



FT Laboratories Ltd

科達測檢試驗所有限公司



Customer : ZHA Environmental Sdn Bhd

Project : Not applicable

Contract No. : -

Work Order No. : Nil

Report No. : B15T54A

(This report is to supercede the previous one with Job Reference No: 11592118- B15T54)

Volume : 1 of 1

Laboratory:

FT Laboratories Ltd.
Lot No. DD 77 Section 1552 S.Ass 1RP,
Ng Chow South Road,
Ping Che, N.T.

Approved Signatory

LAM Wai Man

Issue Date:

Lot No. DD77 Section 1552 S.Ass 1RP, Ng Chow South Road, Ping Che, Fanling, N.T.
P.O. Box 830, Fanling Post Office, Fanling, N.T. Tel:(852) 2758 4861 Fax: (852) 2758 8962

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- 2 . Test Report Summary
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- 4 . Resistance to Indentation
- 5 . Ease of Ignition
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Introduction

1. **Introduction**

FT Laboratories Limited was instructed by their Customer, ZHA Environmental Sdn Bhd on 15-Feb-2017 to undertake Playground Safety Mat testing relating to the project entitled ' Not applicable ' .

This report presents results of testing carried out between 16-Feb-2017 to 22-Feb-2017 .

2. **Testing Laboratory**

Laboratory testing was carried out by FT Laboratories Limited, which is accredited by the Hong Kong Laboratory Accreditation Scheme (HOKLAS Registration No. 071).

3. **Laboratory Testing**

Relevant testing standards are summarized in the following table.

Playground Safety Mat Tests

<i>Test Description</i>	<i>Test Basis</i>	<i>Remarks</i>
Determination of critical fall height	BS EN 1177: 2008	
Resistance to indentation	BS 7188: 1998 + A2 : 2009	Clause 6
Ease of ignition	BS 7188: 1998 + A2 : 2009	Clause 7
Slip Resistance	BS 7188:1998+ A2:2009	Clause 5

Test Report Summary

Determination of Critical Fall Height



Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A (This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Laboratory : FT Laboratories Limited

Address : Lot No.DD77 Section 1552 S.A.ss1RP, Ng Chow South Road, Ping Che, N.T.

Telephone : (852) 2758 4861 **Facsimile** : (852) 2758 8962

Client : ZHA Environmental Sdn Bhd

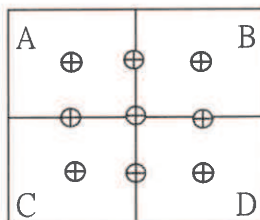
Project : Not applicable

Location of the test : FT Lab

Method of fixing : Loosely laid on concrete floor

Material : TetraPlay Rubber Tiles 50mm

Diagram of test position :



⊕ Test position

Test Method : BS EN1177:2008

Date of Order Received : 15-Feb-17

Date of Test Conducted : 16-Feb-17

Weather : Sunny

Temperature range (°C) : 20

Critical fall height (m) : 1.6

Test Results : The test results are detailed in the subsequent page(s)
(The result(s) given in this Test Report only relate to the location of test and the result(s) measured at the time of the test.)

Notes: (1) * Delete whichever is not applicable

HOKLAS Approved Signatory :

- ☐ YUE Wai Chun (General Manager)
☐ SHU Hon Man (Laboratory Manager)
☐ LAM Wai Man (Senior Technical Engineer)

Date : 18/02

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Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

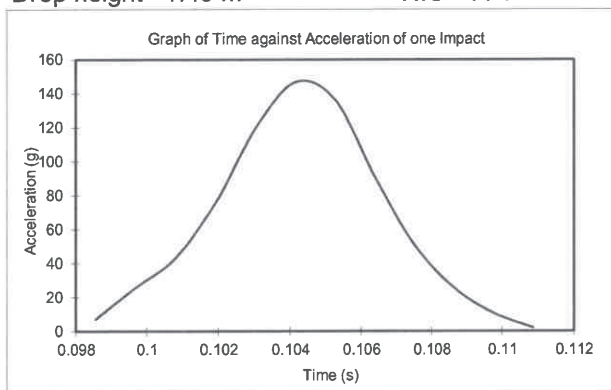
(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Test Results

Test position : Centre of tile A

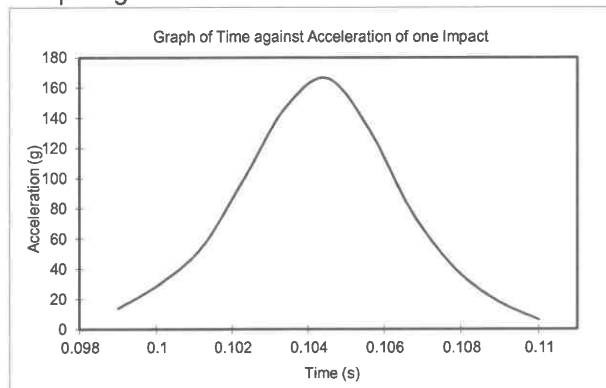
Drop height= 1.40 m

HIC= 774



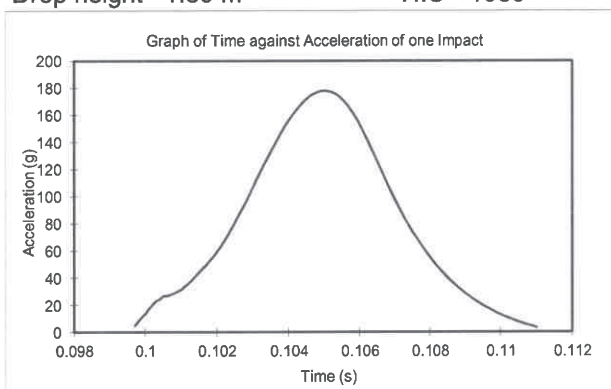
Drop height= 1.60 m

HIC= 956



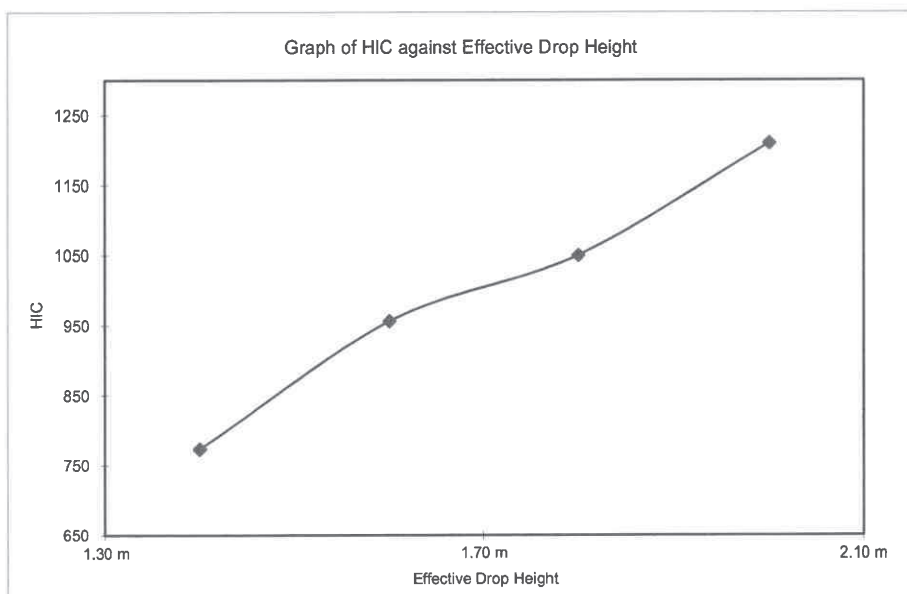
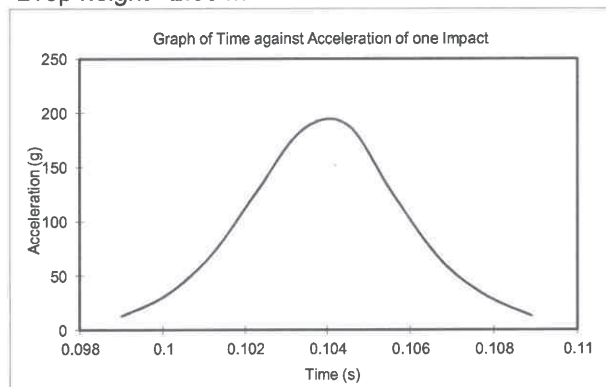
Drop height= 1.80 m

