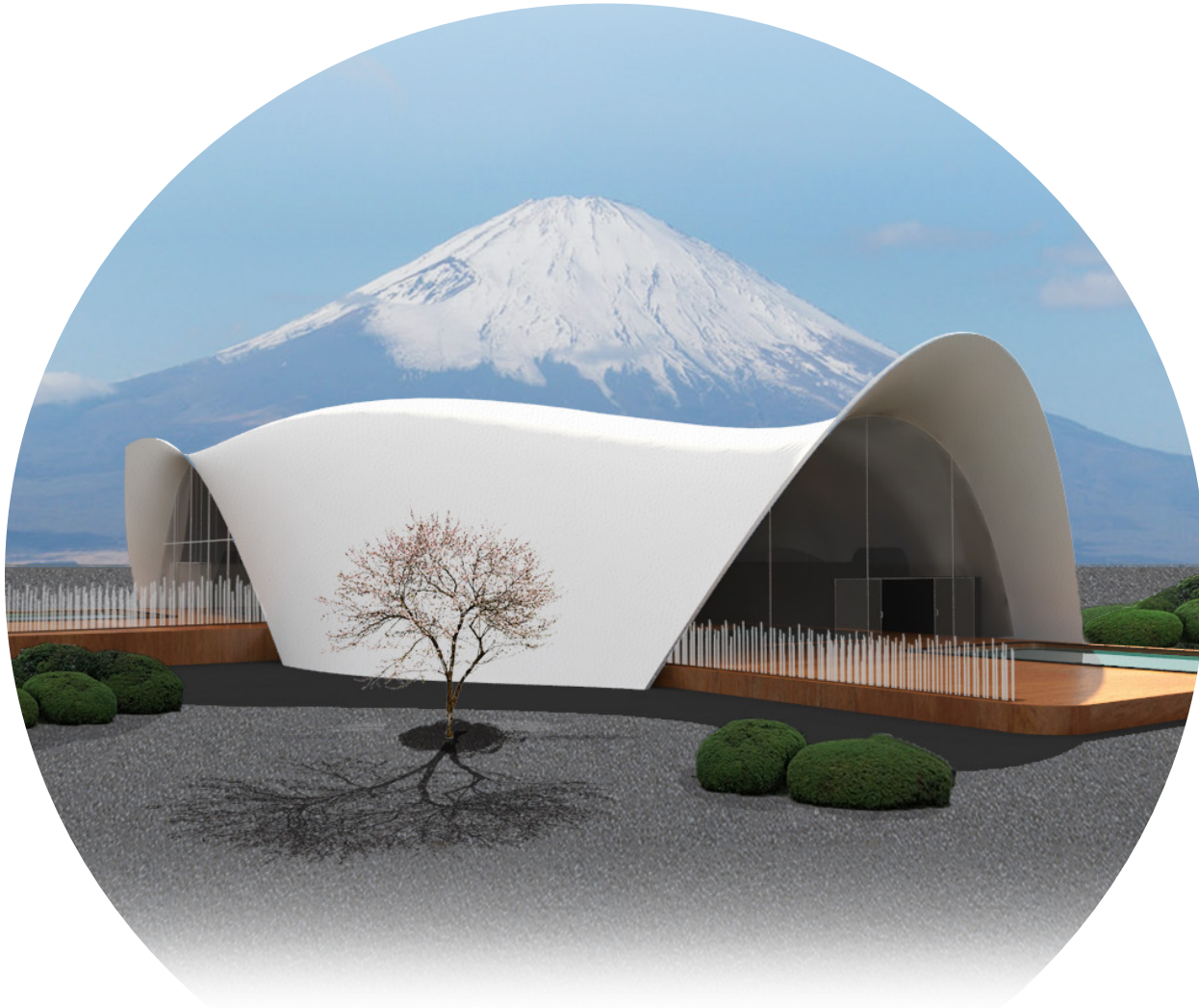
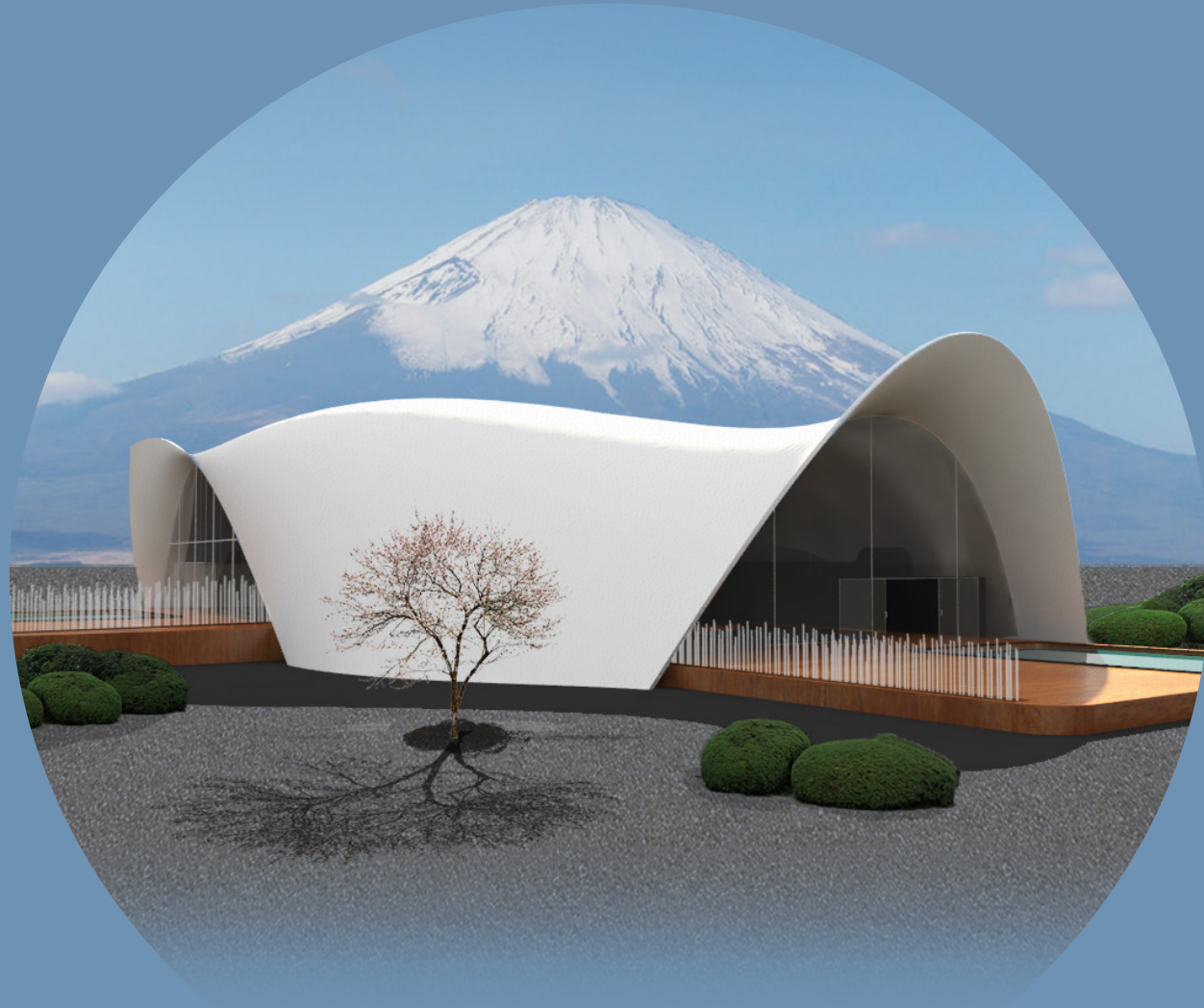


# TRANSCEND



ONSEN | HAKONE, JAPAN

# TRANSCEND



ONSEN | HAKONE, JAPAN

## TRANSCEND.

JAMES BLANCHARD. LILLIAN CAO. NICHOLAS HORANEY.  
HUNTER MOSIER. CORY PETERMAN.

ARCH 452\_ARCE415

CALIFORNIA POLYTECHNIC STATE UNIVERSITY  
SAN LUIS OBISPO, CALIFORNIA 2018.

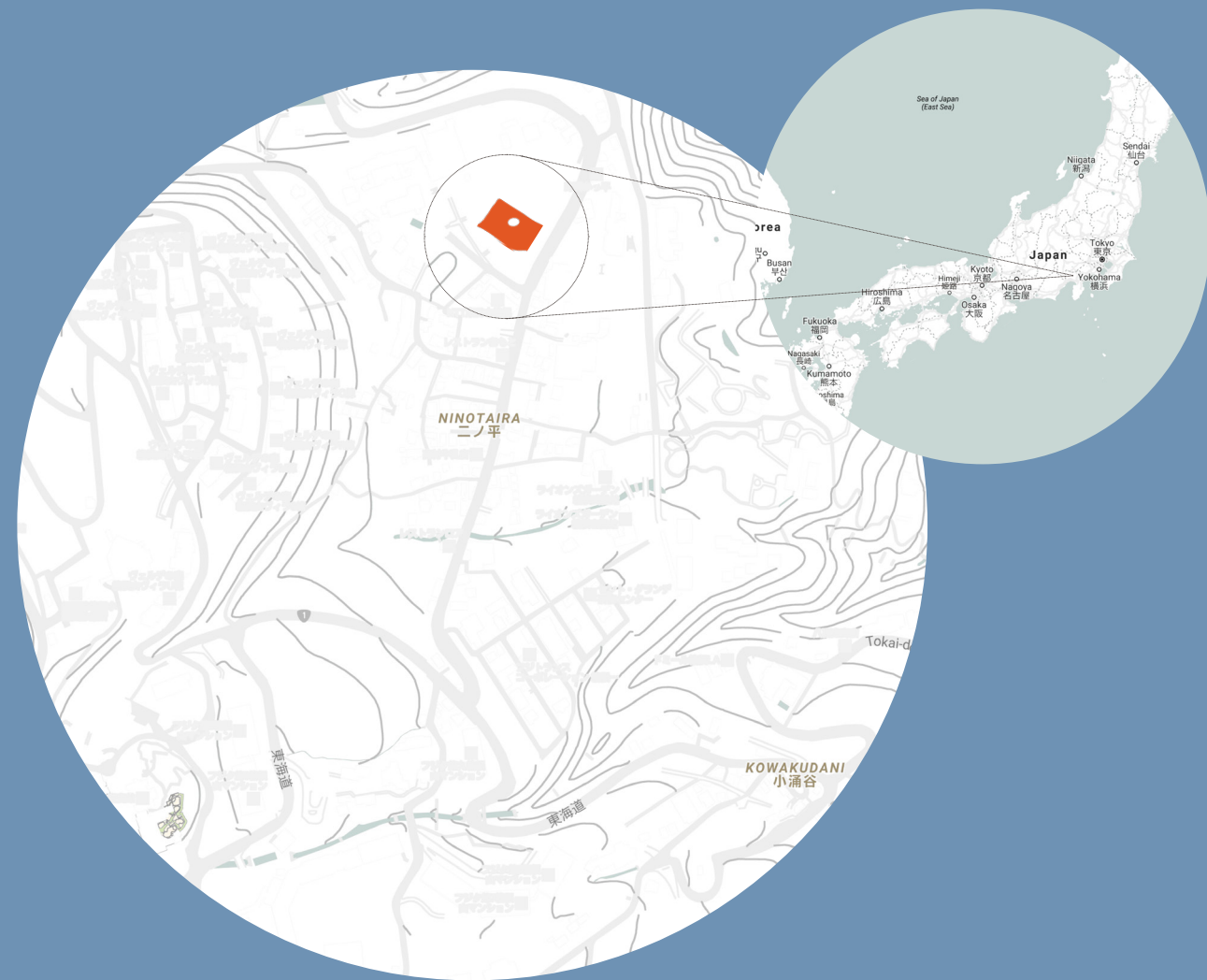
# CONTENT

- 01 SITE ANALYSIS
- 02 BUILDING DESIGN
- 03 LIGHTING DESIGN
- 04 STRUCTURAL ANALYSIS
- 05 CONCEPTS
- 06 CONSTRUCTION
- 07 MODEL IMAGES



