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PROOF LOAD,AND IMPACT TESTS ON MINING NETS

1. INTRODUCTION

At the request of CAT Mining Supplies (Pty) Ltd load and impact tests were conducted on braided polyethylene mining nets, at the SABS Structural Engineering Laboratory.

Scope:

- a) To determine whether the tested net samples were able to sustain without net or tie-down method failure the load specified by the manufacturer.
- b) To determine if the net could safely sustain an impact load similar to that of a person falling from a height of 4 meters.

2. DESCRIPTION

The two samples received for testing were described by the client as "braided polyethylene mining nets".

The nets consisted of either blue or yellow braided mesh with orange surround and diagonal cross over reinforcement rope, secured to the net perimeter with blue tie down rope.

Blue meshed nets were 3 x 4 meter in size, and the yellow meshed nets were 3 x 3m in size. Both sizes were supplied in either braided mesh format only or braided mesh with reinforcement ropes in specified patterns.

The nets and their components had the following specifications and dimensional parameters as per tables 2.1 and 2.2 following;

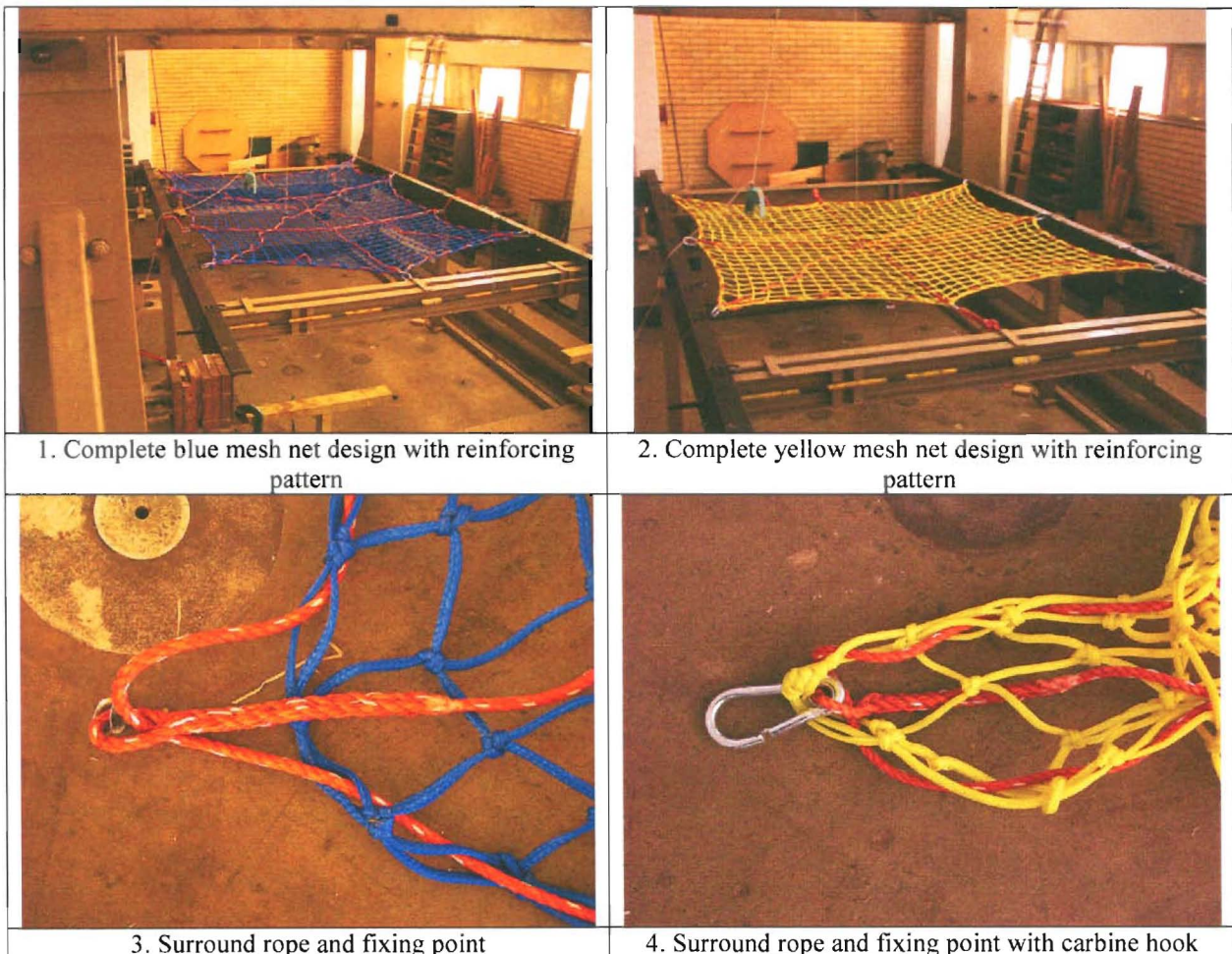
Table 2.1

No.	Component	Description/dimension
1	Complete net	Blue braided mesh 4x3m overall dimensions
2	Braided mesh	Mesh size: 100x1 00mm Rope type: Circular woven, 143 strands, polyethylene 16,77g/m. 10 colour: Blue JP6216
3	Surround and reinforcing rope	Rope type: 010mm Brick-Syn fibre rope. Polypropylene extruded split-film fibers combined into a 3 strand rope of ±45g/m. Breaking strength; ± 1425kgf. 10 colour: Orange with white insert.
4	Reinforcing pattern	H-pattern with 1.3m spacing in length and 1.5m spacing in width, diagonal cross and complete perimeter surround rope.
5	Fixing method	012mm Carbine hook, with spring loaded snap hinge gate on each of 10 perimeter fixing points.

Table 2.2

No.	Component	Description/dimension
1	Complete net	Yellow braided mesh 3x3m overall dimensions
2	Braided mesh	Mesh size: 100x100mm Rope type: Circular woven, 143 strands, polyethylene 17.3g/m. 10 colour: Golden yellow JP3680
3	Surround and reinforcing rope	Rope type: 010mm Brick-Syn fibre rope. Polypropylene extruded split-film fibers combined into a 3 strand rope of ±45g/m. Breaking strength; ± 1425kgf. ID colour: <b>Orange</b> with white insert.
4	Reinforcing pattern	Central perpendicular cross, diagonal cross and complete perimeter surround rope.