HIC= 1050



Drop height= 2.00 m

HIC= 1210



HIC (1000) = 1.70 m



Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

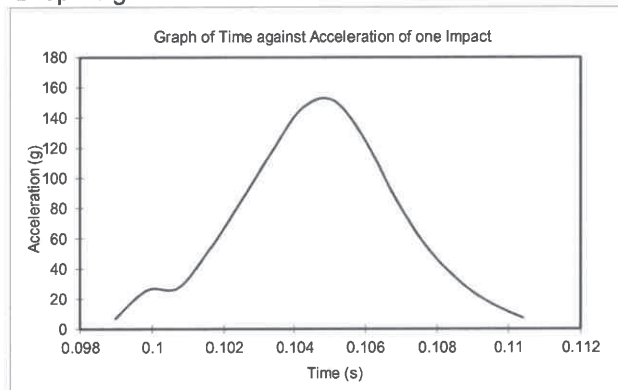
(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Test Results

Test position : Centre of tile B

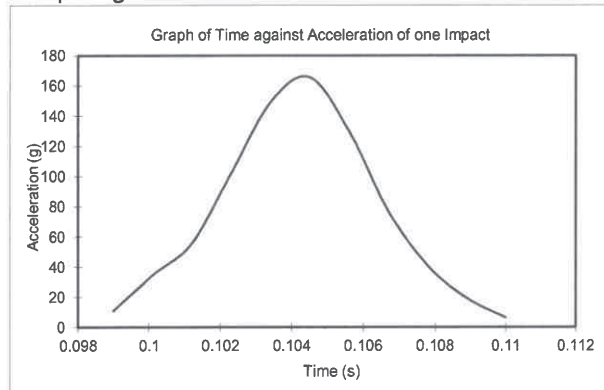
Drop height= 1.40 m

HIC= 790



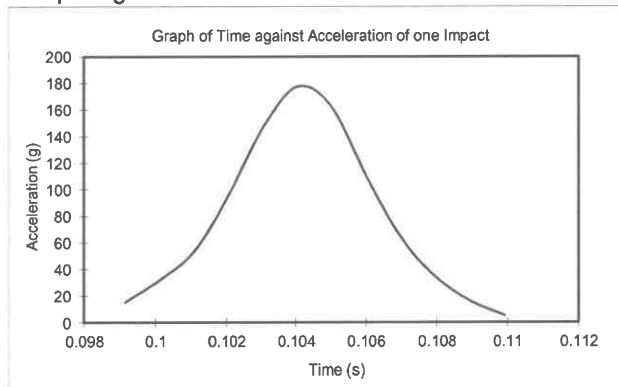
Drop height= 1.60 m

HIC= 952



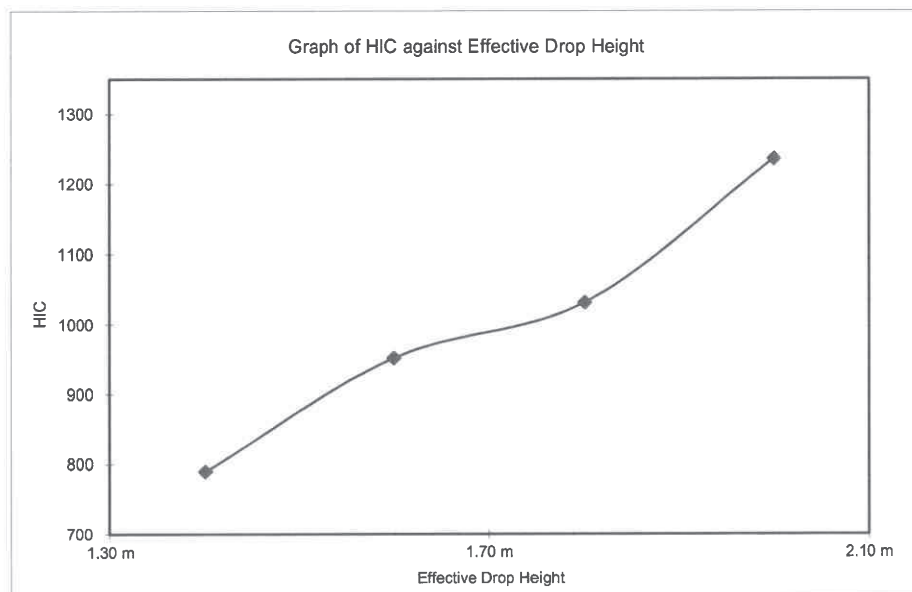
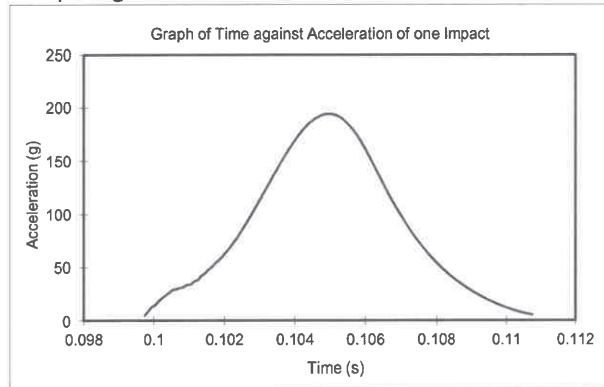
Drop height= 1.80 m

HIC= 1031



Drop height= 2.00 m

HIC= 1236



HIC (1000) = 1.73 m



Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

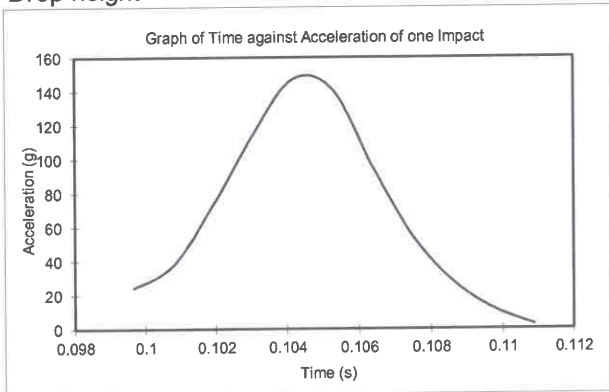
(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Test Results

