TECHNOLOGY CENTRE

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

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Checked by: N. McDonald – Manager

Authorised by: S. R. Moxon – Operations Director

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

UKAS TESTING
0057

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CONTENTS

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

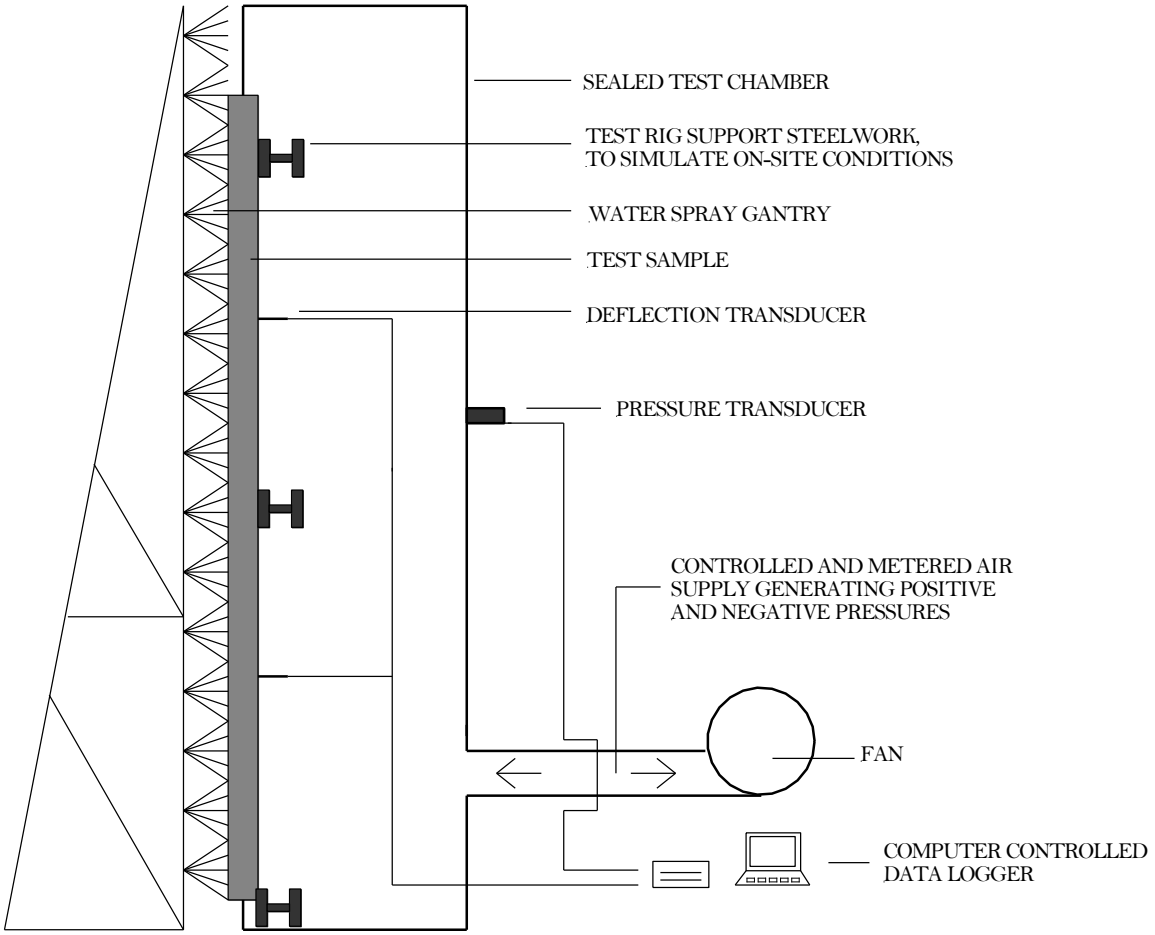
TEST SAMPLE ELEVATION

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/m^2/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

