

**CITY OF EL PASO, TEXAS
AGENDA ITEM
DEPARTMENT HEAD'S SUMMARY FORM**

AGENDA DATE: November 23, 2021

PUBLIC HEARING DATE: N/A

CONTACT PERSON(S) NAME AND PHONE NUMBER: Ben Fyffe, 212-1766

DISTRICT(S) AFFECTED: All

STRATEGIC GOAL: 4: Enhance El Paso's Quality of Through Recreational, Cultural and Educational Environments

SUBGOAL: 4.2 Create innovative recreational, educational and cultural programs

SUBJECT:

APPROVE a resolution / ordinance / lease to do what? OR AUTHORIZE the City Manager to do what? Be descriptive of what we want Council to approve. Include \$ amount if applicable.

Approve a resolution that the City of El Paso will enter into a formal gift agreement for an original commission of a site-specific, exterior museum artwork by Leo Villareal with the El Paso Museum of Art Foundation, a private 501(c)3 non-profit organization, memorializing the parties respective rights and obligations relating to the project, contingent upon the Foundation raising adequate funds for its completion.

BACKGROUND / DISCUSSION:

The El Paso Museum of Art Foundation is committed has pledged to raise funds to commission, fabricate, install and maintain "Star Ceiling," a site-specific installation for the exterior of the El Paso Museum of Art by El Paso-born, world-renowned artist Leo Villareal.

PRIOR COUNCIL ACTION:

Council routinely considers donations of goods and services.

AMOUNT AND SOURCE OF FUNDING:

Item will be realized and maintained by funds raised by the El Paso Museum of Art Foundation, a dedication 501(C)3 non-profit.


HAVE ALL AFFECTED DEPARTMENTS BEEN NOTIFIED? X YES ___NO

PRIMARY DEPARTMENT: MCAD

SECONDARY DEPARTMENT: CID

*****REQUIRED AUTHORIZATION*****

DEPARTMENT HEAD:



RESOLUTION

WHEREAS, the El Paso Museum of Art Foundation (“Foundation”) has proposed to commission a light sculpture installation *Star Ceiling* (“the Sculpture”) by El Paso artist Leo Villareal, a site-specific installation on the El Paso Museum of Art’s (“Museum”) south entrance plaza that encourages connection, communication and community;

WHEREAS, the Foundation, in support of the Museum pledges and promises to exercise its reasonable best efforts to raise funds sufficient to (i) provide finances to renovate the south entrance plaza (the South Plaza) to the Museum, (ii) construct and finance the installation of the Sculpture on the South Plaza, which will be designed and built by Leo Villareal, and (iii) permanently maintain the Sculpture (collectively, the Project);

WHEREAS, the Project is generally shown and described in the proposal attached hereto as Exhibit A;

WHEREAS, upon completion of the Sculpture, the Foundation will donate it to the Museum;

WHEREAS, the Foundation will establish a permanent fund with the Paso del Norte Community Foundation entitled the “Star Ceiling Fund” (“the Fund”) and all donations to the Fund will be used to pay for and support the Project;

WHEREAS, the Foundation plans to commence fundraising for the Project in November, 2021;

WHEREAS, subject to formalizing the mutually acceptable gift agreement and a successful fundraising campaign, the Foundation intends to commence the South Plaza renovation and Sculpture construction on a date agreed on in a subsequent agreement; and

WHEREAS, City Council wishes to accept this donation, which will be a cultural and recreational benefit to the residents and visitors of El Paso.

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF EL PASO:

That the City of El Paso will exercise reasonable best efforts to enter into a formal gift agreement with the Foundation memorializing the parties respective rights and obligations relating to the Project, contingent upon the Foundation raising adequate funds for its completion.

APPROVED this day of November, 2021.


THE CITY OF EL PASO:

Oscar Leeser, Mayor

ATTEST:

Laura D. Prine, City Clerk

APPROVED AS TO FORM:

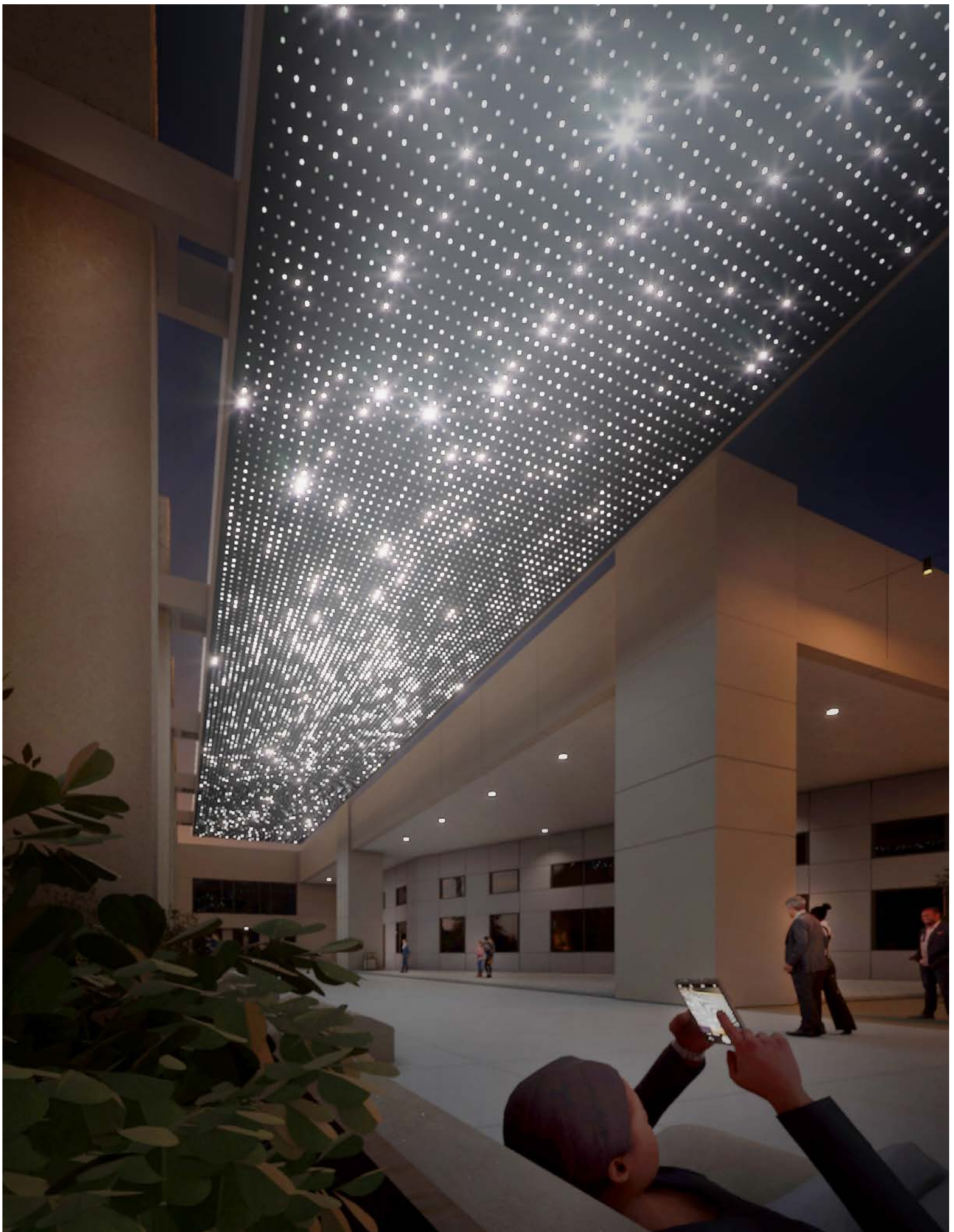


Karla Muñoz
Assistant City Attorney



LEO VILLAREAL

PROPOSAL FOR EL PASO MUSEUM OF ART



May 1, 2020

DEAR EL PASO MUSEUM OF ART,

Thank you for considering my proposal for *Star Ceiling (El Paso)*, a site-specific installation on the museum's south entrance plaza that encourages connection, communication, and community. I envision a comfortable and inspiring gathering place for citizens of El Paso / Juarez that will serve as a space for reflection, free and available to all. I have designed not just a light sculpture but an entire environment that incorporates custom designed seating and landscaping with the goal of transforming the plaza into an outdoor extension of the museum's lively exhibition program. Activating Sheldon Court and linking it thoughtfully with Arts Festival Plaza will create a unified nexus of cultural life that welcomes the public through this important gateway between the Civic Center, the Plaza Theater, and the soon-to-be-realized Children's Museum to the north.

To help illustrate my suggested approach, I am including an animated rendering of *Star Ceiling (El Paso)*. These renderings show only a small example of what's possible. The actual sequencing for the artwork will occur onsite, responding to and complementing the areas surrounding the museum.

I am honored to have the opportunity to present these ideas and appreciate the attention to detail that Veronica Callaghan and Judy Robison have offered in the various conversations that have brought us to this stage. I look forward to hearing your impressions and to answering any questions that arise as you review these materials.

Very best,

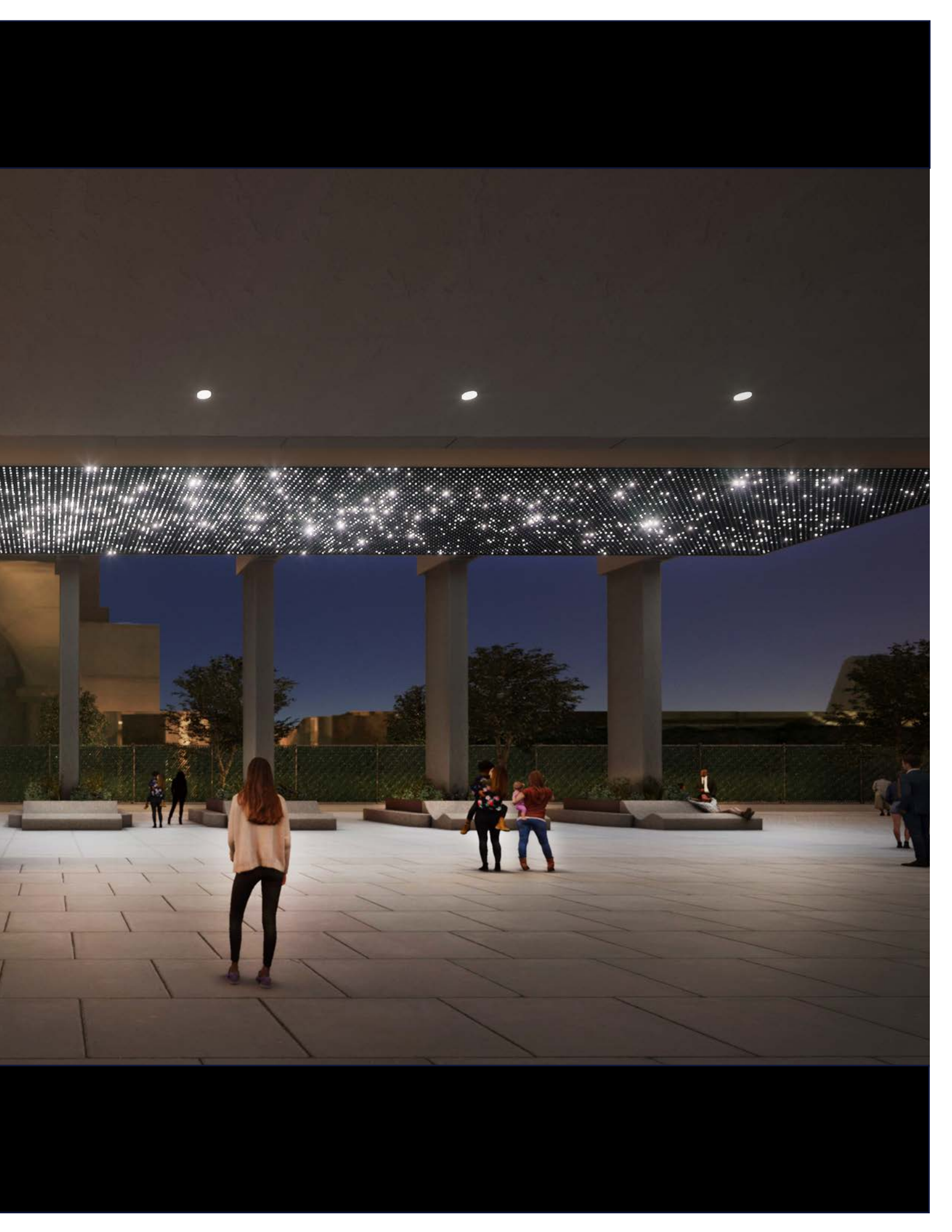
A handwritten signature in white ink, appearing to be the name 'Leo', written in a cursive style.

Leo

CONTENTS

An architectural rendering of a modern building interior. The scene is dimly lit, with a prominent feature being a ceiling composed of a grid of small, glowing LED lights. The ceiling is supported by large, light-colored concrete columns. In the foreground, a paved walkway leads towards a seating area with several people. A tree is visible on the left side of the walkway. The overall atmosphere is sophisticated and contemporary.

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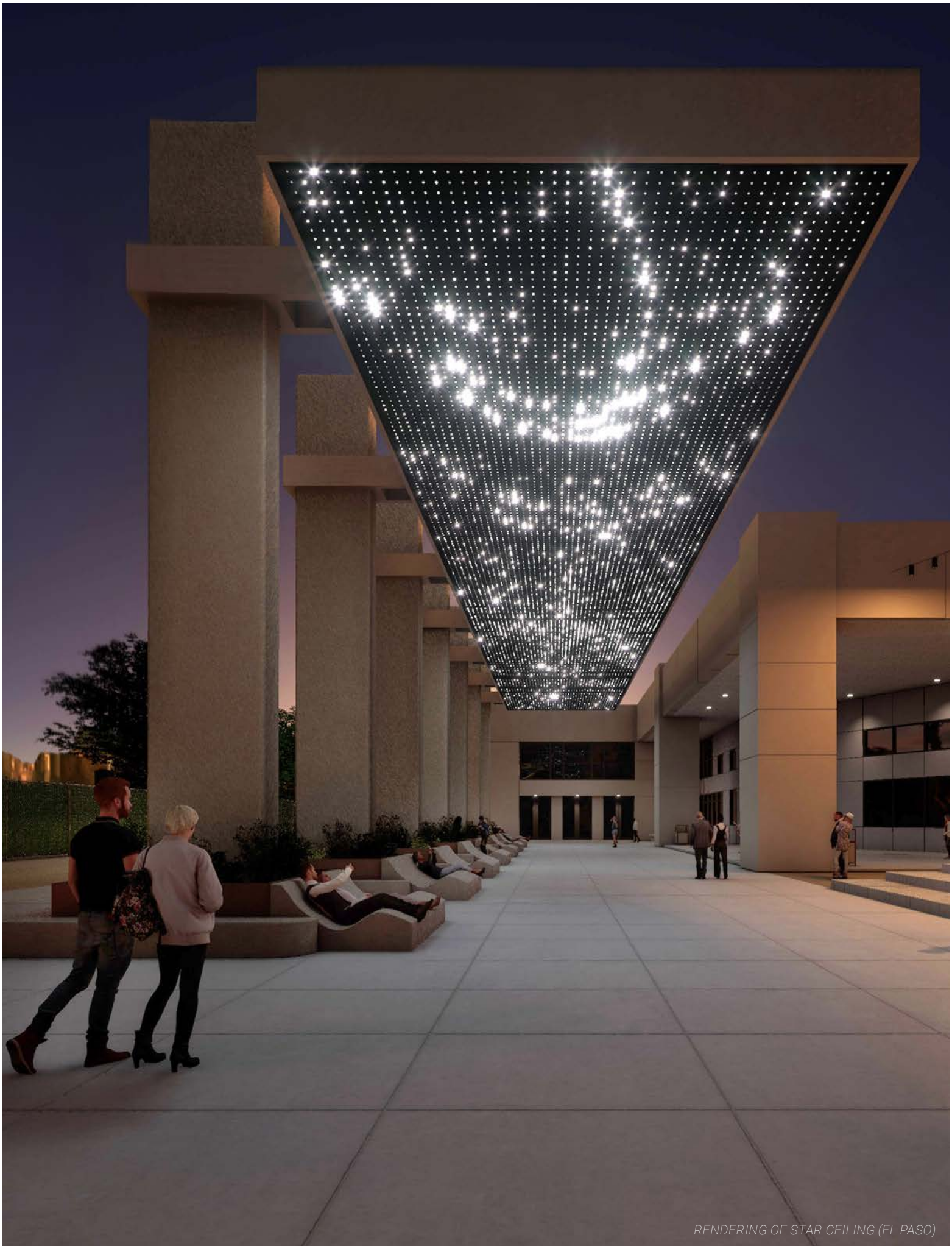
CONCEPT DESCRIPTION

Having grown up in El Paso and Juarez, Leo Villareal has many fond memories from his youth of observing the night sky over the desert, the vast expanse of city lights arrayed across the landscape, the monumental illuminated star on Mount Franklin and the ceiling of the Plaza Theatre with its twinkling constellations and projections of floating clouds. One could argue that these early formative impressions influenced Villareal and the light sculptures he has been creating for the last 20 years that fuse software and LED technology into arrays that evoke pyrotechnic splendor. Villareal's algorithmic artworks, which create non-repeating abstract patterns using code, offer a substantive dimension that is deeper than their immediate optical allure, reflecting on the inner workings of the natural world.

Leo Villareal is honored to present *Star Ceiling (El Paso)*, an immersive artwork for the museum's south entrance plaza that consists of a suspended LED array, zero gravity benches carved out of local stone, and planters filled with species indigenous to the Chihuahuan Desert. A 120 foot long LED array is mounted on the underside of a canopy spanning the seven pillars that compose the existing conceptual pergola. The array is composed of 13,500 individually-addressable, monochrome LEDs that are activated by Villareal's bespoke authoring software. These fixtures are energy-efficient and also bright enough to be vibrant even during periods of full sun. To allow viewers to more fully experience the artwork, Villareal proposes the installation of seven zero gravity benches at 20 foot intervals under the LED display. He is interested in the zero gravity position and its use in early virtual reality experiments. The idea is that by equally distributing body weight, one can create a more powerful sense of immersion. In 2001, Villareal created his first zero gravity bench and has used them in many installations since. Villareal follows in the tradition of artist-created furniture, particularly John Chamberlain's Barges at the Chinati Foundation in Marfa, Texas.

In his site-specific installations, Villareal takes inspiration from the surrounding kinetic activity, manifesting it into ephemeral visual compositions. Hanging overhead, the undulating field of light glows and flickers in abstract patterns that shift in a seamless, non-repeating progression. Moving with a cadence similar to breath, Villareal's sequences suggest rippling water, shifting clouds, flocks of birds, or the vastness of the universe. As Taney Roniger writes, "Villareal's medium is not so much light but code: the invisible algorithms that give life to the otherwise cold and soulless hardware. One of the most profound revelations of digital technology has been that even simple sets of rules elicited by simple yes/no responses can give rise to patterns of astonishing complexity. That those patterns often bear an uncanny resemblance to the forms we see in nature is even more suggestive, as it points to the ontological primacy of information."

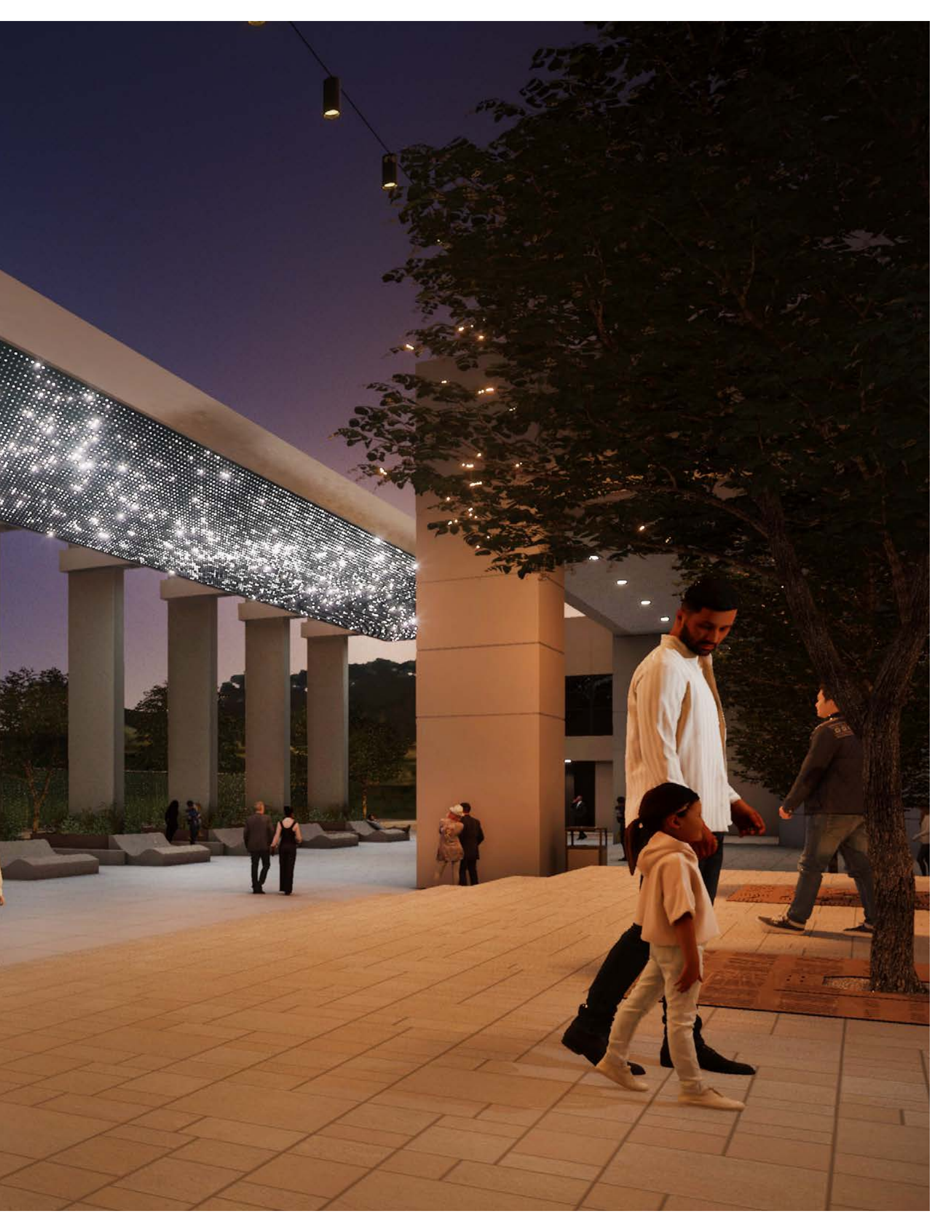
During the course of the commission, Villareal will spend time on-site to study how visitors move through and interact with the space. After a period of careful observation and reflection, Villareal will sequence the artwork, adjusting parameters like opacity, speed, and scale to create compositions that respond to and complement the activity in the surrounding area. The resulting public artwork will resonate deeply as Villareal reveals the universal and human responses that bring people together.



