Title	Waltham College Training Booths
Project no.	
Operation scenario	

Client	Waltham College
Date	14/10/2021

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Content

Main supply report : Supply

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Supply details	
Description	Supply
Supply method	User defined source @500kVA
Phase/Voltage	Three-phase 400/230V 50Hz
Earthing system	TN-S
Voltage drop limit	Public supply: Lighting 3%, other uses 5%

Prospective symmetrical 3Ph fault	
Isc-3ph (kA)	11.98
Zp-p (Ω)	0.0192
cos φ	0.23

Prospective Ph to N fault	
Isc-1ph (kA)	0.61
Zp-n (Ω)	0.38
cos φ	0.23

Prospective earth fault	
Ief (kA)	0.61
Ze (Ω)	0.3803

Earthing arrangements	
Earthing conductor (mm²)	-
Earthing electrode resistance (Ω)	0
Main bonding conductor (mm²)	25

Min/Max Fault levels							
Isc-max (kA)	11.98	**Cmax**	1	**Isc-min (kA)**	0.61	**Cmin**	1

Protection by supplier	Main protective device
Fuse 3P 80A/33kA	

Load calculations				
Phase	**L1**	**L2**	**L3**	**N**
Connected load (A)	26.09	26.09	26.09	
Diversified load (A)	26.09	26.09	26.09	
Spare load (A)	0 (0%)	0 (0%)	0 (0%)	
Design load (A) (Diversified + Spare)	**26.09**	**26.09**	**26.09**	**0**

Design load power calculations				
Phase	**L1**	**L2**	**L3**	**Total**
kVA	6	6	6	18
kW	6	6	6	18
kVAr	0	0	0	0
cos φ	1	1	1	-

Main conductor	4x1Cx25mm² + 1x25mm² E Pvc70/S/Cu Length: 1m

Maximum demand report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Supply details

Description	Supply
Supply method	User defined source @500kVA
Phase/Voltage	Three-phase 400/230V 50Hz
Earthing system	TN-S

Design load power calculations

Phase	L1	L2	L3	Total
kVA	6	6	6	18
kW	6	6	6	18
kVAr	0	0	0	0
cos φ	1	1	1	-

Load calculations

Phase	L1	L2	L3	N
Connected load (A)	26.09	26.09	26.09	
Diversified load (A)	26.09	26.09	26.09	
Spare load (A)	0 (0%)	0 (0%)	0 (0%)	
Design load (A) (Diversified + Spare)	**26.09**	**26.09**	**26.09**	**0**

Load power calculations per switchboard and distribution board

Description [Load type]	Power factor			Connected Load (A)				Connected Load (kVA)			
Supply area (m²)	Diversity factor			Diversified load (A)				Diversified load (kVA)			
Load density (W/m²)	Spare load (%)			Diversified + Spare load (A)				Diversified + Spare load (kVA)			
	L1	L2	L3	L1	L2	L3	N	L1	L2	L3	Total
SB1-Sub-Main Chamber [Sub-Circuits]	1	1	1	26.09	26.09	26.09		6	6	6	18
N/A	1	1	1	26.09	26.09	26.09		6	6	6	18
N/A	0	0	0	26.09	26.09	26.09	0	6	6	6	18
DB1-Current DB [Sub-Circuits]	1	1	1	26.09	26.09	26.09		6	6	6	18
N/A	1	1	1	26.09	26.09	26.09		6	6	6	18
N/A	0	0	0	26.09	26.09	26.09	0	6	6	6	18
DB2-Glasgow Switch [Sub-Circuits]	1	1	1	26.09	26.09	26.09		6	6	6	18
N/A	1	1	1	26.09	26.09	26.09		6	6	6	18
N/A	0	0	0	26.09	26.09	26.09	0	6	6	6	18
DB3 [Sub-Circuits]	1	1	1	26.09	26.09	26.09		6	6	6	18
N/A	1	1	1	26.09	26.09	26.09		6	6	6	18
N/A	0	0	0	26.09	26.09	26.09	0	6	6	6	18

Circuits schedule report : SB1-Sub-Main Chamber

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Description	Voltage	Phase	Total circuit ways	Spare load	Spare ways
SB1-Sub-Main Chamber	400V AC	TP&N	3Ph: 1 / 1Ph: 3	0%	3Ph: 0 , 1Ph: 0

							L1	L2	L3
Location:		Mounting:	Surface	Reference No.:		Connected load (A)	26.09	26.09	26.09
Connected from:	Supply	IP Rating:	IP 4X	Isolator Rating:		Diversified load (A)	26.09	26.09	26.09
Zs (Ω):	0.3809	Board Rating (A):		Fault Rating (kA):		Diversified+Spare load (A)	26.09	26.09	26.09

					Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
Way	**Phase**	**Description**	**Conductor**	**Protective devices**	**L1**	**L2**	**L3**	**L1**	**L2**	**L3**
1	L1,L2,L3	DB1-Current DB	4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu Length: 15m	Fuse 3P 80A/80kA Generic | BS88 fuses	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09
L1,L2,L3		SB1-Sub-Main Chamber	4x1Cx25mm² + 1x25mm² E Pvc70/S/Cu Length: 1m		1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09

Circuits schedule report : DB1-Current DB

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Description	Voltage	Phase	Total circuit ways	Spare load	Spare ways	Empty ways
DB1-Current DB	400V AC	TP&N	3Ph: 1 / 1Ph: 3	0%	3Ph: 0 , 1Ph: 0	1Ph: 0 (0%)

							L1	L2	L3
Location:		Mounting:	Surface	Reference No.:		Connected load (A)	26.09	26.09	26.09
Connected from:	SB1	IP Rating:	IP 4X	Isolator Rating:	125	Diversified load (A)	26.09	26.09	26.09
Zs (Ω):	0.3874	Board Rating (A):		Fault Rating (kA):		Diversified+Spare load (A)	26.09	26.09	26.09

					Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
Way	**Phase**	**Description**	**Conductor**	**Protective devices**	**L1**	**L2**	**L3**	**L1**	**L2**	**L3**
1	L1,L2,L3	DB2-Glasgow Switch	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 12m	MCB C 3P 50A/10kA Generic | BS EN 60898 10kA MCB Type C	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09
L1,L2,L3		DB1-Current DB	4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu Length: 15m	Fuse 3P 80A/80kA Generic | BS88 fuses	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09

Circuits schedule report : DB2-Glasgow Switch

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Description	Voltage	Phase	Total circuit ways	Spare load	Spare ways	Empty ways
DB2-Glasgow Switch	400V AC	TP&N	3Ph: 1 / 1Ph: 3	0%	3Ph: 0 , 1Ph: 0	1Ph: 0 (0%)

							L1	L2	L3
Location:		Mounting:	Surface	Reference No.:		Connected load (A)	26.09	26.09	26.09
Connected from:	DB1	IP Rating:	IP 4X	Isolator Rating:		Diversified load (A)	26.09	26.09	26.09
Zs (Ω):	0.3944	Board Rating (A):		Fault Rating (kA):		Diversified+Spare load (A)	26.09	26.09	26.09

Way	Phase	Description	Conductor	Protective devices	Power factor / Diversity factor / 3rd Harmonics % L1	L2	L3	Connected load (A) / Diversified load (A) / Diversified+Spare load (A) L1	L2	L3
1	L1,L2,L3	DB3	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m	Fuse 3P 32A/80kA Generic | BS88 fuses	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09
L1,L2,L3		DB2-Glasgow Switch	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 12m	MCB C 3P 50A/10kA Generic | BS EN 60898 10kA MCB Type C	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09

Circuits schedule report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Description	Voltage	Phase	Total circuit ways	Spare load	Spare ways	Empty ways
DB3	400V AC	TP&N	3Ph: 10 / 1Ph: 30	0%	3Ph: 3 , 1Ph: 0	1Ph: 0 (0%)

							L1	L2	L3
Location:		Mounting:	Surface	Reference No.:		Connected load (A)	26.09	26.09	26.09
Connected from:	DB2	IP Rating:	IP 4X	Isolator Rating:		Diversified load (A)	26.09	26.09	26.09
Zs (Ω):	0.3976	Board Rating (A):		Fault Rating (kA):		Diversified+Spare load (A)	26.09	26.09	26.09

					Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
Way	**Phase**	**Description**	**Conductor**	**Protective devices**	**L1**	**L2**	**L3**	**L1**	**L2**	**L3**
1	L1,L2,L3	SPD	16mm²	MCB C 3P 6A/10kA Generic | BS EN 60898 10kA MCB Type C						
2	L1	FC1-Booth 1	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
2	L2	FC1-Booth 2	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
2	L3	FC1-Booth 3	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
3	L1	FC1-Booth 4	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
3	L2	FC1-Booth 5	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
3	L3	FC1-Booth 6	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
4	L1	FC1-Booth 7	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		

Circuits schedule report : DB3

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

					Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
Way	Phase	Description	Conductor	Protective devices	L1	L2	L3	L1	L2	L3
4	L2	FC1-Booth 8	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
4	L3	FC1-Booth 9	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
5	L1	FC1-Booth 10	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
5	L2	FC1-Booth 11	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
5	L3	FC1-Booth 12	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
6	L1	FC1-Booth 13	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
6	L2	FC1-Booth 14	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
6	L3	FC1-Booth 15	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
7	L1	FC1-Booth 16	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
7	L2	FC1-Booth 17	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
7	L3	FC1-Booth 18	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35

Circuits schedule report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

					Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
Way	**Phase**	**Description**	**Conductor**	**Protective devices**	**L1**	**L2**	**L3**	**L1**	**L2**	**L3**
8	L1,L2,L3	Spare			1 1 0	1 1 0	1 1 0	0 0	0 0	0 0
9	L1,L2,L3	Spare			1 1 0	1 1 0	1 1 0	0 0	0 0	0 0
10	L1,L2,L3	Spare			1 1 0	1 1 0	1 1 0	0 0	0 0	0 0
L1,L2,L3		DB3	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m	Fuse 3P 32A/80kA Generic | BS88 fuses	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09

Circuits schedule with incomers report : SB1-Sub-Main Chamber

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Served From: Supply / Fuse 3P 80A/33kA / Located:

Design Zs/MaxZs: 0.3809/0.4714Ω **Design Ief: 0.57** **Design Isc: 11.59** **Design Vd: 0.01% @ 230V / 400V = 0.02V / 0.04V**

Earthing Arrangements: TN-S **Frequency: 50Hz** **Design Voltage at input Terminals (AC): 229.98V / 399.96V**

From description			Supply Conductors	Main Switch/Disconnect/Isolator	Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
					L1	L2	L3	L1	L2	L3
Incomer		Supply	4x1Cx25mm² + 1x25mm² E Pvc70/S/Cu Length: 1m		1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09
Way	**Phase**	**Description**	**Conductor**	**Protective devices**	**L1**	**L2**	**L3**	**L1**	**L2**	**L3**
1	L1,L2,L3	DB1-Current DB	4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu Length: 15m	Fuse 3P 80A/80kA Generic | BS88 fuses	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09

Circuits schedule with incomers report : DB1-Current DB

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Served From: SB1-Sub-Main Chamber / 1.L1,L2,L3 Fuse 3P 80A/80kA / Located:

Design Zs/MaxZs: 0.3874/0.542Ω **Design Ief: 0.56** **Design Isc: 9.4** **Design Vd: 0.1% @ 230V / 400V = 0.23V / 0.4V**

Earthing Arrangements: TN-S **Frequency: 50Hz** **Design Voltage at input Terminals (AC): 229.77V / 399.6V**

From description		Supply Conductors	Main Switch/Disconnect/Isolator	Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
				L1	L2	L3	L1	L2	L3
Incomer	SB1-Sub-Main Chamber	4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu Length: 15m	Isolator 125A	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09
Way	**Phase**	**Description**	**Conductor**	**Protective devices**					
1	L1,L2,L3	DB2-Glasgow Switch	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 12m	MCB C 3P 50A/10kA Generic | BS EN 60898 10kA MCB Type C	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09

Circuits schedule with incomers report : DB2-Glasgow Switch

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Served From: DB1-Current DB / 1.L1,L2,L3 MCB C 3P 50A/10kA / Located:

Design Zs/MaxZs: 0.3944/0.437Ω **Design Ief: 0.55** **Design Isc: 7.45** **Design Vd: 0.21% @ 230V / 400V = 0.48V / 0.84V**

Earthing Arrangements: TN-S **Frequency: 50Hz** **Design Voltage at input Terminals (AC): 229.52V / 399.16V**

From description		Supply Conductors	Main Switch/Disconnect/Isolator	Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
				L1	L2	L3	L1	L2	L3
Incomer	DB1-Current DB	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 12m		1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09
Way	**Phase**	**Description**	**Conductor**	**Protective devices**	**L1**	**L2**	**L3**	**L1**	**L2**	**L3**
1	L1,L2,L3	DB3	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m	Fuse 3P 32A/80kA Generic | BS88 fuses	1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09

Circuits schedule with incomers report : DB3

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Served From: DB2-Glasgow Switch / 1.L1,L2,L3 Fuse 3P 32A/80kA / Located:

Design Zs/MaxZs: 0.3976/1.7346Ω **Design Ief: 0.55** **Design Isc: 6.8** **Design Vd: 0.25% @ 230V / 400V = 0.57V / 1V**

Earthing Arrangements: TN-S **Frequency: 50Hz** **Design Voltage at input Terminals (AC): 229.43V / 399V**

From description		Supply Conductors	Main Switch/Disconnect/Isolator	Power factor Diversity factor 3rd Harmonics %			Connected load (A) Diversified load (A) Diversified+Spare load (A)		
				L1	L2	L3	L1	L2	L3
Incomer	DB2-Glasgow Switch	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m		1 1 0	1 1 0	1 1 0	26.09 26.09 26.09	26.09 26.09 26.09	26.09 26.09 26.09
Way	**Phase**	**Description**	**Conductor**	**L1**	**L2**	**L3**	**L1**	**L2**	**L3**
1	L1,L2,L3	SPD	16mm²	MCB C 3P 6A/10kA Generic | BS EN 60898 10kA MCB Type C					
2	L1	FC1-Booth 1	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
2	L2	FC1-Booth 2	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
2	L3	FC1-Booth 3	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
3	L1	FC1-Booth 4	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
3	L2	FC1-Booth 5	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
3	L3	FC1-Booth 6	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
4	L1	FC1-Booth 7	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
4	L2	FC1-Booth 8	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	

Circuits schedule with incomers report : DB3

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Way	Phase	Description	Conductor	Protective devices	L1	L2	L3	L1	L2	L3
4	L3	FC1-Booth 9	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
5	L1	FC1-Booth 10	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
5	L2	FC1-Booth 11	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
5	L3	FC1-Booth 12	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
6	L1	FC1-Booth 13	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
6	L2	FC1-Booth 14	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
6	L3	FC1-Booth 15	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
7	L1	FC1-Booth 16	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	1 1 0			4.35 4.35		
7	L2	FC1-Booth 17	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C		1 1 0			4.35 4.35	
7	L3	FC1-Booth 18	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C			1 1 0			4.35 4.35
8	L1,L2,L3	Spare			1 1 0	1 1 0	1 1 0	0 0	0 0	0 0
9	L1,L2,L3	Spare			1 1 0	1 1 0	1 1 0	0 0	0 0	0 0

Circuits schedule with incomers report : DB3

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Way	Phase	Description	Conductor	Protective devices	L1	L2	L3	L1	L2	L3
10	L1,L2,L3	Spare			1 1 0	1 1 0	1 1 0	0 0	0 0	0 0

Circuits schedule report : SB1-Sub-Main Chamber

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Description	Voltage	Phase	Total circuit ways
SB1-Sub-Main Chamber	400V AC	TP&N	3Ph: 1 / 1Ph: 3

Total circuit ways	Spare load	Spare ways	Empty ways
3Ph: 1 / 1Ph: 3	0%	3Ph: 0 , 1Ph: 0	1Ph: 0 (0%)

Location:		Mounting:	Surface	Reference No.:	
Connected from:	Supply	IP Rating:	IP 4X	Isolator Rating:	
Zs (Ω):	0.3809	Board Rating (A):		Fault Rating (kA):	

Way	Phase	Description	Conductor	Protective devices	In(A)	Ib(A)
1	L1,L2,L3	DB1-Current DB	4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu Length: 15m	Fuse 3P 80A/80kA Generic | BS88 fuses	80	26.09

Circuits schedule report : DB1-Current DB

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Description	Voltage	Phase	Total circuit ways
DB1-Current DB	400V AC	TP&N	3Ph: 1 / 1Ph: 3

Total circuit ways	Spare load	Spare ways	Empty ways
3Ph: 1 / 1Ph: 3	0%	3Ph: 0 , 1Ph: 0	1Ph: 0 (0%)

Location:		Mounting:	Surface	Reference No.:	
Connected from:	SB1	IP Rating:	IP 4X	Isolator Rating:	125
Zs (Ω):	0.3874	Board Rating (A):		Fault Rating (kA):	

Way	Phase	Description	Conductor	Protective devices	In(A)	Ib(A)
1	L1,L2,L3	DB2-Glasgow Switch	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 12m	MCB C 3P 50A/10kA Generic | BS EN 60898 10kA MCB Type C	50	26.09

Circuits schedule report : DB2-Glasgow Switch

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Description	Voltage	Phase	Total circuit ways
DB2-Glasgow Switch	400V AC	TP&N	3Ph: 1 / 1Ph: 3

Total circuit ways	Spare load	Spare ways	Empty ways
3Ph: 1 / 1Ph: 3	0%	3Ph: 0 , 1Ph: 0	1Ph: 0 (0%)

Location:		Mounting:	Surface	Reference No.:	
Connected from:	DB1	IP Rating:	IP 4X	Isolator Rating:	
Zs (Ω):	0.3944	Board Rating (A):		Fault Rating (kA):	

Way	Phase	Description	Conductor	Protective devices	In(A)	Ib(A)
1	L1,L2,L3	DB3	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m	Fuse 3P 32A/80kA Generic | BS88 fuses	32	26.09

Circuits schedule report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Description	Voltage	Phase	Total circuit ways
DB3	400V AC	TP&N	3Ph: 10 / 1Ph: 30

Total circuit ways	Spare load	Spare ways	Empty ways
3Ph: 10 / 1Ph: 30	0%	3Ph: 3 , 1Ph: 0	1Ph: 0 (0%)

Location:		Mounting:	Surface	Reference No.:	
Connected from:	DB2	IP Rating:	IP 4X	Isolator Rating:	
Zs (Ω):	0.3976	Board Rating (A):		Fault Rating (kA):	

Way	Phase	Description	Conductor	Protective devices	In(A)	Ib(A)
1	L1,L2,L3	SPD	16mm²	MCB C 3P 6A/10kA Generic | BS EN 60898 10kA MCB Type C		
2	L1	FC1-Booth 1	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
2	L2	FC1-Booth 2	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
2	L3	FC1-Booth 3	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
3	L1	FC1-Booth 4	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
3	L2	FC1-Booth 5	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
3	L3	FC1-Booth 6	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
4	L1	FC1-Booth 7	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
4	L2	FC1-Booth 8	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
4	L3	FC1-Booth 9	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
5	L1	FC1-Booth 10	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
5	L2	FC1-Booth 11	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
5	L3	FC1-Booth 12	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35

Circuits schedule report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Way	Phase	Description	Conductor	Protective devices	In(A)	Ib(A)
6	L1	FC1-Booth 13	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
6	L2	FC1-Booth 14	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
6	L3	FC1-Booth 15	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
7	L1	FC1-Booth 16	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
7	L2	FC1-Booth 17	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
7	L3	FC1-Booth 18	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	32	4.35
8	L1,L2,L3	Spare				0
9	L1,L2,L3	Spare				0
10	L1,L2,L3	Spare				0

