CHEROKEE HERITAGE CENTER - PHASE 1

SCHEMATIC DESIGN
BASIS OF DESIGN NARRATIVES
FOR COST ESTIMATE

December 12, 2025

SafdieArchitects

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CHEROKEE HERITAGE CENTER

SCHEMATIC DESIGN - ARCHITECTURAL BOD NARRATIVE

DECEMBER 12, 2025

SafdieArchitects

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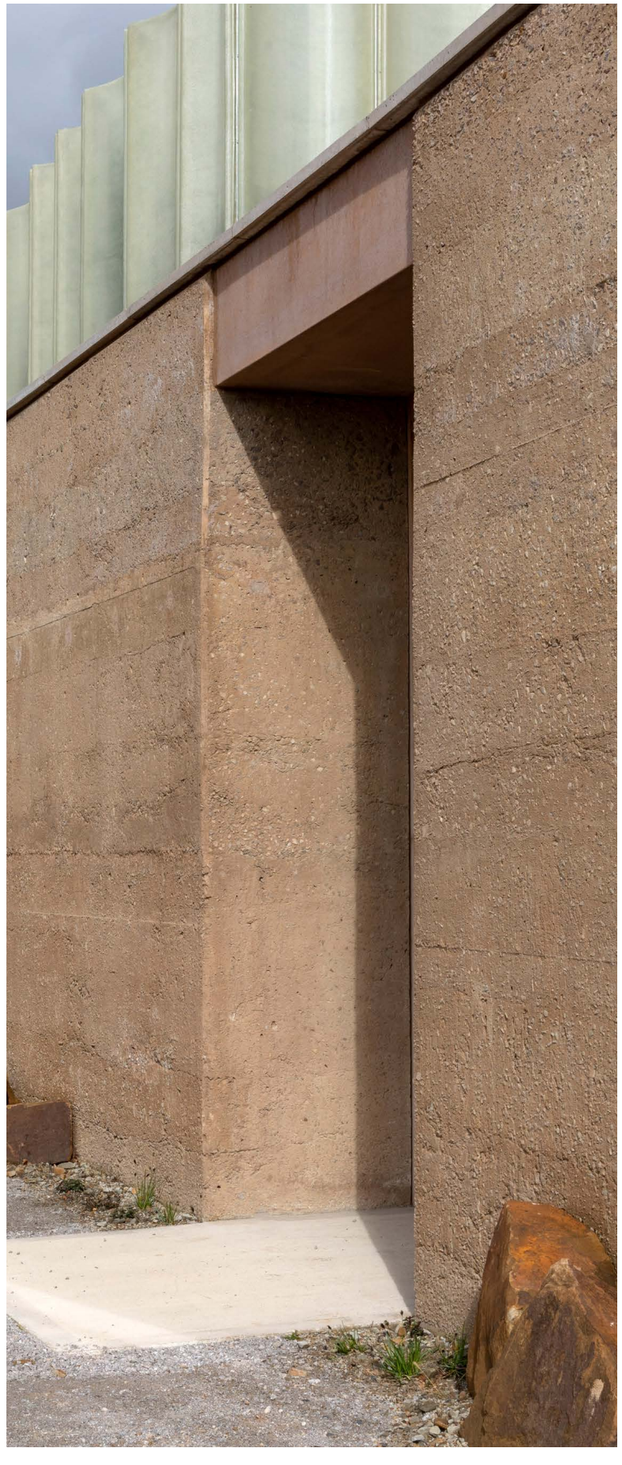
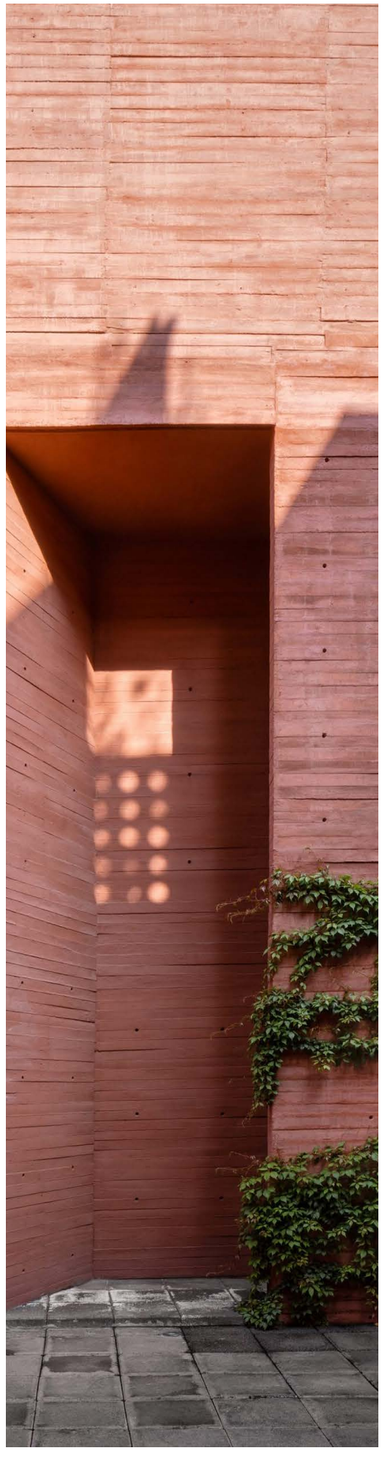
BUILDING FROM MAIN VEHICULAR ENTRANCE

ENTRY VESTIBULE AND GREAT HALL FROM DROP-OFF

ILLUSTRATIVE REFERENCES | PIGMENTED, TEXTURED CONCRETE

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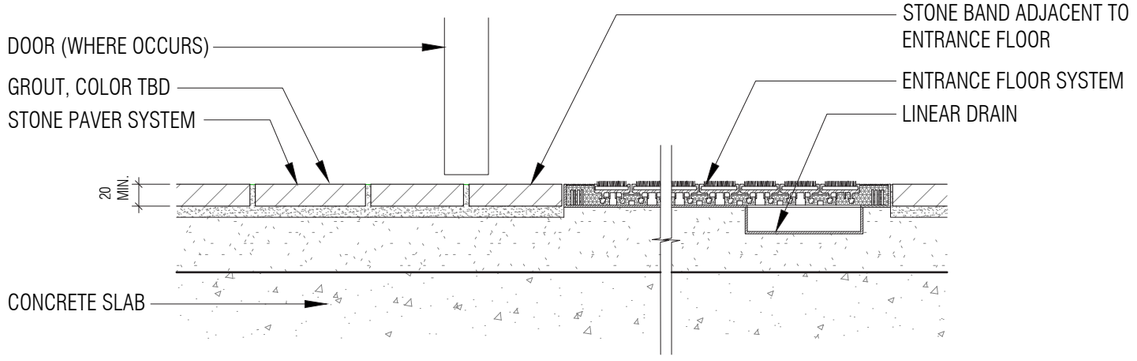

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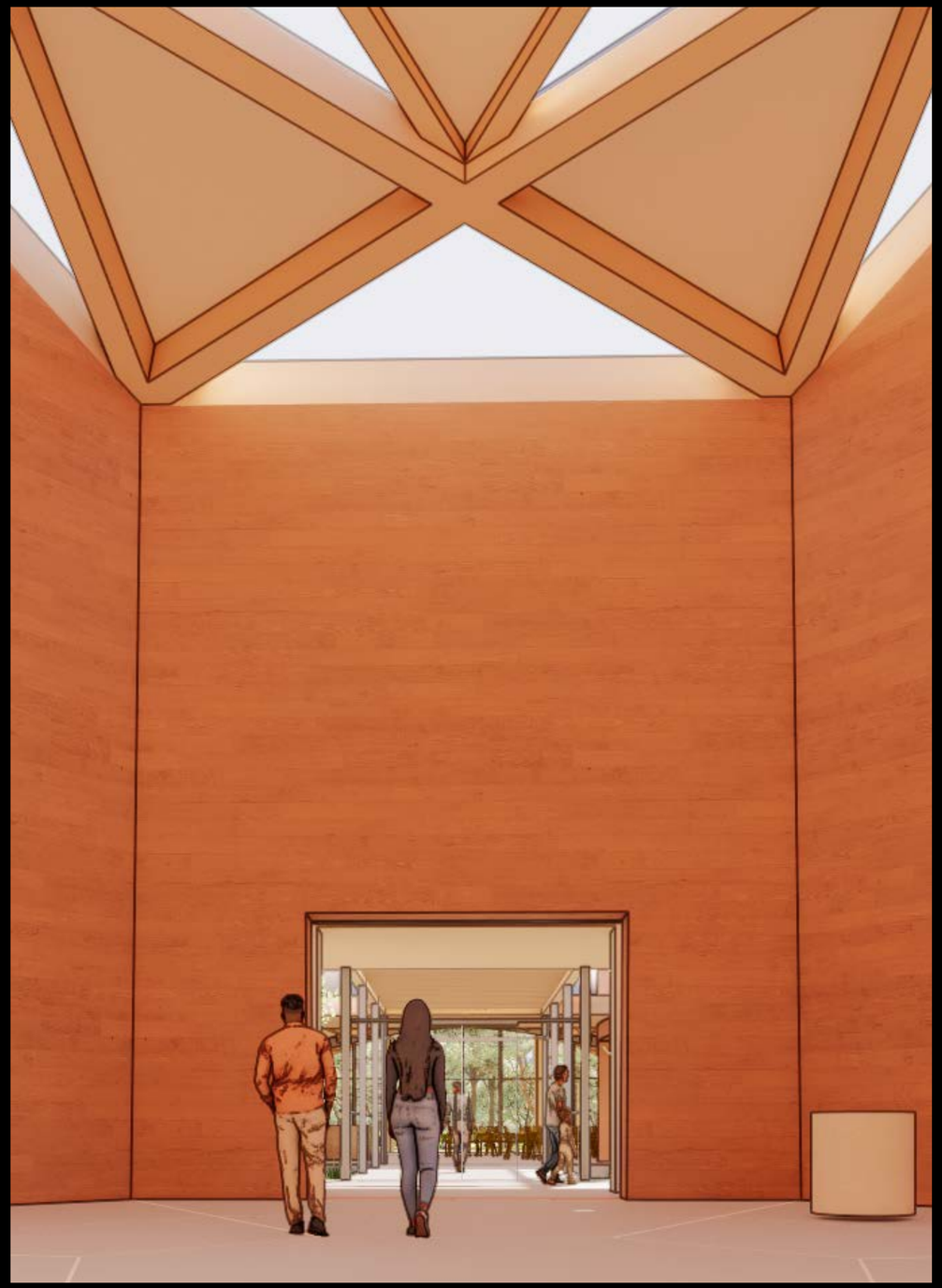
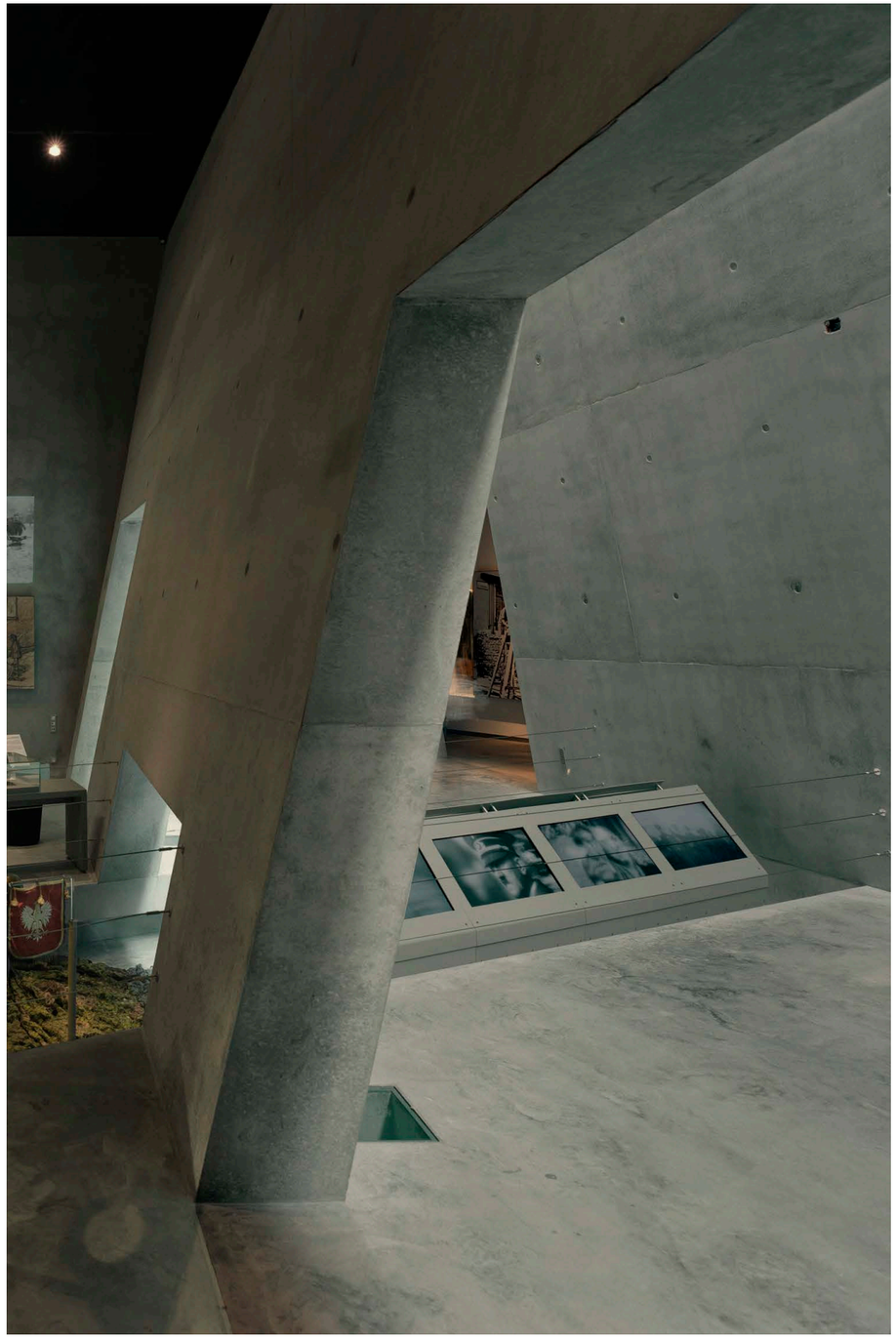


GREAT HALL INTERIOR

ILLUSTRATIVE REFERENCES | GREAT HALL WALL OPENINGS



LEFT EXAMPLE OF CANTED OPENING IN EXPOSED ARCHITECTURAL CONCRETE

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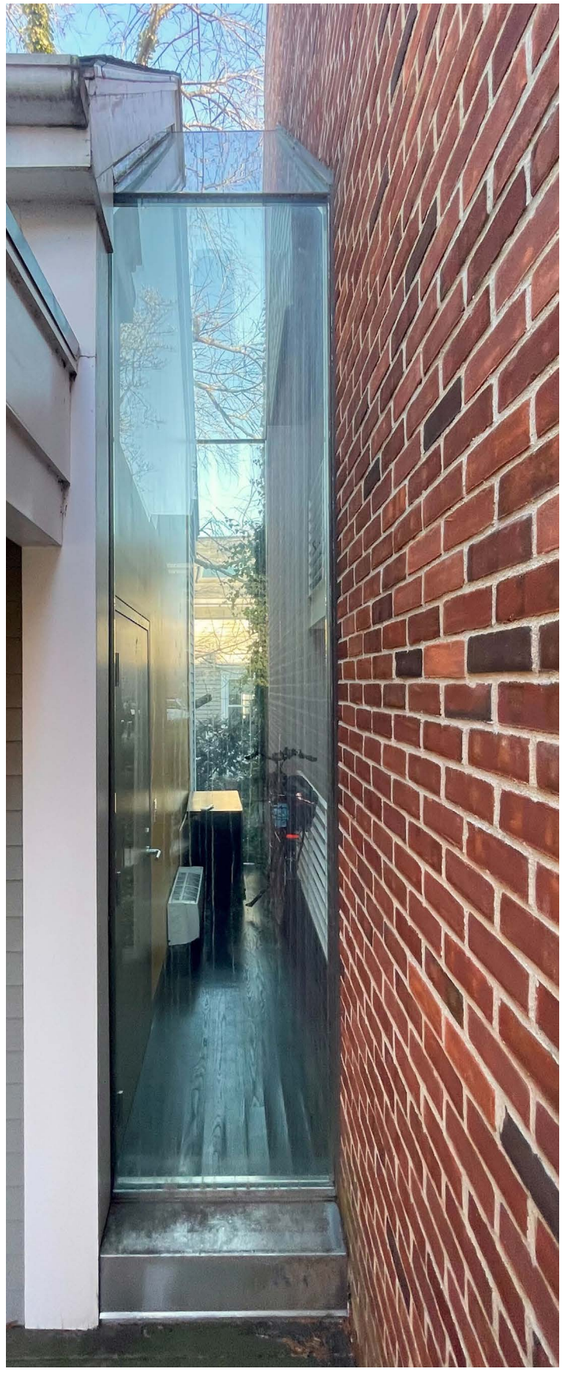

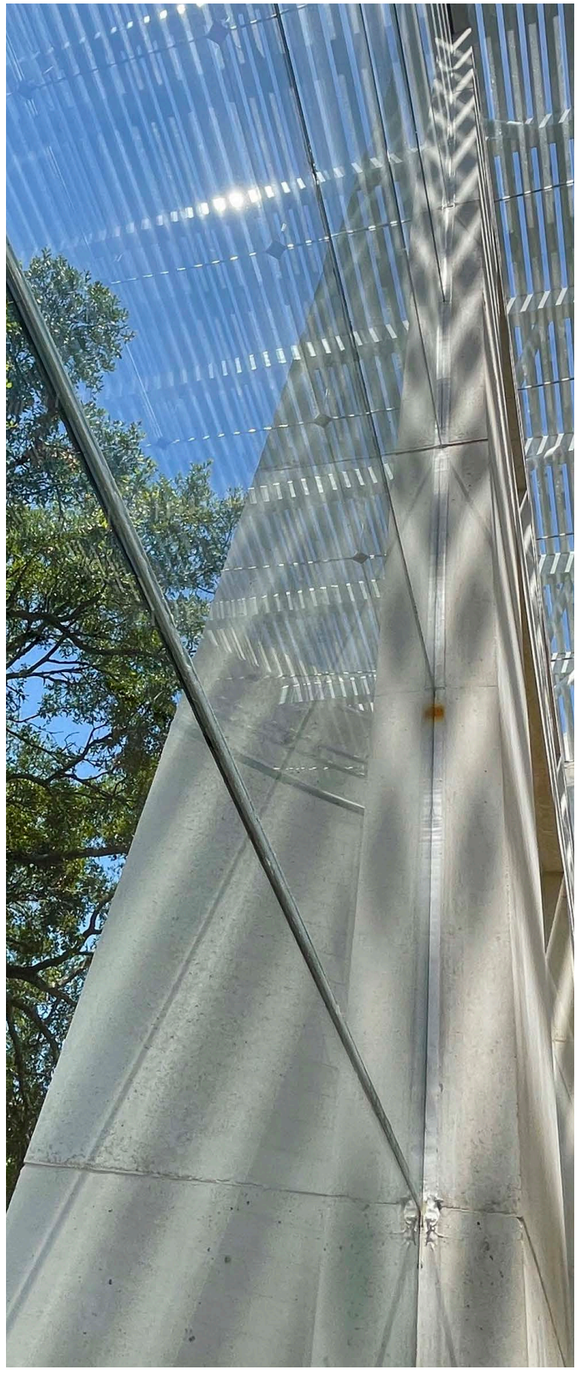

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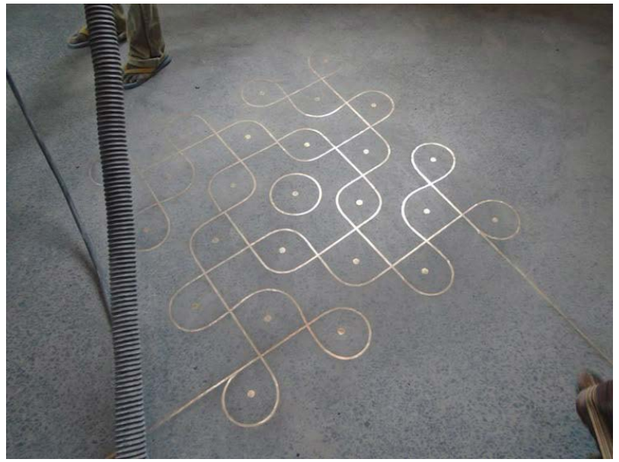

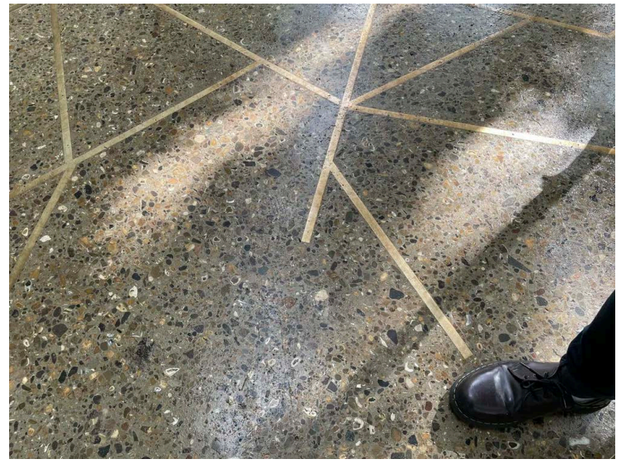

LEFT
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IN GREAT HALL FLOOR

ABOVE
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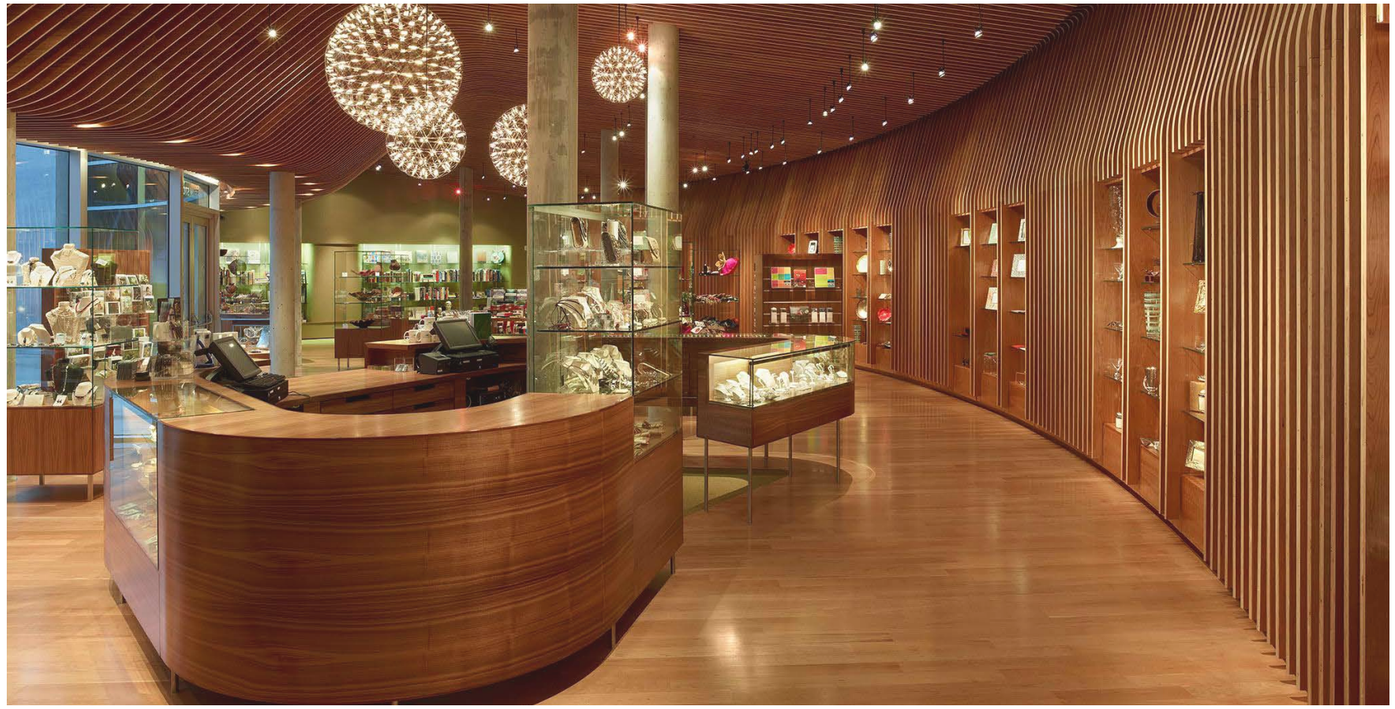
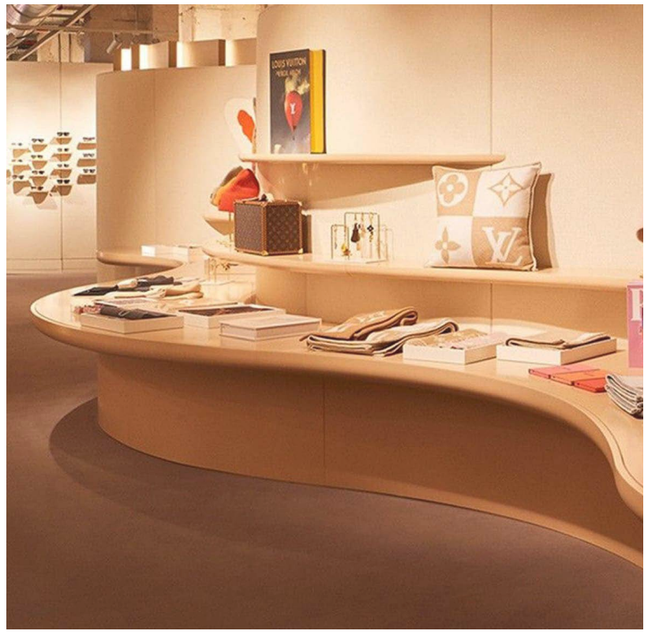
ILLUSTRATIVE REFERENCES | GIFT SHOP CASEWORK





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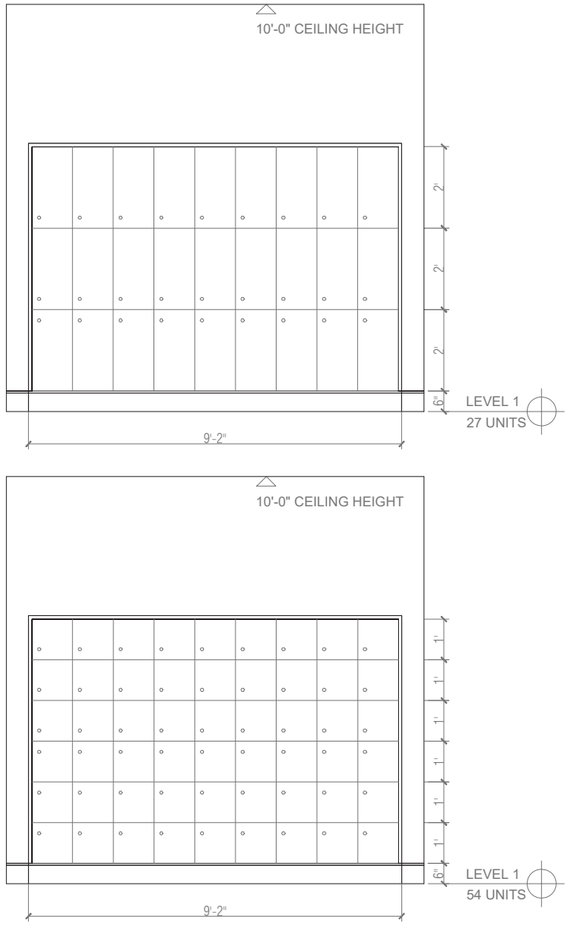

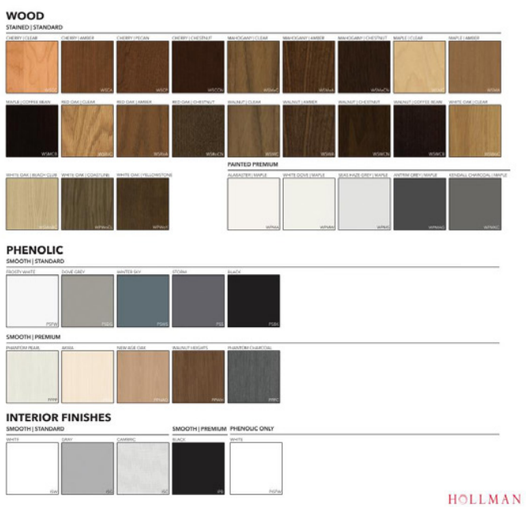

HOLLMAN

HOLLMAN

ILLUSTRATIVE REFERENCES | RESTROOMS

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ILLUSTRATIVE RENDITION | BIRCH CREEK GALLERY

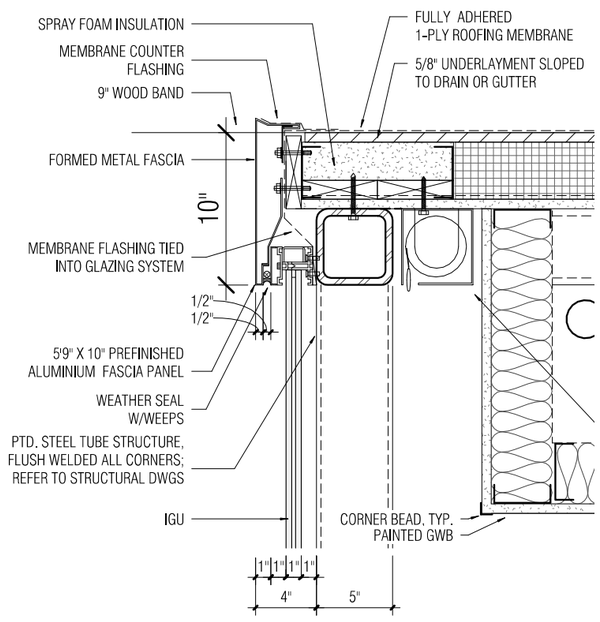
BIRCH CREEK GALLERY LOOKING WEST

BIRCH CREEK GALLERY LOOKING EAST

ILLUSTRATIVE RENDITION | BIRCH CREEK GALLERY

PERMANENT GALLERY FACADE AND BRIDGE FROM BIRCH CREEK GALLERY

ILLUSTRATIVE REFERENCES | BIRCH CREEK GALLERY



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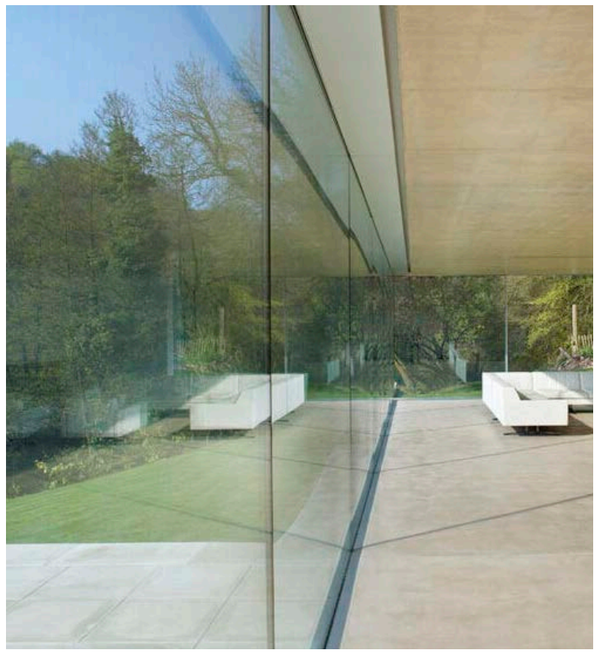

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ILLUSTRATIVE RENDITION | NATIONAL TREASURES GALLERY

NATIONAL TREASURES GALLERY LOOKING NORTH

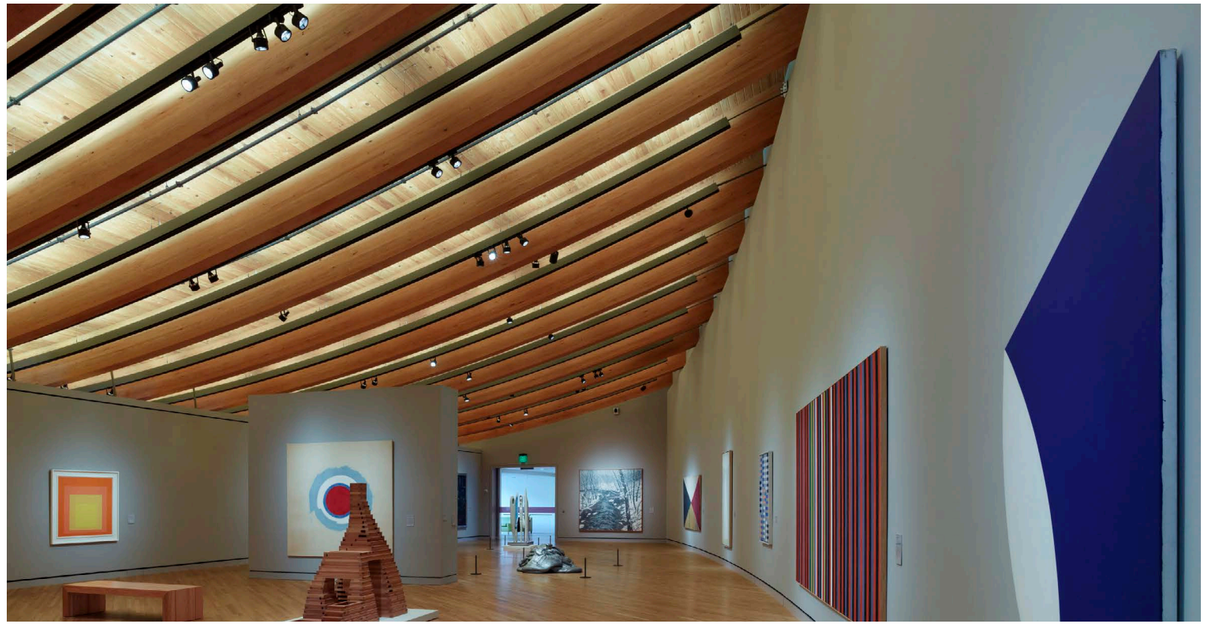
NATIONAL TREASURES GALLERY LOOKING SOUTH

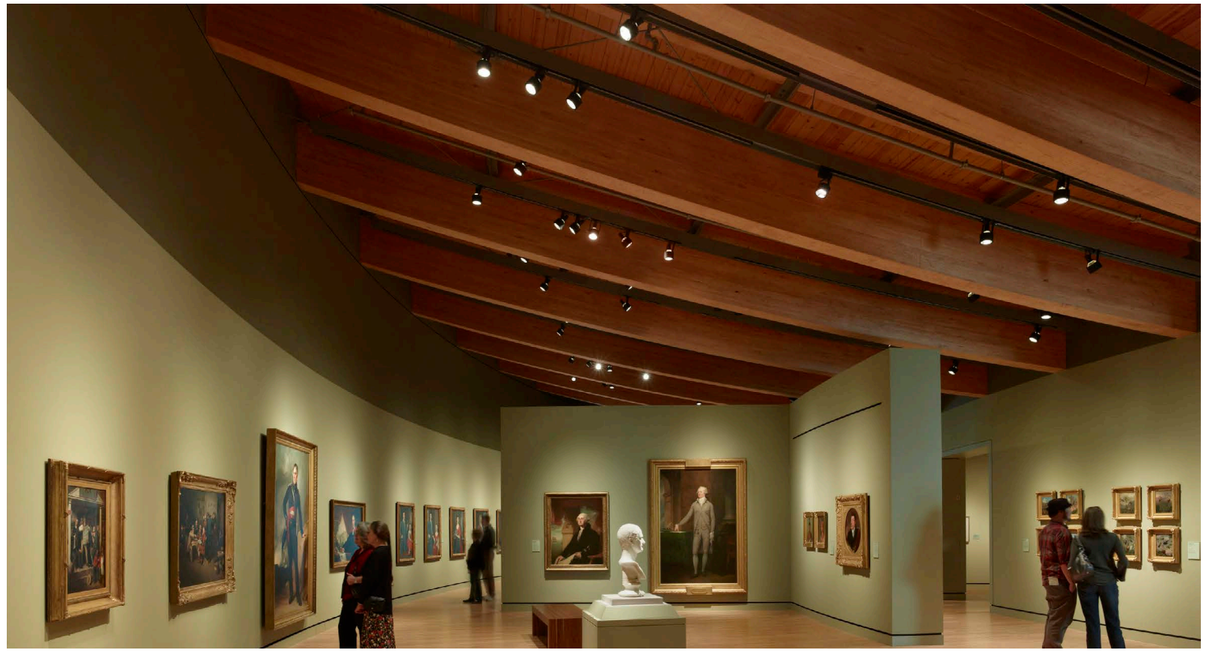
ILLUSTRATIVE RENDITION | PERMANENT GALLERY

INTERIOR OF PERMANENT GALLERY LOOKING EAST

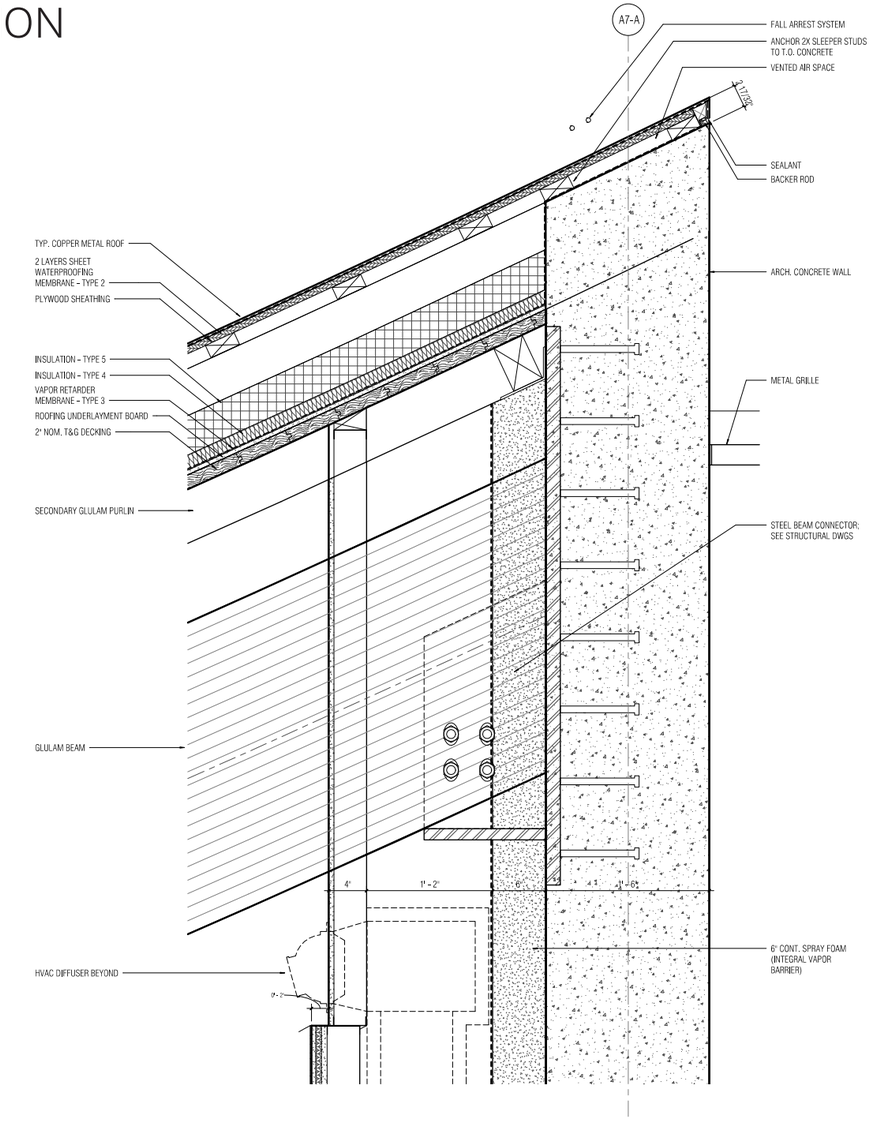
INTERIOR OF PERMANENT GALLERY LOOKING WEST

ILLUSTRATIVE REFERENCES | PERMANENT GALLERY ROOF EXPRESSION





ABOVE
EXAMPLE OF EXPOSED TIMBER ROOFS WITH GALLERY LIGHTING (CURVED BEAM CONDITION DOES NOT APPLY)



ABOVE
EXAMPLE OF CONNECTION DETAIL OF TIMBER MEMBER INTO STRUCTURAL CONCRETE WALL

RIGHT
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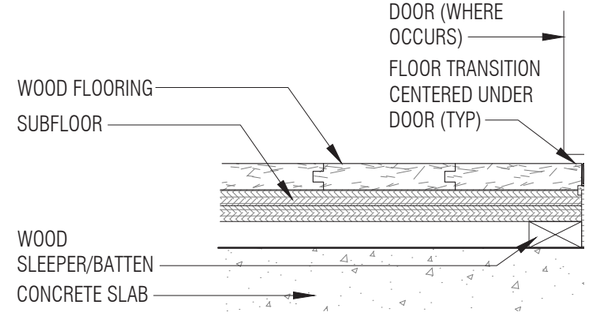
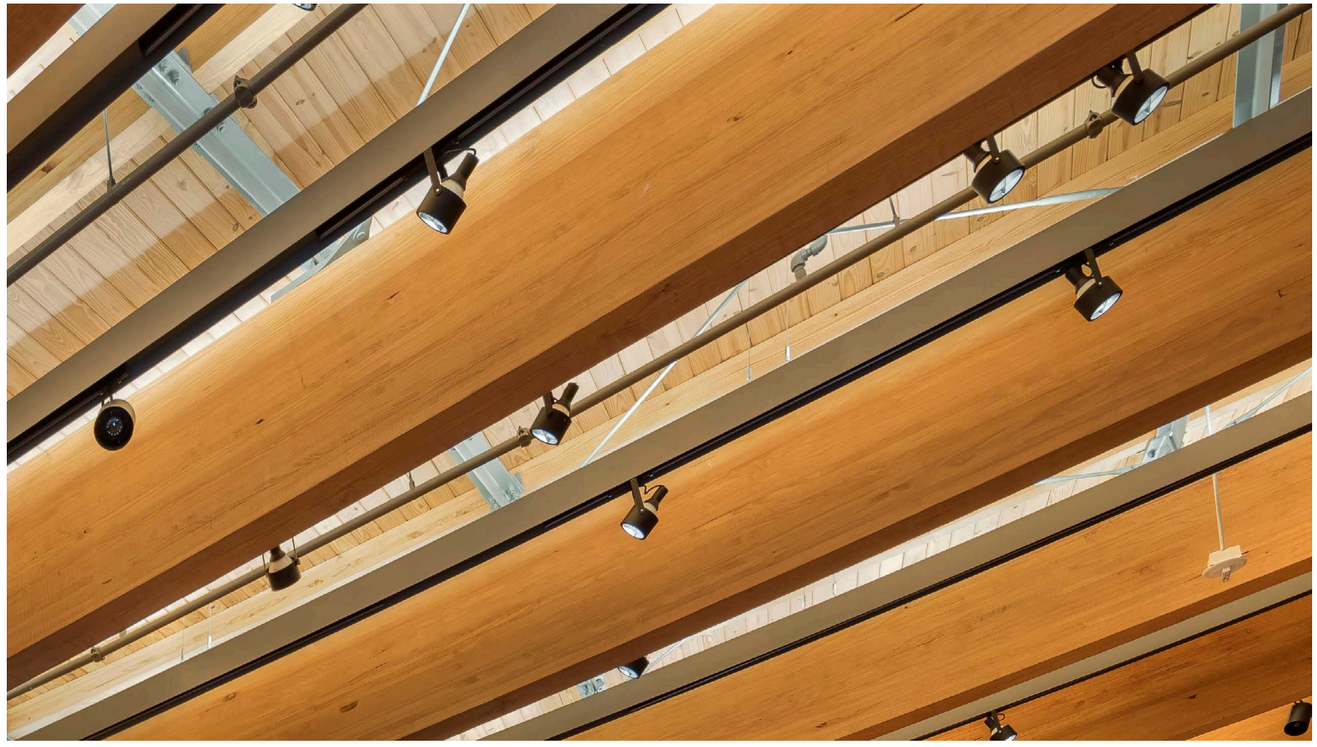
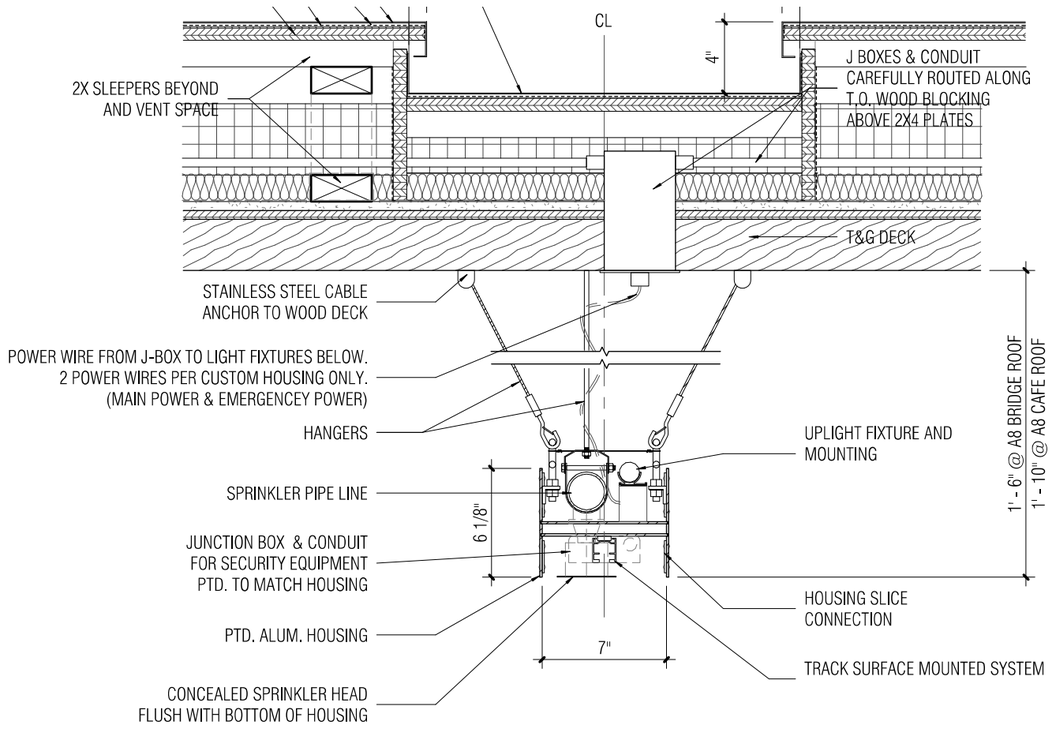


ILLUSTRATIVE REFERENCES | GALLERY LIGHTING SYSTEMS



CUSTOM CONTINUOUS PAINTED ALUMINUM TRACK MOUNTS TO BE INCORPORATED THROUGHOUT NATIONAL TREASURES, PERMANENT AND CHANGING GALLERIES



ILLUSTRATIVE EXAMPLE OF SUSPENDED TRACK MOUNT DETAIL

ILLUSTRATIVE RENDITION | PICTURE WINDOWS

TYPICAL GALLERY WINDOW FROM EXTERIOR

TYPICAL GALLERY WINDOW FROM INTERIOR

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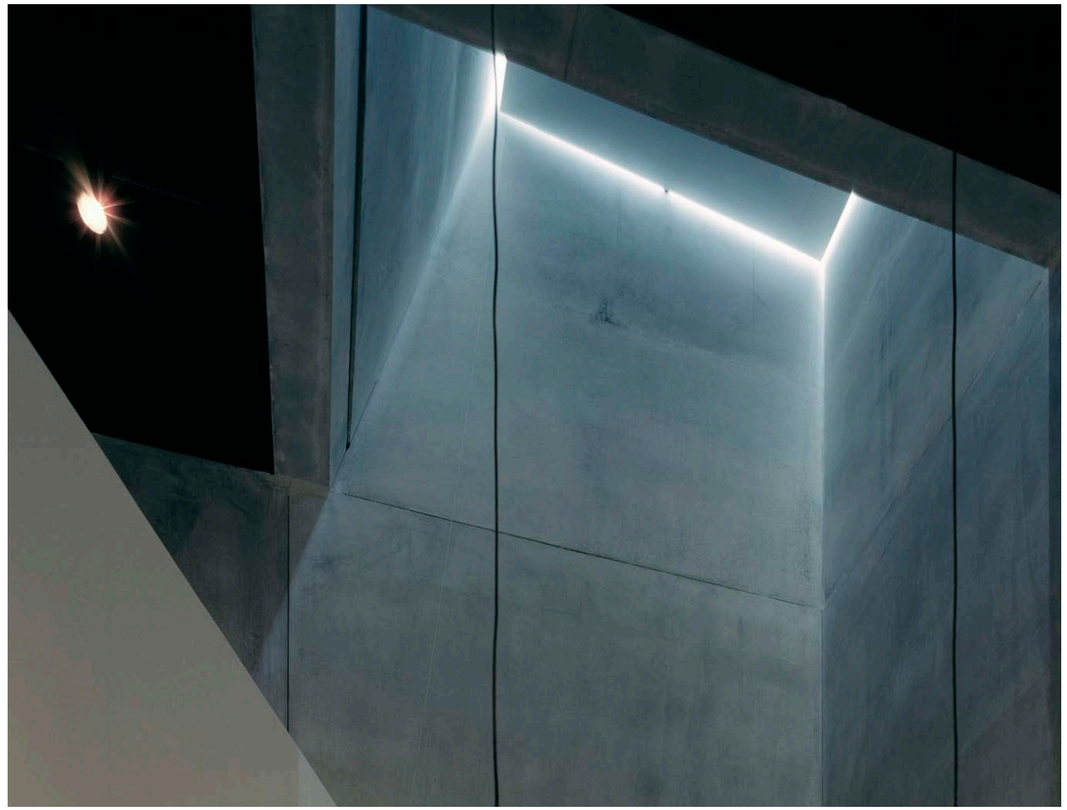
EXAMPLE OF PICTURE WINDOW IN ARCHITECTURAL CONCRETE WALL WITH DRYWALL INTERIOR CONDITION AND FOOTER FLUSH WITH FINISH FLOOR

ILLUSTRATIVE RENDITION | CHANGING GALLERY

CHANGING GALLERY CONFIGURED WITH PARTITIONS

EXAMPLE OF PLANAR TWO-WAY EXPOSED CLULAM ROOFING SYSTEM



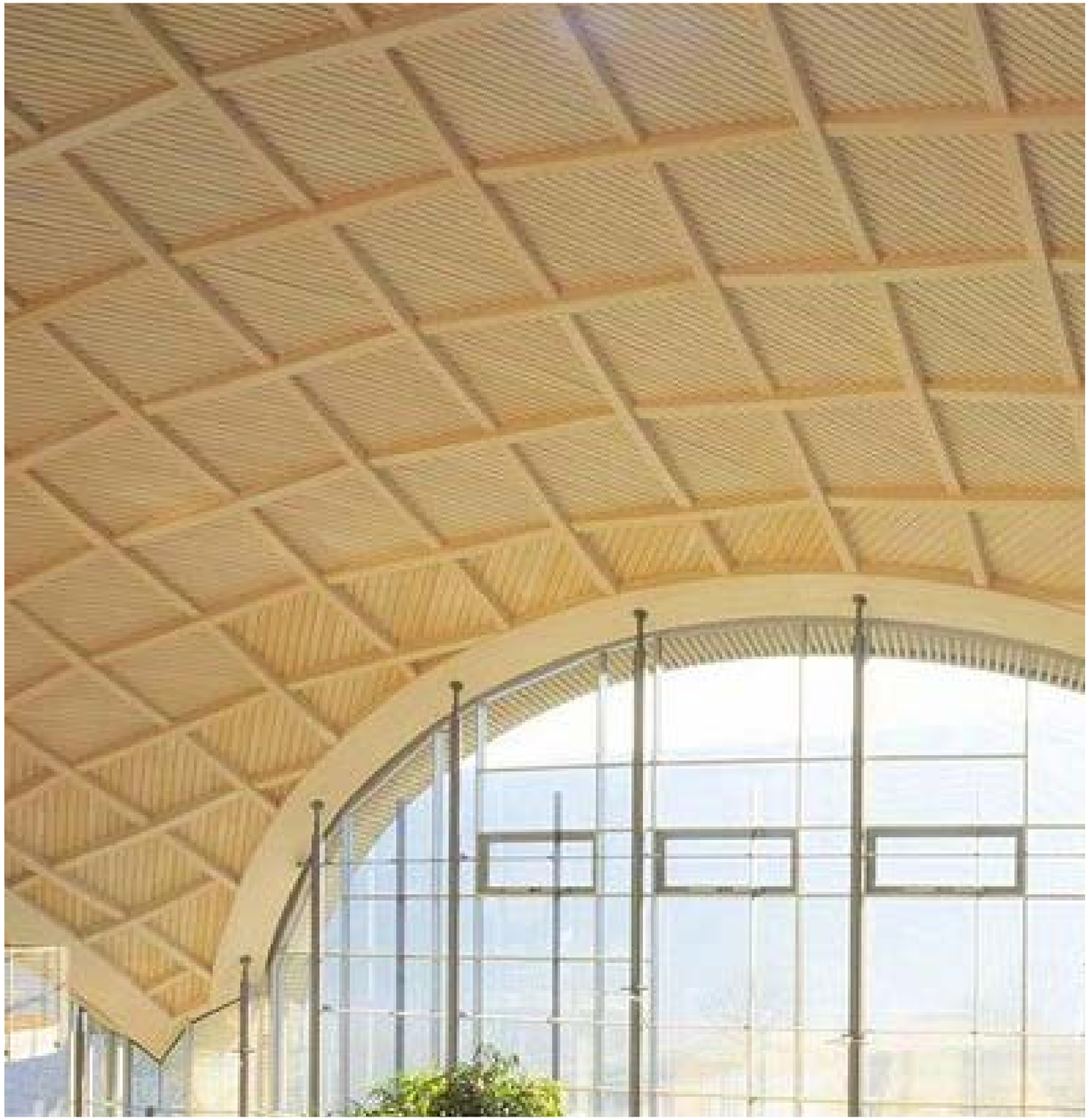
EXAMPLE OF LIGHT BAFFLING IN GALLERY SKYLIGHT (EXPOSED INTERIOR CONCRETE CONDITION NOT APPLICABLE)

ILLUSTRATIVE RENDITION | CAFE

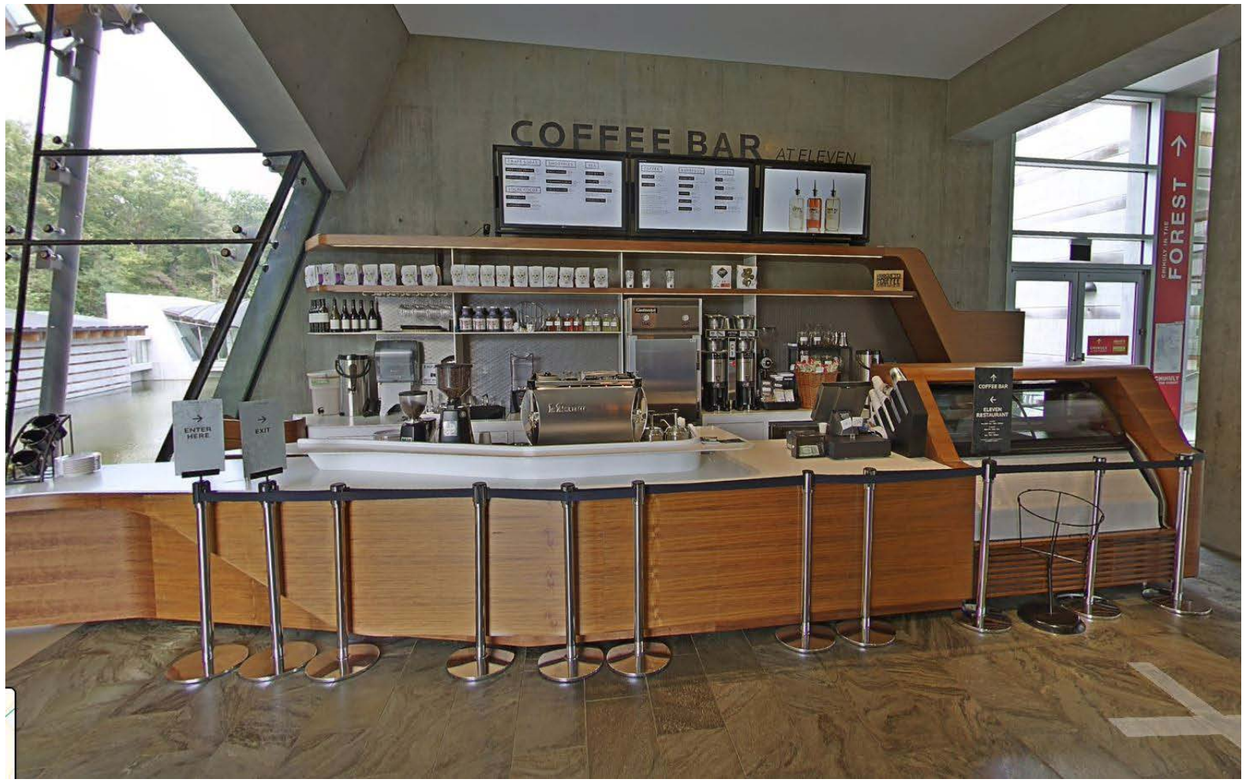
INTERIOR OF CAFE SHOWING CURVING TIMBER ROOF

ILLUSTRATIVE REFERENCES | DOUBLE-CURVE EXPOSED TIMBER ROOF

MISCELLANEOUS EXAMPLES OF DOUBLE-CURCE EXPOSED TIMBER ROOF



ILLUSTRATIVE REFERENCES | CAFE SERVERY



EXAMPLE OF SIZE, EQUIPMENT AND FINISHES FOR CAFE SERVERY

ILLUSTRATIVE RENDITION | CAFE EXTERIOR

CAFE EXTERIOR WITH PERFORMANCE SPACE IN FOREGROUND

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Cherokee Heritage Center – Phase I
Outline Specification Narrative
100% Schematic Design BOD
December 12, 2025

List of Alternates for Cost Estimate

Demolition of existing CHC building:

- Basis of Design: salvage all Exterior stone cladding
- Alternate: demolish all Exterior stone cladding

HVAC – Geothermal vs. Cooling Tower:

- Basis of Design: Centrifugal Chiller with Geothermal Wellfield
- Alternate: Centrifugal Chiller with Cooling Tower – cooling tower to be located above the Utility Building and Loading Area

HVAC – Electric Boiler vs. Gas Boiler:

- Basis of Design: Electric Boilers
- Alternate: Gas Boiler

Emergency Generator – full load vs. minimal backup:

- Basis of Design: full backup 600 kVa
- Alternate: minimal load backed up

Fire Protection – Fire Pump Room in the building vs. remote location:

- Basis of Design: Fire Pump Room in the Basement mechanical room
- Alternate: Remote location at west edge of site, adjacent to Generator location

Fire Protection – wet system vs. pre-action dry system at Galleries:

- Basis of Design: wet-pipe sprinkler system throughout
- Alternate: pre-action system at four Gallery spaces

Structural – steel vs. concrete at bridges

- Basis of Design: concrete bridges span 32’
- Alternate: steel structure

Division 01 - General Requirements

INTRODUCTION

The following narrative outlines systems and materials proposed for subsequent phases of the project's development. The term “Architect(s)” jointly means Safdie Architects and Anishinabe Design. “Division” references are based on CSI (Construction Specifications Institute) MasterFormat.

This "outline" is limited to generic descriptions defining the materials and system quality and appearance. Manufacturer names (or products) are for convenience and visual reference only; they are not intended to imply acceptability of only these items but to identify the types, classes, and qualities of materials proposed. Substitutes will be considered by Design Architect and Local Architect jointly on the basis of performance, features, and characteristics. Material thicknesses and dimensions are for reference and subject to further development / engineering by local team as the project develops. Interior finishes are for preliminary information and subject to a full selection process in collaboration with the local team using locally / regionally available materials. For items visible in completed work, appearance is an important characteristic.

Manufacturers’ requirements and industry accepted standards are generally omitted but shall be considered as if included. Technical requirements are generally not addressed and shall be specified by the local Architect. The “outline” herein is not intended to be complete for all materials and systems that will be incorporated in the final project. Materials and systems listed in the narrative pertain to multiple disciplines and should be coordinated by the local team with consultants.

Division 01 – General Requirements

MOCKUPS:

Visual and performance mockups of a representative grouping of exterior and interior materials will be defined in later design phases, including but not limited to the following:

Composite, full-scale mock-ups prior to production construction.

1. Mock-up Intent: The intent of the mock-up is to provide the Owner, Architects, and Contractor an opportunity to review proposed systems and methods of construction before final design decisions are made and before actual construction occurs. The mock-up will be used to make design decisions and establish quality control levels for the actual construction.
    a. Provide all materials including colors and lighting exactly as to be provided in the actual work. Do not provide simulations unless pre-approved by Owner and Architect. Obtain Owner's and Architects acceptance of visual qualities before proceeding with Construction Documents ordering of materials or construction of components for the actual project.
    b. Revise mock-ups as required following review of the Architect and Owner
    c. Protect and maintain acceptable mock-ups throughout the work of the contract to serve as criteria for accepted work.
2. Mock-up Disposition: Demolish and remove mock-ups at completion of Contract when directed by Owner and Architect.
3. Mock-up Location: Locate and orient the mock-up(s) as directed by the Architect; in an area of the project site which can be maintained in an accessible condition and will not interfere with future construction efforts on the project. Provide solar orientation directed by Architect.
4. Mock-up Scope: Design Architect will prepare initial diagrams of the mockup scope. Architect of record will prepare construction documents for a composite mock-up(s) of the systems that will be determined during Design Development.
5. Mock-up drawings and engineering: The Architect of Record shall prepare a separate set of construction documents for the construction of a full-scale composite mock-up meeting the following requirements:
    a. Construction documents for the mock-up should be expedited to facilitate incorporation of the mock-up findings in the final construction documents.
    b. Engineer and provide all temporary supports needed to properly and safely support the mock-up. Provide engineered construction documents and shop drawings for the entire mock-up assembly and its supports.

Division 03 – Concrete

Cast-in Place Concrete: Refer to Engineering Narrative and Diagrams

1. **Architectural Concrete**: All exposed to view cast-in-place concrete surfaces shall be "architectural" concrete. Architectural Concrete: shall match approved samples and architectural concrete mockup. Architectural Concrete to have color additives and custom cement blends as required to achieve desired color. Joint

location to be coordinated with Design Architect including form joints. No visible chamfers allowed - (sharp “pencil” round corners required). Form work is not to be reused for multiple pours. Clear penetrating sealer (silane-based sealer which does not alter the color or sheen of concrete to be used); epoxy rebar in all above-grade construction.

a. Preliminary Samples and Field Mock-up:
    - Samples: Prepare initial samples (12”x12”x1”- 2” thick) for review of color and finish options.
    - Based on selected options above, provide field mock-up for approval of finish, and color, by the Owner’s Representative and the Architect. Mock-up size shall be 3 ft. x 3 ft. (1 m x 1 m), minimum. Options selected at this stage will be incorporated into a full-scale mock-up (see previous section).
b. Concrete: Color of concrete shall match Design Architects reference sample & / or other instructions; color for architectural concrete shall be uniform throughout area designated.
c. Cement Color: Color meeting approved mock-up. To achieve the desired color/finish of concrete, concrete mix will require the use of white cement. Sand and controlled color aggregates shall match precast concrete.
d. Formwork: Smooth form concrete using resin faced HDO panel forms (or locally suitable equivalent). Joints in formwork shall be sealed. Form-ties shall be uniformly placed accurately located in accordance with layout approved by the Owner's Representative and the Architects.
e. Formwork Ties: Formwork tie spacing and location of ties shall be in a consistent pattern or layout acceptable to the Architect. Tie design shall be designed to seal tightly to the form face material without fluid loss. Tie assembly leave-in metal shall be a minimum of 37 mm (1-1/2 inches) from the face of concrete.
f. Formwork Materials: Simpson "Multipour" HDO; Plastic faced HDO formwork as required to produce a smooth form finish acceptable to the Owner's Representative and the Architect.
g. Form Joint Sealing Material (for sealing field erected corner joints): Foam rubber or neoprene tape gaskets, paper backed with pressure sensitive adhesive on one side, of sufficient width, thickness and compressibility for intended use.
h. Form Joint Sealant (for permanent fabricated unrevealed joints): Silicone sealant; Silpruf as manufactured by General Electric or approved equal.
i. Penetrating Sealer: Low molecular 95% solid Silane sealer; Fabrishield 760 manufactured by Fabrikem in Langley, British Columbia, Canada or approved equal.
j. Reinforcing shall be designed and placed with sufficient cover from the finished concrete surface to minimize the risk of future surface damage due to potential

water infiltration. Reinforcing shall also be properly protected (e.g., epoxy coated) to prevent corrosion-related impacts in all areas *with exposed architectural faces*.

k. Install sealant or gaskets at joints to prevent fluid loss. The intent of the design is to provide sharp edges and smooth surfaces. Formwork must be absolutely water tight to prevent the loss of fines. Formwork sealants shall be confined to overlapping wood formwork joints and detailed to maintain sharp edges and not cause rounding or irregular surfaces. Sealants must be cured prior to concrete pours to prevent plasticizer migration into concrete.
l. Construct forms of sufficient strength to withstand pressures due to concrete-placement operations, internal and external vibrating, lateral forces from curing concrete and temperature changes.

2. **Sitecast Concrete**: Back of house (BOH) and unexposed conditions do not require architectural concrete. Sitecast concrete substructure and superstructure including columns, walls, beams, and slabs. Clear penetrating sealer; epoxy rebar in all non-waterproofed below-grade construction. Below-grade design elements including foundations and retaining walls may be refined or adjusted based upon information of subsurface investigations.

Division 04 – Masonry

Stone Masonry: Stone to match range of samples approved by Architect, minimum 5cm nominal thickness on vertical and 2cm horizontal applications.

Concrete Masonry Unit: Fully grouted, at nonstructural applications such as around mechanical/utility rooms, for refinement with MEPFP and acoustician in further design phases.

Division 05 – Metals

Architecturally Exposed Structural Steel: Required for visible steel.

AISC “Code of Standard Practice for Steel Buildings and Bridges”, Section 10.
> 20 Feet Viewing Distance: Category AESS 2
> 10 Feet and ≤ 20 Feet Viewing Distance: Category AESS 3
≤ 10 Feet Viewing Distance: Category AESS 4

Metal Railings: Grade 316 (exterior) Stainless steel Satin finish TBD (e.g. Brushed No. 4, Bead Blasted or similar); welds ground smooth (typ.). Note: If deemed appropriate by AOR, Grade 304 may be considered for interior applications.

Misc Metal: Misc metals for equipment, including 'strong point' attachments to structure.

EXTERIOR - PAINTED METALS Aluminum Factory Finish: PPG "Duranar XL, Metallic, 4 Coat" to match Architect's sample.

Areaway & Mechanical gratings: Stainless Steel metal bar grating (Interior and Exterior). Press-Locked, Rectangular Bars, ADA compliant (if required), concealed fasteners.

Stainless Steel (e.g. Plates, Rods, Cables, and associated hardware for fabric sunshades): No. 4 Brushed and/or bead-blast finish TBD. Typical Examples include Tri-pyramid and Carl Stahl products. Exterior grade 316 or higher as required by environmental conditions, interior grade 304 (typical).

Metal gutters: Formed stainless steel sheet metal gutter, 1/8" thick, on bent steel plate gutter support and miscellaneous metal framing supporting concealed gutters at edges of curved/sloped roof planes. Provide metal grating for use as service walkway.

Division 06 – Wood, Plastics, Composites

Casework/Millwork: Provide allowance for millwork including but not limited to:

- Quality Standard
  - Front of House Areas: Architectural Woodwork Standards "Premium Grade" (this represents the highest aesthetic grade/quality – exact requirements should be discussed as the project advances). Quarter sliced, concealed installation, water clear, non-yellowing shop finish, ASTM E84 Class A fire performance
  - Back of House Areas: Architectural Woodwork Standards "Custom Grade".
- Visible Wood
  - FOH - Transparent Finish: FSC Certified, species to be determined.
  - BOH - Opaque Finish: FSC Certified, paint grade hardwood
- Types:
  - Trim
  - Shelving at storage/pantry spaces
  - Countertops at restrooms (with stone surface)

- Movable millwork for AV/lighting control positions (approximately 4' wide portions)
- Movable finished wood millwork for presentation lectern

Wood Flooring: Provide tongue and groove hardwood strip flooring system on sleepers where indicated, species and appearance to follow Design Architects samples and be selected from locally / regionally available sources, with surface treatment (finish and sealer) selected with Owner based on maintenance approach.

Structural Glue Laminated Members: refer to Structural engineering basis of design: Appearance grade of members shall be "Industrial" where concealed and "Premium" where exposed.

Division 07 – Thermal and Moisture Protection – Refer to consultant requirements

Sheet Metal Roofing:
Aluminum open-joint metal panel system as shown
Waterproofing: self-adhering polymer modified bituminous sheet materials over cover board

Roof Deck and Roof Terrace Waterproofing:

Waterproofing: Liquid Applied Monolithic Membrane 6125 by American Hydrotech
Ballast: Crushed Stone ballast on stone filter sheet (High Albedo, Light color TBD)
Thermal Insulation: TBD
Pavers at Roof Terrace: Natural Stone or Precast Concrete (Type TBD).
Paver Size: 500mmx500mm
Paver Weight: TBS.
Pedestal System for Drained Terrace Pavers: "Compensator System" by Hanover or equal

Roofing systems at planters and planted roofs:
"Garden Roof" Protected Membrane Roofing Assembly by American Hydrotech
Thermal Insulation: TBD

Division 08 – Openings

Exterior Glass & Glazing systems – High performance, insulated, low-iron glass with high VLT (70% +/-), low reflectivity (15% max), and neutral color low-e coatings (Vitro Solarban 72 / Saint-Gobain COOL-LITE® XTREME 70/33 II). Fixed windows at galleries to be extruded aluminum frames assembled on site with flush mounted framing. Birch Creek Gallery to have 2-sided capture at head and sill with Stainless Steel glazing channel and structural silicone vertical joints.

Exterior Door System: Narrow stile aluminum, insulated glass, with Blumcraft-type hardware (full height vertical rod). If operators are required, concealed on interior at floor.

Skylight System: Aluminum framed insulated, laminated, low iron glass units

Glazed Railing System: Concealed base channel, low-iron, laminated, glass with SGP interlayer. Grade 304 Stainless Steel handrail, with satin finish (TBD).

Exhaust/Intake Louvers: Aluminum sightproof louvers in aluminum frames, custom 3-coat metallic finish (e.g. Duranar XL).

Frit on glazing: 40% linear /dot silkscreen frit pattern on #2 surface (frit % TBD in coordination with environmental analyses).

Interior Door: Public (FOH) doors to be solid-core wood doors – natural finish. BOH doors to be either solid-core wood doors – paint finish, or metal hollow metal doors and welded frames – paint finish. All FOH and BOH doors, frames, and hardware throughout for further description by Design Architect and acoustician in future design phases. “All-Glass” and / or “Glass and Aluminum” doors may also be used in selected interior locations. Traditional “kick-plates” are to be excluded for all doors except “Back-of-house” mechanical service doors not visible to the public.

Metal Finishes: Basis of Design 4-coat metallic (e.g. Duranar XL), applies typically unless noted otherwise.

Door Hardware: Premium grade architectural hardware for all “front of house” spaces; Finish US32D Satin stainless steel.

Exterior Entrances - Front of House Primary Entrances:
Door and Frame: CR Laurence, US Aluminum, “Entice Series, Clad, Brushed Stainless Steel or Aluminum”
Exit Device: CR Laurence, Blumcraft “PA100, Handle F, Full Height”, brushed stainless steel

Glass: Insulating laminated glass unit, low iron, safety glass

Exterior Entrances - Front of House Secondary Entrances:
Door and Frame: CR Laurence, US Aluminum, "Mojave Series 250AT Narrow Stile Thermal Entrances"
Exit Device: CR Laurence, Blumcraft "PA100, Handle F, Full Height", brushed stainless steel
Glass: Insulating laminated glass unit, low iron, safety glass

Automatic Door Operator: Assa Abloy "SW200i-IG In Ground"
Door Operator Activators: ANSI A156.10 including concealed in glazed wall mullion and bollard mount.
Door Operator Bollards: Grade 316 Stainless Steel. Satin finish TBD. Cylindrical / square profile TBD.

Back of House Exterior Doors: Thermally insulated steel doors and frames, fully welded, galvanized, shop primed, and field painted.

Overhead Doors: Thermally insulated, flush panel, steel doors, galvanized, factory painted, motorized. Sectional steel framed, 20-gauge steel door faces with insulated core and thermal breaks, insulated vision panels, weather seals, and powder-coat-applied finish. Electric motor operator consisting of trolley or drawbar, with remote-control station, obstruction detection device.

EXTERIOR – LOUVERS: Basis of Design: Construction Specialties "B5157" with concealed mullions.

Interior Glazed Partitions:

"All Glass" assemblies.
Glass: Clear, low-iron glass, 20mm thick min., laminated safety glass with clear or translucent interlayer.

Channel Base Recessed Into Subfloor: "RB" series, Blumcraft of Pittsburgh, blumcraft.com. (CR Laurence)
Ceiling Channel: "C7500/7501" series, Blumcraft (CR Laurence)
Visible Metal: Non-directional satin stainless steel.

"Aluminum framed" glass assemblies

Glass: Clear, low-iron glass, 6mm thick min., laminated safety glass with clear or translucent interlayer. Perimeter prefinished aluminum frames (narrow stile) with clear sealant filled "butt" vertical joints (i.e. glass-to-glass joints) between glass panels; Variations include acoustic (e.g. Maars Living Wall) and fire rated systems (e.g. Technical Glass Products' (TGP) Fireframes® Designer Series Doors and Fireframes ClearView® systems (both with Pilkington Pyrostop® fire-rated glass).

Profile sizes / details TBD.

ALL interior glazing systems are to be visually similar (with consistent frame types and details).

Note: where plans show curved glass, faceted glass is to be used.

Division 09 – Finishes

Restrooms: Typical finishes to include ceramic tile floors and wet walls (full height), painted moisture-resistant GWB walls and ceilings.

Multi-Purpose Room Assembly: Fabric wrapped acoustic wall panels behind offset painted removable maple wall slats with concealed outriggers and illumination. Preliminary Fabric Reference: Camira Fabrics, "Lucia" – color TBD.

Stone Paving. See Division 4 Masonry. Stone and Tile paving to use Rectified edges (no chamfers); Hand tight / narrow (1.5mm) joints.

