PART 1
PROJECT DESCRIPTION

Use for all categories. Projects are judged based on criteria of sustainable design, architectural merit and innovation.

2022
CANADIAN GREEN BUILDING AWARDS
THE NATIONAL PROGRAM OF SUSTAINABLE ARCHITECTURE & BUILDING MAGAZINE SABMag

Project categories

Identify which Award category you are entering

☐ **1. Residential [small]**
Open to new or renovated buildings less than 600m² in area, of which a minimum of 75% is dedicated to single-family or multi-family residential uses.

☐ **2. Residential [large]**
Open to new or renovated buildings [typically multi-unit buildings or groups of related buildings] greater than 600m² in area, of which at least 75% is dedicated to residential uses.

☐ **3. Commercial/Industrial [small]**
Open to new or renovated buildings up to 2,000m² in area, of which more than 75% is dedicated to commercial or industrial uses.

☐ **4. Commercial/industrial [large]**
Open to new or renovated buildings [or groups of related buildings] greater than 2,000m² in area, of which at least 75% of the floor area is dedicated to commercial or industrial uses.

☒ **5. Institutional [small]**
Open to new or renovated buildings up to 2,000m² in area, of which more than 75% is dedicated to institutional uses.

☐ **6. Institutional [large]**
Open to new or renovated buildings [or groups of buildings] greater than 2,000m² in area, of which at least 75% of the floor area is dedicated to institutional uses.

☐ **7. Mixed Use**
Open to new or renovated buildings [or groups of related buildings] of any size, in which no individual use exceeds 75% of the overall floor area.

☐ **8. Existing Building Upgrade**
Open to buildings of any size or type in which the primary focus of the work has been to enhance the performance or extend the life of an existing structure. Entries in this category are required to respond only to the submission criteria appropriate to the project.

☐ **9. Interior Design**
Open to interior design projects of any size or type. Entries in this category are required to respond only to the submission criteria appropriate to the project.

An award will be given in each category at the discretion of the jury.

PROJECT DETAILS

Project name: Doig River Cultural Centre

Address: Doig River Indian Band, Rose Prairie, BC - exact address unavailable

Year completed: 2020

PROGRAM AND CONTEXT

Project type: [Identify all uses occupying 10% or more of gross floor area]

Institutional - main level comprises 250m2 of community-oriented cultural space and the lower level comprises a daycare and an Elders lounge.

Project site: [Check all that apply]

- [x] Previously undeveloped land
- [ ] Previously developed land
- [ ] Urban
- [ ] Suburban
- [x] Rural

Other Building description: [Check only one]

- [x] New
- [ ] Renovation
- [ ] Both [If both, list __% new and __% renovation]

STATISTICS* Provide the following metrics as applicable to your project.

- Site Area: 1.6 acres m^2
- Building gross floor area: 547 m^2
- Energy Intensity: 45.2 KWhr/m^2/year [Include both base building and process energy]

[optional: report energy intensity separately as follows:

- Energy Intensity, base building: n/a KWhr/m^2/year
- Energy Intensity, process energy: n/a KWhr/m^2/year

- Reduction in energy intensity: n/a %.
- State the reference standard on which the % reduction is based: MNECB, NECB or ASHRAE 90.1

[include version]: n/a

- Recycled materials content: n/a % by value
- Water consumption from municipal source: n/a litres/occupant/year

[Include both base building and process consumption]

- Reduction in water consumption: n/a %
- State the reference on which the % reduction is based: LEED [x] or other [ ]
- Construction materials diverted from landfill: n/a %
- Regional materials by value: n/a %

***NOTE FOR PART 9 RESIDENTIAL PROJECTS: PROVIDE THE STATISTICS ABOVE IF AVAILABLE.** Include in the Executive Summary [see next page] the EnerGuide or the Home Energy Rating System [HERS] ratings if available, and the WalkScore rating [see www.walkscore.com]. Also, a qualitative assessment of project performance should be included in the appropriate sections of the narrative.

PROJECT SUMMARY

Nestled into the slope in a grove of birch and aspen trees, the design for this cultural centre complements its natural surroundings and stands as an important building at the entrance of the community. Designed as a modern answer to the traditional church structure, the building is a hybrid of site-built and prefabricated components. The main level comprises 250m² of community-oriented space, accommodating up to 150 people in the sanctuary with additional seating in the upper mezzanine. The building also houses a daycare and Elders' lounge on the lower floor.

The building is Passive House Institute US (PHIUS) certified, which will result in 90% less energy usage over a conventional building. Sporting R70 walls and roof and quad glazing throughout, the building can remain comfortable with minimal heat even in temperatures as low as -35 degrees Celsius. With the added feature of the PV array on the roof, the building's impact on the environment is negligible. The building is also one of the most northern PHIUS certified building in the world, making it a truly unique structure with exceptional economic resilience in the long winter months.

MAIN PROJECT DESCRIPTION

1. STRATEGIC DECISIONS

As the project was targeting PHIUS certification, the building's orientation was critical, with the need to place the main roof slope southwards to gain the maximum advantage of the winter solar gain and PV panel exposure. This orientation also creates a dynamic display of light and shadow across the splayed walls as the melting snow constantly shifts and changes shape as it makes its way down the surface of the glass.

Having achieved PHIUS certification, the building's passive strategies are proving very effective. The geographic location requires that the building be in heating mode for almost 10 months of the year, yet the super-insulated envelope means this can be achieved with a minimal number of electric baseboard heaters. The expansive windows also provide access to ample natural daylighting and warmth, and the PV array on the roof further enhances the building's passive design performance.

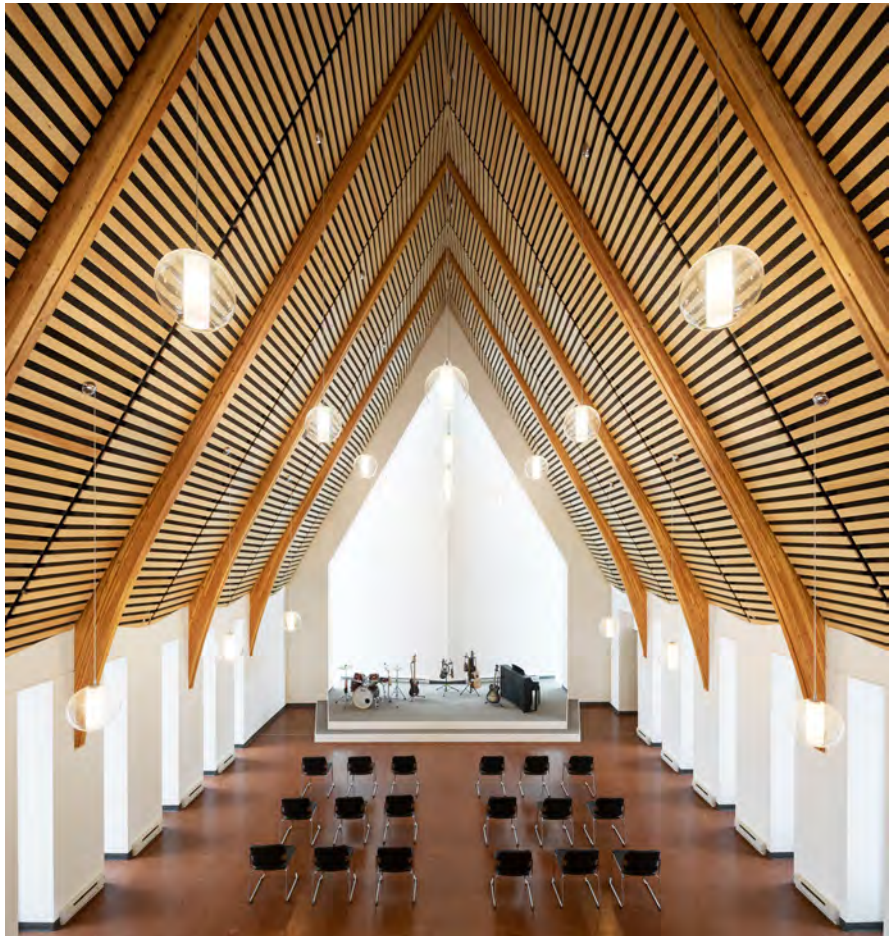
Above: Site location - Rose Prairie, British Columbia

Above: Aerial view of the site location

2. COMMUNITY

The site selection for this project was driven by the desire to locate the Centre close to the community's existing administrative and community building to create a civic centre and minimize the need for extensive infrastructure expansion. As a remote and small community, a close network of buildings is crucial to creating a central gathering place and providing a critical mass for community functions. Additionally, the site's slope facilitates grade access to both levels, which eliminates the need for an elevator or wheelchair lift.

