

FUGRO TECHNICAL SERVICES LIMITED

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MaterialLab

Client Ref. : --

Report No : 124675ST130008(8)

Page 1 of 3

REPORT ON SHEAR STRENGTH TEST OF E12 ANCHOR BOLT EMBEDDED IN NON-CRACKED CONCRETE

Sample Description

Information Supplied by Client

Client : Sunway Metal Manufactory Limited
Project : Shear Strength Test of Anchor Bolt
Sample Description : E12 Anchor Bolt
Client's Sample I.D. : --

For Expanding Anchor

Supplier Name : Sunway Metal Manufactory Limited
Reference Number : E12
Location of the Fixings in the Base Specimen : (Please refer to the diagrams)
Embedded Length : 60 mm Minimum requirement of BS 5080 : 180 mm
Hole Diameter : 12 mm for distance of fixing from the edge
Bolt Diameter : 12 mm Minimum requirement of BS 5080 : 300 mm
Hole Depth : 60 mm anchor spacing of fixing
Concrete Grade : 22 N/mm²

For Concrete

Mix Proportions : Not provided
Location of Reinforcement : Not applicable
Type of reinforcement : Not applicable
Cast Unit Shape : Square
Dimensions of Cast Unit : 500 x 500 x 192 mm
Concrete Age : 30 days
Compressive Strength (Average) : 224 kgf/cm²

Laboratory Information

Location of Test : Product Testing Laboratory of MaterialLab
Lab. Sample I.D. : ST130008/53-55, 57 & 59
Date Received : 03 January 2013
Date Specimens Fixed : 16 April 2013
Date Tested : 24 April 2013
Span of Reaction Support : 320 mm
Test Method : BS 5080 : Part 2 : 1997 and ETAG-001-Annex-A
Loading Method : Increment Loading

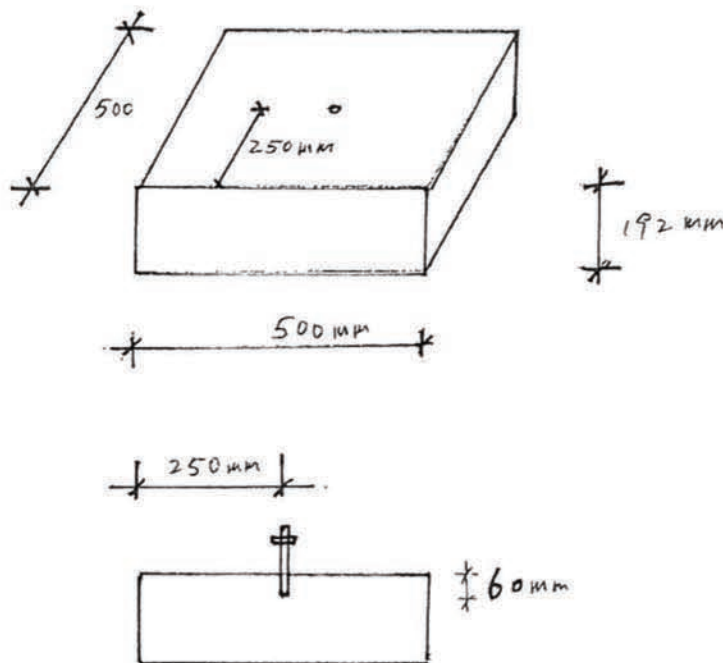
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**REPORT ON SHEAR STRENGTH TEST OF E12 ANCHOR BOLT EMBEDDED
IN NON-CRACKED CONCRETE**

Test Method

石矢強度: 25/20D \pm 5 MPa, 28 天
數量 42 件



Sketch 1 : The specified concrete structure

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REPORT ON SHEAR STRENGTH TEST OF E12 ANCHOR BOLT EMBEDDED IN NON-CRACKED CONCRETE

Summary of Test Results

Lab. Sample I.D.	Force Interval (kN) / Displacement (mm)													Ultimate Force (max.) (kN)
	4 kN	8 kN	12 kN	16 kN	20 kN	24 kN	28 kN	32 kN	36 kN	40 kN	44 kN	48 kN	52 kN	
ST130008/53	0.012	0.532	0.957	1.362	1.844	2.531	3.835	5.324	--	--	--	--	--	33.27
ST130008/54	0.043	0.271	0.342	0.563	0.932	1.479	2.378	3.396	--	--	--	--	--	33.16
ST130008/55	0.035	0.641	0.738	1.056	1.488	1.998	2.745	3.290	--	--	--	--	--	32.68
ST130008/57	0.057	0.529	0.708	0.916	1.468	2.234	3.729	4.123	--	--	--	--	--	35.22
ST130008/59	0.075	0.666	0.824	1.063	1.512	2.258	3.538	5.101	6.754	--	--	--	--	36.18
Mean	--	--	--	--	--	--	--	--	--	--	--	--	--	34.10
Standard Deviation	--	--	--	--	--	--	--	--	--	--	--	--	--	1.51

Remark : The test results relate only to the samples tested.

Checked by : Igor Date : 28/9/2013 Certified by : Chan Chun Wai Ivan Date : 28.5.2013

Chan Chun Wai Ivan
Manager (Product Testing Laboratory)

** End of Report **

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GEN01/0312

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REPORT ON THE SHEAR LOAD TEST OF ANCHOR BOLT

Client : Sunway Metal Manufactory Limited

Project : Pull-out Test of Anchor Bolt

Report No. : 032154ST50391

Date : 21 April 2005

CONTENTS

- 1.0 Sample Description
- 2.0 Summary of Test Results
- 3.0 Individual Results
- 4.0 Diagram
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REPORT ON THE SHEAR LOAD TEST OF ANCHOR BOLT

1.0 Sample Description

1.1 Information Supplied by Client

Client : Sunway Metal Manufactory Limited
Project : Pull-out Test of Anchor Bolt
Sample Description : "Sunway" SW-E12 Medium Duty Anchor
Client's Sample I.D. : --

For Expanding Anchor

Supplier Name : Sunway Metal Manufactory Limited
Reference Number : SW-E12
Specification of the Material of Fixing : Stainless Steel 304
Actual Diameter of Bit used to Drill the Hole : Before Starting : 12 mm
After Completion : 12 mm
Type of Drilled Employed : Rotary-Precussive
Location of the Fixings in the Base Specimen : (Please refer to the diagrams)
Embedded Length : 50 mm Minimum requirement of BS 5080 : 100 mm
Predrilled Hole Diameter : 12 mm for distance of fixing from the edge
Bolt Diameter : 12 mm Minimum requirement of BS 5080 : 100 mm
Hole Depth : 60 mm for anchor spacing of fixing
Tightening Torque : 42 Nm Concrete Grade : 30 MPa

For Concrete

Mix Proportions : Not Provided
Location of Reinforcement : NIL
Type of reinforcement : NIL
Cast Unit Shape : Cube
Dimensions of Cast Unit : 700 x 700 x 700mm
Concrete Age : 18 days
Compressive Strength (Average) : 32 MPa
Density (Average) : 2345 kg/m³ (Average)

1.2 Laboratory Information

Location of Test : Special Testing Laboratory of MaterialLab
Lab. Sample I.D. : ST50391/1-10
Date Specimens Fixed : 06 April 2005 and 07 April 2005
Date Tested : 06 April 2005 and 07 April 2005
Span of Support : --
Test Method : BS 5080 : Part 2 : 1986
Loading Method : Increment Increasing

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REPORT ON THE SHEAR LOAD TEST OF ANCHOR BOLT**2.0 Summary of Test Results**

Lab. Sample I.D.	Maximum Applied Force (kN)
ST50391/1	34.38
ST50391/4	31.14
ST50391/5	31.50
ST50391/7	36.18
ST50391/8	34.38
ST50391/9	37.62
Mean	34.20
Standard Deviation	2.54

Remark : The test results relate only to the samples tested.