Boards schedule report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Board description	Supply from	Phase	Volts (V)	Conductor	Protective devices	Incomer devices
SB1-Sub-Main Chamber	Supply	TPN	400 / 230	4x1Cx25mm² + 1x25mm² E Pvc70/S/Cu Length: 1m		
DB1-Current DB	SB1-Sub-Main Chamber	TPN	400 / 230	4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu Length: 15m	Fuse 3P 80A/80kA Generic | BS88 fuses	Isolator 125A
DB2-Glasgow Switch	DB1-Current DB	TPN	400 / 230	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 12m	MCB C 3P 50A/10kA Generic | BS EN 60898 10kA MCB Type C	
DB3	DB2-Glasgow Switch	TPN	400 / 230	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m	Fuse 3P 32A/80kA Generic | BS88 fuses	

Cables schedule report

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Cable ID	Voltage	From	To	L (m)	Make-up	Type	Method	Classification
c-d-1	400V AC	Supply	SB1-Sub-Main Chamber	1	4x1Cx25mm² + 1x25mm² E Pvc70/S/Cu	Single-core 70°C PVC non-armoured - Cu	Clipped direct flat touching	
c-d-1	400V AC	SB1-Sub-Main Chamber	DB1-Current DB	15	4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	Clipped direct	
c-d-2	400V AC	DB1-Current DB	DB2-Glasgow Switch	12	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	Clipped direct	
c-d-3	400V AC	DB2-Glasgow Switch	DB3	5	4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	Clipped direct	
c-f-1	230V AC	DB3	FC1-Booth 1	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 2	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 3	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 4	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 5	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 6	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 7	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 8	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 9	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 10	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 11	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 12	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 13	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 14	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	

Cables schedule report

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Cable ID	Voltage	From	To	L (m)	Make-up	Type	Method	Classification
c-f-1	230V AC	DB3	FC1-Booth 15	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 16	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 17	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	
c-f-1	230V AC	DB3	FC1-Booth 18	20	3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	Multicore 70°C PVC armoured - Cu	On a perforated cable tray	

Brief calculations report : SB1-Sub-Main Chamber

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit			Current inequalities check		Breaking capacity check	Phase fault adiabatic check	CPC adiabatic check	Maximum Zs at earth fault	Earth fault disconnection time	Status
Way	**Phase**	**Description**	**Ib ≤ In/Ir (A)**	**minIz ≤ It (A)**	**Isc ≤ Icu (kA)**	**$I^2t \leq k^2s^2$ (x10^3)**	**cpc ≥ $\sqrt{(I^2t)}/k$ (mm^2)**	**Zs ≤ maxZs (Ω)**	**disc ≤ max (s)**	
L1,L2,L3		SB1-Sub-Main Chamber	26.09 ≤ 80	80 ≤ 104	11.79 ≤ 33	511.7 ≤ 8265.63	25 ≥ 6.66	0.38 ≤ 0.47	1.78 ≤ 5	OK
1	L1,L2,L3	DB1-Current DB	26.09 ≤ 80	80 ≤ 125	11.59 ≤ 80	361.31 ≤ 16200.63	69.59 ≥ 5.5	0.39 ≤ 0.54	1.26 ≤ 5	OK

Brief calculations report : DB1-Current DB

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit			Current inequalities check		Breaking capacity check	Phase fault adiabatic check	CPC adiabatic check	Maximum Zs at earth fault	Earth fault disconnection time	Status
Way	**Phase**	**Description**	**Ib ≤ In/Ir (A)**	**minIz ≤ It (A)**	**Isc ≤ Icu (kA)**	**$I^2t \leq k^2s^2$ (x10^3)**	**cpc ≥ $\sqrt{(I^2t)}/k$ (mm^2)**	**Zs ≤ maxZs (Ω)**	**disc ≤ max (s)**	
L1,L2,L3		DB1-Current DB	26.09 ≤ 80	80 ≤ 125	11.59 ≤ 80	361.31 ≤ 16200.63	69.59 ≥ 5.5	0.39 ≤ 0.54	1.26 ≤ 5	OK
1	L1,L2,L3	DB2-Glasgow Switch	26.09 ≤ 50	50 ≤ 102	9.4 ≤ 10	3.37 ≤ 8265.63	56.04 ≥ 0.48	0.39 ≤ 0.44	0.01 ≤ 5	OK

Brief calculations report : DB2-Glasgow Switch

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit			Current inequalities check		Breaking capacity check	Phase fault adiabatic check	CPC adiabatic check	Maximum Zs at earth fault	Earth fault disconnection time	Status
Way	**Phase**	**Description**	**Ib ≤ In/Ir (A)**	**minIz ≤ It (A)**	**Isc ≤ Icu (kA)**	**$I^2t \leq k^2s^2$ (x10^3)**	**cpc ≥ $\sqrt{(I^2t)}/k$ (mm^2)**	**Zs ≤ maxZs (Ω)**	**disc ≤ max (s)**	
L1,L2,L3		DB2-Glasgow Switch	26.09 ≤ 50	50 ≤ 102	9.4 ≤ 10	3.37 ≤ 8265.63	56.04 ≥ 0.48	0.39 ≤ 0.44	0.01 ≤ 5	OK
1	L1,L2,L3	DB3	26.09 ≤ 32	32 ≤ 102	7.45 ≤ 80	3.42 ≤ 8265.63	56.04 ≥ 0.51	0.4 ≤ 1.74	0.01 ≤ 5	OK

Brief calculations report : DB3

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Circuit			Current inequalities check		Breaking capacity check	Phase fault adiabatic check	CPC adiabatic check	Maximum Zs at earth fault	Earth fault disconnection time	Status
Way	Phase	Description	Ib ≤ In/Ir (A)	minIz ≤ It (A)	Isc ≤ Icu (kA)	$I^2t \leq k^2s^2$ (x10³)	cpc ≥ √(I²t)/k (mm²)	Zs ≤ maxZs (Ω)	disc ≤ max (s)	
L1,L2,L3		DB3	26.09 ≤ 32	32 ≤ 102	7.45 ≤ 80	3.42 ≤ 8265.63	56.04 ≥ 0.51	0.4 ≤ 1.74	0.01 ≤ 5	OK
1	L1,L2,L3	SPD	-	-	-	-	-	-	-	-
2	L1	FC1-Booth 1	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
2	L2	FC1-Booth 2	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
2	L3	FC1-Booth 3	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
3	L1	FC1-Booth 4	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
3	L2	FC1-Booth 5	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
3	L3	FC1-Booth 6	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
4	L1	FC1-Booth 7	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
4	L2	FC1-Booth 8	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
4	L3	FC1-Booth 9	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
5	L1	FC1-Booth 10	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
5	L2	FC1-Booth 11	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
5	L3	FC1-Booth 12	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
6	L1	FC1-Booth 13	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
6	L2	FC1-Booth 14	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
6	L3	FC1-Booth 15	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
7	L1	FC1-Booth 16	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
7	L2	FC1-Booth 17	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
7	L3	FC1-Booth 18	4.35 ≤ 32	44.44 ≤ 53	4.35 ≤ 10	2.39 ≤ 476.1	16.2 ≥ 0.42	0.45 ≤ 0.68	0.01 ≤ 0.4	OK
8	L1,L2,L3	Spare	-	-	-	-	-	-	-	-

Brief calculations report : DB3

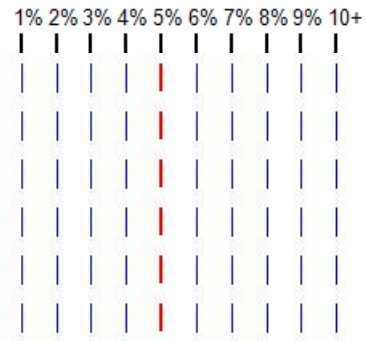
Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Circuit			Current inequalities check		Breaking capacity check	Phase fault adiabatic check	CPC adiabatic check	Maximum Zs at earth fault	Earth fault disconnection time	Status
Way	Phase	Description	Ib ≤ In/Ir (A)	minIz ≤ It (A)	Isc ≤ Icu (kA)	$I^2t \leq k^2s^2$ (x10³)	cpc ≥ √(I^2t)/k (mm^2)	Zs ≤ maxZs (Ω)	disc ≤ max (s)	
L1,L2,L3		DB3	26.09 ≤ 32	32 ≤ 102	7.45 ≤ 80	3.42 ≤ 8265.63	56.04 ≥ 0.51	0.4 ≤ 1.74	0.01 ≤ 5	OK
9	L1,L2,L3	Spare	-	-	-	-	-	-	-	-
10	L1,L2,L3	Spare	-	-	-	-	-	-	-	-

Voltage drop analysis report : SB1-Sub-Main Chamber

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

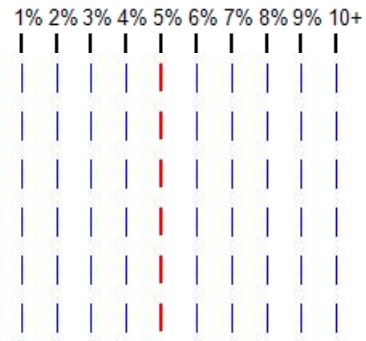
					1Ph AC or DC @ Operating temperature				Voltage drop (%) @ 230V			
Way	**Phase**	**Description**	**Conductor**	**Ib (A)**	**R mΩ/m**	**X mΩ/m**	**cosφ**	**Ct**	**Supply**	**Circuit**	**Total**	**Max**
	L1	SB1-Sub-Main Chamber	1m, 4x1Cx25mm² + 1x25mm² E Pvc70/S/Cu	26.09	0.87	0.14	1	0.88	0	0.01	0.01	5
	L2			26.09			1		0	0.01	0.01	
	L3			26.09			1		0	0.01	0.01	
1	L1	DB1-Current DB	15m, 4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu	26.09	0.64	0.08	1	0.87	0.01	0.09	0.1	5
1	L2	DB1-Current DB	15m, 4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu	26.09	0.64	0.08	1	0.87	0.01	0.09	0.1	5
1	L3	DB1-Current DB	15m, 4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu	26.09	0.64	0.08	1	0.87	0.01	0.09	0.1	5



Voltage drop analysis report : DB1-Current DB

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

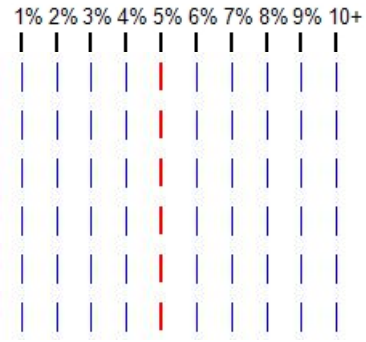
					1Ph AC or DC @ Operating temperature				Voltage drop (%) @ 230V			
Way	**Phase**	**Description**	**Conductor**	**Ib (A)**	**R mΩ/m**	**X mΩ/m**	**cosφ**	**Ct**	**Supply**	**Circuit**	**Total**	**Max**
	L1	DB1-Current DB	15m, 4Cx35mm² + 1x35mm² E(and armour) SwaPvc70/M/Cu	26.09	0.64	0.08	1	0.87	0.01	0.09	0.1	5
	L2			26.09			1		0.01	0.09	0.1	
	L3			26.09			1		0.01	0.09	0.1	
1	L1	DB2-Glasgow Switch	12m, 4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	26.09	0.87	0.08	1	0.88	0.1	0.1	0.21	5
1	L2	DB2-Glasgow Switch	12m, 4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	26.09	0.87	0.08	1	0.88	0.1	0.1	0.21	5
1	L3	DB2-Glasgow Switch	12m, 4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	26.09	0.87	0.08	1	0.88	0.1	0.1	0.21	5



Voltage drop analysis report : DB2-Glasgow Switch

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

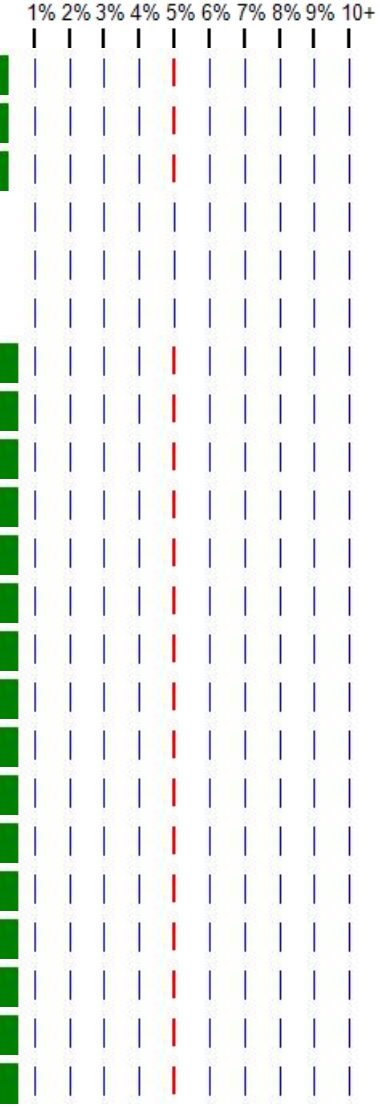
					1Ph AC or DC @ Operating temperature				**Voltage drop (%) @ 230V**			
Way	**Phase**	**Description**	**Conductor**	**Ib (A)**	**R mΩ/m**	**X mΩ/m**	**cosφ**	**Ct**	**Supply**	**Circuit**	**Total**	**Max**
	L1	DB2-Glasgow Switch	12m, 4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	26.09	0.87	0.08	1	0.88	0.1	0.1	0.21	5
	L2			26.09			1		0.1	0.1	0.21	
	L3			26.09			1		0.1	0.1	0.21	
1	L1	DB3	5m, 4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	26.09	0.87	0.08	1	0.88	0.21	0.04	0.25	5
1	L2	DB3	5m, 4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	26.09	0.87	0.08	1	0.88	0.21	0.04	0.25	5
1	L3	DB3	5m, 4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	26.09	0.87	0.08	1	0.88	0.21	0.04	0.25	5



Voltage drop analysis report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

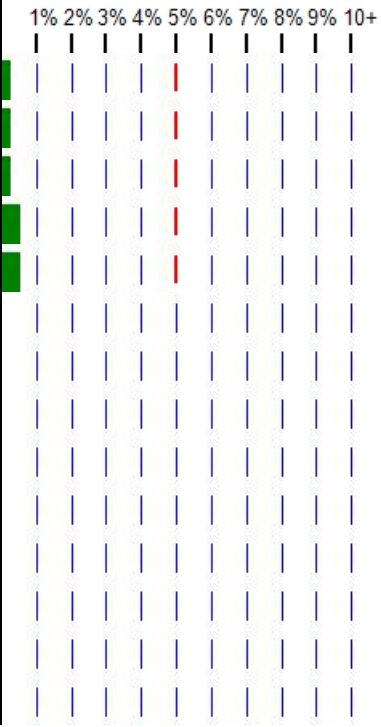
Way	Phase	Description	Conductor	Ib (A)	1Ph AC or DC @ Operating temperature: R mΩ/m	X mΩ/m	cosφ	Ct	Voltage drop (%) @ 230V: Supply	Circuit	Total	Max
L1		DB3	5m, 4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	26.09	0.87	0.08	1	0.88	0.21	0.04	0.25	5
L2				26.09			1		0.21	0.04	0.25	
L3				26.09			1		0.21	0.04	0.25	
1	L1	SPD	-	-	-	-	-	-	-	-	-	-
1	L2	SPD	-	-	-	-	-	-	-	-	-	-
1	L3	SPD	-	-	-	-	-	-	-	-	-	-
2	L1	FC1-Booth 1	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
2	L2	FC1-Booth 2	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
2	L3	FC1-Booth 3	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
3	L1	FC1-Booth 4	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
3	L2	FC1-Booth 5	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
3	L3	FC1-Booth 6	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
4	L1	FC1-Booth 7	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
4	L2	FC1-Booth 8	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
4	L3	FC1-Booth 9	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
5	L1	FC1-Booth 10	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
5	L2	FC1-Booth 11	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
5	L3	FC1-Booth 12	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
6	L1	FC1-Booth 13	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
6	L2	FC1-Booth 14	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
6	L3	FC1-Booth 15	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
7	L1	FC1-Booth 16	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5



Voltage drop analysis report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

					1Ph AC or DC @ Operating temperature				**Voltage drop (%) @ 230V**			
Way	**Phase**	**Description**	**Conductor**	**Ib (A)**	**R mΩ/m**	**X mΩ/m**	**cosφ**	**Ct**	**Supply**	**Circuit**	**Total**	**Max**
	L1	DB3	5m, 4Cx25mm² + 1x25mm² E(and armour) SwaPvc70/M/Cu	26.09	0.87	0.08	1	0.88	0.21	0.04	0.25	5
	L2			26.09			1		0.21	0.04	0.25	
	L3			26.09			1		0.21	0.04	0.25	
7	L2	FC1-Booth 17	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
7	L3	FC1-Booth 18	20m, 3Cx6mm² + E(cable core and armour) SwaPvc70/M/Cu	4.35	7.3	0	1	0.93	0.25	0.26	0.51	5
8	L1	Spare	-	-	-	-	-	-	-	-	-	-
8	L2	Spare	-	-	-	-	-	-	-	-	-	-
8	L3	Spare	-	-	-	-	-	-	-	-	-	-
9	L1	Spare	-	-	-	-	-	-	-	-	-	-
9	L2	Spare	-	-	-	-	-	-	-	-	-	-
9	L3	Spare	-	-	-	-	-	-	-	-	-	-
10	L1	Spare	-	-	-	-	-	-	-	-	-	-
10	L2	Spare	-	-	-	-	-	-	-	-	-	-
10	L3	Spare	-	-	-	-	-	-	-	-	-	-



Connected loads analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Load types analysis for the whole installation

Connected Load Type	Circuits	Installation Points	Phase	L1 (kVA)	L2 (kVA)	L3 (kVA)	Connected kVA
Other circuit	18	18	SPN	6.00	6.00	6.00	18.00

Connected loads analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Load types analysis for distribution circuit

Distribution Circuit Details	
Description	DB3
Voltage (V)	400 / 230
Phase	TPN
Max. Demand	26.09 A
Location	

Connected / Diversified Load				
	L1	**L2**	**L3**	**Total**
Connected kVA	6.00	6.00	6.00	18.00
Diversified kVA	6.00	6.00	6.00	18.00
Power factor	1	1	1	
Spare %	0			

Design Load Analysis				
	L1	**L2**	**L3**	**Total / N**
Amperes	26.09	26.09	26.09	0
kVA	6	6	6	18
kW	6	6	6	18
kVAr	0	0	0	0

Connected Load Type	Circuits	Installation Points	Phase	L1 (kVA)	L2 (kVA)	L3 (kVA)	Connected kVA
Other circuit	18	18	SPN	6.00	6.00	6.00	18.00

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	SB1-Sub-Main Chamber	**Voltage / Phase**	Three phase+N (400V and 230V) / L1,L2,L3	**Cable ID**	c-d-1
Supply from	Supply	**Circuit type**	Switch Board	**Cable Classification**	

Circuit design data

Conductor type	Single-core 70°C thermoplastic insulated non-armoured, 4x1Cx25mm² + 1x25mm² E, Pvc70/S/Cu						**Length (m)**	1
	Element	Copper (Cu)	**Armour**	No	**Temp (°C)**	Full loaded:70 / Actual:32.5	**Reference**	BS/4D1
Installation method	Clipped direct flat touching - Reference method C				**Correction factors**	Ci:1 Cg:1 Ca:1 Ct:0.88 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30.						