RENDERING OF STAR CEILING (EL PASO)



RENDERING OF STAR CEILING (EL PASO)





RENDERING OF STAR CEILING (EL PASO)

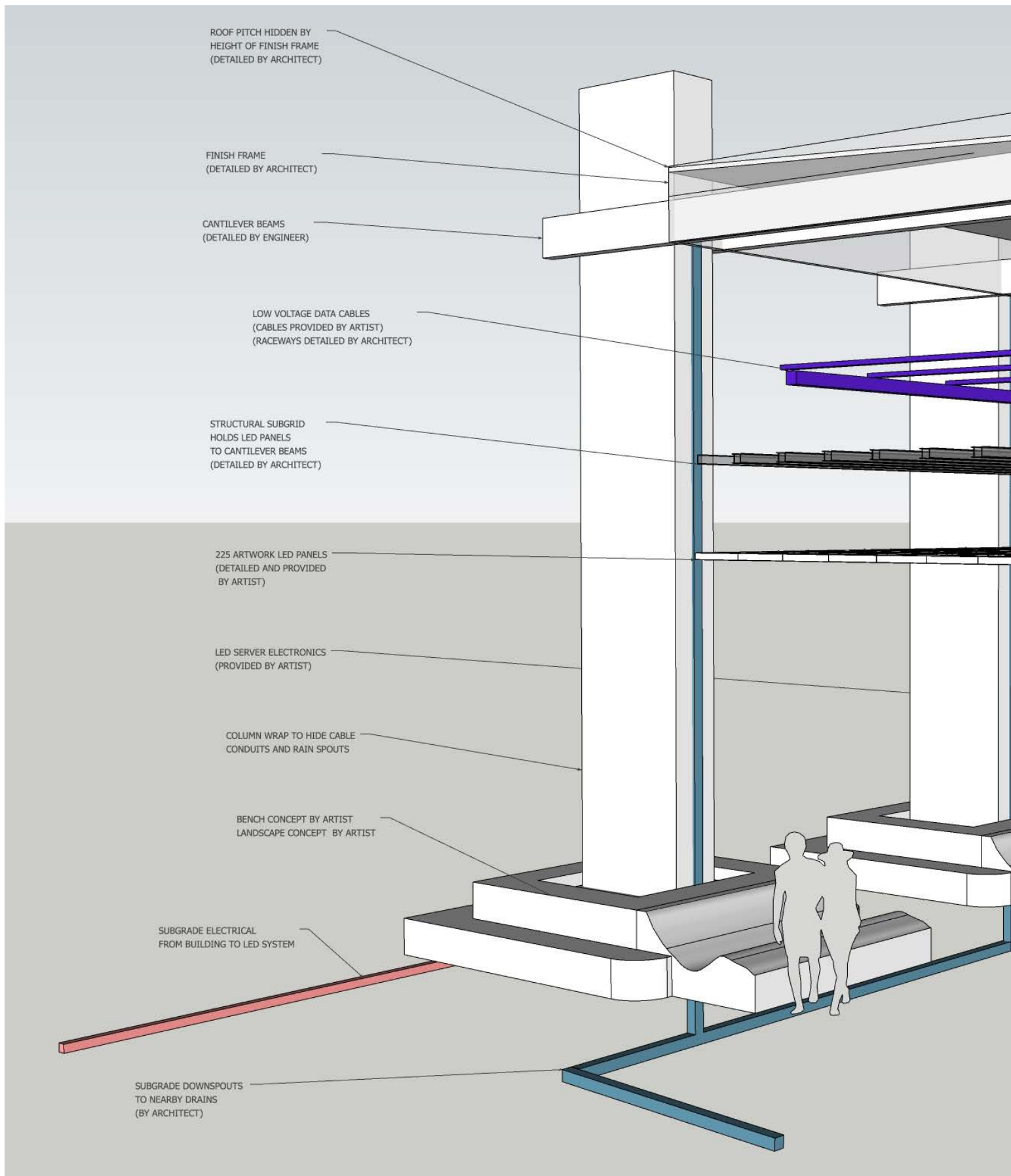


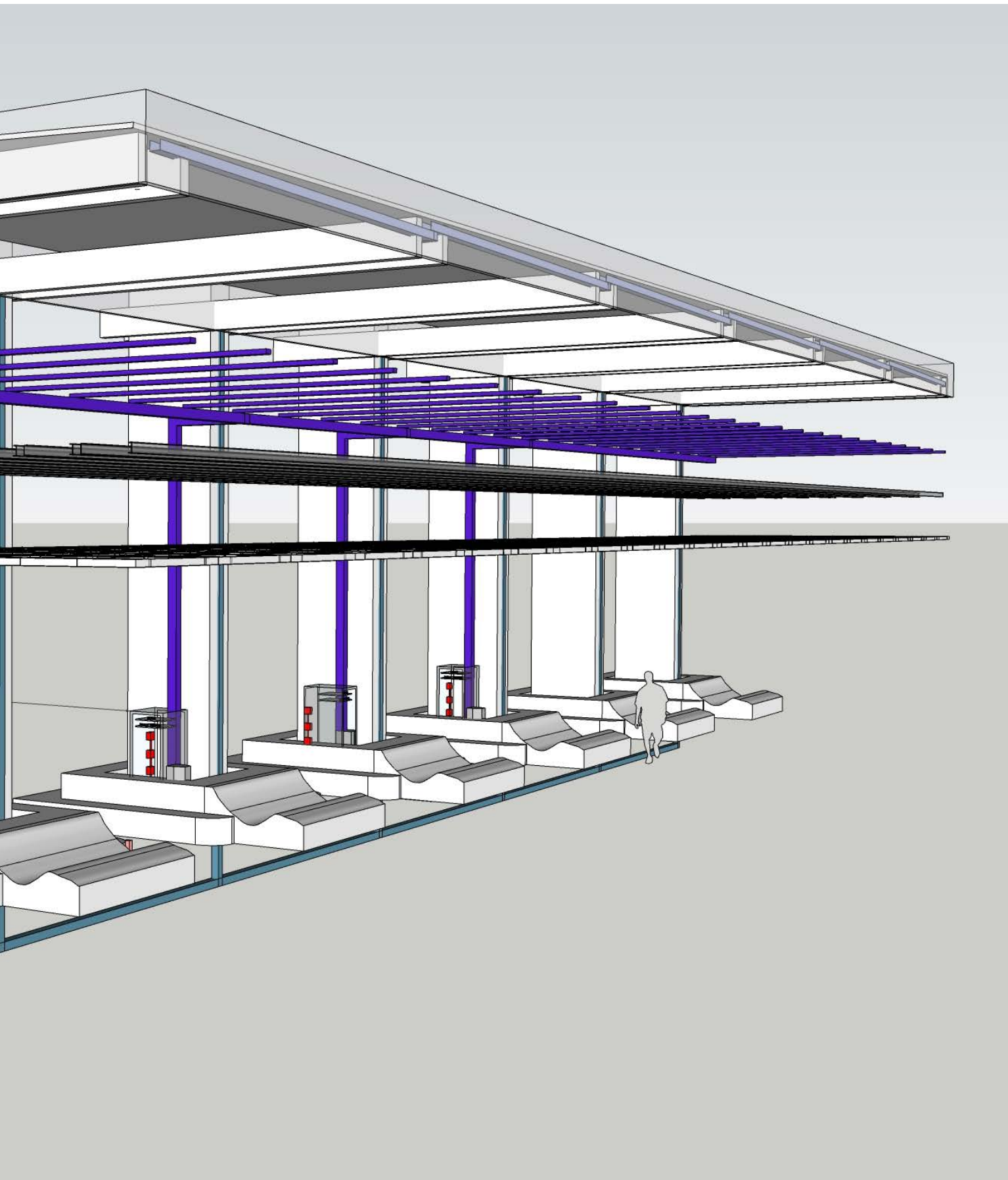


RENDERING OF STAR CEILING (EL PASO)

