

# Hilti KB3 Submission Folder

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**Customer Hotline**

**Hong Kong 8228 8118**

**Macau (Toll free) 00800- 8228 8118**

# SAMPLE SUBMISSION AND APPROVAL FORM

Contract Title:	_____	Ref. No.:	_____
	_____	Date:	_____
		Ref. No. of Previous Submission:	_____
Contract No:	_____	(1)	_____
File Reference:	_____	(2)	_____

## DETAILS OF SUBMISSION

To: Contract Manager's Representative      Attention: \_\_\_\_\_

From: \_\_\_\_\_

The enclosed sample and catalogue\* / certificate of origin\* / technical data\* / test report\* / job reference\* as described below have been checked for compliance with the Specifications and Drawings, and are submitted for approval.

### 1. General Information

- a. Material Description      KB3 Expansion anchor  
\_\_\_\_\_
- b. Location: \_\_\_\_\_  
\_\_\_\_\_
- c. Specification Ref. Page: \_\_\_\_\_      Item: \_\_\_\_\_  
\_\_\_\_\_
- d. Drawing Ref. No. \_\_\_\_\_  
\_\_\_\_\_
- e. B.Q. Ref.No.: \_\_\_\_\_  
\_\_\_\_\_
- f. Anticipated date of approval: \_\_\_\_\_  
\_\_\_\_\_

### 2. Technical Information

The submitted sample has been checked against the specification and drawings as listed below:-

Specification Requirements	Submitted Sample (State details against each item)
a. <b>Brand</b> Not specified	Hilti
b. <b>Country of Origin</b> Not specified	Liechtenstein
c. <b>Manufacturer's Name &amp; Address</b> Not specified	Hilti Corporation, FL-9494 Principality of Liechtenstein
d. <b>Factory's Name &amp; Address(es)</b> Not specified	Hilti Aktiengesellschaft, Hilti AG, Feldkircherstrasse, FL-9494 Schaan, Liechtenstein
e. <b>Supplier (with Applicator, if any)</b> Not specified	Hilti (Hong Kong) Ltd

f. <b>Appearance</b> Not specified	According to the sample submitted
g. <b>Color +</b> Not specified	NIL
h. <b>Specification</b> Not specified	Attached
i. <b>Manufacturer's Catalogue</b> Not specified	Attached
j. <b>Test Report</b> (Original/Certificated True Copy) Not specified	Attached
k. <b>Previous Job Reference</b> Not specified	NIL
l. <b>Supplementary Information</b> Not specified	NIL

For and on behalf of the Contractor

\_\_\_\_\_  
(Quality Control Manager)

<b>CONTRACT MANAGER'S COMMENTS</b>	
To:	
From:	Contract Manager's Representative: _____
On the basis of the sample and information given, the above sample submitted is:	
(1) *	<b>Approved.</b>
(2) *	<b>Not approved</b> because _____
Remarks:	_____ _____ _____
Approval does not alter the requirements of the Contract	
Contract Manager's Representative: _____	
_____ Date: _____	

cc. \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

(\* Delete if appropriate)  
(+ For glass or vitreous mosaic tiles, the contractor is required to confirm the colour range(s) of the submitted sample, i.e. a) light and or medium; or b) dark)

# KB3 Expansion Anchor

for marble fixing

**Base material**

- Non-cracked concrete

**Use**

- For fastening marble granite and architectural features
- For fastening cladding works and facades, shopfronts and balustrades, window wall and steel works
- For fastening aluminum windows and Louvres

**Material**

- A2 stainless steel

**Approvals**



**Benefits**

- Short embedment depth.
- Rounded end for easy installation
- Dog point impact section to prevent thread damage during installation.



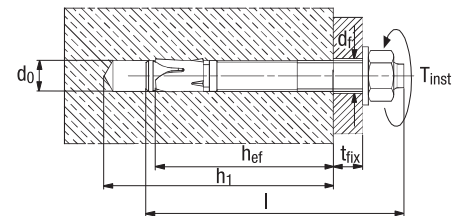
**Technical data**

Recommended load,  $F_{30}$ (kN): non-cracked concrete at 30N/mm<sup>2</sup>, safety factor ( $\gamma$ )=3

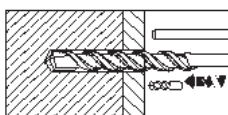
Model	Recommended load	
	KB3 304 SS 3/8" x 2 1/4"	Tensile Load, $N_{rec}$
	Shear Load, $V_{rec}$	10.6 kN

Remarks:

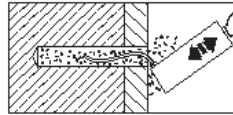
- 1) All the data applies to no edge distance, spacing and other influences



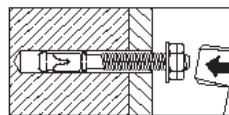
**Installation procedures**



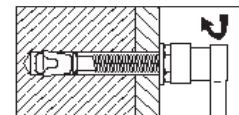
Drill hole with drill bit.



Blow out dust and fragments.



Install anchor.



Apply tightening torque.

