

BROOKHAVEN CITY HALL



Character Sketch

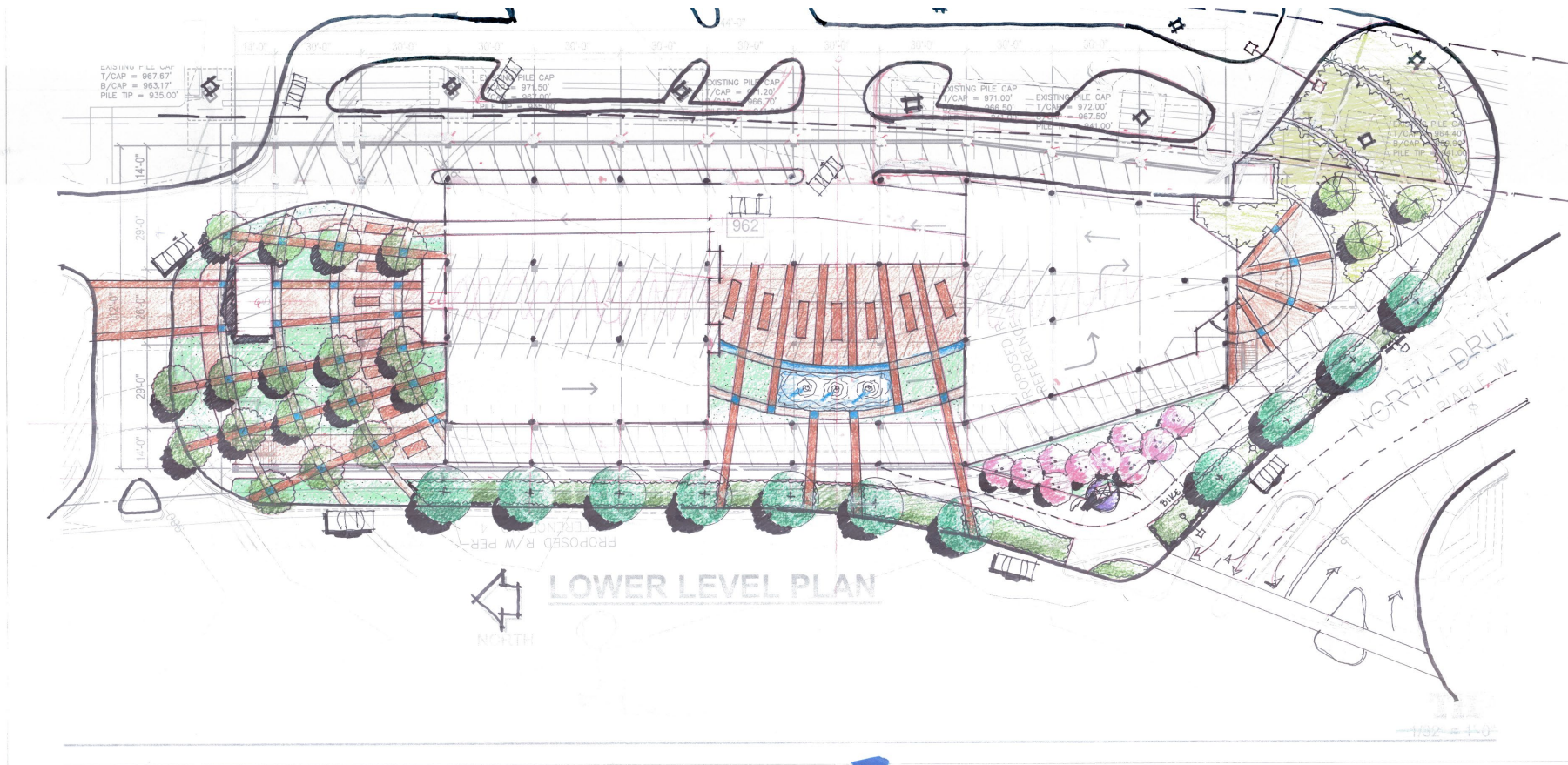
Brookhaven City Hall Costing Package

This document contains information for conceptual costing of the Brookhaven city Hall building and site development.

The scheme included is conceptual in nature and under development. Included are the parking and floor plans, conceptual site plans and a three dimensional rendering.

The systems narrative sections contains descriptions of building elements, systems and specifications.

The sustainability section outlines an approach for the city of Brookhaven to meet their sustainability goals.



THE Hybrid Scheme

Inspiration

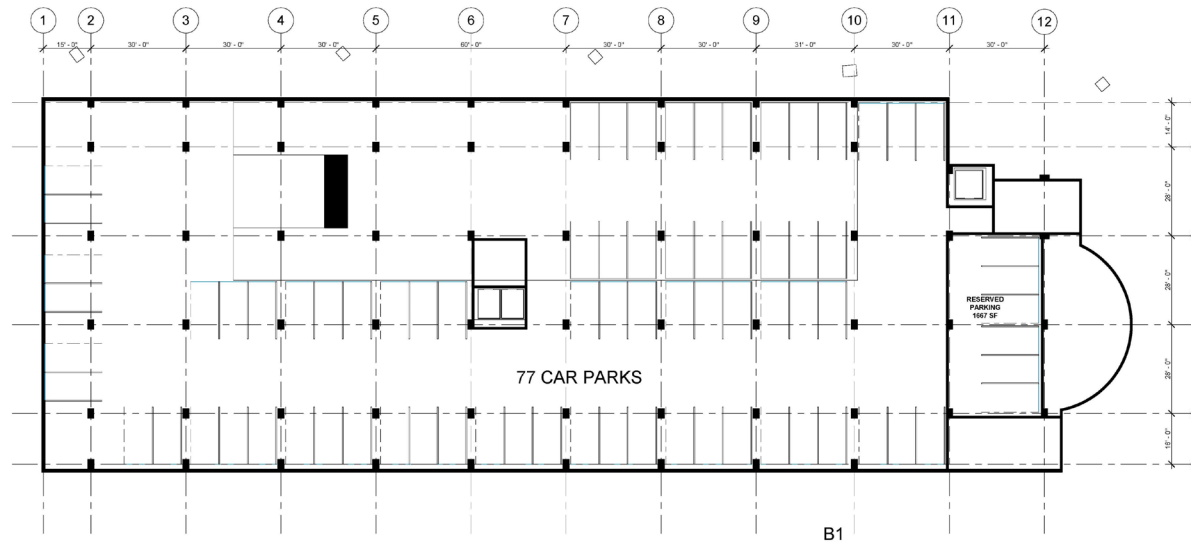
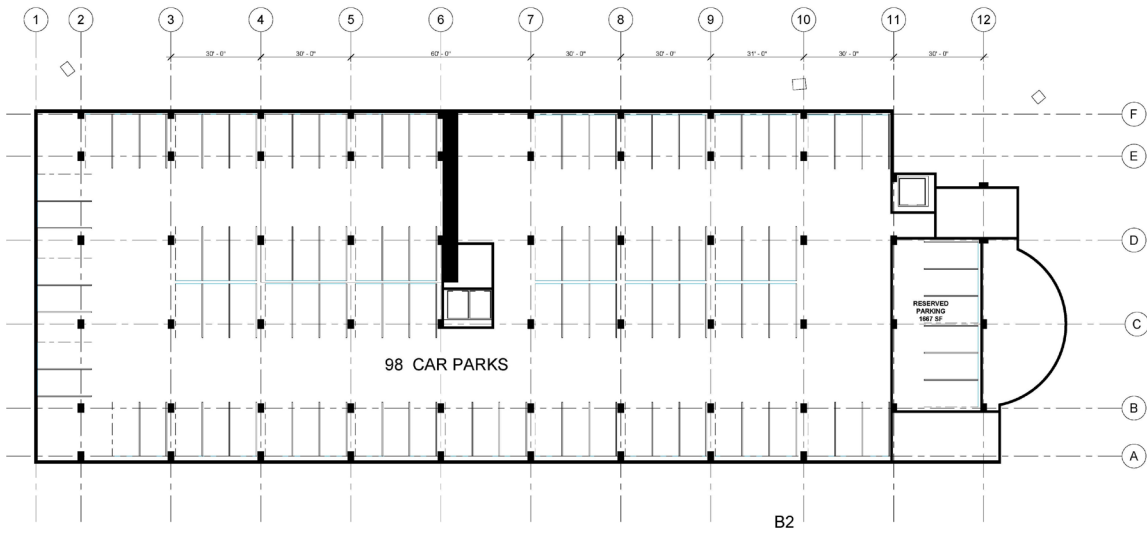
This scheme takes the best elements from the previous designs. It includes the courtyard from the Charrette scheme. It includes the parking, drop off and private parking from the Grand Hall Low rise scheme and the iconic glass feature from the Rotunda Scheme. It is based on feedback from the Leadership team and internal review to arrive at the best use of the site with the programmatic requirement and stated goal.



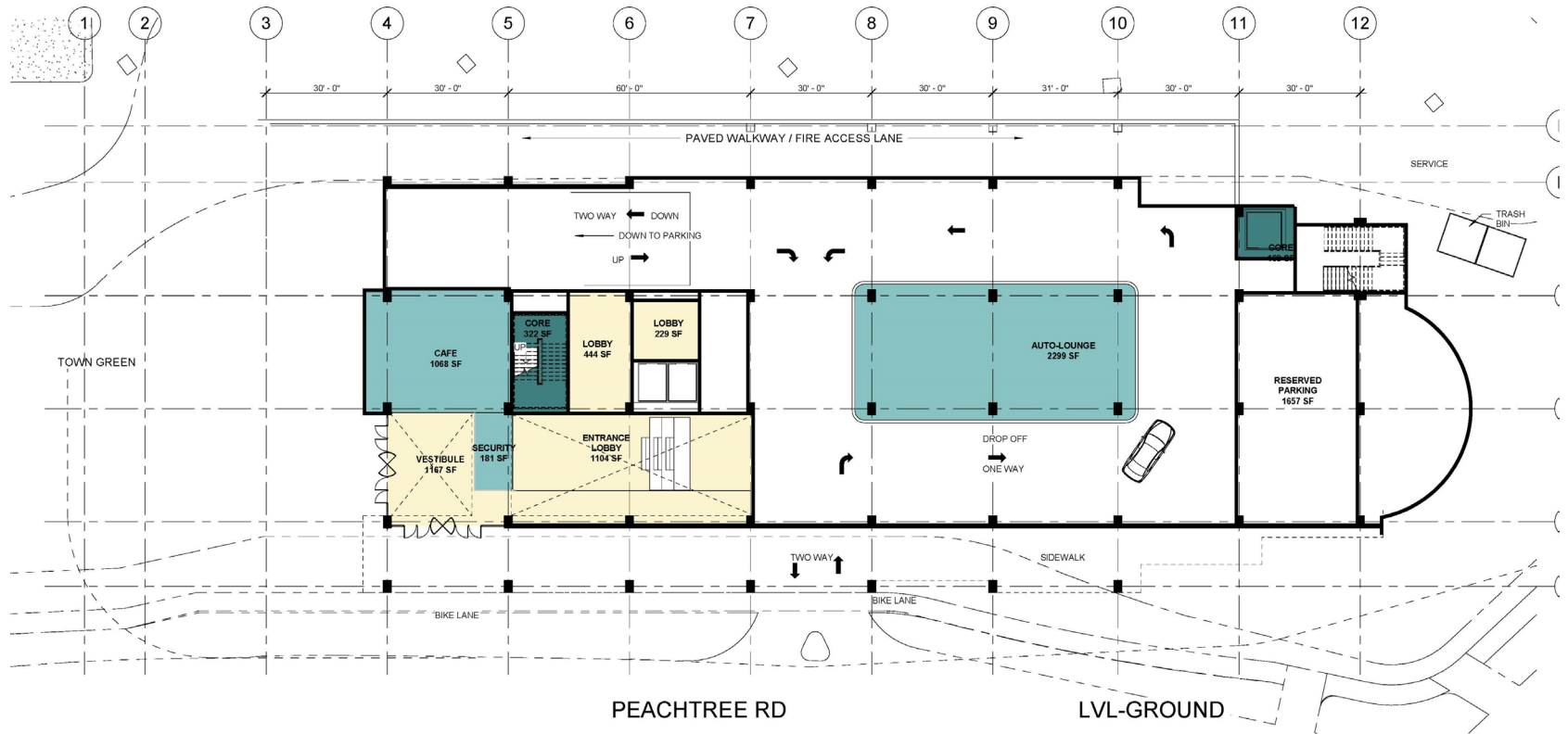
Advantages

1. Ample drop off on ground level at with private executive parking.
2. Good daylight into the offices and the multipurpose.
3. Long Span creating separation from office
4. Car Free Town
5. Lobby areas has a terraced stair that doubles as a gathering place.
6. Large “courtyard” lobby within the building with tree and water feature.
7. Executive conference at rooftop and garden

