BREEZE OF INNOVATION

CODE COMPLIANCE NARRATIVE
& PROJECT WHITE PAPERS

SMAR architecture studio
MBH Architects
Magnusson Klemencic
HOK
niteo
BKF
Engeo
tbd consultants

JAN 18, 2021

CONTENTS

Description of Document:

MBH has compiled this Narrative information to establish the feasibility and background technical information related to SMAR's concept for the 'Breeze of Innovation' competition entry for the Urban Confluence Competition.

This information has been assembled by a team of 16 Professionals, primarily located in the San Francisco Bay area, who are experts and thought leaders in their relative fields. This collective design team has been meeting weekly and comprised of HOK, MBH, MKA, BKF, TBD, Engeo, and SMAR. Each Discipline has a primary advisor as outlined in the team contacts and each team member has authored information herein as indicated in the Title of each section.

The format is a series of White Papers with descriptions and illustrations of the approaches our team has concluded most appropriate for the Suitability, Constructability, Budget, and alignment with the Design vision and program as established by SMAR, While maintaining the Health, Safety, and Welfare of the visiting public and other building occupants.

While the information in this narrative is not a comprehensive list of all coordination items that will need to be addressed during the documentation and permitting phase, this information should be considered as genesis of design and sufficient due diligence for proof of concept for the Jury and Urban Confluence Silicon Valley organizers and board.

This Narrative is intended to be iterative and will be continually modified as work is advanced, or if new information is discovered during the ongoing concept development phase of the project.

CONTENTS

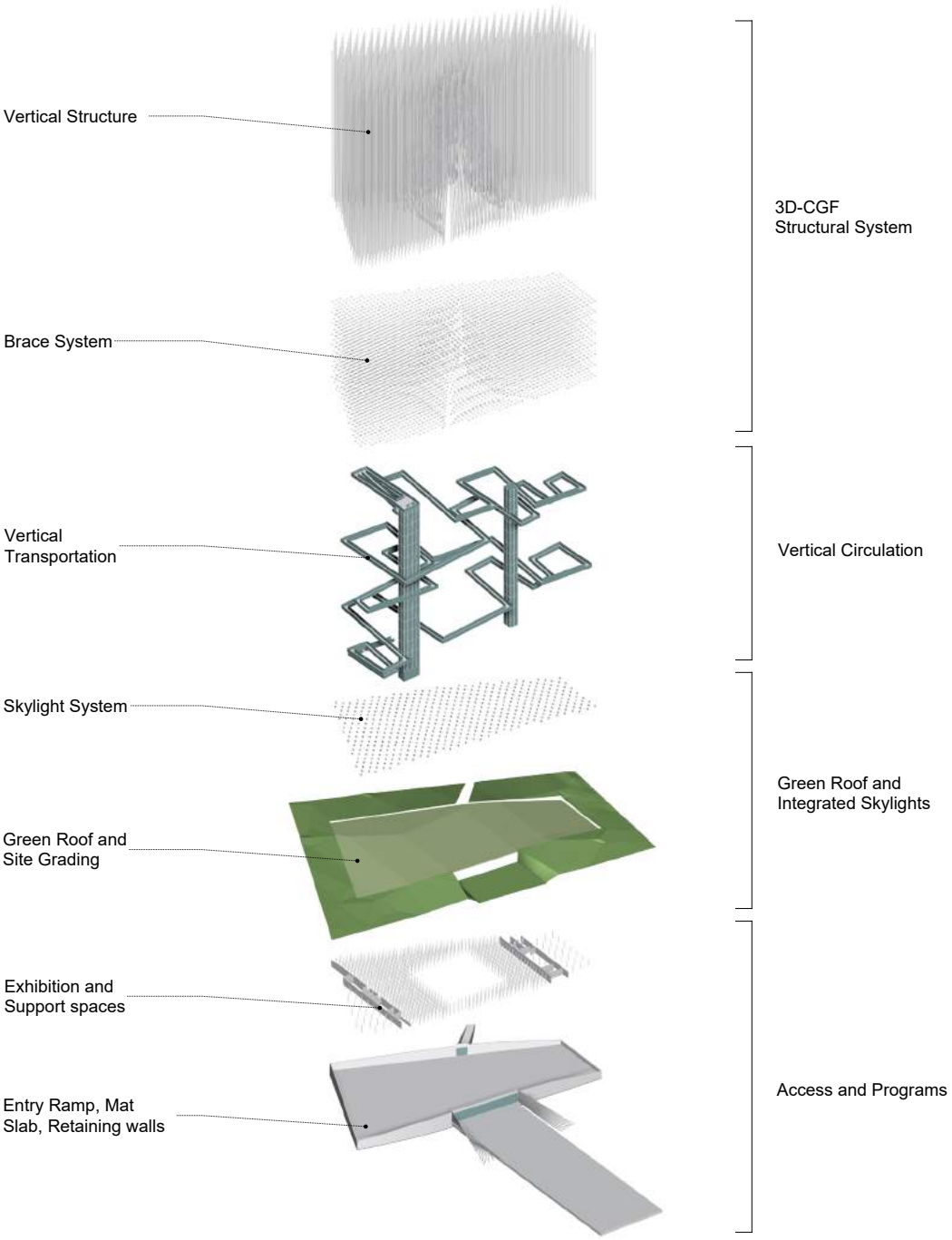

Figure 00-1: Project Components and Systems

01 | Design & Technical Team Contacts

DESIGN & TECHNICAL TEAM CONTACTS

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02 | Structural System

CONTENTS

Superstructure

Abstract:

MKA has worked with the design team to develop A 3-dimensional Cartesian Grid Frame (3D-CGF) constructed of stainless steel pipes provides the primary structural support for the Breeze of Innovation superstructure. The 3D-CGF system is designed to provide safety and stiffness so that visitors are comfortable walking along the many ramps or enjoying vistas from the numerous terraces. The structure is also lightweight and repetitive, providing for economy and simplicity in fabrication and assembly. It supports the ramp-way system, stair towers, elevator shaft-way, and viewing Platform, while simultaneously providing a unique visitor experience and backdrop for lighting.

References:

WP-03 (January 2021) **Vertical Transportation – MBH**

WP-04 (January 2021) **Life Safety – MBH**

WP-05 (January 2021) **Program Assumptions and Use Requirements – MBH/SMAR**

WP-12 (January 2021) **Construction Sequencing and Feasibility Study – MKA**

Exhibits:

Superstructure

Figure 02-1: Innovative structure serves for both support and experience.

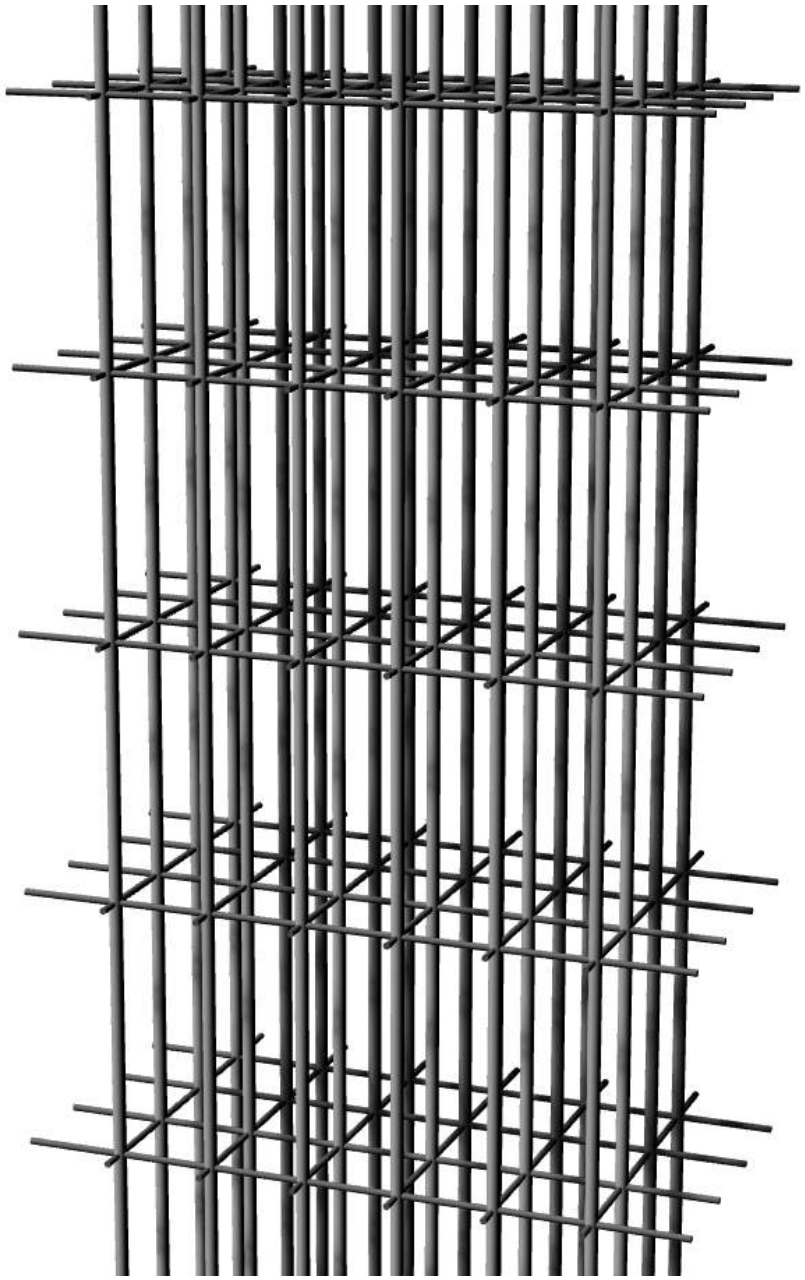


Figure 02-2: Graphic of the 3D-CGF System

The 3-dimensional Cartesian Grid Frame (3D-CGF) is constructed of 8” diameter vertical pipes spaced at 5’-0” on center which are interconnected by a network of 4” diameter horizontal pipes spaced vertically at 12’-0” on center creating a highly redundant 3D-CGF.

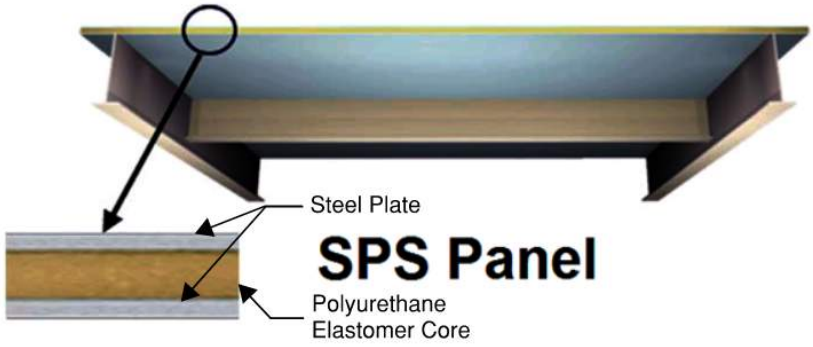


Figure 02-3: SPS panels for the ramp-way, stair, and elevator landings

The ramps and landings are constructed from a panelized flooring system known as SPS panels https://www.spstechnology.com. These lightweight, yet highly stiff and durable panels are the same system used in Avaya Stadium, home of the San Jose Earthquakes. Proven as easily constructible, yet highly durable and maintenance-free, the SPS panels can be readily installed by hand, without the need for a crane.

Wind Performance

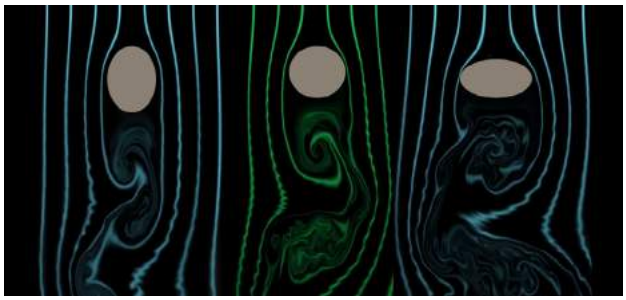


Figure 02-4: examples of shape bias and vortex shedding

The Breeze of Innovation structure is intended to flex in the wind, creating a dramatic visual effect for visitors to experience and enjoy. The movement of the vertical pipe structure may be enhanced by biasing the shape and orientation of the pipes at the perimeter of the structure to intentionally control vortex shedding from the outermost pipes, which will in turn dynamically activate the many inner pipes of the structure. By alternating the lengths of the pipes, visual effects of motion are maximized without adjacent pipes colliding.

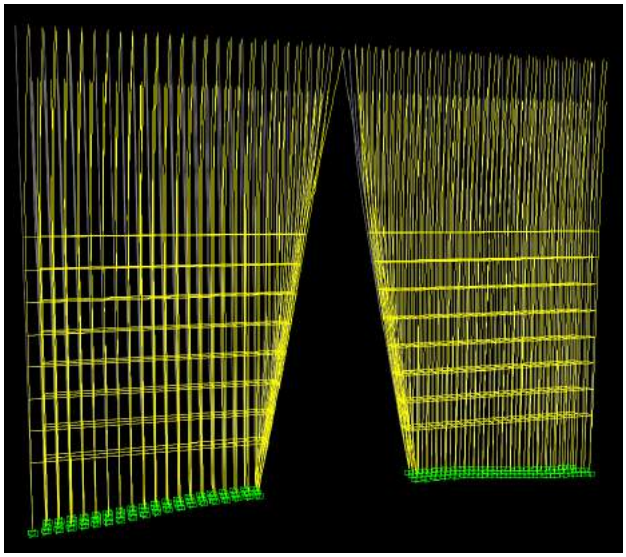


Figure 02-5: Initial finite element analysis on a section of the project

The stiffness of the 3D-CGF will be designed to maintain visitor comfort for winds upwards of 50 miles per hour. In addition, elevators will remain operational by appropriately controlling the amount of sway of the elevator shafts. At wind speeds greater than 50 miles per hour, the Breeze of Innovation structure will be designed to remain safe, but operations will be suspended.

Wind Performance

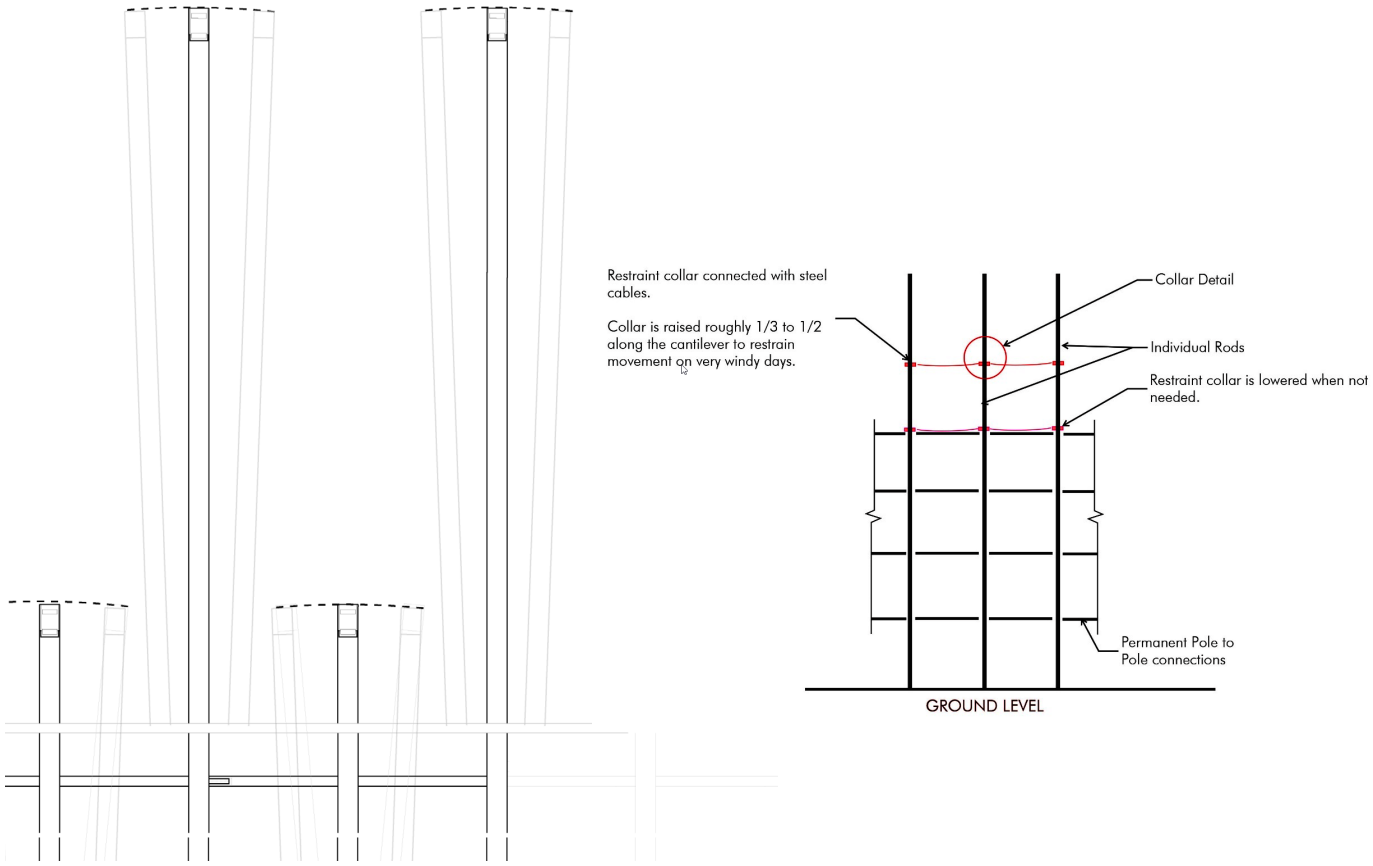


Figure 02-6: Offset vertical rods showing allowable increase in deflection and restraint diagram for extreme wind events

Normal wind loads move the vertical rods to create the dynamic effects at the rod tips. This movement may be maximized without the system colliding by offsetting every other rod in a grid. Shorter rods will have less deflection, and longer rods are afforded more space to move. To prevent the vertical rods from colliding during an extreme wind event, a simple restraint system of collars and cables is envisioned. The restraint system will generally be positioned just above the uppermost horizontal pipes. Prior to an extreme wind event, the collar and cable system will be raised manually using a system of cables and pulleys. Once the wind event subsides, the collar and cable system can easily be returned to is normal resting position.

Seismic Performance; Fatigue; Corrosion & Maintenance

Seismic Performance

The flexible nature of the 3D-CGF combined with the superstructure's light weight results in very modest seismic demands. Also, the highly redundant 3D-CGF provides a superior level of seismic protection and performance even when subjected to the most extreme ground shaking.

Fatigue

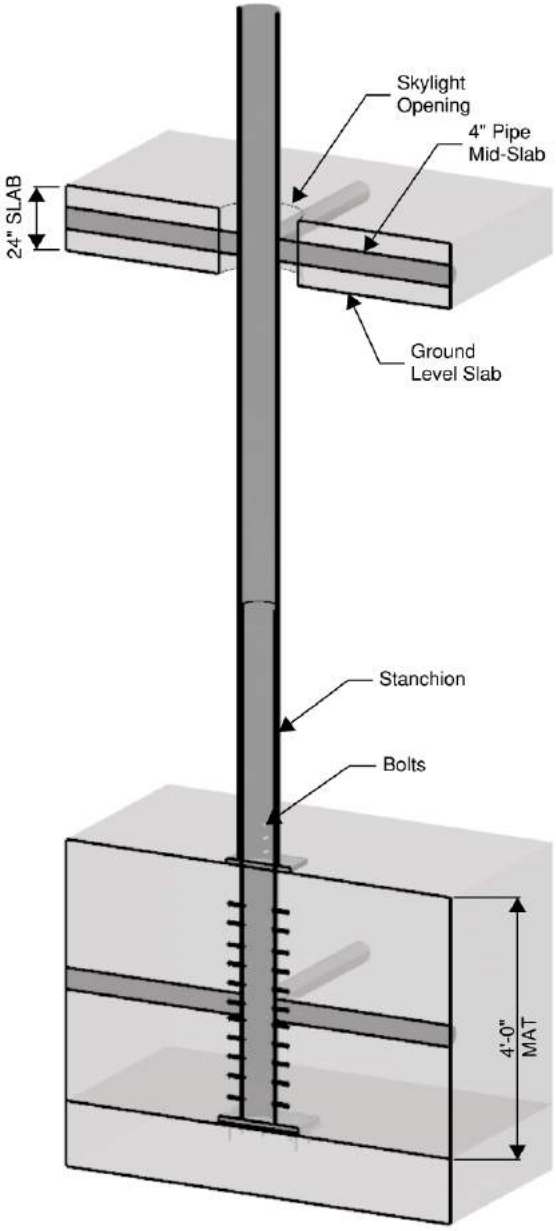
Appropriately selecting pipe diameters and thicknesses to maintain low stress demands will afford long-term fatigue protection. A 100-year service life has been contemplated for the design.

Corrosion and Maintenance

Materials have been selected to provide exceptional corrosion resistance, even in the salt-laden fog which San Jose experiences from time to time. Maintenance of the structure, ramps and terraces is minimized through the use of stainless steel without any applied coatings which might otherwise deteriorate due to pollution or UV exposure.

Figure 02-7: Example of stainless steel process piping with matte finish

Foundation



The Breeze of Innovation superstructure is extremely light weight, despite it's 200-foot height. Roughly equivalent in weight to a standard 3-story office building, foundation support can readily be provided by a shallow mat foundation where net bearing pressures are estimated to be about 500 pounds per square foot.

Figure 02-8: Intersection of 3D-CGF system at foundation and exhibition space roof

CONTENTS

Building Codes, Loading Criteria

Building Codes

The project will be designed in accordance with the following building and material codes:

Building Code

California Building Code, 2019 Edition (IBC 2018) with reference to American Society of Civil Engineers, Minimum Design Loads for Buildings and Other Structures, 2016 Edition (ASCE 7-16).

Material Codes

Reinforced Concrete: American Concrete Institute, Building Code Requirements for Structural Concrete and Commentary, 2014 Edition

Structural Steel: American Institute of Steel Construction, Specification for Structural Steel Buildings,

2016 Edition (ANSI/AISC 360-16).

Stainless Steel: American Institute of Steel Construction, Design Guide 27: Structural Stainless Steel

Loading Criteria

A summary of the project-specific loading criteria follows. This loading meets or exceeds the requirements of the CBC and incorporates loading requirements specific to this project.

Gravity Loading

The following loads are in addition to the self-weight of the structure. The minimum loading requirements have been taken from Table 4-1 of ASCE 7. Live loads are reduced where permitted in accordance with Section 4-7 of ASCE 7. Loads are given in pounds per square foot (psf).

Table 1. Gravity Loads

Use	Live Loading	Superimposed Dead Loading
Lobby/Retail/Assembly	100 psf (not reduced)	25 psf
Mechanical/Electrical	125 psf (not reduced)	15 psf
Ramps and Terraces	100 psf (not reduced)	10 psf

Snow Design Criteria

There is no required design snow load in this location.

Wind Design Criteria, Seismic Design Criteria, Minimum Lateral Force

Wind Design Criteria

Wind loading is in accordance with the CBC and ASCE 7 requirements.

Table 3. Wind Design Criteria

Parameter	Value
Basic Wind Speed, 3-second gust (V)	91 mph
Risk Category	II
Exposure	D
Enclosure Classification	Open
Mean Roof Height	200 ft

Seismic Design Criteria

Seismic loads are in accordance with the CBC and ASCE 7 requirements.

Table 4. Seismic Design Criteria

Parameter	Value
Risk Category	II
Importance Factor (Ie)	1.00
Mapped Spectral Acceleration	Ss = 1.5; S1 = 0.6
Site Class	D
Site Class Coefficients	Fa = 1.0; Fv = 1.8
Spectral Response Coefficients	SDS = 0.80; SD1 = 1.35
Seismic Design Category	D
Lateral System	Ordinary Moment Resisting Frame
Response Modification Coefficient (R)	6
Analysis Procedure Used	Modal Analysis Procedure

Minimum Lateral Force

A notional load equal to 1 percent of the structure's weight is considered as the minimum lateral design force for the building.

CONTENTS

Occupancy And Construction Type, Materials

Occupancy And Construction Type

The occupancy classification is Assembly A-3. The construction type is Type1.

Materials

The material properties used for the design include the following:

Table 5. Structural Steel Properties

Member	Standard, Strength
Wide Flange Shapes	ASTM A992, Fy = 50 ksi ASTM A913, Fy = 50 ksi
Round Pipe Sections	ASTM A240 Stainless Steel 316L, Fy = 25 ksi
Square/Rectangular Tube Sections	ASTM A500, Grade C, Fy = 50 ksi
Angle and Channel Sections	ASTM A36, Fy = 36 ksi
Miscellaneous Plates and Connection Material	ASTM A572, Fy = 50 ksi ASTM A588, Fy = 50 ksi

Stainless Steel

Type 316L is a popular chromium, nickel, molybdenum-bearing stainless steel grade. Though it is often referred to as marine grade stainless steel, it is in fact not resistant to seawater.

Type 316L is known for its corrosion resistance to pitting and crevice corrosion in chloride environments.

Thanks to its outstanding capabilities, Type 316 Stainless Steel can be found in a wide variety of applications including:

Laboratory equipment
Boat fittings
Threaded fasteners
Springs
Food and pharmaceutical processing equipment
Chemical containers
Heat Exchangers
Surgical implants
Paper and Pulp manufacturing
Textiles
Jet engine parts

In order to be considered Type 316 Stainless Steel, alloy must contain certain chemical properties including:

Cr 16-18%
Ni 10-14%
Mo 2-3%
Mn 2%
Si 0.75%
N 0.10%
C 0.08%
S 0.03%

Materials

A Material Selection Consultant will be employed to assist the team in specifying the most appropriate, low-maintenance, durable materials. One such expert is:

Catherine Houska

https://www.houskaconsulting.com/

Catherine has consulted on many notable landmark structures including the Gateway Arch in St. Louis and the Vessel at Hudson Yards.

Table 6. Concrete Properties

Member	Strength*
Slab on Ground, Sidewalks, Curbs, Mechanical Pads	f'c = 4.0 ksi
Mat Foundation	f'c = 5.0 ksi
Substructure Walls and Elevated Slab	f'c = 5.0 ksi

*28-day strength, unless noted otherwise.

SPS Panels

https://www.spstechnology.com/

SPS floor panels are used to the ramps and terraces.

SPS is a structural composite material comprising two metal plates bonded with a solid polyurethane elastomer core

Polyurethane core developed jointly with BASF, who supply material globally

Approved by major regulatory authorities, SPS is used in a wide variety of civil, offshore, maritime and special applications including: stadium terraces, structural flooring, bridge decks and the repair of offshore structures and maritime vessels

SPS is much simpler than stiffened steel plate and much lighter, slimmer and faster to erect than reinforced concrete

SPS has a low carbon footprint and is 100% reusable/recyclable.

END OF SECTION

03 | Vertical Transportation Systems

VERTICAL TRANSPORTATION

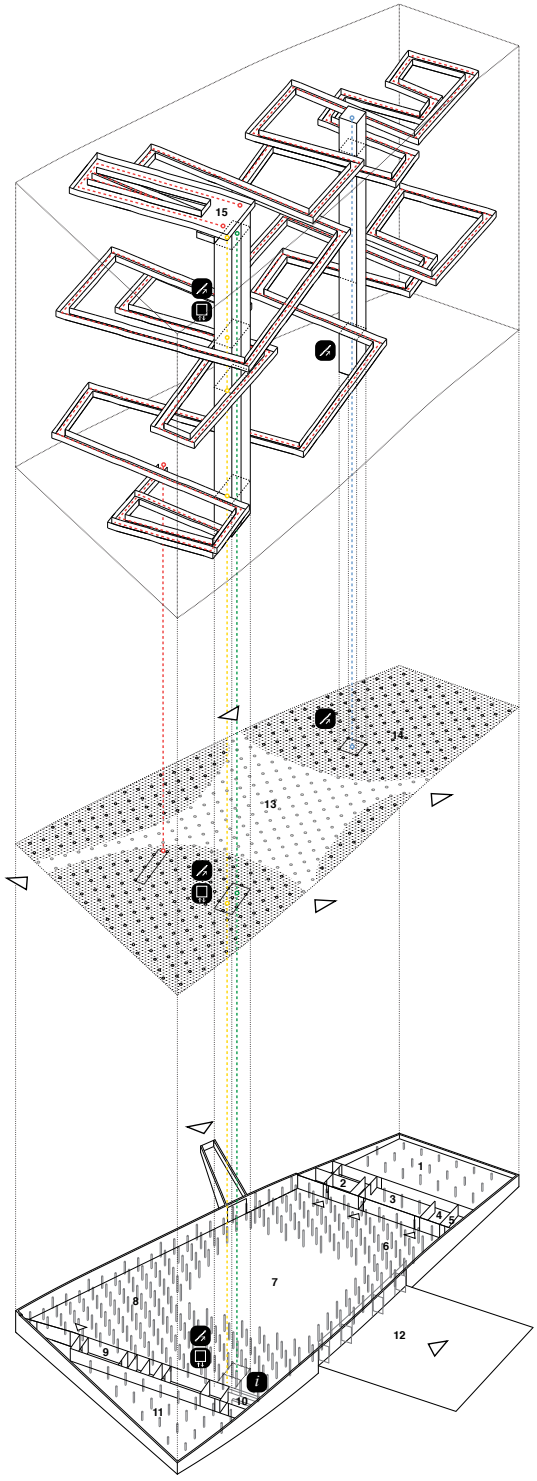


Figure 03-1: Vertical Transportation Systems consist of 2 stairs, 1 elevator, and 1 continuous ramp-way

Abstract:

Vertical transportation for the Breeze of Innovation is divided into 3 parts, Ramp, Stair, and Elevator. The primary mode of travel is via the 1900 foot long ramp-way that moves throughout the structure. It is intended as an experiential path that terminates at the Viewing Platform. 2 Stairwells are provided for maintenance and life safety. The elevator accommodates universal accessibility and has multiple stops along the ramp-way, creating a universally accessible experience for all.

Reference:

WP-02 (January 2021) **Structural System - MKA**

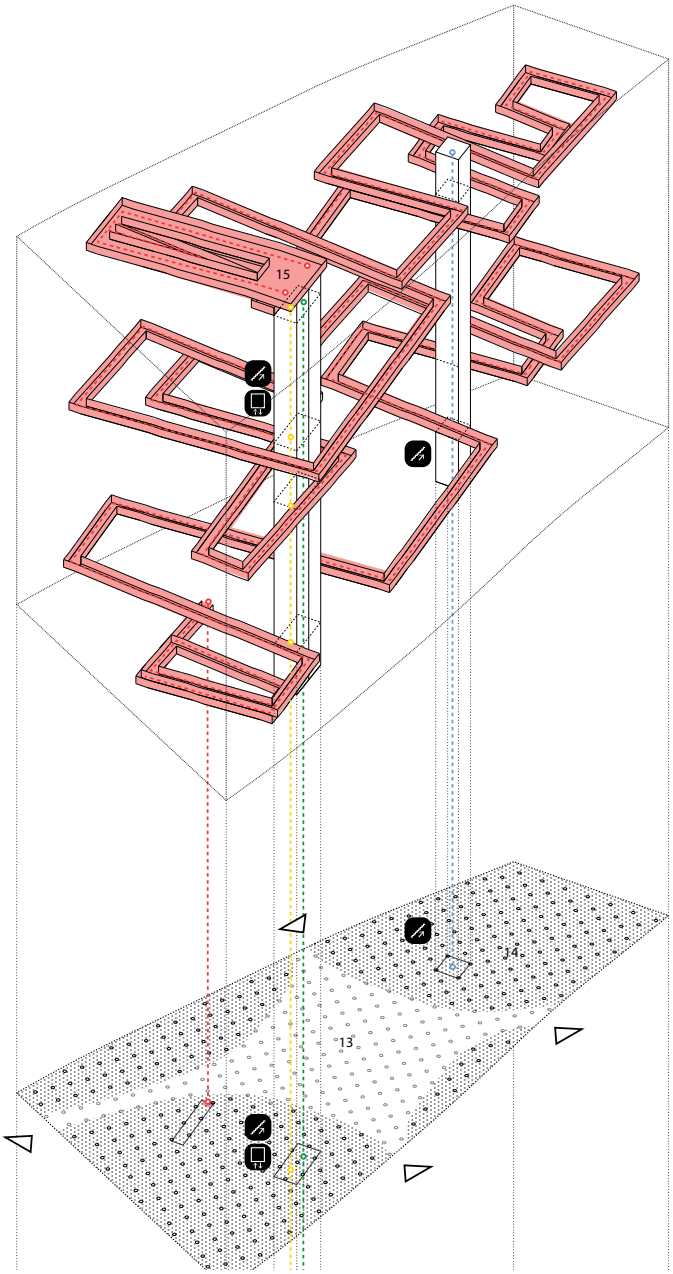
WP-04 (January 2021) **Life Safety – MBH**

WP-05 (January 2021) **Program Assumptions and Use Requirements – MBH/SMAR**

WP-12 (January 2021) **Construction Sequencing and Feasibility Study – MKA**

Exhibits:

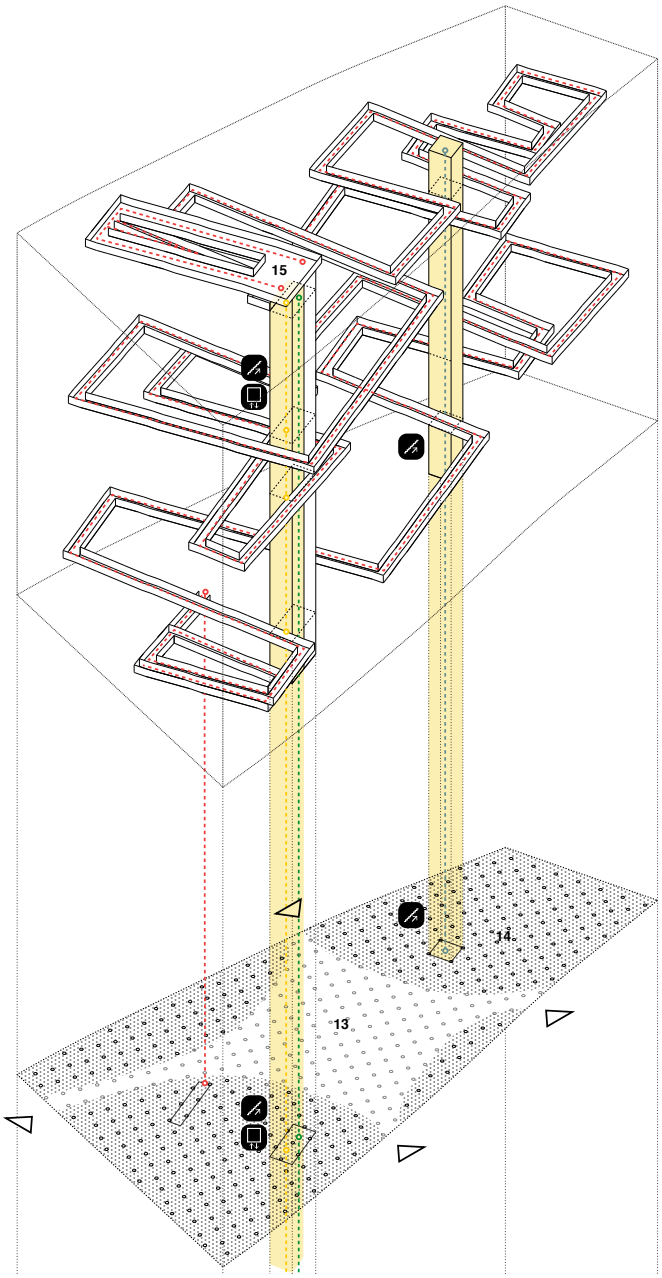
Ramp System Description



- The ramp-way system is nominally 5’ wide, and composed of SPS structural panels that serve as the support system, which in turn is supported by the rods throughout the structure.
- Walking surface is composed of rubberized tiles for anti-slip and integration with the Piezo electric power generation.
- Bypasses shall be provided at no less than every 200’ to meet accessibility requirements, however the stair and elevator landings also provide opportunities for bypass. Due to the flexibility of they system and the capacity of the egress components, it is anticipated that multiple bypasses will be incorporated to provide opportunities for rest, contemplation, and socializing.
- Guardrails and Handrails shall be provided on both sides of ramp-ways throughout the structure and will be self supporting from the structure and compliant with both point load and horizontal loading per CBC 1014.

Figure 03-2: ramp-way landings and possible locations for bypasses

Stair System Description



Stairs are similarly supported by the building superstructure system, however unitized stringer, tread/riser assemblies, and railing will be incorporated into both stair towers.

- It is anticipated these systems will be prefabricated and field installed per the construction sequencing White Paper.

Enclosure

- Perforated enclosure panels are proposed to address the code limitation of 75’ for open air stairwells and to provide a safe path of egress without incurring expense of fully enclosed and conditioned stairs.
- Security doors at ground and exhibition levels will allow the site to be secured while not impeding emergency egress from either stairwell.
- Stair landings terminating at ramp-ways

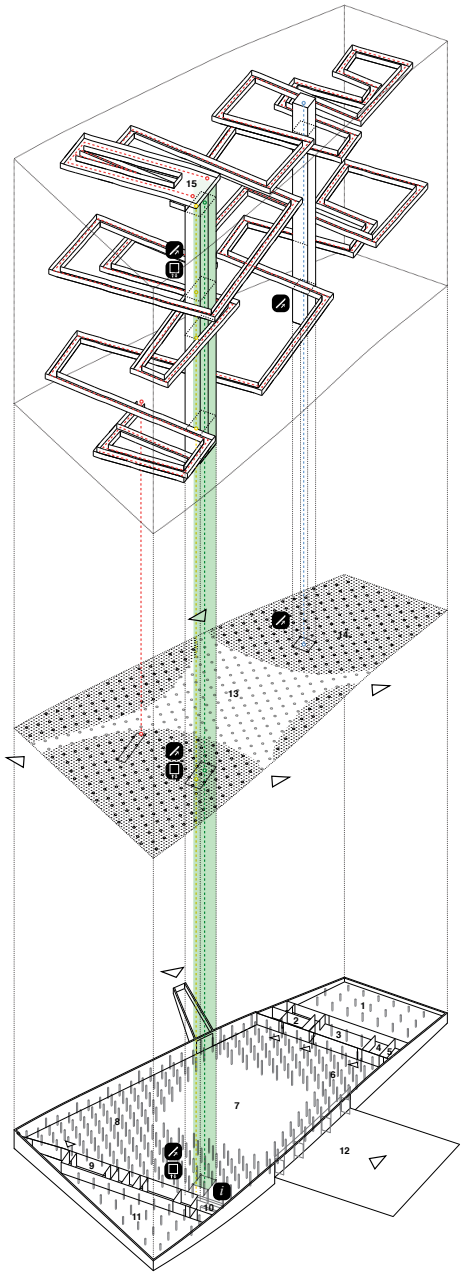
Fire risers

- A fire riser shall be incorporated at both stairwells for use by fire department in the event of an emergency per CFC 905.4.

Signage and wayfinding shall be incorporated into stairwells identifying the stair and level of each landing, and direction of egress. Compliant with California Building Code.

Figure 03-3: Stair landing locations for Stair 1 and Stair 2

Elevator Systems Description:



To accommodate all users and add more flexibility to the building a single elevator shaft-way is proposed for the project. The specific passage elevator proposed is a Schindler 5500 system electric tractionless type.

The cab size accommodates the 51” minimum dimension for a gurney and the carrying capacity for the elevator is a maximum of 3500 lbs, consistent with CBC 3002.4.

The passenger elevator can reach a speed of 500 fpm, which will result in travel from the lowest level to the viewing platform in approximately 30 seconds.

On downward travel the elevator incorporates a regenerative electric drive system, contributing to the energy efficiency of the building and reducing the mechanical space needed outside the shaft-way.

Figure 03-4: Elevator Shaft-way and Landings

Elevator Systems Description:

Smart design saves space
Compact and powerful regenerative drives can be mounted at the top of the hoistway, eliminating a machine room and adding more usable space to the building.

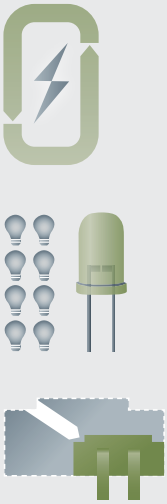
The space-efficient controller fits neatly into the top floor of the elevator door jamb, eliminating the need for even a small control closet in most applications.

From savings to sustainability

up to 30%

up to 20×

up to 50%



Clean drive technology
Thanks to high-efficiency regenerative drives the Schindler 5500 uses about 30% less energy than traditional elevators. With the clean PowerFactor 1 technology, the drives are even able to produce energy that can be fed back into the electricity grid immediately.

LED lighting
LED lights have an extremely long service life. They last up to 20 times longer than standard light bulbs while consuming less energy. A bright solution for passengers and the environment.

Optimized motor and traction media
Big in performance, compact in size. Efficient in travel, effective in energy usage. The new drive and traction configuration weighs up to 50% less than its predecessor while using less oil. Even a non-oil system option is available.

Figure 03-5: Regenerative drive system of the Schindler 5500 elevator model

Elevator Systems Description:

Car operating panels

PORT Terminal
This new range of hall call destination terminals delivers brainpower to your building. Various PORT Terminal options a available to optimize traffic flows. For detailed information, vis www.theporttechnology.com.

Elevator Controls:

- A range of standard control options are available that meet all ADA requirements. Special attention shall be paid to the outdoor nature of the open ramp landings above grade. Lockouts shall be enabled so that security can close out elevator services when the building is closed.

Finishes:

- The interior of the elevator cab walls shall be full height transparent glazing option, including both front and rear doors. Ceiling of cab finish shall be stainless steel and incorporate lighting.
- The constructed cab floor shall have a 1" recessed to allow for final finish flooring. The cab shall be been designed to accommodate finish flooring up to a weight of 300 lbs.
- The outside doors and frame that face the interior of the building at the basement level shall be painted steel or polished aluminum to match adjacent walls in the space.
- Sills – extruded aluminum.

Floors served – The elevator serves 5 stops between the basement level and the viewing platform

- Exhibition Level
- Ground level
- Lower ramp stop
- Upper ramp stop
- Viewing platform

Figure 03-6: standard options for elevator controls

Elevator Systems Description:

Figure 03-7: Schindler 5500 glass cab

The emergency power source shall power the elevator during an in the following sequence: During a power loss, the elevator will stop where they are. When the ATS starts up, the elevators will sequence down to at grade exit level, open the doors to let out any trapped passengers and shut down. The car will then return to operation under generator power.

Elevator sills shall be set and coordinated at the ramp landings, at grade landing, and basement landing for flush transitions.

(2) telecom lines for each elevator cab shall be primed. Connection and routing to the FCC room for fire alarm communication shall be made.

A sump pump shall be provided at the elevator pit The elevator pit is sub-grade and could be exposed to ground water or exterior infiltration. A waterproof outlet shall be provided at the elevator pit for a pump.

Elevator counterweight shall be side type and oriented such that it is against the dividing wall that separates the elevator from the adjacent stairway.

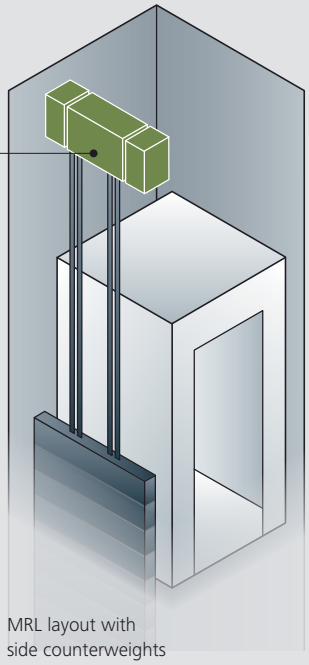
Elevator Systems Description:

MRL and MRA layout

Depending on the dimensions of the hoistway, capacity and travel height requirements, there are MRL and MRA solutions for the Schindler 5500. MRL design is available for nearly all configurations. In addition, side or rear counterweights provide more options for perfect space utilization, maximized rentable space and lower building costs.

Why side counterweights?