**KB3 programme**

Drill bit nom. dia., $d_0$ (inch)	Anchor length, $l$ (mm)	Head mark	Min. hole depth, $h_1$ Standard (mm)	Max. fasten thk. $t_{fix}$ Standard (mm)	Tighten. torque $T_{inst}$ (Nm)	Clearance hole, $d_f$ (mm)	Width across flats, $S_w$ (inch)	Package (pcs)	Order designation	Item no
3/8"	61	B	50	5	27	11	9/16"	50	KB3 304 SS 3/8" x 2 1/4"	282542

**KB3 : stud head (A2 stainless steel)**

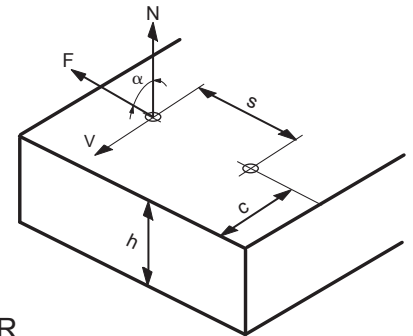


## Hilti KB3 Expansion Anchor

### Product Information

Recommended load  $F_{30}$  in kN, non-cracked concrete  $f_{cc} \geq 30 \text{ N/mm}^2$ ,  $\nu=3$

Anchor size	3/8"	
Property		
Tensile	0°	7.8
Combined load	30°	8.7
	45°	9.2
	60°	9.7
Shear	90°	10.6



Recommended load for specific application :  $F_{rec} = F_{30} \cdot f_B \cdot f_A \cdot f_R$

### Influence of concrete strength $f_B$

$$f_B = 1 + 0.01 \cdot \left(1 - \frac{\alpha}{90}\right) (f_{cc, act} - 30) \quad [20 \leq f_{cc, act} \leq 40]$$

No increase of loading capacity when in concrete of higher strength

### Influence of anchor spacing and edge distance $f_A, f_R$

		Spacing Reduction Factor ( $f_A$ )		Edge Reduction Factor ( $f_R$ )	
		Tension		Tension ( $f_{RN}$ )	Shear ( $f_{RV}$ )
Spacing / Edge Distance (mm)	40	0.62			
	45	0.66		0.70	0.49
	50	0.70		0.73	0.55
	55	0.74		0.76	0.60
	60	0.77		0.80	0.66
	65	0.81		0.83	0.71
	70	0.85		0.86	0.77
	75	0.89		0.89	0.82
	80	0.92		0.93	0.88
	85	0.96		0.96	0.93
	90	1.00		0.99	0.99
	95			1.00	1.00

### Influence of anchor spacing and edge distances, $f_A, f_R$

Formula :

$$s_{min} = 0.9h_{nom}, \quad s_{cr} = 2.2h_{nom}$$

$$f_A = 0.31 \frac{s}{h_{nom}} + 0.32$$

A minimum distance of a  $\geq 2 s_{cr}$  must exist between groups of anchors to exclude any influence

Formula :

$$c_{min} = 1.1 h_{nom}, \quad c_{cr} = 2.2h_{nom}$$

$$f_{RN} = 0.27 \frac{c}{h_{nom}} + 0.4$$

Formula :

$$c_{min} = 1.1 h_{nom}, \quad c_{cr} = 2.2h_{nom}$$

$$f_{RV} = 0.45 \frac{c}{h_{nom}}$$

The following applies to combined loading  $f_R = f_{RN} - (f_{RN} - f_{RV}) \frac{\alpha}{90}$

If the edge distance is less than  $c_{cr}$  reinforcement which can take up 0.25 times the anchor load must be provided between the component edge and the anchor .

## SETTING OPERATION

### Hilti KB3 Expansion Anchor

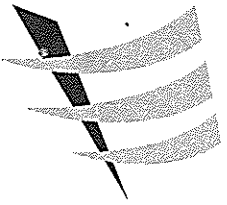
Versions : KB3

Accessories : NIL

Reference : Product Information



<b>Setting Operation:</b>	
1. Drill the hole with drill bit	
2. Blow out dust and fragments	
3. Install anchor	
4. Apply appropriate tightening torque	



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ETS-TESTCONSULT LIMITED

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com

**TEST REPORT**

**HILTI ( Hong Kong) Ltd**

17/F., Tower 6, China Hong Kong City, 33 Canton Road, TST., Hong Kong.

**Tensile Load Test on Anchor Bolt**

**KB3 SS304 3/8"**

**BS5080 : Part 1 : 1993 : Cl. 7.1**

**Date Tested : 07 Apr 09**

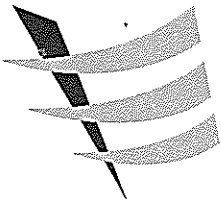
**ETL Ref. No. : 407/2009**

Reported by :

TSANG, Kin On / PANG, Ting Ping  
Assistant Engineer

Approved by :

MONG, Sang Ming  
Assistant Technical Manager



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ETS-TESTCONSULT LIMITED

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
Tel : 2695 8318 E-mail : etl@ets-testconsult.com  
Fax : 2695 3944 Web site : www.ets-testconsult.com



**TEST REPORT**

**Tensile Load Test on Anchor Bolt**

Customer : Hilti (Hong Kong) Ltd Report No. : FDA90424  
Address : 17/F, Tower 6, China HK City, 33 Canton Road, TST Test Date : 07-Apr-09  
Project : - Report Date : 17-Apr-09  
Test Location : ETL's Laboratory Page No. : 2 of 3  
Anchor Type \* : KB3 SS304 3/8" Test Method : BS 5080:Part 1:1993 Cl 7.1  
Amb. Temperature : 23°C

