SHERRERD HALL

PRINCETON UNIVERSITY

JAMIE DEVENGER | THE PENNSYLVANIA STATE UNIVERSITY

LIGHTING SCHEMATIC DESIGN PRESENTATION | 12.09.2009

"LIGHT IS A CENTRAL THEME THROUGHOUT THE BUILDING. IT'S A KIND OF LANTERN, A LANTERN OF KNOWLEDGE AND CIRCULATION." FREDERICK FISHER

BUILDING STATS

SHERRERD HALL

SITE AND LOCATION	PRINCETON UNIVERSITY, NEW JERSEY
OCCUPANT	PRINCETON ORFE AND CITP DEPARTMENTS
SIZE	47,000 SQUARE FEET
LEVELS	4 (3 ABOVE GRADE)
DESIGN TEAM	
ARCHITECT	FREDERICK FISHER AND PARTNERS
LIGHTING DESIGNER	FISHER MARANTZ STONE
MEP ENGINEER	JOSEPH LORING ENGINEERS

ARCHITECT FREDERICK FISHER AND PARTNERS

PHILOSOPHY A BUILDING HAS A COLLAGE-LIKE NATURE AS AN

ASSEMBLAGE OF USE, MATERIAL, AND LIGHT

ARCHITECT FREDERICK FISHER AND PARTNERS

CONSIDERATIONS FOR SHERRERD HALL

INTERIOR AND EXTERIOR SPATIAL RELATIONSHIPS

MATERIALITY AND ENCLOSURE

TRANSPARENCY AND OPACITY

DAYLIGHT

OCCUPANCY TWO DEPARTMENTS

ORFE DEPARTMENT SCHOOL OF ENGINEERING AND APPLIED SCIENCE'S DEPARTMENT OF OPERATIONS RESEARCH AND FINANCIAL ENGINEERING

CITP CENTER FOR INFORMATION TECHNOLOGY POLICY BRINGS COMPUTER SCIENTISTS AND ENGINEERS TOGETHER WITH ECONOMISTS, SOCIOLOGISTS, AND LAWMAKERS TO ADDRESS SOCIETAL ISSUES ARISING FROM ADVANCES IN COMPUTER TECHNOLOGY

OCCUPANCY

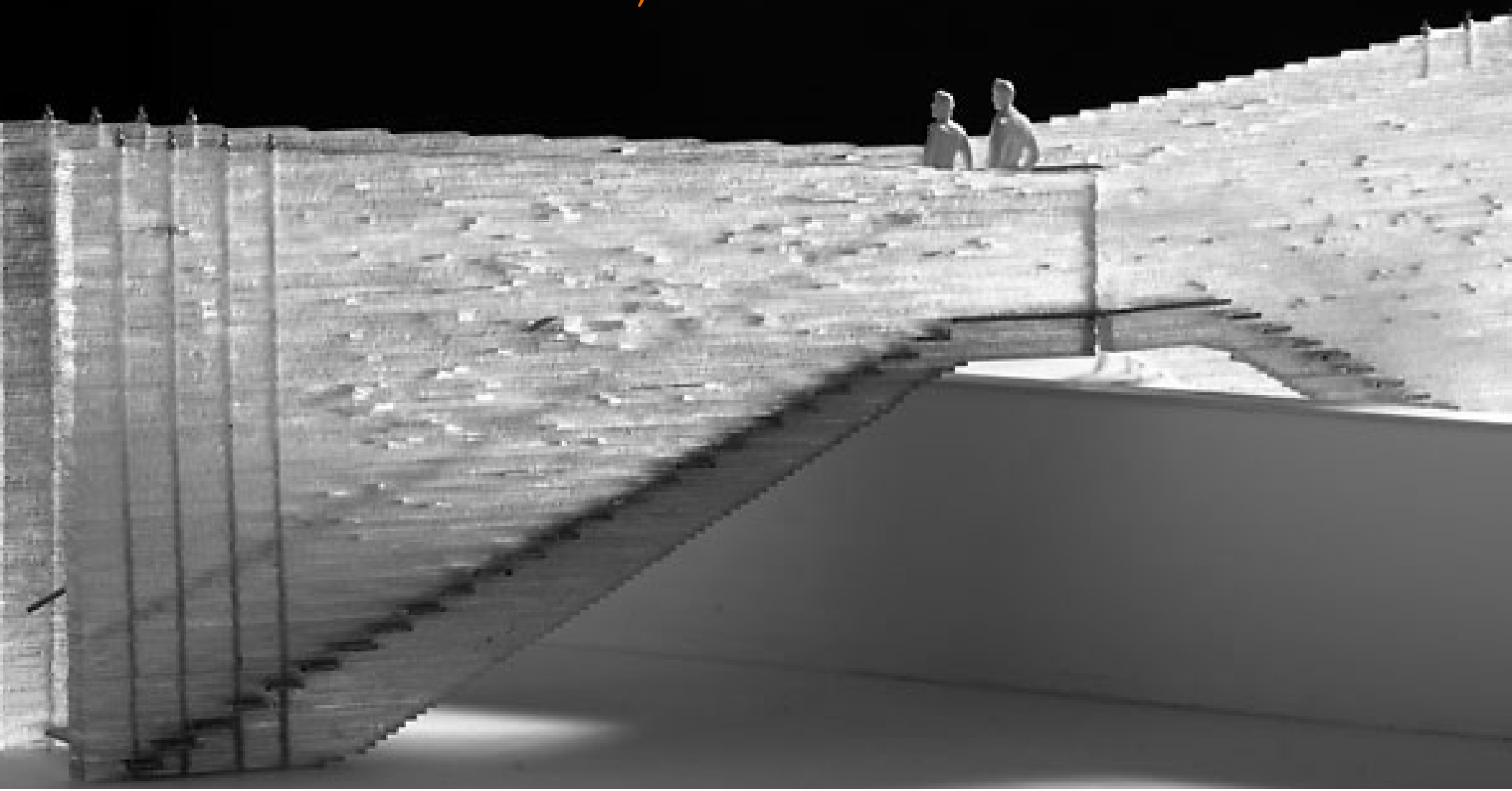
JOINING UNIQUE DISCIPLINES

"RESEARCH AND TEACHING AT SHERRERD HALL WILL CROSS DISCIPLINES...JAY SHERRERD LONG UNDERSTOOD THE VALUE OF COLLABORATION...AND HIS GIFT WILL PROVIDE US A PLACE FOR THESE INTERACTIONS TO FLOURISH."
PRESIDENT TILGHMAN

SITE

JOINING UNIQUE DISCIPLINES

"A BRIDGE BETWEEN SOCIAL SCIENCES AND ENGINEERING," FREDERICK FISHER



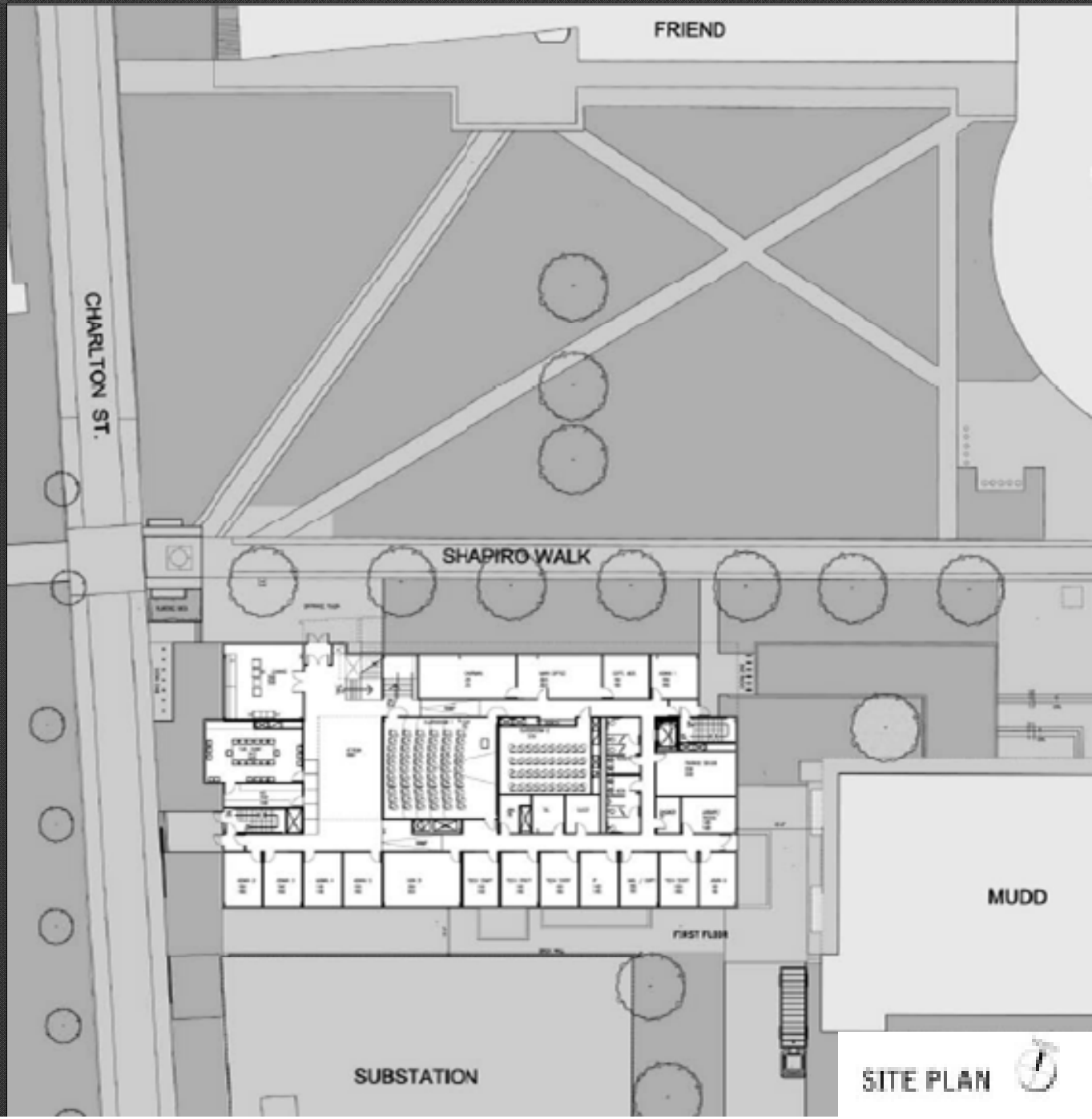
SITE

PRINCETON UNIVERSITY, NJ

PRINCETON CAMPUS

PRINCETON, NEW JERSEY

LOCATED ADJACENT TO SEVERAL OTHER DISTINCT CAMPUS BUILDINGS



SITE

PRINCETON UNIVERSITY, NJ

FRIEND CENTER

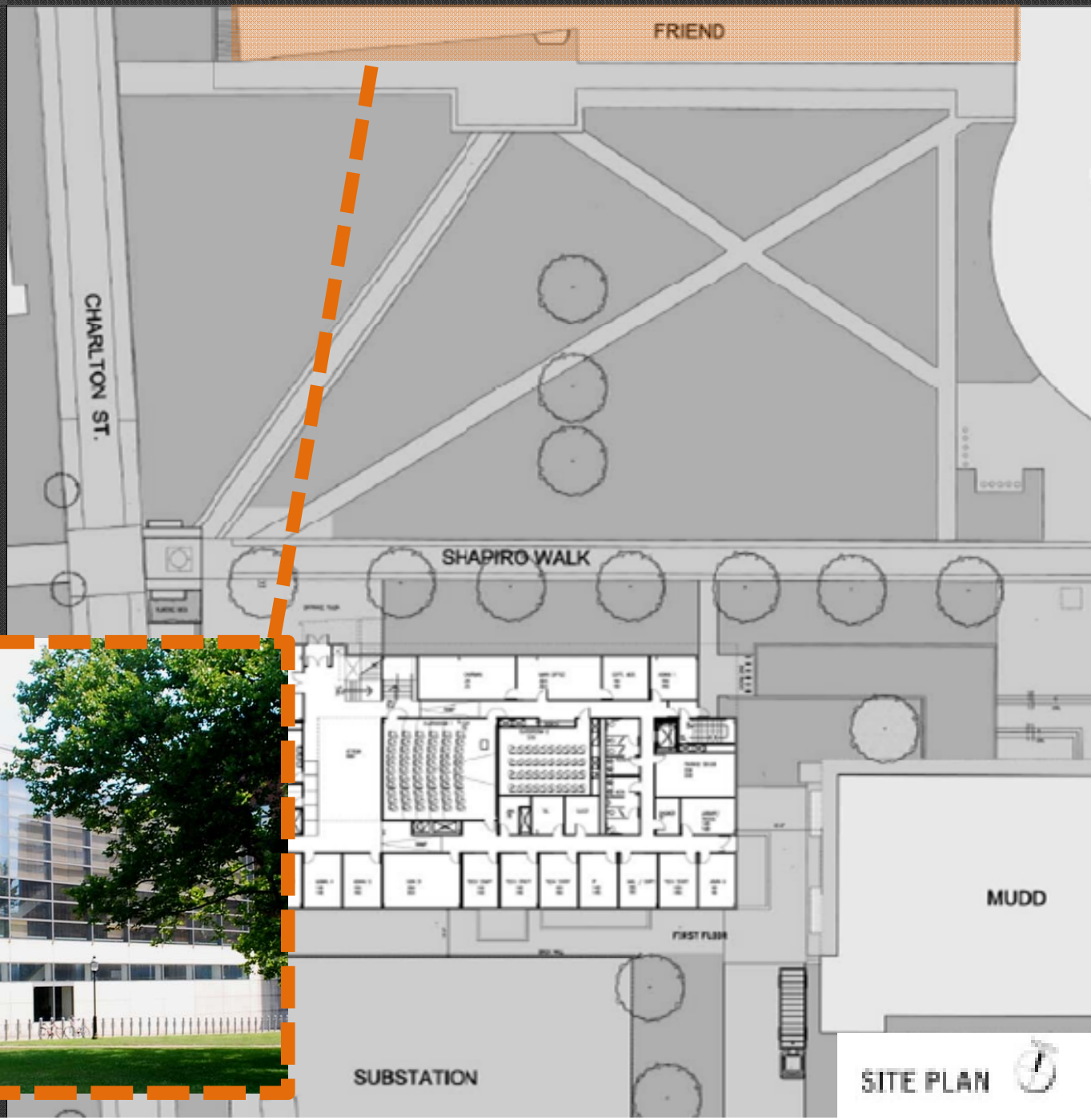
PEI COBB FREED & PARTNERS

CUES FOR SHERRERD HALL:

ORTHOGONAL, STRIPPED LOOK

HEIGHT AND PROPORTION

GLASS PANELS ON SHERRERD ECHO FRIEND CENTER WINDOWS



SITE

PRINCETON UNIVERSITY, NJ

MUDD LIBRARY

HUGH STUBBINS AND ASSOC.

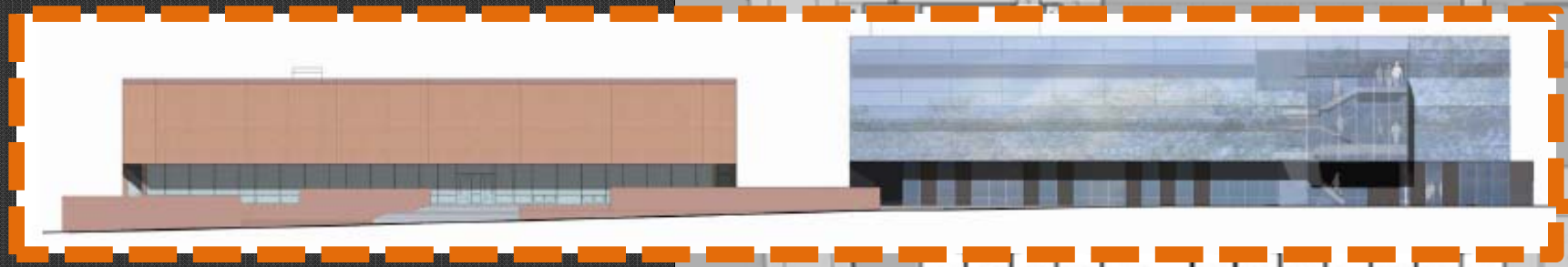
CUES FOR SHERRERD HALL:

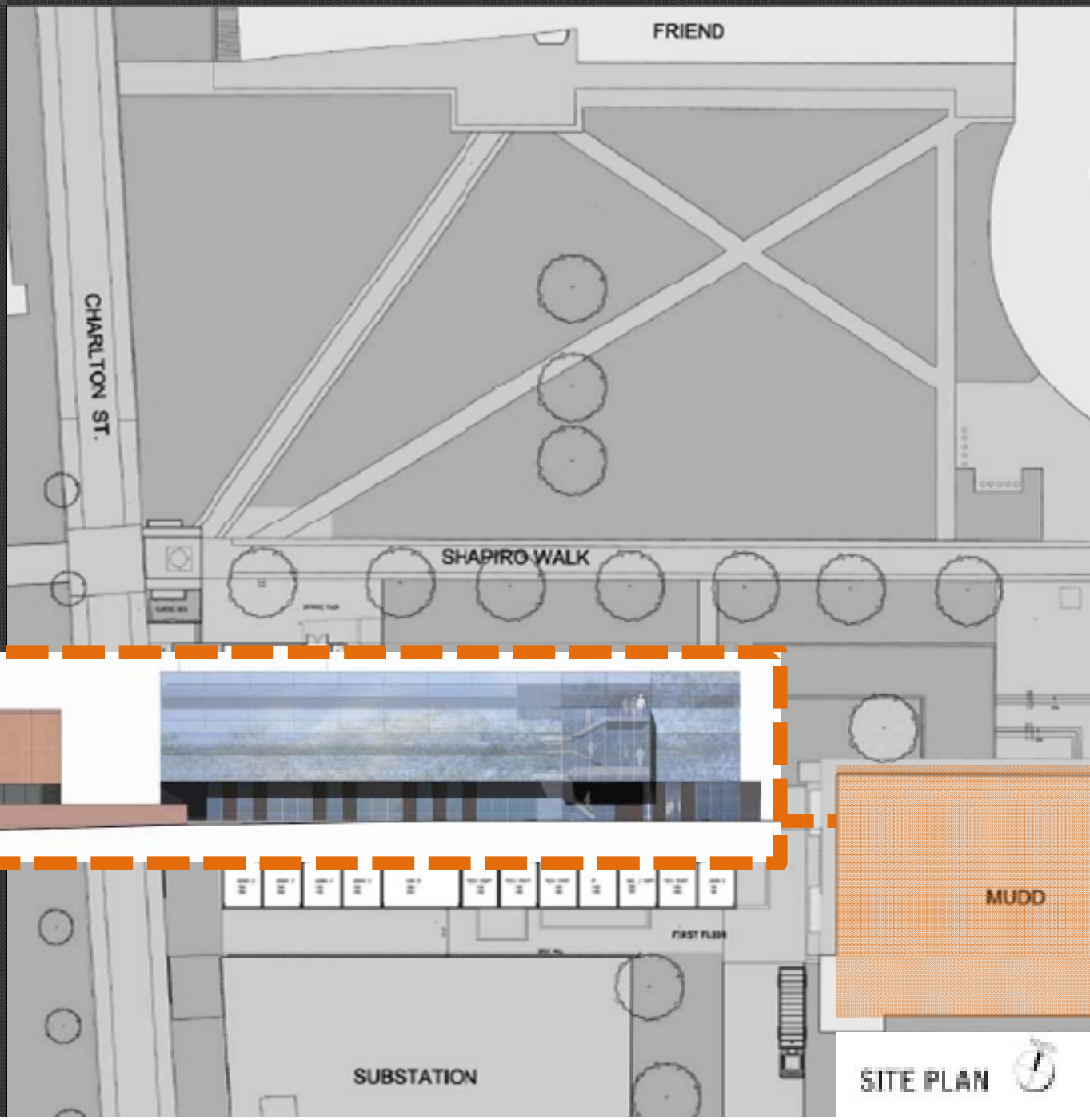
ORTHOGONAL, STRIPPED LOOK

HEIGHT AND PROPORTION

GLASS PANELS ON SHERRERD

ECHO BRICKS ON MUDD LIBRARY





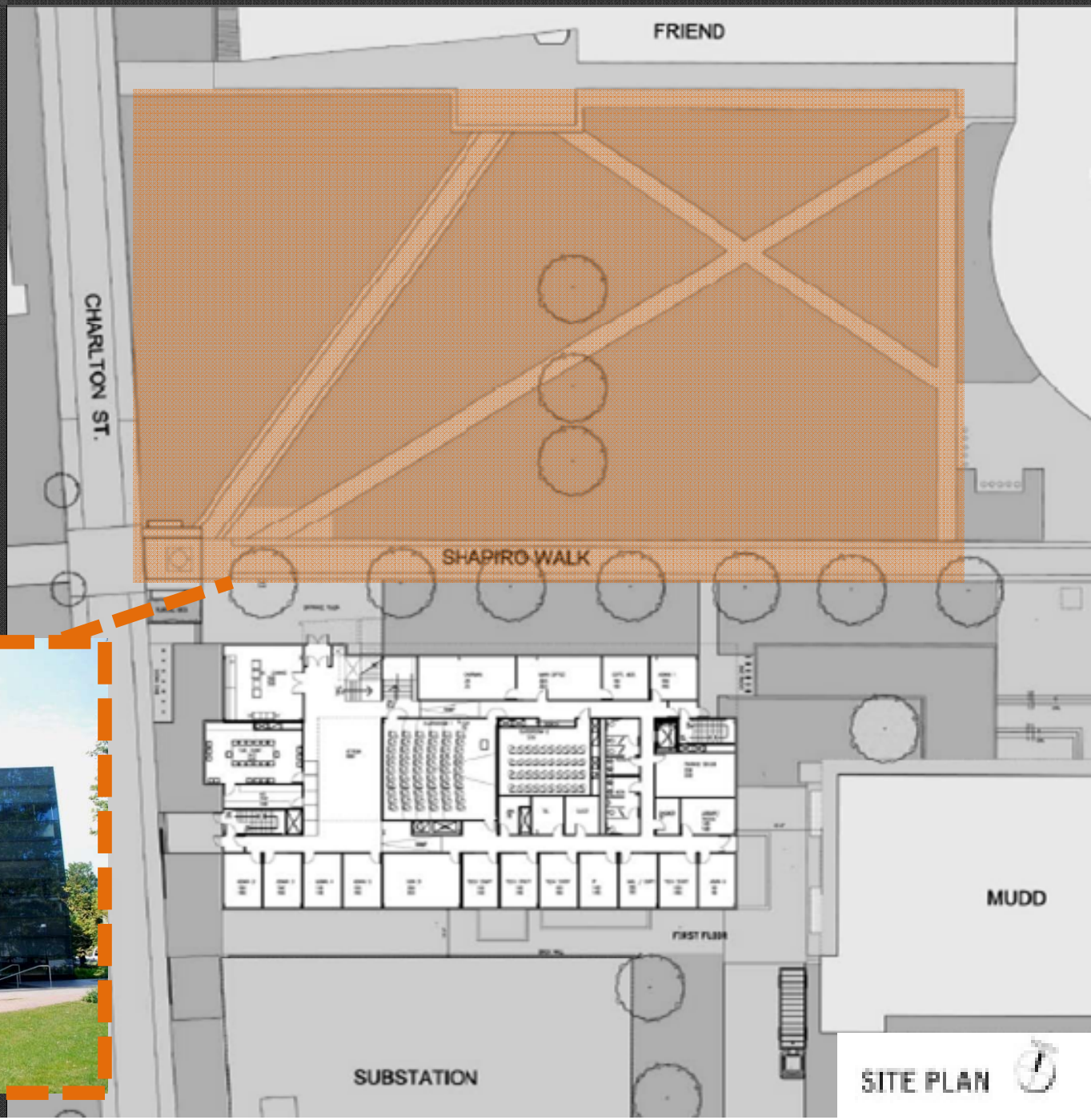
SITE

PRINCETON UNIVERSITY, NJ

SHAPIRO WALK AND QUADRANGLE

ESTABLISH A CONNECTION BETWEEN INTERIOR AND EXTERIOR

INTERSECTION OF PRIMARY CIRCULATION PATHS



LIGHTING DESIGN CONCEPTS

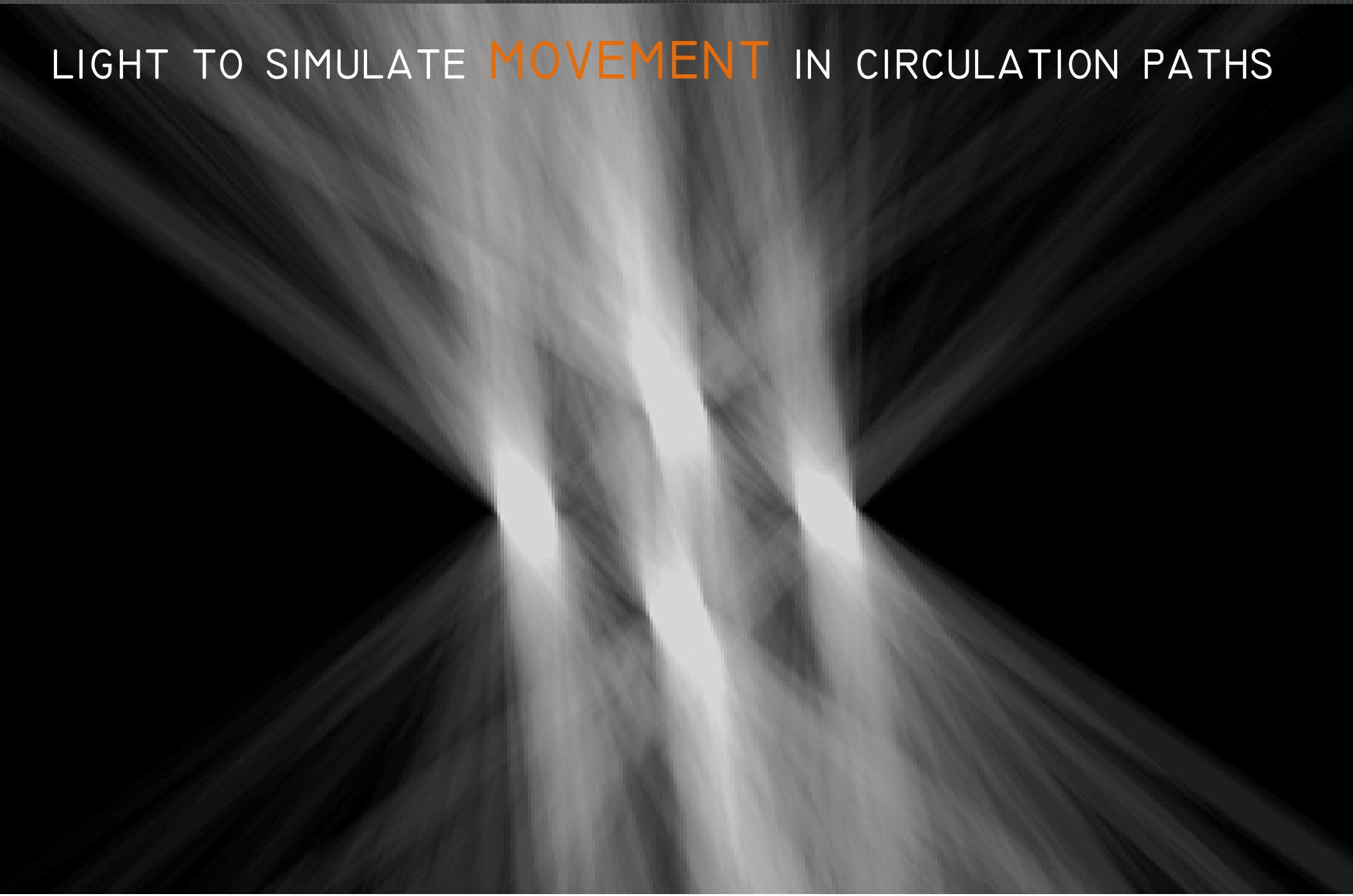
LIGHT AS A METAPHOR FOR KNOWLEDGE AND OPENNESS

LIGHTING DESIGN CONCEPTS

LIGHT FILTERED THROUGH TRANSPARENT AND TRANSLUCENT ENCLOSURES

LIGHTING DESIGN CONCEPTS

LIGHT TO SIMULATE MOVEMENT IN CIRCULATION PATHS



LIGHTING DESIGN CONCEPTS

EMPHASIZE HUMAN FORM BY CREATING SILHOUETTES WITH LIGHT AND MATERIALS

LIGHTING DESIGN FIVE SPACES

1. BUILDING NORTH FAÇADE
2. LOBBY/ATRIUM/STAIR
3. OPEN WORK SPACE
4. GRADUATE BULLPEN
5. LECTURE HALL

BUILDING FAÇADE

CONSTANTLY EVOLVING AESTHETIC

TRANSFER OF LIGHT THROUGH ENCLOSURE

BUILDING FAÇADE

ARCHITECTURAL CONCEPTS

+ GLASS ALLOWS FOR REFLECTION AND TRANSMISSION OF LIGHT
+ DIVERGING AESTHETIC FROM DAY TO NIGHT
+ REVERSAL OF LIGHT TRANSMISSION