Checked by : Stewart Uien Date : 22/04/05 Certified by :  Date : 22/4/05
Gary Winstanley

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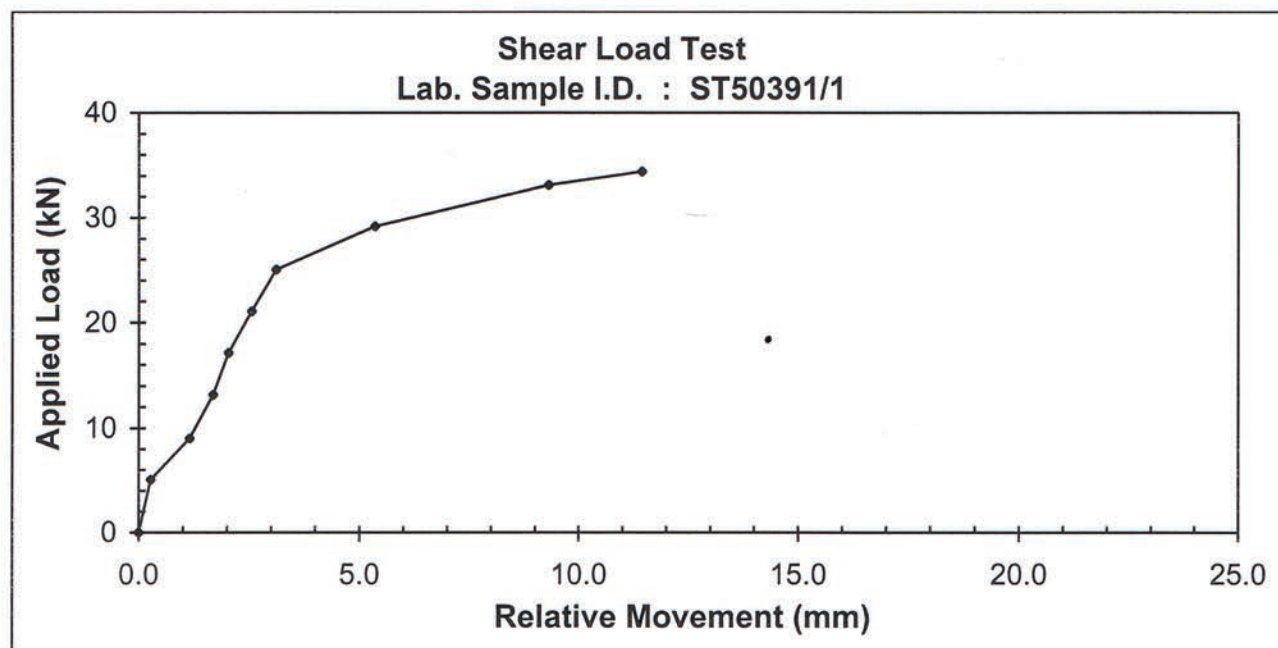
REPORT ON THE SHEAR LOAD TEST OF ANCHOR BOLT

3.0 Test Results

Lab. Sample I.D. : ST50391/1

Date Tested : 06 April 2005

Applied Load (kN)	Relative Movement (mm)	Applied Load (kN)	Relative Movement (mm)
0	0	21.07	2.55
5.07	0.27	25.03	3.11
9.02	1.15	29.17	5.35
13.16	1.68	33.12	9.31
17.12	2.03	34.38	11.44



Observation : Cracking of the surrounding concrete observed at a load of 34.38kN.



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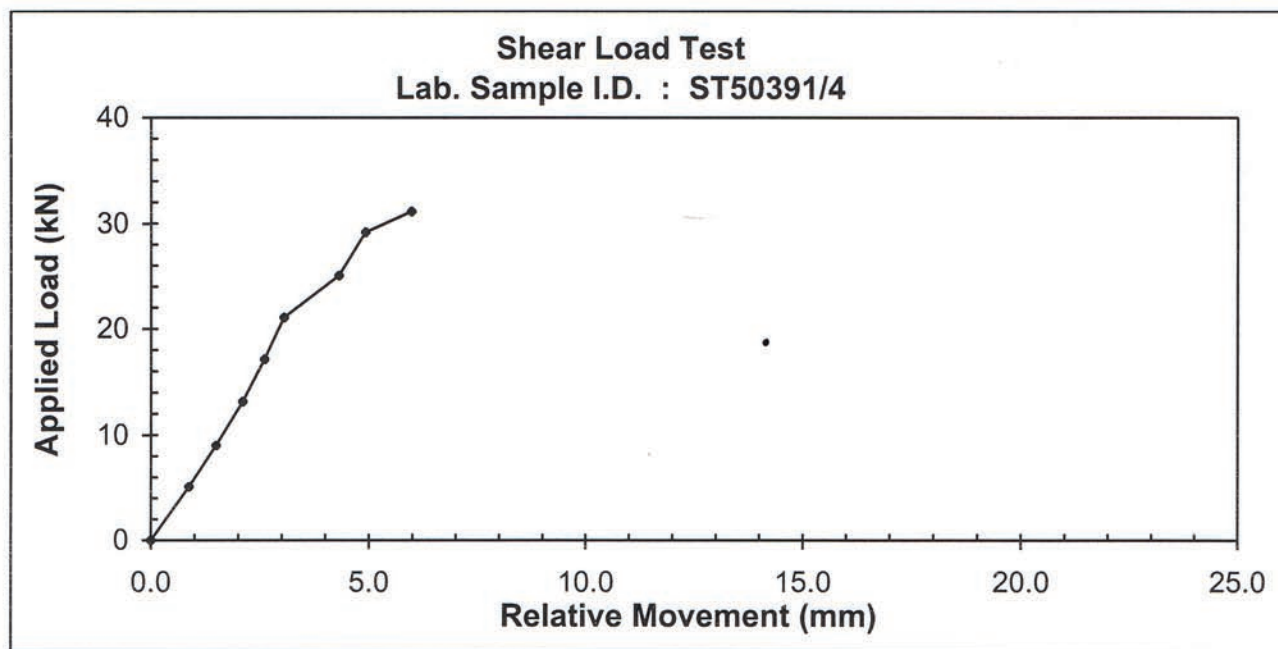
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REPORT ON THE SHEAR LOAD TEST OF ANCHOR BOLT

Lab. Sample I.D. : ST50391/4

Date Tested : 06 April 2005

Applied Load (kN)	Relative Movement (mm)	Applied Load (kN)	Relative Movement (mm)
0	0	21.07	3.05
5.07	0.87	25.03	4.31
9.02	1.49	29.17	4.92
13.16	2.10	31.14	5.97
17.12	2.60		



Observation : Cracking of the surrounding concrete observed at a load of 31.14kN.

