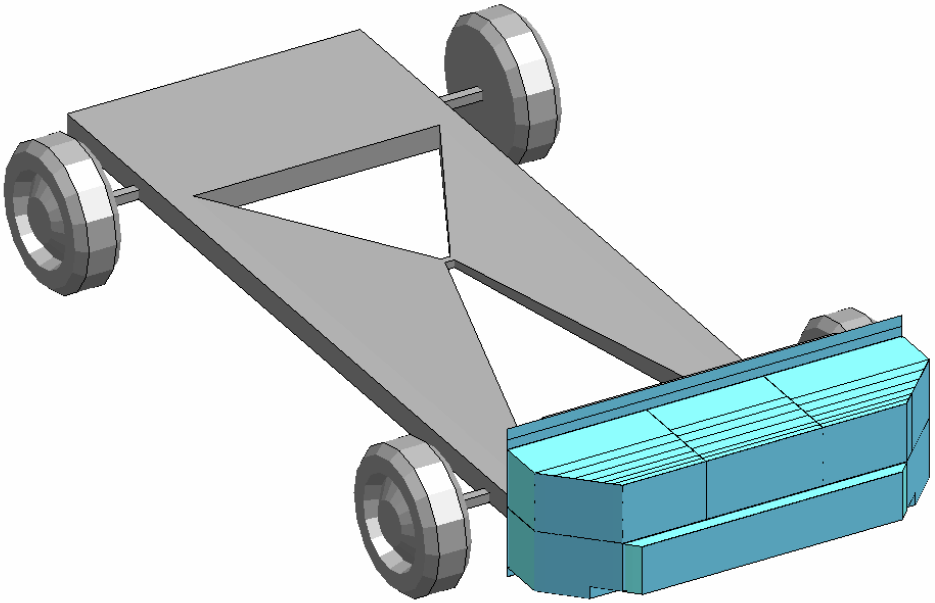
AE-MDB Side Impact Barrier Model
Version 1.0



Development Report

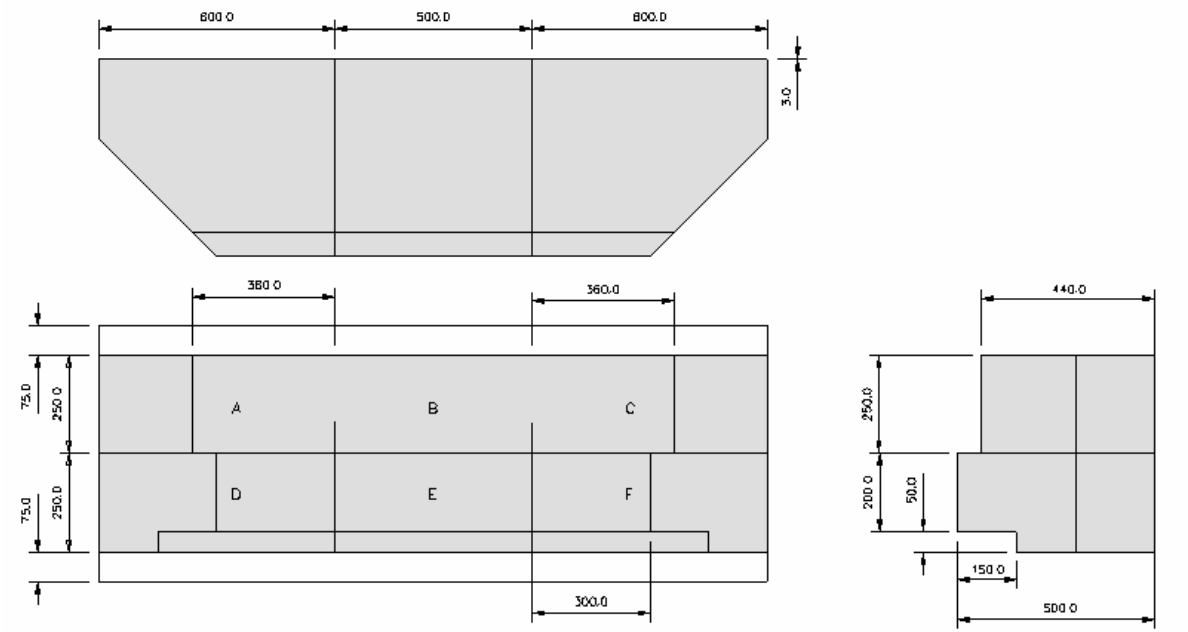
December 2006

General Information

The specification used for the deformable impact barrier in this documentation has been taken from the APROSYS document ‘Development and Evaluation of the Advanced European Mobile Deformable Barrier (AE-MDB) Test Procedure’.