BUILDING FAÇADE PHOTOGRAPHS

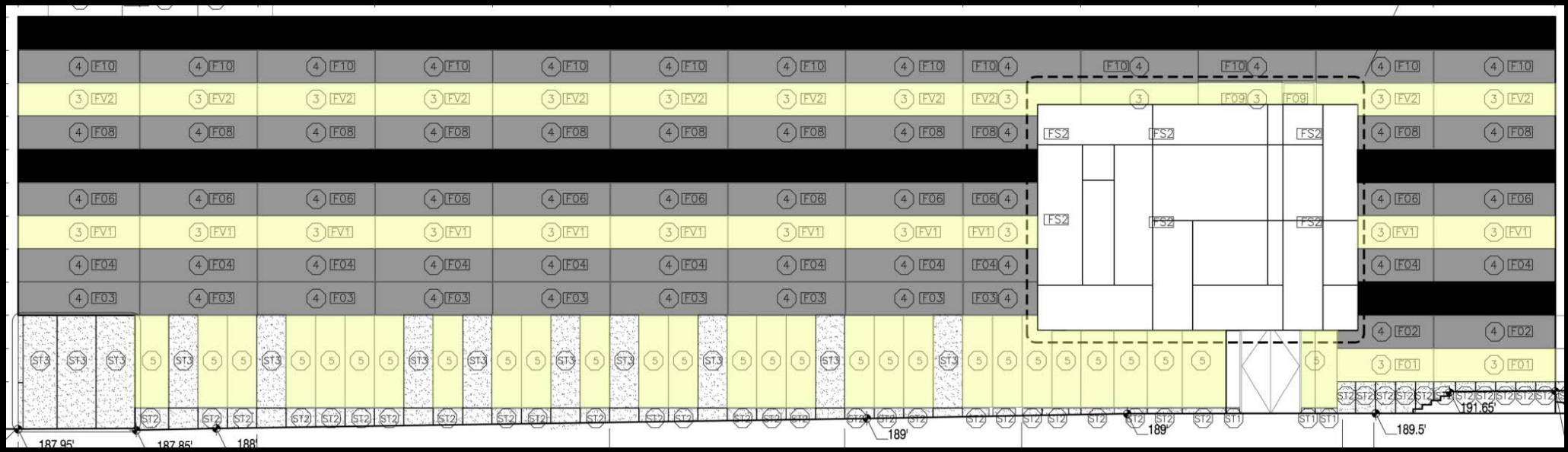
BUILDING FAÇADE PHOTOGRAPHS

BUILDING FAÇADE PHOTOGRAPHS

VISIBLE PROTRUSION OF CENTRAL BUILDING CORE

BUILDING FAÇADE CURTAIN WALL MATERIALS

+ FIVE TYPES OF GLASS AND SPANDREL PANELS
+ OPAQUE, TRANSLUCENT, AND TRANSPARENT



BUILDING FAÇADE FRITTED GLASS

LIKE STROKES OF THE ARTIST'S BRUSH, LIGHT MAY BE PAINTED ON THE FAÇADE

BUILDING FAÇADE

LIGHTING CONCEPT

+ LIGHT IS KNOWLEDGE AND IDEAS
+ GLASS ENCLOSURE ALLOWS FREE FLOW OF BOTH
+ DIRECTION OF TRANSMISSION IS REVERSIBLE
+ ALLOWS FOR BOTH INWARD AND OUTWARD FLOW

DURING THE DAY, THE BUILDING ABSORBS THE SURROUNDINGS AND DAYLIGHT

"THE BUILDING HAS AN ETHEREAL QUALITY THAT CONNECTS IT TO ITS ENVIRONMENT. GLASS REFLECTS THE ENVIRONMENT AND OPENS THE BUILDING TO THE WORLD," FREDERICK FISHER

A CLEAR VIEW FROM THE STAIR TO SHAPIRO WALK: INTERSECTING PATHS OF CIRCULATION

DURING THE NIGHT, THE BUILDING RADIATES LIGHT BACK TO THE EXTERIOR

ARCHITECT'S VISION FOR NIGHT IMAGE

"IT'S A KIND OF LANTERN, A LANTERN OF KNOWLEDGE AND CIRCULATION." FREDERICK FISHER

BUILDING FAÇADE LIGHTING DESIGN CRITERIA

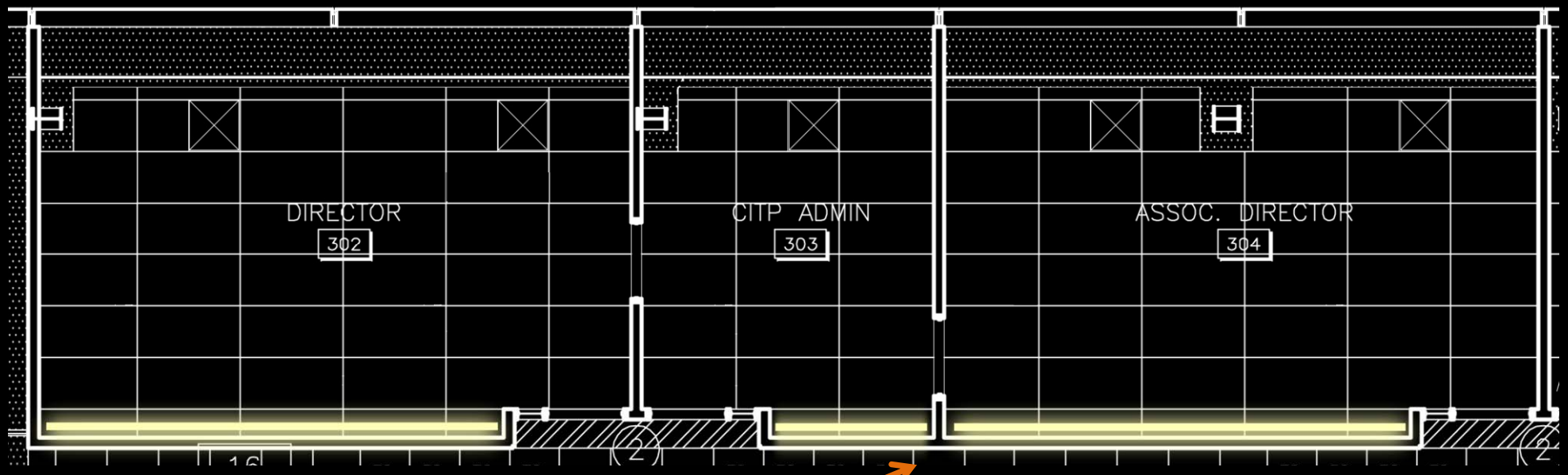
+ HIGHEST LUMINANCE ON WALLS PARALLEL TO GLASS FAÇADE
+ UNIFORM LIGHTING ON WALL SURFACE
+ PREVENT DIRECT GLARE AND VIEW OF LIGHT SOURCE
+ MINIMIZE LIGHT POLLUTION

BUILDING FAÇADE

SCHEMATIC LIGHTING CONCEPT: TYPICAL PLAN

TYPICAL PLAN ALONG NORTH FAÇADE

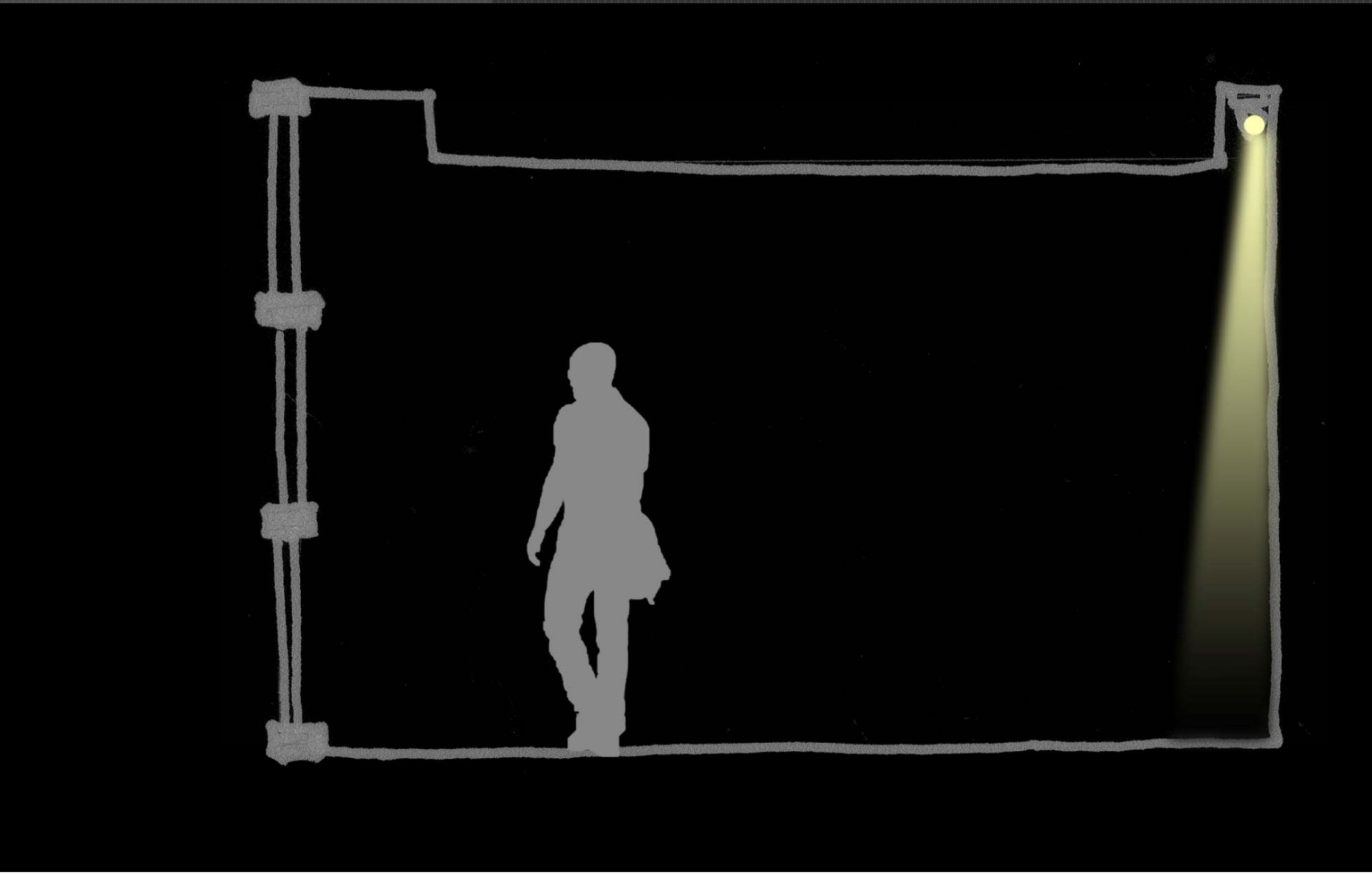
CURTAIN WALL SYSTEM



PROVIDE WALL GRAZING

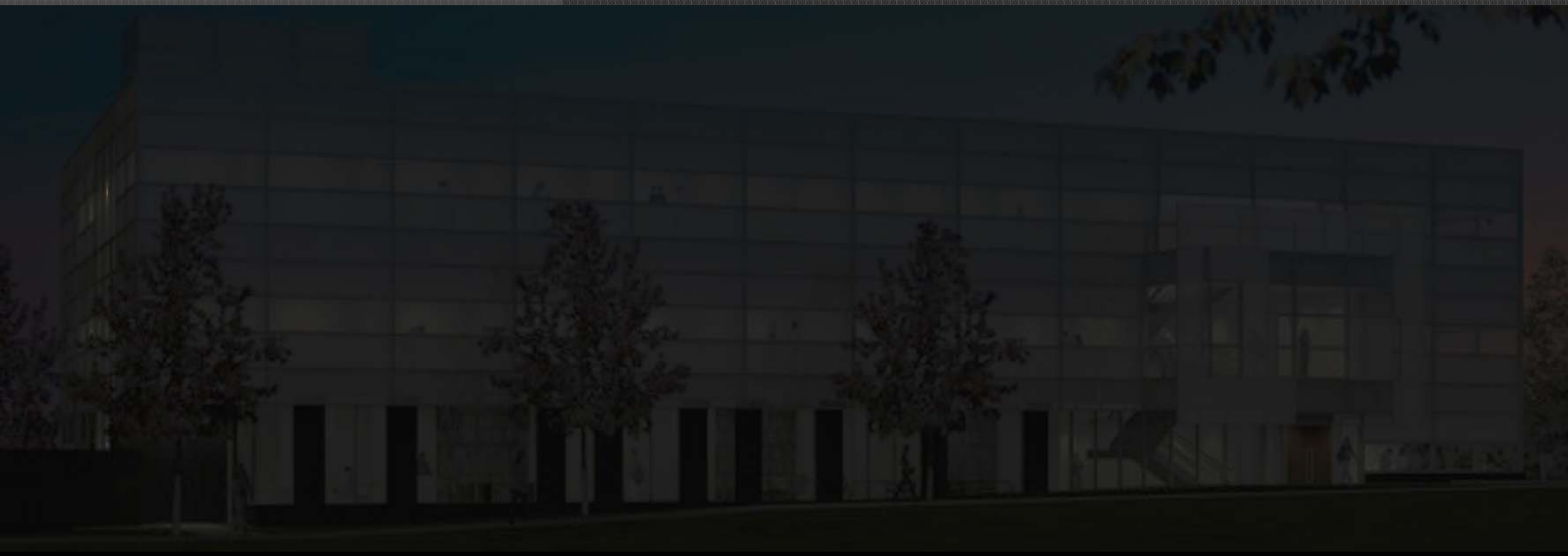
BUILDING FAÇADE

SCHEMATIC LIGHTING
CONCEPT: WALL GRAZING



BUILDING FAÇADE

SCHEMATIC LIGHTING
CONCEPT: EXTERIOR VIEW



BUILDING FAÇADE

SCHEMATIC LIGHTING CONCEPT: EXTERIOR VIEW

UPLIGHTING OF TREES

BUILDING FAÇADE

SCHEMATIC LIGHTING CONCEPT: EXTERIOR VIEW

TRANSLUCENCY

BUILDING FAÇADE

SCHEMATIC LIGHTING CONCEPT: EXTERIOR VIEW

TRANSPARENCY

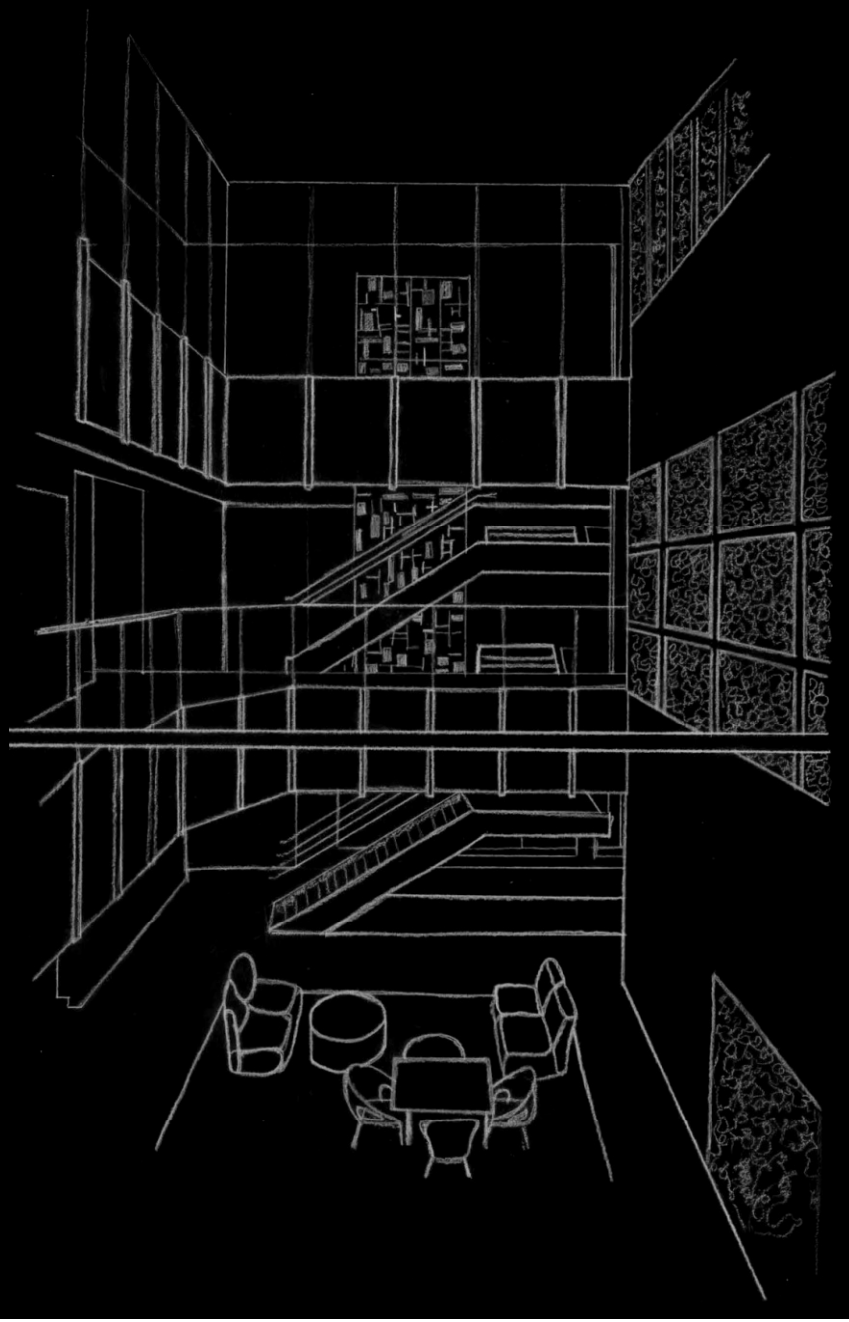
BUILDING FAÇADE

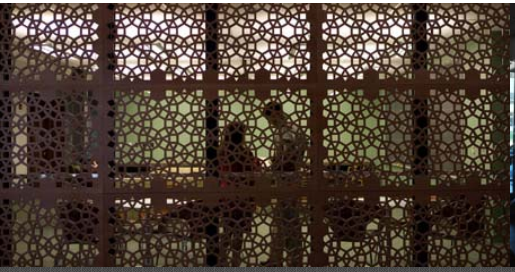
SCHEMATIC LIGHTING CONCEPT: EXTERIOR VIEW

BUILDING ANCHORED BY GLOWING CORE

SPILL LIGHT CAST UPON SHAPIRO WALK

ENERGETIC BUILDING CORE

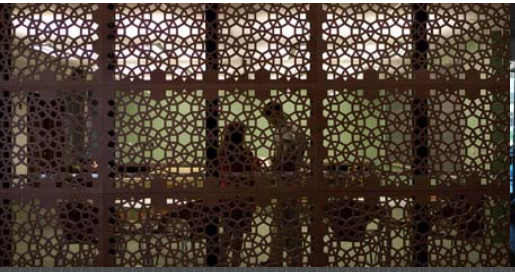




LOBBY/ATRIUM/STAIR

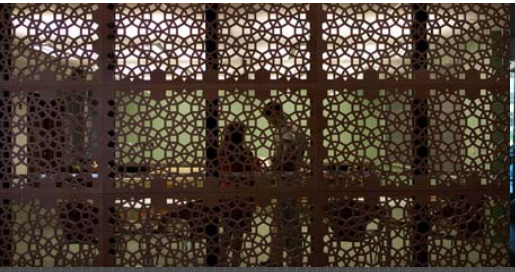
ARCHITECTURAL CONCEPTS

+ CORE ADMITS AND RADIATES ABUNDANT LIGHT
+ TRANSPARENT MATERIALS ALLOW FOR VISUAL CONNECTION IN SPACES ADJACENT TO ATRIUM
+ FEATURE WALL AND LIGHT SCULPTURE PROVIDE UNIFYING ELEMENTS AND VERTICAL BRIDGING



LOBBY/ATRIUM/STAIR SPACE USE

+ MAIN ENTRANCE
+ GATHERING SPACE
+ SMALL LOUNGE AREAS AT EACH LEVEL
+ PRIMARY CIRCULATION PATH
+ PRIMARY OPEN STAIR



LOBBY/ATRIUM/STAIR

ROOM DIMENSIONS

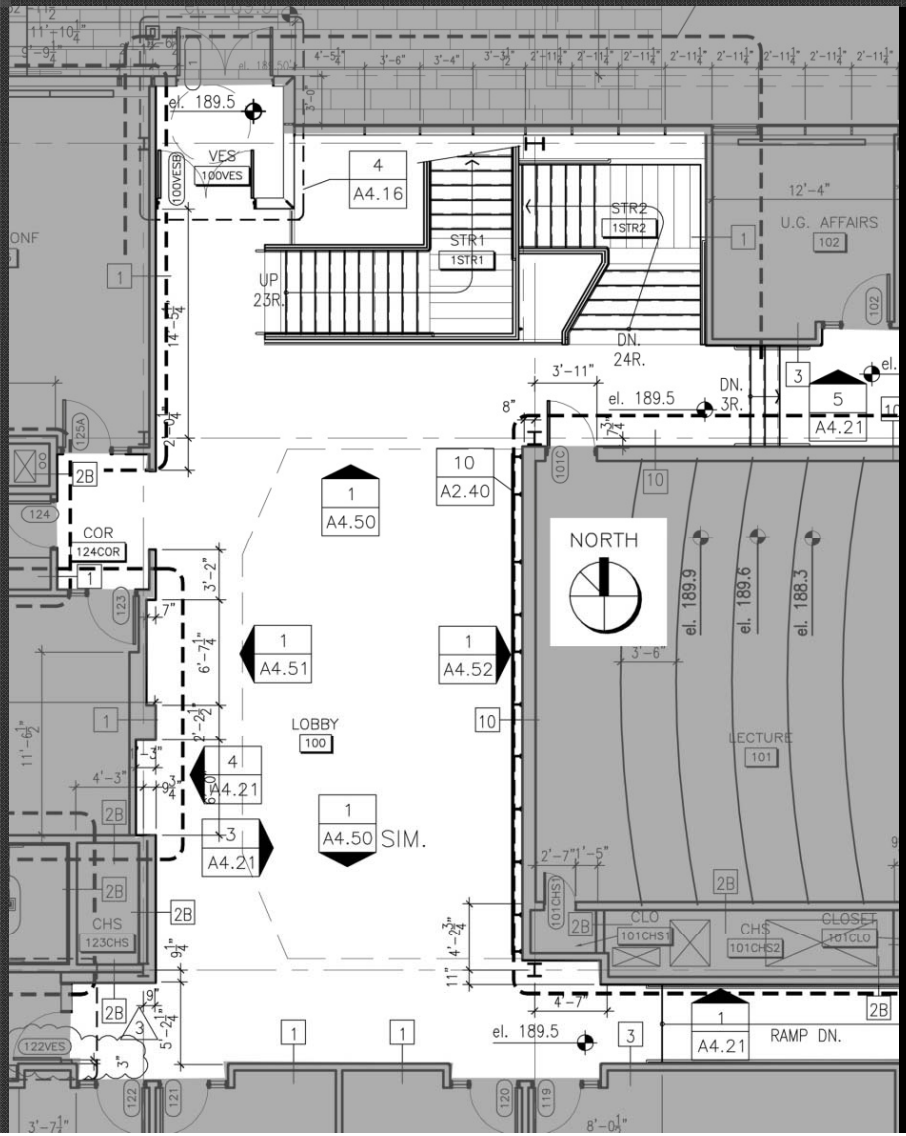
AREA

5095 SQUARE FEET

ROOM DIMENSIONS

ATRIUM AREA IS APPROXIMATELY 23' X 58' WITH AN OVERALL CEILING HEIGHT OF 39'

