

Technical Report

Title: Static water penetration testing of the Barracuda brick slip system

Report No: N950-22-18406



Technical Report

Title: Static water penetration testing of the Barracuda brick slip system

Customer: James & Taylor Ltd,
Sixty-Two, Barwell Business Park,
Leatherhead Road, Chessington, Surrey KT9 2NY.

Issue date: 7 February 2024

VTC job no.: TR0220-3WK2

Author(s): D. Bennett - Technician



Checked by: N. McDonald – Manager



Authorised by: S. R. Moxon – Operations Director



Distribution: 1 copy to James & Taylor
(confidential) 1 copy to project file

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Tel. 0333 5669000

email info@technology-centre.co.uk

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1 INTRODUCTION

This report describes a static water test carried out at VINCI Technology Centre UK Limited at the request of James & Taylor Limited.

The test sample consisted of a Barracuda brick slip system supplied by James & Taylor.

The test was carried out on 26 September 2022 and was to determine the water penetration of the test sample. The test methods were in accordance with the CWCT Standard Test Methods for building envelopes, 2005, for:

Watertightness – static pressure

This test report relates only to the actual sample as tested and described herein.

The results are valid only for sample(s) tested and the conditions under which the tests were conducted.

The long-term durability of the façade system is not assessed by these test methods.

VINCI Technology Centre UK Limited is accredited to ISO/IEC 17025:2017 by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 0057 for a schedule of tests. Tests listed above and marked with an asterisk are not on our schedule.

VINCI Technology Centre UK Limited is Approved Body No. 1766.

VINCI Technology Centre UK Limited is certified by BSI for:

- ISO 9001 Quality Management System,
- ISO 14001 Environmental Management System,
- ISO 45001 Occupational Health and Safety Management System.

The test was witnessed by John Champion of James & Taylor.

2 SUMMARY AND CLASSIFICATION OF TEST RESULTS

The following summarises the results of the test carried out. For full details refer to Section 6.

2.1 SUMMARY OF TEST RESULTS

TABLE 1

Date	Test number	Test description	Result
26 September 2022	1	Watertightness – static	Pass
10 November 2022	2	Controlled dismantle	Pass

2.2 CLASSIFICATION

TABLE 2

Test	Standard	Classification / Declared value
Watertightness	CWCT / BS EN 12154	R7 / 600 pascals

3 DESCRIPTION OF TEST SAMPLE

3.1 GENERAL ARRANGEMENT

The sample was as shown in the photo below and the drawings included as an appendix to this report.

The test sample comprised 9 different brick slip types.

TABLE 3

Brick Types Selected for Independent Testing	
Brick Type No.	Brick Type
1	Wienerberger Sandalwood Yellow Multi
2	Michelmersh Charnwood Light Victorian Red
3	Ibstock Leicester Red Stock
4	Ibstock Chesterton Multi Red Smooth
5	Blockley Windermere Grey Solid
6	Wienerberger Olde Ivory Stock
7	Wienerberger Smeed Dean London Stock
8	Ibstock Aldridge Anglian Red Multi Rustic
9	Michelmersh Hadley Brindle Wirecut

PHOTO 45141

TEST SAMPLE ELEVATION

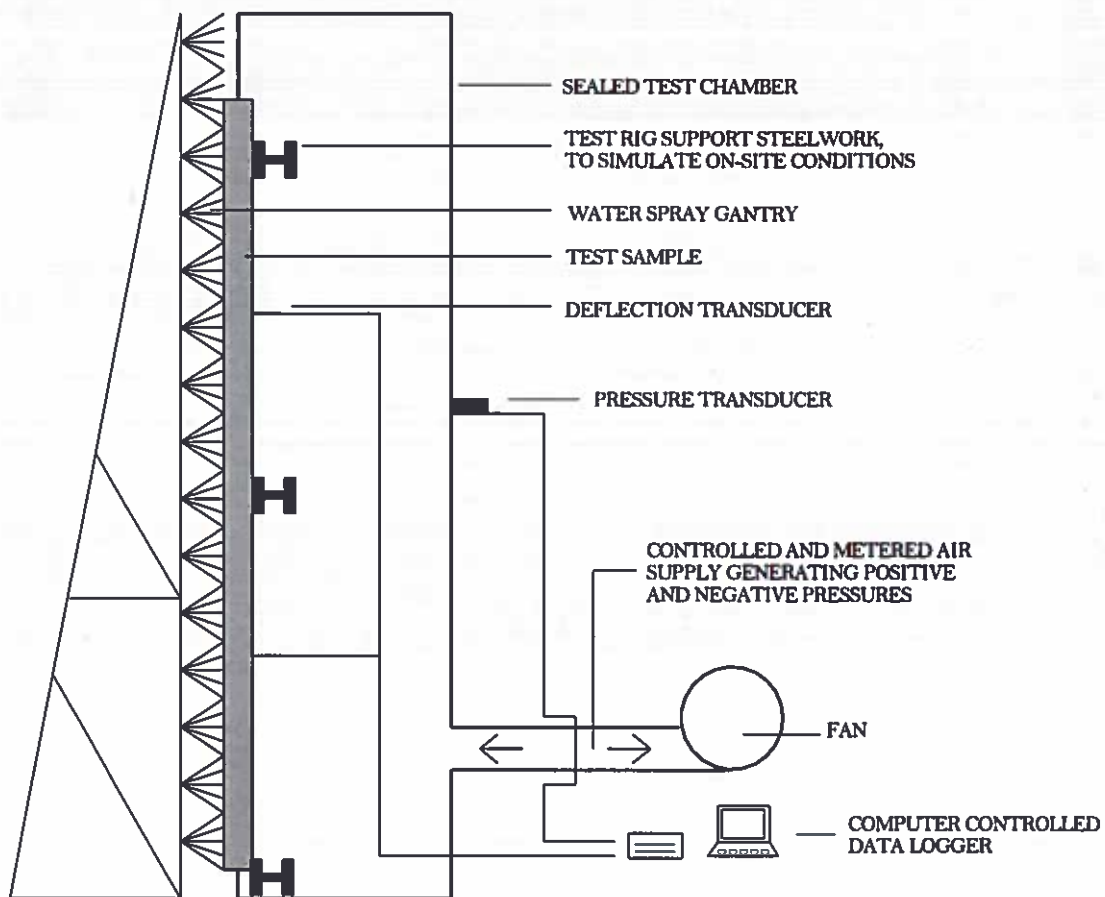


4 TEST RIG GENERAL ARRANGEMENT

The test sample was mounted on a rigid test rig with support steelwork designed to simulate the on-site/project conditions. The test rig comprised a well sealed chamber, fabricated from steel and plywood. A door was provided to allow access to the chamber. Representatives of James & Taylor installed the sample on the test rig. See Figure 1.

FIGURE 1

TEST RIG SCHEMATIC ARRANGEMENT



SECTION THROUGH TEST RIG

5 TEST SEQUENCE

The test sequence was as follows:

- (1) Watertightness – static
- (2) Controlled dismantle

6 TESTING

6.1 INSTRUMENTATION

6.1.1 Pressure

One static pressure tapping was provided to measure the chamber pressure and was located so that the readings were unaffected by the velocity of the air supply into or out of the chamber.

A pressure transducer, capable of measuring rapid changes in pressure to within 2% was used to measure the differential pressure across the sample.

6.1.2 Water Flow

An in-line water flow meter was used to measure water supplied to the spray gantry to within 5%.

6.1.3 Temperature

Platinum resistance thermometers (PRT) were used to measure air and water temperatures to within 1°C.

6.1.4 General

Electronic instrument measurements were scanned by a computer controlled data logger, which also processed and stored the results.

All measuring instruments and relevant test equipment were calibrated and traceable to national standards.

6.2 FAN

The air supply system comprised a variable speed centrifugal fan and associated ducting and control valves to create positive and negative static pressure differentials. The fan provided essentially constant air flow at the fixed pressure for the period required by the tests and was capable of pressurising at a rate of approximately 600 pascals in one second.

6.3 WATER SPRAY

The water spray system comprised nozzles spaced on a uniform grid not more than 700 mm apart and mounted approximately 400 mm from the face of the sample. The nozzles provided a full-cone pattern with a spray angle between 90° and 120°. The spray system delivered water uniformly against the exterior surface of the sample.

6.4 PROCEDURE

Three positive pressure pulses of 660 pascals were applied to prepare the test sample.

Water was sprayed onto the sample using the method described above at a rate of at least 3.4 litres/m²/minute for 15 minutes at zero pressure differential. With the water spray continuing the pressure differential across the sample was then increased in increments of: 50, 100, 150, 200, 300, 450 and 600 pascals, each held for 5 minutes.

Throughout the test the interior face of the sample was examined for water penetration.

6.5 PASS/FAIL CRITERIA

There shall be no excessive water penetration into the test chamber throughout testing. At the completion of the test there shall be no standing water in locations intended to remain dry. Water on the back of the sample should drain out at the base of the sample.

6.6 RESULTS

Test Date: 26 September 2022

At zero pressure minor water leakage was observed seeping through some of the brick slips and running down the rails.

The water leakage rate and area increased with increased pressure and was across all the brick types. The water was confined to the back of the bricks and rails and ran down to the base of the sample where it would drain out through a ventilated cavity.

Chamber temperature= 12°C

Ambient temperature = 12°C

Water temperature = 12°C

PHOTO 081302

INTERNAL VIEW DURING WATER TEST



PHOTO 081411

INTERNAL VIEW DURING WATER TEST



PHOTO 085845

INTERNAL VIEW DURING WATER TEST



6.7 CONTROLLED DISMANTLING

During the dismantling of the sample no discrepancies from the drawings were found.

PHOTO 6137

TEST SAMPLE DURING DISMANTLE



PHOTO 6145

TEST SAMPLE DURING DISMANTLE



PHOTO 6156

TEST SAMPLE DURING DISMANTLE



PHOTO 6157

TEST SAMPLE DURING DISMANTLE



PHOTO 6158

TEST SAMPLE DURING DISMANTLE

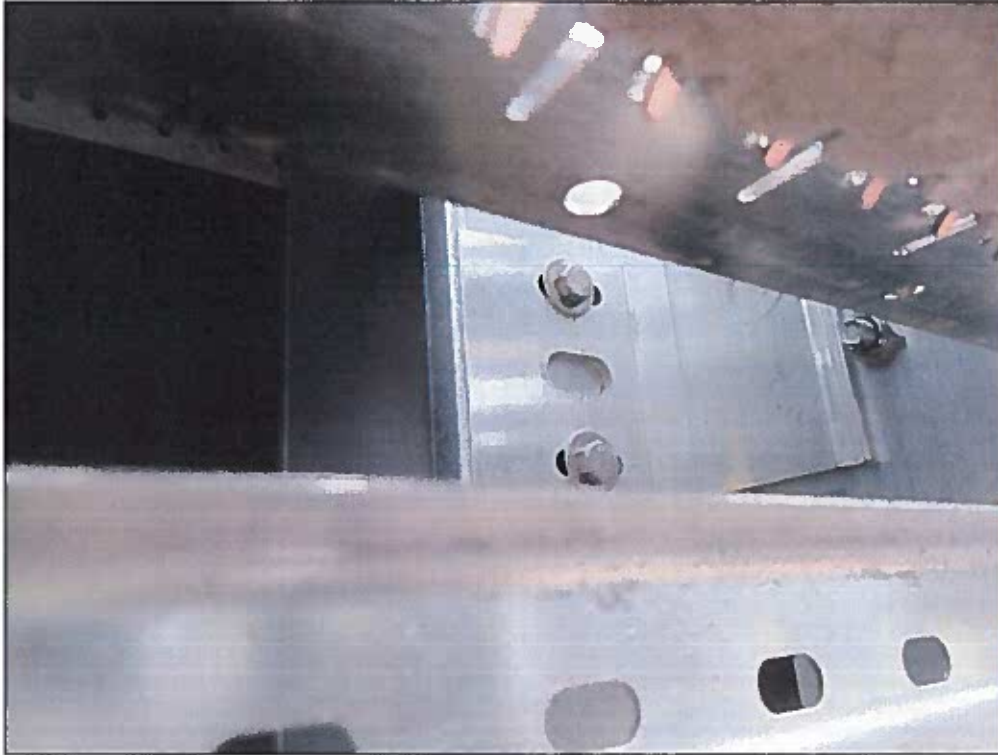


PHOTO 6159

TEST SAMPLE DURING DISMANTLE



PHOTO 6160

BRICK SLIPS REMOVED FROM TEST RIG



PHOTO 6181

SUPPORT FRAME REMOVED FROM TEST RIG



7 APPENDIX - DRAWINGS

The following 4 unnumbered pages are copies of James & Taylor Limited drawings numbered:

BSS-TRA-GA-001,

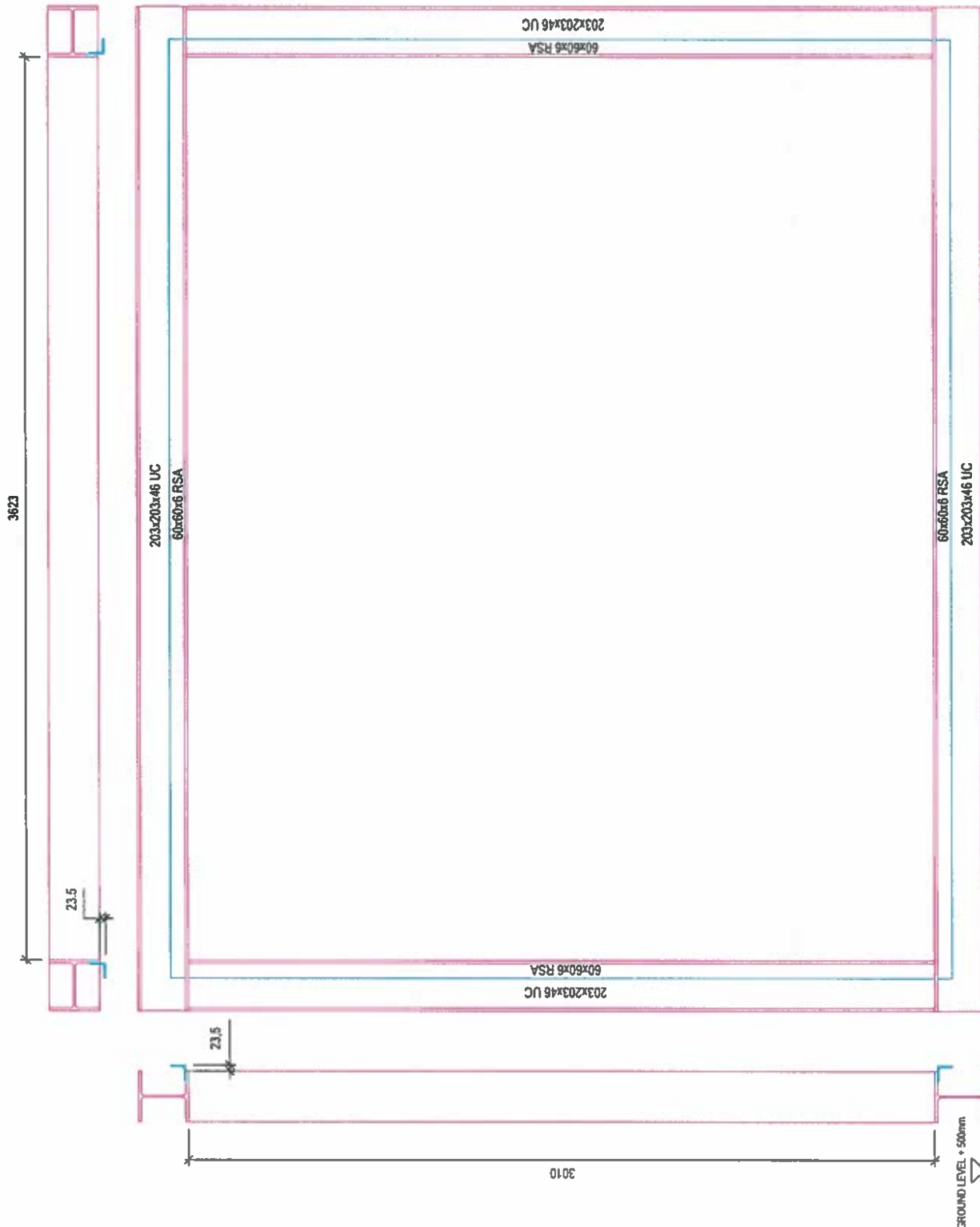
BSS-TRA-GA-002,

BSS-TRA-GA-003,

BSS-TRA-T3.

END OF REPORT

TEST RIG TYPE A
STEEL FRAMING (TO BE PROVIDED BY TECHNOLOGY CENTRE)



56/77 TWO, Grand Business Park, Newmarket Road,
Cambridge CB3 9QY, UK
T: 01223 854211 F: 01223 553188 E: info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR,
ARCHITECT'S AND ENGINEER'S DRAWINGS.

STEEL FRAMING REQUIREMENT

203x203x46 UC (AS DRAWN)

60x60x6 RSA (AS DRAWN)

REVISIONS: DATE:

CLIENT:
JAMES & TAYLOR LTD

PROJECT:
BRICK SLIP SYSTEM

TITLE:
TEST RIG TYPE A
GENERAL ARRANGEMENT

DATE:
03/12/2021

DRAWN BY:
JSC

CHECKED BY:
JSC

SCALE:
1:16

PLOT SIZE:
A3

DRAWING NUMBER:
BSS-TRA-GA-001

REVISION:

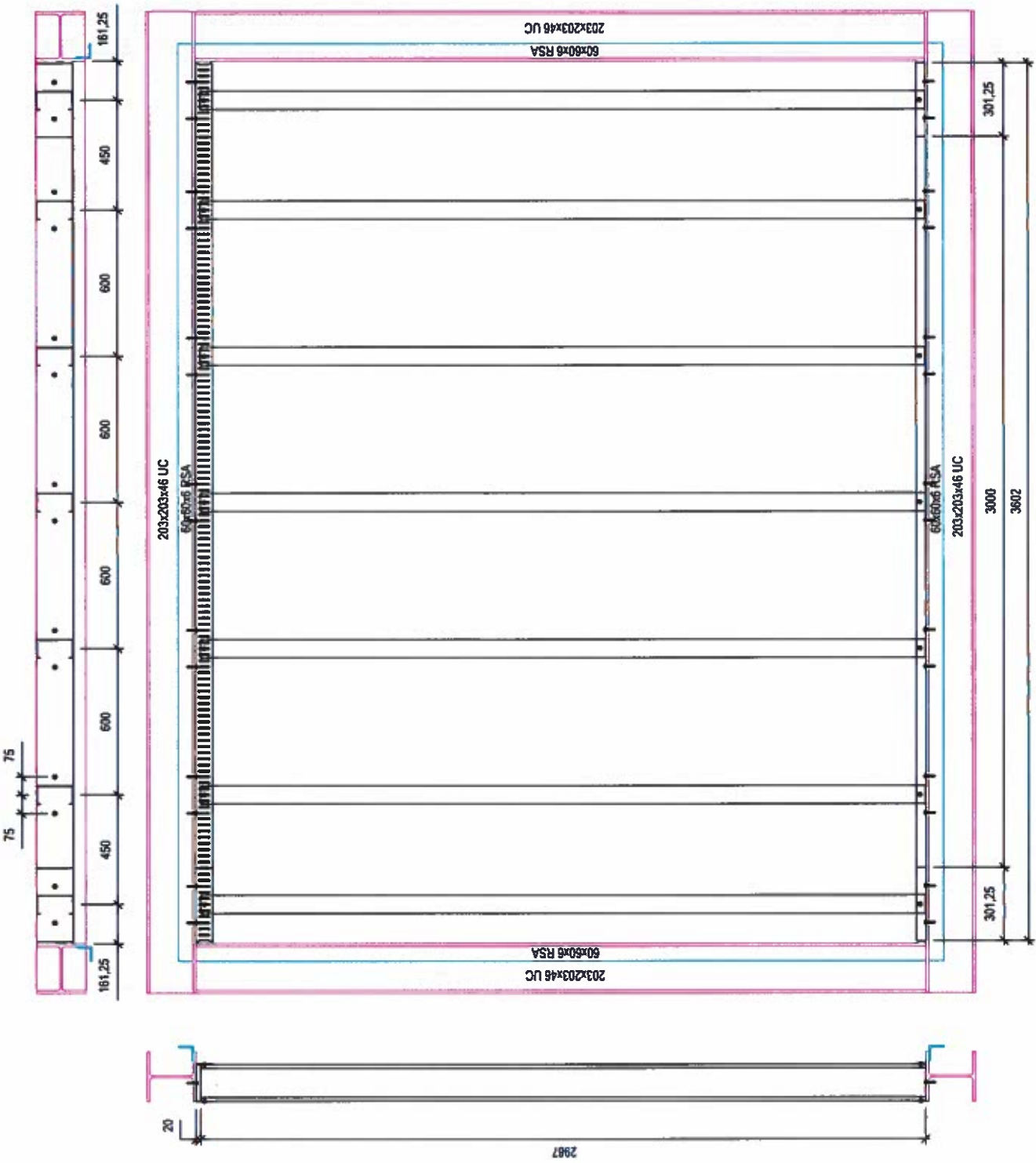
PLOT DATE:
December 5, 2021

5:34 PM

© James & Taylor Ltd 2008

METSEC BACKING WALL; STUDWORK, BASE, AND HEAD TRACK SETTING OUT/CONFIGURATION

TEST RIG TYPE A



GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

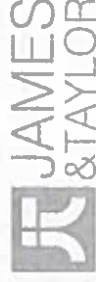
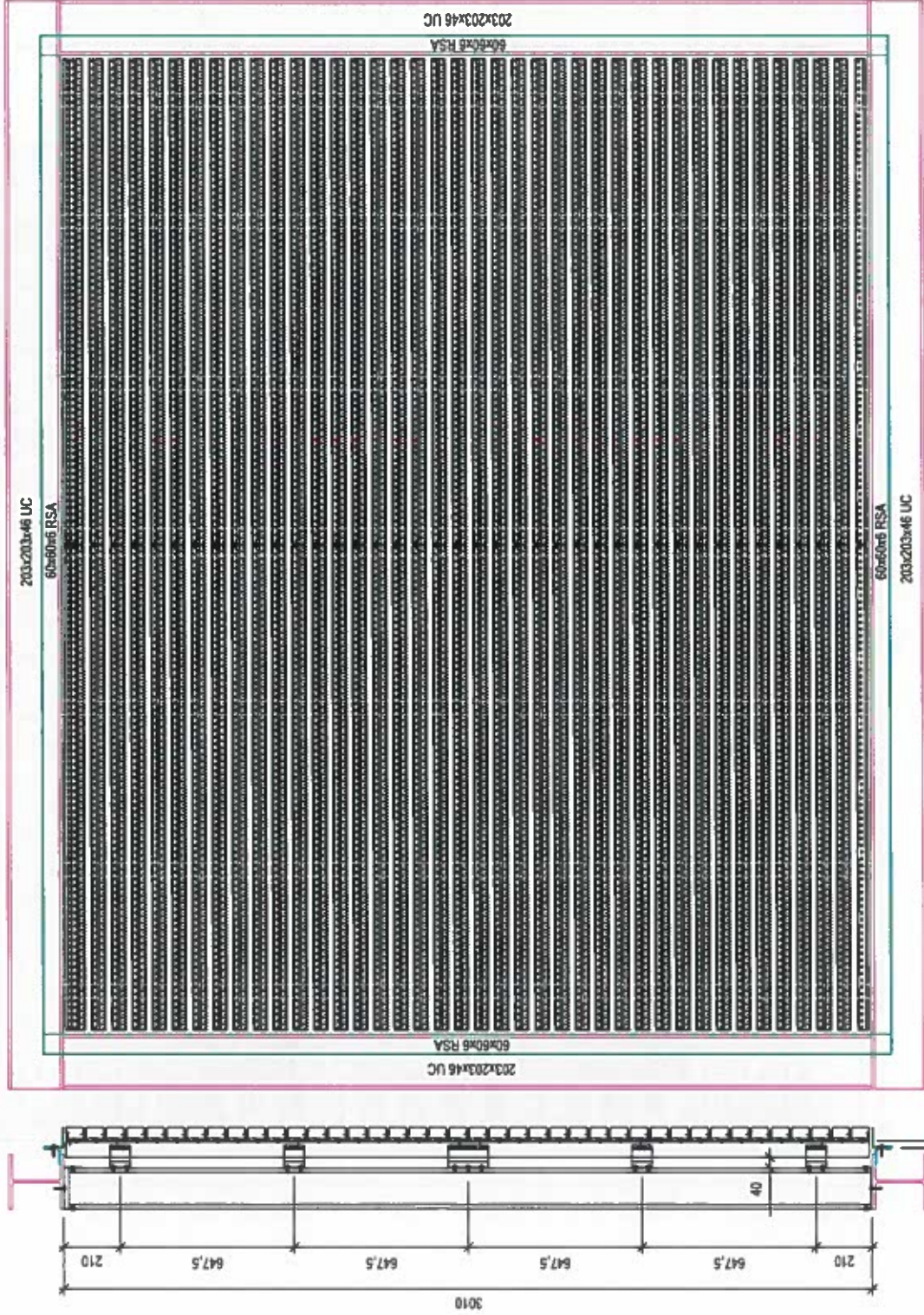
THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT JAMES & TAYLOR, ARCHITECTS AND ENGINEERS DRAWINGS.

- METSEC REQUIREMENT
- VERTICAL STUDS
150M12-75 (THEORETICAL LENGTH 2987mm) = 7 No.
- BASE TRACK
154M12-40 (THEORETICAL LENGTH 3602mm) = 1 No.
- HEAD TRACK
154M16-70s (THEORETICAL LENGTH 3602mm) = 1 No.

REVISION:	DATE:
CLIENT:	JAMES & TAYLOR LTD
PROJECT:	BRICK SLIP SYSTEM
TITLE:	TEST RIG TYPE A
GENERAL ARRANGEMENT	
DATE:	03/12/2021
DRAWN BY:	JSC
CHECKED BY:	JSC
SCALE:	1:16
PLOT SIZE:	A3
DRAWING NUMBER:	BSS-TRA-GA-002
REVISION:	
PLOT DATE:	January 16, 2022
5:18 PM	© James & Taylor Ltd 2020

TEST RIG TYPE A
'HELPING HAND' BRACKET, VERTICAL SUB-STRUCTURE AND BARRACUDA RAIL SETTING OUT/CONFIGURATION

10.5mm OFF STUD CENTRE



SUITY LTD
120 BAC 303 P. 025 838 233 E. info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR,
ARCHITECT'S AND ENGINEER'S DRAWINGS.

BARRACUDA HORIZONTAL RAIL REQUIREMENT

BAR-R1-1800 = 78 No.
BAR-R2-1800 = 2 No.
BAR-R3-1800 = 2 No.

BARRACUDA VERTICAL RAIL REQUIREMENT

BAR-V1.1-2890 = 6 No.
BAR-V7.1-2890 = 1 No.

*HELPING HAND/ BRACKET REQUIREMENT
Nebbs 90 (ADJUSTMENT RANGE 92mm TO 132mm)

VERTICAL LOAD BEARING HELPING HAND = 7 No.
RESTRAIN HELPING HAND = 28 No.

REVISIONS: DATE:

CLIENT:
JAMES & TAYLOR LTD

PROJECT:
BRICK SLIP SYSTEM

TITLE:
TEST RIG TYPE A
GENERAL ARRANGEMENT

DATE:
03/12/2021

DRAWN BY:
JSC

CHECKED BY:
JSC

SCALE:
1:16

PLOT SIZE:
A3

DRAWING NUMBER:
BSS-TRA-GA-003

REVISION:

PLOT DATE:
January 16, 2022

6:58 PM

James & Taylor Ltd 2020



VINCI Technology Centre UK Limited
Stanbridge Road
Leighton Buzzard
Bedfordshire
LU7 4QH
UK

0333 5669000

info@technology-centre.co.uk

www.technology-centre.co.uk

Technical Report

Title: Dynamic water penetration testing of the Barracuda brick slip system

Report No: N950-22-18407



Technical Report

Title: Dynamic water penetration testing a Barracuda brick slip system

Customer: James & Taylor Ltd,
Sixty-Two, Barwell Business Park,
Leatherhead Road, Chessington, Surrey KT9 2NY.

Issue date: 7 February 2024

VTC job no.: TR0220-3WK2

Author(s): D. Bennett - Technician



Checked by: N. McDonald – Manager



Authorised by: S. R. Moxon – Operations Director



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4	TEST RIG GENERAL ARRANGEMENT	8
5	TEST SEQUENCE	9
6	WATERTIGHTNESS TESTING.....	10
7	APPENDIX - DRAWINGS	20

1 INTRODUCTION

This report describes a dynamic water test carried out at VINCI Technology Centre UK Limited at the request of James & Taylor Limited.

The test sample consisted of a Barracuda brick slip system supplied by James & Taylor.

The test was carried out on 26 September 2022 and was to determine the water penetration of the test sample. The test methods were in accordance with the CWCT Standard Test Methods for building envelopes, 2005, for:

Watertightness – dynamic pressure.

This test report relates only to the actual sample as tested and described herein.

The results are valid only for sample(s) tested and the conditions under which the tests were conducted.

The long-term durability of the façade system is not assessed by these test methods.

VINCI Technology Centre UK Limited is accredited to ISO/IEC 17025:2017 by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 0057 for a schedule of tests. Tests listed above and marked with an asterisk are not on our schedule.

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VINCI Technology Centre UK Limited is certified by BSI for:

- ISO 9001 Quality Management System,
- ISO 14001 Environmental Management System,
- ISO 45001 Occupational Health and Safety Management System.

The test was witnessed by John Champion of James & Taylor.

2 SUMMARY AND CLASSIFICATION OF TEST RESULTS

The following summarises the results of the test carried out. For full details refer to Section 6.

2.1 SUMMARY OF TEST RESULTS

TABLE 1

Date	Test number	Test description	Result
26 September 2022	1	Watertightness – dynamic	Pass
10 November 2022	2	Controlled dismantle	Pass

2.2 CLASSIFICATION

TABLE 2

Test	Standard	Classification / Declared value
Watertightness - dynamic	CWCT	600 pascals

3 DESCRIPTION OF TEST SAMPLE

3.1 GENERAL ARRANGEMENT

The sample was as shown in the photo below and the drawings included as an appendix to this report.

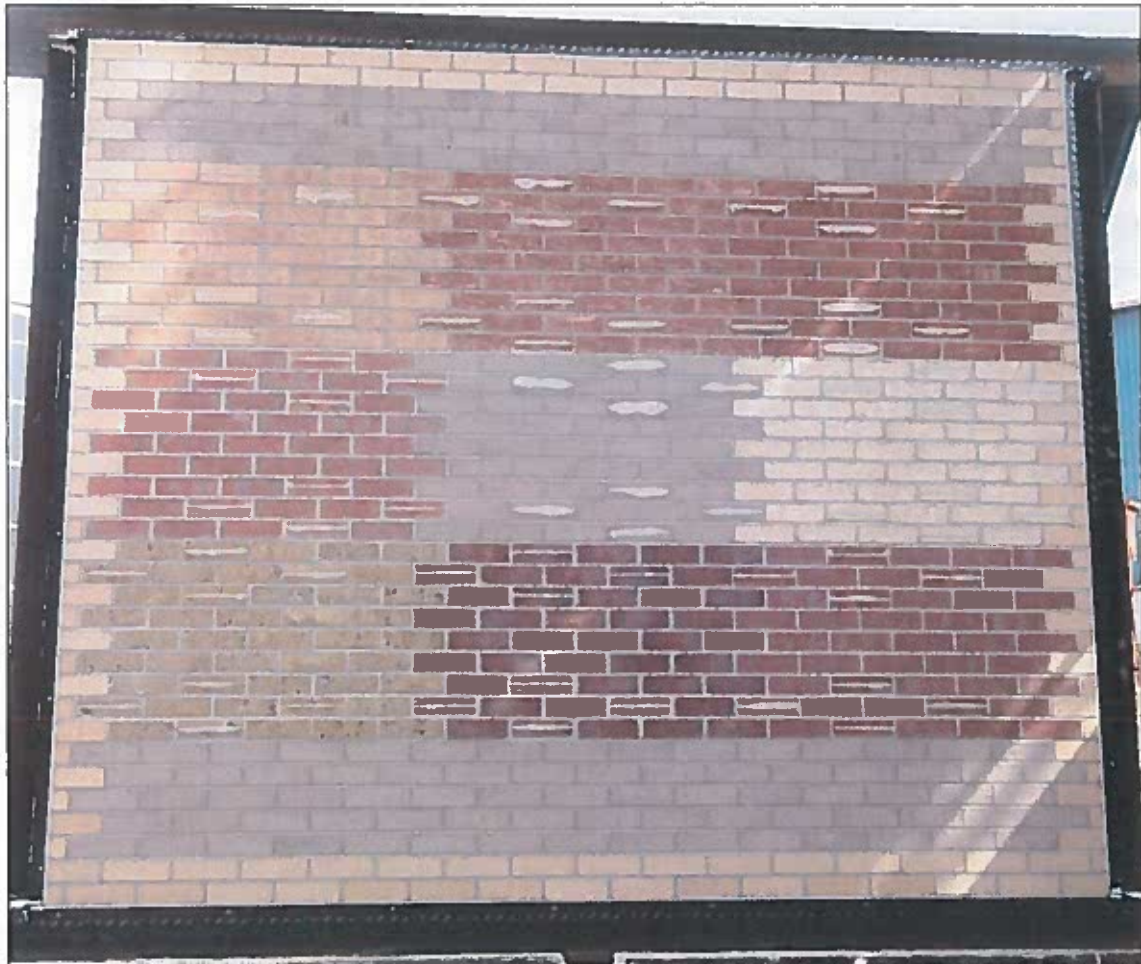
The test sample comprised 9 different brick slip types.

TABLE 3

Brick Types Selected for Independent Testing	
Brick Type No.	Brick Type
1	Wienerberger Sandalwood Yellow Multi
2	Michelmersh Charnwood Light Victorian Red
3	Ibstock Leicester Red Stock
4	Ibstock Chesterton Multi Red Smooth
5	Blockley Windermere Grey Solid
6	Wienerberger Olde Ivory Stock
7	Wienerberger Smeed Dean London Stock
8	Ibstock Aldridge Anglian Red Multi Rustic
9	Michelmersh Hadley Brindle Wirecut

PHOTO 45141

TEST SAMPLE ELEVATION

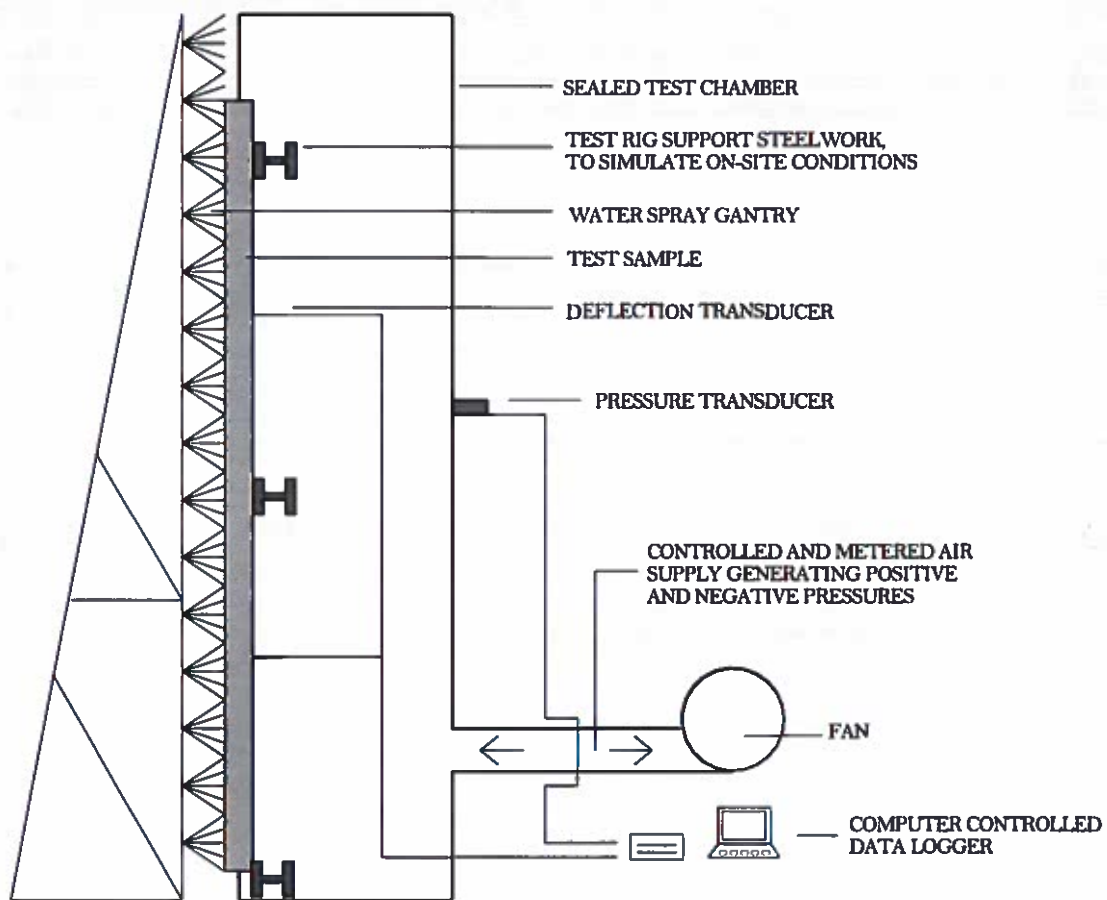


4 TEST RIG GENERAL ARRANGEMENT

The test sample was mounted on a rigid test rig with support steelwork designed to simulate the on-site/project conditions. The test rig comprised a well sealed chamber, fabricated from steel and plywood. A door was provided to allow access to the chamber. Representatives of James & Taylor installed the sample on the test rig. See Figure 1.

FIGURE 1

TEST RIG SCHEMATIC ARRANGEMENT



SECTION THROUGH TEST RIG

5 TEST SEQUENCE

The test sequence was as follows:

- (1) Watertightness – dynamic
- (2) Controlled dismantle

6 TESTING

6.1 INSTRUMENTATION

6.1.1 Pressure

One static pressure tapping was provided to measure the chamber pressure and was located so that the readings were unaffected by the velocity of the air supply into or out of the chamber.

A pressure transducer, capable of measuring rapid changes in pressure to within 2% was used to measure the differential pressure across the sample.

6.1.2 Water Flow

An in-line water flow meter was used to measure water supplied to the spray gantry to within 5%.

6.1.3 Temperature

Platinum resistance thermometers (PRT) were used to measure air and water temperatures to within 1°C.

6.1.4 General

Electronic instrument measurements were scanned by a computer controlled data logger, which also processed and stored the results.

All measuring instruments and relevant test equipment were calibrated and traceable to national standards.

6.2 FAN

A wind generator was mounted adjacent to the external face of the sample and used to create positive pressure differentials during dynamic testing. The wind generator comprised an electric fan.

6.3 WATER SPRAY

The water spray system comprised nozzles spaced on a uniform grid not more than 700 mm apart and mounted approximately 400 mm from the face of the sample. The nozzles provided a full-cone pattern with a spray angle between 90° and 120°. The spray system delivered water uniformly against the exterior surface of the sample.

PHOTO 6181

DYNAMIC WIND TEST



6.4 PROCEDURE

Water was sprayed onto the sample using the method described above at a flow rate of at least 3.4 litres/m²/minute.

An electric fan was used to subject the sample to wind of sufficient velocity to produce average deflections in the principle framing members equal to those produced by a static pressure differential of 600 pascals. These conditions were maintained for 15 minutes. Throughout the test the inside of the sample was examined for water penetration.

6.5 PASS/FAIL CRITERIA

There shall be no excessive water penetration into the test chamber throughout testing. At the completion of the test there shall be no standing water in locations intended to remain dry. Water on the back of the sample should drain out at the base of the sample.

6.6 RESULTS

Test Date: 26 September 2022

After 1 minute into the test, slow dripping was observed down the back of the bricks/rails.

