
CERTIFICATE OF TEST

**TEST OF TWO Y16 x 1.2 m LONG ROOF
BOLTS COMPLETE WITH NUTS, LOAD
INDICATORS AND DOMED DOG-EAR
WASHERS (Cast No.: 094505)**

Application Received: 01 May 2010

Certificate No.: T15312

Order No.: COD

Date of Test: 05 May 2010

SUBMITTED TO

Mr Reuben Nkosi
Reunko Steel Suppliers
Postnet Suite 41
Private Bag X035
ALBERTON
1450

Test witnessed by: Mr Reuben Nkosi

1. INTRODUCTION

At the request of Mr Reuben Nkosi of Reunko Steel Suppliers, two Y16 x 1.2 m roof bolts complete with nuts, load indicators and 5 mm thick domed dog-ear washers (Cast No.: 094505) were submitted for progressive tensile testing to destruction. The test was conducted in accordance with the customer requirements.

2. TEST PROCEDURE

Testing Machine: 1000 kN Amsler Universal.
Test Type: Destruction in tension.
Test specification: Customer request.

The nut was screwed onto the threaded end of the bar for each specimen. The load indicator together with the domed dog-ear washer were fitted adjacent to the nut. The assemblies were in turn installed in the 1000 kN Amsler Universal testing machine using suitable fittings as shown in Figure 1. A gradually increasing tensile load was applied to each assembly until failure occurred.

Notice:

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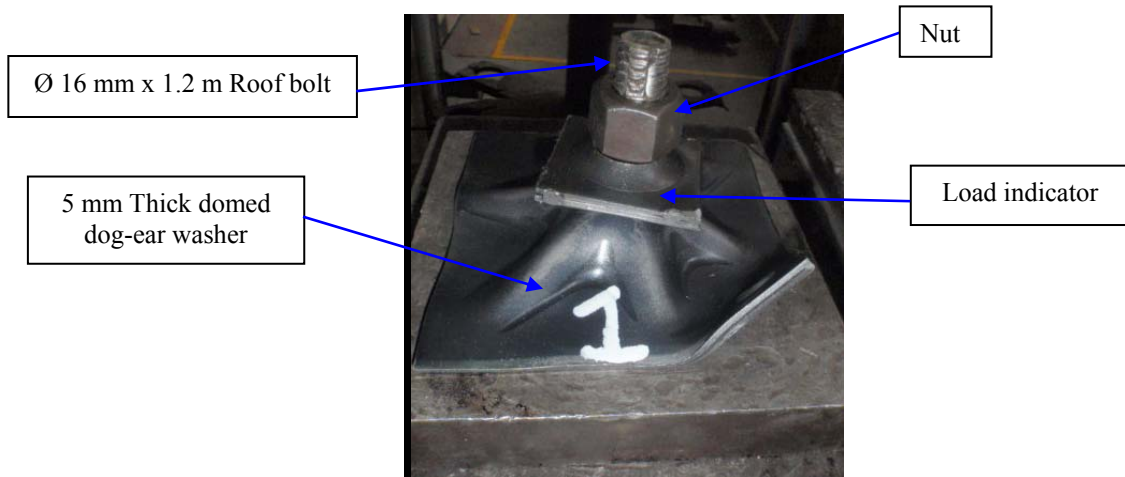


Figure 1. Y16 x 1.2 m Long Roof bolt assembly installed in the testing machine.

3. TEST RESULTS

The test results of the destruction tests carried out on the roof bolts are summarised in Table 1.

Table 1. Test results for the Y16 x 1.2 m long roof bolt assemblies.

<u>Assembly No.</u>	Maximum load carried by the domed dog-ear washer (kN)	Maximum load carried by the roof bolt (kN)
1	149.2	171.8
2	141.6	185.2
Average	145.4	178.5



Figure 2. Y16 x 1.2 m Long Roof bolt assemblies after the test.

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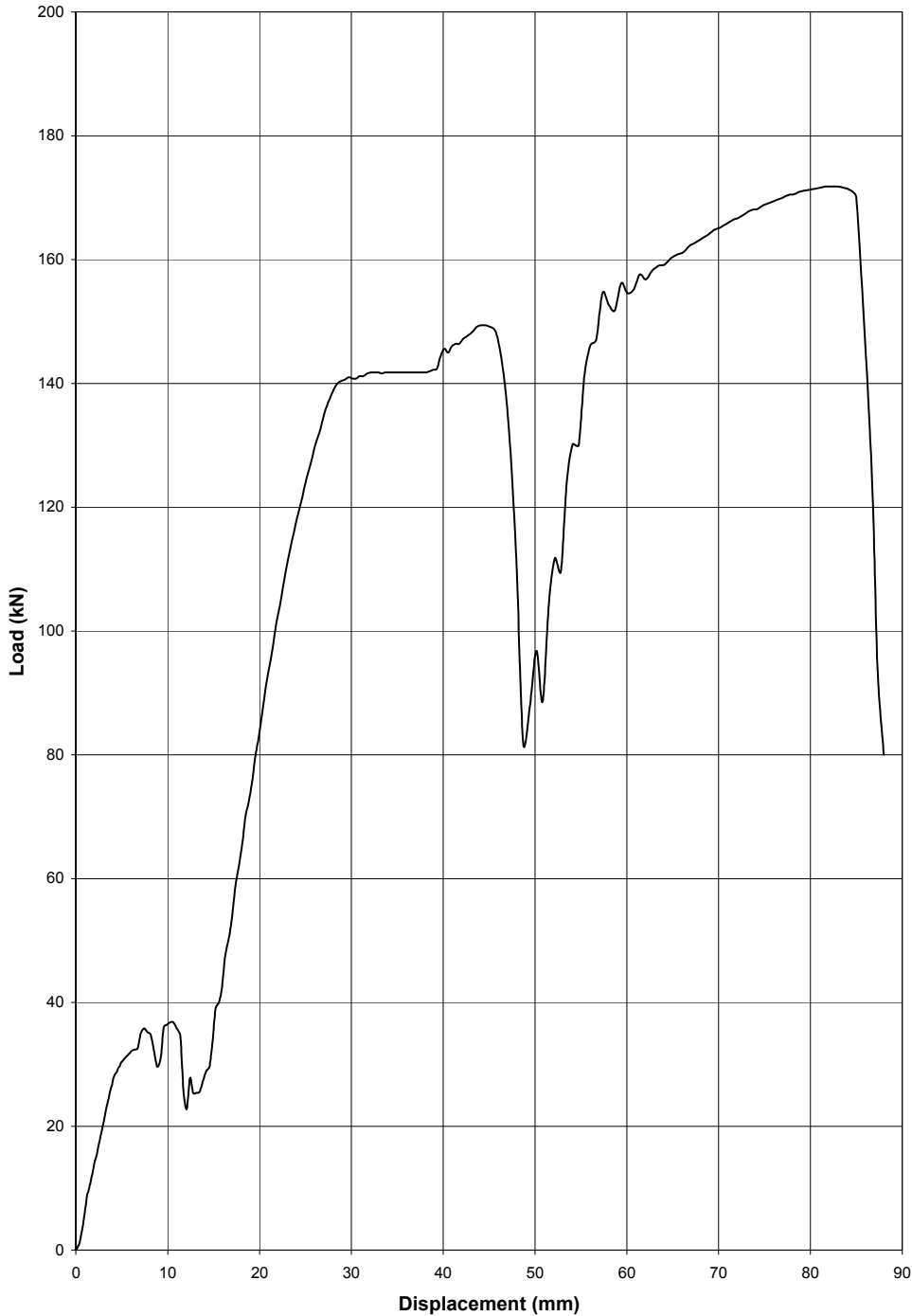
4. TEST COMMENTS (FAILURE SEQUENCE)

1. The load indicator failed (flattened).
2. The domed dog-ear washer failed (flattened).
3. The roof bolt fracture at the threaded portion as shown in Figure 2.

5. DISCLAIMER

1. The CSIR cannot be held responsible for product indifferences and cannot be held responsible for any accidents or incidents as a result thereof.
2. Due to the limited amount of sample(s) tested and the type of testing done, CSIR can only account for the results from those specific samples tested.
3. All CSIR standard terms and conditions of testing apply and will be forwarded upon request.