Barrier Characteristics

- The mass of the barrier including instrumentation should be 1500kg.
- The front and rear track width of the trolley should be 1500 mm.
- The trolley wheelbase should be 3000 mm.
- The centre of gravity of the barrier lie on the barrier’s lateral centerline, 1000mm rearward of the front axle and 2000mm rearward of the barrier face, and 500mm above the ground.



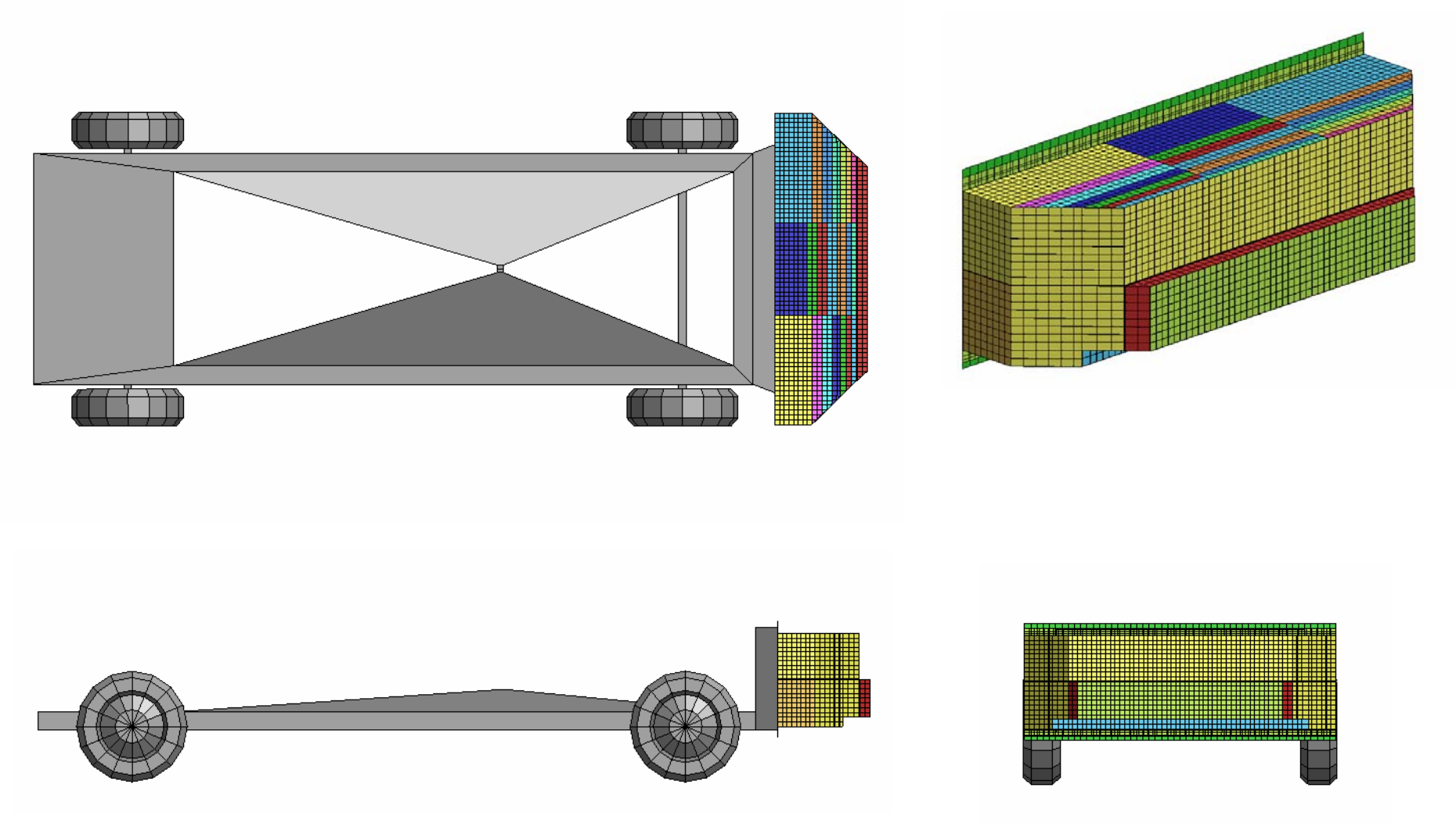
Material Characteristics

- The main body of barrier is made up of 6 individual etched honeycomb cores with differentiated strength through the impact axis. The main body is clad in 0.5mm aluminium sheet
- The bumper honeycomb block should have a crush strength of 1.69 N/mm2 ±0.103 N/mm2 . The front face of the bumper block should be covered with 3 mm aluminium sheet.