Protective conductor C.P.C	**Installation settings**	Separate conductor				
	Separate conductor (mm²)	25	**Other cpc (mm²)**	0	**Total equivalent to Cu (mm²)**	25
Protective devices	**Overcurrent**	Generic, BS1361 fuses (from supply) | Rating(A): 80			**Icu / Ics**	33kA / 33kA
	RCD/Earth fault device	No			**mA**	-

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
26.09	80	80	104	0.00088	0.00088	0.3803	0.0885

Load factors	L1	L2	L3
Power factor	1	1	1
3rd Harmonics (%)	0	0	0
Diversity factor	1	1	1
Spare (%)	0		

Design load	L1	L2	L3	N/Totals
Current (A)	26.09	26.09	26.09	0
Load (kVA)	6	6	6	18
Resistive (kW)	6	6	6	18
Reactive (kVAr)	0	0	0	0

Voltage drop	L1	L2	L3
Source (%)	0	0	0
Circuit (%)	0.01	0.01	0.01
Total (%)	0.01	0.01	0.01
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.57	0.3809	0.4714	5	1.7836	6.66

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of Fuse (s)	Conductors withstand duration (s)
	11.98 (Limited:11.79)	11.59	0.6	1.4	22.68

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	DB1-Current DB	**Voltage / Phase**	Three phase+N (400V and 230V) / L1,L2,L3	**Cable ID**	c-d-1
Supply from	SB1-Sub-Main Chamber (Way 1)	**Circuit type**	Din Rail	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 4Cx35mm² + 1x35mm² E(and armour), SwaPvc70/M/Cu					**Length (m)**	15
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:31.7	**Reference**	BS/4D4
Installation method	Clipped direct - Reference method C				**Correction factors**	Ci:1 Cg:1 Ca:1 Ct:0.87 Cf:1 Ch:1	
	Settings	Ambient temperature (°C): 30.					

Protective conductor C.P.C	**Installation settings**	Cable armour and separate conductor				
	Separate conductor (mm²)	35	**Armour (mm²)**	78	**Total equivalent to Cu (mm²)**	69.59
Protective devices	**Overcurrent**	Generic, BS88 fuses | Rating(A): 80			**Icu / Ics**	80kA / 80kA
	RCD/Earth fault device	No			**mA**	-

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
26.09	80	80	125	0.00961	0.00751	0.3809	0.0902

Load factors	L1	L2	L3
Power factor	1	1	1
3rd Harmonics (%)	0	0	0
Diversity factor	1	1	1
Spare (%)	0		

Design load	L1	L2	L3	N/Totals
Current (A)	26.09	26.09	26.09	0
Load (kVA)	6	6	6	18
Resistive (kW)	6	6	6	18
Reactive (kVAr)	0	0	0	0

Voltage drop	L1	L2	L3
Source (%)	0.01	0.01	0.01
Circuit (%)	0.09	0.09	0.09
Total (%)	0.1	0.1	0.1
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.56	0.3874	0.542	5	1.259	5.5

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of Fuse (s)	Conductors withstand duration (s)
	11.59	9.4	0.59	1.03	46.16

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	DB2-Glasgow Switch	**Voltage / Phase**	Three phase+N (400V and 230V) / L1,L2,L3	**Cable ID**	c-d-2
Supply from	DB1-Current DB (Way 1)	**Circuit type**	Din Rail	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 4Cx25mm² + 1x25mm² E(and armour), SwaPvc70/M/Cu					**Length (m)**	12
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:32.6	**Reference**	BS/4D4
Installation method	Clipped direct - Reference method C				**Correction factors**	Ci:1 Cg:1 Ca:1 Ct:0.88 Cf:1 Ch:1	
	Settings	Ambient temperature (°C): 30.					
Protective conductor C.P.C	**Installation settings**	Cable armour and separate conductor					
	Separate conductor (mm²)	25	**Armour (mm²)**	70	**Total equivalent to Cu (mm²)**		56.04
Protective devices	**Overcurrent**	Generic, BS EN 60898 10kA MCB Type C | Rating(A): 50				**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	No				**mA**	-

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
26.09	50	50	102	0.01044	0.00796	0.3874	0.1094

Load factors	L1	L2	L3
Power factor	1	1	1
3rd Harmonics (%)	0	0	0
Diversity factor	1	1	1
Spare (%)	0		

Design load	L1	L2	L3	N/Totals
Current (A)	26.09	26.09	26.09	0
Load (kVA)	6	6	6	18
Resistive (kW)	6	6	6	18
Reactive (kVAr)	0	0	0	0

Voltage drop	L1	L2	L3
Source (%)	0.1	0.1	0.1
Circuit (%)	0.1	0.1	0.1
Total (%)	0.21	0.21	0.21
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.55	0.3944	0.437	5	0.01	0.48

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of MCB (s)	Conductors withstand duration (s)
	9.4	7.45	0.58	0.01	24.55

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	DB3	**Voltage / Phase**	Three phase+N (400V and 230V) / L1,L2,L3	**Cable ID**	c-d-3
Supply from	DB2-Glasgow Switch (Way 1)	**Circuit type**	Din Rail	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 4Cx25mm² + 1x25mm² E(and armour), SwaPvc70/M/Cu						**Length (m)**	5
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:32.6	**Reference**	BS/4D4
Installation method	Clipped direct - Reference method C				**Correction factors**	Ci:1 Cg:1 Ca:1 Ct:0.88 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30.						

Protective conductor C.P.C	**Installation settings**	Cable armour and separate conductor				
	Separate conductor (mm²)	25	**Armour (mm²)**	70	**Total equivalent to Cu (mm²)**	56.04

Protective devices	**Overcurrent**	Generic, BS88 fuses | Rating(A): 32	**Icu / Ics**	80kA / 80kA
	RCD/Earth fault device	No	**mA**	-

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
26.09	32	32	102	0.00435	0.00332	0.3944	0.1302

Load factors	L1	L2	L3
Power factor	1	1	1
3rd Harmonics (%)	0	0	0
Diversity factor	1	1	1
Spare (%)	0		

Design load	L1	L2	L3	N/Totals
Current (A)	26.09	26.09	26.09	0
Load (kVA)	6	6	6	18
Resistive (kW)	6	6	6	18
Reactive (kVAr)	0	0	0	0

Voltage drop	L1	L2	L3
Source (%)	0.21	0.21	0.21
Circuit (%)	0.04	0.04	0.04
Total (%)	0.25	0.25	0.25
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.55	0.3976	1.7346	5	0.01	0.51

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Let-through Energy of Fuse $I^2 t$ ($A^2 s$) x 10^3	Conductors withstand $k^2 S^2$ x 10^3
	7.45	6.8	0.57	3.42	8265.63

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 1	**Voltage / Phase**	Single phase+N (230V) / L1	**Cable ID**	c-f-1
Supply from	DB3 (Way 2)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	1	-	-
3rd Harmonics (%)	0	-	-
Diversity factor	1	-	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	4.35	-	-	4.35
Load (kVA)	1	-	-	1
Resistive (kW)	1	-	-	1
Reactive (kVAr)	0	-	-	0

Voltage drop	L1	L2	L3
Source (%)	0.25	-	-
Circuit (%)	0.26	-	-
Total (%)	0.51	-	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 2	**Voltage / Phase**	Single phase+N (230V) / L2	**Cable ID**	c-f-1
Supply from	DB3 (Way 2)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	1	-
3rd Harmonics (%)	-	0	-
Diversity factor	-	1	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	4.35	-	4.35
Load (kVA)	-	1	-	1
Resistive (kW)	-	1	-	1
Reactive (kVAr)	-	0	-	0

Voltage drop	L1	L2	L3
Source (%)	-	0.25	-
Circuit (%)	-	0.26	-
Total (%)	-	0.51	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 3	**Voltage / Phase**	Single phase+N (230V) / L3	**Cable ID**	c-f-1
Supply from	DB3 (Way 2)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	-	1
3rd Harmonics (%)	-	-	0
Diversity factor	-	-	1
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	-	4.35	4.35
Load (kVA)	-	-	1	1
Resistive (kW)	-	-	1	1
Reactive (kVAr)	-	-	0	0

Voltage drop	L1	L2	L3
Source (%)	-	-	0.25
Circuit (%)	-	-	0.26
Total (%)	-	-	0.51
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 4	**Voltage / Phase**	Single phase+N (230V) / L1	**Cable ID**	c-f-1
Supply from	DB3 (Way 3)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	1	-	-
3rd Harmonics (%)	0	-	-
Diversity factor	1	-	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	4.35	-	-	4.35
Load (kVA)	1	-	-	1
Resistive (kW)	1	-	-	1
Reactive (kVAr)	0	-	-	0

Voltage drop	L1	L2	L3
Source (%)	0.25	-	-
Circuit (%)	0.26	-	-
Total (%)	0.51	-	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 5	**Voltage / Phase**	Single phase+N (230V) / L2	**Cable ID**	c-f-1
Supply from	DB3 (Way 3)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	1	-
3rd Harmonics (%)	-	0	-
Diversity factor	-	1	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	4.35	-	4.35
Load (kVA)	-	1	-	1
Resistive (kW)	-	1	-	1
Reactive (kVAr)	-	0	-	0

Voltage drop	L1	L2	L3
Source (%)	-	0.25	-
Circuit (%)	-	0.26	-
Total (%)	-	0.51	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 6	**Voltage / Phase**	Single phase+N (230V) / L3	**Cable ID**	c-f-1
Supply from	DB3 (Way 3)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	-	1
3rd Harmonics (%)	-	-	0
Diversity factor	-	-	1
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	-	4.35	4.35
Load (kVA)	-	-	1	1
Resistive (kW)	-	-	1	1
Reactive (kVAr)	-	-	0	0

Voltage drop	L1	L2	L3
Source (%)	-	-	0.25
Circuit (%)	-	-	0.26
Total (%)	-	-	0.51
Limit	Public supply other uses:5%		

	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
Earth Fault Calculations	0.48	0.4536	0.6828	0.4	0.01	0.42

	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
Phase Fault Calculations	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 7	**Voltage / Phase**	Single phase+N (230V) / L1	**Cable ID**	c-f-1
Supply from	DB3 (Way 4)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	1	-	-
3rd Harmonics (%)	0	-	-
Diversity factor	1	-	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	4.35	-	-	4.35
Load (kVA)	1	-	-	1
Resistive (kW)	1	-	-	1
Reactive (kVAr)	0	-	-	0

Voltage drop	L1	L2	L3
Source (%)	0.25	-	-
Circuit (%)	0.26	-	-
Total (%)	0.51	-	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 8	**Voltage / Phase**	Single phase+N (230V) / L2	**Cable ID**	c-f-1
Supply from	DB3 (Way 4)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	1	-
3rd Harmonics (%)	-	0	-
Diversity factor	-	1	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	4.35	-	4.35
Load (kVA)	-	1	-	1
Resistive (kW)	-	1	-	1
Reactive (kVAr)	-	0	-	0

Voltage drop	L1	L2	L3
Source (%)	-	0.25	-
Circuit (%)	-	0.26	-
Total (%)	-	0.51	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 9	**Voltage / Phase**	Single phase+N (230V) / L3	**Cable ID**	c-f-1
Supply from	DB3 (Way 4)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	-	1
3rd Harmonics (%)	-	-	0
Diversity factor	-	-	1
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	-	4.35	4.35
Load (kVA)	-	-	1	1
Resistive (kW)	-	-	1	1
Reactive (kVAr)	-	-	0	0

Voltage drop	L1	L2	L3
Source (%)	-	-	0.25
Circuit (%)	-	-	0.26
Total (%)	-	-	0.51
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 10	**Voltage / Phase**	Single phase+N (230V) / L1	**Cable ID**	c-f-1
Supply from	DB3 (Way 5)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	1	-	-
3rd Harmonics (%)	0	-	-
Diversity factor	1	-	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	4.35	-	-	4.35
Load (kVA)	1	-	-	1
Resistive (kW)	1	-	-	1
Reactive (kVAr)	0	-	-	0

Voltage drop	L1	L2	L3
Source (%)	0.25	-	-
Circuit (%)	0.26	-	-
Total (%)	0.51	-	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 11	**Voltage / Phase**	Single phase+N (230V) / L2	**Cable ID**	c-f-1
Supply from	DB3 (Way 5)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	1	-
3rd Harmonics (%)	-	0	-
Diversity factor	-	1	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	4.35	-	4.35
Load (kVA)	-	1	-	1
Resistive (kW)	-	1	-	1
Reactive (kVAr)	-	0	-	0

Voltage drop	L1	L2	L3
Source (%)	-	0.25	-
Circuit (%)	-	0.26	-
Total (%)	-	0.51	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 12	**Voltage / Phase**	Single phase+N (230V) / L3	**Cable ID**	c-f-1
Supply from	DB3 (Way 5)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	-	1
3rd Harmonics (%)	-	-	0
Diversity factor	-	-	1
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	-	4.35	4.35
Load (kVA)	-	-	1	1
Resistive (kW)	-	-	1	1
Reactive (kVAr)	-	-	0	0

Voltage drop	L1	L2	L3
Source (%)	-	-	0.25
Circuit (%)	-	-	0.26
Total (%)	-	-	0.51
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 13	**Voltage / Phase**	Single phase+N (230V) / L1	**Cable ID**	c-f-1
Supply from	DB3 (Way 6)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	1	-	-
3rd Harmonics (%)	0	-	-
Diversity factor	1	-	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	4.35	-	-	4.35
Load (kVA)	1	-	-	1
Resistive (kW)	1	-	-	1
Reactive (kVAr)	0	-	-	0

Voltage drop	L1	L2	L3
Source (%)	0.25	-	-
Circuit (%)	0.26	-	-
Total (%)	0.51	-	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 14	**Voltage / Phase**	Single phase+N (230V) / L2	**Cable ID**	c-f-1
Supply from	DB3 (Way 6)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	1	-
3rd Harmonics (%)	-	0	-
Diversity factor	-	1	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	4.35	-	4.35
Load (kVA)	-	1	-	1
Resistive (kW)	-	1	-	1
Reactive (kVAr)	-	0	-	0

Voltage drop	L1	L2	L3
Source (%)	-	0.25	-
Circuit (%)	-	0.26	-
Total (%)	-	0.51	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 15	**Voltage / Phase**	Single phase+N (230V) / L3	**Cable ID**	c-f-1
Supply from	DB3 (Way 6)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	-	1
3rd Harmonics (%)	-	-	0
Diversity factor	-	-	1
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	-	4.35	4.35
Load (kVA)	-	-	1	1
Resistive (kW)	-	-	1	1
Reactive (kVAr)	-	-	0	0

Voltage drop	L1	L2	L3
Source (%)	-	-	0.25
Circuit (%)	-	-	0.26
Total (%)	-	-	0.51
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 16	**Voltage / Phase**	Single phase+N (230V) / L1	**Cable ID**	c-f-1
Supply from	DB3 (Way 7)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	1	-	-
3rd Harmonics (%)	0	-	-
Diversity factor	1	-	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	4.35	-	-	4.35
Load (kVA)	1	-	-	1
Resistive (kW)	1	-	-	1
Reactive (kVAr)	0	-	-	0

Voltage drop	L1	L2	L3
Source (%)	0.25	-	-
Circuit (%)	0.26	-	-
Total (%)	0.51	-	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 17	**Voltage / Phase**	Single phase+N (230V) / L2	**Cable ID**	c-f-1
Supply from	DB3 (Way 7)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	1	-
3rd Harmonics (%)	-	0	-
Diversity factor	-	1	-
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	4.35	-	4.35
Load (kVA)	-	1	-	1
Resistive (kW)	-	1	-	1
Reactive (kVAr)	-	0	-	0

Voltage drop	L1	L2	L3
Source (%)	-	0.25	-
Circuit (%)	-	0.26	-
Total (%)	-	0.51	-
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Analytical calculations Report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit Description	FC1-Booth 18	**Voltage / Phase**	Single phase+N (230V) / L3	**Cable ID**	c-f-1
Supply from	DB3 (Way 7)	**Circuit type**	Other circuit	**Cable Classification**	

Circuit design data

Conductor type	Multicore 70°C thermoplastic insulated armoured, 3Cx6mm² + E(cable core and armour), SwaPvc70/M/Cu						**Length (m)**	20
	Element	Copper (Cu)	**Armour**	Steel	**Temp (°C)**	Full loaded:70 / Actual:30.5	**Reference**	BS/4D4
Installation method	On a perforated cable tray - Reference method E				**Correction factors**	Ci:1 Cg:0.72 Ca:1 Ct:0.93 Cf:1 Ch:1		
	Settings	Ambient temperature (°C): 30. Grouped circuits: 18 with Simultaneous overload. Trays: 1. Cables/Tray: 18. Arrangement: Horizontal Touching.						

Protective conductor C.P.C	**Installation settings**	Cable armour and integral conductor				
	Integral conductor (mm²)	6	**Armour (mm²)**	23	**Total equivalent to Cu (mm²)**	16.2
Protective devices	**Overcurrent**	Generic, BS EN 61009 10kA RCBO 30mA Type C | Rating(A): 32			**Icu / Ics**	10kA / 7.5kA
	RCD/Earth fault device	RCBO, 32A. Touch voltage = 0.01V (Maximum = 50V)			**mA**	30

Circuit calculations

Currents (A)				Impedances (Ω) at operating temperature			
Design current Ib	**Device rating In**	**Minimum effective conductor capacity - min Iz**	**Tabulated conductor capacity It**	**Phase conductor Z1**	**CPC Z2**	**Earth external**	**Phase external**
4.35	32	44.44	53	0.073	0.05043	0.3976	0.1389

Load factors	L1	L2	L3
Power factor	-	-	1
3rd Harmonics (%)	-	-	0
Diversity factor	-	-	1
Spare (%)	-		

Design load	L1	L2	L3	N/Totals
Current (A)	-	-	4.35	4.35
Load (kVA)	-	-	1	1
Resistive (kW)	-	-	1	1
Reactive (kVAr)	-	-	0	0

Voltage drop	L1	L2	L3
Source (%)	-	-	0.25
Circuit (%)	-	-	0.26
Total (%)	-	-	0.51
Limit	Public supply other uses:5%		

Earth Fault Calculations	Earth fault current(kA)	Zs(Ω) at fault conditions	Max Zs(Ω)	Max Disconection Time (s)	Device Disconnection Time (s)	Min CPC (mm²)
	0.48	0.4536	0.6828	0.4	0.01	0.42

Phase Fault Calculations	Max at starting point (kA)	Max at end point (kA)	Min at end point (kA)	Disconnection time of RCBO (s)	Conductors withstand duration (s)
	4.35	1.35	0.49	0.01	1.99

Zs - Earth fault loop impedance report : SB1-Sub-Main Chamber

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Uo - Nominal Line Voltage to Earth: 230V

Way	Phase	Description	Conductor	Protective devices	Discon. time	Max Discon.	Zs Calculated (Ω)		Max Zs Calculated (Ω)	
					sec	sec	Zs	Z x 0.8	max Zs	max Zs x 0.8
L1,L2,L3		SB1-Sub-Main Chamber	4x1Cx25mm² 1x25mm² E Pvc70/S/Cu Length: 1m		1.7836	5	0.38	0.31	0.47	0.38
1	L1,L2,L3	DB1-Current DB	4Cx35mm² 1x35mm² E(and armour) SwaPvc70/M/Cu Length: 15m	Fuse 3P 80A/80kA Generic | BS88 fuses	1.259	5	0.39	0.31	0.54	0.43

Zs - Earth fault loop impedance report : DB1-Current DB

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Uo - Nominal Line Voltage to Earth: 230V

Way	Phase	Description	Conductor	Protective devices	Discon. time	Max Discon.	Zs Calculated (Ω)		Max Zs Calculated (Ω)	
					sec	sec	Zs	Z x 0.8	max Zs	max Zs x 0.8
L1,L2,L3		DB1-Current DB	4Cx35mm² 1x35mm² E(and armour) SwaPvc70/M/Cu Length: 15m	Fuse 3P 80A/80kA Generic | BS88 fuses	1.259	5	0.39	0.31	0.54	0.43
1	L1,L2,L3	DB2-Glasgow Switch	4Cx25mm² 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 12m	MCB C 3P 50A/10kA Generic | BS EN 60898 10kA MCB Type C	0.01	5	0.39	0.32	0.44	0.35