SPANS 3 FLOORS

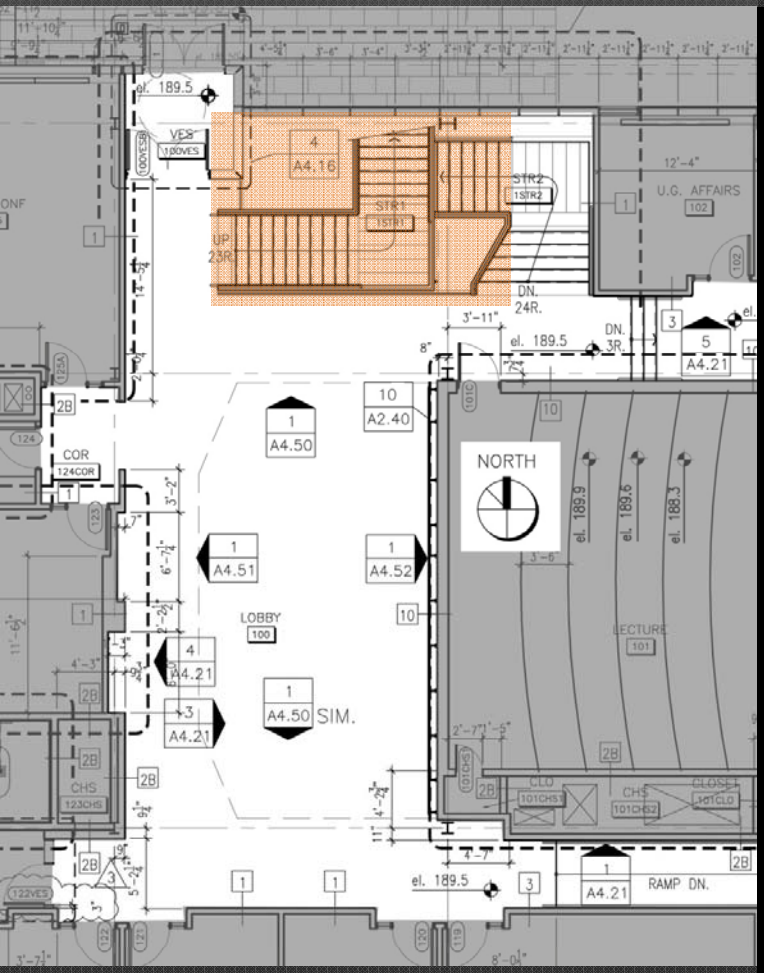


LOBBY/ATRIUM/STAIR

ATRIUM

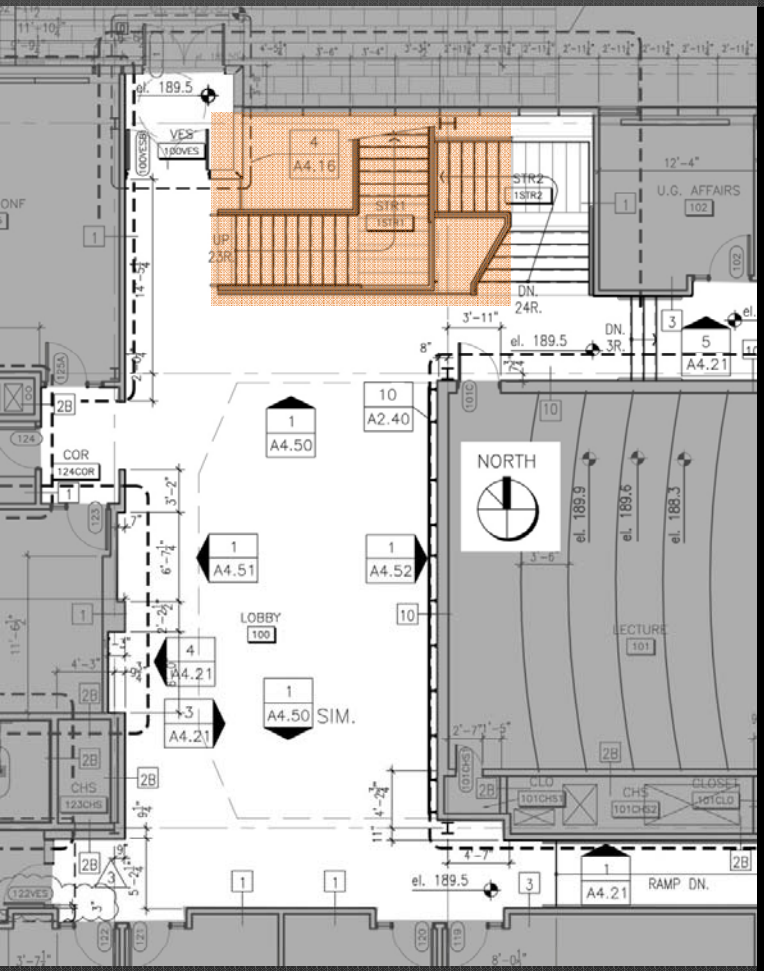
LOBBY/ATRIUM/STAIR

MAIN STAIR



LOBBY/ATRIUM/STAIR

MAIN STAIR

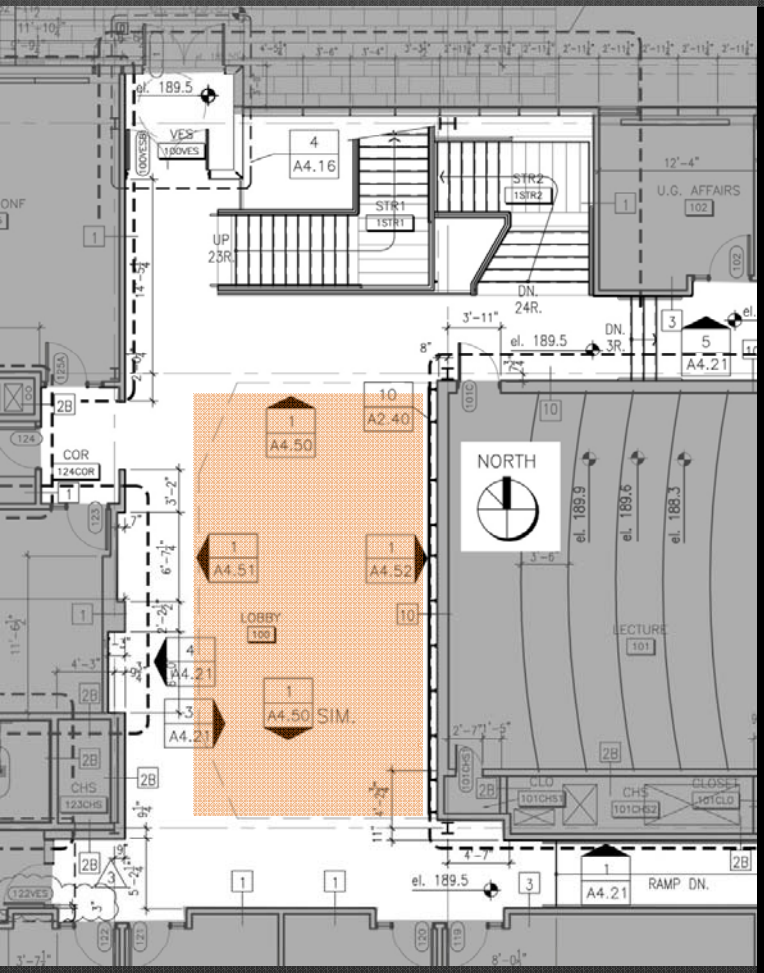


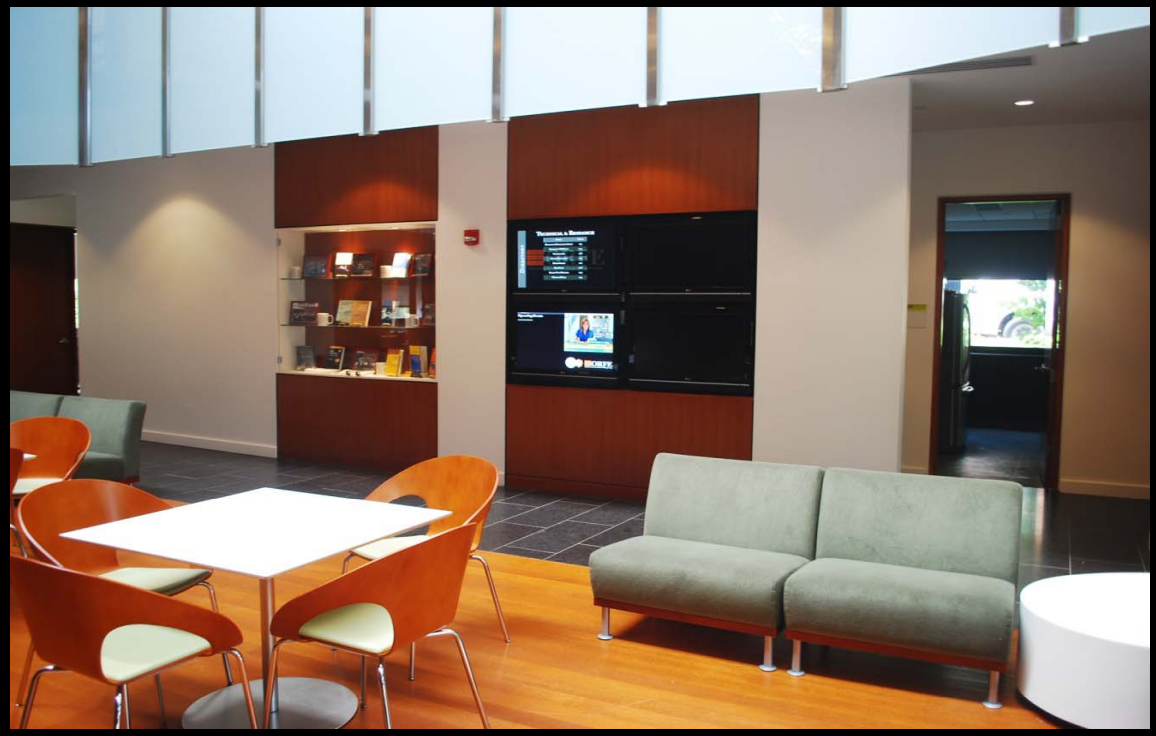
LOBBY/ATRIUM/STAIR

LIGHT SCULPTURE

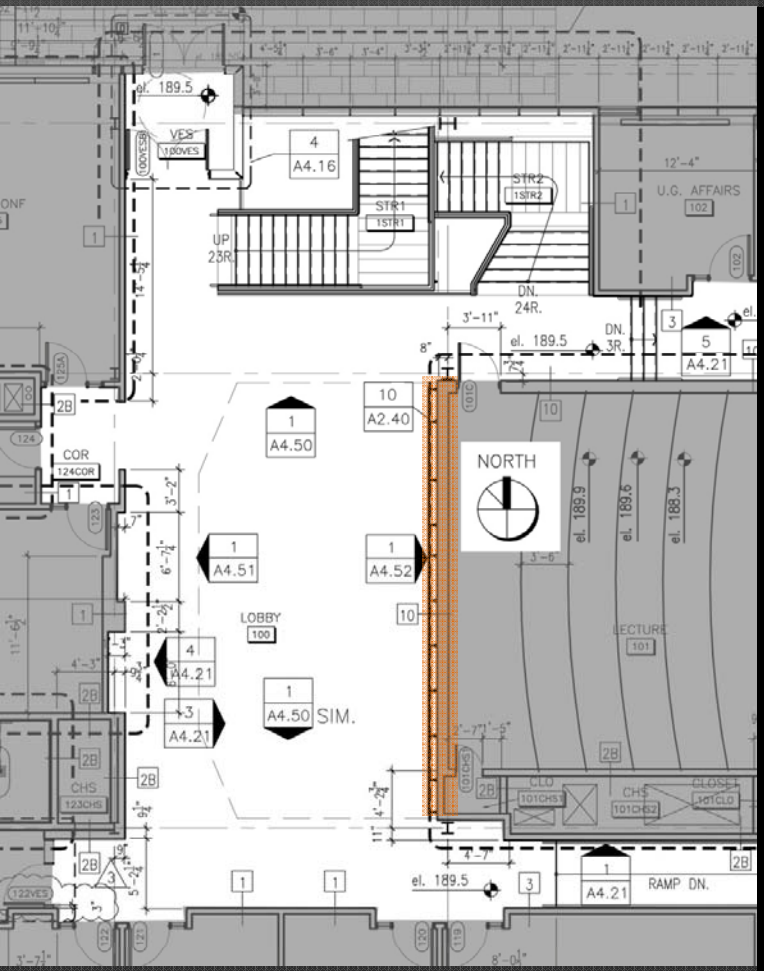
LOBBY/ATRIUM/STAIR

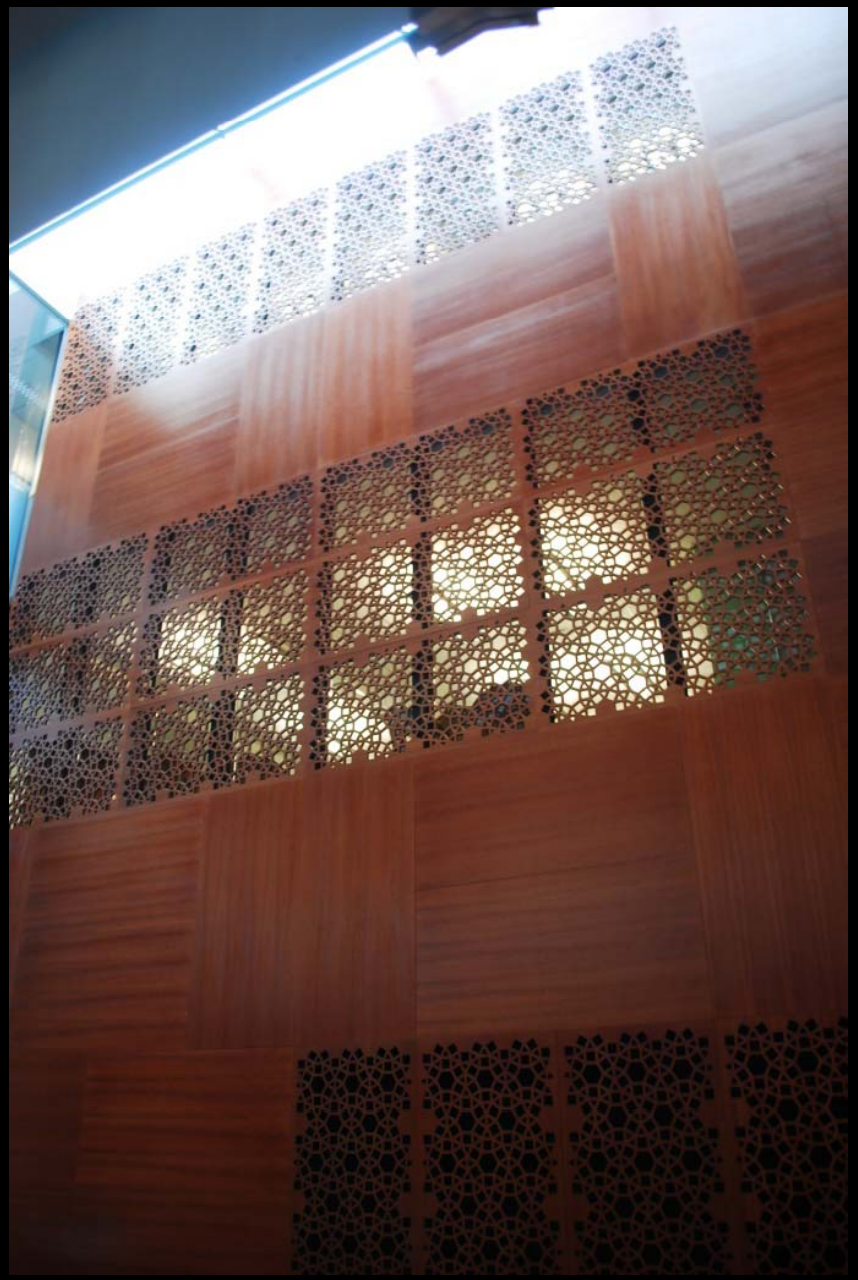
LOUNGE





LOBBY/ATRIUM/STAIR FEATURE WALL

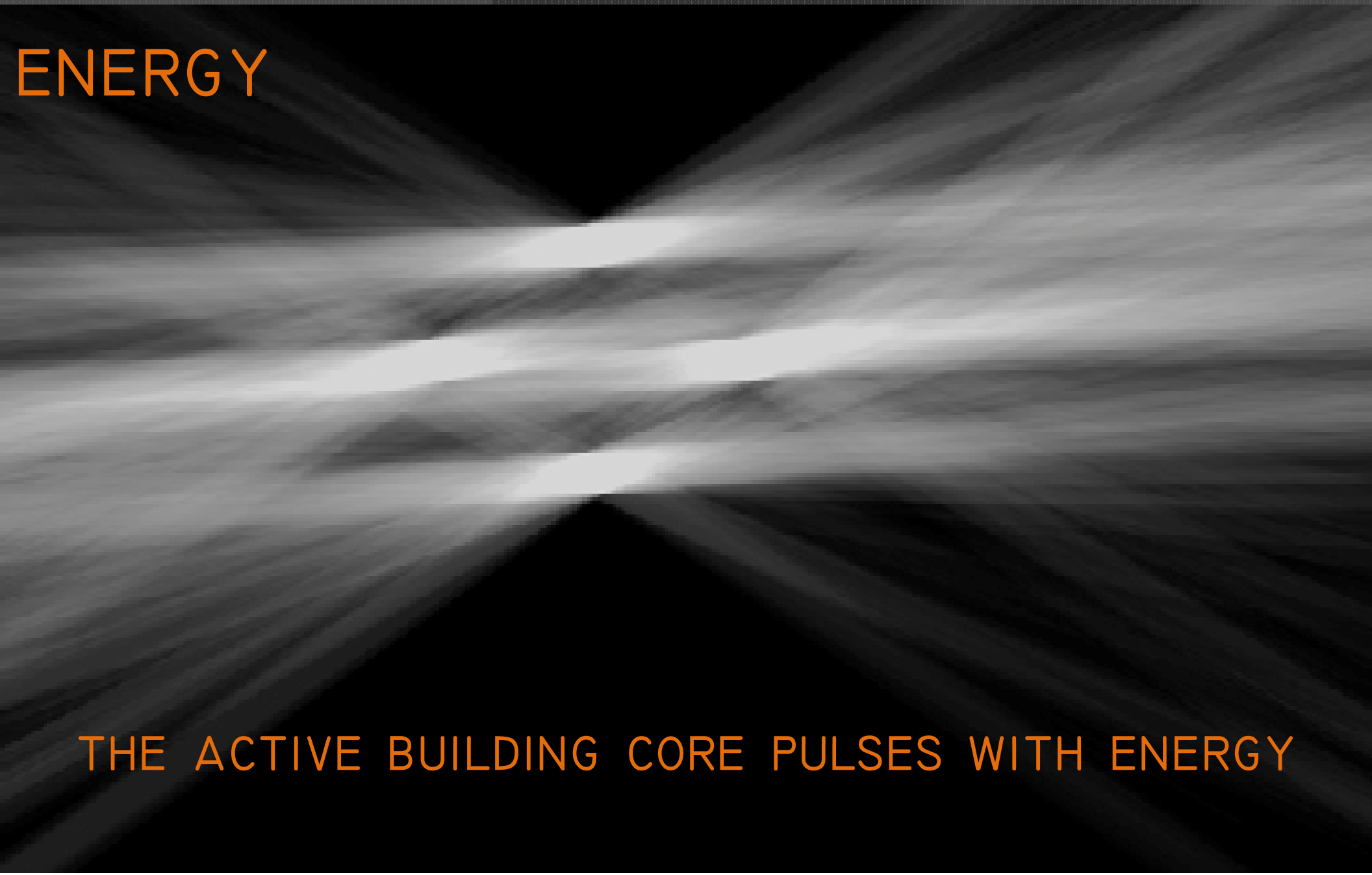




THREE DESIGN CONCEPTS

LOBBY/ATRIUM/STAIR CONCEPT |

ENERGY



THE ACTIVE BUILDING CORE PULSES WITH ENERGY

LOBBY/ATRIUM/STAIR CONCEPT |

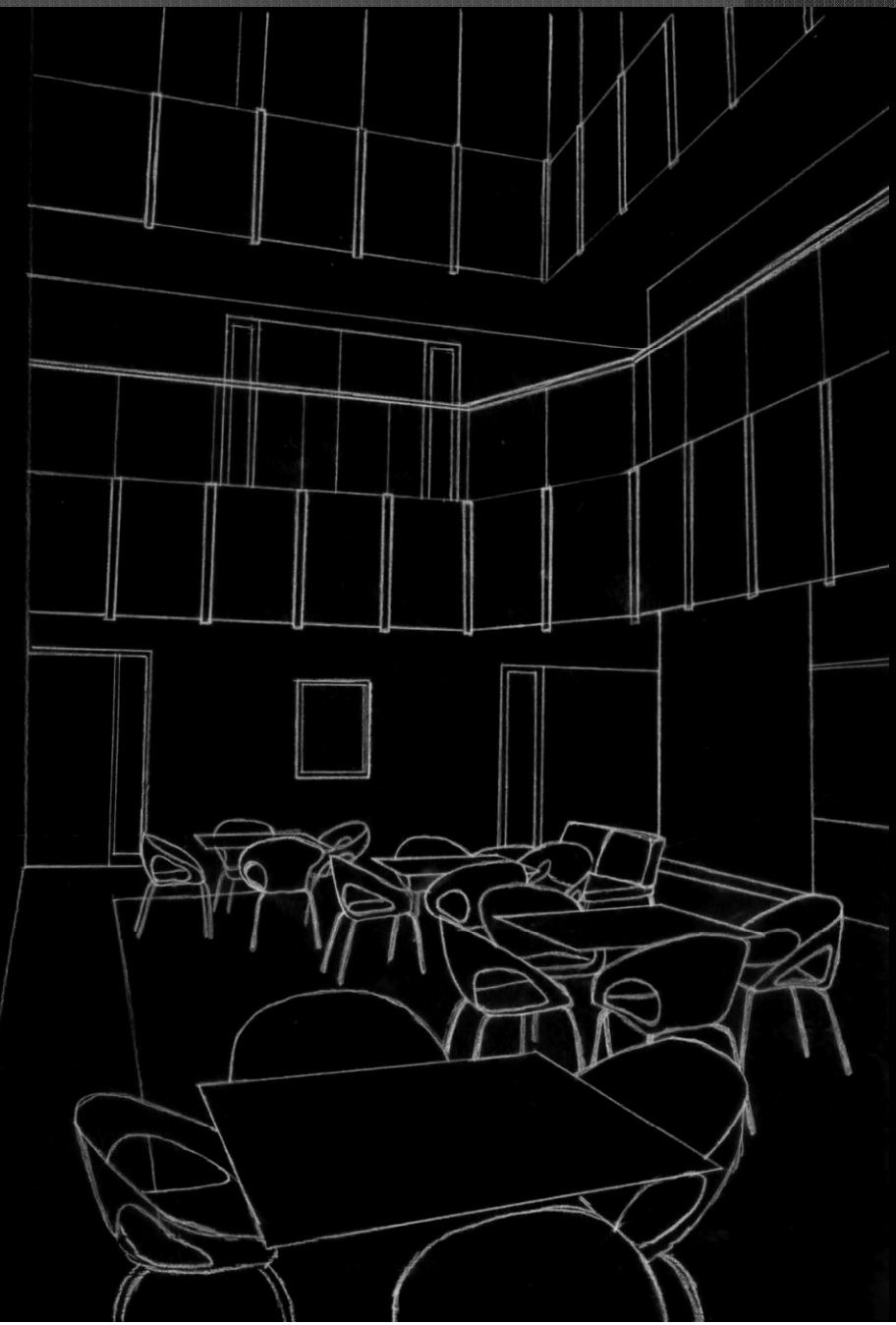
MOVEMENT

PEOPLE AND IDEAS MOVE IN ALL DIRECTIONS

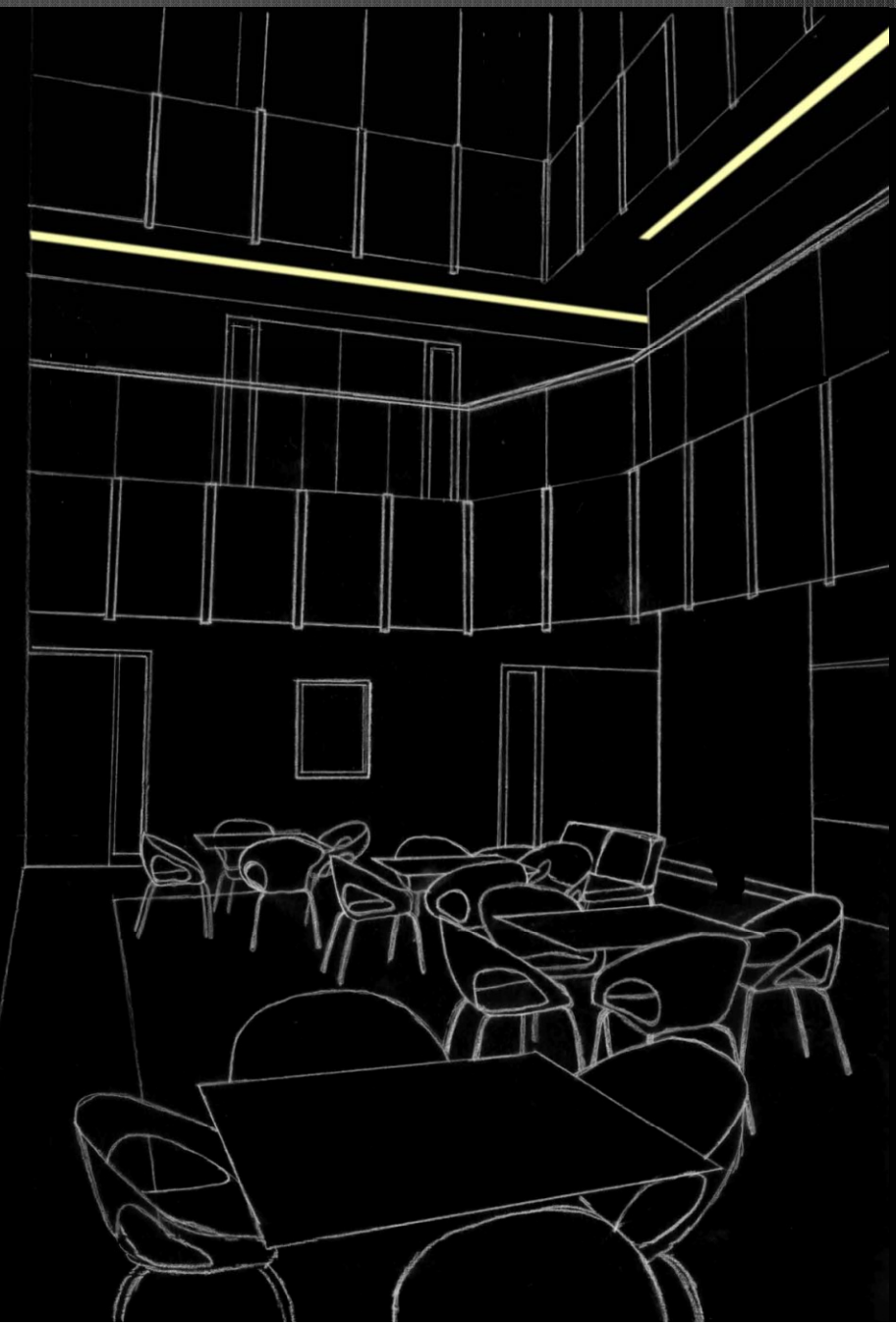
LOBBY/ATRIUM/STAIR CONCEPT MOVING ENERGY