Calibration Procedure

No calibration test is specified for the deformable impact barrier as its crush performance is characterised by its material properties.

Figure 1.1 – AE-MDB model



Calibration Tests

The two test that have been selected for correlating the barrier are described below:

Condition A – Rigid Pole Impact

This test involves the barrier on a trolley impacting a pole. The velocity is 5.55 m/s (20 km/h). Figure 1.2 shows the test configuration. Figure 1.4 shows the deceleration characteristic of the barrier obtained from the analysis compared with test. The curves have been normalized to unity.

Condition B – Rigid Wall Impact

This test involves the barrier on a trolley impacting a rigid wall. The velocity is 9.72 m/s (35km/h). Figure 1.5 shows the test configuration. Figure 1.7 shows the deceleration characteristic of the barrier obtained from the analysis compared with test. The curves have been normalized to unity.

Figure 1.2 – AE-MDB condition A

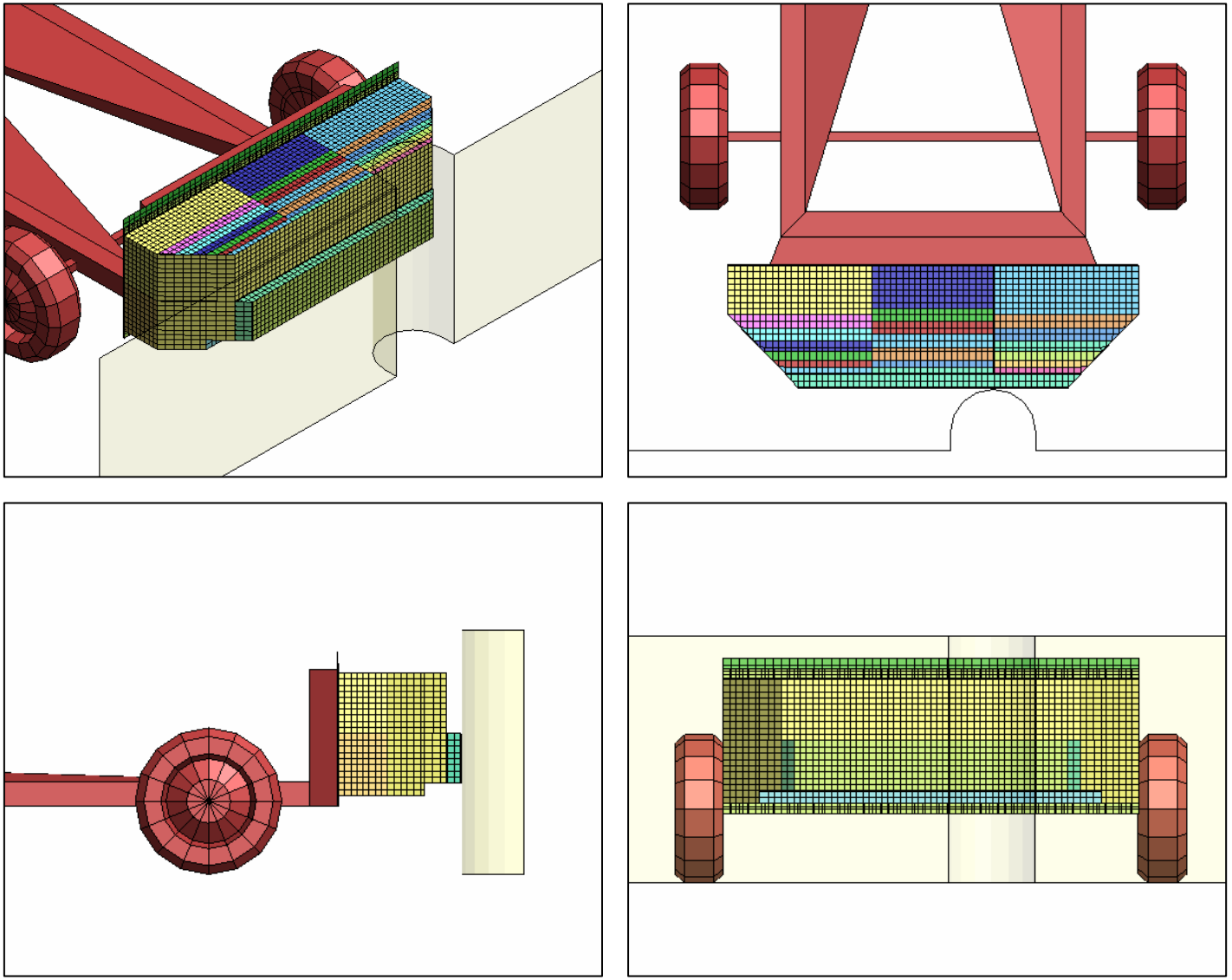
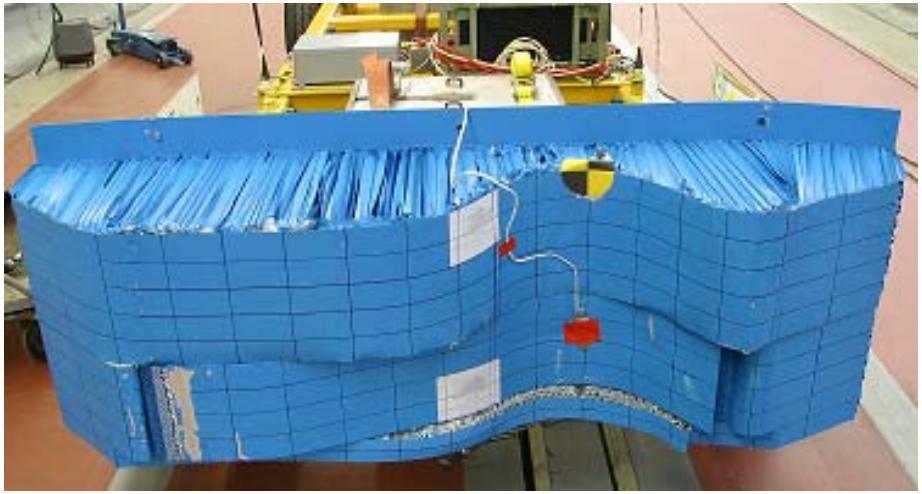
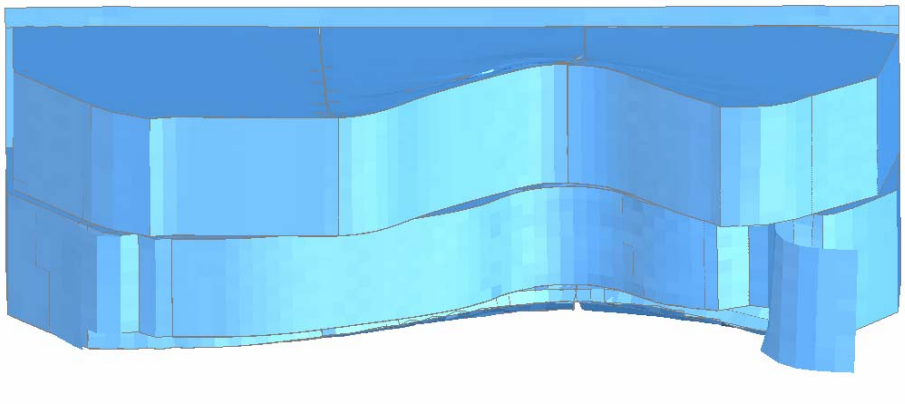