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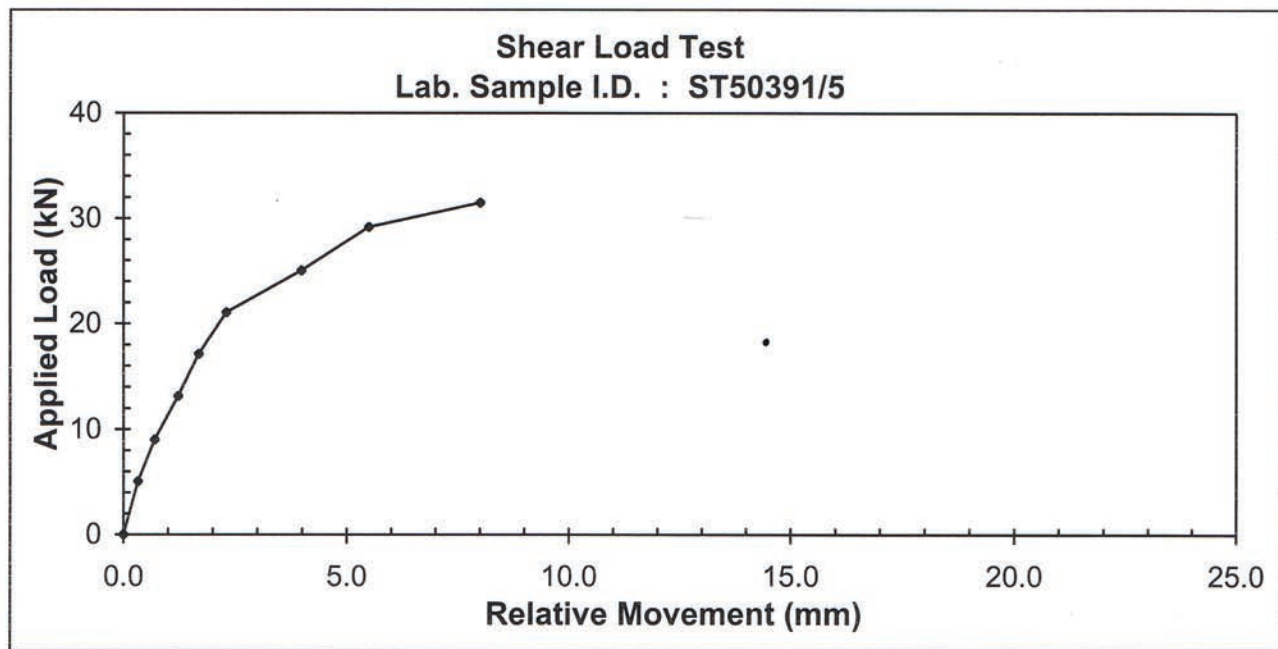
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REPORT ON THE SHEAR LOAD TEST OF ANCHOR BOLT

Lab. Sample I.D. : ST50391/5

Date Tested : 06 April 2005

Applied Load (kN)	Relative Movement (mm)	Applied Load (kN)	Relative Movement (mm)
0	0	21.07	2.30
5.07	0.32	25.03	3.98
9.02	0.70	29.17	5.49
13.16	1.22	31.50	8.00
17.12	1.68		



Observation : Cracking of the surrounding concrete observed at a load of 31.50kN.

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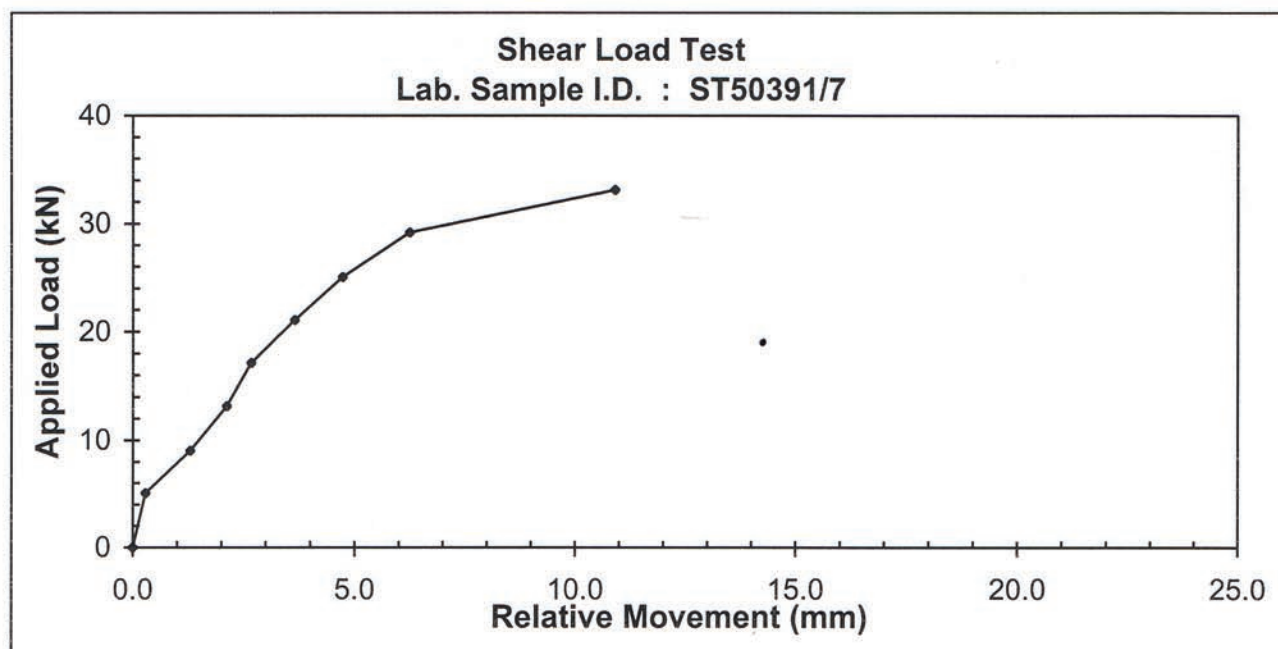
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REPORT ON THE SHEAR LOAD TEST OF ANCHOR BOLT

Lab. Sample I.D. : ST50391/7

Date Tested : 07 April 2005

Applied Load (kN)	Relative Movement (mm)	Applied Load (kN)	Relative Movement (mm)
0	0	21.07	3.65
5.07	0.28	25.03	4.73
9.02	1.29	29.17	6.24
13.16	2.11	33.12	10.91
17.12	2.66	36.18	--



Observation : Bolt failure occurred at a load of 36.18kN.