Interior Ceilings: Typical ceiling types may include

GWB on metal studs (interior and exterior)

Suspended acoustical plank panels (Ecophon Focus-DG with concealed grid)

Seamless acoustic plaster (Baswaphon or Knauf Ensemble Seamless Acoustic Plasterboard (Note: systems with visible holes should not be used; only systems which have a smooth plaster like appearance)

Washable acoustic tile (kitchen / back of house areas)

Division 10 - Specialties

Toilet Compartments and accessories:

Partitions: "Full Height" Floor to ceiling with / without transom panel above or Floating w/Recessed Headrail (~300mm gap below ceiling); Wall, floor and ceiling connections with shadow gap concealed framing, minimal gap at floor; self-closing doors with concealed hinges. Door L-Shape handle or Grip Bar TBD + occupancy indicator. Moisture resistant Styrofoam core with Metal or High-Pressure Laminate (HPL) finish (e.g. Fundermax Aptico, Abet Laminati Polaris, Pfleidorerer X-Treme, or comparable).

Accessory basis of design: Bobrick. Concealed electric hand dryers, concealed automatic soap dispenser with associated remote reservoir, and concealed paper towel dispenser all behind vanity mirror with graphics on mirror identifying locations

Signage: Code-required signage at all interior and exterior spaces including ADA signage. Wayfinding and naming signage by signage consultant during design phases, in collaboration with and approval by Design Architect.

Window treatments: Motorized and Manual window treatments. Single (sunshade) or double (sunshade + blackout) as required. Sunshade fabric with 5% light transmission, non-directional. Basis of design: Nysan Superweave 500

Accessories (fire extinguishers, cabinets, etc.): Trimless, flush, with solid doors in Grade 304 satin stainless steel or painted finished TBD.

Fire Extinguisher Cabinets: JL Industries "Embassy, Fire FX2, 5634FX2", satin stainless steel, duo panel door with safety glass.

Fire Hose Cabinets: JL Industries "Crownline Valve and Hose Cabinets FX2", satin stainless steel, duo panel door with safety glass.

Entrance floor system: High-performance architectural grid system to trap dirt, water, and debris at building entrances - aluminum grid framework recessed into the floor and filled with tread inserts (e.g. carpet, abrasive, or rubber strips). Construction Specialties "Pedigrid", or Geggus "Stabil".

Parking Wheel Stops: Precast concrete

Interior - Seismic and Expansion Control

Interior Floor to Floor: Construction Specialties "SSR Series" with match floor infill

Interior Gypsum Board Wall and Ceiling < 5 cm: Construction Specialties "FWF Series"

Interior Wall To Wall ≥ 5cm: Construction Specialties "XLS-2G" modified for interior use

Fire Rated Assemblies: Add Expansion Control Manufacturer's concealed, fire rated filler.

Division 11 – Equipment

Food Service Equipment: Café food servicing will include Grab and Go options to be determined in a subsequent design phase:

- Refrigerated Self-Service Counter Case
- Meets department of energy standards for commercial refrigeration equipment
- Compressor air rear intake, front discharge

Interior media/screens TBD.

Division 12 – Furnishings

Loose FFE: including as below. To be selected in collaboration between Client, Design Architect and AOR.

- Office furnishings
- Flexible Classroom table/chairs
- Main public spaces /lobbies
- Auditorium fixed seating
- Lockers – manufacturer: Hollman

Custom Millwork:

- Ticketing desks at Great Hall (as shown)
- Café Servery

Division 13 - Special Construction

Façade Maintenance Equipment: Provide full access via abseil and boson's chair with stainless steel tie-offs and supporting steel members as required. Exact placement and

systems to be determined by façade consultant with review by Design Architect. System to be fully and inconspicuously integrated into building without visible elements on the facade**. If required, outriggers and / or davit arms shall be removable type with anchor bases fully concealed below finished paving.** Where required at skylights, systems to be fully integrated into skylight framing with minimal visible components.

Division 21 – Fire Suppression

Sprinkler System: The project is 100% sprinklered. Sprinkler systems shall be laid out and pipe sized shall be hydraulically calculated and engineered according to applicable local / international standards.

Sprinkler heads: Concealed type with white cover in all finished areas. For unfinished areas there will be bronze upright or pendant. Unheated loading docks and garage areas to be dry type system. Note: If sidewall sprinklers are required in "finished" areas investigate whether concealed type are permitted (e.g. Tyco Concealed Horizontal Sprinkler).

Division 22 – Plumbing

Irrigation for exterior and interior plantings to be defined in future design phases.

Drinking Fountains: Wall-Mounted, Dual Bowl (high/Low), Tamper Resistant, Purifier/Chiller**,** similar to Model 107-16. FILTRINE Mfg. Co., 15 Kit St., Keene, NH 03431 U.S.A.

Water Closets: Wall mounted porcelain manufactured by Toto or equal

Sinks:

Individual sinks:'LHT 241.G', 'Supreme' wall mount lavatory manufactured by Toto or equal;

Multiple users: Semi-Custom Slim, trough sink with long countertop extensions. Monolithic basins with solid surface finish, and customizable S.S. (brushed or powder-coated) pipe skirts that fit below the basin. Trough sink can be specified for

deck or wall-mounted fixtures to allow for seamless compatibility with most major fixture brands. Linear trough type (see reference images in Design Guidelines package).

Faucets:

Individual sinks: Goose neck chrome single hole manufactured by Dornbracht or equal;

Multiple user trough type sinks: Toto wall mount TEL5GW Series

Division 23 - Heating, Ventilating, and Air Conditioning (HVAC)

Air distribution devices shall be carefully coordinated between the HVAC consultant and architect for performance and visual appearance. Examples of reference types include:

Continuous Linear Slot Diffusers: Titus “Flowbar” series with concealed border

Linear Grilles: Titus CT-480 series aluminum linear bar brille with flangeless frame

Square / Rectangular ceiling diffusers: Titus Omni or DAT series “Plaque face” type to minimize ceiling impact.

Division 26 – Electrical

All electrical conduits and boxes to be concealed from view. Wherever possible, all switches and controls to be out of public view and located in BOH areas.

Public space exit sign basis of design: Lithonia lighting “EDG-EDGR” series edge-lit clear or mirrored (for double sided applications); recessed ceiling mount.

Lightning protection: Concealed system to be incorporated into skylight framing and roof design with no visible air terminals or similar components.

Division 27 – Communications

All conduits, wiring and boxes to be concealed from view

AV system and equipment,

Allowance for Security, Internet, IT, Wi-Fi, conference AV, and low voltage systems.

Allowance for wayfinding digital signage

Division 28 – Electronic Safety, Security, and Fire Alarm

Exterior and interior security features (i.e. cameras, bollards, etc) to be fully integrated into architecture so systems are concealed or 'invisible,' except where Owner requires visibility as a security feature and crime deterrent.

Fire Alarm system to include typical smoke/heat detectors and infrared heat detectors. Equipment finishes to be white unless prohibited by local requirements.

Division 32 – Exterior Improvements

Final tree and planting selection by Landscape Architect in design phases to follow.

Exterior Hardscape: Stone pavers, minimum 5cm thickness, on setting bed over concrete slab for plaza areas. Hardscape continues into interior for lobby flooring.

Exterior Planting: Trees, shrubs, and perennials for planting in earth. Refer to plans for quantities and distribution. Pre-grown nursery should be anticipated to allow for sufficient size trees on installation. All tree and planting beds to have automated irrigation system.

Planting over structure: Trees for planting over structure. Refer to plans for quantities and distribution. Pre-grown nursery should be anticipated to allow for sufficient size trees on installation. All tree and planting beds to have automated irrigation system.

Exterior drains: Narrow slot/flush top, ADA compliant, 316 stainless steel.

Exterior railings: Grade 316 Stainless steel top rail and posts, with metal mesh. Satin finish TBD.

Exterior connections: For power/data/AV/lighting as required. Locations to include weatherproof enclosures to prevent water from ponding or entering the conduit from these exterior locations back to the interior.

Bollards: Grade 316 Stainless Steel, placement/quantity/type to meet local requirements. Satin finish TBD. Cylindrical / square profile TBD.

Division 33 - Utilities

Site utilities to be designed by the Civil engineer. Below-grade design elements including but not limited to utility service entries and connections may be refined or adjusted based upon information of subsurface investigations.

All visible utility elements (i.e. covers and access points) require coordination with Landscape Architect and Design Architect to ensure their placement and materials are fully coordinated with the overall design.

Preliminary Code Review

Authorities having jurisdiction:

The Cherokee Heritage Center is not located within the city limits of Tahlequah, Oklahoma. It is not located on Trust land. This project will fall under the jurisdiction of the State Fire Marshal unless MOU is granted from the City of Tahlequah.
See Exhibit 1: Tahlequah City Limits.

Applicable Codes:

2018 International Building Code (IBC)
2018 International Fire Code (IFC)
2018 International Fuel Gas Code (IFGC)
2018 International Mechanical Code (IMC)
2018 International Plumbing Code (IPC)
2023 National Electric Code (NEC)*
ICC A117.1-2009
Oklahoma Supplementary Code: Title 748: Uniform Building Code Commission
* The State Fire Marshalls Office has adopted the 2023 NEC, The City of Tahlequah has adopted the 2020 NEC
Oklahoma State Health Department Chapter 257: Food Establishments

Occupancy Type:

A-3, Museums

Accessory Occupancies:
A-2, Food and/or Drink Consumption
B, Business
M, Mercantile
S, Storage

Construction Type:

IIB

Preliminary Occupancy Counts:

Only currently designed exhibit space is being used for occupancy calculations so there has been a slight increase in occupancy. Previously 25% of gallery exhibit space was assumed to be exhibit space.

Preliminary Total Building Occupancy: 526 (First floor – 521, Basement – 5)

Preliminary Plumbing Counts:

Preliminary Fixture Count:

Water closets: Minimum 4 female/ 3male

Lavatories: Minimum 2 female/ 2 male

Drinking Fountains: Minimum 2 drinking fountains

One Service Sink

See Exhibit 2: Preliminary Plumbing Counts

Preliminary Code Review:

Chapter 5 General Building Heights and Areas

SECTION 504 BUILDING HEIGHT AND NUMBER OF STORIES

Table 504.3 Allowable Building Height in Feet Above Grade Plane:

Assembly, Sprinklered, Type IIB: 75'

Actual Building Height: 60'-7"

Table 504.4 Allowable Number of Stories Above Grade Plane:

A-3, Sprinklered, Type IIB: 3 Stories above grade plane

Actual Building Stories: 1 Story above grade plane

SECTION 506 BUILDING AREA

Table 506.2 Allowable Area Factor:

A-3, Sprinklered Single Story, Type IIB: 38,000 sq.ft. no frontage increase needed.

Actual Building Area:

First floor – 23,293sq. ft. *(Including under café roof, and mechanical pavilion)*

Basement – 1,318 sq. ft. *(Full height basement area only)*

Total: 24, 694 sq. ft.

SECTION 507 UNLIMITED AREA BUILDINGS

507.6 Group A-3 Buildings of Type II Construction: The area of a Group A-3 building not more than *one store above grade plane,* used as a place of worship, community hall, dance hall, exhibition hall, gymnasium, lecture hall, indoor swimming pool or tennis court of Type II construction shall not be limited provided all of the following criteria are met:

1. The building shall not have a stage other than a platform.
2. The building shall be equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

3. The building shall be surrounded and adjoined by public ways or yards not less than 60' in width.

SECTION 508 MIXED USE AND OCCUPANCY

508.2 Accessory Occupancies: Accessory occupancies are those occupancies that are ancillary to the main occupancy of the building or portion thereof. Accessory occupancies shall comply with the provisions of Section 508.2.1 through 508.2.4.

508.2.3 Allowable Building Area: The allowable area of the building shall be based on the applicable provisions of section 506 for the main occupancy of the building. Aggregate accessory occupancies shall not occupy more than 10 percent of the floor area of the story in which they are located and shall not exceed the tabular values for nonsprinklered buildings in Table 506.2 for each accessory occupancy.

508.2.4 Separation of Occupancies: No separation is required between accessory occupancies and the main occupancy.

Accessory Occupancies First Floor:

Business - 1.8%
Mercantile - 2.2%
Storage - 5.8%
Total: 9.8%

Chapter 6 Types of Construction

Construction Type: IIB, the building elements listed in Table 601 are of noncombustible materials, except as permitted in Section 603 and elsewhere in this code.

SECTION 602 CONSTRUCTION CLASSIFICATION

Table 601 Fire resistance Rating Requirements for Building Elements:

Building Element	Type II B
Primary structural frame	0 Hours
Bearing walls	Interior: 0 Hours Exterior: 0 Hours *Per table 602: Exterior walls separated by less than 10' will require a one-hour rating*
Nonbearing walls and partitions: Exterior	0 Hours *Per table 602: Exterior walls separated by less than 10' will require a one-hour rating*
Nonbearing walls and partitions: Interior	0 Hours
Floor construction and associated secondary members	0 Hours
Roof construction and associated members	0 Hours (c)

c. In all occupancies, heavy timber complying with Section 2304.11 shall be allowed where a 1-hour or less fire-resistance rating is required.

602.4.3 Exterior Structural Members: Where a horizontal separation of 20 feet or more is provided, wood columns and arches conforming to heavy timbers sizes complying with Section 2304.11 shall be permitted to be used externally.

SECTION 603 COMBUSTIBLE MATERIAL IN TYPES I AND II CONSTRUCTION

603.1 Allowable Materials: Combustible materials shall be permitted in buildings of Type I or II construction in the following applications and in accordance with Section 603.1.1 through 603.1.3:

1. Fire-retardant-treated wood shall be permitted in:
    1.1 Nonbearing partitions where the required fire-resistance rating is 2 hours or less.
    1.2 Nonbearing exterior walls where fire-resistance-rated construction is not required.
    1.3 Roof construction, including girders, trusses, framing and decking.
    1.4 Balconies, porches, decks and exterior stairways not used as required exits on buildings three stories or less above grade plane.
2. Thermal and acoustical insulation, other than foam plastics, having a flame spread index of no more than 25.

    Exceptions:

    1. *Insulation placed between two layers of noncombustible materials without an intervening airspace shall be allowed to have a flame spread index of not more than 100.*
    2. *Insulation installed between a finished floor and solid decking without intervening airspace shall be allowed to have a flame spread index of not more than 200.*
3. Foam plastics in accordance with Chapter 26.
4. Roof coverings that have an A, B, or C classification.
5. Millwork such as doors, door frames, window sashes and frames.
6. Millwork such as doors, door frames, window sashes and frames.
7. Interior wall and ceiling finishes installed in accordance with Section 803.
8. Trim installed in accordance with Section 806.
9. Where not installed greater than 15 feet above grade, show windows, nailing or furring strips and wooden bulkheads below show windows, including their frames, aprons and show cases.
10. Finish flooring installed in accordance with 805.
11. Partitions dividing portions of stores, offices or similar places occupied by one tenant only and that do not establish a corridor serving an occupant load of 30 or more shall be permitted to be constructed of fire-retardant-treated wood, 1-hour fire-resistance-rated construction or of wood panels or similar light construction up to 6 feet in height.

12. Stages and platforms constructed in accordance with 410.2 and 410.3, respectively.
13. Combustible exterior wall coverings, balconies, and similar projections and bay or oriel windows in accordance with Chapter 14 and Section 705.2.3.1.
14. Blocking such as for handrails, millwork, cabinets and window and door frames.
15. Light-transmitting plastics as permitted by Chapter 26.
16. Mastics and caulking materials applied to provide flexible seals between components of exterior wall construction.
17. Exterior plastic veneer installed in accordance with Section 2605.2
18. Nailing or furring strips as permitted by Section 803.15.
19. Heavy timber as permitted by Note c to Table 601 and Sections 602.4.3 and 705.2.3.1.
20. Aggregated, component materials and admixtures as permitted by Section 703.2.2.
21. Spray fire-resistant materials and intumescent and mastic fire-resistant coatings, determined on the basis of fire resistance tests in accordance with Section 703.2 and installed in accordance with Sections 1705.14 and 1705.15, respectively.
22. Materials used to protect penetrations in fire-resistance rated assemblies in accordance with Section 714.
23. Materials used to protect joints in fire-resistance rated assemblies in accordance with Section 715.
24. Materials allowed in the concealed spaces of buildings of Types I and II construction in accordance with Section 718.5.
25. Materials exposed within plenums complying with Section 602 of the International Mechanical Code.
26. Wall construction of freezers and coolers of less than 1,000 square feet, in size, lined on both sides with noncombustible materials and the building is protected throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

Chapter 7 Fire and Smoke Protection Features

SECTION 705 EXTERIOR WALLS

705.2.3.1 Balconies and Similar Projections: Balconies and similar projections of combustible construction other than fire-retardant-treated wood shall be fire-resistance rated where required by Table 601 for floor construction or shall be of heavy timber construction in accordance with Section 2304.11. The aggregate length of the projections shall not exceed 50 percent of the buildings perimeter on each floor.

Exceptions:

1. *On buildings of Types I and II construction, three stories or less above grade plane, fire-retardant-treated wood shall be permitted for balconies, porches, decks and exterior stairways not used as required exits.*
2. *Untreated wood and plastic composites that comply with ASTM D7032 and Section 2612 are permitted for pickets, rails and similar guard components that are limited to 42 inches in height.*
3. *Balconies and similar projections on buildings of Type III, IV, and V construction shall be permitted to be of Type V construction and shall not be required to have a fire-resistance rating where sprinkler protection is extended to these areas.*
4. *Where sprinkler protection is extended to the balcony areas, the aggregate length of the balcony on each floor shall not be limited.*

SECTION 712 VERTICAL OPENINGS

712.1.1 Shaft Enclosures: Vertical openings contained entirely within a shaft enclosure complying with Section 713 shall be permitted.

712.1.12 Exit Access Stairways and Ramps: Vertical openings containing exit access stairways or ramps in accordance with Section 1019 shall be permitted.

Chapter 8 Interior Finishes

SECTION 803 WALL AND CEILING FINISHES

Table 803.13 Interior Wall and Ceiling Finish Requirements by Occupancy

Group Sprinklered	Interior exit stairways and ramps and exit passageways	Corridors and enclosures for exit access stairways and ramps	Rooms and enclosed Spaces
A-3	B	B	C
B, M	B	C	C
S	C	C	C

Chapter 9 Fire Protection and Life Safety Systems

An automatic sprinkler system installed in accordance with Section 903.3.1.1 will be required.

SECTION 902 FIRE PUMP AND RISER ROOM SIZE

902.1 Pump and Riser Room Size: Where provided, fire pump rooms and automatic sprinkler system riser rooms shall be designed with adequate space for all equipment necessary for the installation, as defined by the manufacturer, with sufficient working room around the stationary equipment. Clearances around equipment to elements of

permanent construction, including other installed equipment and appliances, shall be sufficient to allow inspection, service, repair or replacement without removing such elements of permanent construction or disabling the function of a required fire-resistance rated assembly. Fire pump and automatic sprinkler system riser rooms shall be provided with doors and unobstructed passageways large enough to allow removal of the largest piece of equipment.

SECTION 903 AUTOMATIC SPRINKLER SYSTEMS

903.2.1.3 Group A-3: An automatic sprinkler system shall be provided throughout stories containing Group A-3 occupancies and throughout all stores from the Group A-3 occupancy to and including the levels of exit discharge serving that occupancy where one of the following conditions exist:

1. The fire area exceeds 12,000 square feet
2. The fire area as an occupant load of 300 or more
3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

903.3.1.1 NFPA 13 Sprinkler Systems: Where the provisions of this code require that a building or portion thereof be equipped throughout with an automatic sprinkler system in accordance with this section, sprinklers shall be installed throughout in accordance with NFPA 13 except as provided in Sections 903.3.1.1.1 and 903.1.1.2

903.4.2 Alarms: An approved audible device, located on the exterior of the building in an approved location, shall be connected to each automatic sprinkler system. Such sprinkler waterflow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Where a fire alarm is installed, actuation of the automatic sprinkler system shall activate the building fire alarm system.

SECTION 907 FIRE ALARM AND DETECTION SYSTEMS

907.2 Where Required - New Buildings and Structures: An approved fire alarm system installed in accordance with the provisions of this code and NFPA 72 shall be provided in new buildings and structures in accordance with Sections 907.2.1 through 907.2.23 and provide occupant notification in accordance with Section 907.5, unless other requirements are provided by another section of this code.

Not fewer than one manual alarm box shall be provided in an approved location to initiate a fire alarm signal for fire alarm systems employing automatic fire detectors or waterflow detection devices. Where other sections of this code allow elimination of fire alarm boxes due to sprinklers, a single fire alarm box shall be provided.

907.2.1 Group A: A manual fire alarm system that activates the occupant notification system in accordance with Section 907.5 shall be installed in Group A occupancies where

the occupant load due to the assembly occupancy is 300 or more, or where the Group A occupant load is more than 100 persons above or below the lowest level of exit discharge. Group A occupancies not separated from one another in accordance with Section 707.3.10 shall be considered a single occupancy for the purpose of applying this section. Portions of Group E occupancies occupied for assembly purposes shall be provided with a fire alarm system as required by Group E occupancy.

Exception: *Manual fire alarm boxes are not required where the building is equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 and the occupant notification appliances will activate throughout the notification zones upon sprinkler water flow.*

907.4 Initiating Devices: Where manual or automatic alarm initiation is required as part of a fire alarm system, the initiating devices shall be installed in accordance with Sections 907.4.1 through 907.4.3.1.

907.4.1 Protection of Fire Alarm Control Unit: In areas that are not continuously occupied a single smoke detector shall be provided at the location of each fire alarm control unit, notification appliance circuit power extenders, and supervising station equipment.

Exception: *Where ambient conditions prohibit installation of a smoke detector, a heat detector shall be permitted.*

907.4.3 Automatic Smoke Detection: Where an automatic smoke detection system is required it shall utilize smoke detectors unless ambient conditions prohibit such an installation. In spaces where smoke detectors cannot be utilized due to ambient conditions, approved automatic heat detectors shall be permitted.

907.5 Occupant notification systems: A fire alarm system shall annunciate at the fire alarm control unit and shall initiate occupant notification upon activation, in accordance with Sections 907.5.1 through 907.5.2.3.3 Where fire alarm system is required by another section of this code, it shall be activated by:

1. Automatic fire detectors
2. Automatic sprinkler system waterflow devices.
3. Manual fire alarm boxes *(not required for this project, see above)*
4. Automatic fire-extinguishing systems.

<u>SECTION 912 FIRE DEPARTMENT CONNECTIONS</u>

912.1 Installation: Fire department connections shall be installed in accordance with NFPA standard applicable to the system design and shall comply with Sections 912.2 through 912.6.

912.2 Location: With respect to hydrants, driveways, buildings, and landscaping, fire department connections shall be so located that fire apparatus and hose connected to

supply the system will not obstruct access to the buildings for other fire apparatus. The location of fire department connections shall be approved by the fire code official.

Chapter 10 Means of Egress

Per table 1004.5 the preliminary occupant load is 538, see Exhibits 2 and 3.

SECTION 1005 MEANS OF EGRESS SIZING

1005.3.1 Stairways: The capacity, in inches, of means of egress stairways shall be calculated by multiplying the occupant load served by such stairways by a means of egress capacity factor of 0.3inch per occupant. Where stairways serve more than one story, only the occupant load of each story considered individually shall be used in calculating the required capacity of the stairways serving that story.

Basement occupancy is 15, minimum required stair width shall be used.

1005.3.2 Other Egress Requirements: The capacity, in inches, of means of egress components other than stairways shall be calculated by multiplying the occupant load served by such component by a means of egress capacity factor of 0.2 inch per occupant.

1005.5 Distribution of Minimum Width and Required Capacity: Where more than one exit, or access to more than one exit, is required, the means of egress shall be configured such that the loss of any one exit, or access to one exit, shall not reduce the available capacity of width to less than 50 percent of the required capacity or width.

SECTION 1006 NUMBER OF EXITS AND EXIT ACCESS DOORWAYS

Table 1006.2.1 Spaces with One Exit or Exit Access Doorway

Occupancy	Maximum Occupant Load of Space	Maximum Common Path of Egress Travel Distance With Sprinkler System (feet)
A, M	49	75
B	49	100
S	29	100

Schematic Design Required Exits from Assembly Spaces within Cherokee Heritage Center:

Space	Occupants	Number of Exits
Great Hall	78	2
Flex Classroom*	49	2
Birch Creek Gallery	104	2
Small Gallery	28	1
Permanent Gallery	79	2
Temporary Gallery	81	2
Café	76	2
Mechanical Basement	5	1

* The possibility of this space being used with unconcentrated seating will drive up the occupancy requiring two exits.

Table 1006.3.2 Minimum Number of Exits or Access to Exits per Story:
Occupant Count: 501 – 1000 Requires 3 Exits

Table 1006.3.3(2) Stories with One Exit or Access to One Exit for Other Occupancies

Story	Occupancy	Max. Occupant Load per Story	Max. Common Path of Egress Travel Dis.
First story above or below grade plane	S(b)	29	75 Feet

(b): Group B, F and S occupancies in buildings equipped with automatic sprinkler systems in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.

SECTION 1007 EXIT AND EXIT ACCESS DOORWAY CONFIGURATION

1007.1.1 Two Exits and Exit Access Doorways: Where two exits, exit access doorways, exit access stairways or ramps, or any combination of thereof, are required from any portion of the exit access, they shall be placed a distance apart equal to not less than one-half of the length of the maximum overall diagonal dimension of the building or area to be served measured in a straight line between them.

Exception: *Where a building is equipped with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance shall be not less than one-third of the maximum overall diagonal dimension of the area served.*

SECTION 1009 ACCESSIBLE MEANS OF EGRESS

1009.1 Accessible Means of Egress Required: Accessible means of egress shall comply with this section. Accessible spaces shall be provided with not less than one accessible means of egress. Where more than one means of egress is required by Section 1006.2 or 1006.3 from any accessible space, each accessible portion of the space shall be served by not less than two accessible means of egress.

SECTION 1010 DOOR, GATES, AND TURNSTILES

1010.1.10 Panic and Fire Exit Hardware: Swinging doors serving a Group H occupancy and swinging doors serving rooms or spaces with an occupant load of 50 or more in a Group A or E occupancy shall not be provided with a latch or lock other than panic hardware or fire exit hardware.

Oklahoma State Permanent Rule Addition 748:20-2-15: Where electrical equipment rated 800 amperes or more that contains overcurrent devices, switching devices, or control devices is installed and there is a personnel door(s) intended for entrance to and egress from the working space less than 25 feet from the nearest edge of the working space, the

personnel door shall be equipped with panic hardware or fire exit hardware. The door shall open in the direction of egress.

Exceptions:

1. A main exit of a Group A occupancy shall be permitted to have locking devices in accordance with Section 1010.1.9.4, Item 2.

2. Doors provided with panic hardware or fire exit hardware and serving a group A or E occupancy shall be permitted to be electrically locked in accordance with Section 1010.1.9.9 or 1010.1.9.10

SECTION 1011 STAIRWAYS

1011.2 Width and Capacity: The required capacity of stairways shall be determined as specified in Section 1005.1, but the minimum width shall not be less than 44 inches.

Exceptions:

1. *Stairways serving an occupant load of less than 50 shall have a width of not less than 36 inches.*

1011.3 Headroom: Stairways shall have a headroom clearance of not less than 80 inches measured vertically from a line connecting the edge of the nosings. Such headroom shall be continuous above the stairway to the point where the line intersects the landing below, on tread depth beyond the bottom riser. The minimum clearance shall be maintained the full width of the stairway and landing.

1011.6 Stairway Landings: There shall be a floor or landing at the top and bottom of each stairway. The width of landings measured perpendicularly to the direction of travel, shall not be less than the width of stairways served. Every landing shall have a minimum depth, measured parallel to the direction of travel, equal to the width of the stairway or 48 inches, whichever is less. Doors opening onto a landing shall not reduce the landing to less than one-half the required width. When fully open, the door shall not project more than 7 inches into a landing. Where wheelchair spaces are required on the stairway landing in accordance with Section 1009.6.3, the wheelchair space shall not be located in the required width of the landing and doors shall not swing over the wheelchair spaces.

1011.7.2 Outdoor Conditions: Outdoor stairways and outdoor approaches to stairways shall be designed so that water will not accumulate on walking surfaces.

1011.11 Handrails: Flights of stairways shall have handrails on each side and shall comply with Section 1014. Where glass is used to provide the handrail, the handrail shall comply with 2407.

SECTION 1017 EXIT ACCESS TRAVEL DISTANCE

Table 1017.2 Exit Access Travel Distance

Occupancy	Travel Distance with Sprinkler System (feet)
A, M	250
B	300

SECTION 1019 EXIT ACCESS STAIRWAYS AND RAMPS

1019.3 Occupancies other than Groups I-2 and I-3: In other than Group I-2 and I-3 occupancies, floor openings containing exit access stairways or ramps that do not comply with one to the conditions listed in this section shall be enclosed with a shaft enclosure constructed in accordance with Section 713.

1. Exit access stairways and ramps that serve or atmospherically communicate between only two stories. Such interconnected stories shall not be open to other stories.

4. Exit access stairways and ramps in buildings equipped with an automatic sprinkler system in accordance with Section 903.3.1.1, where the area of the vertical opening between stories does not exceed twice the horizontal projected area of the stairway or ramp and the opening is protected by a draft curtain and closely spaced sprinklers in accordance with NFPA 13. In other than Group B and M occupancies, this provision is limited to opening that do not connect more than four stores.

SECTION 1020 CORRIDORS

Table 1020.1 Corridor Fire-Resistance Rating:

Occupancy A, Occupant load served greater than 30, with sprinkler system: 0

SECTION 1029 ASSEMBLY

1029.2 Assembly Main Exit: A building, room or space used for assembly purposes that has an occupant load of greater than 300 and is provided with a main exit, that main exit shall be of sufficient capacity to accommodate not less than one-half of the occupant load, but such capacity shall be not less than the total required capacity of all means of egress leading to the exit. Where the building is classified as a Group A occupancy, the main exit shall front on not less than one street or an unoccupied space of not less than 10 feed in width that adjoins a street or public way. In a building, room or space used for assembly purposes where ether is not a well defined main exit or where multiple main exits are provided, exits shall be permitted to be distributed around the perimeter of the building provided that the total capacity of egress is not less than 100 percent of the required capacity.

Chapter 11 Accessibility

SECTION 1103 SCOPING REQUIREMENTS

1103.2.9 Equipment Spaces: Spaces frequented only by service personnel for maintenance, repair or occasional monitoring of equipment are not required to comply with this chapter.

SECTION 1104 ACCESSIBLE ROUTE

1104.1 Site Arrival Points: At least one accessible route within the site shall be provided from public transportation stops, accessible parking, accessible passenger loading zones, and public streets or sidewalks to the accessible building entrance served.

1104.2 Within a Site: At least one accessible route shall connect accessible buildings, accessible facilities, accessible elements and accessible spaces that are on the same site.

1104.3 Connected Spaces: Where a building or portion of a building is required to be accessible, at least one accessible route shall be provided to each portion of the building, to accessible building entrances connecting accessible pedestrian walkways and to the public way.

SECTION 1106 PARKING AND PASSENGER LOADING FACILITIES

Because the project does not fall within the city limits of Tahlequah, the zoning ordinance for parking will not apply. If an MOU is granted parking requirements will need to be confirmed with City of Tahlequah.

1106.1 Required: Where parking is provided, accessible parking spaces shall be provided in compliance with Table 1106.1

Table 1106.1 Accessible Parking Spaces:

Spaces Provided in Parking Facilities	Required Minimum Number of Accessible Spaces
1 to 25	1
26 to 50	2
51 to 75	3
76 to 100	4
101 to 150	5
151 to 200	6
201 to 300	7
301 to 400	8
401 to 500	9
501 to 1,000	2% of total
1,001 and over	20, plus one for each 100 or fraction thereof, over 1,000

1106.5 Van Spaces:

For every six or fraction of six accessible spaces, at least one shall be a van-accessible parking space.

SECTION 1108 SPECIAL OCCUPANCIES

1108.2.6 Lawn Seating: Lawn seating areas and exterior overflow seating areas, where fixed seats are not provided, shall connect to an accessible route.

SECTION 1109 OTHER FEATURES AND FACILITIES

1109.2 Toilet and Bathing Facilities: Each toilet room and bathing room shall be accessible. Where a floor level is not required to be connected by an accessible route, the only toilet rooms or bathing rooms provided within the facility shall not be located on the inaccessible floor. Except as provided for in Sections 1109.2.2 and 1109.2.3, at least one of each type of fixture, element, control or dispenser in each accessible toilet room and bathing room shall be accessible.

1109.2.1 Family or Assisted-Use Toilet and Bathing Rooms: In assembly and mercantile occupancies, an accessible family or assisted-use toilet room shall be provided where an aggregate of six or more male and female water closets is required.

1109.9.2 Shelving and Display Units: Self-service shelves and display units shall be located on an accessible route. Such shelving and display units shall not be required to comply with reach-range provisions.

1109.12.1 Dressing, Fitting, and Locker Rooms: Where dressing rooms, fitting rooms, or locker rooms are provided, at least 5 percent, but not less than one, of each type of use in each cluster shall be accessible.

Chapter 16 Structural Design

SECTION 1609 WIND LOADS

Figure 1609.3(1) Basic Design Wind Speeds, V, for Risk Category II Buildings and Other Structures:

Oklahoma State Permanent Rule Addition 748:20-2-21: The footnotes to this figure have been modified to correct errata published by the ICC. The errata corrects the URL reference in footnote number 6 from www.atcouncil.org/windspeed to www.hazards.atcouncil.org

Figure 1609.3(2) Basic Design Wind Speeds, V, for Risk Category III Buildings and Other Structures:

Oklahoma State Permanent Rule Addition 748:20-2-21: Footnote 6 has been modified to change the URL reference from www.atcouncil.org/windspeed" to www.hazards.atcouncil.org"

Figure 1609.3(3) Basic Design Wind Speeds, V, for Risk Category III Buildings and Other Structures:

Oklahoma State Permanent Rule Addition 748:20-2-21: Footnote 6 has been modified to change the URL reference from www.atcouncil.org/windspeed" to www.hazards.atcouncil.org"

SECTION 1611 RAIN LOADS

1611.1 Design Rain Loads:

Oklahoma State Permanent Rule Addition 748:20-2-21: Each portion of a roof shall be designed to sustain the load of rainwater that will accumulate on it if the primary drainage system for that portion is blocked plus the uniform load caused by water that rises above the inlet of the secondary drainage system at its design flow. The design rainfall shall be based on rainfall rate of 10.2 inches per hour.

Chapter 23 Wood

SECTION 2304 GENERAL

2304.11 Heavy Timber Construction: Where a structure, portion thereof or individual structural elements are required by provisions of this code to be of heavy timber, the building elements therein shall comply with the applicable provisions of Sections 2304.11.1 through 2304.11.4. Minimum dimensions of heavy timber shall comply with the applicable requirements in Table 2304.11 based on roofs or floors supported and the configuration of each structural element, or in Sections 2304.11.2 through 2304.11.4. Lumber decking shall be in accordance with 2304.9.

2304.11.1.1 Columns: Minimum dimensions of columns shall be in accordance with Table 2304.11. Columns shall be continuous or superimposed throughout all stories and connected in an approved manner. Girders and beams at column connections shall be closely fitted around columns and adjoining ends shall be cross tied to each other, or intertied by caps or ties, to transfer horizontal loads across joints. Wood bolsters shall not be placed on topes of columns unless the columns support roof loads only. Where traditional heavy timber detailing is used, connections shall be by means of reinforced concrete or metal caps with brackets, by properly designed steel or iron caps, with pintles and base plates, by timber splice plates affixed to the columns by metal connectors housed within the contact faces, or by other approved methods.

2304.11.1.2 Floor Framing: Minimum dimensions of floor framing shall be in accordance with Table 2304.11. Approved wall plate boxes or hangers shall be provided where wood beams, girders or trusses rest on masonry or concrete walls. Where intermediate beams are used to support a floor, they shall rest of top of girders, or shall be supported by an approved metal hanger into which the ends of the beams shall be closely fitted. Where traditional heavy timber detailing is used, these connections shall be permitted to be supported by ledgers or blocks securely fastened to the sides of the girders.

2304.11.1.3 Roof Framing: Minimum dimensions of roof framing shall be in accordance with Table 2304.11. Every roof girder and not less than every alternate roof beam shall be anchored to its supporting member to resist forces as required in Chapter 16.
2304.11.4 Roof Decks: Roofs shall be without concealed spaces and roof decks shall be constructed in accordance with Section 2304.11.4.1 or 2304.11.4.2. Other types of decking shall be an alternative that provides equivalent fire resistance and structural properties. Where supported by a wall, roof decks shall be anchored to walls to resisted forces determined in accordance with Chapter 16. Such anchors shall consist of steel bolts, lags, screws or an approved hardware of sufficient strength to resist prescribed forces.
2304.11.4.1 Cross-laminated Timber Roofs: Cross-laminated timber roofs shall not be less than 3 inches nominal in thickness and shall be continuous from support to support and mechanically fastened to one another.
2304.11.4.2 Sawn, Wood Structural Panel, or Glued-laminated plant roofs: Sawn, wood structural panel, or glued-laminated plant roofs shall be one of the following:
1. Sawn or glued laminated, splined or tongue-and-groove plant, not less than 2 inches nominal in thickness.
2. 1-1/8 inch thick wood structural panel (exterior glue).
3. Plants not less than 3 inches nominal in width, set on edge close tougher and laid as required for floors.
2304.12 Protection against decay and termites: Wood shall be protected from decay and termites in accordance with the applicable provisions of Section 2304.12.1 through 2304.12.7
2304.12.1 Locations Requiring Waterborne Preservatives or Naturally Durable Wood: Wood used above ground in the locations specified in Section 2304.12.1.5, 2304.12.3, and 2304.12.5 shall be naturally durable wood or preservative-treated wood using waterborne preservatives, in accordance with AWPA U1 for above-ground use.
2304.12.1.1 Joists, Girders, and Subfloor: Wood joists or wood structural floors that are closer than 18 inches or wood girders that are closer than 12 inches to the exposed ground in crawl spaces or unexcavated areas located within the perimeter of the building foundation shall be of naturally durable or preservative-treated wood.
2304.12.1.2 Wood Supported by Exterior Foundation Walls: Wood joists or wood structural floors that are closer than 18” or wood girders that are closer than 12” to the exposed ground in crawl spaces or unexcavated areas located within the perimeter or the building foundation shall be of naturally durable or preservative-treated wood.
2304.12.1.3 Exterior Walls Below Grade: Wood framing members, including wood sheathing, that are in contact with exterior foundation walls and are less than 8 inches from exposed earth shall be of naturally or preservative-treated wood. **2304.12.1.4 Sleepers**

and Sills: Sleepers and sills on a concrete or masonry slab that is in direct contact with earth shall be of naturally durable or preservative-treated wood.

2304.12.2: Other Locations: Wood used in the locations specified in Sections 2304.12.2.1 through 2304.12.2.5 shall be naturally durable wood or preservative-treated wood in accordance with AWPA U1. Preservative-treated wood used in interior locations shall be protected with two coats of urethane, shellac, latex epoxy or varnish unless waterborne preservatives are used. Prior to application of the protective finish, the wood shall be dried in accordance with the manufacturer's recommendations.

2304.12.2.1 Girder Ends: The ends of wood girders entering exterior masonry or concrete walls shall be provided with a ½" airspace on top, sides and end, unless naturally durable or preservative treated wood is used.

2304.12.2.2 Posts or Columns: Posts or columns supporting permanent structures and supported by a concrete or masonry slab or footing that is in direct contact with the earth shall be of naturally durable or preservative-treated wood.

Exception: *Posts or columns that meet all of the following:*

1. *Are not exposed to the weather, or are protected by a roof, eave, overhang, or other covering if exposed to the weather.*
2. *Are supported by concrete piers or metal pedestals projected not less than 1 inch above the slab or deck and are separated from the concrete pier by an impervious moisture barrier.*
3. *Are located not less than 8" above exposed earth.*

2304.12.2.3 Supporting Member for Permanent Appurtenances: Naturally durable or preservative-treated wood shall be utilized for those portions of wood members that form the structural supports of buildings, balconies, porches or similar permanent building appurtenances where such members are exposed to the weather without adequate protection from a roof, eave, overhand or other covering to prevent moisture or water accumulation on the surface or at joints between members.

Exception: *Buildings located in a geographical region where experience has demonstrated that climatic conditions preclude the need to use durable materials where the structure is exposed to the weather.*

2304.12.2.4 Laminated Timbers: The portions of glued-laminated timbers that form the structural supports of a building or other structure and are exposed to weather and not fully protected from moisture by a roof, eave or similar covering shall be pressure treated with preservative or be manufactured from naturally durable or preservative-treated wood.

2304.12.3.1 Posts of Columns: Posts and columns that are supporting permanent structures and embedded in concrete that is exposed to the weather or in direct contact with the earth shall be of preservative-treated wood.

2304.12.4 Termite Protection: In geographical areas where hazard of termite damage is known to be very heavy, wood floor framing in the locations specified in Section 2304.12.1.1 and exposed framing of exterior decks or balconies shall be of naturally durable species (termite resistant) or preservative treated in accordance with AWPA U1 for the species, product preservative and end use or provided with approved methods of termite protection.

Table 2304.11 Minimum Dimensions of Heave Timber Structural Members

	Heavy Timber Structural Elements	Min. Nominal Solid Sawn Size		Min. Glued-Laminated Net Size		Min. Structural Composite Lumber Net Size	
Roof Loads Only	Columns (Roof and ceiling loads); Lower half of: wood-frame or glued-laminated arches that spring from the floor line of from grade.	6	8	5	8-1/4	5-1/4	7-1/2
	Upper half of: wood-frame or glued-laminated arches that spring from the floor line or from grade	6	6	5	6	5-1/4	5-1/2
	Framed timber trusses and other roof framing (a); Framed or glued-laminated arches that spring from the top of walls or wall abutments	4(b)	6	3(b)	6-7/8	3-1/2 (b)	5-1/2

a. Spaced members shall be permitted to be composed of two or more pieces not less than 3" nominal in thickness where blocked solidly throughout their intervening spaces or where spaces are tightly closed by a continuous wood cover plate of not less than 2" nominal in thickness secured to the underside of the members. Splice plates shall not be less than 3" nominal in thickness.

b. Where protected by approved automatic sprinklers under the roof deck, framing members shall be not less than 3" nominal in width.

Oklahoma State Health Department Chapter 257 Food Establishments:

SUBCHAPTER 11. PHYSICAL FACILITES

310:257-9-19. Toilets and urinals: At least one toilet and not fewer than the toilets required by law shall be provided. IF authorized by law and urinals are substituted for toilets, the substitution shall be done as specified in law. Chemical portable toilets, if

approved, may be substituted for this requirement for temporary, seasonal, and mobile food establishments.

310:257-11-14. Toilet rooms, enclosed: A toilet rooms shall be completely enclosed with a tight-fitting and self closing door, except for the following situations:

(1) When a toilet room is located outside of the food establishment and does not open directly into the food establishment, such as a toilet room provided by the management of a shopping mall; or

(2) When a toilet room that utilizes an offset entrance maze:

(a) Protects exposed food, clean equipment, utensils, linens; and unwrapped single-service and single-use articles to contamination, and

(b) Offensive odors are controlled.

310:257-11-36 Toilet rooms, convenience and accessibility: Toilet rooms shall be conveniently located and accessible to employees during all hours of operations.

NFPA-13 Standard for the Installation of Sprinkler Systems:

Chapter 9 Sprinkler Location Requirements

9.2 ALLOWABLE SPRINKLER OMISSION LOCATIONS

9.2.1* Concealed Spaces Not Requiring Sprinkler Protection

9.2.1.1* Concealed spaces of noncombustible and limited-combustible construction with minimal combustible loading having no access shall not require sprinkler protection.

9.2.1.1.1 The space shall be considered a concealed space even with small opening such as those used as return air for a plenum.

9.2.1.1.2* Small openings with both of the following limits shall be permitted:

1) A combined total area of not more than 20 percent of the ceiling, construction feature, or plane shall be used to determine the boundaries of the concealed space.

2) Gaps greater than 4 feet long shall not be more than 8 inches wide.

9.2.1.2 Concealed spaces of noncombustible and limited-combustible construction with limited access and not permitting occupancy or storage of combustibles shall not required sprinkler protection.

9.2.1.2.2* The space shall be considered a concealed space even with non-fuel-fired equipment and access panels.

9.2.1.16 Sprinklers shall not be required in vertical pipe chases under 10 square feet.

9.2.1.16.1 Pipe chases in accordance with 9.2.1.16 shall contain no sources of ignition.

9.2.2 Spaces Under Ground Floors, Exterior Docks, and Exterior Platforms. Sprinklers shall be permitted to be omitted from spaces under ground floors, exterior docks, and exterior platforms where all of the following conditions exist:
1) The space is not accessible for storage purposes and is protected against accumulation of wind-borne debris.
2) The space contains no equipment such as conveyors or fuel-fired heating units.
3) The floor over the space is constructed in such a manner as to prevent the passage of debris into the space below.
4) No combustible or flammable liquids or materials that under fire conditions would convert into combustible or flammable liquids are processed, handled, or stored on the floor above the space.

9.2.3* Exterior Projections
9.2.3.1* Sprinklers shall be permitted to be omitted where the exterior canopies, roofs, porte-cocheres, balconies, decks, and similar projects are constructed with materials that are noncombustible, limited-combustible, or fire retardant-treated wood as defined in NFPA 703, or where the projections are constructed utilizing a noncombustible frame, limited-combustibles, or fire retardant-treated wood with an inherently flame-resistant fabric overlay as demonstrated by Test Method 2 in accordance with NFPA 701.
9.2.3.1* Sprinklers shall be permitted to be omitted from below the exterior projections of combustible construction, provided the exposed finish material on the exterior projections are noncombustible, limited-combustible, or fire retardant-treated wood as defined in NFPA 703, and the exterior projections contain only sprinklered concealed spaces or any of the following unsprinklered combustible concealed spaces:

Exhibit 1: Tahlequah City Limits

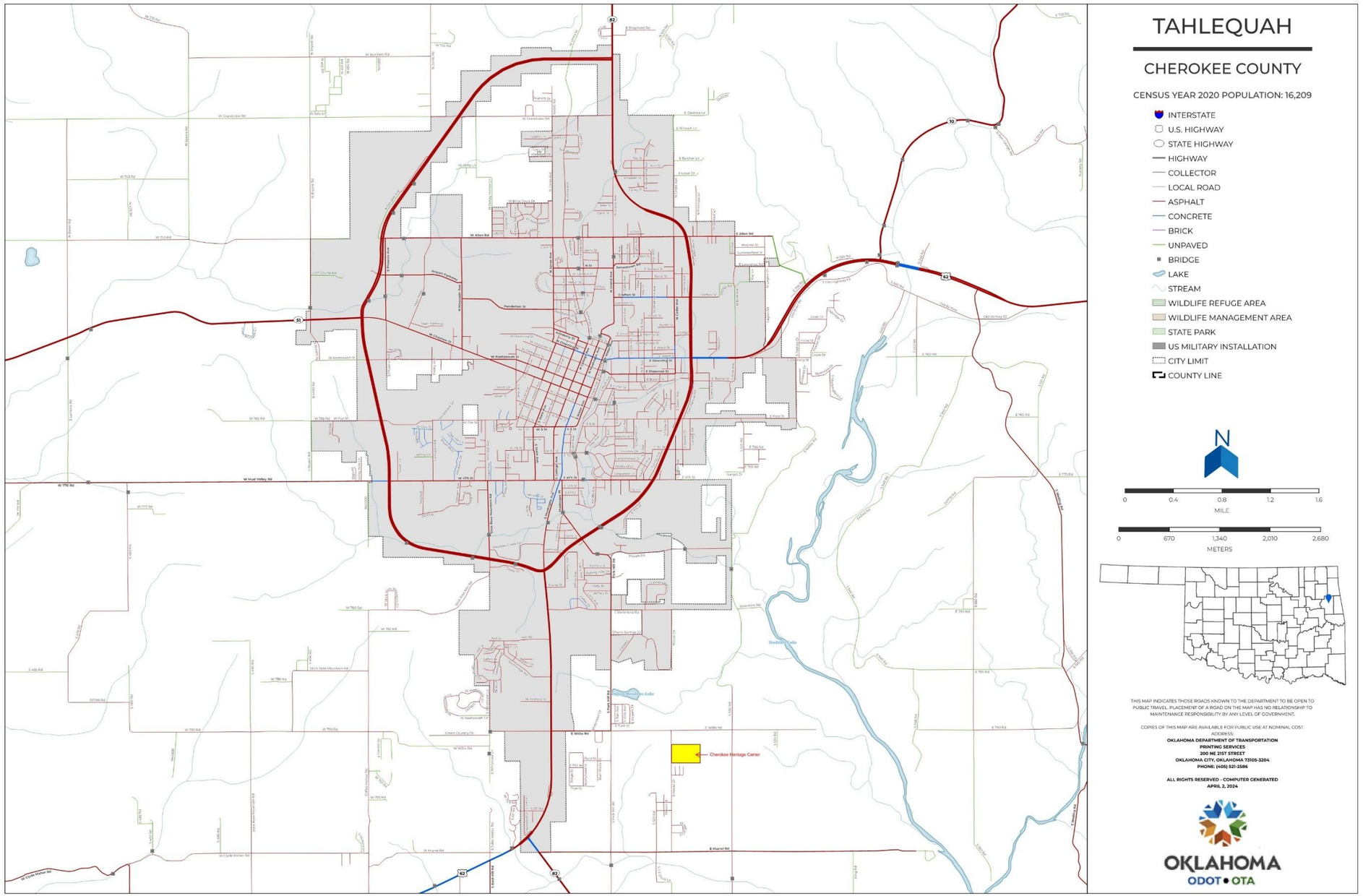

Exhibit 2: Schematic Design Plumbing Counts

Table 2902.1 Minimum Number of Required Plumbing Fixtures

	Water Closets		Lavatories		Drinking Fountains		Service Sink
Assembly: Auditoriums without permanent seating, art galleries, exhibition halls, museums, lecture halls, libraries, arcades, and gymnasiums	Male 1/125 | Female 1/65	Exhibit space + Multiuse Classroom= 419 Occupants. 419/2 = 209.5 **1.68 Male | 3.22 Female**	1 per 200	419/200 = **2.1 Lavatories**	1 per 500	419/500 = **.84 Drinking Fountains**	1 Service Sink
Assembly: Restaurants, banquet halls, and food courts	Male 1/75 | Female 1/75	Cafe = 76 Occupants. 76/2 = 38 **.51 Male | .51 Female**	1 per 200	100/ 200 = **.50 Lavatories**	1 per 500	100/500 = **.20 Drinking Fountains**	1 Service Sink
Business: Buildings for the transaction of business professional services, other services involving merchandise, office buildings, banks, light industrial, ambulatory care and similar uses.	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50	Business Offices = 4 Occupants **.16 Water Closets**	1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80	4/40 = **.1 Lavatories**	1 per 100	4/100 = **.04 Drinking Fountains**	Occupancy is low enough, no service sink required.
Mercantile: Retail Stores, service stations, shops, sales rooms, markets, shopping centers	1 per 500	Mercantile = 8 Occupants **.016 Water Closets**	1 per 750	8/750 = **.01 Lavatories**	1 per 1000	8/1000 = **.008 Drinking Fountains**	Occupancy is low enough, no service sink required.
Storage: Structures for the storage of goods, warehouses, storehouses and freight depots, low and moderate hazard.	1 per 100	Storage = 12 Occupants **.12 Water Closets**	1 per 100	12/100 = **.12 Lavatories**	1 per 1000	12/1000 = **.012 Drinking Fountains**	1 Service Sink
Totals:		Minimum of 7 required water closets, **4 Female** and **3 Male** required		Minimum **3 Lavatories**		Minimum **2 Drinking Fountains**	Minimum **1 Service Sink**

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403.1.2 Single-user toilet facility and bathing room fixtures: The plumbing fixtures located in single-user toilet facilities and bathing rooms, including family or assisted use toilet and bathing rooms that are required by Section 1109.2.1 of the IBC, shall contribute to the total number of required plumbing fixtures for a building or tenant space. Single-user toilet facilities and bathing rooms, and family or assisted-use toilet rooms shall be identified for use by either sex.

410.3 High and Low Drinking Fountains: Where drinking fountains are required, not fewer than two drinking fountains shall be provided. One drinking fountain shall comply with the requirements for people who use a wheelchair and one drinking fountain shall comply with the requirements for standing persons.

Schematic Design Demolition Scope

Reference Drawings

General Demolition Notes:

The general demolition scope referenced in this document is for architectural items only, but the Archaeology Management Plan shall be followed for all demolition activities on site. For general site demolition scope reference civil and landscaping plans.

Demolition shall be carried out according to the Archaeology Management Plan for the Cherokee Heritage Center (attached), key demolition points from the document are listed below:

“A primary concern during the project is the potential for demolition activities to encounter previously unidentified archaeological resources. Architectural features or components may also be encountered onsite. While previous construction, land use, and development may have already destroyed intact archaeological resources that may have previously existed within the monitoring area, evidence from previous geophysical survey and visual assessment suggests that some resources may remain intact. Archeological monitoring of demolition activities allows for close observation of ground-disturbing activities and building demolition, which may more easily and effectively allow for the detection of any intact surface or subsurface archaeological resources present throughout the monitoring area.

Archaeological monitoring will be conducted during all demolition activities within the area previously assessed as a possessing moderate to high potential to contain intact archaeological resources… Monitoring is not recommended at the Tsa-La-Gi Amphitheater or any other structure beyond the vicinity of the Cherokee Heritage Center Museum and Plaza, though other related documents apply in those areas. In general, one Archeological Monitor should be present at each location where active demolition activities are occurring within the Demolition Monitoring Area. In the event that demolition was to occur in more than one area simultaneously, multiple Monitors may be required on site in order to ensure adequate coverage. In this scenario, the necessary level of monitoring coverage will be determined by the Principal Investigator and relayed to the CNB Project Manager and/or Construction Manager.” – Demolition Monitoring Plan for the Cherokee Heritage Center

“If potential archeological resources are discovered unexpectedly during project construction:

1. All work should immediately stop within 50 feet of the discovery, and the Construction Manager and Cherokee Nation THPO should be notified. If there is a Qualified Archaeologist for the project, they should also be notified. No work within 50 feet of the find should occur until the Cherokee Nation THPO or qualified designee can report to the site to inspect the discovery.
2. Temporary protective measures should be implemented. The type of temporary protective measures required and length of stoppage will be dependent on the nature of the discovery; however, the protective measures should be sufficient to protect and allow for safe investigation of the discovery, including any known or potential resources associated with the discovery, without unnecessary hindrance to construction. Work may continue on other areas of the project site while the discovery is being evaluated.
3. The discovery should be identified and evaluated by a qualified professional (e.g. Qualified Archaeologist or Cherokee Nation THPO) for NRHP significance and integrity.
4. Construction activities within a 50-foot radius may resume once the protective measures and/or treatment plan have been fully implemented and notice to proceed has been given by the Cherokee Nation THPO.”
   – Cherokee Heritage Cetner Unanticipated Discoveries Plan

“Based on historical research and the results of the archeological assessment, there is no reason to believe that the project area contains human remains or burials. However, it is important that all involved project personnel are aware of the appropriate discovery response protocols.

1. All work should immediately stop within 50 feet of the discovery, and the Construction Manager and Cherokee Nation THPO should be notified. If involved, a Qualified Archaeologist and Osteologist should be consulted as well.
2. Temporary protective measures should be implemented and should be sufficient to protect and allow for safe investigation of the discovery and any known or potential cultural materials associated with the discovery. These protective measures should also ensure that any human remains are shielded from public view.
3. Local law enforcement (Cherokee Nation Marshal Service) should be immediately contacted to comply with 21 CNCA Chapter 47.
4. Suspected human remains should not be further disturbed nor removed until disposition has been determined by the Cherokee Nation Marshal Service.

5. The Cherokee Nation Marshal Service should notify the Office of the Oklhoma Chief Medical Examiner who should confirm whether the human remains are human and whether the remains are associated with or suspected to be associated with any crime (forensic).
6. If the discovery Is determined to represent archaeological human remains (and associated burial materials) that are American Indian in ancestry, the Cherokee Nation THPO should follow procedures in compliance with the Council of the Cherokee Nation legislative codes 21 CNCA § 1168.2, § 1168.4.E, and § 1168.5.
7. Excavation within 50 feet of the discovery should not resume until a notice to proceed is given by the Cherokee Nation Marshal Service and Cherokee Nation THPO. The measures previously set in place to protect the remains and any associated artifacts should remain in effect until this time.
5. At all times, the human remains must be treated with utmost dignity and respect and in a culturally sensitive manner. "
   – Cherokee Heritage Cetner Unanticipated Discoveries Plan

Demolition of Diligwa Village:

There is a moderate potential for archaeological resources to be discovered in this area.

Demolition within the Diligwa Village is still being developed. There is a potential for full or partial demolition of the Diligwa Village.

The winter houses are octagonal structures approximately 30 feet wide. They have approximately 8 main exterior columns, and 4 interior columns, with secondary posts around the perimeter. Primary columns are approximately 9"-10" in diameter. The structures are approximately 12 feet above the surrounding finish grade, the finished floor inside the structure is approximately 1 foot below the exterior grade.

The summer houses are rectangular structures approximately 30 feet in length and 15 feet wide. They have approximately 12 main exterior columns, and 3 primary interior columns, with secondary posts around the perimeter. Primary columns are approximately 9"-10" in diameter

Demolition of Adams Corner:

There is a moderate potential for archeological resources to be discovered in this area.

The demolition scope of Adams Corner is still being developed. There is a potential for full or partial demolition of Adams Corner.

Demolition of Existing Cherokee Nation Cultural Center Building:

There is a high potential for archaeological resources to be discovered in this area.

Included in this packet are the 1973 architectural drawings for the Cherokee Nation Cultural Center.

The existing Cherokee Nation Cultural Center building is a single two-story building consisting of a ground floor and partial basement. It was originally constructed in 1972; an addition was built in 1985. The ground floor has a gross area of approximately 11,860 feet and the basement is approximately 7,900 square feet. The total gross square footage is approximately 19,750 square feet and the building is approximately 12 feet above grade plane. The exterior consists of sloped concrete walls clad with adhered stone veneer, with some storefront windows/doors and coated concrete overhangs. The roof is a low-slope fully adhered TPO system. All existing electrical, plumbing, and mechanical elements deemed obsolete are to be removed, all utility and drain lines are to be capped. The site will be infilled after demolition.

Hazordous materials are present within the existing Cherokee Nation Cultural Center Building, see attached radon, asbestos and lead reports.

It is requested that the exterior stone be salvaged for use throughout the site. Provide a line item for salvage of the exterior stone with an alternate for demolition.

Demolition of Amphitheater:

There is a low potential for archeological resources to be discovered in this area.

There is a limited scope for the demolition of the existing amphitheater. Demolition at this time will include the main roof structure of the amphitheater and enclosed spaces located on the upper level. Under roof square footage is approximately 17,000 square feet. The enclosed spaces consist mainly of storage space and restrooms. All existing electrical, plumbing, and mechanical elements deemed obsolete are to be removed, all utility and drain lines are to be capped, and all floors effected by the removal of electrical, plumbing, mechanical, and structural systems are to be patched.

AccuStar
Professional Radon Laboratory Services Since 1984

Radon in Air

NELAC NY 11769
NRPP 103216 AL
NRSB ARL0017

EPA Method #402-R-92-004
Liquid Scintillation
NRPP Device Code 8088
NRSB Device Code 12193

Laboratory Report for:

Cherokee Nation of Oklahoma - Shaun West
PO BOX 948
Tahlequah OK 74465

Property Tested:

Cherokee Heritage Center
Not Indicated 4300613 4300611
Tahlequah OK 74464

Log Number	Device Number	Test Exposure Duration:				Area Tested	Result pCi/L
2806468	4300613	11/20/2020	2:00 pm	11/24/2020	10:09 am	Bldg. HC Basement Room Finance	12.1
2806469	4300614	11/20/2020	2:05 pm	11/24/2020	10:12 am	Bldg. HC Basement Room Barb's Office	12.6
2806470	4300612	11/20/2020	2:10 pm	11/24/2020	10:15 am	Bldg. HC Basement Room Curator	11.9
2806471	4300615	11/20/2020	2:15 pm	11/24/2020	10:20 am	Bldg. HC First Floor Room Gift Shop	11.2
2806472	4300611	11/20/2020	2:15 pm	11/24/2020	10:08 am	Bldg. HC First Floor Room Geneology	9.1

Comment: Client declined lab's request for a property test address. Cherokee Nation of Oklahoma was e-mailed a copy of this report. A copy of this report was emailed to swest@cherokee.org.

Test Performed By: Placed: Shaun West Retrieved: Shaun West

Distributed by: Cherokee Nation of Oklahoma

Date Received: 11/25/2020 Date Logged: 11/25/2020 Date Analyzed: 11/26/2020 Date Reported: 11/27/2020

Report Reviewed By: _____ Report Approved By: _____

Shawn Price, Director of Laboratory Operations, AccuStar Labs

Disclaimer:

The uncertainty of this radon measurement is ~+/- 10 %. Factors contributing to uncertainty include statistical variations, daily and seasonal variations in radon concentrations, sample collection techniques and operation of the dwelling. Interference with test conditions may influence the test results.

This report may only be transferred to a third party in its entirety. Analytical results relate to the samples AS RECEIVED BY THE LABORATORY. Results shown on this report represent levels of radon gas measured between the dates shown in the room or area of the site identified above as "Property Tested". Incorrect information will affect results. The results may not be construed as either predictive or supportive of measurements conducted in any area of this structure at any other time. AccuStar Labs, its employees and agents are not responsible for the consequences of any action taken or not taken based upon the results reported or any verbal or written interpretation of the results.

CHEROKEE NATION
Environmental Programs

Asbestos Sampling Report

PARTICIPANT: HERITAGE CENTER

PREPARED BY: Logan E. G **DATE:** 12.16.2020
LOGAN GIRTY. ENVIRONMENTAL SPECIALIST II

REQUESTED BY: CNET, TRAVIS SAWNEY

TABLE OF CONTENTS

I. Site Inspection/Description

Cherokee Nation Environmental Programs (CNEP) has conducted asbestos sampling for the presence of asbestos containing materials (ACM) for the following site:

Heritage Center
21192 S Keeler Rd, Park Hill, OK 74451
918-456-6007
Year of construction: 1970

The sampling was performed to determine the presence of all ACM from within the affected parts of the structure for EPA's National Emissions of Hazardous Air Pollutants (NESHAP) compliance as well as OSHA worker protection.

The inspector responsible for this project was:

Logan Girty ODOL, AHERA Inspector, License No: OK401597

The sampling was conducted on December 4, 2020 at the request of the CNET, Travis Sawney.

The year of construction for this site is 1970. Sampling was limited to areas that would be affected by the project scope of work provided by CNET.

ACM was found at this site. See Section IV for locations.

II. BACKGROUND

The Oklahoma Department of Environmental Quality (ODEQ) has adopted EPA's NESHAP regulation under OAC252:100, 41-15 and has been delegated authority in the state of Oklahoma for its enforcement. Section 61.145(a) of Federal EPA regulation states that prior to commencement of the demolition or renovation of a facility a thorough inspection of the affected part or parts of a facility is required to determine the presence of all asbestos including Category I and Category II non-friable, and friable ACM. ACM is defined by EPA and OSHA as any material that contains greater than 1% asbestos.

III. FIELD PROCEDURES AND ANALYTICAL METHODS

During the on-site inspection, we visually assessed the physical characteristics of suspect asbestos-containing materials (SACM) based on homogeneous areas. Homogeneous areas are areas of asbestos similar in color, texture, and construction, date of application, and in general appearance. For purposes of renovation and demolition, homogeneous areas of SACM can be

further classified according to NESHAPs rules by whether the material is friable, Category I non-friable, or Category II non-friable.

Friable ACM is defined by NESHAPs rules as any material containing more than 1% asbestos as determined by Polarized Light Microscopy (PLM), that, when dry, can be crumbled, pulverized or reduced to powder by hand pressure.

Category I Non-friable ACM is defined by NESHAPs rules as any asbestos-containing packings, gaskets, construction mastics, resilient floor covering (i.e. floor tiles, roll sheet flooring) or asphalt roofing products that contain more than 1% asbestos as determined by PLM.

Category II Non-friable ACM is defined by NESHAPs rules as any material, excluding Category I non-friable ACM, containing more than 1% asbestos as determined by PLM, when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Typically, non-friable materials, such as transite (cementious products) and vinyl floor tiles are not regulated by the State of Oklahoma provided they do not become friable. General deterioration, machine grinding, drilling, sanding, and dry-buffing are all ways of causing non-friable materials to become classified as Regulated Asbestos Containing Materials (RACM). All friable materials are classified RACM. Please note that the following materials, even though classified as non-friable are fully regulated by Oklahoma Department of Labor for removal purposes as friable material: ceiling tiles, roll sheet flooring (linoleum), and joint wall compound when deemed friable

In addition to classification of suspect material into friable and non-friable materials, a determination of current condition was conducted as part of the physical assessment. The condition noted is the representative of the material at the time of inspection. Conditions of materials can change very quickly when disturbed. All suspect material was placed in one of the following categories of condition.

Significantly damaged: Material that is damaged, blistered, deteriorated, water stained over at least 10% of its total area.

Damaged: Material that is damaged, blistered, deteriorated, water stained less than 10% of its total area.

Good: Material that has no visible damage or deterioration.

Guidelines used for the number of samples collected per homogeneous area were determined using the Asbestos Hazard Emergency Response Act (AHERA) protocol promulgated in 40 CFR 763, Appendix E as follows:

Surfacing materials – material that is sprayed or troweled on wall, ceilings, or support columns for fireproofing, acoustical, or even decorative purpose.

- Less than 1000 ft2 – Minimum 3 samples

- From 1000-5000 ft2 – Minimum 5 samples
- Greater than 5000 ft2 – Minimum 7 samples

Thermal System Insulation (TSI) materials – thermal system insulation material applied to tanks, boiler, pipes or other structural component for an insulating purpose.

- May omit areas of fibrous glass, foam glass, rubber, and Styrofoam form sampling. Areas that have mastic on seams or outer jacketing will be sampled.
- At least three samples must be collected from each homogeneous area of TSI.
- Plus an additional sample from each patched area of less than 6 linear feet.
- Fittings require a sufficient amount to determine positive or negative nature.
- Inspector will first collect samples from damaged areas, exposed ends, or areas missing jacketing first.

Miscellaneous materials – all other material that are not thermal system insulation or surfacing materials. This includes gaskets, packings, joint wall compound, cementious asbestos materials, ceiling tiles resilient flooring materials, construction mastics, etc..

- May assume and document as such
- A sufficient amount of samples to determine negative or positive nature. A minimum or one per suspect homogeneous area.
- Collect samples from inconspicuous locations.
- Material such as cementious asbestos or vibration dampening cloths should not be sampled and will be assumed ACM unless instructed by client to collect these samples.

Bulk samples of suspect ACM were analyzed by Polarized Light Microscopy (PLM) in accordance with EPA Methods 600R-93/116. All samples were sent to a NVLAP accredited laboratory for analysis. QuanTEM Laboratories, LLC (NVLAP # 101959-0) in Oklahoma City, OK analyzed the samples. A copy of the full laboratory report and chain of custody can be found in Appendix B.

IV. SUMMARY OF FINDINGS

A total of 19 samples were analyzed from 9 homogeneous area due to multi-layers of material within some homogeneous sample areas. Photographs of all ACM can be found in Appendix C. All accessible and observable areas within the renovation area were sampled for ACM. Samples were not taken of suspect materials that may have placed the inspector at risk of injury (i.e. electrical panel boxes). Any suspect ACM that have not been tested and/or found positive for asbestos must be assumed ACM until they are analyzed. Upon review of laboratory analysis, the following asbestos containing materials can be found in Table 1. All suspect ACM samples that were analyzed and did not contain asbestos can be found in Table 2.

Table 1. Asbestos Containing Materials					
Sample #	Material Description	Locations	Friability (Friable, NF Cat I NF Cat II)	Condition	Sample Results (% Asbestos)
01-01 01-02 01-03 01-04 01-05 01-06 01-07	Ceiling Texture (cementious)	Throughout Upper Level (Lobby)	NF Cat II	Good	3% Chrysotile
02-01	Vinyl Composition Floor Tile	Lower Level	NF Cat I	Good	3% Chrysotile

Table 2. Non – Asbestos Containing Materials				
Sample #	Material Description	Locations	Condition	Sample Results (% Asbestos)
03-01	Carpet Adhesive	Lower Level	Good	None Detected
04-01 04-02 04-03	Wall Texture (cementious)	Lower Level	Good	None Detected
05-01	Drywall	Lower Level	Good	None Detected
06-01	1x1 Ceramic Floor Tile	Bathroom (Stairway)	Good	None Detected
07-01	Vinyl Flooring	Lobby	Good	None Detected
08-01	Formica Countertop	Kitchen	Good	None Detected
09-01 09-02 09-03	Drywall Texture	Kitchen	Damaged	None Detected

V. CONCLUSIONS

Asbestos is not always an immediate hazard. Intact and undisturbed ACM does not pose a health risk. They may, however become a health hazard if they are damaged, disturbed, or deteriorate over time and release fibers into the air. There are no federal, state, or Tribal laws mandating asbestos removal. It is only when the material can no longer be maintained in good condition and/or airborne concentrations of asbestos are measured and found to be above a permissible exposure limit (PEL), or when the building is to be demolished or renovated, that removal may become necessary. Any renovation/demolition work which may impact these positive materials should be conducted in accordance with all applicable Federal, state, and local regulations.

APPENDIX A.

LABORATORY RESULTS
&
CHAIN OF CUSTODY

2033 Heritage Park Dr, Oklahoma City, OK 73120 | 1.800.822.1650

Polarized Light Microscopy Asbestos Analysis Report

QuanTEM Lab No. 329527
Account Number: C162
Date Received: 12/09/2020
Received By: Chloe Collins
Date Analyzed: 12/10/2020
Analyzed By: Katherine Sluder
Methodology: EPA/600/R-93/116

Client: Cherokee Nation Environmental Programs
Logan Girty
PO Box 948
Tahlequah, OK 74464

Project: Heritage Cntr
Project Location: Tahlequah
Project Number: N/A

QuanTEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)		Non-Asbestos Fiber (%)	Non Fibrous
001	01-01	Homogeneous	Tan Texture	Asbestos Present Chrysotile	3	NA	CaCO3 Binder Paint
002	01-02	Homogeneous	Tan Texture	Asbestos Present Chrysotile	3	NA	CaCO3 Binder Paint
003	01-03	Homogeneous	Tan Texture	Asbestos Present Chrysotile	3	NA	CaCO3 Binder Paint
004	01-04	Homogeneous	Tan Texture	Asbestos Present Chrysotile	3	NA	CaCO3 Binder Paint
005	01-05	Homogeneous	Tan Texture	Asbestos Present Chrysotile	3	NA	CaCO3 Binder Paint
006	01-06	Homogeneous	Tan Texture	Asbestos Present Chrysotile	3	NA	CaCO3 Binder Paint

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

QuanTEM is a NVLAP accredited PLM laboratory (Lab Code: 101959-0). This report relates only to the specific items tested. NVLAP accreditation applies only to analysis performed utilizing EPA/600/M4-82-020 and EPA/600/R-93/116 methods. This report may not be used to claim product endorsement by NVLAP or any agency of the US Government. This report may not be reproduced except in full, without the written approval of the laboratory.

QUANTEM LABORATORIES
2033 HERITAGE PARK DR, OKLAHOMA CITY, OK 73120 | 1.800.822.1650

Polarized Light Microscopy Asbestos Analysis Report

QuanTEM Lab No. 329527
Account Number: C162
Date Received: 12/09/2020
Received By: Chloe Collins
Date Analyzed: 12/10/2020
Analyzed By: Katherine Sluder
Methodology: EPA/600/R-93/116

Client: Cherokee Nation Environmental Programs
Logan Girty
PO Box 948
Tahlequah, OK 74464

Project: Heritage Cntr
Project Location: Tahlequah
Project Number: N/A

QuanTEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
007	01-07	Homogeneous	Tan Texture	Asbestos Present Chrysotile 3	NA	CaCO3 Binder Paint
008	02-01	Layered	Tan Floor Tile	Asbestos Present Chrysotile 3	NA	CaCO3
008a		Layered	Black Mastic	Asbestos Not Present	Cellulose 1	CaCO3 Tar
009	03-01	Layered	Red/Black Carpet	Asbestos Not Present	Synthetic 90	Binder CaCO3
009a		Layered	Tan Mastic	Asbestos Not Present	Cellulose 1 Synthetic 2	Glue CaCO3
010	04-01	Homogeneous	Gray Texture	Asbestos Not Present	NA	CaCO3 Sand Paint

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

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2033 Heritage Park Dr, Oklahoma City, OK 73120 | 1.800.822.1650

Polarized Light Microscopy Asbestos Analysis Report

QuanTEM Lab No. 329527
Account Number: C162

Date Received: 12/09/2020
Received By: Chloe Collins
Date Analyzed: 12/10/2020
Analyzed By: Katherine Sluder
Methodology: EPA/600/R-93/116

Client: Cherokee Nation Environmental Programs
Logan Girty
PO Box 948
Tahlequah, OK 74464

Project: Heritage Cntr
Project Location: Tahlequah
Project Number: N/A

QuanTEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)	Non Fibrous
011	04-02	Homogeneous	Gray Texture	Asbestos Not Present	NA	CaCO3 Sand Paint
012	04-03	Homogeneous	Gray Texture	Asbestos Not Present	NA	CaCO3 Sand Paint
013	05-01	Homogeneous	White Drywall	Asbestos Not Present	Cellulose 10	Gypsum
014	06-01	Layered	Brown Ceramic Tile	Asbestos Not Present	NA	Sand Binder
014a		Layered	Gray Grout	Asbestos Not Present	Cellulose 2	CaCO3 Sand Binder
015	07-01	Layered	Gray Flooring	Asbestos Not Present	NA	Vinyl CaCO3

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

QuanTEM is a NVLAP accredited PLM laboratory (Lab Code: 101959-0). This report relates only to the specific items tested. NVLAP accreditation applies only to analysis performed utilizing EPA/600/M4-82-020 and EPA/600/R-93/116 methods. This report may not be used to claim product endorsement by NVLAP or any agency of the US Government. This report may not be reproduced except in full, without the written approval of the laboratory.

QUANTEM LABORATORIES
2033 Heritage Park Dr, Oklahoma City, OK 73120 | 1.800.822.1650

Polarized Light Microscopy Asbestos Analysis Report

QuanTEM Lab No. 329527
Account Number: C162
Date Received: 12/09/2020
Received By: Chloe Collins
Date Analyzed: 12/10/2020
Analyzed By: Katherine Sluder
Methodology: EPA/600/R-93/116

Client: Cherokee Nation Environmental Programs
Logan Girty
PO Box 948
Tahlequah, OK 74464

Project: Heritage Cntr
Project Location: Tahlequah
Project Number: N/A

QuanTEM Sample ID	Client Sample ID	Composition	Color / Description	Asbestos (%)	Non-Asbestos Fiber (%)		Non Fibrous
015a		Layered	Tan Mastic	Asbestos Not Present	Cellulose	2	Glue CaCO3
016	08-01	Layered	Tan Counter Top	Asbestos Not Present	Cellulose	95	Binder
016a		Layered	Tan Mastic	Asbestos Not Present	Cellulose	3	Glue
017	09-01	Homogeneous	White Texture	Asbestos Not Present	NA		CaCO3 Paint
018	09-02	Homogeneous	White Texture	Asbestos Not Present	NA		CaCO3 Paint
019	09-03	Homogeneous	White Texture	Asbestos Not Present	NA		CaCO3 Paint

Katherine Sluder, Analyst

12/10/2020
Date of Report

Unless otherwise noted, upon receipt the condition of the sample was acceptable for analysis.