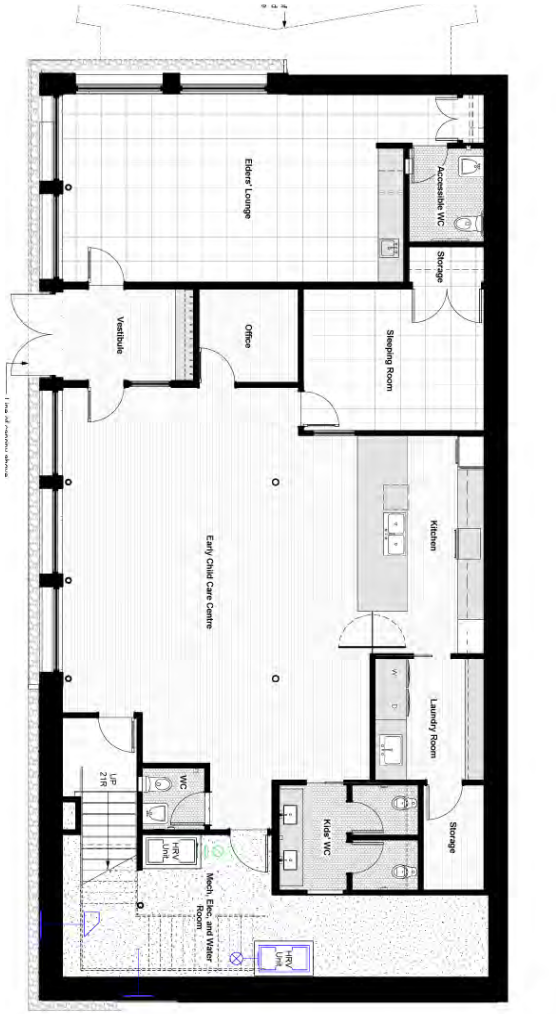
The Centre's main level comprises 250m² of community-oriented space that can be adapted for a range of uses. The lower level includes a daycare and an Elder's lounge. The combination of the Elder's lounge, daycare and main floor gathering space in a single building promotes cross-generational interaction and fulfills the community's desire to provide a safe and healthy space for all its members.