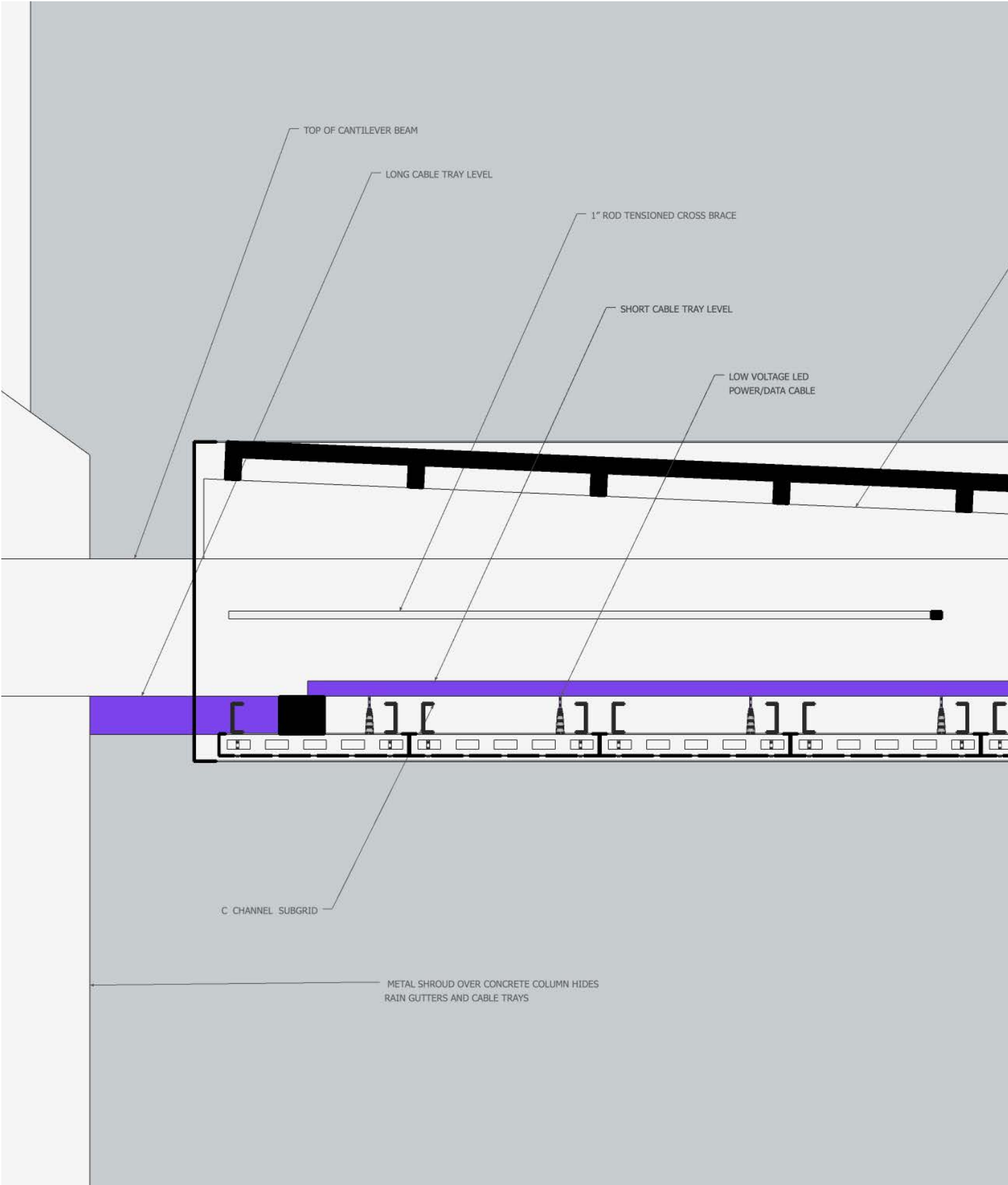


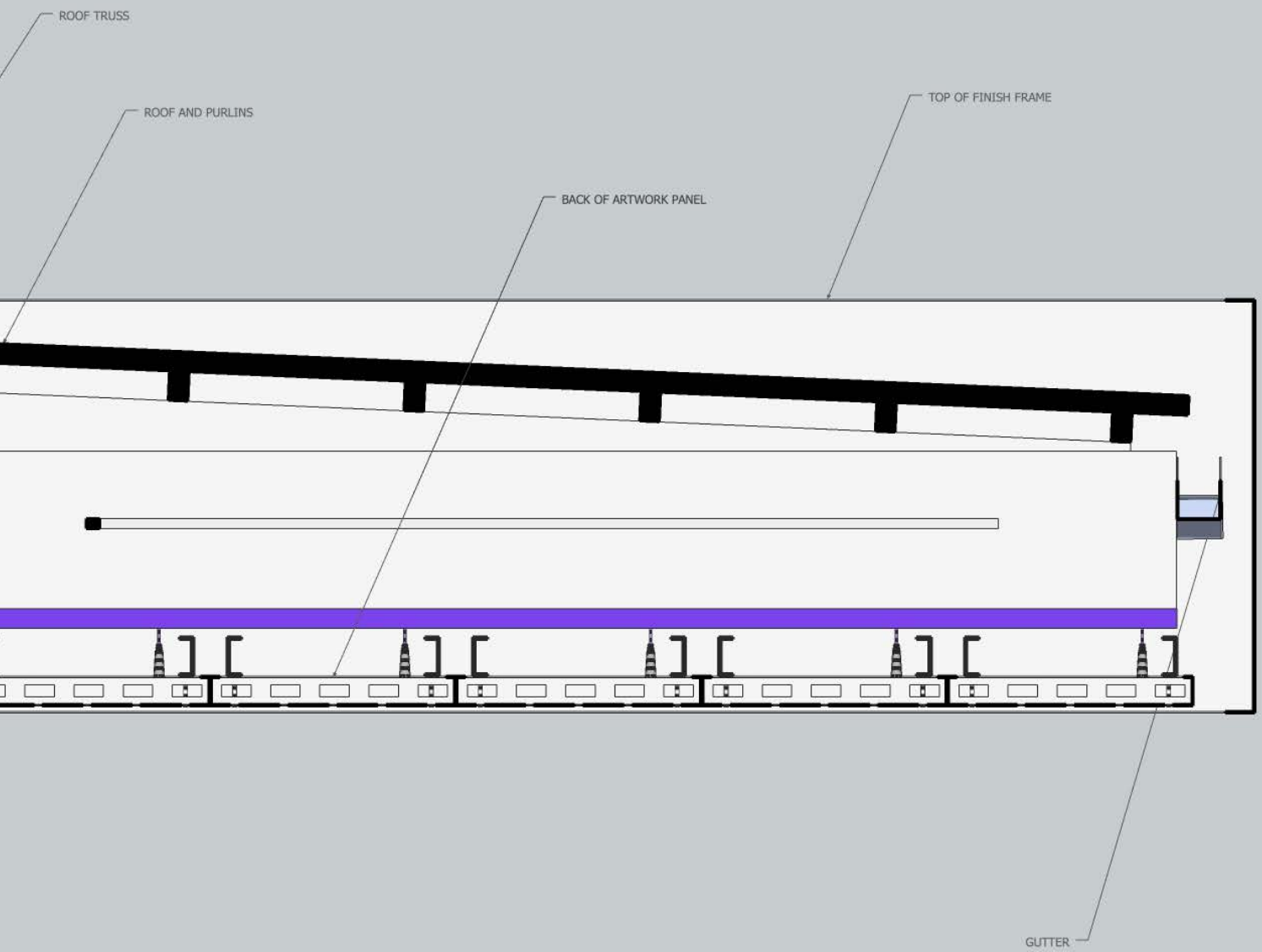
ARTWORK COMPONENTS



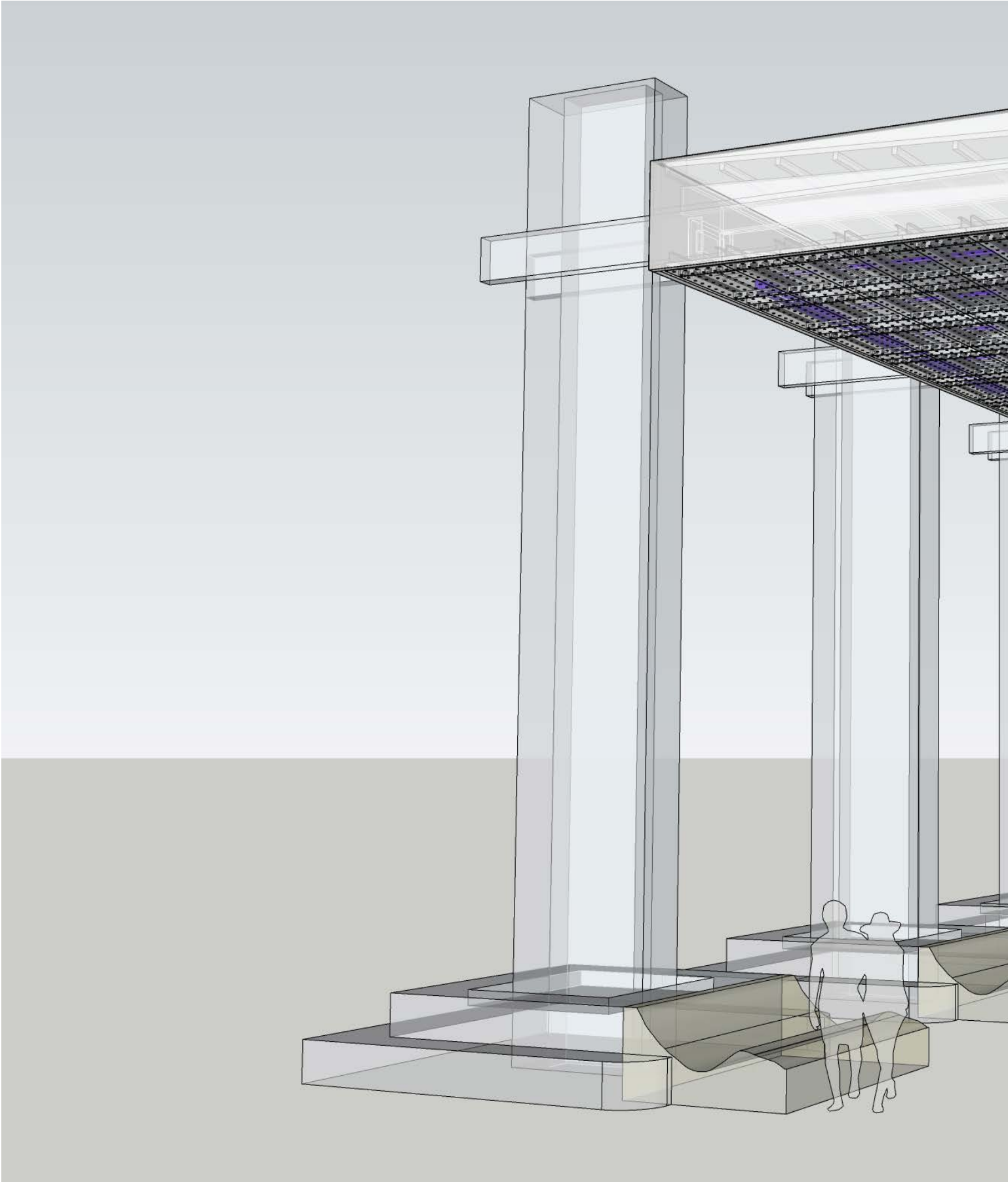


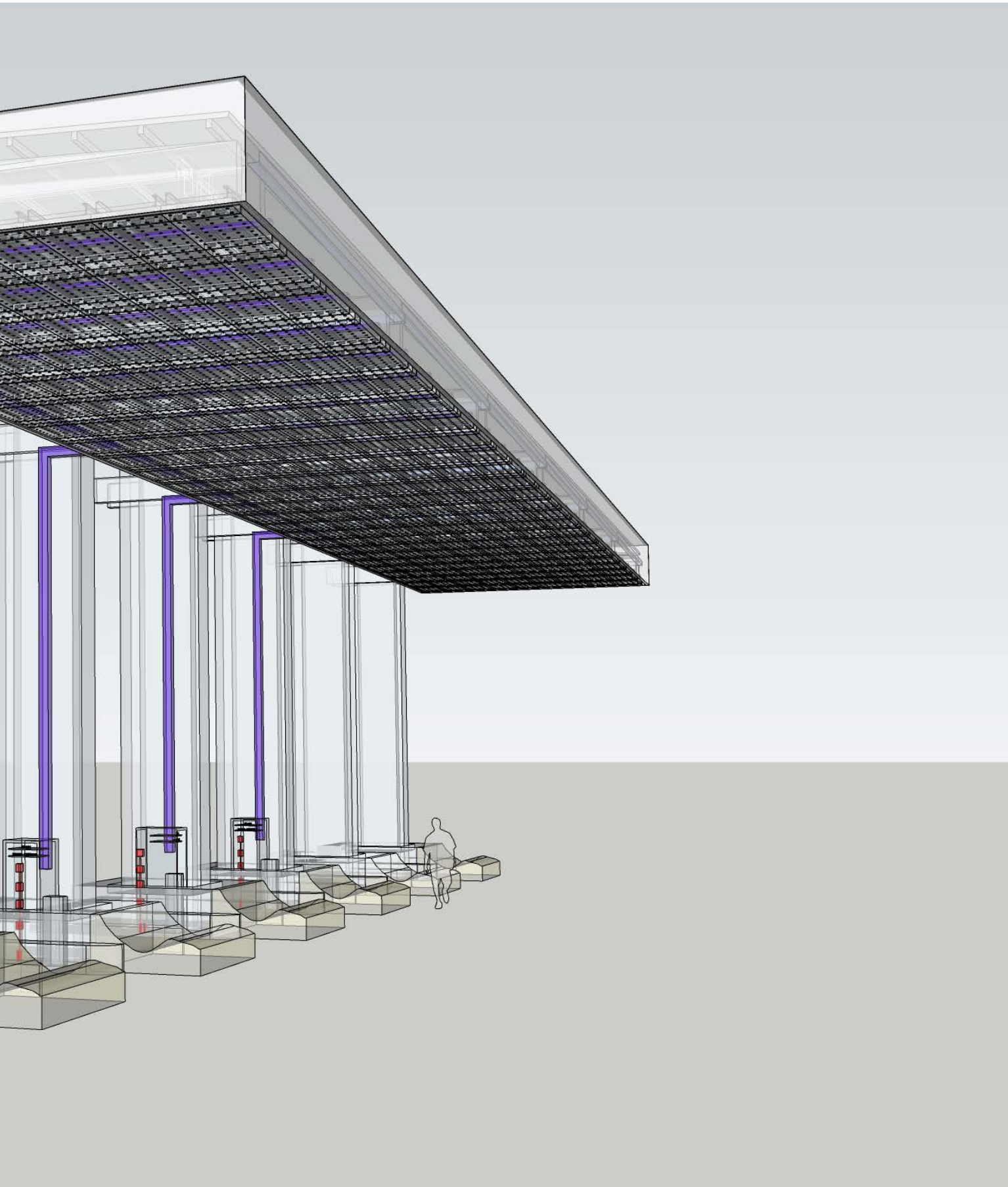
ARTWORK COMPONENTS



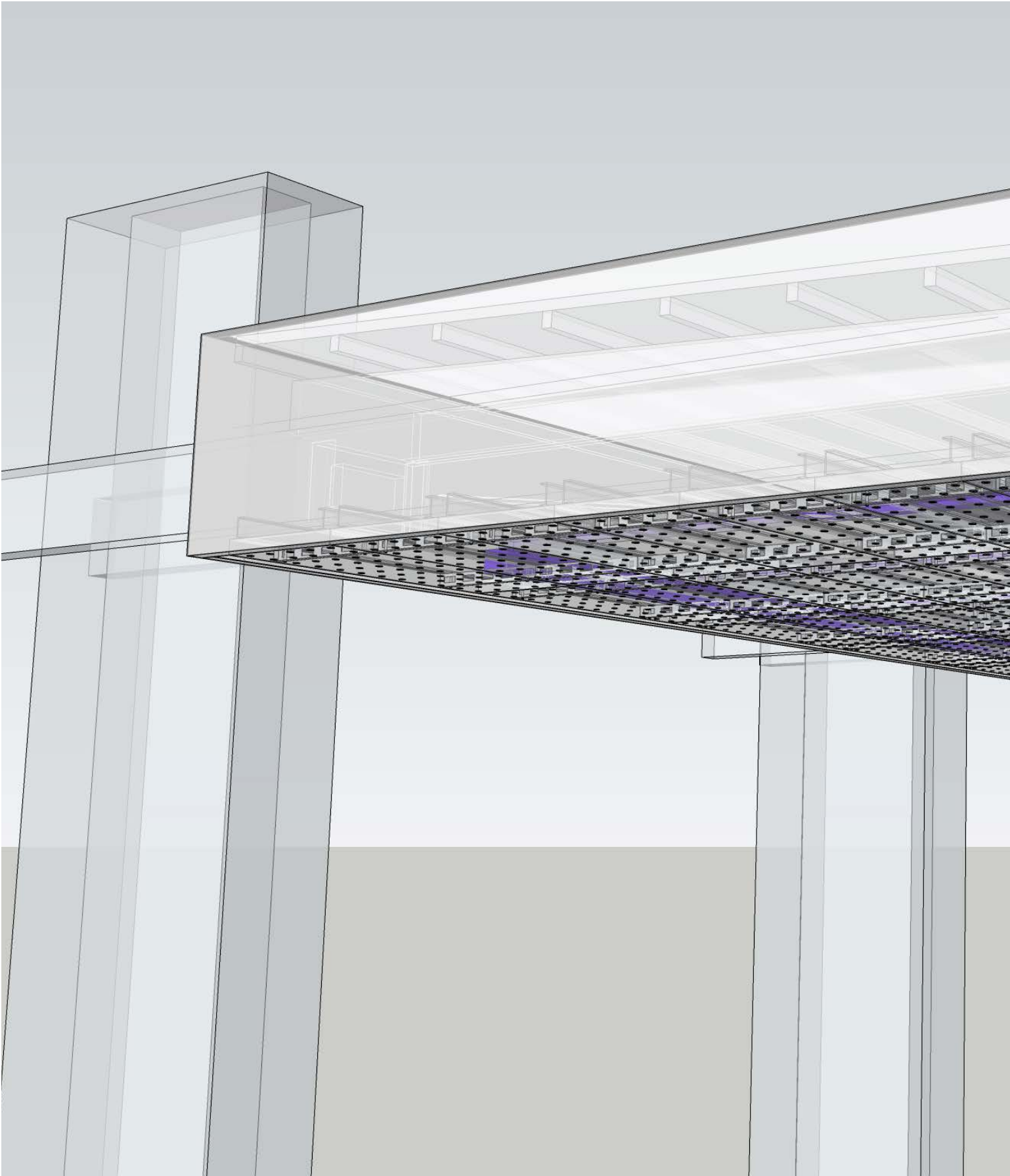


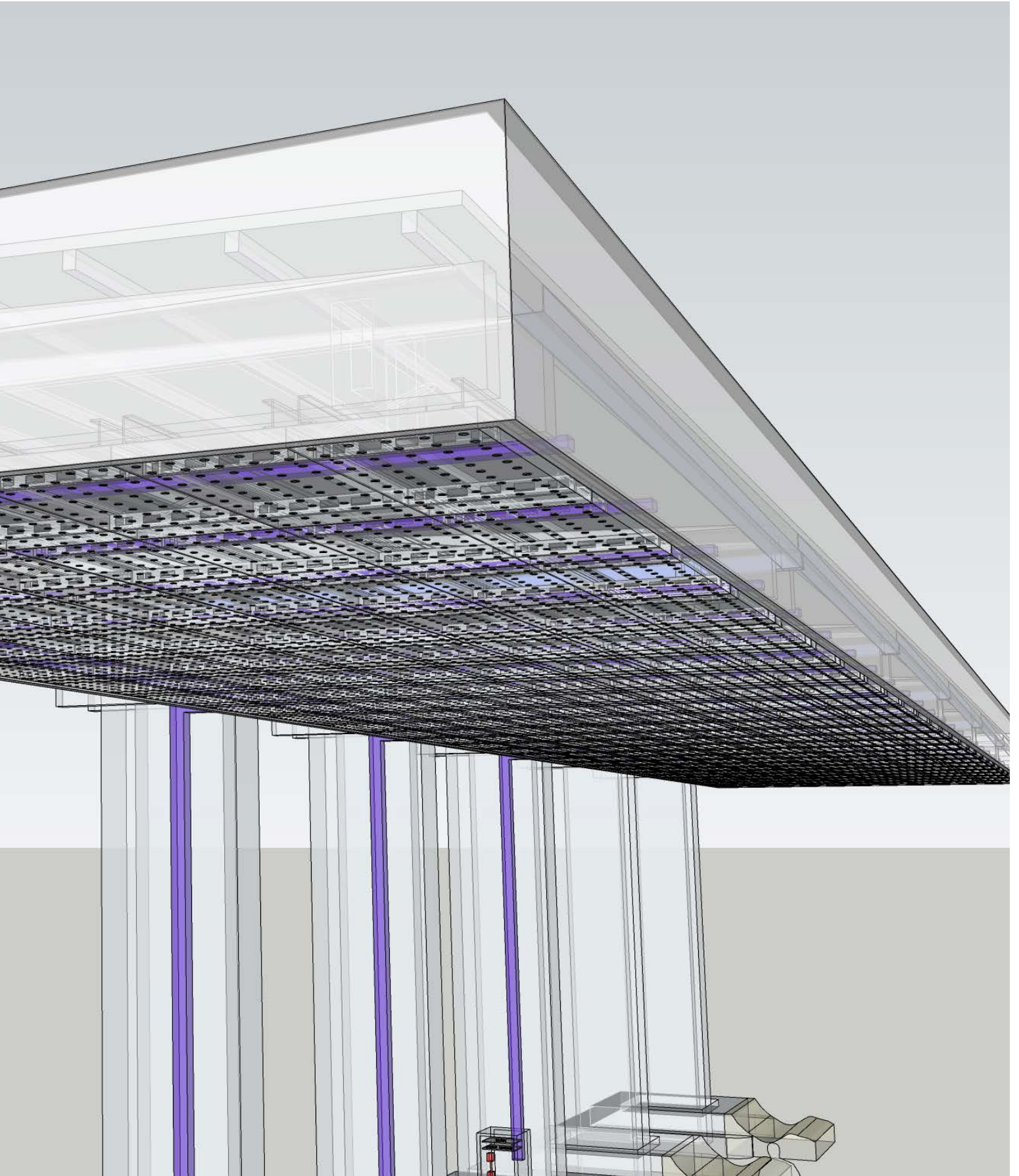
ARTWORK COMPONENTS



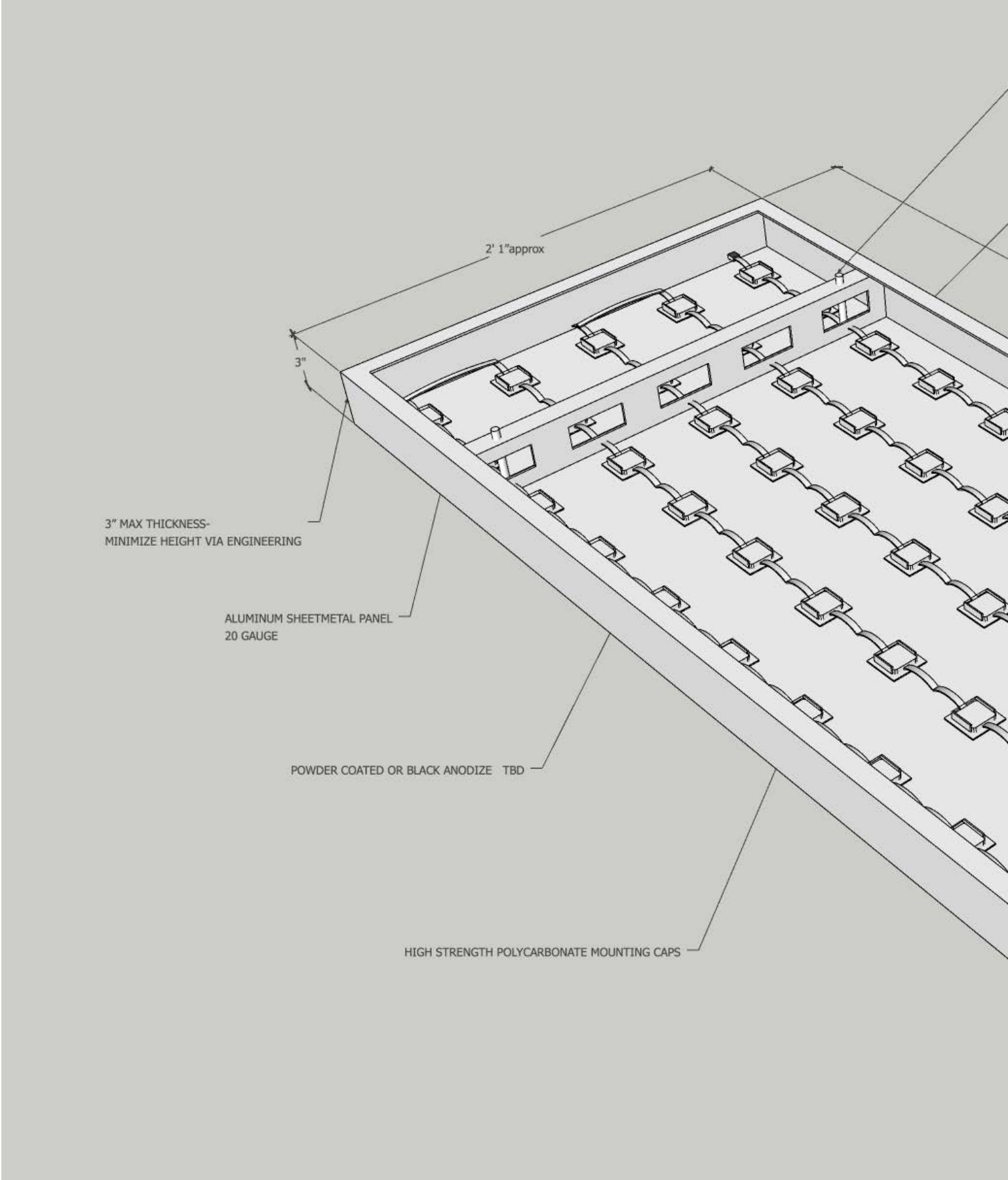


ARTWORK COMPONENTS





ARTWORK COMPONENTS



TO REMOVE ONE PANEL FROM THE LED ARRAY
FOUR RIGGING FASTENERS ARE REMOVED BY WORKERS ON LIFTS
BELOW THE CANOPY AND ONE TWIST LOCK CONNECTOR IS RELEASED.
PANEL WEIGHS UNDER 30 POUNDS

PANEL SIDES WILL NOT BE VISIBLE.
A PROGRAMMED GAP WILL BE PLANNED BETWEEN EACH PANEL
FOR EASE OF SINGLE PANEL REMOVAL FROM THE LARGER MATRIX.

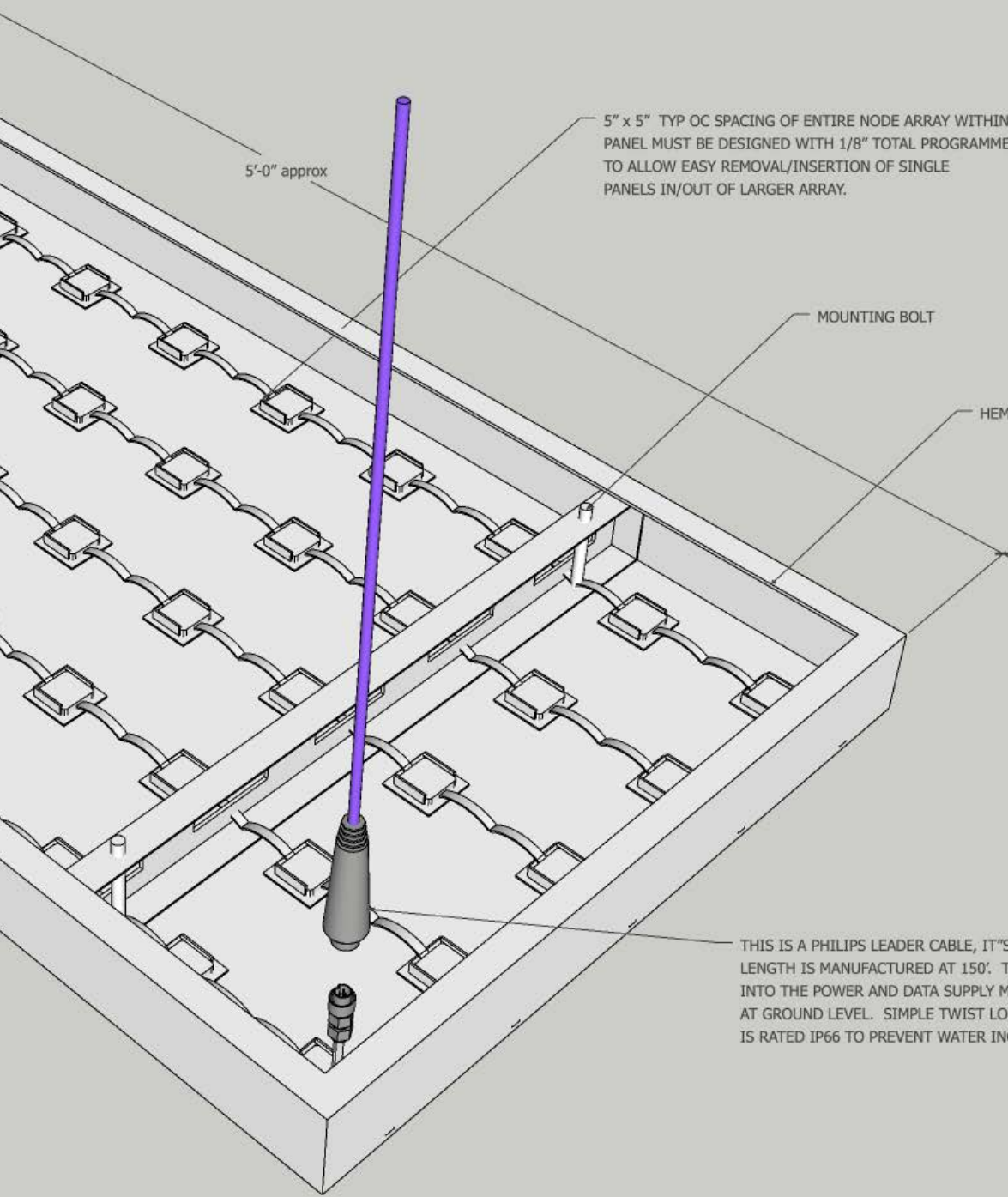
5" x 5" TYP OC SPACING OF ENTIRE NODE ARRAY WITHIN AND BETWEEN PANELS.
PANEL MUST BE DESIGNED WITH 1/8" TOTAL PROGRAMMED GAP
TO ALLOW EASY REMOVAL/INSERTION OF SINGLE
PANELS IN/OUT OF LARGER ARRAY.