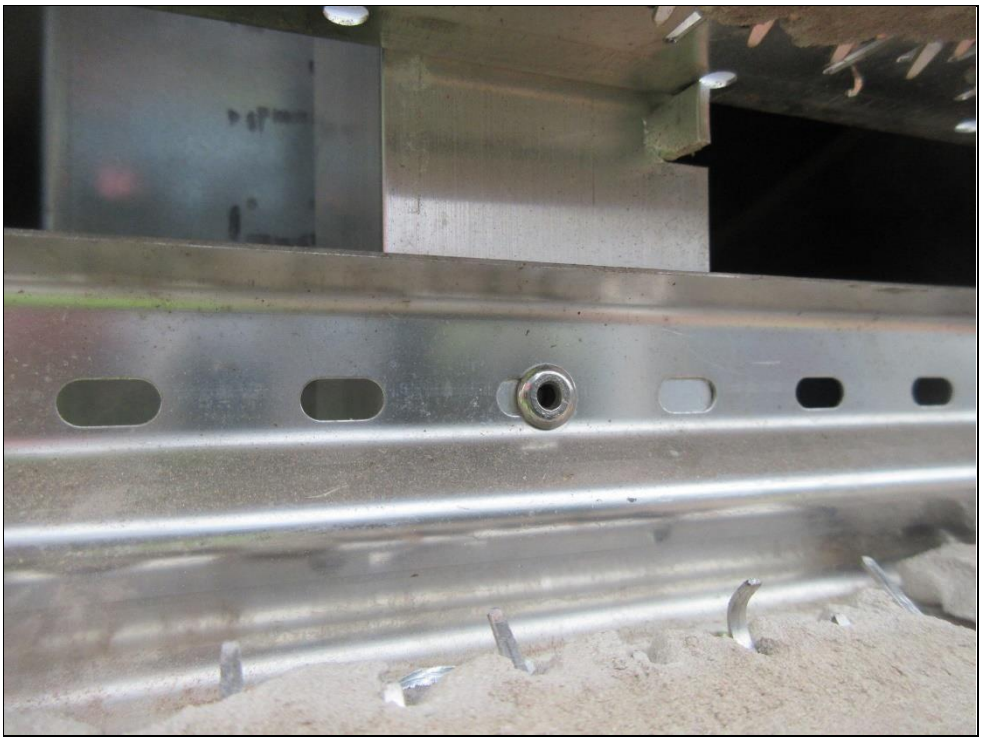


PHOTO 6158

TEST SAMPLE DURING DISMANTLE

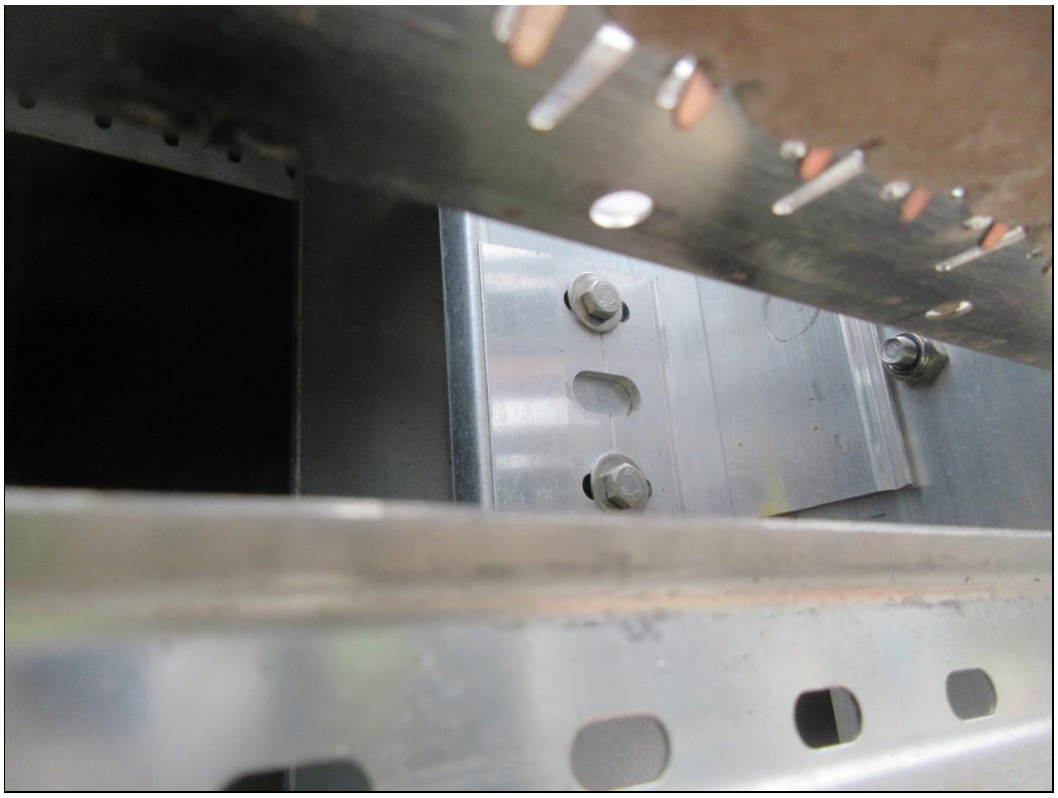


PHOTO 6159

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,

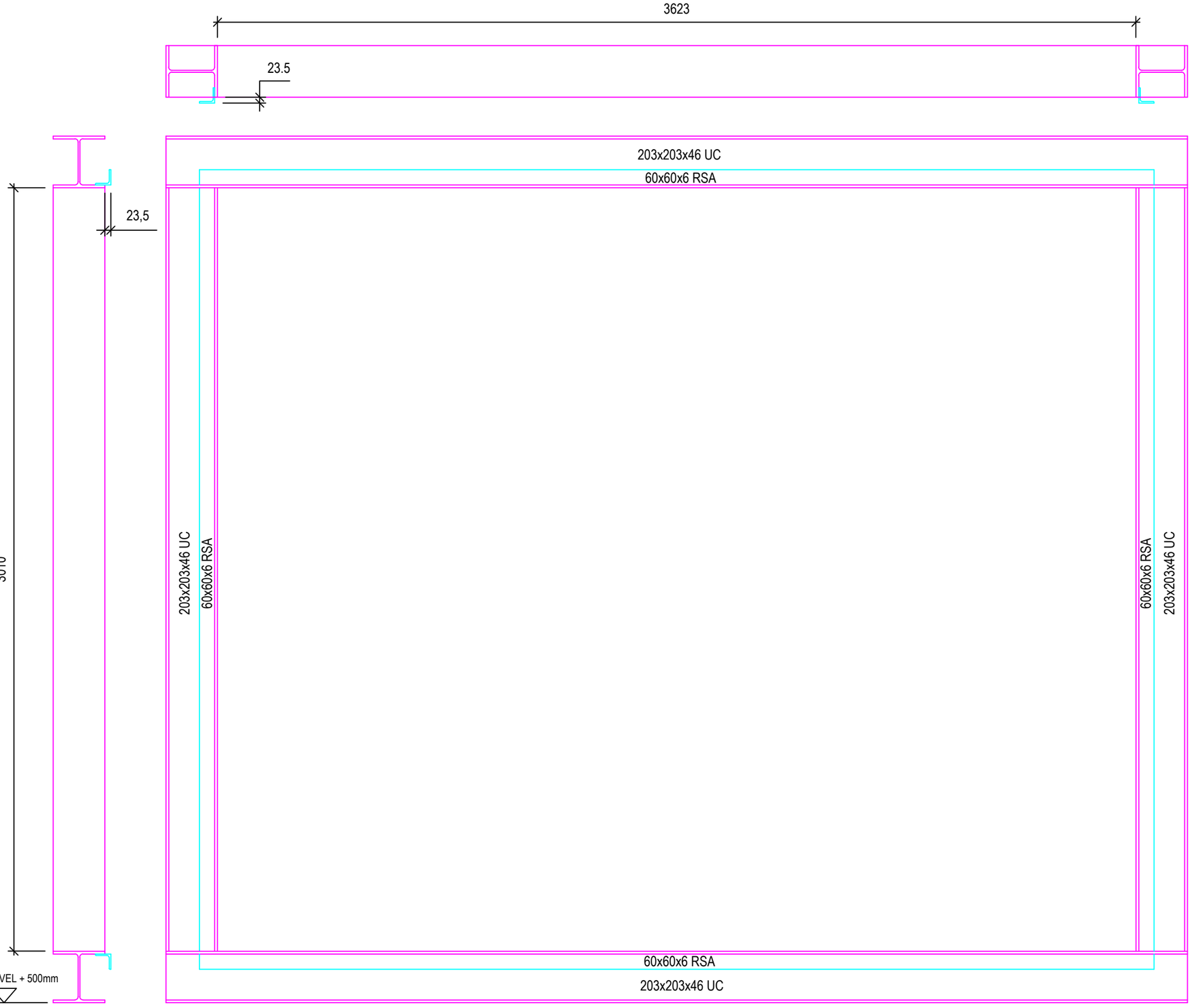
BSS-TRA-GA-002,

BSS-TRA-GA-003,

BSS-TRA-T3.

END OF REPORT

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



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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

