

Eastside III

East Liberty, Pittsburgh, PA

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Tech Report 1 | Lighting Existing Conditions and Design Criteria Report

September 28, 2016



Image courtesy of PJ Dick, Inc.

| Executive Summary

This technical report analyzes the existing conditions of the Eastside III building, located in Pittsburgh, PA. The existing materials, existing lighting, and design criteria will be assessed within the common spaces of the residential portion of Eastside III, on the ground and first levels.

As stated in the Tech 1 Proposal Memo, Eastside III is a mixed-use space, comprised of retail, residential, and parking facilities. The building features and abundance of amenities within the residential portion of the building - including various lounges and lobbies, a media room, fitness center + yoga room, entertainment kitchen, and a dog wash station, as well as an outdoor pool courtyard. The spaces to be analyzed in Tech Report 1 include the following:

- **Circulation space** - Lower Level Lobby
- **Circulation space** - Main Lobby + Concierge Desk
- **Special purpose space** - Display Kitchen + Entertainment Lounge + Billiard Room
- **Large work space** - Fitness Center + Yoga/Stretching Room
- **Outdoor space** - Pool Courtyard

After the spaces were assessed, design criteria was determined for further analysis. The design drivers were divided between *qualitative* criteria and *quantitative* criteria. Throughout this report, all spaces analyzed met the quantitative criteria of the lighting power density standards, but did not obtain recommended illuminance values in all spaces. However, due to the qualitative analyzes of these spaces, it is noted that not all spaces will or *should* meet recommended illuminance values, for various reasons. These reasons and qualitative design drivers will be further assessed in future deliverables.

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| Building Overview

Eastside III is the final phase of a revitalization project in the heart of the East Liberty neighborhood of Pittsburgh, PA. The 221,000 sf building is a mixed-use development comprised of 43,000 sf of mixed-commercial spaces, 360 luxury apartments, and 550 parking spaces. The new market-rate housing and host of amenities to the area includes a new pool and fitness center within the building and contributes the final portion of the 15-acre development that began in 2001. Eastside III was developed jointly with a multi-modal transit hub to reconnect East Liberty to its surrounding neighborhoods and to redefine the residential experience in this trendy Pittsburgh community.

| Building Statistics

- **Building Name** | Eastside III Building B
- **Location + Site** | East Liberty, Pittsburgh, PA
- **Building Occupant Name** | Eastside Bond
- **Occupancy or Function Type** | Mixed Use Development
 - Mixed Commercial Spaces
 - 360 Apartments
 - Parking Facility
- **Size** | 221,000 total sf
- **Number of Stories** | 6 stories above grade
- **Primary Project Team**
 - Owner** | The Mosites Company
 - General Contractor** | PJ Dick, Inc.
 - Architect** | The Design Collective
 - MEP + FP Engineer** | Allen & Shariff Engineering
 - Structural Engineer** | Structural Consultants Associates, Inc.
 - Interior Designer** | RD Jones
- **Dates of Construction** | June 2014 - June 2016 (Substantial Completion June 1, 2016)
- **Total Contract Price** | \$42 Million
- **Project Delivery Method** | Design-Bid-Build

| Proposed Areas of Study

Circulation Space - Lower Level Lobby + E-Lounge

Summary:

The Lower Level Lobby is located on the ground floor of the building, one floor below what is considered the Main Lobby to the residential area (which will also be analyzed and redesigned). The Lower Level Lobby is adjacent to retail spaces on the North and an underground parking garage on the South. This space, along with its adjacent Entertainment Lounge (E-Lounge), will be redesigned using three separate lighting design concepts. These concepts will create a variety of options for such a prominent space in the building, complimenting the lobby's double-height ceiling, unique aesthetics features, and functionality of the space.

Dimensions:

Lower Level Lobby

- Area - 1,250 sf
- Height - 29'-6"

E-Lounge

- Area - 416 sf
- Height - 10'-6"

Tasks + Activities:

The primary function of the lobby space is for transition. The entertainment lounge acts as a circulation space with a digital display TV along with feature displays on wall mounted shelves.

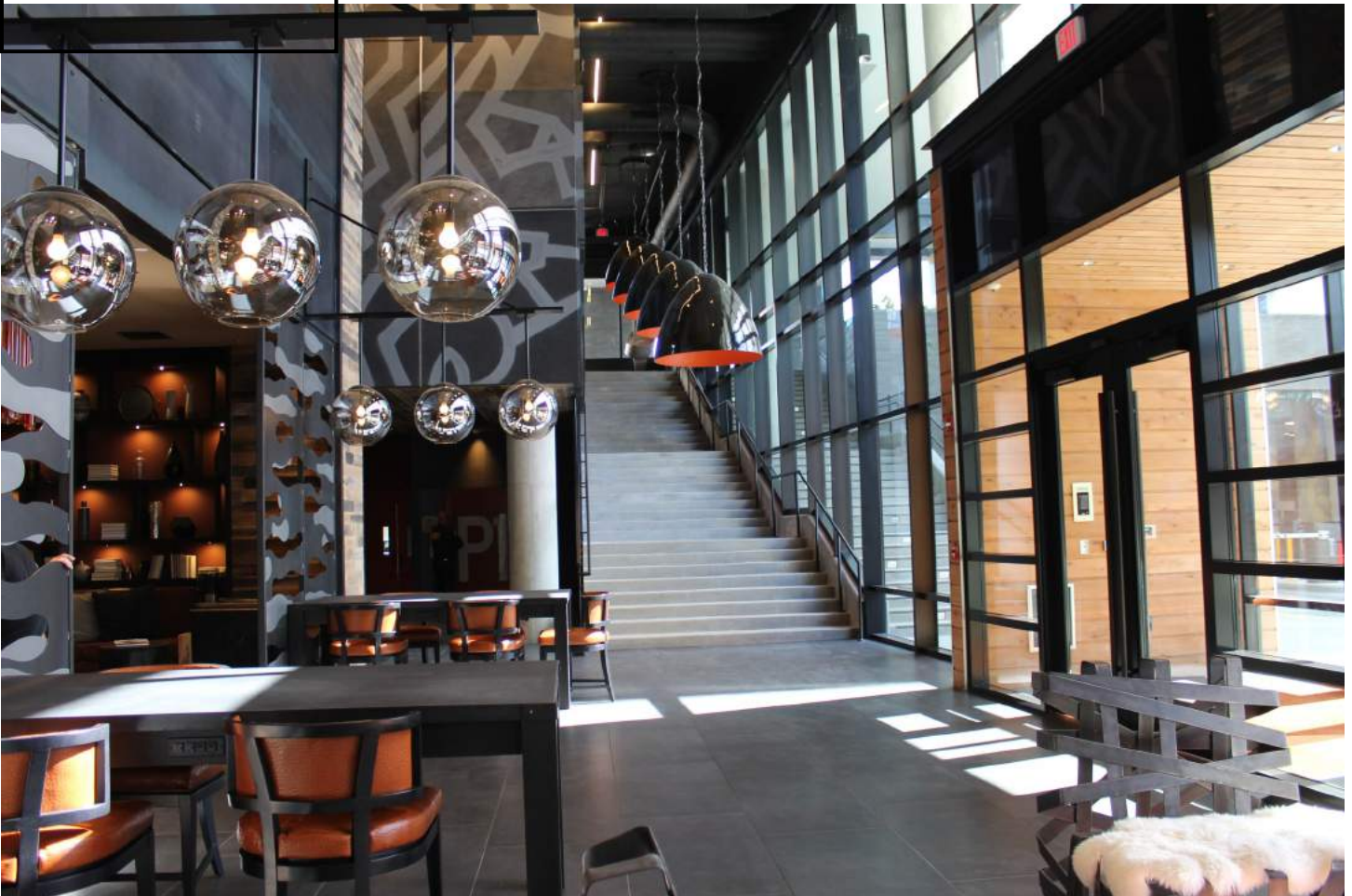


Figure 1 | Ground Floor Lower Level Lobby + E-Lounge

| Proposed Areas of Study

Circulation Space - Lower Level Lobby + E-Lounge

Location + Drawings:

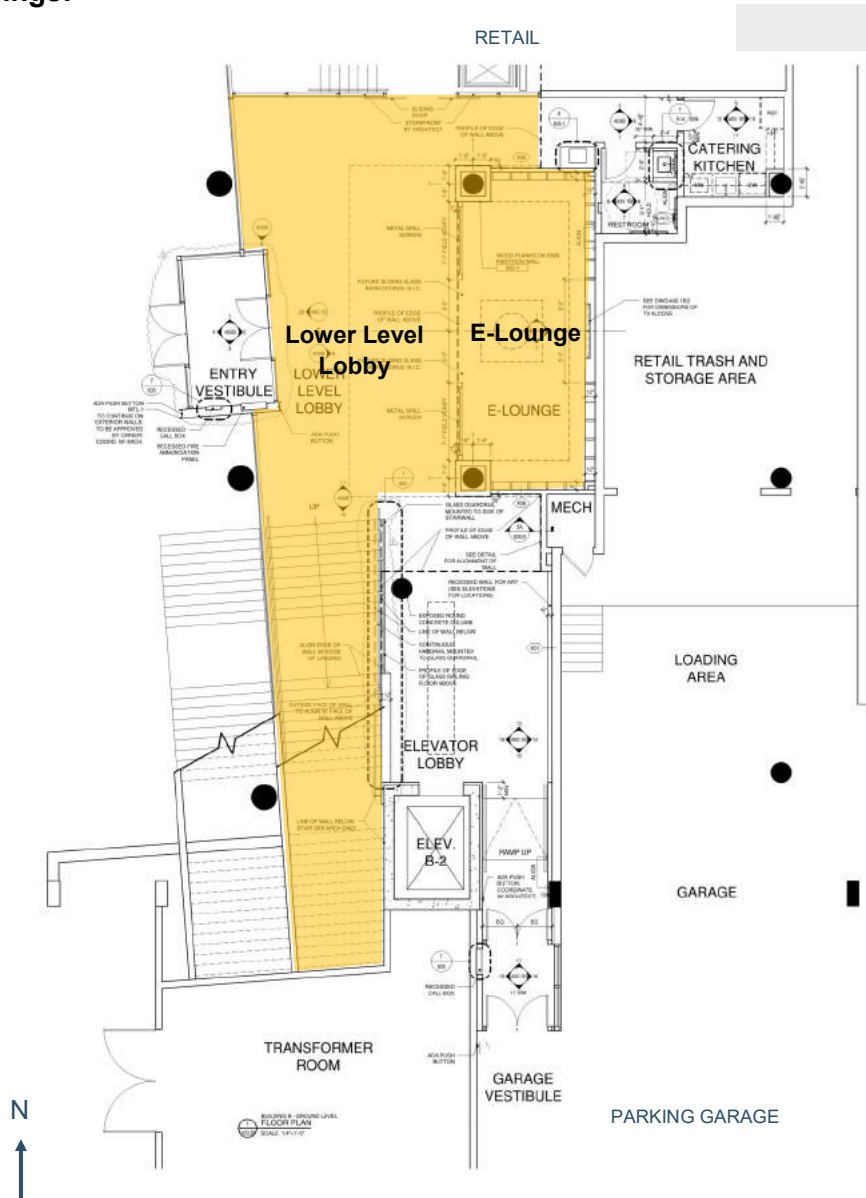
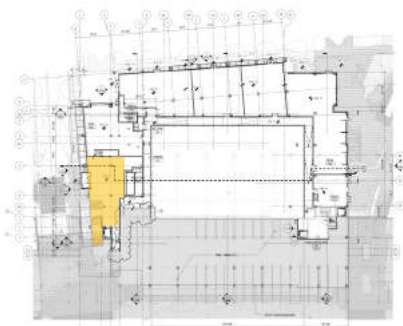


Figure 2 | Ground Floor Plan - Lower Level Lobby + E-Lounge



Ground Floor Key Plan

| Proposed Areas of Study

Circulation Space - Lower Level Lobby + E-Lounge

Location + Drawings:

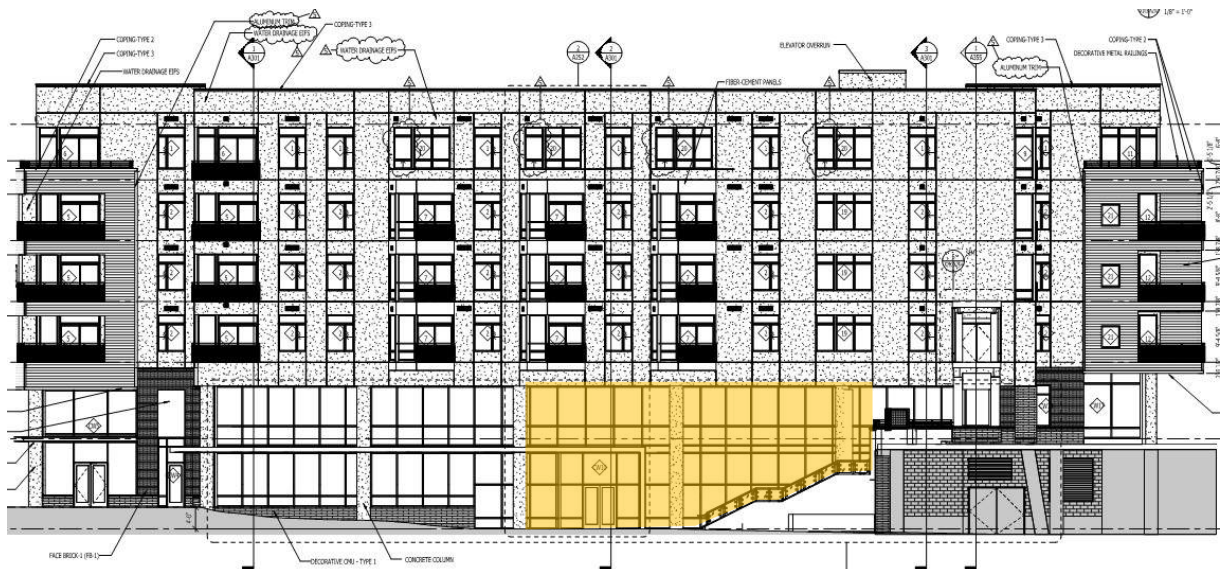
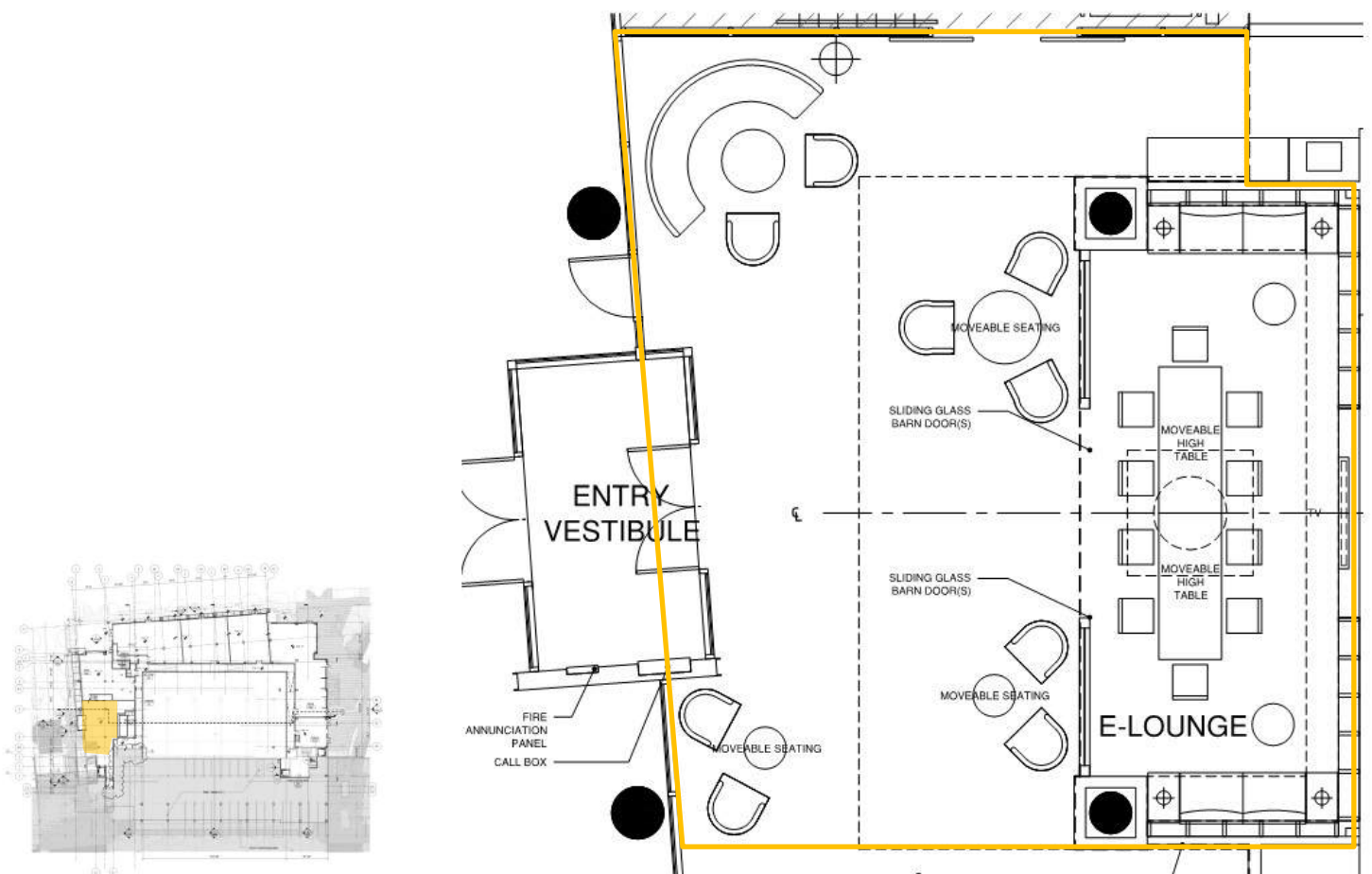


Figure 3 | West Elevation - Lower Level Lobby + E-Lounge



Ground Floor Key Plan

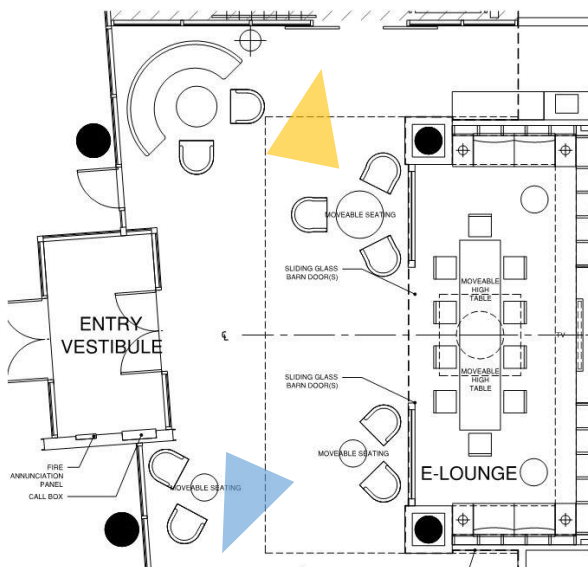
Figure 4 | Ground Floor Furniture Layout - Lower Level Lobby + E-Lounge

| Existing Materials

Circulation Space - Lower Level Lobby + E-Lounge



Figure 5 | Lower Level Lobby + E-Lounge View 1



Views 1 + 2 Key Plan

Materials:

The materials in the Lower Level Lobby, and throughout the remaining residential common spaces, are designed to create a modern, industrial feel to signify the steel industry of Pittsburgh. There is a large variety of materials within the space to create this feel - including materials with dark, neutral finishes, warm color tones, and metallic/steel features.

