

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



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.



0057

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

© Technology Centre

CONTENTS

1	INTRODUCTION.....	4
2	SUMMARY AND CLASSIFICATION OF TEST RESULTS	5
3	DESCRIPTION OF TEST SAMPLE.....	6
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.

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 – 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

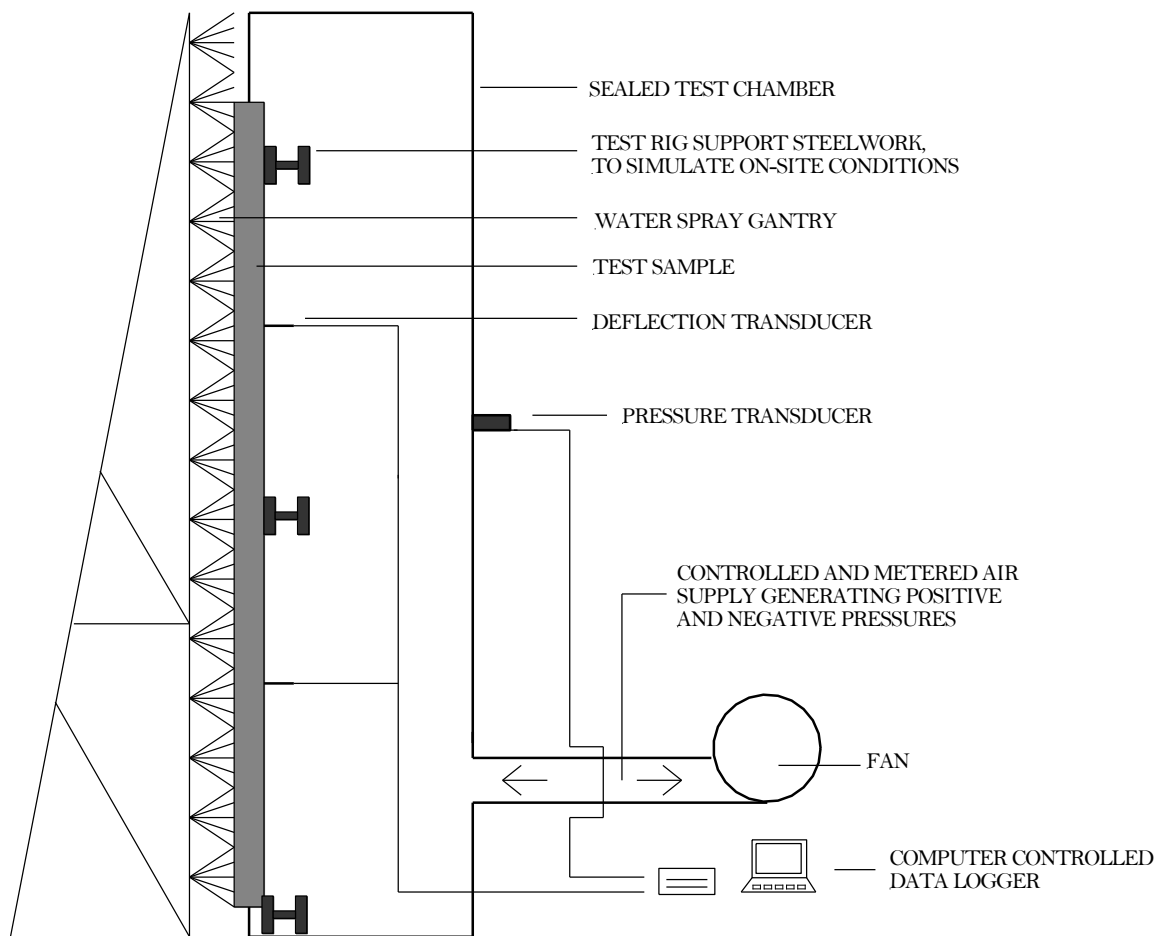


4 TEST RIG GENERAL ARRANGEMENT

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

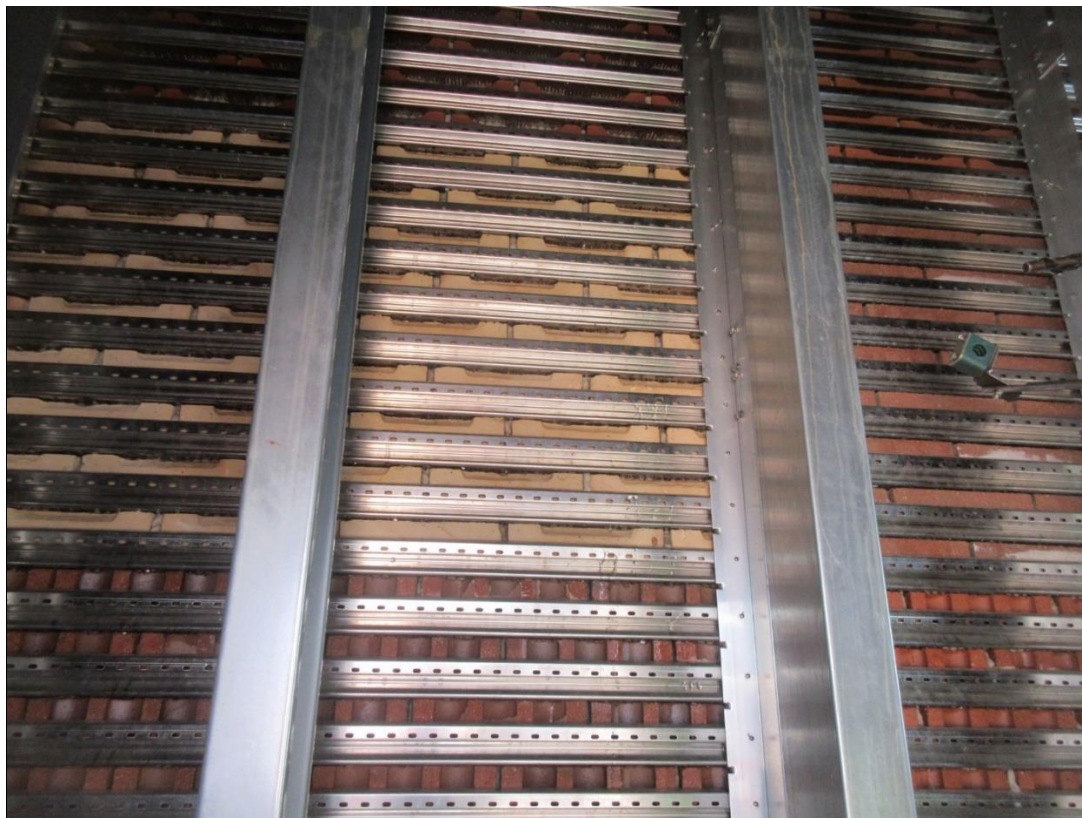


