

RESISTANCE TO FIRE - CLASSIFICATION REPORT EUI-21-000441

1. INTRODUCTION

This classification report defines the classification assigned to loadbearing timber frame with K112 and K118 fire test material in accordance with the procedures given in BS EN 13501-2:2016.

RESISTANCE TO FIRE CLASSIFICATION IN ACCORDANCE WITH EN 13501-2:2007 + A1:2013

Sponsor:	KINGSPAN INSULATION LTD Torvale Industrial Estate Pembridge, Herefordshire HR6 9LA UNITED KINGDOM
Product name:	Loadbearing timber frame with K112 and K118 fire test material
Classification report No.:	EUI-21-000441
Issue number:	1
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2. DOCUMENT TRACKING

Revision Index.	Modification
0	Original document

3. INTRODUCTION

This classification report defines the resistance to fire classification assigned to loadbearing timber frame with K112 and K118 fire test material in accordance with the procedure given in EN 13501-2:2007 + A1:2016.

4. DETAILED OF CLASSIFIED PRODUCT

4.1. GENERAL

The product, Loadbearing wall loadbearing timber frame with K112 and K118 fire test material, is defined as a loadbearing wall with fire separating function in accordance with BS EN 13501-2:2016. Its function is to be fire-resistant as regards fire resistance performance characteristics given in section 7.3.2 of the standard BS EN 13501-2:2016.

The product is described on the test report mentioned on section 5 of this report and is described below.

4.2. DESCRIPTION

The tested element was:

- External breather membrane, 0.4mm thick (Kingspan Nilvent)
- A layer of OSB boarding, 9mm thick
- A timber frame 89mm thick, with 50mm Kooltherm K112 insulation friction fitted within the timber frame
- A Layer if K118 insulated plasterboard, 32.5mm thick

4.3. SCHEDULE OF COMPONENTS

See section 4.4.6 for the schedule of components.

4.4. DETAILED DESCRIPTION OF THE SPECIMEN

The drawings below were supplied by the test Sponsor, who attests their accuracy.

4.4.1. Timber frame panel

- A perimeter frame reference perimeter frame (Kingspan Insulation Limited), with section 89 x 38 mm, C16 grade softwood and stated density 370 kg/m³. The perimeter frame consisted of six vertical studs, 2924mm in length. Horizontal noggins were included at 600mm from the top of the sample. Please see, Drawing 1 for a view of the frame layout. The timber frame was butted with the head and bottom rails running the full width of the panel. The framework was secured with Montana D34GSC 3.1x88mm (DxL) screws, with two screws used per joint.
- An internal layer of K112 framing board (Kingspan Insulation Limited), 50 mm thick, with stated density of 35kg/m³ was included within the frame. The insulation was friction fitted between the vertical timber studs, noggins, and rails.
- One layer of face panel reference OSB facing (Kingspan Insulation Limited), fitted to one side of the frame, 9 mm thick. The OSB board was through fixed into the external timber framework with 2.8x50mm (D x L), FAWGS/SC2 (Montana) screws. The screws were spaced at 150mm centres to the perimeter sections of the external framework and 300mm centres to the intermediate framework

4.4.2. External breather membrane

External breather membrane (Kingspan Nilvent), made of laminated 3-layer polyolefin, 1500mm high, overlapping 450mm and fixed with white tape and secured with 71 x 10 x 0.68mm V2A stapled at 300mm centres. This was secured to the OSB boarding layer, as shown in Photograph 9.