+ APPLY A COMBINATION OF LINEAR LIGHTING ELEMENTS TO CREATE A SENSE OF MOVEMENT AND ENERGY
+ LIGHTING ELEMENTS GUIDE CIRCULATION

LOBBY/ATRIUM/STAIR MOVING ENERGY



LOBBY/ATRIUM/STAIR MOVING ENERGY



EXPOSED, SEAMLESS
LINES OF LIGHT

LOBBY/ATRIUM/STAIR MOVING ENERGY

COMBINATION OF SURFACE, LENSED, AND SLOTTED LINES

LOBBY/ATRIUM/STAIR MOVING ENERGY

LINEAR LIGHTING INTEGRATED WITH FURNISHINGS

LOBBY/ATRIUM/STAIR MOVING ENERGY

DISPLAY LIGHTING

LOBBY/ATRIUM/STAIR MOVING ENERGY

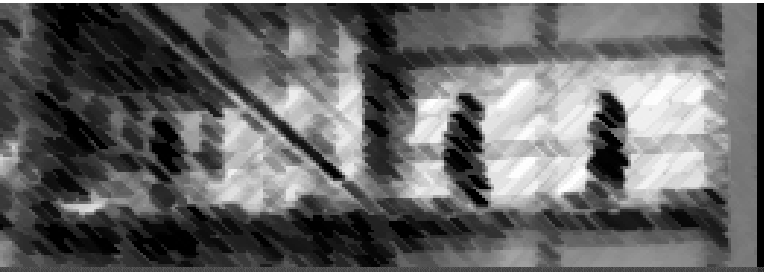
PICTURE LIGHTING

LOBBY/ATRIUM/STAIR MOVING ENERGY

LOBBY/ATRIUM/STAIR CONCEPT 2

TRANSPARENCY

ALLOWS FOR INTERACTION, COLLABORATION, CROSS-POLLINATION



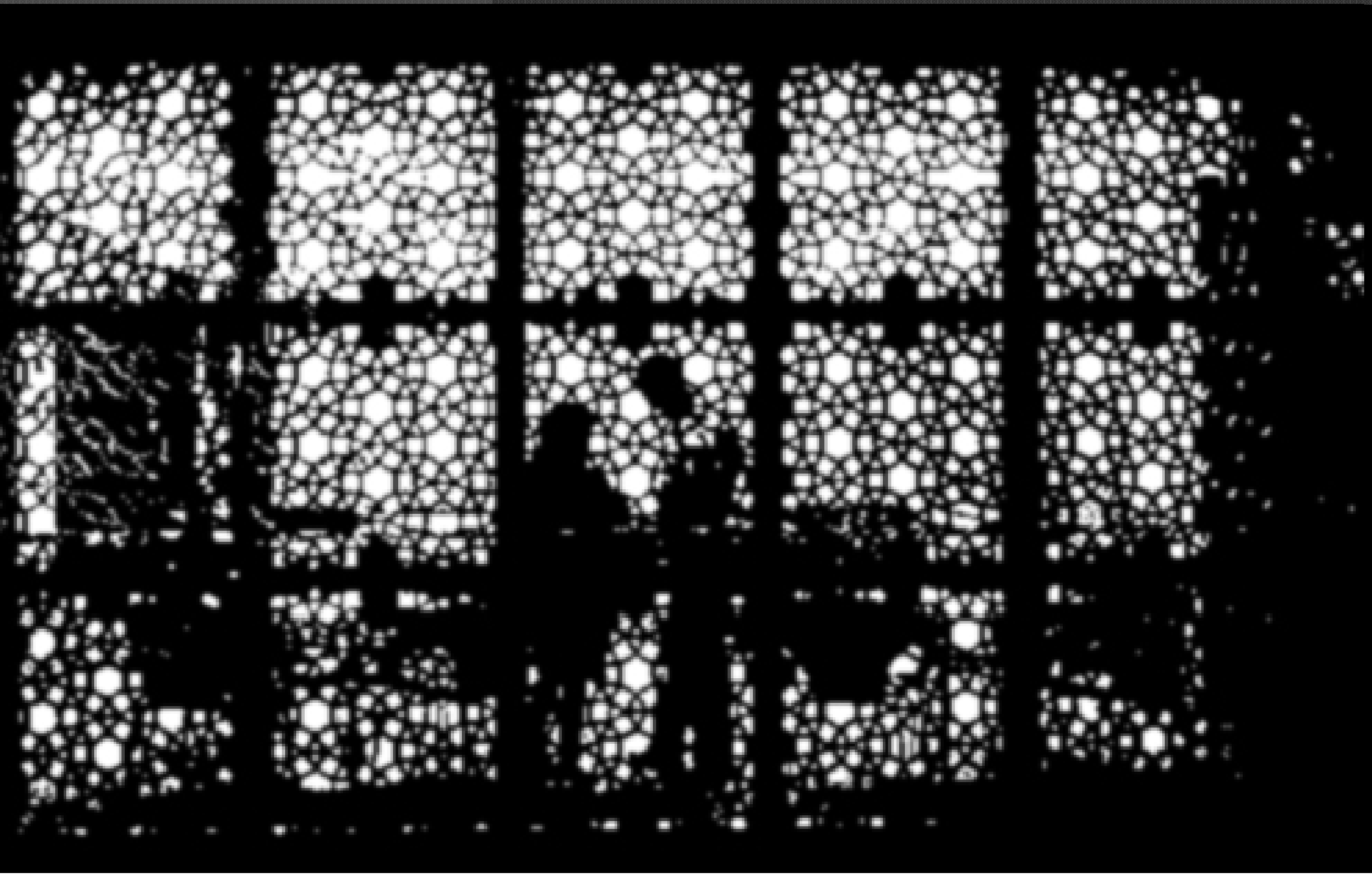
LOBBY/ATRIUM/STAIR

CONCEPT TRANSPARENCY

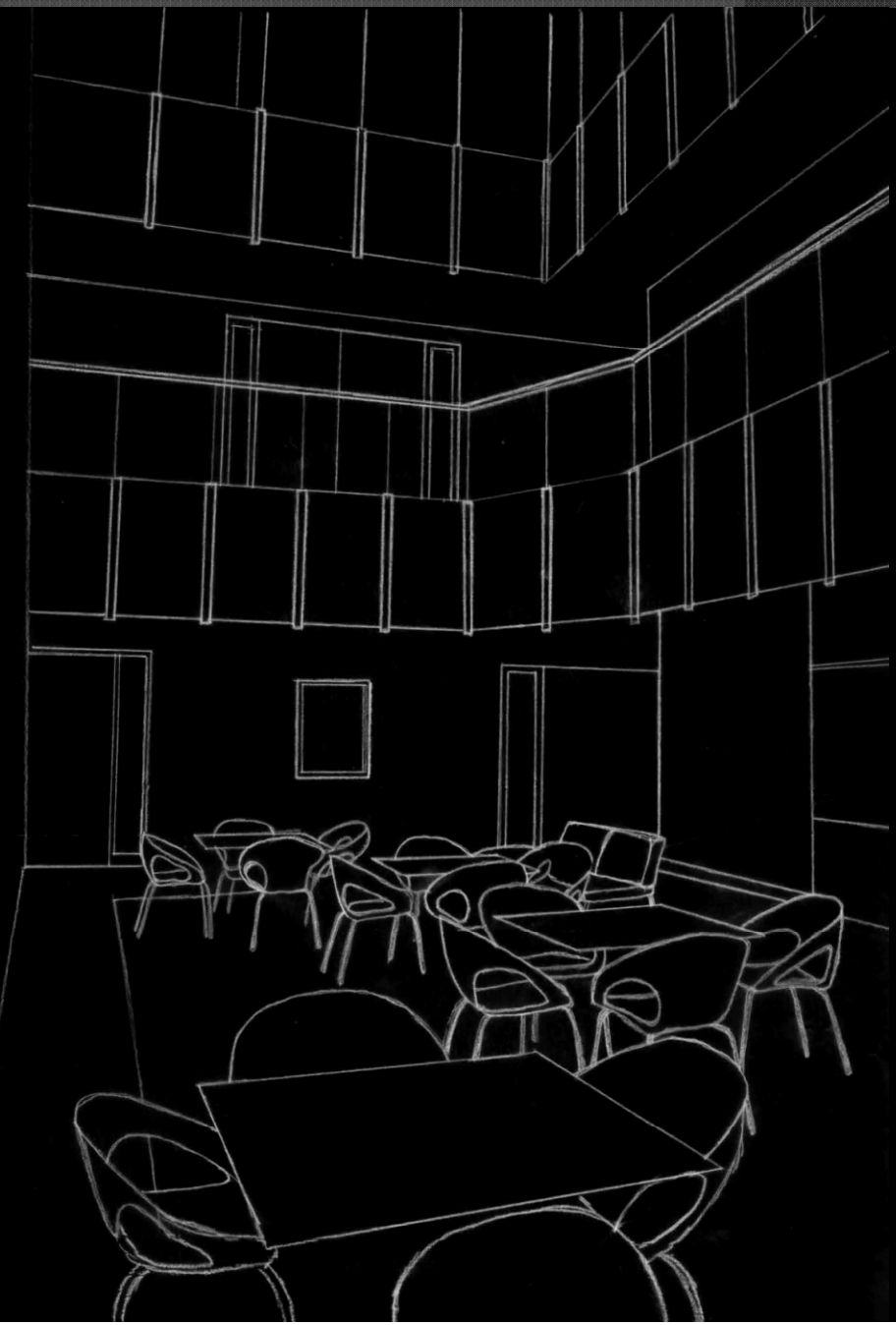
+ ENHANCE THE SENSE OF TRANSPARENCY IN THE SPACE TO INCREASE HUMAN INTERACTION
+ SELECTIVELY ILLUMINATE VERTICAL SURFACES WITH WALL SLOTS TO BACKLIGHT PEOPLE AND OBJECTS
+ SILHOUETTES BECOME CLEARLY VISIBLE FROM ACROSS THE ATRIUM

