

TAKING ACTION

OCTOBER 5TH, 2020

INDIGENUITY

Alfred Waugh Architect AIBC, OAA, MRAIC, LEED AP
Formline Architecture



INDIGENOUS KNOWLEDGE

- KNOWLEDGE IS EXPERIENTIAL BASED ON OBSERVATIONS OF NATURE THROUGH A LONG HISTORY OF TIME
- NATURE IS AT THE CENTER OF THE VALUE SYSTEM AND ALL LIVING THINGS ARE INTERCONNECTED
- KNOWLEDGE IS PASSED ON THROUGH ORAL TRADITION THROUGH STORIES AND THE TEACHINGS OF OUR ELDERS



WESTERN SCIENCE

- KNOWLEDGE IS BASED ON SCIENTIFIC ANALYSIS AND ISOLATING ELEMENTS IN NATURE TO UNDERSTAND ITS UNDERLYING MECHANICS TO ALLOW FOR MANIPULATION AND INVENTION
- HUMAN KIND IS AT THE CENTER OF THE VALUE SYSTEM AND NATURE SERVES IT
- KNOWLEDGE IS PASSED ON THROUGH THE WRITTEN WORD, MATHEMATICS, AND COMPUTER CODE

RECONCILIATION OF HOW WE LIVE ON EARTH

TAKING ACTION:
A CONVERSATION
ON CLIMATE ACTION
AND ARCHITECTURE
IN CANADA

PRENDRE ACTION:
UNE CONVERSATION SUR
L'ACTION CLIMATIQUE
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ENGAGEMENT

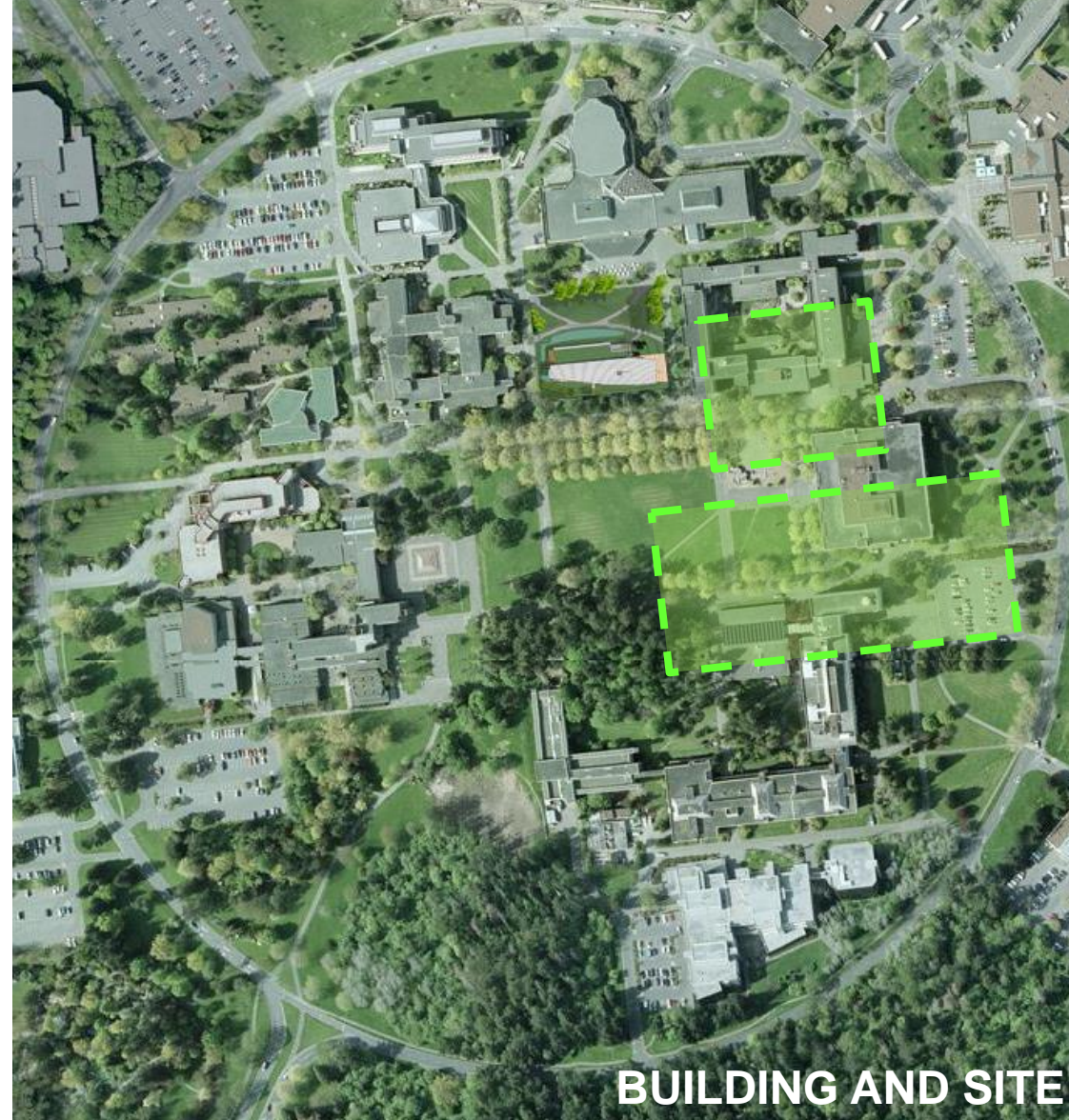
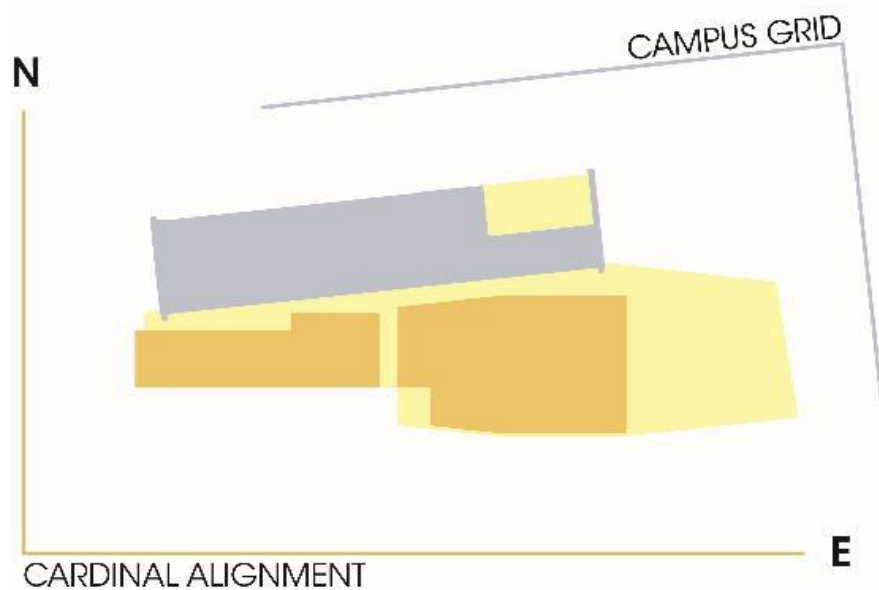
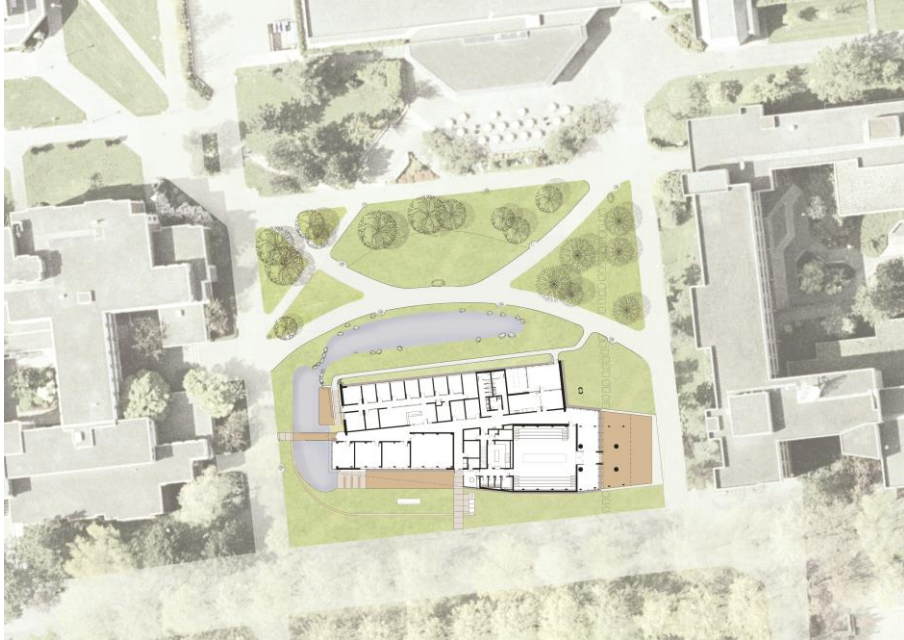
FIRST PEOPLES HOUSE

UNIVERSITY OF VICTORIA, B.C.

