

GERARD LIGHTING - SL25 VARIABLE PITCH LUMINAIRE Non-Linear Boundary Contact Analysis

Date: October 2014

Client: Gerard Lighting

Project Description:

David Beneke Consulting was commissioned by Gerard Lighting to investigate a variable pitch kit which could be added to the existing SL25 street lighting LED luminaire. The purpose of the variable pitch kit was to allow the luminaire to be placed in specific angles from the horizontal, for installations within New Zealand.

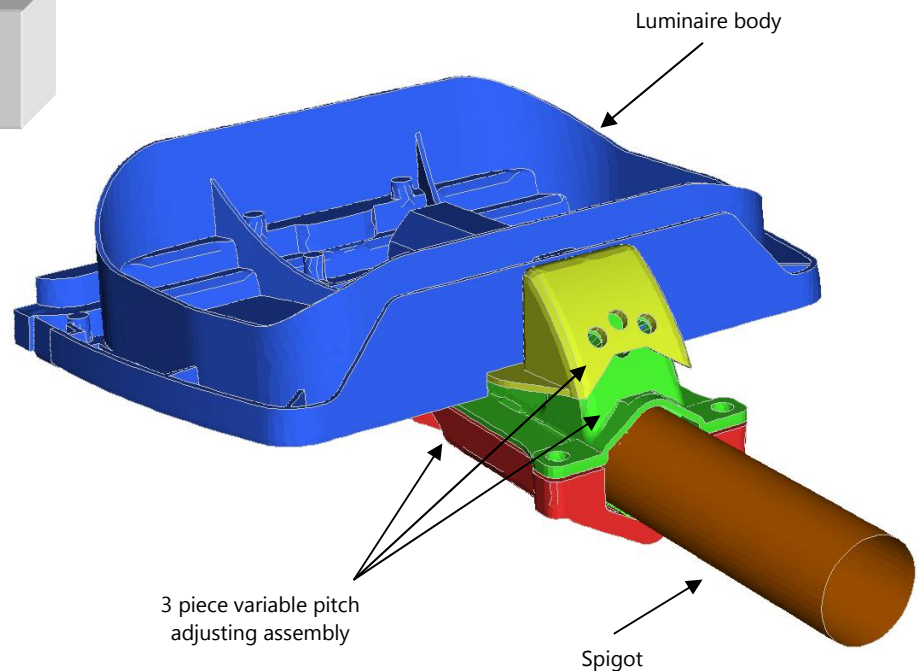
The variable pitch kit consisted of 3 components - the body, the pivot and the clamp from top to bottom. Each of these, including a discrete section of the SL25 luminaire body was modelled using 3D Tet 10 elements. The bolts between these items were modelled using 1D line elements with the support spigot being modelled using 2D plate/shell elements. The contact interfaces between all of the components in the kits as well as the luminaire body and spigot were modelled using a series of 1D point contact elements.

A boundary non-linear analysis was undertaken which assumed linear elastic behaviour for the pressure die-cast aluminium and linear behaviour for geometric effects.

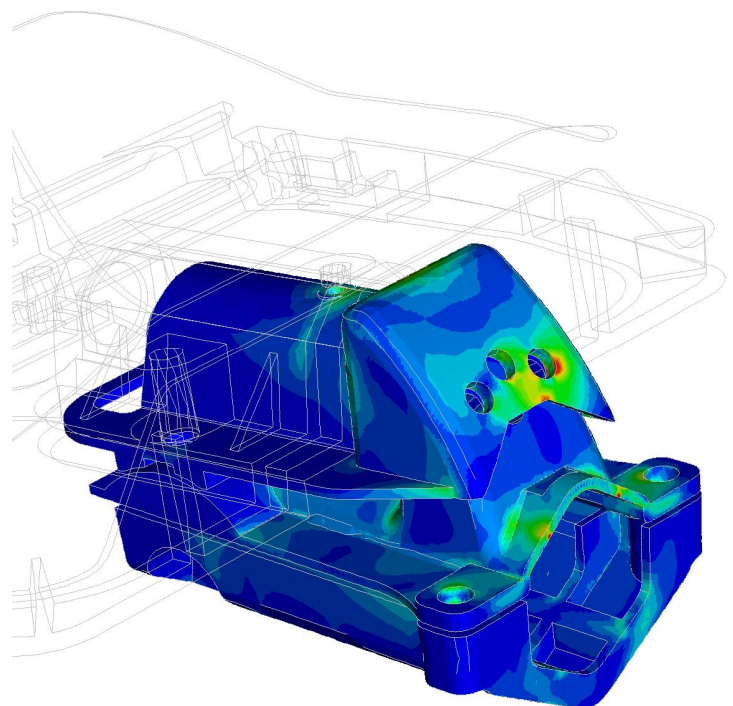
Based on the applied Region W wind loads to AS/NZS1170.2-2011 it was found that some minor modifications to the geometry was required in order to obtain compliance with the relevant standards.

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FEA model of the variable pitch SL25 luminaire.



von Mises stress results for combined wind and dead loading