LOBBY/ATRIUM/STAIR

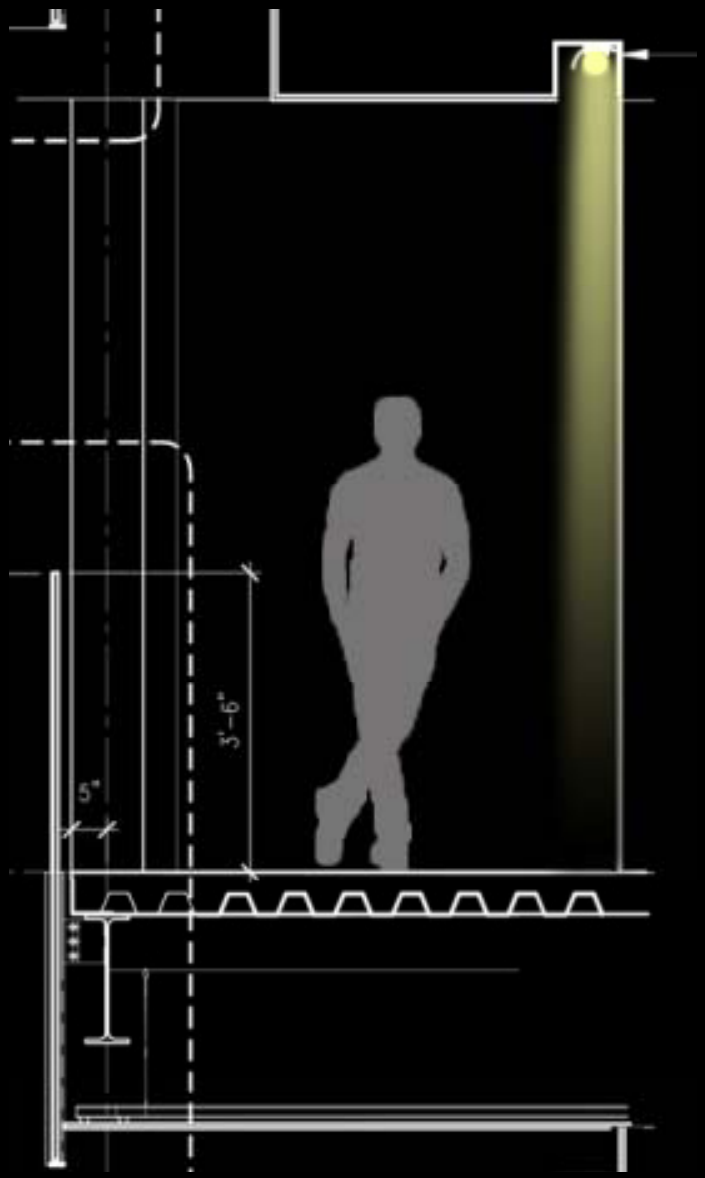
TRANSPARENCY



LOBBY/ATRIUM/STAIR TRANSPARENCY



LOBBY/ATRIUM/STAIR TRANSPARENCY



LOBBY/ATRIUM/STAIR

TRANSPARENCY

PICTURE LIGHTING

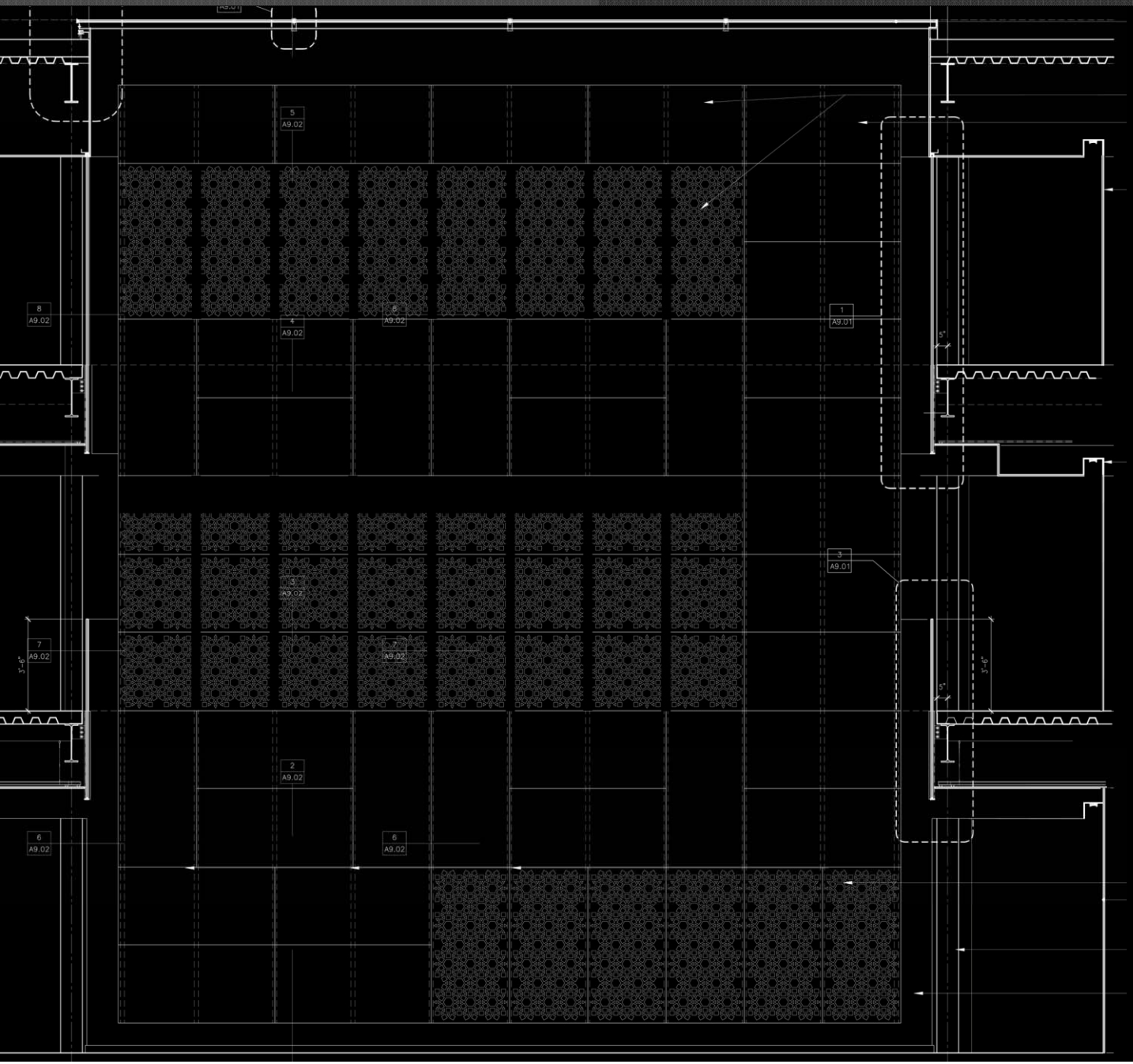
LOBBY/ATRIUM/STAIR TRANSPARENCY

DISPLAY LIGHTING

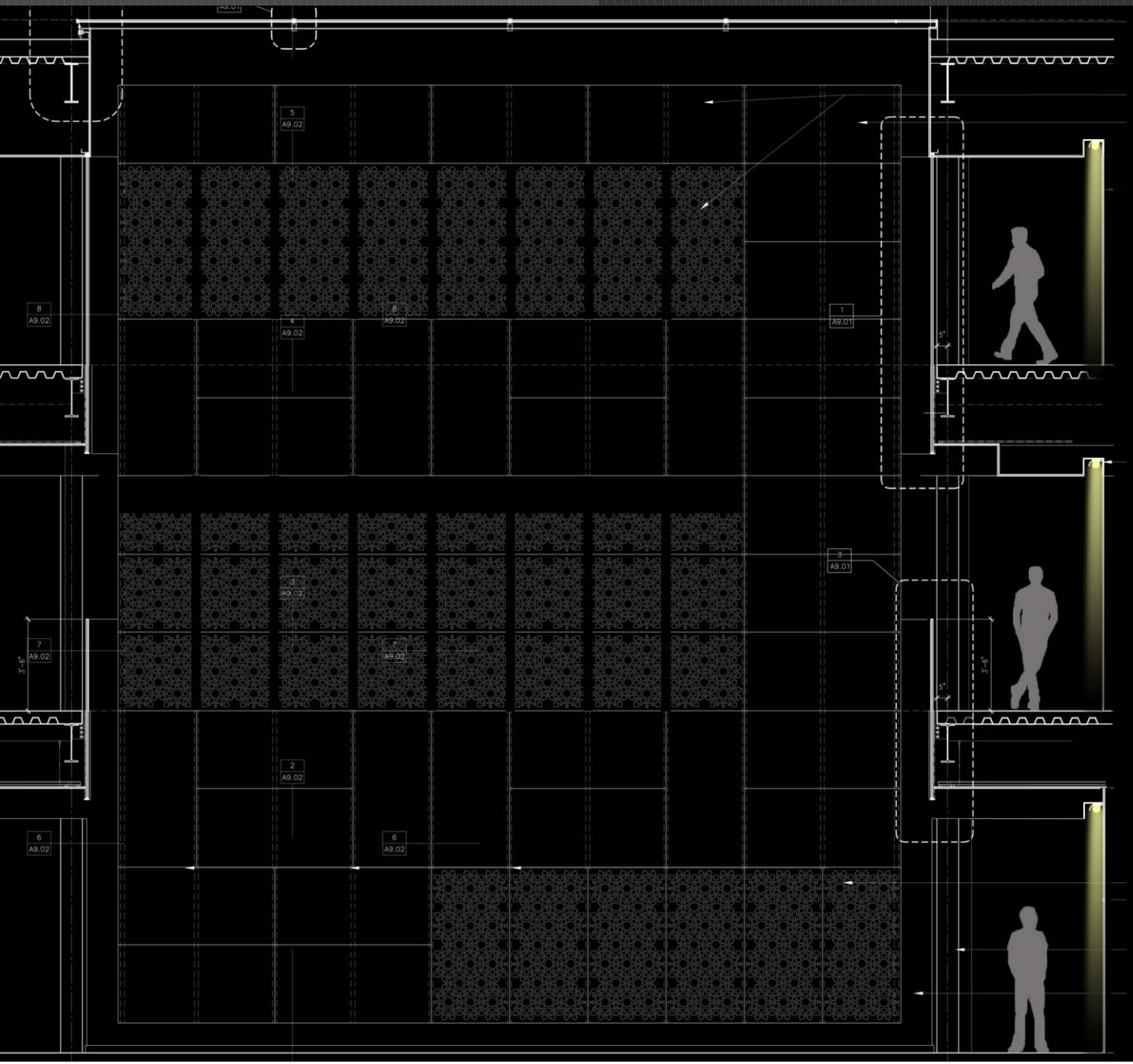
LOBBY/ATRIUM/STAIR TRANSPARENCY

DECORATIVE, GLOWING LIGHT ELEMENT AT TABLE LEVEL

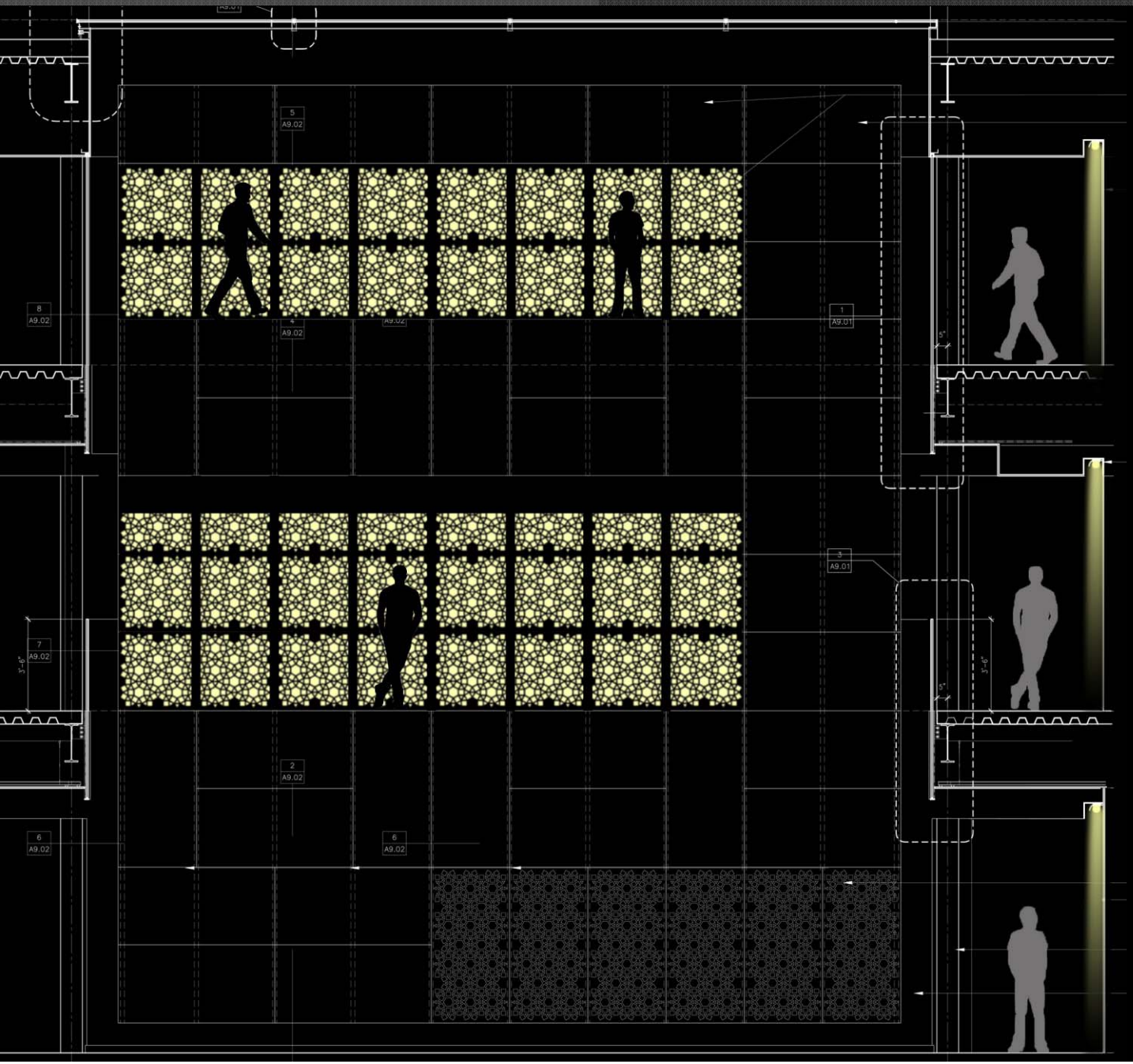
LOBBY/ATRIUM/STAIR TRANSPARENCY



LOBBY/ATRIUM/STAIR TRANSPARENCY



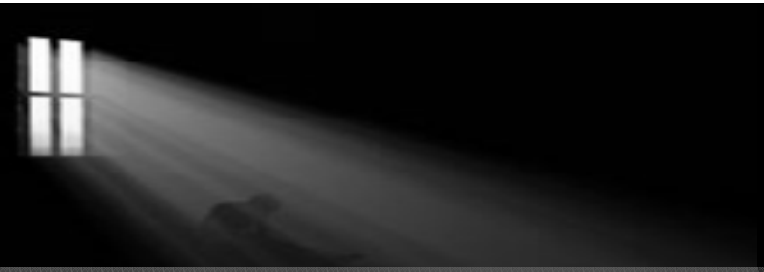
LOBBY/ATRIUM/STAIR TRANSPARENCY



LOBBY/ATRIUM/STAIR CONCEPT 3

EXPANSION

IDEAS AND LIGHT ENTER THE BUILDING AND EXPAND THROUGH THE CORE



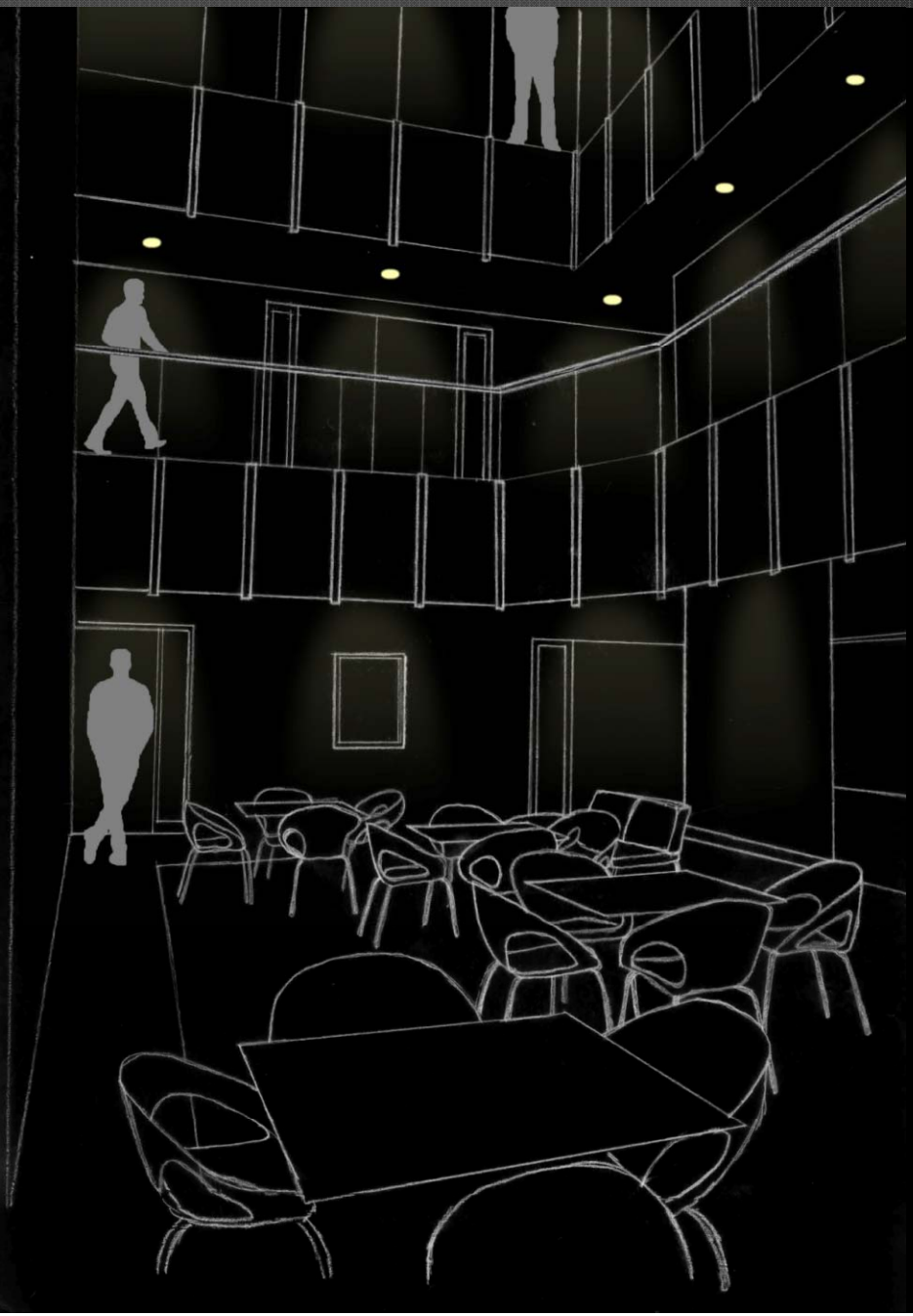
LOBBY/ATRIUM/STAIR

CONCEPT EXPANSION

+ ENHANCE THE SENSE THAT LIGHT AND IDEAS ENTER THE SPACE AND EXPAND
+ A METAPHOR FOR INCREASING KNOWLEDGE THROUGH INTERACTION