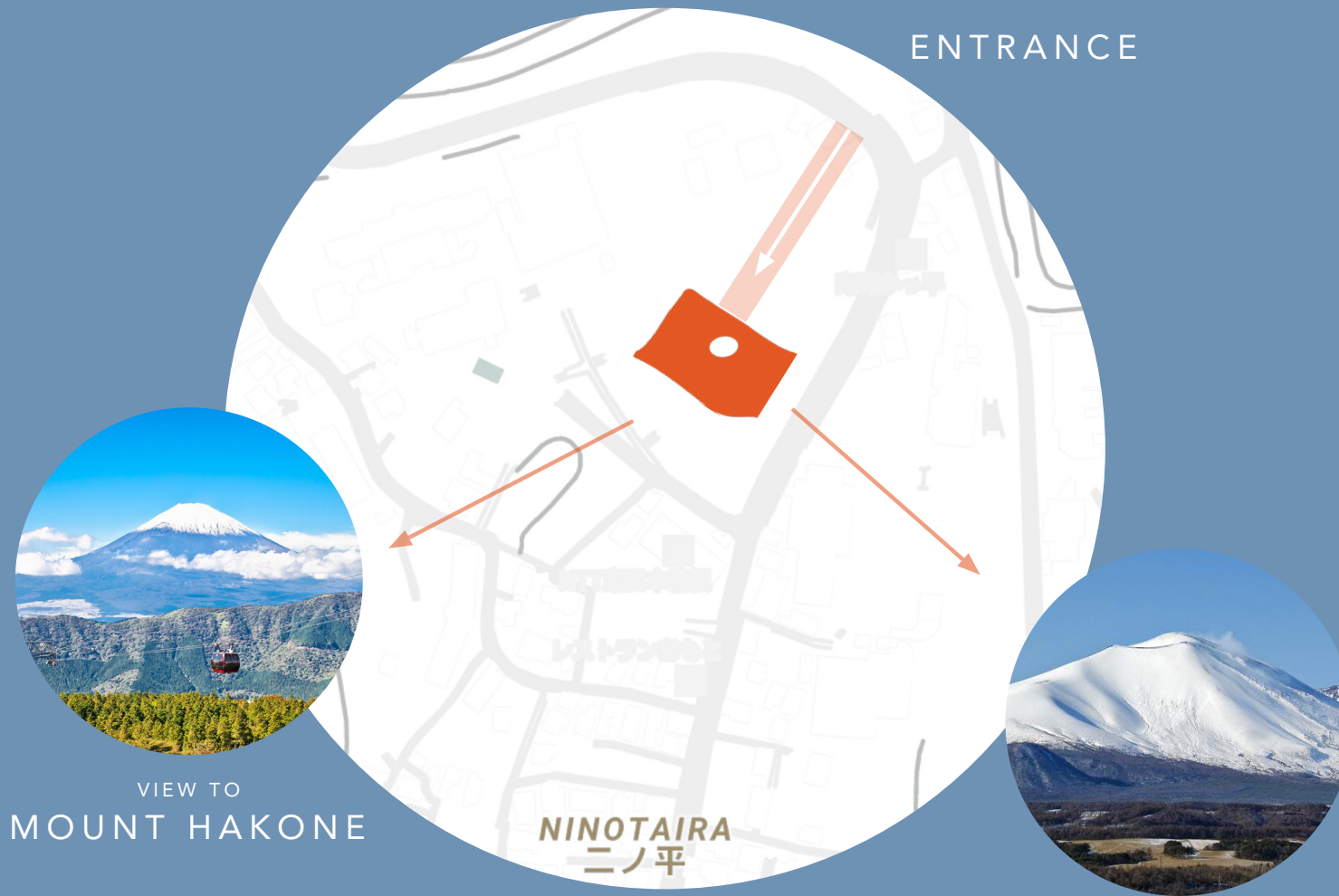
SITE ANALYSIS

SITE ANALYSIS  
LOCATION 01



HAKONE, JAPAN

01 SITE ANALYSIS  
SITE CONTEXT



VIEW TO  
MOUNT HAKONE

VIEW TO  
MOUNT ASAMA

SITE ANALYSIS  
DESIGN DRIVERS

01



MOUNTAINS  
GEOGRAPHY

+



HOT SPRINGS  
TOURISM



TRANSCENDENCE  
CULTURE

*DRIVEN BY THE SITE'S ENVIRONMENT  
AND CULTURE, OUR DESIGN INTENT  
IS TO EMBRACE THE PEOPLE'S  
BELIEF IN THE SPIRITUAL MARRIAGE  
OF THE SURROUNDING MOUNTAINS  
AND THE VOLCANICALLY HEATED  
ONSEN.*

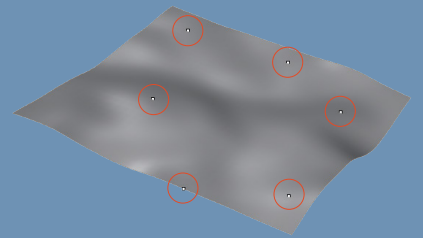
02

BUILDING DESIGN

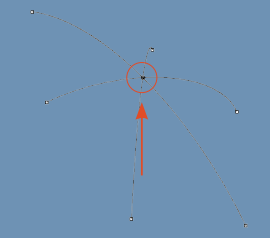
# FORM GENERATION 02

MCNEEL RHINOCEROS

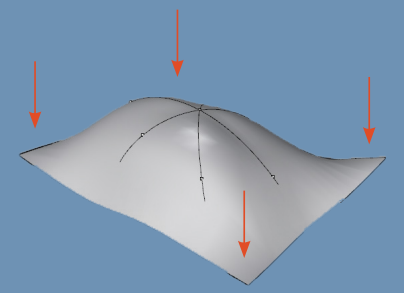
# 02 FLOOR PLAN



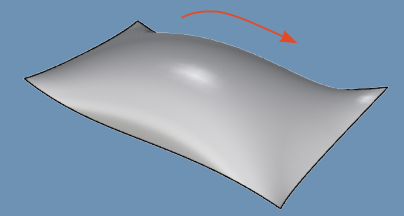
TOPOGRAPHICAL POINTS OF SITE



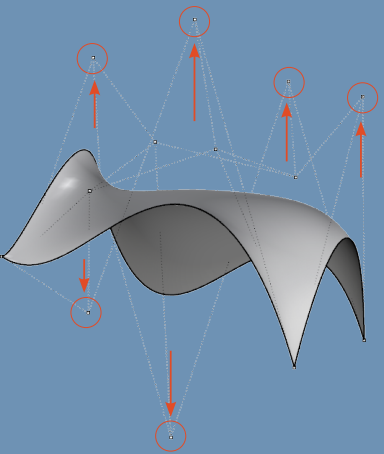
APEX DETERMINED CORRESPONDS TO PROGRAM



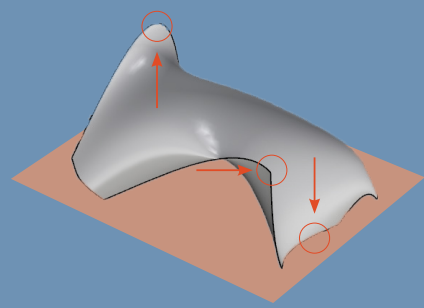
DRAPE SURFACE OVER CURVES



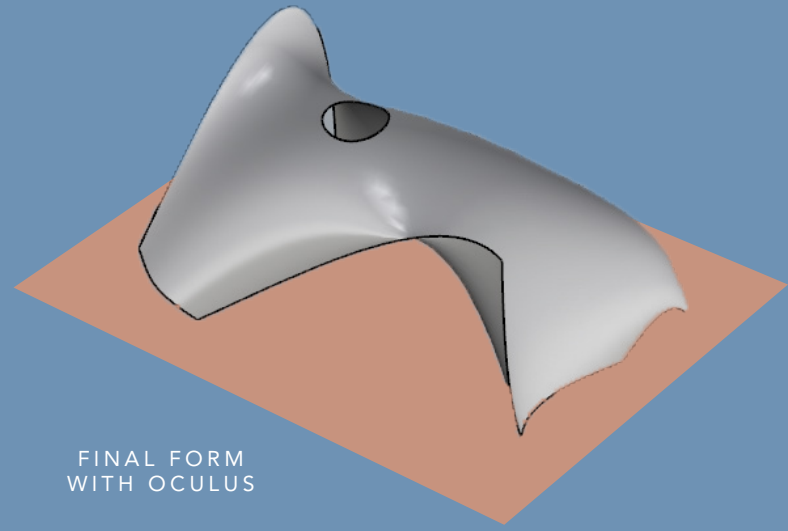
SMOOTH SURFACE



SHIFT CONTROL POINTS ACCORDING TO DESIGN

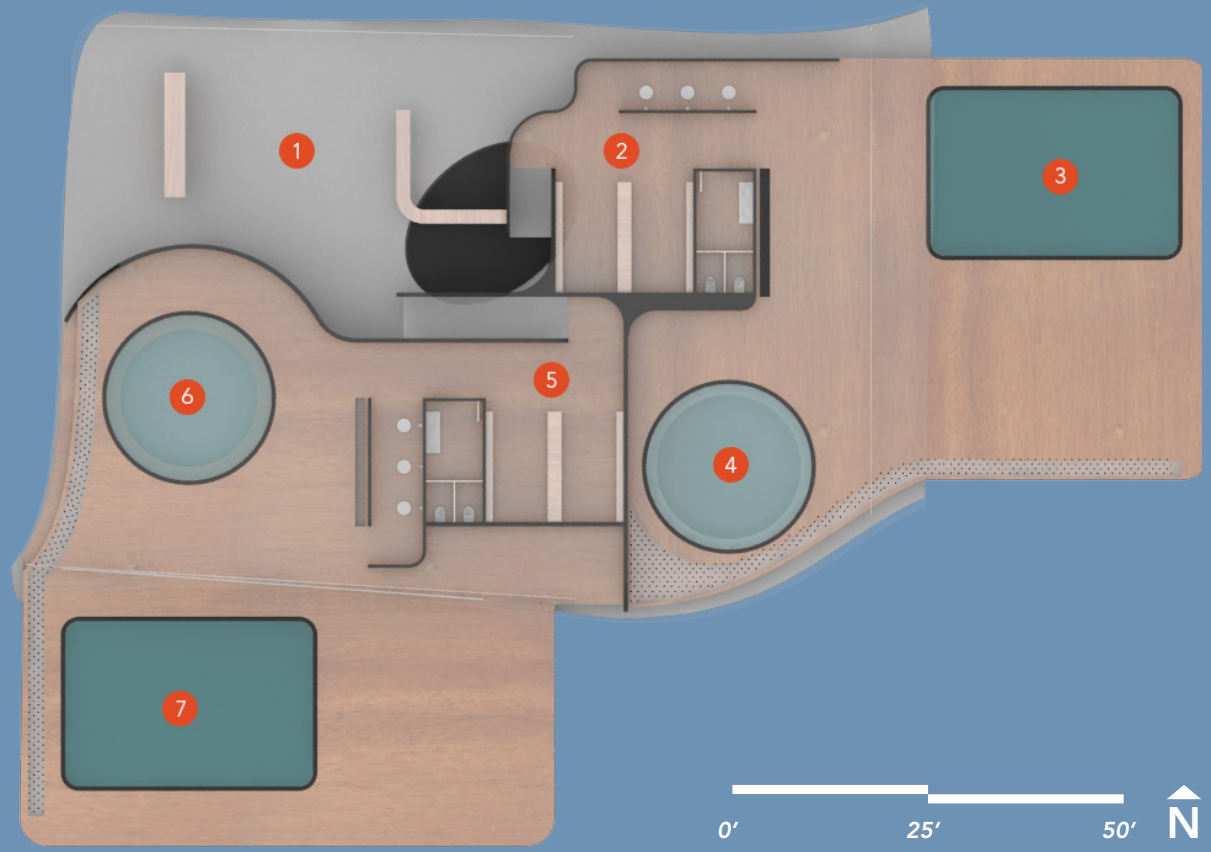


CREATE LEVELED FOOTING

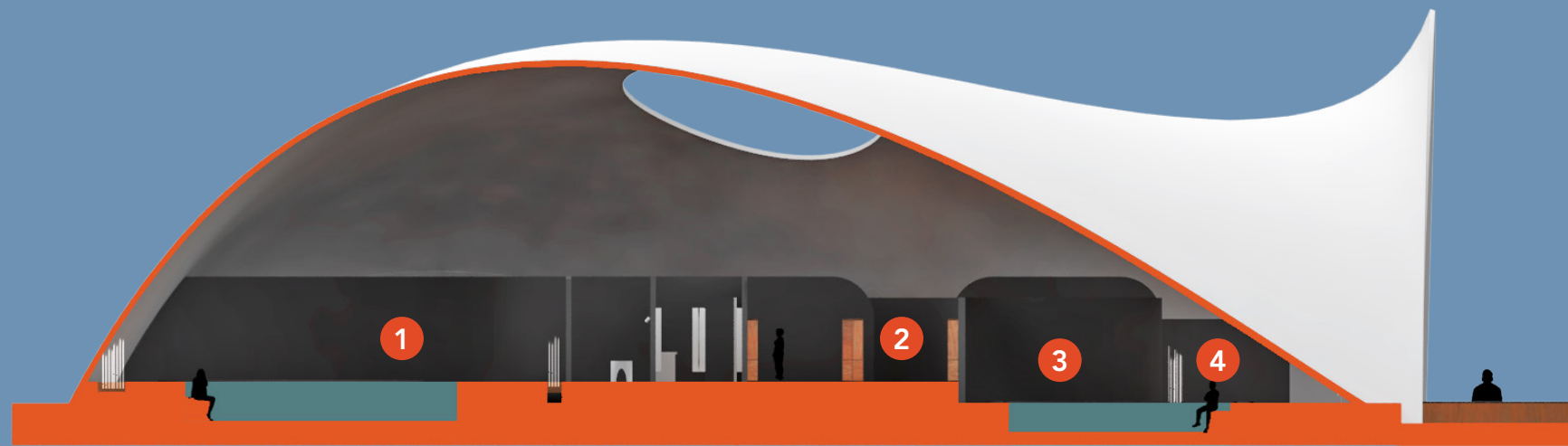


FINAL FORM WITH OCLUSUS

- 1 ENTRY LOBBY
- 2 MEN'S CHANGING ROOM
- 3 MEN'S OUTDOOR BATH
- 4 MEN'S INDOOR BATH
- 5 WOMEN'S CHANGING ROOM
- 6 WOMEN'S INDOOR BATH
- 7 WOMEN'S OUTDOOR BATH