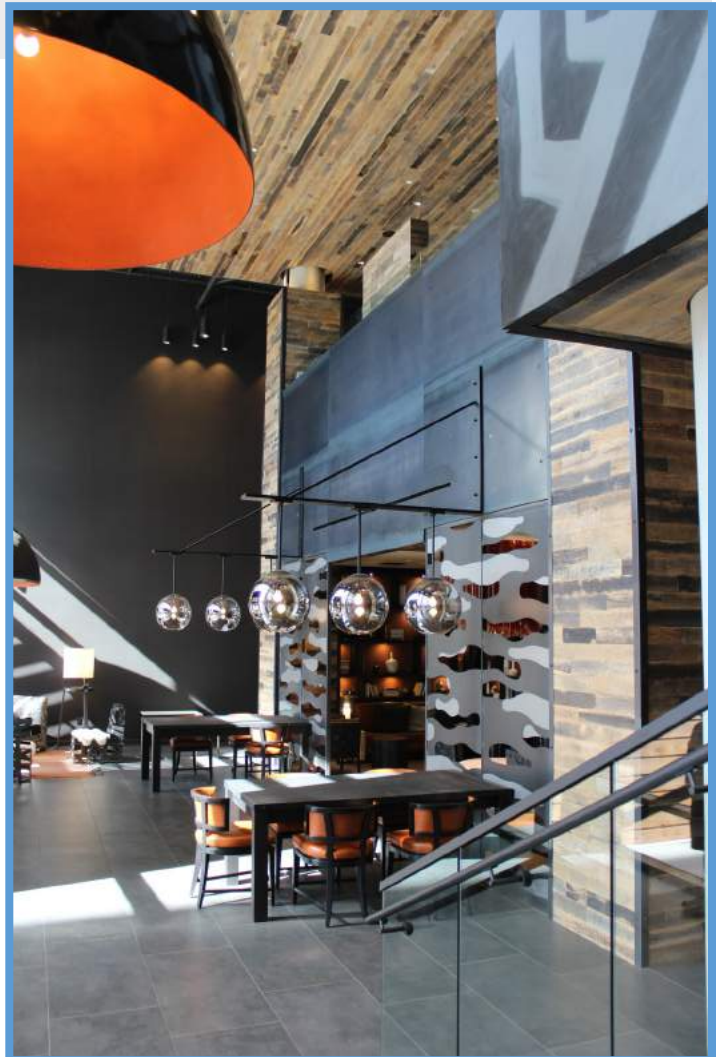


Figure 6 | Lower Level Lobby + E-Lounge View 2

Existing Materials

Circulation Space - Lower Level Lobby

Materials:

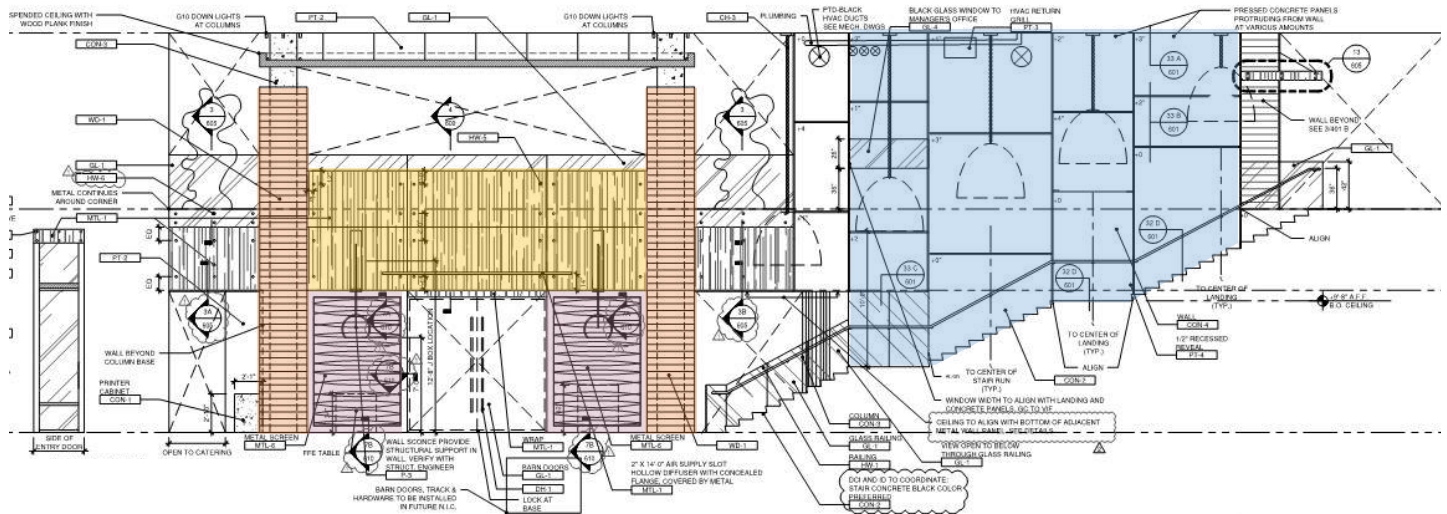


Figure 7 | Ground Floor Interior Elevation - Lower Level Lobby

Table 1 | Material Specifications - Lower Level Lobby

Space	Surface Type	Symbol Color	Description	Material Type	Manufacturer	Color	Product Name	Reflectance
Lower Level Lobby	Floor		Ceramic Tile	T-1	Mosaic Tile Co	Matte Black	Evolve Collection	0.03
	Exposed Ceiling		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
	Suspended Ceiling		Wood Plank Finish	WD-2	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
	Walls		Concrete	CON-2	by GC (PJ Dick)	Matte Black	-	0.05
			Concrete	CON-4	by GC (PJ Dick)	Light Grey	-	0.5
			Metal Grill Screen	MTL-6	Wylie System	Matte Black	Custom Metal Grill	0.03
			Metal Panels	MTL-1	Guitierrez Studios	Grey	Hot Rolled Steel Sheet	0.5
	Columns		Wood Covering	WD-1	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
Curtainwall		Glass	Low-E Glass	Guardian Glass	70/36 + IS-20	ClimaGuard 70/36, 1"	0.68 (trans)	

| Existing Materials

Circulation Space - Entertainment Lounge

Materials:

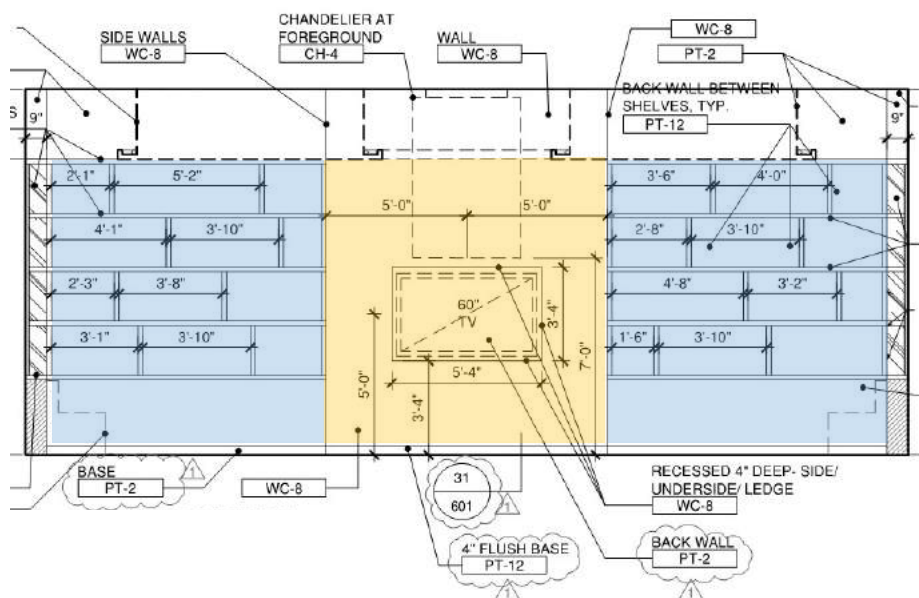


Figure 8 | Ground Floor Interior Elevation - Entertainment Lounge



Figure 9 | E-Lounge Interior

Table 2 | Material Specifications - Entertainment Lounge

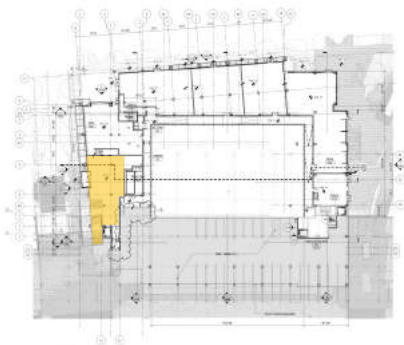
Space	Surface Type	Symbol Color	Description	Material Type	Manufacturer	Color	Product Name	Reflectance
E-Lounge	Floor		Carpet	CPT-6	J+J Invision	Tan	Revue Modular 7906, 551 Bond	0.3
	Ceiling		Painted GWB	PT-5	Sherwin Williams	Tan	Eco Spec, SW6102 Portabello	0.21
	Ceiling, above sculpture		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
	Barn Doors		Glass	GL-2	Forms + Surfaces	White	ViviChrome Scribe, 5/16"	0.7
	Walls		Metal Shelves	MTL-4	Chemetal	Dark Grey	Alu Dark	0.3
			Wallcovering Pattern	WC-8	MDC	Red	Pattern #MRA4913, Esquire	0.4

Existing Lighting Equipment

Circulation Space - Lower Level Lobby + E-Lounge

Existing Lighting:

The lighting within the spaces also contribute to the intended industrial aesthetic. There are many custom fixtures in the Lower Level Lobby and Entertainment lounge, as well as throughout the remainder of Eastside III, designed to achieve this style. Details and images of the custom fixtures used in the Lower Level Lobby, can be found in Table 3 on page 12 of this report. Downlights and wallgrazers contribute to the general lighting within the spaces, but it is evident that the custom fixtures of Eastside III drive it's interior design.



Ground Floor Key Plan

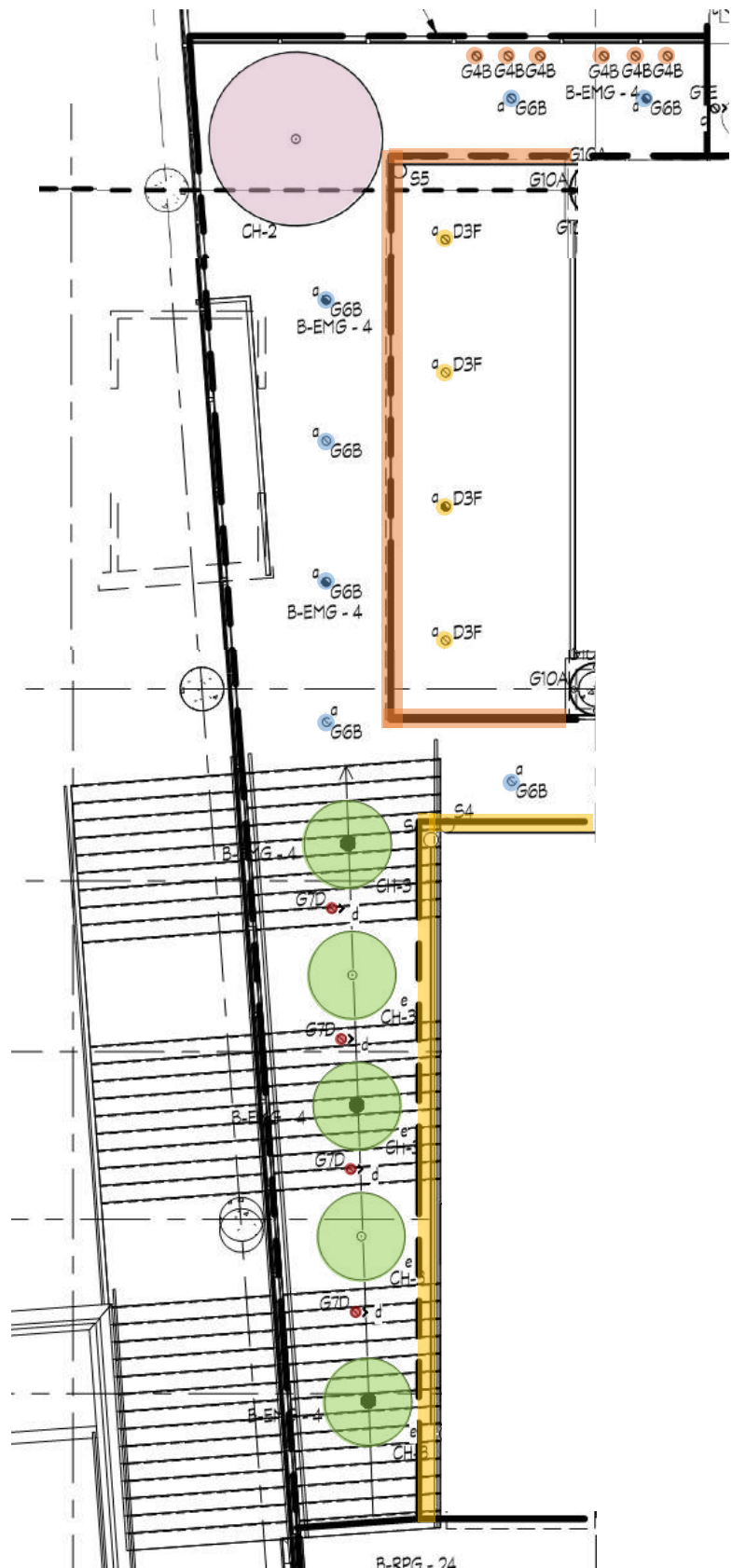


Figure 10 | Ground Floor Lighting Layout - Lower Level Lobby + E-Lounge

| Existing Lighting Equipment

Circulation Space - Lower Level Lobby + E-Lounge

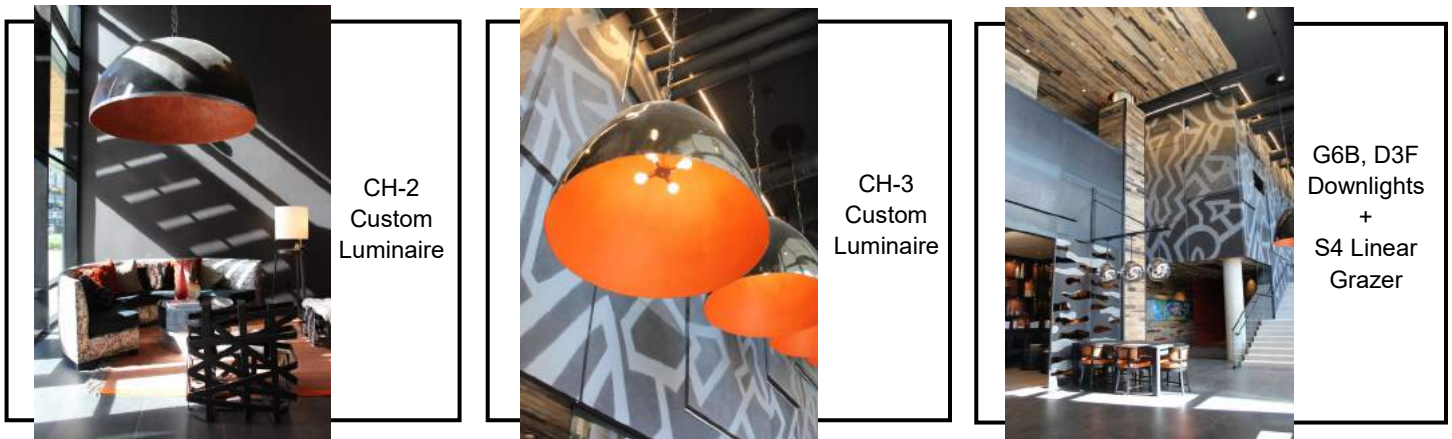










Table 3 | Luminaire Schedule - Lower Level Lobby

Space	Type	Symbol	#	Description	Manufacturer	Catalog #	Mounting	Lamp	Voltage
Lower Level Lobby	G4B		6	4" Open Cylinder, Black Finish, Med Beam, Clear Reflector	Indy Lighting	LC4 C-12-27-U-B-FDL/L400H-C-S/C-48-C	48" Cable	21.2 W, 1700LU, 2700K	120 V
	G6B		6	6" Open Cylinder, Black Finish, Med Beam, Clear Reflector	Indy Lighting	LC6 C-40-27-U-B-FDL/L600H-H-S/C-48-B	48" Cable	43.1 W, 1700LU, 2700K	120 V
	G7D		4	3" Adjustable Mini Cylinder, Black, Spot Beam	Juno Lighting	TLL114G2-3-S-BLTL540U-BL	Recessed	6W, 3000K	120 V
	D3F		3	3" Downlight, Wheat, Flood, IC	Aculux	-	Recessed	12.8 W, 2700K	120 V
	CH2		1	Large Round Dome Shade with Metal Lip and Hammered Metal Interior	Project Light	Custom	9'-0" AFF	(5) E26-23W CFL-TCP-1G3023 Within White Globe	120 V
	CH3		5	Large Round Dome Shade with Metal Lip and Hammered Metal Interior	Project Light	Custom	8'-0" AFF	(3) E26-23W CFL-TCP-1G3023 Within White Globe	120 V
	S4		26 LF	Narrow Body LED 17 Deg Grazer Strip, Black	Ecosense	-	Surface Mounted	11 W/LF, 3000K	120 V
	S5		11 LF	Flexible LED Module String	Ecosense	-	Surface Mounted	3.5 W/LF, 2700K	120 V

| Existing Lighting Equipment

Circulation Space - Lower Level Lobby + E-Lounge

Existing Lighting:

The main focus of the Entertainment Lounge is on center of the space, where a large, glass sculpture extends from the ceiling - illuminated from above. The E-Lounge also features shelf lighting and perimeter linear slot lighting in order to open up the space, while keeping levels low and uniform. These features are further explained in Table 4, as well as in the images on page 14.

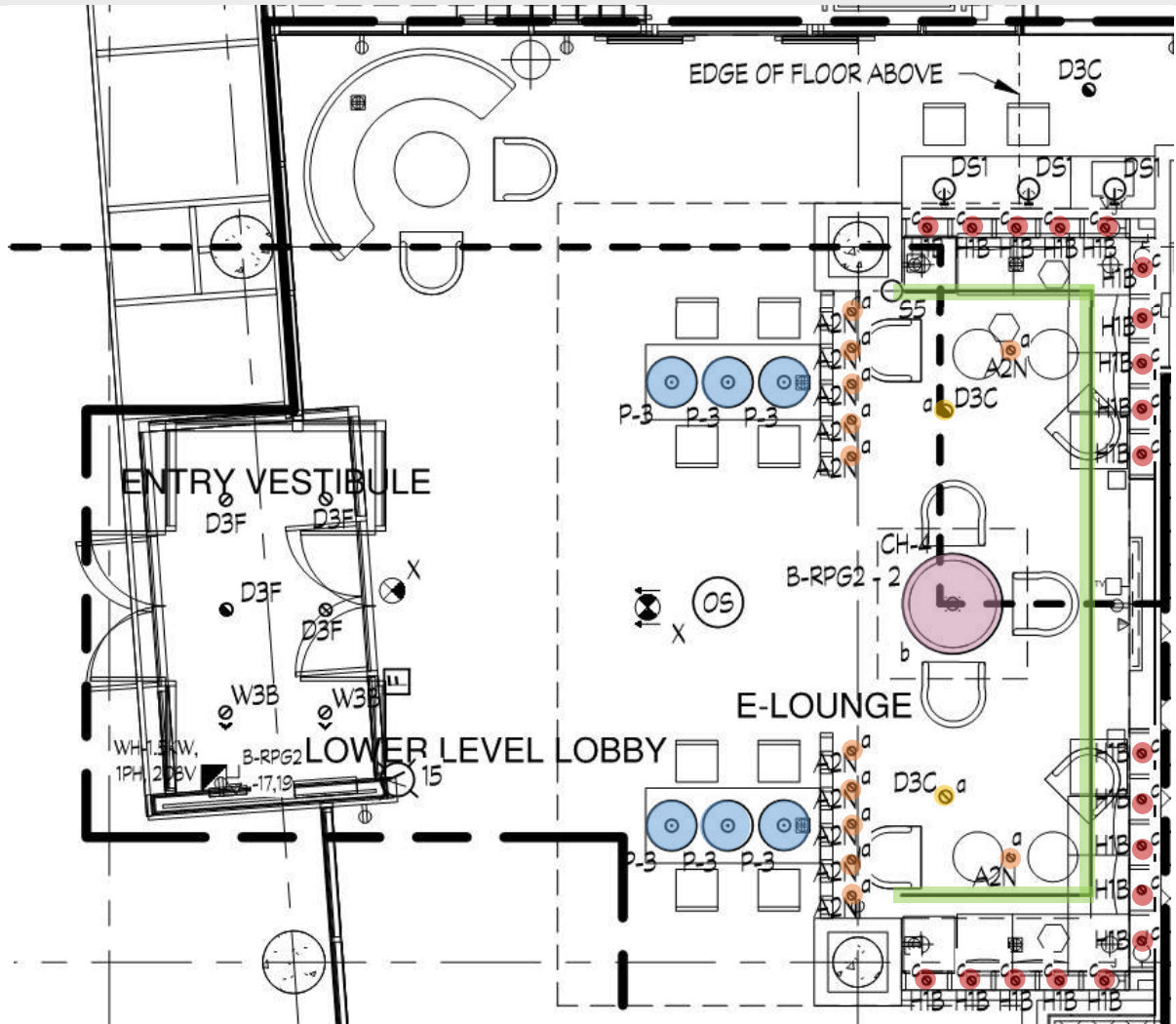
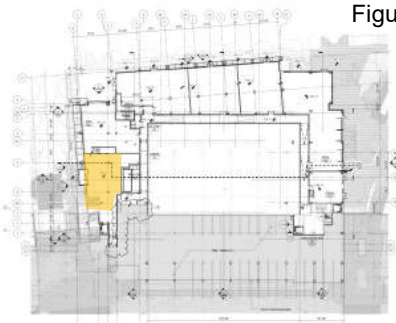


Figure 11 | Ground Floor Lighting Layout - Lower Level Lobby + E-Lounge



Ground Floor Key Plan

| Existing Lighting Equipment

Circulation Space - Lower Level Lobby

P3 Custom Luminaire









CH4 Custom Luminaire + Sculpture



Integrated Under Cabinet LED Pucks



Table 4 | Luminaire Schedule - Entertainment Lounge

Space	Type	Symbol	#	Description	Manufacturer	Catalog #	Mounting	Lamp	Voltage
E-Lounge	A2N		12	2" Adjustable Angle Cut	Aculux	IC207LA-927-N-1/2008-SF	Recessed	10.1W, 2700K	120 V
	CH4		1	Round Glass Tube Chandelier	Project Light	(27) Integrated LED Puck Lights	Suspended	5 W/Puck	120 V
	D3C		2	3" Downlight, Clear, Flood, IC	Aculux	IC43L-827-F-1/437NC-SF	Recessed	12.8 W, 2700K	120 V
	S5		47.75 LF	Flexible LED Module String	Ecosense	Slim Cove INT SCIS-(length)-2700-120-CL	Surface Mounted	3.5 W/LF, 2700K	120 V
	H1B		20	Under cabinet LED Puck	Juno Lighting	USTL1-3K-BZ / UST18G-10 OR 25-BL	Recessed	4.3 W, 2700K	120 V
	P3		6	(3) Glass Oval Shades with Inset Mirror Shade Pendant with Metal Stems Attached to Bracket with Support Cable	Project Light	Custom	7'-0" AFF	(3) E26-23W CFL-TCP-1G3023	120 V

| Design Criteria + Considerations

Circulation Space - Lower Level Lobby + E-Lounge

The design criteria and considerations can represent the assessment through *quantitative* data, as well as through *qualitative* desires, such as the aesthetic appeal of a space. Both criterion methods will be based off of design guidelines provided by the Illuminating Engineering Society (IES) Lighting Handbook and ASHRAE 90.1 2007. A summary of the main design criteria points for the Lower Level Lobby and E-Lounge are listed below.

| Quantitative Criteria

Illuminance + Uniformity Requirements:

The values found in Table 5, represent the recommended illuminance design criteria (measured in lux) by the IES Lighting Handbook for the Lower Level Lobby and E-Lounge. Though these illuminance values are used as a *recommendation* rather than a *requirement*, they are important to achieve in order to fulfill the functions and tasks of the space properly. Since this space is mainly used for circulation, the importance of achieving the uniformity ratio, listed in Table 5, is not as crucial as achieving proper illuminance values. This idea is further discussed under the *Uniformity* section of the design criteria.

Table 5 | Illuminance Requirements - Lower Level Lobby + E-Lounge

Space	Task	E horizontal (lux)	E vertical (lux)	Uniformity Ratio Eh (avg) : Eh (min)
Lower Level Lobby	Circulation: General, Day	100	30	4:1
	Circulation: General, Night	50	20	
E-Lounge	Lounge: Social/Waiting Area	40	15	2:1

Lighting Power Density:

The lighting power density (LPD) was determined using ASHRAE 90.1 2007 standards. The LPD is defined as the allowable watts/square foot for all spaces in the building. This can be calculated using a space-by-space method, or by building type. The LPDs calculated for Eastside III used the space-by-space method. Below is a summary of the Lower Level Lobby and Entertainment Lounge's lighting power density. The redesign of this space should exceed ASHRAE 2007 standards and comply with ASHRAE 90.1 2013 in order to achieve Eastside III's sustainability goal of LEED Gold.