Test position : Centre of tile C

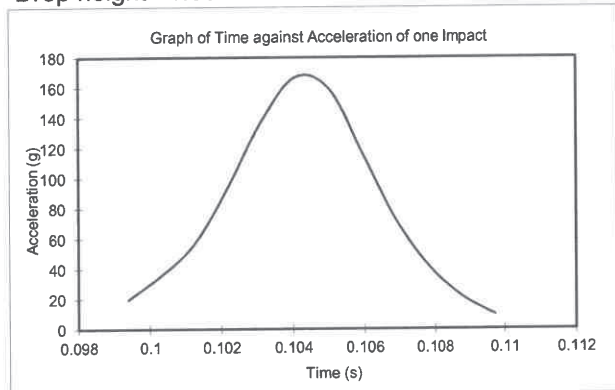
Drop height= 1.40 m

HIC= 810



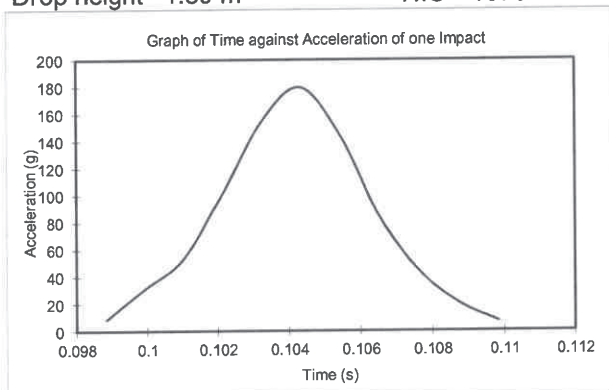
Drop height= 1.60 m

HIC= 966



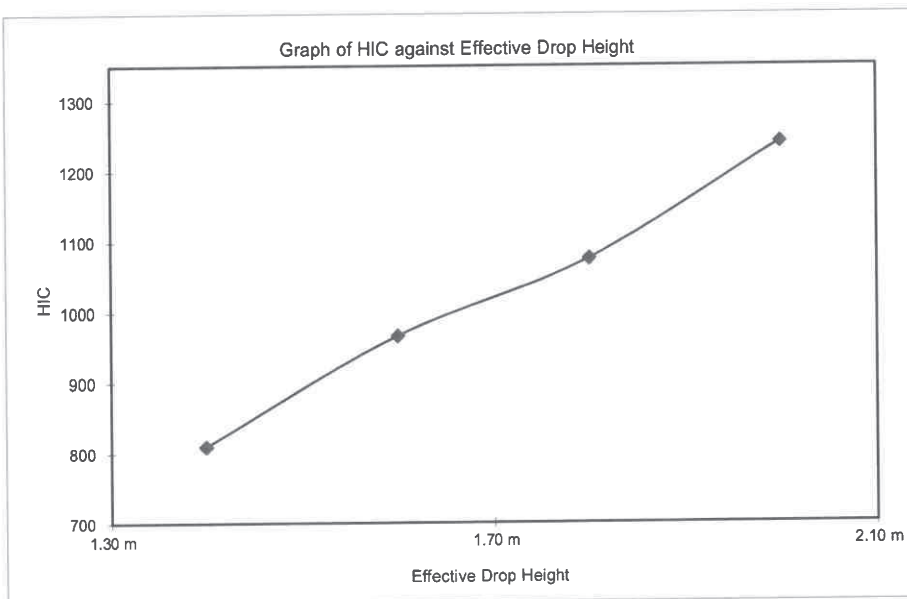
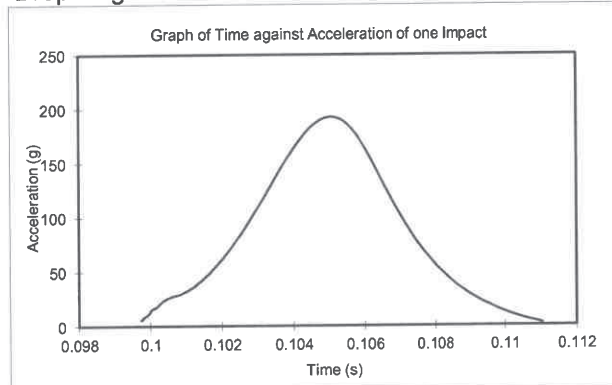
Drop height= 1.80 m

HIC= 1076



Drop height= 2.00 m

HIC= 1241



HIC (1000) = 1.67 m



Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

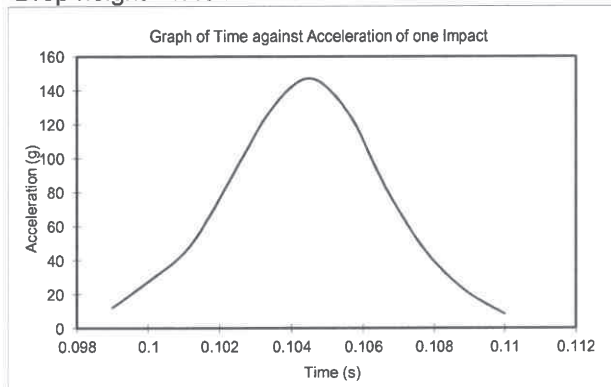
(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Test Results

Test position : Centre of tile D

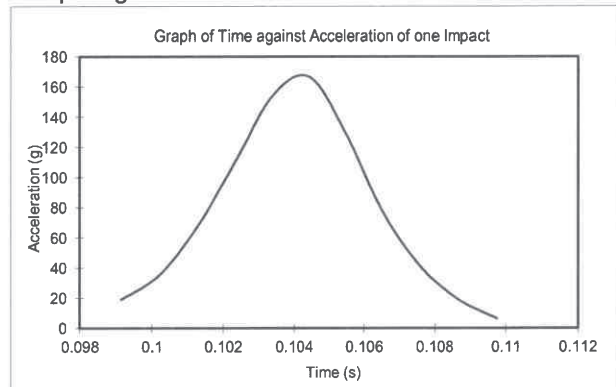
Drop height= 1.40 m

HIC= 803



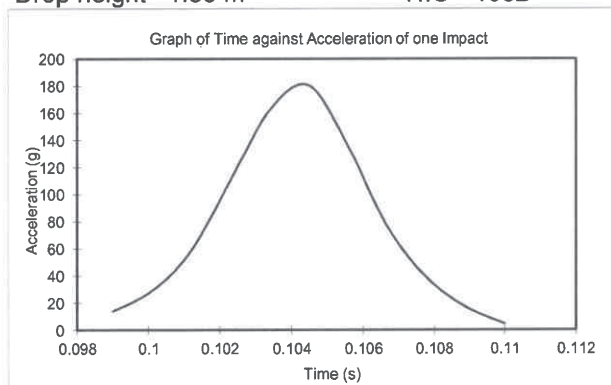
Drop height= 1.60 m

HIC= 951



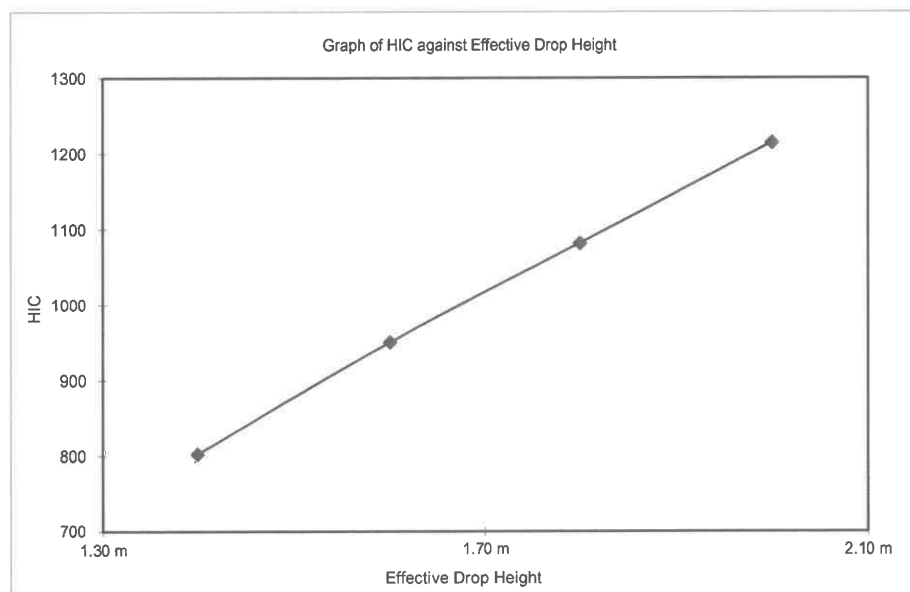
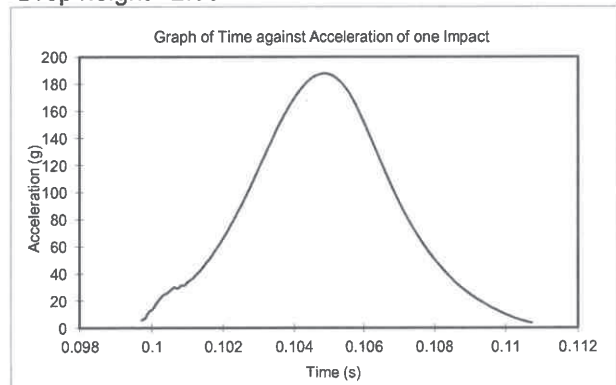
Drop height= 1.80 m

