

REFUSE



*32, Holman Close
Waterlooville
Hants
PO8 8DW*

INSURANCE CLAIM

CONCERNING SUSPECTED SUBSIDENCE

RÉSUMÉ OF TECHNICAL ASPECTS

This résumé is prepared on behalf of [REDACTED] for the purpose of investigating a claim for subsidence. It is not intended to cover any aspect of structural inadequacy or building defect that may otherwise have been in existence at the time of inspection.

14/10/2010

INTRODUCTION

Technical aspects of this claim are being overseen by our Project Manager, Richard West, in accordance with our Project Managed Service.

DESCRIPTION OF BUILDING

Insurers will recall that the subject property is a mid terrace house in a residential estate location on a level plot. The claim concerns damage to the front of the insured's mid terrace house.

CIRCUMSTANCES OF DISCOVERY OF DAMAGE

The policyholder's tenant [REDACTED] first discovered the damage in late July 2009 upon return from a holiday. The policyholder then advised insurers.

NATURE AND EXTENT OF DAMAGE

Description and Mechanism

The indicated mechanism of movement is a downward movement of the front wall, lounge floor and intersecting walls. The front door has jammed due to movement.

Significance

Category 3 Moderate

Onset and Progression

Damage first commenced in July 2009.

SITE INVESTIGATIONS

Site investigations were undertaken by CET Safehouse Ltd comprising one trial hole and two boreholes. The front wall foundations were found to bear at a depth of 950mm in shrinkable clay subsoil. The clay was found to be of high – very high plasticity and medium to high swelling/shrinkage potential

MONITORING

Level monitoring is to be undertaken to confirm a clay shrinkage mechanism.

CAUSE OF DAMAGE

Roots from oak, prunus and vitaceae were found beneath the foundations. The clay in borehole 1 below the foundations was found to have suffered the onset of desiccation at to a depth of 2.5m with desiccation at 3m. Moisture levels were lower in borehole one from 2.5m to 4m compared to the control borehole, consistent with moisture extraction at depth by the mature oak tree. The two properties to the left hand side of the property (34 & 36) have previously been underpinned due we understand to subsidence resulting from moisture extraction by the mature Oak tree to the front lhs of the block.

RECOMMENDATIONS

Investigations including level monitoring are being undertaken to gather information for an application to the local authority in respect of the protected oak tree. The insured have removed vegetation (conifers) in their front garden.

MITIGATION

The investigations have identified roots from the local authority oak, the cherry tree in the front garden of number 30 and vitaceae (ivy group) which are considered to be of adverse influence.

REPAIR

If mitigation is successfully achieved the property will stabilise allowing superstructure repairs to be undertaken.

For CUNNINGHAM LINDSEY

Richard West MScCHE BSc CEng MICE Dip CII
Project Manager

FACTUAL REPORT

OF

INVESTIGATION

AT:- 32 Holman Close, Waterloooville

ON:- 09 September 2010

FOR:-
c/o Cunningham Lindsey - Solent

REF:- 3705266-

JOB NO:- 91449

REPORT ISSUED:- 06/10/2010

SPECIALIST CONTRACTING DIVISION

CET SAFEHOUSE LIMITED

Lawness Barns, Mountnessing Road, Billericay, Essex CM12 0TS

WWW.CETSAFEHOUSE.COM

Tel: 01277 655377

Fax: 01277 655977

Investigation Layout Plan

Sheet: 1 of 1
Job No: 91449E
Date: 09/09/10

Site: 32 Holman Close, Waterloooville
Work carried out for: Cunningham Lindsey

NJ PS DVC
(SI) (Checked) (Drawn)

Weather: Cloudy

REAR LANE

GATE



BIH2

GRASS

SLABS

X2

X2

NO 32 X2

X2

GRASS

SOIL

CONCRETE



TP/BIH1

GRASS

TREES
HT=6m

TREES
HT=5m

TREES
HT=20m

ON SITE TREE IDENTIFICATION FOR GUIDANCE ONLY. NOT AUTHENTICATED. SHARED PATH

Remarks:

Key:

Combined Gully

RWWG

Surface Water Drain

Manhole

MIH

Foul Water Drain

Rain Water Pipe

RWP

Tree / Bush

Rain Water Gully

RWG

(approx. ht in m)

Soil Vent Pipe

SVP

Trial Pit

Waste Gully

WG

Borehole

Waste Pipe

WP

Scale: N.T.S.



