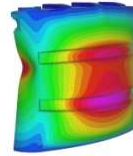


Date: July 2021 to Present
Client: Vanderlande



David Beneke Consulting

Finite Element Analysis for Engineering

CONVEYOR SUPPORT STRUCTURES – DHL CHRISTCHURCH

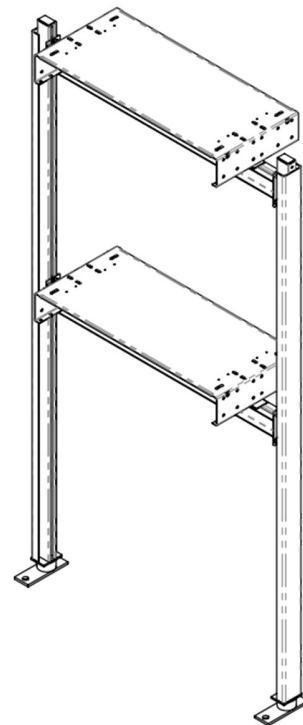
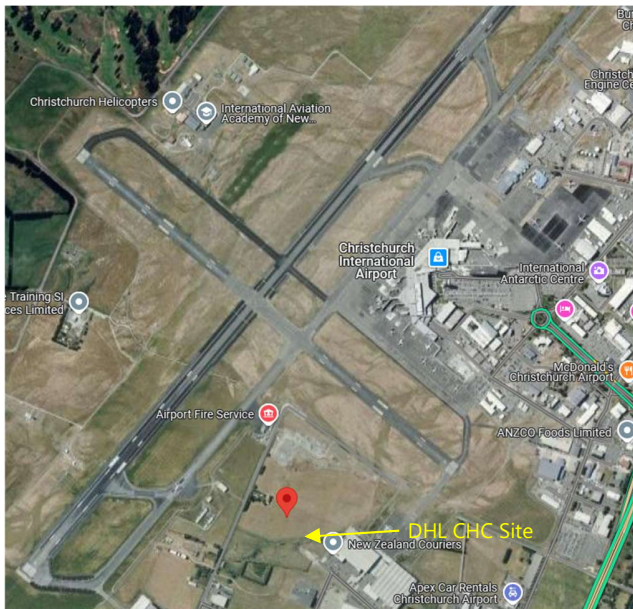
Project Description:

David Beneke Consulting was commissioned by Vanderlande to undertake a Producer Statement PS-1 independent structural engineering certification of the base mounted conveyor support structures at the DHL logistics site, Christchurch New Zealand. The subject site was located in close proximity to Christchurch airport. Our role was to ensure that the Vanderlande connection design between the conveyor support structure base and the supporting slab/mezzanine had sufficient ultimate capacity to withstand the applied vertical and horizontal loads.

In terms of horizontal loads, the ultimate seismic loads to be catered for on this site were significant. With a hazard factor of 0.3 for Christchurch (based on NZS1170.5-2007) the seismic base shears are some 3.33-3.75 times larger than that encountered for the eastern seaboard of Australia (Hazard factor 0.08-0.09). Furthermore, as these structure feature light gauge steel, their ductility was significantly reduced compared to the equivalent hot rolled steel structure. This increased the earthquake load as well.

The results of our independent check indicated that the horizontal loads on the base mounted conveyor supports was having the most profound impact. Uplift at the base connections were the most significant and in particular those supported by rubber dampers. It was these dampers that required additional tether restraints given that the uplift capacity of the dampers was zero.

In addition to the above, additional anchors were required for certain mezzanine floor supported conveyor supports as well as strengthening of column to base member connections with additional double nut-clamps to ensure that the tension/compression load from the column actually could be transferred down into the base member then into the baseplate accordingly.



Duplex Support R4 with Damper Assembly bases

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