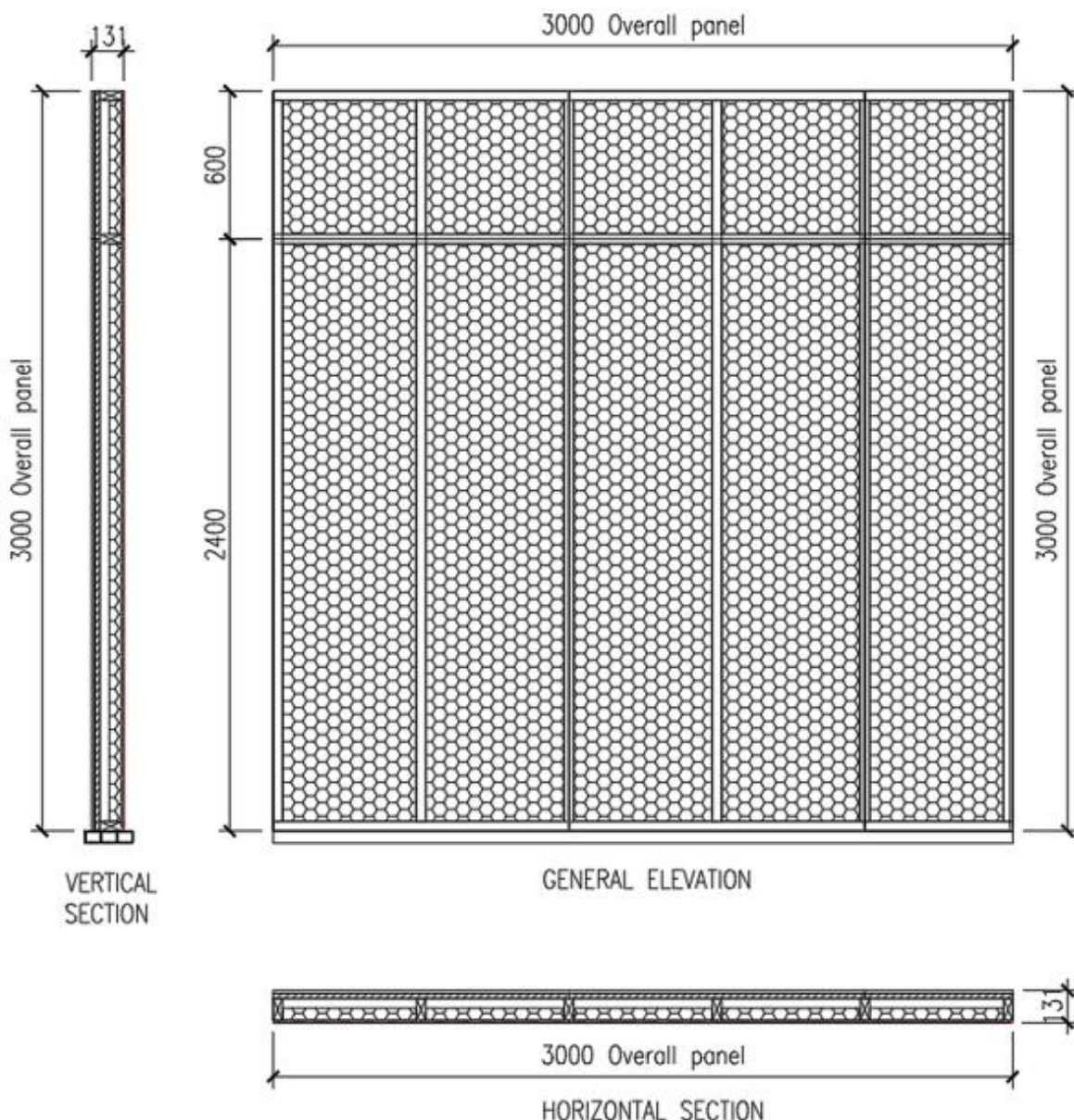
4.4.3. Internal Liner Facings

A layer of Kooltherm K118 insulated plasterboard, 32.5mm thick (20mm insulation + 12.5mm plasterboard) was fixed the timber frame with 4.5x75mm (D x L), 45A75MP drywall screws (Durspin) at 300mm centres to all perimeter and intermediate timber. The plasterboard was taped and jointed using Gypsum tape and joint compound.