Zs - Earth fault loop impedance report : DB2-Glasgow Switch

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Uo - Nominal Line Voltage to Earth: 230V

Way	Phase	Description	Conductor	Protective devices	Discon. time	Max Discon.	Zs Calculated (Ω)		Max Zs Calculated (Ω)	
					sec	sec	Zs	Z x 0.8	max Zs	max Zs x 0.8
L1,L2,L3		DB2-Glasgow Switch	4Cx25mm² 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 12m	MCB C 3P 50A/10kA Generic | BS EN 60898 10kA MCB Type C	0.01	5	0.39	0.32	0.44	0.35
1	L1,L2,L3	DB3	4Cx25mm² 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m	Fuse 3P 32A/80kA Generic | BS88 fuses	0.01	5	0.4	0.32	1.74	1.39

Zs - Earth fault loop impedance report : DB3

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Uo - Nominal Line Voltage to Earth: 230V

Way	Phase	Description	Conductor	Protective devices	Discon. time	Max Discon.	Zs Calculated (Ω)		Max Zs Calculated (Ω)	
					sec	sec	Zs	Z x 0.8	max Zs	max Zs x 0.8
L1,L2,L3		DB3	4Cx25mm² 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m	Fuse 3P 32A/80kA Generic | BS88 fuses	0.01	5	0.4	0.32	1.74	1.39
1	L1,L2,L3	SPD	16mm²	MCB C 3P 6A/10kA Generic | BS EN 60898 10kA MCB Type C	-	-	-	-	-	-
2	L1	FC1-Booth 1	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
2	L2	FC1-Booth 2	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
2	L3	FC1-Booth 3	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
3	L1	FC1-Booth 4	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
3	L2	FC1-Booth 5	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
3	L3	FC1-Booth 6	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
4	L1	FC1-Booth 7	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55

Zs - Earth fault loop impedance report : DB3

Company	UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL
Designer	Neil Bridgeman EngTech, MIET, CMgr FCMI

Uo - Nominal Line Voltage to Earth: 230V

Way	Phase	Description	Conductor	Protective devices	Discon. time	Max Discon.	Zs Calculated (Ω)		Max Zs Calculated (Ω)	
					sec	sec	Zs	Z x 0.8	max Zs	max Zs x 0.8
L1,L2,L3		DB3	4Cx25mm² 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m	Fuse 3P 32A/80kA Generic | BS88 fuses	0.01	5	0.4	0.32	1.74	1.39
4	L2	FC1-Booth 8	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
4	L3	FC1-Booth 9	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
5	L1	FC1-Booth 10	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
5	L2	FC1-Booth 11	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
5	L3	FC1-Booth 12	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
6	L1	FC1-Booth 13	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
6	L2	FC1-Booth 14	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
6	L3	FC1-Booth 15	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55

Zs - Earth fault loop impedance report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Uo - Nominal Line Voltage to Earth: 230V

Way	Phase	Description	Conductor	Protective devices	Discon. time	Max Discon.	Zs Calculated (Ω)		Max Zs Calculated (Ω)	
					sec	sec	Zs	Z x 0.8	max Zs	max Zs x 0.8
L1,L2,L3		DB3	4Cx25mm² 1x25mm² E(and armour) SwaPvc70/M/Cu Length: 5m	Fuse 3P 32A/80kA Generic | BS88 fuses	0.01	5	0.4	0.32	1.74	1.39
7	L1	FC1-Booth 16	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
7	L2	FC1-Booth 17	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
7	L3	FC1-Booth 18	3Cx6mm² E(cable core and armour) SwaPvc70/M/Cu Length: 20m	RCBO C 1P 30mA Class AC 32A/10kA Generic | BS EN 61009 10kA RCBO 30mA Type C	0.01	0.4	0.45	0.36	0.68	0.55
8	L1,L2,L3	Spare	-		-	-	-	-	-	-
9	L1,L2,L3	Spare	-		-	-	-	-	-	-
10	L1,L2,L3	Spare	-		-	-	-	-	-	-

Warnings: SB1-Sub-Main Chamber

Description	Warnings	Notes
SB1-Sub-Main Chamber		
[1.L1,L2,L3] DB1-Current DB	Important: 1) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	

Warnings: DB1-Current DB

Description	Warnings	Notes
DB1-Current DB	Important: 1) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[1.L1,L2,L3] DB2-Glasgow Switch	Important: 1) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	

Warnings: DB2-Glasgow Switch

Description	Warnings	Notes
DB2-Glasgow Switch	Important: 1) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[1.L1,L2,L3] DB3	Important: 1) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	

Warnings: DB3

Description	Warnings	Notes
DB3	Important: 1) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[2.L1] FC1-Booth 1	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[2.L2] FC1-Booth 2	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[2.L3] FC1-Booth 3	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[3.L1] FC1-Booth 4	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[3.L2] FC1-Booth 5	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[3.L3] FC1-Booth 6	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	

Warnings: DB3

Description	Warnings	Notes
DB3	Important: 1) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[4.L1] FC1-Booth 7	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[4.L2] FC1-Booth 8	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[4.L3] FC1-Booth 9	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[5.L1] FC1-Booth 10	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[5.L2] FC1-Booth 11	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[5.L3] FC1-Booth 12	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	

Warnings: DB3

Description	Warnings	Notes
DB3	Important: 1) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[6.L1] FC1-Booth 13	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[6.L2] FC1-Booth 14	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[6.L3] FC1-Booth 15	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[7.L1] FC1-Booth 16	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[7.L2] FC1-Booth 17	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	
[7.L3] FC1-Booth 18	Important: 1) Energy-based selectivity error: Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s) 2) Selectivity warning with upstream device. The protective device is not suitable for selective use during overcurrent	

Harmonic assessment report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

		3rd Harmonic current (%)				3rd Harmonic current (A)			
Board description	**Supply from**	**L1**	**L2**	**L3**	**N**	**L1**	**L2**	**L3**	**N**
SB1-Sub-Main Chamber	Supply	0	0	0	0	0	0	0	0
DB1-Current DB	SB1-Sub-Main Chamber	0	0	0	0	0	0	0	0
DB2-Glasgow Switch	DB1-Current DB	0	0	0	0	0	0	0	0
DB3	DB2-Glasgow Switch	0	0	0	0	0	0	0	0

IT System Touch Voltage report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

					IT 2nd Fault Touch Voltage Checks		
Board description	**Supply from**	**Volts (V)**	**Conductor**	**Length (m)**	**Calculated (V)**	**RAxIa Check (V)**	**Check Limit (V)**

Equipment Type report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Equipment Type	Equipment Description	Supply from	Volts (V)	Conductor	Isc (kA)	In/Ir (A)	Voltage drop (%)	Zs (Ω)

Bill of quantities report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Final circuits

Description	Part No.	Unit	Price/Unit	Quantity	Total price
[1Ph] Other circuit		Unit	0	18	0
[3Ph] SPD T2/In:20kA/Up:2.5kV		Unit	0	1	0
					0

Boards/Connections

Description	Part No.	Unit	Price/Unit	Quantity	Total price
[3Ph] Distribution Board - Din Rail (1 circuits)		Unit	0	2	0
[3Ph] Distribution Board - Din Rail (10 circuits)		Unit	0	1	0
[3Ph] Switch Board		Unit	0	1	0
					0

Cables/Busbar

Description	Part No.	Unit	Price/Unit	Quantity	Total price
Pvc70/S/Cu [Cores: 1] 25mm²		Metres	0	22	0
Pvc70/S/Cu [Cores: 1] 35mm²		Metres	0	15	0
SwaPvc70/M/Cu [Cores: 3] 6mm²		Metres	0	360	0
SwaPvc70/M/Cu [Cores: 4] 25mm²		Metres	0	17	0
SwaPvc70/M/Cu [Cores: 4] 35mm²		Metres	0	15	0
					0

Protective devices

Description	Part No.	Unit	Price/Unit	Quantity	Total price
[1Ph] RCBO C 1P 30mA Class AC 32A/10kA		Unit	0	18	0
[3Ph] Fuse 3P 32A/80kA		Unit	0	1	0
[3Ph] Fuse 3P 80A/80kA		Unit	0	1	0
[3Ph] MCB C 3P 50A/10kA		Unit	0	1	0
[3Ph] MCB C 3P 6A/10kA		Unit	0	1	0
[3Ph] SWITCH AC21/125A		Unit	0	1	0
					0

Grand Total **0**

Selectivity study results report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Upstream	Downstream	Over-current	Energy based	Earth fault
Supply Generic BS1361 fuses In (A): 80	DB1-Current DB Generic BS88 fuses In (A): 80	✖	N/A	N/A
DB1-Current DB Generic BS88 fuses In (A): 80	DB2-Glasgow Switch Generic BS EN 60898 10kA MCB Type C In (A): 50	✖	✔	N/A
DB2-Glasgow Switch Generic BS EN 60898 10kA MCB Type C In (A): 50	DB3 Generic BS88 fuses In (A): 32	✖	N/A	N/A
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 1 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 2 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 3 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 4 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 5 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 6 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 7 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 8 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 9 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 10 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 11 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 12 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 13 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 14 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 15 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔

Selectivity study results report

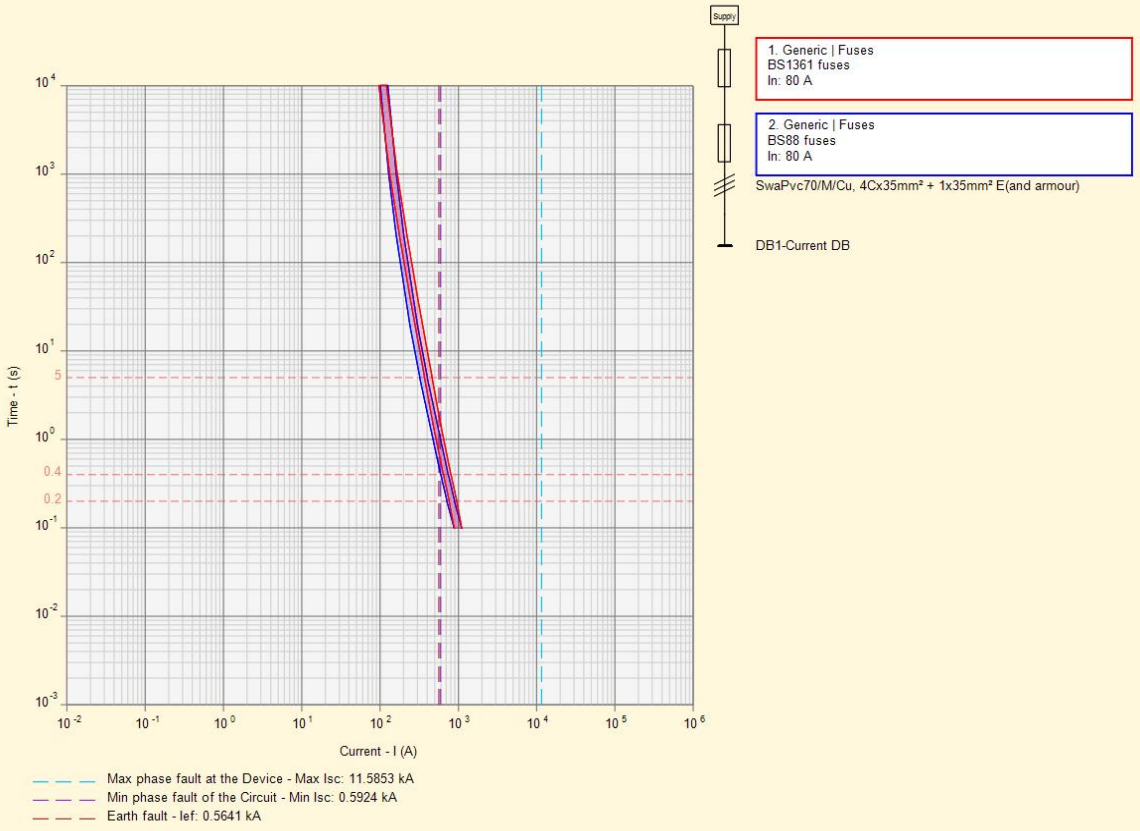
Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Upstream	Downstream	Over-current	Energy based	Earth fault
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 16 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 17 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔
DB3 Generic BS88 fuses In (A): 32	FC1-Booth 18 Generic BS EN 61009 10kA RCBO 30mA Type C In (A): 32	✖	✖	✔

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	Supply	DB1-Current DB
Manufacturer	Generic	Generic
Type	Fuses	Fuses
Family	BS1361 fuses	BS88 fuses
Rating	In (A): 80	In (A): 80
RCD	-	-
Settings	-	-



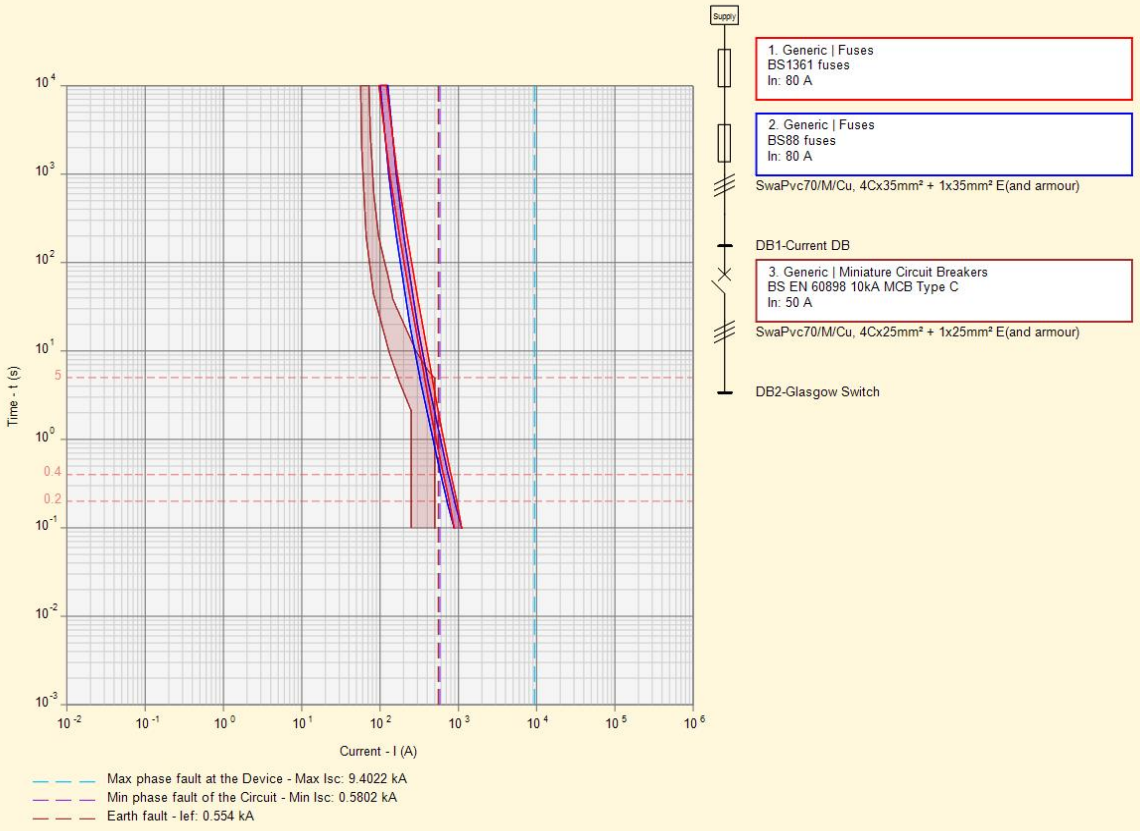
Downstream Circuit Calculations			
Ib (A)	**Max Isc at the Device (kA)**	**Min Isc of the Circuit (kA)**	**Ief (kA)**
26.087	11.59	0.59	0.56

Selectivity checks between Upstream and Downstream devices		
Overcurrent	**Energy based**	**Earth fault**
Fail	N/A	N/A

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB1-Current DB	DB2-Glasgow Switch
Manufacturer	Generic	Generic
Type	Fuses	Miniature Circuit Breakers
Family	BS88 fuses	BS EN 60898 10kA MCB Type C
Rating	In (A): 80	In (A): 50
RCD	-	-
Settings	-	-



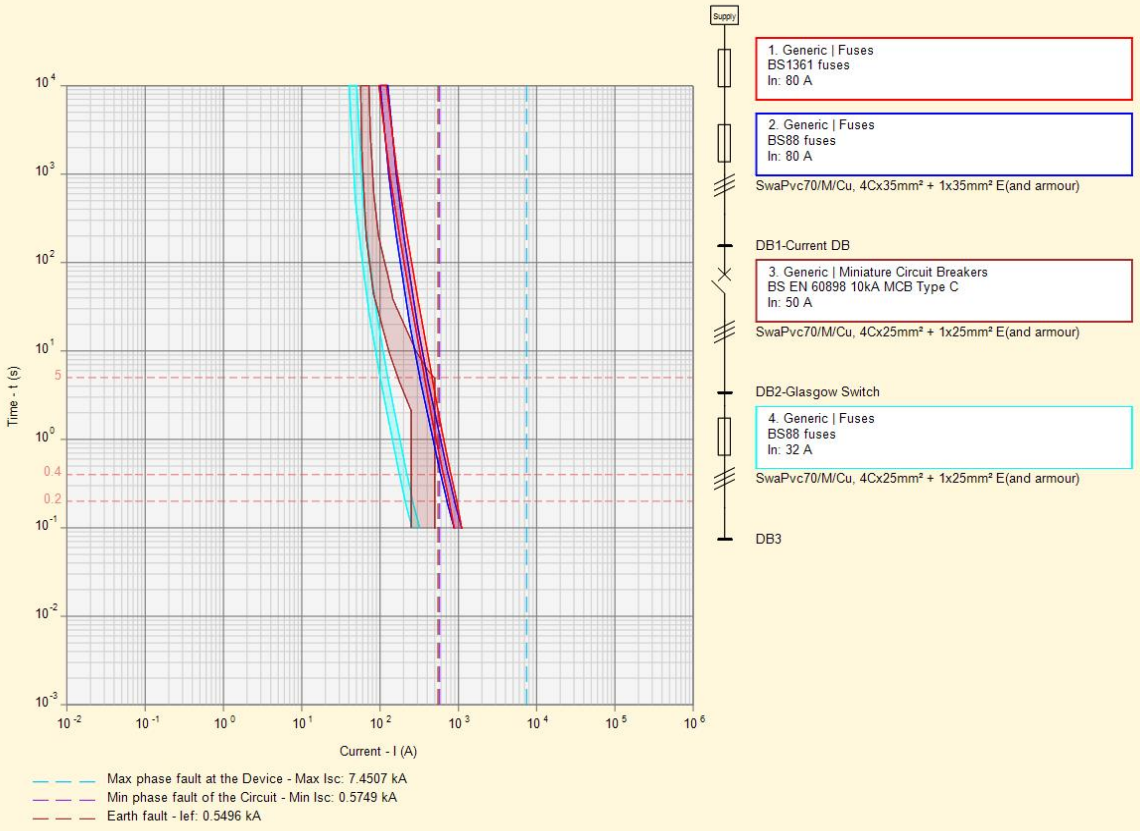
Downstream Circuit Calculations			
Ib (A)	**Max Isc at the Device (kA)**	**Min Isc of the Circuit (kA)**	**Ief (kA)**
26.087	9.4	0.58	0.55

Selectivity checks between Upstream and Downstream devices		
Overcurrent	**Energy based**	**Earth fault**
Fail	OK - Downstream Let-through energy < Upstream Fuse pre-arcing energy (3.37 x 10^3 A^2s < 14.09 x 10^3 A^2s)	N/A