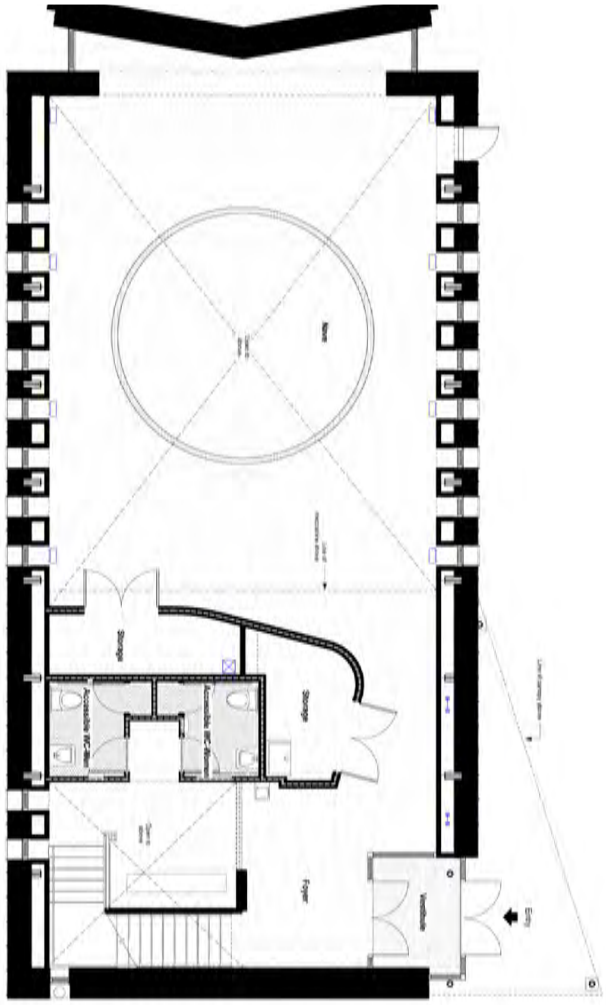
Above: Sanctuary Interior

Above: Daycare Facility

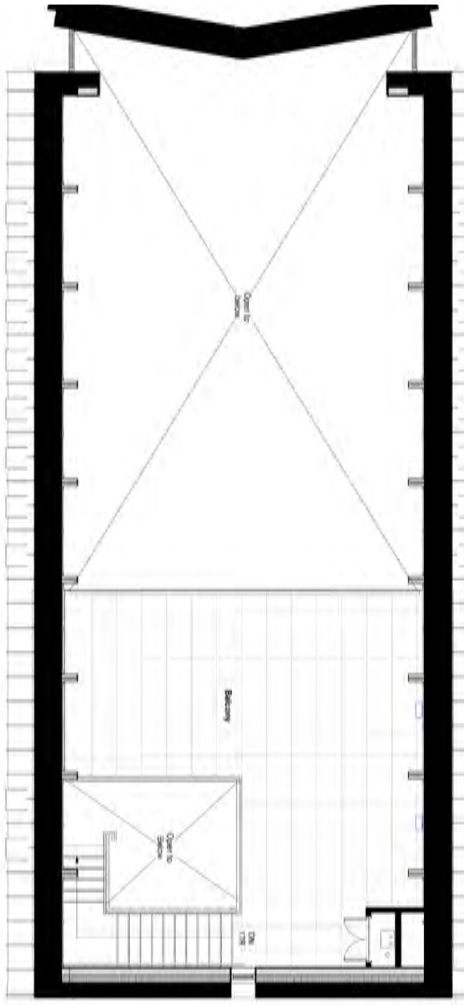
LOWER PLAN



MAIN PLAN

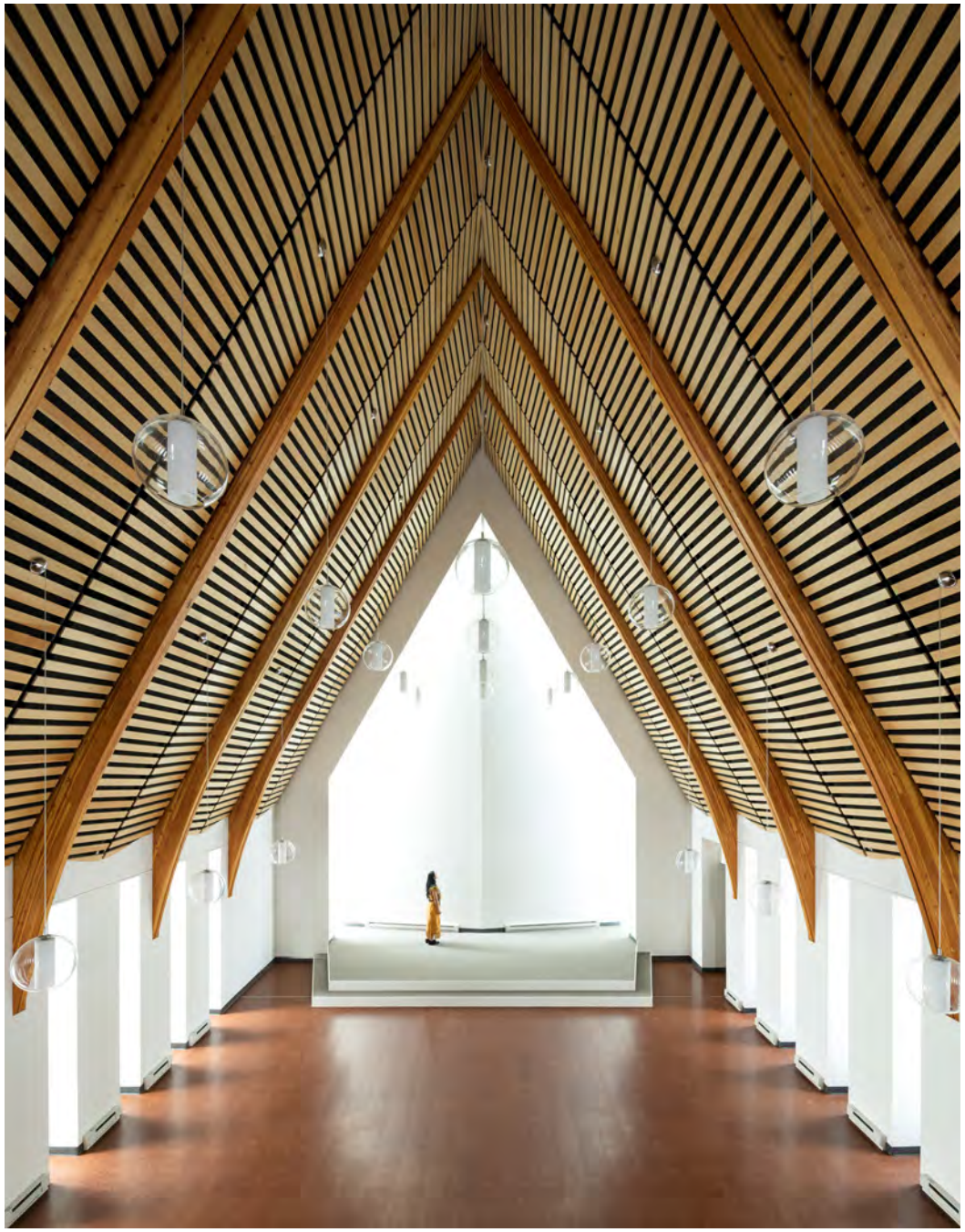


MEZZANINE PLAN



3. SITE ECOLOGY

The compact two-level plus mezzanine organization of the program minimizes the building's footprint, reduces the surface-to-volume ratio, and lessens the environmental impact of the building on the site. We also included a landscape design that integrated native plant species.



4. LIGHT AND AIR

The use of natural light was strategically incorporated into the main hall through the carefully designed curtain wall and skylights. This feature helps create a variety of experiences and moods throughout the space. Additional theatre lighting enhances the space by allowing occupants to deliver an infinite range of atmospheres.

The tall and narrow windows of the building allow sunlight to penetrate deep into the main gathering space during the winter months, reducing the need for electric heating.

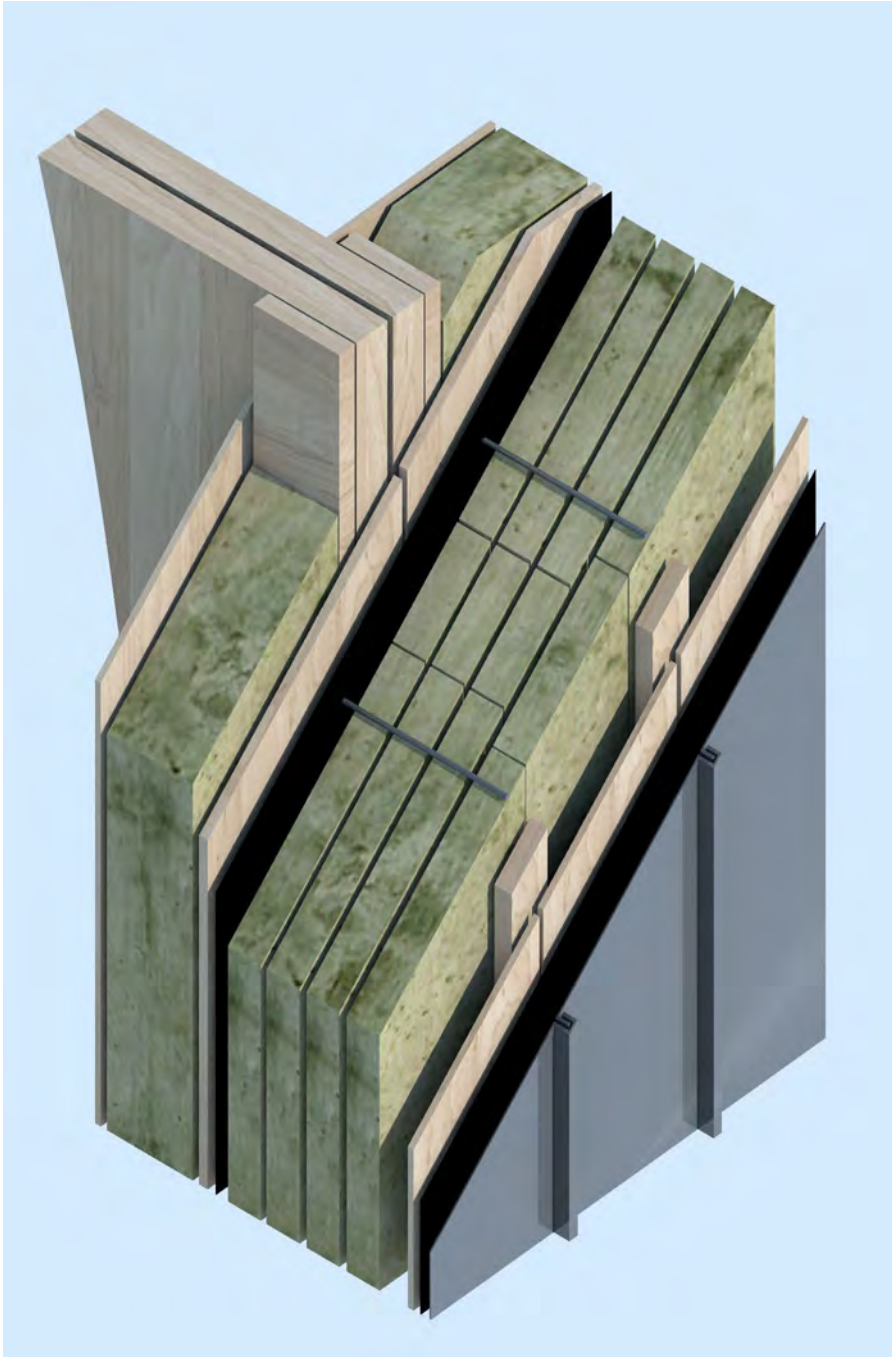
Air ventilation strategies were achieved by using two HRV units which are constantly replenishing the fresh air and delivering up to 3 air changes per hour.

5. WELLNESS

The main gathering space was designed to be inspiring and uplifting with soaring lines tracking the eye upwards. Interior materials were chosen for their warm tones and natural qualities. The wood slats on the ceiling provide both warmth and acoustical treatment as does the cork floor in the main gathering space. Materials were specified with recycled and low VOC content.

The open plan of the main floor gathering space provides flexibility for a range of programming that support both the physical and social wellbeing of the community, such as music, dance, cultural events and workshops.

Above: Sanctuary Interior and Mezzanine



6. WATER CONSERVATION

As the Centre is remotely located, the building water supply is connected to the community's well system. Low-flow fixtures have been used throughout the building to reduce water consumption.

7. OPERATING ENERGY PRESENT AND FUTURE

The building exhibits superior envelope performance and operates at 90% less energy usage than a conventional building. The projected annual energy consumption for the building is 45.2 kWh/m2 yr with an air-tightness rating of 0.41 ACH @ 75Pa. The building boasts R70 walls and roof and quad glazing throughout and can remain comfortable with minimal heat in temperatures as low as -35 degrees Celsius. The rooftop photovoltaic array provides up to 10kW of additional energy. The building's robust envelope and low-energy systems ensures the building will serve the community for generations to come at a substantially reduced cost of what previous buildings were offering.

The building's mechanical sustainable design strategies include a highly efficient instantaneous domestic hot water heater with a recirculation pump to maintain hot water to all the fixtures; two Tempeff 90% efficient heat recovery ventilators with MERV 8 air filters; electric duct heaters in the supply air ducts; and insulated for extreme cold climate motorized dampers on both the intake and discharge of both units. The heat recovery units are controlled by occupancy sensors so that the units only run when motion is detected in any of the spaces. All the supply and outdoor air ductwork is insulated with 125mm thick fiberglass insulation. All of the air systems were air balanced to within +/-5% of the design volumes.