QuanTEM is a NVLAP accredited PLM laboratory (Lab Code: 101959-0). This report relates only to the specific items tested. NVLAP accreditation applies only to analysis performed utilizing EPA/600/M4-82-020 and EPA/600/R-93/116 methods. This report may not be used to claim product endorsement by NVLAP or any agency of the US Government. This report may not be reproduced except in full, without the written approval of the laboratory.

ASBESTOS CHAIN OF CUSTODY

QuanTEM LABORATORIES
www.QuanTEM.com
2033 Heritage Park Drive, Oklahoma City, OK 73120-7502
(800) 822-1650 • (405) 755-7272 • Fax: (405) 755-2058

LEGAL DOCUMENT - PLEASE PRINT LEGIBLY

For Lab Use Only	
Lab No.	329527
	Accept Reject

Contact Information			
Company:	Cherokee Nation Environmental Programs	Phone:	(918) 453-6140
Contact:	Logan Girty	Cell Phone:	(918) 772-8346
Account #:	C 162	E-mail:	logan-girty@cherokee.org
SAMPLED BY: Name:	Logan Girty	Date:	12-8-2020

Project Information	
Project Name:	Heritage Cntr
Project Location:	Tahlequah
Project ID:	
P.O. Number:	256398

Report Results (☑ one box)	
☐	QuanTEM Website
☑	Email logan-girty@cherokee.org
☐	Other _____

RELINQUISHED BY	DATE & TIME	VIA	RECEIVED BY	DATE & TIME
Logan E.	12.8.2020	Fedex	Chloe Calling	12/9/20 8:00
	3:00 PM			

REQUESTED SERVICES (Please ☑ the Appropriate Boxes)

PLM		PLM		TEM		TEM		TURNAROUND TIME	
☑	Bulk Analysis (EPA 600/R-93/116)	☐	Vermiculite Attic Insulation (EPA 600/R-04/004)	☐	Air- AHERA	☐	Bulk- Presence / Absence EPA600/R-93/116	☐	Rush
☐	400 Point Count	☐	Other	☐	Air- NIOSH 7402	☐	Bulk- Quantitative [weight%]- Chatfield	☐	Same Day
☐	1000 Point Count	PCM		☐	Air- ISO 10312	☐	Dust- Presence / Absence	☑	24 - Hour
☐	Gravimetric Preparation	☐	NIOSH 7400	☐	Drinking Water- EPA 100.2	☐	Dust- Quantitative [fibers/sq.cm]- ASTM D5755	☐	3 - Day
☐	Particle ID			☐	Waste Water- EPA 600/4-83-043	☐	Other	☐	5 - Day

No.	Sample ID (10 Characters Max)	☑ To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
1	01-01	☑		ceiling texture		Lobby
2	01-02	☑		ceiling texture		
3	01-03	☑		ceiling texture		
4	01-04	☑		ceiling texture		
5	01-05	☑		ceiling texture		
6	01-06	☑		ceiling texture		
7	01-07	☑		ceiling texture		
8	02-01	☑		VCT		Lower level
9	03-01	☑		Carpet adhesive		lower level
10	04-01	☑		wall texture		lower level

SATURDAY FEDEX SAMPLE DELIVERY - CALL TO SCHEDULE • Use this address for Saturday Delivery only: 4220 N. Santa Fe Ave., Oklahoma City, OK 73105-8517 • Mark Package "Hold for Saturday Pickup"
Please Note - UPS and USPS are NOT available for Saturday Delivery

ASBESTOS CHAIN OF CUSTODY

QUANTEM LABORATORIES
www.QuanTEM.com

2033 Heritage Park Drive, Oklahoma City, OK 73120-7502
(800) 822-1650 • (405) 755-7272 • Fax: (405) 755-2058

LEGAL DOCUMENT - PLEASE PRINT LEGIBLY

For Lab Use Only
Lab No. 329527
(Accept) Reject

Project Information

Company: Cherokee Nation Environmental Programs | Project Name: Heritage Cntr | Project Location: Tahlequah

No.	Sample ID (10 Characters Max)	☑ To Be Analyzed	Color	Description	Volume / Area (as applicable)	Comments / Notes
11	04-02	✓		wall texture		lower level
12	04-03	✓		wall texture		lower level
13	05-01	✓		drywall		lower level
14	06-01	✓		floor 1x1 tile		bathroom
15	07-01	✓		vinyl flooring		~~Lobby~~
16	08-01	✓		formica countertop		kitchen
17	09-01	✓		~~kitchen~~ wall texture		kitchen
18	09-02	✓		~~kitchen~~ wall texture		kitchen
19	09-03	✓		~~kitchen~~ wall texture		kitchen
20		☐				
21		☐				
22		☐				
23		☐				
24		☐				
25		☐				
26		☐				
27		☐				
28		☐				
29		☐				
30		☐				

SATURDAY FEDEX SAMPLE DELIVERY - CALL TO SCHEDULE • Use this address for Saturday Delivery only: 4220 N. Santa Fe Ave., Oklahoma City, OK 73105-8517 • Mark Package "Hold for Saturday Pickup"
Please Note - UPS and USPS are NOT available for Saturday Delivery

CHEROKEE NATION
Environmental Programs

Lead-Based Paint Inspection Report

PARTICIPANT: **Heritage Center**

PREPARED BY: LOGAN GIRTY, ENVIRONMENTAL SPECIALIST II

REQUESTED BY: **CNET, Travis Sawney**

I. GENERAL INFORMATION

DATE OF INSPECTION: December 4, 2020

PARTICIPANT INFO:

Heritage Center
918-456-6007
21192 S. Keeler Rd. Park Hill, OK 74451
Year of construction: 1970's

INSPECTOR INFORMATION

Logan Girty, Environmental Specialist II
Cherokee Nation Environmental Programs
PO Box 948, Tahlequah, OK 74465
(918) 453-5000 ext.6140
Oklahoma Inspector/Risk Assessor, OKRASR13908
Cherokee Nation Inspector/Risk Assessor, CNRASR00037

Cherokee Nation Environmental Programs
PO Box 948, Tahlequah, OK 74465
(918) 453-5009
Oklahoma Firm: OKFIRM11198
Cherokee Nation Firm: CNFIRM00001

EQUIPMENT INFORMATION

XRF Lead Paint Analyzer
Manufacturer: Heuresis Corp.
Model #: Pb200i
Serial Number: 2312
Radioactive Source: Cobalt 57
Sourced Date: 6/1/2019

This site has tested negative for lead-based paint. Please see section 2 for more information.

Inspector Signature: Logan E. Girty Date: 12.16.2020

2. SUMMARY

A lead based paint inspection was conducted at the Heritage Center site on December 4, 2020 as requested by CNET, Travis Sawney. The inspection indicated that no lead in amounts greater than or equal to 1.0 mg/cm^2 in paint was found in any building components, using the inspection protocol in Chapter 7 of the HUD Guidelines for the Evaluation of Control of Lead-Based Pain Hazards in Housing (1997). Therefore, this dwelling qualifies for the exemption in 24 CFR part 35 and 40 CFR part 745 for target housing being leased that is free of lead-based paint, as defined in the rule. However, some painted surfaces may contain levels of lead below 1.0 mg/cm^2, which could create lead dust or lead-contaminated soil hazards if the paint is turned into dust by abrasion, scraping, or sanding. This report should be kept by the owner and all future owners for the life of the dwelling.

DISCLOSURE

A copy of this report or a summary of this report must be provided to new lessees (tenants) and purchasers of the property under Federal law (24 CFR part 35 and 40 CFR part 745) before they become obligated under a lease or sales contract. The complete report must also be provided to new purchasers and it must be made available to new tenants. Landlords (leasers) and sellers are also required to distribute an educational pamphlet approved by the US Environmental Protection Agency and include standard warning language in their leases or sales contracts to ensure that parents have the information they need to protect their children form lead-based paint hazards.

Because the inspection found no lead-based paint, these disclosure requirements do not apply as long as the property is available for lease; should the owner put the property up for sale, the disclosure requirements again apply.

PROTOCOL

The testing protocol used to perform this testing is based on the HUD guidelines of 1997 titled: *Guidelines for the evaluation of Lead-Based Paint Hazards in Housing.*

Perimeter wall sides are identified with the letters A, B, C, and D. Side A for single-family housing is the street address side or the front of the house for rural areas. Side B, C, and D are identified clockwise from side A as one faces the dwelling; thus Wall B is to the left, Wall C is across from Side A, and Side D is to the right of Side A.

Sides in an interior room equivalent follow the overall housing unit side allocation. Therefore when standing in any four sided room facing Side C, the room's Side A will always be to the rear, Side B will be to the left, and Side D will be to the right.

After doing a walk through inspection of the residence to be tested based upon room number, building component types, the residence was tested based upon room number, building component, substrate, and color and condition of painted surfaces. The attached Lead-Based Paint Data Sheet gives the final results as being either positive or negative.

Heuresis Corp.
Pb2O0i
XRF Lead Paint Analyzer
2312
Pb2O0i-4.1-11

Reading #	Pb	Units	Pb Error	Result	Secs	Date	Time	Room	Structure	Member	Substrate	Wall	Condition
1	1.1	mg/cm2	0.1		20	12/4/2020	15:28:45	Calibration					
2	1.1	mg/cm2	0.1		20	12/4/2020	15:30:23	Calibration					
3	1.1	mg/cm2	0.1		20	12/4/2020	15:31:11	Calibration					
4	0.2	mg/cm2	0.3	Negative	2	12/4/2020	15:33:15	Entry	Room	Wall	Concrete	A	Intact
5	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:33:36	Entry	Room	Wall	Concrete	B	Intact
6	-0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:33:49	Entry	Room	Wall	Drywall	C	Intact
7	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:34:32	Entry	Room	Wall	Concrete	D	Intact
8	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:34:54	Entry	Door		Metal	A	Intact
9	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:35:08	Entry	Door	Casing	Metal	A	Intact
10	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:35:20	Bathroom	Room	Wall	Drywall	A	Intact
11	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:35:45	Bathroom	Room	Wall	Drywall	B	Intact
12	0	mg/cm2	0.3	Negative	2	12/4/2020	15:35:57	Bathroom	Room	Wall	Drywall	C	Intact
13	0.2	mg/cm2	0.3	Negative	2	12/4/2020	15:37:45	Bathroom	Room	Wall	Drywall	D	Intact
14	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:38:01	Bathroom	Room	Ceiling	Drywall		Intact
15	0.2	mg/cm2	0.3	Negative	2	12/4/2020	15:38:24	Bathroom	Door		Wood	C	Intact
16	-0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:38:36	Bathroom	Door	Casing	Metal	C	Intact
17	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:40:32	Room 1	Room	Wall	Drywall	A	Intact
18	0.5	mg/cm2	0.3	Negative	2	12/4/2020	15:40:56	Room 1	Room	Wall	Drywall	B	Intact
19	0.2	mg/cm2	0.3	Negative	2	12/4/2020	15:43:26	Room 1	Room	Wall	Drywall	C	Intact
20	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:44:24	Room 1	Room	Wall	Drywall	D	Intact
21	0.7	mg/cm2	0.2	Negative	4	12/4/2020	15:47:38	Room 1	Door	Casing	Metal	B	Intact
22	0.5	mg/cm2	0.3	Negative	2	12/4/2020	15:48:27	Room 1	Door		Wood	B	Intact
23	0.2	mg/cm2	0.3	Negative	2	12/4/2020	15:49:13	Room 2	Room	Wall	Concrete	A	Intact
24	0.1	mg/cm2	0.3	Negative	2	12/4/2020	15:49:30	Room 2	Room	Wall	Concrete	B	Intact
25	0.3	mg/cm2	0.3	Negative	2	12/4/2020	15:49:54	Room 2	Room	Wall	Concrete	C	Intact
26	0.2	mg/cm2	0.3	Negative	2	12/4/2020	15:50:18	Room 2	Room	Wall	Concrete	D	Intact

27	0.6 mg/cm2	0.3 Negative	2	12/4/2020	15:50:59	Room 2	Door	Casing	Metal	B	Intact
28	0 mg/cm2	0.3 Negative	2	12/4/2020	15:51:16	Room 2	Door		Wood	B	Intact
29	0.7 mg/cm2	0.2 Negative	4	12/4/2020	15:51:28	Room 2	Door	Jamb	Metal	B	Intact
30	0.2 mg/cm2	0.3 Negative	2	12/4/2020	15:51:52	Room 2	Room	Ceiling	Concrete		Intact
31	0.2 mg/cm2	0.3 Negative	2	12/4/2020	15:52:34	Room 3	Room	Wall	Concrete	A	Intact
32	0.3 mg/cm2	0.3 Negative	2	12/4/2020	15:52:56	Room 3	Room	Wall	Concrete	B	Intact
33	0 mg/cm2	0.3 Negative	2	12/4/2020	15:53:11	Room 3	Room	Wall	Concrete	C	Intact
34	0.1 mg/cm2	0.3 Negative	2	12/4/2020	15:53:26	Room 3	Room	Wall	Concrete	D	Intact
35	0.2 mg/cm2	0.3 Negative	2	12/4/2020	15:54:02	Room 3	Room	Ceiling	Concrete		Intact
36	0.2 mg/cm2	0.3 Negative	2	12/4/2020	15:54:17	Room 3	Door		Wood	D	Intact
37	0 mg/cm2	0.3 Negative	2	12/4/2020	15:54:33	Room 3	Door	Casing	Metal	D	Intact
38	0.2 mg/cm2	0.3 Negative	2	12/4/2020	15:55:16	Room 4	Room	Wall	Concrete	A	Intact
39	0.2 mg/cm2	0.3 Negative	2	12/4/2020	15:55:38	Room 4	Room	Wall	Concrete	B	Intact
40	0 mg/cm2	0.3 Negative	2	12/4/2020	15:55:57	Room 4	Room	Wall	Concrete	D	Intact
41	0.6 mg/cm2	0.3 Negative	2	12/4/2020	15:56:13	Room 4	Door	Casing	Metal	B	Intact
42	0.2 mg/cm2	0.3 Negative	2	12/4/2020	15:56:28	Room 4	Door		Wood	B	Intact
43	-0.1 mg/cm2	0.3 Negative	2	12/4/2020	15:56:48	Room 4	Room	Ceiling	Concrete		Intact
44	-0.1 mg/cm2	0.3 Negative	2	12/4/2020	15:57:09	Room 5	Room	Wall	Drywall	A	Intact
45	-0.2 mg/cm2	0.3 Negative	2	12/4/2020	15:57:37	Room 5	Room	Wall	Drywall	B	Intact
46	0.3 mg/cm2	0.3 Negative	2	12/4/2020	15:58:45	Room 5	Room	Wall	Drywall	C	Intact
47	-0.1 mg/cm2	0.3 Negative	2	12/4/2020	15:59:12	Room 5	Room	Wall	Drywall	D	Intact
48	-0.1 mg/cm2	0.3 Negative	2	12/4/2020	15:59:27	Room 5	Room	Ceiling	Drywall		Intact
49	0.2 mg/cm2	0.3 Negative	2	12/4/2020	15:59:41	Room 5	Cabinet	Door	Wood	B	Intact
50	0.3 mg/cm2	0.3 Negative	2	12/4/2020	15:59:56	Room 5	Cabinet	Frame	Wood	B	Intact
51	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:00:18	Room 5	Door		Wood	B	Intact
52	0.5 mg/cm2	0.3 Negative	2	12/4/2020	16:00:33	Room 5	Door	Casing	Metal	B	Intact
53	-0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:00:49	Room 6	Room	Wall	Concrete	A	Intact
54	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:01:11	Room 6	Room	Wall	Concrete	B	Intact
55	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:01:28	Room 6	Room	Wall	Concrete	C	Intact
56	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:01:53	Room 6	Room	Wall	Concrete	D	Intact
57	0 mg/cm2	0.3 Negative	2	12/4/2020	16:02:08	Room 6	Room	Ceiling	Concrete		Intact
58	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:02:26	Room 6	Door		Metal	C	Intact
59	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:02:43	Room 6	Door	Casing	Metal	C	Intact
60	-0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:02:57	Room 7	Room	Wall	Concrete	A	Intact

61	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:03:15	Room 7	Room	Wall	Concrete	B	Intact
62	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:03:35	Room 7	Room	Wall	Concrete	C	Intact
63	0.7 mg/cm2	0.2 Negative	4	12/4/2020	16:03:59	Room 7	Door	Casing	Metal	C	Intact
64	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:04:21	Room 7	Door		Metal	C	Intact
65	0 mg/cm2	0.3 Negative	2	12/4/2020	16:04:38	Room 8	Room	Wall	Concrete	A	Intact
66	-0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:04:58	Room 8	Door		Wood	D	Intact
67	0.7 mg/cm2	0.2 Negative	3	12/4/2020	16:05:13	Room 8	Door	Casing	Metal	D	Intact
68	-0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:05:46	Room 9	Room	Wall	Drywall	A	Intact
69	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:06:13	Room 9	Room	Wall	Drywall	B	Intact
70	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:07:06	Room 9	Room	Wall	Drywall	C	Intact
71	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:07:37	Room 9	Room	Wall	Concrete	D	Intact
72	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:09:38	Room 9	Door		Wood	B	Intact
73	0.7 mg/cm2	0.2 Negative	5	12/4/2020	16:09:50	Room 9	Door	Casing	Metal	B	Intact
74	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:10:18	Room 10	Room	Wall	Drywall	A	Intact
75	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:10:31	Room 10	Room	Wall	Concrete	B	Intact
76	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:10:44	Room 10	Room	Wall	Drywall	C	Intact
77	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:13:45	Room 10	Room	Wall	Drywall	D	Intact
78	0.3 mg/cm2	0.3 Negative	2	12/4/2020	16:14:24	Room 10	Door		Wood	B	Intact
79	0 mg/cm2	0.3 Negative	2	12/4/2020	16:15:03	Room 10	Door	Casing	Metal	B	Intact
80	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:15:42	Room 11	Room	Wall	Concrete	A	Intact
81	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:16:21	Room 11	Room	Wall	Drywall	B	Intact
82	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:17:00	Room 11	Room	Wall	Drywall	C	Intact
83	0.1 mg/cm2	0.3 Negative	2	12/4/2020	16:17:39	Room 11	Room	Wall	Concrete	D	Intact
84	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:18:18	Room 11	Room	Ceiling	Concrete		Intact
85	0.2 mg/cm2	0.3 Negative	2	12/4/2020	16:18:57	Room 11	Door		Wood	D	Intact
86	0 mg/cm2	0.3 Negative	2	12/4/2020	16:19:36	Room 11	Door	Casing	Metal	D	Intact
87	1.1 mg/cm2	0.1	20	12/4/2020	16:22:15	Calibration					
88	1.1 mg/cm2	0.1	20	12/4/2020	16:23:45	Calibration					
89	1.1 mg/cm2	0.1	20	12/4/2020	16:24:18	Calibration					

CHEROKEE NATIONAL MUSEUM

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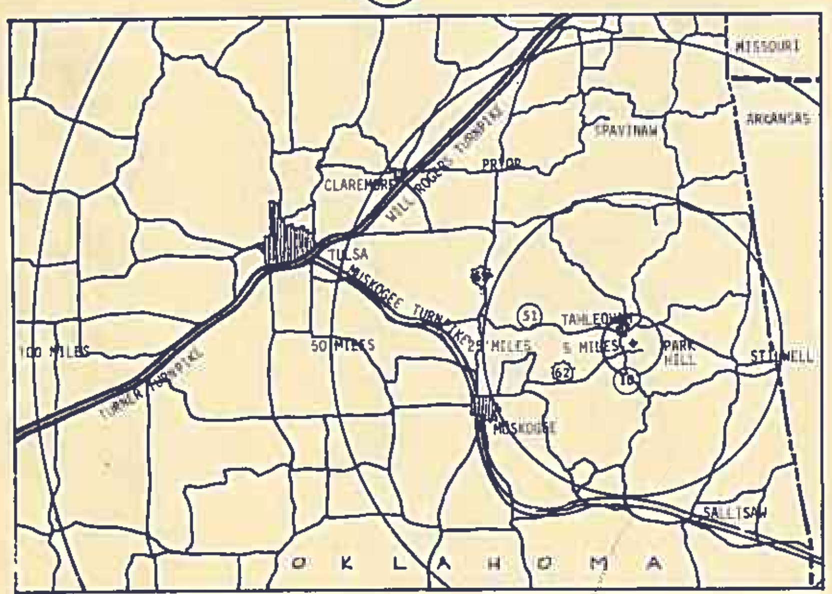
CHEROKEE CULTURAL CENTER

PARK HILL, OKLAHOMA

CHEROKEE NATIONAL HISTORICAL SOCIETY

LOCATION MAP



THE CHEROKEE NATIONAL HISTORICAL SOCIETY 1963

INDEX

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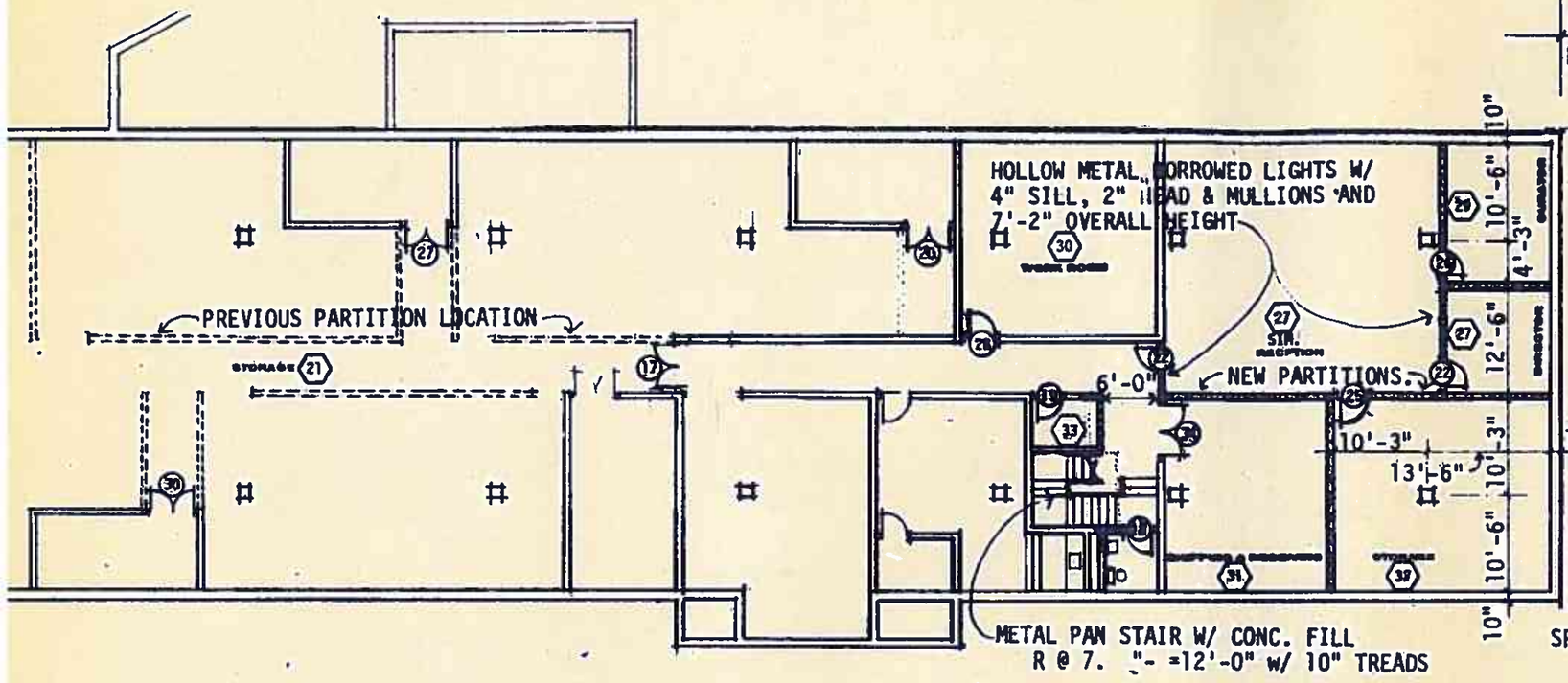
SET 5

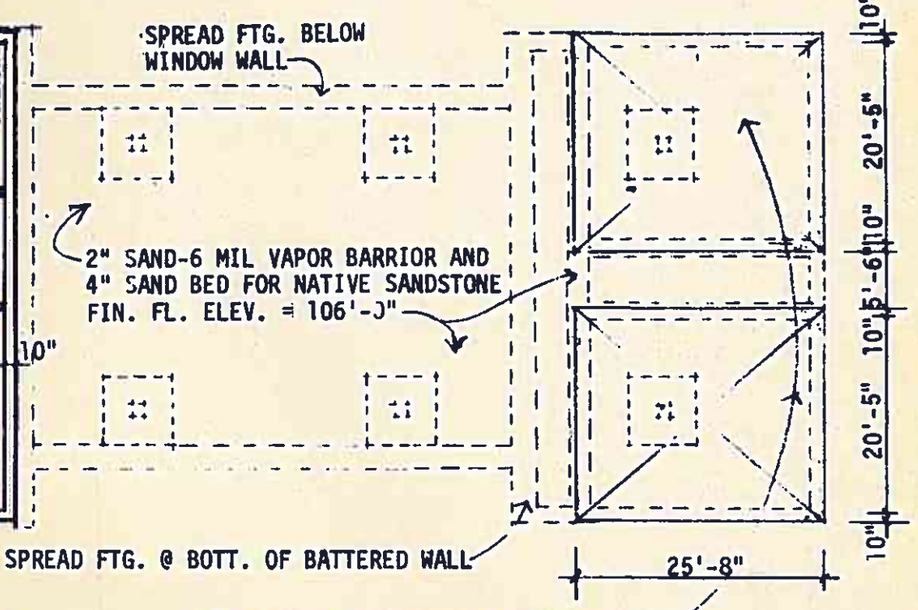
E.D.A. PROJECT NO. 08-1-01276

McCUNE McCUNE & ASSOCIATES ARCHITECTS & ENGINEERS TULSA, OKLAHOMA



LOWER LEVEL PLAN
SCALE 0 5 10 15 20

OMIT LOWER LEVEL
FOUNDATION PLAN FOR UPPER LEVEL SHOWN BELOW



4" CONCRETE SLAB OVER 6 MIL. VAPOR BARRIER OVER 4" SAND FILL. REINF. W/ LAYER OF 6x6 10/10 W. .I. MESH TURN DOWN EDGE OF SLAB 2'-0"- MAKE EDGE 10" THICK.

UPPER LEVEL CHANGES REQ'D FOR ALT. NO. 1

NOTES:
1. OMIT DR 16 AND COMBINE EXIT SPACE INTO JANITOR SPACE ON UPPER LEVEL.
2. CHANGE DR NO. 5 TO A DR SIMILAR TO DR. NO. 6 @ UPPER LEVEL.
3. CHANGE DR. NO. 8 TO A PAIR OF 2'-6" x 7'-0" DRS W/ AN S TYPE FRAME.

LOWER LEVEL MECHANICAL CHANGES REQ'D FOR ALT. NO. 1

NOTES:
1. OMIT 2 TYPE M FIRE DAMPERS.
2. OMIT 1 TYPE L FIRE DAMPERS.
3. OMIT 30' OF 25x12 DUCT.
4. OMIT 42' OF 18x10 DUCT.
5. ADD 24' OF 28x28 BELOW GRADE RETURN DUCT.
6. OMIT 4 IN DUCT FIRE DAMPERS.
7. ZONE 3 DUCTS REMAIN IN AREA REMOVED. CHANGE DUCTS TO BELOW GRADE TYPE. ROUND DUCTS ACCEPTABLE.
8. RELOCATE PLUMBING FOR REVISED TOILET & WORK SHOP SINK LOCATIONS.

LOWER LEVEL ELECTRICAL CHANGES REQ'D FOR ALT. NO. 1

NOTES:
1. OMIT 11 TYPE 5 LIGHT FIXTURES
2. OMIT CIRCUITS A-1,2 & 3.
3. OMIT 7 TYPE 6 LIGHT FIXTURES.
4. OMIT 7 TYPE 7 LIGHT FIXTURES.

CLARIFICATION DWG. TO ADDENDUM #3

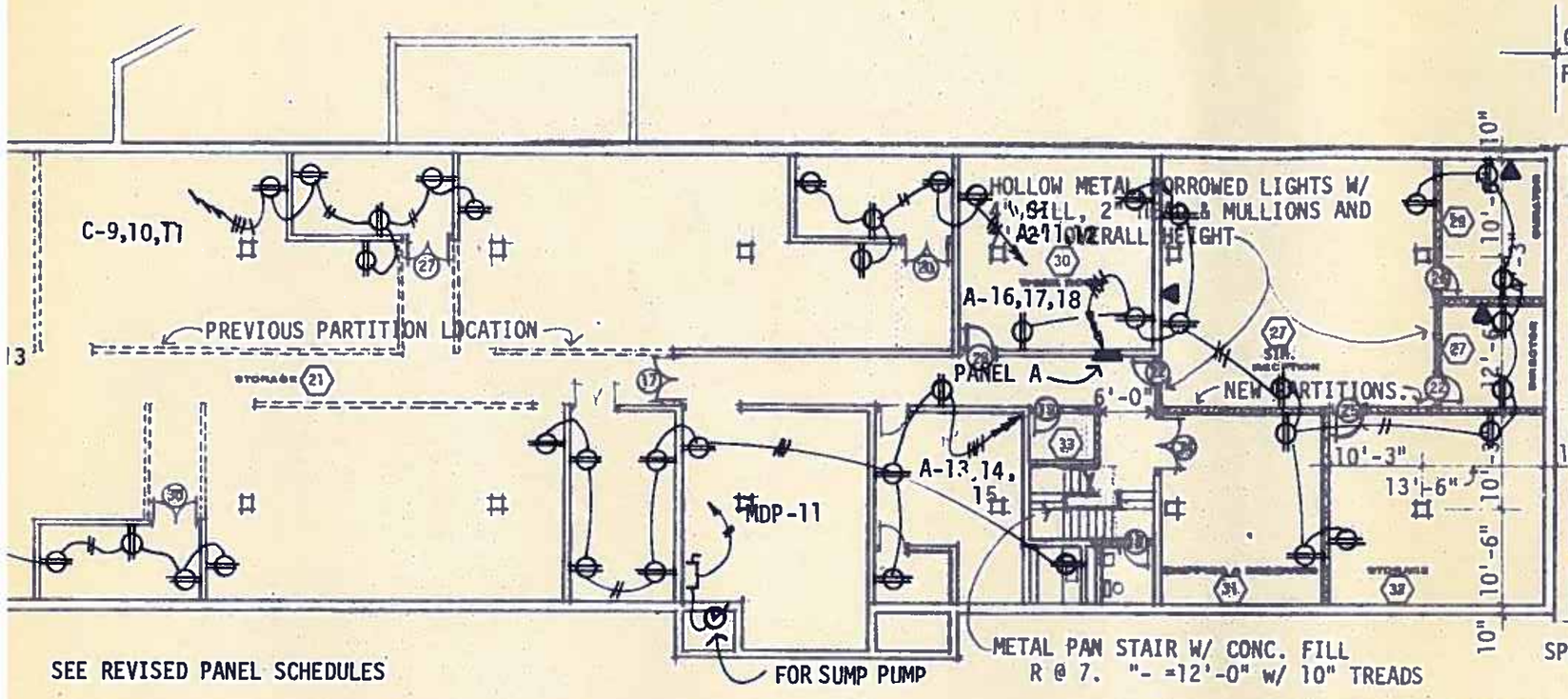
6 NOV 72

AR-C1

17FEB73

E.D.A. PROJECT NO. 08-1-01276

MM



SEE REVISED PANEL SCHEDULES

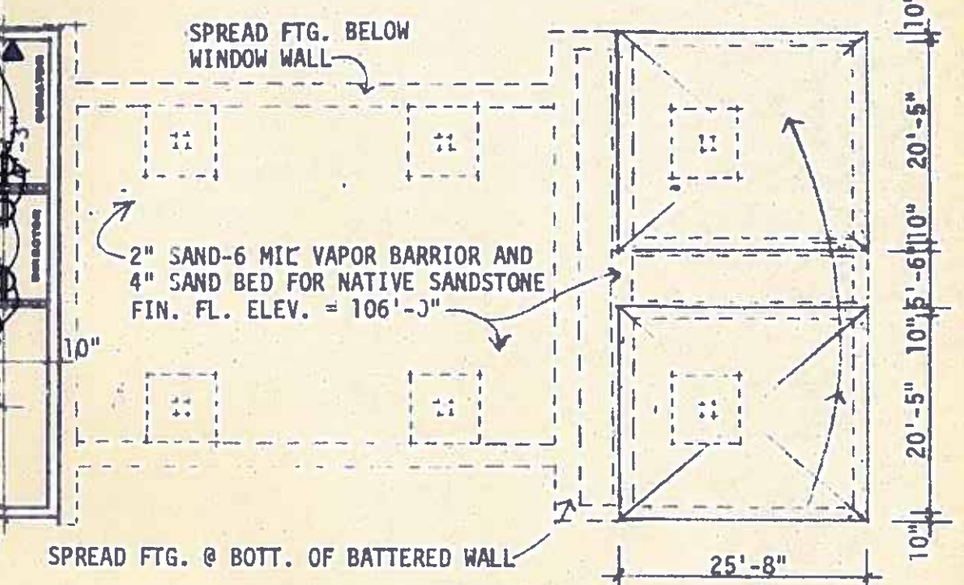
WIRING FOR AIR CONDITIONING AND MECHANICAL EQUIPMENT TO REMAIN AS SHOWN ON ORIGINAL DRAWINGS

LOWER LEVEL PLAN

SCALE 0 5 10 15 20

OMIT LOWER LEVEL

FOUNDATION PLAN FOR UPPER LEVEL SHOWN BELOW



4" CONCRETE SLAB OVER 6 MIL. VAPOR BARRIER OVER 4" SAND FILL. REINF. W/ LAYER OF 6x6 10/10 W. .J. MESH TURN DOWN EDGE OF SLAB 2'-0"- MAKE EDGE 10" THICK.

UPPER LEVEL CHANGES REQ'D FOR ALT. NO. 1

NOTES:
1. OMIT DR 16 AND COMBINE EXIT SPACE INTO JANITOR SPACE ON UPPER LEVEL.
2. CHANGE DR NO. 5 TO A DR SIMILAR TO DR. NO. 6 @ UPPER LEVEL.
3. CHANGE DR. NO. 8 TO A PAIR OF 2'-6" x 7'-0" DRS W/ AN S TYPE FRAME.

LOWER LEVEL MECHANICAL CHANGES REQ'D FOR ALT. NO. 1

NOTES:
1. OMIT 2 TYPE M FIRE DAMPERS.
2. OMIT 1 TYPE L FIRE DAMPERS.
3. OMIT 30'-0F 25x12 DUCT.
4. OMIT 42' OF 18x10 DUCT.
5. ADD 24' OF 28x28 BELOW GRADE RETURN DUCT.
6. OMIT 4 IN DUCT FIRE DAMPERS.
7. ZONE 3 DUCTS REMAIN IN AREA REMOVED. CHANGE DUCTS TO BELOW GRADE TYPE, ROUND DUCTS ACCEPTABLE.
8. RELOCATE PLUMBING FOR REVISED TOILET & WORK SHOP SINK LOCATIONS.

LOWER LEVEL ELECTRICAL CHANGES REQ'D FOR ALT. NO. 1

NOTES:
1. OMIT 11 TYPE 5 LIGHT FIXTURES
2. OMIT CIRCUITS A-1,2 & 3.
3. OMIT 7 TYPE 6 LIGHT FIXTURES.
4. OMIT 7 TYPE 7 LIGHT FIXTURES.

430.50 FT.

CLARIFICATION DWG. TO ADDENDUM #3

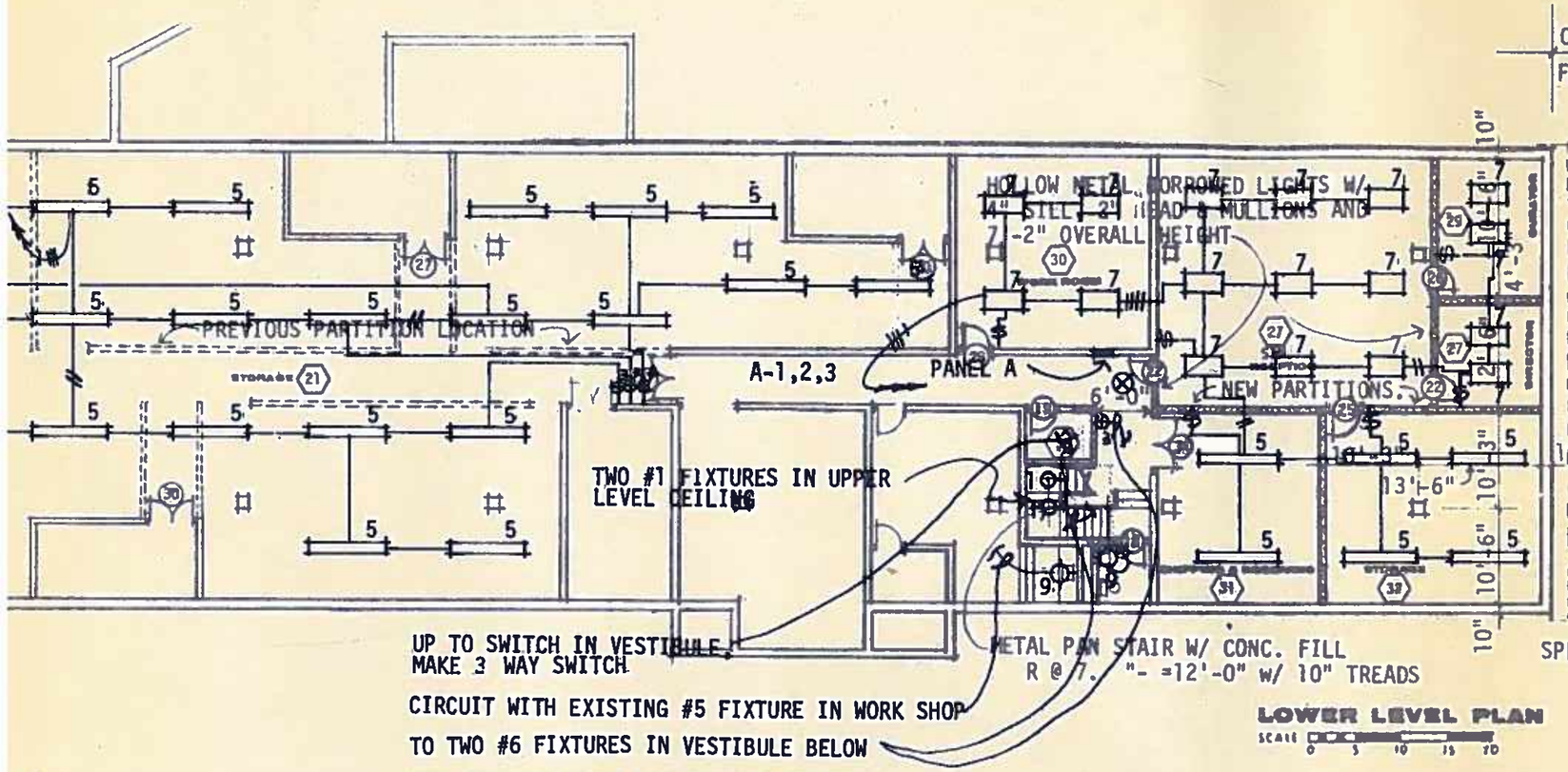
E-C2

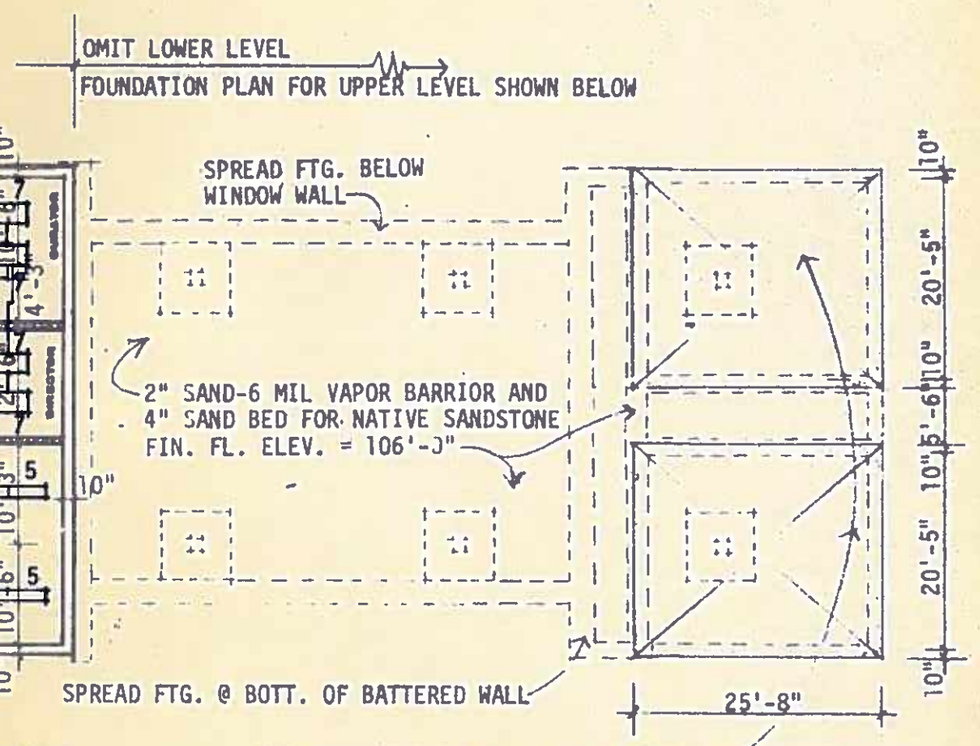
E.D.A. PROJECT NO. 08-1-01276

17FEB73

6 NOV 72

MM





UPPER LEVEL CHANGES REQ'D FOR ALT. NO. 1

NOTES:
1. OMIT DR 16 AND COMBINE EXIT SPACE INTO JANITOR SPACE ON UPPER LEVEL.
2. CHANGE DR NO. 5 TO A DR SIMILAR TO DR. NO. 6 @ UPPER LEVEL.
3. CHANGE DR. NO. 8 TO A PAIR OF 2'-6" x 7'-0" DRS W/ AN S TYPE FRAME.

LOWER LEVEL MECHANICAL CHANGES REQ'D FOR ALT. NO. 1

NOTES:
1. OMIT 2 TYPE M FIRE DAMPERS.
2. OMIT 1 TYPE L FIRE DAMPERS.
3. OMIT 30' OF 25x12 DUCT.
4. OMIT 42' OF 18x10 DUCT.
5. ADD 24' OF 28x28 BELOW GRADE RETURN DUCT.
6. OMIT 4 IN DUCT FIRE DAMPERS.
7. ZONE 3 DUCTS REMAIN IN AREA REMOVED. CHANGE DUCTS TO BELOW GRADE TYPE. ROUND DUCTS ACCEPTABLE.
8. RELOCATE PLUMBING FOR REVISED TOILET & WORK SHOP SINK LOCATIONS.

LOWER LEVEL ELECTRICAL CHANGES REQ'D FOR ALT. NO. 1

NOTES:
1. OMIT 11 TYPE 5 LIGHT FIXTURES
2. OMIT CIRCUITS A-1,2 & 3.
3. OMIT 7 TYPE 6 LIGHT FIXTURES.
4. OMIT 7 TYPE 7 LIGHT FIXTURES.

CLARIFICATION DWG. TO ADDENDUM # 3

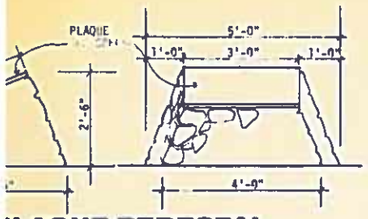
E-C1

17FEB73

E.D.A. PROJECT NO. 08-1-01276

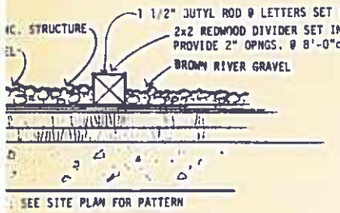
6 NOV 72

MM



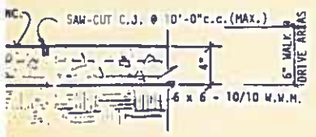
PLAQUE PEDESTAL

SCALE: 0 1 2 3 4



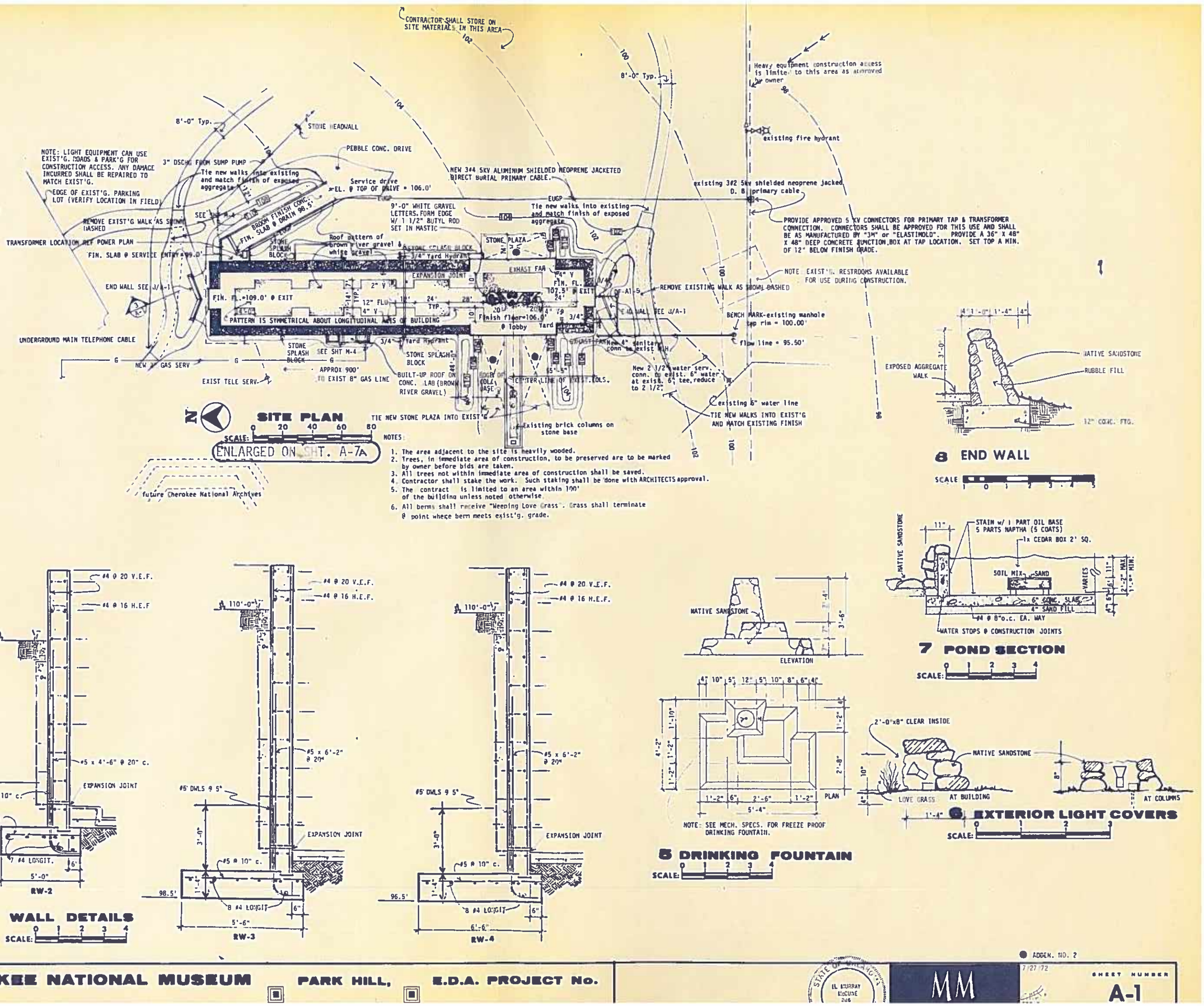
RAIL ROOF PATTERN

3 6 9 12



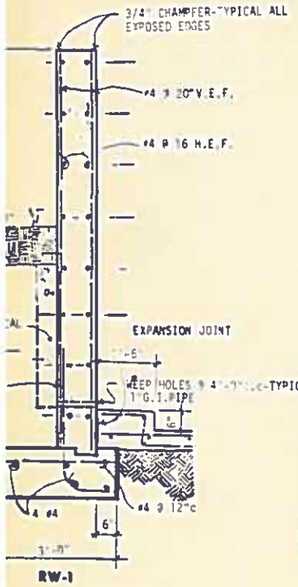
CONC. WALK

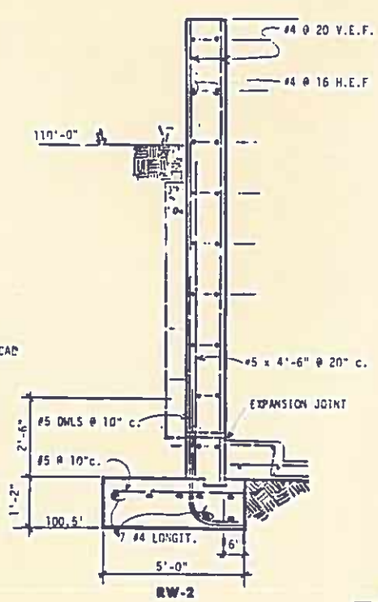
SCALE: 6 0 1



NOTES:

1. The area adjacent to the site is heavily wooded.
2. Trees, in immediate area of construction, to be preserved are to be marked by owner before bids are taken.
3. All trees not within immediate area of construction shall be saved.
4. Contractor shall stake the work. Such staking shall be done with ARCHITECTS approval.
5. The contract is limited to an area within 100' of the building unless noted otherwise.
6. All berms shall receive "Weeping Love Grass". Grass shall terminate @ point where berm meets exist'g. grade.





4 RETAINING WALL DETAILS

RE: SHEET S-1 FOR ELEVATION AND LOCATIONS

SCALE: 0 1 2 3 4

NOTE: SEE MECH. SPECS. FOR FREEZE PROOF DRINKING FOUNTAIN.

5 DRINKING FOUNTAIN

SCALE: 0 1 2 3 4

7 POND SECTION

SCALE: 0 1 2 3 4

EXTERIOR LIGHT COVERS

SCALE: 0 1 2 3

8 END WALL

SCALE 1 0 1 2 3 4 5

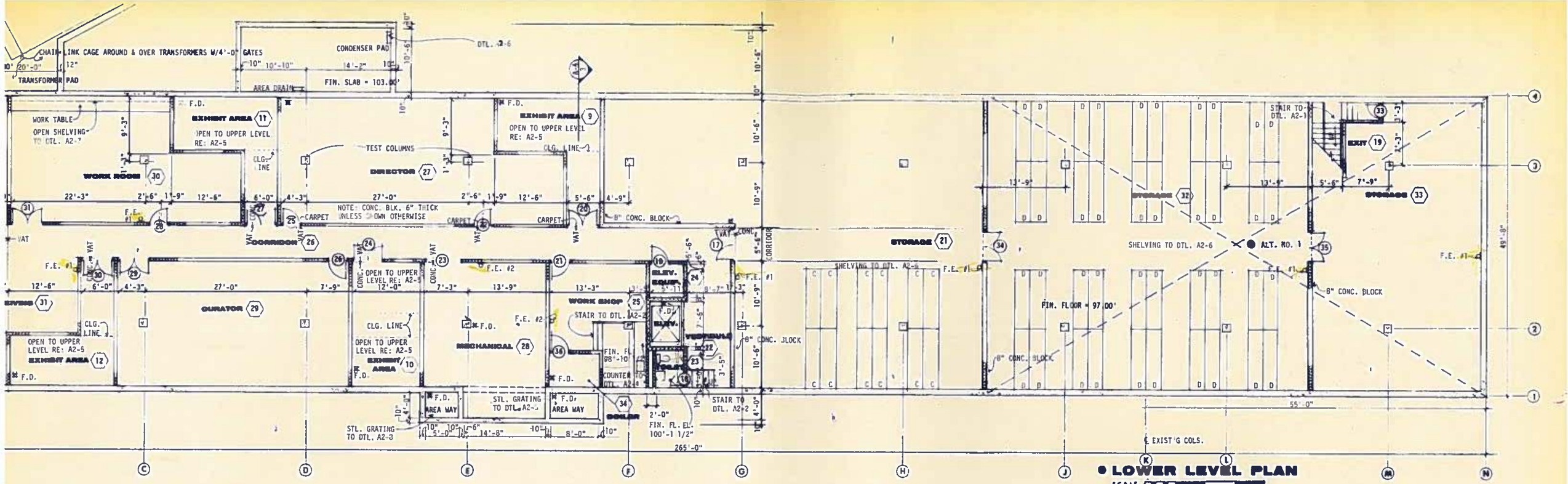
ADDEN. NO. 2

7/27/72

SHEET NUMBER A-1

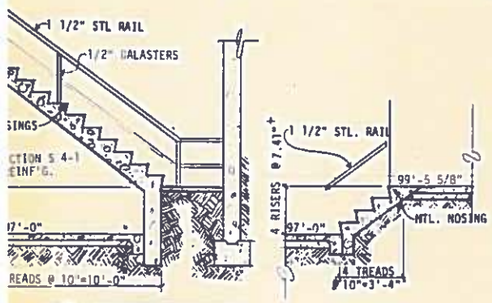
CHEROKEE NATIONAL MUSEUM PARK HILL, E.D.A. PROJECT No.

MM



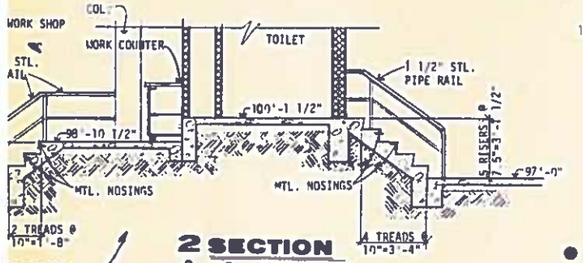
● LOWER LEVEL PLAN

SCALE: 0 5 10 15 20



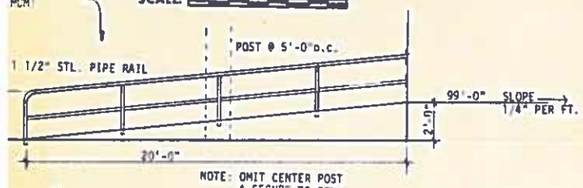
● 1 EXIT STAIR

SCALE: 0 2 4 6 8



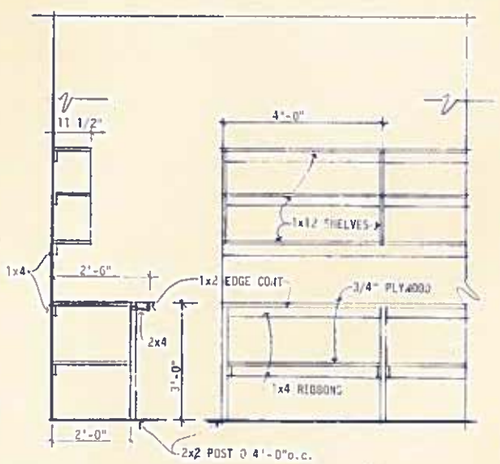
2 SECTION

SCALE: 0 2 4 6 8



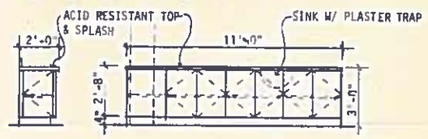
3 SERVICE RAMP

SCALE: 0 2 4 6 8



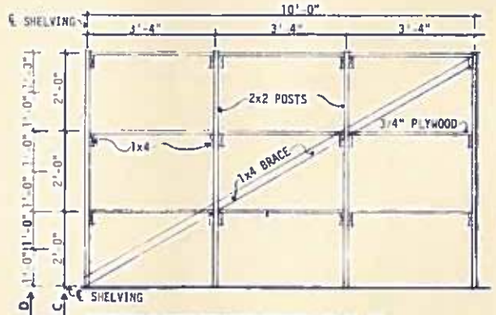
● 7 SHELVES & COUNTER WORK ROOM 30

SCALE 1 0 1 2 3 4 5



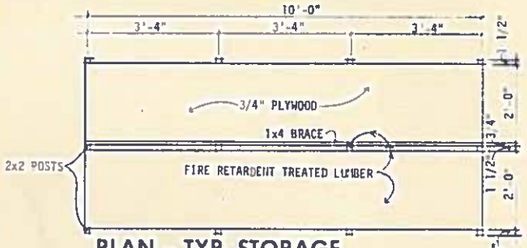
4 WORKSHOP COUNTER

SCALE: 0 2 4 6 8



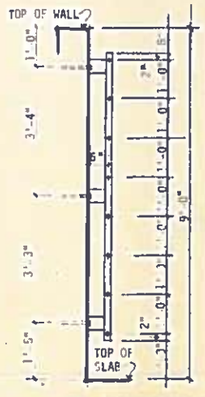
● 5 STORAGE SHELVING C & D

SCALE 1 0 1 2 3 4 5



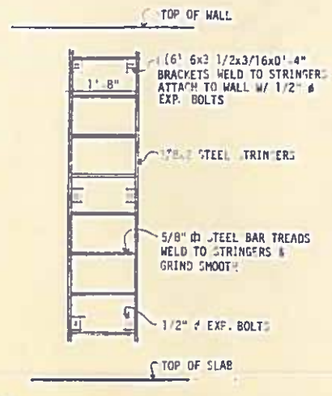
PLAN - TYP. STORAGE SHELV'G. UNIT UNIT

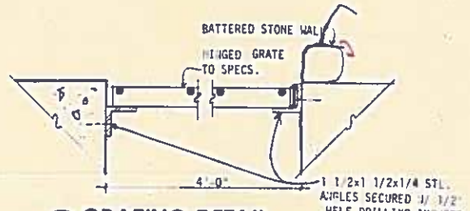
SCALE 1 0 1 2 3 4 5



6 LADDER DETAIL

SCALE 1 0 1 2 3 4 5





8 GRATING DETAIL

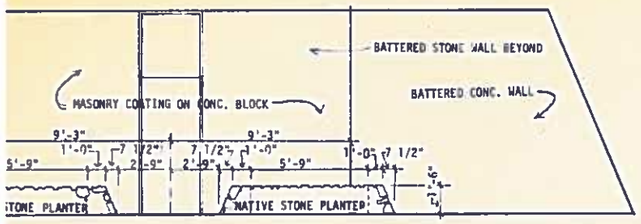
SCALE 12 9 6 3 0

● ADDEN. NO. 2

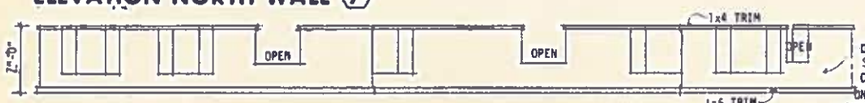
CHEROKEE NATIONAL MUSEUM | PARK HILL, | E.D.A. PROJECT No.

STATE OF OKLAHOMA — EX. DIRECTIVE

SHEET NUMBER A-2

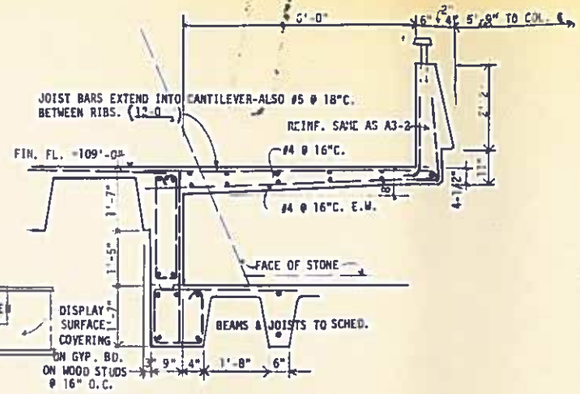


ELEVATION NORTH WALL (7)



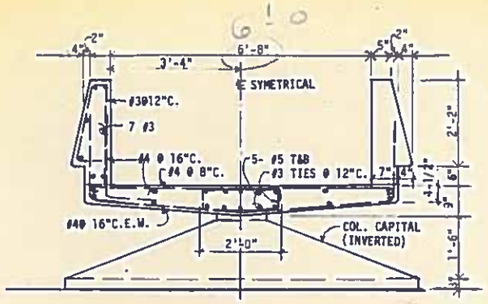
ELEV. OF DIVIDER WALL

SCALE 0 5 10 15 20

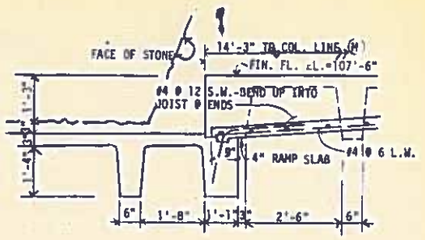


SECT. 1 CANTILEVER

SCALE 0 1 2 3 4 5

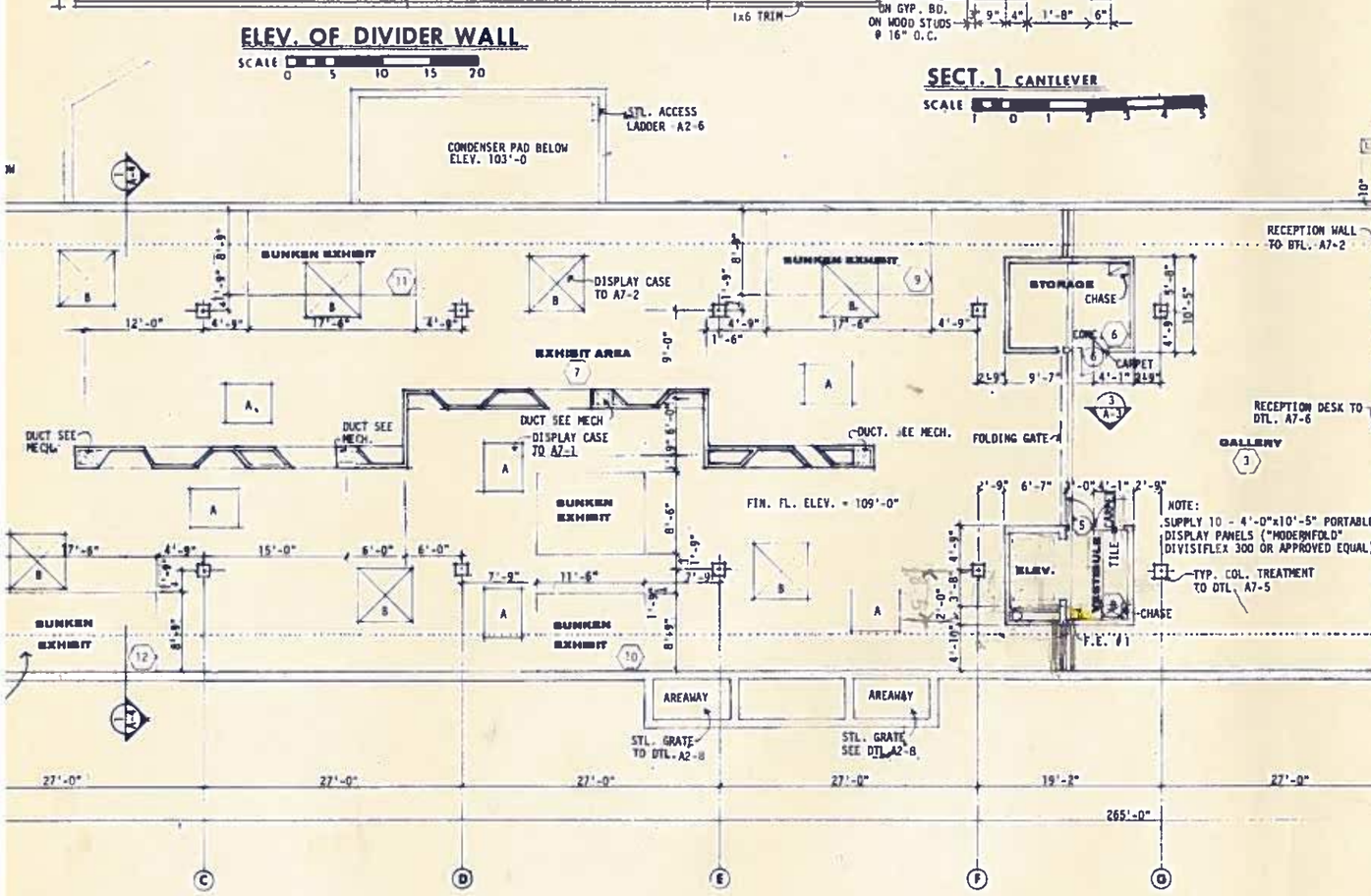


SECT. 2 RAMP

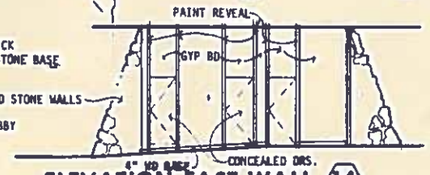


SECT. 3

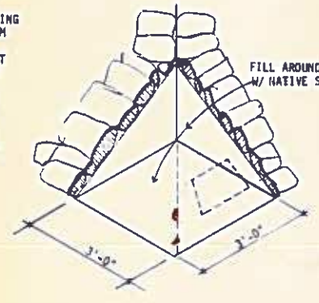
SCALE 0 1 2 3 4 5



ELEVATION EAST WALL (14)

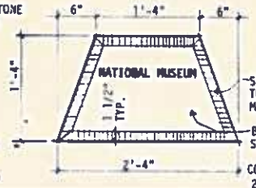


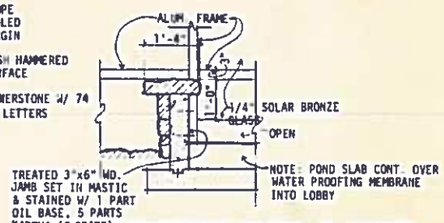
ELEVATION WEST WALL (14)



1 CORNERSTONE DETAIL

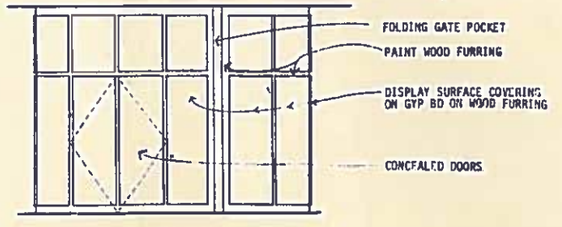
NOT TO SCALE





2 WINDOW JAMB @ POND

SCALE 0 1 2 3



3 INTERIOR ELEVATION

OPP. SIDES SIMILAR

2 UPPER LEVEL PLAN

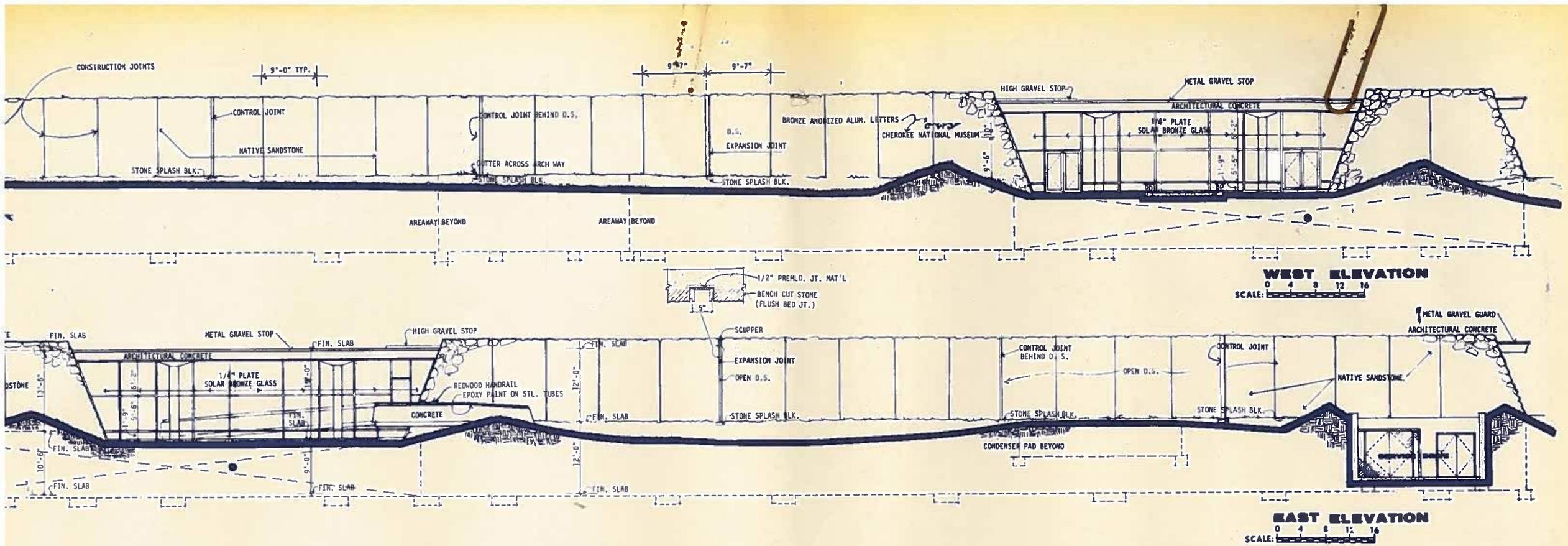
SCALE 0 5 10 15 20

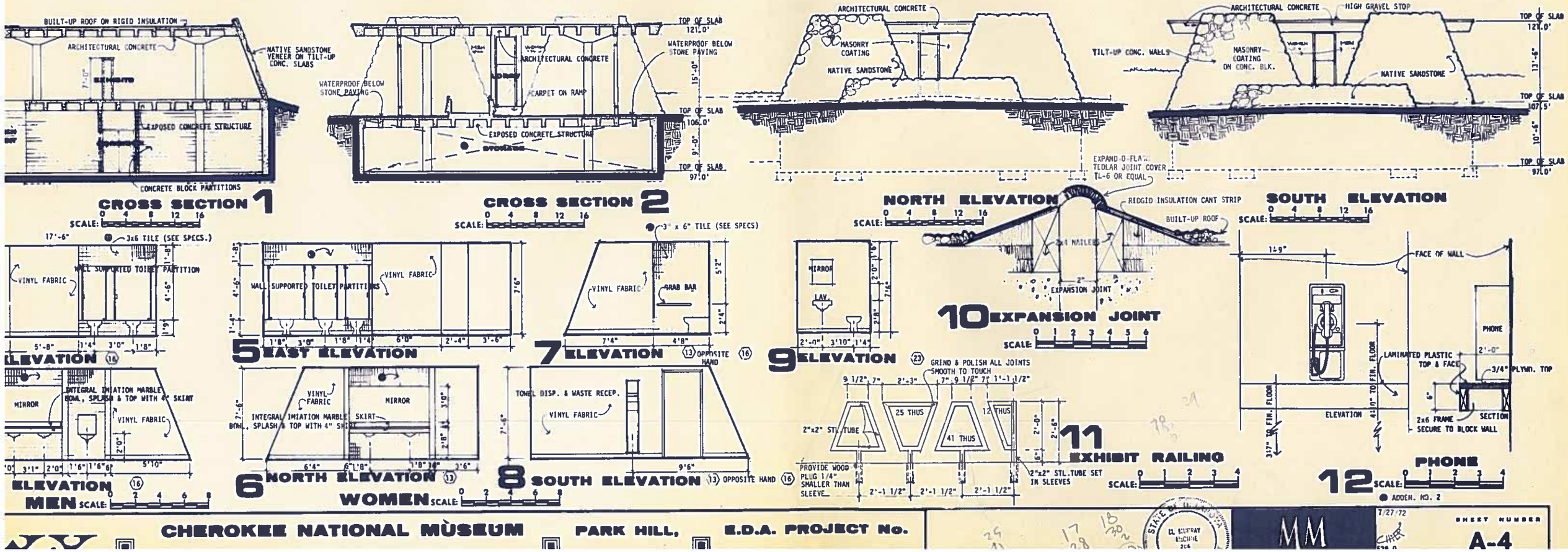
ADDEN. NO. 2

CHEROKEE NATIONAL MUSEUM — PARK HILL, — E.D.A. PROJECT No.

7/27/72

SHEET NUMBER A-2

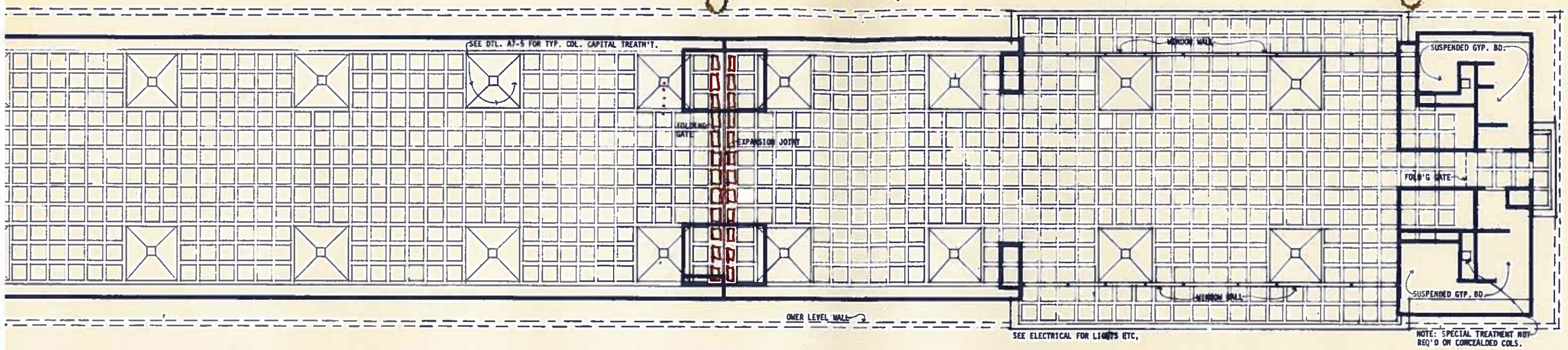




CHEROKEE NATIONAL MUSEUM — PARK HILL, — E.D.A. PROJECT No.