Certificate No.: T15312
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y16 mm x 1.2 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 094505)
Assembly No.: 1
Maximum Force: 149.2 kN (Domed dog-ear washer)
171.8 kN (Roof bolt)

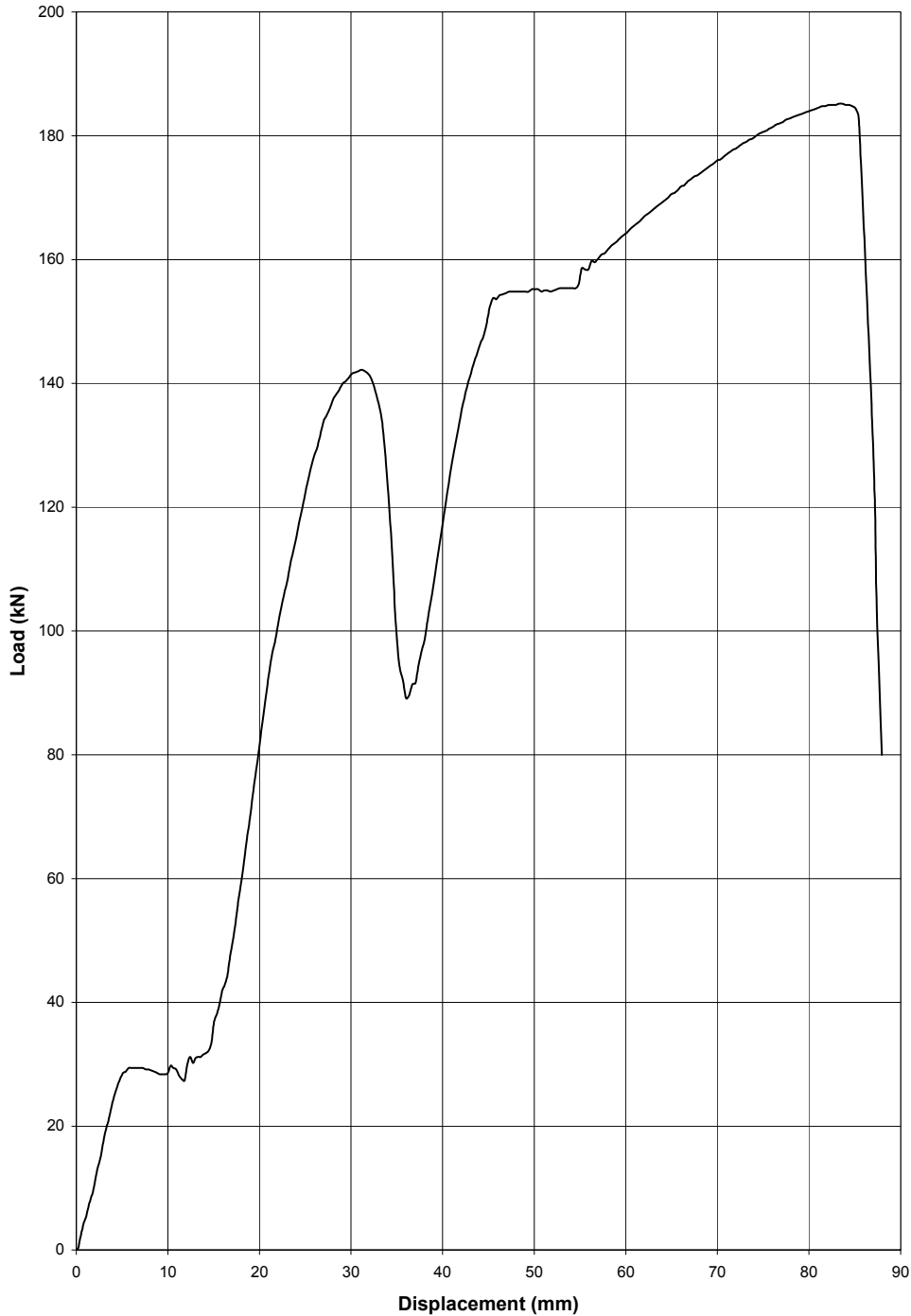


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Testing Officer:
WILLIAM MABITSELA

Engineer:
RIAAAN BERGH

Certificate No.: T15312
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y16 x 1.2 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 094505)
Assembly No.: 2
Maximum Force: 135.7 kN (Domed dog-ear washer)
179.1 kN (Roof bolt)



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Testing Officer:
WILLIAM MABITSELA

Engineer:
RIAAAN BERGH

CERTIFICATE OF TEST

**TEST OF TWO Y18 x 1.5 m LONG ROOF
BOLTS COMPLETE WITH NUTS, LOAD
INDICATORS AND DOMED DOG-EAR
WASHERS (Cast No.: 093887)**

Application Received: 01 May 2010

Certificate No.: T15313

Order No.: COD

Date of Test: 05 May 2010

SUBMITTED TO

Mr Reuben Nkosi
Reunko Steel Suppliers
Postnet Suite 41
Private Bag X035
ALBERTON
1450

Test witnessed by: Mr Reuben Nkosi

1. INTRODUCTION

At the request of Mr Reuben Nkosi of Reunko Steel Suppliers, two Y18 x 1.5 m roof bolts complete with nuts, load indicators and 5 mm thick domed dog-ear washers (Cast No.: 093887) were submitted for progressive tensile testing to destruction. The test was conducted in accordance with the customer requirements.

2. TEST PROCEDURE

Testing Machine: 1000 kN Amsler Universal.
Test Type: Destruction in tension.
Test specification: Customer request.

The nut was screwed onto the threaded end of the bar for each specimen. The load indicator together with the domed dog-ear washer were fitted adjacent to the nut. The assemblies were in turn installed in the 1000 kN Amsler Universal testing machine using suitable fittings as shown in Figure 1. A gradually increasing tensile load was applied to each assembly until failure occurred.

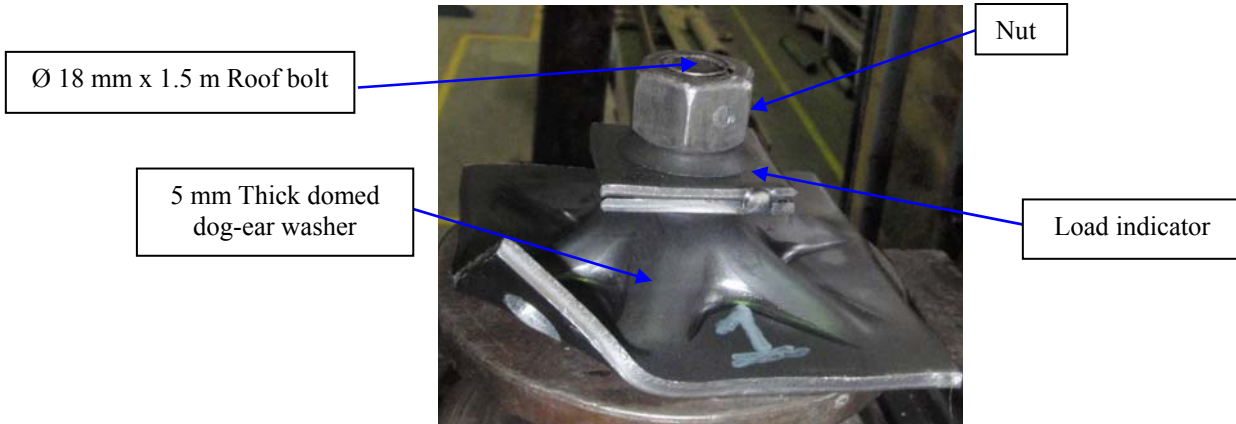


Figure 2. Y18 x 1.5 m Long Roof bolt assembly installed in the testing machine.

3. TEST RESULTS

The test results of the destruction tests carried out on the roof bolts are summarised in Table 1.