Image on left: Detail of building envelope system required to meet PHIUS requirements

- CLADDING (STANDING SEAM METAL)
- ENVIRONMENTAL BARRIER
- 1/2" PLYWOOD SHEATHING
- PREFAB PANEL - 2X4 PT WOOD STRAPPING FASTENED WITH LONG SCREWS TOS TRUCT.
NOTE: CAVITY IS VENTILATED
- PREFAB PANEL - 12" COMFORTBOARD 110 COMMERCIAL MINERAL WOOL INSULTATED BOARD (R48)
- PREFAB PANEL - CONT. VAPOUR IMPERMEABLE CONT VAPOUR IMPERMEABLE P&S MEMB (AS SPECIFIED)
- PREFAB PANEL - 3/4" PLYWOOD (REFER TO STRUCT)
- PREFAB PANEL - 2X8 WD STUDS (REFER TO STRUCT)
- PREFAB PANEL - ROXUL COMFORTBATT INSUL (R28)
- PREFAB PANEL - 1/2" PLYWOOD (REFER TO STRUCT)
- 1/2" GWB (PTD)

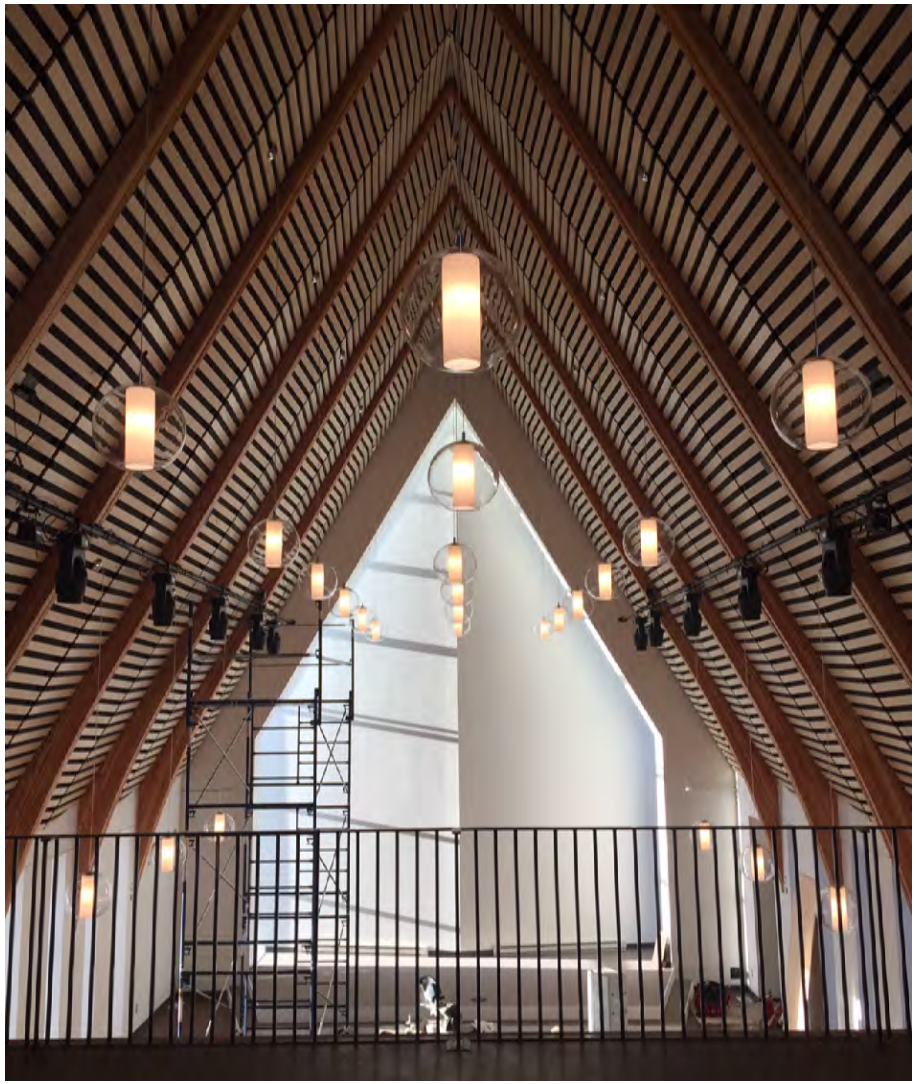
8. MATERIALS AND RESOURCES

Much of the foundational building materials were prefabricated. The primary structural system is comprised of glue-laminated arches with prefabricated panels spanning between them. The 2x8 panels came insulated and an additional 12” of insulation was added around the entire perimeter of the building secured with wood strapping and 14” screws. The screws were oriented in a truss-like configuration to provide vertical rigidity and prevent the insulation from sluffing. Securing that much insulation from the face of the sheathing required careful detailing and a new approach to designing the cladding system. The exterior cladding materials are comprised of standing seam metal roof and wall cladding and a composite shake product made from recycled plastic and wood fibres with a 50-year guarantee.

Above: Construction photos

9. BUILDING LIFE CYCLE CONSIDERATIONS

Life cycle considerations were incorporated into the design approach to ensure the longevity of the building. Because the building is located in a northern region, we selected building materials that were durable and superiorly insulated to withstand the cold conditions. Natural and recycled materials also ensure a lower environmental impact in the future. Flexibility in the building program ensures that the space can easily be adapted for a variety of gathering purposes for the community.



Above: Construction photos

10. EDUCATION AND INFORMATION SHARING

As Canada's most northerly PHI-certified projects and the first certified First Nations community building completed, the Doig River Cultural Centre is a true inspiration. The project reflects both the cultural vision and long-term sustainability goals of its community. The Centre will provide an educational framework for educators, designers and other communities seeking to understand building techniques for an energy-efficent building located in a remote and northern region.