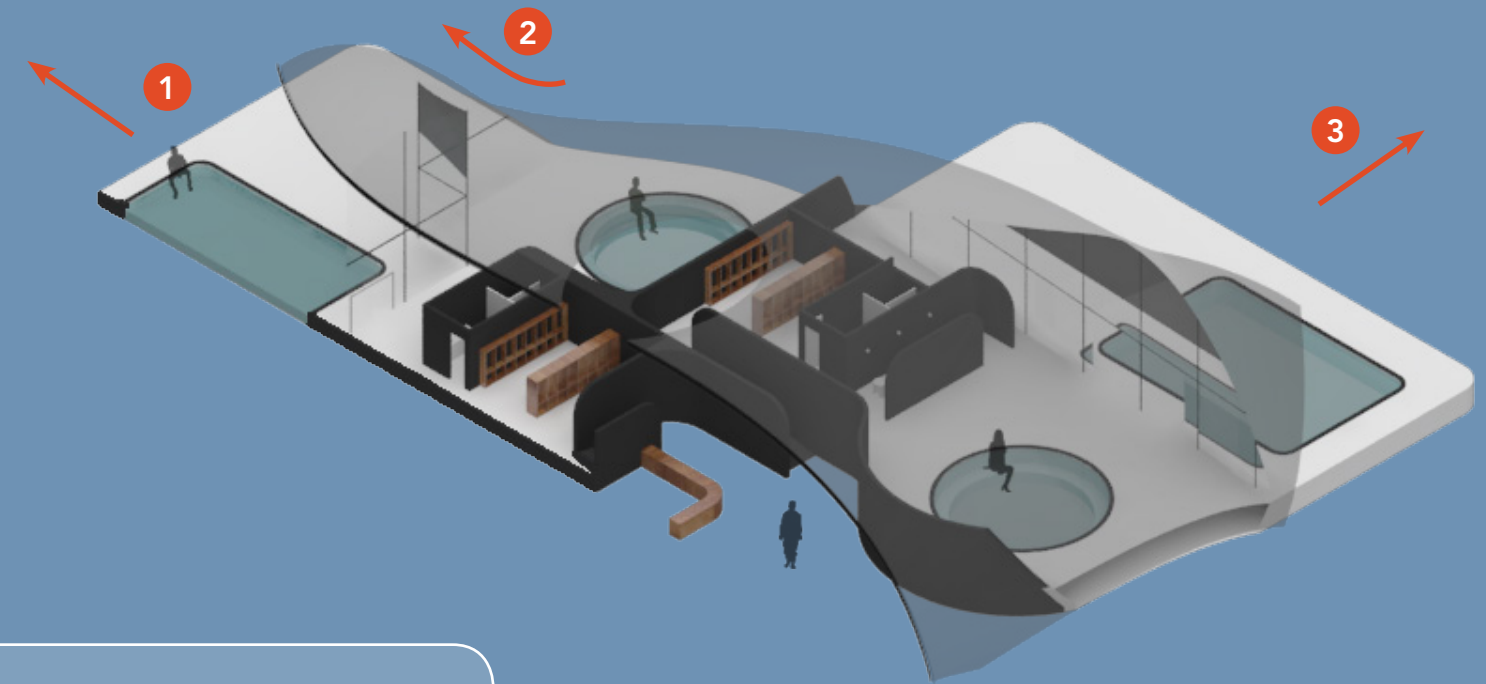


SECTION 02



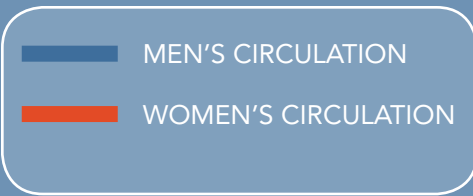
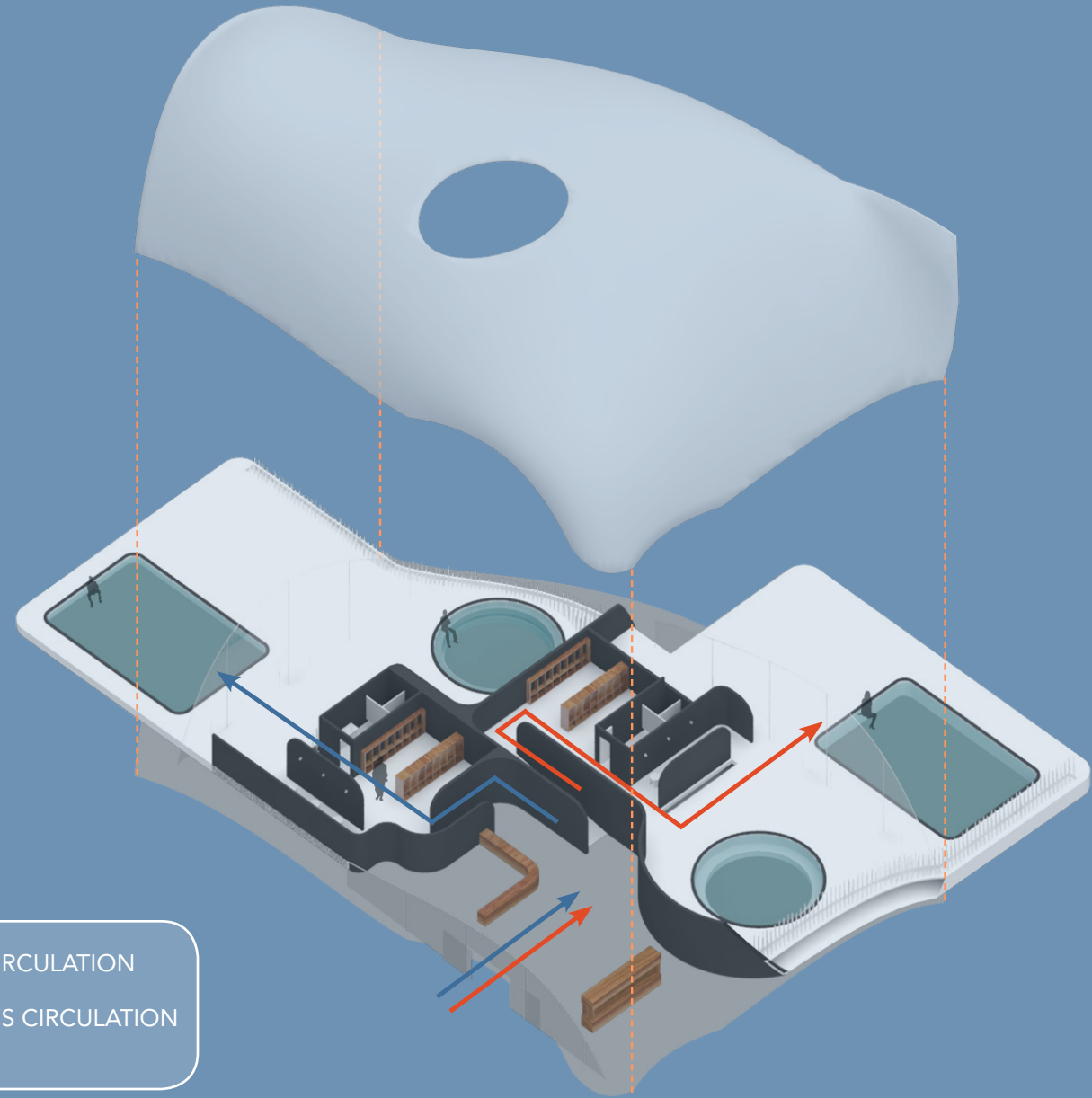
- 1 WOMEN'S BATHS
- 2 WOMEN'S CHANGING ROOM
- 3 MEN'S BATHS
- 4 MEN'S CHANGING ROOM