5	Fixing method	012mm Carbine hook, with spring loaded snap hinge gate on each of 8 perimeter fixing points.

For identification see photographs 1 - 4 following:



(3 Test method follows on pg3)

### 3 TEST METHOD

#### 3.1 Impact test

The test nets were installed by our client to manufacturer's specifications inside a rigid test frame. A test weight dummy constructed from woven polypropylene canvass of Ø 300mm in diameter and 1500mm in length weighing 100kg was suspended four meters (4m) above the center of the net sample, installed inside the rigid test frame. The test weight dummy was then dropped with the aid of a quick release onto the net. The net was inspected after the impact for any sign of damage or failure. Two nets, one blue and one yellow meshed net, were tested for impact. Both tested nets had reinforcing rope per pattern as described in 2.

#### 3.2 Load test

Proof load test, the net was installed by our client as to manufacturer's specification inside a rigid test frame. Using a water bag suspension weight, electronic load cell and an overhead crane weight to the amount of 1500kg was placed onto each test net sample. Each test net was inspected during and after the load test for any sign of damage or failure. Four nets were tested, two 3x3m yellow nets one with and one without reinforcing rope, and two 3x4m blue nets one with and one without reinforcing rope.

### 4. TEST RESULTS

The results of the tests were as described in Table 4.1

Table 4.1 Test results impact and proof load tests

Sample No:	Test Intensity	Test Type	Observation and damage report
1	100 kg over 4m (3924 J)	Impact test	<ul style="list-style-type: none"> <li>Both tested nets sustained the impact load and retained the test weight.</li> <li>The 4x3m net (blue) sustained a single broken mesh rope at the 1/3<sup>rd</sup> in length fixing point.</li> <li>The smaller 3x3m yellow net with slightly less stretch caused some damage on the carbine hooks</li> <li>In all 3 carbine hooks were damaged, two showed signs of yawning and one hinge gate sheared off completely see photographs on the following pages.</li> </ul>
2	Total load applied: 1500 kg	Proof Load test	<ul style="list-style-type: none"> <li>There were no damage reports on any of the load tested nets.</li> <li>Sample 1 - 3x4m + reinforcing - 1080mm</li> <li>Sample 2 - 3x4m without reinforcing - 1160mm</li> <li>Sample 3 - 3x3m + reinforcing - 870mm</li> <li>Sample 4 - 3x3m without reinforcing - 1260mm</li> </ul>