Borehole No: 1		Sheet: 1 of 1		Site: 32 Holman Close, Waterloooville							
Boring Method: CFA		Job No: 91449E								Date: 09/09/2010	
Diameter: 100mm	Coordinates:	Ground Level mOD:								Work Carried out for: Cunningham Lindsey	
Depth (m)	Description of Strata	Thick-ness (m)	Legend	Sample	Test Type	Result	Depth (m)	Field Records/Comments	Depth to water (m)		
1.00	As Trial Pit 1	1.00									
1.60	Stiff, mid brown, mottled grey, silty CLAY with partings of orange silt & fine sand & occasional shell fragments.	0.60		D	V	80 82	1.00	Roots to 2mm diameter to 2.6m			
2.40	Stiff, mid grey, mottled mid brown, as above.	0.80		D	V	110 112	1.50 2.00				
4.00	Stiff, mid to dark grey, silty CLAY with partings of orange silt & fine sand & occasional shell flecks.	1.60		D			2.50	No roots observed below 2.6m			
5.00	Stiff, mid to dark grey, sandy, very silty CLAY.	1.00		D	V	90 86	3.00				
				D			3.50				
				D	V	120+ 120+	4.00	Water strike at	4.00		
				D			4.50				
				D	V	120+ 120+	5.00				
	Borehole ends at 5m										
Remarks: Borehole open with standing water level at 3.1m on completion				Key: T.D.T.D. Too Dense to Drive D Small disturbed sample J Jar sample B Bulk disturbed sample V Pilcon Vane (kPa) W Water sample M Mackintosh Probe							
Logged: NJ	Checked: PS	Typed by: DVC		Scale: NTS			Weather: Cloudy				

Borehole No: 2		Sheet: 1 of 1		Site: 32 Holman Close, Waterloooville							
Boring Method: CFA		Job No: 91449E								Date: 09/09/2010	
Diameter: 100mm	Coordinates:	Ground Level mOD:								Work Carried out for: Cunningham Lindsey	
Depth (m)	Description of Strata	Thick-ness (m)	Legend	Sample	Test Type	Result	Depth (m)	Field Records/Comments	Depth to water (m)		
G.L	Grass over TOPSOIL	0.20						No roots observed			
0.20	MADE GROUND: Soft, mid brown, mottled grey, silty clay with occasional brick, rock & flint fragments.	0.30									
0.50	Firm, mid brown, grey veined, very silty CLAY with occasional stone fragments & thinly laminated with orange silt & fine sand.	0.50									
1.00	Firm, mid brown, silty CLAY thinly laminated with orange silt & fine sand.	0.40		D	V	60 60	1.00				
1.40	Firm, mid brown, silty CLAY with partings of orange silt & fine sand.	0.60		D			1.50				
2.00	Stiff, purple grey, grey veined, silty CLAY with occasional stone fragments & thinly laminated with orange silt & fine sand.	1.10		D	V	110 110	2.00				
3.10	Stiff, purple grey, moist, slightly sandy, silty CLAY with partings of orange silt & fine sand.	0.40		D			2.50				
3.50	Stiff, mid brown, very silty CLAY/clayey SILT.	0.70		D	V	120+ 120+	3.00	Water strike at	3.10		
4.20	Borehole ends at 4.2m Obstruction, drill lifting - Too dense for drill to penetrate				M	50(5) 50(5)	3.50				
Remarks: Borehole open with standing water level at 2.5m on completion					Key: T.D.T.D. Too Dense to Drive D Small disturbed sample J Jar sample B Bulk disturbed sample V Pilcon Vane (kPa) W Water sample M Mackintosh Probe						
Logged: MA	Checked: PS	Typed by: DVC		Scale: NTS		Weather: Cloudy					