PHOTO 5149

INTERNAL VIEW DURING TEST



PHOTO 5151

INTERNAL VIEW DURING TEST



PHOTO 5152

INTERNAL VIEW DURING TEST

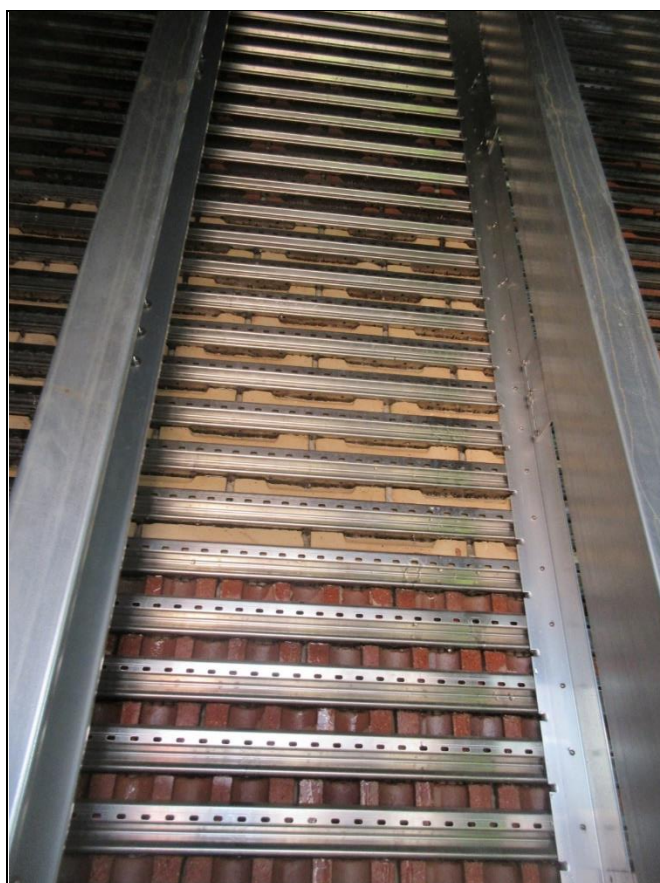


PHOTO 5156

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

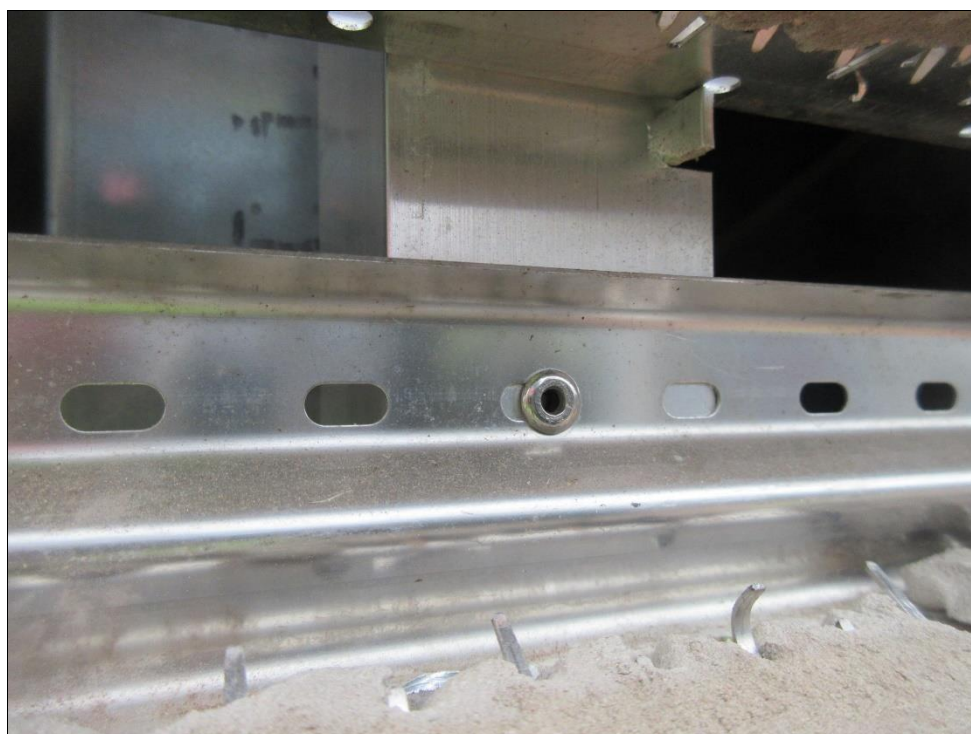


PHOTO 6158

TEST SAMPLE DURING DISMANTLE



