	$0.00	$0	$0.00	$0	$0.00	$455,500	$2.94
02.I Premium/Savings for 50% WWR at PH	$0	$0.00	$0	$0.00	$0	$0.00	($24,100)	($0.16)
02.J Premium/Savings for Triple Paned Glazing	$0	$0.00	$0	$0.00	$0	$0.00	($176,500)	($1.14)
02.K R-30 Insulation	$0	$0.00	$0	$0.00	$0	$0.00	$468,320	$3.03
02.L PV Shading (see 299 kWp PV System)	$0	$0.00	$0	$0.00	$0	$0.00	$0	$0.00
02.M Automatic Shades with Ltg Controls	$0	$0.00	$0	$0.00	$0	$0.00	$166,512	$1.08
02.N WSHP Mechanical System	$0	$0.00	$0	$0.00	$0	$0.00	$2,712,747	$17.54
02.O 299 kWp PV System	$0	$0.00	$0	$0.00	$0	$0.00	$1,429,900	$9.24
SUB TOTAL	$16,152,783	$104.43	$254,224	$1.64	$4,929,570	$31.87	$5,032,378	$32.53
GCs, GRs, and Indirects	$2,422,917	$15.66	$38,134	$0.25	$739,435	$4.78	$754,857	$4.88
PROJECTED CONSTRUCTION COSTS	$18,575,701	$120.09	$292,357	$1.89	$5,669,005	$36.65	$5,787,235	$37.41
TOTAL	$18,575,701	$120.09	$292,357	$1.89	$5,669,005	$36.65	$5,787,235	$37.41

3. Basis of Estimate / Qualifications

QUALIFICATIONS – Revision 1

This qualifications narrative presents a written explanation clarifying the assumptions, exclusions and other bases used in developing DPRs Concept Estimate – Revision 1 dated 08/17/2020. Qualifications noted in this document are intended to supplement the Pricing Package Design Documents and clarify for discussion DPR's understanding of the design.

GENERAL QUALIFICATIONS, CLARIFICATIONS, AND EXCLUSIONS

General Qualifications & Clarifications

1. The Concept Estimate is based upon the documents provided by Hickok Cole
    a. Document File Name: "2020-08-07 DOEE Grant – Pricing Package to DPR_DPR Comments" and associated Appendices A-C received 08/20/2020.
    b. Document File Name: "800 9th Street – Primary STR Scope Plan Markup 3" received 08/20/2020.
    c. Document File Name: "20200820 DOEE GSF_Rev 1" received 08/20/2020.
2. In general, Option C's Roof / Penthouse Option is included for Option A, B, C. Mechanical modifications to Options A, B, C have been made to accommodate the additional square footage.
3. DPR has provided a second breakdown for Mechanical Systems Fit-Out cost so that the team can understand the total cost for the Mechanical Systems. We understand that the Building Owner will be responsible for upgrades and Tenant likely responsible for the fit-out but to understand true ROI, DPR has provided the total Mechanical Cost for reference.

General Exclusions

4. Fit-Out of the areas noted as "Office" – the estimate is inclusive of a Warm, Dark Shell in "Office" areas. See Qualification under Mechanical for assumptions on Mechanical fit-out costs.
5. Additional repositioning or capital improvements work in the Parking Garage or what is designated within the pricing package document.
6. Utility permit & connection fees (i.e. Domestic Water, Sanitary Sewer, Storm Drain, Fire Water, Electrical).
7. Consumption costs for power & water including during construction.
8. Tax exempt provisions, including accounting and documentation.
9. All contaminated or hazardous materials, conditions, and associated work or impacts (including delays and delay damages) not expressly included in the Work of the Contract.
10. Differing subsurface or concealed conditions.
11. Premium and Overtime provisions.
12. Items noted as Owner Project costs.
13. Furniture, fixtures and equipment.
14. Bonds.
15. Testing and inspection.
16. 3rd Party Testing & Inspections.
17. 3rd Party Commissioning.

18. Auditing and monitoring of existing structures and roadways for movement or changes in condition.

TRADE SPECIFIC QUALIFICATIONS, CLARIFICATIONS, AND EXCLUSIONS

02 – Existing Conditions and Demolition

19. Demolition of the existing fit-out areas is included.
20. It is assumed that the construction space will be unoccupied during construction.
21. Hazardous material survey and abatement are not included.
22. A clean bill of health from a third-party testing agency is required to be provided by the Owner prior to mobilization for demolition to ensure that the Owner's site will not expose workers to chemical risks such as lead, asbestos, PCBs, etc.

03 – Concrete

23. Concrete repair in garage noted on Appendix B noted "as required" is not included.

04 – Precast / Stone

24. In order to meet the Option C – Ribbon Window WWR requirement of 55%, pricing includes infilling of Precast.

05 – Structural Steel and Miscellaneous Metals

25. New and extended stairs are included as concrete pan filled steel stairs.
26. Wide flange steel is assumed to 50 lbs per LF at slab openings.
27. The steel structure for the added Penthouse Structure is included at 12 lbs per SF.
28. CFRP is included over the entirety of the existing roof area.
29. Column upgrades for the new penthouse structure and roof mounted PV panels are not included.

07 – Thermal and Moisture Protection

30. Spray fireproofing is included at the new steel structure only.
31. The green roof included in Scenarios B and C is priced as extensive not intensive. Both types were noted on the scope matrix for the roof. It is included where the green color is on the New Roof – Option C drawing along the North, West and South West perimeters. The green color within the terrace area is included as planters and not associated with the green roof.
32. We have included EPDM Roofing at the new Steel Structure (Offices, Core and Lounge).
33. WWR requirement for the Penthouse with Options B and C includes metal panel infill. Pricing reflects metal panel to match the MTL1 on level 1 and includes insulation, waterproofing and backup.

08 – Doors and Glazing

34. New doors are included for both existing and new stairs.
35. A stainless steel and glass railing has been included at the perimeter of the terrace.
36. New doors are included for the new demising of Office Suites.

09 – Finishes

37. Fit-out allowances have been included for a high level finish within the Lobby on the Ground Level and the Lounge on the Roof Level. Costs for the finishes at the Corridors / Elevator Lobbies are also included.

38. The existing partitions are included as intact and fully functional. All ratings or construction of existing walls is included as serviceable for the design intended. Rework of the existing walls not coinciding with the documents is not included.
39. Demising walls are included for the office spaces only.
40. Unexpected major floor preparation or floor leveling is not included.
41. Replacing or adding expansion joint covers is not shown, therefore not included.
42. Moisture mitigation is not included.

10 – Specialties

43. Only code complaint signage is included.

14 – Elevators & Conveying Systems

44. Elevators are included as MRL and therefore an elevator machine room is not included.
45. All elevators are included as being extended to the roof per the Structural drawing. The Narrative states that only one elevator will be extended.

21 – Fire Sprinkler

46. The fire sprinkler system is existing to remain in place, and we have included flushing, testing and recertification only.
47. We have not included any costs to test or retrofit any existing fire pump.
48. Fire sprinkler coverage within elevator shafts is not included.
49. We have included extending the existing fire sprinkler system to cover the new lobby area and the new roof core and lounge areas.
50. Fire sprinkler heads under new exterior canopies under four foot wide. They shall be protected by dry sidewall sprinkler heads. We have not included costs for fire sprinkler heads under canopies over four feet wide.