During the test period the amount of water leakage remained constant and was confined to the back of the tiles and support rails. The water drained out at the base of the sample through drainage holes.

Chamber temperature= 13°C
Ambient temperature = 13°C
Water temperature = 13°C

PHOTO 5147

INTERNAL VIEW DURING TEST



PHOTO 5149

INTERNAL VIEW DURING TEST

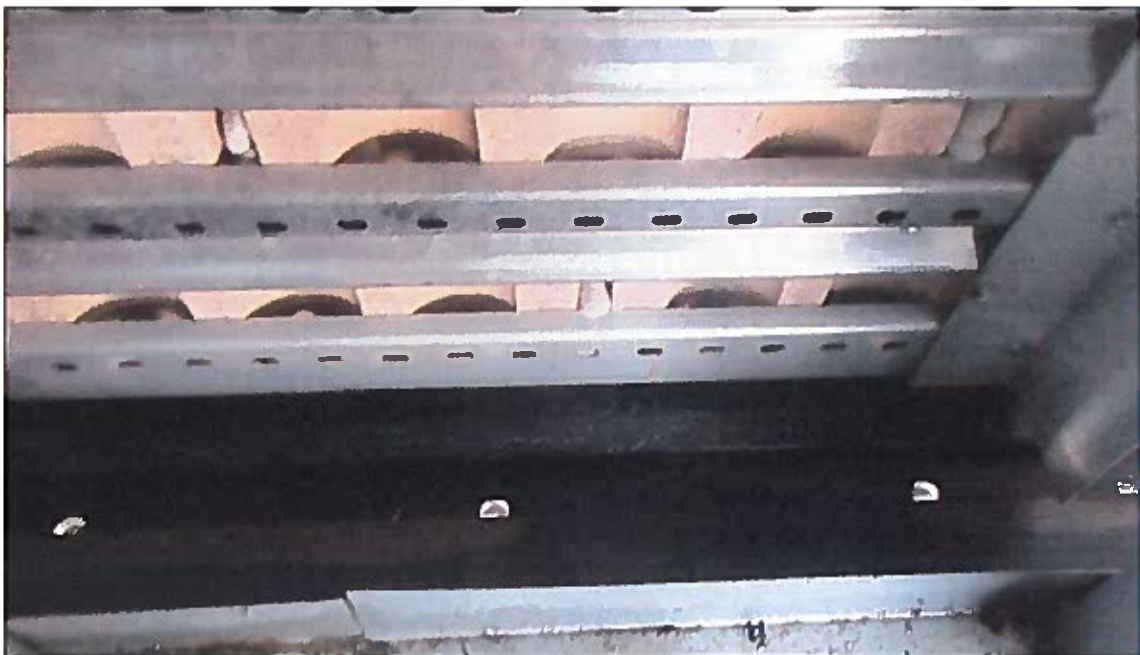


PHOTO 5151

INTERNAL VIEW DURING TEST



PHOTO 5152

INTERNAL VIEW DURING TEST



PHOTO 5156

INTERNAL VIEW DURING TEST



PHOTO 5157

INTERNAL VIEW DURING TEST



6.7 CONTROLLED DISMANTLING

During the dismantling of the sample no discrepancies from the drawings were found.

PHOTO 6137

TEST SAMPLE DURING DISMANTLE



PHOTO 6145

TEST SAMPLE DURING DISMANTLE



PHOTO 6156

TEST SAMPLE DURING DISMANTLE



PHOTO 6157

TEST SAMPLE DURING DISMANTLE



PHOTO 6158

TEST SAMPLE DURING DISMANTLE

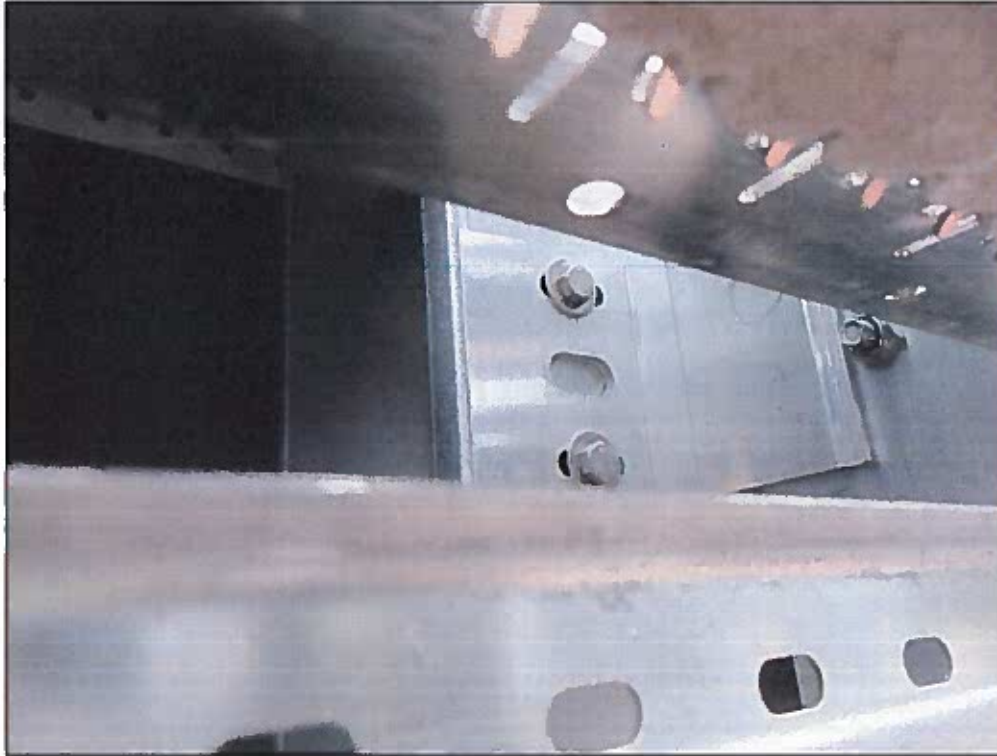


PHOTO 6159

TEST SAMPLE DURING DISMANTLE



PHOTO 6160

BRICK SLIPS REMOVED FROM TEST RIG



PHOTO 6181

SUPPORT FRAME REMOVED FROM TEST RIG



7 APPENDIX - DRAWINGS

The following 4 unnumbered pages are copies of James & Taylor Limited drawings numbered:

BSS-TRA-GA-001,

BSS-TRA-GA-002,

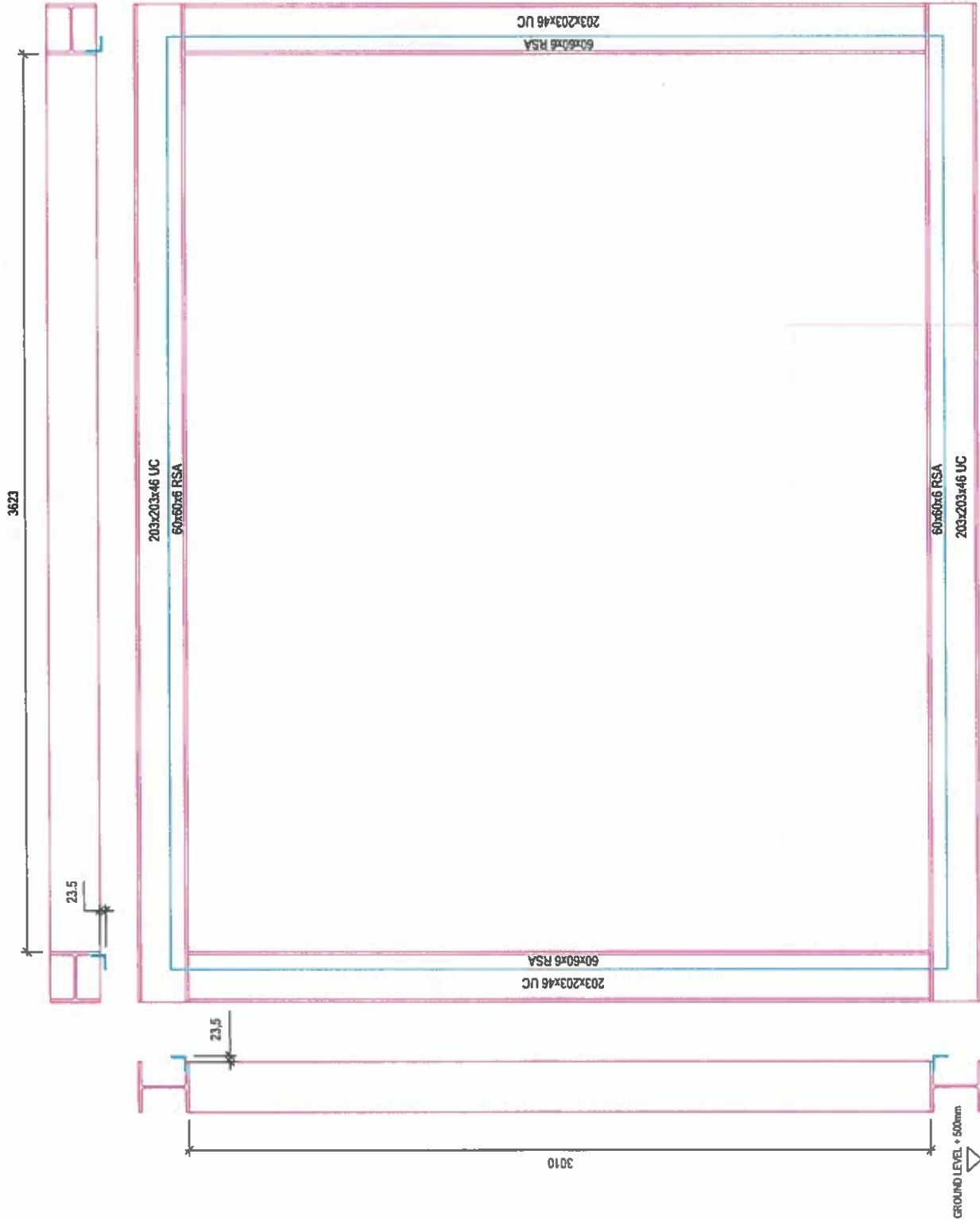
BSS-TRA-GA-003,

BSS-TRA-T3.

END OF REPORT

STEEL FRAMING (TO BE PROVIDED BY TECHNOLOGY CENTRE)

TEST RIG TYPE A



SUITE TWO, BARNET ROAD, POLEWORTH, LEICESTER, LE15 7YU
01533 513535 F 01533 513536 E info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR,
ARCHITECT'S AND ENGINEER'S DRAWINGS.

STEEL FRAMING REQUIREMENT

203x203x46 UC (AS DRAWN)

60x60x6 RSA (AS DRAWN)

REVISIONS: DATE:

CLIENT:
JAMES & TAYLOR LTD

PROJECT:
BRICK SLIP SYSTEM

TITLE:
TEST RIG TYPE A
GENERAL ARRANGEMENT

DATE:
03/12/2021

DRAWN BY:
JSC

CHECKED BY:
JSC

SCALE:
1:16

PLOT SIZE:
A3

DRAWING NUMBER:
BSS-TRA-GA-001

PLOT DATE:
December 5, 2021

5:34 PM

© James & Taylor Ltd. 2020

TEST RIG TYPE A
METSEC BACKING WALL; STUDWORK, BASE, AND HEAD TRACK SETTING OUT/CONFIGURATION



221 FV 1100, Blandford Road, Blandford, Dorset, UK
Chardstock, Dorset, DT11 2JL
T: 01202 354136 M: 07700 12345 E: info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR
ARCHITECTS AND ENGINEERS DRAWINGS.

METSEC REQUIREMENT

VERTICAL STUDS

150M12-75 (THEORETICAL LENGTH 2987mm) = 7 No.

BASE TRACK

154M12-40 (THEORETICAL LENGTH 3602mm) = 1 No.

HEAD TRACK

154M16-70s (THEORETICAL LENGTH 3602mm) = 1 No.

REVISIONS:

CLIENT: JAMES & TAYLOR LTD

DATE:

PROJECT:

BRICK SLIP SYSTEM

TITLE:

TEST RIG TYPE A

GENERAL ARRANGEMENT

DATE:

03/12/2021

DRAWN BY:

JSC

CHECKED BY:

JSC

SCALE:

1:16

PLOT SIZE:

A3

DRAWING NUMBER:

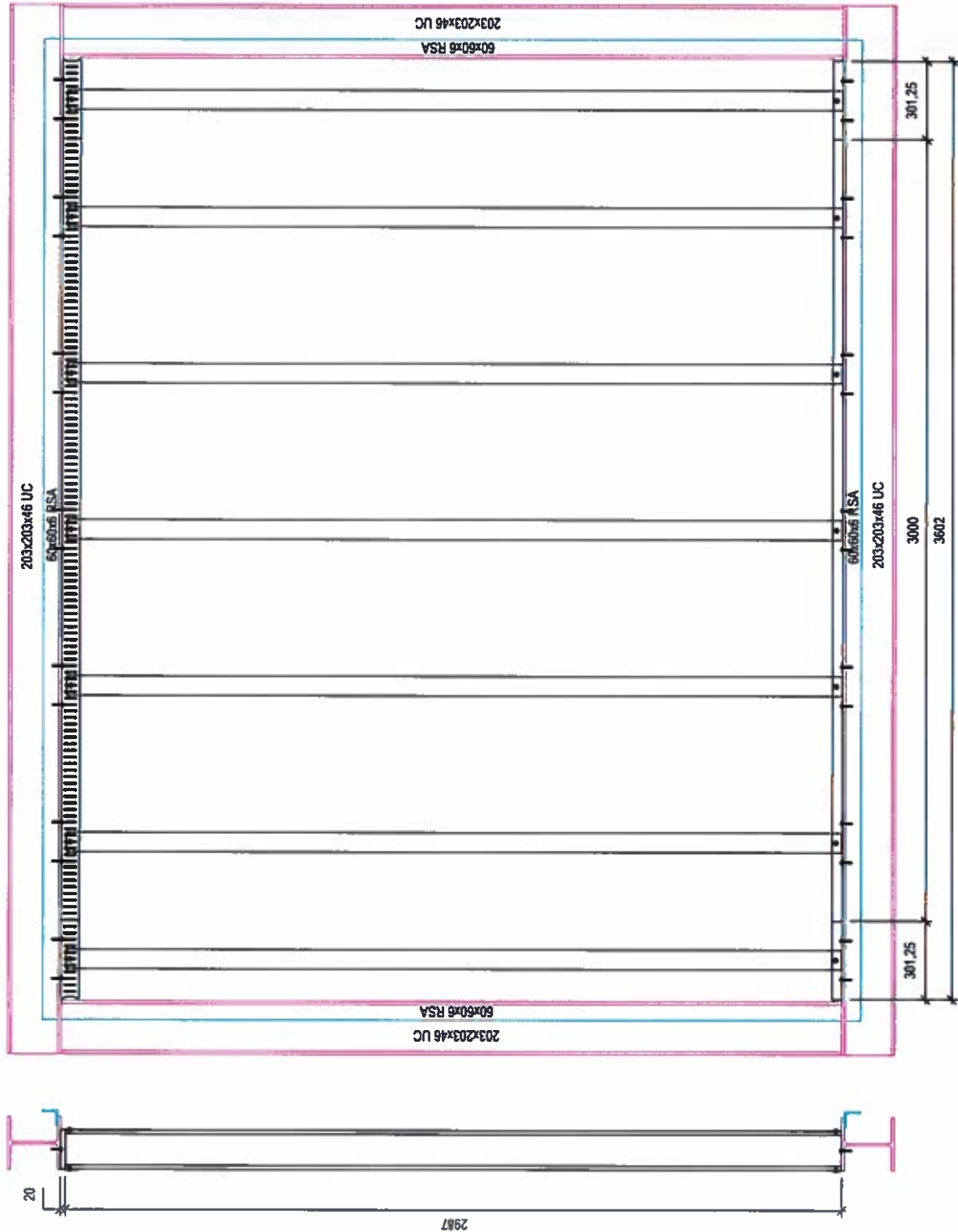
BSS-TRA-GA-002

PLOT DATE:

January 16, 2022

6:18 PM

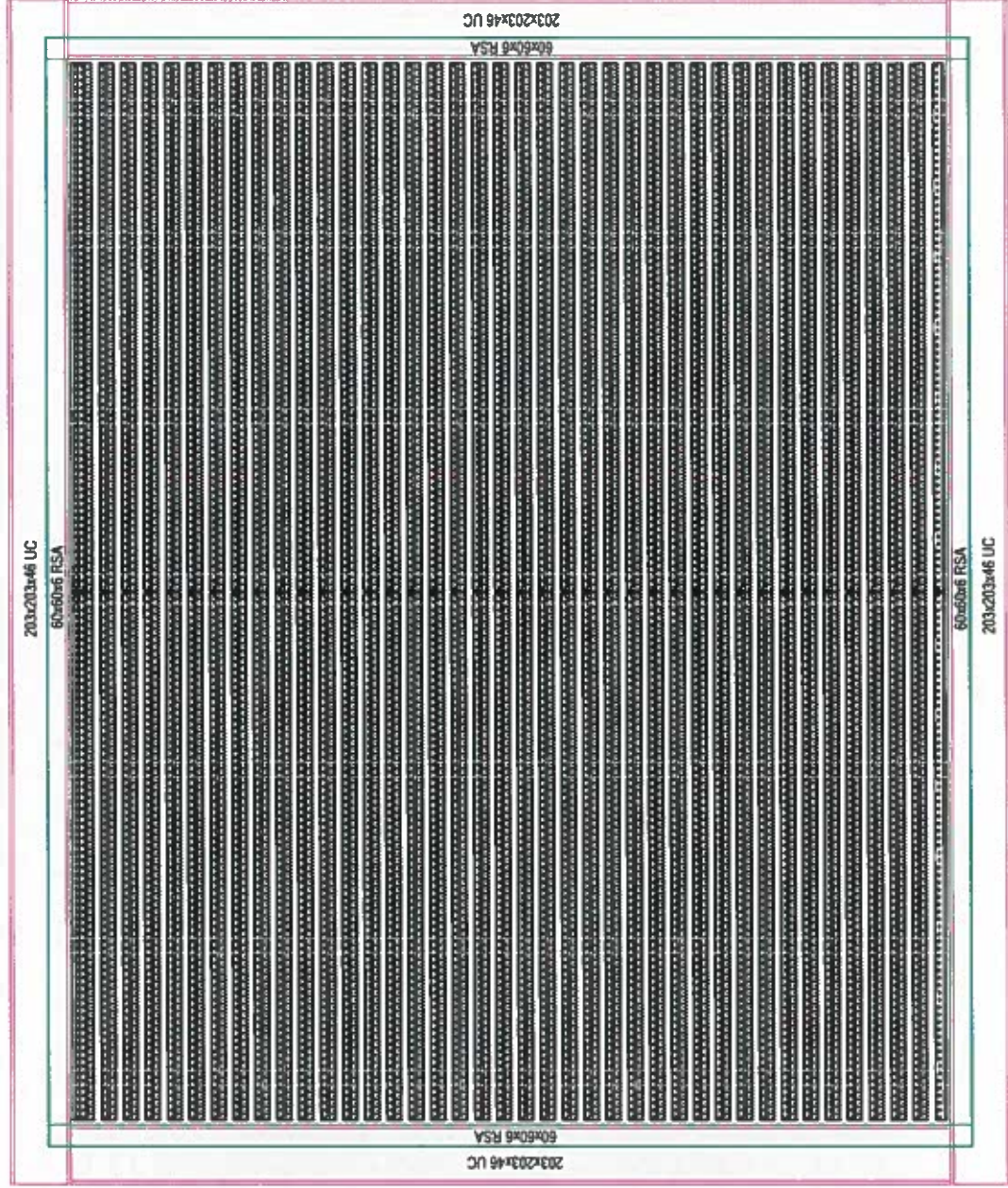
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'HELPING HAND' BRACKET, VERTICAL SUB-STRUCTURE AND BARRACUDA RAIL SETTING OUT/CONFIGURATION

TEST RIG TYPE A

10.5mm OFF STUD CENTRE



BUTY LTD, Barracuda Park, Loughmeade Road,
Chesham, Bucks HP8 4JY
T 029 242 3451 F 029 242 3456 E info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR,
ARCHITECT'S AND ENGINEER'S DRAWINGS.

BARRACUDA HORIZONTAL RAIL REQUIREMENT

BAR-R1-1000 = 70 No.
BAR-R2-1000 = 2 No.
BAR-R3-1000 = 2 No.

BARRACUDA VERTICAL RAIL REQUIREMENT

BAR-V1-2950 = 6 No.
BAR-V71-2950 = 1 No.

'HELPING HAND' BRACKET REQUIREMENT
Nvelope 90 (ADJUSTMENT RANGE 92mm TO 132mm)

VERTICAL LOAD BEARING HELPING HAND = 7 No.
RESTRAIN HELPING HAND = 28 No.

REVISIONS: DATE:

CLIENT:
JAMES & TAYLOR LTD

PROJECT:
BRICK SLIP SYSTEM

TITLE:
TEST RIG TYPE A
GENERAL ARRANGEMENT

DATE:
03/12/2021

DRAWN BY:
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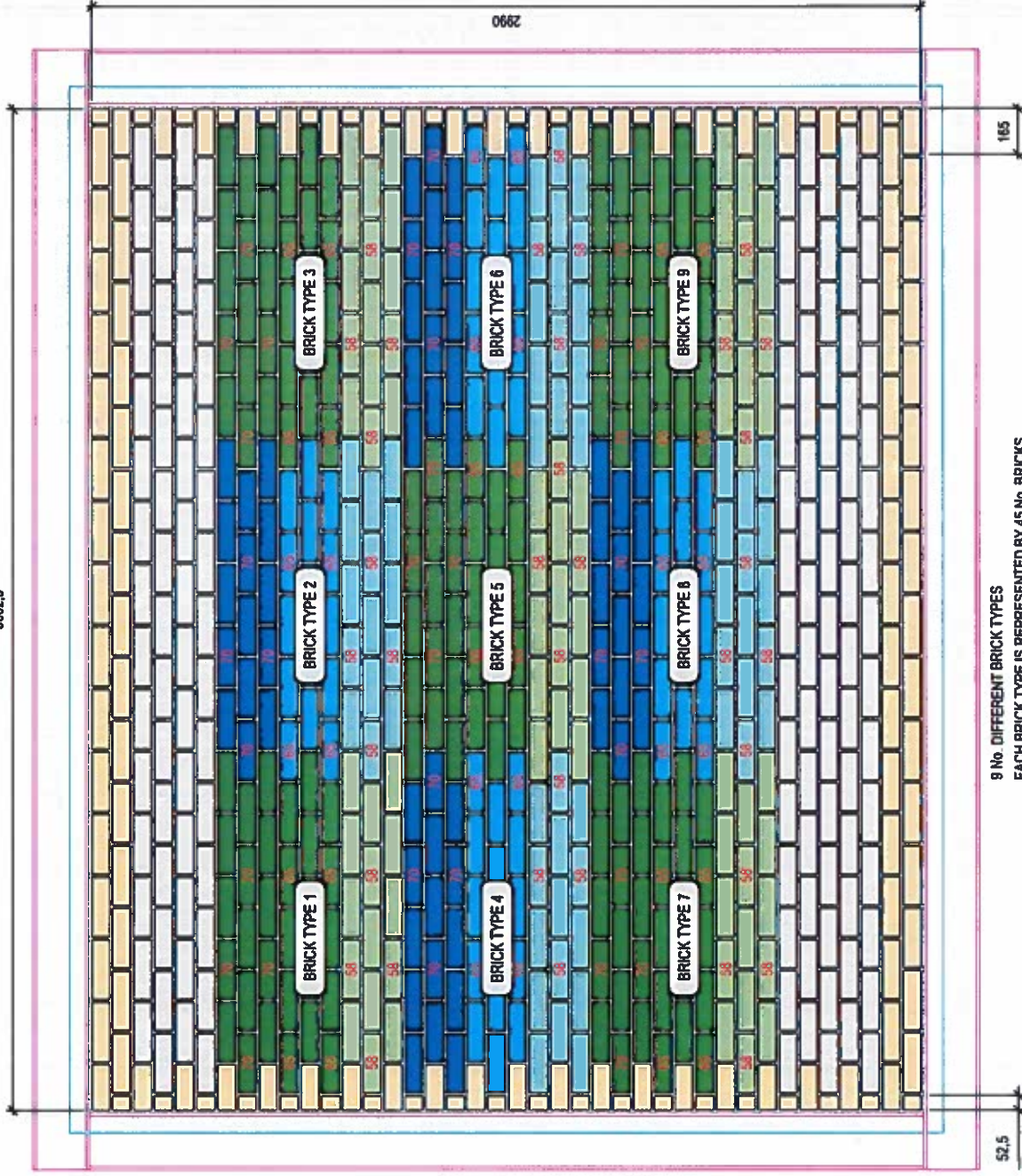
PLOT DATE:
January 16, 2022

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TEST RIG TYPE A - TEST 3 [WATER PENETRATION AND WIND RESISTANCE]

3602.5



9 No. DIFFERENT BRICK TYPES
EACH BRICK TYPE IS REPRESENTED BY 45 No. BRICKS
MEDIAN HEIGHT BRICKS = 15 No.
SMALL BRICKS = 4 No. 58mm HIGH AND 11 No. MEDIAN HEIGHT [26.66%]
LARGE BRICKS = 4 No. 70mm HIGH AND 11 No. MEDIAN HEIGHT [26.66%]



SCOTT WOOD, Building Surveyor, Architectural
Consultant, Survey, 475, 21/1
T: 020 8942 3889 F: 020 8330 7008 E: info@james-taylor.co.uk
www.jamestaylor.co.uk

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 = BLOCKLEY WINDERMERE GREY SOLID
215mm LONG 'STANDARD' SLIPS = 135 No.

 = WIENERBERGER STAFFORDSHIRE
SMOOTH CREAM

215mm LONG 'STANDARD' SLIPS = 30 No.

165mm LONG 'STANDARD' SLIPS = 38 No.

52mm LONG 'STANDARD' SLIPS = 38 No.

215mm LONG SLIPS WITH 'TOP' REBATE = 15 No.

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165mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

52mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

52mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

REVISIONS:

CLIENT

JAMES & TAYLOR LTD

PROJECT

BRICK SLIP SYSTEM

TITLE

TEST RIG TYPE A - TEST 3 WATER
PENETRATION AND WIND RESISTANCE

DATE:

04/12/2021

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VINCI Technology Centre UK Limited
Stanbridge Road
Leighton Buzzard
Bedfordshire
LU7 4QH
UK

0333 5669000

info@technology-centre.co.uk

www.technology-centre.co.uk

Technical Report

Title: Wind resistance testing a Barracuda brick slip system

Report No: N950-22-18408



Technical Report

Title: Wind resistance testing a Barracuda brick slip system

Customer: James & Taylor Ltd,
Sixty-Two, Barwell Business Park,
Leatherhead Road, Chessington, Surrey KT9 2NY.

Issue date: 7 February 2024

VTC job no.: TR0220-3WK2

Author(s): D. Bennett - Technician



Checked by: N. McDonald – Manager



Authorised by: S. R. Moxon – Operations Director



Distribution: 1 copy to James & Taylor
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Stanbridge Road, Leighton Buzzard, Bedfordshire, LU7 4QH

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Tel. 0333 5669000
email info@technology-centre.co.uk
web www.technology-centre.co.uk

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4	TEST RIG GENERAL ARRANGEMENT	8
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1 INTRODUCTION

This report describes tests carried out at VINCI Technology Centre UK Limited at the request of James & Taylor Limited.

The test sample consisted of a Barracuda brick slip system supplied by James & Taylor.

The tests were carried out on 26 September 2022 and were to determine the wind resistance of the test sample. The test methods were in accordance with the CWCT Standard Test Methods for building envelopes, 2005, for:

Wind resistance – serviceability & safety.

This test report relates only to the actual sample as tested and described herein.

The results are valid only for sample(s) tested and the conditions under which the tests were conducted.

The long-term durability of the façade system is not assessed by these test methods.

VINCI Technology Centre UK Limited is accredited to ISO/IEC 17025:2017 by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 0057 for a schedule of tests. Tests listed above and marked with an asterisk are not on our schedule.

VINCI Technology Centre UK Limited is Approved Body No. 1766.

VINCI Technology Centre UK Limited is certified by BSI for:

- ISO 9001 Quality Management System,
- ISO 14001 Environmental Management System,
- ISO 45001 Occupational Health and Safety Management System.

The tests were witnessed in part by John Champion of James & Taylor.

2 SUMMARY AND CLASSIFICATION OF TEST RESULTS

The following summarises the results of the tests carried out. For full details refer to Section 6.

2.1 SUMMARY OF TEST RESULTS

TABLE 1

Date	Test number	Test description	Result
26 September 2022	1	Wind resistance – serviceability	Pass
26 September 2022	2	Wind resistance – safety	Pass
10 November 2022	3	Controlled dismantle	Pass

2.2 CLASSIFICATION

TABLE 2

Test	Standard	Classification / Declared value
Wind resistance	CWCT / BS EN 13116	±2400 pascals serviceability ±3600 pascals safety

3 DESCRIPTION OF TEST SAMPLE

3.1 GENERAL ARRANGEMENT

The sample was as shown in the photo below and the drawings included as an appendix to this report.

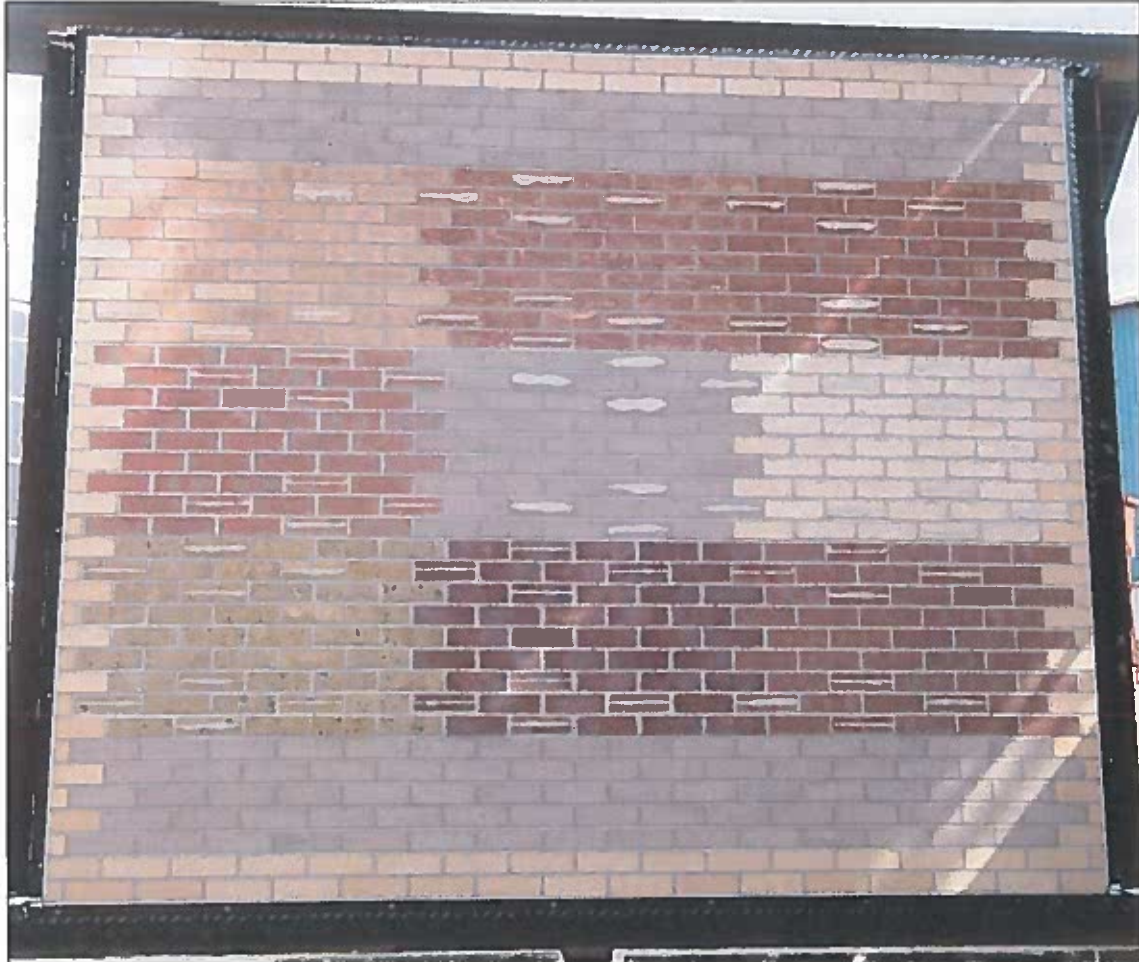
The test sample comprised 9 different brick slip types.

TABLE 3

Brick Types Selected for Independent Testing	
Brick Type No.	Brick Type
1	Wienerberger Sandalwood Yellow Multi
2	Michelmersh Charnwood Light Victorian Red
3	Ibstock Leicester Red Stock
4	Ibstock Chesterton Multi Red Smooth
5	Blockley Windermere Grey Solid
6	Wienerberger Olde Ivory Stock
7	Wienerberger Smeed Dean London Stock
8	Ibstock Aldridge Anglian Red Multi Rustic
9	Michelmersh Hadley Brindle Wirecut

PHOTO 45141

TEST SAMPLE ELEVATION

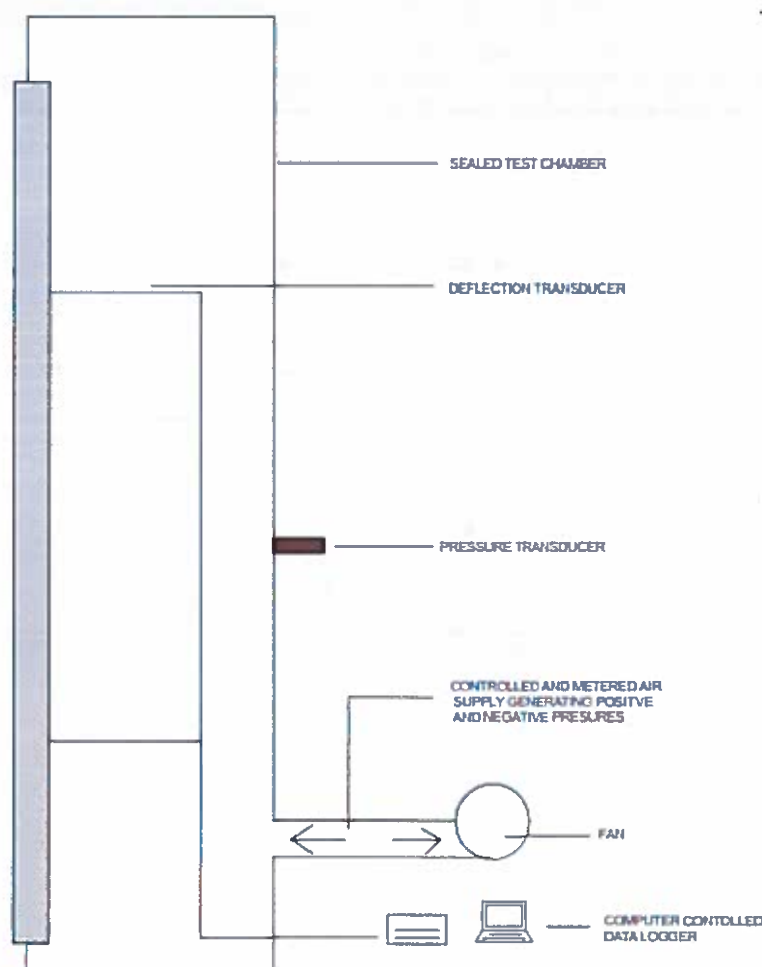


4 TEST RIG GENERAL ARRANGEMENT

The test sample was mounted on a rigid test rig with support steelwork designed to simulate the on-site/project conditions. The test rig comprised a well sealed chamber, fabricated from steel and plywood. A door was provided to allow access to the chamber. Representatives of James & Taylor installed the sample on the test rig. See Figure 1.

FIGURE 1

TEST RIG SCHEMATIC ARRANGEMENT



SECTION THROUGH TEST RIG

5 TEST SEQUENCE

The test sequence was as follows:

- (1) Wind resistance - serviceability
- (2) Wind resistance – safety
- (3) Controlled dismantle

6 TESTING

6.1 INSTRUMENTATION

6.1.1 Pressure

One static pressure tapping was provided to measure the chamber pressure and was located so that the readings were unaffected by the velocity of the air supply into or out of the chamber.

A pressure transducer, capable of measuring rapid changes in pressure to within 2% was used to measure the differential pressure across the sample.

6.1.2 Deflection

Displacement transducers were used to measure the deflection of principle framing members to an accuracy of 0.1 mm. The gauges were set normal to the sample framework at mid-span and as near to the supports of the members as possible and installed in such a way that the measurements were not influenced by the application of pressure or other loading to the sample. The gauges were located at the positions shown in Figure 2.

6.1.3 Temperature

Platinum resistance thermometers (PRT) were used to measure air temperatures to within 1°C.

6.1.4 General

Electronic instrument measurements were scanned by a computer controlled data logger, which also processed and stored the results.

All measuring instruments and relevant test equipment were calibrated and traceable to national standards.

6.2 FAN

The air supply system comprised a variable speed centrifugal fan and associated ducting and control valves to create positive and negative static pressure differentials. The fan provided essentially constant air flow at the fixed pressure for the period required by the tests and was capable of pressurising at a rate of approximately 600 pascals in one second.

6.3 PROCEDURE

6.3.1 Wind Resistance – serviceability

Three positive pressure differential pulses of 1200 pascals were applied to prepare the sample. The displacement transducers were then zeroed.

The sample was subjected to one positive pressure differential pulse from 0 to 2400 pascals to 0. The pressure was increased in four equal increments each maintained for 15 ± 5 seconds. Displacement readings were taken at each increment. Residual deformations were measured on the pressure returning to zero.

Any damage or functional defects were recorded.

Three negative pressure differential pulses of -1200 pascals were applied to prepare the sample. The displacement transducers were then zeroed.

The sample was subjected to one negative pressure differential pulse from 0 to -2400 pascals to 0. The pressure was increased in four equal increments each maintained for 15 ± 5 seconds. Displacement readings were taken at each increment. Residual deformations were measured on the pressure returning to zero.

Any damage or functional defects were recorded.

6.3.2 Wind Resistance – safety

Three positive pressure differential pulses of 1200 pascals were applied to prepare the sample. The displacement transducers were then zeroed.

The sample was subjected to one positive pressure differential pulse from 0 to 3600 pascals to 0. The pressure was increased as rapidly as possible but not in less than 1 second and maintained for 15 ± 5 seconds. Displacement readings were taken at peak pressure. Residual deformations were measured on the pressure returning to zero.

Any damage or functional defects were recorded.

Three negative pressure differential pulses of -1200 pascals were applied to prepare the sample. The displacement transducers were then zeroed.