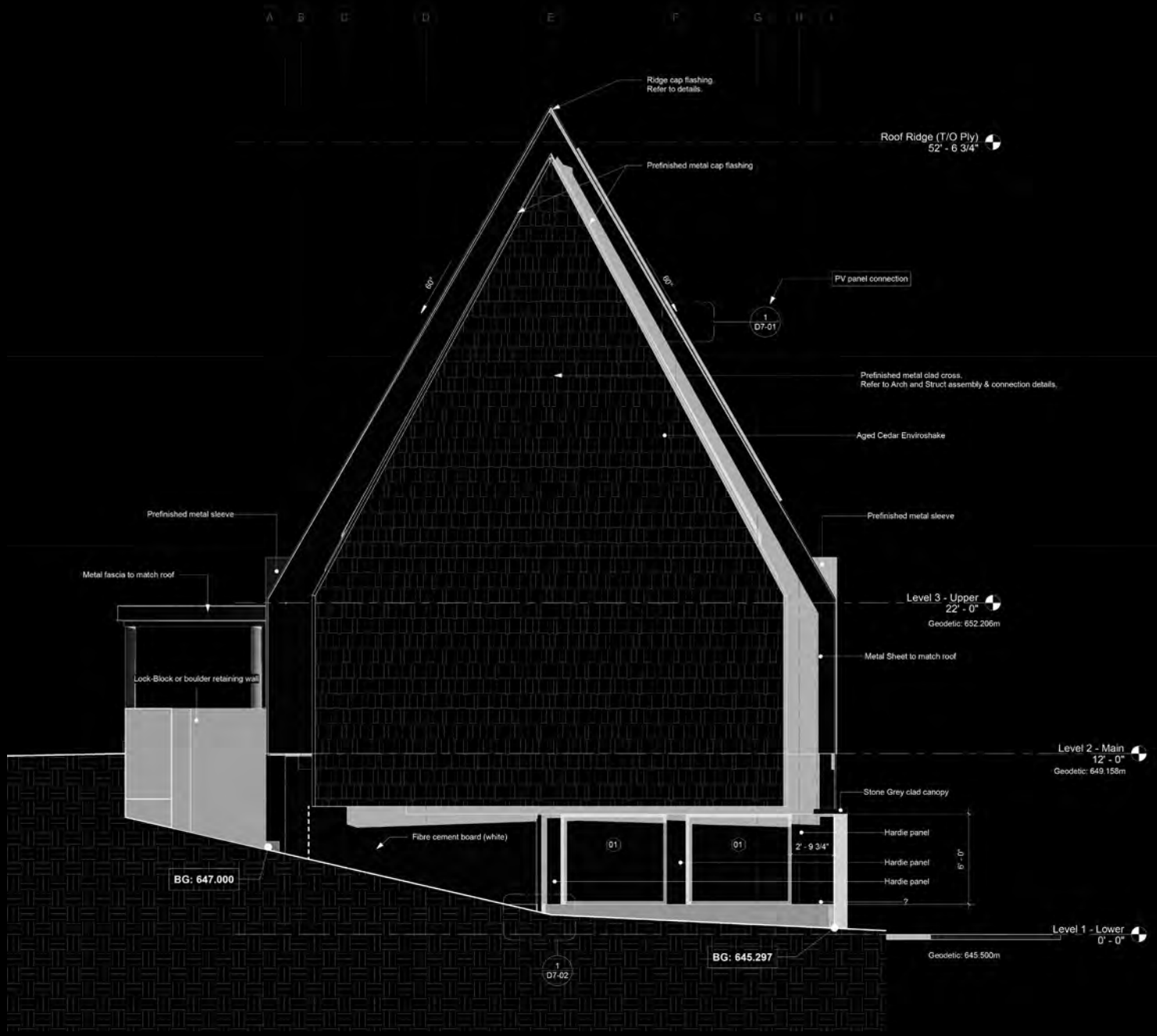
ATTACHMENTS

ELEVATIONS

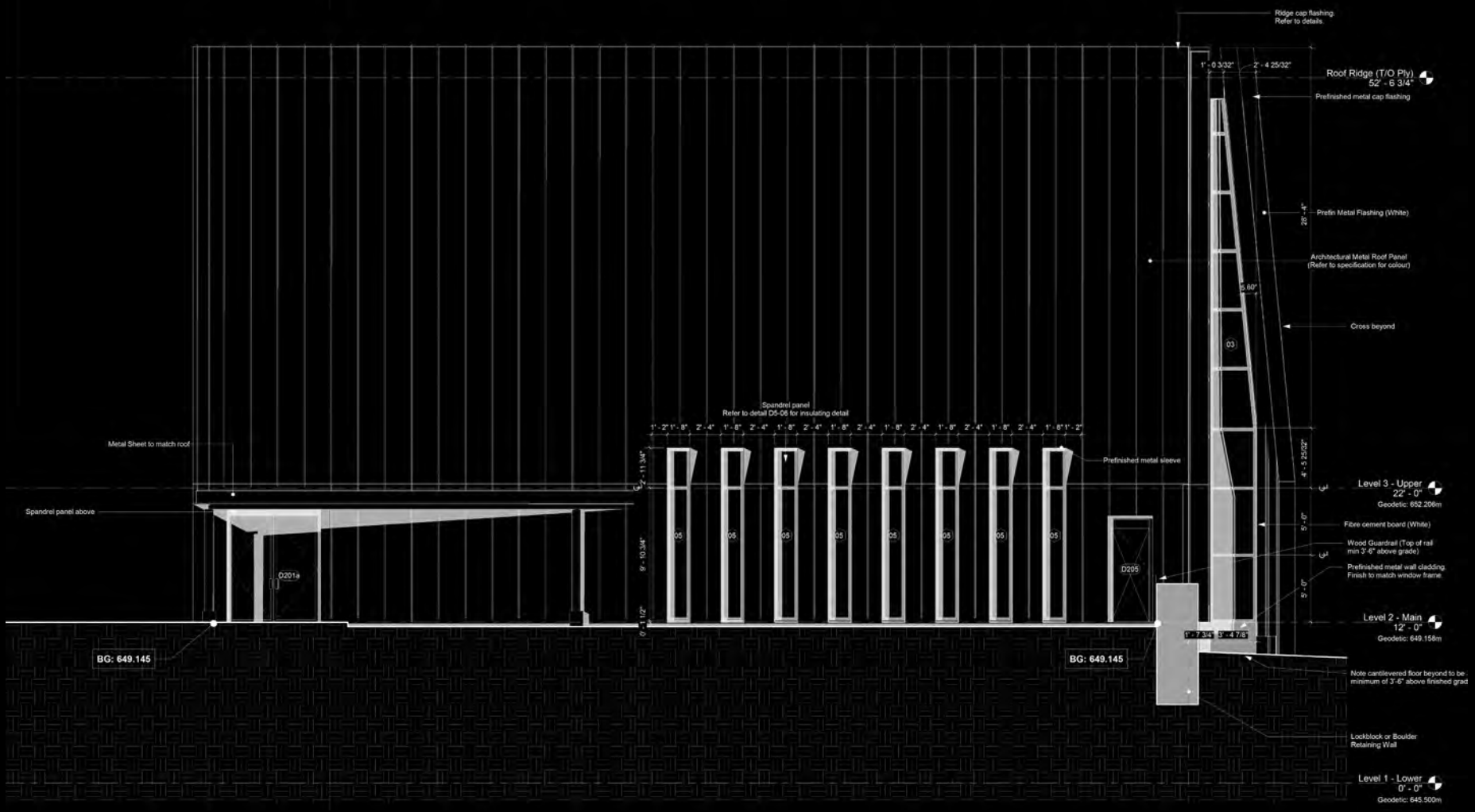
SECTIONS

DRAWING SAMPLES

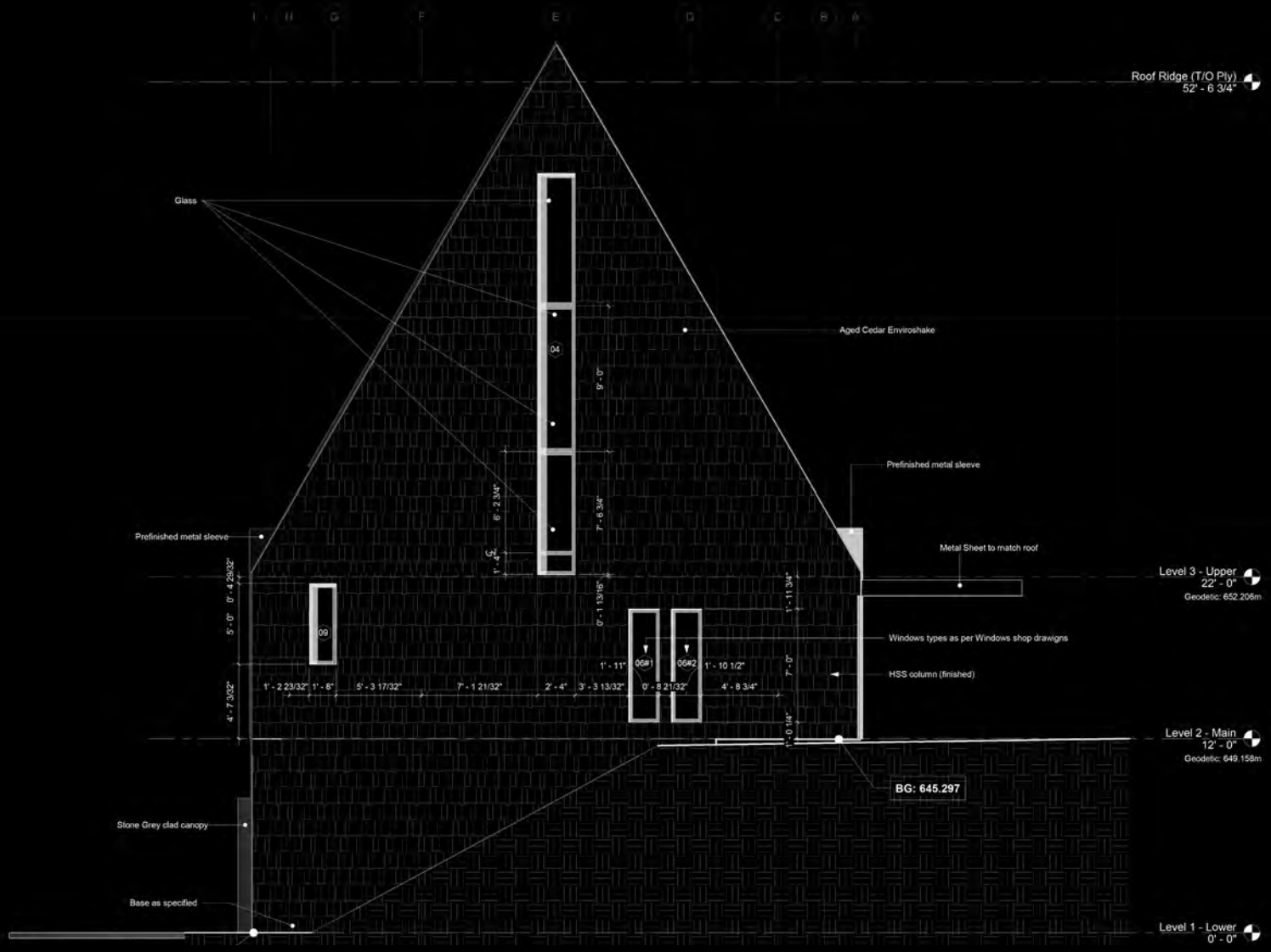
ELEVATIONS


Ridge cap flashing.
Refer to details.
Roof Ridge (T/O Ply)
52' - 6 3/4"
Prefinished metal cap flashing
60°
60°
PV panel connection
1
D7-01
Prefinished metal clad cross.
Refer to Arch and Struct assembly & connection details.
Aged Cedar Enviroshake
Prefinished metal sleeve
Prefinished metal sleeve
Metal fascia to match roof
Level 3 - Upper
22' - 0"
Geodetic: 652.206m
Metal Sheet to match roof
Lock-Block or boulder retaining wall
Level 2 - Main
12' - 0"
Geodetic: 649.158m
Stone Grey clad canopy
Fibre cement board (white)
01
01
2' - 9 3/4"
Hardie panel
Hardie panel
Hardie panel
6' - 0"
?
BG: 647.000
Level 1 - Lower
0' - 0"
Geodetic: 645.500m
BG: 645.297
1
D7-02