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB2-Glasgow Switch	DB3
Manufacturer	Generic	Generic
Type	Miniature Circuit Breakers	Fuses
Family	BS EN 60898 10kA MCB Type C	BS88 fuses
Rating	In (A): 50	In (A): 32
RCD	-	-
Settings	-	-



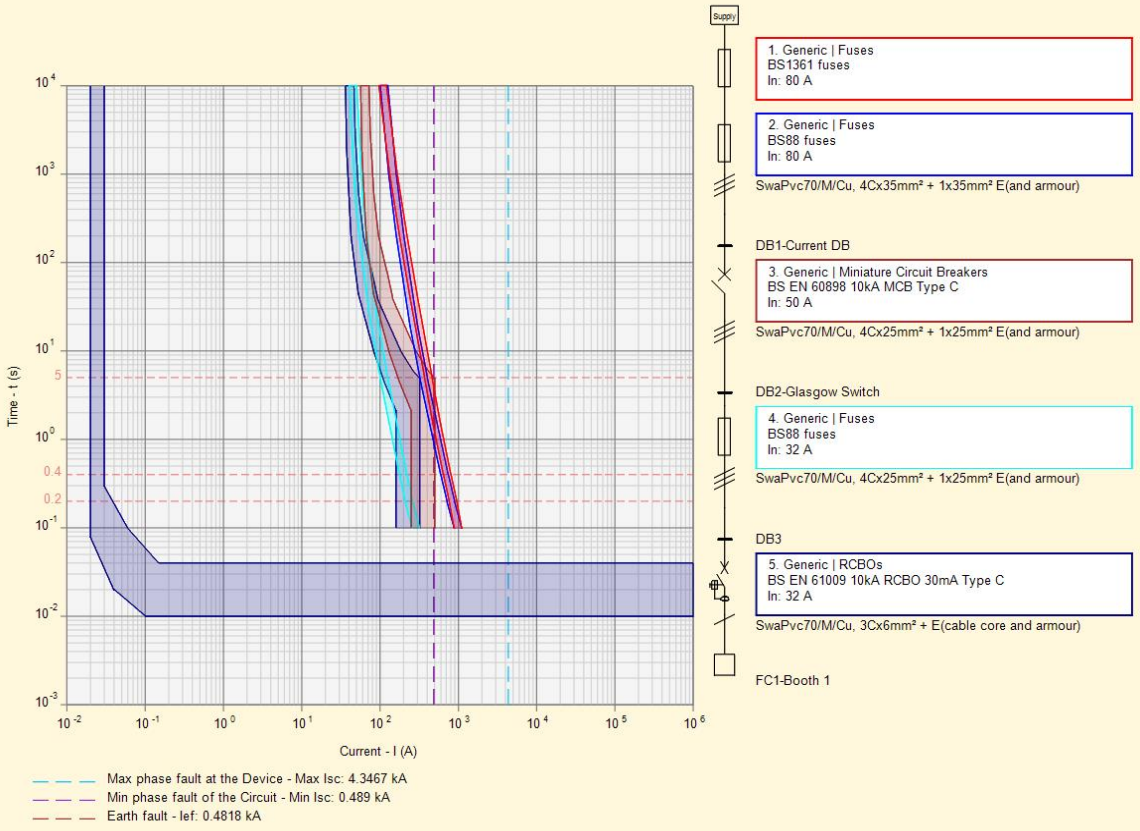
Downstream Circuit Calculations			
Ib (A)	**Max Isc at the Device (kA)**	**Min Isc of the Circuit (kA)**	**Ief (kA)**
26.087	7.45	0.57	0.55

Selectivity checks between Upstream and Downstream devices		
Overcurrent	**Energy based**	**Earth fault**
Fail	N/A	N/A

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 1
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

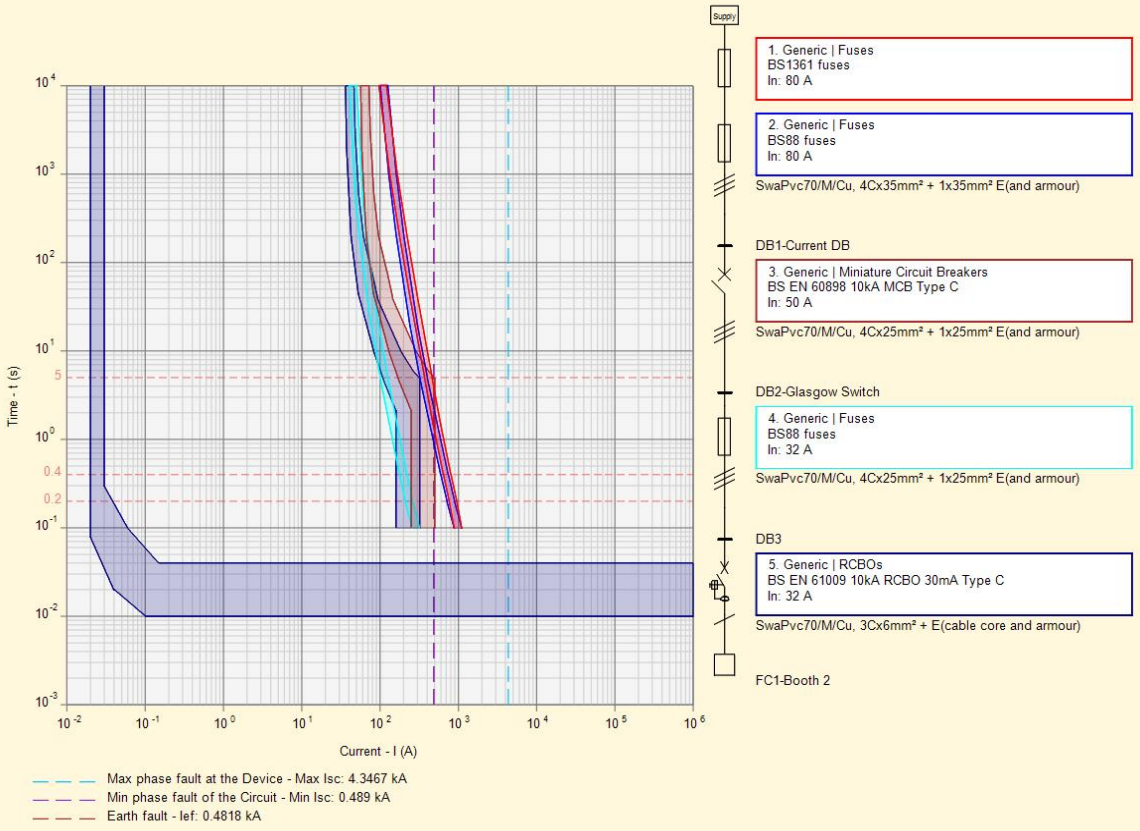
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 2
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



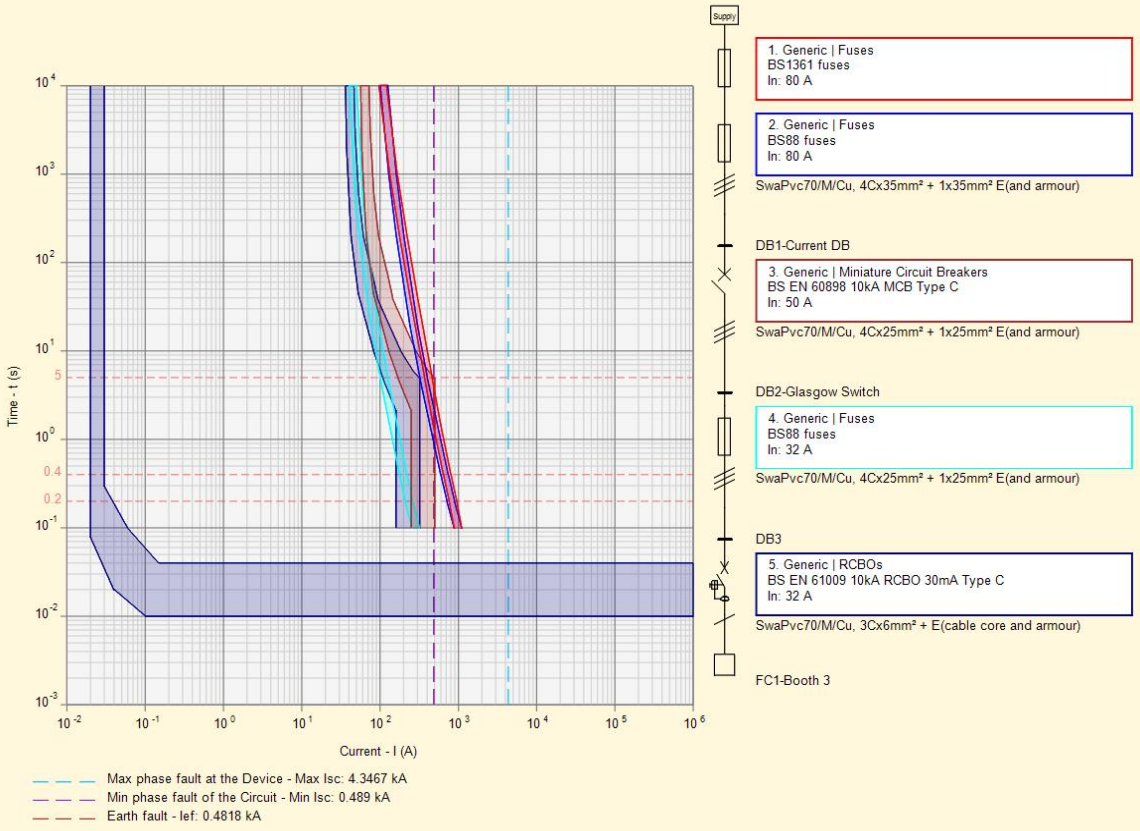
Downstream Circuit Calculations			
Ib (A)	**Max Isc at the Device (kA)**	**Min Isc of the Circuit (kA)**	**Ief (kA)**
4.3478	4.35	0.49	0.48

Selectivity checks between Upstream and Downstream devices		
Overcurrent	**Energy based**	**Earth fault**
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 3
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

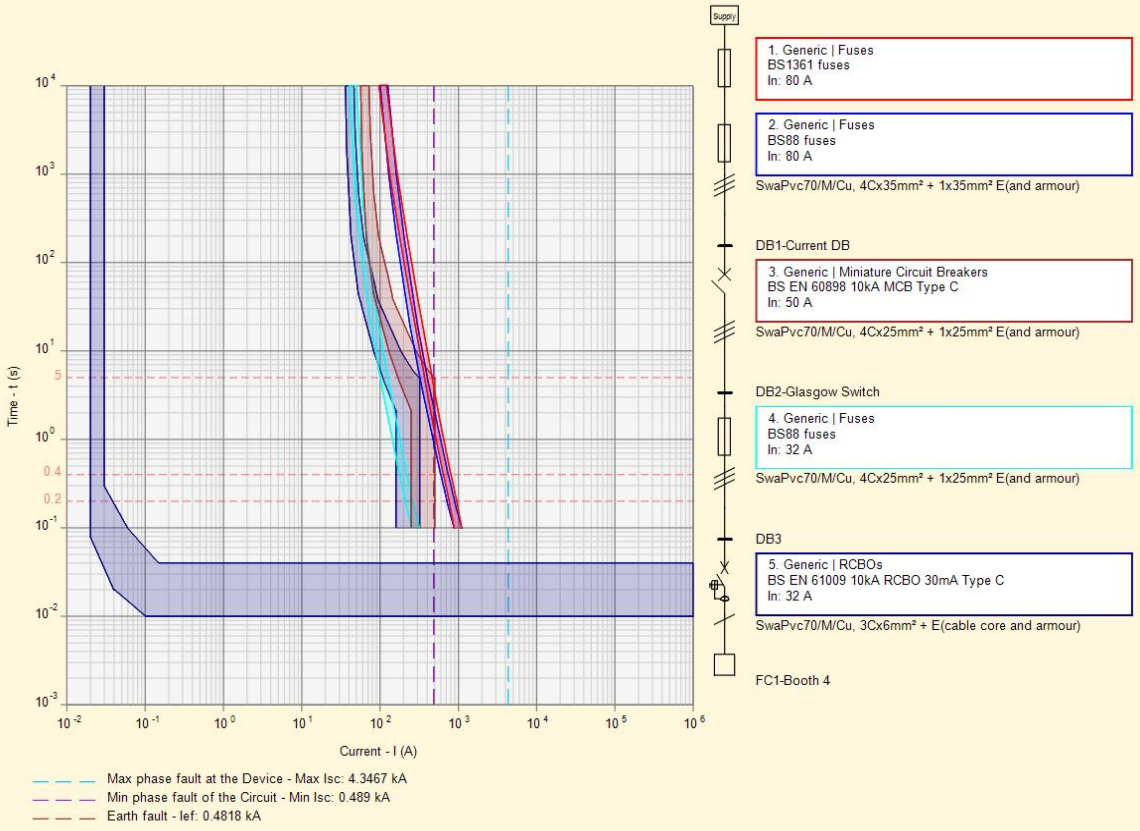
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 4
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

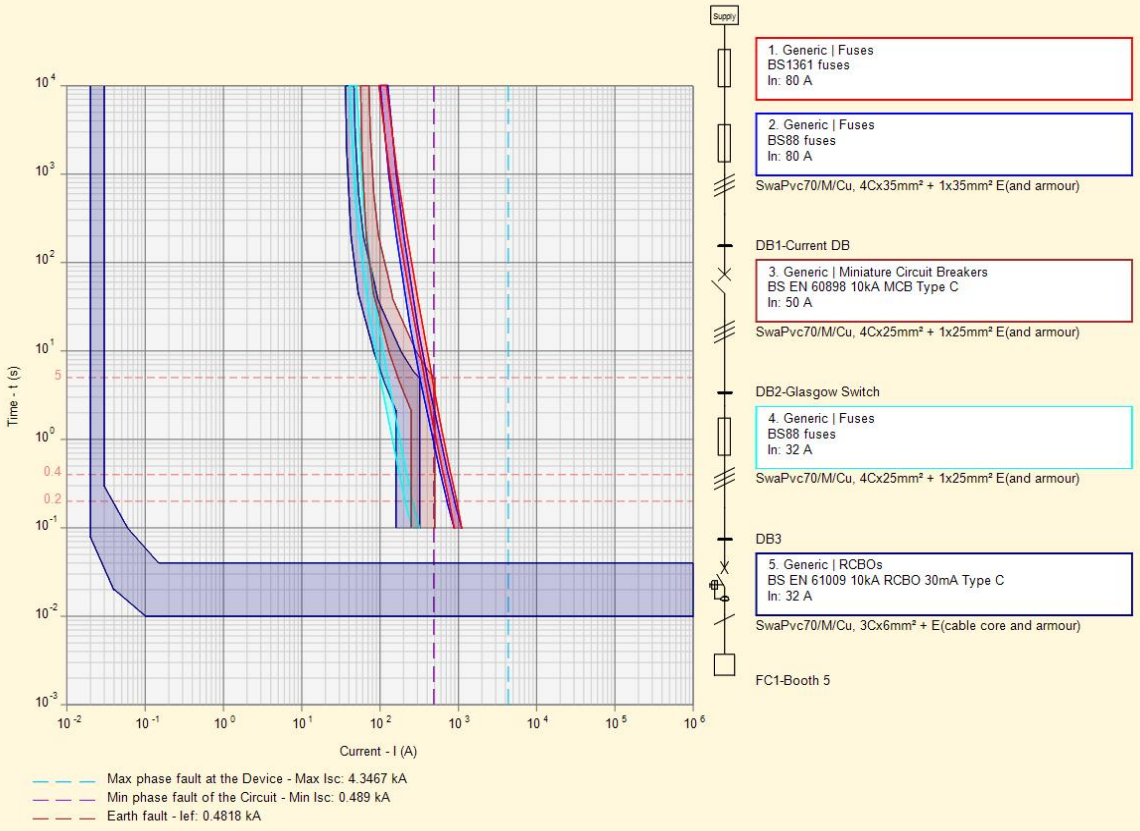
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 5
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



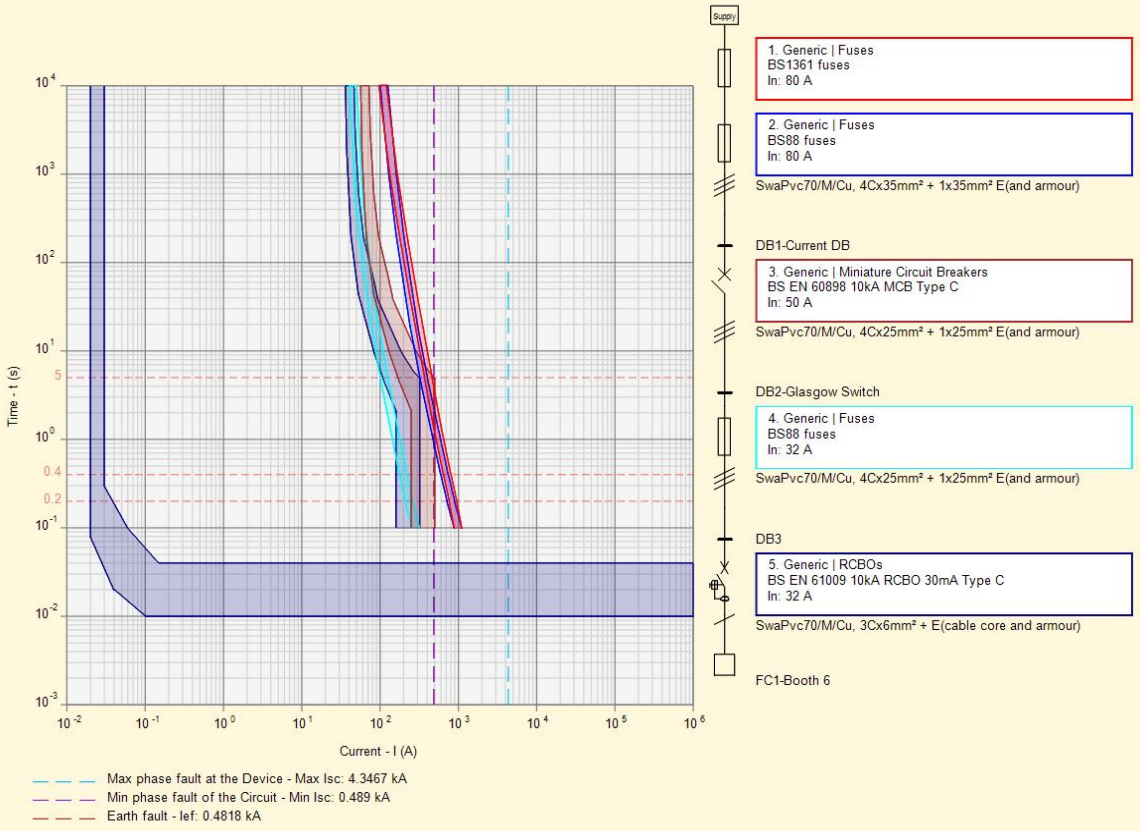
Downstream Circuit Calculations			
Ib (A)	**Max Isc at the Device (kA)**	**Min Isc of the Circuit (kA)**	**Ief (kA)**
4.3478	4.35	0.49	0.48

Selectivity checks between Upstream and Downstream devices		
Overcurrent	**Energy based**	**Earth fault**
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 6
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

