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This year's winner of the SCNZ Student Steel Design Award

The winner of the 2006 SCNZ Student Steel Design Award and a cheque for \$500 is under-graduate and former Lynfield College Head Boy, Jarrod Darlington. In his fourth year studying for his Bachelor of Engineering at the University of Auckland, Jarrod beat the rest of his class in a two project structural steel design competition.

The first project was to design a four-span steel bridge for vehicle traffic in accordance with Transit New Zealand's bridge design manual.

"This project gave me great insight into the whole design process," says Jarrod. "Naturally, the beam spans had to be designed for bending, shear, lateral buckling and web crushing and the use of web stiffeners. This was the first time I had ever been exposed to the use of shear studs to connect the decking to the steel beam. To achieve the required serviceability, I used a transformed section of the decking and beam combined."

The second project, a two storey portal frame building under both seismic and gravity loading, was more challenging, as it involved the design of the columns and first floor beams, as well as the endplate connections and splice joints.

"As with the bridge design," says Jarrod, "we started with minimal information and had to determine all the loads from the design codes. For most of our university course work, everything is done by hand, but for this project we were introduced to the computer package SAP2000. This made it easier to analyse the frame under multiple load combinations. One's analytical knowledge was applied to real world computer tools to solve the problem."

After determining the critical design actions from the SAP analysis, Jarrod designed the beams and columns for bending, shear, axial and combined loadings.

"Designing the connections was a new experience. How the various pieces are joined together can often be very complicated and take up most of your time," says Jarrod. "We designed the moment end plates, the column base plates, as well as the tension and compressions stiffeners at the connections. We had to stipulate the weld types, the lengths and strength that should be used, the bolt

sizes and group arrangements and the splice joint for the web and flange of the universal beam. Each student had to provide sketches for all the connections, to scale and use standard notations to produce a set of drawings and calculations that would be acceptable in a professional design office.”

Presenting Jarrod with his cheque and the SCNZ Student Steel Design Award certificate, SCNZ Secretary Manager Clark Hyland congratulated the winner on making such an impressive start to an exciting career.

Jarrod has taken up an offer of a full-time position with Sinclair Knight Merz Ltd. “SKM awarded me a scholarship after my first year of study and I have worked there during my summer breaks. I hope to gain valuable experience in a variety of disciplines both here in New Zealand and overseas, before settling on a more defined career path.”

Outside of engineering Jarrod is a keen sportsman, playing tennis, soccer and Australian rules football. His team, which he also manages, reached the playoffs for this season. “It’s much more physically demanding than most other sports, because of its non-stop style.”

After four years of university study, Jarrod is stopping for a while. He’s planned a well-earned trip through parts of Australia over the New Year period.



CAPTION:

SCNZ Secretary Manager Clark Hyland (left) with the winner of this year's SCNZ Student Steel Design Award, Jarrod Darlington.

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