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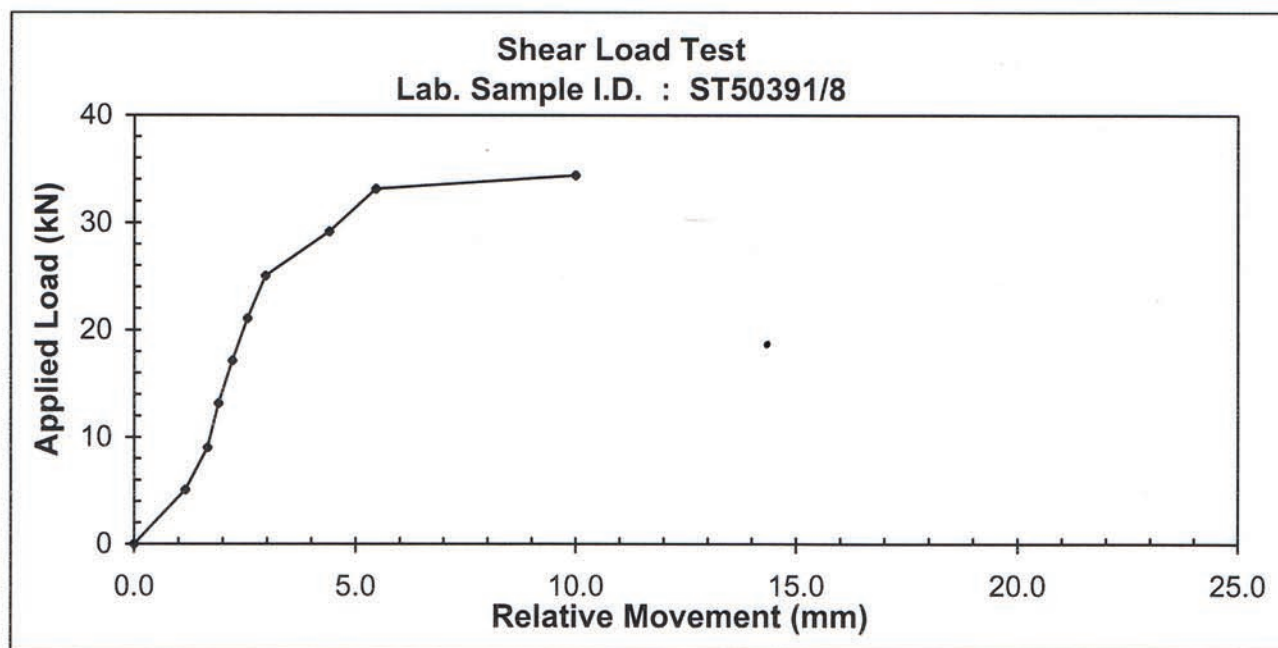
Report No. : 032154ST50391

REPORT ON THE SHEAR LOAD TEST OF ANCHOR BOLT

Lab. Sample I.D. : ST50391/8

Date Tested : 07 April 2005

Applied Load (kN)	Relative Movement (mm)	Applied Load (kN)	Relative Movement (mm)
0	0	21.07	2.55
5.07	1.15	25.03	2.96
9.02	1.65	29.17	4.40
13.16	1.90	33.12	5.45
17.12	2.21	34.38	9.99



Observation : Cracking of the surrounding concrete observed at a load of 34.38kN.

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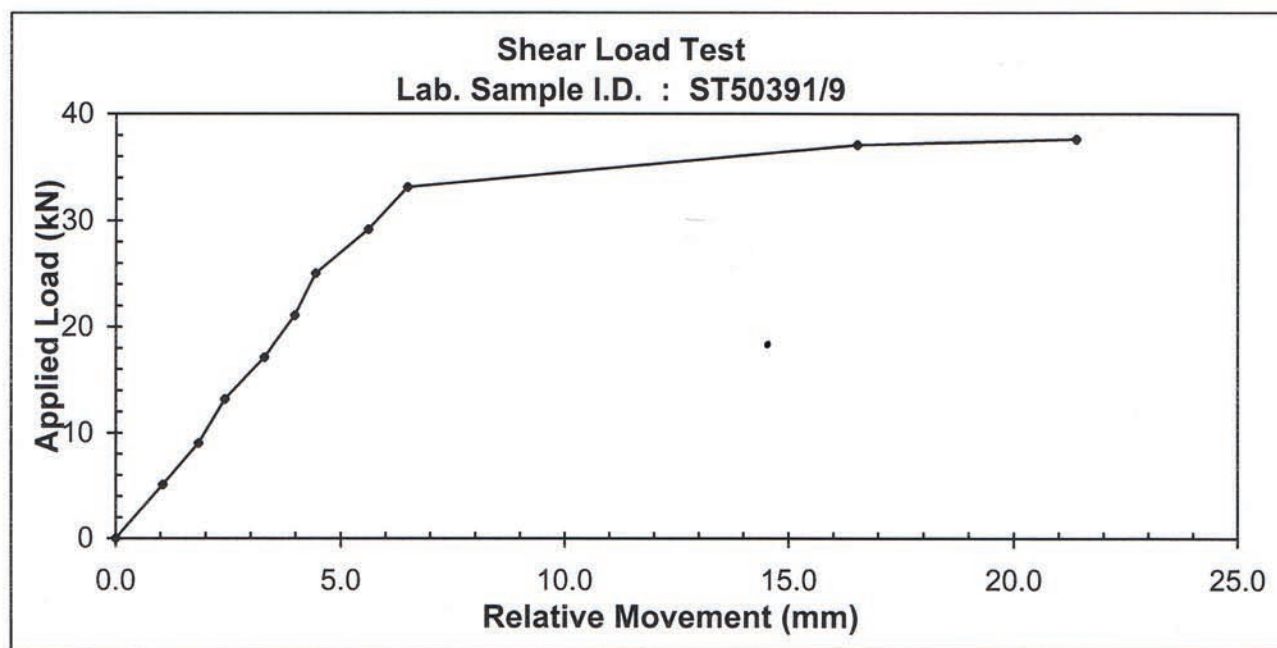
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REPORT ON THE SHEAR LOAD TEST OF ANCHOR BOLT

Lab. Sample I.D. : ST50391/9

Date Tested : 07 April 2005

Applied Load (kN)	Relative Movement (mm)	Applied Load (kN)	Relative Movement (mm)
0	0	25.03	4.44
5.07	1.05	29.17	5.61
9.02	1.84	33.12	6.48
13.16	2.42	37.08	16.52
17.12	3.30	37.62	21.38
21.07	3.98		



Observation : Cracking of the surrounding concrete observed at a load of 37.62kN.