22 – Plumbing

51. All storm drainage is estimated to be existing and the mains are rerouted to a retention tank for reuse as cooling tower make up water or irrigation water.
52. We have included costs to add the overflow storm drainage inlets and piping to daylight outlets. The overflow piping does not connect to the stormwater retention tank.
53. All other plumbing systems shall remain in place.
54. We have included costs to inspect all existing plumbing fixtures and equipment to remain and report only. We have not included any costs to replace or repair any fixtures or trim.
55. The plumbing fixture counts are based upon the fixtures shown on the architectural drawings.
56. We have included costs to flush and disinfect the existing domestic water distribution system.
57. We have not included costs for repair to existing plumbing piping insulation, nor have we included costs for the addition of plumbing piping insulation for noise control.
58. All existing floor by floor domestic hot water heaters are to remain in place.
59. Purple pipe flushing has not been included.

23 – Heating, Ventilation, and Air Conditioning

SCENARIO A

60. The cooling towers, condenser water pumps and heating hot water pumps shall be fitted with new HE motors and variable frequency drives.
61. All variable frequency drives include internal bypass.
62. This estimate includes costs to check and clean the existing cooling towers. We have not included costs to replace any fill or drift eliminators.
63. We have included costs to clean and flush all existing hydronic piping and clean all in line strainers.
64. We have included costs limited to one manhour per unit, to check and service all existing water source heat pumps
65. All existing systems balancing shall be checked and adjusted to parameters set by the design engineer.
66. We have not included costs for opposite season balancing once the project is completed.
67. We have not included cost for replacement or repairs to the existing insulation.
68. Heat tracing is not included.
69. Temporary space conditioning equipment. All temporary space conditioning shall be performed utilizing the permanent HVAC equipment.
70. A DDC automatic temperature control system is included for all new areas, connected as a single automatic temperature controls system.
71. All exposed cabling shall be in conduit. Concealed cabling may be in plenum rated cable.
72. All hardware controllers are 100% native BACnet and can communicate with all third party BACnet IP and BACnet MSTP devices.

SCENARIO B

73. All VRF terminal units include condensate drain to the nearest approved receptor.
74. All existing HVAC equipment is to be demolished and a new variable refrigerant flow system is provided in this scenario to condition the renovated space. It is assumed that the building will be unoccupied during this renovation process.
75. The fan coil units are one ton each and serve an area approximately 400 SF. Each branch selector serves four fan coil units and each rooftop condensing unit serves 5 branch selector units.
76. The DOAS unit is sized per the design narrative and includes energy recovery through the exhaust air stream and exchanges the heat to condition incoming outside air.
77. Each floor includes six variable air volume supply and six variable air volume exhaust terminal units for air level control.
78. Ventilation air through the DOAs unit feeds air directly to each fan coil unit return plenum.
79. All refrigerant piping is ACR copper tubing with brazed joints and is insulated on the liquid side.
80. This estimate includes the cost of a complete system for a completely fitted office space per the design narrative.
81. All ductwork is galvanized steel designed, constructed and supported in accordance with SMACNA standards. This estimate is based on fully ducted supply and exhaust / return connected to the air handling units.
82. Humidification control is not included for winter operation.
83. All condensate drain piping is insulated.
84. All supply and exhaust ductwork is thermally insulated with fiberglass wrap.
85. All air systems include final balancing. We have not included costs for opposite season balancing once the project is completed.
86. This scenario consists of a completely new building management system including the energy meters as described in the design narrative.

87. Area pressure control is passive utilizing the variable air volume boxes at each floor level.

SCENARIO C

88. All existing HVAC equipment is to be demolished and a new water source heat pump system is provided in this scenario to condition the renovated space. It is assumed that the building will be unoccupied during this renovation process.
89. Each heat pump unit one ton each and serve an area approximately 450 SF.
90. The DOAS unit is sized per the design narrative and includes energy recovery through the exhaust air stream and exchanges the heat to condition incoming outside air.
91. Each floor includes six variable air volume supply and six variable air volume exhaust terminal units for air level control.
92. Ventilation air through the DOAs unit feeds air directly to each heat pump unit return plenum.
93. All condenser water piping is schedule 40 black pipe for sizes 2-1/2" and larger and L hard copper tubing for sizes 2" and smaller. The condenser water piping is not insulated.
94. This estimate includes the cost of a complete system for a completely fitted office space per the design narrative.
95. All ductwork is galvanized steel designed, constructed and supported in accordance with SMACNA standards. This estimate is based on fully ducted supply and exhaust / return connected to the air handling units.
96. Humidification control is not included for winter operation.
97. All supply and exhaust ductwork is thermally insulated with fiberglass wrap.
98. All condensate drain piping is insulated.
99. All air systems include final balancing. We have not included costs for opposite season balancing once the project is completed.
100. This scenario consists of a completely new building management system including the energy meters as described in the design narrative.

26 – Electrical

101. Temporary power for construction purposes is included as utilizing the existing electrical system.
102. Feeders and branch circuitry are included as EMT conduit and or MC cable as applicable by code. PVC coated Rigid Conduit is excluded.
103. Lighting Protection ground ring is not included.
104. New fire alarm system is included.
105. Emergency power with battery backup and a supplemental fire tank is not included.