Table 1. Test results for the Y18 x 1.5 m long roof bolt assemblies

<u>Assembly No.</u>	Maximum load carried by the domed dog-ear washer (kN)	Maximum load carried by the roof bolt (kN)
1	156.0	208.6
2	161.8	216.3
Average	158.9	212.5

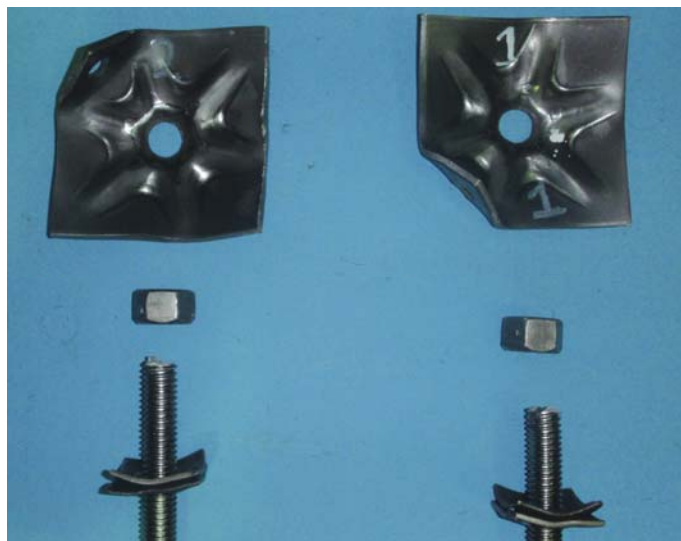


Figure 2. Y18 x 1.5 m Long Roof bolt assemblies after the test.

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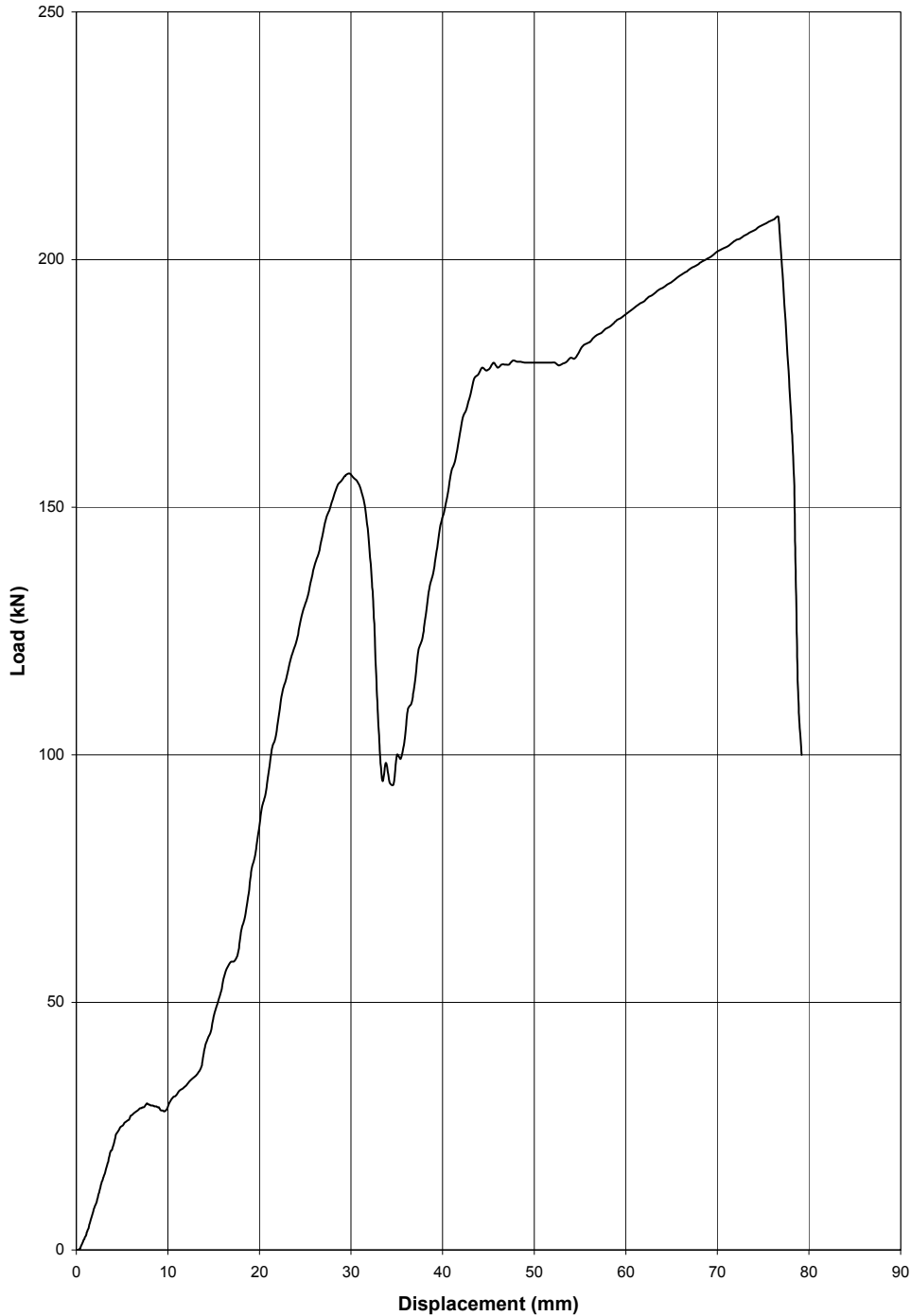
4. TEST COMMENTS (FAILURE SEQUENCE)

1. The load indicator failed (flattened).
2. The domed dog-ear washer failed (flattened).
3. The roof bolt fracture at the threaded portion as shown in Figure 2.

5. DISCLAIMER

1. The CSIR cannot be held responsible for product indifferences and cannot be held responsible for any accidents or incidents as a result thereof.
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Certificate No.: T15313
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y18 mm x 1.5 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 093887)
Assembly No.: 1
Maximum Force: 156.0 kN (Domed dog-ear washer)
208.6 kN (Roof bolt)

