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For the attention of: James Burns

Technical Report

Subject: LIMITED TESTING OF SEVERAL DIFFERENT LADDERS USING THE TEST METHODS GIVEN IN EN 795: 2012
Our ref: SPC0219789/1346 Issue 2
Date: 20th February 2014
This replaces report reference SPC0219789/1346 dated 17th February 2014

Report signed by: D Harrison
Position: PPE Technologist
Department: Safety Product Centre

Technical Report

WORK REQUESTED

Samples of ladder as described in table 1 were made available to SATRA on 11th February 2014, for testing using the methods given in EN 795: 2012

Table 1 – Description of ladders tested

Reference	Ladder Manufacturer	Description of ladder
1	Messrs Lyte Industries of Swansea	4.8m long aluminium ladder, 280mm distance between stile centres and 300mm distance between rung centres. Total rungs in each ladder section is 16, with spigot connection within stiles at ladder section joints (see figure 1)
2	Ramsay Ladders of Forfar	3.0m long aluminium ladder, 300mm distance between stile centres and 250mm distance between rung centres. Total rungs in each ladder section is 12, with 200mm external sleeve connections at ladder section joints (see figure 2)
3	Messrs Layher GmbH	2.9m aluminium ladder, 420mm distance between stile centres and 280mm distance between rung centres. Total rungs in each ladder section is 10, with spigot connection within stiles at ladder section joints (see figure 3)

TESTING

Testing was carried out in accordance with EN 795: 2012 on the 11th February 2014 in the presence of representatives of ATLAS

For the purposes of testing, the anchor device was installed against a test tower and lashed every 1.5m. The ladder was positioned on a flat surface as would be in required in normal use. The anchorage point consisted of putting an anchorage sling around one of the stiles. This was used as a direct anchorage point, for example an energy absorbing lanyard (see figure 4), or as an anchorage point for pulley allowing a belay system to be used (see figures 5 & 6). Test forces were applied in a vertical direction

Samples were tested as received, and were not subject to any pre-conditioning processes other than those stated in individual test clauses