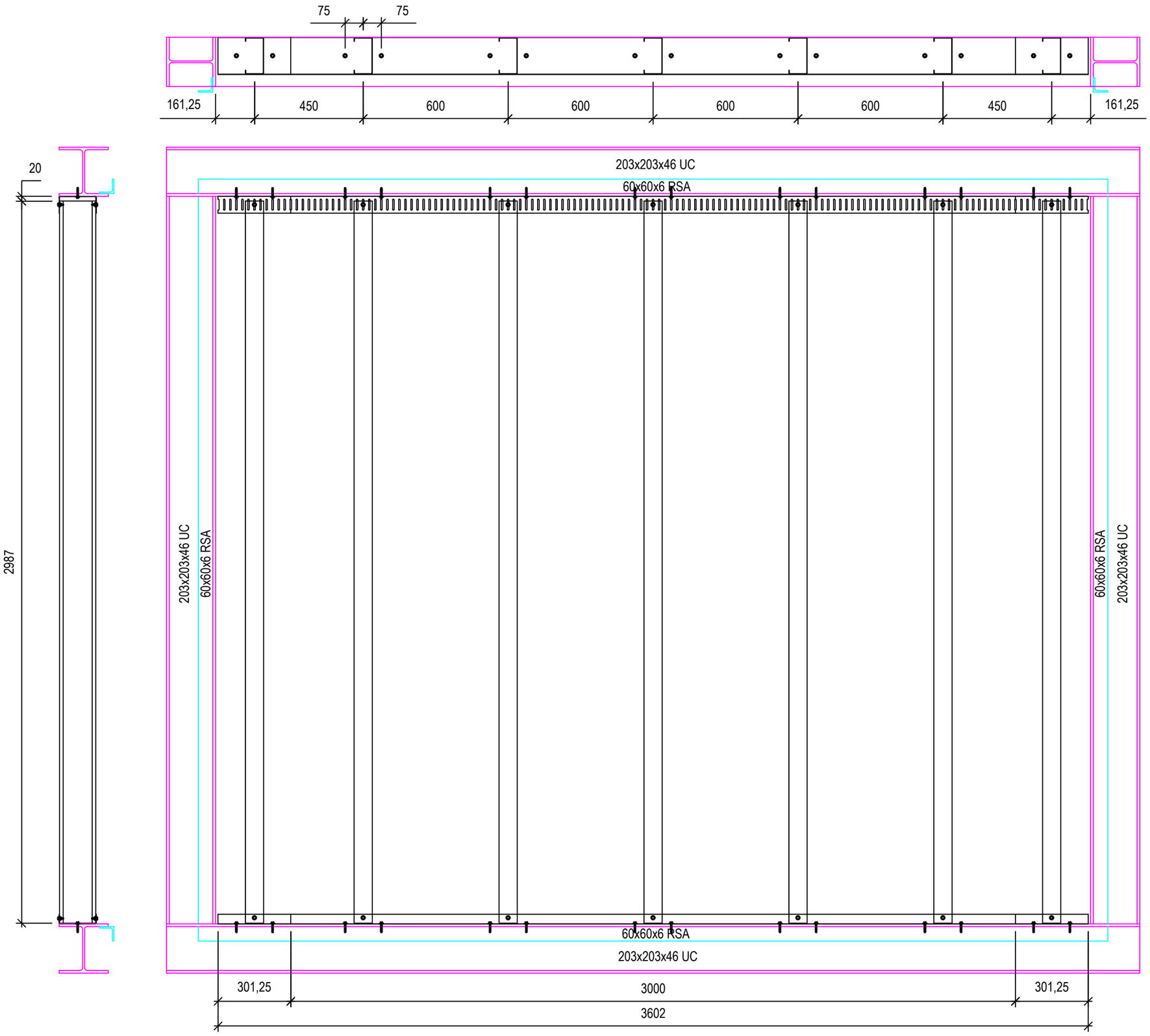
DRAWN BY: JSC
CHECKED BY: JSC

SCALE: 1:16
PLOT SIZE: A3

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

PLOT DATE:
December 5, 2021 5:34 PM

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



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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: DATE:

CLIENT:
JAMES & TAYLOR LTD

PROJECT:
BRICK SLIP SYSTEM

TITLE:
TEST RIG TYPE A
GENERAL ARRANGEMENT

DATE:
03/12/2021

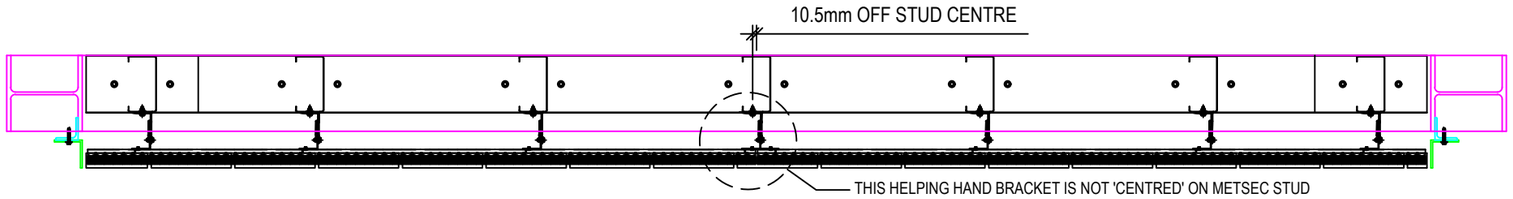
DRAWN BY: JSC
CHECKED BY: JSC

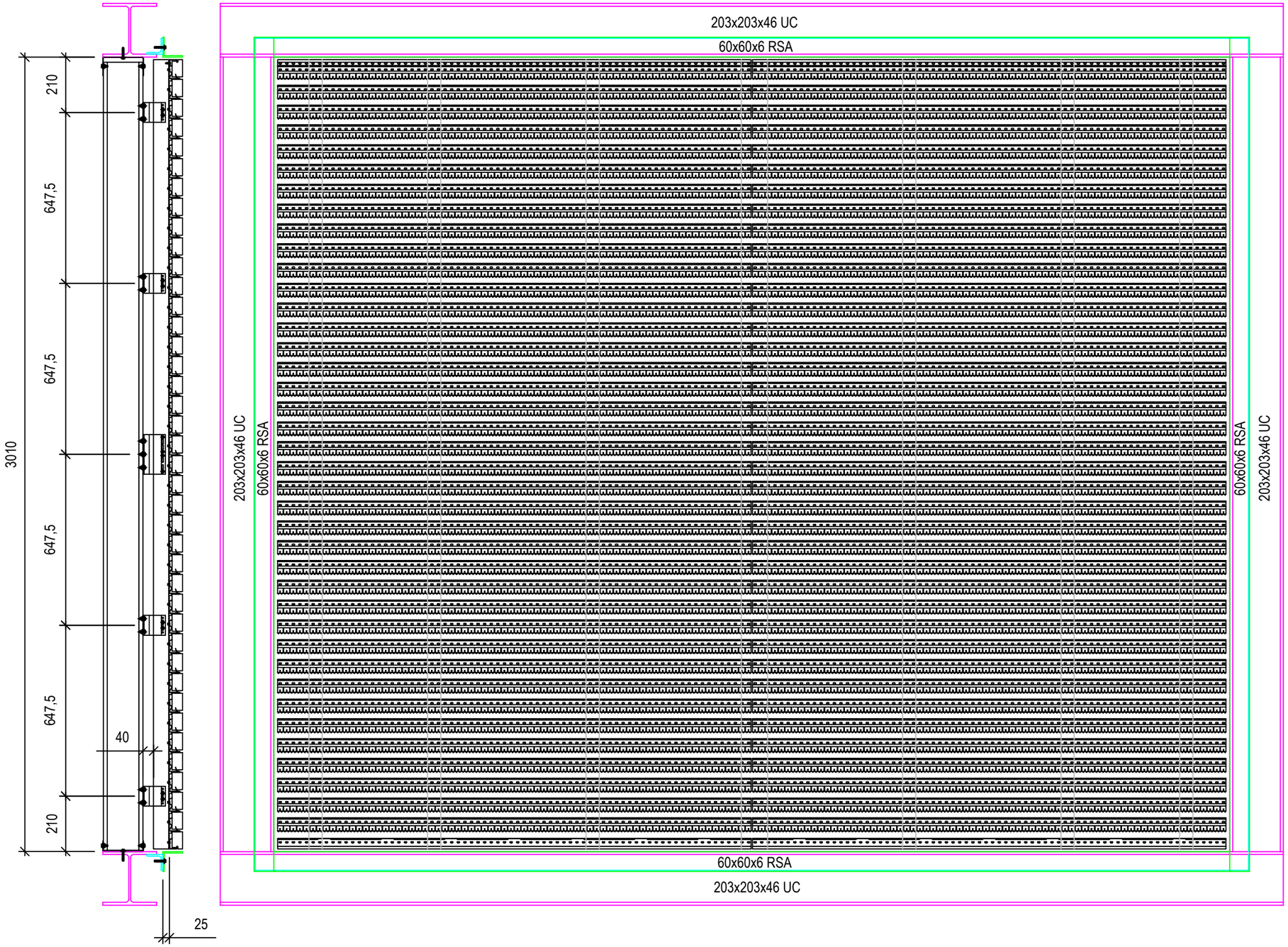
SCALE: 1:16
PLOT SIZE: A3

DRAWING NUMBER: BSS-TRA-GA-002
REVISION:

PLOT DATE:
January 16, 2022 6:18 PM

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





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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
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