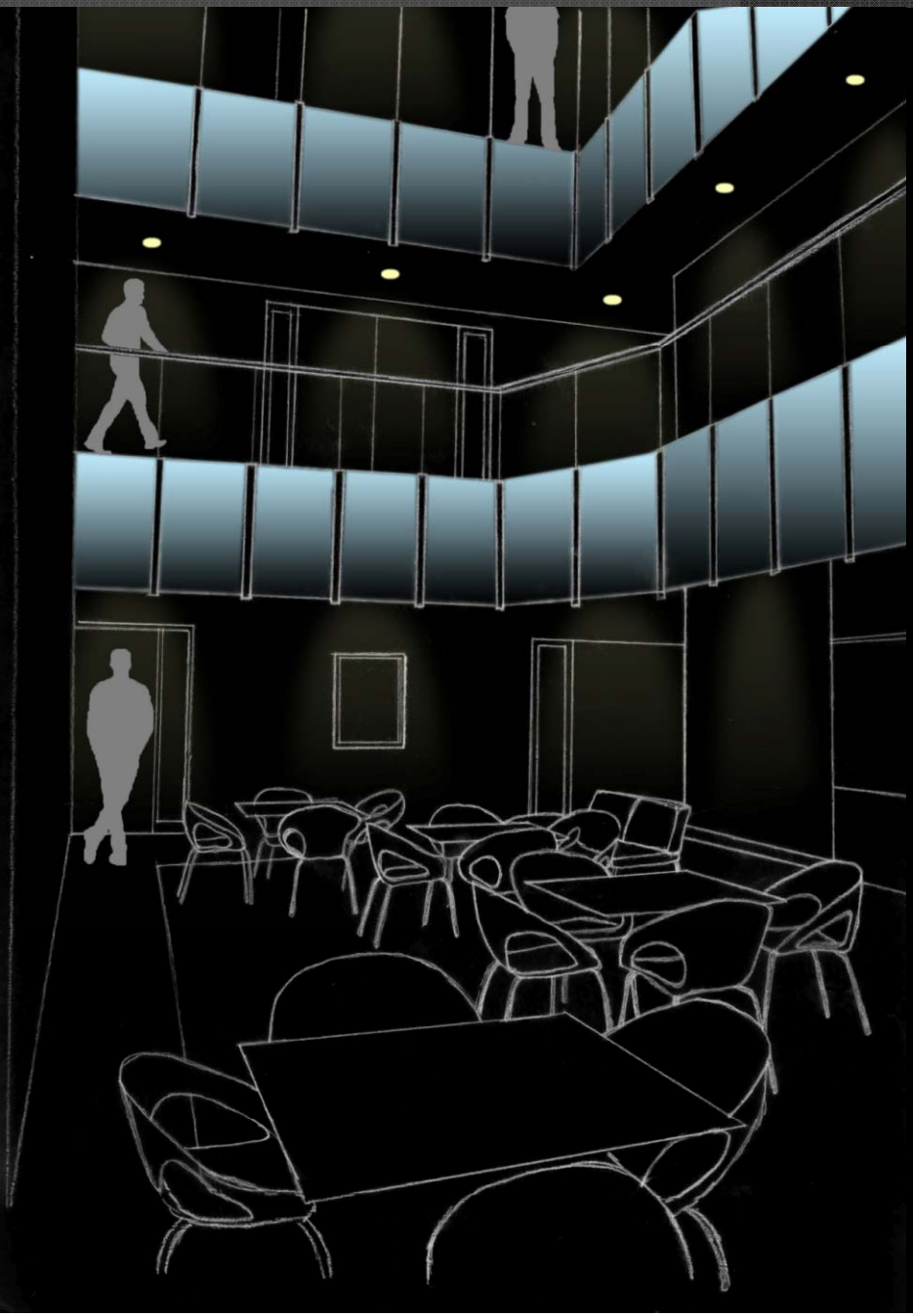
LOBBY/ATRIUM/STAIR EXPANSION

LOBBY/ATRIUM/STAIR EXPANSION



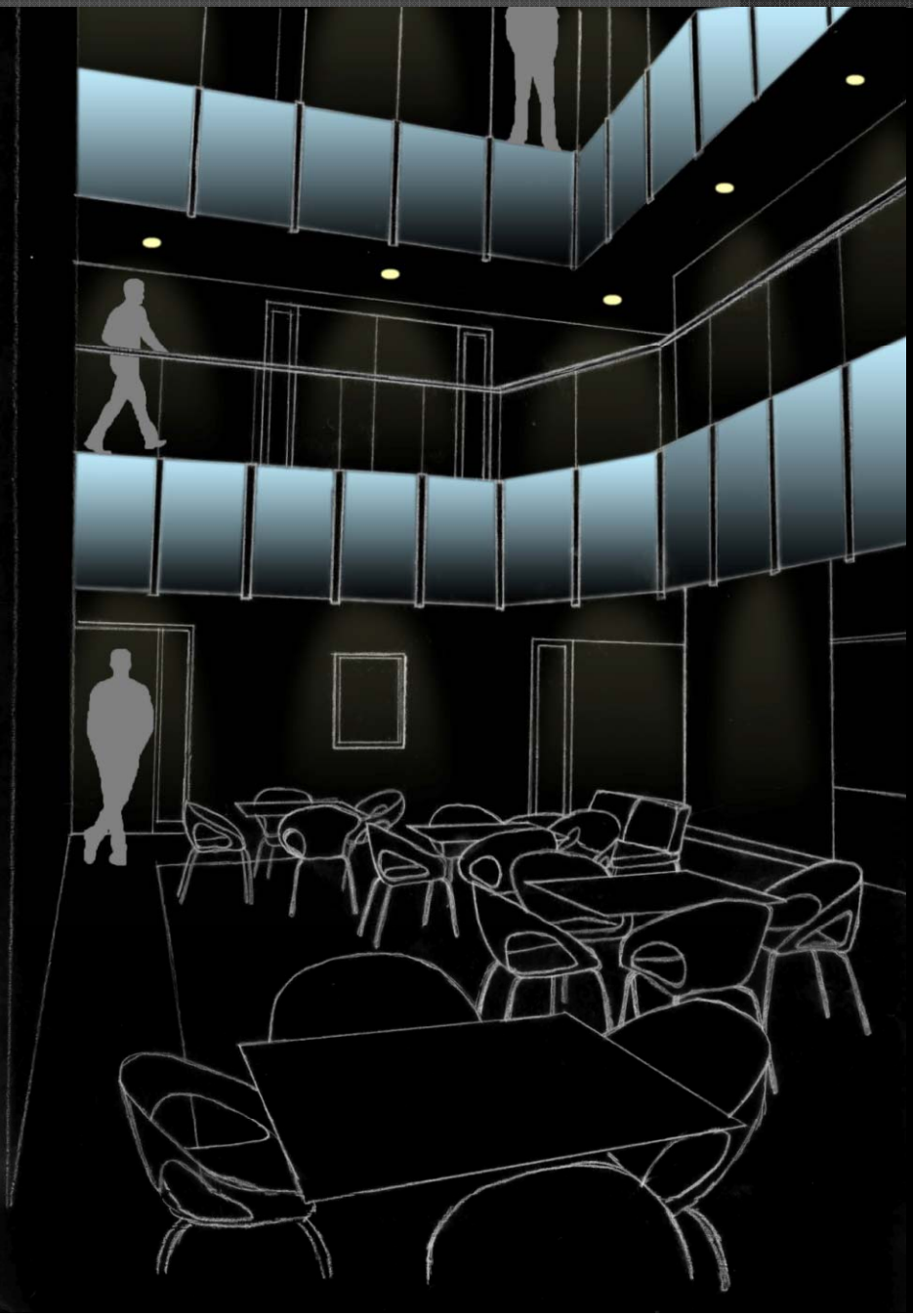
DOWNLIGHTING IN CORRIDORS

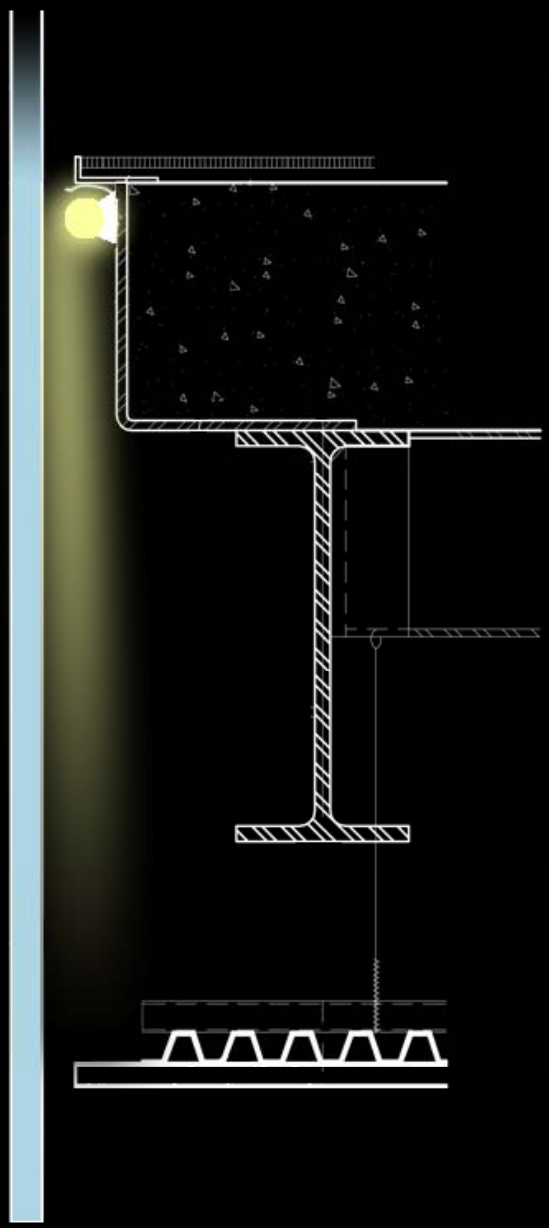
LOBBY/ATRIUM/STAIR EXPANSION



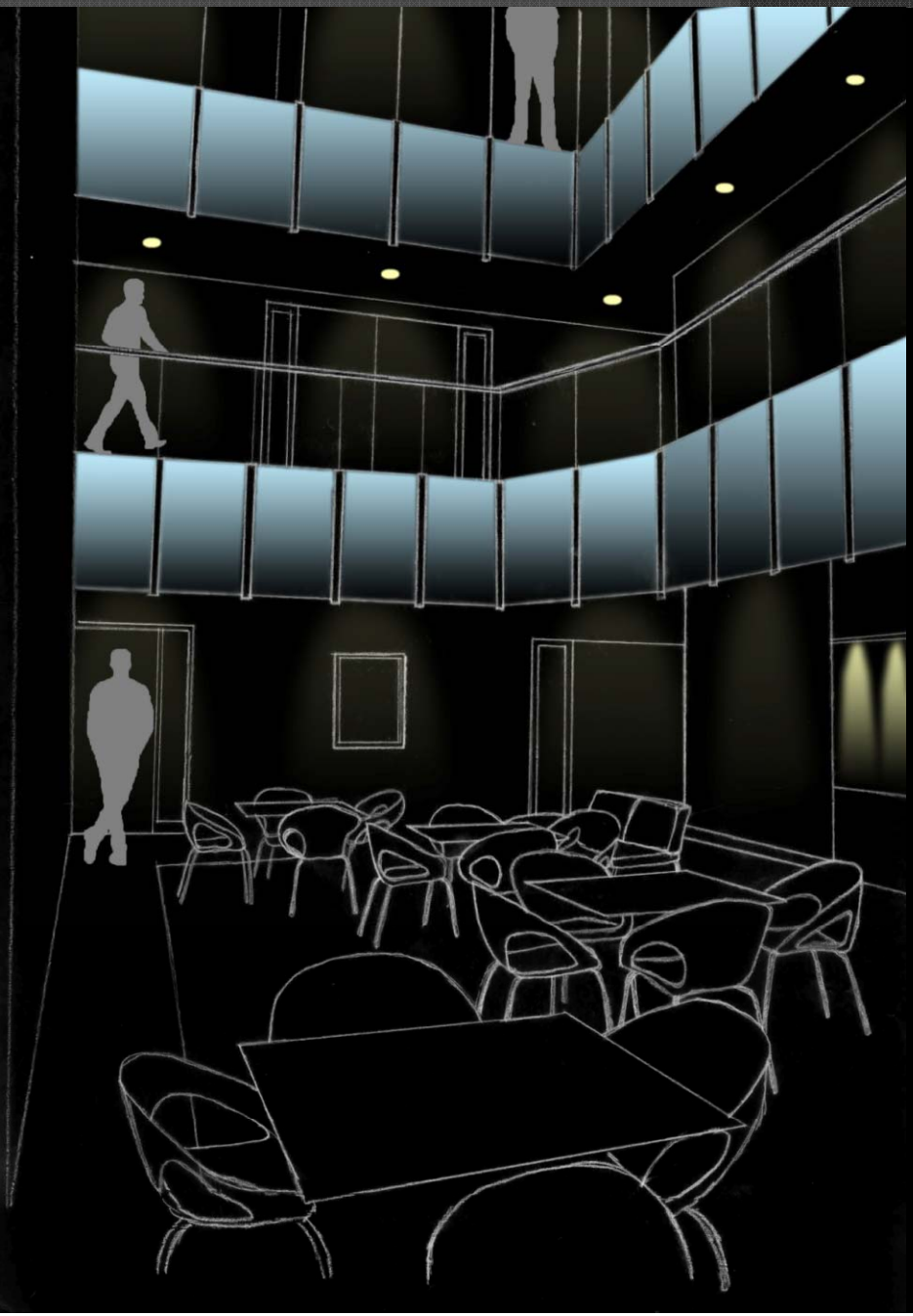
GLOWING PANELS

LOBBY/ATRIUM/STAIR EXPANSION



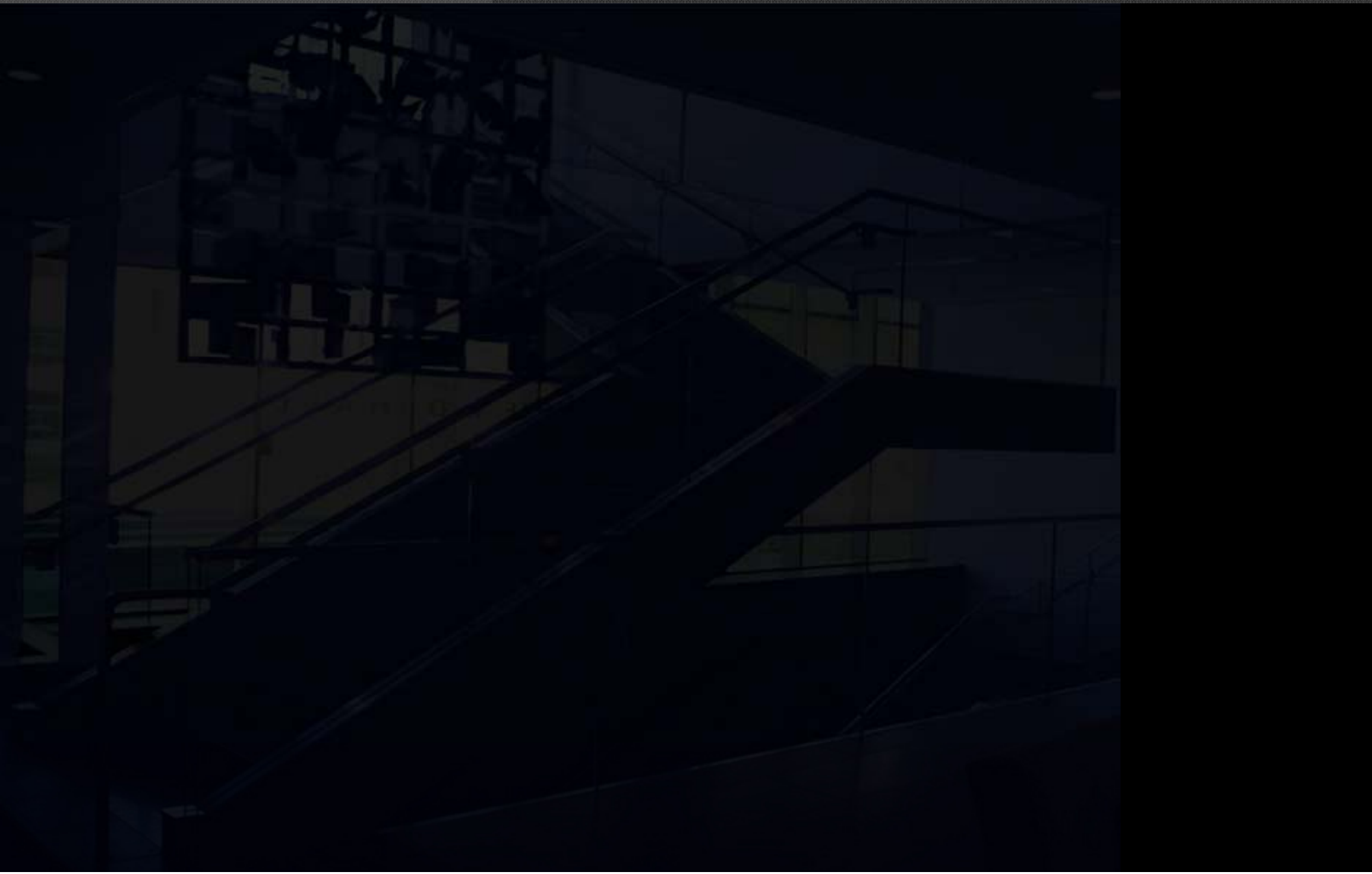


LOBBY/ATRIUM/STAIR EXPANSION

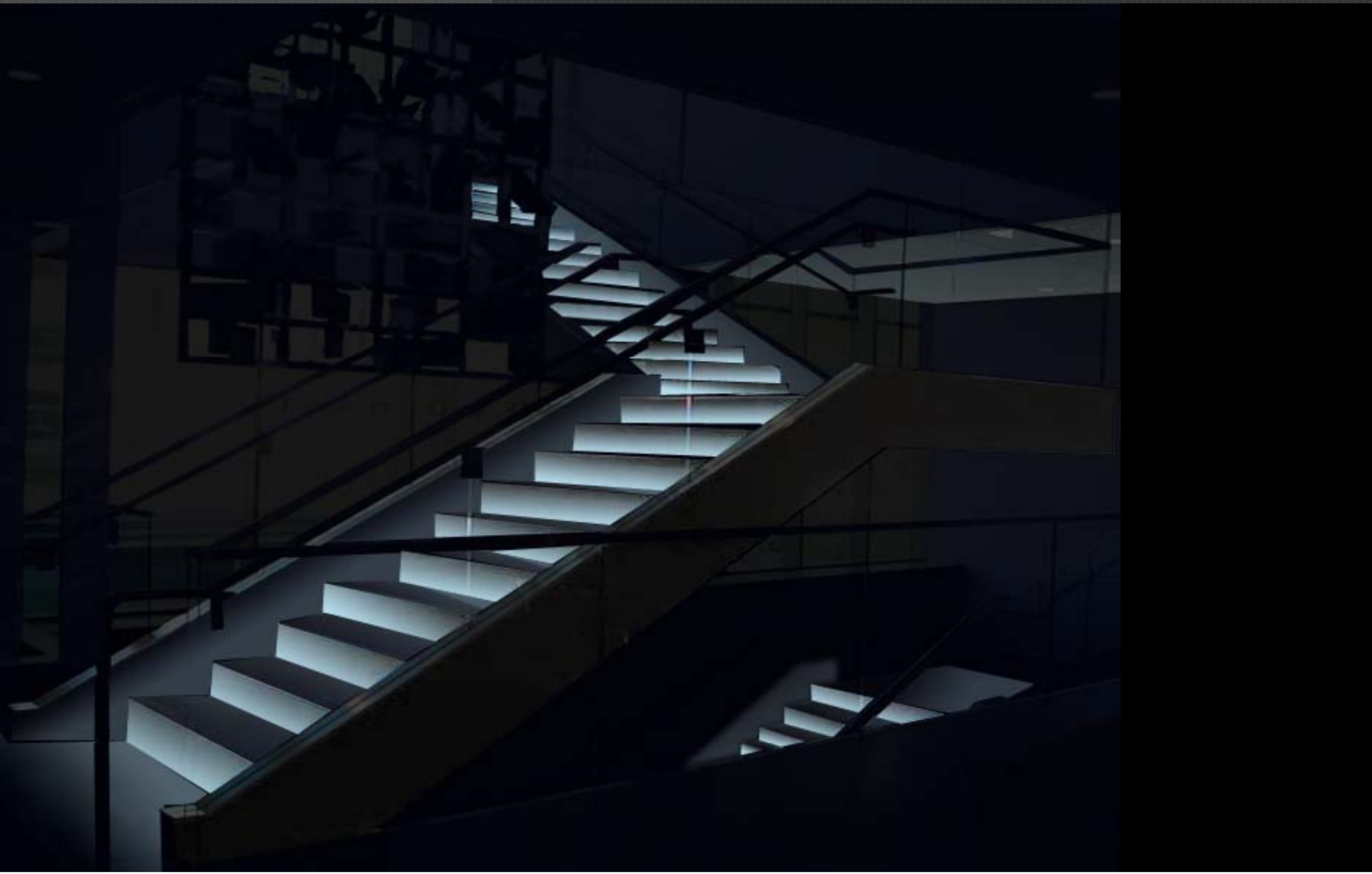


DISPLAY LIGHTING

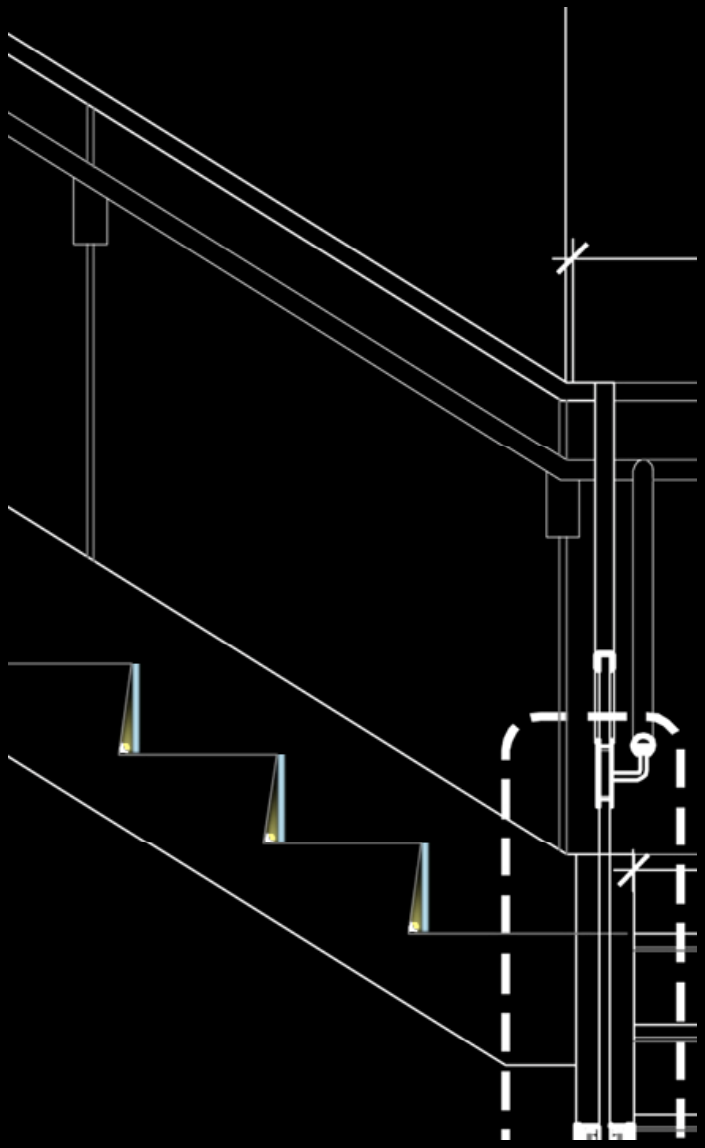
LOBBY/ATRIUM/STAIR EXPANSION

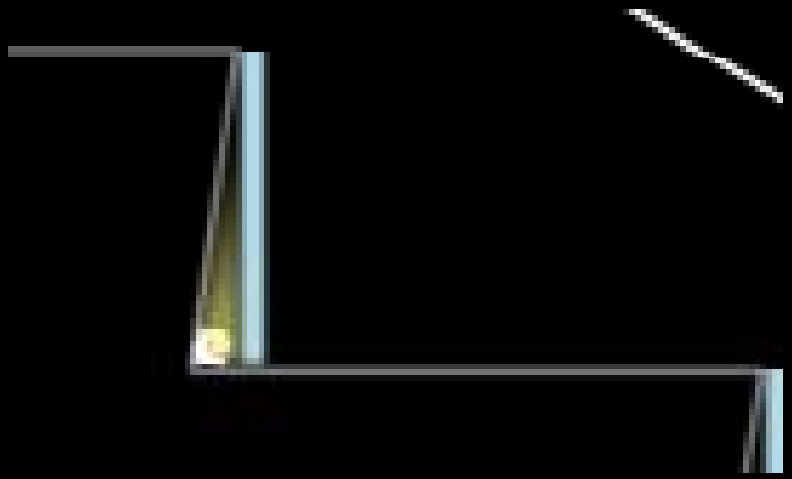


LOBBY/ATRIUM/STAIR EXPANSION

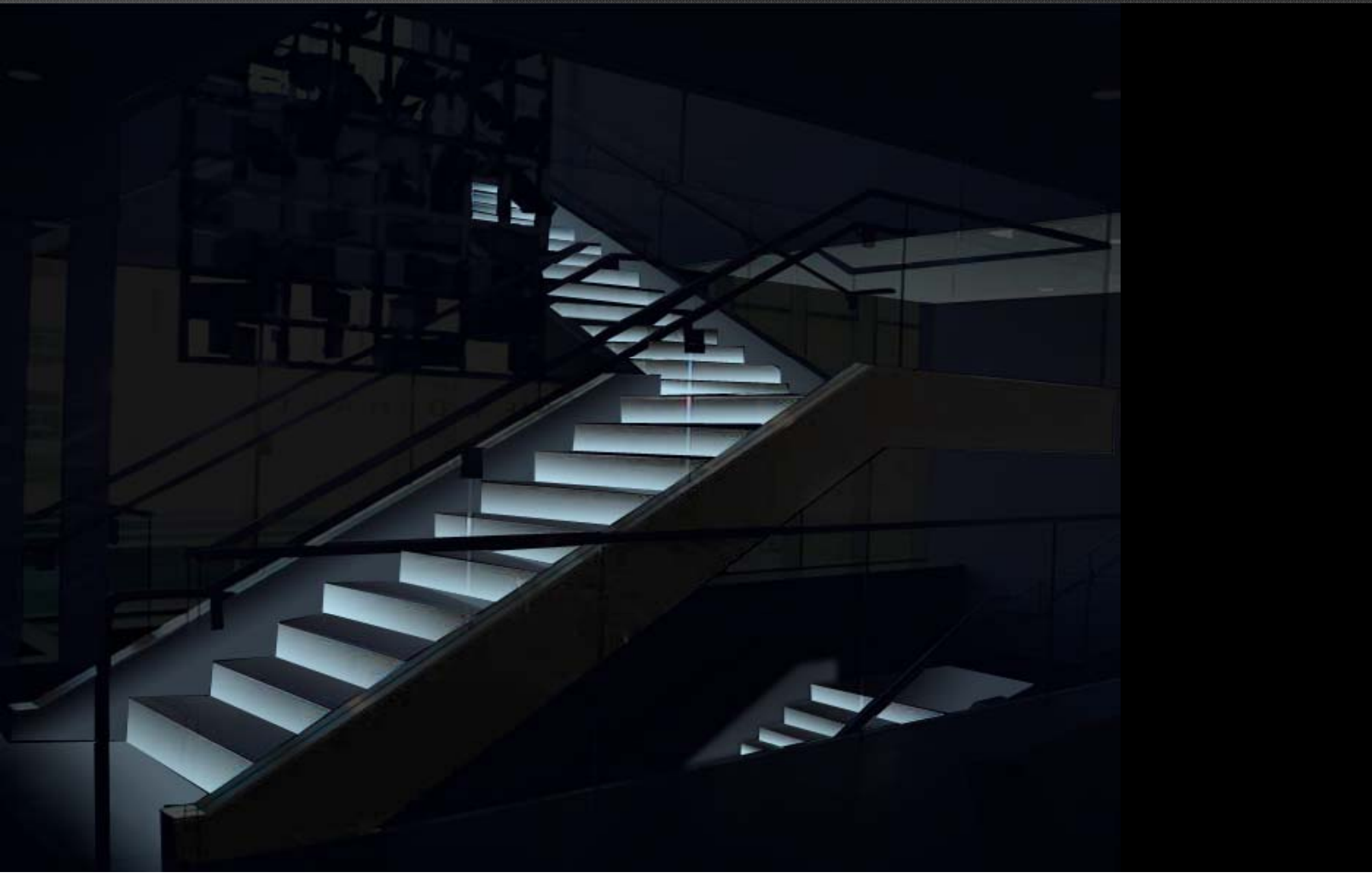


LOBBY/ATRIUM/STAIR EXPANSION

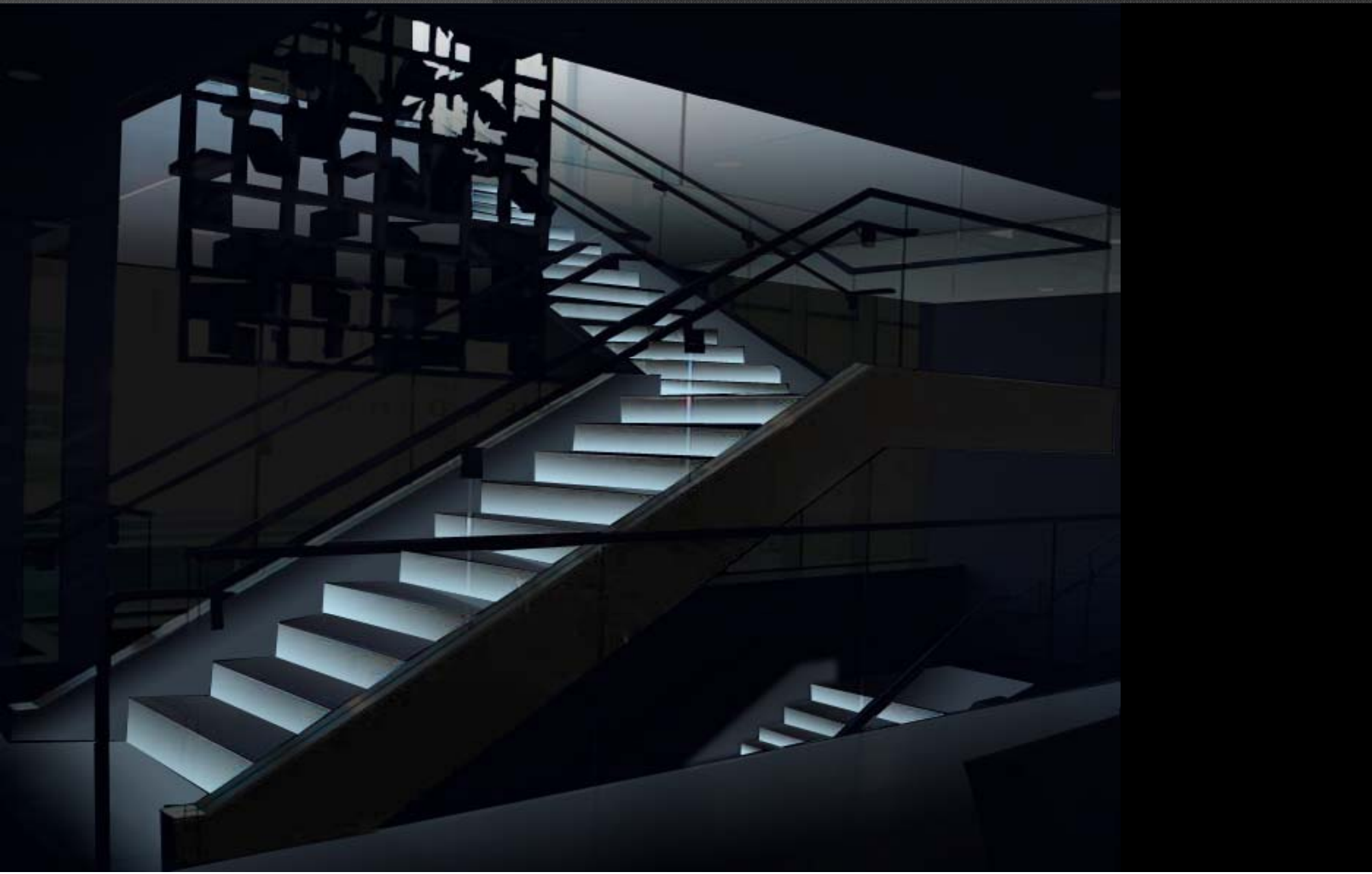




LOBBY/ATRIUM/STAIR EXPANSION



LOBBY/ATRIUM/STAIR EXPANSION



LOBBY/ATRIUM/STAIR EXPANSION

LOBBY/ATRIUM/STAIR EXPANSION

OPEN WORK SPACE

3

CREATE IMPRESSIONS WITH LIGHT

OPEN WORK SPACE

ARCHITECTURAL CONCEPTS

+ TRANSPARENCY TO BUILDING CORE
+ OPENNESS AND FLEXIBILITY OF SPACE TO ALLOW FOR INTERACTION

OPEN WORK SPACE

SPACE USE

+ LOUNGE, CLASSROOM, AND WORK AREA
+ MULTI-USE SPACE
  + ACADEMIC FUNCTIONS
  + ENTERTAINMENT/RELAXATION FUNCTIONS

OPEN WORK SPACE

AREA

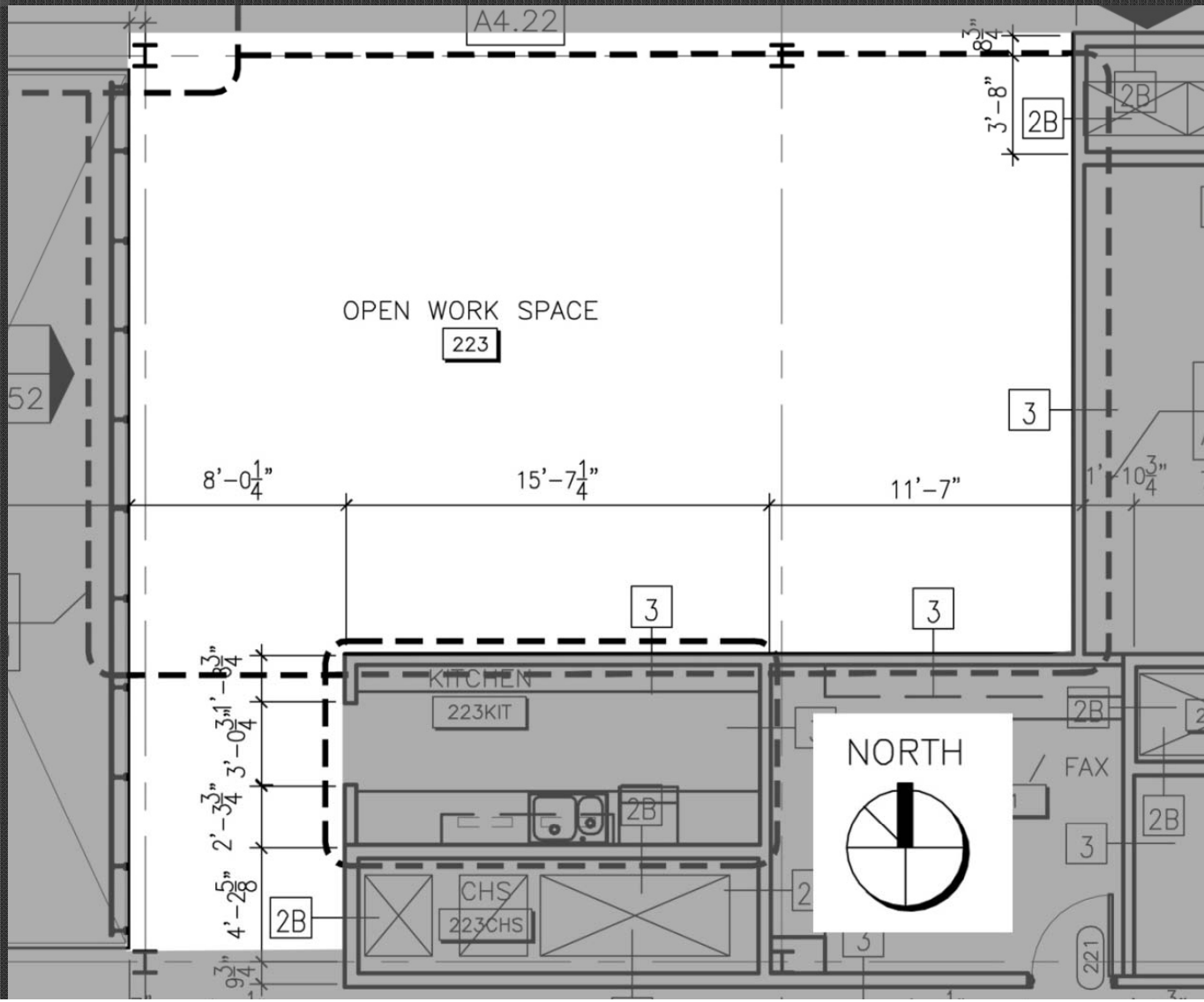
888 SQUARE FEET

ROOM DIMENSIONS

35’ X 23’ IN MAIN ROOM

CEILING HEIGHT OF 9’

ROOM DIMENSIONS



OPEN WORK SPACE PHOTOGRAPHS

OPEN WORK SPACE

LIGHTING DESIGN CRITERIA

+ CREATE PUBLIC AND RELAXATION IMPRESSIONS
+ PROVIDE A FLEXIBLE SOLUTION
+ CONSIDER LIGHT DISTRIBUTION ON ROOM SURFACES FOR EACH IMPRESSION

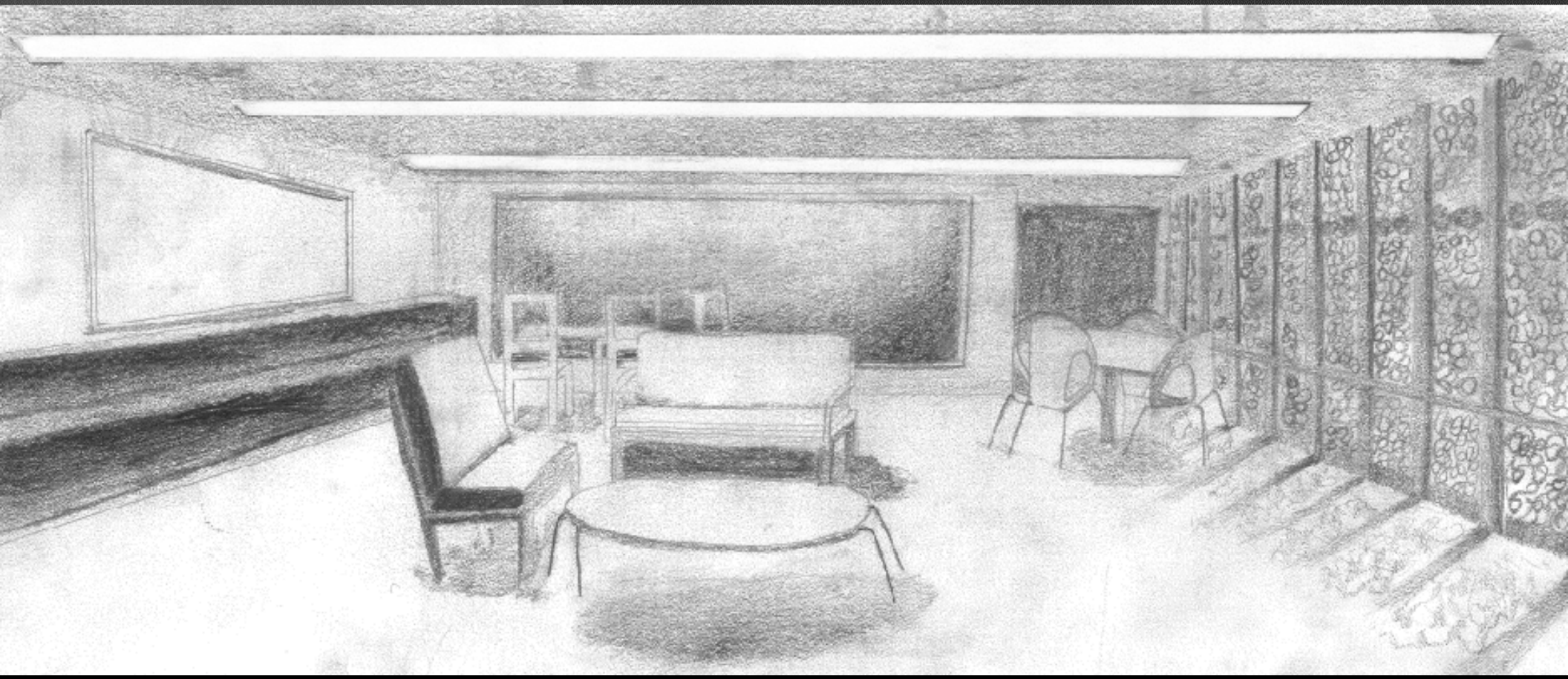
OPEN WORK SPACE

FLYNN STUDY

+ SEPARATE LIGHTING SOLUTIONS FOR ACADEMIC VERSUS ENTERTAINMENT/RELAXATION FUNCTIONS
+ CONSIDER FLYNN IMPRESSIONS FOR PSEUDO-OPPOSITES:

PUBLIC VERSUS RELAXATION

OPEN WORK SPACE PUBLIC IMPRESSION



+ HIGHER LEVELS OF ILLUMINATION
+ UNIFORM LIGHT DISTRIBUTION ON SURFACES
+ LIGHT FROM OVERHEAD

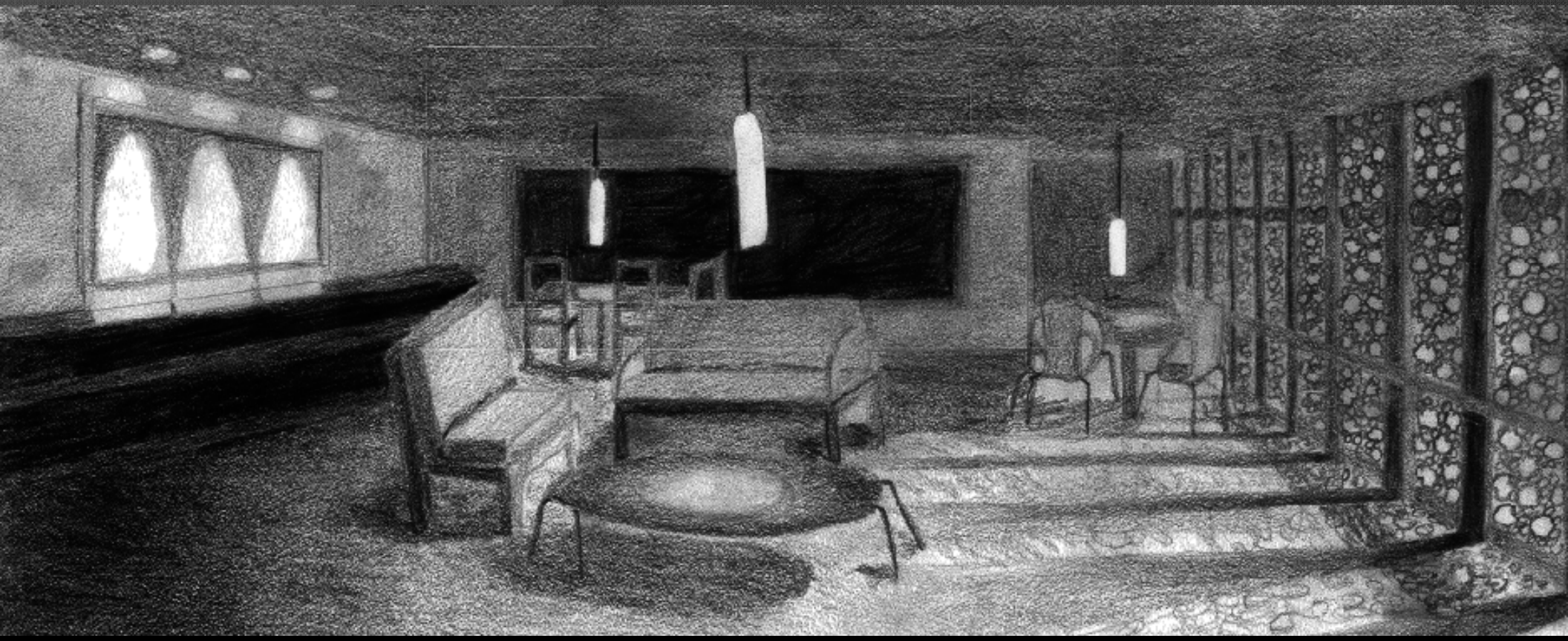
OPEN WORK SPACE

LIGHTING MODEL: PUBLIC IMPRESSION

OPEN WORK SPACE

LIGHTING MODEL: PUBLIC IMPRESSION

OPEN WORK SPACE RELAXATION IMPRESSION



+ LOWER LEVELS OF ILLUMINATION
+ NON-UNIFORM LIGHTING
+ EMPHASIZE WALL LIGHTING
+ SOFT “POOLS OF LIGHT”