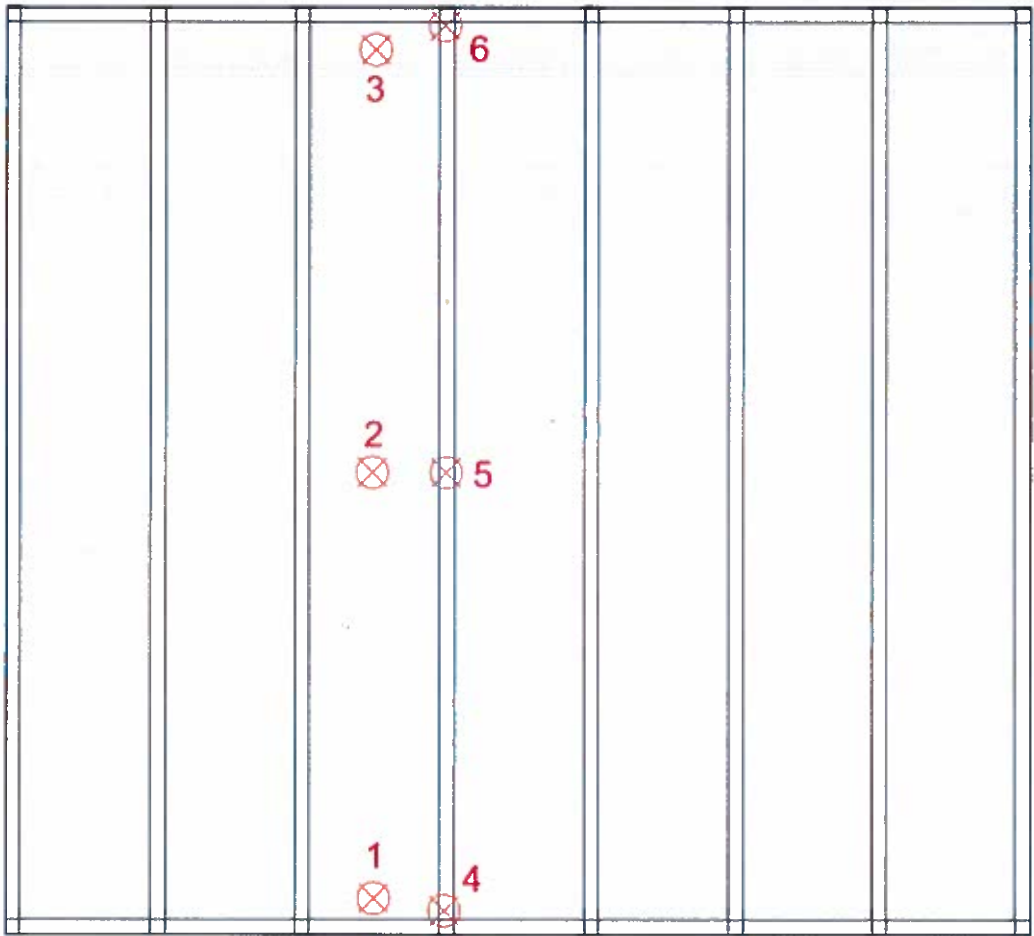
The sample was subjected to one negative pressure differential pulse from 0 to -3600 pascals to 0. The pressure was increased as rapidly as possible but not in less than 1 second and maintained for 15 ± 5 seconds. Displacement readings were taken at peak pressure. Residual deformations were measured on the pressure returning to zero.

Any damage or functional defects were recorded.

FIGURE 2

DEFLECTION GAUGE LOCATIONS

Internal View



⊗ Deflection gauge

6.4 PASS/FAIL CRITERIA

6.4.1 Calculation of permissible deflection

Serviceability Test

TABLE 4

Gauge number	Member	Span (L) (mm)	Permissible deflection (mm)	Permissible residual deformation
2	Brick slips	2987	$L/200 = 14.9$	BS EN 13116: 5% of measured deflection CWCT: 1 mm
5	Vertical stud	2987	$L/200 = 14.9$	

Safety Test

TABLE 5

Gauge number	Member	Span (L) (mm)	Permissible deflection (mm)	Permissible residual deformation
2	Brick slips	2987	n/a	$L/500 = 6.0$ mm
5	Vertical stud	2987	n/a	$L/500 = 6.0$ mm

6.5 RESULTS

Test 3 (serviceability) Date: 26 September 2022

The deflections measured during the wind resistance test, at the positions shown in Figure 2, are shown in Tables 8 and 9.

Summary:

Serviceability Test

TABLE 6

Gauge number	Member	Pressure differential (Pa)	Measured deflection (mm)	Residual deformation (mm)
2	Brick slips	2399 -2391	4.4 -7.2	0.3 -0.4
5	Vertical stud	2399 -2391	6.7 -8.1	0.4 -0.3

No damage to the test sample was observed.

Ambient temperature = 13°C
Chamber temperature = 13°C

Test 4 (safety)

Date: 26 September 2022

The deflections measured during the structural safety test, at the positions shown in Figure 2, are shown in Table 10.

Summary

Safety Test

TABLE 7

Gauge number	Member	Pressure differential (Pa)	Measured deflection (mm)	Residual deformation (mm)
2	Brick slips	3591 -3604	6.9 -9.2	0.5 -0.7
5	Vertical stud	3591 -3604	10.3 -11.7	0.4 -0.7

No damage to the sample was observed.

Ambient temperature = 14°C
Chamber temperature = 14°C

TABLE 8

WIND RESISTANCE – POSITIVE SERVICEABILITY TEST RESULTS

Position	Pressure (pascals) / Deflection (mm)				
	614	1205	1805	2399	Residual
1	1.3	2.4	3.7	5.1	0.1
2	2.2	4.4	7.1	10.0	0.5
3	1.4	2.8	4.5	6.3	0.3
4	1.0	1.9	2.8	3.7	0.1
5	2.3	4.6	7.5	10.7	0.5
6	1.0	2.0	3.1	4.3	0.2
2 *	0.9	1.8	3.1	4.4	0.3
5 *	1.3	2.6	4.6	6.7	0.4

* Mid-span reading adjusted between end support readings

TABLE 9

WIND RESISTANCE – NEGATIVE SERVICEABILITY TEST RESULTS

Position	Pressure (pascals) / Deflection (mm)				
	-598	-1197	-1794	-2391	Residual
1	-1.7	-3.2	-4.7	-6.5	0.1
2	-2.8	-6.1	-10.1	-14.6	-0.6
3	-1.5	-3.3	-5.6	-8.3	-0.6
4	-1.1	-1.9	-2.8	-3.8	0.2
5	-2.6	-5.4	-8.8	-12.7	-0.5
6	-1.0	-2.0	-3.5	-5.3	-0.5
2 *	-1.2	-2.9	-4.9	-7.2	-0.4
5 *	-1.5	-3.4	-5.6	-8.1	-0.3

* Mid-span reading adjusted between end support readings

TABLE 10

WIND RESISTANCE - SAFETY TEST RESULTS

Position	Pressure (pascals) / Deflection (mm)			
	3591	Residual	-3604	Residual
1	7.3	0.1	-9.5	-0.9
2	15.3	0.8	-19.9	-1.9
3	9.5	0.6	-11.9	-1.5
4	5.1	-0.1	-5.2	-1.1
5	16.1	0.6	-18.4	-2.0
6	6.5	0.5	-8.1	-1.5
2 *	6.9	0.5	-9.2	-0.7
5 *	10.3	0.4	-11.7	-0.7

* Mid-span reading adjusted between end support readings

6.6 CONTROLLED DISMANTLING

During the dismantling of the sample no discrepancies from the drawings were found.

PHOTO 6137

TEST SAMPLE DURING DISMANTLE



PHOTO 6145

TEST SAMPLE DURING DISMANTLE



PHOTO 6156

TEST SAMPLE DURING DISMANTLE



PHOTO 6157

TEST SAMPLE DURING DISMANTLE

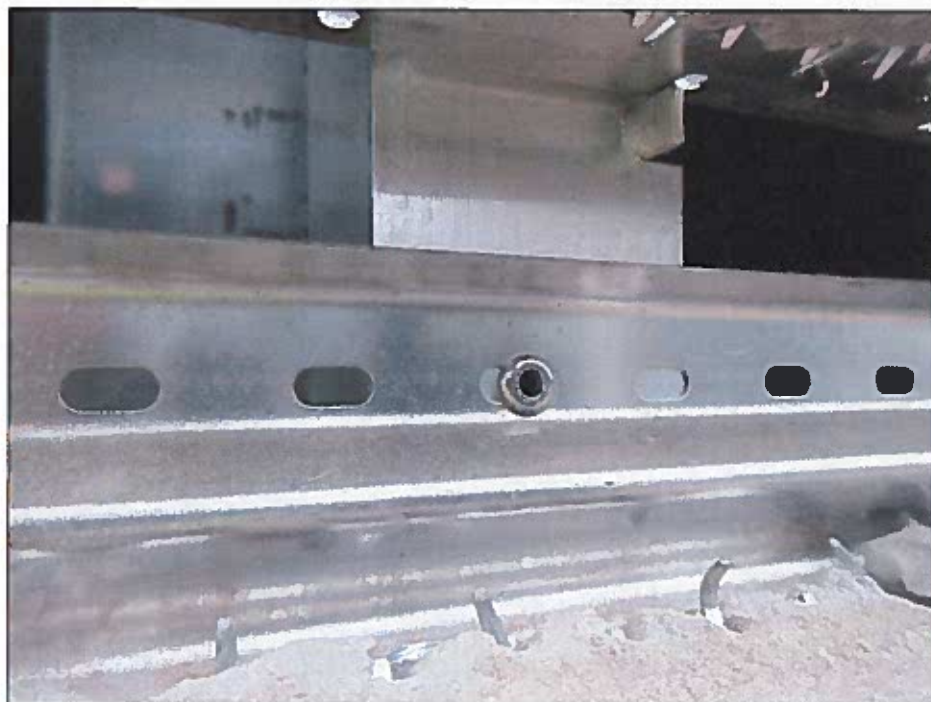


PHOTO 6158

TEST SAMPLE DURING DISMANTLE



PHOTO 6159

TEST SAMPLE DURING DISMANTLE



PHOTO 6160

BRICK SLIPS REMOVED FROM TEST RIG



PHOTO 6181

SUPPORT FRAME REMOVED FROM TEST RIG



7 APPENDIX - DRAWINGS

The following 4 unnumbered pages are copies of James & Taylor Limited drawings numbered:

BSS-TRA-GA-001,

BSS-TRA-GA-002,

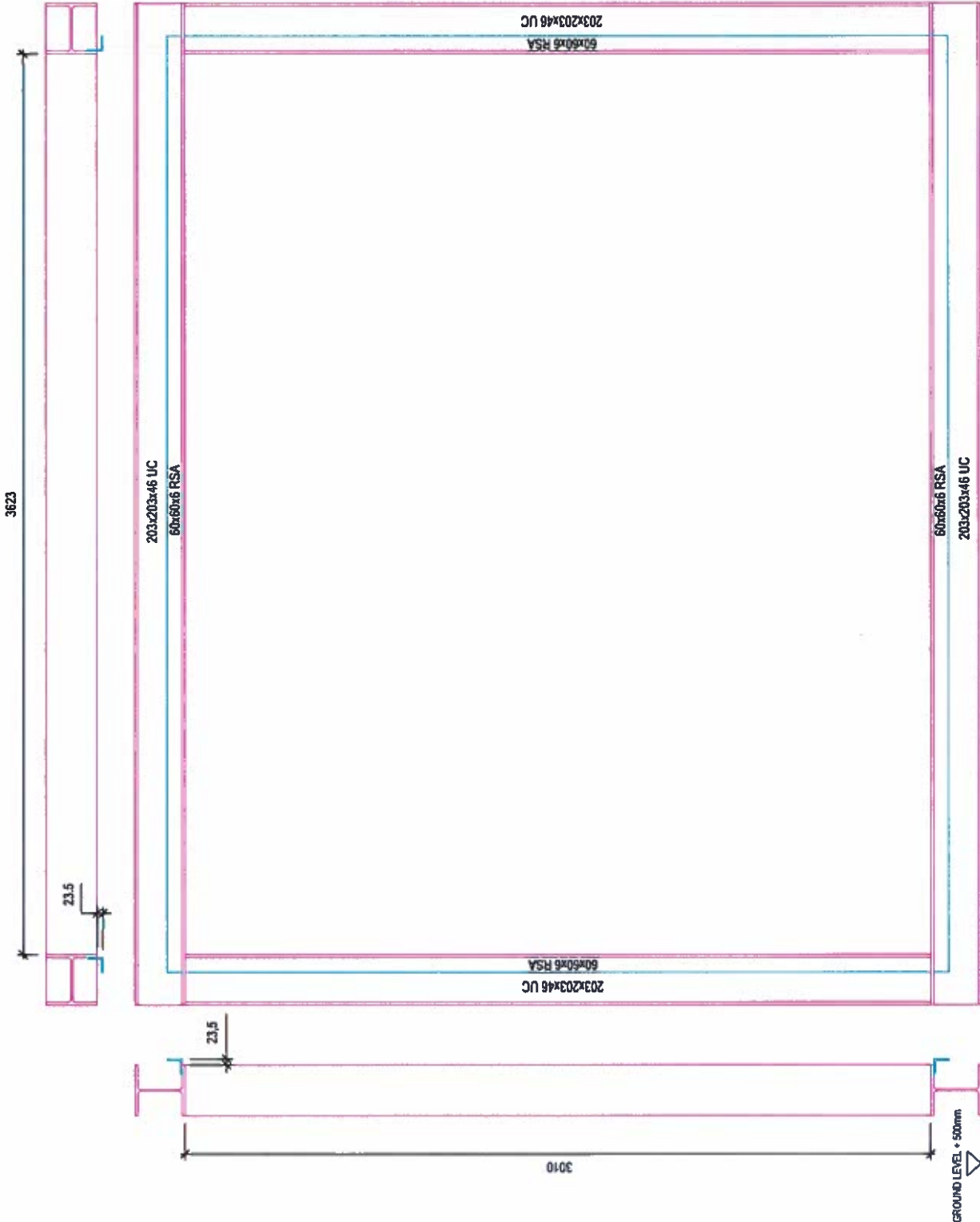
BSS-TRA-GA-003,

BSS-TRA-T3.

END OF REPORT

STEEL FRAMING (TO BE PROVIDED BY TECHNOLOGY CENTRE)

TEST RIG TYPE A



55 CITY WAY, BARNOLD, SOUTHAMPTON, HAMPSHIRE, SO9 4JY
023 8236 7236 F 023 8236 7236 E info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

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STEEL FRAMING REQUIREMENT

203x203x46 UC (AS DRAWN)
60x60x6 RSA (AS DRAWN)

REVISIONS: DATE:

CLIENT: JAMES & TAYLOR LTD

PROJECT: BRICK SLIP SYSTEM

TITLE:

TEST RIG TYPE A
GENERAL ARRANGEMENT

DATE: 03/12/2021

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CHECKED BY: JSC

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METSEC REQUIREMENT

VERTICAL STUDS

150M12-75 (THEORETICAL LENGTH 2987mm) = 7 No.

BASE TRACK

154M12-40 (THEORETICAL LENGTH 3602mm) = 1 No.

HEAD TRACK

154M18-70s (THEORETICAL LENGTH 3602mm) = 1 No.

REVISIONS

DATE: _____

CLIENT:
JAMES & TAYLOR LTD

PROJECT:
BRICK SLIP SYSTEM

TITLE:
TEST RIG TYPE A
GENERAL ARRANG

DATE:

03/12/2021

DRAWN BY:

251

31705

52

DRAWING NUMBER:

BSS-TRA-GA-002

PLOT DATE:

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& TAYLOR

SUITE TWO, Grand Quarters Park, 441 Grand Road,
Chickadee, Surrey K7G 7T1
TEL: 604-278-5520 FAX: 604-278-5520
www.luna-sailor.co.uk

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BARRACUDA HORIZONTAL RAIL REQUIREMENT

BAR-R1-1800 = 78 No.
BAR-R2-1800 = 2 No.
BAR-R3-1800 = 2 No.

BARRACUDA VERTICAL RAIL REQUIREMENT

BAR-VL1-2990 = 6 No.
BAR-VT1-2990 = 1 No.

'HELPING HAND' BRACKET REQUIREMENT
 W/loops 80 (ADJUSTMENT RANGE 82mm TO 132mm)

REVISIONS: _____ DATE: _____

CLIENT:

JAMES & TAYLOR LTD

PROJECT:

BRICK SLIP SYSTEM

TIME

TEST RIG TYPE A

GENERAL ARRANGEMENT

DATE:

03/12/2021

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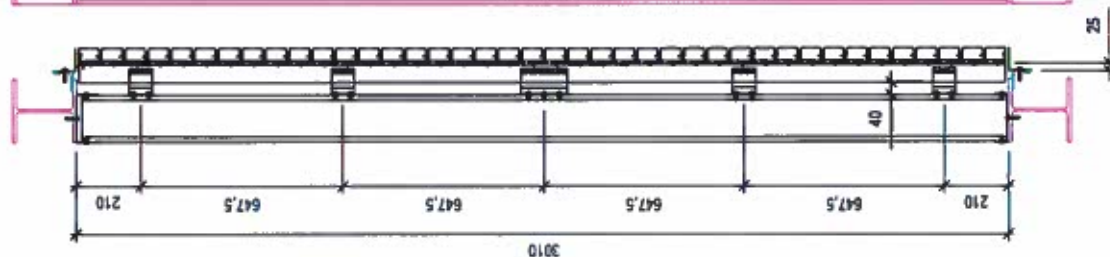
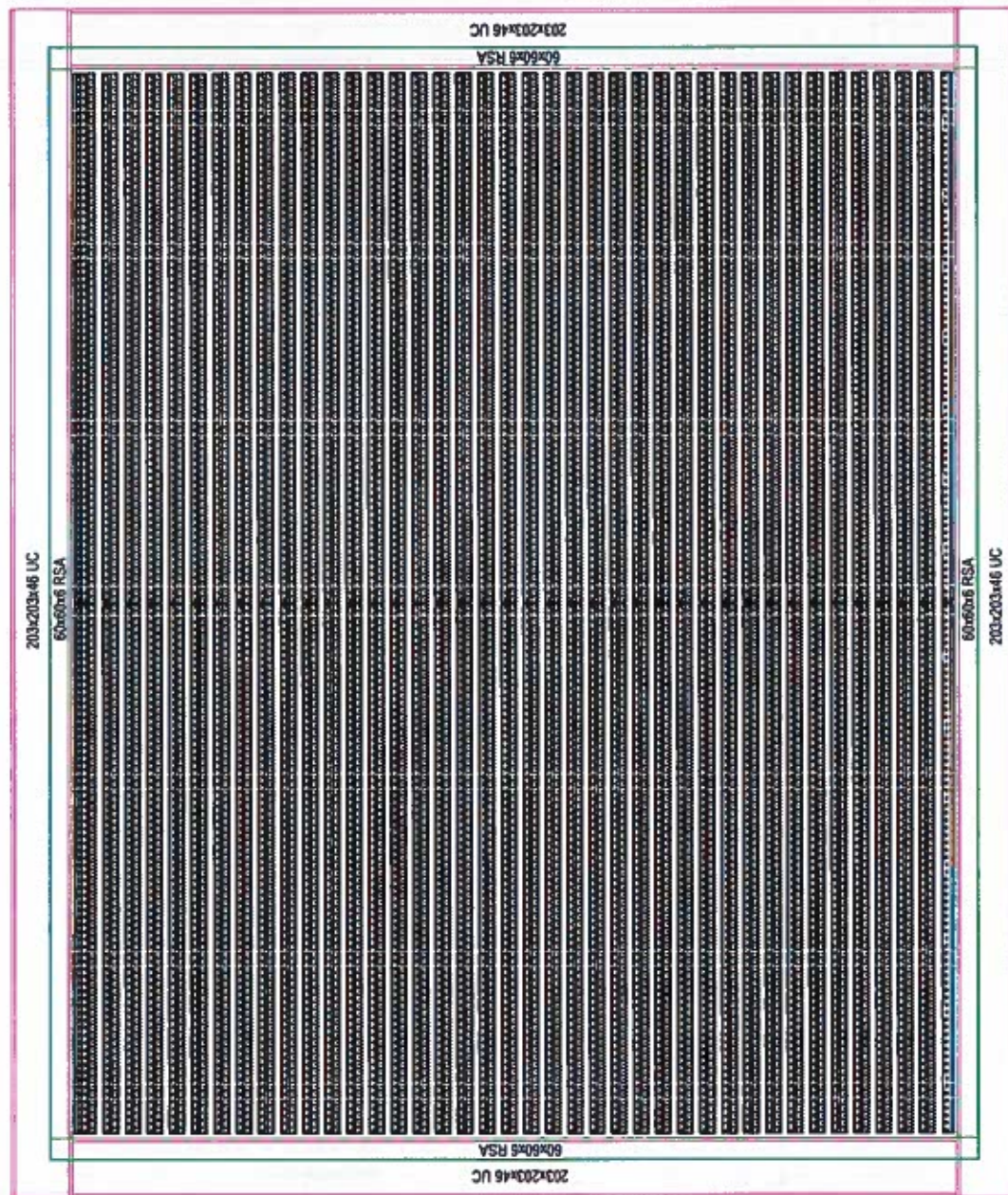
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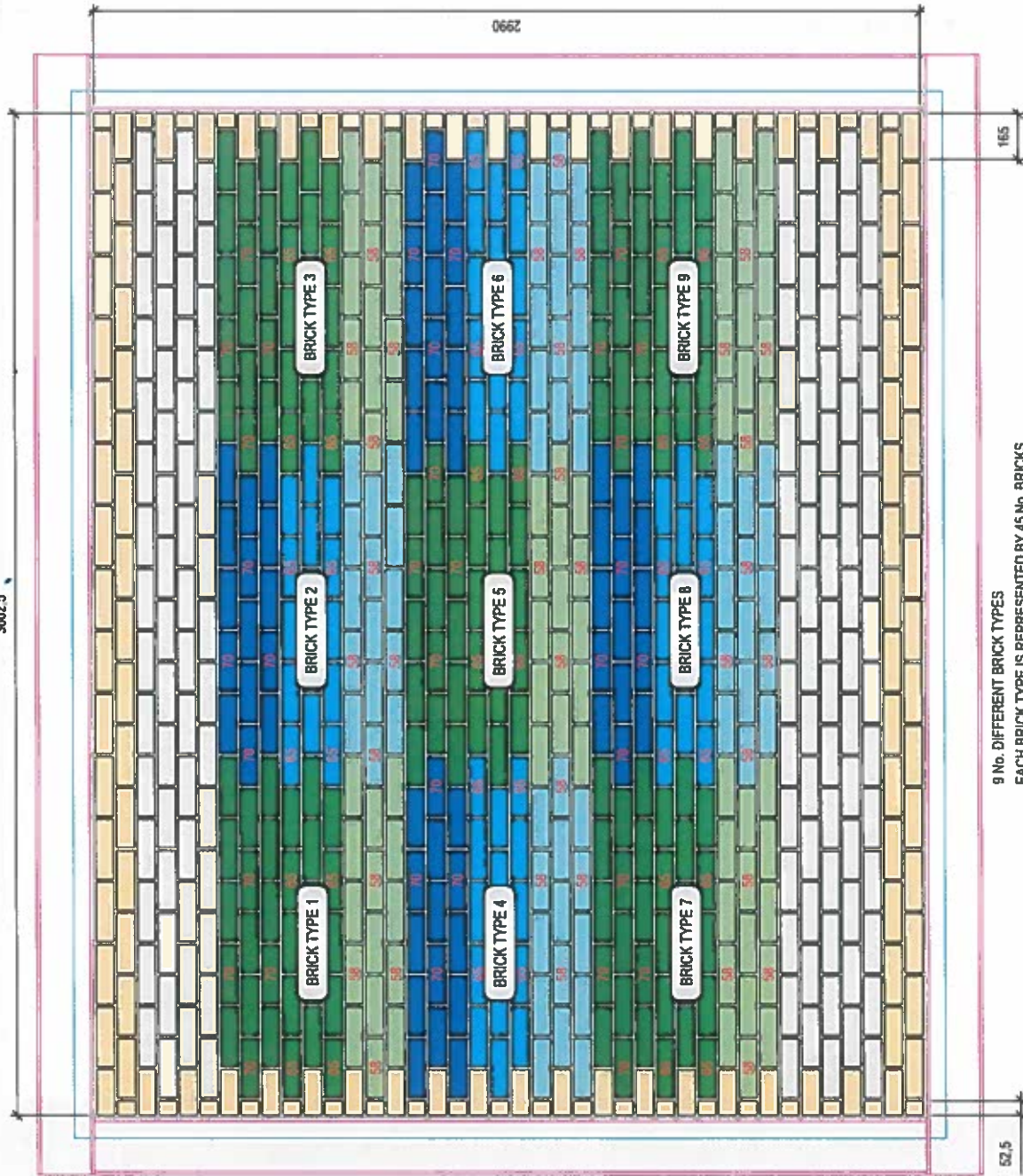
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TEST RIG TYPE A - TEST 3 [WATER PENETRATION AND WIND RESISTANCE]

3602.5



9 No. DIFFERENT BRICK TYPES
EACH BRICK TYPE IS REPRESENTED BY 45 No. BRICKS
MEDIAN HEIGHT BRICKS = 15 No.
SMALL BRICKS = 4 No. 50mm HIGH AND 11 No. MEDIAN HEIGHT [26.66%]
LARGE BRICKS = 4 No. 70mm HIGH AND 11 No. MEDIAN HEIGHT [26.66%]



56 CITY VIEW, BARNET BUSINESS PARK, 1, LETCHWORTH ROAD,
LETCHWORTH, CAMBRIDGESHIRE, MK45 2JY
T: 0773 864 7489 E: info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

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215mm LONG 'STANDARD' SLIPS = 135 No.

= WIENERBERGER STAFFORDSHIRE
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52mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

52mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

REVISIONS: _____ DATE: _____

CLIENT:

JAMES & TAYLOR LTD

PROJECT:

BRICK SLIP SYSTEM

TITLE:

TEST RIG TYPE A - TEST 3 WATER
PENETRATION AND WIND RESISTANCE

DATE:

04/12/2021

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VINCI Technology Centre UK Limited
Stanbridge Road
Leighton Buzzard
Bedfordshire
LU7 4QH
UK

0333 5669000

info@technology-centre.co.uk

www.technology-centre.co.uk

Technical Report

Title: Impact testing of Barracuda Brick Slip System (Un-Mortared)

Report No: N950-24-18684



Technical Report

Title: Impact Testing of Barracuda Brick Slip System (Un-Mortared).

Customer: James & Taylor Ltd,
Sixty-Two, Barwell Business Park,
Leatherhead Road, Chessington, Surrey KT9 2NY.

Issue date: 4 March 2024

VTC job no.: TR0220-3WK2

Author(s): S. Bahera – Assistant Engineer

S. Bahera

Checked by: N. McDonald – Manager

N. McDonald

Authorised by: S. R. Moxon – Operations Director

S. R. Moxon

Distribution: 1 copy to James & Taylor
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Stanbridge Road, Leighton Buzzard, Bedfordshire, LU7 4QH

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email info@technology-centre.co.uk

web www.technology-centre.co.uk

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2 SUMMARY AND CLASSIFICATION OF TEST RESULTS5

3 IMPACT CLASSES6

4 DESCRIPTION OF TEST SAMPLE.....7

5 TEST EQUIPMENT10

6 TEST PROCEDURE11

7 TEST RESULTS12

8 APPENDIX - DRAWINGS26

1 INTRODUCTION

This certificate of test describes impact tests carried out at the request of James & Taylor Ltd. on 12th September 2023 at VINCI Technology Centre, Leighton Buzzard.

The test was carried out in accordance with CWCT TN75/76.

The test was witnessed by:

John Champion - James & Taylor Ltd.

This test report relates only to the actual sample as tested and described herein.

The results are valid only for sample(s) tested and the conditions under which the tests were conducted.

The long-term durability of the façade system is not assessed by these test methods.

VINCI Technology Centre UK Limited is accredited to ISO/IEC 17025:2017 by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 0057 for a schedule of tests. Tests listed above and marked with an asterisk are not on our schedule.

VINCI Technology Centre UK Limited is Approved Body No. 1766.

VINCI Technology Centre UK Limited is certified by BSI for:

- ISO 9001 Quality Management System,
- ISO 14001 Environmental Management System,
- ISO 45001 Occupational Health and Safety Management System.

2 SUMMARY AND CLASSIFICATION OF TEST RESULTS

Impact testing has been carried out for safety impacts only, serviceability impacts have not been carried out.

Soft body impacts

500 J Safety
Negligible risk

Hard body impacts

10 J Safety
Low Risk

3 IMPACT CLASSES

Note: Tables 1 is taken from CWCT TN76.

Table 1 - Classes for safety performance

Class	Explanation/examples
Negligible risk	No material dislodged during test, and No damage likely to lead to materials falling subsequent to test, and No sharp edges produced that would be likely to cause severe injury to a person during impact, and Cladding not penetrated by impactor.
Low risk	Maximum mass of falling particle 50 g, and Maximum mass of particle that may fall subsequent to impact 50 g, and No sharp edges produced that would be likely to cause severe injury during impact.
Moderate risk	Maximum mass of falling particle less than 500 g, and Maximum mass of particle that may fall subsequent to impact less than 500 g, and Cladding not penetrated by impact, and No sharp edges produced that would be likely to cause severe injury during impact.
High risk	Maximum mass of falling particle greater than 500 g, or Cladding penetrated by impact, or Sharp edges produced that would be likely to cause severe injury during impact.

4 DESCRIPTION OF TEST SAMPLE

The sample was mounted to a solid steel frame which was fixed to a concrete slab as shown in the photograph below.

PHOTO IMG-5655



TEST SAMPLE

PHOTO IMG-5358



SUPPORT BRACKET

PHOTO IMG_5352



CLOSE UP OF BRICK SLIPS

5 TEST EQUIPMENT

The soft body impactor comprised a canvas spherical/conical bag 400 mm in diameter filled with 3 mm diameter glass spheres with a total mass of 50 kg suspended from a cord at least 3 m long.

The hard body impactor was solid steel ball of 62.5 mm diameter and mass of 1.0 kg.

6 TEST PROCEDURE

6.1 SOFT BODY

The impactor almost touched the face of the sample when at rest. It was swung in a pendular movement to hit the sample normal to its face.

The test was performed at the locations shown in Figure 1.

The impact energies were 500 J for safety.

6.2 HARD BODY

The impactor almost touched the face of the sample when at rest. It was swung in a pendular movement to hit the sample normal to its face.

The test was performed at the locations shown in Figure 2.

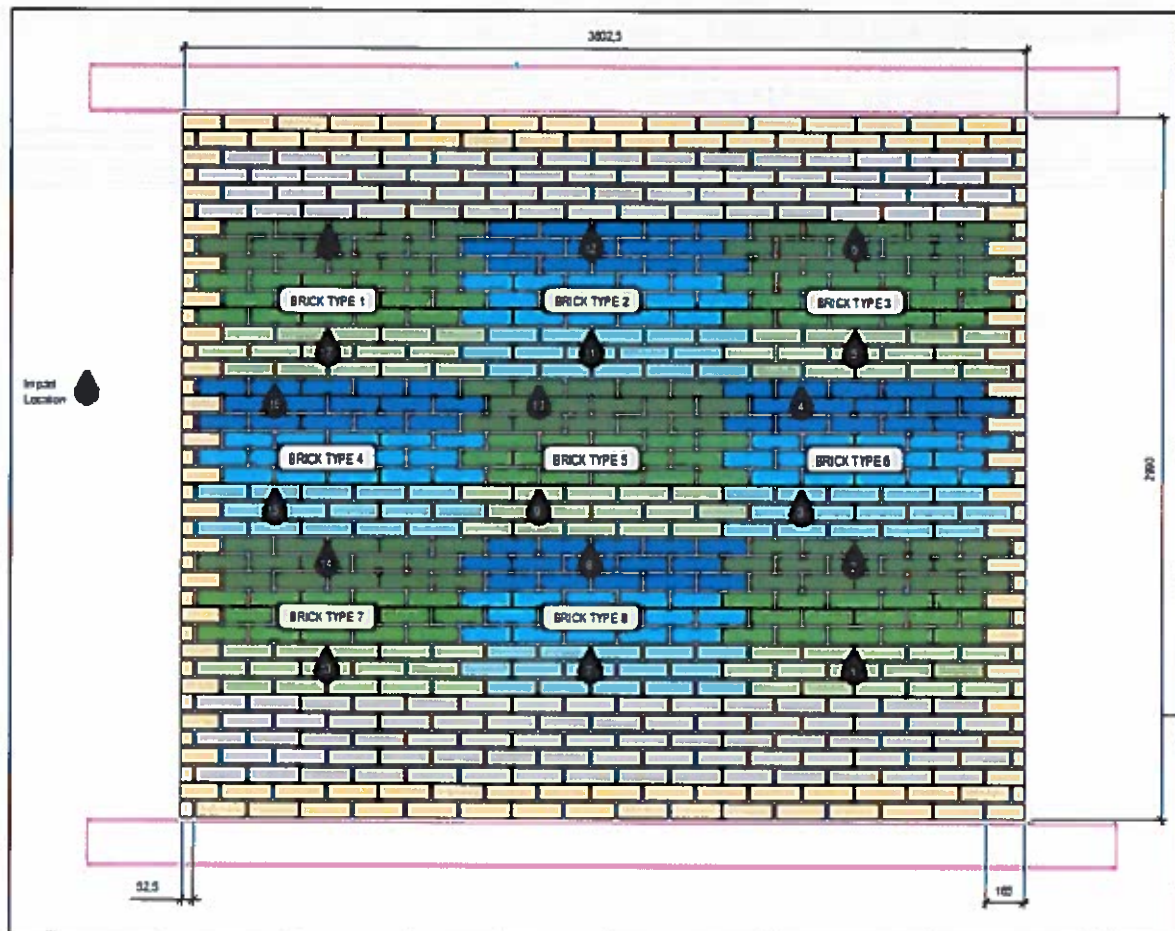
The impact energies were 10 J.

7 TEST RESULTS

Test Date: 14th September 2023

Ambient temperature = 20 °C

FIGURE 1



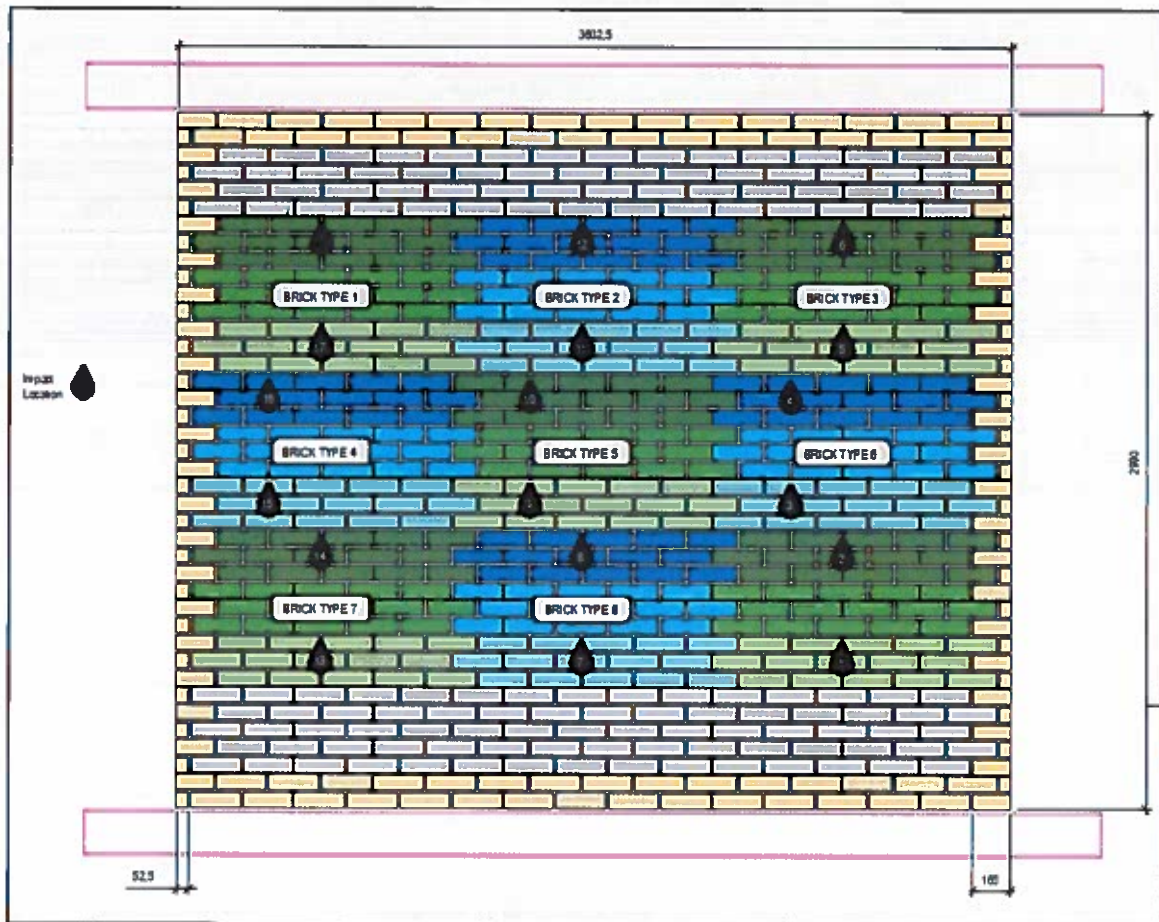
SOFT BODY IMPACT LOCATIONS

TABLE 3

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
1	500	No damage observed	Negligible risk
2	500	No damage observed	Negligible risk
3	500	No damage observed	Negligible risk
4	500	No damage observed	Negligible risk
5	500	No damage observed	Negligible risk
6	500	No damage observed	Negligible risk
7	500	No damage observed	Negligible risk
8	500	No damage observed	Negligible risk
9	500	No damage observed	Negligible risk
10	500	No damage observed	Negligible risk
11	500	No damage observed	Negligible risk
12	500	No damage observed	Negligible risk
13	500	No damage observed	Negligible risk
14	500	No damage observed	Negligible risk
15	500	No damage observed	Negligible risk
16	500	No damage observed	Negligible risk
17	500	No damage observed	Negligible risk
18	500	No damage observed	Negligible risk

FIGURE 2



HARD BODY IMPACT LOCATIONS

TABLE 4
HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
1	10	Crack through full height of tile	Low risk
2	10	Crack through full height of tile	Low risk
3	10	Crack through full height of tile. Small chip to corner of brick	Low risk
4	10	Minor indent	Negligible risk
5	10	Crack through full height of tile	Low risk
6	10	Crack through full height of tile	Low risk
7	10	Crack through full height of tile	Low risk
8	10	Crack through full height of tile. Small chip to corner of brick (4 g)	Low risk
9	10	Crack through full height of tile	Low risk
10	10	Minor indent	Negligible risk
11	10	Crack through full height of tile	Low risk
12	10	Crack through full height of tile	Low risk
13	10	Crack through full height of tile	Low risk
14	10	Crack through full height of tile	Low risk
15	10	Crack through full height of tile	Low risk
16	10	Crack through full height of tile	Low risk
17	10	Crack through full height of tile. Small chip to corner of brick	Low risk
18	10	Crack through full height of tile. Small chip to corner of brick (4 g)	Low risk

PHOTO IMG_9288



SOFT BODY IMPACTOR

PHOTO IMG_9311



HARD BODY IMPACTOR

PHOTO IMG_9310



IMPACT LOCATION 1

PHOTO IMG_9312



IMPACT LOCATION 2

PHOTO IMG_9314



IMPACT LOCATION 3

PHOTO IMG_9316



IMPACT LOCATION 5

PHOTO IMG_9319



IMPACT LOCATION 6

PHOTO 9321



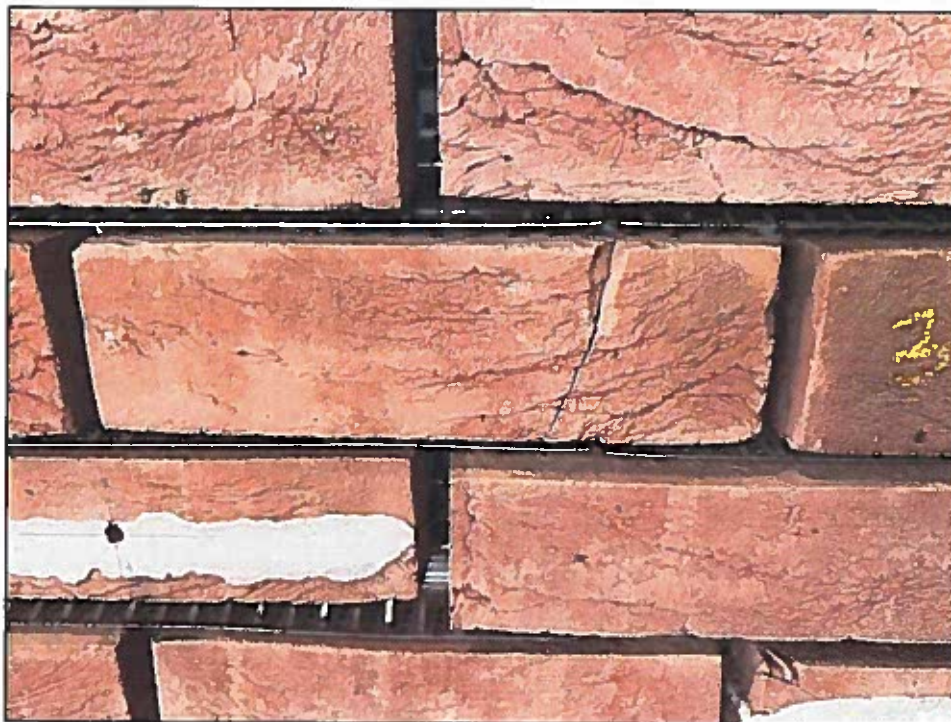
IMPACT LOCATION 7

PHOTO IMG_9323



IMPACT LOCATION 8

PHOTO IMG_9325



IMPACT LOCATION 9

PHOTO IMG_9329



IMPACT LOCATION 9

PHOTO IMG_9331



IMPACT LOCATION 11

PHOTO IMG_9336



IMPACT LOCATION 12

PHOTO IMG_9338



IMPACT LOCATION 13

PHOTO IMG_9340



IMPACT LOCATION 14

PHOTO IMG_9342



IMPACT LOCATION 15

PHOTO IMG_9344



IMPACT LOCATION 16

PHOTO IMG_9349



IMPACT LOCATION 17

PHOTO IMG_9354



IMPACT LOCATION 18

8 APPENDIX - DRAWINGS

The following 4 unnumbered pages are copies of James & Taylor Limited drawings numbered:

- BSS-TRB-GA-001
- BSS-TRB-GA-002
- BSS-TRB-GA-003
- BSS-TRA-T1

END OF REPORT

TEST RIG TYPE A - TEST 1 [UNMORTARED BRICK PULL]

3602.5

JAMES & TAYLOR
DITV TWO, Blandford Business Park, Blandford (Dorset) Bland,
Dorset DT11 9JG, UK
T: 0120 742 3434 F: 0120 742 3435 E: info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR
ARCHITECTS AND ENGINEERS DRAWINGS.