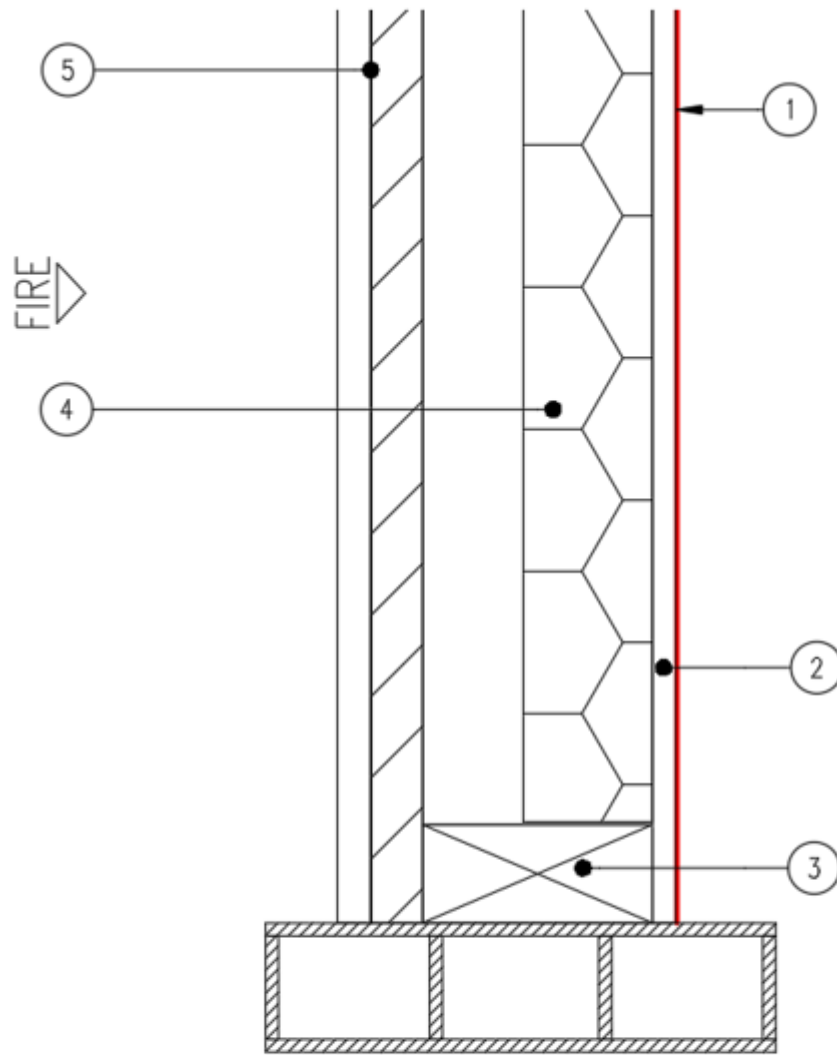
4.4.4. Additional equipment

No additional equipment was installed on the sample.