PHOTO 6159

TEST SAMPLE DURING DISMANTLE

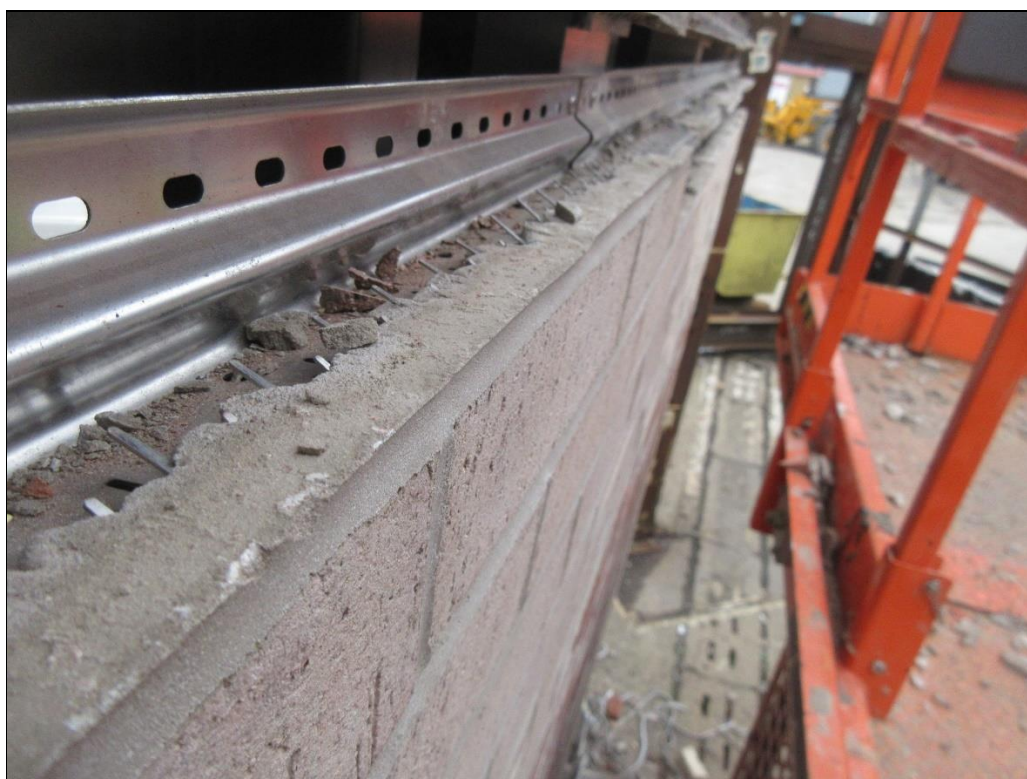


PHOTO 6160

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,

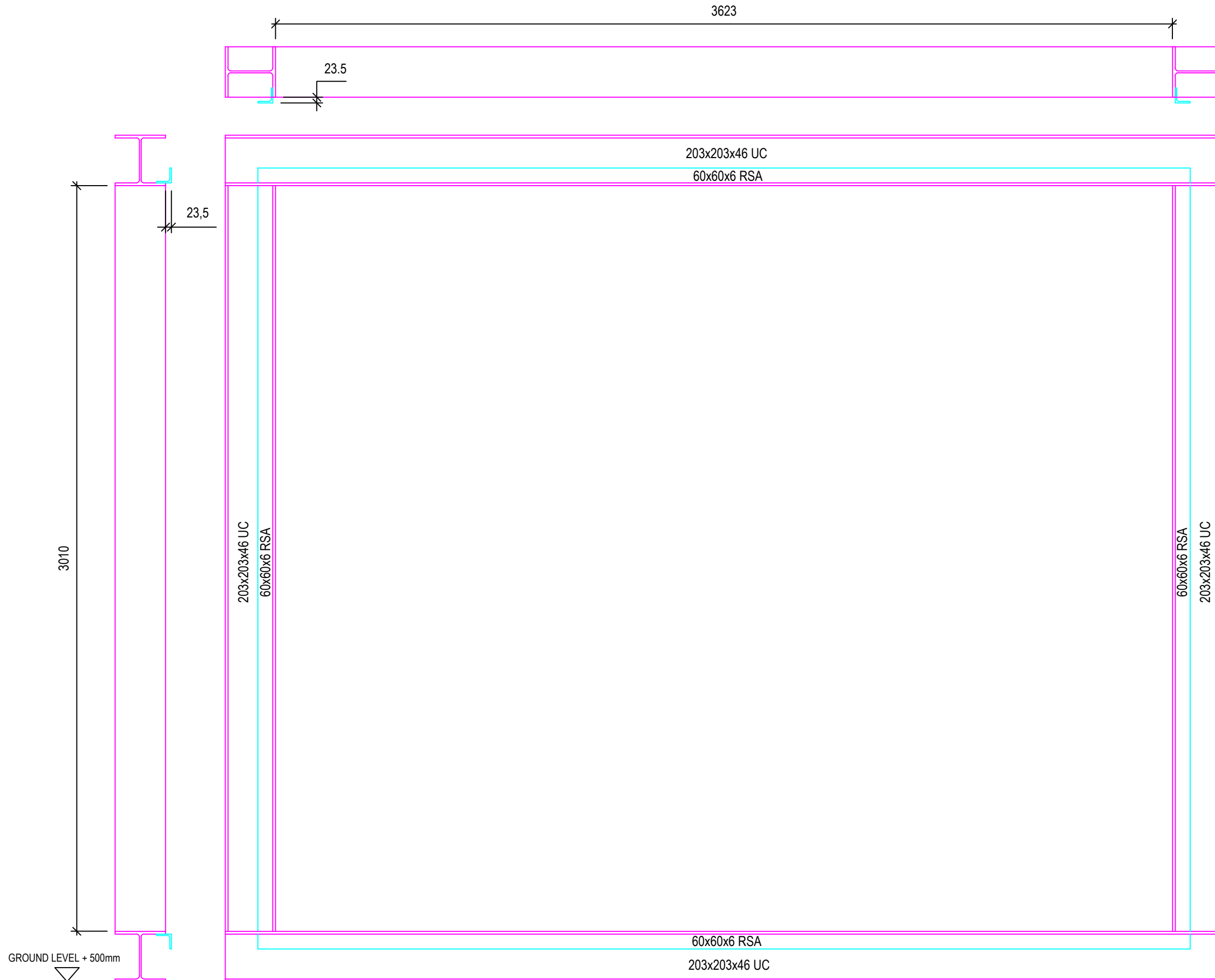
BSS-TRA-GA-002,

BSS-TRA-GA-003,

BSS-TRA-T3.

END OF REPORT

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



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: CHECKED BY:
JSC JSC

SCALE: PLOT SIZE:
1:16 A3

DRAWING NUMBER: REVISION:
BSS-TRA-GA-001

PLOT DATE:
December 5, 2021 5:34 PM © James & Taylor Ltd - 2009

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



GENERAL NOTES:

DO NOT SCALE FROM THIS DRAWING.