 = BLOCKLEY WINDERMERE GREY SOLID
215mm LONG 'STANDARD' SLIPS = 135 No.

 = WIENERBERGER STAFFORDSHIRE
SMOOTH CREAM

215mm LONG 'STANDARD' SLIPS = 30 No.

165mm LONG 'STANDARD' SLIPS = 38 No.

52mm LONG 'STANDARD' SLIPS = 38 No.

215mm LONG SLIPS WITH 'TOP' REBATE = 15 No.

215mm LONG SLIPS WITH 'BOTTOM' REBATE = 15 No.

165mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

165mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

52mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

52mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

REVISIONS:
DATE:

CLIENT:
JAMES & TAYLOR LTD

PROJECT:
BRICK SLIP SYSTEM

TITLE:
**TEST RIG TYPE A - TEST 1
UNMORTARED BRICK PULL**

DATE:
04/12/2021

DRAWN BY:
JSC

CHECKED BY:
JSC

SCALE:
1:16

PLOT SIZE:
A3

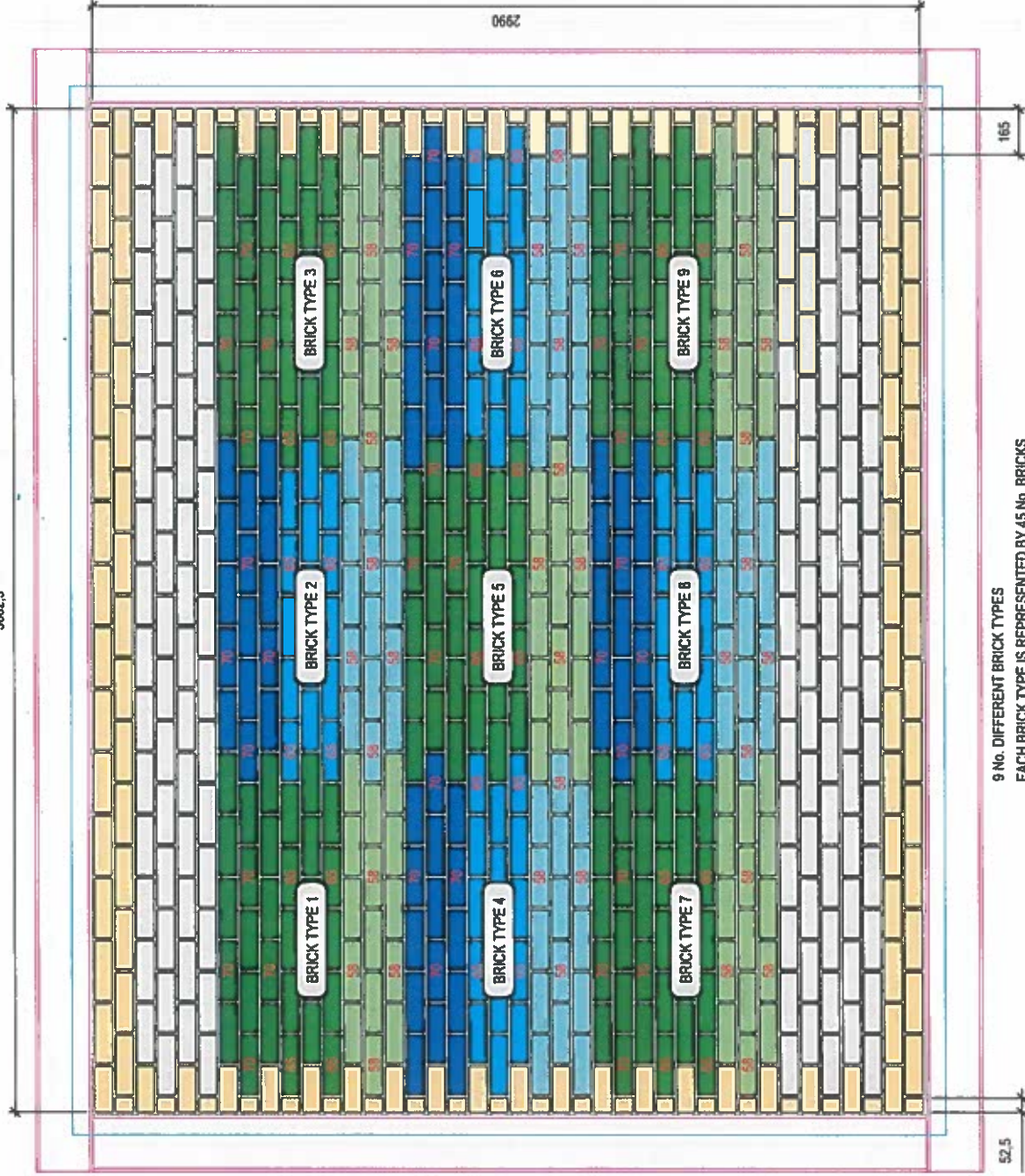
DRAWING NUMBER:
BSS-TRA-T1

REVISION:

PLOT DATE:
December 5, 2021

5:38 PM

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9 No. DIFFERENT BRICK TYPES

EACH BRICK TYPE IS REPRESENTED BY 45 No. BRICKS

MEDIAN HEIGHT BRICKS = 15 No.

SMALL BRICKS = 4 No. 58mm HIGH AND 11 No. MEDIAN HEIGHT (26.66%)

LARGE BRICKS = 4 No. 70mm HIGH AND 11 No. MEDIAN HEIGHT (26.66%)

TEST RIG TYPE B
STEEL FRAMING (TO BE PROVIDED BY TECHNOLOGY CENTRE)

4400

203x203x46 UC

203x203x46 UC

0100

GROUND LEVEL + 500mm



SUITE 100, BARNET BUSINESS PARK, LUTON, LU3 2JY
Tel: 01298 318181 Fax: 01298 318182 Email: info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES:

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STEEL FRAMING REQUIREMENT
203x203x46 UC (AS DRAWN)
60x60x6 RSA (AS DRAWN)

REVISIONS:

CLIENT

JAMES & TAYLOR LTD

PROJECT:

BRICK SLIP SYSTEM

TITLE

TEST RIG TYPE B

GENERAL ARRANGEMENT

DATE:

03/12/2021

DRAWN BY:

JSC

CHECKED BY:

JSC

SCALE:

1:16

PLOT SIZE:

A3

DRAWING NUMBER:

BSS-TRB-GA-001

REVISION:

DATE:

December 5, 2021

5:40 PM

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JAMES
&TAYLOR

SIXTY TWO, Barnwell Business Park, Leith Road
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T 01296 824111 F 01296 2235 E info@sixtytwo.co.uk
www.sixtytwo.co.uk

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METSEFC REQUIREMENT

VERTICAL STUNS

150M12.75 (THEORETICAL LENGTH 2987mm) = 7 No

BASE TRACK

154M17-40 (THEORETICAL LENGTH 3602mm) = 1 No.

HEAD TRACK

HEAD INCH

REVISIONS:

DATE: _____

CLIENT:

CLIENT:
JAMES & TAYLOR LTD

PROJECT

PROJECT:
BRICK SLIP SYSTEM

三、

FILE
TEST RIG TYPE B

TEST RIG TYPE B GENERAL ARRANGEMENT

DATE: _____

03/12/2021

GET AWAY BY:

JSC

HECKEN AY:

JST

पृष्ठ संख्या

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PLOT SIZE:

23

Abstract

BSS-TRB-GA-002

DISCLAIMER

Notes:

PLOT DATE:PLUT DATE
December 5, 2021

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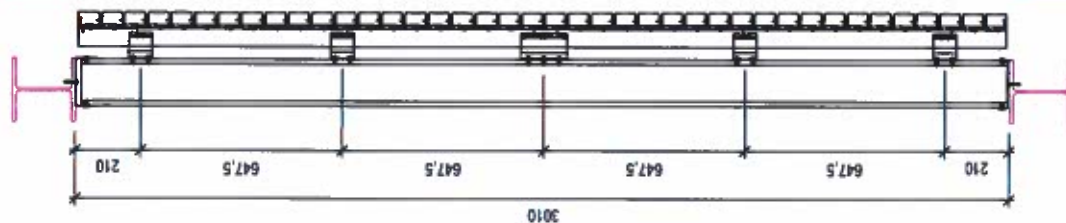
© James & Taylor Ltd - 2008

10.5mm OFF STUD CENTRE



THIS HELPING HAND BRACKET IS NOT 'CENTRED' ON METSEC STUD

203x203x46 UC



0106

2013x2013x46 UC



CITY TWO Bureau Address Paid 967-08995 Report
Chargen: SURV KTS MAY
CIVIL 8342 3620 F 270 8130 7536 F 140-08995-0101A
www.farrington.com

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WITH ALL RELEVANT JAMES & TAYLOR,
ARCHITECT'S AND ENGINEER'S DRAWINGS.

BAR-R1-1000 = 70 No.

BAR-R2-1800 = 2 No.

BAR-R3-1800 = 2 No.

800-441-1000

BAR-VL 1-2990 = 6 No.

BAR-VT1-2890 = 1 No.

0011-0007/02/0005-0000\$05.00/0

HELPING HAND BRACKET REQUIREMENT
Envelope 90 (ADJUSTMENT RANGE 92mm TO 132mm)

VERTICAL LOAD BEARING HELPING HAND = 7 No.

RESTRAIN HELPING HAND ■ 28 No.

REVISIONS: _____ DATE: _____

CLIENT:
JAMES & TAYLOR LTD

PROJECT:
BRICK SLIP SYSTEM

time:

TEST RIG TYPE B

GENERAL ARRANGEMENT

DATE:

03/12/2021

DRAWN BY:

JSC JSC

SCALE: _____

1:16 A3

DRAWING NUMBER:

BSS-TRB-GA-003

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VINCI Technology Centre UK Limited
Stanbridge Road
Leighton Buzzard
Bedfordshire
LU7 4QH
UK

0333 5669000

info@technology-centre.co.uk

www.technology-centre.co.uk

Technical Report

Title: Impact resistance testing of the Barracuda brick slip system

Report No: N950-22-18403



Technical Report

Title: Impact resistance testing of the Barracuda brick slip system

Customer: James & Taylor Ltd,
Sixty-Two, Barwell Business Park,
Leatherhead Road, Chessington, Surrey KT9 2NY.

Issue date: 7 February 2024

VTC job no.: TR0220-3WK2

Author(s): D. Bennett - Technician



Checked by: N. McDonald – Manager



Authorised by: S. R. Moxon – Operations Director



Distribution: 1 copy to James & Taylor
(confidential) 1 copy to project file

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VINCI Technology Centre UK Limited,
Stanbridge Road, Leighton Buzzard, Bedfordshire, LU7 4QH

Registered Office, Watford. Registered No. 05640885 England.

Tel. 0333 5669000

email info@technology-centre.co.uk

web www.technology-centre.co.uk

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1 INTRODUCTION

This report describes tests carried out at VINCI Technology Centre UK Limited at the request of James & Taylor Limited.

The test sample consisted of a brick slip system supplied by James & Taylor.

The tests were carried out on 19 October 2022 and were to determine the impact resistance of the test sample. The test methods were in accordance with the CWCT Standard Test Methods TN 75/76.

This test report relates only to the actual sample as tested and described herein.

The results are valid only for sample(s) tested and the conditions under which the tests were conducted.

The long-term durability of the façade system is not assessed by these test methods.

VINCI Technology Centre UK Limited is accredited to ISO/IEC 17025:2017 by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 0057 for a schedule of tests. Tests listed above and marked with an asterisk are not on our schedule.

VINCI Technology Centre UK Limited is Approved Body No. 1766.

VINCI Technology Centre UK Limited is certified by BSI for:

- ISO 9001 Quality Management System,
- ISO 14001 Environmental Management System,
- ISO 45001 Occupational Health and Safety Management System.

The tests were witnessed by John Champion of James & Taylor.

2 CLASSIFICATION OF TEST RESULTS

TABLE 1

Test	Standard	Classification / Declared value
Impact resistance	CWCT TN76	<u>Soft body</u> Class 1 – serviceability/120 J Negligible risk – safety/350 J & 500 J <u>Hard body</u> Class 1 – serviceability/3 J, 6 J & 10 J Negligible risk – safety/3 J & 10 J

3 DESCRIPTION OF TEST SAMPLE

3.1 GENERAL ARRANGEMENT

The sample was as shown in the photo below and the drawings included as an appendix to this report.

The test sample was mounted on a rigid test rig with support steelwork designed to simulate the on-site/project conditions. Representatives of James & Taylor installed the sample on the test rig.

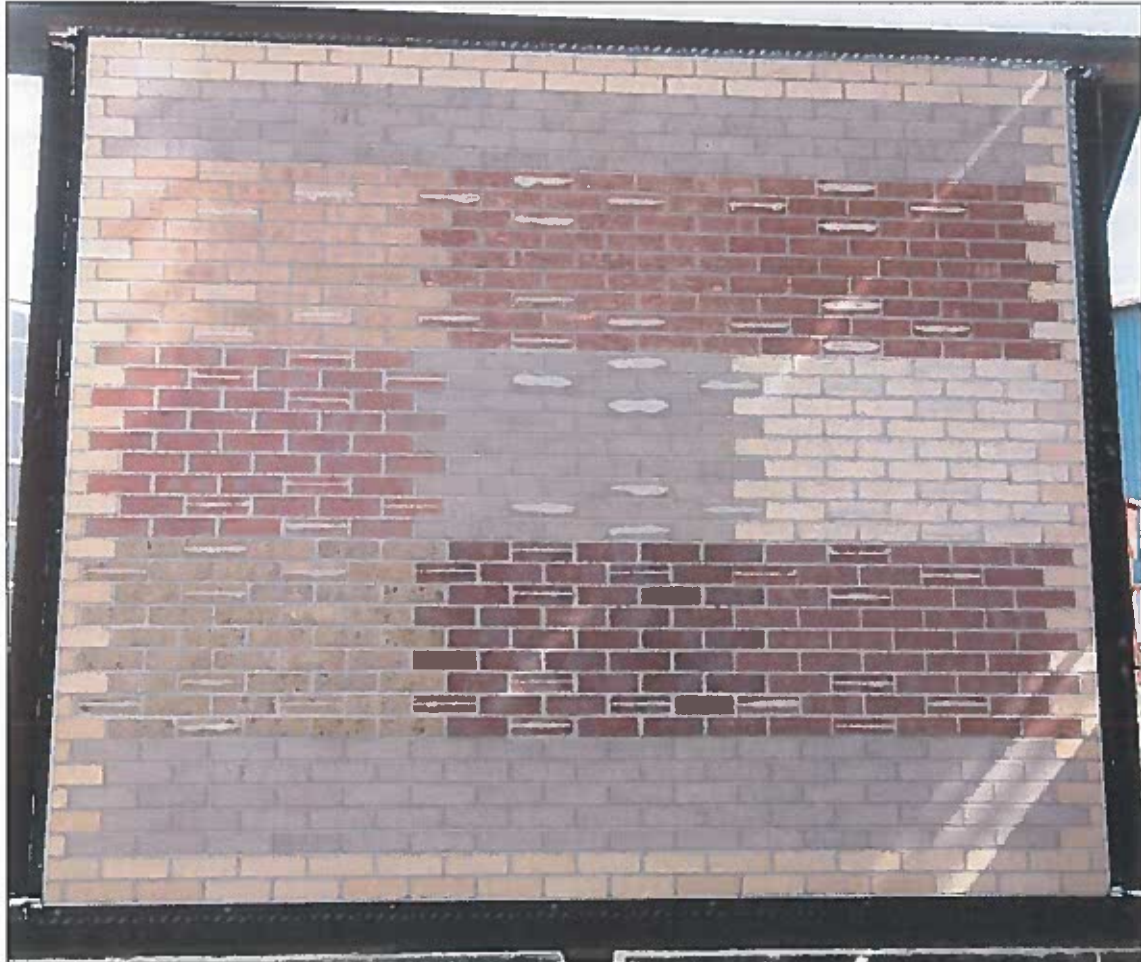
The test sample comprised 9 different brick slip types.

TABLE 2

Brick Types Selected for Independent Testing	
Brick Type No.	Brick Type
1	Wienerberger Sandalwood Yellow Multi
2	Michelmersh Charnwood Light Victorian Red
3	Ibstock Leicester Red Stock
4	Ibstock Chesterton Multi Red Smooth
5	Blockley Windermere Grey Solid
6	Wienerberger Olde Ivory Stock
7	Wienerberger Smeed Dean London Stock
8	Ibstock Aldridge Anglian Red Multi Rustic
9	Michelmersh Hadley Brindle Wirecut

PHOTO 45141

TEST SAMPLE ELEVATION



4 IMPACTORS

4.1 SOFT BODY

The soft body impactor shall comprise a canvas spherical/conical bag 400 mm in diameter filled with 3 mm diameter glass spheres with a total mass of approximately 50 kg suspended from a cord at least 3 m long.

PHOTO 4016

SOFT BODY IMPACTOR



4.2 HARD BODY

The hard body impactor was a solid steel ball of 50 mm or 62.5 mm diameter and approximate mass of 0.5 kg or 1.0 kg.

PHOTO 4047

HARD BODY IMPACTOR



5 PROCEDURES

5.1 SOFT BODY

The impactor almost touched the face of the sample when at rest. It was swung in a pendular movement to hit the sample normal to its face. The test was performed at the locations shown in Figure 1. The impact energies were 120 J for serviceability and 350 J and 500 J for safety.

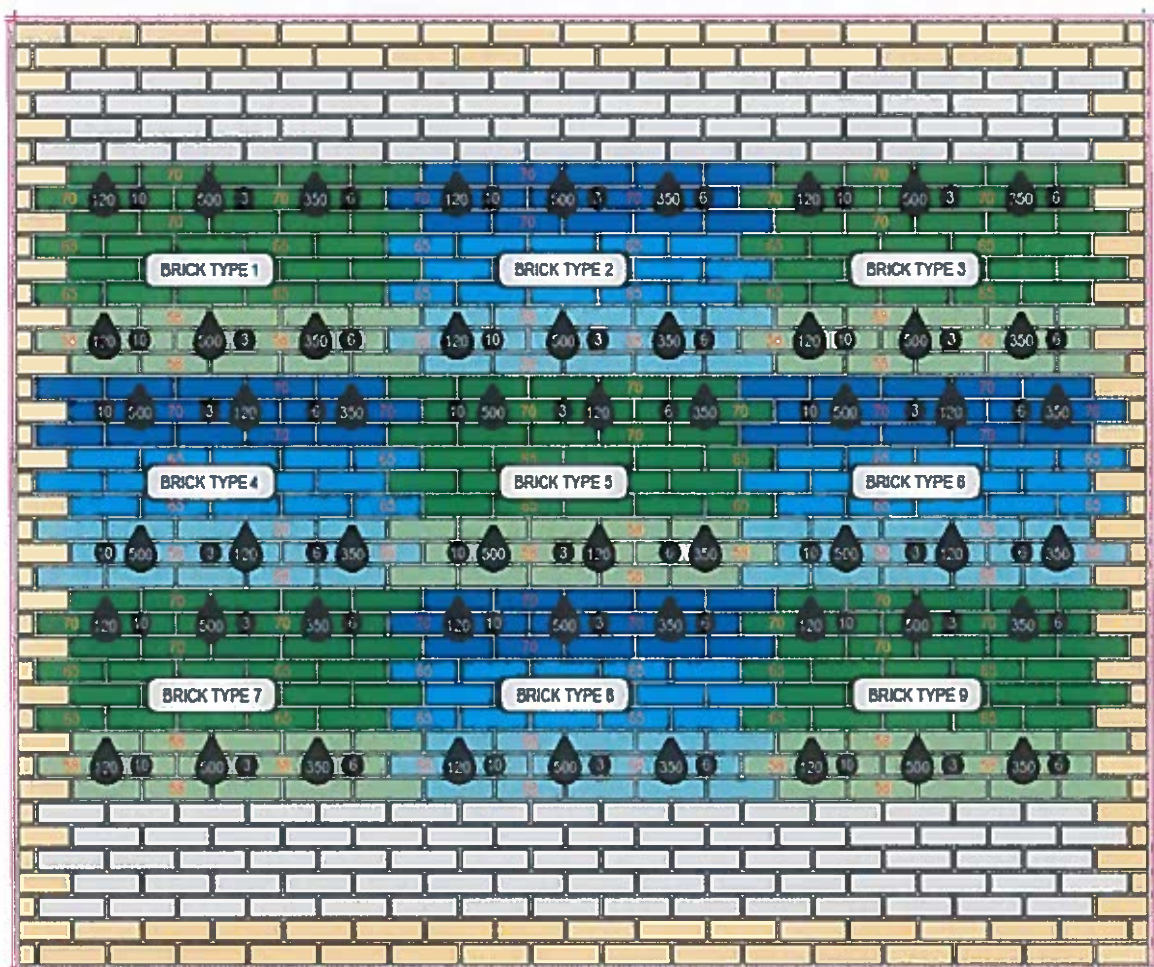
5.2 HARD BODY

The impactor almost touched the face of the sample when at rest. It was swung in a pendular movement to hit the sample normal to its face. The test was performed at the locations shown in Figure 1. The impact energies were 3 J, 6 J and 10 J for serviceability and 3 J and 10 J for safety.

FIGURE 1

IMPACT TEST LOCATIONS

External View



6 PASS/FAIL CRITERIA

Note: Tables 1 to 2 are taken from CWCT TN76.

Table 1 - Classes for serviceability performance

Class	Definition	Explanation/Examples
1	No damage.	No damage visible from 1m, and Any damage visible from closer than 1m unlikely to lead to significant deterioration.
2	Surface damage of an aesthetic nature which is unlikely to require remedial action.	Dents or distortion of panels not visible from more than 5m (note visibility of damage will depend on surface finish and lighting conditions – damage will generally be more visible on reflective surfaces), and Any damage visible from closer than 5m unlikely to lead to significant deterioration.
3	Damage that may require remedial action or replacement of components to maintain appearance or long term performance but does not require immediate action.	Dents or distortion of panels visible from more than 5m, or Spalling of edges of panels of brittle materials, or Damage to finishes that may lead to deterioration of the substrate.
4	Damage requiring immediate action to maintain appearance or performance. Remedial action may include replacement of a panel but does not require dismantling or replacement of supporting structure.	Significant cracks in brittle materials e.g. cracks that may lead to parts of tile falling away subsequent to test, or Fracture of panels causing significant amounts of material to fall away during test.
5	Damage requiring more extensive replacement than 4.	Buckling of support rails.

Table 2 - Classes for safety performance

Class	Explanation/examples
Negligible risk	No material dislodged during test, and No damage likely to lead to materials falling subsequent to test, and No sharp edges produced that would be likely to cause severe injury to a person during impact, and Cladding not penetrated by impactor.
Low risk	Maximum mass of falling particle 50g, and Maximum mass of particle that may fall subsequent to impact 50g, and No sharp edges produced that would be likely to cause severe injury during impact.
Moderate risk	Maximum mass of falling particle less than 500g, and Maximum mass of particle that may fall subsequent to impact less than 500g, and Cladding not penetrated by impact, and No sharp edges produced that would be likely to cause severe injury during impact.
High risk	Maximum mass of falling particle greater than 500g, or Cladding penetrated by impact, or Sharp edges produced that would be likely to cause severe injury during impact.

7 TEST RESULTS

Test Date

Date: 19 October 2022

Ambient temperature = 17°C

7.1 BRICK TYPE 1 IMPACT TEST RESULTS

TABLE 3

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper left	120 x 3	No visible damage	Class 1
Upper right	350	No visible damage	Negligible risk
Upper centre	500	No visible damage	Negligible risk
Lower left	120 x 3	No visible damage	Class 1
Lower right	350	No visible damage	Negligible risk
Lower centre	500	No visible damage	Negligible risk

TABLE 4

HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	3	No visible damage	Class 1/Negligible risk
Upper right	6	Small mark	Class 1
Upper left	10	Small mark	Class 1/Negligible risk
Lower centre	3	No visible damage	Class 1/Negligible risk
Lower right	6	Small mark	Class 1
Lower left	10	Small mark	Class 1/Negligible risk

PHOTO 4016

BRICK TYPE 1 AFTER IMPACT TESTS



PHOTO 4047

3 J HARD BODY IMPACT



PHOTO 4016

3 J HARD BODY IMPACT



PHOTO 4045

6 J HARD BODY IMPACT



PHOTO 4046

6 J HARD BODY IMPACT



PHOTO 4056

10 J HARD BODY IMPACT



PHOTO 4057

10 J HARD BODY IMPACT



7.2 BRICK TYPE 2 IMPACT TEST RESULTS

TABLE 5

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper left	120 x 3	No visible damage	Class 1
Upper right	350	No visible damage	Negligible risk
Upper centre	500	No visible damage	Negligible risk
Lower left	120 x 3	No visible damage	Class 1
Lower right	350	No visible damage	Negligible risk
Lower centre	500	No visible damage	Negligible risk

TABLE 6

HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	3	Small mark	Class 1/Negligible risk
Upper right	6	Small mark	Class 1
Upper left	10	Small mark	Class 1/Negligible risk
Lower centre	3	Small mark	Class 1/Negligible risk
Lower right	6	Small mark	Class 1
Lower left	10	Small mark	Class 1/Negligible risk

PHOTO 4057

BRICK TYPE 2 AFTER IMPACT TESTS



PHOTO 4036

3 J HARD BODY IMPACT



PHOTO 4037

3 J HARD BODY IMPACT



PHOTO 4034

6 J HARD BODY IMPACT



PHOTO 4035

6 J HARD BODY IMPACT



PHOTO 4058

10 J HARD BODY IMPACT



PHOTO 4059

10 J HARD BODY IMPACT



7.3 BRICK TYPE 3 IMPACT TEST RESULTS

TABLE 7

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper left	120 x 3	No visible damage	Class 1
Upper right	350	No visible damage	Negligible risk
Upper centre	500	No visible damage	Negligible risk
Lower left	120 x 3	No visible damage	Class 1
Lower right	350	No visible damage	Negligible risk
Lower centre	500	No visible damage	Negligible risk

TABLE 8

HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	3	Small mark	Class 1/Negligible risk
Upper right	6	Small mark	Class 1
Upper left	10	Small mark	Class 1/Negligible risk
Lower centre	3	Small mark	Class 1/Negligible risk
Lower right	6	Small mark	Class 1
Lower left	10	Small mark	Class 1/Negligible risk

PHOTO 5719

BRICK TYPE 3 AFTER IMPACT TESTS



PHOTO 4025

3 J HARD BODY IMPACT



PHOTO 4026

3 J HARD BODY IMPACT



PHOTO 4023

6 J HARD BODY IMPACT



HOTO 4024

6 J HARD BODY IMPACT

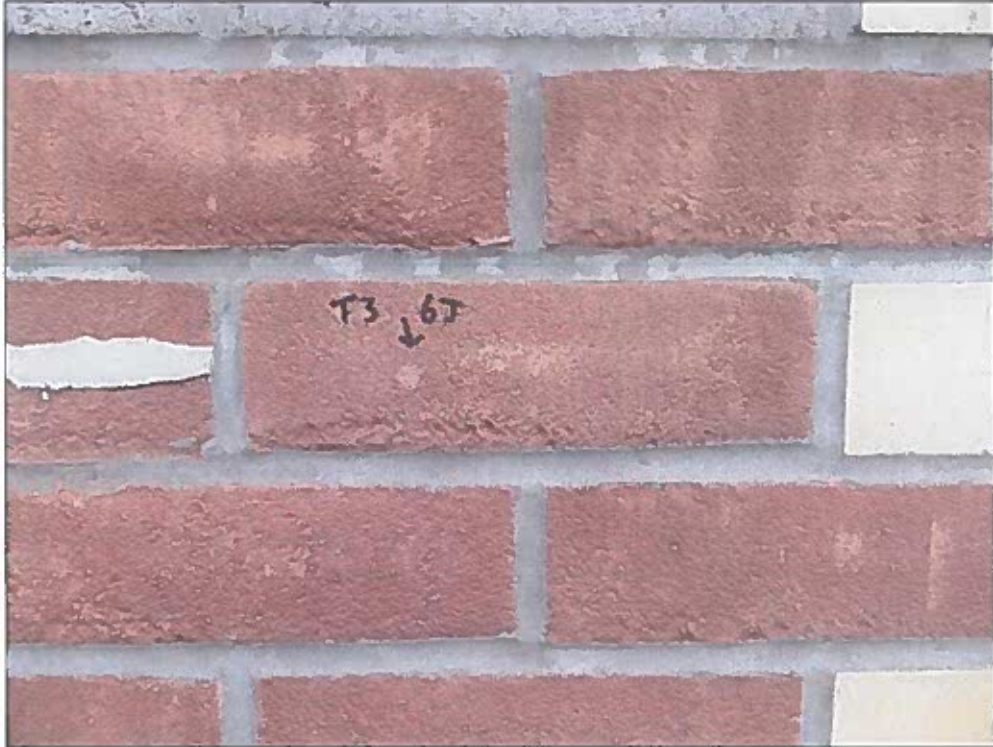


PHOTO 4066

10 J HARD BODY IMPACT



PHOTO 4067

10 J HARD BODY IMPACT



7.4 BRICK TYPE 4 IMPACT TEST RESULTS

TABLE 9

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	120 x 3	No visible damage	Class 1
Upper right	350	No visible damage	Negligible risk
Upper left	500	No visible damage	Negligible risk
Lower centre	120 x 3	No visible damage	Class 1
Lower right	350	No visible damage	Negligible risk
Lower left	500	No visible damage	Negligible risk

TABLE 10

HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	3	No visible damage	Class 1/Negligible risk
Upper right	6	No visible damage	Class 1
Upper left	10	Small mark	Class 1/Negligible risk
Lower centre	3	No visible damage	Class 1/Negligible risk
Lower right	6	No visible damage	Class 1
Lower left	10	Small mark	Class 1/Negligible risk

PHOTO 5716

BRICK TYPE 4 AFTER IMPACT TESTS



PHOTO 4048

3 J HARD BODY IMPACT



PHOTO 5722

3 J HARD BODY IMPACT



PHOTO 4044

6 J HARD BODY IMPACT



PHOTO 5726

6 J HARD BODY IMPACT



PHOTO 4054

10 J HARD BODY IMPACT

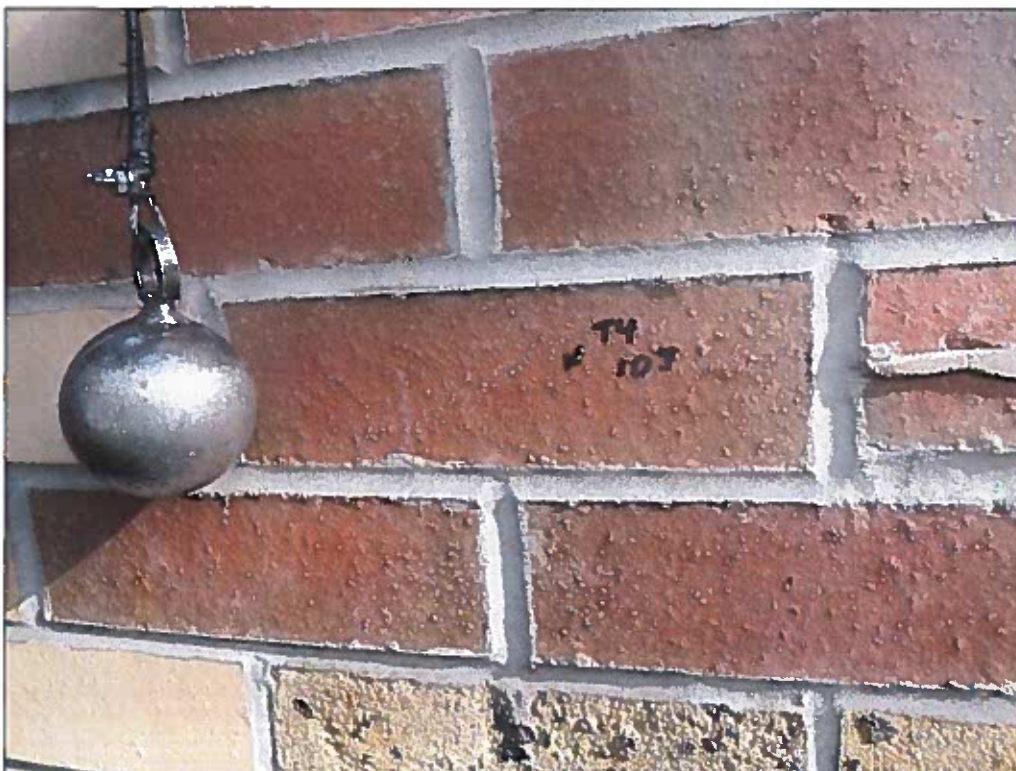


PHOTO 4055

10 J HARD BODY IMPACT



7.5 BRICK TYPE 5 IMPACT TEST RESULTS

TABLE 11

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	120 x 3	No visible damage	Class 1
Upper right	350	No visible damage	Negligible risk
Upper left	500	No visible damage	Negligible risk
Lower centre	120 x 3	No visible damage	Class 1
Lower right	350	No visible damage	Negligible risk
Lower left	500	No visible damage	Negligible risk

TABLE 12

HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	3	Small mark	Class 1/Negligible risk
Upper right	6	Small mark	Class 1
Upper left	10	Small chip	Class 1/Negligible risk
Lower centre	3	Small mark	Class 1/Negligible risk
Lower right	6	Small mark	Class 1
Lower left	10	Small mark	Class 1/Negligible risk

PHOTO 5715

BRICK TYPE 5 AFTER IMPACT TESTS



PHOTO 4038

3 J HARD BODY IMPACT



PHOTO 4039

3 J HARD BODY IMPACT



PHOTO 4032

6 J HARD BODY IMPACT

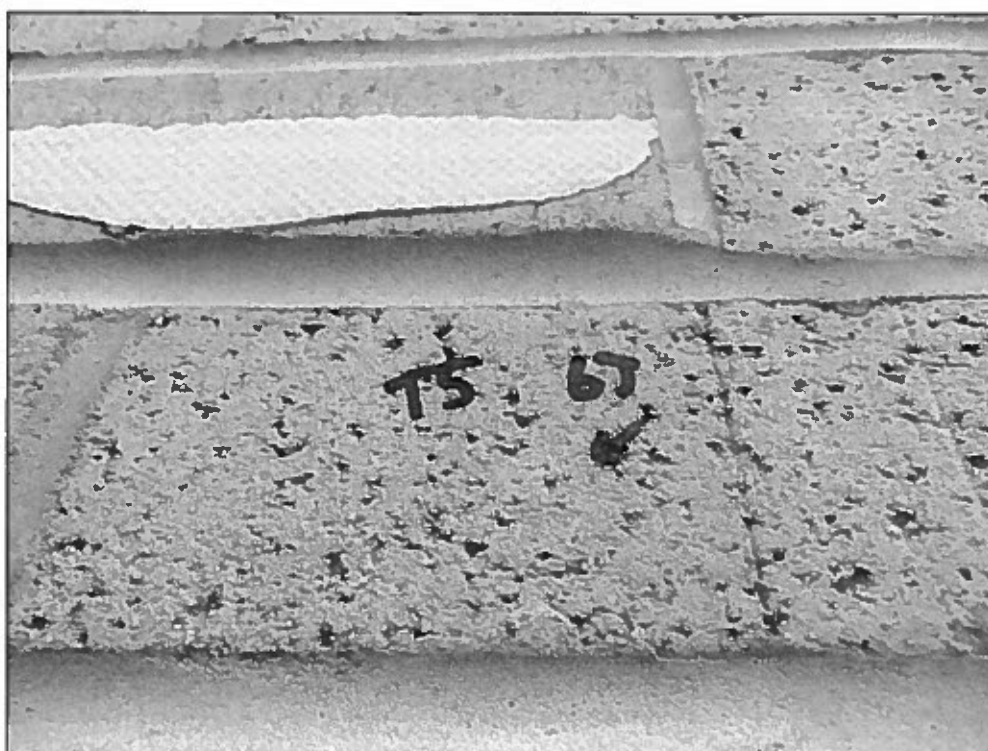


PHOTO 4033

6 J HARD BODY IMPACT



PHOTO 4060

10 J HARD BODY IMPACT



PHOTO 4061

10 J HARD BODY IMPACT



7.6 BRICK TYPE 6 IMPACT TEST RESULTS

TABLE 13

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	120 x 3	No visible damage	Class 1
Upper right	350	No visible damage	Negligible risk
Upper left	500	No visible damage	Negligible risk
Lower centre	120 x 3	No visible damage	Class 1
Lower right	350	No visible damage	Negligible risk
Lower left	500	No visible damage	Negligible risk

TABLE 14

HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	3	Small mark	Class 1/Negligible risk
Upper right	6	Small mark	Class 1
Upper left	10	Small mark	Class 1/Negligible risk
Lower centre	3	Small mark	Class 1/Negligible risk
Lower right	6	Small mark	Class 1
Lower left	10	Small mark	Class 1/Negligible risk

