TRANSCEND

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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
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
DRAPE SURFACE OVER CURVES
FINAL FORM WITH OCULUS
SMOOTH SURFACE

FORM GENERATION
MCNEEL RHINOCEROS

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
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
CIRCULATION 02

LIGHTING DESIGN 03
LIGHTING DESIGN

OCULUS

03

THIN OCULUS EDGE

LIP TO REROUTE RAINWATER

WIRE MESH REINFORCEMENT

SCREW CONNECTION TO CONCRETE SHELL

ACRYLIC OCULUS COVER

CONTINUOUS REINFORCEMENT AROUND OCULUS CIRCUMFERENCE

OCULUS DETAIL
OCULUS CONNECTION DETAIL

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

LIGHTING DESIGN

OCULUS

SOL GROTTO
RAEL SAN FRATELLO
BERKELEY BOTANICAL GARDEN
LIGHTING DESIGN

PLAN VIEW

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
COMPRESSED SAND

COMPRESSED GRAVEL

SLAB

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

LIGHTING DESIGN
FOOTING DETAIL

MEN'S BATH LIGHTING

LIGHTING DESIGN
03

03
BUCKLING ANALYSIS

SAFETY FACTOR: 11.49

ALL NUMERICAL VALUES IN PSI

RESPONSE SPECTRUM ANALYSIS

SDS: 1.52
STRUCTURAL ANALYSIS
TIME HISTORY ANALYSIS
NORTHRIEG EARTHQUAKE GROUND MOTION

0.065" 0.111" 0.171" 0.149" 0.205"

15 PSI 60 PSI 140 PSI
45 PSI 15 PSI

0.045° 0.111° 0.149° 0.205°

CONCEPTS
WOMEN’S BATHS 05

CONSTRUCTION 06
FREE-FORM CATALAN VAULT
ZURICH, SWITZERLAND

CONSTRUCTION PRECEDENT

06
06

CONSTRUCTION

MATERIALS

HAKONE CONSTRUCTION

MATERIAL
1" PLYWOOD SHEET
5MM ROOFING MEMBRANE
RECYCLED MATERIAL
ALUMINUM SCAFFOLDING (RENTAL)
SOIL
CONCRETE
GLASS TUBES

AMOUNT
1,500 SQ FT
14,800 SQ FT
N/A
50 QTY
750 CY
400 CY
400 CT

COST ESTIMATE
$340
$784
N/A
$42,300
N/A
$26,000
$2,400

CAL POLY CONSTRUCTION

MATERIAL
4’X8’ CARDBOARD
3.5 MM PLASTIC MEMBRANE
SAND
CONCRETE
2X3 LUMBER (FORMWORK)
2X6 LUMBER (FORMWORK)

AMOUNT
28 SHEETS
100 SQ FT
2 CY
0.5 CY
8
8

COST ESTIMATE
DONATED
DONATED
DONATED
DONATED
$30
$76

FREE-FORM CATALAN VAULT
ZURICH, SWITZERLAND

HAKONE CONSTRUCTION

MATERIAL
1" PLYWOOD SHEET
5MM ROOFING MEMBRANE
RECYCLED MATERIAL
ALUMINUM SCAFFOLDING (RENTAL)
SOIL
CONCRETE
GLASS TUBES

AMOUNT
1,500 SQ FT
14,800 SQ FT
N/A
50 QTY
750 CY
400 CY
400 CT

COST ESTIMATE
$340
$784
N/A
$42,300
N/A
$26,000
$2,400

CAL POLY CONSTRUCTION

MATERIAL
4’X8’ CARDBOARD
3.5 MM PLASTIC MEMBRANE
SAND
CONCRETE
2X3 LUMBER (FORMWORK)
2X6 LUMBER (FORMWORK)

AMOUNT
28 SHEETS
100 SQ FT
2 CY
0.5 CY
8
8

COST ESTIMATE
DONATED
DONATED
DONATED
DONATED
$30
$76

FREE-FORM CATALAN VAULT
ZURICH, SWITZERLAND
Pallet Substitution for Scaffolding

Cardboard Waffle Grid Substitution for Plywood

Filling Waffle Voids with Sand

Attached Edges to Retain Sand

Models CAL POLY Scale 07

Models CAL POLY Scale 07
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