LEED GOLD CERTIFIED

2006/2009





BUILDING AND SITE



ENVIRONMENT-INDIGENOUS LANDSCAPE



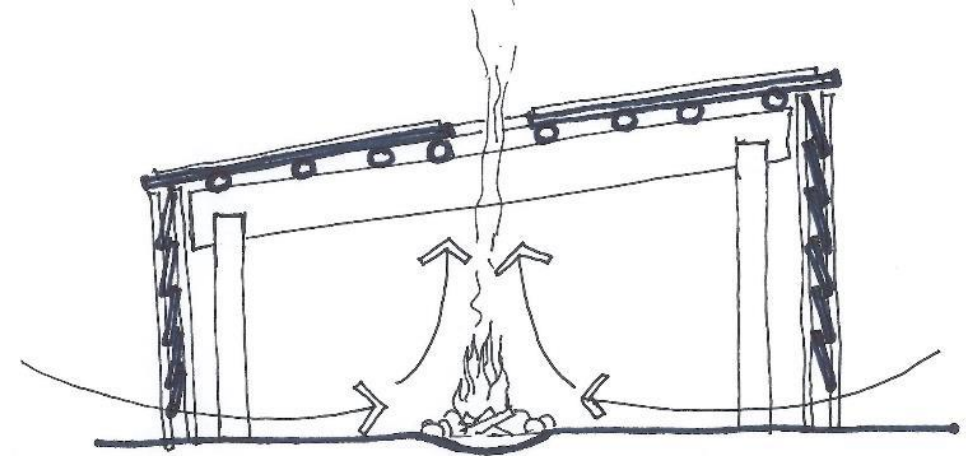
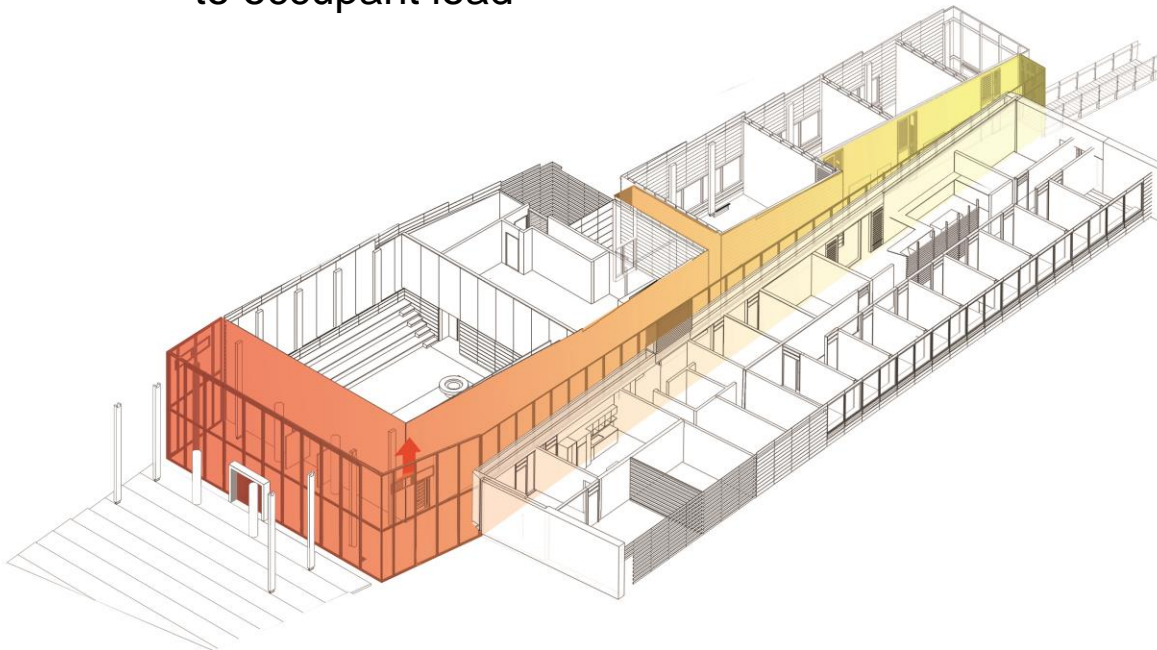
WATER CONSERVATION

TAKING ACTION:
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DISPLACEMENT VENTILATION

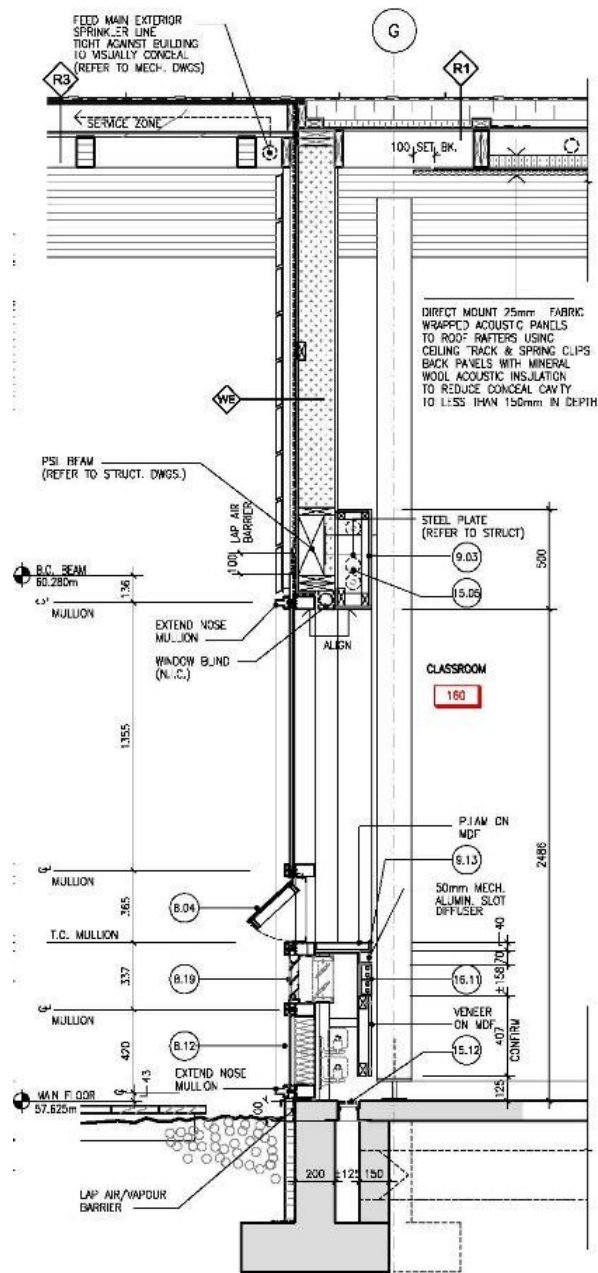
- Passively cooled
- 100% outdoor air handling unit
- Operable windows
- Fresh air earth loop
- Computer fluid dynamic modelling to calibrate ventilation requirements to occupant load



DISPLACEMENT VENTILATION



AIR INTAKE TOTEM



USER CONTROLLED + DDC CONTROLLED OPERABLE OPENINGS



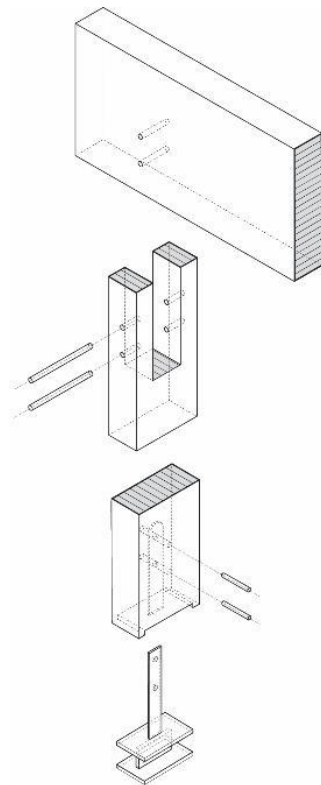
EXHAUST OPENINGS
CALIBRATED TO OCCUPANT LOAD



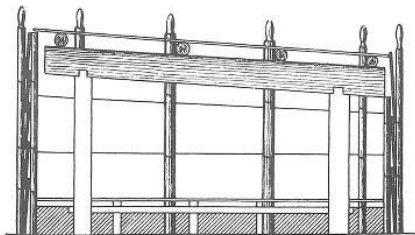
THE IMPORTANCE OF CEDAR

TIMBER CONNECTION

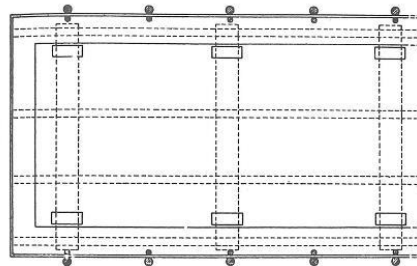
- Interpretation of the slotted post and beam connection for the Coast Salish Long house
- 25mm Tight fit stainless steel pins with 2mm taper
- Knife plate base connection
- Glulam columns 175mm x 380 to 456mm
- Glulam beams sized to span from 175 x 532mm to 722mm