4.4.5. Drawings

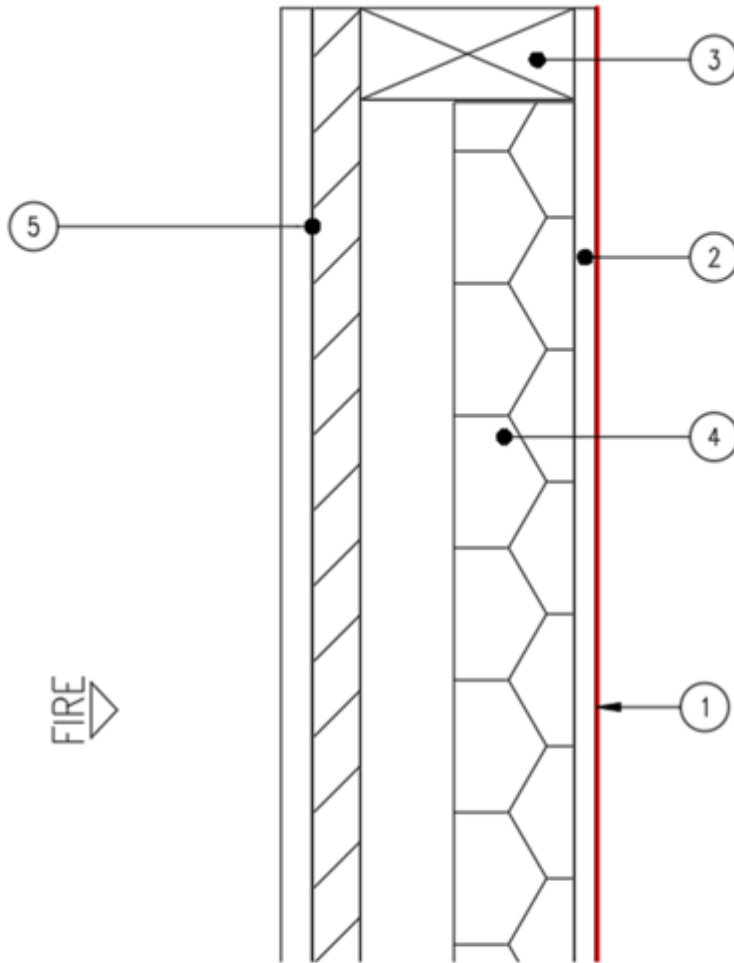


Drawing 1 – Elevation view of the test construction



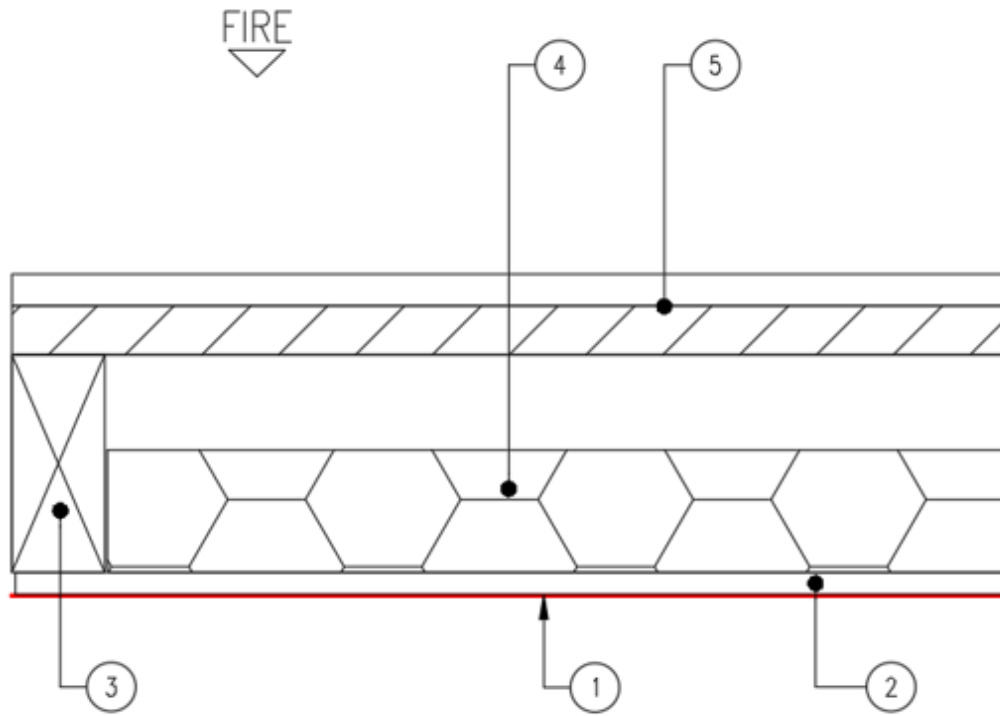
TYPICAL SECTION THROUGH BASE

Drawing 2 – Details of the panel



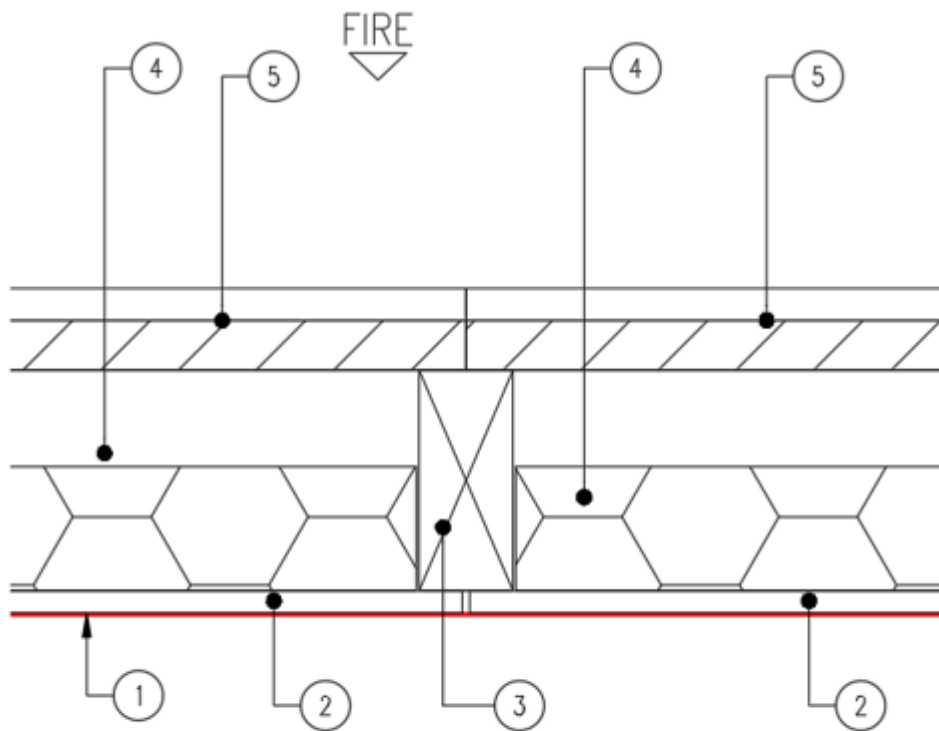
TYPICAL SECTION THROUGH HEAD

Drawing 3 – Details of the panel



TYPICAL SECTION THROUGH BASE

Drawing 4 – Details of the panel



TYPICAL SECTION THROUGH BASE

Drawing 5 – Details of the panel

4.4.6. Schedule of components

Schedule of Components

(Refer to Figures 1 to 5)
 (All values are nominal unless stated otherwise)
 (All other details are as stated by the sponsor)

Item	Description
1. Membrane	
Manufacturer	: Kingspan
Reference	: Nilvent
Material	: Laminated 3-layer polyolefin
Thickness	: 0.4mm
Fixing method	: White tape applied and then held in place with 71x10V2A staples fixed at 300mm centres.
2. External Facings	
Material	: OSB (Oriental Strand Board)
Thickness	: 9mm
Fixing method	: Through fixed into external timber framework (item 3)
Fixings	
i. manufacturer	: Montana
ii. reference	: FAWGS/SC2
iii. type	: Circular smooth shank coil nails
iv. material	: Galvanised Mild Steel
v. overall size	: 2.8mm diameter x 50mm long
vi. centres	: 150mm to the perimeter sections of the external framework (item 1) and 300mm centres to intermediate framework.
3. External Perimeter Framework	
Material	: C16 grade Whitewood, softwood