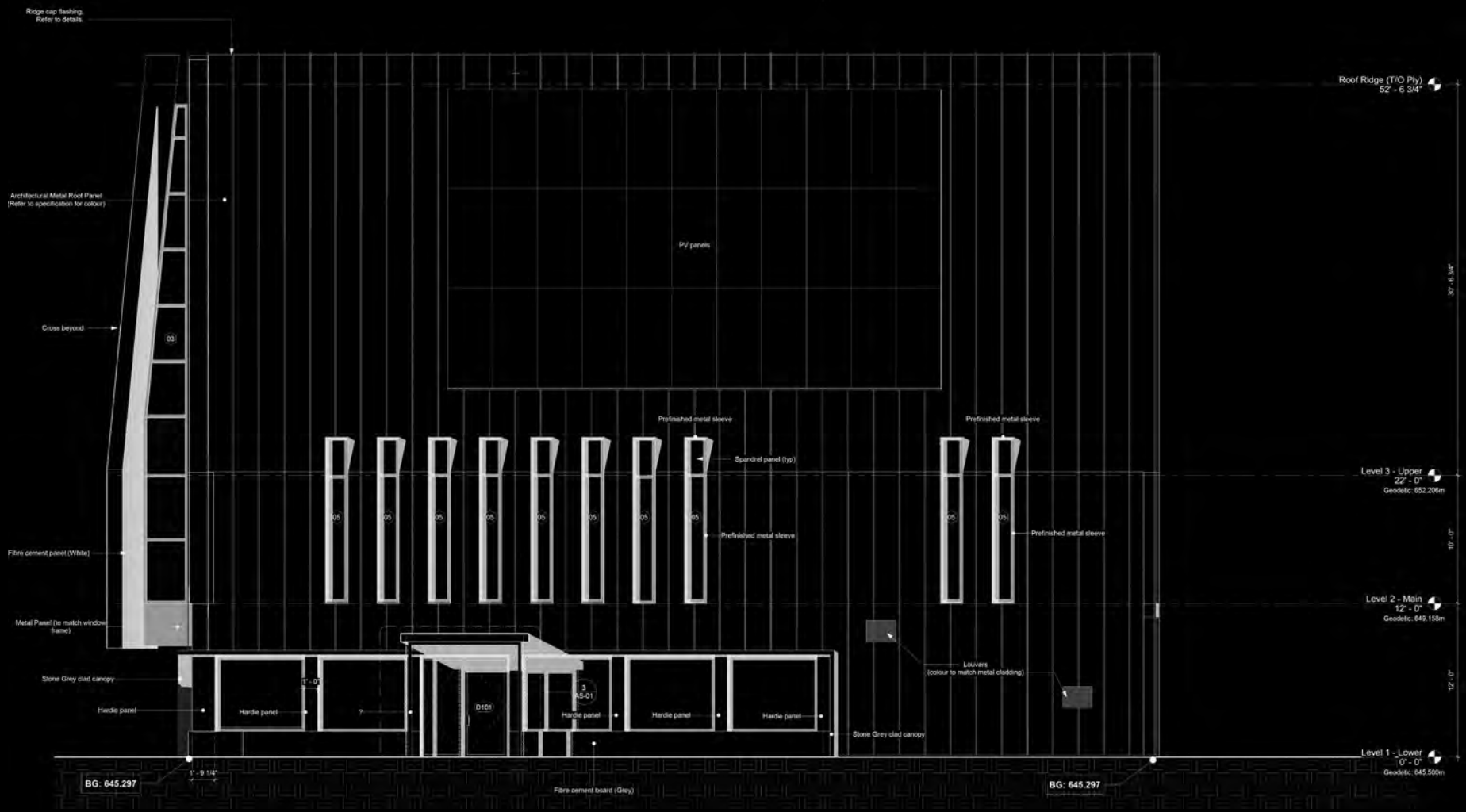
ELEVATIONS


Ridge cap flashing.
Refer to details.
Roof Ridge (T/O Ply)
52' - 6 3/4"
Prefinished metal cap flashing
Prefin Metal Flashing (White)
Architectural Metal Roof Panel
(Refer to specification for colour)
Cross beyond
Spandrel panel
Refer to detail D5-06 for insulating detail
Metal Sheet to match roof
Prefinished metal sleeve
Spandrel panel above
D201a
D205
Level 3 - Upper
22' - 0"
Geodetic: 652.206m
Fibre cement board (White)
Wood Guardrail (Top of rail
min 3'-6" above grade)
Prefinished metal wall cladding.
Finish to match window frame.
Level 2 - Main
12' - 0"
Geodetic: 649.158m
BG: 649.145
BG: 649.145
Note cantilevered floor beyond to be
minimum of 3'-6" above finished grad
Lockblock or Boulder
Retaining Wall
Level 1 - Lower
0' - 0"
Geodetic: 645.500m

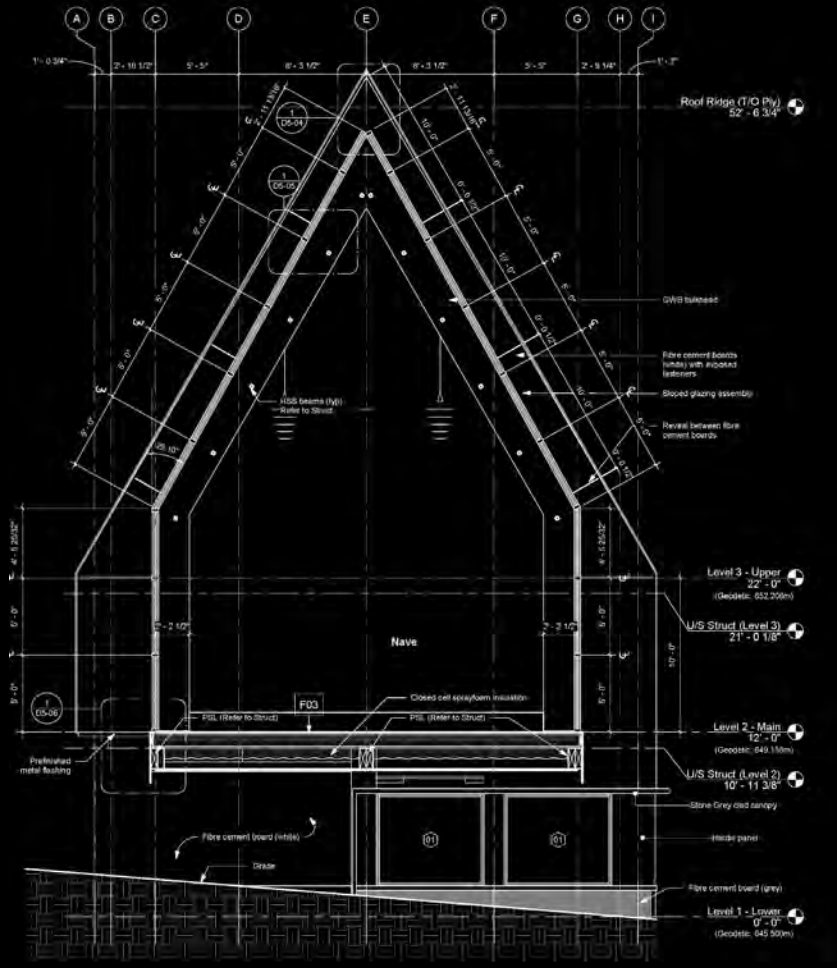
ELEVATIONS


Roof Ridge (T/O Ply)
52' - 6 3/4"
Glass
Aged Cedar Enviroshake
04
9' - 0"
Prefinished metal sleeve
6' - 2 3/4"
7' - 6 3/4"
1' - 4"
Prefinished metal sleeve
Metal Sheet to match roof
Level 3 - Upper
22' - 0"
Geodetic: 652.206m
0' - 4 29/32"
5' - 0"
09
0' - 1 13/16"
1' - 11 3/4"
Windows types as per Windows shop drawigns
06#1
06#2
1' - 11"
1' - 10 1/2"
HSS column (finished)
7' - 0"
1' - 2 23/32"
1' - 8"
5' - 3 17/32"
7' - 1 21/32"
2' - 4"
3' - 3 13/32"
0' - 8 21/32"
4' - 8 3/4"
4' - 7 3/32"
1' - 0 1/4"
Level 2 - Main
12' - 0"
Geodetic: 649.158m
BG: 645.297
Slone Grey clad canopy
Base as specified
Level 1 - Lower
0' - 0"