Axo view of post to beam joinery



Section



Salish house plan



TIMBER DETAILING



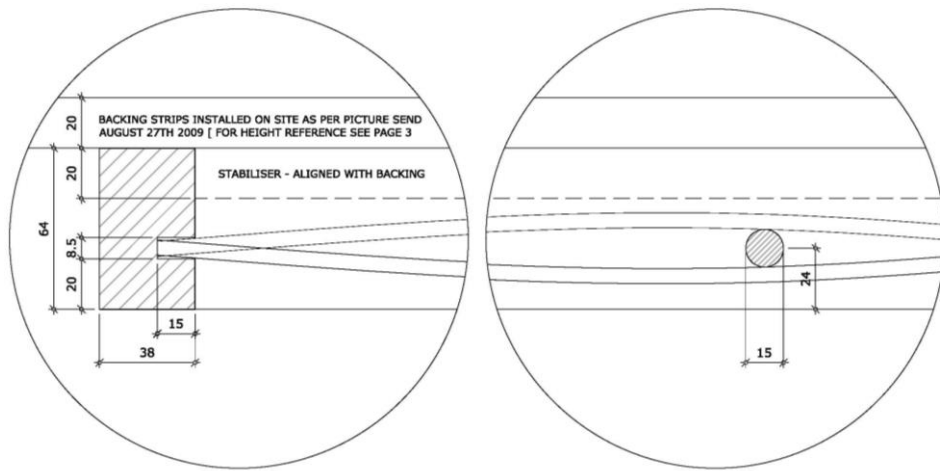
CEREMONIAL HALL | INTERPRETATION OF THE BIG HOUSE



MULTI-FUNCTIONAL SPACE

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WOVEN CEDAR DETAIL

- Inspired from the bullrush matt used to keep the draft out of Longhouses.
- 45mm x 6mm cedar strips woven between 16mm diameter wood dowels
- Panel models 1524mm wide