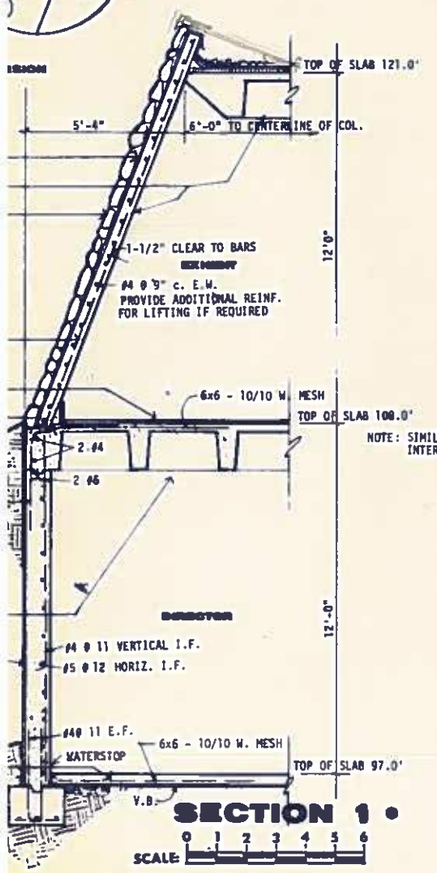
7/27/72

SHEET NUMBER A-4



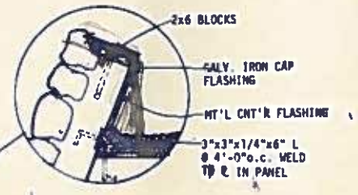
REFLECTED CEILING PLAN

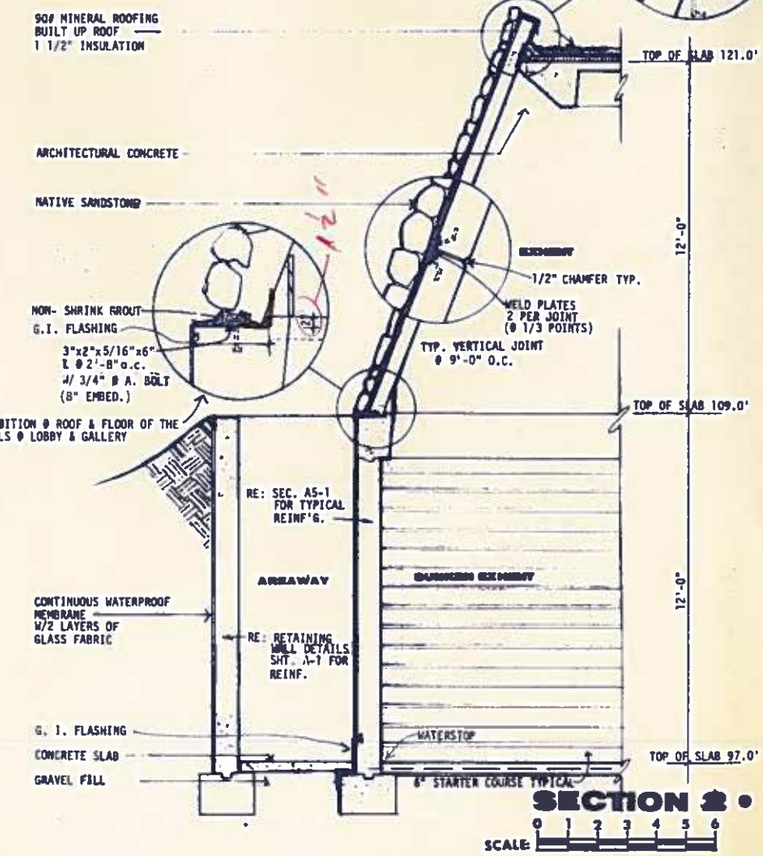
SCALE: 0 4 8 12 16



SECTION 1 •

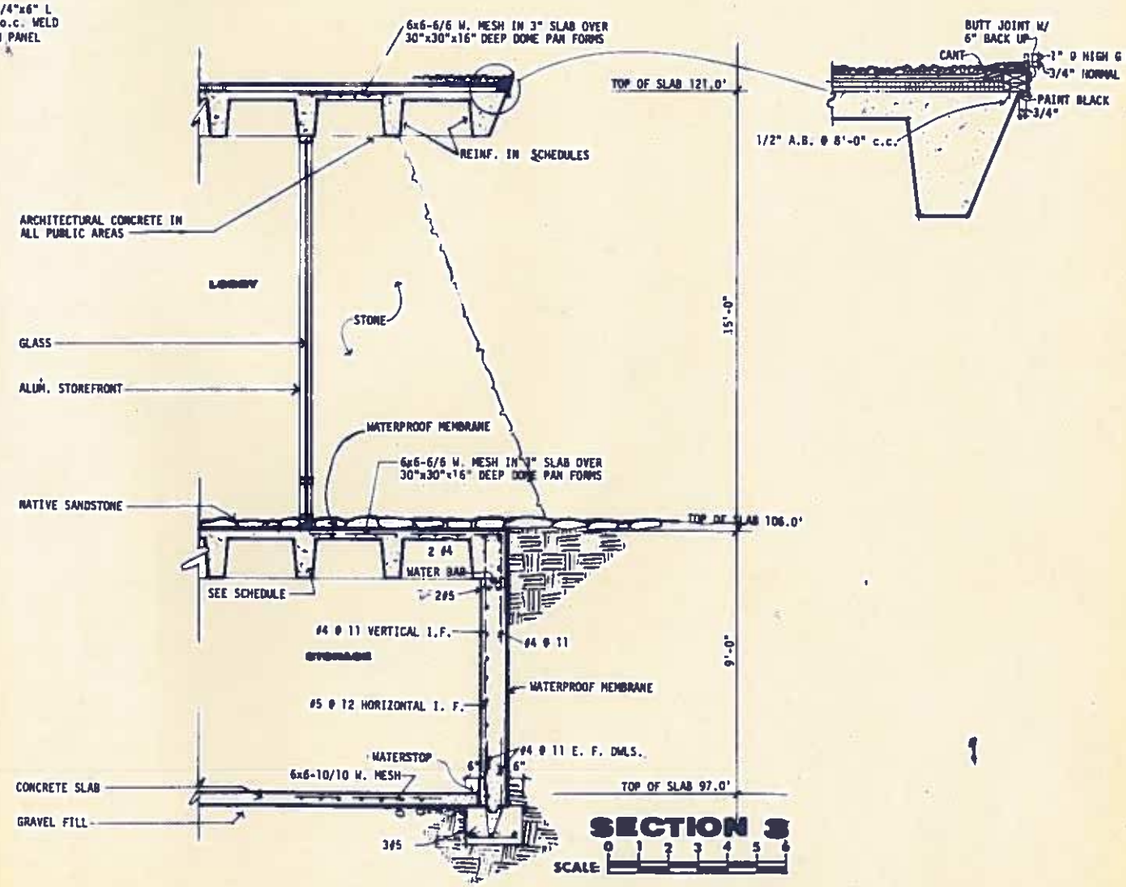
SCALE: 0 1 2 3 4 5 6





SECTION 2 •

SCALE: 0 1 2 3 4 5 6



SECTION 3

SCALE: 0 1 2 3 4 5 6

ADDEN. NO. 2

CHEROKEE NATIONAL MUSEUM — PARK HILL, — E.D.A. PROJECT No.

STATE OF OKLAHOMA — B. MURRAY

7/27/72

SHEET NUMBER A-5

OPENING SCHEDULE

			FRAME							REMARKS
	MATERIAL	FINISH	DETAIL NO. HEAD	JAMB	SILL	TYPE	MATERIAL	FINISH		
	9	G	A7-4	A7-4	A7-4	A7-4	9	G		
	9	G	A7-4	A7-4	A7-4	A7-4	9	G		
	9	G	A7-4	A7-4	A7-4	A7-4	9	G		
	5	F	SIM. A7-2	A7-2	—	R	9	E		
	5	F	SIM. A7-5	A7-5	—	R	9	E		"B" LABEL
	5	F	SIM. A7-5	A7-5	—	R	9	E		
	5	F	SIM. A7-5	SIM. A7-5	—	R	9	E		
	9	E	SIM. A7-1	SIM. A7-1	SIM. A7-4	S	9	E		
	5	F	SIM. A7-2	A7-2	—	R	9	E		
	5	F	SIM. A7-2	A7-2	—	T	9	E		OMIT GYP. BD. W/ ON DR.
	9	E	SIM. A7-1	SIM. A7-1	SIM. A7-4	T	9	E		
	5	F	SIM. A7-2	A7-2	SIM. A7-2	R	9	E		
	5	F	SIM. A7-2	SIM. A7-2	—	T	9	E		OMIT GYP. BD. ON DOOR
	5	F	SIM. A7-2	A7-2	—	R	9	E		
	5	F	SIM. A7-2	A7-2	SIM. A7-2	R	9	E		
	5	F	SIM. A7-2	A7-2	SIM. A7-2	R	9	E		
	5	F	SIM. A7-1	A7-1	—	R	9	E		"B" LABEL (8" WALL)
	5	F	SIM. A7-1	A7-1	—	R	9	E		
	5	F	SIM. A7-1	A7-1	—	R	9	E		"B" LABEL
	5	F	SIM. A7-1	A7-1	—	R	9	E		
	5	F	SIM. A7-1	A7-1	—	R	9	E		
	-	-	SIM. A7-4	A7-6	—	R	9	E		CASED OPENING ONLY
	5	F	SIM. A7-1	A7-1	—	R	9	E		
	5	F	SIM. A7-1	A7-1	—	R	9	E		
	5	F	SIM. A7-1	A7-1	—	R	9	E		
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	5	F	SIM. A7-1	A7-1	—	R	9	E		
	5	F	SIM. A7-1	A7-1	—	R	9	E		GRILLE IN EA. DR.
	5	F	SIM. A7-1	A7-1	—	R	9	E		
	5	F	SIM. A7-1	A7-1	—	R	9	E		
	9	E	SIM. A7-3	A7-3	A7-4	R	9	E		
	5	F	SIM. A7-1	A7-1	—	R	9	E		"B" LABEL
	5	F	SIM. A7-1	A7-1	—	R	9	E		"B" LABEL (8" WALL)
	5	F	SIM. A7-1	A2-1	—	R	9	E		"B" LABEL (8" WALL)
	5	B	SIM. A7-1	A7-1	—	R	9	E		"B" LABEL

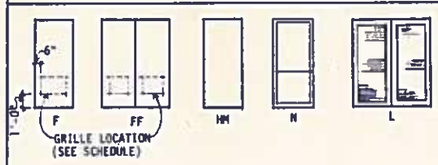
TYPE SCHEDULE

DESCRIPTION	REMARKS
Full glass-Narrow style-Alum.	
"do"	
Solid-core-wood-Birch	
"do"	
hollow metal	
Solid-core-wood-Birch	
HOLLOW METAL	
SOLID CORE WOOD BIRCH	
HOLLOW METAL	

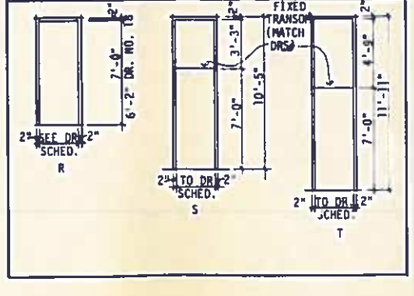
INTERIOR FINISH SCHEDULE

MK	AREA	FLOOR M	FLOOR F			WALLS N M	WALLS N F	WALLS E M	WALLS E F	WALLS S M	WALLS S F	WALLS W M	WALLS W F	CEILING M	CEILING F	CEILING HT.	TRIM DOOR/WIND. M	TRIM DOOR/WIND. F	TRIM DOOR/WIND. M	TRIM DOOR/WIND. F	MILLWORK M	MILLWORK F	MILLWORK DETAIL	REMARKS
1	LOBBY	10	M	10	A	10	A	B	A	10	A	B	A	2	L	13'-4"	9	G	9	G				
2	RECEPTION	4	A'	5		—	—	10	A	7	C	10	A	2	L	10'-4"	9	E	--	--				
3	GALLERY	4	A	5	F	--	--	2	L	10	A	2	L	2	L	10'-4"	9	E	--	--				
4	STORAGE	1	A	—	—	1/1		1	--	1	--	1/1		13	N	10'-4"	9	E	--	--				
5	STORAGE	1	A	—	—	7	--	1	--	1	--	1	--	13	N	10'-4"	9	E	--	--				
6	STORAGE	1	A	—	—	7	--	7	--	7	--	7	--	13	N	10'-4"	9	E	--	--				
7	EXHIBIT AREA	4	A	5	F	2/L		2	L	--	--	2	L	2	L	10'-4"	9	E	--	--				
8	VESTIBULE	12	B	—	—	7	C	7	C	7	C	7	C	2	L	10'-4"	9	E	--	--				
9	SUNKEN EXHIBIT	1	A	—	—	7	C	2	L	7	C	7	C	--	--	VARIABL	9	E	--	--				
10	SUNKEN EXHIBIT	1	A	—	—	7	C	7	C	7	C	2	L	--	--	FROM 20'-4" TO	9	E	--	--				
11	SUNKEN EXHIBIT	1	A	—	—	7	C	2	L	7	C	7	C	--	--		9	E	--	--				
12	SUNKEN EXHIBIT	1	A	—	—	7	C	7	C	7	C	2	L	--	--	10'-4"	9	E	--	--				
13	WOMEN	3	A	3	A	3/5	A/D	3/5	A/D	3/5	A/D	2	L	6	C	7'-6"	9	E	--	--				
14	CORRIDOR	4	M	5/10	F/A	5	D	5	D	5	D	5	D	2	L	11'-10"	9	E	--	--				WOOD BASE ON CONC. BLK. JALL ONLY
15	JANITOR	1	A	—	—	7	--	7	--	7	--	7	--	13	N	11'-10"	9	E	--	--				
16	MEN	3	A	3	A	3/5	A/D	2	L	3/5	A/D	3/5	A/D	6	C	7'-6"	9	E	--	--				
17	STORAGE	1	A	—	—	7	--	2	--	2	--	2	--	13	N	11'-10"	9	E	--	--				
18	STORAGE	1	A	—	—	7	--	2	--	2	--	2	--	13	N	11'-10"	9	E	--	--				
19	STAIRS	1	A	—	—	1	L	1	L	7	C	7	C	13	R	VARIES	9	E	--	--				
20	STORAGE	1	A	—	—	7	--	7	--	7	--	7	--	13	N	11'-10"	9	E	--	--				
21	STORAGE	1	A	—	—	7	C	2	L	2	L	2	L	13	N	10'-4"	9	E	--	--				
22	VESTIBULE	12	B	11	A	7	C	--	--	7	C	2	L	13	N	10'-4"	9	E	--	--				
23	TOILET	3	A	3	A	7	D	7	D	7	D	2	L	13	N	8'-2 1/2"	9	E	--	--				
24	ELEV. EQUIP.	1	A	—	—	7	--	7	--	7	--	7	--	13	--	10'-4"	9	E	--	--				
25	WORK SHOP	12	B	11	A	7	C	7	C	7	C	2	L	13	R	10'-4"	9	E	--	--				
26	CORRIDOR	12	B	11	A	--	--	7	C	--	--	7	C	13	—	10'-4"	9	E	--	--				
27	DIRECTOR	4	A	5	F	7	C	2	L	7	C	7	C	5/13	L/N	10'-4"	9	E	--	--				
28	MECHANICAL	1	A	—	—	7	--	7	--	7	--	2	--	13	BL	10'-4"	9	E	--	--				
29	CURATOR	12	B	11	A	7	C	7	C	7	C	2	L	13	A	10'-4"	9	E	--	--				
30	WORK ROOM	12	B	11	A	7	C	2/1	L/C	7	C	7	C	13	N	10'-4"	9	E	--	--				
31	SHIPPING & RECEIVING	1	A	11	A	2	--	2	--	7	C	1/7	L/C	13	N	10'-4"	9	E	--	--				RAMP BROOM FIN. CONC.
32	STORAGE	1	A	—	—	7	C	2	L	7	C	2	L	13	N	7'-4"	9	E	--	--				
33	STORAGE	1	A	—	—	7	C	2	L	2	L	2	L	13	N	8'-10"	9	E	--	--				
34	BOILER	1	A	—	—	7	--	7	--	7	--	1	--	13	—	10'-4"	9	E	--	--				

DOOR DESIGN



FRAME DESIGN



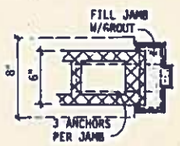
MATERIAL KEY

MK	MATERIAL	DESCRIPTION
1	Concrete	Steel trowel finish with hardner where exposed-light brush finish
2	Concrete	Sand-blasted See Specs.
3	Ceramic-tile	See specs.
4	CARPET	See specs.
5	Wood	Select solid stock-See specs.
6	Gypsum Board	5/8"Gyp.B.-taped joint,sanded smooth
7	Concrete Block	Lt.Wt.Blks.-sizes as shown-see detail and specs.
8	Glass	See details and specs.
9	Metal	See details and specs.
10	Native Sandstone	See details and specs.
11	Vinyl	2 1/2" Vinyl base
12	Vinyl asbestos tile	9"x9"x3/32" Tile
13	Concrete	Form finish
14	SHEET VINYL ON GYP. BD	

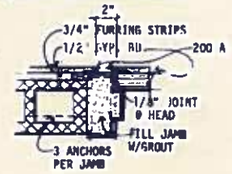
FINISH KEY

MK	DESCRIPTION	SPECIFICATION
A	Clean	As recommended by manufacturer
B	Clean & Wax	2 coats wax recommended by manufacturer
C	Paint 2 coats	1 coat filler 1 coat rubber base paint
D	Paint 2 coats	1 coat filler-primer 1 coat satin enamel
E	Paint 3 coats	1 coat rust-inhibitive primer-(or shop coat) 2 coats metal paint
F	Stain & Varnish	1 coat stained sealer- 1 coat gloss varnish 1 coat satin varnish
G	Factory Finish	Prefinished by manufacturer
H	Paint 3 coats	1 coat rust-inhibitive primer (or shop coat) 2 coats exterior metal paint
J	Sealer	2 coats Chemstop
K	Paint 2 coats	2 coats ext.masonry paint
L	Sealer	clear-see specs.
M	CLEAN & SEAL	
N	Paint 1 coat	1 coat rubber base

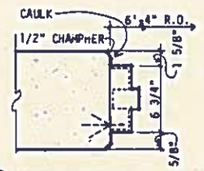
DOOR DETAILS



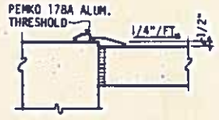
1 JAMB HEAD SIMILAR



2 JAMB

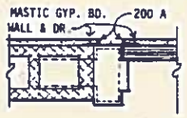


3 JAMB HEAD SIMILAR



4 SILL

5 JAMB HEAD SIMILAR



6

● ADDEN. NO. 2

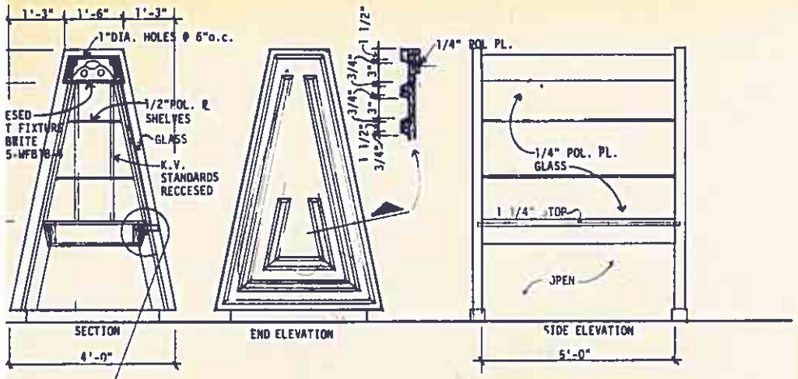
CHEROKEE NATIONAL MUSEUM | PARK HILL, | E.D.A. PROJECT No.

STATE OF OKLAHOMA — H. MURRAY [illegible]

MM

7/27/72

SHEET NUMBER A 6



•1 DISPLAY CASE TYPE A (9 REQUIRED)

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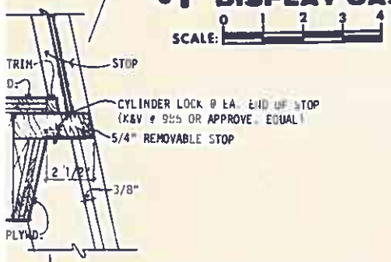
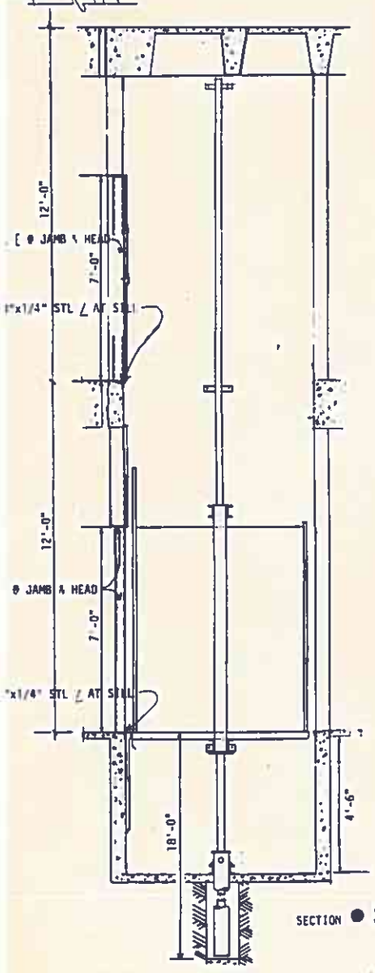
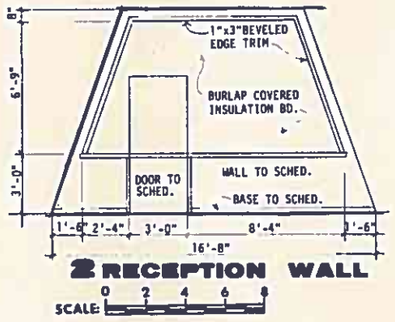




SECTION

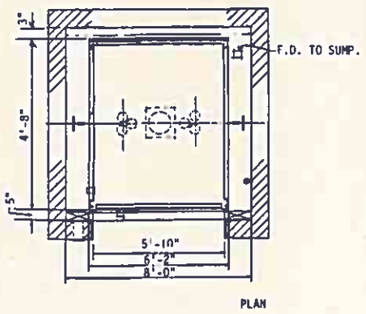
•3 ELEVATOR DETAIL

NOT TO SCALE

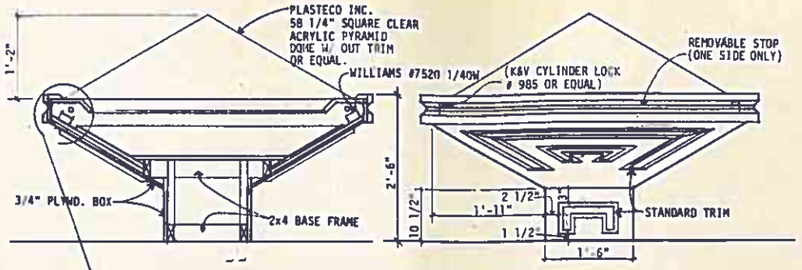


2 RECEPTION WALL

SCALE: 0 2 4 6 8



PLAN



• 7 DISPLAY CASE TYPE B (7 REQUIRED)

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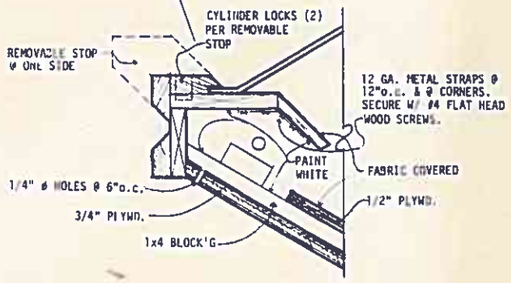

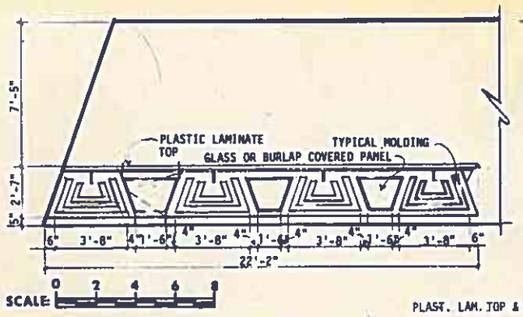

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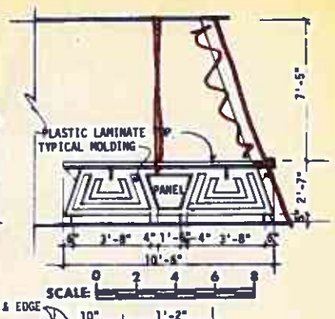
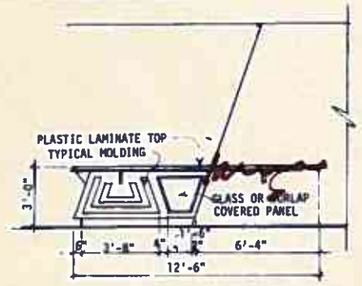
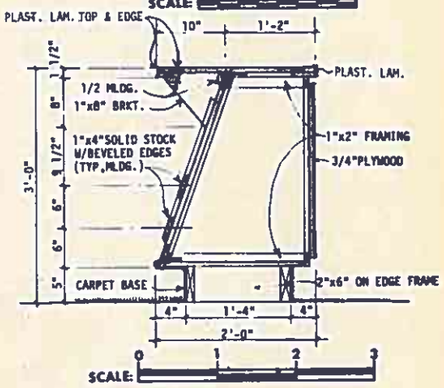


SCALE: 0 2 4 6 8

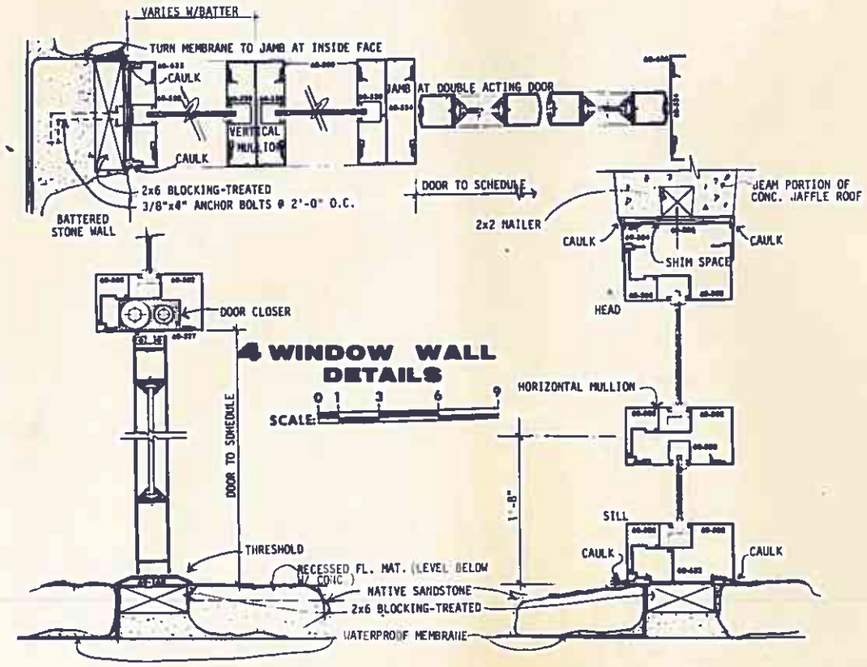


6 RECEPTION COUNTER

SCALE: 0 2 4 6 8

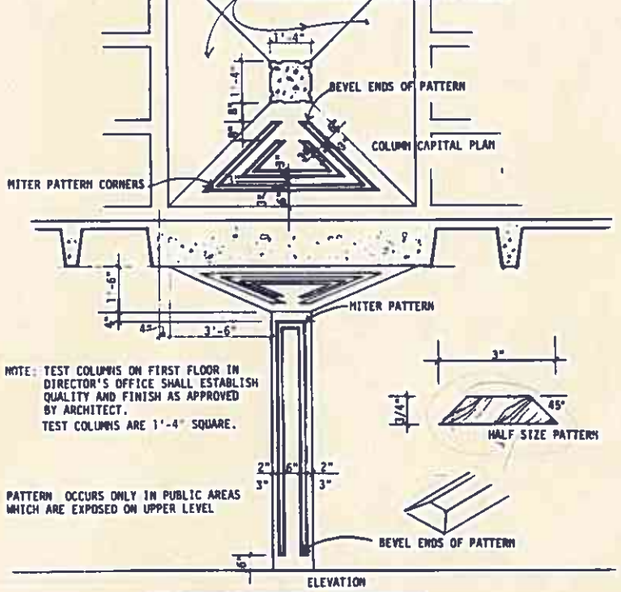


SCALE: 0 1 2 3



4 WINDOW WALL DETAILS

SCALE: 0 1 3 6 9

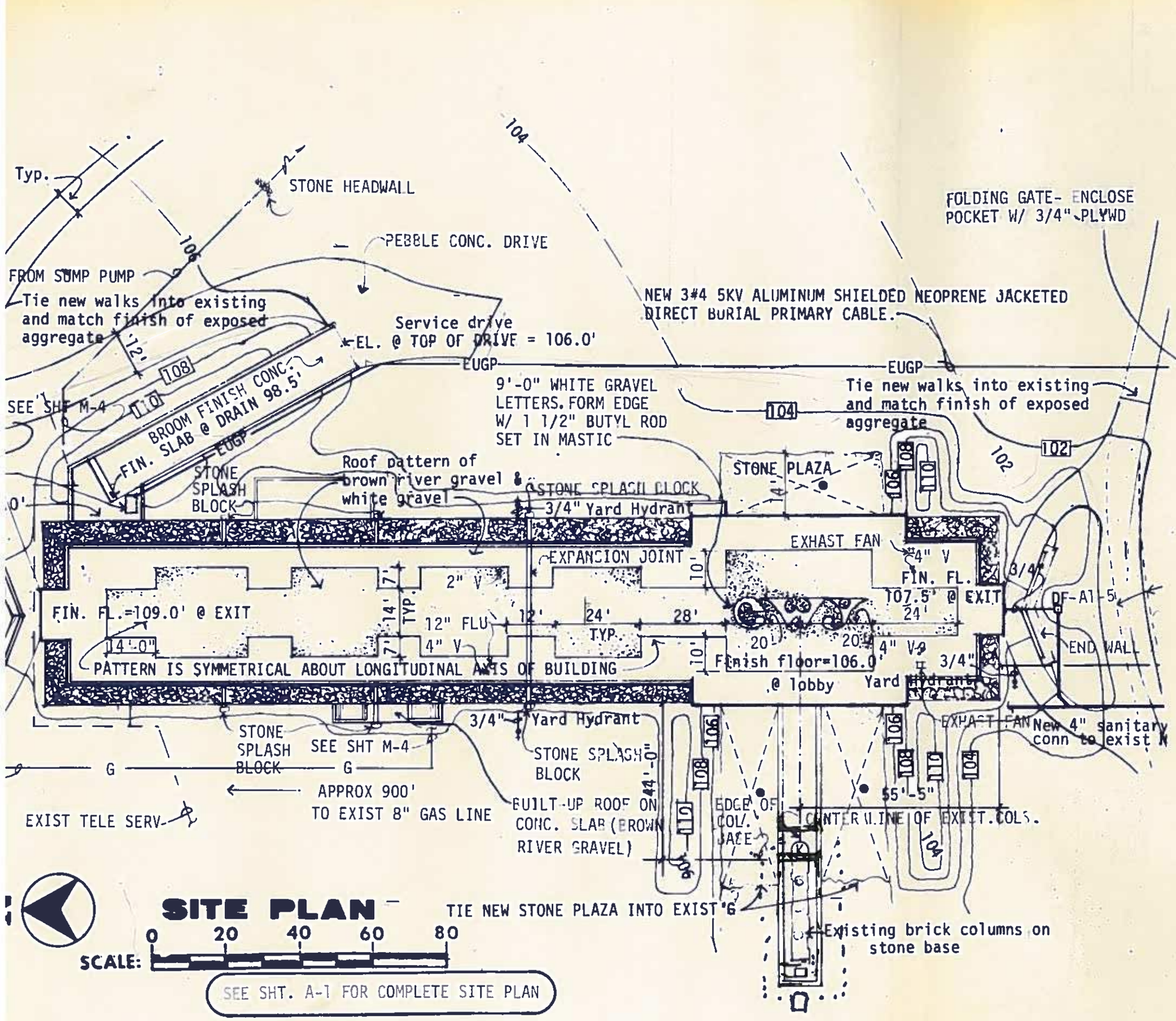


5 COLUMN DETAIL

SCALE: 0 1 2 3 4 5 6

ADDEN. NO. 2

W.V. | CHEROKEE NATIONAL MUSEUM | PARK HILL, | E.D.A. PROJECT No. | MM | 7/27/72 | SHEET NUMBER A-7

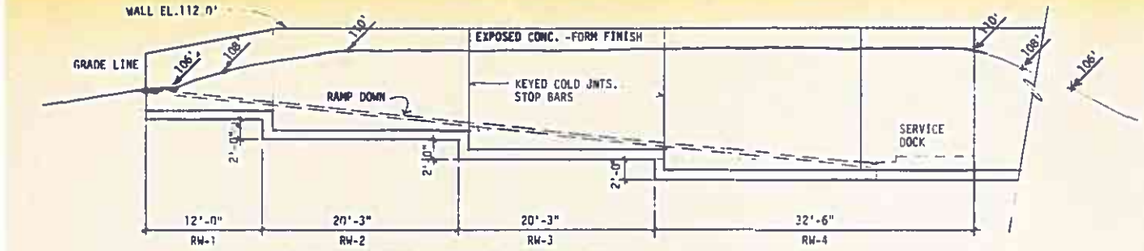


CHEROKEE NATIONAL MUSEUM
CHEROKEE CULTURAL CENTER
PARK HILL, OKLAHOMA
E.D.A. PROJECT No. 08-1-01276

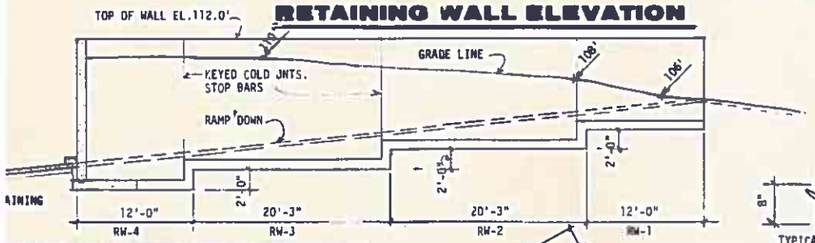
ADDEN. NO. 2

MM
MCCUNE MCCUNE & ASSOCIATES
ARCHITECTS & ENGINEERS TULSA OKLAHOMA

SHEET NUMBER A-7A
OF 7 SHEETS

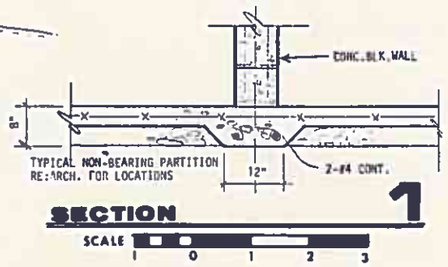


RETAINING WALL ELEVATION



AINING WALL ELEVATION

-1 FOR SECTIONS
RCING



SECTION 1

SCALE 1 0 1 2 3

COLUMN AND FOOTING SCHEDULE

MARK		C-1	C-2	C-3	C-4	C-5
ROOF TOP OF SLAB EL.121.0'		14-1/2x14-1/2 4-#7 #3 T @ 12"	14-1/2x14-1/2 4-#7 #3 T @ 12"		14-1/2 x14-1/2 4-#7 #3 T @ 12"	14-1/2 x14-1/2 4-#7 #3 T @ 12"
FLOOR EL.109.0'						
FLOOR EL.107.5'		16 x 16 4-#11 #3 T @ 12"	16x16 4-#10 #3 T @ 12"			
FLOOR EL.106.0'				10 x 16 4-#6 #3 T @10"	16 x 16 4-#11 #3 T @ 12"	16 x16 4-#9 #3 T @ 12"
LOWER FLOOR EL.97.0'						
FOOTING	SIZE	7'-0"x7'-0"	6'-6"x6'-9"	5'-0"x5'-0"	7'-3"x7'-3"	6'-3"x6'-3"
	THICKNESS	21"	21"	15"	22"	19"
	REINFORCING	9-#7 E.W.	8-#7 E.W.	7-#5 E.W.	8-#8 E.W.	7-#7 E.W.

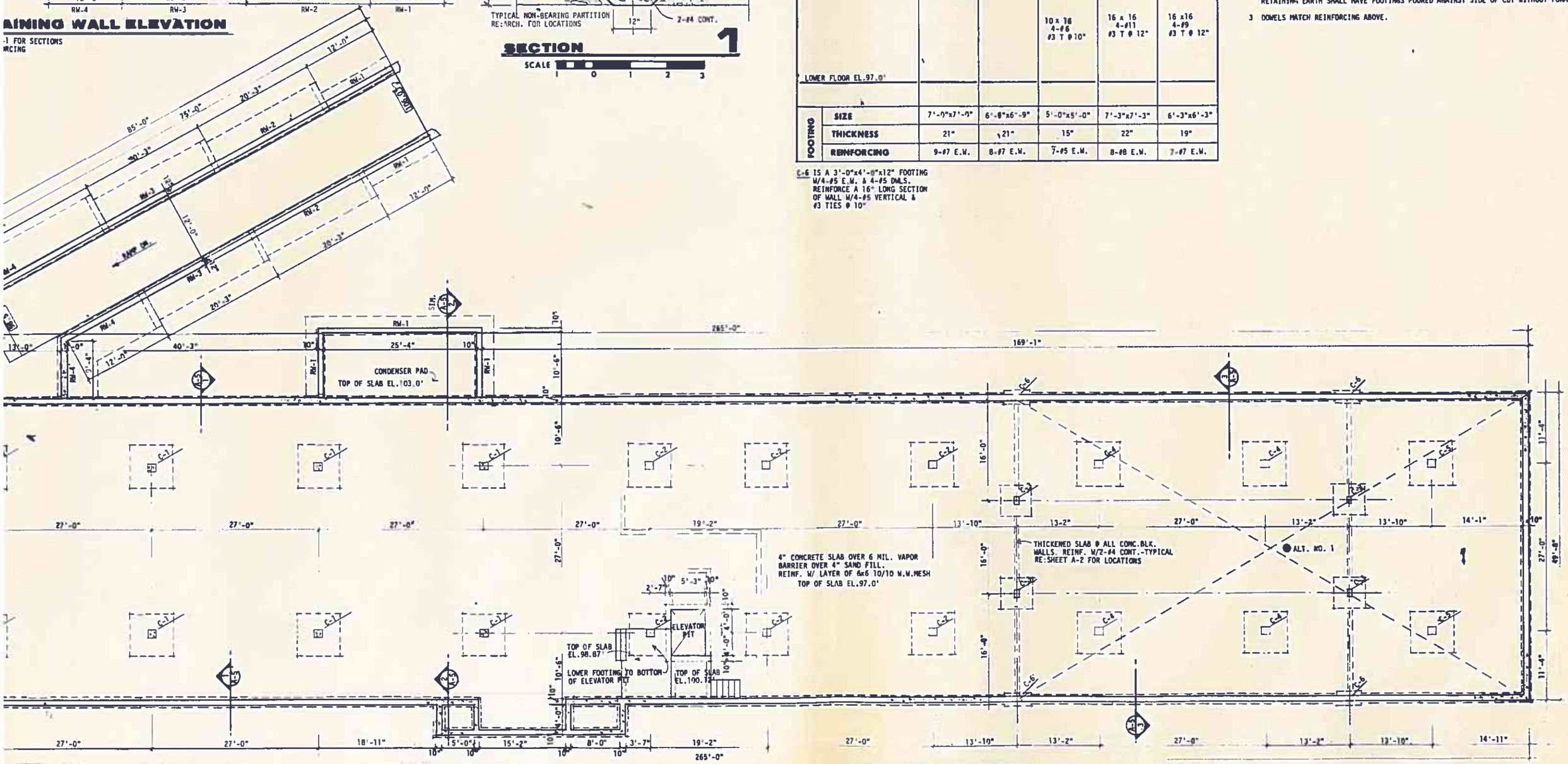
C-6 IS A 3'-0"x4'-0"x12" FOOTING W/4-#5 E.W. & 4-#5 DWLS. REINFORCE A 16" LONG SECTION OF WALL W/4-#5 VERTICAL & #3 TIES @ 10"

CONCRETE NOTES:

1. ALL CONCRETE WORK SHALL CONFORM TO ACI 318-71 BUILDING CODE REQUIREMENTS. DESIGN IS BASED ON THE ULTIMATE STRENGTH CONCEPT; SEE ACI 301-66 FOR STRENGTH TEST REQUIREMENTS.
2. CONCRETE STRENGTHS TO BE 3,000p.s.i. FLOORS OVER PANS TO HAVE 1/2" MAX. COARSE AGGREGATE; OTHER CONCRETE TO HAVE 1" MAX. IF CONCRETE IS PUMPED, A SPECIALLY DESIGNED PUMP MIX WILL BE REQUIRED.
3. MINIMUM YIELD STRENGTH OF REINFORCING STEEL TO BE:
   60,000p.s.i. FOR NO.5 AND LARGER BARS
   40,000p.s.i. FOR NO.3 AND NO.4 BARS
   DETAILS TO CONFORM TO C.R.S.I. AND ACI 315(1970 PROPOSED REVISION)
4. JOINTING DETAILS WILL CONFORM TO THE ABOVE STANDARDS WITH KEYWAYS, ADDITIONAL REINFORCING, CORNER BARS, ETC. GENERAL CONTRACTOR WILL OBTAIN APPROVAL OF CONSTRUCTION JOINT LOCATIONS AND DETAILS.
5. POCKET WALLS TO RECEIVE BEAMS. WALLS ACTING AS RETAINING WALLS TO BE ADEQUATELY BRACED UNTIL RESTRAINING SLAB (SLABS) ARE 7 DAYS OLD.
6. UNLESS NOTED TO BE "PLAIN CONCRETE" ALL CONCRETE WILL HAVE AT LEAST ACI MINIMUM (TEMPERATURE) REINFORCING. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS.

FOUNDATION NOTES:

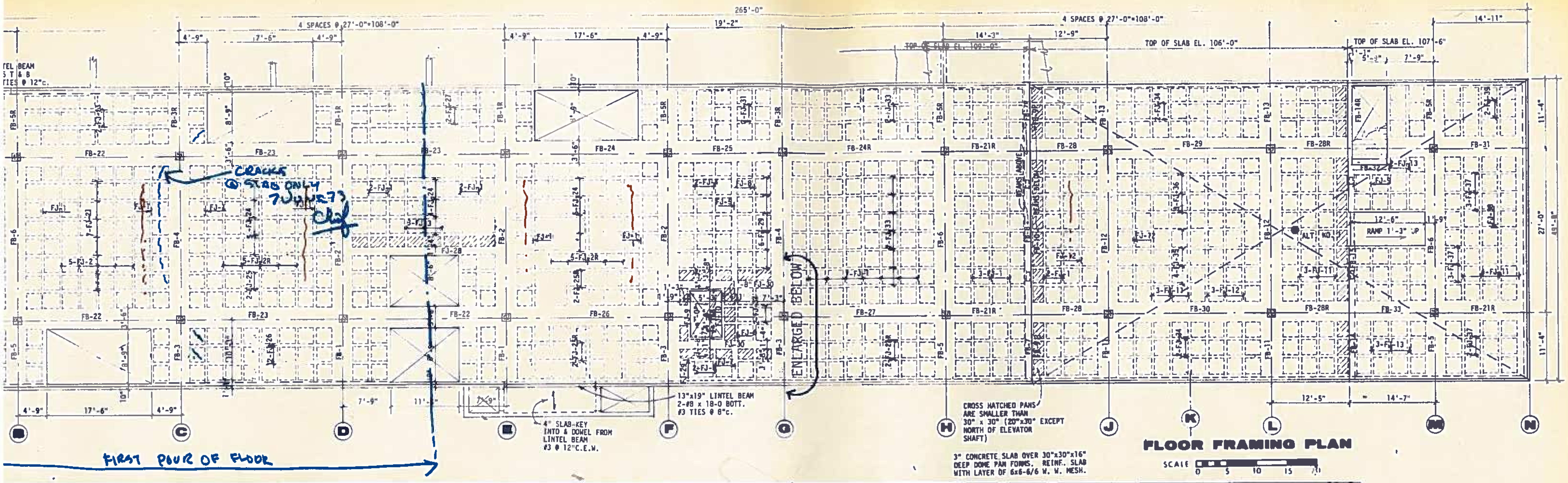
1. FOOTINGS BEAR INTO UNDISTURBED NATURAL SOIL DESIGNED TO SAFELY SUPPORT 2.5 TONS PER SQUARE FOOT.
2. BOTTOMS AND SIDES OF FOOTING CUTS SHALL BE CLEAN. WALLS RETAINING EARTH SHALL HAVE FOOTINGS POURED AGAINST SIDE OF CUT WITHOUT FORMS
3. DOWELS MATCH REINFORCING ABOVE.



FOUNDATION PLAN

SCALE 0 5 10 15

ADDEN. NO. 2



FLOOR FRAMING PLAN

SCALE 0 5 10 15 20

RETE JOIST SCHEDULE

Mark	Size	Reinforcing (East or North ← Centerline Supports → West or South)	Remarks
		#5 x 20-4 + HK; #4 x 41-10; #4 x 49'-4	
		#4 x 8-9 + HK; #5 x 20-4 + HK; #4 x 36-8 + HK; #5 x 39-9	
		#4 x 8-9 + HK; #5 x 12-11 + HK; #4 x 24-8 + HK; #4 x 27-9	
		#4 x 5-9 + HK; #5 x 20-4 + HK; #4 x 30-11 + HK; #4 x 34'-0	
		2-#5 x 37-0; 2-#5 x 20-4 + HK; #4 x 30-8 + HK; 2-#5 x 33'-9	
		TOP BARS FROM ADJACENT SPANS; 2-#4 x 10-9	
		2-#5 x 11-6 + HK; #4 x 6-9 + HKS; 3-#4 x 6-9	
		2-#4 x 49-4 + HKS; 2-#4 x 49-4	
		2-#4; 2-#4	JOIST AT N. SIDE OF ELEV. SHAFT IS 5" WIDE
		2-#5 x 10-10 + HKS; 2-#5 x 10-10	

CONCRETE JOIST SCHEDULE

Mark	Size	Reinforcing (East or North ← Centerline Supports → West or South)	Remarks
FJ-11	6 x 19	#5 x 20-4 + HK; #5 x 41-10; #4 x 49'-4	
FJ-12	6 x 19	#5 x 20-4 + HK; #6 x 23-6 + HK; #5 x 41-10; #6 x 49'-4	
FJ-13	6 x 19	#5 x 20-4 + HK; #5 x 18-7 + HK; 2-#4 x 21-9	
FJ-21	6 x 19	#5 x 23-9 + HK; #4 x 13-0; 6-6; #4 x 46-2; #4 x 42-3	15'-3; 14'-6; 15'-3
FJ-22	6 x 19	2-#4 x 19-4 + HKS; 2-#4 x 19-4	
FJ-23	6 x 19	#4 x 23-9 + HK; #4 x 13-7 + HK; #4 x 41-9 + HK; #4 x 46-4	
FJ-24	6 x 19	#4 x 18-0; 6-6; #4 x 46-2; #4 x 28-0	
FJ-25	#4 x 13-0-FJ-25R ONLY; 6 x 19	6-6; #5 x 16-7 + HK; #5 x 45-9 + HK; #4 x 35-1	
FJ-26	6 x 19	2-#4 x 39-2 + HKS; 2-#4 x 39-2	

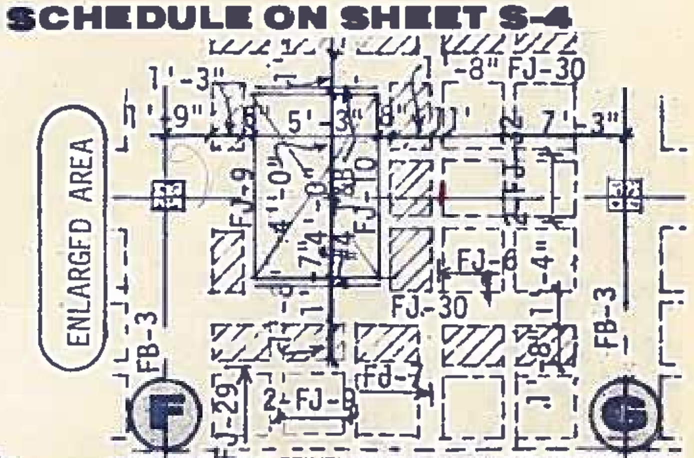
CONCRETE JOIST SCHEDULE

Mark	Size	Reinforcing (East or North ← Centerline Supports → West or South)	Remarks
FJ-27	6 x 19	#4 x 13-7 + HK; #4 x 37-2; #4 x 36-2	
FJ-28	16 x 19	2-#7 x 10-7 + HK; 2-#7 x 10-7 + HK; 2-#6 x 31-3 + HKS; #6 x 46-2 INTO FJ-24'S; 2-#7 x 28-0	
FJ-29	6 x 19	9'-0; #4 x 37-2; 2-#4 x 20-2	
FJ-30	16 x 19	2-#6 x 9-7 + HK; 2-#6 x 9-7 + HK; 2-#5 x 23-5 + HKS; #5 x 38-4; 2-#6 x 20-2	
FJ-31	6 x 19	#4 x 9-0 + HK; #4 x 32-9 + HK; 2-#4 x 24-3	
FJ-32	6 x 19	2-#6 x 19-4 + HK; 2-#4 x 10-10	
FJ-33	6 x 19	6'-6; #4 x 13-0; 9-0; #5 x 30-0; #5 x 58-2; #4 x 41-7	
FJ-34	6 x 19	#5 x 22-4 + HK; #4 x 46-2; #4 x 53'-8	
FJ-35	6 x 19	#5 x 22-4 + HK; #5 x 46-2; #5 x 53'-8	

CONCRETE JOIST SCHEDULE

Mark	Size	Reinforcing (East or North ← Centerline Supports → West or South)	Remarks
FJ-36	6 x 19	#5 x 22-4 + HK; #6 x 26-0 + HK; #6 x 46-2; #6 x 53'-8	
FJ-37	6 x 19	#5 x 20-4 + HK; #5 x 20-4 + HK; 2-#4 x 29-2	
FJ-38	6 x 19	5-0; #5 x 10-0; #5 x 20-4 + HK; 2-#4 x 16-4	TOP BARS BEND INTO RAMP
FJ-39	6 x 19	#5 x 16-7 + HK; #5 x 20-4 + HK; 2-#4 x 22-4	
		ALL JOIST BARS (INCLUDING #4) TO BE GRADE 60	

CONCRETE BEAM SCHEDULE ON SHEET S-4



● ADDEN. NO. 2

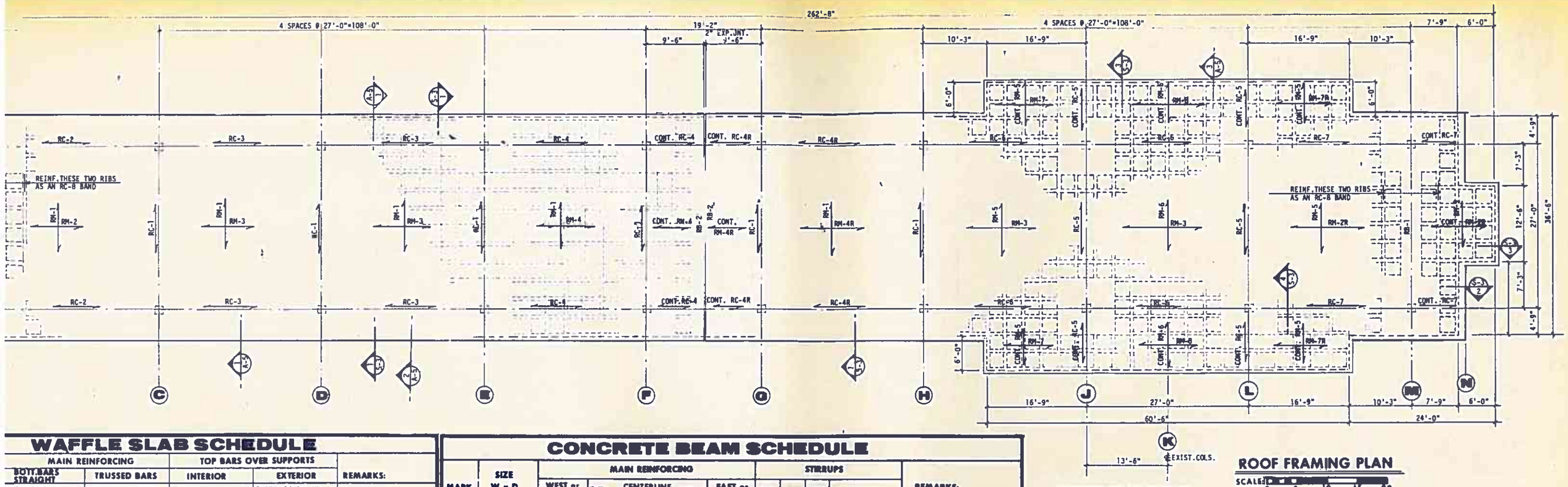
CHEROKEE NATIONAL MUSEUM PARK HILL, E.D.A. PROJECT No.

STATE OF OKLAHOMA E. MURRAY McCUNE

MM

7/27/72 J.Mc. B.Mc.

SHEET NUMBER S-2



3" CONCRETE SLAB OVER 30"x30"x16" DEEP DOME PAN FORMS. REINF. SLAB WITH LAYER OF 6x6-6/6 W.W.MESH.

ROOF FRAMING PLAN

SCALE: 0 5 10 15 20

9,49.45
876
10,025.45 SQ.FT.

WAFFLE SLAB SCHEDULE

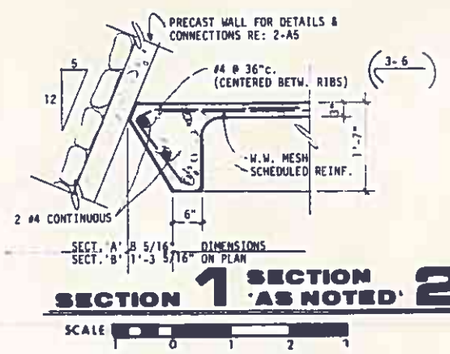
MAIN REINFORCING: BOTT. BARS STRAIGHT	MAIN REINFORCING: TRUSSED BARS	TOP BARS OVER SUPPORTS: INTERIOR	TOP BARS OVER SUPPORTS: EXTERIOR	REMARKS:
4-#5 x 20-0	4-#5 x 38-5		8-#5 x 14-3 + HK (4 EA.END)	
4-#5 x 20-0	4-#6 x 46-2		4-#5 x 18-3 + HK; 3-#4 x 14-3 BETWN.RIBS	4-#4 x 5-0 BOTT. IN CANTIL.RIBS
4-#5 x 20-0	4-#5 x 46-2	9-#4 x 14-3 BETWEEN RIBS		
4-#5 x 20-0	4-#6 x 46-2	9-#4 x 14-3 BETWEEN RIBS	4-#5 x 18-3 + HK; 3-#4 x 14-3 BTWN.RIBS	4-#4 x 5-0 BOTT. IN CANTIL.RIBS
4-#5 x 20-0	4-#5 x 46-2		8-#5 x 20-3 + HK (4 EA.END)	8-#4 x 6-9 (4 EA.END) IN CANTIL.RIBS
4-#5 x 20-0	4-#6 x 46-2	9-#4 x 14-3 BETWEEN RIBS		
4-#5 x 20-0	4-#6 x 46-2		4-#5 x 18-3 + HK; 3-#4 x 14-3 BTWN.RIBS	4-#4 x 5-0 BOTT. IN CANTIL. RIBS
2-#5 x 20-0	2-#5 x 38-5		2-#5 x 37-4 + HKS	ONE RIB EA.SIDE OF RB-1
5-#5 x 36-2	5-#5 x 38-6		10-#5 x 12-0 + HK (5 EA.END)	
5-#4 x 40-11	5-#5 x 41-10		5-#6 x 27-0 + HK; 8-#4 x 27-0 BTWN.RIBS	
5-#4 x 27-8	5-#5 x 41-10			
5-#4 x 36-8	5-#5 x 41-10		5-#4 x 18-3 + HK	
REINFORCE ONE RIB AS RM-1 AND FOUR RIBS AS RM-6				
5-#4 x 48-2	5-#5 x 46-2		10-#5 x 20-3 + HK (5 EA.END)	
2-#5 x 17-0			2-#5 x 23-4 + HK	
2-#4 x 27-8	2-#5 x 41-10			
2-#5 x 12-2	SHORT RIBS		2-#5 x 13-6 + HKS	REINF. LONG RIB AS 1/5 OF AN RM-1 BAND

ARE TOTALS. DISTRIBUTE EQUALLY AND PLACE IN RIBS - UNLESS NOTED
REINFORCING
BANDS
BANDS
BANDS
BANDS

CONCRETE BEAM SCHEDULE

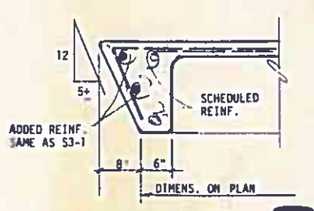
MARK	SIZE W x D	MAIN REINFORCING: WEST or SOUTH	MAIN REINFORCING: CENTERLINE SUPPORTS	MAIN REINFORCING: EAST or NORTH	STIRRUPS: NO.	STIRRUPS: SIZE	STIRRUPS: TYPE	STIRRUPS: SPACING	REMARKS:
RB-1	42 x 19	4-#6 x 14-3 + HK	4-#6 x 14-3 + HK; 3-#11 x 20-0; 2-4-#10 x 30-0		10	#4		2 @ 8, 3 @ 24 EA.END	STIRRUPS ARE IN TWO PARTS ⊓ AND ⊔
RB-2	27 x 19	#5 x 12-0 + HK	#5 x 12-0 + HK; 2-#5 x 37-4 + HKS; #7 x 20-0; 2-#7 x 36-2		24	#3	4'-3	@ 18" c. (2 PER PAN)	

MARKS SUFFIXED "R" ARE SAME AS SCHEDULED BUT PLACED OPPOSITE HAND.



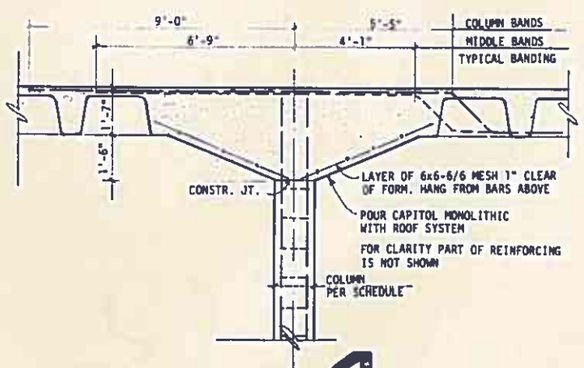
SECTION 1 SECTION 'AS NOTED' 2

SCALE 1 0 1 2 3



SECTION 3

SCALE 1 0 1 2 3



SECTION 4

SCALE 1 0 2 3 4 5

CHEROKEE NATIONAL MUSEUM — PARK HILL, — E.D.A. PROJECT No.

STATE OF OKLAHOMA — H. MURRAY McCUNE — REG.

MM

12-1-71
J.Mc.
B.Mc.

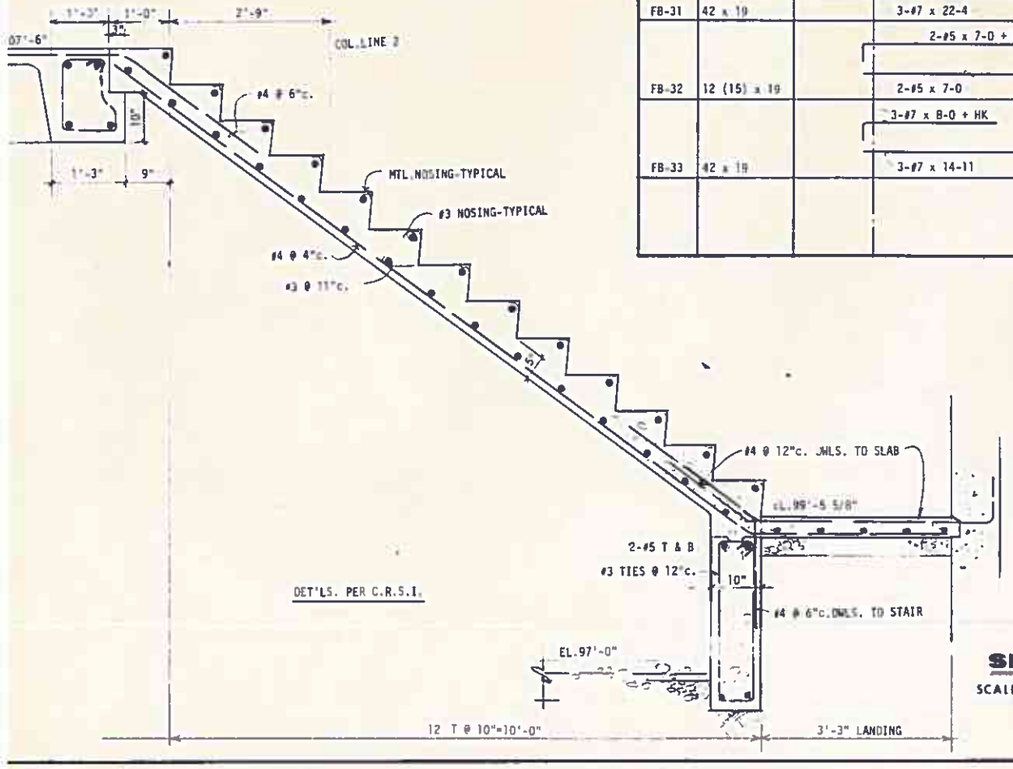
SHEET NUMBER S-3

CONCRETE BEAM SCHEDULE

MARK	SIZE W x D	MAIN REINFORCING: EAST or NORTH ← CENTERLINE SUPPORTS → WEST or SOUTH	STIRRUPS: NO.	SIZE	TYPE	SPACING	REMARKS:
FB-21	42 x 19	2-#8 x 9-0; 4'-6; 3-#8 x 23-9 + HK; 3-#7 x 15-3	8	#4		2 @ 8, 2 @ 24 EACH END	STIRRUPS ARE IN TWO PARTS [ ] AND [ ]
FB-22	42 x 19	2-#9 x 10-0; 5-0; 3-#9 x 18-0; 9-0; 2-#7 x 20-0; 3-#8 x 28-0	10	#4	"do"	2 @ 8, 3 @ 24 EACH END	"do"
FB-23	42 x 19	2-#8 x 9-0; 4-6; 3-#9 x 18-0; 9-0; 2-#8 x 22-0; 3-#7 x 28-0	10	#4	"do"	2 @ 8, 3 @ 24 EACH END	"do"
FB-24	42 x 19	2-#9 x 11-0; 5-6; 3-#8 x 18-0; 2-#7 x 20-0; 9-0; 3-#8 x 28-0	10	#4	"do"	2 @ 8, 3 @ 24 EACH END	
FB-25	42 x 19	TOP BARS FROM ADJACENT SPANS; 3-#7 x 20-2	10	#4	"do"	2 @ 8, 3 @ 24 EACH END	
FB-26	42 x 19	2-#8 x 7-9 + HK; 3-#8 x 12-3 + HK; 2-#8 x 22-0; 3-#8 x 30-9	12	#4	"do"	2 @ 8, 3 @ 24 EACH END; 2 @ 8 SO.OF LINE "F"	BARS EXTEND TO ELEVATOR SHAFT
FB-27	42 x 19	9-0; 2-#7 x 18-0 INTO JOISTS; 4-#8 x 10-7 + HK; 2-#9 x 23-0; 3-#8 x 28-0	12	#4	"do"	2 @ 8, 3 @ 24 EACH END; 2 @ 8 NO.OF LINE "G"	
FB-28	42 x 19	3-#8 x 7-0 + HK; 3-#7 x 14-0	8	#4	"do"	2 @ 8, 2 @ 24 EACH END	
FB-29	42 x 19	5-0; 2-#10 x 10-0; 2-#10 x 10-0; 5-0; 3-#10 x 18-0; 9-0; 2-#10 x 22-0; 3-#10 x 18-0; 3-#10 x 28-0	14	#4	"do"	5 @ 8, 2 @ 24 EACH END	
FB-30	42 x 19	5-0; 2-#9 x 10-0; 2-#9 x 10-0; 5-0; 3-#9 x 18-0; 3-#9 x 18-0; 9-0; 2-#8 x 20-0; 3-#9 x 28-0	12	#4	"do"	3 @ 8, 3 @ 24 EACH END	
FB-31	42 x 19	6-0; 2-#9 x 12-0; 3-#8 x 22-4 + HKS; 3-#7 x 22-4	12	#4	"do"	2 @ 8, 2 @ 24 EACH END; 2 @ 8, 2 @ 24 NO. OF LINE "M"	
FB-32	12 (15) x 19	2-#5 x 7-0 + HKS; 2-#5 x 7-0	6	#4		@ 12"c.	
FB-33	42 x 19	3-#7 x 8-0 + HK; 3-#7 x 14-11	8	#4		2 @ 8, 2 @ 24 EACH END	

CONCRETE BEAM SCHEDULE

MARK	SIZE W x D	MAIN REINFORCING: EAST or NORTH ← CENTERLINE SUPPORTS → WEST or SOUTH	STIRRUPS: NO.	SIZE	TYPE	SPACING	REMARKS:
FB-1	42 x 19	4'-0; 4'-6; 2-#8 x 9-0; 3-#9 x 20-2 + HK; 3-#5 x 12-0	7	#4		2 @ 8 EACH END, BAL. @ 24	STIRRUPS ARE IN TWO PARTS [ ] AND [ ]
FB-2	42 x 19	TOP BARS FROM ADJACENT SPANS; 2-#8 x 20-0; 3-#8 x 28-0	10	#4	"do"	2 @ 8, 3 @ 24 EACH END	"do"
FB-3	42 x 19	5-0; 5-0; 2-#9 x 10-0; 3-#9 x 20-2 + HK; 3-#5 x 12-0	7	#4	"do"	2 @ 8 EACH END, BAL. @ 24	"do"
FB-4	42 x 19	TOP BARS FROM ADJACENT SPANS; 2-#9 x 22-0; 3-#8 x 28-0	10	#4	"do"	2 @ 8, 3 @ 24 EACH END	"do"
FB-5	42 x 19	4-0; 4-6; 2-#8 x 9-0; 3-#8 x 20-2 + HK; 3-#5 x 12-0	7	#4	"do"	2 @ 8 EACH END, BAL. @ 24	"do"
FB-6	42 x 19	TOP BARS FROM ADJACENT SPANS; 2-#8 x 22-0; 3-#7 x 28-0	10	#4	"do"	2 @ 8, 3 @ 24 EACH END	"do"
FB-7	9 x 36	#8 x 8-0; 4-0; 2-#7 x 25-10 + HK; 2-#8 x 17-2	12	#3		@ 16" c.	TOP EL.109'-0
FB-8	9 x 36	TOP BARS FROM ADJACENT SPANS; 2-#7 x 17-0	12	#3	4-3	@ 16" c.	"do"
FB-9	13 x 19	#8 x 8-0; 4-0; 2-#7 x 25-10 + HK; 2-#8 x 17-2	23	#4	4-3	@ 8" c.	TOP EL.106'-0 #4 @ 4-3 @ 16" c. DWLS.TO BEAM ABOVE
FB-10	13 x 19	TOP BARS FROM ADJACENT SPANS; 2-#7 x 17-0	18	#3	4-3	7 @ 8, 2 @ 16 EACH END	"do" EL. "do" DWLS.
FB-11	42 x 19	2-#10 x 10-0; 5-0; 3-#10 x 22-0 + HK; 3-#5 x 12-0	9	#4		3 @ 8 EACH END BAL. @ 24" c.	
FB-12	42 x 19	TOP BARS FROM ADJACENT SPANS; 2-#10 x 22-0; 3-#10 x 28-0	21	#4		6 @ 5, 6 @ 6, 3 @ 8, EAST END 3 @ 8, 3 @ 24 WEST END	4-#7 DWLS. TO POST SUPPORT'G RAMP
FB-13	42 x 19	4-6; 2-#11 x 9-0; 3-#11 x 20-2 + HK; 3-#5 x 12-0	9	#4		3 @ 8 EACH END BAL. @ 24"c.	
FB-14	13 x 37	#9 x 10-0; 5-0; 1-3; 2-#9 x 21-9 + HKS; 2-9; 2-#10 x 17-2	16	#3	4-3	@ 12" c.	
FB-15	13 x 37 (13 x 19)	2-#10 x 10-0; #10 x 10-0; 2-#10 x 17-0	10	#3	4-3	@ 12"c. IN 37" DEPTH	
			10	#3		@ 6"c. IN 19"DEPTH	



SECTION 1
SCALE 0 1 2 3

39 16 16 6 6

83 35 44

CHEROKEE NATIONAL MUSEUM PARK HILL, E.D.A. PROJECT No.

8/16/72
J.Mc.
..Mc.
529.0

SHEET NUMBER S-4

AREA DRAIN

AREA DRAIN

FD

HOLD HIGH OVER 12/12 DUCT

INSTALL FIRE DAMPER(BOTH DUCTS)

ALL FD'S 2"
ALL LINE 4"

NEW SUMP PUMP LOCATION
SEE SH. A-1 FOR
SURFACE DISCHARGE

HUMIDIFIER(SEE SPECS)
NEW LOCATION

HOLD HIGH UNDER 20/8 DUCT

THRU WALL

UP

DOWN

44/14

200CFM

400CFM

375CFM

450CFM

CHANGE LOCATION

R/A DR. GRLS
BY G.C.

NEW PARTITIONS
HOLD DUCT LOW TO BRANCH UNDER 28/18

1800CFM R/A

26"ø

18"ø 14"ø 12"ø

19"ø

PVC COATED SPIRAL DUCT

20"ø

UNDERGROUND SUPPLY DUCTS
(SEE UPPER LEVEL FOR GRILLES)

T800CFM R/A

10"ø

20/18

THRU WALL

PVC COATED SPIRAL DUCT

12"ø

18"ø 14"ø

20"ø

BOLD LINES INDICATE CHANGES COVERED IN ADDENDUM NO.3

LOWER LEVEL MECHANICAL PLAN

Scale 0 5 10 15 20 25 in feet

2-30"x48"GRILLES
@2400CFM EA.

14"
12"
14"
30"
10'-4"CLG.
7'DOOR

SECTION A-A
DETAIL @ R/A TO CORRIDOR

UPPER LEVEL

48/96 REL AIR LOUVER w/DAMPER

HEATING COIL

RA

6" FLEX

COOLING COIL

A.H. #1

FILTER SEC.

SPRING ISOLATORS

OA & RA MIXING BOX

DIR. OFF

CORR.

MECH. ROOM

NOTE:
PROVIDE MANUAL
BALANCING DAMPERS
EACH ZONE.

ZONE	CFM	NO. SEG.
1	12,150	7
2	2,750	2
3	4,200	2
4	1,100	1
5	2,350	2

SECTION 1

Scale 0 1 2 3 4 5 6 7 8 9 10 in feet

CLARIFICATION DWG. TO ADDENDUM #3

2-12-73

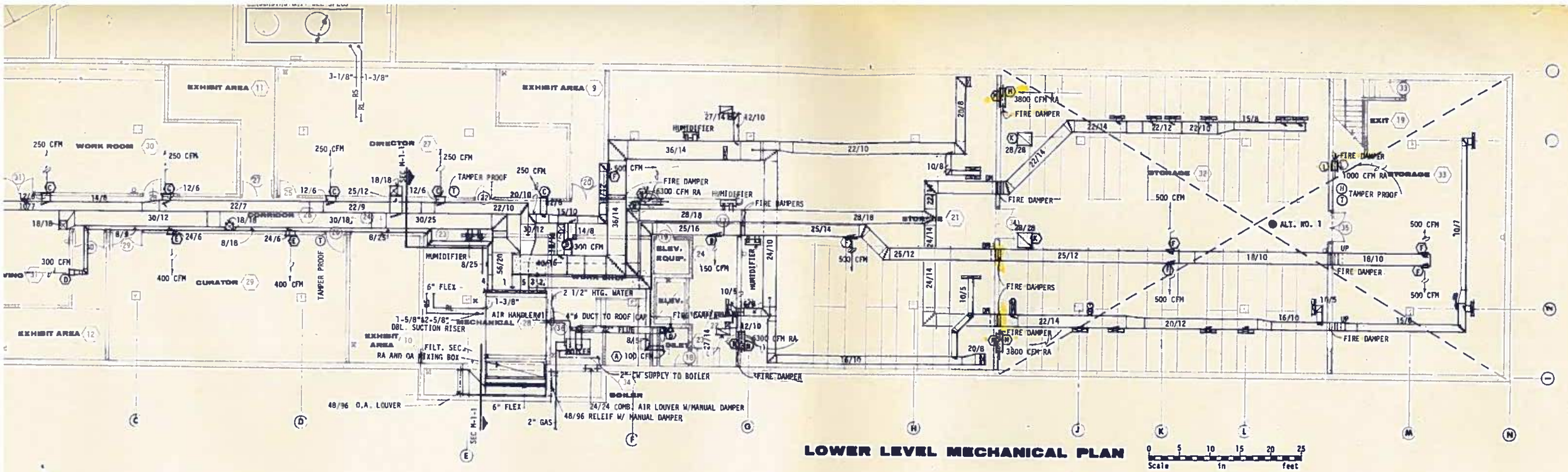
ISOMETRIC OF MECHANICAL ROOM

NOT TO SCALE

CHEROKEE NATIONAL MUSEUM | PARK HILL, | E.D.A. PROJECT No.

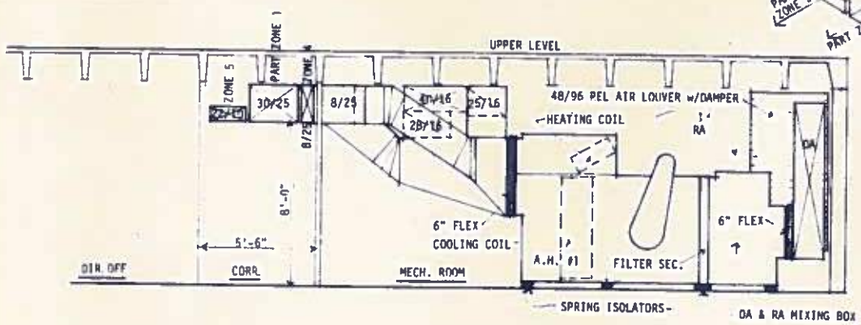
ADDEN. NO. 2
7/27/72.

