Warehouse Concrete Floor (ABS)

Contents

ABS
George Baker
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Dane Road Industrial Estate
Dane Road
Sale
Cheshire
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0161 972500

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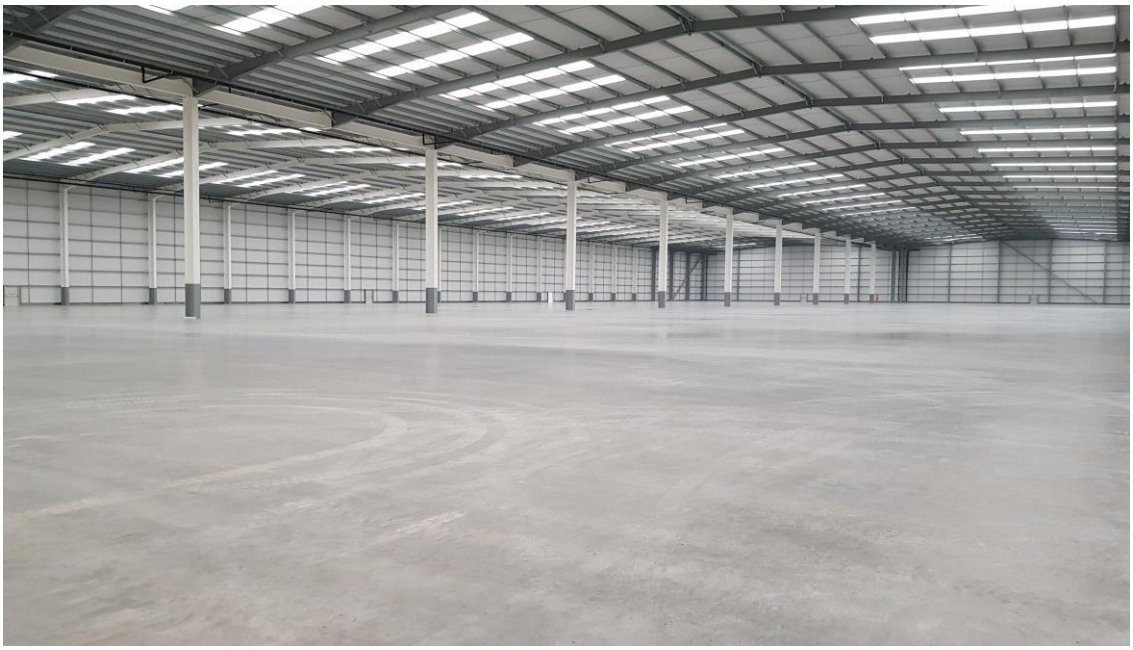
Scope of Works

winvic

winvic.co.uk

DOCUMENT REF	00001
ABS PROJECT NO	B2354
CLIENT	WINVIC CONSTRUCTION LTD
PROJECT	PLOT 3 WINGATES
LOCATION	BOLTON



DOCUMENT REF 00001
ABS PROJECT NO B2354
CLIENT WINVIC CONSTRUCTION LTD
PROJECT PLOT 3 WINGATES
LOCATION BOLTON

CONTENTS

DOCUMENT REF	00001
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SECTION 1 - SCOPE OF WORKS & BRIEF DESCRIPTION

ABS Brymar floors were contracted to design & install the ground floor concrete slab for the project in Bolton

The floor slabs were cast in large bay format utilising Somero laser screed technology over a period of 4 days in April 2024.

The floor slab consists of a 175mm deep slab of well graded C32/40 concrete laid onto a 2000g polythene membrane which has been lapped and taped using 75mm proprietary tape. The slab has 1 layer of A142 mesh reinforcement throughout which is positioned 40mm from the bottom of the slab.

All areas of the slab were treated with a spray applied curing and sealing agent.

All joints within the slab have been sealed using a polysulphide sealant as part of ABS Brymar's contracted works.

The brief design statement on the as built drawings & the design calculations enclosed within this document should be consulted to ascertain the loading capacity of the slab.

The engineer's information within the O&M file should be consulted to ascertain the loading capacity of the slab.

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ABS PROJECT NO	B2353
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PROJECT	PLOT 3 WINGATES
LOCATION	BOLTON

SECTION 2 - OPERATION & USE

The floor slab on this project has primarily been designed to support the loads placed upon it & to provide a working platform for personnel and operational vehicles to function in a safe manner.
Concrete floors are not maintenance free & to remain in a safe and serviceable condition the concrete slab will require regular inspections and maintenance.
Maintenance includes regular cleaning, re-filling of joints, repairs to damaged joints edges and surface repairs to damaged or worn areas, failure to adhere to a strict cleaning and maintenance regime will result in higher long-term maintenance & repair costs.
ABS Brymar Floors Ltd recommend that a thorough inspection of the floor is carried out periodically on at least a 3-monthly cycle, together with a cleaning regime and inspection of joints, carried out on a more regular basis.
Floor slabs can vary significantly in their construction and whilst it is not important for the "end user" to understand the design of the floor it may be helpful to understand the construction techniques and the terminology used later in this document.

The following pages within this section have been compiled as a first point of reference & guidance for building owners & tenants regarding their floor slab, its construction & ongoing inspection & maintenance.

Design Loadings & Setting Out of Racking / Equipment

The magnitude and location of high bay racking, elevated mezzanine floors and equipment supported on the slab must be installed fully in accordance with the design parameter documented on the design drawings and calculations taking full recognition of maximum loads and spatial requirements away from floor joints.

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Introduction

Concrete slabs are constructed from natural elements e.g.: - cement and gravel materials and as such are affected like any other natural element by volumetric changes associated with contraction and expansion due to climate and ambient temperature changes.

Your floor slabs incorporate reinforcement which consists of steel fabric reinforcement to control expansion and contraction. Reinforcement together with appropriately designed construction joints help to minimise the affects of early drying shrinkage, thermal effects and provide structural integrity to the slab to support equipment/material loads applied to the floor.

The floor slab will incorporate construction joints as follows: -.

Contraction Joints are formed using proprietary steel armoured joints.

"Sawn Induced Joints" approximately 3 mm wide installed at 5m to 6m centres. Sawn joints are positioned between the more widely spaced Contraction Joints as described above. The visible edges of floor joints at the surface of the slab are called "edge arises".

Certificates/Warranties/Guarantees

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

WARRANTIES

For all matters regarding slab warranty documents please contact ABS Brymar Floors on the general office telephone number 01619725000 or email general@absbrymarfloors.co.uk

EMERGENCY CONTACT INFORMATION

In the unlikely event of emergency or for any further information or clarification please contact ABS Brymar floors on Tel No 01619725000, or email General @absbrymarfloors.co.uk

ABS BRYMAR ADDRESS

ABS Brymar floors ltd
Unit 40 Drumhead road
Chorley North Ind Estate
Chorley
Lancashire
PR6 7BX

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PROJECT	PLOT 3 WINGATES
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SECTION 7 - WARRANTY/TEST /COMPLIANCE CERTIFICATES

7.1 WARRANTY

For all matters regarding slab warranty documents please contact ABS Brymar Floors on the general office telephone number 0161 9725000 or email general@absbrymarfloors.co.uk.

7.2 TEST /COMPLIANCE CERTIFICATES

See enclosed documents:

1) Floor Tolerance Survey
2) Slab Calculation Sheet
3) Abrasion Tests (where requested)
4) Concrete Cube Tests Results (where requested)- These are getting chased currently and will be forwarded once received and this document reissued with the results attached

Note: - All concrete is supplied in accordance with EN206. The additional requirement to carry out independent testing and testing certificates is subject to the main contractors' requirements (where requested).

FACE CONSULTANTS LTD
Global Flooring Consultants

FREE MOVEMENT SURVEY REPORT

For Floor Classification FM2

PROJECT REFERENCE: FS/24/1635

APRIL 2024

ABS Brymar Floors
at
C/o Winvic Construction
Wingates Industrial Estate
Bolton
BL5 3XH

ABS BRYMAR FLOORS

CoGri GROUP

Superior Floor Technology

design > consultancy > Q.A. > surveying > testing

TABLE OF CONTENTS

ABS BRYMAR FLOORS| BOLTON

CONTRACT DETAILS

ABS BRYMAR FLOORS| BOLTON

BRIEF:

To conduct a Free Movement Survey to check compliance with the FM2 flatness and levelness classification.

APPOINTED BY:

George Baker
ABS Brymar Floors

SITE ADDRESS:

C/o Winvic Construction
Wingates Industrial Estate
Bolton
BL5 3XH

FLOORING CONTRACTOR:

ABS Brymar Floors

SURVEY DATES:

16/04/2024

FREE MOVEMENT SURVEY METHOD:

PROPERTY F
Property F readings were recorded using the Face Digital Property II Meter.

PROPERTY E
Property E readings were recorded using an Engineers Precise Level, PPM and Invar Staff.

LEVEL TO DATUM
Level to datum readings were recorded using an Engineers Precise Level, PPM and Invar Staff.

FLATNESS CLASSIFICATION:

The Free Movement area has been surveyed for compliance with the FM2 classification defined by table 3.1 of the Fourth Edition of the Concrete Society's Technical Report Number 34.

FM2 Property E permissible 95th percentile limit: 6.5mm

FM2 Property F permissible 95th percentile limit: 2.0mm

FM2 Level to datum maximum limit: +/-15mm

DESCRIPTION OF WORKS

ABS BRYMAR FLOORS| BOLTON

DETAILS:

The floor was tested for Properties E & F by setting out a 3-metre grid over the Free Movement area. Level readings were taken at the intersection points of the 3 metre grid lines (see survey plan in this report) and the differences in elevation between adjacent intersection points have been calculated to determine compliance with Property E.

Property F readings were measured using the Face Digital Property II Meter.
Property F data is available in Annex A of this report upon request.

ENVIRONMENTAL CONDITIONS:

Building Conditions - Incomplete
Floor Conditions - Debris/Materials/Plant
Weather Conditions - Exposed to Wind
Lighting Conditions - Good

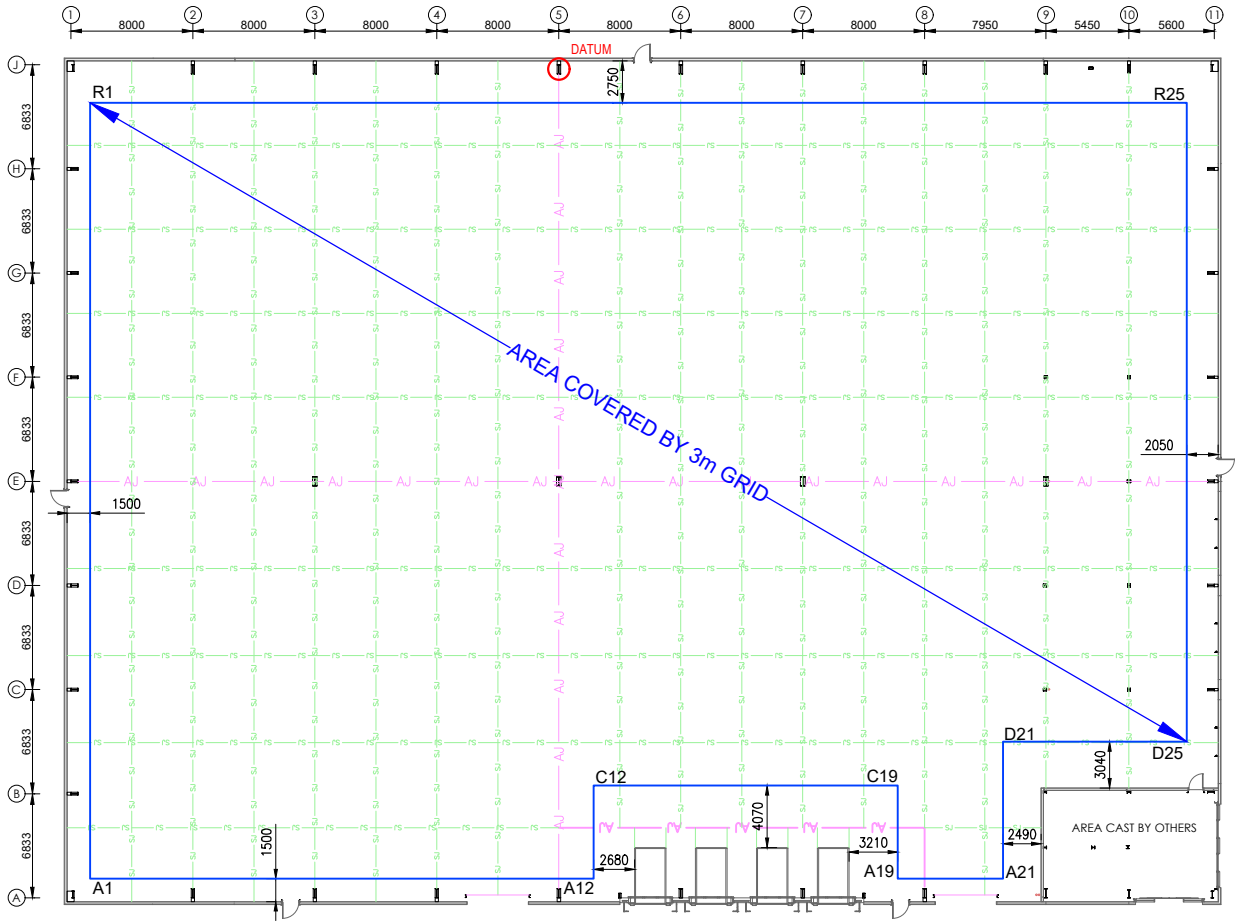
PROPERTY II METER SERIAL NUMBERS:

P2B 047

SURVEY PLAN

ABS Brymar Floors
at
C/o Winvic Construction
Wingates Industrial Estate
Bolton
BL5 3XH

ALL PERIMETER WALLS ARE EXTERNAL UNLESS STATED OTHERWISE



Notes:

Datum +1.4m FFL on column near R11 on 3m grid

AJ Armoured Joint

SJ Saw Joint

Site Address:	Winvic Construction Wingates Industrial Estate Bolton BL5 3XH	Drawing No:	FS.24.1635.FM
		Survey Date:	APRIL 2024
Client:	ABS BRYMAR FLOORS LTD.	Scale A4:	NTS
Drawing Title:	Free Movement Survey Plan	Drawn:	RT

FACE CONSULTANTS LTD
Global Flooring Consultant

Dene House,
North Road, Kirkburton,
Huddersfield
HD8 0RW
www.face-consultants.com

PROPERTY F

LOCATION OF SURVEY RUNS

ABS Brymar Floors
at
C/o Winvic Construction
Wingates Industrial Estate
Bolton
BL5 3XH

Property II Meter File Name:		1635ABSBolton	
42m			
Run Number	**Run Location**	**Run Number**	**Run Location**
1	D2 – R2	7	D25 – D11
2	R5 – D5	8	H16 – H2
3	D9 – R9	9	L2 – L16
4	R13 – D13	10	N11 – N25
5	D18 – R18	11	P25 – P11
6	R21 – D21	12	R16 – R2

PROPERTY F

SUMMARY OF RESULTS

ABS Brymar Floors
at
C/o Winvic Construction
Wingates Industrial Estate
Bolton
BL5 3XH

Summary of Results

Job Name:	1635ABSBolton	**Job Number:**	FS241635
Location:	Bolton	**Date:**	2024-04-16
Surveyor:	AM	**Device Serial:**	P2B047

Specification	Description	Limit
FM2 4th Edition	95th Percentile	2.00 mm

95th Percentile Limit	Achieved	Pass/Fail
2.0	1.7	Pass

PROPERTY E

RESULTS

ABS Brymar Floors
at
C/o Winvic Construction
Wingates Industrial Estate
Bolton
BL5 3XH

FS.24.1635 - ABS Brymar, Wingates Industrial Estate, Bolton, FM2 (TR34 4th Edition), Property E

Property E	Ref		A		B		C		D		E		F		G		H		I		J		K		L		M		N		O		P		Q		R	
			0m		3m		6m		9m		12m		15m		18m		21m		24m		27m		30m		33m		36m		39m		42m		45m		48m		51m	
Reduced Reading	1	0m	COL		VOID		COL		-0.7		COL		-1.5		COL		-2.1		VOID		COL		-1.2		COL		-4.6		COL		-0.2	-1.7	-1.9		COL		VOID	
Diff. In Elev.									-2.7				-1.3				0.5						-3.7				-1.4				-7.6		-2.8					
	2	3m	-2.7	0.1	-2.6	-0.7	-3.3	-0.1	-3.4	-1.3	-4.7	1.9	-2.8	-0.5	-3.3	1.7	-1.6	-1.8	-3.4	0.5	-2.9	-2.0	-4.9	-0.7	-5.6	-0.4	-6.0	1.3	-4.7	-3.1	-7.8	3.1	-4.7	0.1	-4.6	0.5	-4.1	
					-1.2		1.2		-1.2		0.8		0.3		-3.8		-0.8		-0.2		-0.6		0.4		-1.3		2.7		0.9		2.7		2.3		3.0		3.0	
	3	6m	COL		-3.8	1.7	-2.1	-2.5	-4.6	0.7	-3.9	1.4	-2.5	-4.6	-7.1	4.7	-2.4	-1.2	-3.6	0.1	-3.5	-1.0	-4.5	-2.4	-6.9	3.6	-3.3	-0.5	-3.8	-1.3	-5.1	2.7	-2.4	0.8	-1.6	0.5	-1.1	
					-0.4		-2.2		1.3		-1.7		-1.1		3.0		-1.5		-0.2		0.8		-0.4		0.8		-0.7		-0.1		2.4		-0.8		-1.1		-2.6	
	4	9m	-4.4	0.2	-4.2	-0.1	-4.3	1.0	-3.3	-2.3	-5.6	2.0	-3.6	-0.5	-4.1	0.2	-3.9	0.1	-3.8	1.1	-2.7	-2.2	-4.9	-1.2	-6.1	2.1	-4.0	0.1	-3.9	1.2	-2.7	-0.5	-3.2	0.5	-2.7	-1.0	-3.7	
			2.1		0.0		0.1		0.2		1.2		0.2		-0.4		0.4		-1.0		0.3		1.2		0.0		1.7		3.1		0.8		1.0		-0.5		-0.2	
	5	12m	-2.3	-1.9	-4.2	0.0	-4.2	1.1	-3.1	-1.3	-4.4	1.0	-3.4	-1.1	-4.5	1.0	-3.5	-1.3	-4.8	2.4	-2.4	-1.3	-3.7	-2.4	-6.1	3.8	-2.3	1.5	-0.8	-1.1	-1.9	-0.3	-2.2	-1.0	-3.2	-0.7	-3.9	
			-0.2				-0.5		-2.5		-0.7		-1.7		-0.1		-3.5		-0.1		-3.8				-0.6		-2.6		-2.6		-3.7		-2.6		0.7		2.6	
	6	15m	-2.5		COL		-4.7	-0.9	-5.6	0.5	-5.1	0.0	-5.1	0.5	-4.6	-2.4	-7.0	2.1	-4.9	-1.3	-6.2		COL		-6.7	1.8	-4.9	1.5	-3.4	-2.2	-5.6	0.8	-4.8	2.3	-2.5	1.2	-1.3	
			-5.5				-2.0		1.1		1.3		-1.5		0.8		0.6		1.6		1.4				2.8		-1.3		-1.5		2.6		3.3		-2.1		-3.6	
	7	18m	-8.0	3.1	-4.9	-1.8	-6.7	2.2	-4.5	0.7	-3.8	-2.8	-6.6	2.8	-3.8	-2.6	-6.4	3.1	-3.3	-1.5	-4.8	-0.6	-5.4	1.5	-3.9	-2.3	-6.2	1.3	-4.9	1.9	-3.0	1.5	-1.5	-3.1	-4.6	-0.3	-4.9	
					-2.4		0.0		-1.1		-0.9		0.3		-0.9		6.5		-0.1		-0.6		-1.9		-0.4		2.0		2.3		-1.9		-1.6		1.7		1.7	
	8	21m	COL		-7.3	0.6	-6.7	1.1	-5.6	0.9	-4.7	-1.6	-6.3	1.6	-4.7	4.8	0.1	-3.5	-3.4	-2.0	-5.4	-1.9	-7.3	3.0	-4.3	0.1	-4.2	1.6	-2.6	-2.3	-4.9	1.8	-3.1	0.2	-2.9	-0.3	-3.2	
					2.5		2.6		2.0		-1.7		2.7		3.6		-5.9		0.5		-0.1		2.9		2.2		1.3		-2.1		2.5		-0.3		-0.6		-1.9	
	9	24m	-5.9	1.1	-4.8	0.7	-4.1	0.5	-3.6	-2.8	-6.4	2.8	-3.6	2.5	-1.1	-4.7	-5.8	2.9	-2.9	-2.6	-5.5	1.1	-4.4	2.3	-2.1	-0.8	-2.9	-1.8	-4.7	2.3	-2.4	-1.0	-3.4	-0.1	-3.5	-1.6	-5.1	
							-0.6		-2.5		3.1		-1.2		-3.9		1.4		0.5		-0.8		2.6		-3.6		-2.5		0.0		0.6		-1.2		1.3		-0.3	
	10	27m	COL		VOID		-4.7	-1.4	-6.1	2.8	-3.3	-1.5	-4.8	-0.2	-5.0	0.6	-4.4	2.0	-2.4	-3.9	-6.3	4.5	-1.8	-3.9	-5.7	0.3	-5.4	0.7	-4.7	2.9	-1.8	-2.8	-4.6	2.4	-2.2	-3.2	-5.4	
							4.7		3.6		-1.5		-1.0		-0.5		-1.0		-5.2		5.7		-2.4		1.7		3.6		2.2		-1.5		3.0		0.2		4.6	
	11	30m	-5.3	1.7	-3.6	3.6	0.0	-2.5	-2.5	-2.3	-4.8	-1.0	-5.8	0.3	-5.5	0.1	-5.4	-2.2	-7.6	7.0	-0.6	-3.6	-4.2	0.2	-4.0	2.2	-1.8	-0.7	-2.5	-0.8	-3.3	1.7	-1.6	-0.4	-2.0	1.2	-0.8	
			2.9		-0.5		-1.5		4.3		1.4		3.4		3.7		2.1		5.2		-5.9		-1.9		-1.6		-3.1		-1.8		-1.5		-4.8		-5.5		-3.7	
	12	33m	-2.4	-1.7	-4.1	2.6	-1.5	3.3	1.8	-5.2	-3.4	1.0	-2.4	0.6	-1.8	-1.5	-3.3	0.9	-2.4	-4.1	-6.5	0.4	-6.1	0.5	-5.6	0.7	-4.9	0.6	-4.3	-0.5	-4.8	-1.6	-6.4	-1.1	-7.5	3.0	-4.5	
							4.0		-1.2		2.4		-0.9		0.2		4.4		2.3		3.7		0.4		0.1		0.6		2.2		1.4		1.4		1.0		-2.3	
	13	36m					2.5	-1.9	0.6	-1.6	-1.0	-2.3	-3.3	1.7	-1.6	2.7	1.1	-1.2	-0.1	-2.7	-2.8	-2.9	-5.7	0.2	-5.5	1.2	-4.3	2.2	-2.1	-1.3	-3.4	-1.6	-5.0	-1.5	-6.5	-0.3	-6.8	
							-1.8		0.0		1.6		3.0		0.1		-3.6		-0.3		-0.1		-0.8		3.1		0.2		-1.8		-0.1		0.8		1.5		3.9	
	14	39m					0.7	-0.1	0.6	0.0	0.6	-0.9	-0.3	-1.2	-1.5	-1.0	-2.5	2.1	-0.4	-2.5	-2.9	-3.6	-6.5	4.1	-2.4	-1.7	-4.1	0.2	-3.9	0.4	-3.5	-0.7	-4.2	-0.8	-5.0	2.1	-2.9	
							-3.2		0.0		-1.8		-1.2		-2.7		-1.4		-4.2		0.5		0.9		-2.1		1.5		-0.2		-1.4		1.0		-0.3		-0.1	
	15	42m					-2.5	3.1	0.6	-1.8	-1.2	-0.3	-1.5	-2.7	-4.2	0.3	-3.9	-0.7	-4.6	2.2	-2.4	-3.2	-5.6	1.1	-4.5	1.9	-2.6	-1.5	-4.1	-0.8	-4.9	1.7	-3.2	-2.1	-5.3	2.3	-3.0	
			DOCKS				-1.8		-2.8		-1.6		-1.1		1.8		-0.1		4.3				2.2		2.4		-0.4		-2.3		1.1		0.1		2.8		2.4	
	16	45m					-4.3	2.1	-2.2	-0.6	-2.8	0.2	-2.6	0.2	-2.4	-1.6	-4.0	3.7	-0.3		COL		-3.4	1.3	-2.1	-0.9	-3.0	-3.4	-6.4	2.6	-3.8	0.7	-3.1	0.6	-2.5	1.9	-0.6	
							1.1		0.6		0.6		-0.1		0.1		1.0		-1.2				1.1		2.4		0.2		3.1		0.5		-0.2		2.4		-4.7	
	17	48m					-3.2	1.6	-1.6	-0.6	-2.2	-0.5	-2.7	0.4	-2.3	-0.7	-3.0	1.5	-1.5	-1.0	-2.5	0.2	-2.3	2.6	0.3	-3.1	-2.8	-0.5	-3.3	0.0	-3.3	0.0	-3.3	3.2	-0.1	-5.2	-5.3	
							0.4		-0.4		0.4		0.0		0.6		0.6		-1.6		-1.4		-0.8		-2.4		-1.1		-0.7		-1.5		-0.6		-3.8		2.7	
	18	51m					-2.8	0.8	-2.0	0.2	-1.8	-0.9	-2.7	1.0	-1.7	-0.7	-2.4	-0.7	-3.1	-0.8	-3.9	0.8	-3.1	1.0	-2.1	-1.8	-3.9	-0.1	-4.0	-0.8	-4.8	0.9	-3.9	0.0	-3.9	1.3	-2.6	
							0.5		3.0		-0.6		-0.3		0.1		-0.8		3.6		-1.5		-2.3		-1.3		-1.0		-0.8		0.7		-0.8		1.8		5.5	
	19	54m	VOID		-2.7	0.4	-2.3	3.3	1.0	-3.4	-2.4	-0.6	-3.0	1.4	-1.6	-1.6	-3.2	3.7	0.5	-5.9	-5.4	0.0	-5.4	2.0	-3.4	-1.5	-4.9	0.1	-4.8	0.7	-4.1	-0.6	-4.7	2.6	-2.1	5.0	2.9	
					4.1		0.4		-3.2		-1.9		0.6		1.3		-1.2		-1.2		3.8		4.0		0.8		1.5		2.2		2.5		1.2		-0.6		-2.2	
	20	57m	VOID		1.4	-3.3	-1.9	-0.3	-2.2	-2.1	-4.3	1.9	-2.4	2.1	-0.3	-4.1	-4.4	3.7	-0.7	-0.9	-1.6	0.2	-1.4	-1.2	-2.6	-0.8	-3.4	0.8	-2.6	1.0	-1.6	-1.9	-3.5	0.8	-2.7	3.4	0.7	
					-5.5		-1.7		-2.5		-0.6		-2.3		-2.4		-0.2		-2.8		-0.6		-5.2		-2.0		-3.2		-1.8		-2.1		-1.2		-2.4		-4.6	
	21	60m	VOID		-4.1	0.5	-3.6	-1.1	-4.7	-0.2	-4.9	0.2	-4.7	2.0	-2.7	-1.9	-4.6	1.1	-3.5	1.3	-2.2	-4.4	-6.6	2.0	-4.6	-2.0	-6.6	2.2	-4.4	0.7	-3.7	-1.0	-4.7	-0.4	-5.1	1.2	-3.9	
									-0.7				-0.4				0.1		-4.1				-0.2				-2.3		-4.5		-3.7		-3.6		-2.8		-1.9	
	22	63m							-5.4		COL		-5.1		COL		-4.5	-3.1	-7.6		COL		-6.8		COL		-8.9	0.0	-8.9	1.5	-7.4	-0.9	-8.3	0.4	-7.9	2.1	-5.8	
									0.8				0.2				1.2		3.8				3.2				2.8		1.7		2.3		3.6		3.3		0.7	
	23	66m							-4.6	0.4	-4.2	-0.7	-4.9	2.0	-2.9	-0.4	-3.3	-0.5	-3.8	1.1	-2.7	-0.9	-3.6	-2.3	-5.9	-0.2	-6.1	-1.1	-7.2	2.1	-5.1	0.4	-4.7	0.1	-4.6	-0.5	-5.1	
			OFFICE						-3.4				-3.7				-2.3		-4.5				-3.1				-1.2		0.3		0.8		-0.2		-1.8		0.2	
	24	69m							-8.0		COL		-8.6		COL		-5.6	-2.7	-8.3		COL		-6.7		COL		-7.3	0.4	-6.9	2.6	-4.3	-0.6	-4.9	-1.5	-6.4	1.5	-4.9	
									1.4				1.7				-3.7		0.9				-1.3				0.7		1.3		-0.5		-0.2		0.9		-3.7	
	25	72m							-6.6	0.3	-6.3	-0.6	-6.9	0.8	-6.1	-3.2	-9.3	1.9	-7.4	0.8	-6.6	-1.4	-8.0	0.2	-7.8	1.2	-6.6	1.0	-5.6	0.8	-4.8	-0.3	-5.1	-0.4	-5.5	-3.1	-8.6	

