

## Vehicle Research Wind Tunnel Wins Cold-Formed Steel Design Award

*Freightliner Corporation Structure for Vehicle Development Captures Top Honor in CFSEI “Award for Innovative Design” Competition*

Washington, D.C., Oct. 30, 2008 — The first-ever Cold-Formed Steel Engineers Institute (CFSEI) “Award for Innovative Design,” recognizing pioneering use of cold-formed steel in structural design, was presented for “**Research Wind Tunnel for Freightliner Trucks**,” a Salem, Ore. vehicle development project commissioned by Freightliner Corporation, the largest truck manufacturer in the United States. Alpine Structural Consultants, the Haines City, Fla.-based structural framing consultant for the project, received the Award as the principal engineering entity responsible for the innovative use of cold-formed steel. The Award was bestowed in a ceremony during the Steel Framing Alliance’s 10<sup>th</sup> Anniversary Dinner at METALCON International, following a close competition which featured more than two-dozen projects that capitalized on advantages made possible by the use of cold-formed steel. The wide-range of innovative designs entered in the Award competition created a challenge for the judging panel, but the unique aspects of the Research Wind Tunnel propelled it to the top honor.

“A visually exciting project that proves cold-formed steel framing is definitely not limited to ‘stick built’ construction,” was how one judge described the Wind Tunnel project. Another described the winning entry as an “excellent and creative solution using cold-formed steel material, and in doing so, capitalizing on some of the positive aspects the material offers such as lightweight and strong.” All of the judges, industry experts with diverse backgrounds ranging from engineers to general contractors, academics and manufacturers, were impressed with the Research Wind Tunnel’s uniqueness and innovative design applications.

The Research Wind Tunnel for Freightliner Trucks was constructed in Swan Island, Ore. and completed March 1, 2004. VLMK Consulting Engineers served as project engineer and Mega Pacific was the general contractor, both based in Portland, Ore, while Alpine Structural Consultants (Haines City, Fla.) and Pacific Panel & Steel Truss, Inc. (Vancouver, Wash.) provided consulting services for the project, which is owned by Portland, Ore. based Freightliner LLC.

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The design department of Pacific Panel and Steel Truss, Inc. worked with the engineers at Freightliner, VLMK Consulting Engineers and Alpine Structural Consultants over a three year period to develop a design for the intake portion of the tunnel that could be built entirely of cold-formed steel trusses. Pacific Panel and Steel Truss, Inc. developed a framing concept and were able to answer the owner's structural and geometric needs as well as address issues surrounding erection in the field. This structure needed to be easy and quick to install, without the use of a large labor force or machinery.

Combinations of trusses were engineered to create the roof, floor and walls of the 80 foot-long tunnel. The frames at the opening of the tunnel began at 57 feet wide by 52 feet tall and tapered down throughout the throat of the tunnel to 32 feet by 24 feet by the time the intake portion entered the lab. The frames bear on two wide flange beams extended out over the Willamette River.

The 12,000 square foot tunnel, with an interior of fiberboard and steel reinforced Plexiglas walls, employs ten large fans on one end to pull air from its open end, which extends out over the Swan Island Lagoon. The fans, with a combined 25,000 horsepower, can generate wind speeds of 65 MPH. Disruptions of air flow and load factors that the wind places on the vehicles are measured by a host of computers and gauges. Freightliner has used its research to design a truck that boasts a 15 percent reduction in air drag and a 5 percent reduction of fuel use. Additional research will investigate cab noise reduction, improved brake cooling and other issues.

The facility opened April 13, 2004 with a gathering attended by political and business dignitaries including Oregon Governor Ted Kulongoski, Portland Mayor Vera Katz, U.S. Rep. David Wu, D-Ore. and other leaders.