WOVEN CEDAR PANELS



1. Doug Lafortune
Coast Salish



2. Charles Elliot
Tsartlip First Nation



3. Rande Cook
Kwakwak'wakw



4. Luke Marston
Coast Salish



5. Morris (Moy) Sutherland Jr.
Nuu-chah-nulth



6. Rick Harry
Squamish Nation



1



1



2



2



3



3



4



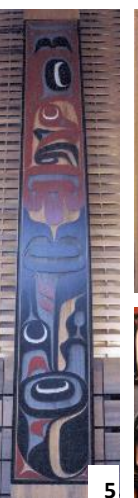
4



4



5



5



6



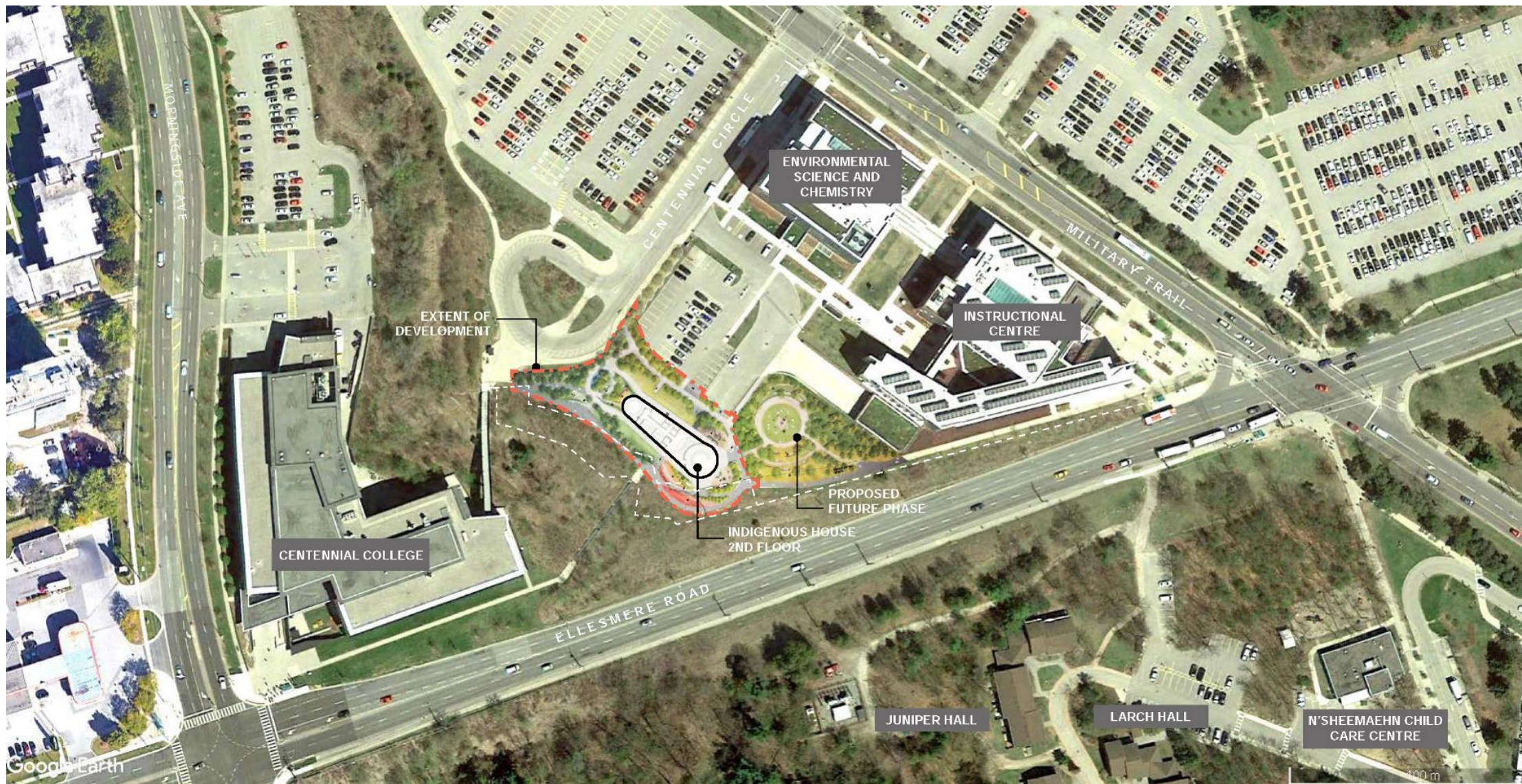
John Livingston- Art
Coordinator

ARTISTS

UNIVERSITY OF TORONTO SCARBOROUGH INDIGINOUS HOUSE

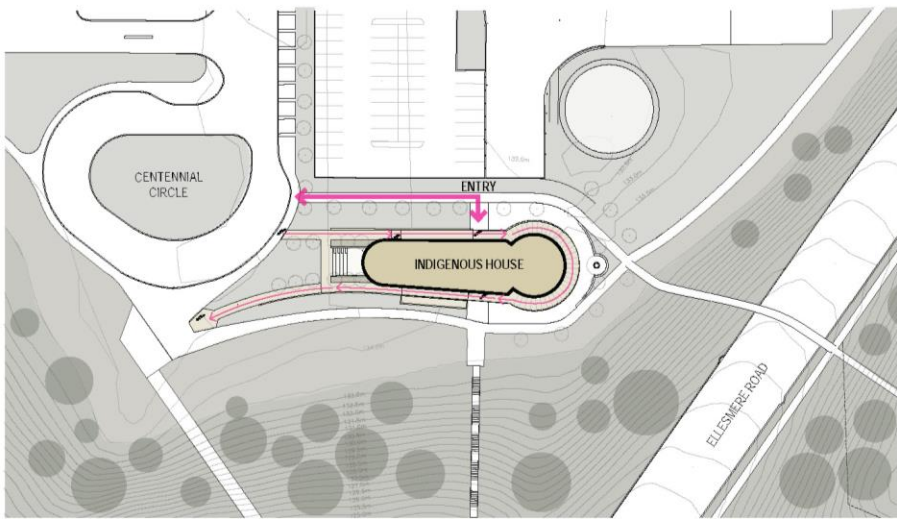
Toronto, Ontario