Load (kN)	Dial Gauge Reading (mm)				
	Sample 1	Sample 2	Sample 3	Sample 4	Sample 5
0.0	0.00	0.00	0.00	0.00	0.00
3.0	0.00	0.00	0.00	0.00	0.00
6.0	0.00	0.00	0.00	0.00	0.01
9.0	0.00	0.00	0.01	0.00	0.01
12.0	0.01	0.01	0.02	0.01	0.02
15.0	0.03	0.02	0.04	0.03	0.03
18.0	0.05	0.04	0.08	0.04	0.04
21.0	0.10	0.07	0.12	0.09	0.10
24.0	0.32	0.26	0.34	0.29	0.21
27.0	-	-	-	-	-
30.0	-	-	-	-	-
33.0	-	-	-	-	-
36.0	-	-	-	-	-
39.0	-	-	-	-	-
42.0	-	-	-	-	-
45.0	-	-	-	-	-
48.0	-	-	-	-	-
51.0	-	-	-	-	-
Failure Load (kN)	24.3	24.9	24.4	24.7	25.2
Failure Mode	F4	F4	F4	F4	F4
Average Failure Load (kN)	24.70				
Standard Deviation (kN)	0.37				

<b>A) Test Apparatus</b>	Load Cell : Comp. Load cell YZC-219, 100kN (ET/930/10/01) S/N : 50603015	
	Load Cell Indicator : Load Indicator, XT1500 (ET/930/03/02) S/N : 1000090910	
	Cylinder : Hydraulic Cylinder RCH 121 (ET/903/14) S/N : -	