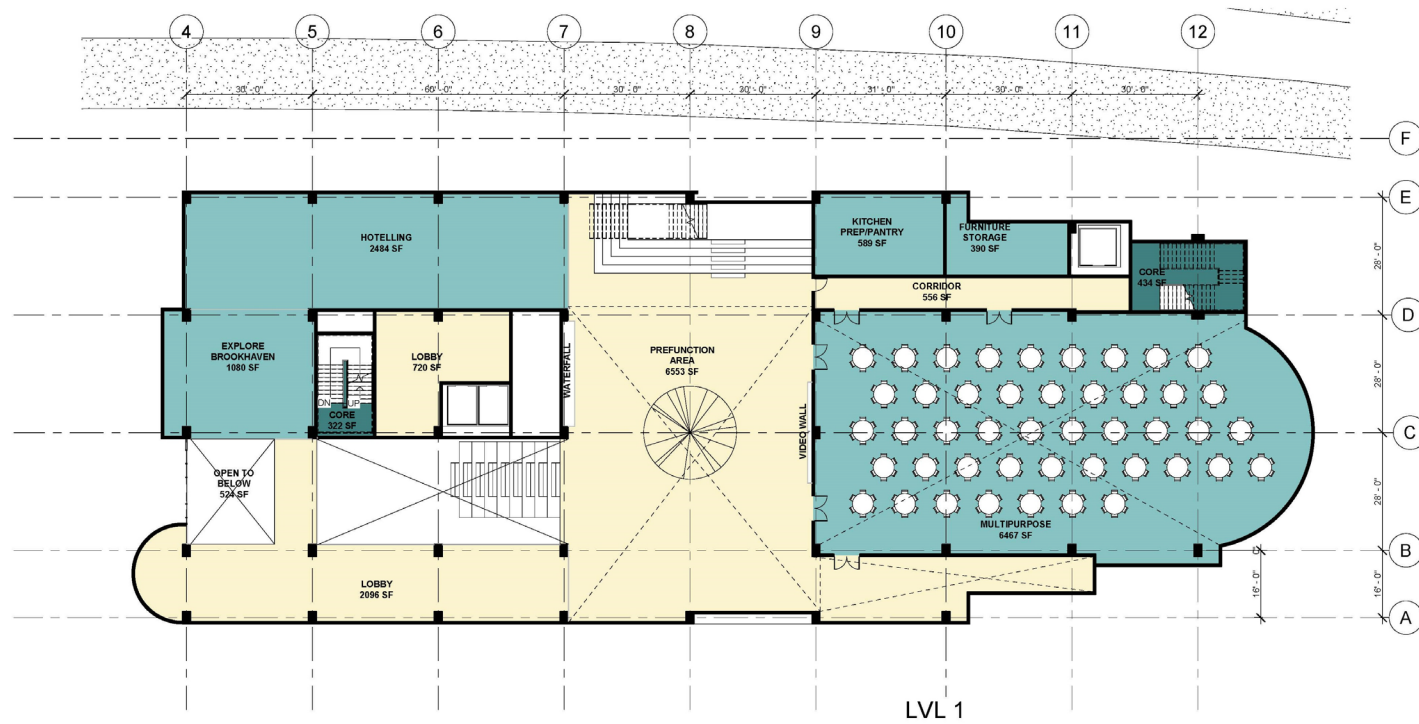
Parking Level



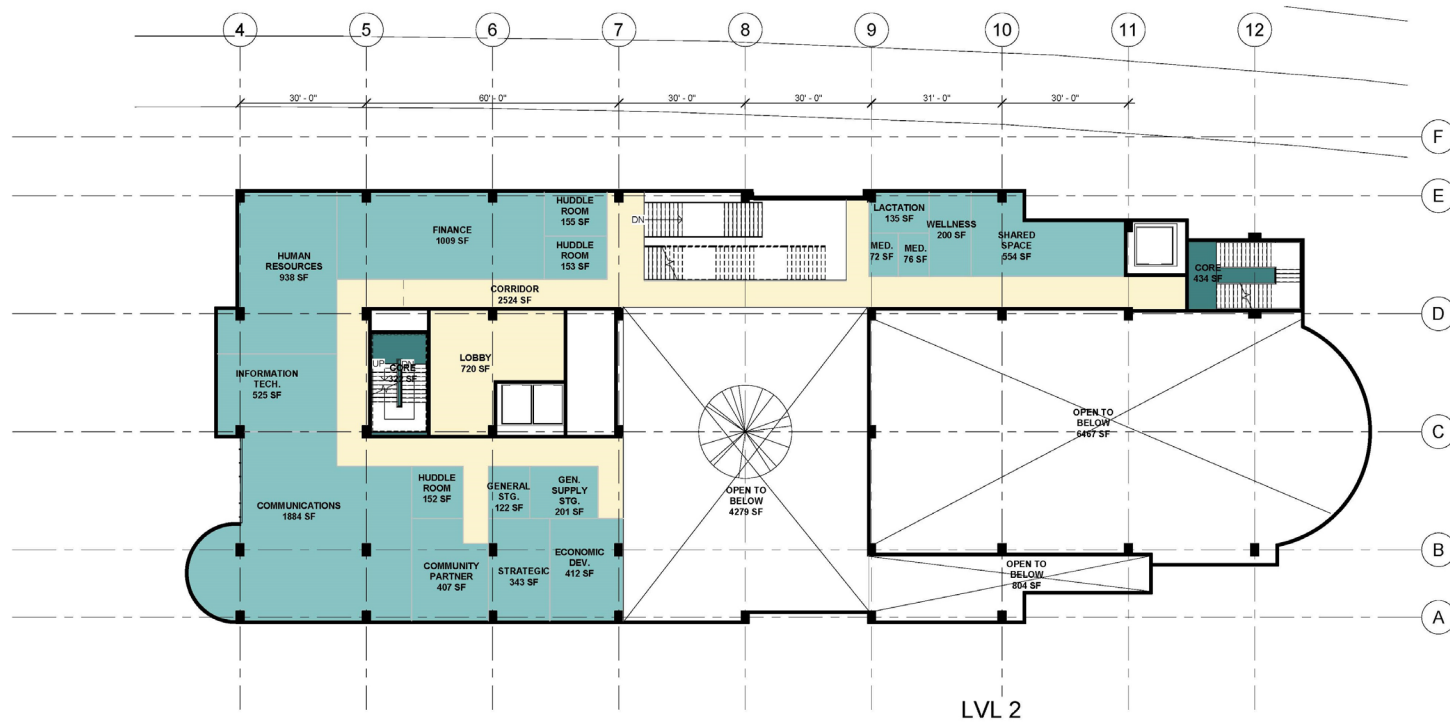
Ground Level



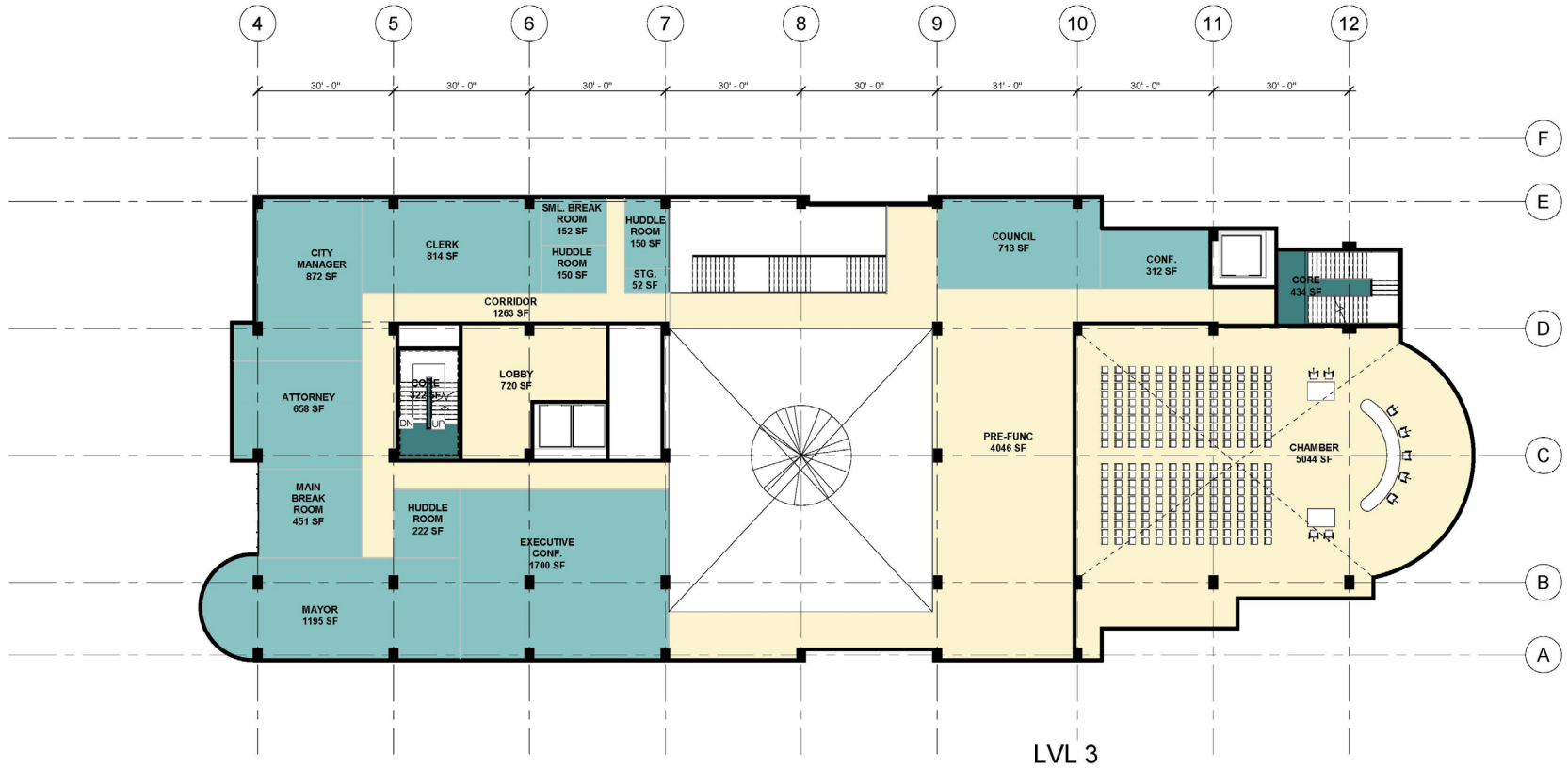
First Level



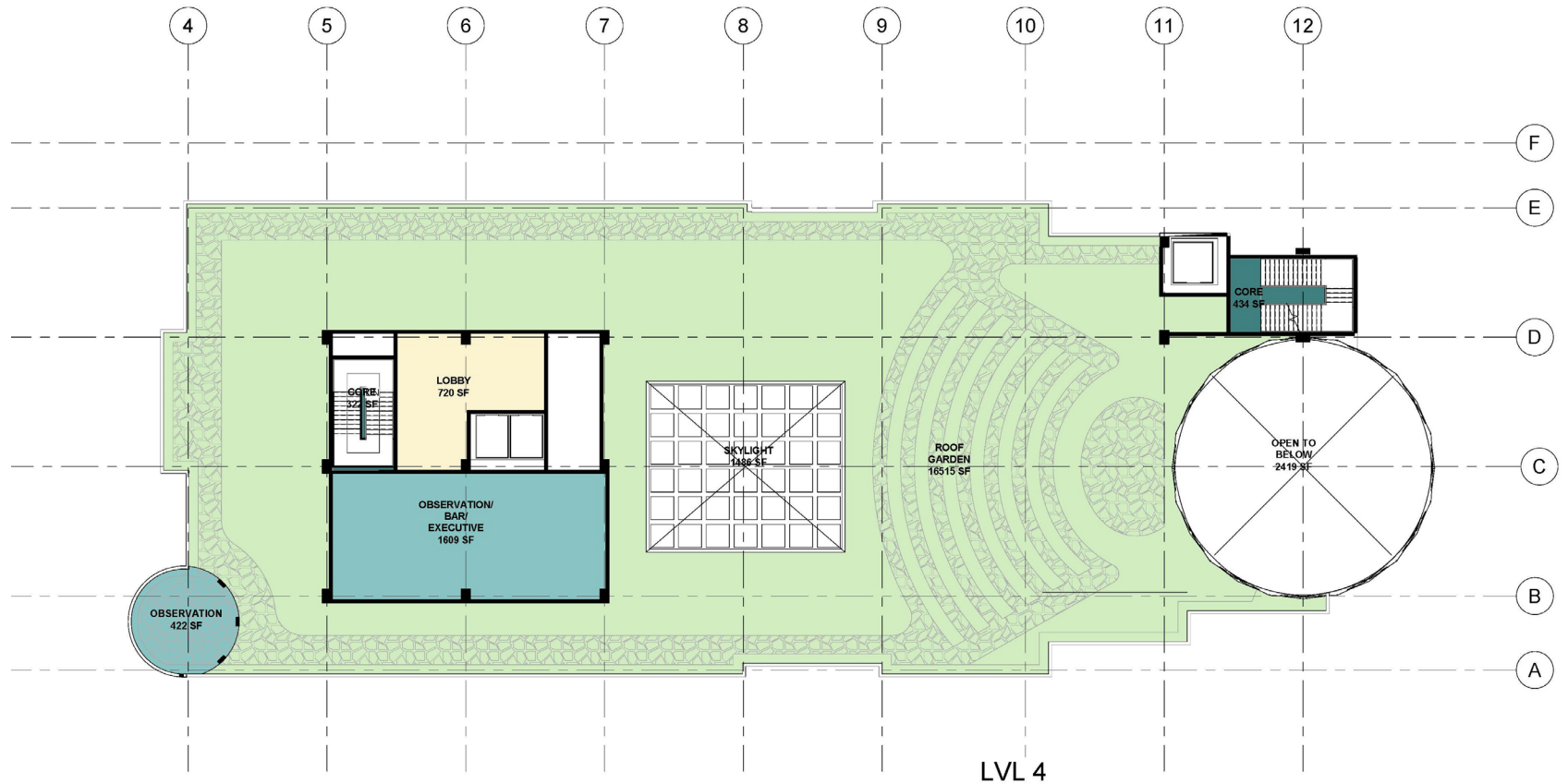
Second Level



Third Level



Roof Level



Systems Narratives

The following sections include narratives and specifications for architectural and building systems.

Architecture

Introduction

This package includes three design options. The third option is a compilation of the best features of the previous two schemes and was developed with the input of the core team. Each scheme contains approximately 56,000 sf of floor area, above two levels of underground parking. The structural system will be concrete at the parking levels and mass timber above, within the building. Column grid dimensions are indicated on the schemes. The columns for the covered walkway are concrete clad in granite. There are two stair towers and two elevator cores, to be constructed out of concrete and extending from the lowest parking level to the top floor. Office areas will be built to class “A” office quality standards. Public spaces will be upfit with premium finishes and materials. The building will be designed to LEED Gold and Well building standards, but the certifications will not be sought. The green roof top terraces or balconies are approximately 3000 sf.

Site features will include green space and paved areas. This public plaza will be located above the underground parking with 3’ of soil for ornamental trees and plantings. Provisions for waterproofing the slab are needed. The streetscape will include a green strip along Peachtree Street with trees, a bike lane and a 14’ pedestrian loggia.

1.1 Itemized Breakdown

Division 05 – Concrete

- Underground parking for two levels below grade / 24” retaining walls
- Ground level – concrete structure and slab between the ground floor and first occupied level.
- Concrete/asphalt surface parking and drive ~ (0.51 acres or 22,400 SF)
- Concrete sidewalk along North Druid Hills and Peachtree Road (15’ wide strip) = 0.21 acres or 9,200 SF).

Division 04 – Masonry

- Locally source granite cladding the building envelope and wrapped columns

Division 05 – Metals

- Steel exit stairs with concrete pans
- Miscellaneous steel connection for mass timber structure

Division 06 – Wood and Plastic

- Mass Timber –Structural system – See Structural narrative for more information

Division 07 –Thermal and Moisture Protection

- Vapor barrier to be identifies at exterior envelope
- Waterproofing to be identified at slab below the green space at the parking deck
- Waterproofing system to be identified at underground retaining wall and slab at underground parking garage.
- Roof membrane and waterproofing systems to be identified at roof and green roof.

Division 08 – Doors and Windows

- Exterior Curtain wall system
- Sound dampening windows or window inserts
- Ethylene / Tetraflouroethylene horizontal glazing for dome construction

Division 9 – Finishes

- Cradle to Cradle certification on product specified per Well standards
- All materials to be tested by an independent agency to ensure materials comply with Well Building standards such as ingredient composition or off gassing standards
- MR resistant materials in all wet areas such as moisture resistant wall boards.
- Sound mitigation materials in public areas – such as ACT with NRC of .90 or more

Civil Scope Narrative

Below is a list of civil items needed to accommodate the construction of the Brookhaven City Hall located at the intersection of North Druid Hills and Peachtree Road.

Civil scope includes:

- Demolition:
 - Removal of existing approximate 0.8-acre paved parking area
 - Removal of storm existing storm infrastructure conflicting with proposed site.
 - Removal of right turn lane from North Druid Hills onto Peachtree Road.
 - Relocation of existing MARTA electric line.
- Improvements
 - New streetscape along North Druid Hills and Peachtree Road consisting of 10' wide landscape strip, 5' bike lane, 10-15' pedestrian walkway.
 - Domestic and fire taps
 - Sanitary Sewer Connection into Tract 1B (North East).
 - 20' wide emergency Vehicle and trash pickup route.
 - 32 surface head in parking stalls.
 - Underground detention system.
 - Storm inlets and piping for parking lot runoff collection.

1.1 Itemized Breakdown

Below is a list of quantities Long Engineering has currently identified:

- Pavement
 - Concrete/asphalt surface parking and drive ~ (0.51 acres or 22,400 SF)
 - Concrete sidewalk along North Druid Hills and Peachtree Road (15' wide strip) = 0.21 acres or 9,200 SF).
 - Removal and replacement of approximately 640 SF of asphalt drive for underground detention installation.
- Earth Work
 - Cut attributed with the installation of the underground parking ~ 16,150 Cubic Yards. Assuming each underground parking level has a ceiling and ceiling height of 10'

- Cut attributed with the installation of the underground system ~ 6,108 Cubic Yards. This assumption doesn't account for any of the cut earth being reused as backfill material.
- Storm
 - Underground detention volume of 15,000 CF provided by 2 runs of 72-inch pipe each having a length of 300'. This system will be encased in gravel.
 - The site will treat roughly 3,000 CF of water quality volume via an onsite bio retention garden.

Landscape Architecture

Introduction

The City of Brookhaven seeks to develop a transit-oriented City Hall that engages the public through experiential amenities, provides universal access to and from the property and incorporates an iconic design philosophy. The project is tracking LEED and WELL sustainable certification. Strategic elements to carry out the design approach are as follows:

- Streetscape Design
- On-Structure Plaza Design
- Rooftop Design
- Planting Design
- Irrigation Design
- Sustainable Design

X.1 Itemized Breakdown

Streetscape Design

- Approximately 400 LF x 25 LF = 10,000 SF
- Opinion of Probable Cost: \$26/SF = \$260,000
- Designed to meet the City Center Master Plan streetscape guidelines. Actual widths may vary based on final design
- Includes: 10' wide landscape strip, 10' wide concrete sidewalk, 5' wide concrete bike lane with painted striping, 4" Caliper Shade Trees@ 30' o.c., (1 Gallon) ground cover, fine grading, soils, mulch, and irrigation
- Lighting, Marta transit shelter, burying overhead utilities, and intersection improvements at North Druid Hills is assumed to be provided by others and is excluded from the Landscape Architecture scope
- Arcade by Architect may cover 10' wide concrete sidewalk for a portion of the site

On-Structure Plaza Design

- Approximately 10,200 SF
- Opinion of Probable Cost: \$85-\$100 per SF
- 10,200 x \$90 = \$969,000
- Optional Splash Pad \$250,000 – \$300,00 LS

- Includes: conduits, colored concrete, pavers, 4" Caliper shade trees, silva cells, site furnishings, bollards (security), lightweight structural soil, planters, landscape lighting, non-floatable mulch, irrigation, and site furnishings,
- Pedestrian/site lighting, shade elements, waterproofing, structural and MEP related items are assumed to be provided by others and is excluded from the Landscape Architecture scope

Rooftop Design

- **Design currently not in contract**
- Approximately 2,000 SF
- Opinion of Probable Cost: \$110-\$150 per SF
- 2000 SF x \$130 = \$260,000
- Includes: 8" green roof base system, irrigation, planters, trees, shrubs, ground cover, lightweight structural soil, mulch, site furnishings, pavers, landscape lighting

Planting Design

- Approximately 7,500 SF
- Opinion of Probable Cost: \$14LF x 7,500 SF = \$105,000
- Fine grading, planting soil, amendments, trees, shrubs, ground cover, lawn, and seasonal color

Irrigation Design

- Approximately 7,500 sf
- Opinion of Probable Cost: \$1.50 per SF x 7,500 SF = \$11,250
- Optional Rainwater System: \$2.50 per SF x 7,500 SF = \$18,750

Sustainable Design

- Water Efficiency: Reduce landscape water requirement by 50% of the calculated baseline for the site's peak watering month: 1 point
- Potentially Protect or Restore Habitat: 1 point
 - Restore a minimum of 15% of the site with native and/or adaptive plant material as follows:
- Plant a minimum of 6 species of vegetation that are native or adapted to the project's EPA Level III ecoregion (or local equivalent for projects outside of the U.S.). Include a minimum of 2 out of the following plant categories: tree, shrub, and ground cover. Designate a portion

1. STRUCTURAL SUMMARY

This report outlines the strategy for the structural design and provides our schematic design narrative for this project.

The structure will be a multi-story city hall building above one or two levels of underground parking located in Brookhaven, GA. No geotechnical report was available at the time of writing this narrative. Temporary earth shoring and MARTA foundation shoring designed by a specialty contractor is required for the below grade parking excavation. The structural system of the elevated parking levels will consist of post-tension concrete slabs supported by cast-in-place concrete columns and perimeter cast in place walls. The structural system of the city hall building will be mass timber with glulam beams, columns, and cross-laminated timber (CLT) or nail-laminated timber (NLT) floor plates. Steel framing will be utilized as required for larger spans, loads, or overhead clearance requirements. The lateral system for the building may consist of buckling-restrained braced frames, cast-in-place concrete shear (core) walls, or steel braced frames.

As the design progresses into design phase, the following items will be addressed:

- Development of column grids and beam lines
- Development of the lateral systems and lateral element locations
- Design of gravity and lateral elements
- Coordination of architectural components with the structure
- Coordination of MEP systems with the structure
- Foundation designs based on geotechnical investigations

2. GENERAL PROJECT INFORMATION

2.1 Project Data

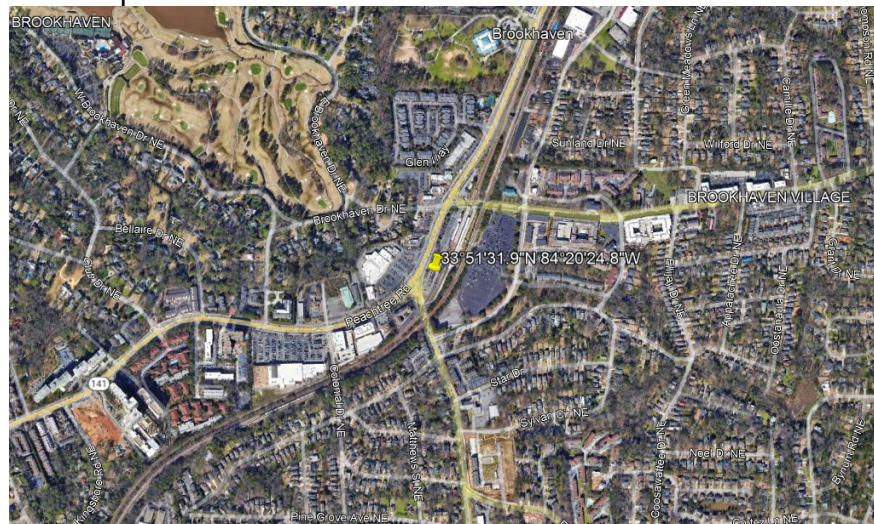
Name of Project:	Brookhaven City Hall
Project Address:	3989 Peachtree Rd NE, Atlanta, GA 30319
Latitude / Longitude:	33°51'31.9"N 84°20'24.8"W
Local Jurisdiction:	Brookhaven City
Owner / Owner Agent:	Brookhaven City
Architect of Record:	Sizemore Group
Engineer of Record:	Britt, Peters, & Associates Inc.