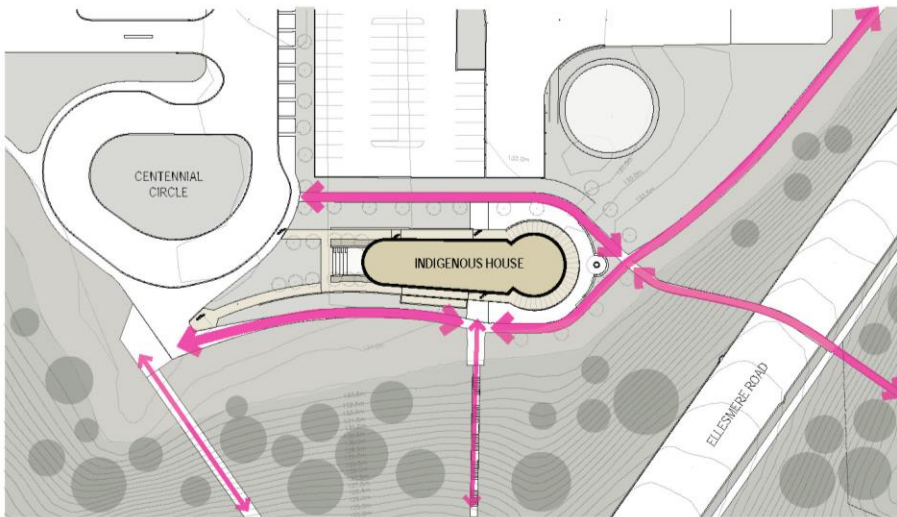


SITE CONTEXT

DESIGN IDEAS: ARRIVAL CIRCUIT

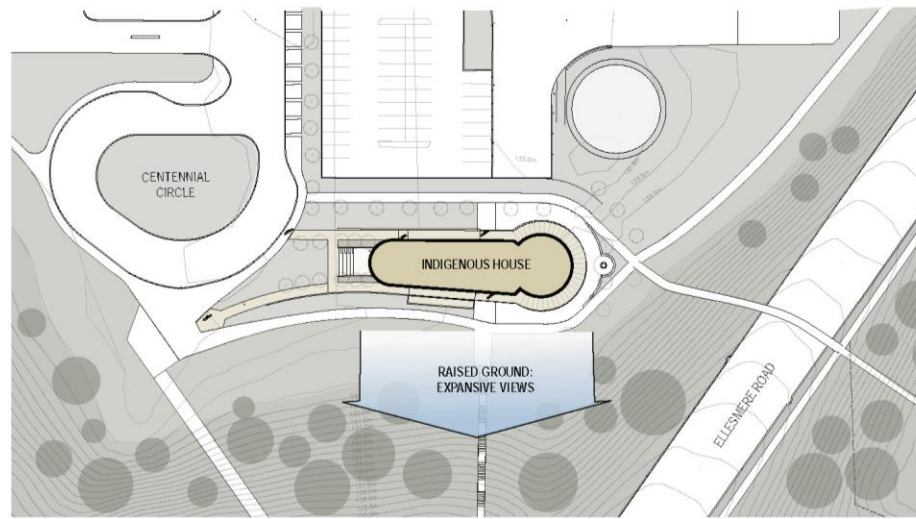


DESIGN IDEAS: SITE CIRCULATION

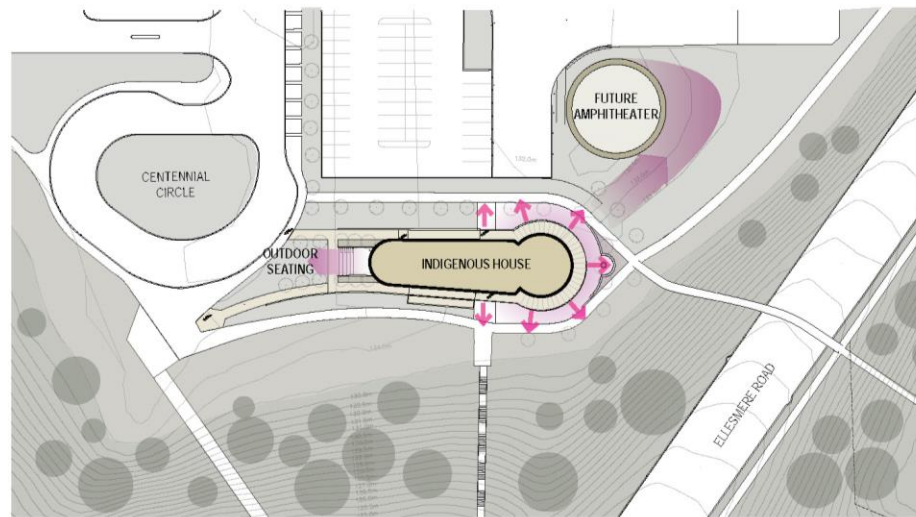


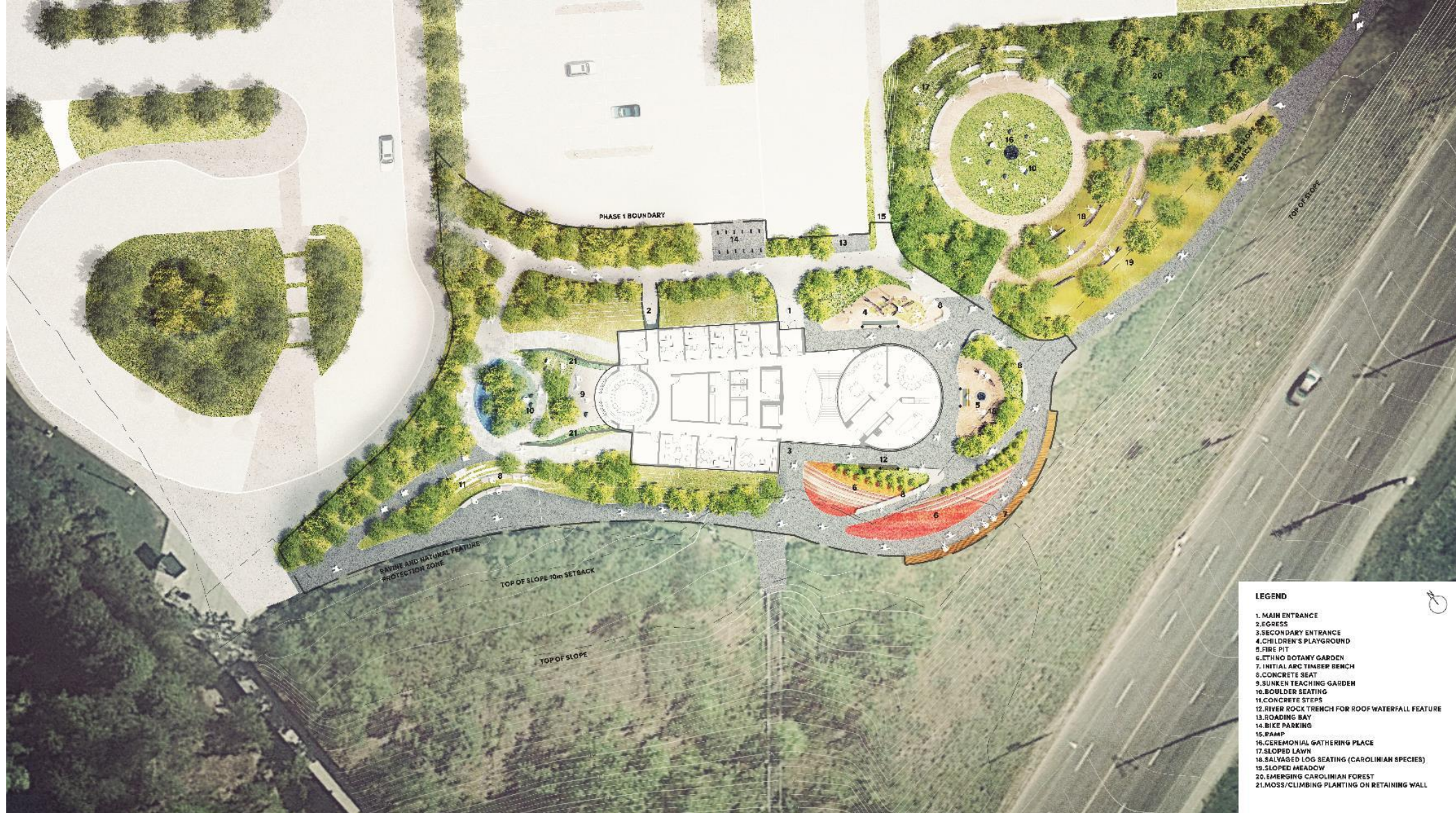
SITE DIAGRAMS

DESIGN IDEAS: EXPANSIVE VIEWS

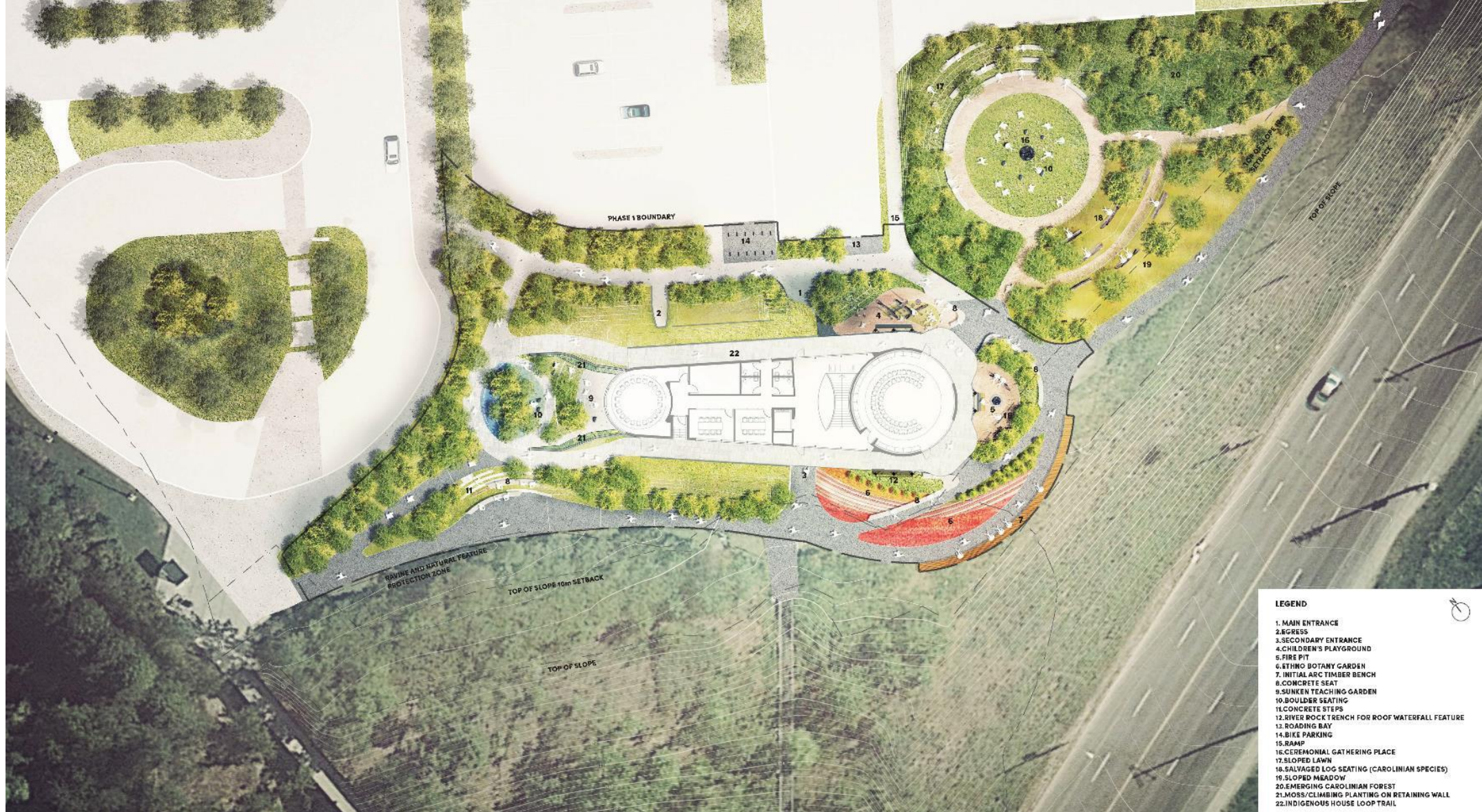


DESIGN IDEAS: LANDSCAPE IMMERSION





SITE PLAN GROUND FLOOR



SITE PLAN SECOND FLOOR



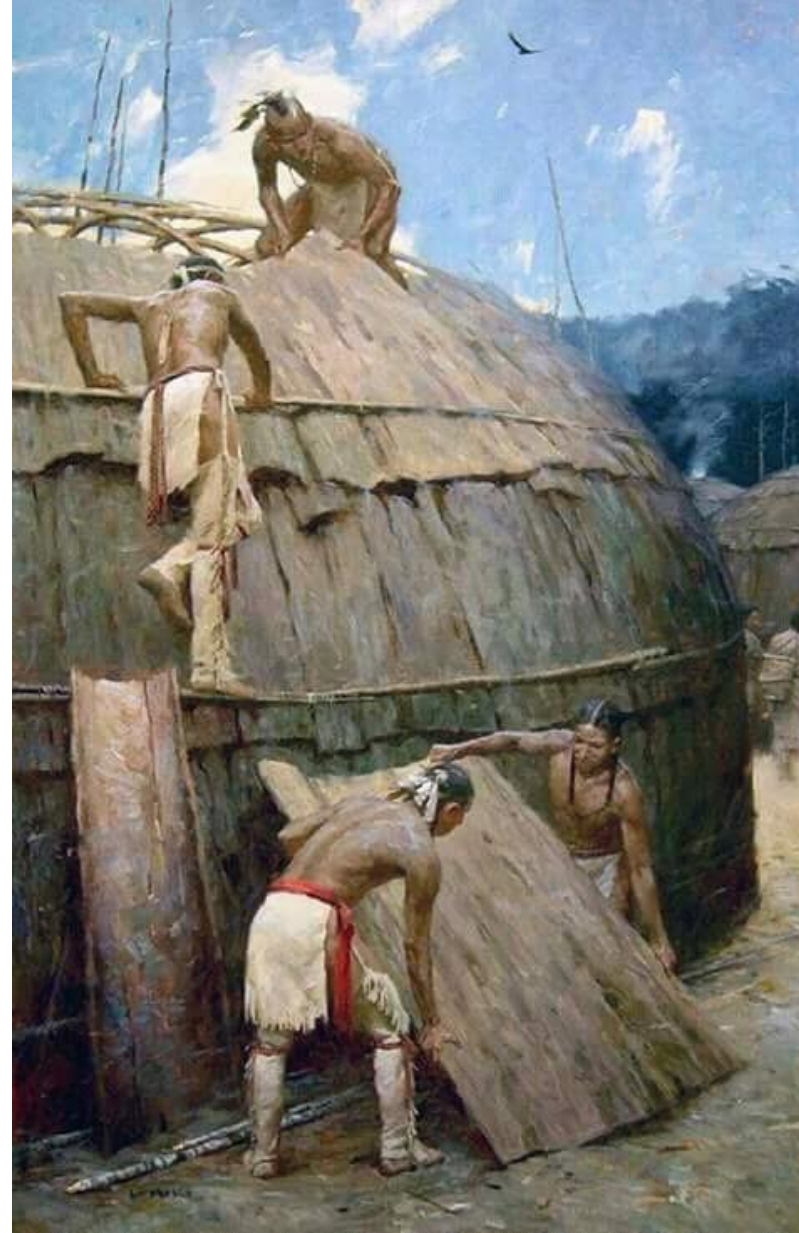
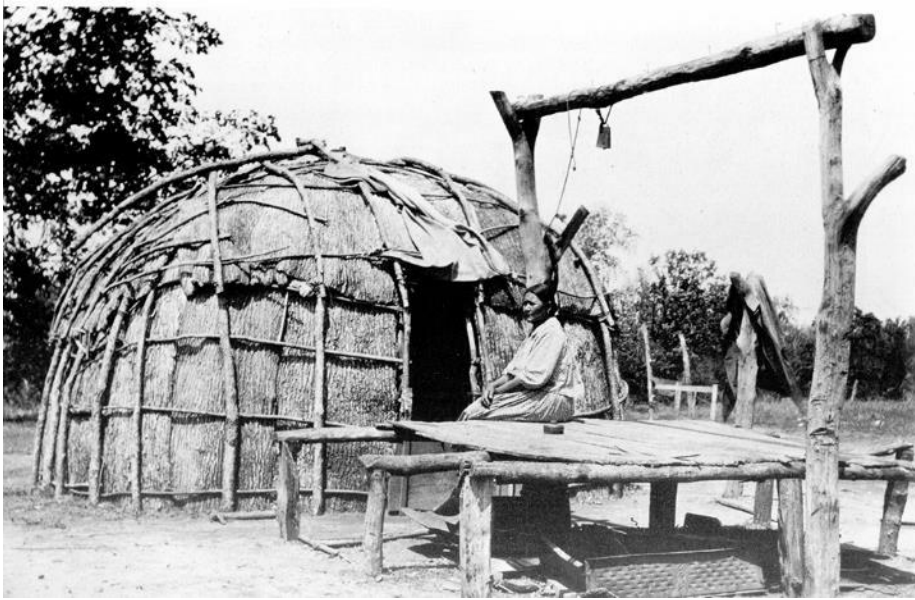
LANDSCAPE PLAN - GROUND COVER



