



COMPOSITE POLE TIP LOAD & DEFLECTION TEST

9.5m Pole Tip Load Test

Date: 4/02/13

Pole Type: 9.5m Two-Piece ActewAGL (prototype made by Shakespeare Composites)

Notes on Test Procedure:

The pole was potted in Polecrete (4lbs/cu.ft) inside the steel clamp. The two-piece joint was engaged for a length of 670mm and thru-bolted with an M20 bolt torqued to a firm tension. The bolt axis was horizontal to present the worst case load scenario for the horizontal test. The pole centreline height was 480mm above ground line and a tip support trolley was provided. The tip load was applied 300mm from the pole top via a 5t winch and load-cell.



Fig 1. Pole Test Rig



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Observations:

The load was increased in approximately 200kg intervals and held for one minute before further increasing. Approximately 50kg creep back was noted in the first 30sec (likely occurring in the winch cable), therefore the load was applied initially above target and allowed to run back until stable. The stable reading was recorded.

With a tip load of 8kN, the pole deflected 390mm which is very close to the 5% cantilever height ($0.05 \times 7.9\text{m} = 395\text{mm}$). There was considered to be negligible deflection in the Polecrete base at this load.



Fig 2. - Deflection at 8kN



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Fig 3. - Pole at 8kN

Once the load reached 1600kg, it was held for 2 mins and then released for inspection. No deformation of the pole was noted however approximately 100mm of tip deflection was apparent due to compression of the Polecrete.

The load was further applied up to 25kN. Considerable deflection was noted and the Polecrete was compressing significantly causing over 1.5m pole tip deflection which resulted in a lack of cable length on the winch. No conclusion was reached whether the ultimate tip load of 32kN could be reached.



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Fig 4. - Pole at 25kN Tip Load

Table 1 - Tip Load -v- Deflection

Test Load (kg)	Deflection (mm)
195	110
420	210
600	300
810	390
970	480
1190	600
1395	720
1605	840



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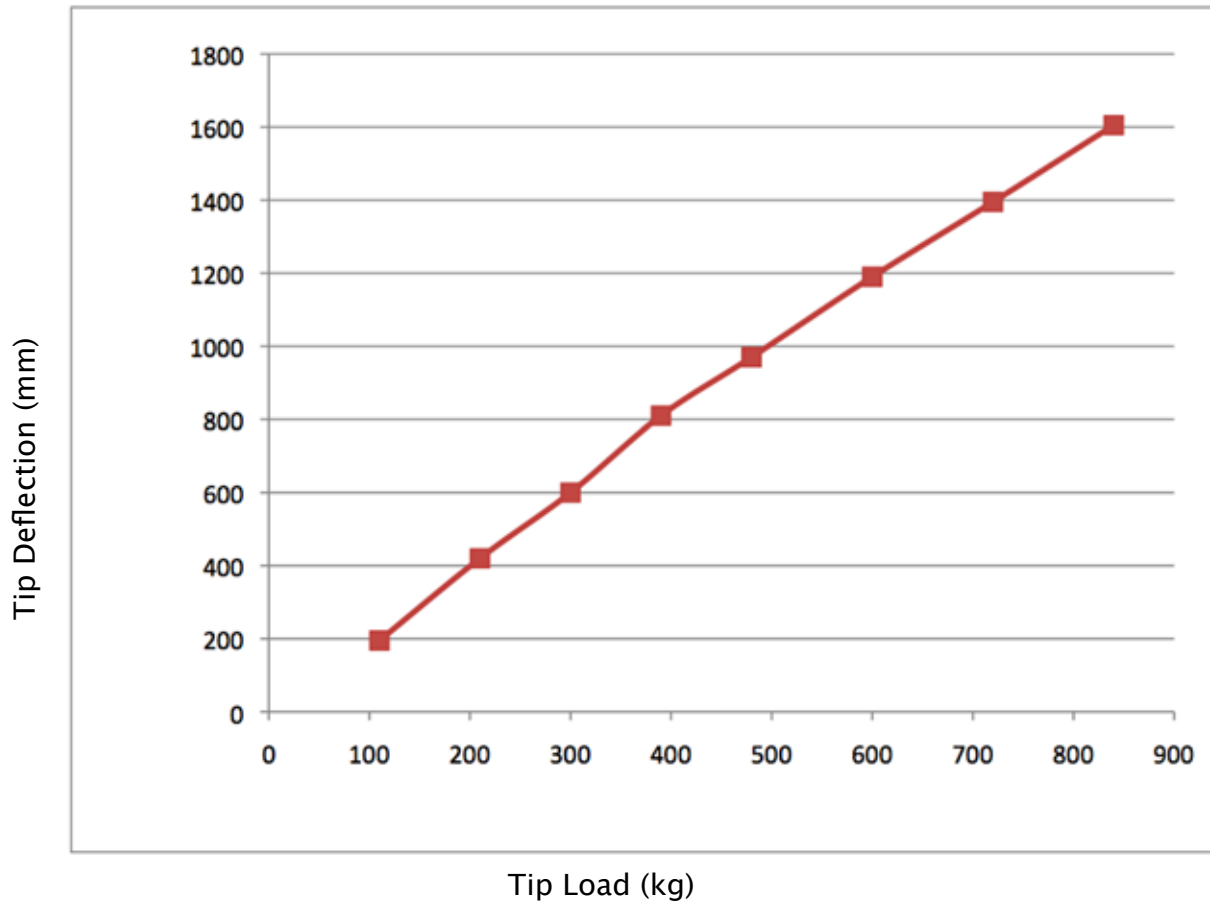


Fig 5 - Plot of Tip Load -V- Deflection