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Allan Partridge  
Principal  
HIP Architects

## Designing a Greener Future

For one award-winning Canadian architectural firm, the path to a greener design is made possible with building information modeling (BIM) and Autodesk® Revit® Building.

### Climate Controlled

HIP Architects is a 25-person design firm with a solid reputation spanning over 65 years of service promoting design, quality and innovation. Based in Edmonton, Alberta, HIP has vast experience applying new technologies needed to design structures for the often inhospitable climate conditions of Northern Canada. As such, the firm has always needed to be adventurous - pushing the limits of design and construction. With a growing number of clients interested in environmentally sensitive buildings, HIP has recently turned to BIM and Autodesk Revit Building to facilitate the complex processes required to support sustainable design and “green” certification.

### BIM for Green Design

HIP partner Allan Partridge explains, “Revit Building helps us with the demanding aspects of sustainable design like daylighting and automates routine tasks like documentation.” HIP is currently working on several exceptionally green projects - for clients who have a strong sense of environmental stewardship.

### Environmental Standard

Amongst HIP’s current Revit Building projects is the design of a new hostel in Jasper National

Park for Hostelling International Canada. The 3-story 18,000 sq. ft. building, which incorporates innovative sustainable features such as a green roof, is being designed to the gold standard of the LEED (Leadership in Energy and Environmental Design) Green Building Rating System® - accepted as the North American standard for sustainable design, now adopted by the Canadian Green Building Council.

### Rocky Location

To site the hostel correctly in the valley surrounding the site, HIP scanned existing topographic maps to create a terrain model of the surrounding Canadian Rockies. Using that site model, they performed year-round sun studies to understand when the mountains provided natural shading - optimizing the orientation of the hostel to maximize afternoon shading from the hot summer sun and properly sizing the roof overhangs to minimize solar heat gain.

### Sustainable Options

To maximize use of interior space while keeping the building footprint small, HIP relied on design options to keep potential building plans “live” until they settled on a design. “We investigated a wide variety of designs and their impact on



*Autodesk Revit Building helps HIP Architects push the limits of sustainable design and construction for the cold climate conditions of Northern Canada. Revit Building allows HIP designers to:*

- *Quickly and easily create multiple green design scenarios*
- *Perform complex sustainable design analyses early on in the design process*
- *Help their clients visualize how their green design will look and understand how it will perform*
- *Ease the documentation requirements of sustainable design certification*
- *Keep the cost of green design on par with conventional designs*

energy requirements - all within the same building information model,” remarked Partridge. “Then we ran a baseline energy analysis, confirming that the design exceeded our energy goal by performing 50% better than a conventional building.”

### **Certified Green**

HIP also added a myriad of data to the building information model to assist in their downstream LEED certification efforts - data such as recycled material content, renewable material, etc. “We were able to filter and sort on material quantities automatically, bypassing the manual extraction/calculation process required for LEED certification,” said Partridge.

### **Increased Productivity**

It took just 10 hours to sketch the building and another 20 hours to complete the entire design concept - a project that would have taken at least four times that amount just five years ago. Partridge remarked, “I was able to present the building to my client in real-time and involve them in the process of design.”

### **Conservation Showcase**

HIP’s most recent green design is an education center for Northern Environmental Action Team (NEAT), an environmental organization in Fort St. John (British Columbia) committed to increasing awareness of resource conservation through educational programs. The 2-story building will house NEAT offices and feature a 40-person classroom - and its green design will showcase conservation practices in action, illustrating the feasibility of sustainable technology.

### **Form and Function**

Slated for construction in 2006, the site was donated by Fort St. John - contingent on city officials approving the building design. “The lot is a high profile commercial space, located opposite the city hall and visible from window offices of city officials, who were worried that the green design might look too radical (“strawbale”, recycled

materials, etc) - clashing with the surrounding buildings,” explained Partridge. At the end of a weekend design charette with NEAT board members, Partridge had developed the conceptual design for the building, then producing renderings and drawings (in another 3 days) that NEAT used to obtain approval from the city. “For us, developing a design that was Regional and Functional was at the heart of our desire to be 100% energy effective,” stated Partridge.

### **Interior Considerations**

Using Revit Building, Partridge quickly generated initial building volumes and quantities for early pricing estimates and assured NEAT that interior line of sight requirements were met - enabling NEAT volunteers to interact with visitors and monitor the entry way.

### **Next Steps**

During detailed design, HIP will leverage design options to iterate on window placement and run energy calculations to qualify the center for government funding (by demonstrating a decreased energy use of least 50% compared to conventional building). The center will also be submitted for gold, perhaps platinum, LEED certification making it the most northern certified building in British Columbia. Partridge reports, “Revit Building will prove invaluable for performing all the calculations and material takeoffs needed for LEED certification, not to mention generating the submittal requirements for LEED credits.”

### **A Green Future**

With several Revit Building green designs under their belt and more in the works, HIP is looking forward to a robust trade in sustainable building projects. Partridge offers this final note, “Autodesk Revit Building is perfectly suited for sustainable design. Conventional design tools produce conventional designs, but Revit enables us to produce high-quality, competitive sustainable designs for our clients and our environment.”