LANDSCAPE PLAN - TREE COVER



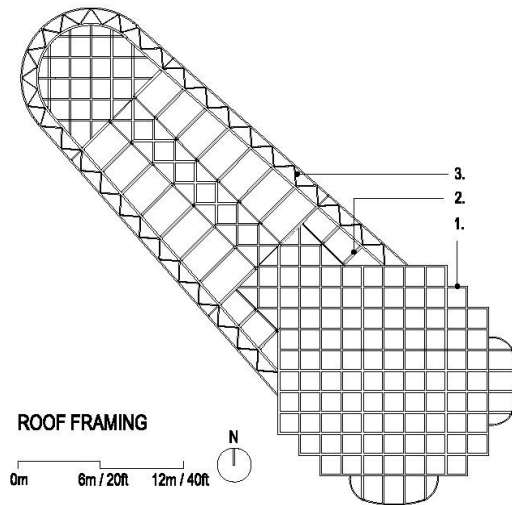
VIEW FROM THE WEST LOOKING UP THE RAMP AND AT THE SUNKEN GARDEN



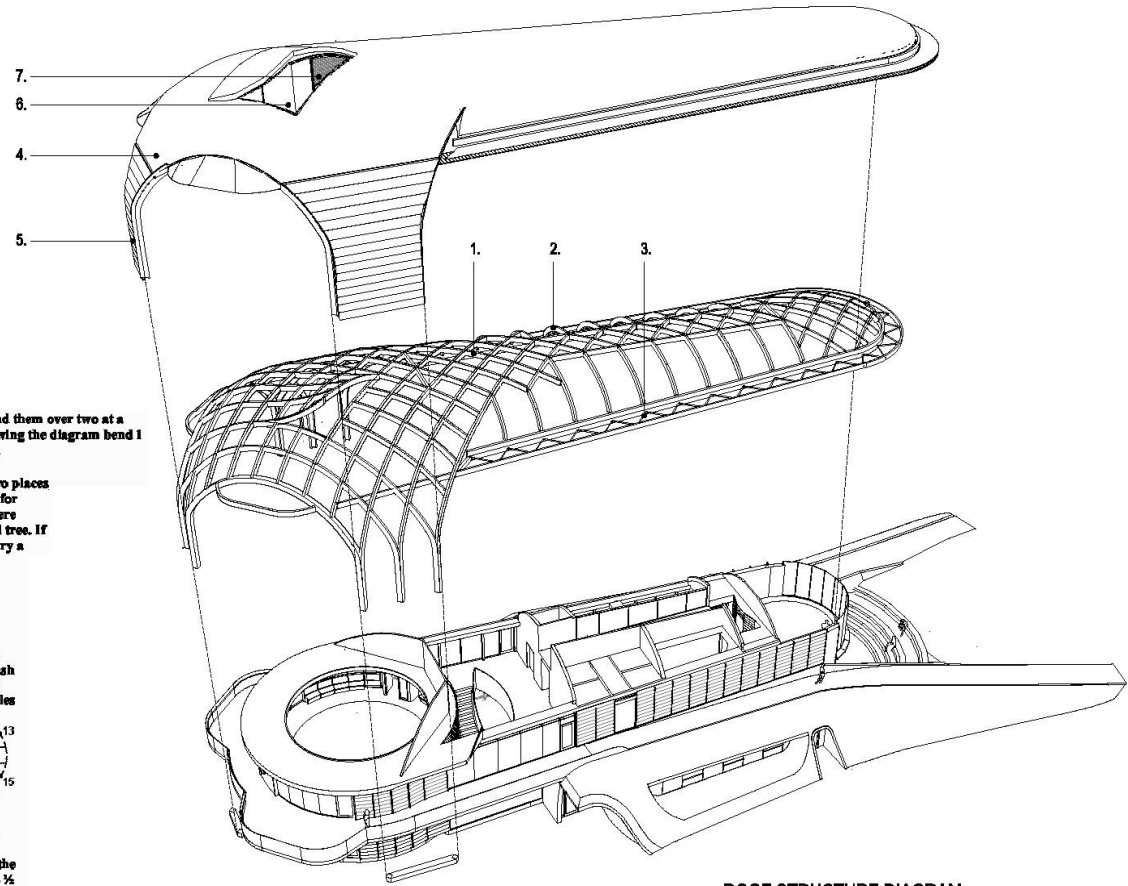
WIGWAM – CULTURAL PRECEDENT

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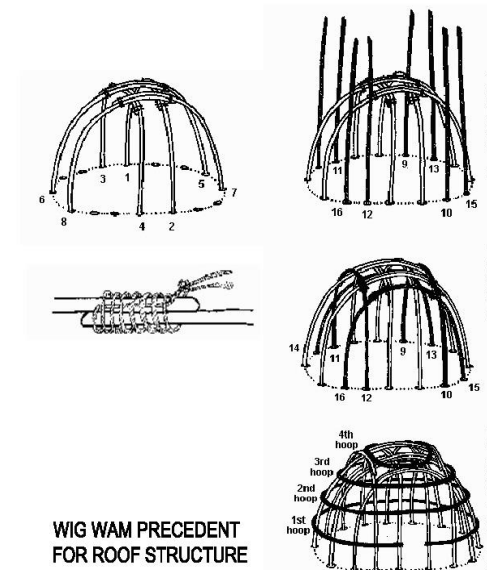
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- LEGEND:
1. 130 x 305 ARCHED GLULAM 1525 X 1525 2-WAY DIAGRID ROOF STRUCTURE
 2. 130 x 305 ARCHED GLULAM RIBS
 3. HORIZONTAL STEEL TRUSS TO PREVENT THE THRUST OF THE ARCH
 4. DIAMOND FLAT SEAM METAL ROOF TILE OVER BUILT OFF ROOF SYSTEM ON 10mm PLYWOOD ON 38X38 WHITE CEDAR DECKING
 5. SANDBLASTED SHINGLED FIBER GLASS WATERFALL FEATURE
 6. EAST FACING DOUBLE GLAZED CLERESTORY
 7. NATURAL VENTILATION GRILL WITH INSULATED MOTORIZED DAMPER



ROOF STRUCTURE DIAGRAM



WIG WAM PRECEDENT FOR ROOF STRUCTURE

Plant the first set of eight poles numbered 1-8. Bend them over two at a time so they overlap about two to three feet. Following the diagram bend 1 to meet 2, 3 to meet 4, 5 to meet 6, and 7 to meet 8.

Lash the ends of each set of two poles together at two places about three inches from each end using the method for lashing parallel branches. Traditionally the poles were lashed together with the inner bark of the basswood tree. If you do not have basswood in your area, you might try a commercial lashing like heavy jute or steel twine

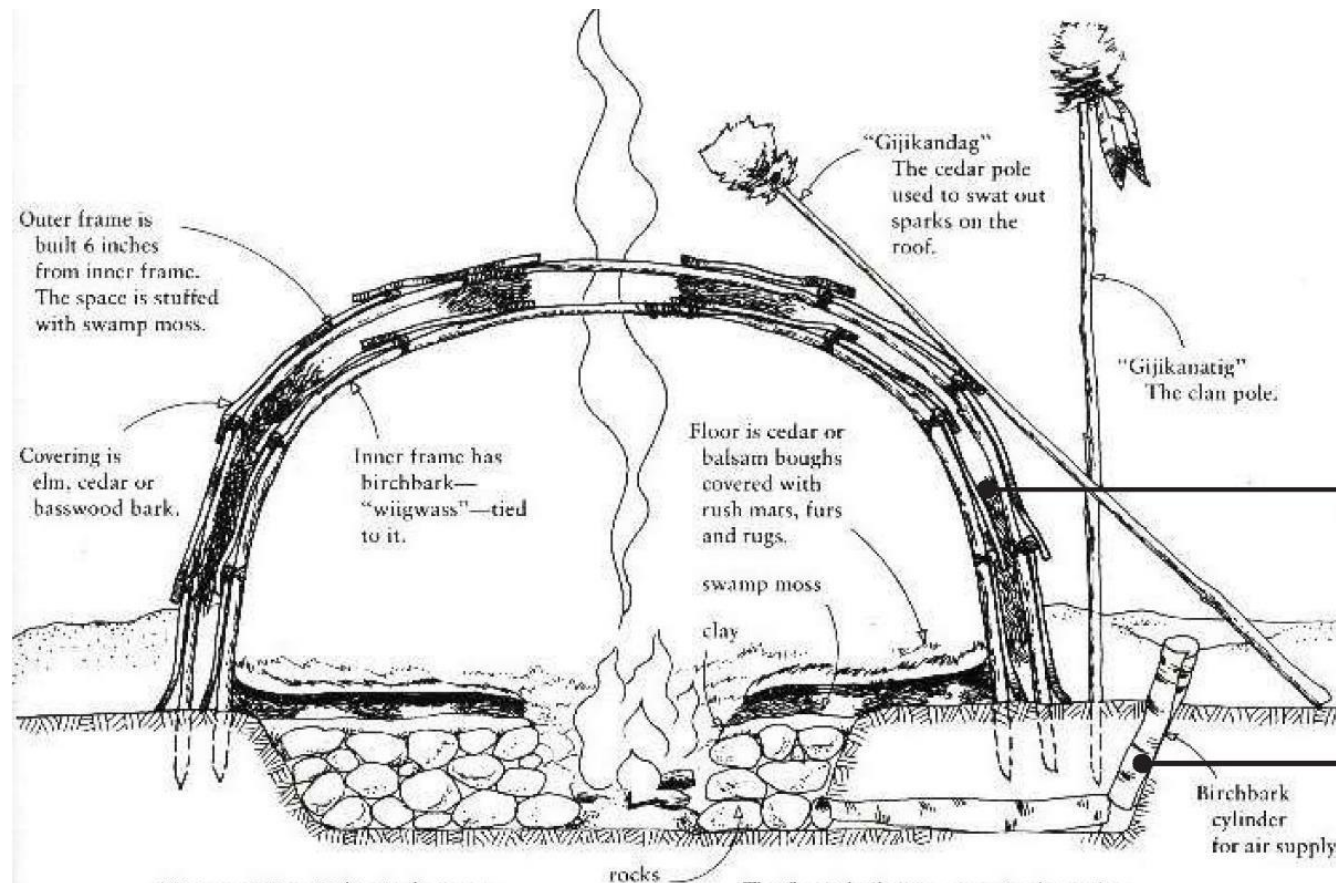
These are bent over, following the diagram, 9 to meet 10, 11 to meet 12, 13 to meet 14, and 15 to meet 16. Lash the overlaps in the same way that you lashed the first set of poles, and lash together "every" place where poles cross each other.