	Side	Rear
Machine loads supported by the hoistway, not the building	✓	–
Contractor not required to provide pockets of machine support	✓	–
Lower hoistway construction costs	✓	–
Up to 20% faster installation with less coordination required with the contractor	✓	–
Machine can be raised through the hoistway without a crane	✓	–
Building can be topped off prior to elevator installation	✓	–



MRL layout with side counterweights

Figure 03-8: counterweight option to conceal against stair 1

END OF SECTION

04 | Life Safety

Abstract:

The concept for the Breeze of Innovation is unique in that it is a partly occupied, very tall structure, yet is inequivalent to a high rise building in terms of occupant load. It is also unique in that the primary occupied area above grade is the ramp-way. The following analysis is based on the 2019 California Building Code, however as noted herein, there are necessary interpretations of this code relating to the intent to maintain the safety and welfare of the public.

Initial discussions with the San Jose Public Works Division have occurred as part of the Due Diligence effort put forth for the 'Breeze of Innovation' competition entry, resulting in changes to prior versions of this design to appropriately address egress redundancy and interpret the code application in a conservative manner.

References:

WP-02 (January 2021) **Structural System - MKA**

WP-03 (January 2021) **Vertical Transportation - MBH**

WP-05 (January 2021) **Program Assumptions and Use Requirements – MBH/SMAR**

WP-06 (January 2021) **MEP, Fire, and Technology Systems – HOK**

Exhibits:

Building Type, Height; Fire Protection

Building Type, Height

Construction Type

- Type 1b non-flammable and non-rated construction
    - The upper portion of the building is composed of 8" Stainless steel rods which are stabilized by 4" stainless steel braces for the lower 120' of structure. The 5' spacing of primary structural members and almost no loading results in a supremely redundant structure.
    - The Basement level construction is composed of Concrete Mat foundation, topping slab, retaining walls, and roof structure supported by the bases of the upper portion structure.

Building height limitation

- CBC Table 504.3 Defines allowable building height above grade plane. For Assembly Occupancy in a non sprinklered application, Type 1B is listed as limited to 160'. Our proposal modestly exceeds this limit by approximately 35'. An Alternate Means and Methods Request is expected to be filed to achieve this.

Fire Protection

Sprinkler system

- Foundation Exhibition level – Provided
    - CBC 903.2.1.3.2 requires sprinklers in A3 occupancy fire areas with occupant load over 300 persons.
    - Sprinkler system would be incorporated in the concrete ceiling by way of cover plates over slab leave outs.
    - It is assumed NFPA definitions would dictate light hazard application over the Foundation level spaces.
- Upper ramp-way and viewing platform - None
    - The outdoor nature of the ramp-way and viewing platform preclude effective use of a sprinkler protection in that the system will not be able to detect heat effectively.
    - CBC Chapter 2 defines a Fire area as an enclosed area or an outdoor area under a roof. Neither of these conditions apply to the ramp-way or viewing platform.

Fire Protection

Standpipe(s) and fire pump

- Fire pump shall be located in the Foundation Exhibition level of the building in an accessible room off the main exhibition space.
- Class I Dry manual Standpipes shall be located in each of 2 stairwells at mid level landings per CBC 905.1 exception 3 and CBC 905.4, and CBC 905.8 unless otherwise approved by fire code official.
- Should a Class 1 automatic wet standpipe be required by the AHJ per CBC 905.3.2, provisions to prevent freezing shall be provided.

FDC

- Fire Department Connections shall be provided either at the Foundation level entrance off North Autumn Street street or as a free standing FDC adjacent to Autumn Street.

Aerial apparatus access point

- The Aerial apparatus access point is proposed along Autumn Street, however given the unusual design of the building and minimal roof area access points, combined with a lack of enclosure one of the two following approaches is recommended. Ultimately the AHJ shall determine the specific requirements.
    - Inclusion of an Aerial apparatus access point, potentially resulting in impact to the ramp layout at an agreeable portion of the ramp at an elevation that accommodates ladder truck access.
    - Omission of an Aerial apparatus access in lieu of other protections as acceptable to AHJ.

Occupant Loads & Occupied areas

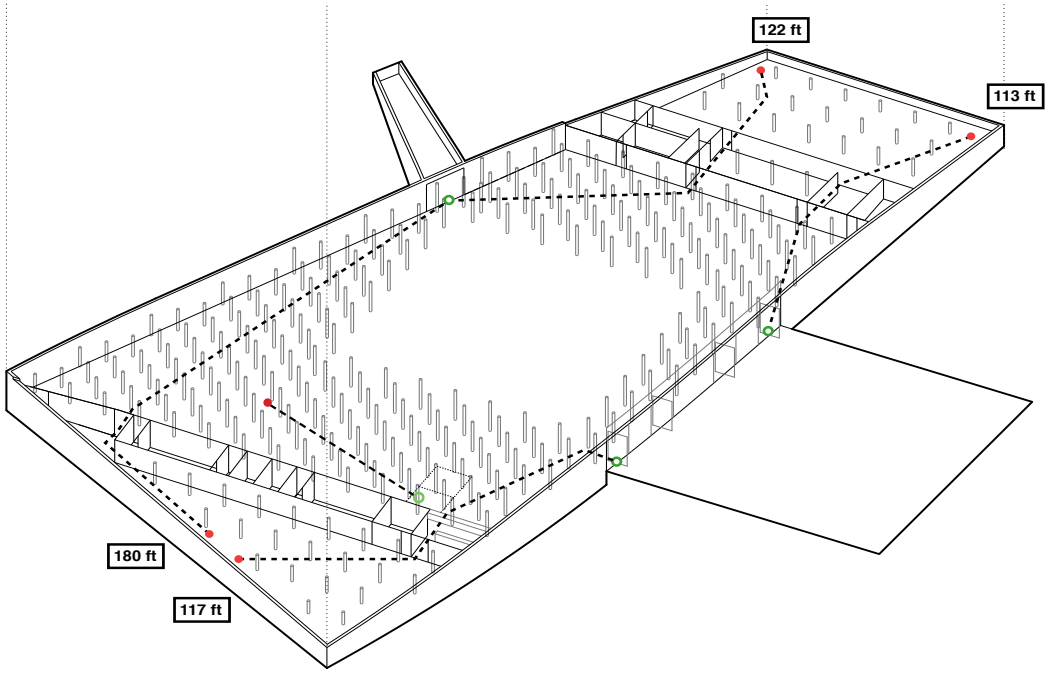


Figure 04-1: Foundation Exhibition Level egress diagram

Occupant Loads and occupied areas

Foundation Exhibition Level – Figure 1

- Foundation Level occupied area is divided into public and 'back of house spaces'
- Public space is approximately 17,500 square feet and is classified as Assembly occupancy A3. At 30 square feet per occupant; occupant load is 590.
- Back of house areas are divided into Business occupancy and Storage occupancy in the diagram, with 1,550 square feet and 5,300 square feet respectively. The occupant load for business is calculated at 100 sf per person and storage at 5000 sf per person.
- The combined life safety occupant load of the basement level is 622 persons, and as such 3 egress points are required, and 4 egress points are provided per the diagram.

    1. Primary entryway from east side
    2. Primary entryway from east side
    3. Stair #1 which extends to Foundation Level
    4. Secondary entryway from West side (to North Autumn Street)

Occupant Loads & Occupied areas

Exhibiton Space:	A3 @ 30 SF/occ	17702 SF = 590
Front Desk/ Info:	B @ 100 SF/Occ	155 SF = 2
Public Facilities:	Unoccupicd	634 SF = 0
Staff Break-out:	B @ 100 SF/Occ	641 SF = 7
Staff Facilities:	Unoccupied	536 SF = 0
Kitchen:	B @ 100 SF/Occ	206 SF = 3
IT & Security:	B @ 100 SF/Occ	141 SF = 2
Storage:	S @ 300 SF/Occ	2609 SF = 9
Plant:	S @ 300SF/Occ	2615 SF = 9
Vertical Circ.:	Unocoupied	207 SF = 0
Cafe	Accessory Use	

Total Occupant Load
Foundation Exhibit Level = 622 Persons

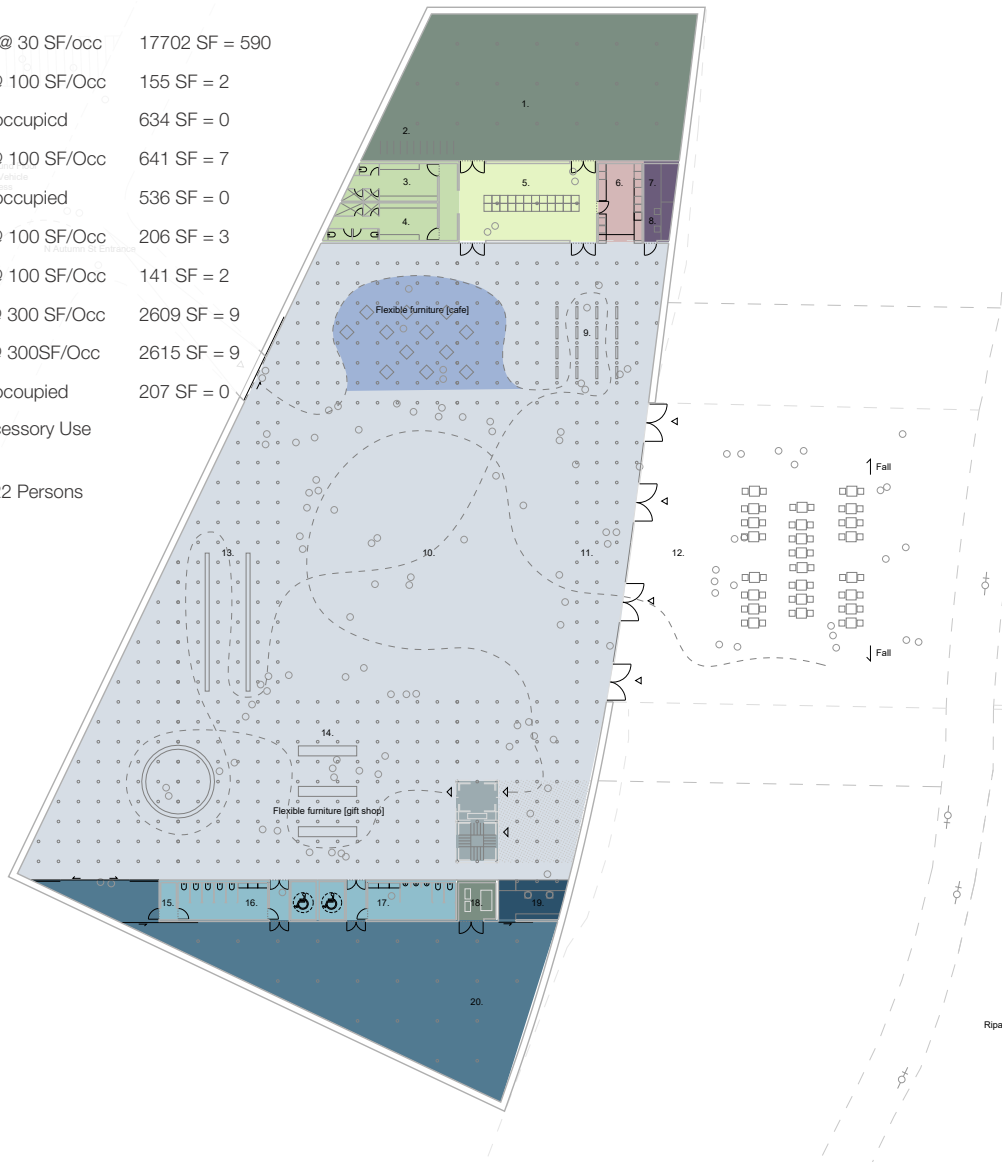


Figure 04-2: Foundation Exhibition Level Occupant Load and Occupancy Types

Occupant Loads & Occupied areas

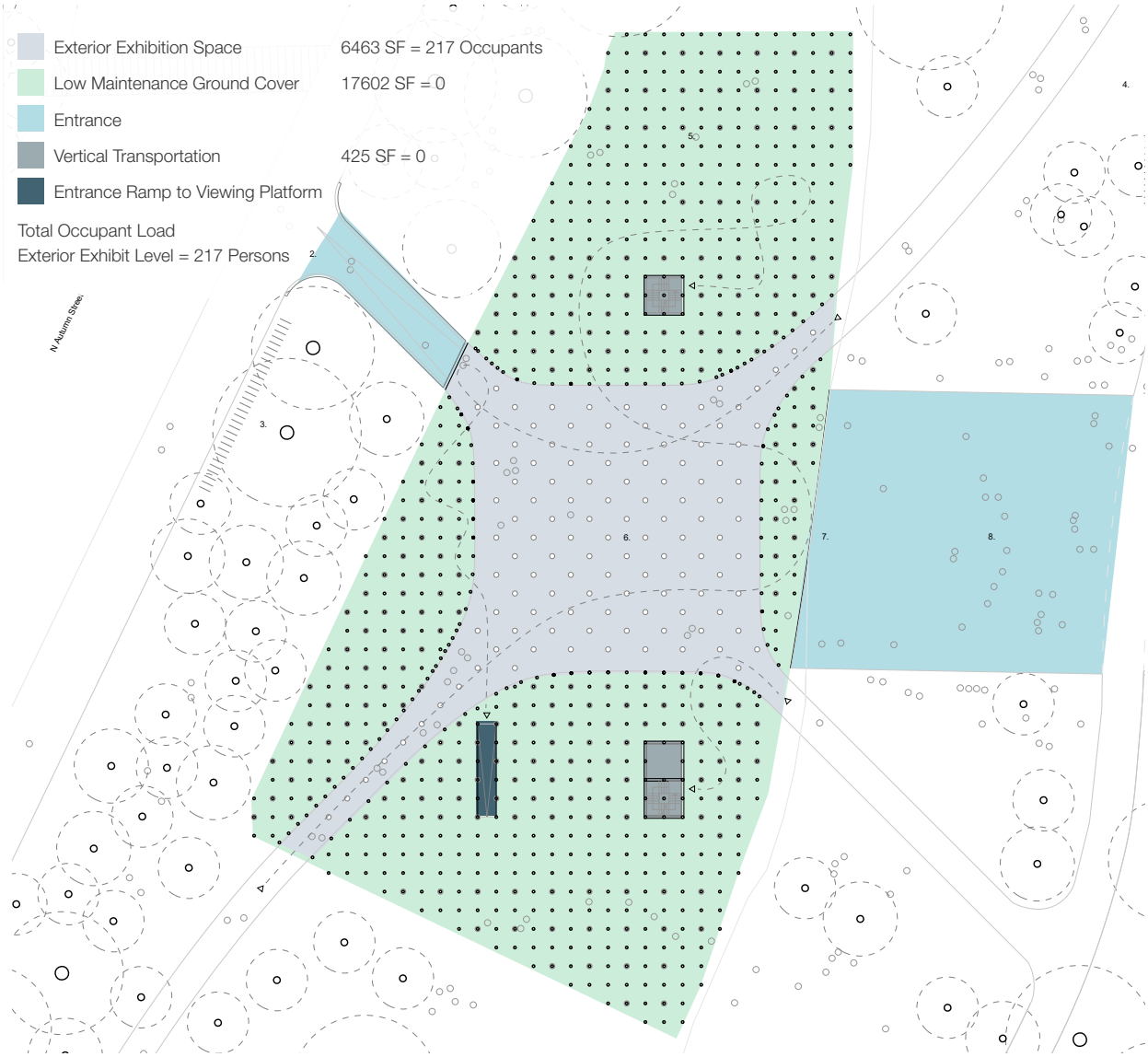


Figure 04-3: Ground Level Exhibition Space Occupant Load and Occupancy Types

Ground Level Exhibition Space

- The ground floor of the concept is open air and located at the modified grade level, it essentially serves as part of the parkway. This area is approximately 6,500 square feet and is classified as Assembly occupancy A3. At 30 square feet per occupant the anticipated load is 217 persons. Because this is an open air environment and is essentially permeable, no egress calculation is required at this level. Egress points from the Ramp-way is illustrated for clarity. These are calculated as the point of egress for that ramp-way, due to their open air nature.

Occupant Loads & Occupied areas

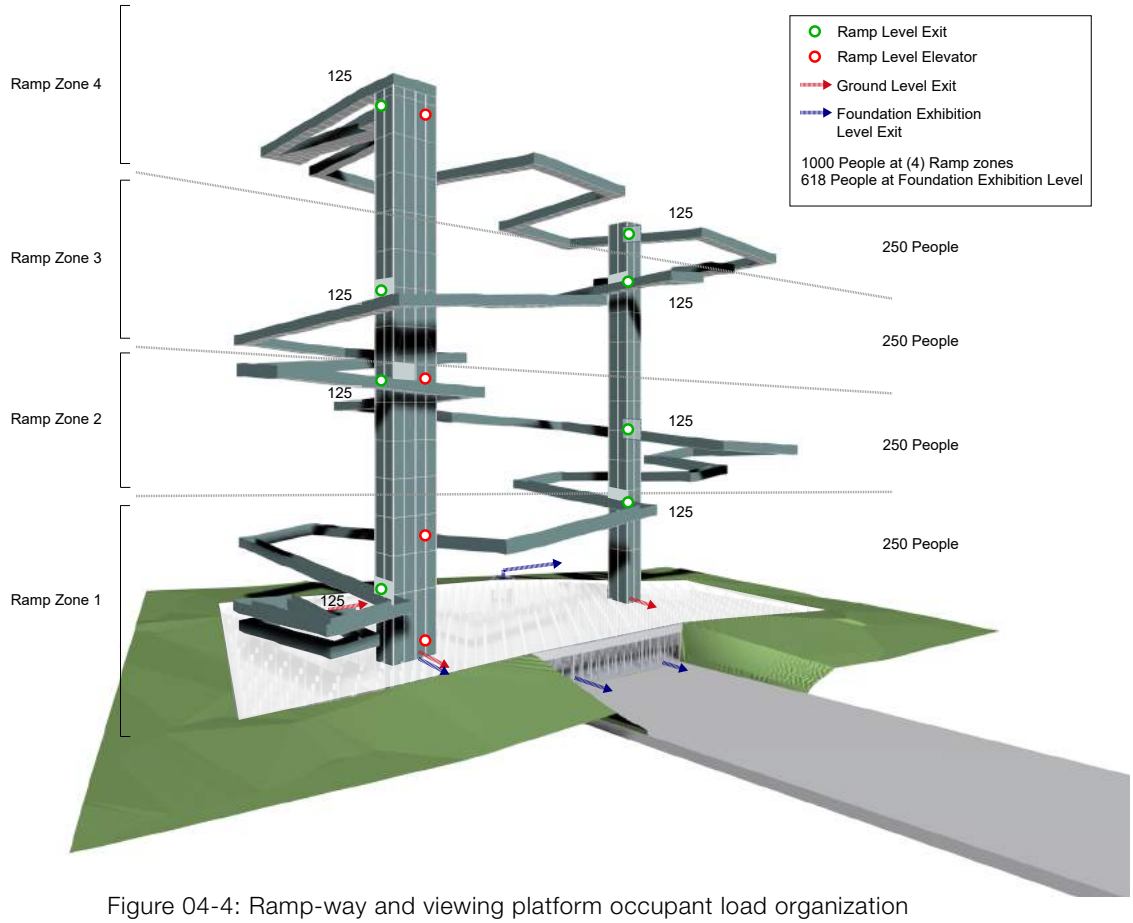


Figure 04-4: Ramp-way and viewing platform occupant load organization

Ramp-way and Viewing Platform

- Normally per the CBC interpretation ramp-ways would not be counted as occupied area. The above grade portion of Breeze of Innovation is composed primarily of ramp-ways extending throughout the structure to a small viewing platform, and conceptually visitors will either take the elevator to the top and walk down, or walk up to the platform using ramps. Because of this and to ensure the safety and welfare of occupants, the ramp-ways here are being calculated as occupied area at an occupant load of 15SF per occupant. This results is a total occupant load spread across the approximate 14,000 SF ramp-way of 934 occupants.
- Per preliminary discussion with the City of San Jose Public Works, as the ramp-way is unusually long in this application, a number of alternate egress components have been introduced to accommodate egress. Two stairwells meeting typical separation requirements of a building are accessible at 8 points along the ramp-way, this effectively divides the occupied areas along the ramp-way into 8 separate pieces, resulting in an occupant load of 125 persons at any egress access point at each stair.

Egress Components

Elevators

- 1 Passenger elevator is included in the project and also meets all requirements to serve as an occupant evacuation elevator. In addition to this it has been sized to meet Gurney elevator requirements as listed in the

Stairs

- 2 dedicated egress stairs are provided for redundancy in the egress plan. This is in conformance with CBC 1006.3, in that the loss of one of these egress paths would not result in more than a 50% reduction of available egress

Ramp-way

- Ramp-way width is nominally 4'-4" between the structural elements on 5' centers. Occupant load calculated at .2" per occupant Per CBC 1005.3.2 yields an occupant capacity of 260 persons using the ramp-way as an egress component. Refer to the occupant egress where a maximum occupant load is demonstrated at any point along the ramp-way that is less than this capacity.
- Per CBC section 1017 Exit Access Travel Distance, The allowable Path of Travel along the ramp-way has been calculated for an Assembly occupancy in a non-sprinklered building of 200' in addition, the outdoor nature of the ramp-ways is consistent with CBC 1017.2.1 Exterior egress balcony increase which grants a 100' extension based on the open air nature of the pathways. Therefor the total maximum allowable Exit Access Travel Distance is set at 300'.
- In application the maximum distance between any egress point along the 9 sections of ramp-way is
- The Exit access travel distance is calculated from the center point of any ramp run and demonstrates compliance.
    - Run 1 – 142' - Exit access distance of 71'
    - Run 2 – 178' - Exit access distance of 89'
    - Run 3 – 193' - Exit access distance of 97'
    - Run 4 – 198' - Exit access distance of 99'
    - Run 5 – 146' - Exit access distance of 74'
    - Run 6 - 142' - Exit access distance of 71'
    - Run 7 - 138' - Exit access distance of 69'
    - Run 8 - 186' - Exit access distance of 93'
    - Run 9 - 171' - Exit access distance of 86'

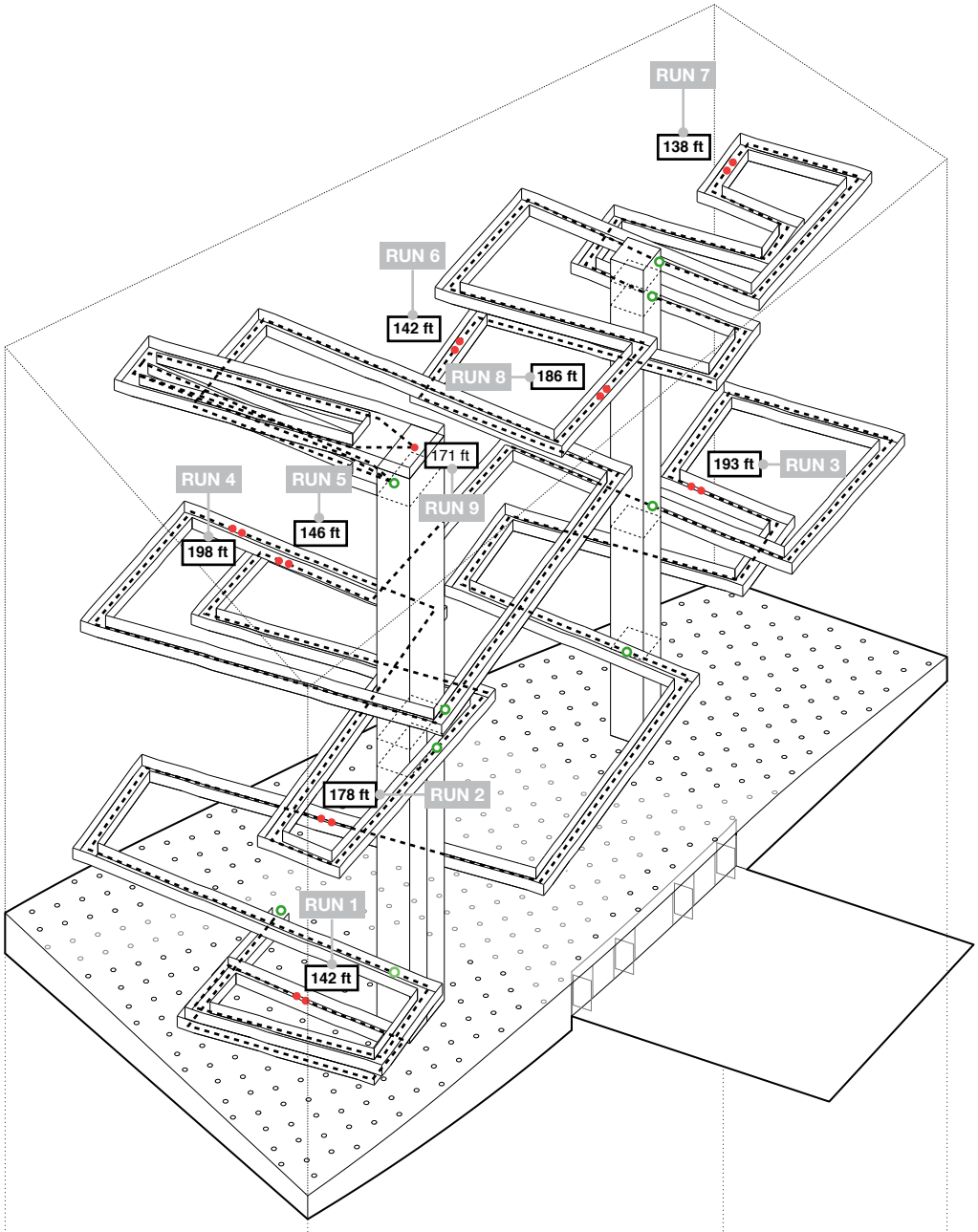


Figure 04-5: Ramp-way and Viewing platform egress access points

Accessibility Components

Elevator

- Meets CBC chapter 11B requirements for accessible path to the viewing platform and intermediate landings. The elevator serves the Basement level as well.

Ramp-way

- Meets CBC chapter 11B requirements for accessible path of travel including a slope no greater than 1:12, intermediate landings every 30” of rise and at change of direction, and bypasses every 200’ per CBC 11B-405.

Ground floor

- Earthwork and pathways shall be made compliant with path of travel and maximum slopes as outlined in CBC chapter 11B.
- Gravel surfaces shall be fortified with geogrid type substrate and incorporate binding agent and aggregates appropriate to provide a stabilized path that meets universal access requirements. This is not directly addressed in the California Building Code, but is consistent with 2010 ADA Standards For Accessible Design (ADAAG)

Basement

- Basement level of the structure is located approximately 4’ below existing grade. This semi-recessed condition means that the basement floor is nearly level with the sidewalk along North Autumn Street. Additional access from the existing parkway paths is accomplished via a sloped slab into the Basement space and is envisioned as a continuous slope-way at less than 1:20. This precludes the requirements for intermediate landings and railings.

END OF SECTION

05 | Program Assumptions & Use Requirements

Abstract:

Program for the Breeze of Innovation is divided into 3 layers; The Forest Pathway and Viewpoint, The Electric Light Tower Event Space, and the Foundation vent and support spaces. Each layer incorporates a unique visitor experience, serves different ranges of functions, provides different interactions with the icon, and can provide differing opportunities for revenue.

Reference:

WP-03 (January 2021) **Vertical Transportation Systems - MBH**

WP-04 (January 2021) **Life Safety – MBH**

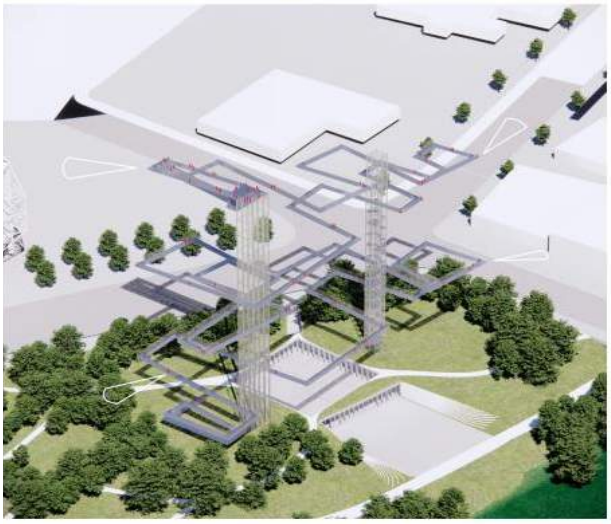
WP-06 (January 2021) **MEP, Fire, and Technology Systems - HOK**

WP-07 (January 2021) **Site Access, Hardscape, Landscaping - HOK**

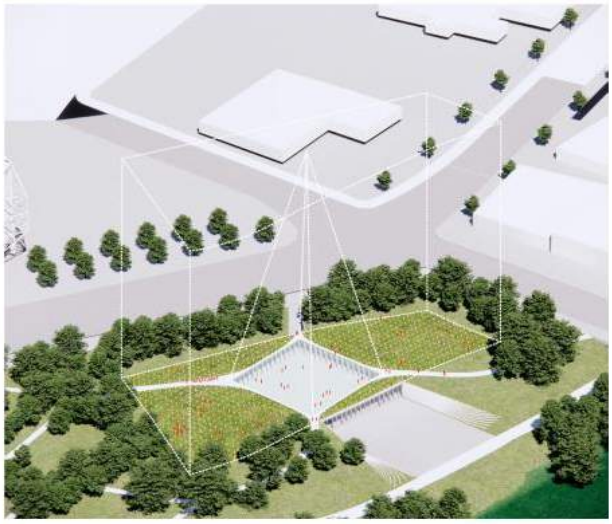
WP-10 (January 2021) **Specialty Lighting - Niteo**

Exhibits:

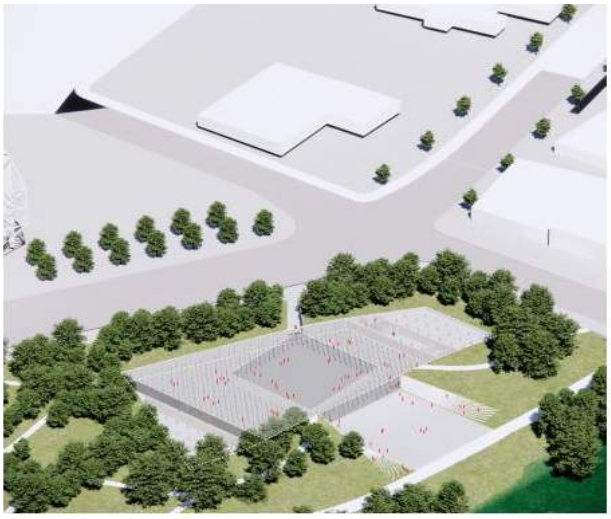
Figure 05-1: Illustration showing use of entry ramp-way as outdoor café space



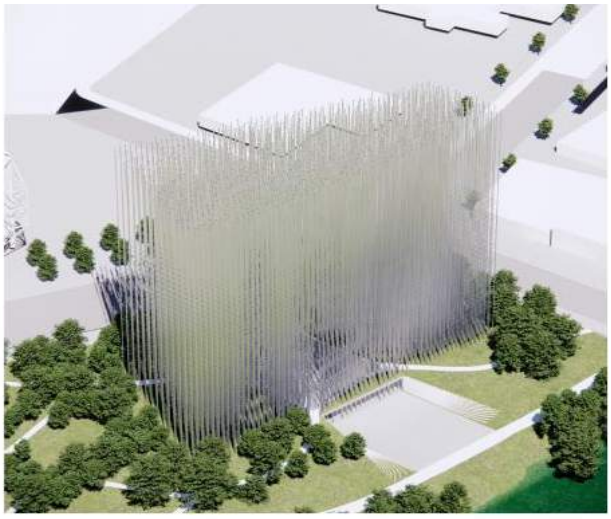
Forest Pathway and Viewpoint



ELT Event Space



Foundation Event Space



Icon

Figure 05-2: Overall Graphics of layers of spaces on Breeze of innovation

Forest Pathway and Viewpoint

15 Viewing Platform

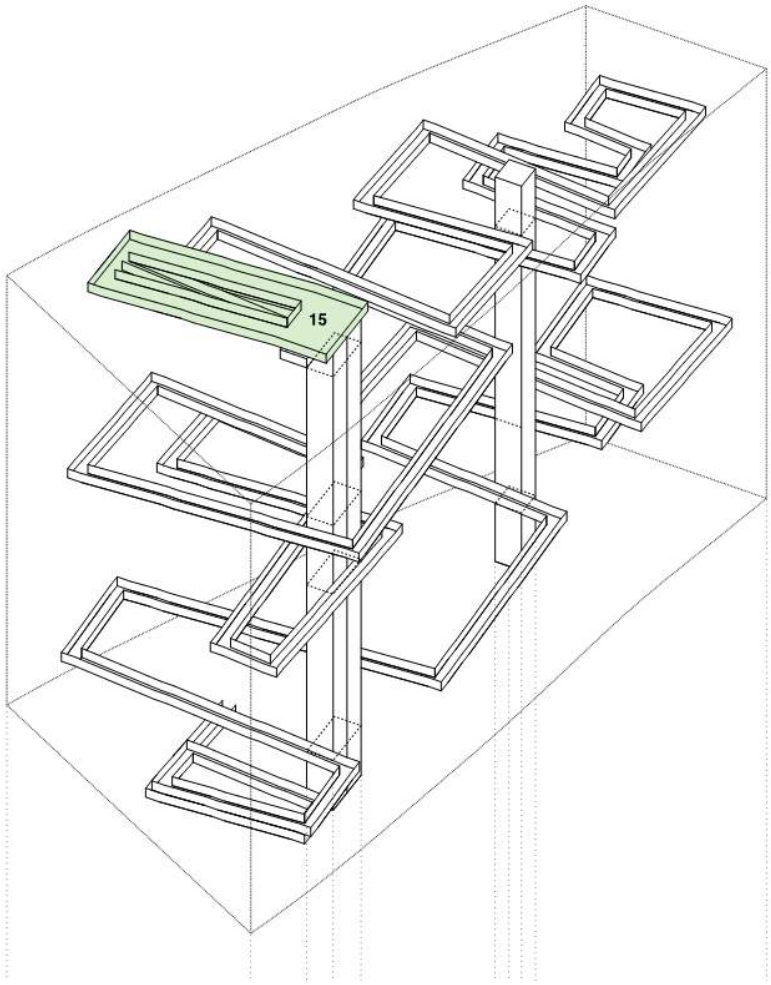


Figure 05-3: Forest Pathway and Viewpoint Space

Forest Pathway and Viewpoint

Function

The ramp-way and viewing platform is considered the primary experiential component to the Breeze of Innovation and acts as essentially a vertical park, providing circulation, resting areas, socializing areas, and access to stair towers and elevators for safety and universal access.

Components

Ramp

- Consists of 5’ wide, 1900’ long ramp-way leading from ground level up to Viewpoint at approximately 200’. Bypasses will be provided at each entry point to a stair or elevator, in addition bypasses may be provided at strategic lookout points and be sized to accommodate resting benches.

Viewing Platform:

- Is oriented to the east but offers views in all directions of both the park itself, and adjacent areas of downtown San Jose. Visibility from the platform on clear days is up to 19.3 miles.

Stair and Elevator:

- Access are envisioned as alternate means for travel to multiple points along the ramp-way via intermediate landings at approximately 10 locations. This introduces practical access for visitors who are differently abled or simply wish to experience the ramp-way or platform in different ways.

Access

Time of access

- Access is completely controllable since the entry to the ramp-way, stairs, and elevator are securable.

Staffing

- It is expected some minimum level of staffing is present at the viewing platform during open hours.
- Should ticket sales or other revenue development be desired, additional staff will need to be present to control access and make sales.
- Should requirements imposed by the San Jose Fire Authority prohibit the free access of pedestrians by limiting the occupant count, staff may be required to control access regardless of ticket sales.

Security

- Ramp-way, stairs, and elevators may be monitored by camera.
- The elevator provides efficient access to 4 points along the ramp-way for security access.

Forest Pathway and Viewpoint

Opportunities for Revenue

- Ticket Sales may be of interest to the managing authority for the Breeze of Innovation. Relevant comparisons to other icons throughout the United States establish this as a practical way to cover operational expenses.
- The ramp-way provides a unique viewing experience during events which could be considered premier access for ticketholders at events held in the exterior exhibition space.

Maintenance and Operation

- Maintenance of the Ramp-way and viewing platform will in most cases be accommodated by the path itself. In the event of highwork repairs, the structure offers multiple opportunities for temporary maintenance pathways or planks
- The Structure itself is stainless steel with a matte finish, requiring no periodic maintenance work. Should cleaning be required due to smog or other atmospheric pollutants the maintenance plan above addresses approximately 80% of the structure.
- The remaining 20% of the structure may be accessed via a mechanical platform that uses the same rigging system as the wind even lockout. Refer to Structural.

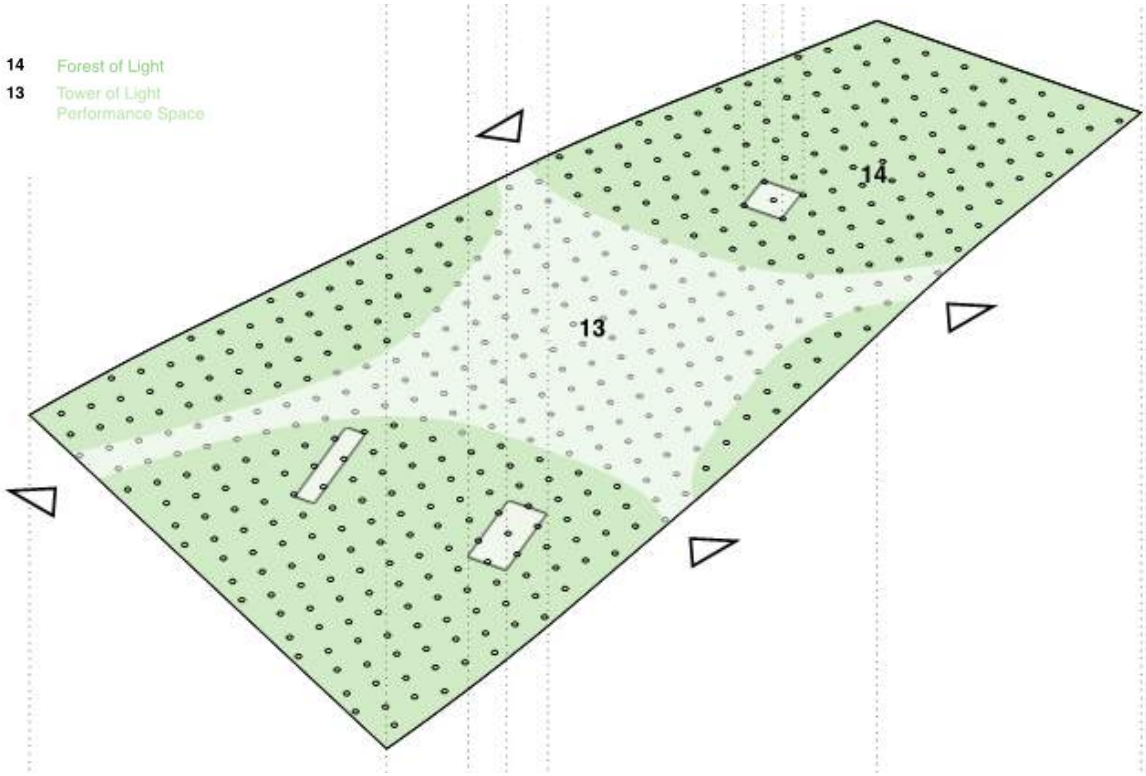


Figure 05-4: Tower of Light Performance Space

Tower of Light Performance Space

Function

- This event space is incorporated into the existing parks pathway system and is accessible directly from ground level by 3 pathways or from below by the stair and elevator. It may serve as an extension of the park space or as a gathering space for events.

Components

- 1 open-air exhibition space of approximately 6500 square feet.
- Entry ramp-ways at autumn street and off the park pathway adjacent to Guadalupe River,
- Access points to vertical transportation to both above and below.

Access

Time

- Pathways and the central exhibit space could be open to the public at all times, serving as a continuation of the park path system. Minimum lighting and safety requirements shall be met.

Staffing

- Minimum staffing includes grounds maintenance which could be park services, security, and access control, depending on the requirements applied to the ramp-way above.

Security

- Camera or direct monitoring of space from above is expected to maintain minimum security requirements. Minimum lighting at ground level should be maintained during night hours to discourage vandalism.

Opportunities for Revenue

- Access to the ramp-way could be fee based.
- Special events in the Electric Tower Event Spaces could be ticketed.

Maintenance and Operation

- Gravel paths and event space is intended as low maintenance, along with surrounding no-mow ground cover native grass species.

Foundation Exhibit Space

1	Plant	2615 SF	**6**	Indoor Cafe	302 SF	**10**	Public facilities	634 SF
2	Staff facilities	536 SF	**7**	Exhibition space	17400 SF	**11**	Storage	2609 SF
3	Staff break-out / green room	641 SF	**8**	Donor recognition	-	**12**	Front desk / information	155 SF
4	Staff Kitchenette	206 SF	**9**	Outdoor Cafe	~3000 SF			
5	IT & security	141 SF						

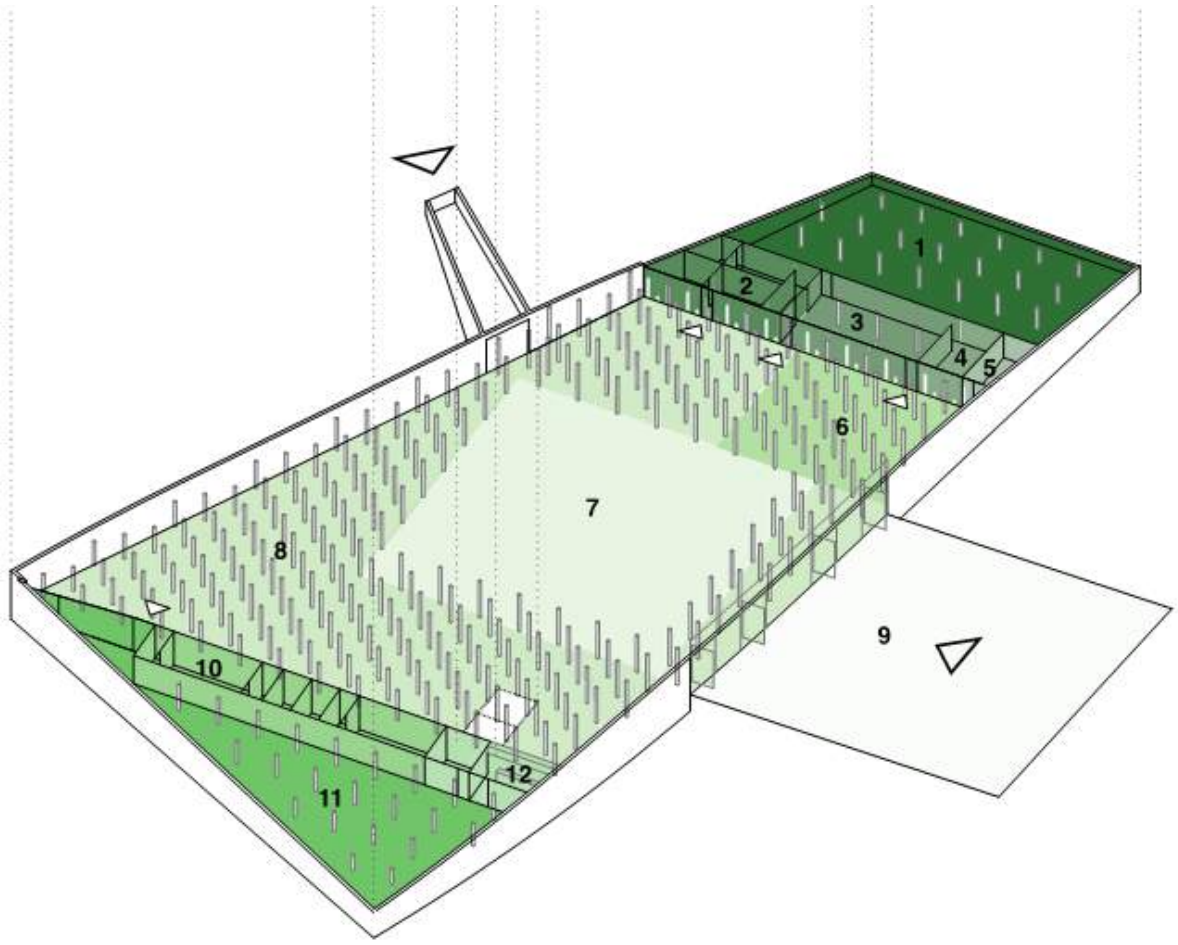


Figure 05-5: Foundation Exhibit Space

Foundation Exhibit Space

Function

The foundation Exhibition space provides for a weatherproof exhibit area and support spaces for the Breeze of Innovation site. Back of house services for day-to-day operation such as staff areas, building services, security and maintenance are all accommodated as described below. In addition, these spaces are flexible to provide support space for events such as rehearsal and dress areas, flexible exhibit areas, or even partitioning off parts of the space to further accommodate catering or entertaining BOH functions. Ample storage is available on site, as are restrooms, information kiosk, and café functionality.