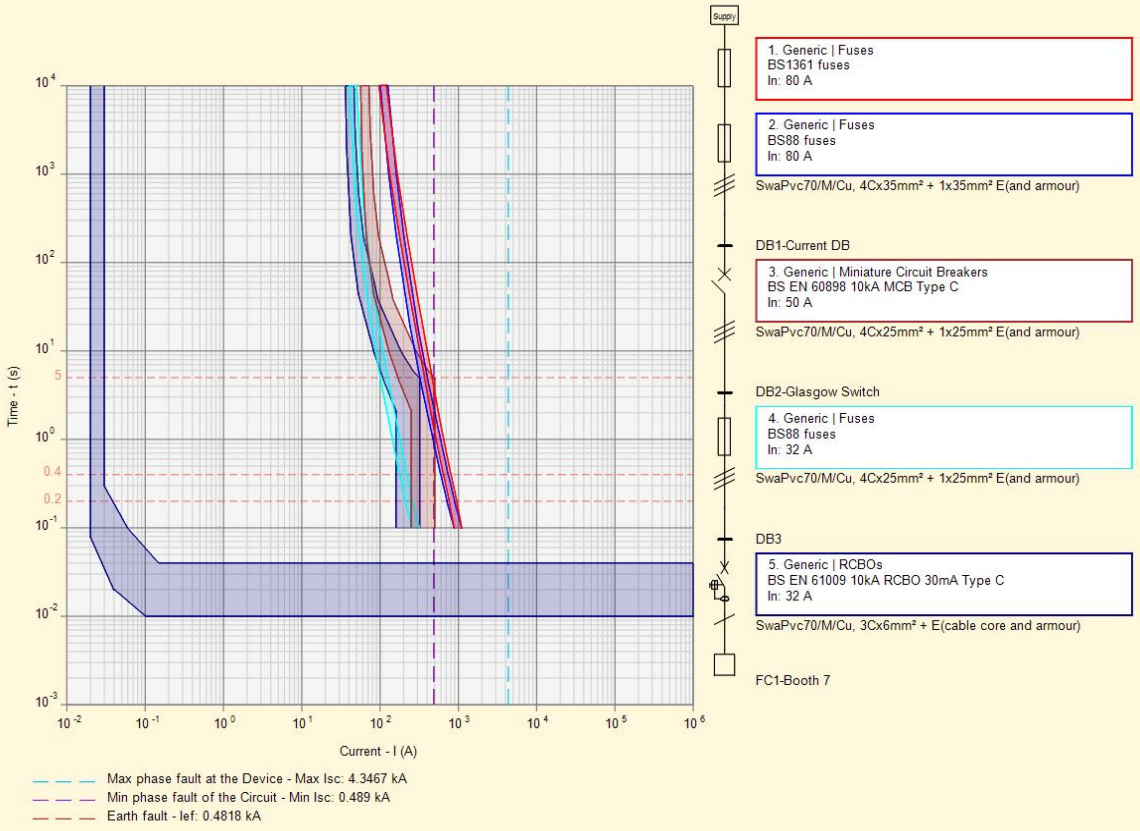
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 7
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

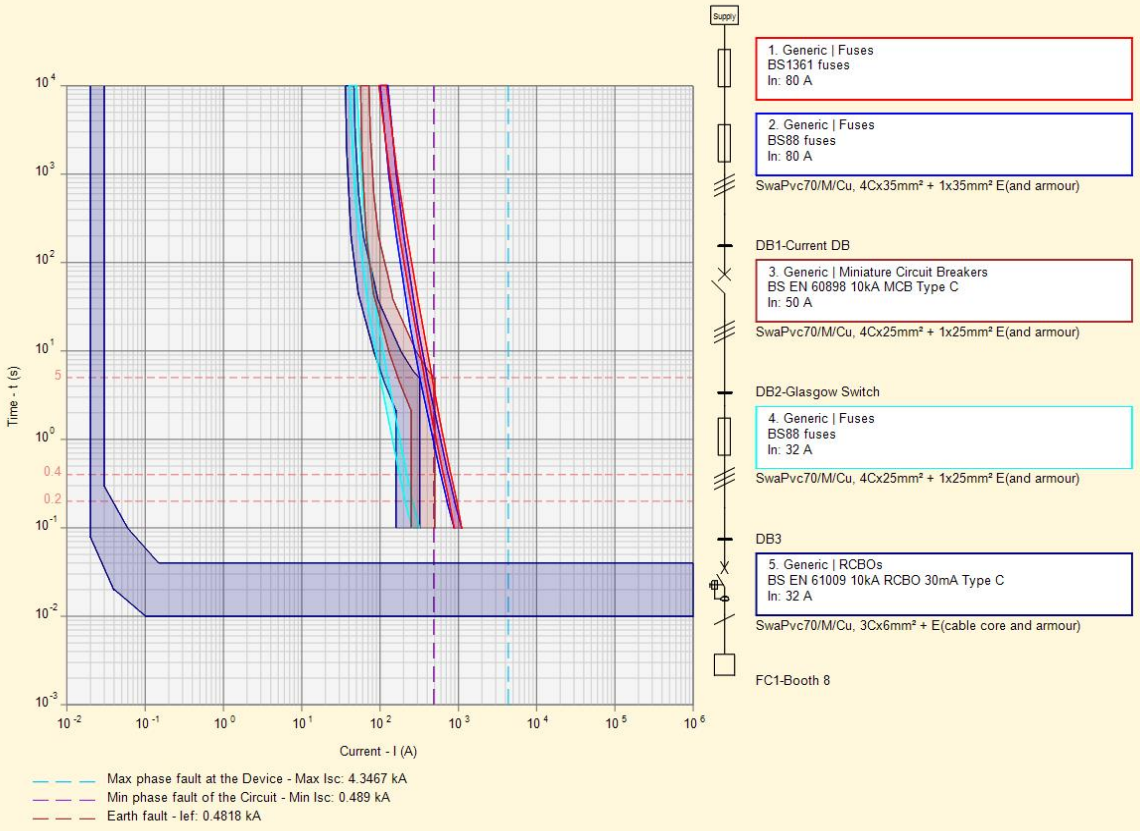
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 8
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

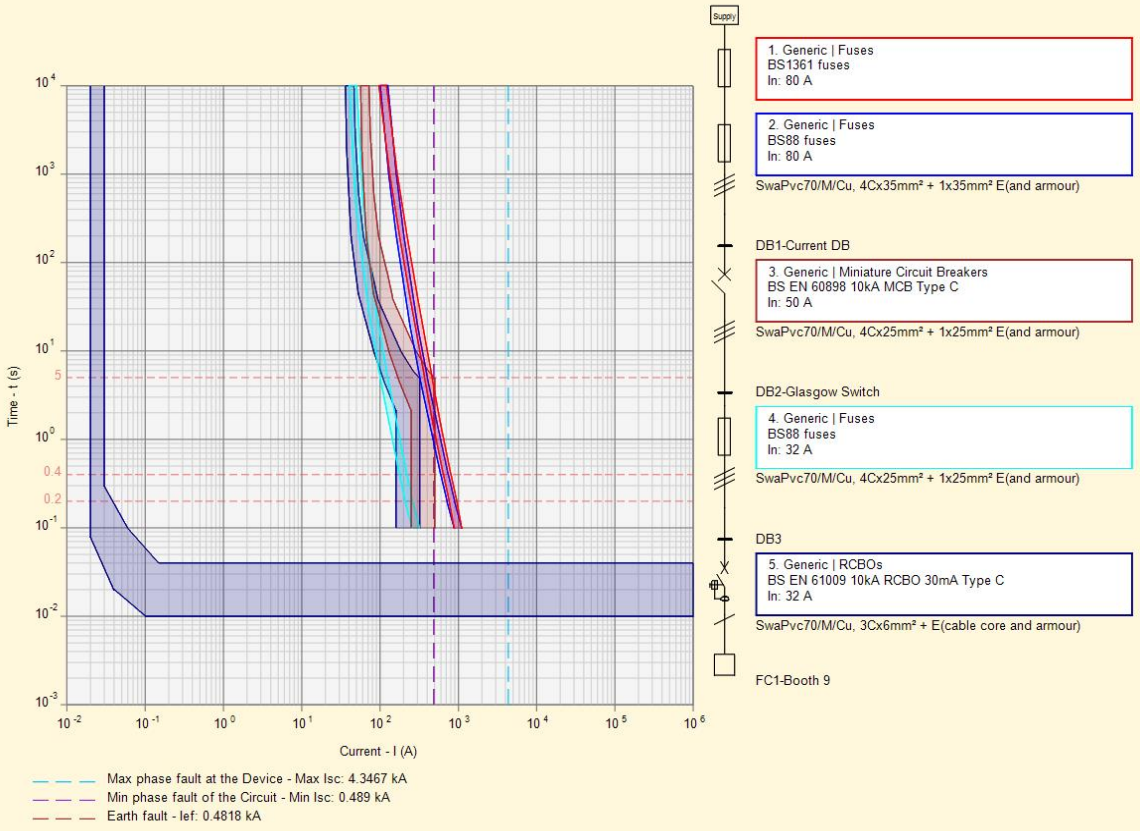
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 9
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

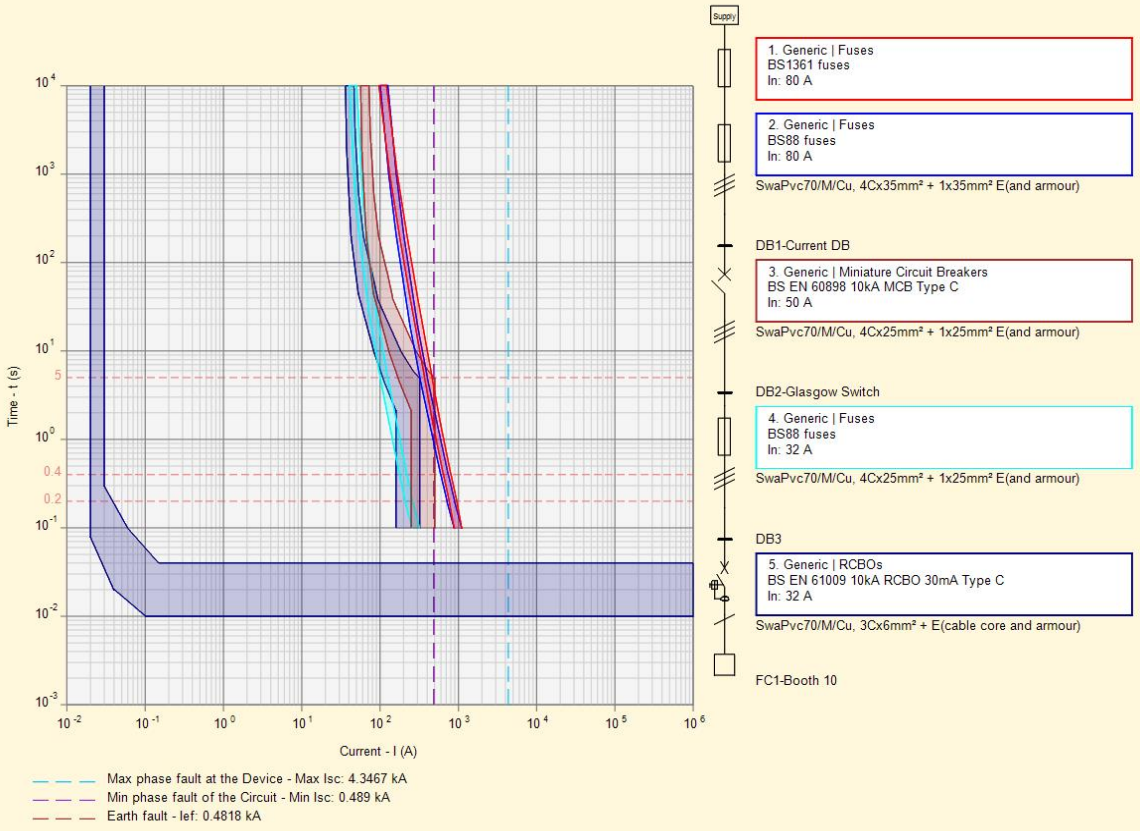
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 10
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

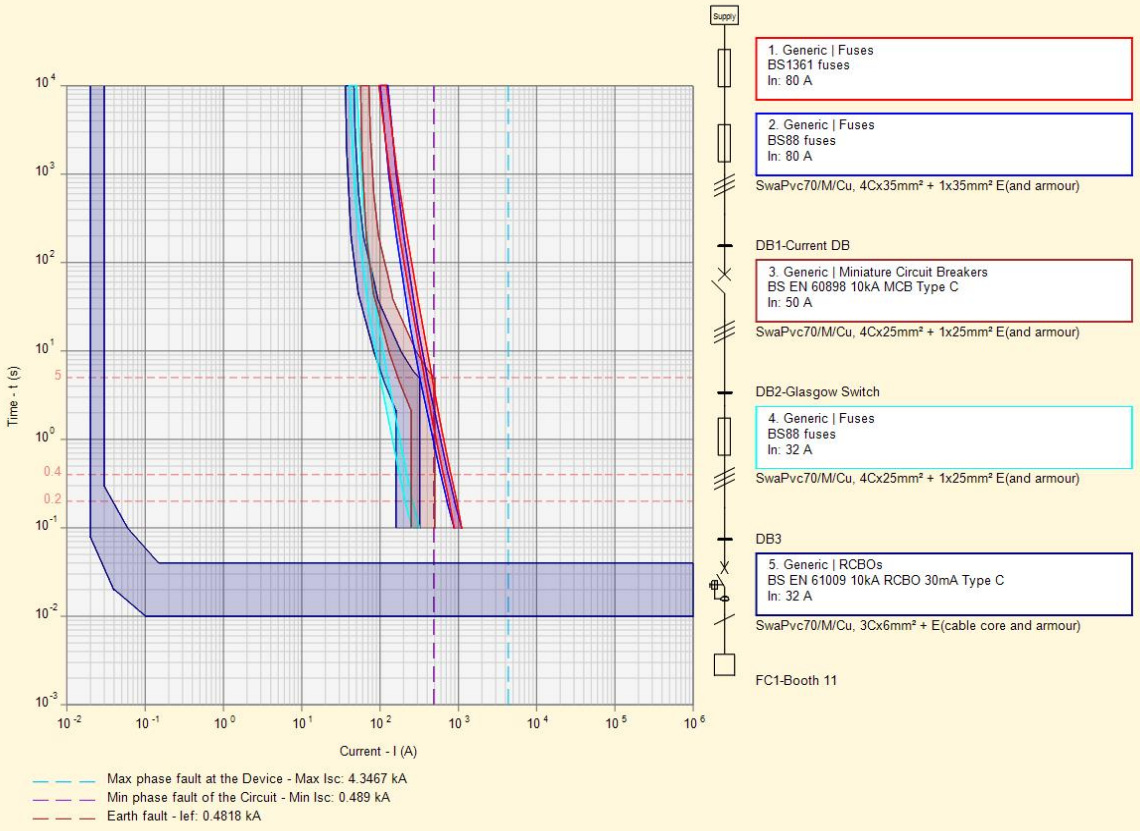
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 11
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

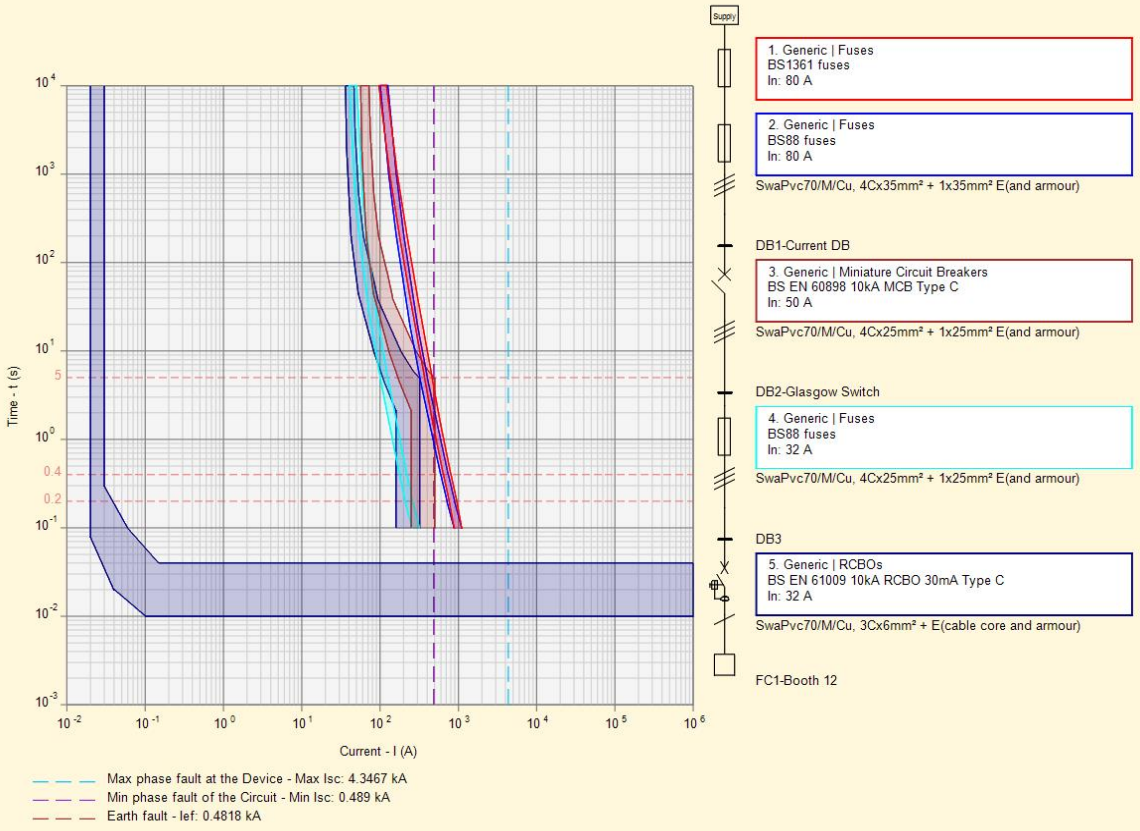
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 12
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

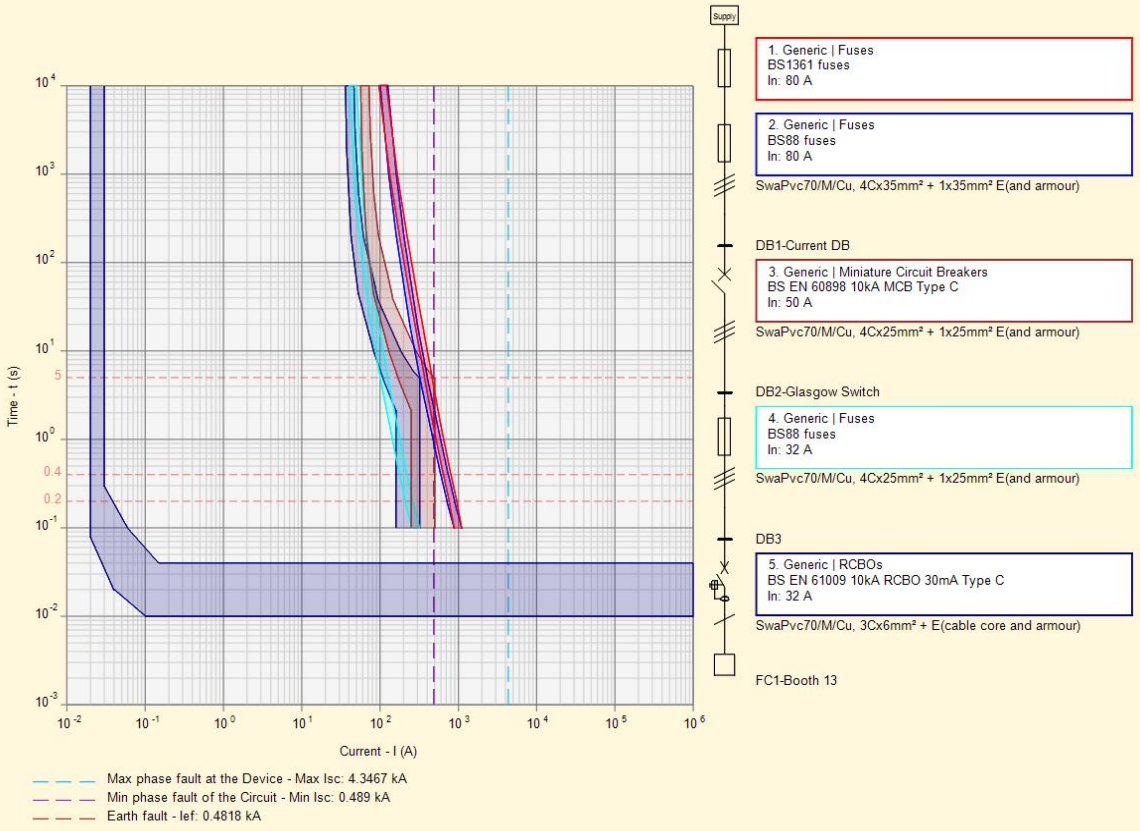
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 13
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