HIC= 1082



Drop height= 2.00 m

HIC= 1215



HIC (1000) = 1.68 m



Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

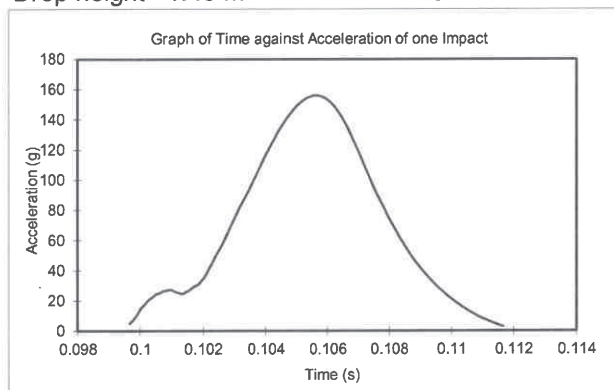
(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Test Results

Test position : Joint edges of two tile AB

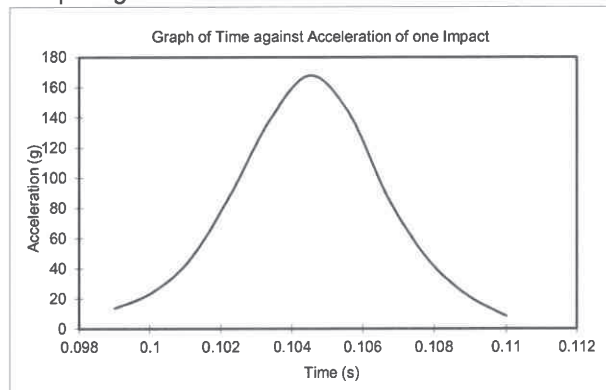
Drop height= 1.40 m

HIC= 809



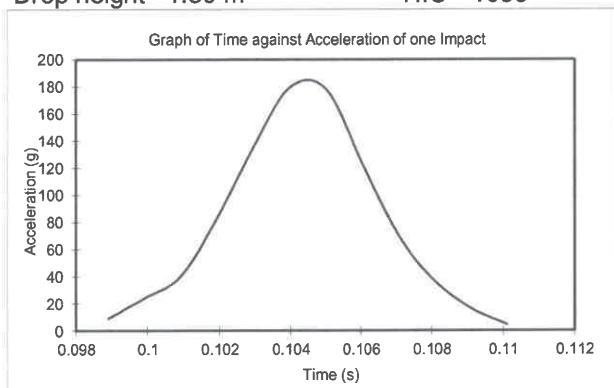
Drop height= 1.60 m

HIC= 938



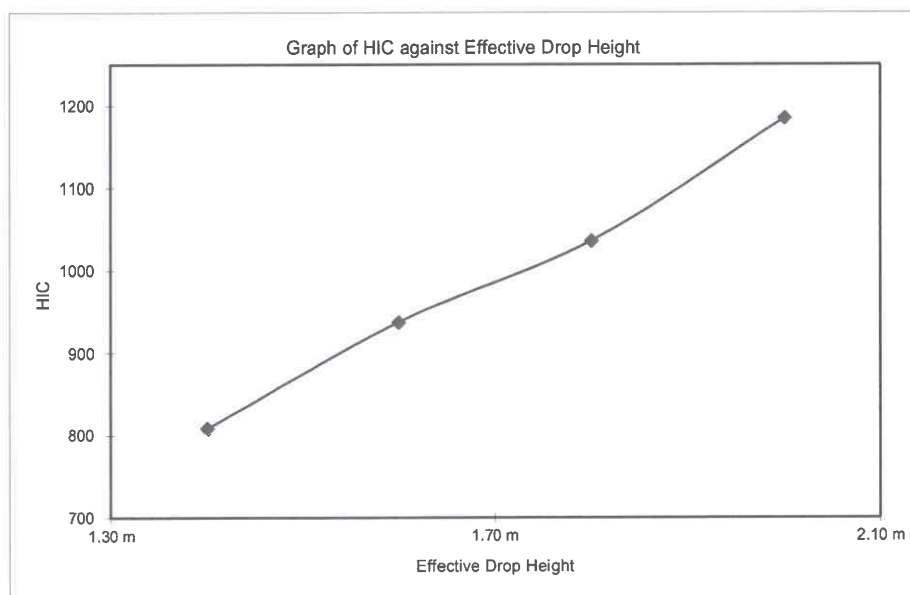
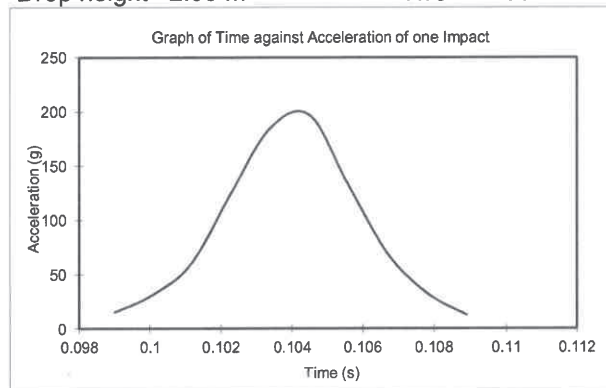
Drop height= 1.80 m

HIC= 1036



Drop height= 2.00 m

HIC= 1185



HIC (1000) = 1.71 m



Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

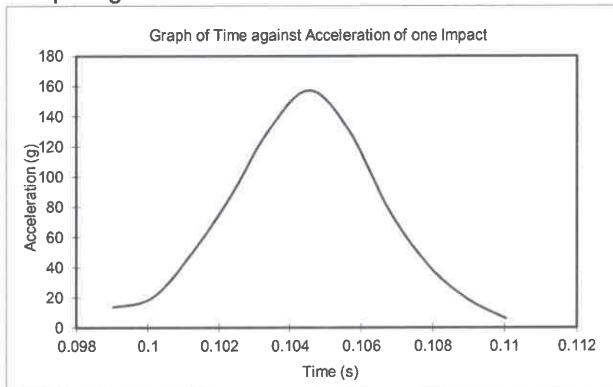
(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Test Results