Key:

	Indicates area is over the 95th Percentile Limit (6.5mm)
UTS	Indicates Unable to Survey due to obstruction
COL	Indicates a Column within 1.5m radius
VOID	Indicates a Void area (not surveyed)

Results

Datum	Actual	Target
Datum =	1654.4 mm	
Lowest Elev. from datum =	-9.3 mm	+/-15 mm
Highest Elev. from datum =	2.9 mm	+/-15 mm

PASS

95th Percentile Limit

95th Percentile Limit	6.5 mm
95th Percentile Calculated	4.1 mm

PASS

Additional Info

Greatest Diff. in Elev. over 3m=	7.6 mm
% of Results over 6.5mm =	0.3 %
Range (Max - Min) =	12.2 mm

CONCLUSION

ABS BRYMAR FLOORS| BOLTON

PROPERTY E

From the Property E readings gathered it can be seen that the floor area surveyed **complies** with the required FM2 classification as defined by table 3.1 of the Fourth Edition of the Concrete Society's Technical Report Number 34.

PROPERTY F

From the Property F readings gathered it can be seen that the floor area surveyed **complies** with the required FM2 classification as defined by table 3.1 of the Fourth Edition of the Concrete Society's Technical Report Number 34.

LEVEL TO DATUM

From the Property E readings gathered it can be seen that the floor area surveyed **complies** with the required FM2 classification as defined by table 3.1 of the Fourth Edition of the Concrete Society's Technical Report Number 34.

THIS REPORT SHOULD NOT BE REPRODUCED EXCEPT IN FULL

Report Compiled By:	Nihal Udaranikkal
Signed	
Date:	18/04/2024
Report Checked By:	David Stockwell
Signed:	
Date:	18/04/2024

ANNEX A

PROPERTY F
GRAPHIC TRACES

ABS Brymar Floors
at
C/o Winvic Construction
Wingates Industrial Estate
Bolton
BL5 3XH

This Data is Available Upon Request

END OF REPORT

Global Flooring **Consultants...**

Proving the World is **Flat...**

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KONTRAD LLP DRUMHEAD RD CHORLEY	**Project:** WINGATES	**Calcs by:** SP GMICE	**Date:** 18/01/2024
	Section: FLOOR SLAB	**Check by:** GT IMI StructE	**Date:** 18/01/2024
	Job Ref: B2354	**Sheet No./Rev:**	**Issue Date**

Floor Slab Calculations for :-

NEW DISTRIBUTION WAREHOUSE

WINGATES, PLOT 3

BOLTON

Prepared by :-

KONTRAD LLP

INDUSTRIAL FLOORING CONSULTANTS

REV DATE

VERSION J

INTRODUCTION

SP

GMICE

THE FOLLOWING CALCULATIONS HAVE BEEN PREPARED IN ACCORDANCE WITH TR34 (4TH EDITION) TO DEMONSTRATE THE REQUIRED SLAB DEPTH NECESSARY TO SUSTAIN THE IMPOSED LOADS AS NOTED BELOW.

IMPOSED LOAD CRITERIA USED IN THE DESIGN HAS BEEN TAKEN FROM THE FOLLOWING DOCUMENTATION :-
BWB DRAWING - P23012-BWB-P3-XX-DR-S-0001 Rev C01 Project Notes

QUOTATION REFERENCE	B23087 REV 2	DATE	18/01/2024

SLAB DESIGN IS BASED ON THE FOLLOWING LOAD CASES :-

WINGATES, PLOT 3

RACKING AND SHELVING SYSTEMS

(MODULAR END FRAME CONSIDERED WITH 2 UPRIGHT LEGS AT 1050-1200 CTRS ONLY)

LOAD CASE 1 BOLTON

INDIVIDUAL RACK LEG LOADS PLACED IN A BACK TO BACK SITUATION POSITIONED AWAY FROM ANY JOINTS IN THE SLAB GREATER THAN "L" (RADIUS OF RELATIVE STIFFNESS)

LOAD CASE 2

INDIVIDUAL RACK LEG LOADS PLACED IN A BACK TO BACK SITUATION POSITIONED A SPECIFIED DISTANCE FROM A SAWN INDUCED JOINT BUT WITHIN "L"(RADIUS OF RELATIVE STIFFNESS)

LOAD CASE 3

INDIVIDUAL RACK LEG LOADS PLACED IN A BACK TO BACK SITUATION POSITIONED A SPECIFIED DISTANCE FROM A PROPRIETARY ARMOUR JOINT.BUT WITHIN "L"(RADIUS OF RELATIVE STIFFNESS)

LOAD CASE 4

INDIVIDUAL RACK LEG LOAD (AISLE SIDE) COMBINED WITH A SINGLE FLT WHEEL LOAD APPLIED ADJACENT A JOINT

LOAD CASE 5

INDIVIDUAL RACK LEG LOAD POSITIONED A SPECIFIED DISTANCE FROM THE FREE SLAB EDGE

GENERAL LOADING CONDITION

LOAD CASE 6

UNIFORMLY DISTRIBUTED LOAD

DESIGN PARAMETERS

DEPTH	175	mm		Denotes Input Fields
REINFORCEMENT	142	mm		Denotes Output Data
BAR SIZE	6	mm		

THE SLAB DESIGN IS BASED UPON A MINIMUM "K" VALUE / MODULUS OF RIGIDITY BEING AVAILABLE ON TOP OF THE SUB GRADE / CAPPING LAYER / INSULATION MATERIAL OF :-

0.054 N/mm3

THIS VALUE IS EQUIVALENT TO A CBR VALUE OF 10%

PLATE LOAD TESTS WILL BE CARRIED OUT TO VERIFY THE ABOVE DESIGN CRITERIA WHEN DESIGN RESPONSIBILITY FOR THE SLAB DESIGN IS UNDERTAKEN BY ABS BRYMAR FLOORS AND KONTRAD LLP

	fck	fcu	
CONCRETE STRENGTH VALUES AT 28 DAYS SHALL BE C :-	32	40	N/mm2

COVER TO BOTTOM STEEL SHALL BE 40 mm

RACKING SYSTEMS ***(MODULAR END FRAME WITH 2 UPRIGHT LEGS AT 1050-1200 CTRS)***

SINGLE LEG LOAD		75	kN			
BACK TO BACK SPACING	x	300	mm			
RACK DEPTH	C	1100	mm		DISTANCE TO CTR	
RACK LENGTH	A	2750	mm		LINE OF BASE PLATE	
BASE PLATE EDGE CLEARANCE		*250*	mm		300	mm
BASE PLATE SIZE		100	Lw	X	100	Ll mm
PERIMETER SLAB EDGE BASE PLATE CLEARANCE		250	mm		*TO EDGE OF BASE PLATE*	

MHE

MAX STATIC WHEEL LOAD		40	kN		*ASSUMED MAX LOAD*
WHEEL CONTACT AREA		100	X	100	mm
SPACING WITH RACK	H1	250	mm		*CONSERVATIVE ASSESSMENT*

UDL

LOAD PER SQUARE METRE 50 kN/m2

LINE LOADS

LOAD PER LINEAR METRE 25 kN/m *ASSUMED MAX VALUE*

SLAB DESIGN DUE TO RACKING LOADS SP

STANDARD 2 LEG END FRAME ONLY

Denotes Input GMICE

Denotes Output Data GT

Slab description					
Slab type				Fabric Reinforced	
Slab thickness	Structural Depth		h =	175.000	mm
	cover (bottom) =			40.000	mm
Reinforcement Details			d=	129.000	mm
Characteristic strength of steel	fy=			500.000	N/mm2
Fabric reinforcement	Type			A 142.000	
Area of steel in each direction				142.000	mm2
Bar Diameter				6.000	mm
Percentage of Reinforecment provided.	WINGATES,	As_percent = 100As/bh		0.081	%
			Query Ast %	OK	
	BOLTON				

Ast is based on structural depth only

Minimum Ast 0.080 %

Maximum Ast 0.125 %

Partial Safety Factors

ULS	Plain/fibre reinf **concrete**	1.5	ɣm
	Bar and Fabric **reinforcement**	1.15	ɣm
	Permanent Loads (Racking)	1.2	ɣG
	Variable actions	1.5	ɣQ
	Dynamic actions	1.6	ɣD
	All partial Safety Factors	1	

NOTE :-

A142 MESH -150 MM TO 178 MM

A193 MESH - 155 MM UP TO 240 MM

A252 MESH - 200MM -310MM

A393 MESH - 315MM - 475MM

Concrete Properties.

Characterisic Concrete Strength (cylinder)	fck	32.000	N/mm2
Characteristic Compressive strength (cube)	fcu	40.000	N/mm2
Mean compressive strength (cylinder)	fcm =fck + 8 N/mm2	40.000	N/mm2
Mean Axial tensile strength	fctm = 0.3 N/mm2 x (fck/1 N/mm2)^0.66	3.017	N/mm2
Youngs modulus of elasticity	Ecm=22000 N/mm2 * (fcm/10N/mm2)^0.3	33.346	kN/mm2
Design Flexural strength of concrete	fctd_fl = fctm * (1.6-h/1000)/ɣm	2.866	N/mm2

Sub Grade Construction

Modulus of Sub Grade Reaction	k=	0.054	N/mm3

Properties of Reinforced Slabs

Negative Moment capacity	Mun = fctd_fl*h2 / 6		14.628	kNm/m
Posotive Moment capacity	Mpfab = 0.95*As fy*d / ɣm*10^6	(Or Max Mun)	7.566	kNm/m
			SATISFACTORY	
Poissons ratio	v = 0.2		0.200	
Radius of Relative Stiffness	l = [Ecm * h3 / (12 * (1 - v2) * k)]^ 0.25		0.732	m
Characteristic of System	ɣ = [3 * k / (Ecm * h3)]^0.25		0.976	m^-1

Loading

			Back to Back Leg Ctrs	
Pallet Racking / Shelving	75.000	kN	300	mm
MHE/FLT	40.000	kN		

Load Case 1 **Individual Rack Leg Loads (remote from any slab edges)**

RACKING SYSTEM				
No of Point loads		N=	2.000	
Permanent Point Load		Gk	75.000	kN
Length of Loaded Area		Lw	100.000	mm
Width of loaded Area		Ll	100.000	mm
Spacing Between Loads		X	300.000	mm
Calculate contact radius of single load			56.370	mm
Combined Area of adjacent loads			43805.089	mm2
Equivalent contact radius of adjacent loads		a eqiv	117.981	
Radius Ratio		a/l	0.161	
Loading Applied to slab	F= N *(Gk x ɣG)	F=	180.000	kN

CHECK INTERNAL LOAD CAPACITY

FOR a/l = 0
Pu= 2 π (Mpfab +Mun) 139.453 kN

FOR a/l=0.2
Pu= 4 π (Mpfab +Mun) / 1 - (a/3/) 294.738 kN

FOR a/l= 0.161
Pu (interpolated) Capacity = 264.576 kN OR MAX CELL I88 264.576 kN > 180.00 kN
SATISFACTORY

Punching shear at face of the loaded area

Design concrete compressive strength (cylinder)	fcd=fck/ɣ	21.333	N/mm2
Shear factor	k2=0.6(1-fck/250)	0.523	N/mm2
Length of perimeter at face of loaded area	Uo= 4*(Ll+lw)	800.000	mm
Shear stress at face of contact area	vmax=0.5*k2*fcd	5.581	N/mm2
Maximum load capacity in punching	Ppmax=Vmax*Uo*d	575.939 kN > 180.000 kN SATISFACTORY	

Punching shear at the critical perimeter

Shear factor	ks=1+(200/d)^0.5	2.00	N/mm2
	2.25 N/mm2	or Max 2.0 N/mm2	
Ratio of reinforcement by area in x - direction	px=As/d	0.001	
Ratio of reinforcement by area in y - direction	py=As/d	0.001	
Reinforcement ratio	p1=SQRT (px + py)	0.001	
Maximum shear stress at 2d from face of load	Vrdc=0.035*ks^1.5*fck^0.5	0.560	N/mm2
Length of Perimeter at 2d from face of load	u1	2620.240	mm
Maximum load capacity in punching at 2d from face of load	Pp=Vrdc*u1*d	189.286 kN > 180.000 kN SATISFACTORY	

Load Case 2 **Individual rack Leg Loads as Edge Point Loads (adjacent a sawn joint)**

RACKING SYSTEM				
No of Point loads	N=		2.000	
Permanent Point Load	Gk		75.000	kN
Length of Loaded Area (this cell checks edge dim)		Lw	100.000	mm
Width of loaded Area		Ll	100.000	mm
Spacing Between Loads		X	300.000	mm
Calculate contact radius of single load			56.370	mm
Combined Area of adjacent loads			43800.036	mm2
Equivalent contact radius of adjacent loads		a eqiv	117.975	
Radius Ratio		a/l	0.161	

Loading Applied to slab	F= N *(Gk x ɣG)		F=	180.000	kN
CHECK EDGE LOAD CAPACITY					
FOR a/l = 0					
Pu= [π * (Mpfab +Mun)/2]+2*Mun				64.103	kN
FOR a/l=0.2					
Pu= [π* (Mpfab +Mun) +4*Mun] / [1-(2*a/(3*l]				143.636	kN
FOR a/l=	0.161				
Pu (interpolated)		Capacity = 128.184 kN	OR MAX CELL I153	128.184	kN

Check ultimate load capacity of the slab edge due to an offset leg load of "ey" 250 mm

Inner load capacity =		264.576	
Edge load capacity =		128.184	
By Interpolation the slab capacity at the offset leg load position is =		184.074	kN
Half Base Plate =	50 mm		

Load transfer capacity due to aggregate interlock

15% of Edge Load Capacity		19.228	kN

Load transfer capacity due to steel fabric passing thro joint clause 7.9.2

A142 MESH	15.5 kN/m				
A193 MESH	21.5 kN/m				
A252 MESH	28.4 kN/m				
A393 MESH	36.1 kN/m				
	Mcap=	15.5 x (0.9*2*L)+ X		25.076	kN
Total Load transfer at slab edge =				44.303	kN

NB Load transfer value cannot be greater than 50% of applied load
50% = 90.00 kN THEREFORE, USE LOAD TRANSFER LOAD VALUE

Total loading applied to slab edge =	180.000	kN		
Load transfer available at slab edge =	44.303	kN		
Loading applied to slab edge after load transfer =	135.697	kN <	184.074	kN
	SATISFACTORY			

Punching shear at face of the loaded area

Design concrete compressive strength (cylinder)	fcd=fck/ɣ	21.333	N/mm2	
Shear factor	k2=0.6(1-fck/250)	0.523	N/mm2	
Length of perimeter at face of loaded area	Uo= 4*(Ll+lw)	800.000	mm	
Shear stress at face of contact area	vmax=0.5*k2*fcd	5.581	N/mm2	
Maximum load capacity in punching	Ppmax=Vmax*Uo*d	575.939	kN >	135.697 kN
		SATISFACTORY		

Punching shear at the critical perimeter

Shear factor	ks=1+(200/d)^0.5	2.00	N/mm2	
	2.25 N/mm2	or Max 2.0 N/mm2		
Ratio of reinforcement by area in x - direction	px=As/d	0.001		
Ratio of reinforcement by area in y - direction	py=As/d	0.001		
Reinforcement ratio	p1=SQRT (px + py)	0.001		
Maximum shear stress at 2d from face of load	Vrdc=0.035*ks^1.5*fck^0.5	0.560	N/mm2	
Length of Perimeter at 2d from face of load	u1	1910.120	mm	
Maximum load capacity in punching at 2d from face of load	Pp=Vrdc*U1*d	137.987	kN >	135.697 kN
		SATISFACTORY		

Load Case 3 **Individual rack Leg Loads as Edge Point Loads (adjacent a proprietary armoured joint)**

No of Point loads	N=		2.000	
Permanent Point Load	Gk		75.000	kN
Length of Loaded Area (this cell checks edge dim)		Lw	100.000	mm
Width of loaded Area		Ll	100.000	mm
Spacing Between Loads		X	300.000	mm
Calculate contact radius of single load			56.370	mm
Combined Area of adjacent loads			43800.036	mm2
Equivalent contact radius of adjacent loads		a eqiv	117.975	
Radius Ratio		a/l	0.161	

Loading Applied to slab F= N *(Gk x ɣG) F= 180.000 kN

CHECK EDGE LOAD CAPACITY

FOR a/l = 0
Pu= [π * (Mpfab +Mun)/2]+2*Mun 64.103 kN

FOR a/l=0.2
Pu= [π* (Mpfab +Mun) +4*Mun] / [1-(2*a/(3*l] 143.636 kN

FOR a/l= 0.161
Pu (interpolated) Capacity = 128.184 kN OR MAX CELL I245 128.184 kN

Check ultimate load capacity of the slab edge due to an offset leg load of ey 250 mm

Inner load capacity = 264.576
Edge load capacity = 128.184
By Interpolation the slab capacity at the offset leg load position is = 184.074
Half Base Plate = 50 mm

Load transfer capacity due to aggregate interlock
NIL 0.000 kN

Load transfer capacity due to steel fabric passing thro joint
NIL 0.000 kN

Load transfer capacity of proprietary joint (**Value taken from Appendix C**)

Pcap for 8 mm plate =	42.39 kN/m	<	NB Load transfer value cannot be greater than 50% of applied load	
with 20 mm gap width			50% = 90.00 kN THEREFORE, USE LOAD TRANSFER VALUE	
Load transfer capacity of joint	Mcap= 42.39 x (0.9*2*L) + X		68.583 kN	
Total loading applied to slab =			180.000 kN	
Load transfer at slab edge =			68.583 kN	
Loading applied to slab edge after load transfer =			111.417 kN <	184.074 kN
			SATISFACTORY	

Punching shear at face of the loaded area

Design concrete compressive strength (cylinder)	fcd=fck/ɣ	21.333	N/mm2
Shear factor	k2=0.6(1-fck/250)	0.523	N/mm2
Length of perimeter at face of loaded area	Uo= 4*(Ll+lw)	1100.000	mm
Shear stress at face of contact area	vmax=0.5*k2*fcd	5.581	N/mm2
Maximum load capacity in punching	Ppmax=Vmax*Uo*d	791.916 kN >	111.417 kN
		SATISFACTORY	

Punching shear at the critical perimeter

Shear factor	ks=1+(200/d)^0.5	2.00	N/mm2
	2.25 N/mm2	or Max 2.0 N/mm2	
Ratio of reinforcement by area in x - direction	px=As/d	0.001	
Ratio of reinforcement by area in y - direction	py=As/d	0.001	
Reinforcement ratio	p1=SQRT (px + py)	0.001	
Maximum shear stress at 2d from face of load	Vrdc=0.035*ks^1.5*fck^0.5	0.560	N/mm2
Length of Perimeter at 2d from face of load	u1	1910.120	mm
Maximum load capacity in punching at 2d from face of load	Pp=Vrdc*U1*d	137.987 Kn >	111.417 kN
		SATISFACTORY	

Load Case 4

Individual rack Leg Load (AISLE SIDE) combined with a single FLT wheel load positioned a specified distance from any **sawn induced** floor joints.