5'-0" approx

MOUNTING BOLT

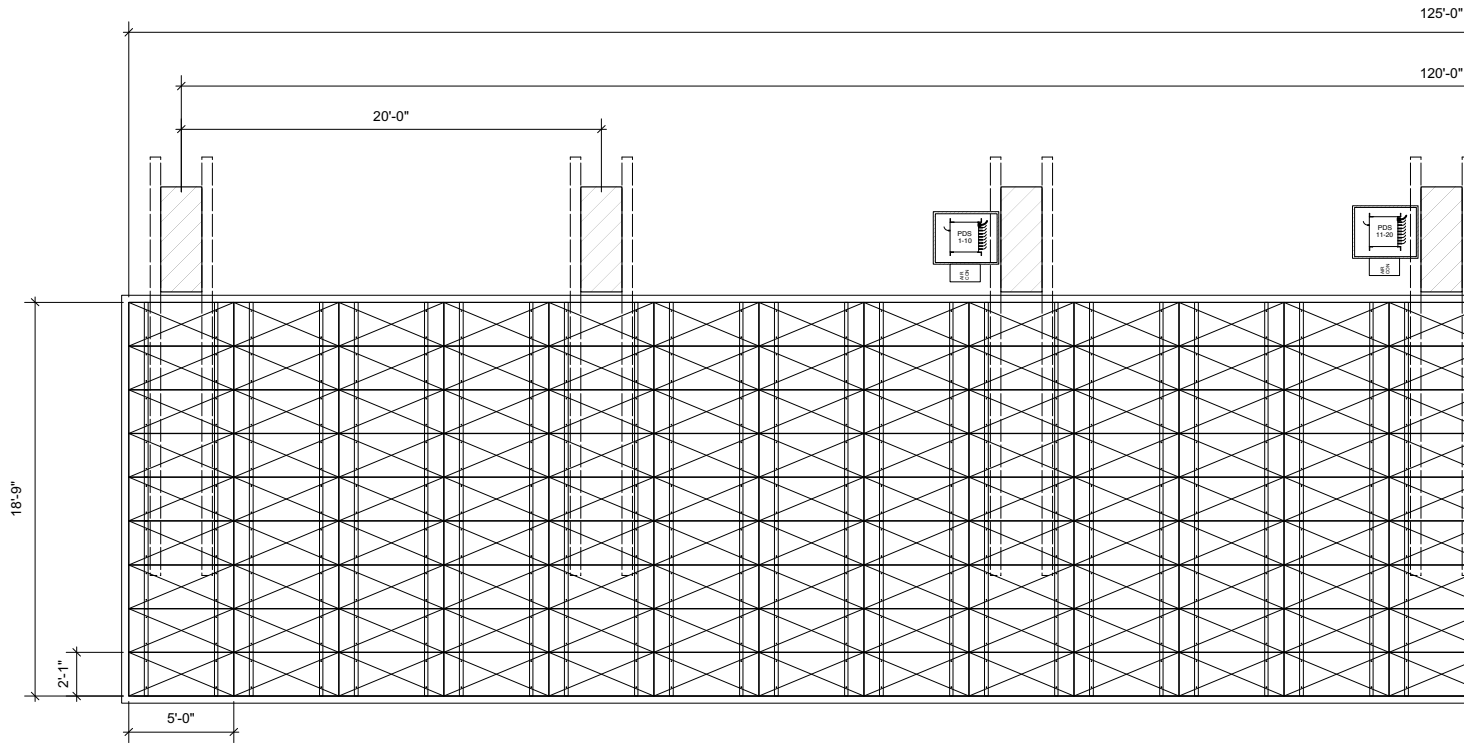
HEM EDGE

THIS IS A PHILIPS LEADER CABLE, IT'S MAXIMUM
LENGTH IS MANUFACTURED AT 150'. THIS CABLE PLUGS
INTO THE POWER AND DATA SUPPLY MODULE
AT GROUND LEVEL. SIMPLE TWIST LOCK CONNECTOR
IS RATED IP66 TO PREVENT WATER INGRESS



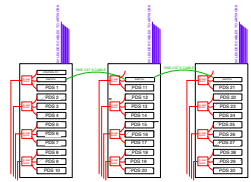
ARTWORK COMPONENTS

EL PASO MUSEUM OF ART

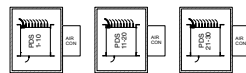


PLAN V

EQUIPMENT DETAILS



ONE POSSIBLE ELEVATION OF PDS CABINET



ONE POSSIBLE PLAN OF PDS CABINETS

NOTES ON PDS UNITS (POWER AND DATA SUPPLY) :

- LED'S ARE FED POWER AND DATA VIA RACKMOUNTED PREMANUFACTURED PDS UNITS
- 30 PDS UNITS ARE REQUIRED TO DRIVE ALL LED'S. EACH PDS UNIT BEARS 8 EXIT PORTS FOR A COMBINED DATA/POWER CABLE TO BE ROUTED TO THE ARTWORK
- PDS RACKS SHOULD BE LOCATED IN A CLIMATE CONTROLLED ENVIRONMENT. A LOCKABLE CLOSET OR GATE IS RECOMMENDED FOR SAFETY AND SECURITY
- DIMENSIONS OF PDS RACKS APPROX 40" wide x 30" deep x 72" TALL. ARTIST WILL PROVIDE 7 SERVER RACKS SUFFICIENT FOR THE TASK, DETAILS TBD
- PDS ENCLOSURES ARE INTERNALLY FAN COOLED AND THEREFORE REQUIRE PLACEMENT IN AN AREA ALLOWING ADEQUATE CIRCULATION FOR COOLING TO OCCUR
- PDS ENCLOSURES CAN BE LOCATED NO FURTHER THAN 150' FROM THE START OF THE FARTHEST STRAND OF LED'S
- LED DATA/POWER CABLES ARE NON-SPLICABLE AND MAY NOT BE EXTENDED VIA TRADITIONAL SPLICING METHODS. DISCUSS IDEAL LOCATION OF CONSIDERABLE CABLE SLACK.
- THE PDS UNIT IS A PRODUCT MANUFACTURED BY PHILLIPS. ITEM # sPDS-480ca 24 V

LOCATION OF ALL PDS CABINETS TO BE DETERMINED- PLEASE ADVISE

SERVER EQUIPMENT DETAILS:

THE DRAWING TO THE LEFT DEPICTS A TYPICAL SERVER RACK ARRANGEMENT OF LED SYSTEM GEAR. THIS IS JUST ONE EXAMPLE OF THE PHYSICAL ARRANGEMENT OF GEAR. ALL EQUIPMENT CAN BE DESIGNED TO FIT INTO SEVERAL SMALLER SPACES.

APPROXIMATE ELECTRONICS LIST AS FOLLOWS (ALL SUPPLIED BY ARTIST):

- 30 PDS UNITS: PHILLIPS 480 ca 24 VT
- 1 DRIVE COMPUTER (ONE FULLY CONFIGURED BACKUP PC WILL BE PROVIDED)
- 3 ETHERNET SWITCHES
- ETHERNET CABLES SUFFICIENT TO COMPLETE THE SYSTEM
- LEADER CABLES SUFFICIENT TO COMPLETE THE SYSTEM (240+ 3% EXTRAS)

POWER DETAILS:

REQUIRED POWER: 3 PDS UNITS MAY RUN OFF ONE 20AMP EDISON QUAD BOX. THIS ALLOWS AMPLE OVERHEAD ON EACH CIRCUIT. INSTALLATION REQUIRES A MAXIMUM OF 12 20AMP QUAD BOXES DEPENDING UPON FINAL PHYSICAL LAYOUT OF THE EQUIPMENT

EACH PDS UNIT DRAWS APPROXIMATELY 5 AMPS IF LED'S ARE POWERED TO 100% BRIGHTNESS. DURING NORMAL PLAYBACK IT IS SAFE TO ASSUME AN APPROXIMATE 40% POWER DRAW MAX DUE TO THE CONSTANT DIMMING OF ALL LED'S AT ALL TIMES.

LEADER CABLE ROUTING:

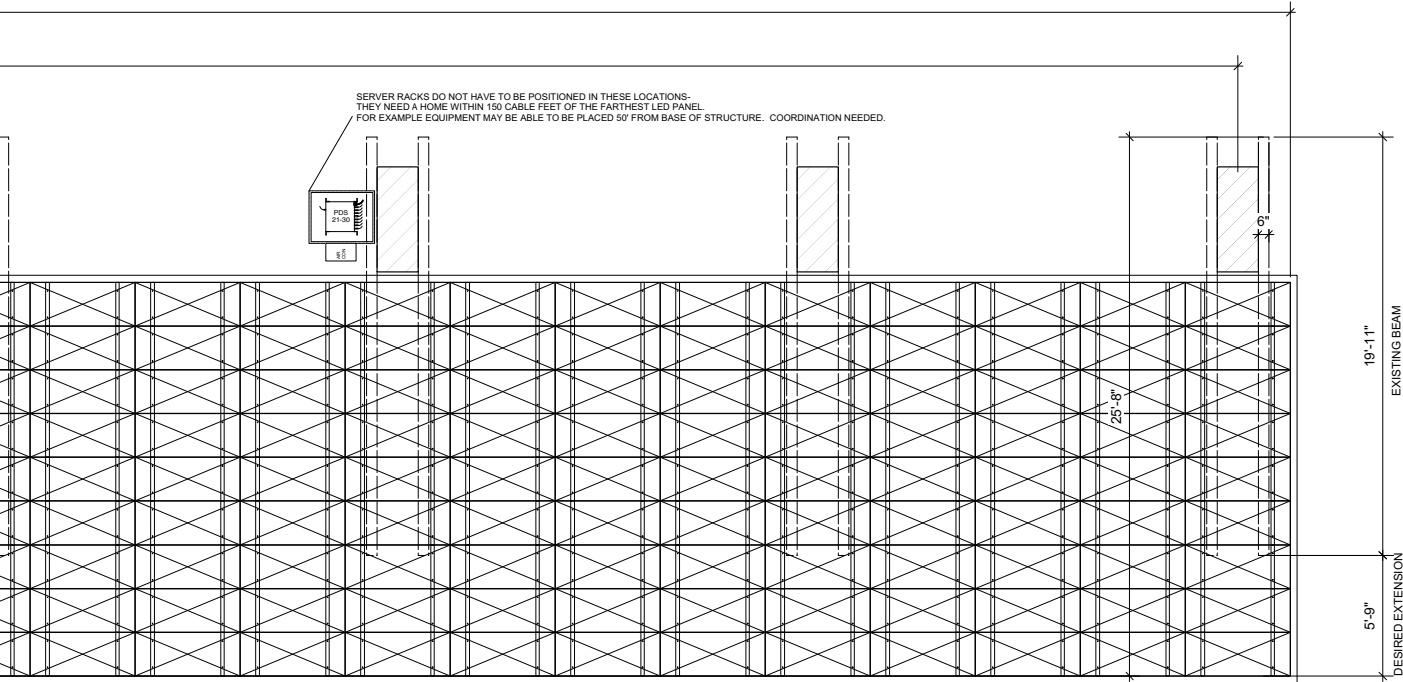
EIGHT POWER/DATA CABLE BUNDLES EXIT THE REAR OF EACH PDS UNIT AND FANLES WHICH MAKE UP ONE OF THE 35 ROWS OF THE ARTWORK.
NOTE: PHILLIPS LEADER CABLE PATHS MUST NOT EXCEED 150' OF TRAVEL FROM EACH CABLE MAY BE FIELD SHORTENED AT THE PDS END OF THE CABLE ON
NOTE: ALL CABLES BEING BETWEEN ELECTRONICS AND THE ARTWORK AREA

SERVER CABINET COOLING DETAILS:

- EACH PDS UNIT PRODUCES 410 BTU/Hr WHEN ALL LED'S ARE RUNNING FULL BRIGHTNESS
- MAXIMUM OPERATING TEMPERATURE BEFORE FAILURE IS 125 DEGREES F
- STANDARD SIZED AIR CONDITIONED EQUIPMENT RACKS CAN BE PURCHASED

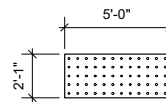
PROJECT:	EL PASO MUSEUM OF ART
ISSUE:	
SCALE:	1/4" = 1' 0"
NOTES:	

MUSEUM OF ART



VIEW

TYPICAL ARTWORK LED PANEL



- THE ARTWORK CONTAINS 225 LED PANELS, 60 LED'S PER PANEL, 13,500 LED'S IN TOTAL
- EACH LED CONSUMES 1 WATT OF POWER IF AT 100% BRIGHTNESS
- PANEL ARRIVES ON-SITE READY TO INSTALL
- INSTALLATION MAY OCCUR FROM BELOW - 4 SIMPLE FASTENERS PER PANEL
- ALUMINUM SHEET METAL CONSTRUCTION- POWDERCOATED
- LVS WILL ENGINEER THE PANEL AND FASTENERS FOR WIND, SEISMIC, GRAVITATIONAL LOADS
- 225 PANELS ARE REQUIRED FOR THE ARTWORK, A NUMBER OF EXTRA PANELS WILL BE DELIVERED FOR TYPICAL REPLACEMENT PROCEDURES
- LED NODES ARE EASILY REMOVED FROM PANELS FOR REPLACEMENT. ONCE PANEL IS AT GROUND LEVEL THE LED REPLACEMENT PROCESS IS A 15-MINUTE PROCESS FOR ONE PERSON.
- A LIGHTWEIGHT SUBGRID MUST BE DEVISED AS A STRUCTURAL INTERFACE BETWEEN THE EXISTING STRUCTURE AND THE LED PANELS

DO NOT TRAVEL OUT OF THE ELECTRONICS ENCLOSURE AND UP THE VERTICAL COLUMNS TO THE ARTWORK. CABLES SHOULD BE BUNDLED IN SETS OF NINE TO CORRESPOND TO THE NINE ARTWORK POSITIONS. FROM THE BACK OF THE POS'S TO THE FARTHEST LED PANEL. THIS LENGTH THRESHOLD WILL BE A PRIMARY DRIVER WHEN INVESTIGATING OPTIONS FOR OPTIMIZED EQUIPMENT LOCATIONS.

ALL WHITE AT 100%
NORMAL OPERATING TEMP IS APPROXIMATELY 115°F WHEN THE EQUIPMENT IS PLACED WITHIN IN A 75 DEGREE ENVIRONMENT.
SPECS FROM LOCAL MANUFACTURERES. CUSTOM SIZED ENCLOSURES CAN ALSO BE SPECIFIED FROM SOME RETAILERS.

L E O V I L L A R E A L			
MUSEUM OF ART	REVISION	A 1	CLIENT
	REVISION		ADDRESS
	REVISION		PROJECT OR RECORD
	REVISION		DATE OF DRAWING
ARTWORK PANEL PLAN VIEW		MARCH 31, 2020	

LED SYSTEM

The animated light patterns central to the artwork will be displayed on an array of custom designed and fabricated LED panels provided by the studio. Each LED panel will contain 60 individually-addressable LED nodes arranged on 5-inch on-center spacing. The artwork will contain a total of 225 LED panels, for a total of 13,500 LEDs.

The studio has specified a Philips Color Kinetics product (eW Flex Compact 1" diameter white LED) for this installation. This LED product, which is in use in Leo Villareal artworks worldwide, offers efficient and consistent light output and can withstand extreme weather conditions over long periods of time. The LEDs are visible in daylight; each draws 1 watt of power when turned on at full brightness.

The eW Flex LED product line includes two other accessories to complete the system: (1) a Power Data Supply Unit (PDS 480s 24v) to deliver power and data to the lights and (2) a Leader Cable to connect each linear strand of 60 LEDs to the Power Data Supply Unit. Each LED panel features 60 individually-addressable LED nodes in a single strand, and one leader cable is required to connect that strand to the Power Data Supply Unit. One Power Data Supply Unit is capable of controlling up to eight LED panels.

Approximately 30 Power Data Supply Units will be needed to drive the artwork. The Power Data Supply Units are rated for indoor use and can be mounted within three NEMA-rated air-conditioned server racks to protect them from the elements. These racks must be located within 50 feet of the artwork footprint. If no appropriate location can be found, alternate power and data strategies can be formed during the schematic design phase.

The Philips lighting products that are specified are rated to last 56,000 hours if driven at 100% brightness 24 hours per day, every day of the year. Mr. Villareal's light sequences feature a range of brightnesses and never are driven to 100% brightness. In addition, the artwork may or may not be programmed to be on 24 hours per day. Given this intended use of the product, it is reasonable to assume that the Philips equipment specified will last longer than ten years. The studio's artwork operation manual will offer direct-ordering information for the products so that additional replacement stock may be ordered, as desired. The LEDs are designed to snap in and out of the artwork panels, making replacement efforts a routine task that can be performed by the building's maintenance staff. Please see the maintenance section of the proposal for further detail.



INFINITE BLOOM, 2017
AMOREPACIFIC MUSEUM OF ART, SEOUL, SOUTH KOREA

PROJECT PHASES

Realizing a well-integrated and robust artwork will require careful study of the site and coordinated planning of the artwork's aesthetic and technical requirements. The museum and their team members will be responsible for preparing the site according to specifications provided by the studio, and the studio will collaborate closely with these team members to help create an efficient process. We suggest that the artwork planning and implementation unfold in the following phases:

Schematic Design: begins with detailed site surveys and ends when project costs are quantified

Design Development: subcontractors produce final technical drawings for studio review and approval

Site Preparation: begins when general contractor is contracted to implement the developed design drawings and ends when all site criteria are complete and the canopy is ready to accept LED artwork panels

Installation: begins when LED artwork panels arrive at the site and concludes after LED systems tests are complete

LED Systems Testing: begins when LVS studio technician(s) arrive onsite. This phase includes any problem solving that may be needed to ensure clean delivery of power and data to each pixel in the LED array. Testing is complete when all systems hardware and the studio's proprietary software are fully commissioned and ready for sequencing.

Artwork Sequencing: begins when Mr. Villareal arrives on site to create the artwork's light patterns. The process concludes when sequences for all times of day have been finalized and all programming is saved on the artwork control computers.



STAR CEILING 2, 2020
OKLAHOMA CONTEMPORARY ART CENTER, OKLAHOMA CITY, OK

SCHEMATIC DESIGN PROCESS

Collaboration between Villareal Studio, Architect, and General Contractor

Required Consultants: Structural Engineer (retained by LVS), Electrical Contractor (retained by Architect), Landscape Architect (retained by architect)

The goal of the schematic design phase is to develop the designs for the supporting aspects of the project (including column preparation, canopy construction, electrical site preparation, landscaping, seating, and LED panel installation preparation) to a degree suitable for cost analysis.

In the leadup to the schematic design phase, the local architect will identify key consultants including a general contractor, a landscape architect, and an electrical contractor for the museum's and the studio's review. Once all of the consultants have been selected and their individual scopes have been defined, the schematic design process may begin with initiation of site surveys.

The concept designs included in this proposal will serve as the starting point for a deeper technical collaboration with the architect and the general contractor that will occur during the schematic design phase. LVS will retain structural engineering firm Craft Studio during this phase to optimize the existing parametric canopy model to ensure that aesthetic objectives can be prioritized as the technical design develops. Early input from the builder during the schematic design phase can be crucial in developing a dependable order of operations for installation and a predictable project schedule. The landscape architect will advise regarding plant species, planter design, and irrigation. The electrician will design the electrical service and electrical cable conduit runs, offering code-compliant strategies for routing power from the power source to the base of the existing column array and distributing the power to the lighting equipment provided by the studio. The studio's chief responsibilities in the schematic design process will be to (1) ensure that the LED system requirements are satisfied, (2) see that efficient installation modes are adopted, and (3) confirm that the artist's aesthetic objectives are met.

The collaborative work performed during this phase will ensure that the canopy structure is robust and simple to erect, that the artwork is maintainable, and that the supporting design aspects represent a coherent whole. The process will help establish clean lines of direct communication and will provide a strong basis for streamlined project management and execution.

SITE SURVEYS

The plaza contains a number of existing features that require careful documentation and measurement. A structural column survey, demolition survey, electrical survey, and landscape survey will be required. We propose that a local architect be engaged to initiate these surveys at the beginning of the schematic design phase and to ensure that all information contained in them is complete.

The criteria for the surveys will emerge from a collaborative design process during the schematic design phase. Having accurate facts about the existing site conditions will allow the team to obtain reliable cost estimates and will pave the way for a smooth permitting process. A general outline for these surveys is as follows:

Structural Column Survey: To begin the process of engineering the cantilevered canopy our team will require an As Built drawing of the existing column stamped by a structural engineer. A detailed section of one typical column, its footing, and its internal structural buildup should be included in this document. This data may already exist in an existing drawing set. (NB: The drawing set provided to the studio during the concept design phase contains a reference to detail plates that are not included. If it is possible to locate these detail plates, further structural analysis may not be necessary.) If the data cannot be found within an existing drawing set, it will be necessary to engage a local engineer to verify the existing column conditions above and below the sidewalk grade. A traditional dimensional survey or a more exacting point cloud model may be needed in order to detect nuanced relationships between columns.

Demolition Survey: In order to realize the new vision for the ground-level elements of the artwork, it will be necessary to remove the existing planter that runs the length of the column array. A demolition survey will quantify the labor, the cost, and the site impacts associated with removing the existing planter.

Electrical Survey: An electrical site survey will determine whether the artwork's estimated electrical draw is available within the museum's existing power infrastructure. The studio's preliminary estimates suggest that a new subpanel containing five 20 AMP circuits at 220 volts may be required. Actual equipment draw will be under 50% of this required supply. The museum's electricians should review these requirements and make recommendations about whether additional power infrastructure will be required. An electrical contractor should then review the site and offer code-compliant strategies for routing power from the power source to the base of the existing column array and for distributing the power to the lighting equipment provided by the studio.

Landscape Survey: A landscape survey will determine the feasibility of the new planter array and will inform strategies for irrigation and subgrade drainage for the planters as well as the runoff from the 2,400 square-foot LED canopy. Existing seating features and surface treatments should be photographed for artist review.

The surveys detailed above should be coordinated by the project architect, and the data collected can then be shared with the studio for review.

ARTWORK DETAILING AND PROJECT COST ESTIMATION

Mr. Villareal will collaborate with a local architect to complete the aesthetic detailing of the canopy, the landscaping, the seating, the plantings, and the surrounding surface treatments that, together, compose the artwork. This aesthetic detailing of the environment may include a review of adjacent lighting in order to shape ideal evening viewing conditions for the artwork. After the visual aspects of the site modifications are quantified (along with the unseen site alterations such as electrical work, drainage, and surface preparations), the architect will communicate the proposed modifications in technical terms to consultants in order to seek cost estimates. The schematic design phase will be complete when Mr. Villareal has approved the design (including all materials and finishes) for conformance with his concept, when the studio has reviewed the design for compliance with the LED system's technical requirements, and when project costs have been quantified.