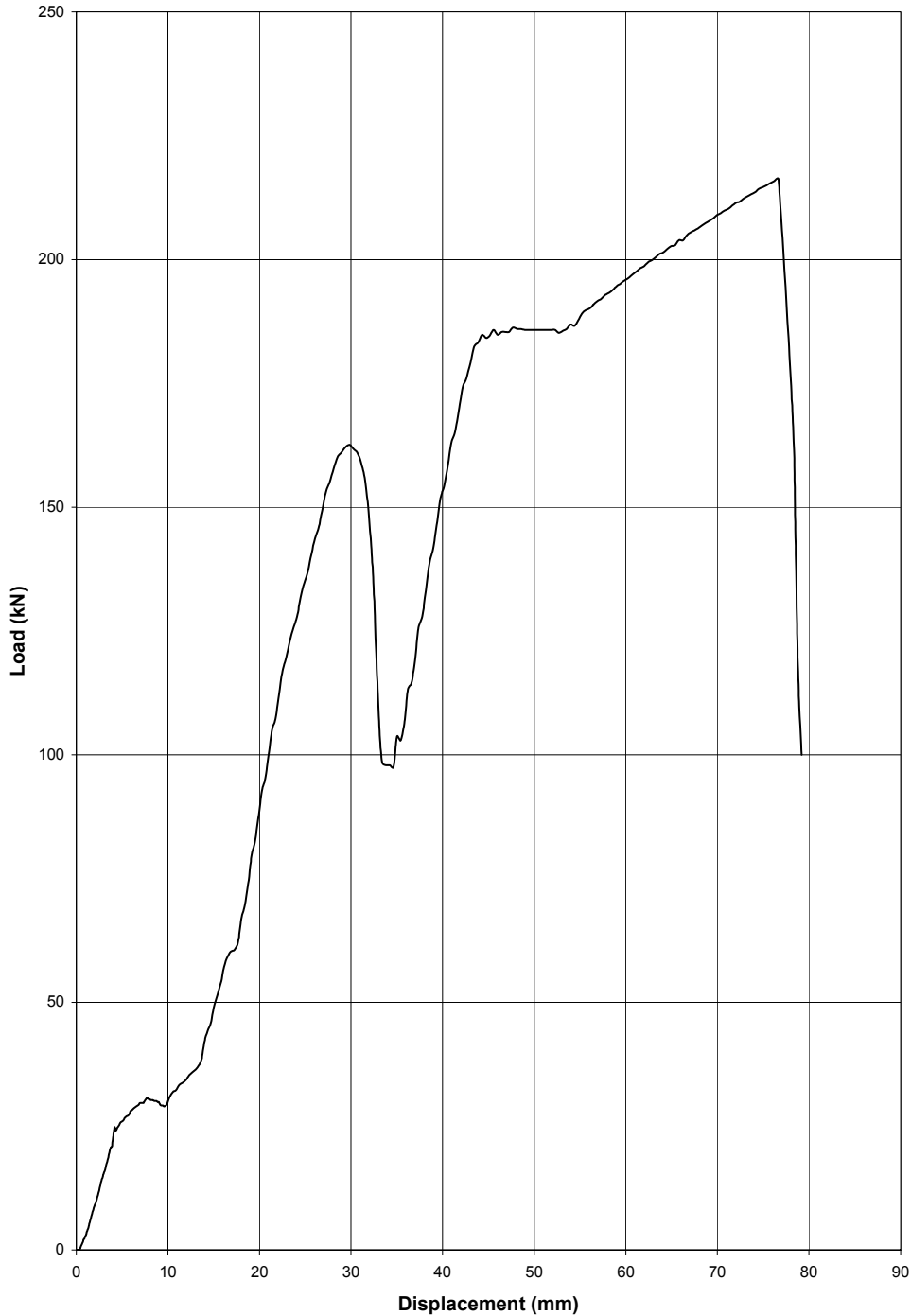


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Testing Officer:
WILLIAM MABITSELA

Engineer:
RIAAAN BERGH

Certificate No.: T15313
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y18 mm x 1.5 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 093887)
Assembly No.: 2
Maximum Force: 161.8 kN (Domed dog-ear washer)
216.3 kN (Roof bolt)



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Engineer:
RIAAAN BERGH

CERTIFICATE OF TEST

**TEST OF TWO Y18 x 1.8 m LONG ROOF
BOLTS COMPLETE WITH NUTS, LOAD
INDICATORS AND DOMED DOG-EAR
WASHERS (Cast No.: 093887)**

Application Received: 01 May 2010

Certificate No.: T15314

Order No.: COD

Date of Test: 05 May 2010

SUBMITTED TO

Mr Reuben Nkosi
Reunko Steel Suppliers
Postnet Suite 41
Private Bag X035
ALBERTON
1450

Test witnessed by: Mr Reuben Nkosi

1. INTRODUCTION

At the request of Mr Reuben Nkosi of Reunko Steel Suppliers, two Y18 x 1.8 m roof bolts complete with nuts, load indicators and 5 mm thick domed dog-ear washers (Cast No.: 093887) were submitted for progressive tensile testing to destruction. The test was conducted in accordance with the customer requirements.

2. TEST PROCEDURE

Testing Machine: 1000 kN Amsler Universal.
Test Type: Destruction in tension.
Test specification: Customer request.

The nut was screwed onto the threaded end of the bar for each specimen. The load indicator together with the domed dog-ear washer were fitted adjacent to the nut. The assemblies were in turn installed in the 1000 kN Amsler Universal testing machine using suitable fittings as shown in Figure 1. A gradually increasing tensile load was applied to each assembly until failure occurred.

Testing Officer:
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Engineer:
RIAAAN BERGH

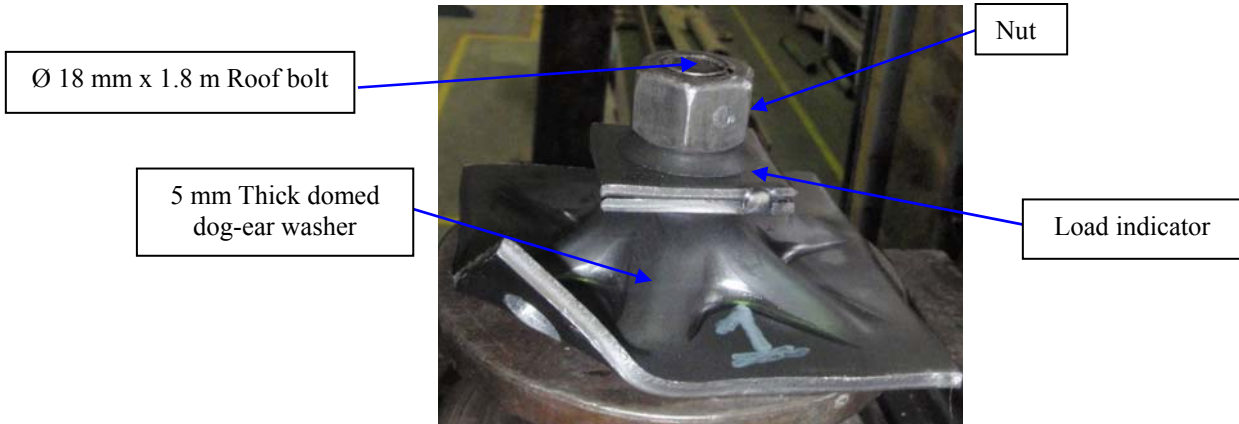


Figure 3. Y18 x 1.8 m Long Roof bolt assembly installed in the testing machine.

3. TEST RESULTS

The test results of the destruction tests carried out on the roof bolts are summarised in Table 1.

Table 1. Test results for the Y18 x 1.8 m long roof bolt assemblies

<u>Assembly No.</u>	Maximum load carried by the domed dog-ear washer (kN)	Maximum load carried by the roof bolt (kN)
1	154.2	207.2
2	145.6	165.2
Average	149.9	186.2



Figure 2. Y18 x 1.8 m Long Roof bolt assemblies after the test.

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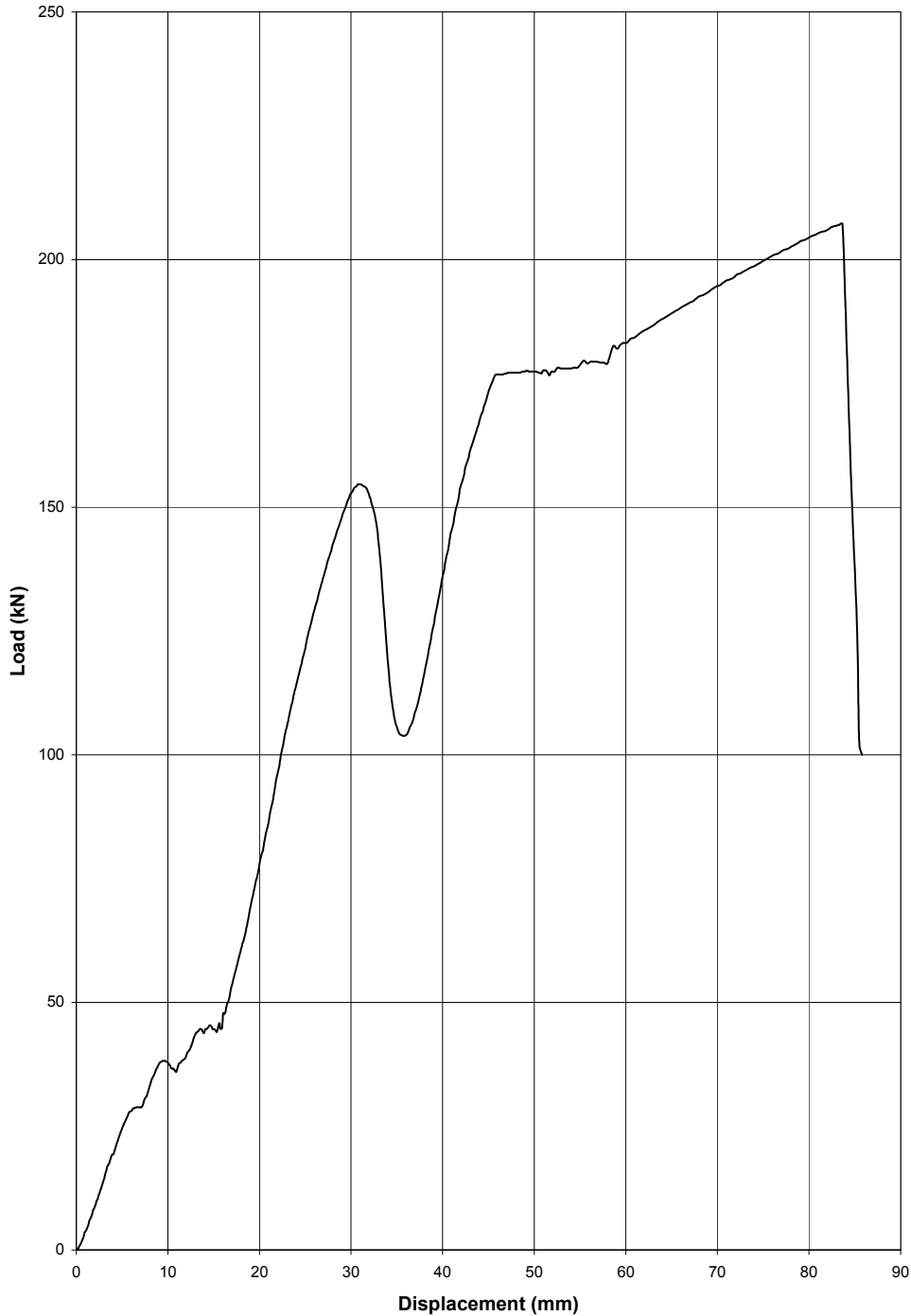
4. TEST COMMENTS (FAILURE SEQUENCE)