*(4 Test results photographic follows on pg4)*

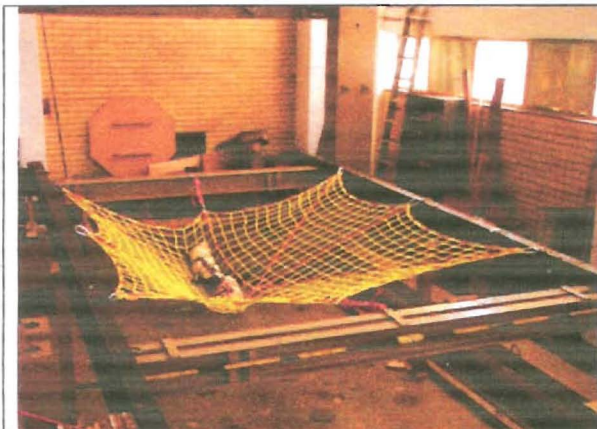




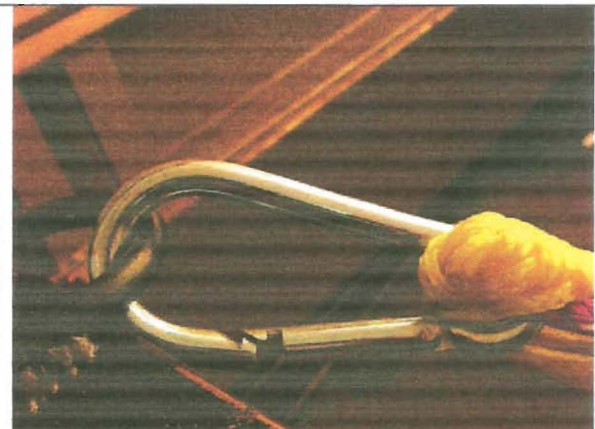
5. Impact test net sample 1



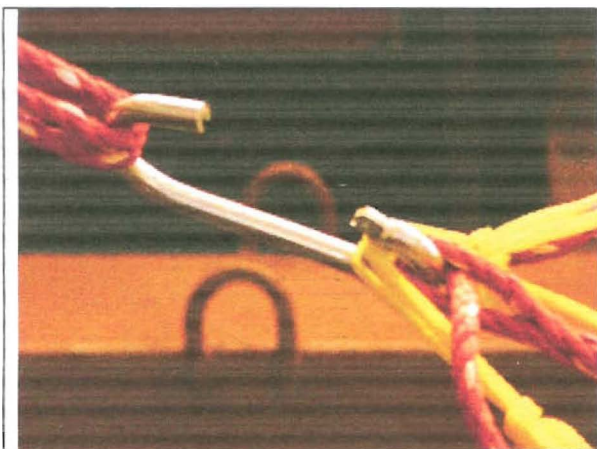
6. Impact test net sample 1 damage recorded



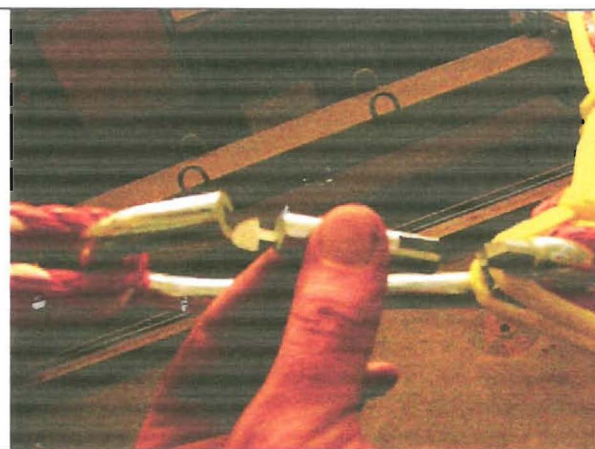
7. Proof load test net sample 1



8. Impact test result carbine hook yawning



9. Hinge gate sheared off completely.



10. Hinge gate retrieved showed yawning as well

*(5 Conclusion follows on pg5)*

## 6 CONCLUSION

Our conclusion therefore as per the results obtained from testing and the observations made are;

a) The impact load was contained by both tested samples as described in 2, with minimal damage. None of the tested samples lost more than one fixing point which could negatively affect the nets load bearing ability.

b) All tested samples proved to sustain the 1500kg load test. The load applied also failed to cause any visible damage to any of the tested samples with or without reinforcing ropes, as described in 2.

**Note, that the tested samples referred to in this report are regarded as safety equipment and the materials and methods used to construct them should be specified by the client and must compare favorably with the description supplied in 2 of this report.**



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