02 SECTION PERSPECTIVE



- 1 VIEW TO MOUNT ASAMA
- 2 TRANSCENDING CEILING HEIGHTS TO VIEWS
- 3 VIEW TO MOUNT HAKONE

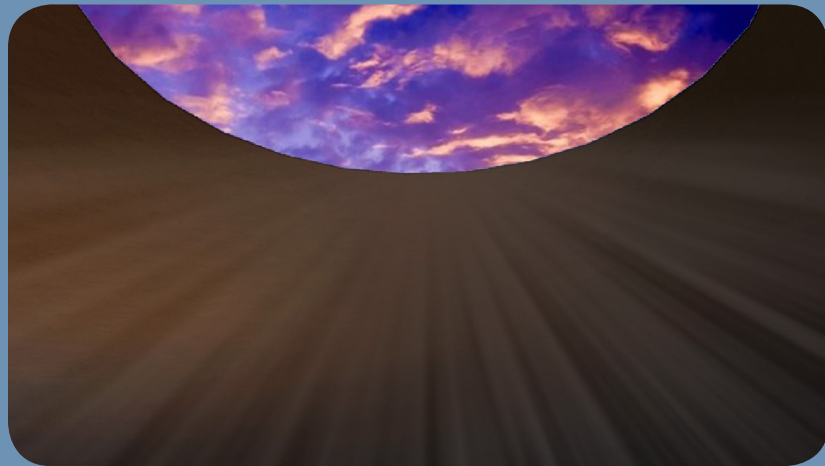
CIRCULATION 02



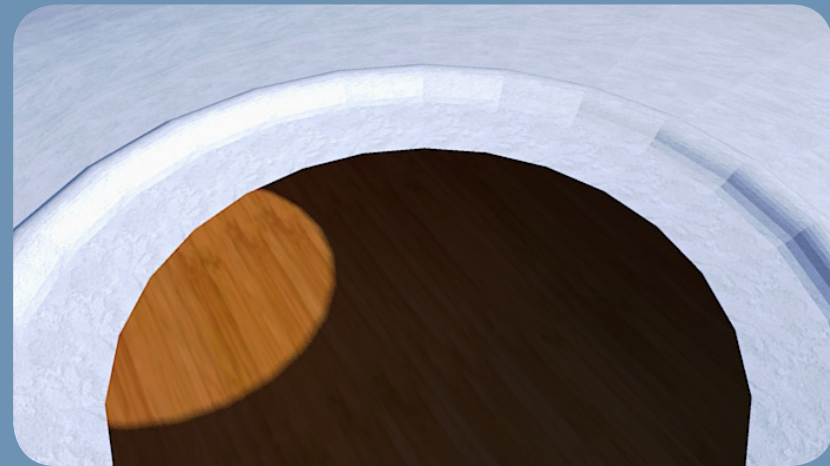
03

LIGHTING DESIGN

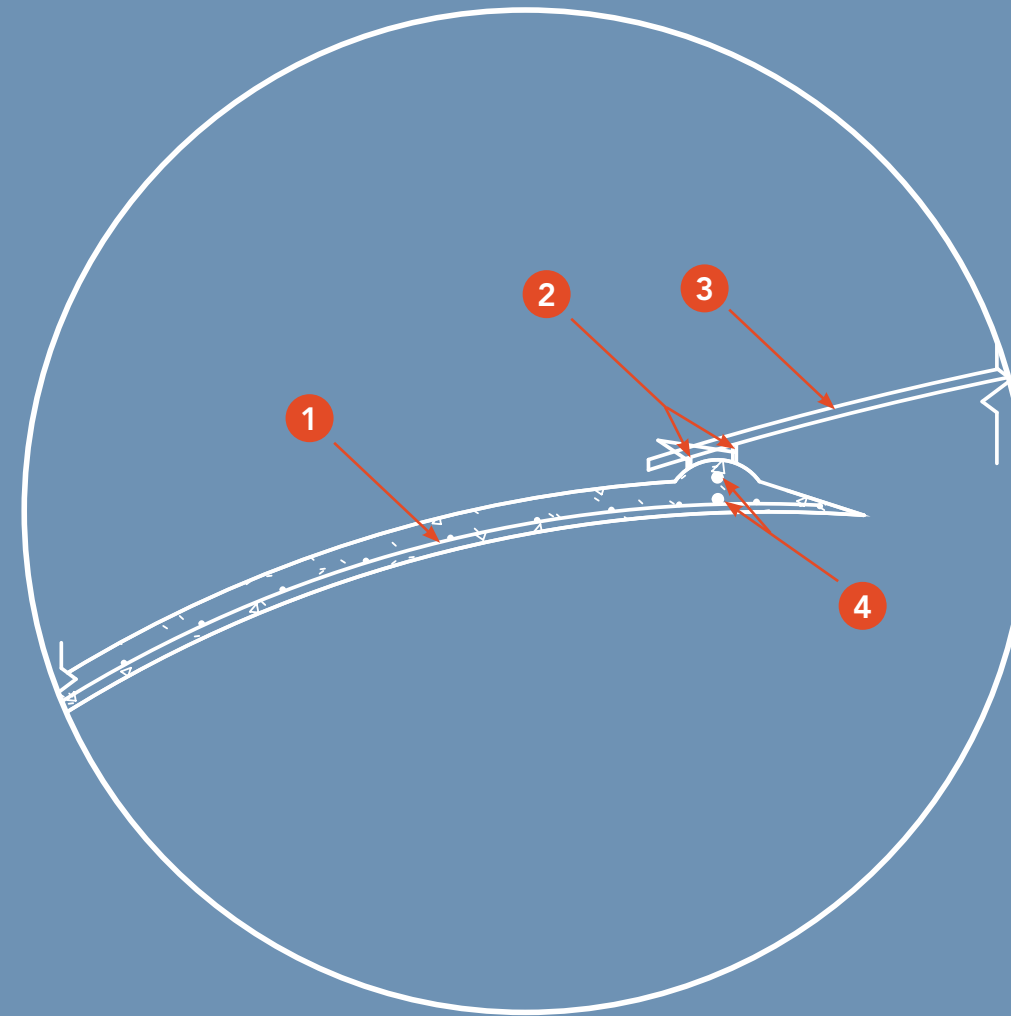




THIN OCULUS EDGE



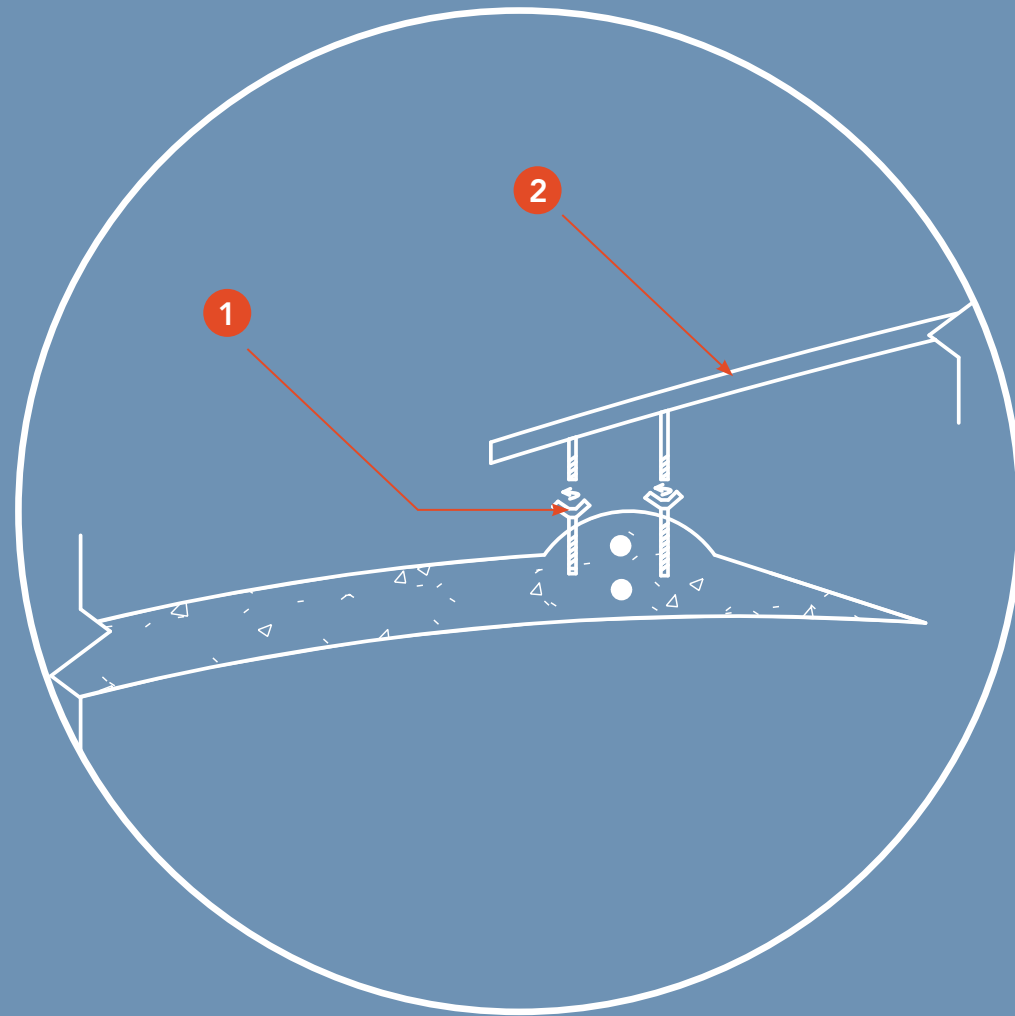
LIP TO REROUTE RAINWATER



OCULUS DETAIL

- 1 WIRE MESH REINFORCEMENT
- 2 SCREW CONNECTION TO CONCRETE SHELL
- 3 ACRYLIC OCULUS COVER
- 4 CONTINUOUS REINFORCEMENT AROUND OCULUS CIRCUMFERENCE