Figure 1.3 – AE-MDB condition A final deformation





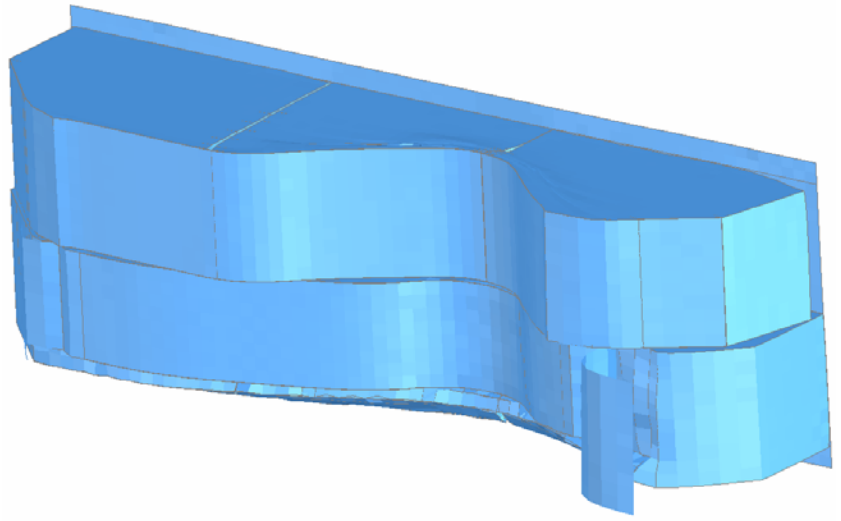


Figure 1.4 – AE-MDB condition A Acceleration Curve (C60)