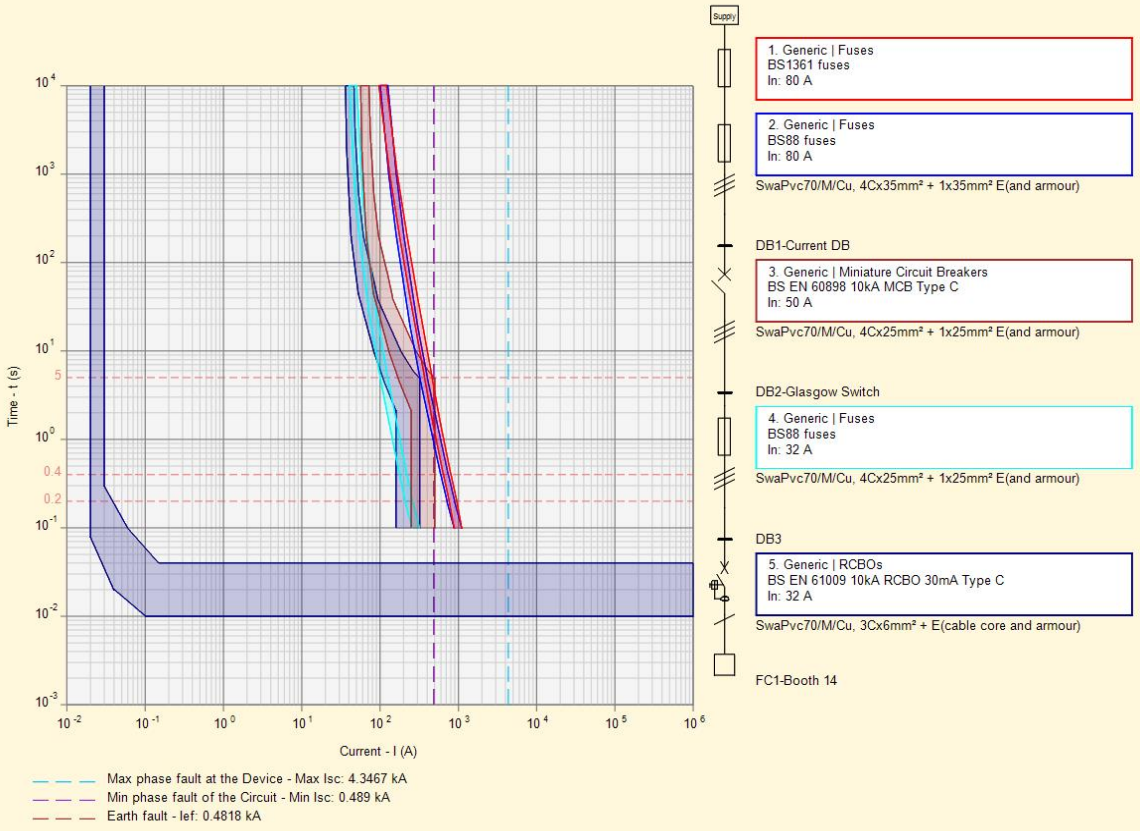
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 14
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

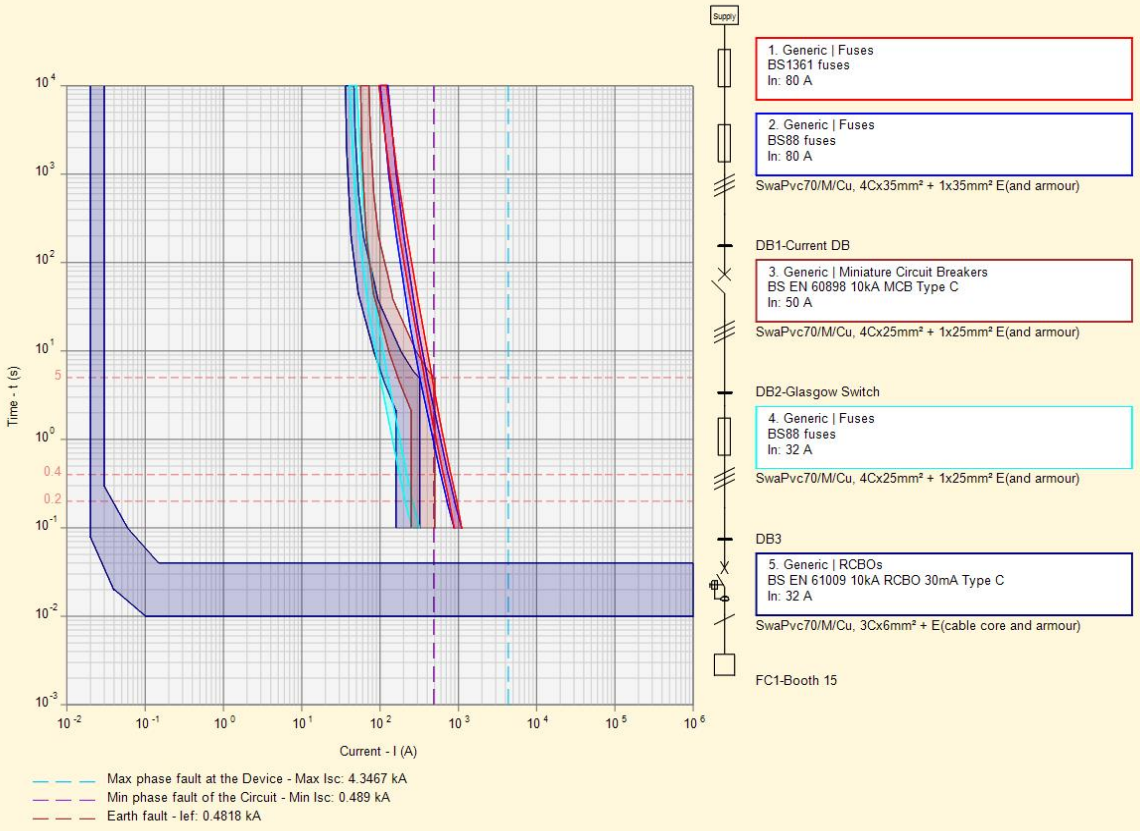
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 15
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

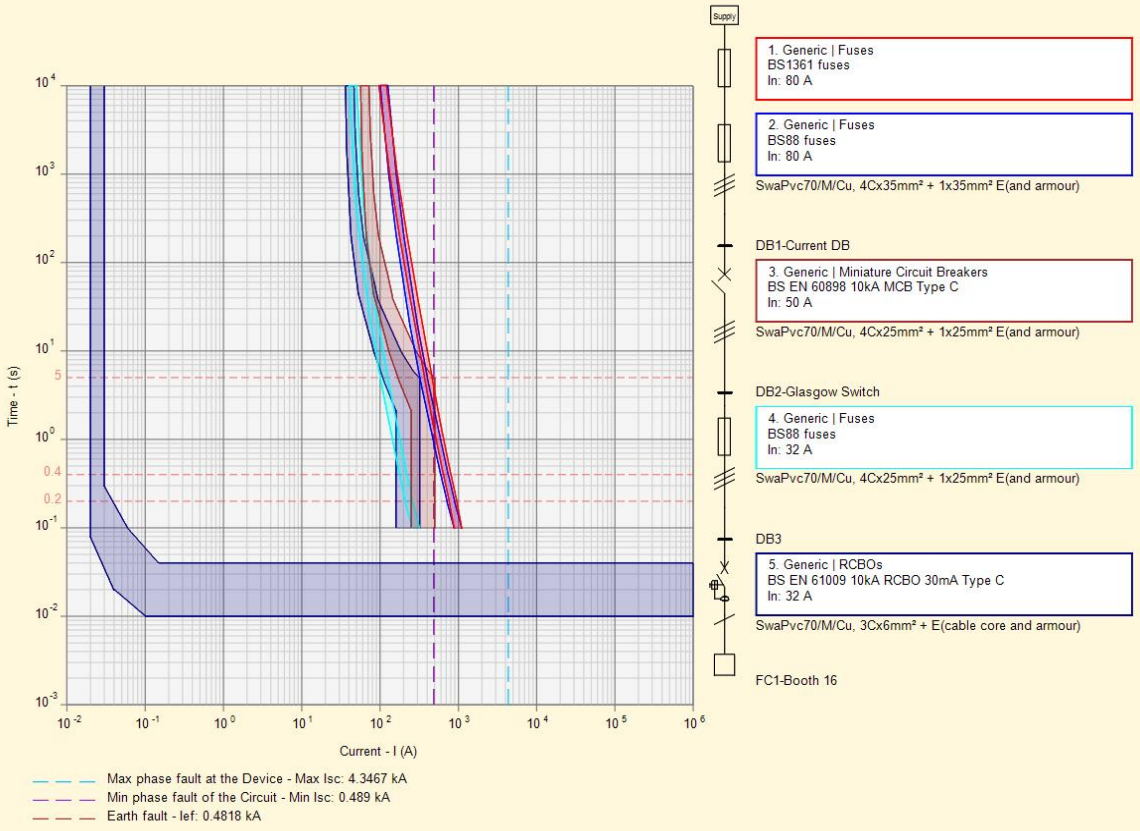
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 16
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

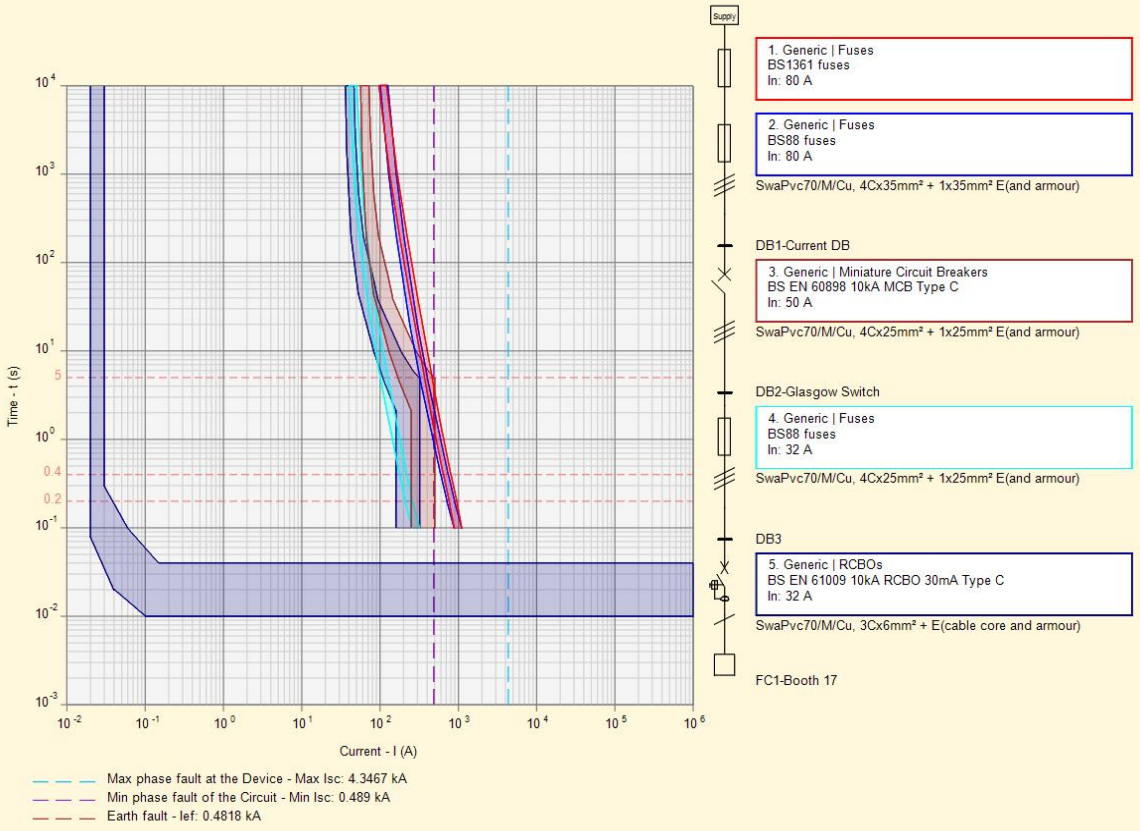
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 17
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations

Ib (A)	Max Isc at the Device (kA)	Min Isc of the Circuit (kA)	Ief (kA)
4.3478	4.35	0.49	0.48

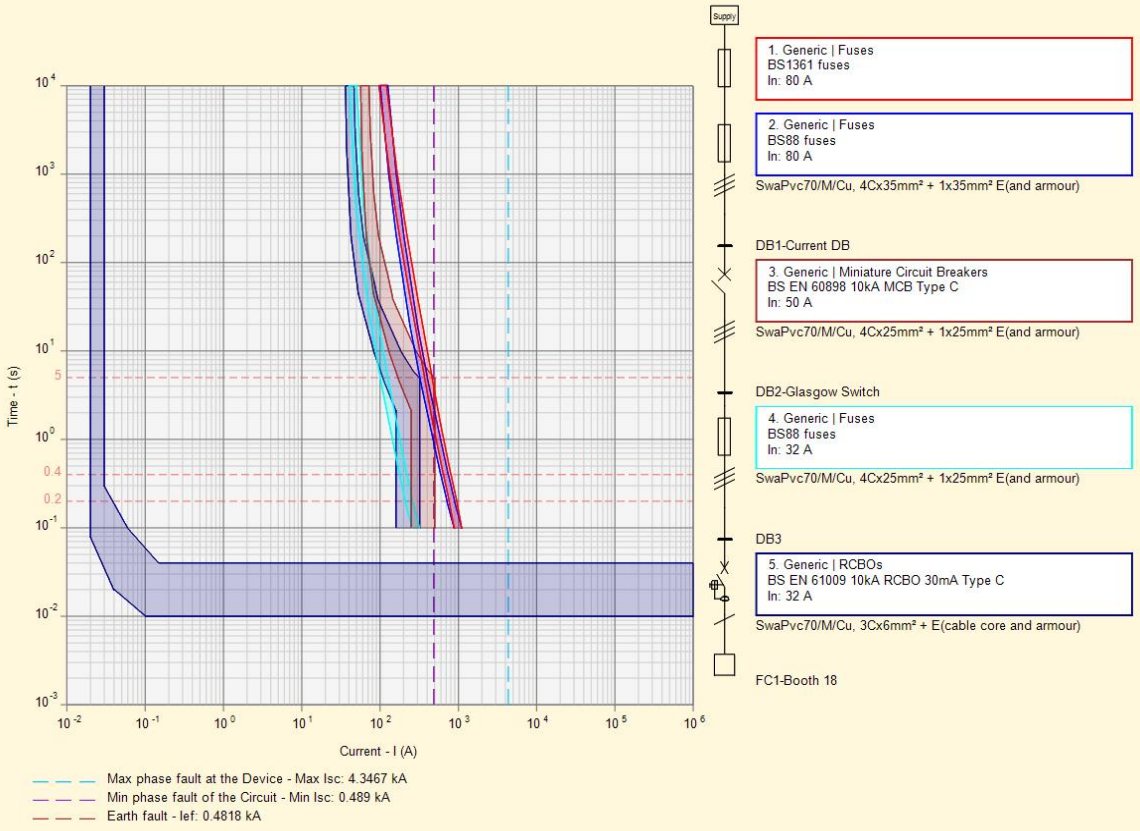
Selectivity checks between Upstream and Downstream devices

Overcurrent	Energy based	Earth fault
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Selectivity study analysis report

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

	Upstream	Downstream
Circuits	DB3	FC1-Booth 18
Manufacturer	Generic	Generic
Type	Fuses	RCBOs
Family	BS88 fuses	BS EN 61009 10kA RCBO 30mA Type C
Rating	In (A): 32	In (A): 32
RCD	-	-
Settings	-	-



Downstream Circuit Calculations			
Ib (A)	**Max Isc at the Device (kA)**	**Min Isc of the Circuit (kA)**	**Ief (kA)**
4.3478	4.35	0.49	0.48

Selectivity checks between Upstream and Downstream devices		
Overcurrent	**Energy based**	**Earth fault**
Fail	Fail - Downstream Let-through energy > Upstream Fuse pre-arcing energy (2.39 x 10^3 A^2s > 1.61 x 10^3 A^2s)	OK

Current limiting report : SB1-Sub-Main Chamber

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Distribution circuit	Devices	Reinforced Breaking Capacity (kA)	Use Limiting	Non Limited Fault In (rms) (kA)	Limited Fault Out (Peak) (kA)	Limited Fault Out (rms) (kA)	Limited (1ph) Fault (rms) Out (kA)	Current limiting %
DB1-Current DB	Generic\BS88 fuses\80A	N/A	No	11.59	21.3	11.59	11.42	0%
DB2-Glasgow Switch	Generic\BS EN 60898 10kA MCB Type C\50A	N/A	No	9.4	14.96	9.4	7.45	0%
DB3	Generic\BS88 fuses\32A	N/A	No	7.45	11.85	7.45	4.99	0%

Protective devices commissioning report : SB1-Sub-Main Chamber

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	DB1-Current DB	**Supply from**	SB1-Sub-Main Chamber	**Cable ID**	c-d-1
Device	Generic\BS88 fuses				
Rating - In	80 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	80 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Protective devices commissioning report : DB1-Current DB

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	DB2-Glasgow Switch	**Supply from**	DB1-Current DB	**Cable ID**	c-d-2

Device	Generic\BS EN 60898 10kA MCB Type C				
Rating - In	50 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Protective devices commissioning report : DB2-Glasgow Switch

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	DB3	**Supply from**	DB2-Glasgow Switch	**Cable ID**	c-d-3
Device	Generic\BS88 fuses				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	80 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Protective devices commissioning report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	SPD	**Supply from**	DB3	**Cable ID**	c-f-20
Device	Generic\BS EN 60898 10kA MCB Type C				
Rating - In	6 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 1	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 2	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Protective devices commissioning report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	FC1-Booth 3	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 4	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 5	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Protective devices commissioning report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	FC1-Booth 6	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 7	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 8	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Protective devices commissioning report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	FC1-Booth 9	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 10	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 11	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Protective devices commissioning report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	FC1-Booth 12	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 13	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 14	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Protective devices commissioning report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	FC1-Booth 15	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