31 – Sitework

106. No work is included for the Garage or Site.

-END OF QUALIFICATIONS-

4. Detailed Estimate

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
00 BUILDING REPOSITIONING					
00.A Exterior Skin - 9th Street					
01-DEMOLITION					
Concrete					
Saw Cut Precast to Allow for Larger Glass		600	lf	$25.00	$15,000
Subtotal: Concrete					**$15,000**
Subtotal: 01-DEMOLITION					**$15,000**
06-EXTERIOR SKIN					
Storefront System					
Aluminum Storefront along 9th Street		1,400	sf	$90.00	$126,000
Subtotal: Storefront System					**$126,000**
Subtotal: 06-EXTERIOR SKIN					**$126,000**
Subtotal: 00.A Exterior Skin - 9th Street					**$141,000**
00.B Exterior Skin - Remainder (Exist Bldg)					
01-DEMOLITION					
Shell Demolition					
Remove Exterior Windows		484	ea	$133.91	$64,814
Subtotal: Shell Demolition					**$64,814**
Concrete					
Saw Cut Precast for Louvers on Ground Floor		52	lf	$25.00	$1,300
Subtotal: Concrete					**$1,300**
Subtotal: 01-DEMOLITION					**$66,114**
05-SUPERSTRUCTURE					
Concrete Columns					
Waterproofing / Rework of Existing Sills, Jambs, and Headers to accept new ribbon windows at Precast		2,274	lf	$25.00	$56,850
Subtotal: Concrete Columns					**$56,850**
Subtotal: 05-SUPERSTRUCTURE					**$56,850**
06-EXTERIOR SKIN					
Metal Framing					
CFMF, Insulation and Waterproofing behind Metal Panels		3,860	sf	$20.00	$77,200
Subtotal: Metal Framing					**$77,200**
Preformed Metal Paneling					
Metal Panels		1,280	sf	$75.00	$96,000
Metal Panel Column Covers		1,400	sf	$100.00	$140,000
Subtotal: Preformed Metal Paneling					**$236,000**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Wall Louvers					
Wall Louvers, Aluminum		120	sf	$125.00	$15,000
Subtotal: Wall Louvers					**$15,000**
Storefront System					
Aluminum Storefront		2,741	sf	$90.00	$246,690
Subtotal: Storefront System					**$246,690**
Entrance Doors					
Storefront Doors		18	ea	$7,500.00	$135,000
Subtotal: Entrance Doors					**$135,000**
Aluminum Windows					
Ribbon Windows		11,372	sf	$65.00	$739,180
Subtotal: Aluminum Windows					**$739,180**
Curtainwall					
Aluminum Curtain Wall		4,283	sf	$130.00	$556,790
Subtotal: Curtainwall					**$556,790**
Texcoating & Painting					
Precast Mineral Coating		17,177	sf	$45.00	$772,965
Stone Mineral Coating		5,694	sf	$45.00	$256,230
Subtotal: Texcoating & Painting					**$1,029,195**
Canopies					
Entry Canopy		1	ea	$75,000.00	$75,000
Subtotal: Canopies					**$75,000**
Subtotal: 06-EXTERIOR SKIN					**$3,110,055**
Subtotal: 00.B Exterior Skin - Remainder (Exist Bldg)					**$3,233,019**
00.C New Penthouse (incl Elev, Stair, etc.)					
01-DEMOLITION					
Concrete					
Saw Cut for Slab Openings for Vertical Transportation		1,330	lf	$18.82	$25,031
Subtotal: Concrete					**$25,031**
Subtotal: 01-DEMOLITION					**$25,031**
05-SUPERSTRUCTURE					
Cem. Decks & Toppings					
Topping Slab - Roof (Interior + Terrace)		28,850	sf	$13.20	$380,820
CFRP at Roof		34,656	sf	$25.00	$866,400
Subtotal: Cem. Decks & Toppings					**$1,247,220**
Concrete Pan Fill Stairs					
Concrete Pan Fill Stairs		20	cy	$300.00	$6,000

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Subtotal: Concrete Pan Fill Stairs					**$6,000**
Structural Steel					
Steel for Added Penthouse Offices and Canopy		190	tn	$5,000.00	$948,930
Subtotal: Structural Steel					**$948,930**
Steel Roof Deck					
Open Type, Galv., 1 1/2" 22ga		22,650	sf	$5.00	$113,250
Subtotal: Steel Roof Deck					**$113,250**
Miscellaneous Metals					
Miscellaneous Metals for Elevators		5	stp	$10,000.00	$50,000
Steel for Slab Openings		33	tn	$5,000.00	$166,250
Steel Support @ Metal Stairs		8	ea	$5,000.00	$40,000
Subtotal: Miscellaneous Metals					**$256,250**
Handrails & Railing					
Stainless Steel / Glass Rail @ Terrace		400	lf	$550.00	$220,000
Subtotal: Handrails & Railing					**$220,000**
Concrete Filled Panstair					
Steel Pan Stair, w/Railings		8	flt	$15,000.00	$120,000
Subtotal: Concrete Filled Panstair					**$120,000**
Fireproofing					
Fireproofing of New Steel		22,650	sf	$3.50	$79,275
Subtotal: Fireproofing					**$79,275**
Subtotal: 05-SUPERSTRUCTURE					**$2,990,925**
06-EXTERIOR SKIN					
Preformed Metal Paneling					
Metal Panels @ Penthouse		1,180	sf	$75.00	$88,500
Subtotal: Preformed Metal Paneling					**$88,500**
Storefront System					
Aluminum Storefront @ Penthouse		10,625	sf	$100.00	$1,062,500
Subtotal: Storefront System					**$1,062,500**
Subtotal: 06-EXTERIOR SKIN					**$1,151,000**
08-INTERIOR CONSTRUCTION					
Interior Improvements					
Lounge Fit-Out Allowance		2,075	sf	$140.00	$290,500
Subtotal: Interior Improvements					**$290,500**
Countertops					
Restroom Countertops		24	lf	$420.00	$10,080
Subtotal: Countertops					**$10,080**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Metals Studs & Drywall					
Stair and Elevator Shafts		17,622	sf	$11.00	$193,842
Subtotal: Metals Studs & Drywall					**$193,842**
Gypsum Board Ceilings					
Drywall Ceilings @ Restrooms on Roof		1,100	sf	$20.00	$22,000
Subtotal: Gypsum Board Ceilings					**$22,000**
Tile					
Ceramic Walls @ Restrooms on Roof		2,260	sf	$25.00	$56,500
Ceramic Floors @ Restrooms on Roof		1,100	sf	$20.00	$22,000
Subtotal: Tile					**$78,500**
Toilet Partitions					
Toilet Partitions		11	ea	$1,525.00	$16,775
Subtotal: Toilet Partitions					**$16,775**
Toilet Accessories					
Large Bathrooms		2	ea	$3,430.40	$6,861
Subtotal: Toilet Accessories					**$6,861**
Subtotal: 08-INTERIOR CONSTRUCTION					**$618,558**
09-CONVEYING					
Passenger Elev.-Gearless					
Replace Existing Elevators and Extend to Roof Level		5	stp	$57,000.00	$285,000
Cab Allowance		3	ea	$20,400.00	$61,200
Subtotal: Passenger Elev.-Gearless					**$346,200**
Subtotal: 09-CONVEYING					**$346,200**
11-PLUMBING/PROCESS PIPING					
Plumbing System					
Lounge Addition		2,075	sf	$13.00	$26,969
Subtotal: Plumbing System					**$26,969**
Plumbing Project Req.					
Testing and Inspections		8	mh	$114.10	$913
Supervision		40	mh	$125.25	$5,010
Subtotal: Plumbing Project Req.					**$5,923**
Storm Drainage Systems					
No Hub Cast Iron, SV, 6"		480	lf	$74.52	$35,768
Overflow Drain		8	ea	$829.30	$6,634
Overflow Outlet		8	ea	$680.30	$5,442
Subtotal: Storm Drainage Systems					**$47,845**
Waste Drainage Systems					
C.I. No Hub Waste & Vent AG 3"		40	lf	$55.42	$2,217
C.I. No Hub Waste & Vent AG 4"		80	lf	$66.70	$5,336