Components

- Flexible Exhibition Space
- Front Desk/Info
- Public Restroom Facilities
- Staff Break areas / event support space
- Staff change rooms/ dedicated restroom facilities
- Kitchen space
- Information Technology
- Security
- Plant or mechanical spaces
- Vertical Circulation
- Entrance from Park

Access

Time

- Operation hours may be set at operators' discretion.

Staffing

- Minimum staffing consists of security staff, which may be full or part time, Café operation, Information/ front desk, and Janitorial services.

Security

- Area is fully securable and enclosed.

Opportunities for Revenue

- Pop up Café can serve public year round, focusing indoors during winter months but expanding to the entry ramp-way during favorable weather.
- Exhibition space is separated from outdoor spaces and could be ticketed for events.

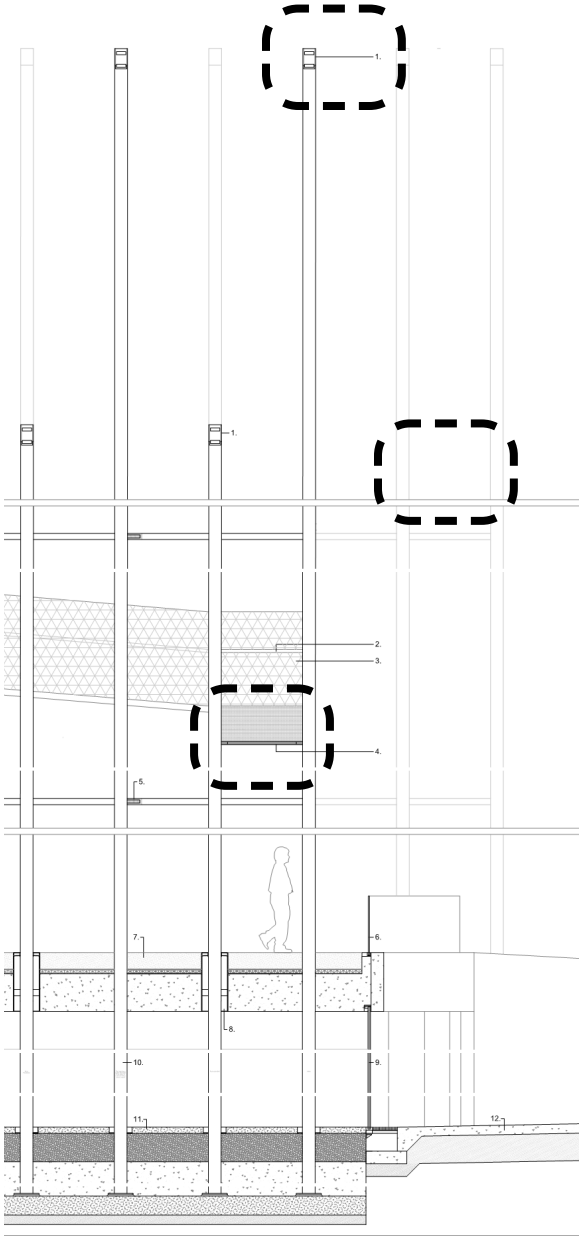


Figure 05-6: Diagram of Maintenance access areas

Maintenance

Since the ramp-way is the primary access to the top of the structure it must be considered as the starting point for maintenance access. The primary Maintenance items on the building are as follows.

- Lighting at the structure - addressed through use of flood lighting, limiting access requirements. Under the ramp lighting may be accessed by hatchways built into the ramp to replace fixtures. Other fixtures may need to be accessed by use of temporary platforms for maintenance which will be supported by the horizontal structural members.
- Rod Tips - a number of iterations of rod tips have been developed and the ongoing design approach is to minimize 1) the need for maintenance access by using robust and redundant technology, and 2) engaging a facade access engineer to develop mechanical access via the rods in the form of custom rigging work, based on a precedent of event lighting at stadiums, ball parks, and sports arenas.
- General structure cleaning - the material of the Breeze of Innovation requires no repainting or regular cleaning. For occasional cleaning of bird nests, debris, or smog pollutants, access via temporary pathways similar to the remote lighting is proposed. Typically this is not expected to be more than on a 2-5 year maintenance schedule.

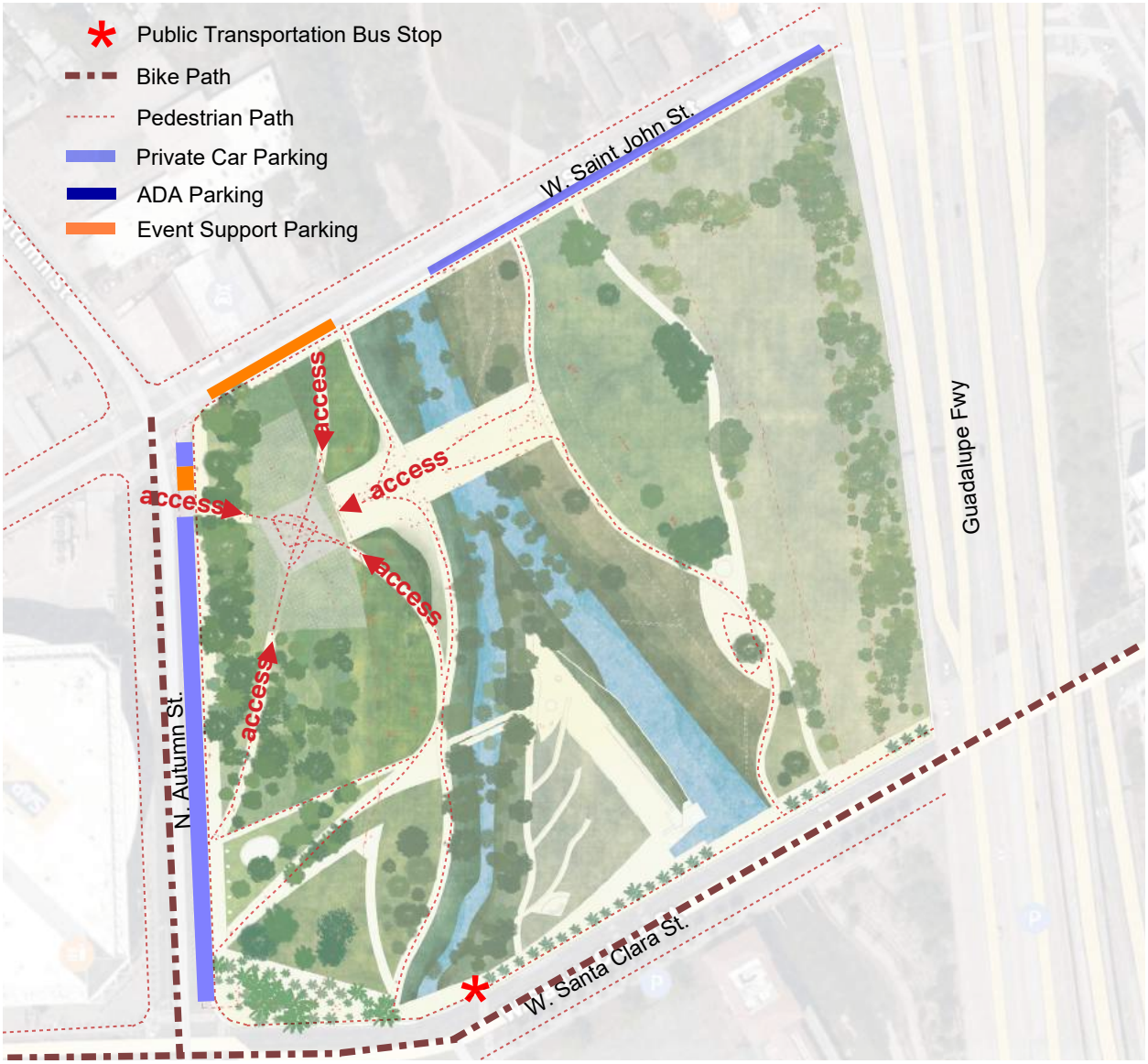


Figure 05-7: Delivery access and event support areas

Management

- The information/front desk may double as the management hub for the space.

Security

- A centralized building security office is planned on the foundation level.
- Program consisting of Office and Building monitoring station for security personnel, common Break area, and changing room and lockers for personnel.

Operation

Deliveries and receiving

- Mail, Packages, and other correspondence shall be accommodated by the information desk during open hours and a drop box location off North Autumn street entry during off hours.
- Street deliveries / freight as related to exhibitions or events
    - Metered Street parking can temporarily accommodate large deliveries via North Autumn Street entryway.
    - Catering or other service based deliveries should assume street parking along West Saint John Street, which provides equal access to the Foundation Exhibition space and Exterior Exhibition Spaces.

Trash

- Daily or weekly trash and recycling services can be accommodated via the corridor to North Autumn Street. Standard 40 Gallon sized containers may be stored inside the building for pickup, should special events require more waste disposal, street containers may be located along either Autumn Street or West St John Street.

Employee access and support

- Parking:
    - Limited staffing is anticipated, as such no dedicated on-site parking has been included in program and it is assumed employees will use nearby street parking or garage parking.
- Bike storage:
    - A centralized bike storage area may be accommodated inside the building to meet long term bike parking needs. The ultimate program would be dependent on staffing however would consist of the following:
        - Minimum secured bike storage racks adequate to meet counts required by AHJ.
        - Dedicated shower stalls and restrooms compliant with CALGreen.

Employee break spaces

- Program consists of:
    - File storage.
    - Break room / flex room.
    - Kitchenette for staff use.

Building engineering and maintenance space

- Is assumed to be off site. Storage for attic stock materials, safety and maintenance materials, and cleaning supplies can be accommodated on site.

Cleaning

- Janitors Closet off the plan south restroom bank can accommodate typical janitorial materials, for specialized cleaning or maintenance, additional storage may be dedicated as necessary.

Storage

- Storage for event supplies such as displays, tables, folding or modular seating, lighting supplies, AV equipment, modular casework or partitions, and office supplies

END OF SECTION

06 | MEP, Fire & Technology Systems

Abstract:

Utility services as designed for this building were predicated on the following planned uses.

Approximately 20,000 SF of partially sub-grade gallery space occupied as A-3, which is primarily passively conditioned and mechanically ventilated.

Mechanical and plumbing service to key 'Back of House' spaces, including utility MPOE rooms, fire pump room, restrooms, café kitchenette, and staff spaces. Approximately 5,000 feet in total.

Unconditioned ramping pathway to an unconditioned viewing platform at the top of the structure.

Lighting throughout the sub-grade gallery, exterior spaces, along ramps and elevators, and integrated into the structure and surrounding area in a variety of formats (see specialty lighting for more details).

On-site power generation integrated with battery storage systems designed to offset architectural and landscape lighting energy use and limit power demand on the local grid during peak demand periods in the evening hours.

References:

WP-03 (January 2021) **Vertical Transportation - MBH**

WP-04 (January 2021) **Life Safety - MBH**

WP-05 (January 2021) **Program Assumptions and Use Requirements – MBH/SMAR**

WP-08 (January 2021) **Site Constraints, Utilities and Flood Considerations - BKF**

WP-09 (January 2021) **Power Generation systems – HOK**

WP-10 (January 2021) **Specialty Lighting - Niteo**

WP-11 (January 2021) **LEED Requirements and sustainability - HOK**

Exhibits:

Applicable Codes, Standards and Guidelines:

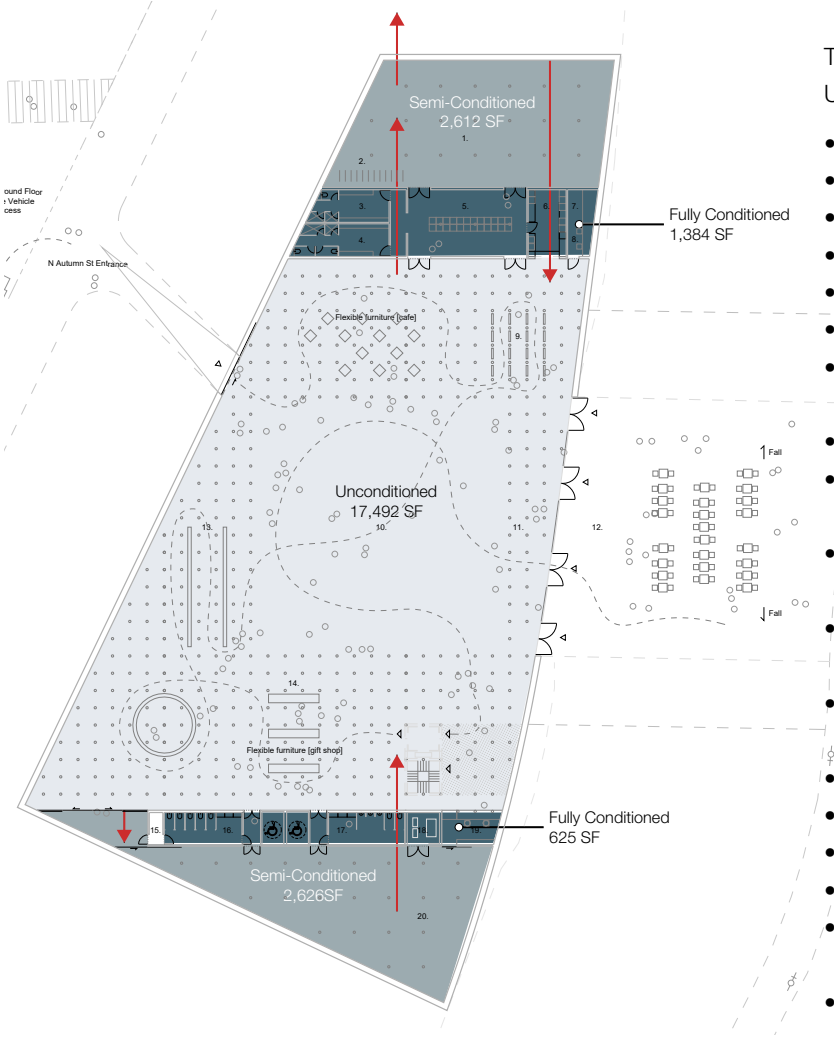


Figure 06-1: Conditioned Area Plan

The following is a description of Building Utilities and services organized by discipline:

- 2019 California Building Code
- 2019 California Mechanical Code
- 2019 California Plumbing Code
- 2019 California Electrical Code
- 2019 California Fire Code
- 2019 California Energy Code
- 2019 California Green Building Standards Code
- Local ordinances and code amendments
- Requirements of the Authority Having Jurisdiction (AHJ)
- ASHRAE Standards 55 and 62.1, latest editions
- NFPA 13 – Standard for the Installation of Sprinkler Systems
- NFPA 20 – Standard for the Installation of Stationary Pumps for Fire Protection
- NFPA 70 – National Electrical Code
- NFPA 72 – National Fire Alarm Code
- SMACNA, Duct Construction Standards
- UL – Underwriter's Laboratories, Inc
- Institute of Electrical and Electronic Engineers - IEEE
- Electronics Industrial Association / Telecommunications Industry Association 568/569 - EIA/TIA

Mechanical

Mechanical air conditioning systems to provide conditioned air to approximately 1,400 square feet of staff back of house spaces and IT/AV spaces. Mechanical fan systems to provide ventilation air or exhaust air to approximately 23,000 square feet of occupiable space. Mechanical equipment will be controlled by a direct digital control system.

Design Criteria Summary:

Outside Design Criteria

- Location: San Jose, CA
- Elevation: 49 ft
- Latitude: 37.37 North
- Weather: SAN JOSE INTL AP, CA, USA
- CA Climate: 4

Outside Design Conditions:

- Winter: 35.7 ºF DB
  (ASHRAE 99.6% - Annual Heating Data)
- Summer: 92.4 ºF DB / 67.1 ºF WB
  (ASHRAE 0.4%– Annual Cooling Data)

Interior Design Criteria

- Temperature: 70-75 deg F (Fully Conditioned Spaces)
  Not Controlled (Ventilation Only Spaces)
- Humidity: Not Controlled
- Noise Criteria: NC 35 (Break Room / Office)
  NC 40 (Restrooms / Showers / Changing Rooms)
  NC 45 (MEP / IT Rooms / Storage)
- Occupants: 75 ft2/person (Break Room)
  125 ft2/person (Changing Rooms)
  200 ft2/person (Office)
  N/A (Restrooms / Showers / MEP / IT Rooms / Storage)
- Occ. Gains: 250 Btuh (Sensible) / 200 Btuh (Latent) per person
- Lighting Gains: 0.65 W/ft2 (Break Room / Restrooms / Showers / Office)
  0.60 W/ft2 (Changing Rooms)
  0.50 W/ft2 (Storage Rooms / Stairwell)
  0.40 W/ft2 (MEP / IT Rooms / Storage)
- Equip. Gains: 0.2 W/ft2 (Storage / Changing Rooms)
  0.5 W/ft2 (Restrooms)
  1.0 W/ft2 (Mech / Plumb / Break Room / Office)
  2.5 W/ft2 (Elec)
  15.0 W/ft2 (IT Rooms)
  N/A (Stairwell / Showers)
- Exhaust Rate: 1.0 CFM/ft2 (Restrooms / Showers)
  0.5 CFM/ft2 (Changing Rooms)
  N/A (Break Room / Storage / Office / MEP / IT Rooms)

Mechanical

Mechanical Systems:

- The staff break room, security, kitchen, restrooms, and changing rooms will be conditioned by a heat pump VRV/VRF fan coil unit concealed above the ceiling and ducted to air terminals in each room and the outdoors for ventilation air. The indoor unit cooling capacity is estimated at 36,000 Btuh and the heating capacity at 24,000 Btuh.
- The IT room will be conditioned by a heat pump VRV/VRF fan coil unit high wall mounted in each room. The indoor unit cooling capacity is estimated at 24,000 Btuh and the heating capacity at 6,000 Btuh.
- A single outdoor air-cooled heat recovery VRV/VRF condensing unit will serve both indoor units. The outdoor unit capacity is estimated at 60,000 Btuh. The condensing unit will be pad mounted away from the light tower structure with refrigerant lines, power wiring, and communications cabling routed in conduit below ground to the indoor units. The VRV/VRF indoor and outdoor units will be controlled by the packaged equipment controller provided with the system.
- The exhibition space and info desk will be ventilated by a variable speed in-line supply fan with an EC motor. A MERV-13 filter will be supplied with the exhaust fan. Demand control ventilation sequence of operation will vary the supply fan speed in response to space occupancy and CO2 levels. The supply fan will be controlled by the BMS. Space pressurization will be controlled through an exhaust opening with barometric damper to the exterior.
- The public restrooms, storage rooms, and janitor's closet will be exhausted by a constant volume in-line exhaust fan with an EC motor. The exhaust fan will be controlled by the BMS on a time schedule. The make-up air for the exhaust rooms will be transferred from the exhibition space through transfer grilles.
- The MEP rooms will be exhausted by a variable volume in-line exhaust fan with an EC motor. The exhaust fan will be controlled by the BMS in response to space temperature. The make-up air for the exhausted rooms will be transferred from the exhibition space through transfer grilles.
- Active smoke control systems are not anticipated.

Mechanical

Distribution Systems:

- Ductwork shall be low pressure sheet metal duct, externally insulated. All ductwork will be constructed in accordance with SMACNA 2” construction class. Supply air, return air, and outside air ductwork will be sized at 0.08” per 100ft. Exhaust air ductwork will be sized at 0.10” per 100ft. Flexible ductwork shall only be installed at diffuser, register, or grille connections and be between 3’ and 5’ in length.
- Shower room exhaust ductwork shall be constructed of stainless steel or aluminum between the exhaust grille and connection to the main exhaust duct.
- Transfer air openings or ductwork shall be sized at 500 fpm maximum velocity.
- Refer to the Plumbing section for condensate drainage requirements.
- VRV/VRF refrigerant and oil line piping shall be designed, sized, and insulated in accordance with the manufacturer’s requirements and the project codes and standards.

Building Management System (BMS):

- All new mechanical equipment shall be provided with microprocessor based direct digital controllers as part of the building management system (BMS). Mechanical equipment controllers shall be located on or adjacent to the equipment. BMS control panels shall be located in mechanical, electrical, or IT rooms. BMS control panels and equipment controllers shall be connected to standby power where the floor or associated mechanical equipment is connected to standby power.

Balancing and Commissioning:

- Testing, Adjusting, and Balancing (TAB) of the air conditioning systems and related ancillary equipment will be performed by a certified third party independent of the Subcontractor who specializes in testing, adjusting, and balancing of heating, ventilating, air-moving equipment and hydronic systems and has a minimum of 5 years of experience in this specialty.
- HVAC commissioning shall be included in the design and construction to verify HVAC systems and components meet the owner’s project requirements and are in accordance with the applicable codes and standards. Commissioning shall be performed in accordance with the applicable codes and standards by personnel trained and certified in commissioning.

Electrical

The existing Arena Green project site has two (2) PG&E meter pedestals: one is located on the north end of the carousel and another is located at the south end of the carousel. Most of the existing electric facilities within Arena Green project site are on the "customer" side of the meter pedestals and are owned by the City of San Jose. All existing underground electrical lines on the project site now serve the existing restrooms, carousel, outdoor lighting, etc. and are owned by City of San Jose. Based on preliminary discussions with PG&E, a new underground electrical service, extended from Autumn Street, is recommended to serve the new facility.

Normal Power System:

- Preliminary load calculations indicate that this facility will require a 400A, 480/277V, 3P, 4W normal (utility) electrical service. The distribution system will be designed to segregate load types (lighting, power, mech/plumbing equipment, etc.) to allow for future sub-metering, as required by Title 24.
- Title 24 requires a main power meter to be provided at the service entrance location but does not mandate sub-metering for segregated load types. However, the main distribution board will be provided enough physical space to allow for easier future addition of sub-meters.
- California Green Building Standards Code requires that at least 6% of total parking spaces (that pertain to the project area) be designated as "EV Charging" spaces. The electrical service will include capacity for the required EV spaces plus up to one (1) additional future EV charging space. The EV charging stations will be served from the normal power system.

Emergency Power System:

- No emergency or standby generator system is anticipated for this project.
- Code will require emergency egress lighting to provide 90-minutes of emergency illumination when utility power is lost. To facilitate a single location to service and test emergency lighting, the facility will be provided with 10kW/kVA central emergency lighting inverter.
- In addition to providing egress lighting along the path of egress in corridors, large meeting rooms, locker rooms, and other similar areas, also provide emergency egress lighting in exterior stairs, mech/electrical rooms, MPOE/MDF room, and fire riser room.

Electrical

	Interior Lighting (kBtu)	Receptacle Equipment (kBtu)	Space Heating (kBtu)	Service Water Heating (kBtu)	Space Cooling (kBtu)	Heat Rejection (kBtu)	Interior Central Fans (kBtu)	Interior Local Fans (kBtu)	Exhaust Fans (kBtu)	Pumps (kBtu)	Total Energy Use (kBtu)	EUI (kBtu/ sqft/yr)
JAN	2,649.0	3,775.0	667.0	-	1.0	350.0	602.0	-	355.0	-	8,399.0	0.32
FEB	2,286.6	3,498.0	416.0	-	11.0	1,364.0	545.0	-	321.0	-	8,441.6	0.32
MAR	2,463.0	3,947.0	205.0	-	38.0	928.0	596.0	-	355.0	-	8,532.0	0.33
APR	2,209.8	3,797.0	79.0	-	140.0	284.0	574.0	-	344.0	-	7,427.8	0.28
MAY	2,087.1	3,774.0	-	-	255.0	16.0	614.0	-	355.0	-	7,101.1	0.27
JUN	2,078.7	3,797.0	-	-	678.0	43.0	639.0	-	344.0	-	7,579.7	0.29
JUL	2,159.1	3,867.0	-	-	672.0	43.0	638.0	-	355.0	-	7,734.1	0.30
AUG	2,202.3	3,854.0	-	-	777.0	50.0	667.0	-	355.0	-	7,905.3	0.30
SEP	2,236.5	3,797.0	-	-	638.0	41.0	644.0	-	344.0	-	7,700.5	0.29
OCT	2,411.1	3,775.0	2.0	-	243.0	16.0	598.0	-	355.0	-	7,400.1	0.28
NOV	2,602.8	3,797.0	77.0	-	66.0	229.0	573.0	-	344.0	-	7,688.8	0.29
DEC	2,822.7	3,947.0	536.0	-	15.0	852.0	600.0	-	355.0	-	9,127.7	0.35
SUM TOTAL	**28,208.7**	**45,625.0**	**1,982.0**	**-**	**3,534.0**	**4,216.0**	**7,290.0**	**-**	**4,182.0**	**-**	**95,037.7**	**3.64**
Floor Area (sqft)	26108.7											

Figure 06-2: Annual energy demand table

Renewable Energy Generation System(s):

The goal of this project is to offset architectural, landscape, and exhibit hall lighting energy use with on-site available renewable power sources (PV panels and piezo tiles). To store the power produced from these on-site power generation sources, a battery storage system with capacity of approximately 972kWH is anticipated. This size assumes that ~60.75kW of lighting load will be powered for 8hrs/night (including during the peak “duck curve” hours of the evening), with 2 nights worth of storage capacity (i.e. 16 hrs of storage capacity). The battery system will be located outdoors. An inverter system will be required to convert DC output from the power generation sources to usable AC (and charge the battery system). A central inverter system is recommended for each of the following systems: the battery system, PV array system, and the piezo tile system. Central inverter systems are generally more cost effective and easier to maintain.

Electrical

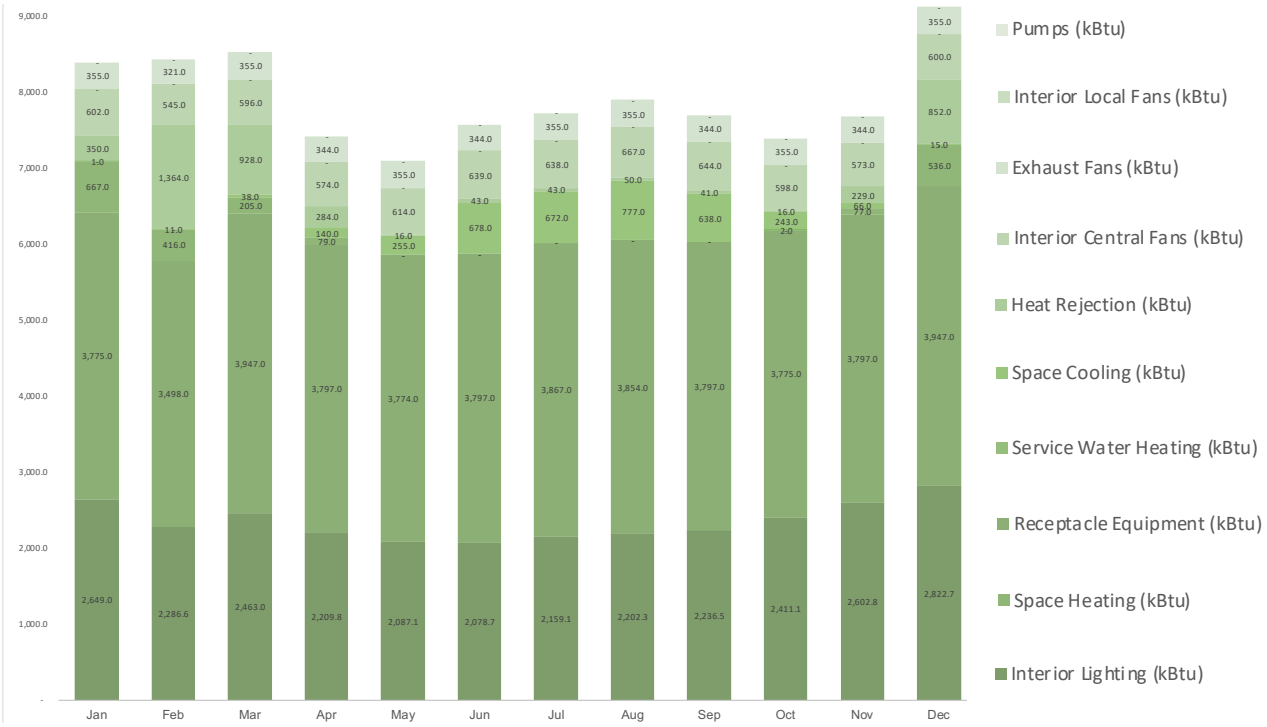


Figure 06-3: Annual energy use by system

General Design Requirements:

- Sufficient access and working space should be planned and provided about all electric equipment to permit ready and safe operation and maintenance of such equipment.
- An unobstructed access path should be provided to access large equipment such as building transformers (if any), central lighting inverter system, PV system, battery system, and similar equipment. The access path should be large enough allow passage of section of equipment and moving/lifting devices in times of removal. All the equipment mentioned, but also including lighting control panels and fire alarm panels, should be located in dedicated space and protected from damage and access from unauthorized personnel.
- Distribution of power circuits is anticipated to be accomplished with conduit and wire, including conduit risers on the north and south side. Conduits/raceways will be routed concealed within the steel rods to get power distribution to the upper areas of the facility. Horizontal conduit/raceway runs should be concealed to greatest extent possible or routed in a way that complements the steel rod structure.

Electrical

Branch Devices and Circuiting:

- In the security office, info office, staff/green/rehearsal room, and other similar function rooms, every wall of the room should have at least one (1) double-duplex outlet consisting of a controlled duplex outlet and a non-controlled duplex outlet such that a controlled outlet is located within six feet of each non-controlled outlet. The controlled duplex outlets should be controlled by the room occupancy sensor.
- General-purpose and circulation space receptacle circuits should be limited to six (6) duplex receptacle outlets per 20A circuit.
- Outlets serving computers and other similar equipment should be limited to no more than five (5) per circuit.
- Receptacles in areas likely to serve copy machines, laser printers, coffeemakers, etc. should be served by dedicated circuits.
- Within exhibition space, provide receptacles no further than 45ft apart on center.
- Provide at least one (1) duplex receptacle at all elevator lobbies, at every other stair landing, and within every storage room.
- Voltage drop to any device should be limited to a maximum of 5%: 2% maximum on feeders and 3% maximum on branch circuits. Up-size conductors where required.
- NEMA configuration should be obtained from equipment manufacturer for each special outlet and identified on the drawings.
- All GFCI receptacles should have a green power-on indicator light. Provide GFCI receptacles within 6ft of the edge of the sink or in wet/damp areas and do not daisy-chain devices to the load-side of GFCI devices to obtain GFCI protection. Receptacles exposed to weather should be GFCI type with extra-deep weatherproof-while-in-use type covers.
- Electrical power connections should be made to all mechanical and plumbing, to include providing all electrically associated devices such as disconnect switches, contractors, magnetic or manual starters, lockout switches, etc., not furnished under Division 23. Provide convenience receptacle within 25’-0” of all major mechanical and plumbing equipment.
- Electrical power connections should be made to support all miscellaneous equipment. Connections should include disconnect safety switches and wiring to support interlocks to remote devices.

Electrical

Lighting and Lighting Controls:

Interior Lighting:

- New luminaires should be highly-efficient, dimmable LED type. Energy efficient sources and automatic control technologies should be implemented to comply with current Title 24 requirements and to provide for the most efficient and effective electric lighting system for the facility occupants and task. Back-of- house (BOH) lighting will consist of basic recessed or ceiling mounted 2'x2' LED fixtures in occupied BOH spaces, wall mounted indirect lighting or corner mount indirect lighting in the bathrooms, and ceiling mounted (surface or suspended) 4' LED strip lights in unoccupied BOH spaces, and egress stairs will have wall mounted LED linear light fixtures.
- Light fixtures should be chosen and located to allow easy maintenance.
- Lighting levels should conform to the current Title 24 requirements and current IES standards.
- Lighting fixtures should have a multi-voltage (120-277V) ballast.
- Unless indicated otherwise in the Lighting Basis of Design, the Illumination Schedule should be:

Function / Space	Illuminance (Avg. Foot-candles)
Offices	35 FC
Exhibition Space	10-20 FC (dimmable to 5 FC)
MEP/IT Rooms	35 FC
Stairways	5-10 FC
Corridors/Circulation/Vestibules	5-10 FC
Storage Rooms/Janitor Closets	10 FC
Changing Rooms:	15 FC
Restrooms	10 FC
Breakroom	35 FC

Electrical

Exterior/Site Lighting:

- Each fixture should be fused with a time delay fuse in a weatherproof holder. Fuse should be in the base or in the base pullbox.
- Site lighting luminaires should be scheduled on and off by the building management system (BMS).
- Site lighting luminaires should have a concrete pullbox installed adjacent to each fixture with conduits and wiring terminating in this pullbox. Site lighting luminaire pullboxes should include a concrete bottom with drain hole.
- If the Owner opts to do so, “blue-light” call stations can be provided at strategically placed locations.
- Per Title 24, motion sensors should be provided for all outdoor luminaries at or below 24 ft with more than 40 watts. Exception: Luminaires with mounting height over 24 ft, luminaries with maximum labeled wattage of 40W or less.

Emergency Lighting:

- Designated luminaires will illuminate the path of egress and provide an average of 1 foot-candle (FC), with a maximum to minimum illumination level of less than or equal to 40:1 per Title 24. Emergency lighting will also be provided in restrooms and all stairways.
- Luminaries designated for emergency egress and all exit lights will be served from a central battery inverter system to focus maintenance and annual fixture testing to one location.

Electrical

Lighting Controls:

- New lighting controls should be provided in compliance with California Title 24 Energy Code. All new lighting controls should be capable of connection to the BMS system via BACnet protocol and be able to accomplish automatic demand response as required by Title 24, Section 110.12.

Task/Area	Control Method
Corridor and Stairs	Corridor Occupancy Sensor, dim to 20% output when no occupancy.
Private Office, Breakroom	Wall Switch, Multi-level control, Occupancy Sensor, automatic dimming based on daylight level.
Exhibition Space (Note 1)	Wall Switch, Multi-level control, Occupancy Sensor, automatic dimming based on daylight level.
Restrooms	Wall Switch (keyed), Occupancy Sensor
MEP/IT Rooms	Wall Switch, Occupancy Sensor
Changing Rooms	Wall Switch (keyed), Multi-level control, Occupancy Sensor
Building Interior Perimeter Areas	Photocell – Daylight Dimming (based on arrangement of windows)
Building Exterior (Note 2)	Photocell or Astronomical Time clock, Motion Sensors (Note 3)

Note 1: Where presentation systems are provided, lighting should interface and be able to accept a scene setting from the A/V system.

Note 2: All exterior lighting must be controlled to allow at least 50% of it to be turned OFF at night (but no more than 90%). Must allow minimum of two night-time periods with independent lighting levels. An override function that turns ON exterior lighting during its scheduled dim or OFF state for a period of no more than 2-hours when an override is initiated is allowed.

Note 3: Motion sensors on exterior luminaires should have a maximum time delay of 15 minutes and be capable of reducing outdoor lighting power by at least 50%, but no more than 90%, and separately turn OFF exterior luminaires during unoccupied period (HIGH-LOW-OFF). A single sensor cannot control more than 1500W of exterior lighting load.

Electrical

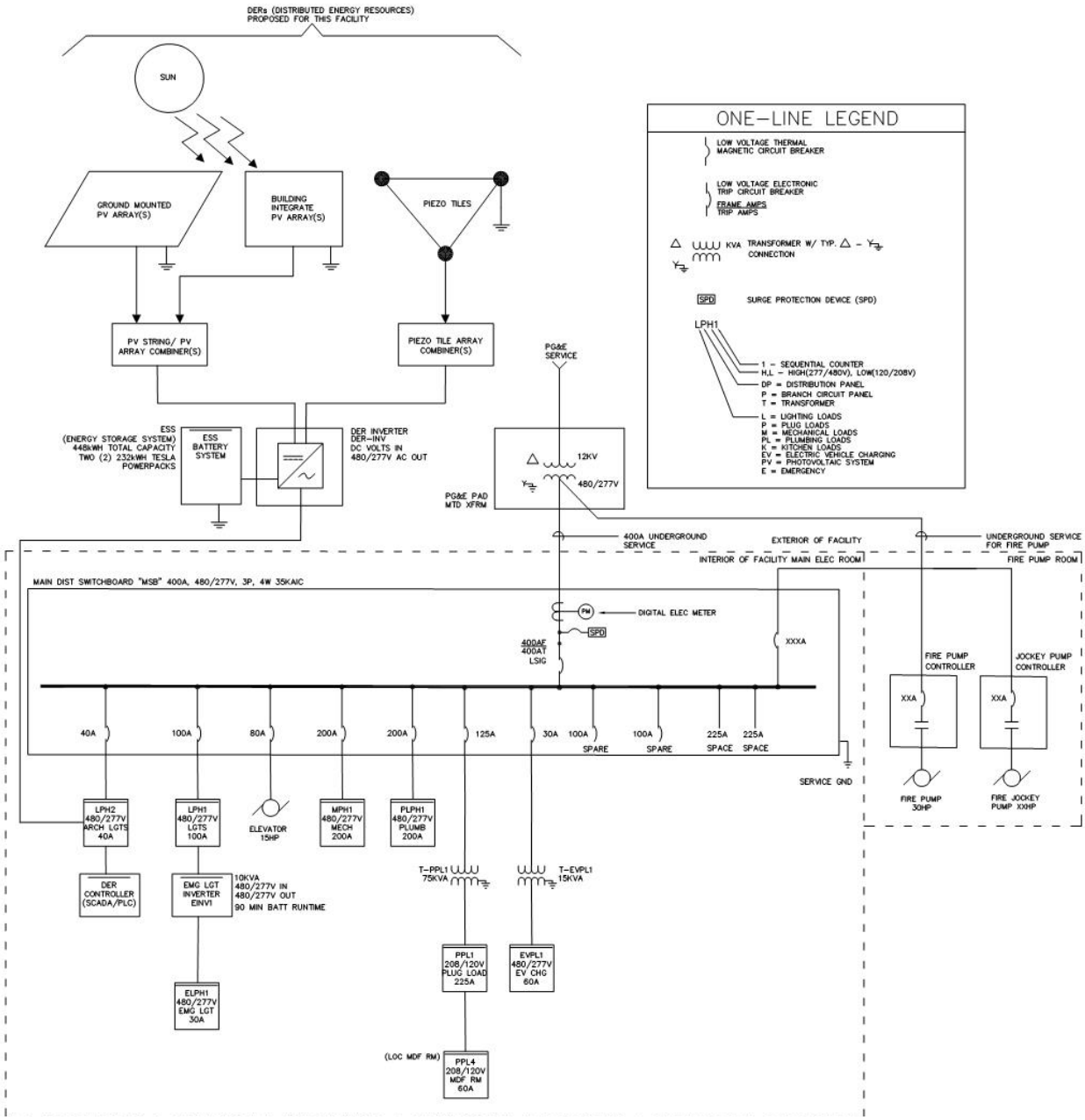


Figure 06-4: Electrical single line diagram

Telecommunications and Security Systems

The technology infrastructure will be comprised of spaces, pathways, grounding backbone, cabling, and administration, intended to support voice services (digital signals from a telephone system), network services (IP-based Ethernet signals and other data-type signals), and future technology services.

MPOE (Main Point of Entry) connectivity to street:

- The MDF (main distribution frame) will be the MPOE for this facility. No additional IDF rooms are anticipated. The main incoming backbone cabling (fiber cabling and twisted pair copper cabling) will terminate in, and the intra-building backbone cabling will originate from, the MDF room.
- The MDF will contain standard 7’ high by 19” wide (mounting) equipment racks with vertical cabling sections at the row ends and between each rack. The quantity of racks, and ultimately the resulting size of the MDF, will be determined by the size of the room’s service area.
- The phone service will support elevator, fire alarm, and the emergency responder radio coverage system (ERRCS)
- Rack mounted UPS systems with 15-minute battery runtime will be provided to provide uninterrupted power for server racks and other rack mounted equipment.

Structured Cabling System (SCS):

- A structured cabling system should be provided to support multiple applications (such as voice, data, and video) and other building systems. The SCS will be designed and constructed compliant to industry standards and for compatibility with multiple systems initially and well into the future.
- The SCS will be comprised of backbone cabling, horizontal cabling, and connecting media. The SCS and the building pathways are closely coupled in design and use (as the pathways fulfill conveyance of the cables).
- The backbone cabling will be comprised of twisted pair and fiber optic cables, termination apparatus at both ends, patch cords/cross-connects, labeling, and testing.
- The horizontal cabling will be comprised of cables, termination apparatus in the MDF, connectors and outlet assemblies at the work areas, patch cords/ cross-connects, and labeling.

Security

The facility is recommended to be provided with an electronic security system for controlling and monitoring access. This system should include controller boards, wiring/cabling, software and hardware.

Access Control System:

- The access control system will be card reader based and will be programmable to define which users are given access to specific spaces. The system will be programmable to lock and unlock a group of or individual doors at specified times.
- The security system equipment/racks will be provided with rack-mounted UPS system with a 15-minute runtime.
- Recommended card reader locations:
    - Each perimeter doors (entry and egress) will receive a card reader.
    - Entrances to staff/greenroom suite.
    - MDF room.
    - Elevator Interface: The access control system should also interface with the elevator conveying system. This interface will allow the security system to disable either car call or floor call (depending on the elevator system). The elevator car's traveling cable should contain the cabling connections described herein.

Video Surveillance System:

- The video surveillance system will be based on IP (internet protocol) video surveillance products and software. The video surveillance system will consist of the following:
    - Cameras: the cameras will be IP and "PoE" (powered over ethernet). Cameras will be selected based on compatibility for the specific locations.
    - Cabling: one category cable to each camera. These cables will originate from the MDF room or where the security system equipment/racks will be located.
- Fields of View: Cameras will be located to capture the following fields of view:
    - Main entrances and exits, strategic locations within the exhibit hall, public restroom entrances, elevator landings, and strategic intermittent locations along the accessible pathway and stairways.
    - Cameras should be located to capture as many views as possible.
    - Cameras should be visible but located in a sensible manner to avoid the appearance of "being watched".

Fire Alarm Systems

Per CFC 907.2.1.1, a voice evacuation system will be required for this facility as there is a possibility that the occupant load of the facility may equal or be greater than 1000 occupants. The new fire alarm system should be addressable and should comply with latest version of NFPA 72.

- Provide new notification (strobe, speaker-strobe, etc.) and initiation devices (smoke detectors, heat detectors, duct detectors, etc.) in all areas and floors of the building where required by Code.
- Provide addressable manual stations where required by Code.
- Smoke detectors should be provided for elevator capture, HVAC system control, IDF rooms, and other areas required by Code. HVAC systems should be provided with duct detectors where the supply rating is greater than 2000 CFM. Provide addressable relay modules adjacent to any single HVAC controller and program them to shut down each air-handling unit in response to an alarm generated by its associated detector.
    - Visual evacuation signals should be visible in the evacuation path. Signals will be located no more than 10 feet from exit doors and no more than 100 feet on center in corridors. Signals should also be installed in restrooms, common use areas, and rooms larger than 2000 square feet. Strobes should meet ADA requirements. All commonly visible strobe devices should be synchronized.
- Provide a minimum of one (1) audible/visual notification device and one (1) manual pull station at the stairwell door(s).
- The fire alarm control panel, sub-panels, and terminal cabinets are to be located within electrical rooms, or at a location that is secure (i.e. no public access), or where directed by the Owner.
- A remote annunciator panel should be provided at the security office, or where directed by Owner.
- The FAS system should monitor all fire sprinkler system flow switches, valve tamper switches, isolation valves, and fire protection systems.
- The FAS should release magnetically held-open doors and fire shutters (if any).
- Power for door magnets (where required by Code) should be provided by the FAS. Magnet hardware should be provided by the door hardware supplier.
- The system should also signal the building security system to unlock select doors upon alarm and release any delayed-egress hardware.
- All fire alarm wiring should be installed in raceways, raceway fill should be no more 40%.
- Provide 15% spare capacity for future expansion of Initiation and Notification Circuits.