No of Point loads		N=			2.000	
Permanent Point Load	Single Rack Leg	Gk			75.000	kN
Dynamic Point Load (FLT)	Wheel	Dk			40.000	kN
Rack base Plate Area				100	100.000	mm
Wheel contact area				100	100.000	mm
Spacing Between Single Rack and a Single wheel Load				"X"	250.000	mm
Calculate contact radius of single rack leg					56.370	mm
Calculate contact radius of wheel contact area					56.370	mm
Average Radius					56.370	mm
Combined Area of adjacent loads					38162.990	mm2
Equivalent contact radius of adjacent loads				a eqiv	110.122	mm
Radius Ratio				a/l	0.150	
Loading Applied to slab		F= N *(Gk x ɣG) +N*(Dk + ɣ D)		F=	154.000	kN

CHECK EDGE LOAD CAPACITY

FOR a/l = 0

Pu= [π * (Mpfab +Mun)/2]+2*Mun — 64.103 kN

FOR a/l=0.2

Pu= [π* (Mpfab +Mun) +4*Mun] / [1-(2*a/(3*l] — 142.494 kN

FOR a/l= 0.150

Pu (interpolated) — Capacity = 123.059 kN OR MAX CELL I339 — 123.059 kN

Check ultimate load capacity of the slab edge due to an offset wheel load of "H1" 250 mm

H1 is taken from Appendix A in TR34 showing the relationship between rack leg and wheel load when the rack leg is positioned :-_ 250 *mm away from the joint.*

Inner load capacity = 264.576

Edge load capacity = 123.059

By Interpolation the slab capacity at the offset wheel load position is = 181.049 kN

Half Bearing Area = 50 mm

Load transfer capacity due to aggregate interlock

15% of Edge Load Capacity — 18.459 kN

Load transfer capacity due to steel fabric passing thro joint clause 7.9.2

A142 mesh	15.5	kN/m
A193 mesh	21.5	kN/m
A252 mesh	28.4	kN/m
A393 mesh	36.1	kN/m

Mcap= 15.5 x (0.9*2*L)+ X — 25.076 kN

Total Load transfer value at slab edge = 43.535 kN

NB Load transfer value cannot be greater than 50% of applied load

50% = 77.00 kN THEREFORE , USE LOAD TRANSFER VALUE

Total loading applied to slab edge =		154.000 kN	
Load transfer at slab edge =		43.535 kN	
Loading applied to slab edge after load transfer =	W - Load transfer cap =	110.465 kN<	181.049 kN
		SATISFACTORY	

Punching shear at face of the loaded area

Design concrete compressive strength (cylinder)	fcd=fck/ɣ	21.333	N/mm2
Shear factor	k2=0.6(1-fck/250)	0.523	N/mm2
Length of perimeter at face of loaded area	Uo	800.000	mm
Shear stress at face of contact area	vmax=0.5*k2*fcd	5.581	N/mm2
Maximum load capacity in punching	Ppmax=Vmax*Uo*d	575.939 kN>	110.465 kN
		SATISFACTORY	

Punching shear at the critical perimeter

Shear factor	ks=1+(200/d)^0.5	2.00	N/mm2	
	2.25 N/mm2	or Max 2.0 N/mm2		
Ratio of reinforcement by area in x - direction	px=As/d	0.001		
Ratio of reinforcement by area in y - direction	py=As/d	117.190		
Reinforcement ratio	p1=SQRT (px + py)	0.326		
Maximum shear stress at 2d from face of load	Vrdc=0.035*ks^1.5*fck^0.5	0.560	N/mm2	
Length of Perimeter at 2d from face of load	U1	1760.120	mm	
Maximum load capacity in punching at 2d from face of load	Pp=Vrdc*U1*d	127.151	kN >	110.465 kN
		SATISFACTORY		

Load Case 5 **Individual rack Leg Load at slab edge**

RACKING SYSTEM

No of Point loads	N=	1.000		
Permanent Point Load	Gk	75.000	kN	
Length of Loaded Area (this cell checks edge dim)	Lw	100.000	mm	
Width of loaded Area	Ll	100.000	mm	
Calculate contact radius of single load	a	56.370	mm	
Radius Ratio	a/l	0.077		
Loading Applied to slab	F= N *(Gk x ɣG)	F=	90.000	kN

CHECK EDGE LOAD CAPACITY

FOR a/l = 0
Pu= [π * (Mpfab +Mun)/2]+2*Mun 64.103 kN

FOR a/l=0.2
Pu= [π* (Mpfab +Mun) +4*Mun] / [1-(2*a/(3*l] 135.142 kN

FOR a/l= 0.077
Pu (interpolated) Capacity = 91.452 kN 91.452 kN

Check ultimate load capacity of the slab edge due to an offset leg load of "ey" 250 mm

Inner load capacity =	264.576	
Edge load capacity =	91.452	
By Interpolation the slab capacity at the offset leg load position is =	162.394	kN
Half Base Plate = 50 mm		

Load transfer capacity due to aggregate interlock

15% of Edge Load Capacity	0.000	kN
Load transfer capacity due to steel fabric passing thro joint	0.000	kN
Total Load transfer at slab edge =	0.000	kN
Total loading applied to slab edge =	90.000	kN
Load transfer available at slab edge =	0.000	kN
Loading applied to slab edge after load transfer =	90.000	kN < 162.394 kN
	SATISFACTORY	

Punching shear at face of the loaded area

Design concrete compressive strength (cylinder)	fcd=fck/ɣ	21.333	N/mm2	
Shear factor	k2=0.6(1-fck/250)	0.523	N/mm2	
Length of perimeter at face of loaded area	Uo= 2*(Ll+lw)	400.000	mm	
Shear stress at face of contact area	vmax=0.5*k2*fcd	5.581	N/mm2	
Maximum load capacity in punching	Ppmax=Vmax*Uo*d	287.969	kN >	90.000 kN

SATISFACTORY

Punching shear at the critical perimeter

Shear factor	ks=1+(200/d)^0.5	2.00	N/mm2	
	px=As/d N/mm2	or Max 2.0 N/mm2		
Ratio of reinforcement by area in x - direction	px=As/d	0.001		
Ratio of reinforcement by area in y - direction	py=As/d	0.001		
Reinforcement ratio	p1=SQRT (px + py)	0.001		
Maximum shear stress at 2d from face of load	Vrdc=0.035*ks^1.5*fck^0.5	0.560	N/mm2	
Length of Perimeter at 2d from face of load	u1	1610.120	mm	
Maximum load capacity in punching at 2d from face of load	Pp=Vrdc*U1*d	116.315	kN >	90.000 kN
		SATISFACTORY		

SLAB DESIGN DUE TO UNIFORMLY DISTRIBUTED LOADS SP

GMICE

LOAD CASE 6 GT

Slab description

Slab type Fabric Reinforced

Slab thickness h = 175.000 mm

Denotes Input Fields

Denotes Output Data

Partial Safety factors

ULS Plain/fibre reinf **concrete** 1.5 ɣm

Concrete Properties.

WINGATES, PLOT 3

Characterisic Concrete Strength (cylinder)	fck	32.000	N/mm2
Characteristic Compressive strength (cube)	fcu	40.000	N/mm2
Mean compressive strength (cylind BOLTON	fcm =fck + 8 N/mm2	40.000	N/mm2
Mean Axial tensile strength	fctm = 0.3 N/mm2 x (fck/1 N/mm2)^0.66	3.017	N/mm2
Secant modulus of elasticity	Ecm=22000 N/mm2 * (fcm/10N/mm2)^0.3	33.346	kN/mm2
Design Flexural strength of concrete	fctd_fl = fctm * (1.6-h/1000)/ɣm	2.866	N/mm2

Sub Grade Construction

Modulus of Sub Grade Reaction k= 0.054 N/mm3

Properties of Reinforced Slabs

Negative Moment capacity	Mun = fctd_fl*h2 / 6	Eq2	14.628	kNm/m
Poissons ratio	v = 0.2		0.200	
Radius of Relative Stiffness	l = [Ecm * h^3 / (12 * (1 - v^2) * k)]^ 0.25		0.732	m
Characteristic of System	ɣ = [3 * k / (Ecm * h3)]^0.25		0.976	m^-1

Loading

General Storage / Display / UDL 50.000 kN/m2

The load capacity per unit area, q is given by

q = 5.95 * ɣ^2 * Mn Eq 35 82.87 kN/m2 > 50 kN/m2

where Mn = moment capacity of plain concrete from (Eq 2) THEREFORE CAPACITY IS SATISFACTORY

APPENDIX C SP

DERIVATION OF LOAD TRANSFER CAPACITY OF PROPRIETARY PLATE DOWEL SYSTEM GMICE

GT

Denotes Output Data

Concrete Properties.

Characterisic Concrete Strength (cylinder)	fck	32.000	N/mm2
Characteristic Compressive strength (cube)	fcu	40.000	N/mm2
Mean compressive strength (cylinder)	fcm =fck + 8 N/mm2	40.000	N/mm2
Mean Axial tensile strength	fctm = 0.3 N/mm2 x (fck/1 N/mm2)^0.66	3.017	N/mm2
Youngs modulus of elasticity	Ecm=22000 N/mm2 * (fcm/10N/mm2)^0.3	33.346	kN/mm2
Design Flexural strength of concrete	fctd_fl = fctm * (1.6-h/1000)/ɣm	3.218	N/mm2

WINGATES, PLOT 3

Slab thickness			175	mm
Slab Effective Depth of 0.75 h	(Eurocode recommendation)	d=	131.25	mm
depth to plate 0.5h	Plate at mid dep BOLTON	d2=	65.625	mm

Shear factor	ks=1+(200/d)0.5		2.000	N/mm2
Maximum shear stress at 2d from face of load	Vrdc=.035*ks^1.5*(fck/1)^0.5*1		0.560	N/mm2
Total shear resistance	Vrdc,ct		0.560	N/mm2
Shear factor	k2=0.6(1-fck/250)		0.5232	N/mm2
Max shear strength	vmax=0.5*k2*fcd		5.581	N/mm2
Design concrete compressive strength (cylinder)	fcd=fck/ɣ		21.333	N/mm2
Confined concrete factor	k3		3	

Dowel Data

Length of side		pL	120	mm
Width of plate		pb	150	mm
Plate thickness		tp1	8	mm
		tp2	10	mm
		tp3	12	mm

Plate Design strength			Py	410	N/mm2
Long term joint opening	e =	10 mm	x	20	mm
Plate fixed embeddment			emb1	65	mm
Sleeved embeddment			emb2	45	mm
Critical palte width	At face of joint		Wcrt	150	mm
Critical bearing area	Wcrit*emb2		A.bear	6750	mm2

Plate Centres **600** mm

Critical spacings for bursting no perimeter overlap: Scrit1 - Wcrit + 4.d2

	Scrit1 =	412.5	mm
		OK NO OVERLAP	
critical perimeter no overlap		692.125	mm
critical perimeter with overlap		NA	mm
critical perimeter sleeve side	U1	**692.125**	mm

ULS Load Transfer per dowel

	tp	**8**			**10**			**12**	
0.6*Py*t*Wcrt*9 =	Pshear	265.68	kN	Psh	332.1	kN	Psh	398.52	kN
2*e*k3*fcd*pb =	b1	192000.00		b1	192000.00		b1	192000.00	
2*k3*fcd*pb^2*tp^2*Fyd :	c1	65714086957		c1	1.02678E+11		c1	1.47857E+11	
0.5(b1^2+c1)^0.5-b1 =	Pmax	64.14	kN	Pmax	90.78	kN	Pmax	118.90	kN
(U1*d2*vRd,ct) =	Pburst	25.44	kN	Pburst	25.44	kN	Pburst	25.44	kN
	Critical value	25.44	kN	Critical value	25.44	kN	Critical value	25.44	kN
	ULS transfer/m	42.39	kN/m	ULS transfer/m	42.39	kN/m	ULS transfer/m	42.39	kN/m

USE THIS VALUE

CONCLUSION

SP

WINGATES

GMICE

THE CALCULATIONS CONFIRM THAT THE SLAB DESIGN SHALL BE CONSTRUCTED TO THE FOLLOWING KONTRAD SPECIFICATION.

SLAB DEPTH			175	mm	
REINFORCEMENT		TYPE -"A"	142		
CONCRETE	C	32	40	N/mm2	CEM1 OR CEM 11
COVER (B)			40	mm	
SAW CUTS			50	mm	
ARMOURED JOINTS		8mm @	600	ctrs	(OR R12 @ 300 CTRS)

SLAB DESIGN HAS BEEN BASED ON THE FOLLOWING LOADING :----------

RACKING AND SHELVING *WINGATES, PLOT 3*

SINGLE LEG LOAD			75	kN	
BACK TO BACK SPACING			300	mm	
RACK DEPTH		BOLTON	1100	mm	
RACK LENGTH			2750	mm	
JOINT DISTANCE TO CTR OF BASE PLATE			300	mm	TO CTR LINE BASE PLATE
BASE PLATE SIZE			100	X	100 mm
SLAB EDGE TO CTR LINE BASE PLATE			300	mm	TO CTR LINE BASE PLATE

MHE

MAX STATIC SINGLE WHEEL LOAD	40	kN	*ASSUMED MAX VALUE*
WHEEL CONTACT AREA	100	cm2	

UDL

LOAD PER SQUARE METRE	50	kN/m2

LINE LOADS

LOAD PER LIN METRE	25	kN/m	ASSUMED MAX VALUE

THE SLAB DESIGN IS BASED UPON A MINIMUM "K" VALUE / MODULUS OF RIGIDITY BEING AVAILABLE ON TOP OF THE SUB GRADE / CAPPING LAYER MATERIAL OF :-

0.054 N/mm3

THIS VALUE IS EQUIVALENT TO A CBR VALUE OF 10%

PLATE LOAD TESTS WILL BE CARRIED OUT TO VERIFY THE ABOVE DESIGN CRITERIA WHEN DESIGN RESPONSIBILITY FOR THE SLAB DESIGN IS UNDERTAKEN BY ABS BRYMAR FLOORS AND KONTRAD LLP

SUB BASES MAY BE LIGHTLY BLINDED SUITABLE TO RECEIVE THE POLYTHENE SLIP MEMBRANE HOWEVER THE DEPTH OF ANY BLINDING MUST NOT EXCEED 10 MM IN ORDER TO ALLOW ACCESS FOR CONSTRUCTION TRAFFIC WITHOUT EXCESSIVE RUTTING.

THE REQUIREMENT FOR ANY UNDERSLAB INSULATION SHALL BE DESIGNED SUPPLIED AND INSTALLED BY OTHERS TO ACHIEVE THE SAME SUPPORT PARAMETERS AS THE SOIL BELOW.

THE DESIGN OF HOLDING DOWN BOLTS FOR RACKING INSTALLATIONS SHALL BE THE RESPONSIBILITY OF OTHERS BASED UPON THE SLAB THICKNESS SPECIFIED ABOVE AND APPROPRIATE EDGE DIMENSIONS TO PREVENT BURSTING OF THE CONCRETE.

SLAB DESIGN CONDITIONS ARE NOT TAKEN CONCURRENTLY EXCEPT WHERE NOTED FOR EXAMPLE LOAD CASE 4 - SINGLE RACK + FLT WHEEL LOAD.

THE SLAB CONSTRUCTION WILL BE SUITABLE FOR STANDARD (UK) ROAD VEHICLES INGRESSING AND EGRESSING THE BUILDING IN FORWARD AND REVERSE GEAR AT SLOW SPEED

REFER TO ABS BRYMAR JOINT LAYOUT FOR PROPOSED DETAILS. P23012-ABS-XX-00-DR-X-0001
P230112-ABS-XX-00-DR-X-0002

DRAWING NOTES

WINGATES

THE SLAB CONSTRUCTION INDICATED ON THIS DRAWING FOR THE WAREHOUSE AREA HAS BEEN BASED ON THE FOLLOWING DESIGN CRITERIA.

UNIFORMLY DISTRIBUTED LOAD OF	**50**		kN/m2	
OR				
(MODULAR END FRAME WITH 2 LEGS AT 1050-1200 CTRS)				
INDIVIDUAL RACK LEG LOAD OF	**75**		kN	
TAKEN IN A BACK TO BACK SITUATION AT MINIMUM SPACING OF	**300**		mm ctrs	
MINIMUM SIZE BASE PLATE SIZE OF (**Lw x Ll**)	**100**	**x**	**100**	mm
CENTRE LINE OF BASE PLATES POSITIONED A MINIMUM DISTANCE FROM JOINT	**300**		mm	
CENTRE LINE OF BASE PLATES AT SLAB EDGE POSITIONED A MINIMUM DISTANCE FROM THE SLAB EDGE OF	**300**		mm	
THE MAXIMUM INDIVIDUAL MHE WHEEL LOAD ACTING IN COMBINATION WITH A SINGLE RACK LEG LOAD (AISLE SIDE) MUST NOT EXCEED	**40**		kN	

THE SLAB AS DESIGNED WILL SUSTAIN A LINE LOAD DIRECTLY ADJACENT A FLOOR JOINT OF……..	**25**	kN/M

WHERE LINE LOADS EXCEED THIS VALUE UNDERSLAB THICKENNINGS MAY BE REQUIRED AND SHALL BE DESIGNED AND INSTALLED BY OTHERS PRIOR TO SLAB WORKS COMMENCING

THE SLAB DESIGN IS BASED UPON A MINIMUM MODULUS OF SUB GRADE REACTION ACHIEVING A K VALUE OF	**0.054**	N/mm3

THE REQUIREMENT FOR ANY UNDERSLAB INSULATION (DESIGNED SUPPLIED AND INSTALLED BY OTHERS) SHALL BE BASED UPON ACHIEVING AN EQUIVALENT SUB GRADE REACTION AS NOTED ABOVE.

ALLOWANCE HAS BEEN TAKEN FOR WHEEL LOADING ASSOCIATED WITH STANDARD UK HEAVY GOODS VEHICLES DRIVING ON THE SLAB WITH MAXIMUM AXLE LOADS OF 11.5T

LOADING CONDITIONS WITHIN THE DESIGN ARE NOT CONCURRENT BUT ARE ASSUMED TO ACT SEPERATLY UNLESS NOTED OTHERWISE.

REFER TO SEPARATE CALCULATIONS PREPARED BY "KONTRAD LLP - INDUSTRIAL FLOORING CONSULTANTS" FOR FULL DETAILS OF THE DESIGN.

Isotest Ltd
8, Hood Road,
Daventry,
Northmptonshire
NN11 4JS
Email: info@isotest.org.uk

TEST REPORT

Determination of Abrasion Resistance Wear

Client: ABS Brymar
Report Number: 22051/24/01
Address: Unit 40, Drumhead Road
Chorley North Industrial Park
Chorley
Lancashire
Our Ref: E390-01
Postcode: PR6 7BX
Contact: Mark Tugman

Site: C/O Winvic Construction, Plot 3, Panattoni Park, Great Bank Road, Wingates, Bolton, BL3 3XN

Equipment Details:

Make & Type: BCA
Equipment Number: LAB 204514

Test Details:

Date Tested: 14/05/2024
Time of Test: 10:00am
Test Location: Internal Slab
Mix Design: C32/40
Cast Dates: 09th April - 12th April 2024

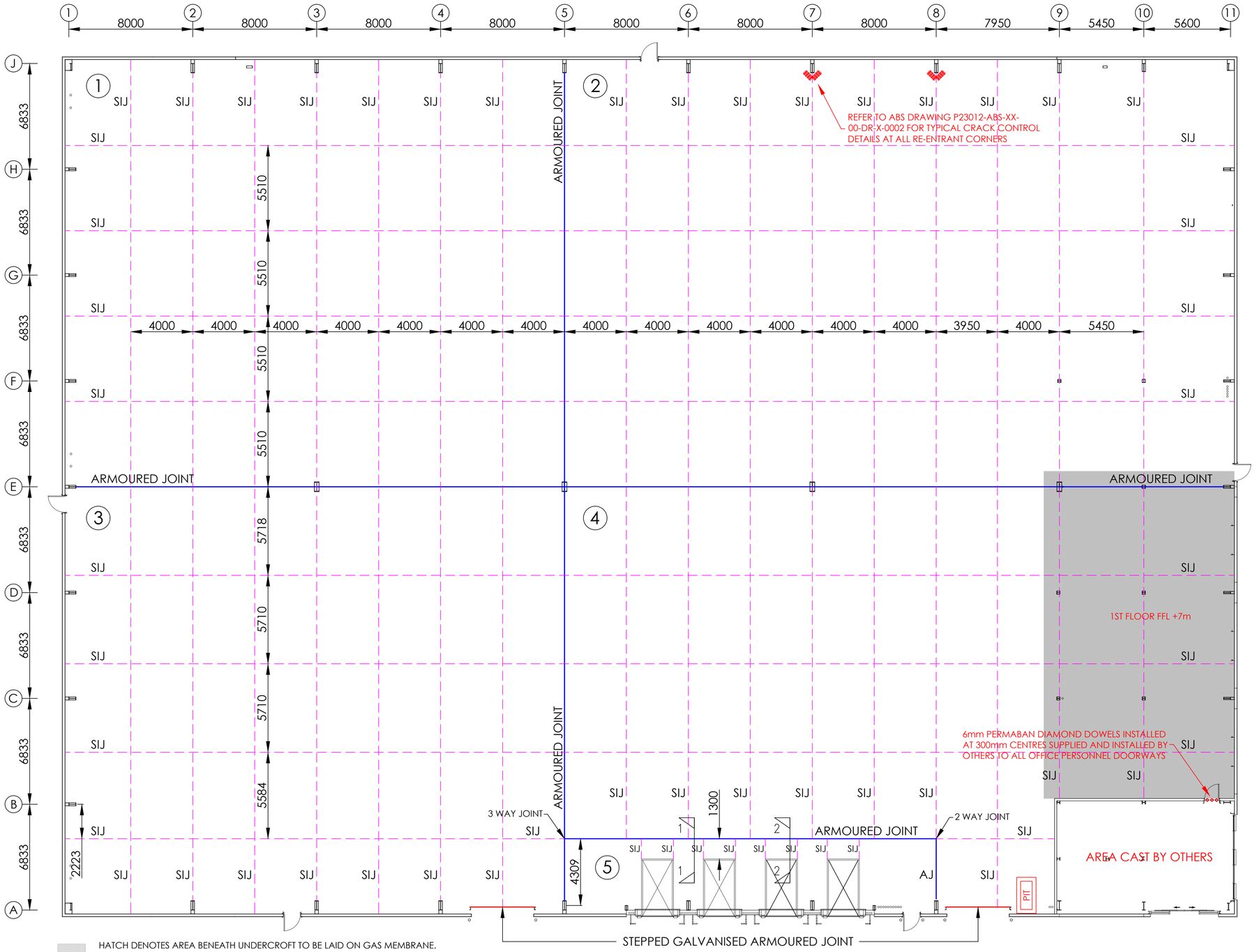
Test Results:

Location/ Test Ref	Surface Condition	Mean depth of wear (mm)	Complies with BS Class
Area 1	Good	0.01	AR0.5 (Special)
Area 4	Good	0.01	AR0.5 (Special)

Certified that the testing was carried out in accordance with Tested to BS 8204: Part 2: 2003+A2:2011 using Method in BS EN 13892-4:2002

Comments:

Date: 16/05/2024 **Signed:** _____ [✓]S.Hudspeth -Director



HATCH DENOTES AREA BENEATH UNDERCROFT TO BE LAID ON GAS MEMBRANE. GAS MEMBRANE TO BE SUPPLIED AND INSTALLED BY ACS LININGS PRIOR TO ABS WORKS. MEMBRANE TO EXTEND 1000mm PAST GL '9' & 'E' INTO WAREHOUSE.

SLAB SPECIFICATION

175mm THICK INTERNAL CONCRETE SLAB

C40 WELL GRADED CONCRETE

1 LAYER OF A142 MESH FABRIC WITH 400mm LAPS (MIN 300mm) PLACED ONTO 40mm SNAKE SPACERS AT 800mm CENTRES AS WORK PROCEEDS

ALL AREAS EXCLUDING THE UNDERCROFT AND OFFICE AREA TO BE LAID ONTO ONE LAYER OF 2000g POLYTHENE WITH 150mm LAPPED & TAPED JOINTS. JOINTS TO BE TAPED USING 75mm PROPRIETARY (GAFFA) TAPE BETWEEN SHEETS ONLY. MEMBRANE AT ANY COLUMN / JUNCTION OR PENETRATIONS TO BE LAPPED UP THE FACE ONLY. UNDERCROFT AREA TO BE LAID ON A GAS MEMBRANE SUPPLIED AND INSTALLED BY ACS LININGS

SURFACE TO RECEIVE A POWER FLOAT FINISH

1 COAT OF SPRAY APPLIED COMBINED CURE AND SURFACE SEALER

LAID UTILISING LASER SCREED

TOLERANCE TR34 (2013) FM2 PROPERTIES E & F

SUB-BASE TOLERANCE TO ACHIEVE +/- 10mm WITH AN AVERAGE OF ZERO

SLAB DESIGN

THE SLAB CONSTRUCTION INDICATED ON THIS DRAWING FOR THE WAREHOUSING AREA HAS BEEN BASED UPON THE FOLLOWING DESIGN CRITERIA:-

- UNIFORMLY DISTRIBUTED LOAD – 50kN/M²

OR

- INDIVIDUAL RACK LEG LOAD OF 70kN
- TAKEN IN A BACK TO BACK CONFIGURATION AT 300mm CENTRES.
- MINIMUM SIZE BASE PLATES OF 100mm X 100mm.
- CENTRE LINE OF RACKING BASE PLATES POSITIONED A MINIMUM DISTANCE OF 300mm FROM ANY JOINTS IN THE SLAB.

THE MAXIMUM INDIVIDUAL MHE WHEEL LOAD ACTING IN COMBINATION WITH A SINGLE RACK LEG LOAD (AISLE SIDE) MUST NOT EXCEED 40kN.

THE SLAB AS DESIGNED WILL SUSTAIN A LINE LOAD CAPACITY DIRECTLY ADJACENT A FLOOR JOINT OF 25kN/M. WHERE LINE LOADS EXCEED THIS VALUE UNDERSLAB THICKENINGS MAY BE REQUIRED AND SHALL BE DESIGNED AND INSTALLED BY OTHERS PRIOR TO SLAB WORKS COMMENCING.