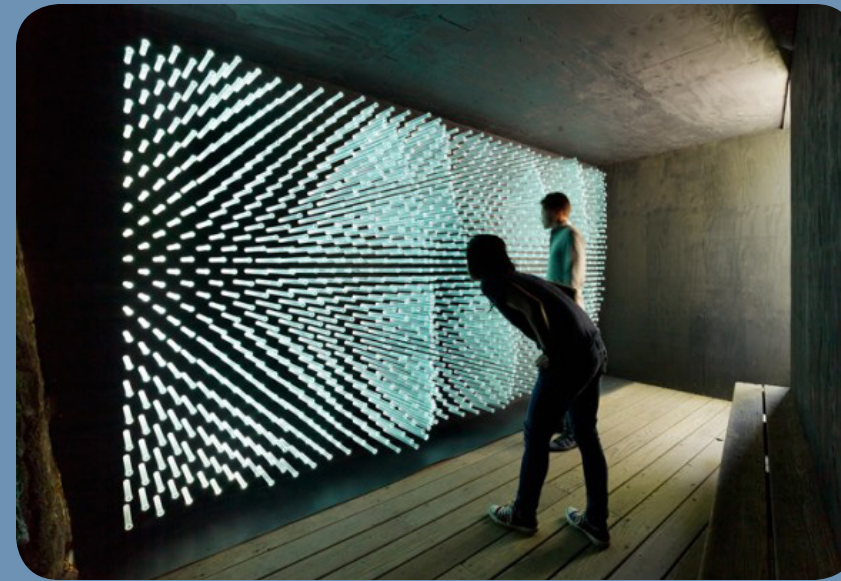
LIGHTING DESIGN  
OCULUS 03



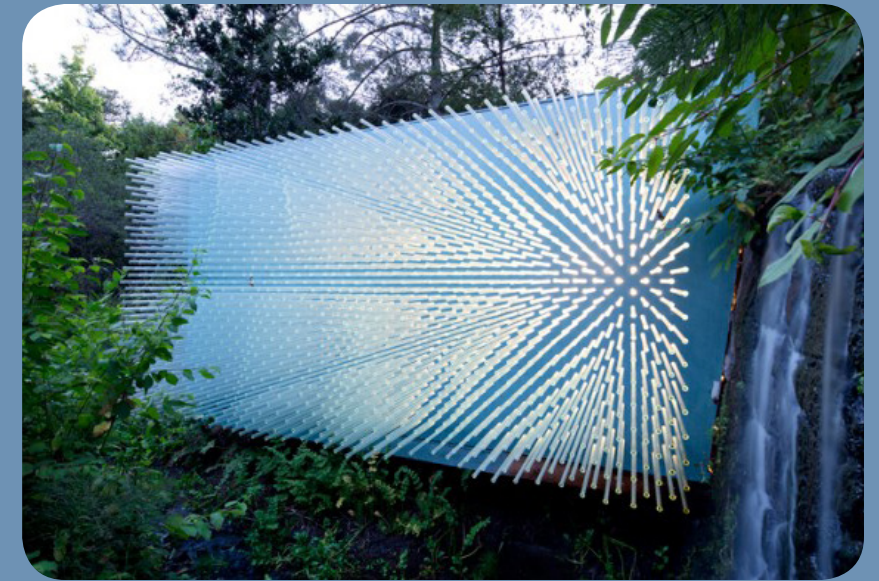
- 1 THREADED BOLT CONNECTION WITH TWISTING HEADS
- 2 ACRYLIC OCULUS COVER

OCULUS CONNECTION DETAIL

03 LIGHTING DESIGN  
PRECEDENT



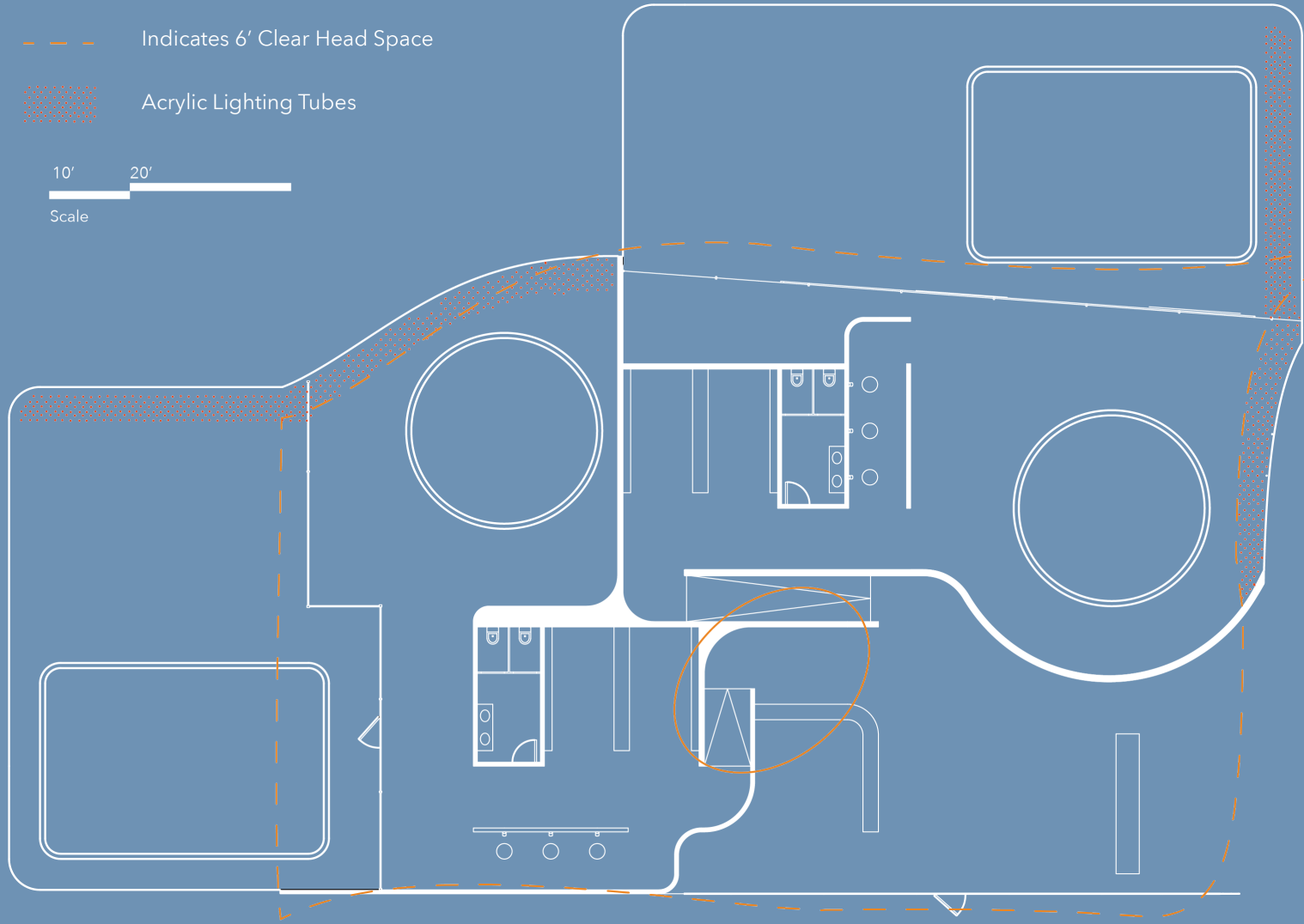
SOL GROTTA  
RAEL SAN FRATELLO  
BERKELEY BOTANICAL GARDEN



# LIGHTING DESIGN

PLAN VIEW

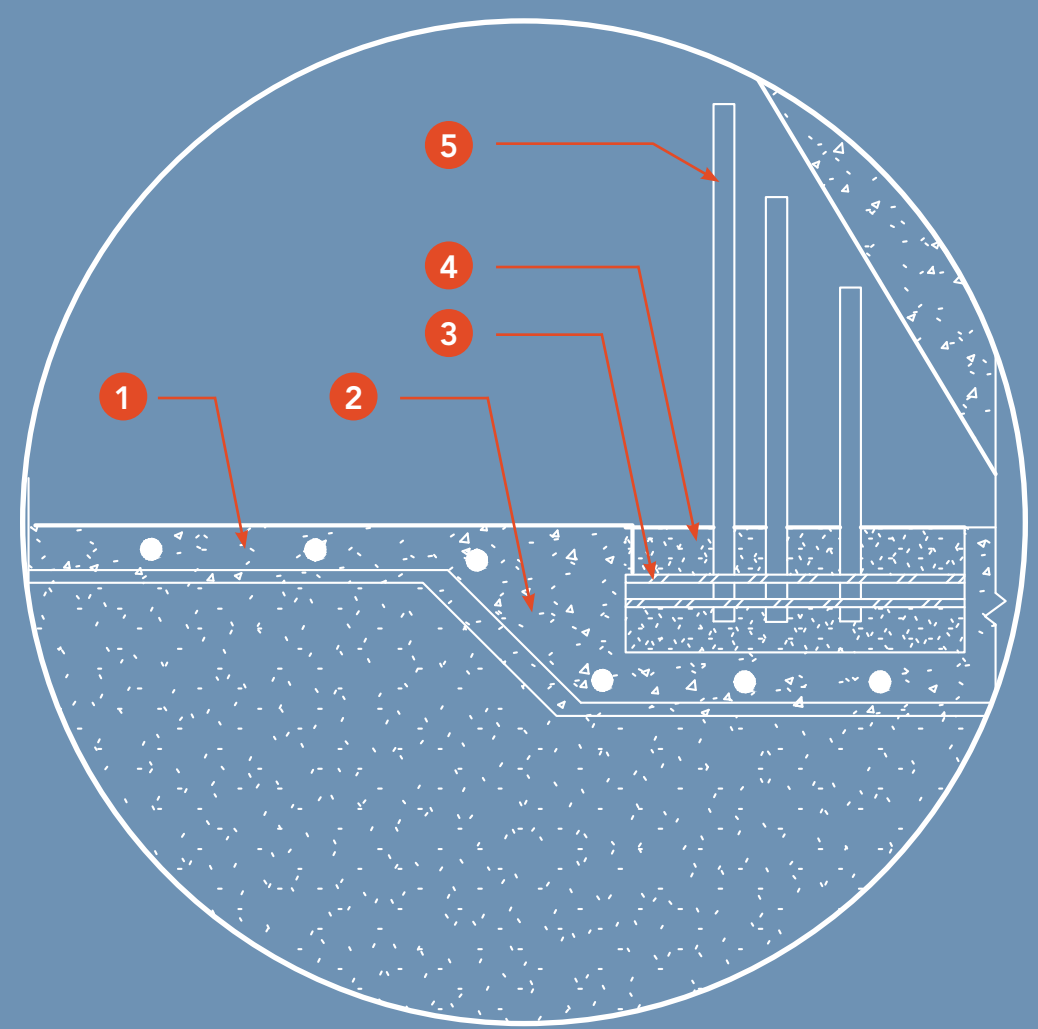
03



# LIGHTING DESIGN

LIGHTING FOOTING

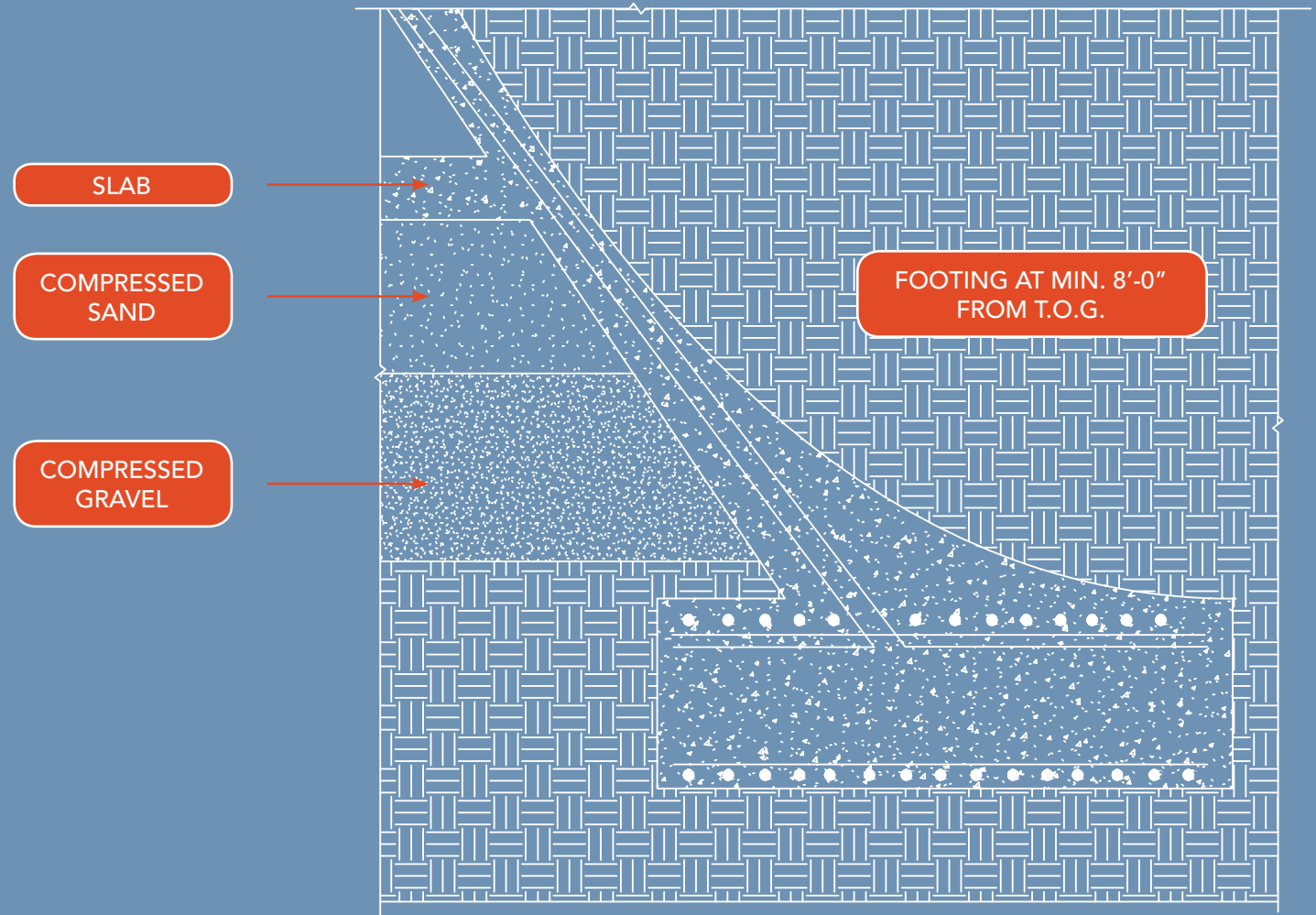
03



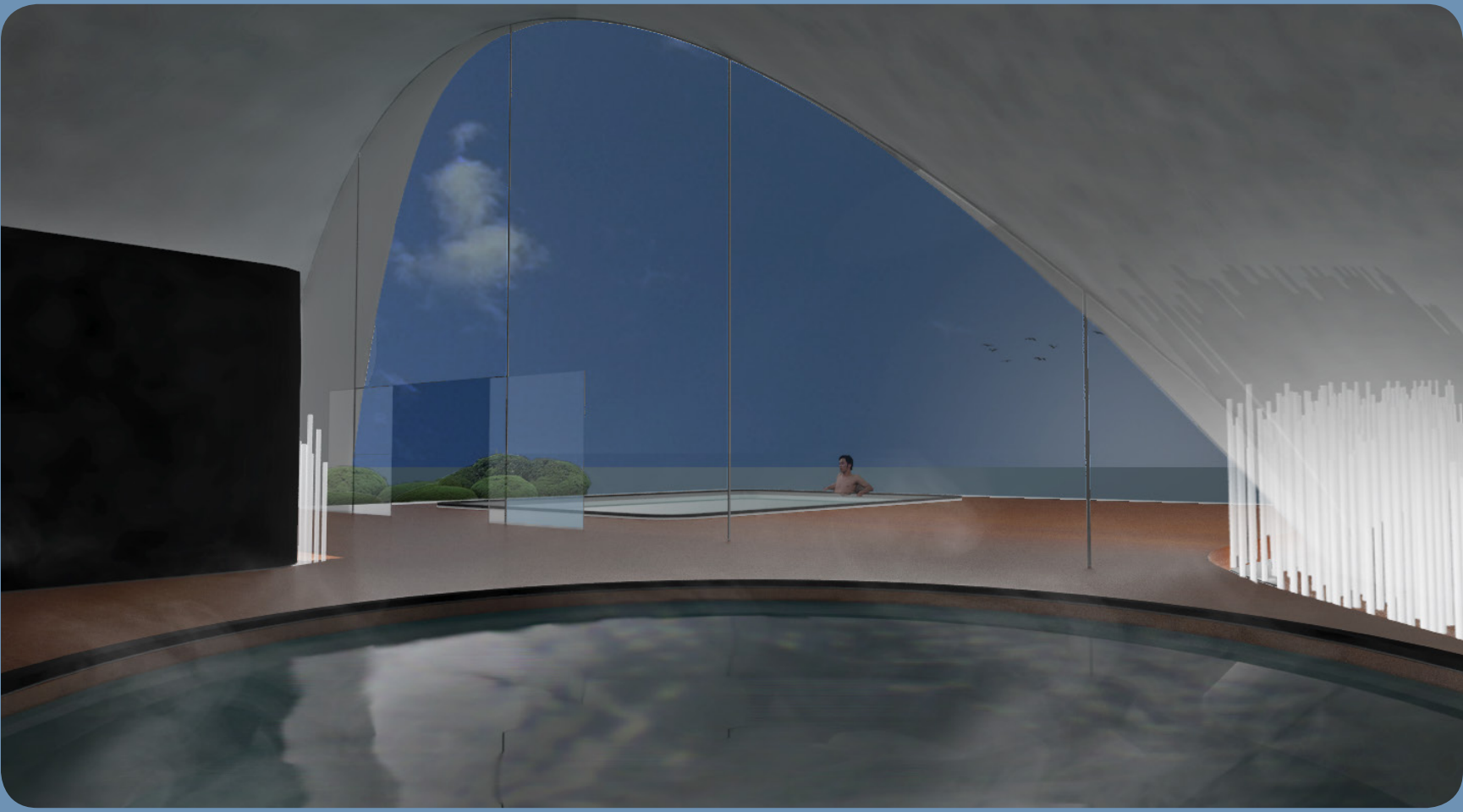
- 1 6" S.O.G.
- 2 1'-6" S.O.G.
- 3 METAL GRATING FOR DRAINAGE
- 4 RESTING BED OF GRAVEL WITH L.E.D. LIGHTING EMBEDDED
- 5 2" DIAMETER TRANSPARENT TUBES