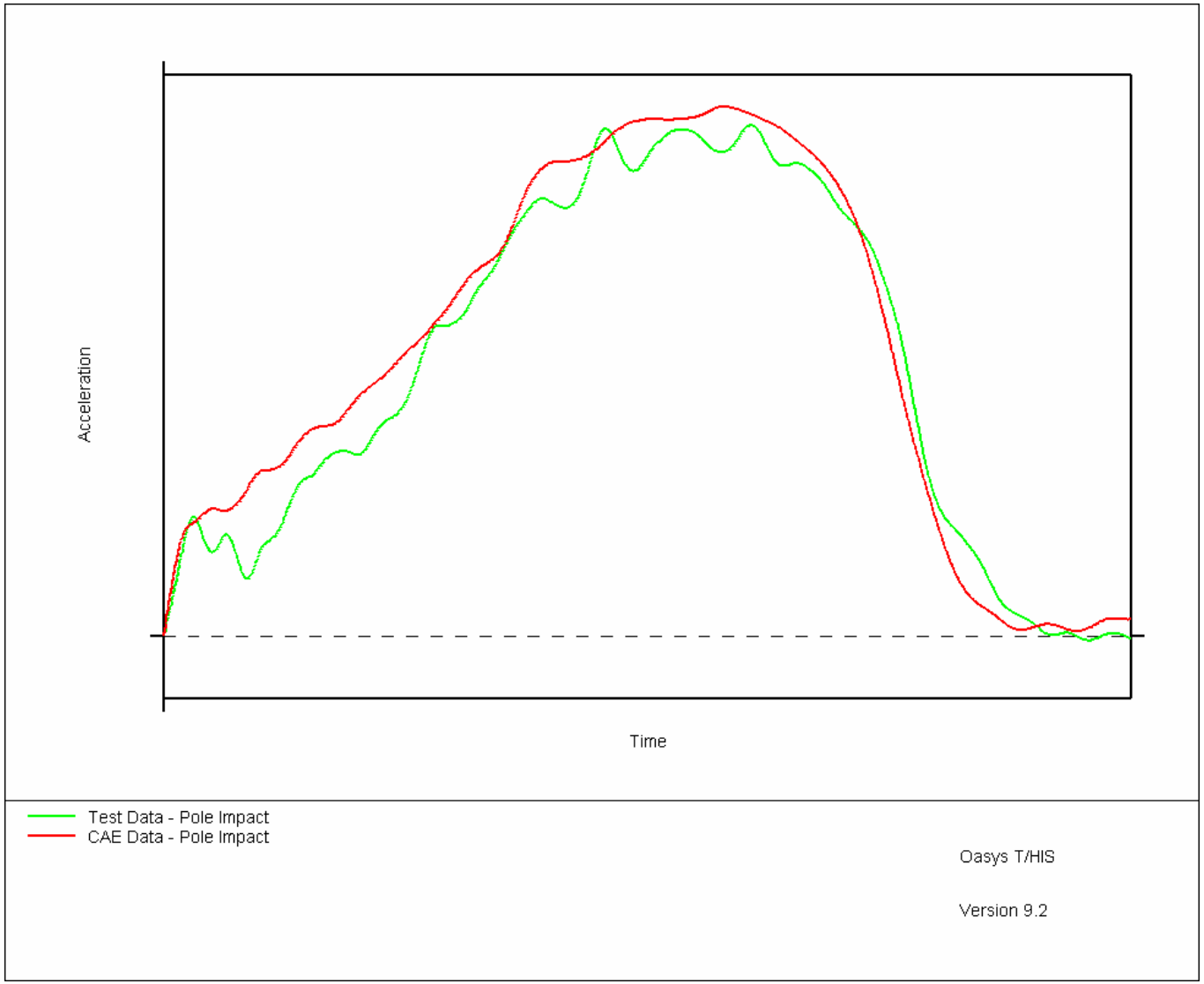


Figure 1.5 – AE-MDB condition B

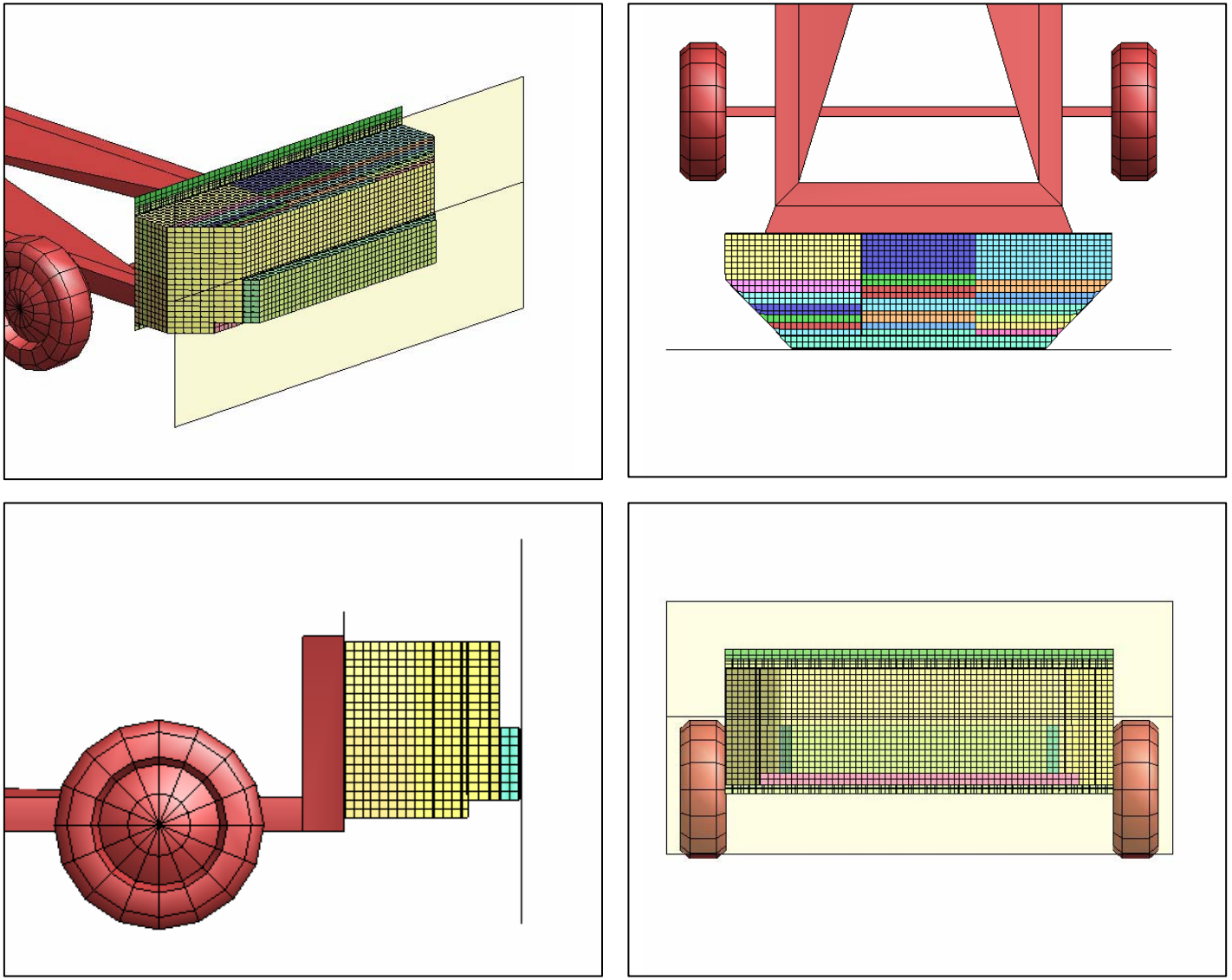