Using your remaining prepared saplings, you need to fasten hoops around the perimeter of your wigwam frame at three to four places. The hoops really make the structure sturdy. Start with the bottom hoop (about 2 1/2 feet up from the base). This first hoop will use two to three saplings to go all the way around, lash the hoop on making sure to leave a "gap" for the door (entrance) to your wigwam. Keeping them about 2 feet apart, lash down the second, third (and fourth hoop near the top if your wigwam needs four hoops to make it sturdy). Your second and third hoops will probably need two saplings

ROOF STRUCTURAL CONCEPT



CEREMONIAL GATHERING PLACE



Outer frame is built 6 inches from inner frame. The space is stuffed with swamp moss.

Covering is elm, cedar or basswood bark.

Inner frame has birchbark—“wiigwass”—tied to it.

Floor is cedar or balsam boughs covered with rush mats, furs and rugs.

swamp moss
clay

“Gijikandag”
The cedar pole used to swat out sparks on the roof.

“Gijikanatig”
The clan pole.

Birchbark cylinder for air supply.

Wigwam is 8 to 12 feet in diameter.

Frame is built with 12 to 15 poles 2 feet apart. Maple is used but ironwood is preferred.

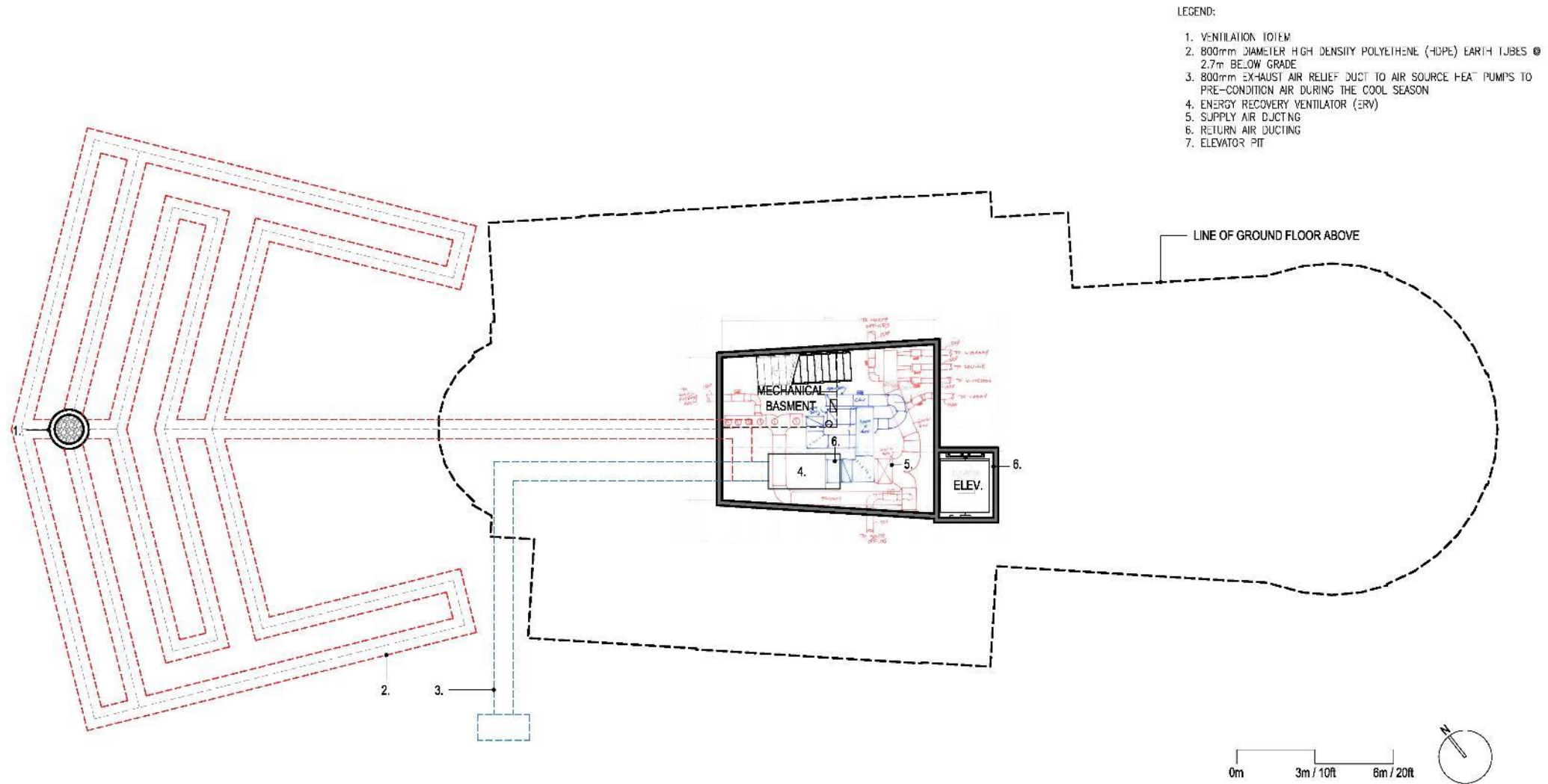
rocks

The fire is built in a recess in the rocks, which radiate stored heat after the fire dies out.

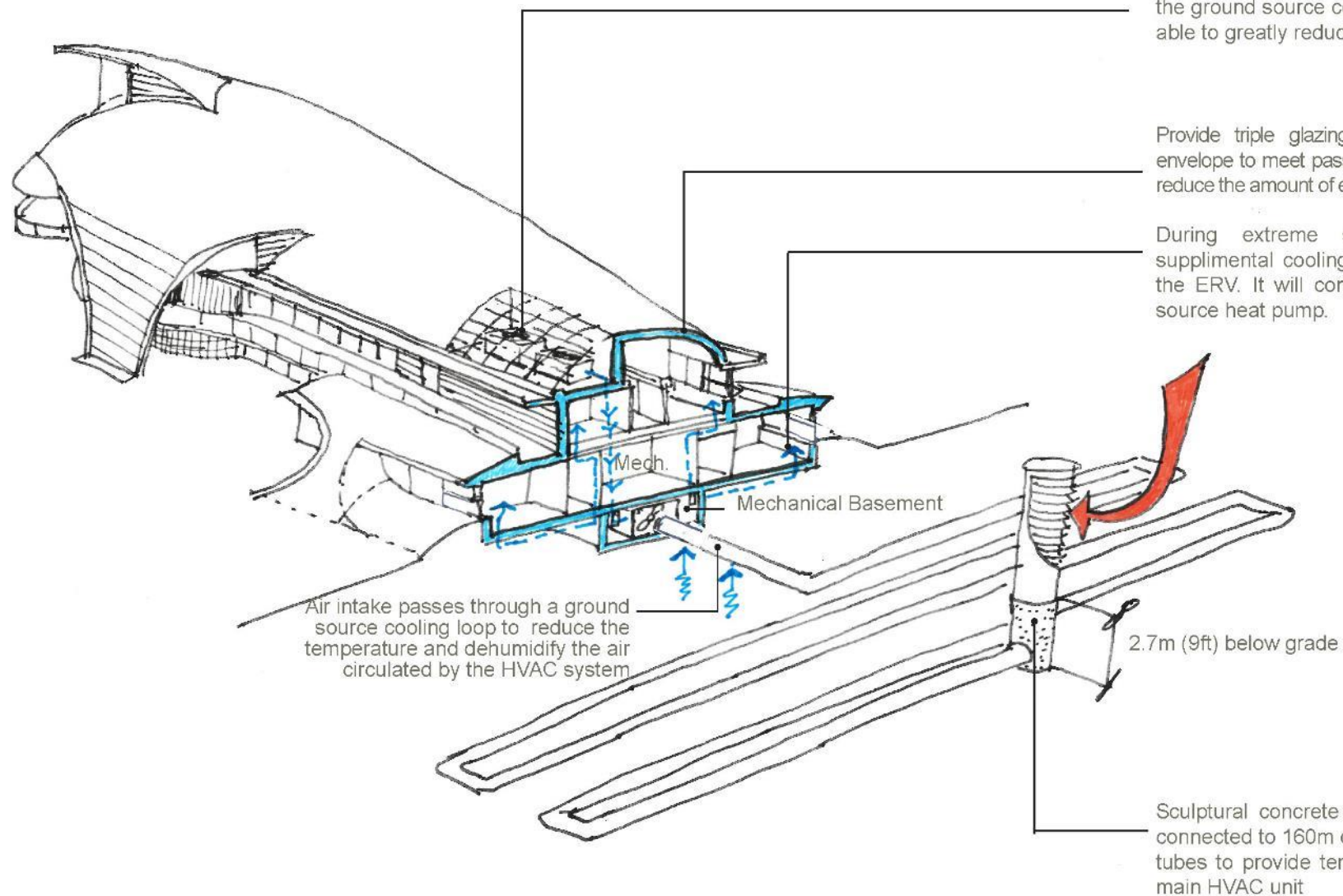
DEVELOP A PASSIVE MECHANICAL SYSTEM INSPIRED BY THE WIG WAM BUILDING

DESIGN A SUPER INSULATED BUILDING ENVELOPE INSPIRED BY THE WIG WAM DOUBLE WALL SYSTEM USING SWAMP MOSS OR TULLE REEDS TO INSULATE A CENTRAL LAYER

TRANSLATE THE BIRCH BARK CYLINDER TO A MODERN EARTH TUBE SYSTEM TO BENEFIT FROM THE STABLE TEMPERATURE OF THE GROUND TO TEMPER THE INTAKE AIR FOR THE BUILDING DEPENDING ON THE SEASON



BASEMENT FLOOR PLAN- MECHANICAL ENERGY RECOVERY VENTILATOR DIAGRAM



Roof top air source heat pump concealed by a metal slat screen integrated into the roof form. If the ground source cooling is sufficient we may be able to greatly reduce or delete these units

Provide triple glazing and a super insulated envelope to meet passive house requirements to reduce the amount of energy required for cooling

During extreme summer conditions a supplemental cooling coil will be provided in the ERV. It will connect to the roof top air source heat pump.