2.2 Project Location

Site Map:



Area Map:



2.3 Codes & Standards

Design and construction work shall be in accordance with the following codes:



- International Building Code (IBC), 2018 edition, as adopted by the State of Georgia and Amendments.
- American Society of Civil Engineers (ASCE), Minimum Design Loads for Buildings and Other Structures (ASCE 7).
- American Concrete Institute (ACI), Building Code Requirements for Structural Concrete (ACI 318).
- American Concrete Institute (ACI), Specifications for Structural Concrete (ACI 301).
- American Institute of Steel Construction (AISC), Steel Construction Manual, including Specifications for Structural Steel Buildings (ANSI/AISC 360) and Code of Standard Practice for Steel Buildings and Bridges (AISC 303).
- American Institute of Steel Construction (AISC), Seismic Provisions for Structural Steel Buildings (ANSI/AISC 341).
- American Iron and Steel Institute (AISI), North American Specification for the Design of Cold-Formed Steel Structural Members (S100).
- American Iron and Steel Institute (AISI), North American Specification for the Design of Cold-Formed Steel Framing – General Provisions (S200).
- American Iron and Steel Institute (AISI), North American Specification for the Design of Cold-Formed Steel Framing – Wall Stud Design (S211).
- American Wood Council (AWC), National Design Specification and Supplement for Wood Construction (NDS)

- American Wood Council (AWC), Special Design Provisions for Wind & Seismic (SDPWS)

2.4 Building Risk Category

Buildings and structures are classified to a building risk category based on the risk to human life, health and welfare associated with their damage or failure (loss). The building risk category is proportioned based on the individual building occupancy use. Buildings which could pose a substantial hazard to the community and/or buildings containing hazardous materials (fuels, chemicals, or waste) are considered essential facilities. Also, buildings and structure required to maintain the functionality of essential facilities, must also be classified as essential facilities.

The building has been assigned to the following risk category, in accordance with ASCE 7.

Risk Category:	III
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2.5 Applied Loads

The following loads have been used as a structural design criterion and will be incorporated into the structural design. Based on the nature of the occupancy the building.

2.5.1 Dead Load

Dead load is the downward force on a building by all materials of constructions incorporated into different aspects of a building such as roofs, walls, stairways, and ceilings, and other stationary components such as architectural cladding and fixed service equipment. The self-weight of the structure will be calculated as part of the analysis.

Superimposed dead loads will be calculated per ASCE 7 in the design phase.

2.5.2 Live Load

Live loads include any temporary or transient forces that act on a building or structural element. This can include people, furniture, movable partition walls, mechanical equipment, and anything else that can be moved throughout a building.



Based on the intended use or occupancy, live loads have been applied in accordance with ASCE 7 Chapter 4.

Floors:

Office Areas:	50 psf (reducible) + 15 psf (non-reducible) *100 psf (non-reducible) can be considered for future flexibility.
Public Lobby and Corridors:	100 psf (non-reducible)
Elevator Machine Room	150 psf
Restrooms:	60 psf

Assembly Areas:

Fixed seats (fastened to floor):	60 psf
Lobbies:	100 psf
Other Assembly Areas:	100 psf
Movable Seats:	100 psf
Platforms (Assembly):	100 psf

Storage:

Paper Storage	150 psf
High Density Storage	TBD

Roof Level:

Ordinary Flat or Pitched Roof:	20 psf (reducible)
Roof areas used for assembly	100 psf

2.5.3 Snow Load

Snow load is the downward force on a building's roof caused by the weight of accumulated snow and ice, including drifting snow deposited by wind. Drifting snow can accumulate in large mounds or banks on vertical building surfaces or building pockets. Ground snow loads are measured with a 2% annual probability of exceedance (50-year MRI), using local meteorologic data collected by the National Weather Service (NWS).

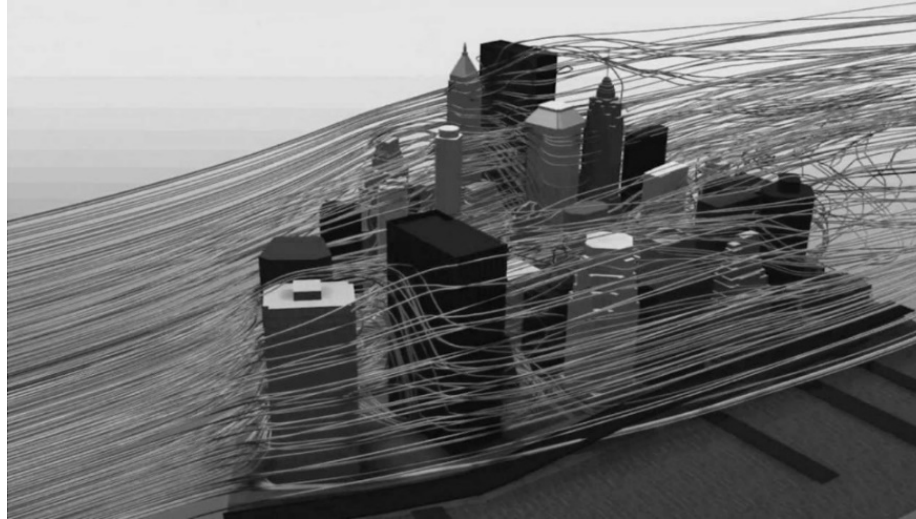


Based on the project data and project location, snow loads have been applied in accordance with ASCE 7 Chapter 7.

Importance Factor (IS):	1.1
Ground Snow Load (Pg):	5 psf
Terrain Category:	'B'
Exposure Factor (Ce):	1.0 (Partially Exposed)
Thermal Factor (Ct):	1.0

2.5.4 Wind Load

When moving air (wind) is stopped by a surface, the dynamic energy is transformed into wind pressure acting normal to the building surfaces. The respective wind pressures can be converted into transient building forces used for structural analysis and design. The basic wind speed is measured at a 3-second gust located 33 feet above the ground, using local meteorologic data collected by the NWS. The performance criteria (probability of exceedance) changes for each building risk category and are noted below.



Based on the project data and project location, wind loads have been applied in accordance with ASCE 7.

Wind Speeds (1700-year MRI):	114 mph (3-sec gust / Strength)
Wind Speeds (10-year MRI):	73 mph (3-sec gust / Serviceability)
Exposure Category:	'B'
Directionality Factor (Kd):	0.85
Topographic Factor (Kzt):	1.0
Internal Pressure Coefficient (GCpi):	+/- 0.18 (Enclosed Building)

2.5.5 Seismic Load

Seismic loads are caused from an agitation to a building structure (or its model) from ground accelerations triggered by an earthquake. The ground accelerations are transformed into both static and dynamic design loads applied to the building structure. Mapped seismic ground motions are measured based on a target risk of structural collapse equal to 1% exceedance in 50 years.



Based on the project data and project location, seismic loads have been applied in accordance with ASCE 7.

Importance Factor (IE):	1.25
Mapped MCER Spectral Response at Short Periods (SS):	0.191 g (USGS Seismic Design Maps)
Mapped MCER Spectral Response at 1-sec Period (S1):	0.086 g (USGS Seismic Design Maps)
Site Class:	'D' (Assumed)
Short-Period Site Coefficient at 0.2-sec (Fa):	1.6
Long-Period Site Coefficient at 1-sec (Fv):	2.4
MCER Spectral Response at Short Periods (SMS):	0.306 g
MCER Spectral Response at 1-sec Period (SM1):	0.208 g

Design Spectral Response at Short Periods (SDS):	0.204 g
Design Spectral Response at 1-sec Period (SD1):	0.138 g
Seismic Design Category (SDC):	'C'
Analysis Procedure:	"Equivalent Lateral Force Procedure"
Seismic Force-Resisting System:	Steel buckling-restrained braced frames, cast-in-place concrete shear (core) walls, or steel braced frames
Response Modification Coefficient (R):	TBD
Overstrength Factor (Ω_0):	TBD
Deflection Amplification Factor (Cd):	TBD

2.6 Building Performance

2.6.1 Deflection Criteria

The deflection criteria is the performance specification that is used to measure building structural elements, and can directly affect the architectural, mechanical, plumbing, electrical and process equipment in the building.

Structural members shall be sized to comply with the deflection criteria in the IBC.

2.6.2 Story Drift

Story drift is the allowable amount of side sway between two adjacent stories of a building caused by lateral wind and/or seismic loads. The structure is designed to limit the distance that a building may drift so as to not cause issues with serviceability, architectural cladding, windows, and brick facade.

The structural design will adhere to ASCE 7 requirements for story drift in the design phase.

Amplified Seismic Load:

Allowable Story Drift (In Terms of Story Height, h):	$h/50$
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Wind Load (50-Year MRI):

Allowable Story Drift (In Terms of Story Height, h):	$h/400$
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2.7 Materials

Materials have been selected with due regard to availability, cost, constructability, and architectural aspiration. All material properties are in accordance with American Society for Testing and Materials (ASTM) standards.

Concrete:

Portland Cement:	
Not subject to Sulphates:	Type I and II
Subjected to Sulphates:	Type V
Concrete Compressive Strength (f'c)	
Pile Caps:	6,000 psi at 28 days (NWT)
Slab on Grade:	4,500 psi at 28 days (NWT)
Post-Tension Slabs:	6,000 psi at 28 days (NWT)
Columns, Foundation Walls, and Shear Walls	6,000-8,000 psi at 28 days (NWT)
Reinforcing:	
Deformed and Plain Bars:	ASTM A615, Grade 60, (Fy = 60 ksi)
Macro Synthetic Fiber:	ASTM D7508
Post-Tension Tendons:	A416 Seven Wire, (Fu = 270 ksi)

Structural Steel:

W-Shaped Beams and Columns:	ASTM A992, Grade 50, (Fy = 50 ksi)
HSS Beams and Columns (Rectangular):	ASTM A500, Grade C, (Fy = 50 ksi)
HSS Beams and Columns (Round):	ASTM A500, Grade C, (Fy = 46 ksi)
Angles and Plates:	ASTM A36, (Fy = 36 ksi)

Mass Timber:

Cross Laminated Timber	Multi-ply Layups Consisting of Southern Pine
Glue-Laminated Timber (Glulam) Beams	Southern Pine 24F-1.8E
Glue-Laminated Timber (Glulam) Columns	Southern Pine 47 N2M 1:8
All Other Structural Dimensional Lumber	Southern Pine #2

*Alternative species can be considered

2.8 Structural Description

2.8.1 Basement Parking

- Approx. 30'x30' column grid spacing w/ 18"x30" concrete columns.
- 8"-12" Post-tension concrete slab
- 12"-36" steps with corresponding thickened slabs on beams at terraces
- 12"-16" CIP concrete wall cast against soil nail or sheet pile walls.
 - Permanent sheet pile walls can be explored in lieu of CIP wall by the contractor and their specialty sub

2.8.2 Timber Frame

- Assume 5-ply V3 (6 7/8" thick) CLT flooring
- Approx. 12"x30" glulam beams @ 15'-0" oc. Larger spans will require larger beams.
- Larger spans or limited overhead depth may require steel.
- Tall unbraced column heights may require steel columns pending architectural limitations on column sizes.

2.8.3 Delegated Design Items

The design of these items should be included in the contractor's pricing. Design services for these items are typically provided by the supplier and/or installer. All items listed may not be included in the project construction.

- Timber connections
- CLT connections
- Post-tension slabs

- Steel connections
- Temporary shoring of site for excavation (soil nail walls, soldier pile walls, sheet piles)
- Shoring of MARTA foundations for excavation
- All shoring associated with erection
- Exterior facades including light gauge design and curtainwall
- Buckling restrained brace frames (if selected)
- Precast piles (if used)
- Specialty foundation systems (RAP, rigid inclusions, etc.)

of the habitat area for a pollinator garden consisting of native flowering plants and totaling at least 30 square feet

- Open Space: Potentially 1 point
 - Provide outdoor space greater than or equal to 30% of the total site area (including building footprint). At least 25% of the calculated outdoor open space must be vegetated space planted with two or more types of vegetation or have overhead vegetated canopy

Monument for Project

- Opinion of Probable Cost: 400,000 to 750,000 Lump Sum
- Includes: foundations, monument materials, lighting, logo

Mechanical Narrative

A.1 Base Building Services

- The base building HVAC system shall consist of a VRF system in conjunction with rooftop dedicated outdoor air system unit (DOAS). Preliminary cooling load capacity of ~150 tons.
 - DOAS shall be included with Energy Wheel
- Indoor VRF system will be a combination of wall mounted and ceiling mounted cassettes with ducted units
- Any rooftop equipment shall be screened (DOAS unit and Condensing Unit)
- No gas heating, electric only
- All refrigerant and condensate piping shall be copper and installed with 1" insulation
- Each zone/space shall be controlled by a local sensor and terminal unit controller
- Restroom exhaust to be ducted to the ERU (DOAS unit equipped with energy wheel)

A.2 Building Automation System (BAS)

- BAS shall be web based Direct Digital Control (DDC) System
- All HVAC equipment shall be controlled via DDC

A.3 LEED Credits

- Provide thermal comfort controls for at least 50% of individual occupant spaces.
- HVAC design and building envelope shall meet the requirements of ASHRAE Standard 55-2017, Thermal Comfort Conditions for Human Occupancy.
- HVAC design shall be no less than 30% improvement from base line model

Electrical Narrative

B.1 Electrical Service

- The electrical service to the facility will be underground from a pad mounted transformer served from Georgia Power's electrical distribution system.
- The service voltage to the building will be 480Y/277 volts, 1200A three phase, four wire.
- The service disconnecting means will be the main circuit breakers in the main switchboard.
- An advanced energy meter will be provided for monitoring the electrical service.
- The main electrical room will be approximately 250 square feet and will encompass a main distribution panel, transformers, lighting control panel, inverter, and a smart meter.
- Each level will have an electrical room of approximately 80 square feet which will contain panelboards, transformers, and relay control panels.

B.2 Stand-By Power System

- Stand-by power will be provided by an engine driven generator. The generator will be installed in a weather tight housing located in a secured outdoor location adjacent to the facility.
- The generator will be driven by a natural gas engine.
- The standby generator will have an associated automatic transfer switch with manual bypass isolation switch to allow operation of the distribution system if maintenance is required on the transfer switch.
- The stand-by power system will provide for limited operation of the facility in the event of normal utility power failure.
- The system will provide power for the selected interior and exterior lighting, the elevators, selected power outlets, and the communications systems.
- The stand-by power system will also provide backup power to the building HVAC control system.
- Emergency egress power will be provided via a 2100VA, floor mounted inverter in each electrical room.

B.3 Lighting

- The lighting system shall be provided complete and consisting of luminaries, lenses, lamps, drivers, and controls.
- Fixtures shall consist of recessed and surface mount types. All fixtures shall be LED or as selected by the lighting designer. Refer to the lighting designer's narrative for additional lighting requirements and information.
- All light fixtures provided shall be commercial quality grade fixtures.
- Circuits will generally be 277 volts for back of house fixtures, and 120 volts for select display, and accent specialty fixtures where required and as specified by the lighting designer.
- Refer to the lighting design narrative for additional information.
- Provide exits signs and egress life safety lighting with emergency battery packs along all interior paths of egress and exterior egress areas in accordance with NFPA and all pertinent local codes.
- Exit signs shall be LED type that clearly indicate the occupant path of egress. An exit sign shall be provided along all egress paths, every egress door, and stairwell exit doors from the upper levels.
- All interior areas of the facility shall be provided with a lighting system to achieve maintained illumination levels recommended by IES, ASHRAE 90.1, NEC and NFPA.

B.4 Lighting Controls

- The interior lighting shall be controlled utilizing a combination of automatic vacancy or occupancy sensors, dimmers, lighting control panels, time clocks, and override switches. Refer to the lighting design narrative for additional controls information.
- Lighting will have the ability to dim to warm, tunable white, and full color tuning.
- The exterior lighting fixtures shall be controlled via photocells and time clocks for automatic on/off control.
- All lighting controls shall be in compliance with the IECC and all other applicable state and local codes.

B.5 Wiring Devices

- Receptacles will be flush floor/wall mounted duplex and quadruplex style, with three wires. They will have cable terminations on both the back and the sides of the receptacles.
- Receptacles will be rated for 20A and 125 volts (NEMA 5-20R). Ground fault receptacles will be provided in the restrooms and other areas in accordance with the NEC.
- Provide all wiring, conduit and controls for the elevator, HVAC equipment, plumbing equipment, etc. Each piece of equipment shall be fed from a dedicated circuit with dedicated neutral, unless noted otherwise, with branch wiring and conduit sized for the load(s).
- A maximum of six duplex outlets shall be on a circuit unless noted otherwise. All building exterior outlets shall be weatherproof and GFCI rated. All receptacles and light switches shall be 20 amp rated and specification grade.

B.6 Raceways

- Conduits shall be sized and installed according to the NEC.
- The minimum conduit size for branch circuits is $\frac{3}{4}$ " and 1" for feeders.
- Rigid conduit, intermediate metal conduit or electrical metallic tubing shall be utilized as permitted by NEC. Flexible metal conduit shall be used only for final connection to equipment with maximum length not to exceed 6 feet.
- Conduit systems shall be concealed in areas (other than mechanical/electrical rooms) where studs and drywall are provided.
- Public spaces using concrete as the finish shall, where practical, have all conduit concealed within the concrete. Branch circuit conduits will not be permitted in the slab unless approved by the structural engineer.
- Electrical service conduits shall be installed duct banks 36" below finish grade. The conduit shall be schedule 40 PVC with PVC coated galvanized rigid steel elbows. A 6" wide red warning tape shall be installed 18" above all duct banks. Schedule 80 PVC shall be used where conduit penetrates the concrete slab.

B.7 Grounding

- The grounding system shall consist of grounding the new electrical equipment to a copper grounding electrode and bonding to cold water piping and building steel.
- Provide a ground bus bar in all electrical rooms and IT/telecommunications rooms.
- Provide a separate grounding conductor in all raceways.
- The conduit shall not be utilized as an equipment ground. Securely ground each side of all raceways containing sections of plastic, fiber, or flexible raceways. Provide grounding sizes and install all grounding in accordance with the NEC.
- A lightning protection system will be provided and will conform to the NEC 780 and UL listing requirements.

B.8 Distribution Panelboards

- Panelboards shall be provided with full size neutral and ground bars, all copper bus of 98% conductivity, with thermal magnetic type molded case main and branch breakers.

B.9 Transformers

- Transformers shall be dry type, two winding types for each phase, with silicon steel cores, copper windings in compliance with NEMA TP-1 and NEMA ST-20. Units shall have 115° C class insulation with four taps at 2 1/2 percent rated at full capacity on the high side winding.
- Transformers K rating will be coordinated with the Acoustician
- Provide site or manufacturer insulation resistance testing specific for each unit. Transformers provided shall comply with the efficiency ratings of the latest adopted codes. All transformers shall be fastened and secured on a 4" housekeeping pad.

B.10 Lighting and Appliance Panelboards

- Provide dead-front safety type panelboards as indicated, with switching and protective devices in quantities, ratings, types as required to feed the loads.