1. The load indicator failed (flattened).
2. The domed dog-ear washer failed (flattened).
3. The roof bolt fracture at the threaded portion as shown in Figure 2.

5. DISCLAIMER

1. The CSIR cannot be held responsible for product indifferences and cannot be held responsible for any accidents or incidents as a result thereof.
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3. All CSIR standard terms and conditions of testing apply and will be forwarded upon request.

Certificate No.: T15314
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y18 mm x 1.8 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 093887)
Assembly No.: 1
Maximum Force: 154.2 kN (Domed dog-ear washer)
207.2 kN (Roof bolt)

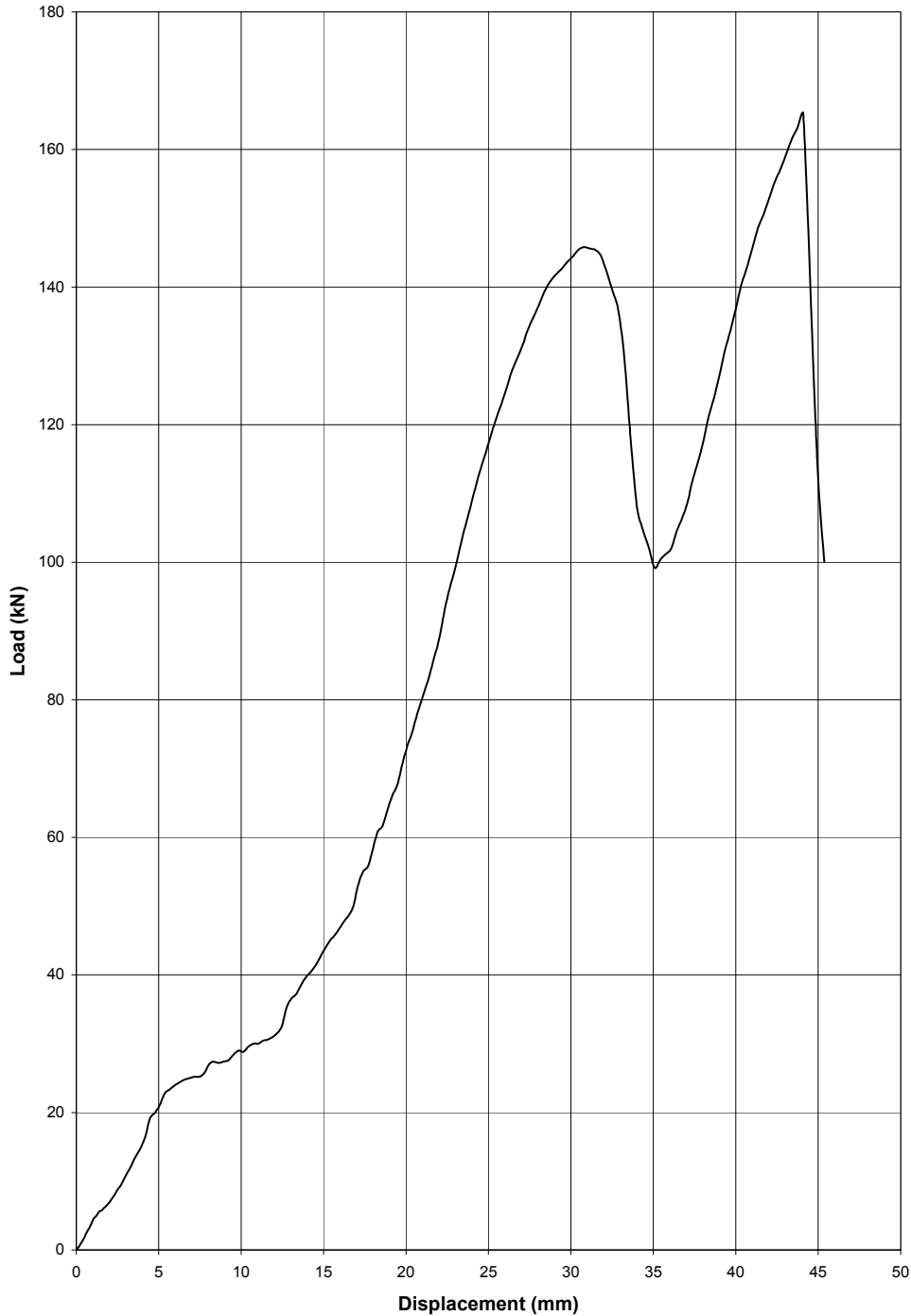


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Testing Officer:
WILLIAM MABITSELA

Engineer:
RIAAAN BERGH

Certificate No.: T15314
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y18 mm x 1.8 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 093887)
Assembly No.: 2
Maximum Force: 145.6 kN (Domed dog-ear washer)
165.2 kN (Roof bolt)



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Testing Officer:
WILLIAM MABITSELA

Engineer:
RIAAN BERGH

CERTIFICATE OF TEST

**TEST OF TWO Y20 x 1.5 m LONG ROOF
BOLTS COMPLETE WITH NUTS, LOAD
INDICATORS AND DOMED DOG-EAR
WASHERS (Cast No.: 093762)**

Application Received: 01 May 2010

Certificate No.: T15315

Order No.: COD

Date of Test: 05 May 2010

SUBMITTED TO

Mr Reuben Nkosi
Reunko Steel Suppliers
Postnet Suite 41
Private Bag X035
ALBERTON
1450

Test witnessed by: Mr Reuben Nkosi

1. INTRODUCTION

At the request of Mr Reuben Nkosi of Reunko Steel Suppliers, two Y20 x 1.5 m roof bolts complete with nuts, load indicators and 5 mm thick domed dog-ear washers (Cast No.: 093762) were submitted for progressive tensile testing to destruction. The test was conducted in accordance with the customer requirements.

2. TEST PROCEDURE

Testing Machine: 1000 kN Amsler Universal.
Test Type: Destruction in tension.
Test specification: Customer request.

The nut was screwed onto the threaded end of the bar for each specimen. The load indicator together with the domed dog-ear washer were fitted adjacent to the nut. The assemblies were in turn installed in the 1000 kN Amsler Universal testing machine using suitable fittings as shown in Figure 1. A gradually increasing tensile load was applied to each assembly until failure occurred.