Test position : Joint edges of two tile AC

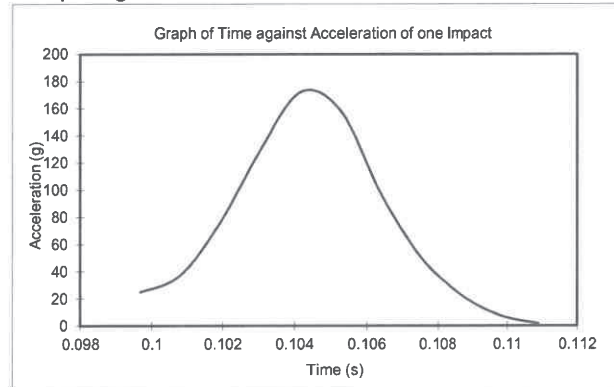
Drop height= 1.40 m

HIC= 811



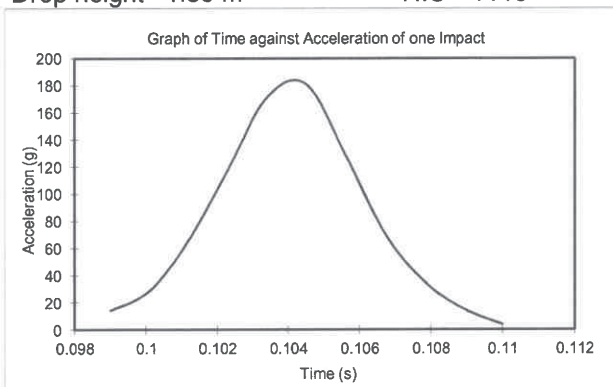
Drop height= 1.60 m

HIC= 946



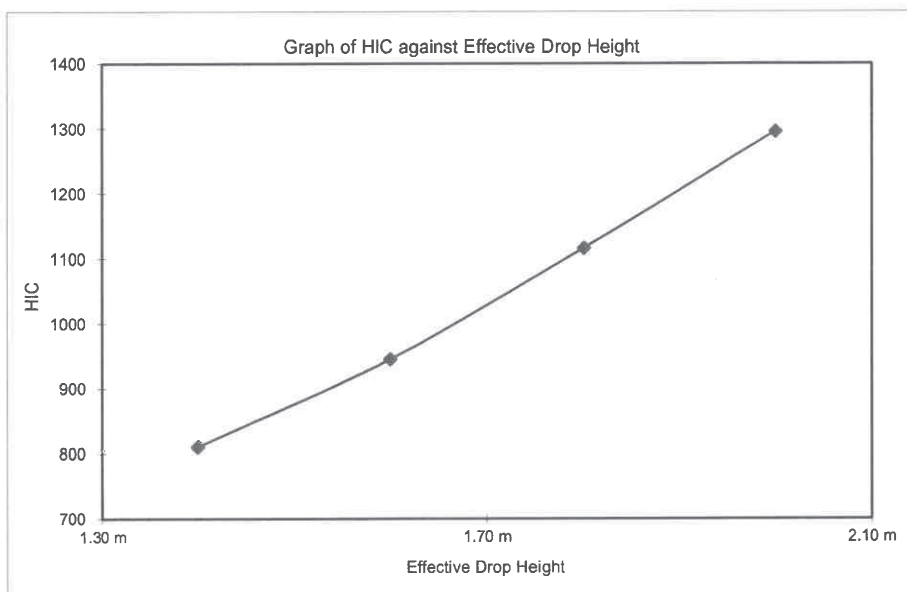
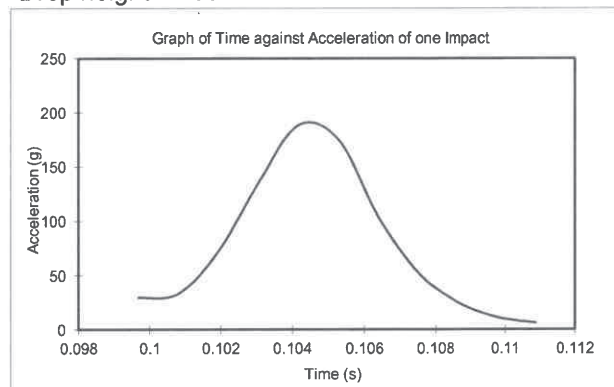
Drop height= 1.80 m

HIC= 1116



Drop height= 2.00 m

HIC= 1296



HIC (1000) = 1.68 m



Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

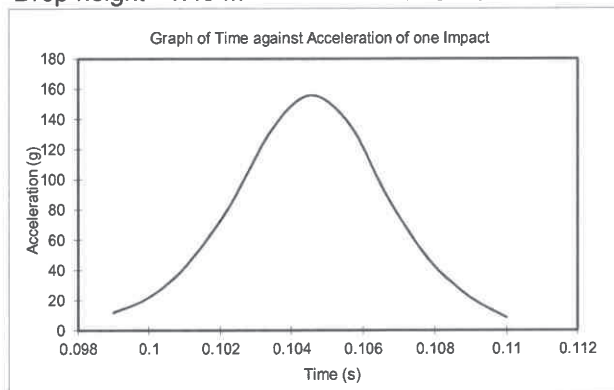
(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Test Results