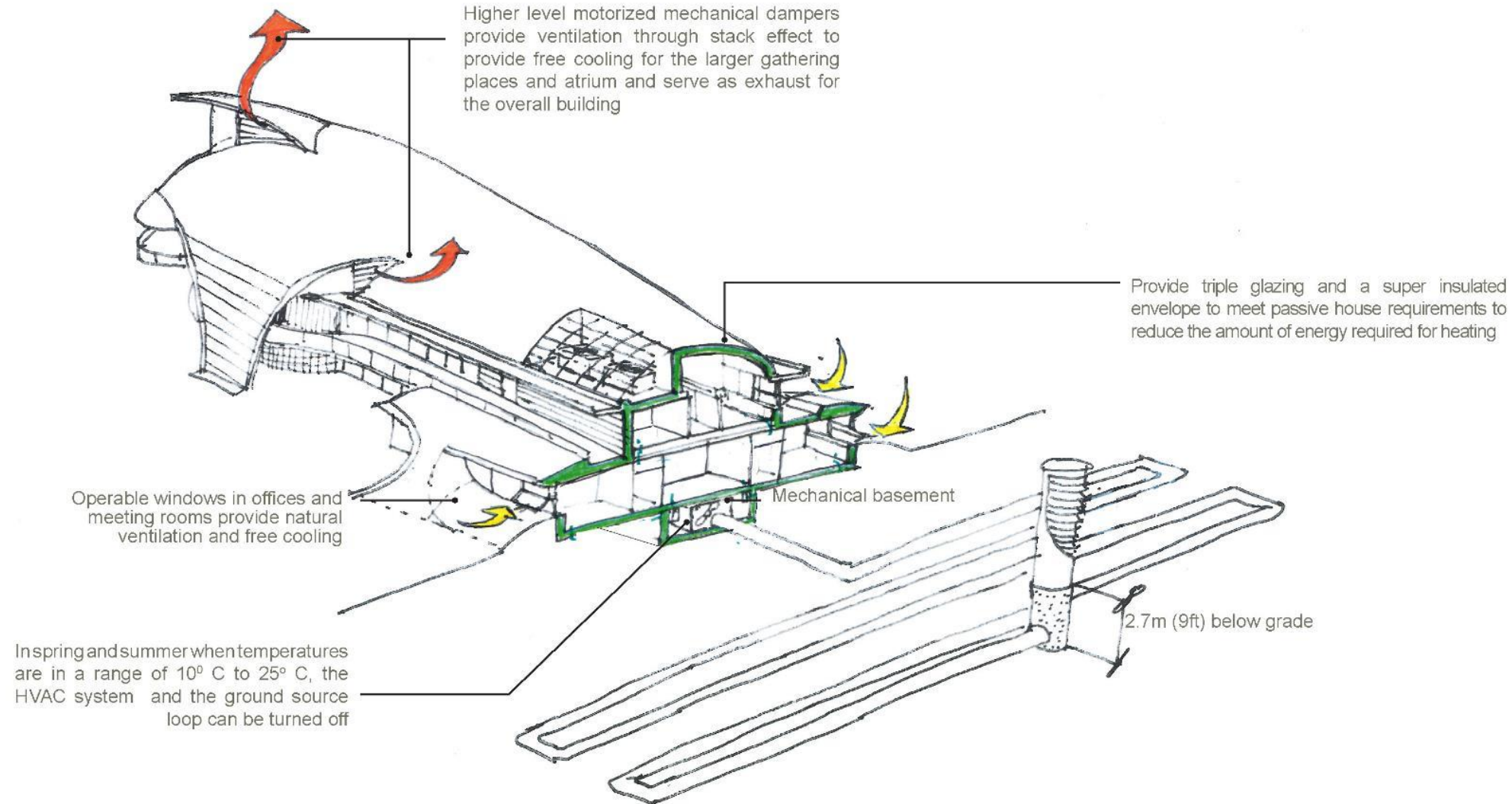
Air intake passes through a ground source cooling loop to reduce the temperature and dehumidify the air circulated by the HVAC system

Mechanical Basement

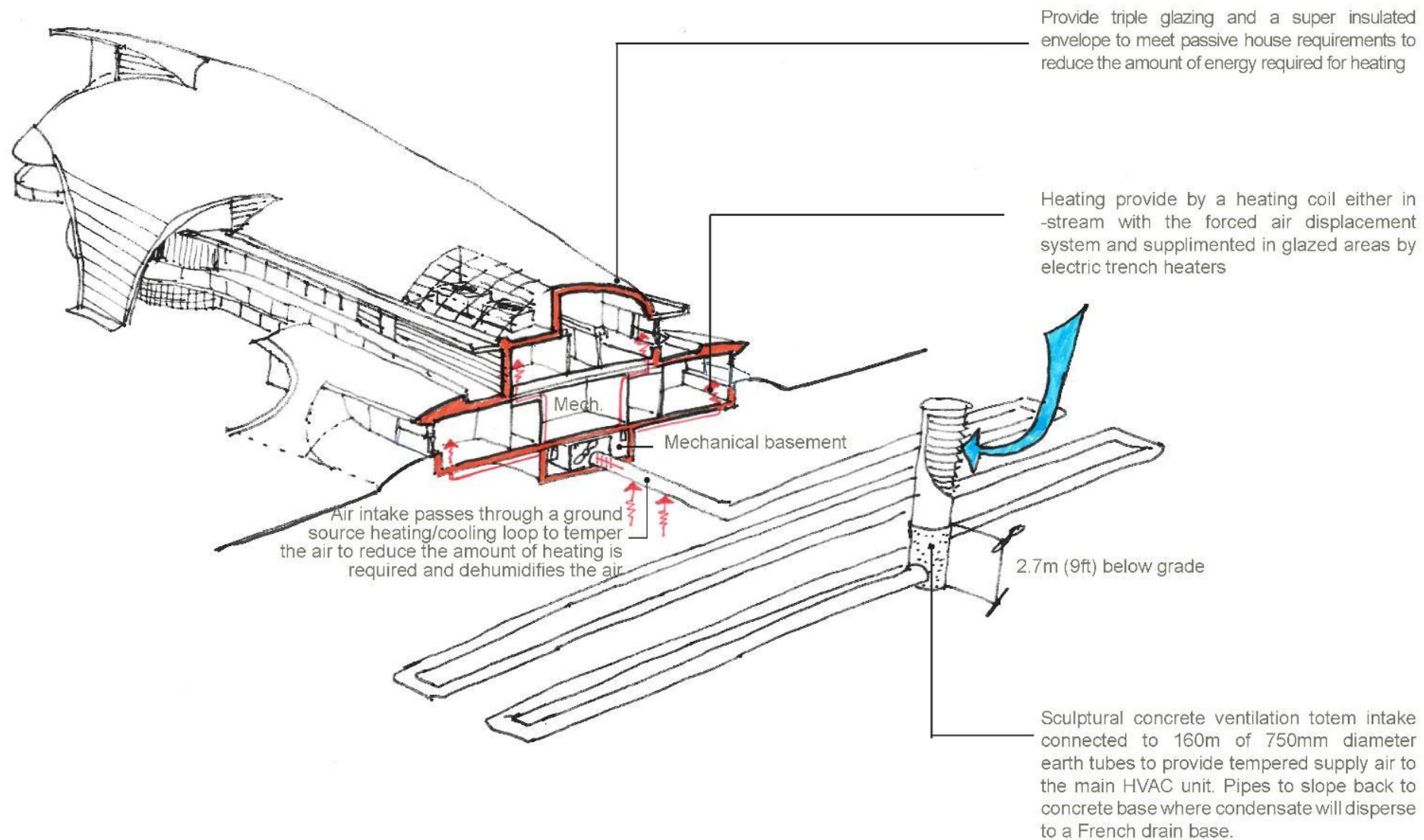
2.7m (9ft) below grade

Sculptural concrete ventilation totem intake connected to 160m of 750mm diameter earth tubes to provide tempered supply air to the main HVAC unit

VENTILATION DIAGRAM – SUMMER MODE



VENTILATION DIAGRAM – SPRING AND FALL MODE



VENTILATION DIAGRAM – WINTER MODE

THANK YOU!

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