Plumbing

Plumbing updates to the building consist of new systems from street main inward including risers and horizontal distribution of sanitary, domestic, vent, storm, and provided where required to support the building needs. Services have capacity to support exhibit area and back of house uses.

Domestic Cold Water

- A 3" DCW POC for the public restrooms on the south end and a 2" DCW POC for staff restrooms on the north end will be provided. Domestic water service connection location to be determined. Refer to Civil drawings for the remote reduced pressure backflow preventer and water meter locations.
- If SJLT preferred to have the water meter inside instead of the remote meters, water meters will be provided at the water risers in the mechanical/storage rooms. Water meters to be connected to the BMS system.
- Water meter will be provided and connected to BMS system for usage monitoring.
- Pipe sizing will be based on CPC fixture unit sizing criteria plus equipment and mechanical make-up water demand. Velocities will be maintained to below 6 fps.

Domestic Hot Water

Point of use electric water heaters will be provided as below:

- (4) 15 kw point of use water heaters will be provided in Men's, Women's restrooms, Kitchen sink, and Janitor room.
- (2) 3 kw point of use water heaters will be provided in the single use restrooms.
- (1) 64 kw point of use water heater with a 5-gallon tank will be provided for the Staff shower/changing rooms. The addition of a 5-gallon storage tank will help to reduce the "sandwich" effect on the water heater for small loads.
- Pipe sizing will be based on CPC fixture unit sizing criteria. Velocities will be maintained to below 4 fps.

Sanitary Sewer and Vent

- A new 6" sanitary sewer connection will be provided on the west side of the building. Refer to Civil drawings for the sanitary sewer continuation to the existing 36" sewer main on site. The sanitary line shall be sloped at 2% minimum. The invert elevation is TBD.
- Multiple floor sinks will be provided for the equipment drainage and floor drains for general areas.
- Condensate waste from air handling units, fan coil units, condensing boilers will be routed to the nearest floor sinks or waste receptors.

Plumbing

- If condensate can't be gravity drained to a waste receptor, condensate pumps will be provided by Division 23 Contractor.
- Condensate pans and overflow sensors are provided by Division 23 Contractor. All condensate drain piping (gravity or pumped) shall terminate over service sink, floor drain or floor sink.
- It is assumed that underground piping are not supported from the structure – to be verified once the Geotech report becomes available.
- Pipe sizing will be based on CPC fixture unit sizing criteria at the minimum of 2% slope.

Grease Waste and Vent

- For the sink in the kitchen area, an above-slab hydro-mechanical type grease interceptor will be provided below the sink to collect the grease. Size to be determined.
- Pipe sizing will be based on CPC fixture unit sizing criteria at the minimum of 2% slope.

Storm Water

- There will be (2) 10" relocated storm water mains along the west and east sides of the building. Refer to Civil drawings for the routing.
- Four (4) 6" storm water POCs from the open space will be provided, (2) on the west side and (2) on the east side. The exact locations of the storm POCs are to be determined.
- Assumed sub-surface and perimeter drainage to be designed by Civil and not in plumbing scope of work.
- Storm water drainage for the ram way on the east side will be provided via trench drains at the edge of the plaza. Size is to be determined.

Natural Gas

- No natural gas service is anticipated.

Irrigation Water

- An IRR POC with backflow prevention will be provided for landscape area. Size and location to be determined.

Plumbing

Plumbing Fixtures

- Commercial Water Closet: American Standard AFWALL or approved equal, low flow dual flush valve 1.28 gpf, ADA compliant.
- Commercial Urinal: American Standard Washbrook or approved equal, 0.125 gpf flush valve, ADA compliant.
- Commercial Lavatory: American Standard Aqualyn or approved equal, 0.5 gpm.
- Commercial Shower: American Standard: Sterling ADA shower stall or approved equal, ADA compliant, 1.5 gpm.
- Commercial Sinks: Just Sinks ADA compliant, stainless steel under counter mount sinks with 1.5 gpm single lever high spout faucet.
- Commercial Service Sink: Floor mounted molded stone mop sink with wall mounted faucet, 2 gpm.

Plumbing Piping Material

- Domestic Cold and Hot water pipe: Water piping, interior above grade will be copper tube (ASTM B88), Type L, soldered for 2-1/2" and smaller and brazed joints for 3" and larger. Cold water, hot water piping, supply and return, will be insulated.
- Sanitary waste/vent pipe: Below ground will be cast iron ASTM A74 service weight No-Hub pipe with heavy duty shielded couplings (80 lb torque) with elastomeric gaskets, copper DWV ASTM B306 with soldered joints. Above ground will be cast iron ASTM A888 or CISPI 301 service weight No-Hub pipe with heavy duty shielded couplings (80 lb torque) with elastomeric gaskets, copper DWV ASTM B306 with soldered joints.
- Condensate Drain piping: Copper Type L with pressure fittings, ASTM (B88) and soldered joint for 1" and smaller. Copper Type DWV, ASTM (B306) or Type N, ASTM (B88) with soldered joint for 1-1/2" and larger.

Fire

Fire protection systems are composed of a complete and automatic wet and dry sprinkler systems for the ground floor, and a fire pump for the elevator shaft and covered stair landing areas.

- A recent hydrant flow test shall be obtained for the available water flow and pressure on site.
- (1) 6" fire service will be provided for the building near the fire pump room. The fire pump room shall have an exterior access door. The fire pump location is to be determined.
- The fire pump is electric-driven and shall be connected to the emergency power or a reliable source of power. Refer to Civil drawing for the remote double check valve back flow preventer for the fire water service.
- A 30 hp fire pump will be provided to boost the pressure for the sprinkler heads in the elevator shaft, stairs (fully enclosed or more than 50% partly enclosed) as well as in the covered landing areas (more than 4' in width as required if constructed with combustible materials). A second source of fire water storage (estimated 6,000 gallon) will be provided to meet the sprinkler demand and hose stream demand for 30 minutes for light hazard classification. Coordination with the Fire Marshal will be undertaken to verify the specific requirements in these areas. Fire pump and storage tank sizing will be verified once the hydrant flow test becomes available.
- For the lower level, sprinkler demands are not needed to connect to the fire pump. Provide wet sprinkler piping for the enclosed fully conditioned and semi-conditioned spaces. For the unconditioned exhibition spaces, provide dry sprinkler piping for the areas exposed to freezing.
- Standpipes will be provided at both north and south stair wells.
- The sprinkler piping in the exhibition space will be routed in the pocket/block-out with the concealed sprinkler head with the sprinkler cover plate flush with the bottom of the concrete ceiling slab. Coordination with Structural will be undertaken.
- Sprinkler test drain will be routed to the hub drain to sanitary.
- Provide appropriately sized fire department connection with proper signage. Location is to be determined.
- A complete automatic wet-system and associated equipment will be provided for the ground floor for operation in accordance with NFPA 13. The design of the automatic wet and dry pipe sprinkler system shall be:
    - Building Service Areas: Ordinary Hazard, Group 1
    - Electrical Equipment Rooms: Ordinary Hazard, Group 1
    - General Storage Areas: To be determined based on commodities
    - Mechanical Equipment Rooms: Ordinary Hazard, Group 1
    - Office and Public Areas: Light Hazard
    - Kitchen Service Areas: Ordinary Hazard, Group 1
    - Fuel Oil System Areas: Extra Hazard Group 2

Fire

- Minimum Density for Automatic Sprinkler Piping Design:
  - Light Hazard Occupancy: 0.1 gpm over 1,500 sq. ft.
  - Ordinary Hazard Group 1: 0.15 gpm over 1,500 sq. ft.
  - Ordinary Hazard Group 2: 0.2 gpm over 1,500 sq. ft.
  - Extra Hazard Group 1: 0.3 gpm over 2,500 sq. ft.
  - Extra Hazard Group 2: 0.4 gpm over 2,500 sq. ft.
- Minimum Protection Area per sprinkler: Per UL listing
  - Office and Public Spaces: 225 sq. ft.
  - Storage Areas: 130 sq. ft.
  - Mechanical Equipment Rooms: 130 sq. ft.
  - Electrical Rooms: 130 sq. ft.
  - Other Areas: According to NFPA 13 recommendations unless otherwise indicated.
- Total combined hose stream demand requirement: 250 gpm
- Sprinkler schedules
  - Rooms without Ceilings: Upright sprinklers.
  - Rooms with Suspended Ceilings: Recessed sprinklers.
  - Wall Mounting: Sidewall sprinklers.
  - Spaces Subject to Freezing: Pendent, dry sprinklers.
  - Special Applications: Extended-coverage, flow-control, and quick-response sprinklers where indicated.
  - Provide protective sprinkler guards where pendant heads are subject to damage (mechanical rooms)
- Fire protection materials
  - Steel Pipe and Fittings: Standard weight, galvanized and black steel pipe, ASTM A 53/A 53M, Type E, Grade B. Pipe ends may be factory or field formed to match joining method.
  - Schedule 40, Black-Steel Pipe: ASTM A 135 or ASTM A 795/A 795M, Schedule 40 in NPS 5 and smaller; and 2013-NFPA 13-specified wall thickness in NPS 6 to NPS 10, plain end.
  - Galvanized- and Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.
  - Galvanized and Uncoated, Steel Couplings: ASTM A 865, threaded.
  - Galvanized and Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- Fire protection specialties
  - All valves shall be UL listed FP approved with minimum pressure rating of 200 psig.
  - Sprinkler specialty pipe fittings
  - Alarm
  - Pressure gages
  - Special fire protection system such as pre-action system.

END OF SECTION

07 | Site Access, Hardscape, Landscaping

Abstract:

Breeze of Innovation has a unique relationship to the building site. The proposed location in the northwest portion of Arena Green optimizes visual impact and public access. The site's proximity to the Guadalupe River corridor places the tower within a larger regional landscape ecosystem characterized by mixed riparian forests and woodlands, seasonal grasses, understory species, and a sunny Mediterranean climate. Located in the central portion of the Guadalupe River Park, Breeze of Innovation will be an iconic landmark within an existing framework of major destinations and points of interest. The tower is just a short 5-min walk from Diridon Station, the primary multimodal transit hub for the Silicon Valley, and a block away from the main entrance to the SAP Center, making it perfectly situated to support events and festivals throughout the year. The importance of making inter-connections to the rest of the Guadalupe River Park is critical to the activation and success of the tower, this is achieved through a seamless use of hardscape materials and direct connections to surrounding walkways and primary arrival points. The design team has also considered several enhancements to the immediate park surroundings to further activate and integrate Breeze of Innovation into the larger park system. These potential enhancements include; habitat restoration and exhibition gardens along the river's eastern and western banks, a new pedestrian/bicycle bridge, and elevated boardwalks along the river to bring people closer to nature while preserving sensitive riparian flora and fauna.

References:

WP-08 (January 2021) **Site Constraints, Utilities and Flood Considerations - BKF**

WP-12 (January 2021) **Construction Sequencing and Feasibility Study - MKA**

Exhibits:

Relation to Riparian Corridor

The project site is adjacent to the Guadalupe River corridor, providing direct connections to the river's rich natural habitat and vegetation. The downtown section of the river corridor flows through Guadalupe River Park in the heart of downtown San Jose. The combination of man-made flood protection elements and preserved river ecology characterize this section of the river.

The proposed site design is composed of a series of landscape 'strips' that are inspired and informed by the various iconic Northern California landscapes that the Guadalupe River flows through.

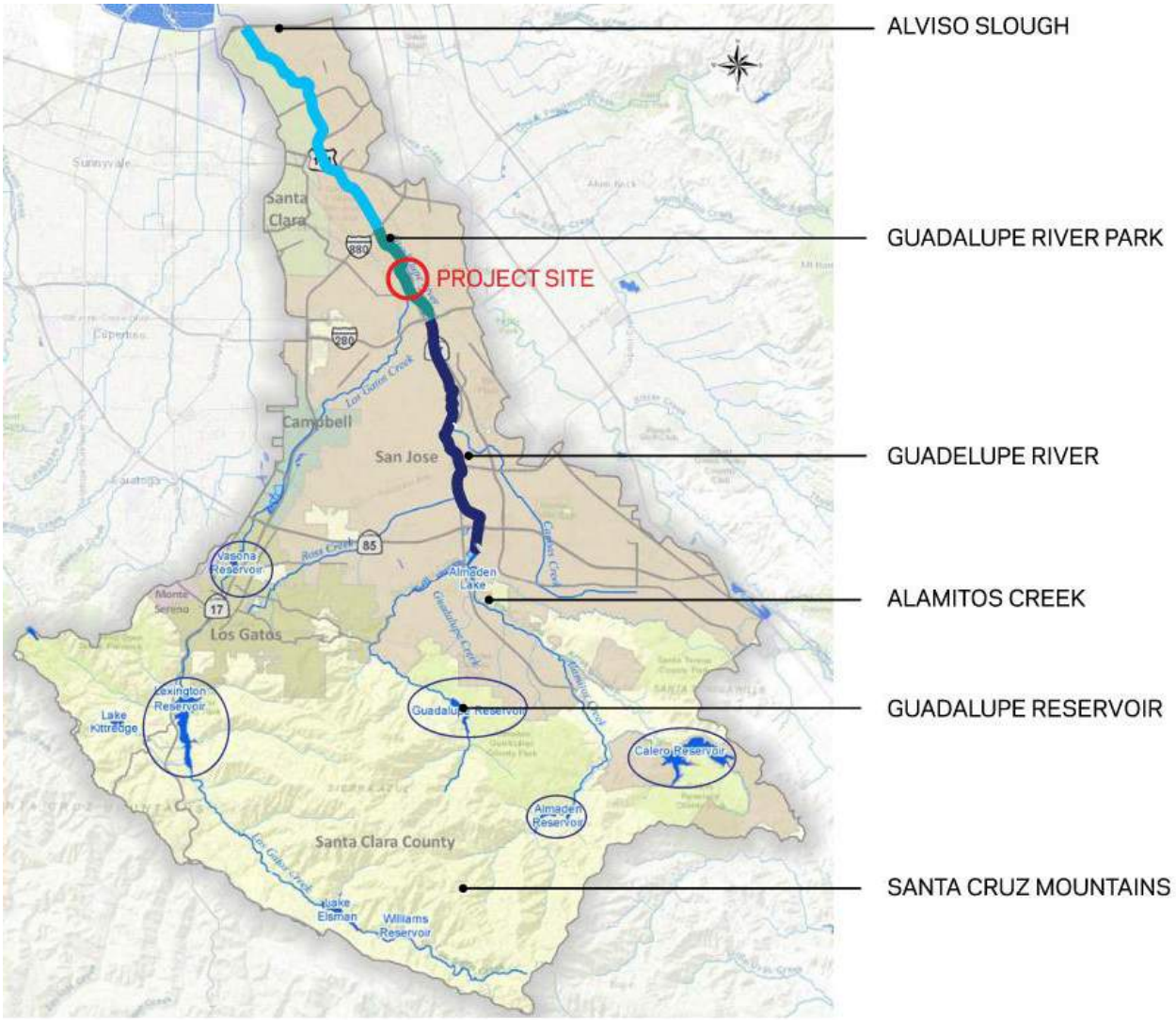


Figure 07-1: Guadalupe River Watershed – Ecosystem Map

Relation to Riparian Corridor

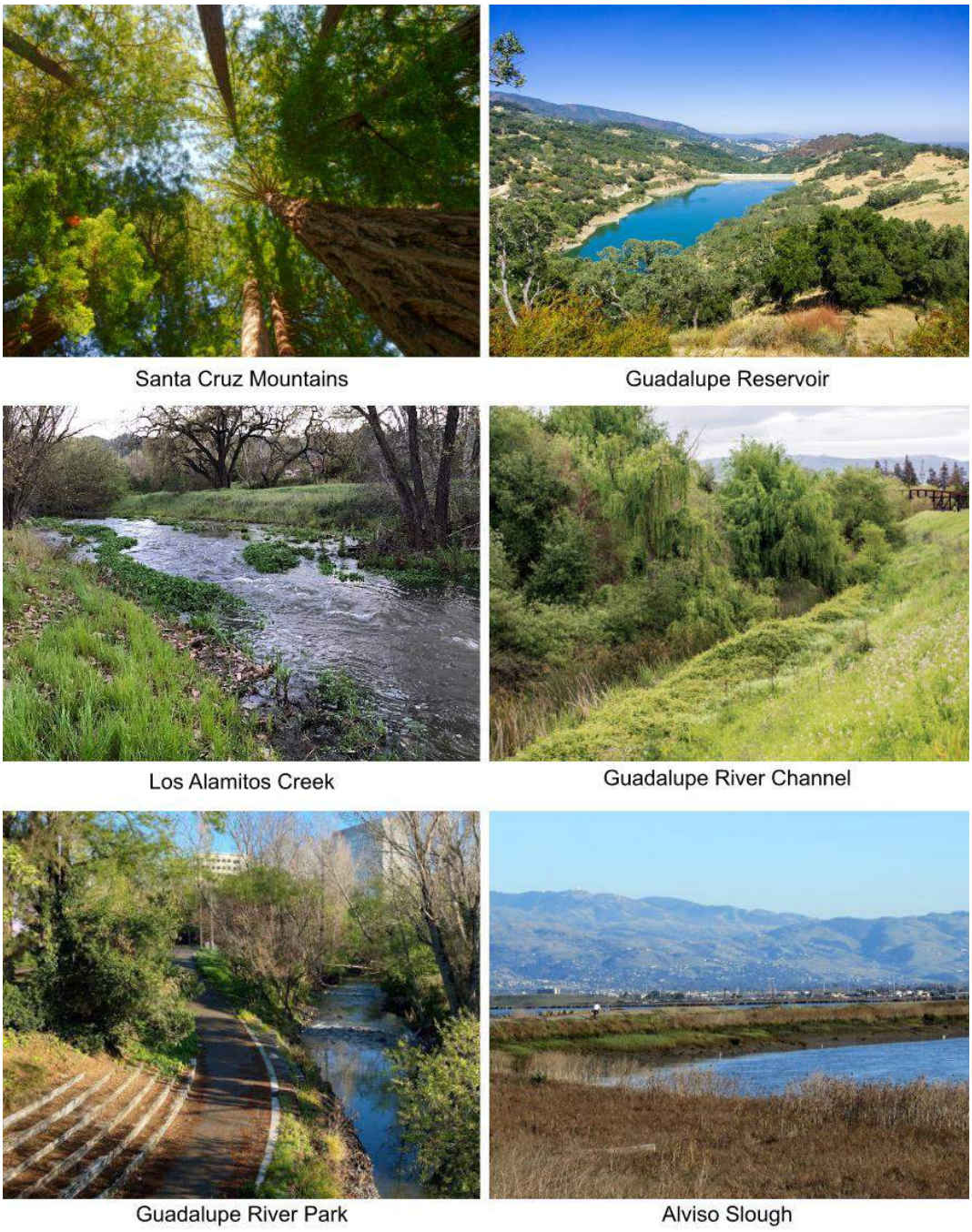


Figure 07-2: Guadalupe River – Landscape Typologies

Site Access

By car:

- The site is bordered by W. St. John Street to the north, N. Autumn Street to the west, and W. Santa Clara Street to the south. The closest public parking stalls are located along N. Autumn Street located directly along the western side of the site.

Transit:

- Diridon Station, San Jose's central passenger rail depot, is a 5-minute walk from the site, and is served by Caltrain, ACE, VTA light rail, and Amtrak trains. The bus plaza at the station is served by Amtrak Thruway Motorcoach, Greyhound, Megabus, Monterey-Salinas Transit, Santa Cruz Metro, and VTA buses.
- In addition, the nearest VTA bus stops are located south of Arena Green along W. Santa Clara Street.

By pedestrian:

- The site is bordered by ADA accessible sidewalks along W. St. John Street to the north, N. Autumn Street to the west, W. Santa Clara Street to the south, and an ADA accessible trail runs along the east side of the site at the river corridor. The project proposes to provide accessible pedestrian walkways to each of the surrounding streets and the river trail to promote site connectivity and universal accessibility to all visitors.

Event/Service staff:

- For event/service staff there is parking along W. St. John Street and there will be service access from the parking area to the building entries for people, equipment, and catering for events.

Site Access

Figure 07-3: Site Access

Planting

See Figure 07-4 for representative planting palette, see Figure 07-5 for planting zone concept

The planting design for the project site is informed by the rich riparian forest and woodland plant communities that are found along the Guadalupe River corridor. Characterized by an abundance of native plants, shrubs and trees.

The project site is envisioned to include four distinct planting zones:

- Mixed Riparian Forest and Woodland. This zone will provide a forested setting for the building along it's north, west, and south sides, and will be comprised of a mix of tree species including California Sycamore, Coast Live Oak, and Valley Oak. The forested zones are located along the east and west boundaries of the project site and will provide both a visual and acoustic buffer to the busy Guadalupe Parkway and N. Autumn Street.
- Native Ground cover
    - This landscape zone will be a native meadow comprised of grasses, perennials, and shrubs. Representative species include ceanothus, manzanita, fescue, and yarrow.
    - Low maintenance no mow native grass is proposed for the on-structure planting in between the 5' x 5' grid of 8" rods.
- Multi-Use Lawn. This zone is proposed along the building site's eastern side to provide a multi-use ground cover and connection to the existing lawn areas along the river trail. Existing lawn areas to the east and west are to be maintained and will provide an opportunity for flexible public programming including markets, pop-up events and festivals to be integrated with the Breeze of Innovation Landmark.
- Riparian Vegetation. High quality riparian vegetation on the western bank will be maintained and/or enhanced. Lower quality vegetation on the eastern bank presents the opportunity for value-add via the enhancement of riparian habitat and the integration of user experience, offering moments to be immersed in nature.

Existing Trees. (see Figure 6 for images of existing trees) Many of the existing site trees that will be impacted due to proposed construction are Coast Live Oaks (Quercus agrifolia) that appear to be approximately 30 years old. An estimated 75 to 100 trees will either need to be removed or relocated as part of the project. The landscape design intent is to relocate as many high-quality existing trees as feasible to the forested landscape zones on the east and west side of the project site. The total number of trees relocated will be dependent on arborist review and recommendations as well as the project budget.

Planting

Coast Live Oak
Quercus agrifolia

Valley Oak
Quercus lobata

California Sycamore
Platanus racemosa

Mow Free Sod
Combination of Fine Fescues
(semi-intensive soil depth min. 8")

California Fescue
Festuca californica

White Yarrow
Achillea millefolium

San Bruno Bearberry
Arctostaphylos uva-ursi

Figure 07-4: Representative Planting Palette

Planting

Figure 07-5: Landscape Zones Concept Plan

Planting

Figure 07-6: Existing trees on the site

Irrigation; Hardscapes; Maintenance

Irrigation

Irrigation design plans will follow the California Model Water Efficient Landscape Ordinance (MWELO) to the fullest degree.

Hardscapes

In order to promote connectivity to the Guadalupe River Park system, Breeze of Innovation seeks to match the existing park hardscapes where appropriate.

- Cast in place concrete walks will tie into existing park walks and the surrounding sidewalks and will utilize the same concrete mix design and finish as the existing concrete walks throughout the Guadalupe River Park.
- At the Confluence Entrance to the east of the building site, granite pavers like those used at other significant locations in the park will be used to punctuate this prominent entry along the river corridor.
- At the level 1 plaza, stabilized decomposed granite will be the primary hardscape material, providing a permeable and ADA compliant surface.

Maintenance

The design proposes the use of durable and long-lasting hardscape materials, many of which already exist throughout the park today. Similarly, the proposed planting design is comprised of plant species that have a proven track record of thriving in dense urban areas.

Figure 07-7: Hardscape Material Palette

END OF SECTION

08 | Site Constraints, Utilities & Flood Considerations

Abstract:

The park and competition sites are constrained to the east by the 100-foot riparian setback and the Santa Clara Valley Water District (SCVWD) setback. The 100-year flood elevation in Guadalupe River is also a constraint that needs to be considered in the grading design. Although the project site is outside of the SCVWD setback and generally above the 100-year flood elevation, any regrading work along the east side of the side needs to consider the flood elevation.

References:

WP-05 (January 2021) **Program Assumptions and Use Requirements – MBH/SMAR**

WP-06 (January 2021) **MEP, Fire, and Technology Systems - HOK**

WP-07 (January 2021) **Site Access, Hardscape, Landscaping - HOK**

WP-12 (January 2021) **Construction Sequencing and Feasibility Study - MKA**

Exhibits:

Figure 08-1: Site plan

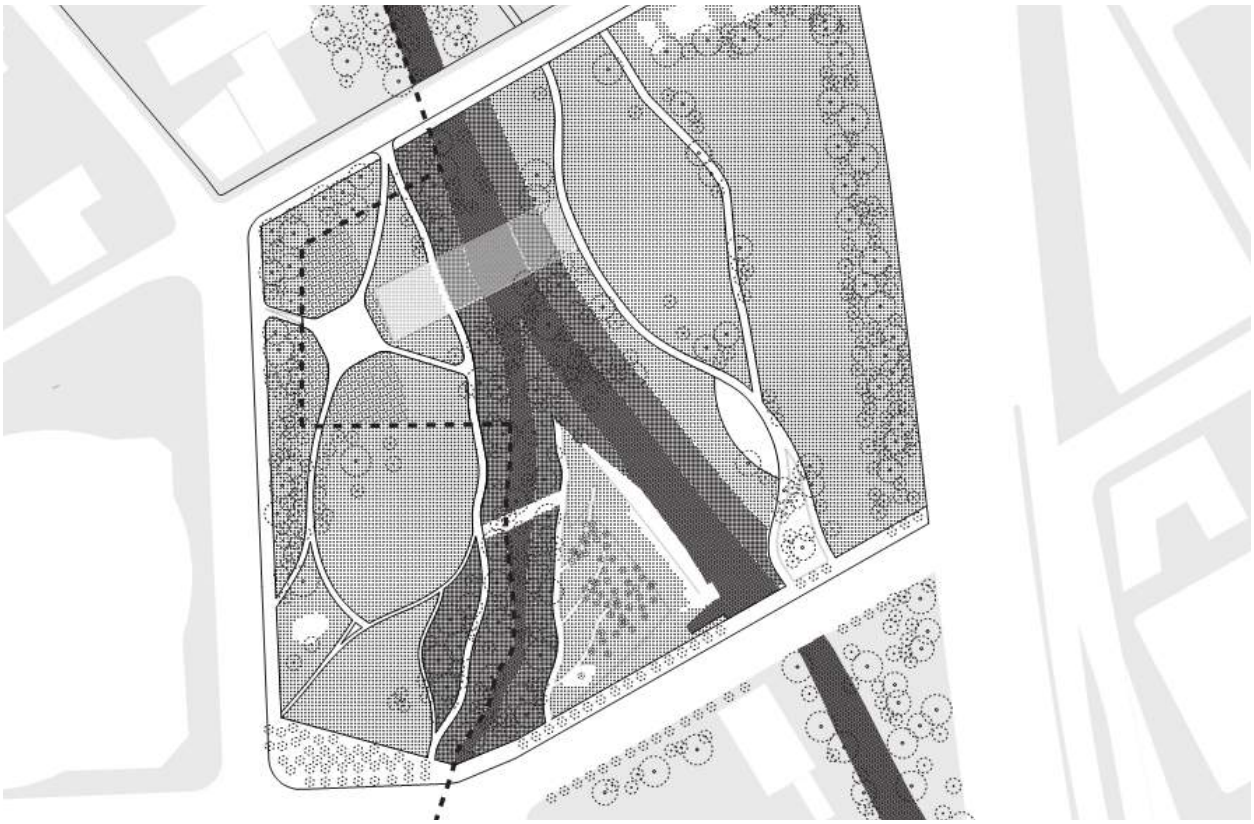


Figure 08-1 Site plan

Storm Drain

The public storm drain system in N. Autumn Drive and West St. John Street is owned by the City of San Jose. Based on the City GIS maps, there is a 42” storm drain line in N. Autumn Drive and a 48” storm drain line in West St. John Street. Within the park area, there is a small private storm drain system that collects runoff from the park and conveys it in a 10” storm drain line that runs south to north and connects to the 48” storm drain line in West St. John Street. The 10” line is within the footprint of the proposed Light Tower and will need to be relocated as shown on Figure 1.

The private storm drain system will also need to be extended to collect runoff along the west side of the Light Tower. The new system will connect to the existing 10” line on site.

Sanitary Sewer

The public sanitary sewer system in N. Autumn Drive and West St. John Street is owned by the City of San Jose. Based on the City GIS maps, there is a 36" sanitary sewer line in N. Autumn Drive and West St. John Street. The City GIS maps do not show any sewer lines within the park area.

To serve the Light Tower, a new sanitary sewer lateral is proposed to connect to the 36" sewer line in N. Autumn Drive. The approximate invert elevation of the 36" sewer line is 70, which is lower than the finish floor elevation of the Light Tower. A sewer pump within the building is not anticipated.

Water

The public water system N. Autumn Drive and West St. John Street is owned by San Jose Water. Based on site observations, there are existing irrigation services to the park area on both N. Autumn Drive and West St. John Street.

A new domestic and fire water service will be installed to serve the Light Tower. These services are planned on West St. John Street. The domestic service will require a water meter in the sidewalk. Both services will require an above grade backflow preventer installed behind the back of sidewalk within the park area. The fire service will also require a fire department connection accessible to the fire department. The fire department connection needs to be within 50' of a fire hydrant. Depending on the exact location of the new fire service and fire department connection, a new public fire hydrant may be required.

Electrical

Electrical service is provided by PG&E. There are overhead electrical lines on West St. John Street. A new electrical service will be required to serve the Light Tower. The electrical service will require a new pad-mounted transformer that requires truck access. The transformer is planned to be located along the north side of the site on West St. John Street. PG&E will determine the point of connection and routing of the new electrical service from their facilities to the transformer.

Telephone

AT&T provides telephone service in the area. A new service will be required to serve the Light Tower. AT&T will determine the point of connection and routing of the new telephone service from their facilities to the building.

Grading

The existing site elevations range from 83' to 85' (NAVD 88). The site grades generally fall from the south to the north. The ground floor elevation of the Light Tower is about 72.5'. The site will be excavated down to the bottom of the foundation. Under the foundation, the soil will be over-excavated and re-compacted based on the geotechnical recommendations. The finish site grades will gradually slope up from the existing elevations to the first floor elevation of approximately 92'.

Given the close proximity to Guadalupe River, groundwater will likely be encountered during excavation. During construction, any groundwater will need to be managed by the contractor to provide a dry work area. For the Light Tower, a perimeter subdrain system will likely be needed to actively drain groundwater away from the foundation walls.

Guadalupe River and Los Gatos Creek and large drainage systems within San Jose. The Downtown Guadalupe River Flood Protection Project was completed in 2004 and increased the capacity of the river to convey the 100-year flow. FEMA flood profiles show the 100-year flood elevation at the confluence of Guadalupe River and Los Gatos Creek to be elevation 83. The grading design of the ramp on the east side of the Light Tower needs to consider the 100-year flood elevations. The top of the ramp should not be lower than elevation 83 as this could allow 100-year flood waters to flow down into the ground floor. A further detailed study of the grading, flood elevations and allowable grading within the SCVWD setback will need to be completed during the detailed design phase of the project.

Stormwater Management

The site design will need to incorporate Low Impact Design (LID) strategies to help manage stormwater runoff from impervious surfaces. In order to maintain the existing peak stormwater flow rates from the site, runoff from new impervious surfaces should be directed to landscaped areas to help reduce the peak runoff rate. Specific stormwater management features (i.e. bioretention areas) can also be used to treat the runoff before it enters the public storm drain system and help reduce the peak flow rate.

END OF SECTION

09 | Power Generation Systems

Abstract:

One of the innovations central to the concept of the Breeze of Innovation is its power generation component and the interactivity with the environment and visitors. Harnessing movement of wind, physical activity, and sunlight to the tower will provide energy generation and storage on site that is used to light the rods, pathways, and exhibit spaces respectively.

Throughout the day, this interaction is captured in the swaying rods above the observation platforms, changing dynamics of light and shadow across the tower and its exhibits spaces below, and active storage of footsteps through piezo energy. At night, this is reflected in an interactive lighting display, with the tip of the rods illuminated in concert with the energy of the wind, a vibrant lighting cloud powered by the walking, running, and jumping steps of visitors, while daytime stored energy provides reliable and constant lighting as required by code. Demonstrating sustainable stewardship through LEED Certification and Zero Net Energy through an all-electric (carbon neutral) building are critical to the Breeze of Innovation.

The following is a description of power generation systems and components central to the concept of on-site generation, along with applicable notes from due diligence phase. Where applicable specific product or manufacturer information has been provided. Energy generation systems have been developed as a matrix response to align bespoke energy generation systems with the associated lighting system, building system, and/or other site wide energy demands. Each lighting system across the project can be complemented through a renewable energy system.

References:

WP-05 (January 2021) **Program Assumptions and Use Requirements – MBH/SMAR**
WP-06 (January 2021) **MEP, Fire, and Technology Systems - HOK**
WP-10 (January 2021) **Specialty Lighting - Niteo**
WP-11 (January 2021) **LEED Requirements and sustainability - HOK**

Exhibits:

POWER GENERATION SYSTEMS

An Icon for the Future

Connecting with the Planet

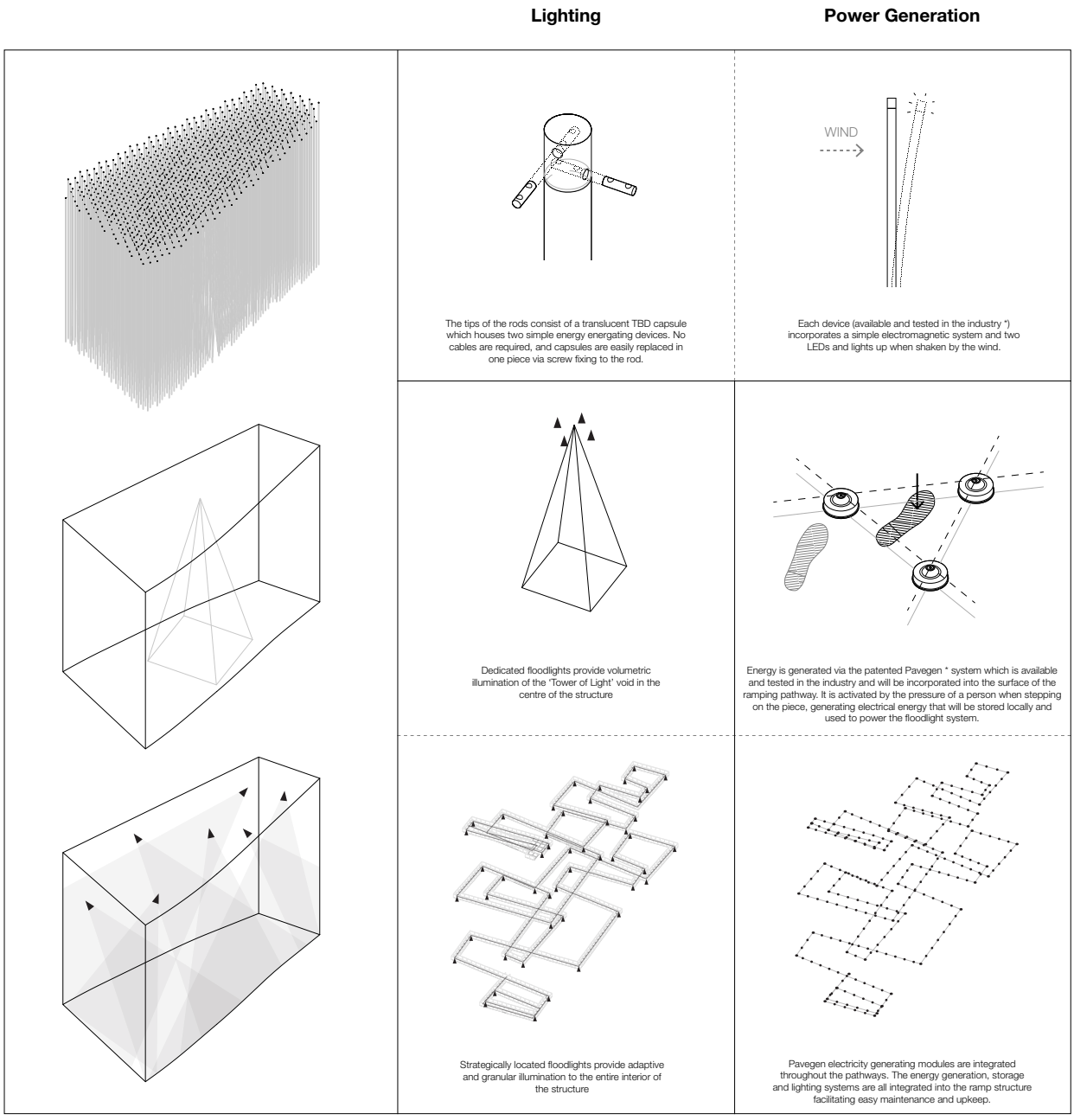


Figure 09-1: Illustration of wind driven and pedestrian driven power generation systems

Lighting Types

The Lighting effects throughout the Breeze of Innovation tower are interactive: dynamic in illumination of the structure. Energy generation systems have been developed to create an engaging effect through interaction between lights and environmental/physical phenomenon with: wind, physical footfall, and sun.

Rod Tops

- Illumination Intent: Wind Powered
- Energy Interaction/Generation: Enclosed Electromagnetic Actuators

Structure – 4D Cloud

- Illumination Intent: Floodlights
- Energy Interaction/Generation: Piezoelectric Tiles

SJLT Representation

- Illumination Intent: Framing Projectors from Above
- Energy Interaction/Generation: Piezoelectric Tiles

Underground / Gallery

- Illumination Intent: Architectural Lighting
- Energy Interaction/Generation: Solar Pavement

Bridge Paths

- Illumination Intent: Lighting at Approach Path
- Energy Interaction/Generation: Piezoelectric Tiles

Landscape Pathways

- Illumination Intent: Moon lighting from trees
- Energy Interaction/Generation: Solar Pavement

Structure Ramps

- Illumination Intent: Flood Lights (same fixture type as Cloud 4D)
- Energy Interaction/Generation: Piezoelectric Tiles

Rod Tops

Electromagnetic Actuator (Motion Powered Lights)

Battery Free Enclosure

- Electromagnetic actuators capture motion in a straight or circular motion to power motors, lights, or generate energy.
- Adapting this technology, Motion Power Lights are proposed for the tips of the 1,000 rods. A singular encased component is comprised of electromagnetic actuators and an array of LED bulbs.
- Each sway of the pole causes a multi-directional displacement of two electromagnetic cores.
- Each actuation generates 0-2 watts of electrical energy (based on sway, vibration and direction of force). A rapid strong movement will create a strong burst of light, while slow steady movement will create a flicker.

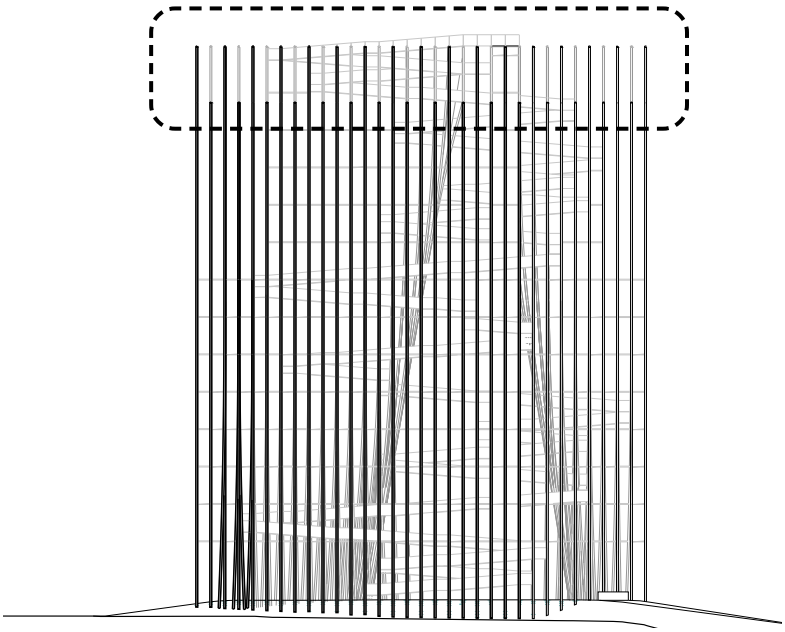


Figure 09-2: Wind Inspired Energy Generation

Rod Tops

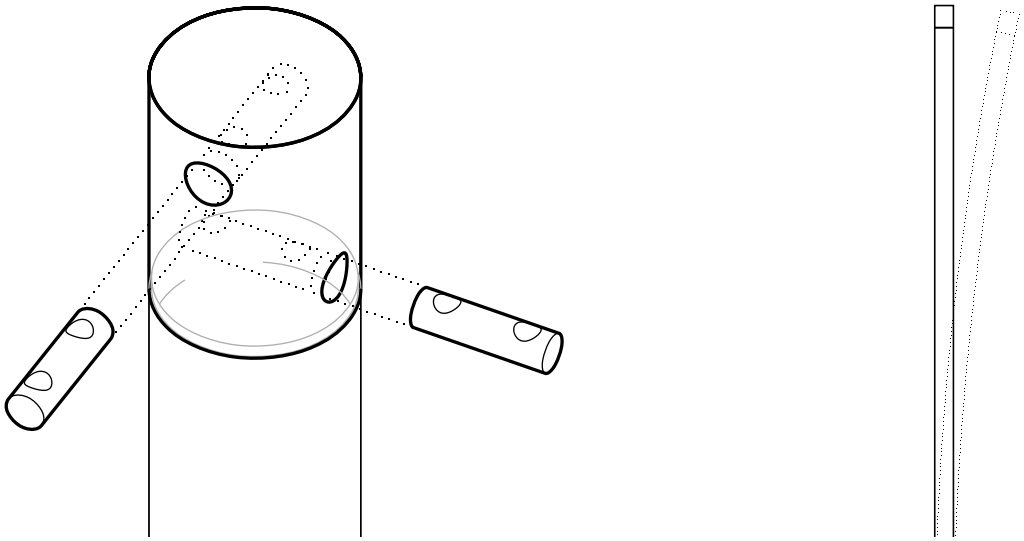


Figure 09-3: Rod top concept

- Distributed LEDs collect the energy and illuminate an acrylic dome with lens shaped to amplify the light.
- Motion Powered Lights are characterized by the following:
    - Battery free: Powered by motion
    - Hypersensitive: Powered by even the slightest movement
    - Bright: 150 Lumen intensity (up to 2 watts)
    - Visibility: +1000 ft
- As an encased module, Motion Powered Lights can be mechanically fastened to the tip of the rods. There is no maintenance or wiring outside of the lighting canister. It can be design to a IPX6 Rating, weatherproof.
- Lights are inherently redundant in case of partial failure, rod tips will still light, minimizing maintenance.
- Lightweight energy generators can be separated from rod tip for replacement.

Figure 09-4: Motion Powered Light Enclosure & Scale Model by HOK @1:20 (& Multiplied Digitally)

Energy Generation for:

- Rod Tops
    - Illumination Intent: Wind Powered
    - Motion powered lights are intended to be integrated into the tops of the rods, so they are illuminated as wind moves the rods.

Generative Walkways

Piezoelectric Energy (Pavegen Tiles)

Piezoelectric materials can convert mechanical energy of motion and vibration to electricity. Piezoelectric generators (energy harvesters) offer a robust and reliable solution by converting normally wasted vibration energy in the environment to usable electrical energy.