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
C.I. No Hub Waste & Vent AG 8"		30	lf	$138.07	$4,142
Floor Drain, CI		2	ea	$521.15	$1,042
Trap Primer Unit w/ L Hard C Tubing		2	ea	$228.10	$456
Subtotal: Waste Drainage Systems					**$13,194**
Domestic Hot & Cold Water					
L-Cu Dist. Piping 1-1/2" and Smaller		120	lf	$36.23	$4,348
L-Cu Dist. Piping 2-1/2"		40	lf	$64.44	$2,578
L-Cu Dist. Piping 3"		40	lf	$81.50	$3,260
Check, Test and Certify Existing		1	ea	$601.40	$601
Trap Primer, Dist Panel		1	ea	$484.49	$484
Wall Hydrants 3/4"		2	ea	$1,184.40	$2,369
Elec Dom HWH, 40 Gal w/ Specialties		1	ea	$5,433.60	$5,434
Subtotal: Domestic Hot & Cold Water					**$19,074**
Piping Insulation					
Domestic Water Insulation - Run Outs		120	lf	$14.58	$1,750
Domestic Water Insulation - Mains		80	lf	$23.10	$1,848
Subtotal: Piping Insulation					**$3,598**
Plumb. Fix/Comm. w/Ro. In					
Water Closet, Wall Hung, Carrier, Flush Valve (Sensor)		5	ea	$2,170.44	$10,852
Water Closet, Wall Hung, Carrier, Flush Valve (Sensor) HC		2	ea	$2,170.44	$4,341
Urinal, Wall Hung, Flush Valve (Sensor)		2	ea	$1,455.79	$2,912
Lavatory, Countertop, Undermount, Faucet and Trim		8	ea	$1,597.33	$12,779
Mop Receptor, Molded Stone, Faucet and Trim		1	ea	$2,261.40	$2,261
Subtotal: Plumb. Fix/Comm. w/Ro. In					**$33,145**
Misc. Plumbing Items					
Disinfection		1	ls	$2,832.80	$2,833
Core Drilling		4	ea	$404.10	$1,616
Fire Safing		20	ea	$162.10	$3,242
Subtotal: Misc. Plumbing Items					**$7,691**
Subtotal: 11-PLUMBING/PROCESS PIPING					**$157,438**
12-FIRE PROTECTION					
Fire Protection Proj Req					
Testing and Inspections		8	mh	$89.90	$719
Supervision		16	mh	$97.25	$1,556
Coordination / Submittals / Record Drwgs / O&MMs		32	mh	$84.90	$2,717
Hydraulic Calcs, Design and Engineering Costs		8	mh	$155.00	$1,240
Testing and Inspection of Existing System		40	mh	$89.90	$3,596
Subtotal: Fire Protection Proj Req					**$9,828**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Wet Pipe Sprinkler					
Light Hazard System (Roof Core)		36	hds	$287.80	$10,361
Light Hazard System (Roof Lounge)		18	hds	$287.80	$5,180
Main and Riser Piping		1	flr	$11,392.00	$11,392
Floor Control Valves		1	ea	$1,898.40	$1,898
Hose Valve Stations		1	ea	$1,010.80	$1,011
Roof Canopy Coverage		30	hds	$495.60	$14,868
Subtotal: Wet Pipe Sprinkler					**$44,710**
Subtotal: 12-FIRE PROTECTION					**$54,538**
Subtotal: 00.C New Penthouse (incl Elev, Stair, etc.)					**$5,343,690**
00.D Restroom Upgrades					
08-INTERIOR CONSTRUCTION					
Interior Improvements					
Restroom Upgrades in Existing Core		8	ea	$150,000.00	$1,200,000
Subtotal: Interior Improvements					**$1,200,000**
Subtotal: 08-INTERIOR CONSTRUCTION					**$1,200,000**
Subtotal: 00.D Restroom Upgrades					**$1,200,000**
00.E Lobby Upgrade & New Structure					
01-DEMOLITION					
Shell Demolition					
Demo Columns for Ground Floor Expansion		2	ea	$3,470.00	$6,940
Demo Ground Floor Walls for Expanded Area		2,860	sf	$11.15	$31,889
Subtotal: Shell Demolition					**$38,829**
Subtotal: 01-DEMOLITION					**$38,829**
05-SUPERSTRUCTURE					
Concrete Columns					
Concrete Columns Extended to Underside of 4th Floor; Braced at 3rd Flr Slab		1	ea	$15,400.00	$15,400
Subtotal: Concrete Columns					**$15,400**
Cem. Decks & Toppings					
Topping Slab - Architectural Infill Ground Level		5,890	sf	$13.20	$77,748
Subtotal: Cem. Decks & Toppings					**$77,748**
Structural Steel					
Steel for Extended Ground Floor / Lobby / Entrance Canopy		36	tn	$5,000.00	$180,000
Subtotal: Structural Steel					**$180,000**
Subtotal: 05-SUPERSTRUCTURE					**$273,148**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
06-EXTERIOR SKIN					
Entrance Doors					
Lobby Doors		8	ea	$15,000.00	$120,000
Subtotal: Entrance Doors					$120,000
Subtotal: 06-EXTERIOR SKIN					$120,000
08-INTERIOR CONSTRUCTION					
Interior Improvements					
Lobby Fit-Out Allowance		3,030	sf	$180.00	$545,400
Subtotal: Interior Improvements					$545,400
Glazing					
Fire Rated Glass at Lobby		21	sf	$330.00	$6,930
Fire Rated Glass at Stairs		168	sf	$330.00	$55,440
Subtotal: Glazing					$62,370
Metals Studs & Drywall					
Reconfigure Shaft for New Stair from Parking Level		1	ls	$6,080.00	$6,080
Subtotal: Metals Studs & Drywall					$6,080
Subtotal: 08-INTERIOR CONSTRUCTION					$613,850
12-FIRE PROTECTION					
Wet Pipe Sprinkler					
Light Hazard System (Lobby)		24	hds	$287.80	$6,907
Subtotal: Wet Pipe Sprinkler					$6,907
Subtotal: 12-FIRE PROTECTION					$6,907
14-ELECTRICAL					
Electrical System					
Main Lobby, Lounge, & Core		30,631	sf	$15.00	$459,465
Subtotal: Electrical System					$459,465
Subtotal: 14-ELECTRICAL					$459,465
Subtotal: 00.E Lobby Upgrade & New Structure					$1,512,199
00.F Roof Replacement					
01-DEMOLITION					
Shell Demolition					
Demo Concrete Curb @ Roof		330	lf	$15.00	$4,950
Demo of Existing Pavers @ Roof		5,500	sf	$3.22	$17,710
Subtotal: Shell Demolition					$22,660
Subtotal: 01-DEMOLITION					$22,660
02-SITEWORK					