Technical Report

Figure 1 – Ladder referenced 1

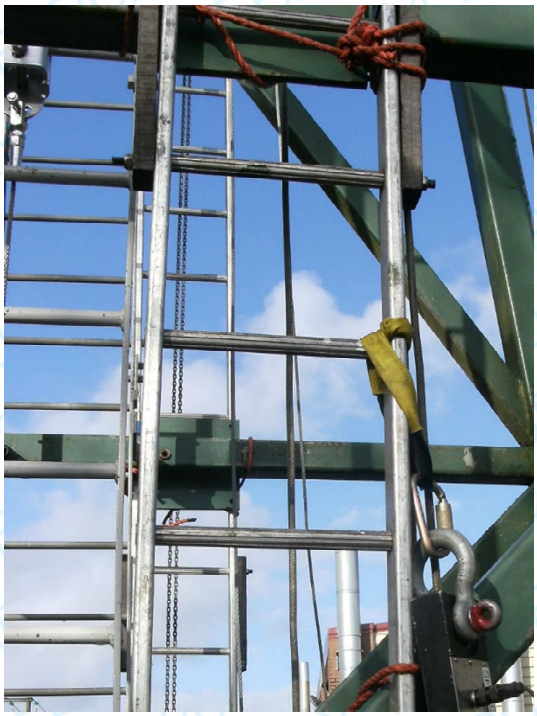

Figure 2 – Ladder referenced 2

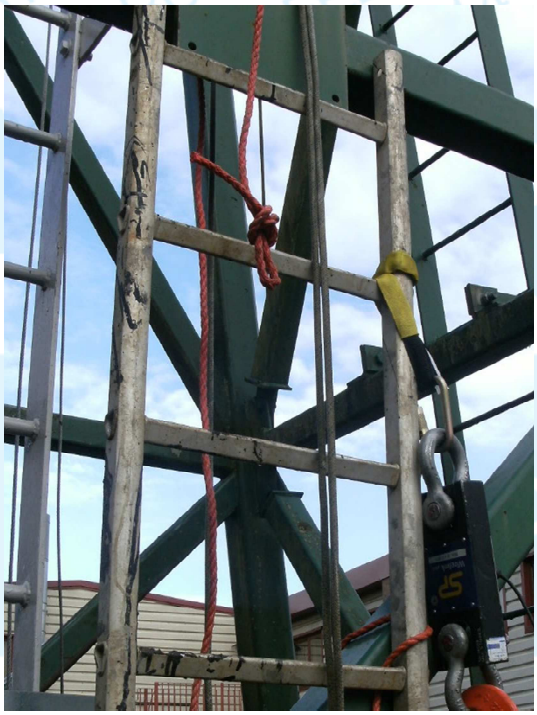

Figure 3 – Ladder referenced 3

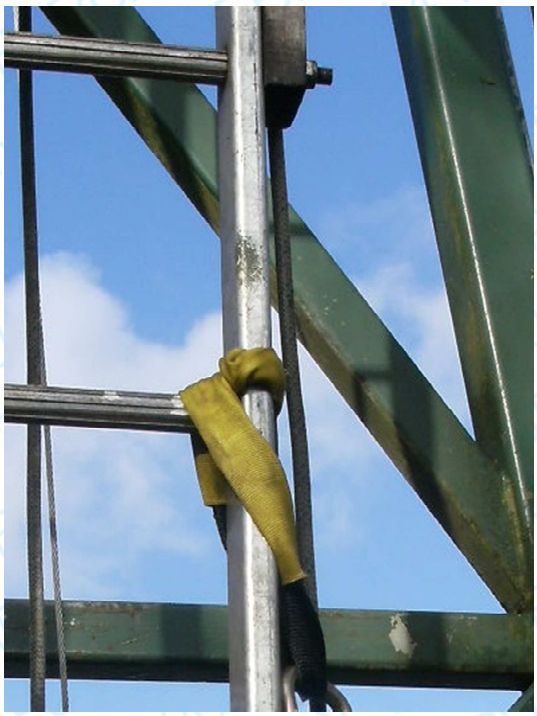

Figure 4 – Direct anchorage point

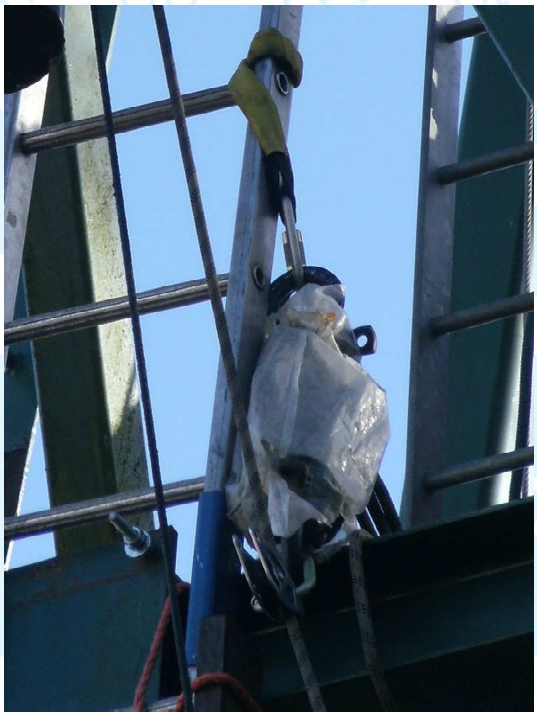

Figure 5 – Anchorage point for

Figure 6 – Belay system

TEST RESULTS

Table 1 – Testing of ladder described as "1" in accordance with EN 795: 2012

EN 795: 2012 CLAUSE / TEST	EN 795: 2012 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
4.4.1.2 Specific requirements – Type A anchor dynamic strength & integrity test	When tested dynamically with a rigid steel mass of 100 kg, the test mass shall be arrested. The anchor must then hold an increased mass of 300kg for 3 minutes	Test setup: Direct anchorage point Attachment point: At lashing point 100kg mass held following 3.1m free fall Peak arrest force: 8.9kN (see figure 7) Residual strength: 300kg held for 3 minutes	± 40 mm See note 2	PASS
		Test setup: Belay system (no reference lanyard used. 3.1m free fall was generated by putting slack in Belay system) Attachment point: Centre point between lashing points 100kg mass held following 3.1m free fall Peak arrest force: 10.9kN (see figure 8) Residual strength: 300kg held for 3 minutes		
4.4.1.3 Specific requirements – Type A anchor static strength test	Metallic elements shall sustain a force of at least 12 kN for 3 minutes without release, and non-metallic elements shall sustain a force of at least 18kN for 3 minutes without release	Test setup: Direct anchorage point Attachment point: At lashing point 12kN sustained for 3 minutes without failure See note 3	± 50 N See note 2	PASS

Table 2 – Testing of ladder described as "2" in accordance with EN 795: 2012

EN 795: 2012 CLAUSE / TEST	EN 795: 2012 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
4.4.1.2 Specific requirements – Type A anchor dynamic strength & integrity test	When tested dynamically with a rigid steel mass of 100 kg, the test mass shall be arrested. The anchor must then hold an increased mass of 300kg for 3 minutes	Test setup: Direct anchorage point Attachment point: At lashing point 100kg mass held following 3.1m free fall Peak arrest force: 8.9kN (see figure 9) Residual strength: 300kg held for 3 minutes	± 40 mm See note 2	PASS