THE SLAB DESIGN IS BASED UPON A MINIMUM MODULUS OF SUB GRADE REACTION ACHIEVING A "K-VALUE" OF 0.054 N/mm³

THE REQUIREMENT FOR ANY UNDERSLAB INSULATION (DESIGNED, SUPPLIED AND INSTALLED BY OTHERS) SHALL BE BASED UPON ACHIEVING AN EQUIVALENT SUB GRADE REACTION AS NOTED ABOVE.

ALLOWANCE HAS BEEN TAKEN FOR WHEEL LOADING ASSOCIATED WITH STANDARD UK HEAVY GOODS VEHICLES DRIVING ON THE SLAB.

LOADING CONDITIONS WITHIN THE DESIGN ARE NOT CONCURRENT BUT ARE ASSUMED TO ACT SEPARATELY UNLESS NOTED OTHERWISE.

REFER TO SEPARATE CALCULATIONS PREPARED BY "KONTRAD LLP – INDUSTRIAL FLOORING CONSULTANTS" FOR FULL DETAILS OF SLAB DESIGN

REFERENCE SHALL ALSO BE MADE TO THE "OPERATION AND MAINTENANCE DOCUMENT" WHICH PROVIDES GUIDANCE ON CLEANING AND ROUTINE INSPECTIONS TO BE CARRIED OUT BY THE END USER.

GENERAL NOTES

- PRIOR TO PLACING CONCRETE, ALL ROOF AND WALL SHEETING SHALL BE COMPLETED WHERE PRACTICAL TO PROVIDE PROTECTION FROM THE SUN, WIND AND RAIN. LOADING DOORS SHALL BE FIXED IN PLACED AND OPENINGS SHEETED.
- THE JOINTS ARE TO BE INITIALLY SEALED USING A SEALANT WITH A SHORE "A" HARDNESS IN THE RANGE OF 30–50 & M.A.F. IN THE RANGE OF 25%–35%, INSTALLED BY OTHERS (UNLESS NOTED OTHERWISE). THE SEALANT IS DESIGNED TO BE A TEMPORARY APPLICATION AND THE INSPECTION AND MAINTENANCE OF SAID SEALANT IS THE RESPONSIBILITY OF THE TENANT / BUILDING USER. ALL INSPECTION, MAINTENANCE AND CLEANING OPERATIONS ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS OF CHAPTER 13, TR34 4TH EDITION 2013. SEALING JOINTS SHOULD BE LEFT AS LATE IN THE CONSTRUCTION PROCESS AS POSSIBLE.
- SPACING BETWEEN FIXINGS INTO THE SLAB AND ANY SAWN OR FORMED JOINT IS TO BE A MINIMUM 5 X HOLE DIAMETER AND MAXIMUM 2/3 SLAB DEPTH.
- THE SLAB CAN BE USED BY LIGHT TRAFFIC 7 DAYS AFTER IT IS POURED. THE LOADS SHALL NOT EXCEED 30% OF THE DESIGN CAPACITY. THE FLOOR SHALL NOT BE LOADED TO ITS FULL DESIGN CAPACITY BEFORE 28 DAYS HAVE PASSED SINCE POURING.
- AREA NUMBERS DO NOT REPRESENT POUR SEQUENCE BUT ARE FOR IDENTIFICATION PURPOSES ONLY.
- JOINT SEALANT WORKS ARE BY OTHERS
- THE EXACT POSITION OF SHUTTERING/JOINTS AT DOORWAYS IS TO BE CONFIRMED ON SITE BY MAIN CONTRACTORS SITE ENGINEER TO SUIT THE VARIOUS DOOR TYPES & FIXING REQUIREMENTS
- IT IS THE MAIN CONTRACTORS RESPONSIBILITY TO ENSURE THAT 'DOCK LEVELLERS' ARE FULLY SHUTTERED AND/OR SEALED TO PREVENT CONCRETE INFILL OR GROUT LOSS DROPPING INTO THE PIT BELOW DURING SLAB PLACEMENT. ABS BRYMAR ARE UNABLE TO ACCEPT ANY RESPONSIBILITY FOR LEAKAGES INTO THE PIT.
- IN ACCORDANCE WITH CS–TR34 CLAUSE 11.10. ABS BRYMAR FLOORS DO NOT RECOMMENDED THE USE OF PORTAL TIE BARS TO RESIST HORIZONTAL FORCES WHICH MAY INDUCE SLAB RESTRAINT AND COULD RESULT IN SIGNIFICANT CRACKING.
- THE JOINT LAYOUT SHOWN ON THIS DRAWING HAS NOT BEEN CO–ORDINATED WITH ANY RACKING. SHOULD A RACKING LAYOUT BE MADE AVAILABLE PRIOR TO CASTING THE FLOOR SLAB THE JOINT POSITIONS CAN BE ADJUSTED TO SUIT UPON RECEIPT OF THE FINALISED RACK LAYOUT.
- REFER TO ABS DRAWING P23012–ABS–XX–00–DR–X–0002 FOR TYPICAL DETAILS.

REV	DATE	DESCRIPTION
AB1	18.04.2024.	AS BUILT STATUS.
C04	22.02.2024.	SLAB SPECIFICATION UPDATED TO INDICATED TAPED MEMBRANE BETWEEN SHEETS.
C03	19.02.2024.	GAS MEMBRANE AREA REDUCED. 1200g POLYTHENE OMITTED AND REPLACED WITH 2000g POLYTHENE.
C02	07.02.2024.	ELECTRICAL PIT ADDED TO PLAN.
C01	31.01.2024.	ISSUED FOR CONSTRUCTION.
P01	18.01.2024.	ISSUED FOR APPROVAL.

ABS BRYMAR FLOORS LTD
Unit 40
Drumhead Road
Chorley North Ind Park
Chorley
PR6 7BX
Tel: 0161 972 5000.
E: general@absbrymarfloors.co.uk

PLEASE NOTE:- THIS DRAWING WILL BE DEEMED ACCEPTABLE FOR CONSTRUCTION BY THE MAIN CONTRACTOR/CLIENT IF NO COMMENTS TO THE CONTRARY ARE RECEIVED PRIOR TO COMMENCEMENT ON SITE.

AS BUILT

DRAWN	DATE	SCALE	ABS DRAWING NO.	REV
MT	18.04.2024	DNS	2354 - 01	AB1

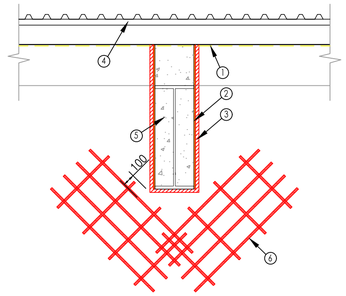
CLIENT
WINVIC CONSTRUCTION LTD

PROJECT TITLE
WINGATES, PLOT 3, BOLTON

DRAWING TITLE
PROPOSED JOINT LAYOUT

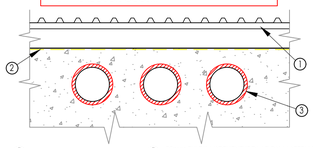
PROJECT–ORIGINATOR–ZONE–LEVEL–TYPE–ROLE–NO
P23012 - ABS - XX - 00 - DR - X - 0001

1. 2000g MEMBRANE TURNED UP THE FACE OF PFC
2. 10mm GRC SHEET PLACED ACROSS COLUMN FLANGES
3. 20mm THICK MIOTHENE ISOLATION MATERIAL WRAPPED AROUND COLUMN EXTENDING TO FULL DEPTH OF SLAB
4. EXTERNAL CLADDING
5. INFILL CAST AT SAME TIME AS SURROUNDING AREA
6. PREFABRICATED B785 MESH MAT COMPRISING 4 No H10 / 800mm LONG BARS PLACED ACROSS RE-ENTRANT CORNERS SUPPORTED ON SUITABLE SIZED SNAKE SPACERS OFF BOTTOM MAT TO GIVE 75mm TOP COVER



PLAN ON PERIMETER COLUMN ENCASEMENT

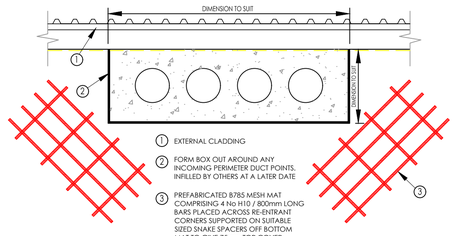
IF 3 OR LESS DUCTS ARE IN CLOSE PROXIMITY, 20mm MIOTHENE IS TO BE WRAPPED AROUND EACH INDIVIDUAL DUCT. REFER TO BOX OUT DETAIL FOR SCENARIOS WHERE 4 OR MORE DUCTS OCCUR.



1. EXTERNAL CLADDING
2. 2000g MEMBRANE TURNED UP THE FACE OF PFC
3. 20mm THICK MIOTHENE ISOLATION MATERIAL WRAPPED AROUND RIGID INCOMING SERVICE DUCTS. FLEXIBLE DUCTS DO NOT REQUIRE ISOLATION

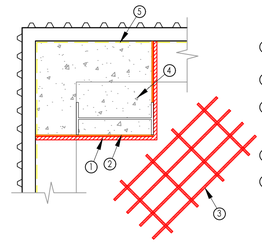
TYPICAL PLAN ON PERIMETER FLOOR DUCTS

TIMBER SHUTTER INSTALLED AROUND DUCTS WHEN 4 OR MORE DUCTS ARE IN CLOSE PROXIMITY



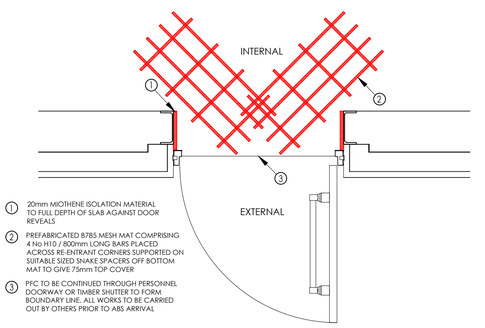
1. EXTERNAL CLADDING
2. FORM BOX OUT AROUND ANY INCOMING PERIMETER DUCT POINTS. INFILLED BY OTHERS AT A LATER DATE
3. PREFABRICATED B785 MESH MAT COMPRISING 4 No H10 / 800mm LONG BARS PLACED ACROSS RE-ENTRANT CORNERS SUPPORTED ON SUITABLE SIZED SNAKE SPACERS OFF BOTTOM MAT TO GIVE 75mm TOP COVER

TYPICAL PLAN ON PERIMETER FLOOR DUCTS BANK



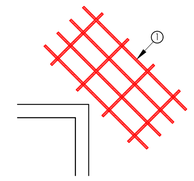
1. 20mm THICK MIOTHENE ISOLATION MATERIAL WRAPPED AROUND COLUMN EXTENDING TO FULL DEPTH OF SLAB
2. 10mm GRC SHEET PLACED ACROSS COLUMN FLANGES
3. PREFABRICATED B785 MESH MAT COMPRISING 4 No H10 / 800mm LONG BARS PLACED ACROSS RE-ENTRANT CORNERS SUPPORTED ON SUITABLE SIZED SNAKE SPACERS OFF BOTTOM MAT TO GIVE 75mm TOP COVER
4. INFILL CAST AT SAME TIME AS SURROUNDING AREA
5. 2000g POLYTHENE TURNED UP THE FACE OF PFC

PLAN ON CORNER PERIMETER COLUMN ENCASEMENT



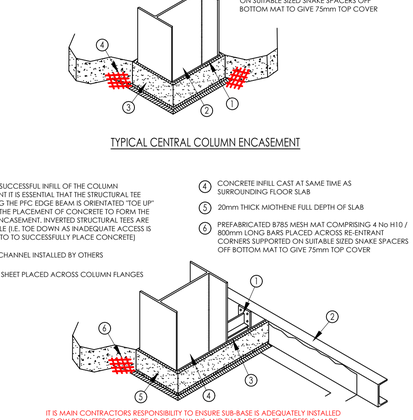
1. 20mm MIOTHENE ISOLATION MATERIAL TO FULL DEPTH OF SLAB AGAINST DOOR REVEALS
2. PREFABRICATED B785 MESH MAT COMPRISING 4 No H10 / 800mm LONG BARS PLACED ACROSS RE-ENTRANT CORNERS SUPPORTED ON SUITABLE SIZED SNAKE SPACERS OFF BOTTOM MAT TO GIVE 75mm TOP COVER
3. PFC TO BE CONTINUED THROUGH PERSONNEL DOORWAY OR TIMBER SHUTTER TO FORM BOUNDARY LINE. ALL WORKS TO BE CARRIED OUT BY OTHERS PRIOR TO ABS ARRIVAL

DETAIL AT PERSONNEL DOORWAYS



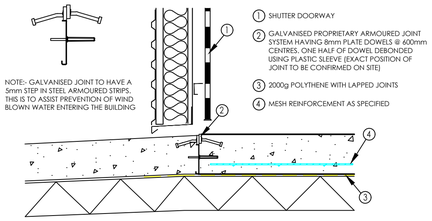
1. PREFABRICATED B785 MESH MAT COMPRISING 4 No H10 / 800mm LONG BARS PLACED ACROSS RE-ENTRANT CORNERS SUPPORTED ON SUITABLE SIZED SNAKE SPACERS OFF BOTTOM MAT TO GIVE 75mm TOP COVER (100mm END COVER)

TYPICAL CRACK CONTROL TO ALL RE-ENTRANT CORNERS BOX OUTS & COLUMN ENCASEMENTS



1. 10mm GRC SHEET PLACED ACROSS COLUMN FLANGES
2. CONCRETE INFILL CAST AT SAME TIME AS SURROUNDING FLOOR SLAB
3. 20mm THICK MIOTHENE FULL DEPTH OF SLAB
4. PREFABRICATED B785 MESH MAT COMPRISING 4 No H10 / 800mm LONG BARS PLACED ACROSS RE-ENTRANT CORNERS SUPPORTED ON SUITABLE SIZED SNAKE SPACERS OFF BOTTOM MAT TO GIVE 75mm TOP COVER

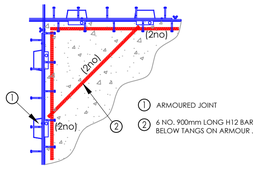
TYPICAL CENTRAL COLUMN ENCASEMENT



NOTE:- GALVANISED JOINT TO HAVE A 5mm STEP IN STEEL ARMOURED STRIPS. THIS IS TO ASSIST PREVENTION OF WIND BLOWN WATER ENTERING THE BUILDING

1. SHUTTER DOORWAY
2. GALVANISED PROPRIETARY ARMOURED JOINT SYSTEM HAVING 8mm PLATE DOWELS @ 600mm CENTRES. ONE HALF OF DOWEL DEBONDED USING PLASTIC SLEEVE (EXACT POSITION OF JOINT TO BE CONFIRMED ON SITE)
3. 2000g POLYTHENE WITH LAPPED JOINTS
4. MESH REINFORCEMENT AS SPECIFIED

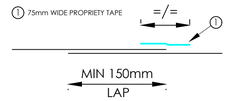
TYPICAL SECTION THROUGH ROLLER SHUTTER DOORWAY



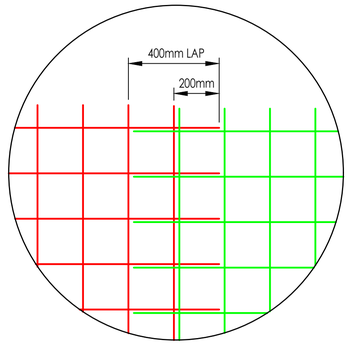
1. ARMOURED JOINT
2. 6 NO. 900mm LONG H12 BARS WIRED BELOW TANGS ON ARMOUR JOINT

DETAIL SHOWING ADDITIONAL ANTI-CRACK BARS AT 2 & 3 WAY ARMOUR JOINT INTERSECTIONS

1. 75mm WIDE PROPRIETY TAPE

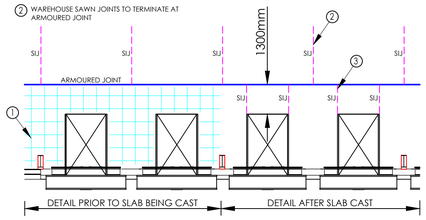


TYPICAL LAP DETAIL FOR TAPED MEMBRANES



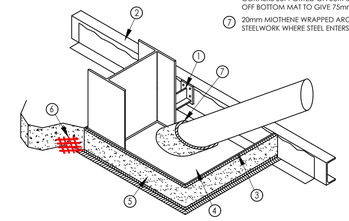
TYPICAL "ECO MESH" LAP DETAIL

1. MESH REINFORCEMENT AS SPECIFIED (400mm LAP) REFER TO SECTION 1-1 & 2-2 FOR MESH BUILD UP
2. WAREHOUSE SAWN JOINTS TO TERMINATE AT ARMOURED JOINT
3. SAWN INDUCED JOINTS INSTALLED OFF ALL DOCK LEVELLER CORNERS AND TERMINATE AT ARMOURED JOINT



TYPICAL DETAIL AT DOCK ISOLATION STRIP

1. TO ALLOW SUCCESSFUL INFILL OF THE COLUMN ENCASEMENT IT IS ESSENTIAL THAT THE STRUCTURAL TEE SUPPORTING THE PFC EDGE BEAM IS ORIENTATED "TOE UP" TO ALLOW THE PLACEMENT OF CONCRETE TO FORM THE COLUMN ENCASEMENT. INVERTED STRUCTURAL TEES ARE NOT SUITABLE (I.E. TOE DOWN AS INADEQUATE ACCESS IS AVAILABLE TO TO SUCCESSFULLY PLACE CONCRETE)
2. PERIMETER CHANNEL INSTALLED BY OTHERS
3. 10mm GRC SHEET PLACED ACROSS COLUMN FLANGES
4. CONCRETE INFILL CAST AT SAME TIME AS SURROUNDING FLOOR SLAB
5. 20mm THICK MIOTHENE FULL DEPTH OF SLAB
6. PREFABRICATED B785 MESH MAT COMPRISING 4 No H10 / 800mm LONG BARS PLACED ACROSS RE-ENTRANT CORNERS SUPPORTED ON SUITABLE SIZED SNAKE SPACERS OFF BOTTOM MAT TO GIVE 75mm TOP COVER
7. 20mm MIOTHENE WRAPPED AROUND BRACE STEELWORK WHERE STEEL ENTERS FLOOR SLAB

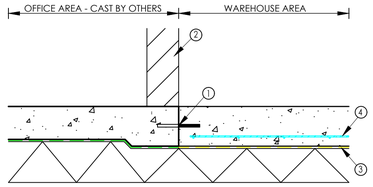


TYPICAL PERIMETER COLUMN ENCASEMENT AT BRACED BAYS

IT IS MAIN CONTRACTORS RESPONSIBILITY TO ENSURE SUB-BASE IS ADEQUATELY INSTALLED BELOW PERIMETER PFC AND REAR OF COLUMNS AND THAT ADEQUATE ACCESS IS MADE AVAILABLE TO LAY CONCRETE

TYPICAL PERIMETER COLUMN ENCASEMENT

1. PERMABAN 6mm DIAMOND DOWELS WITH ONE HALF OF DOWELS DEBONDED USING PLASTIC SLEEVES AT 450mm CENTRES SUPPLIED AND INSTALLED BY OTHERS
2. WALL BUILT OFF SLAB
3. 2000g POLYTHENE WITH LAPPED & TAPED JOINTS
4. MESH REINFORCEMENT AS SPECIFIED (50mm END COVER)

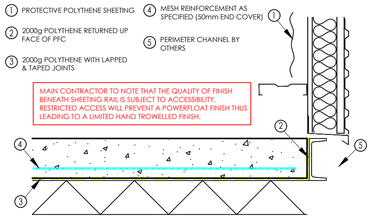


OFFICE / WAREHOUSE INTERFACE AT PERSONNEL DOORWAYS ONLY

WHERE VNA AISLES OCCUR IT IS ESSENTIAL FOR A DEFECT FREE FLOOR THAT ANY LONGITUDINAL FLOOR JOINT WITHIN DEFINED MOVEMENT AREAS (I.E AISLES) ARE KEPT A MINIMUM DISTANCE OF 300mm FROM THE CENTRE LINE OF ANY MHE WHEEL TRACKS AND WIRE GUIDANCE

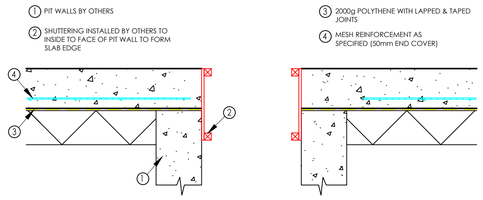
1. PROTECTIVE POLYTHENE SHEETING
2. 2000g POLYTHENE RETURNED UP FACE OF PFC
3. 2000g POLYTHENE WITH LAPPED & TAPED JOINTS
4. MESH REINFORCEMENT AS SPECIFIED (50mm END COVER)
5. PERIMETER CHANNEL BY OTHERS

MAIN CONTRACTOR TO NOTE THAT THE QUALITY OF FINISH BENEATH SHEETING RAIL IS SUBJECT TO ACCESSIBILITY. RESTRICTED ACCESS WILL PREVENT A POWERFLOAT FINISH THUS LEADING TO A LIMITED HAND TROWELLED FINISH.



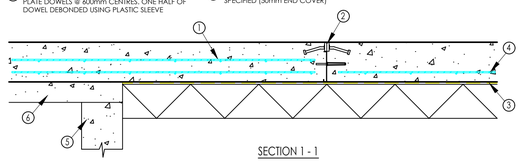
TYPICAL PERIMETER DETAIL

1. PIT WALLS BY OTHERS
2. SHUTTERING INSTALLED BY OTHERS TO INSIDE TO FACE OF PIT WALL TO FORM SLAB EDGE
3. 2000g POLYTHENE WITH LAPPED & TAPED JOINTS
4. MESH REINFORCEMENT AS SPECIFIED (50mm END COVER)

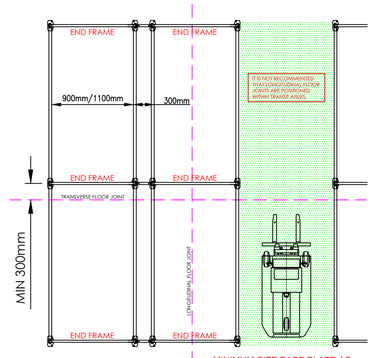


TYPICAL DETAIL AT ELECTRICAL PIT

1. ADDITIONAL LAYER OF A142 MESH FABRIC 75mm TOP COVER WITHIN THE DOCK ISOLATION STRIP
2. PROPRIETARY ARMOURED JOINT SYSTEM HAVING PLATE DOWELS @ 600mm CENTRES. ONE HALF OF DOWEL DEBONDED USING PLASTIC SLEEVE
3. 2000g POLYTHENE WITH LAPPED & TAPED JOINTS
4. MESH REINFORCEMENT AS SPECIFIED (50mm END COVER)
5. PRE-CAST DOCK WALL BY OTHERS
6. BISCUIT SLAB BY OTHERS

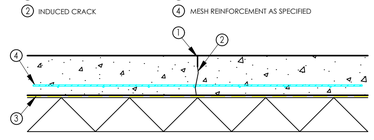


SECTION 1 - 1



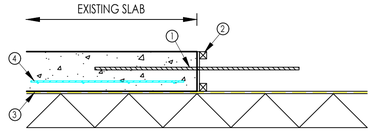
TYPICAL RACKING / TRUCK JOINT ARRANGEMENT ADOPTING STANDARD 2 LEG END FRAMES

1. 50mm x 3mm WIDE SAWN GROOVE
2. INDUCED CRACK
3. 2000g POLYTHENE WITH LAPPED & TAPED JOINTS
4. MESH REINFORCEMENT AS SPECIFIED



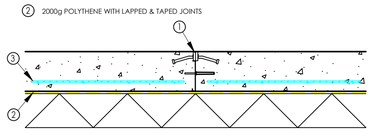
TYPICAL SAWN INDUCED JOINT (SJ)

1. FORMED JOINT CONSISTING OF 900mm LONG H12 BARS AT 150mm CENTRES
2. TIMBER SHUTTER
3. 2000g POLYTHENE WITH LAPPED & TAPED JOINTS
4. MESH REINFORCEMENT AS SPECIFIED



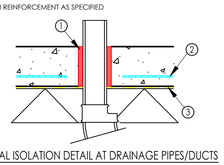
EMERGENCY STOP END / TERMINATION DETAIL

1. PROPRIETARY ARMOURED JOINT SYSTEM HAVING 8mm PLATE DOWELS @ 600mm CENTRES. ONE HALF OF DOWEL DEBONDED USING PLASTIC SLEEVE
2. 2000g POLYTHENE WITH LAPPED & TAPED JOINTS
3. MESH REINFORCEMENT AS SPECIFIED



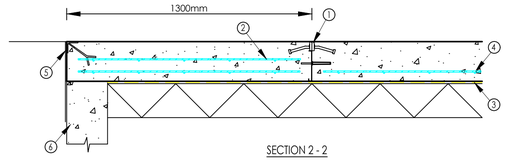
ARMOURED JOINT

1. 20mm MIOTHENE WRAPPED AROUND RIGID INCOMING SERVICE DUCTS. FLEXIBLE DUCTS DO NOT REQUIRE ISOLATION.
2. MESH REINFORCEMENT AS SPECIFIED
3. 2000g POLYTHENE WITH LAPPED & TAPED JOINTS



TYPICAL ISOLATION DETAIL AT DRAINAGE PIPES/DUCTS

1. PROPRIETARY ARMOURED JOINT SYSTEM HAVING PLATE DOWELS @ 600mm CENTRES. ONE HALF OF DOWEL DEBONDED USING PLASTIC SLEEVE
2. ADDITIONAL LAYER OF A142 MESH FABRIC 75mm TOP COVER WITHIN THE DOCK ISOLATION STRIP
3. 2000g POLYTHENE WITH LAPPED & TAPED JOINTS
4. MESH REINFORCEMENT AS SPECIFIED (50mm END COVER)
5. DOCK FRAME BOX BY OTHERS
6. PRE-CAST DOCK WALL BY OTHERS



SECTION 2 - 2

SLAB SPECIFICATION

175mm THICK INTERNAL CONCRETE SLAB

C40 WELL GRADED CONCRETE

1 LAYER OF A142 MESH FABRIC WITH 400mm LAPS (MIN 300mm) PLACED ONTO 40mm SNAKE SPACERS AT 800mm CENTRES AS WORK PROCEEDS

ALL AREAS EXCLUDING THE UNDERCROFT AND OFFICE AREA TO BE LAID ONTO ONE LAYER OF 2000g POLYTHENE WITH 150mm LAPPED & TAPED JOINTS. JOINTS TO BE TAPED USING 75mm PROPRIETARY (DAFTA) TAPE BETWEEN SHEETS ONLY. MEMBRANE AT ANY COLUMN / JUNCTION OR PENETRATIONS TO BE LAPPED UP THE FACE ONLY. UNDERCROFT AREA TO BE LAID ON A GAS MEMBRANE SUPPLIED AND INSTALLED BY ACS LININGS

SURFACE TO RECEIVE A POWER FLOAT FINISH

1 COAT OF SPRAY APPLIED COMBINED CURE AND SURFACE SEALER

LAID UTILISING LASER SCREED

TOLERANCE TR34 (2013) FM2 PROPERTIES E & F

SUB-BASE TOLERANCE TO ACHIEVE +/- 10mm WITH AN AVERAGE OF ZERO

SLAB DESIGN

THE SLAB CONSTRUCTION INDICATED ON THIS DRAWING FOR THE WAREHOUSING AREA HAS BEEN BASED UPON THE FOLLOWING DESIGN CRITERIA:-

- UNIFORMLY DISTRIBUTED LOAD – 50kN/M²

OR

- INDIVIDUAL RACK LEG LOAD OF 70kN
- TAKEN IN A BACK TO BACK CONFIGURATION AT 300mm CENTRES.
- MINIMUM SIZE BASE PLATES OF 100mm X 100mm.
- CENTRE LINE OF RACKING BASE PLATES POSITIONED A MINIMUM DISTANCE OF 300mm FROM ANY JOINTS IN THE SLAB.