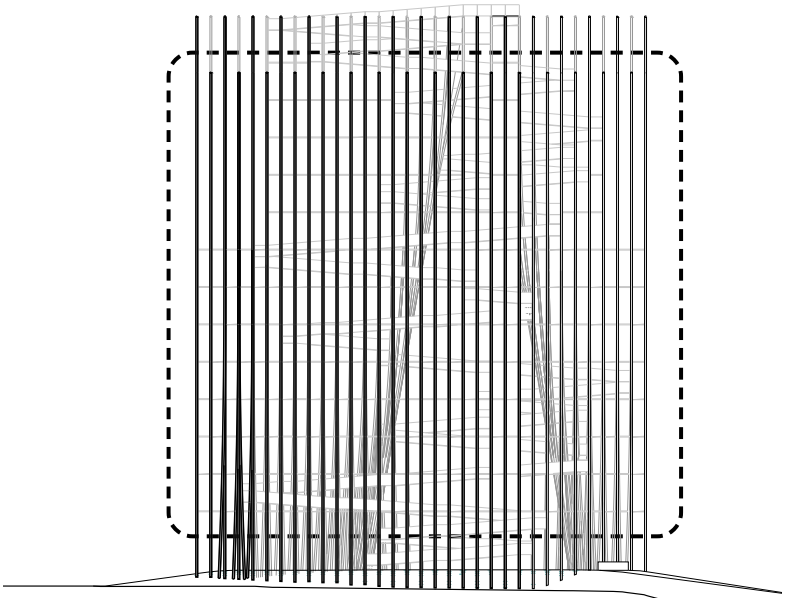


Figure 09-5: Pavegen system module

Visitor Created Power

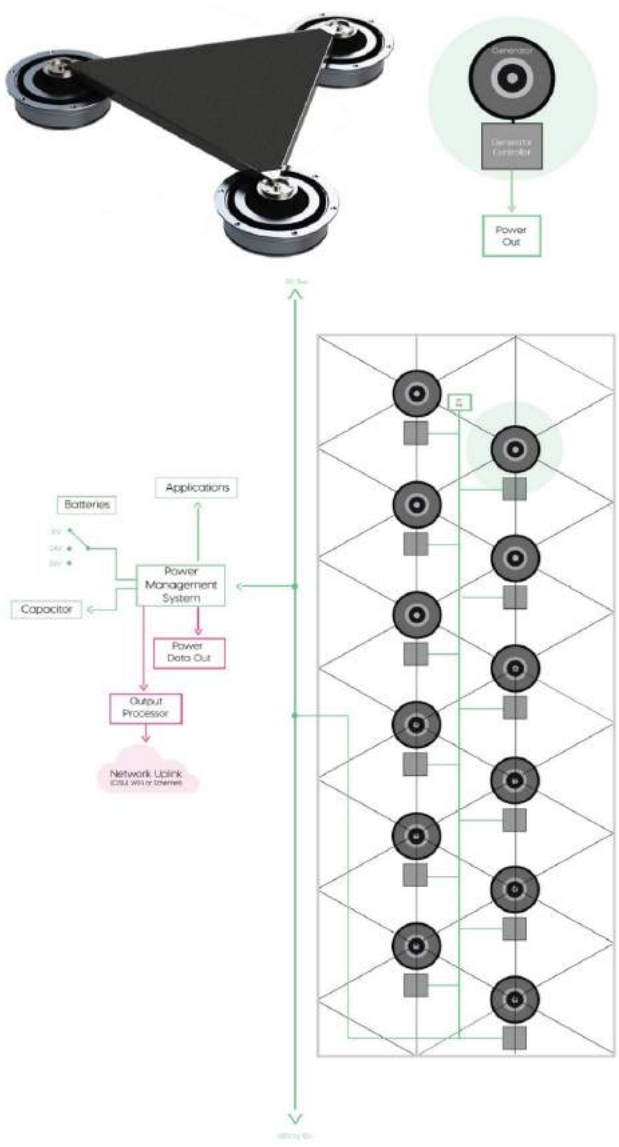


Figure 09-6: Pavegen System Diagram

Pavegen Tiles

- Pavegen develops and manufactures a patented flooring technology which converts footfall into off-grid energy, data and rewards.
- The Pavegen system's key components are a triangular composite tile surface, electro-magnetic generators, and interaction with people.
- As people step on the tiles, their weight causes the top surface to vertically displace by 10mm/0.4 in.
- The linear actuation generates 3-5 watts of electrical energy (based on weight and pressure).
- 5 Watts of electrical energy can power 5 ft of lineal LED lighting or 20 seconds of light on an LED Filament or can be stored for later release.
- The linear actuation of the generators beneath, initiates a rotation in their electro-magnetic mechanisms, which generates electrical energy. The triangular arrangement ensures that the Pavegen technology maximizes both energy output and real-time data from each footstep. The Pavegen smart-flooring system tessellates into larger rectangular arrays that can power a range of low voltage applications and provide a unique intractability.
- The system is designed to take significant point and distributed loading. The Pavegen technology can be used indoor and out for a variety of different applications. The maximum loading of 9 kN/2023 lbf makes it extremely robust and durable. The system is water resistant to a depth of 1.5 meters for 30 minutes. Precision Output: Pavegen tiles are paired with a Smart Controller with flexible architecture, an on-board low energy microcontroller that significantly expands the range of features & capabilities for Pavegen installations. The device enables system configuration with a range of battery capacities, to control lighting and to report data points from single or groups of units.

Visitor Created Power

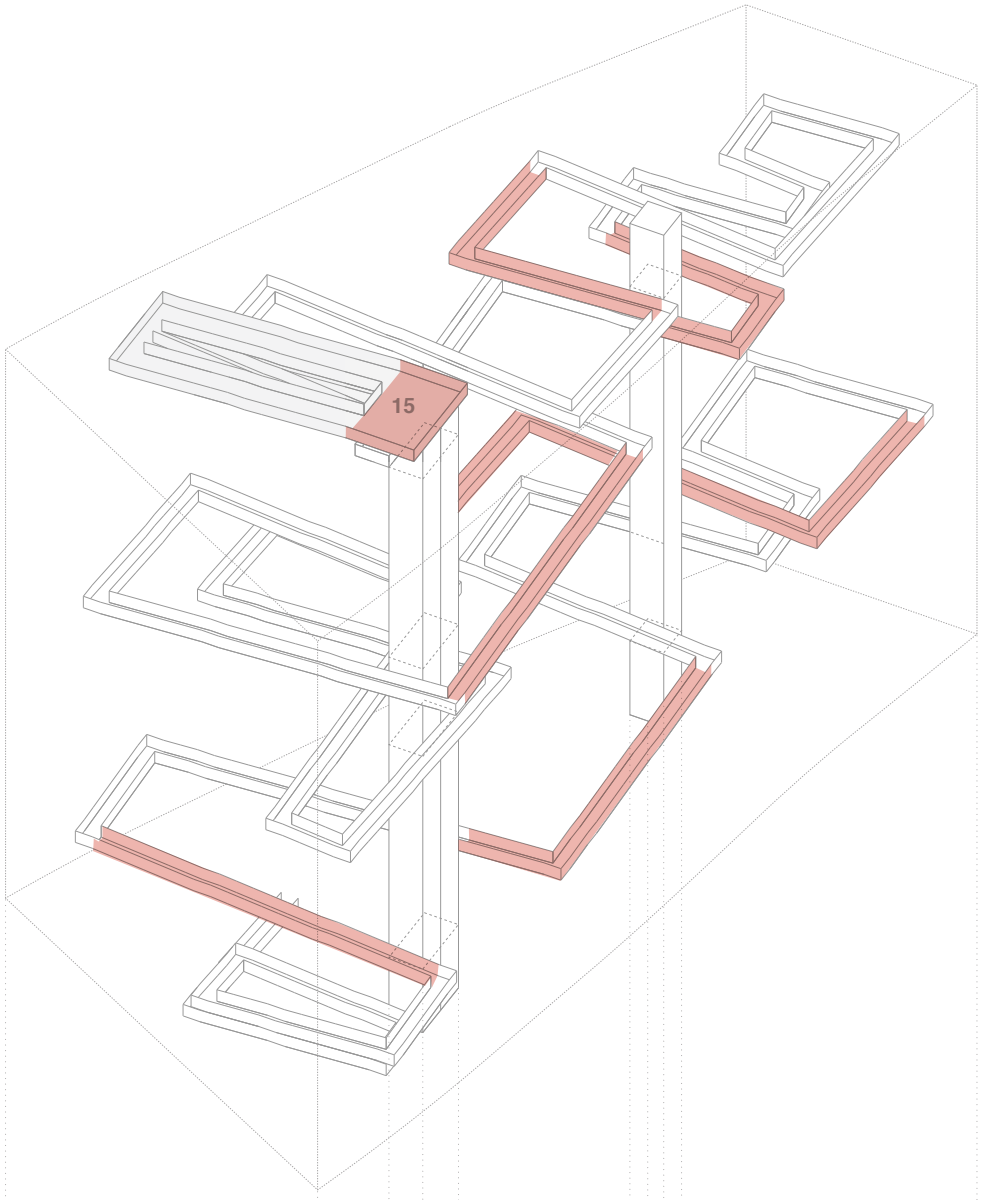


Figure 09-7: Pavegen Landings and Pathway Locations

Visitor Created Power

Energy Generation for:

- Structure – 4D Cloud
    - Illumination Intent: Floodlights
- Structural Ramps
    - Illumination Intent: Floodlights
    - As visitors travel up ramps to the top of the structure, their footsteps will activate the Pavegen tiles to illuminate the 4D cloud and ramp lighting.
    - As one walks up the ramp, floodlights will light the path in front of the individual. The more activity of the Pavegen ramp, the more illuminated the 4D cloud will glow. 15 runners will enable full illumination of the 4D Cloud.
- SJLT Representation
    - Illumination Intent: Framing Projectors from Above
- Landscape Pathways I
    - Illumination Intent: Lighting at Approach Path
    - As visitors congregate on the plaza and approach the gallery, their footsteps will activate the Pavegen tiles to illuminate the SJLT and plaza lighting.
    - As one walks towards the gallery entrance, wall luminaires will light the path in front of the individual. The more activity of the Pavegen plaza, the brighter the San Jose Light Tower illumination will be. 4-8 dancers will enable full illumination of the SJLT.

Solar Power

Solar Pavement

Platio Solar Pavement

- Platio develops and manufactures a solar pavement system, providing the opportunity to integrate PV technology in exterior site walkways.
- Each tile is comprised of three layers: tempered and slip-proof glass tiles, high-performance photovoltaic cells, and a base of recycled plastic waste.
- The system can generate up to 17 Watts per square foot.
- The tiles are modular units that interlock together to create a solar surface, with built in wiring.
- Each tile is about 1 square foot.

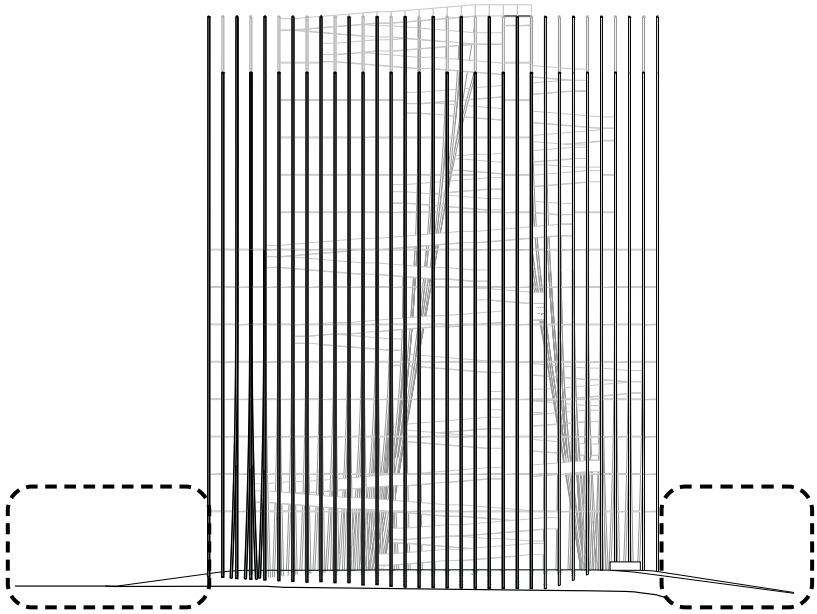


Figure 09-8: Sun Inspired Energy Generation

Solar Power

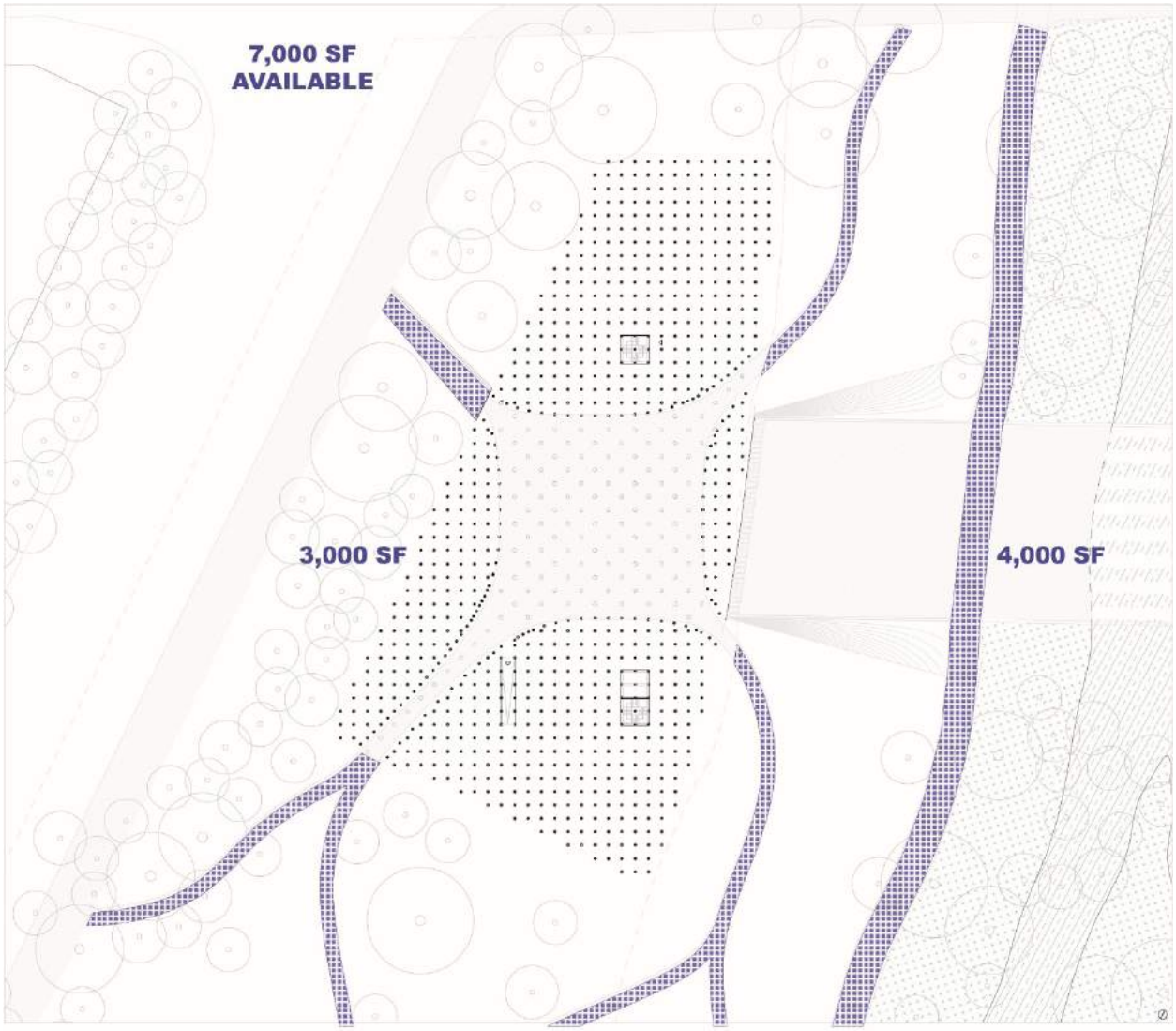


Figure 09-9: Available Area for Solar Pavement Tiles

Solar Power

Energy Generation for:

- Underground / Gallery
    - Illumination Intent: Architectural Lighting
    - The tiles will be placed along pathways to generate energy for the architectural lighting in the gallery space. (1,225 sf)
- Landscape Pathway
    - Illumination Intent: Park/Forest Pathways – Moon Lighting
    - The tiles will be placed along pathways to generate energy for landscape and pathway site lighting. (1,375 sf)
- Available Area
    - ~7,000 sf of pathways are available for the appropriate integration of solar pavement tiles.
    - 1,225 sf would be required to fulfill Underground Gallery Lighting
    - 1,375 sf would be required to fulfill Park Landscape Lighting
    - 4,425 sf would be required to fulfill building system loads.
- Energy Intent: Alternate approach to fulfill building energy loads
    - A solar array can be designed on-site in the park or off-site, to neutralize any additional building energy loads other renewable energy systems may not cover.

Zero Net Energy

The goal of this project is to offset architectural, landscape, and exhibit hall lighting energy use with on-site available renewable power sources. To store the power produced from these on-site power generation sources, a battery storage system is being designed as referenced through WP-05.00 MEP, Fire, and Technology Systems. There are a variety of strategies by which the building's annual consumption load can be neutralized by renewable energy, the solutions presented here are assuming all generation takes place on site.

Energy Consumption - Building

- Utility services for this building were predicated and estimated through energy modeling as documented through WP-05.00 MEP, Fire, and Technology Systems.
- In a minimally conditioned approach to the underground and gallery, annual consumption has been estimated at ~27,846 kWh. If additional load is required, renewable energy can be scaled up to match.

Energy Generation for Building

- To neutralize building load for zero net energy operations, it is recommended to provide an additional 10% generation than the annual consumption, as annual weather conditions, sky cover, and facility use may lead to variations in the building's real energy demand. Generation load is estimated at ~30,620 kWh, Yielding a minor surplus in energy.

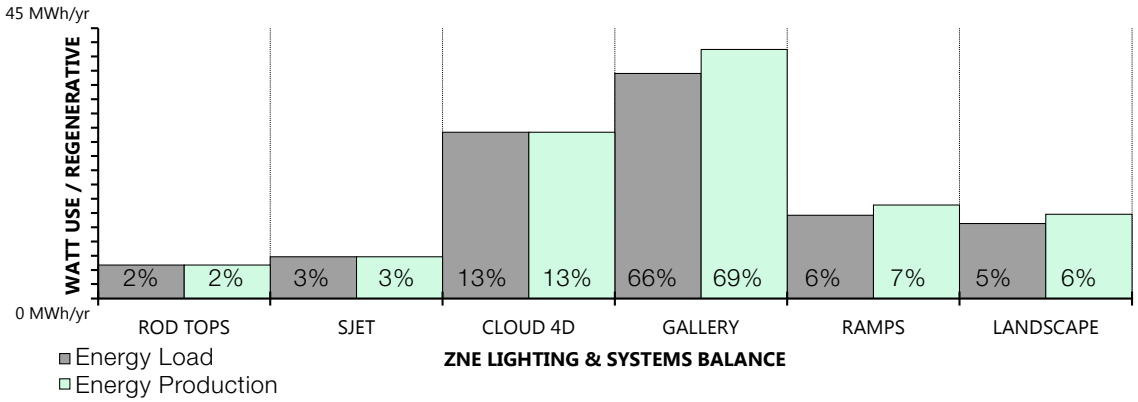


Figure 09-10: Zero Net Energy Diagram illustrating approximate use and generation split across building zones

	Layer 1	Layer 2	Layer 3	Layer 4	Layer 5	Layer 6	Layer 7	Layer 8
	Rod Tops	Cloud 4D	SJLT	Underground	Bridge Paths	Landscape	Structure Ramps	Building
Fixture	LED + Driver integrated in Electro Magnetic Enclosure	Floodlights	Framing Projectors from Above	Ring Lights around openings @ ceiling to simulate rods +BOH	Lighting at approach path	Moon lighting from trees	Flood lights (same fixture type as Cloud 4D)	Building Loads
QTY	1,000	200	25	200	50	75	100	
Wattage [W ea]	2	50	100	20	15	50	50	
Wattage [Total W]	2,000	10,000	2,500	4,000	750	3,750	5,000	
EMERGENCY REQ'TS		-	-	YES	YES	YES	YES	YES
Power Generation	Electromag	Piezo Tiles	Piezo Tiles	PV Pavers	Piezo Tiles	PV Pavers	Piezo Tiles	PV Pavers
Efficiency	2 W/unit	5 W/tile	5 W/tile	11 W/sf	5 W/tile	11 W/sf	5 W/tile	11 W/sf
QTY / Area (sf)	1000 units	2,500	1,031	1,225	766	1,378	2,500	4,425
Variable	wind power	15 runners	4-8 dancers	9 hrs	8 walkers	9 hrs	12 walkers	-
Power Generation [kWh/day]				36.00	6.75	40.50	5.00	130.00
Power Storage	*NO*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*	*YES*
Power Storage [Total kWh]	*0*	*160*	*40*	*64*	*12*	*60*	*80*	*TBD*

Figure 09-11: Energy Generation Matrix

END OF SECTION

10 | Specialty Lighting

Abstract:

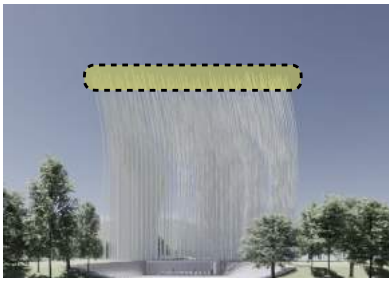
Lighting for the Breeze of Innovation shares function and form of the project experience. Changes through movement and time create a dynamic variation throughout the day. The perception of space and depth are created by layers of light, starting from an ode to the once vibrant 1881 Light Tower of San Jose.

The lighting types have been divided into (2) two sections: Feature Lighting and General Lighting. Each of those types have several layers that are listed below. From those layers, there are options within the layers. All lighting layers have their own dedicated power source, however there are a few layers with an option to have Zero Light (or a feature that requires no electricity or light source, yet produces dynamic lighting effects by way of leveraging reflectances and/or movement).

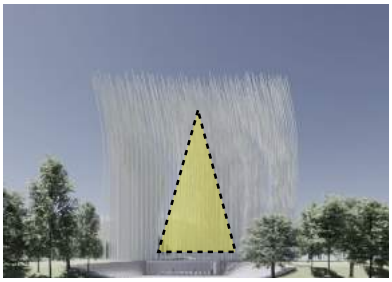
Contents:

Lighting Layer Diagrams

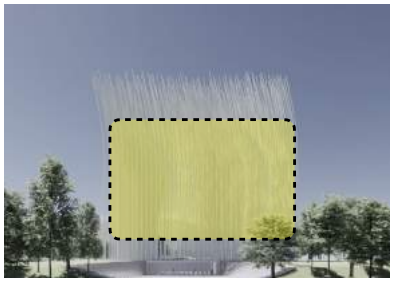
Rod Tops
(Electro/wind powered lights)



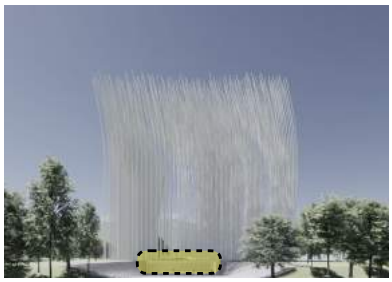
SJET
(Lighting the void)



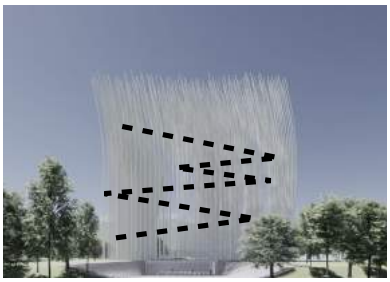
Cloud 4D
(Addressable floodlights)



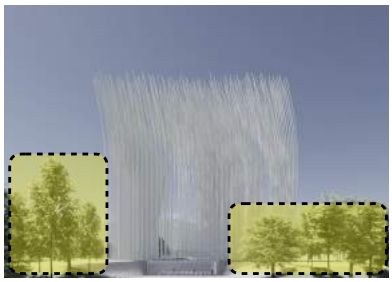
Gallery
(Interior light columns)

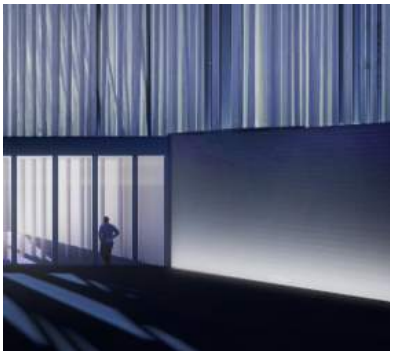


Ramps
(Dapple floodlighting)



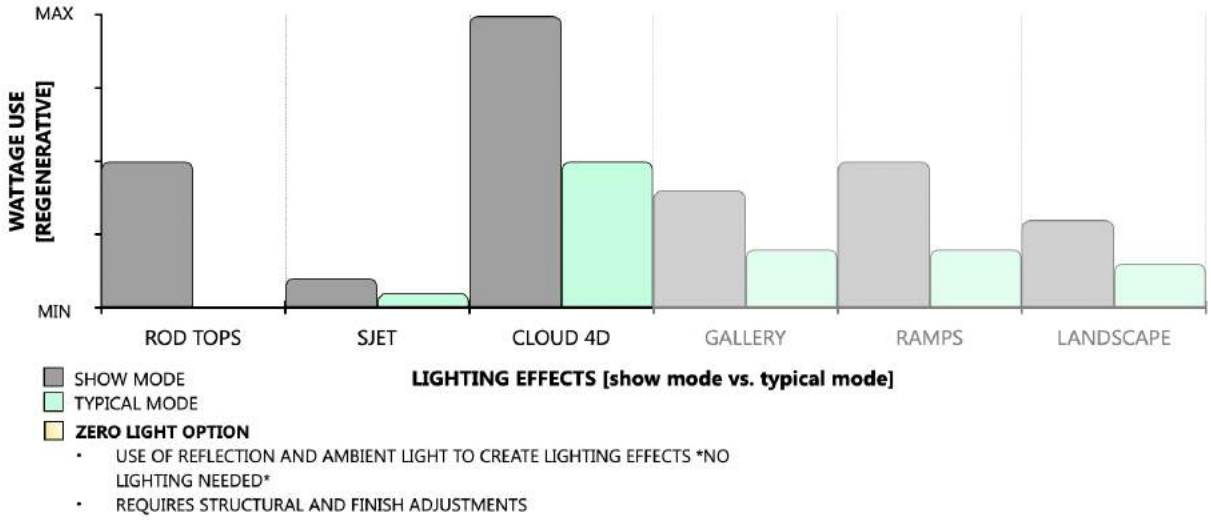
Landscape
(Moonlighting + welcome light)





Option A: Lighting Layers (Preferred)

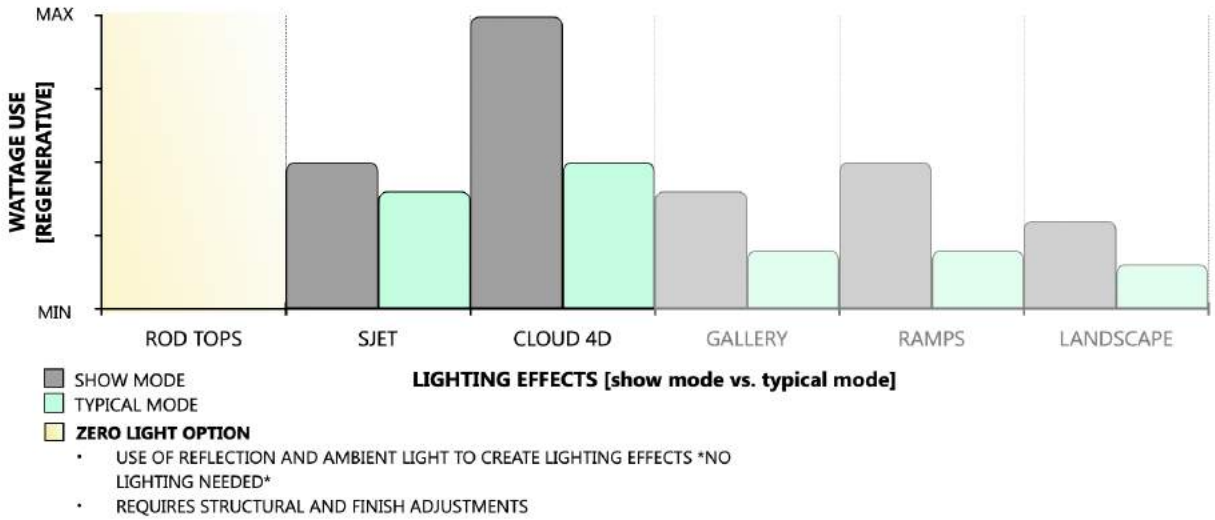
	ROD TOPS	SJET	CLOUD 4D	GALLERY	RAMPS	LANDSCAPE
REQUIRES POWER	✓	✓	✓	✓	✓	✓
REGENERATIVE POWER BY OTHERS	✓	✓	✓	✓	✓	✓
ZERO LIGHT OPTION						



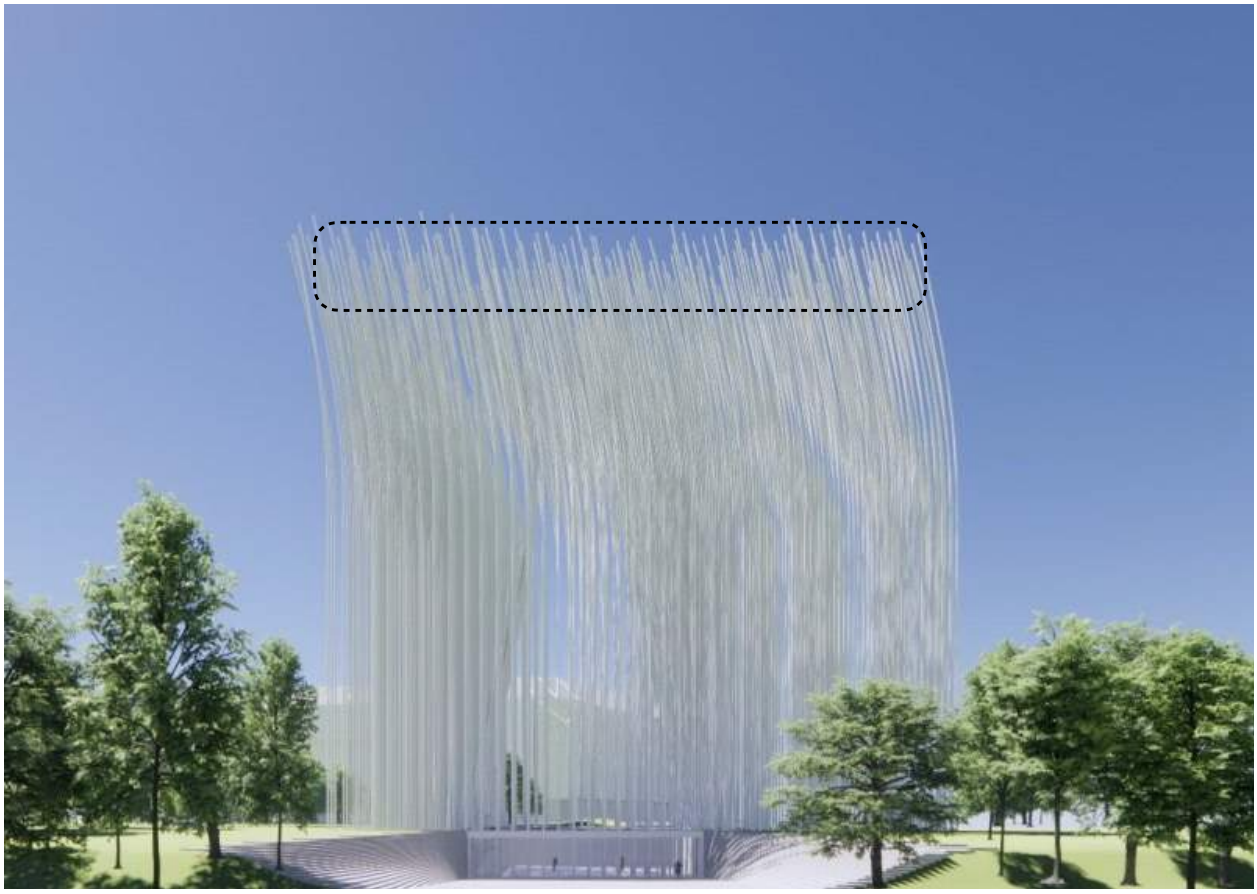
- USE OF REFLECTION AND AMBIENT LIGHT TO CREATE LIGHTING EFFECTS *NO LIGHTING NEEDED*
- REQUIRES STRUCTURAL AND FINISH ADJUSTMENTS

Option B: Lighting Layers (Alternate)

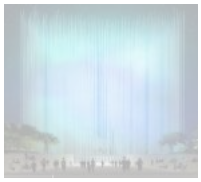
	ROD TOPS ALTERNATE	SJET ALTERNATE	CLOUD 4D	GALLERY	RAMPS	LANDSCAPE
REQUIRES POWER		✓	✓	✓	✓	✓
REGENERATIVE POWER BY OTHERS		✓	✓	✓	✓	✓
ZERO LIGHT OPTION	✓					



- USE OF REFLECTION AND AMBIENT LIGHT TO CREATE LIGHTING EFFECTS *NO LIGHTING NEEDED*
- REQUIRES STRUCTURAL AND FINISH ADJUSTMENTS








1 2 3 4 5 6

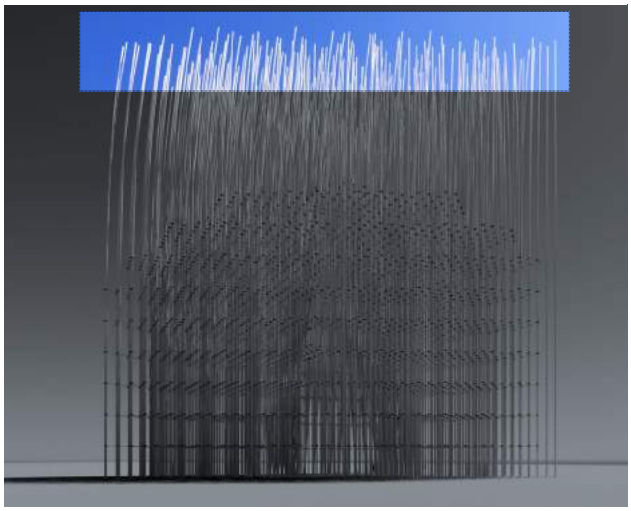
Rod Tops

A beautiful array of lit rod tops, providing distinguished differentiation between the structural component and the tips of rods. Natural movement caused by wind gusts are what create the lighting twinkle. If there is a lack of wind, the rod tops are dim or off.

Rod Tops

Option A: Energy Generation

Lighting using responsive energy



Option B: Breeze Interaction

Zero electrical/lighting effect. Use of reflective surface and surrounding environment

Rod Tops

Option A: Daily Lighting Changes

Daytime w/no wind
Rod tops **OFF**
Structural lighting **OFF**

Nighttime w/wind movement
Rod tops **ON**
Structural lighting **OFF**

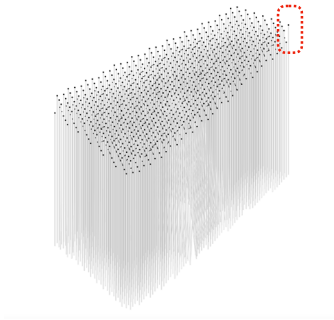
Nighttime w/wind movement
Rod tops **ON**
Structural lighting **ON**

Rod Tops

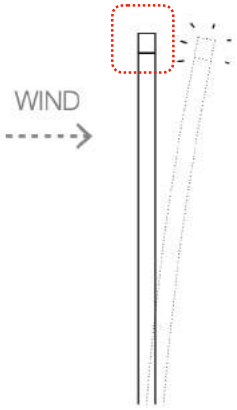
Application Options - Using Wind Responsive Lighting

LEGEND

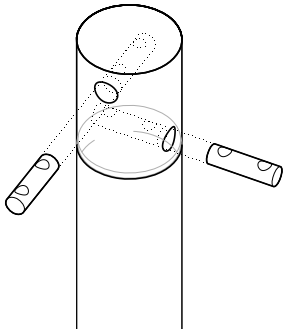
- LED lighting
- Wind responsive lighting + electro-magnet
- TBD translucent lighting material
- Structural rods



Rod Tops Lighting locations



Each device (available and tested in the industry*) incorporates a simple electromagnetic system with two LEDs that light up when shaken by the wind.



The tips of the rods consist of a translucent TBD capsule which houses two patented energy generating devices. No cables are required, and capsules are easily replaced in one piece via screw fitting to the rod.

DEFLECTION = ENERGY
Electro magnets movement

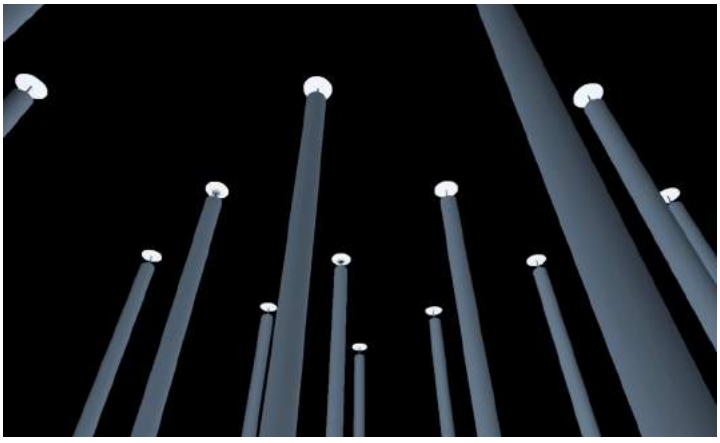
Electromagnets generate energy and changes color in this example

Double side LED locations

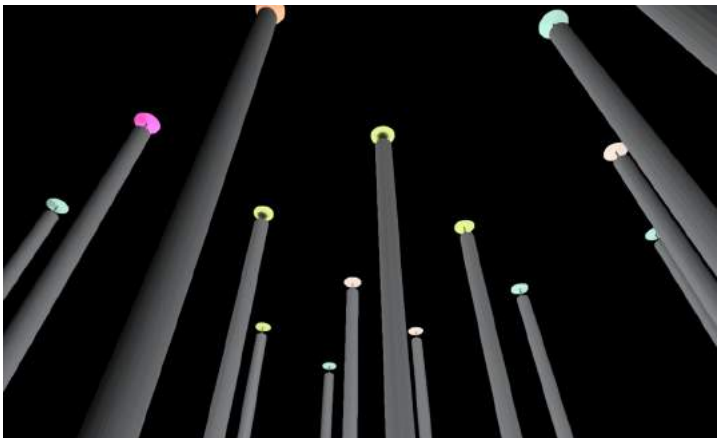
Rod Tops

Option B: Reflective Surface / Zero Energy

Daytime
Rod tops **REFLECT ENVIRONMENT**
Structural lighting **OFF**



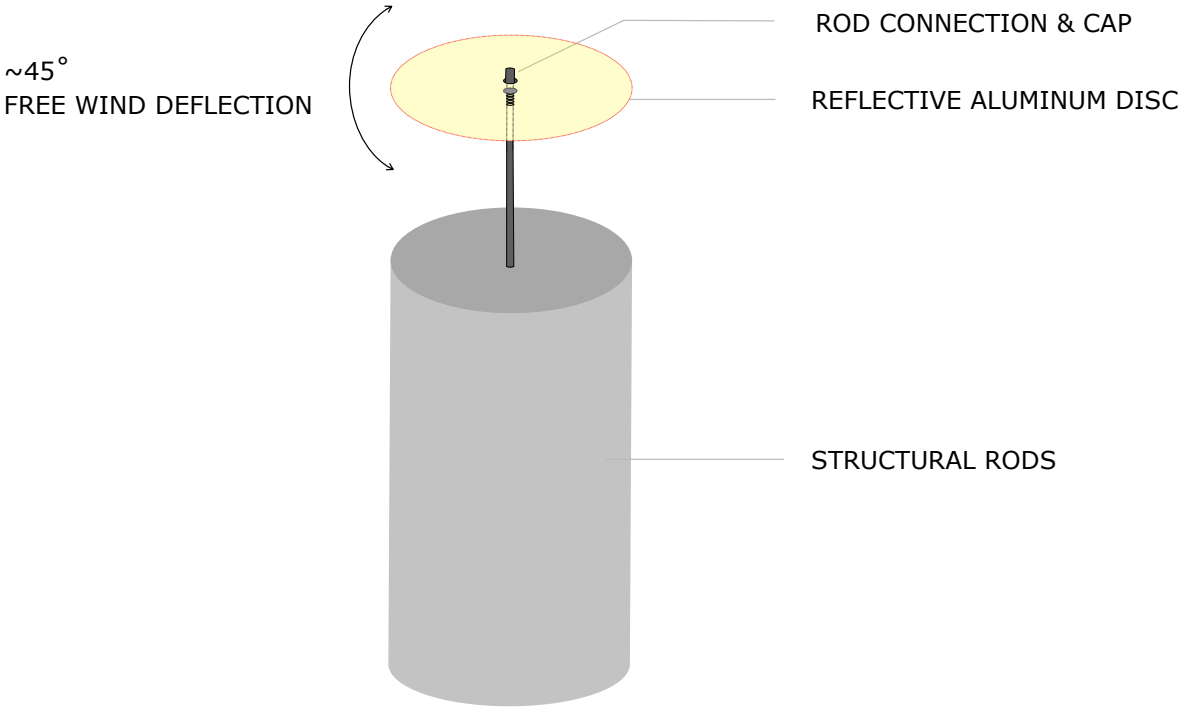
Nighttime
Rod tops **REFLECT LIGHT**
Structural lighting **ON**