LIGHTING DESIGN  
FOOTING DETAIL

03

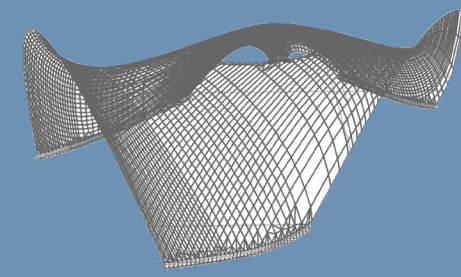


03 LIGHTING DESIGN  
MEN'S BATH LIGHTING

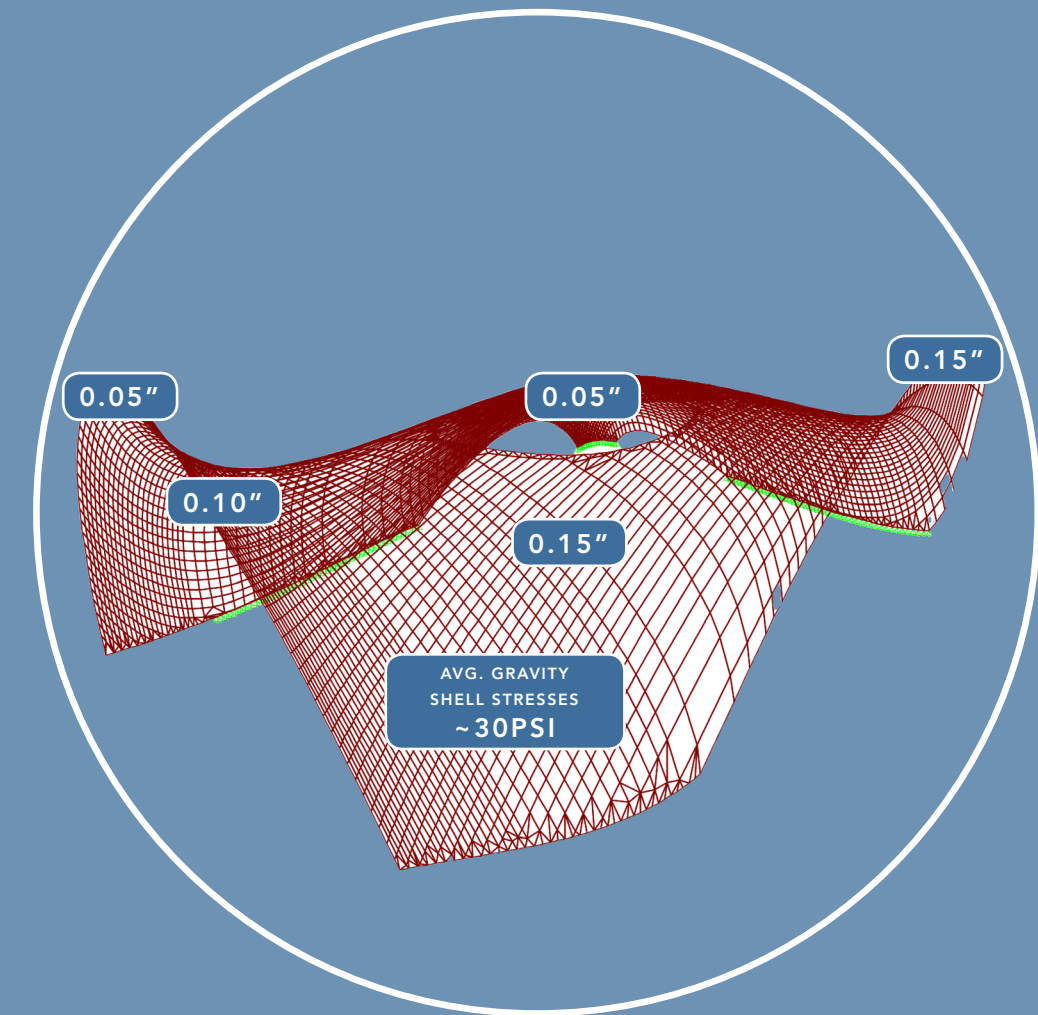


04

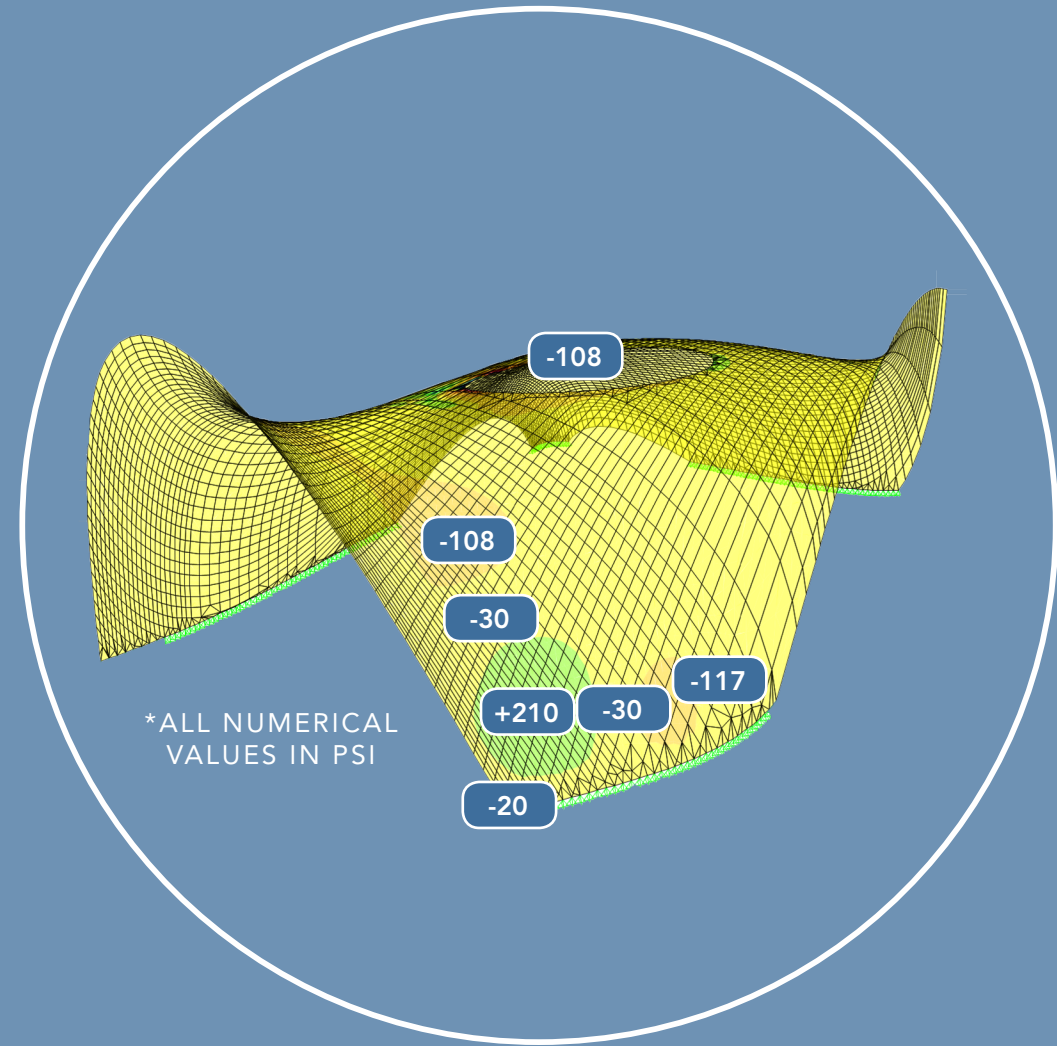
STRUCTURAL  
ANALYSIS



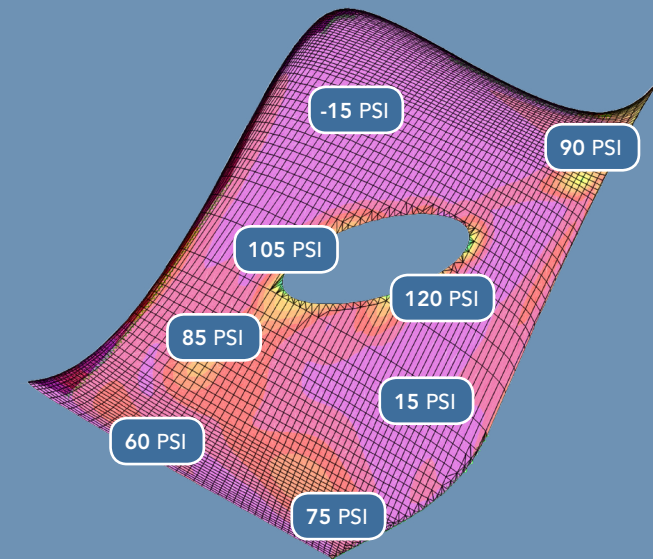
MESH



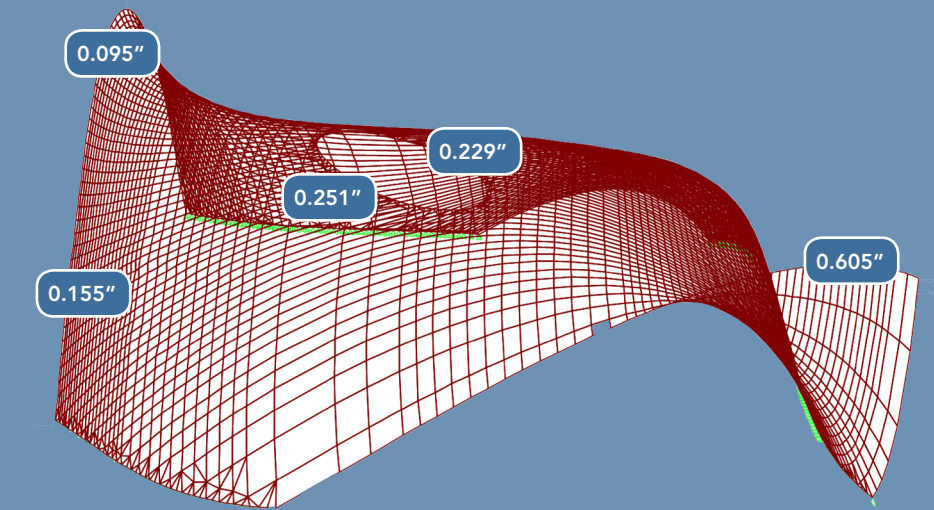
GRAVITY ANALYSIS

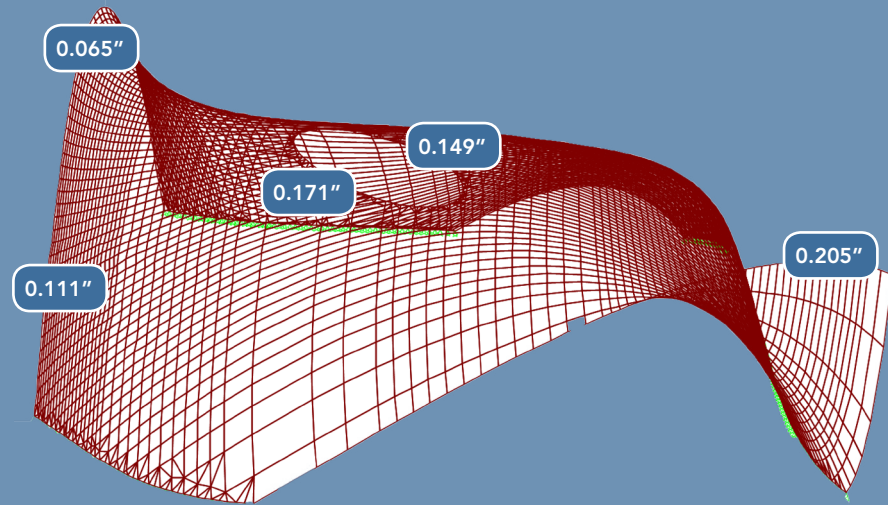
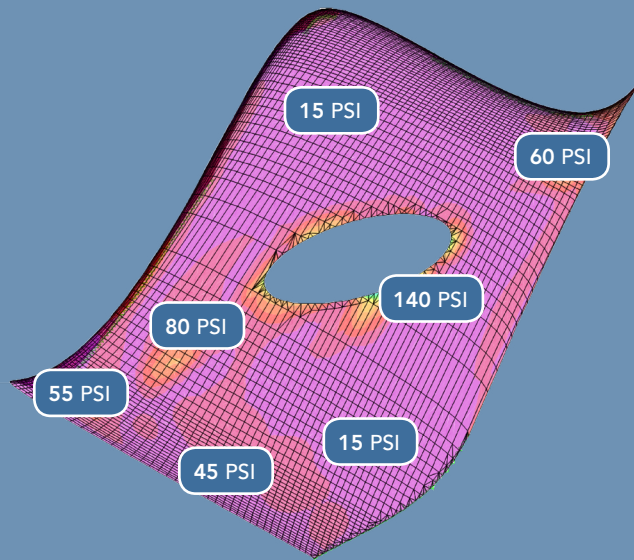