- Provide copper buss bars, full-sized neutral bar, with bolt-in type heavy duty, quick-make, quick-break circuit breakers, with toggle handles that indicate when tripped.
- Provide suitable lugs on neutral buss for each outgoing feeder required; and provide bare un-insulated grounding bars suitable for bolting to enclosures. Provide steel cabinet enclosures fabricated by the same manufacturers as panelboards, which match properly with panelboards.
- Provide circuit breakers that are fully rated for available short-circuit condition but not less than 10,000 SYM. AIC at 120/208 volts; and 14,000 SYM. AIC at 277/480 volts.

Plumbing Narrative

C.1 Base Building Services

- The base building Plumbing systems shall be designed to provide domestic water to fixtures and equipment throughout the building.
 - Domestic water heating shall be provided by means of point-of-use electric water heaters.
 - Wastewater from lavatories, drinking fountains and service sinks shall be captured, treated and delivered to urinal and water closet flushometers.
 - Rainwater shall be partially captured and reused for irrigation and cleaning.
 - Rainwater cistern shall overflow to site storm system detention.
 - Low-flow fixtures shall be provided to reduce domestic water flow rates.
 - Lavatory faucets shall be aerated and restricted to 0.5 gpm
 - Water closets and urinals shall be flushed with reclaimed grey water
- No gas heating, electric only

C.2 Building Automation System (BAS)

- Components to be monitored:
 - All pressure gauges before and after domestic booster pumps
 - Domestic booster pump controllers
 - Meters for reclaimed water and irrigation systems.

C.3 LEED Credits

- Reduce interior water use by 50%.
- Provide for permanent metering at irrigation connections and reclaimed water system outlet.

C.4 Plumbing Systems to be installed

- Domestic water system: Type L copper with press fittings
- Storm/DWV/Graywater system: PVC with hubless couplings (*Hubless cast iron in acoustically sensitive rooms/areas)
- Graywater reclaimed: CPVC

Fire Suppression Narrative

D.1 Base Building Services

- The base building Fire Suppression system shall consist of an Automatic-wet Class III standpipe system in conjunction with fire sprinkler coverage in accordance with applicable codes and NFPA 13, 14 and 20.
- Building Use Group: A-3
- Light Hazard with Ordinary Hazard Areas (parking, mechanical rooms)

D.2 Applicable Codes and Standards

- Pursuant to OCGA 8-2-20 and 8-2-25, adopts International Fire Code as amended by omitting Section 108
- International Building Code
- NFPA 13
- NFPA 14
- NFPA 20

D.3 Administration and Enforcement of the State Minimum Standard Codes

To properly administer and enforce the state minimum standard codes, local governments must adopt reasonable administrative provisions. The power to adopt these administrative procedures is set forth in O.C.G.A. Section 8-2-26(a)(1). These provisions should include procedural requirements for the enforcement of the codes, provisions for hearings, provisions for appeals from decisions of local inspectors, and any other procedures necessary for the proper local administration and enforcement of the state minimum standard codes.

These powers include:

- Inspecting buildings and other structures to ensure compliance with the code.
- Employing inspectors and other personnel necessary for the proper enforcement of codes.
- Requiring permits and to establishment charges for said permits; and
- Contracting with other local governments for code enforcement.

If the City chooses to locally enforce any of these codes, it must enforce the latest editions and the amendments adopted by DCA.

D.4 Design Responsibility for Fire Protection Systems

- The professional engineer (PE) provides a partial design and specifies the design criteria to be used by the installing contractor who finalizes the system layout, provides calculations to confirm the design criteria. The PE reviews and approves the installing contractor's final layout and calculations. The PE is considered the engineer of record and certifies system installation for code compliance at completion.

D.5 Proposed Fire Protection Systems

- Water supply, fire mains and hydrants
- Automatic sprinkler system and components
- Automatic Fire Pump, jockey pump controllers and test headers and associated appurtenances.
- Standpipe system and components
- Emergency power equipment
- Seismic considerations

DIVISION 21 - FIRE SUPPRESSION

210513	COMMON MOTOR REQUIREMENTS FOR FIRE SUPPRESSION EQUIPMENT
210517	SLEEVES AND SLEEVE SEALS FOR FIRE-SUPPRESSION PIPING
210518	ESCUTCHEONS FOR FIRE-SUPPRESSION PIPING
210523	GENERAL-DUTY VALVES FOR WATER-BASED FIRE-SUPPRESSION PIPING
210529	HANGERS AND SUPPORTS FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT
210548	VIBRATION AND SEISMIC CONTROLS FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT
210553	IDENTIFICATION FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT
210700	FIRE-SUPPRESSION SYSTEMS INSULATION
211119	FIRE DEPARTMENT CONNECTIONS
211200	FIRE-SUPPRESSION STANDPIPES
211213	FIRE-SUPPRESSION HOSES AND NOZZLES
211313	WET-PIPE SPRINKLER SYSTEMS
211316	DRY-PIPE SPRINKLER SYSTEMS
213113	ELECTRIC-DRIVE, CENTRIFUGAL FIRE PUMPS
213413	PRESSURE-MAINTENANCE PUMPS
213900	CONTROLLERS FOR FIRE-PUMP DRIVERS

DIVISION 22 – PLUMBING

220513	COMMON MOTOR REQUIREMENTS FOR PLUMBING EQUIPMENT
220516	EXPANSION FITTINGS AND LOOPS FOR PLUMBING PIPING
220517	SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING
220518	ESCUTCHEONS FOR PLUMBING PIPING
220519	METERS AND GAGES FOR PLUMBING PIPING
220529	HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
220533	HEAT TRACING FOR PLUMBING PIPING
220548	VIBRATION AND SEISMIC CONTROLS FOR PLUMBING PIPING AND EQUIPMENT
220553	IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT
220593	TESTING, ADJUSTING, AND BALANCING FOR PLUMBING
220716	PLUMBING EQUIPMENT INSULATION
220719	PLUMBING PIPING INSULATION
221116	DOMESTIC WATER PIPING

221117	GRAY-WATER PIPING
221119	DOMESTIC WATER PIPING SPECIALTIES
221123	DOMESTIC-WATER PACKAGED BOOSTER PUMPS
221316	SANITARY WASTE AND VENT PIPING

DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING

230500	COMMON WORK RESULTS FOR HVAC
230513	COMMON MOTOR REQUIREMENTS FOR HVAC EQUIPMENT
230529	HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
230553	IDENTIFICATIONS FOR HVAC PIPING AND EQUIPMENT
230593	TESTING, ADJUSTING, AND BALANCING FOR HVAC
230713	DUCT INSULATION
230800	COMMISSIONING OF HVAC
230900	BUILDING MANAGEMENT SYSTEM
230993	SEQUENCE OF OPERATIONS FOR HVAC CONTROLS
232300	REFRIGERANT PIPING
233113	METAL DUCTS
233300	AIR DUCT ACCESSORIES
233423	HVAC POWER VENTILATORS
233713	DIFFUSERS, REGISTERS, AND GRILLES
237433	DEDICATED OUTDOOR-AIR UNITS
238126	SPLIT SYSTEM AIR CONDITIONERS
238129	VARIABLE-REFRIGERANT-FLOW HVAC SYSTEMS

DIVISION 26 – ELECTRICAL

26 00 10	Basic Electrical Requirements
26 01 26	Electrical Equipment Acceptance Testing
26 05 19	Low Voltage Electrical Power Conductors and Cables
26 05 26	Grounding and Bonding for Electrical Systems
26 05 29	Hangers and Supports for Electrical Systems
26 05 33	Raceway and Boxes for Electrical Systems
26 05 43	Underground Ducts and Raceways for Electrical Systems
26 05 53	Electrical Identification
26 05 72	Overcurrent Protective Device Short-Circuit Study

26 05 73	Overcurrent Protective Device Coordination Study
26 09 23	Lighting Control Equipment
26 22 00	Transformers
26 24 13	Switchboards
26 24 16	Panelboards
26 27 26	Wiring Devices
26 281 3	Fuses (600 volts and below)
26 28 16	Circuit and Motor Disconnects
26 32 13	Engine Generators
26 41 13	Lightning Protection for Structures
26 43 13	Surge Protection Devices
26 51 00	Interior Lighting Fixtures
26 52 00	Emergency Lighting Fixtures
26 56 00	Exterior Lighting Fixtures

DIVISION 26.4

1.1 EXECUTIVE SUMMARY

This report describes lighting and controls for the following areas for a new City Hall in Brookhaven, Georgia. The lighting design will continue to be refined to incorporate comments from Sizemore Group and the City of Brookhaven.

1.2 PROJECT DESCRIPTION AND GOALS

The lighting will be designed to provide a visually comfortable, aesthetically pleasing environment that enables and supports the right ambiance and tasks performed at each space type. The design will include a layered solution of general, accent and task lighting that supports the program of each area. Lighting equipment will be selected for energy efficiency and simplified lighting maintenance to minimize operating costs.

26.4.1 TECHNICAL CRITERIA

- A. **SPECIFICATION STRATEGY:** A three-line specification of architectural grade fixtures and controls will be provided for lighting. Except for custom fixtures that are required to create a required aesthetic--all other basis-of-design products will be listed alongside two alternate manufacturers & makes. This will allow for competitive bidding within local distributors.

Fixture manufacturer and model selection will rely on energy efficiency, quality of optical design, construction, performance data compliant with WELL and LEED targets, and finish for architectural fixtures. This does not include custom/decorative fixtures which are selected for visual appeal. Alternates and substitutions will have to adhere to the performance criteria to qualify for review.

- B. **LAMP TECHNOLOGIES:** Appropriate lamp technology application is critical to a well-designed, energy efficient and maintenance friendly lighting systems. At this juncture, all fixtures for the project will be specified with integral LED modules whenever offered.

All LED modules will provide warm white color temperature of 3000K/3500K with color rendering index of 90+ CRI, and color consistency of $\pm 100K$.

- C. **CONTROL SYSTEMS:** The lighting control system will consist of a modular control system composed of independently operational control units for each contiguous space.

- D. **SUSTAINABILITY:** In compliance with individual LEED GOLD and WELL GOLD targets, drivers for LED fixtures will be confirmed as being unlikely to create flicker, color rendering for all fixtures will be 90 or better, glare will be minimized in areas occupied at length, and occupants will be able to dim groups of lights or individual fixtures. A lighting control system should be specified for both interior and exterior lighting, so that any fixtures aimed towards the night sky can be shut off during select hours. It is estimated that electric lighting will account for approximately a third of the total energy use in the building. It is essential that this energy is used responsibly, and the lighting systems should be designed to achieve the recommended illuminance levels while minimizing energy consumption. LED luminaires will be RoHS compliant to reduce the amount of toxic heavy metals entering the waste stream.
- E. **MAINTENANCE:** Fixtures will be located with maintenance and ease of accessibility in mind.

26.4.2 CODE & STANDARDS

The project shall meet energy and control requirements outlined in the most current edition of the energy code as adopted by the most current version of Local Building Code and Energy Compliance or described below:

- A. ASHRAE 90.1-2013 or IECC 2015 will be used as the reference energy standard.
- B. All illumination levels and lighting strategies are based on recommendations from The Illuminating Engineering Society of North America (IESNA) Handbook, 10th Edition.
- C. LEED Gold lighting guidelines for interior/exterior fixtures
- D. WELL Gold lighting guidelines for interior/exterior fixtures

26.4.3 DESIGN CRITERIA

A. FACADE

Design Criteria: The design will highlight the architectural framing and accent large surface areas compositionally. Brightness ratios will be thoughtfully applied while minimizing glare. In an effort to align with local ordinances, up-lighting will be kept to a minimum in order to preserve dark skies for the community (lighting zone to be determined).

Lighting Approach options:

- In-grade linear or point source LED lights to accent specific areas of the building that overhang
- Building mounted linear or flood lights that aim a specified beam of light towards façade elements.

Controls Approach:

- Dimming system to fine tune exterior fixtures, which would then be set to switch on/off via system timeclo

B. MAIN LOBBIES + VESTIBULES

Design Criteria: The design will create a welcoming impression when you walk into the space, highlight branded elements, and define feature elements within the larger space to create an impressionable, yet inviting atmosphere. The lighting design will continue to be refined to incorporate comments from Sizemore Group and the City of Brookhaven.

Lighting Approach options:

- Performance pendants with indirect light
- Linear graze or wall wash fixture, integrated with the ceiling edge
- Small profile, high output downlights in the ceiling
- Adjustable fixtures to highlight vertical art or signage

Controls Approach:

- Dimming system with 1-4 Zones+ 5 button keypad: (3) scenes/on-off/raise/lower

C. CORRIDORS, ELEVATOR LOBBIES, RECEPTION AREA

Design Criteria: The design will support wayfinding of various spaces within corridors and provide sufficient illuminance for circulation. The lighting and controls will support the intended program of each area, while also providing a unique character. The lighting design will continue to be refined to incorporate comments from Sizemore Group and the City of Brookhaven.

Lighting Approach options:

- Perimeter light along the ceiling edge to provide wall and floor brightness
- Vertical and horizontal lines of light integrated with the wood ceiling/wall system
- Recessed downlights as required to achieve adequate light levels in the elevator lobbies

- Recessed or pendant mount wall wash fixtures to add vertical brightness
- Recessed or surface mount downlights for general illuminance in select areas of circulation

Controls Approach:

- Zones can be dimmed to set and then controlled via timeclock
- Fixtures within daylight zones can respond to natural light levels via photocell (light levels to be preset within 25, 50, 75, and 100%)

D. RESTROOMS

Design Criteria: The design will provide uniform illumination and vertical brightness at mirrors. Light sources will be concealed unless decorative, in which case low-glare fixtures will be used. The lighting design will continue to be refined to incorporate comments from Sizemore Group and the City of Brookhaven.

Lighting Approach options:

- Linear cove light
- Backlit mirror or decorative sconces
- Small aperture downlights

Controls Approach:

- Dimming system will switch lights on/off via occupancy or vacancy sensors

E. COFFEE BAR + SEATING

Design Criteria: The design will support a social environment that is adjacent to a glass wall, which provides view and natural light as a respite from the workday. Brightness ratios will be thoughtfully applied between dimmable and potentially non-dimmable fixtures. The lighting design will continue to be refined to incorporate comments from Sizemore Group and the City of Brookhaven.

Lighting Approach options:

- Recessed or pendant mount fixtures for general illumination
- Linear accent light under bar counter and in shelf millwork
- Decorative pendants over select seats or sections of the bar
- Adjustable lights to highlight artwork and/or signage

Controls Approach:

- Dimming system with scenes that adjust fixtures within the daylight zone and dimmable fixtures. Scenes to adjust according to photocell or system timeclock, with a keypad for potential operations override.
- Dimming system with a 5 button keypad: (3) scenes/on-off/raise/lower

F. CITY COUNCIL CHAMBERS

Design Criteria:

Lighting Approach options:

- Linear cove light
- Recessed downlights with appropriate selection of beam angle, lumen output, color temperature binning within 4 MacAdam Ellipses, and glare control
- Decorative pendants and/or wall sconces
- Task light integrated with council seating millwork

Controls Approach:

- Dimming system with 1-4 Zones plus a 5 button keypad to control: (3) scenes/on-off/raise/lowers.

G. MULTIPURPOSE / PREFUNCTION

Design Criteria:

Lighting Approach options:

- Large scale decorative LED fixtures with integral LED diodes and 0-10V dimmable drivers
- Recessed fixed and adjustable downlights for general illumination
- Recessed adjustable and wall wash fixtures for accent lighting
- Decorative wall sconces with integral LED diodes and 0-10V dimmable drivers
- Linear cove or perimeter lighting to highlight architectural features and create vertical brightness

Controls Approach:

- Dimming system with a 5 button keypad to control: (3) scenes/on-off/raise/lowers.
- Partition sensors in the multipurpose room to activate all joined areas when partitions are opened
- Occupancy / Vacancy sensors to limit wattage used by fixtures when the space is unoccupied

H. SITE LIGHTING FOR HARDSCAPE + LANDSCAPE

Design Criteria: The design will support an ambient lighting composition within hardscape and landscape elements that is comfortable and low-glare. Fixtures lighting the ground will be full cutoff (BUG rating 0 for up light). Fixtures lighting vertical surfaces will be provided with shields or louvers as required to minimize spill light into the night sky. In addition, fixtures aimed up can be dimmed or turned off after curfew or between select hours of darkness. The lighting design will continue to be refined to incorporate comments from Sizemore Group and the City of Brookhaven.

Lighting Approach options:

- Pole lights for pedestrian areas
- Bollards for plaza area
- Linear or point source step lights to be integrated with benches, planters, walls, and steps
- In-grade or bullet flood lights to light select trees (to be turned off within certain windows of time as required by LEED)

Controls Approach:

- Pole mount fixtures will dim to 50% after curfew or turn off between midnight and dawn, pending LEED requirements
- Fixtures mounted below 4'0" that are aimed downward will switch on/off
- Fixtures that allow direct view to the source at all will be dimmed to appropriate brightness and then switched on/off with system timeclock.
- Control panel will live in a non-public space within the building that corresponds to each exterior area

26.4.4 COST ESTIMATION

A. PUBLIC SPACES (INTERIOR)

Previous experience has found that light fixture costs for designed interior public spaces are generally \$12 - \$13 per square foot. This excludes labor, taxes, freight, and all materials associated with installing light fixtures (conduit, wire, etc.). Public spaces are defined as lobbies, corridors, restrooms, food/beverage stations, Council Chambers, and public meeting rooms.

B. PRIVATE SPACES

Previous experience has found that light fixture costs for designed private spaces are generally \$9 - \$10 per square foot. This excludes labor, taxes, freight, and all materials associated with installing light fixtures (conduit, wire, etc.). Public spaces are defined as private offices and rooms available to staff only.

C. PUBLIC SPACES (EXTERIOR) AND BUILDING FACADE

Pricing based on design narrative above

D. LIGHTING CONTROLS

Previous experience has found that a lighting controls package will be 20-25% the sum of all light fixture costs.

E. WELL COMPLIANT MATERIALS

Previous experience has found that WELL efforts add 30-35% to the sum of all light fixtures, as compliant products are limited and of high caliber.

End of DIV 26.4

Audiovisual Systems

Introduction

Waveguide met with the Owner's AV representative on November 7, 2022, to review existing systems and understand the project's current challenges and desired outcomes. Additionally, we received input from the IT director via email. We have noted a set of consistent goals for the AV systems. The goals brought forth by Brookhaven's key stakeholders are:

- Good viewing angles and sightlines
- Reliable
- Intuitive
- Expandable
- Simple, consistent user experience
- Flexible
- Economical
-

Specific system information and descriptions are listed below.

Council Chambers

The Council Chambers will host public meetings, hearings, votes, and community engagement events. The meetings will continue to expand community engagement through a Unified Communications (UC) platform (e.g., Zoom) and capture the proceedings in the Owner's Minute Tracker system. Technical operators will be supported with automated camera switching based on push-to-talk microphone positioning.