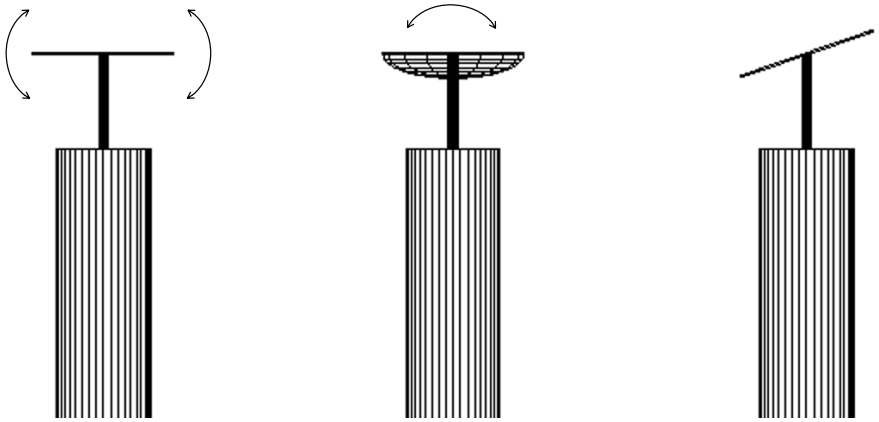


Nighttime
Rod tops **REFLECT (COLOR FINISH)**
Structural lighting **ON**

Rod Tops

Option B: Schematic Detail





Rotates 45°

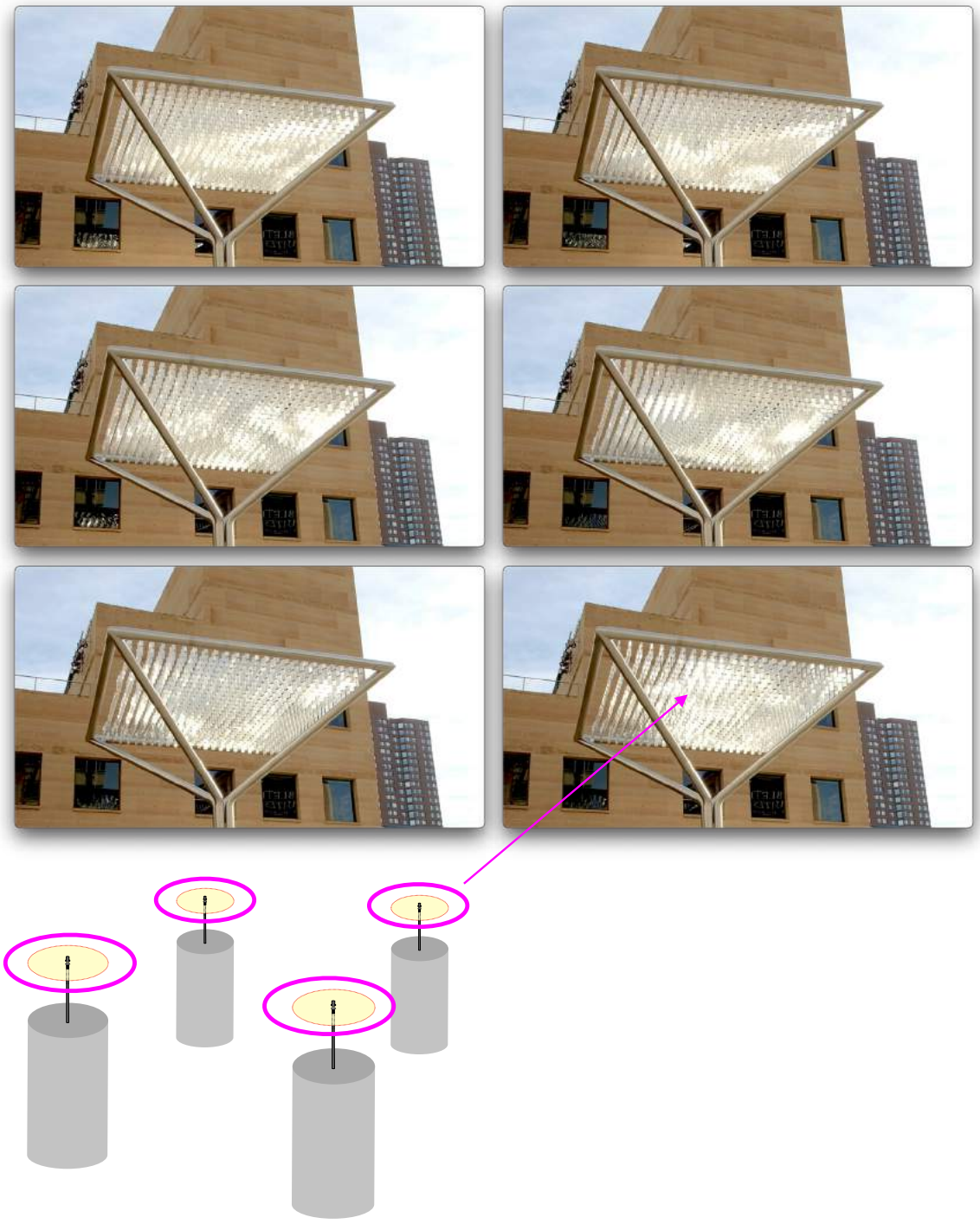
Orbits 360°

Fixed position

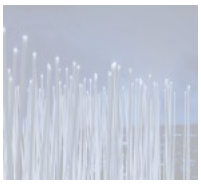
Rod Tops

Option B: Precedent Application

*Variations of light as time passes



REFERENCE: Reflective tops reflect ambient light surrounding the space





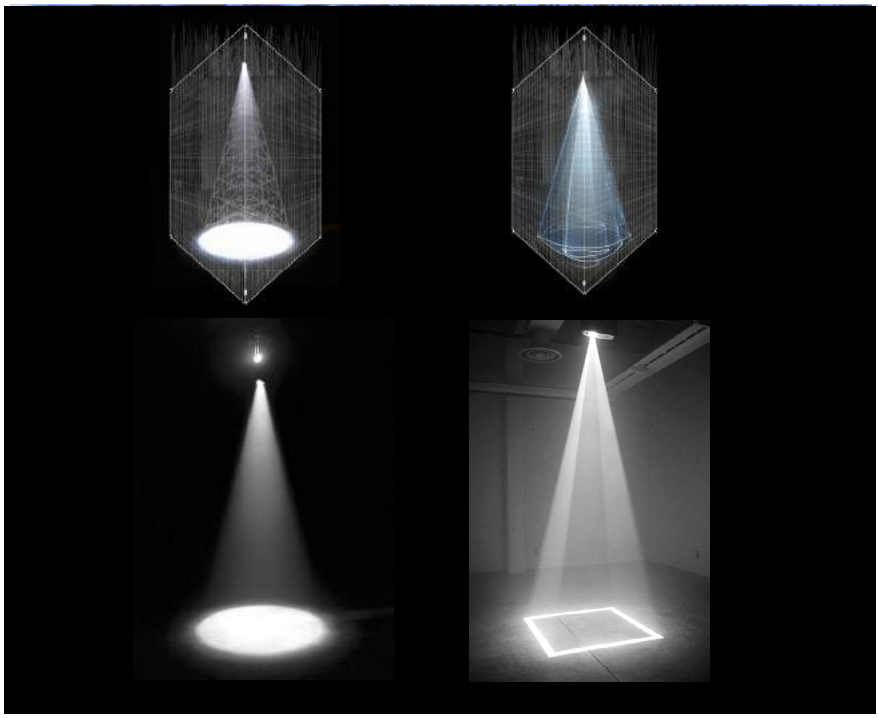

1 2 3 4 5 6

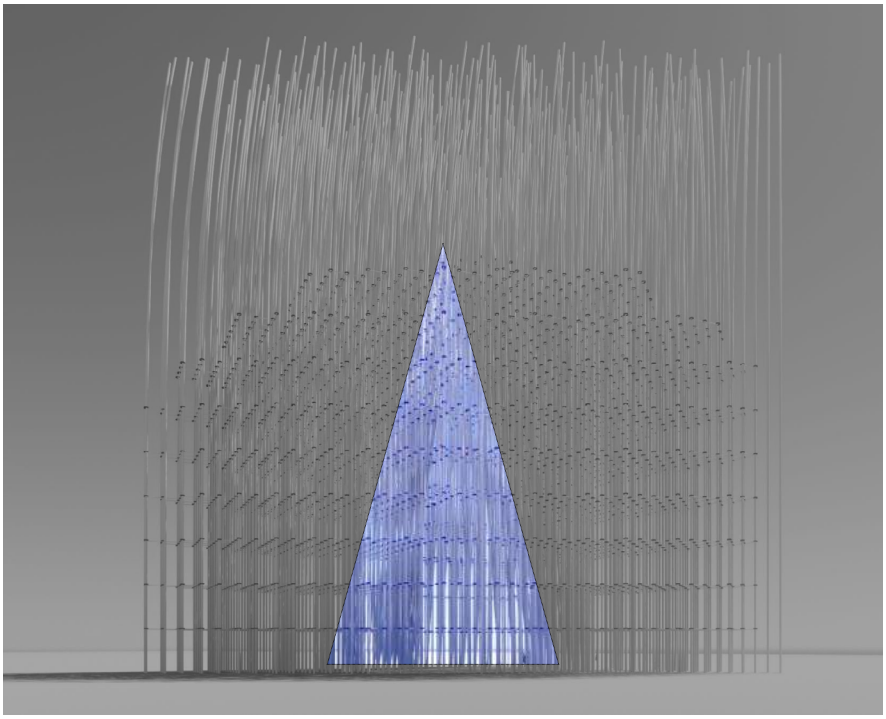
SJET Representation

A dedication to what used to be. The Electric Tower of light that used to dawn these grounds now becomes a void within the structure that is illuminated through projection from above. Changes in day equal changes in lighting color, helping to effect a vibrance or calming mood through the color of light.

SJET Historical Representation

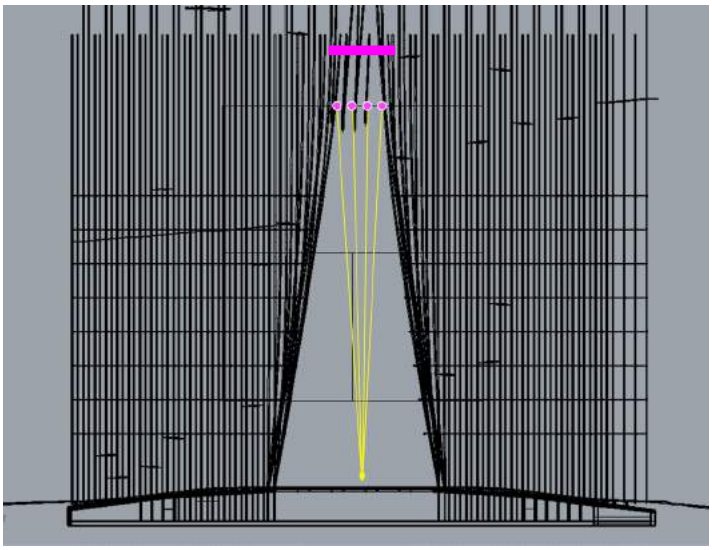
Framing Projection from Aboe

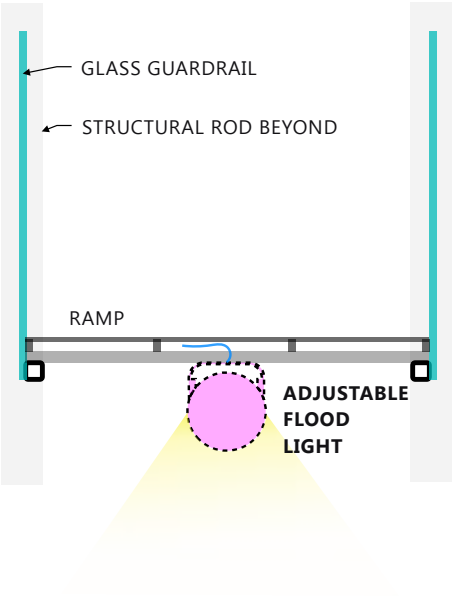




SJET Historical Representation

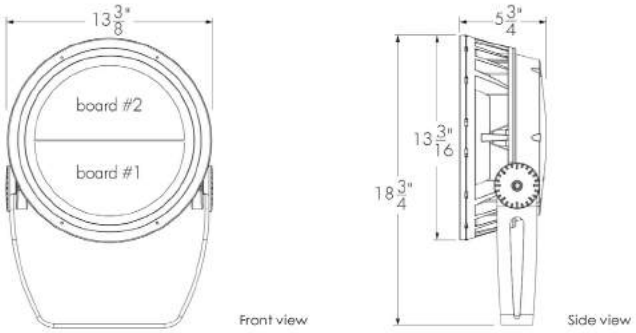
Framing Projection Details





FIXTURE SELECTION

ADJUSTABLE FLOOD LIGHT WITH VARIABLE BEAM SPREAD



SJET Historical Representation

Circadian Lighting - Emulating Natural Light Improving Health and Sleep Patterns

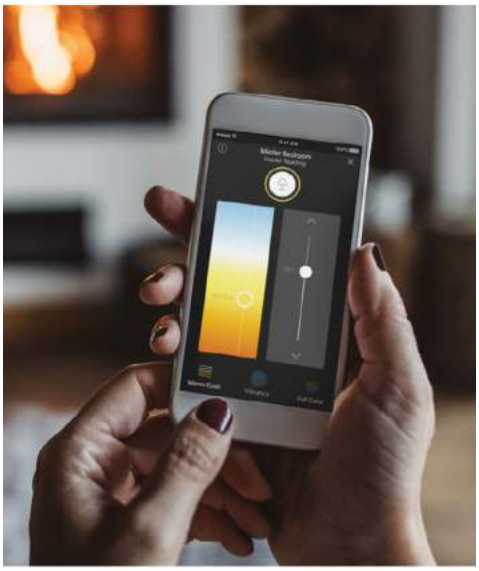
6,000 K	5,000 K	4,000 K	3,500 K	3,000 K	2,850 K	2,200 K
OVERCAST SKY	DIRECT SUN @ NOON	MORNING / AFTERNOON	MID AM / MID PM	EARLY AM / LATE PM	SUNRISE / SUNSET	SUNRISE / SUNSET

COOL AND WARM

DIFFERENTIATE ENERGY OR CALM DEPENDING ON COLOR

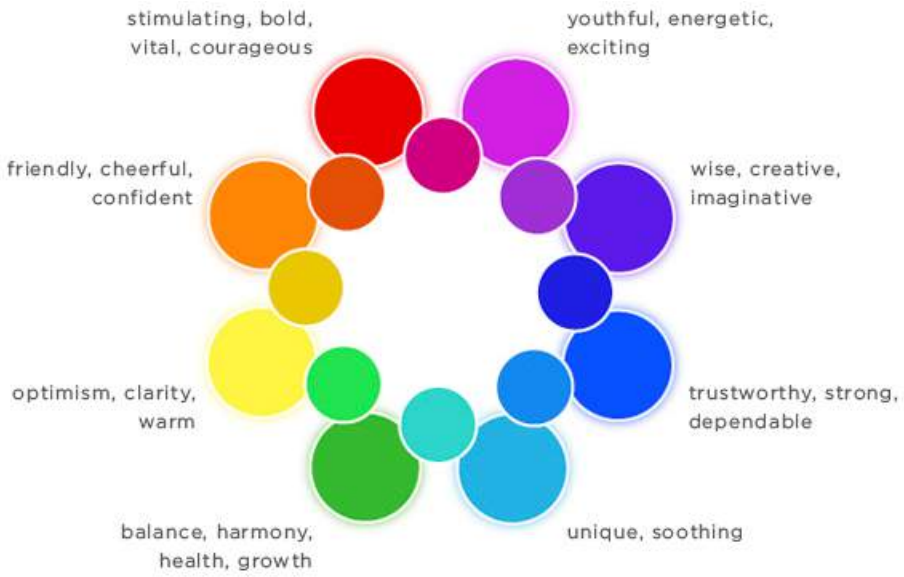
CONTROL

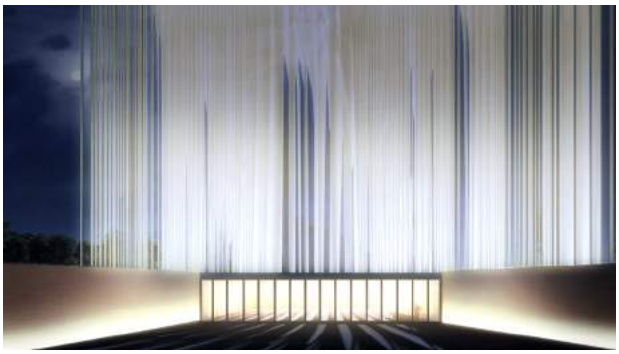
REMOTE CONTROL SETTINGS AVAILABLE

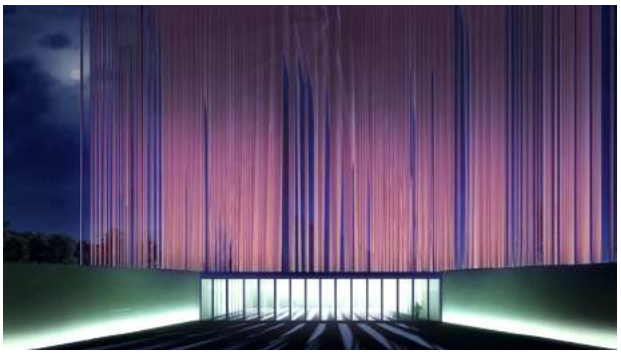


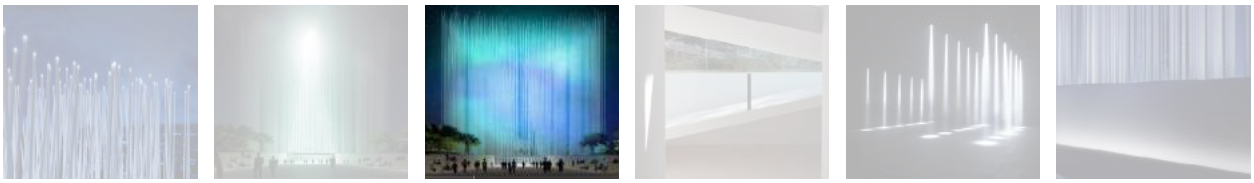
SJET Historical Representation

Evoke Mood & Feeling with Light









1 2 3 4 5 6

Cloud 4D

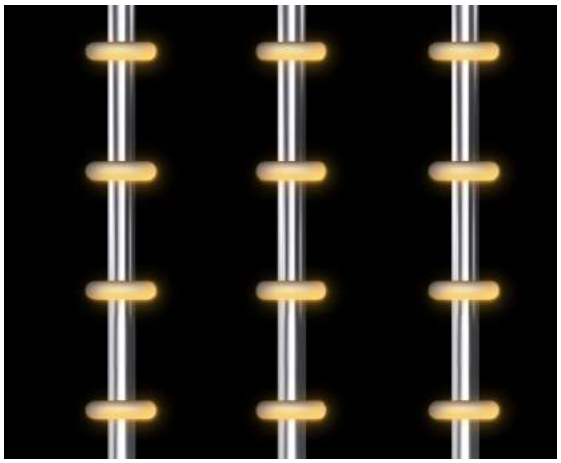
The most prominent component of the installation are the vertical members. During the day, they glow from daylight and provide a sense of destination. At night, the structure has a dynamic appearance glowing from all angles. Projector lights are mounted below the ramps in strategic positions and aimed down through the structure. The effect is a glow from within.

Cloud 4

Floodlights Under Pathways

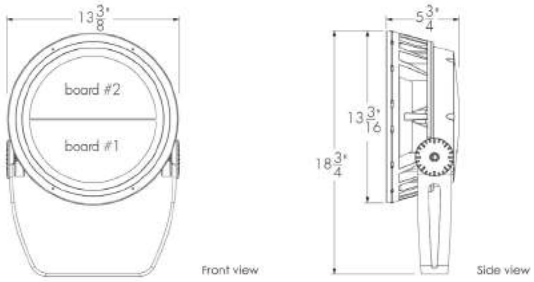
Lighting Intent

Floodlights located under ramps aimed down onto structural collars

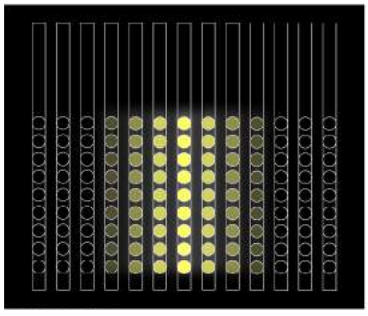


FIXTURE SELECTION

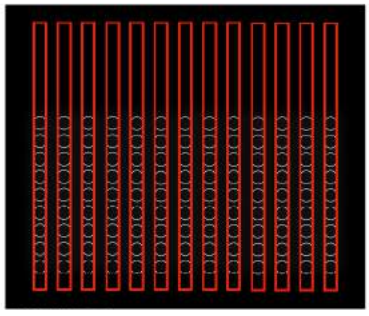
Adjustable fixtures, beam spread options, color tuning options



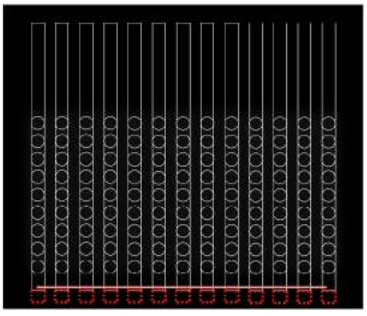
EFFECTS GRAPHIC



ADDRESS POINTS



POWER SOURCE / ACCESS



SPECIALTY LIGHTING

Cloud 4

Effect Reference

Wuxi Taihu Show Theatre by Steven Chilton Architects

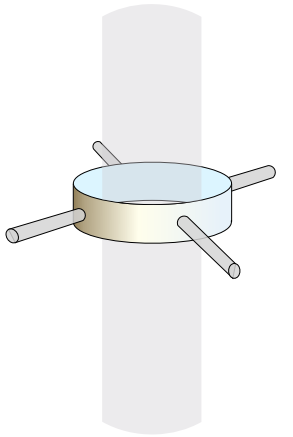
Finnskogens hus in Svullrya, Norge by Lipinski Lasovsky Johansson

clear plastic tarp curtain scenography ile ilgili görsel sonucu

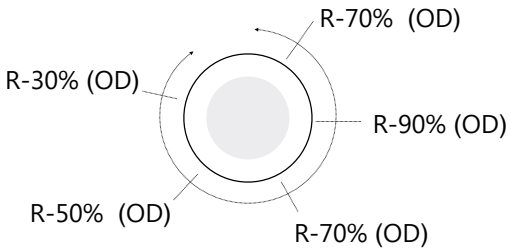
Cloud 4

Detail Locations

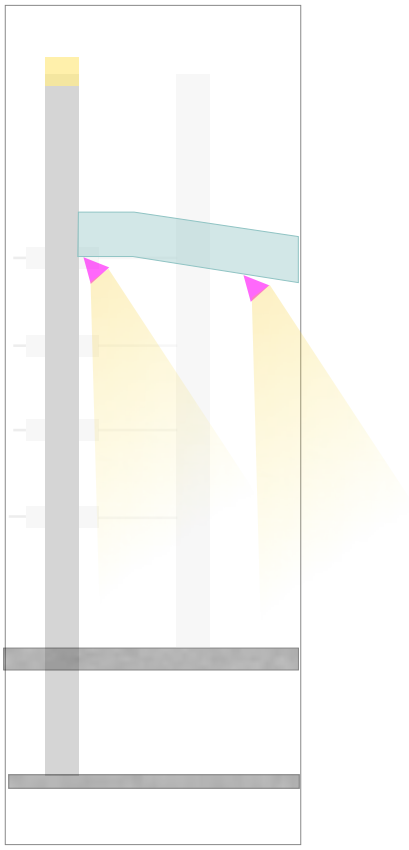
Collar Detail
Locating reflectance values across the exterior of the structural ring.



Reflectances (R)
Outside Surface (OD)

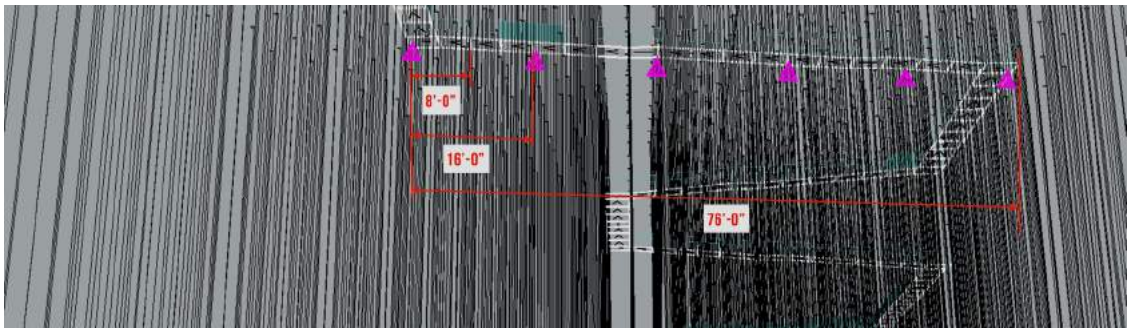


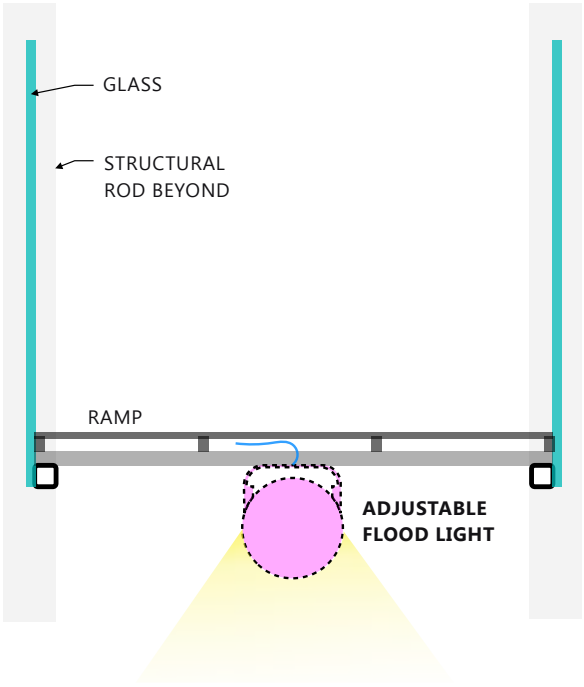
Light Fixture Mounting Detail
Adjustable fixtures are located under the ramps. They can be positioned and programmed aiming within the structure.

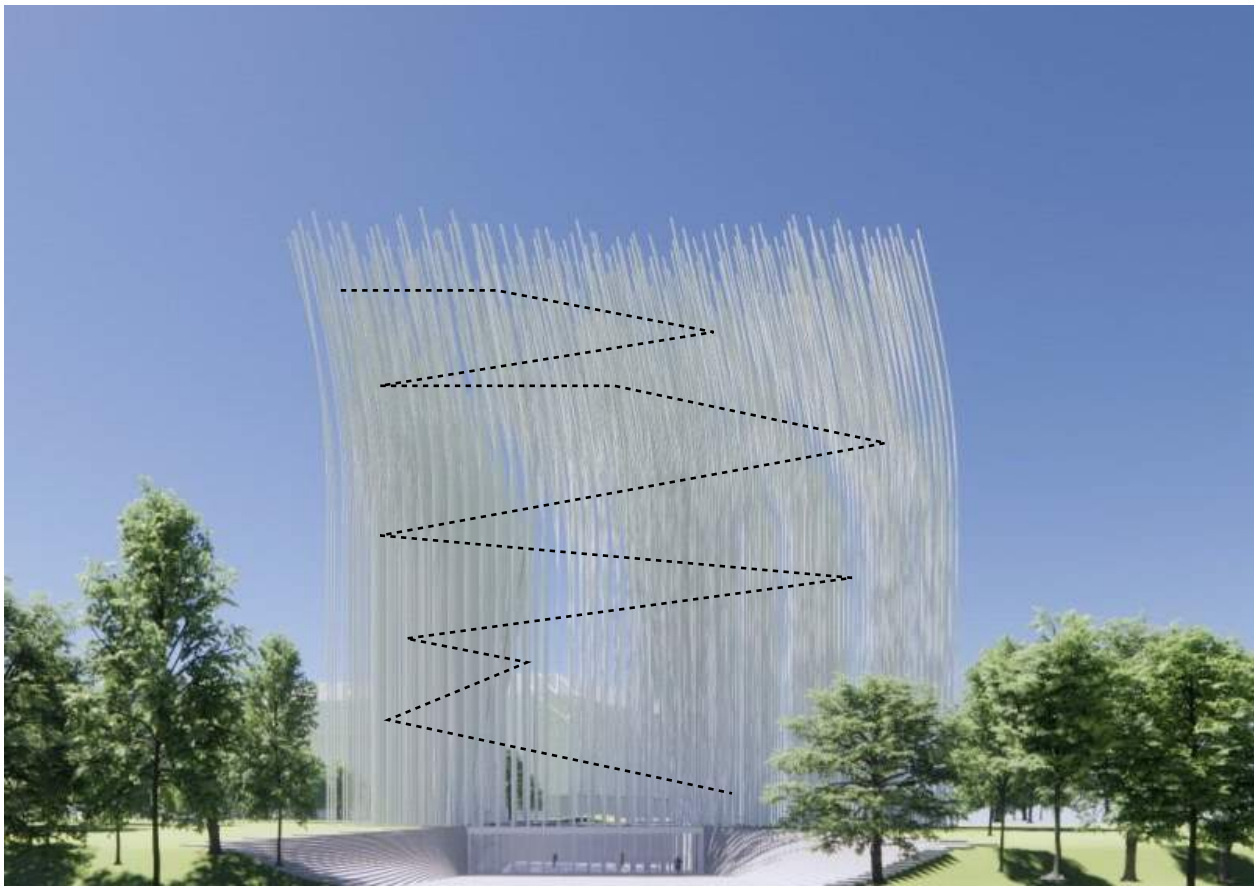


Cloud 4

Detail Locations







1 2 3 4 5 6

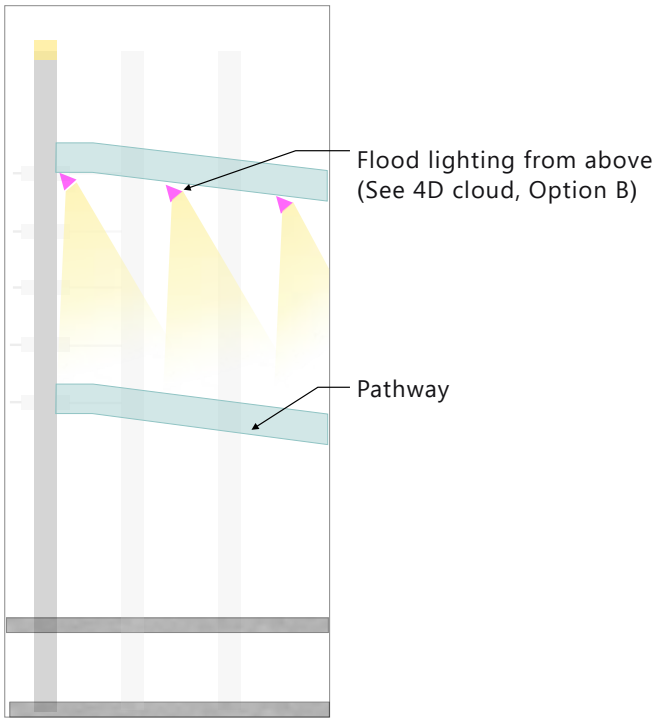
Structural Ramps

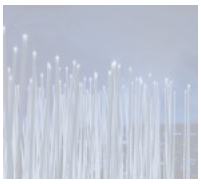
Lighting required for the ramps are provided by projector lighting from above. These light fixtures are included in the count for the Cloud 4D, they are simply aimed and tuned to provide a dappled lighting effect for egress purposes, and powered by the people walking on it.

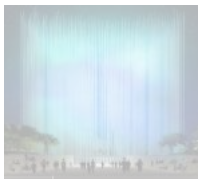
Structural Ramps

Lighting Approach

Floodlighting from above to illuminate pathway
- dappled lighting effect from light and shadow created by structure and collars on rods







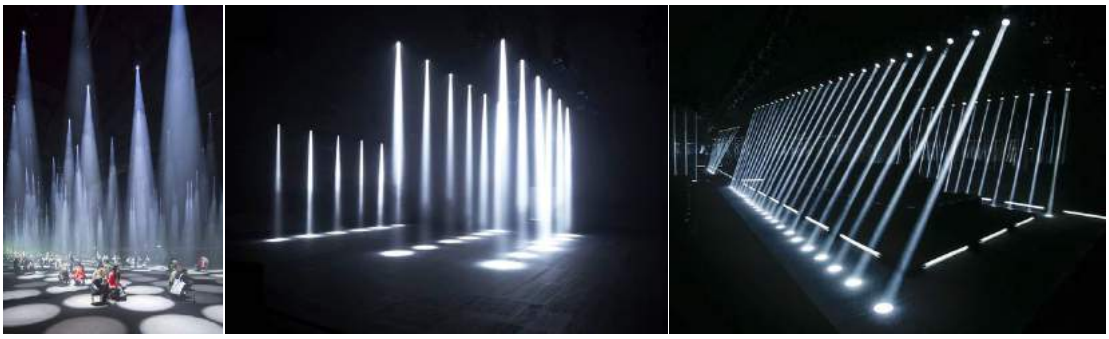

1 2 3 4 5 6

Gallery
Located below the main rod structure and underground, the gallery is an experience that comes to life at night through beam of light that emulate the rod structure above. Tuned lighting that matches the spacing and cadence of the rods, they provide an interesting point of reflection above.

Gallery

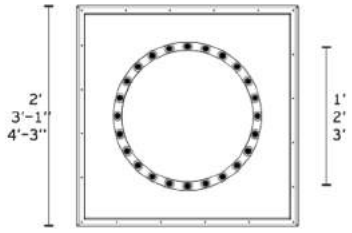
Reference Application

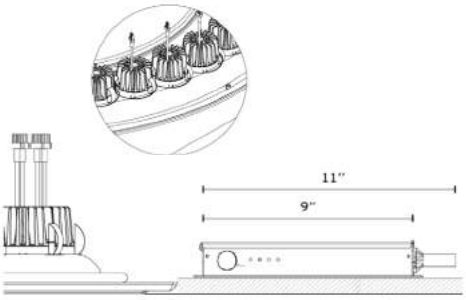
Beams of daylight pass through light tunnel in daytime. Artificial light simulates at night



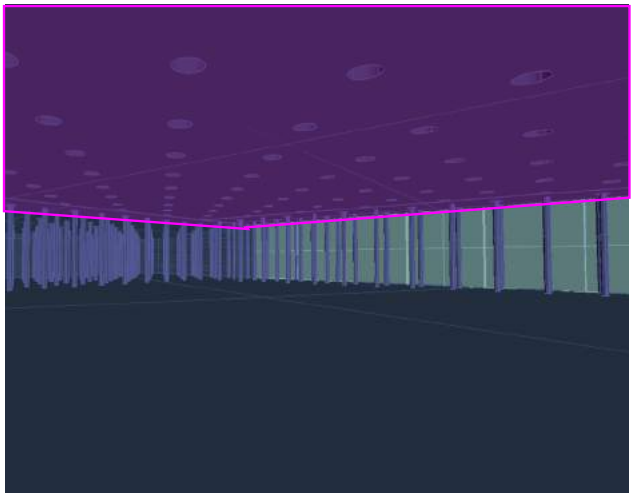
FIXTURE SELECTION

Recessed ring downlight surrounding light openings

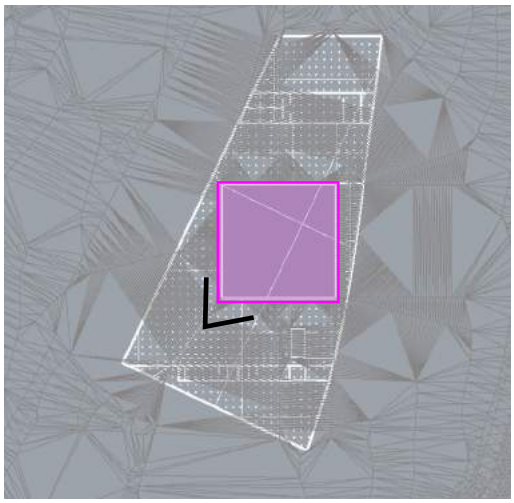


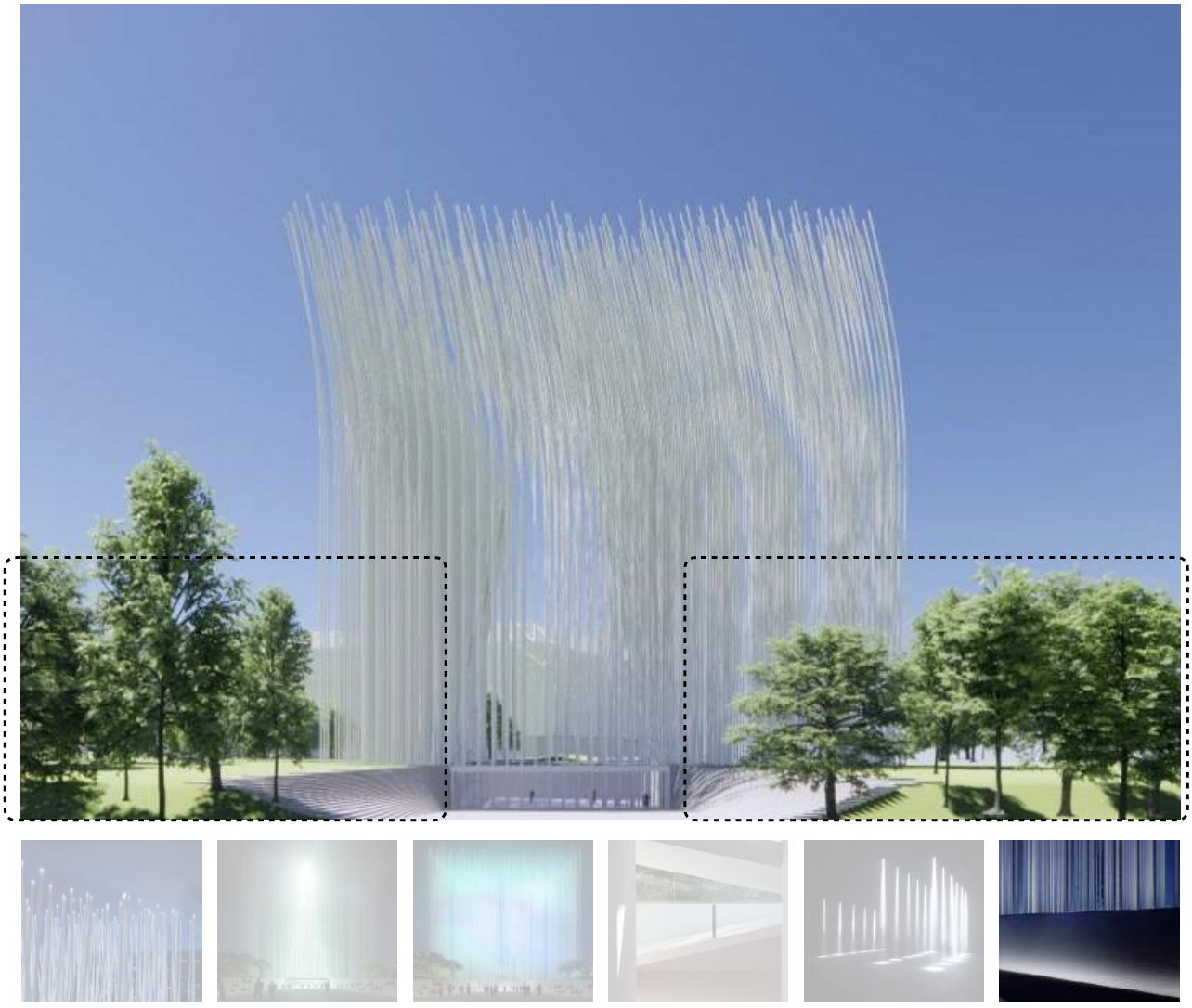


EFFECTS LOCATIONS



MULTIPLE OPENINGS IN CEILING





1 2 3 4 5 6

Landscape/Pathways

Utilizing the natural environment given to us, we are able to shine dappled lighting through trees. Very similar to moonlight coming through a dark forest. The pattern and natural effect can be achieved through tall mounted floodlights aimed through the foliage. Juxtaposed to the clean lines of the rods, the pathway approach has a life and mood that reflects or contrasts with the height of the rods. Something wonderful to portray mood and volume.

Landscape

Approach Path Visualization - Lighting Intensity

5:00PM NIGHT EVENT
100% ON EVERYTHING

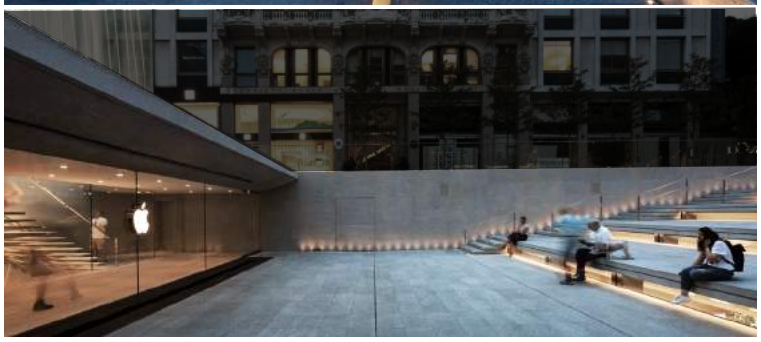
7:00PM TYPICAL DAY
SOFT GLOW INTERIOR AND EXTERIOR

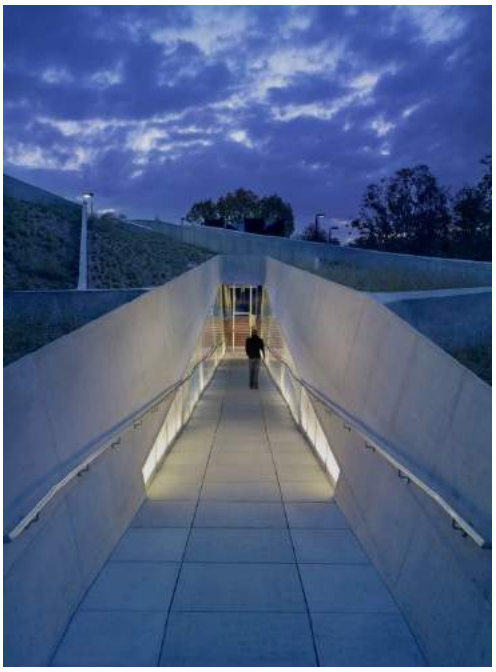
9:00 PM END OF EVENT
PATH AND INTERIOR LIGHTING
FOR WAYFINDING

11:00PM CLOSED
ONLY INTERIOR LIGHTING FOR
CLEANING

Landscape

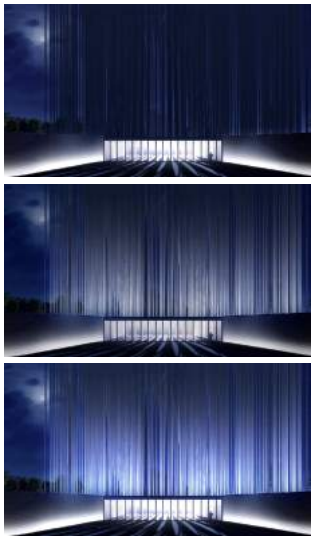
Approach Path Reference

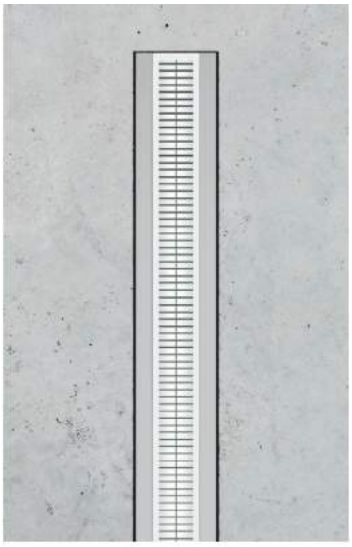




FIXTURE SELECTION

INGRADE LINEAR ARCHITECTURAL LIGHT @ APPROACH PATH





Landscape

Approach Path Scenes

Daytime **Sunset** **Night ver.1** **Night ver.1** **Night ver.2**

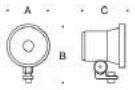
New year **ValentineS** **4th July** **Halloween** **Christmas**

Landscape

Moonlight Path Reference

FIXTURE SELECTION

POLE OR TREE STRAP FLOOD LIGHTS



Compact floodlight · **wide beam**

Lamp		β	A	B	C
77 685	13.9 W LED	46°	5½	8	5½

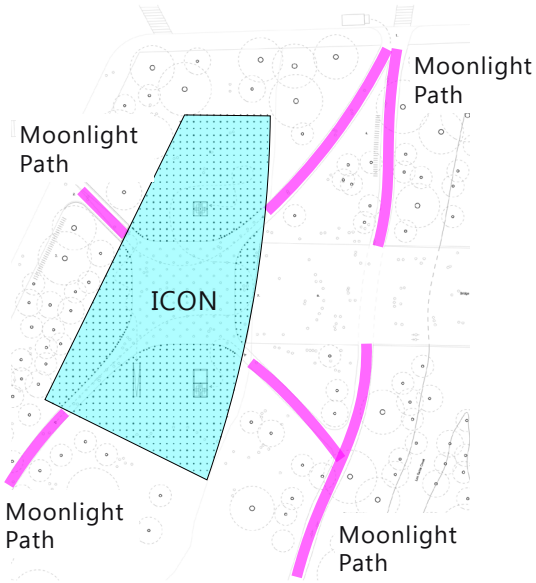
Exchangeable lenses — flat beam — 180° glare shield — β = Beam angle

Accessories

70 055 **70 756**

LOCATION

PLAN VIEW



NITEO CALIFORNIA, LLC

11 | LEED Requirements & Sustainability

Abstract:

Sustainability requirements are a critical component to the Breeze of Innovation. The tower and associated public park and exhibit spaces are designed through a process that reflects the core vision of the project: to engage with the community, enhance the surrounding natural environment, and signify an innovative approach to environmental stewardship. The project relies on ecosystem services for a sustainable development at Arena Green along the Guadalupe River park; responsible use of natural resources to generate energy, manage water, and conserve materials; and aspires to reduce embodied carbon and neutralize operational carbon through a high performance structure and all-electric building.

This conceptual narrative is written to convey the holistic sustainable design objectives of the project, and prepare a LEED Certification work-plan based on the sustainable design points required to achieve LEED Certification. The structure and building will be designed and constructed to a standard suitable to obtain, at a minimum, United States Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) Building Design + Construction (BD+C) v4.0 Green Building Rating System, Silver Level Certification. Through the design team's integrative approach, there is a great opportunity to achieve Gold or even Platinum and Zero Net Energy Certification.