SHEET NUMBER
M-1



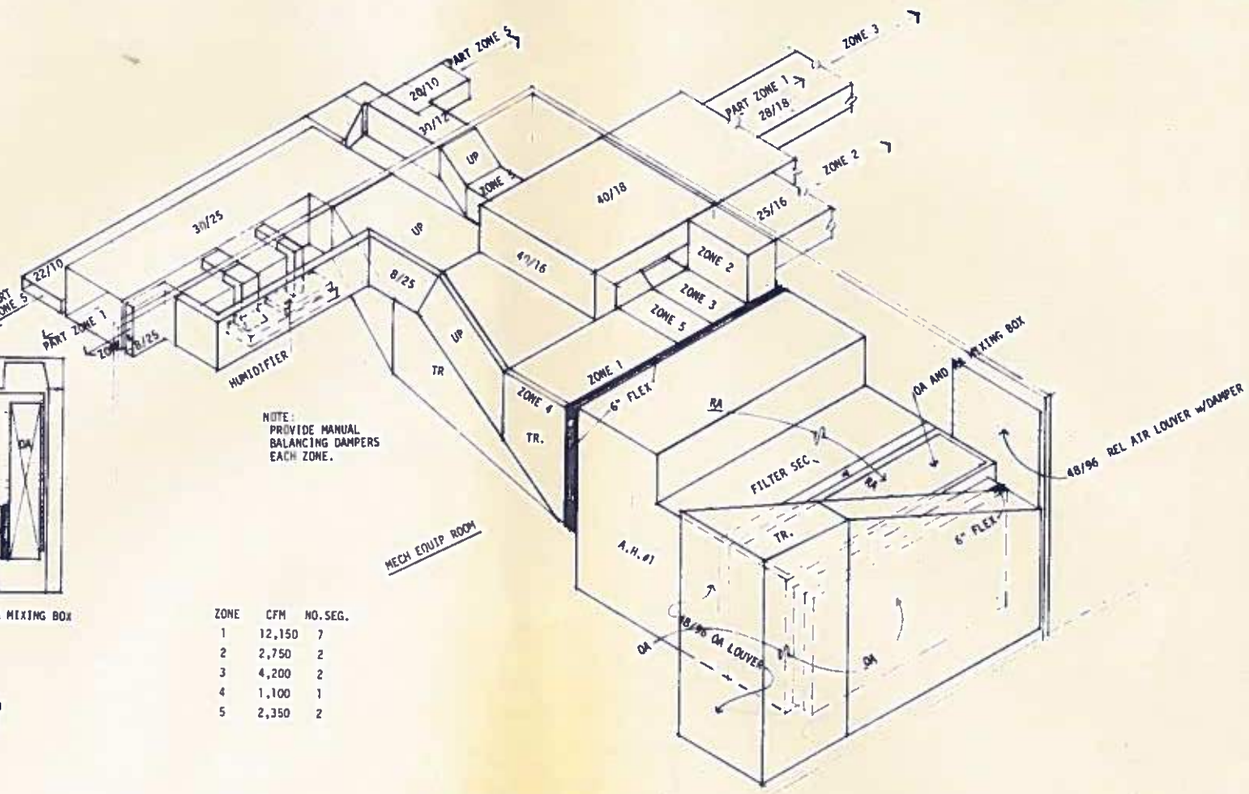
LOWER LEVEL MECHANICAL PLAN

Scale 0 5 10 15 20 25 in feet



SECTION 1

Scale 0 1 2 3 4 5 6 7 8 9 10 in feet



NOTE:
PROVIDE MANUAL BALANCING DAMPERS EACH ZONE.

ZONE	CFM	NO. SEG.
1	12,150	7
2	2,750	2
3	4,200	2
4	1,100	1
5	2,350	2

ISOMETRIC OF MECHANICAL ROOM

NOT TO SCALE

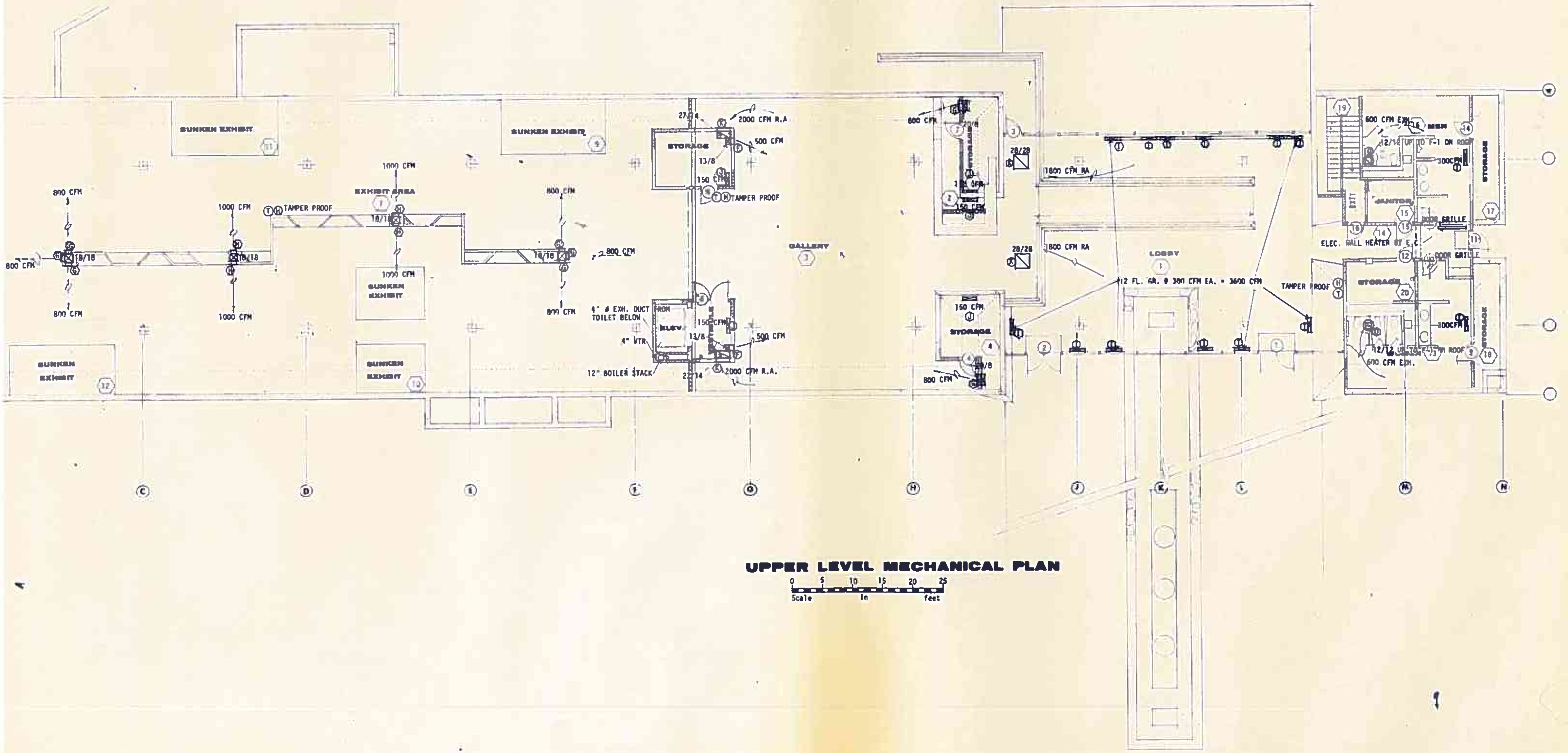
CHEROKEE NATIONAL MUSEUM
CHEROKEE CULTURAL CENTER
PARK HILL, OKLAHOMA
E.D.A. PROJECT No. 99-1-01279

STATE OF OKLAHOMA — H. MURRAY McCUNE — 253 — TULSA, OKLA. — LICENSED ARCHITECT

MM McCUNE McCUNE & ASSOCIATES

ADDEN. NO. 2
7/27/72.
529.0

SHEET NUMBER M-1
OF 4 SHEETS



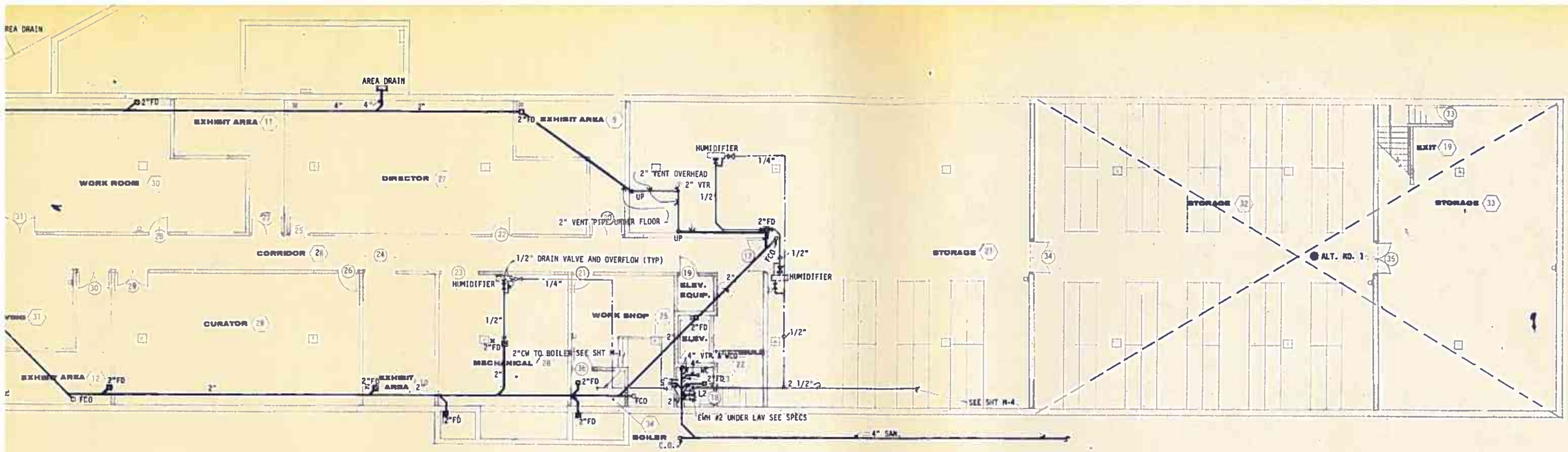
UPPER LEVEL MECHANICAL PLAN

Scale in feet: 0 5 10 15 20 25

CHEROKEE NATIONAL MUSEUM PARK HILL, E.D.A. PROJECT No.

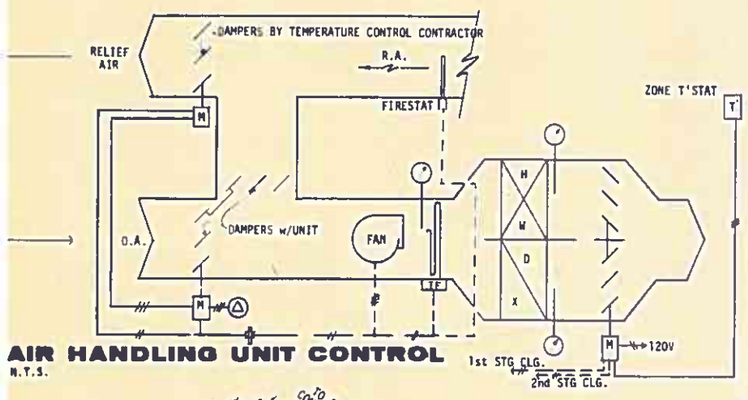
7/27/72

SHEET NUMBER M-2



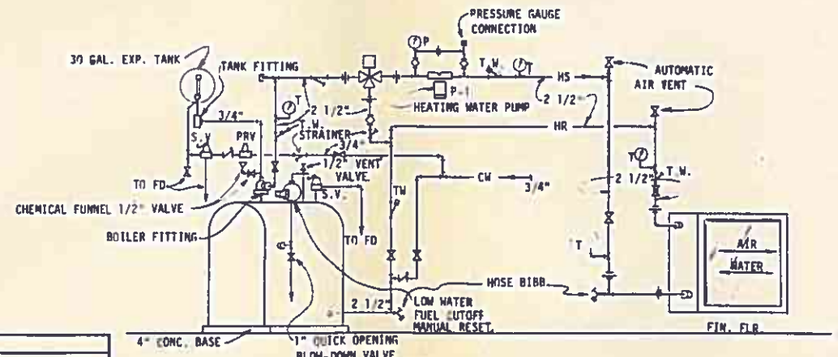
LOWER LEVEL PLUMBING PLAN ●

SCALE: 1/4"=1'-0"



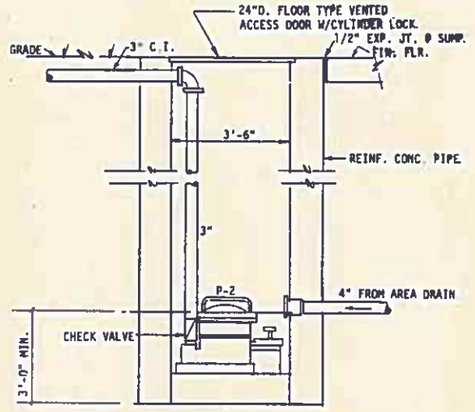
AIR HANDLING UNIT CONTROL

N.T.S.



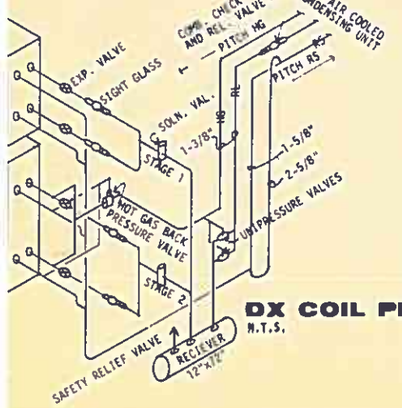
HEATING WATER PIPING SCHEMATIC

N.T.S.



SUMP PUMP DETAIL

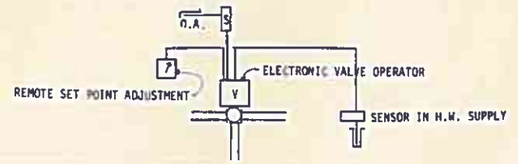
N.T.S.



DX COIL PIPING

N.T.S.

PLUMBING LEGEND	
SYMBOL	DESCRIPTION
CW	COLD WATER
HW	DOMESTIC HOT WATER
HWS	HEATING WATER SUPPLY
HWR	HEATING WATER RETURN
RL	REFRIGERANT LIQUID
RS	REFRIGERANT SUCTION
4" VTR	VENT THRU ROOF (SIZE INDIC.)
SAN	SANITARY SEWER
STM	STORM SEWER
G	GAS
3/4"YH	YARD HYDRANT
3/4"WH	WALL HYDRANT
2"FD	FLOOR DRAIN
	AREA DRAIN
T	THERMOSTAT
H	HUMIDISTAT



BOILER WATER RESET CONTROL

N.T.S.

● ADDEN. NO. 2

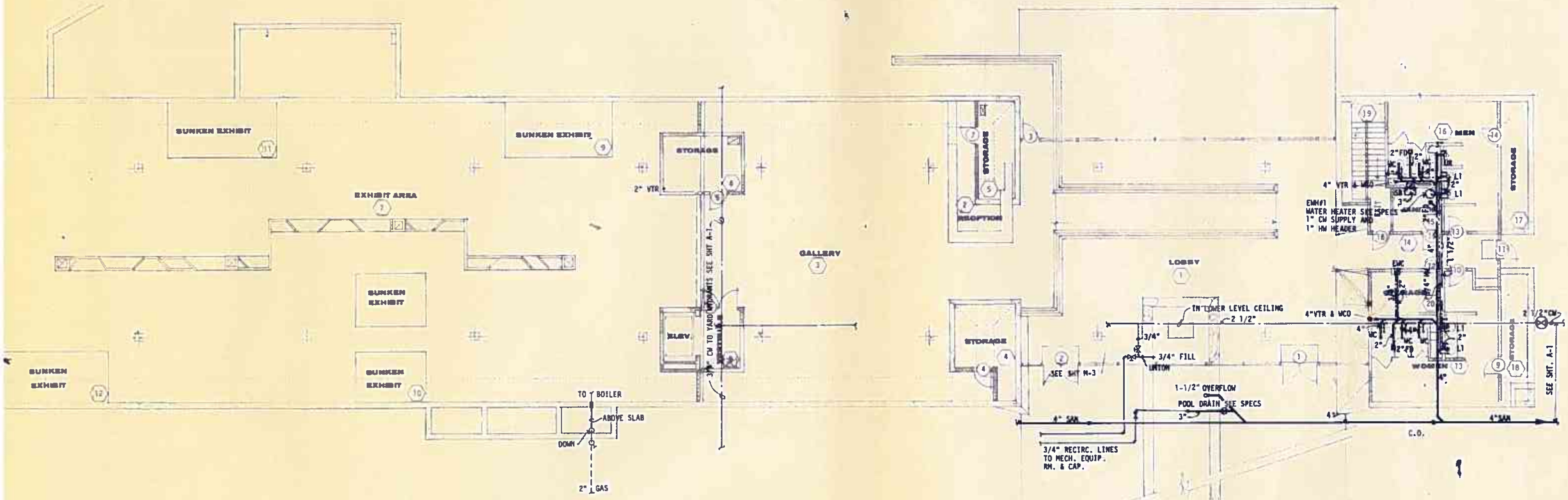
CHEROKEE NATIONAL MUSEUM | PARK HILL, | E.D.A. PROJECT No.

STATE OF OKLAHOMA — H. MURRAY McCLURE

MM

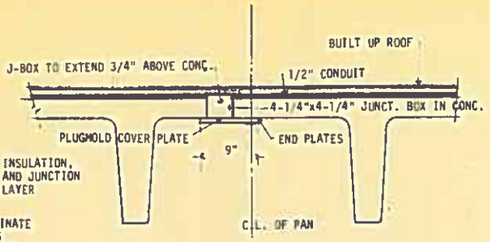
7/27/72

SHEET NUMBER M-3



UPPER LEVEL PLUMBING PLAN

SCALE: 1/16"=1'-0"



NOTE: TWO LAYERS OF 3/4" RIGID INSULATION, CUT FIRST LAYER AROUND CONDUIT AND JUNCTION BOXES AS REQUIRED. RUN SECOND LAYER CONTINUOUS OVER ROOF. BY GC

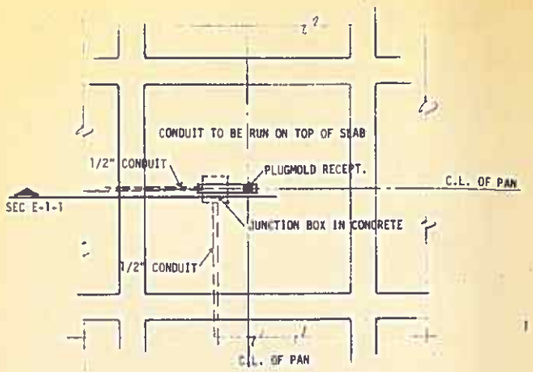
ELECTRICAL CONTRACTOR TO CO-ORDINATE LOCATIONS OF J-BOX PENETRATIONS W/GENERAL CONTRACTOR FROM SHT E-2

PLUGMOLD STRIP TO BE CUT FROM STOCK LENGTH OF PLUGMOLD W/RECEPTS @ 9" O.C.

PARALLEL RUNS AS MUCH AS POSSIBLE TO ELIMINATE CROSSING.

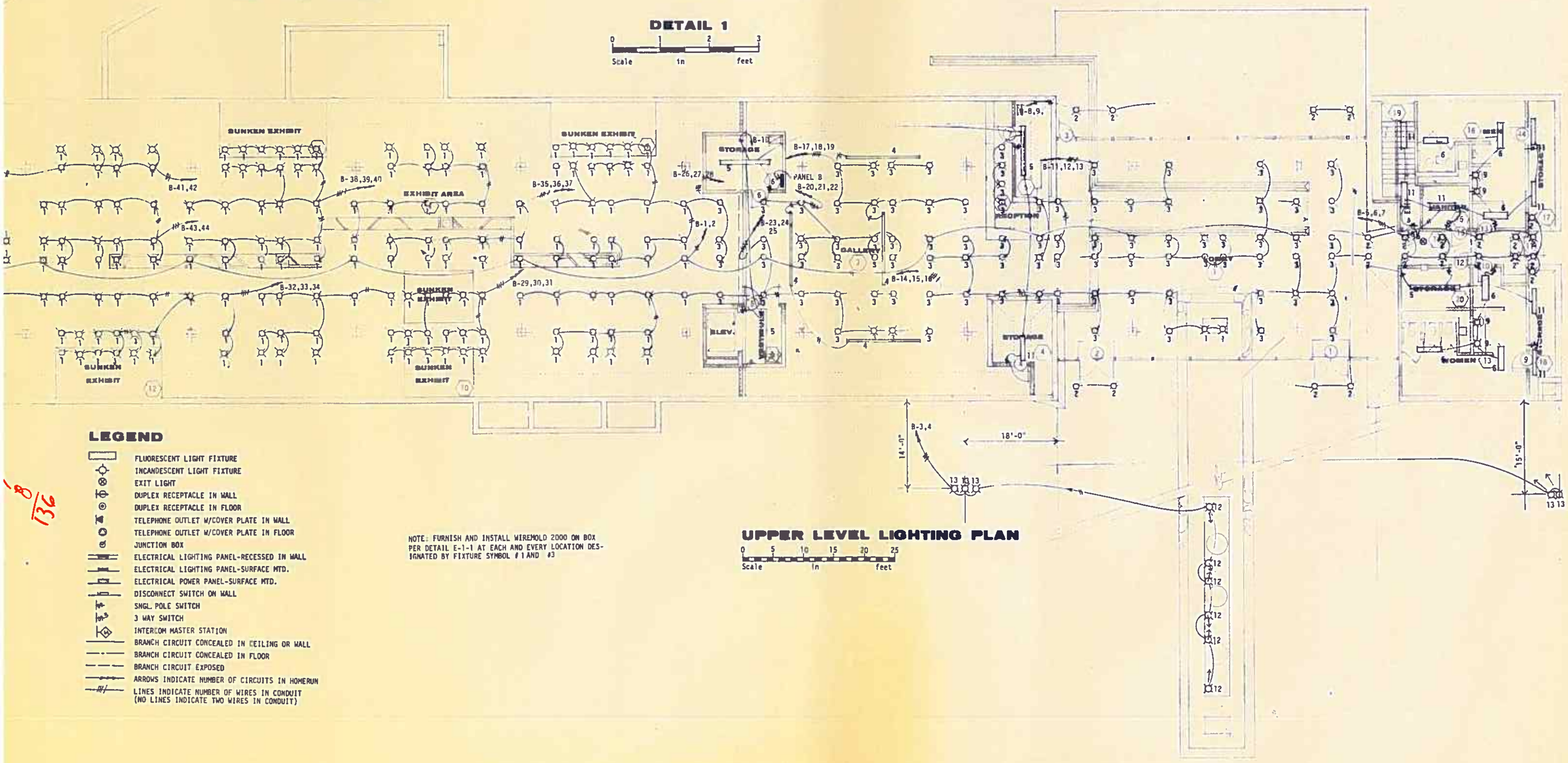
SECTION 1

Scale 0 1 2 3 in feet



DETAIL 1

Scale 0 1 2 3 in feet



UPPER LEVEL LIGHTING PLAN

Scale 0 5 10 15 20 25 in feet

LEGEND

- FLUORESCENT LIGHT FIXTURE
- INCANDESCENT LIGHT FIXTURE
- EXIT LIGHT
- DUPLEX RECEPTACLE IN WALL
- DUPLEX RECEPTACLE IN FLOOR
- TELEPHONE OUTLET W/COVER PLATE IN WALL
- TELEPHONE OUTLET W/COVER PLATE IN FLOOR
- JUNCTION BOX
- ELECTRICAL LIGHTING PANEL-RECESSED IN WALL
- ELECTRICAL LIGHTING PANEL-SURFACE MTD.
- ELECTRICAL POWER PANEL-SURFACE MTD.
- DISCONNECT SWITCH ON WALL
- SNGL. POLE SWITCH
- 3 WAY SWITCH
- INTERCOM MASTER STATION
- BRANCH CIRCUIT CONCEALED IN CEILING OR WALL
- BRANCH CIRCUIT CONCEALED IN FLOOR
- BRANCH CIRCUIT EXPOSED
- ARROWS INDICATE NUMBER OF CIRCUITS IN HOMERUN
- LINES INDICATE NUMBER OF WIRES IN CONDUIT (NO LINES INDICATE TWO WIRES IN CONDUIT)

NOTE: FURNISH AND INSTALL WIREMOLD 2000 ON BOX PER DETAIL E-1-1 AT EACH AND EVERY LOCATION DESIGNATED BY FIXTURE SYMBOL #1 AND #3

-8/136

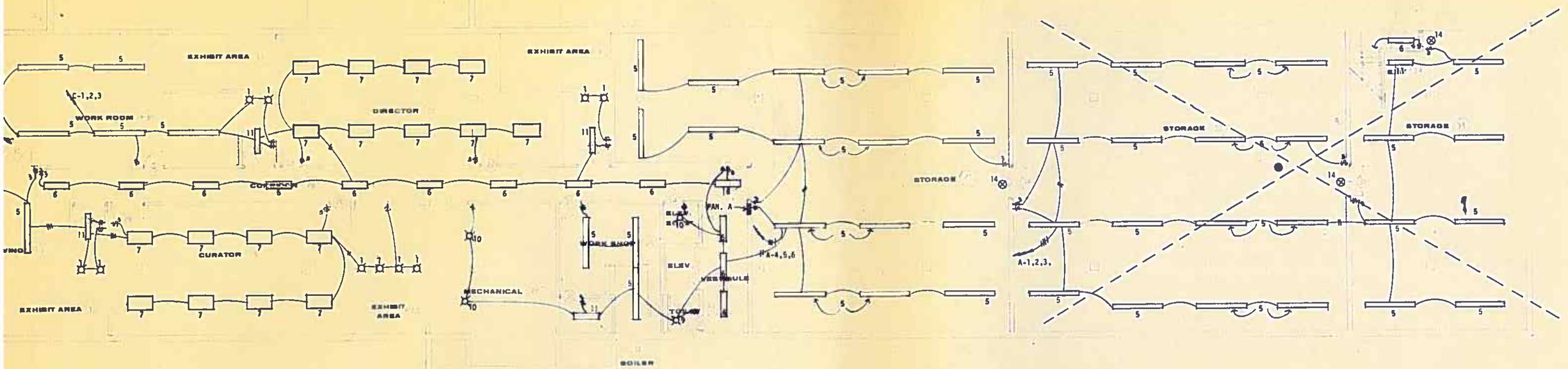
CHEROKEE NATIONAL MUSEUM ▣ PARK HILL, ▣ E.D.A. PROJECT No. 529.0

STATE OF OKLAHOMA — EL MURRAY EXECUTIVE

MM

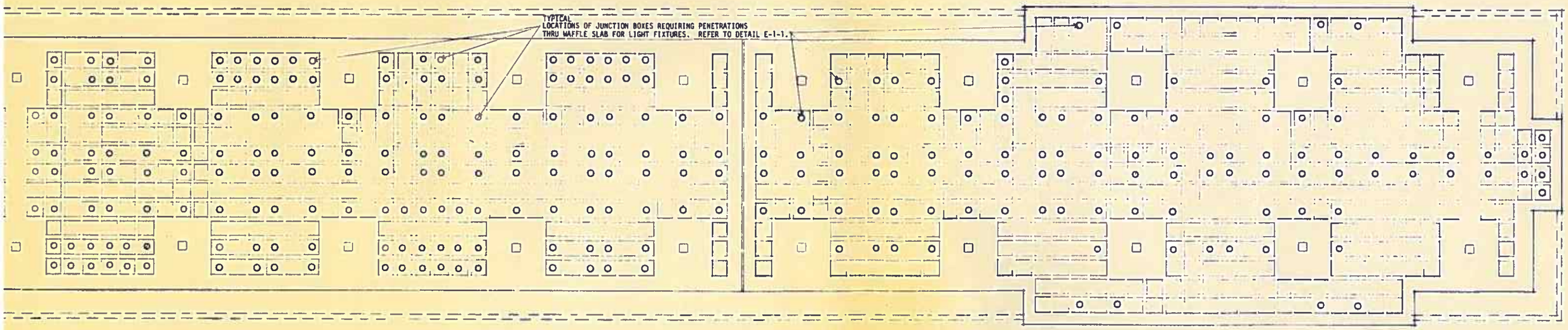
7/27/72

SHEET NUMBER E-1



LOWER LEVEL LIGHTING PLAN

Scale 0 5 10 15 20 25 in feet



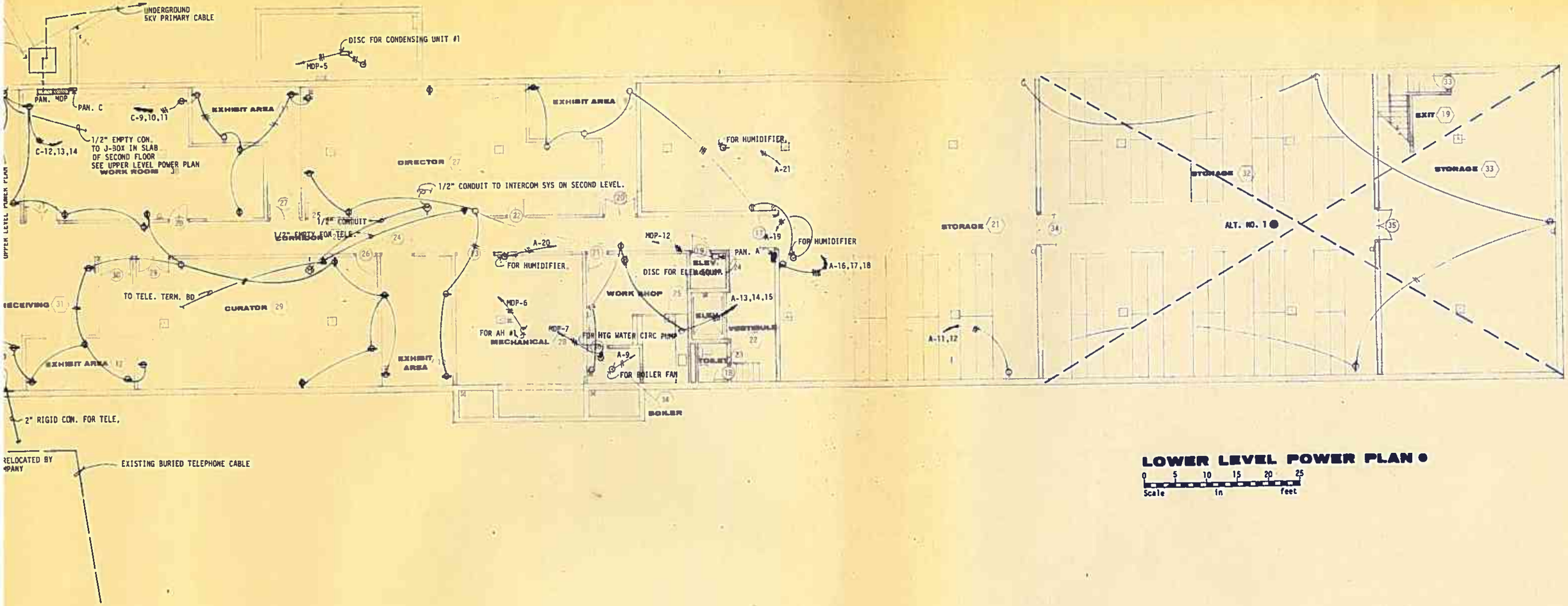
UPPER LEVEL REFLECTED CEILING PLAN

Scale 0 5 10 15 20 25 in feet

CHEROKEE NATIONAL MUSEUM PARK HILL, E.D.A. PROJECT No.

ADDEN. NO. 2

SHEET NUMBER 5.2



LOWER LEVEL POWER PLAN ●

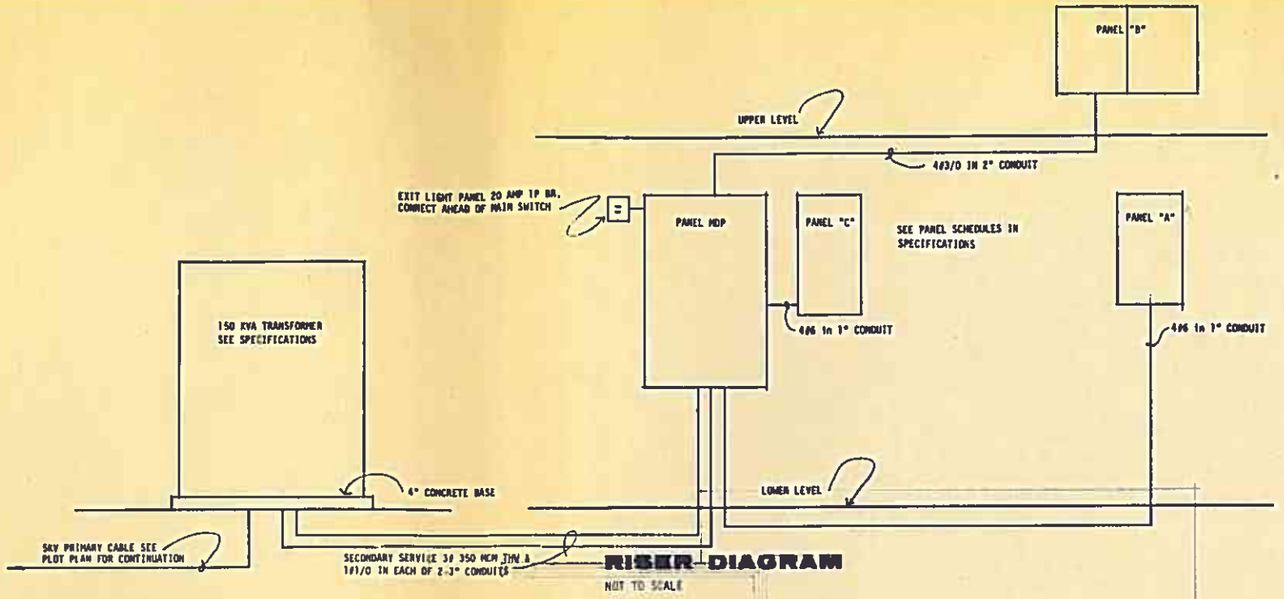
Scale 0 5 10 15 20 25 in feet

● ADDEN. NO. 2

7/27/72

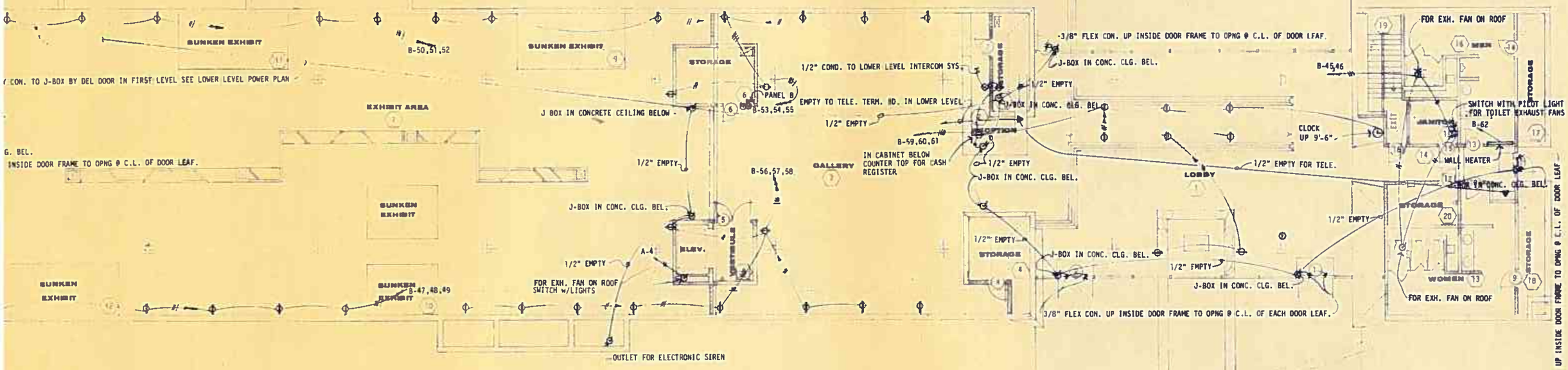
CHEROKEE NATIONAL MUSEUM PARK HILL, E.D.A. PROJECT No.

SHEET NUMBER E-3



RISER DIAGRAM

NOT TO SCALE



UPPER LEVEL POWER PLAN

Scale 0 5 10 15 20 25 in feet

CLOCK -
#6772- 23" DIAMETER 3 DIMENSIONAL BAR HOUR INDICATOR BY HOWARD MILLER CLOCK COMPANY

WALL HEATER - CHROMALOX
#KDR-483TS, 3KW,10236 BTU
SEMI RECESSED ELECTRIC

INTERCOM SYSTEM
MASTER STATIONS - WEBSTER #2606 6 STATION
WIRING - BELDEN 8743

ALARM SYSTEM INCLUDING ALL LABOR AND MATERIAL NECESSARY TO INSTALL ALL BELLS, SIRENS, WIRE, CONTROLS, PHOTO CELL TRANSMITTERS, RECEIVERS, ETC., IS NOT A PART OF THE ELECTRICAL CONTRACT AND IS INCLUDED IN ANOTHER PART OF THESE SPECIFICATIONS.

CHEROKEE NATIONAL MUSEUM | PARK HILL, | E.D.A. PROJECT No.

STATE OF OKLAHOMA — M. MURRAY McCUNE

MM

7/27/72

SHEET NUMBER E-4

BURO HAPPOLD

Cherokee Heritage Center & Museum

100% Schematic Design BOD Report

0055132

8 December 2025

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Revision	Description	Issued by	Date	Checked
00	50% Schematic Design Issue	AS/LB	11/14/2025	PR/NM
01	100% Schematic Design Issue	AS/LB	12/08/2025	PR/NM

This report has been prepared for the sole benefit, use, and information of Cherokee Nation. The liability of Buro Happold Consulting Engineers P.C. in respect of the information contained in the report will not extend to any third party.

Approved **Paul Richardson**

Signature 

Date **December 8th, 2025**

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Section Ref	Author	Date
Introduction	Aaron Slamowitz	12/08/2025
Design Standards and Codes	Aaron Slamowitz	12/08/2025
Mechanical Systems	Aaron Slamowitz	12/08/2025
Electrical	Mac Anderson	12/08/2025
Plumbing	Nicholas Stephens	12/08/2025
Fire Protection	Nicholas Stephens	12/08/2025
Structural Engineering	Luke Bastian	12/08/2025

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Contents

1 Introduction

1.1 Project Overview

Cherokee Heritage Center Museum is located in Park Hill, Oklahoma. The new heritage center and museum will be approximately 21,000 square feet, containing galleries, a café, as well as space for a gift shop, offices, and some flexible educational rooms.

This report forms the Basis of Design at issuance of the Schematic Design phase of the project. Buro Happold have been engaged to provide the Structural and MEP Engineering services for the project.

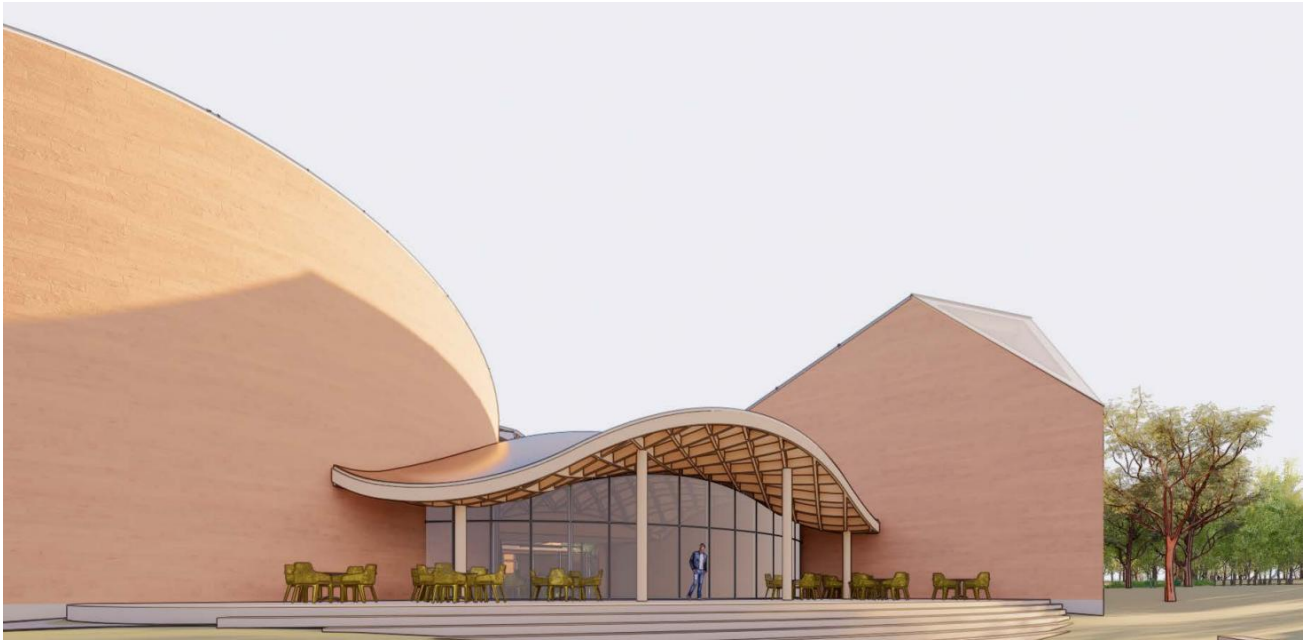


Figure 1-1-11 Cherokee Heritage Center Museum Phase 2 Expansion (View from South)

1.1 Applicable Codes and Standards:

The design shall adhere to the following codes as adopted by the city of Tahlequah, Oklahoma: 2018 IRC, IBC, IMC, IPC, IPMC, IEBC, IFGC, IFC and 2020 NEC.

1. NFPA 13-16 2016: Standard for the Installation of Sprinkler System
2. NFPA 14-16 2016: Standard for the Installation of Standpipe and Hose System

3. NFPA 20-16 2016: Standard for the Installation of Stationary Pumps for Fire Protection
4. Oklahoma Electrical Code 2023: NFPA 70, 2023 with amendments.
5. Oklahoma Fire alarm Code 2016: NFPA 72, 2016.
6. ASHRAE 62.1 – 2016: Ventilation for Acceptable Indoor Air Quality
7. ANSI/ASHRAE/IESNA 90.1-2016: Energy Standard for Buildings Except Low-rise Residential Buildings
8. International Building Code 2018 (IBC 2018)
9. International Mechanical Code 2018 (IMC 2018) – Oklahoma Mechanical Code 2018
10. Oklahoma Energy Code for Commercial Construction 2006

2 Mechanical Systems

The information contained within this narrative is meant to summarize the minimum building performance criteria and design and construction standards used in developing mechanical engineering system designs for the Cherokee Heritage Center & Museum. This report section outlines proposed building systems and relevant information for pricing. Strategies proposed here have been developed to address the prospective needs of the building. All HVAC systems will be new and implemented to support the function of the museum.

2.1 Design Criteria

The following design criteria includes the inputs to be used for the purposes of engineering calculations.

For the purposes of room and zone heating and cooling load calculations, the summer outdoor design-day conditions used are the ASHRAE 2021 0.4% design dry bulb (DB) temperature and mean coincident wet bulb (WB) temperature for Tulsa International Airport in Tulsa, OK. Likewise, the winter design conditions are the ASHRAE 99.6% design dry bulb temperature (10.3°F DB) for the same location. These conditions are likely to be exceeded for roughly 35 hours annually. These conditions are:

Summer: 99.4° DB/ 75.8°F WB (ASHRAE 0.4%).

Winter: 10.9°F DB (Beyond ASHRAE 99.6%).

2.2 Indoor Design Conditions

The summarized values below represent the internal design criteria used in the preliminary load calculations for the HVAC system for normally occupied spaces.

Space Type	Minimum O.A. Ventilation Rate (ASHRAE 62.1-2010)	Summer Design		Winter Design		Pressuri-zation	Final Filter MERV Rating & % Efficiency	Remarks
		Temp. Set Point (°F)	Max. Relative Humidity (% R.H.)	Temp. Set Point (°F)	Min. Relative Humidity (% R.H.)			
Lobby Areas (Great Hall)	5 cfm/person 0.06 cfm/sq. ft.	72 (+/- 4F)	-	70 (+/- 4F)	-	Pos.	MERV 13 >90%	NC-35
Galleries	7.5 cfm/person 0.06 cfm/sq. ft.	72 (+/- 4F)	50% (+/- 10%)	70 (+/- 4F)	40% (+/- 10%)	Pos.	MERV 17 >98%	NC-30
Cafe	5 cfm/person 0.06 cfm/sq. ft.	72 (+/- 4F)	-	70 (+/- 4F)	-	Neg.	MERV 13 >90%	NC-35
Offices	5 cfm/person 0.06 cfm/sq. ft.	72 (+/- 4F)	-	70 (+/- 4F)	-	-	MERV 13 >90%	NC-35
Corridors	0.06 cfm/sq. ft.	72 (+/- 4F)	-	70 (+/- 4F)	-	-	MERV 13 >90%	NC-35
Gift Shop	5 cfm/person 0.06 cfm/sq. ft.	72 (+/- 4F)	-	70 (+/- 4F)	-	-	MERV 13 >90%	NC-35
Classroom	5 cfm/person 0.06 cfm/sq. ft.	72 (+/- 4F)	-	70 (+/- 4F)	-	-	MERV 13 >90%	NC-35
Small Gallery	7.5 cfm/person 0.06 cfm/sq. ft.	72 (+/- 4F)	-	70 (+/- 4F)	-	Pos.	MERV 13 >90%	NC-30

Table 2-1 Internal Design Criteria

2.2.1 Internal Load Criteria

In the formulation of preliminary loads, the following figures for occupancy, lighting and equipment loads were used. These are based on industry guidance from ASHRAE 62.1, *Ventilation for Indoor Air Quality*.

Space Type	People Load	Lighting Load * *does not include exhibit lighting*	Equipment Load	Remarks
Lobby Areas	250 gsf/person	1.0 W/gsf	0.5 W/gsf	
Galleries	25 gsf/person	0.6 W/gsf	0.5 W/gsf	
Offices	100 gsf/person	0.7 W/gsf	175 W/workstation	
Classroom	30-40 gsf/person	0.6 W/gsf	0.5 W/gsf	
Café	25 gsf/person	0.6 W/gsf	0.5 W/gsf	

Table 2-2 Internal Load Criteria

2.3 Ventilation

Ventilation shall be delivered to the spaces mechanically by air handling units and ductwork systems. Minimum outdoor airflow rates have been determined by ASHRAE's 62.1-*Ventilation for Indoor Air Quality* ventilation rates as depicted in Table 3.1, above. Additional ventilation air is required in some areas to meet the pressurization requirements of the building, particularly at entrances to galleries, where maintenance of pressurization and humidification is vital to maintenance of the gallery environment.

2.4 Building Pressurization

The building will generally be positively pressurized during occupied and unoccupied periods. This will be done to discourage the ingress of untreated, unfiltered air, and to maintain required humidity levels. Overall building pressurization will be 10% positive. Bathrooms, janitor's closets, the café, and other odor producing areas will be kept negatively pressurized with respect to adjacent spaces to contain odors, and galleries will be kept positively pressurized with respect to other spaces to maintain environmental conditions.

2.5 HVAC System Design

2.5.1 Cooling

Basis of Design: Centrifugal Chiller with Geothermal Wellfield

Cooling will be provided by chilled water produced by a single chiller. Heat generated by the chiller will be rejected to a geothermal wellfield. A manifold will be provided within the building with a set of pumps and heat exchanger to isolate the ground well condenser water loop from the building condenser water loop that will be used to draw heat from the chilled water. Automatic isolation should be provided on both sides of the heat exchanger to shut off water flow in the event a leak is detected in the system.

The new chiller shall be a high efficiency, magnetic bearing primary variable centrifugal water chiller, sized for 80 tons of cooling. The chiller shall be York YZ or equivalent and shall have a minimum turndown ration of 5:1. The chiller will be complete with a variable frequency drive (VFD) to assist in reducing energy loads during part-load conditions.

Chilled water is distributed throughout the building via (3) variable primary pumps each capable of providing an equal percentage of the load. The pumps shall be arranged in a lead/lag/standby arrangement. This provides an N+1 arrangement for the building to allow for full functionality, in the event one of the pumps fails. The pumps will be controlled such that operating hours for the pumps are shared via a lead-lag arrangement. All pumps will have premium efficiency motors and shall be complete with VFD. Chilled water will be supplied at 44°F and returned at 56°F, designing to a 12°F delta in the temperature. There will be (3) 80 GPM variable speed primary chilled water pumps, as described above.

Alternate Design: Centrifugal Chiller with Cooling Tower

As an alternate to the basis of design, a cooling tower will function to reject heat from the building chilled water loop, as opposed to the geothermal system. The chiller and chilled water pumps remain the same as in the basis of design described above.

A new, 80-ton single cell, evaporative crossflow, stainless steel cooling tower will sit on the roof above the loading dock. The cooling tower will be served by (3) 100 GPM condenser water pumps which will be located in the mechanical room below the loading dock, with pipework routed to and from the towers on the roof. Similar to the chilled water system, the (3) condenser water pumps will be variable primary pumps each capable of providing an equal percentage of the load. The pumps shall be arranged in a lead/lag/standby arrangement. This provides an N+1 arrangement for the building to allow for full functionality, in the event one of the pumps fails. The pumps will be controlled in a lead-lag fashion, such that operating hours for the pumps are shared. All pumps will have premium efficiency motors and shall be complete with VFDs. The cooling tower will be supported by steel dunnage and will have basin heat, water treatment, and packaged controls.

2.5.2 Heating

Basis of Design: Electric Boilers

Two (2) new 400 MBH electric resistance boilers and a heating hot water piping distribution system will be the primary source of heating in the new building. The heating hot water system will distribute 135°F supply hot water and return 105°F hot water. Each boiler shall be fitted with a flow control and automatic isolation valve, as well as an in-line circulator pump. Each boiler shall include packaged controls.

Heating hot water is distributed throughout the building via (3) variable primary pumps each capable of providing an equal percentage of the load. The pumps shall be 55 GPM each and shall be arranged in a lead/lag/standby arrangement. This provides an N+1 arrangement for the building to allow for full functionality, in the event one of the pumps fails. The pumps will be controlled such that operating hours for the pumps are shared. All pumps will have premium efficiency motors and shall be complete with VFD.

Alternate Design: Gas Boiler

As an alternate to the basis of design, heating hot water will be generated using one (1) 800 MBH high efficiency gas fired condensing boiler with associated flues and controls located in the mechanical room. Heating hot water will be distributed in the same manner as with the basis of design.

2.5.3 Ventilation

Ventilation air to occupied spaces will be provided by two (2) dedicated outdoor air handling units (DOAS) providing 100% outdoor air to the spaces.

One unit will be located in the mechanical room beneath the loading dock. This unit will provide ventilation to all occupied spaces north of the creek and shall be sized to be 2,600 CFM. This unit will contain the following:

11. Heating hot water and chilled water coils

12. MERV 8 pre filters

13. MERV 13 final filters

14. Total energy (enthalpy) wheels

15. VFD's on supply/exhaust fans and energy recovery wheel

16. High-efficiency motors, with ECM controls and supply and return fan arrays for redundancy

17. Packaged controls

18. Acoustic housing

19. Fan array supply and return fans for redundancy

The second DOAS unit will be located in the auxiliary mechanical room at grade adjacent to the Changing Gallery. This unit will provide ventilation to all occupied spaces south of the creek, including the Changing Gallery, Café and the Permanent Gallery. This unit will be sized for 3,500 CFM. The DOAS unit will contain all the above components, in addition to the following:

20. HEPA final filters

21. Electric steam humidification

The volumetric flow rate of outside air delivered to each space will modulate depending on feedback received from wall-mounted space temperature and humidity sensors, and carbon dioxide (CO_2) sensors. In gallery spaces, maintenance of gallery conditions will be prioritized over energy savings. Minimum outdoor airflow rates as required by ASHRAE Standard 62.1 will be distributed to all spaces, the details of which are shown in the previous section of this report.

2.5.4 Fan Coil Units

Fan coil units (FCUs) will deliver cooling and heating to all occupied spaces within the building by mixing recirculated air from spaces with treated outdoor air from the DOAS units. Cooling and heating coils in the fan coil units will temper mixed return/OA air to meet space temperature requirements based on readings from local thermostats. The FCU's will be selected at medium speed and be provided with ECM motors to reduce the noise impact of fan cycling. Ventilation air to the FCU's will be provided from the DOAS units detailed previously.

Fan coil units feeding gallery spaces and the café will be vertical units located in both the mechanical room underneath the loading dock as well as the auxiliary mechanical room located adjacent to the temporary gallery. Supply and return air will be ducted to/from each unit to the zone that it is serving. Each gallery and the café will be equipped with an individual unit for zone temperature/humidity control. Fan coil units feeding all other spaces will be horizontal units.

2.5.5 Demand Control Ventilation

All air handling units shall be capable of providing demand control ventilation (i.e. modulating outdoor air based on specific occupancy and air quality metrics). Monitoring the need for outdoor air supply can be done in different ways. The most common strategies are noted below:

- CO2 control – CO2 sensors located in the occupied zone or return which send a signal to the AHU to ramp fans up or down
- Occupancy sensors – when activated, sensors signal the air handling unit to ramp fans up or down

Strategy for this project is to use CO2 sensors. Further investigation in the next stages shall determine if control with occupancy sensors is viable. All zones should also have temperature and humidity sensors.

2.5.6 Toilet and Janitor's Room Exhaust

Toilet rooms will be provided with exhaust ductwork routed back to the DOAS units, where energy from this waste air stream will be recaptured to cool and heat incoming air while still conveying odors outside of the building. The toilet exhaust will be sized per the number of plumbing fixtures. Makeup air will be transferred into the toilet rooms from adjacent spaces, maintaining a negative pressure in the toilet rooms.

There are no forms of specialty exhaust for this building, including smoke exhaust or stair pressurization.

2.5.7 Building Automation System and Metering

The building shall include a direct digital control (DDC) system with a head end. The BAS shall monitor all HVAC equipment and allow for remote adjustment of setpoints, as well as display of alarms. Night setback and smoke sequences will be controlled by the BAS as well.

3 Electrical

3.1 Incoming Electrical Service

The building will have a dedicated 13.8kV:480/277V pad mounted transformer supplied by the Utility fed by underground 13.5kV primary feeders from the local supply lines.

A 1600A XHHW-2 secondary feeders will migrate underground from the transformer into the Main service switchboard. A 480V/277V sectional switchboard with dedicated CT compartment will be located at the main electrical room of the basement level. The project will require concrete-encased raceways for the underground primary and secondary feeders.

The main electrical room will occupy approximately 600 square feet and will be located above the flood plain. In accordance with NEC 110 requirements, there shall be at least one entrance and egress point to the designated working space for large electrical equipment. Doors serving this space must open in the direction of egress travel.

3.2 Design Criteria

The following design criteria includes the inputs to be used for the purposes of engineering calculations.

3.2.1 Electrical Load Estimates

The electrical demand load has been calculated using a combination of NEC, IEEE and connected load parameters using professional engineering judgement.

Cherokee Museum- Electrical Concept Level Load Estimate						
Area Breakdown (SF)		**NSF**				
Public Space		9,500				
Café		4,400				
Galleries		13,500				
Education		9,400				
Office		1,300				
BOH		1,200				
Total		**39,300**				
Est. Loads Type	**w/sf**	**(W)**	**Connected (VA) - (0.9pf)**	**Demand factor**	**Demand (kVA)**	**NOTES**
Lighting	1.00	25,800	28,667	1.00	28,667	
Lighting (Gallery)	1.60	21,600	24,000	1.00	24,000	
Receptacles (General)	1.00	38,000	42,222	0.50	21,111	

Receptacles (Offices)	4.00	5,200	5,778	0.80	4,622	
Electric Vehicle Charging Stations		180,000	200,000	0.50	100,000	Assume 20 EV station with smart charging
Mech - Heating/Cooling	16.00	628,800	698,667	0.80	558,933	
Café	25.00	110,000	122,222	0.70	85,556	
Misc. Loads	2.00	78,600	87,333	0.80	69,867	Eg. Hot Water, Pumps, trace heating, etc
			1,208,889		892,756	
				Amps	1,074	
				Main Service	**1,600**	**Amps at 480V/277V, 3-Ph**

Table 3—1 Estimated Demand Loads

3.2.2 Electrical Low Voltage Distribution

The electrical distribution system shall be classified into normal, emergency and optional standby branches in accordance with National Electrical Code Article 700 (emergency power), Article 702 (optional standby power). Normal power serves the general power, lighting, and equipment loads in the building. Emergency power is used to power life safety loads, such as egress/exit lighting and fire alarm systems. The design topology of the electrical distribution will consist of all three of these classifications of power, depending on code-related impacts of the building design.

3.2.3 Distribution Scheme

The electrical distribution for the building will originate from a 1600A, 480Y/277V switchboard in the Main Electrical Room where it would be provided with surge protection device. Owner metering for the building will be provided at the main switchboard and shall be compatible with DDC standards.

Normal power feeders will distribute 480V power to distribution panelboards in electrical closets in strategic locations within the building. The closets will distribute 480Y/277V to mechanical and lighting branch circuits and to step-down transformers for 208Y/120V branch circuit loads.

Mechanical power shall be distributed via Distribution panels at 480V throughout the mechanical plant rooms. It is envisaged that lighting power, general power and mechanical services power shall be segregated via different transformers and panel boards, wherever possible through the design of LV power distribution, as the design continues, where feasible and economical.

3.3 Distribution Boards and Panel Boards

Distribution boards, and panelboards will be sized to accommodate the building loads and an additional 25% spare capacity. Adequate space will be provided in distribution boards and panelboards for future connections and loads, as follows:

Distribution boards will include bussed space for future breakers.

Panelboards will have a minimum of forty-two (42) single-pole circuits per section and will include 25% spare breakers

Distribution boards and panelboards will be provided with full size copper bussing and 100%-rated neutral bus.

Main circuit breakers provided in panelboards will be molded case quick-make, quick-break, with thermal magnetic trip, bolt-on type.

The distribution system will be fully rated. Series ratings for panelboards will not be permitted. Equipment will be rated to withstand 110% of available short circuit current. Minimum Ampere Interrupting Capacity (AIC) rating and bus ratings of electrical equipment will be as indicated on the drawings.

Circuit breakers between 100A and less than 200A shall be equipped with adjustable instantaneous protection settings. Circuit breakers 200A and greater shall be equipped with fully adjustable (i.e. pickup and delay settings) electronic long time, short time & instantaneous protection (LSI).

3.4 Electrical Sub Metering

Electrical sub-metering shall be provided for the building in compliance with ASHRAE 90.1-2013. Individual energy meters shall be provided at the panelboards to monitor energy usage at feeders level serving lighting, receptacle and HVAC panelboards. The system shall measure real time current, voltage and energy consumption and demand hourly, daily, monthly and annually and be provided with remote monitoring by BMS.

The system must trend a minimum of monthly data per resource (e.g. electricity, natural gas). Additionally; The system must trend a minimum of hourly, daily, monthly and annual data for those energy end-uses making up 10% or more of the whole building consumption, with storage over at least 36 months and remote accessibility.

3.5 Transformers

Low-voltage transformers shall be dry-type, ventilated, with copper windings, and rated for a 150 degree C rise, with 220 degree C insulation. Full capacity taps shall be provided with two 2.5% taps above and four 2.5% taps below normal full capacity. Electrostatic shields shall be provided for transformers serving computer and telecommunication loads, and K-rated transformers will be provided for loads with high harmonic currents.

Transformers will be provided with vibration isolation using double neoprene pads mounted on concrete housekeeping pads or on steel channel systems where hung.

3.6 Feeders and Branch Circuits

All low voltage conductors will be copper and rated 600V with type THWN-2 or XHHW-2 insulation for wet or underground locations and type THHN insulation for dry and damp locations.

Branch-circuit conductors will have an ampacity rating not less than the overcurrent protective device rating. The minimum wiring conductor sizes permitted will be as follows per the National Electrical Code (NEC).

1) 20A Circuit: #12 AWG minimum
2) 30A Circuit: #10 AWG minimum

Multiple-wire branch circuits are not permitted. All branch circuits will contain a separate grounded conductor (neutral) and insulated equipment grounding conductor. Sharing of neutrals between circuits is not permitted.

All conductors will be fully installed in conduits/raceways throughout. Circuits of different panels or different voltages shall not be installed in the same raceway or pull box.

Feeders will be sized for 20% greater capacity than required by Code to allow for future growth. Feeders will be sized based on the over-current protection rating and including all necessary derating and voltage drop allowances. Three-phase feeders will be provided with 100% neutrals.

Electrical voltage drop, fault current and demand load calculations will be carried out in accordance with the requirements of the National Electrical Code. Voltage drop will generally be limited to 2% on Feeders and 3% on Branch Circuits.

3.7 Wiring Services

Gallery, Exhibit along with Lobby and Break spaces shall be provided with floor boxes to provide flexibility for changing exhibits – The feasibility and exact provisions are to be determined with the Museum. Power will be provided via a flush screed conduit that will feed flush mounted power boxes. The boxes shall be specially designed housings with reinforced box lids to minimize the deflection in the floor and therefore preventing any damage to the finish of the floor.

Wiring devices will be heavy-duty, NEMA Commercial Grade, manufactured by a single manufacturer, and rated for specific environment and application. Wiring device face plates will be white.

Mechanical/plumbing equipment (e.g. water heaters, HVAC units, etc.) furnished by plumbing/individual heating / ventilation contractor will be wired and provided with appropriate motor overload protection per manufacturer's recommendations and the National Electrical Code.

Small power systems will generally be provided throughout the building, consisting of receptacles and connection units to items of fixed equipment such as hand dryers, drinking fountains, overhead doors and dock levelers.

To comply with latest energy codes, at least 50% of the power receptacles inside the offices, break rooms, meeting rooms and classrooms will be automatically controlled by either a time clock or occupancy sensor from the Lutron control system.

IDF rooms (see section on IT and Telecom Systems) are expected to contain power panels, duplex convenience receptacles, quad 20 amp dedicated receptacles as required.

Duplex receptacles will be provided in all storage rooms, restrooms, electrical and mechanical rooms, etc. All receptacles within 6' of sinks, therapeutic tubs and in kitchens will be ground fault interrupting (GFCI) type. A GFCI protected receptacle will be provided in all janitor's closets, mechanical and electrical rooms, indoor wet locations and locker rooms. All duplex or special receptacles will be provided as required for specialized equipment, as determined during the design, and will typically be on a separate dedicated circuit.

No more than eight (8) general use duplex receptacles will be loaded on one (1) 20A circuit. All receptacles, outlets, junction boxes, gutters, switches, controllers, motors and appliances will be permanently engraved with panel name and circuit number.

A GFCI receptacle will be provided within 25 feet of all heating, ventilation air-conditioning and refrigeration equipment. Receptacles will be located on the same level as the equipment. Receptacle will not be connected to the load side of the equipment disconnected means. Weatherproof GFCI protected duplex receptacles will be provided adjacent to all roof mounted equipment outdoor compressors. All appliances will comply with Article 422 of the National Electrical Code.

All switch disconnects will be horsepower rated, fused and heavy-duty type.

Toggle switches will be full size, heavy duty, NEMA Commercial Grade, AC quite type, rated 20A, 120V/277V.

3.8 Raceways

Refer to the project's contract for a detailed breakdown of the consultants' division of responsibilities.

The cable containment will be clearly separated, and it will be possible to identify the system category. The separation distances will be designed in accordance with the tables below.

3.9 Lighting Controls

Buro Happold will work closely with the lighting designer to coordinate the lighting control requirements for the selected fixtures. A Network lighting control system will be employed in the project. Lighting control devices, including occupancy sensors and switches, will be provided per ASHRAE 90.1-2022 requirements. This will include a multi-level lighting controls, automatic shut-off controls and automatic daylight controls, with interface to the BMS for monitoring. Basis of design Lutron Athena.

Space Type	Section 9.4.1.1 Interior Lighting Controls Requirements					Additional Lighting Controls
	Manual ON or Partial Auto ON	Bi-level Lighting Control	Automatic Daylight Control	Partial Auto OFF	Full Auto OFF or Scheduled Shutoff	
Lobby, Typical			●	●	●	TC, SC, DM
Classroom / Lecture	●	●	●		●	OS, SC, DM
Conference / Meeting	●	●	●		●	OS, SC, DM
Lounge / Breakroom	●	●	●		●(1)	VS, SC, DM
Food Preparation Area	●	●	●		●	TC, SC
Café / Dining Area	●	●	●		●	TC, SC
Locker Room	●	●	●		●(1)	OS, SC
Corridor / Transition			●	●	●	TC, OS
Stairway		●	●	●	●	TC, OS
Restrooms			●		●(1)	OS
Retail / Sales Area	●	●	●			TC, DM
Electrical / Mechanical			●			MS
Storage	●	●	●		●	OS, MS

TC = Astronomical Timeclock; SC = Scene Controller; VS = Vacancy Sensor (auto off, manual on); DM = Dimming; OS = Occupancy Sensor (auto on/off); MS = Manual Switch

Note (1): Automatic Full OFF is required for this space.

Note (2): For atriums over 20 ft in height.

Note (3): Lighting power of each luminaire shall be automatically reduced by a minimum of 30% when there is no activity is detected within a lighting zone for 20 minutes. Lighting zones for this requirement shall be no larger than 3,600 ft^2.

3.10 Secondary Source of Power

A source of secondary power is required by code for emergency loads in the case of a power outage. Secondary power will be provided to emergency systems by means of an emergency diesel generator. The emergency generator(s) shall provide full power during outage to critical life safety systems, to enable the Museum to be evacuated.

As an alternate, a larger generator will be provided to backup power to life safety systems as well as to provide standby power to heating, cooling and humidification (no ventilation) to the galleries to maintain environmental conditions in these spaces.

The system will be designed under NFPA 110 standard as a Class 24, Type 10 and have subbase day tank sufficient to provide the necessary backup for 24 hrs.

The EPSS (Emergency power supply system) will be installed in the 2 hr rated 250 sq.ft main emergency electrical room. The room will be located above the flood plain. In accordance with NEC 110 requirements, there shall be at least one entrance and egress point to the designated working space for large electrical equipment. Doors serving this space must open in the direction of egress travel.

MI feeders will be routed from the main emergency distribution board to the emergency panel boards located within 2 hr rated closets. BH will work closely with the architect to size and locate the new main emergency electrical room as the design progresses.

Based on the proposed size of the building, a 200 kW 480/277V generator is anticipated. The Generator housed in a sound attenuated enclosure with a 100kW radiator-mounted load bank.

A layer of protection shall be added to the enclosure to protect the engine against freezing temperatures which includes thermostatically controlled motorized louvers and battery warmers. A generator annunciator communicating with the generator control panel will be provided at the security office.

Provisions for connecting a temporary source of power for maintenance or repair of the secondary source of power will be provided at the grade level next to the generator. Basis of Design Trystar TBDS-105P with kirk keys and strip heater.

Below table lists the anticipated loads requiring secondary sources of stand-by power:

Description	Approx. kW
Emergency Lighting	20kW
Fire Pump	60 kW

Table 3—2 Emergency Power Requirements

Alternate 1:

To provide secondary power to life safety and emergency systems, as well as mechanical loads for heating, cooling and humidification a 600 kVA generator is anticipated. The generator will be housed in a sound attenuated enclosure with a 300 kW radiator-mounted load bank. This generator will be housed externally and will requires the same protections previously listed. Below are the anticipated loads secondary power:

Description	Approx. kW
Emergency Lighting	20kW
Space Conditioning for Galleries, (including Chillers, electric boiler, Circulating Pumps, AHU Fans and Electric humidification)	450 kW

Refrigeration	5 kW
Heat Trace	20kW
Sump pumps	15 kW
Fire Alarm system	10 kW
Security Alarm system	15 kW
IT/Telecom Equipment	15 kW
AV equipment	10 kW
BMS	5 kW
Fire Pump	60 kW

3.11 Automatic Transfer Switch and Standby Distribution

Emergency and fire pump power will have to be fed via separate automatic transfer switches (ATS) that provide normal or generator backed power. The ATS for emergency loads, fire pump and emergency distribution system will require a dedicated 2-hour rated emergency electrical room to be situated next to the main electrical room and in close proximity to the generator in order to reduce the lengthy runs of feeders.

BH will work closely with the architect to size and locate the new main emergency electrical room as the design progresses. The automatic transfer switch (ATS) shall be an open-transition, four-pole with a switched neutral, electrically operated and mechanically held contactor-type mechanism. A bypass isolation feature is required for the emergency ATS. Connections to the Building Management System (BMS) shall provide monitoring of the transfer switch, including its status and position.

Alternate 1:

Under this alternate the mechanical systems within the gallery spaces will be backed up by emergency power. This will include the addition of a 1200A 4 pole ATS dedicated to optional standby loads. This ATS will be fed from the emergency generator and a 1200A distribution board will serve mechanical equipment required.

3.12 Grounding and Bonding System

Grounding system, which will be designed in accordance with the National Electrical Code and ANSI/TIA/EIA 607 shall be tied to the existing grounding network.

Connections will be exothermic welds, or with UL listed compression connections. Bonding jumpers will be provided per National Electrical Code. All feeders and branch circuits will be provided with a ground conductor, regardless of raceway type.

The main service switchboard room will be fitted with main copper ground bar for general connection of grounding systems. Each of the copper ground bars will allow for the connection of ground provisions with spare connections and will incorporate a link facility to enable disconnection for test purposes, without the loss of the system ground connection. These ground bars will be bonded together and connected back to the single point ground in the main incoming service.

Surge Protective Devices (SPD) will be provided at the main switchboards and at all AV panelboards. SPD protection will be the parallel type, where surge protectors are connected in parallel with the circuit and operate when a transient voltage exceeds a preset limit. Parallel surge protectors have little interaction with the circuit under normal conditions.

3.13 Lightning Protection

A lightning protection system will be provided to fully protect the building, its contents and occupants against the hazard of a lightning strike. The lightning protection system will comprise four main elements as follows:

1. Early streamer Emission (ESE) Air terminals with remote test kit that will provide the Museum remote access to their equipment to monitor the condition and operational status of the ESE, Basis of Design Prevectron 3 Connect.
2. Down conductor network through structural elements
3. Ground rods.
4. Cross-bonding of other incoming services and the structure
5. Down conductors are to be provided and terminated in ground pits equipped with testing facilities located below grade.

The lightning protection system will be fully bonded to other systems, which shall include, but not be limited to, the following elements:

6. Electrical grounding system
7. Equipment exposed at roof level
8. Roof level metalwork
9. Main water service

10. Main metallic drainage services

11. Incoming gas main, if available

3.14 Fire Detection and Alarm

The building will be provided with a new addressable fire alarm system installed in accordance with the provisions of IBC section 907 and NFPA 72. The new fire detection and alarm system will be an alarm notification system and will be comprised of sprinkler flow and valve tamper switches, full coverage smoke detectors, smoke detectors in elevator lobbies and machine rooms for elevator recall, strobe and speaker notification appliances throughout the building, and an addressable fire control panel (FACP).

The addressable system will be capable of identifying precise areas of fire/alarm enabling rapid direct response to an incident. The design of the fire alarm system will comprise the division of the building into zones for ease of identification. The size of each zone will follow statutory standards and requirements of NFPA 72 and local codes. The zones will generally be enclosed within a fire compartment to be determined by architectural fire walls and fire barriers.

The system loops will contain modules to interface and control the following:

1. Air-handling plant

- VESDA Air sampling detection for the galleries and art vault
- Sprinkler tamper and flow switches
- BMS system
- Door access control system
- Magnetic door holders
- AV systems to mute audio
- Centralized lighting control system
- Elevators recall functions.
- Kitchen equipment hoods.
- Shunt trip of Kitchen equipment under the hood.

Fire system wiring will be fully installed in EMT conduit, colored red.

Fire alarm and communication system equipment, including booster power supplies (BPS), fire alarm terminal cabinets (FATC), electric water flow devices, and automatic fire and smoke detection devices, will be powered from normal power branch circuits and include battery backup for 24 hrs standby followed by 15 min of operation during alarm conditions.

Visual and audible alarm indication will be installed in all public spaces, and back of house spaces for full coverage, to ensure both abled and disabled persons are aware of the emergency. Audible alarm indication shall be provided at a minimum of 15dBA above ambient noise level, with additional speakers provided for high-ambient noise spaces.

Pull stations shall be semi-flush mount, double-action type and will be provided with weatherproof cover where exposed to high levels of moisture.

Smoke detection devices will be installed for full coverage as required by owner standards and to protect ceiling voids as required by code. Smoke detection will also be installed in the return air path of AHU systems above 2,000 cfm.

The FACP will include paging capability to individual fire zones. Remote annunciator(s) will be placed at main entrances to the building. The building shall have a common entrance with the City Fire Department for the location of the FACP, and graphic annunciator.

A firefighter and police communication system is required by code, a emergency radio communication system will be provided for the building and shall be coordinated with the City Fire Department and the City Police Department.

Area of Rescue Assistance two-way communication system will be provided between all areas of refuge and security desk. Phone line connection to 911 for when security desk is unoccupied.

A multiple-station smoke detection system will be installed in accordance with the provisions of the local Code including but not limited to:

12. Remote Annunciator panels in lobbies will be considered in the building entrances
13. Pull station

- At front desk and security station
- At each main fire alarm panel
- Egress exit to stairs

14. Speakers

- Coverage with class A wiring
- Provision in stairways every other floor

15. Speaker Strobes

- Building common areas
- Building public spaces
- Building Event common areas
- Building Event public spaces

16. Smoke detectors (provided as a full coverage as per Owner standards)

- Equipment rooms
- At the top of stair shafts
- Above smoke doors with door holders
- Above fire alarm control panel
- Above booster supplies for smoke dampers
- Within proximity of a fire smoke damper

17. Beam Detectors/VESDA air sampling

- Galleries
- Art vault
- Atrium/High ceiling areas.

18. Heat detectors

- Boiler Room
- Kitchen area

19. Duct detectors

- Return ducts where the CFM exceeds the minimum CFM

20. Rigid conduit (painted red) for:

- Installations up to 8′ from finished floor in rough service areas
- Mechanical rooms
- Loading docks

4 Plumbing Systems

4.1 Introduction

The following chapter summarizes our current understanding of the Basis of Design following the workshops and presentations held during design. For the forthcoming estimate, Buro Happold has provided narrative sections addressing the plumbing design intent. All scope to be new and code compliant. Limit of scope is up to 10' outside of the building.

4.2 Applicable Codes and Standards

The following list is intended to illustrate the minimum standards which the proposed building design is intended to satisfy.

1. International Building Code, 2018 with amendments

2. International Fire Code, 2018 with amendments

3. International Gas Code, 2018 with amendments

4. International Plumbing Code, 2018 with amendments

4.3 Plumbing Fixtures

All plumbing fixtures will match any and all Owner standards, and will comply with the following:

1. Fixtures will be provided with CP brass trim and individual stop valves.
2. Water closets will be vitreous china, wall hung, siphon jet, high efficiency flushometer type.
3. Urinals will be vitreous china, wall-hung, siphon jet high efficiency flushometer type.
4. Public lavatories will be provided with electronic sensor operated faucets.
5. Electric water coolers will be wall-hung, self-contained, electric, wheelchair-accessible units with dual height bowls and bottle fillers.
6. Mop receptors will be provided in janitor closets at each floor.
7. Accessible fixtures will be provided in accordance with ADA as well as with State and Local Plumbing Codes.
8. All fixtures shall be provided with individual stop valves.
9. Interior hose bibs in toilet rooms and mechanical rooms and exterior wall hydrants at street level along the

10. building wall will be provided.

11. All plumbing fixtures will be operated by electronic sensors utilizing integral battery supplied direct current.

Fixture quantities will be based on code driven requirements. Refer to architectural drawings for bathroom and plumbing fixture layouts. All plumbing fixtures shall be high efficiency, low flow type designed to the following minimum criteria:

12. Water Closet: 1.28 gpf

13. Urinals: 0.125 gpf

14. Lavatories: Electronic, no touch faucets 0.35 gpm

15. Sinks: 1.5 gpm

16. Drinking Fountain (w/ bottle filler): 1.1 gpm

17. Mop Sinks: 2.5 gpm

4.4 Sanitary

Sanitary drainage from toilet rooms and other plumbing fixtures and equipment will be gravity discharged to the building sewer system. Floor drains furnished with trap primers will be provided in all core toilet rooms and mechanical rooms. All fixtures will be vented to protect trap seals in accordance with the plumbing code. The main vent stacks will be run through the roof.

Provide an above floor mechanical grease interceptor for the café server. The café is supposed to be a grab and go program without in-house cooking. The grease trap requirement needs to be reviewed for dishwashing needs with the AHJ. No general drains are intended to go to the grease trap. No 140° hot water is intended to be required for the café.