CORE USE CASES

- Meet in person
- Present wirelessly, including support for mobile devices
- Present from a user's laptop or mobile device (wired)
- Participate in a web conference hosted by the in-room computers
- Record meetings, community engagement, and votes
- Operate in attended/unattended mode
- Provide one-way streaming of live events
- Watch live news events
- Hear audio with an assistive listening system

Devices

- Ceiling-mounted projection system
- Distributed ceiling speakers
- Wireless presentation receiver
- Lectern w AV connectivity
- Technician production station
- Press output plate
- Ceiling mounted microphones
- PTZ Cameras
- 28-30 push-to-talk microphones
- Integrated video confidence monitors
- Four wireless microphone systems
- Virtual audio mixer

Multipurpose Room

The Multipurpose Room will be a space that large groups can use for training, presentations, small concerts, or other similar events.

CORE USE CASES

- Meet in person
- Present wirelessly, including support for mobile devices
- Present from a user's laptop or mobile device (wired)
- Participate in a web conference hosted by the in-room computer
- Watch live news events
- Listen to an audio-only performance/presentation
- Hear audio with an assistive listening system

ENHANCED USE CASES

- Host small concerts with supplemental and improved audio system
- Provide presenter support with confidence monitors

Core Devices

- Ceiling-mounted projection system
- Distributed ceiling speakers
- Wireless presentation receiver
- Lectern w AV connectivity
- Wall-mounted control touch panel
- Ceiling mounted microphones
- PTZ Cameras

Enhanced Devices

- A portable audio speaker system
- Confidence monitors on carts
- Direct view LED (DV-LED) wall

- Four wireless microphone systems

Executive Conference Room

The Executive Conference room will allow collaboration in person and with remote participants. The space may also act as a digital collaboration space with portable digital whiteboards.

CORE USE CASES

- Meet in person
- Participate in an audio conference call with an integrated audio system
- Present wirelessly, including support for mobile devices
- Present from a user's laptop or mobile device (wired)
- Present from the in-room computer, including playing video recordings for debriefing
- Watch live news events
- Participate in a web conference hosted by the in-room computer
- Hear audio with an assistive listening system

ENHANCED USE CASES

- Present with digital whiteboard
- Dual displays on the long wall, instead of a single display on the short wall, will offer extra space for multiple information streams in hybrid meetings.

Core Devices	Enhanced Devices
<ul style="list-style-type: none"> • Wall-mounted flat panel display • Distributed ceiling speakers • Wireless presentation receiver • Tabletop cable management with power, USB charging, and USB-C • Touch panel for user control • Ceiling mounted microphones • Integrated auto-tracking web camera 	<ul style="list-style-type: none"> • Dual wall-mounted flat panel displays • Digital whiteboard

Medium Conference Rooms

Medium Conference rooms are spaces that will allow users to meet in person and communicate with remote participants.

CORE USE CASES

- Meet in person
- Participate in an audio conference with a table speakerphone

ENHANCED USE CASES

- Participate in an audio conference call with integrated systems
- Present wirelessly, including support for mobile devices
- Present from a user's laptop or mobile device (wired)
- Participate in a video web conference hosted from a user device connected to in-room peripherals.

Core Devices	Enhanced Devices
<ul style="list-style-type: none">• Table-top speakerphone	<ul style="list-style-type: none">• Wall-mounted flat panel display• USB web camera and speaker bar• Tabletop cable management with power, USB charging, and USB-C• Touch panel for user control

Huddle Rooms

Like the Medium Conference rooms, the Huddle Rooms are spaces that will primarily allow users to meet in person and communicate with remote participants.

CORE USE CASES

- Meet in person
- Participate in an audio conference with a table speakerphone

ENHANCED USE CASES

- Participate in an audio conference call with integrated systems
- Present wirelessly, including support for mobile devices
- Present from a user's laptop or mobile device (wired)
- Participate in a video web conference hosted from a user device connected to in-room peripherals.

Core Devices	Enhanced Devices
<ul style="list-style-type: none">• Table-top speakerphone	<ul style="list-style-type: none">• Wall-mounted flat panel display• USB web camera and speaker bar• Tabletop cable management with power, USB charging, and USB-C• Touch panel for user control

Break Rooms

Break rooms will include a television for users to view while on break.

CORE USE CASES

- View TV content from a cable or satellite service provider

Core Devices
<ul style="list-style-type: none">• Wall-mounted flat panel display with integral loudspeakers• Wall-mounted touch panel for control

Background Music

Public spaces will include loudspeakers to allow users to listen to background music.

CORE USE CASES

- Listen to background music

Core Devices
<ul style="list-style-type: none">• Ceiling mounted loudspeakers• Audio head-end player

IT Infrastructure

IT Infrastructure Overview

Planning and design support for information technology (IT) and structured cabling will facilitate building infrastructure development for data networking, telecommunications cabling, and equipment installation. Recommendations and designs will be based on the Owner's standards and industry best practices.

The project's structured cabling system is expected to include a mix of wired and wireless data connectivity points, including optical fiber and copper backbone and station cabling, equipment racks, cable management, patch panels, patch cords, and modular data jacks. Structured cabling is also expected to include backbone and horizontal cabling for broadband television distribution.

Structured Cabling

Text as Needed The structured cabling system for the new facility will employ Category 6e cabling for data, and voice will be VOIP. CATV/SATV distribution will be supported by creating a campus IPTV system.

All cabling and connection devices will be installed following industry standard practices and methods (i.e., BICSI standards). The number of drops and locations for drops will follow industry standard practices and any specific owner guidelines or requirements.

Fiber optic risers will service the data (and voice via VOIP) systems throughout the building. The sizes of the risers will be based on the number of drops served and industry standard practices.

Networking and Communications Systems

There will be a mix of hardwired and wireless network access. Where hardwired network access is required, a data outlet will be provided as part of the building cabling system; we understand there would be the need for dual drops at each workstation. As wireless utilization is anticipated to be the primary network connectivity method, high-bandwidth data in support of AV could represent up to 50% of the wired network drops within the facility.

Where wireless access is required, a data outlet will be provided in the ceiling or at an alternately convenient location to serve as an access point for that area. The wireless data

network coverage will encompass all interior areas of the building. The electronics required for wireless access to the network (i.e., access points and wireless cards) are not included within the structured cabling system.

Building infrastructure and pathways and structured cabling to support the communications systems will be a part of the general construction scope. The cost of providing the building's structured cabling system is part of the base building budget. However, this cost would not include any active electronics required for a functioning data network or telephone system. The active electronic systems anticipated to be designed, specified and installed by the Owner's IT group or vendor include routers, switches, servers, wireless access points, and phone systems.

NOTE: These active electronics are not included within the structured cabling system and will be considered owner-furnished equipment (OFE).

Sustainability Guidelines

The following sections include guidelines for sustainability goals. The project will be design to LEED and Well Building Gold benchmarks. Each system requires a minimum of 60 point for Gold status. Inclusions of the items listed will be dependent upon costing and owner approval. Certification for will not be sought.

SUSTAINABILITY

Introduction

VISION: Brookhaven will be nationally recognized as a beautiful community where multiple generations can live in safety, flourish in business, and succeed in a historic sustainable environment with exceptional education and transportation options.

The Brookhaven City Hall will serve as demonstration in the community that will exemplify the city's VISION for sustainability, community involvement, and act as beacon of state of the art technology achieving a timeless and memorable architectural experience. Several key features in Sustainability will be embraced and pursued as a goal of this project, under the Guidelines of LEED and WELL:

1.1 Itemized Breakdown

A place that respects the SITE

- 1.2 Creating a functional layout on a 1.1 acre site that includes green space and a hub for community involvement.
- 1.3 Autonomous vehicular drop off and access to Public Transportation via MARTA Bus and Rail line.
- 1.4 Connection to the community in bike trails, walking trails and sidewalks, with tree-lined canopy streets.
- 1.5 Reduced Parking footprint, and maximizing passive green space for market places, concerts, and events.

An environment to achieve greatness

- 1.6 Daylighting in 90% of occupied interior spaces, all having views of the exterior and connection to the natural world.
- 1.7 Enhanced indoor air quality, with increased ventilation, filtration, and monitoring and testing.
- 1.8 Interior lighting with glare control, color rendering, circadian phase disruption, and lighting controls for occupants.
- 1.9 HVAC to be thermally zoned, with controls accessible to occupants.

A building for the people

- 1.10 Nutrition; promote fruits and vegetables if food is sold or provided on a daily basis, and provide nutritional information.

- 1.11 Movement; a building that promotes healthy circulation, encouraging the use of stairs, walking and bicycling.
- 1.12 Ergonomic workstation design; workstations for all employees, height adjustable. Treadmill desks, adjustable seating.
- 1.13 Sound mapping; acoustic considerations to provide loud and quiet spaces, limit reverberation, flutter, and echo.
- 1.14 Mental health is strengthened by positive work conditions, an active lifestyle, and nutritional-based healthy behaviors.

Healthy Materials for occupants and the ecology

- 1.15 Environmental Production Declarations; listing the content of products chosen.
- 1.16 Use products that have a compliant embodied carbon optimization, and high recycled content.
- 1.17 Sourcing raw materials locally with low impact on the ecology.
- 1.18 Utilizing materials with Low VOC (Volatile Organic Compounds), for excellent indoor air quality.

A building that conserves Energy & Water:

- 1.19 Energy use reduction at 30 – 40 % above Code Standards of ASHRAE 90.1.
- 1.20 Advanced Energy Metering and Water Metering.
- 1.21 Water use reduction with high efficiency fixtures, grey water reuse, and rain water harvesting.
- 1.22 Drinking water treated and evaluating the chemical parameters complies with health based limits.

Innovation in Structural Design -

- 1.23 Use mass timber for the city hall structure above parking levels. Mass timber has the lowest embodied carbon for a construction material compared to a steel or concrete frame.
- 1.24 LEED requires that wood products be from certified forests or sourced from ASTM D7612-certified forests.
- 1.25 Recycled aggregates and materials can be explored for use in concrete as well as the use of wood cellulose nanocrystals.
- 1.26 Adding fly ash to concrete to reduce the use of Portland Cement and utilize a building material with Low Embodied Energy.
- 1.27 Recycled content in steel framing. Steel framing with 90 – 100% recycled content, to reduce landfill and construction waste.

Conceptual Graphic Indicating Green elements at the site and rooftop



Sustainability



LEED v4.1 BD+C
Project Checklist

Project Name: Brookhaven City Hall
Date: 11.14.22

Y	?	N			
1			1	1	1
19 5 Location and Transportation 16					
1			18	1	1
2			2	1	1
2	3	2	3	2	0
2		3	3	3	0
1			1	1	1
1			1	1	1
1			1	1	1
5 4 Sustainable Sites 10					
Y			1	1	1
1			1	1	1
1	1		1	1	1
1			1	1	1
1	2		1	2	1
2			2	2	1
1			1	1	1
8 3 Water Efficiency 11					
Y			1	1	1
Y			1	1	1
Y			1	1	1
1		1	1	1	1
1			1	1	1
1		2	1	2	1
1			1	1	1
12 11 Energy and Atmosphere 33					
Y			1	1	1
Y			1	1	1
Y			1	1	1
Y			1	1	1
1	8		1	8	1
1	4	5	1	4	5
1			1	1	1
2			2	2	1
1		5	1	5	1
1			1	1	1

Y	?	N			
1	4		1	4	1
1	1		1	1	1
2			2	2	1
1	1		1	1	1
1	1		1	1	1
17 11 Indoor Environmental Quality 16					
Y			1	1	1
Y			1	1	1
2			2	2	1
5			5	5	1
1			1	1	1
1	1		1	1	1
1			1	1	1
2			2	2	1
3			3	3	1
1			1	1	1
1			1	1	1
3 1 Innovation 6					
2			2	2	1
1			1	1	1
1 1 Regional Priority 4					
1			1	1	1
1			1	1	1
1			1	1	1
1			1	1	1

60 42 18 TOTALS Possible Points: 110
 Achieved: 40 to 48 points, Silver; 50 to 58 points, Gold; 60 to 78 points, Platinum; 80 to 110 points, Diamond

THE TOTALS REFLECTED IN THE ABOVE GRAPH ILLUSTRATES THE PRELIMINARY CALCULATIONS DURING THE SCHEMATIC DESIGN PHASE ONLY. THIS IS AN ESTIMATED SCORE BASED ON THE AFOREMENTIONED SUGGESTIONS, REVIEWS, AND GUIDANCE OF THE HIGHLY EDUCATED AND EXPERIENCED PROFESSIONALS. WE ARE SEEKING A GOLD STANDARD AND ARE FOLLOWING SPECIFIC DESIGN STANDARDS, THE NARRATIVE BELOW PROVIDE DETAILED INFORMATION ON HOW THE GOLD STANDARD WILL BE ACHIEVED.

Sustainability Review: LEED

LANDSCAPE ARCHITECTURE

LEED SCHEMATIC DESIGN NARRATIVE

11.14.2022

MATERIALS AND RESOURCES: 6 POINTS (Possible 7 extra points)

STORAGE AND COLLECTION OF RECYCLABLES MR PREREQUISITE

Provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building. Collection and storage areas may be separate locations. Recyclable materials must include mixed paper, corrugated cardboard, glass, plastics, and metals. Take appropriate measures for the safe collection, storage, and disposal of two of the following: batteries, mercury-containing lamps, and electronic waste.

PBT SOURCE REDUCTION – MERCURY MR PREREQUISITE

As part of the project's recycling collection system, identify the following: ☒ types of mercury-containing products and devices to be collected; ☒ criteria governing how they are to be handled by a recycling program; and ☒ disposal methods for captured mercury

BUILDING LIFE-CYCLE IMPACT REDUCTION 1 point (Possible 3-4 extra points)

For new construction (buildings or portions of buildings), Architect will conduct a cradle- to-grave life-cycle assessment of the project's structure and enclosure and select one or more of the following paths below to earn up to 4 points: Path 1: Conduct a life cycle assessment of the project's structure and enclosure (1 point).

ENVIRONMENTAL PRODUCT DECLARATION 1 point (possible 1 extra point)

Option 2. Embodied Carbon/LCA Optimization (1 point) Use products that have a compliant embodied carbon optimization report or action plan separate from the LCA or EPD. Use at least 5 permanently installed products sourced from at least three different manufacturers. Products are valued according to the table below.

Sustainability Review: LEED

LANDSCAPE ARCHITECTURE

BROOKHAVEN CITY HALL LEED V4.1 BD+C
LANDSCAPE ARCHITECTURE REVIEW 11/9/2022

LOCATION AND TRANSPORTATION: 5 POINTS + 2 POTENTIAL POINTS

LEED FOR NEIGHBORHOOD DEVELOPMENT LOCATION: 0 points

The project is not located within the boundary of a development certified under LEED for Neighborhood Development (Stage 2 or Stage 3 under the Pilot or v2009 rating systems, Certified Plan or Certified Built Project under the LEED v4 rating system).

SENSITIVE LAND PROTECTION: 1 point

Option 1. Previously Developed Land The development footprint is located on land that has been previously developed

HIGH PRIORITY SITE AND EQUITABLE DEVELOPMENT: ? points

Further discussion is required to better understand how this point relates to our project.

SURROUNDING DENSITY AND DIVERSE USES ? points

Size more to provide feedback on if the project meets the following criteria:

ACCESS TO QUALITY TRANSIT: 1 point

Brookhaven Marta Station has approximately 75 trips per weekday and 59 weekend trips

BICYCLE FACILITIES: 1 point

Size more Bicycle Storage and Shower Rooms : Commercial or Institutional Projects Provide short-term bicycle storage for at least 2.5% of all peak visitors, but no fewer than four storage spaces per building. Provide long-term bicycle storage for at least 5% of all regular building occupants, but no fewer than four storage spaces per building in addition to the short-term bicycle storage spaces. Provide at least one on-site shower with changing facility for the first 100 regular building occupants and one additional shower for every 150 regular building occupants thereafter.

REDUCED PARKING FOOTPRINT 1 point

Size more Option 2. Car-share?: Provide dedicated parking for car-share vehicles. Provide car-share vehicle parking space(s) for at least 1% of total parking spaces, rounded up. If the project has fewer than 100 parking spaces, provide one car-share vehicle parking space. Establish an agreement between the project and car-share company guaranteeing that new or existing car-share vehicle space(s) will be dedicated for a minimum of two years from the certificate of building occupancy.

ELECTRIC VEHICLES: 1 point

Option 1. Electric Vehicle Supply Equipment (1 point) Install electrical vehicle supply equipment (EVSE) in 5% of all parking spaces used by the project or at least two spaces, whichever is greater. Clearly identify and reserve these spaces for the sole use by plug-in electric vehicles.

SUSTAINABLE SITES: 1 POINT + 6 POTENTIAL POINTS

SITE ASSESSMENT: Potentially 1 point available

Sustainability Review:LEED

LANDSCAPE ARCHITECTURE

Prepare a survey and site assessment including the following:

Topography, Hydrology, Climate, Vegetation, soils, human use, human health effects

PROTECT OR RESTORE HABITAT Potentially 1 point available

Restore a minimum of 15% of the site with native and/or adaptive plant material as follows:

Plant a minimum of 6 species of vegetation that are native or adapted to the project's EPA Level III ecoregion (or local equivalent for projects outside of the U.S.). Include a minimum of 2 out of the following plant categories: tree, shrub, and ground cover. Designate a portion of the habitat area for a pollinator garden consisting of native flowering plants and totaling at least 30 square feet (3 square meters).

OPEN SPACE: Potentially 1 point available

Provide outdoor space greater than or equal to 30% of the total site area (including building footprint). At least 25% of the calculated outdoor open space must be vegetated space planted with two or more types of vegetation or have overhead vegetated canopy.

RAINWATER MANAGEMENT: Potentially 2 points available CIVIL TO REVIEW

HEAT ISLAND REDUCTION : 1 point

Option 2. Parking under Cover (1 point) Place a minimum of 75% of parking spaces under cover. Any roof used to shade or cover parking must (1) have an aged SRI of at least 32 (if aged value information is not available, use materials with an initial SRI of at least 39 at installation), (2) be a vegetated roof (EXCLUDES ARTIFICIAL TURF)

LIGHT POLLUTION REDUCTION: 1 potential points

Lighting consultant to review

WATER EFFICIENCY:

OUTDOOR WATER USE REDUCTION : 1 potential point

Sustainability Review

STRUCTURAL

BROOKHAVEN CITY HALL LEED V4.1 BD+C

STRUCTURAL REVIEW 11/11/2022

Whole-Building Life-Cycle Assessment: (1-4 points)

- 1 Point: Conduct a life cycle assessment of the project's structure and enclosure
- 3 Potential Points: Demonstrate that the structure and enclosure have a 5% (1 point) to 10% reduction (2 points) reduction in 3 of 6 categories when compared to a baseline building. If 5% or 10% reduction is achieved an additional 1 point can be achieved with the use of salvaged materials in the structure.
 - The current intent is to use mass timber for the city hall structure above the parking levels. Mass timber has the lowest amount of embodied carbon for a construction material when compared to steel or concrete framed structures.
 - LEED requires that wood products be from certified forests or sourced from ASTM D7612-certified forests if they are all from legal (non-controversial) sources such as forests managed using responsible practices and if at least 70 percent (based on cost) are from responsible sources.
 - Recycled aggregates and materials can be explored for use in concrete as well as the use of wood cellulose nanocrystals.
 - Recycled content in steel framing.