		Test setup: Belay system (no reference lanyard used. 3.1m free fall was generated by putting slack in Belay system) Attachment point: Centre point between lashing points 100kg mass held following 3.1m free fall Peak arrest force: 11.1kN (see figure 10) Residual strength: 300kg held for 3 minutes		
4.4.1.3 Specific requirements – Type A anchor static strength test	Metallic elements shall sustain a force of at least 12 kN for 3 minutes without release, and non-metallic elements shall sustain a force of at least 18kN for 3 minutes without release	Test setup: Direct anchorage point Attachment point: At lashing point 12kN sustained for 3 minutes without failure See note 3	± 50 N See note 2	PASS

Table 3 – Testing of ladder described as "3" in accordance with EN 795: 2012

EN 795: 2012 CLAUSE / TEST	EN 795: 2012 REQUIREMENT	RESULT / COMMENT	UoM (See note 1)	PASS / FAIL
4.4.1.2 Specific requirements – Type A anchor dynamic strength & integrity test	When tested dynamically with a rigid steel mass of 100 kg, the test mass shall be arrested. The anchor must then hold an increased mass of 300kg for 3 minutes	Test setup: Direct anchorage point Attachment point: At lashing point 100kg mass held following 3.1m free fall Peak arrest force: 8.8kN (see figure 11) Residual strength: 300kg held for 3 minutes	± 40 mm See note 2	PASS
		Test setup: Belay system (no reference lanyard used. 3.1m free fall was generated by putting slack in Belay system) Attachment point: Centre point between lashing points 100kg mass held following 3.1m free fall Peak arrest force: 11.4kN (see figure 12) Residual strength: 300kg held for 3 minutes		
4.4.1.3 Specific requirements – Type A anchor static strength test	Metallic elements shall sustain a force of at least 12 kN for 3 minutes without release, and non-metallic elements shall sustain a force of at least 18kN for 3 minutes without release	Test setup: Direct anchorage point Attachment point: At lashing point 12kN sustained for 3 minutes without failure See note 3	± 50 N See note 2	PASS