PHOTO 5714

BRICK TYPE 6 AFTER IMPACT TESTS



PHOTO 4027

3 J HARD BODY IMPACT



PHOTO 4028

3 J HARD BODY IMPACT



PHOTO 4021

6 J HARD BODY IMPACT



PHOTO 4022

6J HARD BODY IMPACT



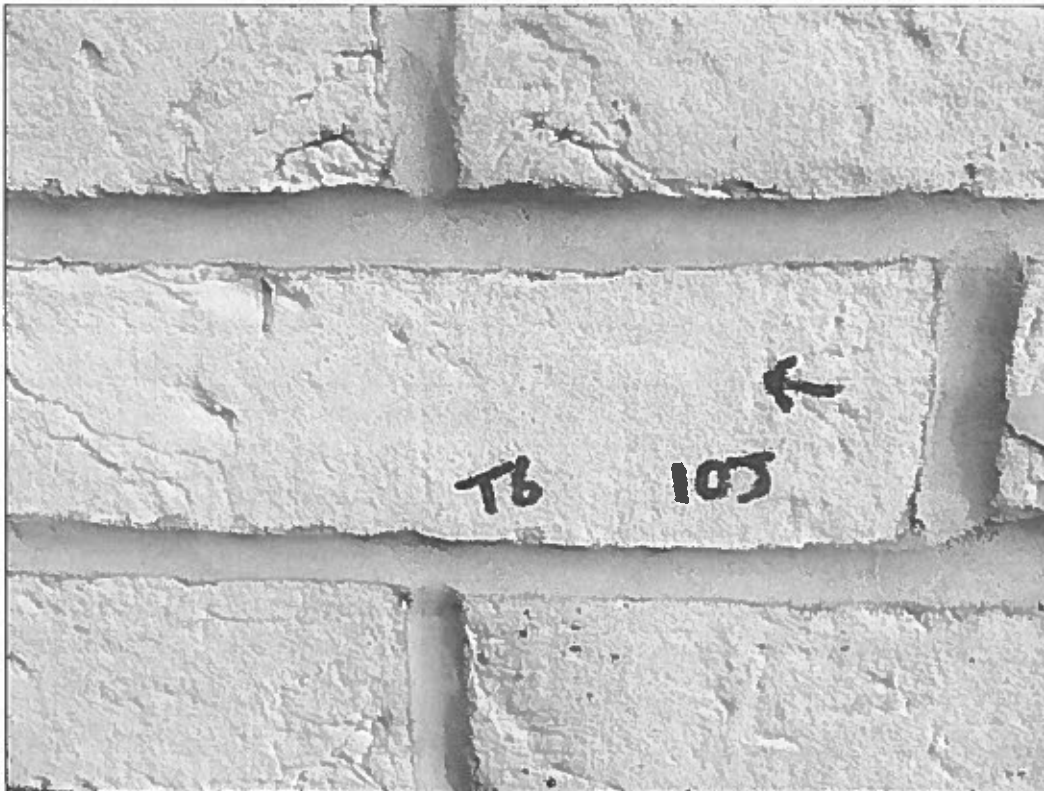
PHOTO 4068

10 J HARD BODY IMPACT



PHOTO 4070

10 J HARD BODY IMPACT



7.7 BRICK TYPE 7 IMPACT TEST RESULTS

TABLE 15

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper left	120 x 3	No visible damage	Class 1
Upper right	350	No visible damage	Negligible risk
Upper centre	500	No visible damage	Negligible risk
Lower left	120 x 3	No visible damage	Class 1
Lower right	350	No visible damage	Negligible risk
Lower centre	500	No visible damage	Negligible risk

TABLE 16

HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	3	Small mark	Class 1/Negligible risk
Upper right	6	Small mark	Class 1
Upper left	10	Small mark	Class 1/Negligible risk
Lower centre	3	Small mark	Class 1/Negligible risk
Lower right	6	Small mark	Class 1
Lower left	10	Small mark	Class 1/Negligible risk

PHOTO 5711

BRICK TYPE 7 AFTER IMPACT TESTS



PHOTO 4049

3 J HARD BODY IMPACT



PHOTO 4050

3 J HARD BODY IMPACT



PHOTO 4042

6 J HARD BODY IMPACT



PHOTO 4043

6 J HARD BODY IMPACT



PHOTO 4052

10 J HARD BODY IMPACT



PHOTO 4053

10 J HARD BODY IMPACT



7.8 BRICK TYPE 8 IMPACT TEST RESULTS

TABLE 17

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper left	120 x 3	No visible damage	Class 1
Upper right	350	No visible damage	Negligible risk
Upper centre	500	No visible damage	Negligible risk
Lower left	120 x 3	No visible damage	Class 1
Lower right	350	No visible damage	Negligible risk
Lower centre	500	No visible damage	Negligible risk

TABLE 18

HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	3	Small mark	Class 1/Negligible risk
Upper right	6	Small mark	Class 1
Upper left	10	No visible damage	Class 1/Negligible risk
Lower centre	3	Small mark	Class 1/Negligible risk
Lower right	6	Small mark	Class 1
Lower left	10	No visible damage	Class 1/Negligible risk

PHOTO 5712

BRICK TYPE 8 AFTER IMPACT TESTS

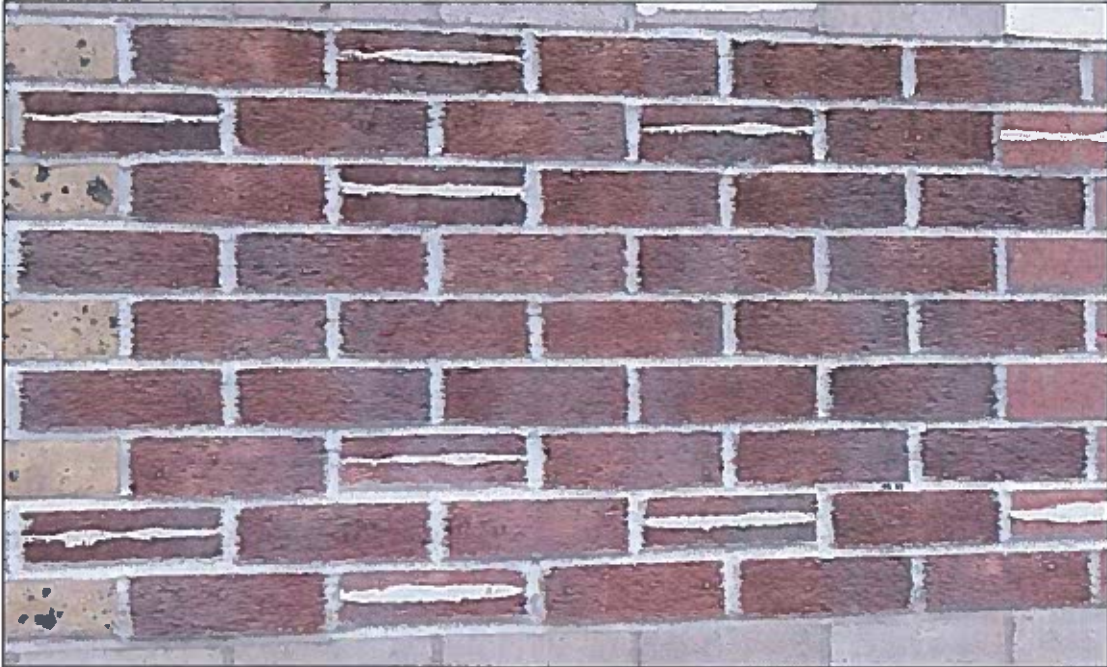


PHOTO 4040

3 J HARD BODY IMPACT



PHOTO 4041

3 J HARD BODY IMPACT



PHOTO 4030

6 J HARD BODY IMPACT



PHOTO 4031

6 J HARD BODY IMPACT



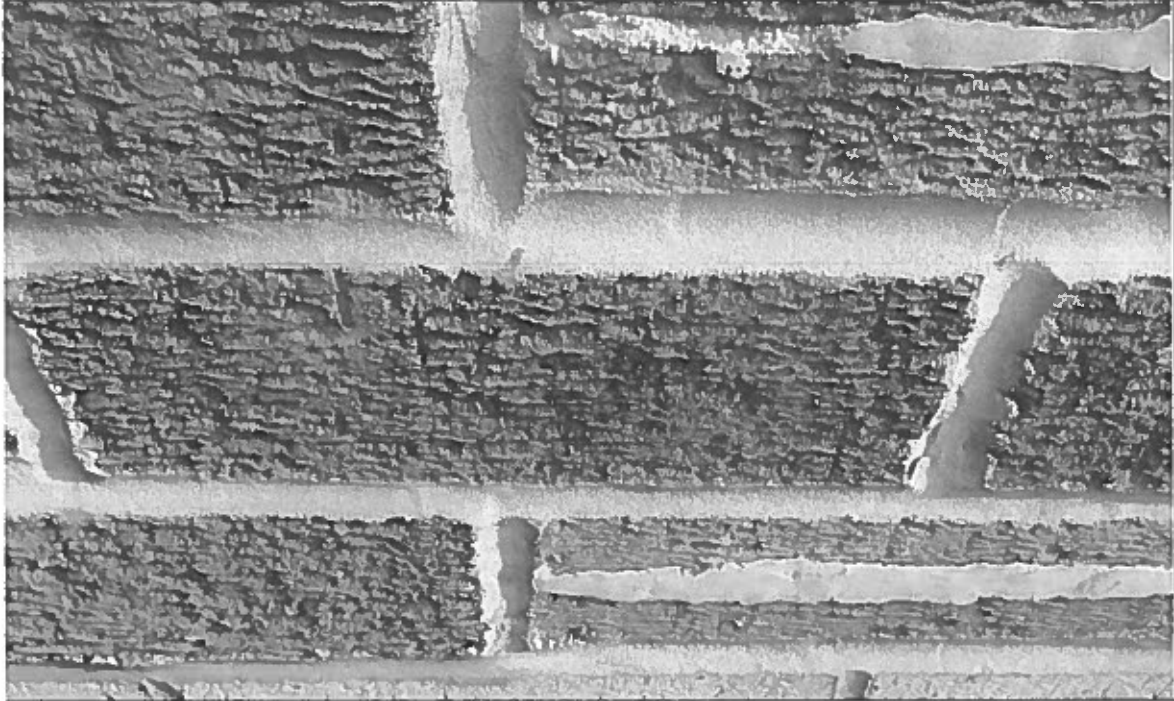
PHOTO 4063

10 J HARD BODY IMPACT



PHOTO 4064

10 J HARD BODY IMPACT



7.9 BRICK TYPE 9 IMPACT TEST RESULTS

TABLE 19

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper left	120 x 3	No visible damage	Class 1
Upper right	350	No visible damage	Negligible risk
Upper centre	500	No visible damage	Negligible risk
Lower left	120 x 3	No visible damage	Class 1
Lower right	350	No visible damage	Negligible risk
Lower centre	500	No visible damage	Negligible risk

TABLE 20

HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
Upper centre	3	Small mark	Class 1/Negligible risk
Upper right	6	Small mark	Class 1
Upper left	10	Small mark	Class 1/Negligible risk
Lower centre	3	Small mark	Class 1/Negligible risk
Lower right	6	Small mark	Class 1
Lower left	10	Small mark	Class 1/Negligible risk

PHOTO 5713

BRICK TYPE 9 AFTER IMPACT TESTS



PHOTO 4018

3 J HARD BODY IMPACT



PHOTO 4029

3 J HARD BODY IMPACT



PHOTO 4019

6 J HARD BODY IMPACT



PHOTO 4020

6 J HARD BODY IMPACT



PHOTO 4071

10 J HARD BODY IMPACT



PHOTO 4072

10 J HARD BODY IMPACT



7.10 CONTROLLED DISMANTLING

During the dismantling of the sample no discrepancies from the drawings were found.

PHOTO 6137

TEST SAMPLE DURING DISMANTLE



PHOTO 6145

TEST SAMPLE DURING DISMANTLE



PHOTO 6156

TEST SAMPLE DURING DISMANTLE



PHOTO 6157

TEST SAMPLE DURING DISMANTLE

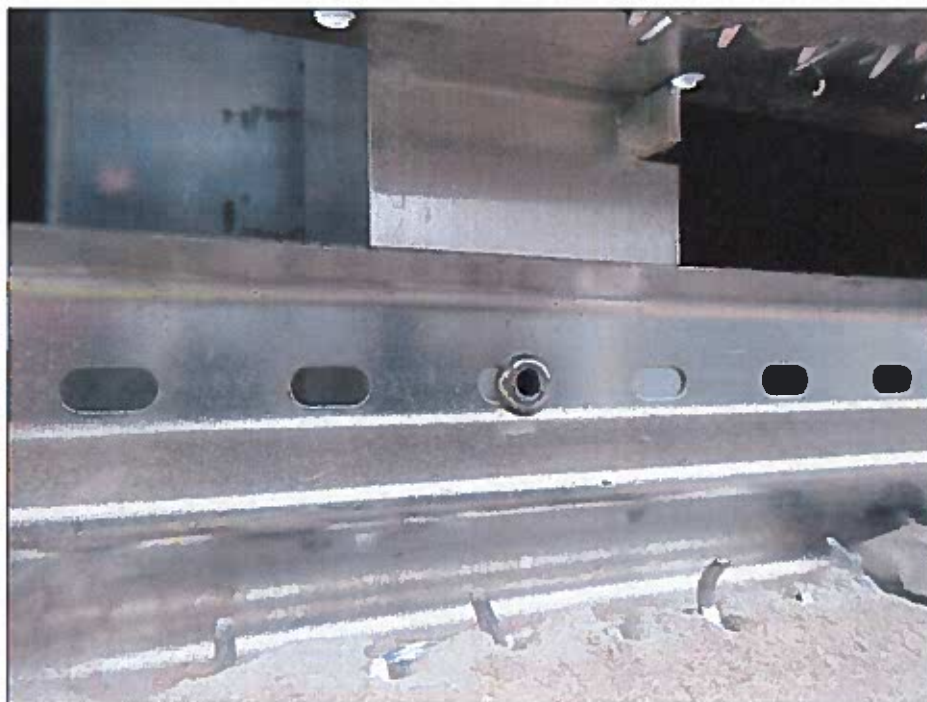


PHOTO 6158

TEST SAMPLE DURING DISMANTLE

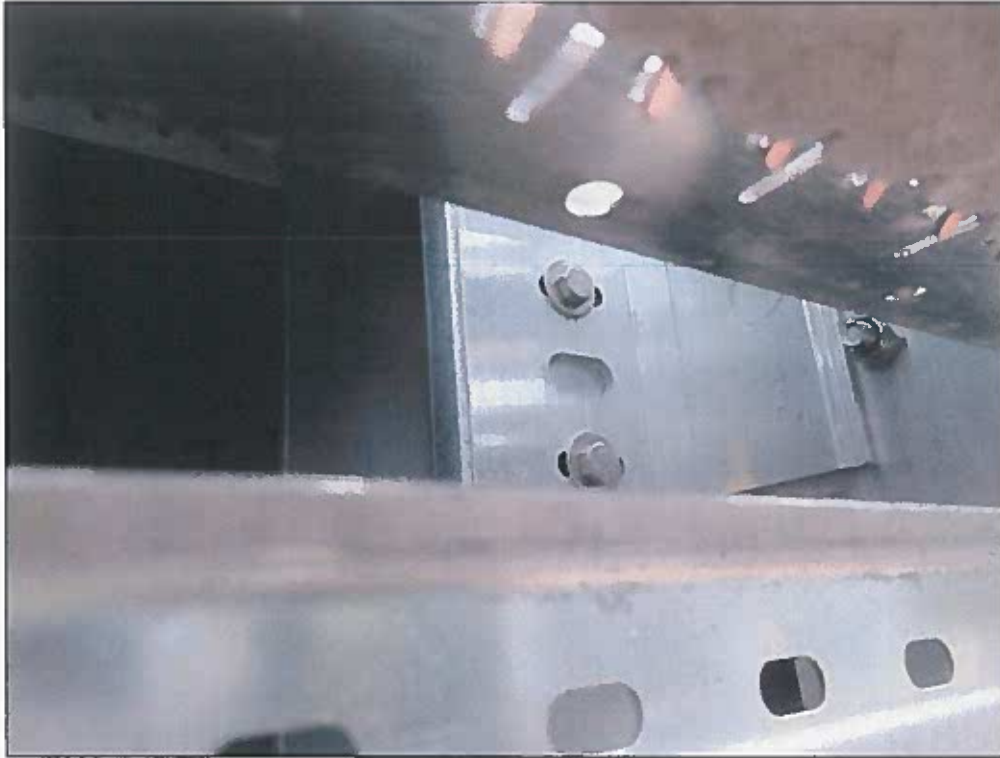


PHOTO 6159

TEST SAMPLE DURING DISMANTLE



PHOTO 6160

BRICK SLIPS REMOVED FROM TEST RIG



PHOTO 6181

SUPPORT FRAME REMOVED FROM TEST RIG



8 APPENDIX - DRAWINGS

The following 4 unnumbered pages are copies of James & Taylor Limited drawings numbered:

BSS-TRA-GA-001,

BSS-TRA-GA-002,

BSS-TRA-GA-003,

BSS-TRA-T4-Rev B.

END OF REPORT

3673

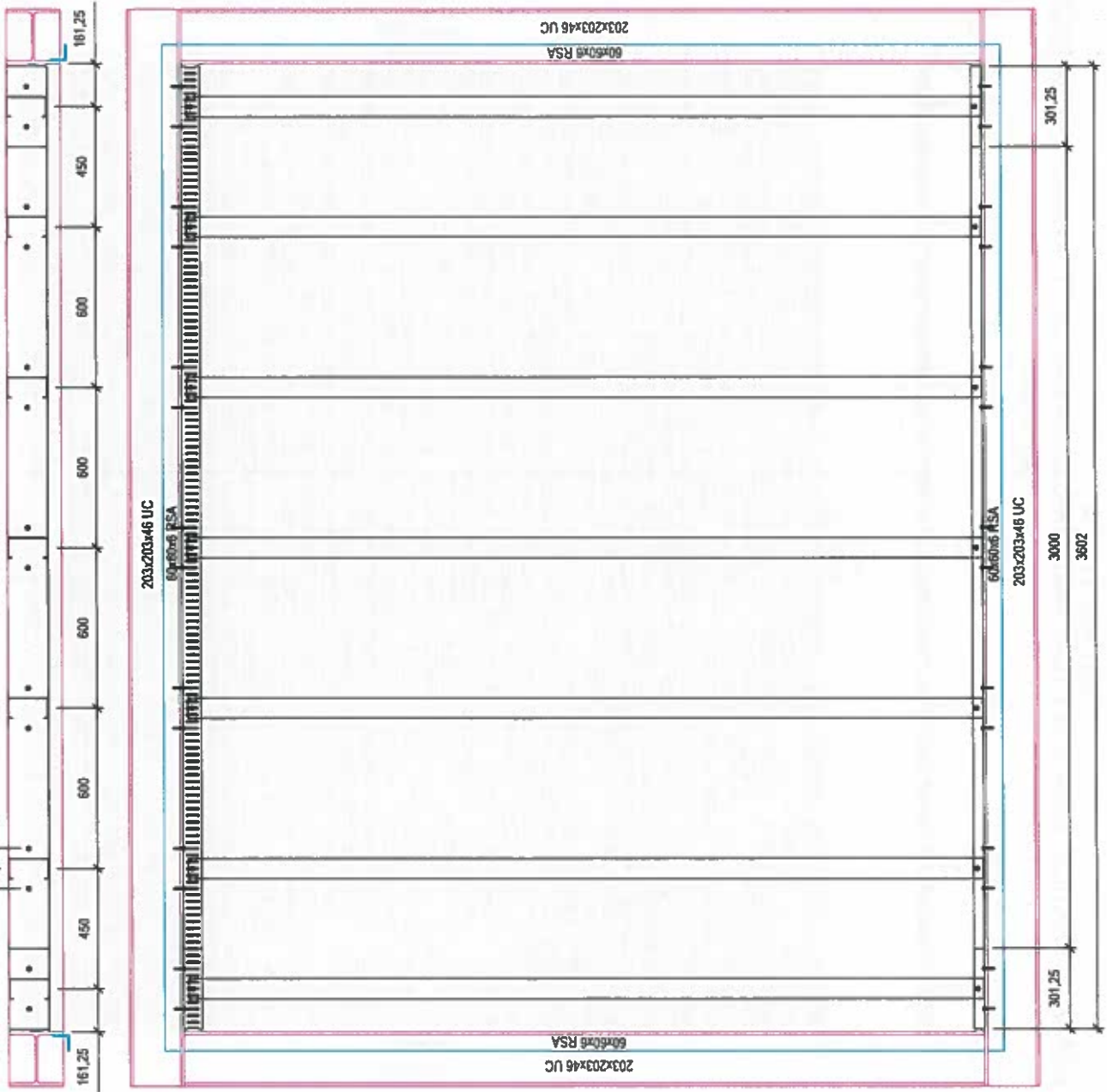


DO NOT SCALE FROM THIS DRAWING.

STEEL FRAMING REQUIREMENT
203x203x46 UC (AS DRAWN)
60x60x6 RSA (AS DRAWN)

REVISIONS	DATE
CLIENT	JAMES & TAYLOR LTD
PROJECT	BRICK SLIP SYSTEM
TITLE	TEST RIG TYPE A GENERAL ARRANGEMENT
DATE	03/12/2021
DRAWN BY:	JSC
CHECKED BY:	JSC
SCALE	1:16
PLOT SIZE	A3
DRAWING NUMBER:	BSS-TRA-GA-001
PLOT DATE:	December 5, 2021
	5:34 PM
	© James & Taylor Ltd 2020

TEST RIG TYPE A



SIXTY TWO, Bureau Bureau Park, Industrial Road
Chandler, Surrey KT9 2TY
T 020 2512 3666 F 020 836 3635 E info@acromag.com
www.acromag.com

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR,
ARCHITECTS AND ENGINEER'S DRAWINGS.

METSEC REQUIREMENT

VERTICAL STUDS

150M12.75 (THEORETICAL LENGTH 2987mm) = 7 No.

BASE TRACK

154M12-40 (THEORETICAL LENGTH 3602mm) = 1 No.

HEAD TRACK

154M18-70s (THEORETICAL LENGTH 3602mm) = 1 No.

REVISIONS:

DATE: _____

CURRENT:

JAMES & TAYLOR LTD

PROJECT:

BRICK SLIP SYSTEM

—

TEST RIG TYPE A

GENERAL ARRANGEMENT

DATE: _____

03/12/2021

DRAWN BY

125

CHECKED BY:

251

अभिलेख

135

32

91:1

DRAWING NUMBER:

BSS-TRA-GA-002

PLOT DATE:

January 18, 2022

6:18 PM

© James R. Taylor Ltd. 2009

TEST RIG TYPE A
'HELPING HAND' BRACKET, VERTICAL SUB-STRUCTURE AND BARRACUDA RAIL SETTING OUT/CONFIGURATION



Charles Taylor Surveyors Ltd
100-102, 104-106, 108-110, 112-114, 116-118, 120-122, 124-126, 128-130, 132-134, 136-138, 140-142, 144-146, 148-150, 152-154, 156-158, 160-162, 164-166, 168-170, 172-174, 176-178, 180-182, 184-186, 188-190, 192-194, 196-198, 200-202, 204-206, 208-210, 212-214, 216-218, 220-222, 224-226, 228-230, 232-234, 236-238, 240-242, 244-246, 248-250, 252-254, 256-258, 260-262, 264-266, 268-270, 272-274, 276-278, 280-282, 284-286, 288-290, 292-294, 296-298, 300-302, 304-306, 308-310, 312-314, 316-318, 320-322, 324-326, 328-330, 332-334, 336-338, 340-342, 344-346, 348-350, 352-354, 356-358, 360-362, 364-366, 368-370, 372-374, 376-378, 380-382, 384-386, 388-390, 392-394, 396-398, 400-402, 404-406, 408-410, 412-414, 416-418, 420-422, 424-426, 428-430, 432-434, 436-438, 440-442, 444-446, 448-450, 452-454, 456-458, 460-462, 464-466, 468-470, 472-474, 476-478, 480-482, 484-486, 488-490, 492-494, 496-498, 500-502, 504-506, 508-510, 512-514, 516-518, 520-522, 524-526, 528-530, 532-534, 536-538, 540-542, 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988-990, 992-994, 996-998, 1000-1002, 1004-1006, 1008-1010, 1012-1014, 1016-1018, 1020-1022, 1024-1026, 1028-1030, 1032-1034, 1036-1038, 1040-1042, 1044-1046, 1048-1050, 1052-1054, 1056-1058, 1060-1062, 1064-1066, 1068-1070, 1072-1074, 1076-1078, 1080-1082, 1084-1086, 1088-1090, 1092-1094, 1096-1098, 1100-1102, 1104-1106, 1108-1110, 1112-1114, 1116-1118, 1120-1122, 1124-1126, 1128-1130, 1132-1134, 1136-1138, 1140-1142, 1144-1146, 1148-1150, 1152-1154, 1156-1158, 1160-1162, 1164-1166, 1168-1170, 1172-1174, 1176-1178, 1180-1182, 1184-1186, 1188-1190, 1192-1194, 1196-1198, 1200-1202, 1204-1206, 1208-1210, 1212-1214, 1216-1218, 1220-1222, 1224-1226, 1228-1230, 1232-1234, 1236-1238, 1240-1242, 1244-1246, 1248-1250, 1252-1254, 1256-1258, 1260-1262, 1264-1266, 1268-1270, 1272-1274, 1276-1278, 1280-1282, 1284-1286, 1288-1290, 1292-1294, 1296-1298, 1300-1302, 1304-1306, 1308-1310, 1312-1314, 1316-1318, 1320-1322, 1324-1326, 1328-1330, 1332-1334, 1336-1338, 1340-1342, 1344-1346, 1348-1350, 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TEST RIG TYPE A - TEST 4 [MORTARED IMPACT]

3602.5



JAMES & TAYLOR
SOTTY LTD, Barnard Business Park, Lutterworth Road,
Chatterton, Surrey, KT9 2YF
T: 01753 828 828 F: 01753 828 828 E: info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR,
ARCHITECT'S AND ENGINEER'S DRAWINGS.

= BLOCKLEY WINDERWIRE GREY SOLID
215mm LONG 'STANDARD' SLIPS = 135 No.

= WIENERBERGER STAFFORDSHIRE
SMOOTH CREAM

215mm LONG 'STANDARD' SLIPS = 30 No.

165mm LONG 'STANDARD' SLIPS = 38 No.

52mm LONG 'STANDARD' SLIPS = 38 No.

215mm LONG SLIPS WITH 'TOP' REBATE = 15 No.

215mm LONG SLIPS WITH 'BOTTOM' REBATE = 15 No.

165mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

165mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

52mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

52mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

Rev B DRAWING REVISIONED JSC 11/11/2022
Rev A IMPACT LOCATIONS ADDED JSC 15/10/2022

REVISIONS:
CLIENT: JAMES & TAYLOR LTD
DATE:

PROJECT:
BRICK SLIP SYSTEM

TITLE:
TEST RIG TYPE A - TEST 4
MORTARED IMPACT

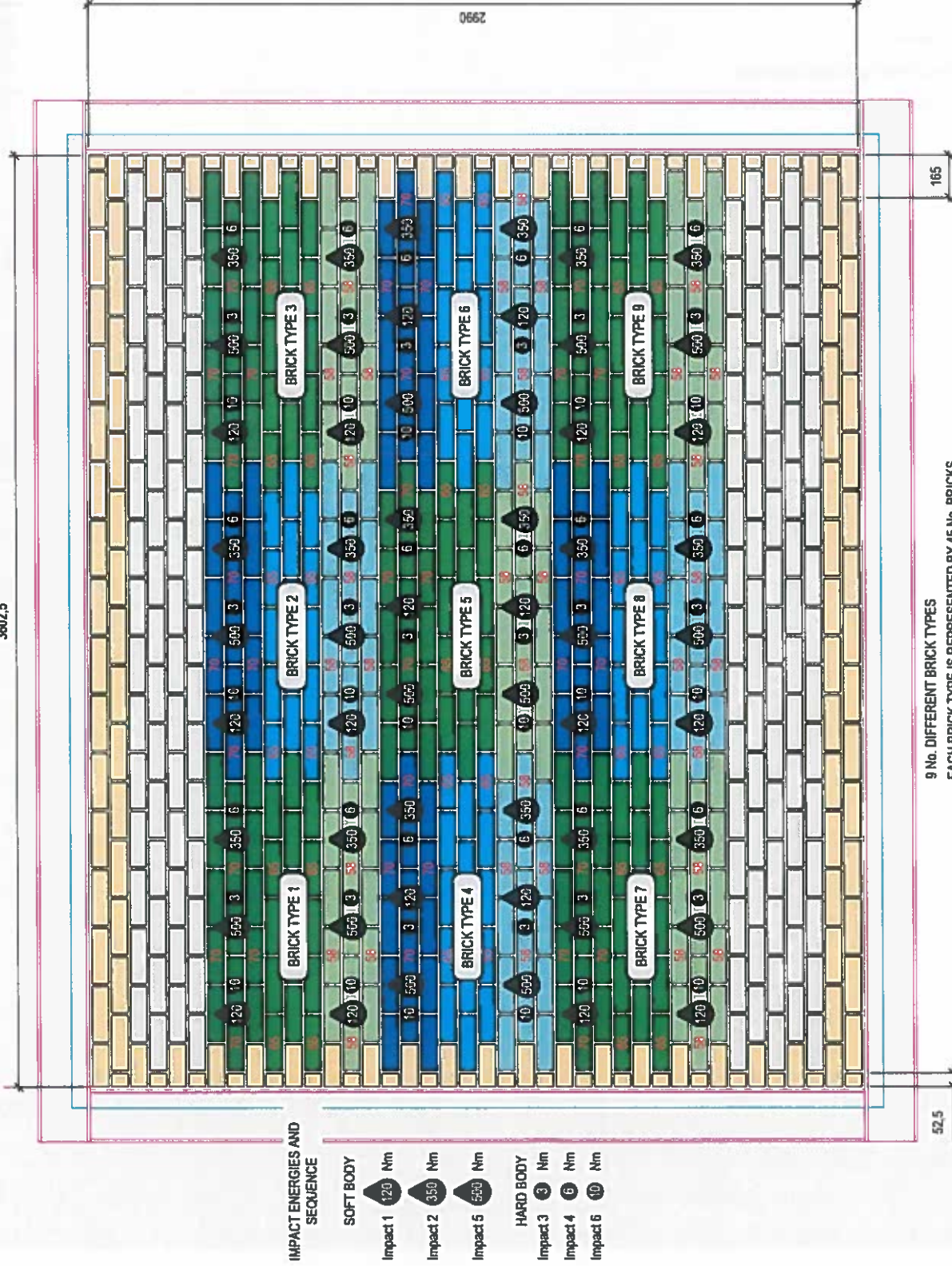
DATE:
04/12/2021

DRAWN BY:
JSC
CHECKED BY:
JSC

SCALE:
1:16
PLOT SIZE:
A3

DRAWING NUMBER:
BSS-TRA-T4
REVISION:
B

PLOT DATE:
November 11, 2022 12:20 PM © James & Taylor Ltd. 2009



9 No. DIFFERENT BRICK TYPES
EACH BRICK TYPE IS REPRESENTED BY 45 No. BRICKS
MEDIAN HEIGHT BRICKS = 15 No.
SMALL BRICKS = 4 No. 58mm HIGH AND 11 No. MEDIAN HEIGHT [26.66%]
LARGE BRICKS = 4 No. 70mm HIGH AND 11 No. MEDIAN HEIGHT [26.66%]

IMPACT ENERGIES AND SEQUENCE

SOFT BODY

Impact 1 120 Nm

Impact 2 350 Nm

Impact 5 550 Nm

HARD BODY

Impact 3 3 Nm

Impact 4 6 Nm

Impact 6 10 Nm



VINCI Technology Centre UK Limited
Stanbridge Road
Leighton Buzzard
Bedfordshire
LU7 4QH
UK

0333 5669000

info@technology-centre.co.uk

www.technology-centre.co.uk

Technical Report

Title: Heat Rain, Freeze Thaw, Cyclic Wind Loading and Impact Testing of Barracuda Brick Slip System.

Report No: N950-24-18683



Technical Report

Title: Heat Rain, Freeze Thaw, Cyclic Wind Load and Impact Testing of Barracuda Brick Slip System

Customer: James & Taylor Ltd,
Sixty-Two, Barwell Business Park,
Leatherhead Road, Chessington, Surrey KT9 2NY.

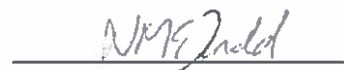
Issue date: 6 March 2024

VTC job no.: TR0220-3WK2

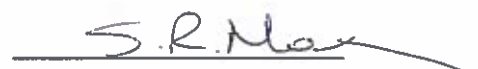
Author(s): J. Lakin – Engineer



Checked by: N. McDonald – Manager



Authorised by: S. R. Moxon – Operations Director



Distribution: 1 copy to James & Taylor
(confidential) 1 copy to project file

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VINCI Technology Centre UK Limited,
Stanbridge Road, Leighton Buzzard, Bedfordshire, LU7 4QH

Registered Office, Watford. Registered No. 05640885 England.

Tel. 0333 5669000

email info@technology-centre.co.uk

web www.technology-centre.co.uk

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1 INTRODUCTION

This certificate of test describes testing carried out at the request of James & Taylor Ltd. between November 2022 and July 2023 at VINCI Technology Centre, Leighton Buzzard.

Testing carried out was in accordance or general accordance with the following:

- *EAD 090062-00-0404 (M.1.2 Hygrothermal Cycles, Heat – Rain Cycles)
- *CEN/TS: 772-22:2006 (9.2 Freeze/Thaw Cycling)
- CWCT Standard for systemised building envelopes (Part 8, 8.14.6)
- CWCT TN75/76

Tests listed above and marked with an asterisk are not on our UKAS schedule.

Testing was undertaken by J. Lakin at the VINCI Technology Centre, Stanbridge Road, Leighton Buzzard, Bedfordshire, LU7 4QH, at the instruction of James & Taylor Ltd..

The test was witnessed by:

John Champion - James & Taylor Ltd.

This test report relates only to the actual sample as tested and described herein.

The results are valid only for sample(s) tested and the conditions under which the tests were conducted.

VINCI Technology Centre UK Limited is accredited to ISO/IEC 17025:2017 by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 0057 for a schedule of tests. Tests listed above and marked with an asterisk are not on our schedule.

VINCI Technology Centre UK Limited is Approved Body No. 1766.

VINCI Technology Centre UK Limited is certified by BSI for:

- ISO 9001 Quality Management System,
- ISO 14001 Environmental Management System,
- ISO 45001 Occupational Health and Safety Management System.

2 SUMMARY AND CLASSIFICATION OF TEST RESULTS

2.1 HEAT RAIN CYCLING

Hairline cracking <0.2 mm was observed running horizontally through the mortar beds at several locations, up to a maximum length of 1.5 m.

No blistering or peeling was observed to the brick slip sample during and after the completion of the testing.

No damage or degradation was observed to any of the brick slips or supporting elements during and after the completion of the testing.

2.2 FREEZE THAW CYCLING

Hairline cracking <0.2 mm was observed running horizontally through the mortar beds at several locations, up to a maximum length of 1.5 m.

No blistering or peeling was observed to the brick slip sample during and after the completion of the testing.

No damage or degradation was observed to any of the brick slips or supporting elements during and after the completion of the testing.

2.3 CYCLIC WIND LOADING

No blistering or peeling was observed to the brick slip sample during and after the completion of the testing.

No damage or degradation was observed to any of the brick slips or supporting elements during and after the completion of the testing.

2.4 IMPACT TESTING

2.4.1 Soft body impacts

120 J serviceability	350 J safety	500 J safety
Class 1	Negligible risk	Negligible risk

2.4.2 Hard body impacts

3 J serviceability / safety	6 J serviceability	10 J serviceability / safety
Class 1 / Negligible risk	Class 1	Class 1 / Negligible risk

2.4.3 Impact classes

Note: Tables 1 to 2 are taken from CWCT TN76.

Table 1 - Classes for serviceability performance

Class	Definition	Explanation/Examples
1	No damage.	No damage visible from 1m, and Any damage visible from closer than 1 m unlikely to lead to significant deterioration.
2	Surface damage of an aesthetic nature which is unlikely to require remedial action.	Dents or distortion of panels not visible from more than 5m (note visibility of damage will depend on surface finish and lighting conditions – damage will generally be more visible on reflective surfaces), and Any damage visible from closer than 5 m unlikely to lead to significant deterioration.
3	Damage that may require remedial action or replacement of components to maintain appearance or long term performance but does not require immediate action.	Dents or distortion of panels visible from more than 5 m, or Spalling of edges of panels of brittle materials, or Damage to finishes that may lead to deterioration of the substrate.
4	Damage requiring immediate action to maintain appearance or performance. Remedial action may include replacement of a panel but does not require dismantling or replacement of supporting structure.	Significant cracks in brittle materials e.g. cracks that may lead to parts of tile falling away subsequent to test, or Fracture of panels causing significant amounts of material to fall away during test.
5	Damage requiring more extensive replacement than 4.	Buckling of support rails.

Table 2 - Classes for safety performance

Class	Explanation/examples
Negligible risk	No material dislodged during test, and No damage likely to lead to materials falling subsequent to test, and No sharp edges produced that would be likely to cause severe injury to a person during impact, and Cladding not penetrated by impactor.
Low risk	Maximum mass of falling particle 50g, and Maximum mass of particle that may fall subsequent to impact 50g, and

	No sharp edges produced that would be likely to cause severe injury during impact.
Moderate risk	Maximum mass of falling particle less than 500g, and Maximum mass of particle that may fall subsequent to impact less than 500g, and Cladding not penetrated by impact, and No sharp edges produced that would be likely to cause severe injury during impact.
High risk	Maximum mass of falling particle greater than 500g, or Cladding penetrated by impact, or Sharp edges produced that would be likely to cause severe injury during impact.

3 DESCRIPTION OF TEST SAMPLE

The sample was mounted in a solid steel frame which was fixed to a rigid concrete wall as shown in the photograph below.

The sample was installed and mortar injected and left for 28 days prior to any testing commencing.

PHOTO 6119



TEST SAMPLE

PHOTO IMG_6608



SUPPORT BRACKET

PHOTO IMG_6609



SUPPORT BRACKETS / RAIL

PHOTO IMG_6606



CLOSE UP OF BRICK SLIPS

4 TEST EQUIPMENT

4.1 HEAT RAIN CYCLING

Temperature was measured using suitable type k thermocouples.

Relative humidity was measured using a hygrometer.

375 W heat lamps along with a 30 kWh convection based heater.

Spray bar with nozzles 400 mm apart, nozzles had a full cone pattern between 90 ° and 120 ° spread.

4.2 FREEZE THAW CYCLING

Temperature was measured using suitable type k thermocouples.

Relative humidity was measured using a hygrometer.

Large industrial freezer unit.

Spray bar with nozzles 400 mm apart, nozzles had a full cone pattern between 90 ° and 120 ° spread.

4.3 CYCLIC WIND LOADING

Pressure was measured using a suitable ranged pressure transducer and digital display.

Pressure was applied using suitable sized fans, along with diverter valve to allow for transition between positive and negative pressure.

4.4 IMPACT TESTING

The soft body impactor comprised a canvas spherical/conical bag 400 mm in diameter filled with 3 mm diameter glass spheres with a total mass of 50 kg suspended from a cord at least 3 m long.

The hard body impactor was solid steel ball of 50.0 mm or 62.5 mm diameter and mass of 0.5 kg or 1.0 kg.

5 INSTRUMENTATION

Below is Table 3 showing details of all the of direct measurement equipment and it's accuracy used during testing.

Table 3 – Details of Measurement Instrumentation Used.

