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2015 R+D AWARDS

Citation: Philip J. Currie Dinosaur Museum

Teeple Architects created custom laminated plywood nodes to support their angular timber structure and design.

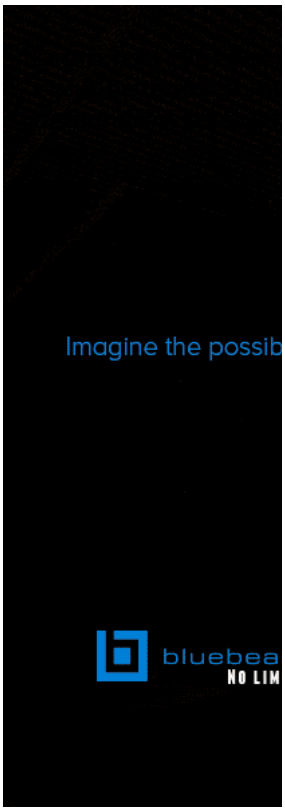
By JENNY JONES



Tom Arban

The Philip J. Currie Dinosaur Museum in in Wembley, Alberta

Located near Highway 43 in Wembley, Alberta, the Philip J. Currie Dinosaur Museum celebrates one of the world's richest dinosaur-bone beds, Pipestone Creek. The prehistoric remains and the region's hilly topography helped inform Toronto-based Teeple Architects' design of the triangulated structure and its exposed timber skeleton—a pivoted A-frame in which as many as six structural members can converge at one joint.



ABOUT THE AUTHOR



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Tom Arban



Tom Arban

Tying those members together requires elaborate custom connections, for which the firm initially planned to use steel. Then it determined that laminating CNC-milled Douglas fir plywood would be less complex, expensive, and difficult to craft, says principal Stephen Teeple. Wood, an abundant resource in western Canada, would also preserve the aesthetic of the building, which was constructed with beetle-kill pine timber.

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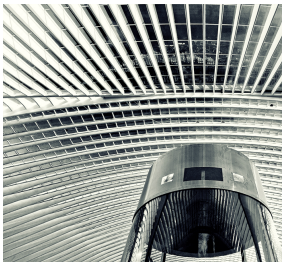

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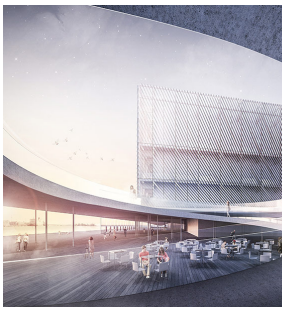

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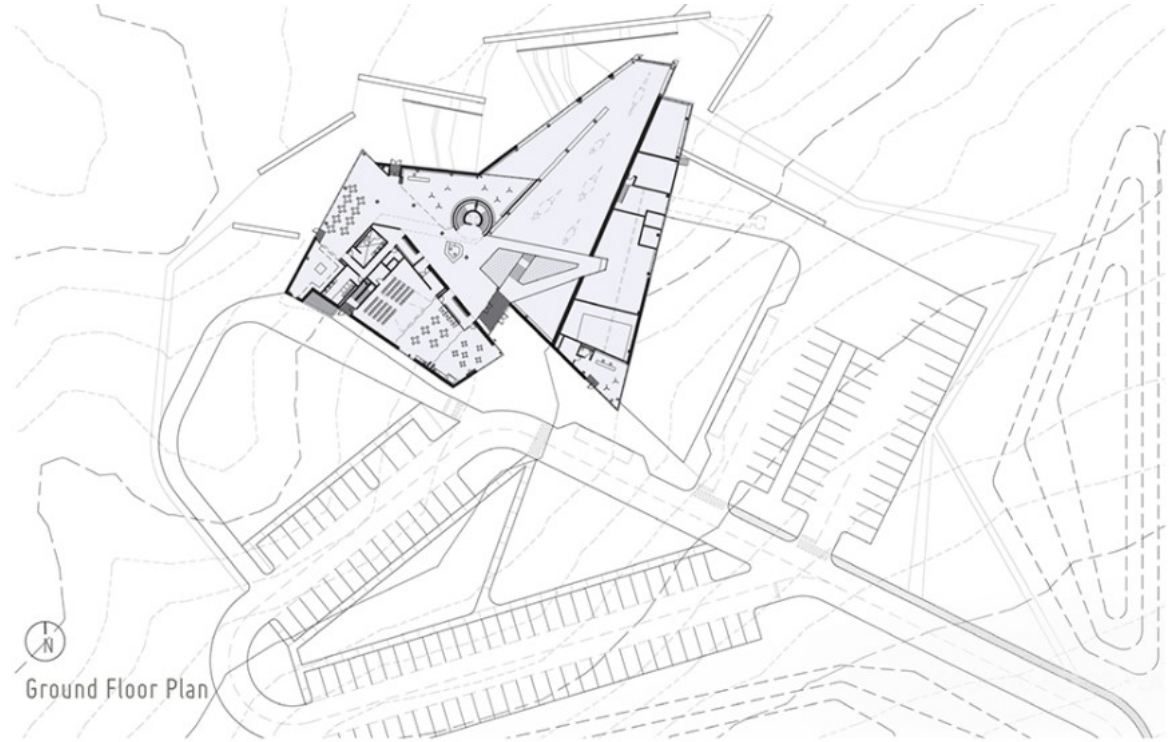