THE MAXIMUM INDIVIDUAL MHE WHEEL LOAD ACTING IN COMBINATION WITH A SINGLE RACK LEG LOAD (AISLE SIDE) MUST NOT EXCEED 40kN.

THE SLAB AS DESIGNED WILL SUSTAIN A LINE LOAD CAPACITY DIRECTLY ADJACENT A FLOOR JOINT OF 25kN/M. WHERE LINE LOADS EXCEED THIS VALUE UNDERSLAB THICKENINGS MAY BE REQUIRED AND SHALL BE DESIGNED AND INSTALLED BY OTHERS PRIOR TO SLAB WORKS COMMENCING.

THE SLAB DESIGN IS BASED UPON A MINIMUM MODULUS OF SUB GRADE REACTION ACHIEVING A "K-VALUE" OF 0.054 N/mm³

THE REQUIREMENT FOR ANY UNDERSLAB INSULATION (DESIGNED, SUPPLIED AND INSTALLED BY OTHERS) SHALL BE BASED UPON ACHIEVING AN EQUIVALENT SUB GRADE REACTION AS NOTED ABOVE.

ALLOWANCE HAS BEEN TAKEN FOR WHEEL LOADING ASSOCIATED WITH STANDARD UK HEAVY GOODS VEHICLES DRIVING ON THE SLAB.

LOADING CONDITIONS WITHIN THE DESIGN ARE NOT CONCURRENT BUT ARE ASSUMED TO ACT SEPARATELY UNLESS NOTED OTHERWISE.

REFER TO SEPARATE CALCULATIONS PREPARED BY "KONTRAD LLP – INDUSTRIAL FLOORING CONSULTANTS" FOR FULL DETAILS OF SLAB DESIGN

REFERENCE SHALL ALSO BE MADE TO THE "OPERATION AND MAINTENANCE DOCUMENT" WHICH PROVIDES GUIDANCE ON CLEANING AND ROUTINE INSPECTIONS TO BE CARRIED OUT BY THE END USER.

GENERAL NOTES

- PRIOR TO PLACING CONCRETE, ALL ROOF AND WALL SHEETING SHALL BE COMPLETED WHERE PRACTICAL TO PROVIDE PROTECTION FROM THE SUN, WIND AND RAIN. LOADING DOORS SHALL BE FIXED IN PLACED AND OPENINGS SHEETED.
- THE JOINTS ARE TO BE INITIALLY SEALED USING A SEALANT WITH A SHORE "A" HARDINESS IN THE RANGE OF 30-50 & M.A.F. IN THE RANGE OF 25%-35%, INSTALLED BY OTHERS (UNLESS NOTED OTHERWISE). THE SEALANT IS DESIGNED TO BE A TEMPORARY APPLICATION AND THE INSPECTION AND MAINTENANCE OF SAID SEALANT IS THE RESPONSIBILITY OF THE TENANT / BUILDING USER. ALL INSPECTION, MAINTENANCE AND CLEANING OPERATIONS ARE TO BE CARRIED OUT IN ACCORDANCE WITH THE RECOMMENDATIONS OF CHAPTER 13, TR34 4TH EDITION 2013. SEALING JOINTS SHOULD BE LEFT AS LATE IN THE CONSTRUCTION PROCESS AS POSSIBLE.
- SPACING BETWEEN FIXINGS INTO THE SLAB AND ANY SAWN OR FORMED JOINT IS TO BE A MINIMUM 5 X HOLE DIAMETER AND MAXIMUM 2/3 SLAB DEPTH.
- THE SLAB CAN BE USED BY LIGHT TRAFFIC 7 DAYS AFTER IT IS POURED. THE LOADS SHALL NOT EXCEED 30% OF THE DESIGN CAPACITY. THE FLOOR SHALL NOT BE LOADED TO ITS FULL DESIGN CAPACITY BEFORE 28 DAYS HAVE PASSED SINCE POURING.
- AREA NUMBERS DO NOT REPRESENT POUR SEQUENCE BUT ARE FOR IDENTIFICATION PURPOSES ONLY.
- JOINT SEALANT WORKS ARE BY OTHERS
- THE EXACT POSITION OF SHUTTERING/JOINTS AT DOORWAYS IS TO BE CONFIRMED ON SITE BY MAIN CONTRACTORS SITE ENGINEER TO SUIT THE VARIOUS DOOR TYPES & FIXING REQUIREMENTS
- IT IS THE MAIN CONTRACTORS RESPONSIBILITY TO ENSURE THAT 'DOCK LEVELLERS' ARE FULLY SHUTTERED AND/OR SEALED TO PREVENT CONCRETE INFILL OR GROUT LOSS DROPPING INTO THE PIT BELOW DURING SLAB PLACEMENT. ABS BRYMAR ARE UNABLE TO ACCEPT ANY RESPONSIBILITY FOR LEAKAGES INTO THE PIT.
- IN ACCORDANCE WITH CS-TR34 CLAUSE 11.10, ABS BRYMAR FLOORS DO NOT RECOMMEND THE USE OF PORTAL TIE BARS TO RESIST HORIZONTAL FORCES WHICH MAY INDUCE SLAB RESTRAINT AND COULD RESULT IN SIGNIFICANT CRACKING.
- THE JOINT LAYOUT SHOWN ON THIS DRAWING HAS NOT BEEN CO-ORDINATED WITH ANY RACKING. SHOULD A RACKING LAYOUT BE MADE AVAILABLE PRIOR TO CASTING THE FLOOR SLAB THE JOINT POSITIONS CAN BE ADJUSTED TO SUIT UPON RECEIPT OF THE FINALISED RACK LAYOUT.
- REFER TO ABS DRAWING P23012-ABS-XX-00-DR-X-0002 FOR TYPICAL DETAILS.

REV	DATE	DESCRIPTION
AB1	18.04.2024.	AS BUILT STATUS.
C04	22.02.2024.	SLAB SPECIFICATION UPDATED TO INDICATE TAPED JOINTS BETWEEN SHEETS. DETAIL ADDED TO SUIT.
C03	19.02.2024.	ALL MEMBRANE NOTES UPDATED TO REFER TO 2000g MEMBRANE.
C02	07.02.2024.	ELECTRICAL PIT DETAIL ADDED.
C01	31.01.2024.	DOCK DETAIL UPDATED TO 5mm STEPPED. ISSUED FOR CONSTRUCTION.
P01	18.01.2024.	ISSUED FOR APPROVAL.

ABS BRYMAR FLOORS LTD

Unit 40
Drumhead Road
Chorley North Ind Park
Chorley
PR6 7BX

Tel: 0161 972 5000.
E: general@absbrymarfloors.co.uk

PLEASE NOTE:- THIS DRAWING WILL BE DEEMED ACCEPTABLE FOR CONSTRUCTION BY THE MAIN CONTRACTOR/CLIENT IF NO COMMENTS TO THE CONTRARY ARE RECEIVED PRIOR TO COMMENCEMENT ON SITE.

AS BUILT

DRAWN	DATE	SCALE	ABS DRAWING NO.	REV
MT	18.04.2024.	DNS	2354 - 02	AB1

CLIENT
WINVIC CONSTRUCTION LTD

PROJECT TITLE
WINGATES, PLOT 3, BOLTON

DRAWING TITLE
TYPICAL DETAILS

PROJECT-ORIGINATOR-ZONE-LEVEL-TYPE-ROLE-NO
P23012 - ABS - XX - 00 - DR - X - 0002

TEST SAMPLE CERTIFICATE

812

NATIONAL LABORATORY
HANSON AGGREGATES
THE RIDGE

CHIPPING SODBURY
BS37 6AY

Tel: 07977 251228
Fax: NO FAX
Email:

Contractor	A B S Brymar Floors Ltd

Site	BOLTON PLOT 3- WINGATES- WINGAT
Mix	C32/40

Certificate Date:	24/05/2024
Certificate No:	367210

Date Cast	Date Received (at Lab)	Location (if provided)	Docket Number (if provided)	Consistence Class (If known)	Lab / Plant Ref No	Customer Ref No	Date Tested	Age (days)	Platen Face Dimension 1	Platen Face Dimension 2	Dimension 3	Weight of Cube (g)	Density (kg/m³)	Max Load (kN)	Compressive Strength (N/mm²)	Mode of Failure	Comments Number (See Key)
09/04/2024	16/04/2024	SLAB CO94407	2090677112	150	3057/38A	A	16/04/2024	7	100	100	100	2446	2450	311	31.1	N	

All testing is carried out in accordance with BS EN 12390-3 & 7 : 2009.
Specimens tested in a saturated surface dry condition unless otherwise stated.
Cubes received surface damp and density based on nominal dimensions unless otherwise stated.
Any consistence test results are outside our U.K.A.S Accredition.
Documentation received and cubes made in calibrated moulds unless otherwise stated.

 # Please see supplementary page for additonal comment(s)

Signed H Roberts

Name:

Position:

Key to Comments

01 Condition on receipt - Surface dry	07 Cube honeycombed	13 Cube air cured
02 Condition on receipt - Surface Damp	08 Cube showed signs of frost attack	14 Cube retained 28 days for inspection
03 Chipped corners	09 Fins removed by filing	15 Cube unsuitable to test
04 Rough or damaged edges	10 Cube slightly out of square	16 Density based on normal dimensions
05 Rough or exposed aggregate face(s)	11 Density measured as received	17 Cube curing temp > maximum over 24hrs
06 Air voids on surface of cube	12 Cube tested in a moist condition	18 Cube curing temp < minimum over 24hrs

TEST SAMPLE CERTIFICATE

812

NATIONAL LABORATORY
HANSON AGGREGATES
THE RIDGE

CHIPPING SODBURY
BS37 6AY

Tel: 07977 251228
Fax: NO FAX
Email:

Contractor	A B S Brymar Floors Ltd

Site	BOLTON PLOT 3- WINGATES- WINGAT
Mix	C32/40

Certificate Date:	24/05/2024
Certificate No:	367212

Date Cast	Date Received (at Lab)	Location (if provided)	Docket Number (if provided)	Consistence Class (If known)	Lab / Plant Ref No	Customer Ref No	Date Tested	Age (days)	Platen Face Dimension 1	Platen Face Dimension 2	Dimension 3	Weight of Cube (g)	Density (kg/m³)	Max Load (kN)	Compressive Strength (N/mm²)	Mode of Failure	Comments Number (See Key)
09/04/2024	16/04/2024	SLAB C094408	2090676573	150	3057/39A	A	16/04/2024	7	100	100	100	2454	2450	328	32.8	N	

All testing is carried out in accordance with BS EN 12390-3 & 7 : 2009.
Specimens tested in a saturated surface dry condition unless otherwise stated.
Cubes received surface damp and density based on nominal dimensions unless otherwise stated.
Any consistence test results are outside our U.K.A.S Accredition.
Documentation received and cubes made in calibrated moulds unless otherwise stated.

 # Please see supplementary page for additonal comment(s)

Signed H Roberts

Name:

Position:

Key to Comments

01 Condition on receipt - Surface dry	07 Cube honeycombed	13 Cube air cured
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06 Air voids on surface of cube	12 Cube tested in a moist condition	18 Cube curing temp < minimum over 24hrs

TEST SAMPLE CERTIFICATE

812

Contractor	A B S Brymar Floors Ltd

Site	BOLTON PLOT 3- WINGATES- WINGAT
Mix	C32/40

NATIONAL LABORATORY
HANSON AGGREGATES
THE RIDGE

CHIPPING SODBURY
BS37 6AY

Tel: 07977 251228
Fax: NO FAX
Email:

Certificate Date:	24/05/2024
Certificate No:	367214

Date Cast	Date Received (at Lab)	Location (if provided)	Docket Number (if provided)	Consistence Class (If known)	Lab / Plant Ref No	Customer Ref No	Date Tested	Age (days)	Platen Face Dimension 1	Platen Face Dimension 2	Dimension 3	Weight of Cube (g)	Density (kg/m³)	Max Load (kN)	Compressive Strength (N/mm²)	Mode of Failure	Comments Number (See Key)
10/04/2024	16/04/2024	SLAB CO94494	2090681782	150	3057/40A	A	17/04/2024	7	100	100	100	2451	2450	394	39.4	N	

All testing is carried out in accordance with BS EN 12390-3 & 7 : 2009.
Specimens tested in a saturated surface dry condition unless otherwise stated.
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TEST SAMPLE CERTIFICATE

812

NATIONAL LABORATORY
HANSON AGGREGATES
THE RIDGE

CHIPPING SODBURY
BS37 6AY

Tel: 07977 251228
Fax: NO FAX
Email:

Contractor	A B S Brymar Floors Ltd

Site	BOLTON PLOT 3- WINGATES- WINGAT
Mix	C32/40

Certificate Date:	24/05/2024
Certificate No:	367216

Date Cast	Date Received (at Lab)	Location (if provided)	Docket Number (if provided)	Consistence Class (If known)	Lab / Plant Ref No	Customer Ref No	Date Tested	Age (days)	Platen Face Dimension 1	Platen Face Dimension 2	Dimension 3	Weight of Cube (g)	Density (kg/m³)	Max Load (kN)	Compressive Strength (N/mm²)	Mode of Failure	Comments Number (See Key)
10/04/2024	16/04/2024	SLAB CO94507	2090682230	150	3057/41A	A	17/04/2024	7	100	100	100	2464	2460	372	37.2	N	

All testing is carried out in accordance with BS EN 12390-3 & 7 : 2009.
Specimens tested in a saturated surface dry condition unless otherwise stated.
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Any consistence test results are outside our U.K.A.S Accredition.
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Signed H Roberts

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Position:

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TEST SAMPLE CERTIFICATE

812

NATIONAL LABORATORY
HANSON AGGREGATES
THE RIDGE

CHIPPING SODBURY
BS37 6AY

Tel: 07977 251228
Fax: NO FAX
Email:

Contractor	A B S Brymar Floors Ltd

Site	BOLTON PLOT 3- WINGATES- WINGAT
Mix	C32/40

Certificate Date:	24/05/2024
Certificate No:	367218

Date Cast	Date Received (at Lab)	Location (if provided)	Docket Number (if provided)	Consistence Class (If known)	Lab / Plant Ref No	Customer Ref No	Date Tested	Age (days)	Platen Face Dimension 1	Platen Face Dimension 2	Dimension 3	Weight of Cube (g)	Density (kg/m³)	Max Load (kN)	Compressive Strength (N/mm²)	Mode of Failure	Comments Number (See Key)
11/04/2024	17/04/2024	SLAB	2090690058	150	3057/42A	A	18/04/2024	7	100	100	100	2439	2440	348	34.8	N	

All testing is carried out in accordance with BS EN 12390-3 & 7 : 2009.
Specimens tested in a saturated surface dry condition unless otherwise stated.
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TEST SAMPLE CERTIFICATE

812

Contractor	A B S Brymar Floors Ltd

Site	BOLTON PLOT 3- WINGATES- WINGAT
Mix	C32/40

NATIONAL LABORATORY
HANSON AGGREGATES
THE RIDGE

CHIPPING SODBURY
BS37 6AY

Tel: 07977 251228
Fax: NO FAX
Email:

Certificate Date:	24/05/2024
Certificate No:	367220

Date Cast	Date Received (at Lab)	Location (if provided)	Docket Number (if provided)	Consistence Class (If known)	Lab / Plant Ref No	Customer Ref No	Date Tested	Age (days)	Platen Face Dimension 1	Platen Face Dimension 2	Dimension 3	Weight of Cube (g)	Density (kg/m³)	Max Load (kN)	Compressive Strength (N/mm²)	Mode of Failure	Comments Number (See Key)
12/04/2024	18/04/2024	INTERNAL SLAB CO 94925	2090697220	150	3057/44A	A	19/04/2024	7	100	100	100	2453	2450	374	37.4	N	

All testing is carried out in accordance with BS EN 12390-3 & 7 : 2009.
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Signed

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Position:

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TEST SAMPLE CERTIFICATE

812

NATIONAL LABORATORY
HANSON AGGREGATES
THE RIDGE

CHIPPING SODBURY
BS37 6AY

Tel: 07977 251228
Fax: NO FAX
Email:

Contractor	A B S Brymar Floors Ltd

Site	BOLTON PLOT 3- WINGATES- WINGAT
Mix	C32/40

Certificate Date:	24/05/2024
Certificate No:	367222

Date Cast	Date Received (at Lab)	Location (if provided)	Docket Number (if provided)	Consistence Class (If known)	Lab / Plant Ref No	Customer Ref No	Date Tested	Age (days)	Platen Face Dimension 1	Platen Face Dimension 2	Dimension 3	Weight of Cube (g)	Density (kg/m³)	Max Load (kN)	Compressive Strength (N/mm²)	Mode of Failure	Comments Number (See Key)
12/04/2024	18/04/2024	INTERNAL SLAB CO 94942	2090698596	150	3057/45A	A	19/04/2024	7	100	100	100	2445	2440	389	38.9	N	9

All testing is carried out in accordance with BS EN 12390-3 & 7 : 2009.
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Cleaning and Maintenance Regimes

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

CLEANING & MAINTENANCE TABLE & INFORMATION

Please refer to the following maintenance table and information to help you understand your floor slab construction and ongoing care for your floor slab.

Cleaning and Maintenance Regimes

This maintenance schedule for **P23012 Wingates Plot 3** is to be followed from **01/07/2024** year on year to ensure all plant and equipment is kept within warranty.

Please keep a log of these inspections so that records can be checked should an issue arise.

Code; ✓**Blue – Recommended** ✓**Red – To Maintain Warranty**

Item	Daily	Weekly	Monthly	3 Months	6 Months	9 Months	12 months	5 Yearly	Certificates	Regime
General cleaning & mopping	✓									***Daily-*** Local cleaning of loose /spilled materials liquids etc.
Mechanical cleaning		✓								***Weekly-*** Thorough cleaning with mechanical cleaning equipment i.e., with floor scrubber fitted with nonabrasive pads
General inspection		✓							No certificate mandatory element	***Weekly-*** General inspection of floor slab. Joints, cracks & joint sealant. Arrange repair as necessary using a specialist concrete repair & or joint sealant contractor
Thorough inspection				✓					No certificate mandatory element	***3 Months-*** Full inspection of floor slab, attention to high forklift trafficked areas, arrange repair as necessary using a specialist concrete repair & or joint sealant contractor.

Item	Daily	Weekly	Monthly	3 Months	6 Months	9 Months	12 months	5 Yearly	Certificates	Regime
Sacrificial floor joint sealant replacement							✓		No certificate mandatory element	***12 Months-*** ABS recommend any initial joint sealant is treated as sacrificial and should be raked out and replaced once all initial slab shrinkage has occurred.

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

CLEANING & MAINTENANCE INFORMATION

The floor slab on this project has primarily been designed to support the loads placed upon it & to provide a working platform for personnel and operational vehicles to function in a safe manner.
Concrete floors are not maintenance free & to remain in a safe and serviceable condition the concrete slab will require regular inspections and maintenance
Maintenance includes regular cleaning, re-filling of joints, repairs to damaged joints edges and surface repairs to damaged or worn areas, failure to adhere to a strict cleaning and maintenance regime will result in higher long-term maintenance & repair costs.
ABS Brymar Floors Ltd recommend that a thorough inspection of the floor is carried out periodically on at least a 3-monthly cycle, together with a cleaning regime and inspection of joints, carried out on a more regular basis.
Floor slabs can vary significantly in their construction and whilst it is not important for the “end user” to understand the design of the floor it may be helpful to understand the construction techniques and the terminology used later in this document.

The following pages within this section have been compiled as a first point of reference & guidance for building owners & tenants regarding their floor slab, its construction & ongoing inspection & maintenance.

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

Introduction

Concrete slabs are constructed from natural elements e.g.: - cement and gravel materials and as such are affected like any other natural element by volumetric changes associated with contraction and expansion due to climate and ambient temperature changes.

Your floor slabs incorporate reinforcement which consists of steel fabric reinforcement to control expansion and contraction. Reinforcement together with appropriately designed construction joints help to minimise the effects of early drying shrinkage, thermal effects and provide structural integrity to the slab to support equipment/material loads applied to the floor.

The floor slab will incorporate construction joints as follows: -.

“Contraction Joints” spaced at 40m to 50m centres formed using proprietary steel armoured joints.

“Sawn Induced Joints” approximately 3 mm wide installed at 5m to 6m centres. Sawn joints are positioned between the more widely spaced Contraction Joints as described above.

Stepped Galvanised Armoured joints were installed at the vehicular level access doorways.

The visible edges of floor joints at the surface of the slab are called “edge arrises”

Maintenance regime

The Floor Slab shall be monitored by the Building User or Representative, to inspect and carry out maintenance issues including but not limited to: -

1.0 General Cleaning Issues.

2.0 Construction Joints and Sealants.

3.0 Surface Wear and Abrasion.

4.0 Impact Damage.

5.0 Floor Slab Restraint Cracking.

6.0 Health & Safety Issues.

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

1.0 General Cleaning Issues

It is important to establish a cleaning regime that prevents dirt and dust from building up on the surface of the slab.

The operation of many types of Material Handling Equipment (MHE) on dirty/dusty floors will create increased wear of the floor.

Power-floated concrete floors can normally be easily cleaned with a wet scrubber and vacuum type machine using neutral non-acidic and non-abrasive detergents. Dry vacuum and sweeping will also remove dust and dirt deposits.

For large floor areas “walk behind” or “ride on” scrubber-driers, vacuums and sweepers are recommended for speed and effectiveness.

Manufacturers and specialist floor cleaning contractors should be consulted at an early stage to provide advice and product selection for individual circumstances.

1.1 Oil, Grease and Chemical Spillages

Spillages should be cleaned up immediately and the surface cleaned as outlined in Clause 1.0

Specialist advice may be required to adopt an appropriate cleaning product to safely remove and clean the affected surface.