Our Ref : 91449

Laboratory Testing Results

Date Sampled: 09/09/2010

Location : 32 Holman Close Waterloooville

Date Received : 21/09/2010

Work carried out for: Cunningham Lindsey

Date Tested : 21/09/2010

Date of Report : 29/09/2010

Sample Ref		Type	Moisture Content (%) [1]	Soil Fraction > 0.425mm (%) [2]	Liquid Limit (%) [3]	Plastic Limit (%) [4]	Plasticity Index (%) [5]	Liquidity Index [5]	Modified Plasticity Index (%) [6]	Soil Class [7]	Filter Paper Contact Time (h) [8]	Soil Sample Suction (kPa)	In situ Shear Vane Strength (kPa) [9]	Organic Content (%) [10]	pH Value [11]	Sulphate Content (g/l)		Class [14]
TP/BH No	Depth (m)															SO ₃ [12]	SO ₄ [13]	
TP1	0.95(U/S)	D	33	<5	77	28	48	0.10	48	CV			76					
	1.0	D	33	<5									81					
	1.5	D	27	<5														
	2.0	D	26	<5	62	25	36	0.03	36	CH			111					
	2.5	D	22	<5														
	3.0	D	24	<5	50	19	31	0.17	31	CH			88					
	3.5	D	23	<5														
	4.0	D	29	<5									> 120					
	4.5	D	23	<5														
	5.0	D	24	<5									> 120					

Test Methods / Notes

[1] BS 1377 : Part 2 : 1990, Test No 3.2

[2] Estimated if <5%, otherwise measured

[3] BS 1377 : Part 2 : 1990, Test No 4.4

[4] BS 1377 : Part 2 : 1990, Test No 5.3

[5] BS 1377 : Part 2 : 1990, Test No 5.4

[6] BRE Digest 240 : 1993

[7] BS 5930: 1981 : Figure 31 - Plasticity Chart for the classification of fine soils

[8] In-house method S9a adapted from BRE IP 4/93

[9] Values of shear strength were determined in situ by CET Sufhouse using

a Pilon hand vane or Geosor vane (GV).

[10] BS 1377 : Part 3 : 1990, Test No 4

[11] BS 1377 : Part 3 : 1990, Test No 9

[12] BS 1377 : Part 3 : 1990, Test No 5.6

[13] SO₄ = 1.2 x SO₃

[14] BRE Special Digest One (Concrete in Aggressive Ground)2005

Note that if the SO₄ content falls into the DS-4 or DS-5 class, it would be prudent to consider the sample as falling into the DS-4m or DS-5m class respectively unless water soluble magnesium testing is undertaken to prove otherwise

Key

D Disturbed sample (small)

B Disturbed sample (bulk)

U Undisturbed sample

W Groundwater sample

ENP Essentially Non-Plastic by inspection

U/S Underside of Foundation

Our Ref: 91449

Location: 32 Holman Close Waterloo

Work carried out for: Cunningham Lindsey

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TP/BH No.	Depth (m)															SO ₃ [12]	SO ₄ [13]	
BH2	1.00	D	26	<5	65	23	41	0.06	41	CH			60					
	1.5	D	26	<5														
	2.0	D	26	<5	63	24	39	0.05	39	CH			110					
	2.5	D	28	<5														
	3.0	D	26	<5	43	21	22	0.25	22	CI			> 120					
	3.5	D	31	<5														