BUCKLING ANALYSIS  
SAFETY FACTOR: 11.49



RESPONSE SPECTRUM ANALYSIS  
SDS: 1.52



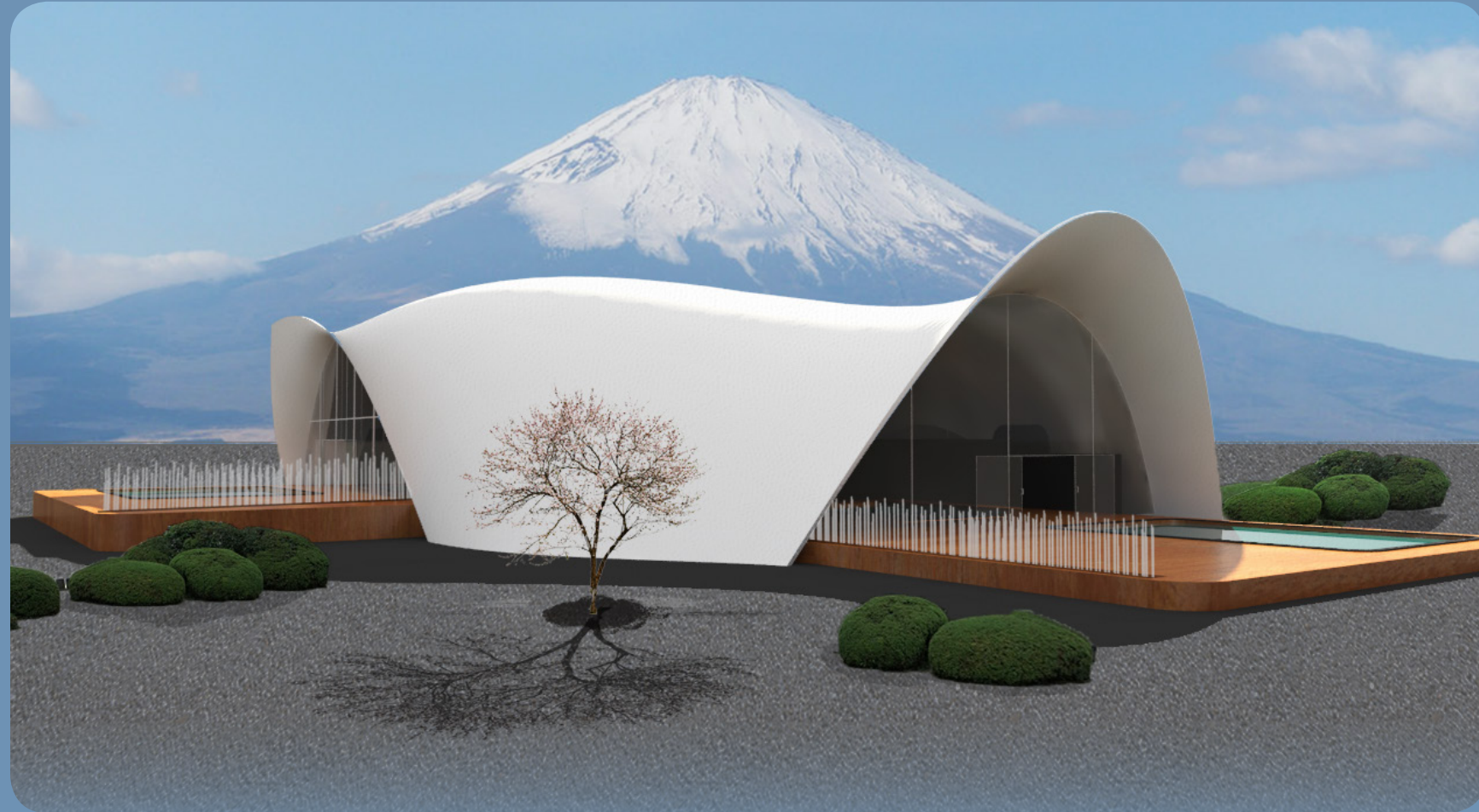


TIME HISTORY ANALYSIS  
NORTHRIDGE EARTHQUAKE GROUND MOTION

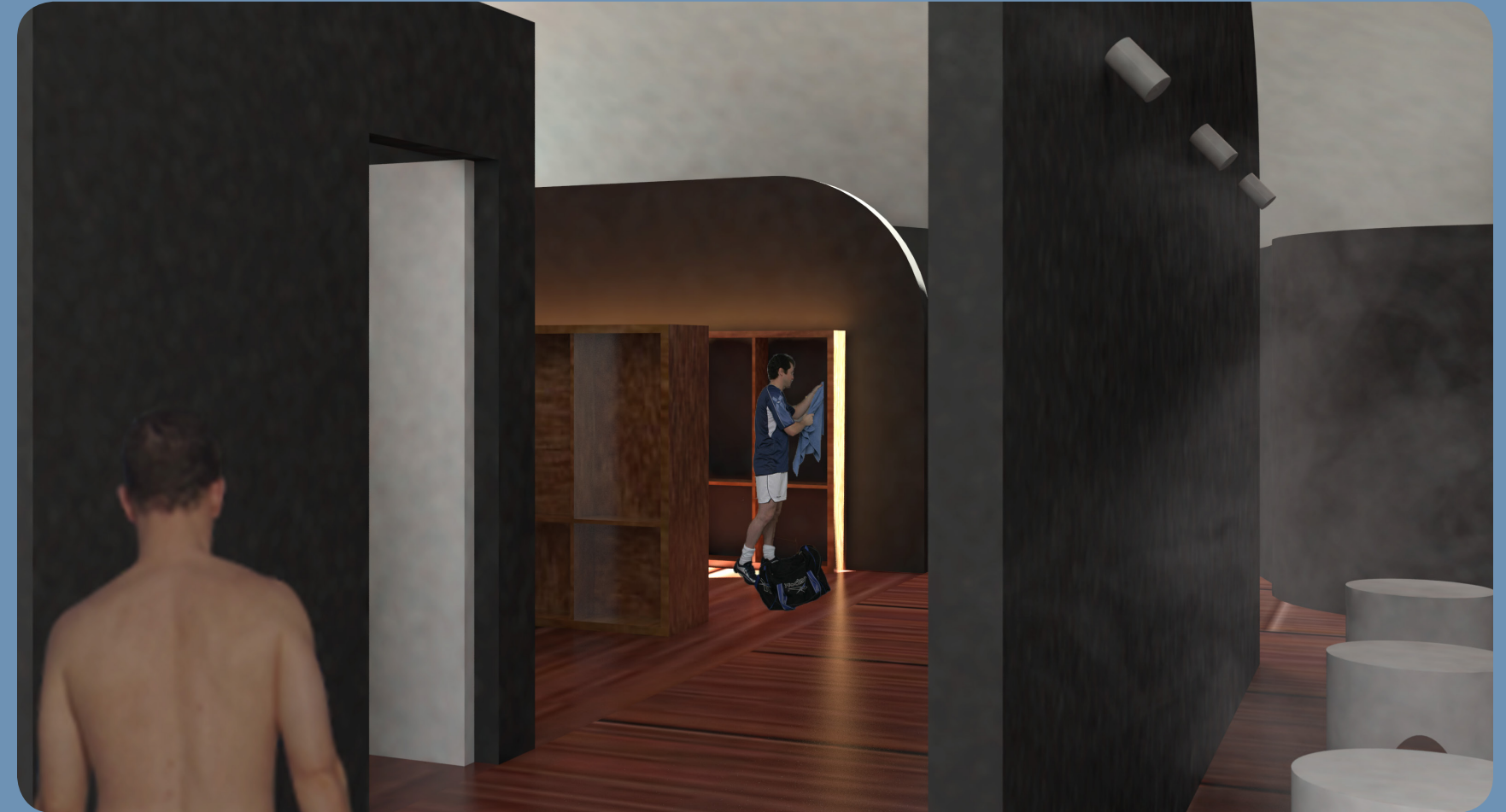
05

CONCEPTS

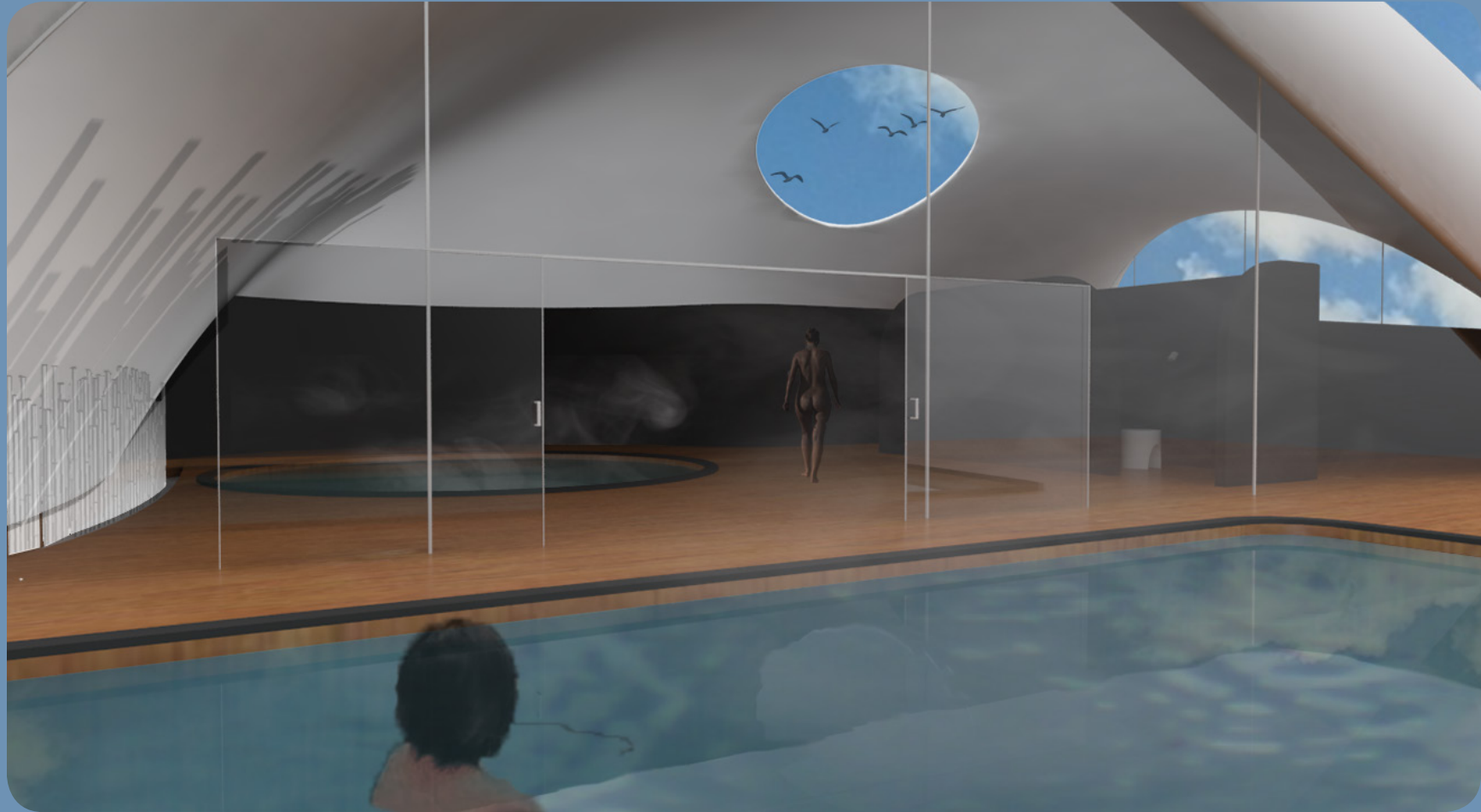
EXTERIOR BATHS 05



05 MEN'S CHANGING ROOM







06

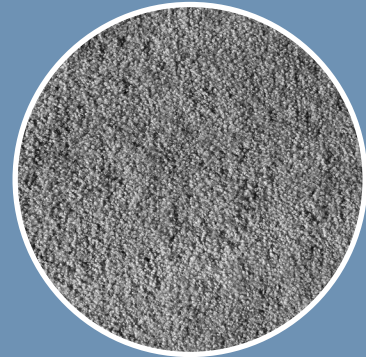
CONSTRUCTION

CONSTRUCTION PRECEDENT 06



FREE-FORM CATALAN VAULT  
ZURICH, SWITZERLAND

06 CONSTRUCTION MATERIALS



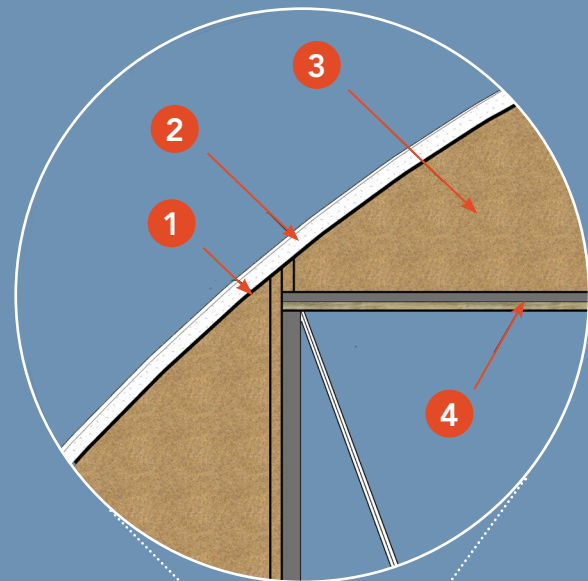
HAKONE CONSTRUCTION

MATERIAL	AMOUNT	COST ESTIMATE
1" PLYWOOD SHEET	1,500 SQ FT	\$340
5MM ROOFING MEMBRANE	14,800 SQ FT	\$784
RECYCLED MATERIAL	N/A	N/A
ALUMINUM SCAFFOLDING (RENTAL)	50 QTY	\$42,300
SOIL	750 CY	N/A
CONCRETE	400 CY	\$26,000
GLASS TUBES	400 CT	\$2,400

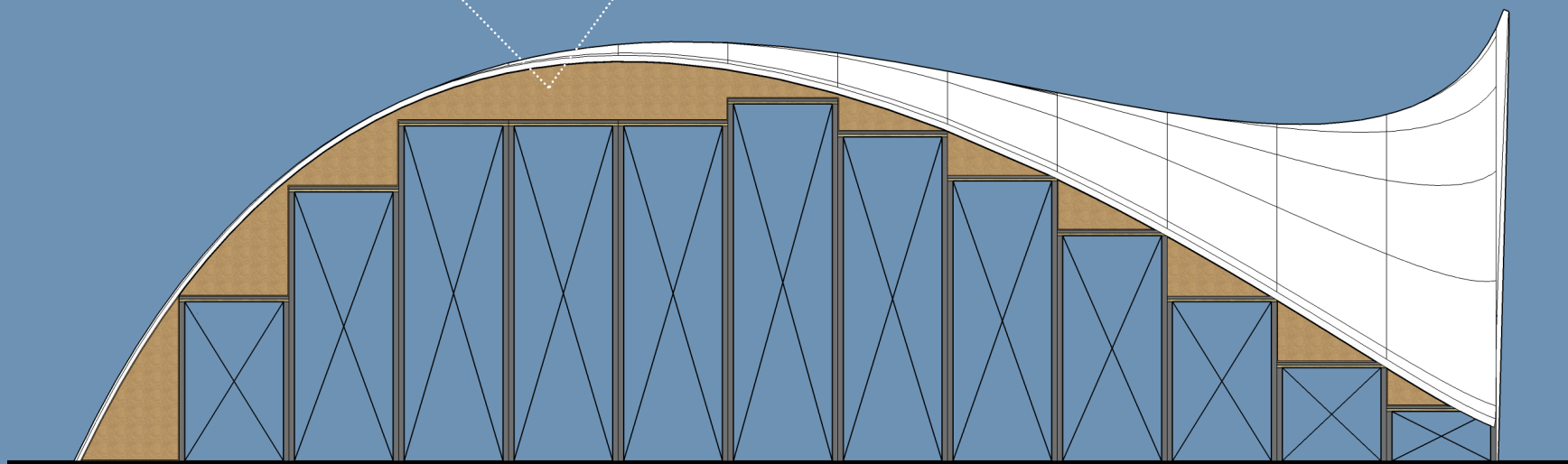
CAL POLY CONSTRUCTION

MATERIAL	AMOUNT	COST ESTIMATE
4'X8' CARDBOARD	28 SHEETS	DONATED
3.5 MM PLASTIC MEMBRANE	100 SQ FT	DONATED
SAND	2 CY	DONATED
CONCRETE	0.5 CY	DONATED
2X3 LUMBER (FORMWORK)	8	\$30
2X6 LUMBER (FORMWORK)	8	\$76