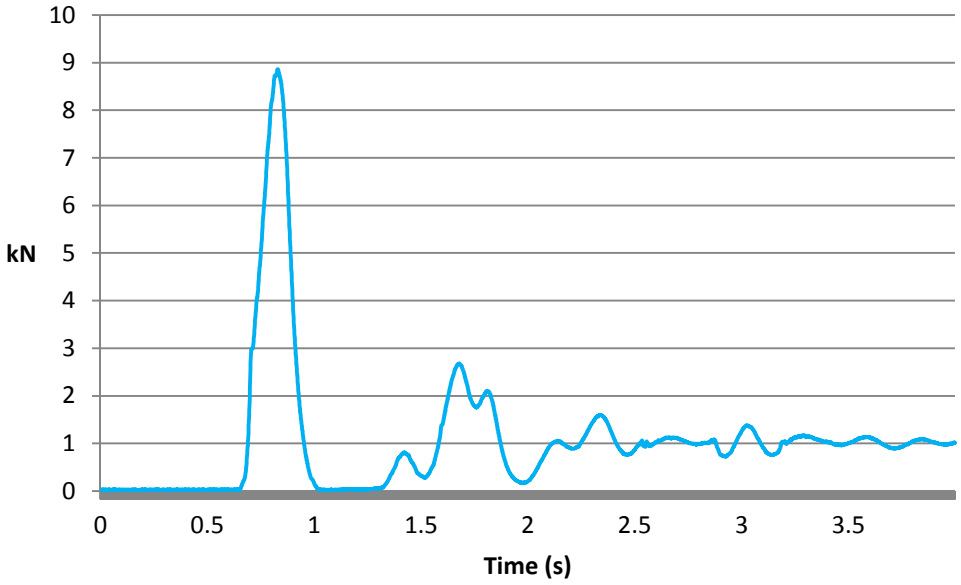

Figure 7 – Dynamic performance test: Graph of force vs. time

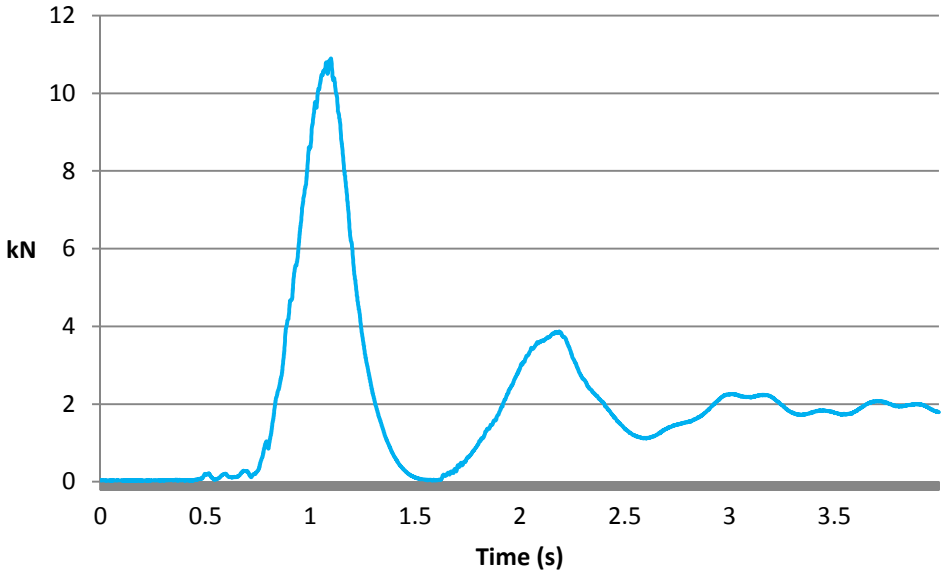

Figure 8 – Dynamic performance test: Graph of force vs. time

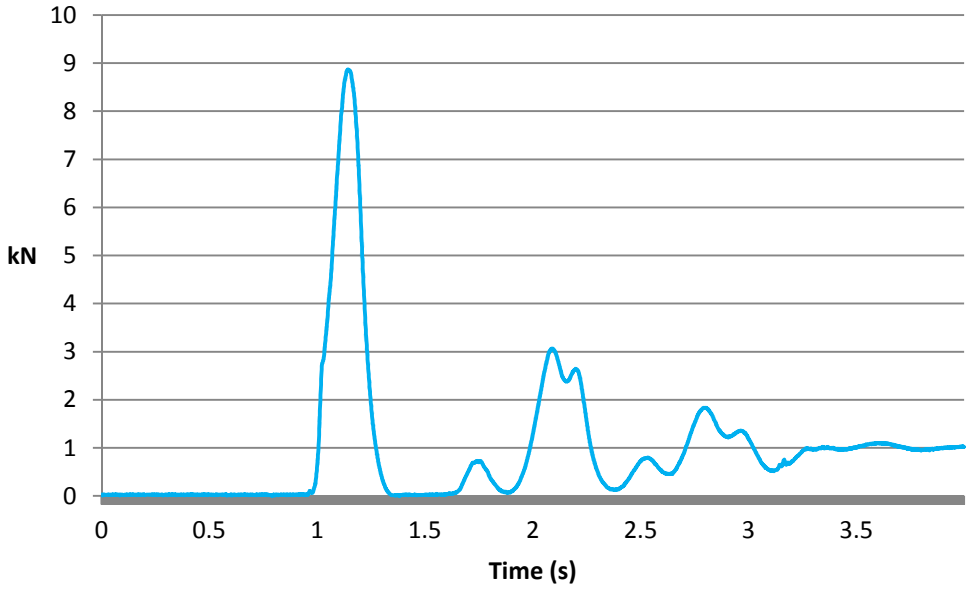

Figure 9 – Dynamic performance test: Graph of force vs. time

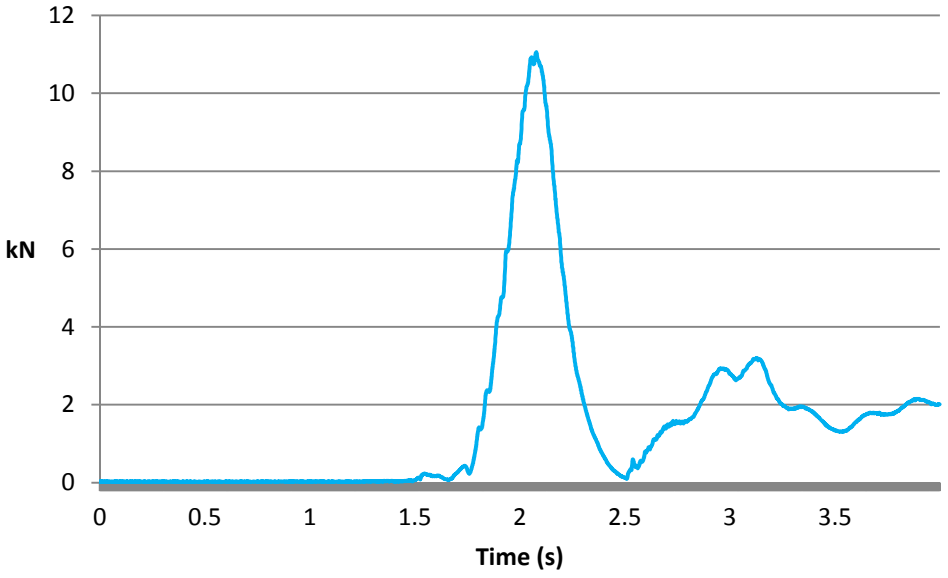

Figure 10 – Dynamic performance test: Graph of force vs. time

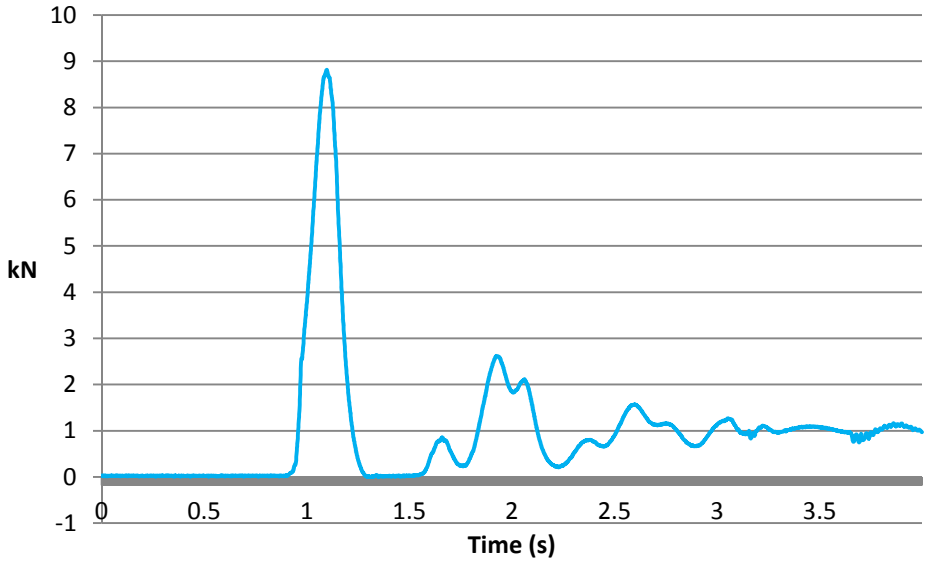

Figure 11 – Dynamic performance test: Graph of force vs. time