Table 6 | Lighting Power Density Lower - Level Lobby + E-Lounge

Space	Space Description	Allowance (W/SF)
Lower Level Lobby	Lobby	1.3
E-Lounge	Lounge/Recreation	1.2

| Design Criteria + Considerations

Circulation Space - Lower Level Lobby + E-Lounge

| Qualitative Criteria

Controls:

The Lower Level Lobby and E-Lounge are controlled utilizing forward phase dimming on the downlights. The space is also controlled using occupancy sensors. Due to the West façade curtainwall, the use of daylight photosensor controls should be analyzed in further reports to minimize energy use in the general luminaires of the space.

Glare:

Glare can be achieved through excess sun exposure and/or from the fixtures. In this space, the main concern would be glare from the sun. Since this space is mainly used for circulation, the exposure to solar glare may not be a large concern. However, the use of a low-e, tempered glass and possibly fritted glass may need to be analyzed for the large curtainwall on the West side of this lobby to reduce solar heat gain and glare issues.

Sustainability:

Eastside III's project goal is to achieve LEED Gold rating under LEED for Homes 2009. The following design features within the Lower Level Lobby and E-Lounge contribute to this LEED certification:

- Thermally insulated glazing - the thermally insulated glazing for the new window system will reduce the amount of heat gain within the building from natural daylighting
- LED lighting - most energy-efficient lighting technologies
- Low-emitting materials - used materials with low VOC levels

Maintenance:

Since the Lower Level Lobby is a double-height space, the importance of maintenance must be considered. The access to fixtures in order repair or adjust the fixtures must be achievable after construction.

Uniformity:

The purpose of uniformity is to deter from visual distractions in order to achieve the task of the space. In this case, where the main task is for circulation, the uniformity can vary to allow for dramatic effects within the space or to lead the eye to the next space - like towards the sculpture in the E-Lounge or up the stairs to the Main Lobby. In an aesthetically driven space like this, a "spark of interest" or dramatic effect may not achieve a uniform illuminance ratio.

| Design Criteria + Considerations

Circulation Space - Lower Level Lobby + E-Lounge

The evaluation of each space will provide the comparison and contrast of the existing design and its relevance to the *quantitative* design criteria established for the space.

| Evaluation

The lighting in this space strongly compliments the modern, industrial aesthetic that the interior design achieves with its materials. As mentioned previously, the custom fixtures were specifically designed for Eastside III and fit the prominent design style. The space is well daylighted with a curtainwall running along the West side of the lobby space. Daylight also enters from the top of the stairwell, where the curtain wall from the first floor Main Lobby connects to the ground floor. The integration of daylight sensor controls will be analyzed in this space and deemed necessary. The qualitative design criteria will be further analyzed to serve as design drivers in the future re-design of the space. The re-design of the space will also be designed to meet appropriate recommendations from the IES Lighting Handbook and ASHRAE 90.1 2013 standards. According to the Lighting Power Density evaluation documented in Table 6, the Lower Level Lobby and Entertainment Lounge both comply with energy codes, as seen below.

Existing Lighting Power Density | Lower Level Lobby:



- ASHRAE 2007 Allowance for Lobby = **1.3 W/SF**
- 1360 total W / 1250 total SF = **1.09 W/SF**

Existing Lighting Power Density | E-Lounge:



- ASHRAE 2007 Allowance for Lounge = **1.2 W/SF**
- 1360 total W / 1250 total SF = **0.47 W/SF**

| Proposed Areas of Study

Circulation Space - Main Lobby + Concierge Desk

Summary:

The Main Lobby is located on the first level of the building. Due to a elevation grade change from North to South, this lobby acts as the primary entry from the South facing street level into the residential area. The Main Lobby connects the Lower Level Lobby from the ground floor to the remainder of the residential public spaces on the first level. As one circulates through the first floor, a lobby lounge, leasing area and concierge desk can be found branching from the main lobby. The Concierge Desk will also be redesigned to ensure proper task lighting and aesthetics.

Dimensions:

Main Lobby

- Area - 1,550 sf
- Height - 13'-0"

Concierge Desk

- Length - 8'-5"
- Height - 4'-0"

Tasks + Activities:

The primary function of the lobby space is for transition. The concierge desk will have reading, writing, and computer tasks performed.

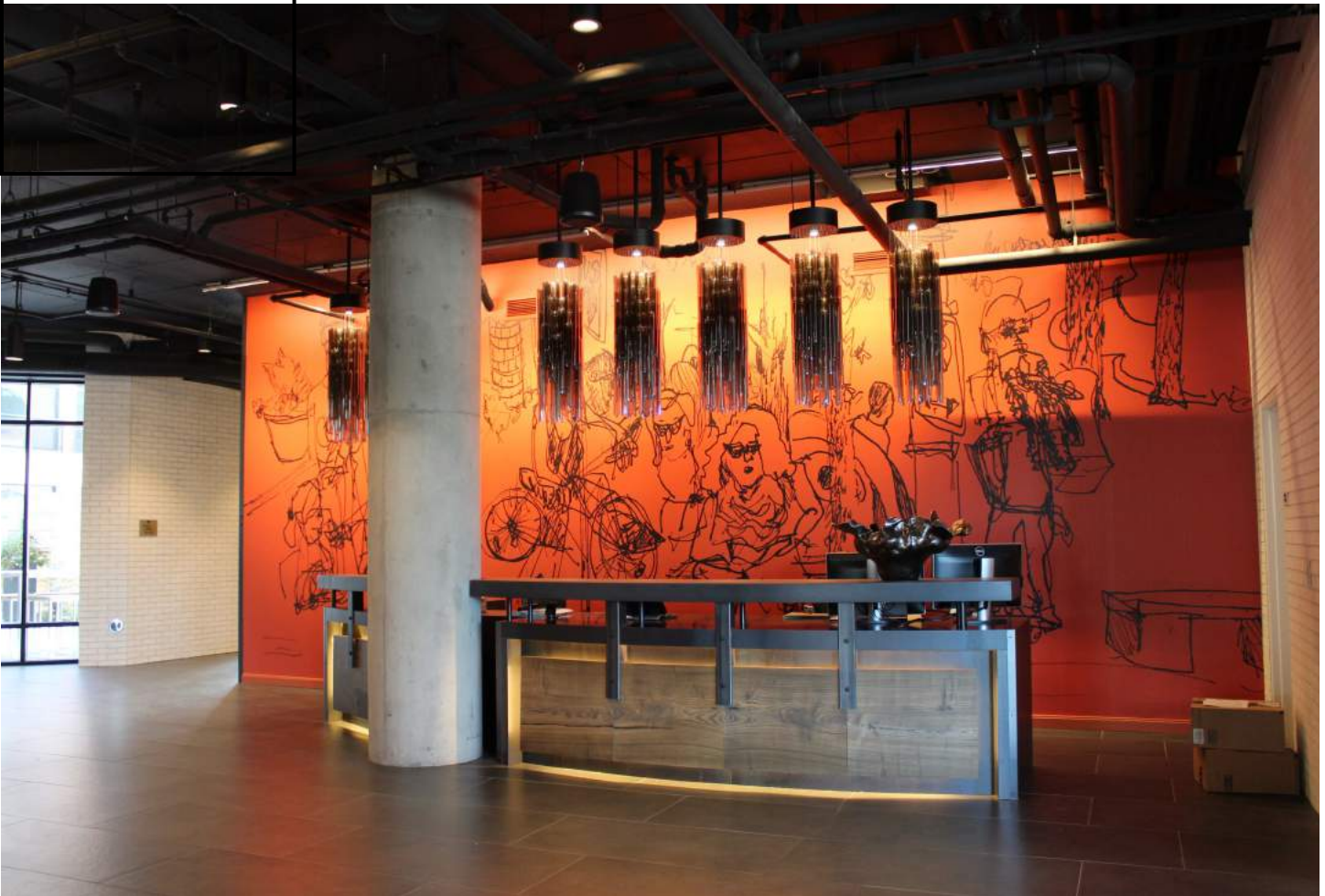


Figure 12 | Main Lobby + Concierge Desk

| Proposed Areas of Study

Circulation Space - Main Lobby + Concierge Desk

Location + Drawings:

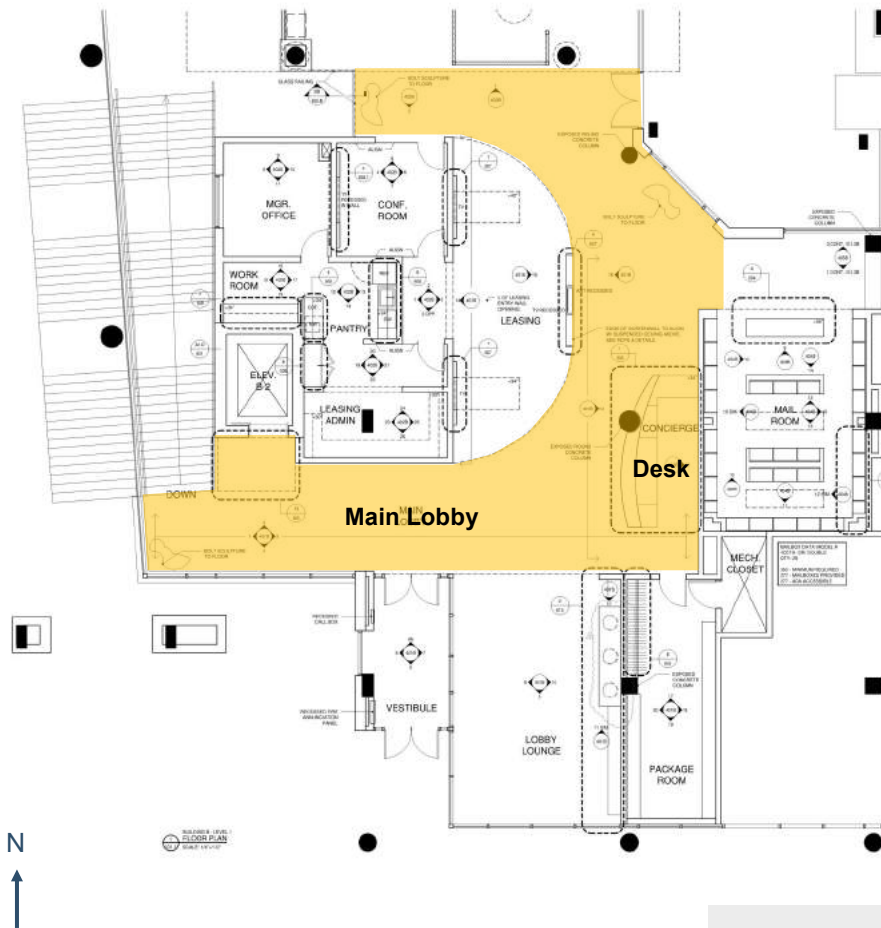
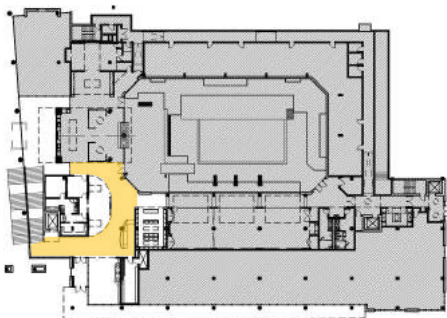


Figure 13 | Level 1 Floor Plan - Main Lobby + Concierge Desk



Level 1 Key Plan

| Proposed Areas of Study

Circulation Space - Main Lobby + Concierge Desk

Location + Drawings:

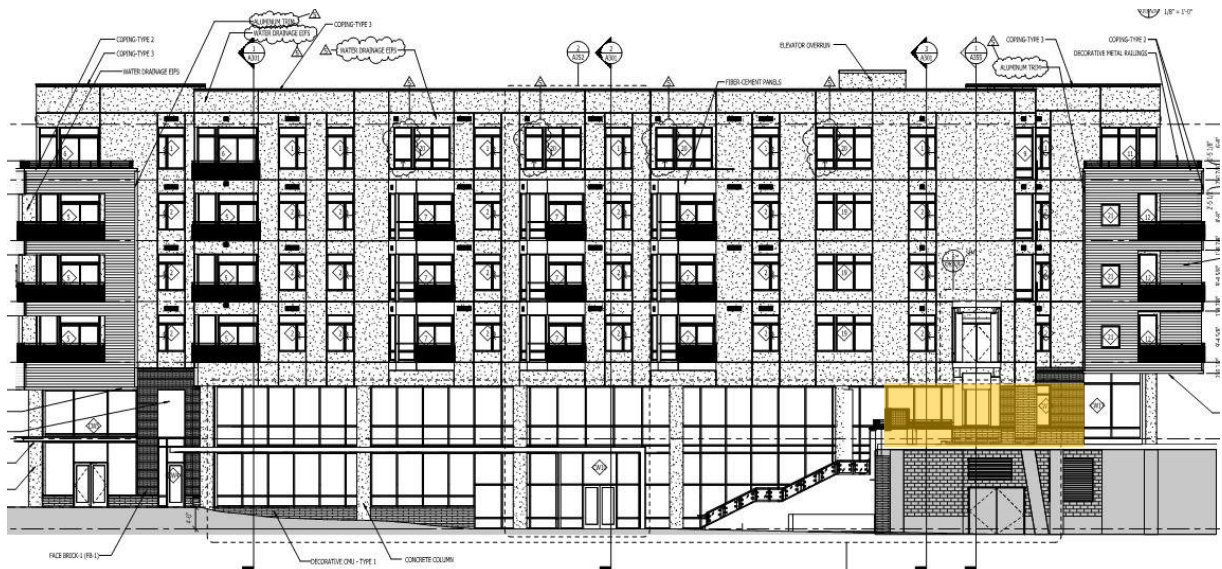
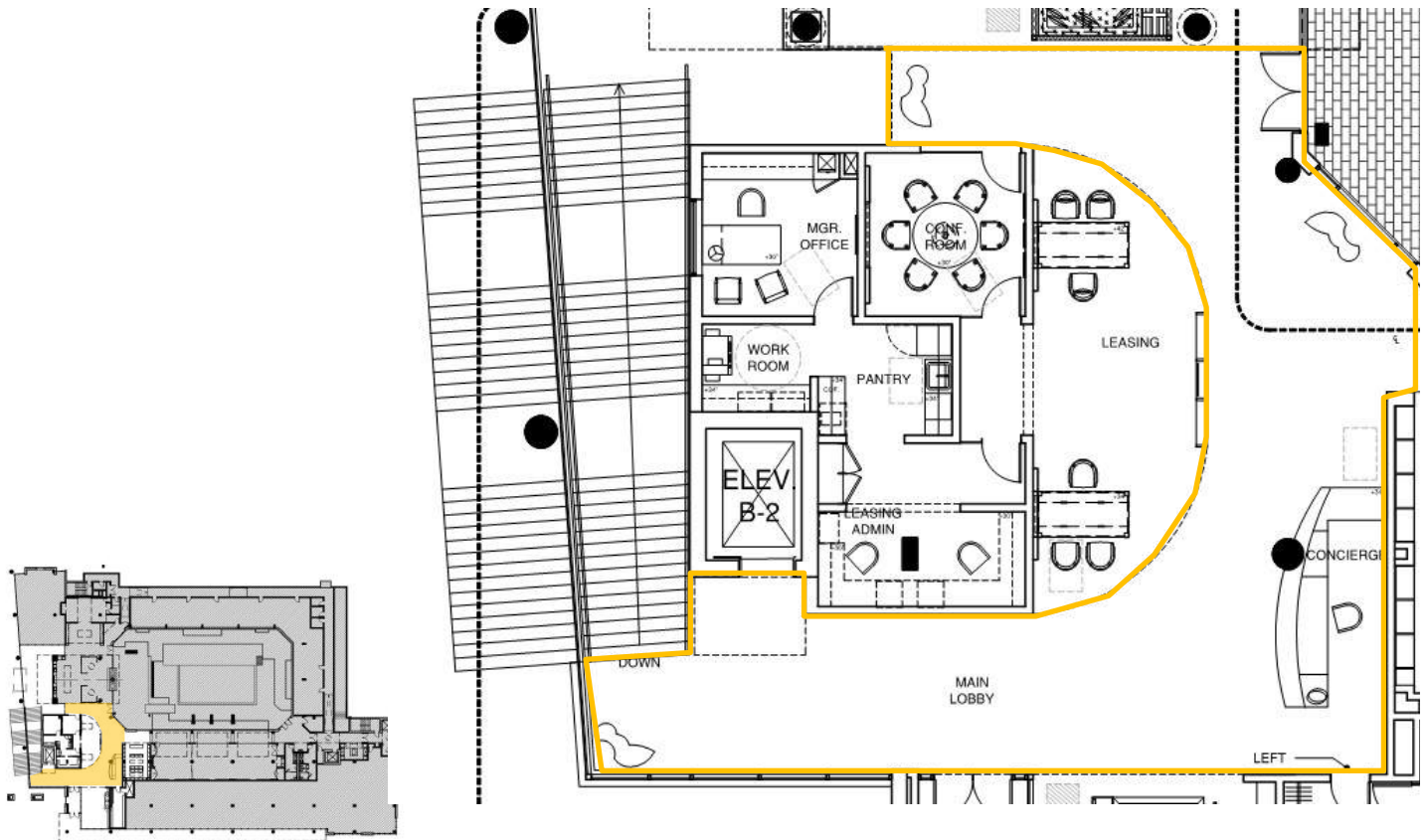


Figure 14 | West Elevation - Main Lobby + Concierge Desk



Level 1 Key Plan

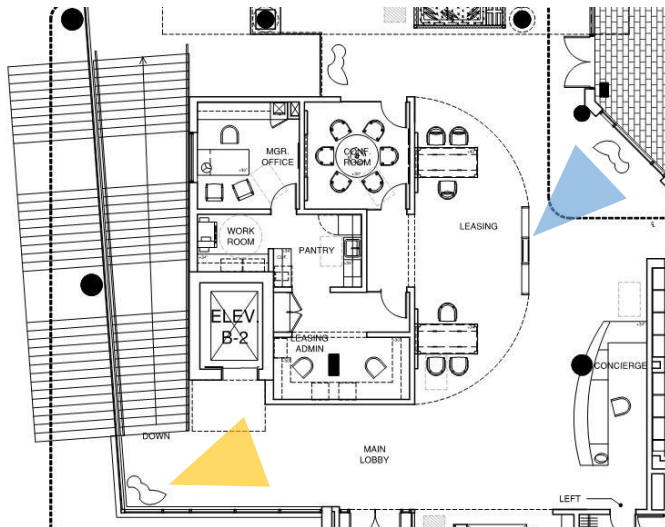
Figure 15 | Level 1 Furniture Layout - Main Lobby + Concierge

| Existing Materials

Circulation Space - Main Lobby + Concierge Desk



Figure 16 | Main Lobby View 1



Views 1 + 2 Key Plan

Materials:

As stated previously, the intent of the common spaces within Eastside III is to bring the aesthetics of industrial Pittsburgh within the space. The main lobby is providing a concept of liveliness, by opening up the space to daylight and providing points of interest such as the mural walls, sculptures, and concierge desk. These features play a big role in how one experiences the space and where their eyes are drawn towards next.