4.5 Storm Drain

Flat roofs will have primary and secondary storm systems. Primary storm system will discharge to the street sewer. Secondary Storm drainage will discharge to the exterior 18" above grade. Pitched roofing will be discharged to gutters and connected to the civil storm system. Horizontal storm drain piping will have a 1" anti-sweat insulation.

Condensate drain stub will be stubbed into each retail tenant space for HVAC condensate. Condensate lines will be connected to the Storm system with a check valve prior to connection.

4.6 Potable Water

A new 3-inch domestic water service will serve the building. Water meter and reduced pressure zone type backflow preventer will be provided in the building water service room. Water meter and backflow preventers will be installed in accordance to the local authority having jurisdiction (AHJ). There is no current information on street pressure. It is assumed that street pressure will suffice for the fixtures are the first floor.

Non-freeze type wall hydrants will be provided around the building exterior at the street. Electronic trap primer assemblies shall be provided to provide water to all floor drain traps as required by code.

4.7 Domestic Hot Water System

Duplex 120-gallon horizontal electric water heaters will be provided the entire building. The hot water heater assembly will have a mixing valve and hot water circulation pump. Leak detection and drain pan will be provided. 140° hot water is not required for the café.

4.8 Insulation

All piping, components, and equipment subject to sweating, heat loss or freezing (hot and cold water and horizontal storm drainage) will be insulated with appropriate thickness of fiberglass and fire-retardant jacket in accordance with the latest State Energy Code and the Owner's standards.

Insulation will be covered with an all-service jacket equal to Owens Corning Co. Fiberglass 25 ASJ vapor barrier jacketing. Fitting and valve covers will be pre-molded PVC covers with fiberglass insert.

All piping exposed to freezing conditions will be provided with electric resistance heat tracing for freeze protection. The electric resistance wire will generate 12 Watts per foot and will be installed on the pipe under piping insulation.

4.9 Metering Requirements

Main building meter will meet local water department requirements. No additional meters are required. Hold allowance for two additional meters on sub systems.

5 Fire Protection

5.1 Introduction

The following chapter summarizes our current understanding of the Basis of Design following the workshops and presentations held during design. For the forthcoming estimate, Buro Happold has provided narrative sections addressing the plumbing design intent. All scope to be new and code compliant. Limit of scope is up to 10' outside of the building. Factory mutual requirements do not need to be met.

5.2 Applicable Codes and Standards

The following list is intended to illustrate the minimum standards which the proposed building design is intended to satisfy.

1. International Building Code, 2018 with amendments
2. International Fire Code, 2018 with amendments
3. International Gas Code, 2018 with amendments
4. International Plumbing Code, 2018 with amendments
5. NFPA 13, 2019 Edition

5.3 Source of Water

The water entrance will be a 6" main connect to the street. The water entrance will be protected by a dual alarm control assembly. The building will have two floor control valve assemblies. Due to the height of the building no standpipe system is required.

An automatic Fire Pump Assembly will be provided to supply the required sprinkle demand within the basement mechanical room. The existing flow tests at Keller Rd. are 650 gpm @ 80 psi static, 28 psi residual and 920 gpm @ 70 psi static, 30 psi residual. The Fire Pump Assembly will be rated at 500 GPM and 50 HP and will consist of fire pump, 3 HP Jockey Pump. The fire pump controllers and electrical feeds will be water-tight. It is assumed that the fire pump will need to be oversized to accommodate the dead leg to the building which will be over 1000' of linear pipe. Fire pump room needs 2 hour rated access to the exterior. The fire pump requires a secondary source of power, so an electrical generator will be provided.

As an alternate hold an allowance for locating the fire pump near the street in a head house. The fire pump, controller, fire department connections, backflow preventer, and wet alarm control valve assembly will all be located at the head house. The pump will then distribute to the building floor control valve assemblies. Is not intended for the fire pump to supply the additional site hydrants. It will be for the building sprinkler demand only.

5.4 Sprinkler System

The building will be sprinkled throughout. The sprinkler system will be hydraulically calculated based on the criteria outlined in Table 5—1.

Space	Classification of Occupancy	Sprinkler Coverage	Density	System Type
Assembly, Galleries	Light Hazard	225SF/Sp. Head	0.10 GPM/1500 SF	Wet
Mechanical and Storage Areas	Ordinary Hazard	130 SF/Sp. Head	0.20 GPM/2000 SF	Wet

Table 5—1 Sprinkler System Types

Basis of Design

A wet-pipe sprinkler system will be provided in all areas except in areas subject to freezing. The loading dock and combustible overhang at the exterior amphitheater will be protected by a dry system. Dry type pendant sprinklers attached to the wet sprinkler system will be provided for vestibules. A nitrogen system will be provided for the dry system to protect the piping against corrosion.

Sprinklers in mechanical and Storage areas will have upright sprinkler head guards. In mechanical areas where ductwork exceeds 4' 0" in width sprinklers will be provided above and below ductwork to provide proper coverage. All sprinkler heads will be quick response type.

All automatic sprinkler mains and branches will be schedule 10 black steel pipe joined by grooved fittings with mechanical joints for pipe sizes 2-1/2-inch and larger. Sizes 2-inch and smaller will also be schedule 40 black steel pipe with cast iron threaded fittings. All dry piping to be galvanized black steel in the sizes listed above.

Alternate Design: Pre-Action System

As an alternate, particularly sensitive areas will be protected by Pre-action extinguishing systems to avoid water damage. The initiation of the system actuation will be determined between an air sampling or detection systems. All systems shall be provided with monitoring and alarm functions through the fire alarm system. Spaces to be protected by a pre-action system include the following:

- Permanent Gallery
- Temporary Gallery
- Birch Creek Gallery
- National Treasures Gallery

6 Structural Engineering

6.1 Introduction

The new Cherokee Heritage Center and Museum will feature a series of distinct building volumes, each constructed with architectural reinforced concrete and topped with timber roofs that vary in style from one volume to the next.

1. The Great Hall, located north of Birch Creek, is a reinforced concrete structure supporting a glue laminated timber (glulam) diagrid roof.

2. The Café, located south of Birch Creek, is a single-story reinforced concrete and steel structure supporting a glulam grid shell roof.

3. The Permanent Gallery, located south of Birch Creek, is a single-story reinforced concrete structure supporting a sloping glulam roof.

4. The Changing Gallery, located south of Birch Creek, is a single-story reinforced concrete structure supporting a sloping glulam lamella roof.

5. The Birch Creek Hall Gallery and Connection Bridges, located along the Birch Creek, are reinforced concrete and steel structures supporting conventional glulam roofs.

6. The Small Gallery, Gift Shop, and Flexible Classroom, located North of Birch Creek, are reinforced concrete structures supporting conventional glulam and mass timber roofs.

7. The Office, Loading Dock, and other support buildings are reinforced concrete structures supporting reinforced concrete roofs. There is additionally a one-story basement below the loading dock.

Although the overall design comprises approximately ten distinct volumes, the building will be separated into two structurally independent sections by an expansion joint. Each section will be designed to resist both gravity and lateral loads without reliance on the other.

At this stage the design team has not received a Geotechnical Engineering report to confirm ground conditions and flood elevations. Once received, this report will confirm the foundation strategy and hydrostatic forces imposed on the structure.

The mass timber structure has been designed assuming Construction Type IIB in coordination with the Architect, where compliance with fire-resistance requirements is achieved using an automatic sprinkler system rather than increasing member dimensions for additional char layers on framing members.

Preliminary framing plans for Level 1 and the Roof level can be found in Appendix A.

Figure 6-1 Cherokee Heritage Center & Museum Exterior Rendering (Safdie Architects)

6.2 Preliminary Foundation Strategy and Site Considerations

6.2.1 Foundation Strategy

Subject to confirmation through the planned Geotechnical investigation, it is anticipated that walls and columns will be supported on shallow foundations wherever feasible. Foundations will be designed to extend below the local frost depth to prevent frost heave and ensure long-term stability. Grade beams will be incorporated as required to provide continuity between isolated footings and to resist differential settlement wherever necessary. Alternative foundation systems such as deep foundations may be considered where soil conditions or loading demands require it.

6.2.2 Hydrostatic Water Pressure

Considering the site and the relative location to water, hydrostatic pressure may need to be addressed in the foundation and slab-on-grade design. Depending on the findings of the Geotechnical investigation, additional measures - such as increased footing size, structured slabs, waterproofing systems, or drainage provisions - may be required to accommodate the added loads and mitigate any water-related effects.

6.2.3 Mechanical Trench and Loading Dock Basement

Trenches and a full-height basement beneath the loading dock will be incorporated to house mechanical, electrical, and plumbing equipment, as well as service routing for the project. A minimum 4" concrete slab-on-grade will be provided in these areas – subject to confirmation by the Geotechnical Engineer. Concrete retaining walls will enclose these spaces on all sides, and additional stub columns may be required locally to support the Level 1 gallery slabs above.

The strategy for the trenches and basements will be further developed as the design progresses.

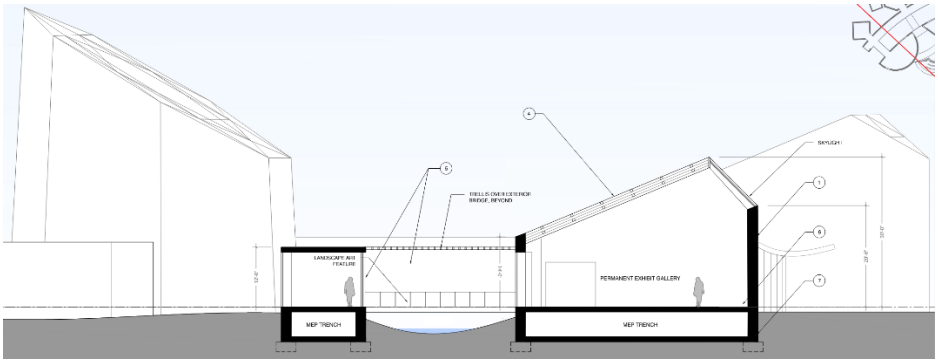


Figure 6-2 Section at MEP Trenches beneath Museum Galleries

6.3 Building Superstructure

The following section presents the structural design approach for the building's superstructure, addressing both vertical and horizontal load-resisting systems. It outlines strategies for supporting gravity loads through columns, walls, and floor systems, as well as methods for resisting lateral forces from wind and seismic events. Key considerations include material selection, structural continuity, and integration with architectural requirements to ensure performance, durability, and constructability.

Refer to Appendix A for preliminary structural framing plans.

6.3.1 Movement Joints

The new structure is to be divided into separate sections, interconnected with an expansion joint. The joint is anticipated to provide approximately a 1/2-inch clear separation – although further analysis is required to verify this. The joint will allow potential differential movements & settlement of the two sections of the building. The location of the expansion joint can be found in the figure below.

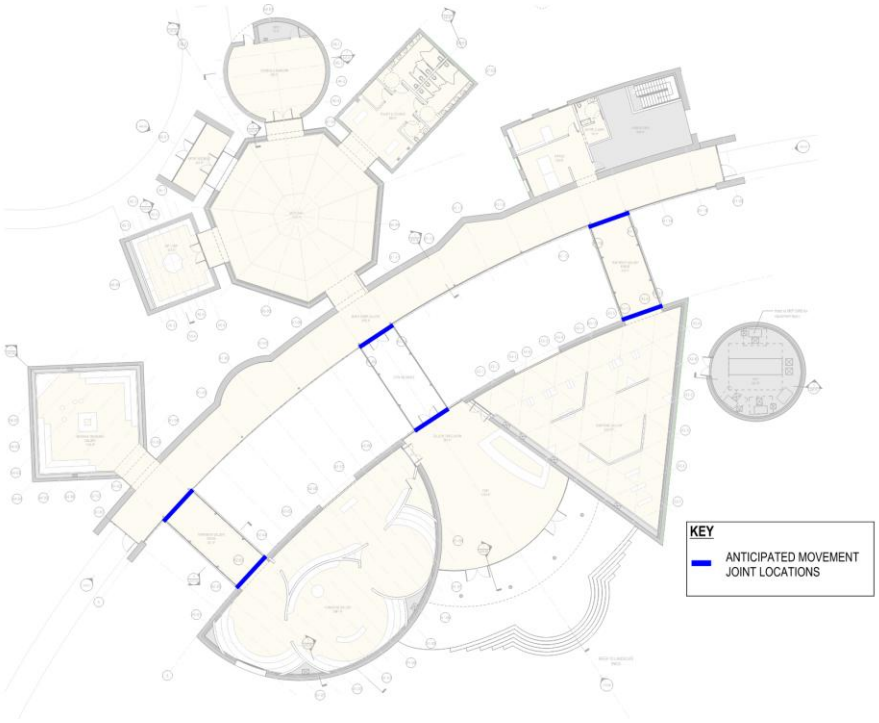


Figure 6-3 Anticipated Movement Joint Locations

6.3.2 Level 1 Structure

Where mechanical trenches or basement spaces occur below, the Level 1 floor will be supported by one-way and two-way reinforced concrete slabs ranging from 10 to 12 inches in thickness. Additional stub columns may be introduced locally

within the basement areas - coordinated with architectural layouts and MEP services - to reduce slab spans and optimize slab thickness. These columns will also help control deflection and improve overall structural efficiency.

Considerations for load transfer and integration with service penetrations will be addressed as part of the ongoing design development. This strategy will continue to evolve in coordination with the architectural and MEP teams as the design progresses.

6.3.3 Great Hall Roof

The Great Hall serves as the main entrance to the Heritage Center and features concrete walls up to 60 feet high that support a sloping glulam roof. The current design intent is to utilize a sandwich wall system consisting of an exterior 5" concrete layer, an insulation layer, and an interior 14" concrete layer into which the roof beams will be anchored. The glulam beams vary in depth as illustrated below.

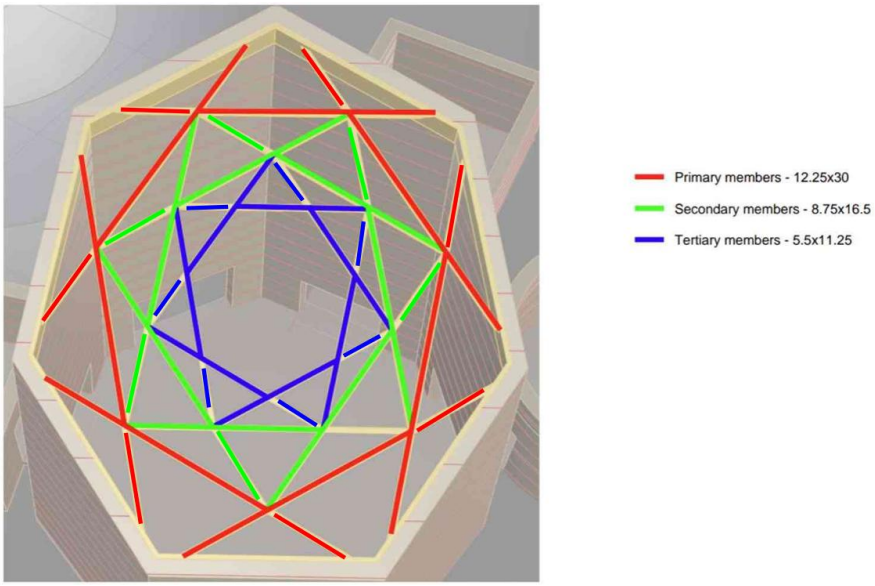


Figure 6-4 Great Hall Roof – Preliminary Framing Sizes

6.3.4 Café Roof

The café is situated between the curved wall of the permanent gallery and the straight but angled wall of the changing gallery. As shown below, the current scheme is a mass timber grid shell with a flat back edge beam, a line of support at glazing, and four exterior columns.

Figure 6-5 Cafe Roof – Exterior Axonometric (L) and Architectural Plan Layout (R)

The portion between the back edge beam and the glazing will have members primarily acting in compression like a typical grid shell. Above the glazing will be a steel HSS ring beam to restrain the outward trust. The back edge beam will be a 12x24 glulam beam spanning wall to wall. Outboard of the glazing will still have the layout of a grid shell, but members will be primarily in bending. As indicated in Figure 6-6 Cafe Roof – Preliminary Structural Framing Strategy (L) and Roof Decking with Multiple Layers of Plywood to Accommodate the Curvature of the Roof (R).Figure 6-6, a Y-Column, or something similar, will need to be utilized to break up the span of the overhang.

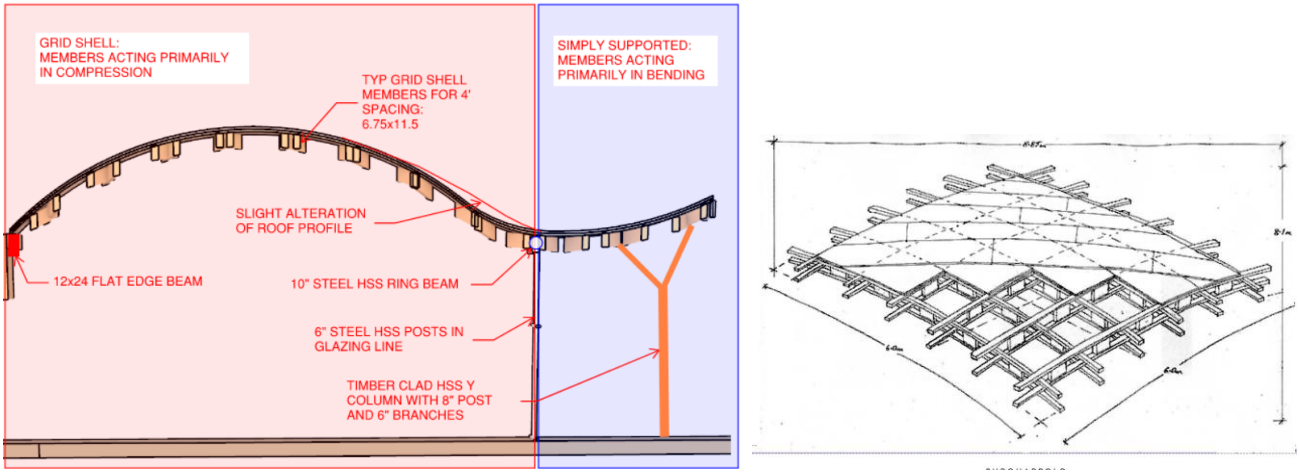


Figure 6-6 Cafe Roof – Preliminary Structural Framing Strategy (L) and Roof Decking with Multiple Layers of Plywood to Accommodate the Curvature of the Roof (R).

A 4′ × 4′ grid shell spacing has been selected as it is the maximum spacing that will allow typical single 4′ x 8′ plywood sheets to be laid across grid shell members to form the roof deck. 2-4 layers of thin (1/4"-1/2") plywood sheets will be utilized as the thinness will allow for slight bending of the plywood to match the proposed curvature of the roof. Careful coordination with the contractor will be required to ensure the layout and orientation of roof members will allow for the bending of the plywood.

Figure 6-7 - Cafe Roof - Precedent Lamella Connection

All grid shell members - both inboard and outboard of the glazing - will be 6.75″ × 11.5″ glulam beams. They will all be connected following a lamella pattern (see above). To achieve a curved lamella geometry, beams will typically be 8′ long (twice the grid length) and connect into the center of adjacent beams. They also will have to be curved to follow the profile of the roof and likely will require complex machining to precisely join timber members directly to one another.

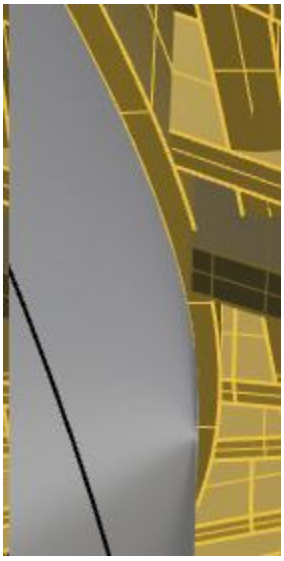


Figure 6-8 Cafe Roof – Interior Axonometric from Below of the Complex Connections at the Curved Wall of the Permanent Gallery

One final complexity to note involves the connections to the concrete walls. For both the Permanent and Changing Gallery walls, the angles at which the beams frame into the walls will be unique. Additionally, at the curved wall of the Permanent Gallery, fabricating a curved edge beam to match the wall profile and support the roof decking would be highly challenging. Instead, we propose framing the incoming roof members directly into the concrete wall and offsetting the edge beams slightly from the wall.

6.3.5 Permanent Gallery Roof

The Permanent Gallery features a semi-circular layout with 16 glulam members spanning between a 14″ concrete back wall and a curved 16″ concrete wall. The curved wall is larger due to its proximity to the cafe grid shell. Glulam member depths vary with span length, with the deepest sections located at the center and the shallowest toward the edges. Preliminary sizing schematically below and in the accompanying Framing Plan.

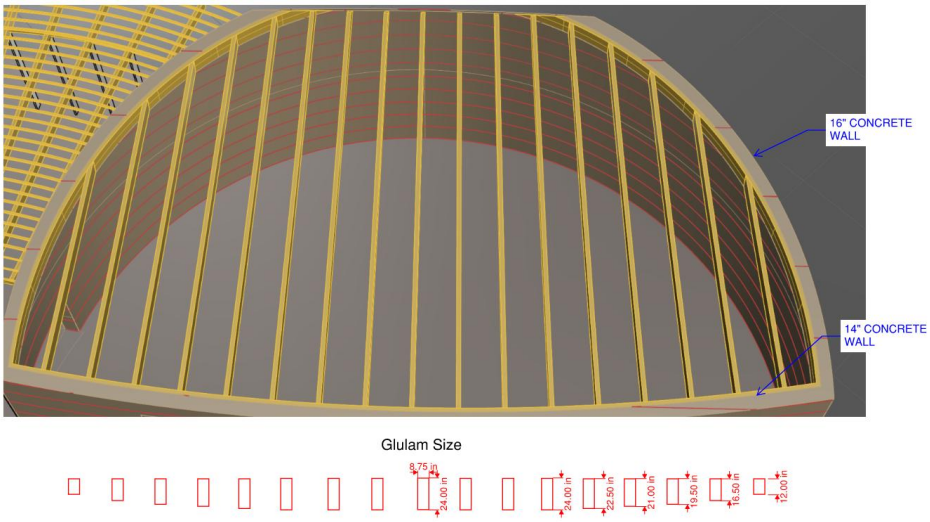


Figure 6-9 Permanent Gallery – Structural Framing Strategy

6.3.6 Changing Gallery Roof

The Changing Gallery is triangular in plan, featuring a slightly curved back wall. The concrete wall adjacent to the cafe is 16″ thick, while the other two walls are 14″ thick. The roof consists of a flat glulam lamella system with primary beams of matching depth and smaller infill beams utilized to reduce tongue-and-groove timber deck spans.

Figure 6-10 Changing Gallery – Interior Architectural Axonometric (L) and Architectural Plan (R)

In addition to the flat lamella option, a curved lamella configuration was investigated. Layouts of each are provided below.

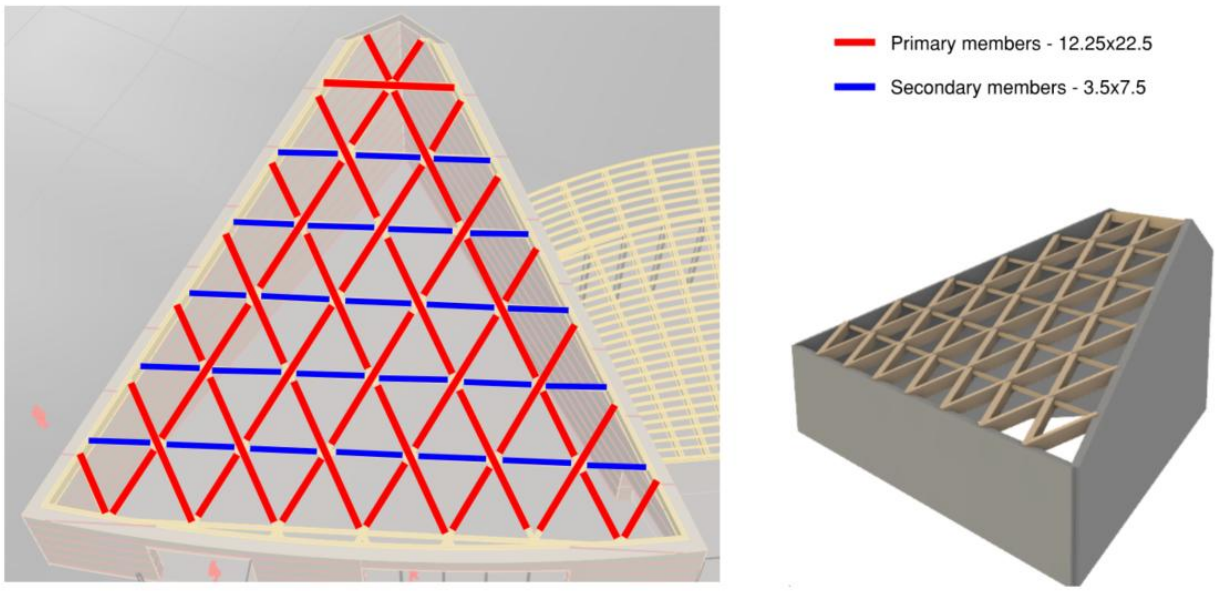


Figure 6-11 Changing Gallery – Structural Framing Strategy – Flat Roof Geometry

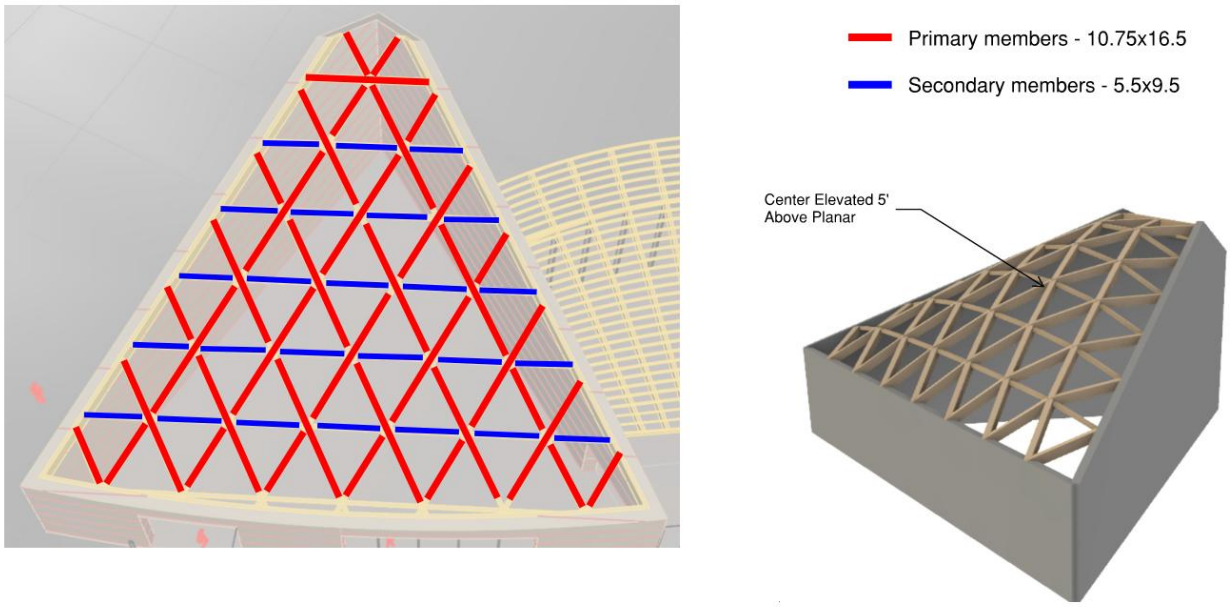


Figure 6-12 Changing Gallery – Structural Framing Strategy – Curved Roof Geometry

6.3.7 Birch Creek Hall Gallery and Connection Bridge Roofs

The Birch Creek Gallery runs along the north side of Birch Creek. The roof of the Hall Gallery is supported by a 12" concrete wall on one side and a line of glazing with HSS posts spaced at 24' on center. Glulam roof beams are concealed within the gallery ceiling but remain exposed at the bridge connections crossing Birch Creek. As shown in the accompanying framing plan, a 10x6 HSS girder is utilized between HSS posts to reduce structural depth. Alternatively, this could be a 6.75x13.75 glulam girder.

Figure 6-13 Birch Creek Hall Gallery – Interior Architectural Rendering

Three Connection Bridges span over Birch Creek connecting the Birch Creek Hall Gallery to the Changing and Permanent Galleries and the Cafe. The span of the connection bridges is approximately 32' and will be a concrete slab on metal deck supported by four W12 beams. These beams will need to be galvanized and preferably cambered. The roof of the Connection Bridges will be supported using a similar strategy to the Birch Creek Hall Gallery, but with a glulam instead of steel girder. An alternate concrete beam option was also provided.

Figure 6-14 Connection Bridges – Exterior Architectural Rendering (L) and Preliminary Level 1 Structural Framing Strategy (R)

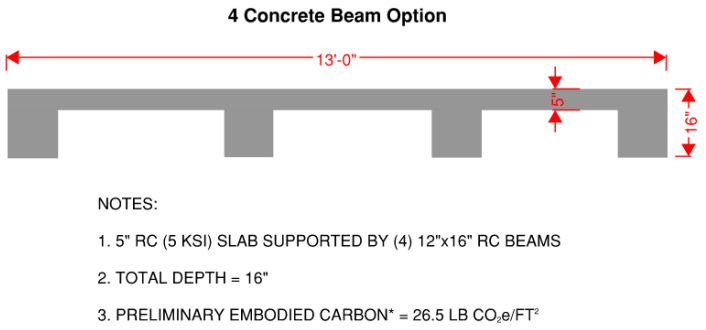


Figure 6-15 Connection Bridges – Alternate Concrete Framing Option

6.3.8 The Small Gallery, Gift Shop, and Flexible Classroom Roofs

These smaller spaces will again be comprised of 14" walls supporting sloping timber roofs. The small gallery and flexible classroom will each have glulam beams spaced at 6' on center. The flexible classroom will have a typical glulam beam construction as the beams will span in the same direction as the roof slope. However, the small gallery beams will run perpendicular to the roof slope and need to be built-up as shown below. At the gift shop, timber joists will be used instead of glulam.

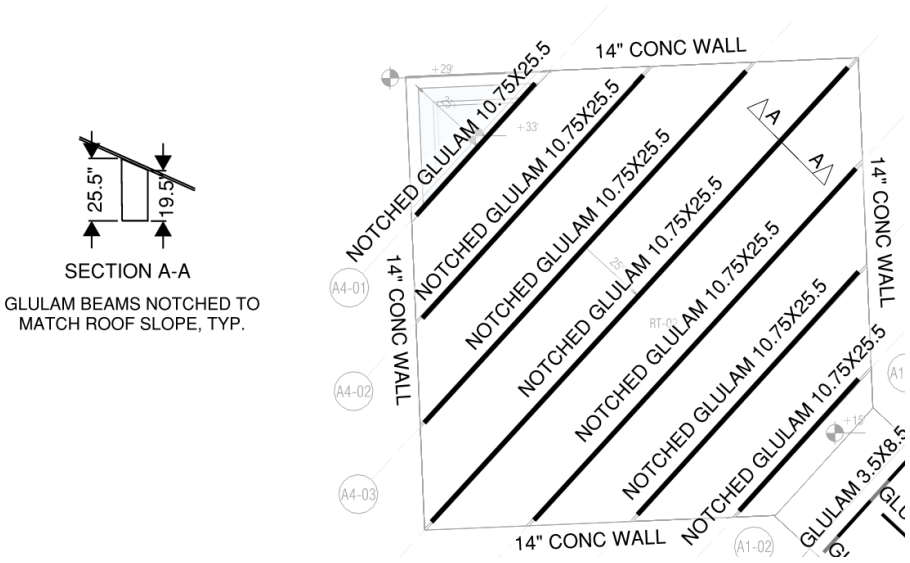


Figure 6-16 Small Gallery Roof – Structural Strategy

6.3.9 Office, BOH, Loading Dock, and Restrooms

The office loading dock and miscellaneous space will be reinforced concrete structures with 12" concrete walls, a 10" concrete flat plate roof, and infill 14" concrete columns to break up the spans. These columns will be coordinated with Architecture and MEP as their locations in the Office/Loading Dock Building will impact the MEP basement space below.

6.3.10 Architectural Concrete

Architecturally exposed concrete is used throughout the project. Generally, the areas requiring this finish are limited to the external faces of building walls and public/lobby areas.

Refer to architectural drawings to confirm all areas of architecturally exposed concrete.

6.4 Structural Design Criteria

6.4.1 Design Standards

The structure is designed to meet or exceed the minimum requirements of the 2018 International Building Code (2018 IBC), and the following reference standards, as modified by the Oklahoma Building Code:

Loads	ASCE 7-16	'Minimum Design Loads for Buildings and Other Structures', by American Society of Civil Engineers
Steel	AISC 360-16	'Specification for Structural Steel Buildings', by American Institute of Steel Construction
Steel	AISC 341-16	'Seismic Provisions for Structural Steel Buildings', by American Institute of Steel Construction
Welding	AWS D1.1:2015	'Structural Welding Code – Steel' by American Welding Society
Concrete	ACI 318-14	'Building Code Requirements for Structural Concrete', by American Concrete Institute
Masonry	ACI 530-16	'Building Code Requirements for Masonry Structures', by the American Concrete Institute
Cold Formed Steel	AISI S100-16	'North American Specification for the Design of Cold-Formed Steel Structural Members' by American Iron and Steel Institute
Aluminium	AA-ADM 1-15	'Aluminium Design Manual' by Aluminium Association
Timber	AWS NDS-2018	National Design Specification for Wood Construction

6.4.2 Risk Category and Importance Factors

In order to match the existing design standards, the structural design of the Museum Expansion is based on the following risk category (2018 IBC) and its associated importance factors:

Risk Category	II (T. 1604.5)
Snow Importance Factor, $I_{E,Snow}$	1
Wind Importance Factor, $I_{E,Wind}$	1
Seismic Importance Factor, $I_{E,Seismic}$	1

6.5 Loading

6.5.1 Gravity Loads

General criteria for dead and live loads are given in this section.

6.5.1.1 Material Self Weight

Material Densities	lb/ft^3
Concrete (normal weight)	150
Concrete (light weight)	115
Steel	490
Concrete Block (CMU) – High density	130
Concrete Block (CMU) – Medium density	115
Soil / landscape finishes	125
Glass	180
Screed	140
Glass Reinforced Concrete	200
Cement Plaster	140
Wood	35

6.5.1.2 Super Imposed Dead Loads

Super Imposed Dead Loads	lb/ft^2
Finished (light finishes)	30
Finished (heavy finishes)	50
Roof finishes	30
Ceiling	5
Services	5
Partitions	20

6.5.1.3 Live Loads

Live Loads	lb/ft^2	Notes
Offices	50	
Galleries	150	
Assembly (Public spaces)	100	
Lobbies/Corridors	100	

Live Loads	lb/ft^2	Notes
Stairs	100	
Loading Dock	250	
Storage	150	
MEP Equipment Rooms	150	or weight of actual equipment
Retail	100	
Roof	20	

6.5.1.4 Live Load Reductions

Reduction is permitted for:	Floor live loads smaller or equal 100 psf and $K_{LL} A_T$ greater than 400 sq ft
	Live loads exceeding 100 psf and tributary area greater than 2 floors and $K_{LL} A_T$ greater than 400 sq ft, then max reduction is 20%
Reduction is NOT permitted for:	Floor live load exceeding 100 psf, except members supporting two or more floors (see above)
	Roof live loads, except as provided for in ASCE7-10 Section 4.8
	One way slabs as defined by ASCE7-10 Section 4.7.6
	Passenger car garages, except members supporting two or more floors, then max reduction of 20%
	Places of assembly

6.5.2 Snow Loads

Snow loads are determined in accordance with ASCE 7-16 Chapter 7.

Ground Snow Load (p_g)	10 psf	
Exposure Factor (C_e)	1.0	Partially Exposed, Exposure Category C
Thermal Factor (C_t)	1.0	
Importance Factor (I_s)	See 6.2.1.	
Flat Roof Snow Load (p_f)	7 psf	
Minimum Roof Snow Load	10 psf	

6.5.3 Wind Loads

Wind loads are determined according to ASCE 7-16 Chapter 26 and 27.

3-Second Gust Wind Velocity	107 mph	Per Risk Category – 7% exceedance in 50 Yrs
Risk Category	See 6.2.1.	
Exposure Category	C	
Gust Effect factor, G	0.85	(Rigid Buildings)
External Pressure Coefficient, C_p	Var.	Per chapter 27.4
Internal Pressure Coefficient, (GC_{pi})	+/-0.18	(Enclosed Buildings)
Mean Roof Height	45 ft max	(Great Hall)
Velocity Pressure, q, at max Height	19 psf	27.3-1
Design Wind Pressure, p	Var.	Per chapter 27.4

6.5.4 Seismic Loads

Seismic loads are determined according to ASCE 7-16 Chapter 11 and 12.

Site Class	D (Default)	To be confirmed.
Spectral Response Acceleration at T=0.2, S_S	0.139g	
Spectral Response Acceleration at T=1.0, S_1	0.078g	
Response Modification Factor (R)	4	(Ordinary reinforced shear walls)
Importance Factor	See 6.2.1.	
Short Period Site Coefficient (S_{MS})	0.222g	
Long Period Site Coefficient (S_{M1})	0.187g	
Design Spectral Response Parameter (at T=0.2), S_{DS}	0.148g	
Design Spectral Response Parameter (at T=1.0), S_{D1}	0.124g	
Seismic Design Category	B	
Seismic Base Shear Coefficient (Cs)	0.037g	

6.5.5 Load Combinations

LRFD Load Combinations	
1	1.4 (D + F)
2	1.2 (D + F) + T + 1.6 (L + H) + 0.5 (L_r +S or R)
3	1.2D + 1.6 (L_r or S or R) + (f_1L or 0.5W)
4	1.2D + 1.0W + f_1L + 0.5(Lr or S or R)

5	1.2D + 1.0E + f_1L + f_2S
6	0.9D + 1.0W + 1.6H
7	0.9D + 1.0E + 1.6H

Where: f_1 = 1.0 for floors in place of public assembly, for live loads in excess of 100 psf, and for parking garage live loads
f_1 = 0.5 for other live loads
f_2 = 0.7 for roof configurations that do not shed show off structure
f_2 = 0.2 for other roof configurations

ASD Load Combinations	
1	D + F
2	D + H + F + L + T
3	D + H + F + (L_r or S or R)
4	D + H + F + 0.75(L + T) + 0.75 (L_r or S or R)
5	D + H + F + (0.6W + 0.7E)
6	D + H + F + (0.6W + 0.7E) + 0.75L + 0.75 (L_r or S or R)
7	0.6D + 0.6W + H
8	0.6D + 0.7E + H

Note: Flat roof snow loads of 30 psf or less need not be combined with seismic loads. Where flat roof snow loads exceed 30 psf, 20 percent shall be combined with seismic loads.

6.5.6 Serviceability Criteria (IBC Table 1604.3)

Element Type	**Live Load**	**Wind Load**	**Dead + Live**
Roof members supporting plaster ceiling	L/360	L/360	L/240
Roof members supporting non-plaster ceiling	L/240	L/240	L/180
Roof members not supporting ceiling	L/180	L/180	L/120
Floor members	L/360	-	L/240
Exterior walls and interior partitions with brittle finish	-	L/240	-
Exterior walls and interior partitions with flexible finish	-	L/120	-

Note: For cantilever members, L shall be taken as twice the cantilever length.

6.6 Materials

6.6.1 Structural Steel

Section Type	**Material Specification**	**F_y (ksi/MPa)**	**Select Shape From:**
Wide Flange	ASTM A992M Grade 345	50/345	AISC Manual

WT	ASTM A992M Grade 345	50/345	AISC Manual
Channel	ASTM A36M	36/250	AISC Manual
Angles	ASTM A36M	36/250	AISC Manual
Plates and Bars	ASTM A36M	36/250	See AISC Manual for standard thicknesses
Built-up sections	ASTM A572M Grade 345	50/345	-
HSS (rectangular)	ASTM A500 Grade C	50/345	AISC Manual
HSS (round)	ASTM A500 Grade C	46/317	AISC Manual, ASTM Specs
Pipe	ASTM A53M Grade B Type E or S	35/240	AISC Manual, ASTM Specs

6.6.2 Steel Properties

Density	490 lbs/ft^3 (7850 kg/m^3)
Modulus of Elasticity	E_s = 29,000 ksi (200,000 MPa)
Poisson's Ratio	ν = 0.30
Coefficient of Thermal Expansion	α = 11.7E-6/°C

6.6.3 Special Testing Requirements

Charpy Notch Test	ASTM A6/A6M
Impact Test	A673/A763M
Min absorbed energy	20 ft-lbs
Temperature	+70F (21 C)
Supplementary Requirement	S30
Supplementary Requirement	S5
Frequency	P

6.6.4 Concrete

***f'$_c$ (psi)**	**Cement Type**	**Density**	**Locations**	**Indicative WCR**
3,500	Type I	Light Weight	Composite Deck	TBD
4,000	Type I	Normal Weight	Slab on Grade	TBD
5,000	Type I	Normal Weight	Walls, Columns	TBD
5,000	Type I	Normal Weight	Beams, elev. Slabs	TBD
5,000	Type I	Normal Weight	Foundations	TBD

Note: *f'$_c$ = 28-day compressive strength of a cylinder (6 in dia x 12 in)

Plain Concrete Density (lb/ft^3)	150 (Normal Weight Concrete – NWC) 115 (Light Weight Concrete – LWC)
Reinforced Concrete Density (lb/ft^3)	150 (Normal Weight Concrete – NWC) 115 (Light Weight Concrete – LWC)
Poisson's Ratio	ν = 0.2
Coefficient of Thermal Expansion	α = 9.0E-6/ºC
Aggregate Size	3/4 in
Grout Strength	8 ksi
Shop Drawings Code	ACI 315: 'Details and Detailing of Concrete Reinforcement'

6.6.5 Steel Reinforcement

Deformed Reinforcing Bars	**Material Spec**	**Grade**	**F_y (ksi)**
Flexural Design	ASTM A615	Grade 60	60
Shear, torsion, and shear friction design	ASTM A615	Grade 60	60

Welded Wire Fabric	**Material Spec**	**Size**	**F_y (ksi)**
Deformed	ASTM A497M	MD25	70
Plain	ASTM A185M	MW10 to MW25	65
Plain	ASTM A185M	MW10 and smaller	55

Bar Designation	**Nominal Diameter (in)**	**Nominal Area (in^2)**	**Weight (lb/ft)**
#3	0.375	0.11	0.376
#4	0.500	0.20	0.668
#5	0.625	0.31	1.043
#6	0.750	0.44	1.502
#7	0.875	0.60	2.044
#8	1.000	0.79	2.670
#9	1.128	1.00	3.400
#10	1.270	1.27	4.303

Condition	**Reduction Factor Φ**
Tension-controlled sections	0.90
Compression-controlled sections – members with spiral reinforcement	0.70
Compression-controlled sections – other reinforced members	0.65

Shear and torsion	0.75
Bearing on concrete	0.65

6.6.6 Welding

Welders Certified By:	AWS requirements
Electrodes	E70XX
Grade	Fu = 70 ksi
Minimum Fillet Size	0.25 in
Penetration Weld Electrodes	E70
Charpy V-Notch toughness	20 lb-ft
At Temperature	-29ºC

6.6.7 Glue-Laminated Timber

Wood Species	Southern Pine	Western Species
Wood Grade	24F-V5	24F-V8
Density	33pcf	33 pcf
Modulus of Elasticity	1700 psi	1800 ksi
Bending Strength (positive)	2400 psi	2400 psi
Bending Strength (negative)	2400 psi	2400 psi

Appendix A – Structural Framing Plans

LEVEL 1 FRAMING PLAN

NOTES:

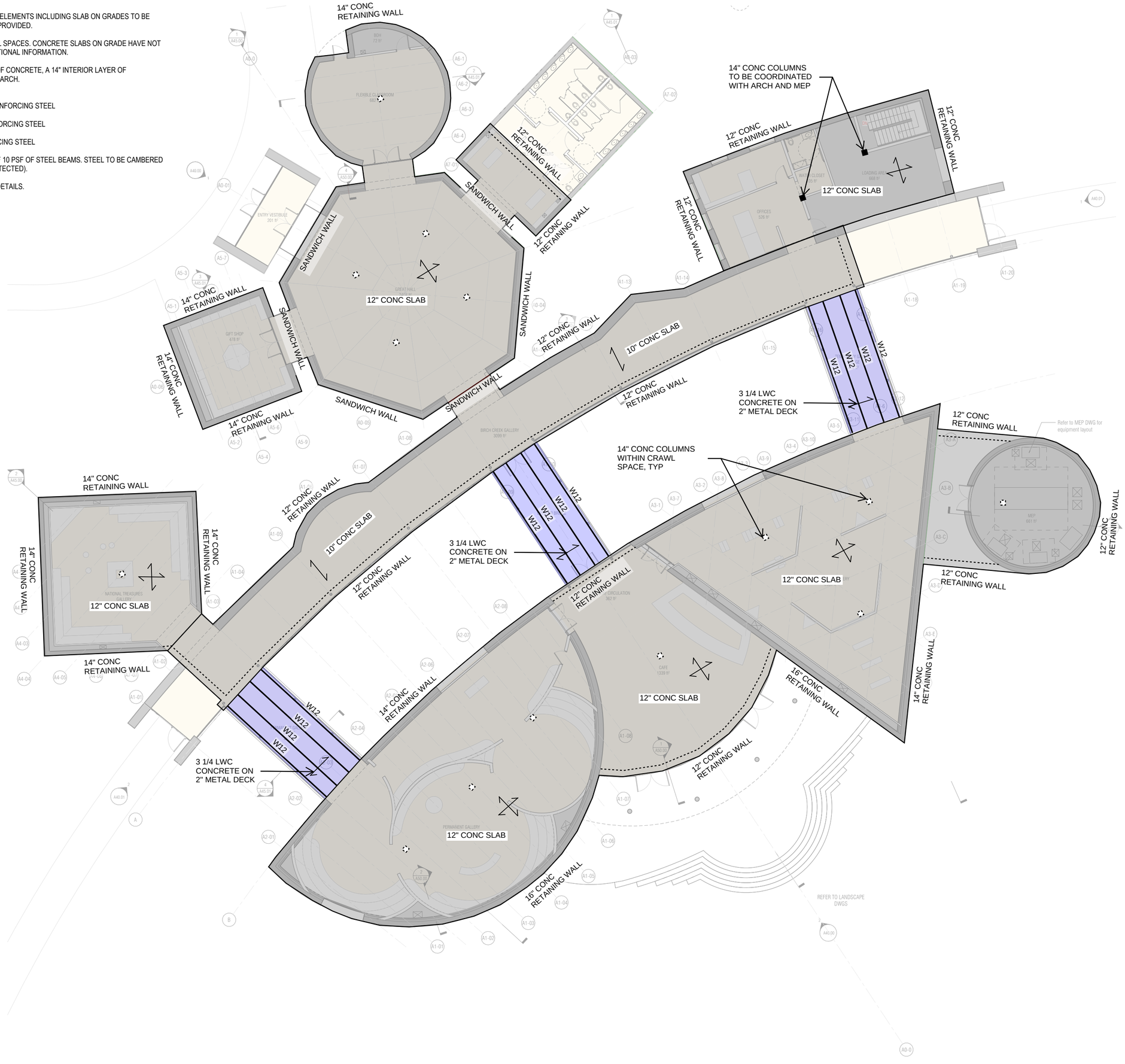
1. ADDITIONAL INFORMATION REGARDING FOUNDATION ELEMENTS INCLUDING SLAB ON GRADES TO BE PROVIDED ONCE A GEOTECHINCAL REPORT HAS BEEN PROVIDED.

2. FLOOR SLABS SHOWN ARE AT BASEMENTS OR CRAWL SPACES. CONCRETE SLABS ON GRADE HAVE NOT BEEN SHOWN FOR CLARITY. REFER TO ARCH FOR ADDITIONAL INFORMATION.

3. "SANDWICH WALL" INDICATES A 5" EXTERIOR LAYER OF CONCRETE, A 14" INTERIOR LAYER OF CONCRETE, AND A MIDDLE LAYER OF INSULATION - SEE ARCH.

4. ALLOWANCES:
   - CONCRETE FLOOR SLABS TO HAVE 7.5 PSF OF REINFORCING STEEL
   - CONCRETE COLUMNS TO HAVE 300 PCY OF REINFORCING STEEL
   - CONCRETE WALLS TO HAVE 250 PCY OF REINFORCING STEEL
   - BIRCH CREEK BRIDGES ARE TO BE COMPRISED OF 10 PSF OF STEEL BEAMS. STEEL TO BE CAMBERED AND GALVANIZED (OR OTHERWISE WEATHER PROTECTED).

5. REFER TO BASIS OF DESIGN REPORT FOR FURTHER DETAILS.



ROOF FRAMING PLAN

NOTES:

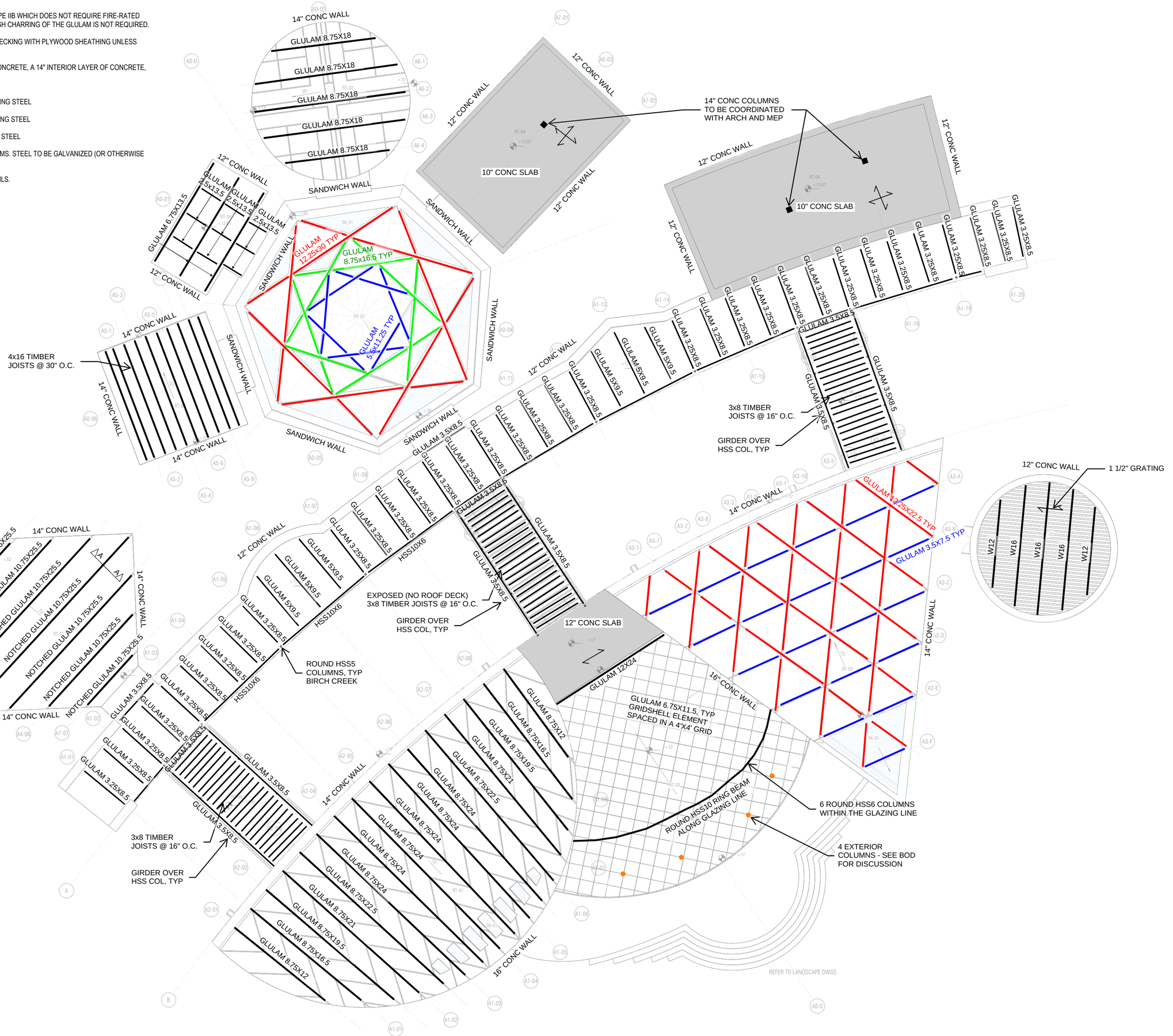
1. FRAMING HAS BEEN SIZED ASSUMING CONSTRUCTION TYPE IIB WHICH DOES NOT REQUIRE FIRE-RATED ROOF ASSEMBLIES. THEREFORE, FIRE RESISTANCE THROUGH CHARRING OF THE GLULAM IS NOT REQUIRED.

2. ROOF DECKING TO BE 2" TONGUE AND GROOVE TIMBER DECKING WITH PLYWOOD SHEATHING UNLESS NOTED OTHERWISE.

3. "SANDWICH WALL" INDICATES A 5" EXTERIOR LAYER OF CONCRETE, A 14" INTERIOR LAYER OF CONCRETE, AND A MIDDLE LAYER OF INSULATION - SEE ARCH.

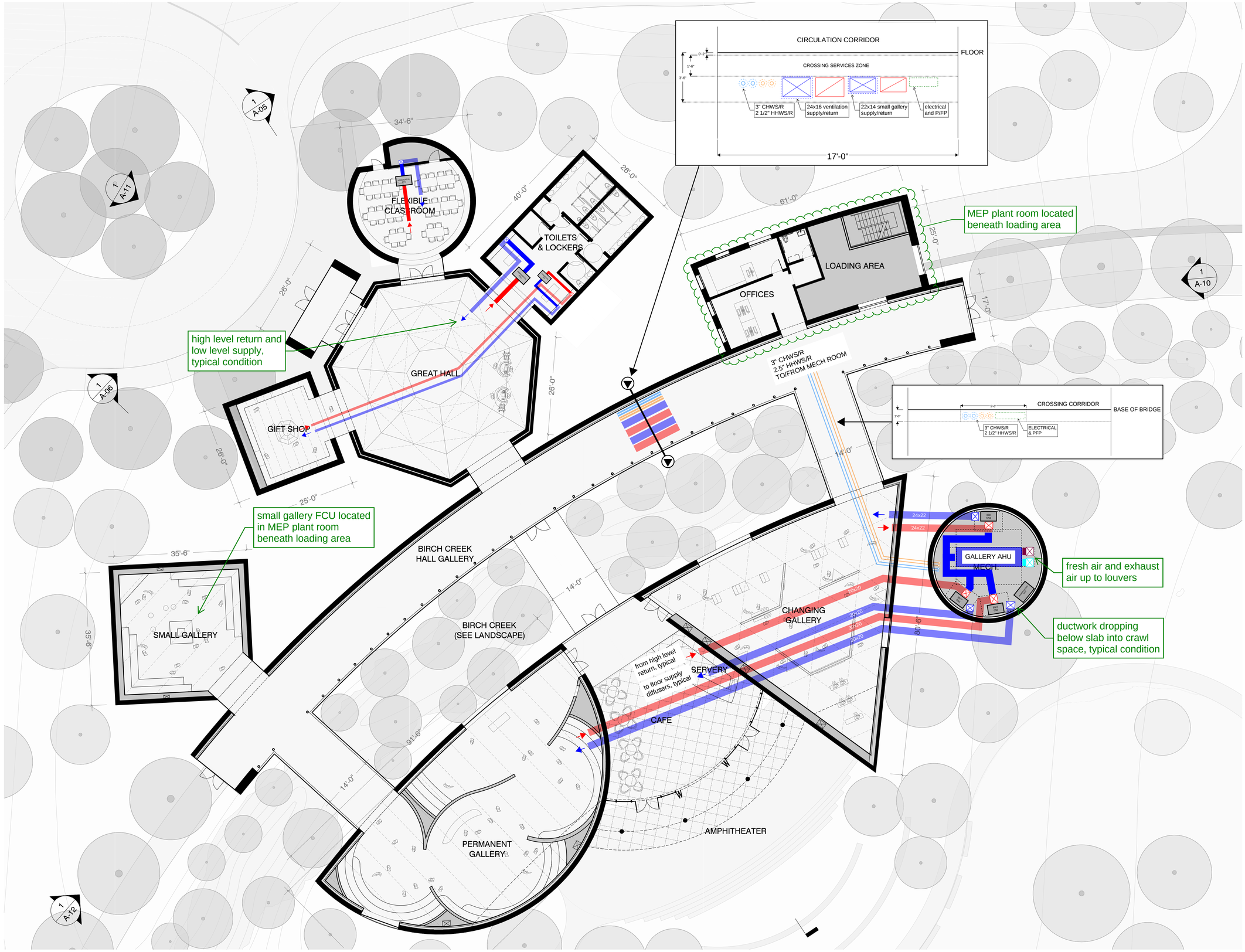
4. ALLOWANCES:
   - CONCRETE ROOF SLABS TO HAVE 6 PSF OF REINFORCING STEEL
   - CONCRETE COLUMNS TO HAVE 300 PCY OF REINFORCING STEEL
   - CONCRETE WALLS TO HAVE 250 PCY OF REINFORCING STEEL
   - STEEL SUPPORTED ROOFS TO BE 7 PSF OF STEEL BEAMS. STEEL TO BE GALVANIZED (OR OTHERWISE WEATHER PROTECTED).

5. REFER TO BASIS OF DESIGN REPORT FOR FURTHER DETAILS.



SECTION A-A

GLULAM BEAMS NOTCHED TO MATCH ROOF SLOPE, TYP.



BURO HAPPOLD	*Project:* Cherokee Heritage Center Museum		*Project Number:* 055132	*Status:* 100% Schematic Design	
	Sketch Title: Mechanical Distribution Sketch		*Sketch Number:* BH-MEP-001	*Date:* 12/08/2025	*Initials:* AS	*Revision:* 00

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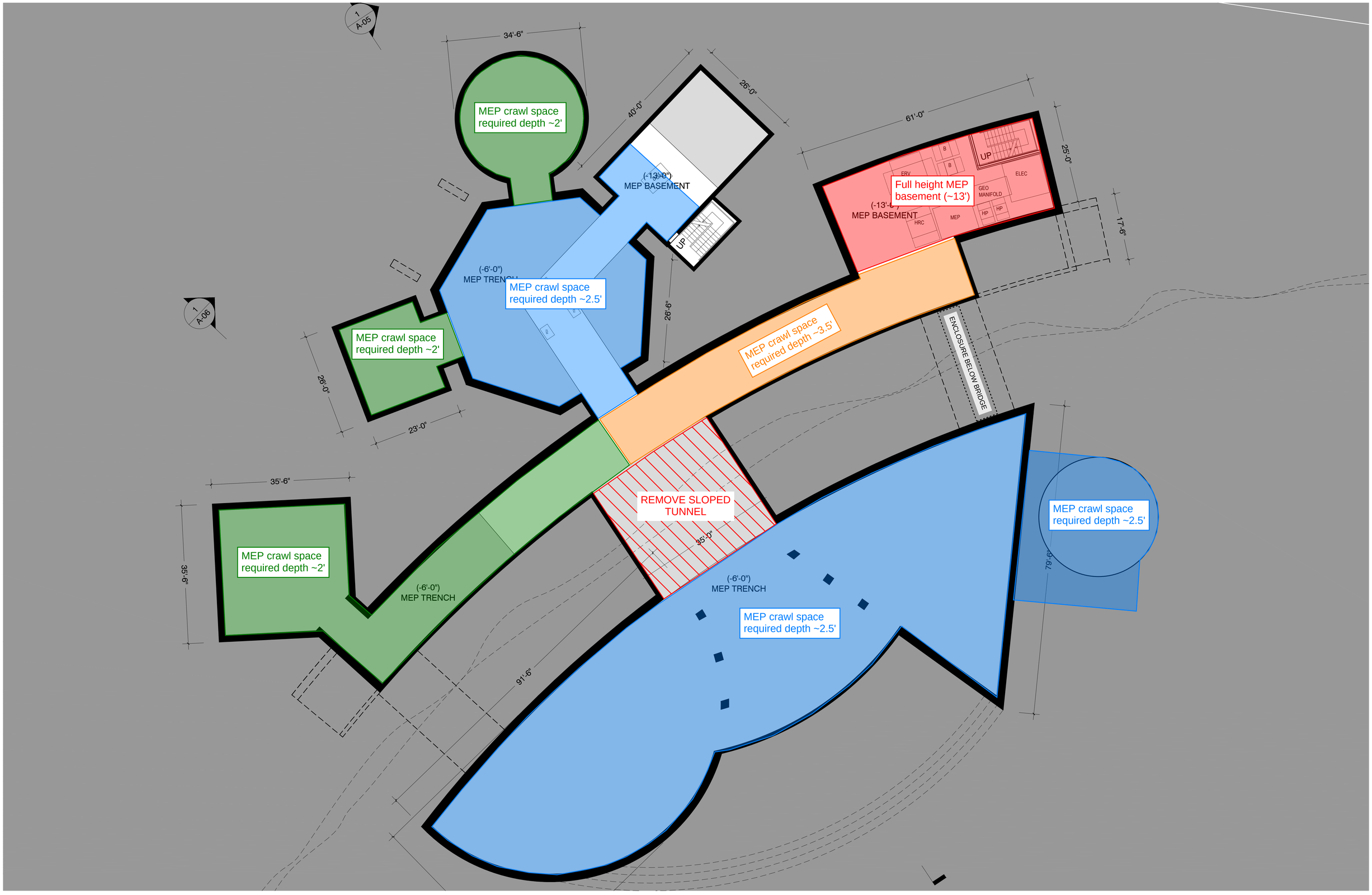

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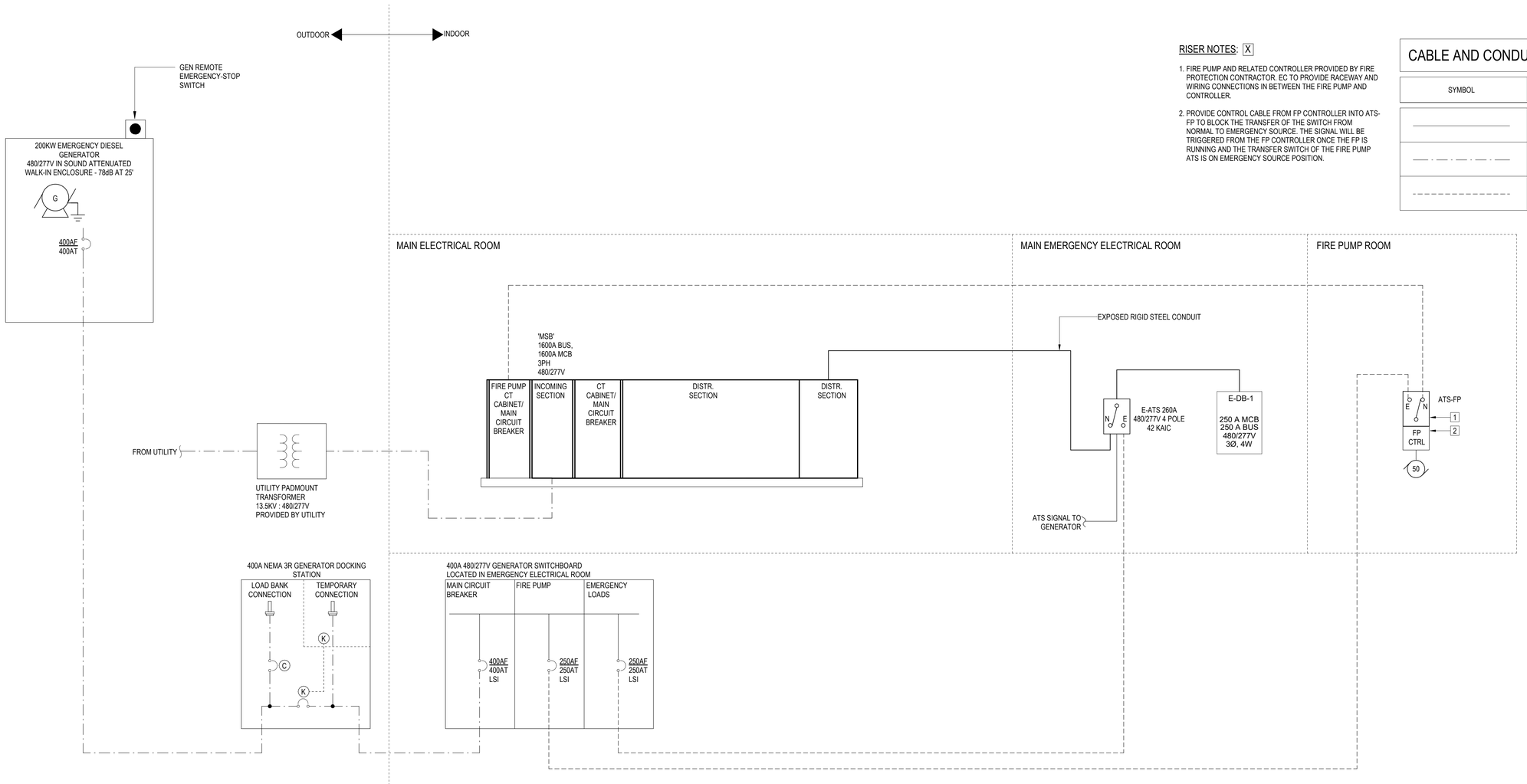

1 CHC RISER

NOT TO SCALE

RISER NOTES: X

1. FIRE PUMP AND RELATED CONTROLLER PROVIDED BY FIRE PROTECTION CONTRACTOR. EC TO PROVIDE RACEWAY AND WIRING CONNECTIONS IN BETWEEN THE FIRE PUMP AND CONTROLLER.
2. PROVIDE CONTROL CABLE FROM FP CONTROLLER INTO ATS-FP TO BLOCK THE TRANSFER OF THE SWITCH FROM NORMAL TO EMERGENCY SOURCE. THE SIGNAL WILL BE TRIGGERED FROM THE FP CONTROLLER ONCE THE FP IS RUNNING AND THE TRANSFER SWITCH OF THE FIRE PUMP ATS IS ON EMERGENCY SOURCE POSITION.

CABLE AND CONDUIT SYSTEMS

SYMBOL	DESCRIPTION
———	SURFACE MOUNT CONDUIT
—— · —— · ——	UNDERGROUND CONCRETE ENCASED DUCTBANK
- - - - - - - -	MI CABLE

BURO HAPPOLD

Project: Cherokee Heritage Center Museum	*Project Number:* 055132	*Status:* 100% Schematic Design	
Sketch Title: ELECTRICAL RISER	*Sketch Number:* BH-MEP-003	*Date:* 12/08/2025	*Initials:* MA / *Revision:* 00

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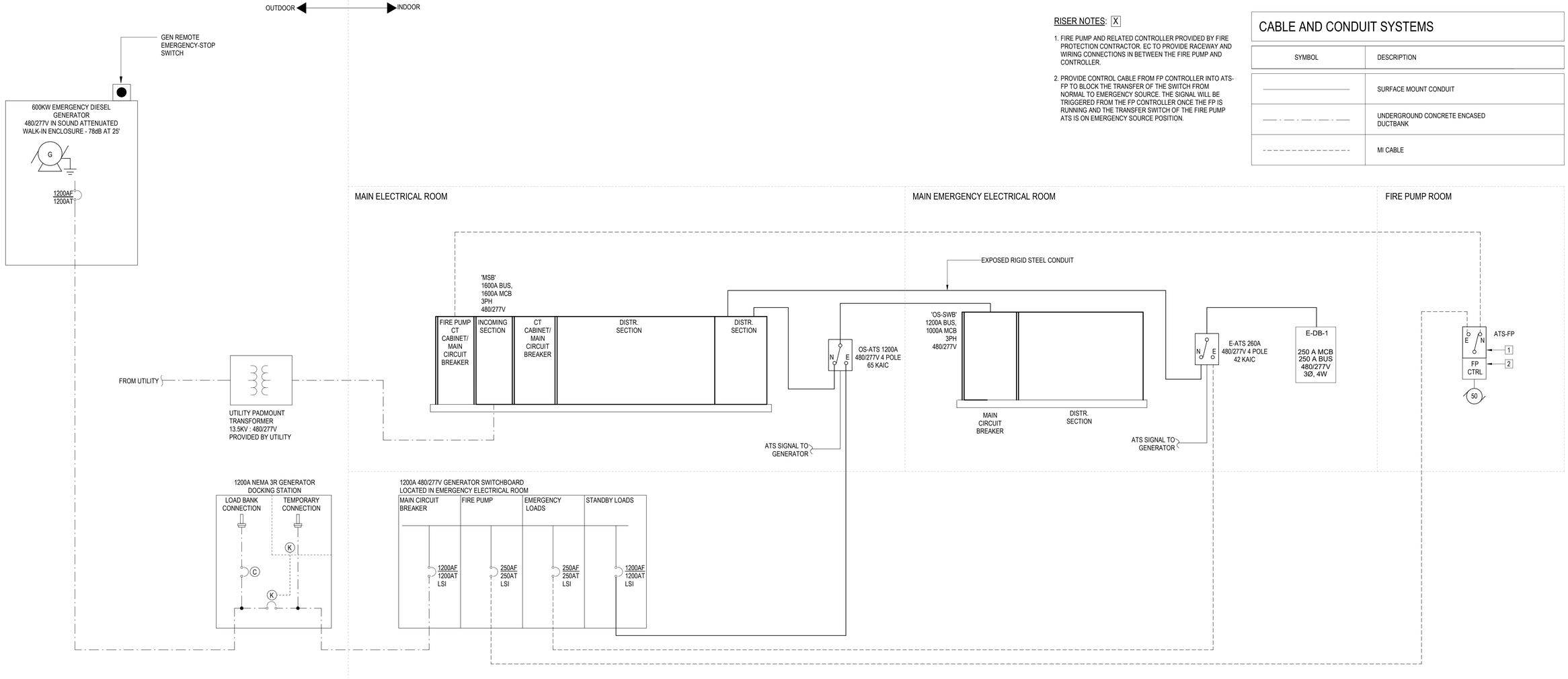

RISER NOTES: X

1. FIRE PUMP AND RELATED CONTROLLER PROVIDED BY FIRE PROTECTION CONTRACTOR. EC TO PROVIDE RACEWAY AND WIRING CONNECTIONS IN BETWEEN THE FIRE PUMP AND CONTROLLER.
2. PROVIDE CONTROL CABLE FROM FP CONTROLLER INTO ATS-FP TO BLOCK THE TRANSFER OF THE SWITCH FROM NORMAL TO EMERGENCY SOURCE. THE SIGNAL WILL BE TRIGGERED FROM THE FP CONTROLLER ONCE THE FP IS RUNNING AND THE TRANSFER SWITCH OF THE FIRE PUMP ATS IS ON EMERGENCY SOURCE POSITION.

CABLE AND CONDUIT SYSTEMS

SYMBOL	DESCRIPTION
————	SURFACE MOUNT CONDUIT
—— — —— — ——	UNDERGROUND CONCRETE ENCASED DUCTBANK
- - - - - - - -	MI CABLE

1 CHC RISER - ALTERNATE 1

N.T.S.