**"Research Wind Tunnel for Freightliner Trucks"** claimed the top prize in the closely-contested competition, but outstanding innovations incorporated in other projects earned those projects Honorable Mention status, including:

- **"Holiday Inn Express – Hotel and Suites,"** in Hearne, Texas. Presented to Cory W. Potts of Lobsinger and Potts Structural Engineering, Inc. in Fort Worth, Texas.
- **"The Century Tower"** in Century City, Calif. Presented to Brady Innovations, ProX Header in Los Angeles, Calif.
- **"Magic House – The Children's Museum"** in St. Louis, Mo. Presented to Engineered Steel Products in Wright City, Mo.
- **"Design Build Construction LLC"** for Innovative Design of Light Gauge Steel Foundation System. Presented to Design Build Construction LLC in New Orleans, La.

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- **“Piatt Place Residences and Mixed-Use Commercial”** in Pittsburgh, Pa. Presented to Shaffer, Wilson, Sarver & Gray, P.C. in Reston, Va.
- **“The Village at Winter Park, Village Core”** in Winter Park, Colo. Presented to Milender White Construction Co. in Golden, Colo.

“The explosive pace of innovation among engineers who are currently specifying cold-formed steel is beyond impressive,” CFSEI President Jeff Klaiman said. “The advancements reflected in many of the projects entered in the competition demonstrate cold-formed steel’s potential in modern construction, and great potential as a material of choice in the buildings of the future.”

Cold-formed steel has been used for decades to design and build strong, aesthetically pleasing and cost-effective structures around the world, and the inaugural CFSEI “Award for Innovative Design” celebrates the contributions of the engineers responsible for these structural achievements. The CFSEI Award Program was first announced in October 2007, and in the months that followed, more than 30 projects were submitted for consideration to claim the top prize. Each project had to be initiated or completed between January 1, 2002 and April 30, 2008, and had to meet at least one of the six specific criteria, in order to be eligible.

CFSEI also presented the Award for Distinguished Service to Jeff Ellis, P.E., S.E. Ellis was one of six finalists nominated by Institute members for outstanding contributions to the industry and spreading technical knowledge, which has played an important role in facilitating many of the innovations currently in use or being developed. Dick Layding, P.E., Rob Madsen, P.E., Ben Schafer, Ph.D., P.E., Rahim Zadeh, P.E. and Roger A. LaBoube, Ph.D., P.E. were the other finalists for the Award.

CFSEI will help tell the stories of the innovative projects receiving recognition in the “Award for Innovative Design” competition, including those of honorable mention winners and other notable projects, on the CFSEI Web site at [www.cfsei.org](http://www.cfsei.org), during the next year. For photographs, renderings and details for media publication, additional information on the winning projects or the Awards competition, contact CFSEI Manager Brian Berger at [bberger@cfsei.org](mailto:bberger@cfsei.org).

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### **About the Cold-Formed Steel Engineers Institute**

The Cold-Formed Steel Engineers Institute (CFSEI), the technical arm of the Steel Framing Alliance (SFA), serves as the steel-framing industry's technical resource and professional forum for design professionals. Widely recognized as the "must-have technical and professional resource" for designers of cold-formed steel (CFS) structures, CFSEI's members include more than 850 structural engineers and design professionals who are finding a better way to produce safe and efficient designs for commercial and residential structures with cold-formed steel. CFSEI's mission is to enable and encourage the efficient design of safe and cost effective cold-formed steel (CFS) framed structures. To learn more, visit [www.cfsei.org](http://www.cfsei.org).

### **About the Steel Framing Alliance**

The Steel Framing Alliance (SFA) is a market development group charged with facilitating the growth of cold-formed steel framing in both the residential and commercial construction markets. In addition to education and training, research and solutions development, and supporting the development of codes and standards for steel framing, SFA activities include marketing and promotion, technical services, and special initiatives that continue to improve the competitive position of steel framing. Headquartered in Washington, D.C., the SFA has more than 1,500 corporate, organizational and individual members from all areas of the construction industry. Established by the steel framing industry in 1998, the SFA's principal investors include American Iron and Steel Institute (AISI) steel producers.

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