Environmental Product Declarations (1 point)

- 1 Point – 2 options to achieve this:
 - Environmental Production Declarations conforming to the requirements of LEED V4.1 BD+C must be submitted by the contractor.
 - Use products that have a compliant embodied carbon optimization report separate from the LCA or EPD as required of LEED V4.1 BD+C.

Sourcing of Raw Materials (1 point)

- 1 Point: The contractor must source products as required to meet the requirements of LEED V4.1 BD+C.

Low-Emitting Materials (Varies based on product categories)

- 1 product category: Composite Wood Materials. Structural wood falls within this category and must be sourced to meet the requirements of LEED V4.1 BD+C.
- 1 product category: Flooring. Concrete slabs and concrete toppings meet the requirements for inherently non-emitting materials.

ADDITIONAL CREDITS TO EXPLORE WITH THE USE OF MASS TIMBER:

Innovation Credits

Regional Priority: Specific Credit

Sustainability Review

LIGHTING DESIGN

LEED V4.1 BD+C -LIGHTING REVIEW 11/9/2022

SUSTAINABLE SITES: 1 POINT + 6 POTENTIAL POINTS

LIGHT POLLUTION REDUCTION 1 potential points

Based on Brookhaven's lighting ordinance, which states that exterior fixtures should have a maximum of 2.5% lumens emitted above 90 degrees, it would seem that Lighting Zone 2 (LZ2) would be appropriate for LEED calculations. LZ2 limits uplight to 1.5% above 90 degrees, while LZ3 limits uplight to 3%, which is greater than Brookhaven's allowed percentage. However, LEED allows buildings in LZ3 to use tree and facade uplighting at night, if they are turned off from midnight to 6am, via an exterior lighting control system. The project's proper lighting zone should be discussed with the City of Brookhaven and the LEED consultant, prior to developing an exterior lighting scheme.

Uplight Option 1. BUG RATING METHOD

With this method, all specified light fixtures for exterior lighting should have a BUG rating. This does not apply to fixtures aimed up at the facade or trees. This method limits applied lighting to wall and pole mounted fixtures.

Uplight Option 2. CALCULATION METHOD

This method can be calculated using AGI32 photometry software, which includes a template for LEED documentation. To calculate, all specified fixtures must have the ies file provided from their respective manufacturer and know the lighting zone of the site.

Light Trespass Option 1. BUG RATING METHOD

With this method, all specified light fixtures for exterior lighting should have a BUG rating. This does not apply to fixtures aimed up at the facade or trees. This method limits applied lighting to wall and pole mounted fixtures.

Light Trespass Option 2. CALCULATION METHOD

This method can be calculated using AGI32 photometry software, which includes a template for LEED documentation. To calculate, all specified fixtures must have the ies file provided from their respective manufacturer and know the lighting zone of the site. The LEED boundary must also be drawn to scale.

Sustainability Review

LIGHTING DESIGN

INDOOR ENVIRONMENTAL QUALITY: 2 POINT + 9 POTENTIAL POINTS

INTERIOR LIGHTING 2 potential points

- o Glare Control*

All FOH interior fixtures will need to be specified from manufacturers that can provide either UGR or cd/m2 data. CD+M prefers UGR data as it is more common among manufacturers.

- o Color Rendering

All FOH interior fixtures will need to be specified with minimum 90 CRI or a combination of Color Fidelity > 78 with Gamut Index between 97-110. CD+M prefers minimum 90 CRI as it is more common among manufacturers.

- o Lighting Control

90% of FOH spaces will be dimmable, with a control system specified and control zones for groups of fixtures that align with occupant interaction at various times of day.

- o Surface Reflectivity

Interior Designer / Architect to review

*This is a time-intensive item

Sustainability Review

MEP/FP REVIEW

BROOKHAVEN CITY HALL LEED V4.1 BD+C

MEP REVIEW 11/11/2022

WATER EFFICIENCY: 1 POINT + 6 POTENTIAL POINTS

- INDOOR WATER USE REDUCTION - 6 potential points
 - Further reduce fixture and fitting water use from the calculated baseline in WE Prerequisite Indoor Water Use Reduction. Additional potable water savings can be earned above the prerequisite level using alternative water sources. Include fixtures and fittings necessary to meet the needs of the occupants.
 - Capturing gray water to flush toilets would help us achieve 6 points

WATER METERING - 1 point

- Install permanent water meters for two or more of the following water subsystems, as applicable to the project:
 - Irrigation. Meter water systems serving at least 80% of the irrigated landscaped area. Calculate the percentage of irrigated landscape area served as the total metered irrigated landscape area divided by the total irrigated landscape area. Landscape areas fully covered with xeriscaping or native vegetation that requires no routine irrigation may be excluded from the calculation.
 - Indoor plumbing fixtures and fittings. Meter water systems serving at least 80% of the indoor fixtures and fitting described in WE Prerequisite Indoor Water Use Reduction, either directly or by deducting all other measured water use from the measured total water consumption of the building and grounds.
 - Domestic hot water. Meter water use of at least 80% of the installed domestic hot water heating capacity (including both tanks and on-demand heaters).
 - Reclaimed water. Meter reclaimed water, regardless of rate. A reclaimed water system with a makeup water connection must also be metered so that the true reclaimed water component can be determined.

Table 1. Points for reducing water use

Percentage reduction	Points (BD&C)	Points (Schools, Retail, Hospitality, Healthcare)	Points (ID&C)	Points (CI Retail)	Points (CI Hospitality)
25%	1	1	2	2	2
30%	2	2	4	4	4
35%	3	3	6	6	6
40%	4	4	8	8	8
45%	5	5	10	10	10
50%	6	**	12	**	11

Sustainability Review

MEP/F REVIEW

ENERGY AND ATMOSPHERE: 15 POINTS + 2 POTENTIAL POINTS

ENHANCED COMMISSIONING- 5 points

Implement, or have in place a contract to implement, the following commissioning process activities in addition to those required under EA Prerequisite Fundamental Commissioning and Verification. Commissioning authority

- The CxA must have documented commissioning process experience on at least two building projects with a similar scope of work. The experience must extend from early design phase through at least 10 months of occupancy.
- The CxA may be a qualified employee of the owner, an independent consultant, or a disinterested subcontractor of the design team.

Option 1: Enhanced Systems Commissioning (3-4 points)

- Path 1: Enhanced commissioning (3 points)
- Review contractor submittals.
- Verify inclusion of systems manual requirements in construction documents.
- Verify inclusion of operator and occupant training requirements in construction documents.
- Verify systems manual updates and delivery.
- Verify operator and occupant training delivery and effectiveness.
- Verify seasonal testing.
- Review building operations 10 months after substantial completion.
- Develop an on-going commissioning plan.

Path 2: Enhanced and monitored-based (4 points)

Includes the procedure from Path 1 plus the CxA must address the following:

- Roles and responsibilities.
- Measurement requirements (meters, points, metering systems, data access).
- The points to be tracked, with frequency and duration for trend monitoring.
- The limits of acceptable values for tracked points and metered values (where appropriate, predictive algorithms may be used to compare ideal values with actual values).
- The elements used to evaluate performance, including conflict between systems, out-of-sequence operation of systems components, and energy and water usage profiles.
- An action plan for identifying and correcting operational errors and deficiencies.
- Training to prevent errors.
- Planning for repairs needed to maintain performance; and
- The frequency of analyses in the first year of occupancy (at least quarterly).
- Update the systems manual with any modifications or new settings, and give the reason for any modifications from the original design.

Sustainability Review

MEP/F REVIEW

Option 2: Envelope Commissioning (2 points)

- Fulfill the requirements in EA Prerequisite Fundamental Commissioning and Verification as they apply to the building's thermal envelope in addition to mechanical and electrical systems and assemblies.
- Complete the following commissioning process (CxP) activities for the building's thermal envelope in accordance with ASHRAE Guideline 0–2005 and the National Institute of Building Sciences (NIBS) Guideline 3–2012, Exterior Enclosure Technical Requirements for the Commissioning Process, as they relate to energy, water, indoor environmental quality, and durability.
- Commissioning authority must complete the following:
 - Review contractor submittals.
 - Verify inclusion of systems manual requirements in construction documents. Verify inclusion of operator and occupant training requirements in construction documents.
 - Verify systems manual updates and delivery.
 - Verify operator and occupant training delivery and effectiveness.
 - Verify seasonal testing.
 - Review building operations 10 months after substantial completion.
 - Develop an on-going commissioning plan.

Optimize Energy Performance: 9 points

Option 1: Energy Performance Compliance (1-18 points)

- Demonstrate a Performance Cost Index (PCI)¹ below the Performance Cost Index Target (PCIt) calculated in accordance with Section 4.2.1.1 of ANSI/ASHRAE/IESNA Standard 90.1-2016, Appendix G, Table 4.2.1.1. For mixed use buildings, the required PCI shall be calculated by using an area weighted average of the building types.
- Calculate the PCI, PCIt, and percentage improvement using metrics of cost and greenhouse gas (GHG) emissions. For each energy source serving the building, the GHG emission factors must be identical for the Baseline and Proposed building models.
- LEED points are calculated based on the project percent improvement PCI below the PCIt using metrics of cost and GHG emissions. Total points have been divided equally between the metrics of energy cost and greenhouse gas emissions. Points are awarded according to Table 1 and Table 2.
- For project percent improvement for the cost metric, on-site renewable energy may be subtracted from proposed energy cost prior to calculating proposed building performance per ASHRAE Standard 90.1-2016 Section G 2.4.1.

Sustainability Review

MEP/F REVIEW

- Advanced Energy Metering: 1 point
 - Install advanced energy metering for the following:
 - all whole-building energy sources used by the building; and
 - any individual energy end uses that represent 10% or more of the total annual consumption of the building.
 - The advanced energy metering must have the following characteristics.
 - Meters must be permanently installed, record at intervals of one hour or less, and transmit data to a remote location.
 - Electricity meters must record both consumption and demand. Whole-building electricity meters should record the power factor, if appropriate.
 - The data collection system must use a local area network, building automation system, wireless network, or comparable communication infrastructure.
 - The system must be capable of storing all meter data for at least 36 months.
 - The data must be remotely accessible.
 - All meters in the system must be capable of reporting hourly, daily, monthly, and annual energy use.
- GRID HARMONIZATION: 1 potential point
 - Option 1. Demand Response Program Available and Participation (1 point)
 - Participate in an existing demand response (DR) program and complete the following activities.
 - Have in place a system with the capability for real-time, fully automated DR based on external initiation by a DR program provider. Semi-automated DR may be utilized in practice.
 - Enroll in a minimum one-year DR participation amount contractual commitment with a qualified DR program provider, with the intention of multi-year renewal, for at least 10% of the annual on-peak electricity demand. On-peak demand is based on electric utility bills with an on-peak demand period defined by the local utility. The on-peak demand may vary based on the utility climate and pricing structures.
 - Develop a comprehensive plan for meeting the contractual commitment during a Demand Response event.
 - Include the DR processes in the current facilities requirements and operations and maintenance plan.
 - Initiate at least one full test of the DR plan.
 - Option 2. Demand Response Capable Building (1 point)

Have infrastructure in place to take advantage of future demand response programs or dynamic, real-time pricing programs and complete the following activities. Develop a comprehensive plan for shedding at least 10% of the annual on-peak electricity demand. Peak demand is based on electric utility bills.

Sustainability Review

MEP/F REVIEW

Include the DR processes in the current facilities requirements and operations and maintenance plan.

Initiate at least one full test of the DR plan as part of the building commissioning program.

Contact local utility representatives to discuss participation in future DR programs.

ENHANCED REFRIGERANT MANAGEMENT: 1 potential point

Do not use refrigerants or use only refrigerants (naturally occurring or synthetic) that have an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than 50.

INDOOR ENVIRONMENTAL QUALITY: 9 POINTS + 1 POTENTIAL POINT

ENHANCED INDOOR AIR QUALITY 1 point and 1 potential point

Must comply with (3) strategies listed below for 1 point or 6 strategies for 2 points

- Strategy 1: Entryway Systems
- Strategy 2: Interior Cross Contamination Prevention
- Strategy 3: Filtration of Outdoor Air
- Strategy 4: Filtration of recirculated Air
- Strategy 5: Increased Ventilation 15%
- Strategy 6: Increased Ventilation 30%
- Strategy 7: Operable windows
- Strategy 8: Engineered Natural Ventilation

- Strategy 9: Carbon monoxide monitoring
- Strategy 10: Additional source control and monitoring

INDOOR AIR QUALITY ASSESSMENT: 1 point

Before occupancy, install new filtration media and perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot (4 267 140 liters of outdoor air per square meter) of gross floor area while maintaining an internal temperature of at least 60°F (15°C) and no higher than 80°F (27°C) and relative humidity no higher than 60%

THERMAL COMFORT: 1 point

- Must meet thermal comfort design and thermal comfort control requirements
- Thermal comfort design: Design heating, ventilating, and air-conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55–2017, Thermal Comfort Conditions for Human Occupancy with errata or a local equivalent. For natatoriums, demonstrate compliance with ASHRAE HVAC Applications Handbook, 2015 edition, Chapter 5, Places of Assembly, Typical Natatorium Design Conditions, with errata.
- Thermal comfort control: Provide individual thermal comfort controls for at least 50% of individual occupant spaces. Provide group thermal comfort controls for all shared multi-occupant spaces. Thermal comfort controls allow occupants, whether in individual spaces or shared multi-occupant spaces, to adjust at least one of the following in their local environment: air temperature, radiant temperature, air speed, and humidity.

Sustainability Review

MEP/F REVIEW

INTERIOR LIGHTING 2 points

Meet (3) strategies to achieve 2 points

Strategy 1: Glare Control

- For all regularly occupied spaces, meet one of the following requirements:
- Use light fixtures with a luminance of less than 7,000 candela per square meter (cd/m²) between 45 and 90 degrees from nadir. OR
- Achieve a Unified Glare Rating (UGR) rating of <19 using software modeling calculations of the designed lighting.

Strategy 2: Color Rendering

- For all regularly occupied spaces meet one of the following requirements:
- Use light sources that have a Color Rendering Index (CRI) of at least 90.
- Use light sources that have a Color Fidelity Index greater than or equal to 78 and a gamut index between 97 and 110, determined in accordance with Illuminating Engineering Society (IES) TM-30.

Strategy 3: Lighting Control

- Provide dimmable or multi-level lighting for 90% of occupant spaces

DAYLIGHT 3 points

Option 2: Simulation

- Perform computer simulations for luminance at 9 a.m. and 3 p.m. on a clear-sky day at the equinox for each regularly occupied space.

Healthcare projects should use the regularly occupied spaces located in the perimeter area determined under EQ Credit Quality Views. Demonstrate luminance levels are between 300 lux and 3,000 lux at both 9 a.m. and 3 p.m. Spaces with view-preserving automatic (with manual override) glare-control devices may demonstrate compliance for only the minimum 300 lux luminance level. Points are awarded according to Table 2.

- To be completed by lighting consultant as part of photometric package

Table 2. Points for Option 2

<i>New Construction, Core and Shell, Schools, Retail, Data Centers, Warehouses and Distribution Centers, Hospitality</i>		<i>Healthcare</i>	
<i>Percentage of regularly occupied floor area</i>	<i>Points</i>	<i>Percentage of regularly occupied floor area within perimeter area</i>	<i>Points</i>
55%	1	55%	1
75%	2	75%	2
90%	3	90%	Exemplary performance

Sustainability Review

MEP/F REVIEW

TABLE 1:
POINTS FOR PERCENTAGE IMPROVEMENT IN ENERGY PERFORMANCE -
% Cost PCI Below PCI_t (1-9 points NC and CS, 1-8 points Schools, 1-10) points
Healthcare)

New Construction	Healthcare, Major Renovation, CS	Points BD+C (except Schools, Healthcare)	Points Healthcare	Points Schools
5%	2%	1	1	1
10%	5%	2	2	2
15%	10%	3	3	3
20%	15%	4	4	4
25%	20%	5	5	5
30%	25%	6	6	6
35%	30%	7	7	7
40%	35%	8	8	8
45%	40%	9	9	8
50%	45%	EP	10	EP

TABLE 2:
POINTS FOR PERCENTAGE IMPROVEMENT IN ENERGY PERFORMANCE - %
Greenhouse Gas Emissions PCI Below PCI_t (1-9 points NC, 1-8 points Schools,
1-10) points Healthcare)

New Construction	Healthcare, Major Renovation, CS,	Points BD+C (except Schools, Healthcare)	Points Healthcare	Points Schools
5%	2%	1	1	1
10%	5%	2	2	2
16%	10%	3	3	3
24%	16%	4	4	4
32%	24%	5	5	5
40%	32%	6	6	6
50%	40%	7	7	7
65%	50%	8	8	8
80%	65%	9	9	8
100%	80%	EP	10	EP

LEED Lighting Review

BROOKHAVEN CITY HALL LEED V4.1 BD+C

LIGHTING REVIEW 11/9/2022

SUSTAINABLE SITES: 1 POINT + 6 POTENTIAL POINTS

- **LIGHT POLLUTION REDUCTION 1 potential points**

Based on Brookhaven's lighting ordinance, which states that exterior fixtures should have a maximum of 2.5% lumens emitted above 90 degrees, it would seem that Lighting Zone 2 (LZ2) would be appropriate for LEED calculations. LZ2 limits uplight to 1.5% above 90 degrees, while LZ3 limits uplight to 3%, which is greater than Brookhaven's allowed percentage. However, LEED allows buildings in LZ3 to use tree and façade uplighting at night, if they are turned off from midnight to 6am, via an exterior lighting control system. The project's proper lighting zone should be discussed with the City of Brookhaven and the LEED consultant, prior to developing an exterior lighting scheme.

- Uplight Option 1. BUG RATING METHOD

With this method, all specified light fixtures for exterior lighting should have a BUG rating.

This does not apply to fixtures aimed up at the façade or trees. This method limits applied lighting to wall and pole mounted fixtures.

- Uplight Option 2. CALCULATION METHOD

This method can be calculated using AGI32 photometry software, which includes a template for LEED documentation. To calculate, all specified fixtures must have the ies file provided from their respective manufacturer and know the lighting zone of the site.

- Light Trespass Option 1. BUG RATING METHOD

With this method, all specified light fixtures for exterior lighting should have a BUG rating.

This does not apply to fixtures aimed up at the façade or trees. This method limits applied lighting to wall and pole mounted fixtures.

