

# WOOD DESIGN & BUILDING

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# Aspen Root Passive Home

Prototype home incorporates research by the Cold Climate Housing Research Centre, local suppliers and materials, and passive building principles

Gimli, MB





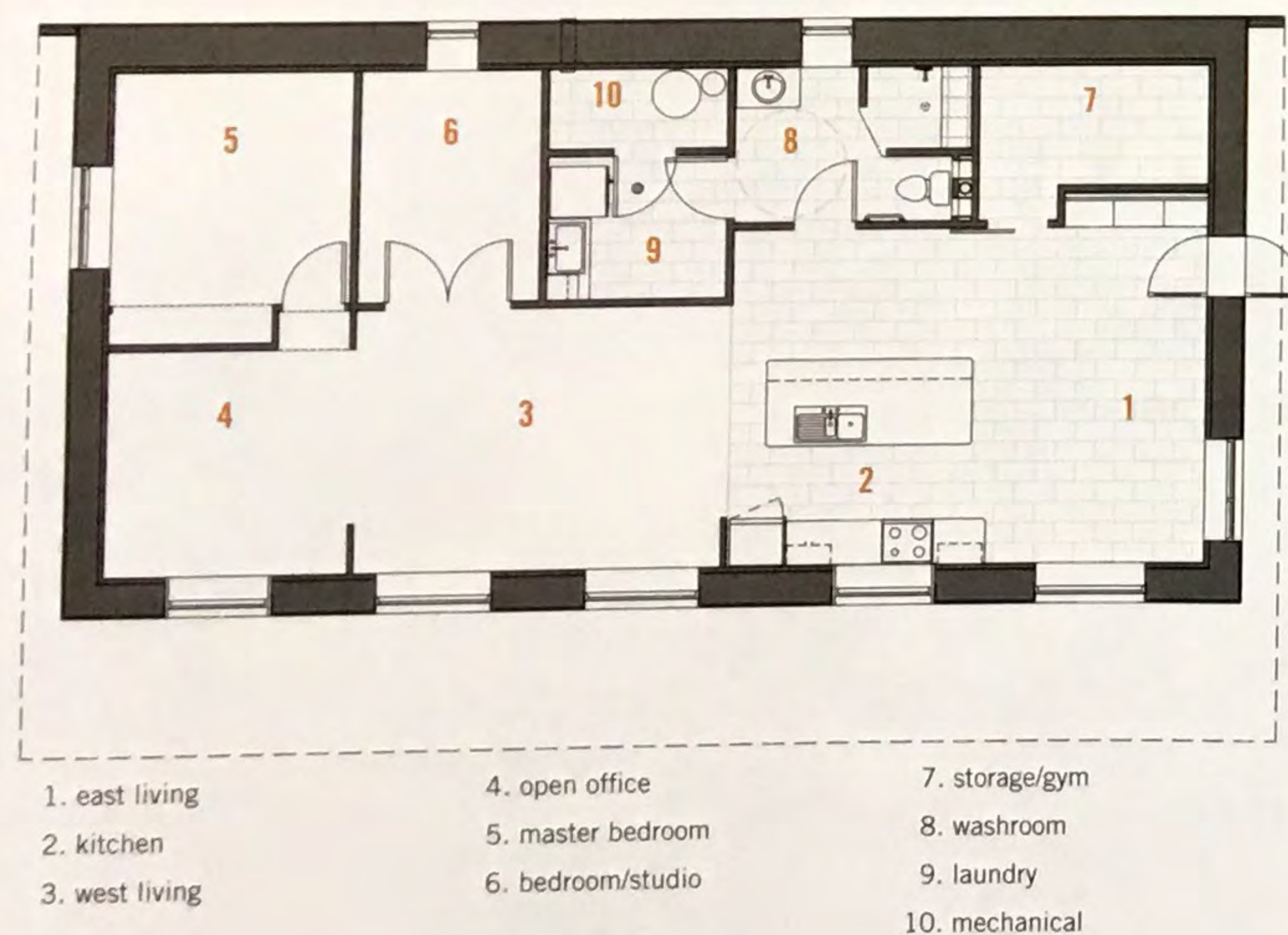
The Aspen Root Passive Home is the result of a 25-year journey for the owners who both work in the environmental industry and are committed to living a sustainable and low-impact lifestyle. From the outset, the owners and the design team established goals which would guide the project to completion: to create a home that was highly energy efficient, durable, and constructed with natural materials and finishes that require little or no maintenance.

In order to measure success, the Passive House standard was selected early on. Passive House is a rigorous building standard that focusses on the building envelope with the primary objective of reducing heat loss through superinsulation, air tightness, high-performance fenestration, minimized thermal bridging, and high efficiency heat recovery.

The home is located 50 miles north of Winnipeg, MB, near the shores of Lake Winnipeg in the Aspen parkland ecoregion. Orientation and building shape were carefully determined. Through energy modeling, the window locations, sizes, and roof overhangs were optimized to allow maximum solar gain during the winter months while remaining shaded in summer.