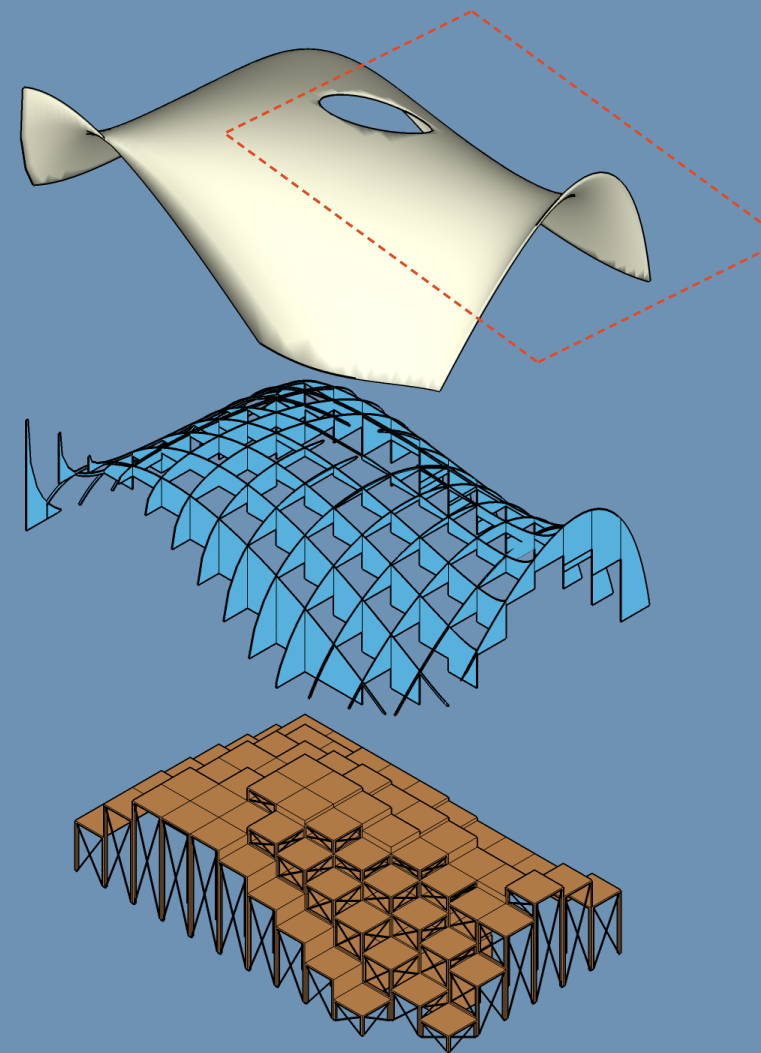
CONSTRUCTION SECTION 06



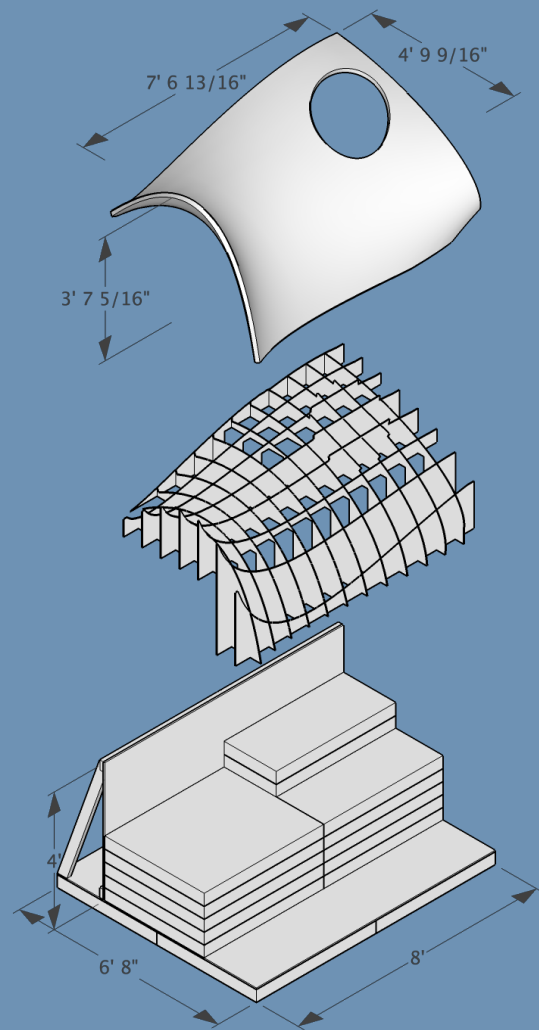
- 1 MEMBRANE
- 2 CONCRETE SHELL
- 3 SOIL
- 4 PLATFORM



06 CONSTRUCTION EXPLODED AXON



HAKONE CONSTRUCTION PROPOSED METHOD



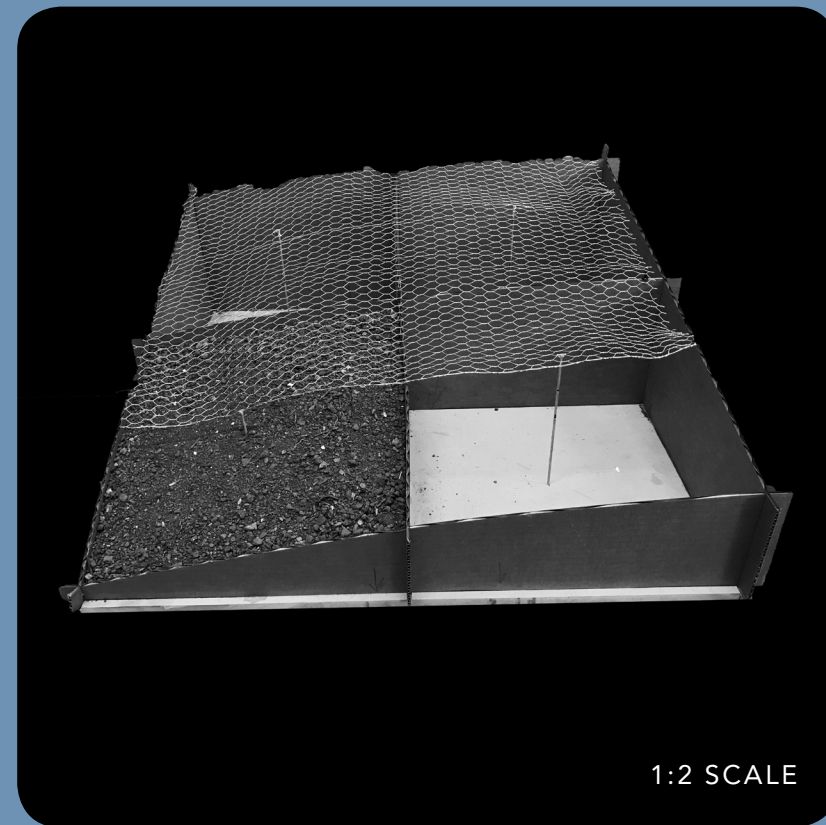
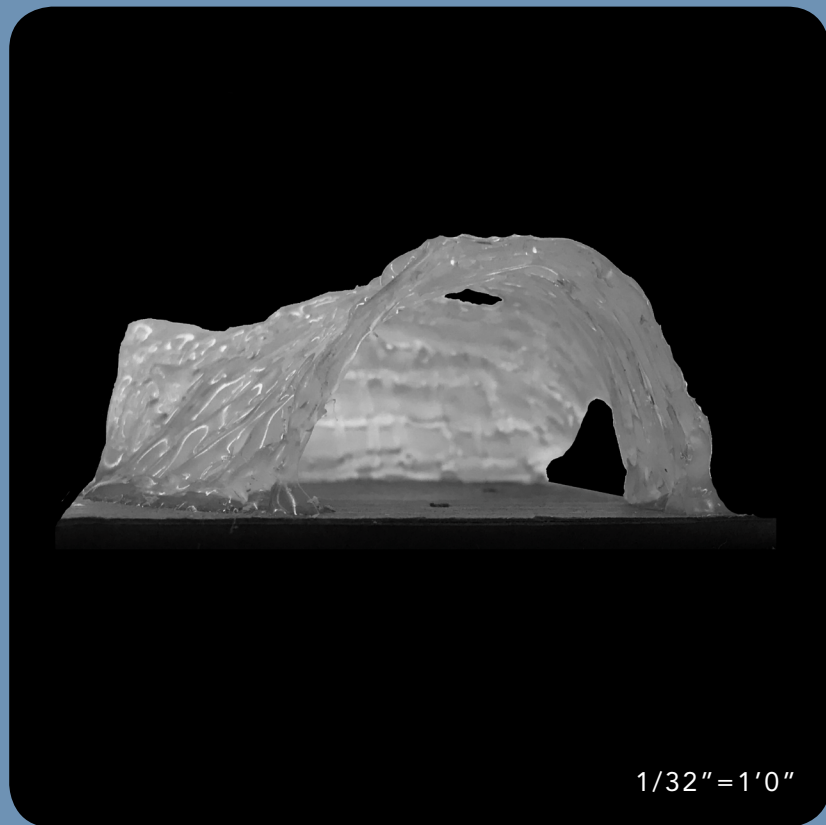
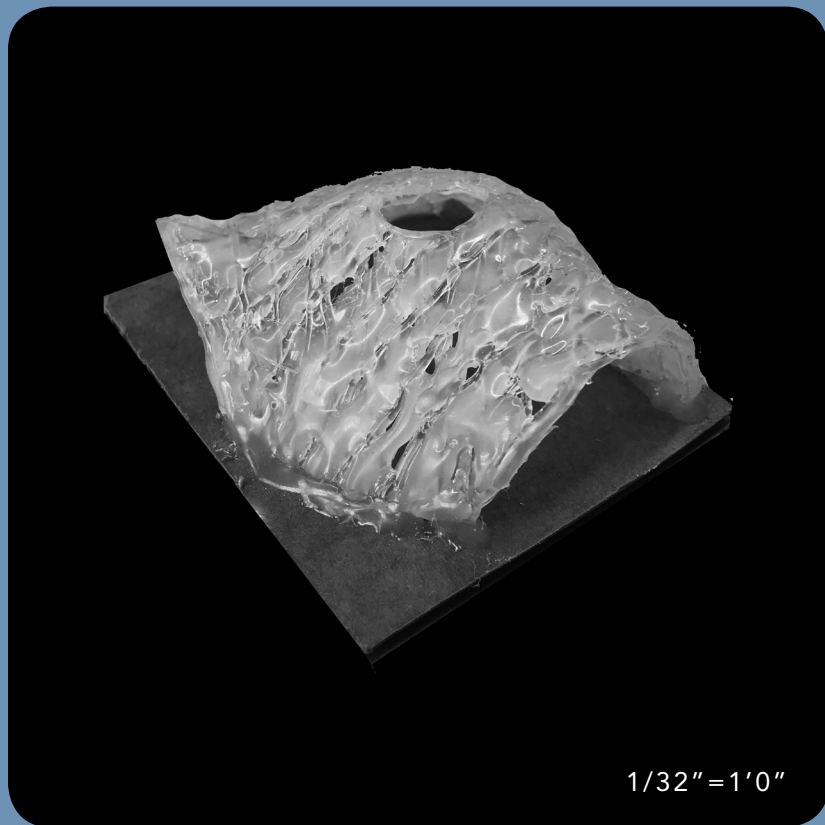
CAL POLY CONSTRUCTION  
ALTERNATE METHOD



MODELS

MODELS  
PRELIMINARY 07

07 MODEL  
PRELIMINARY





PALLET SUBSTITUTION  
FOR SCAFFOLDING



CARDBOARD WAFFLE GRID  
SUBSTITUTION FOR PLYWOOD



FILLING WAFFLE VOIDS  
WITH SAND



ATTACHED EDGES TO RETAIN  
SAND



SMOOTHED SAND SURFACE



APPLICATION OF PLASTIC  
MEMBRANE



CONCRETE IS APPLIED WITH WIRE  
MESH AS REINFORCEMENT



CONCRETE IS SMOOTHED  
AND FINISHED FOR CURING

MODELS  
CAL POLY SCALE 07



CURED CONCRETE SHELL

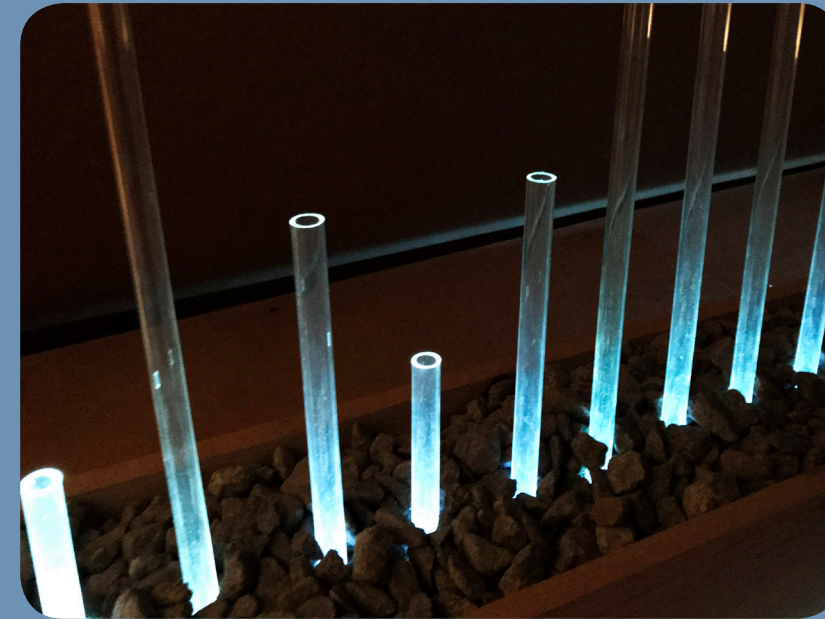


FORMWORK REMOVAL

07 MODEL  
CAL POLY SCALE



FORMWORK REMOVED AND  
SUPPORT BEAMS ARE PLACED



LIGHTING PREPARED FOR  
INSTALLATION