Spillages should be rectified as soon as possible or “cordoned off” to prevent the spillage being trafficked and then dispersed or transported around the floor by foot traffic or machine wheels etc.

Chemical attack on concrete floors usually arises from the spillage of aggressive chemicals. The intensity of attack depends on many factors, principally the composition and concentration of the aggressive agent, the pH and permeability of the concrete, and the contact time.

Examples of common substances that may meet concrete floors are acids, wines, beers, milk, sugars, and mineral and vegetable oils.

Further guidance can be obtained from the Concrete Society Technical Report No 54.

Any agent that attacks concrete will eventually cause surface damage if it remains in contact with the floor for long enough. Although frequent cleaning to remove aggressive agents will reduce deterioration, repeated cycles of spillage and cleaning will cause long-term surface damage.

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

Where further chemical attack is likely, consideration should be given to protecting the floor with a chemically resistant material or system that will resist the action of the aggressive agent. Advice on resin coatings is available in BS 8204-6 and from specialist suppliers and applicators.

1.2 Loose Debris/Dust

These are divided into ‘soft’ and ‘hard’ dusts. The soft type, such as talc, flour and cement dust, form a thin layer on both the concrete and the shoe sole which modifies the frictional performance of the two, potentially reducing the slip resistance. The hard type of dust, usually of much larger grain size, can act like ball bearings, particularly if the grains are rounded rather than angular, again potentially reducing slip resistance.

A regular routine of sweeping with mechanical or manual brushes is required.

If mechanical sweepers are adopted, ensure abrasive bristles are not used as these may abrade the slab surface.

Manufacturers and specialist floor cleaning contractors should be consulted at an early stage to provide advice and product selection for individual circumstances.

1.3 Tyre Deposits

The removal of tyre deposits is extremely difficult to achieve and MHE drivers should be encouraged not to speed, spin, skid or apply brakes harshly, any of which may result in excessive tyre wear and deposits on the surface of the slab.

Scrape the surface to remove any build-up of rubber. Clean stubborn deposits with spray applied floor polish speed stripper (used sparingly) allow to stand for approximately 5 minutes and then scrub with mechanical rotary brush and rinse thoroughly with clean water using wet vacuum equipment to remove surplus.

All floors that are cleaned or degreased should be rinsed thoroughly and the areas cordoned off and safety notices posted until the floor is dry to prevent accidents whilst the floor is wet and greasy.

Manufacturers and specialist floor cleaning contractors should be consulted at an early stage to provide advice and product selection for individual circumstances.

2.0 Construction Joints and Sealants

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

Floor Joints typically require the most attention in any maintenance plan, as they are the weakest feature of any floor.

The visible edges of “Contraction Joints” are prone to damage as these types of joints are designed to open as the slab contracts. The joints are constructed with proprietary armoured steel edges comprising of two 10 mm wide steel strips cast in the slab. This type of joint is more able to withstand heavy wear, although regular inspection and maintenance is still required.

The visible edges of “Sawn Induced Joints” generally perform well in service although they can be susceptible to heavy trafficking by small hard nylon wheels (e.g., pallet trucks). In heavily trafficked areas, any unprotected arrises of these joints may suffer damage if the joints are not maintained.

Initial ‘soft’ elastomeric mastic should be installed in all joints; this sealant will allow a degree of movement as the joint opens during the first 12 - 18 months. This sealant provides nominal support to the edge arris and will keep the joint free from dirt and debris. Once the sealant has reached the limit of its elasticity, it may de-bond from one of the joint faces and should be replaced. This is not a defect and replacement must be undertaken by the Tennant as part of the planned maintenance regime.

Joint sealants should be inspected regularly and their ability to protect the edge arris assessed. Once edge arrises are damaged the sealant will need to be replaced. Damage to arrises should be repaired as soon as possible as they will very quickly deteriorate leading to expensive slab repairs.

Dependent upon the ambient temperatures and heating conditions within a building, slabs can take between 12 – 18 months to fully cure i.e., dry out. When movement of the joints has stabilised, the initial sacrificial sealant should be replaced with a final sealant with nominal elasticity that can provide full support to the edge arris. Continued regular inspection locating any further natural deterioration of the sealant can be successfully treated at an early stage before significant damage to the joint occurs.

It may be necessary to replace sealants in heavily trafficked transfer aisles or circulation areas on a more frequent basis and this type of ongoing maintenance should be allowed for within a building maintenance budget.

It is essential that armoured joints are similarly inspected to ensure that joints sealants remain intact, whilst armoured joints work extremely well in practice it has been documented that a lack of

sealant in the joint can be a contributory factor to the joint deteriorating and this can be observed as a hairline crack occurring at the back of the steel plate.
All armoured joints should be filled with a soft elastomeric sealant to ensure that adequate provision is left for the joint to contract.
Hard solid sealants are not suitable in armoured joints as they do not offer sufficient elasticity throughout a lifetime cycle.
With the use of modern construction methods comprising large slab areas, it is not unusual for contraction joints to open more than 25 mm during a lifetime cycle and accordingly sealants should be replaced as necessary to accommodate such movement.
ABS Brymar Floors do not accept any responsibility to carry out slab repairs where in-adequate maintenance has been carried out other than for when a genuine latent defect has occurred.

3.0 Surface Wear and Abrasion

Providing a floor is regularly cleaned and maintained, the surface should remain serviceable for its design life although some wear may occur, which may require maintenance.
For power-trowelled floors in normal warehouse working conditions, abrasion is not usually an issue.
Rates of wear of concrete floors depend on the types of MHE and traffic intensity using the facility and the cleaning regime.

4.0 Impact Damage

Areas of impact damage occurring from dropped goods or scouring from MHE forks, etc. should be treated with a suitable epoxy mortar or resin to prevent further degradation of the affected area.
Often the scraping of pallets and forks across the floor can damage the surface and cause joint edges to spall. It is important to maintain pallets in good condition and to avoid unnecessary pushing of pallets and other equipment across the floor surface.

5.0 Floor Slab Restraint Cracking

As with joints, any cracks that develop should be monitored and, where appropriate, repaired by a specialist.

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

Fine cracks may only be a consideration of appearance, in which case they are best left untreated although they should be monitored as part of the floor inspection and maintenance regime. If the edge arris of a crack begins to spall or if the crack widens, it should be treated to avoid further deterioration. However, this should be balanced against a need to leave new cracks untreated until they have become dormant i.e., not undergoing any further opening after approximately 12 months of curing.
Where cracks are not dormant and it is considered essential to provide some degree of arris support, then semi-flexible sealants may be used.

Cracks less than 0.5mm wide and showing no signs of degradation are generally better left alone as aesthetically the repair of such cracks may be more noticeable to the naked eye.

6.0 Health & Safety Issues

Concrete floors have been shown to be slip resistant in clean and dry conditions, when wet, the floor may become more slippery and areas prone to becoming wet should be given special consideration, it is also important to note that moisture may not always be visible.
Build-up of dust around less trafficked areas may cause a slip hazard and should be routinely cleaned or prevented.

The floor slab has been designed to meet specific loading requirements, where ABS Brymar Floors have been responsible for the design of the slab, the specific loading parameters will have been specified and can be identified in the “As Built” General Arrangement drawings which will be located within the Building Manual.
The Design Loading criteria should not be exceeded and where a specific “change of use” is required it will be necessary to allow a specialist Consulting Engineer to review the slab construction and comment on the new requirements.

Data Sheets

winvic

winvic.co.uk

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

SECTION 1 SCOPE OF WORKS & BRIEF DESCRIPTION

ABS Brymar floors were contracted to design & install the ground floor concrete slab for the project in Bolton

The floor slabs were cast in large bay format utilising Somero laser screed technology over a period of 4 days in April 2024.

The floor slab consists of a 175mm deep slab of well graded C32/40 concrete laid onto a 2000g polythene membrane which has been lapped and taped using 75mm proprietary tape. The slab has 1 layer of A142 mesh reinforcement throughout which is positioned 40mm from the bottom of the slab.

All areas of the slab were treated with a spray applied curing and sealing agent.

All joints within the slab have been sealed using a polysulphide sealant as part of ABS Brymar's contracted works.

The brief design statement on the as built drawings & the design calculations enclosed within this document should be consulted to ascertain the loading capacity of the slab.

The engineer's information within the O&M file should be consulted to ascertain the loading capacity of the slab.

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

Location of items installed.

Concrete slabs are constructed from natural elements e.g.: - cement and gravel materials and as such are affected like any other natural element by volumetric changes associated with contraction and expansion due to climate and ambient temperature changes.

Your floor slabs incorporate reinforcement which consists of steel fabric reinforcement to control expansion and contraction. Reinforcement together with appropriately designed construction joints help to minimise the effects of early drying shrinkage, thermal effects and provide structural integrity to the slab to support equipment/material loads applied to the floor.

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Stepped Galvanised Armoured joints were installed at the vehicular level access doorways.

The visible edges of floor joints at the surface of the slab are called “edge arrises”

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

SITE ADDRESS

Winvic Construction Ltd
Unit 3
Pannatoni Park
Great Bank Road
Wingates Industrial Estate
Westhoughton
Bolton
BL5 3XN

ABS BRYMAR ADDRESS

ABS Brymar floors ltd

Unit 40 Drumhead road

Chorley North Ind Estate

Chorley

Lancashire

PR6 7BX

EMERGENCY INFORMATION

In the unlikely event of emergency or for any further information or clarification please contact ABS Brymar floors on Tel No 01619725000, or email General @absbrymarfloors.co.uk

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

CERTIFIICATES/ TESTING

Please see enclosed documents – Refer to O&M document

1) Floor slab calculation sheet
2) 28-day cube results
3) Floor tolerance report
4) Abrasion test report

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

PRODUCT / MANUFACTURERS LITERATURE

See enclosed documents – Refer to O&M document

1) Concrete data sheet
2) Mesh data sheet
3) Polythene data sheet
4) PICS WB Sealer data sheet
5) Pemaban Armour joint data sheet
6) Arbomeric MP20 sealant data sheet

CLIENT PROJECT No **P23012**
ABS PROJECT No **B2354**
CLIENT **WINVIC CONSTRUCTION LTD**
PROJECT **PLOT 3 WINGATES**
LOCATION **BOLTON**

SECTION 4 LIST OF MATERIALS & COMPONENTS

PRODUCT /MATERIAL	SUPPLIER	WHERE USED
Concrete	Hanson	Whole Slab Area
Mesh Reinforcement	BRC Ltd	Within all Areas of Slab
Armoured Joints	Permaban (RCR)	Day Joints / Roller Shutter Doorways
Under Slab Membrane	Miers	Beneath all Areas of Floor Slab
Curing Agent	PICS HATCRETE	All Areas of Floor Slab
Joint Sealant	Phoenix Sealants	Sawn Joints and Columns

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ABS PROJECT No **B2354**
CLIENT **WINVIC CONSTRUCTION LTD**
PROJECT **PLOT 3 WINGATES**
LOCATION **BOLTON**

SECTION 5 LIST OF SUPPLIERS & SUB- CONTRACTORS

Name	Address	Tel & Fax Nos	Work Done/Products Supplied
Hanson	Local Plant	Tel: 0330 1233530	Concrete
BRC Reinforcement	Station Road, Sutton-In-Ashfield, NG17 5FY	Tel: 01623 555111 Email: sales@midlands.brc.ltd.uk	Mesh Reinforcement
Permaban (RCR)	Mill Close, Lee Mill Industrial Estate, Ivybridge, Devon, PL21	Tel: 01752 895288 Email: info@permaban.com	Armoured Joints
Miers	Unit 2, Central Trading Est, Bewsey Road, Warrington, WA2 7LP	Tel: 01925 202128 Email: sales@miersconstructionproducts.co.uk	Underslab Membrane
PICS HATCRETE	Unit 2, Red Shute Hill Industrial Estate, Newbury, RG18 9QL	Tel: 01635 202224 Email: sales@picsuk.com	Curing Agent
Phoenix Sealants	Forge Trading Estate, Halesowen B63 4DH	Tel 01384 566882	Joint Sealant

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MODIFICATION/ DEMOLITION /DISOSAL INFORMATION

Modification

Under no circumstances should any modifications take place without the approval of ABS Brymar Floors Ltd

Demolition

In the event of demolition, a competent demolition contractor should be appointed to undertake the works

Disposal

Concrete is recyclable, your appointed demolition contractor should be consulted as to where your material is being recycled

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Completion Report – Warehouse Concrete Floor Slab

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Maintenance Regime

The Floor Slab shall be monitored by the Building User or Representative, to inspect and carry out maintenance issues including but not limited to: -

1.0 General Cleaning Issues.

2.0 Construction Joints and Sealants.

3.0 Surface Wear and Abrasion.

4.0 Impact Damage.

5.0 Floor Slab Restraint Cracking.

6.0 Health & Safety Issues.

1.0 General Cleaning Issues

It is important to establish a cleaning regime that prevents dirt and dust from building up on the surface of the slab.

The operation of many types of Material Handling Equipment (MHE) on dirty/dusty floors will create increased wear of the floor.

Power-floated concrete floors can normally be easily cleaned with a wet scrubber and vacuum type machine using neutral non-acidic and non-abrasive detergents. Dry vacuum and sweeping will also remove dust and dirt deposits.

For large floor areas "walk behind" or "ride on" scrubber-driers, vacuums and sweepers are recommended for speed and effectiveness.

Manufacturers and specialist floor cleaning contractors should be consulted at an early stage to provide advice and product selection for individual circumstances.

1.1 Oil, Grease and Chemical Spillages

Spillages should be cleaned up immediately and the surface cleaned as outlined in Clause 1.0.

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Specialist advice may be required to adopt an appropriate cleaning product to safely remove and clean the affected surface.
Spillages should be rectified as soon as possible or "cordoned off" to prevent the spillage being trafficked and then dispersed or transported around the floor by foot traffic or machine wheels etc.
Chemical attack on concrete floors usually arises from the spillage of aggressive chemicals. The intensity of attack depends on many factors, principally the composition and concentration of the aggressive agent, the pH and permeability of the concrete, and the contact time.
Examples of common substances that may meet concrete floors are acids, wines, beers, milk, sugars, and mineral and vegetable oils.
Further guidance can be obtained from the Concrete Society Technical Report No 54.
Any agent that attacks concrete will eventually cause surface damage if it remains in contact with the floor for long enough. Although frequent cleaning to remove aggressive agents will reduce deterioration, repeated cycles of spillage and cleaning will cause long-term surface damage.

Where further chemical attack is likely, consideration should be given to protecting the floor with a chemically resistant material or system that will resist the action of the aggressive agent. Advice on resin coatings is available in BS 8204-6 and from specialist suppliers and applicators.

1.2 Loose Debris/Dust

These are divided into 'soft' and 'hard' dusts. The soft type, such as talc, flour and cement dust, form a thin layer on both the concrete and the shoe sole which modifies the frictional performance of the two, potentially reducing the slip resistance. The hard type of

dust, usually of much larger grain size, can act like ball bearings, particularly if the grains are rounded rather than angular, again potentially reducing slip resistance.
A regular routine of sweeping with mechanical or manual brushes is required.
If mechanical sweepers are adopted, ensure abrasive bristles are not used as these may abrade the slab surface.
Manufacturers and specialist floor cleaning contractors should be consulted at an early stage to provide advice and product selection for individual circumstances.

1.3 Tyre Deposits

The removal of tyre deposits is extremely difficult to achieve and MHE drivers should be encouraged not to speed, spin, skid or apply brakes harshly, any of which may result in excessive tyre wear and deposits on the surface of the slab.
Scrape the surface to remove any build up of rubber. Clean stubborn deposits with spray applied floor polish speed stripper (used sparingly) allow to stand for approximately 5 minutes and then scrub with mechanical rotary brush and rinse thoroughly with clean water using wet vacuum equipment to remove surplus.
All floors that are cleaned or degreased should be rinsed thoroughly and the areas cordoned off and safety notices posted until the floor is dry to prevent accidents whilst the floor is wet and greasy.
Manufacturers and specialist floor cleaning contractors should be consulted at an early stage to provide advice and product selection for individual circumstances.

2.0 Construction Joints and Sealants

Floor Joints typically require the most attention in any maintenance plan, as they are the weakest feature of any floor.
The visible edges of "Contraction Joints" are prone to damage as these types of joint are designed to open as the slab contracts.

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The joint is constructed with proprietary armoured steel edges comprising of two 10 mm wide steel strips cast in the slab. This type of joint is more able to withstand heavy wear, although regular inspection and maintenance is still required. The visible edges of "Sawn Induced Joints" generally perform well in service although they can be susceptible to heavy trafficking by small hard nylon wheels (e.g., pallet trucks). In heavily trafficked areas, any unprotected arrises of these joints may suffer damage if the joints are not maintained.

Initial 'soft' elastomeric mastic should be installed in all joints; this sealant will allow a degree of movement as the joint opens during the first 12 - 18 months. This sealant provides nominal support to the edge arris and will keep the joint free from dirt and debris. Once the sealant has reached the limit of its elasticity, it may de-bond from one of the joint faces and should be replaced. This is not a defect and replacement must be undertaken by the Tennant as part of the planned maintenance regime.

Joints sealants should be inspected regularly and their ability to protect the edge arris assessed. Once edge arrises are damaged the sealant will need to be replaced. Damage to arrises should be repaired as soon as possible as they will very quickly deteriorate leading to expensive slab repairs.

Dependant upon the ambient temperatures and heating conditions within a building, slabs can take between 12 – 18 months to fully cure i.e., dry out. When movement of the joints has stabilised, the initial sacrificial sealant should be replaced with a final sealant with nominal elasticity that can provide full support to the edge arris. Continued regular inspection locating any further natural deterioration of the sealant can be successfully treated at an early stage before significant damage to the joint occurs.

It may be necessary to replace sealants in heavily trafficked transfer aisles or circulation areas on a more frequent basis and this type of ongoing maintenance should be allowed for within a building maintenance budget.

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It is essential that armoured joints are similarly inspected to ensure that joints sealants remain intact, whilst armoured joints work extremely well in practice it has been documented that a lack of sealant in the joint can be a contributory factor to the joint deteriorating and this can be observed as a hairline crack occurring at the back of the steel plate.

All armoured joints should be filled with a soft elastomeric sealant to ensure that adequate provision is left for the joint to contract.

Hard solid sealants are not suitable in armoured joints as they do not offer enough elasticity throughout a lifetime cycle.

With the use of modern construction methods comprising large slab areas, it is not unusual for contraction joints to open more than 25 mm during a lifetime cycle and accordingly sealants should be replaced as necessary to accommodate such movement.

ABS Brymar Floors do not accept any responsibility to carry out slab repairs where in-adequate maintenance has been carried out other than for when a genuine latent defect has occurred.

3.0 Surface Wear and Abrasion

Providing a floor is regularly cleaned and maintained, the surface should remain serviceable for its design life although some wear may occur, which may require maintenance.

For power-trowelled floors in normal warehouse working conditions, abrasion is not usually an issue.

Rates of wear of concrete floors depend on the types of MHE and traffic intensity using the facility and the cleaning regime.

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4.0 Impact Damage

Areas of impact damage occurring from dropped goods or scouring from MHE forks, etc. should be treated with a suitable epoxy mortar or resin to prevent further degradation of the affected area.

Often the scraping of pallets and forks across the floor can damage the surface and cause joint edges to spall. It is important to maintain pallets in good condition and to avoid unnecessary pushing of pallets and other equipment across the floor surface.

5.0 Floor Slab Restraint Cracking

As with joints, any cracks that develop should be monitored and, where appropriate, repaired by a specialist.

Fine cracks may only be a consideration of appearance, in which case they are best left untreated although they should be monitored as part of the floor inspection and maintenance regime. If the edge arris of a crack begins to spall or if the crack widens, it should be treated to avoid further deterioration. However, this should be balanced against a need to leave new cracks untreated until they have become dormant i.e., not undergoing any further opening after approximately 12 months of curing.

Where cracks are not dormant and it is considered essential to provide some degree of arris support, then semi-flexible sealants may be used.

In accordance with the recommendations of the concrete society cracks less than 0.8 mm wide and showing no signs of degradation are generally better left alone as aesthetically the repair of such cracks may be more noticeable to the naked eye.

6.0 Health & Safety Issues

Concrete floors have been shown to be slip resistant in clean and dry conditions, when wet, the floor may become more slippery and areas prone to becoming wet should be

given special consideration, it is also important to note that moisture may not always be visible.
Build up of dust around less trafficked areas may cause a slip hazard and should be routinely cleaned or prevented.

The floor slab has been designed to meet specific loading requirements, where ABS Brymar Floors have been responsible for the design of the slab, the specific loading parameters will have been specified and can be identified in the "As Built" General Arrangement drawings which will be located within the Building Manual.
The Design Loading criteria should not be exceeded and where a specific "change of use" is required it will be necessary to allow a specialist Consulting Engineer to review the slab construction and comment on the new requirements.

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Aesthetical Issues

Introduction

In many completed concrete floors, there will always be a risk of some minor aesthetical blemishes, small defects and cracking occurring. Even high standards of workmanship will not eliminate the risk of surface imperfections.

1.0 Colour & Appearance

Concrete floors are constructed primarily from naturally occurring materials and finished by techniques that cannot be controlled as precisely as would be expected in a factory production process. Good materials and workmanship may reduce variations in colour and appearance, but they will not eliminate them, and the final appearance of a floor will never be as uniform as a painted surface finish, some features evident on the surface of newly laid concrete floors can be related to the early drying of the floor and become less visible with time.

2.0 Cracking

In a well designed and constructed floor the risk of random cracking will be low, but it is not possible to totally prevent cracking. Cracking occurs when the tensile stress in a section of slab exceeds the tensile strength of the concrete. This situation most often occurs when the long-term drying shrinkage of the slab is restrained for some reason. Such cracks do not generally have any structural significance.

Many factors affect the formation of restrained shrinkage cracks and it is impossible to guarantee that a floor will be completely crack-free.

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3.0 Crazing

Many power trowelled concrete floors exhibit an irregular pattern of fine cracks. This is known as surface crazing. It is an inherent feature of power trowelled concrete surfaces and is considered to be a matter of appearance only, and generally no structural or serviceability issues are associated. It tends to be more visible on floors that are wetted and cleaned as the extremely fine cracks trap moisture and dust.

The mechanisms of crazing in floors are not fully understood but it is known that the surface zone consists predominantly of mortar paste. In power-finished floors, this paste is intensively compacted by the trowelling process and can have a very low water/cement ratio. The heat build-up by the final power trowel finishing process may also be a contributory factor. As the mechanism is poorly understood it is not possible to recommend measures that can reduce its occurrence.

There is no appropriate treatment for crazing.

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4.0 Curling

Curling is quite common at joints and edges of slabs. Floor panels sometimes curl to such an extent that truck performance is affected. Where necessary, departures from the required surface regularity can be corrected by grinding however it should be noted that curling is not a defect of the floor slab. Care should be taken at personnel doors as curled slab can introduce a trip hazard and this has been considered during the design process using dowels and sleeves to maintain load transfer.

5.0 Delamination

There is a risk of surface delamination on power trowelled concrete surfaces. The risk of occurrence of delamination increases with the variability of the concrete used or changes in curing conditions.

Delamination is the process whereby a thin (2–4mm) layer becomes detached from the surface and breaks down usually under trafficking. The mechanisms of delamination are not fully understood but are believed to result from several factors, including differential setting of the surface concrete, air content and bleed characteristics of the concrete. Accelerated drying of the surface by cross winds from open environments can significantly affect bleeding and set characteristics.

Delamination is repaired by cutting away the affected surface in areas bounded by shallow saw cuts and then filling with cementitious self-levelling industrial compound.

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6.0 Surface Aggregates

Occasionally, aggregate particles lie exposed at or are very close to the surface. If they are well 'locked into' the surface, they are unlikely to affect durability although their appearance may be considered an aesthetic issue. Particles can be dislodged by materials handling equipment or other actions, leaving small surface voids. These voids can be drilled out and filled with resin mortar. Where soft particles, such as naturally occurring mudstone or lignite, are exposed in the surface, they should be removed by drilling and replaced with mortar as described above.

7.0 Surface Finishing Marks

Trowel marks such as 'swirls' or discolouration from burnishing are often a consequence of the normal variations in setting of the concrete, the visual impact of these marks will reduce significantly with time. Excess curing compound or multiple layers of curing compound causes darker areas. These will wear and disappear with time and use of the floor without adverse effect on the surface.

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SECTION 3 - MAINTENANCE & CLEANING INSTRUCTIONS

ITEM	DAILY	WEEKLY	MONTHLY	3 MONTHS	AFTER FIRST 12 MONTHS	NOTES
General cleaning Brush/mopping	√					Local cleaning of loose /spilled materials liquids etc
Mechanical cleaning		√				Thorough cleaning with mechanical cleaning equipment, (nonabrasive)
General inspection		√				General inspection of floor slab. Joints, cracks & joint sealant. Repair as necessary
Thorough inspection				√		Full inspection of floor slab, attention to high trafficked areas, repair as necessary
Sacrificial sealant replacement					√	ABS recommend any initial joint sealant is treated as sacrificial and should be raked out and replaced once all initial slab shrinkage has occurred.