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Site Furnishings					
Planters at Roof		5	ea	$3,850.00	$19,250
Subtotal: Site Furnishings					**$19,250**
Subtotal: 02-SITEWORK					**$19,250**
07-ROOFING					
Built Up Roofing					
Remove & Replace SBS-Modified, Hot Applied @ 4th Floor Roof		12,460	sf	$25.00	$311,500
Demo of Roofing		21,340	sf	$9.00	$192,060
Subtotal: Built Up Roofing					**$503,560**
EPDM Roofing					
EPDM Roofing at Offices / Core / Lounge - on new metal deck		21,340	sf	$12.00	$256,080
Extensive Greenroof		1,300	sf	$25.20	$32,760
Subtotal: EPDM Roofing					**$288,840**
Misc. Roofing Items					
Rooftop Terrace (Pavers,Protection,etc.)		6,427	sf	$22.92	$147,307
Subtotal: Misc. Roofing Items					**$147,307**
Subtotal: 07-ROOFING					**$939,707**
11-PLUMBING/PROCESS PIPING					
Storm Drainage Systems					
Terrace and Green Roof Drainage		23,000	sf	$1.50	$34,485
Subtotal: Storm Drainage Systems					**$34,485**
Subtotal: 11-PLUMBING/PROCESS PIPING					**$34,485**
14-ELECTRICAL					
Electrical System					
Lightning Protection Sys (per sf of Roof)		21,000	sf	$2.02	$42,462
Subtotal: Electrical System					**$42,462**
Subtotal: 14-ELECTRICAL					**$42,462**
Subtotal: 00.F Roof Replacement					**$1,058,564**
00.G Rainwater Storage Code Reqmt					
05-SUPERSTRUCTURE					
Suspended Deck					
Structural Upgrades for Rainwater Harvesting		1	ls	$20,000.00	$20,000
Subtotal: Suspended Deck					**$20,000**
Subtotal: 05-SUPERSTRUCTURE					**$20,000**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
11-PLUMBING/PROCESS PIPING					
Storm Drainage Systems					
Rainwater Storage for DC Compliance		10,000	gal	$6.84	$68,410
Rainwater / Filter / Pump Set		1	ls	$11,064.00	$11,064
Piping Revisions		1	ls	$31,656.00	$31,656
Subtotal: Storm Drainage Systems					**$111,130**
Subtotal: 11-PLUMBING/PROCESS PIPING					**$111,130**
Subtotal: 00.G Rainwater Storage Code Reqmt					**$131,130**
00.H Warm Dark Shell / Other Repositioning Upgrades					
01-DEMOLITION					
Shell Demolition					
Laser Scanning of Slabs Prior to Demolition		3	ea	$3,500.00	$10,500
Demo Exterior Stair to Garage Level		1	ls	$15,000.00	$15,000
Subtotal: Shell Demolition					**$25,500**
Interior Demolition					
Demolition of Existing Office / Tenant Space		124,050	sf	$3.50	$434,175
Subtotal: Interior Demolition					**$434,175**
Subtotal: 01-DEMOLITION					**$459,675**
05-SUPERSTRUCTURE					
Cem. Decks & Toppings					
Infill Slab at Demo'd Exterior Stair		225	sf	$65.00	$14,625
Subtotal: Cem. Decks & Toppings					**$14,625**
Subtotal: 05-SUPERSTRUCTURE					**$14,625**
08-INTERIOR CONSTRUCTION					
Interior Improvements					
Offices - Warm Lit Shell	Minor patching of walls included	124,050	sf	$2.50	$310,125
Subtotal: Interior Improvements					**$310,125**
Rough Carpentry					
Rough Carpentry Allowance		154,681	sf	$0.45	$69,606
Subtotal: Rough Carpentry					**$69,606**
Interior Caulking					
Caulking Allowance		154,681	sf	$0.25	$38,670
Subtotal: Interior Caulking					**$38,670**
Doors, Frames & Hardware					
New Doors at Stairs		14	ea	$1,950.00	$27,300
Single Door Assemblies in Demising Wall		13	ea	$1,950.00	$25,350
Double Door Assemblies in Demising Wall		15	ea	$3,280.00	$49,200
Subtotal: Doors, Frames & Hardware					**$101,850**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Glazing					
Fire Rated Vision Panels in Stair Doors		5	sf	$330.00	$1,650
Subtotal: Glazing					**$1,650**
Metals Studs & Drywall					
Demising Partitions for Office Suites		27,000	sf	$12.00	$324,000
Full Height Walls in Core		7,300	sf	$10.00	$73,000
Subtotal: Metals Studs & Drywall					**$397,000**
Acoustical Ceilings					
Ceiling in Core Corridors		8,280	sf	$6.75	$55,890
Subtotal: Acoustical Ceilings					**$55,890**
Carpeting					
Carpet Tiles in Corridors		8,280	sf	$4.50	$37,260
Subtotal: Carpeting					**$37,260**
Latex Painting					
Paint Interior Walls		34,300	sf	$1.25	$42,875
Subtotal: Latex Painting					**$42,875**
Signage					
Code Compliant Signage Allowance		1	ls	$3,500.00	$3,500
Subtotal: Signage					**$3,500**
Fire Ext. Cabinets					
FEC/FEs		21	ea	$290.00	$6,090
Subtotal: Fire Ext. Cabinets					**$6,090**
Window Coverings					
Manual Shades		30,421	sf	$6.50	$197,737
Subtotal: Window Coverings					**$197,737**
Subtotal: 08-INTERIOR CONSTRUCTION					**$1,262,253**
12-FIRE PROTECTION					
Wet Pipe Sprinkler					
Turn Sprinkler Heads Up		1,220	hds	$91.90	$112,118
Subtotal: Wet Pipe Sprinkler					**$112,118**
Subtotal: 12-FIRE PROTECTION					**$112,118**
14-ELECTRICAL					
Electrical System					
Office Warm Lit Shell		124,050	sf	$5.00	$620,250
Subtotal: Electrical System					**$620,250**
Subtotal: 14-ELECTRICAL					**$620,250**
Subtotal: 00.H Warm Dark Shell / Other Repositioning Upgrades					**$2,468,921**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
00.I Upgrade Existing MEP Systems					
11-PLUMBING/PROCESS PIPING					
Plumbing Project Req.					
Testing and Inspections		24	mh	$114.10	$2,738
Supervision		120	mh	$125.25	$15,030
Coordination / Submittals / Record Drwgs / O&MMs		80	mh	$109.10	$8,728
Subtotal: Plumbing Project Req.					**$26,496**
Plumb. Fix/Comm. w/Ro. In					
Check and Service ETR Plumbing Fixtures / Trim		80	ea	$52.05	$4,164
Subtotal: Plumb. Fix/Comm. w/Ro. In					**$4,164**
Subtotal: 11-PLUMBING/PROCESS PIPING					**$30,660**
12-FIRE PROTECTION					
Fire Protection Proj Req					
Testing and Inspection of Existing System		40	mh	$89.90	$3,596
Subtotal: Fire Protection Proj Req					**$3,596**
Subtotal: 12-FIRE PROTECTION					**$3,596**
13-MECHANICAL					
HVAC Project Req.					
Testing and Inspections		48	mh	$114.10	$5,477
Supervision		48	mh	$125.25	$6,012
Coordination / Submittals / Record Drwgs / O&MMs		48	mh	$109.10	$5,237
Subtotal: HVAC Project Req.					**$16,726**
HVAC System Revisions					
Motor Replacement - Cooling Tower		100	hp	$192.05	$19,205
Motor Replacement - Condenser Water Pumps		80	hp	$192.05	$15,364
Motor Replacement - Heating Hot Water Pumps		50	hp	$192.05	$9,603
Variable Frequency Drives		200	hp	$208.41	$41,682
Check and Clean Tower, Flush all Piping and Strainers		1	ls	$25,156.00	$25,156
Check and Service all Heat Pumps (1 every 400 SF)		386	ea	$322.30	$124,408
Subtotal: HVAC System Revisions					**$235,417**
Air & Water Balancing					
Air and Water Balancing (Check and Adjust)		154,681	sf	$0.20	$30,936
Subtotal: Air & Water Balancing					**$30,936**
Subtotal: 13-MECHANICAL					**$283,079**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
14-ELECTRICAL					
Electrical System					
Temporary Electrical System		1	ls	$7,500.00	$7,500
Subtotal: Electrical System					**$7,500**
Electrical Demo and Temp Power					
Circuit Trace and Safe-off		160	mh	$84.80	$13,568
Subtotal: Electrical Demo and Temp Power					**$13,568**
Distribution Panels					
3-Phase Green Class Sub-meter, (100-400A)		5	ea	$1,555.94	$7,780
Subtotal: Distribution Panels					**$7,780**
Variable Frequency Drives					
50hp, 480V. VFD (Labor Only)		6	ea	$935.75	$5,615
Subtotal: Variable Frequency Drives					**$5,615**
Hook-Up					
Water Heater Connection - Disc		5	ea	$298.24	$1,491
Subtotal: Hook-Up					**$1,491**
Fire Alarm and Life Safety Systems					
Fire Alarm System (Non-HR, open wire)		154,681	sf	$2.42	$374,019
Subtotal: Fire Alarm and Life Safety Systems					**$374,019**
Miscellaneous Electrical					
Electrical Rigging		1	ls	$10,000.00	$10,000
Subtotal: Miscellaneous Electrical					**$10,000**
Subtotal: 14-ELECTRICAL					**$419,972**
Subtotal: 00.I Upgrade Existing MEP Systems					**$737,308**
00.J Emergency Power					
02-SITEWORK					
Chain Link Fence					
Fencing around Gen Pad		250	lf	$24.29	$6,073
Subtotal: Chain Link Fence					**$6,073**
Landscaping					
Landscape Repair		1	ls	$3,500.00	$3,500
Subtotal: Landscaping					**$3,500**
Subtotal: 02-SITEWORK					**$9,573**
04-SUBSTRUCTURE					
Curbs & Pads					
Generator Pad		600	sf	$29.53	$17,717
Subtotal: Curbs & Pads					**$17,717**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Subtotal: 04-SUBSTRUCTURE					**$17,717**
14-ELECTRICAL					
Back-up Power					
750kW/937.5kVA, 277/480 Diesel Engine Generator		1	ea	$234,503.00	$234,503
Add for Weatherproof Enclosure		1	ea	$42,361.50	$42,362
250A 480/277V, Xfer Sw, Nema 1		1	ea	$9,659.50	$9,660
400A 480/277V, Xfer Sw, Nema 1		1	ea	$13,138.60	$13,139
Subtotal: Back-up Power					**$299,663**
Subtotal: 14-ELECTRICAL					**$299,663**
Subtotal: 00.J Emergency Power					**$326,952**
Subtotal: 00 BUILDING REPOSITIONING					**$16,152,783**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
01 SUSTAINABLE ALTERNATES					
01.A 50% Extensive Green Roof					
07-ROOFING					
EPDM Roofing					
Extensive Greenroof		4,730	sf	$25.20	$119,196
Subtotal: EPDM Roofing					**$119,196**
Subtotal: 07-ROOFING					**$119,196**
11-PLUMBING/PROCESS PIPING					
Domestic Hot & Cold Water					
Irrigation Connection (Roof Level)		1	ea	$2,600.80	$2,601
Subtotal: Domestic Hot & Cold Water					**$2,601**
Subtotal: 11-PLUMBING/PROCESS PIPING					**$2,601**
Subtotal: 01.A 50% Extensive Green Roof					**$121,797**
01.C End Use Submeters					
14-ELECTRICAL					
Distribution Panels					
3-Phase Green Class Sub-meter, (100-400A)		12	ea	$1,555.94	$18,671
Software Package 1-50 meters (Req'd for single phase meters)		17	ea	$6,691.50	$113,756
Subtotal: Distribution Panels					**$132,427**
Subtotal: 14-ELECTRICAL					**$132,427**
Subtotal: 01.C End Use Submeters					**$132,427**
Subtotal: 01 SUSTAINABLE ALTERNATES					**$254,224**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
02B ENERGY SAVING ALTS - SCEN B					
02.A Premium/Savings for 75% WWR at PH					
06-EXTERIOR SKIN					
Metal Framing					
CFMF, Insulation and Waterproofing behind Metal Panels		1,770	sf	$20.00	$35,400
Subtotal: Metal Framing					**$35,400**
Preformed Metal Paneling					
Metal Panels @ Penthouse		1,770	sf	$75.00	$132,750
Subtotal: Preformed Metal Paneling					**$132,750**
Storefront System					
Aluminum Storefront @ Penthouse		(1,765)	sf	$100.00	($176,500)
Subtotal: Storefront System					**($176,500)**
Subtotal: 06-EXTERIOR SKIN					**($8,350)**
Subtotal: 02.A Premium/Savings for 75% WWR at PH					**($8,350)**
02.B Premium/Savings for Higher Performance Glazing					
06-EXTERIOR SKIN					
Aluminum Windows					
Ribbon Windows		-	sf	-	$113,720
Subtotal: Aluminum Windows					**$113,720**
Subtotal: 06-EXTERIOR SKIN					**$113,720**
Subtotal: 02.B Premium/Savings for Higher Performance Glazing					**$113,720**
02.C R-20 Insulation					
06-EXTERIOR SKIN					
Thermal Insulation					
Insulation behind Existing Opaque Walls for R-20 Value (includes removal and replacement)		22,871	sf	$15.00	$343,065
Subtotal: Thermal Insulation					**$343,065**
Subtotal: 06-EXTERIOR SKIN					**$343,065**
Subtotal: 02.C R-20 Insulation					**$343,065**
02.D Fixed Shading					
06-EXTERIOR SKIN					
Misc. Exterior Skin					
Sun Shades		3,266	sf	$125.00	$408,250
Subtotal: Misc. Exterior Skin					**$408,250**
Subtotal: 06-EXTERIOR SKIN					**$408,250**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Subtotal: 02.D Fixed Shading					**$408,250**
02.E Automatic Shades with Ltg Controls					
08-INTERIOR CONSTRUCTION					
Window Coverings					
Automated Shades tied to Daylighting / Glare Controls	Programming to be included with Tenant Fit-Out based on final layout	28,656	sf	$18.00	$515,808
Manual Shades		(30,421)	sf	$6.50	($197,737)
Subtotal: Window Coverings					**$318,072**
Subtotal: 08-INTERIOR CONSTRUCTION					**$318,072**
Subtotal: 02.E Automatic Shades with Ltg Controls					**$318,072**
02.F VRF Mechanical System					
13-MECHANICAL					
HVAC System					
Remove Scenario A / Repos Mechanical Upgrades		(1)	ls	$283,079.00	($283,079)
Subtotal: HVAC System					**($283,079)**
HVAC Project Req.					
Testing and Inspections		200	mh	$114.10	$22,820
Supervision		400	mh	$125.25	$50,100
Coordination / Submittals / Record Drwgs / O&MMs		400	mh	$109.10	$43,640
Subtotal: HVAC Project Req.					**$116,560**
Refrigerant Piping					
Suction and Liquid Piping (Condenser to Selector Branch)		13,800	lf	$29.65	$409,170
Subtotal: Refrigerant Piping					**$409,170**
Insulation					
Refrigerant Piping		13,800	lf	$6.75	$93,150
Ductwork FC ASJ 2" Thick		47,900	sf	$3.85	$184,415
Subtotal: Insulation					**$277,565**
Variable Refrigerant Volume System					
Condensing Units, 20 Ton Units		24	ea	$29,865.60	$716,774
Branch Selection Unit (4 FCU per Selector) (Single Circuit)		115	ea	$1,176.40	$135,286
Rigging		1	ls	$17,498.40	$17,498
Subtotal: Variable Refrigerant Volume System					**$869,559**
Specialty AHU					
DOAS Unit w/Heat Recovery		14,500	cfm	$9.15	$132,632
Rigging		1	ls	$6,249.20	$6,249
Subtotal: Specialty AHU					**$138,881**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Sup/Ret/Gen. Exh. Duct					
Galvanized Ductwork and Duct Specialties		91,400	lb	$11.56	$1,056,584
Subtotal: Sup/Ret/Gen. Exh. Duct					**$1,056,584**
Air Distribution Devices					
Linear Slot Diffuser, Exterior Perimeter		640	lf	$135.55	$86,749
Subtotal: Air Distribution Devices					**$86,749**
Terminal Zone Units					
VAV Box, Cooling Only (OA / Exhaust Level Control)		8	ea	$1,713.20	$13,706
Subtotal: Terminal Zone Units					**$13,706**
ATC Controls					
Control Points		220	ea	$857.00	$188,540
Subtotal: ATC Controls					**$188,540**
Air & Water Balancing					
Air Balancing		154,681	sf	$0.10	$15,468
Subtotal: Air & Water Balancing					**$15,468**
Misc. Mechanical Items					
Sleeves, Seals and Penetration Fire Safing		550	ea	$180.10	$99,055
Temporary HVAC		3	mo	$14,372.00	$43,116
Subtotal: Misc. Mechanical Items					**$142,171**
Subtotal: 13-MECHANICAL					**$3,031,873**
14-ELECTRICAL					
Electrical System					
Remove Building Repositioning		(1)	ls	$419,972.00	($419,972)
Temporary Electrical System		1	ls	$7,500.00	$7,500
HVAC Equipment Hook-Up		154,681	sf	$2.00	$309,362
Subtotal: Electrical System					**($103,110)**
Electrical Demo and Temp Power					
Circuit Trace and Safe-off		160	mh	$84.80	$13,568
Subtotal: Electrical Demo and Temp Power					**$13,568**
Distribution Panels					
3-Phase Green Class Sub-meter, (100-400A)		5	ea	$1,555.94	$7,780
Subtotal: Distribution Panels					**$7,780**
Hook-Up					
VAV Box Connection		24	ea	$295.77	$7,098
Large Chiller Connection		1	ea	$2,299.43	$2,299
Water Heater Connection - Disc		10	ea	$298.24	$2,982
Local Disc 600v,3ph,400A,3R,200-300hp		1	ea	$2,855.11	$2,855
Subtotal: Hook-Up					**$15,235**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Branch Circuiting					
HVAC Control Panel Power		1	ea	$448.50	$448
Subtotal: Branch Circuiting					**$448**
Fire Alarm and Life Safety Systems					
Fire Alarm System (Non-HR, open wire)		154,681	sf	$2.42	$374,019
Subtotal: Fire Alarm and Life Safety Systems					**$374,019**
Miscellaneous Electrical					
Electrical Rigging		1	ls	$10,000.00	$10,000
Subtotal: Miscellaneous Electrical					**$10,000**
Subtotal: 14-ELECTRICAL					**$317,940**
Subtotal: 02.F VRF Mechanical System					**$3,349,813**
02.G 90 kWp PV System					
14-ELECTRICAL					
Renewable Energy					
Penthouse Roof Mtd. 248 Panels		90	kWp	$4,500.00	$405,000
Subtotal: Renewable Energy					**$405,000**
Subtotal: 14-ELECTRICAL					**$405,000**
Subtotal: 02.G 90 kWp PV System					**$405,000**
Subtotal: 02B ENERGY SAVING ALTS - SCEN B					**$4,929,570**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
02C ENERGY SAVING ALTS - SCEN C					
02.H Premium/Savings for 60% WWR at 9th Street					
05-SUPERSTRUCTURE					
Concrete Columns					
Waterproofing / Rework of Existing Sills, Jambs, and Headers to accept new ribbon windows at Precast		(1,024)	lf	$25.00	($25,600)
Subtotal: Concrete Columns					**($25,600)**
Subtotal: 05-SUPERSTRUCTURE					**($25,600)**
06-EXTERIOR SKIN					
Precast Panels					
Insulated Precast to meet WWR Ratio		5,117	sf	$100.00	$511,700
Subtotal: Precast Panels					**$511,700**
Storefront System					
Aluminum Storefront along 9th Street		(340)	sf	$90.00	($30,600)
Subtotal: Storefront System					**($30,600)**
Subtotal: 06-EXTERIOR SKIN					**$481,100**
Subtotal: 02.H Premium/Savings for 60% WWR at 9th Street					**$455,500**
02.I Premium/Savings for 50% WWR at PH					
06-EXTERIOR SKIN					
Metal Framing					
CFMF, Insulation and Waterproofing behind Metal Panels		4,720	sf	$20.00	$94,400
Subtotal: Metal Framing					**$94,400**
Preformed Metal Paneling					
Metal Panels @ Penthouse		4,720	sf	$75.00	$354,000
Subtotal: Preformed Metal Paneling					**$354,000**
Storefront System					
Aluminum Storefront @ Penthouse		(4,725)	sf	$100.00	($472,500)
Subtotal: Storefront System					**($472,500)**
Subtotal: 06-EXTERIOR SKIN					**($24,100)**
Subtotal: 02.I Premium/Savings for 50% WWR at PH					**($24,100)**
02.J Premium/Savings for Triple Paned Glazing					
06-EXTERIOR SKIN					
Aluminum Windows					
Ribbon Windows		(5,120)	sf	$34.47	($176,500)
Subtotal: Aluminum Windows					**($176,500)**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Subtotal: 06-EXTERIOR SKIN					**($176,500)**
Subtotal: 02.J Premium/Savings for Triple Paned Glazing					**($176,500)**
02.K R-30 Insulation					
06-EXTERIOR SKIN					
Thermal Insulation					
Insulation behind Existing Opaque Walls for R-30 Value (includes removal and replacement)		23,416	sf	$20.00	$468,320
Subtotal: Thermal Insulation					**$468,320**
Subtotal: 06-EXTERIOR SKIN					**$468,320**
Subtotal: 02.K R-30 Insulation					**$468,320**
02.L PV Shading (see 299 kWp PV System)					
06-EXTERIOR SKIN					
Misc. Exterior Skin					
PV Sun Shades - w/ PV Costs	See 299 kWp System	-	sf	-	$0
Subtotal: Misc. Exterior Skin					**$0**
Subtotal: 06-EXTERIOR SKIN					**$0**
Subtotal: 02.L PV Shading (see 299 kWp PV System)					**$0**
02.M Automatic Shades with Ltg Controls					
08-INTERIOR CONSTRUCTION					
Window Coverings					
Automated Shades tied to Daylighting / Glare Controls	Programming to be included with Tenant Fit-Out based on final layout	20,236	sf	$18.00	$364,248
Manual Shades		(30,421)	sf	$6.50	($197,737)
Subtotal: Window Coverings					**$166,512**
Subtotal: 08-INTERIOR CONSTRUCTION					**$166,512**
Subtotal: 02.M Automatic Shades with Ltg Controls					**$166,512**
02.N WSHP Mechanical System					
13-MECHANICAL					
HVAC System					
Remove Scenario A / Repos Mechanical Upgrades		(1)	ls	$283,079.00	($283,079)
Subtotal: HVAC System					**($283,079)**
HVAC Project Req.					
Testing and Inspections		200	mh	$114.10	$22,820
Supervision		400	mh	$125.25	$50,100
Coordination / Submittals / Record Drwgs / O&MMs		400	mh	$109.10	$43,640