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U/S Underside of Foundation

Our Ref: 91449

Location: 32 Holman Close Waterloo

Work carried out for: Cunningham Lindsey

Moisture Content and Shear Strength Profiles

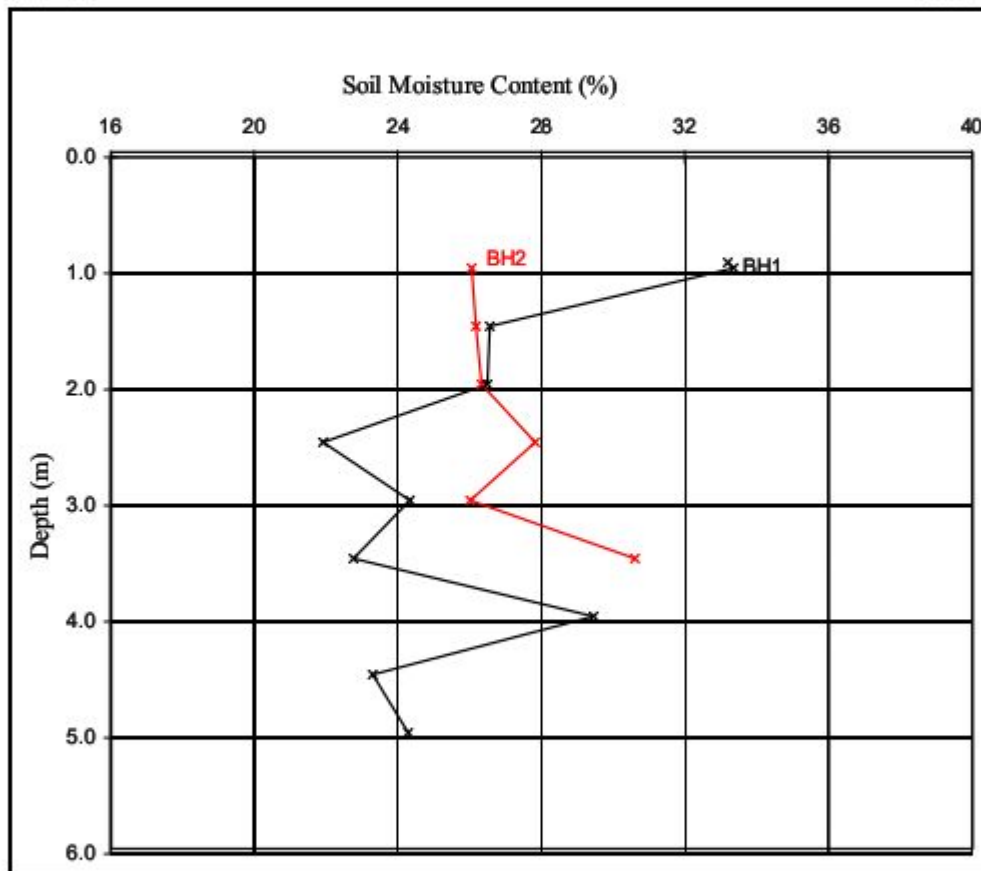
Date Sampled: 09/09/2010

Date Received: 21/09/2010

Date Tested: 21/09/2010

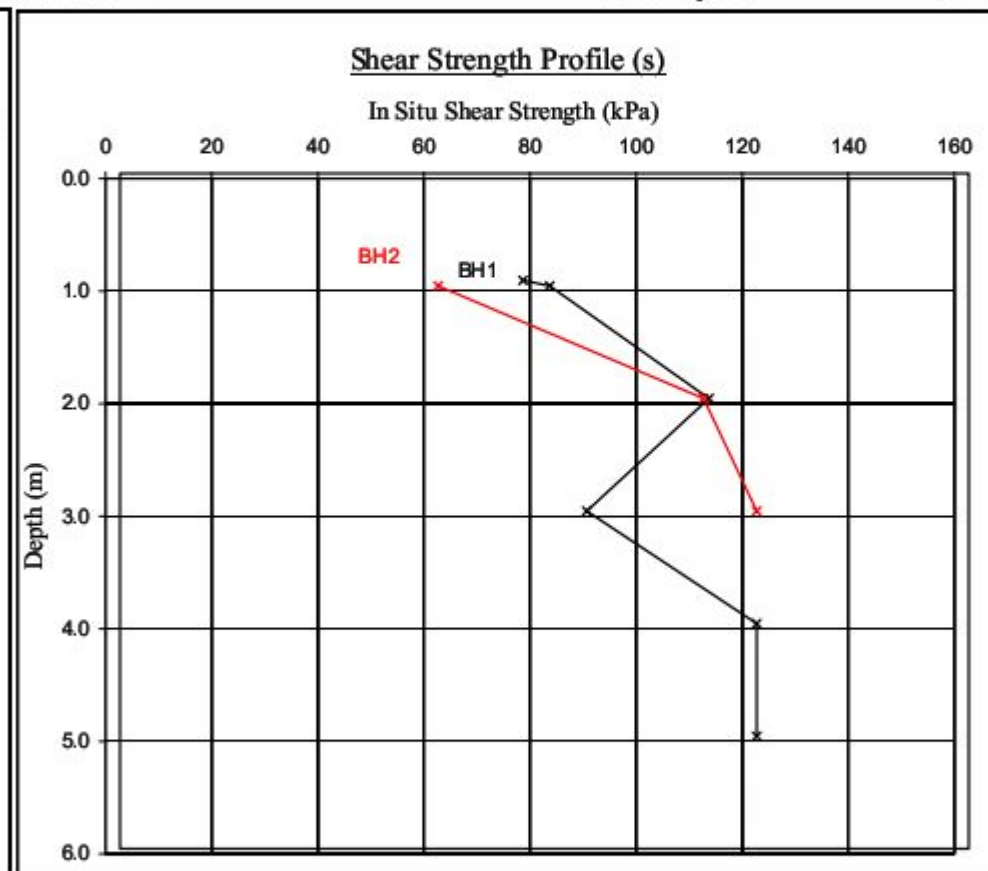
Date of Report: 29/09/2010

Note: Unless specifically noted the profiles have not been related to a site datum.