	Digital Dial Gauge : ET/430/19	
<b>B) Concrete Grade</b>	30 ± 3 MPa	
<b>C) Anchor installed date</b>	07-Apr-09	
<b>D) Failure Modes</b>	P = No sign of failure in anchor and/or structural member F2 = Failure in structural member F4 = Failure of structural member in a shear cone F6 = Failure in structural member with crack radiates outward from anchor F7 = Other failure mode(s) : Anchor Breaking	F1 = Failure of anchor or its accessories F3 = Pull out of anchor F5 = Failure by continuous displacement or decreasing load
<b>E) Span width(mm)</b>	400	
<b>F) Edge distance(mm)</b>	200	
<b>G) Embedded Length(mm)</b>	64	

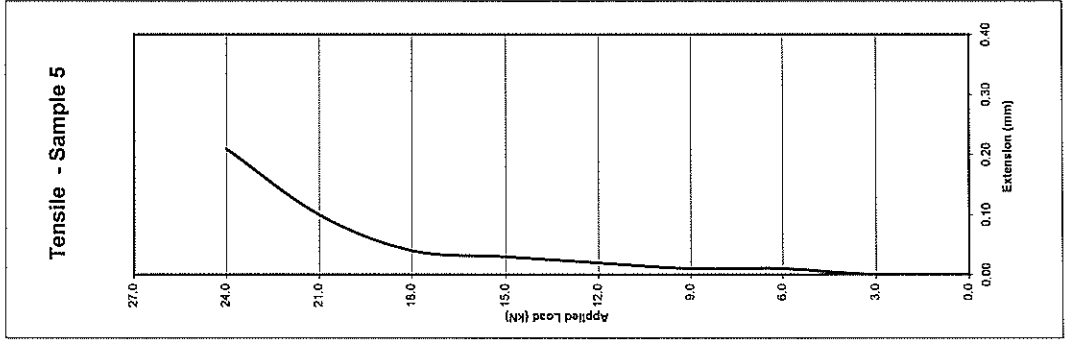
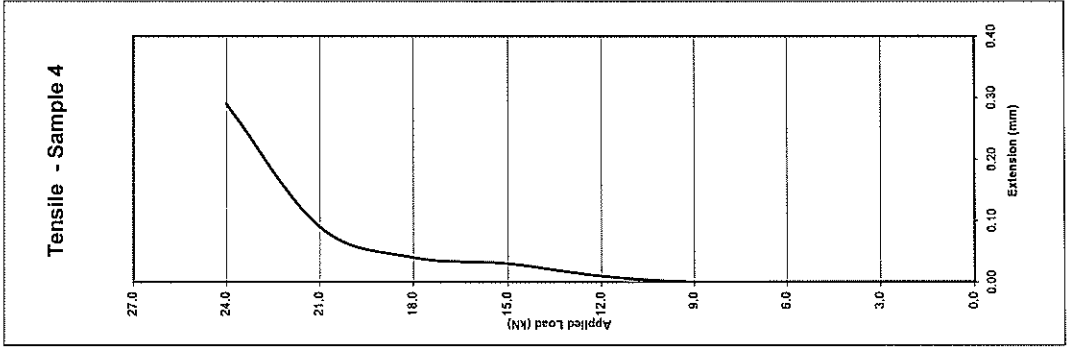
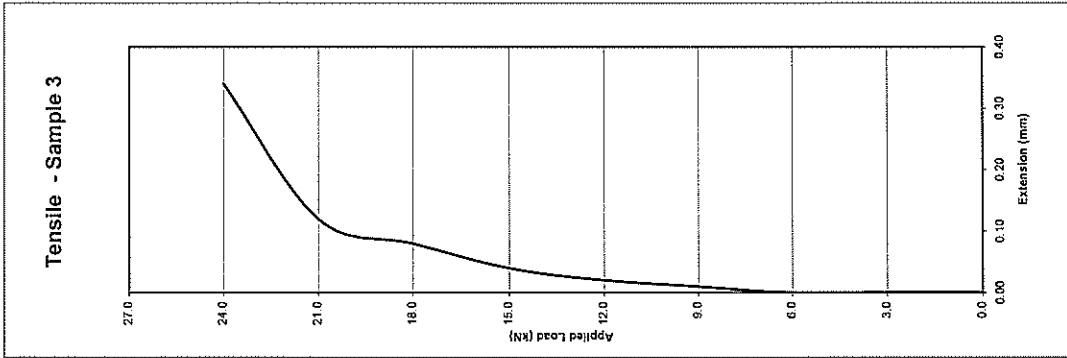
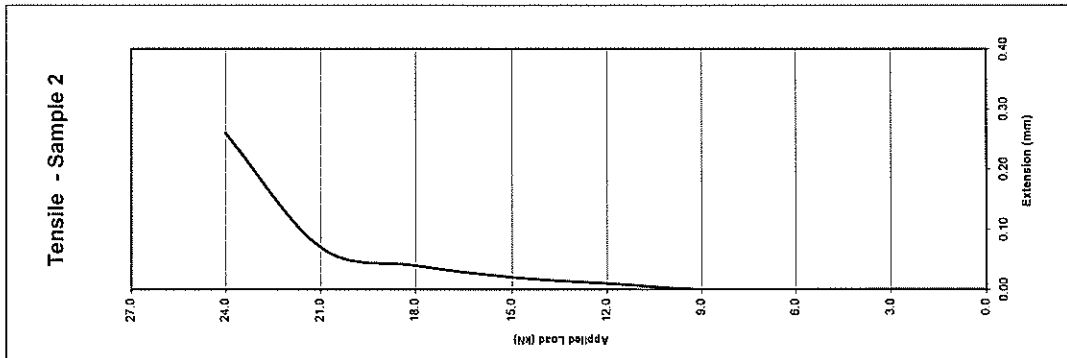
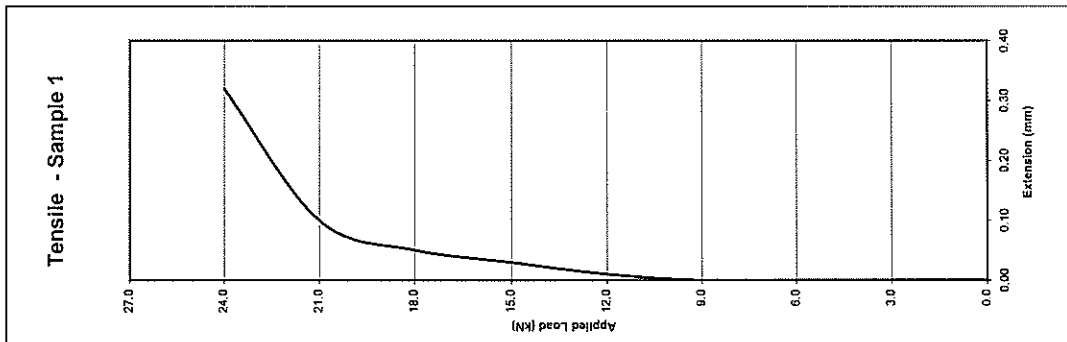
\* Information provided by customer