FLOOR PLAN

The wall assembly was inspired by the Larsen truss, a superinsulated wood framing system used successfully across North America. In order to meet comfort levels required by Passive House in this climate zone, more than 18 inches of insulation were required for the walls, a much thicker depth than the 12 inches typical of Larsen truss walls. To accommodate this thickness, a parallel chord wood wall truss was used, similar to that of the roof and floor. The placement of plywood sheathing on the interior face of the walls and ceiling with taped joints to form the vapor barrier and provide air tightness is a unique feature of the wall system. On the ceiling, good one side Douglas fir plywood is used as sheathing and exposed with wood battens covering the taped joints. The walls are furred out and finished with gypsum board to form a service chase. The walls and roof use a vapor-permeable reinforced house wrap specifically designed for use with dense pack cellulose without exterior sheathing. This increases drying potential to the exterior. Fully vented rain-screen cladding shields the whole home. The use of vapor open materials on both sides of the wall allows superior drying performance and promotes long-term health and durability of the wall assembly.

The exterior design and materials reinforce the importance of passive principles in the home – facing the sun, exterior walls are clad using Western red cedar shiplap with a rough-sawn face. The more closed north wall is clad with standing seam metal which wraps down from the roof. The exterior beam and columns supporting the roof overhang are rough sawn cedar and finished using a pine tar wood preservative. On the interior of the home, the plywood ceiling, trim and millwork are all finished using a manufactured oil and wax.

The kitchen cabinets and other millwork case bodies and drawer boxes are NAUF (no added urea formaldehyde) veneer core plywood with veneer NAUF particleboard core door and drawer fronts faced with Douglas fir shiplap to recall the exterior cladding. The overall result is a warm interior that speaks to the industrial quality of the exterior through simple detailing and exposed ductwork.

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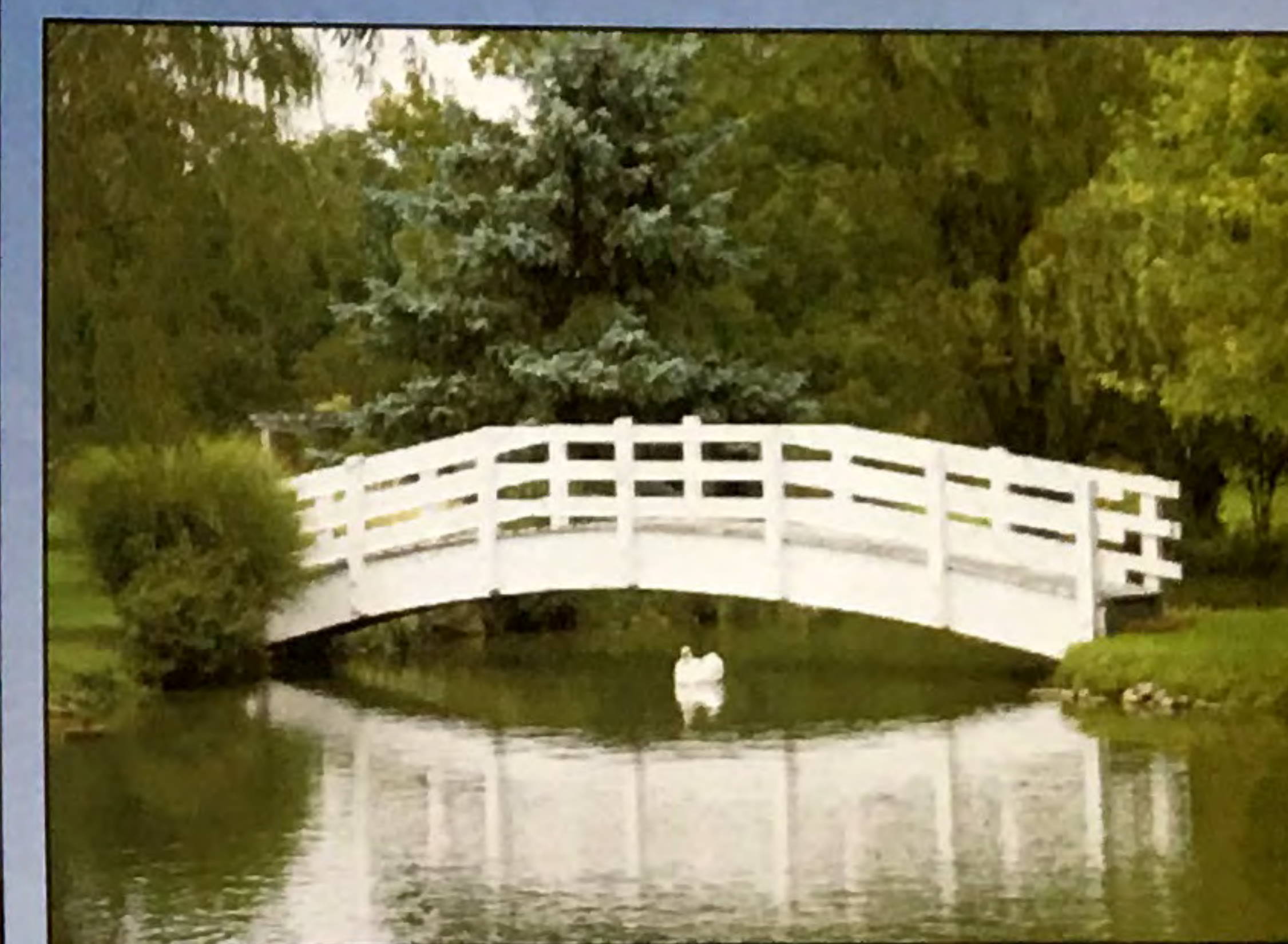
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