TRANSCEND

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CALIFORNIA POLYTECHNIC STATE UNIVERSITY
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ONSEN | HAKONE, JAPAN
01 SITE ANALYSIS
02 BUILDING DESIGN
03 LIGHTING DESIGN
04 STRUCTURAL ANALYSIS
05 CONCEPTS
06 CONSTRUCTION
07 MODEL IMAGES
SITE ANALYSIS

LOCATION

VIEW TO MOUNT HAKONE

VIEW TO MOUNT ASAMA

SITE CONTEXT

ENTRANCE

HAKONE, JAPAN

NINOTAIRA 三ノ平
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.
TOPOGRAPHICAL POINTS OF SITE
SHIFT CONTROL POINTS ACCORDING TO DESIGN
APEX DETERMINED CORRESPONDING TO PROGRAM
CREATE LEVELLED FOOTING
DRAPED SURFACE OVER CURVES
SMOOTH SURFACE
FINAL FORM WITH OCULUS

FORM GENERATION
MCNEEL RHINOCEROS

02

FLOOR PLAN

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

ENTRY LOBBY
MEN'S CHANGING ROOM
MEN'S OUTDOOR BATH
MEN'S INDOOR BATH
WOMEN'S CHANGING ROOM
WOMEN'S INDOOR BATH
WOMEN'S OUTDOOR BATH
SECTION 02

WOMEN’S BATHS
WOMEN’S CHANGING ROOM
MEN’S BATHS
MEN’S CHANGING ROOM

02 SECTION PERSPECTIVE

VIEW TO MOUNT ASAMA
TRANSCENDING CEILING HEIGHTS TO VIEWS
VIEW TO MOUNT HAKONE
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
Occlus Connection Detail

1. Threaded Bolt Connection with Twisting Heads
2. Acrylic Occlus Cover
LIGHTING DESIGN
PLAN VIEW

Indicates 6’ Clear Head Space
Acrylic Lighting Tubes

1’-0" Scale

LIGHTING DESIGN
LIGHTING FOOTING

1. 4" S.O.G.
2. 1-1/4" 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

SLAB
COMPRESSED SAND
COMPRESSED GRAVEL

FOOTING AT MIN. 8'-0" FROM T.O.G.

LIGHTING DESIGN
MEN'S BATH LIGHTING
04 STRUCTURAL ANALYSIS

GRAVITY

MESH

AVG. GRAVITY SHELL STRESSES ~30 PSI
BUCKLING ANALYSIS

SAFETY FACTOR: 11.49

*ALL NUMERICAL VALUES IN PSI

STRUCTURAL ANALYSIS

BUCKLING

RESPONSE SPECTRUM

SDS: 1.52
### Hakone Construction

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<tr>
<th>Material</th>
<th>Amount</th>
<th>Cost Estimate</th>
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<tbody>
<tr>
<td>1&quot; Plywood Sheet</td>
<td>1,500 sq ft</td>
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<td>5mm Roofing Membrane</td>
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<td>Recycled Material</td>
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<td>Aluminum Scaffolding (Rental)</td>
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<td>Soil</td>
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<td>Glass Tubes</td>
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### Cal Poly Construction

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<tr>
<td>4’X8’ Cardboard</td>
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<td>3.5 mm Plastic Membrane</td>
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<tr>
<td>Sand</td>
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<tr>
<td>Concrete</td>
<td>0.5 cu yd</td>
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<td>2x3 Lumber (Formwork)</td>
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<td>2x6 Lumber (Formwork)</td>
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<td>$76</td>
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CONSTRUCTION SECTION 06

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

06 CONSTRUCTION EXPLODED AXON

HAKONE CONSTRUCTION PROPOSED METHOD
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
CURED CONCRETE SHELL

FORMWORK REMOVAL

FORMWORK REMOVED AND SUPPORT BEAMS ARE PLACED

LIGHTING PREPARED FOR INSTALLATION