BURO HAPPOLD	*Project:* Cherokee Heritage Center Museum		*Project Number:* 055132	*Status:* 100% Schematic Design	
	Sketch Title: ELECTRICAL RISER - ALTERNATE 1		*Sketch Number:* BH-MEP-004	*Date:* 12/08/2025	*Initials:* MA	*Revision:* 00

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Paul Richardson
Buro Happold Consulting Engineers P.C.
11 Beacon Street, Suite 400
Boston, MA 02108
USA

T: +1 617 419 2284
Email: paul.richardson@burohappold.com

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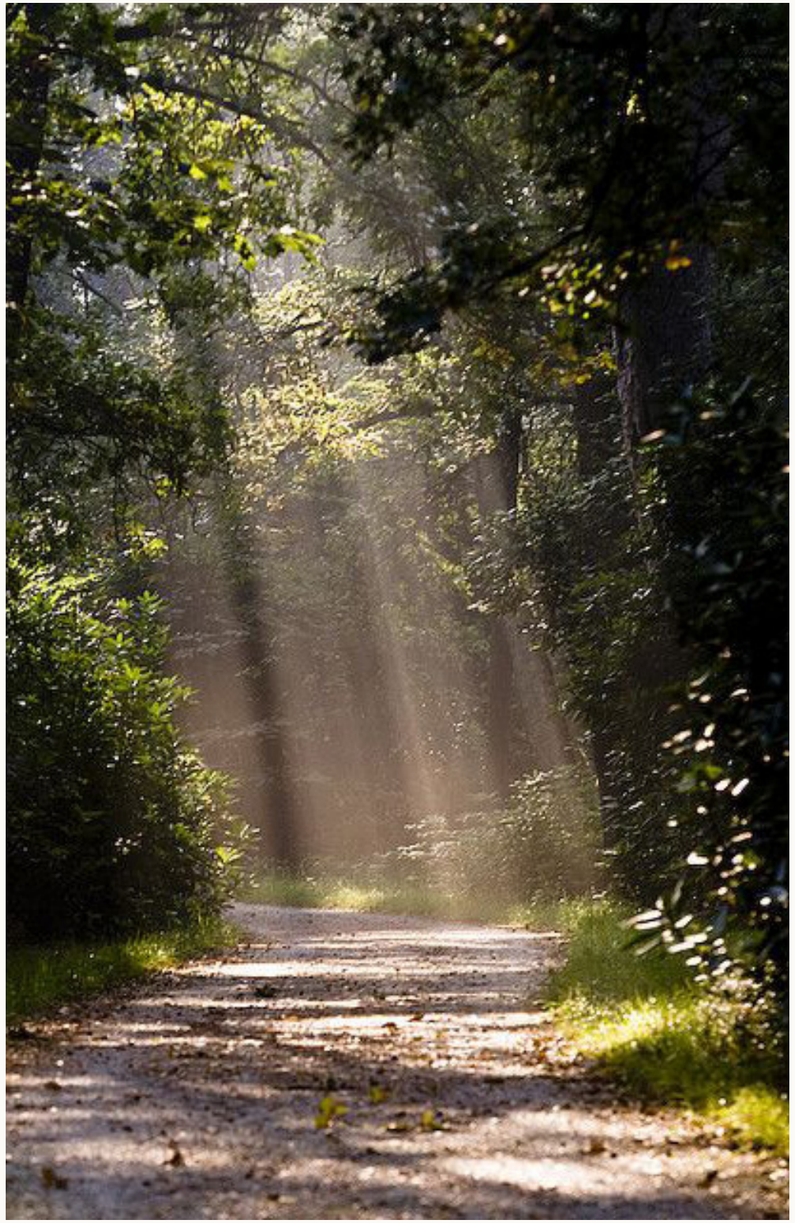
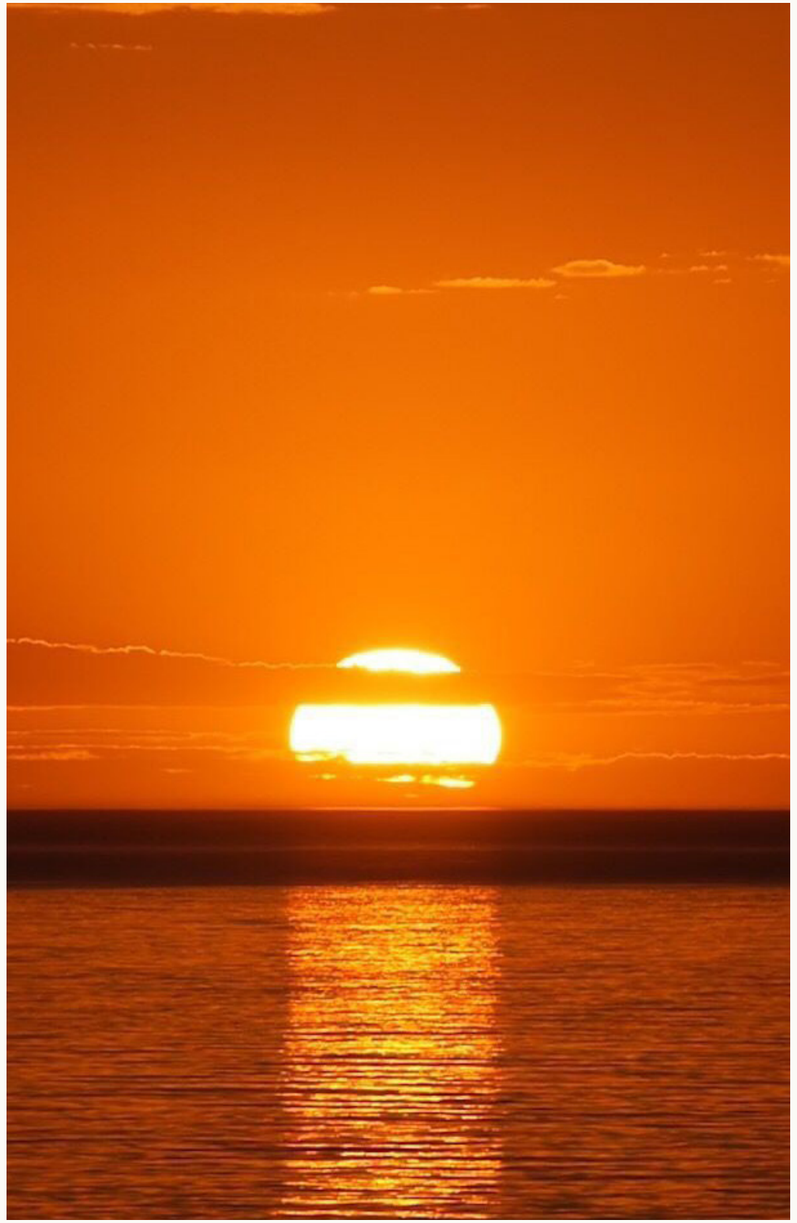
Cherokee Heritage Center - Tahlequah, Oklahoma

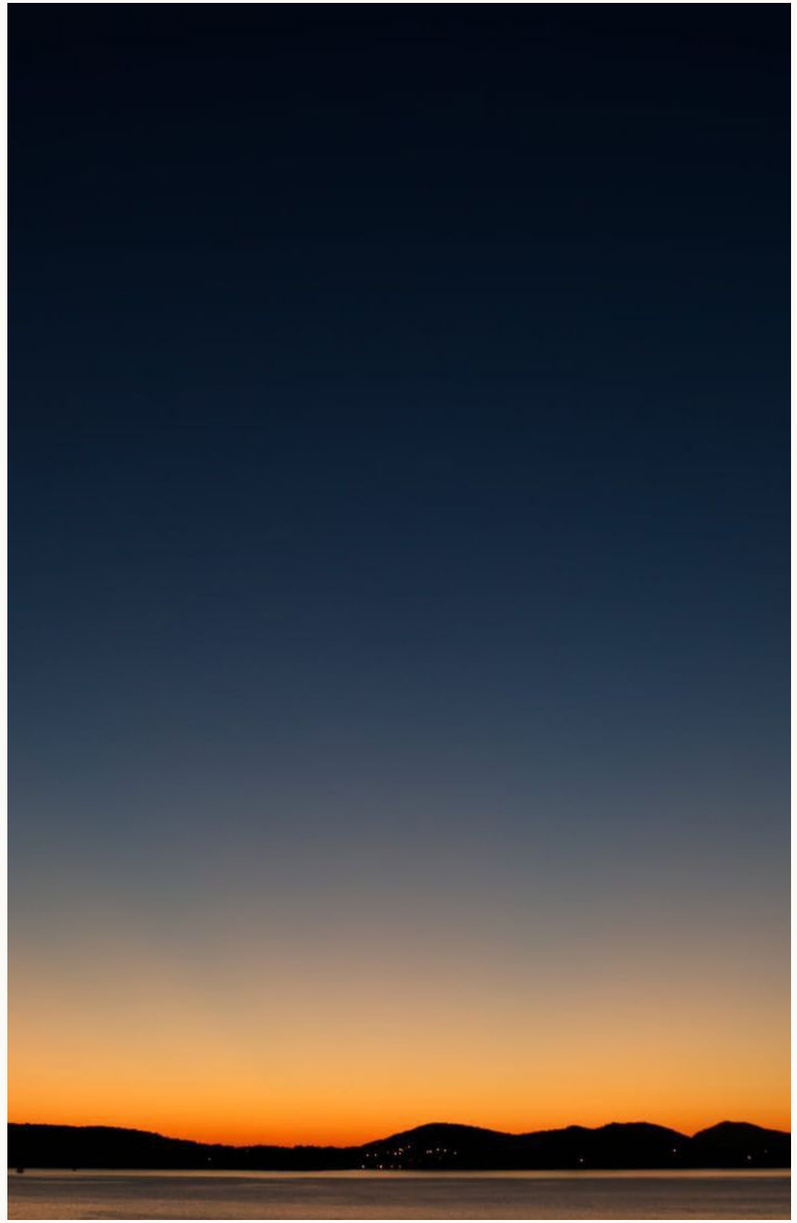
New York | California

Basis of Design Narrative | December 2025

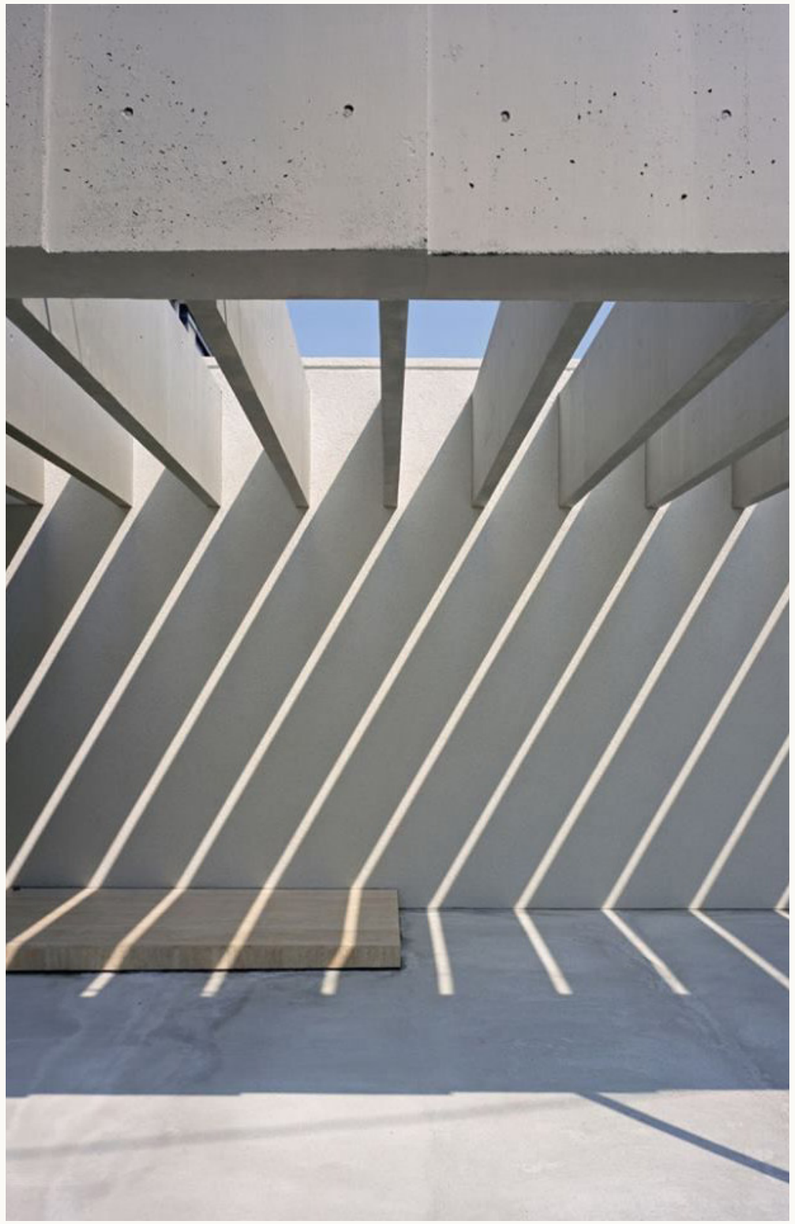
Cherokee Heritage Center

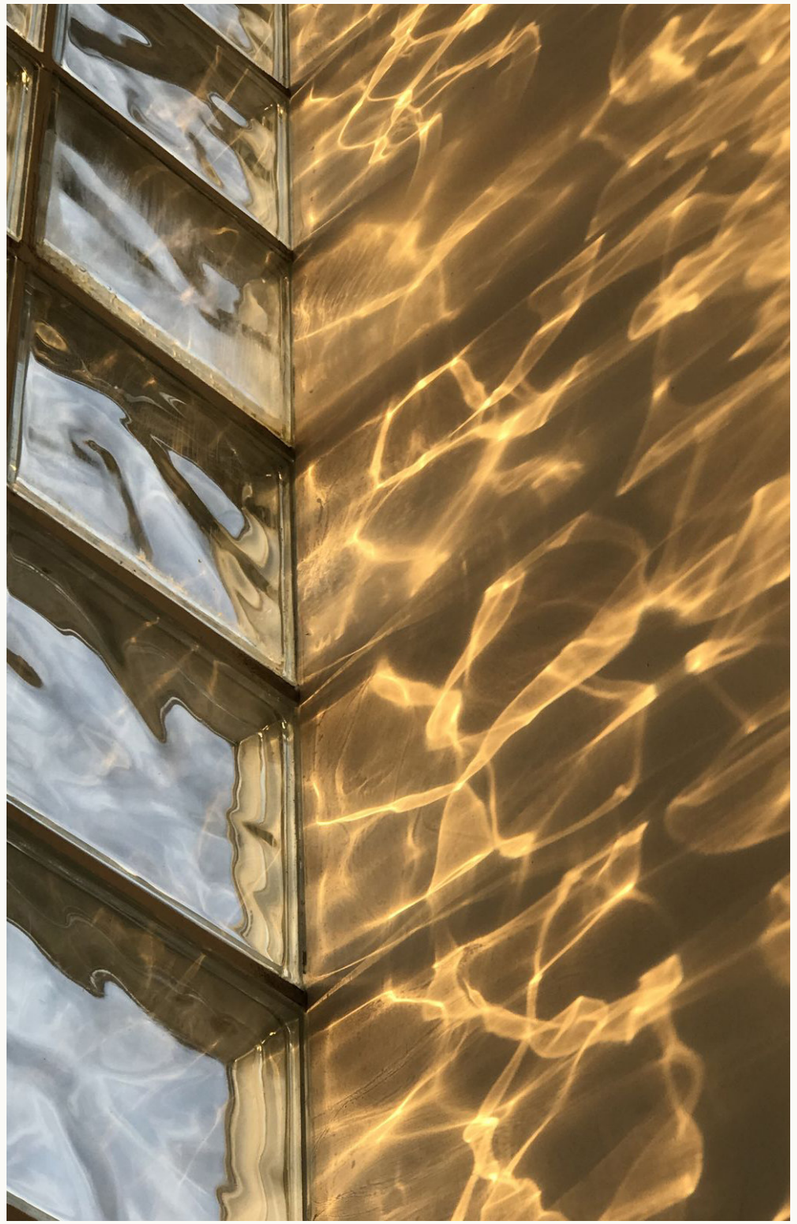


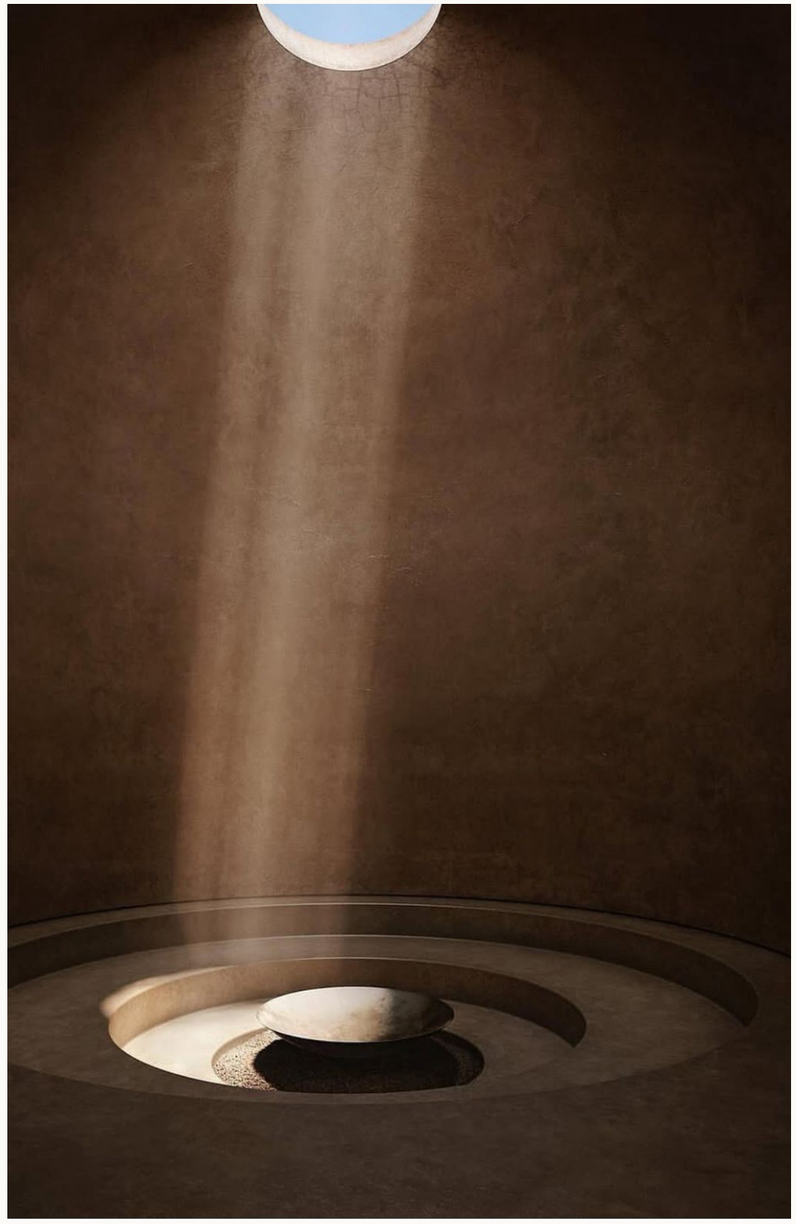




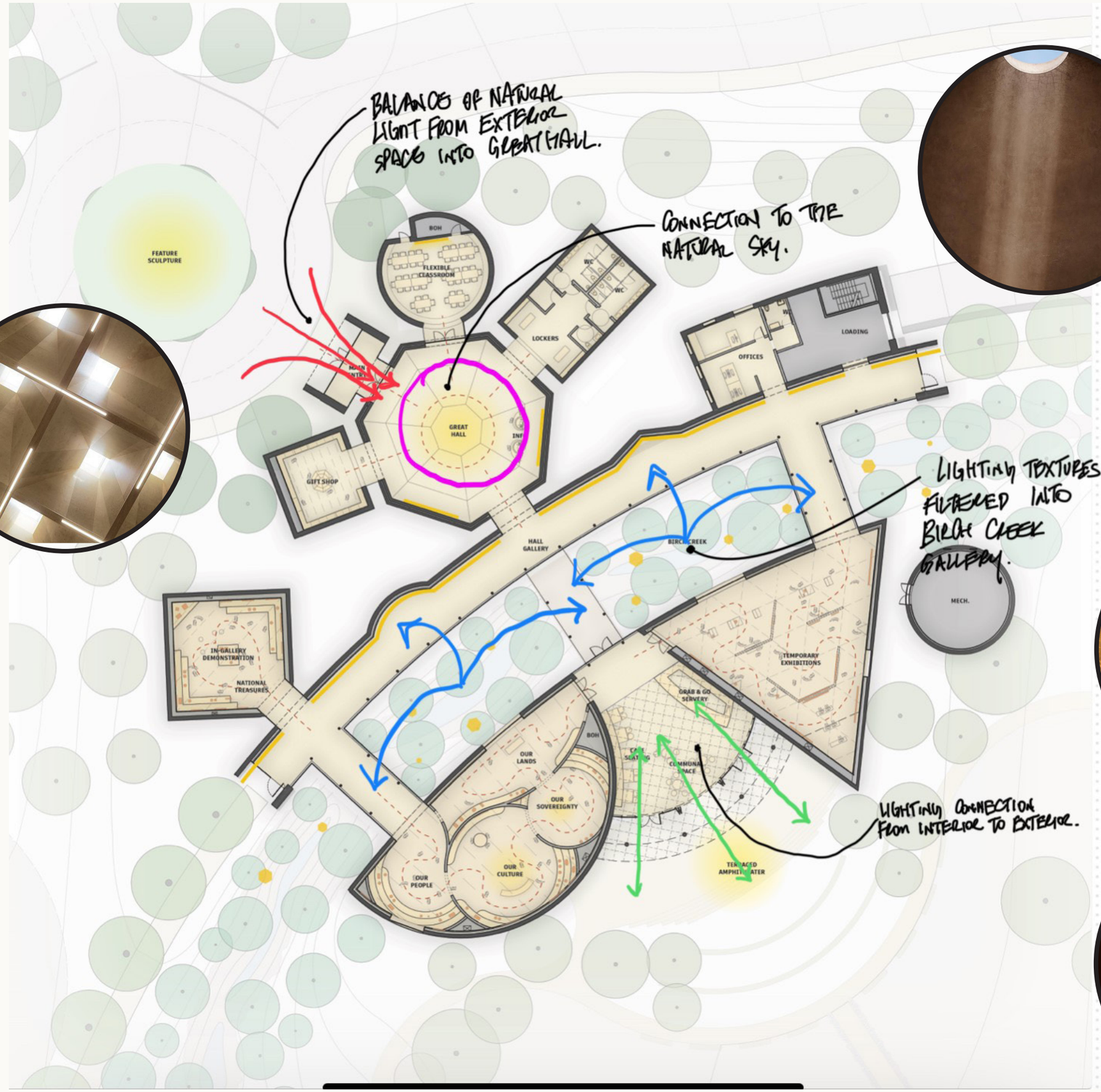
Our architectural lighting strategy is rooted in the rhythms and qualities of natural light. By drawing inspiration from the *circadian cycle*, the design supports a sense of balance and well-being, mirroring the subtle transitions found in nature from dawn to dusk. Light becomes a *connective tissue*—linking interior and exterior spaces, *guiding movement*, and reinforcing a deeper relationship between *people and* their *environment*. Through warm tones, controlled contrast, and mindful placement, the lighting cultivates harmony with the landscape while enhancing the architecture's presence in a way that feels *organic*, intuitive, and inherently human.

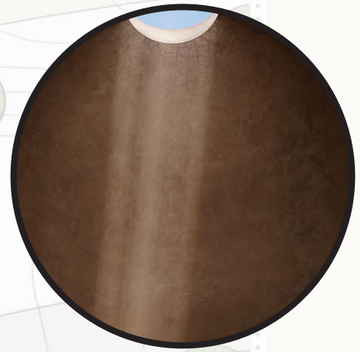


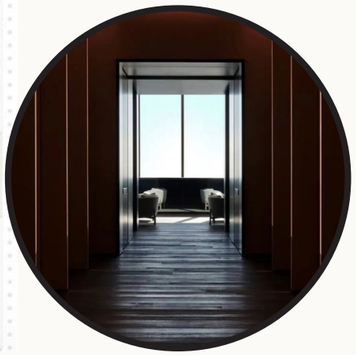


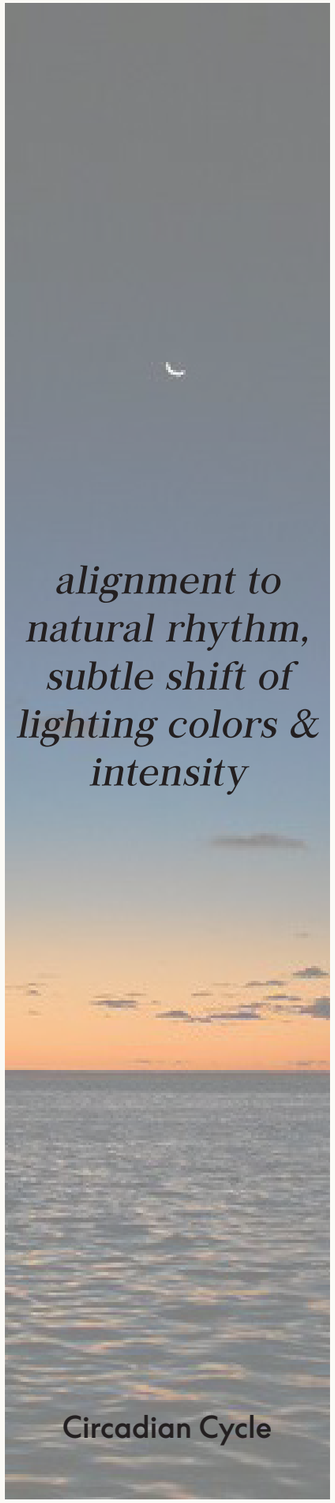


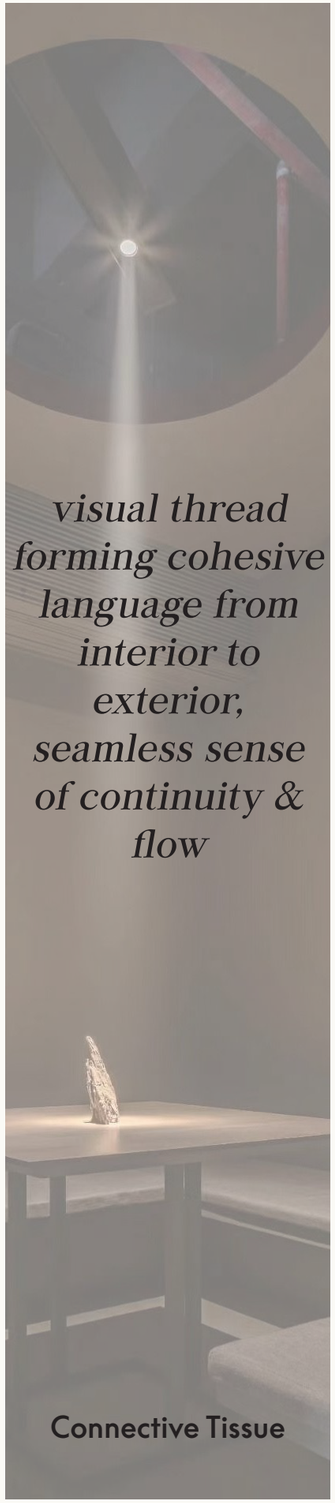
Natural lighting textures are paramount to our design approach, guiding how we *shape and reveal* the architecture. Rather than imposing harsh or artificial effects, we prioritize the subtle gradients, softness, and nuance found in nature. These authentic lighting qualities create spaces that feel effortless and grounded, allowing the architecture to breathe and the environment to speak. By embracing light as it naturally behaves—*diffused, dynamic, and responsive*—we avoid anything that feels forced, ensuring the experience remains intuitive, timeless, and deeply connected to place.


BALANCE OF NATURAL LIGHT FROM EXTERIOR SPACE INTO GREAT HALL.
CONNECTION TO THE NATURAL SKY.
LIGHTING TEXTURES FILTERED INTO BIRCH CREEK GALLERY.
LIGHTING CONNECTION FROM INTERIOR TO EXTERIOR.
FEATURE SCULPTURE
BOH
FLEXIBLE CLASSROOM
WC
WC
LOCKERS
GREAT HALL
GIFT SHOP
OFFICES
LOADING
HALL GALLERY
BIRCH CREEK
MECH.
IN-GALLERY DEMONSTRATION
NATIONAL TREASURES
TEMPORARY EXHIBITIONS
GRAB & GO SERVERY
BOH
OUR LANDS
OUR SOVEREIGNTY
COMMUNAL SPACE
OUR PEOPLE
OUR CULTURE



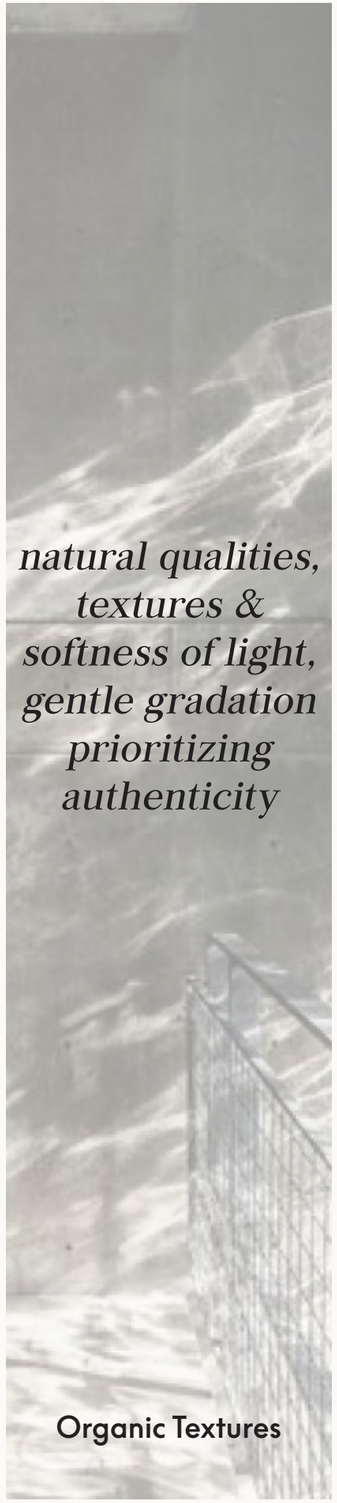



alignment to natural rhythm, subtle shift of lighting colors & intensity
Circadian Cycle

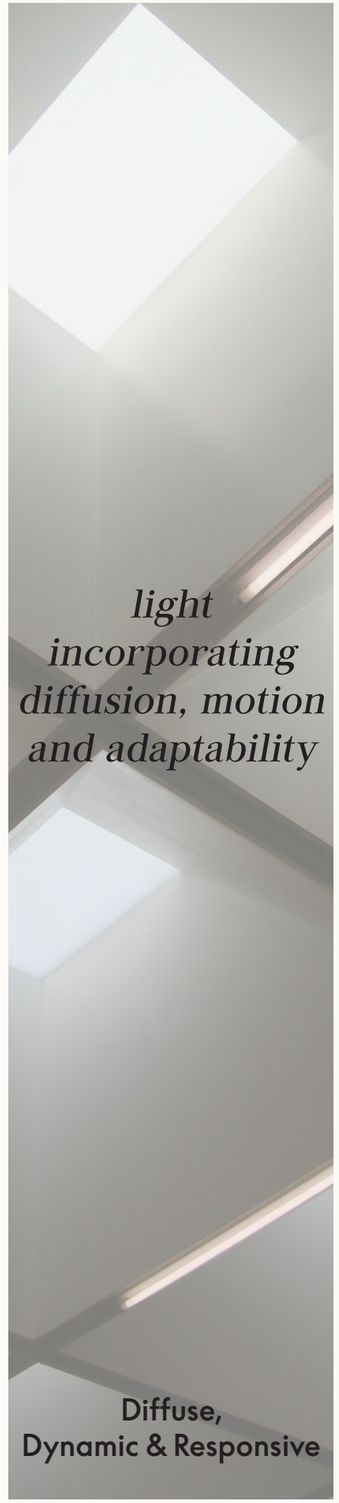

visual thread forming cohesive language from interior to exterior, seamless sense of continuity & flow
Connective Tissue


lighting as navigator, shaping movement through the spaces with contrast & rythym
Guiding Movement

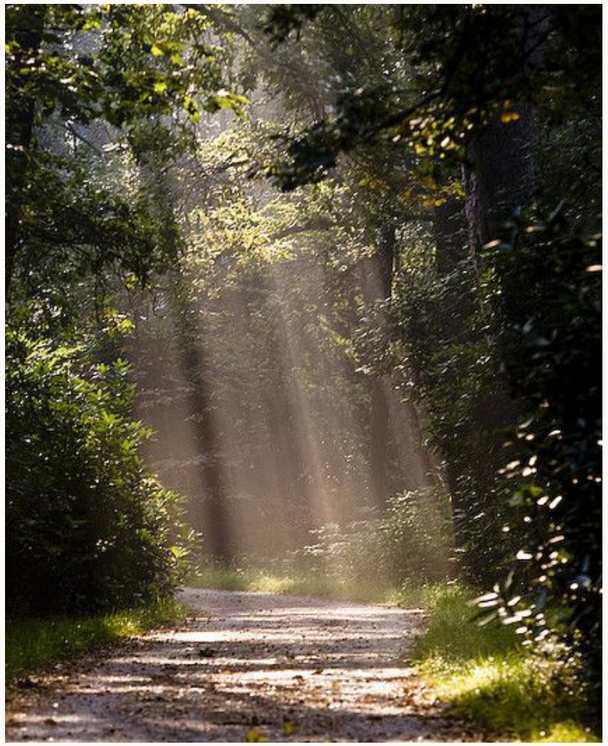

interaction between people & place, enhancing comfort, supporting activity and creating a sense of place
People & Environment

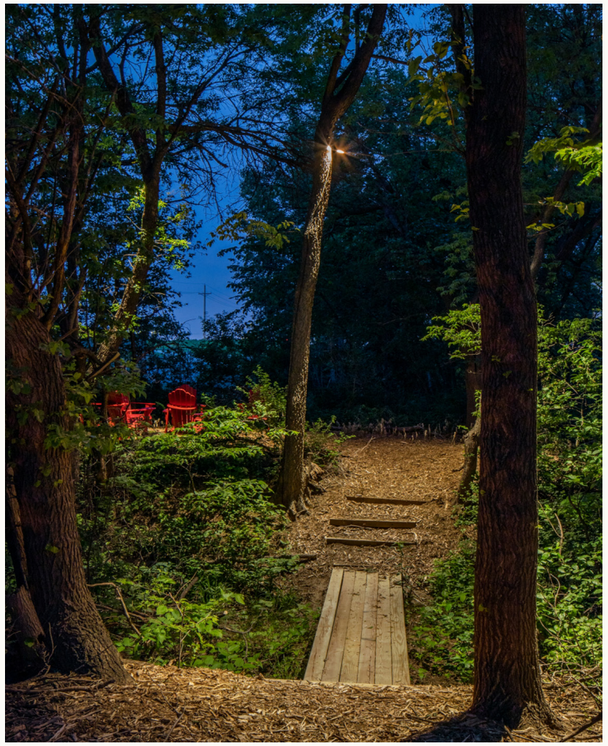

natural qualities, textures & softness of light, gentle gradation prioritizing authenticity
Organic Textures


light as sculptural tool, shaping architecture & revealing form
Shape & Reveal


light incorporating diffusion, motion and adaptability
Diffuse, Dynamic & Responsive

The evening arrival experience should feel organic, with lighting that draws its textures directly from nature. Moonlight-inspired fixtures will filter softly through the trees, revealing natural patterns and casting gentle, neutral-toned light reminiscent of true moonlight.
Low level landscape lighting will evoke the inviting warmth of campfire, creating a welcoming and intimate approach.





Lighting Attributes

Moonlight:
Tree-strap mounted low voltage LED accent lights in 3500k neutral white. Glare shields and moonlight fiters to be included.

Landscape Lighting:
Stake-mounted low voltage LED accent lights in 2200k warm white to hightlight landscape. Low level pathway lighting in 2200k warm white to be included along walk paths.

Signage Lighting:
Signage lighting to be included to provide a soft wash of light for wayfinding. Allow for 2200k warm white linear LED.

Lighting Controls:
All exterior lighting should be dimmable and tied to the lighting control system and to be triggered by astronomical timeclock.

The arrival experience should feel welcoming and uplifting. Soft uplighting gently washes the building's forms, while the entry portal frames and elevates the moment of arrival. Low-level landscape lighting along the walkpaths subtly guides visitors toward the architecture.

Lighting Attributes

Building Uplight:
In-grade, linear line voltage LED grazer with controlled optics highlighting form of building. Tunable White, 2200k to 3500k.

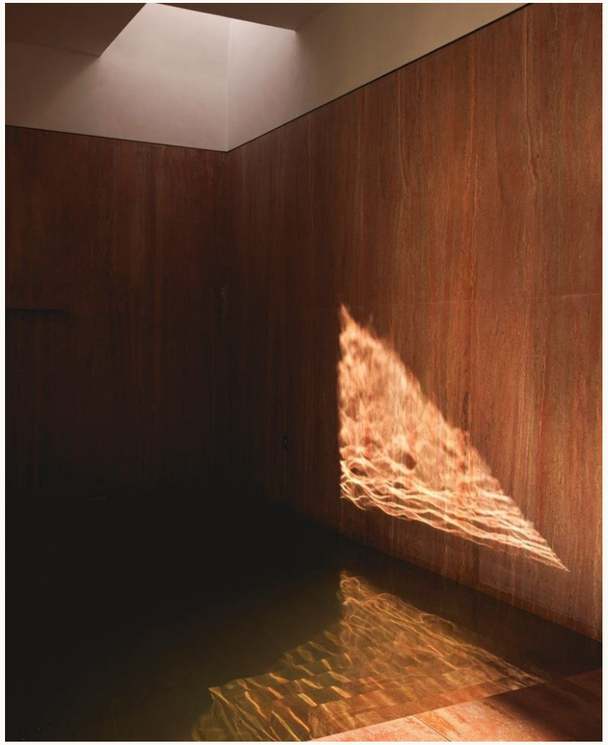
Portal Lighting:
In-grade, linear, narrow aperture LED line-of-light, with dot-free diffusion. Tunable White, 2200k to 3500k

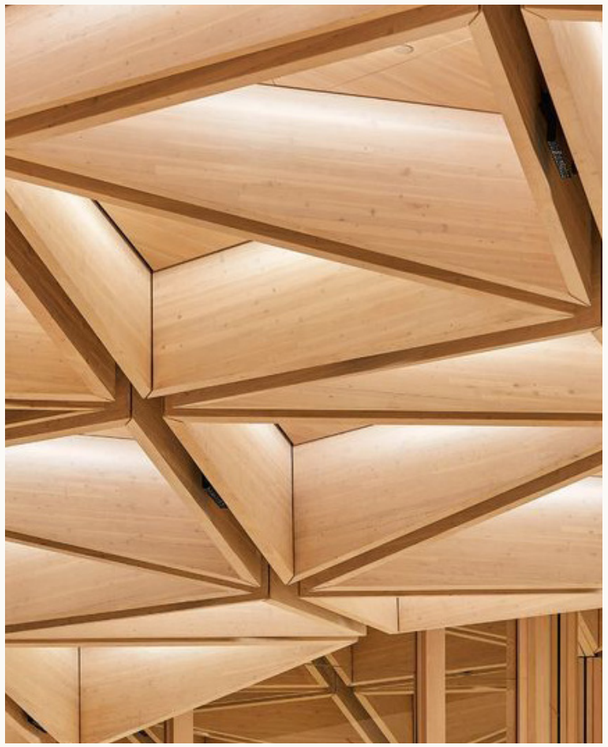
Landscape Lighting:
Stake-mounted low voltage LED accent lights in 2200k warm white to hightlight landscape. Low level pathway lighting in 2200k warm white to be included along walk paths.

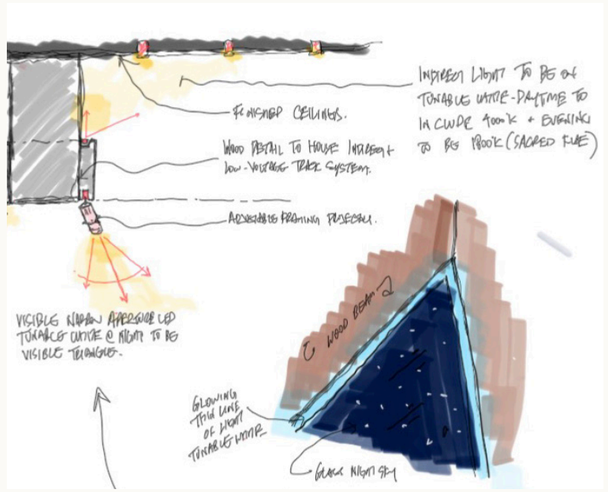
Signage Lighting:
Signage lighting to be included to provide a soft wash of light for wayfinding. Allow for 2200k warm white linear LED.

Lighting Controls:
All exterior lighting should be dimmable and tied to the lighting control system and to be triggered by astronomical timeclock.

As guests enter the Great Hall, the lighting should create a strong connection between people and the environment. Visual cues guide the eye upward with softly illuminated ceilings transition into a nighttime scene that frames the night sky. Micro-aperture accent lights provide gentle illumination, echoing the faint glow of starlight above. Exhibit displays are highlighted with track-mounted projectors, ensuring clarity and focus.







Lighting Attributes

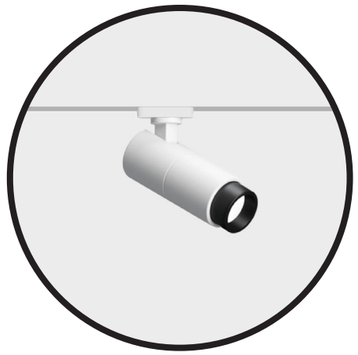
Ambient Cove Light:
Linear low voltage diode-free LED light strip in tunable white 1800k to 6500k to be integrated into articulated ceiling.

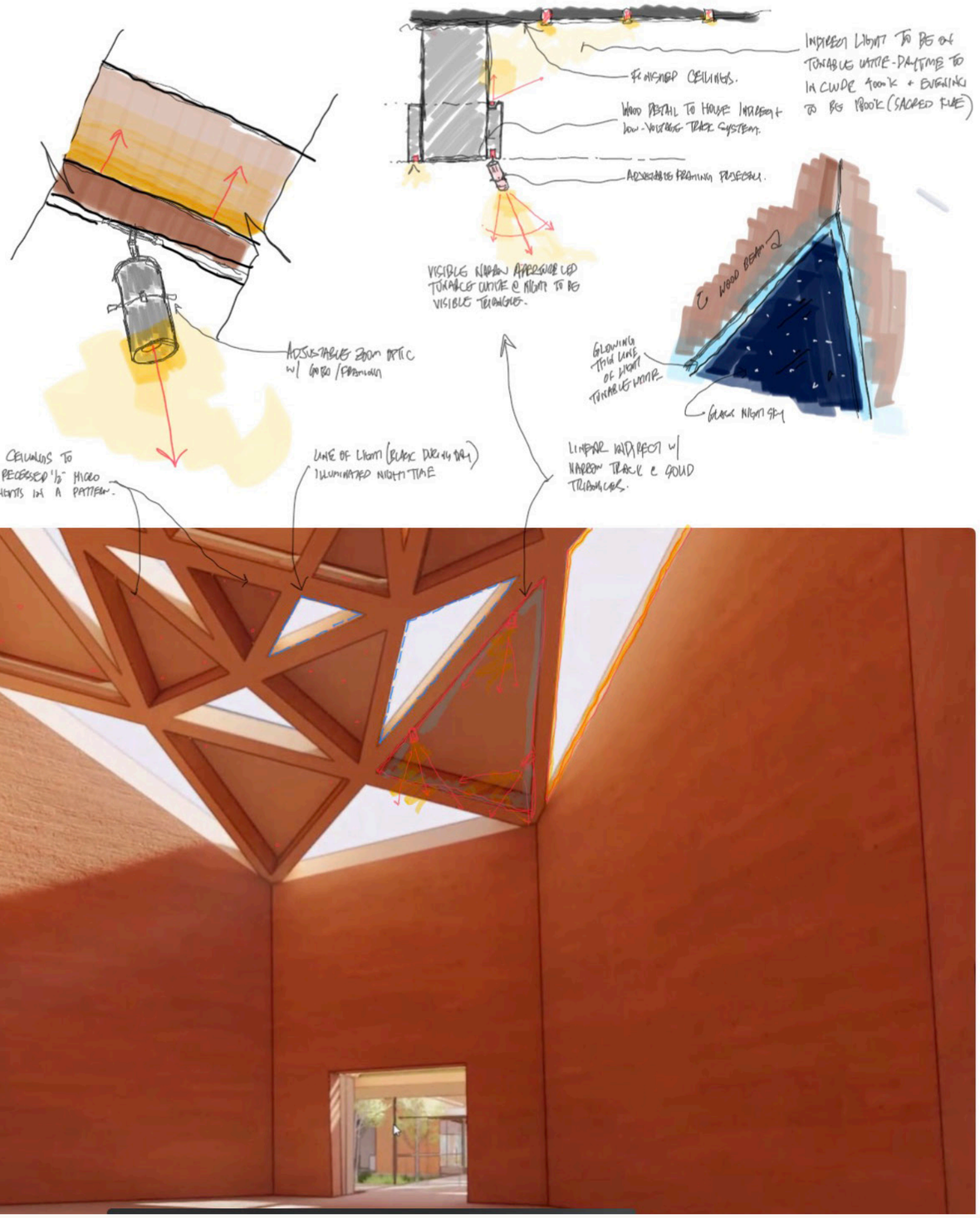
Ambient Direct Light at Skylight:
Fixture intended to be direct view, micro aperture, linear low voltage diode-free LED light strip in tunable white 1800k to 6500k framing skylight.

Starry Skies Light:
Recessed mounted micro 1/2" aperture low voltage LED downlight in tunable white 1800k to 6500k.

Exhibition Light:
Micro-track mounted, low voltage LED projectors with adjustable optics and framing shutters. Integrated lighting at exhibitions should be low-voltage LED.

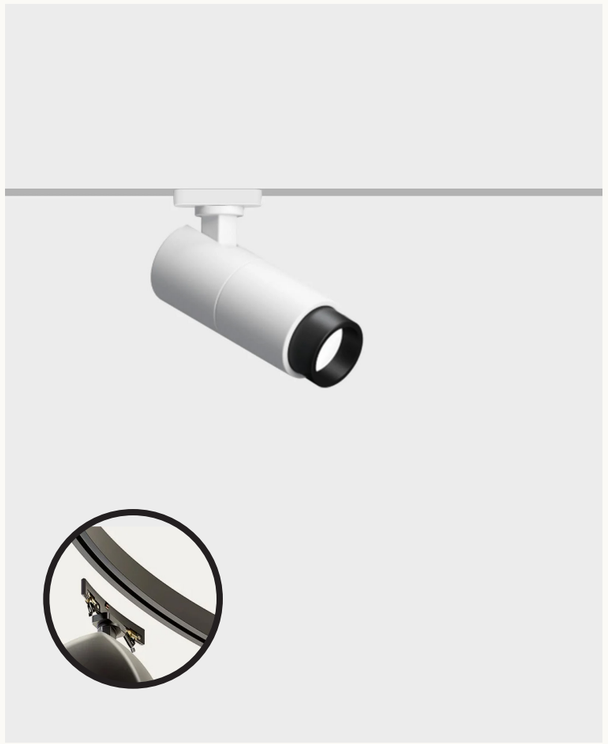
Lighting Controls:
All lighting to be fully flicker-free dimmable tied to scene based lighting control system.





Initial Design Sketches

The Birch Creek Gallery should maintain a visual connection to nature, with light patterns and shifting color temperatures guiding the gallery throughout the day. Curved, micro low-voltage track projectors illuminate the artwork, while ceiling-mounted micro downlights softly accent the floor. Wall-mounted micro path lights bridge the interior to the exterior, casting a warm, campfire-like glow that enriches the gallery.



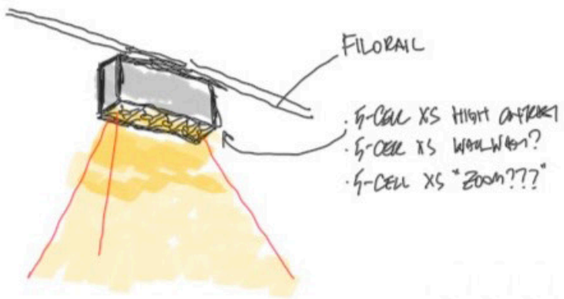
Lighting Attributes

Exhibition Light:
Micro-track mounted, low voltage LED projectors with adjustable optics and framing shutters. Integrated lighting at exhibitions should be low-voltage LED. Narrow "line of light" curved micro track runs parallel to the gallery wall.

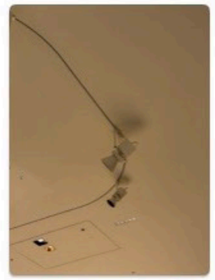
General Light:
Micro aperture high contrast low voltage LED downlight in tunable white 1800k-6500k.

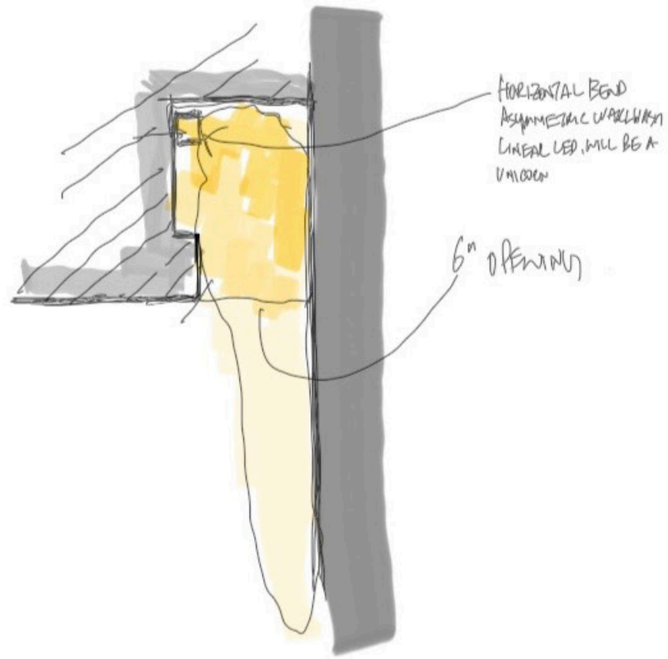
Wall-mount Path Light:
Column mounted micro path light (round), low voltage LED, 1800k warm white.

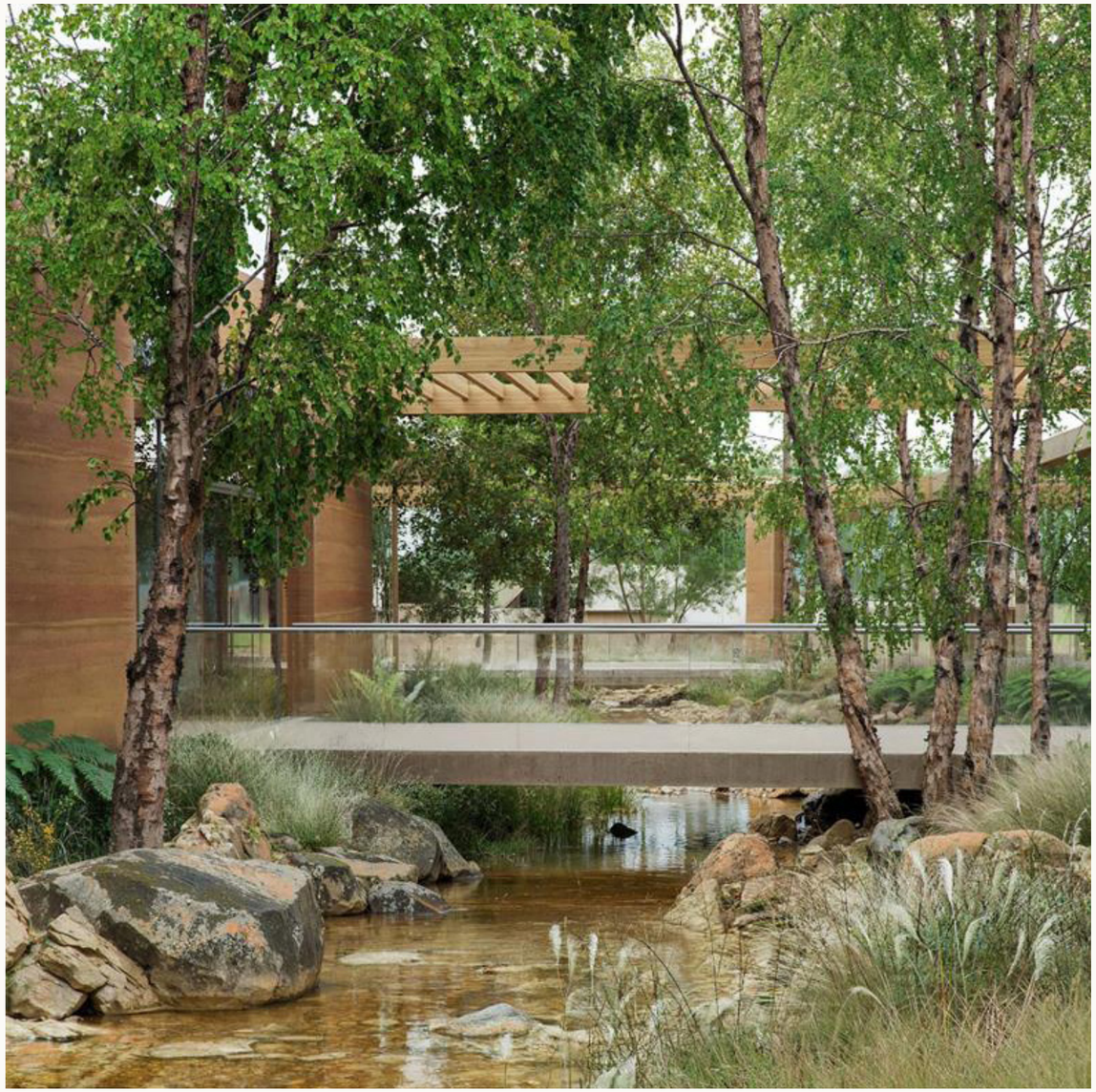
Lighting Controls:
All lighting to be fully flicker-free dimmable tied to scene based lighting control system.

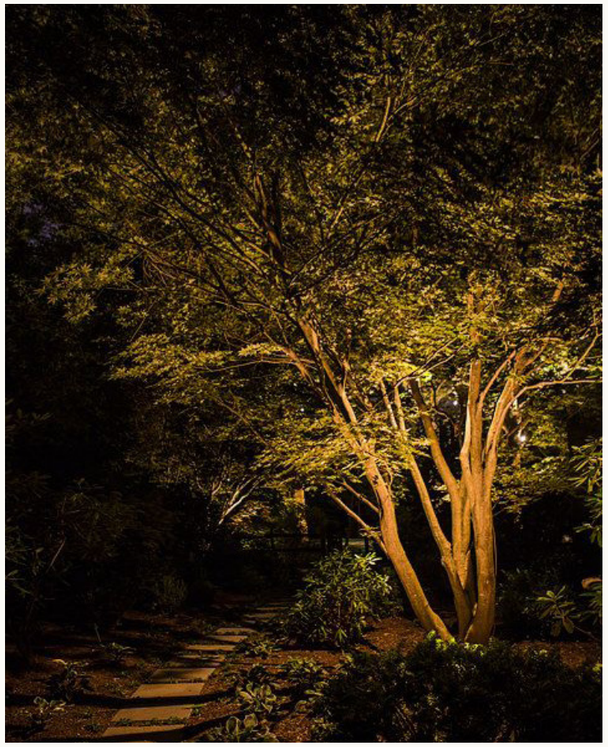


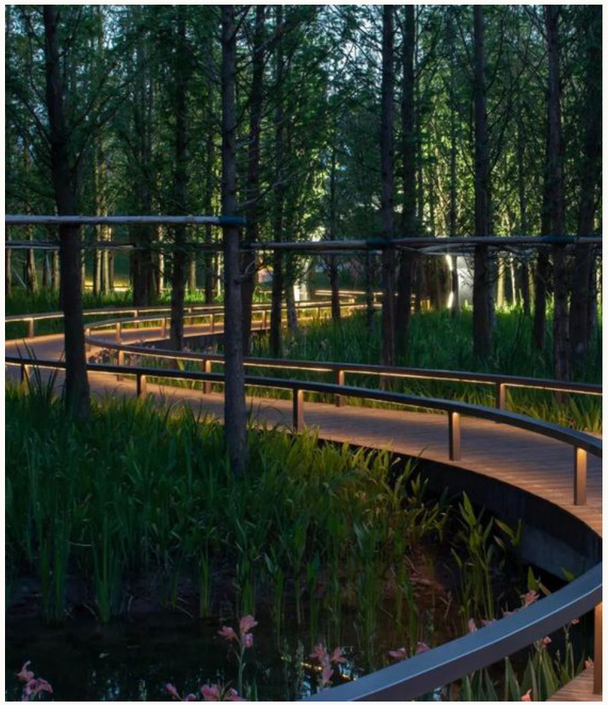
ARM LASERBLADE TRACK ADAPTER? (THEY MAKE A SINGLE CELL XS) I NEED A FAMILY OF IT. XS











Lighting Attributes

Light Under Bridge:
Linear, low voltage LED light strip in 1800k warm white.

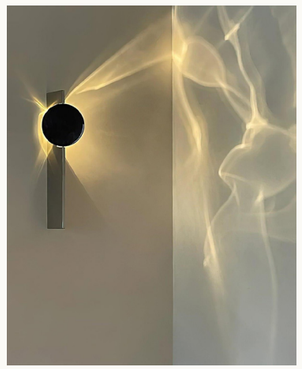
Landscape Lighting:
Stake-mounted low voltage LED accent lights in 2200k warm white to hightlight landscape. Low level pathway lighting in 2200k warm white to be included along walk paths.

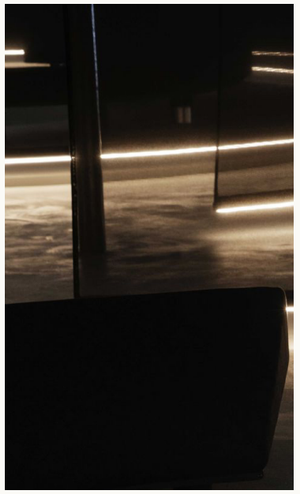
Column-mount Path Light:
Column mounted micro path light (round), low voltage LED, 1800k warm white.

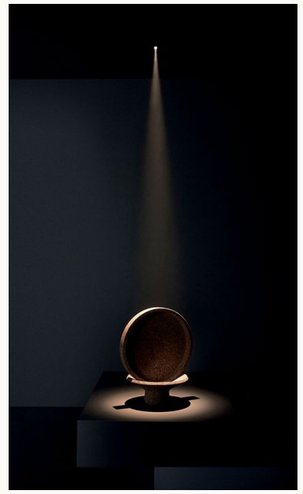
Lighting Controls:
All exterior lighting should be dimmable and tied to the lighting control system and to be triggered by astronomical timeclock.

The Birch Creek lighting should visually link the adjacent interiors with subtle, intentional lighting gestures. Low-level lighting discreetly integrated within the landscape, pairs with minimal accent lighting on select trees to create a gentle, cohesive connection between indoors and out.

The National Treasures Gallery will include soft, playful light projections that dance across the vertical walls, echoing the shifting patterns of sunlight in nature. Exhibition lighting to be illuminated with discreet fixtures with accessible, adjustable optics and a ribbon of low level toe-kick light that guides visitors from one treasure to the next.







Lighting Attributes

Ambient Cove Light at Beams:
Linear low voltage diode-free LED light strip in tunable white 1800k to 6500k to be integrated into ceiling beams.

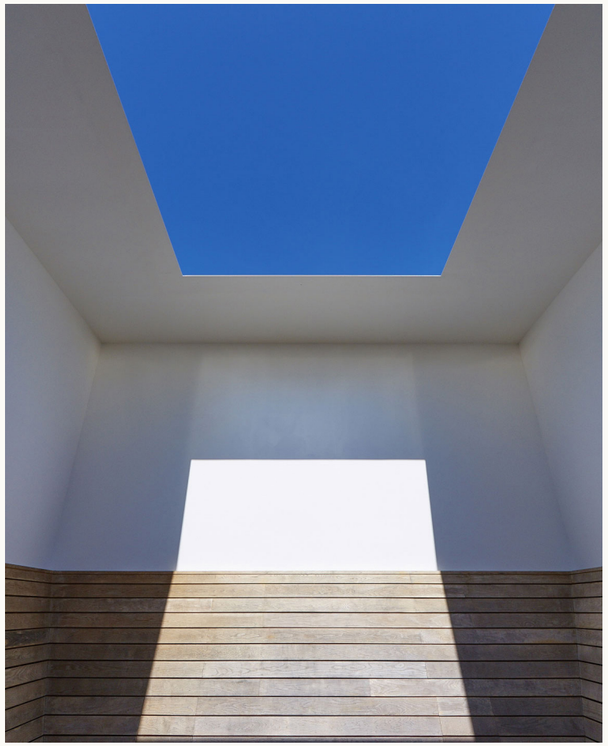
Projected Light:
Surface mounted in architectural detail, LED projector light with gobo and zoom optics, programmable with interchangable pattern filter in tunable white 1800k to 6500k.

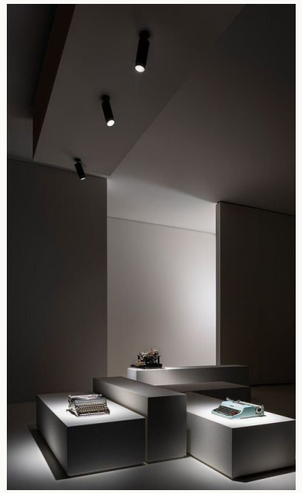
Low Level Perimeter & Toe-kick Light:
Linear low-voltage diode-free LED light strip in tunable white 1800k to 6500k.

Exhibition Light:
Micro-track mounted, low voltage LED projectors with adjustable optics and framing shutters. Integrated lighting at exhibitions should be low-voltage LED.

Lighting Controls:
All lighting to be fully flicker-free dimmable tied to scene based lighting control system.

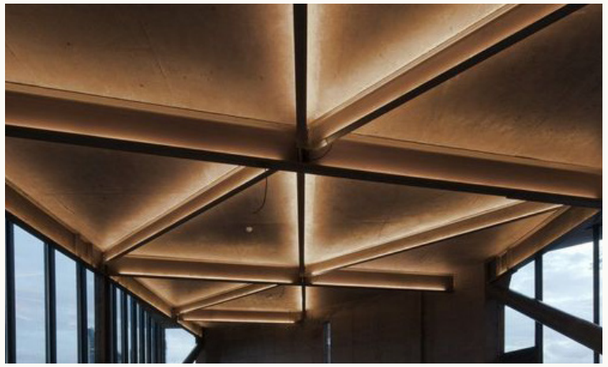
The Changing Gallery should feature highly flexible lighting to support rotating and changing exhibits. Simple-form exhibition projectors integrate seamlessly into the articulated ceiling, while soft ambient lighting gently highlights the ceiling's contours. This layered approach maintains a careful balance with the natural light that filters in through the skylight.





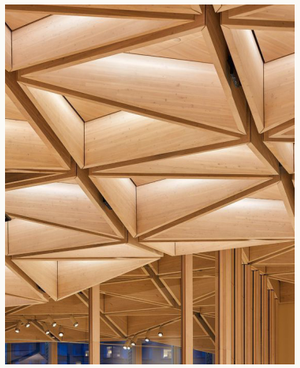
Lighting Attributes

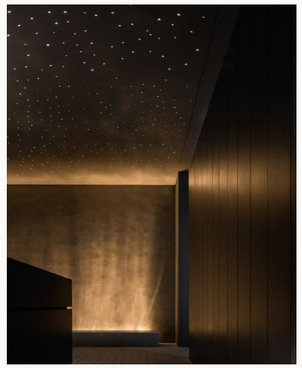
Ambient Cove Light:
Linear low voltage diode-free LED light strip in tunable white 1800k to 6500k to be integrated into articulated ceiling.



Ambient Direct Light at Skylight:
Fixture intended to be direct view, micro aperture, linear low voltage diode-free LED light strip in tunable white 1800k to 6500k framing skylight.

Starry Skies Light:
Recessed mounted micro 1/2" aperture low voltage LED downlight in tunable white 1800k to 6500k.

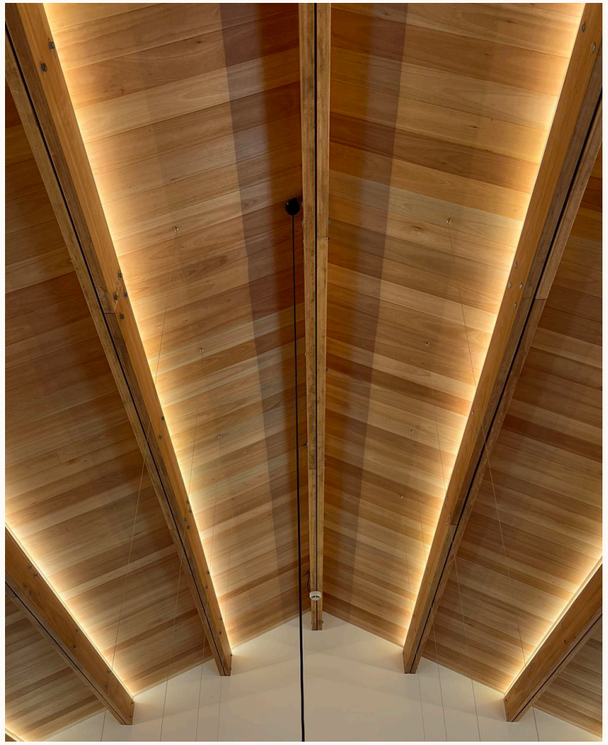


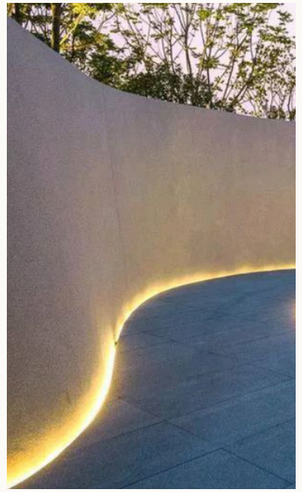


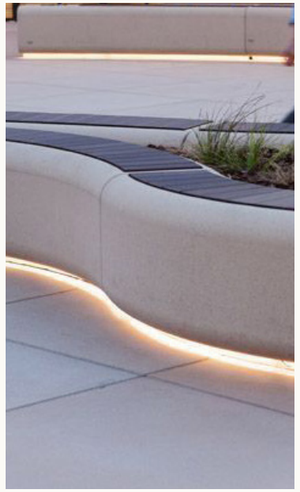
Exhibition Light:
Micro-track mounted, low voltage LED projectors with adjustable optics and framing shutters. Integrated lighting at exhibitions should be low-voltage LED.

Lighting Controls:
All lighting to be fully flicker-free dimmable tied to scene based lighting control system.

The Permament Gallery will include soft ambient wash light providing sculptural lighting gestures at the tiered display paired with ceiling mounted accent lighting focused on the permanent exhibition. Linear ambient architectural features to highlight the angled ceiling with lighting colors adjusted through natural circadian.

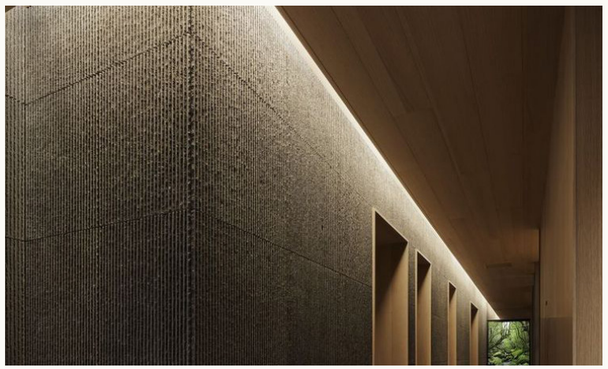






Lighting Attributes

Ambient Cove Light:
Linear low voltage diode-free LED light strip in tunable white 1800k to 6500k to be integrated into articulated ceiling.

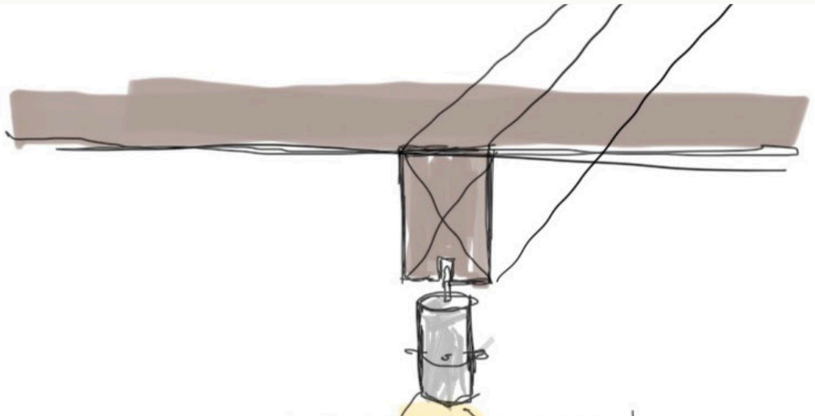


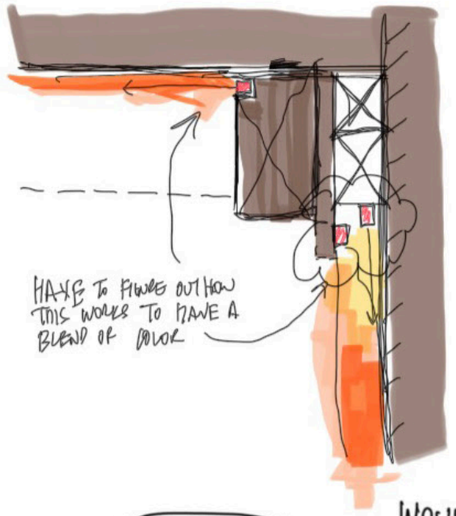
Projected Light:
Surface mounted in architectural detail, LED projector light with gobo and zoom optics, programmable with interchangable pattern filter in tunable white 1800k to 6500k.

Low Level Perimeter & Toe-kick Light:
Linear low-voltage diode-free LED light strip in tunable white 1800k to 6500k.

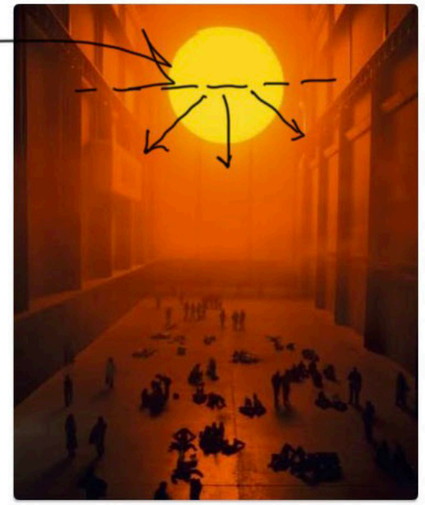
Exhibition Light:
Micro-track mounted, low voltage LED projectors with adjustable optics and framing shutters. Integrated lighting at exhibitions should be low-voltage LED.

Lighting Controls:
All lighting to be fully flicker-free dimmable tied to scene based lighting control system.

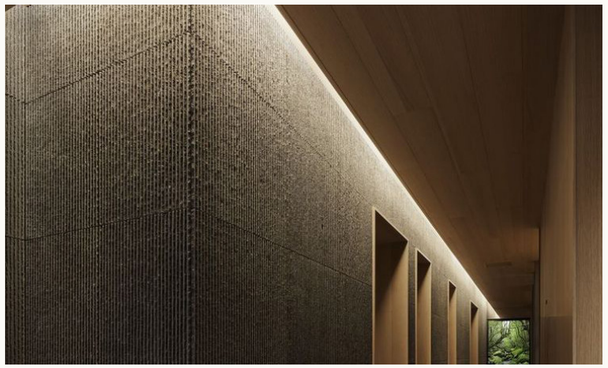


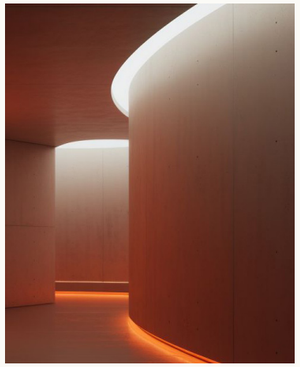


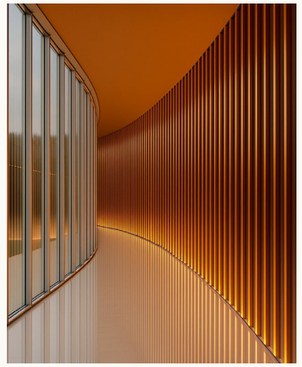
WOULD BE SO
COOL IF WE CAN
DO A FADE/BLEND OF
SATURATED WARMTH OF
THE SUN, SIMILAR TO
THE OLAFUR ELIASSON
"WEATHER PROJECT"
INSTALLATION

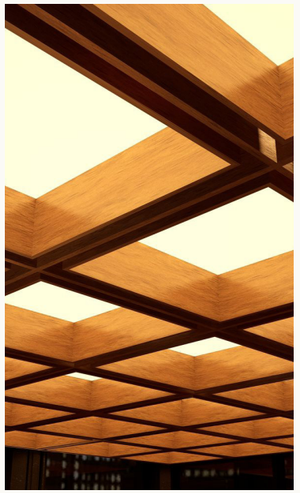


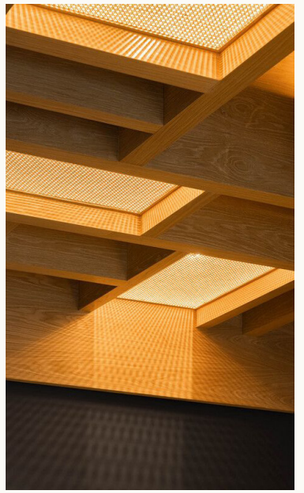
The Café will create a woven, interconnected light experience, carrying key gestures from adjacent spaces, guiding visitors through movement and visual continuity. The ceiling will layer multiple lighting elements to form a woven effect, with by low-level uplighting highlighting the architectural form. Low level lighting will connect seamlessly to the exterior amphitheater, reinforcing the dialogue between indoor and outdoor spaces.











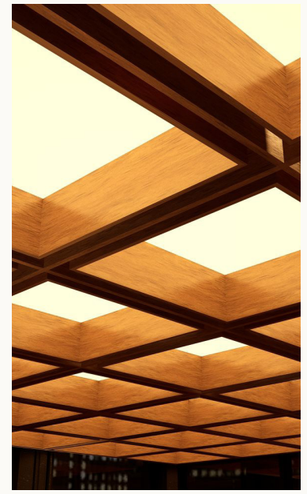
Lighting Attributes

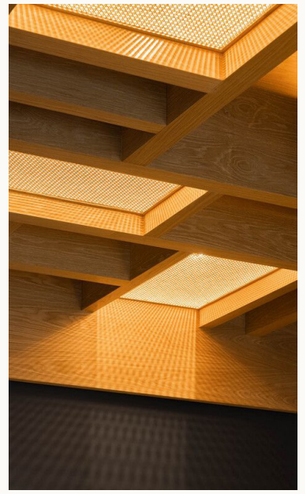
Ambient Cove Light:
Multiple layers of Linear low voltage diode-free LED light strip in tunable white 1800k to 6500k to be integrated into articulated ceiling.

Low Level Perimeter Upight:
Linear low-voltage diode-free LED light strip in tunable white 1800k to 6500k.

Lighting Controls:
All lighting to be fully flicker-free dimmable tied to scene based lighting control system.

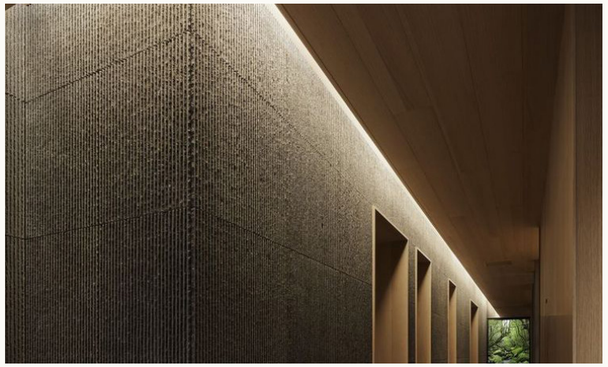
The Café exterior and amphitheater will embrace key lighting gestures from the interior, complemented by low-level illumination woven throughout the landscape. The lighting strategy is designed to harmonize the space, creating a welcoming and community-oriented atmosphere. Architectural forms will be softly uplit to enhance their presence while maintaining a calm, cohesive visual experience.





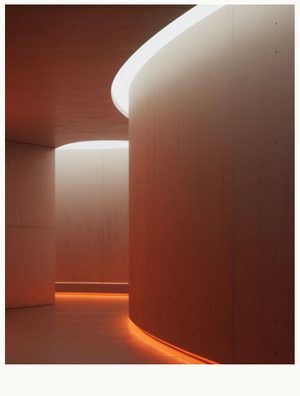
Lighting Attributes

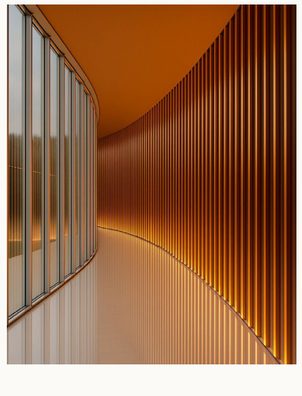
Ambient Cove Light:
Multiple layers of Linear low voltage diode-free LED light strip in tunable white 1800k to 6500k to be integrated into articulated ceiling.



Landscape Lighting:
Stake-mounted low voltage LED accent lights in 2200k warm white to hightlight landscape. Low level pathway lighting in 2200k warm white to be included along walk paths.

Building Uplight:
In-grade, linear line voltage LED grazer with controlled optics highlighting form of building. Tunable White, 2200k to 3500k.





Lighting Controls:
All exterior lighting should be dimmable and tied to the lighting control system and to be triggered by astronomical timeclock.