Hong Kong Accreditation Service (HKAS) has accredited this laboratory under the Hong Kong Laboratory Accreditation Scheme (HOKLAS) for specific laboratory activities as listed in the HOKLAS directory of accredited laboratories. The results shown in this report were determined by this laboratory in accordance with its terms of accreditation. Such terms of accreditation stipulate that the results shall be traceable to the International System of Units (S.I.) or recognised measurement standards. This report shall not be reproduced unless with prior written approval from this laboratory.





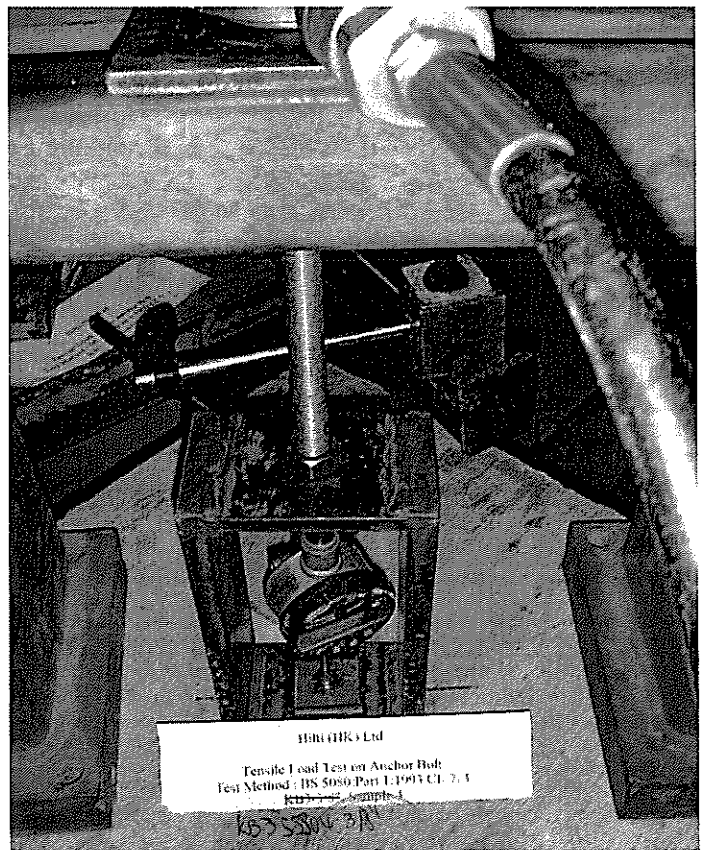
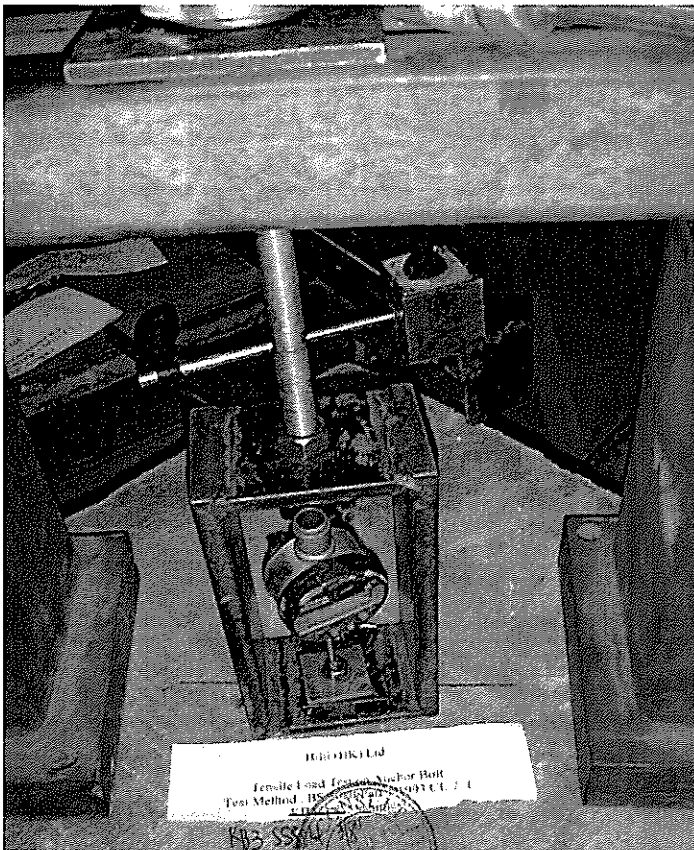
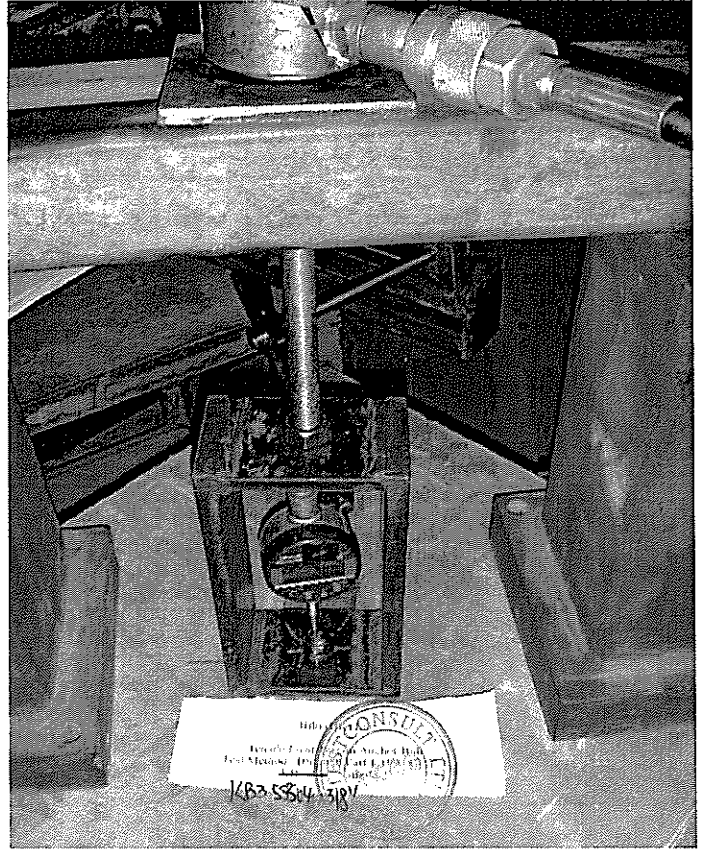
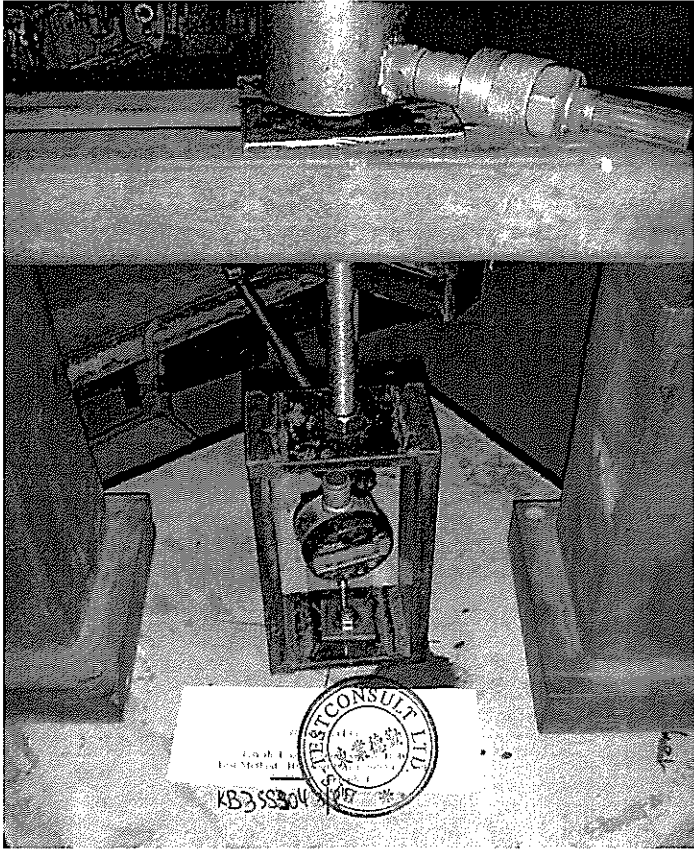
KB3 SS304 3/8"