Type	: CLS (Canadian Lumber Standard)
Density	: 370 kg/m ³ (stated)
Overall size	: 89 x 38mm
Jambs to head jointing method	: Butted with the head and bottom rails running the full width of the panel.
i. manufacturer	: Montana
ii. type	: D34GSC
iii. material	: Circular screw shank coil nails
iv. reference	: Galvanised mild steel
v. overall size	: 3.1mm diameter x 88mm long
vi. quantity	: 2 number per joint
4. Panel Insulation	
Manufacturer	: Kingspan Insulation Limited
Reference	: Kooltherm K112 Framing Board
Material	: Fibre free rigid thermoset phenolic core with aluminium foil faces.
Thickness	: 50mm
Density	: 38.24kg/m ³ (stated)
Fixing method	: Friction fitted between vertical timber studs (and noggins) & the timber top and bottom rails.

Item
Description
5. Internal Liner Facings

Manufacturer	:	Kingspan Insulation Limited
Reference	:	Kooltherm K118 Insulated Plasterboard
Material	:	Fibre free rigid thermoset phenolic insulation core bonded to a tapered edge gypsum based plasterboard.
Thickness	:	32.5mm overall (20mm insulation + 12.5mm plasterboard type A)
Compressive Strength	:	Typically exceeds 100kPa at 10% compression.
Fixing Method	:	
Fixings to perimeter framework	:	
i. manufacturer	:	<u>Durspin</u>
ii. reference	:	45A75MP
iii. type	:	Drywall Screws
iv. material	:	Mild Steel
v. overall size & centres	:	4.5mm diameter x 75mm long 300mm centres to all perimeter and intermediate timber work.