Note

If plotted, 0.4 LL and PL+2 (after Driscoll, 1983) should only be applied to London Clay (and similarly overconsolidated clays) at shallow depths.



Note

Unless otherwise stated, values of Shear Strength were determined in situ by CET Safehouse using a Pilcon Hand Vane the calibration of which is limited to a maximum reading of 150 kPa.

Tree Root Identification Ltd

Sheet: 1 of 1

Job No: 91449
Date: 16/09/2010
Order No: 317798
Our Ref: CET160910

Site: 32 Holmans Close,
Waterlooville.
Work carried
out for: Cunningham Lindsey

Certificate of Analysis

The following work was commissioned by CET Safehouse Limited on behalf of their client. Root samples were obtained in sealed packets from the above site with no reference given as to the types of tree or shrub from which they may have originated.

The results were as follows -

<u>Trial pit/ Borehole number</u>	<u>Root diameter (mm)</u>	<u>Tree, shrub or climber from which root originates</u>	<u>Result of starch test#</u>
TP/BH1 (underside)	(i) 2.0	a member of the family Vitaceae* (1 root)	positive
	(ii) 2.5	<u>Quercus</u> (oak) (1 root)	positive
	(iii) 2.0	<u>Prunus</u> (e.g. cherry, plum, cherry laurel) (2 roots)	positive
BH1 (depth: 1.0 to 2.6m)	(i) 2.0	<u>Prunus</u> (e.g. cherry, plum, cherry laurel) (1 root)	positive
	(ii) 1.0	<u>Quercus</u> (oak) (2 roots)	positive

The presence of starch indicates that the root was alive in the recent past.

* Members of the Vitaceae include Virginia Creeper (Parthenocissus), Boston Ivy (Ampelopsis) and grape (Vitis).

Ronald Macleod

DR RONALD D MACLEOD
Principal Scientist

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Telephone: 01738 630873

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Principal Scientist: RD. MacLeod, BSc., PhD.,

Accounts/Quality Manager: Fiona M. Sinclair, HNC. (Management)

Registered in Scotland, No. 258058. Registered Office: "Mandays", Highfield Place, Bankfoot, PH1 4AX.



Your ref: SOHPC/PXL/3705266

Our ref: QM2026CL

monitoring 020 8208 0343 ↩

general enquiries 020 8208 4476

e-mail: mon@geo-serv.com

date: 2 August, 2011

Cunningham Lindsey Subsidence Scanning Centre
Woodhead House Centre
27 Business Park Woodhead Rd,
Birstall,
WF17 9TD

Monitoring Report

Owners name		Suspected cause	To be advised	Monitoring type	
Address	32 Holman Close Waterlooville Hants PO8 8DW	Principal area of damage		Installed	22/10/10
Home telephone		Damage Category		Frequency	
Work telephone		Surface geology	To be advised	Status	open
Correspondence address		Redback from last visit			
Comment	Sketch showing approximate location of monitoring points Front Elevation				