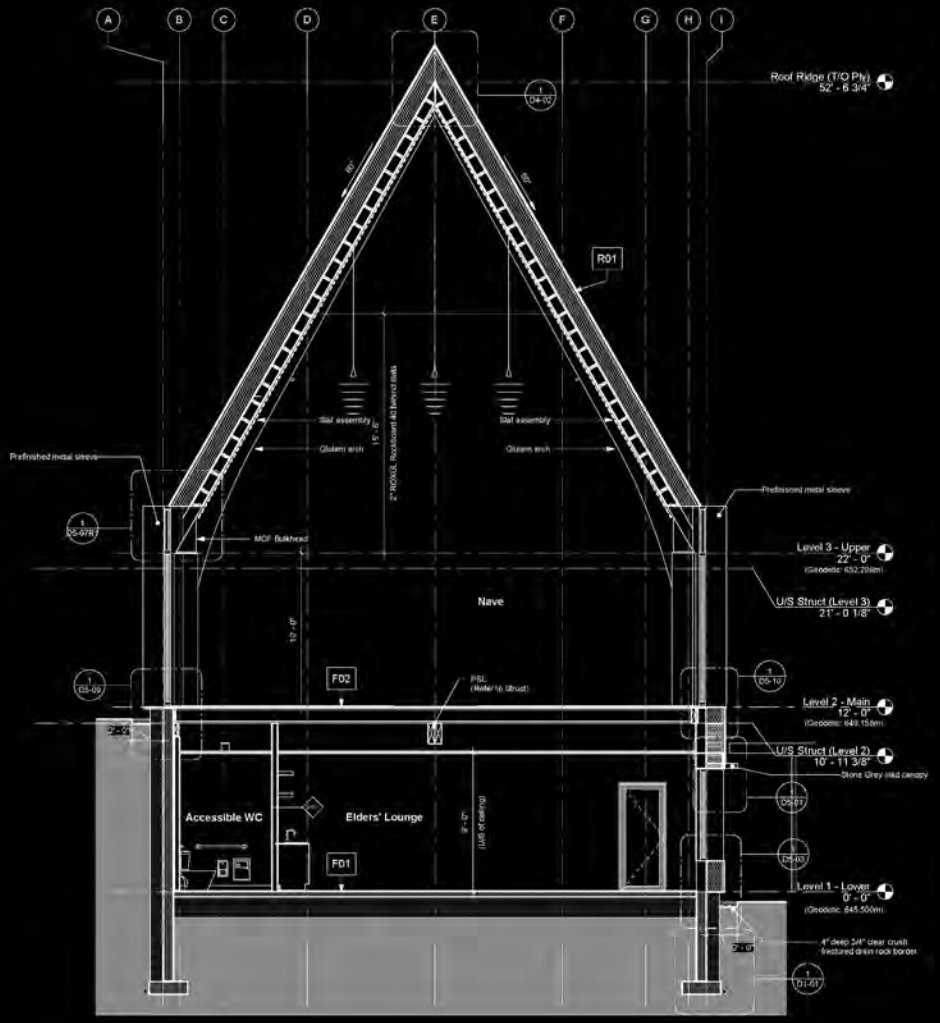
ELEVATIONS


Ridge cap flashing. Refer to details.
Architectural Metal Roof Panel (Refer to specification for colour)
Cross beyond
Fibre cement panel (White)
Metal Panel (to match window frame)
Stone Grey clad canopy
Hardie panel
PV panels
Prefinished metal sleeve
Spandrel panel (typ)
Louvers (colour to match metal cladding)
Fibre cement board (Grey)
Roof Ridge (T/O Ply) 52' - 6 3/4"
Level 3 - Upper 22' - 0" Geodetic: 652.206m
Level 2 - Main 12' - 0" Geodetic: 649.158m
Level 1 - Lower 0' - 0" Geodetic: 645.500m
BG: 645.297
BG: 645.297
30' - 6 3/4"
10' - 0"
12' - 0"