SCOPES OF RESPONSIBILITY

The studio will work closely with the El Paso Museum of Art's contractors to integrate the artwork into the site. Below please find an outline of how the studio proposes to share responsibilities:

Leo Villareal (Artist) will be responsible for:

- Creation of the artwork concept, including a full reconceptualization of the artwork site (the artwork is defined as the LED canopy, the structure, the seating, and the landscaping)
- Creation of all artwork renderings
- Creation of preliminary technical concepts in support of the artwork, including LED system support requirements, electrical requirements, and custom bench design
- Concept-level canopy detailing and engineering analysis sufficient for proof of concept
- Provision of aesthetic criteria for landscape design
- Creation of preliminary site plan and elevation
- Creation of all final technical documentation for LED system including detailed instructions for LED cable handling and artwork panel handling
- Collaboration with architect, general contractor, and all subcontractors in order to ensure the successful execution of the creative vision
- Provision of one technical liaison to coordinate technical details relating to studio deliverables
- Provision of structural engineering services through schematic design phase
- Provision of final build drawings of LED panel module during schematic design phase
- Provision of instruction set defining the order of operations for installing LED support systems and control hardware
- Provision of all LED system hardware, LED artwork panels, and drive computers

Architect: Project Coordinator will be responsible for:

Schematic Design

- **Suggest and agree upon** key team members as follows:
 - General Contractor - interview several GC's to determine suitability. Budgets and construction strategies to be established as a pre-construction service
 - Structural Engineer (Craft Engineering Studio)
 - Mechanical | Electrical Engineer
 - Civil Engineer (if needed)
 - Landscape Architect
- **Review** with Leo Villareal project aesthetics, program, and other information furnished as applicable to code and regulation requirements.
- **Obtain and identify** pertinent information about the project's physical characteristics, such as:
 - Size
 - Geotechnical reports (if needed)
 - Site Boundaries | Legal Description of site
 - Availability of public and private utilities | services
 - Produce specifications defining the demolition of the existing ground-level planter and the existing decorative (non-structural) elements on the column array

-
- Coordinate site surveys for Electrical, Landscaping, Demolition, and Column Structural review and submit resulting data to LVS
 - **Collaborate** with Leo Villareal upon all project aesthetics and **provide design solutions for:**
 - LED panel integration with framework + fascia
 - Placement within the site of LED systems equipment and cooling equipment
 - Roofing | waterproofing | drainage + gutter development
 - Landscape elements, i.e. benches and other possible landscape features
 - Design solutions for cables, conduits, access panels, and other technical support (including sub-grid specifications, distribution methods, and location of low-voltage cable transits)
 - Materials and finish submittals (including procuring physical samples for review by artist)
 - **Coordinate and communicate** all applicable design criteria to project team and develop project components (including coordinating with studio's structural engineer to produce a developed design of the existing structure and integrate suggested connection methodologies throughout the structure)
 - **Prepare preliminary design documents** consisting of plans, sections, elevations, study model if appropriate, sketches, and digital representations. This will include a set of landscape bid drawings for GC including all below-grade trenching, systems integration, topical ground treatments, and additional site lighting (3D visuals to be produced by LVS)
 - **Engage General Contractor** to provide pre-construction services such as preliminary estimate of Cost of Work (including electrical and landscape elements) and, if needed, alternative approaches to design and construction of the project
 - **Submit** to Leo Villareal Studio and museum preliminary estimate of the Cost of Work and Schematic Design Documents for approvals

Design Development

Refine the design

Construction Documents

Prepare detailed drawings and specifications for the GC

Contracting of Subcontractors

Review and evaluate bids

Construction Administration

Assist the museum in ensuring that the design is implemented in accordance with drawings and specifications and in a way that is consistent with artistic vision

SCOPES OF RESPONSIBILITY

Landscape Designer

- Respond to aesthetic criteria furnished by the artist and architect to prepare necessary site plans, specifications, and cost estimates
- Produce drawings suitable for build detailing landscape elements, drainage, and irrigation
- Submit materials and finish samples (including procuring physical samples for review by artist)
- Possible coordination of ground plane accent lighting during schematic design and design development phases
- Possible procurement or preparation of BOM for procurement by others

Structural Engineer

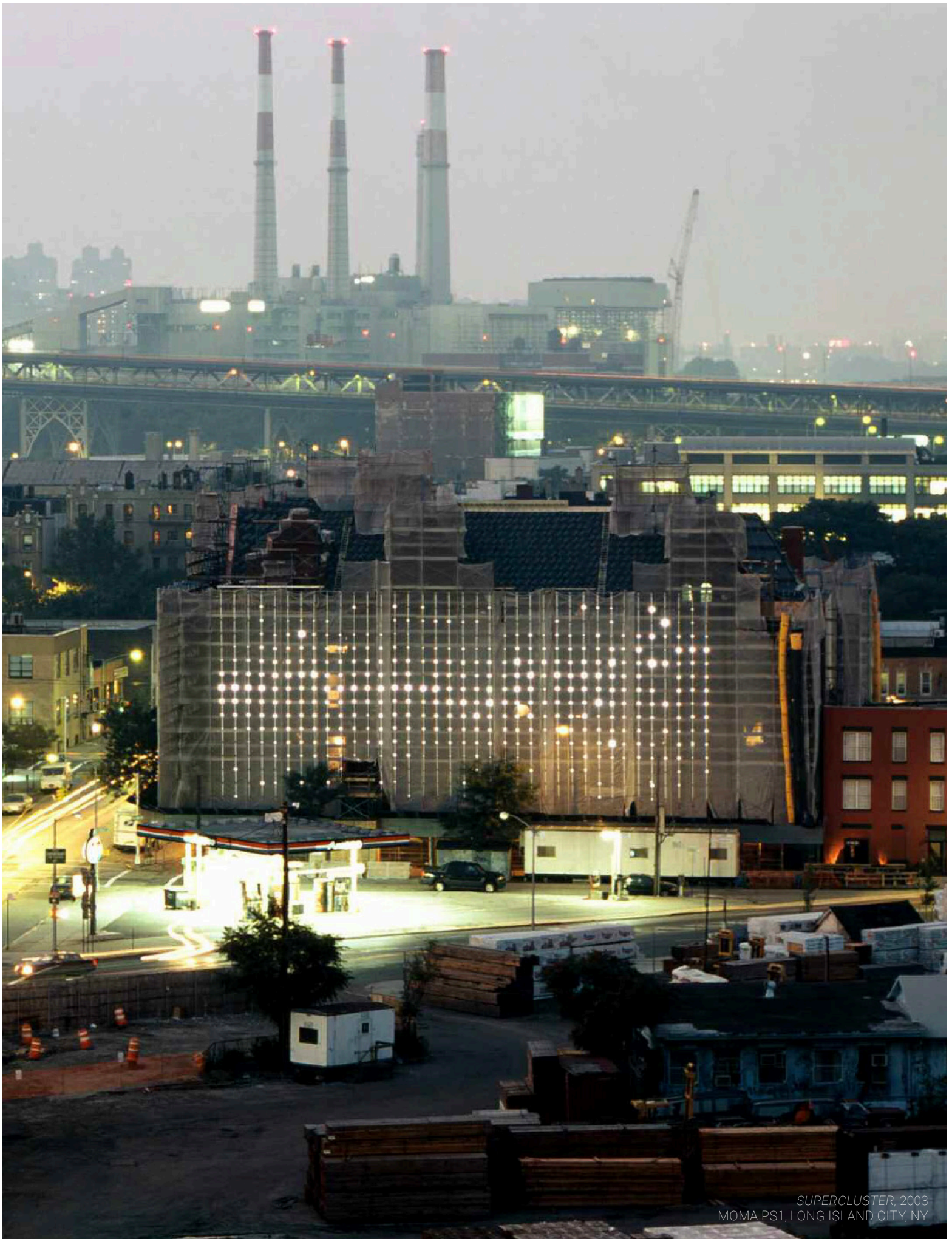
- Perform preliminary analysis of the existing structure during concept phase
- Collaborate upon strategies to arrive at a successful set of developed designs and make recommendations regarding feasibility for wind, gravitational, live, and seismic loads
- Collaborate with studio and project architect in the development of structural sub grid, LED panel array, outer framework and fascias, and cable transits so that all weights and measures can be quantified for analysis within Robot model
- Produce preliminary 50% calculation report describing loading criteria during schematic design phase
- Produce final 100% calculation reports for submission to general contractor

General Contractor: Project Builder

- Interface with architect and receive all schematic design drawings for early feasibility and cost analysis
- Interface with architect, engineer, and project electrician
- Receive all developed design drawings and format them as shop drawings and bid sets
- Produce final bids
- Negotiate build scheduling
- File permits
- Accept artwork panel and LED system deliveries and store crates in a secure location
- Provide all labor for demolition, site preparation, general construction, canopy construction, and installation of the LED panels and low-voltage cabling
- Provide access equipment (e.g. lifts) and labor during LED systems testing, supporting adjustments and repairs as directed by studio staff

El Paso Museum of Art: Client

- Manage the contract flow, entering direct contracts with the studio, the architect, and the general contractor (among others)
- Develop the master schedule
- Fully fund the project
- Offer approvals as defined at intervals by architect



SUPERCLUSTER, 2003
MOMA.PS1, LONG ISLAND CITY, NY

MAINTENANCE & STEWARDSHIP

The artwork LED system will require occasional maintenance. Typical artwork conservation falls into three general categories: burn-in repairs (to replace equipment that fails during the first six months or artwork operation), yearly maintenance (visual inspection of the equipment closets, general cleaning, and upkeep), and long-term maintenance (which includes the LED replacement planning in keeping with the manufacturer's stated lifespan of the of the LED products).

The studio provides a comprehensive operating manual after the artwork is installed. The operating manual provides basic guidelines (including text and visuals) for the three categories of maintenance listed above. The manual and maintenance strategies are organized around the premise that the client will provide a local staff person to serve as the artwork steward. The artwork steward will be trained in techniques outlined in the manual and will serve as the studio's single point of technical feedback for any problem that arises during the studio's one-year warranty period (see below). The steward will be tasked with maintaining the stock replacement LED hardware provided with the artwork, understanding the on/off procedures used to reboot the system as a whole, understanding the proper replacement techniques for changing the LEDs within the LED panels, and receiving any shipments from the studio if any future spare parts are required.

The studio designs the artwork with future maintenance in mind, ensuring that power supplies, data drivers, and computers are located at the ground level, where they may be easily accessed by service providers. Methods for accessing the LED array in order to replace LEDs will include standard lift equipment or simple scaffolds. Maintenance strategies will be defined early in the collaborative planning sessions with the local team members.

The studio provides a one-year manufacturing guarantee with each electronic artwork. During this period, the studio will rectify any manufacturing defects. If the defect can be corrected by replacing the failed component with a replacement part, the studio will provide instructions and consultation for such procedure, and the client shall carry out the recommended procedure. If the defect cannot be readily cured by means of such a routine replacement, the studio shall remedy the defect at its own expense.



COSMOS, 2012
CORNELL UNIVERSITY, ITHACA, NY

SOCIAL & ECONOMIC IMPACT: *THE BAY LIGHTS*

Leo Villareal's artworks in the public realm are proven drivers of community engagement and positive economic impact while demonstrating a keen environmental awareness. Each piece is created with sensitivity to the physical, functional, and communal attributes of the site.

The Bay Lights is a 1.8 mile wide and 525 foot high LED sculpture. The artwork's 25,000 white LED lights are individually programmed by artist Leo Villareal to create a never-repeating, dazzling display across the West Span of the Bay Bridge. First launched for a two year run in March 2013 to commemorate the Bay Bridge's 75th Anniversary, it was then made permanent in 2016.

In its initial two-year run, *The Bay Lights* was seen by over 50 million people in the Bay Area with billions of media impressions worldwide. The economic impact assessment conservatively estimated that in those first years \$97 million was added to the local economy. The now permanent installation's impact continues to grow exponentially.

THE BAY LIGHTS – SURVEY

In a survey mounted by the presenting organization Illuminate the Arts to evaluate the economic impact and "happiness index" resulting from the ongoing presence of *The Bay Lights*, the following was found:

- 87% of respondents thought it should be permanent, and the majority of all respondents who viewed the sculpture felt awed, peaceful, and happy
- 76% of respondents when asked, "Do you think we need public art like *The Bay Lights* to ignite imaginations and enliven public spaces?" said it is "Very Important"
- 75% of respondents, when asked on a scale of 1-5 how much they enjoy *The Bay Lights*, gave it a "5"

“As engaging and open-ended as it is brilliantly ephemeral, Mr. Villareal's *The Bay Lights* offers a breathtaking encounter with the fugitive forces of its surroundings as captured by state-of-the-art technology. It is public art at its best—temporal, contemporary and indescribably beautiful.”

Mary Lewis, *Wall Street Journal*, April 2, 2013



SOCIAL & ECONOMIC IMPACT: *ILLUMINATED RIVER*

Leo Villareal's artwork, *Illuminated River*, is the first artistic and cohesive vision for London's central bridges, celebrating them as architectural, social, and historical landmarks, and creating a symbolic link across the capital. Once complete, at 2.3 miles in length (spanning 4.5 nautical miles of the Thames), this artwork will be the longest public art commission in the world, seen over 130 million times each year. Free and publicly accessible for all to enjoy, *Illuminated River* will transform the experience of the city at night and define the bridges as renewed civic spaces for Londoners.

It is expected that *Illuminated River* will cultivate an entirely new river experience that will support leisure and businesses near the Thames, especially relating to the night-time economy. Mayor of London, Sadiq Khan, endorsed the project saying that, "*Illuminated River* will give London free art and encourage more people to move around the city and in doing so bring support to nearby businesses and communities."

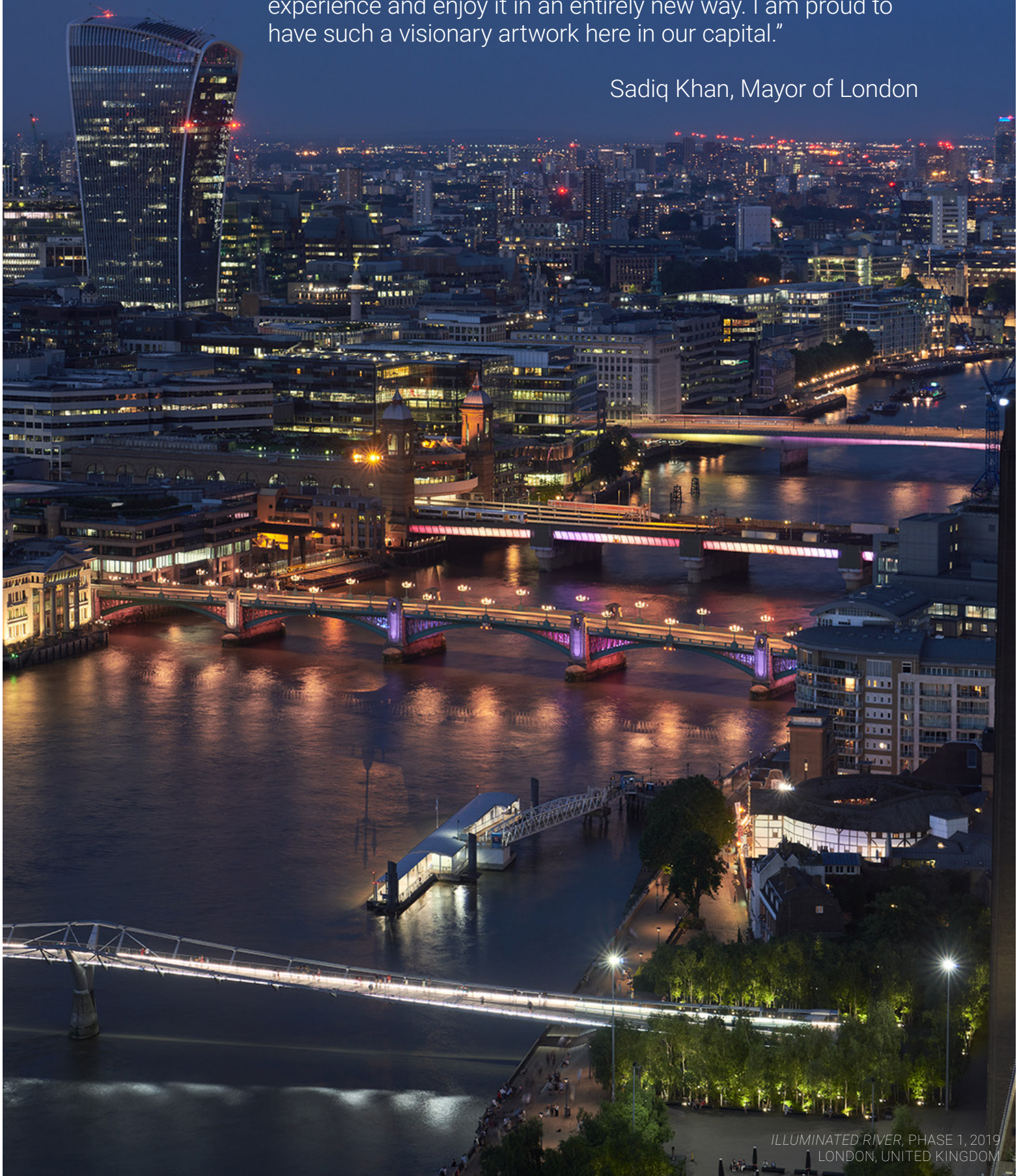
Illuminated River will refocus attention not only on the bridges but on the public spaces around them, encouraging more people to come and enjoy the river and riverside areas at night. This will be a catalyst for wider conversations about improvements to public space and lighting. The studio is working with bridge owners and local authorities to improve access to and around the bridges, exploring opportunities to make these areas more communal, inclusive, and safe, as well as to improve lighting and add more public seating.

The Illuminated River Foundation is committed to making improvements to this vital urban infrastructure. As the bridges currently have a varied spectrum of functional lighting, the organization will support the maintenance and energy costs of all of the bridges that are not currently or are only partially illuminated. When complete, the artwork will result in a net reduction in energy costs to all of the bridge owners. After the artwork's ten year duration, the lighting fixtures will be given to the bridge owners, creating a lasting tangible impact for all of London.

Illuminated River will enrich the experience of travelling along and across the river at night, at street level, on foot, and by boat. It will encourage people to use the river (currently the city's most under-used artery) as a means of transport and will support a wider walkability agenda.

"*Illuminated River* is both a global and local project, and one of unprecedented scale and significance. It is already a beacon of London's creativity, and will bring people to the Thames to experience and enjoy it in an entirely new way. I am proud to have such a visionary artwork here in our capital."

Sadiq Khan, Mayor of London



ESTIMATED TIMELINE

Schematic Design

2 - 4 months

Expanded proposal phase to produce developed design drawings and estimated construction costs

- assumes that 100% of client surveys contain actionable information*
- requires direct access to the builder and electrician*

Client Approval of Artwork Concept and Estimated Construction Budget

Enter Commission Agreement with Studio

Design Development

2 - 3 months

Construction Documents

2 - 4 months

Contracting of Subcontractors

1 - 2 months

Construction

at minimum 6 months

LED System Installation and Commissioning

1 month

LED System Installation (by General Contractor)

2 weeks

LVS technician onsite to aid in LED systems set up

1 week

to coincide with completion of leader cable installation (by General Contractor)

LVS technician onsite to aid in testing LED panel array

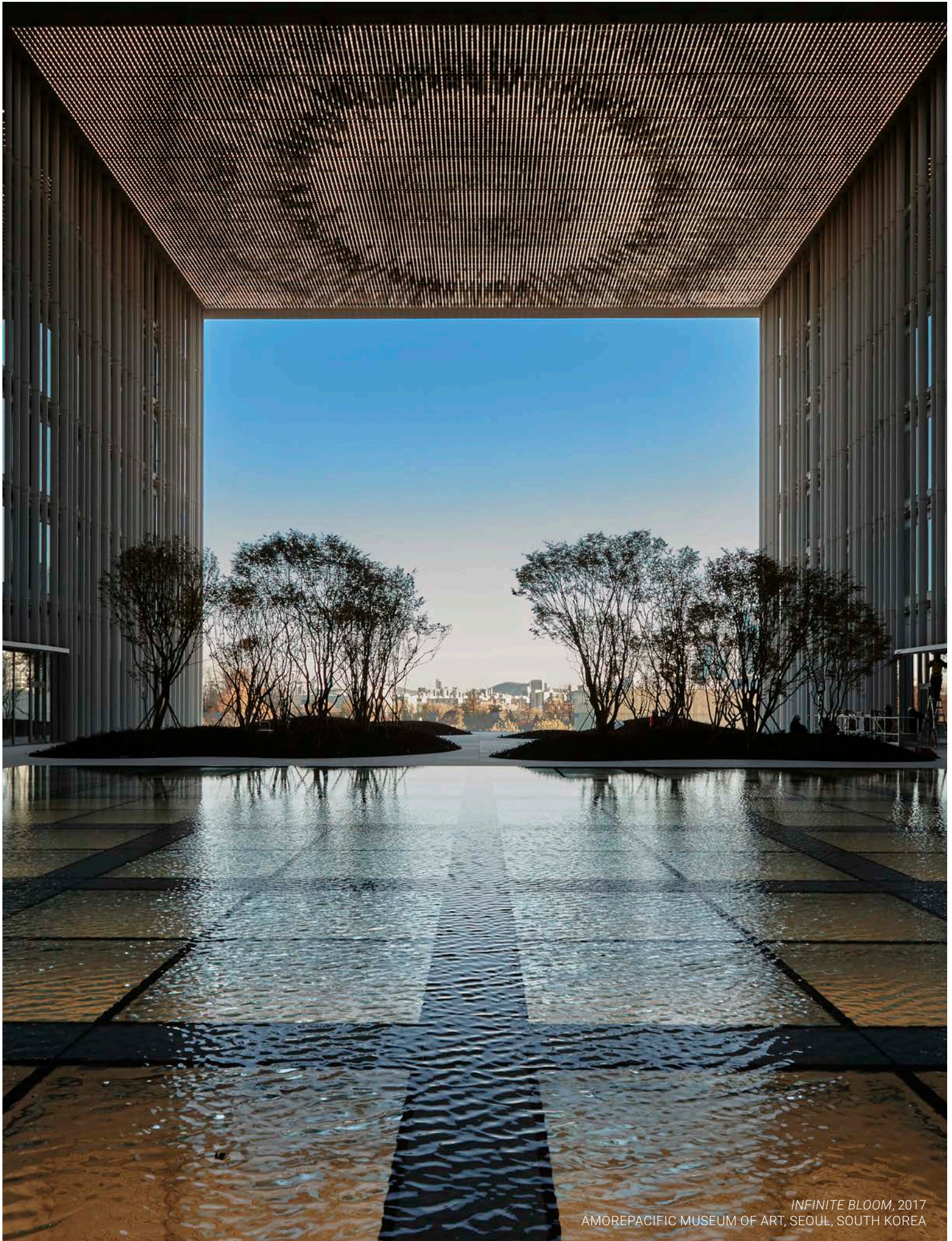
1 week

to occur after LED panel installation, requires lifts and installer labor

Onsite Sequencing (by Leo Villareal)