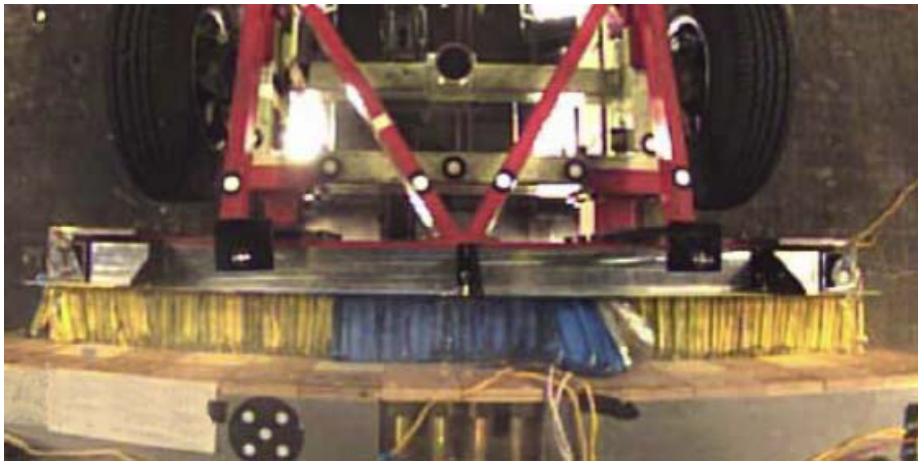
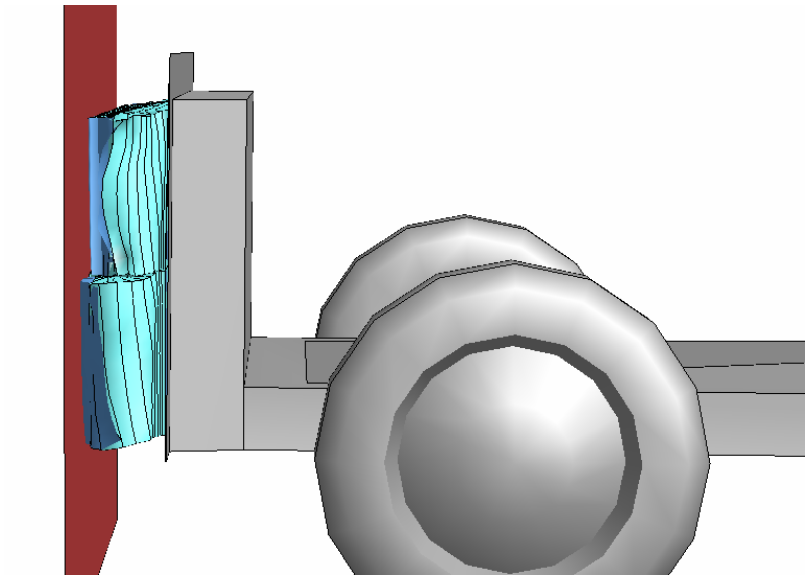