Figure 17 | Main Lobby View 1

| Existing Materials

Circulation Space - Main Lobby + Concierge Desk

Materials:

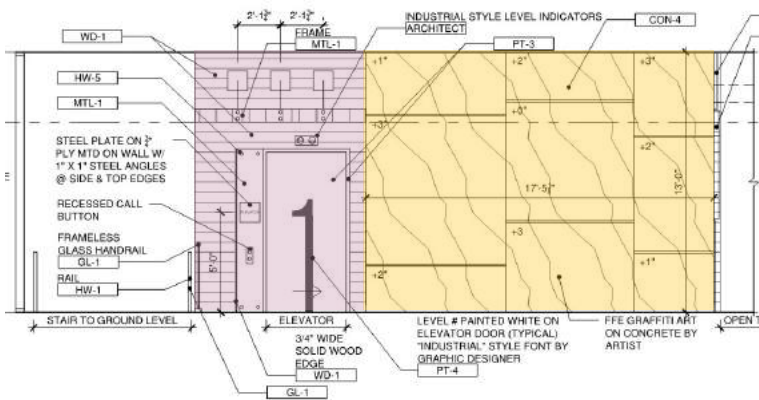


Figure 18 | Level 1 Interior Elevation - Main Lobby

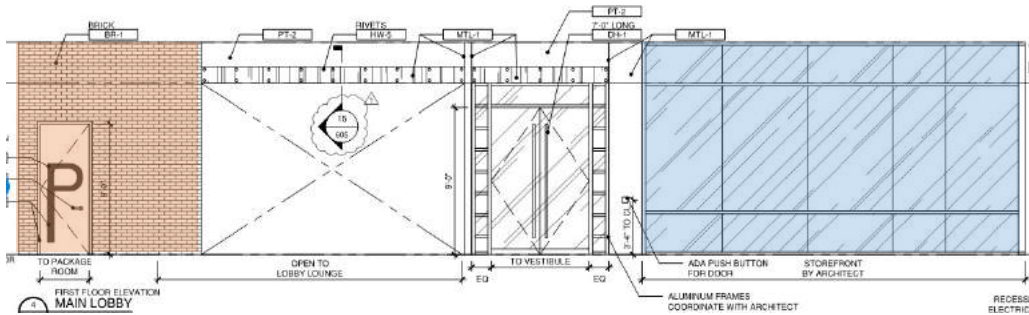


Figure 19 | Level 1 Interior Elevation - Main Lobby

Table 7 | Material Specifications - Main Lobby

Space	Surface Type	Symbol Color	Description	Material Type	Manufacturer	Color	Product Name	Reflectance
Main Lobby	Floor		Ceramic Tile	T-1	Mosaic Tile Co	Matte Black	Evolve Collection	0.03
	Exposed Ceiling		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
	Elevator Ceiling		Metal Mesh	MTL-3	Armstrong	Silver Grey + Black	Metelworks Mesh Welded Wire	0.5
	Elevator Wall		Wood Slats	WD-1	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
	Walls		Brick	BR-1	L & L Supply Corporation	Aspen White (W804)	Engobe Series, Modular	0.7
			Concrete	CON-4	by GC (PJ Dick)	Light Grey	-	0.5
			Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
	Curtainwall		Glass	Low-E Glass	Guardian Glass	70/36 + IS-20	ClimaGuard 70/36	0.68 (trans)

| Existing Materials

Circulation Space - Main Lobby + Concierge Desk

Materials:

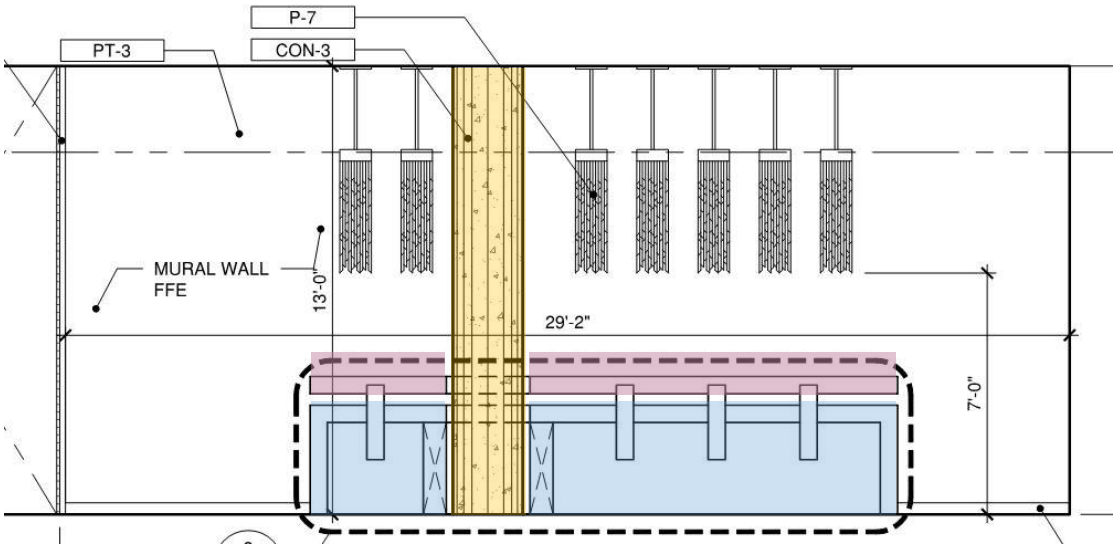


Figure 20 | Level 1 Interior Elevation - Concierge Desk

Table 8 | Material Specifications - Concierge Desk

Space	Surface Type	Symbol Color	Description	Material Type	Manufacturer	Color	Product Name	Reflectance
Concierge Desk	Floor		Ceramic Tile	T-1	Mosaic Tile Co	Matte Black	Evolve Collection	0.03
	Desk		Wood Slats	WD-5	Building Salvage Specialist	Matte Grey	Light Grey	0.15
	Desktop		Metal Top	MTL-1	Gutierrez Studios	Grey	Hot Rolled Steel Sheet	0.5
	Desktop		Concrete	CON-1	by GC (PJ Dick)	Grey	Stained Concrete, No Gloss	0.3
	Concrete Columns		Concrete	CON-3	by GC (PJ Dick)	Grey	Raw Concrete	0.3
	Walls		Mural Wall	PT-3	Benjamin Moore	Red	Ultra Spec 500, AF-280 Salsa Dancing	0.4

Existing Lighting Equipment

Circulation Space - Main Lobby + Concierge Desk

Existing Lighting:

The existing lighting within the Lower Level Lobby and Entertainment Lounge

See Table 3 for Luminaire Schedule

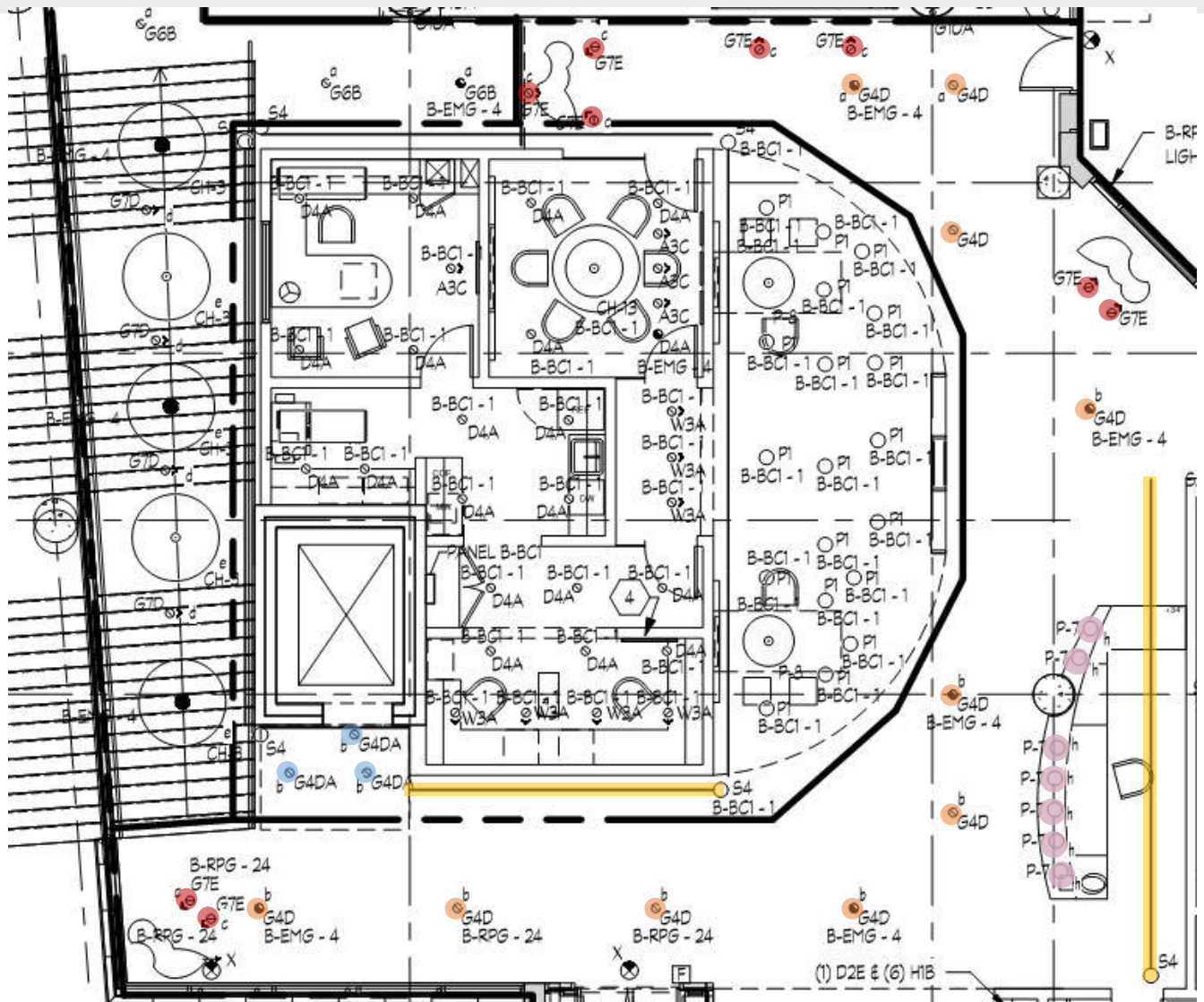
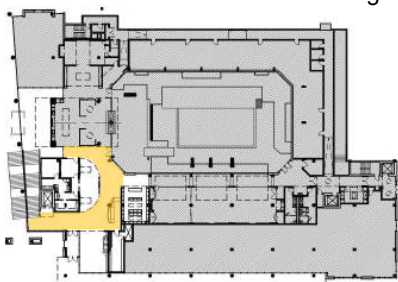


Figure 21 | Level 1 Lighting Layout - Main Lobby + Concierge Desk



Level 1 Floor Key Plan

| Existing Lighting Equipment

Circulation Space - Main Lobby + Concierge Desk



Table 9 | Luminaire Schedule - Main Lobby + Concierge Desk

Space	Fixture Type	Symbol	#	Description	Manufacturer	Catalog #	Mounting	Lamp	Voltage
Main Lobby	G4D		14	4" Open Cylinder, Black, Wide Beam, Clear Reflector	Indy Lighting	LC4C-17-27-U-B-FDL/L400HW-C-S/C-48-B	Surface Mounted	21.2 W, 1700U, 2700K	120 V
	G4DA		3	4" Open Cylinder, Black, Wide Beam, Clear Reflector	Indy Lighting	LC4C-17-27-U-B-FDL/L400HW-C-S/C-48-B	144" Cable	21.2 W, 1700U, 2700K	120 V
	G7E		9	3" Adjustable Mini Cylinder, Black, Narrow Flood Beam	Juno Lighting	TL114G2-N-S-BL BLTL540U-BL	-	6 W, 3000K	120 V
	S4		27.5 LF	Narrow Body LED 17 Deg Grazer Strip, Black	Ecosense	WWIS-LENGTH30-120-17/LDCM-120-277-010-V-GR/IN-A-MNT-ADJ/WWI-A-MP3	-	11 W/LF, 3000K	120 V
Concierge Desk	P7		7	Cluster of 1" Diam Glass Tubes with Curved and Angled Edge, Attached to Metal Canopy with Single Puck Light	Project Light	Custom	7'-0" AFF	Integrated Puck Light, 4.3 W, 2700K	120 V
	S4		28 LF	Narrow Body LED 17 Deg Grazer Strip, Black	Ecosense	WWIS-LENGTH30-120-17/LDCM-120-277-010-V-GR/IN-A-MNT-ADJ/WWI-A-MP3	-	11 W/LF, 3000K	120 V

| Design Criteria + Considerations

Circulation Space - Main Lobby + Concierge Desk

The design criteria and considerations can represent the assessment through *quantitative* data, as well as through *qualitative* desires, such as the aesthetic appeal of a space. Both criterion methods will be based off of design guidelines provided by the Illuminating Engineering Society (IES) Lighting Handbook and ASHRAE 90.1 2007. A summary of the main design criteria points for the Main Lobby and Concierge Desk are listed below.

| Quantitative Criteria

Illuminance + Uniformity Requirements:

The values found in Table 10, represent the recommended illuminance design criteria (measured in lux) by the IES Lighting Handbook for the Main Lobby and Concierge Desk. Though these illuminance values are used as a *recommendation* rather than a *requirement*, they are important to achieve in order to fulfill the functions and tasks of the space properly. Though this space is mainly used for circulation, the importance of achieving the uniformity ratio is relevant due to the tasks performed at the Concierge Desk and the visual recognition needed.

Table 10 | Illuminance Requirements - Main Lobby + Concierge Desk

Space	Application/Task	E horizontal (lux)	E vertical (lux)	Eh (avg) : Eh (min)
Main Lobby	Circulation: General, Day	100	30	4:1
	Circulation: General, Night	50	20	
Concierge Desk	Reception Lobby: Desktop	150	50	4:1
Concierge Desk: Focal Wall Behind Desk	Moderate Attraction: Feature Wall (0.4 Reflectance)	-	-	5:1 focal-point-to-task

Lighting Power Density:

The lighting power density (LPD) was determined using ASHRAE 90.1 2007 standards. The LPD is defined as the allowable watts/square foot for all spaces in the building. This can be calculated using a space-by-space method, or by building type. The LPDs calculated for Eastside III used the space-by-space method. Below is a summary of the Main Lobby and Concierge Desk's lighting power density. The redesign of this space should exceed ASHRAE 2007 standards and comply with ASHRAE 90.1 2013 in order to achieve Eastside III's sustainability goal of LEED Gold.

Table 11 | Lighting Power Density Lower - Main Lobby + Concierge Desk

Space	Space Description	Allowance (W/SF)
Main Lobby + Concierge Desk	Lobby	1.3

| Design Criteria + Considerations

Circulation Space - Main Lobby + Concierge Desk

| Qualitative Criteria

Controls:

The existing controls for the Main Lobby consist of occupancy sensors in the transition areas. Since the building entrance is facing a Southern glazed façade, the use of daylight control sensors should be analyzed to dim the general lighting during peak hours. Since the custom luminaires are such prominent features to the interior design of Eastside III, the occupancy or daylight sensors would not completely turn them off, but adjust them to a dimmed setting where the decorative aspect of the fixture would still be featured.

Glare:

Glare can be achieved through excess sun exposure and/or from the fixtures. In this space, the main concern would be glare from the sun. Proper glare analyses should be run to ensure that the tasks performed at the Concierge Desk are unaffected by solar glare.

Sustainability:

Eastside III's project goal is to achieve LEED Gold rating under LEED for Homes 2009. The following design features within the Main Lobby that contribute to this LEED certification:

- Thermally insulated glazing - the thermally insulated glazing for the new window system will reduce the amount of heat gain within the building from natural daylighting.
- LED lighting - most energy-efficient lighting technologies
- Low-emitting materials - used materials with low VOC levels

Uniformity:

As discussed in the quantitative criteria, the purpose of uniformity is to deter from visual distractions in order to achieve the task of a space. In this case, the main task is for circulation, and thus can have non-uniformity to allow for dramatic effects within the space. However, uniform and proper light levels should be achieved on the Concierge Desk to perform reading, writing and computer tasks.

Uniformity should also be considered when *transitioning* between spaces within Eastside III. During a site visit on September 10, 2016, I noticed many of the common spaces on the first level to be abundant with daylight, while other areas had the opposite feeling. Due to the dark color materials within Eastside III, the transition between a naturally daylit space and an enclosed space was found to be harsh. This consideration of transition illuminance levels and uniformity will be discussed in later deliverables.

| Design Criteria + Considerations

Circulation Space - Main Lobby + Concierge Desk

The evaluation of each space will provide the comparison and contrast of the existing design and its relevance to the *quantitative* design criteria established for the space.

| Evaluation

The industrial style interiors and natural daylighting continues through to the Main Lobby and Concierge desk, as one enters from the main entrance on the first level, or from the Lower Level Lobby on the ground floor. The low-e curtainwall glazing hugs the south façade of Eastside III, creating a well daylit building entry and lobby space.

The lighting in this space strongly compliments the modern, industrial aesthetic that the interior design achieves with its materials. As mentioned previously, the custom fixtures were specifically designed for Eastside III and fit the prominent design style. The space is well daylit with a curtainwall running along the West side of the lobby space. Daylight also enters from the top of the stairwell, where the curtain wall from the Level 1 Main Lobby connects to the ground floor. The integration of daylight sensor controls will be analyzed in this space and deemed necessary. The qualitative design criteria will be further analyzed to serve as design drivers in the future re-design of the space. The re-design of the space will also be designed to meet appropriate recommendations from the IES Lighting Handbook and ASHRAE 90.1 2013 standards. According to the Lighting Power Density evaluation documented in Table 6, the Lower Level Lobby and Entertainment Lounge both comply with energy codes, as seen below.

Existing Lighting Power Density | Main Lobby:

- ASHRAE 2007 Allowance for Lobby = **1.3 W/SF**
- 1360 total W / 1250 total SF = **0.68 W/SF**



| Proposed Areas of Study

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

Summary:

Within the first level of Eastside III, there are multiple amenities offered for the residences of the apartments above. Some of these amenities include an Entertainment Kitchen, Entertainment Lounge, and Billiard Room, which will be analyzed together as a special purpose space. Though these three spaces in and of themselves have separate purposes, their overall lighting concept will compliment one another and provide a psychological impression of a public + private space. Since these spaces are *public* areas within the building, yet their functions hint at providing a *private* feel, the lighting concept will use a combination of both impressions, with the help of lighting controls. Having lighting control capabilities will provide flexibility within the space in order to host a variety of events and activities.

Dimensions:

Kitchen

- Area - 607 sf
- Height - 10'-6"

E-Lounge

- Area - 664 sf
- Height - 10'-6"

Billiard Room

- Area - 540 sf
- Height - 10'-6"

Tasks + Activities:

The kitchen serves as a display kitchen, mainly for gathering, lounge, and tabletop tasks. The entertainment space will act primarily as a lounge with a wall mounted TV. The billiard room will have the task of a club and game room along with perimeter standing bar areas and wall mounted TVs on either side.



Figure 22 | Kitchen + Lounge + Billiard Room (courtesy of PJ Dick)

| Proposed Areas of Study

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

Location + Drawings:

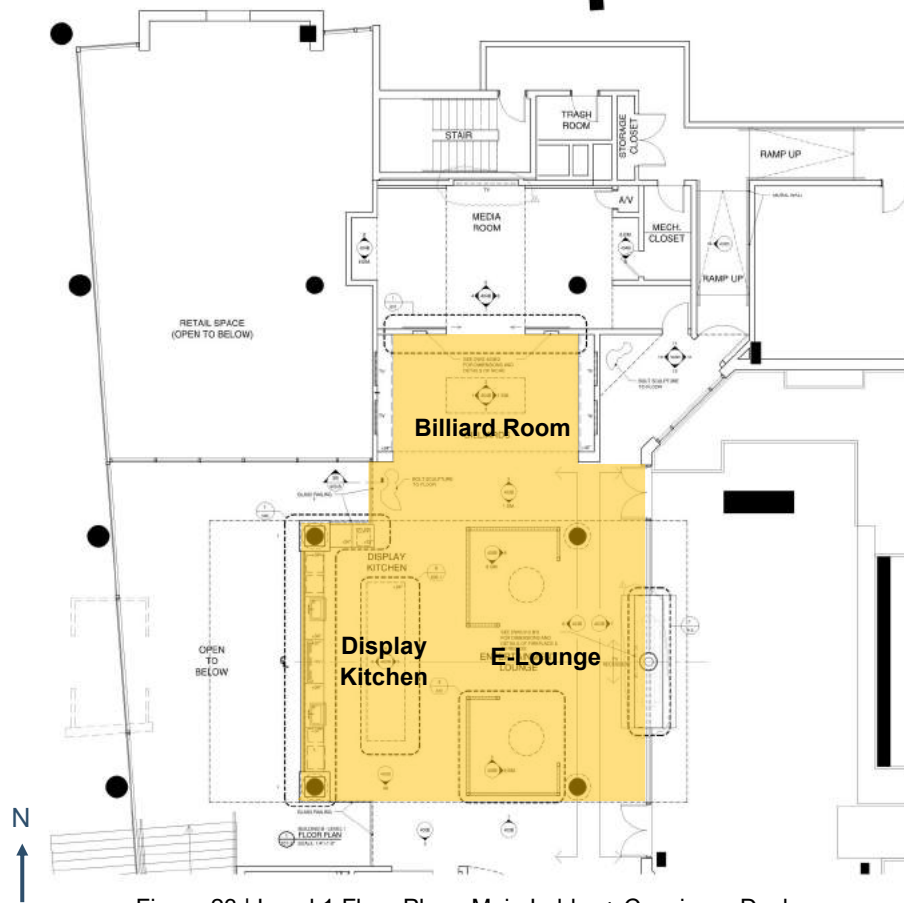
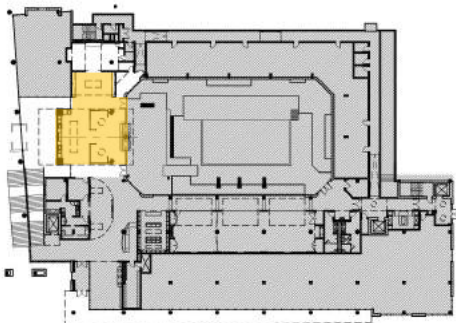


Figure 23 | Level 1 Floor Plan - Main Lobby + Concierge Desk



Level 1 Key Plan

Proposed Areas of Study

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

Location + Drawings:

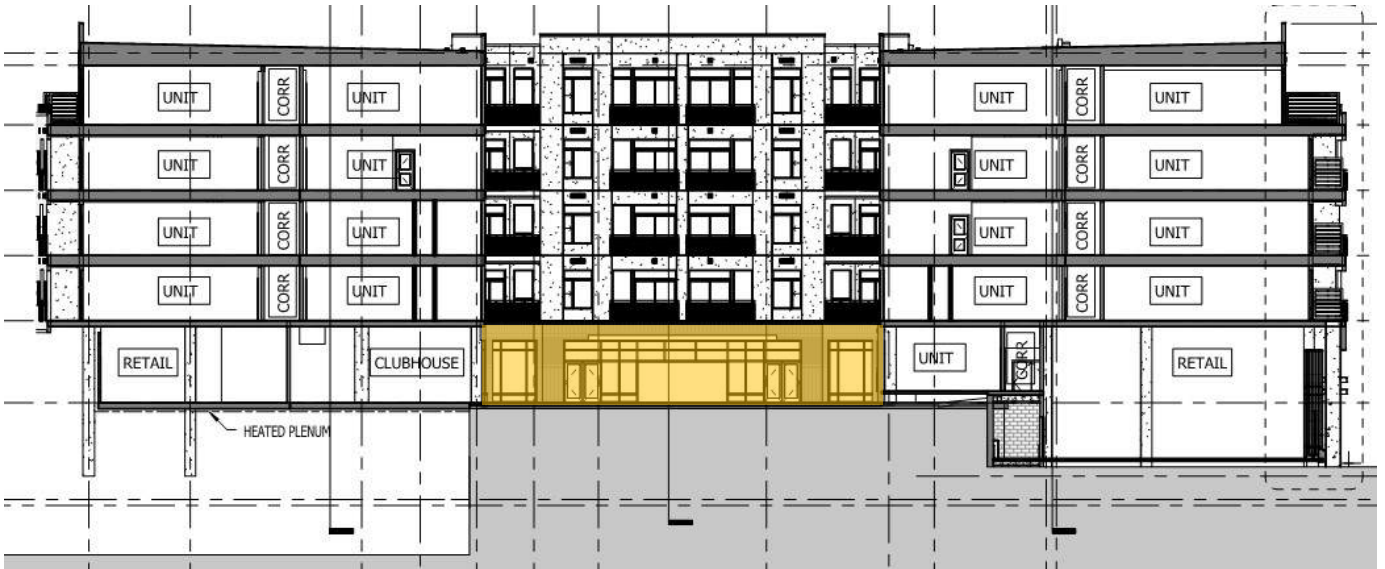


Figure 24 | N/S Building Section - Kitchen + E-Lounge + Billiard Room

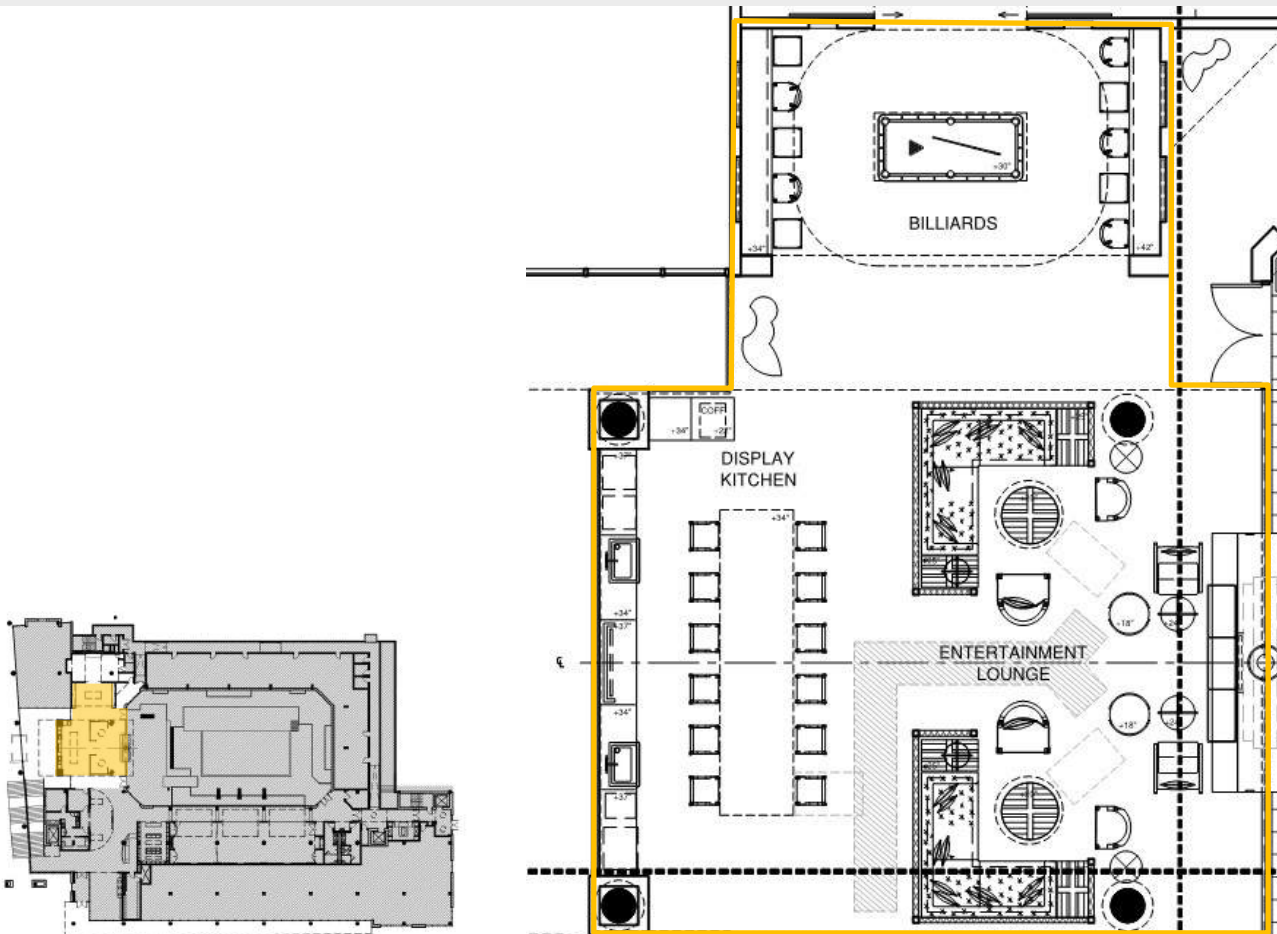


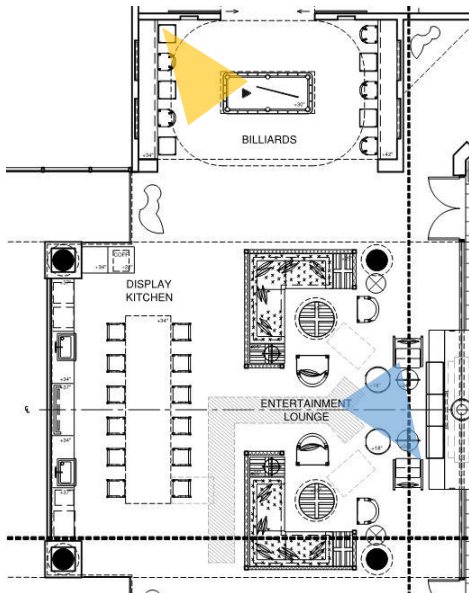
Figure 25 | Level 1 Furniture Layout - Kitchen + E-Lounge + Billiard

| Existing Materials

Special Purpose Space - Kitchen + E-Lounge + Billiard Room



Figure 26 | Billiard Room View 1



Views 1 + 2 Key Plan

Materials:

The materials within this special purpose space are a continuation of the industrial concept previously discussed in the lobby spaces. Wood flooring and wood ceilings are now introduced, providing a warm and inviting feel to the space. The Kitchen table top is a wood finish and the furniture within the Entertainment Lounge also compliment this modern aesthetic.

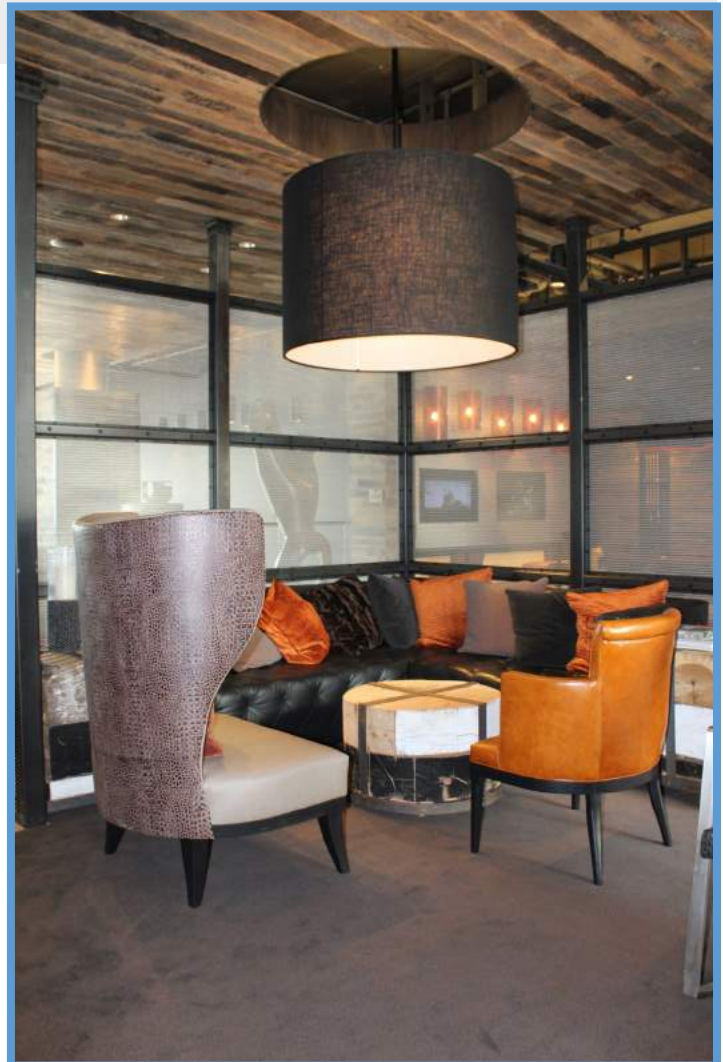


Figure 27 | E-Lounge View 2

| Existing Materials

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

Materials:

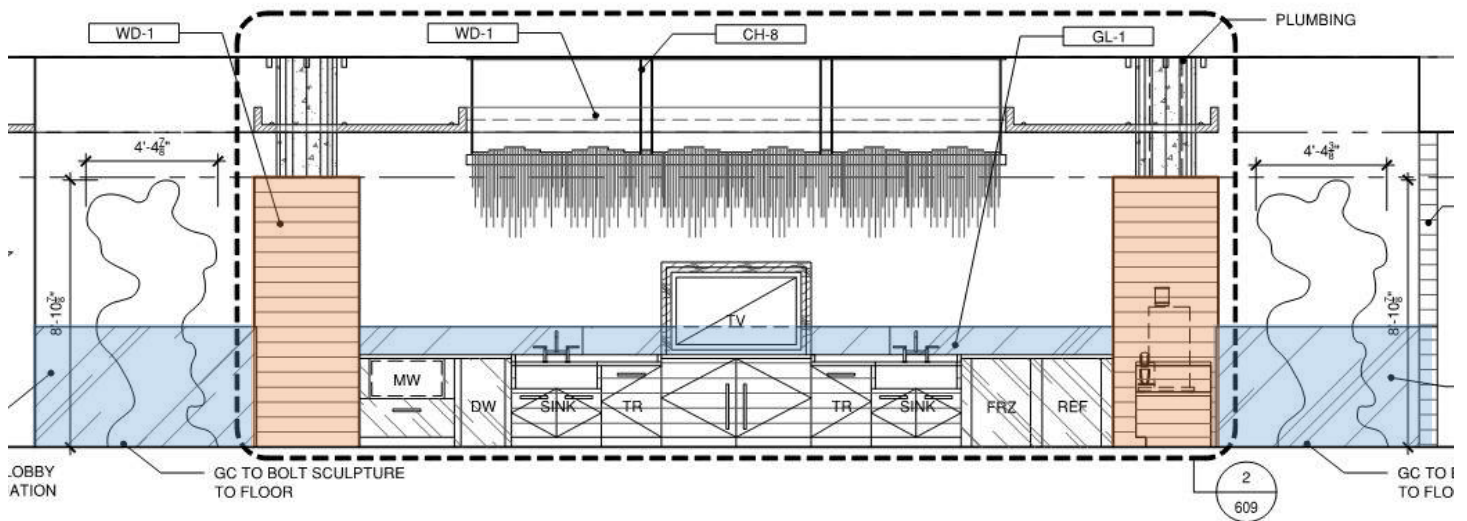


Figure 28 | Level 1 Interior Elevation - Display Kitchen

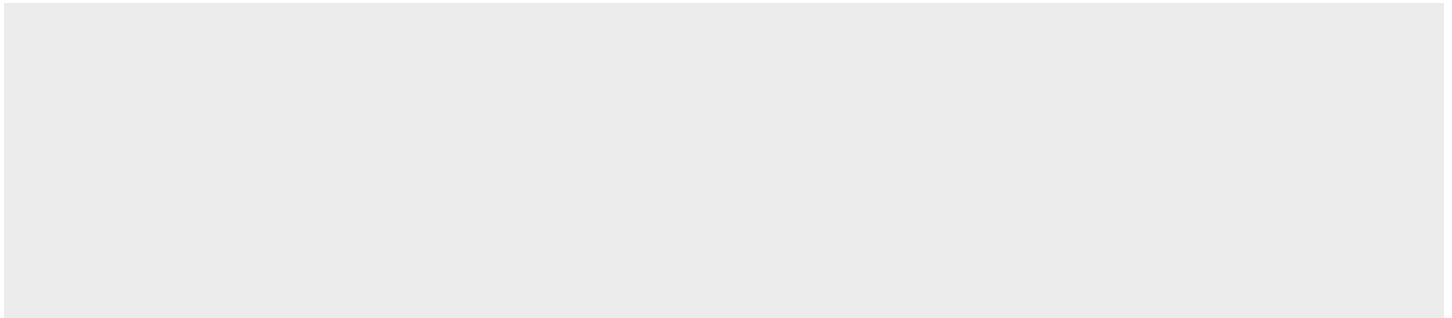


Table 12 | Material Specifications - Display Kitchen

Space	Surface Type	Symbol Color	Description	Material Type	Manufacturer	Color	Product Name	Reflectance
Display Kitchen	Floor		Ceramic Tile	T-1	Mosaic Tile Co	Matte Black	Evolve Collection	0.03
	Exposed Ceiling		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
	Ceiling		Wood Plank	WD-2	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
	Walls		Wood Finish	WD-1	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
	Interior Glazing		Glass	GL-1	by GC (PJ Dick)	Clear	Tempered Glass, 5/16"	0.78

| Existing Materials

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

Materials:

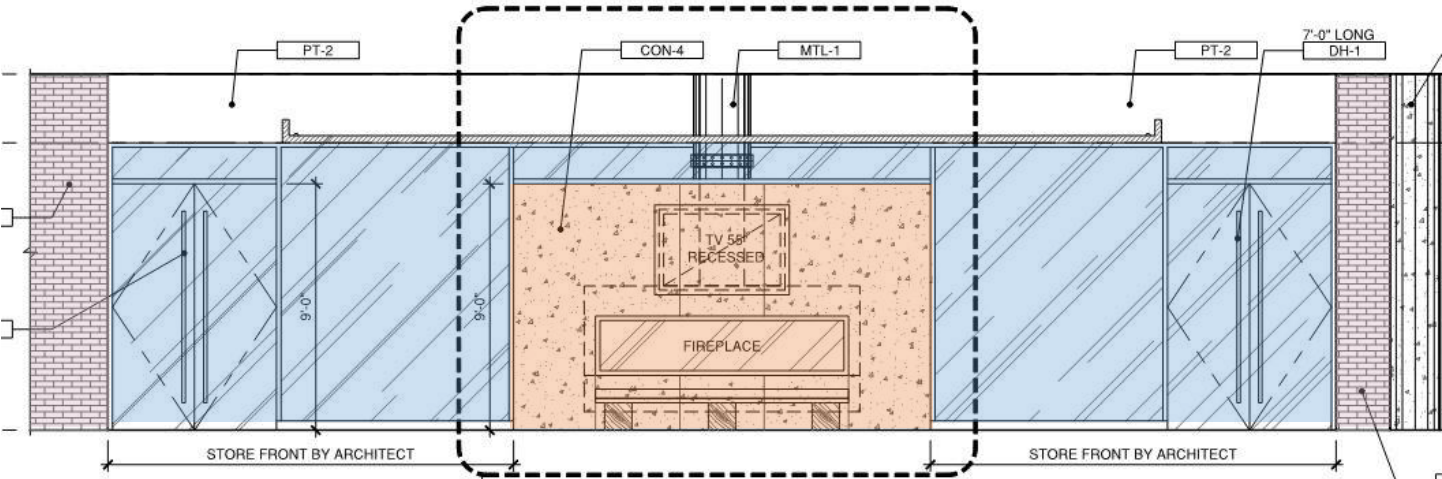


Figure 29 | Level 1 Interior Elevation - E-Lounge

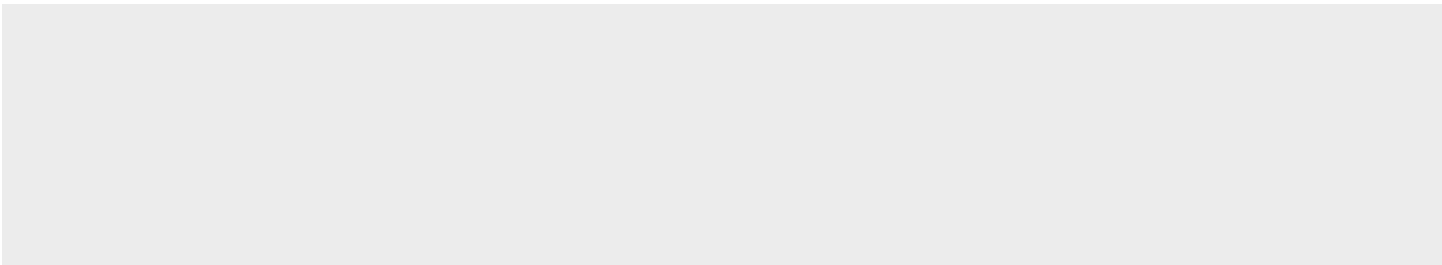


Table 13 | Material Specifications - E-Lounge

Space	Surface Type	Symbol Color	Description	Material Type	Manufacturer	Color	Product Name	Reflectance
E-Lounge	Floor		Carpet	CPT-5	Textstyle	Grey	Custom	0.4
	Ceiling		Wood Plank	WD-2	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
	Concrete Columns		Concrete	CON-3	by GC (PJ Dick)	Grey	Raw Concrete	0.3
	Walls		Wood Finish	WD-1	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
			Brick	BR-1	L & L Supply Corporation	Aspen White (W804)	Engobe Series, Modular	0.7
			Concrete	CON-4	by GC (PJ Dick)	Light Grey	-	0.5
			Metal Mesh	MTL-5	WTP Collection	Stainless Steel	115 Flexy TR Metal Mesh	0.5
	Exterior Glazing		Glass	Low-E Glass	Guardian Glass	70/36 + IS-20	ClimaGuard 70/36	0.68 (trans)

| Existing Materials

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

Materials:

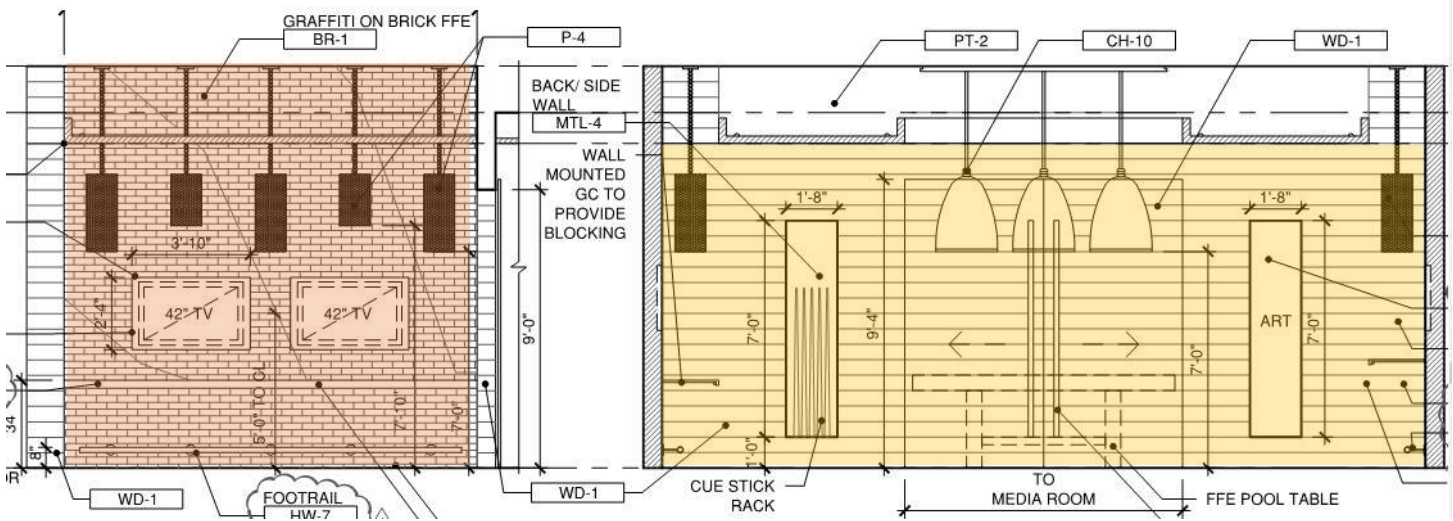


Figure 30 | Level 1 Interior Elevation - Billiard Room

Table 14 | Material Specifications - Billiard Room

Space	Surface Type	Symbol Color	Description	Material Type	Manufacturer	Color	Product Name	Reflectance
Billiard Room	Floor		Wood Floor	WF-1	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
	Ceiling		Wood Plank	WD-2	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
	Exposed Ceiling		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
	Walls		Wood Finish	WD-1	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
			Brick	BR-1	L & L Supply Corporation	Aspen White (W804)	Engobe Series, Modular	0.7

| Existing Lighting Equipment

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

Existing Lighting:

The continuation of custom luminaires are also brought into these three spaces. A custom sculpture is mounted over the Kitchen table top, illuminated by small spotlights above, creating a central focal point as one enters the space. The overall lighting concept is heavily driven by the custom luminaires, which is prevalent throughout Eastside III.