1 week

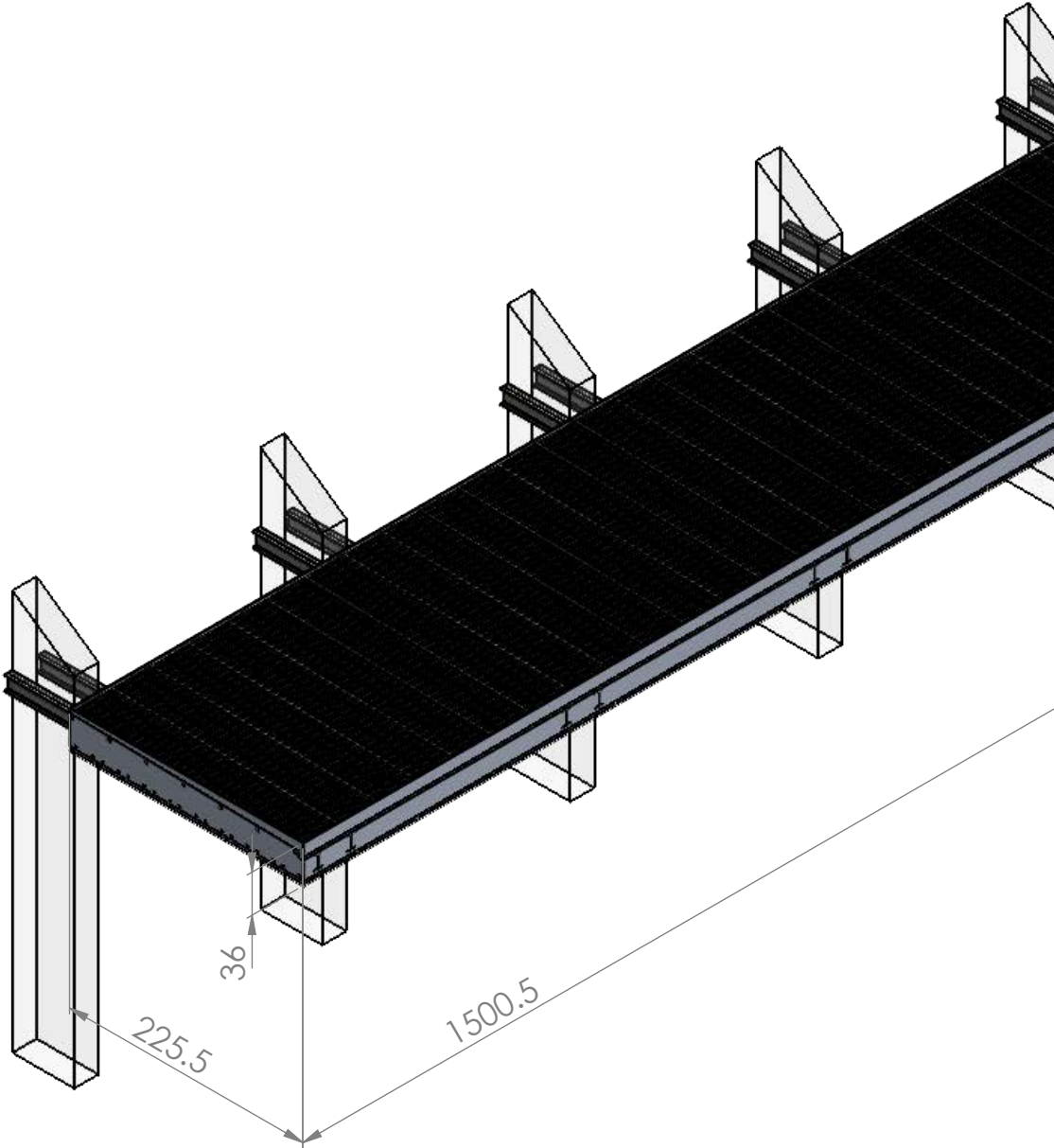
to occur at least one week after completion of LED testing

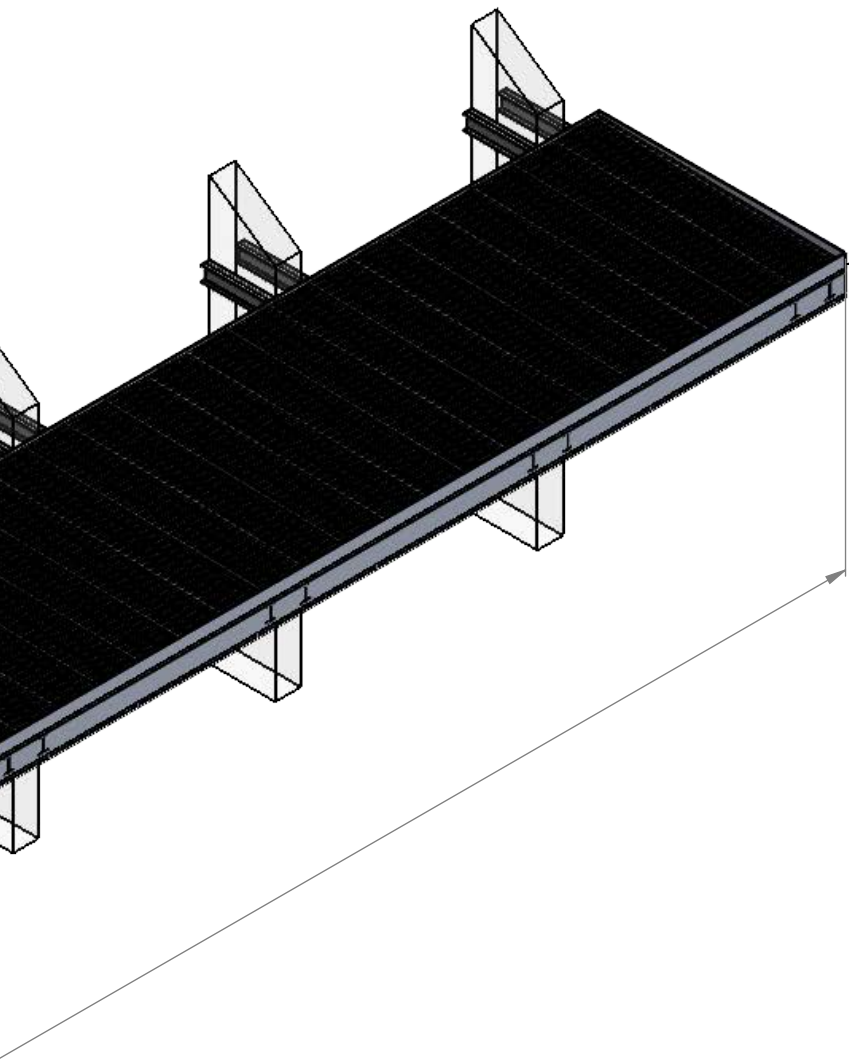


INFINITE BLOOM, 2017
AMOREPACIFIC MUSEUM OF ART, SEOUL, SOUTH KOREA

FABRICATION STUDIES

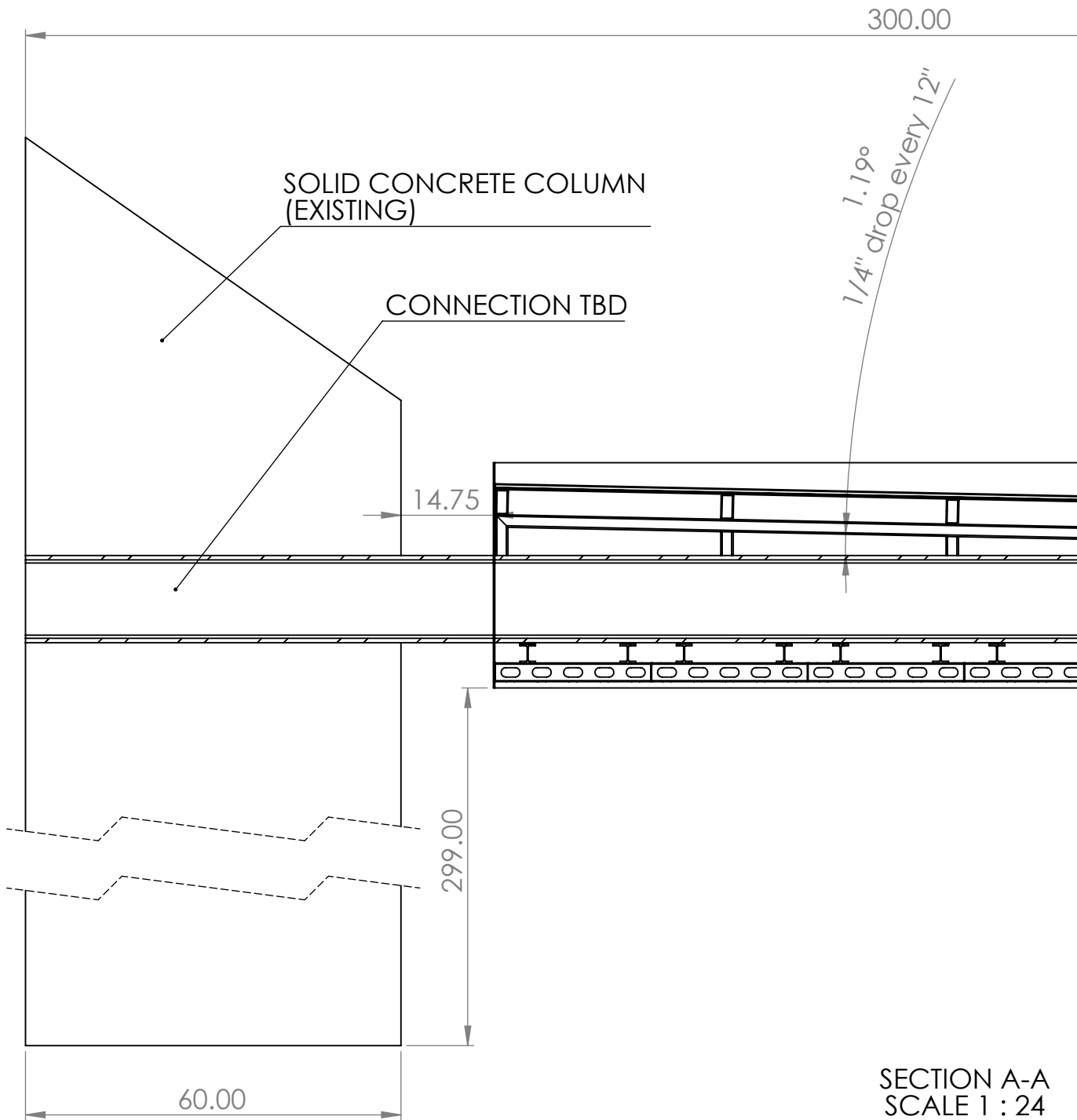
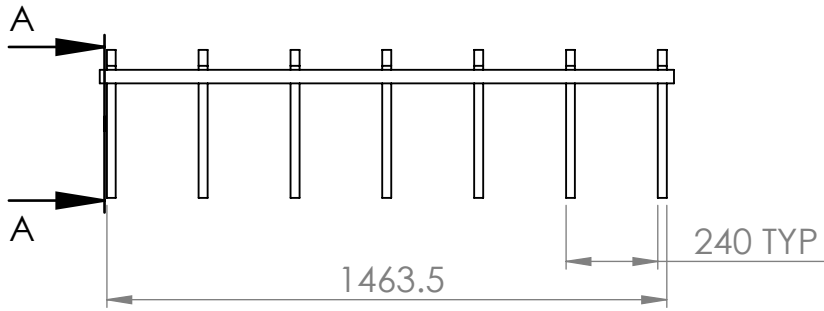
PREDICTED METAL WORK ASSEMBLY WEIGHT -
48,000 LBS
~19.5 LBS PER SQ FOOT

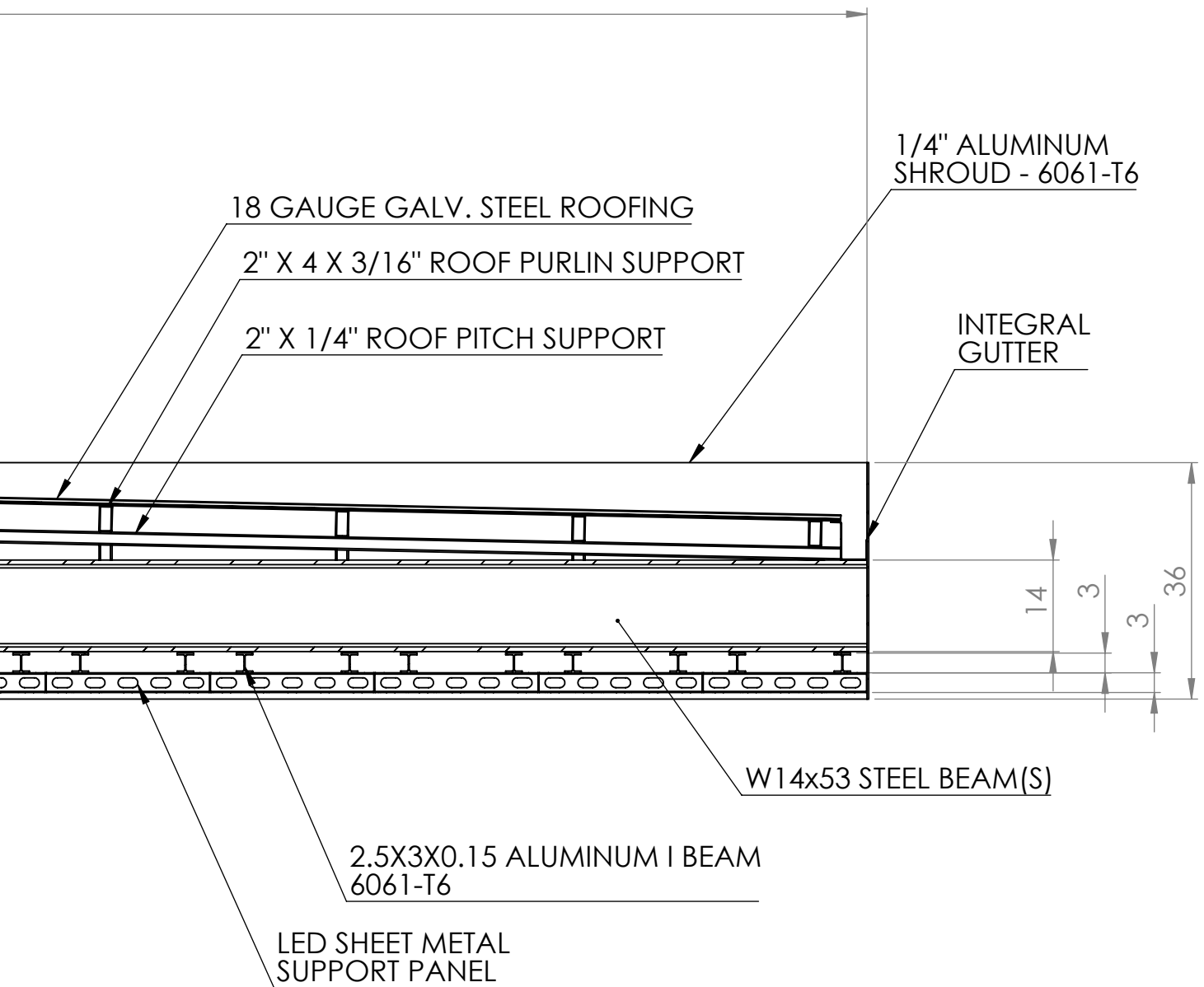




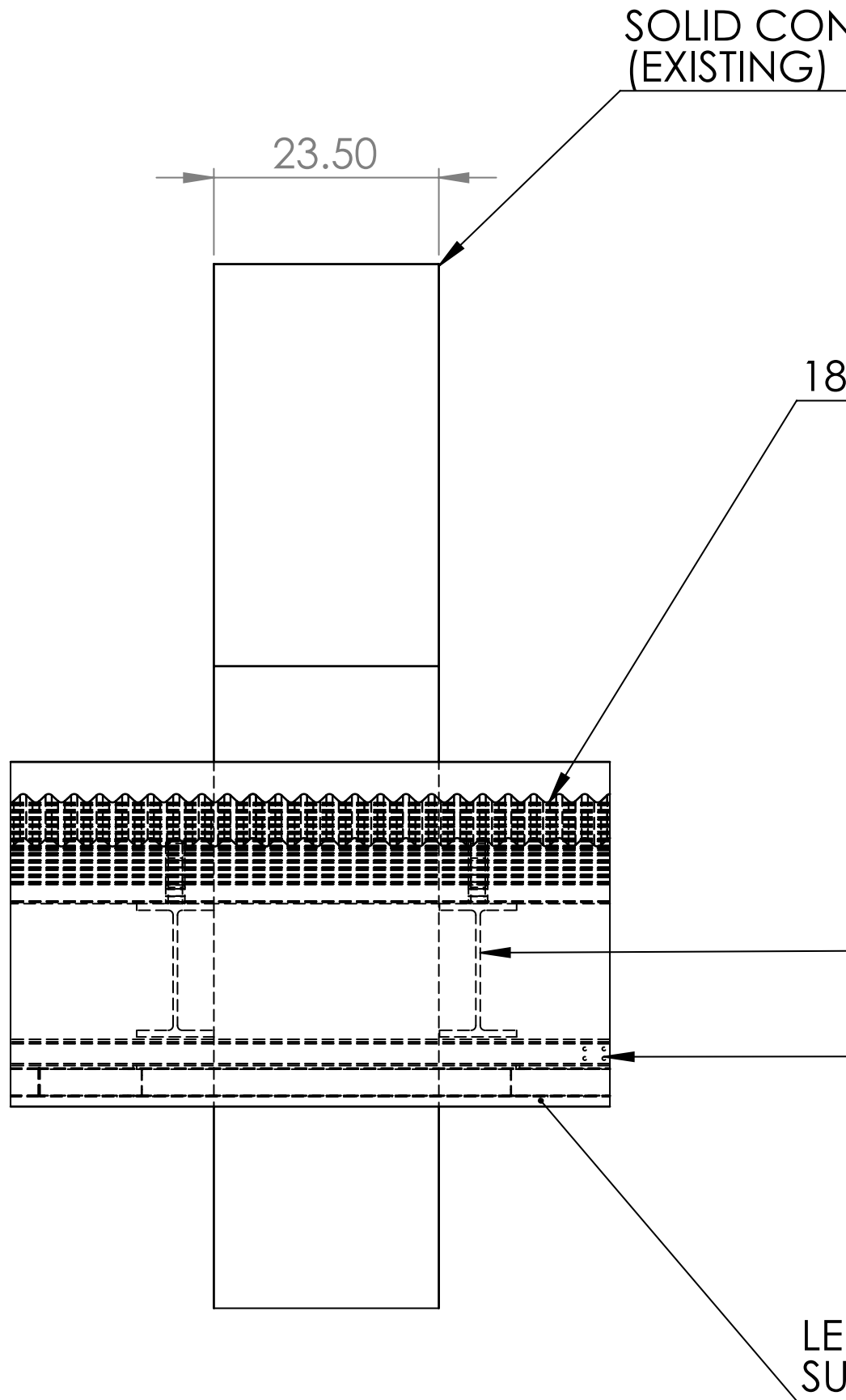
48" TALL ALUMINUM
PERIMETER SHROUD

FABRICATION STUDIES





FABRICATION STUDIES



CONCRETE COLUMN

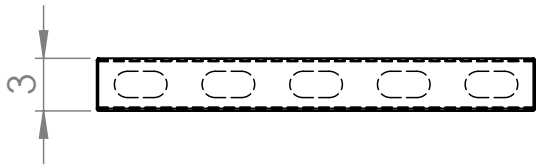
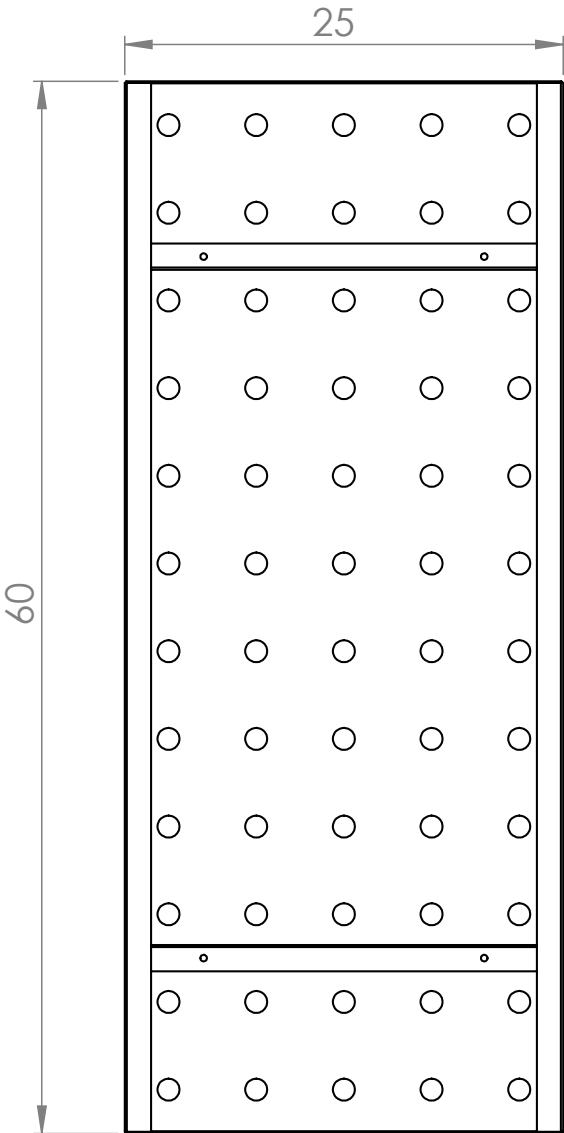
18 GAUGE GALV. STEEL ROOFING