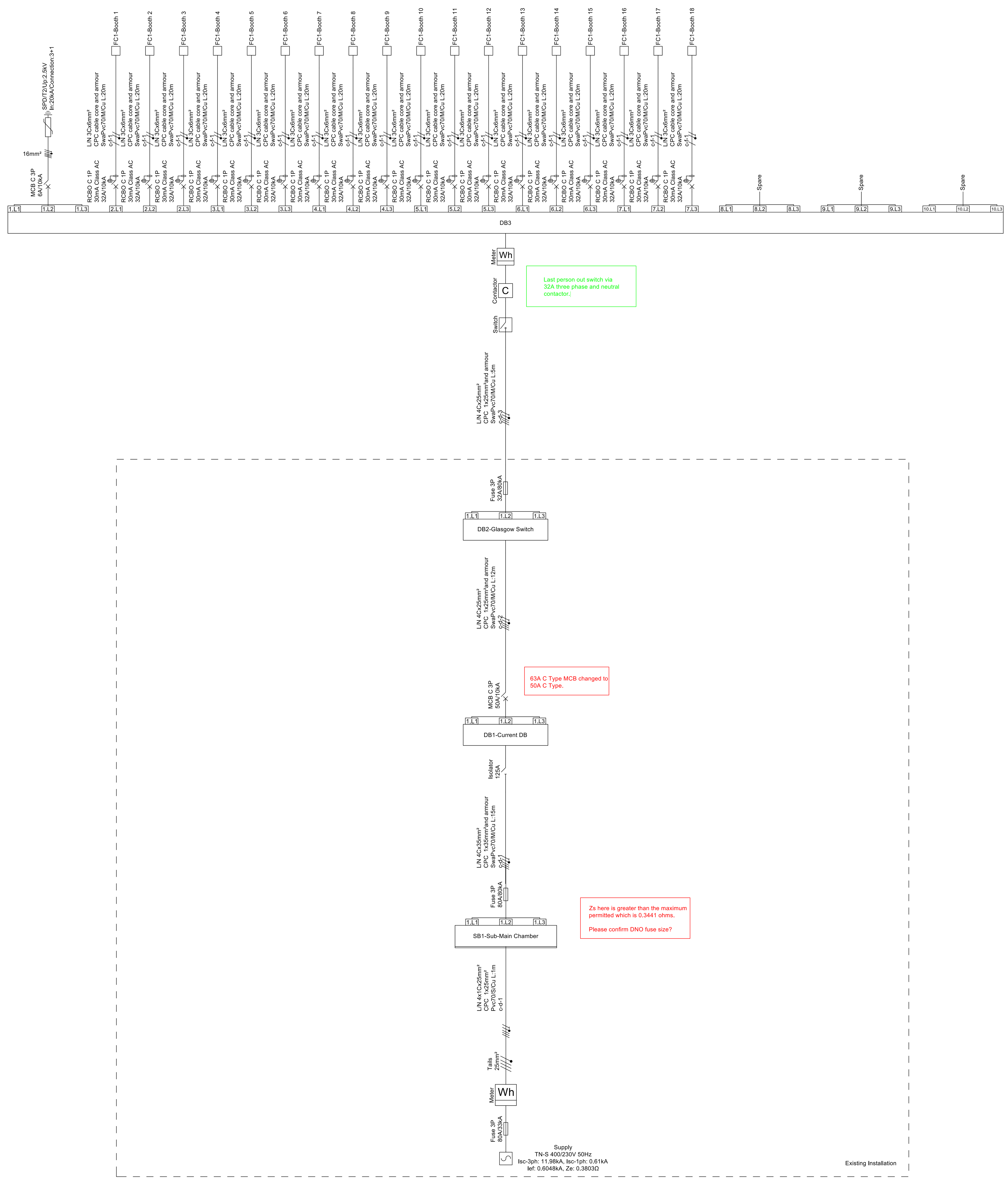
Circuit	FC1-Booth 16	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Circuit	FC1-Booth 17	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					

Protective devices commissioning report : DB3

Company	**UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL**
Designer	**Neil Bridgeman EngTech, MIET, CMgr FCMI**

Circuit	FC1-Booth 18	**Supply from**	DB3	**Cable ID**	c-f-1
Device	Generic\BS EN 61009 10kA RCBO 30mA Type C				
Rating - In	32 A	**Adjusted Rating - Ir**	N/A	**Breaking Capacity - Icu**	10 kA
RCD: No		Arc Fault Detection: No			
Device Settings					
N/A					
Commissioning Information					
Full name		**Signature**		**Date**	
Comments					



Project description	Details		
Waltham College Training Booths	Main		
Design firm UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL	Design by Neil Bridgeman EngTech, MIET, CMgr FCMI	Design date 14/10/2021	Drawing No.
Client Waltham College	Revision by	Revision date	Sheet No.

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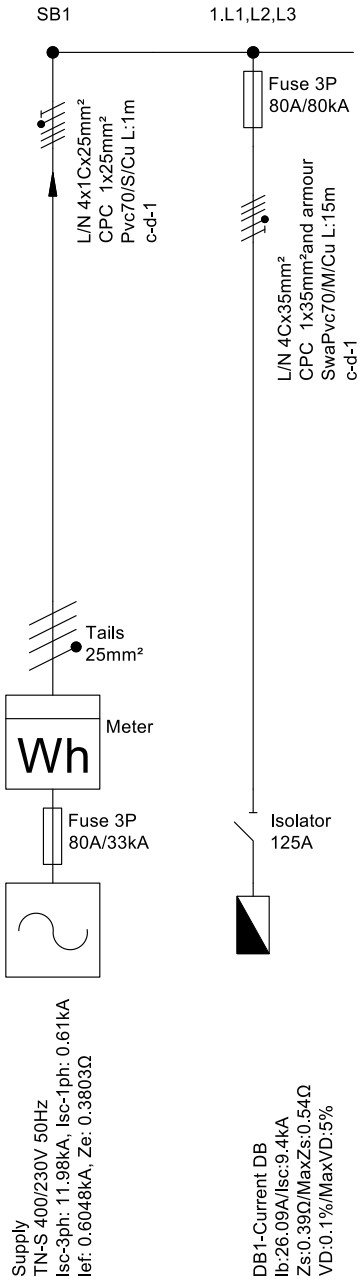

SB1-Sub-Main Chamber results:
Load(A): L1: 26.09 , L2: 26.09 , L3: 26.09
Isc(kA) Start point: 11.79 / End point: 11.59
Zs(Ω): 0.38 / Max Zs(Ω): 0.47
VD(%): 0.01 / Max VD(%): 5

Project description Waltham College Training Booths		Details SB1-Sub-Main Chamber	
Design firm UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL	Design by Neil Bridgeman EngTech, MIET, CMgr FCMI	Design date 14/10/2021	Drawing No.
Client Waltham College	Revision by	Revision date	Sheet No. 1

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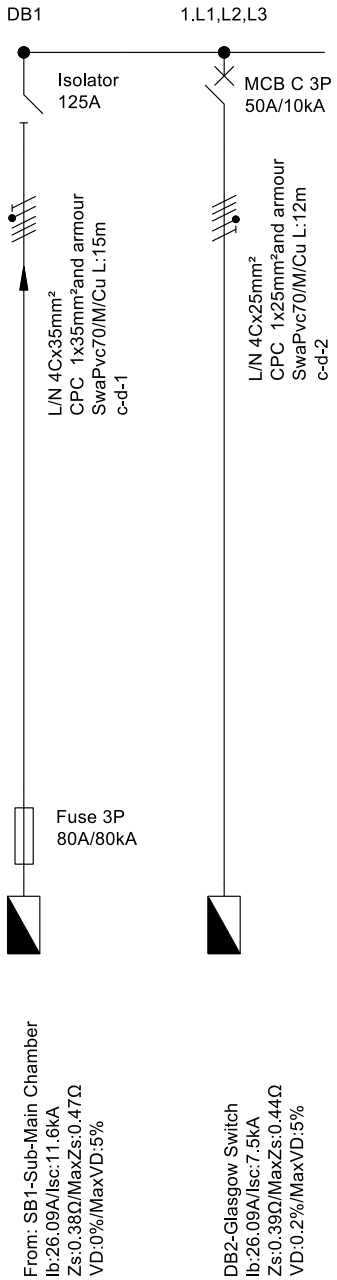

DB1-Current DB results:
Load(A): L1: 26.09 , L2: 26.09 , L3: 26.09
Isc(kA) Start point: 11.59 / End point: 9.4
Zs(Ω): 0.39 / Max Zs(Ω): 0.54
VD(%): 0.09 / Max VD(%): 5

Project description Waltham College Training Booths		Details DB1-Current DB	
Design firm UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL	Design by Neil Bridgeman EngTech, MIET, CMgr FCMI	Design date 14/10/2021	Drawing No.
Client Waltham College	Revision by	Revision date	Sheet No. 1

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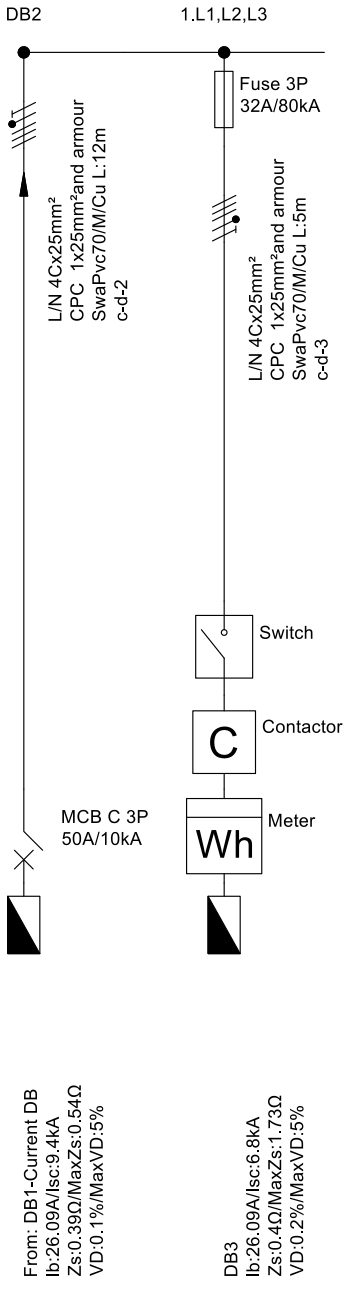

DB2-Glasgow Switch results:
Load(A): L1: 26.09 , L2: 26.09 , L3: 26.09
Isc(kA) Start point: 9.4 / End point: 7.45
Zs(Ω): 0.39 / Max Zs(Ω): 0.44
VD(%): 0.1 / Max VD(%): 5

Project description Waltham College Training Booths		Details DB2-Glasgow Switch	
Design firm UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL	Design by Neil Bridgeman EngTech, MIET, CMgr FCMI	Design date 14/10/2021	Drawing No.
Client Waltham College	Revision by	Revision date	Sheet No. 1

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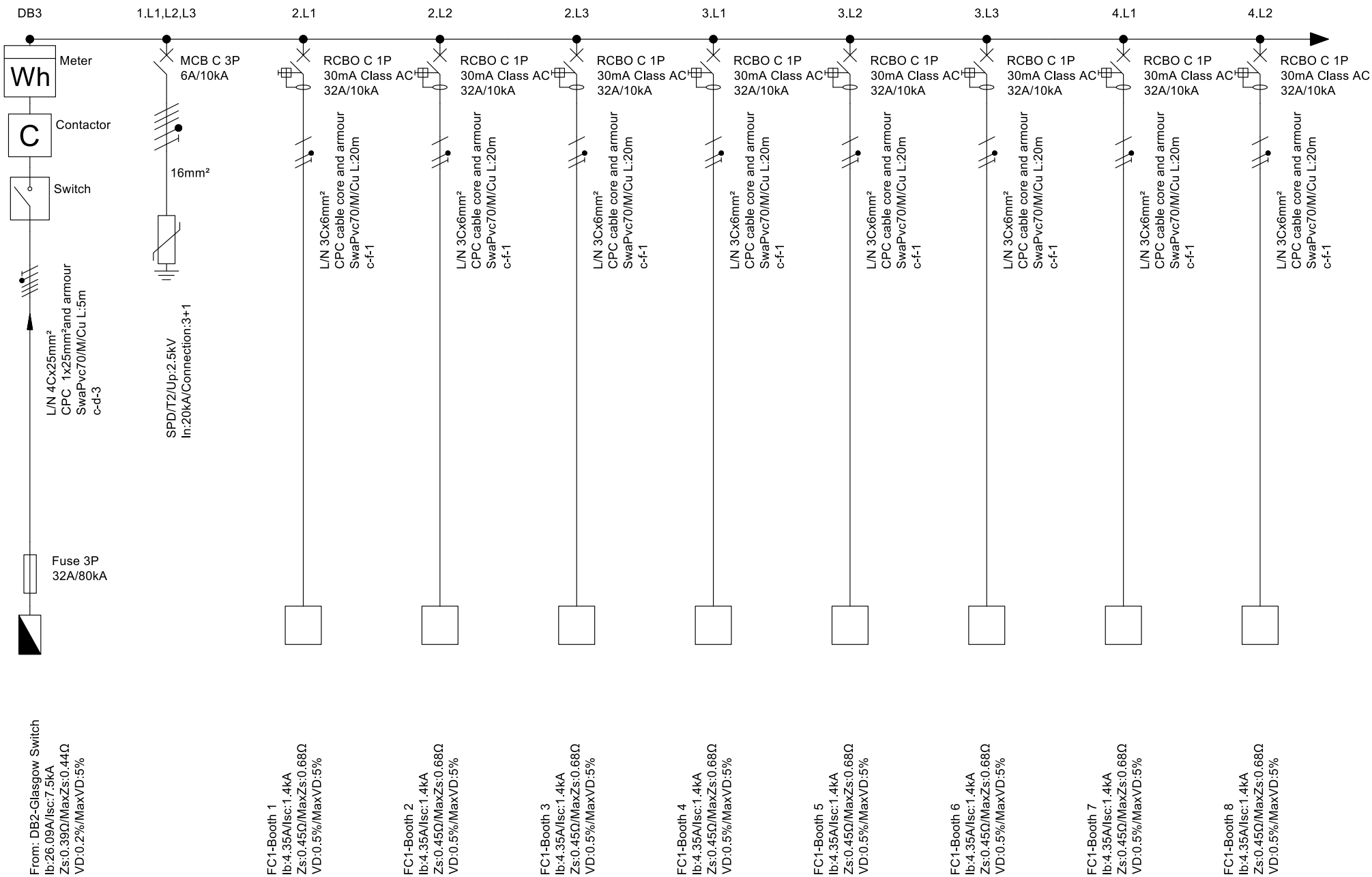

DB3 results:
Load(A): L1: 26.09 , L2: 26.09 , L3: 26.09
Isc(kA) Start point: 7.45 / End point: 6.8
Zs(Ω): 0.4 / Max Zs(Ω): 1.73
VD(%): 0.04 / Max VD(%): 5

Project description Waltham College Training Booths		Details DB3	
Design firm UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL	Design by Neil Bridgeman EngTech, MIET, CMgr FCMI	Design date 14/10/2021	Drawing No.
Client Waltham College	Revision by	Revision date	Sheet No. 1

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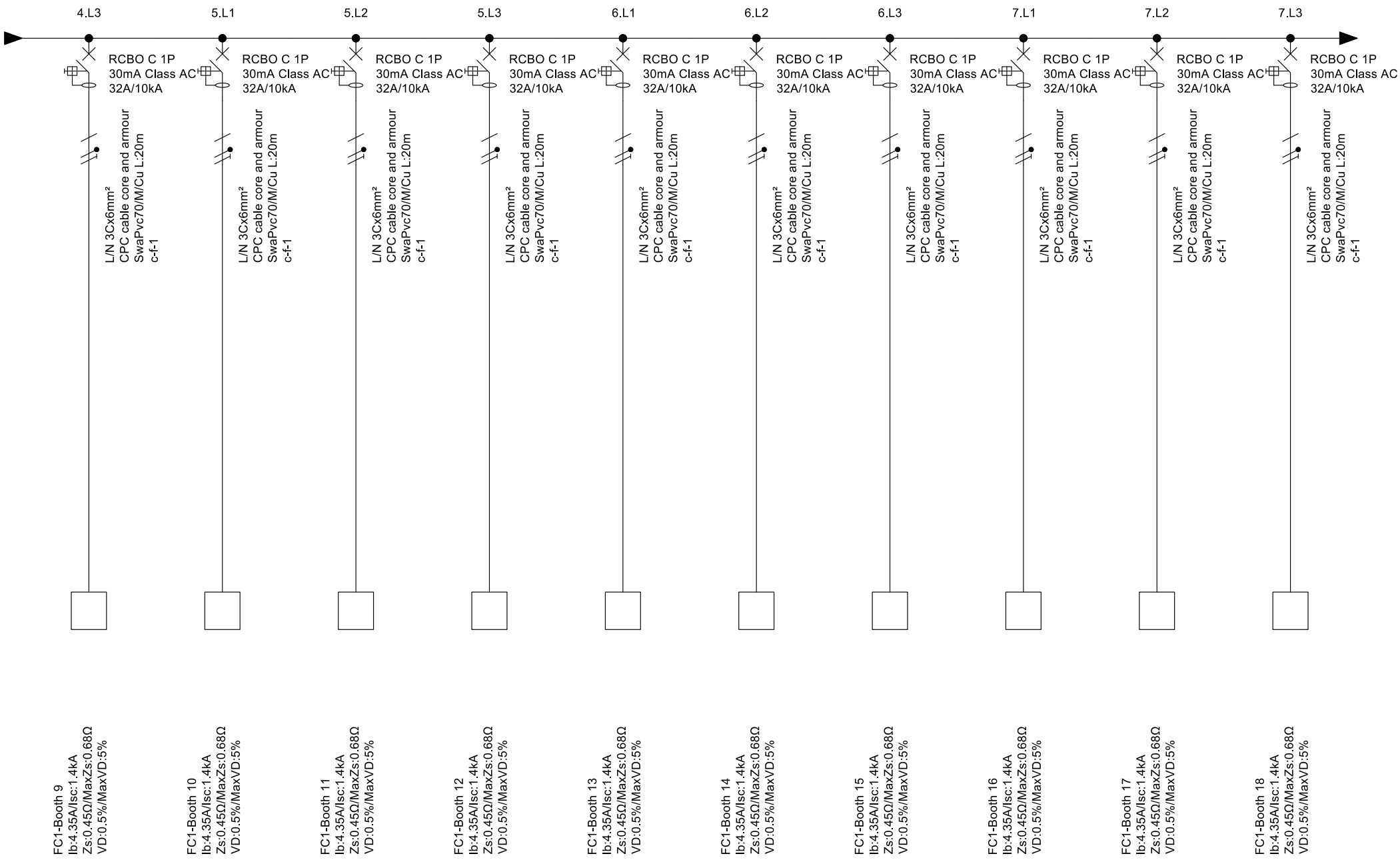

DB3 results:
Load(A): L1: 26.09 , L2: 26.09 , L3: 26.09
Isc(kA) Start point: 7.45 / End point: 6.8
Zs(Ω): 0.4 / Max Zs(Ω): 1.73
VD(%): 0.04 / Max VD(%): 5

Project description: Waltham College Training Booths		Details: DB3	
Design firm: UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL	Design by: Neil Bridgeman EngTech, MIET, CMgr FCMI	Design date: 14/10/2021	Drawing No.
Client: Waltham College	Revision by	Revision date	Sheet No.: 2

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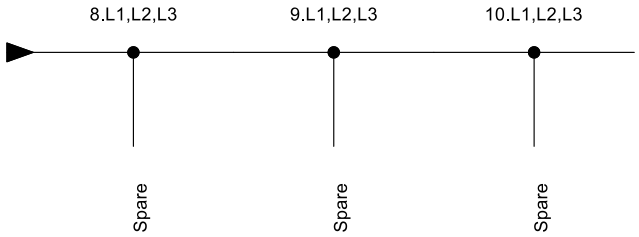

DB3 results:
Load(A): L1: 26.09 , L2: 26.09 , L3: 26.09
Isc(kA) Start point: 7.45 / End point: 6.8
Zs(Ω): 0.4 / Max Zs(Ω): 1.73
VD(%): 0.04 / Max VD(%): 5

Project description: Waltham College Training Booths		Details: DB3	
Design firm: UKES Rail Ltd - Kingsbury House, Kingsbury Square, Melksham, Wiltshire, SN12 6HL	Design by: Neil Bridgeman EngTech, MIET, CMgr FCMI	Design date: 14/10/2021	Drawing No.
Client: Waltham College	Revision by	Revision date	Sheet No.: 3

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