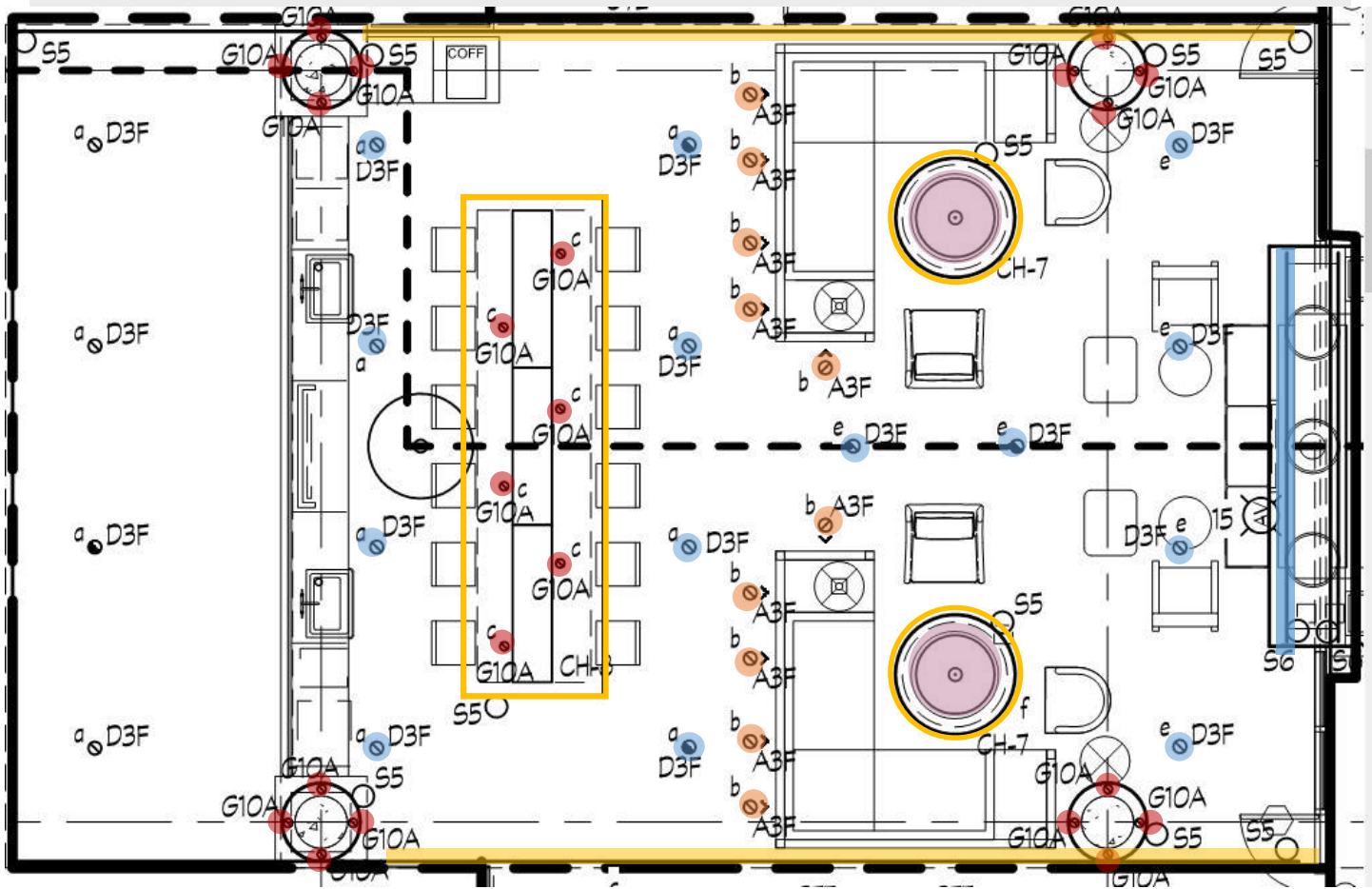
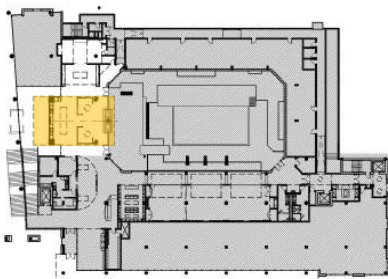


Figure 31 | Level 1 Lighting Layout - Kitchen + E-Lounge



Level 1 Floor Key Plan

| Existing Lighting Equipment

Special Purpose Space - Kitchen + E-Lounge + Billiard Room











G10A Luminaire over Custom Sculpture



CH7 Custom Luminaire



Table 15 | Luminaire Schedule - Display Kitchen + E-Lounge

Space	Fixture Type	Symbol	#	Description	Manufacturer	Catalog #	Mounting	Lamp	Voltage
Display Kitchen	A3F		8	3" Adjustable Angle Cut, Wheat, Narrow Floor, IC	Aculux	IC43L-827-F-1/430NHZ-SF	-	12.8 W, 2700K	120 V
	D3F		8	3" Downlight, Wheat, Floor, IC	Aculux	-	-	12.8 W, 2700K	120 V
	G10A		14	2" Open Cylinder, Black, Spot Beam, Shroud, Louver, Softening Lens	BK Lighting	SM-MN-LE-D-E37-SP-BLP-12-11--E	-	8.3 W, 2700K	120 V
	S5		123 LF	Flexible LED Module String	Ecosense	-	-	3.5 W/LF, 2700K	120 V
E-Lounge	A3F		2	3" Adjustable Angle Cut, Wheat, Narrow Floor, IC	Aculux	IC43L-827-F-1/430NHZ-SF	-	12.8 W, 2700K	120 V
	D3F		6	3" Downlight, Wheat, Floor, IC	Aculux	-	-	12.8 W, 2700K	120 V
	G10A		8	2" Open Cylinder, Black, Spot Beam, Shroud, Louver, Softening Lens	BK Lighting	SM-MN-LE-D-E37-SP-BLP-12-11-E	-	8.3 W, 2700K	120 V
	CH7		2	Chandelier, Black Linen Fabric Drum Shade with Self Welt and 1" Thick Stems Connected to Shade by tripod, 12" Clear Glass around Globe	Project Light	-	7'-0" AFF	(1) E26-23 W CFL - TCP 1G3023	120 V
	S5		87 LF	Flexible LED Module String	Ecosense	-	-	3.5 W/LF, 2700K	120 V
	S6		15 LF	LED Flex String for Exterior Applications	Ecosense	-	-	3.5 W/LF, 2700K	120 V

| Existing Lighting Equipment

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

Existing Lighting:

The Billiard Room has three large custom luminaires over the pool table, with decorative pendants highlighting the perimeter walls. The main feature of the pool table luminaires are for decorative purposes, so the Billiard Room and other areas of the special purpose space have general lighting integrated within the decorative fixtures.

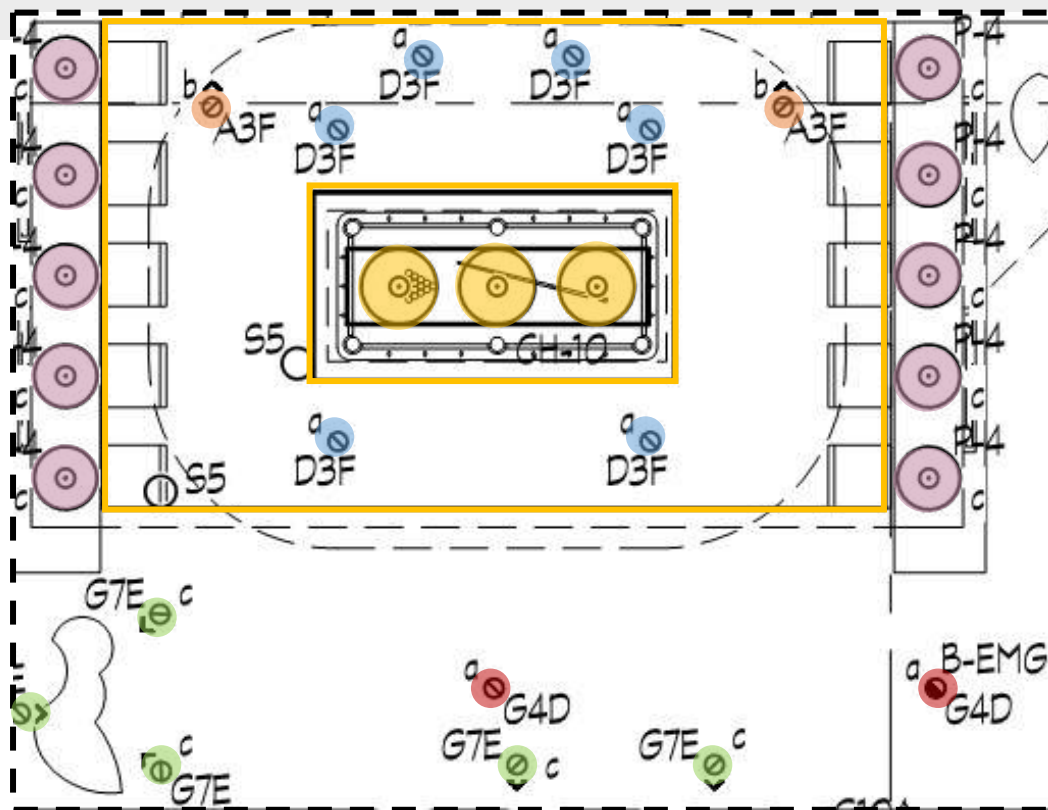
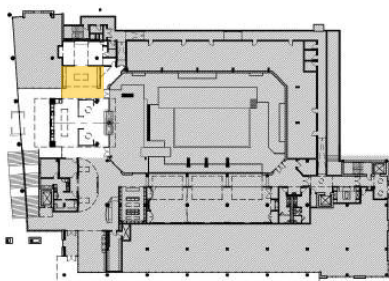


Figure 32 | Level 1 Lighting Layout - Billiard Room



Level 1 Floor Key Plan

| Existing Lighting Equipment

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

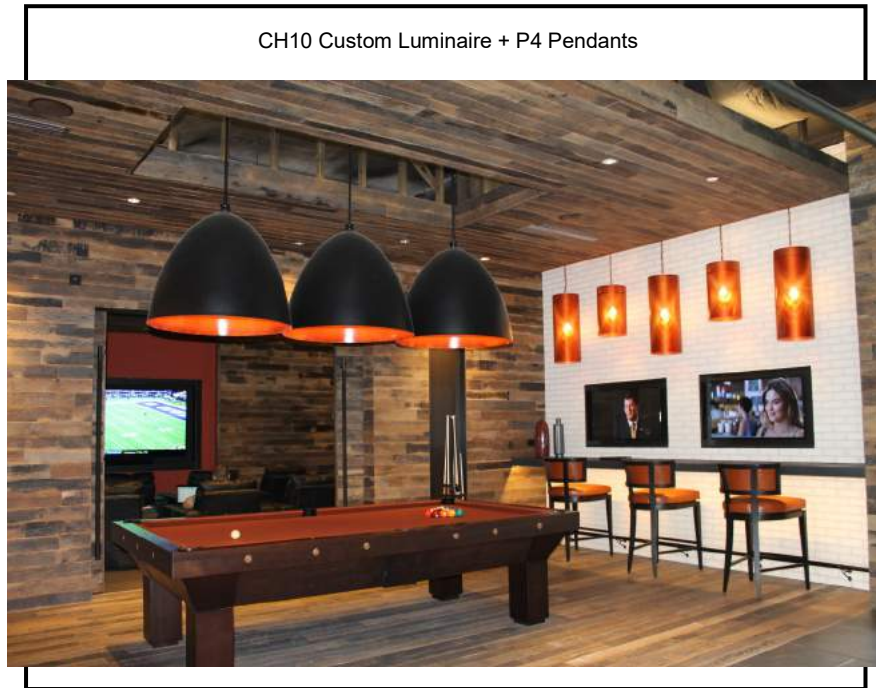









Table 16 | Luminaire Schedule - Display Kitchen + E-Lounge

Space	Fixture Type	Symbol	#	Description	Manufacturer	Catalog #	Mounting	Lamp	Voltage
Billiard Room	A3F		2	3" Adjustable Angle Cut, Wheat, Narrow Floor, IC	Aculux	IC43L-827-F-1/430NHZ-SF	-	12.8 W, 2700K	120 V
	CH10		3	Large Round Dome Shade with Metal Lip and Hammered Metal Interior	Aculux	-		12.8 W, 2700K	120 V
	D3F		6	3" Downlight, Wheat, Floor, IC	Aculux	-	-	12.8 W, 2700K	120 V
	G4D		2	4" Open Cylinder, Black, Wide Beam, Clear Reflector	Indy Lighting	LC4C-17-27-U-B-FDL/L400HW-C-S/C-48-B	Surface Mounted	21.2 W, 1700U, 2700K	120 V
	G7E		5	3" Adjustable Mini Cylinder, Black, Narrow Flood Beam	Juno Lighting	TL114G2-N-S-BL BLTL540U-BL	-	6 W, 3000K	120 V
	P4		10	Perforated Metal Shades with 6" diam Glass Globe Lights and Chain Links	Project Light	Custom	13'-0" AFF	(1) E26-19 W CFL - TCP 1G4019	120 V
	S5		48 LF	Flexible LED Module String	Ecosense	-	-	3.5 W/LF, 2700K	120 V

| Existing Lighting Equipment

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

The existing illuminance values of the Special Purpose Space were assessed using AGi32. Illuminance levels were analyzed and compared to recommendations provided by the IES Lighting Handbook, as well as Lighting Power Density standards provided by ASHRAE 90.1 2007, which can be seen in Tables 17-18. The existing illuminance levels can be seen in Figure 33 below.

The following assumptions were made in order to perform the lighting calculations:

- Light Loss Factor for LED fixtures = 0.85
- Light Loss Factor for Compact Fluorescent fixtures = 0.7

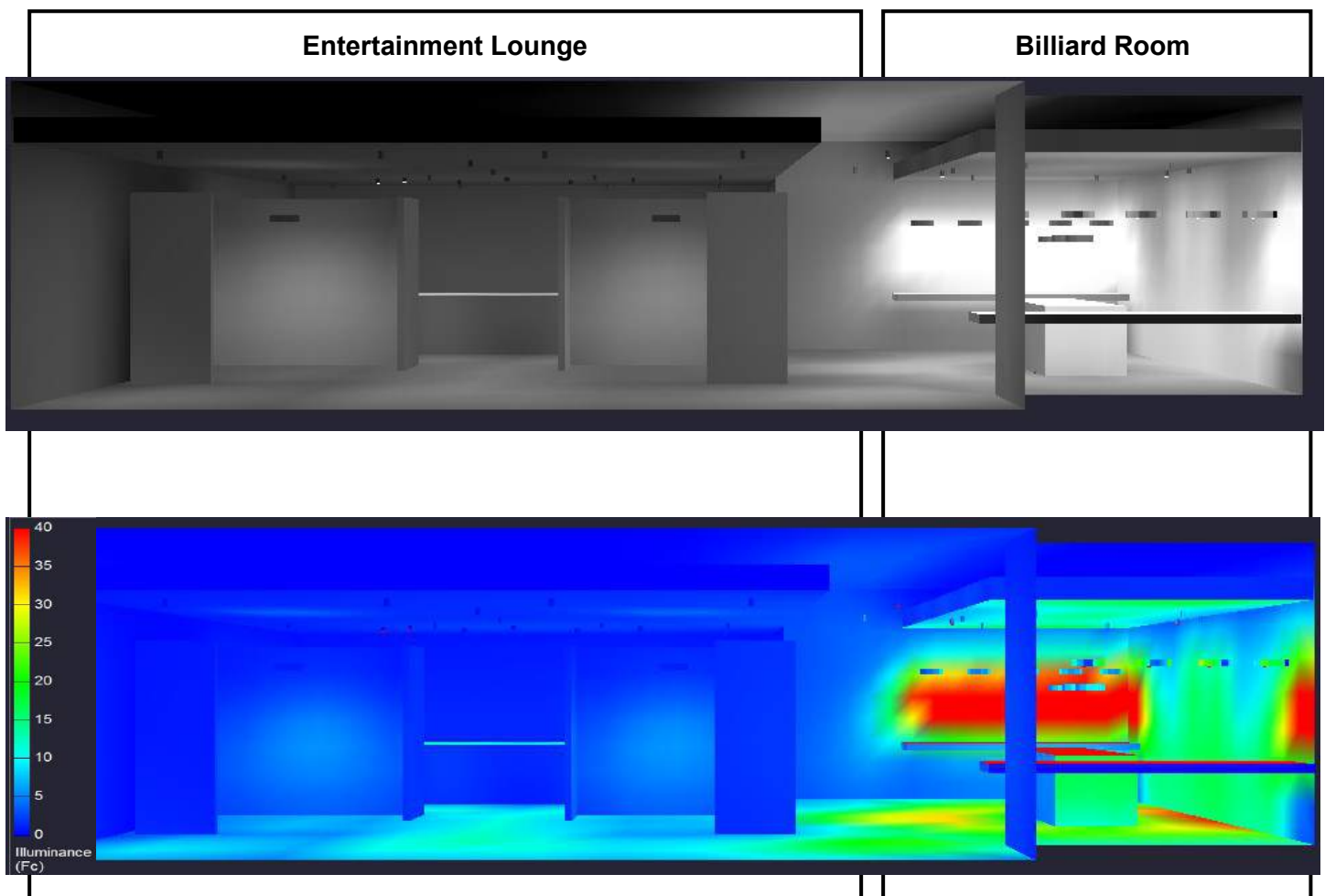


Figure 33 | Special Purpose Space AGi32 Renderings

| Design Criteria + Considerations

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

The design criteria and considerations can represent the assessment through *quantitative* data, as well as through *qualitative* desires, such as the aesthetic appeal of a space. Both criterion methods will be based off of design guidelines provided by the Illuminating Engineering Society (IES) Lighting Handbook and ASHRAE 90.1 2007. A summary of the main design criteria points for the Special Purpose Space listed below.

| Quantitative Criteria

Illuminance:

The values found in Table 17, represent the recommended illuminance design criteria (measured in lux) by the IES Lighting Handbook for the Kitchen, E-Lounge, and Billiard Room. Though these illuminance values are used as a *recommendation* rather than a *requirement*, they are important to achieve in order to fulfill the functions and tasks of the space properly. However, the tasks within this area are mainly used for social gathering purposes. These spaces will be designed based on the how the space has achieved it's *psychological* impression, rather than it's illuminance levels.

Table 17 | Illuminance Requirements - Kitchen + E-Lounge + Billiard Room

Space	Application/Task	E horizontal (lux)	E vertical (lux)	Eh (avg) : Eh (min)
Display Kitchen	Lounge: Reading/Work Areas	150	50	-
E-Lounge	Lounge: Social/Waiting Area	40	15	2:1
Billiard Room	Lounge: Game Room	40	15	4:1
Corridor	Circulation: General, Day	100	30	4:1
	Circulation: General, Night	50	20	

Lighting Power Density:

The lighting power density (LPD) was determined using ASHRAE 90.1 2007 standards. The LPD is defined as the allowable watts/square foot for all spaces in the building. This can be calculated using a space-by-space method, or by building type. The LPDs calculated for Eastside III used the space-by-space method. A summary of the Special Purposes Spaces' lighting power density can be found in Table 18. The redesign of these should exceed ASHRAE 2007 standards and comply with ASHRAE 90.1 2013 in order to achieve Eastside III's sustainability goal of LEED Gold.

Table 18 | Lighting Power Density - Kitchen + E-Lounge + Billiard Room

Space	Space Description	Allowance (W/SF)
Display Kitchen + E-Lounge + Billiard Room	Lounge/Recreation	1.2

| Design Criteria + Considerations

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

| Qualitative Criteria

Psychological Impression:

The impressions gathered in these spaces contribute to the driving concept that will be later discussed in the lighting re-design of the Kitchen, E-Lounge and Billiard Room. The psychological intent will outweigh the quantitative criteria designed for in this space. The concept of *public versus private* spaces will be introduced with a new lighting and material layout. Instead of focusing on one psychological impression, the impression of both public and private will be accomplished through the use of controls to cater to different events and functions of this *public* space within Eastside III.

Glare:

Glare can be achieved through excess sun exposure and/or from the fixtures. It is important to analyze the effect the lighting is having on custom fixtures and sculptures with specular reflective surfaces, like the piece over the Kitchen table, which can be seen on Page 37.

Controls:

The existing controls for the kitchen, entertainment lounge and billiard room are occupancy sensors. When the lighting re-design is analyzed, controls will need to be considered in order to achieve the psychological impressions mentioned previously.

Uniformity:

Uniformity should also be considered when *transitioning* between spaces within Eastside III. During a site visit on September 10, 2016, I noticed many of the common spaces on the first level to be abundant with daylight, while other areas had the opposite feeling. Though this type of psychological impression will be designed for within this space, uniformity must be analyzed to ensure proper illuminance levels for safe transitions.

| Design Criteria + Considerations

Special Purpose Space - Kitchen + E-Lounge + Billiard Room

The evaluation of each space will provide the comparison and contrast of the existing design and its relevance to the *quantitative* design criteria established for the space.

| Evaluation

The existing interior design and lighting design of the Kitchen, E-Lounge, and Billiard Room strongly contribute to the modern, industrial style that is common throughout Eastside III. I will study different material types, aesthetic design drivers, and luminaires as part of my lighting re-design and study of psychological impression.

When looking at the AGi32 calculation results of the existing fixtures, I found the levels to be much lower than what was recommended in the IES Handbook for the Kitchen's task and much higher results for the Billiard Room's task. My assumption of a working lounge for the Display Kitchen came after my site visit, where I found many Eastside III tenants working at the table on their laptops. However, as my re-design proposal mentions, the illuminance values are strictly *recommendations*, so the design intention for these spaces could have branched from a different source or assumption. The high illuminance values calculated in the Billiard Room could have occurred due to the fixture assumptions made for the calculation. Since many of the fixtures in Eastside III are custom, assumptions had to be made based on size and wattage of the fixtures.

The re-design of the space will also be designed to meet appropriate recommendations from the IES Lighting Handbook and ASHRAE 90.1 2013 standards. According to the Lighting Power Density evaluation documented in Table 18, the Kitchen, E-Lounge and Billiard Room all comply with energy codes, as seen below.

Existing Lighting Power Density | Special Purpose Space

- ASHRAE 2007 Allowance for Lobby = **1.2 W/SF**
- 1360 total W / 1250 total SF = **0.77 W/SF**



| Proposed Areas of Study

Large Work Space - Fitness Center + Yoga Room

Summary:

The Fitness Center and Yoga Room branch off from the public residential spaces mentioned previously as one walks through the first level. These spaces are adjacent to a daylight-exposed corridor to the exterior center courtyard, which will be analyzed as part of the outdoor lighting redesign. The existing materials and feel of the fitness center are very dark and confined. I am proposing to create a psychological impression of *spaciousness* for the Fitness Center and the impression of *relaxation* for the Yoga Room.

Dimensions:

Fitness Center

- Area - 1,350 sf
- Height - 13'-0"

Yoga Room

- Area - 590 sf
- Height - 13'-0"

Courtyard Corridor

- Area - 630 sf
- Height - 10'-6"

Tasks + Activities:

The primary functions of the fitness center and yoga room are to perform general exercise tasks along with serving circulation purposes.