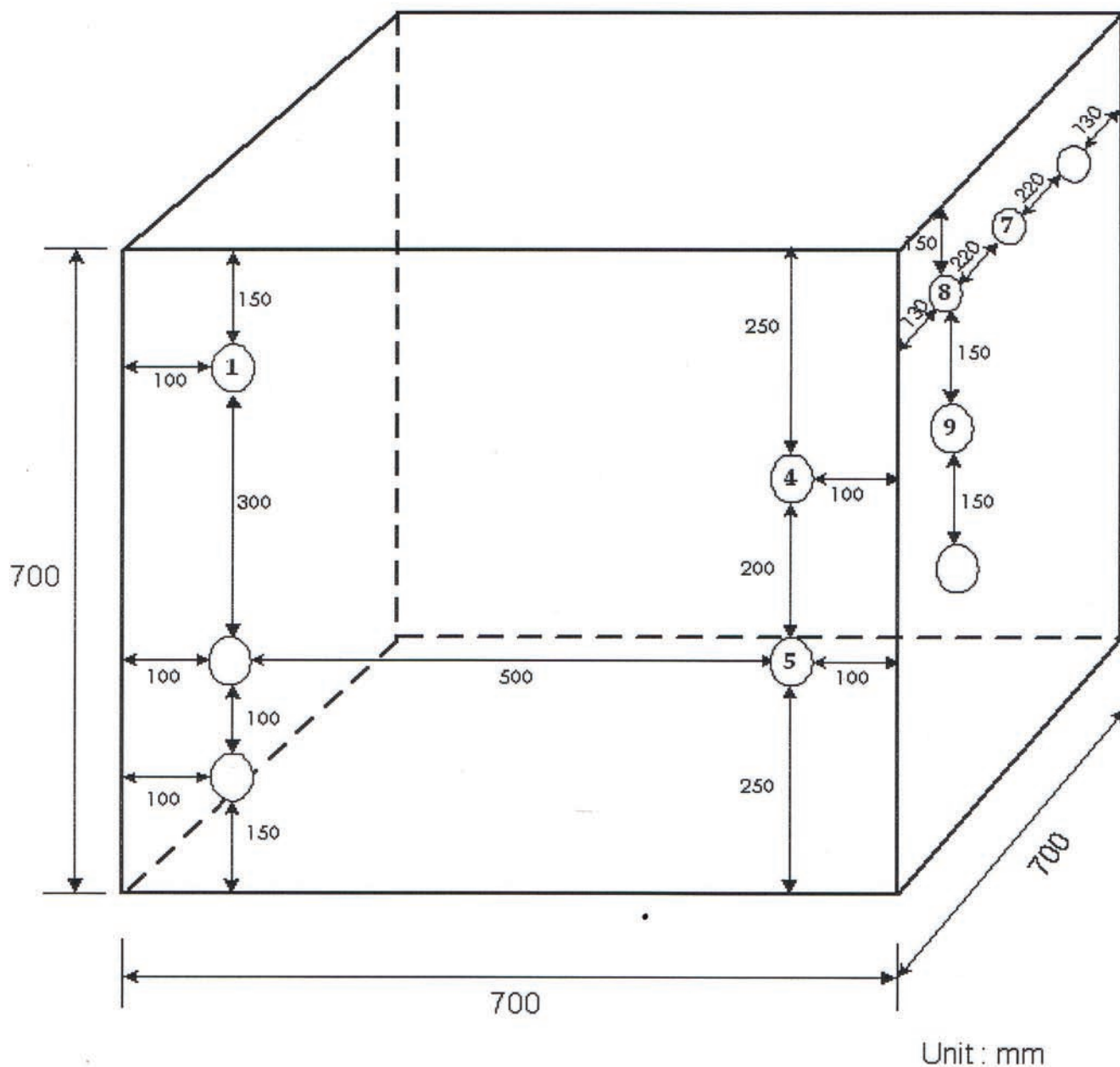


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4.0 Diagram

Lab. Sample



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5.0 Record Photographs



Test Configuration
Sample I.D. : ST50391/1-10



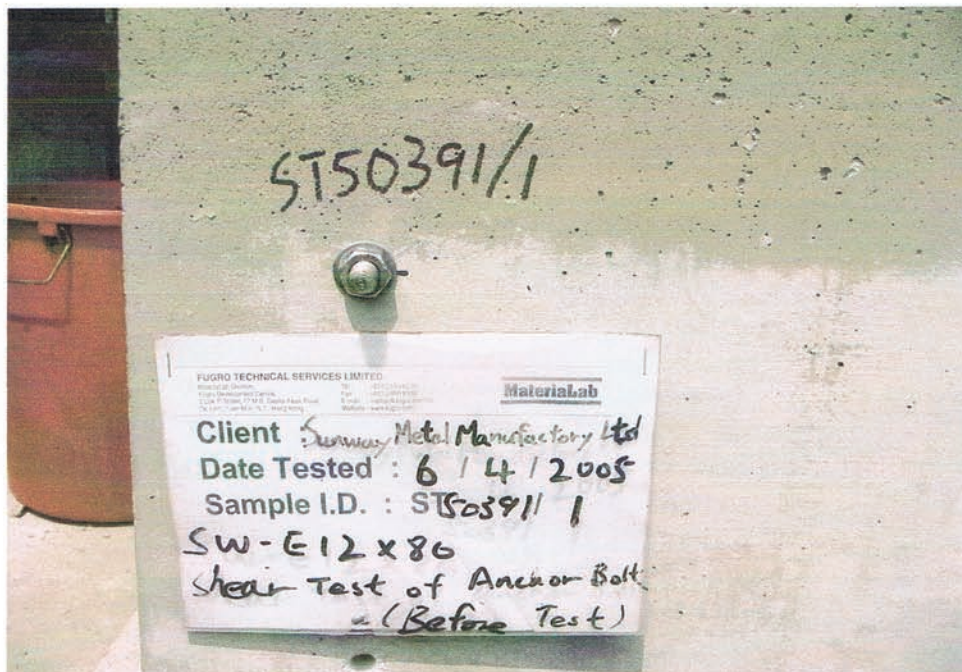
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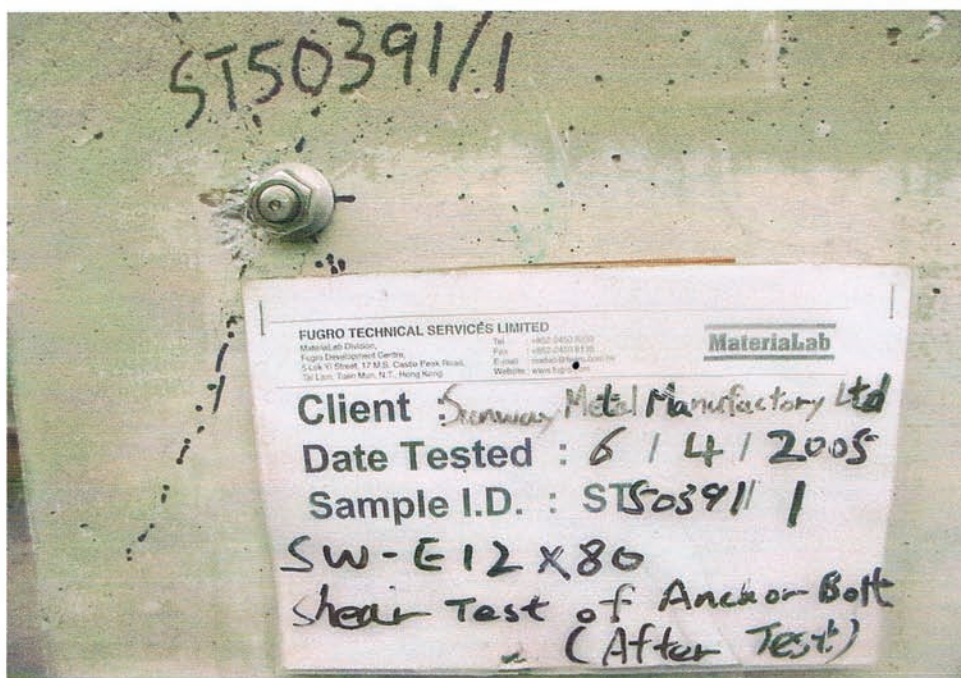
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Before Test
Sample I.D. : ST50391/1