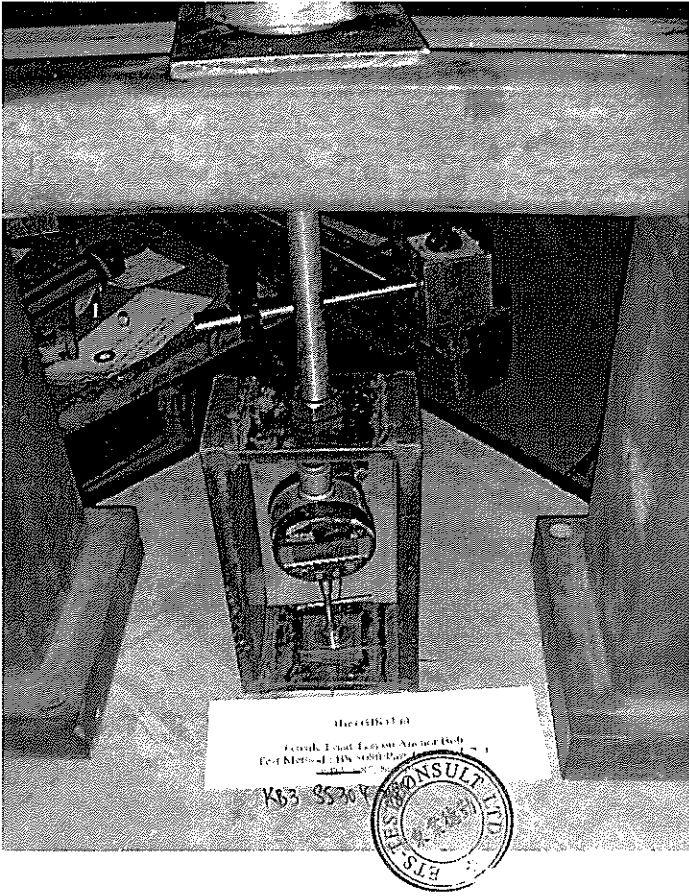




## APPENDIX A

### Photos of Set Up

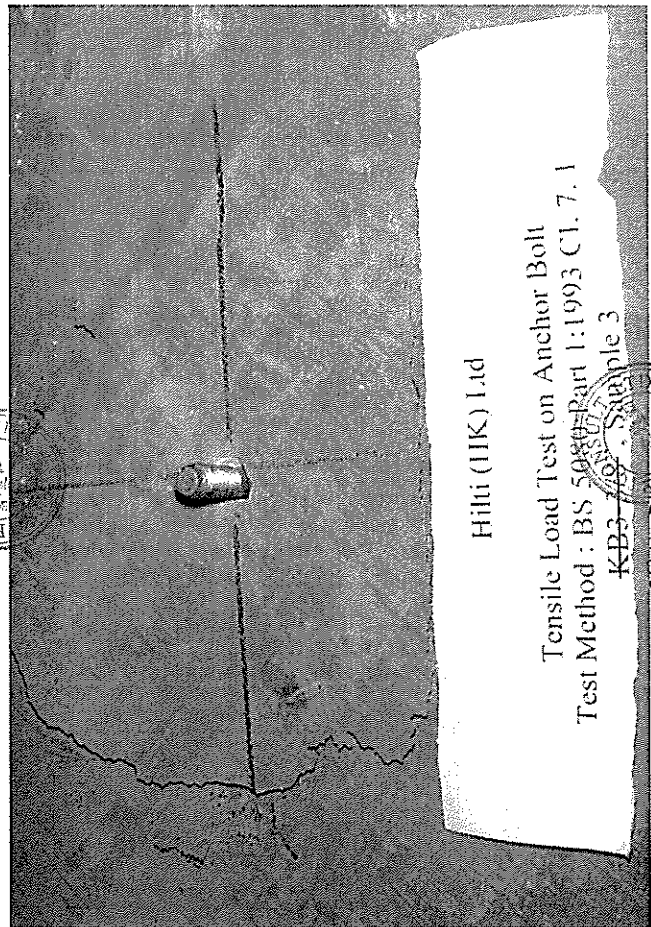