- Light Trespass Option 2. CALCULATION METHOD

This method can be calculated using AGI32 photometry software, which includes a template for LEED documentation. To calculate, all specified fixtures must have the ies file provided from their respective manufacturer and know the lighting zone of the site. The

LEED boundary must also be drawn to scale.

INDOOR ENVIRONMENTAL QUALITY: 2 POINT + 9 POTENTIAL POINTS

- **INTERIOR LIGHTING 2 potential points**

- Glare Control*

All FOH interior fixtures will need to be specified from manufacturers that can provide either UGR or cd/m² data. *CD+M prefers UGR data as it is more common among*

manufacturers.

- Color Rendering

All FOH interior fixtures will need to be specified with minimum 90 CRI or a combination of

Color Fidelity > 78 with Gamut Index between 97-110. *CD+M prefers minimum 90 CRI as it*

is more common among manufacturers.

- Lighting Control

90% of FOH spaces will be dimmable, with a control system specified and control zones for groups of fixtures that align with occupant interaction at various times of day.

- Surface Reflectivity

Interior Designer / Architect to review

*This is a time-intensive item

Well Building Guidelines

Certification represents the highest pinnacle of health achievement across all 10 concepts. Projects must achieve all preconditions, as well as a certain number of points towards different levels of WELL Certification:

Total points achieved	WELL Certification		WELL Core Certification	
	Minimum points per concept	Level of certification	Minimum points per concept	Level of certification
40 pts	0	WELL Bronze	0	WELL Core Bronze
50 pts	1	WELL Silver	0	WELL Core Silver
60 pts	2	WELL Gold	0	WELL Core Gold
80 pts	3	WELL Platinum	0	WELL Core Platinum

At SG, we are looking at the future of the built environment and focusing on health and wellness. We are not pursuing certification for WELL but are using the standards as a guide.

WELL V2 is based on a point system and to achieve Gold you must accumulate 60 points.

Complying with the following will achieve equivalency to level Gold in WELL certification.

AIR

Provide acceptable air quality levels, as determined by public health authorities.

Meet these thresholds in occupiable spaces:

PM : 15 $\mu\text{g}/\text{m}^3$ or lower.

PM : 50 $\mu\text{g}/\text{m}^3$ or lower.

In polluted regions meet these thresholds:

PM : 25 $\mu\text{g}/\text{m}^3$ or lower.

PM : 50 $\mu\text{g}/\text{m}^3$ or lower.

For Organic Gases, meet these thresholds for all occupiable spaces:

Benzene (CAS 71-43-2): 10 $\mu\text{g}/\text{m}^3$ or lower.

Formaldehyde (CAS 50-00-0): 50 $\mu\text{g}/\text{m}^3$ or lower.

Toluene (CAS 108-88-3): 300 $\mu\text{g}/\text{m}^3$ or lower

D .For Inorganic Gases, meet these thresholds for all occupiable spaces:

Carbon monoxide: 10 mg/m^3 [9 ppm] or lower.

Ozone: 100 $\mu\text{g}/\text{m}^3$ [51 ppb] or lower

SMOKE FREE ENVIRONMENT

Ban indoor smoking and ban or restrict outdoor smoking within project boundaries.

Restrict outdoor smoking for all spaces within 25 ft (7.5m) of all entrances, building intakes and operable windows and use signage to communicate the ban.

If any areas allow smoking, post signage along pathways that describes the hazards of smoking. This space must be 100 ft from project boundary.

On decks, patios, balconies, rooftops and other occupiable outdoor areas above ground level.

VENTILATION DESIGN

To ensure adequate ventilation for all spaces, fresh air needs to be brought in from the outside through mechanical and/or natural means.

a.For mechanically ventilated systems these requirements are met

ASHRAE 62.1-2010 or any more recent versions (Ventilation Rate Procedure or IAQ Procedure).

ASHRAE 62.2-2016.

EN 16798-1 (for Category IV buildings).

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CIBSE Guide

Environmental Design, version 2007 or any more recent version.

Existing ventilation systems have been tested and balanced to meet supply and exhaust rates set in one or more ventilation guidelines listed above within the last five years.

CONSTRUCTION POLLUTION MANAGEMENT

During project construction, strategies such as envelope protection, moisture and dust management, filter replacement, air flush and proper equipment selection are required.

For construction, the following requirements are met:

Ducts are sealed and protected from possible contamination during construction.

Ducts are cleaned prior to installing registers, grills and diffusers.

Storage of carpets, acoustical ceiling panels, fabric wall coverings, insulation, upholstery and furnishings and other absorptive materials are stored separately in a designated area protected from moisture damage.

Quarantine work areas from other spaces by sealed doorways or windows or through the use of temporary barriers.

Walk-off mats are used at entryways to reduce the transfer of dirt and

pollutants.

Saws and similar tools use dust guards or collectors to capture generated dust.

ENHANCED VENTILATION DESIGN

To benefit human health and productivity, implementing these requirements can achieve higher air quality.

For mechanically ventilated projects, the following requirements are met in all occupiable spaces:

Must exceed outdoor air supply rates determined in Ashrae 62.1. by 30%.

POLLUTION INFILTRATION MANAGEMENT

Reduce the transmission of air and pollutants from outdoors to indoors through the building entrance and envelope.

To promote healthy entryways, install a entryway system the width of the entrance and 10 feet long in the primary direction of travel composed of one of the following:

Grilles

Grates

Slots or roll out mats

Removable carpet tiles

If entry opens up to pedestrian traffic, install two doorways or revolving doors.

COMBUSTION MINIMIZATION

Use low-emission combustion products or eliminate combustion-based products entirely.

Prohibit vehicle engine idling for more than 30 seconds at all pick up, drop off and parking areas. Must provide signage indicating this.

AIR FILTRATION

With mechanically ventilated spaces use adequate air filtration and document a maintenance protocol for installed filters and meet the following thresholds:

Annual Average Outdoor PM Threshold Minimum Air Filtration Level (PM removal) 23 $\mu\text{g}/\text{m}^3$

or less $\geq 80\%$ (e.g., MERV 12 or M6) 24–39 $\mu\text{g}/\text{m}^3$ $\geq 90\%$ (e.g., MERV 14 or F8) 40 $\mu\text{g}/\text{m}^3$ or greater $\geq 95\%$ (e.g., MERV 16 or E10)

MICROBE AND MOLD CONTROL

To reduce or eliminate growth of microbes and mold, use UVGI systems and/or conduct regular inspections on components of the cooling system and meet the following requirements:

Install ultraviolet lights for all central air handling/conditioning units. This kills bacteria and is a low cost way to prevent virus circulation. Use the light to diffuse and clean the fresh air brought into the space.

Maintain light replacement records according to manufacturer's recommendation.

WATER

WATER QUALITY INDICATORS

All water delivered to the project and can come in contact with occupants (e.g., drinking, cooking and dishwashing, handwashing,) is to have onsite testing for turbidity and coliforms. Water filtration can assist in reducing turbidity (water cloudiness) however not necessarily a health concern but does pose an aesthetic concern.

Meets the following thresholds:

1. Turbidity is less than or equal to 1.0 NTU, FTU or FNU (nephelometric turbidity, formazin turbidity or formazin nephelometric units, respectively).

Coliforms are not detected in any 100 ml sample.

DRINKING WATER QUALITY

Drinking water is treated and evaluating the chemical parameters complies with health based limits.

For meeting Chemical Thresholds For All Spaces, the following parameters are met for drinking water dispensers:

Arsenic ≤ 0.01 mg/L.

Cadmium ≤ 0.003 mg/L.

Chromium (total) ≤ 0.05 mg/L.

Copper ≤ 2 mg/L.

Fluoride \leq 1.5 mg/L.

Lead \leq 0.01 mg/L.

Mercury (total) \leq 0.006 mg/L.

Nickel \leq 0.07 mg/L.

Nitrate \leq 50 mg/L as Nitrate (11 mg/L as Nitrogen).

Nitrite \leq 3 mg/L as Nitrite (0.9 mg/L as Nitrogen). 11. Total chlorine \leq 5 mg/L.

All drinking water dispensers provide water that meets the following parameters:

Residual (free) chlorine does not exceed 4 mg/L.

The concentration of total trihalomethanes (TTHM, sum of dibromochloromethane, bromodichloromethane, chloroform and bromoform) is 0.08 mg/L or less.

The concentration of haloacetic acids (HAA5, sum of chloroacetic, dichloroacetic, trichloroacetic, bromoacetic and dibromoacetic acids) is 0.06 mg/L or less.

a.. All reported pesticides comply with the following thresholds:

Aldrin and Dieldrin (combined): 0.00003 mg/L or less.

Atrazine: 0.1 mg/L or less.

Carbofuran: 0.007 mg/L or less.

Chlordane: 0.0002 mg/L or less.

2,4-Dichlorophenoxyacetic acid (2,4-D): 0.03 mg/L or less.

Dichlorodiphenyltrichloroethane (DDT) and metabolites: 0.001 mg/L or less.

Lindane: 0.002 mg/L or less.

Pentachlorophenol (PCP): 0.009 mg/L or less.

b. All reported organic contaminants comply with the following thresholds:

Benzene: 0.01 mg/L.

Benzo[a]pyrene: 0.0007 mg/L.

Carbon tetrachloride: 0.004 mg/L.

1,2-Dichloroethane: 0.03 mg/L.

Tetrachloroethene (Tetrachloroethylene): 0.04 mg/L.

Toluene: 0.7 mg/L.

Trichloroethene: 0.02 mg/L. 8. 2,4,6-Trichlorophenol: 0.2 mg/L. 9. Vinyl Chloride: 0.0003 mg/L. 10. Xylenes (o-, m- and p-): 0.5 mg/L

BASIC WATER MANAGEMENT

Implementing protocols to test drinking water for quality of water and for Legionella colonization.

The following water parameters are sampled at intervals of no less than once per year:

Turbidity.

pH.

Residual (free) chlorine.

Total coliforms, only if residual chlorine is below detection limits.

DRINKING WATER PROMOTION

Promote healthy hydration by making good quality water easily available and in proper working order.

Ensure drinking water access by meeting the following requirements:

At least one drinking water dispenser (minimum one per floor) is located within a 100 ft (30 m) walk distance of all regularly occupied floor area and in

Sustainability Review

MEP/F REVIEW

- Advanced Energy Metering: 1 point
 - Install advanced energy metering for the following:
 - all whole-building energy sources used by the building; and
 - any individual energy end uses that represent 10% or more of the total annual consumption of the building.
 - The advanced energy metering must have the following characteristics.
 - Meters must be permanently installed, record at intervals of one hour or less, and transmit data to a remote location.
 - Electricity meters must record both consumption and demand. Whole-building electricity meters should record the power factor, if appropriate.
 - The data collection system must use a local area network, building automation system, wireless network, or comparable communication infrastructure.
 - The system must be capable of storing all meter data for at least 36 months.
 - The data must be remotely accessible.
 - All meters in the system must be capable of reporting hourly, daily, monthly, and annual energy use.
- GRID HARMONIZATION: 1 potential point
 - Option 1. Demand Response Program Available and Participation (1 point)
 - Participate in an existing demand response (DR) program and complete the following activities.
 - Have in place a system with the capability for real-time, fully automated DR based on external initiation by a DR program provider. Semi-automated DR may be utilized in practice.
 - Enroll in a minimum one-year DR participation amount contractual commitment with a qualified DR program provider, with the intention of multi-year renewal, for at least 10% of the annual on-peak electricity demand. On-peak demand is based on electric utility bills with an on-peak demand period defined by the local utility. The on-peak demand may vary based on the utility climate and pricing structures.
 - Develop a comprehensive plan for meeting the contractual commitment during a Demand Response event.
 - Include the DR processes in the current facilities requirements and operations and maintenance plan.
 - Initiate at least one full test of the DR plan.
 - Option 2. Demand Response Capable Building (1 point)

Have infrastructure in place to take advantage of future demand response programs or dynamic, real-time pricing programs and complete the following activities. Develop a comprehensive plan for shedding at least 10% of the annual on-peak electricity demand. Peak demand is based on electric utility bills.

Sustainability Review

MEP/F REVIEW

Include the DR processes in the current facilities requirements and operations and maintenance plan.

Initiate at least one full test of the DR plan as part of the building commissioning program.

Contact local utility representatives to discuss participation in future DR programs.

ENHANCED REFRIGERANT MANAGEMENT: 1 potential point

Do not use refrigerants or use only refrigerants (naturally occurring or synthetic) that have an ozone depletion potential (ODP) of zero and a global warming potential (GWP) of less than 50.

INDOOR ENVIRONMENTAL QUALITY: 9 POINTS + 1 POTENTIAL POINT

ENHANCED INDOOR AIR QUALITY 1 point and 1 potential point

Must comply with (3) strategies listed below for 1 point or 6 strategies for 2 points

- Strategy 1: Entryway Systems
- Strategy 2: Interior Cross Contamination Prevention
- Strategy 3: Filtration of Outdoor Air
- Strategy 4: Filtration of recirculated Air
- Strategy 5: Increased Ventilation 15%
- Strategy 6: Increased Ventilation 30%
- Strategy 7: Operable windows
- Strategy 8: Engineered Natural Ventilation

- Strategy 9: Carbon monoxide monitoring
- Strategy 10: Additional source control and monitoring

INDOOR AIR QUALITY ASSESSMENT: 1 point

Before occupancy, install new filtration media and perform a building flush-out by supplying a total air volume of 14,000 cubic feet of outdoor air per square foot (4 267 140 liters of outdoor air per square meter) of gross floor area while maintaining an internal temperature of at least 60°F (15°C) and no higher than 80°F (27°C) and relative humidity no higher than 60%

THERMAL COMFORT: 1 point

- Must meet thermal comfort design and thermal comfort control requirements
- Thermal comfort design: Design heating, ventilating, and air-conditioning (HVAC) systems and the building envelope to meet the requirements of ASHRAE Standard 55–2017, Thermal Comfort Conditions for Human Occupancy with errata or a local equivalent. For natatoriums, demonstrate compliance with ASHRAE HVAC Applications Handbook, 2015 edition, Chapter 5, Places of Assembly, Typical Natatorium Design Conditions, with errata.
- Thermal comfort control: Provide individual thermal comfort controls for at least 50% of individual occupant spaces. Provide group thermal comfort controls for all shared multi-occupant spaces. Thermal comfort controls allow occupants, whether in individual spaces or shared multi-occupant spaces, to adjust at least one of the following in their local environment: air temperature, radiant temperature, air speed, and humidity.

Sustainability Review

MEP/F REVIEW

INTERIOR LIGHTING 2 points

Meet (3) strategies to achieve 2 points

Strategy 1: Glare Control

- For all regularly occupied spaces, meet one of the following requirements:
- Use light fixtures with a luminance of less than 7,000 candela per square meter (cd/m²) between 45 and 90 degrees from nadir. OR
- Achieve a Unified Glare Rating (UGR) rating of <19 using software modeling calculations of the designed lighting.

Strategy 2: Color Rendering

- For all regularly occupied spaces meet one of the following requirements:
- Use light sources that have a Color Rendering Index (CRI) of at least 90.
- Use light sources that have a Color Fidelity Index greater than or equal to 78 and a gamut index between 97 and 110, determined in accordance with Illuminating Engineering Society (IES) TM-30.

Strategy 3: Lighting Control

- Provide dimmable or multi-level lighting for 90% of occupant spaces

DAYLIGHT 3 points

Option 2: Simulation

- Perform computer simulations for luminance at 9 a.m. and 3 p.m. on a clear-sky day at the equinox for each regularly occupied space.

Healthcare projects should use the regularly occupied spaces located in the perimeter area determined under EQ Credit Quality Views. Demonstrate luminance levels are between 300 lux and 3,000 lux at both 9 a.m. and 3 p.m. Spaces with view-preserving automatic (with manual override) glare-control devices may demonstrate compliance for only the minimum 300 lux luminance level. Points are awarded according to Table 2.

- To be completed by lighting consultant as part of photometric package

Table 2. Points for Option 2

<i>New Construction, Core and Shell, Schools, Retail, Data Centers, Warehouses and Distribution Centers, Hospitality</i>		<i>Healthcare</i>	
<i>Percentage of regularly occupied floor area</i>	<i>Points</i>	<i>Percentage of regularly occupied floor area within perimeter area</i>	<i>Points</i>
55%	1	55%	1
75%	2	75%	2
90%	3	90%	Exemplary performance

Sustainability Review

MEP/F REVIEW

TABLE 1:
POINTS FOR PERCENTAGE IMPROVEMENT IN ENERGY PERFORMANCE -
% Cost PCI Below PCI_t (1-9 points NC and CS, 1-8 points Schools, 1-10) points
Healthcare)

New Construction	Healthcare, Major Renovation, CS	Points BD+C (except Schools, Healthcare)	Points Healthcare	Points Schools
5%	2%	1	1	1
10%	5%	2	2	2
15%	10%	3	3	3
20%	15%	4	4	4
25%	20%	5	5	5
30%	25%	6	6	6
35%	30%	7	7	7
40%	35%	8	8	
45%	40%	9	9	8
50%	45%	EP	10	EP

TABLE 2:
POINTS FOR PERCENTAGE IMPROVEMENT IN ENERGY PERFORMANCE - %
Greenhouse Gas Emissions PCI Below PCI_t (1-9 points NC, 1-8 points Schools,
1-10) points Healthcare)

New Construction	Healthcare, Major Renovation, CS,	Points BD+C (except Schools, Healthcare)	Points Healthcare	Points Schools
5%	2%	1	1	1
10%	5%	2	2	2
16%	10%	3	3	3
24%	16%	4	4	4
32%	24%	5	5	5
40%	32%	6	6	6
50%	40%	7	7	7
65%	50%	8	8	
80%	65%	9	9	8
100%	80%	EP	10	EP

LEED Lighting Review

BROOKHAVEN CITY HALL LEED V4.1 BD+C

LIGHTING REVIEW 11/9/2022

SUSTAINABLE SITES: 1 POINT + 6 POTENTIAL POINTS

- **LIGHT POLLUTION REDUCTION 1 potential points**

Based on Brookhaven's lighting ordinance, which states that exterior fixtures should have a maximum of 2.5% lumens emitted above 90 degrees, it would seem that Lighting Zone 2 (LZ2) would be appropriate for LEED calculations. LZ2 limits uplight to 1.5% above 90 degrees, while LZ3 limits uplight to 3%, which is greater than Brookhaven's allowed percentage. However, LEED allows buildings in LZ3 to use tree and façade uplighting at night, if they are turned off from midnight to 6am, via an exterior lighting control system. The project's proper lighting zone should be discussed with the City of Brookhaven and the LEED consultant, prior to developing an exterior lighting scheme.

- Uplight Option 1. BUG RATING METHOD

With this method, all specified light fixtures for exterior lighting should have a BUG rating.

This does not apply to fixtures aimed up at the façade or trees. This method limits applied lighting to wall and pole mounted fixtures.