After Test
Sample I.D. : ST50391/1

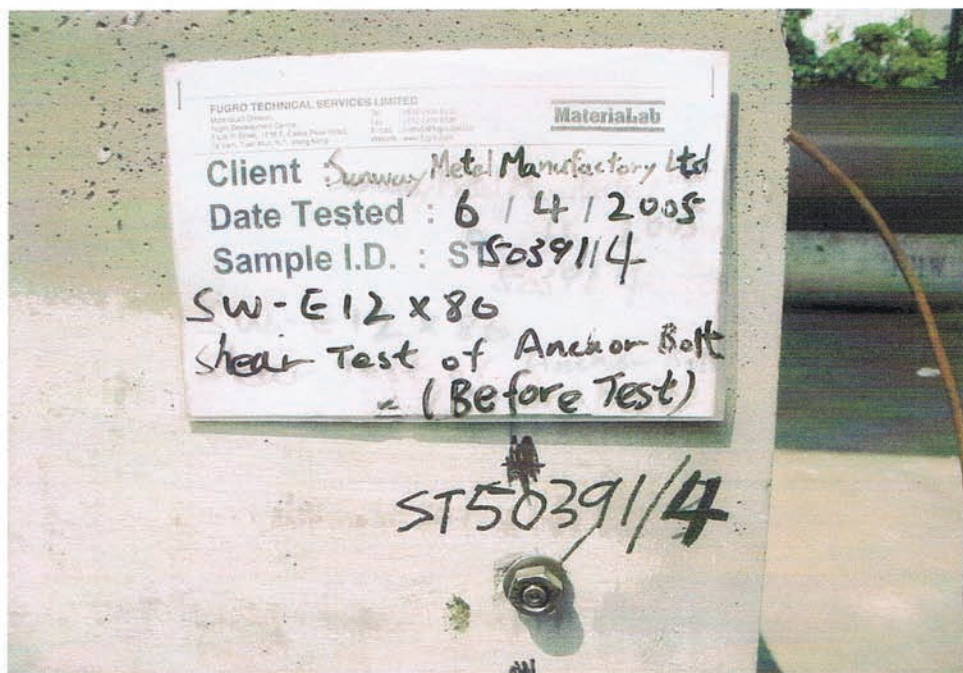
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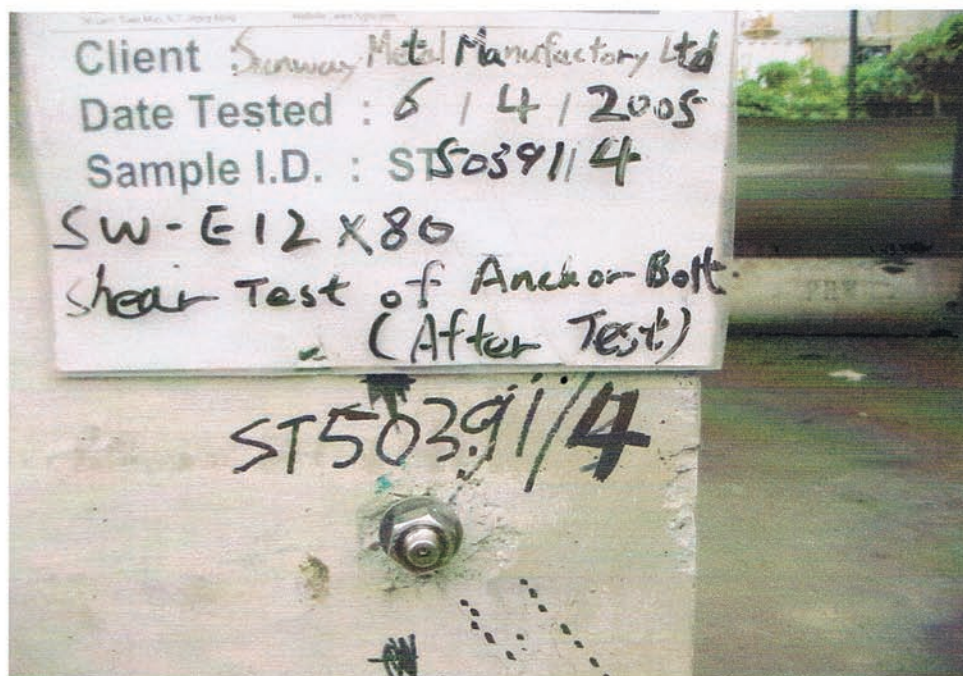
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Before Test
Sample I.D. : ST50391/4



After Test
Sample I.D. : ST50391/4



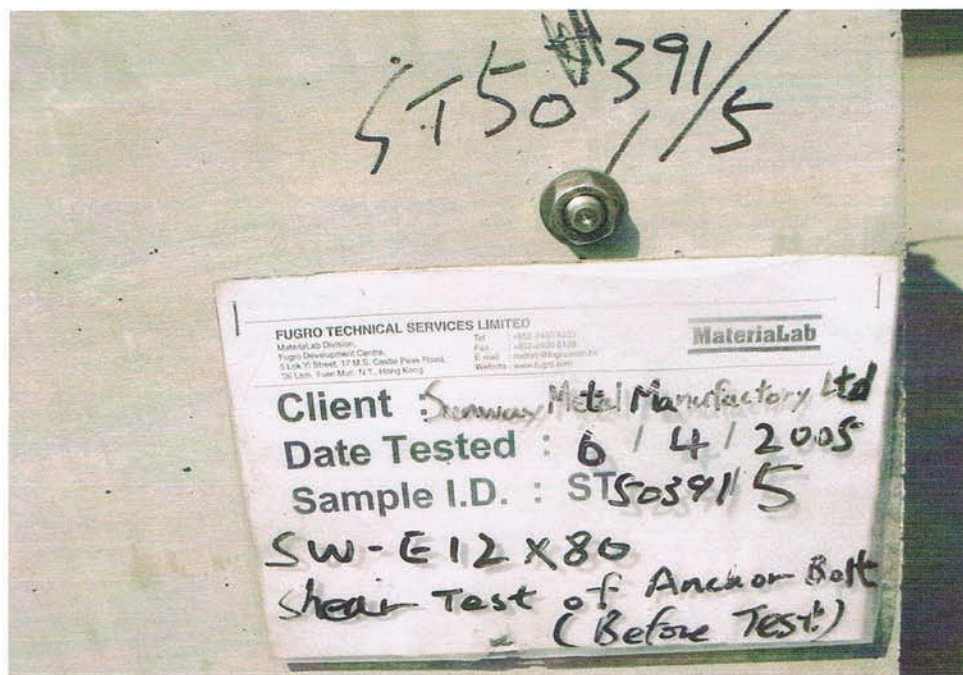
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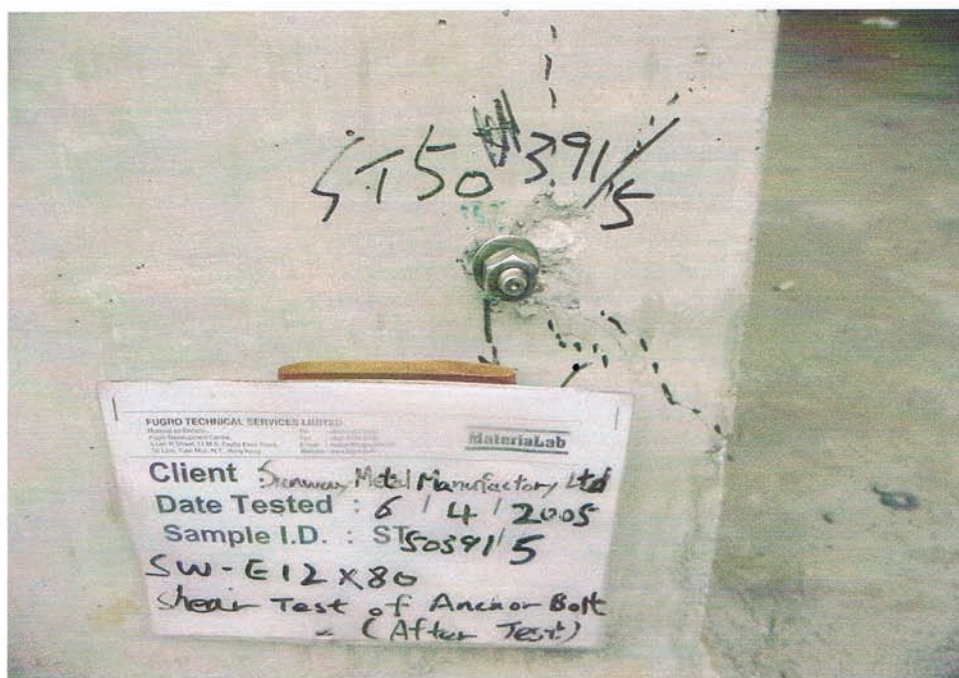
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Before Test
Sample I.D. : ST50391/5