Test position : Joint edges of two tile BD

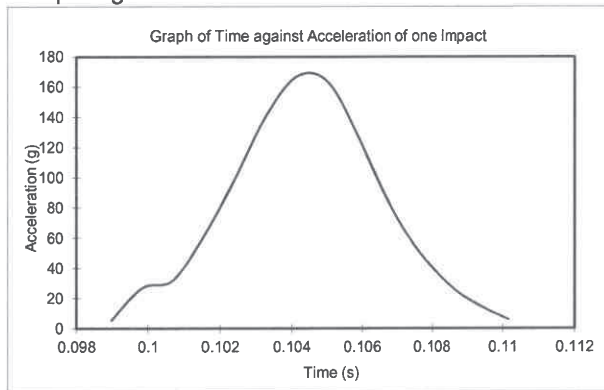
Drop height= 1.40 m

HIC= 813



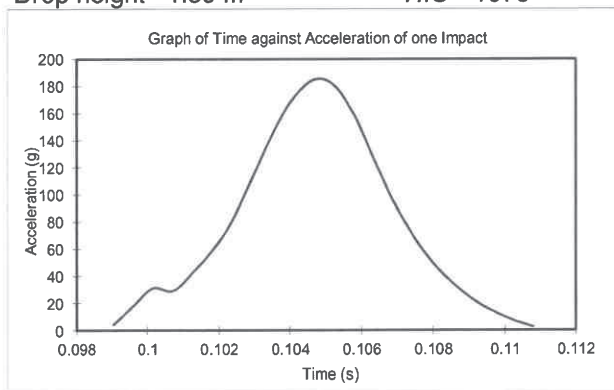
Drop height= 1.60 m

HIC= 941



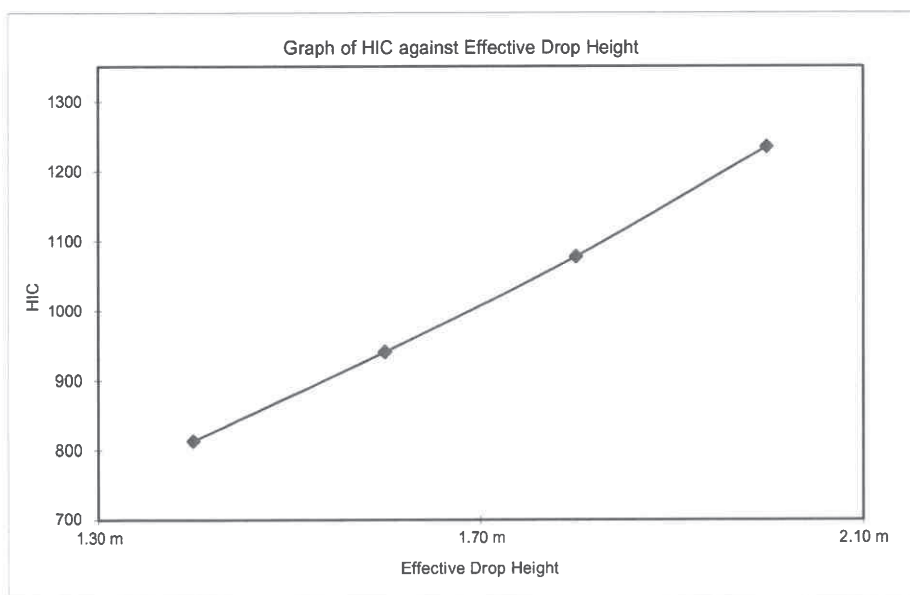
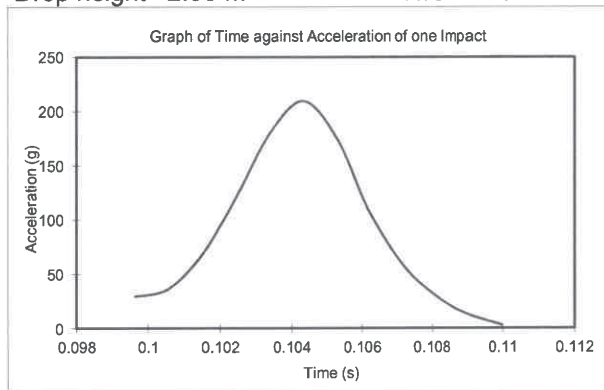
Drop height= 1.80 m

HIC= 1078



Drop height= 2.00 m

HIC= 1234



HIC (1000) = 1.68 m



Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

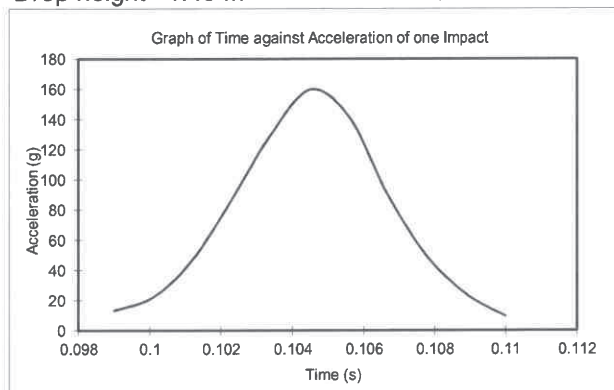
(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Test Results

Test position : Joint edges of two tile CD

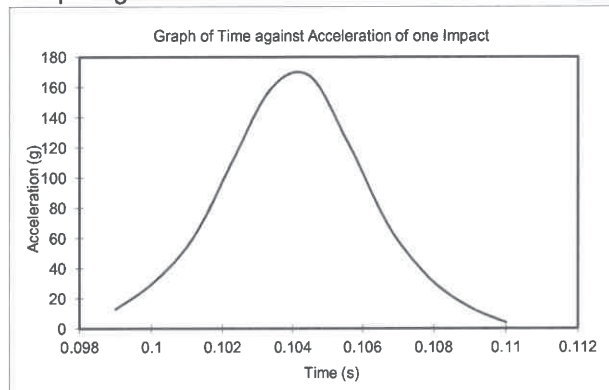
Drop height= 1.40 m

HIC= 810



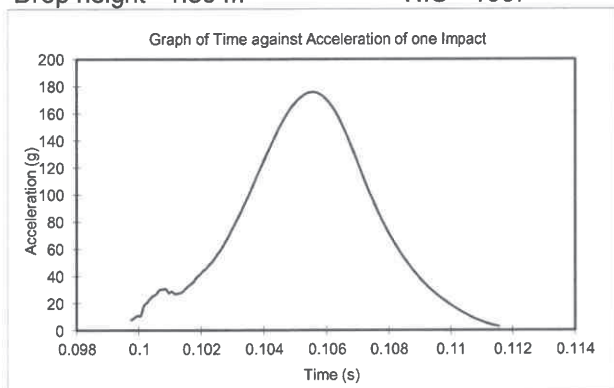
Drop height= 1.60 m

HIC= 943



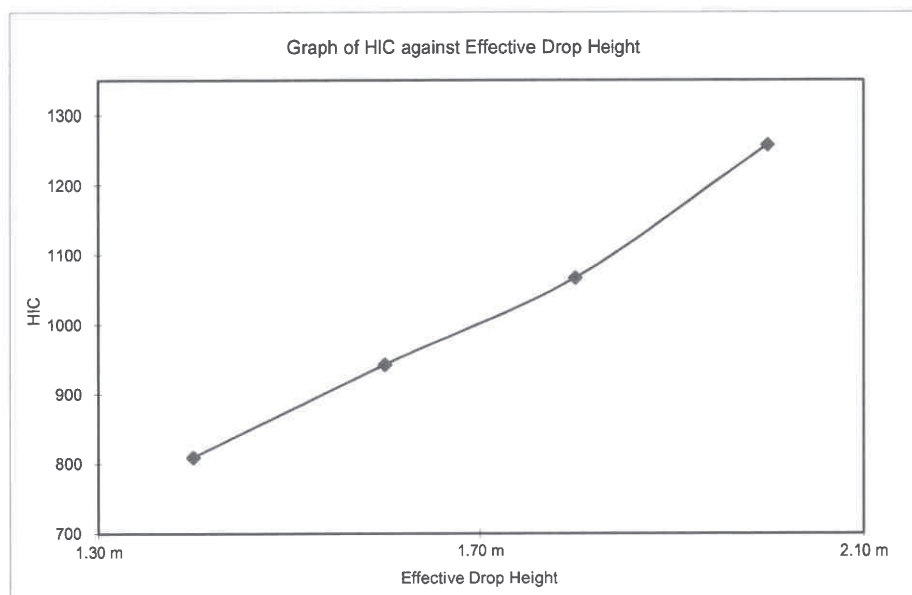
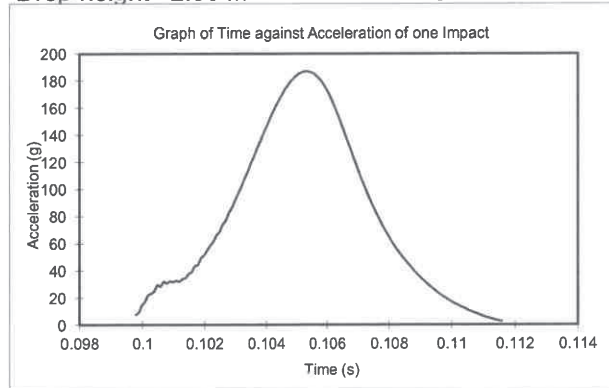
Drop height= 1.80 m

HIC= 1067



Drop height= 2.00 m

HIC= 1257



HIC (1000) = 1.67 m



Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

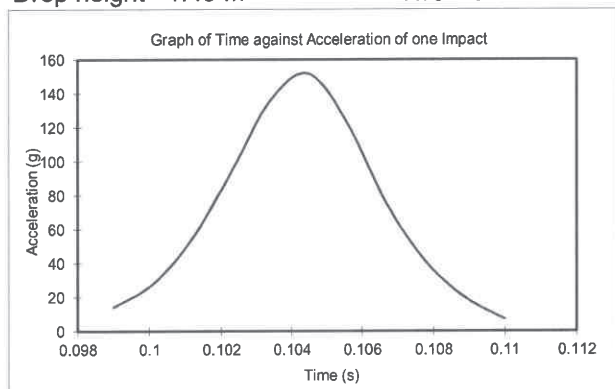
(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Test Results