The design and construction team will coordinate closely throughout the design process and demonstrate the cost of certification during the pricing package. Consideration is given specifically to those strategies that provide operational savings, meet local code requirements, and an improved occupant experience.

Agencies:

- United States Green Building Council (USGBC)
- City of San Jose Building Division and Environmental Services
- California Building Standards Commission
- California Energy Commission

Codes:

- LEED v4 BD+C
- City of San Jose Green Building Requirements & Energy and Water Ordinances
- 2019 California Green Building Standards Code, Title 24, Part 11
- 2019 CA Title 24 Part 6 Energy Code

References:

WP-02 (January 2021) **Structural System - MKA**

WP-03 (January 2021) **Vertical Transportation - MBH**

WP-05 (January 2021) **Program Assumptions and Use Requirements – MBH/SMAR**

WP-06 (January 2021) **MEP, Fire, and Technology Systems – HOK**

WP-07 (January 2021) **Site Access, Hardscape, Landscaping - HOK**

WP-09 (January 2021) **Power Generation systems - HOK**

WP-10 (January 2021) **Specialty Lighting - Niteo**

WP-12 (January 2021) **Construction Sequencing and Feasibility Study - MKA**

Exhibits:

Figure 11-1: LEEDv4 BD+C Checklist

To support the development of a high-performance, cost-effective project, the architectural design team and all design consultants have engaged in an integrative design process from the outset of design. This process ensures that design decisions are informed through holistic benefits across a variety of factors. The design intent is that the site development, water use, energy use, material use, and environmental quality enhance the facility's flexibility of use, provide a safe and comfortable environment, optimize energy consumption, and minimize maintenance costs, for the lowest possible construction cost within the available budget.

The following narrative has been written based on discussions, findings, and direction from multiple design team workshops. This document will serve as a detailed outline to the approach and methodology that the design team would pursue in order to meet the sustainability goals and requirements outlined by the Urban Confluence Competition Requirements, and associated City of San Jose, California Green Building Standards and LEED. Sustainability strategies and resultant credits will be revised and refined throughout the design process by engaging with team members and all stakeholders.

In compliance with LEED NC v4, the following credit pursuits have been identified:

Integrative Process

An integrated design process will be facilitated to optimize resource use on the project through practical strategies and innovative solutions to distinguish the structure.

LEED v4 for BD+C: New Construction and Major Renovation
Project Checklist

Y	H?	L?	N			
1	0	0	0	Credit	Integrative Process	1
9	1	6	0	**Location and Transportation**		16
0	0	0	0	Credit	LEED for Neighborhood Development Location	16
1	0	0	0	Credit	Sensitive Land Protection	1
0	0	2	0	Credit	High Priority Site	2
2	0	3	0	Credit	Surrounding Density and Diverse Uses	5
4	0	1	0	Credit	Access to Quality Transit	5
1	0	0	0	Credit	Bicycle Facilities	1
1	0	0	0	Credit	Reduced Parking Footprint	1
0	1	0	0	Credit	Green Vehicles	1
7	1	2	0	**Sustainable Sites**		10
Y				Prereq	Construction Activity Pollution Prevention	Required
1	0	0	0	Credit	Site Assessment	1
0	0	2	0	Credit	Site Development - Protect or Restore Habitat	2
1	0	0	0	Credit	Open Space	1
2	1	0	0	Credit	Rainwater Management	3
2	0	0	0	Credit	Heat Island Reduction	2
1	0	0	0	Credit	Light Pollution Reduction	1
7	1	1	2	**Water Efficiency**		11
Y				Prereq	Outdoor Water Use Reduction	Required
Y				Prereq	Indoor Water Use Reduction	Required
Y				Prereq	Building-Level Water Metering	Required
1	0	1	0	Credit	Outdoor Water Use Reduction	2
5	1	0	0	Credit	Indoor Water Use Reduction	6
0	0	0	2	Credit	Cooling Tower Water Use	2
1	0	0	0	Credit	Water Metering	1
31	0	2	0	**Energy and Atmosphere**		33
Y				Prereq	Fundamental Commissioning and Verification	Required
Y				Prereq	Minimum Energy Performance	Required
Y				Prereq	Building-Level Energy Metering	Required
Y				Prereq	Fundamental Refrigerant Management	Required
4	0	2	0	Credit	Enhanced Commissioning	6
18	0	0	0	Credit	Optimize Energy Performance	18
1	0	0	0	Credit	Advanced Energy Metering	1
2	0	0	0	Credit	Demand Response	2
3	0	0	0	Credit	Renewable Energy Production	3
1	0	0	0	Credit	Enhanced Refrigerant Management	1
2	0	0	0	Credit	Green Power and Carbon Offsets	2

Figure 11-1: LEEDv4 BD+C CHECKLIST (page 1 of 2)

LEED v4 for BD+C: New Construction and Major Renovation
Project Checklist

6	**1**	**4**	**2**	**Materials and Resources**		**13**
Y				Prereq	Storage and Collection of Recyclables	Required
Y				Prereq	Construction and Demolition Waste Management Planning	Required
1	1	1	2	Credit	Building Life-Cycle Impact Reduction	5
1	0	1	0	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
1	0	1	0	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
1	0	1	0	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2	0	0	0	Credit	Construction and Demolition Waste Management	2
14	**1**	**1**	**0**	**Indoor Environmental Quality**		**16**
Y				Prereq	Minimum Indoor Air Quality Performance	Required
Y				Prereq	Environmental Tobacco Smoke Control	Required
2	0	0	0	Credit	Enhanced Indoor Air Quality Strategies	2
3	0	0	0	Credit	Low-Emitting Materials	3
1	0	0	0	Credit	Construction Indoor Air Quality Management Plan	1
2	0	0	0	Credit	Indoor Air Quality Assessment	2
1	0	0	0	Credit	Thermal Comfort	1
2	0	0	0	Credit	Interior Lighting	2
2	1	0	0	Credit	Daylight	3
1	0	0	0	Credit	Quality Views	1
0	0	1	0	Credit	Acoustic Performance	1
6	**0**	**0**	**0**	**Innovation**		**6**
1	0	0	0	Credit	Innovation	1
1	0	0	0	Credit	Innovation	1
1	0	0	0	Credit	Pilot	1
1	0	0	0	Credit	Exemplary Performance	1
1	0	0	0	Credit	Exemplary Performance	1
1	0	0	0	Credit	LEED Accredited Professional	1
4	**0**	**0**	**0**	**Regional Priority**		**4**
1	0	0	0	Credit	Indoor water use reduction	1
0	0	0	0	Credit	Rainwater management	1
0	0	0	0	Credit	Outdoor water use reduction	1
1	0	0	0	Credit	Access to Quality Transit	1
1	0	0	0	Credit	BPDO- Sourcing of Raw Maaterials	1
1	0	0	0	Credit	Optimize Energy Performance	2
85	**5**	**16**	**4**	**TOTALS**	Possible Points:	**110**

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

Figure 11-1: LEEDv4 BD+C CHECKLIST (page 2 of 2)

Location & Transportation

LT Credit 2 – Sensitive Land Protection

- The development footprint on land does not meet any criteria for sensitive land.

LT Credit 3 – High Priority Site

- Soil or groundwater contamination on site is currently unknown. More information regarding contamination identification and remediation is required to determine compliance with Option 3 to achieve 2 points.

LT Credit 4 – Surrounding Density and Diverse Uses

- The project is located within ½ mile walking distance of the entrances to over 8 existing, public, and diverse amenities (Option 2: Diverse Uses, 2 points).

LT Credit 5 – Access to Quality Transit

- The project will follow LEED v4.1 requirements for this credit.
- Locate the project's main entry within 1/4 mile walking distance of existing planned bus, streetcar or informal transit stops, or within a ½-mile (800-meter) walking distance of existing or planned bus rapid transit stops, light or heavy rail stations, commuter rail stations or ferry terminals.
- The transit service at those stops and stations in aggregate must provide at least 250 Weekday trips and 160 Weekend Trips (4 points)
    - 22 Bus Route: 68 weekday, 67 weekend
    - 64A Bus Route: 23 weekday, 15 weekend
    - 64B Bus Route: 21 weekday, 9 weekend
    - 68 Bus Route: 48 weekday, 33 weekend
    - Rapid 522 Bus Route: 64 weekday, 43 weekend
    - Green Line Light Rail: 51 weekday 35 weekend
    - 275 weekday and 202 weekend total trips, 4 points
- To achieve one additional point for Regional Priority, the project must achieve at least 5 points for Access to Quality Transit.

LT Credit 6 – Bicycle Facilities

- The project will follow LEED v4.1 requirements for this credit.
- Provide short-term bicycle parking for 2.5% of peak occupants (or at least 4 spaces) & long-term parking to 5% of regular building occupants (or at least 4 spaces). Provide at least one on-site shower with changing facility for the first 100 regular building occupants and one additional shower for every 150 regular building

occupants thereafter.

- The project will have at least 4 bicycle racks for full time occupants and 4 bicycle racks for visitors.
- At least 1 shower will be installed in the building.

LT Credit 7 – Reduced Parking Footprint

- The project will follow LEED v4.1 requirements for this credit.
- The project will not be providing any off-street parking.

LT Credit 8 – Green Vehicles

- The project will follow LEED v4.1 requirements for this credit.
- Install electrical vehicle supply equipment (EVSE) in 2% of all parking spaces (or at least 2 spaces) used by the project or make 6% of parking spaces (or at least 6 spaces) EV Ready.
- The project will include at least 2 EV chargers.

SS Prerequisite 1 – Construction Activity Pollution Prevention

- Create and implement an erosion and sedimentation control plan for construction activities associated with the Project. The plan must conform to erosion and sedimentation requirement of the 2012 U.S. EPA Construction General Permit and/or local requirements to prevent pollution during construction of the building.
- This prerequisite can also be achieved through the California Alternative Compliance Path.

SS Credit 1 – Site Assessment

- Complete and document a site survey or assessment to inform and influence the design of the building. The assessment should include information on, topography, hydrology, climate, vegetation, soils, human use and human health effects.

SS Credit 2 – Site Development – Protect and Restore Habitat

- The project will follow LEED v4.1 requirements for this credit.
- Provide financial support of $0.20/sf of site area (including the building footprint) to a nationally or locally recognized land trust that falls within the same EPA III level ecoregion (within 100 miles of the site).

SS Credit 3 – Open Space

- A minimum of 30% of the total site area (including the building footprint) must be kept as open space. A minimum of 25% of that open space must be vegetated (turf grass does not count as vegetation) or have overhead vegetated canopy.
- As the project is within a larger regional park, 25% of the open space available can be allocated within or outside the project boundary and elsewhere within the park. This area would need to be preserved in perpetuity.

Sustainable Sites and Water Efficiency

SS Credit 4 - Rainwater Management

- The project will follow LEED v4.1 requirements for this credit.
- Treat run-off from pollutant-generating impervious surfaces (i.e. vehicle pavement, service courts, trash enclosures) using low-impact development (LID) practice. Retain (i.e. infiltrate, evapotranspirate, or collect and reuse) on site the runoff from the developed site for the 80th – 90th percentile of regional or local rainfall events.
- The City of San Jose requires new developments to manage site runoff from the 85th percentile of regional or local rainfall events.
- To achieve one additional point for Regional Priority, the project must achieve at least 3 points for Rainwater Management.

SS Credit 5 – Heat Island Reduction

- Provide an average weighted SRI for all roof and non-roof area greater than total site paving and roof area. Use roofing materials that have an SRI equal to or greater than 82 for low-sloped and 39 for steep-sloped roofs.
- High solar reflectance value materials, solar panels, and vegetated surfaces will be used to reduce urban heat island effect.

SS Credit 6 – Light Pollution Reduction

- Meet uplight and light trespass requirements, using either the backlight-uplight-glare (BUG) method (Option 1) or the calculation method (Option 2). Projects may use different options for uplight and light trespass.
- This credit can also be achieved through the California Alternative Compliance Path.

WE Prerequisite 1 and Credit 1 – Outdoor Water Use Reduction

- LEED Compliance for outdoor water use for landscape irrigation can be achieved by reducing outdoor water use by at least 50% (1 point) and 100% (2 points) below the baseline.
- Outdoor water use reduction can be achieved by choosing native and adaptive plants for landscaping applications, as well as choosing more efficient fixtures and schedules. The project will use native and/or drought tolerant plants to reduce outdoor water use needs by at least 50% and potentially offset the remaining water usage from municipal recycled water to meet 100% of the project's irrigation requirements.
- To achieve one additional point for Regional Priority, the project must achieve at least 2 points for Outdoor Water Use Reduction.
- This prerequisite and credit can also be achieved through the California Alternative Compliance Path (1 point only).

Water Efficiency and Energy & Atmosphere

WE Prerequisite 2 and Credit 2 – Indoor Water Use Reduction

- Indoor water use will be reduced by at least 45% below baseline, with low flow water fixtures for toilets, urinals, restroom and kitchen faucets, showers, etc.
- This prerequisite and credit can also be achieved through the California Alternative Compliance Path (1point only).
- To achieve one additional point for Regional Priority, the project must achieve at least 4 points for Indoor Water Use Reduction.

WE Prerequisite 3 and Credit 4 – Water Metering

- Permanent water meters will be installed at the building level, and permanent sub meters will be installed for at least two the following systems, if present: irrigation, indoor plumbing fixtures and fittings, domestic hot water, boiler, reclaimed water, and other process water. Meter data must be compiled into monthly and annual summaries and shared with USGBC for 5 years.
- This prerequisite can also be achieved through the California Alternative Compliance Path.

EA Prerequisite 1 – Fundamental Commissioning and Verification

- LEED Requirement: Complete the following commissioning process activities for mechanical, electrical, plumbing, and renewable energy systems and assemblies. The Commissioning Authority must do the following:
    - Review the OPR, BOD, and project design
    - Develop and implement a Cx plan
    - Confirm incorporation of Cx requirements into the construction documents
    - Develop construction checklists
    - Develop a system test procedure
    - Verify system test execution
    - Maintain an issues and benefits log throughout the Cx process
    - Prepare a final Cx process report
    - Document all findings and recommendations and report directly to the owner throughout the process
- CALGreen Requirement: For new buildings 10,000 square feet and over, building commissioning shall be included in the design and construction processes of the building project to verify that the building systems and components meet the owner's or owner representative's project requirements. Commissioning shall be performed in accordance with this section by trained personnel with experience on projects of comparable size and complexity. All occupancies other than I-occupancies and L-occupancies shall comply with the California Energy Code as prescribed in California Energy Code Section 120.8. For I-occupancies that are not regulated by OSHPD or for I-occupancies and L-occupancies that are not regulated by the California Energy Code Section 100.0 Scope, all requirements in Sections 5.410.2 through 5.410.2.6 shall apply.

Energy & Atmosphere

- Commissioning requirements shall include:
    - Inclusion of system manuals in construction documents
    - Training manuals in construction documents
    - System manual updates and delivery
    - Training delivery and effectiveness
    - Seasonal testing
    - Review of building operations 10 months after substantial completion
    - Develop an ongoing commissioning plan
    - Develop monitoring-based procedures and identify points to be measured and evaluated to access performance of energy and water systems
    - This prerequisite can also be achieved through the California Alternative Compliance Path.

EA Prerequisite 2 and Credit 2 – Energy Performance

- Demonstrate an improvement of 5% in the proposed building performance rating compared with the ASHRAE 90.1-2010 baseline building performance rating.
- The project will target a reduction of 50% below ASHRAE Baseline and explore opportunities on/off site to neutralize all energy consumption loads through renewable energy.
- The project team is currently evaluating system design options to maximize energy savings potential. The building is being designed for 100% electrification. The current estimated EUI for the project is 23.9 kBTU/sf/year before renewable energy generation.
- The project team is currently designed to enable the feasibility of Zero Net Energy through inclusion of a diverse portfolio of renewable energy systems.
- This prerequisite and credit can also be achieved through the California Alternative Compliance Path (1 point only).
- To achieve one additional point for Regional Priority, the project must achieve at least 10 points for Optimize Energy Performance.

EA Prerequisite 3 – Building-Level Energy Metering

- Install building-level energy meters to provide building-level data representing total building energy consumption (electricity, natural gas, chilled water, steam, fuel oil, propane, biomass, etc.). Building-level energy data will be shared with USGBC for 5 years.
- This prerequisite can also be achieved through the California Alternative Compliance Path.

Energy & Atmosphere

EA Prerequisite 4 – Fundamental Refrigerant Management

- Do not use chlorofluorocarbon (CFC)-based refrigerants in new heating, ventilating, air-conditioning, and refrigeration (HVAC&R) systems
- This prerequisite can also be achieved through the California Alternative Compliance Path.

EA Credit 1 – Enhanced Commissioning

- Review all submittals, verify inclusion of system manuals in construction documents, training manuals in construction documents, system manual updates and delivery, training delivery and effectiveness, seasonal testing, review building operations 10 months after substantial completion, develop on-going commissioning plan. (3 points).
- Additionally, develop monitoring-based procedures and identify points to be measured and identify points to be measured and evaluated to access performance of energy and water consuming system (1 additional point)

EA Credit 3 – Advanced Energy Metering

- Install energy metering on all whole-building energy sources and any individual energy end uses that represent 10% or more of the total annual consumption of the building.

EA Credit 4 – Demand Response

- Participate in a demand response program with the utility company for minimum 1 year for at least 10% of the estimated peak electricity demand.

EA Credit 5 – Renewable Energy Production

- Offset at least 15% of building's predicted annual energy cost through renewable energy generated on-site.
- The project team is investigating the inclusion of electromagnetic, piezo and solar technologies on the structure, surrounding plaza and park to meet 100% of the project's annual energy consumption.
- This energy generation approach will contribute to achieve 3 points under the Renewable Energy credit as well as one additional point under the exemplary performance criteria under Innovation credits.

EA Credit 6 - Enhanced Refrigerant Management

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

EA Credit 7 – Green Power and Carbon Offsets

- Offset 100% of annual building cost using green power, renewable energy credits, or carbon offsets for a minimum of 5 years or offset 300% for a minimum of 1 year (2 points).

Energy & Atmosphere and Materials & Resources

EA Credit 1 – Enhanced Commissioning

- Complete envelope commissioning process in accordance to ASHRAE Guidelines 0-2005 and National Institute of Building Sciences (NIBS) guideline 3-2012. (2 Points)

MR Prerequisite 1 – Storage and Collection of Recyclables

- Provide dedicated areas accessible to waste haulers and building occupants for the collection and storage of recyclable materials for the entire building.
- This prerequisite can also be achieved through the California Alternative Compliance Path.

MR Prerequisite 2 and Credit 5 – Construction and Demolition Waste Management Planning

- Develop and implement a construction and demolition waste management plan. Establish waste diversion goals for the project by identifying at least five materials (both structural and nonstructural) targeted for diversion. Approximate a percentage of the overall project waste that these materials represent. Specify whether materials will be separated or commingled and describe the diversion strategies planned for the project. Describe where the materials will be taken and how the recycling facility will process the material.
- Additionally, divert at least 50% of total construction and demolition waste material constituting at least 3 material waste streams (1 point) or 75% of total construction and demolition waste material constituting at least 4 material streams (2 points).
- This prerequisite and credit can also be achieved through the California Alternative Compliance Path (one point only).

MR Credit 1 – Building Life-Cycle Impact Reduction

- The project will follow LEED v4.1 requirements for this credit.
- Whole building life-cycle analysis (WBLCA) will be conducted, demonstrating a 5% (2 points) reduction compared to the baseline for at least 3 of the 6 following environmental impact categories, one of which must be global warming potential:
    - Global warming potential
    - Stratospheric ozone depletion
    - Acidification of land and water sources
    - Eutrophication
    - Formation of tropospheric ozone
    - Depletion of non-renewable energy sources

Materials & Resources

- WBLCA quantifies energy use, carbon emissions and other environmental impacts associated with all life cycle phases of the building: raw material procurement, manufacturing, construction, operation, and decommissioning. WBLCA enables designers and owners to measure and understand environmental impacts of design decisions.
- The project will aim to reduce greenhouse gas emissions by a minimum of 5% through an integrated process of design.

MR Credit 2 – Building Product Disclosure and Optimization: Environmental Product Declarations

- The project will follow LEED v4.1 requirements for this credit
- A minimum of 20 products from 5 different manufacturers with Environmental Product Declarations will be used.

MR Credit 3 – Building Product Disclosure and Optimization – Sourcing of Raw Materials

- The project will follow LEED v4.1 requirements for this credit.
- Products that meet at least one of the responsible extraction criteria below for at least 20%, by cost, of the total value of permanently installed building products will be used. Products sourced within 100 miles count as double.
    - Extended producer responsibility
    - Bio-based materials
    - Wood products
    - Material Reuse
    - Recycled content
- To achieve one additional point for Regional Priority, the project must achieve at least 1 point for Sourcing of Raw Materials.

MR Credit 4 – Building Product Disclosure and Optimization – Material Ingredients

- Use at least 20 different permanently installed products from at least five different manufacturers that use one of the programs, demonstrating chemical inventory of the product to be at least 0.1% (1000 ppm):
    - Manufacturer Inventory
    - Health Product Declaration
    - Cradle to Cradle
    - Declare
    - ANSI/BIFMA e3 Furniture Sustainability Standard

- Product Lens Certification
- NSF/ANSI 336: Sustainability Assessment for Commercial Furnishings Fabric
- The project will follow LEED v4.1 requirements for this credit

MR Credit 1 – Building Life-Cycle Impact Reduction

- The project will follow LEED v4.1 requirements for this credit.
- Whole building life-cycle analysis demonstrating a 10% reduction compared to the baseline for 2 additional environmental impact categories (1 additional point).

MR Credit 2 – Building Product Disclosure and Optimization – Environmental Product Declarations

- The project will follow LEED v4.1 requirements for this credit.
- Use products that comply with one of the LEED criteria for 10%, by cost, of the total value of permanently installed products in the project, or use at least 10 permanently installed products sourced from at least three different manufacturers. Products sourced within 100 miles are valued at 200%. (1 additional point)

MR Credit 3 – Building Product Disclosure and Optimization – Sourcing of Raw Materials

- The project will follow LEED v4.1 requirements for this credit.
- Use products sourced from at least five different manufacturers that meet at least one of the responsible sourcing and extraction criteria for at least 40%, by cost, of the total value of permanently installed building products in the project. (1 additional point)

MR Credit 4 – Building Product Disclosure and Optimization – Material Ingredients

- The project will follow LEED v4.1 requirements for this credit.
- Use permanently installed products from at least three different manufacturers that document their material ingredient optimization using the paths below. Choose either 10 compliant products, or select products that constitute at least 10%, by cost, of the total value of permanently installed products in the project. (1 additional point).

Indoor Environmental Quality

EQ Prerequisite 1 – Minimum Indoor Air Quality Performance

- Meet the minimum requirements of ASHRAE 62.1.2010 for ventilation requirements and outdoor air intake.
- This prerequisite can also be achieved through the California Alternative Compliance Path.

EQ Prerequisite 2 – Environmental Tobacco Smoke Control

- No smoking rooms in the buildings or within 25 feet of any openings. Install “No Smoking” signage within 10 feet of all building entrances.
- This prerequisite can also be achieved through the California Alternative Compliance Path.

EQ Credit 1 – Enhanced Indoor Air Quality Strategies

- Install permanent entryway systems at least 10 feet long in the primary direction of travel. Sufficiently exhaust each space where hazardous gases or chemicals may be present or used. Install MERV 13 filters. (1 point)
- Additional strategies such as exterior contamination prevention, increased ventilation, carbon monoxide monitoring, or additional source control and monitoring must be provided to meet the additional point.

EQ Credit 2 – Low-Emitting Materials

- The project will meet LEED v4.1 requirements for this credit.
- Low VOC materials will be used in at least 2 (1 point), 3 (2 points), 4 (3 points), or 5 (3 points + Exemplary Performance) of the following categories:
    - Interior paints and coatings applied on site
    - Interior adhesives and sealants applied on site
    - Flooring
    - Wall panels
    - Ceilings
    - Insulation
    - Furniture
    - Composite Wood

EQ Credit 3 – Construction Indoor Air Quality Management Plan

- Develop and implement an indoor air quality (IAQ) management plan for the construction and preoccupancy phases of the building.
- This credit can also be achieved through the California Alternative Compliance Path.

EQ Credit 4 – Indoor Air Quality Assessment

- Perform a building flush-out (1 point) or air quality tests (2 points) after construction ends and before occupancy.

Indoor Environmental Quality

EQ Credit 5 – Thermal Comfort

- HVAC systems will be designed to meet the requirements of ASHRAE 55 2010, and thermal comfort control will be provided for a minimum of 50% of individual occupied spaces group thermal comfort controls will be provided for all shared multi-occupant spaces.

EQ Credit 6 – Interior Lighting

- Option 1: Provide lighting control in 90% of individual occupant spaces with 3 levels of control and group lighting control in shared occupant spaces.
- Option 2: Implement at least four lighting strategies in the project from the list below. (1 additional point)
- For all regularly occupied spaces, use light fixtures with a luminance of less than 2,500 cd/m2 between 45 and 90 degrees from nadir.
- For the entire project, use light sources with a CRI of 80 or higher.
- For 75% of the total connected lighting load, use light sources that have a rated life (or L70 for LED sources) of at least 24,000 hours
- Use direct-only overhead lighting for 25% or less of the total connected lighting load for all regularly occupied spaces.
- For 90% of the regularly occupied floor area, meet the following thresholds for area-weighted average surface reflectance: 85% for ceilings, 60% for walls, and 25% for floors.
- If furniture is included in the scope of work, select furniture finishes to meet the following thresholds for area-weighted average surface reflectance: 45% for work surfaces, and 50% for movable partitions
- For 75% of the regularly occupied floor area, meet ratio of average wall surface illuminance (excluding fenestration) to average work plane (or surface, if defined) illuminance that does not exceed 1:10. Must also meet strategy E, strategy F, or demonstrate area-weighted surface reflectance of 60% for walls.
- For 75% of the regularly occupied floor area, meet ratio of average ceiling illuminance (excluding fenestration) to work surface illuminance that does not exceed 1:10. Must also meet strategy E, strategy F, or demonstrate area-weighted surface reflectance of 85% for ceilings.

EQ Credit 7 – Daylight

- The project will follow LEED v4.1 requirements for this credit.
- The average spatial daylight autonomy for the regularly occupied floor area must be at least 40% (1 point), 55% (2 points), or 75% (3 points). For any regularly occupied spaces with Annual Sunlight Exposure greater than 10%, identify how the space is designed to address glare.

Indoor Environmental Quality

EQ Credit 8 – Quality Views

- A direct line of sight to the outdoors via vision glazing must be achieved for at least 75% of all regularly occupied floor area.
- Two of the four kinds of views must be achieved.
- Multiple lines of sight to vision glazing in different directions at least 90 degrees apart.
- Views that include flora, fauna or sky, movement or objects at least 25 feet from the exterior of the glazing
- Unobstructed views located for a distance of up to 3 times head height of the vision glazing
- Views with a view factor of 3 or greater as defined in “Windows and Offices: A study of office worker performance and the indoor environment”.

EQ Credit 9 – Acoustic Performance

- The project will follow LEED v4.1 requirements for this credit.
- For all occupied spaces, meet the requirements, as applicable, for the following
    - HVAC Background noise
    - Sound isolation
- Reverberation time
- Sound reinforcement and masking

Innovation & Design

The following credits will be evaluated to meet the Innovation requirements:

ID Credit 1.1 – 1.5: To achieve all five innovation points, a project team must achieve at least one pilot credit, at least one innovation credit and no more than two exemplary performance credits. The list of innovation and pilot options below may be expanded on and confirmed through future Performance Track Workshops.

- Innovation Credit Options
    - Purchasing - Lamps: Implement the lighting purchasing plan that specifies an overall building average of 35 picograms of mercury per lumen-hour or less for all mercury-containing lamps purchased for the building and associated grounds within the project boundary.
    - O+M Starter Kit: Submit documentation for at least 2 LEED O+M establishment policies: Site Management, Ongoing Purchasing and Waste, Facility Maintenance and Renovations, Green Cleaning, or Integrated Pest Management.
    - Green Building Education: Select two of the following items to develop an education plan: A comprehensive signage program, manual, guideline, or case study of the building, or an educational outreach program or guided tour.
    - Design for Active Occupants: Buildings must have at least one main stair that enables occupants to travel between the building entrance floor(s), occupant's own destination floor and common use floors. Access to floors may be restricted by use of security devices, such as card keys, codes or other access devices. Include seven or more active design features within the project for primary staircase(s)
    - WELL Features: Pursue WELL Feature 87: Beauty and Design I from the WELL Building Standard. Integrate features intended for all of the following: Human delight, celebration of culture, celebration of spirit, celebration of place, meaningful integration of public art.
- Pilot Credit Options
    - Designing with nature, biophilic design for the indoor environment: Engage in the exploration of the biophilic design potential for the project and connecting people to the natural environment. The exploration must result in the development and implementation of a biophilic design plan that includes at least five distinct design strategies related to biophilic design.
    - Comprehensive Composting: Provide composting infrastructure to meet the needs of the entire project, either with regular compost collection and offsite processing, or on-site compost processing.
    - Solar Access to Green Space: Demonstrate through computer modeling that the annual sun hours in the darkest occupiable location of the surrounding affected public parks or green spaces achieved by the proposed envelope is at least 3 times the hours in same location under the baseline case.
    - All Gender Restrooms: Provide single or multi-stall restroom facilities to be used by every occupant.
- Exemplary Performance Options
    - Optimize Energy Performance: Demonstrate an improvement of 54% or more using a whole building

energy simulation.

- Renewable Energy Production: Offset 15% or more of building's predicted annual energy cost through renewable energy generated on-site.

- ID Credit 2 – LEED Accredited Professional: At least one principal participant of the project team is a LEED Accredited Professional.

END OF SECTION

12 | Construction Sequencing & Feasibility

Abstract

The project team developed the proposed sequencing and modeled it in an animated video sequence. The team's strategy is an effective way to construct the Breeze of Innovation efficiently and safely using existing technology and methods. The following narrative displays stills from the video sequence.

Exhibits

Figures 12-1 - 12-17 Construction Sequencing Video Stills

Introduction

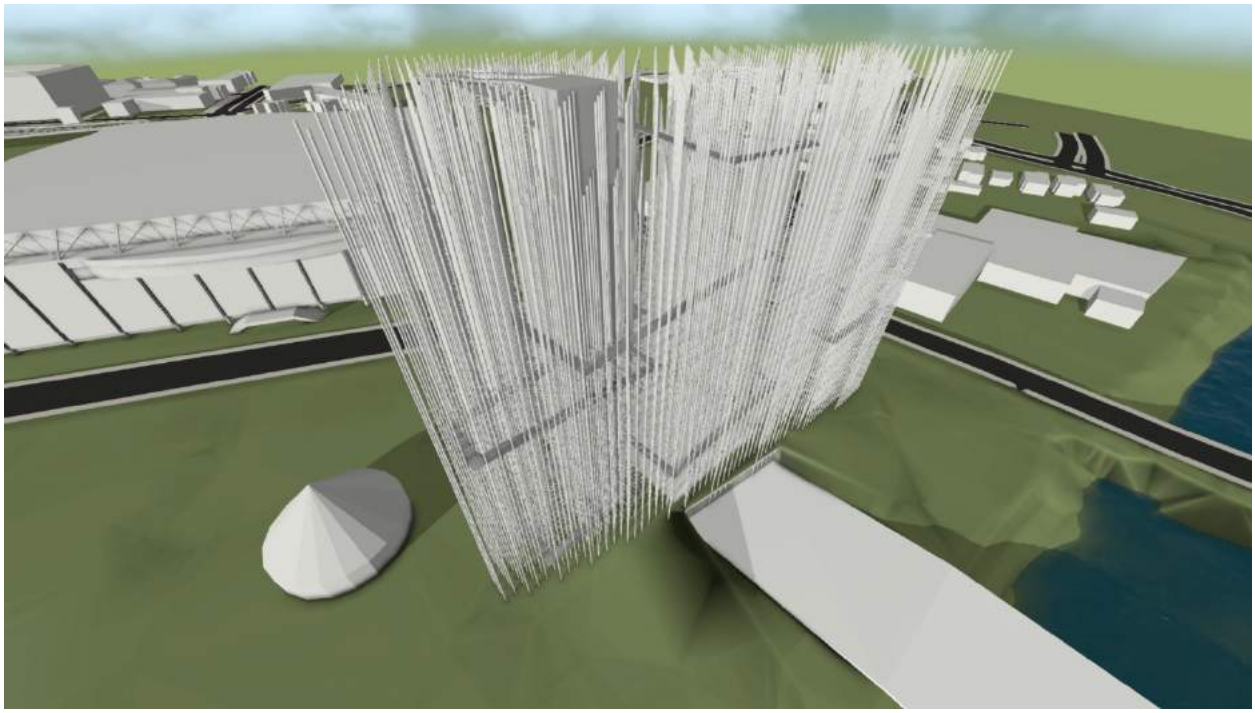


Figure 12-1: Constructing the Breeze of Innovation structure is as innovative as the design itself. Prefabrication, and assembly on the ground, will offer maximum safety and efficiency for construction workers. The elimination of all field welding through an innovative system of couplers and locking bolts allows the entire structure to be assembled with a power drill.

Setting Slab & 3D Cartesian Grid

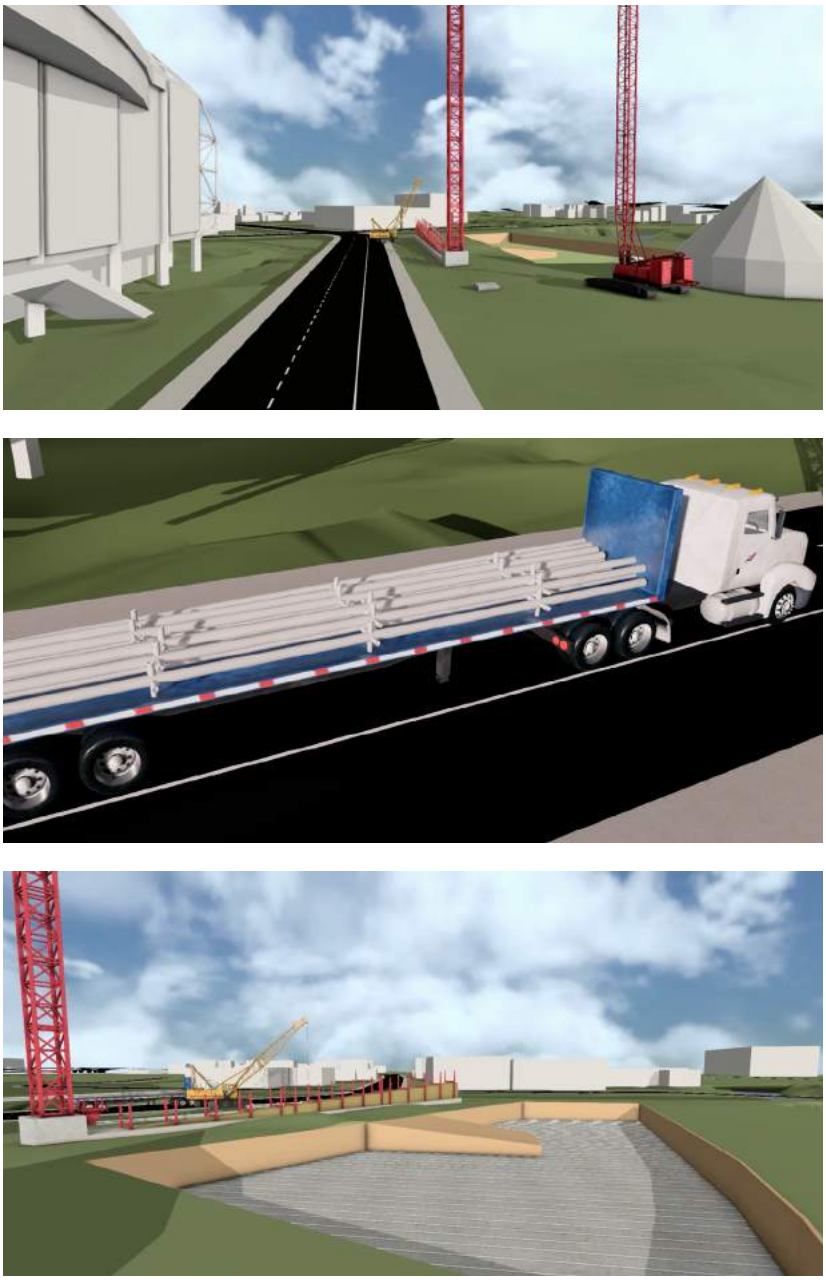


Figure 12-2: Prefabricated lengths (up to 60 feet) of stainless steel pipe are easily transported by truck to the site. Once on site, the pipes are positioned into sub-assemblages of the 3D-Cartesian Grid Frame (3D-CGF) on a sloping ramp/jig system. Vertical lengths are attached by a simple bolted connection.

Foundation Stanchions

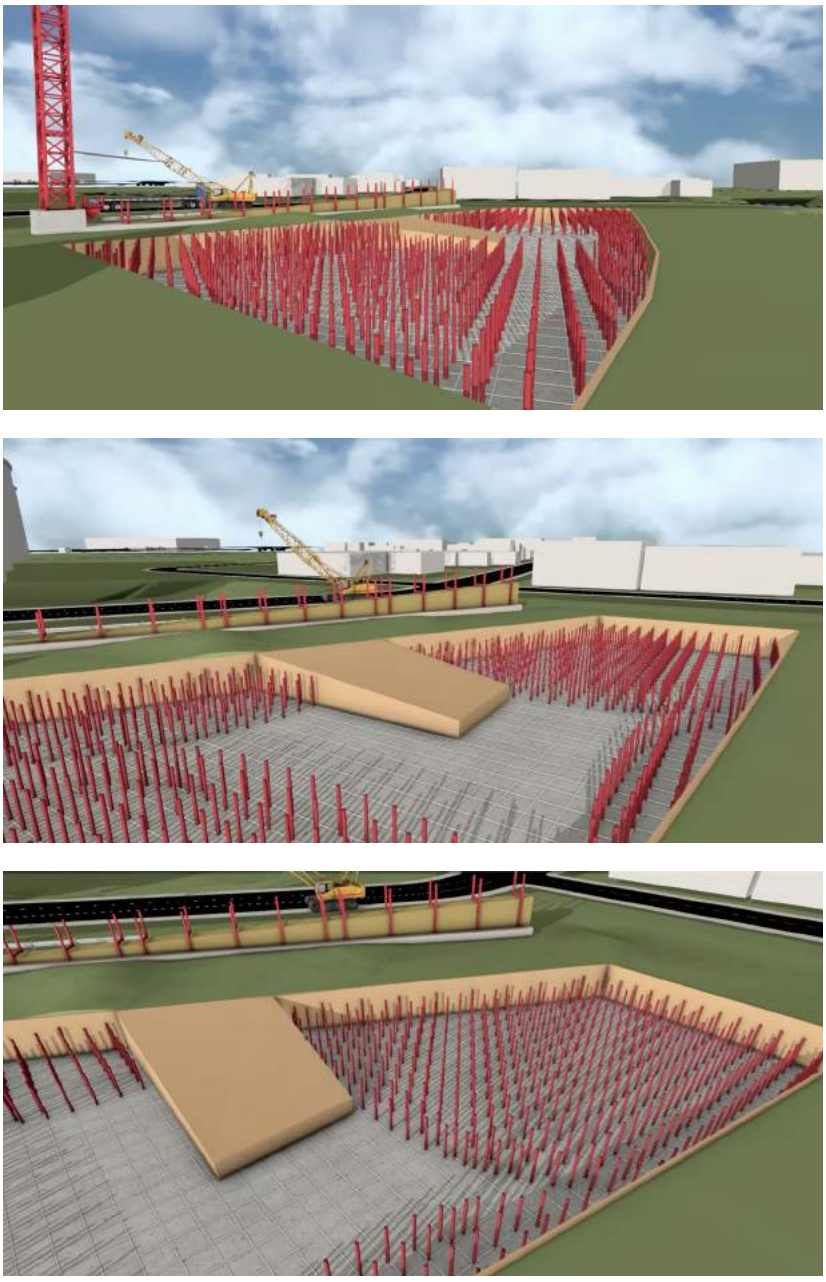


Figure 12-3: Installation of steel stanchions embedded into a mat slab provides a framework for easy installation of sub-assemblages later. Stanchions are anchored to a setting out slab which doubles as a waterproofing protection slab.

Figure 12-3.1:

Mat Foundation

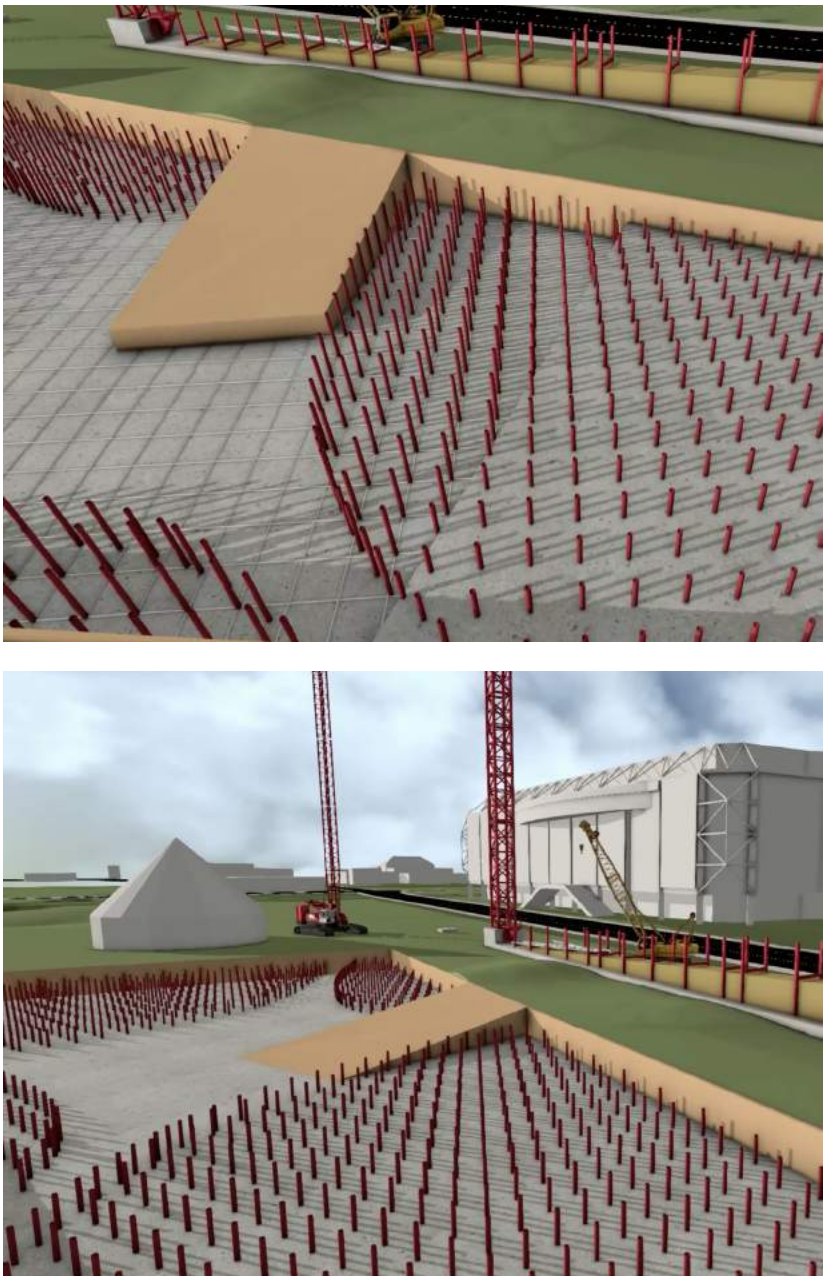


Figure 12-4: Mat foundation of approximately 4’ thickness is then poured, anchoring the stanchions in place. MEP infrastructure is routed above this slab in a gravel layer and topping slab installation.