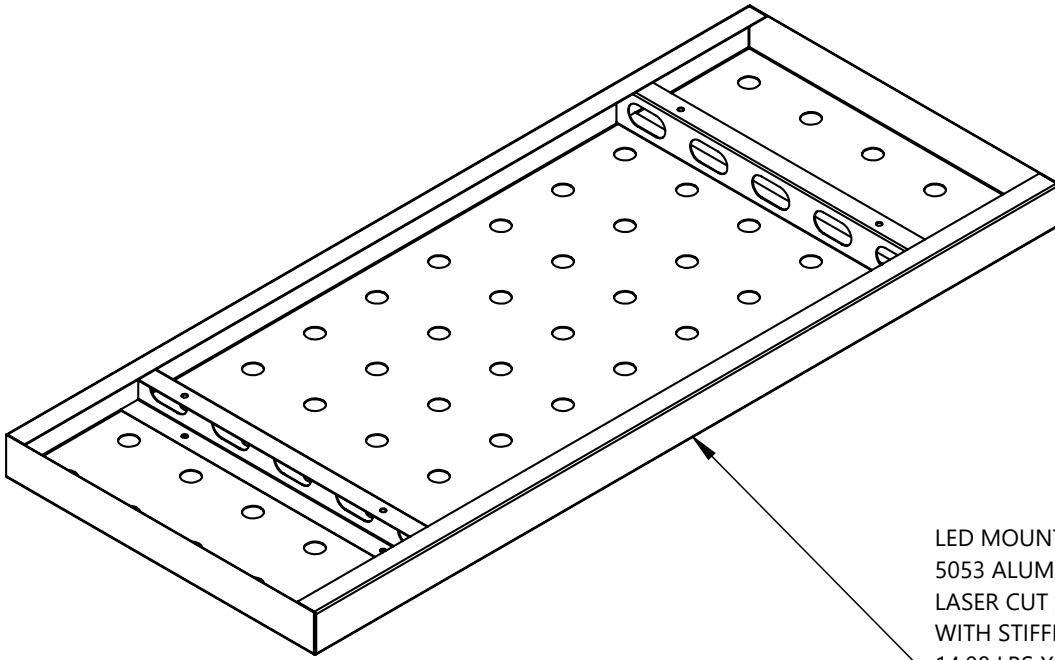
W14X53 GALV. STEEL BEAM

2.5X3X0.15 ALUMINUM I BEAM
6061-T6

1/2" THICK SHEET METAL
SUPPORT PANEL

FABRICATION STUDIES



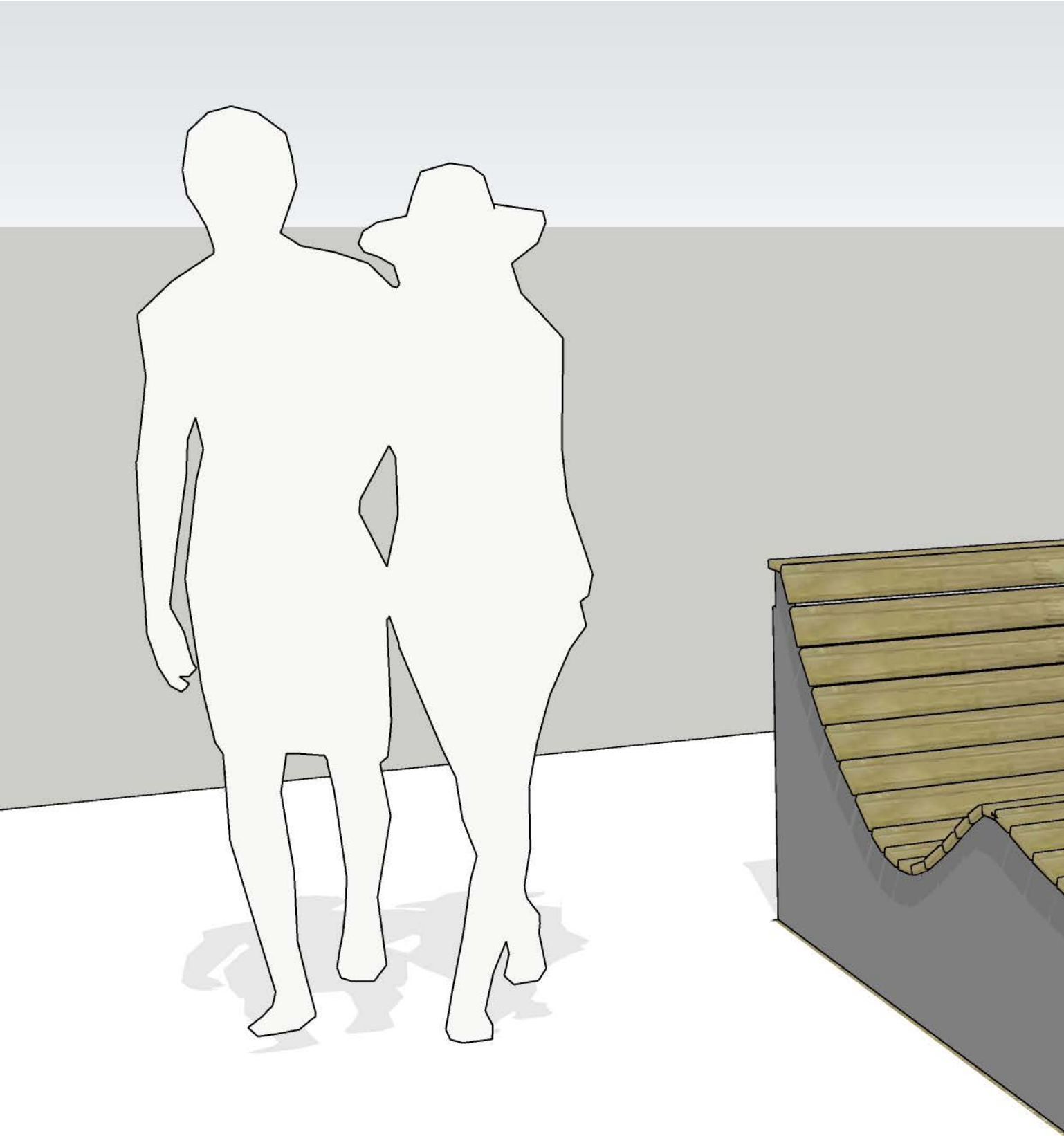


LED MOUNTING PANEL
5053 ALUMINUM 16 GAUGE
LASER CUT AND BENT
WITH STIFFENED CHANNEL
14.08 LBS X 225 PANELS IN ASSEMBLY = 3168 LBS

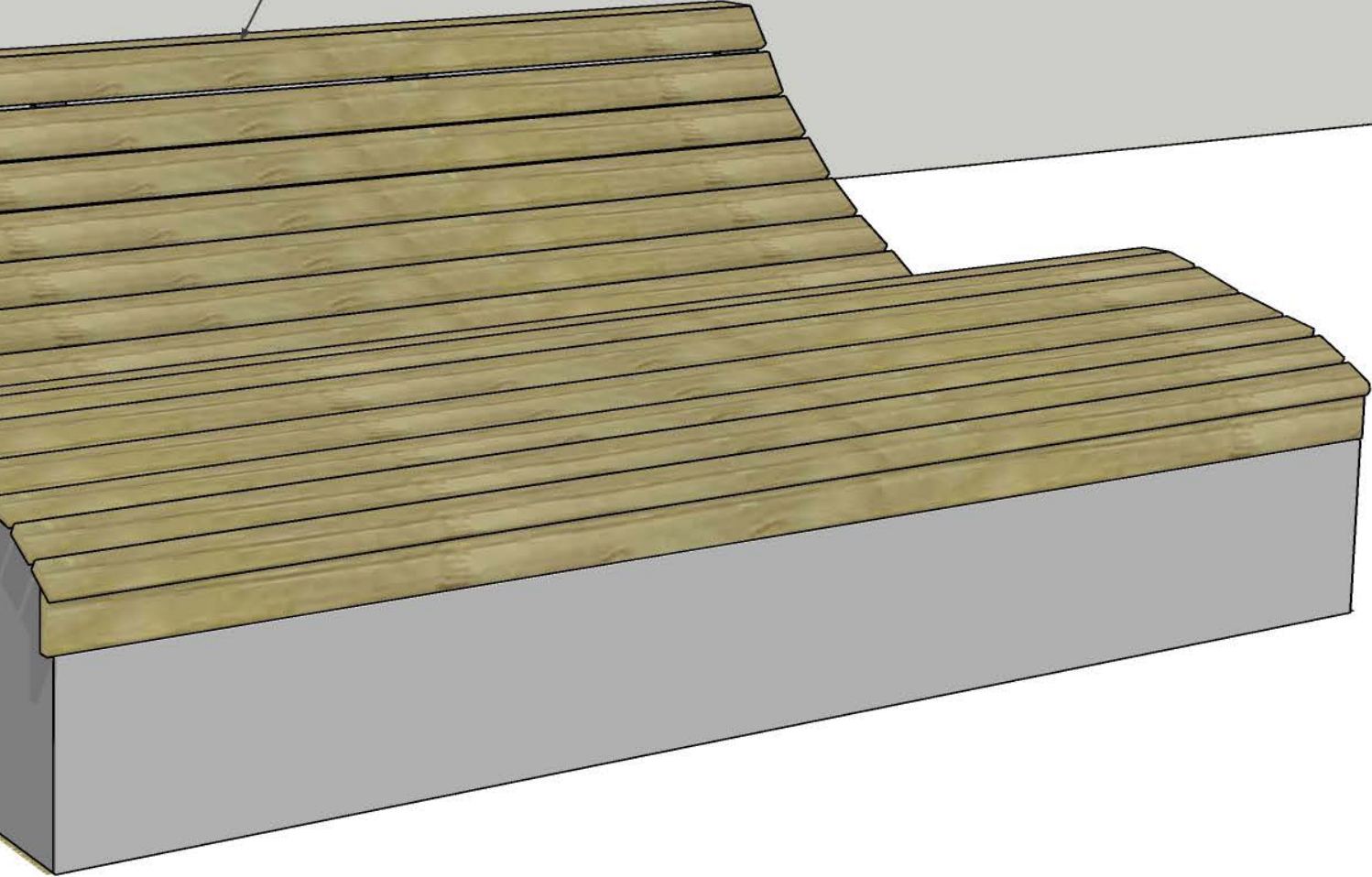
MARQUEE IS 2457 SQ FEET
PANELS WEIGH 1.29 LBS PER SQ FOOT



FABRICATION STUDIES

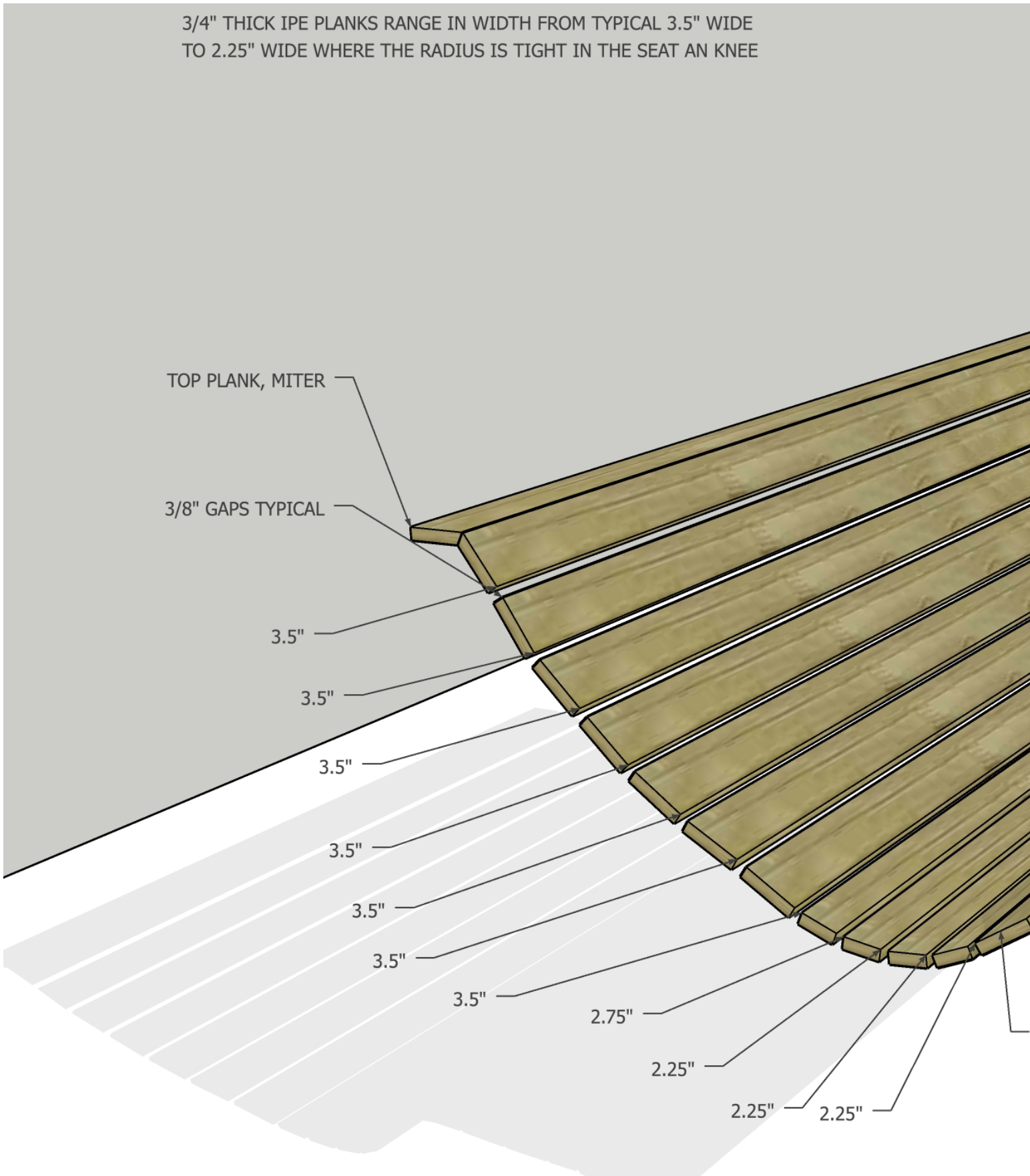


ZERO GRAVITY BENCH BY LEO VILLAREAL
IMPLEMENTED AT CORNELL UNIVERSITY (COSMOS)
MADISON SQUARE PARK NYC (BUCKYBALL)
STAR CEILING (OKLAHOMA MUSEUM OF ART)

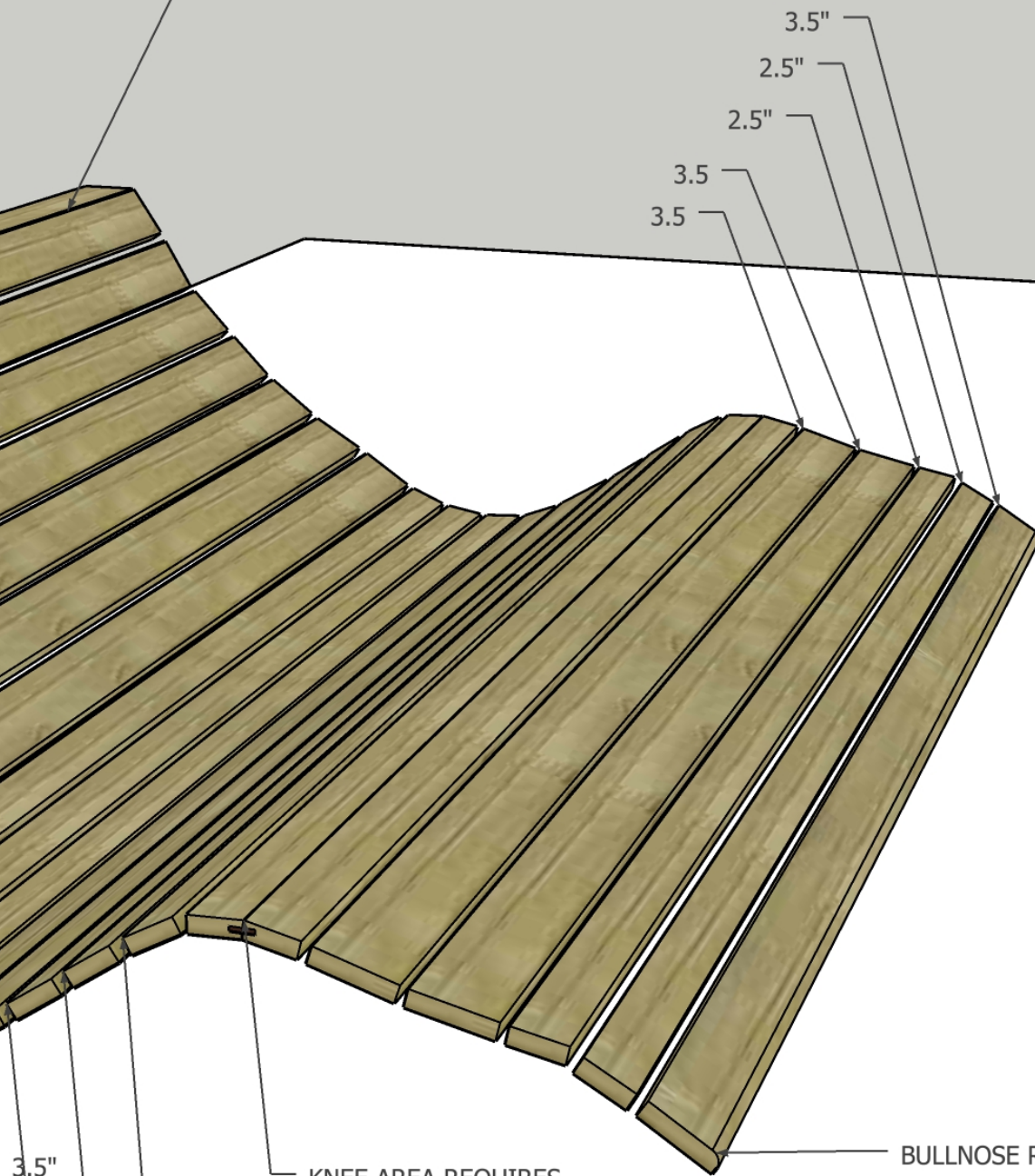


FABRICATION STUDIES

3/4" THICK IPE PLANKS RANGE IN WIDTH FROM TYPICAL 3.5" WIDE TO 2.25" WIDE WHERE THE RADIUS IS TIGHT IN THE SEAT AN KNEE



SAND ALL EDGES AND FACES SO THAT NO SPLINTERS EMERGE- IPE REQUIRES THIS IMPORTANT STEP



KNEE AREA REQUIRES MITRER AND A BISCUIT USING TWO 2.5" SLATS

BULLNOSE ROUNDOVER

PRELIMINARY ENGINEERING REPORT

DESIGN SPECIFICATIONS

TEXAS BUILDING CODE 2015
INTERNATIONAL BUILDING CODE 2015

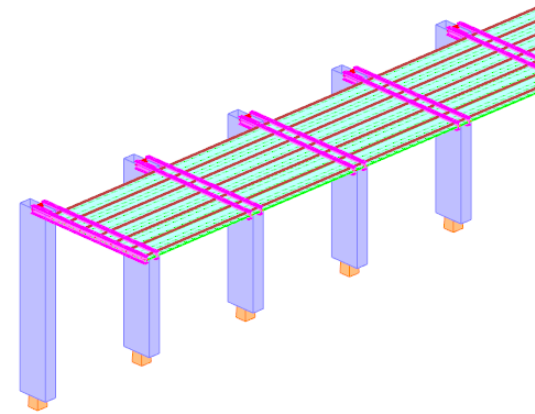
LOADING ASSUMPTIONS

DEAD LOAD				
STRUCTURE SELF-WEIGHT				
TOP - ASSEMBLY - HSS 4X2X3/16	=		10080	lb
TOP - ASSEMBLY - HSS 2X2X3/16	=		1361	lb
W14X53 STEEL CANTILEVER BEAM	=		18550	lb
BOT - 1 2X3X0.15 ALUMINUM BEAM	=		4210	lb
TOP - 18 GA. GALV STL PL.	=		2.04	lb/ft ²
BOT - LED MOUNTING PANEL	=		1.29	lb/ft ²
SUPERIMPOSED DEAD LOAD				
BOT - LED EQUIPMENT	=		0.20	lb/ft ²
TOTAL	=		47762	lb
LIVE LOAD				
MAINTENANCE WORKER	=		20.0	lb/ft ²
WIND LOAD				
BASIC WIND SPEED	=		115	mph
EXPOSURE CATEGORY	=		B	
qz	=		19.7	lb/ft ²
	CASE	DIRECTION	ZONE	LOAD
	A	0/180	1	20.12 lb/ft ²
	A	0/180	2	5.03 lb/ft ²
	A	90	1	-13.42 lb/ft ²
	A	90	2	-10.06 lb/ft ²
	A	90	3	-5.03 lb/ft ²
	B	0/180	1	-18.45 lb/ft ²
	B	0/180	2	-1.68 lb/ft ²
	B	90	1	13.42 lb/ft ²
	B	90	2	8.38 lb/ft ²
	B	90	3	5.03 lb/ft ²

STRUCTURAL ANALYSIS ASS

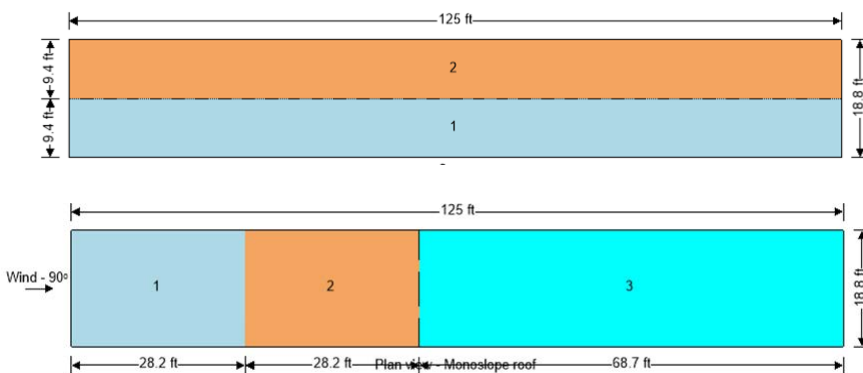
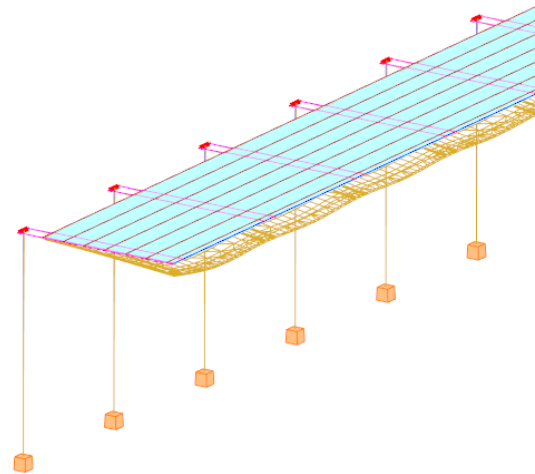
1. ASSUME MINIMUM REINFORCEMENT REINFORCED CONCRETE COLUMN
2. ASSUME EXISTING FOUNDATION DESIGN LOADS

ROBOT STRUCTURAL ANALY



DEFLECTION (UNDER DEAD L

THE MAXIMUM DEFLECTION UNDER LOAD IS 0.87 INCHES, SMALLER THAN ALLOWABLE DEFLECTION OF L/480



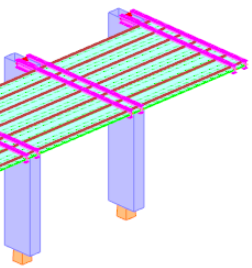
LOADING DIAGRAM FOR WIND LOAD

ASSUMPTIONS

EXISTING REINFORCED COLUMN WITH MINIMUM REINFORCEMENT

IS ABLE TO SUPPORT THE CANOPY UNDER DESIGN LOADS.