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Subtotal: HVAC Project Req.					**$116,560**
Condenser Water Piping					
1-1/2" L-Hard Copper		320	lf	$41.83	$13,384
2" L-Hard Copper		960	lf	$56.70	$54,435
3" Schedule 40 CS Welded		640	lf	$87.64	$56,090
4" Schedule 40 CS Welded		1,280	lf	$115.84	$148,271
6" Schedule 40 CS Welded		105	lf	$136.18	$14,299
8" Schedule 40 CS Welded		210	lf	$190.89	$40,087
Subtotal: Condenser Water Piping					**$326,566**
Piping Connections					
Cooling Tower		2	ea	$11,978.40	$23,957
Pump, End Suction		2	ea	$4,701.60	$9,403
Subtotal: Piping Connections					**$33,360**
Insulation					
Condenser Water Piping		3,515	lf	$8.45	$29,702
Ductwork FC ASJ 2" Thick		53,000	sf	$3.85	$204,050
Subtotal: Insulation					**$233,752**
Heating Water Equipment					
Electric Boiler 450 KW		2	ea	$90,564.00	$181,128
End Suction Pump, HHW		2	ea	$5,553.60	$11,107
Boiler Make Up System		1	ls	$2,659.20	$2,659
Water Treatment System		1	ls	$3,124.20	$3,124
Rigging		1	ls	$6,998.40	$6,998
Subtotal: Heating Water Equipment					**$205,017**
Chilled Water Equipment					
Cooling Tower (2 @ 2/3 Capacity)		675	tons	$255.64	$172,557
End Suction Pump, CW		2	ea	$5,723.60	$11,447
Variable Frequency Drive		80	hp	$205.68	$16,454
Water Treatment System		1	ls	$8,624.20	$8,624
Rigging		1	ls	$9,998.40	$9,998
Subtotal: Chilled Water Equipment					**$219,081**
Specialty AHU					
DOAS Unit w/Heat Recovery		14,500	cfm	$9.15	$132,632
Rigging		1	ls	$6,249.20	$6,249
Subtotal: Specialty AHU					**$138,881**
Sup/Ret/Gen. Exh. Duct					
Galvanized Ductwork and Duct Specialties		91,400	lb	$11.56	$1,056,584
Subtotal: Sup/Ret/Gen. Exh. Duct					**$1,056,584**
Terminal Zone Units					
VAV Box, Cooling Only (OA / Exhaust Level Control)		8	ea	$1,713.20	$13,706
Subtotal: Terminal Zone Units					**$13,706**