Testing Officer:
WILLIAM MABITSELA

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RIAAAN BERGH

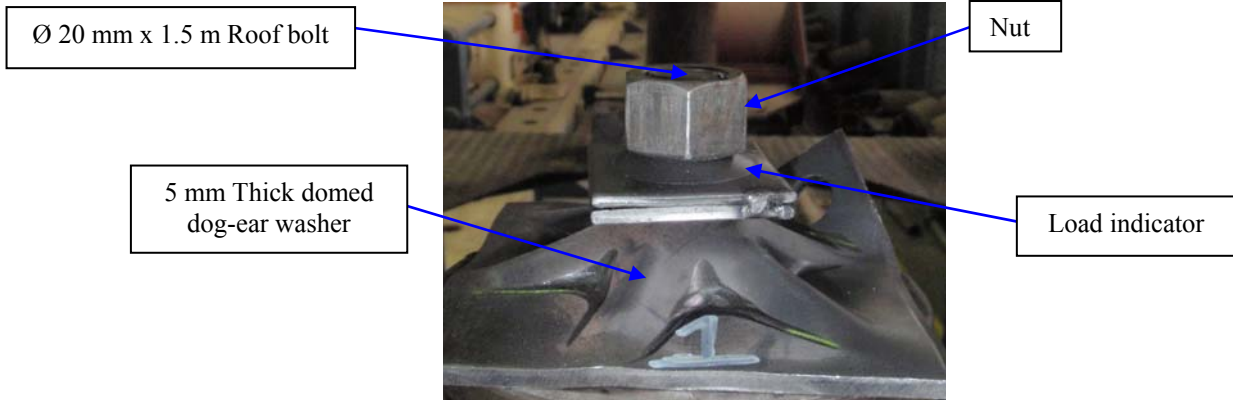


Figure 4. Y20 x 1.5 m Long Roof bolt assembly installed in the testing machine.

3. TEST RESULTS

The test results of the destruction tests carried out on the roof bolts are summarised in Table 1.

Table 1. Test results for the Y20 x 1.5 m long roof bolt assemblies

<u>Assembly No.</u>	Maximum load carried by the domed dog-ear washer (kN)	Maximum load carried by the nut (kN)
1	159.4	232.6
2	161.0	253.2
Average	160.2	242.9



Figure 2. Y20 x 1.5 m Long Roof bolt assemblies after the test.

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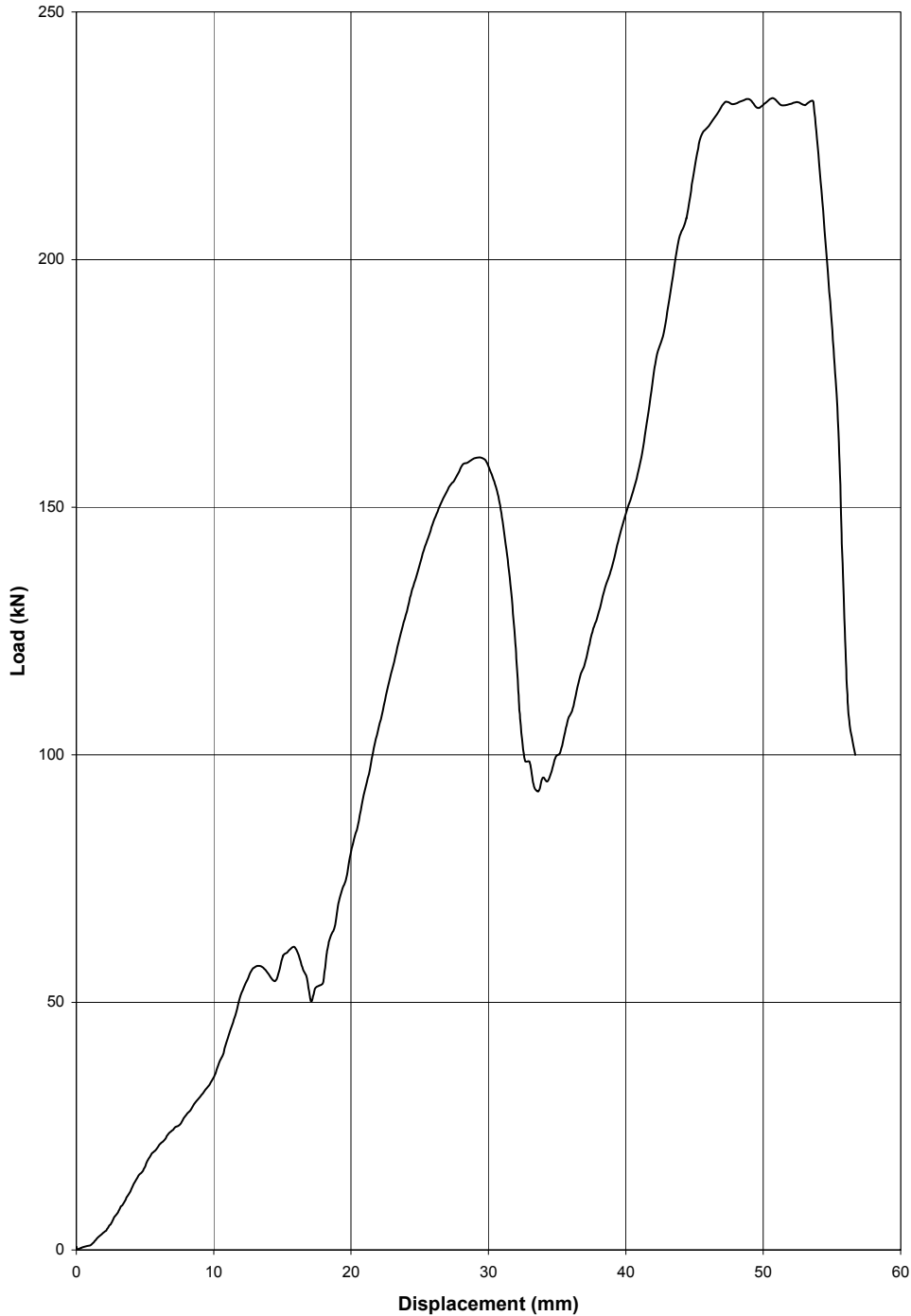
4. TEST COMMENTS (FAILURE SEQUENCE)

1. The load indicator failed (flattened).
2. The domed dog-ear washer failed (flattened).
3. The nut stripped off the roof bolt threaded portion as shown in Figure 2.

5. DISCLAIMER

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3. All CSIR standard terms and conditions of testing apply and will be forwarded upon request.

Certificate No.: T15315
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y20 mm x 1.5 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 093762)
Assembly No.: 1
Maximum Force: 159.4 kN (Domed dog-ear washer)
253.2 kN (Roof bolt)