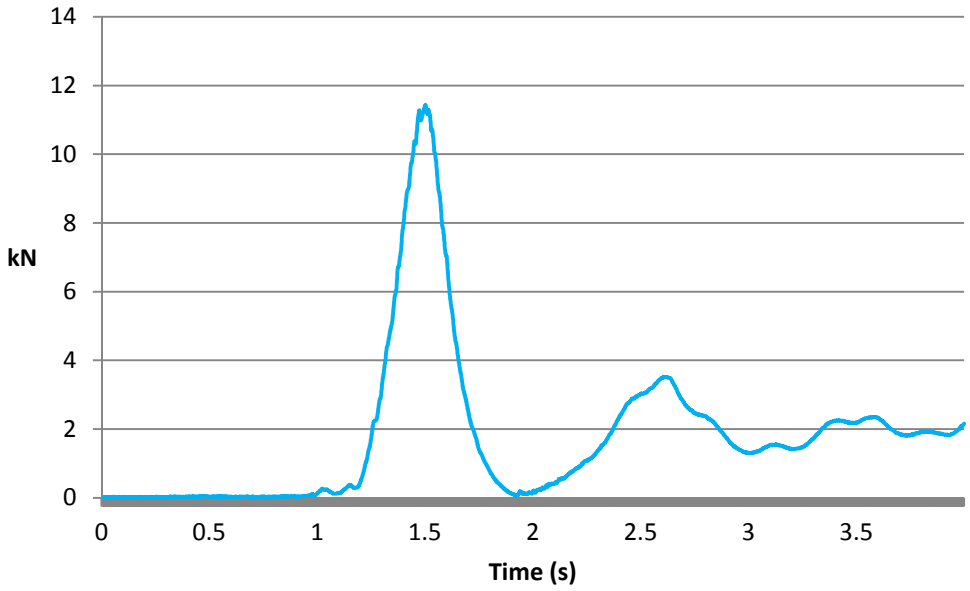

Figure 12 – Dynamic performance test: Graph of force vs. time

ADDITIONAL INFORMATION / NOTES

Note 1 – 'UoM' denotes estimated Uncertainty of Measurement for stated test results. This uncertainty value is based on a standard uncertainty multiplied by a coverage factor k = 2, which provides for a confidence level of approximately 95%

Note 2 – Estimated uncertainty of measurement applied at point of test (e.g. to applied force or to tolerance limits) to ensure product meets requirements of the standard

Note 3 – Static strength testing carried out by manually increasing loading, therefore rate of stressing / crosshead velocity as per EN 364: 1992 Clauses 4.1.2.1 & 4.1.2.2 cannot be accurately determined (see VG11 recommendation for use sheet CNB/P/11.023 dated 25.10.2007)

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13. CONSTRUCTION AND ARBITRATION
The laws of England shall govern all contracts and the parties submit to exclusive jurisdiction of the courts of England, unless otherwise agreed.