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
ATC Controls					
Control Points		220	ea	$857.00	$188,540
Subtotal: ATC Controls					**$188,540**
Air & Water Balancing					
Air Balancing		154,681	sf	$0.10	$15,468
Subtotal: Air & Water Balancing					**$15,468**
Misc. Mechanical Items					
Sleeves, Seals and Penetration Fire Safing		520	ea	$180.10	$93,652
Temporary HVAC		3	mo	$14,372.00	$43,116
Subtotal: Misc. Mechanical Items					**$136,768**
Subtotal: 13-MECHANICAL					**$2,401,203**
14-ELECTRICAL					
Electrical System					
Remove Building Repositioning		(1)	ls	$419,972.00	($419,972)
Temporary Electrical System		1	ls	$7,500.00	$7,500
HVAC Equipment Hook-Up		154,681	sf	$2.00	$309,362
Subtotal: Electrical System					**($103,110)**
Electrical Demo and Temp Power					
Circuit Trace and Safe-off		160	mh	$84.80	$13,568
Subtotal: Electrical Demo and Temp Power					**$13,568**
Distribution Panels					
3-Phase Green Class Sub-meter, (100-400A)		5	ea	$1,555.94	$7,780
Subtotal: Distribution Panels					**$7,780**
Variable Frequency Drives					
75hp, 480V. VFD (Labor Only)		1	ea	$1,147.75	$1,148
Subtotal: Variable Frequency Drives					**$1,148**
Hook-Up					
Large Chiller Connection		1	ea	$2,299.43	$2,299
Boiler Connection		2	ea	$1,204.49	$2,409
Water Heater Connection - Disc		10	ea	$298.24	$2,982
Subtotal: Hook-Up					**$7,691**
Branch Circuiting					
HVAC Control Panel Power		1	ea	$448.50	$448
Subtotal: Branch Circuiting					**$448**
Fire Alarm and Life Safety Systems					
Fire Alarm System (Non-HR, open wire)		154,681	sf	$2.42	$374,019
Subtotal: Fire Alarm and Life Safety Systems					**$374,019**
Miscellaneous Electrical					
Electrical Rigging		1	ls	$10,000.00	$10,000