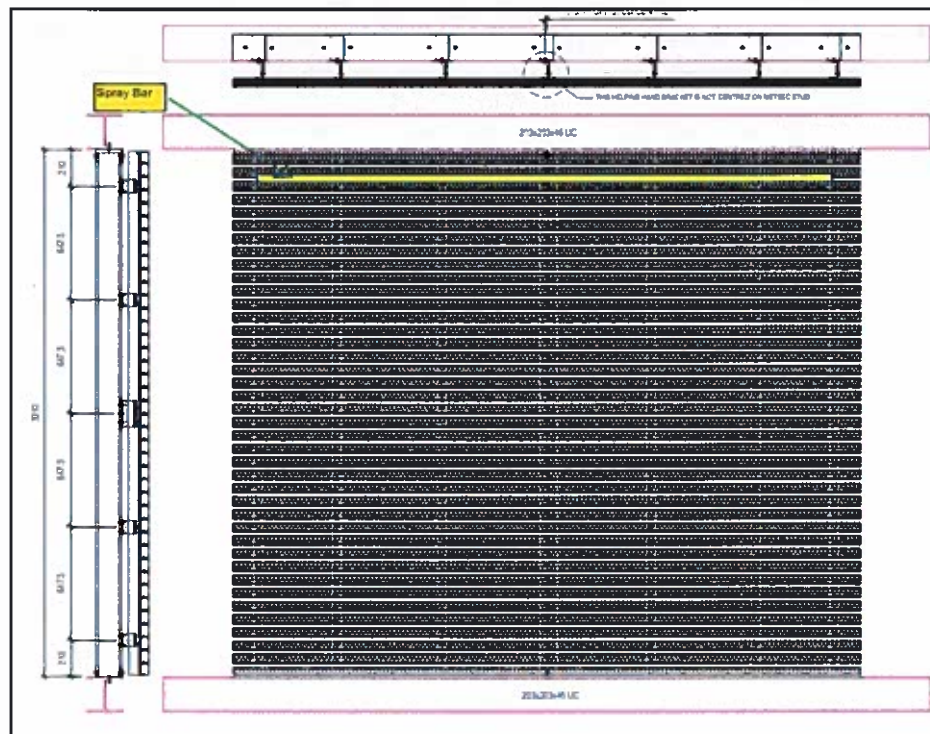
VINCI Technology Centre Ref.	Description	Accuracy
CLR755	Type K Thermocouples and Readout	2 °C
CLR510	Humidity Sensor	5 %
CLR740	8 m Tape Measure	2 mm
CLR467	± 4000 Pa Differential Pressure Transducer	2 %

6 TEST PROCEDURE

6.1 HEAT RAIN CYCLING

A controlled thermal environment enclosure was installed and sealed around the external face of the sample.

The water spray system was installed at the head of the sample, spraying uniformly and being allowed to run down the sample. See Drawing 1 for details of spray bar location.



Drawing 1 – Spray Bar Location.

The sample was subject to 100 cycles (six hours each cycle), comprising of the following phases:

1. Heated to 70 °C, over three hours rising and maintained at 70 ± 5 °C at 10 % to 30 % RH.
2. Sprayed at 1.0 l/m² min, water temperature 15 ± 5 °C for one hour.
3. Left for 2 hours to drain.

After a period of every four cycles the sample was inspected and any change in characteristics or performance (blistering, detachment, crazing, loss of adhesion, formation of cracks) was recorded.

Total Single Cycle Time = 6 Hours

6.2 FREEZE THAW CYCLING

A controlled thermal environment enclosure was installed and sealed around the external face of the sample.

The water spray system was installed at the head of the sample, spraying uniformly and being allowed to run down the sample. See Drawing 1 for details of spray bar location.

Samples was subject to 100 cycles (150 minutes each cycle), comprising of the following phases:

Temperature measurements were be based upon an air temperature measurement, taken from $30 \text{ mm} \pm 10 \text{ mm}$ away from the centre of the exposed face.

The first freezing period lasted for $6 \text{ h} \pm 5 \text{ min}$.

1. Temperature fell from $20 \pm 3^\circ\text{C}$ to $-15 \pm 3^\circ\text{C}$ in more than 20 but less than 30 minutes. The temperature was then be held at $-15 \pm 3^\circ$ for more than 90 but less than 100 minutes.
2. Temperature the rose from $-15 \pm 3^\circ\text{C}$ to $20 \pm 3^\circ\text{C}$ in more than 15 but no less than 20 minutes. The total warm air period including the period of temperature rise was 20 minutes 1 ± 1 minutes.
3. Sprayed at $6 \pm 0.5 \text{ l/min}$ per metre width of sample for $120 \pm 10 \text{ s}$.

At the end of the 100th cycle the panel was allowed to thaw completely and any visible damage to the exposed face of the were panel recorded.

Total Single Cycle Time = 150 Minuets

6.3 CYCLIC WIND LOADING

The following cyclic load tests were carried out on the sample.

No of cycles	Applied pressure (pascals)
1	$0.9 \times W_p = \pm 2160$
960	$0.4 \times W_p = \pm 960$
60	$0.6 \times W_p = \pm 1440$
240	$0.5 \times W_p = \pm 1200$
5	$0.8 \times W_p = \pm 1920$
14	$0.7 \times W_p = \pm 1680$

Where W_p = design wind load

The sequence above was repeated for a total of six times and then a single pulse of W_p (± 2400 pascals) was applied.

The frequency of oscillation was seven seconds between loading, with loading applied in a sinusoidal manner.

6.4 IMPACT TESTING

6.4.1 Soft body

The impactor almost touched the face of the sample when at rest. It was swung in a pendular movement to hit the sample normal to its face. The test was performed at the locations shown in Figure 1.

The impact energies were 120 J for serviceability and 350 J or 500 J for safety.

6.4.2 Hard body

The impactor almost touched the face of the sample when at rest. It was swung in a pendular movement to hit the sample normal to its face. The test was performed at the locations shown in Figure 1.

The impact energies were 3 J, 6 J and 10 J.

7 TEST RESULTS

7.1 HEAT RAIN CYCLING

Test Date: 23/11/22 and 29/02/23.

Hairline cracking <0.2 mm was observed running horizontally through the mortar beds at several locations, up to a maximum length of 1.5 m.

No blistering or peeling was observed to the brick slip sample during and after the completion of the testing.

No damage or degradation was observed to any of the brick slips or supporting elements during and after the completion of the testing.

PHOTO 20221123_132854



TEST SETUP AND WATER SPRAYING OCCURING

7.2 FREEZE THAW CYCLING

Test Date: March 2023 to May 2023

Hairline cracking <0.2 mm was observed running horizontally through the mortar beds at several locations, up to a maximum length of 1.5 m.

No blistering or peeling was observed to the brick slip sample during and after the completion of the testing.

No damage or degradation was observed to any of the brick slips or supporting elements during and after the completion of the testing.

PHOTO IMG_56422



ICE BUILD UP ON FACE OF BRICKS SLIPS BEFORE THAWING

7.3 CYCLIC WIND LOADING

Test Date: 8th May 2023 to 12th May 2023

No blistering or peeling was observed to the brick slip sample during and after the completion of the testing.

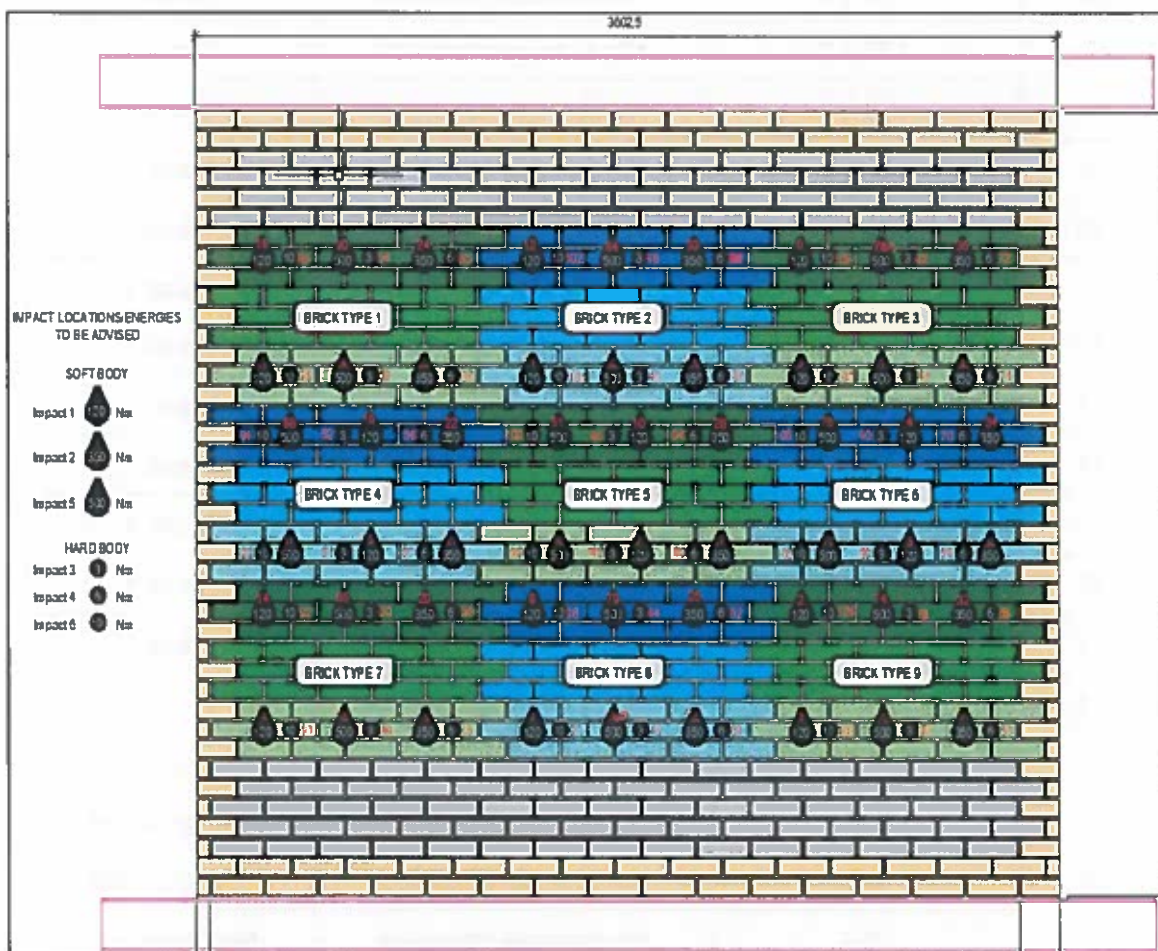
No damage or degradation was observed to any of the brick slips or supporting elements during and after the completion of the testing.

7.4 IMPACT TESTING

Test Date: 25th July 2023

Ambient temperature = 18 °C

FIGURE 1



SOFT BODY IMPACT LOCATIONS

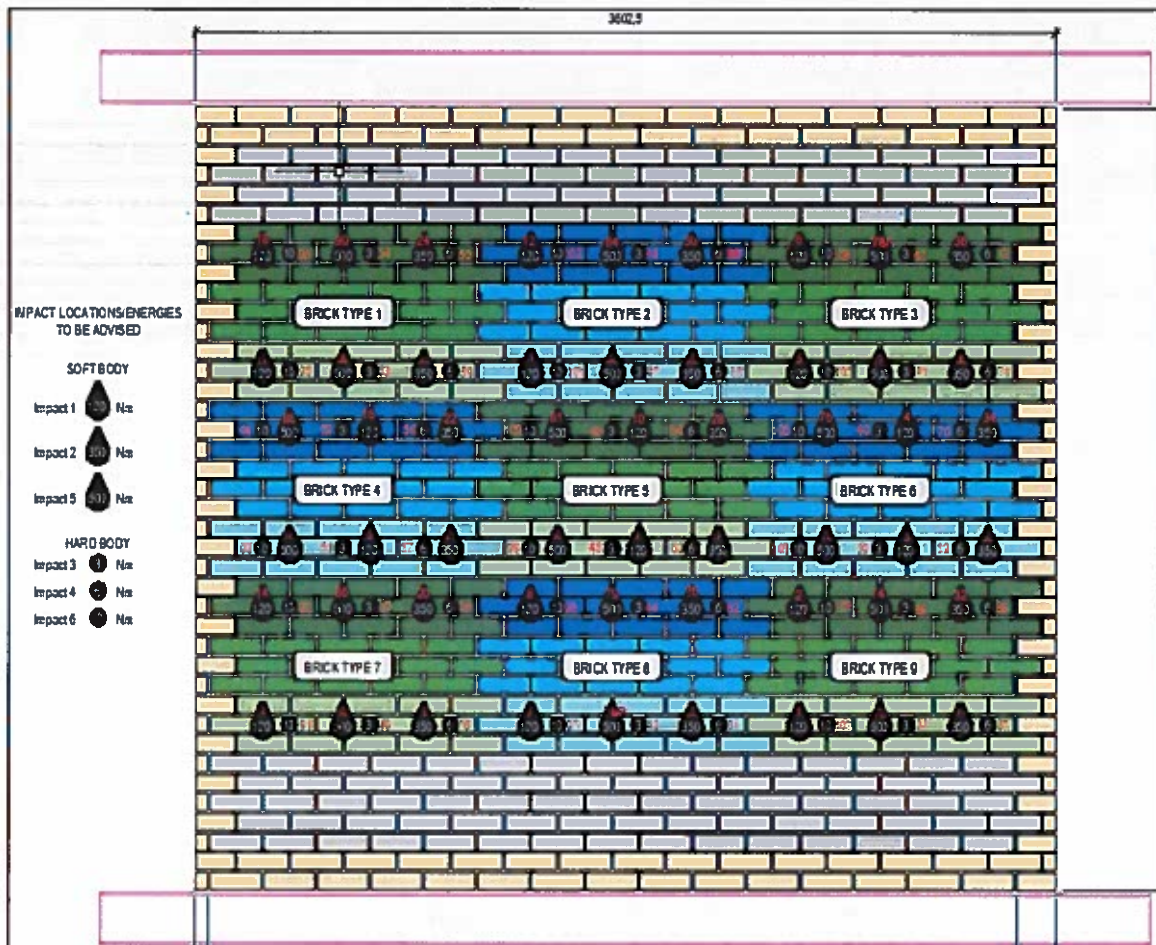
TABLE 3

SOFT BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
1	120 x 3	No damage observed	Class 1
2	120 x 3	No damage observed	Class 1
3	120 x 3	No damage observed	Class 1
4	120 x 3	No damage observed	Class 1
5	120 x 3	No damage observed	Class 1
6	120 x 3	No damage observed	Class 1
7	120 x 3	No damage observed	Class 1
8	120 x 3	No damage observed	Class 1
9	120 x 3	No damage observed	Class 1
10	120 x 3	No damage observed	Class 1
11	120 x 3	No damage observed	Class 1
12	120 x 3	No damage observed	Class 1
13	120 x 3	No damage observed	Class 1
14	120 x 3	No damage observed	Class 1
15	120 x 3	No damage observed	Class 1
16	120 x 3	No damage observed	Class 1
17	120 x 3	No damage observed	Class 1
18	120 x 3	No damage observed	Class 1
19	350	No damage observed	Negligible risk
20	350	No damage observed	Negligible risk
21	350	No damage observed	Negligible risk
22	350	No damage observed	Negligible risk
23	350	No damage observed	Negligible risk
24	350	No damage observed	Negligible risk
25	350	No damage observed	Negligible risk
26	350	No damage observed	Negligible risk
27	350	No damage observed	Negligible risk

28	350	No damage observed	Negligible risk
29	350	No damage observed	Negligible risk
30	350	No damage observed	Negligible risk
31	350	No damage observed	Negligible risk
32	350	No damage observed	Negligible risk
33	350	No damage observed	Negligible risk
34	350	No damage observed	Negligible risk
35	350	No damage observed	Negligible risk
36	350	No damage observed	Negligible risk
73	500	No damage observed	Negligible risk
74	500	No damage observed	Negligible risk
75	500	No damage observed	Negligible risk
76	500	No damage observed	Negligible risk
77	500	No damage observed	Negligible risk
78A	500	No damage observed	Negligible risk
78B	500	No damage observed	Negligible risk
79	500	No damage observed	Negligible risk
80	500	No damage observed	Negligible risk
81	500	No damage observed	Negligible risk
82	500	No damage observed	Negligible risk
83	500	No damage observed	Negligible risk
84	500	No damage observed	Negligible risk
85	500	No damage observed	Negligible risk
86	500	No damage observed	Negligible risk
87	500	No damage observed	Negligible risk
88	500	No damage observed	Negligible risk
89	500	No damage observed	Negligible risk
90	500	No damage observed	Negligible risk

FIGURE 2



HARD BODY IMPACT LOCATIONS

TABLE 4

23HARD BODY IMPACT TEST RESULTS

Location	Impact energy (J)	Observations	Classification
37	3	Small mark	Class 1 Negligible risk
38	3	Small mark	Class 1 Negligible risk
39	3	Small mark	Class 1 Negligible risk
40	3	Small mark	Class 1 Negligible risk
41	3	Small mark	Class 1

			Negligible risk
42	3	Small mark	Class 1 Negligible risk
43	3	Small mark	Class 1 Negligible risk
44	3	Small mark	Class 1 Negligible risk
45	3	Small mark	Class 1 Negligible risk
46	3	Small mark	Class 1 Negligible risk
47	3	Small mark	Class 1 Negligible risk
48	3	Small mark	Class 1 Negligible risk
49	3	Small mark	Class 1 Negligible risk
50	3	Small mark	Class 1 Negligible risk
51	3	Small mark	Class 1 Negligible risk
52	3	Small mark	Class 1 Negligible risk
53	3	Small mark	Class 1 Negligible risk
54	3	Small mark	Class 1 Negligible risk
55	6	Small mark	Class 1
56	6	Small mark	Class 1
57	6	Small mark	Class 1
58	6	Small mark	Class 1
59	6	Small mark	Class 1
60	6	Small mark	Class 1
61	6	Small mark	Class 1

62	6	Small mark	Class 1
63	6	Small mark	Class 1
64	6	Small mark	Class 1
65	6	Small mark	Class 1
66	6	Small mark	Class 1
67	6	Small mark	Class 1
68	6	Small mark	Class 1
69	6	Small mark	Class 1
70	6	Small mark	Class 1
71	6	Small mark	Class 1
72	6	Small mark	Class 1
91	10	Small mark	Class 1 Negligible risk
92	10	Small mark	Class 1 Negligible risk
93	10	Small mark	Class 1 Negligible risk
94	10	Small mark	Class 1 Negligible risk
95	10	Small mark	Class 1 Negligible risk
96	10	Small mark	Class 1 Negligible risk
97	10	Small mark	Class 1 Negligible risk
98	10	Small mark	Class 1 Negligible risk
99	10	Small mark	Class 1 Negligible risk
100	10	Small mark	Class 1 Negligible risk
101	10	Small mark	Class 1 Negligible risk

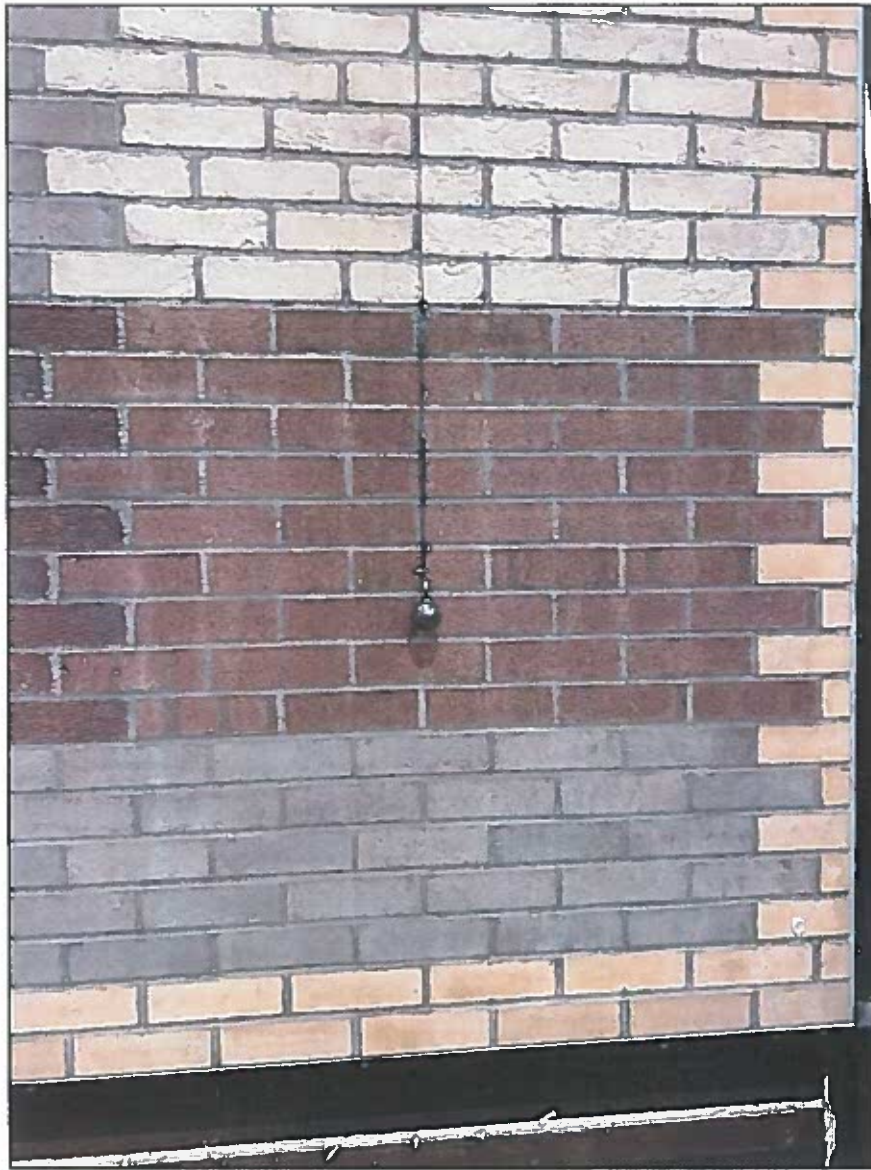
102	10	Small mark	Class 1 Negligible risk
103	10	Small mark	Class 1 Negligible risk
104	10	Small mark	Class 1 Negligible risk
105	10	Small mark	Class 1 Negligible risk
106	10	Small mark	Class 1 Negligible risk
107	10	Small mark	Class 1 Negligible risk
108	10	Small mark	Class 1 Negligible risk

PHOTO IMG_6120



SOFT BODY IMPACTOR

PHOTO IMG_6155



HARD BODY IMPACTOR

PHOTO IMG_6156



IMPACT LOCATION 37

PHOTO IMG_6157



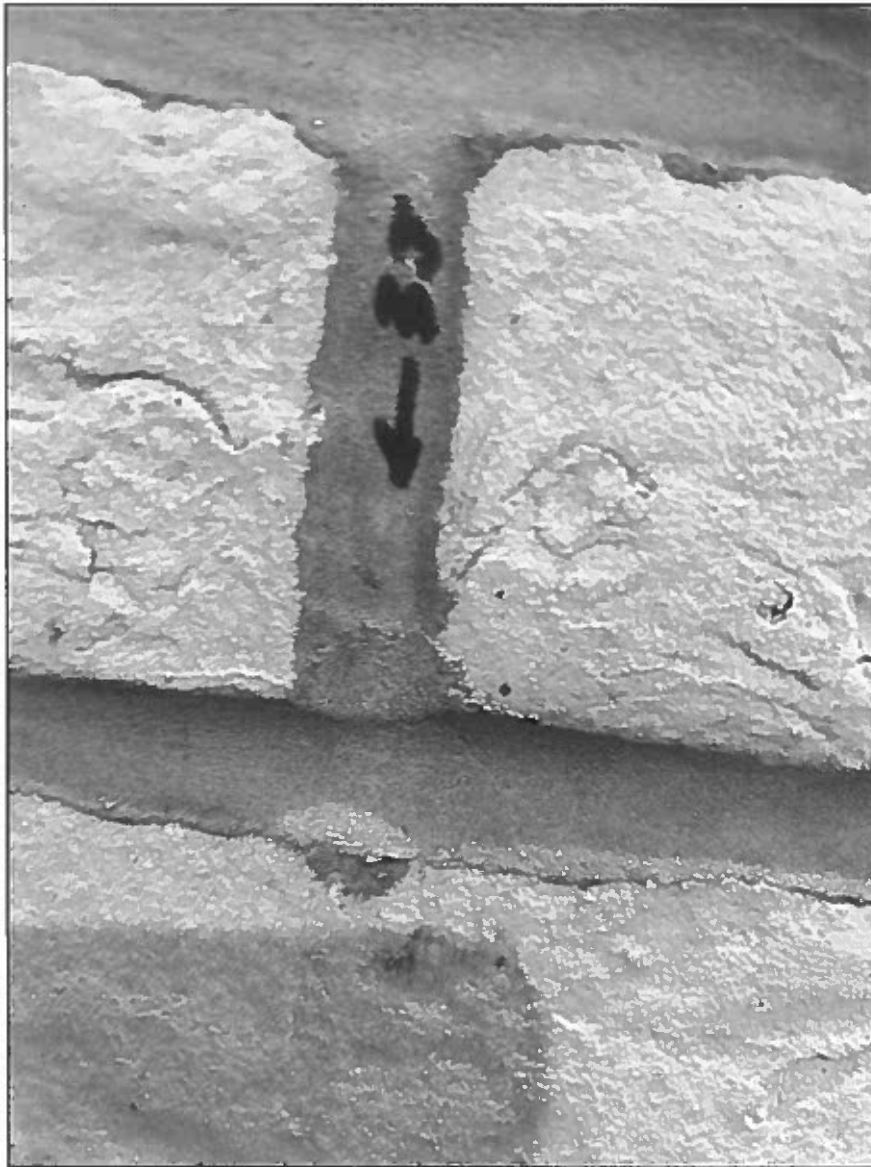
IMPACT LOCATION 38

PHOTO IMG_6158



IMPACT LOCATION 39

PHOTO IMG_6159



IMPACT LOCATION 40

PHOTO IMG_6160



IMPACT LOCATION 41

PHOTO IMG_6161



IMPACT LOCATION 42

PHOTO IMG_6162



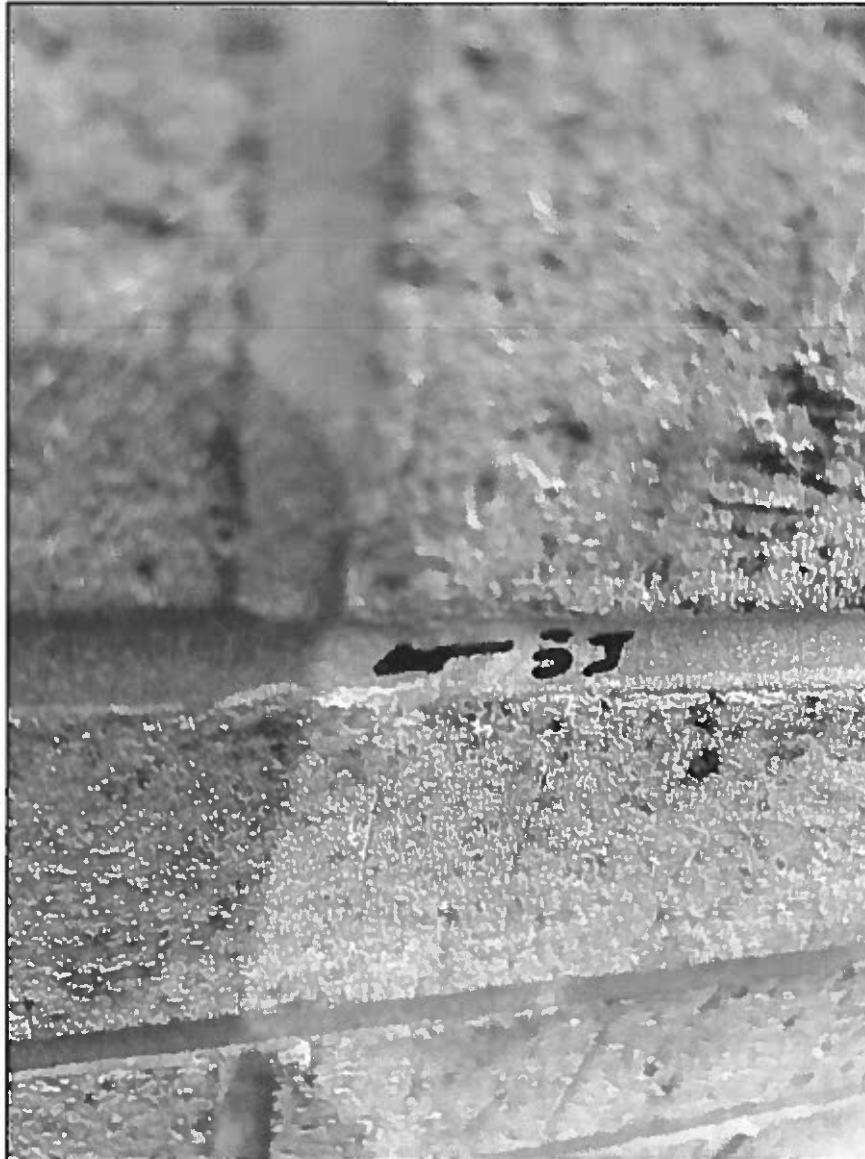
IMPACT LOCATION 43

PHOTO IMG_6163



IMPACT LOCATION 44

PHOTO IMG_6164



IMPACT LOCATION 45

PHOTO IMG_6165



IMPACT LOCATION 46

PHOTO IMG_6166



IMPACT LOCATION 47

PHOTO IMG_6167



IMPACT LOCATION 48

PHOTO IMG_6168



IMPACT LOCATION 49

PHOTO IMG_6169



IMPACT LOCATION 50

PHOTO IMG_6170



IMPACT LOCATION 51

PHOTO IMG_6171



IMPACT LOCATION 52

PHOTO IMG_6172



IMPACT LOCATION 53

PHOTO IMG_6173



IMPACT LOCATION 54

PHOTO IMG_6174



IMPACT LOCATION 55

PHOTO IMG_6175



IMPACT LOCATION 56

PHOTO IMG_6176



IMPACT LOCATION 57

PHOTO IMG_6177



IMPACT LOCATION 58

PHOTO IMG_6178



IMPACT LOCATION 59

PHOTO IMG_6179



IMPACT LOCATION 60

PHOTO IMG_6180



IMPACT LOCATION 61

PHOTO IMG_6181



IMPACT LOCATION 62

PHOTO IMG_6182



IMPACT LOCATION 63

PHOTO IMG_6183



IMPACT LOCATION 64

PHOTO IMG_6184



IMPACT LOCATION 65

PHOTO IMG_6185



IMPACT LOCATION 66

PHOTO IMG_6186



IMPACT LOCATION 67

PHOTO IMG_6187



IMPACT LOCATION 68

PHOTO IMG_6188



IMPACT LOCATION 69

PHOTO IMG_6189



IMPACT LOCATION 70

PHOTO IMG_6190



IMPACT LOCATION 71

PHOTO IMG_7239



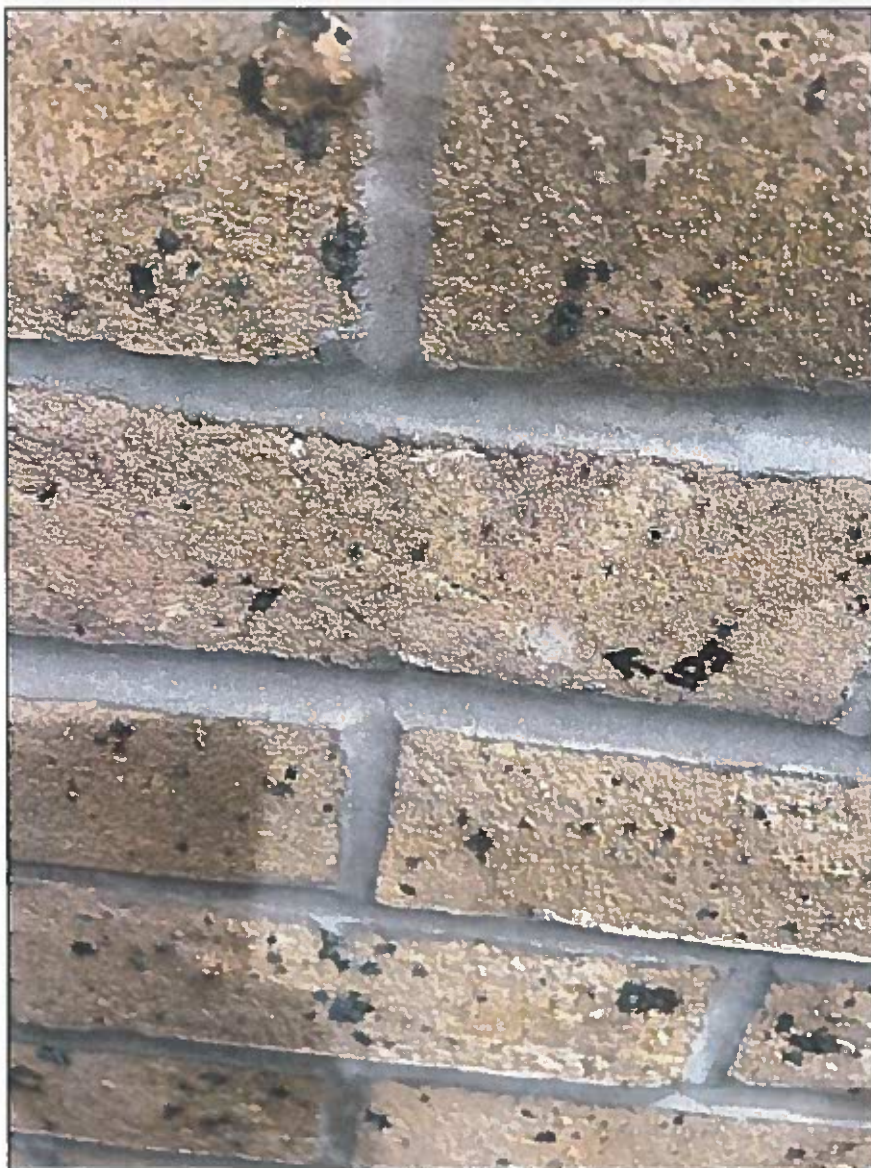
IMPACT LOCATION 72

PHOTO IMG_6205



IMPACT LOCATION 91

PHOTO IMG_6206



IMPACT LOCATION 92

PHOTO IMG_6207



IMPACT LOCATION 93

PHOTO IMG_6208



IMPACT LOCATION 94

PHOTO IMG_6209



IMPACT LOCATION 95

PHOTO IMG_6210



IMPACT LOCATION 96

PHOTO IMG_6211



IMPACT LOCATION 97

PHOTO IMG_6212



IMPACT LOCATION 98

PHOTO IMG_6214



IMPACT LOCATION 99

PHOTO IMG_6215



IMPACT LOCATION 100

PHOTO IMG_6216



IMPACT LOCATION 101

PHOTO IMG_6217



IMPACT LOCATION 102

PHOTO IMG_6218



IMPACT LOCATION 103

PHOTO IMG_6219



IMPACT LOCATION 104

PHOTO IMG_6220



IMPACT LOCATION 105

PHOTO IMG_6221



IMPACT LOCATION 106

PHOTO IMG_6222



IMPACT LOCATION 107

PHOTO IMG_7239



IMPACT LOCATION 108

8 APPENDIX - DRAWINGS

The following 4 unnumbered pages are copies of James & Taylor Limited drawings numbered:

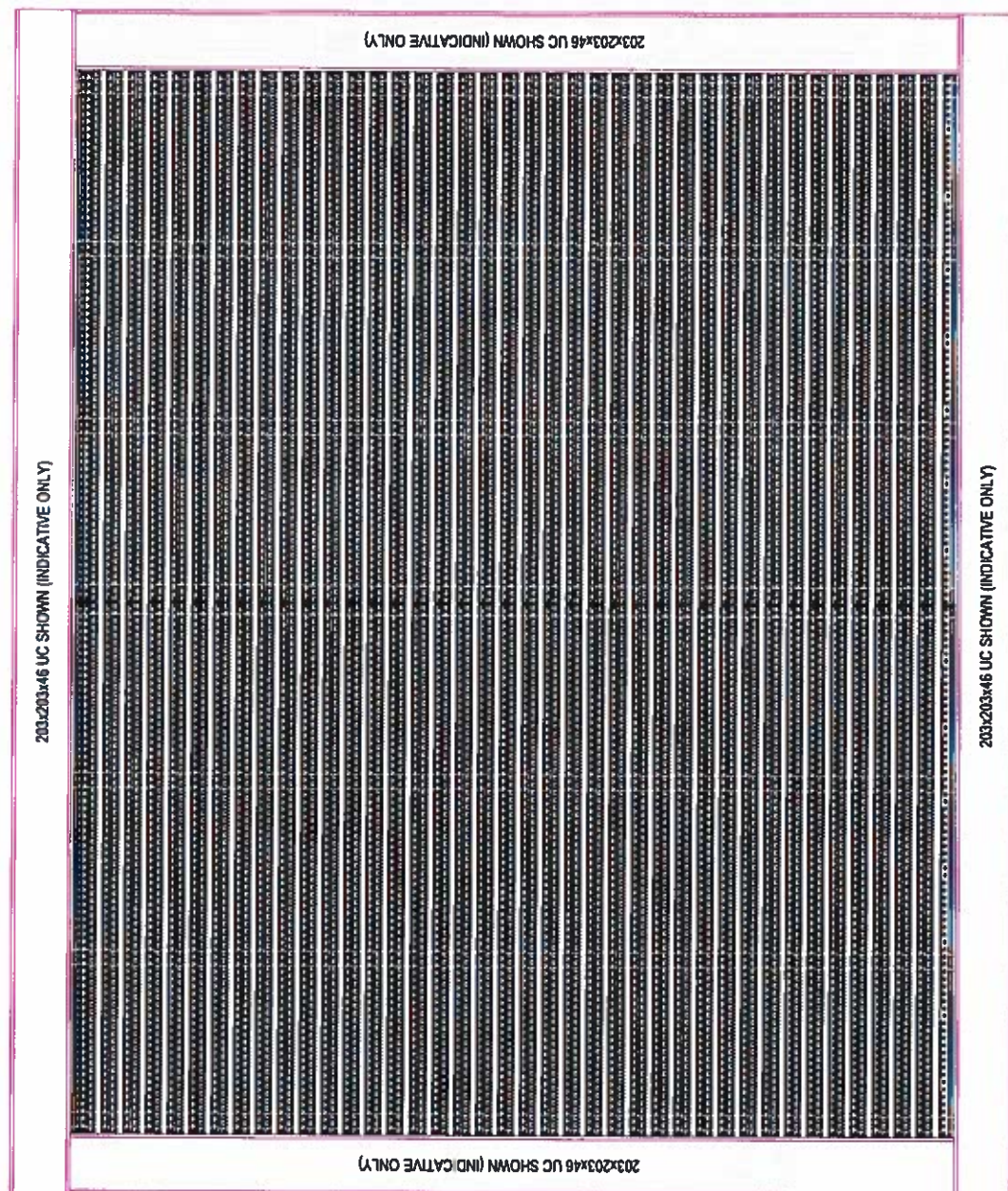
- BSS-TRA-003
- BSS-TRA-DT-001
- BSS-TRA-GA-002
- BSS-TRA-T4 Rev B

END OF REPORT

3602,5



203x203x46 UC SHOWN (INDICATIVE ONLY)



203x203x46 UC SHOWN (INDICATIVE ONLY)



0106



SIXTY TWO EUREKA DRIVE P.O. BOX 100000
CHICAGO, ILL 60610
TEL 312 637 3933 FAX 312 637 3936 E-MAIL info@eureka.com

DO NOT SCALE FROM THIS DRAWING.

THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR,
ARCHITECT'S AND ENGINEER'S DRAWINGS.

BARRACUDA HORIZONTAL RAIL REQUIREMENT

BAR-R1-1800 = 78 No.

BAR-R2-1800 = 2 No.

BAR-R3-1800 = 2 No.

BARRACUDA VERTICAL RAIL REQUIREMENT

BAR-VL1-2990 = 6 No.

BAR-VT1-2990 = 1 No.

THE HELPING HAND: BRACKET REQUIREMENT

VERTICAL LOAD BEARING HELPING HAND = 7 No.
RESTRAINT HELPING HAND = 28 No.