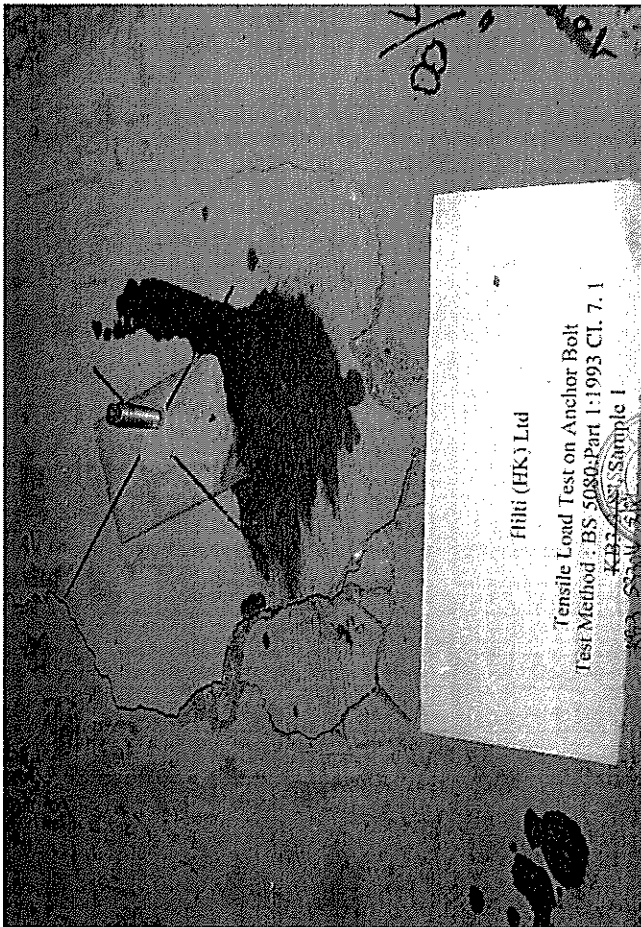
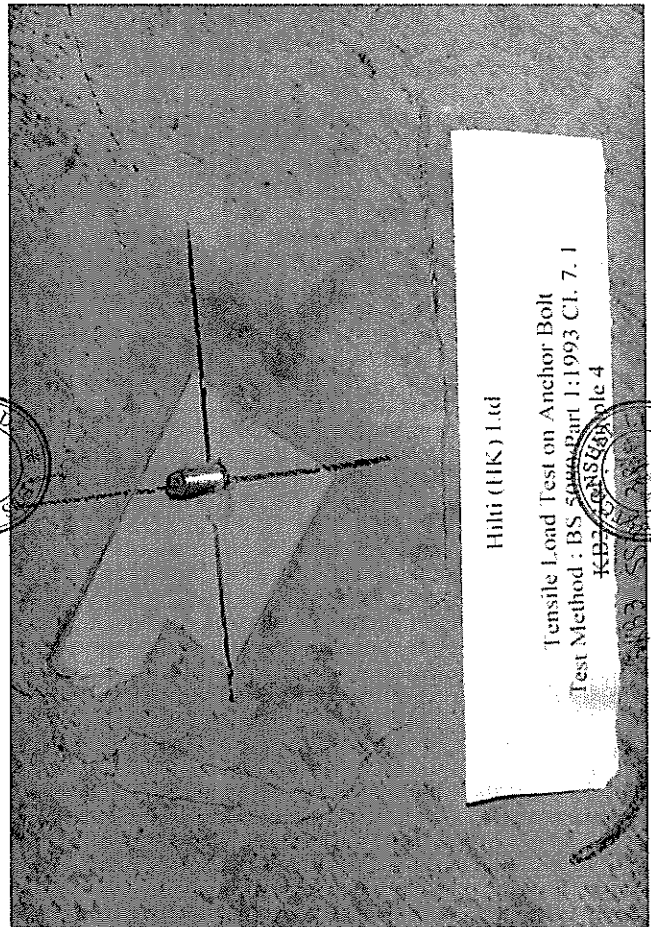
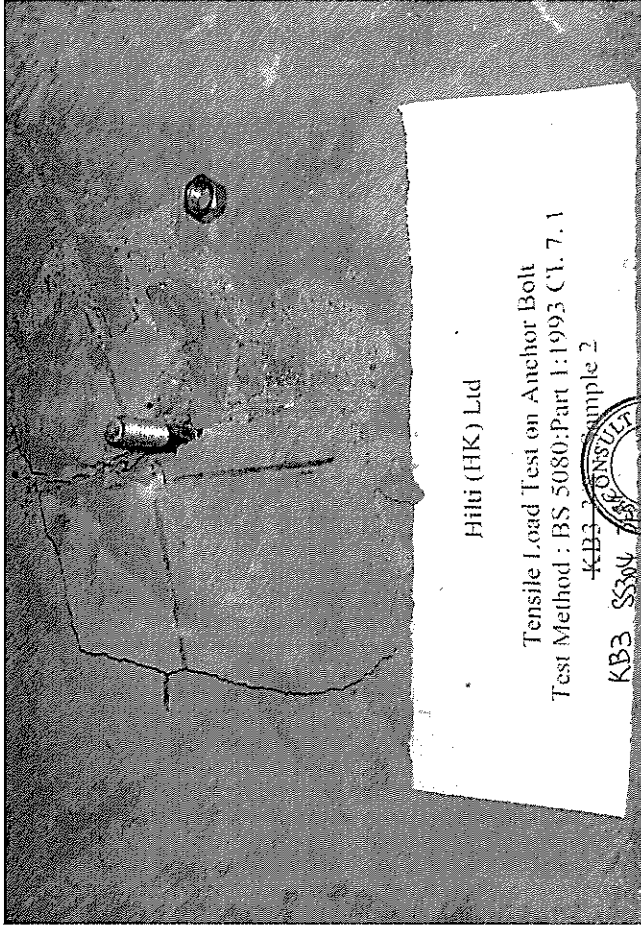