SECTIONS

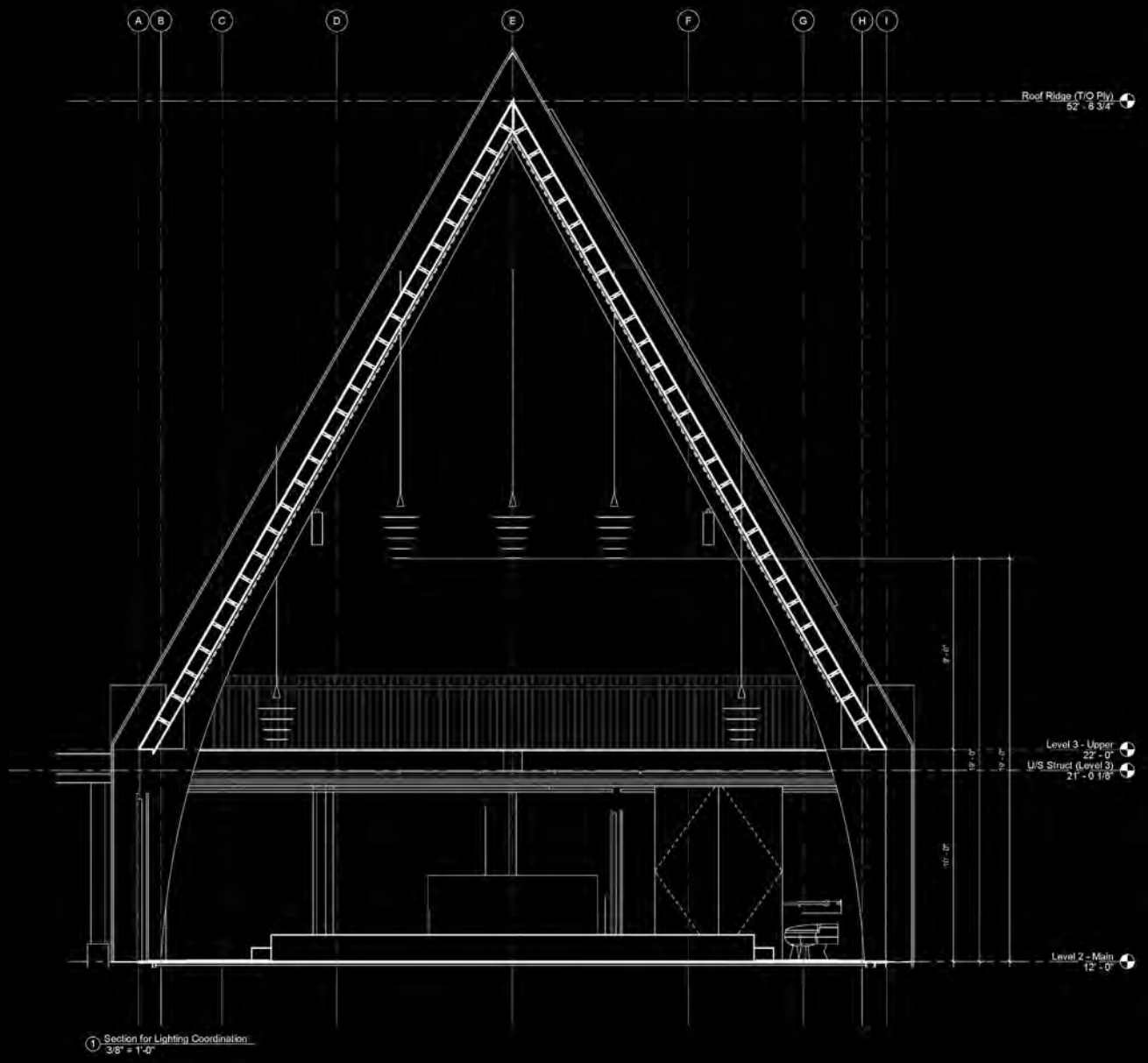


1 Section 1-1
1/4" = 1'-0"

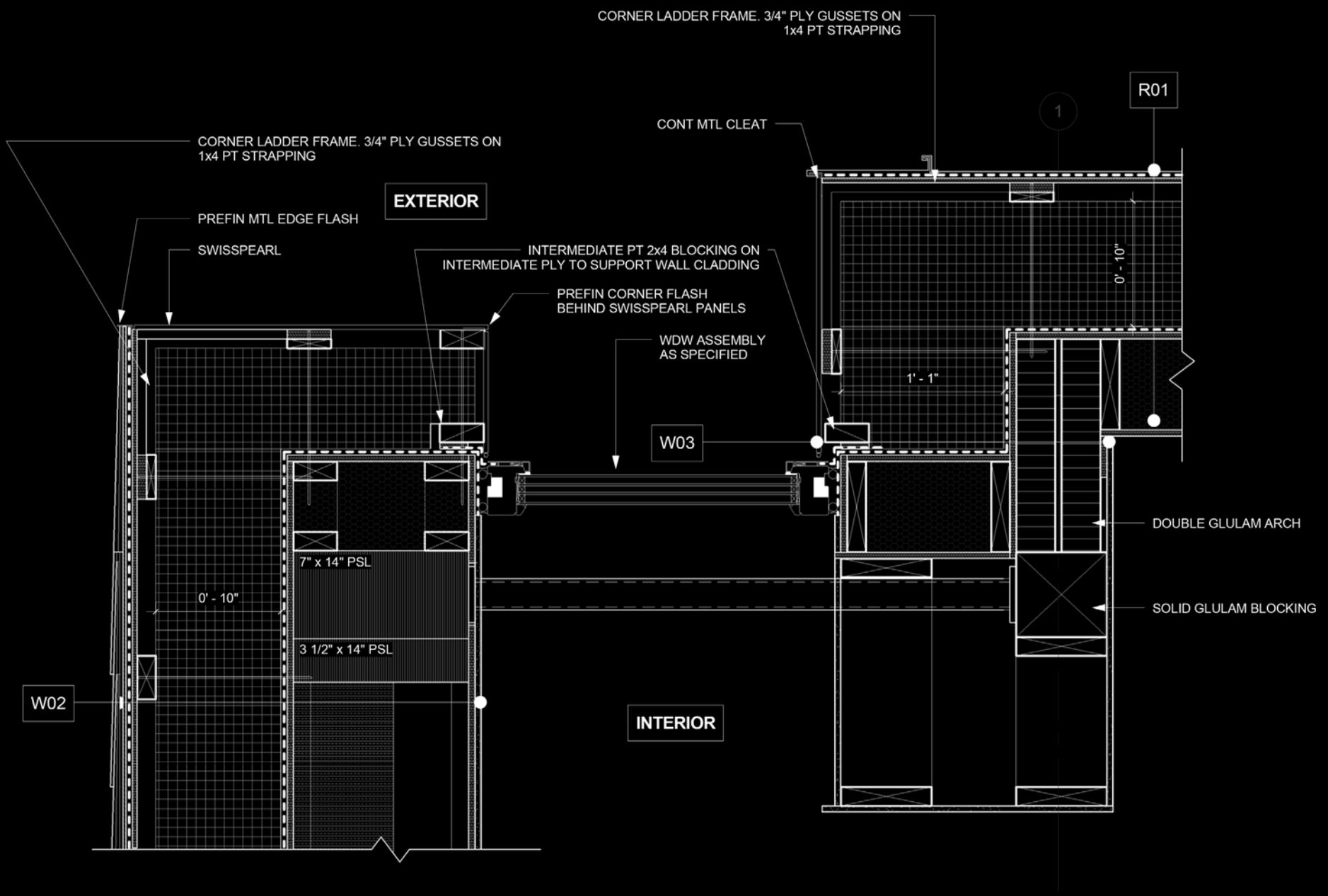


2 Section 2-2
1/4" = 1'-0"

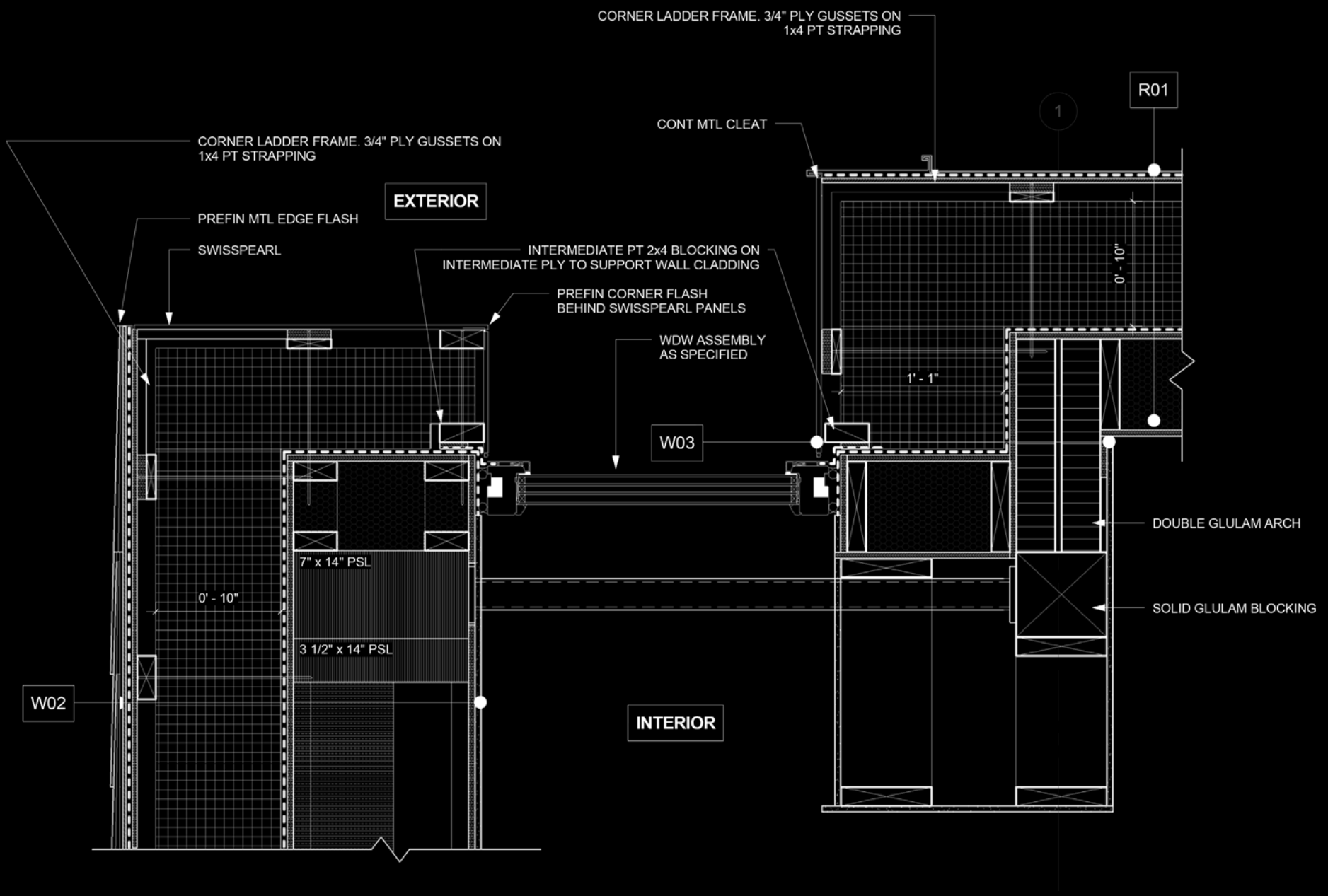
SECTIONS


A
B
C
D
E
F
G
H
I
Roof Ridge (T/O Ply)
52' - 6 3/4"
Level 3 - Upper
22' - 0"
U/S Struct (Level 3)
21' - 0 1/8"
Level 2 - Main
12' - 0"
1 Section for Lighting Coordination
3/8" = 1'-0"

DRAWING SAMPLE



DRAWING SAMPLE



DRAWING SAMPLE