REVISIONS:

DATE: _____

CLIENT:

JAMES & TAYLOR LTD

PROJECT

BRICK SLIP SYSTEM

Time

TEST RIG TYPE A

GENERAL ARRANGEMENT

DATE:

21/09/2020

DRAWING BY:

CHECKED BY:

Just

JSC
JSC BY:**SCALE**

PLOT SIZE:

1-16

A2

DRAWING NUMBER:

PREVISION®

BSS-TRA-003

PLANT DATE:

1

September 23, 2020 11:37 AM

●

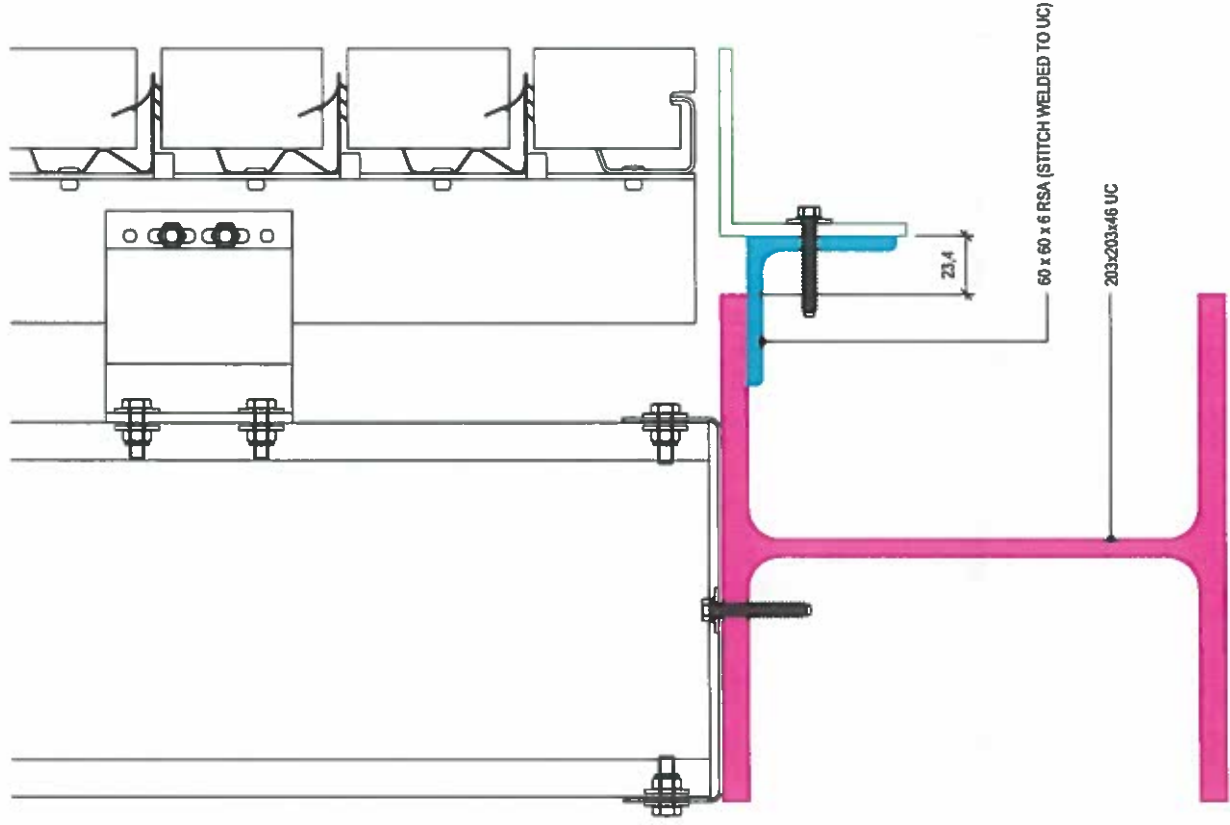
© James & Taylor Ltd - 2000

JAMES
& TAYLOR

SUTY TWO, Banded Business Park, Loughmore Road,
Chesham, Bucks HP8 2JY
T 0129 834 2000 F 0129 838 2030 E info@macys.co.uk
www.jamesmacys.co.uk

DO NOT SCALE FROM THIS DRAWING.

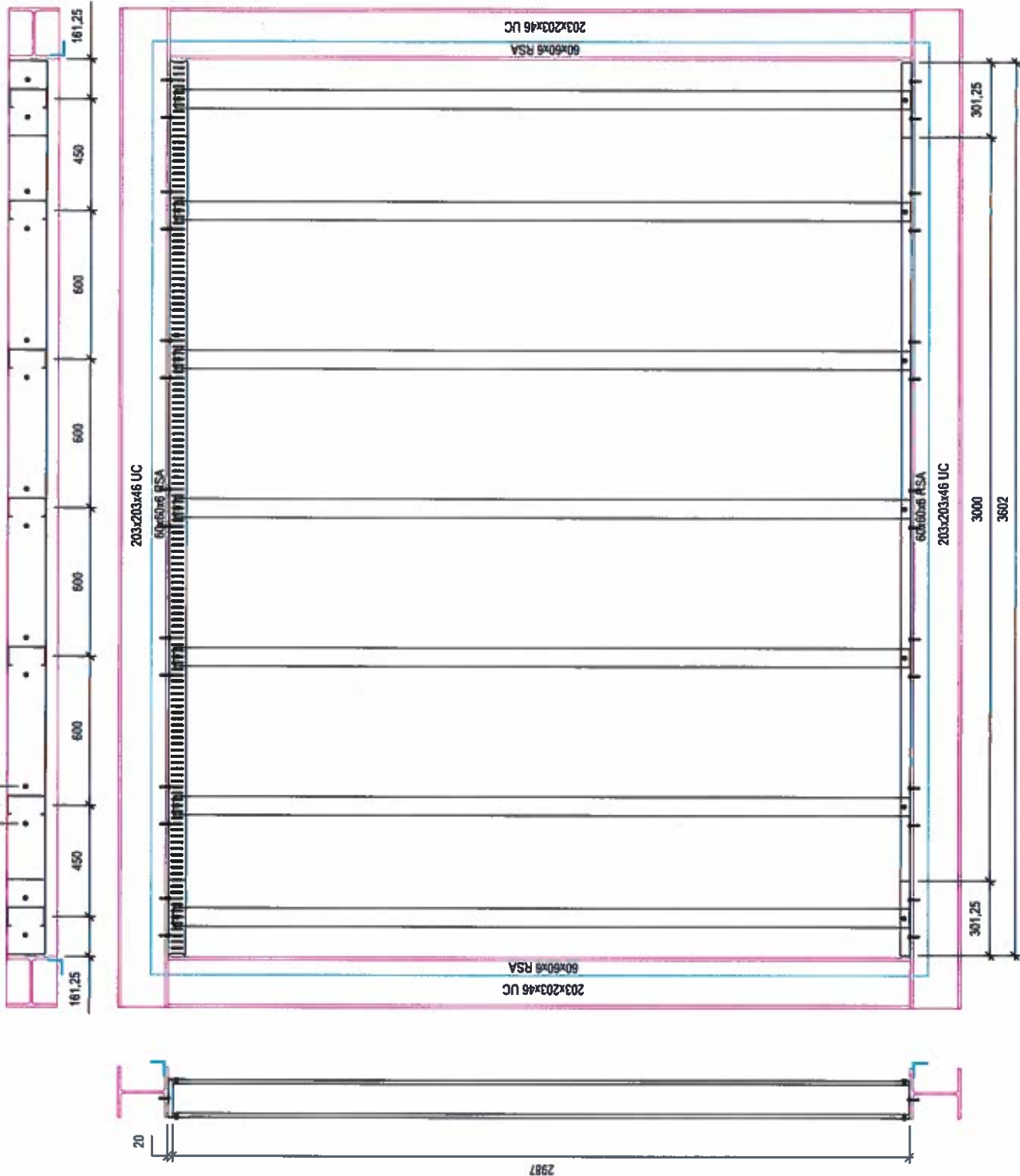
THIS DRAWING IS TO BE READ IN CONJUNCTION
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ARCHITECT'S AND ENGINEER'S DRAWINGS.



REVISIONS:	DATE:
CLIENT:	JAMES & TAYLOR LTD
PROJECT:	BRICK SLIP SYSTEM
TITLE:	TEST RIG TYPE A TYPICAL PERIMETER DETAIL
DATE:	03/12/2021
DRAWN BY:	CHECKED BY:
JSC	JSC
SCALE:	PLOT SIZE:
1:2	A3
DRAWING NUMBER:	REVISION:
BSS-TRA-DT-001	
PLOT DATE:	
December 3, 2021	4:39 PM
© James & Taylor Ltd. 2008	

METSEC BACKING WALL; STUDWORK, BASE, AND HEAD TRACK SETTING OUT/CONFIGURATION

TEST RIG TYPE A



SEITY LTD, General Building, 100, South Street, South
Oxfordshire, South, OX1 1JY
T: 01235 3442 344 F: 01235 344 344 E: info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES:

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WITH ALL RELEVANT JAMES & TAYLOR
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METSEC REQUIREMENT

VERTICAL STUDS

150M12-75 (THEORETICAL LENGTH 2987mm) = 7 No.

BASE TRACK

154M12-40 (THEORETICAL LENGTH 3602mm) = 1 No.

HEAD TRACK

154M16-70s (THEORETICAL LENGTH 3602mm) = 1 No.

REVISIONS:

CLIENT

JAMES & TAYLOR LTD

PROJECT:

BRICK SLIP SYSTEM

TITLE

TEST RIG TYPE A

GENERAL ARRANGEMENT

DATE

03/12/2021

DRAWN BY:

JSC

CHECKED BY:

JSC

SCALE

1:16

PLOT SIZE

A3

DRAWING NUMBER:

BSS-TRA-GA-002

REVISION:

PLOT DATE:

January 16, 2022

6:18 PM

James & Taylor Ltd 2020

TEST RIG TYPE A - TEST 4 [MORTARED IMPACT]

3602.5



50771 WYO, Barrow Business Park, Louth Road, Chester, Cheshire, Surrey, KT9 2XJ
T: 020 8402 3000 F: 020 8330 2030 E: info@jamesandtaylor.co.uk
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GENERAL NOTES:

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THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT JAMES & TAYLOR, ARCHITECT'S AND ENGINEER'S DRAWINGS.

= BLOCKLEY WINDERMERE GREY SOLID
215mm LONG 'STANDARD' SLIPS = 135 No.

= WIENERBERGER STAFFORDSHIRE SMOOTH CREAM

215mm LONG 'STANDARD' SLIPS = 30 No.

165mm LONG 'STANDARD' SLIPS = 38 No.

52mm LONG 'STANDARD' SLIPS = 38 No.

215mm LONG SLIPS WITH 'TOP' REBATE = 15 No.

215mm LONG SLIPS WITH 'BOTTOM' REBATE = 15 No.

165mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

165mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

52mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

52mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

Rev B DRAWING REVISION JSC 11/11/2022

Rev A IMPACT LOCATIONS ADDED JSC 15/10/2022

REVISIONS: DATE

CLIENT: JAMES & TAYLOR LTD

PROJECT: BRICK SLIP SYSTEM

TITLE: TEST RIG TYPE A - TEST 4
MORTARED IMPACT

DATE: 04/12/2021

DRAWN BY: JSC

CHECKED BY: JSC

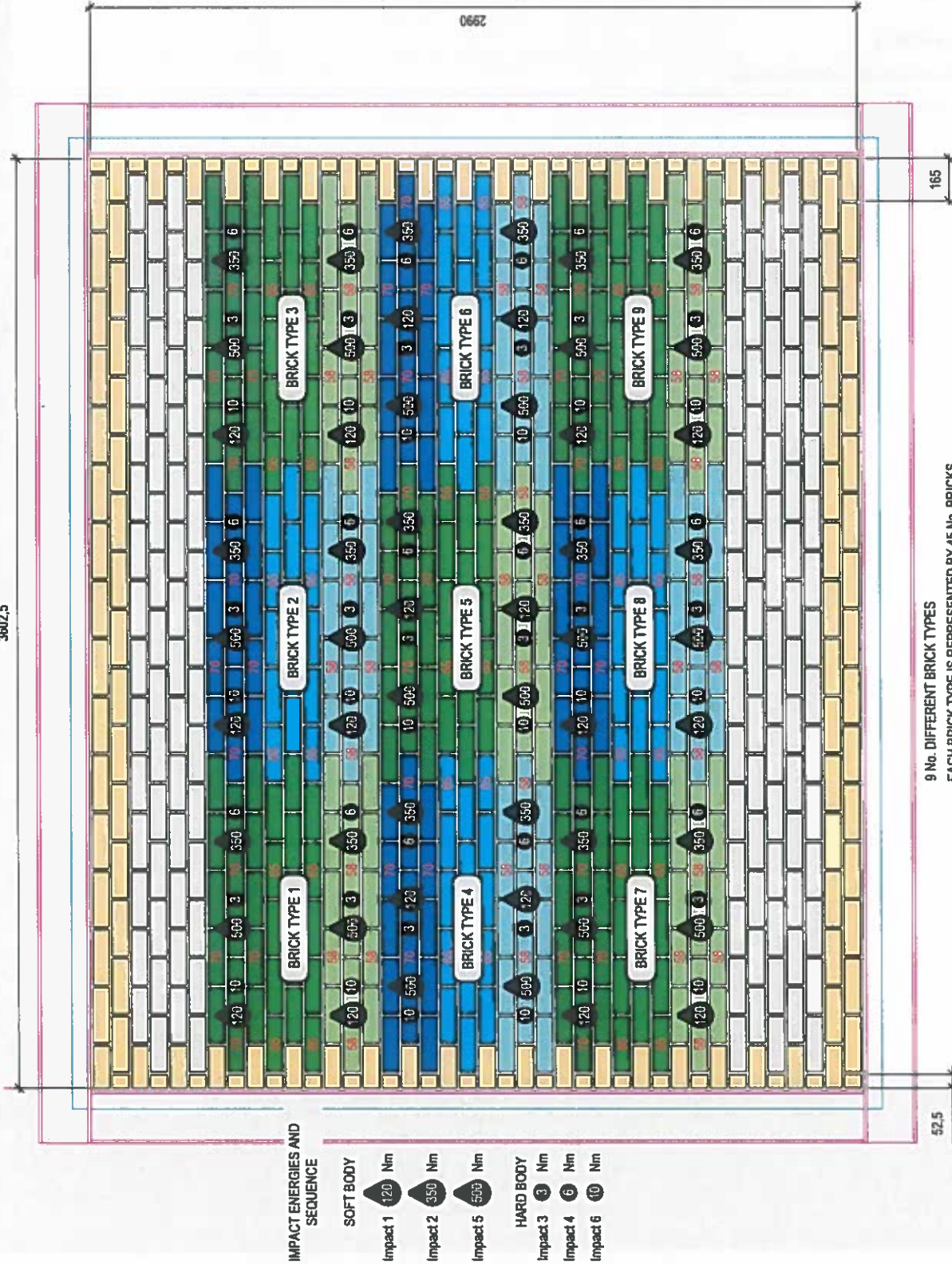
SCALE: 1:16

PLOT SIZE: A3

DRAWING NUMBER: BSS-TRA-T4

REVISION: B

PLOT DATE: November 11, 2022 12:20 PM © James & Taylor Ltd 2009



9 No. DIFFERENT BRICK TYPES
EACH BRICK TYPE IS REPRESENTED BY 45 No. BRICKS
MEDIAN HEIGHT BRICKS = 15 No.
SMALL BRICKS = 4 No. 58mm HIGH AND 11 No. MEDIAN HEIGHT [26.66%]
LARGE BRICKS = 4 No. 70mm HIGH AND 11 No. MEDIAN HEIGHT [26.66%]

TECHNOLOGY CENTRE



VINCI Technology Centre UK Limited
Stanbridge Road
Leighton Buzzard
Bedfordshire
LU7 4QH
UK

0333 5669000

info@technology-centre.co.uk

www.technology-centre.co.uk

Technical Report

Title: Pull Out Testing of Barracuda Brick Slip System (Un-Mortared).

Report No: N950-24-18685



Technical Report

Title: Pull Out Testing of Barracuda Brick Slip System (Un-Mortared).

Customer: James & Taylor Ltd;
Sixty-Two, Barwell Business Park,
Leatherhead Road, Chessington, Surrey KT9 2NY.

Issue date: 6 March 2024

VTC job no.: TR0220-3WK2

Author(s): S. Bahera – Assistant Engineer

S. Bahera

Checked by: N. McDonald – Manager

N. McDonald

Authorised by: S. R. Moxon – Operations Director

S. R. Moxon

Distribution: 1 copy to James & Taylor
(confidential) 1 copy to project file

This report and the results shown and any recommendations or advice made herein is based upon the information, drawings, samples and tests referred to in the report. Where this report relates to a test for which VINCI Technology Centre UK Limited is UKAS accredited, the opinions and interpretations expressed herein are outside the scope of the UKAS accreditation. We confirm that we have exercised all reasonable skill and care in the preparation of this report within the terms of this commission with the client. This approach takes into account the level of resources, manpower, testing and investigations assigned to it as part of the client agreement. We disclaim any responsibility to the client and other parties in respect of any matters outside the scope of our instruction. This report is confidential and privileged to the client, his professional advisers and VINCI Technology Centre UK Limited and we do not accept any responsibility of any nature to third parties to whom the report, or any part thereof, is made known. No such third party may place reliance upon this report. Unless specifically assigned or transferred within the terms of the agreement, we assert and retain all copyright, and other Intellectual Property Rights, in and over the report and its contents.



VINCI Technology Centre UK Limited,
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email info@technology-centre.co.uk

web www.technology-centre.co.uk

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3	DESCRIPTION OF TEST SAMPLE.....	6
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1 INTRODUCTION

This report describes tests carried out at VINCI Technology Centre UK Limited at the request of James & Taylor Limited.

The test sample consisted of a Barracuda brick slip system supplied by James & Taylor.

The tests were carried out between March 2023 and August 2023

Testing carried out was in accordance VINCI Technology Centre test method statement: ST8488_MS_REV01 – Test No. 1

Testing was undertaken by S. Bahera at the VINCI Technology Centre, Stanbridge Road, Leighton Buzzard, Bedfordshire, LU7 4QH, at the instruction of James & Taylor Ltd..

The test was witnessed in full or partly by:

John Champion - James & Taylor Ltd.

This test report relates only to the actual sample as tested and described herein.

The results are valid only for sample(s) tested and the conditions under which the tests were conducted.

The long-term durability of the façade system is not assessed by these test methods.

VINCI Technology Centre UK Limited is accredited to ISO/IEC 17025:2017 by the United Kingdom Accreditation Service as UKAS Testing Laboratory No. 0057 for a schedule of tests. Tests listed above and marked with an asterisk are not on our schedule.

VINCI Technology Centre UK Limited is Approved Body No. 1766.

VINCI Technology Centre UK Limited is certified by BSI for:

- ISO 9001 Quality Management System,
- ISO 14001 Environmental Management System,
- ISO 45001 Occupational Health and Safety Management System.

2 SUMMARY AND CLASSIFICATION OF TEST RESULTS

All bricks slips tested held four consecutive applied loads.

All brick slips tested held a load of at least 85 N for 30 seconds three times without becoming dislodged from their retaining rails.

All brick slips tested held a load of at least 100 N for 30 seconds one time without becoming dislodged from their retaining rails.

3 DESCRIPTION OF TEST SAMPLE

The sample was mounted to a solid steel frame which was fixed to a concrete slab as shown in the photograph below.

PHOTO IMG-5655



TEST SAMPLE

PHOTO IMG-5358



SUPPORT BRACKET

PHOTO IMG_5352



CLOSE UP OF BRICK SLIPS

4 TEST EQUIPMENT

4.1 PULL OUT TESTING

Load was applied using a pneumatic actuator. A pressure regulator was used to control the load.

Load was measured using a 200 kg s-beam load cell.

Displacement was measured using potentiometric displacement transducers.

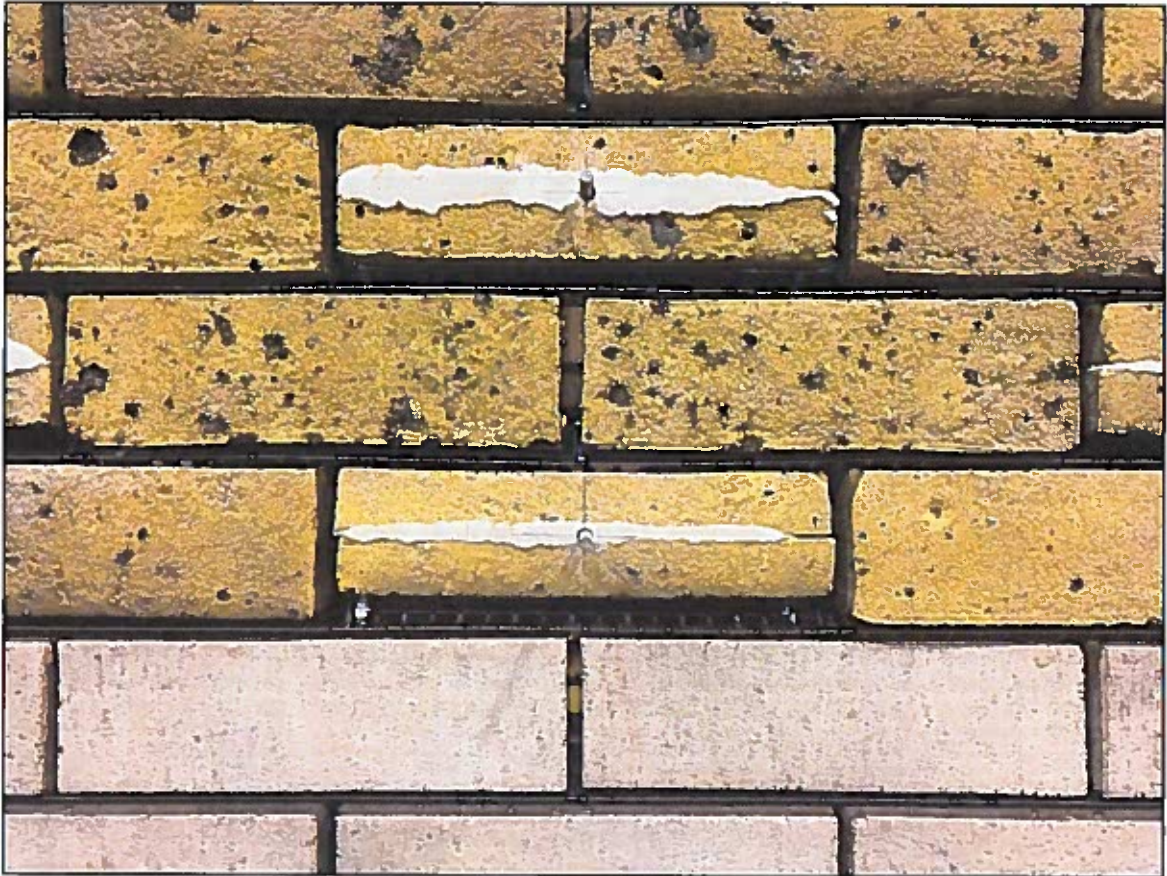
See photo IMG-6586 below for depiction of test setup.

PHOTO IMG-6586



EXAMPLE OF PULL-OUT TEST SETUP

PHOTO IMG-5255



CLOST UP OF STUDS USED TO APPLY LOAD TO BRICK SLIP

5 INSTRUMENTATION

Below is Table 1 showing details of all the of direct measurement equipment and it's accuracy used during testing.

Table 1 – Details of Measurement Instrumentation Used.

VINCI Technology Centre Ref.	Description	Accuracy
STR061	Displacement Transducer	0.1 mm
STR062	Displacement Transducer	0.1 mm
CLR739	Load Cell	1 %

6 TEST PROCEDURE

6.1 PULL OUT TESTING

A total of 108 No. brick slips were tested, locations of each brick slip were designated by James and Taylor prior to testing.

Four consecutive loads were applied to each designated brick slip location.

Three loads of 85 N were applied using a pneumatic actuator attached through a hole drilled in the centre of the slip. Holes were drilled by James and Taylor.

The load was transferred through the back face of the slip using a threaded rod and suitable size nut a washer arrangement.

Three loads were applied with a stabilisation period of 30 seconds allowed under load and a recovery period of 30 seconds allowed after release before deflection measurements were recorded.

A final load of 100N was then be applied with the pneumatic actuator and held for 30 seconds and recovery period of 1 minute was allowed after release before final deflection measurements were taken.

Displacement transducers were used to measure the deflection of the brick slip. The gauges were installed at the mid height of the slip, one at each end.

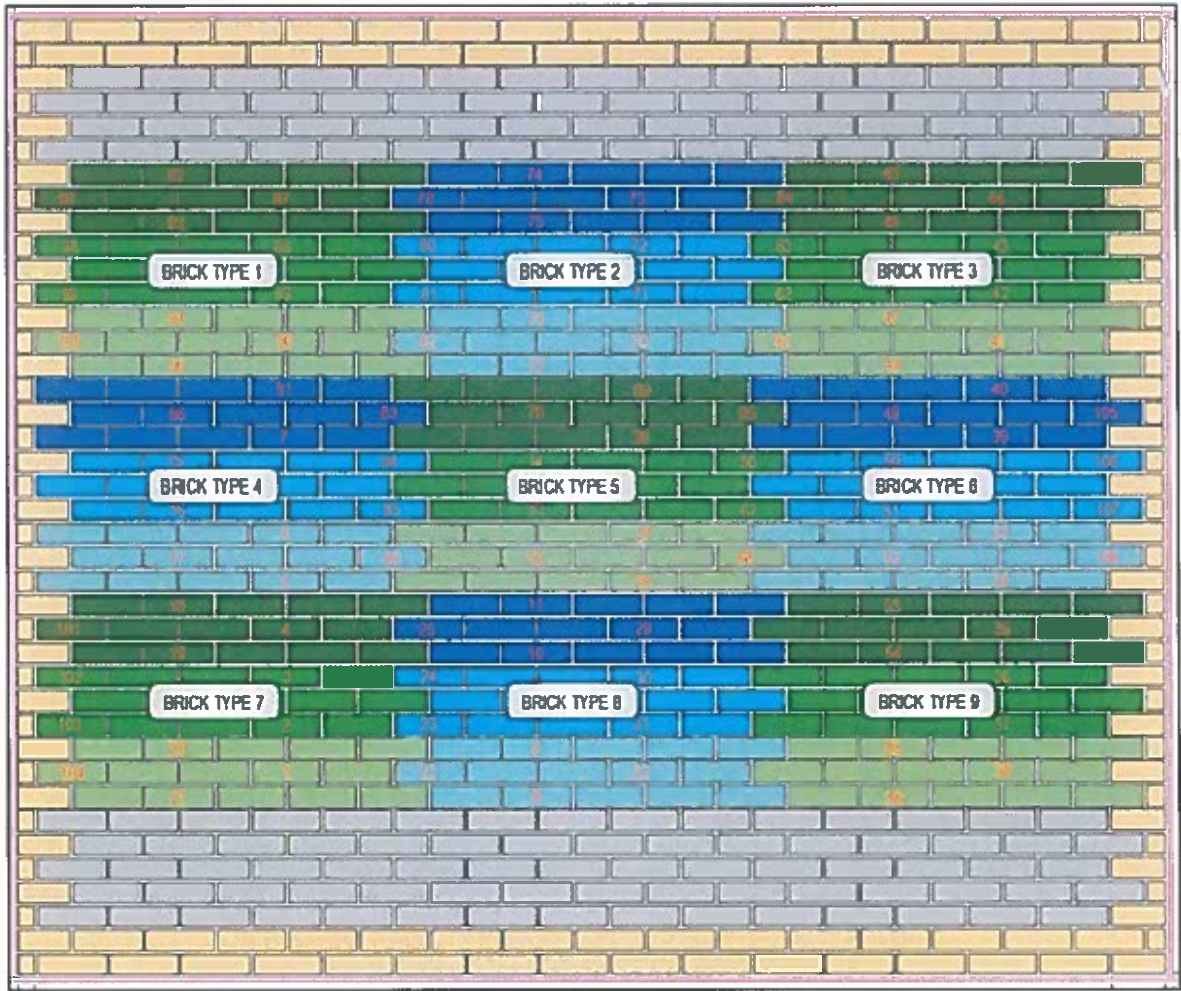
The following sequence was applied at each designated brick slip location.

1. Displacement transducers and load cell were zeroed.
2. A load of 85 N was applied. This was held for a minimum of 30 seconds.
3. Load was then be removed and left for a minimum of 30 seconds.
4. A load of 85 N was applied. This was held for a minimum of 30 seconds.
5. Load was then be removed and left for a minimum of 30 seconds.
6. A load of 85 N was applied. This was held for a minimum of 30 seconds.
7. Load was then be removed and left for a minimum of 30 seconds.
8. A load of 100 N was applied. This was held for a minimum of 30 seconds.
9. Load was then be removed and left for a minimum of 1 minute.

Displacement under load and residual displacement were recorded along with load throughout the test.

7 TEST RESULTS

DRAWING 1



TEST SAMPLE LOCATIONS (MARKED IN RED TEXT)

7.1 PULL OUT TESTING

Test Date: March 2023 to August 2023.

Table 2 – Brick Slip Pull Out Results – Test Sample 1.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.23	0.23	89.70
85	0.23	0.24	86.09
85	0.24	0.26	85.60
100	0.26	0.27	105.08
Residual Readings	0.000	0.002	-0.13

Table 3 – Brick Slip Pull Out Results – Test Sample 2.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.28	87.93
85	0.25	0.29	88.27
85	0.25	0.28	86.83
100	0.30	0.33	101.30
Residual Readings	0.18	0.10	0.44

Table 4 – Brick Slip Pull Out Results – Test Sample 3.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.19	0.24	87.08
85	0.29	0.40	87.09
85	0.31	0.42	90.80
100	0.27	0.30	107.45
Residual Readings	0.00	0.00	0.01

Table 5 – Brick Slip Pull Out Results – Test Sample 4.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.30	0.40	87.09
85	0.26	0.37	86.13
85	0.26	0.38	87.87
100	0.36	0.47	106.18
Residual Readings	0.01	0.01	0.08

Table 6 – Brick Slip Pull Out Results – Test Sample 5.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.21	0.26	85.23
85	0.21	0.27	87.82
85	0.21	0.27	88.57
100	0.27	0.36	103.78
Residual Readings	0.07	0.06	-0.12

Table 7 – Brick Slip Pull Out Results – Test Sample 6.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.19	0.24	88.61
85	0.22	0.26	88.17
85	0.23	0.27	89.13
100	0.26	0.31	107.31
Residual Readings	0.02	0.02	0.04

Table 8 – Brick Slip Pull Out Results – Test Sample 7.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.27	89.58
85	0.27	0.29	89.05
85	0.27	0.29	88.61
100	0.43	0.43	107.12
Residual Readings	0.06	0.05	0.22

Table 9 – Brick Slip Pull Out Results – Test Sample 8.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.77	0.77	85.01
85	0.79	0.78	88.13
85	0.83	0.82	89.91
100	0.77	0.81	101.30
Residual Readings	0.08	0.07	-0.15

Table 10 – Brick Slip Pull Out Results – Test Sample 9.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.31	0.29	87.22
85	0.32	0.30	88.63
85	0.32	0.30	87.90
100	0.37	0.36	100.89
Residual Readings	0.02	0.04	0.28

Table 11 – Brick Slip Pull Out Results – Test Sample 10.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.30	0.29	85.90
85	0.30	0.29	85.01
85	0.31	0.30	88.76
100	0.36	0.36	102.27
Residual Readings	0.01	0.02	-0.17

Table 12 – Brick Slip Pull Out Results – Test Sample 11.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.26	0.31	88.15
85	0.27	0.31	87.27
85	0.27	0.33	88.37
100	0.34	0.37	105.02
Residual Readings	0.06	0.08	0.01

Table 13 – Brick Slip Pull Out Results – Test Sample 12.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.20	0.25	85.52
85	0.27	0.31	85.02
85	0.28	0.33	85.22
100	0.33	0.39	105.19
Residual Readings	0.06	0.03	0.39

Table 14 – Brick Slip Pull Out Results – Test Sample 13.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.20	0.21	88.34
85	0.22	0.25	88.31
85	0.22	0.25	86.07
100	0.27	0.27	101.10
Residual Readings	0.12	0.05	-0.15

Table 15 – Brick Slip Pull Out Results – Test Sample 14.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.18	0.26	89.09
85	0.18	0.26	89.30
85	0.18	0.26	85.56
100	0.27	0.34	105.32
Residual Readings	0.13	0.10	0.33

Table 16 – Brick Slip Pull Out Results – Test Sample 15.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.18	0.27	85.77
85	0.24	0.37	85.63
85	0.26	0.40	85.85
100	0.39	0.44	106.80
Residual Readings	0.00	0.00	0.02

Table 17 – Brick Slip Pull Out Results – Test Sample 16.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.23	0.39	88.02
85	0.23	0.38	85.65
85	0.23	0.38	85.16
100	0.32	0.50	106.65
Residual Readings	0.02	0.03	-0.12

Table 18 – Brick Slip Pull Out Results – Test Sample 17.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.07	0.22	88.32
85	0.11	0.24	87.57
85	0.11	0.24	86.94
100	0.16	0.31	105.47
Residual Readings	0.00	0.01	0.13

Table 19 – Brick Slip Pull Out Results – Test Sample 18.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.16	0.20	88.68
85	0.17	0.21	89.87
85	0.18	0.21	87.01
100	0.21	0.25	101.08
Residual Readings	0.04	0.02	0.20

Table 20 – Brick Slip Pull Out Results – Test Sample 19.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.36	86.46
85	0.26	0.37	86.13
85	0.26	0.38	87.87
100	0.36	0.47	106.18
Residual Readings	0.01	0.01	0.07

Table 21 – Brick Slip Pull Out Results – Test Sample 20.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.34	0.43	85.35
85	0.44	0.51	89.33
85	0.43	0.50	88.40
100	0.47	0.54	104.51
Residual Readings	0.14	0.12	-0.11

Table 22 – Brick Slip Pull Out Results – Test Sample 21.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.56	0.45	86.20
85	0.58	0.46	85.88
85	0.52	0.47	87.37
100	0.85	0.70	103.62
Residual Readings	0.08	0.06	0.04

Table 23 – Brick Slip Pull Out Results – Test Sample 22.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.21	0.65	89.42
85	0.21	0.63	87.81
85	0.21	0.64	88.96
100	0.54	0.73	106.01
Residual Readings	0.06	0.35	0.24

Table 24 – Brick Slip Pull Out Results – Test Sample 23.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.49	0.30	88.41
85	0.51	0.30	88.27
85	0.51	0.32	88.74
100	0.56	0.46	100.96
Residual Readings	0.03	0.05	0.49

Table 25 – Brick Slip Pull Out Results – Test Sample 24.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.28	0.23	88.23
85	0.32	0.27	86.66
85	0.35	0.31	89.70
100	0.38	0.34	100.50
Residual Readings	0.04	0.09	-0.17

Table 26 – Brick Slip Pull Out Results – Test Sample 25.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.30	0.30	87.40
85	0.32	0.31	88.57
85	0.33	0.31	86.73
100	0.47	0.58	105.05
Residual Readings	0.11	0.37	0.27

Table 27 – Brick Slip Pull Out Results – Test Sample 26.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.32	0.22	85.64
85	0.32	0.21	85.11
85	0.31	0.20	82.55
100	0.41	0.30	105.28
Residual Readings	0.03	0.03	-0.70

Table 28 – Brick Slip Pull Out Results – Test Sample 27.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.11	0.27	87.49
85	0.15	0.32	88.51
85	0.15	0.31	86.91
100	0.27	0.44	101.13
Residual Readings	0.00	0.01	0.08

Table 29 – Brick Slip Pull Out Results – Test Sample 28.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.34	0.43	86.01
85	0.34	0.44	87.45
85	0.34	0.43	86.18
100	0.31	0.56	100.91
Residual Readings	0.04	0.04	0.03

Table 30 – Brick Slip Pull Out Results – Test Sample 29.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.28	87.86
85	0.25	0.30	89.35
85	0.25	0.30	89.19
100	0.23	0.32	104.28
Residual Readings	0.11	0.09	-0.15

Table 31 – Brick Slip Pull Out Results – Test Sample 30.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.59	0.56	86.35
85	0.61	0.58	86.00
85	0.64	0.61	89.99
100	0.77	0.72	102.16
Residual Readings	0.49	0.43	-0.10

Table 32 – Brick Slip Pull Out Results – Test Sample 31.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.47	0.62	87.00
85	0.47	0.62	85.96
85	0.47	0.63	87.83
100	0.63	0.81	107.00
Residual Readings	0.04	0.08	0.21

Table 33 – Brick Slip Pull Out Results – Test Sample 32.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.27	88.57
85	0.27	0.29	89.86
85	0.27	0.29	89.93
100	0.42	0.42	104.18
Residual Readings	0.02	0.01	0.06

Table 34 – Brick Slip Pull Out Results – Test Sample 33.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.81	0.81	89.45
85	0.79	0.79	89.16
85	0.80	0.80	87.21
100	0.79	0.83	103.96
Residual Readings	0.06	0.05	-0.11

Table 35 – Brick Slip Pull Out Results – Test Sample 34.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.21	87.80
85	0.25	0.21	86.09
85	0.21	0.21	87.67
100	0.31	0.29	101.19
Residual Readings	0.05	0.05	0.02

Table 36 – Brick Slip Pull Out Results – Test Sample 35.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.19	0.18	88.73
85	0.22	0.21	89.36
85	0.22	0.20	88.12
100	0.25	0.24	105.34
Residual Readings	0.04	0.02	0.20

Table 37 – Brick Slip Pull Out Results – Test Sample 36.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.16	0.18	89.55
85	0.17	0.19	85.78
85	0.18	0.19	86.85
100	0.24	0.26	106.55
Residual Readings	0.02	0.02	0.08

Table 38 – Brick Slip Pull Out Results – Test Sample 37.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.23	0.26	86.61
85	0.26	0.26	86.27
85	0.26	0.26	86.34
100	0.32	0.33	107.97
Residual Readings	0.03	0.02	0.45

Table 39 – Brick Slip Pull Out Results – Test Sample 38.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.57	0.73	87.31
85	0.57	0.72	89.03
85	0.56	0.71	85.66
100	0.66	0.84	104.22
Residual Readings	0.06	0.00	0.43

Table 40 – Brick Slip Pull Out Results – Test Sample 39.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.55	0.71	85.18
85	0.55	0.70	85.26
85	0.55	0.71	85.93
100	0.67	0.85	107.46
Residual Readings	0.01	0.00	-0.07

Table 41 – Brick Slip Pull Out Results – Test Sample 40.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.42	0.41	85.80
85	0.43	0.39	87.48
85	0.39	0.38	86.69
100	0.51	0.48	101.66
Residual Readings	0.21	0.19	0.22

Table 42 – Brick Slip Pull Out Results – Test Sample 41.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.26	0.19	89.24
85	0.25	0.18	87.56
85	0.27	0.21	86.20
100	0.31	0.25	100.62
Residual Readings	0.04	0.03	0.46

Table 43 – Brick Slip Pull Out Results – Test Sample 42.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.26	0.19	89.63
85	0.24	0.18	85.92
85	0.28	0.21	89.68
100	0.32	0.26	104.34
Residual Readings	0.03	0.03	0.38

Table 44 – Brick Slip Pull Out Results – Test Sample 43.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.24	0.27	88.10
85	0.25	0.28	87.47
85	0.25	0.30	87.61
100	0.28	0.34	101.40
Residual Readings	0.23	0.25	0.46

Table 45 – Brick Slip Pull Out Results – Test Sample 44.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.27	0.27	88.08
85	0.29	0.28	85.48
85	0.31	0.30	89.41
100	0.30	0.32	106.19
Residual Readings	0.03	0.01	0.18

Table 46 – Brick Slip Pull Out Results – Test Sample 45.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.27	0.27	86.81
85	0.29	0.29	86.16
85	0.31	0.29	87.78
100	0.30	0.32	107.69
Residual Readings	0.03	0.01	-0.17

Table 47 – Brick Slip Pull Out Results – Test Sample 46.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.42	0.41	87.97
85	0.39	0.39	87.45
85	0.38	0.37	86.78
100	0.48	0.47	104.23
Residual Readings	0.06	0.07	0.07

Table 48 – Brick Slip Pull Out Results – Test Sample 47.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.42	0.41	88.24
85	0.39	0.39	87.80
85	0.37	0.37	85.59
100	0.47	0.46	102.00
Residual Readings	0.06	0.06	0.07

Table 49 – Brick Slip Pull Out Results – Test Sample 48.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.58	0.71	88.01
85	0.58	0.71	87.74
85	0.60	0.76	87.77
100	0.66	0.84	107.51
Residual Readings	0.04	0.00	0.34