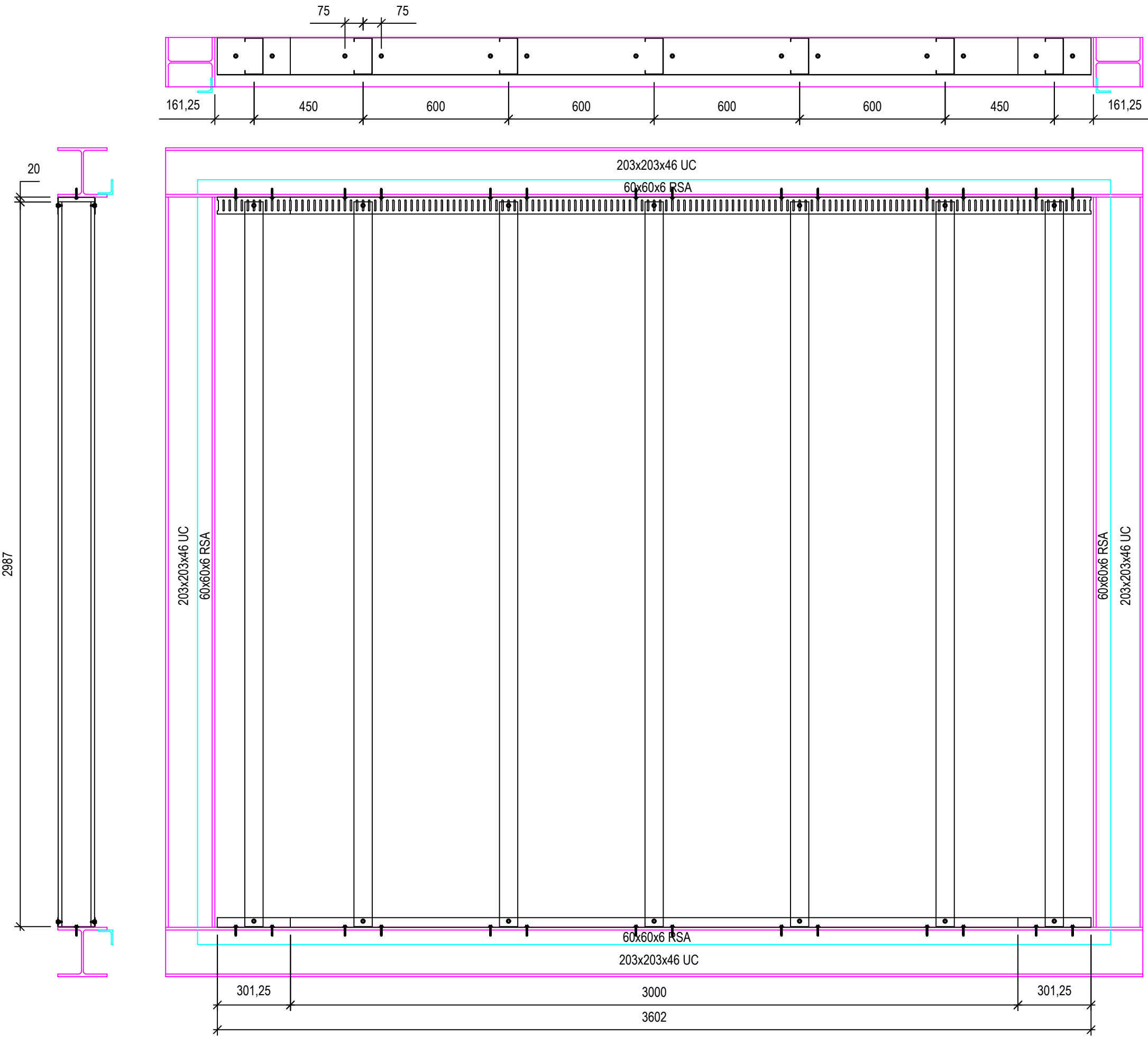
THIS DRAWING IS TO BE READ IN CONJUNCTION
WITH ALL RELEVANT JAMES & TAYLOR,
ARCHITECT'S AND ENGINEER'S DRAWINGS.

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: _____ DATE: _____

CLIENT: _____

JAMES & TAYLOR LTD

PROJECT: _____

BRICK SLIP SYSTEM

TITLE: _____

**TEST RIG TYPE A
GENERAL ARRANGEMENT**

DATE: _____

03/12/2021

DRAWN BY: _____ CHECKED BY: _____

JSC **JSC**

SCALE: _____ PLOT SIZE: _____

1:16 **A3**

DRAWING NUMBER: _____ REVISION: _____

BSS-TRA-GA-002

PLOT DATE: _____

January 16, 2022 6:18 PM © James & Taylor Ltd - 2009

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

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.