Test position : Joint corners of four tiles

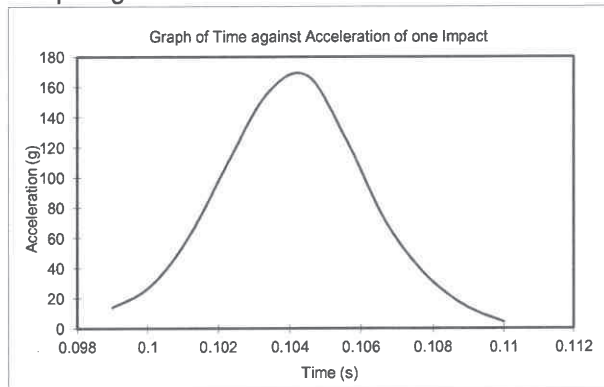
Drop height= 1.40 m

HIC= 811



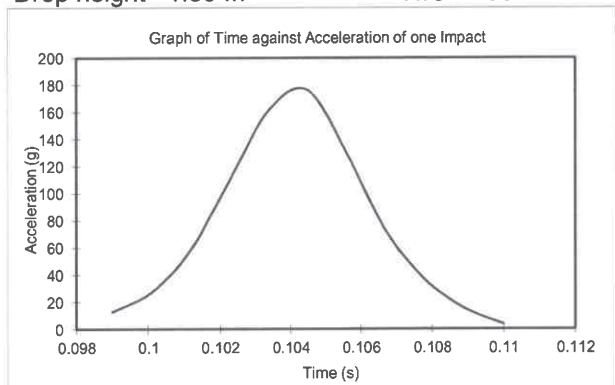
Drop height= 1.60 m

HIC= 969



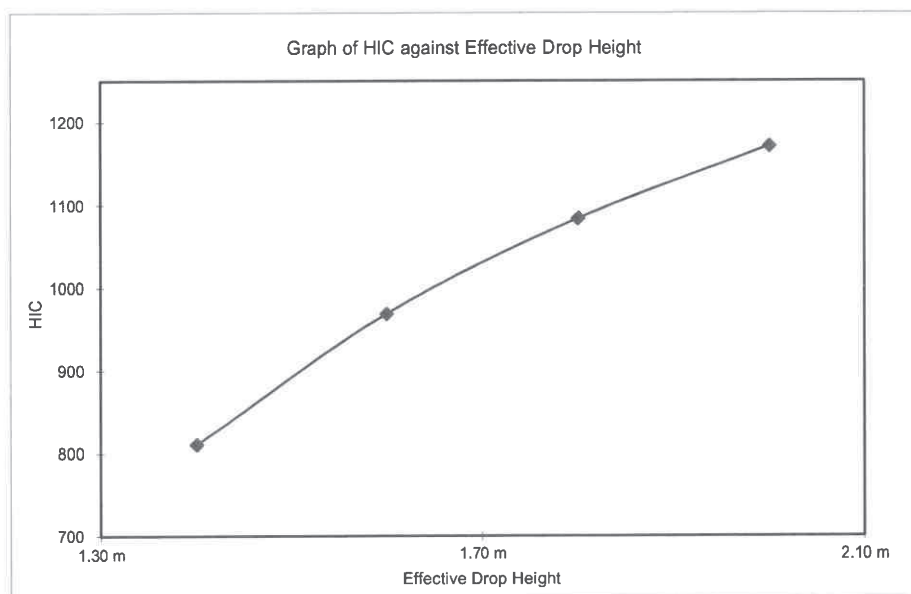
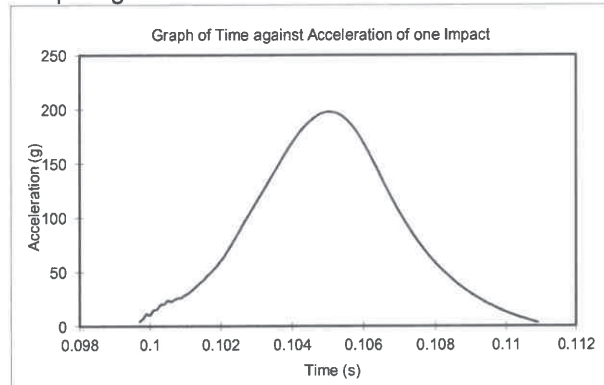
Drop height= 1.80 m

HIC= 1084



Drop height= 2.00 m

HIC= 1171



HIC (1000) = 1.69 m

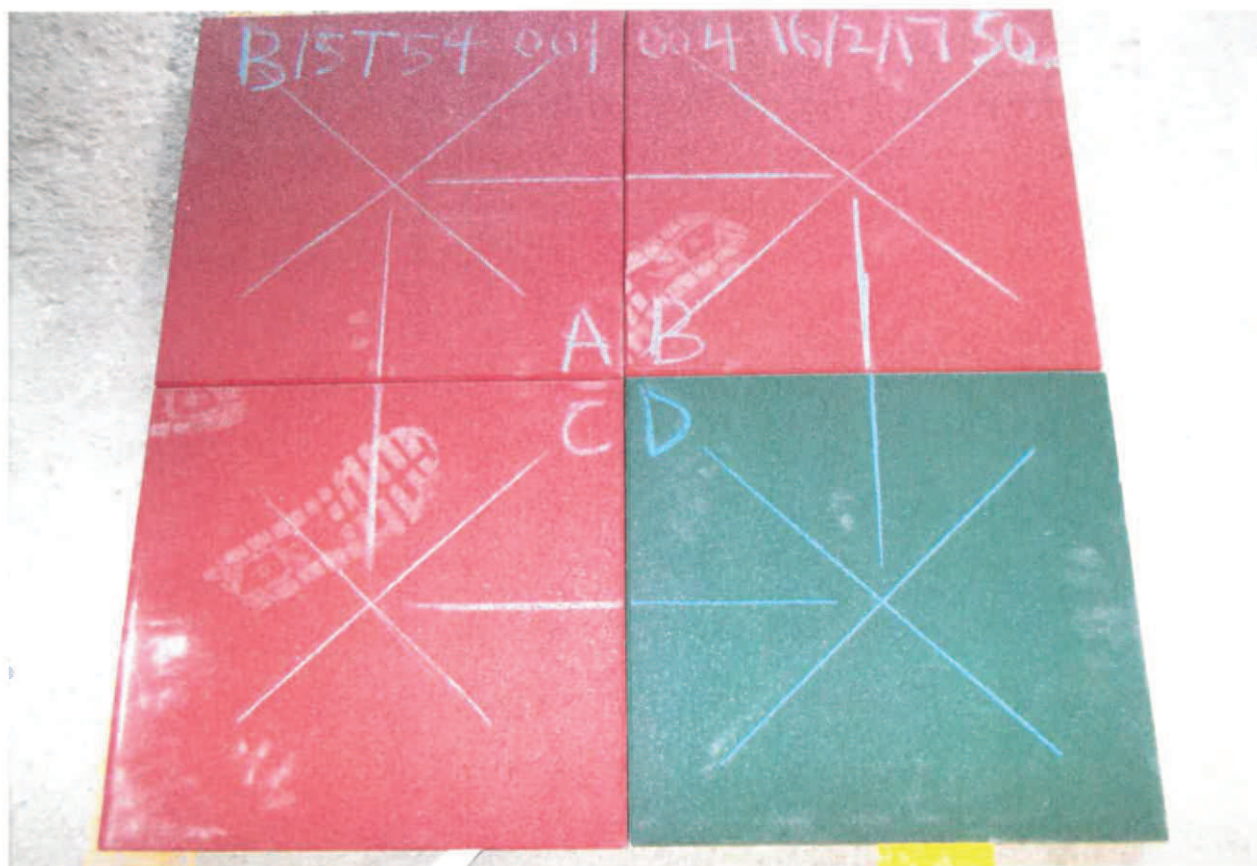


Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Photo





Test Report on Impact Attenuating Playground Surfacing

Job Reference No. : 11592118-B15T5401A

(This report is to supercede the previous one with Job Reference No: 11592118-B15T5401)