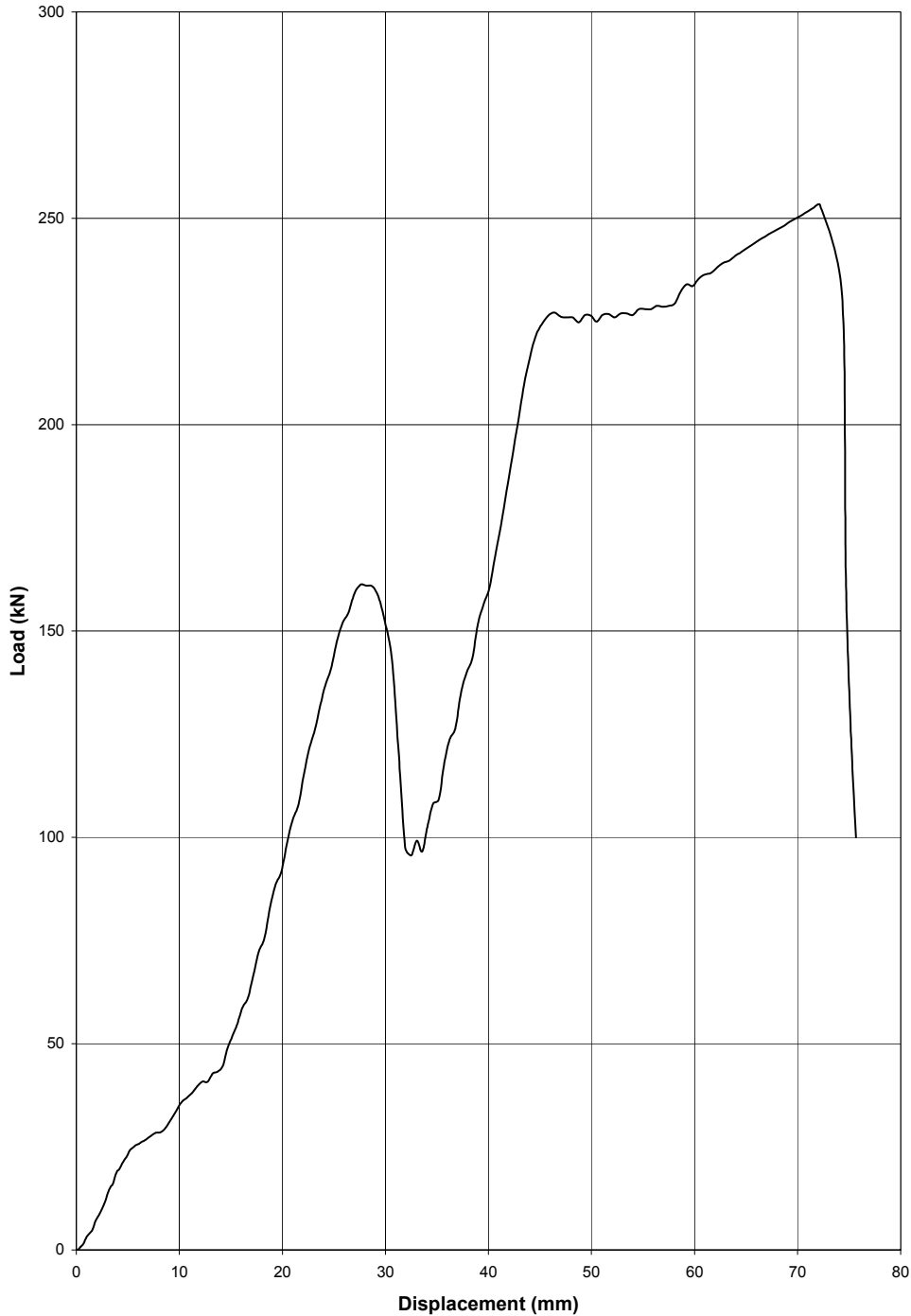


Testing Officer:
WILLIAM MABITSELA

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Engineer:
RIAAAN BERGH

Certificate No.: T15315
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y20 mm x 1.5 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 093762)
Assembly No.: 2
Maximum Force: 161.0 kN (Domed dog-ear washer)
179.1 kN (Roof bolt)



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Testing Officer:
WILLIAM MABITSELA

Engineer:
RIAAAN BERGH

CERTIFICATE OF TEST

**TEST OF TWO Y20 x 1.8 m LONG ROOF
BOLTS COMPLETE WITH NUTS, LOAD
INDICATORS AND DOMED DOG-EAR
WASHERS (Cast No.: 093762)**

Application Received: 01 May 2010

Certificate No.: T15316

Order No.: COD

Date of Test: 05 May 2010

SUBMITTED TO

Mr Reuben Nkosi
Reunko Steel Suppliers
Postnet Suite 41
Private Bag X035
ALBERTON
1450

Test witnessed by: Mr Reuben Nkosi

1. INTRODUCTION

At the request of Mr Reuben Nkosi of Reunko Steel Suppliers, two Y20 x 1.8 m roof bolts complete with nuts, load indicators and 5 mm thick domed dog-ear washers (Cast No.: 093762) were submitted for progressive tensile testing to destruction. The test was conducted in accordance with the customer requirements.

2. TEST PROCEDURE

Testing Machine: 1000 kN Amsler Universal.
Test Type: Destruction in tension.
Test specification: Customer request.

The nut was screwed onto the threaded end of the bar for each specimen. The load indicator together with the domed dog-ear washer were fitted adjacent to the nut. The assemblies were in turn installed in the 1000 kN Amsler Universal testing machine using suitable fittings as shown in Figure 1. A gradually increasing tensile load was applied to each assembly until failure occurred.

Testing Officer:
WILLIAM MABITSELA

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Engineer:
RIAAAN BERGH

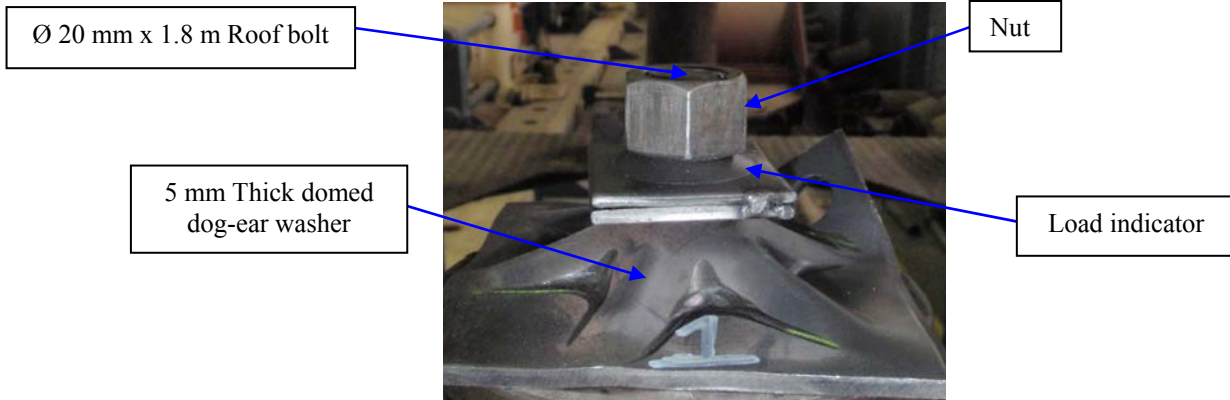


Figure 5. Y20 x 1.8 m Long Roof bolt assembly installed in the testing machine.

3. TEST RESULTS

The test results of the destruction tests carried out on the roof bolts are summarised in Table 1.

Table 1. Test results for the Y20 x 1.8 m long roof bolt assemblies.

<u>Assembly No.</u>	Maximum load carried by the domed dog-ear washer (kN)	Maximum load carried by the nut (kN)
1	163.8	253.8
2	158.8	270.2
Average	161.3	262.0

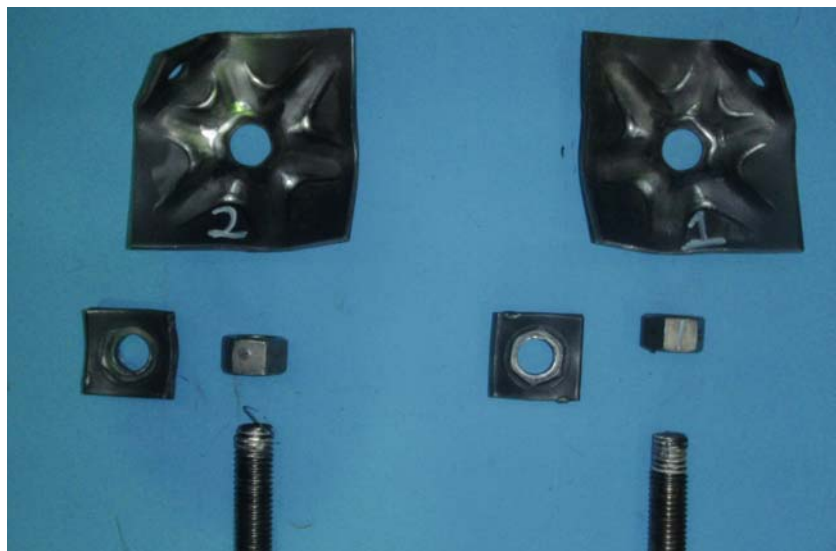


Figure 2. Y20 x 1.8 m Long Roof bolt assemblies after the test.