Figure 1.6 – AE-MDB condition B final deformation





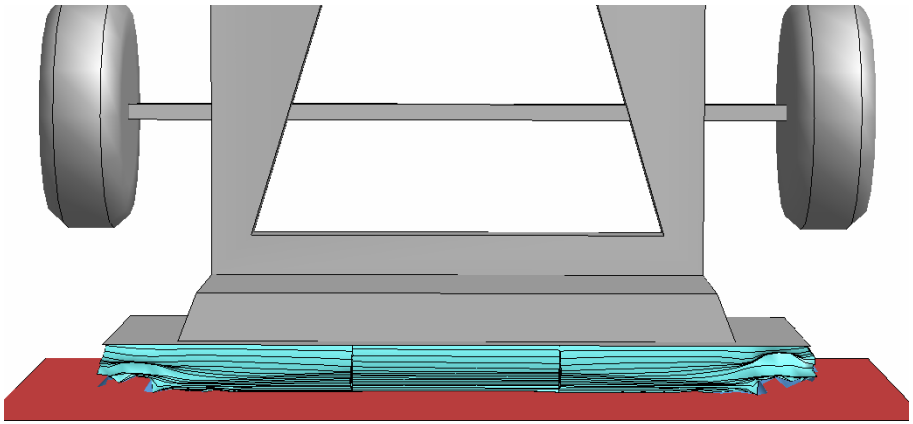
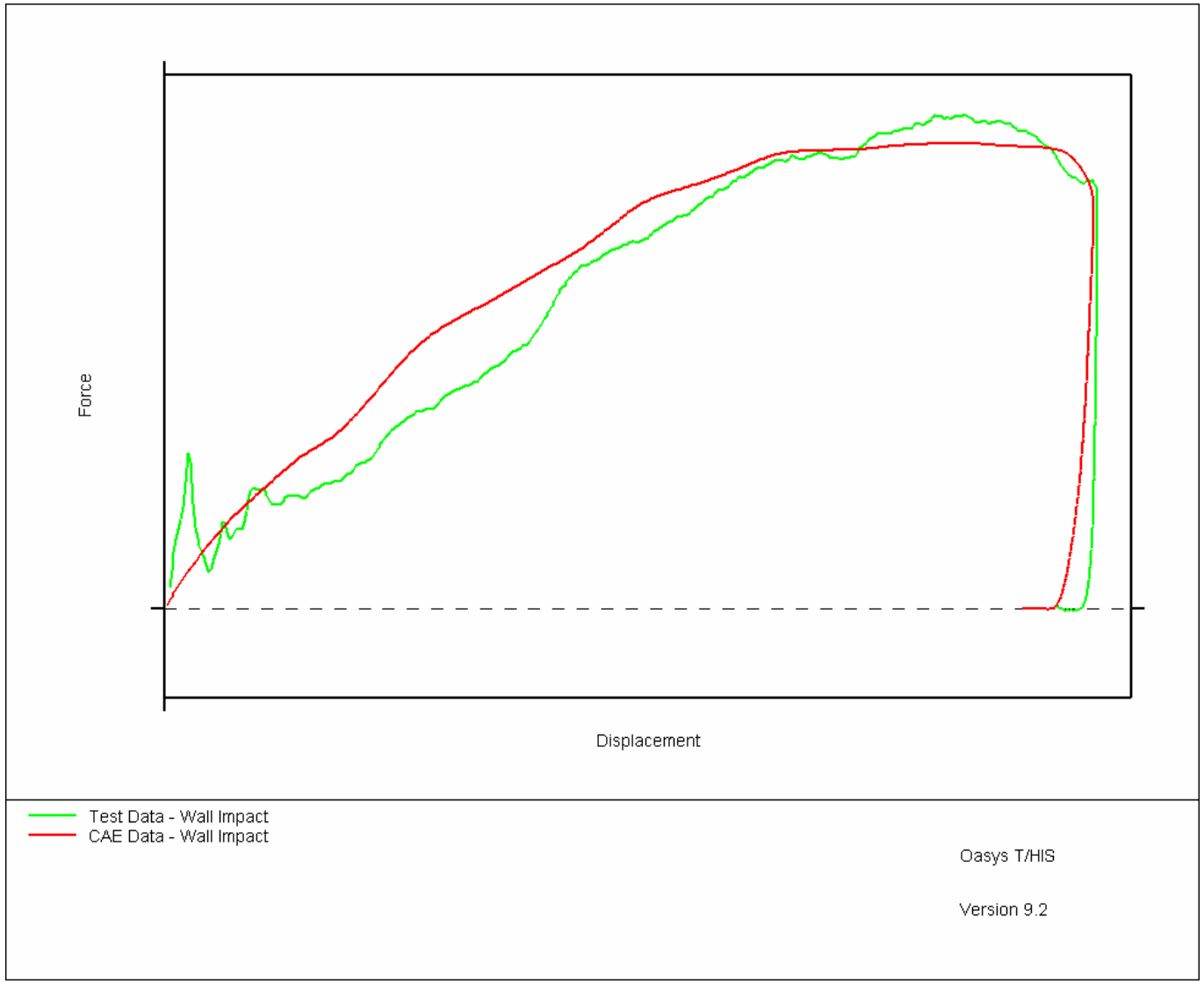


Figure 1.7 – AE-MDB condition B Acceleration Curve (C60)



Company and Contact Information

The AE-MDB model is developed by Cellbond Composites Ltd in association with Arup.

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