Name of layer	Brand name	Batch no	Density or weight of product	D.O.M	Thickness	Product standard
K118 insulated plaster board	Kingspan k118	8100459710	11.42kg / m ²	11/01/22	32.5mm-20mm <u>kooltherm</u> insulation bonded to 12.5mm Gypsum board	BS EN 13950
K112	Kingspan k112	8100460540	38.24	14/01/22	50mm	BS EN 13166
Timber frame with K112 between	<u>Stora Enso</u> C16 CLS	783434	370	17/6/21	89mmx38mm	N/A
OSB	Norbord Sterling OSB3	IO 1060135	5.45kg /m ²	10/01/22	9mm	BS EN 300
Breather membrane	Kingspan Nilvent (Tyvek)	FDX0119486	0.13kg / m ²		0.4mm	BS EN 13859-2

5. REPORTS AND RESULTS IN SUPPORT OF THIS CLASSIFICATION
5.1. REPORTS

Name of Laboratory	Name of sponsor	Report ref. no	Test method and date field of application rules and date
EFFECTIS UK/Ireland	Kingspan insulation	EUI-21-000441	BS EN 1363-1:2020 BS EN 1365-1:2012

5.2. RESULTS

Test method and test number	Parameter(s)	Results
EUI-21-B-000441 BS EN 1363-1:2020 BS EN 1365-1:2012	Composition	Structure: Timber frame Exposed side: K118 insulated plasterboard 12.5mm Unexposed side: OSB boarding 9mm and an external breather membrane
	Applied load	40 kN total load
	Fire side	One layer of 12.5mm thick K118 plasterboard, secured to the timber frame
	Loadbearing capacity Integrity Insulation	41 minutes 41 minutes 41 minutes

6. CLASSIFICATION AND FIELD OF APPLICATION

6.1. REFERENCE OF CLASSIFICATION

This classification has been carried out in accordance with clause 7 of EN 13501-2:2007 + A1:2013.

6.2. CLASSIFICATION

The element, Loadbearing timber frame with K112 and K118 fire test material, is classified according to the following combination of performance parameters and classes as appropriate:

R	E	I	W		t	-	M	S	C	IncSlow	sn	ef	r
R	E	I			30								

FIRE RESISTANCE CLASSIFICATION	REI30
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6.3. FIELD OF APPLICATION

According to the standard BS EN 13501-2:2016, the classification is valid for the following end use applications:

Fire side: as tested – fire on the side with the K118 plasterboard

NOTE: The present classification report is not valid for the product exposed on the side with the OSB panel and the breather membrane

6.3.1 FIELD OF DIRECT APPLICATION OF THE TEST RESULTS

The direct application field of the test results is limited to the determination of the permissible modifications of the test specimen following a successful fire resistance test. These modifications may be automatically introduced without the sponsor having to apply for any additional assessment, calculation, or agreement.

The results of the fire test are directly applicable to similar constructions where one or more of the changes listed below are made and the construction continues to comply with the appropriate design code for its stiffness and stability:

- a) decrease in height;
- b) increase in the thickness of the wall;
- c) increase in the thickness of component materials;
- d) decrease in linear dimensions of boards or dimensions of panels of but not thickness;
- e) decrease in stud spacing;
- f) decrease in distance of fixing centres;
- g) increase in the number of horizontal joints when tested with one joint not more than 500 ± 150 mm from the top edge
- h) decrease in the applied load;

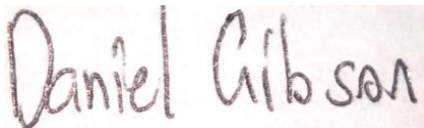
NOTE: For the reference test, the total load applied was 40kN, on a 3000 mm high sample.

- i) increase in the width provided that the specimen was tested at full width or 3 m wide, whichever is the larger.

7. LIMITATIONS

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

SIGNED



Daniel Gibson
In charge of the Test
Project Leader

APPROVED



Maurice McKEE
Lab Manager