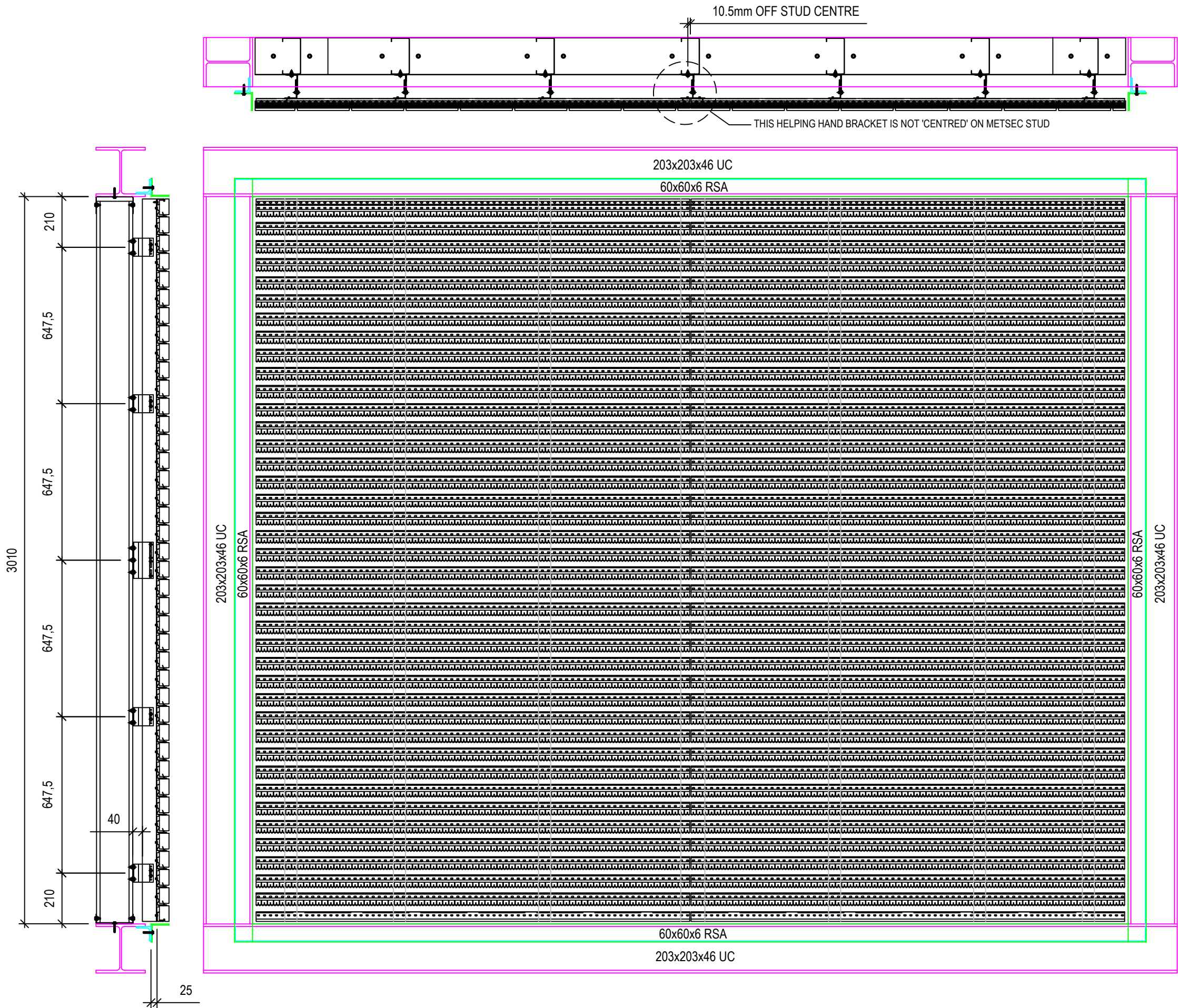
BARRACUDA HORIZONTAL RAIL REQUIREMENT
BAR-R1-1800 = 78 No.
BAR-R2-1800 = 2 No.
BAR-R3-1800 = 2 No.

BARRACUDA VERTICAL RAIL REQUIREMENT
BAR-VL1-2990 = 6 No.
BAR-VT1-2990 = 1 No.