After Test
Sample I.D. : ST50391/5



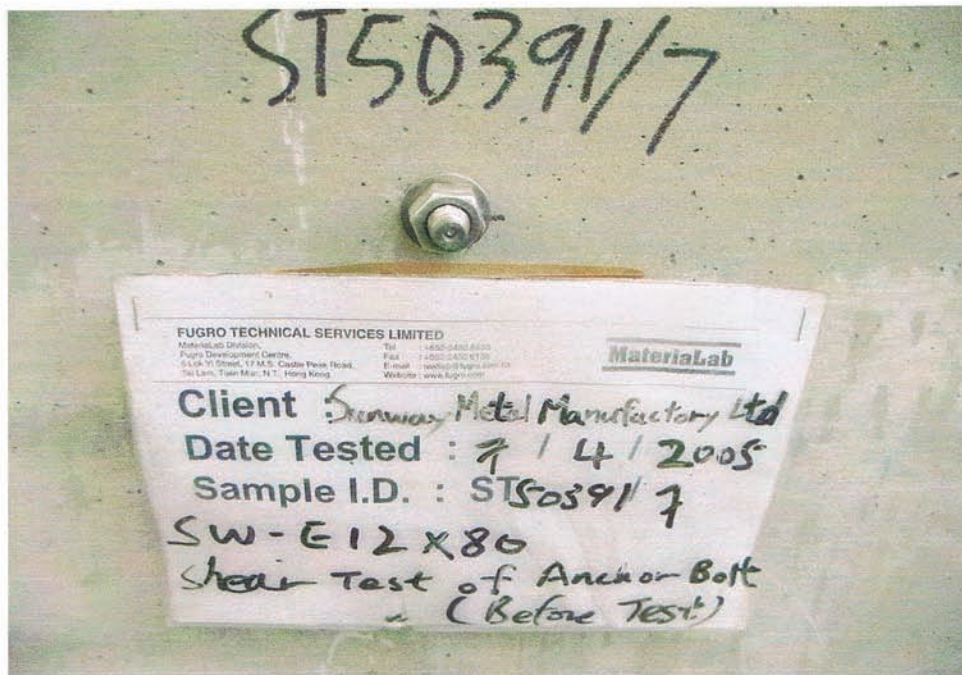
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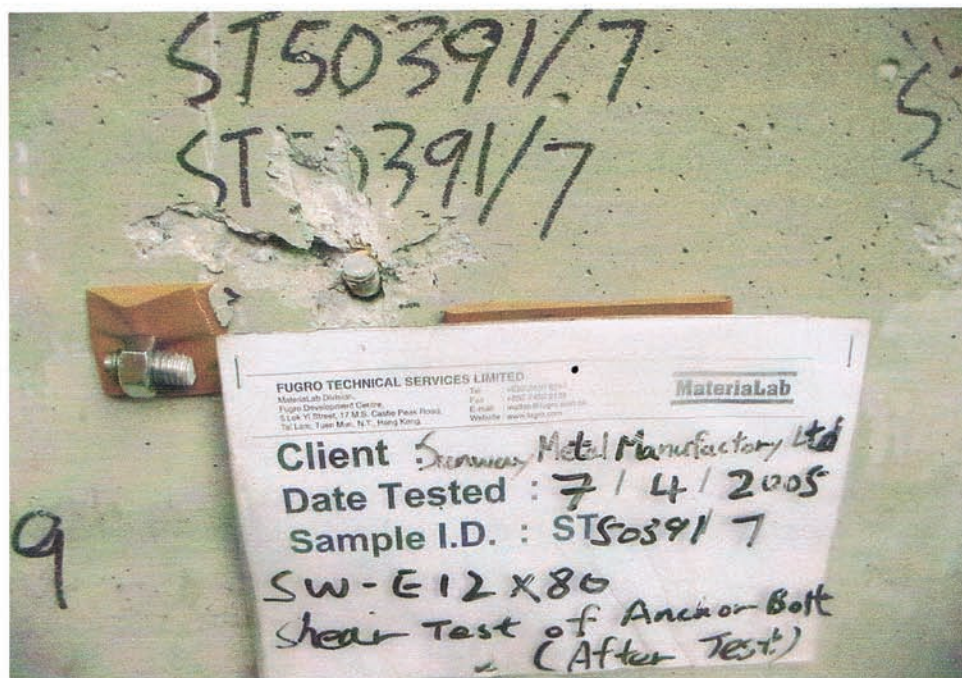
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Before Test
Sample I.D. : ST50391/7