Photo



Resistance to Indentation



Test Report on Determination of Resistance to Indentation

Job Reference No.: 11592118-B15T5402A (This report is to supercede the previous one with Job Reference No: 11592118-B15T5402)

Test Method : BS 7188 : 1998 + A2 : 2009 Clause 6

Customer Supplied Information

Customer : ZHA Environmental Sdn Bhd

Project : Not applicable

Contract No. : -

Works Order No. : -

Material Information

Name of supplier : ZHA Environmental Sdn Bhd

Name of product : TetraPlay Rubber Tiles-50mm

Date of test started : 17-Feb-17

Source of origin : Malaysia

Date of test completed : 18-Feb-17

Size : 500mm x 500mm

Manufacture thickness of the surface (mm) : 50

Overall thickness of each layer (mm) : 50

Results

Lab Ref No.	Client sample No.	Initial specimen thickness (mm)	Indentation (i)		Residual indentation (r)				Observed
			90 s	15 min	90 s	15 min	150 min	22 h	
B15T54001	-	49	16.20	19.85	6.42	5.24	4.92	4.65	no cracking, no splitting & no perforation
B15T54002	-	49	17.22	17.46	4.67	4.02	3.96	3.94	no cracking, no splitting & no perforation
B15T54003	-	49	11.29	14.99	3.23	2.78	2.50	2.30	no cracking, no splitting & no perforation

Notes : (1) Acceptance criteria:

- For each of the three specimens tested, the residual indentation, after 24 h recovery, shall be not more than 5.0 mm.
- After removal of the load and after allowing 24 h recovery, none of the three specimens tested shall exhibit any cracking, splitting or perforation around the point at which the load was applied.

(2) * Delete whichever is not applicable

Remarks:

HOKLAS Approved Signatory:

- ☐ YUE Wai Chun (General Manager)
☐ Sit Hon Man (Laboratory Manager)
☒ LAM Wai Man (Senior Technical Engineer)

Date : 18/02/17

Ease of Ignition



FT Laboratories Ltd.

科達測檢試驗所有限公司



Test Report on Determination of Ease of Ignition

Job Reference No.: 11592118-B15T5403A (This report is to supercede the previous one with Job Reference No: 11592118-B15T5403)

Test Method : BS 7188 : 1998 + A2 : 2009 Clause 7

Customer Supplied Information

Customer : ZHA Environmental Sdn Bhd

Project : Not applicable

Contract No. : -

Works Order No. : -

Material Information

Name of supplier : ZHA Environmental Sdn Bhd

Name of product : TetraPlay Rubber Tiles-50mm

Date of test started : 22-Feb-17

Source of origin : Malaysia

Date of test completed : 22-Feb-17

Size : 500mm x 500mm

Manufacture thickness of the surface (mm): 50

Overall thickness of each layer (mm) : 50

Results

Lab Ref No.	Customer sample No.	Method of mounting specimen	Ignition in Clamping Ring			Radius of use-surface (mm)	Radius of under-surface (mm)
			Elapsed time extinction on the flame (sec)	Time of any smouldering (sec)	Time of ignition reach the clamping (sec)		
B15T54001	-	Loose-laid	42	-	Not reach the clamp ring	15.0	No effect of ignition
B15T54002	-	Loose-laid	58	-	Not reach the clamp ring	15.0	No effect of ignition
B15T54003	-	Loose-laid	51	-	Not reach the clamp ring	17.5	No effect of ignition

Notes : (1) Acceptance criteria:

For each of the three specimens tested, the greater radius of the effect of ignition shall not exceed 35 mm and shall thereby be classified as having "LOW radius of effects of ignition".

(2) The test result relate only to the behavior of the test specimens after application of a small source of ignition; they shall not be used as a means of assessing how the product will contribute to an established fire.

(3) * Delete whichever is not applicable

Remarks: -

HOKLAS Approved Signatory :

- ☐ YUE Wai Chun (General Manager)
☐ SIU Hon Man (Laboratory Manager)
☒ LAM Wai Man (Senior Technical Engineer)

Date: 18/8

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Address: Lot No.DD77 Section 1552 S.A.ss1RP, Ng Chow South Road, Ping Che, N.T.
Form No.: S 065 001 Rev4 (28/01/2016)

Tel: 27584861 Fax: 27588962

Slip Resistance



Test Report on Determination of Slip Resistance

Job Reference No: 11592118- B15T5404A (This report is to supercede the previous one with Job Reference No: 11592118- B15T5404)

Test Method : BS7188:1998 + A2 : 2009 Clause 5

Customer Supplied Information

Customer : ZHA Environmental Sdn Bhd

Project : Not applicable

Contract No. : -

Works Order No. : -

Material Information

Name of supplier : ZHA Environmental Sdn Bhd

Date of test started : 17-Feb-17

Name of product : TetraPlay Rubber Tiles-50mm

Date of test completed : 17-Feb-17

Source of origin: : Malaysia

Size: : 500mm x 500mm

Manufacture thickness of the surface (mm): 50mm

Sample Direction 0°

Overall thickness of each layer (mm) : 50mm

Results

Lab Ref No.	Customer Sample No.	Specimen thickness (mm)	Slip Resistance	
			Dry	Wet
B15T54001	-	-	95	75
B15T54002	-	-	85	80
B15T54003	-	-	90	80

Notes : (1) Acceptance criteria: the minimum slip resistance measured on any specimen, in any direction of test, under either wet or dry conditions, shall be not less than 40.

(2) * Delete whichever is not applicable

Remarks: -

HOKLAS Approved Signatory:

- ☐ YUE Wai Chun (General Manager)
☐ SIU Hon Man (Laboratory Manager)
☒ LAM Wai Man (Senior Technical Engineer)

Date: 18/2

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Test Report on Determination of Slip Resistance

Job Reference No: 11592118- B15T5404A (This report is to supercede the previous one with Job Reference No: 11592118- B15T5404)

Test Method : BS7188:1998 + A2 : 2009 Clause 5

Customer Supplied Information

Customer : ZHA Environmental Sdn Bhd

Project : Not applicable

Contract No. : -

Works Order No. : -

Material Information

Name of supplier : ZHA Environmental Sdn Bhd

Date of test started : 17-Feb-17

Name of product : TetraPlay Rubber Tiles-50mm

Date of test completed : 17-Feb-17

Source of origin: : Malaysia

Size: : 500mm x 500mm

Manufacture thickness of the surface (mm): 50mm

Sample Direction 180°

Overall thickness of each layer (mm) : 50mm

Results

Lab Ref No.	Customer Sample No.	Specimen thickness (mm)	Slip Resistance	
			Dry	Wet
B15T54001	-	-	95	75
B15T54002	-	-	95	75
B15T54003	-	-	90	75

Notes : (1) Acceptance criteria: the minimum slip resistance measured on any specimen, in any direction of test, under either wet or dry conditions, shall be not less than 40.

(2) * Delete whichever is not applicable

Remarks: -

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