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SECTION 4 - LIST OF MATERIALS & COMPONENTS

PRODUCT /MATERIAL	SUPPLIER	WHERE USED
Concrete	Hanson	Whole Slab Area
Mesh Reinforcement	BRC Ltd	Within all Areas of Slab
Armoured Joints	Permaban (RCR)	Day Joints / Roller Shutter Doorways
Under Slab Membrane	Miers	Beneath all Areas of Floor Slab
Curing Agent	PICS HATCRETE	All Areas of Floor Slab

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SECTION 5 - LIST OF SUPPLIERS & SUB - CONTRACTORS

Name	Address	Tel & Fax Nos	Work Done/Products Supplied
Hanson	Local Plant	Tel: 0330 1233530	Concrete
BRC Reinforcement	Station Road, Sutton-In-Ashfield, NG17 5FY	Tel: 01623 555111 Email: sales@midlands.brc.ltd.uk	Mesh Reinforcement
Permaban (RCR)	Mill Close, Lee Mill Industrial Estate, Ivybridge, Devon, PL21	Tel: 01752 895288 Email: info@permaban.com	Armoured Joints
Miers	Unit 2, Central Trading Est, Bewsey Road, Warrington, WA2 7LP	Tel: 01925 202128 Email: sales@miersconstructionproducts.co.uk	Underslab Membrane
PICS HATCRETE	Unit 2, Red Shute Hill Industrial Estate, Newbury, RG18 9QL	Tel: 01635 202224 Email: sales@picsuk.com	Curing Agent

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SECTION 6 - PRODUCT / MANUFACTURERS

LITERATURE See enclosed documents:

1) Concrete Data Sheet
2) Mesh Data Sheet
3) Polythene Data Sheet
4) PICS HATCRETE Data Sheet
5) Permaban (RCR) Armour Joint Data Sheet
6) Arbomeric Sealant Data Sheet

Concrete and Mortar
Health and Safety Datasheet

Hazard Information

1 COMPOSITION

Concrete:

Mixture of natural aggregates, cement and water. Other ingredients may include admixtures, Pulverised Fuel Ash (PFA) and Ground Granulated Blast-furnace Slag (GGBS). Such additions are made to alter/improve the working characteristics of the material or to affect/enhance its properties once hardened

Mortar:

Mixture of natural aggregates, cement and water. Admixtures, hydrated lime and/or pigments may be added

2 HAZARDS IDENTIFICATION

Wet Concrete/mortar

Contact with eyes may cause irritation or, in severe cases, alkali burns

Skin contact may provoke allergic contact dermatitis in those sensitised to chromium compounds which occur in cement

Prolonged skin contact may result in irritant contact dermatitis and/or ulceration

Prolonged skin contact may cause sensitisation to chromium compounds

Dry concrete/mortar dust

Inhalation of silica particles in dust created by cutting or surface treatment of hardened concrete containing high silica aggregates (e.g. flint, quartzite, granite) may cause respiratory damage.

Emergency Action

3 FIRST AID MEASURES

Wet concrete/mortar

Eye Contact: Irrigate eye(s) immediately with clean water for at least 10 minutes. Seek immediate medical attention.

Skin Contact: Wash thoroughly with clean water as soon as contamination occurs.

NOTE: Skin contact Includes indirect contact through saturated clothing which should be changed.

Any concrete/mortar which gets into boots or Wellingtons (either through holes or over the tops of them) should be dealt with immediately by removing boots/wellingtons, socks, trouser etc. thoroughly washing off the affected areas with clean water **DO NOT** replace any boots or clothing which have concrete/mortar residue either in or on them. The feet and legs are very sensitive to Alkali burns. Therefore these procedures must be adhered to.

Dry concrete/mortar dust

Eye contact: Irrigate eye(s) immediately with clean water. Seek medical attention

Skin contact: Wash with clean water.

NOTE: Skin contact includes indirect contact through saturated clothing which should be changed

Inhalation/ingestion: Remove patient to fresh air

4 FIRE FIGHTING MEASURE

None needed:

Materials do not support combustion

5 ACCIDENTAL RELEASE MEASURES

Personal protection

Avoid contact with skin and eyes

Wear impervious protective clothing Note: (see under section 7 EXPOSURE CONTROLS/PERSONAL PROTECTION)

Environmental measures

Prevent from entering drains, sewers or water courses

Method of cleaning

Recover bulk spillage, without delay and while material is still in non-hardened (plastic) state, using suction system or mechanical shovel

Precautions

6 HANDLING & STORAGE

Wet concrete/mortar

Avoid direct skin and eye contact with set concrete/mortar

Do not kneel or sit on wet concrete/mortar

Exercise care adjacent to deep sections of newly-placed concrete which is still fluid/plastic

Note: For personal protection, also see section 7

Dry concrete/mortar dust

Minimise dust creation wherever possible

Note: For personal protection, also see section 7

7 EXPOSURE CONTROLS/PERSONAL PROTECTION

Wet concrete/mortar

Hand protection: impervious gloves

Eye protection: suitable protection is advisable where there is risk of accidental exposure/splashing

Skin protection: long sleeved clothing, full-length trousers, and impervious boots. Also kneepads, if kneeling down to provide a surface finish.

Dry concrete/mortar dust

NOTE: Occupational Exposure Standards (OES) or Maximum Exposure Limits (MEL) for inhalable and respirable dusts are set by the Health & Safety Commision.

These are published annually in HSE Guidance Note EH40. The following limits (8 hour time-weighted averages) are given in EH40/99:

8 Hour TWA

Total inhalable dust: 10mg/cubic metre OES

Respirable dust: 4mg/cubic metres OES

Respirable crystalline silica: 0.3mg/cubic metre MEL

Engineering control measure: containment and local exhaust ventilation where airborne dust exposure is likely to reach exposure limits

Respiratory protection: suitable respiratory protective equipment to HSE approved standard if engineering control measures are insufficient

Hand protection: anti-dust goggles to approved HSE standard

Product Information

9 PHYSICAL & CHEMICAL PROPERTIES

Detailed properties vary according to:

The specific mix, and

The ingredients added to affect the working characteristic of the material

All mixes are:

Abrasive Alkaline (typically pH10-14)

10 STABILITY & REACTIVITY

Not applicable

11 TOXICOLOGICAL INFORMATION

Wet concrete/mortar

Eye contact: may cause irritation or, in sever cases alkali burns

Skin contact: (short-term exposure) may cause alkali burns; may cause acute allergic dermatitis in people sensitised to chromium compounds

Dry concrete/mortar dust

Eye contact: may cause transient irritation

Skin contact: (brief/occasional) no harm likely

Inhalation: inhalation of large quantities of dust or dust containing respirable silica (generated by cutting, drilling etc.) may cause progressive lung damage, leading to permanent disability and, in extreme cases, to premature death

Ingestion: no harm likely

12 ECOLOGICAL INFORMATION

No date is available on the preparation themselves. When used as intended, no environmental impact is anticipated.

If spillage occurs, do not allow material to enter drains, sewers or water courses.

Waste Disposal

13 DISPOSAL CONSIDERATIONS

Not hazardous. However, disposal subject to local authority current requirements and regulations.

Additional Information

14 TRANSPORT INFORMATION

Not hazardous: no vehicle labelling required.

15 REGULATORY INFORMATION

Chemicals (Hazard Information and Packaging for Supply) Regulations 1997

Danger Classification: IRRITANT (+ hazard symbol)

R38: Irritating to the skin

R41: Risk of serious damage to the eyes

R43: May cause sensitisation by skin contact

S24: Avoid contact with skin

S25: Avoid contact with eyes

S26: In case of contact with eyes, rinse immediately with plenty of water and seek medical advice

Other statutory provisions

Health & Safety at Work etc. Act 1974

Consumer Protection Act 1987

Control of Substances Hazardous to Health Regulations (COSHH) 1994

Construction (Design & Management) Regulations 1995

Environmental Protection Act 1990

IMPORTANT NOTES:

The information contained in this Safety Data Sheet does NOT constitute the user's own assessment of workplace risk as required by other safety legislation. If purchasing on behalf of a third party who will work with the material, it is your statutory duty to pass on this information to them BEFORE such work begins.

16 OTHER INFORMATION

Data and advice in this Safety Data Sheet is provided to alert all purchasers and users to possible hazards of use when the material is used as intended. This information should enable them to take necessary precautions to protect the health and safety of all personnel.

Guidance references

Available from HMSO, HSE are offices, or local authority Environmental Health Department:

EH40: Occupation Exposure Limits

A Step by Step Guide to COSHH (HS[G]97)

BAR & FABRIC REINFORCEMENTS

Fabric Reinforcement

Fabric is manufactured to BS4483, from cold reduced wire which complies with BS4482. Ribbed wire classified as Type 2 and recognised in BS8110 as having improved bond characteristics, is available as standard material. Each wire intersection is resistance welded using electronically controlled techniques.

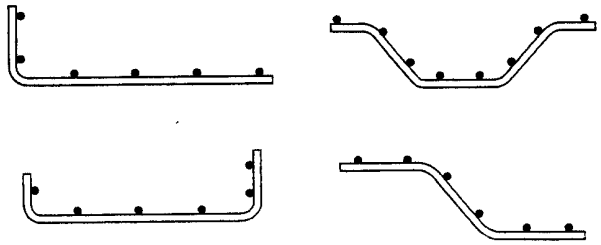
- Standard Sheets are 4.8 x 2.4m. (Also available 3.6 x 2.0m merchant size sheets - see below).
- Standard and merchant size sheets are available ex stock.
- When ordering non-standard sheets, the main wire length should be the first dimension stated.

BS Reference	Mesh Size Nominal Pitch of Wires		Wire Sizes		Cross Sectional Area per Metre Width		Nominal Weight per m^2 (kg)	Sheets per Tonne (approx)	Sheet Weight (kg)	Sheets per Bundle	Sq Metres per Tonne
	Main (mm)	Cross (mm)	Main (mm)	Cross (mm)	Main (mm)	Cross (mm)					
STANDARD SIZES (4.800 x 2.400)											
A393	200	200	10	10	393	393	6.16	15	70.96	18	162.34
A252	200	200	8	8	252	252	3.95	22	45.50	28	253.16
A193	200	200	7	7	193	193	3.02	29	34.79	34	331.13
A142	200	200	6	6	142	142	2.22	40	25.57	46	450.45
A98	200	200	5	5	98	98	1.54	57	17.74	60	649.35
B1131	100	200	12	8	1131	252	10.90	8	125.57	10	91.74
B785	100	200	10	8	785	252	8.14	11	93.57	14	122.85
B503	100	200	8	8	503	252	5.93	15	68.31	18	168.63
B385	100	200	7	7	385	193	4.53	20	52.19	24	220.75
B283	100	200	6	7	283	193	3.73	24	42.97	30	268.10
B196	100	200	5	7	196	193	3.05	29	35.14	36	327.87
C785	100	400	10	6	785	70.8	6.72	13	77.41	16	148.81
C636	100	400	9	6	636	70.8	5.55	16	63.94	20	180.18
C503	100	400	8	5	503	49.0	4.34	20	50.00	26	230.41
C385	100	400	7	5	385	49.0	3.41	26	39.28	30	293.26
C283	100	400	6	5	283	49.0	2.61	34	30.07	32	383.14
D98	200	200	5	5	98.0	98.0	1.54	57	17.74	60	649.35
D49	100	100	2.5	2.5	49.1	49.1	0.77	113	8.87	50	1298.70
MERCHANT SIZES (3.600 x 2.000)											
A393	200	200	10	10	393	393	6.16	23	44.35	26	162.34
A252	200	200	8	8	252	252	3.95	35	28.44	30	253.16
A193	200	200	7	7	193	193	3.02	46	21.74	50	331.13
A142	200	200	6	6	142	142	2.22	63	15.98	50	450.45

Cut & Bent Fabric

We can supply Fabric Radius or Bent in accordance with BS8666/BS4466. Either in standard sheets or special cut to size sheets.

When specifying, shapes must relate to BS8666/BS4466 shape codes, or a fully dimensioned sketch indicating the direction of bending relating to transverse or longitudinal wires.



For all bent fabric reinforcement.

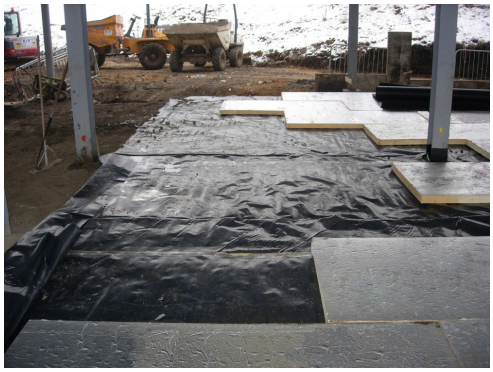
The bending dimensions must avoid welded transverse wires occurring within four diameters of the start of a bend.

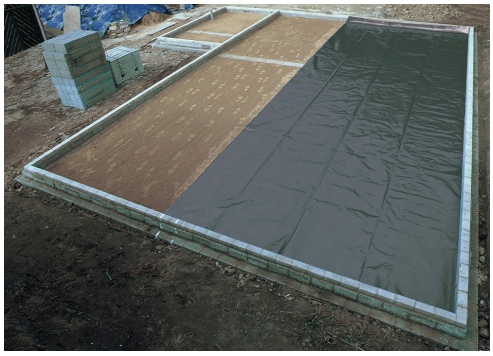
DATASHEET

Technical Support: 0333 202 6800
LAST UPDATED: 24.05.2018

VISQUEEN ECOMEMBRANE 100% RECYCLED

Ecomembrane
CE Mark to EN 13967





CE BBA APPROVAL INSPECTION TESTING CERTIFICATION TECHNICAL APPROVALS FOR CONSTRUCTION CERTIFICATE NO. 94/3009 CPD MEMBER Construction CPD Certification Service nsfPlus

- **Accredited by the British Board of Agrément (BBA: 94/3009)**
- **Manufactured using 100% recycled polythene**
- **Visqueen's low cost Eco entry level brand**
- **Suitable for use below concrete floors in accordance with clause 11 of CP 102:1973**

Description
Visqueen EcoMembrane® is manufactured from 100% recycled polyethylene suitable for use as a Type “A” damp proof membrane as defined by BS EN 13967: 2012. It is black or blue in colour, available in 250µm, 300µm and 500µm thicknesses and in convenient multi folded rolls.

Applications and use
Visqueen EcoMembrane® DPM is suitable for use below concrete floors in accordance with clause 11 of CP 102:1973, where there may be capillary rise of moisture but not where it may be subject to hydrostatic pressure. In such a circumstance, Visqueen Tanking Membranes should be used. Where there is a risk that the ground may be waterlogged, sub-soil drainage in accordance with CP 102 and BS 8102 should be provided.

For jointing adjacent sheets of Visqueen DPM, DPM to DPC and DPC to DPC, Visqueen Jointing System should be used. To complete the approved system use the following components when installing the membrane:

- VisqueenPro Double Sided Jointing Tape
- VisqueenPro Single Sided Jointing Tape
- Visqueen TreadGUARD1500
- Visqueen Zedex CPT DPC
- Visqueen Top Hat Units

IMPORTANT
Based on BBA, BRE and CIRIA guidelines, Visqueen Building Products recommend the use of special gas protection membranes (rather than traditional polythene DPMs) as suitable protection against ground gases. On brownfield sites or where there is ground contamination please seek further advice from Visqueen Building Products .

For high-rise buildings and commercial heavy duty RC slabs please use Visqueen High Performance 500 um centre-folded DPM in conjunction with Visqueen TreadGUARD as a cost-effective solution. Typical building examples of this use would be schools, hospitals, leisure and shopping centres.

Installation
When used in accordance with the BBA certificate and the relevant clauses of CP102: 1973 in concrete floors not subject to hydrostatic pressure, Visqueen Damp Proof Membranes form an effective barrier to the passage of moisture from the ground. The DPM must be continuous with the DPC in the surrounding walls.

The membrane should be installed on a compacted sand blinding layer or smooth concrete float finish. The DPM must be covered by Visqueen TreadGUARD1500 or rigid under slab insulation as soon as possible after installation. Care should be taken to ensure that the membrane is not stretched or displaced when placing the concrete or screed over the membrane.

Jointing Procedures

VISQUEEN

- Always ensure that the membrane is clean, dust free and dry at the time of jointing
- Adjacent sheets must be overlapped by a minimum of 150mm
- Bond together using Visqueen PRO Double Sided Jointing Tape
- The joint should then be sealed using Visqueen PRO Single Sided Jointing Tape.

Where the sheets have been perforated they should be patched with sheets of identical thickness lapped at least 150mm beyond the limits of the puncture and bonded with Visqueen PRO Double Sided Jointing Tape and sealed with Visqueen PRO Single Sided Jointing Tape.

Service Pipe Penetrations
Please use Visqueen Top Hat Pipe Cloaks for any service pipe penetrations. The base of the Visqueen Top Hat Units should be sealed using Visqueen Double Sided PRO Jointing Tape and Visqueen PRO Single Sided Jointing Tape.

Storage and Handling
Visqueen Ecomembrane is classified as non-hazardous when used in accordance with the relevant Code of Practice (CP 102:1973). The product is chemically inert and is not affected by acids and alkalis that may be present in the sub-soils.

The material is not recommended for uses where it will be exposed to long periods of outdoor weathering as exposure to ultraviolet light will embrittle the product. When a Vapour Control Layer is required please refer to Visqueen's Vapour barrier range. We do NOT recommend Ecomembrane for this use.

Weathering will not occur when the membrane is installed in accordance with CP102 1973.Care should be taken to avoid accidental damage when handling the membrane on site.

Visqueen PRO Double Sided Jointing Tape and Visqueen PRO Single Sided Jointing Tape should be kept in a warm, dry place until needed.

Installation is not recommended below 5°C.

Technical Data and CE Mark

Visqueen Ecomembrane complies with the requirements and clauses of EN 13967 - Flexible sheets for waterproofing.

British Board of Agrement performed the initial inspection of the manufacturing plant and of factory production control and the continuous surveillance, assessment and evaluation of factory production control, and issued the certificate of constancy of conformity of the factory production control. 0836–CPD – 13/F029 applies.

DATASHEET

Technical Support: 0333 202 6800
LAST UPDATED: 24.05.2018

VISQUEEN ECOMEMBRANE 100% RECYCLED

Ecomembrane

CE Mark to EN 13967

Product Data

Product Data

heading	Characteristic	Test method	Units	Compliance criteria	0.25	0.3mm	0.5mm
	Visible defects	EN 1850 -2	-	Pass/Fail	Pass	Pass	Pass
	Length	EN 1848-2	m	-0%/+10%	25	25	12.5
	Width	EN 1848-2	m	-2.5%/+2.5%	4	4	4
	Straightness	EN 1848-2	-	Pass/Fail	Pass	Pass	Pass
	Tensile Strength - MD	EN EN12311		>MLV	13	13	15
	Tensile Strength - CD	EN EN12311		>MLV	13	13	15
	Tensile Elongation - MD	EN EN12311	%	>MLV	300	300	300
	Tensile Elongation - CD	EN EN12311	%	>MLV	300	300	300
	Joint Strength	EN12317-2	N	>MLV	136	169	256
	Watertightness 2kPa	EN 1928	-	Pass/Fail	Pass	Pass	Pass
	Resistance to impact	EN 12691	mm	>MLV	150	150	200
	Durability (artificial ageing)	EN 1296 and EN 1928	-	Pass/Fail	Pass	Pass	Pass
	Durability Chemical Resistance	EN 1847	-	Pass/Fail	Pass	Pass	Pass
	Resistance to tearing (nail shank)	EN 12310-1	N	MDV	165	205	310
	Resistance to tearing (nail shank)	EN 12310-1	N	MDV	170	250	310
	Resistance to static loading	EN 12730	Kg	>MLV	Pass -20	Pass -20	Pass -20
	Water vapour transmission - resistance	EN 1931	MNs/g	MDV	586	682	1390
	Water vapour transmission - permeability	EN 1931		MDV	0.36	0.32	0.16
	Reaction to Fire	EN 13501-1	Class	MDV	F	F	F

DATASHEET

Technical Support: 0333 202 6800
LAST UPDATED: 24.05.2018

VISQUEEN ECOMEMBRANE 100% RECYCLED

Ecomembrane
CE Mark to EN 13967

Appendix A

About Visqueen

Visqueen is the market leader in the manufacture and supply of structural waterproofing and gas protection systems. Visqueen offers the complete package – a proven, reliable range backed by a technical support service that goes unmatched in the market - everything you would expect from a reputable and ethical company.

Complete Range, Complete Solution

- Structural Waterproofing
- Damp Proof Course
- Damp Proof Membranes
- Gas Protection and Gas Venting
- Vapour Control Layers
- Stormwater Protection

Download Library

- Technical Datasheet
- Standard Details
- Technical Service
- Visqueen Gas Protection Brochure
- NBS Clauses
- BBA Certificates
- Material Safety Datasheets
- Specification Guide

Find your local stockist

Search our directory of Visqueen specification Specialist Centres to locate your nearest Visqueen Partner.

Technical support throughout your project

We are specialists in our field and can help you specify the correct solutions with the necessary performance levels, in accordance with building regulations.

- Nationwide site support team
- Specification advice
- Installation guidance & project sign off
- System design including CAD details

CPD Seminars and Training Academy

Gas Protection CPD
The specification, technical design, and installation of gas protection systems, enabling the sustainable regeneration of brownfield sites.

Structural Waterproofing CPD
The specification, technical design, and installation of structural waterproofing systems for protection against water and damp ingress in both above and below ground projects.

Visqueen Training Academy
We are now able to offer exclusive in depth training opportunities on a wide variety of Visqueen products at our Training Academy.

Visqueen Special Projects
We provide high-level expertise, comprehensive support and experience in all types of waterproofing and gas protection.

VISQUEEN
Part of RPC bpi group
Heanor Gate Road, Heanor, Derbyshire, DE75 7RG
0333 202 6800 enquiries@visqueen.com www.visqueen.com

Technical Data – PICS Water Based Curing and Sealing Solution

(90.41) E (G)

PRODUCT DESCRIPTION

PICS Water Based Curing and Sealing Solution is a water based acrylic emulsion.

PURPOSE

PICS Water Based Curing and Sealing Solution can be applied to aid curing of freshly laid concrete or can be used to seal existing concrete surfaces.

SPECIAL PROPERTIES

As a curing agent:

- Aids curing of fresh concrete
- Slows surface drying
- Reduces chances of plastic cracking
- Can be used on colour hardened concrete floors
- Suitable for interior or exterior use
- 84% curing efficiency
- Conforms with ASTM C-309 and ASTM C-156

As a sealer:

- Improves abrasion resistance
- Enhances colour and aesthetics
- UV light and weather resistant
- Inhibits moss or algae growth
- Resists staining
- Suitable for interior or exterior use

APPLICATION INSTRUCTIONS

Mix well, or shake container thoroughly before use.

As a curing agent: As soon as final finish is completed and the concrete surface is free of any bleed water, the product should be applied by sprayer as soon as the surface has gained sufficient strength to withstand spray application without damage.

The product must be applied at a MINIMUM of 5m²/ litre in one or two applications. Allow first coat to dry tack free prior to applying second coat (if required). Application rates may increase due to surface porosity, surface profile and uniformity of application.

As a sealer: Existing concrete surfaces should be clean, dry and free of any surface laitance.

When used outside, the product must be applied when there is no chance of rain before the product has fully dried. Concrete should not be sealed below 10°C or above 30°C.

Drying times will vary, depending on temperature, humidity and air flow, however as a guide, the film will be tack free within 2 hours at 20°C. Foot traffic may be permitted after 12 hours and vehicular traffic after a minimum of 24 hours at 20°C.

Treated floors which are suitably cleaned and / or prepared can be compatible with future waterbased or solvent based coatings. Always apply a small test area prior to recoating or subsequent applications. Contact PICS technical department if in doubt.

PACKAGING

25 and 200 litre metal drums

STORAGE

Store at minimum 5°C. Do not allow to freeze.

CURING EFFICIENCY

Independently tested to BS7542:1992 guidelines with colour hardener added and trowelled into the surface and final finish trowelled to replicate on site conditions. After 72 hours in the drying cabinet, in the sprayed specimen 84% of the moisture in the mortar that was available to evaporate had been retained.

SPECIFICATION CLAUSE

"*Freshly laid concrete, which has received its final finish shall be treated with **PICS Water Based Curing and Sealing Solution** from PICS (Tel 01635 202224) to aid curing of the finished slab. All materials should comply to ISO9001 for Quality Assurance. All work should be carried out in conjunction with the manufacturer's current technical data sheet and instructions for use*".