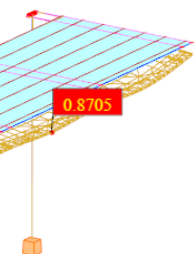
ANALYSIS MODEL



- HSRE 4x2x0.1875
- HSSQ 2x2x0.1875
- I-2.5x3x0.15 (ALUM)
- RC C23.5x60
- W 14x53

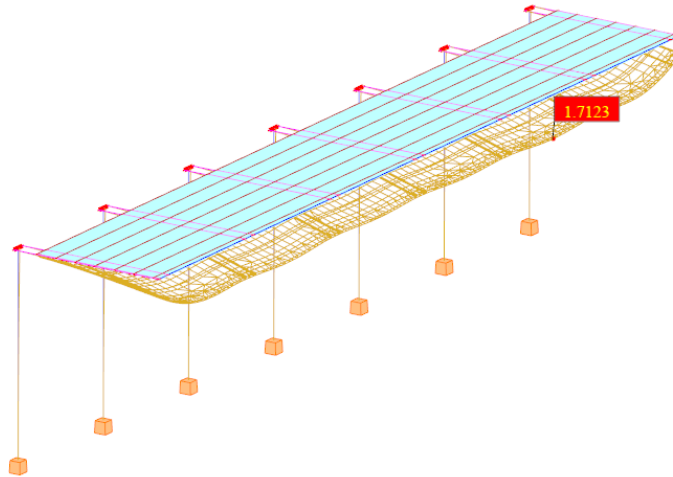
LOADS

DEFLECTION UNDER DEAD AND LIVE LOAD IS 1.72 INCHES, SMALLER THAN THE ALLOWABLE DEFLECTION OF $L/240 = 2.25$ INCHES



DEFLECTION (UNDER DEAD AND LIVE LOAD)

THE MAXIMUM DEFLECTION UNDER DEAD AND LIVE LOAD IS 1.72 INCHES, SMALLER THAN THE ALLOWABLE DEFLECTION OF $L/240 = 2.25$ INCHES



CONCLUSION

THE EXISTING 23.5" x 60" REINFORCED COLUMN WITH MINIMUM REINFORCEMENT ASSUMED IS ABLE TO SUPPORT THE CANOPY UNDER DESIGN LOADS.

FOR THE LED PANEL, AN ASSUMED THICKNESS OF 1/16 INCHES IS SUFFICIENT IN BOTH STRESS AND DEFLECTION. FURTHER ANALYSIS WILL BE PERFORMED ONCE CONNECTIONS ARE KNOWN.

LED PRODUCT SPECIFICATIONS

Exterior flexible strands of high-intensity nodes with single temperature white light

eW Flex Compact is a versatile strand of 50 individually controllable LED nodes. The flexible form factor allows dynamic points of white light to be installed across nearly any interior or exterior surface, including walls, ceilings, floors, three-dimensional sculptures, and set pieces. eW Flex Compact can also light tight alcove spaces and signage, and in certain cases, can even display video.



- Daylight visible—At full brightness, each node produces light output of up to 89.6 candela and 129,758 nits.
- Adaptable mounting—Strands can be mounted directly to a surface, like traditional string lights. Detachable leader cables in multiple lengths allow you to install strings at the appropriate distance from power/data supplies. Optional mounting tracks ensure straight linear runs, while snap-on spacers hide cabling and mounting hardware. Single node mounts can be positioned individually as anchor points for installations with uneven node spacing or complex geometries.
- Outdoor rated—Fully sealed for maximum node life and IP66-rated for outdoor applications.
- Supports cost-effective video displays—Flexible form factor, offering maximum lighting control at 50 W per strand, accommodates unique lighting installations, including two- and three-dimensional video displays. White nodes enable classic black and white video or reverse (shadow) video.
- Multiple lens options—Standard clear flat, translucent dome, and narrow beam lenses. Optional translucent flat, clear dome, narrow beam, semi-frosted flat, and semi-frosted dome lenses are available.
- Standard and custom lengths and node spacing—eW Flex Compact strands are available with standard on-center node spacing of 75 mm (3 in) or 610 mm (24 in) along a three-wire, 16 AWG cable. For information about custom orders, see the eW Flex Compact Ordering Sheet at www.colorkinetics.com/ls/essentialwhite/ewflexcompact/.
- Custom leader cables—Custom leader cable lengths are available in addition to standard cables of 7.6 m (25 ft), 15.2 m (50 ft), and 30.5 m (100 ft).
- Industry-leading controls—eW Flex Compact works seamlessly with the Color Kinetics full range of controllers, including Light System Manager, Video System Manager Pro, iPlayer 3, Antumbra iColor Keypad, and ColorDial Pro, as well as third-party DMX controllers.
- Superior light output—eW Flex Compact strands consist of 50 individually controllable, high-intensity LED nodes. Each node produces solid white light output of up to 89.6 candela.
- Digital Dimming—Smooth dimming down to 1% with optional Data Enabler Pro and digital control interface.

For detailed product information, please refer to the Flex Family Product Guide at www.colorkinetics.com/global/products/essentialwhite/ewflexcompact/

Specifications

Due to continuous improvements and innovations, specifications may change without notice.

Output

Color Temperature*	4000 K
Viewing Angle	105°
Lumens per node†	87
Luminance per node	47,679 cd/m ²
On-Axis Candela per node	31.5
Efficacy (lm/W)	86.9
CRI	84

Electrical

Input Voltage	24 VDC via PDS-60ca 24V, sPDS-60ca 24V, sPDS-480ca 24V, or CM-150 CA 24V
Power Consumption	1 W <small>(Maximum per node at full output, steady state)</small>

Control

Interface	PDS-60ca 24V (Pre-programmed, or DMX/Ethernet) sPDS-60ca 24V (DMX/Ethernet) sPDS-480ca 24V (Ethernet) CM-150 CA (DIN Rail or Surface Mount)
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Control System

Color Kinetics full range of controllers, including Light System Manager, Video System Manager Pro, iPlayer 3, Antumbra iColor Keypad, and ColorDial Pro, or third-party controllers

Remote Monitoring & Management	Philips ActiveSite Ready, works with Interact Landmark
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Lumen Maintenance

Threshold [§]	Ambient Temperature	Reported [¶]	Calculated [¶]
L ₉₀	25 °C	20,000	20,000
	50 °C	20,000	20,000
L ₈₀	25 °C		37,000
	50 °C	37,000	37,000
L ₇₀	25 °C	56,000	56,000
	50 °C	56,000	56,000

Physical

Dimensions <small>(Height x Width x Depth)</small>	31 x 32 x 17 mm (1.2 x 1.3 x 0.7 in)
Weight	1.74 kg (3.84 lb) <small>50 nodes</small>
Housing Material	White polycarbonate
Lens	Clear UV-protected polycarbonate
Luminaire Connections	Integrated watertight 3-pin connector

Temperature Ranges

-40 to 50 °C (-40 to 122 °F) Operating
> 0 °C (> 32 °F) Handling
-20 to 50 °C (-4 to 122 °F) Startup
-40 to 80 °C (-40 to 176 °F) Storage

Humidity	0 to 95%, non-condensing
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Maximum Luminaires Per Power/Data Supply

PDS-60ca 24V: 1 strand
sPDS-60ca 24V: 1 strand
sPDS-480ca 24V: 8 strands
CM-150 CA: 2 strands

Certification and Safety

Approbation	UL/cUL, FCC Class A, CE
Environment	Dry/Damp/Wet Location, IP66



* Correlated color temperature (CCT) complies with ANSI C78.377-2008 for the chromaticity of solid state lighting products.

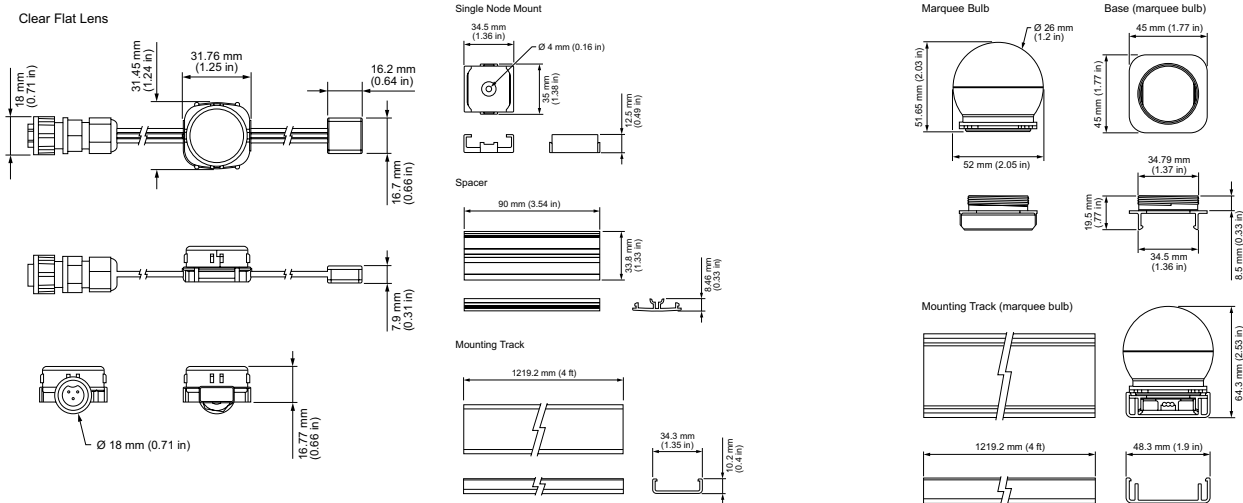
† Lumen output measurements comply with IES LM-80-08 testing procedures.

§ Lxx = xx% lumen maintenance (when light output drops below xx% of initial output). All values are given at B10, or the median value where 90% of the LED population is better than the reported or calculated lumen maintenance measurement.

¶ Lumen maintenance figures are based on lifetime prediction graphs supplied by LED source manufacturers. Whenever possible, figures use measurements that comply with IES LM-80-08 testing procedures. In accordance with TM-21-11, Reported values represent the interpolated value based on six times the LM-80-08 total test duration (in hours). Calculated values represent time durations that exceed six times the total test duration.

LED PRODUCT SPECIFICATIONS

Dimensions



For help estimating the light output and distribution of lighting luminaires, please contact Color Kinetics Applications Engineering Services at <http://www.lighting.philips.com/support/connect/contact-us>.

Luminaire and Accessories

Use Item Number when ordering in North America

Luminaire	Item Number	Item 12NC
eW Flex Compact 4000 K, Clear Flat Lens, White Housing, 12 in On-Center Node Spacing 50 node strand	500-000012-28	912400130647
Accessories		
Leader Cable, 7.6 m (25 ft), Black (for use with Power/Data Supplies)	108-000045-00	910503700696
Leader Cable, 15.2 m (50 ft), Black (for use with Power/Data Supplies)	108-000045-01	910503700697
Leader Cable, 30.5 m (100 ft), Black (for use with Power/Data Supplies)	108-000045-02	910503700698
Leader Cable, 4-Wire, 15.2 m (50 ft) (for use with CM-150 CA Item # 109-000033-00)	108-000080-01	912400135907
Leader Cable, 4-Wire, 30.5 m (100 ft) (for use with CM-150 CA Item # 109-000033-00)	108-000080-02	912400135908
Leader Cable, 3-Wire, 305 mm (1 ft) (for use with CM-150 CA Item # 109-000033-02)	108-000081-01	912400136051
Leader Cable, 3-Wire, 7.6 m (25 ft) (for use with CM-150 CA Item # 109-000033-02)	108-000081-00	912400135909
Leader Cable, 4-Wire, 15.2 m (50 ft) (for use with CM-150 CA Item # 109-000034-00)	108-000082-01	912400135910
Leader Cable, 4-Wire, 30.5 m (100 ft) (for use with CM-150 CA Item # 109-000034-00)	108-000082-02	912400135911
Leader Cable, 3-Wire, 7.6 m (25 ft) (for use with CM_150CA Item # 109-000034-02)	108-000083-00	912400135912
Mounting Track, 1.2 m (4 ft), White	101-000057-00	910503700044
Spacers, Qty 50, 305 mm (12 in), White	101-000059-01	910503700049
Single-Node Mounts, Qty 50, White	101-000058-00	910503700046
Marquee Lens Kits, Qty 50, Clear, White	999-007997-00	910503702308
Marquee Lens Kits, Qty 50, Semi-Frosted, White	999-007997-04	910503702312
Marquee Lens Kits, Qty 50, Translucent, White	999-007997-02	910503702310
Glare Shield Kits, Qty 50, Black	120-000179-00	912400130036
Marquee/Accessory Mounting Track, 1.2 m (4 ft), White	101-000057-03	910503704266
Marquee/Accessory Spacers, Qty 50, 305 mm (12 in), White	101-000075-01	910503704273

Luminaire and Accessories (cont.)

Use Item Number when ordering in North America

	Item Number	Item 12NC
Power Supplies		
PDS-60ca 24V Power/Data Supply, Pre-programmed	109-000016-00	910503700095
PDS-60ca 24V Power/Data Supply, DMX/Ethernet	109-000016-04	912400133526
sPDS-60ca 24V Power/Data Supply, DMX/Ethernet (NA Power Cord)	109-000021-04	912400133527
sPDS-60ca 24V Power/Data Supply, DMX/Ethernet (EU/CE Power Cord)	109-000021-05	912400133636
sPDS-480ca 24V Power/Data Supply, Ethernet	109-000026-01	912400133528
CM-150 CA, DIN Rail Mount, Four-Wire Terminal, 24V	109-000033-00	912400135766
CM-150 CA, DIN Rail Mount, Three-Wire Terminal, 24V	109-000033-02	912400135768
CM-150 CA, Surface Mount (IP66), Four-Wire Terminal, 24V	109-000034-00	912400135770
CM-150 CA, Surface Mount (IP66), Three-Wire Terminal, 24V	109-000034-02	912400135772
eW Flex SLX In-lin On/Off Power Adapter	107-000008-00	910503700068
XITANIUM 100W 24V Power Supply	309-000001-00	912400130191
Power Supply Enclosure, NEMA 3R, 15 x 3 in, North America only	320-000001-00	913710841202

LED PRODUCT SPECIFICATIONS

Power/data supply for large-scale Ethernet installations

sPDS-480ca 24V is a power/data supply designed for large-scale Ethernet LED lighting installations using low-voltage luminaires from Color Kinetics.



- sPDS-480ca 24 V delivers 480 watts of output via eight 60-watt ports and automatically accommodates input voltages ranging from 100 VAC to 240 VAC. Short-circuit protection prevents device failure due to incorrectly wired fixtures. The standard IEC power inlet accepts both US and international power cables.
- With onboard controls, sPDS-480ca 24 V incorporates automatic fixture discovery and testing, eliminating the need for additional addressing tools or software. sPDS-480ca 24 V features a backlit LCD for easy menu viewing.
- Housed in a 2U rack-mountable enclosure, sPDS-480ca 24 V includes rack handle and surface-mount brackets, for versatile mounting options.
- Over-temperature detection and selectable shutdown options protect sPDS-480ca 24 V against operation beyond its rated temperature specification. Variable-speed fans keep noise levels low and include serviceable air filters.

For more information, please refer to www.colorkinetics.com/ls/pds/spds48024/

Specifications

Due to continuous improvements and innovations, specifications may change without notice.

Electrical

Input Voltage	100 to 240 VAC, auto-switching, 50/60 Hz*
Fuse Rating	(8) 4 A, 125 V, 5 x 20 fast blow fuses
Power Consumption	6 A at 100 VAC 5 A at 120 VAC 2.5 A at 240 VAC
Power Output	24 VDC, 480 W (60 W per power port)

Connections

Data Input Source

Color Kinetics full range of controllers, third-party DMX controllers, or KINET-compatible* third-party Ethernet controllers

Power Input	IEC 320 receptacle type C13, locking clamp
Data Input	RJ-45 input connector
Power/Data Output	(8) 4-pin output receptacles

Compatible Luminaires

eW Flex Micro	600 nodes
eW Flex Compact	480 nodes
iColor Flex LMX gen2	480 nodes

* KINET is the Ethernet lighting protocol from Color Kinetics.

Physical

Dimensions (Height x Width x Depth)	89 x 483 x 457 mm (3.5 x 19 x 18 in)
Weight	12 kg (26.5 lb)
Housing	2U aluminium chassis
Mounting	Rack and Surface-mountable
Finish	Black matte
Operating Temperature	-10 to 50 °C (14 to 122 °F)
Startup Temperature	-10 to 50 °C (14 to 122 °F)
Storage Temperature	-40 to 80 °C (-40 to 176 °F)
Humidity	0 to 95%, non-condensing
Cooling	(2) speed-configurable fans, with serviceable air filters
Airflow	Front panel input, back panel output
Heat Dissipation	25% of total power input

Certification and Safety

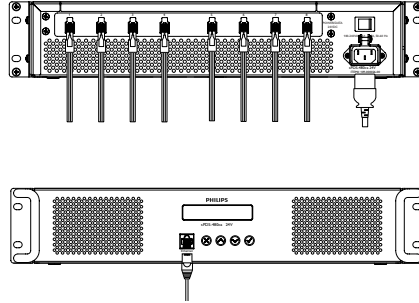
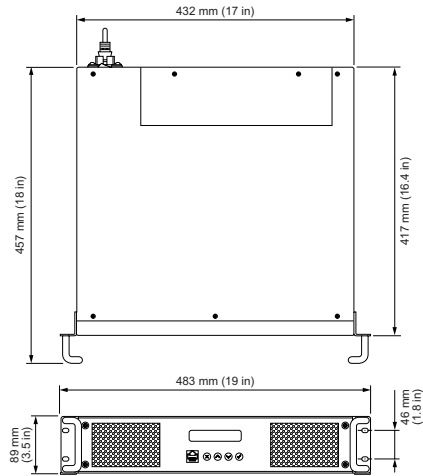
Certification	UL/cUL, FCC Class A, CE, PSE
Classification	UL Class 2 power supply
Environment	Dry Location, IP20



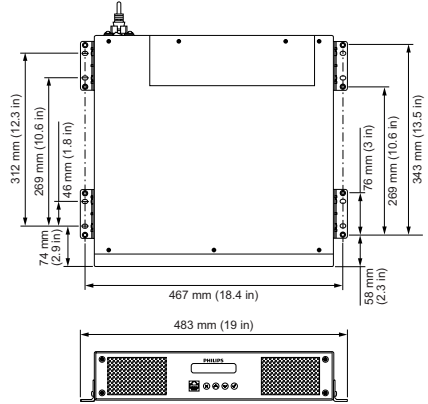
LED PRODUCT SPECIFICATIONS

Dimensions

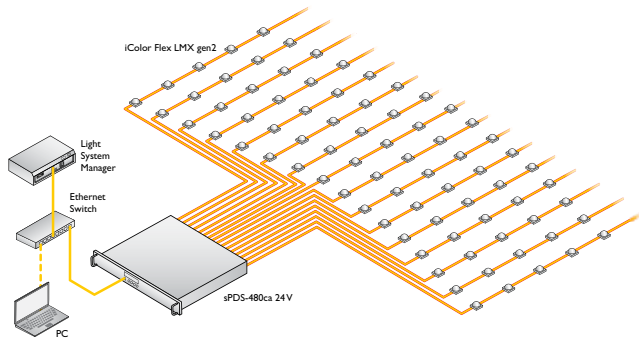
Rack Mount Configuration



Surface Mount Configuration



Installation Example



Each sPDS-480ca 24 V unit delivers power and data to a maximum of 480 nodes. The maximum number of sPDS-480ca 24 V units per installation varies based on the controller type and the node quantities of the luminaires.

Part Numbers

Use Item Number when ordering in North America.

Power/Data Supply	Item Number	Item 12NC
sPDS-480ca 24V <i>Power/data supply, IEC US power cord, rack-mount brackets, surface-mount brackets, and Installation Instructions</i>	109-000026-01	912400133528





CONTACT

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