Site plan

Working with Vancouver, British Columbia–based engineering firm Fast + Epp, the architects used Rhinoceros to model and then deconstruct the nodes into manageable 2D pieces for milling. The largest nodes, at more than 59 inches tall and 94 inches wide, stack together approximately 180 plies. “With computer technology, it was easy to map out each layer and to create the form we were looking for,” Teeple says.

Using the plug-in Grasshopper, Fast + Epp virtually inserted stainless steel screws, as long as 47 inches, through the modeled nodes as rebar. Similar to a strut-and-tie system, the screws allow the nodes to handle both compression and tension loads, which the firm confirmed through physical mock-ups.



Scott Massey

Approximately 180 plies were used to construct the largest nodes.



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Teeple Architects

The structure is built from beetle-kill pine timber.

The 3D models also helped Delta, British Columbia–based StructureCraft Builders ensure quality during fabrication. Six-inch-long wooden dowels were inserted into holes drilled into each ply, positioning it within the node stack. Screws were then drilled where the models indicated. “It was a natural flow from the model to production,” Teeple says.

Juror Joyce Hwang was impressed with the complexity and final appearance of the nodes. “Not only are the architects making this joint work with laminated wood, but there’s also a beautiful effect,” she said. “Even though it’s a simple project, it was quite innovative in terms of thinking about a joint.”



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As many as six structural members come together at the custom nodes.

Juror Steven Rainville also liked the firm's resourcefulness on the project, with the building's skeleton. “They're using wood that is going to be thrown away and recombining it in new ways,” he said. “It's showing the industry that you can change the paradigm.”







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As many as six structural members come together at the custom nodes.



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Fabrication of the CNC-milled plywood pieces

Project Credits

Project: Philip J. Currie Dinosaur Museum, Wembley, Alberta

Client: Philip J. Currie Dinosaur Museum

Design Firm: Teeple Architects, Toronto—Stephen Teeple, Martin Baron, Mark Baechler, Will Elsworthy, Lang Cheng, Carla Pareja, Gloria Perez

Architect of Record: Architecture | Tkalcic Bengert

Structural Engineer: Fast + Epp

Mechanical Engineer: Hemisphere Engineering
Electrical and Civil Engineer: AECOM
Exhibit Consultant: Reich+Petch
Landscape Architects: Scatliff+Miller+Murray
LEED Consultant: Enermodal Engineering (now part of MMM Group)
Contractor: PCL Construction Management
Fabricators: StructureCraft Builders in collaboration with Fast + Epp
Photography: Tom Arban
Size: 42,000 square feet

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Jenny Jones is a Washington, D.C.–based writer who covers building technology.

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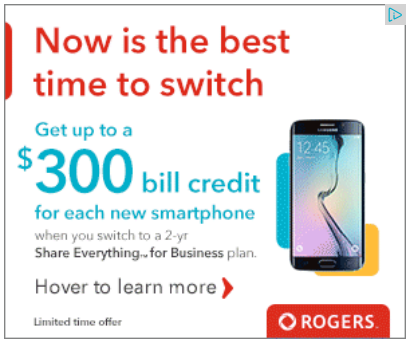

Keywords:

SUBJECT:
Wood | Fabrication | Cultural Projects | Structure

PEOPLE:
Stephen Teeple | Steven Rainville | Joyce Hwang

ORGANIZATION:
StructureCraft Builders | StructureCraft | Teeple Architects | Fast + Epp | Fast + Epp Structural Engineers

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