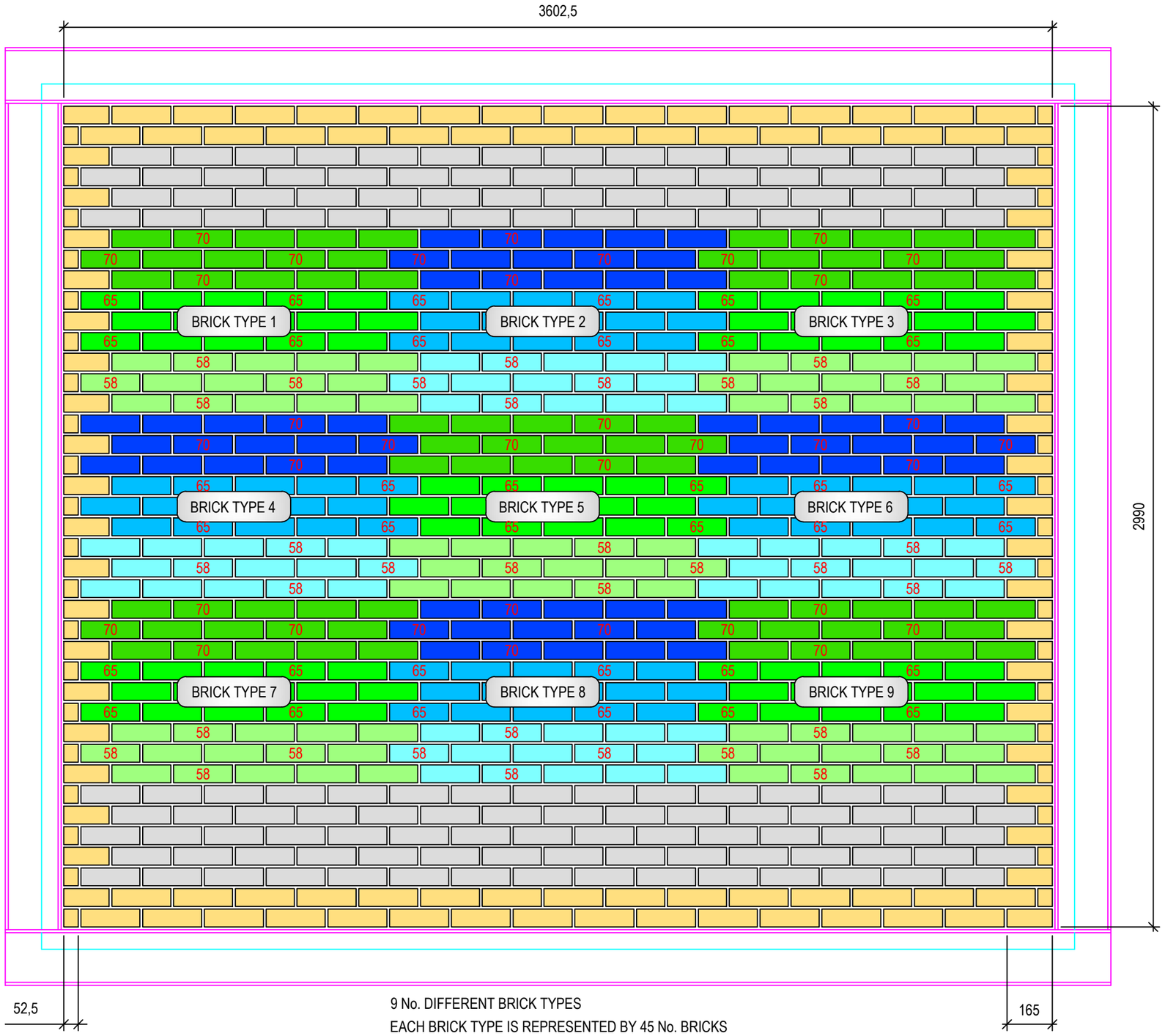
DRAWN BY: JSC
CHECKED BY: JSC

SCALE: 1:16
PLOT SIZE: A3

DRAWING NUMBER: BSS-TRA-GA-003
REVISION:

PLOT DATE:
January 16, 2022 6:56 PM

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%]

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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: 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

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