Lighting Attributes

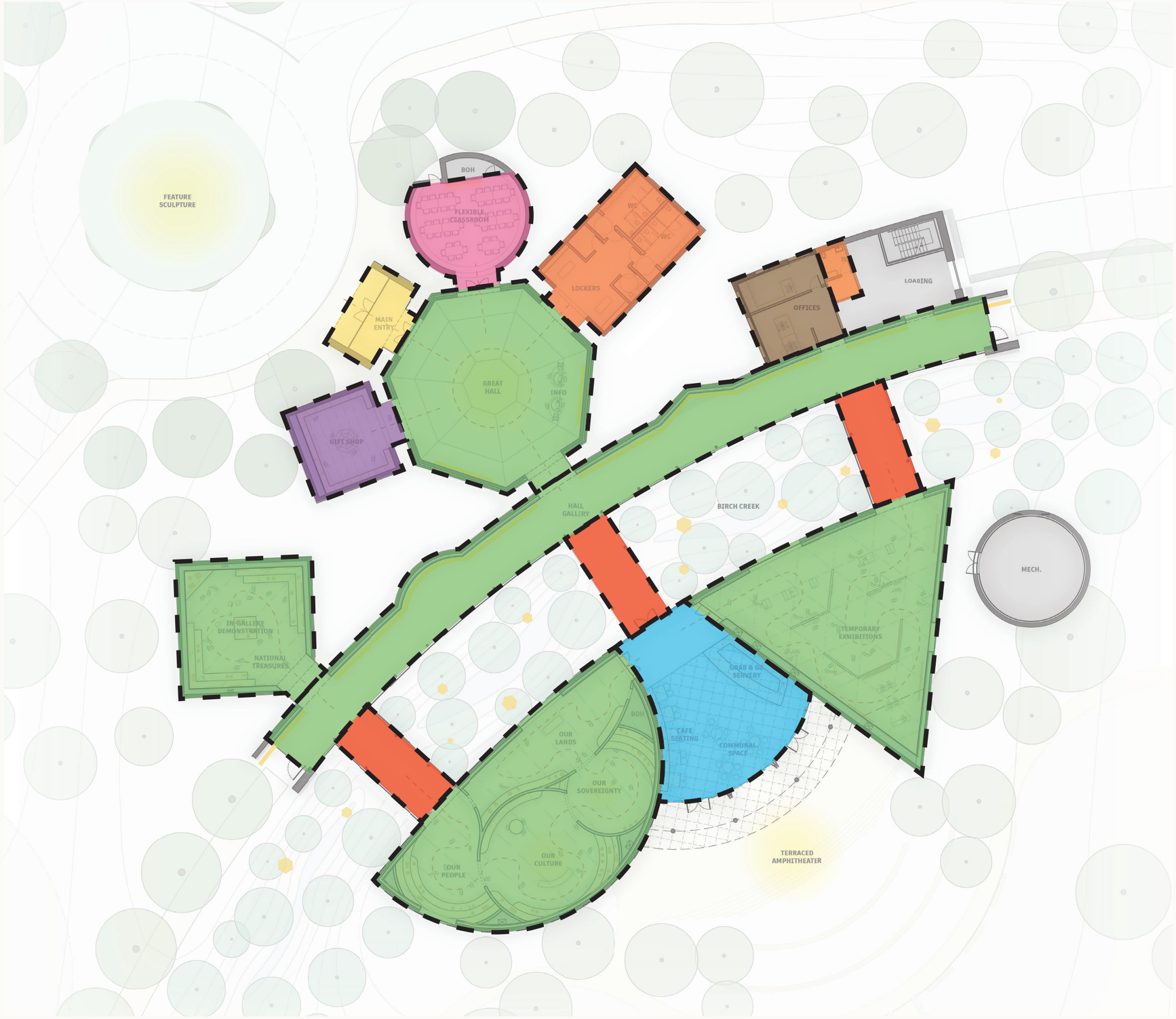
Moonlight:
Tree-strap mounted low voltage LED accent lights in 3500k neutral white. Glare shields and moonlight fiters to be included.

Landscape Lighting:
Stake-mounted low voltage LED accent lights in 2200k warm white to hightlight landscape. Low level pathway lighting in 2200k warm white to be included along walk paths.

Signage Lighting:
Signage lighting to be included to provide a soft wash of light for wayfinding. Allow for 2200k warm white linear LED.

Lighting Controls:
All exterior lighting should be dimmable and tied to the lighting control system and to be triggered by astronomical timeclock.

The masterplan landscape entry sequence should feel natural and effortless, with lighting that mirrors the experience of moving through a moonlit grove. Soft, moonlight-like illumination filters through the trees in neutral tones, while low level pathway lighting introduces a subtle campfire warmth. Together, they create an inviting, organic arrival experience that not only enhances the entry sequence but also offers a quiet preview of the warmth, connection, and atmosphere that unfolds.



ENCLOSED OFFICE 1.10 W/SF
OFFICE

LOBBY 0.90 W/SF
ENTRY

CLASSROOM/LECTURE/TRAINING 1.40 W/SF
FLEXIBLE CLASSROOM

RETAIL - SALES AREA 1.70 W/SF
GIFT SHOP

CAFE AREA 0.90 W/SF
CAFE SEATING
COMMUNAL SPACE
GRAB & GO SERVERY

CORRIDOR/TRANSITION 0.50 W/SF
CIRCULATION

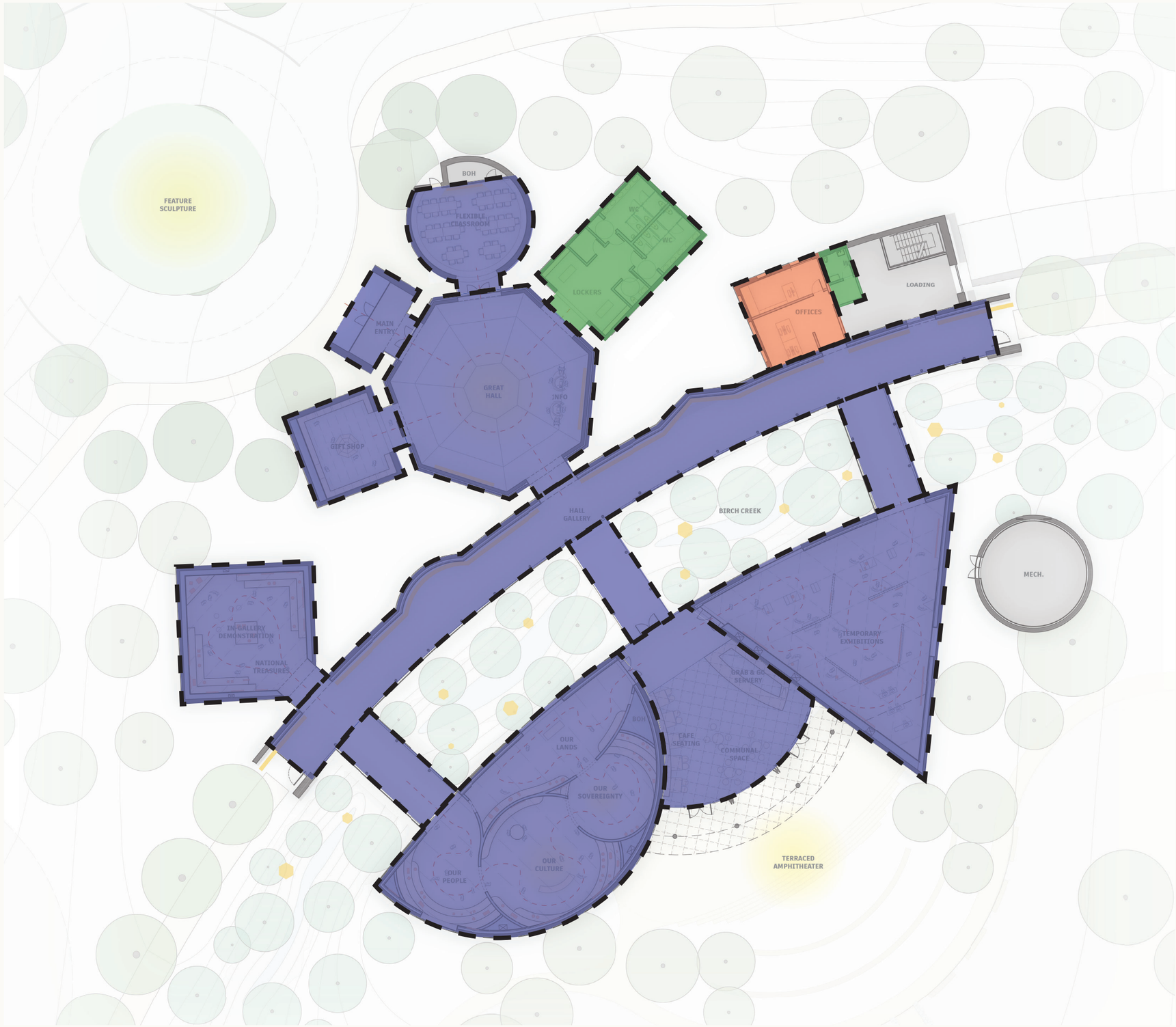
RESTROOMS 0.90 W/SF
LOCKERS/WC

GENERAL EXHIBITION 1.00 W/SF
GREAT HALL/INFO.
IN-GALLERY DEMONSTRATIONS
NATIONAL TREASURES
HALL GALLERY
TEMPORARY EXHIBITIONS
OUR PEOPLE
OUR CULUTURE
OUR SOVEREIGNTY
OUR LAND

ENERGY COMPLIANCE TARGERS PER OKLAHOMA ENERGY CODE (IECC-2006 & ASHRAE 90.1-2003)

BOLD PROPOSED LIGHTING REDUCTION TARGET 10% BELOW CODE.

ASHRAE 9.6.2 (ADDITIONAL INTERIOR LIGHTING POWER)
(a.) FOR SPACES IN WHICH LIGHTING IS SPECIFIED TO BE INSTALLED IN ADDITION TO THE GENERAL LIGHTING FOR THE PURPOSE OF DECORATIVE APPEARANCE OR FOR HIGHLIGHTING ART OR EXHIBITS, PROVIDED THAT THE ADDITIONAL LIGHTING POWER SHALL NOT EXCEED 1-W/SF OF SUCH SPACES.



VACANCY SENSOR (MANUAL ON, AUTO OFF)
OFFICE

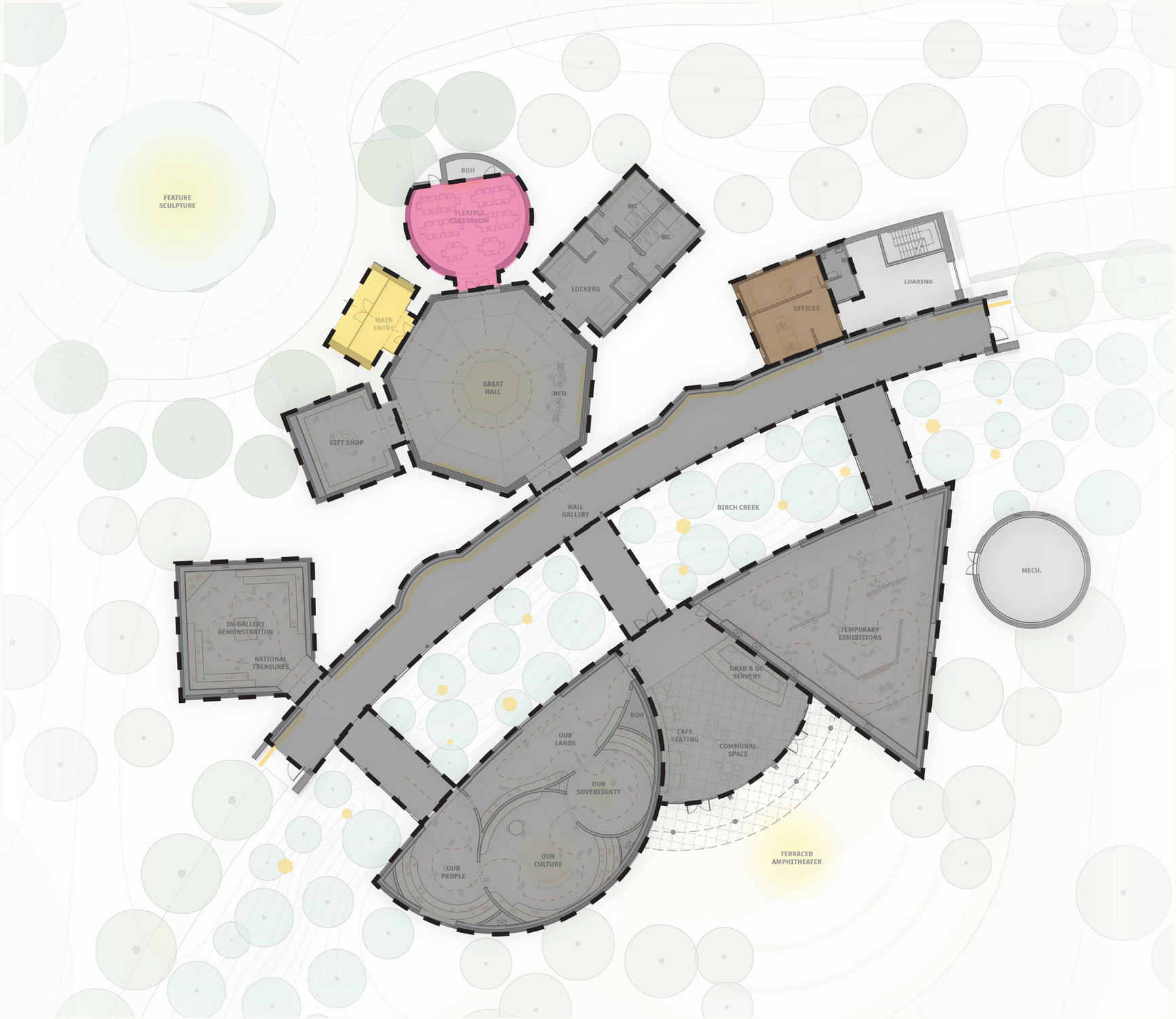
OCCUPANCY SENSOR (AUTO ON, AUTO OFF)
LOCKERS/WC
BACK OF HOUSE/STORAGE

SCENE BASED LIGHTING CONTROL SYSTEM (WITH ASTRONOMICAL TIMECLOCK)
GREAT HALL/INFO.
IN-GALLERY DEMONSTRATIONS
NATIONAL TREASURES
HALL GALLERY
TEMPORARY EXHIBITIONS
OUR PEOPLE
OUR CULUTURE
OUR SOVEREIGNTY
OUR LAND
CAFE SEATING
COMMUNAL SPACE
GRAB & GO SERVERY
CIRCULATION/HALL
GIFT SHOP
MAIN ENTRY
FLEXIBLE CLASSROOM
EXTERIOR SPACES

ALL FRONT OF HOUSE SPACES SHOULD BE TIED TO SCENE-BASED LIGHTING CONTROL SYSTEM WITH ASTRONOMICAL TIMECLOCK CONTROL. SPACES WILL NATURAL DAY LIGHT SHOULD INCLUDE DAYLIGHT SENSORS.

ALL SENSOR BASED SPACES INCLUSIVE OF VACANCY AND OCCUPANCY SENSORS SHOULD BE DUAL-TECHNOLOGY (INFRARED & ULTRASONIC).

BOLD RECOMMENDED LIGHTING CONTROL SYSTEM (LUTRON ATHENA)



ENCLOSED OFFICE
OFFICE

LIGHTING AT THE OFFICE SPACE WILL INCLUDE HIGH EFFICIENCY ARCHITECTURAL LIGHTING WITH COLOR TEMPERATURES BETWEEN 3000K TO 3500K AND A COLOR RENDERING VALUE OF CRI90+. AMBIENT ILLUMINATION WILL BE CONSIDERED WITH PROPER TASK ILLUMINATION AT THE WORK PLANE.

LOBBY
ENTRY

LIGHTING AT THE LOBBY ENTRY WILL BE THOUGHTFULLY COMPOSED TO CREATE A SEAMLESS TRANSITION FROM THE NATURAL ENVIRONMENT INTO THE GREAT HALL. THIS THRESHOLD EXPERIENCE REQUIRES A DELIBERATE BALANCE OF LIGHT COMPRESSION AND EXPANSION, ENHANCING THE SENSE OF ARRIVAL AND EMPHASIZING THE GRANDEUR OF THE GREAT HALL BEYOND.

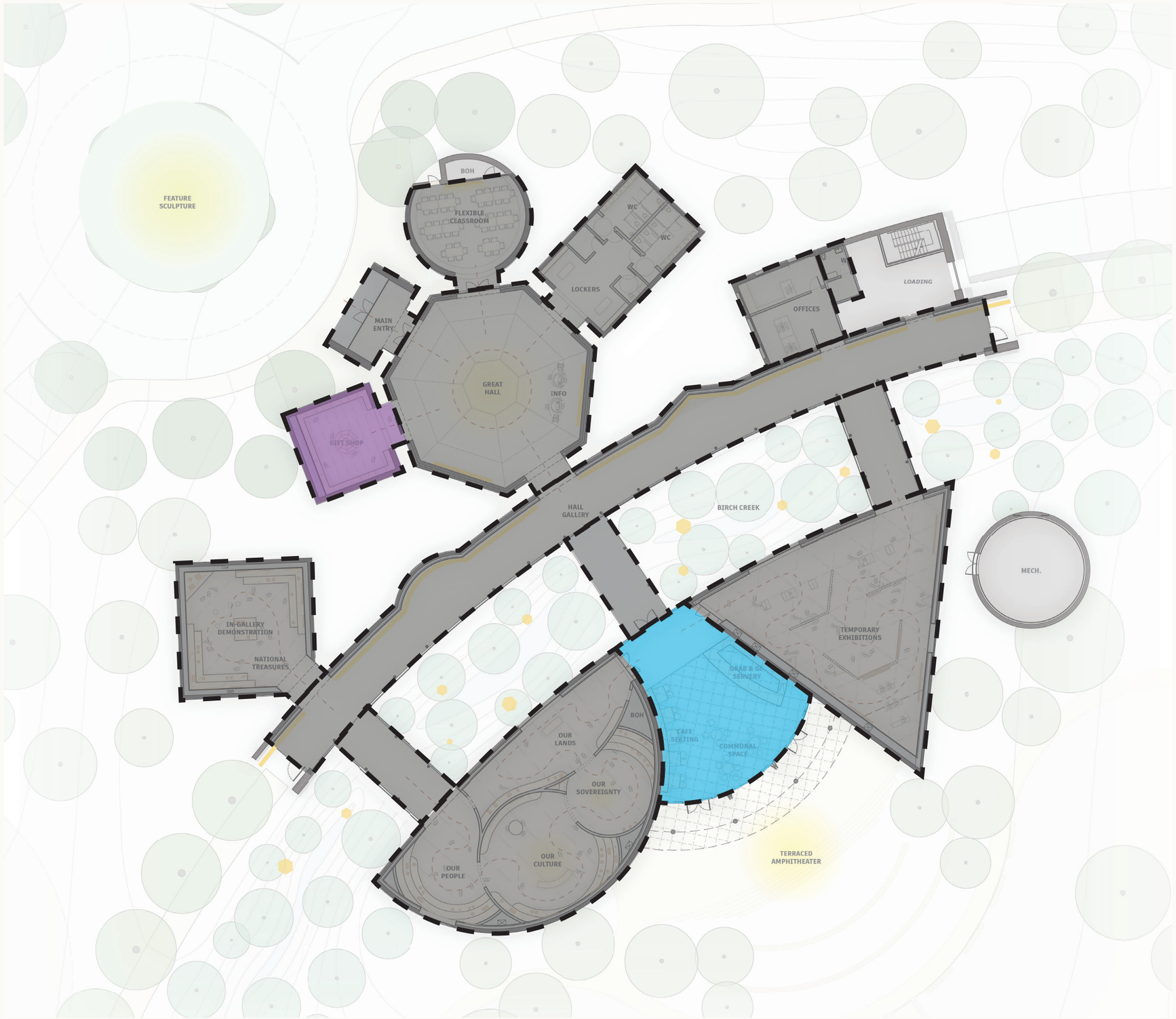
ARCHITECTURALLY INTEGRATED DYNAMIC-WHITE LIGHTING WITH TUNABLE-WHITE TECHNOLOGY WILL ENABLE ADAPTABLE LIGHTING SCENES THROUGHOUT THE DAY, HARMONIZING WITH AVAILABLE DAYLIGHT AND EVENING AMBIENT CONDITIONS. THIS APPROACH REINFORCES A CIRCADIAN-AWARE CONNECTION TO NATURE, UTILIZING A BROAD COLOR TEMPERATURE RANGE FROM 1800K TO 6500K AND ENSURING EXCEPTIONAL COLOR QUALITY WITH A MINIMUM CRI OF 90+.

CLASSROOM/LECTURE/TRAINING
FLEXIBLE CLASSROOM

LIGHTING FOR THE FLEXIBLE CLASSROOM WILL BE DESIGNED TO SUPPORT A WIDE RANGE OF USES, FROM EDUCATIONAL TRAINING AND INSTRUCTIONAL ACTIVITIES TO CONFERENCES AND PRESENTATIONS FOR A FULLY ADAPTABLE AND RESPONSIVE ENVIRONMENT THAT ENHANCES BOTH TEACHING AND VISUAL ENGAGEMENT.

AMBIENT ILLUMINATION WILL BE DELIVERED , OFFERING A SOFT AND COMFORTABLE VISUAL ATMOSPHERE. THE COLOR TEMPERATURE RANGE WILL INCLUDE 2700K-3500K WITH A CRI OF 90+ TO ENSURE EXCELLENT COLOR QUALITY.

A COMPLEMENTARY LAYER OF DYNAMIC-WHITE ACCENT LIGHTING, TUNABLE BETWEEN 1800K AND 6500K, WILL PROVIDE FOCUSED TASK ILLUMINATION AS NEEDED OR BE ADJUSTED TO SUPPORT PRESENTATION MODES, ARTIFACT DISPLAYS, AND OTHER SPECIALIZED VISUAL REQUIREMENTS. THIS LAYERED APPROACH ENSURES THE SPACE REMAINS VERSATILE, VISUALLY BALANCED, AND ABLE TO ACCOMMODATE A BROAD SPECTRUM OF FUNCTIONAL NEEDS.



RETAIL - SALES AREA

GIFT SHOP

ADJUSTABLE, FLEXIBLE ARCHITECTURAL LIGHTING AND INTEGRATED MILLWORK LIGHTING WILL BE INCLUDED AT THE GIFT SHOP. THE LIGHTING SHOULD FEEL LIKE AN EXTENSION OF THE EXHIBITIONS WITH LAYERED LIGHTING THAT HIGHLIGHTS THE ARCHITECTURAL FEATURES WITH FOCAL LIGHTING AT THE PRODUCT DISPLAY.

ARCHITECTURALLY INTEGRATED DYNAMIC-WHITE LIGHTING WITH TUNABLE WHITE CAPABILITY WILL SUPPORT ADAPTABLE SCENE SETTINGS THROUGHOUT THE DAY, BALANCING NATURAL DAYLIGHT WITH EVENING AMBIENT CONDITIONS. THIS SYSTEM PROVIDES A CIRCADIAN-AWARE CONNECTION TO NATURE, WITH COLOR TEMPERATURES RANGING FROM 1800K TO 6500K AND A MINIMUM COLOR RENDERING VALUE OF CRI90+.

ALL ARCHITECTURAL LIGHT FIXTURES WILL BE SELECTED AND POSITIONED TO MINIMIZE GLARE AND REDUCE VISIBILITY OF LIGHT SOURCES. MIRRORING NATURAL ENVIRONMENTS, FOCAL LIGHTING WILL REMAIN PRECISE AND DIRECTED SOLELY TOWARD EXHIBITED WORKS, WHILE AMBIENT LAYERS WILL BE CONCEALED WITHIN ARCHITECTURAL DETAILS SUCH AS INDIRECT COVES AND MILLWORK.

CAFE AREA

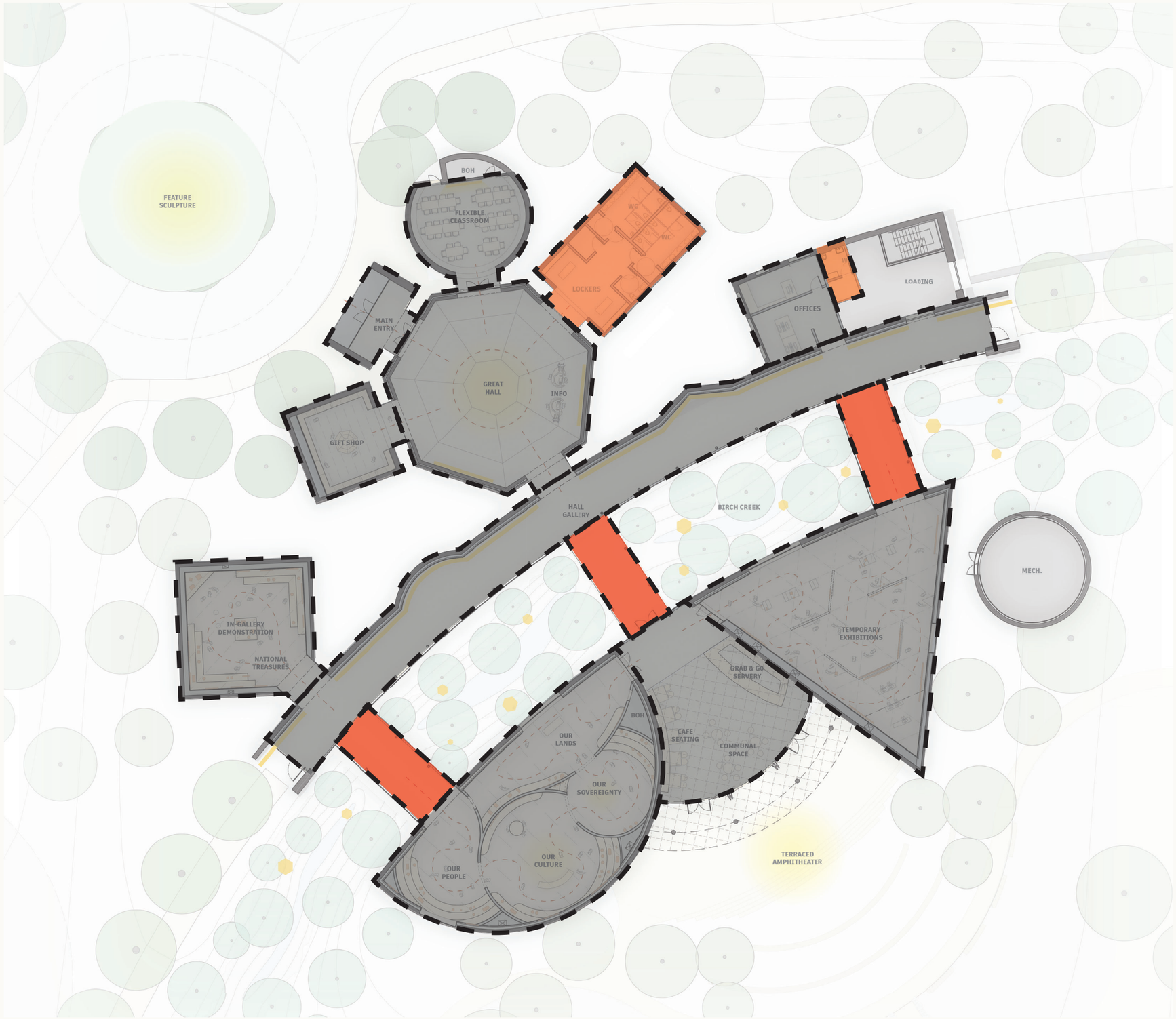
CAFE SEATING
COMMUNAL SPACE
GRAB & GO SERVERY

THE CAFÉ LIGHTING WILL CREATE A SEAMLESS VISUAL CONNECTION BETWEEN THE EXHIBITION AND GALLERY AREAS AND THE EXTERIOR TERRACED AMPHITHEATER. COLOR TEMPERATURES WILL BE CAREFULLY BALANCED TO HARMONIZE WITH NATURAL LIGHT FILTERING IN FROM THE TERRACE AND BIRCH CREEK.

LIGHTING WILL HIGHLIGHT KEY ARCHITECTURAL ELEMENTS AND THOUGHTFULLY ACCENT THE FOOD AND BEVERAGE AREAS, SUPPORTING A HOSPITALITY-DRIVEN ATMOSPHERE THAT MAINTAINS A STRONG CONNECTION TO NATURE.

AMBIENT ILLUMINATION WILL BE PRIMARILY INDIRECT, PROVIDING A SOFT AND COMFORTABLE VISUAL ENVIRONMENT. TUNABLE WHITE FIXTURES RANGING FROM 1800K TO 6500K WITH A MINIMUM CRI OF 90+ ENSURE HIGH COLOR QUALITY AND ADAPTABILITY.

THIS LAYERED APPROACH DELIVERS VERSATILITY, VISUAL BALANCE, AND THE FLEXIBILITY TO SUPPORT A WIDE RANGE OF FUNCTIONAL AND EXPERIENTIAL NEEDS.



CORRIDOR/TRANSITION

CIRCULATION (ENCLOSED & OPEN BRIDGE)

THE CIRCULATION BRIDGE SERVES AS A VITAL CONNECTOR BETWEEN THE BIRCH CREEK GALLERY, THE CAFÉ, AND THE EXHIBITION SPACES. AS A TRANSITIONAL MOMENT THROUGH NATURE, THE LIGHTING MUST REMAIN CAREFULLY BALANCED TO PRESERVE THE VISUAL CONTINUITY AND AVOID DISRUPTING THE BIRCH CREEK EXPERIENCE. FIXTURES WILL BE STRATEGICALLY PLACED TO MAINTAIN A SEAMLESS CONNECTION TO THE EXTERIOR AND SURROUNDING LANDSCAPE.

LIGHTING WILL REMAIN DISCREET AND ARCHITECTURALLY INTEGRATED, ALLOWING THE BRIDGE TO ACT AS A VISUAL EXTENSION OF THE GALLERY SPACES RATHER THAN A POINT OF INTERRUPTION.

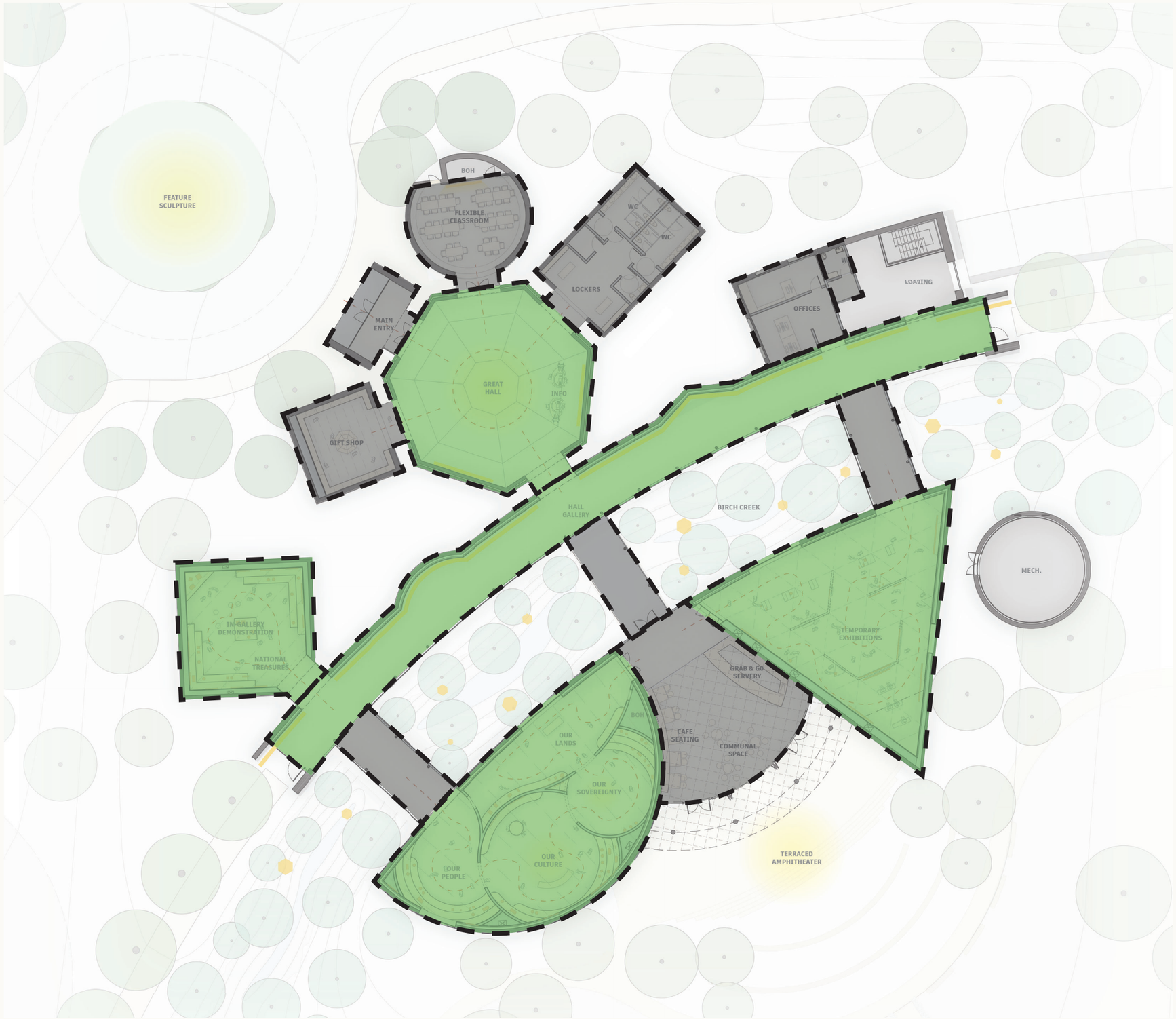
ILLUMINATION WILL BE PRIMARILY INDIRECT, CREATING A SOFT AND COMFORTABLE ENVIRONMENT. TUNABLE-WHITE FIXTURES RANGING FROM 1800K TO 6500K WITH A MINIMUM CRI OF 90+ WILL PROVIDE HIGH COLOR QUALITY AND THE FLEXIBILITY NEEDED TO ADAPT TO VARYING CONDITIONS AND PROGRAMMATIC NEEDS.

RESTROOMS

LOCKERS/WC

THE LIGHTING WITHIN THE RESTROOMS WILL CUE LIGHTING COMPONENTS THAT MIMICS NATURE, AMBIENT COVE LIGHTING WILL BE INCLUDED THAT MIMICS THE CIRCADIAN TIME OF DAY WITH HUMAN SCALE ARCHITECTURAL AND DECORATIVE LIGHTING LAYERS.

AMBIENT LIGHTING WILL BE TUNABLE-WHITE WITH COLOR TEMPERATURE RANGES FROM 1800K TO 6500K WHILE DECORATIVE LIGHTING LAYERS WILL BE WARM WITH A COLOR TEMPERATURE RANGE OF 1800K TO 2700K, BOTH WITH COLOR RENDERING VALUES OF CRI90+ ALLOWING FOR HIGH COLOR AND VISUAL QUALITY.



GENERAL EXHIBITION

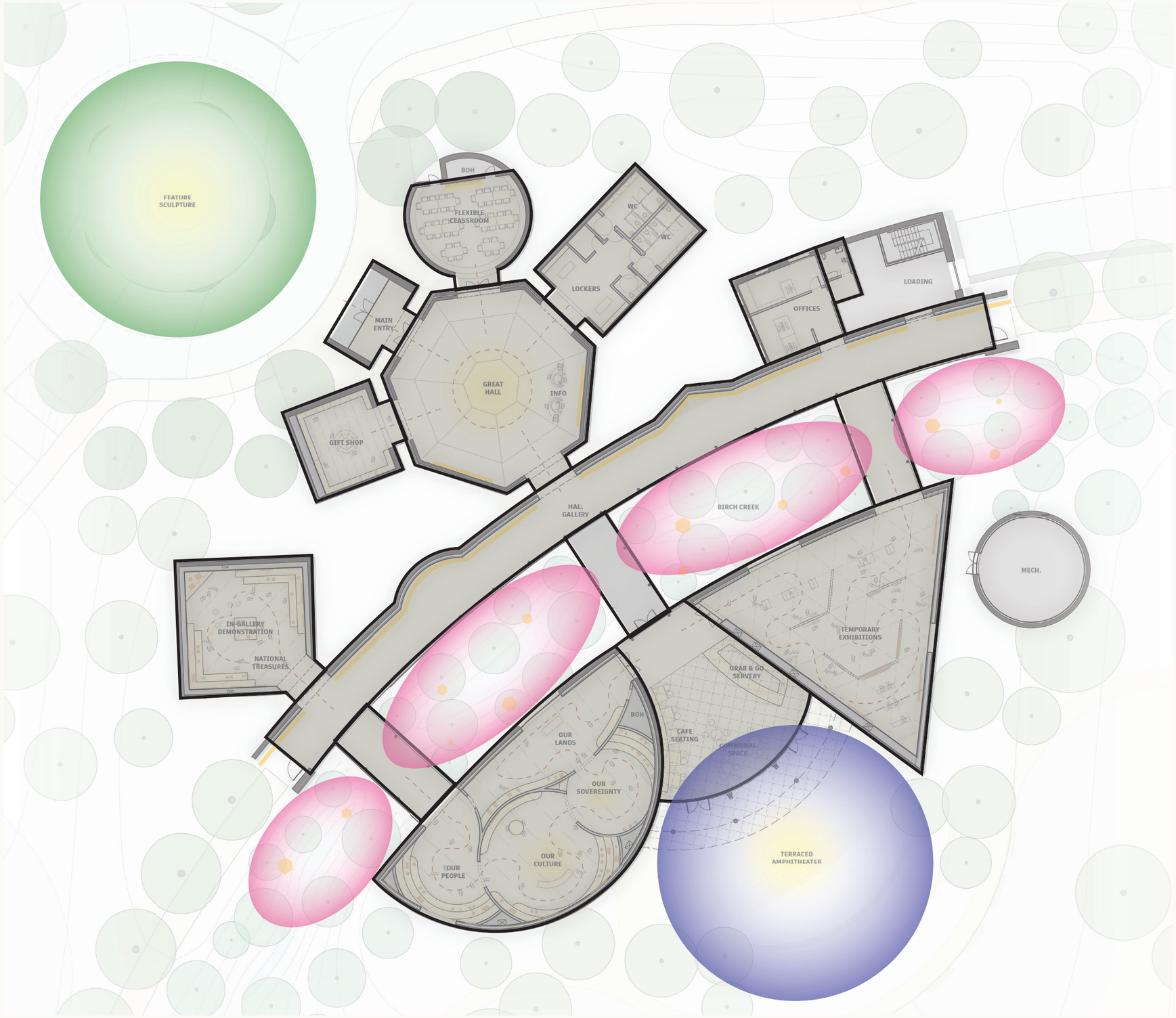
GREAT HALL/INFO.
IN-GALLERY DEMONSTRATIONS
NATIONAL TREASURES
HALL GALLERY
TEMPORARY EXHIBITIONS
OUR PEOPLE
OUR CULUTURE
OUR SOVEREIGNTY
OUR LAND

LIGHTING FOR THE GALLERY AND EXHIBITION SPACES WILL BE COMPOSED OF MULTIPLE LAYERS OF ARCHITECTURAL ILLUMINATION, ENHANCING THE INTERIOR ARCHITECTURE WHILE ACCENTUATING KEY EXHIBITION FEATURES.

ARCHITECTURALLY INTEGRATED DYNAMIC-WHITE LIGHTING WITH TUNABLE WHITE CAPABILITY WILL SUPPORT ADAPTABLE SCENE SETTINGS THROUGHOUT THE DAY, BALANCING NATURAL DAYLIGHT WITH EVENING AMBIENT CONDITIONS. THIS SYSTEM PROVIDES A CIRCADIAN-AWARE CONNECTION TO NATURE, WITH COLOR TEMPERATURES RANGING FROM 1800K TO 6500K AND A MINIMUM COLOR RENDERING VALUE OF CRI90+.

ALL ARCHITECTURAL LIGHT FIXTURES WILL BE SELECTED AND POSITIONED TO MINIMIZE GLARE AND REDUCE VISIBILITY OF LIGHT SOURCES. MIRRORING NATURAL ENVIRONMENTS, FOCAL LIGHTING WILL REMAIN PRECISE AND DIRECTED SOLELY TOWARD EXHIBITED WORKS, WHILE AMBIENT LAYERS WILL BE CONCEALED WITHIN ARCHITECTURAL DETAILS SUCH AS INDIRECT COVES AND MILLWORK.

ADAPTIVE, FLEXIBLE EXHIBITION LIGHTING WILL FEATURE EASILY ACCESSIBLE AIMING AND ADJUSTMENT, OFFERING CONTROLLED GLARE, DEFINED CUT-OFF, AND A RANGE OF BEAM-OPTIC OPTIONS TO ACCOMMODATE CHANGING DISPLAY NEEDS.



FEATURE SCULPTURE

THE LIGHTING FOR THE FEATURE SCULPTURE SHOULD THOUGHTFULLY RESPOND TO BOTH THE LANDSCAPE AND THE ARCHITECTURAL FORMS. IT SHOULD BE GUIDED BY THE NATURAL ENVIRONMENT, MINIMIZING UNNECESSARY ILLUMINATION AND SUPPORTING DARK-SKY PRINCIPLES.

LIGHTING TO BE DETERMINED.

BIRCH CREEK

LIGHTING AT THE BIRCH CREEK SHOULD BE MINIMAL AND EMBRACING THE PRESENCE OF NATURE. LIGHTING SHOULD BE CONCEALED AND ILLUUMINATE FEATURE ZONES THAT RELATE TO THE INTERIOR SPACES. LIGHTING WITHIN THE BIRCH CREEK SHOULD BE CONTAINED WITHIN THE ARCHITECTURAL BOUNDARIES AND TO SUPPORT DARK-SKY PRINCIPLES.

LIGHTING WILL BE WARM AND FOCUSED PRIMARILY ON AMBIENT LIGHT. COLOR TEMPERATURE RANGES WILL BE BETWEEN 1800K TO 2400K WITH A COLOR TEMPERATURE VALUE OF CRI90+.

AMPHITHEATER

LIGHTING AT THE AMPHITHEATER SHOULD CREATE A VISUAL DIALOGUE WITH THE CAFÉ, SEAMLESSLY CONNECTING THE INTERIOR AND EXTERIOR THROUGH A SHARED LIGHTING CONCEPT INSPIRED BY NATURE.

ALL ILLUMINATION WITHIN THE AMPHITHEATER SHOULD REMAIN CONTAINED WITHIN THE ARCHITECTURAL BOUNDARIES, MINIMIZING SPILL LIGHT AND SUPPORTING DARK-SKY PRINCIPLES.

THE LIGHTING WILL BE WARM AND AMBIENT, WITH COLOR TEMPERATURES RANGING FROM 1800K TO 2400K AND A CRI OF 90+ TO ENSURE A NATURAL, INVITING GLOW.

TYPE	DESCRIPTION	COLOR TEMP/ COLOR RENDERING	WATTAGE	MANUFACTURER	DIMMING	CONTROLS
INTERIOR						
AMBIENT COVE LIGHT	LINEAR, LOW VOLTAGE DIODE-FREE LED LIGHT STRIP, MANUFACTURER PRE-ASSEMBLED TAPE-IN-CHANNEL SYSTEM IN TUNABLE WHITE LED. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES.	1800K TO 6500K (CRI 90+)	8 WATTS/LF	LUMINII	YES	DALI-2
AMBIENT DIRECT LIGHT STRIP	INTENDED FOR DIRECT VIEW, NARROW APERTURE, LINEAR, LOW VOLTAGE DIODE-FREE LED LIGHT STRIP, MANUFACTURER PRE-ASSEMBLED TAPE-IN-CHANNEL SYSTEM WITH POLYURETHANE ENCAPSULATION, CAPABLE OF VERTICAL FLEX "3D-BEND" IN TUNABLE WHITE LED. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES.	1800K TO 6500K (CRI 90+)	8 WATTS/LF	LUMINII	YES	DALI-2
STARRY SKIES LIGHT	CUSTOM/STANDARD MODIFIED, RECESSED MOUNTED FLANGELESS, MICRO APERTURE, NOMINAL 1/2" DIAMETER, LOW VOLTAGE LED "MICRO DOWNLIGHT" IN TUNABLE WHITE LED. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES.	1800K TO 6500K (CRI 90+)	6 WATTS	DELTA LIGHTING	YES	DALI-2
EXHIBITION LIGHTING TRACK	RECESSED MOUNTED, FLANGELESS, MICRO APERTURE LOW VOLTAGE 24V POWER DISTRIBTION "FLIORAIL" TRACK SYSTEM INTENDED TO BE SEAMLESSLY INTEGRATED INTO ARCHITECTURAL MILLWORK DETAIL. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES.	N/A	N/A	I-GUZZINI	YES	DALI-2
EXHIBITION PROJECTOR LIGHT (HIGH OUTPUT)	"FILORAIL" TRACK SYSTEM MOUNTED, LOW VOLTAGE, HIGH-OUTPUT PROJECTOR LIGHT WITH ADJUSTABLE ZOOM OPTICS AND LIGHT CUTTING FRAMING SHUTTERS, STATIC COLOR TEMPERATURE.	3000K (CRI 97+)	25 WATTS	I-GUZZINI	YES	DALI-2
EXHIBITION PROJECTOR LIGHT (STANDARD OUTPUT)	"FILORAIL" TRACK SYSTEM MOUNTED, LOW VOLTAGE, STANDARD-OUTPUT PROJECTOR LIGHT WITH ADJUSTABLE ZOOM OPTICS AND LIGHT CUTTING FRAMING SHUTTERS, STATIC COLOR TEMPERATURE.	3000K (CRI 97+)	15 WATTS	I-GUZZINI	YES	DALI-2
EXHIBITION STANDARD TRACK LIGHT (STANDARD OUTPUT)	"FILORAIL" TRACK SYSTEM MOUNTED, LOW VOLTAGE, STANDARD-OUTPUT PROJECTOR LIGHT WITH INTERCHANGABLE OPTICS AND GLARE ACCESSORIES (HEX LOUVERS, SPREAD LENS, SNOOTS), STATIC COLOR TEMPERATURE.	3000K (CRI 97+)	15 WATTS	I-GUZZINI	YES	DALI-2
EXHIBITION MILLWORK LIGHT (LINEAR)	SURFACE MOUNTED IN ARCHITECTURAL MILLWORK DETAIL, LINEAR LOW-VOLTAGE LED LIGHT STRIP, NARROW APERTURE, DIODE-FREE ILLUMINATION, TUNABLE WHITE, POLYURETHANE ENCAPSULATION, WITH HORIZONTAL FLEX (3D-BEND). SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES.	1800K TO 3500(CRI 97+)	6 WATTS/LF	LUMINII	YES	DALI-2
EXHIBITION MILLWORK LIGHT (POINT SOURCE)	RECESSED MOUNTED IN ARCHITECTURAL MILLWORK DETAIL, MICRO APERTURE LOW-VOLTAGE LED ACCENT LIGHT WITH GLARE FREE OPTICS, INTERCHANGABLE LENSES AND DIFFUSERS, TUNABLE WHITE. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES.	1800K TO 3500(CRI 97+)	6 WATTS	LUMINII-PRECISION	YES	DALI-2
EXHIBITION MILLWORK LIGHT (CASEGOODS)	SURFACE MOUNTED IN ARCHITECTURAL MILLWORK DETAIL, MICRO APERTURE LOW-VOLTAGE LED ACCENT LIGHT WITH GLARE FREE OPTICS, INTERCHANGABLE LENSES AND DIFFUSERS, TUNABLE WHITE. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES.	1800K TO 3500(CRI 97+)	6 WATTS	LUMINII-PRECISION	YES	DALI-2
GENERAL RECESSED LIGHT (HIGH OUTPUT)	RECESSED MOUNTED, NOMINAL 3.5" APERTURE, HIGH OUTPUT, ADJUSTABLE, TUNABLE WHITE, LED ACCENT LIGHT WITH CONICAL REGRESSED TRIM LENS WITH RECESSED FLANGELESS TRIM. FIXTURE TO BE PROVIDED WITH INTERCHANGABLE OPTICS, DIFFUSING LENS AND HEX LOUVER.	1800K TO 6500K (CRI 90+)	24 WATTS	USAI LIGHTING	YES	0-10V

TYPE	DESCRIPTION	COLOR TEMP/ COLOR RENDERING	WATTAGE	MANUFACTURER	DIMMING	CONTROLS
GENERAL RECESSED LIGHT (STANDARD OUTPUT)	RECESSED MOUNTED, NOMINAL 3.5" APERTURE, STANDARD OUTPUT, ADJUSTABLE, TUNABLE WHITE, LED ACCENT LIGHT WITH CONICAL REGRESSED TRIM LENS WITH RECESSED FLANGELESS TRIM. FIXTURE TO BE PROVIDED WITH INTERCHANGABLE OPTICS, DIFFUSING LENS AND HEX LOUVER.	1800K TO 6500K (CRI 90+)	18 WATTS	USAI LIGHTING	YES	0-10V
GENERAL RECESSED LIGHT (MICRO APERTURE)	RECESSED MOUNTED, MICRO APERTURE NOMINAL 1", HIGH CONTRAST ADJUSTABLE, TUNABLE WHITE LED DOWNLIGHT WITH FLANGELESS TRIM. FIXTURE TO BE PROVIDED WITH DIFFUSING LENS AND HEX LOUVER.	1800K TO 6500K (CRI 90+)	12 WATTS	USAI LIGHTING	YES	0-10V
WALL MOUNTED PATH LIGHT (INTERIOR)	RECESSED WALL MOUNTED, LOW-VOLTAGE LED PATH-LIGHT/STEP LIGHT IN STATIC COLOR TEMPERATURE. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES.	2400K (90+CRI)	6 WATTS	MINIMIS LIGHTING	YES	0-10V
GENERAL LINEAR COVE/WALLWASH	SURFACE MOUNTED IN ARCHITECTURAL MILLWORK, HIGH OUTPUT, NARROW APERTURE, LINEAR, LOW VOLTAGE DIODE-FREE LED LIGHT STRIP, MANUFACTURER PRE-ASSEMBLED TAPE-IN-CHANNEL SYSTEM WITH POLYURETHANE ENCAPSULATION, CAPABLE OF VERTICAL FLEX "3D-BEND" IN TUNABLE WHITE LED. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES. FIXTURE NOT INTENDED FOR DIRECT VIEW	1800K TO 3000K (CRI 90+)	6 WATTS/LF	LUMINII	YES	0-10V
GENERAL LINEAR TOE-KICK/ FLOORWASH	SURFACE MOUNTED IN ARCHITECTURAL MILLWORK, LOW OUTPUT, NARROW APERTURE, LINEAR, LOW VOLTAGE DIODE-FREE LED LIGHT STRIP, MANUFACTURER PRE-ASSEMBLED TAPE-IN-CHANNEL SYSTEM WITH POLYURETHANE ENCAPSULATION, CAPABLE OF VERTICAL FLEX "3D-BEND" IN TUNABLE WHITE LED. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES. FIXTURE NOT INTENDED FOR DIRECT VIEW	1800K TO 3000K (CRI 90+)	4 WATTS/LF	LUMINII	YES	0-10V
EXTERIOR						
MOONLIGHT	TREE-STRAP MOUNTED, LOW-VOLTAGE LED ACCENT LIGHT WITH GLARE SHIELDS, HEX LOUVERS, SPREAD LENSES AND MOONLIGHT FILTERS. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES TO BE LOCATED IN WET LOCATION BURIAL BOX OR REMOTELY LOCATED IN INTERIOR CONDITIONED ROOMS	3500K (90+CRI)	7 WATTS	HEVILITE	YES	ELV
LANDSCAPE LIGHT (TREE UPLIGHT)	STAKE MOUNTED, LOW-VOLTAGE LED ACCENT LIGHT WITH GLARE SHIELDS, HEX LOUVERS, SPREAD LENSES. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES TO BE LOCATED IN WET LOCATION BURIAL BOX OR REMOTELY LOCATED IN INTERIOR CONDITIONED ROOMS	2200K (90+CRI)	7 WATTS	HEVILITE	YES	ELV
LANDSCAPE LIGHT (PATHLIGHT)	STAKE MOUNTED, LOW-VOLTAGE LED PATH LIGHT WITH GLARE SHIELDS, HEX LOUVERS, SPREAD LENSES. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES TO BE LOCATED IN WET LOCATION BURIAL BOX OR REMOTELY LOCATED IN INTERIOR CONDITIONED ROOMS	2200K (90+CRI)	7 WATTS	HEVILITE	YES	ELV
SIGNAGE LIGHT (ACCENT)	STAKE MOUNTED, LOW-VOLTAGE LED PATH LIGHT WITH GLARE SHIELDS, HEX LOUVERS, SPREAD LENSES. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES TO BE LOCATED IN WET LOCATION BURIAL BOX OR REMOTELY LOCATED IN INTERIOR CONDITIONED ROOMS	2200K (90+CRI)	7 WATTS	HEVILITE	YES	ELV

TYPE	DESCRIPTION	COLOR TEMP/ COLOR RENDERING	WATTAGE	MANUFACTURER	DIMMING	CONTROLS
SIGNAGE LIGHT (LINEAR)	SURFACE MOUNTED WITH STAKE OR ARCHITECTURAL POST, LOW OUTPUT, NARROW APERTURE, LINEAR, OPTICALLY DRIVEN, LED LIGHT STRIP, MANUFACTURER PRE-ASSEMBLED TAPE-IN-CHANNEL SYSTEM. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES..	2200K (90+CRI)	10 WATTS	I-GUZZINI	YES	0-10V
ARCHITECTURAL UPLIGHT (BUILDING, LINEAR)	LINEAR, LINE VOLTAGE LED LIGHT STRIP WITH ADJUSTABLE BEAM OPTICS, GLARE SHIELDS.	2700K (90+CRI)	12 WATTS/LF	I-GUZZINI	YES	0-10V
SCULPTURE ACCENT (SURFACE MOUNTED)	STAKE MOUNTED, LOW-VOLTAGE ACCENT LIGHT WITH GLARE SHIELDS, HEX LOUVERS, SPREAD LENSES. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES TO BE LOCATED IN WET LOCATION BURIAL BOX OR REMOTELY LOCATED IN INTERIOR CONDITIONED ROOMS	2700K (90+CRI)	16 WATTS	I-GUZZINI	YES	0-10V
SCULPTURE ACCENT (RECESSED MOUNTED)	RECESSED MOUNTED, LOW-VOLTAGE ACCENT LIGHT WITH GLARE SHIELDS, HEX LOUVERS, SPREAD LENSES. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES TO BE LOCATED IN WET LOCATION BURIAL BOX OR REMOTELY LOCATED IN INTERIOR CONDITIONED ROOMS	2700K (90+CRI)	16 WATTS	I-GUZZINI	YES	0-10V
GENERAL LINEAR UNDER BENCH	SURFACE MOUNTED IN ARCHITECTURAL DETAIL, STANDARD OUTPUT, NARROW APERTURE, LINEAR, LOW VOLTAGE DIODE-FREE LED LIGHT STRIP, MANUFACTURER PRE-ASSEMBLED TAPE-IN-CHANNEL SYSTEM WITH POLYURETHANE ENCAPSULATION, CAPABLE OF VERTICAL FLEX "3D-BEND" IN TUNABLE WHITE LED. SYSTEM TO BE PROVIDED WITH FULLY FLICKER FREE DIMMABLE REMOTE POWER SUPPLIES. FIXTURE NOT INTENDED FOR DIRECT VIEW	1800K TO 3000K (CRI 90+)	6 WATTS/LF	LUMINII	YES	0-10V
LIGHTING CONTROLS						
SCENE BASED LIGHTING CONTROL SYSTEM	SMART LIGHT SYSTEM MANAGEMENT SOLUTION WITH INTEGRATED LIGHTING CONTROL ZONES, DAYLIGHT SENSORS AND AUTOMATED LIGHTING SCENE CONTROL THROUGH UNIFIED CONTROL DEVICE. SYSTEM CAPABLE OF ADJUSTING LIGHT LEVELS, COLOR TEMPERATURES AND SCHEDULES, INTEGRATED FOR USE IN FOR INTERIOR AND EXTERIOR LIGHTING. INTUITIVE SCENE-BASED CONTROLS, CLOUD BASED CENTRALISED MANAGEMENT SYSTEM WITH BUILDING AUTOMATION, FOR USE WITH ALL CONTROL LOAD TYPES. EXTERNAL MOBILE APPLICATION USER CONTROL.	N/A	N/A	LUTRON ATHENA	N/A	N/A
DAYLIGHT SENSORS	AUTOMATIC ADJUSTMENT OF LIGHT LEVELS THROUGH NATURAL DAYLIGHT IN SPACE, DUAL-TECHNOLOGY DAYLIGHT SENSOR.	N/A	N/A	LUTRON ATHENA	N/A	N/A
VACANCY SENSOR	MANUAL ON, AUTOMATIC OFF LIGHTING CONTROL SENSOR WITH DUAL TECHNOLOGY (INFRARED AND ULTRASONIC)	N/A	N/A	LUTRON ATHENA	N/A	N/A
OCCUPANCY SENSOR	AUTOMATIC ON/OFF LIGHTING CONTROL SENSOR WITH DUAL TECHNOLOGY (INFRARED AND ULTRASONIC)	N/A	N/A	LUTRON ATHENA	N/A	N/A

Thank you.

Cherokee Heritage Center - Tahlequah, Oklahoma | New York | California

151 West 25th Street, New York NY 10001 | www.boldllc.com | @studioboldllc

1.1 SUMMARY

A. Environmental graphics and wayfinding signage are essential and powerful tools in identifying and establishing a sense of place within the 44-acre site that comprises the Cherokee Heritage Center. The rich and storied history of the Cherokee will inform a dual-language program that will guide visitors and everyday users to their intended destinations. The program will be carefully designed as bespoke, highly functional fixtures, carefully integrating within the landscaping, architecture and interiors with coordinated materials, finishes and design elements.

1.2 ANTICIPATED SIGNAGE TYPOLOGIES

A. The program will provide key identification and wayfinding elements throughout the site and its buildings, and anticipates including the signage components listed below:

B. Exterior Signage

1. Site Identification
2. Building Identification
3. Villages, Plaza and Amphitheater Identification
4. Wayfinding Signage, Vehicular
5. Wayfinding Signage, Pedestrian
6. Site Map/Directory Housings, if applicable
7. Service entry signage, if applicable

C. Interior Signage

1. Welcome Desk Identification
2. Various Space Identification signs (e.g. Gathering Spaces, Galleries, etc)
3. Café, Servery and Gift Shop Identification
4. Wayfinding
5. Directory Housings
6. Room Identification Signage
7. Stair and Floor Identification Signage
8. Restroom and Wellness Room Identification
9. ADA-required signs
10. Regulatory signs
11. Distraction markings, if required

1.3 APPLICABLE CODES

A. The Signage for the project will conform with the following codes and standards, as applicable:

1. International Building Code (IBC) 2018
2. International Code Council (ICC) A117.1-2009 Standards
3. 2010 ADA Standards for Accessible Design
4. Oklahoma Supplementary Code, Title 748, as applicable

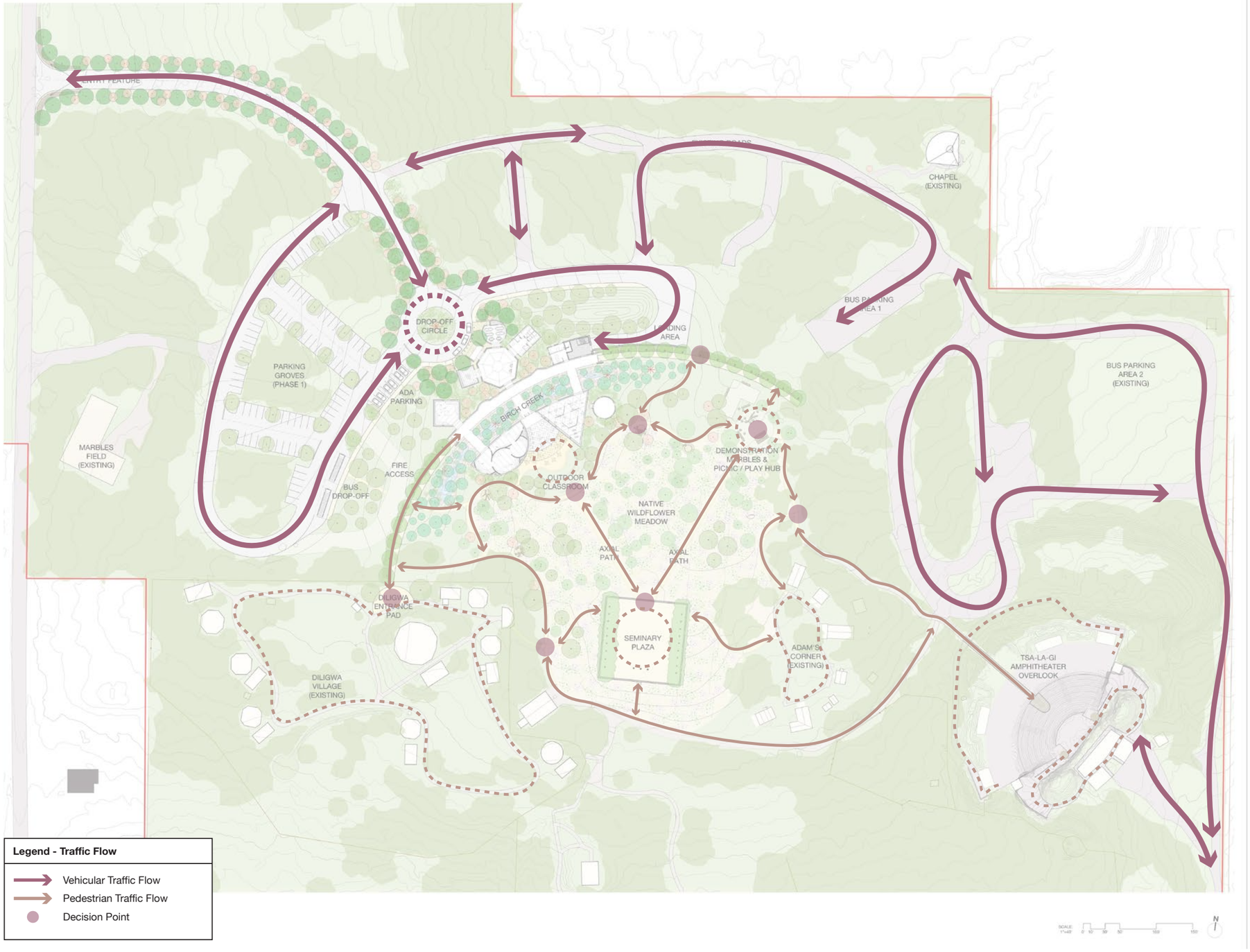
END OF SECTION

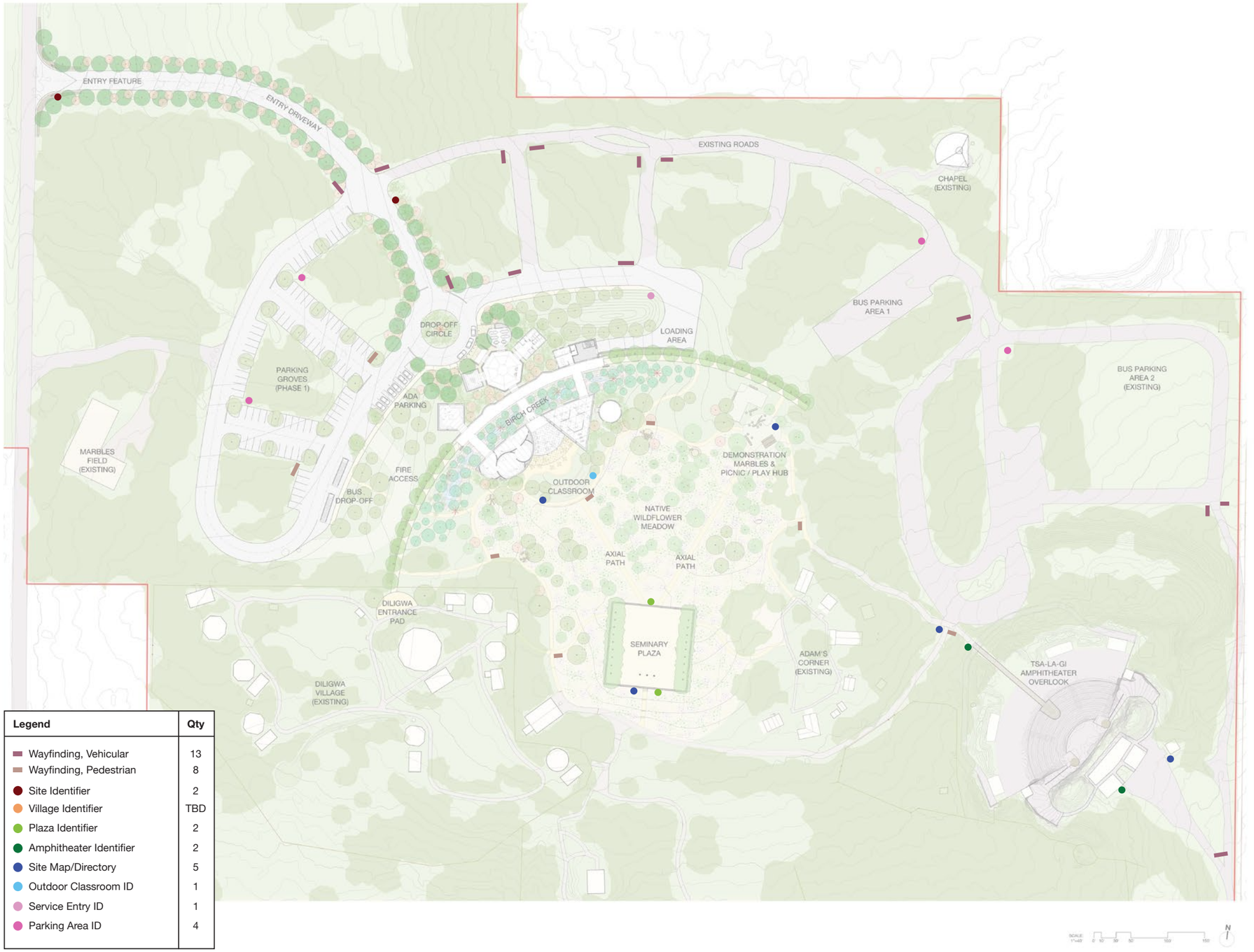
Cherokee Heritage Center

Basis of Design: Preliminary Sign Locations and Quantities

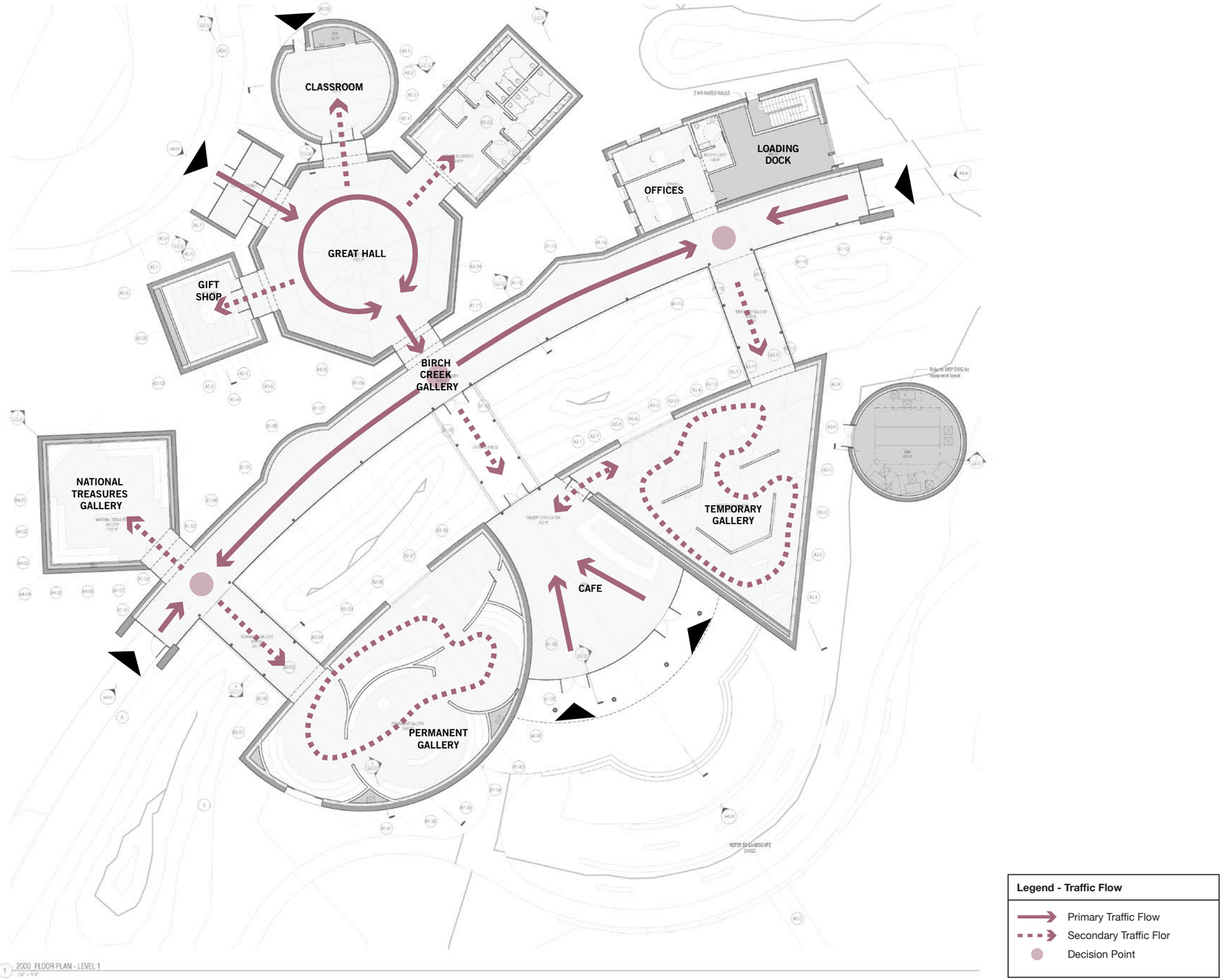
Pentagram

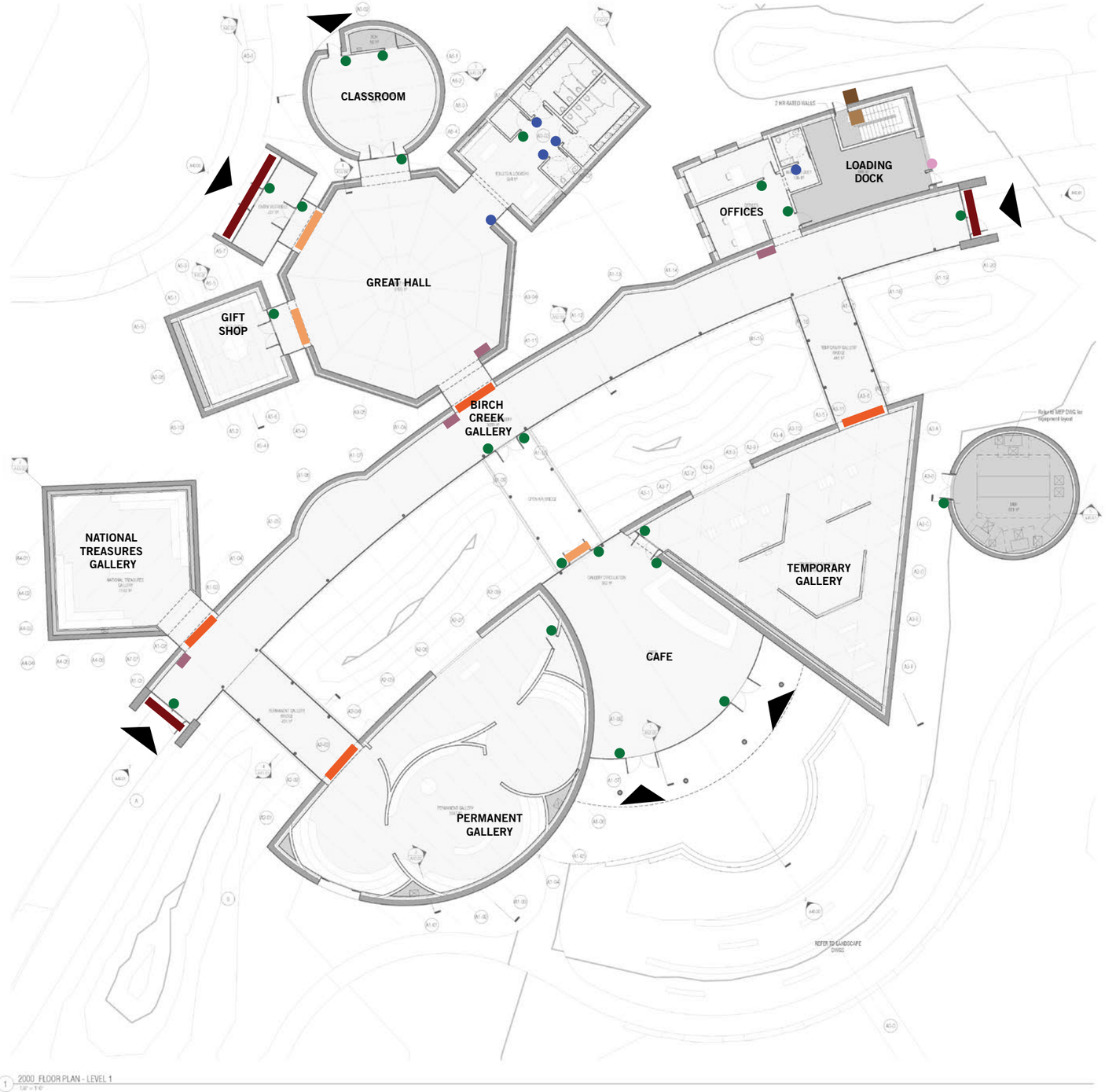
12.12.25


ENTRY FEATURE
CHAPEL
(EXISTING)
DROP-OFF
CIRCLE
LOADING
AREA
BUS PARKING
AREA 1
PARKING
GROVES
(PHASE 1)
ADA
PARKING
BIRCH CREEK
BUS PARKING
AREA 2
(EXISTING)
MARBLES
FIELD
(EXISTING)
FIRE
ACCESS
DEMONSTRATION
MARBLES &
PICNIC / PLAY HUB
OUTDOOR
CLASSROOM
BUS
DROP-OFF
NATIVE
WILDFLOWER
MEADOW
AXIAL
PATH
AXIAL
PATH
DILIGWA
ENTRANCE
PAD
SEMINARY
PLAZA
ADAM'S
CORNER
(EXISTING)
TSA-LA-GI
AMPHITHEATER
OVERLOOK
DILIGWA
VILLAGE
(EXISTING)
Legend - Traffic Flow
Vehicular Traffic Flow
Pedestrian Traffic Flow
Decision Point
SCALE
1"=40'
0
10
30
50
100
150
N



Legend	Qty
Wayfinding, Vehicular	13
Wayfinding, Pedestrian	8
Site Identifier	2
Village Identifier	TBD
Plaza Identifier	2
Amphitheater Identifier	2
Site Map/Directory	5
Outdoor Classroom ID	1
Service Entry ID	1
Parking Area ID	4


CLASSROOM
GREAT HALL
GIFT SHOP
BIRCH CREEK GALLERY
NATIONAL TREASURES GALLERY
OFFICES
LOADING DOCK
TEMPORARY GALLERY
CAFE
PERMANENT GALLERY
2 HR RATED WALLS
REFER TO LANDSCAPE DWGS
1 2000_FLOOR PLAN - LEVEL 1
Legend - Traffic Flow
Primary Traffic Flow
Secondary Traffic Flor
Decision Point



Legend	Qty
Building ID	3
Gallery ID	4
Cafe, Great Hall, Gift Shop ID	4
Wayfinding, Interior	4
Room ID	21
Restroom ID	4
Loading Dock ID	1
Regulatory Signs	TBD
Distraction Markings	TBD
Stair ID	1
Level ID	1
ADA-Signage	TBD

Thank You