After Test
Sample I.D. : ST50391/7

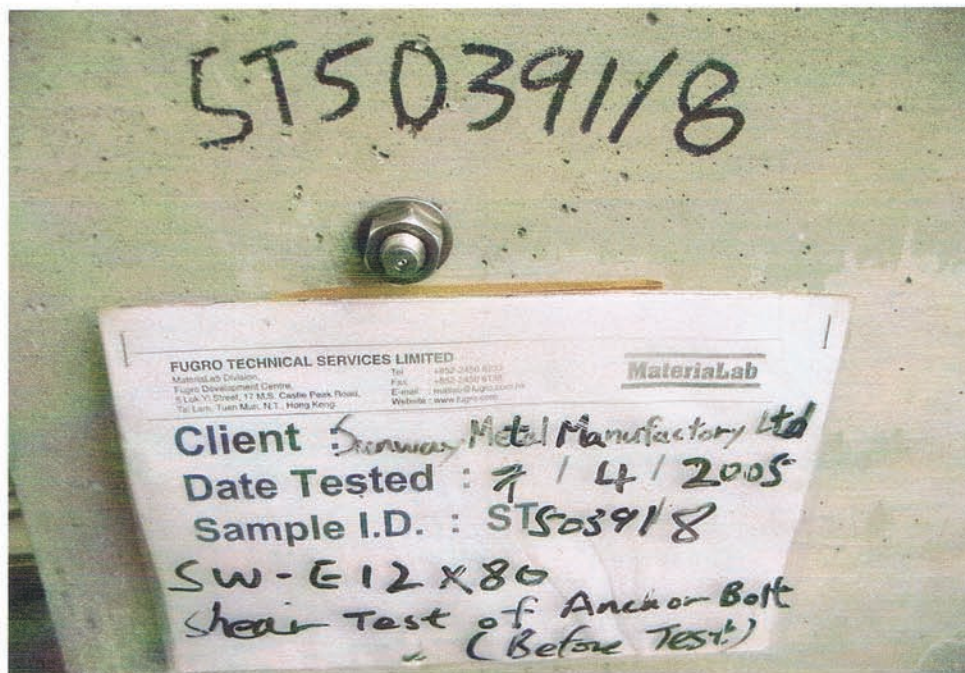
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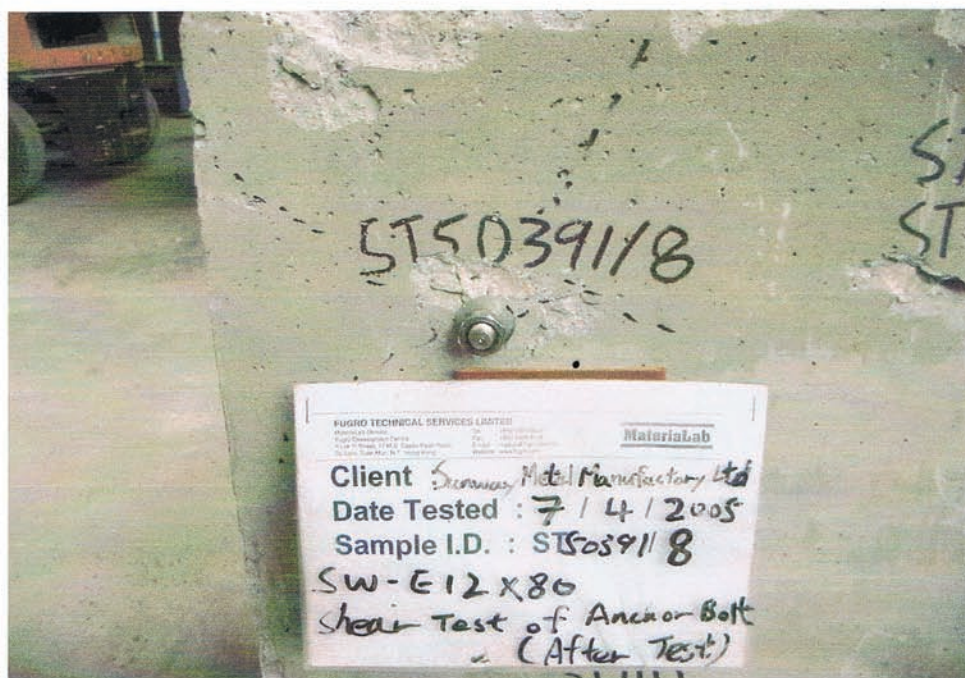
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Before Test
Sample I.D. : ST50391/8



After Test
Sample I.D. : ST50391/8



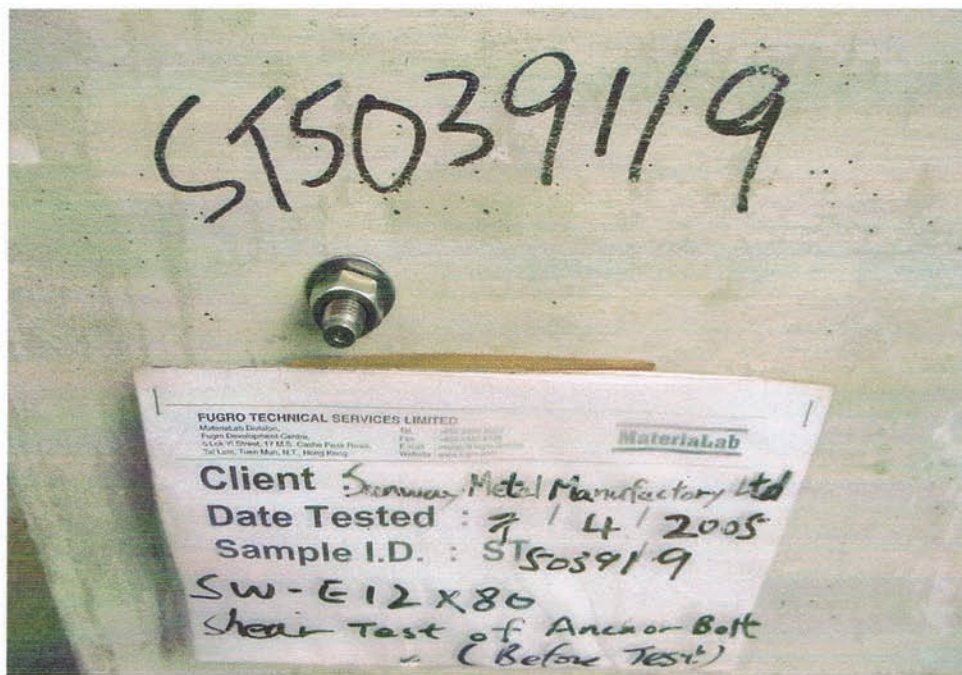
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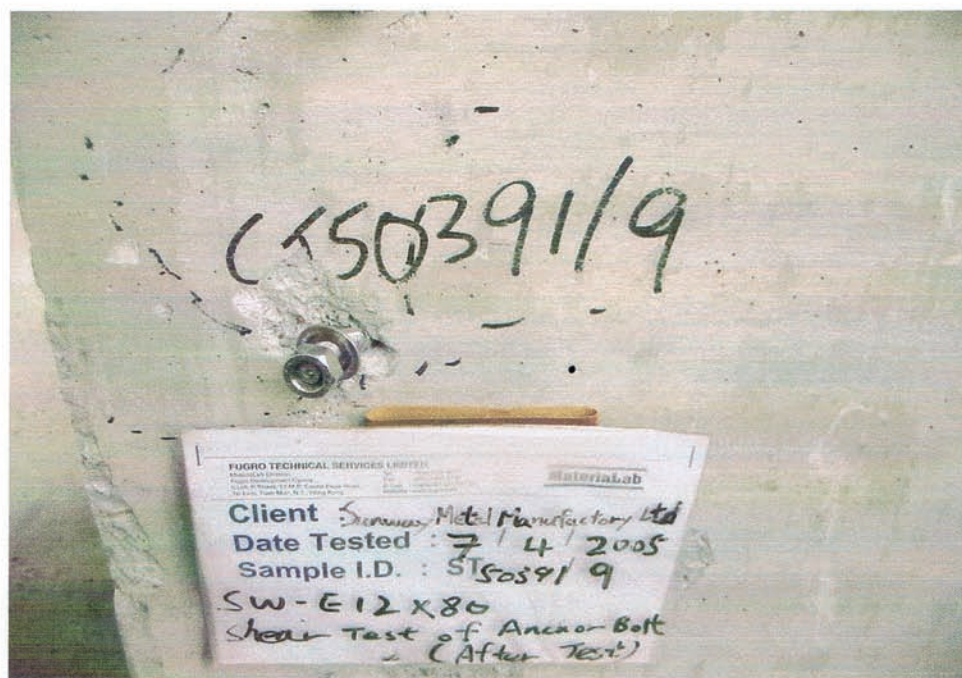
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Before Test
Sample I.D. : ST50391/9



After Test
Sample I.D. : ST50391/9