Natural History Museum of Utah, Rio Tinto Center, University of Utah
Building and Construction Media Fact Sheet

Updated 10/11/2011

Overview:

The Natural History Museum of Utah constructed a new facility, the Rio Tinto Center, located at the foothills of the Wasatch Mountain Range to serve as the state's new natural history museum building. The building's design process began in 2005 when the architectural team embarked on a state-wide tour to experience a variety of Utah's natural sites and talk with residents to understand their desires for a new Museum building. The result, through its forms and materials, is a building that is an expression and extension of Utah's landscape. Its environmentally sensitive design blends the building into the foothills, and its inspiring architecture offers innovative public gallery spaces with breathtaking views of the Wasatch Front. The construction of the Rio Tinto Center was complex, involving an 80-foot steep excavation and detailed lagging support system to secure the building and protect it from natural forces. The building's many defining features--beautiful curved corners and walls, detailed board-formed concrete, and striking copper cladding--were handled by the construction team with expertise, skill, and precision.

Announcements:

Architect Design Announcement: May 15, 2008; Groundbreaking: July 29, 2008

Opening Dates:

November 17, 2011 – Dedication and Community Gala
November 18, 2011 – Public Opening (Free Admission to Celebrate Opening)

Blending Into the Environment

- The Rio Tinto Center rests on a series of terraces that step up the hill and lay along the contours of the hillside, causing minimal disruption to the surrounding landscape.
- Native vegetation on the site and on the building's planted roofs allow for seamless integration into the surrounding natural environment. Planted roofs help to absorb rainwater, provide insulation, create a habitat for wildlife, and lower urban air temperatures.
- An 8-foot wide band around the edge of the roof and the entire roof of the circular *Native Voices* gallery is planted with five different types of native plants: Stonecrop (several species of *Sedum*); Bear Grass (*Nilina microcarpa*); Snow-in-Summer (*Creastium tomentosum)*; Purple Carpet Creeping Thyme (*Thymus praecox*); and Blue Wildrye (*Elymus glaucus*).
- The parking area for 150 cars is terraced below the new building, providing unobstructed views from the building and the surrounding hiking trails.
- Majority of excavated material was processed and re-used on site as backfill, in construction stabilization walls, and to form the decorative rock gabion walls. Large boulders are used in the landscaping and several are featured in the *Land* Gallery, which takes a look at the geology of the region.
- The Museum, in partnership with Salt Lake County, secured an easement to protect an area in the lower section of the site that supports an old Gambel Oak Clone. This area will provide a walking trail and interpretative text for visitors.

Copper Facade

- A $15 million donation from Kennecott Utah Copper/Rio Tinto included copper mined from Kennecott's 106-year-old Bingham Canyon Mine, located across the Salt Lake Valley from the new Museum site.
- The final installed design incorporates approximately 42,000 square feet of standing seam copper, articulated in horizontal bands of various heights to represent the layered rock formations seen throughout Utah.
- The bands are enriched with small amounts of copper-zinc and copper-tin to enhance the subtle variegation of copper's natural patina and are offset in sections to articulate the geophysical processes that have sculpted the state.

Construction Highlights:

- Total square footage of the Rio Tinto Center is 163,000 square feet, with approximately 51,000 of that as public gallery space, including *The Canyon,* the main gathering area.
- *The Canyon* featues a three-story building tall glass case called the Collections Wall used to highlight more than 500 objects from the Museum's various research collections.
- Constructed a steep, and complex, soldier pile wall, an earth retention system, by drilling vertical steel columns 80 feet deep. Wood lagging was placed between the steel columns and the whole surface was sprayed with shotcrete to provide the building lateral resistance of the soil and surcharge load. Visitors walking to the back of *The Canyon* will be 80 feet below the old grade prior to construction.
- It took 13,100 cubic yards of concrete to build the Rio Tinto Center. This amount is equivalent to pouring a three-foot wide sidewalk, stretching from the Museum's new site to Santaquin, Utah, approximately 70 miles south of the Rio Tinto Center.
- The Rio Tinto Center contains 800 tons of rebar and 1,460 tons of structural steel-- that's nearly 3 million pounds of steel.
- 42,000 cubic yards of dirt were moved during construction, or enough dirt to fill approximately 3,230 standard dump trucks.
- Over 190 miles of copper electrical cable is used in the new building.
- With as many as 180 construction workers on site at any given time, the construction team achieved an outstanding safety record of 700,000 man hours without a lost time accident.
- Board-form, cast in place concrete, a time intensive process using lumber to create an exposed formed structure, appears in many places, including at the base of the building to make the transition from the earth to the manmade copper panels.
- Three large concrete dinosaur platforms in *Past Worlds* Gallery proved to be more challenging due to their various heights and angles. The platforms are made of concrete, with some areas having the board-formed finish, and their unique support base makes some of platforms appear as if they are floating in air.
- Mechanically stabilized earth walls (MSE), more commonly used to support large bridges, are found in several locations of the Rio Tinto Center. Located six inches behind the concrete walls, MSE walls use steel baskets to keep the surrounding earth away from the building.
- A large concrete slab hanging off of the wall in the back of *The Canyon*, representing rock formations commonly found in Utah's landscape, was formed in place and required an 80-foot scaffolding. The slab, 13 feet wide by 14 feet high and 5 feet deep, required a master woodworker to build the wood form. Crews inserted the form to support the weight of the concrete until it dried and used rebar to tieback the concrete into the wall.
- Construction team used the Building Information Modeling (BIM) to render sections of the building for architects and consultants to review before activating crews. This approach provided construction leaders with better decison-making capabilities to build more economically, and with less environmental impact. The Museum project was built on schedule and on budget.

Project Cost and Funding:

- Construction of the Rio Tinto Center is a result of a successful public/private partnership to raise the total cost of $102.5 million. This figure includes building construction costs, the design and fabrication of the new exhibitions, and landscaping. The funding mix includes: $16.5 million from the federal government, $25 million from the Utah State Legislature, $15 million as a result of a Salt Lake County bond, and more than $44 million raised through individual, corporate, and foundation support.

Construction and Architect Team:

Big-D Construction:
With a portfolio that is complex and vast, Big-D Construction has been an industry leader in sustainable design and construction for more than 40 years. The company has built well over 35 LEED certified buildings, including the first one completed for the State of Utah. Among many, recent highly recognized projects include the Westminster College Meldrum Science Center, Swaner EcoCenter, and the Vernal Dinosaur National Monument Quarry Visitor Center. More information www.big-d.com

Ennead Architects:
Known for powerful building designs for cultural, educational, scientific and not-for-profit institutions, Ennead's research-based design process sponsors creates signature building designs that are expressive on an institution's philosophy and vision. Ennead is noted for its work in the museum industry, including the Newseum in Washington D.C, the Dallas Museum of Nature and Science, and the American Museum of Natural History, Rose Center for Earth and Space, among many others. More information www.ennead.com

GSBS Architects:
GSBS embraces emerging principles of architecture to create positive structures that are more pleasant to be in, less costly to maintain, and contribute to a healthier environment. A recognized leader in sustainable design for more than three decades, GSBS has designed 14 LEED-certified buildings, including one of the first LEED certified buildings in the world, the 2002 Olympic Speed Skating Oval. The award-winning Escalante Visitors Center is recognized for its zero carbon footprint and photo-voltaic array. More information www.gsbsarchitects.com

Design Workshop:
An award-winning firm practicing landscape architecture, Design Workshop merges artistic vision, environmental sensitivity, community values and sound economics to create compelling places that stand the test of time. Since forming in 1969, Design Workshop excels in many areas of green design, including restoring natural landscapes, conserving ecosystems, and creating places that are compelling and sustainable. Their work is consistently recognized nationally for excellence. More information www.designworkshop.com