- Uplight Option 2. CALCULATION METHOD

This method can be calculated using AGI32 photometry software, which includes a template for LEED documentation. To calculate, all specified fixtures must have the ies file provided from their respective manufacturer and know the lighting zone of the site.

- Light Trespass Option 1. BUG RATING METHOD

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LEED boundary must also be drawn to scale.

INDOOR ENVIRONMENTAL QUALITY: 2 POINT + 9 POTENTIAL POINTS

- **INTERIOR LIGHTING 2 potential points**

- Glare Control*

All FOH interior fixtures will need to be specified from manufacturers that can provide either UGR or cd/m² data. *CD+M prefers UGR data as it is more common among*

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All drinking water dispensers provide water that meets the following parameters:

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The concentration of total trihalomethanes (TTHM, sum of dibromochloromethane, bromodichloromethane, chloroform and bromoform) is 0.08 mg/L or less.

The concentration of haloacetic acids (HAA5, sum of chloroacetic, dichloroacetic, trichloroacetic, bromoacetic and dibromoacetic acids) is 0.06 mg/L or less.

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Implementing protocols to test drinking water for quality of water and for Legionella colonization.

The following water parameters are sampled at intervals of no less than once per year:

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pH.

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Total coliforms, only if residual chlorine is below detection limits.

DRINKING WATER PROMOTION

Promote healthy hydration by making good quality water easily available and in proper working order.

Ensure drinking water access by meeting the following requirements:

At least one drinking water dispenser (minimum one per floor) is located within a 100 ft (30 m) walk distance of all regularly occupied floor area and in

all dining areas.

Water delivered by the dispensers is directly piped through the building's water supply or is stored in containers designed for refilling.

All newly installed drinking water fountains are designed for water bottle-refilling.

MOISTURE MANAGEMENT

Develop good strategies to minimize excess moisture and dampness through effective design of the buildings's curtain wall, water piping assemblies, material selection and ventilation systems.

For All Spaces, design the building's envelope for moisture protection through the following:

verification of site drainage and storm water management during building construction phase.

Assess water vapor transfer. Ir tightness testing to assess water vapor transfer.

Adverse vapor pressure differentials that may cause condensation on interstitially hidden materials.

Entryway design that considers at least three strategies to minimize the ingress or permeation of water into the building.

Installation of a continuous drainage plane (e.g., a weather-resistant barrier integrated with flashing systems at penetrations), interior to the exterior cladding.

Minimization of capillary suction (wicking) in porous building materials through one of the below capillary break methods:

7. Free-draining spaces (e.g., between exterior cladding, weather-resistant barriers in wall assemblies).

Non-porous materials (e.g., closed-cell foams, waterproofing membranes, metal) between porous materials.

b. For all interior spaces, manage moisture that address the following:

Protection of moisture-sensitive building materials and selection of moisture-resistant materials or finishes in surfaces likely to be exposed to liquid water (e.g., finished floors) or that may absorb moisture such as interior sheathing in basements, areas at or below grade, bathrooms, janitorial rooms or kitchens.

Condensation on cold surfaces such as basements, slab-on-grade floors, the inside of exterior walls and glazing.

All hard-piped fixtures, such as toilets, dishwashers, icemakers, water treatment devices and clothes washers, have a labeled, readily accessible single-throw manual shut-off (governed or activated per use) or automatic shut-off at point-of-connection.

All installed water treatment devices have a waste line fixed in-place, equipped with a backflow preventor.

HYGIENE SUPPORT

Provide bathrooms that accommodate users with diverse needs and to improve hygiene by offering large sinks, soap containers, hand drying support and reduced touch points.

All bathrooms meet the following requirements:

Provide trash receptacles in stalls (in women's and single-user bathrooms). If toilet paper cannot be flushed down toilets, trash receptacles must be placed in all bathroom stalls.

Provide sanitary pads, tampons and/or other menstrual products at no cost or subsidized by at least 50% (in women's and single-user bathrooms).

Provide a hook, shelf or equivalent storage support in each toilet stall.

All occupants have access to at least one bathroom per floor that provides an accessible stall.

Provide one bathroom per floor with an infant changing table.

All regular occupants may request a syringe drop box at no cost, which the project places in one or more bathrooms based on occupant demand.

All single-user bathrooms (if present) are open to all individuals with accompanying signage and at minimum one single-user bathroom per floor (if present) meets the room and stall dimensions required by local accessibility code.

Floor drains have a self-primed liquid-seal trap

Toilets have hands-free flushing.

Contactless soap dispensers and hand drying.

Users can exit the bathroom hands-free.

Faucets meet the following:

Sensor-activated.

Equipped with a programmable line-purge system.

If mixing is used, hot- and cold-water lines are mixed at the point of use.

For All Spaces, if sinks are used for handwashing the following is required:

The faucet design prevents the water column from flowing directly into the drain or a sink drain stopper is installed.

Water does not splash outside the sink when the faucet is fully open. 6,19

The following parameters must be met for newly installed sinks:

The sink basin is at least 9 inches(23 cm) in width and length.

The water column from the sink to the basin is at least 6 inches(15 cm) in length (measured along flow of water, even if at an angle).

The water column is at least 3 inches(7.5 cm) away from any edge of the sink.

NUTRITION

FRUITS AND VEGETABLES

a.Promote fruits and vegetables if food is sold or provided on a daily basis.

NUTRITIONAL TRANSPARENCY

a.Provide detailed nutritional information for all foods and beverages sold or provided on a daily basis .

b.Provide Nutritional Information For All Spaces including items sold in vending machines.

LIGHT

LIGHT EXPOSURE

Provide appropriate light exposure to create indoor environments for visual, mental, and biological health through computer simulations.

Regularly occupied spaces achieve one of the following targets:

1.Calculations per IES LM-83-12 Calculations per Annex A of CEN 17037:2018 Average sDA is achieved for > 30% of regularly occupied floor area OR Target illuminance 19 fc(200 lux) is achieved for >30% of individual unit area throughout 50% of daylight hours of the year

Common spaces that have unassigned seating for at least 15% of regular occupants at any given time achieve one of the following targets:

1.Calculations per IES LM83-12 Calculations per Annex A of CEN 17037:2018 Average sDA is achieved for > 75% of floor area OR Target illuminance

28 fc(300 lux) is achieved for >30% of individual unit area and average illuminance 9 fc(100 lux) is achieved for >95% of individual unit area throughout 50% of daylight hours of the year

At least 30% of the regularly occupied area is within a 20 ft(6 m) horizontal distance of envelope glazing in each floor and/or in each individual unit.

Common spaces have unassigned seating and can accommodate at least 15% of regular occupants at any given time.

At least 70% of all seating in the spaces is within a 16 ft(5 m) horizontal distance of envelope glazing.

VISUAL LIGHTING DESIGN

Provide appropriate illumination on all work surfaces for all age groups.

a. Comply with illuminance thresholds specified in one of the following guidelines:

IES Lighting Handbook 10 Edition.

EN 12464-1: 2011.

ISO 8995-1:2002(E) (CIE S 008/E:2001).

GB50034-2013. 5. CIBSE SLL Code for Lighting.

The illuminance thresholds take into consideration the tasks and the age groups of the occupants.

C. For predetermined light levels, the following requirements are met:

More than 50% of the occupants are under the age of 65.

At least 90% of the project area is comprised of the following space types and meets the associated illuminance thresholds:

Offices and classrooms: minimum 30 fc(320 lux) at task surface.

Lobby, atrium and transition (including corridor and outdoor pathways): minimum 10 fc(110 lux) at floor level.

Storage spaces: minimum 10 fc(110 lux) at floor level.

Dining, Lounge and Restrooms: minimum 10 fc(110 lux) at task surface

CIRCADIAN LIGHTING DESIGN

Provide lighting environment that reduces circadian phase disruption with appropriate exposure to light for maintaining sleep quality which impacts productivity and mood.

For All Spaces, provide the following lighting achievement level thresholds at workstations:

The following light levels are achieved for at least four hours (beginning by noon at the latest) at a height of 18 in(45 cm) above the work-plane for all workstations in regularly occupied spaces: Threshold Threshold for Projects with Enhanced Daylight Points At least 150 EML [136 M-EDI(D65)] OR The project achieves at least 120 EML [109 MEDI(D65)] and L05 Part 1 or L06 Part 1 1(2) At least 240 EML [218 M-EDI(D65)] OR The project achieves at least 180 EML [163 MEDI(D65)] and L05 Part 1 or L06 Part 1 3(4)

The light levels are achieved on the vertical plane at eye level to simulate the light entering the eye of the occupant.

ELECTRIC LIGHT GLARE CONTROL

Manage by minimizing glare of electric light by choosing the appropriate lighting fixtures.

For all spaces, requirements for each luminaire with the exception of wall wash and concealed fixtures:

100% of light is emitted above the horizontal plane.

Classified with Unified Glare Rating (UGR) of 16 or lower.

3 Luminance that does not exceed 6,000 cd/m at any angle between 45 and 90 degrees from nadir

Option 2:

A .The following requirement is met in all regularly occupied spaces:

Unified Glare Rating (UGR) of 16 or lower.

DAYLIGHT DESIGN STRATEGIES

Use the following strategies to provide daylight exposure indoors.

One of the following requirements is met for interior daylight exposure:

70% of all workstations are within 25 ft(7.5 m) of transparent envelope glazing.

Visible light transmittance (VLT) is greater than 40%. OR Envelope glazing is no less than 15% of the regularly occupied floor area or individual unit.

Visible light transmittance (VLT) of windows is greater than 40%. 1(2) 70% of all workstations are within 16 ft(5 m) of transparent envelope glazing.

Visible light transmittance (VLT) is greater than 40%. OR Envelope glazing is no less than 25% of the regularly occupied floor area or individual unit.

Visible light transmittance (VLT) of windows is greater than 40%. 2(3) Pts.

Solar Shading, the following requirements are met in regularly occupied spaces:

All vertical transparent envelope glazing has shading that meet one of the following: Type of Shading Points Manual shading controllable by occupants at all times.

Shades are regularly opened once a day for all days that the project is in use

1(2) Shading is automated to prevent glare 2(3) Pts.

VISUAL BALANCE

Create strategies to provide a visually comfortable lighting environment.

a.Meet the following requirements for ambient visual balance in all regularly occupied areas:

Horizontal and vertical luminance contrast ratios for an ambient light system is no more than 10 between adjacent independently controlled zones.

Illuminance uniformity ratio of at least 0.4 or 1:2.5 (minimum light level: average light level) is achieved on any horizontal task plane within a space.

The Correlated Color Temperature (CCT) in each room for similar fixtures is consistent (± 200 K) at any point of time.

ELECTRIC LIGHT QUALITY

Provide these considerations for characteristics of electric light used in the space such as color rendering and flicker.

For all spaces except Circulation Areas: All luminaires (except decorative fixtures, emergency lights and other special-purpose lighting) meet at least one of the following color rendering requirements.

CRI ≥ 90 .

CRI ≥ 80 with R9 ≥ 50 .

IES R ≥ 78 , IES R ≥ 100 , $-1\% \leq \text{IES R} \leq 15\%$.

For Circulation Areas: All luminaires (except decorative fixtures, emergency lights and other special-purpose lighting) meet at least one of the following color rendering requirements:

CRI \geq 80.

IES R \geq 75, IES R \geq 95, $-7\% \leq$ IES R \leq 15%.

OCCUPANT LIGHTING CONTROL

Provide lighting strategies for consideration of personal preferences of users as well as their interfacing with the physical space.

For all spaces, ambient lighting options to meet the following requirements:

Lighting systems have at least three lighting levels or scenes that allow for changes in light levels and have the ability to change at least one of the following:

Color.

Color temperature.

Distribution of light by controlling different groups of lights or through preset scenes.

All regular occupants have control over their immediate lighting environment through at least one of the following:

Manual controls (e.g. switches or control panels) located in the same space as each lighting zone.

Digital interface available on a computer or phone.

Lighting for presentation or projection walls are separately controlled.

MOVEMENT

ACTIVE BUILDINGS AND COMMUNITIES

Choose one of the following to meet requirements for healthy circulation:

Staircase -

For all spaces: Promote good circulation with one staircase open to service all floors designated by either music, artwork, windows to daylight, natural design elements and light levels of at least 20 foot candles for illuminacy.

Cycling -

Must be located in an area zip with a minimum Walk Score of 70.

Must have continuous sidewalks present on both sides of project and bike lanes.

No cost physical Activity -

Must ensure programming is age, ability and culture appropriate.

Programming for physical activity is offered in person within a 650 ft walk distance of the project boundary.

Site provides mass transit.

ERGONOMIC WORKSTATION DESIGN

Provide active workstations to all employees who work at stationary workstations.

Height adjustable desks (HAD) allow users to customize their workstation.

At least 50% of workstations

Monitor, or screen, keyboard or mouse is adjustable to allow for standing heights.

Monitors with built-in height and angle adjustment.

Adjustable seating to allow for user comfort with seat height and depth.

Backrest height and lumbar support.

Backrest angle.

Armrest height and distance between armrests.

Treadmill desk.

Stepper machine.

At workstations in which users are required to stand for 50% or more of their working hours include the following:

Anti-fatigue mats, or cushions flooring to reduce stress on legs.

Recessed toe space at least 4 in(10 cm) depth and height. 13

A footrest or footrail. d. A leaning chair

THERMAL COMFORT

THERMAL PERFORMANCE

Provide an environment that most occupants of the building find comfortable and support their health and well being.

For all regularly occupied spaces, meet the following requirements:

Mechanically conditioned - PMV Range Percentage of Occupied Hours

Percentage of Regularly Occupied Spaces Other Requirements +/- 0.5 For at least 90% +/- 1.0 For at least 95% .

Control over temperature in which occupants can access the thermostats or a digital interface accessible to occupants on a computer or phone.

Allow flexible dress code.

Humidity Control

Limit the growth of pathogens, reduce off-gassing and maintain thermal comfort by providing the appropriate level of humidity.

SOUND

SOUND MAPPING

Provide strategies that identify how noise can impact the interior spaces.

Design an acoustic plan that details the loud and quiet zones and indicates speech privacy, reverberation time and impact noise.

Loud Zones

Quiet Zones

Mixed Zones

Circulation Zones

Engage a professional in acoustics that generates a report focusing on managing the following:

impact noise

speech privacy

reverberation time

background noise.

SOUND BARRIERS

Design for sound isolation at Walls and Doors.

a .For all spaces, the following requirements are met for interior walls for sound transmission class (STC):

Interior Wall Type - Between Loud zones and other occupiable spaces.

Minimum STC or Rw 60.

Interior Wall Type - Between areas for conferencing, learning regularly

occupied spaces. Minimum STC 55.

Interior Wall Type - Between adjacent Quiet zones. Minimum STC 50.

Interior Wall Type - Between rooms for concentration and other regularly occupied spaces. Minimum STC 45.

Interior Wall Type - Between Circulation zones and regularly occupied spaces. Minimum STC 40.

At doors to mechanical equipment rooms that have a non-hollow core, minimum STC/Rw of 30.

At doors that connect two occupiable rooms that have a non-hollow core, minimum STC of 30.

SOUND REDUCING SURFACES

Provide acoustic materials that absorb or block sound this can directly reduce frequencies that cause reflected sound known as reverberation.

For All Spaces with the following types listed:

Open workstations - 0.90 for all available ceiling area.

Conference or Training areas – 0.90 for all available ceiling area.

Dining areas – 0.90 for all available ceiling area.

Space Type 2 Points(1 Point)

MATERIALS

MATERIAL RESTRICTIONS

For all spaces,ensure the following products do not contain over 1,000 ppm of asbestos.

Thermal protection, including all insulation (lagging) applied to pipes, fittings, boilers, tanks and ducts.

Acoustic treatments.

Sheathing.

Roofing and siding.

Fire and smoke protection.

Joint protection.

Plaster and gypsum board.

Ceilings.

Resilient flooring.

For all spaces,ensure the following products do not contain no more than 0.01% (100 ppm) of lead.

Fire alarms

Meters,

Sensors,

Relays,

Thermostats and load break switches.

For all spaces,ensure paints do not contain no more than 0.01% (100 ppm) of lead and have no added lead carbonates and lead sulfates.

VOC RESTRICTIONS

For safety of all occupants the following emission thresholds should be adhered to for materials inside the building envelope.

All products are tested by third party laboratory to meet testing methods and thresholds established in one of the following standards:

SCAQMD Rule 1168 (Adhesives and Sealants, 2017).

GB 33372-2020 (Adhesives).

2019 CARB SCM for Architectural Coatings.

EU Ecolabel for indoor and outdoor paints and varnishes.

HJ 2537-2014 (Paints).

Any other standard listed in the 'VOC content evaluation' section of the 'Low-Emitting Materials' credit of the LEED v4.1 standard.

At least 75% of products (by surface area or volume) are tested by a third-party laboratory to meet testing methods and thresholds established in one of the following standards and/or regulations for VOC emissions:

California Department of Public Health (CDPH) Standard Method v1.2.

AgBB.

European Union LCI VOC thresholds following EN 16516-1:2018 testing methods

MIND

MENTAL HEALTH PROMOTION

Provide education and training for mental health awareness to all employees at no cost.

Establish healthy working hours with maximum hours to be worked in 24

hour period.

Provide a wellness space for restoration and relaxation away from the main circulation of the building and include policy for permitting breaks during the day.

Provide training or health courses outlining policies related to mental health.

NATURE AND PLACE

Provide natural elements into the building such as plant, water fountains or natural views. Incorporate these elements in shared areas along circulation paths and continue paths outside the building into areas of green and blue spaces.

ENHANCED ACCESS TO NATURE

Include exposure to natural elements through views to link the outside with the inside.

Provide a combination of plants, water features, or nature views to incorporate nature through interior design. The following combinations should be met:

75% of all workstations, conference rooms, or offices should have a direct sight line .

Within 33 ft of all workstations and conference rooms.

COMMUNITY

Provide a better understanding of what good health and well being means to the occupant and how promoting health literacy can produce positive health results.

Conduct tours of the spaces after completion of construction and explain the building operations, maintenance, policies and programs to new

employees and to all stakeholders.

describe how providing a building that takes into account the well being of all employees can provide comfort and support to all occupants- establishing a health centered mission.

define how the organizational health is a mission statement.

Explain the sustainability goals as they relate to the building with restored water sources and ecosystem services.

develop emergency management plans as they relate to natural, fire, civil unrest, technological and health related causes.

Provide a 7 ft x 7 ft space for lactation room for employees with the following requirements:

Comfortable chair and work surface.

two electrical outlets

Signage with user operated lock.

Book the space through usage of a number system for employee privacy.

Access to a refrigerator for storage of pumped milk and storage space for pump supplies.

ambient lighting and thermal comfort.

Offer child support care

Provide community space to the public at no cost that is open at all times unless closed for security reasons.

Provide a building that is accessible and usable for people of all ages, backgrounds and abilities.

NEXT STEPS

CM @ Risk Input
Leadership input
Pricing Set
Conclusion of Schematic Design