DESCRIPTION	COMMENTS	QUANTITY	UNIT	UNIT COST	TOTAL
Subtotal: Miscellaneous Electrical					**$10,000**
Subtotal: 14-ELECTRICAL					**$311,543**
Subtotal: 02.N WSHP Mechanical System					**$2,712,747**
02.0 299 kWp PV System					
05-SUPERSTRUCTURE					
Miscellaneous Metals					
Attachments for PV Panels at South Facade		72	ea	$450.00	$32,400
Subtotal: Miscellaneous Metals					**$32,400**
Subtotal: 05-SUPERSTRUCTURE					**$32,400**
14-ELECTRICAL					
Renewable Energy					
Mechanical Roof Mtd. 72 Panels		26	kWp	$4,500.00	$117,000
PV Canopy Structure W. Roof Patio 103 Panels		37	kWp	$4,500.00	$166,500
Facade Mtd. PV Shading - 8x9 Panel Mts.		26	kWp	$6,500.00	$169,000
Penthouse Roof Mtd. 582 Panels		210	kWp	$4,500.00	$945,000
Subtotal: Renewable Energy					**$1,397,500**
Subtotal: 14-ELECTRICAL					**$1,397,500**
Subtotal: 02.0 299 kWp PV System					**$1,429,900**
Subtotal: 02C ENERGY SAVING ALTS - SCEN C					**$5,032,378**