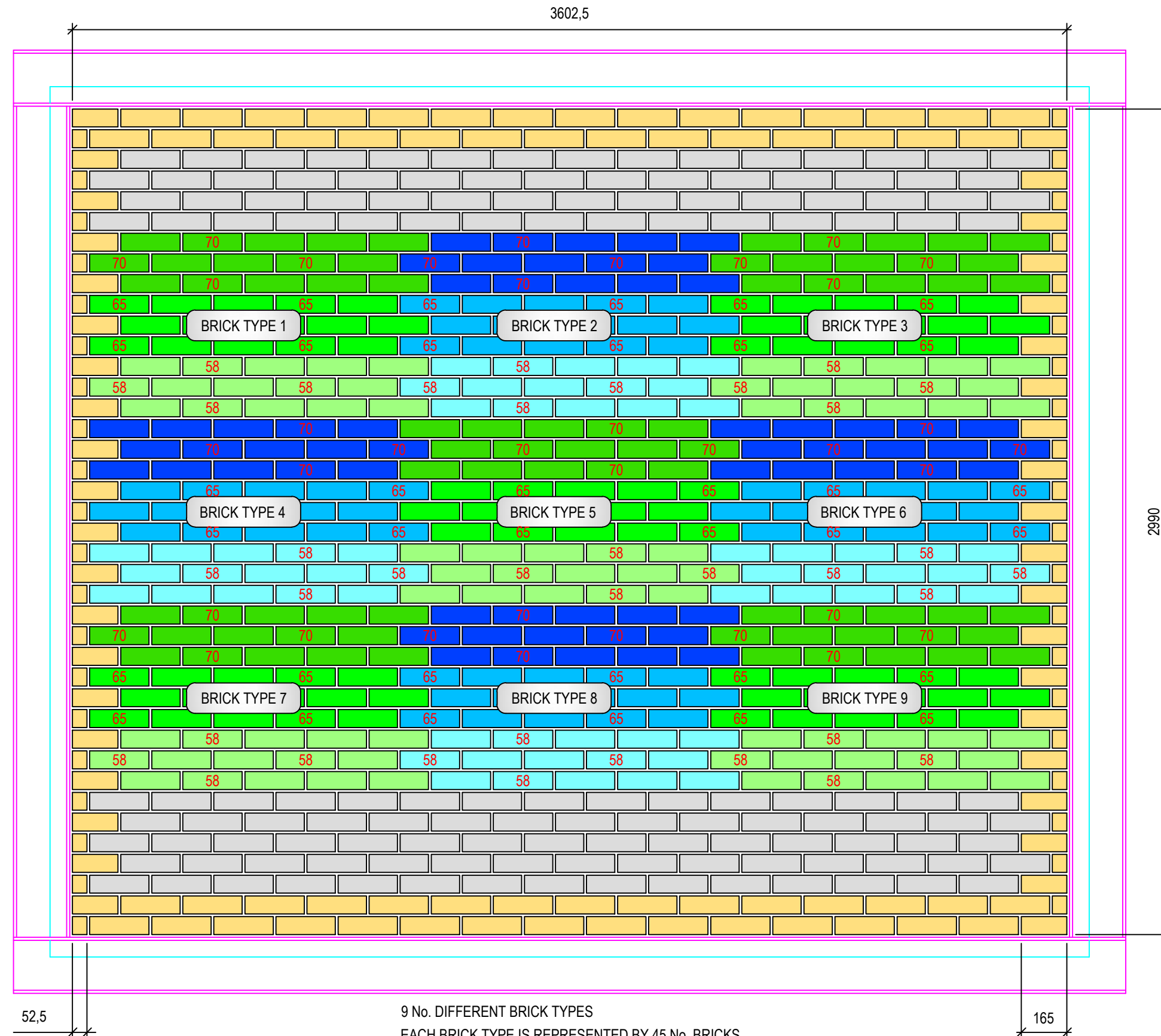
'HELPING HAND' BRACKET REQUIREMENT
Nvelope 90 (ADJUSTMENT RANGE 92mm TO 132mm)

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:	CHECKED BY:
JSC	JSC
SCALE:	PLOT SIZE:
1:16	A3
DRAWING NUMBER:	REVISION:
BSS-TRA-GA-003	
PLOT DATE:	
January 16, 2022	6:56 PM
© James & Taylor Ltd - 2009	



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



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%]

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 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 3 WATER
PENETRATION AND WIND RESISTANCE**

DATE:
04/12/2021

DRAWN BY: **JSC** CHECKED BY: **JSC**

SCALE: **1:16** PLOT SIZE: **A3**

DRAWING NUMBER: **BSS-TRA-T3** REVISION: _____

PLOT DATE:
December 5, 2021 5:39 PM © James & Taylor Ltd - 2009



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