OPEN WORK SPACE

LIGHTING MODEL: RELAXATION IMPRESSION

OPEN WORK SPACE

LIGHTING MODEL: RELAXATION IMPRESSION

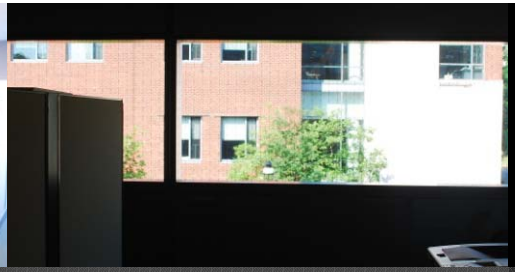
OPEN WORK SPACE

LIGHTING MODEL: COMPARISON

GRADUATE BULLPEN

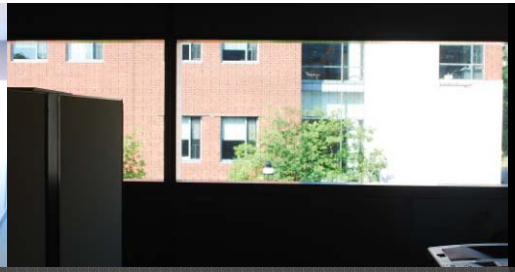
4

ENHANCE PERFORMANCE IN A WORK SPACE



GRADUATE BULLPEN SPACE USE

+ OPEN WORK SPACE FOR INDIVIDUAL AND GROUP WORK
+ USE AS OFFICE AND STUDY SPACE FOR GRADUATE STUDENTS



GRADUATE BULLPEN

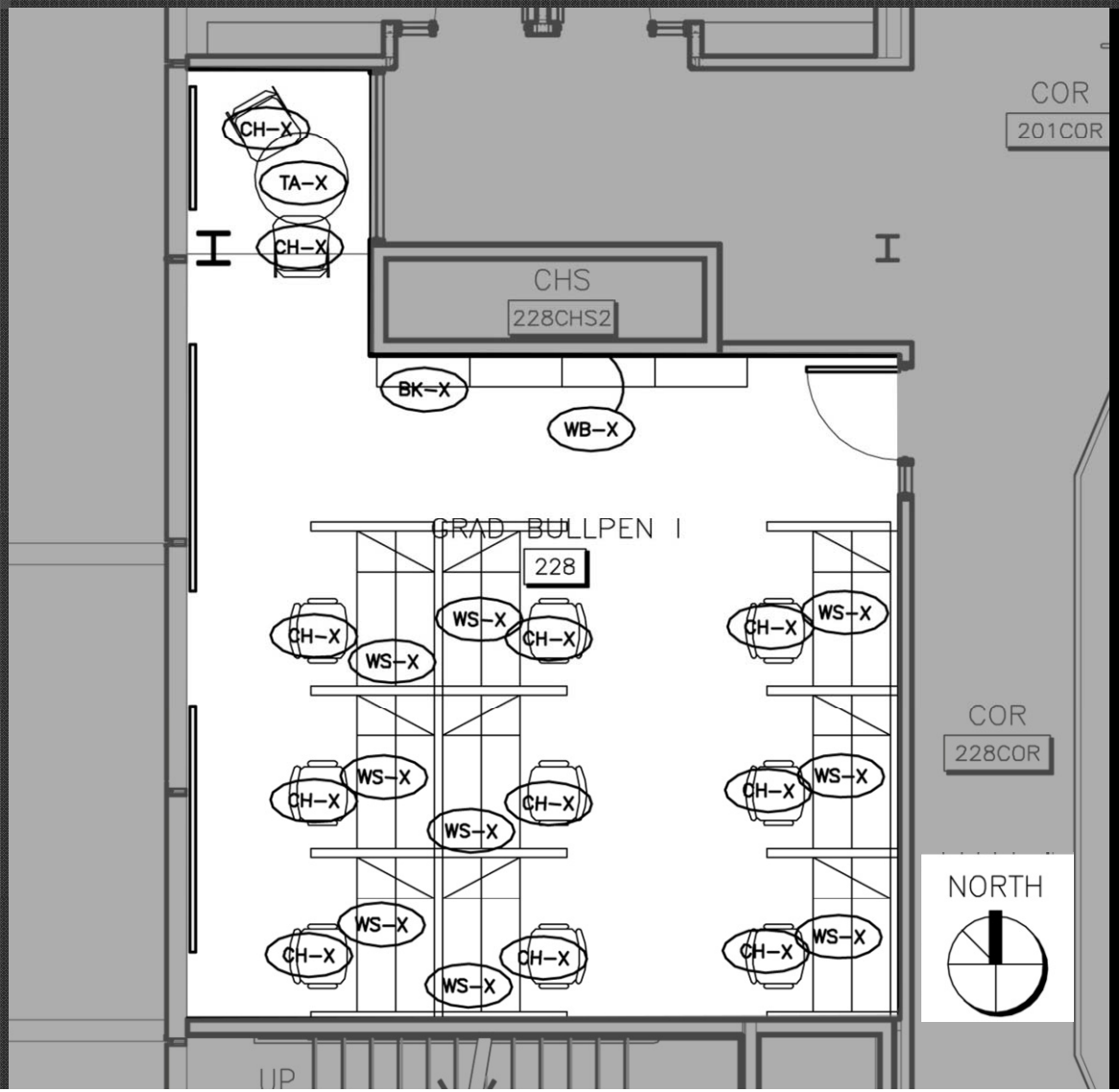
ROOM DIMENSIONS

AREA

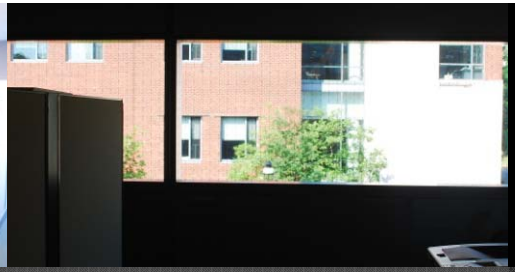
572 SQUARE FEET

ROOM DIMENSIONS

22.5’ X 22’, WITH A CEILING HEIGHT OF 9’



GRADUATE BULLPEN PHOTOGRAPHS

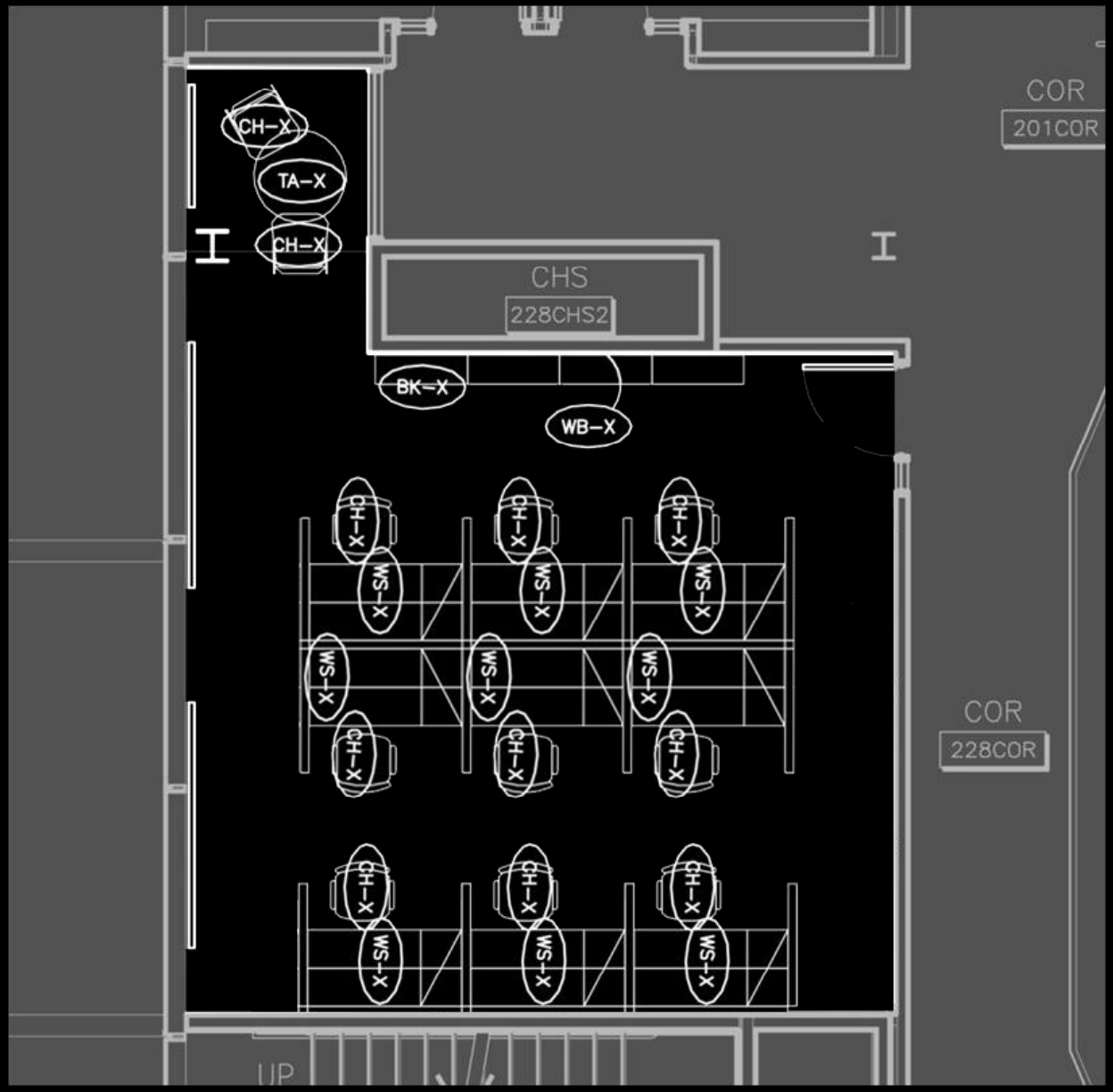


GRADUATE BULLPEN

LIGHTING DESIGN CRITERIA

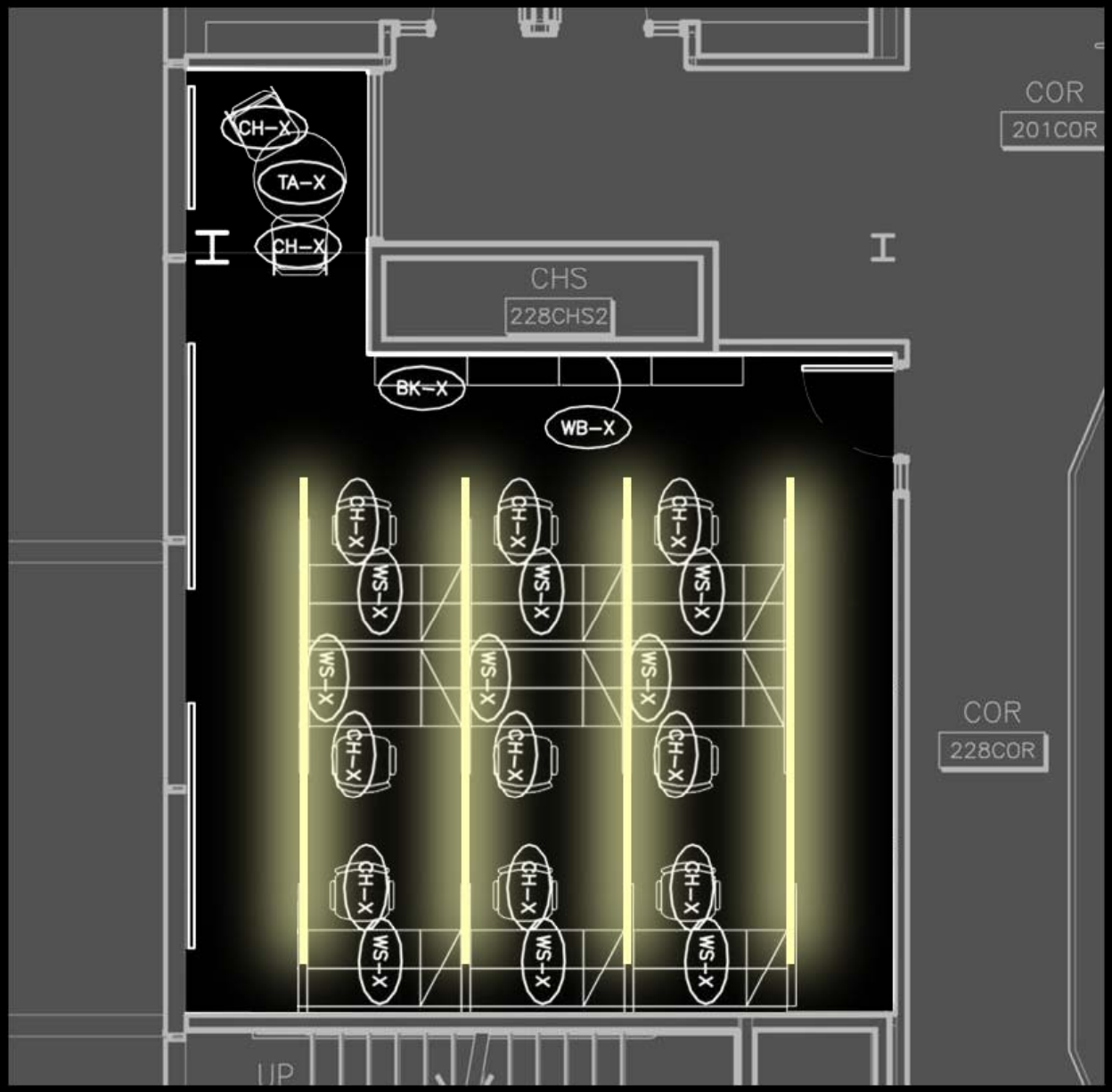
+ ELECTRIC LIGHTING SYSTEM TO BE INTEGRATED WITH DAYLIGHTING SYSTEM
+ MINIMIZE DIRECT GLARE
+ MINIMIZE REFLECTED GLARE ON COMPUTER SCREENS
+ LIGHT DISTRIBUTION ON TASK PLANE
+ LUMINANCES OF ROOM SURFACES

GRADUATE BULLPEN LIGHTING PLAN



REORIENT DESKS WITH RESPECT TO WINDOWS

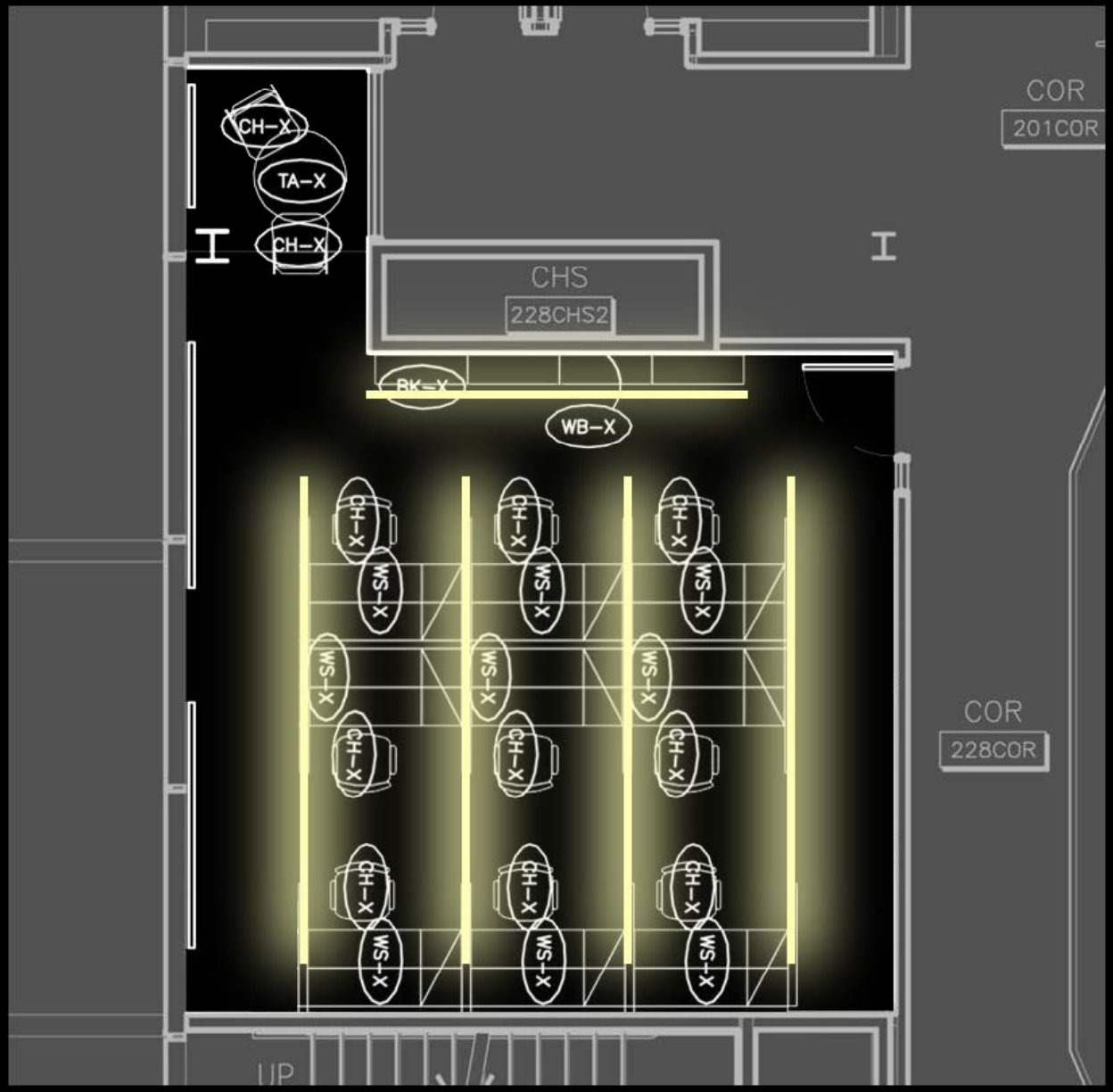
GRADUATE BULLPEN LIGHTING PLAN



INDIRECT AMBIENT LIGHTING SYSTEM

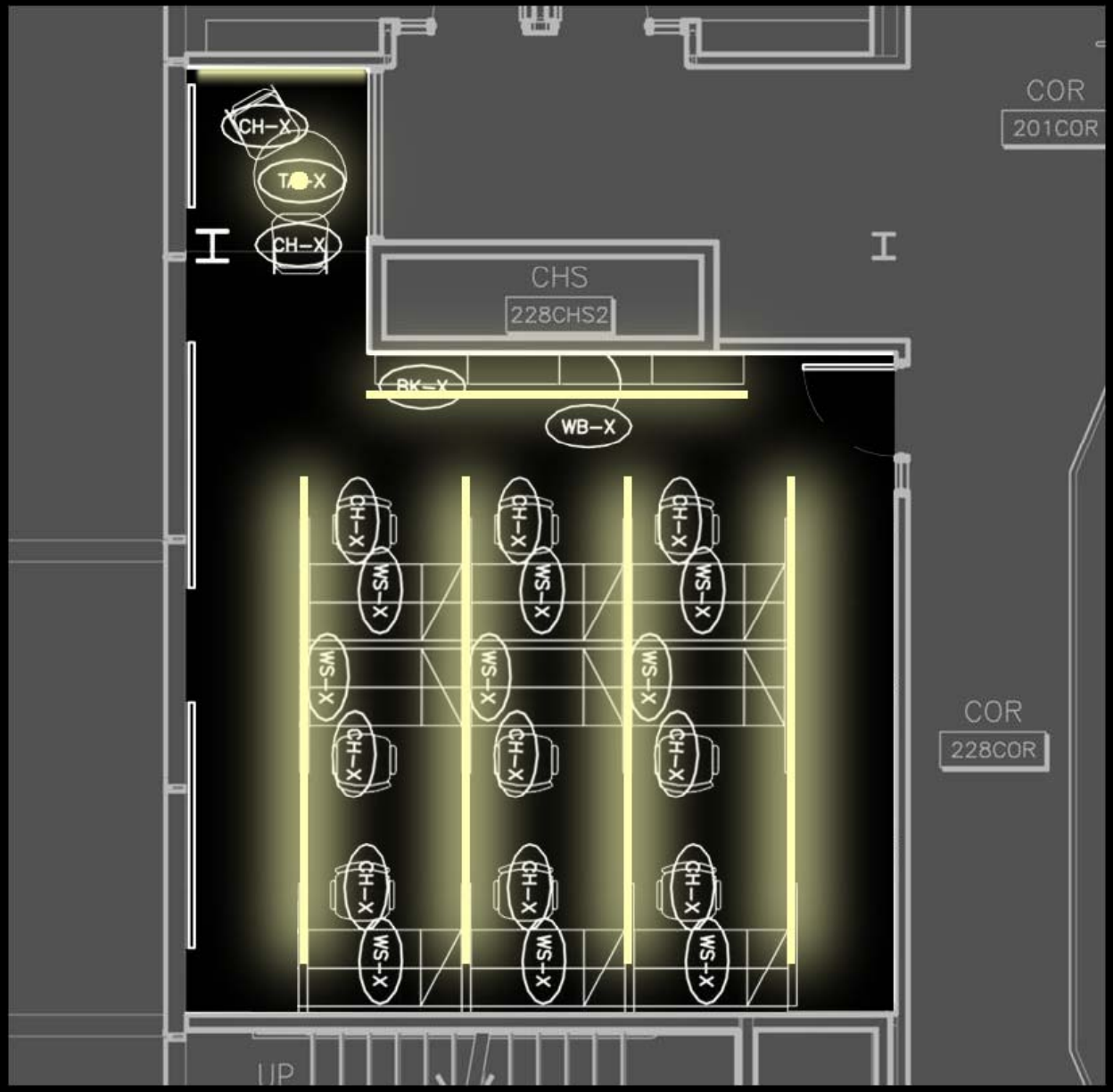
COMBINE WITH TASK LIGHTING AT DESKS

GRADUATE BULLPEN LIGHTING PLAN



PROVIDE UNIFORM WASH OF LIGHT ON DISCUSSION BOARD

GRADUATE BULLPEN LIGHTING PLAN



SIMULATE A LOUNGE FEEL IN THE ALCOVE

GRADUATE BULLPEN LIGHTING DESIGN

DESKS NO LONGER FACE THE WINDOWS

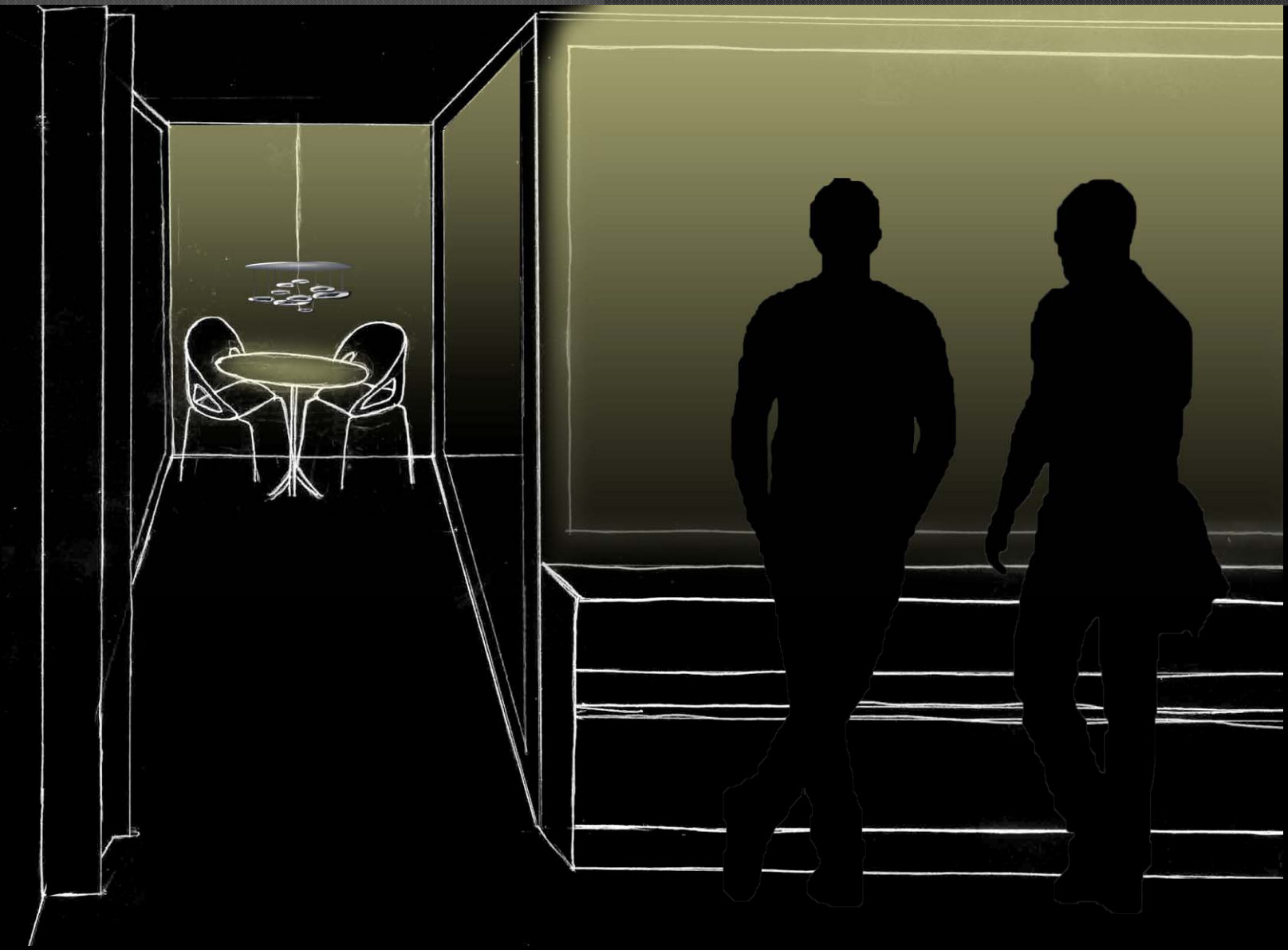
INDIRECT LIGHTING REDUCES DIRECT GLARE AND BALANCES ROOM SURFACE LUMINANCES

GRADUATE BULLPEN LIGHTING DESIGN

TASK LIGHTING AT EACH WORK STATION ALLOWS FOR OCCUPANT CONTROL AND COMFORT

GRADUATE BULLPEN

LIGHTING DESIGN

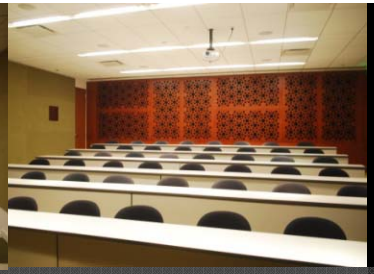


LIGHTING IN ALCOVE

LECTURE HALL

5

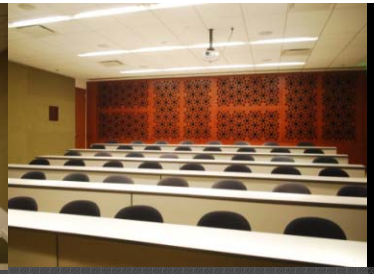
PROVIDE EFFECTIVE LIGHTING OF TASKS



LECTURE HALL

ARCHITECTURAL CONCEPTS

+ PERFORATED CHERRY WOOD FEATURE WALL ANCHORS SPACE TO CORE ATRIUM
+ ACOUSTICAL ELEMENTS INTEGRATED WITH ARCHITECTURE



LECTURE HALL SPACE USE

- LARGEST LECTURE SPACE IN BUILDING
- USED FOR BOTH LECTURES ON A CHALK BOARD AND LECTURES AIDED BY AUDIOVISUAL EQUIPMENT