Figure 34 | Fitness Center + Yoga Room (courtesy of PJ Dick)

| Proposed Areas of Study

Large Work Space - Fitness Center + Yoga Room

Location + Drawings:

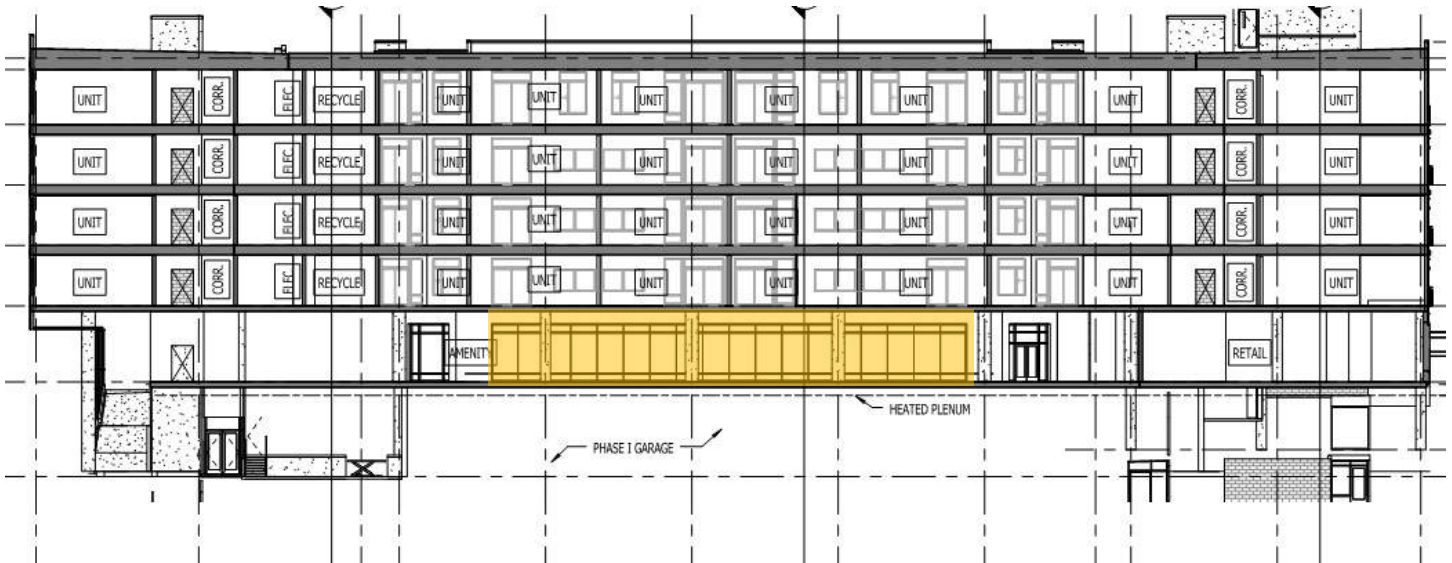


Figure 35 | E/W Building Section - Fitness Center + Yoga Room

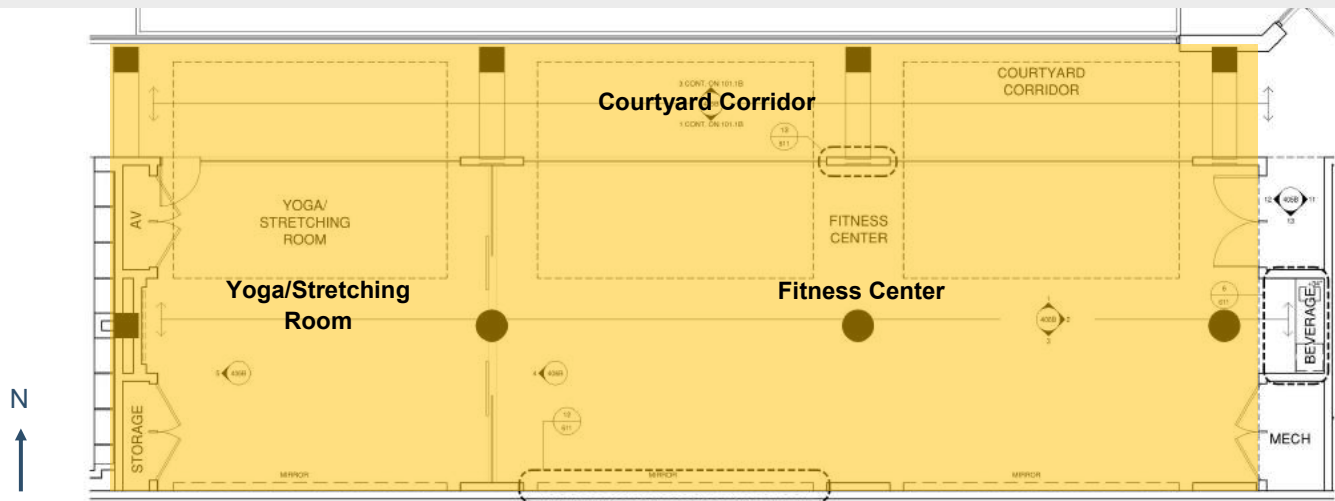
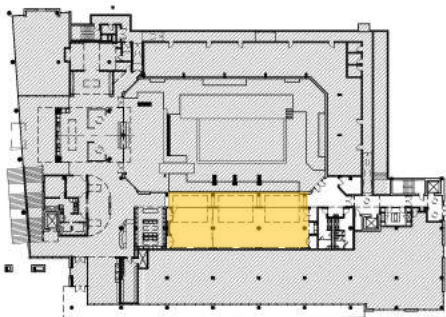


Figure 36 | Level 1 Floor Plan - Fitness Center + Yoga Room



Level 1 Key Plan

| Existing Materials

Large Work Space - Fitness Center + Yoga Room

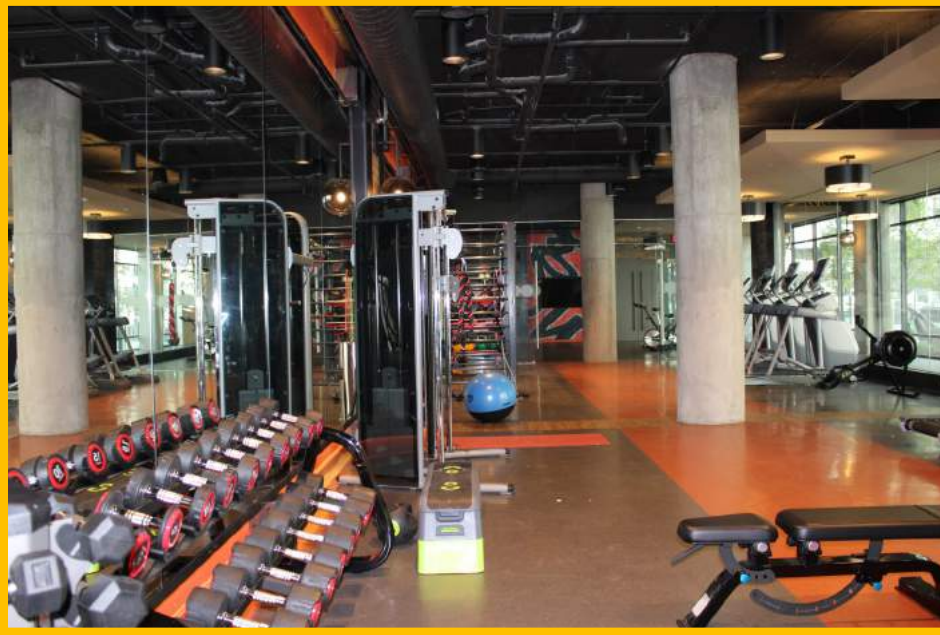


Figure 37 | Fitness Center View 1

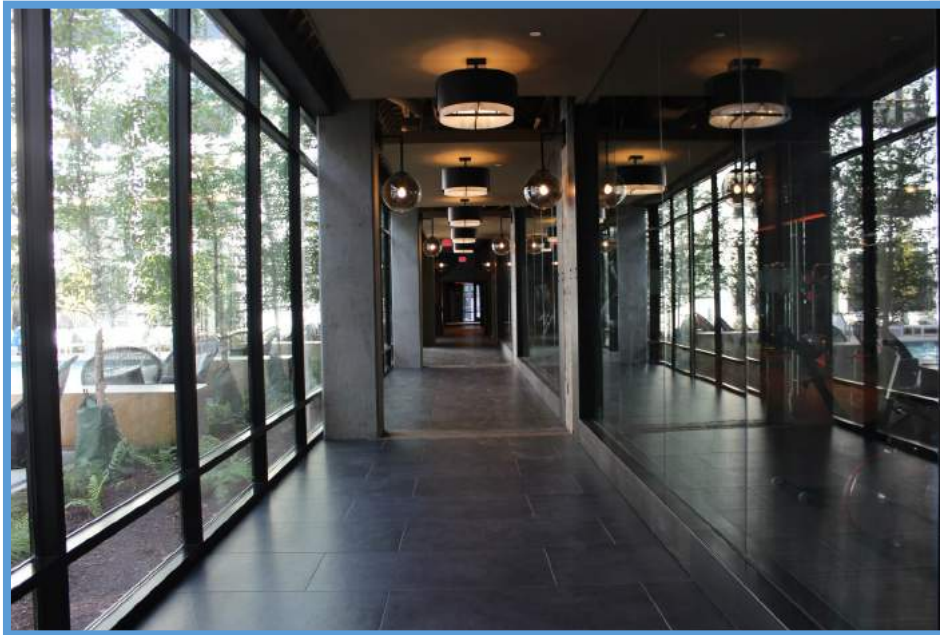
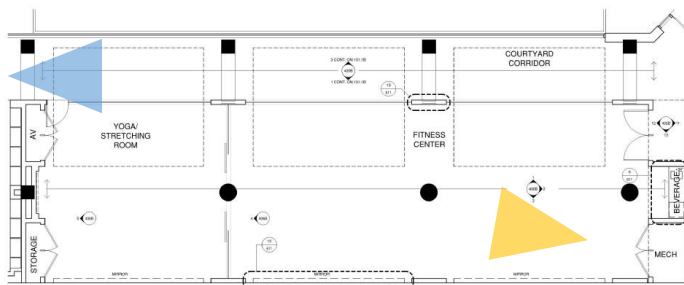


Figure 38 | Fitness Center View 2



Views 1 + 2 Key Plan

Materials:

The materials within the Fitness Center and Yoga Room follow the same color palette and overall style of the other Eastside III common spaces. One of the main differences found, is the introduction to specular materials such as vinyl flooring and mirror-covered walls.

| Existing Materials

Large Work Space - Fitness Center + Yoga Room

Materials:

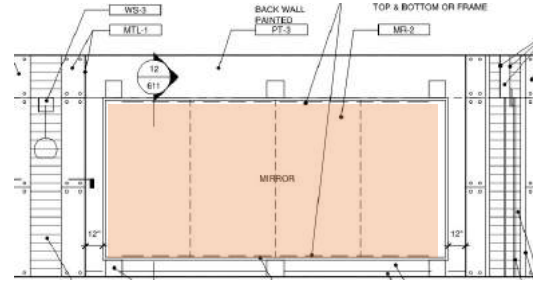
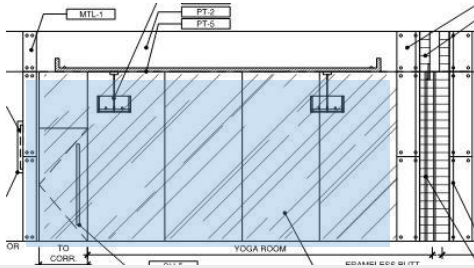


Table 19 | Material Specifications - Fitness Center + Yoga Room

Space	Surface Type	Symbol Color	Description	Material Type	Manufacturer	Color	Product Name	Reflectance
Corridor	Floor		Ceramic Tile	T-1	Mosaic Tile Co	Matte Black	Evolve Collection	0.03
	Ceiling		Painted GWB	PT-5	Sherwin Williams	Tan	Eco Spec, SW6102 Portabello	0.21
	Exposed Ceiling		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
	Exterior Glazing		Glass	Low-E Glass	Guardian Glass	70/36 + IS-20	ClimaGuard 70/36	0.68 (trans)
Fitness Center	Floor		Vinyl	VF-2	Capri Cork	Red	Sequel, Geranium	0.4
				VF-3		Black	Sequel, Ebony	0.1
	Ceiling		Painted GWB	PT-5	Sherwin Williams	Tan	Eco Spec, SW6102 Portabello	0.21
	Exposed Ceiling		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
	Concrete Columns		Concrete	CON-3	by GC (PJ Dick)	Grey	Raw Concrete	0.3
	Interior Glazing		Frameless Butt Joint Glass	GL-1	by GC (PJ Dick)	Clear	Tempered Glass, 5/16"	0.78
	Walls		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
			Mirrored Covered	MR-2	-	-	-	0.95
Yoga Room	Floor		Wood Floor	WF-1	Building Salvage Specialist	Oak, Grey	Horse Country Oak	0.4
	Ceiling		Painted GWB	PT-5	Sherwin Williams	Tan	Eco Spec, SW6102 Portabello	0.21
	Exposed Ceiling		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
	Concrete Columns		Concrete	CON-3	by GC (PJ Dick)	Grey	Raw Concrete	0.3
	Interior Glazing		Frameless Butt Joint Glass	GL-1	by GC (PJ Dick)	Clear	Tempered Glass, 5/16"	0.78
	Walls		Painted GWB	PT-2	Benjamin Moore	Black	Ultra Spec 500, 2128-10 Black Beauty	0.05
			Mirrored Covered	MR-2	-	-	-	0.95

| Existing Lighting Equipment

Large Work Space - Fitness Center + Yoga Room

Existing Lighting:

The existing lighting within the fitness center compliments its interior materials. The use of surface mounted fixtures from the drop ceiling creates a focal point within the space, as well as mimics the custom luminaire design found in the adjacent corridor. General lighting and wall grazing are also shown in the Fitness Center and Yoga Room.

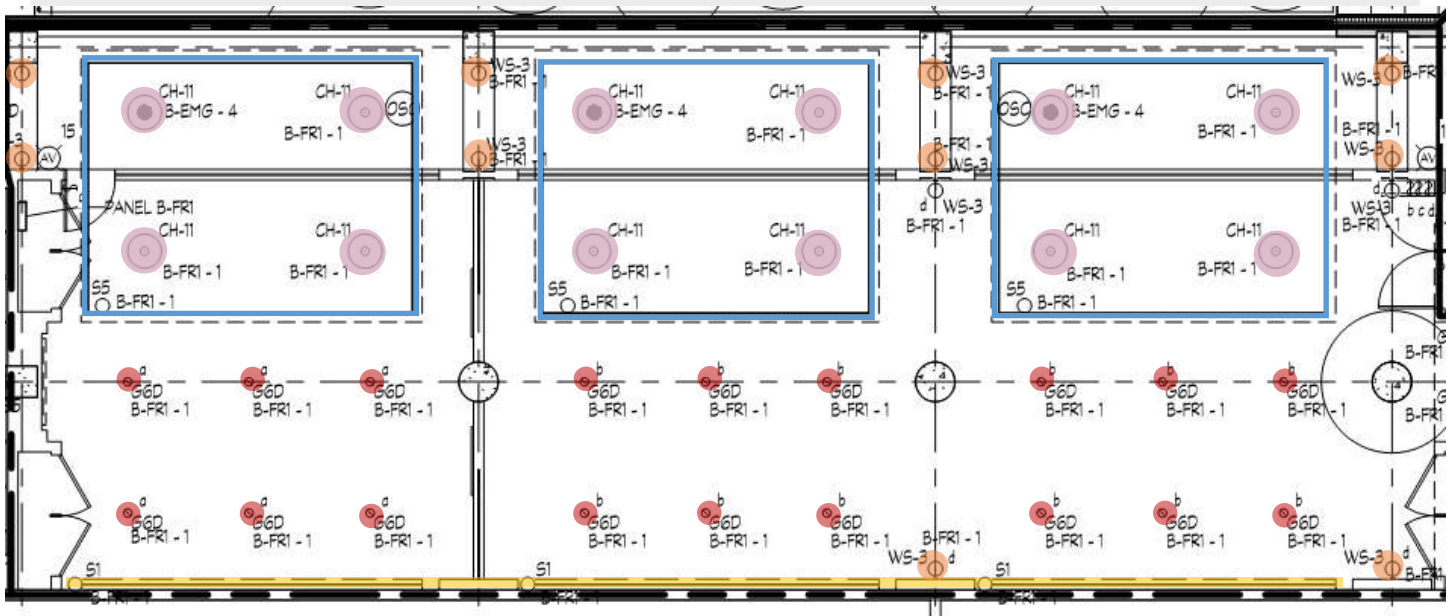
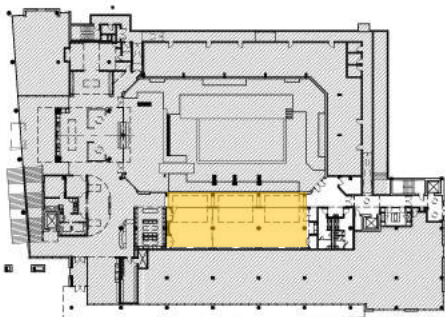


Figure 39 | Level 1 Lighting Layout - Kitchen + E-Lounge















Level 1 Key Plan

| Existing Lighting Equipment

Large Work Space - Fitness Center + Yoga Room



Table 20 | Luminaire Schedule - Fitness Center + Yoga Room

Space	Fixture Type	Symbol	#	Description	Manufacturer	Catalog #	Mounting	Lamp	Voltage
Corridor	CH11		6	Chandelier, Black Metal Ring Frosted Acrylic Shade, Hold 4 Bulbs	Project Light	Custom	8'-0" AFF	(4) E12-9 W CFL-TCP 10709C	120 V
	WS3		8	Wall Sconce, Glass Oval Shade with Mirrored Shade Pendant and Metal Stem	Project Light	Custom	7'-0" AFF	(1) E26-23W CFL-TCP 1G3023	120 V
	S5		47 LF	Flexible LED Module String	Ecosense	-	-	3.5 W/LF, 2700K	120 V
Fitness Center	G6D		12	3" Adjustable Mini Cylinder, Black, Medium Flood Beam	Juno Lighting	TL114G2-N-S-BL BLTL540U-BL	-	6 W, 3000K	120 V
	CH11		4	Chandelier, Black Metal Ring Frosted Acrylic Shade, Hold 4 Bulbs	Project Light	Custom	8'-0" AFF	(4) E12-9 W CFL-TCP 10709C	120 V
	WS3		4	Wall Sconce, Glass Oval Shade with Mirrored Shade Pendant and Metal Stem	Project Light	Custom	7'-0" AFF	(1) E26-23W CFL-TCP 1G3023	120 V
	S1		20 LF	24 Volt LED Tape (Signage and Under Counter Tops)	-	-	-	4 W/LF	120 V
	S5		25 LF	Flexible LED Module String	Ecosense	-	-	3.5 W/LF, 2700K	120 V
Yoga Room	G6D		6	3" Adjustable Mini Cylinder, Black, Medium Flood Beam	Juno Lighting	TL114G2-N-S-BL BLTL540U-BL	-	6 W, 3000K	120 V
	CH11		2	Chandelier, Black Metal Ring Frosted Acrylic Shade, Hold 4 Bulbs	Project Light	Custom	8'-0" AFF	(4) E12-9 W CFL-TCP 10709C	120 V
	S1		10 LF	24 Volt LED Tape (Signage and Under Counter Tops)	-	-	-	4 W/LF	120 V
	S5		17.5 LF	Flexible LED Module String	Ecosense	-	-	3.5 W/LF, 2700K	120 V

| Existing Lighting Equipment

Large Work Space - Fitness Center + Yoga Room

The existing illuminance values of the Large Work Space was assessed using AGi32. Illuminance levels were analyzed and compared to recommendations provided by the IES Lighting Handbook, as well as Lighting Power Density standards provided by ASHRAE 90.1 2007, which can be seen in Tables 21-22. The existing illuminance levels can be seen in Figure 40 below.

The following assumptions were made in order to perform the lighting calculations:

- Light Loss Factor for LED fixtures = 0.85
- Light Loss Factor for Compact Fluorescent fixtures = 0.7

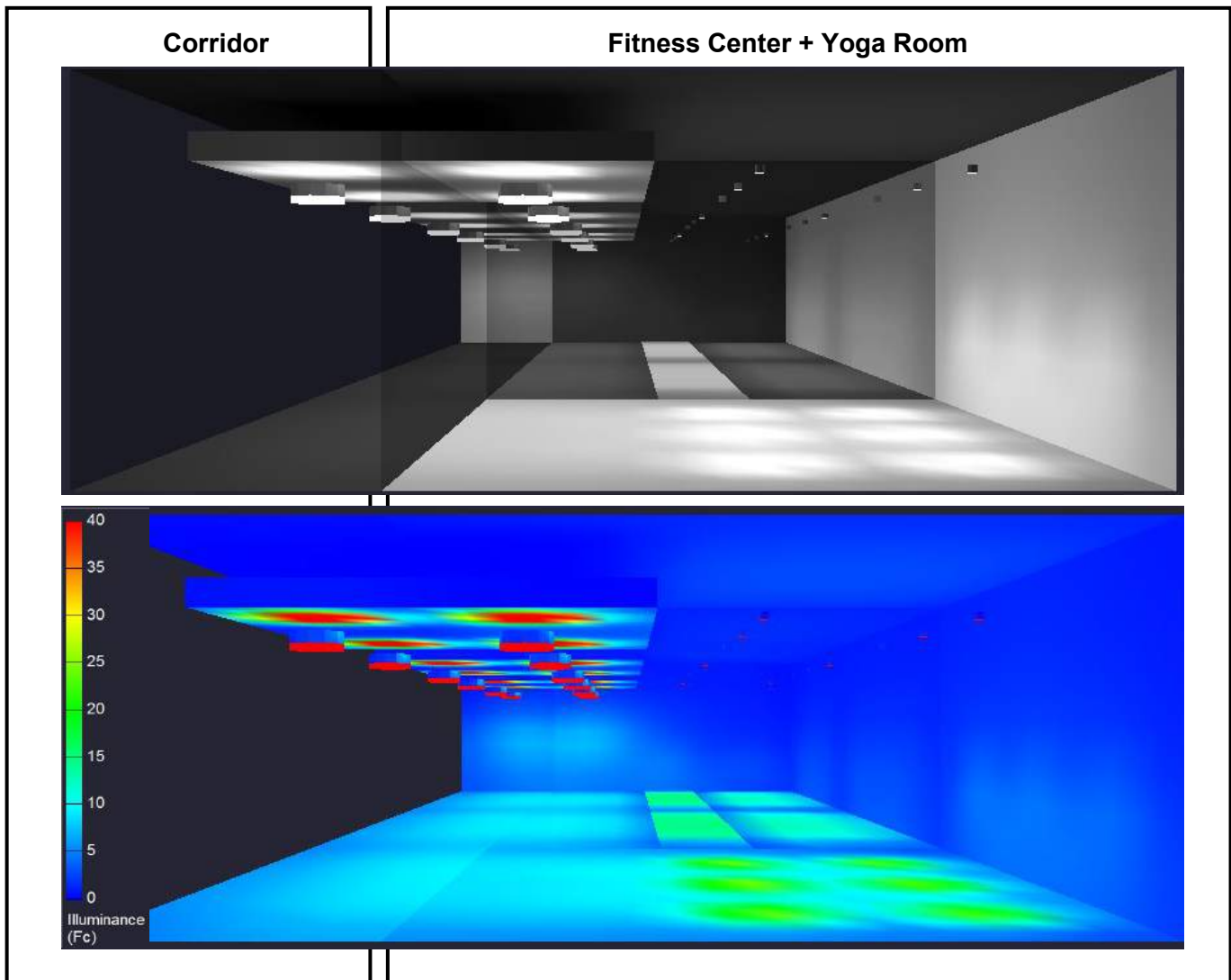


Figure 40 | Large Work Space AGi32 Renderings

| Design Criteria + Considerations

Large Work Space - Fitness Center + Yoga Room

The design criteria and considerations can represent the assessment through *quantitative* data, as well as through *qualitative* desires, such as the aesthetic appeal of a space. Both criterion methods will be based off of design guidelines provided by the Illuminating Engineering Society (IES) Lighting Handbook and ASHRAE 90.1 2007. A summary of the main design criteria points for the Fitness Center and Yoga Room.

| Quantitative Criteria

Illuminance + Uniformity Requirements:

The values found in Table 21, represent the recommended illuminance design criteria (measured in lux) by the IES Lighting Handbook for the Fitness Center and Yoga Room. Though these illuminance values are used as a *recommendation* rather than a *requirement*, they are important to achieve depending on the task within the space. Since this space exercise use, the importance of achieving the uniformity ratio recommended in Table 21 is an important factor. Another important consideration in the Fitness Center and the Yoga room is the psychological impressions of the space. Due to the exercise activity within the Fitness Center, IES illuminance values should be met. However, the illuminance values for the Yoga Room should be analyzed to deliver a uniform design in order to achieve a *relaxed* feeling in the space, rather than simply meet illuminance levels.