4. TEST COMMENTS (FAILURE SEQUENCE)

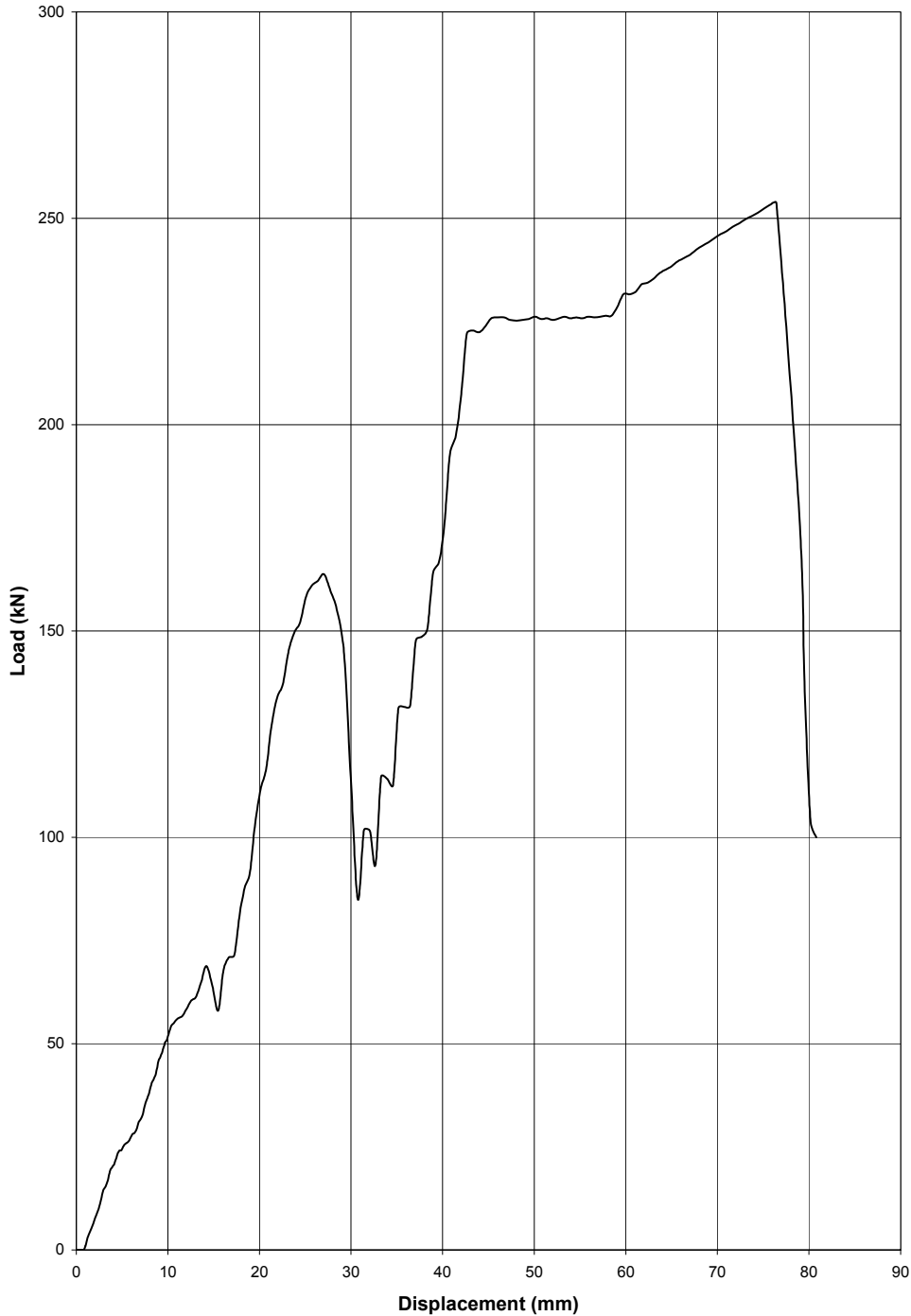
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1. The load indicator failed (flattened).
2. The domed dog-ear washer failed (flattened).
3. The nut stripped off the roof bolt threaded portion as shown in Figure 2.

5. DISCLAIMER

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Certificate No.: T15315
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y20 mm x 1.5 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 093762)
Assembly No.: 1
Maximum Force: 163.8 kN (Domed dog-ear washer)
253.80 kN (Roof bolt)

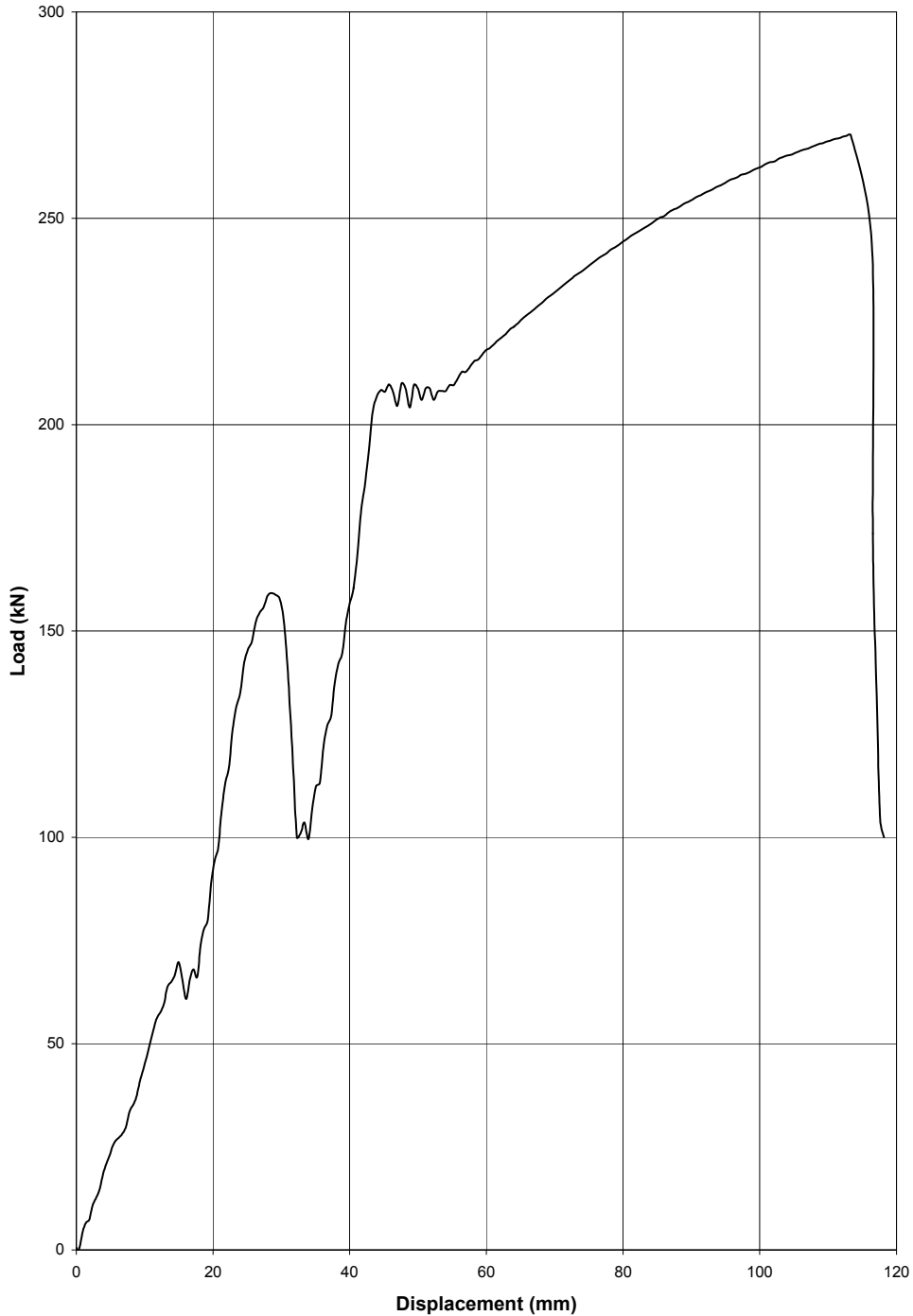


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Testing Officer:
WILLIAM MABITSELA

Engineer:
RIAAAN BERGH

Certificate No.: T15315
Date of test: 05 May 2010
Applicant: Reunko Steel Suppliers
Description: Y20 mm x 1.5 m long roof bolt complete with nut, load indicator and 5 mm thick domed dog-ear washer (Cast No.: 093762)
Assembly No.: 2
Maximum Force: 158.8 kN (Domed dog-ear washer)
270.2 kN (Roof bolt)



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Engineer:
RIAAAN BERGH