LECTURE HALL

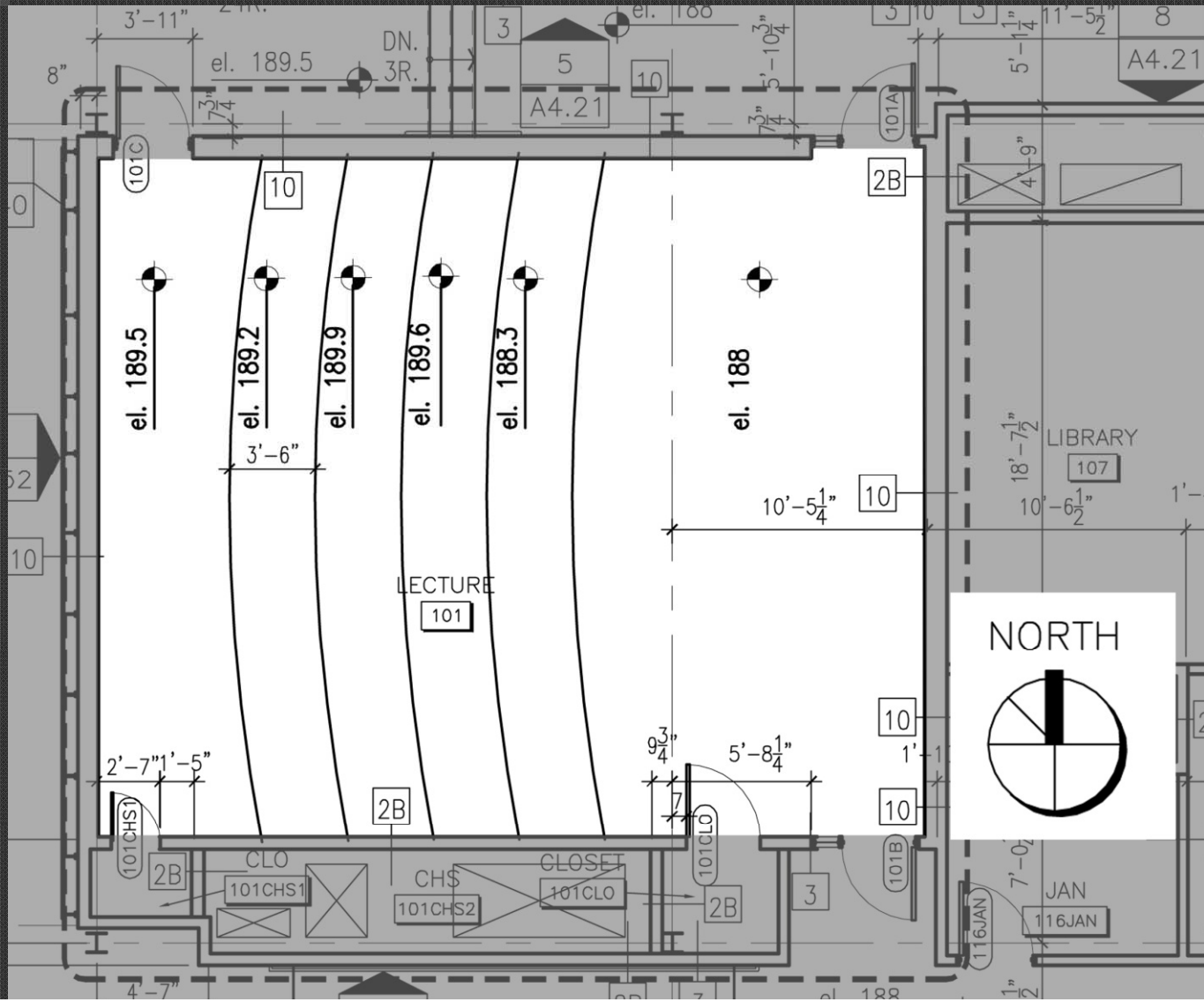
ROOM DIMENSIONS

AREA

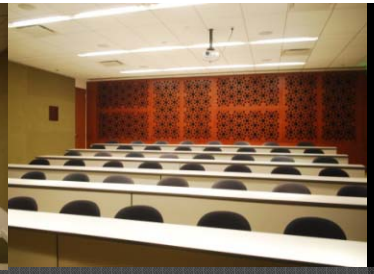
942 SQUARE FEET

ROOM DIMENSIONS

34’ X 28’, WITH A CEILING HEIGHT OF 10.5’ AT THE BOTTOM STAIR AND 9’ AT THE TOP STAIR



LECTURE HALL PHOTOGRAPHS

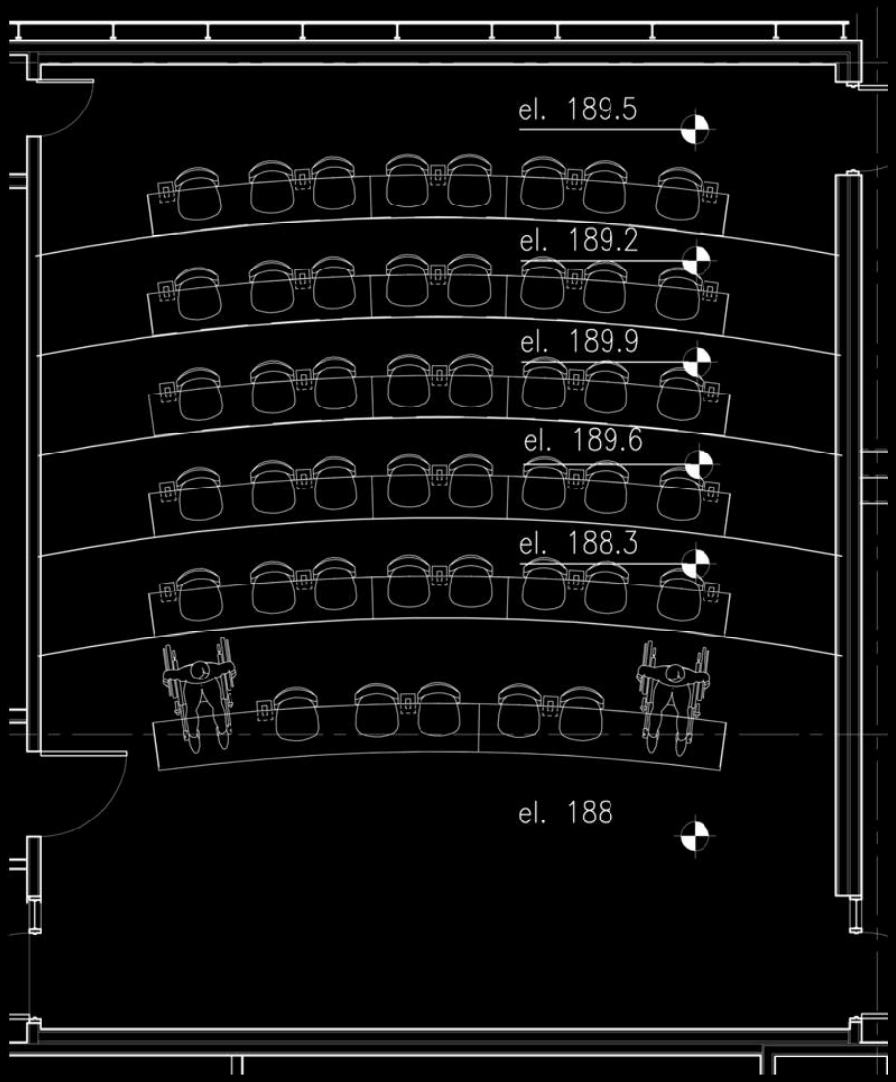


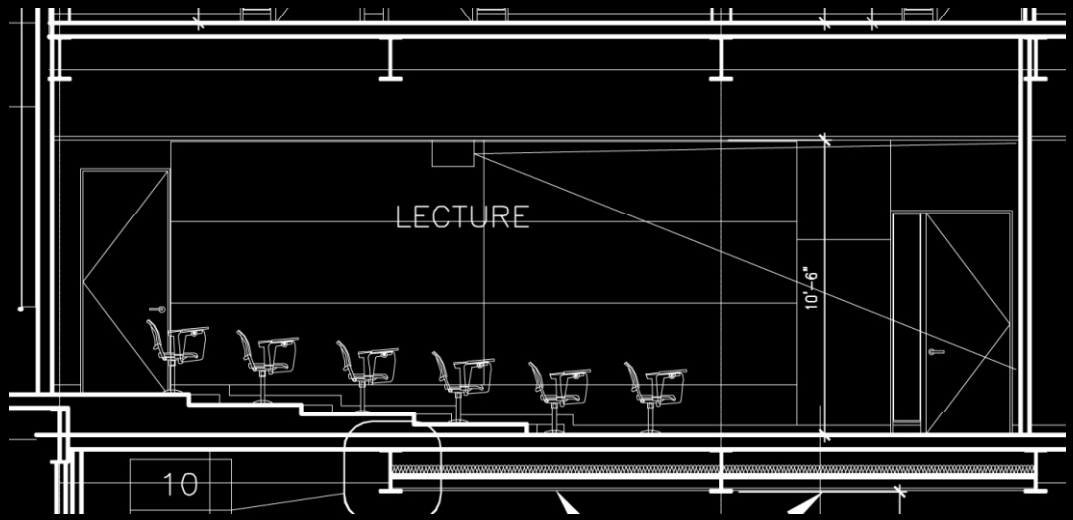
LECTURE HALL

LIGHTING DESIGN CRITERIA

+ EMPHASIZE POINTS OF INTEREST
+ MINIMIZE GLARE POTENTIAL
+ PROVIDE UNIFORM LIGHT ON DESKS AND CHALKBOARD
+ PROVIDE A FLEXIBLE SYSTEM
+ PROVIDE EFFECTIVE MODELING OF INSTRUCTOR'S FACE

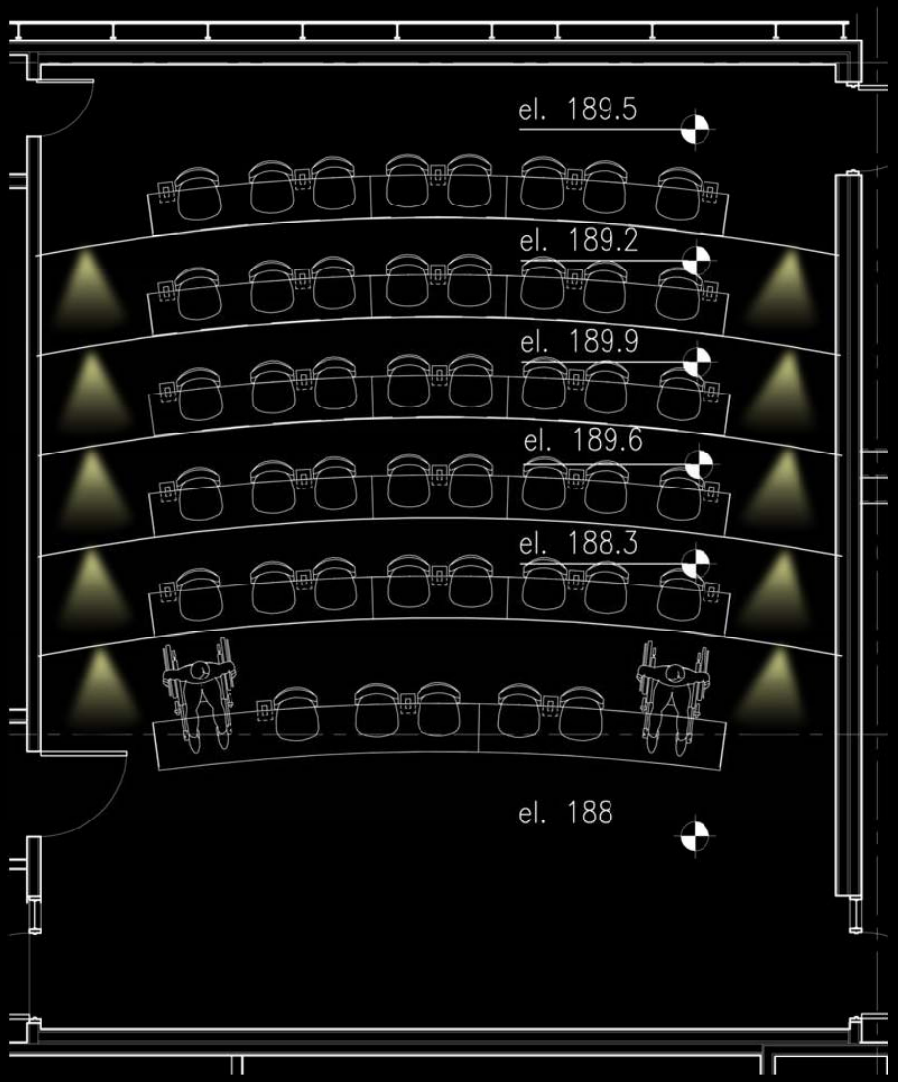
LECTURE HALL LIGHTING ELEMENTS

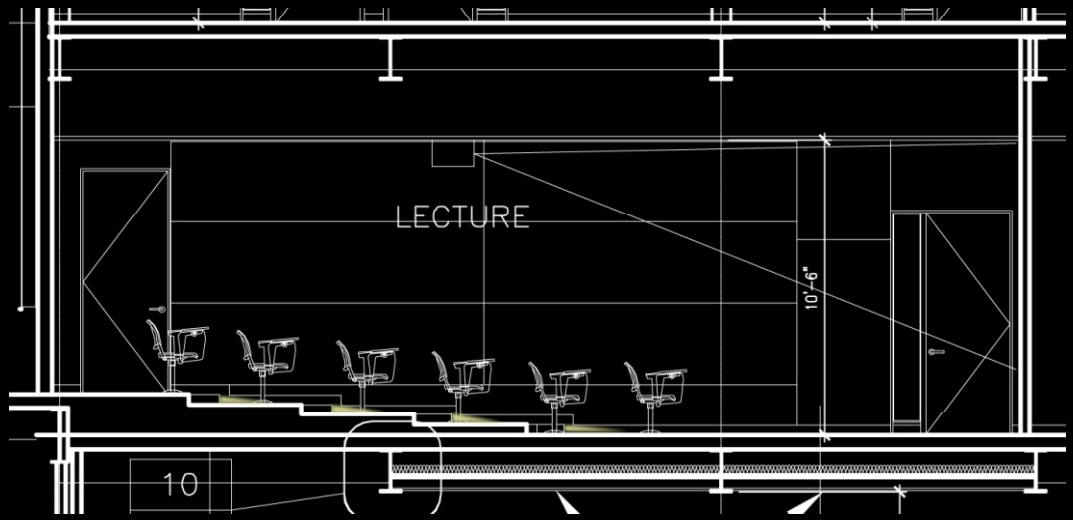




LECTURE HALL

LIGHTING ELEMENTS

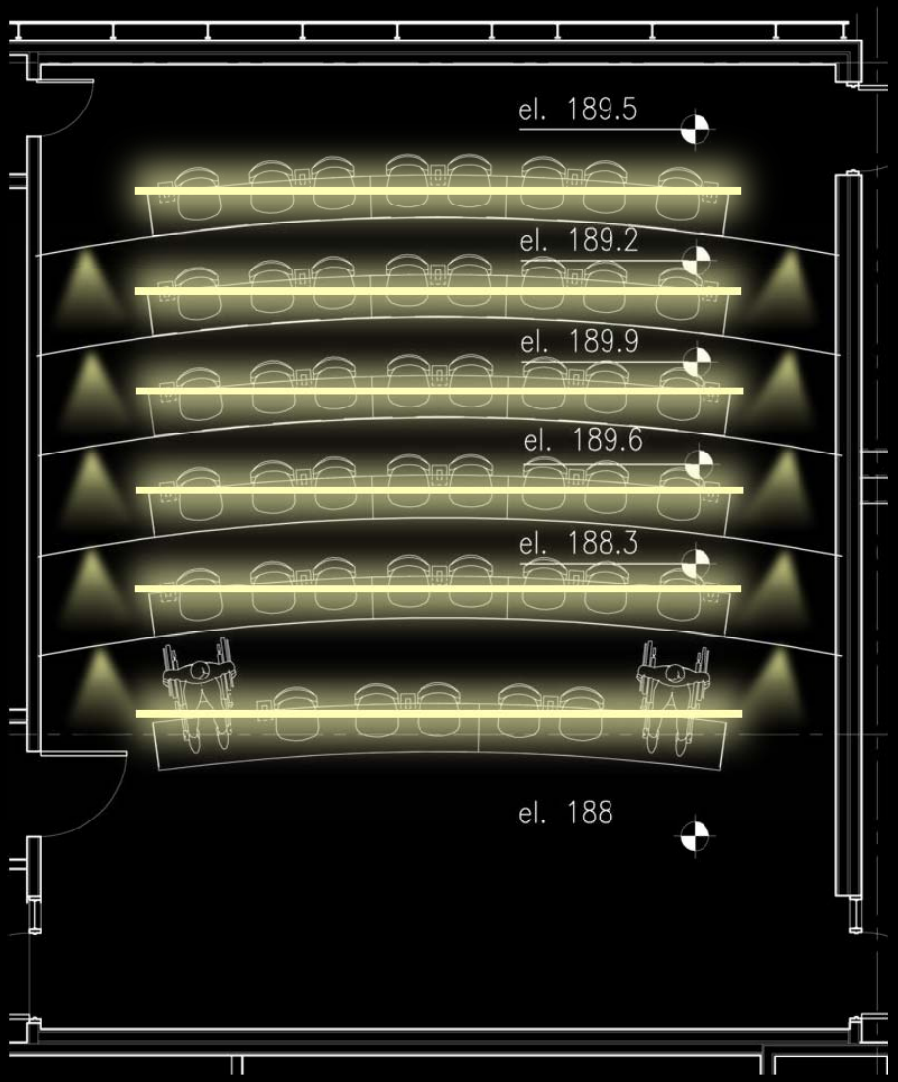


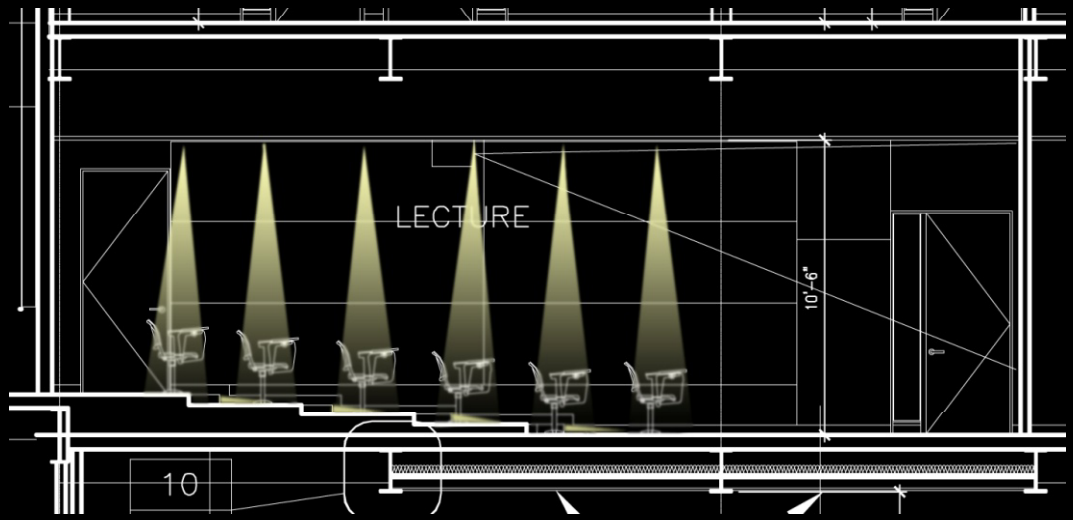


RECESSED STEP LIGHTING

LECTURE HALL

LIGHTING ELEMENTS

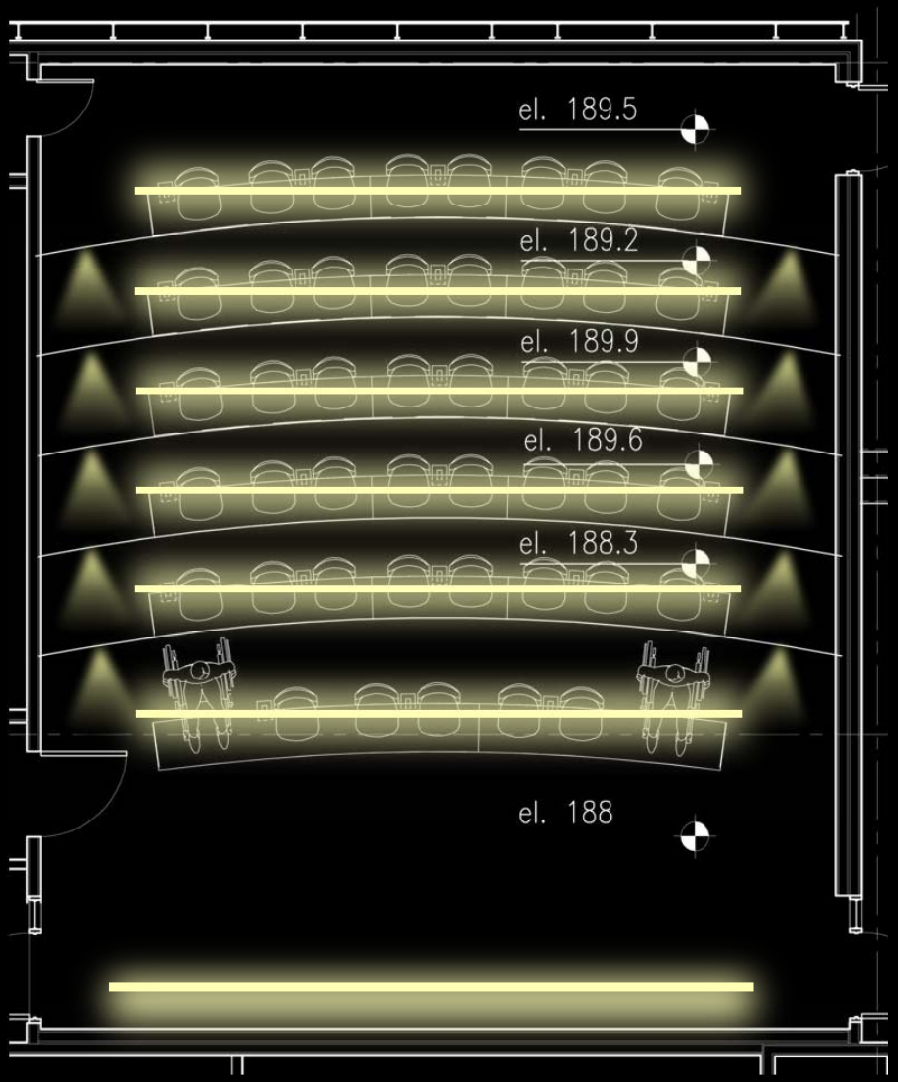


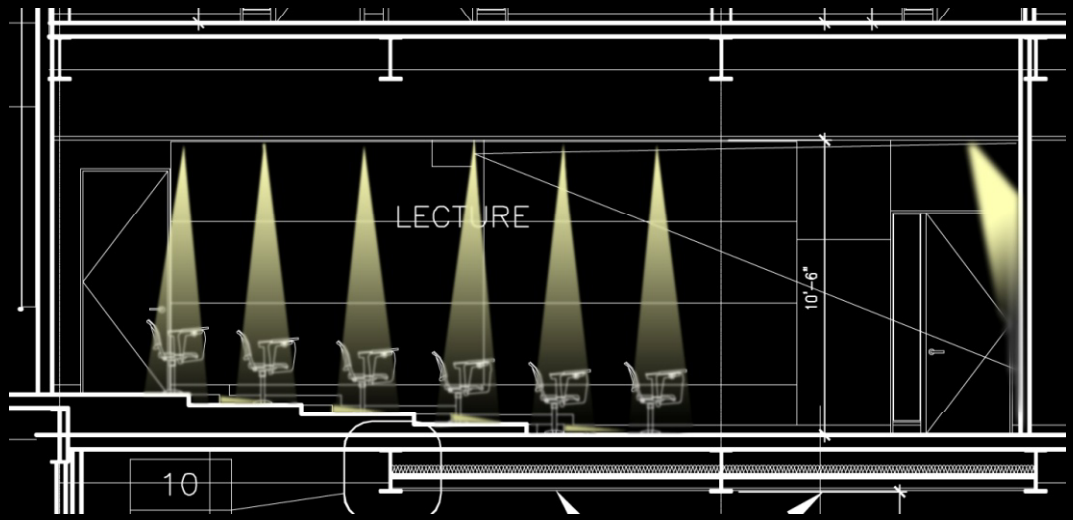


RECESSED LINEAR LIGHTING OVER DESKS

LECTURE HALL

LECTURE MODE I: CHALKBOARD





UNIFORM WASH OF LIGHT ON CHALKBOARD

LECTURE HALL

LECTURE MODE I: CHALKBOARD

LECTURE HALL

WALL LIGHTING OPTION

QUESTIONS AND COMMENTS