Table 50 – Brick Slip Pull Out Results – Test Sample 49.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.45	0.58	88.78
85	0.44	0.56	85.20
85	0.44	0.57	86.93
100	0.53	0.70	107.61
Residual Readings	0.16	0.30	0.43

Table 51 – Brick Slip Pull Out Results – Test Sample 50.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.45	0.58	89.09
85	0.45	0.58	88.60
85	0.44	0.57	86.03
100	0.52	0.68	104.82
Residual Readings	0.14	0.33	0.18

Table 52 – Brick Slip Pull Out Results – Test Sample 51.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.75	0.52	86.39
85	0.77	0.53	87.97
85	0.76	0.53	87.52
100	0.89	0.59	107.05
Residual Readings	0.03	0.03	0.06

Table 53 – Brick Slip Pull Out Results – Test Sample 52.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.24	0.21	86.28
85	0.26	0.22	89.99
85	0.21	0.21	86.09
100	0.31	0.29	101.24
Residual Readings	0.04	0.03	0.32

Table 54 – Brick Slip Pull Out Results – Test Sample 53.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.05	0.25	86.27
85	0.06	0.26	87.98
85	0.06	0.26	89.11
100	0.12	0.31	104.56
Residual Readings	0.04	0.05	0.14

Table 55 – Brick Slip Pull Out Results – Test Sample 54.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.27	0.27	89.65
85	0.27	0.27	89.71
85	0.26	0.26	85.50
100	0.32	0.33	103.86
Residual Readings	0.10	0.06	0.12

Table 56 – Brick Slip Pull Out Results – Test Sample 55.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.15	0.17	85.61
85	0.18	0.19	87.83
85	0.18	0.19	86.66
100	0.24	0.25	103.41
Residual Readings	0.12	0.12	0.43

Table 57 – Brick Slip Pull Out Results – Test Sample 56.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.15	0.18	87.11
85	0.18	0.19	87.40
85	0.18	0.19	85.42
100	0.24	0.26	106.94
Residual Readings	0.12	0.12	0.45

Table 58 – Brick Slip Pull Out Results – Test Sample 57.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.16	0.18	89.88
85	0.18	0.20	89.22
85	0.18	0.19	85.48
100	0.24	0.26	107.61
Residual Readings	0.13	0.14	0.49

Table 59 – Brick Slip Pull Out Results – Test Sample 58.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.19	0.18	88.79
85	0.22	0.21	88.72
85	0.21	0.20	85.46
100	0.25	0.24	104.62
Residual Readings	0.01	0.01	-0.05

Table 60 – Brick Slip Pull Out Results – Test Sample 59.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.23	0.21	89.78
85	0.22	0.22	89.80
85	0.22	0.21	88.52
100	0.31	0.31	107.13
Residual Readings	0.05	0.05	-0.19

Table 61 – Brick Slip Pull Out Results – Test Sample 60.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.05	0.26	88.92
85	0.06	0.26	87.49
85	0.06	0.26	89.79
100	0.12	0.31	105.70
Residual Readings	0.01	0.01	-0.04

Table 62 -- Brick Slip Pull Out Results – Test Sample 61.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.11	0.21	88.87
85	0.12	0.21	87.67
85	0.12	0.21	85.08
100	0.19	0.28	103.84
Residual Readings	0.12	0.08	0.36

Table 63 – Brick Slip Pull Out Results – Test Sample 62.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.23	0.27	86.93
85	0.29	0.32	89.66
85	0.29	0.30	87.81
100	0.30	0.35	102.43
Residual Readings	0.17	0.17	0.42

Table 64 – Brick Slip Pull Out Results – Test Sample 63.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.14	0.23	88.35
85	0.15	0.24	89.62
85	0.15	0.23	88.74
100	0.18	0.28	101.59
Residual Readings	0.05	0.05	-0.19

Table 65 – Brick Slip Pull Out Results – Test Sample 64.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.24	0.23	86.34
85	0.25	0.25	89.23
85	0.27	0.25	88.84
100	0.33	0.31	107.78
Residual Readings	0.00	0.00	0.24

Table 66 – Brick Slip Pull Out Results – Test Sample 65.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.19	0.15	86.57
85	0.20	0.17	89.95
85	0.23	0.18	88.37
100	0.26	0.23	105.45
Residual Readings	0.03	0.03	0.44

Table 67 – Brick Slip Pull Out Results – Test Sample 66.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.19	85.85
85	0.27	0.21	87.49
85	0.27	0.21	86.80
100	0.33	0.25	105.36
Residual Readings	0.05	0.11	0.32

Table 68 – Brick Slip Pull Out Results – Test Sample 67.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.29	0.25	87.35
85	0.31	0.26	88.24
85	0.32	0.27	87.27
100	0.36	0.32	105.61
Residual Readings	0.10	0.17	0.43

Table 69 – Brick Slip Pull Out Results – Test Sample 68.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.18	0.26	89.09
85	0.18	0.26	89.30
85	0.18	0.26	85.56
100	0.27	0.34	105.32
Residual Readings	0.13	0.10	0.33

Table 70 – Brick Slip Pull Out Results – Test Sample 69.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.31	0.20	88.36
85	0.34	0.23	88.45
85	0.33	0.23	86.63
100	0.37	0.26	102.22
Residual Readings	0.02	0.02	-0.18

Table 71 – Brick Slip Pull Out Results – Test Sample 70.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.43	0.27	86.99
85	0.46	0.30	85.59
85	0.47	0.31	87.04
100	0.57	0.45	102.91
Residual Readings	0.04	0.10	0.12

Table 72 – Brick Slip Pull Out Results – Test Sample 71.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.18	0.14	85.05
85	0.21	0.17	89.03
85	0.20	0.16	86.00
100	0.26	0.21	100.84
Residual Readings	0.01	0.01	0.37

Table 73 – Brick Slip Pull Out Results – Test Sample 72.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.28	0.25	86.67
85	0.30	0.25	85.06
85	0.32	0.26	88.70
100	0.38	0.32	107.58
Residual Readings	0.03	0.03	-0.14

Table 74 – Brick Slip Pull Out Results – Test Sample 73.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.37	0.16	87.79
85	0.41	0.19	89.50
85	0.39	0.18	86.70
100	0.46	0.24	104.49
Residual Readings	0.05	0.12	0.12

Table 75 – Brick Slip Pull Out Results – Test Sample 74.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.20	87.69
85	0.26	0.21	88.41
85	0.27	0.21	89.98
100	0.34	0.42	100.07
Residual Readings	0.14	0.15	0.19

Table 76 – Brick Slip Pull Out Results – Test Sample 75.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.34	0.27	89.30
85	0.34	0.30	85.29
85	0.35	0.31	86.47
100	0.41	0.32	104.28
Residual Readings	0.03	0.03	0.26

Table 77 – Brick Slip Pull Out Results – Test Sample 76.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.39	0.26	88.56
85	0.39	0.26	87.39
85	0.49	0.30	88.97
100	0.54	0.30	105.58
Residual Readings	0.03	0.06	0.06

Table 78 – Brick Slip Pull Out Results – Test Sample 77.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.44	0.32	87.00
85	0.45	0.34	88.10
85	0.46	0.34	88.43
100	0.54	0.39	102.08
Residual Readings	0.06	0.06	0.08

Table 79 – Brick Slip Pull Out Results – Test Sample 78.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.24	0.23	89.00
85	0.26	0.25	89.07
85	0.25	0.24	85.54
100	0.30	0.32	103.28
Residual Readings	0.01	0.04	0.07

Table 80 – Brick Slip Pull Out Results – Test Sample 79.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.31	0.29	87.48
85	0.32	0.30	89.94
85	0.30	0.29	86.22
100	0.37	0.36	105.66
Residual Readings	0.12	0.15	0.01

Table 81 – Brick Slip Pull Out Results – Test Sample 80.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.22	0.28	87.42
85	0.23	0.28	86.11
85	0.23	0.30	88.18
100	0.27	0.26	101.54
Residual Readings	0.02	0.08	-0.15

Table 82 – Brick Slip Pull Out Results – Test Sample 81.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.21	0.18	85.49
85	0.26	0.22	87.79
85	0.26	0.22	89.83
100	0.29	0.23	101.26
Residual Readings	0.01	0.00	0.25

Table 83 – Brick Slip Pull Out Results – Test Sample 82.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.60	0.66	89.32
85	0.58	0.64	88.87
85	0.56	0.59	85.08
100	0.63	0.65	104.53
Residual Readings	0.07	0.08	0.17

Table 84 – Brick Slip Pull Out Results – Test Sample 83.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.22	0.26	87.64
85	0.24	0.30	89.11
85	0.23	0.34	85.95
100	0.30	0.37	106.23
Residual Readings	0.06	0.19	0.24

Table 85 – Brick Slip Pull Out Results – Test Sample 84.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.29	85.77
85	0.26	0.33	87.68
85	0.29	0.31	89.81
100	0.39	0.42	105.28
Residual Readings	0.22	0.28	0.20

Table 86 – Brick Slip Pull Out Results – Test Sample 85.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.23	0.27	89.87
85	0.34	0.40	88.92
85	0.32	0.36	85.20
100	0.15	0.20	101.17
Residual Readings	0.08	0.11	0.08

Table 87 – Brick Slip Pull Out Results – Test Sample 86.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.47	0.49	86.83
85	0.47	0.50	89.88
85	0.45	0.54	87.72
100	0.49	0.56	106.56
Residual Readings	0.04	0.05	0.14

Table 88 – Brick Slip Pull Out Results – Test Sample 87.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.31	0.40	88.37
85	0.31	0.37	87.40
85	0.31	0.37	85.93
100	0.37	0.47	101.06
Residual Readings	0.02	0.02	0.35

Table 89 – Brick Slip Pull Out Results – Test Sample 88.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.32	0.39	86.58
85	0.33	0.37	87.30
85	0.33	0.41	86.06
100	0.38	0.47	100.75
Residual Readings	0.05	0.16	0.48

Table 90 – Brick Slip Pull Out Results – Test Sample 89.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.40	0.47	89.75
85	0.40	0.50	88.08
85	0.40	0.39	87.58
100	0.45	0.50	100.48
Residual Readings	0.10	0.10	0.42

Table 91 – Brick Slip Pull Out Results – Test Sample 90.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.48	0.51	86.71
85	0.48	0.52	86.11
85	0.51	0.61	89.19
100	0.62	0.71	104.00
Residual Readings	0.06	0.09	-0.64

Table 92 – Brick Slip Pull Out Results – Test Sample 91.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.33	0.39	86.33
85	0.34	0.40	85.11
85	0.36	0.40	89.30
100	0.40	0.47	103.71
Residual Readings	0.08	0.13	0.49

Table 93 – Brick Slip Pull Out Results – Test Sample 92.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.29	0.29	86.73
85	0.30	0.34	88.38
85	0.31	0.31	89.51
100	0.33	0.37	102.05
Residual Readings	0.03	0.06	-0.18

Table 94 – Brick Slip Pull Out Results – Test Sample 93.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.26	0.25	87.03
85	0.26	0.28	88.18
85	0.30	0.32	87.68
100	0.35	0.45	108.00
Residual Readings	0.01	0.01	0.02

Table 95 – Brick Slip Pull Out Results – Test Sample 94.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.48	0.47	88.38
85	0.49	0.49	86.77
85	0.50	0.58	89.90
100	0.59	0.64	102.53
Residual Readings	0.08	0.19	-0.13

Table 96 – Brick Slip Pull Out Results – Test Sample 95.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.44	0.53	85.10
85	0.52	0.52	86.81
85	0.45	0.46	86.42
100	0.47	0.47	100.84
Residual Readings	0.02	0.07	0.20

Table 97 – Brick Slip Pull Out Results – Test Sample 96.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.28	0.28	86.79
85	0.28	0.28	88.24
85	0.28	0.34	86.02
100	0.35	0.39	107.63
Residual Readings	0.00	0.01	0.07

Table 98 – Brick Slip Pull Out Results – Test Sample 97.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.35	0.36	86.04
85	0.37	0.39	89.03
85	0.38	0.40	87.67
100	0.45	0.47	105.79
Residual Readings	0.01	0.01	-0.04

Table 99 – Brick Slip Pull Out Results – Test Sample 98.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.16	0.30	89.79
85	0.20	0.21	88.71
85	0.19	0.13	86.85
100	0.23	0.40	105.86
Residual Readings	0.01	0.08	0.05

Table 100 – Brick Slip Pull Out Results – Test Sample 99.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.36	0.49	85.26
85	0.37	0.47	86.06
85	0.42	0.55	85.67
100	0.49	0.58	104.83
Residual Readings	0.05	0.05	-0.07

Table 101 – Brick Slip Pull Out Results – Test Sample 100.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.47	0.56	87.07
85	0.51	0.54	85.07
85	0.54	0.57	88.82
100	0.80	0.85	104.36
Residual Readings	0.17	0.21	-0.17

Table 102 – Brick Slip Pull Out Results – Test Sample 101.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.28	0.36	86.14
85	0.28	0.31	85.41
85	0.29	0.40	89.79
100	0.40	0.46	107.72
Residual Readings	0.01	0.02	-0.04

Table 103 – Brick Slip Pull Out Results – Test Sample 102.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.25	0.34	85.11
85	0.27	0.29	87.92
85	0.26	0.33	85.00
100	0.37	0.37	105.04
Residual Readings	0.12	0.14	0.17

Table 104 – Brick Slip Pull Out Results – Test Sample 103.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.28	0.37	85.73
85	0.29	0.39	86.47
85	0.29	0.38	85.31
100	0.37	0.49	104.43
Residual Readings	0.04	0.09	0.06

Table 105 – Brick Slip Pull Out Results – Test Sample 104.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.55	1.01	89.82
85	0.52	1.01	86.12
85	0.53	1.03	88.98
100	0.63	1.08	105.71
Residual Readings	0.07	0.27	0.50

Table 106 – Brick Slip Pull Out Results – Test Sample 105.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.57	0.70	86.12
85	0.59	0.72	88.72
85	0.59	0.75	86.35
100	0.63	0.80	103.05
Residual Readings	0.00	0.00	-0.09

Table 107 – Brick Slip Pull Out Results – Test Sample 106.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.31	0.30	89.62
85	0.30	0.29	85.10
85	0.31	0.29	87.51
100	0.40	0.37	107.49
Residual Readings	0.02	0.07	0.10

Table 108 – Brick Slip Pull Out Results – Test Sample 107.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.42	0.56	86.30
85	0.44	0.57	88.90
85	0.43	0.56	86.77
100	0.52	0.68	105.33
Residual Readings	0.02	0.03	0.02

Table 109 – Brick Slip Pull Out Results – Test Sample 108.

Target Load (N)	Displacement 1 (mm)	Displacement 2 (mm)	Actual Load (N)
85	0.57	0.40	87.82
85	0.57	0.40	87.17
85	0.57	0.40	86.98
100	0.87	0.58	103.81
Residual Readings	0.01	0.01	-0.01

8 APPENDIX - DRAWINGS

The following 5 unnumbered pages are copies of James & Taylor Limited drawings numbered:

- BSS-TRB-GA-001
- BSS-TRB-GA-002
- BSS-TRB-GA-003
- BSS-TR-IBPRC-SK-01
- BSS-TRA-T1

END OF REPORT

\$400

4000

203x203x46 L/C

3010

GROUND LEVEL + 500mm



SALLY TWO, Revised Business Park, 1 off Wilford Road,
Creswick, Surrey KT9 7JY
T. 079 6942 3039 F. 079 6942 3136 E. info@metastats.co.uk
www.liverpoolcity.co.uk

GENERAL NOTES:

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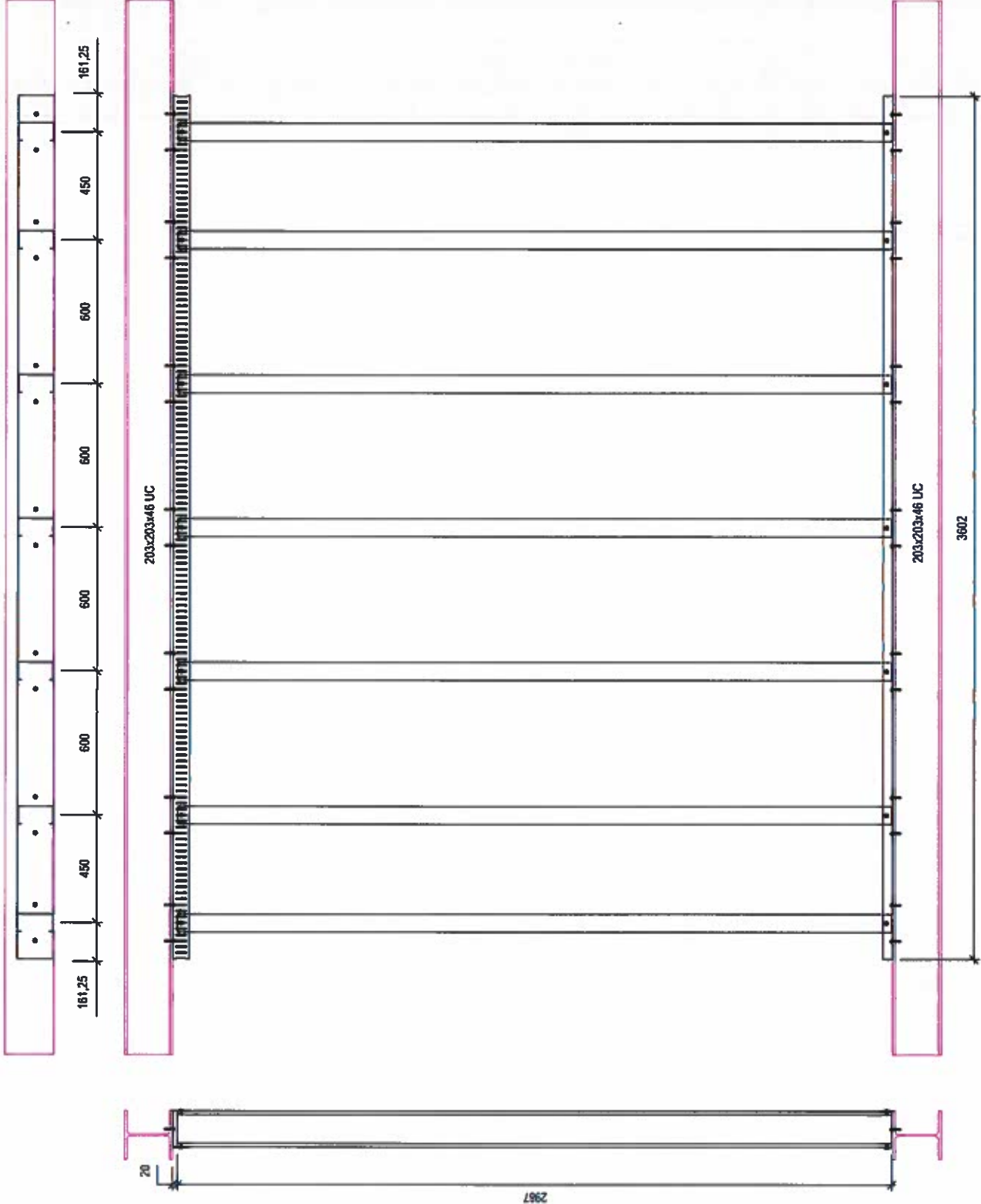
THIS DRAWING IS TO BE READ IN CONJUNCTION
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STEEL FRAMING REQUIREMENT

203x203x46 UC (AS DRAWN)
60x60x6 RSA (AS DRAWN)

REVISIONS:	DATE:
CLIENT:	
JAMES & TAYLOR LTD	
PROJECT:	
BRICK SLIP SYSTEM	
TITLE:	
TEST RIG TYPE B	
GENERAL ARRANGEMENT	
DATE:	
2021/12/33	
DRAWN BY:	
JSC	
CHECKED BY:	
JSC	
PLOT SIZE:	
SCALE:	
1:16	
DRAWING NUMBER:	
88S-TRB-GA-001	
PLOT DATE:	
December 5, 2021	
5:40 PM	
© James & Taylor Ltd 2000	

TEST RIG TYPE B
METSEC BACKING WALL; STUDWORK, BASE, AND HEAD TRACK SETTING OUT/CONFIGURATION



SUITE 1100, BENTLEY BUSINESS PARK, LETCHWORTH ROAD
CHESHAM, Bucks, MK37 7YJ
T: 029 8841 3484 F: 029 838 2038 E: info@jamesandtaylor.co.uk
www.jamesandtaylor.co.uk

GENERAL NOTES:

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METSEC REQUIREMENT

VERTICAL STUDS

150M12-75 (THEORETICAL LENGTH 2987mm) = 7 No.

BASE TRACK

154M12-40 (THEORETICAL LENGTH 3602mm) = 1 No.

HEAD TRACK

154M16-70e (THEORETICAL LENGTH 3602mm) = 1 No.

REVISIONS:

CLIENT: JAMES & TAYLOR LTD

DATE:

PROJECT:

BRICK SLIP SYSTEM

TITLE:

TEST RIG TYPE B

GENERAL ARRANGEMENT

DATE:

03/12/2021

DRAWN BY:

JSC

CHECKED BY:

JSC

SCALE:

1:16

PLOT SIZE:

A3

DRAWING NUMBER:

BSS-TRB-GA-002

REVISION:

PLOT DATE:

December 5, 2021

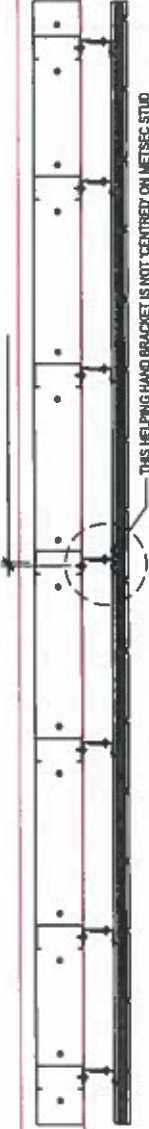
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5:42 PM

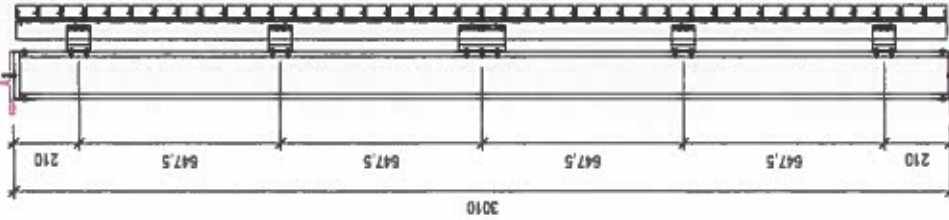
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TEST RIG TYPE B
'HELPING HAND' BRACKET, VERTICAL SUB-STRUCTURE AND BARRACUDA RAIL SETTING OUT/CONFIGURATION

10.5mm OFF STUD CENTRE



203x203x46 UC



203x203x46 UC



SALES & MARKETING
01203 842 2001 • 01203 842 2002 • 01203 842 2003
www.jamesandtaylor.co.uk

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BARRACUDA HORIZONTAL RAIL REQUIREMENT

BAR-R1-1800 = 78 No.
BAR-R2-1800 = 2 No.
BAR-R3-1800 = 2 No.

BARRACUDA VERTICAL RAIL REQUIREMENT

BAR-VL1-2890 = 6 No.
BAR-VT1-2890 = 1 No.

*HELPING HAND' BRACKET REQUIREMENT
N=elopes 80 (ADJUSTMENT RANGE 82mm TO 132mm)

VERTICAL LOAD BEARING HELPING HAND = 7 No.
RESTRAIN HELPING HAND = 28 No.

REVISIONS: DATE:

CLIENT:
JAMES & TAYLOR LTD

PROJECT:
BRICK SLIP SYSTEM

TITLE:
TEST RIG TYPE B
GENERAL ARRANGEMENT

DATE:
03/12/2021

DRAWN BY:
JSC

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JSC

SCALE:
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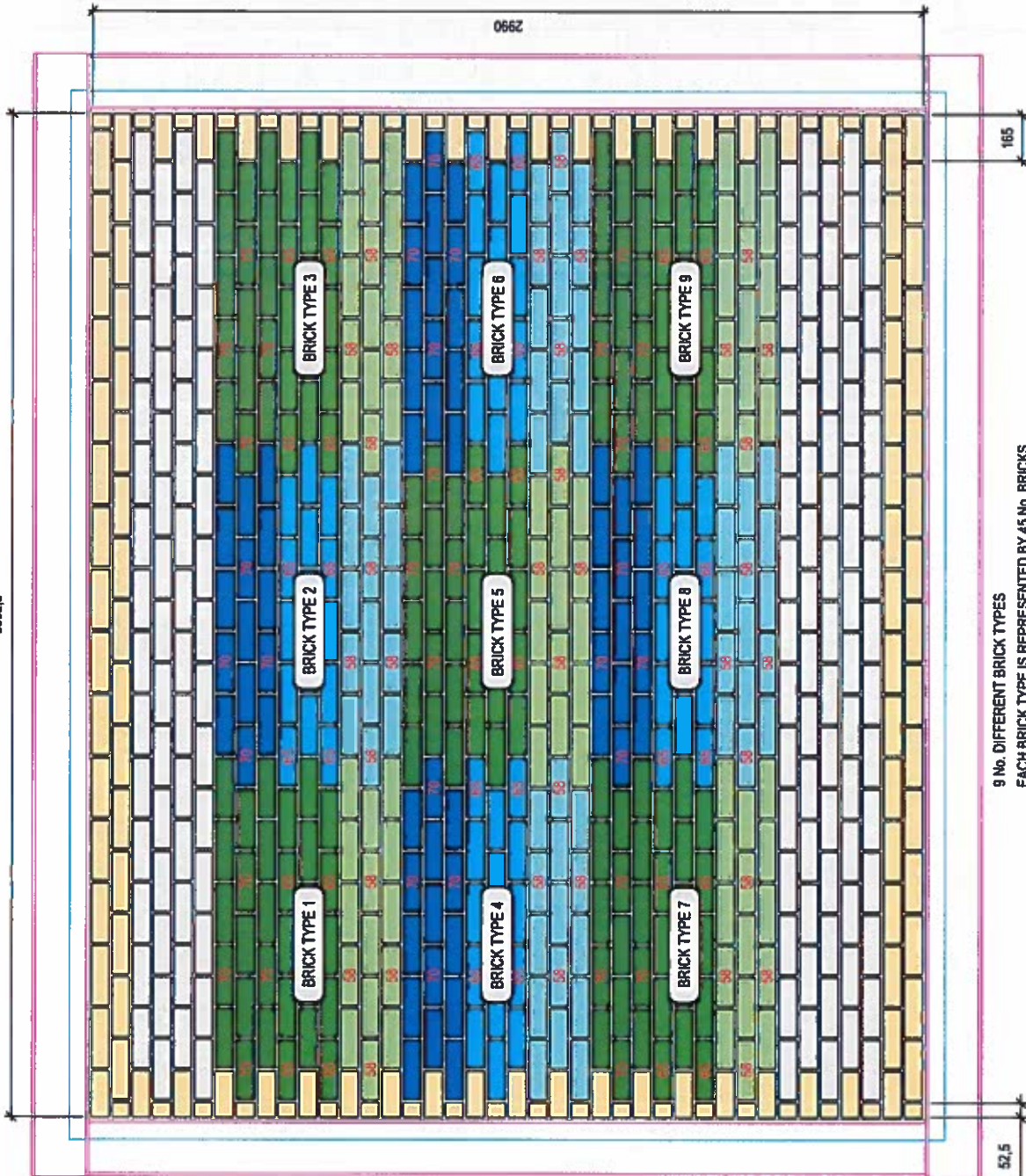
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A3

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BSS-TRB-GA-003

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December 5, 2021 5:45 PM © James & Taylor Ltd 2009

TEST RIG TYPE A - TEST 1 [UNMORTARED BRICK PULL]

3602.5



9 No. DIFFERENT BRICK TYPES
EACH BRICK TYPE IS REPRESENTED BY 45 No. BRICKS
MEDIAN HEIGHT BRICKS = 15 No.
SMALL BRICKS = 4 No. 58mm HIGH AND 11 No. MEDIAN HEIGHT (26.66%)
LARGE BRICKS = 4 No. 70mm HIGH AND 11 No. MEDIAN HEIGHT (26.66%)



JAMES & TAYLOR
SILVER TAD, Darnley Business Park, Leiston Road,
Creighton, Derby S41 7NY
T: 01293 334 111 F: 01293 334 112 E: info@jamesandtaylor.co.uk
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 = BLOCKLEY WINDERMERE GREY SOLID
215mm LONG 'STANDARD' SLIPS = 135 No.

 = WIENERBERGER STAFFORDSHIRE
SMOOTH CREAM

215mm LONG 'STANDARD' SLIPS = 30 No.

165mm LONG 'STANDARD' SLIPS = 38 No.

52mm LONG 'STANDARD' SLIPS = 38 No.

215mm LONG SLIPS WITH 'TOP' REBATE = 15 No.

215mm LONG SLIPS WITH 'BOTTOM' REBATE = 15 No.

165mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

165mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

52mm LONG SLIPS WITH 'TOP' REBATE = 1 No.

52mm LONG SLIPS WITH 'BOTTOM' REBATE = 1 No.

REVISIONS:

CLIENT: JAMES & TAYLOR LTD

DATE:

PROJECT:

BRICK SLIP SYSTEM

TITLE:

TEST RIG TYPE A - TEST 1

UNMORTARED BRICK PULL

DATE:

04/12/2021

DRAWN BY: JSC

CHECKED BY: JSC

SCALE: 1:16

PLOT SIZE: A3

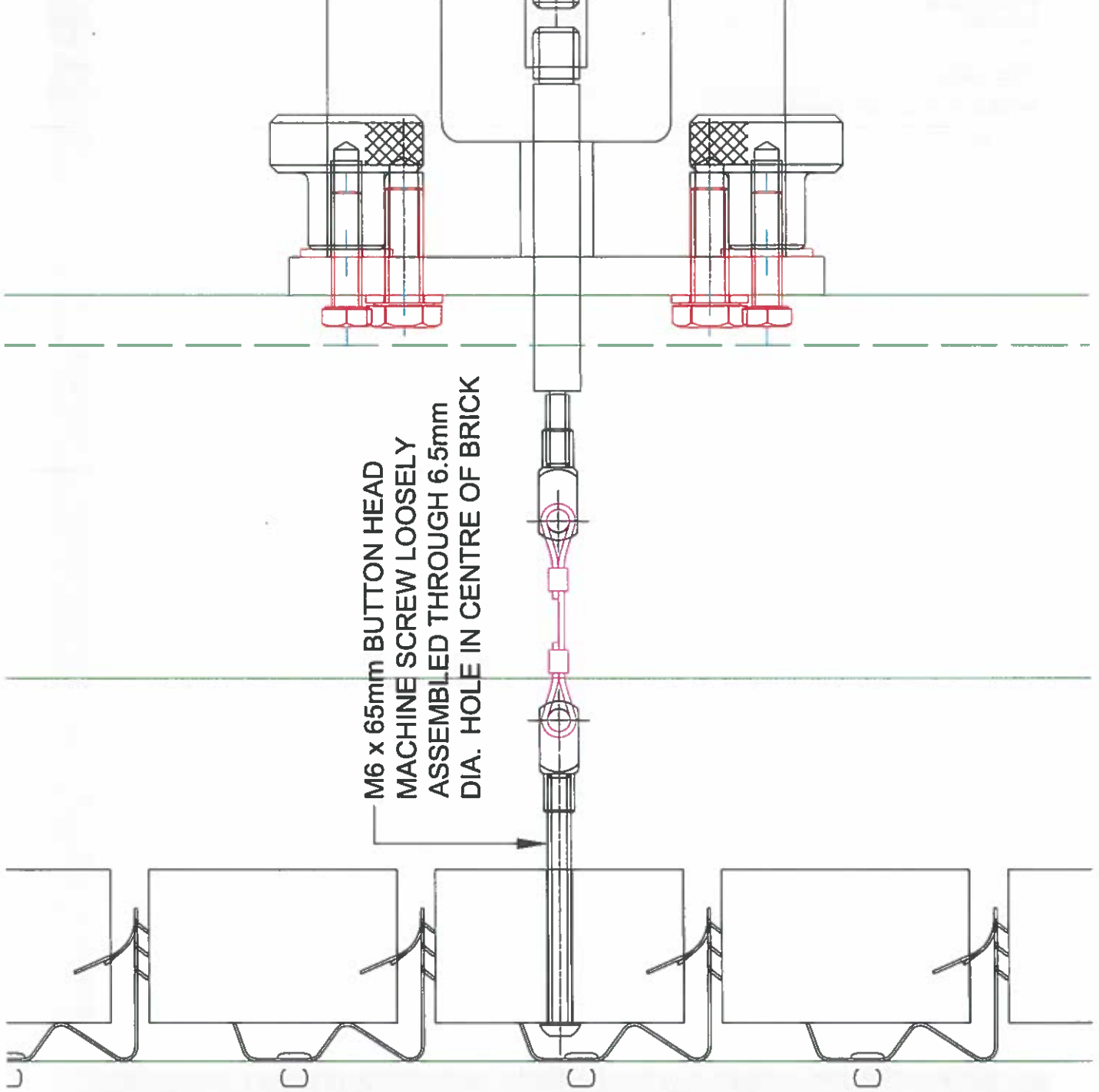
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REVISIONS: DATE:

CLIENT: JAMES & TAYLOR LTD

PROJECT: BRICK SLIP SYSTEM

TITLE: INDIVIDUAL BRICK PULL BRICK CONNECTION CONFIGURATION

DATE: 06/01/2022

DRAWN BY: JSC CHECKED BY: JSC

SCALE: 1:1 PLOT SIZE: A3

DRAWING NUMBER: BSS-TRA-IBPRC-SK-01

PLOT DATE: January 6, 2022 8:39 PM © James & Taylor Ltd 2020



VINCI Technology Centre UK Limited
Stanbridge Road
Leighton Buzzard
Bedfordshire
LU7 4QH
UK

0333 5669000

info@technology-centre.co.uk

www.technology-centre.co.uk

System Laboratories UK LTD
Classification Report
Classification of reaction to fire
performance of construction products and
building elements in accordance with BS
EN 13501-1:2018

System Laboratories UK
LTD
Unit 13
Apex Park
Leighton Road
Leighton Buzzard
LU7 3RE
United Kingdom

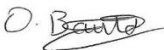
Report Number 775
Issue A
Prepared for James Taylor Ltd.
Date 22/05/2024

Issue	Date	Notes
A	22/05/2024	First issue

Prepared by

Name Oliver Bauld

Position Laboratory Technician

Signature 

Authorised by

Name Asaf Gitarts

Position Laboratory Manager

Date 22/05/2024

Signature 

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1. Introduction

This classification report defines the classification assigned to The Barracuda Brick Slip Support System, in accordance with the procedures given in BS EN 13501-1: 2018.

CLASSIFICATION OF REACTION TO FIRE IN ACCORDANCE WITH BS EN 13501-1: 2018

Sponsor:	James Taylor Ltd.
Prepared for:	James Taylor Ltd.
Place of manufacture:	62 Barwell Business Park, Leatherhead Road, KT9 2NY, UK
CAB Number:	N/A
Classification report No.:	775-A
Date of issue	22/05/2024

This classification report may only be used or reproduced in its entirety.

2. Details of classified product

2.1. General

Classification according to BS EN 13501-1:2018 of The Barracuda Brick Slip Support System.

2.2. Traceability

The test sample was supplied by the sponsor. System Laboratories UK LTD was not involved in the sampling process and therefore cannot comment upon the relationship between the samples supplied for the test and the products supplied to the market.

2.3. Sample details

Test sponsor	James Taylor Ltd. 62 Barwell Business Park Leatherhead Road KT9 2NY UK
Place of manufacture	As above
Trade name	The Barracuda Brick Slip Support System
Sample description (as provided by sponsor)	Brick slip support system
Product data (as provided by sponsor)	
Generic type of product	Brick slip support system
Nominal thickness (mm)	100 mm
Density of core (kg/m ³)	7900 (Stainless Steel) & 2700 (Aluminium)
Mass per unit area (kg/m ²)	8.788
Colour	Metallic
Test face	N/A

Flame retardant added, or N/A
 organic content limited
 during production

Substrate and ventilation conditioned

Substrate N/A
 Type of air gap Any

2.4. Detailed product description

The product is configured as detailed below, front to back.

Horizontal Brick Slip Retention Rail	Type of product/layer	Horizontal Brick Slip Retention Rail
	Product/layer reference	Barracuda Stainless Steel 'Standard' Rail [R1]
	Thickness	40 mm (Projecting leg dimension)
	Colour	Metallic
	Construction form	Riveted to Vertical Rails VL and VT
Horizontal Brick Slip Retention Rail	Type of product/layer	Horizontal Brick Slip Retention Rail
	Product/layer reference	Barracuda Stainless Steel 'Bottom' Rail [R2]
	Thickness	30.75 mm (Projecting leg dimension)
	Colour	Metallic
	Construction form	Riveted to Vertical Rails VL and VT
Horizontal Brick Slip Retention Rail	Type of product/layer	Horizontal Brick Slip Retention Rail
	Product/layer reference	Barracuda Stainless Steel 'Top' Rail [R3]
	Thickness	30.75 mm (Projecting leg dimension)
	Colour	Metallic
	Construction form	Screwed to Vertical Rails VL and VT
Vertical Substructure Rail	Type of product/layer	Vertical Substructure Rail
	Product/layer reference	Barracuda Extruded Aluminium Vertical Rail [VL]
	Thickness	68mm [maximum projecting dimension]
	Colour	Metallic
	Construction form	Screwed to Helping Hand Brackets
Mineral Wool	Type of product/layer	Mineral wool
	Product/layer reference	Mineral wool
	Thickness	Any
	Colour	Green
	Construction form	Friction fit

3. Reports and results in support of this classification

3.1. Reports

Name of laboratory	Name of test sponsor	Test report No.	Test method/field of application
System Laboratories UK	James Taylor Ltd.	773A	BS EN ISO 1182:2020
System Laboratories UK	James Taylor Ltd.	774A	BS EN ISO 1716:2018

3.2. Results

Standard/Decision	Parameter	Number of tests	Results	
			Continuous parameter mean	Compliance with class
				A1
BS EN ISO 1716:2018 (a) Mineral Wool	MJ/kg	3	0.573 MJ/kg	$\leq 2 \text{ MJ/kg}$ Compliant
BS EN ISO 1716:2018 (e) Product as whole	MJ/kg	3	0.117 MJ/kg	$\leq 2 \text{ MJ/kg}$ Compliant
BS EN ISO 1182:2020 Mineral Wool	ΔT	5	7.14 °C	$\leq 30 \text{ °C}$ Compliant
BS EN ISO 1182:2020 Mineral Wool	Δm	5	2.23%	$\leq 50 \%$ Compliant
BS EN ISO 1182:2020 Mineral Wool	t_f	5	No sustained flaming	No sustained flaming Compliant

Note:

Metals were not tested in accordance with BS EN ISO 1716:2018 clause 9.4.1 where all metals are deemed to have a calorific value of 0.

4. Classification and field of application

4.1. Reference of classification

This classification has been carried out in accordance with BS EN 13501-1:2018.

4.2. Classification

The product The Barracuda Brick Slip Support System, in relation to reaction to fire behaviour is classified:

Fire behaviour	Smoke production	Flaming droplets
A1	- s -	, d -

Reaction to fire classification:	A1
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4.3. Field of application

This classification is valid for the following product and mounting and fixing parameters:

Thickness	Any
Colour	Metallic, Green (Mineral Wool)
Composition/build up	Mineral wool can be removed
Density of core	Any
Mass per unit area	Any

5. Limitations

This classification document does not represent type approval or certification of the product.

The laboratory has played no part in sampling of the product.

6. References

BS EN 13501-1:2018 - Fire classification of construction products and building elements

BS EN ISO 1182:2020 - Reaction to fire tests for products — Non-combustibility test

BS EN ISO 1716:2018 – Reaction to fire tests for products — Determination of the gross heat of combustion (calorific value)

-End of Report-