Table 21 | Illuminance Requirements - Fitness Center + Yoga Room

Space	Application/Task	E horizontal (lux)	E vertical (lux)	Eh (avg) : Eh (min)
Fitness Center	Fitness Center: Aerobics	150	40	3:1
	Fitness Center: Strength Training	400	150	3:1
Yoga Room	Fitness Center: Group Exercise	300	100	3:1
Corridor	Circulation: General, Day	100	30	4:1
	Circulation: General, Night	50	20	

Lighting Power Density:

The lighting power density (LPD) was determined using ASHRAE 90.1 2007 standards. The LPD is defined as the allowable watts/square foot for all spaces in the building. This can be calculated using a space-by-space method, or by building type. The LPDs calculated for Eastside III used the space-by-space method. Below is a summary of the Fitness Center + Yoga Room's lighting power density. The redesign of this space should exceed ASHRAE 2007 standards and comply with ASHRAE 90.1 2013 in order to achieve Eastside III's sustainability goal of LEED Gold.

| Design Criteria + Considerations

Large Work Space - Fitness Center + Yoga Room

Table 22 | Lighting Power Density Lower - Fitness Center + Yoga Room

Space	Space Description	Allowance (W/SF)
Fitness Center + Yoga Room	Fitness Area	1.2
Corridor	Corridor/Transition	0.5

| Qualitative Criteria

Controls:

The existing lighting in the Fitness Center and Yoga Room are controlled by switches, and there are occupancy sensors in the adjacent corridor. The space's controls should be further analyzed to create a more efficient design when the room is unoccupied, by installing vacancy sensors, for example. In spaces like the Yoga Room, where a relaxed feeling may be desired, occupant controls should be accessible to dim and control the different layers of light.

Glare:

Glare can be achieved through excess sun exposure and/or from the fixtures. In this space, since the glazing is North facing, direct solar glare should not be an issue. However, potential glare from fixtures could cause problems with highly reflective surfaces, like the wall-mounted mirrors in the space. Fixture placement and their form factors should be further assessed in order to reduce any potential glare issues from the electric lighting.

Sustainability:

Eastside III's project goal is to achieve LEED Gold rating under LEED for Homes 2009. The following design features within the Fitness Center and Yoga Room contribute to this LEED certification:

- Thermally insulated glazing - the thermally insulated glazing for the new window system will reduce the amount of heat gain within the building from natural daylighting.
- LED lighting - most energy-efficient lighting technologies
- Low-emitting materials - used materials with low VOC levels

Uniformity:

The purpose of uniformity is to deter from visual distractions in order to achieve the task of the space. In this case, where the main task is for exercise, the uniformity should be considered and designed to meet recommendations giving by the IES Lighting Handbook, for functionality and safety purposes. The transition area should also be analyzed with the psychological impression of relaxation being introduced to the Yoga Room, since it will be directly next to an area that requires high illuminance levels for exercise.

| Design Criteria + Considerations

Large Work Space - Fitness Center + Yoga Room

The evaluation of each space will provide the comparison and contrast of the existing design and its relevance to the *quantitative* design criteria established for the space.

| Evaluation

The aesthetics and existing lighting of the Fitness Center and Yoga Room continues the modern style through the building, leading guests to the residential areas and/or the Pool Courtyard.

When looking at the AGi32 calculation results of the existing fixtures, I noticed many harsh reflections on the ground in the Yoga Room. This is an area that would need to be further studied, adjusting material reflectances and the lighting layout in order to achieve the psychological impression of *relaxation*.

The re-design of the space will also be designed to meet appropriate recommendations from the IES Lighting Handbook and ASHRAE 90.1 2013 standards. According to the Lighting Power Density evaluation documented in Table 18, the Kitchen, E-Lounge and Billiard Room all comply with energy codes, as seen below.

Existing Lighting Power Density | Fitness Center + Yoga Room

- ASHRAE 2007 Allowance for Lobby = **1.2 W/SF**
- 1360 total W / 1250 total SF = **0.19 W/SF**



Existing Lighting Power Density | Corridor

- ASHRAE 2007 Allowance for Lobby = **0.5 W/SF**
- 1360 total W / 1250 total SF = **0.35 W/SF**



| Proposed Areas of Study

Outdoor Space - Pool Courtyard

Summary:

The outdoor Pool Courtyard space is accessible to all residents who live in the Eastside III building. Along with the pool itself, there are a variety of lounge areas which include outdoor fire pits, table and seating areas, and poolside lounging areas. The center courtyard space is broken up to give the feel of a private yet public space for the building's occupants.

Dimensions:

Pool Courtyard

- Area - 6,350 sf

Pool

- Area - 1,300 sf

Tasks + Activities:

The tasks within the courtyard are mainly circulation and lounging. The pool itself has the tasks of swimming for day and night occupancy.



Figure 41 | Pool Courtyard (courtesy of PJ Dick)

| Proposed Areas of Study

Outdoor Space - Pool Courtyard

Location + Drawings:

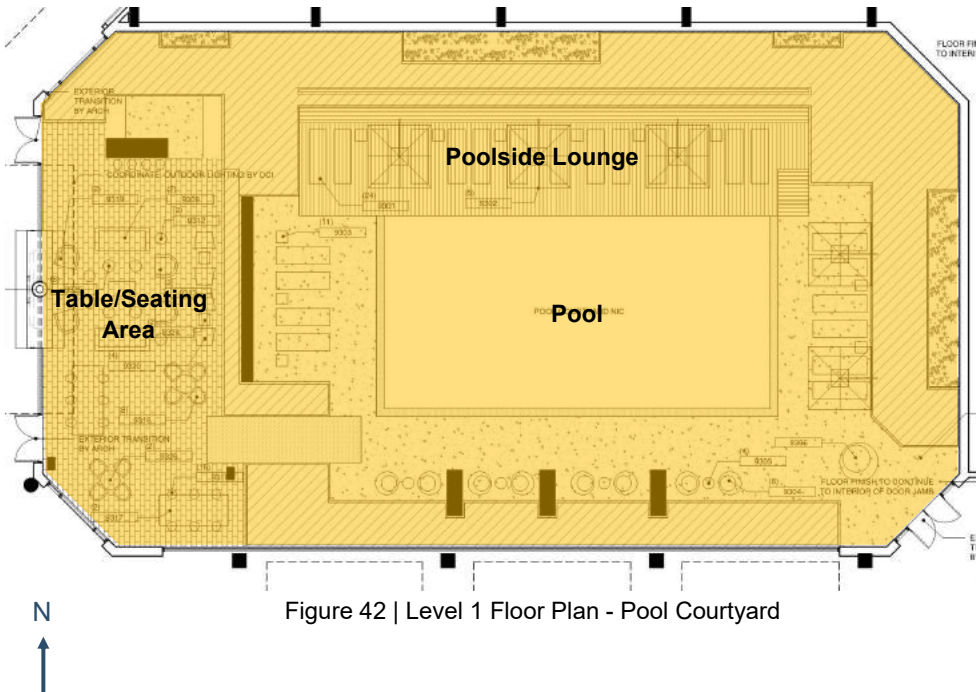


Figure 42 | Level 1 Floor Plan - Pool Courtyard

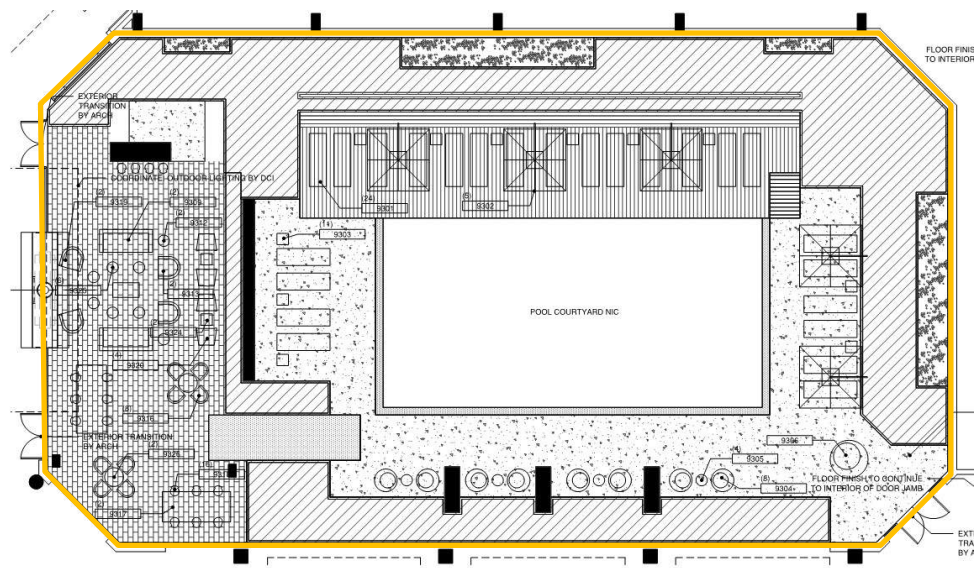
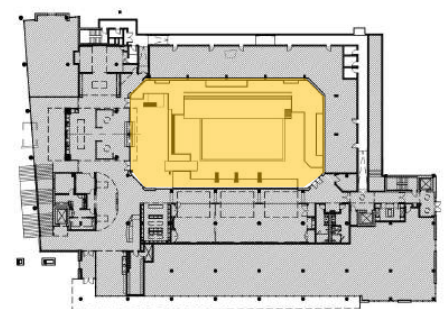


Figure 43 | Level 1 Furniture Plan - Pool Courtyard



Level 1 Key Plan

| Existing Materials

Outdoor Space - Pool Courtyard



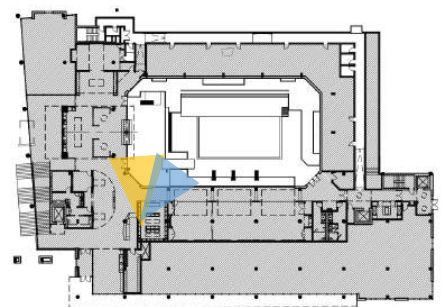
Figure 44 | Pool Courtyard View 1



Figure 45 | Pool Courtyard View 2

Materials:

The materials surrounding the pool vary from different concrete finishes for the flooring and brick accents, such as the water wall and space divider, as shown in Figures 5 and 6.



Views 1 + 2 Key Plan

| Existing Materials

Outdoor Space - Pool Courtyard

Materials:

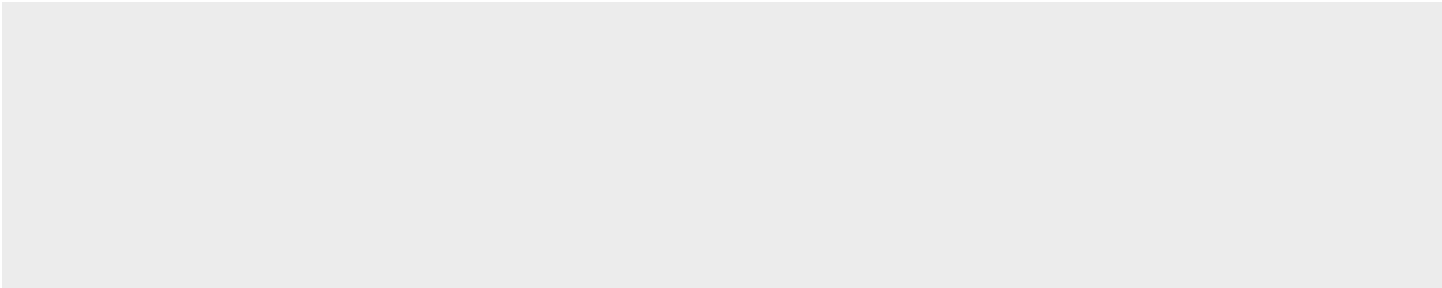
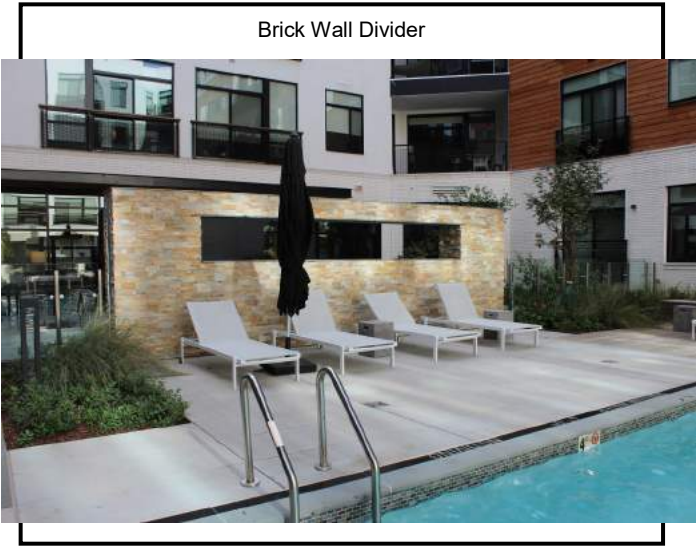
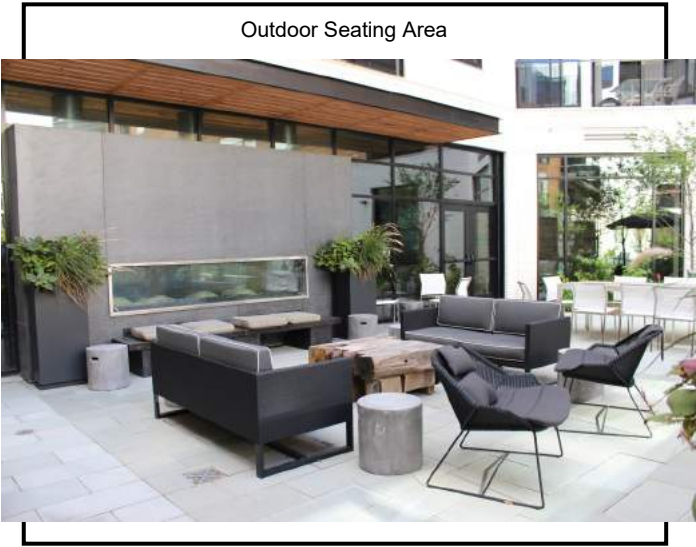


Table 23 | Material Specifications - Pool Courtyard

Space	Surface Type	Description	Material Type	Manufacturer	Color	Product Name	Reflectance
Poolside	Floors	Polished Concrete	CON-1	by GC (PJ Dick)	Grey	Stained Concrete, No Gloss	0.3
		Wood Floor	WF-1	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
Outdoor Seating	Floor	Multi-Colored Concrete Block	CON-1	by GC (PJ Dick)	Grey	Stained Concrete, No Gloss	0.5
	Ceiling	Wood Plank	WD-2	Building Salvage Specialist	Oak, Grey Face	Horse Country Oak	0.4
	Wall Divider	Brick	BR-1	L & L Supply Corporation	Aspen White (W804)	Engobe Series, Modular	0.7
	Glass Divider	Glass	GL-1	by GC (PJ Dick)	Clear	Tempered Glass, 5/16"	0.78

| Existing Lighting Equipment

Outdoor Space - Pool Courtyard

Existing Lighting:

The lighting for the Pool Courtyard is comprised of bollards and accent lighting onto the water wall between the poolside space and the outdoor gathering space.

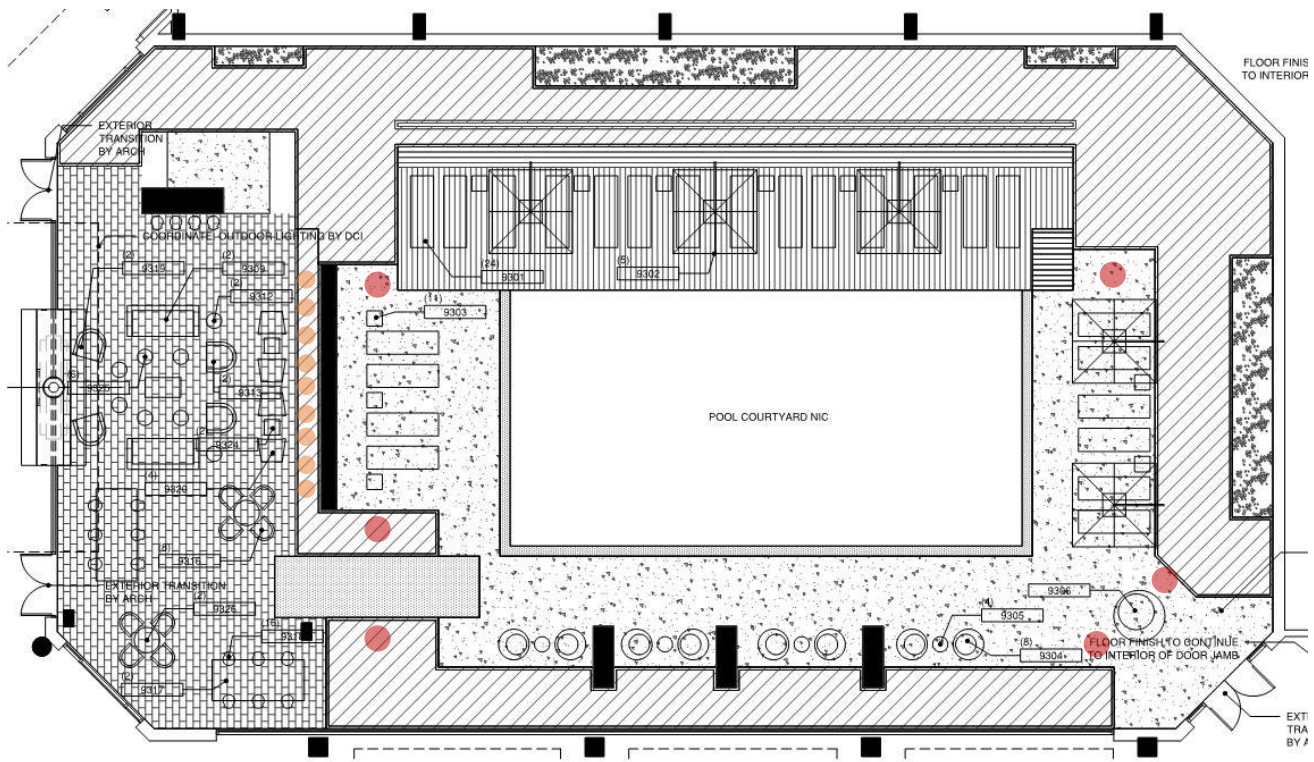


Figure 46 | Level 1 Lighting Layout - Pool Courtyard

Table 24 | Luminaire Schedule - Pool Courtyard

Space	Symbol	#	Description	Manufacturer	Catalog #	Mounting	Lamp	Voltage
Poolside	●	6	Outdoor Garden and Pathway Bollard	Bega	BGA-B77340	-	6W, 3000L	120 V
Outdoor Seating	●	9	LED In Grade Beam Wallwasher	Erco	Beamer Projector	In Grade	14W	120 V

| Design Criteria + Considerations

Outdoor Space - Pool Courtyard

The design criteria and considerations can represent the assessment through *quantitative* data, as well as through *qualitative* desires, such as the aesthetic appeal of a space. Both criterion methods will be based off of design guidelines provided by the Illuminating Engineering Society (IES) Lighting Handbook and ASHRAE 90.1 2007. A summary of the main design criteria points for the Fitness Center and Yoga Room.

| Quantitative Criteria

Illuminance:

The values found in Table 25, represent the recommended illuminance design criteria (measured in lux) by the IES Lighting Handbook for the outdoor Pool Courtyard. Though these illuminance values are used as a *recommendation* rather than a *requirement*, they are important to achieve depending on the task within the space. For safety purposes, it is important to achieve uniform levels for residents occupying the courtyard at night.

Table 25 | Illuminance Requirements - Pool Courtyard

Space	Application/Task	E horizontal (lux)	E vertical (lux)	Eh (avg) : Eh (min)
Poolside	Exterior Pool Deck: Low Activity, Moderate Ambient Light	1	0	3:1
Outdoor Seating	Exterior Social Area: Low Activity, Moderate Ambient Light	4	1	4:1

Lighting Power Density:

The lighting power density (LPD) was determined using ASHRAE 90.1 2007 standards. The LPD is defined as the allowable watts/square foot for all spaces in the building. This can be calculated using a space-by-space method, or by building type. The LPDs calculated for Eastside III used the space-by-space method. Below is a summary of the Pool Courtyard's power density. The redesign of this space should exceed ASHRAE 2007 standards and comply with ASHRAE 90.1 2013 in order to achieve Eastside III's sustainability goal of LEED Gold.

Table 26 | Lighting Power Density - Pool Courtyard

Space	Space Description	Allowance (W/SF)
Pool Courtyard	Building Grounds: Special Feature Area	0.2

| Design Criteria + Considerations

Outdoor Space - Pool Courtyard

| Qualitative Criteria

Glare:

Due to the high reflectance of water, glare should be considered in the outdoor courtyard, if the space is occupied at night.

Uniformity:

During nighttime occupancy, even illuminance levels must be achieved for the safety of the residents. The illuminance levels should also follow the IES recommendations due to the specific functionality and tasks of the courtyard.

| Evaluation

The re-design of the lighting in the Pool Courtyard will be designed to meet appropriate recommendations from the IES Lighting Handbook and ASHRAE 90.1 2013 standards. According to the Lighting Power Density evaluation documented in Table 26, Pool Courtyard all comply with energy codes, as seen below.

Existing Lighting Power Density | Pool Courtyard

- ASHRAE 2007 Allowance for Lobby = **0.2 W/SF**
- 1360 total W / 1250 total SF = **0.02 W/SF**



| References

The Following references were used throughout the extent of this Tech 1 Report:

ASHRAE Standard 90.1 - Energy Standard for Buildings Except Low-rise Residential Buildings. 2007th ed. ASHRAE, Print.

DiLaura, David, Kevin Houser, Richard Mistrick, and Gary Steffy. Illuminating Engineering Society *The Lighting Handbook*. 10th ed. IESNA, Print.