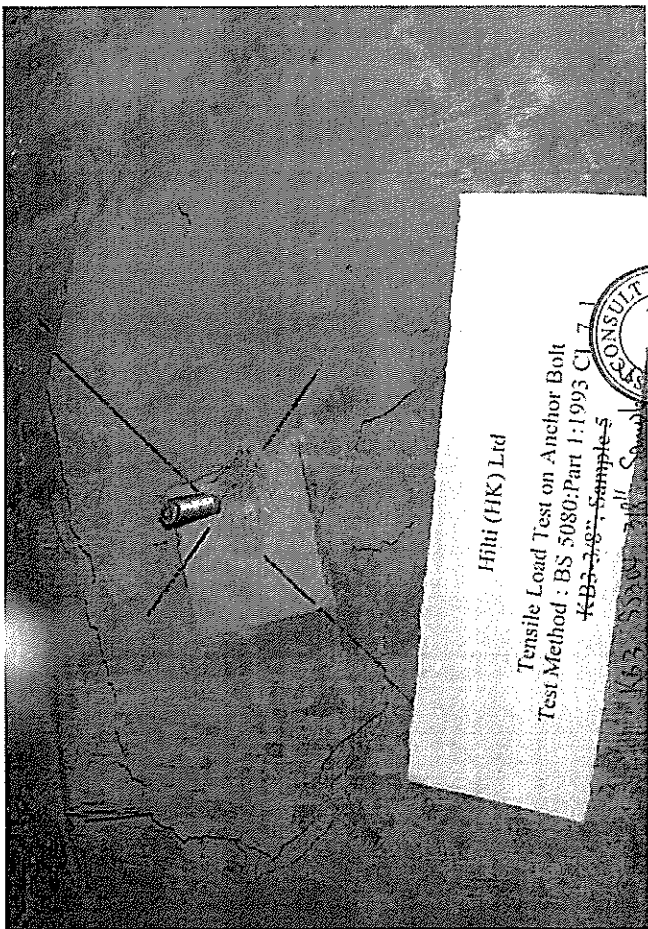




## APPENDIX B

### Photos of Failure Mode







## APPENDIX C

### Concrete Cube Compressive Strength





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ETS - TESTCONSULT LIMITED

8/F., Block B, Veristrong Industrial Centre, 34-36 Au Pui Wan Street, Fotan, Hong Kong  
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Fax : 2695 3944 Web site : www.ets-testconsult.com



**TEST REPORT**

**Concrete Cube Compressive Strength**

Form C/CO/R/54/Issue 12 (1/2) [02/04]

**Information Supplied by Customer**

Customer : Hilti (Hong Kong) Ltd  
Address : 17/F Tower 6, China Hong Kong City, 33 Canton Road, T S T, Hong Kong  
Contract No : N/A  
Project : Tensile and Shear Load on anchor (BS5080 Part 1 : 1993 & BS5080 Part 2 : 1986)

**Laboratory Information**

Report No : CCA91681  
Page No : 1 of 1  
Report Date : 23/04/2009  
Test Method : CS1 : 1990 Section 12 (AMD 1201 & 1202)

Date Cast : 04/04/2009  
Customer Ref No : N/A  
Description of Sample : 100 mm nominal size cube  
Concrete Grade: 30D/20  
Sample Used : Concrete Block  
Location

Test Procedure: TPM/017/O  
Date Received : 06/04/2009  
Date Tested : 07/04/2009  
Age at Test : 3 days

Lab Ref No	Cube Mark	Received Conditions <sup>1</sup>	Measured Dimensions L x W x H (mm)	Mass (kg)	Density (kg/m <sup>3</sup> )	Maximum Load (kN)	Compressive Strength (MPa)	Test Condition & Failure Appearance <sup>2</sup>	Expanded <sup>3,4</sup> Uncertainty
				As Received	As Received				
901X000781	1	N	100.2 x 100.6 x 101.0	2.365	2320	301.3	30.0	2,5,S	N/A
901X000782	2	N	100.1 x 100.1 x 100.7	2.347	2330	308.9	30.5	2,5,S	N/A
901X000783	3	N	99.6 x 100.2 x 100.7	2.346	2330	312.3	31.0	2,5,S	N/A

**Curing Conditions :** Curing Tank at 27±3°C(Laboratory curing from date received)  
**Volume Determination Method :** Determined by direct measurement method as described in CS1 : 1990 Section 16 (AMD 1201, 1202).

- Codes :** 1 N = Normal, D = Damaged Edge, P = Poor Compacting, H = Honeycombing, U = Undersize, O = Oversize, I = Out of Squareness (Irregular)  
2 1 = Cubes received saturated, 2 = Cubes received surface wet, 3 = Cubes received surface dry, 4 = Cubes tested saturated, 5 = Cubes tested surface wet, 6 = Cubes tested surface dry, S = Satisfactory failure, F(X) = Unsatisfactory failure (serial no.), See CS1 : 1990 Volume 2 Figure 6 for pictorial description and serial nos. of cube failure patterns.  
3 The uncertainty was carried out at 95% confidence level with coverage factor, k=2  
4 Sampling uncertainty is not included in this uncertainty calculation since this is a unit test of a single specimen

Remarks :  Automatic Cube Dimension and Weight Measurement  Manual Cube Dimension and Weight Measurement  
Sampling, making and curing test cube are carried out by customer, information not available.  
Time of adding water has not been given by customer, the exact age at tests not determined to C1.10.4 of CS1 : 1990

Tested By : WONG, Gee Sang

Checked By : YEUNG, Siu Ki Kelvin

Approved By :

CHOI, Kam Wah Wallace (Assistant Operations Manager)  
YEUNG, Siu Ki Kelvin (Supervisor)





