HEALTH AND SAFETY

PICS Water Based Curing and Sealing Solution is non-toxic and non-flammable. The solution can normally be applied without a vapour mask or safety glasses. Avoid contact with skin and eyes. Flush affected areas with water. Do not take internally. Refer to Health & Safety Data Sheet for further information.

TECHNICAL SERVICES

For further information, call our technical dept. on:-

☎ UK (01635) 202224

☎ International +44(0) 1635 202224

e-mail info@picsuk.com
Web Site www.picsuk.com

14-10-2016

Manufactured by:
PATTERN IMPRINTED CONCRETE SUPPLIES LIMITED
Unit 2, Red Shute Hill Ind. Est., Hermitage,
Nr Newbury, Berkshire, RG18 9QL, United Kingdom
www.picsuk.com
info@picsuk.com

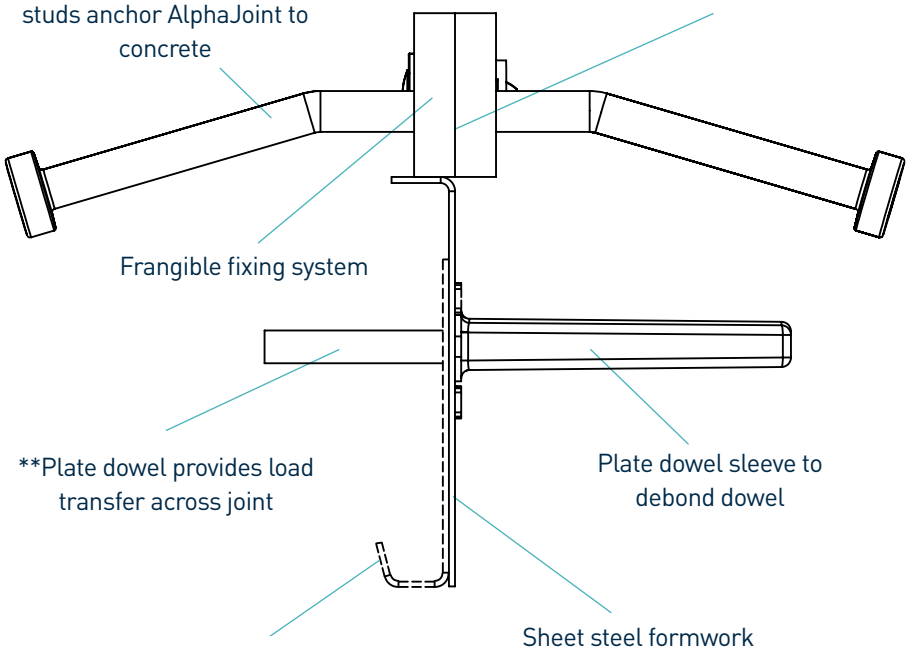
www.rcrflooringproducts.com
RCR Flooring Products Limited
Mill Close, Lee Mill Industrial Estate, Ivybridge, Devon, PL21 9GL
t: +44 1752 895288 | f: +44 1752 395800 | e: info@rcrflooringproducts.com

permaban®

AlphaJoint® Classic 4010

Specification Sheet
Issue 6.1
01/03/2021

AlphaJoint® Classic 4010



*Also available in electro-galvanised steel and stainless steel
**Dowels available in thicknesses of 6mm, 8mm and 10mm

AlphaJoint® Classic 4010

www.rcrflooringproducts.com
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t: +44 1752 895288 | f: +44 1752 395800 | e: info@rcrflooringproducts.com

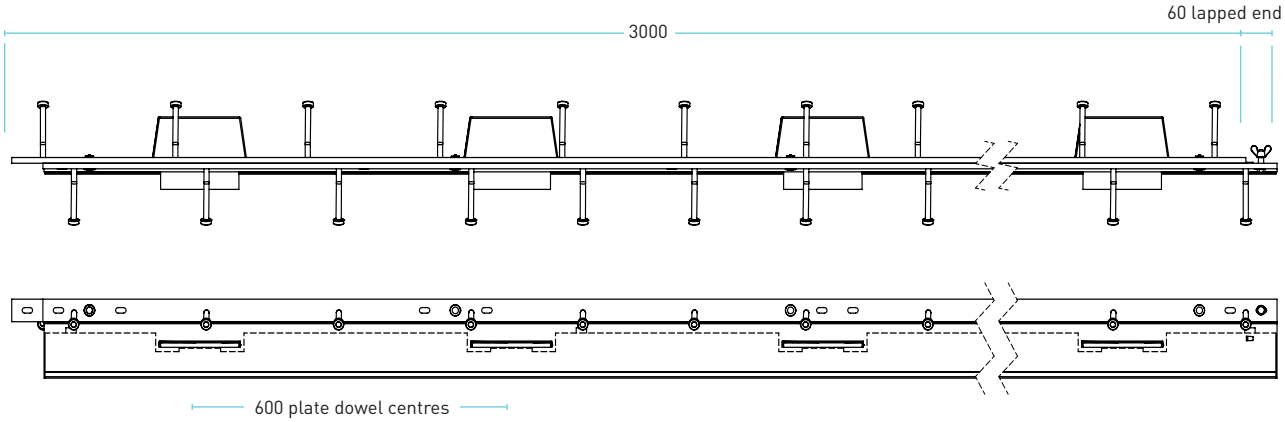
AlphaJoint® Classic 4010

Specification Sheet Issue 6.1
01/03/2021

manufacturing tolerances

Length	±2.0mm	**Height**	±1mm	**Straightness**	±0.5mm/600mm

dimensions of AlphaJoint® Classic 4010



dimensions in mm

dimensions and weight of AlphaJoint® Classic 4010

Nominal Slab Depth (mm)	Joint Height, h (mm)	Dowel Size (mm)	Dowel Centres (mm)	Length (mm)	Single Joint Weight (kg)	Number Per Bundle	Bundle Weight (kg)
150 - 200	140 - 190	151 x 120 x 8	600	3000	33.0	42	1485.0
220	200				35.0	35	1451.0
240	225				36.0	35	1493.4

Typical height and length values shown only. Weight values shown are based on AlphaJoint® Classic 4010 including TD8 dowels and are approximate.

materials

Component	Material
Joint arris armouring (4010)	EN 10277-1:2018 S235JRC
Sheet steel formwork	BS EN 1030:2006 DC01
Shear stud	EN ISO 13918 :2017 S235J2
Plate dowel	BS EN 10025-2:2004 S275JRG2
Plate dowel sleeve	HDPP

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permaban®

AlphaJoint® Classic 4010

Specification Sheet Issue 6.1
01/03/2021

theoretical calculated ultimate loads at failure of dowel or concrete

(For typical slabs, 40N/mm2 concrete and 20mm joint opening)

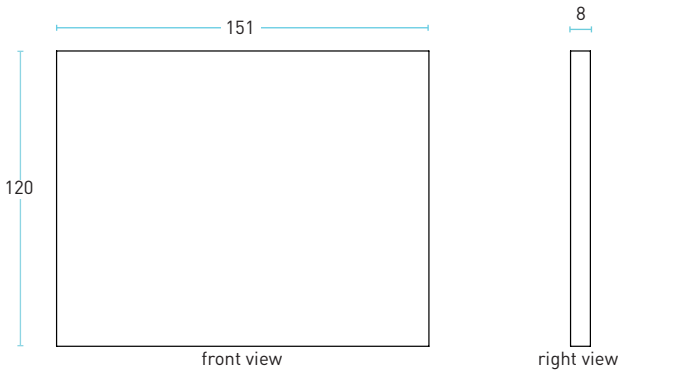
		Unreinforced Slab	
Slab Depth (mm)	**Dowel Type**	**Bursting (kN/m)**	**Bending (kN/m)**
Universal Divider Plate to Suit 150 - 200	TD6	35.7	53.4
	TD8	35.7	87.2
	TD10	35.7	124.7
225	TD6	60.7	53.4
	TD8	60.7	87.2
	TD10	60.7	124.7
250	TD6	72.4	53.4
	TD8	72.4	87.2
	TD10	72.4	124.7

Ultimate load (kN/m)

This table shows the load at failure in bursting (failure of the concrete) and bending (failure of the dowel) for a joint opening of 20mm - larger joint openings can be accommodated. The ultimate load has been calculated in accordance with TR34 4th Edition. Dowel positions taken at mid depth of slab. For more detailed analysis please contact RCR Flooring Products Ltd.

*All design calculations should be verified by a suitably qualified structual engineer.

compatible dowel systems



SAFETY DATA SHEET
ARBOMERIC MP 20

1 IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY/UNDERTAKING

PRODUCT NAME ARBOMERIC MP 20

APPLICATION Structural joints in heavy cladding. Structural movement joints in floors. Floor joints in heavily trafficked areas.

SUPPLIER Adshead Ratcliffe & Co. Ltd.
Derby Road, Belper
Derbyshire.
DE56 1WJ
Tel. (+44) 01773 826661
Fax. (+44) 01773 821215

2 COMPOSITION/INFORMATION ON INGREDIENTS

Name	EC No.	CAS-No.	Content	Classification
TRIMETHOXY VINYLSILANE	220-449-8	2768-02-7	1-5%	Xn;R20. Xi;R38. R10.

The Full Text for all R-Phrases are Displayed in Section 16

COMPOSITION COMMENTS

Silyl-terminated polyether, with fillers, organosilane additives, and auxiliaries.

3 HAZARDS IDENTIFICATION

Not regarded as a health or environmental hazard under current legislation.

HUMAN HEALTH

The product contains a small amount of sensitising substance which may provoke an allergic reaction among sensitive individuals in contact with skin.

4 FIRST-AID MEASURES

INHALATION

Move the exposed person to fresh air at once. Get medical attention if any discomfort continues.

INGESTION

Immediately rinse mouth and drink plenty of water (200-300 ml). DO NOT induce vomiting. Get medical attention immediately.

SKIN CONTACT

Remove affected person from source of contamination. Remove contaminated clothing. Wash the skin immediately with soap and water. Get medical attention if any discomfort continues.

EYE CONTACT

Make sure to remove any contact lenses from the eyes before rinsing. Promptly wash eyes with plenty of water while lifting the eye lids. Continue to rinse for at least 15 minutes. Get medical attention if any discomfort continues.

5 FIRE-FIGHTING MEASURES

EXTINGUISHING MEDIA

Water spray. Foam, carbon dioxide or dry powder.

PROTECTIVE MEASURES IN FIRE

Self contained breathing apparatus and full protective clothing must be worn in case of fire.

6 ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS

Wear appropriate protective clothing. Follow precautions for safe handling described in this safety data sheet.

ENVIRONMENTAL PRECAUTIONS

Do not discharge into drains, water courses or onto the ground.

SPILL CLEAN UP METHODS

Collect in containers and seal securely. Wash thoroughly after dealing with a spillage.

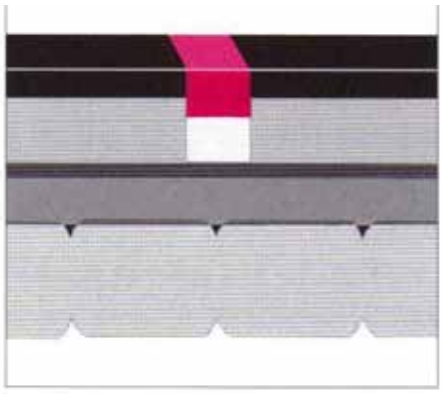
7 HANDLING AND STORAGE

ARBO SEALANTS

Technical Datasheet

ARBOMERIC MP20

DESCRIPTION
Arbomeric MP20 is a one part high modulus modified polymer sealant which cures on exposure to moisture vapour to form a tough but elastic rubber.



FLOOR JOINTS

MAIN APPLICATIONS
Arbomeric MP 20 is recommended for use in many forms of construction including structural joints in heavy cladding, structural movement joints in floors and floor joints in heavily trafficked areas. NB Not recommended for joints in lightweight cladding and swimming pools.

SPECIFICATION COMPLIANCE
BS EN ISO 11600 – F – 25 HM

APPLICATION INSTRUCTIONS
Joint preparation
The joint surfaces must be clean, dry and free from all contamination. The surfaces should be degreased using the appropriate Arbo Cleaner. Primers may be required on some substrates. It is recommended that Adshead Ratcliffe Technical Services Department should be consulted and advice obtained with regard to the choice of primer for specific purposes.

Joint Backing
Where applicable, appropriate joint filler e.g. closed cell polyethylene foam, should be used to provide the correct joint depth.

All joint preparation, priming, and sealant application should be carried out in accordance with BS 8000 Part 16, the British Standard for the sealing of joints in buildings using sealants.

APPLICATION
Arbomeric MP20 is supplied in polyethylene 380ml cartridges and 600 ml foils

Joint Size Suitability
Joint Width
Minimum 6mm
Maximum 25mm (single application); 35mm (multiple applications)

Joint Depth
Minimum 10mm on porous substrates (12mm in floor joints)
Minimum 6mm on non-porous substrates (12mm in floor joints)
Maximum 20mm

Width: Depth ratio (within above min/max restrictions)
2:1 butt joints
1:1 lap joints/floor joints

PACKAGING
25 x 380ml Polyethylene Cartridges per box. Polyethylene Nozzles are included in each box.

COLOURS
White, Grey, Black.

STORAGE LIFE
12 months in original unopened packaging stored in a cool, dry place out of direct sunlight.

HEALTH AND SAFETY
No particular health hazards are associated with this product but please consult Material Safety Data Sheet for full information.

TECHNICAL DATA

Skin Time at 20º C/65 % RH:	15 minutes
Application Temperature:	+ 5º C to + 35º C
Service Temperature:	- 40º C to + 120º C
Typical Shore A Hardness:	55
Cure Rate at 20º C/65 % RH:	2mm/24 hours
Chemical Resistance:	Resistant to most dilute acids and alkalis. Organic solvents may cause the sealant to swell and lose adhesion. Strong cleaning agents can cause surface deterioration and may affect the efficiency of the material.
UV Resistance:	Very Good
Service Life:	20 years + (when used in trafficked areas the life may be reduced)
Movement Accommodation:	Butt joints (movement in tension and compression): 35 %.
Lap joints (movement in shear):	70 %.
Modulus @ 100 % extension:	1.12 N/mm²
Ultimate elongation:	220%
Tensile strength @ break:	1.85 N/mm²

ACCESSORIES

Primers

Arbo Primer 2650 (500ml tin):
Yield approximately 125 metres per tin

Cleaners

Arbo Cleaner No.17- 1 Litre Tin (Xylene based – not suitable for use with plastics or delicate finishes)

Arbo Cleaner No. 16 - 1 Litre Tin (Alcohol Based)

Ancillary Equipment

Polyethylene Nozzles
Arbo Caulking Guns

QUANTITY ESTIMATOR

Joint Size (mm)	Metres/Litre
6 x 6	27.8
9 x 6	18.5
12 x 9	9.3
18 x 10	5.6
25 x 10	4.0

Important: The information in this leaflet is given in good faith and based on results gained from experience and tests. However, all recommendations or suggestions are made without guarantee since the conditions of use are beyond our control. Goods are supplied subject to the Company's terms and conditions of sales, a copy of which is available on request.

Arbo sealants are manufactured in the U.K. by Adshead Ratcliffe.

Adshead Ratcliffe & Co. Ltd. Derby Road, Belper, Derbyshire, DE56 1WJ | **UK Tel:** 01773 826661 | **Fax:** 01773 821215 | **Web:** www.arbo.co.uk

ARBOMERIC MP 20

USAGE PRECAUTIONS

Avoid spilling, skin and eye contact. Observe good industrial hygiene practices.

STORAGE PRECAUTIONS

Store in tightly closed original container in a cool, dry well-ventilated place.

8 EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE EQUIPMENT

ENGINEERING MEASURES

No particular ventilation requirements.

HAND PROTECTION

Use protective gloves.

EYE PROTECTION

Wear approved safety goggles.

HYGIENE MEASURES

DO NOT SMOKE IN WORK AREA! Wash at the end of each work shift and before eating, smoking and using the toilet. Wash promptly if skin becomes contaminated. Promptly remove any clothing that becomes contaminated. When using do not eat, drink or smoke.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Thixotropic paste.		
ODOUR	Mild (or faint).		
SOLUBILITY	Insoluble in water		
RELATIVE DENSITY	1.50 - 1.53 @ 20"C	VISCOSITY	8,000 - 10,000 Ps @ 20"C
FLASH POINT (°C)	Not determined.	AUTO IGNITION TEMPERATURE (°C)	> 400

10 STABILITY AND REACTIVITY

STABILITY

Stable under normal temperature conditions and recommended use.

CONDITIONS TO AVOID

Avoid excessive heat for prolonged periods of time.

HAZARDOUS DECOMPOSITION PRODUCTS

No specific hazardous decomposition products noted.

11 TOXICOLOGICAL INFORMATION

INHALATION

No specific health warnings noted.

INGESTION

No harmful effects expected in amounts likely to be ingested by accident.

SKIN CONTACT

The product contains a small amount of sensitising substance which may provoke an allergic reaction among sensitive individuals after repeated contact.

EYE CONTACT

May cause irritation to eyes.

12 ECOLOGICAL INFORMATION

ECOTOXICITY

Not regarded as dangerous for the environment.

DEGRADABILITY

Not degradable.

ACUTE FISH TOXICITY

Toxicity to fish is improbable.

13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Do not allow runoff to sewer, waterway or ground. Dispose of waste and residues in accordance with local authority requirements.

14 TRANSPORT INFORMATION

GENERAL — The product is not covered by international regulation on the transport of dangerous goods (IMDG, IATA, ADR/RID).

15 REGULATORY INFORMATION

RISK PHRASES

NC	Not classified.

SAFETY PHRASES

P13	Safety data sheet available for professional user on request.
P14	Contains 3-(2-AMINOETHYLAMINO)-PROPYLTRIMETHOXYSILANE. May produce an allergic reaction.

STATUTORY INSTRUMENTS

Chemicals (Hazard Information and Packaging) Regulations. Control of Substances Hazardous to Health.

GUIDANCE NOTES

Workplace Exposure Limits EH40. CHIP for everyone HSG(108).

16 OTHER INFORMATION

REVISION COMMENTS

General review

REVISION DATE	25/08/05
REV. NO./REPL. SDS GENERATED	26/02/04
SDS NO.	10203

RISK PHRASES IN FULL

R10	Flammable.
R20	Harmful by inhalation.
R38	Irritating to skin.

CLIENT PROJECT No	**P23012**
ABS PROJECT No	**B2354**
CLIENT	**WINVIC CONSTRUCTION LTD**
PROJECT	**PLOT 3 WINGATES**
LOCATION	**BOLTON**

Aesthetical Issues

Introduction

In many completed concrete floors, there will always be a risk of some minor aesthetical blemishes, small defects and cracking occurring. Even high standards of workmanship will not eliminate the risk of surface imperfections.

1.0 Colour & Appearance

Concrete floors are constructed primarily from naturally occurring materials and finished by techniques that cannot be controlled as precisely as would be expected in a factory production process. Good materials and workmanship may reduce variations in colour and appearance, but they will not eliminate them, and the final appearance of a floor will never be as uniform as a painted surface finish, some features evident on the surface of newly laid concrete floors can be related to the early drying of the floor and become less visible with time.

2.0 Cracking

In a well designed and constructed floor the risk of random cracking will be low, but it is virtually impossible to totally prevent cracking. The risk of cracking occurring increases with the size of the floor and increased distance between shrinkage control joints.

Cracking occurs when the tensile stress in a section of slab exceeds the tensile strength of the concrete. This situation most often occurs when the long-term drying shrinkage of the slab is restrained for some reason. Such cracks do not generally have any structural significance.

Many factors affect the formation of restrained shrinkage cracks and it is impossible to guarantee that a floor will be completely crack-free.

3.0 Crazing

Many power trowelled concrete floors exhibit an irregular pattern of fine cracks. This is known as surface crazing. It is an inherent feature of power trowelled concrete surfaces and is considered to be a matter of appearance only, and generally no structural or serviceability issues are associated. It tends to be more visible on floors that are wetted and cleaned as the extremely fine cracks trap moisture and dust. The mechanisms of crazing in floors are not fully understood but it is known that

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the surface zone consists predominantly of mortar paste. In power-finished floors, this paste is intensively compacted by the trowelling process and can have a very low water/cement ratio. The heat build-up by the final power trowel finishing process may also be a contributory factor. As the mechanism is poorly understood it is not possible to recommend measures that can reduce its occurrence. There is no appropriate treatment for crazing.

4.0 Curling

Curling is quite common at joints and edges of slabs. Floor panels sometimes curl to such an extent that truck performance is affected. Where necessary, departures from the required surface regularity can be corrected by grinding.

Curling can cause the loss of sub-base support causing the floor to move under the passage of trucks. This movement can be a major contributor to joint arris breakdown, particularly where there is weak or non-existent load transfer across the joint. Movement should be monitored as part of the maintenance regime and dealt with as required. Under-slab grouting can restore support.

Care should be taken at personnel doors as curled slab can introduce a trip hazard and this should be considered during the design process using dowels and sleeves to maintain load transfer

5.0 Delamination

There is a risk of surface delamination on power trowelled concrete surfaces. The risk of occurrence of delamination increases with the variability of the concrete used or changes in curing conditions.

Delamination is the process whereby a thin (2–4mm) layer becomes detached from the surface and breaks down usually under trafficking. The mechanisms of delamination are not fully understood but are believed to result from several factors, including differential setting of the surface concrete, air content and bleed characteristics of the concrete. Accelerated drying of the surface by cross winds from open environments can significantly affect bleeding and set characteristics.

Delamination is repaired by cutting away the affected surface in areas bounded by shallow saw cuts and then filling with cement- or resin-based mortar systems.

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6.0 Surface Aggregates

Occasionally, aggregate particles lie exposed at or are very close to the surface. If they are well 'locked into' the surface, they are unlikely to affect durability although their appearance may be considered an issue. However, particles can be dislodged by materials handling equipment or other actions, leaving small surface voids. These voids can be drilled out and filled with resin mortar.

Where soft particles, such as naturally occurring mudstone or lignite, are exposed in the surface, they should be removed by drilling and replaced with mortar as described above.

7.0 Surface Finishing Marks

Trowel marks such as 'swirls or discolouration from burnishing are often a consequence of the normal variations in setting of the concrete, the visual impact of these marks will reduce significantly with time.

Excess curing compound or multiple layers of curing compound cause darker areas. These will wear and disappear with time and use of the floor without adverse effect on the surface.

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SECTION 8 - MODIFICATION/ DEMOLITION /DISPOSAL INSTRUCTIONS

Modification

Under no circumstances should any modifications take place without the approval of ABS Brymar Floors Ltd.

Demolition

In the event of demolition, a competent demolition contractor should be appointed to undertake the works.

Disposal

Concrete is recyclable, your appointed demolition contractor should be consulted as to where your material is being recycled.

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Aesthetical Issues

Introduction

In many completed concrete floors, there will always be a risk of some minor aesthetical blemishes, small defects and cracking occurring. Even high standards of workmanship will not eliminate the risk of surface imperfections.

1.0 Colour & Appearance

Concrete floors are constructed primarily from naturally occurring materials and finished by techniques that cannot be controlled as precisely as would be expected in a factory production process. Good materials and workmanship may reduce variations in colour and appearance, but they will not eliminate them, and the final appearance of a floor will never be as uniform as a painted surface finish, some features evident on the surface of newly laid concrete floors can be related to the early drying of the floor and become less visible with time.

2.0 Cracking

In a well designed and constructed floor the risk of random cracking will be low, but it is virtually impossible to totally prevent cracking. The risk of cracking occurring increases with the size of the floor and increased distance between shrinkage control joints.

Cracking occurs when the tensile stress in a section of slab exceeds the tensile strength of the concrete. This situation most often occurs when the long-term drying shrinkage of the slab is restrained for some reason. Such cracks do not generally have any structural significance.

Many factors affect the formation of restrained shrinkage cracks and it is impossible to guarantee that a floor will be completely crack-free.

3.0 Crazing

Many power trowelled concrete floors exhibit an irregular pattern of fine cracks. This is known as surface crazing. It is an inherent feature of power trowelled concrete surfaces and is considered to be a matter of appearance only, and generally no structural or serviceability issues are associated. It tends to be more visible on floors that are wetted and cleaned as the extremely fine cracks trap moisture and dust. The mechanisms of crazing in floors are not fully understood but it is known that

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SECTION 9 - EMERGENCY CONTACT INFORMATION

In the first instance, the general office telephone should be the first point of contact 0161 9725000 or general@absbrymarfloors.co.uk your concerns can then be directed to the most appropriate member of staff.

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SECTION 10 - INDEX OF AS BUILT DRAWINGS & SLAB CALCULATIONS

10.1 (ABS DESIGNED)

DRAWING NUMBER	DRAWING TITLE	SUPPLIER	REVISION
2354 - 01	Proposed Joint Layout	ABS Brymar Floors Limited	
2354 – 02	Typical Details	ABS Brymar Floors Limited	

Structural Calculations	ABS Brymar Floors Limited	