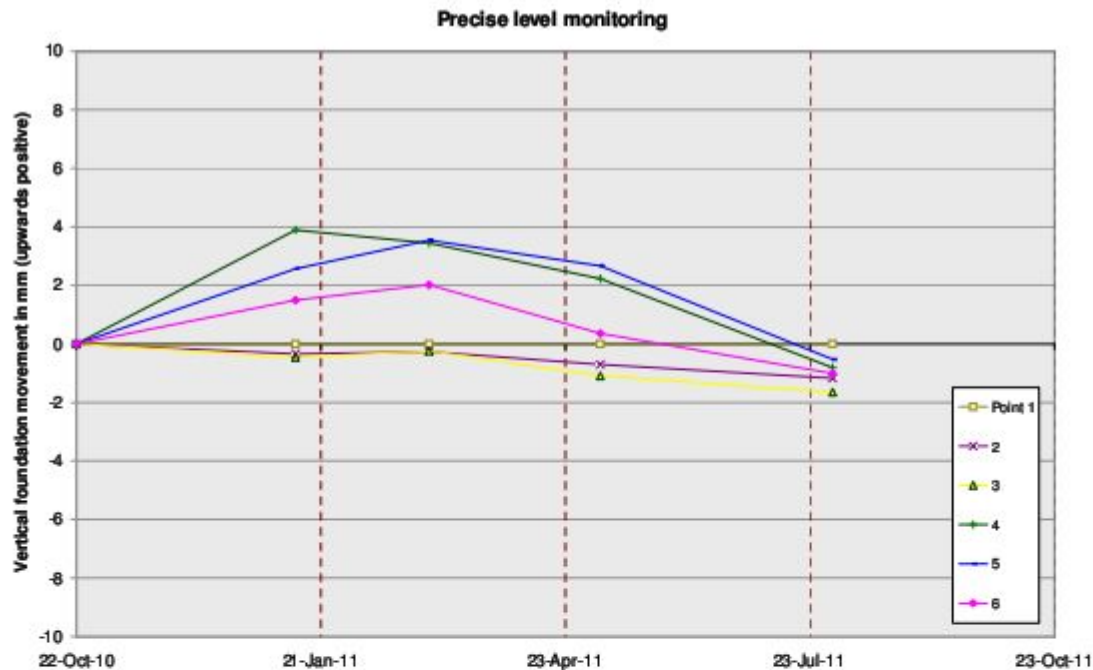
Results of: **precise levelling** . crack monitoring . distortion survey . verticality monitoring

Survey Date:	2010/1 22-Oct	2011/2 12-Jan		2011/3 03-Mar		2011/4 06-May		2011/5 01-Aug	
Point ID	levels mm	levels mm	chngs mm	levels mm	chngs mm	levels mm	chngs mm	levels mm	chngs mm
Point 1	1000.00	1000.00	0.0	1000.00	0.0	1000.00	0.0	1000.00	0.0
2	1000.99	1000.65	-0.3	1000.72	-0.3	1000.29	-0.7	999.82	-1.2
3	995.46	995.00	-0.5	995.22	-0.2	994.37	-1.1	993.81	-1.7
4	1234.06	1237.95	3.9	1237.50	3.4	1236.29	2.2	1233.25	-0.8
5	1226.66	1229.23	2.6	1230.20	3.5	1229.33	2.7	1226.13	-0.5
6	1229.80	1231.30	1.5	1231.82	2.0	1230.16	0.4	1228.79	-1.0
Point 1	1000.13	999.91		1000.38		999.57		999.99	

Results are changes in level relative to baseline survey performed and assume that point marked with an asterisk remains static

Closing errors (mm)

Sum	0.13	-0.09	0.38	-0.43	-0.01
Datum	0.13	-0.09	0.38	-0.43	-0.01



Results of: precise levelling crack monitoring distortion survey . verticality monitoring

Survey: Date:	2010/1 22-Oct	2011/2 12-Jan		2011/3 03-Mar		2011/4 06-May		2011/5 01-Aug	
Crack ID	sprtn mm	sprtn mm	chngs mm	sprtn mm	chngs mm	sprtn mm	chngs mm	sprtn mm	chngs mm
A(horiz)	46.61	46.31	-0.3	46.91	0.3	46.85	0.2	46.70	0.1
A(vert)	50.52	50.45	-0.1	50.88	0.4	50.66	0.1	50.92	0.4
A(diag)	69.46	69.14	-0.3	69.78	0.3	69.74	0.3	69.54	0.1
B(horiz)	58.37	58.39	0.0	58.86	0.5	58.61	0.2	58.52	0.2
B(vert)	56.04	55.99	0.0	56.41	0.4	56.42	0.4	56.32	0.3
B(diag)	82.49	82.36	-0.1	82.89	0.4	82.76	0.3	82.72	0.2
C(horiz)	67.40	67.69	0.3	67.87	0.5	67.71	0.3	67.59	0.2
C(vert)	49.04	48.85	-0.2	48.97	-0.1	48.95	-0.1	48.97	-0.1
C(diag)	76.80	76.69	-0.1	76.99	0.2	76.95	0.2	76.97	0.2

NOTE: All measurements made with inside jaws except those marked with an asterisk.

The description 'vertical' and 'horizontal' refer to the positions of the demecs and not the direction of the cracks themselves.

- A:** Demec triplet, external, front elevation, above G/F window
B: Demec triplet, external, front elevation, above door
C: Demec triplet, external, front elevation, below G/F window