Sub-Assemblage & Jig

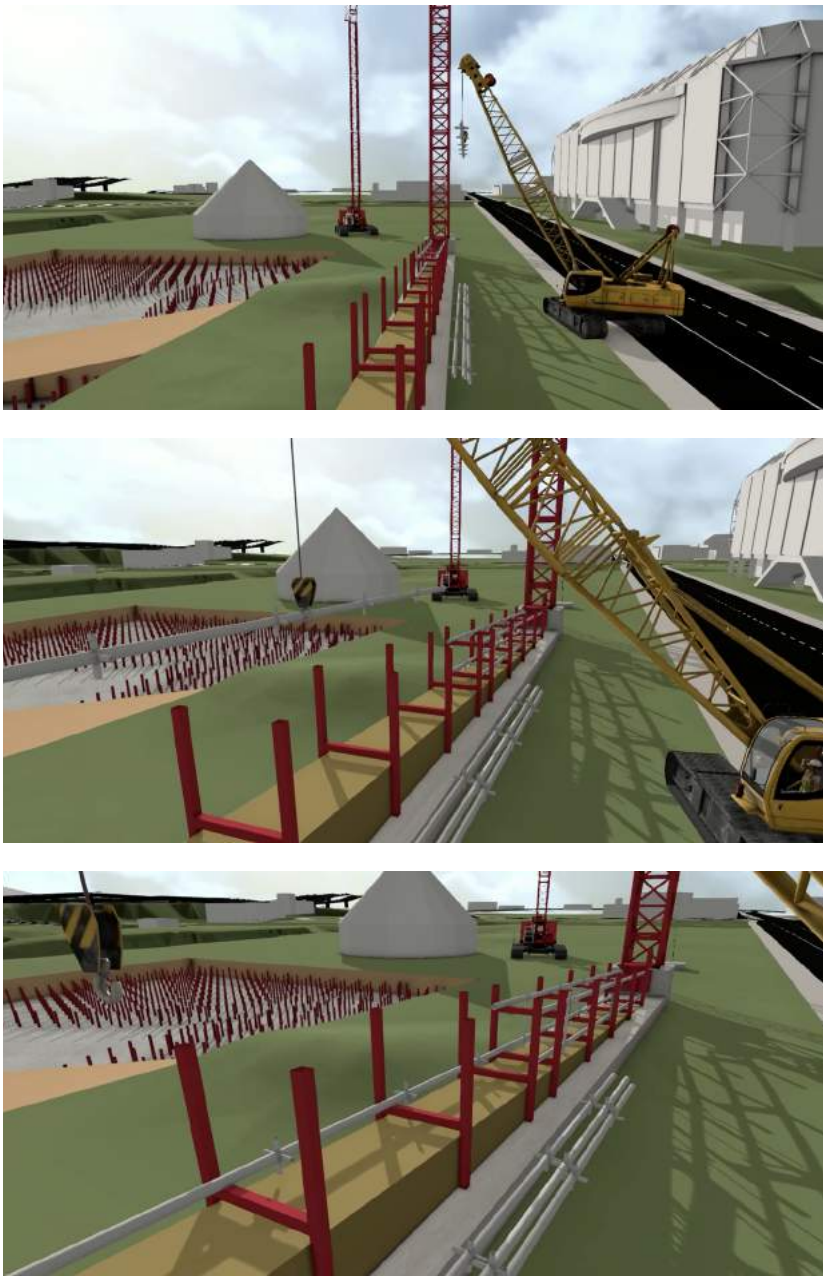


Figure 12-5: The site assembly jig is erected and sub-assemblage are built out of pre fabricated pipe sections. Rod tops are also installed at this point.

Sub-Assemblage & Connection

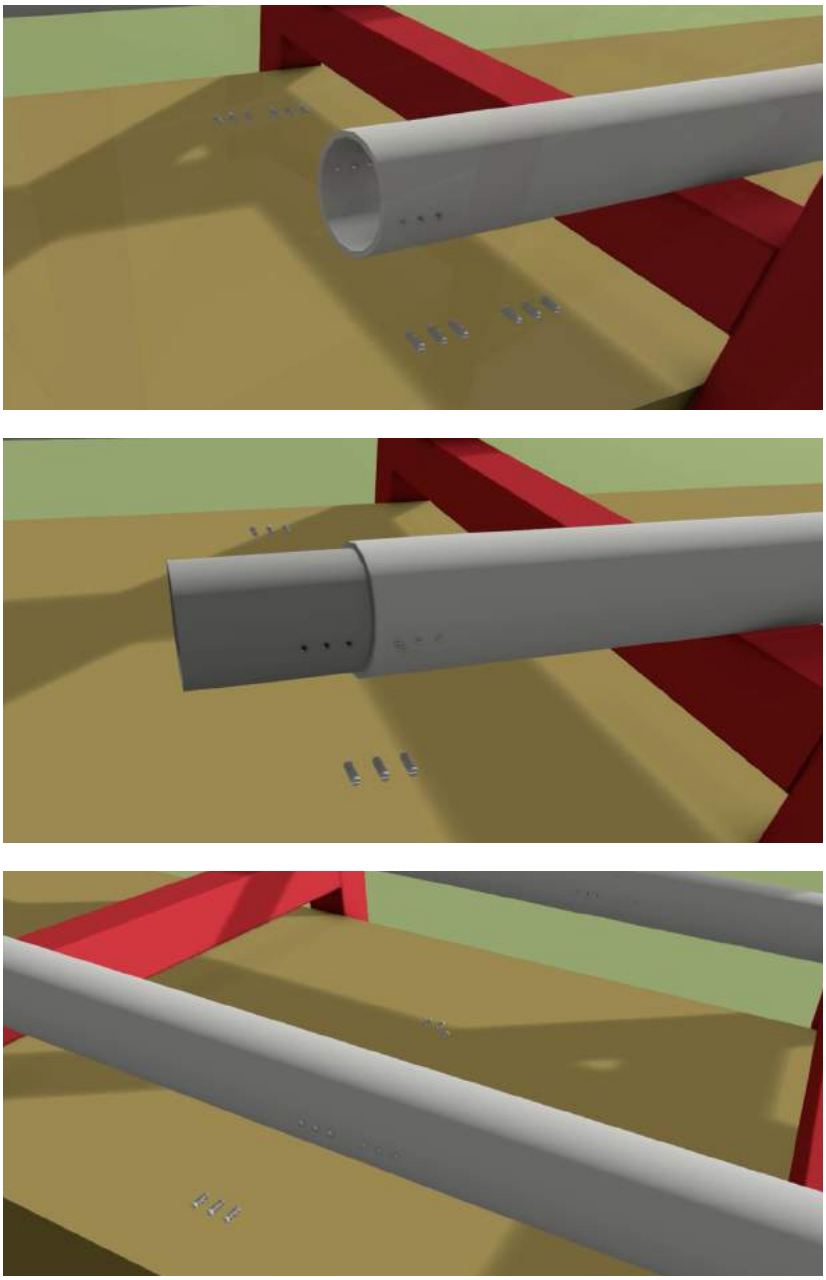


Figure 12-6: Pipe sections splices are achieved seamlessly with a coupling and flush threaded connectors.

Hoisting Tower

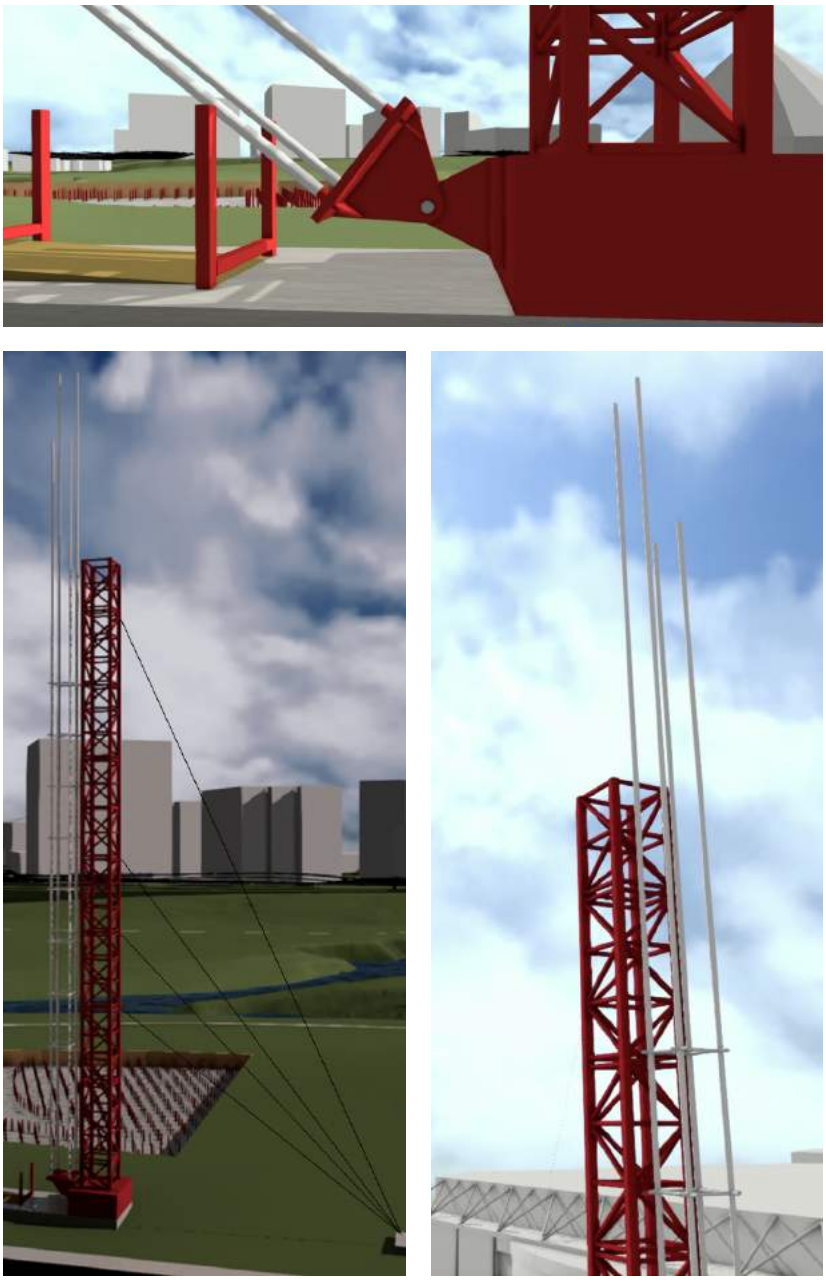


Figure 12-7: Each sub-assemblage is then rotated into the vertical position by a series of cables rigged from a hoisting tower.

Mobile Crane Placement

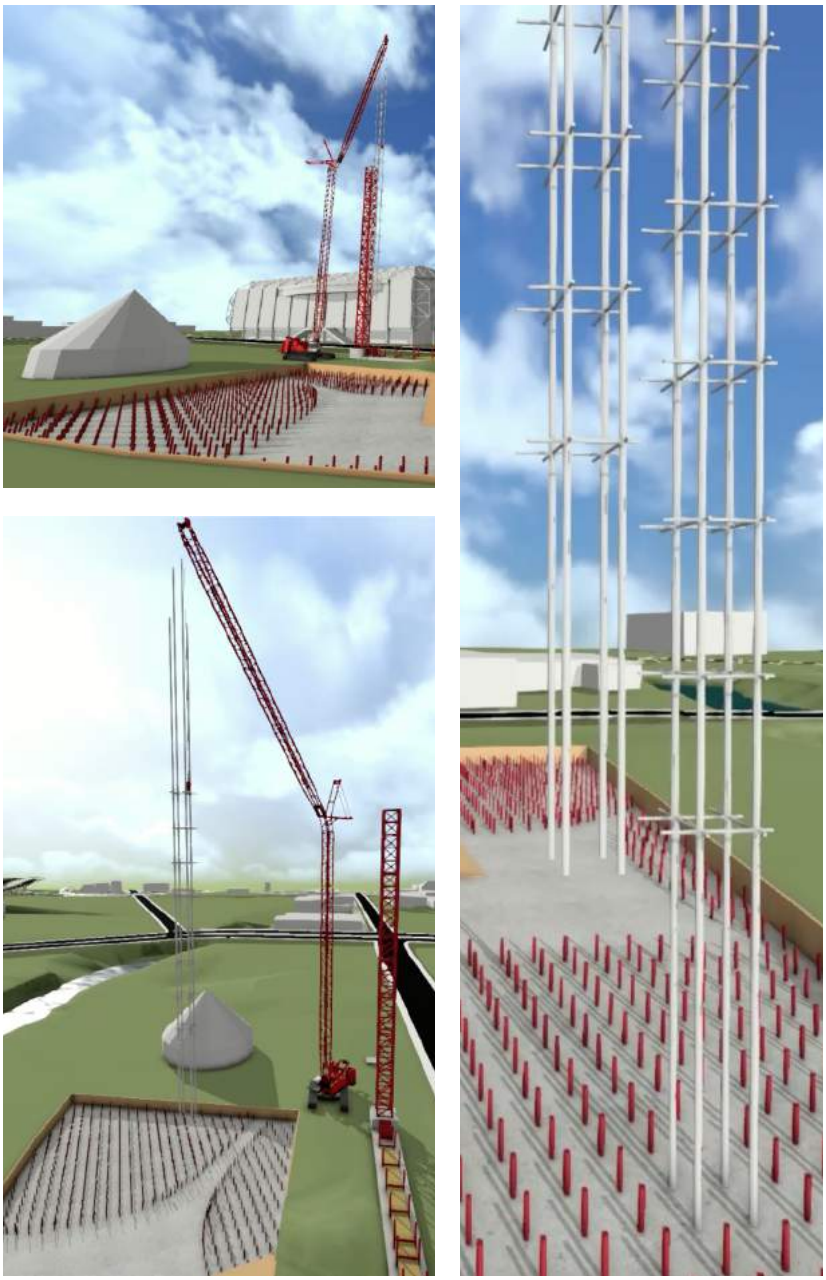


Figure 12-8: Once vertical, a mobile crane is able to lift each sub-assembly (weighing roughly 20 tons) swinging it into final position.

Connection to Stanchions

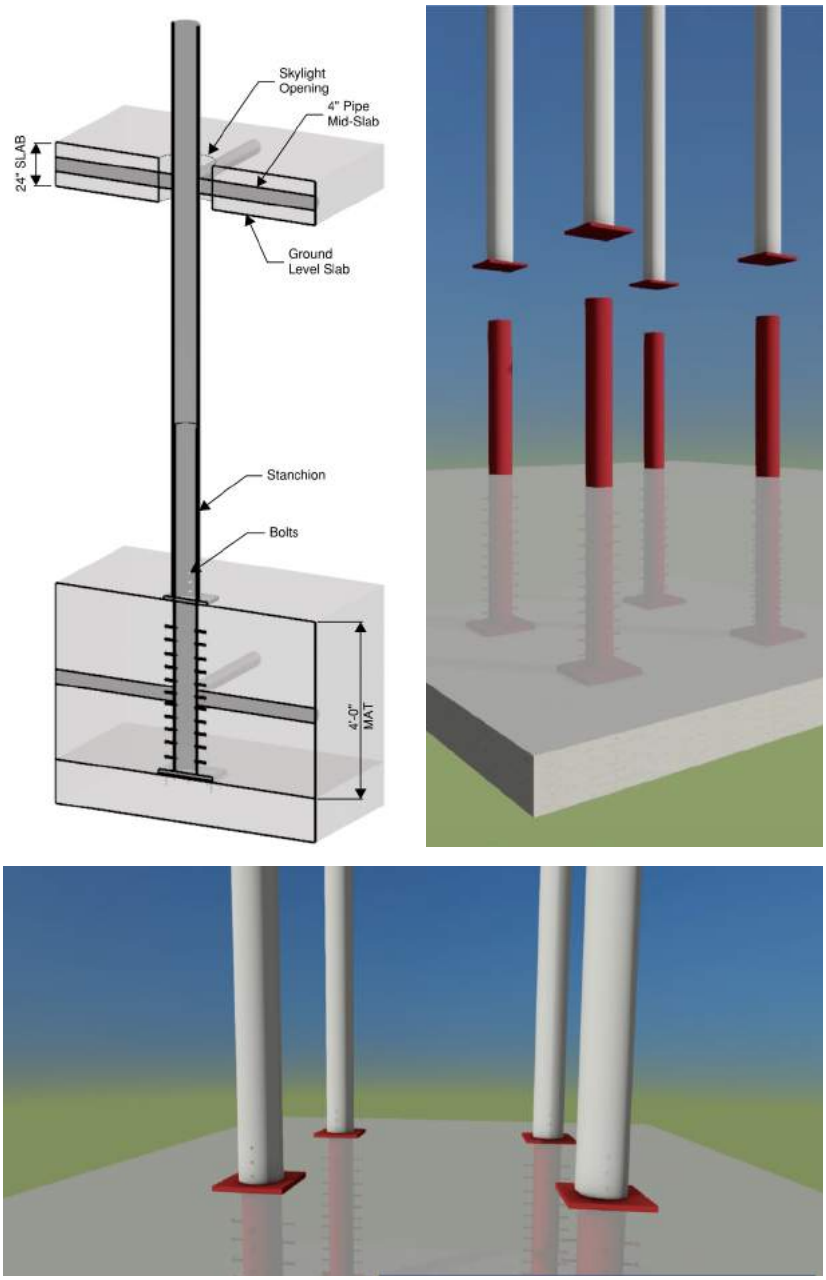


Figure 12-9: Individual sub-assemblies are secured by anchoring to pre-positioned stanchions at their base

Threaded Coupler Connection

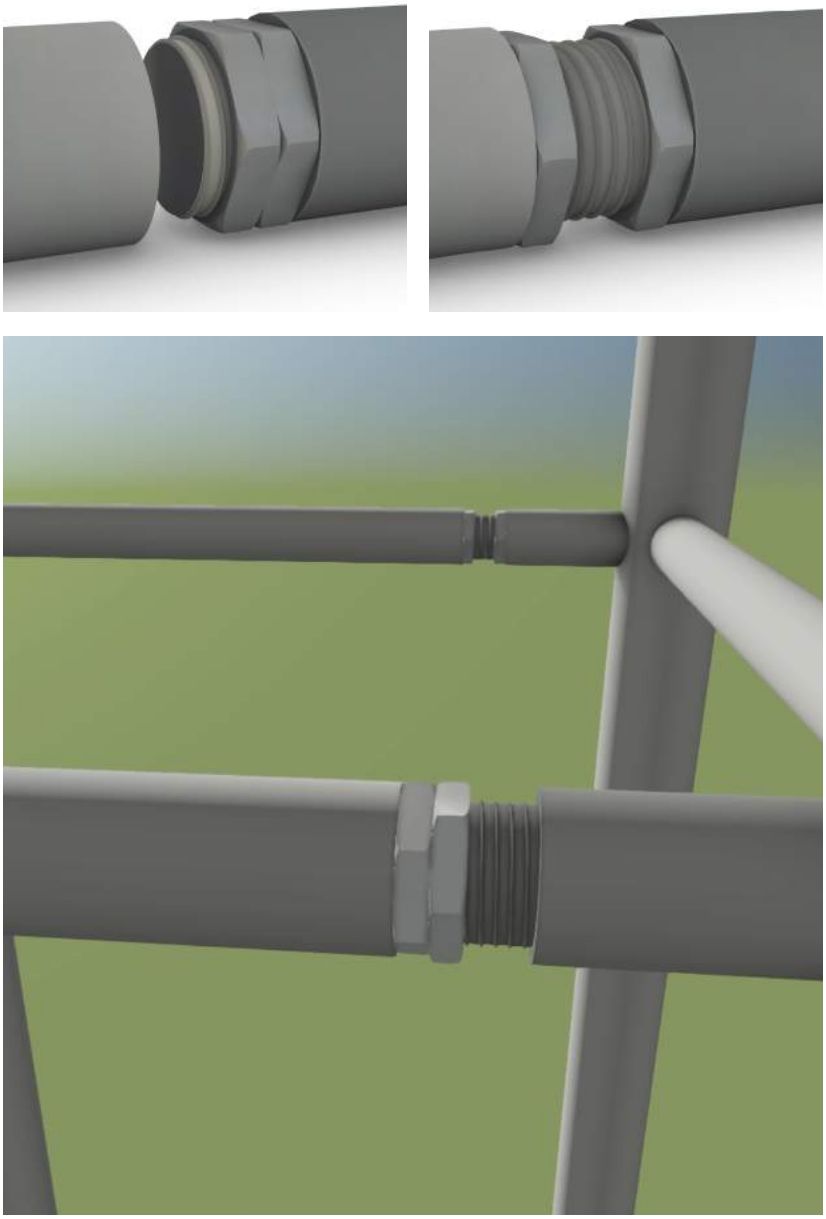


Figure 12-10: Final connections between sub-assemblies are made by advancing threaded couplers on the horizontal rods and locking the couplers into final position with locking bolts.

Sub-Assemblage Placement

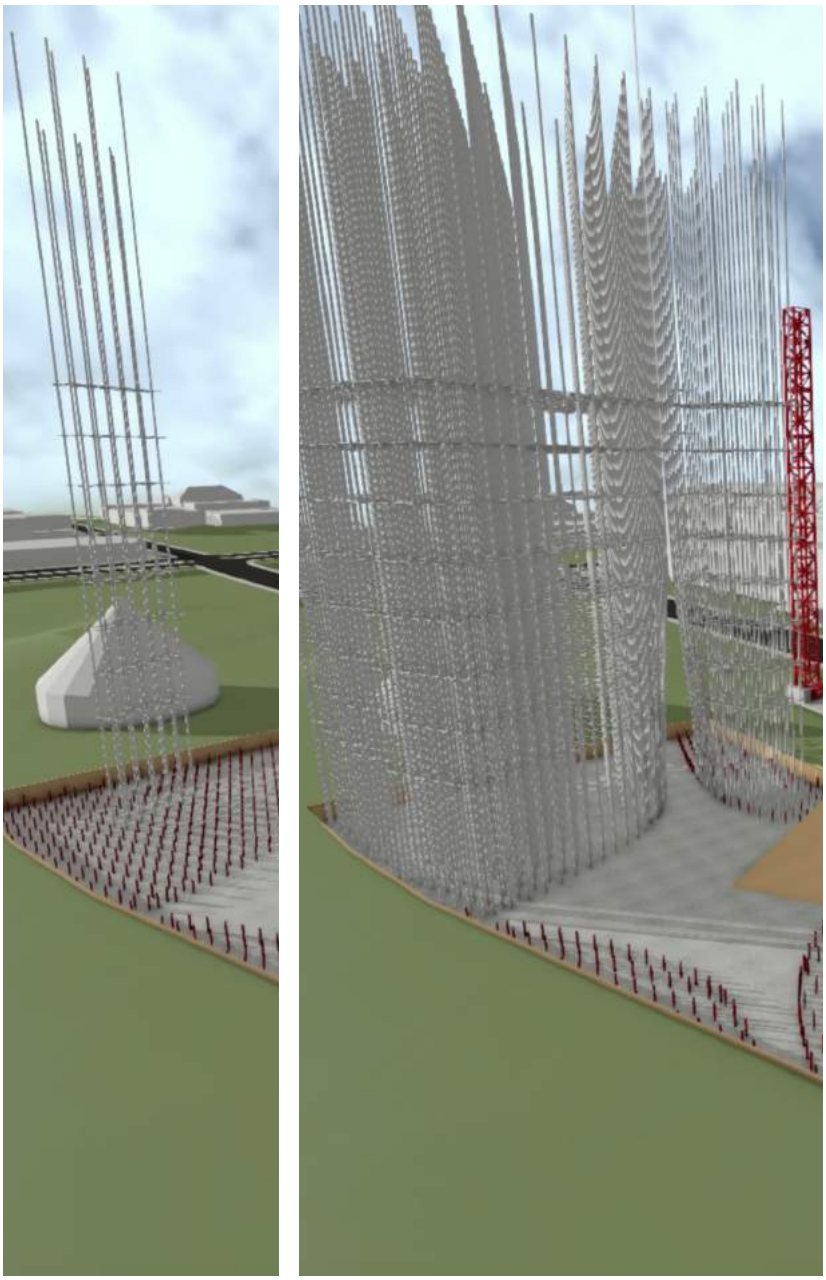


Figure 12-11: Successive placement of rod sub assemblies is a repeatable and efficient exercise.

Demolition of Construction Access Ramp

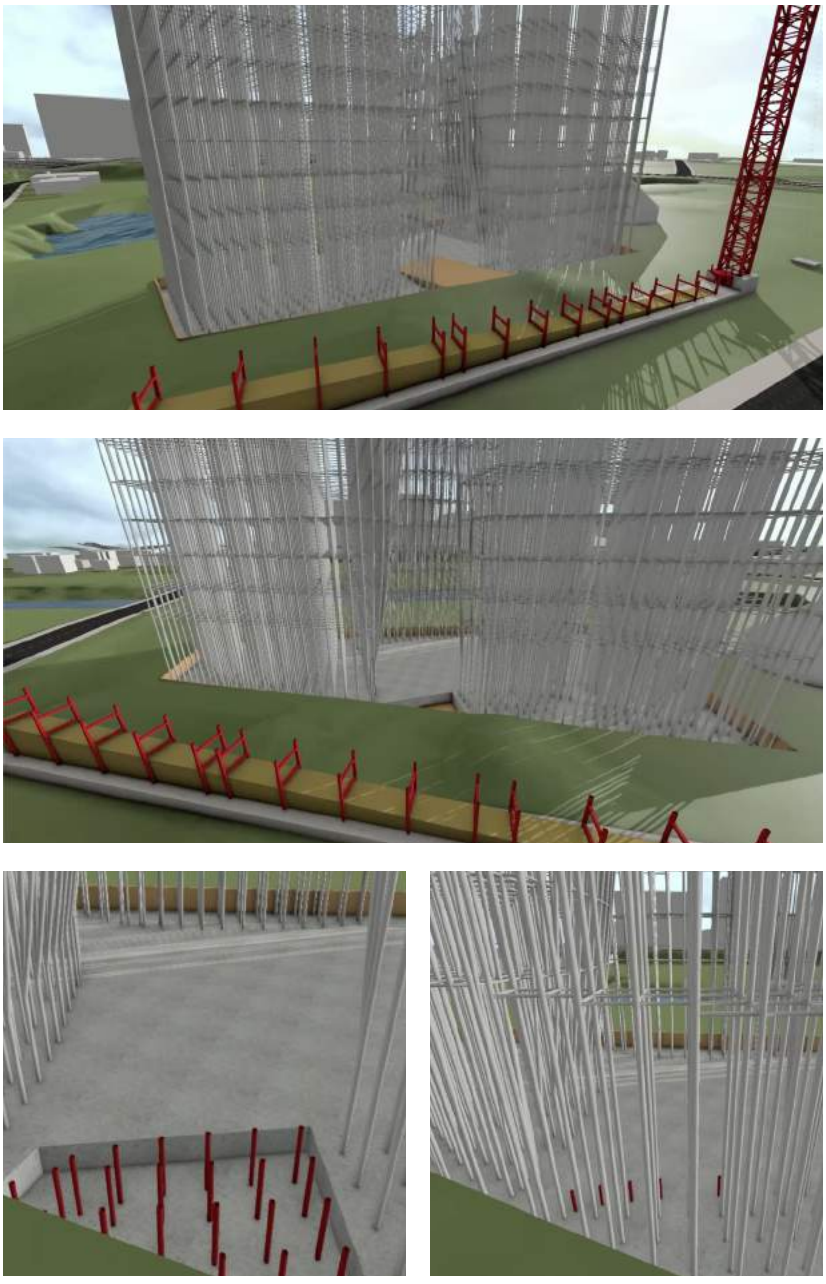
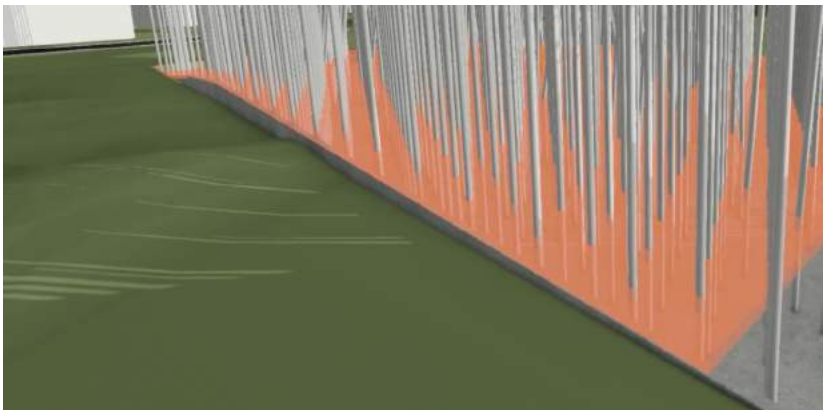


Figure 12-12: access ramp removal and placement of the remaining stanchions and rod assemblies completes crane work for the structure.

Ground Level Slab



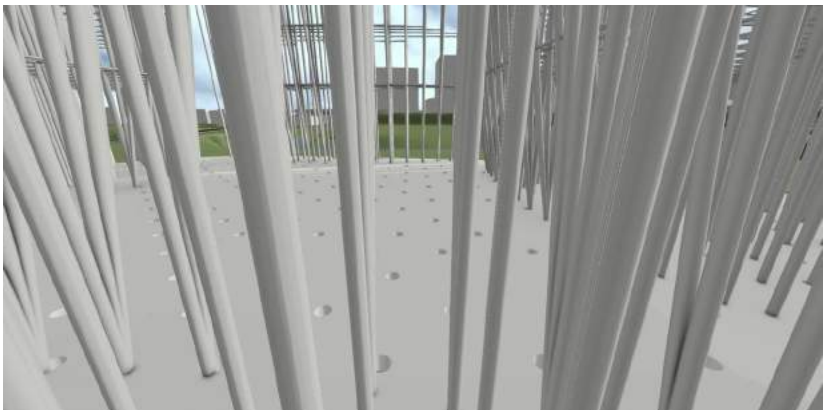


Figure 12-13: Casting of ground level slab is made around the placed rods and supported by horizontal connections at the level of the slab. Slab leave-outs for the small round skylights are accommodated and later infilled with prefabricated units.

Ground Level Slab

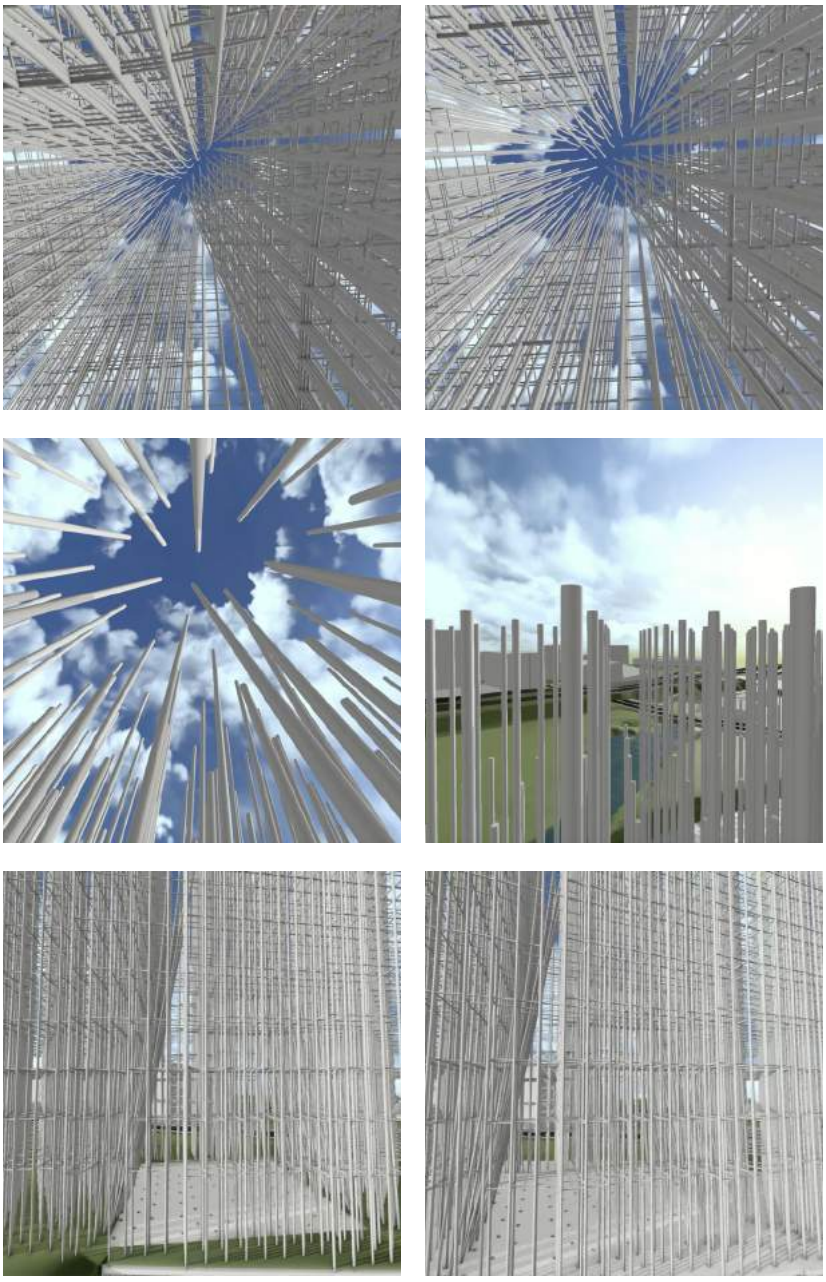
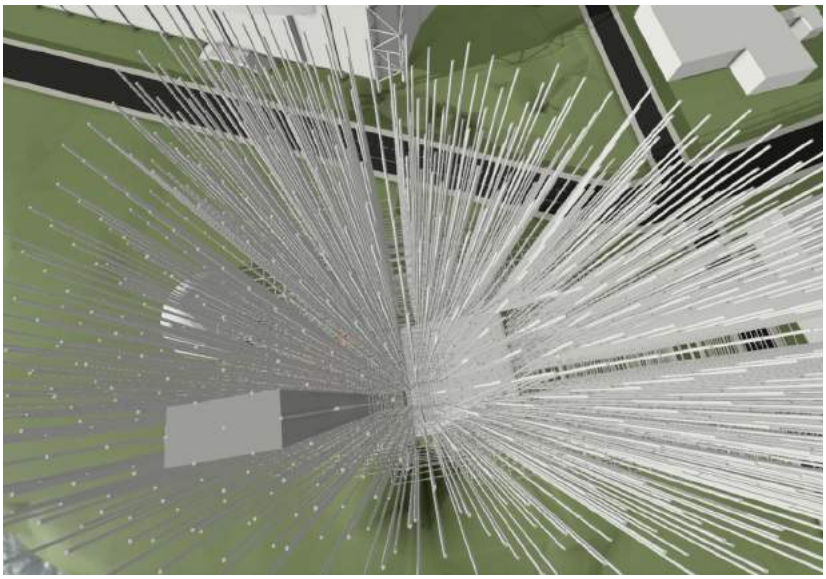
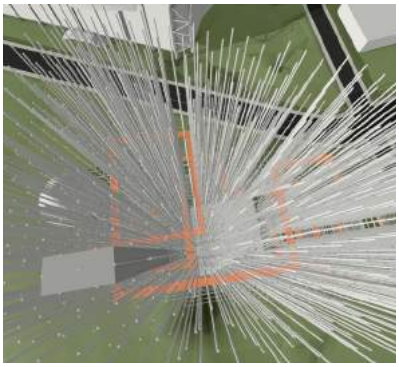
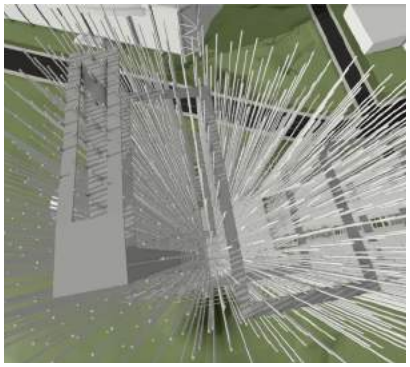


Figure 12-14: At this stage the overall shape and feel of the Breeze of Innovation are completed, including the Rod Tops, which were assembled prior to erection.

Core Structures, Stairs, and Ramp-ways







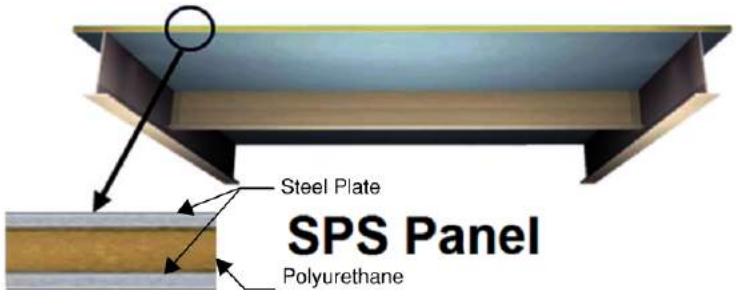


Figure 12-15: Ramp-ways and stairs are all supported by the 3d-CGF system. Stairs may be assembled from prefabricated sections, Ramps may be built from ground level up by securing SPS panels to horizontal members and then installing railings and other systems, such as lighting, power, and energy generation.

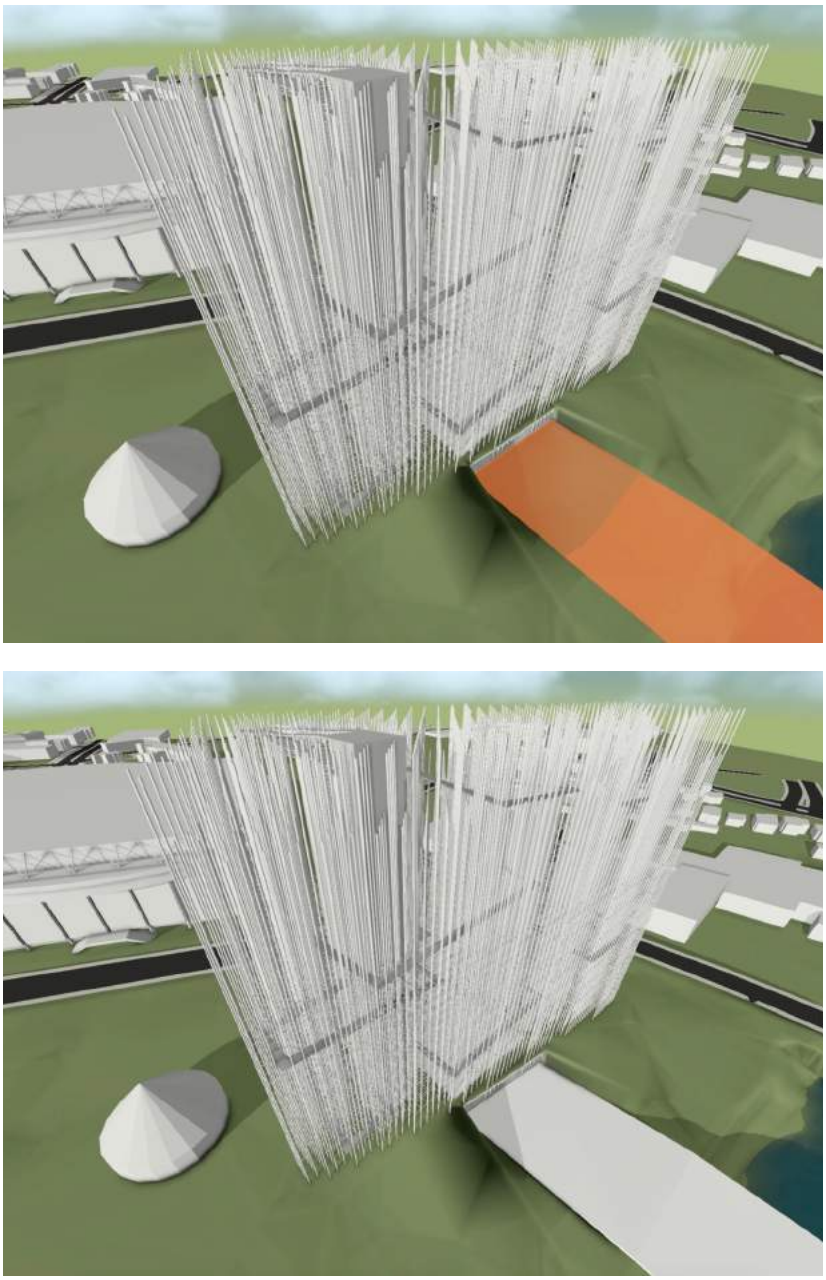


Figure 12-16: Cast in place entry ramp and final grading work can then proceed.

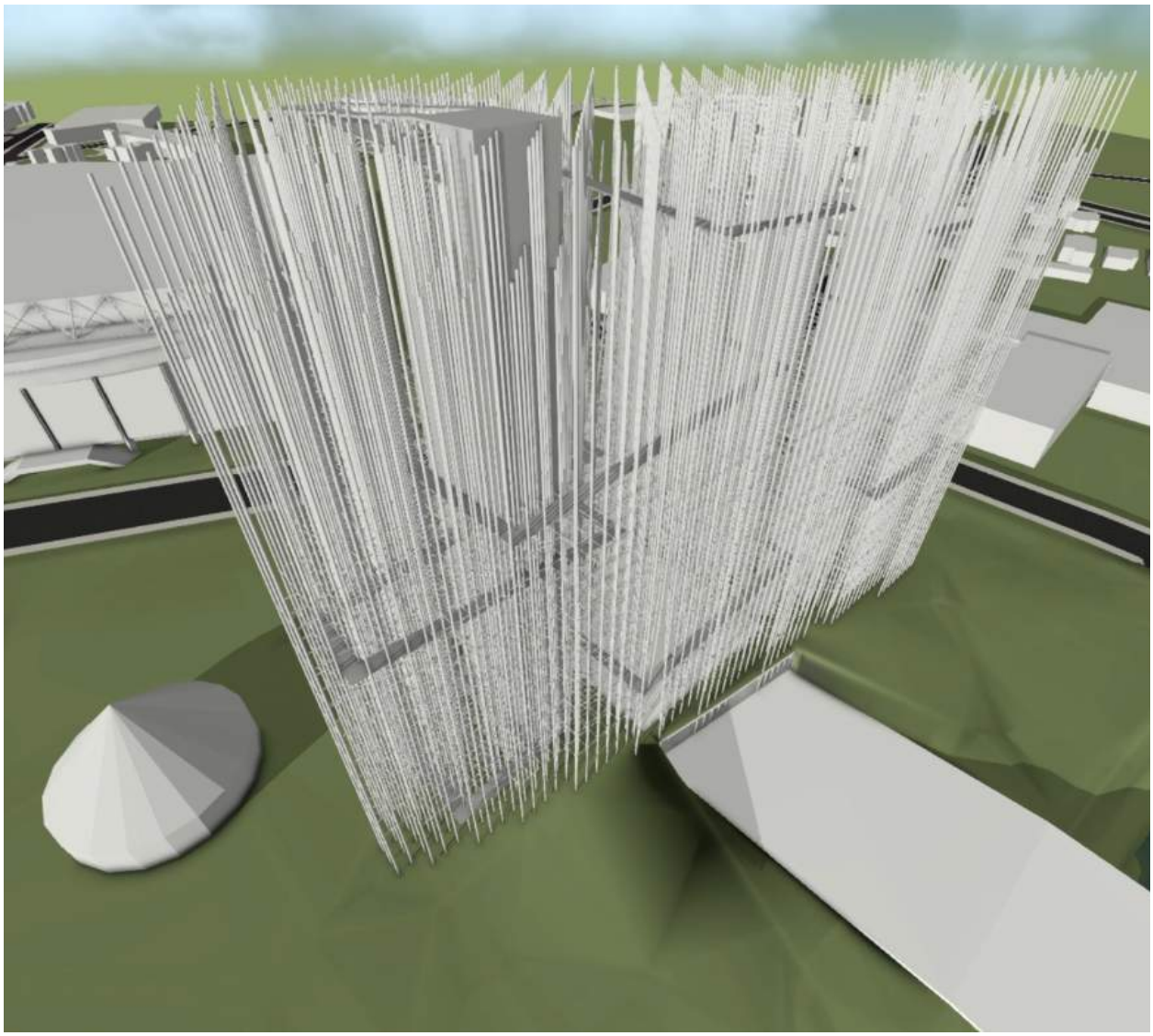


Figure 12-17: Landscaping, tree placement, interior fit out and completion of elevator and lighting systems, testing and commissioning are the last steps of construction before opening to the public as a new icon in Silicon Valley.