GLASS CABIN
An Off-Grid Family Retreat

2018 AIA Indiana Design Awards submission
New Construction | Residential | Less than $1,000,000
Wasipinicon River, Northeast Iowa
Substantial Completion Date | July 2018
Reclaimed Glass, Natural Materials and the Reclaimed Prairie on the land entrusted to the grandkids of a sesquicentennial farm was the genesis of the design for the off-grid Glass Cabin in Northeastern Iowa.

Designed as a family retreat for occasional use when returning to the family farm, the extension of the front façade creates a man-made edge to a clearing in the woods next to the Wapsipinicon River, with “barn” doors sliding open to reveal the northern glass front, closing to provide security when away.

Reclaimed Prairie
The environmentally friendly, sustainable design began with the north-south orientation and a raised structure to minimize the disturbance of the grasslands and flood plain. The cabin is off-grid, net-zero, with solar and battery power, and a compost toilet. The 14’ x 32’ Great Room, with floor to ceiling glass on three sides creates an experience of being outdoors, with northern daylighting and prairie views. A screened-in porch, east and west terraces, and a lower terrace complete the outdoor interaction.

Reclaimed Glass
5’x7’ and 2.5’x7’ pieces of clear and frosted insulated glass removed from a commercial office building expansion, created the north façade pattern imposed on a standard 8’ grid (to minimize lumber length construction waste). Operable windows and side patio doors provide additional daylighting and natural ventilation. The frosted glass is used in the back bedrooms and toilet room to diffuse the southern daylighting and provide privacy.

Natural Materials
The exposed rough-sawn structure, barn doors, exterior and interior siding, and exterior decking is predominately Western Red Cedar, selected for its natural moisture-resistance, insect-resistance, fire-retardant, acoustical properties, and a renewable resource...as well as it smells great! The cedar was left natural to patina to a warm grey, complementary to the aged barns in the area. The raised structure is essentially an agricultural modified pole barn/wood frame structure. A central 2x8 post extends from the precast concrete foundation (originally designed for cattle barns) to the roof, with side 2x6 posts integrated with the window framing and supporting the floor beams and the roof rafters. The roof structure transforms from 16-inch on-center rafters in the back to 32-inch on-center double rafters exposing 2x6 roof decking above the Great Room. All flooring is a natural cork. The Kitchenette countertop is copper and the wall cabinets are custom build cedar with frosted glass doors. While primarily a three-season retreat, a Norwegian wood stove provides warmth for the holidays.
GLASS CABIN  Plan & North Elevation

1 Great Room
2 Screened-in Porch
3 Bedroom
4 Kitchenette
5 Bathroom
6 Passageway
7 Storage
8 East Terrace
9 West Terrace
10 Lower Terrace

SITE PLAN sketch
GLASS CABIN  Great Room - Looking Northwest | North & West Window Walls with Reclaimed Glass, Operable Windows & Screened Patio Doors
GLASS CABIN  Great Room | Center Wall with Western Red Cedar Select Knotty Channel Rustic (rough-sawn) Vertical Siding
GLASS CABIN  Bedrooms | Western Red Cedar Roof Rafters transform from 16" on-center to 32" on-center Double Rafters and exposed 2x6 Decking
Design - Build
Primarily stick built by one-person, with occasional help from family and friends

Modified Pole Barn/Post Frame Structure
2x8 - (2) 2x6 composite posts with precast Perma-Column foundations
Reclaimed Prairie
Environmentally Friendly | Sustainable Design

The Glass Cabin is Off-Grid, and thus Net-Zero with the following passive features:

1. **Raised Structure**
   - Allows flood water to flow freely below
   - Minimum disturbance of the grasslands

2. **North-South Orientation**
   - 2A | Northern windowwall
   - 2B | Trellis for east & west shading

3. **Reclaimed 1” Low-E Insulated Glass**
   - Provides daylighting and views
   - From a commercial office building expansion

4. **Natural Ventilation**
   - 4A | Operable windows and patio doors
   - 4B | Screened-in porch
   - 4C | Ceiling fans

5. **Wood Burning efficient Stove**
   - Warmth and Light

6. **Western Red Cedar Structure, Siding and Decking**
   - Natural finish
   - Water-, fire- and insect-resistant

7. **Minimum Construction Waste**
   - Standard lumber sizes

8. **Insulated Floor, Roof and Walls**
   - R-30 floor, R-22 roof and R-15 walls
   - Mineral wool and rigid insulation
   - + 2x6 wood floor and roof decking

9. **White Metal Roof**
   - Minimize heat gain

10. **Solar Panels and Battery Power**
    - LED lighting
    - DC motor ceiling fans

11. **Compost Toilet**

12. **Gray Water Filtration**
GLASS CABIN  North Facade | North Reclaimed Clear Glass, Operable Windows & Screened-In Porch | Open & Closed Barn Doors
GLASS CABIN  West Terrace | Trellis with Solar Panels
GLASS CABIN  View from Southwest | South Reclaimed Frosted Glass & Operable Windows | Open & Closed Barn Doors
GLASS CABIN  View from Southeast | East Entry Terrace & Screened-in Porch
GLASS CABIN  Great Room with Uplighting
GLASS CABIN  Great Room with Uplighting
GLASS CABIN  View from Northwest | Closing the Barn Doors | Great Room with Barn Doors closed
GLASS CABIN  Norwegian Wood Stove for Seasonal Warmth and Light